Workshop Manual

911 Carrera

DR. ING. h. c. F. PORSCHE Aktiengesellschaft

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This workshop manual describes all of the important operations for which special instructions are required to assure proper completion. This manual is essential for the shop foremen and mechanics, who need this information to keep the vehicles in a safe operating condition. The basic safety rules, of course, also apply to repairs on vehicles without exception.

The information is grouped according to repair numbers which are identical to the first two digits of the repair time and warranty code.

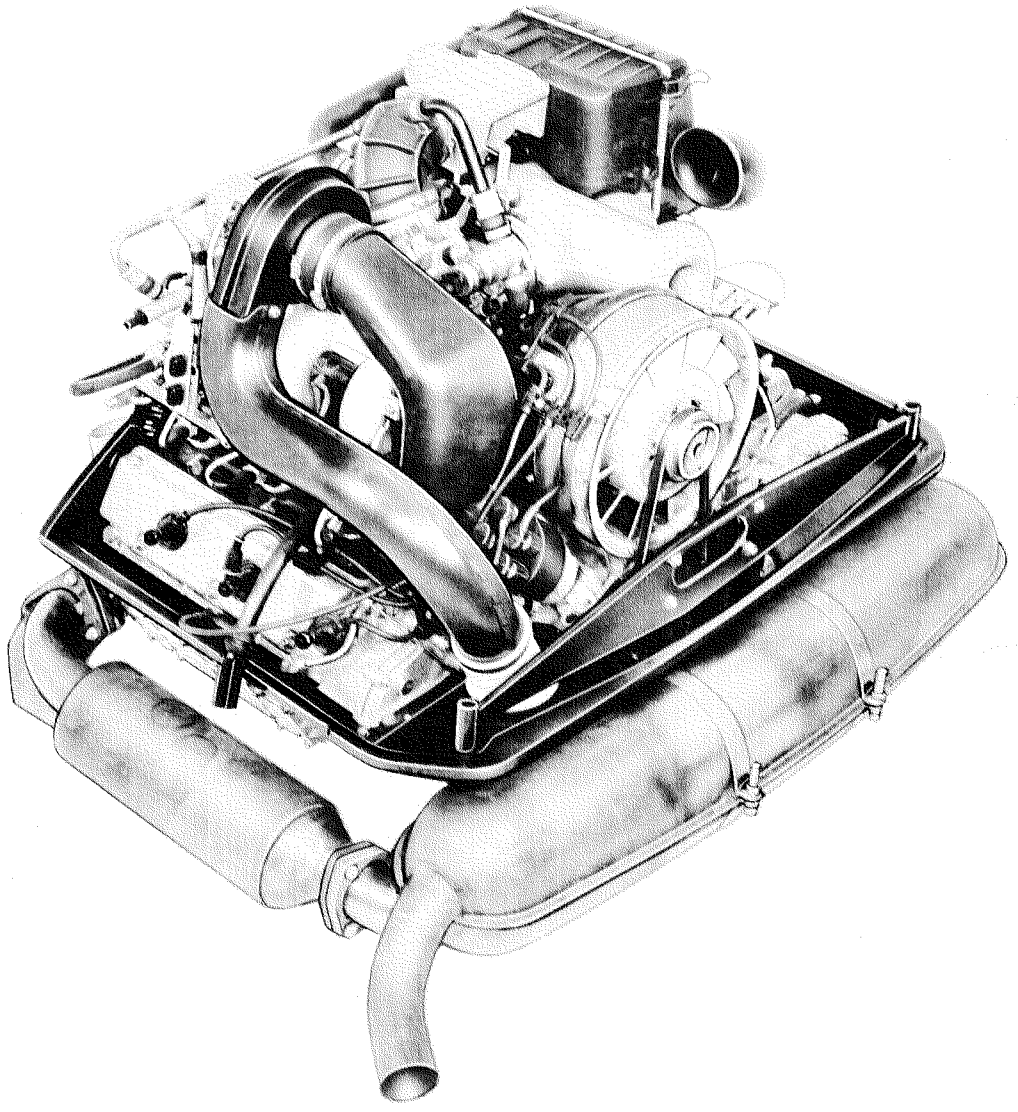
The repair group index, an alphabetical index and the register table are quick guides to find information in the manual.
The parts in illustrations of this workshop manual are numbered in the order of disassembling and, if necessary, will be supplemented with information on procedures and application of special tools on the following pages.

Descriptions of design and function can be found in the service training course reference material.

This workshop manual will be kept up to date with Technical Information bulletins, which will be made part of the manual from time to time. We recommend that these workshop bulletins be filed in the special folder provided for this purpose.

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TECHNICAL DATA - 911 CARRERA

(Adjusting specifications and wear limits are listed in each individual repair group.)

Note: USA values in parentheses
* Engine type 930/25
** Engine type 930/25 Australia

Engine

Internal engine code		930/20 (930/21) 930/26 (930/25*)
Number of cylinders		6
Bore	mm/in.	95.0/3.74
Stroke	mm/in.	74.4/2.93
Displacement (actual)	cc/in.^{3}	3164/193
Displacement (taxation)	cc/in.^{3}	3125
Compression ratio		10.3:1 (9.5:1) (9.5:1*) 9.5:1**
Max. power to 80/1269 EWG	kW/HP	170/231 (152/207) (160/214*) 152/207**
Net power to SAE J 1349	kW/HP	166/223 (149/200)
at engine speed	rpm	5900
Max. torque to 80/1269 EWG	Nm/Kpm	284/29.0 262/26.7 260/26.5**
Net torque to SAE J 1349	Nm/ftlb	278/276 (251/185) (265/195*)
at engine speed	rmp	4800
Max. specific power output	kWL/HPI	53/73 (48/65) 48/65**
Net power to SAE J 1349	kWL/HPI	53/75 (47/63)
Fuel grade	RON/MON	98/89 (91/82 unleaded - recommended 96/86) (95/super unleaded*)
Max. engine speed	rpm	6520
Engine weight (dry)	kg/lbs	219/483

Engine design

Type	6 cylinder, 4 stroke, internal combustion engine with two opposite banks of cylinders (opposite cylinder engine)

Crankcase	Light alloy, two-piece
Crankshaft	Forged steel, 8 bearings
Crankshaft bearings	Plain
Connecting rods	Forged steel
Connecting rod bearings	Plain
Pistons	Forged light alloy
Cylinders	Light alloy separate cylinders
Cylinder head	Light alloy separate cylinder heads
Valve guides	Special brass, press-fit
Valve arrangement	1 intake, 1 exhaust, overhead V
Valve timing	One each overhead camshaft left and right
Camshaft	Cast steel
Camshaft drive	Chain
Valve clearance	0.10 mm (intake and exhaust, cold)
Timing	Intake opens 4° before TDC Intake closes 50° after BDC Exhaust opens 46° before TDC Exhaust closes at TDC

Engine cooling

Type	Air cooling
Fan drive	Belt-driven from crankshaft
Crankshaft/fan ratio	approx. 1 to 1.67
Air flow rate	1500 ltr./sec. at crankshaft speed of 6000 rpm

Engine lubrication	
Type	Dry sump lubrication with separate oil tank
Oil cooling	Thermostatically controlled oil cooler on crankcase in fan stream and front oil cooler in right front fender - with blower*, 87 models onward
Oil filter	Full flow
Oil pressure at 5000 rpm	At lest 3.5 bar at 90°C/190°F oil temperature
Oil pressure indication	Indicator lamp and pressure gage
Oil consumption	Up to 1.5 liters/1000 km
Exhaust system	Standard: single pipe system with junction outside of heat exchanger, primary and main mufflers. Optional extra: USA (49 states) as standard, catalytic converter instead of primary muffler.
Emission control	Standard: ---- Optional extra: USA (49 states) oxygen sensor with 3-way catalytic converter. 930/26 with secondary air injection.
Heating	Engine-dependent warm air heating with additional electric blowers and automatic temperature control
Fuel system	
Type	DME (Ditigal Motor Electronics)
Fuel delivery	1 electric roller cell pump

Electrical system

Suppression		ECE-R 10 and 72/245/EC or VDE 0879
Battery voltage	V	12
Battery capacity	Ah	66
Battery capacity (optional extra)	Ah	88
Alternator output	A/W	90/1260
Ignition		Electronic ignition (breakerless)
Firing order		1 - 6 - 2 - 4 - 3 - 5
Ignition timing		DME

Body design

Integral all steel body, optional with front and rear spoilers
- as Coupe, with/without sunroof
- as Targa with removable hardtop
- as Cabriolet with convertible top, electric drive optional
- optionally in Turbo Look

Dimensions (at DIN curb weight)

Length	mm/in.	4291/168.94	
Width	mm/in.	1652/65.04	
Height	mm/in.	1320/51.97	
Wheelbase (in design pos.)	mm/in.	2272/89.45	
			Rim size:
Track, front	mm/in.	1372 (54.9)	6 J x 15
		1372 (54.9)	6 J x 16
		1398 (55.0)	7 J x 15
rear	mm/in.	1354 (53.3)	6 J x 15
		1354 (53.3)	6 J x 16
		1380 (54.3)	7 J x 15
		1380 (54.3)	7 J x 16
		1405 (55.3)	8 J x 15

Dimensions (at DIN curb weight)

Ground clearance (at total weight)	mm/in.	120/4.72
Bed clearance (at total weight)	mm/in.	70/2.76
Overhand angle, front		15.5°
Overhand angle, rear		17°

Weights (to DIN 70020)

Curb weight - front	kg/lbs	490/1080 (500/1102)
Curb weight - rear	kg/lbs	720/1558 (750/1654)
Curb weight - total	kg/lbs	1210/2668 (1250/2756)
Max. total weight	kg/lbs	1530/3374 (1550(3418)
Max. axle load - front	kg/lbs	680/1499 (650/1433)
Max. axle load - rear	kg/lbs	940/2073 (950/2095)
Max. roof load, incl. weight of roof luggage carrier	kg/lbs	35/77 or 75/165 with original Porsche roof transport system (only Coupe)
Max. trailer load (without trailer brakes)*	kg/lbs	480/1058
Max. trailer load (with trailer brakes)*	kg/lbs	800/1764 (750/1654)
Max. car/trailer weight	kg/lbs	2330/5138 (2300/5071)
Max. drawbar load	kg/lbs	50/110 50/124 to 100 km/h - for Italy

* For gradients up to 16%

Capacities

Engine - depending on measurement with oil dipstick according to Driver's Manual	Quality HD oils to API Classification SE or SF - see Driver's Manual

Capacities

Engine oil volume	approx. 13 liters
Transmission and differential	approx. 3 liters of hypoid oil SAE 90 to MIL-L 2105 B, API Classification GL 5
Fuel tank	approx. 80 liters, of which 8 in reserve
85 models onward	approx. 85 liters, of which 8 in reserve
Brake fluid reservoir	approx. 0.2 liters
Windshield and headlight washing fluid reservoir	approx. 8 liters
Intensive cleaning system	approx. 0.6 l. Use only "Porsche Special Silicone Remover"

Performance

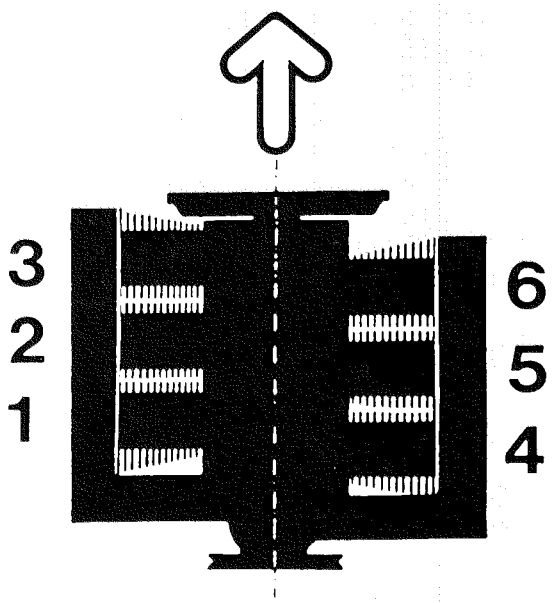
Top speed	km/h/mph	245/152 (235/146: 240/149, 87 models onward
Acceleration from 0 - 100 km/h*	sec.	6.1
(from 0 - 60 mph)*	sec.	(6.3; 6.1, 87 models onward)
Kilometer from standing start*	sec.	26.1
(1/4 mile from standing start)*	sec.	(14.7; 14.4, 87 models onward)

* DIN curb weight and half of payload

Hill climbing

In % (slip limit)	Manual transmission
1st gear	73(73)
2nd gear	45(38)
3rd gear	26(23)
4th gear	16(16)
5th gear	12(10)

DESIGNATION OF CYLINDERS



Maintenance Schedule

The recommended service intervals apply under normal driving conditions and do not take into consideration all of the optional equipment available. Dusty areas require more frequent checking and possibly replacement of the air filter cartridge. Tire, clutch, and brake wear as well as the condition of the oil in the engine in particular depend greatly on the driving habits and are adversely influenced by extreme operating conditions; this might necessitate shorter intervals for checking and replacement and applies logically also for the item "check battery acid level".

Also, the new moving components of the chassis require a certain running-in period. We recommend, therefore, having an alignment check performed after the first 2000 to 3000 miles / 3000 to 5000 km.

Maintenance service should be carried out at least once a year and precautionary measures against corrosion should be taken before winter. The brake fluid should be renewed every two years.

Service items apply to both 911 Carrera and 911 Turbo unless model is specified.

300 to 1200 miles / 500 to 2000 km		Service required	Then at and every 12000 miles / 20000 km
■	1	Change engine oil and replace engine oil filter. Clean magnetic screws. Check transmission oil level.	■
	2	Change transmission oil. Clean magnetic screws.	every 80000 km
■	3	Check valve clearence. At first service check rocker arm shafts for tightness (when engine cold).	■
	4	Replace spark plugs	■
	5	Fuel supply system: Replace fuel filter. Check all pipe connections for possible leaks and tight fitting. **911 Turbo:** Check fuel pump safety switches for proper functioning.	■
	6	Check throttle linkage for smooth action.	■
	7	Replace air filter element and check hose connections for tightness. **911 Turbo:** Replace filter element in auxiliary air pump. Lubricate throttle valve shaft and check for smooth action.	■
■	8	Check condition and tension of V-belt/toothed belt.	■
	9	**911 Turbo:** Check action of supercharger pressure safety switch.	■
■	10	**911 Turbo:** Check exhaust flange for tightness and whole exhaust system for leaks.	■
■	11	Check idling setting with exhaust gas analyser (engine oil temperature approx. 90 °C). **911 Turbo:** Check ignition timing.	■
■	12	Check engine, oil reservoir, pipes and lines, front oil cooler and transmission for leaks.	■
■	13	Check clutch play and accelerator pedal travel, lubricate clutch release lever and helper spring (not at 500–2000 km).	■
	14	Check brake fluid level in reservoir, brake pads wear, push rod free play between brake pedal and brake booster. Check free travel of hand and foot brake. Inspect all pipings, hoses and hose connections for damage and corrosion. Inspect entire brake system for possible leaks. Check handbrake and brake pedal (road test or test stand run).	■
	15	Steering: Check tightness and function of all connections to steering gear, track rods, control arms and joints. Check tightness of protection caps (remove cover).	■
	16	Check front wheel bearing play.	■
■	17	**911 Turbo:** Check rear wheel bearing play.	■
■	18	Check tire pressure.	■
	19	Check battery acid level: Check headlight adjustment and operation of turn indicators, stop and rear lights, as well as windshield wipers and horns. Check adjustment of spray nozzles, top up washer reservoir (anti-freeze).	■
	20	Attend to seals on doors, lids, Targa/Convertible top. Remove any accumulated rubber dust. Check door catches. Lubricate door hinges. Check door and lid locks as well as front lid safety catch for tightness and function.	■
	21	Check function of heating, ventilation/air conditioner (driver's and passenger side).	■

I. Required Maintenance for the Emission Control System

Required at 500 - 2000 miles / 800 - 3200 km		Required every 15000 miles / 24000 km	Required every 30000 miles / 48000 km
Change	Engine oil	Change	Change
Replace	Engine oil filter	Replace	Replace
Check and adjust	Valve clearance (replace cover gasket)	Check and adjust	Check and adjust
	V-belts and Drive-belt: check tension and condition. New V-belts must be readjusted after the first 1000 miles / 1500 km		Adjust or replace if necessary
	Spark plugs (at least every two years)		Replace
Check and adjust	Engine idle speed		
	Air cleaner filter element		Replace

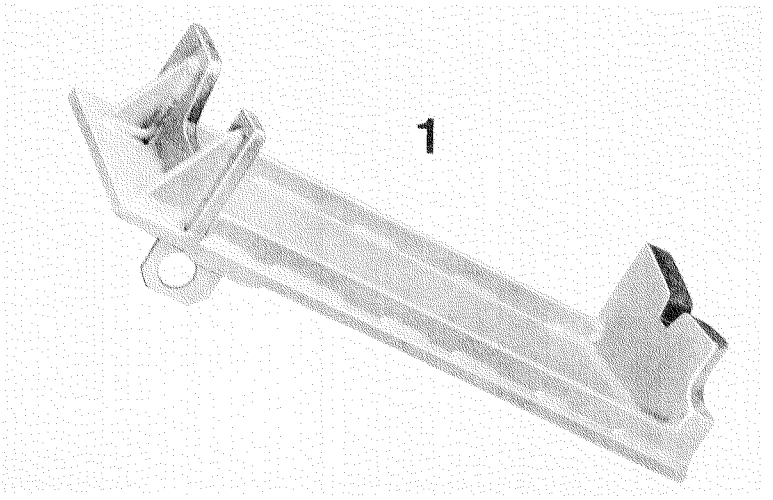
II. Required Maintenance and Lubrication Service

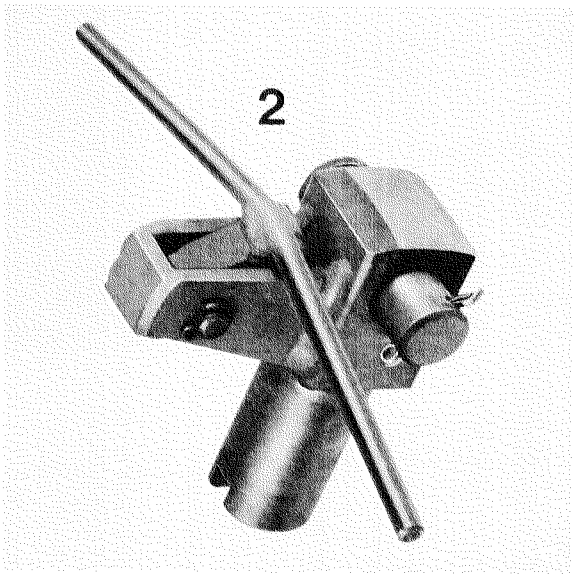
Required at 500 - 2000 miles / 800 - 3200 km		Required every 15000 miles / 24000 km	Required every 30000 miles / 48000 km
	Door hinges	Lubricate	Lubricate
	Accelerator linkage on throttle housing	Lubricate	Lubricate
	Door and Targa top weatherstrips: remove rubber residue from contacting areas and coat with talcum powder or other suitable rubber lubricant	Maintain	Maintain
	Transmission oil (clean magnetic drain plug)	Check and correct	Change
	Windshield and headlight washer, operation and fluid level	Check and correct	Check and correct
	Front wheel bearing play	Check and adjust	Check and adjust
	Front axle: steering gear, tie-rod connections and rubber boots	Check for tightness and leaks	Check for tightness and leaks
Check and adjust	Clutch pedal free play	Adjust	Adjust
	Brake system, all lines and hoses (incl. wear and leaks)	Check	Check
Check	Operation of lights, horns, wipers an washer	Check	Check
Check	Headlight adjustment	Check and correct	Check and correct
	Ignition/steering lock, safety belt warning light and buzzer alarm	Check	Check
	Battery electrolyte level	Check	Check
Check and correct pressure	Tires	Check and correct pressure	Check and correct pressure
During road or dynamometer test:			
Check	Braking, clutch, steering, heating, ventilation systems	Check	Check
Check	All instruments, control and warning lights	Check	Check

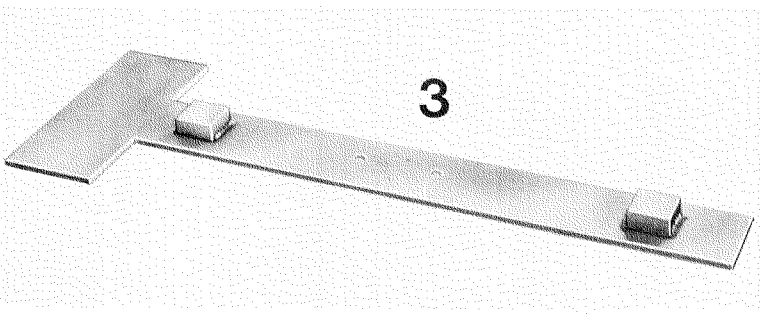
The recommended service intervals apply under normal driving conditions. If you drive mainly in dusty areas, check the air cleaner element more often and replace if necessary. The conditions of oil, and wear-and-tear items (such as tires, brakes, clutch lining) depend greatly on the amount of driving and on driving habits. Therefore, oil and wear-and-tear items should be checked more frequently, and if necessary replaced at shorter intervals. Also, the battery electrolyte level should be checked more often. A complete maintenance and lubrication service should be performed at least once a year, preferably before the winter. The same applies to protective undercoating for the vehicle.
The brake fluid must be replaced every two years, regardless of mileage. The fuel filter should be replaced every 60000 miles/96000 km.
During the break-in period of a new vehicle, all moving parts of the drive train and the suspension system adjust to each other to a certain degree. Therefore, the manufacturer recommends a wheel alignment service after the car has been driven for about 1800 to 3000 miles or 3000 to 5000 kilometers.

REMOVING AND INSTALLING ENGINE

TOOLS







No.	Description	Special Tool	Remarks
1	Engine holder	9111	
2	Engine holder adapter	9111/1	
3	Support	9111/2	

REMOVING AND INSTALLING ENGINE

The complete engine/transmission assembly is removed from below.

Removing

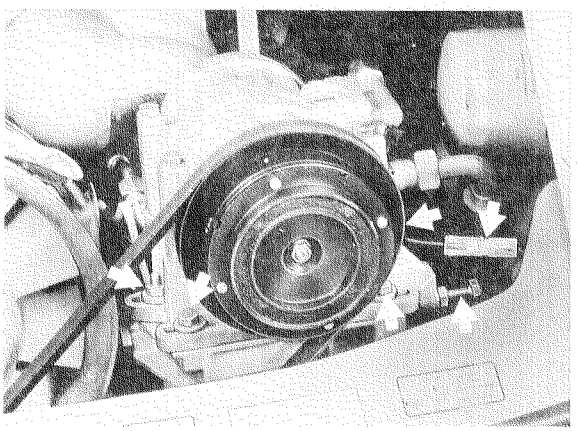
1. Take up car on take-up points.

2. Disconnect battery ground wire.

3. If car has an air conditioner, detach compressor on console and leave compressor in car with hoses connected.

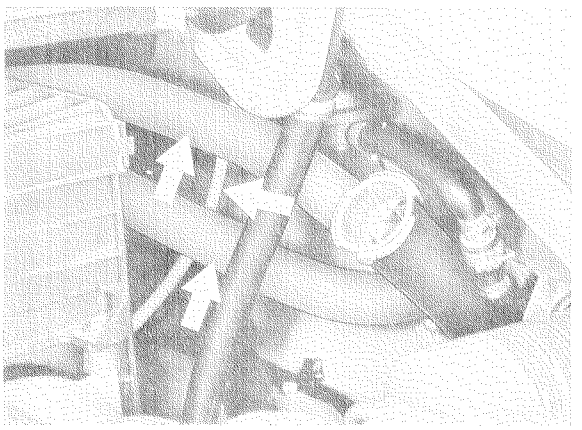
Note:

Air conditioner must be discharged and charged, if hoses are disconnected on compressor.

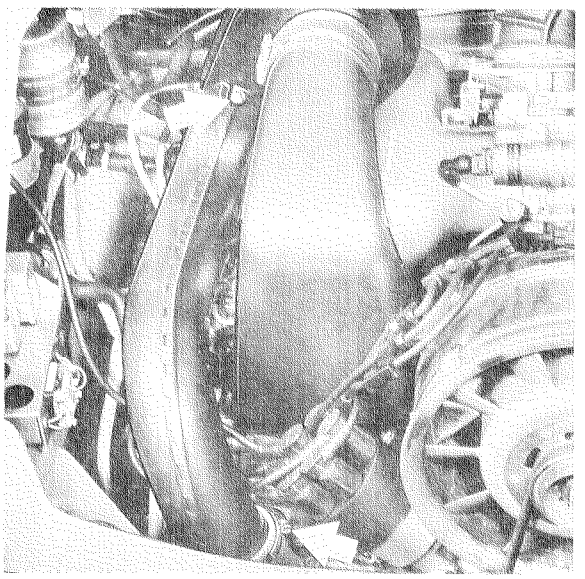


4. Take off air cleaner cover with air filter cartridge.

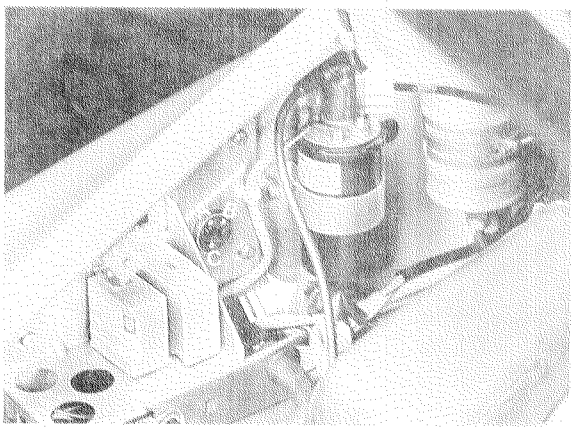
5. Disconnect bottom hose for crankcase breather and top hose from intake hose/ throttle housing on oil tank as well as hoses on air valve.
Also disconnect hose from active carbon cannister on air cleaner of USA cars.



6. Remove hose between extra fan and heat exchangers.



7. Take cover off of central electric board. Pull off multiple pin plug on control board and high voltage lead on ignition coil.



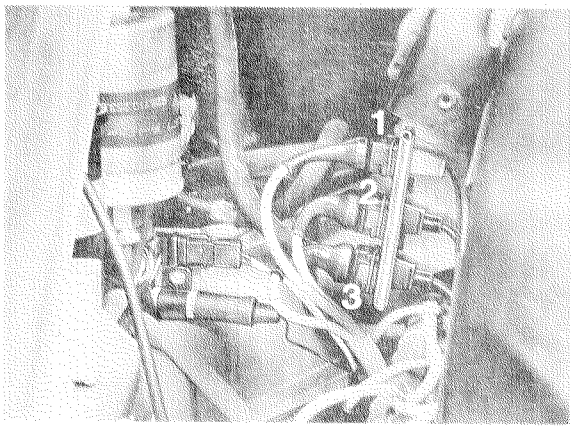
8. Disconnect central engine ground on intake pipe of cylinder no. 1.

9. Plug 1 = wire to temperature sensor II cylinder no. 3

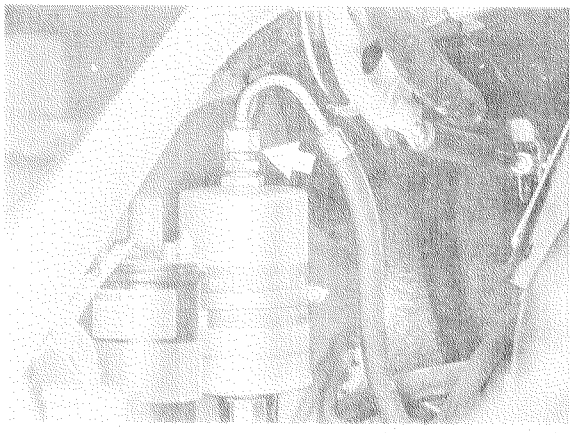
Plug 2 = wire to speed transmitter (DG)

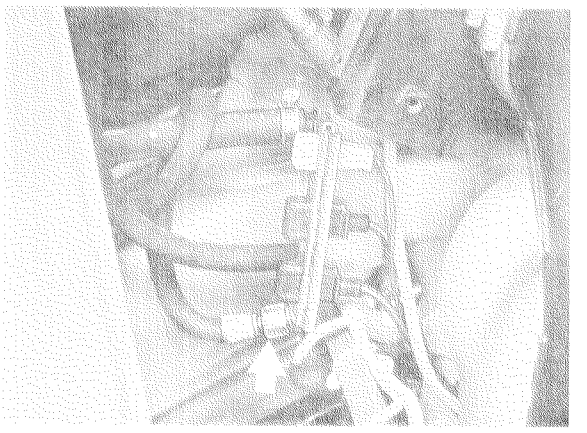
Plug 3 = wire to reference mark transmitter (BG)

Pull off plugs after pressing in clamp. On USA cars also disconnect plug for oxygen sensor and plug for oxygen sensor heating.



10. Unscrew fuel hoses on filter and return line, being sure to counterhold appropriately.





11. Disconnect hose for brake booster.

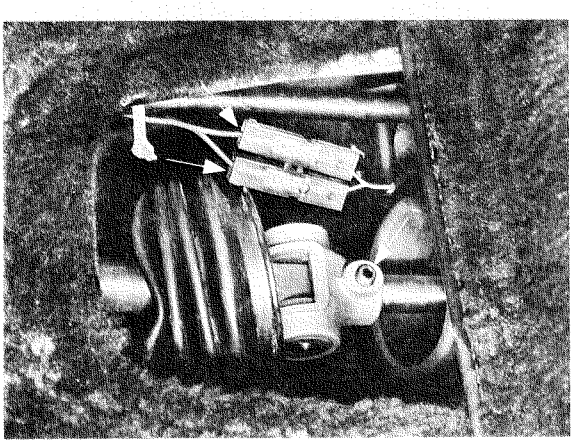


12. Unscrew phillips screws on cover for rear end of tunnel and take off cover.

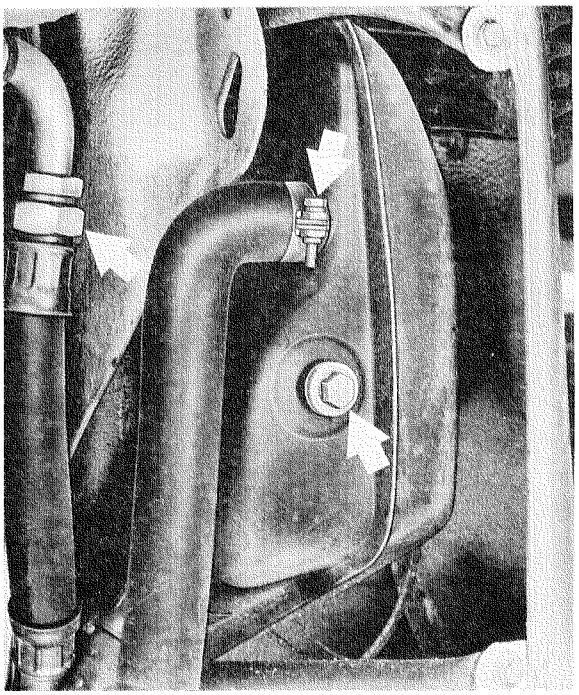
a) Pull seal off of retaining edge on body and push forward over selector rod.

b) Unscrew tapered screw of selector rod coupling and pull coupling off of internal selector arm of transmission.

c) Pull off wires for speed transmitter of electronic speedometer in tunnel and take out rubber sleeve with wire plug.

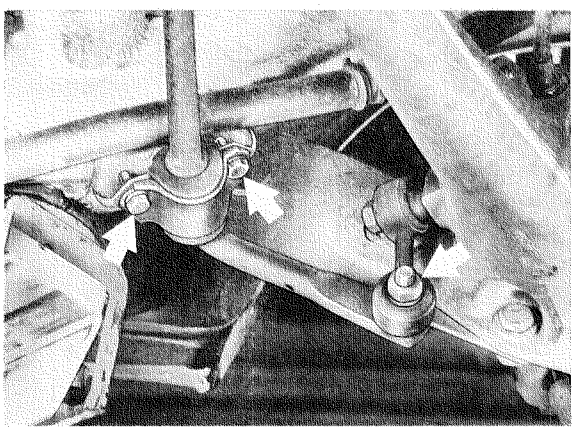


13. Lift car. Drain engine oil. Disconnect oil hose or oil line on engine and oil tank, making sure to counterhold on the oil line.



14. Unscrew and pull off heater hoses on heat exchangers.

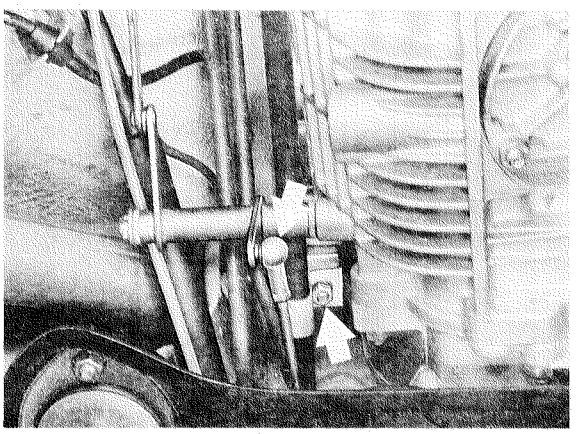
15. Remove rear stabilizer.



16. Disconnect ground strap on body.

17. Disconnect battery wire on starter.

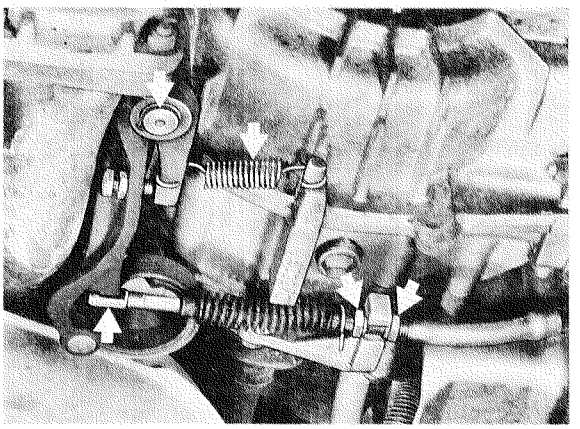
18. Disconnect accelerator pull rod on operating arm and unscrew clutch cable retainer.



19. Remove clutch release lever with spring.

a) Disconnect clutch cable on release lever after loosening cable on holder.

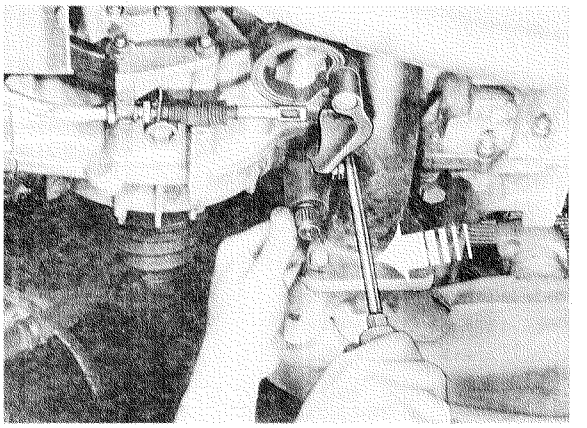
b) Disconnect spring for positioning lever on transmission. Take off circlip and remove positioning lever.



20. Push release lever forward with a suitable tool.

Note:

The spring will expand after passing a pressure point so that the release lever will snap forward.

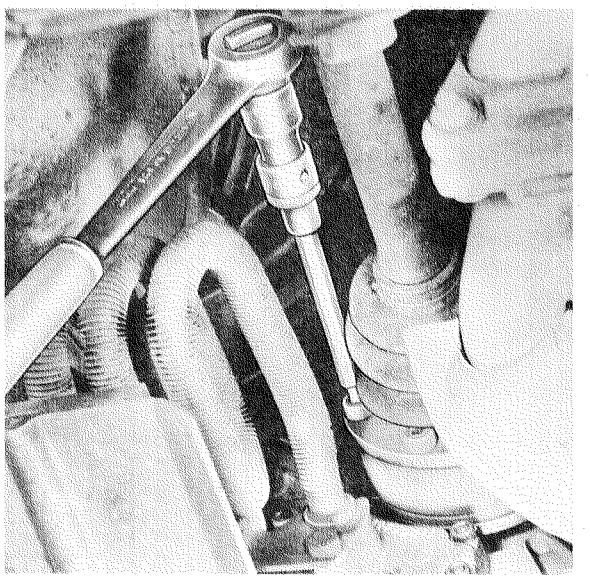


21. Take release lever off of release lever shaft.

22. Unscrew propeller shaft bolts on flange for differential.

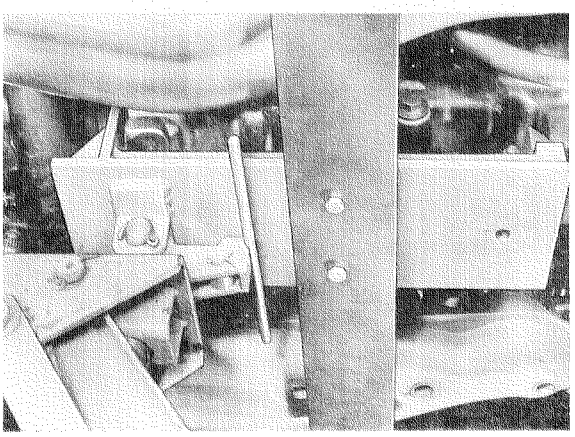
Note:

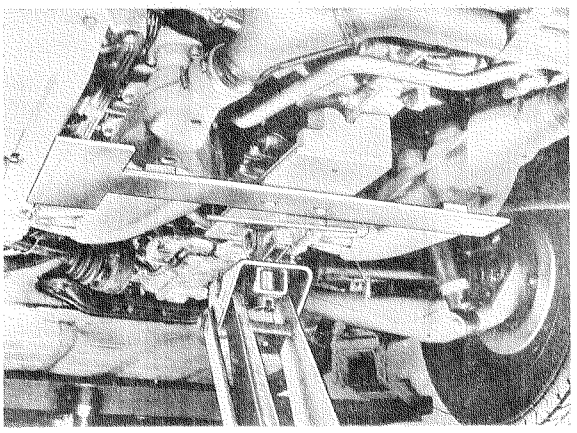
Suspend left propeller shaft from car with a piece of wire to avoid damage on transmission cooling pipe coil when removing and installing engine / transmission assembly.



23. Unscrew rear cowl panel screws and take off cowl panel with seal.

24. Place workshop jack fitted with engine take-up plate underneath engine / transmission assembly at center of gravity point with slight pre-load.

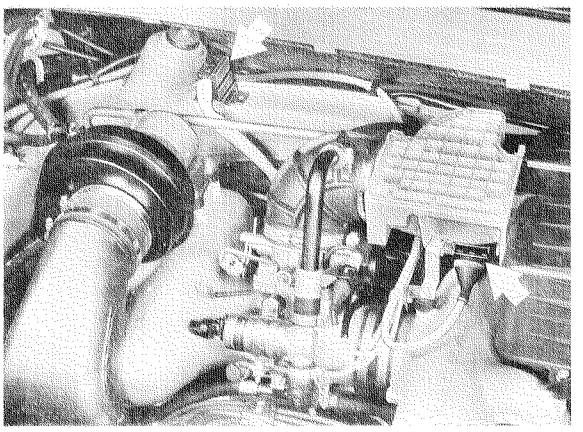




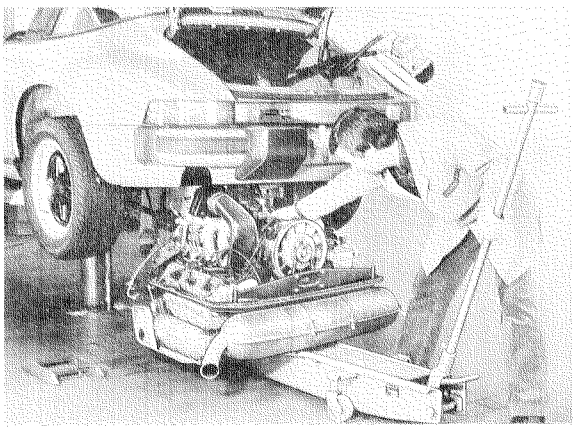
25. Unscrew bolts on transmission carrier.

26. Unscrew bolts on engine carrier.

27. Lower workshop jack with engine / transmission assembly slightly and pull off multiple pin plug on shock absorber cross member as well as plug on air flow sensor.



28. Lower workshop jack with engine/ transmission assembly carefully and roll out toward rear of car.



If the car has to be moved after removal of engine / transmission assembly, suspend propeller shafts from car with pieces of wire in horizontal position (prevents damage on dust covers).

Installing

Check following points when installing.

1. Caution ! Do not clamp heater hoses. Connect hoses on heat exchangers shortly before reaching correct installed position of engine / transmission assembly.

2. Tightening torque:

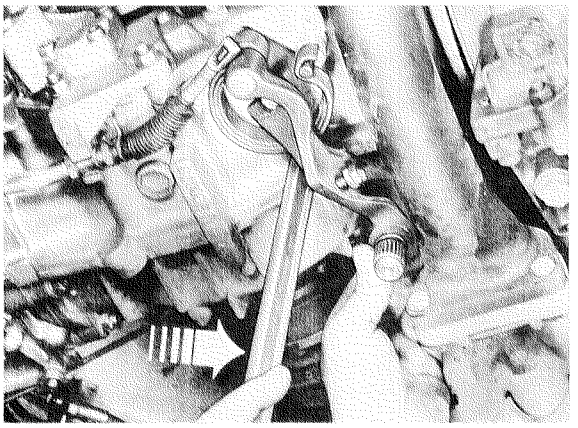
Hexagon head bolts for engine and transmission carriers = 80 Nm (58 ftlb).

Socket head bolts for propeller shaft flange= 42 Nm (30 ftlb).

3. Mount clutch release lever, coating following sliding and bearing surfaces with a waterproof lubricant, for example, Staburags NBU 12 KB 300 from Klueber, or with a multi-purpose grease.

- release lever bore
- release lever shaft (also teeth for positioning lever)
- spring bearing surface on console bolts
- clutch cable installation point on release lever.

4. Place seal and release lever on release lever shaft.
Place spring on console bolt.
Push back release lever until spring exceeds pressure point (lever snaps against console stop).



5. Mount position lever (with seal) in correct position. Keep distance between adjusting screw and positioning lever as small as possible after connection of spring.

6. Make basic clutch adjustment.

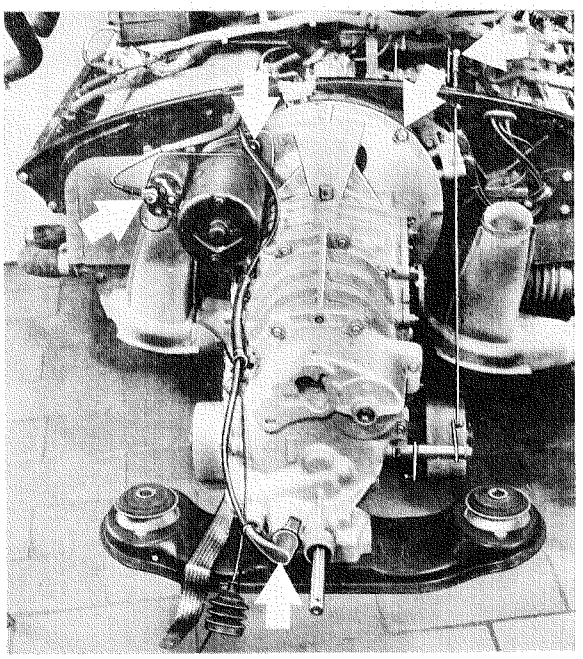
DISCONNECTING AND CONNECTING ENGINE / TRANSMISSION

Disconnecting

1. Disconnect wires on starter and backup light switch.

a) Remove circlip on top for accelerator linkage and disconnect linkage.

b) Unscrew 4 mounting nuts and take transmission off of engine.

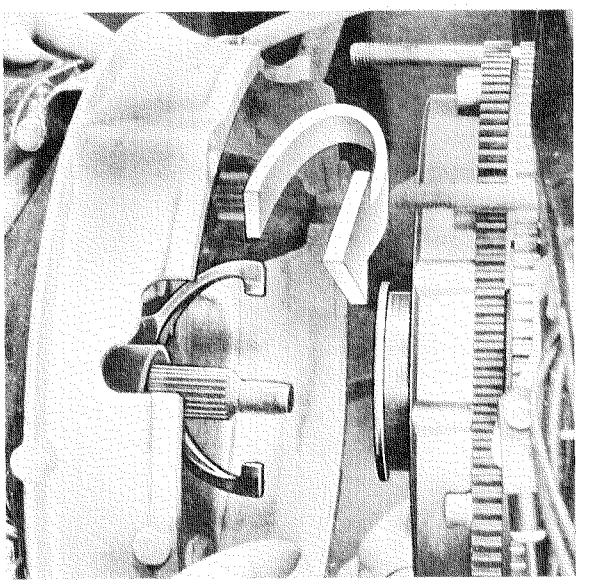


Connecting

Note:

Lubricate all sliding surfaces of clutch release with a multi-purpose grease containing. MoS_2 and teeth of drive shaft with Optimoly HT.

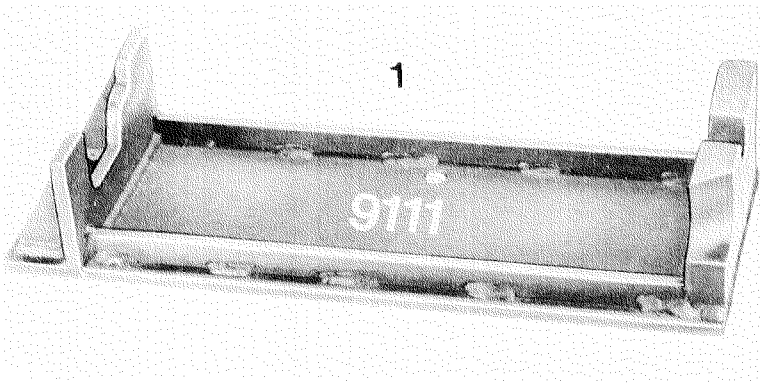
1. Connect release fork while bolting on release bearing.
   Check for correct positioning through opening in transmission case.

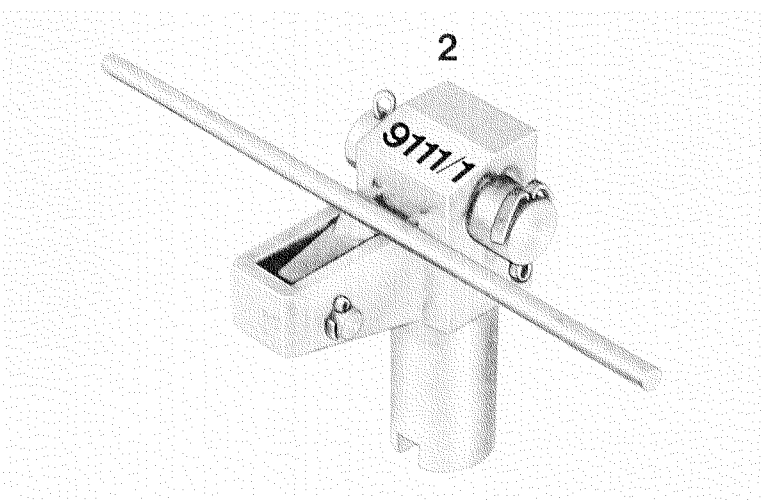


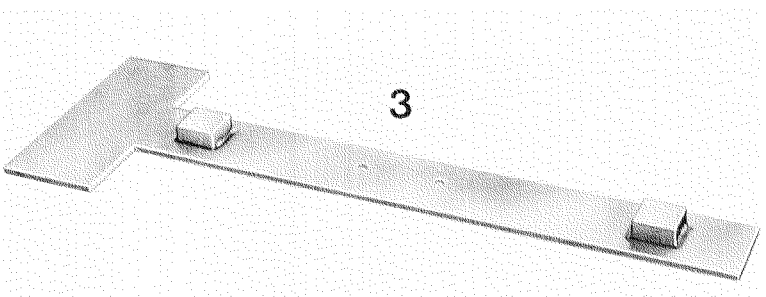
2. Tighten mounting nuts to torque of 45 Nm (32 ftlb).

ENGINE, REMOVING AND INSTALLING
87 MODELS ONWARD
HYDRAULIC
CLUTCH ACTUATION

TOOLS







No.	Description	Special Tools	Remarks
1	Engine holder	9111	
2	Engine holder adapter	9111/1	
3	Support	9111/2	

ENGINE REMOVING AND INSTALLING HYDRAULIC CLUTCH ACTUATION

The complete engine/transmission assembly is removed from below.

Removing

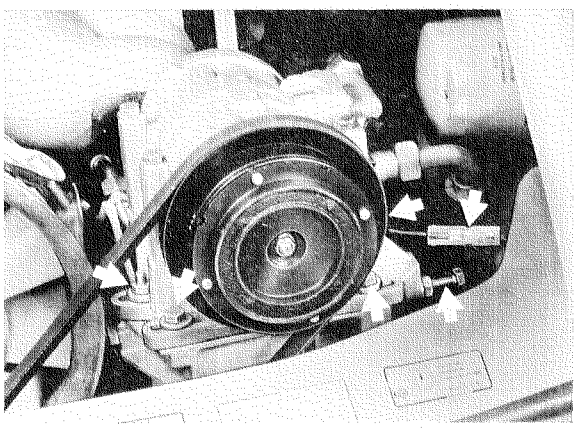
1. Raise car at jacking points.

2. Disconnect ground lead from battery.

3. If an air conditioner is fitted, detach compressor from bracket and leave compressor in car with hoses connected. The compressor can be placed on the right at the rear of the compartment on a suitable support.

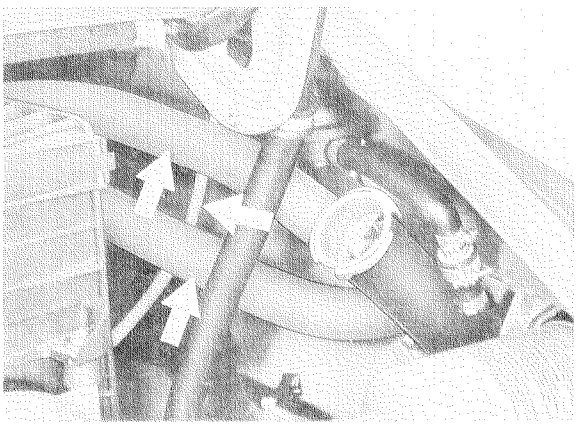
Note:

The system must be recharged if the hoses are disconnected from the compressor.

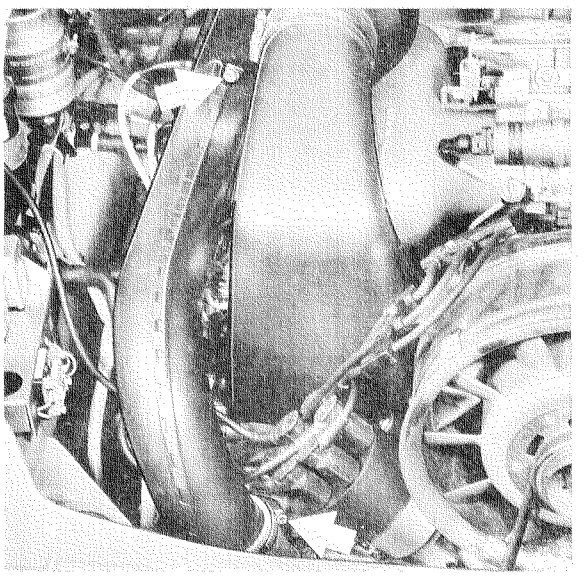


4. Remove air filter cover with air filter cartridge.

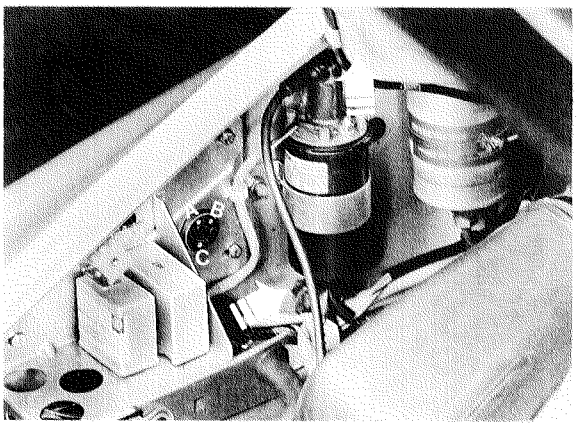
5. Disconnect bottom hose for crankcase breather and top hose from intake hose/throttle housing on oil tank and hoses from air valve. Also disconnect the hose from the air-filter housing of cars fitted with activated-charcoal cannisters.



6. Remove hose between secondary fan and heat exchanger.



7. Remove cover from central electrics board, disconnect multiple-pin plug from control board and high-voltage lead from ignition coil.



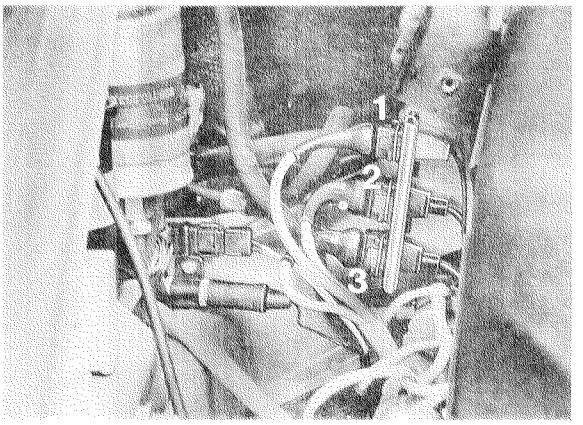
8. Disconnect central engine ground lead from intake to cylinder No. 1.

9. Plug 1:
Cable to temperature sensor II, cylinder No. 3

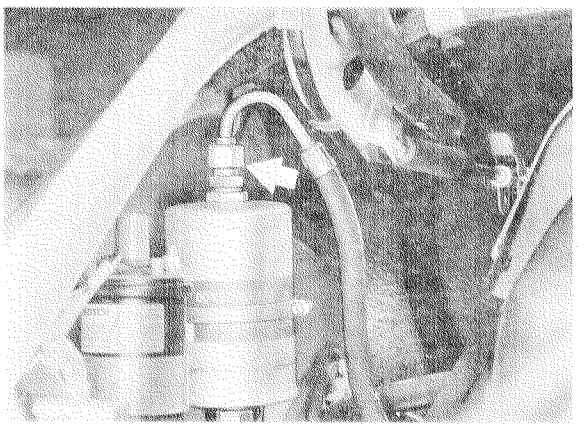
Plug 2:
Cable to speed sensor (DG)

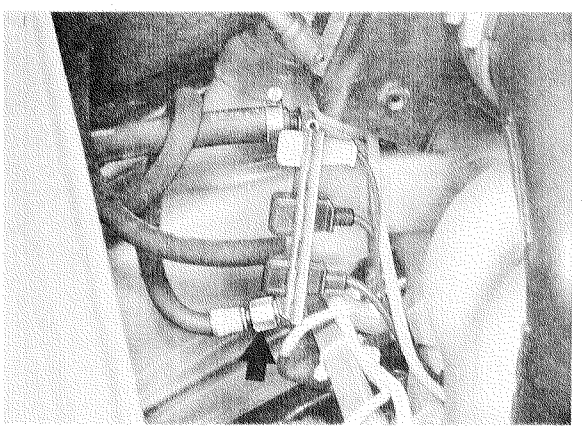
Plug 3:
Cable to reference-mark sensor
Disconnect these plugs by pressing clamp in.

Also disconnect plug for oxygen sensor in vehicles fitted with catalytic converters.

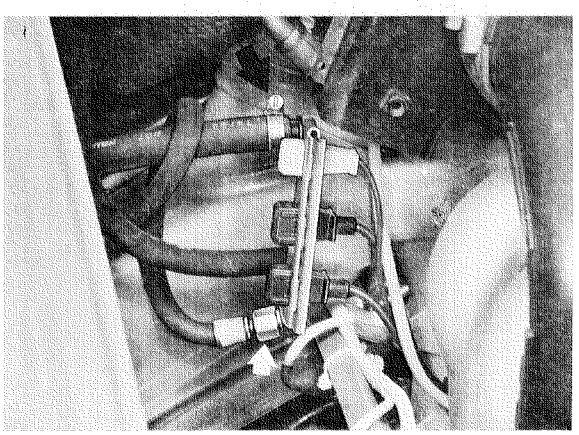


10. Unscrew fuel supply line to filter and return line, making sure that nuts are properly countered.

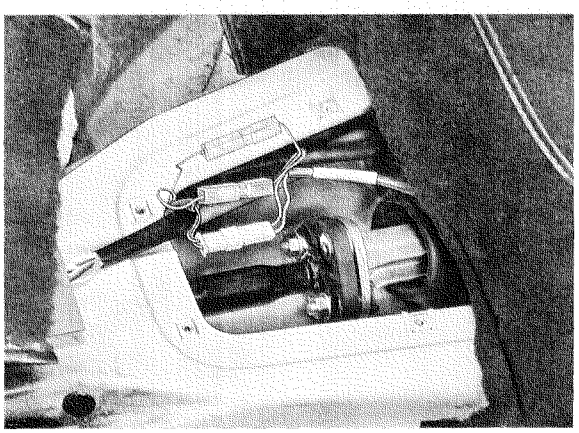




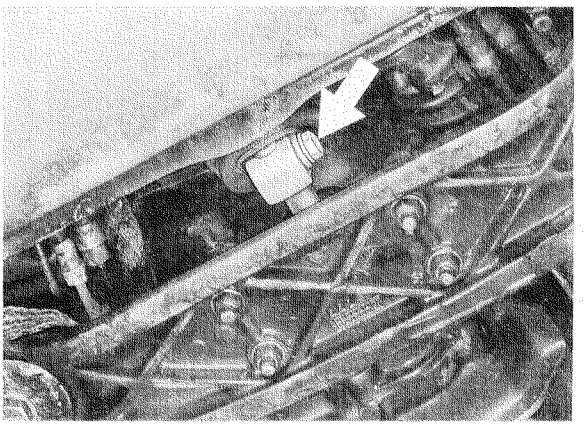
11. Disconnect hose for brake booster.



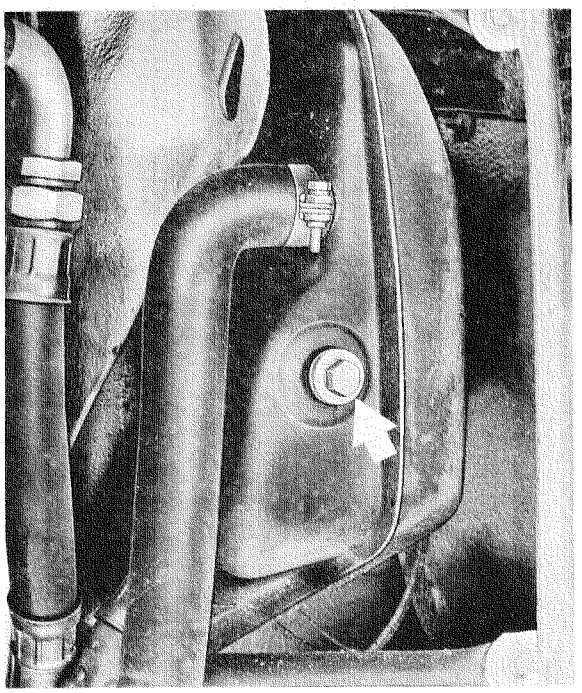
12. Unscrew Phillips screws holding rear tunnel cover and remove cover. Disconnect plug connectors for electronic speedometer in tunnel and pull out rubber sleeve with cable plug.



13. Unscrew hex screw in selector-rod coupling and detach from internal selector arm of transmission.

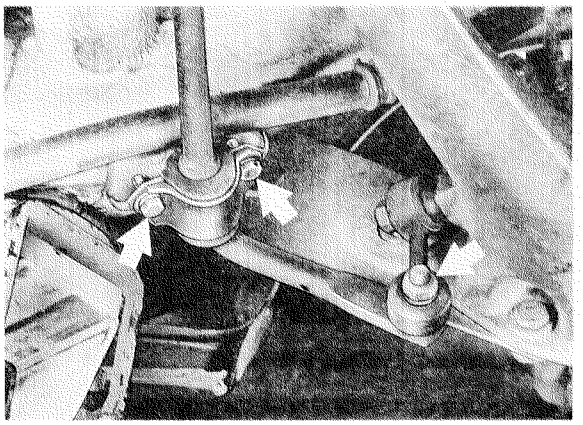


14. Drain engine oil and disconnect oil hose or oil line from engine and oil tank, making sure to counter the oil line.



15. Unscrew clamps and pull heater hoses off heat exchangers.

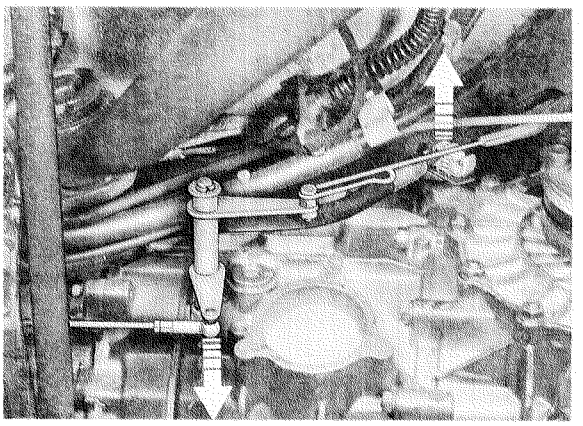
16. Remove rear stabilizer.



17. Disconnect ground lead from body.

18. Disconnect 3 cables from the starter.

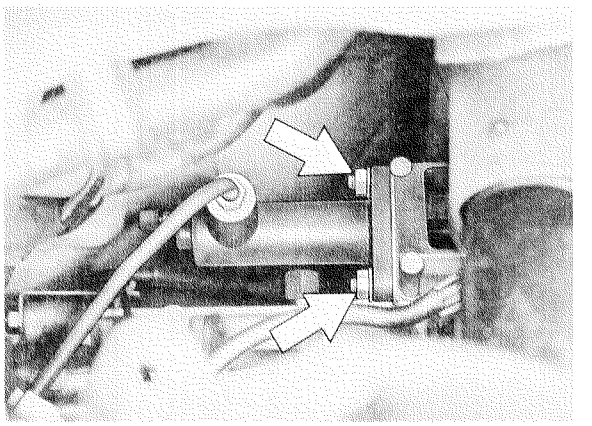
19. Remove retaining clamp and disconnect accelerator pullrod. Unclip clutch cable to release cylinder from its holder.



20. Unbolt clutch release cylinder and move aside with line connected.

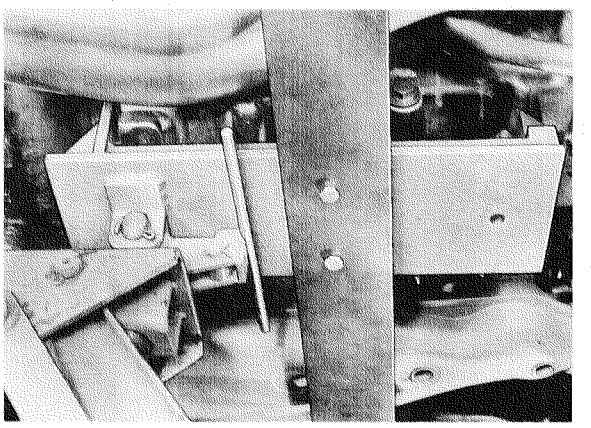
Note:

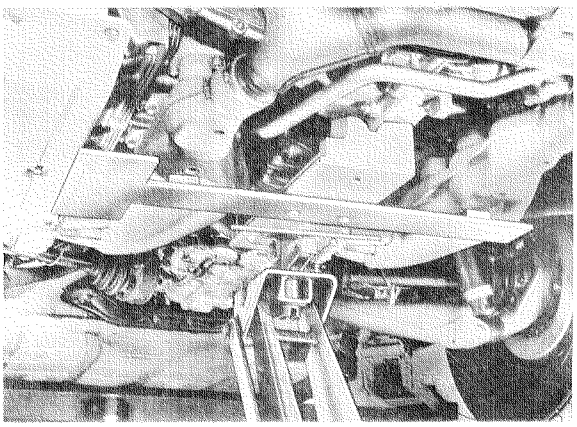
Under no circumstances should the clutch be depressed with the release cylinder unbolted.



21. Remove the stud bolts holding the propshaft to the differential flange.

22. Place workshop jack with engine support plate beneath the center of gravity of the engine/transmission unit and raise jack to take load.

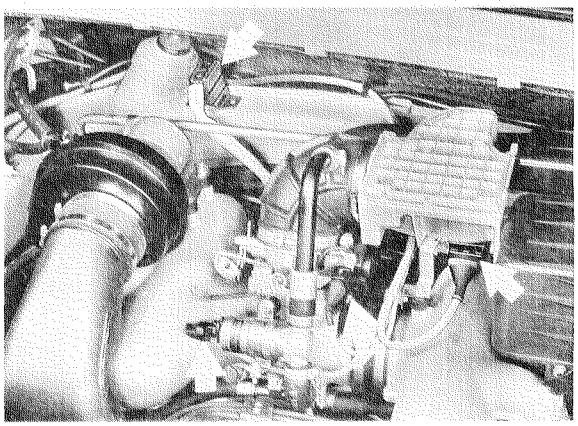




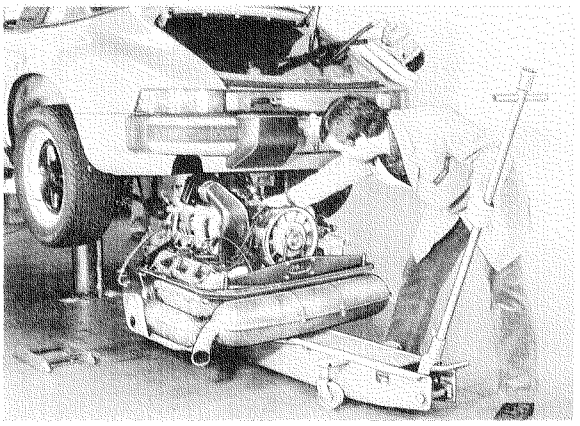
23. Unscrew bolts holding transmission carrier.

24. Unscrew bolts holding engine carrier.

25. Lower workshop jack with engine/transmission unit slightly and disconnect multiple-pin plug on damper cross member and plug on air-flow sensor, idle actuator and throttle switch.



26. Carefully lower workshop jack with engine/transmission unit and roll out toward rear of car.



If the car has to be moved after removal of the engine/transmission unit, keep propshafts horizontal by attaching them to the car with pieces of wire (to prevent damaging the dust covers)

Installing

Note the following points when installing the engine:

1. Caution! Do not catch the heater hoses. Push hoses onto heat exchangers shortly before engine/transmission unit is brought to its final installation position.

2. Tightening torques:

   Hex-head bolts for engine and transmission carriers = 80 Nm (58 ftlb).

   Socket-head cap screws for propshaft flange M8 = 42 Nm (30 ftlb).

ENGINE TIGHTENING TORQUES

Location	Threads	Tightening Torque Nm	Tightening Torque ftlb
Connecting-rod nuts Stage 1 Stage 2	M 9 x 1.25	 20 90° ± 2° of turn	 14
Crankcase bolts	M 10	35	25
All bolts on crankscase and camshaft housing	M 8	25	18
Flywheel to crankshaft	M 10 x 1.25	90	65
Bush with needle bearing to crankshaft	M 6	10	7
Pulley to crankshaft, bolt with spring washer	M 12 x 1.5	80	8
Durlok bolt for single and double-belt pulley	M 12 x 1.5 x 22	170	123
Safety valve plug to crankcase	M 18 x 1.5	60	43
Pressure relief valve plug to crankcase	M 18 x 1.5	60	43
Adaptor (of oil pressure transmitter nozzle) to crankcase	M 12 x 1	35	25
Adaptor (oil return line) in crankcase	M 22 x 1	120	87
Cylinder-head nuts* Stage 1 Stage 2	M 10 socket head	 15 1 x 90° ± 2° of turn	 11
Rocker-arm shafts	M 7 socket head	18	13

Location	Threads	Tightening Torque Nm	ftlb
Hex bolt on camshaft**	M 12 x 1.5	120	87
Cover to camshaft housing	M 8	8	6
Bracket for engine carrier	M 10	40	29
Wide strap on blower housing	M 8	12	9
Spark plug	M 14 x 1.25	25-30	18-22
Pulley on alternator	M 17 x 1.5	40	29
Oil-pressure control switch to crankcase	M 10 x 1	max. 20	max. 14
Temperature transmitter to crankcase	M 14 x 1.5	max. 25	max. 18
Oil-pressure transmitter to connector	M 18 x 1.5	max. 35	max. 25
Oxygen sensor to catalytic converter	M 18 x 1.5	50-60	36-43
Plug for catalytic converter exhaust sampling point	M 8 x 1	15	11
Oil drain plug (crankcase)	M 20 x 1.5	70	51
Oil drain plug (oil tank)	M 22 x 1.5	42	30
Capped nut on fuel distributor line	M 12 x 1.5	12	9

* Use cylinder head nuts SP No. 901 104 382 02, distinguishing feature: yellow passivated.

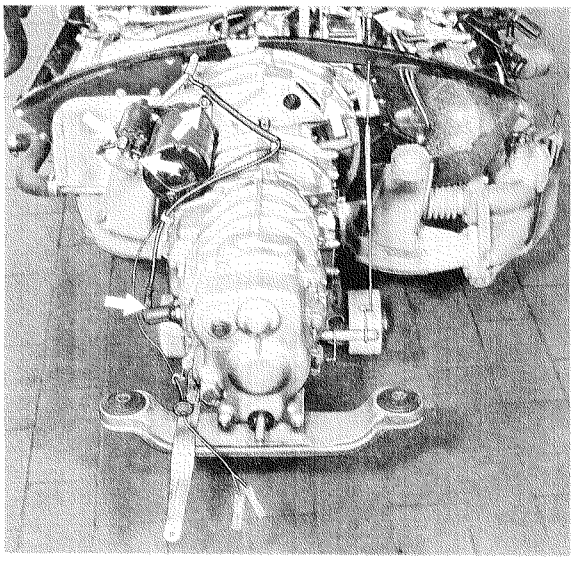
Apply a thin coat of Optimoly HT to threads of stud bolts for cylinder-head attachment and contact surface of cylinder-head nuts.

** Apply thin coat of Optimoly HT to threads.

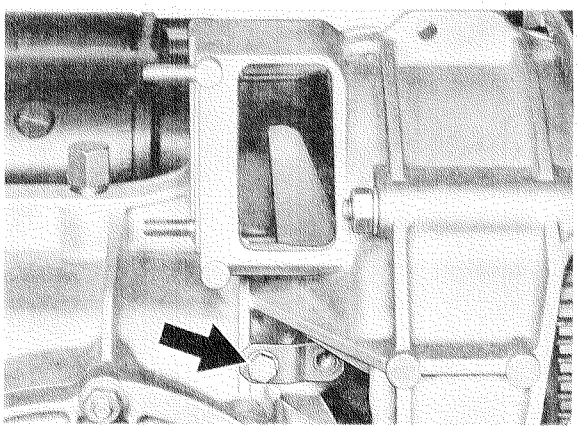
ENGINE/TRANSMISSION ASSEMBLY, SEPARATING AND REJOINING
HYDRAULIC CLUTCH ACTUATION
87 MODELS ONWARD

Separating

1. Disconnect cable from starter and cable from backup light switch.
Remove retaining clip at top of accelerator linkage ball socket and remove linkage.



2. Unscrew hex bolt from release shaft and withdraw shaft.



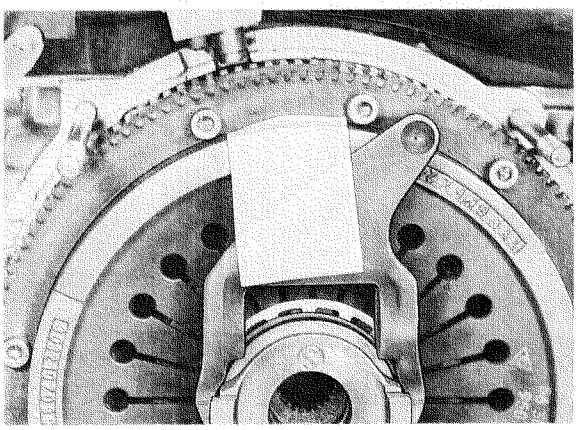
3. Unscrew 4 mounting bolts and separate transmission from engine. Use special tool P119 to unscrew starter motor upper retaining nut.

Rejoining

Note:

Apply a multi-purpose grease containing MoS_2 to all sliding surfaces of the clutch release mechanism and lubricate the teeth of the input shaft with Cptimoly HT.

1. Insert release fork in release bearing and hold in place provisionally using a length of suitable adhesive tape.



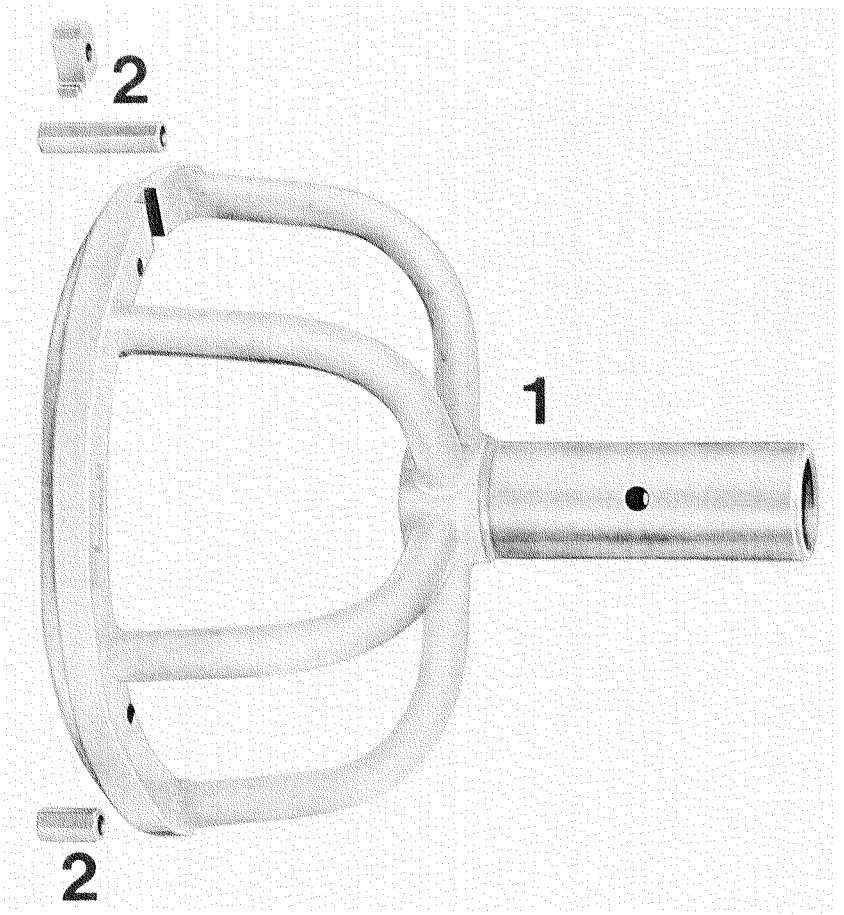
2. Rejoin transmission and engine

3. Insert release shaft in release fork from below.

4. Remove adhesive tape through assembly aperture.

5. Tighten release shaft retaining bolt (M 6 x 16).

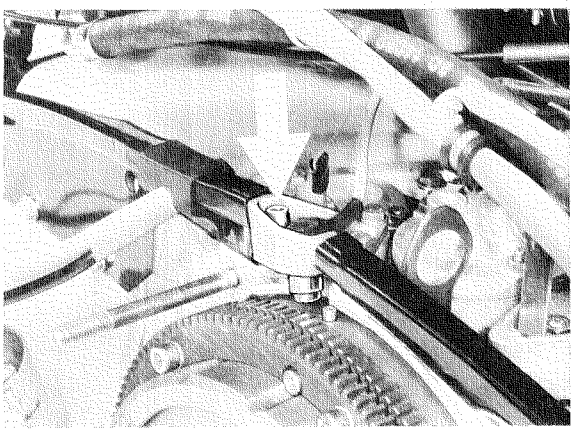
TOOLS



No.	Description	Special Tools	Remarks
1	Engine holder	P 201	
2	Toothed element and mounting parts	P 201 b	

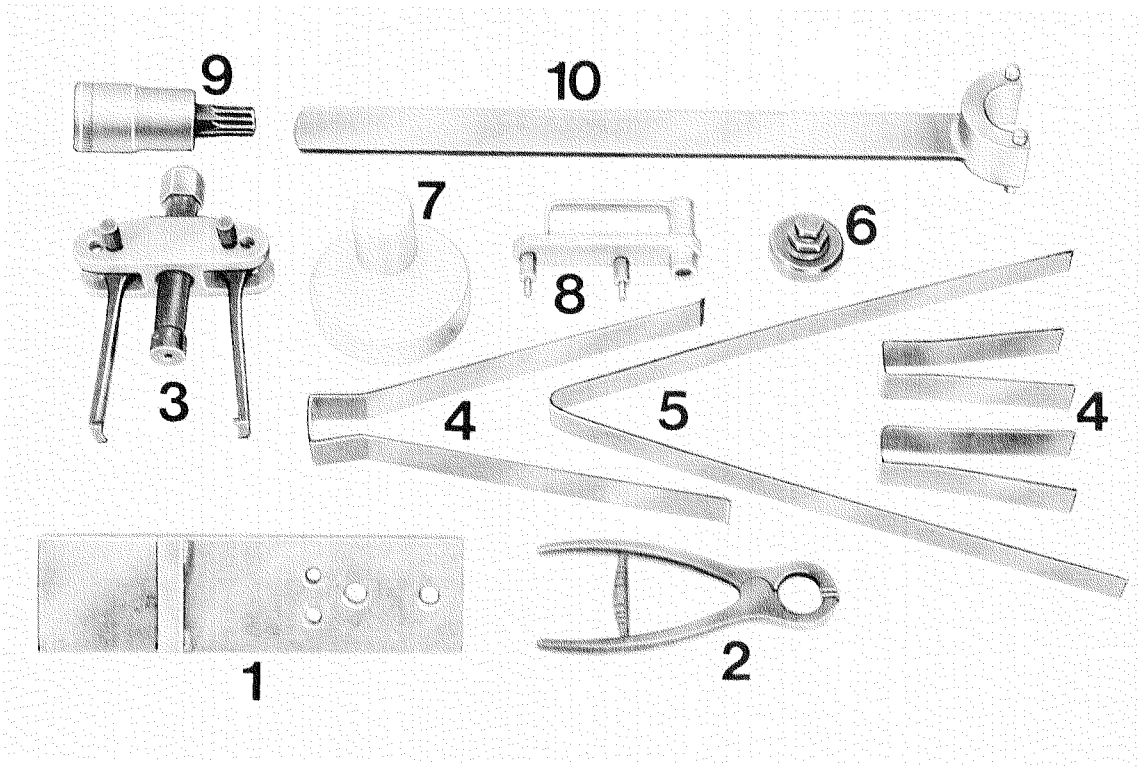
APPLYING ENGINE HOLDER / SPECIAL TOOL P 201

1. Unscrew the top dead center sensor before mounting engine holder on engine.



2. Mount engine holder on studs of right crankcase section. Right side looking forward in car = engine oil cooler side.

TOOLS

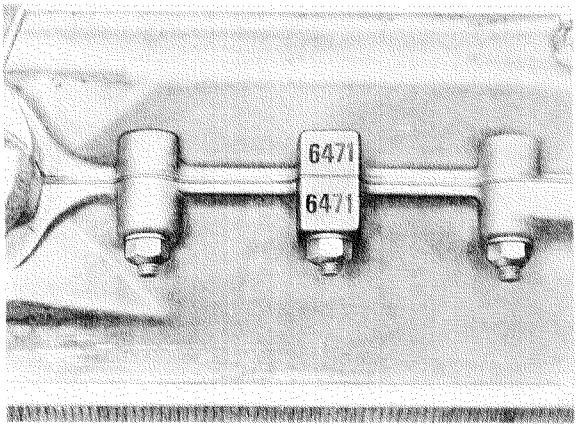


No.	Description	Special Tools	Remarks
1	Holder	P 209 a	Bolt crankshaft on holder with bolts, Part No. 928 102 151 01
2	Circlip pliers		Standard tool
3	Puller	VW 202	
4	Compressor (connecting rods)	P 221	
5	Compressor (timing chain)	P 222	

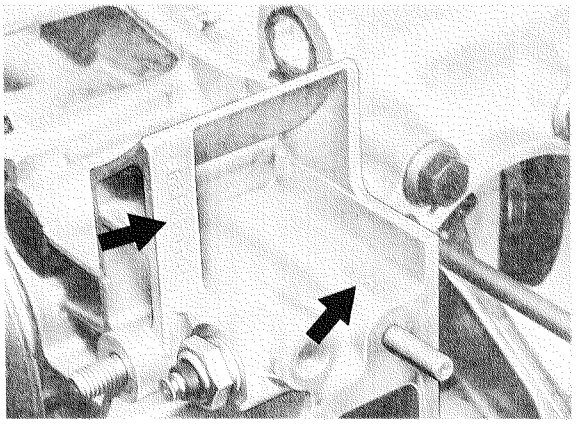
No.	Description	Special Tools	Remarks
6	Seal pulling in tool (pulley end)	P 216	
7	Seal thrust pad (flywheel end)	9126	
8	Flywheel installer	P 238 a	
9	Screwdriver socket		Standard tool
10	Pulley holder	9236	

Crankcase identification - engine number and engine type code

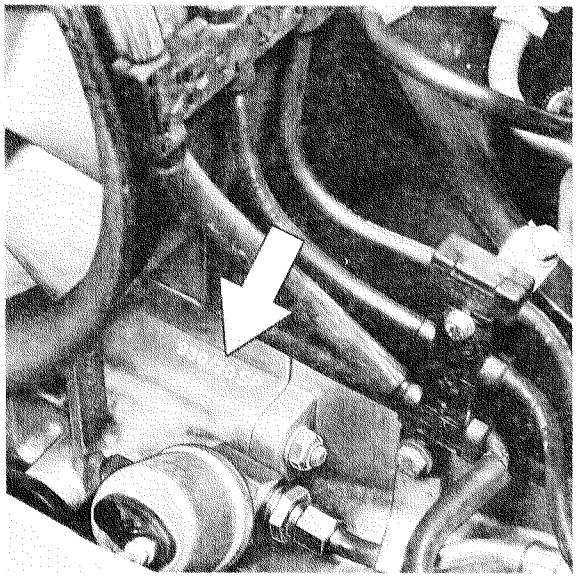
1. Crankcase sections are always machined together and must always be installed together. Check codes.



2. Engine number and engine type code

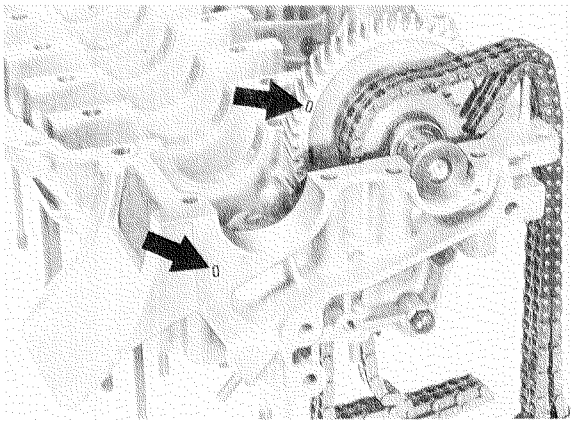


2 a. Engine type code - Club Sport

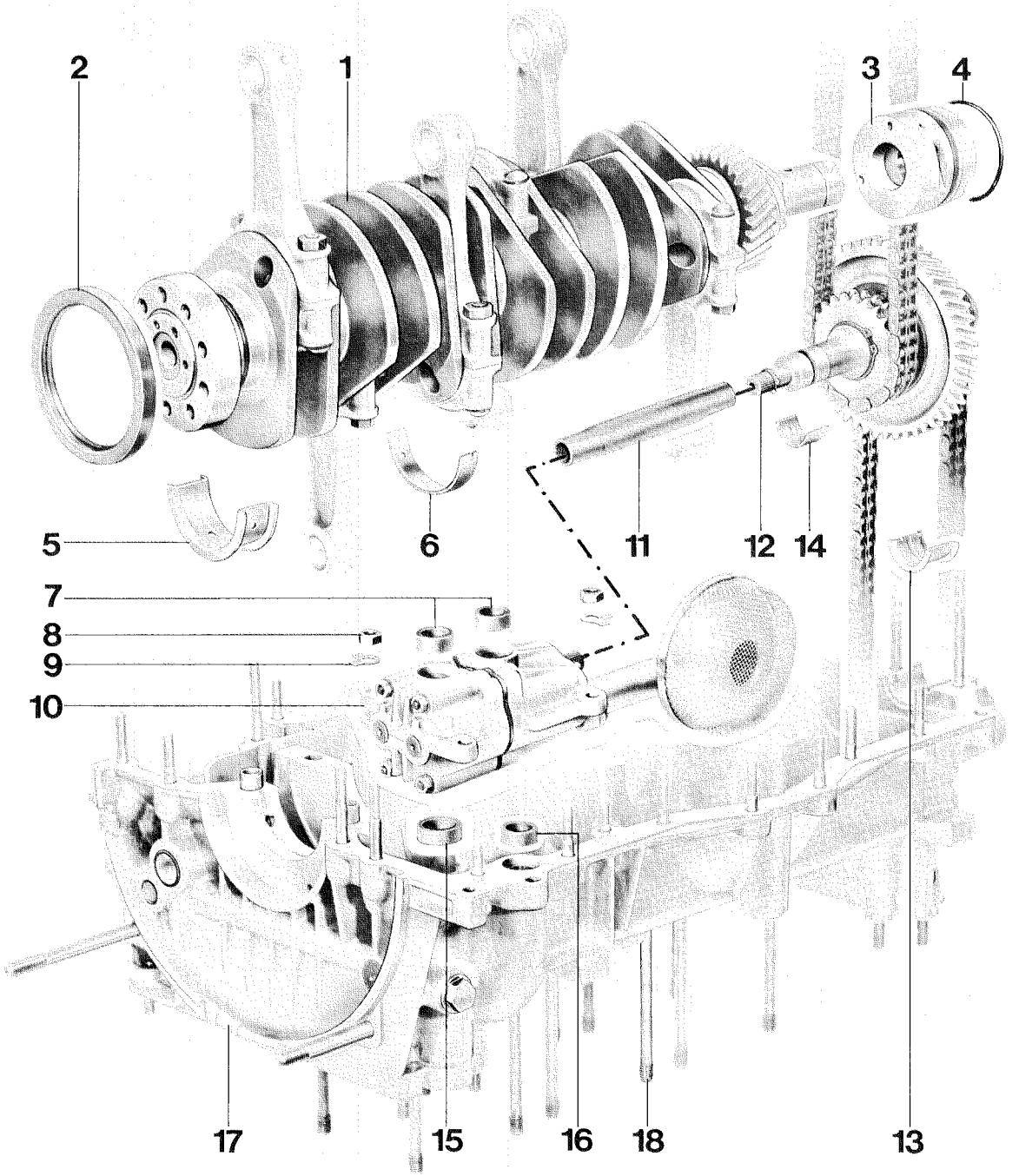


87/834

3. Crankcase/intermedia shaft pairing code



DISASSEMBLING AND ASSEMBLING CRANKCASE AND CRANKSHAFT



No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
1	Crankshaft	1		Conrods 2–4–6 face up	
2	Crankshaft seal	1		Replace,lubricate	
3	Bearing sleeve 8	1		Make sure bearing engages in pin	
4	Round seal	1		Replace, position correctly	
5	Bearing shell – main bearing 1	2	Mark	Do not mix up used shells	
6	Bearing shell – main bearings 2–7	12	Mark		
7	Seal	2		Coat with grease	
8	Nut M 8	3		Torque: 23 Nm (17 ftlb)	
9	Lockplate	3		Always replace	
10	Oil pump	1		Check movement	
11	Connecting shaft	1			
12	Intermediate shaft	1		Check pairing with drive gear on crankshaft and crankcase	
13	Thrust bearing for intermediate shaft	2			
14	Intermediate shaft bearing	2			
15	Seal	1		Install with grease	
16	Seal	1		Install with grease	
17	Crankcase section, right	1			
18	Dilavar bolts	24			

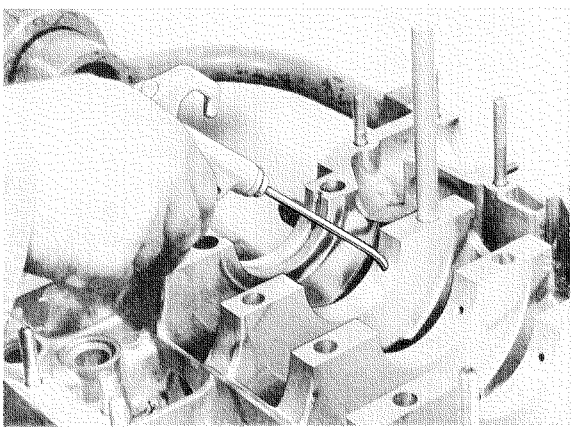
CHECKING PISTON COOLING SPRAY VALVE

Right crankcase section looking forward in car.

Insert suitable plug (12 mm dia.) in bore for anchorage bolt.

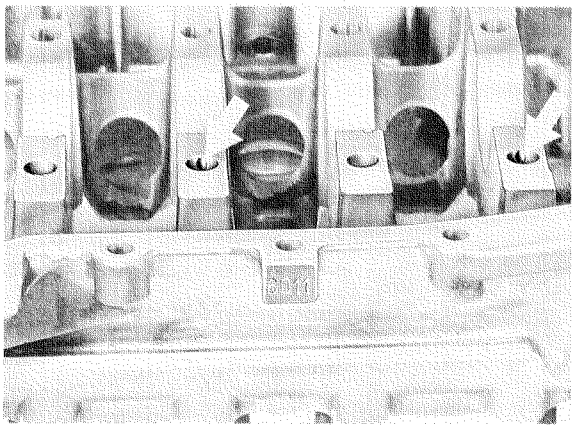
Inject methylated spirits into oil feed bore for main bearing seat.

Apply air pressure in oil feed bore for main bearings and observe ejection pattern of spray valve.



Left crankcase section looking forward in car.

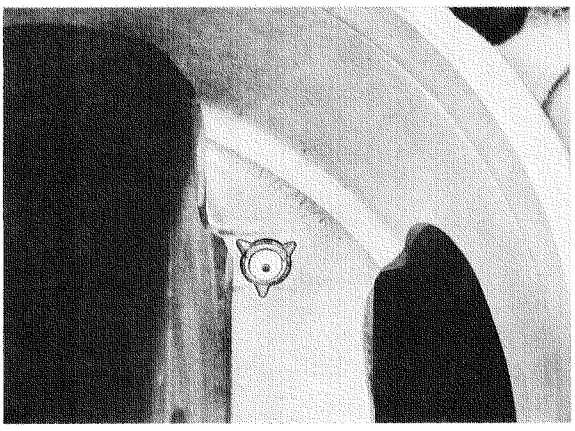
Apply air pressure in bores (arrows) on bearing seat and observe ejection pattern.



CEMENTING PISTON COOLING SPRAY VALVE

Clean take-up bore for spray valve thoroughly and cement in a new spray valve with Loctite No. 640.

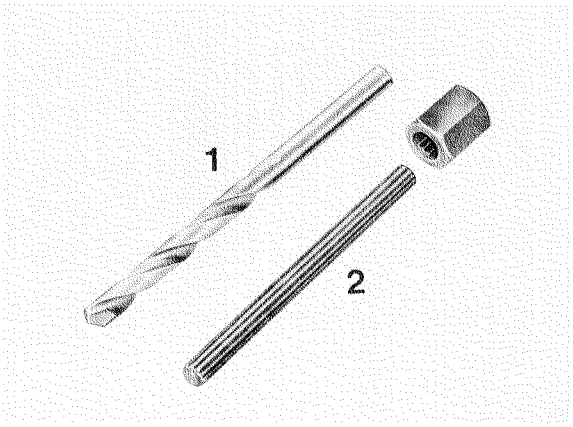
Then lock spray valve.



REPLACING DILAVAR STUDS IN CRANKCASE

Replacing Studs Which Are Broken Off Above Thread Runout on Crankcase End.

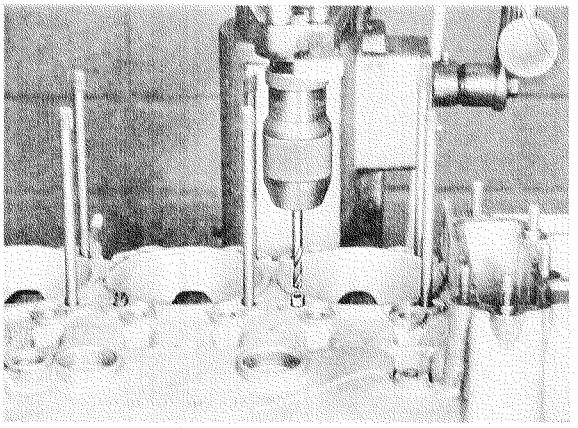
Tools



1 – Drill (special alloy)
DBF – 1/4"
2 – Stud remover E - 3

1. Level off broken stud and punch mark the center point.

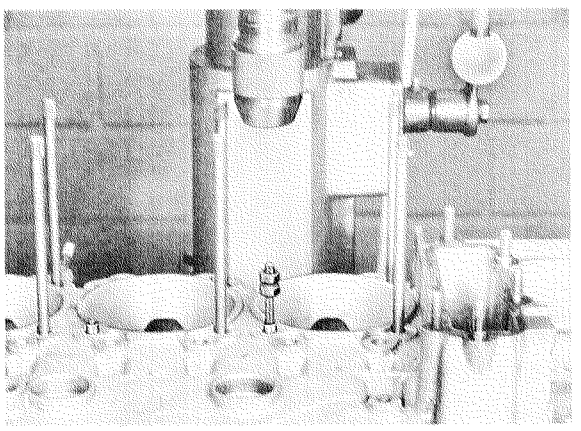
2. Drill an approx. 15 mm deep hole in stud with a 1/4" (6.35 mm) dia. special drill or hard metal drill of same size in a table or stand drilling machine.



3. Drive in remover approx. 10 mm deep with a hammer.

4. Heat crankcase section to about 200 °C/ 395 °F with a hot air blower, e. g. VAG Special Tool 1416, or in an oven, in area of studs (to melt Loctite cement).

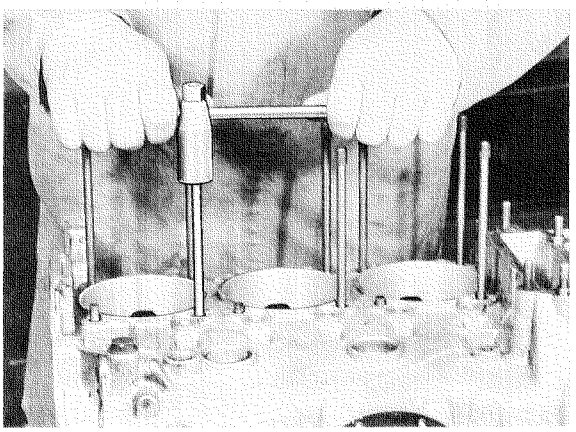
5. Unscrew remover including broken stud and hexagon nut.



6. Tap threads and screw in new Dilavar stud with Loctite No. 270.
Tool Supplier:
SNAP-ON Tools GmbH
Rudolf-Diesel-Str. 6
D - 7104 Willsbach
Tel.: 07134 / 3054

Replacing Whole Dilavar Studs

1. A stud remover from Rothenberger, designated Romax – Size 10, is suitable for removing whole studs.



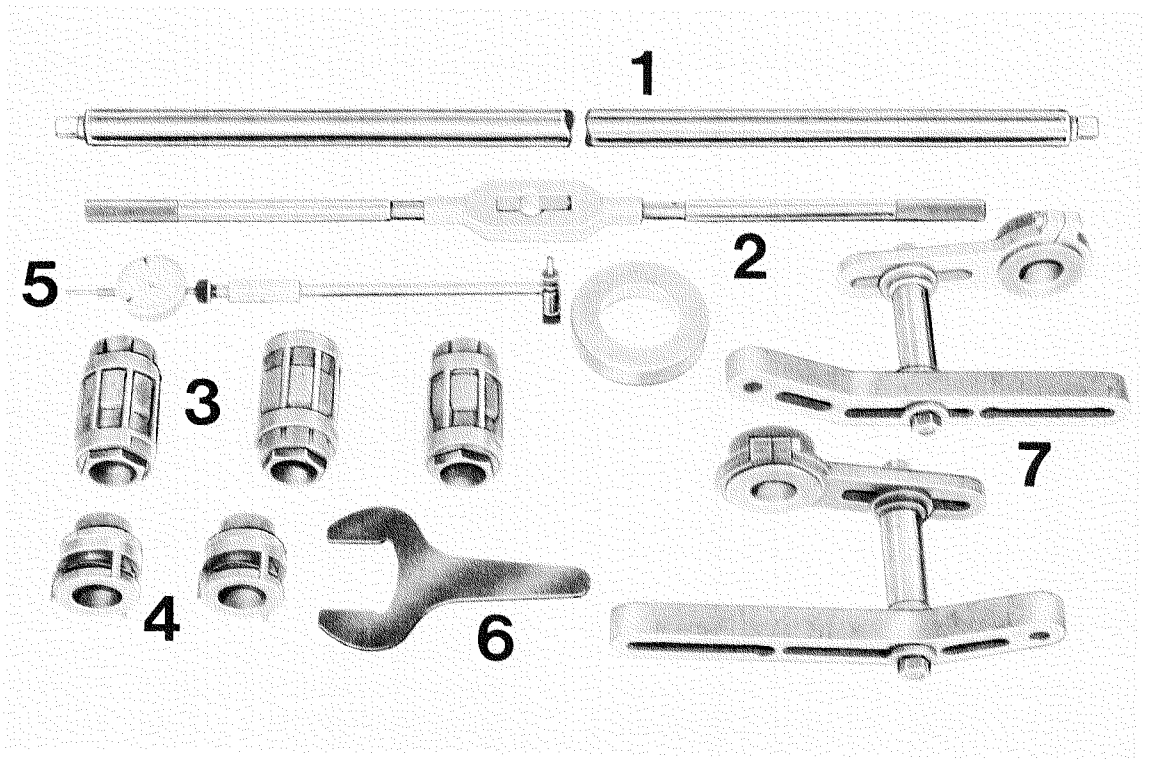
2. A stud remover of the same make, designated Romax – Size 8, is suitable for unscrewing broken off studs with a protruding stud length of at least 30 mm.

Note:

Heating the Loctite cement in the crankcase before unscrewing studs is important.

Tool Supplier:
Rothenberger GmbH & Co.
Industrie Str. 7
D-6233 Kelkheim / Ts.
Tel.: 06195 / 8001

TOOLS



No.	Description	Special Tools	Remarks
1	Reamer guide rod 35 x 1500 mm		Standard (Hunger)
2	Tap wrench, size 4		Standard (Hunger)
3	Main bearing reamer		Standard (Hunger)
4	End bearing sleeve EL 35		Standard (Hunger)
5	Internal calipers with measuring ring 65.000 mm dia.		Standard
6	Wrench, size 58		Standard (Hunger)
7	Guiding fixture to support guide rod		Standard (Hunger)

MEASURING AND/OR MACHINING CRANKCASE

General

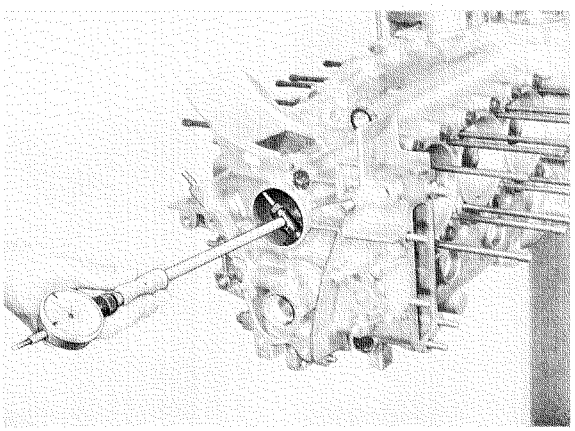
The main bearing bores should always be measured each time the engine is overhauled and the crankcase is disassembled.

Measuring

1. Mount crankcase on engine holder P 201 in conjunction with mounting parts P 201 b and bolt both case sections.
   Screw in all anchorage bolts and four M 8 nuts on bearing 1 (flywheel end) and bearing 8 (pulley end) finger tight.

2. Align both case sections with each other with light knocks from a plastic hammer. Joint must not offset in bearing bore no. 8.

   Measure bearing bore no. 8 crosswise with an internal calipers, centering bore again if necessary.



3. Tighten all anchorage bolts and four M 8 nuts with specified tightening torque.

   Anchorage bolts M 10 = 35 Nm
   4 nuts (bearing 1) M 8 = 22 to 24 Nm
   (bearing 8)

4. Measure all 8 main bearing bores with an internal calipers.

   If bearing bores are too tight, ream to standard size of 65.00 mm diameter with a standard size reamer.

   The size for bearing bores 1 through 8 is 65.00 to 65.019 mm.

5. If bearing bores are too large, ream to oversize diameter of 65.25 mm (B bearing) with a rough reamer and finish reamer.

   The control size for B bearings is 65.25 to 65.269 mm diameter.

Machining and Reaming

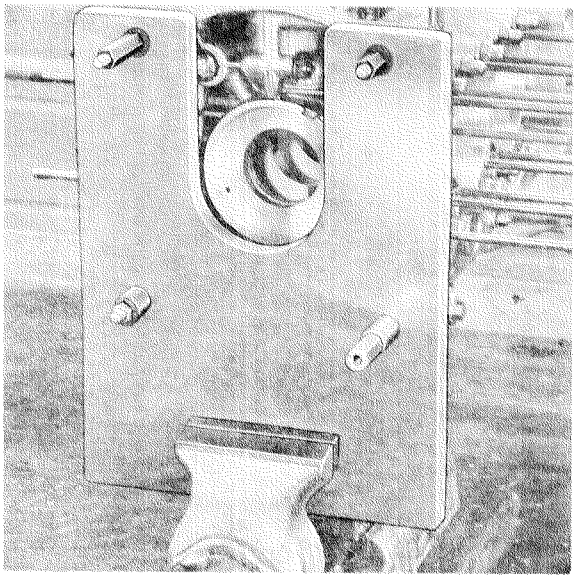
General

Bores in light alloy silumin crankcases must be reamed to B bearing size in two steps. Lubricating the reamer with gasoline is essential while reaming out bores.

1st step = rough reamer = 65.20 mm dia.
2nd step = finish reamer = 65.25 mm dia.

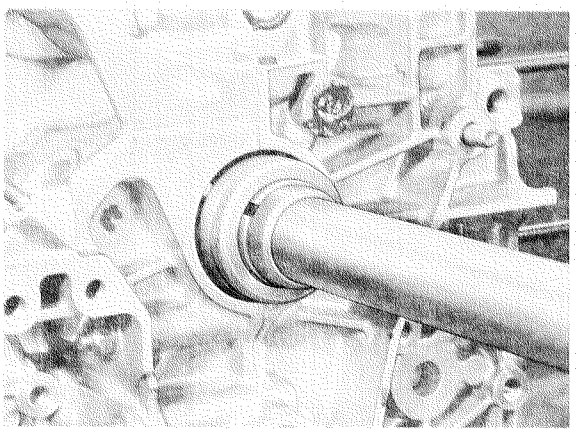
Reaming

1. Mount locally made tool on crankcase and clamp in a vise.



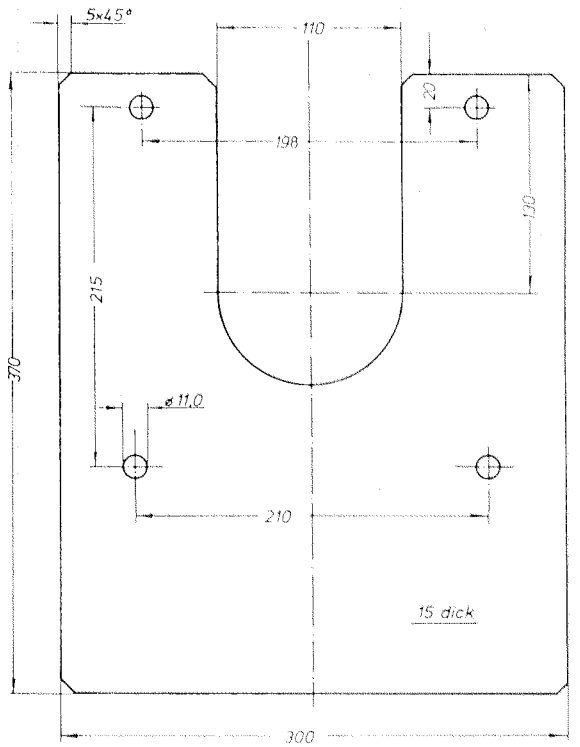
2. Insert end bearing sleeve EL - 35 in bearing bore no. 1.

3. Insert end bearing sleeve EL - 35 in bearing bore no. 8 and align with guide rod 35 x 1500.

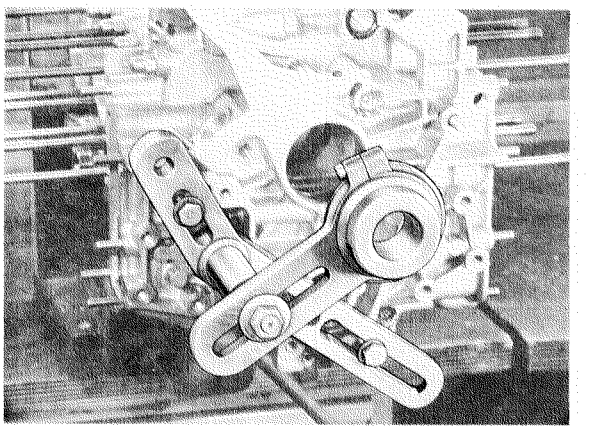


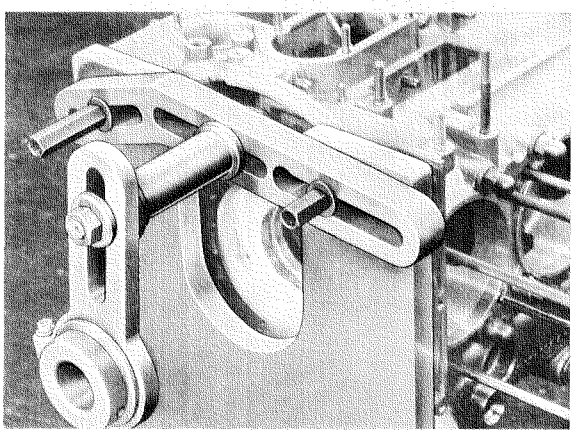
Locally Made Tool Sketch

Material: sheet steel or aluminum



4. Only now install the guiding fixture to support front of guide rod.
Use M 10 x 45 bolts.

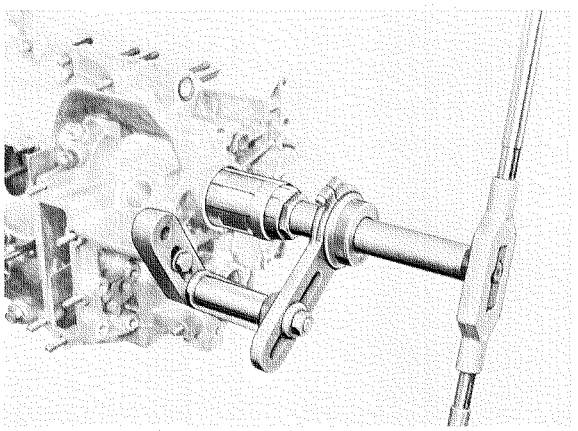




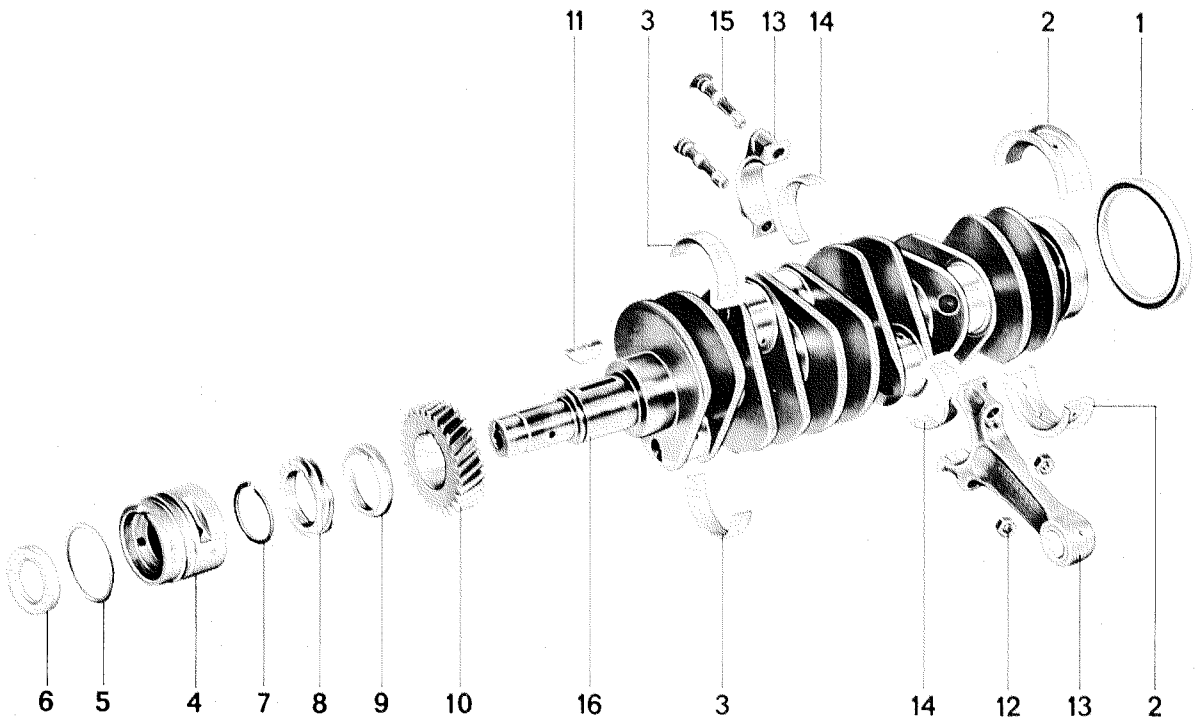
5. Run guide rod 35 x 1500 mm with reamer into bearing bore no. 8 and ream out all bearing bores slowly and uniformly.

Note:

Have a second person provide thorough lubrication with methylated spirits while reaming out bearing bores.



DISASSEMBLING AND ASSEMBLING CRANKSHAFT



No.	Description	Qty.	Note When: Removing	Installing
1	Radial oil seal	1		Replace
2	Thrust bearing shells 1	2	Check for wear	Lubricate
3	Main bearing shells 2 - 7	12		Lubricate
4	Bearing sleeve no. 8	1		Lubricate
5	Round seal	1		Replace
6	Radial oil seal	1		Replace
7	Circlip	1		
8	Drive gear for distributor	1		
9	Intermediate ring	1		Note installation position
10	Timing gear	1		
11	Woodruff key	1		
12	Connecting rod nut	12		Torque: Stage 1: 20 Nm (14 ftlb) Stage 2: 90° ± 2° of turn, thread and contact surface lightly oiled
13	Connecting rod	6		Note installation position and weight
14	Connecting rod bearing shells	12	Check for wear	Lubricate
15	Connecting rod bolts	12		Always replace
16	Crankshaft	1	Check for wear	

CONNECTING ROD WEIGHT CLASSES

Connecting rods are available in different weight classes.

Pertinent weight class can be identified with the last digit of the part number.

This final digit is inscribed in the shaft of connecting rods, which are supplied as spare parts.

Weight More than gr.	Up to gr.	Weight Class for Service	Service Conrod Part Number	Connecting Rod Code
615	624	3	930.103.020.73	73
624	633	4	930.103.020.74	74
633	642	5	930.103.020.75	75
642	651	6	930.103.020.76	76
651	660	7	930.103.020.77	77
660	669	8	930.103.020.78	78
669	678	9	930.103.020.79	79
678	687	10	930.103.020.80	80
687	696	11	930.103.020.81	81

Note:

The connecting rods installed in one engine must not differ in weight by more than 9 grams. Weight a complete connecting rod, but without bearing shells, to determine the weight class.

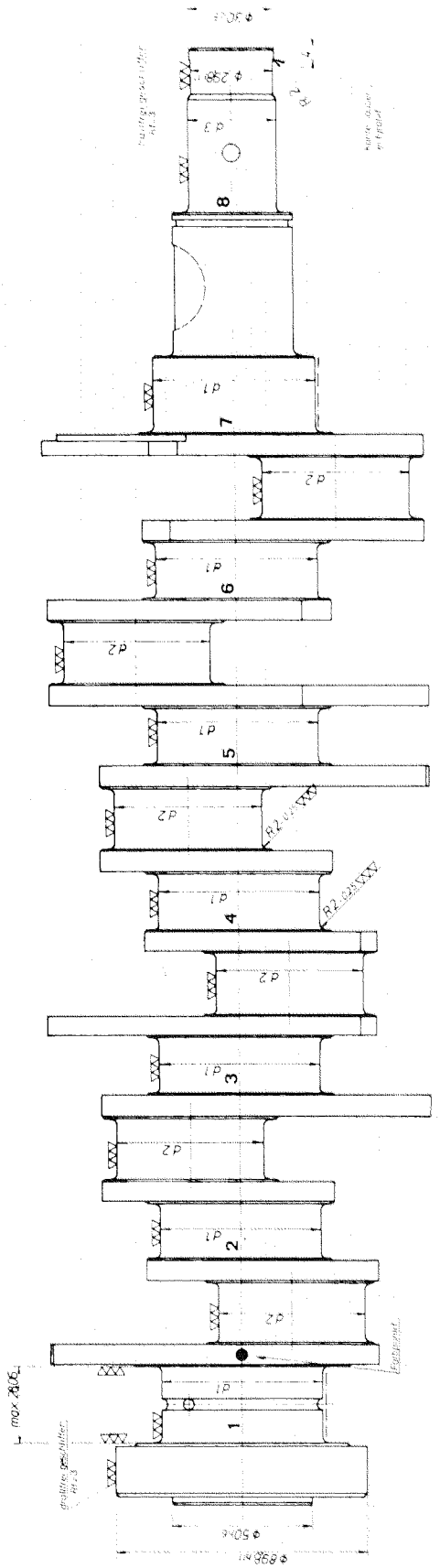
Connecting rod codes for service sector parts are inscribed electrically.

CRANKSHAFT

Standard and Undersizes

Size	Crankcase Dia. Bearings 1–8	All Main Bearings Dia. d 1	Conrod Bearings Dia. d 2	Main Bearing Dia. d 3 of Crankshaft Bearing 8
Standard	Standard 65.000 to 65.019	59.971 to 59.990	54.971 to 54.990	30.980 to 30.993
–0.25 mm		59.721 to 59.740	54.721 to 54.740	30.730 to 30.743
–0.50 mm	65.250 to 65.269	59.471 to 59.490	54.471 to 54.490	30.480 to 30.493

Size	Collar Dia. d 4	Timing Gear Seat Dia. d 5	Take-up Dia. d 6	Thrust Bearing Width A
Standard	89.780 to 90.000	42.002 to 42.013	29.960 to 29.993	28.000 to 28.060
–0.25 mm				
–0.50 mm	89.780 to 89.800		29.670 to 29.800	



Only grind bearing surface for radial oil seals to 29.8 mm and 89.8 mm specified here, if scoring is too deep.

Otherwise polish when necessary; Rt = 3.

Give oil bores a radius of 0.5 mm after grinding.

Break sharp edges with a radius of 0.2 to 0.5 mm.

Permissible radial runout in reference to take-up in — - — - — = max. 0.04 mm.

Specifications for tenifer treatment according to Tenifer 90 W PN 1053.

Do not machine main bearings 3 and 5 after tenifer treatment.

All other main bearing journals may be corrected by way of machining the radii.

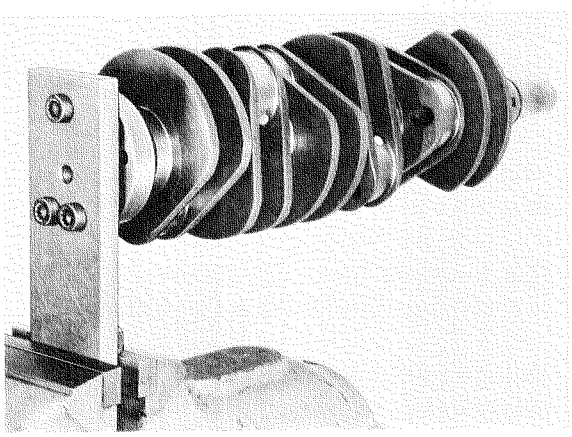
Reground Size Color Codes:

1st reground size	blue paint dot
2nd reground size	green paint dot

DISASSEMBLING AND ASSEMBLING CRANKSHAFT

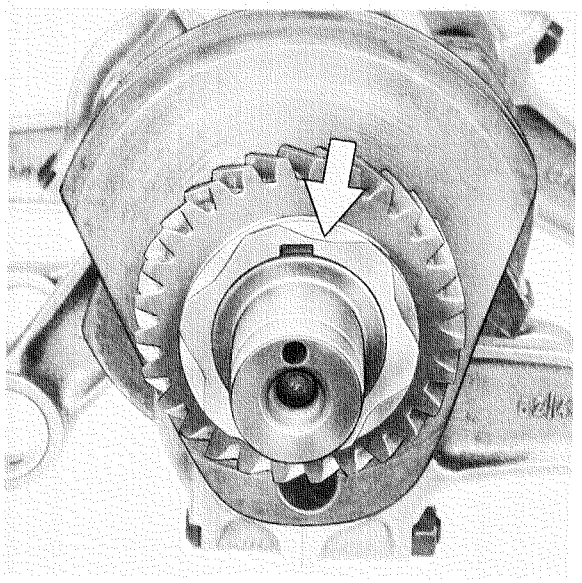
Clamping Crankshaft

Bolt crankshaft on holder P 209 a with bolts, Part No. 928 102 151 01. First remove 6 x 16 mm key with a pliers or drill a hole in the holder to take the key.



Mounting Drive Gear for Clockwise Turning Distributor

If the drive gear is only marked with the Porsche trademark, it must face the pulley when installed in correct position. If the drive gear is marked with an electrically inscribed "X", the Porsche trademark is not applicable and, in this case, the "X" mark faces the pulley.
If the drive gear is not positioned correctly, the basic timing will deviate by 13° on crankshaft.



Installing Circlip on Crankshaft

Circlips are available in different thicknesses for adjustment of the distributor drive gear's axial play.

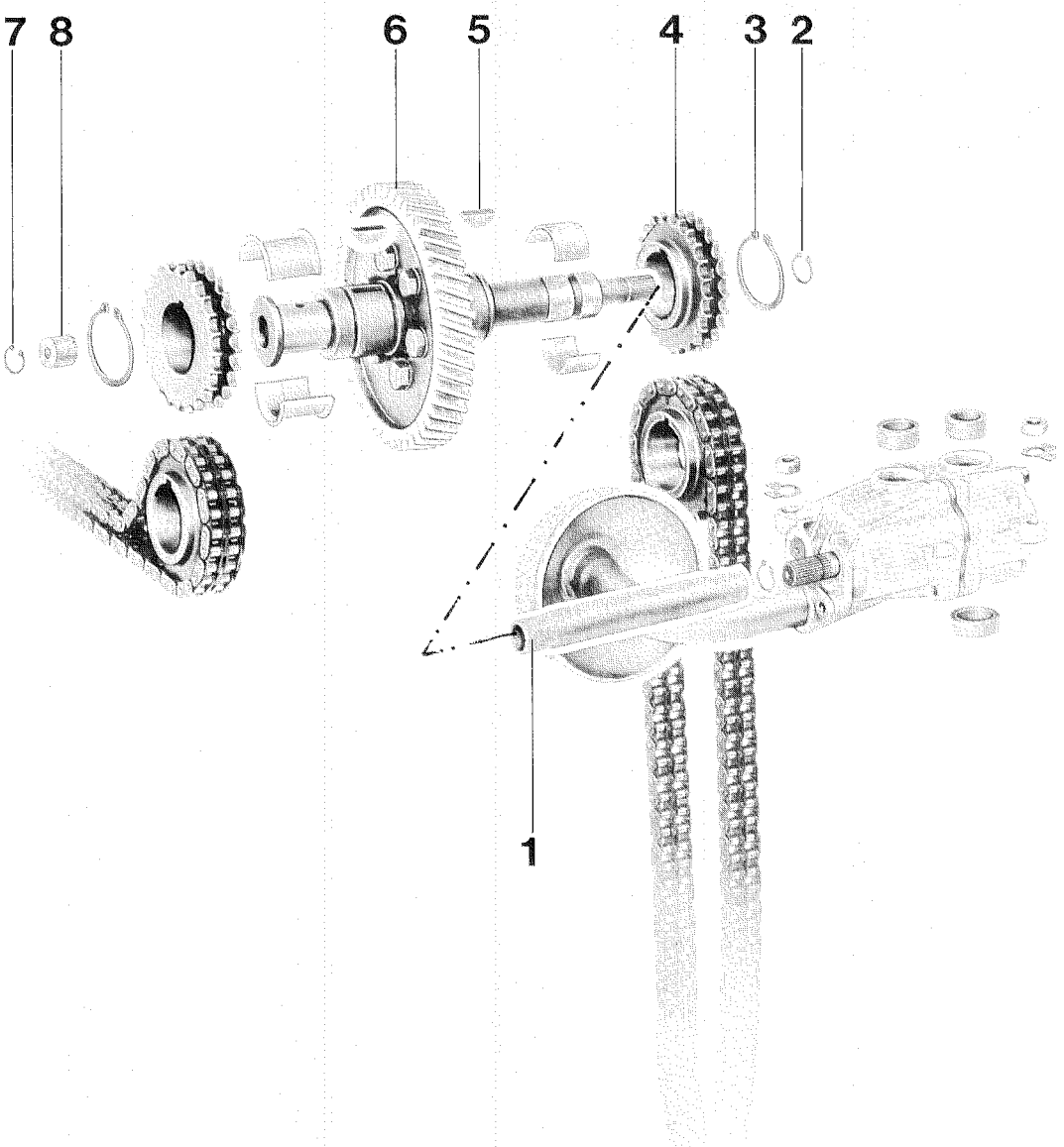
Available Circlips:

Part Number	Thickness in mm	Code
901.102.148.00	2.4	0
901.102.148.01	2.3	1
901.102.148.02	2.2	2
901.102.148.03	2.1	3

Mount timing gear, intermediate ring and drive gear for clockwise-turning distributor on crankshaft against stop. Select circlip of correct thickness by testing the fit. Circlip must be installed without play.



Disassembling and assembling intermedia shaft

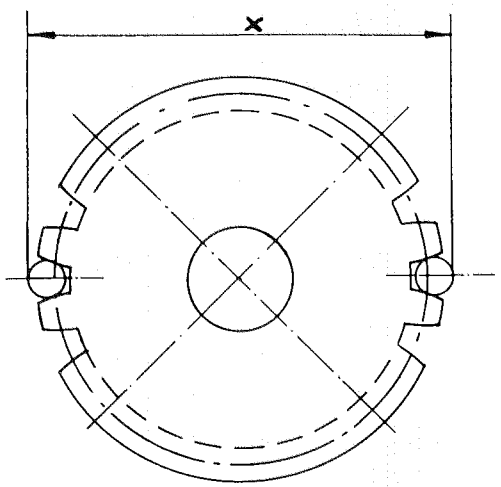


No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Connecting shaft	1		Check for perfect concentric running	
2	Circlip 13 x 1	2			
3	Circlip 36 x 1.75	2			
4	Chain sprocket	2	Press off	Heat on hotplate, slide on against stop	
5	Woodruff key	2			
6	Intermediate shaft	1			
7	Circlip 16 x 1	1			
8	Aluminum plug	1			

CHECKING AND INSTALLING INTERMEDIATE SHAFT

Checking

1. Check intermediate shaft gear for wear. Measure intermediate shaft gear with 4.5 mm dia. steel rollers.



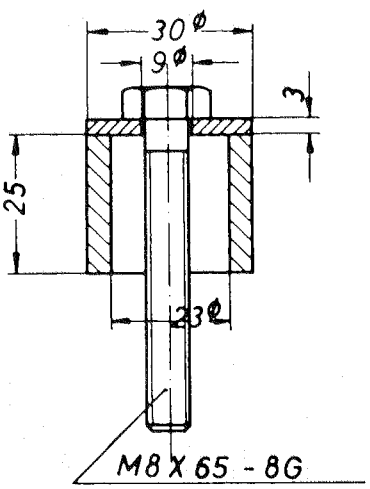
If distance "X" is less than 136.5 mm, replace intermediate shaft gear and drive gear on crankshaft.
If the intermediate shaft gear is marked with code 1, distance "X" must not be less than 136.55 mm. In addition to checking the size, visual inspection for signs of wear is very important. If applicable, always replace both the intermediate shaft and drive gear on the crankshaft.

Note:

The intermediate shaft with bolted gear is a single spare part and can only be replaced complete.

2. The aluminum plug must be removed from the face of the intermediate shaft and the oil bore cleaned to remove residue in case of engine with many miles of performance or when performing a general engine overhaul (also in case of bearing damage).

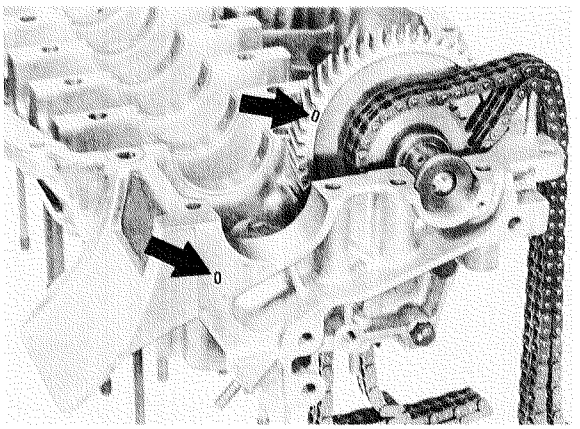
3. Drill a hole in center of aluminum plug with a 6.4 mm dia. drill and cut threads with a M 8 tapper. Pull out aluminum plug with special tool and clean oil bore in intermediate shaft. Then press in a new aluminum plug.



Installing

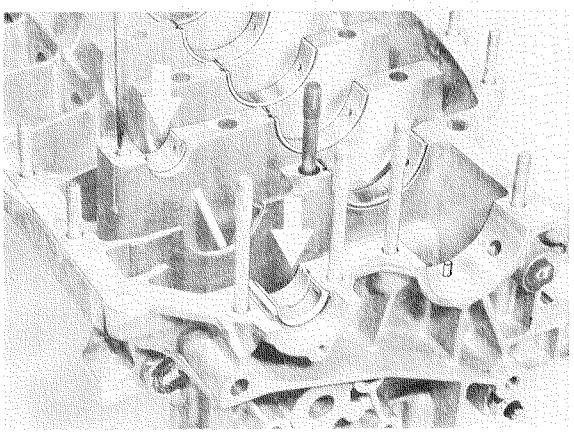
1. Gears and crankcases may only be paired as shown in the table below.

Code (0 or 1) is stamped in the crankcase on the left side below the alternator take-up.



Axle Distance mm	Crankcase Code	Crankshaft Drive Gear Code	Intermediate Shaft Gear Code	Backlash mm
103.975 to 103.990	0	0	0	0.029 to 0.049
		installation still permitted		
		1	0	0.016 to 0.042
		0	1	0.017 to 0.043
103.990 to 104.000	1	1	1	0.012 to 0.041
		installation still permitted		
		0	1	0.025 to 0.049
		1	0	0.025 to 0.048

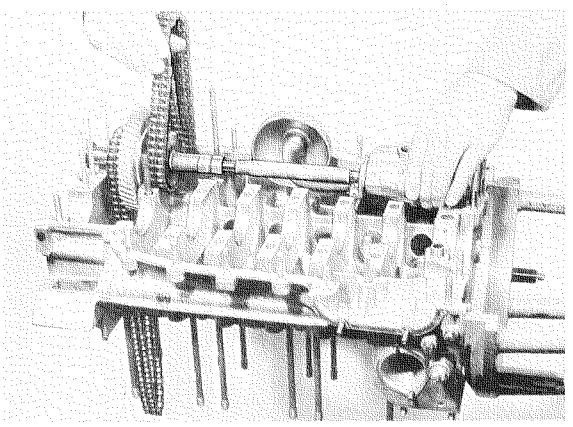
2. Install intermediate shaft bearing shells.



3. Install intermediate shaft in crankcase together with the connecting shaft and oil pump, but without timing chains. Mount oil pump and check, whether intermediate shaft, connecting shaft and oil pump run without runout. Keep changing spline connection of parts until smooth running is reached.

4. Install seal between right crankcase section and oil pump with grease.

5. Place completely pre-assembled oil pump/ intermediate shaft unit in right crankcase section.



SEALING CRANKCASE MATING SURFACES

Note:

Only Loctite 574 (orange) should be used as a sealant.
Loctite 574 will dry only in conjunction with metal and exclusion of air. After applying a coat of sealant the bolts should be installed and tightened no later than 10 minutes, since the sealant on the metal will start to dry.

Removing Old Sealant

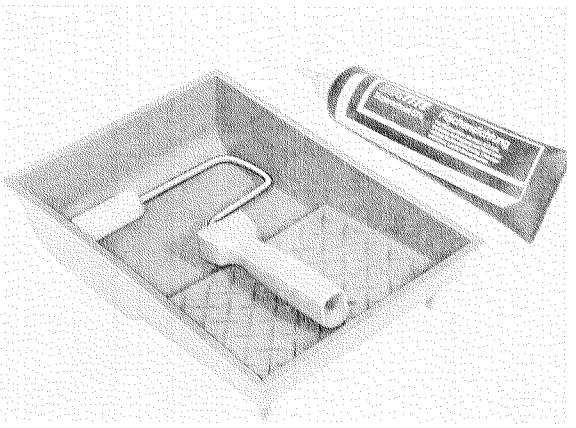
The old sealant does not have to be removed for repairs. It is only necessary to remove grease from the surface, so that after the cleaning solution has dried the new coat of sealant can be applied.

The new Loctite will dissolve the old sealant in the surface finish and dry again after assembling.

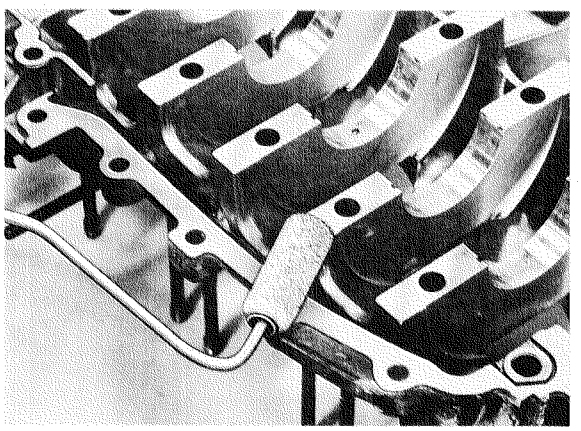
We recommend a fine steel brush or Loctite remover 80646 for removing old sealant, if this is ever necessary.

Applying Sealant

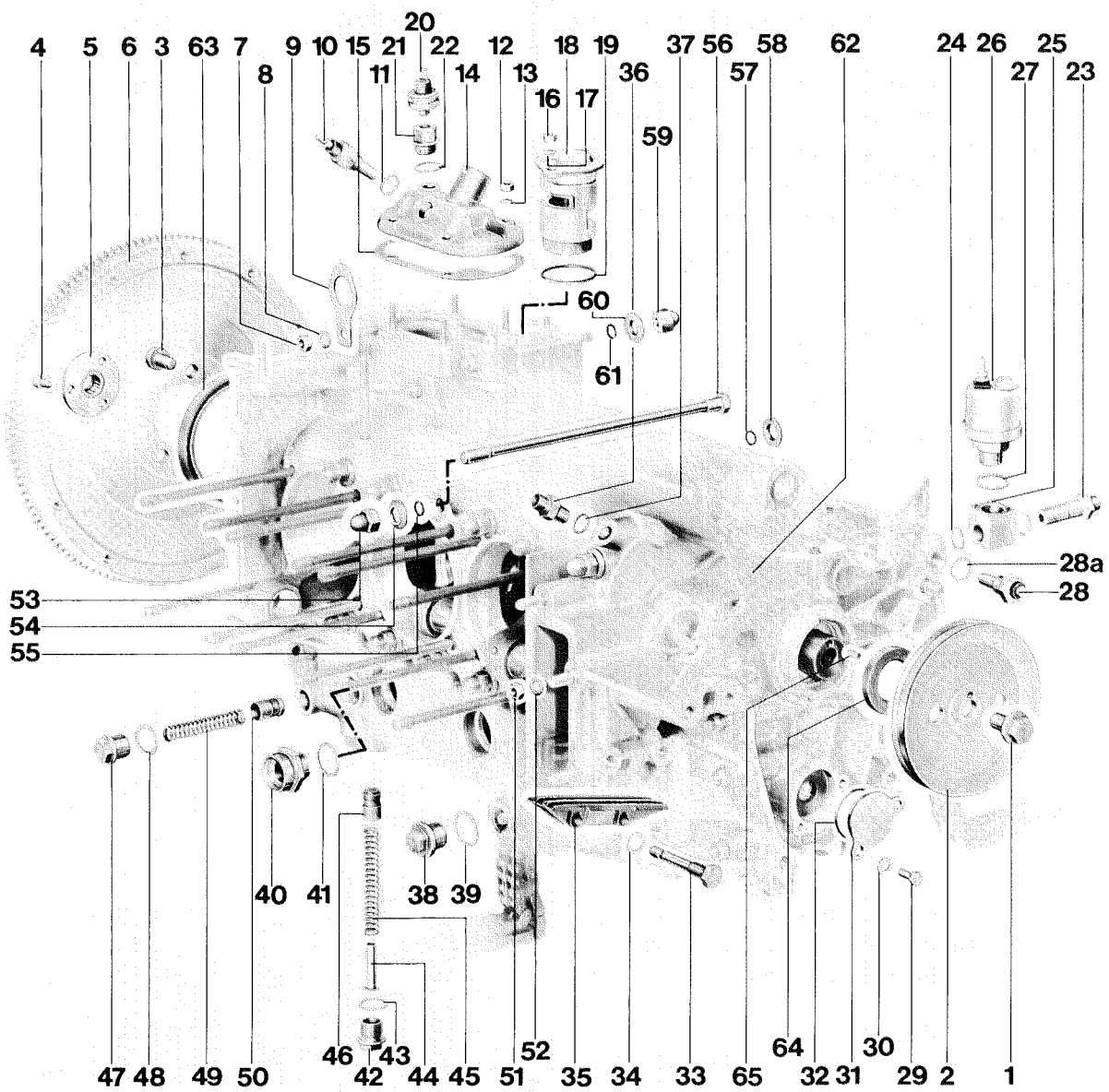
1. We recommend a short-pile velour roller for application by hand. A tray will also be required for the sealant and should have a rough edge to scrape excess sealant from the roller.



2. Roll an uniform coat of Loctite 574 on the mating surface of left crankcase section with a velour roller. Brush on sealant around studs.



DISASSEMBLING AND ASSEMBLING CRANKCASE AND EQUIPMENT



No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
1	Bolt	1		Check locking teeth, replacing bolt if necessary	
2	Pulley	1			
3	Bolt	9		Torque: 90 Nm (65 ftlb)	
4	Bolt M 6 x 12	3		Use Loctite 270	
5	Sleeve complete with needle bearing	1		First mount flywheel, then sleeve	
6	Flywheel	1			
7	Nut	1			
8	Washer	1			
9	Engine transporting eye	1			
10	Heater blower temperature switch	1			
11	Seal	1		Replace	
12	Nut	4			
13	Washer	4			
14	Vent cover	1			
15	Gasket	1		Replace, thin coat of Loctite 574 on both sides	

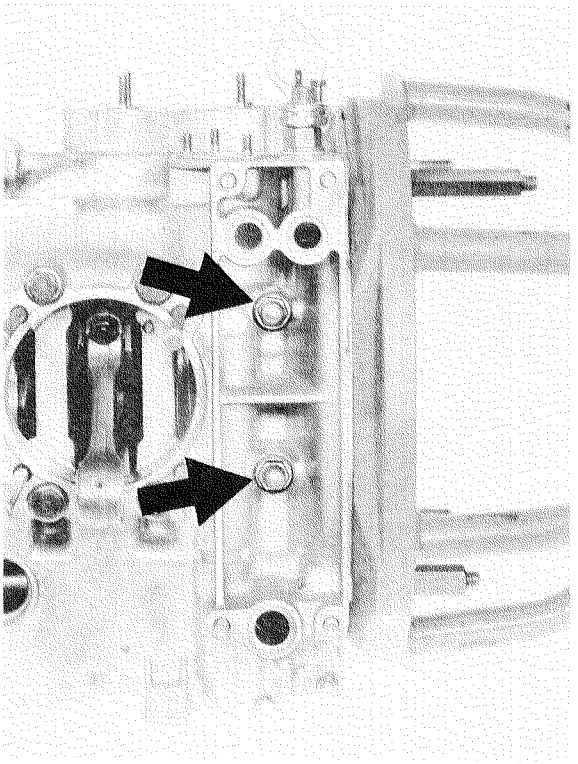
No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
16	Bolt	2			
17	Washer	2			
18	Oil temperature regulator	1			
19	O-ring	1		Replace	
20	Oil pressure switch	1			
21	Hollow union bolt	1		Thin coat of Loctite 270 on external threads	
22	Seal	1		Replace	
23	Adapter	1			
24	Seal	2		Replace	
25	Connector	1			
26	Oil pressure sensor	1		Torque: 35 Nm (25 ftlb). Always clamp connector in a vise when tightening.	
27	Seal	1		Replace	
28	Temperature sensor	1			
28a	Seal	1		Replace	
29	Bolt 6 x 16	2			
30	Washer	2			
31	End cover for intermediate shaft	1			

No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
32	Seal 33.3 x 2.4	1		Replace	
33	Guide rail pin	8			
34	Seal	8		Replace	
35	Guide rail	4			
36	Adapter	1			
37	Seal	1		Replace	
38	Oil drain plug	1		Torque: 70 Nm (51 ftlb)	
39	Seal	1		Always replace	
40	Adapter	1		Use Loctite 270	
41	Seal	1		Always replace	
42	Plug	1		Torque: 60 Nm (43 ftlb)	
43	Seal	1			
44	Spring guide	1			
45	Spring	1			
46	Pressure relief valve piston	1		Check	
47	Plug	1		Torque: 60 Nm (43 ftlb)	
48	Seal	1		Replace	

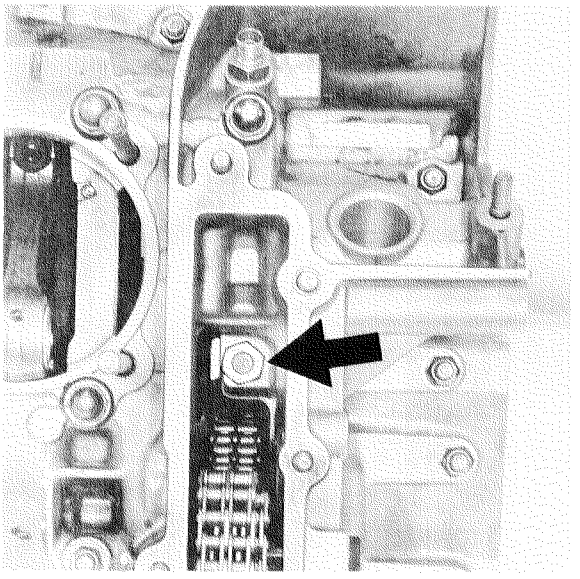
No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
49	Spring	1			
50	Safety valve piston	1		Check	
51	Nut M 10 x 1	1		Torque: 35 Nm (25 ftlb)	
52	Washer B 10 x 1	1			
53	Capped nut	11			
54	Washer	11			
55	Seal	11		Replace; light coat of oil	
56	Bolt	11			
57	Seal	11		Replace	
58	Washer	11			
59	Capped nut	2			
60	Washer	2		Install in correct position	
61	Seal	2		Replace; light coat of oil	
62	Crankcase section, left	1	Remove first	Coat mating surface with Loctite 574	
63	Radial oil seal	1		Replace	
64	Radial oil seal	1		Replace	
65	Dowel pin	1			

DISASSEMBLING AND ASSEMBLING CRANKCASE

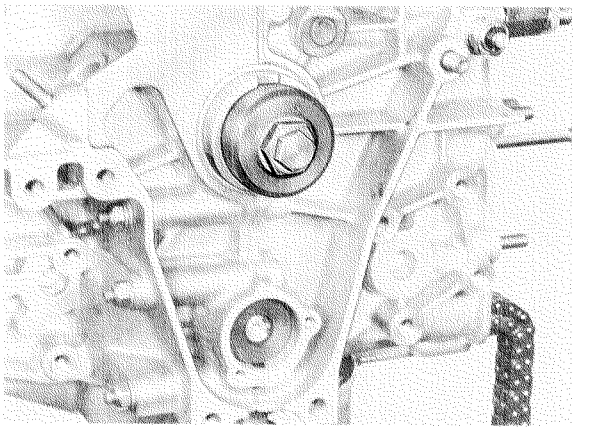
1. First tighten both capped nuts in area of oil cooler flange (bearing no. 1) with torque of 35 Nm (25 ftlb), and then the anchorage bolts.



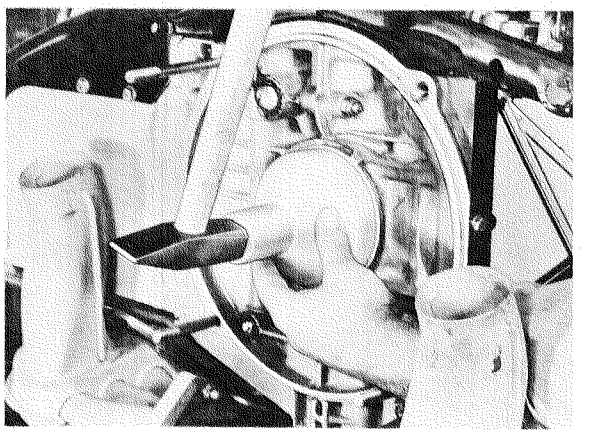
2. Tighten M 10 x 1 nut on staybolt for bearing no. 7 with torque of 35 Nm (25 ftlb).



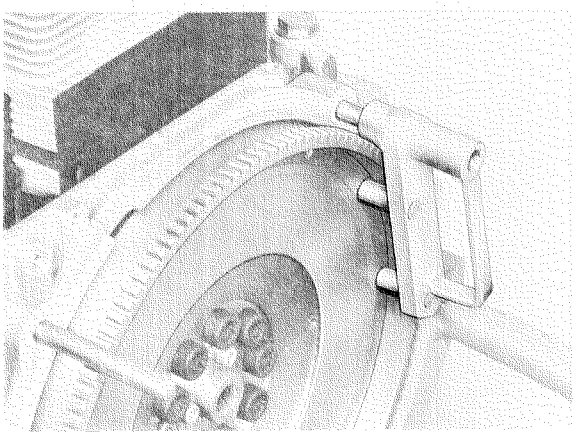
3. Coat sealing lip with oil and pull in seal with Special Tool P 216.



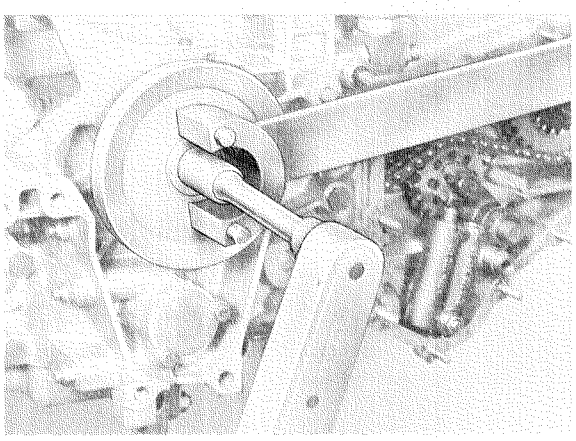
4. Coat sealing lip with oil and drive in seal with Special Tool 9126.



5. Hold flywheel with Special Tool P 238 b and tighten nut with torque of 90 Nm (65 ftlb).



6. Hold pulley with Special Tool 9236.



Note:

Always only hold pulley with Special Tool 9236. Pulley could be damaged by holding the flywheel instead of the pulley.

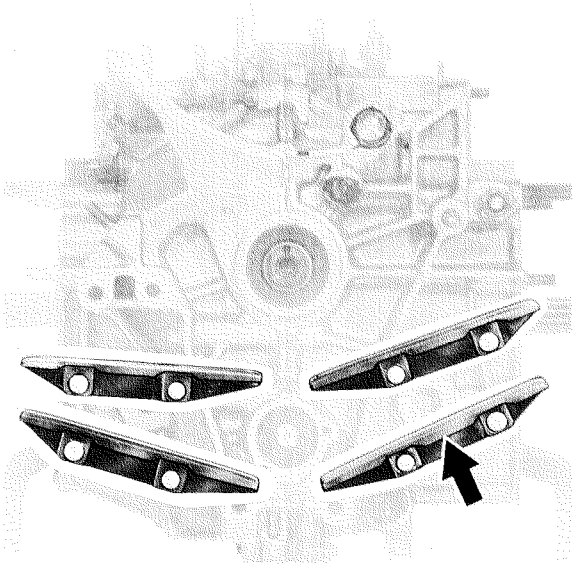
Printed in Germany – XII, 1988

DISASSEMBLING AND ASSEMBLING CRANKCASE

Guide Rail Arrangement on Crankcase

Three black guide rails,
Part No. 911 105 222 06, and
one brown guide rail,
Part No. 911 105 222 05.

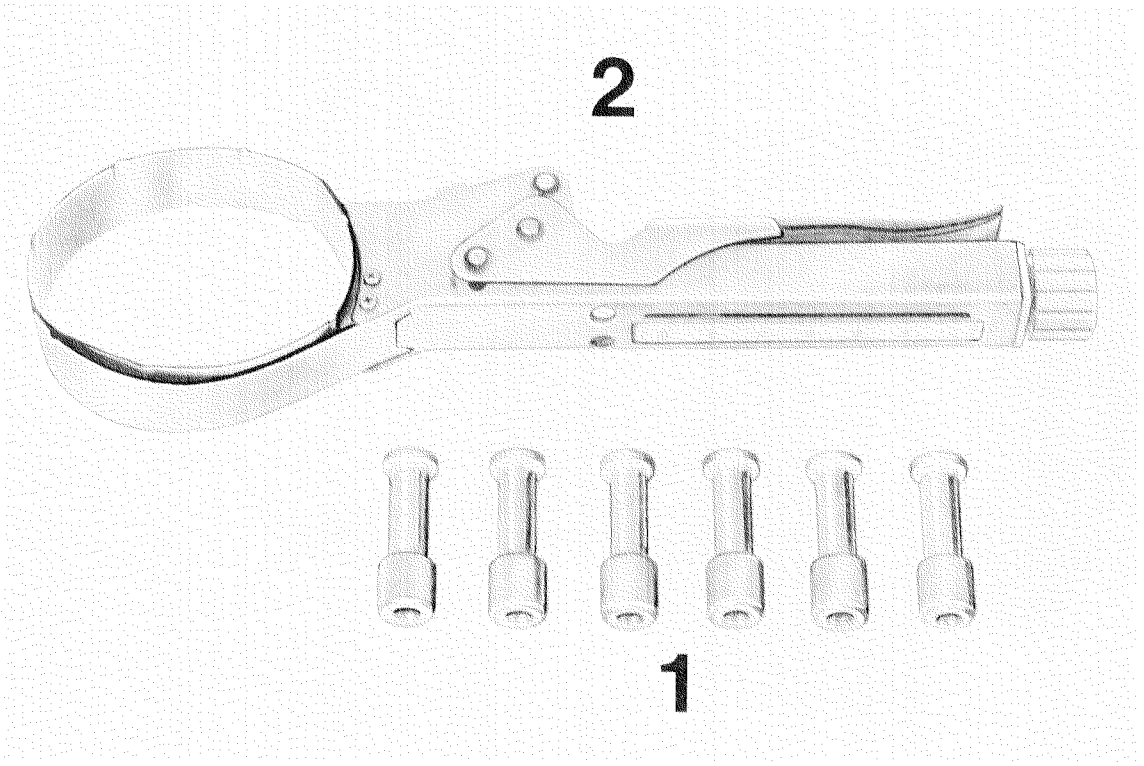
Brown guide rail must be mounted on bottom of right crankcase section (arrow).



Mounting Guide Rails

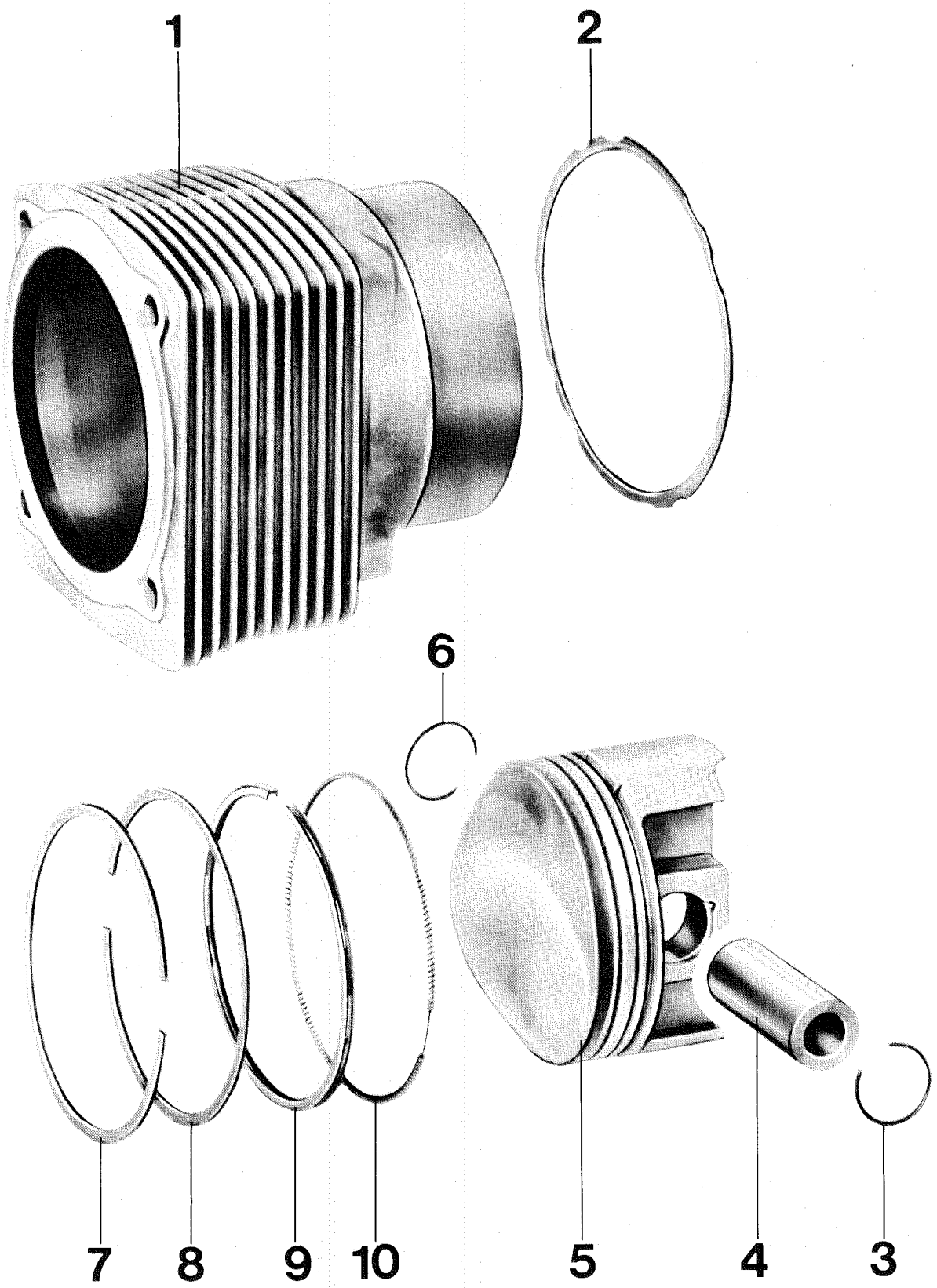
Screw in mounting bolts while simultaneously pressing guide rail against mounting bolts that guide rail engages in grooves of mounting bolts. Long end of guide rail faces timing chain sprockets on intermediate shaft.

PISTON AND CYLINDER TOOLS



No.	Description	Special Tool	Remarks
1	Cylinder holder	P 140	
2	Piston ring compressor		Standard, e. g. Hazet 794 - U - 3

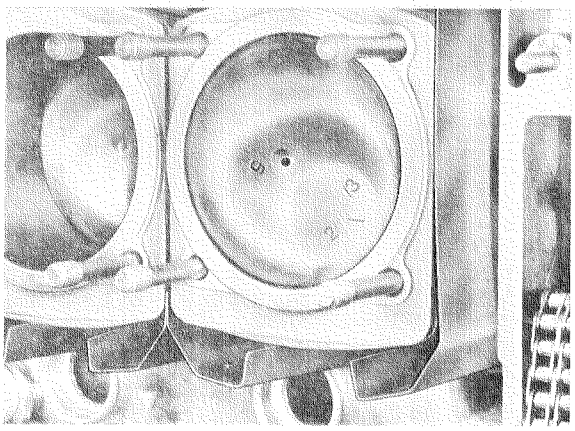
DISASSEMBLING AND ASSEMBLING PISTONS AND CYLINDERS



No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Cylinder	6	Mark installed position	Check	
2	Cylinder base gasket 0.25 mm thick	6		Replace	
3	Circlip	6	Pry out	Check for correct fit	
4	Piston pin	6	Must always remain with matched piston and may not even be used on different piston in same engine. Mark pistons and pins if necessary, when disassembling and assembling engine.		
5	Piston	6			
6	Circlip	6	Pry out	Check for correct fit	
7	Piston ring Groove 1	6			
8	Piston ring Groove 2	6			
9	Piston ring Groove 3	6			
10	Rubber lined spring Groove 3	6			

DISASSEMBLING AND ASSEMBLING PISTONS AND CYLINDERS

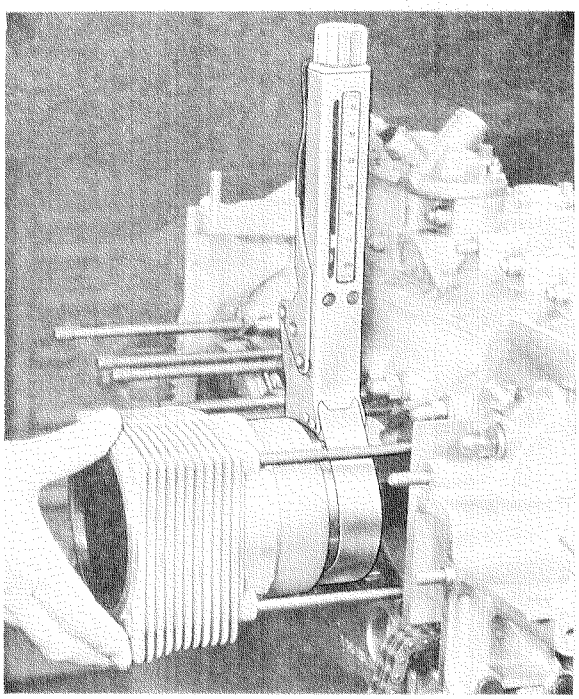
Installing Pistons



Piston Installed Position

Installing Cylinders

Lubricate piston and cylinder bore with oil. Apply piston ring compressor (Hazet 794 - U - 3). Installation must be made conscientiously and with feeling. Stop installation immediately if considerable resistance is felt and start again after inspecting the rings.



PISTON AND CYLINDER SIZES - 911 CARRERA

● MAHLE

Cylinder code	Cylinder dia. mm (Nikasil)	Piston dia. D mm
Standard size Stamped		
0	95.000 to 95.007	94.965 to 94.975
1	95.007 to 95.014	94.972 to 94.982
2	95.014 to 95.021	94.979 to 94.989
3	95.021 to 95.028	94.986 to 94.996

Clearance between cylinder and piston: 0.025 to 0.042 mm.

PISTON AND CYLINDER SIZES - 911 CARRERA

● KS

Cylinder code	Cylinder dia. mm (Alusil)	Piston dia. D mm
Standard size Stamped		
0	95.000 to 95.005	94.975 to 94.980
1	95.005 to 95.010	94.980 to 94.985
2	95.010 to 95.015	94.985 to 94.990
3	95.015 to 95.020	94.990 to 94.995

Clearance: cylinder-piston 0.020 to 0.030 mm

PISTON WEIGHT CLASSES

Weight Classes for Mahle Pistons

Pistons are weighed with accessories (piston pin, piston rings and circlips).

	Complete piston weight in g Weight tolerance within set of pistons		Code
Engine Type	930/20/26 RoW	930/21/25 USA	
Standard	618 to 622	613 to 617	--
	622 to 626	617 to 621	-
Permissible tolerance = ± 4 g	626 to 630	621 to 625	+
	630 to 634	625 to 629	++
For replacements: Permissible tolerance = ± 8 g	618 to 626	613 to 621	-- or -
	626 to 634	621 to 629	+ or ++

Weight Classes for KS Pistons

Pistons are weighed with accessories (piston pin, piston rings and circlips).

	Complete piston weight in g Weight tolerance within set of pistons	Code
Engine Type	930/25 USA	
Standard	650 to 654	--
	654 to 658	-
Permissible tolerance = ± 4 g	658 to 662	+
	662 to 666	++
For replacements: Permissible tolerance = ± 8 g	650 to 658	-- or -
	658 to 666	+ or ++

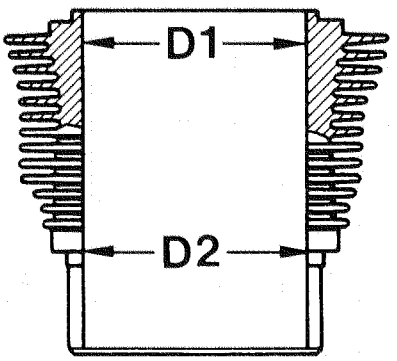
MEASURING PISTONS AND CYLINDERS

Cylinder

D1 = Measuring point for wear and ovality

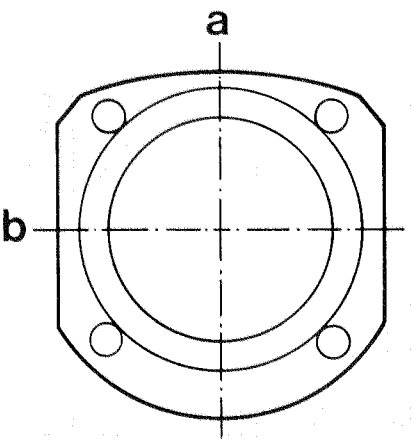
30 mm beneath upper edge of cylinder

The cylinder is worn when the diameter at this measuring point exceeds the original diameter by 0.08 mm. The ovality of the cylinder is measured by comparing axes a and b. The difference between a and b must not exceed 0.04 mm.



D2 = Measuring point for piston ring end clearance

Rings pushed in at level of cylinder base gasket.

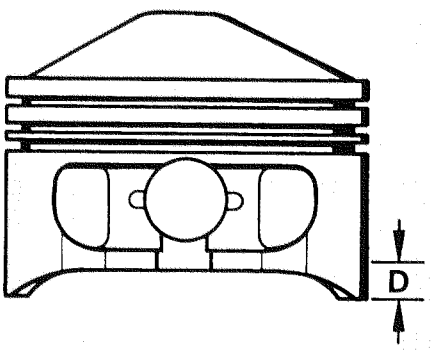


Pistons

D = Measuring point for wear

Mahle piston = 18 mm
KS piston = 10 mm

If the running clearance exceeds 0.12 mm, renew piston and cylinder. The running clearance is the difference between the largest cylinder diameter and the smallest piston diameter.



End Clearance of Piston Rings

Piston ring	End clearance mm (Installation)	End clearance mm (Wear limit)
Plain compression ring, groove 1	0.2 - 0.4	0.8
Scraper ring, groove 2	0.2 - 0.4	1.0
Double-beveled spring-loaded oil ring or single-beveled spring-loaded oil ring, groove 3	0.3 - 0.6	2.0

Vertical Clearance of Piston Rings

Piston ring	Vertical clearance mm (Installation)	Vertical clearance mm (Wear limit)
Plain compression ring, groove 1	0.070 - 0.102	0.2
Scraper ring, groove 2	0.040 - 0.072	0.2
Double-beveled spring-loaded oil ring or single-beveled spring-loaded oil ring, groove 3	0.020 - 0.052	0.1

---

911 Carrera

DISTINGUISHING FEATURES - MAHLE AND KS PISTONS AND CYLINDERS

Nikasil=	Alusil-
Mahle Cylinder	KS Cylinder
coated aluminum cylinder, yellowish	Uncoated aluminum cylinder, light grey
Piston, forged, leaded, dark grey	Piston (Ferrocoat piston), cast, iron-coated, light grey
Piston ring, groove 3	Piston ring, groove 3
Single-beveled spring-loaded oil ring, not chrome-plated	Double-beveled spring-loaded oil ring, chrome-plated

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End Clearance of Piston Rings

Piston ring	End clearance mm (Installation)	End clearance mm (Wear limit)
Plain compression ring, groove 1	0.2 - 0.4	0.8
Scraper ring, groove 2	0.2 - 0.4	1.0
Double-beveled spring-loaded oil ring or single-beveled spring-loaded oil ring, groove 3	0.3 - 0.6	2.0

Vertical Clearance of Piston Rings

Piston ring	Vertical clearance mm (Installation)	Vertical clearance mm (Wear limit)
Plain compression ring, groove 1	0.070 - 0.102	0.2
Scraper ring, groove 2	0.040 - 0.072	0.2
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---

911 Carrera

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Single-beveled spring-loaded oil ring, not chrome-plated	Double-beveled spring-loaded oil ring, chrome-plated

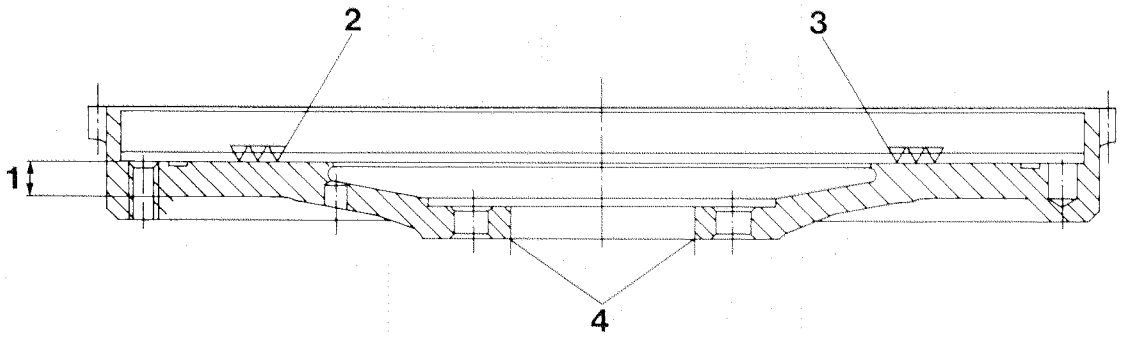
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MACHINING FLYWHEEL

When badly scored or scorched, the bearing surface for the driven plate on the flywheel can be machined on a lathe.

The metal removal should be kept as small as possible.

Wear limit for flywheel thickness: 8.5 mm.

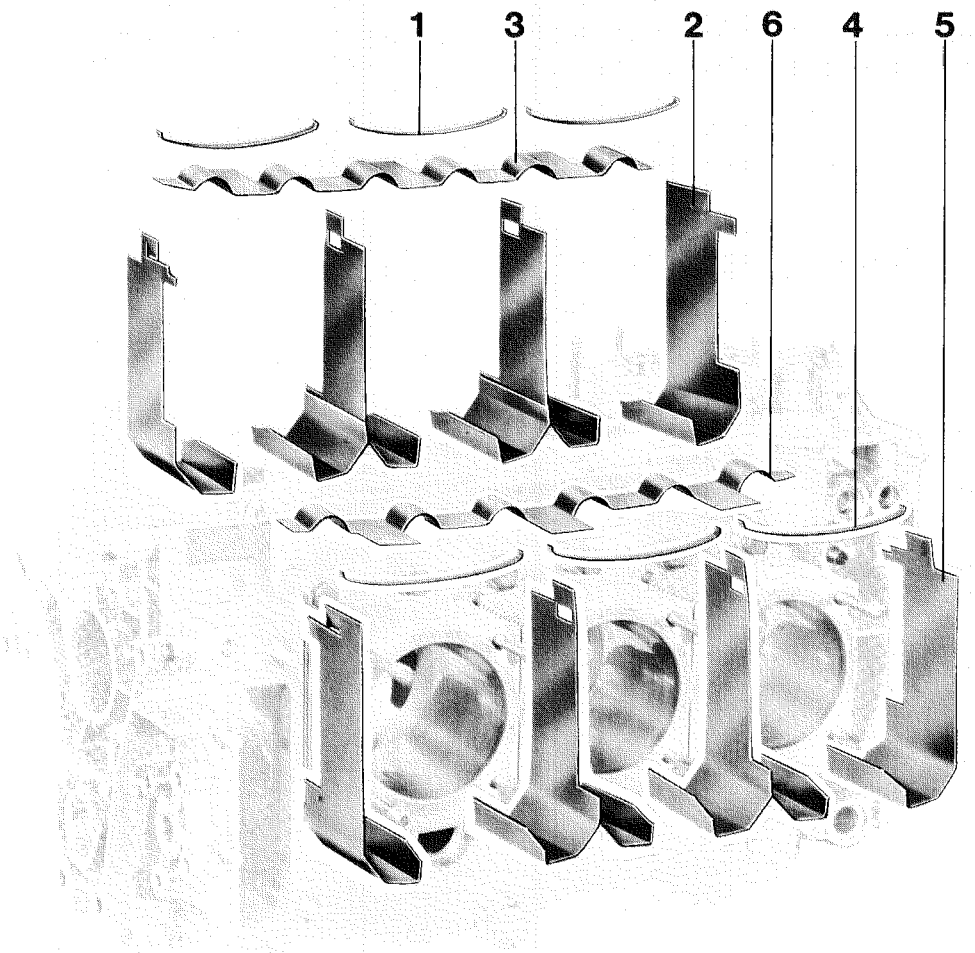


1 Wear limit 8.5 mm
2 Smallest possible metal removal
3 Max. runout 0.1 mm
4 Take-up for machining

MACHINING FLYWHEEL, 87 models

As of model year 87, it is not permissible to remachine the bearing surface for the rubber-damped driven plate. Depending on tolerances, remachining could cause the release bearing to contact the damper of the driven plate.

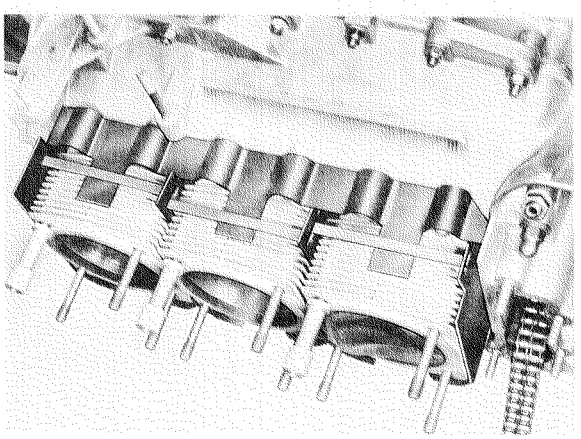
REMOVING AND INSTALLING AIR GUIDE PLATES



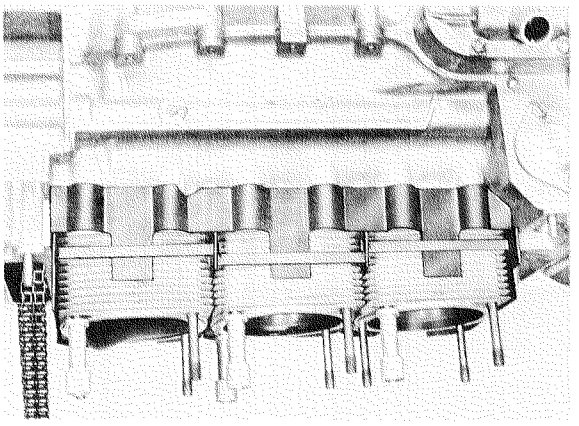
No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
1	Leaf spring	3			
2	Air guide plate Cyl. bank 1 – 3	4			
3	Cover	1			
4	Leaf spring	3			
5	Air guide plate Cyl. bank 4 – 6	4			
6	Cover	1			

REMOVING AND INSTALLING AIR GUIDE PLATES

Installed Position of Air Guide Plates



Cylinder Bank 1 – 3

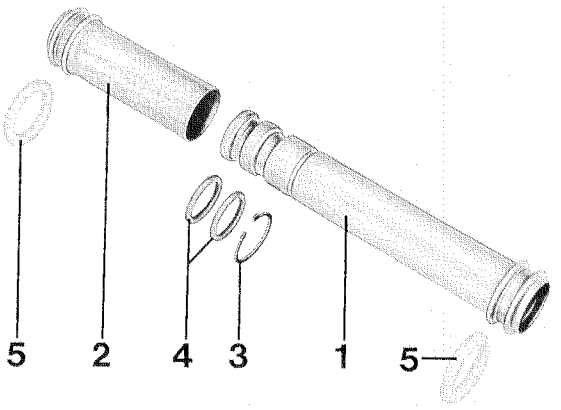


Cylinder Bank 4 – 6

Oil return pipes, removing and installing

Note:

As well as the one-piece oil return pipes, sectioned oil return pipes are also available for repairs. This makes it possible to replace them without removing and dismantling the engine. The one-piece oil return pipes should however be used when reconditioning an engine.



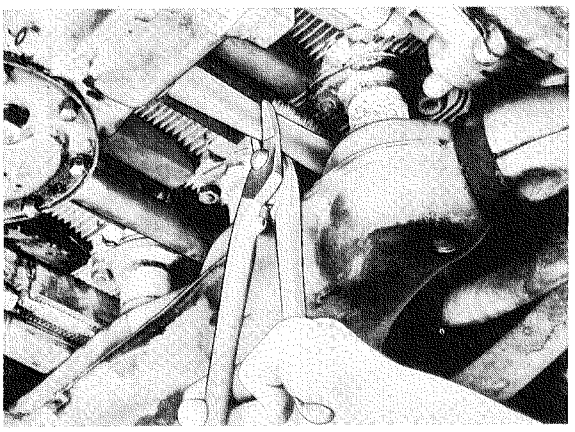
77/4679

1 Oil pipe long
2 Oil pipe short
3 Retaining ring
4 O-rings
5 Round seal

Removing

1. Remove the left-hand heat exchanger. The right-hand heat exchanger can remain on the engine.

2. Cut through the one-piece oil return pipe in the middle with metal shears. Drain off residual oil.



77/4681

3. Remove pieces of pipe. Clean sealing surfaces on the crankshaft and camshaft housings.

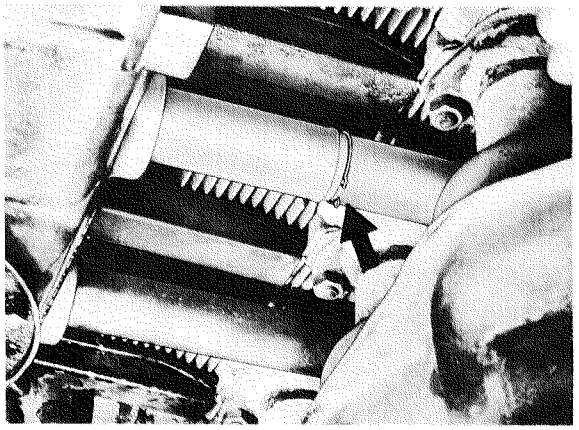
4. Preassemble the sectioned oil return pipe, i.e. mount the O-rings and round seals and apply a light film of tire-mounting paste (e.g. Contifix). Push the retaining ring out of the groove and slide approx. 40 mm along the pipe. Plug pipes together.

5. Press the telescoped pipes apart on the engine, so that the round seals are located in the sealing surfaces and the retaining ring groove is free.

Note:

Install the short oil pipe on the crankcase side.

6. Replace the retaining ring in the groove. Turn the installed pipe slightly to ensure that the round seals are correctly seated.



77/4685

7. After a test run, check the engine for leaks

Timing chains, removing and installing

Note:

As well as the continuous, rivetted timing chains, segmented timing chains are available for repairs. These make it possible to replace timing chains without removing and dismantling the engine. Do not fit segmented timing chains simultaneously, but one after the other, as the chains have different senses of direction. The continuous, rivetted timing chains should, however be used when reconditioning an engine.

Removing

1. Remove spark plugs, the engine will crank more easily.

2. Set the engine to ignition TDC cylinder 1 (overlapping cylinder 4).

3. Remove chain tensioner, sprocket carrier, guide rails and camshaft sprocket.

4. Grind through both bolts of a link of the built-in chain and remove the link. Ensure that no grinding dust gets into the engine.

Installing

1. Attach the new chain with the connecting link to the end of the old chain running into the engine when the engine is cranked.

2. Turn the camshaft until the center mark or 930 mark points to approx. 45 outwards. No valves are completely opened when the camshaft is in this position.

3. Turn the crankshaft slowly in the sense of rotation keeping the chain tensioned.

Note:

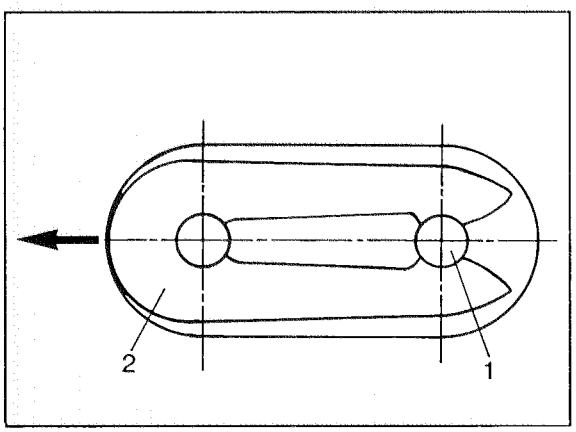
When turning the crankshaft make sure that the valves are not in contact with the piston top. If any pressure is felt, move the crankshaft backwards immediately and adjust the camshaft accordingly.

4. Crank the engine until the connecting pin can be inserted on the other end of the new chain.

5. Remove the old chain and connect the new, drawn-in chain with the connecting pin.

Note:

Insert the connecting pin (1) from the front (housing side), not forgetting the spacers. Insert the spring fastening (2) with the closed end pointing in the direction of rotation. Observe the sense of direction of the chains.



6. Install guide rails, sprocket carrier and camshaft sprocket and adjust valve timing (Repair Guide Volume 1, Page 15 - 24).

CHECKING AND ADJUSTING FAN DRIVE BELT TENSION

Note:

Drive belt must be tight to guarantee fan cooling efficiency.

Checking

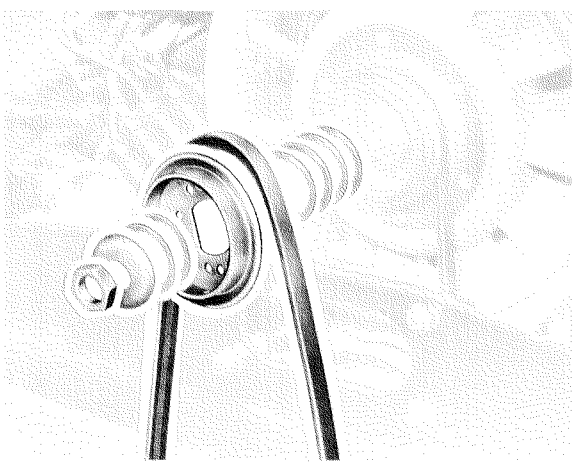
Check tension by applying thumb pressure at center of belt. Belt gives by approx. 5 mm.

Adjusting

1. Tighten belt with shims so that center of belt gives under thumb pressure by 10 to 15 mm.

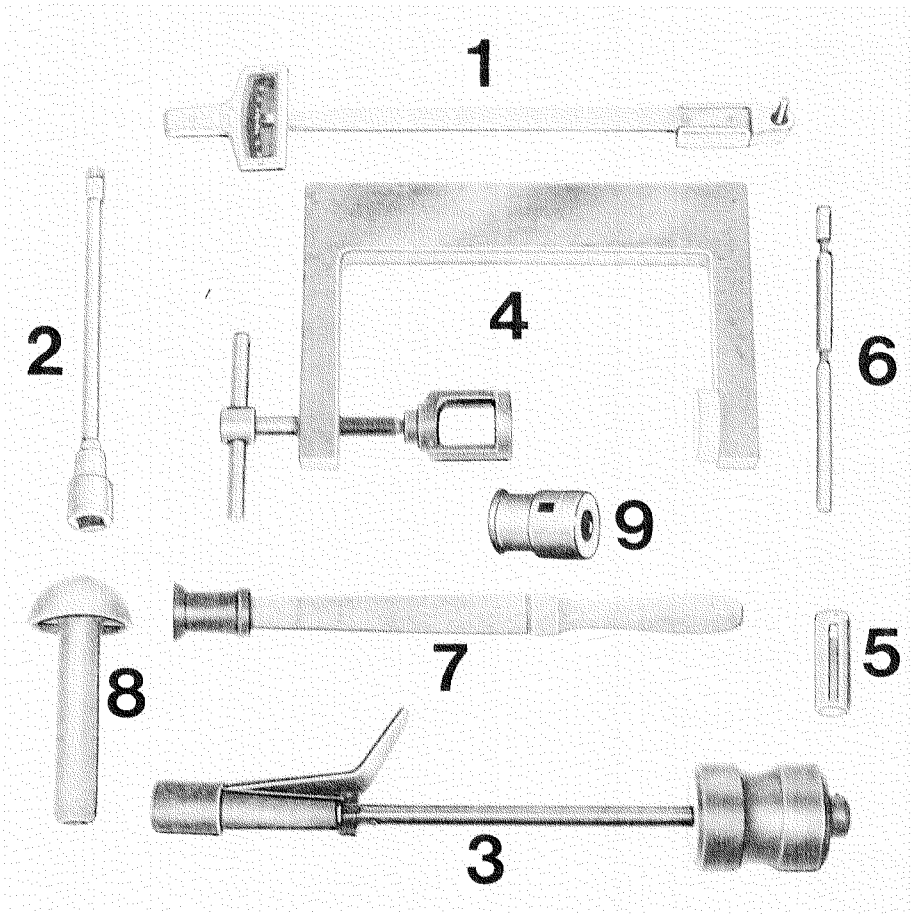
2. Remove one shim from between both pulley sections and install it in front of the front pulley section. Do not change total number of 6 shims.

   This will provide correct belt tighteness, i.e. belt will give by approx. 5 mm.



Torque for hexagon nut, 40 Nm (29 ftlb)

CYLINDER HEAD TOOLS

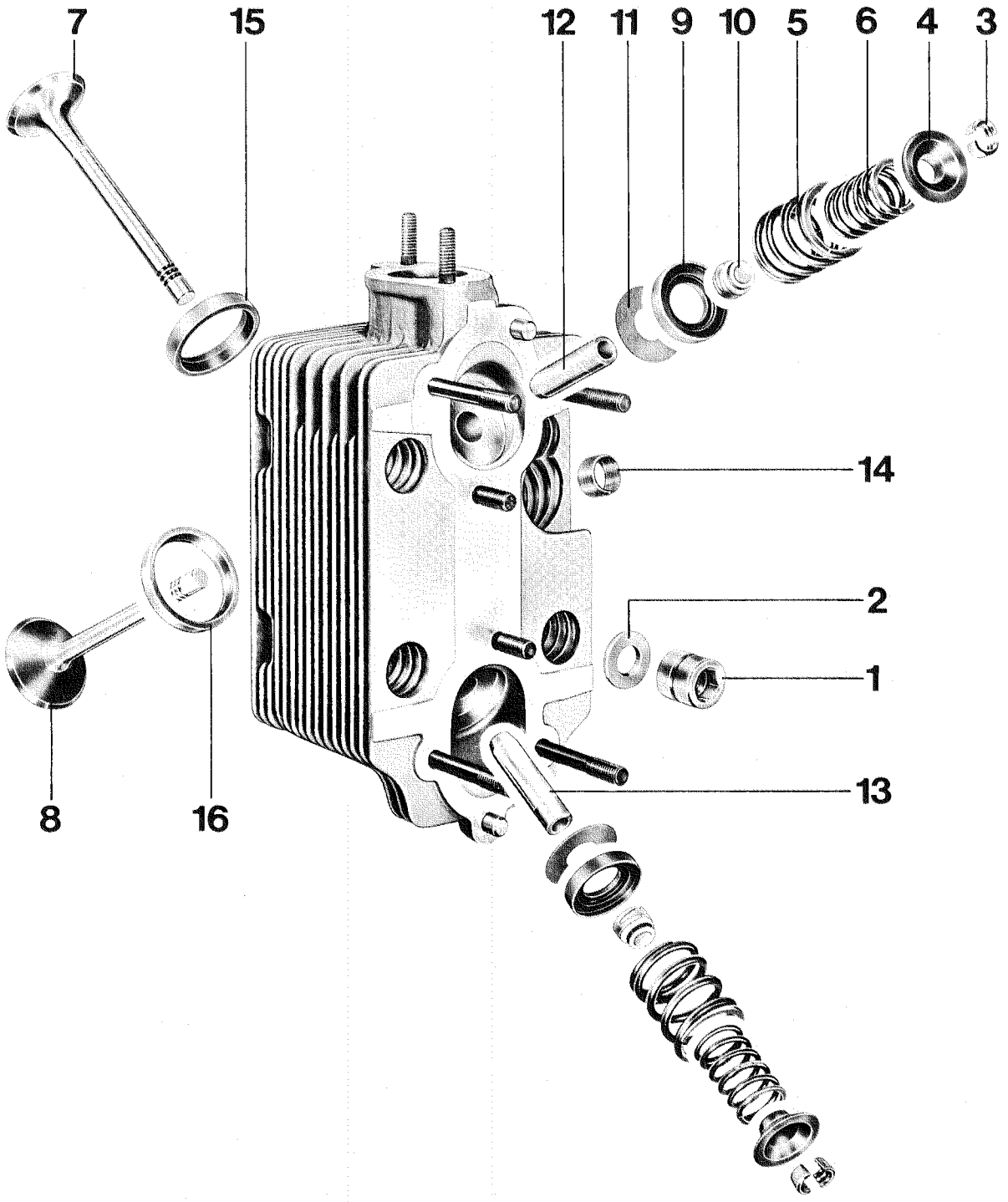


CYLINDER HEAD TOOLS

No.	Description	Special Tools	Remarks
1	Torque wrench with socket and bits		Standard (Stahlwille 73 Nm V/3 and 49 - 5)
2	Socket wrench for cyl. head nuts, 10 mm	P 119	
3	Puller for valve stem seals	3047	
4	Valve spring compressor	P 200 a	
5	Wrench socket for temperature sensor II in cyl. head (cyl. 3)	9222	
6	No-go gage for valve guides	P 206	
7	Valve grinder		Standard
8	Thrust pad for pressing in valve stem seals	10 - 204	
9	Valve spring adjuster	P 10 c	

DISASSEMBLING AND ASSEMBLING CYLINDER HEAD

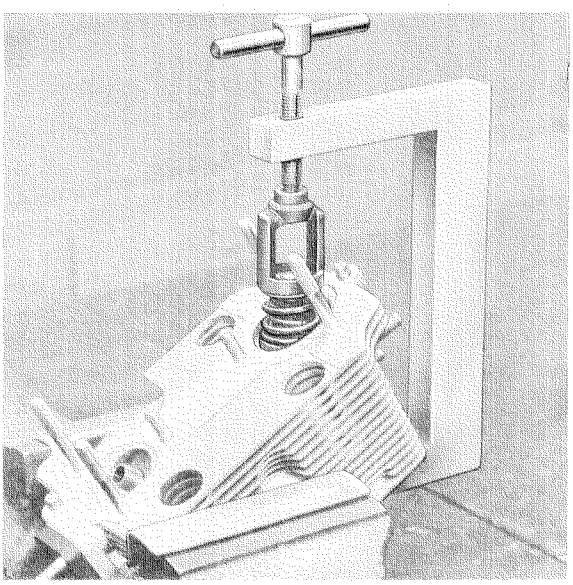
DISASSEMBLING AND ASSEMBLING CYLINDER HEAD



No.	Description	Qty.	Note When: Removing	Installing
1	Cylinder head nut	24		Apply thin coat of Optimoly HT to cylinder head nut contact surface (see page 15 - 8d)
2	Washer	24		Domed surface faces up
3	Valve keeper	24		
4	Valve spring retainer	12		
5	Outer valve spring	12		
6	Inner valve spring	12		
7	Intake valve	12		Club Sport see page 15 - 18 e
9	Valve spring disc	12		
10	Valve stem seal	12		Always replace
11	Washer	X		Measure with Special Tool P 10 c
12	Intake valve guide	6		See page 15 - 8a
13	Exhaust valve guide	6		See page 15 - 8a
14	Threaded insert	6		
15	Intake valve insert	6		
16	Exhaust valve insert	6		

DISASSEMBLING AND ASSEMBLING CYLINDER HEAD

Removing and Installing Valve Springs

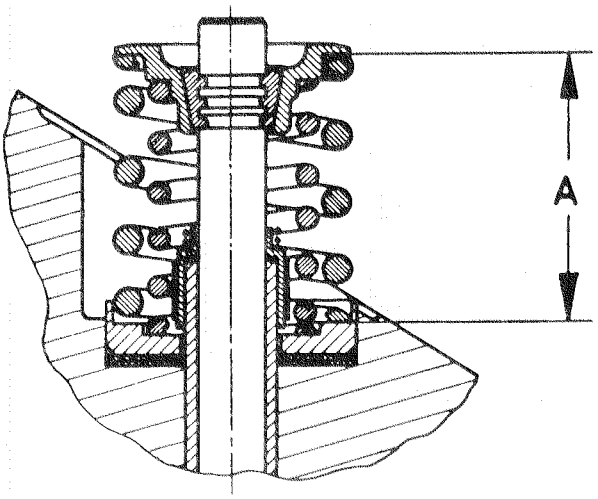


Use P 200 a for removal and installation of valve springs.

Checking Installed Length of Valve Springs

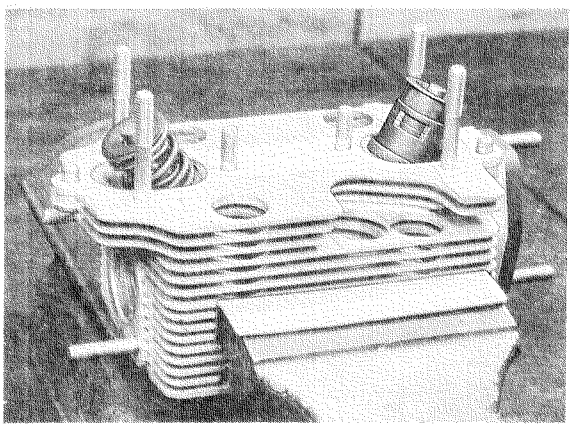
1. Install Special Tool P 10 c with shims belonging to a pertinent valve, spring retainer, spring disc and both keepers.

2. Read distance "A" from Special Tool P 10 c and, if necessary, correct by adding or removing shims.



Note:

Make sure spring retainer fits perfectly in special tool, machining special tool if necessary.



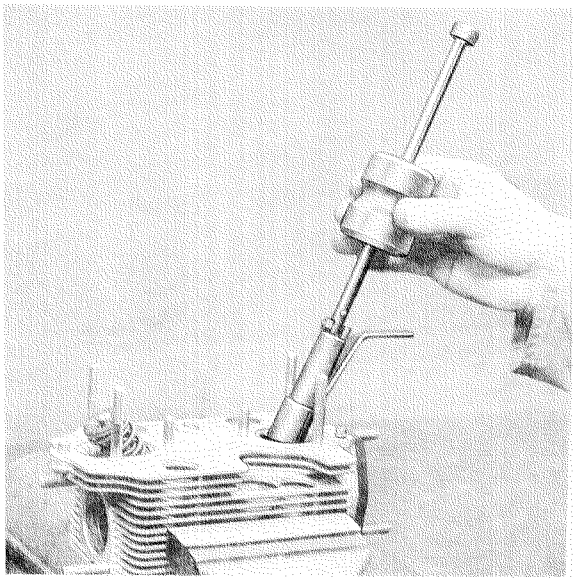
Installed Distances:

Intake valve	34.5 ± 0.3 mm
Exhaust valve	34.5 ± 0.3 mm

Installing Valve Springs

Outer valve springs are wound progressively. Small diameter end of springs rests on cylinder head. Installed position of inner valve springs is not important.

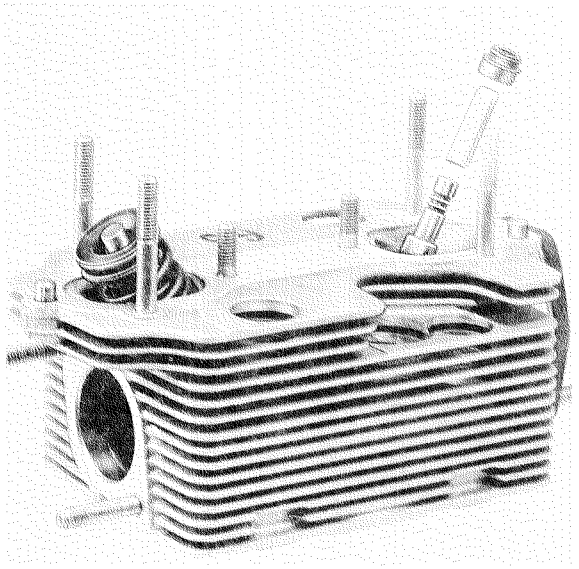
Removing and Installing Valve Stem Seals



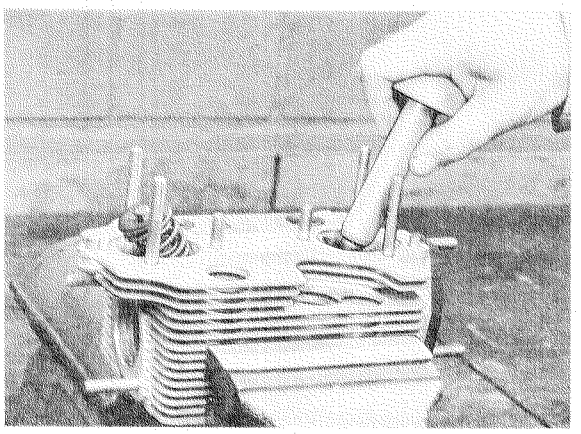
Pull off valve stem seals with Special Tool 3047.

Installing

Slide plastic sleeve on to valve stem to avoid damaging new valve stem seal.



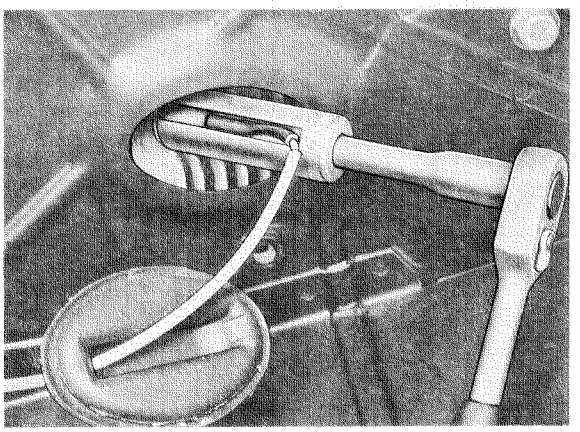
Lubricate sealing lip of valve stem seal with light coat of oil and press seal on to valve guide carefully and feelingly with Special Tool 10 - 204.



Supplier of Plastic Sleeves:

Cartool
Alfred-Brehm-Str. 5
D - 8070 Ingolstadt

Removing and Installing Temperature Sensor II

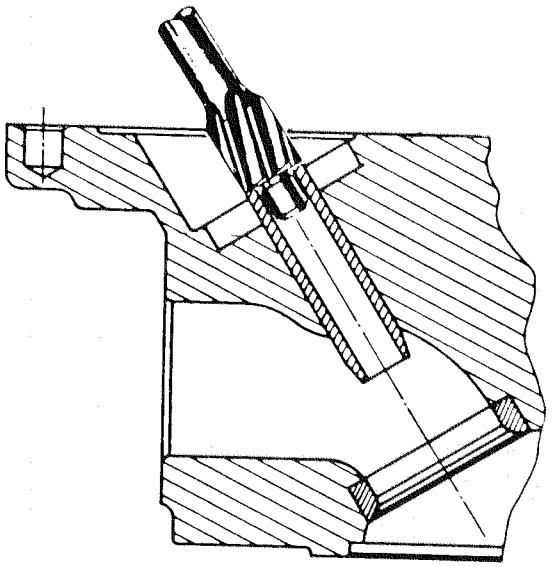


Apply light coat of Molykote HSC paste on threads. Tighten temperature sensor II with torque of 15 Nm (11 ftlb), using Special Tool 9222/1.

REPLACING VALVE GUIDES

Removing

Working from the camshaft side, use a facing cutter to mill projecting valve guides until guides are flush with cylinder head. With a sharp blow with a hammer, dislodge each guide and use a press to force out toward combustion-chamber side.



Installing

The holes which accommodate the valve guides in the cylinder head will have been made slightly wider by removal of the old guides.
New oversize valve guides must be installed and machined to fit (see table of sizes).

1. Measure valve-guide holes in cylinder head.

2. On a lathe, machine the oversize valve guides to the correct outside diameter to fit the hole in the cylinder head. The squeeze for intake and exhaust valves must be 0.06 - 0.09 mm.

3. Dust machined valve guides with talcum powder and, working from the camshaft side, press guides into cylinder head with improvised mandrel.

4. With a broach or on a precision drilling bench, bore valve guides out to size "g" = 9.00 - 9.015 mm. If no other tool is available, a reamer can also be used to enlarge the valve guides.
Important: Always set or clamp the cylinder head at the correct angle before pressing in and boring the valve guides.
After replacing valve guides, check bearing pattern on valve seat and remachine valve seat if necessary.

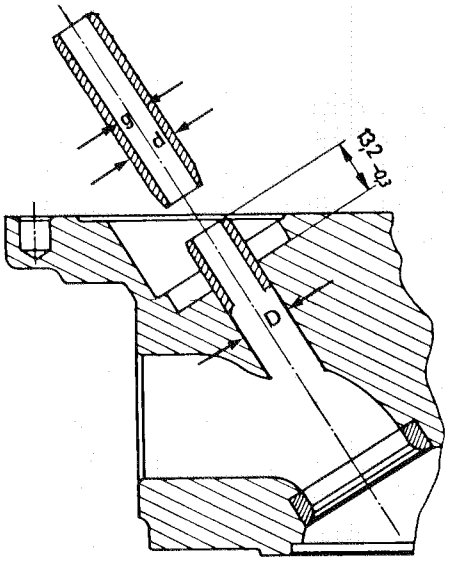
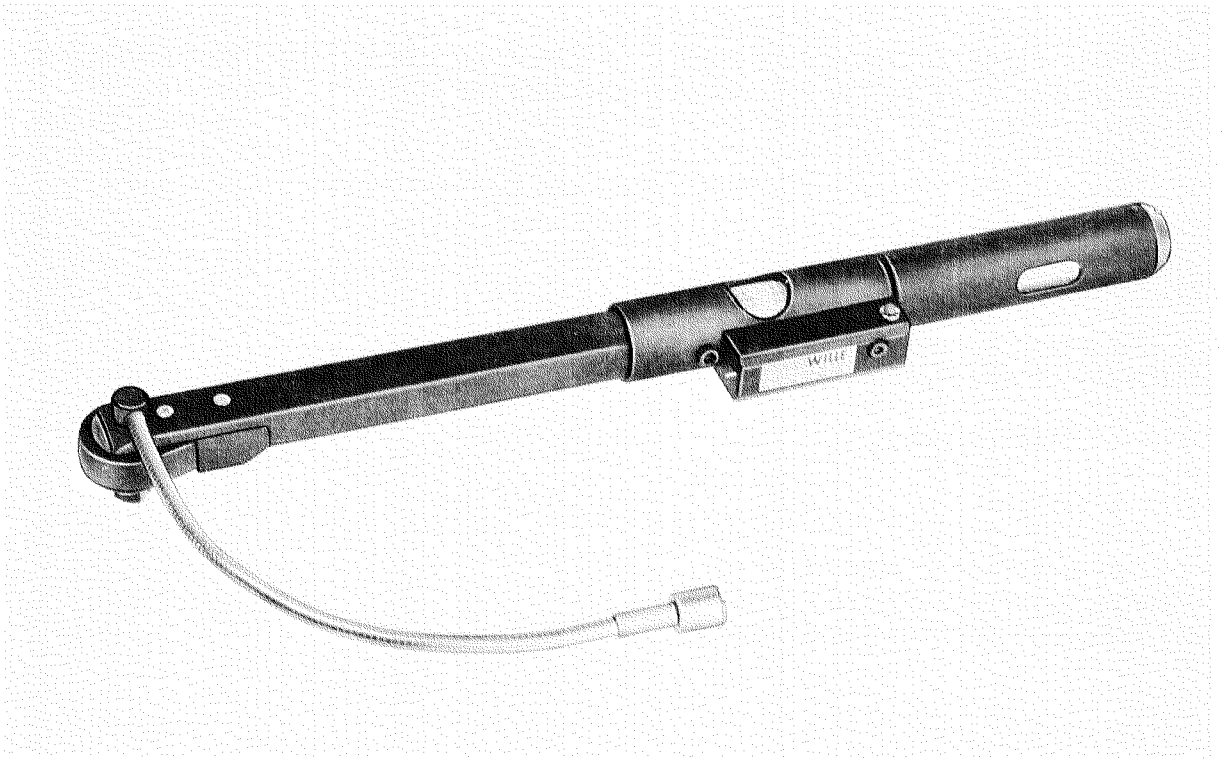


Table of sizes for installing valve guides:

Valve guide	Outside diameter *Valve guide	Hole diameter Cylinder head
Standard size (series)	13.060	13.000 - 13.018
Oversize 1	13.260	13.000 - 13.200

* Machine outside diameter of valve guides to fit diameter of hole - take squeeze into account.

TOOL - INSTALLING CYLINDER HEAD
TORQUING BY DEGREES OF TURN



No.	Description	Special Tool	Remarks
	Degree meter		Commercially available, e.g. Stahlwille No. 715/20

INSTALLING CYLINDER HEADS

Use torquing by degrees of turn method to torque cylinder heads.

Engine types 930/20/21/25/26

Note:

The earlier torque-controlled method of tightening the cylinder-head bolts has been replaced by the method of torquing by degrees of turn. The method of torquing by degrees of turn applies to repairs on all 911 Carrera engines (84 models onward). Cylinder-head nuts, Part No. 901 104 382 02 must always be used. The new nuts are yellow passivated, the earlier versions were grey.

Notes on assembly

1. Apply a thin coat of Optimoly HT to thread of crankcase studs.

2. Install cylinder heads.

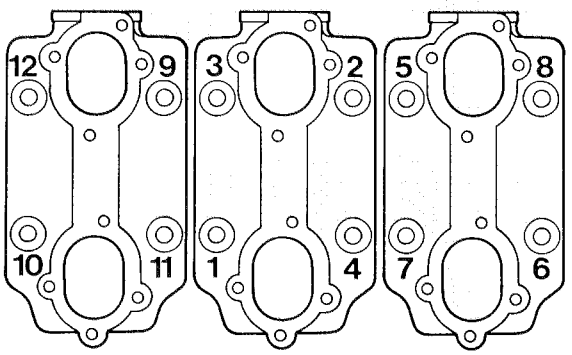
3. Install washers

4. Apply a thin coat of Optimoly HT to contact surface of cylinder head nuts and tighten as follows:

Two-stage tightening:

Stage 1: 15 Nm (11 ftlb) in specified sequence

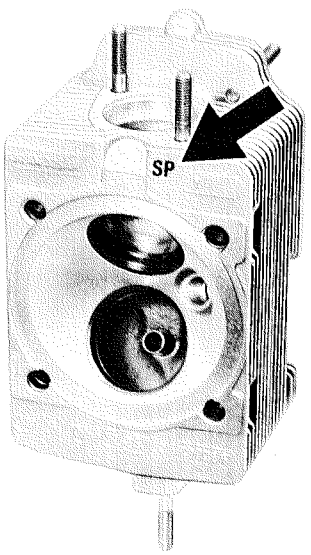
Stage 2: 1 x 90° ±2° in same sequence



Cylinder head, Club Sport

Distinctive features compared to standard cylinder head:

1. Cylinder heads with "SP" emblem (stamped).



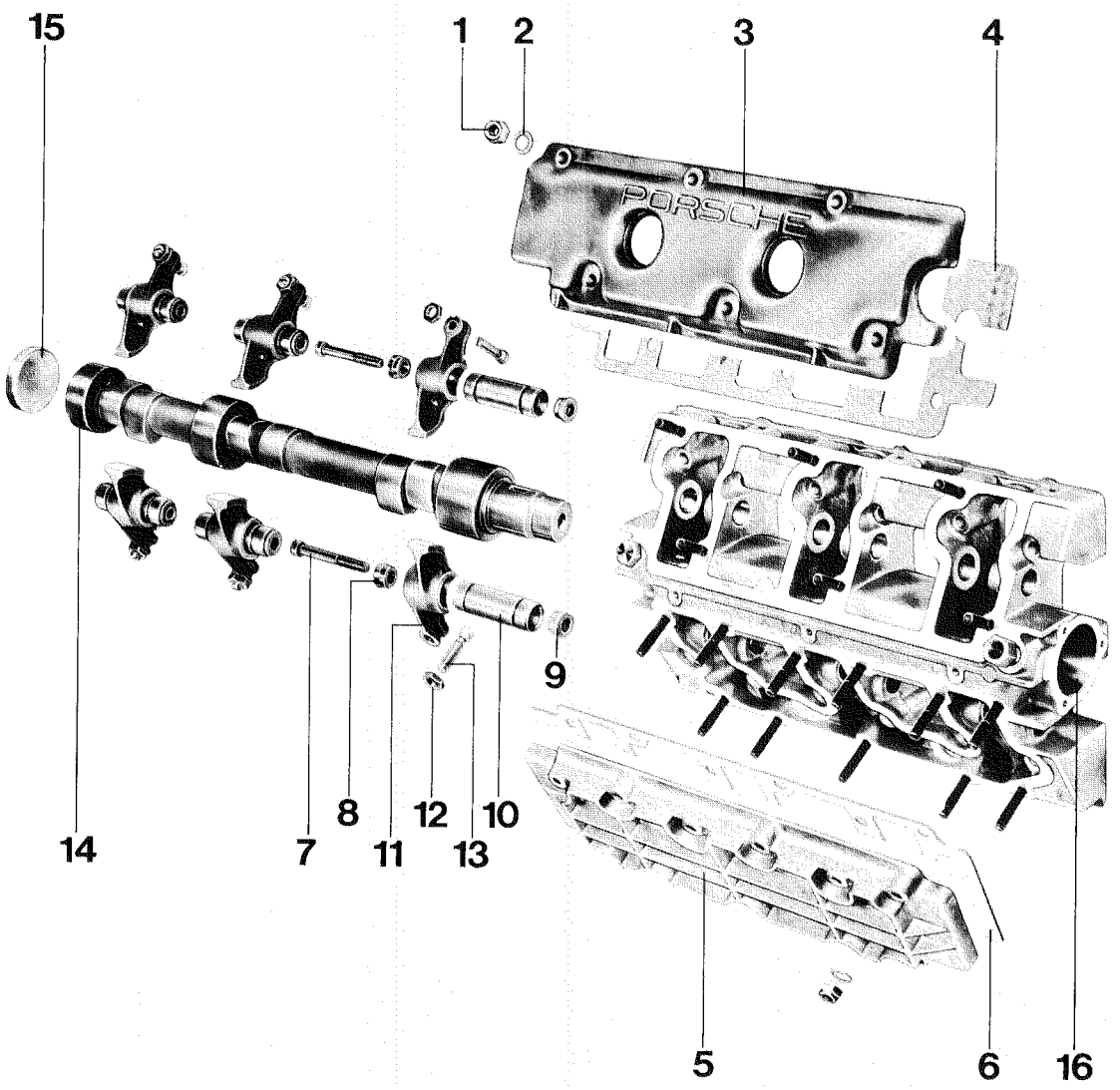
87/833

2. Inlet valve - hollow-stem valve (not sodium filled).

Piston shank ends marked with
930.105.409.14 T-T 30.184/1 burnished.

DISASSEMBLING AND ASSEMBLING CAMSHAFT CASE

DISASSEMBLING
AND ASSEMBLING CAMSHAFT CASE



No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
1	Self-locking nut	34		Replace	
2	Aluminum washer	34		Replace	
3	Upper camshaft case cover	2			
4	Gasket	2		Check, replacing if necessary	
5	Lower camshaft case cover	2			
6	Gasket	2		Replace	
7	Bolt	12			
8	Sleeve	12			
9	Nut	12			
10	Rocker arm shaft	12			
11	Rocker arm	12		Check for scoring	
12	Nut	12			
13	Adjusting screw	12			
14	Camshaft	2		Check for runout and scoring	
15	End cover	2			
16	Camshaft case	2			

DISASSEMBLING AND ASSEMBLING CAMSHAFT CASE

Removing and Installing Spray Tube on Camshaft Case

Note:
Spray tubes must always be removed and cleaned thoroughly when bearings are damaged and engine is overhauled.

Removing

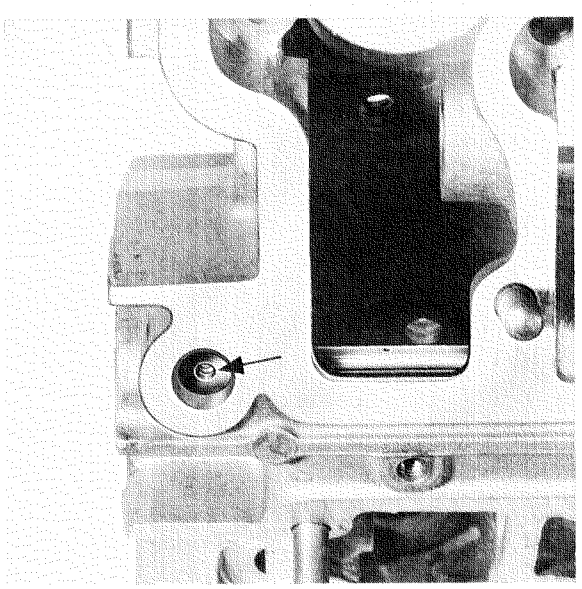
1. Drill hole in plug approx. 9 mm deep with a 4.8 to 5.0 mm dia. drill. Then cut M 6 threads in hole with a standard tapper. Pull out plug with a M 6 screw and spacer.

Note:
Be careful not to damage sealing surface when pulling out.

2. Unscrew centering screws and remove spray tube from the side.

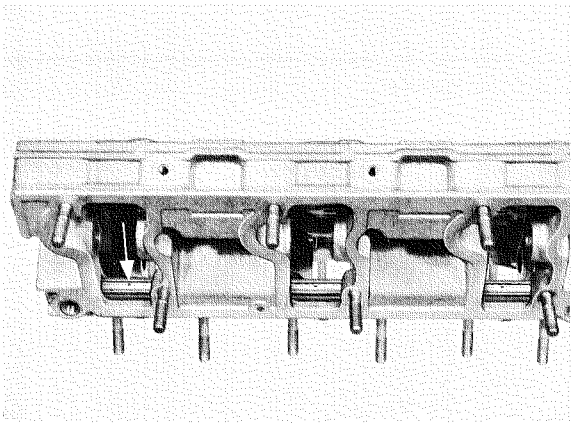
Installing

1. Install spray tube in correct position, making sure plug locating bore is lined up correctly.



Note:

Single bores must face up to the intake valve covers. Double bores (not shown in figure) face cam sliding surface.

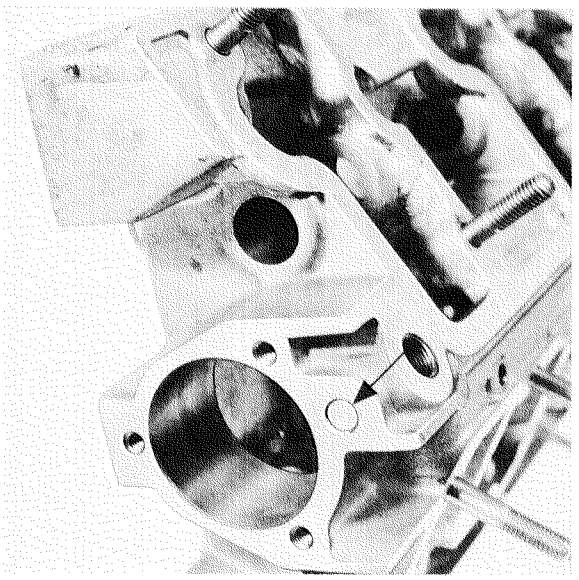


2. Coat new plug with Optimoly HT and press in plug.

Note:

If plug no longer has a press-fit in the case, upset plug before installing.

3. Plug must be pressed in approx. 0.3 mm deeper than sealing surface.



SEALING CYLINDER HEAD / CAMSHAFT CASE MATING SURFACE

Note:

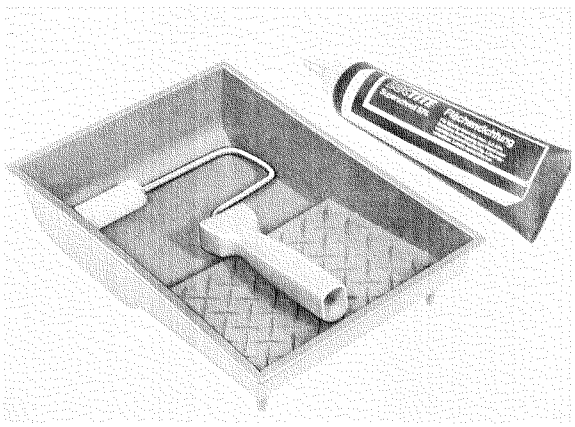
Only Loctite 574 (orange) should be used as a sealant.
Loctite 574 will dry only in conjunction with metal and exclusion of air. After applying a coat of sealant the bolts should be installed and tightened no later than 10 minutes, since the sealant on the metal will start to dry.

Removing Old Sealant

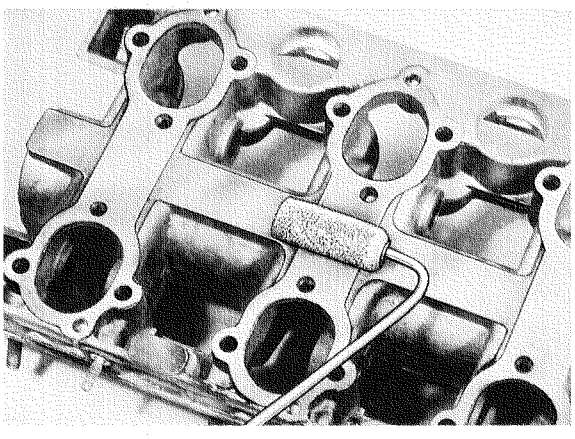
The old sealant does not have to be removed for repairs. It is only necessary to remove grease from the surface, so that after the cleaning solution has dried the new coat of sealant can be applied. The new Loctite will dissolve the old sealant in the surface finish and dry again after assembling.
We recommend a fine steel brush for removing old sealant, if this is ever necessary.

Applying Sealant

1. We recommend a short-pile velour roller for application by hand. A tray will also be required for the sealant and should have a rough edge to scrape excess sealant from the roller.



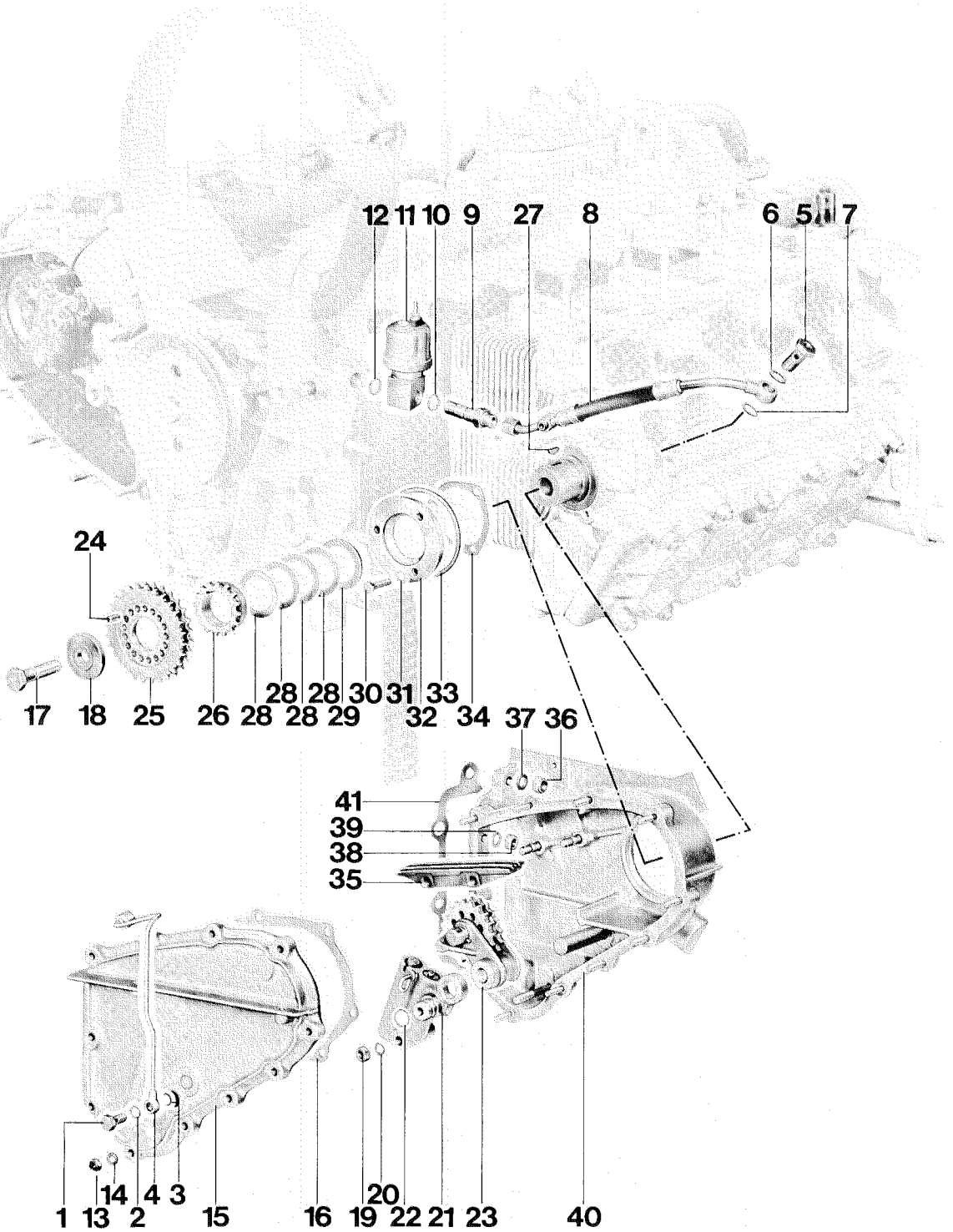
2. Apply a very thin coat of sealant on mating surface of camshaft case.



DISASSEMBLING AND ASSEMBLING TIMING CHAIN HOUSING AND CAMSHAFT DRIVE

DISASSEMBLING AND ASSEMBLING TIMING CHAIN HOUSING AND CAMSHAFT DRIVE

Cylinder Bank 4 – 6



No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
1	Hollow union bolt	1			
2	Seal	1		Replace	
3	Seal	1		Replace	
4	Chain tensioner oil supply pipe	1			
5	Hollow union bolt	1			
6	Seal	1		Replace	
7	Seal	1		Replace	
8	Camshaft oil supply pipe	1			
9	Adapter	1			
10	Seal	1			
11	Oil pressure sensor on connector	1		Clamp connector in a vise and then tighten oil pressure sensor to approx. 35 Nm (25 ftlb)	
12	Seal	1		Replace	
13	Self-locking nut	11		Check, replacing if necessary	
14	Washer 6.4 x 11, alu	11		Replace	
15	Timing chain housing end cover (right)	1			
16	Gasket	1		Always replace	

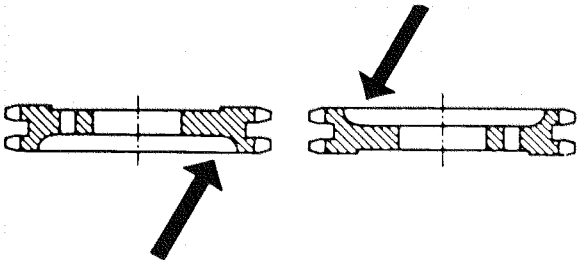
No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
17	Bolt M 12 x 1.5 x 50	1		Thin coat of Optimoly HT on threads. Torque: 120 Nm (87 ftlb)	
18	Washer	1			
19	Nut	1			
20	Spring	1			
21	Chain tensioner	1	Cannot be repaired		
22	O-ring	1		Always replace	
23	Sprocket carrier assy.	1			
24	Dowel pin	1		Pull out with Special Tool P 212	
25	Sprocket	1		Check (deep recess faces forward, flywheel end)	
26	Sprocket flange	1			
27	Woodruff key	1			
28	Shims	X		Measure thickness	
29	Thrust washer	1		Position correctly, recess faces camshaft	
30	Bolt M 6 x 25	3			
31	Washer	3			
32	End cover	1			
33	O-ring 67.5 x 75.4 x 4	1		Always replace	

No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
34	Gasket	1		Always replace	
35	Guide rail	1		Longer end of guide rail faces sprocket of camshaft. Slide on to mounting pin far enough that guide rail engages in grooves of mounting pin.	
36	Self-locking nut	3		Check, replacing if necessary	
37	Washer	3			
38	Nut	2			
39	Washer	2			
40	Chain box (right)	1			
41	Gasket	1		Always replace	

Installing Camshaft Drive

1. Install thrust washer and same number of removed shims on camshaft (sprocket flange is identical for both sides).

2. Sprocket on camshaft is identical for both sides, however, the chain bearing center on the sprocket take-up flange is offset. Mount sprocket on cylinder side 1 – 3 in such a manner that deeper recess faces rear. Deeper recess must face forward when mounting on cylinder side 4 – 6.



Cylinder Side 1 – 3 Cylinder Side 4 – 6

3. Hold sprockets with Special Tool 9191 and tighten bolts with 120 Nm (87 ftlb) torque.

Note:

First give threads of bolts a light coat of Optimoly HT.

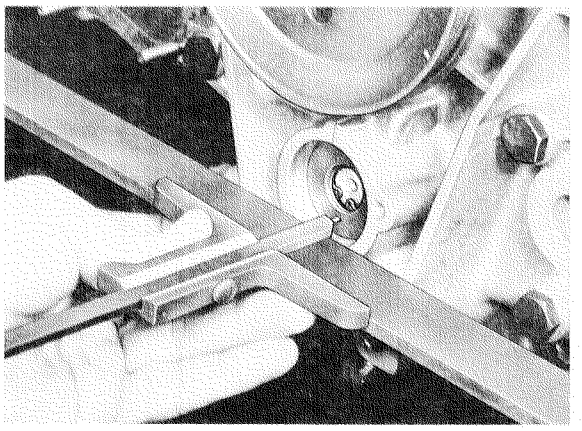
Checking Parallel of Sprockets

Deviation in parallel between the driving sprocket on the intermediate shaft and driven sprocket on the camshaft must not exceed ± 0.25 mm. Before measuring move intermediate shaft and camshafts in axial direction toward flywheel to position guiding collar of bearings.

Sprockets are adjusted by adding or removing shims, Part No. 901.105.561.00. Shim thickness: 0.5 mm.
Normally 3 shims will be required underneath the left sprocket (cyl. 1 – 3) and 4 shims underneath the right sprocket (cyl. 4 – 6).

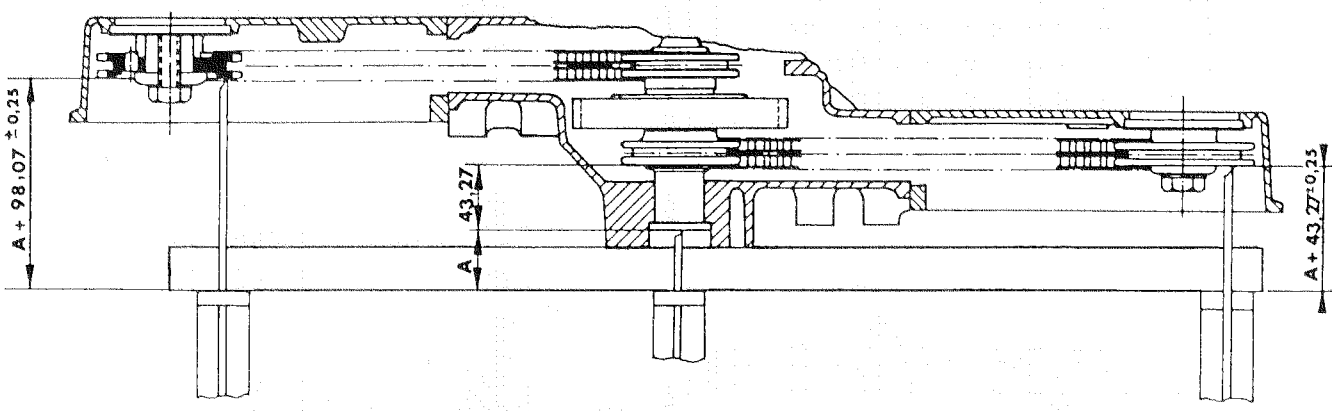
Adjusting

1. Measure distance "A" from front edge of crankcase or lineal to face of intermediate shaft.

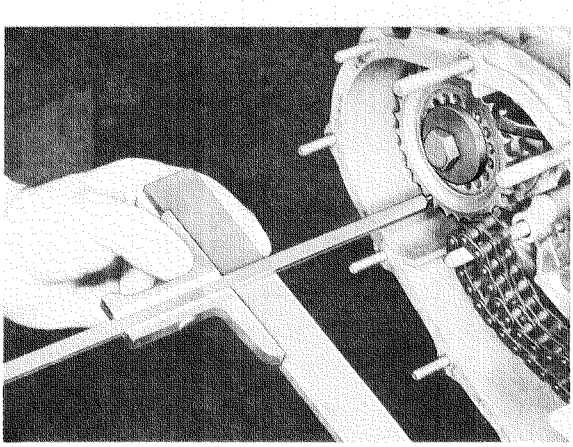


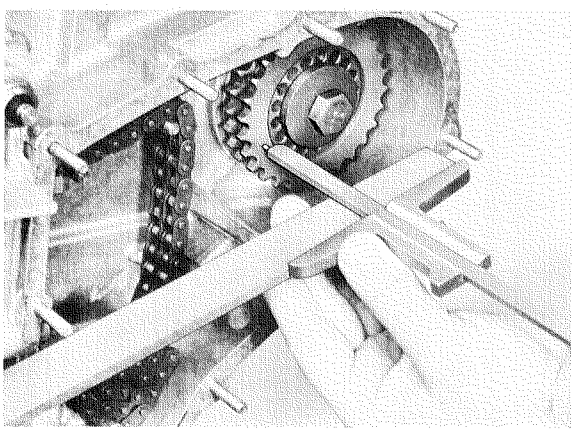
Design distance of drive gears on intermediate shaft:
From face of intermediate shaft
to face of rear intermediate shaft sprocket (cyl. 1 – 3) = 98.07 mm
to face of front intermediate shaft sprocket (cyl. 4–6) = 43.27 mm

Design distance + measured distance "A" produces position of sprockets on camshafts (max. permissible deviation = ± 0.25 mm).



Example: Measured distance "A" = 35.5 mm
Consequently for cyl. 1 – 3 sprocket A + 98.07 =
35.5 + 98.07 = 133.57 ± 0.25 mm



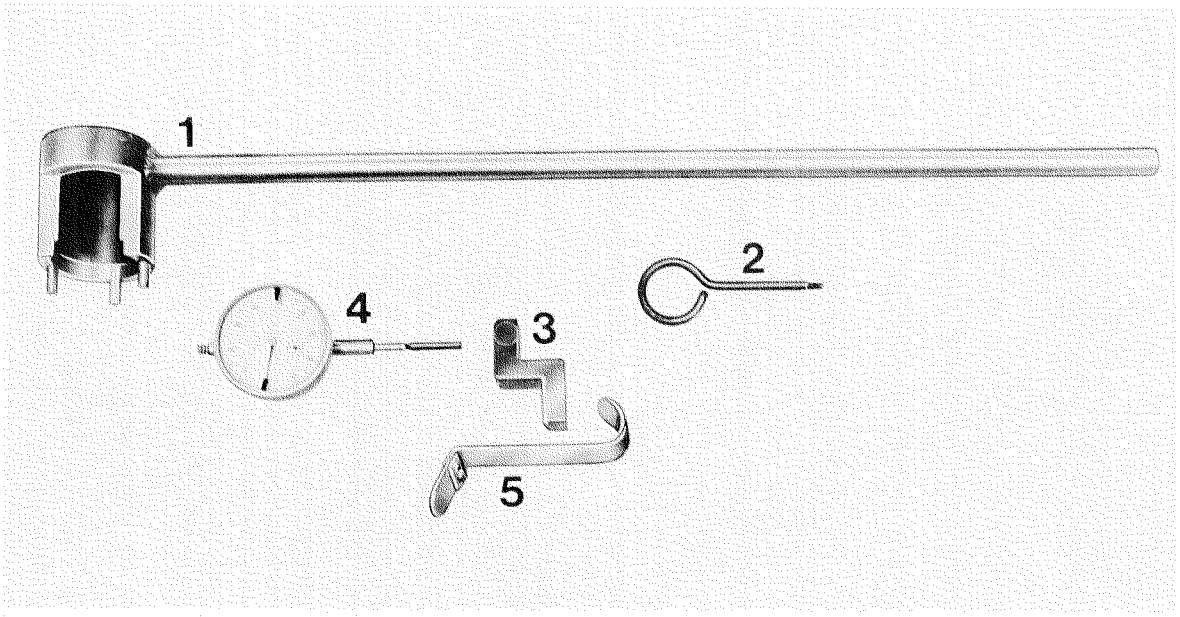


For cyl. 4 – 6 sprocket A + 43.27 =
35.5 + 43.27 = 78.77 ± 0.25 mm

ADJUSTING TIMING

(Camshafts with Bolt Mounted Sprockets)

TOOLS

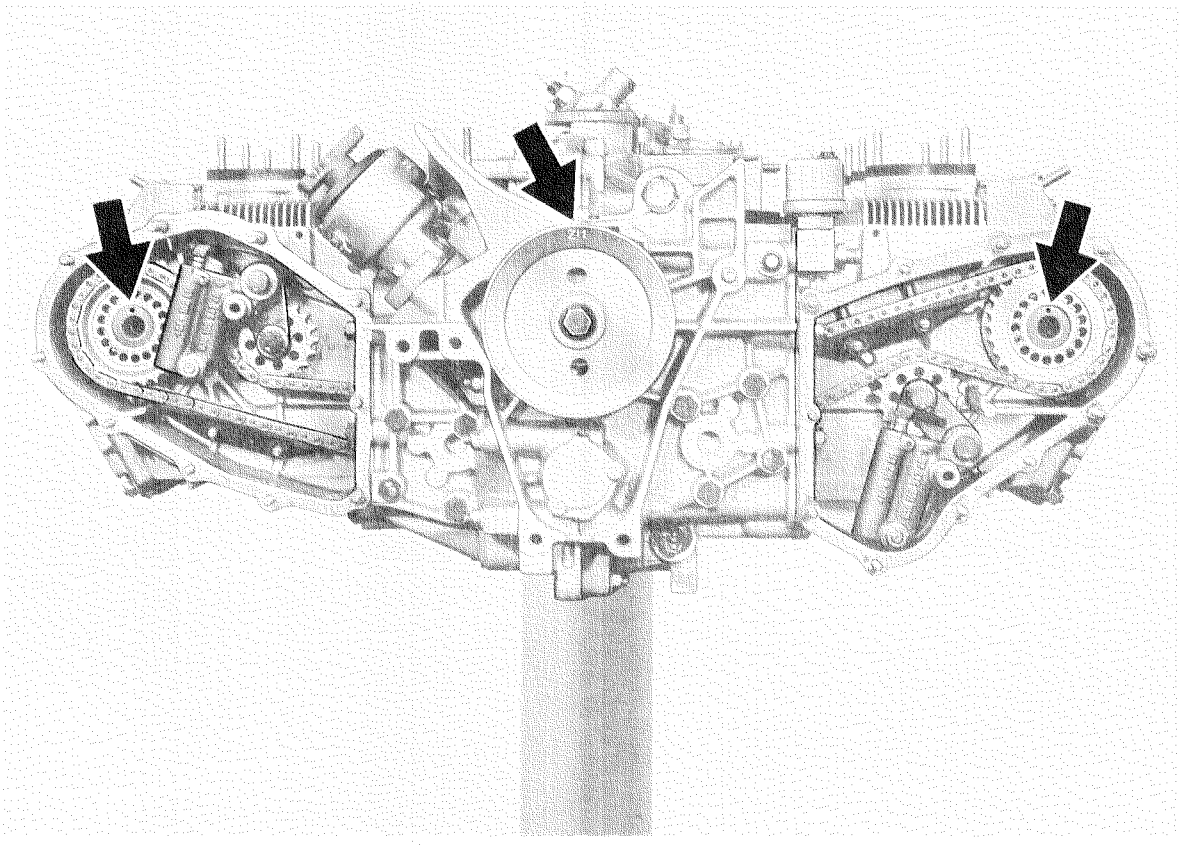


No.	Description	Special Tool	Remarks
1	Sprocket holding wrench	9191	
2	Puller	P 212	
3	Dial gage holder	P 207	
4	Dial gage with feeler pin		Standard, feeler pin approx. 40 mm long
5	Feeler gage	P 213	

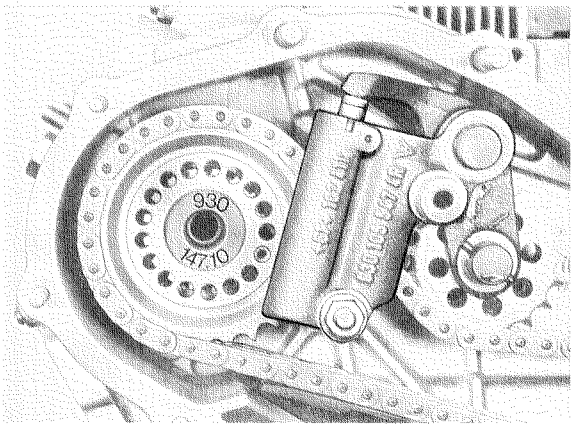
ADJUSTING TIMING

Rough Adjustment

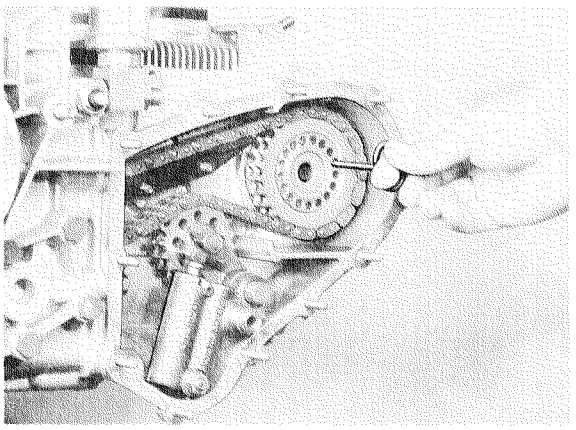
1. Turn crankshaft until mark Z 1 on pulley is aligned accurately with joint of crankcase or stripe on blower housing.



2. Set both camshafts with punch marks or code 930 facing up.
   Basic engine setting of cylinder no. 1 at TDC and cylinder no. 4 overlapping is given by adjusting mark Z 1 on pulley to joint and punch marks on camshafts to face up.



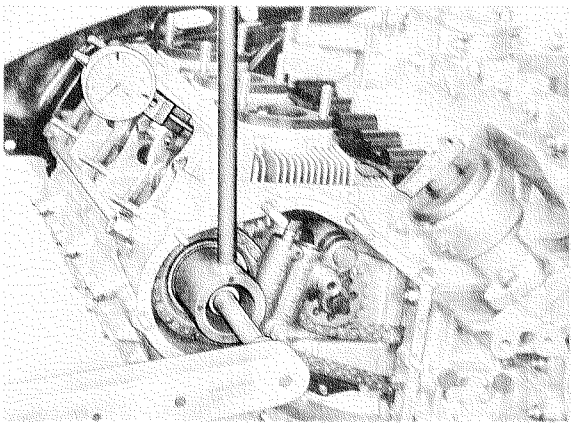
3. In the above mentioned position a bore in the sprocket will be precisely aligned with a bore in the sprocket flange. Insert dowel pin in these accurately aligned bores.



4. Screw on bolts for sprockets finger tight. Hold with Special Tool P 9191.

Note:

Apply a light coat of Optimoly HT on threads of bolts.

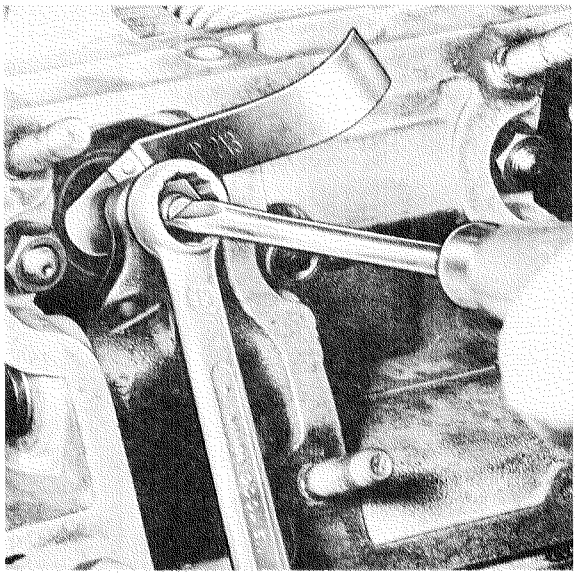


Note:

Proceed as follows in case one of the camshafts has been turned out of basic setting position.
Take dowel pin out of camshaft in basic setting position so that it cannot turn during following adjustment.
Correct offset camshaft to basic setting position (punch mark or code 930 facing up) with Special Tool P 9191.
Then remove sprocket mounting bolt and dowel pin, and turn crankshaft back to mark Z 1.

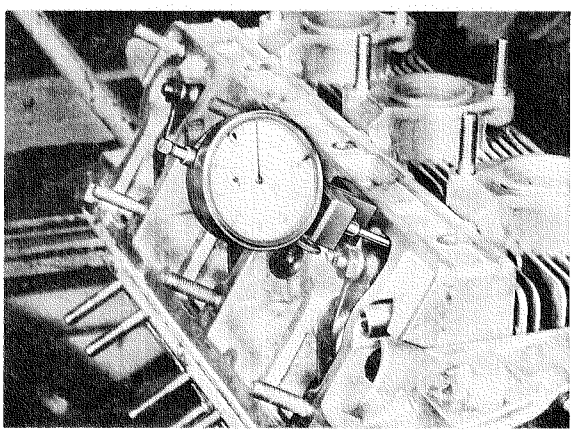
Fine Adjustment

1. Check valve clearance or adjust to precisely 0.10 mm with Special Tool P 213. Precise valve clearance of intake valves in cylinders 1 and 4 is sufficient for adjustment of timing.



Left Camshaft Adjustment (Cyl. 1)

2. Mount dial gage on stud of camshaft case with Special Tool P 207. Set dial gage to zero with approx. 10 mm preload on spring retainer of closed cyl. 1 intake valve.



3. Now turn crankshaft slowly in clockwise direction from Z 1 (TDC) approx. 1 turn, while observing the dial gage.
Turn far enough that the mean value of the adjusting tolerance is reached.

Adjusting Specification

Engine 930/20	1.1 to 1.4 mm
930/21, 930/26	
Ideal value:	1.25 mm

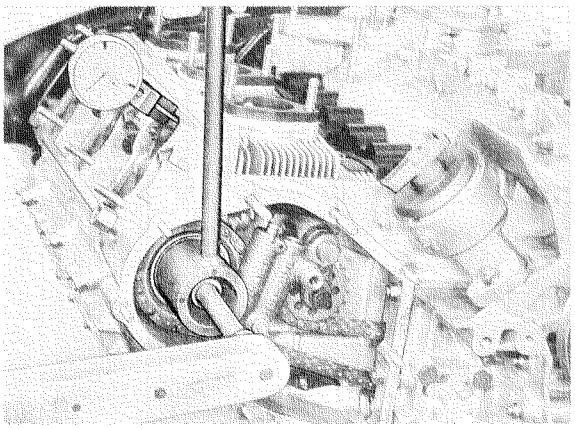
4. Unscrew and remove mounting bolt on left chain sprocket and pull out dowel pin with Special Tool P 212.

5. Turn crankshaft accordingly until mark Z 1 on pulley is aligned accurately with joint of crankcase or stripe mark on blower housing.

6. Install dowel pin again and screw on bolt finger tight, while counterholding.

7. Turn crankshaft clockwise two turns (720°) and recheck adjustment. Value read from dial gage must now be within tolerances.

8. Tighten bolt of left camshaft to final torque of 120 Nm (87 ftlb), having a second person hold with Special Tool P 9191.



Right Camshaft Adjustment (Cyl. 4)

1. Set cylinder no. 4 to TDC (cylinder no. 1 overlaps).

2. Repeat adjusting procedures on cylinder no. 4 as described in points 2 through 8 of "Fine Adjustment".

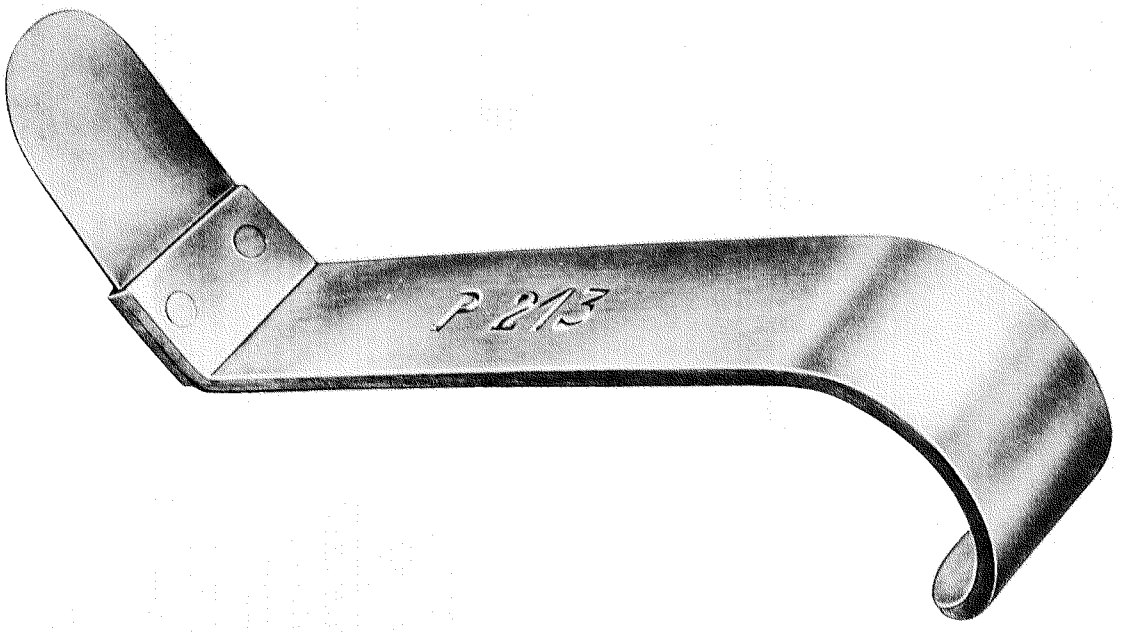
CAMSHAFTS, TIMING

Type	Camshaft left, SP No.	Camshaft right, SP No.	Stamp on end of camshaft		Intake valve lift at crossover point TDC, valve clearance 0.1 mm	Ignition timing, valve clearance 1 mm
			left	right		
930/20						I. op. 4°b.TDC
930/21						I. cl. 50°a.BDC
930/25	93010514710	93010514810	93014710	93014810	*1.1-1.4	E. op. 46°b.BDC
930/26						E. cl. at TDC

* optimum setting 1.25

CHECKING AND ADJUSTING VALVE CLEARANCE

TOOLS



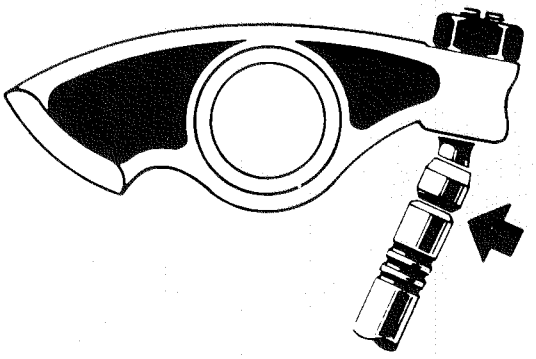
No.	Description	Special Tool	Remarks
	Feeler gauge	P 213	

CHECKING AND ADJUSTING VALVE CLEARANCE

Note:

Valve clearance is always checked and adjusted on a cold engine and with an ambient temperature of approx. 20 °C.

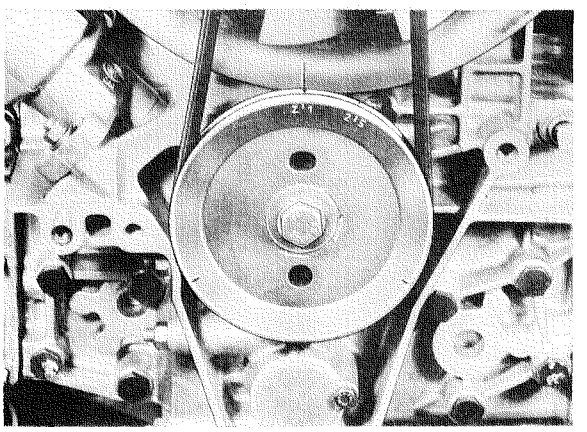
Clearance is checked by inserting a feeler gauge between shaft end surface and cap of valve adjusting screw.



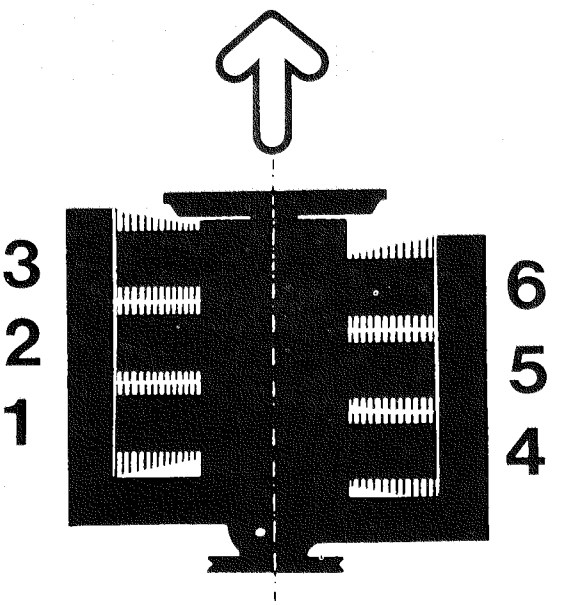
Valve clearance of cold engine:

Intake valve	0.1 mm
Exhaust valve	0.1 mm

Make adjustments in sequence of firing order (1–6–2–4–3–5). Piston of pertinent cylinder must be at TDC of compression stroke, since both valves will then be closed. TDC mark of each cylinder is made on pulley.



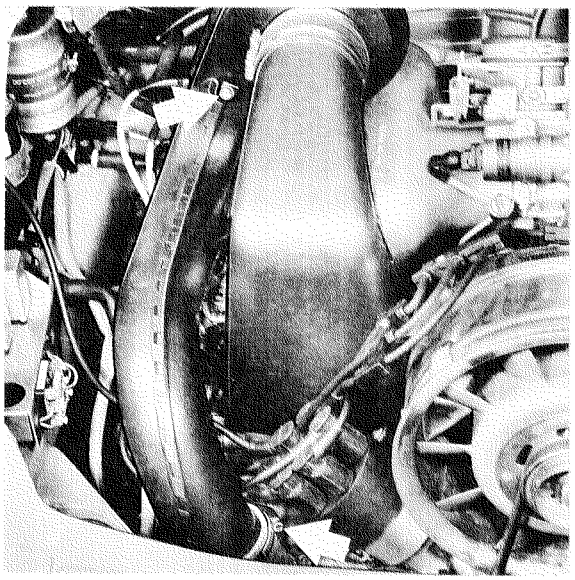
Numbering of Cylinders



Firing Order: 1–6–2–4–3–5

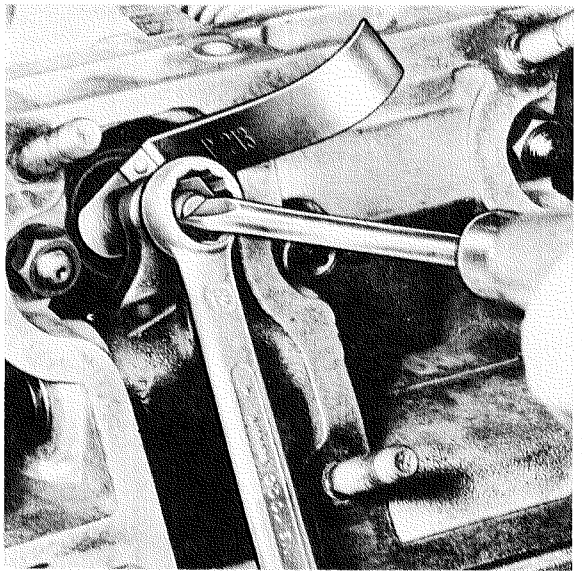
Adjusting

1. Remove hot air ducts between fan and heat exchangers as well as cover for camshaft housing.



2. If adjustments are started with cylinder no. 1, turn crankshaft on pulley clockwise until both valves of cylinder are closed (valves of cylinder no. 4 overlap) and TDC mark (Z1) on pulley is aligned with joint of crankcase or stripe on fan housing.

3. Check valve clearance with P 213. If necessary, loosen nut on adjusting screw and correct valve clearance by turning adjusting screw with a suitable screwdriver. Hold adjusting screw and tighten nut.



4. Recheck clearance.

5. Now turn crankshaft on pulley to next mark (120°). Valves of cylinder no. 6 can be adjusted in this position.

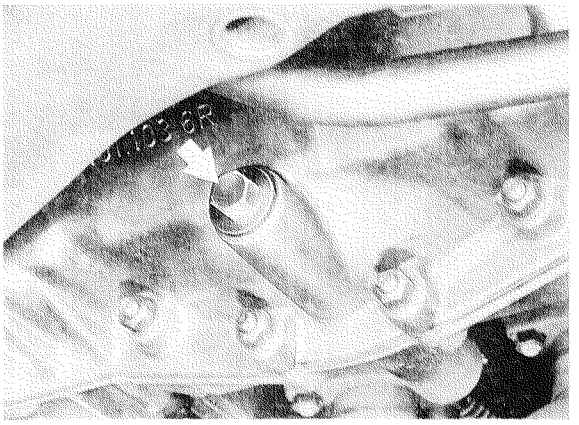
6. Turning crankshaft (120°) to next mark brings the valves of cylinder no. 2 into position.

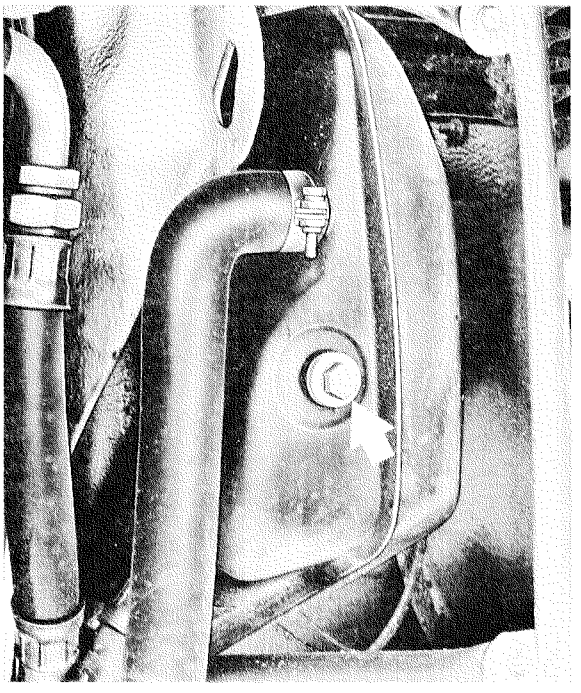
7. Repeat procedures accordingly for adjustment of remaining valves (cylinder nos. 4, 3 and 5).

REPLACING ENGINE OIL AND ENGINE OIL FILTER

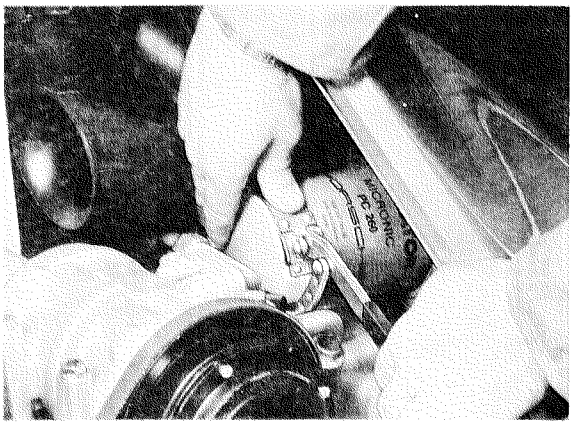
Requirement:
Engine at operating temperature.

1. Unscrew oil drain plug in crankcase and oil tank and drain engine oil.





2. Loosen oil filter with a standard strap. Catch remaining oil.



3. Clean drain plugs. Always replace seals. Tighten drain plug in the crankcase to 70 Nm (51 ft lb) and in the oil tank to 42 Nm (30 ft lb).

4. Lubricate seal on oil filter with oil slightly, tighten filter by hand until pressed against seal. Then tighten by one half turn more.

5. Add engine oil, run engine to operating temperature and check for leaks.

6. Check oil level on engine running at idle speed and operating temperature.

CHECKING ENGINE, OIL SUPPLY TANK, LINES AND FRONT OIL COOLER FOR LEAKS

Visual Inspection

REMOVING AND INSTALLING OIL COOLER BLOWER

Removing

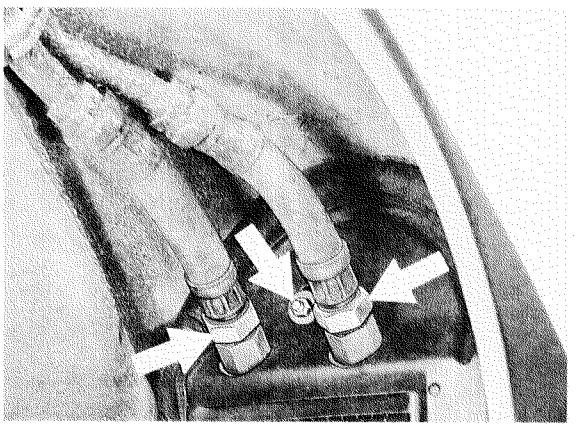
1. Remove right-hand front wheel.

2. Disconnect oil hoses.

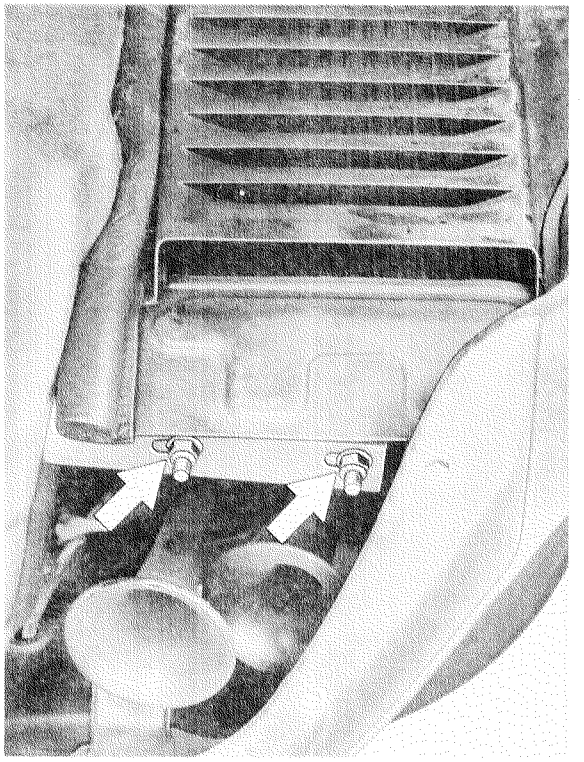
Note:

Use a suitable open-ended wrench to counter oil hoses when disconnecting. Catch escaping oil in a suitable container. Plug connections and lines.

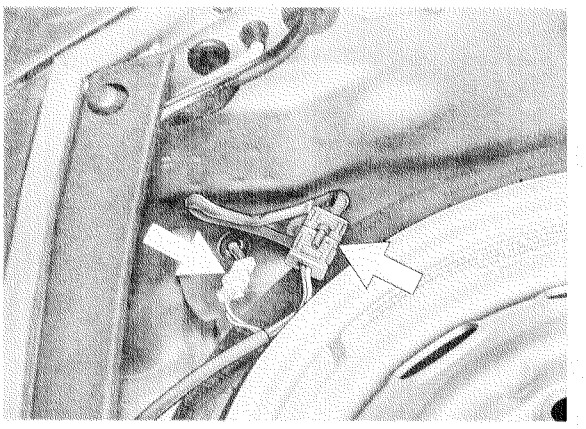
3. Remove upper retaining nut.



4. Remove lower retaining nuts.

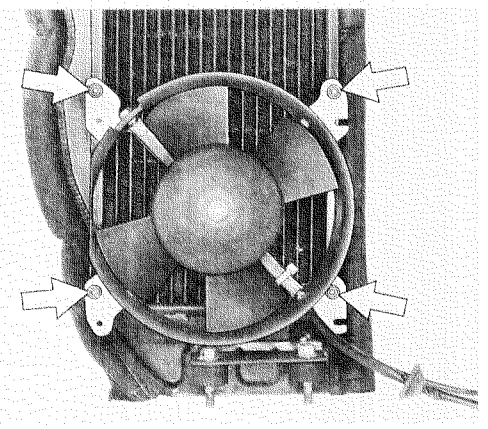


5. Disconnect plug-in connectors and push cables with rubber grommets to outside.



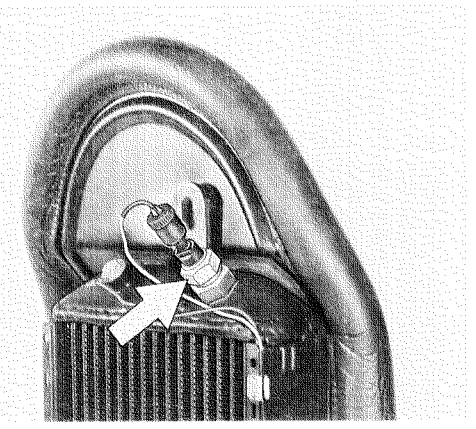
6. Remove oil cooler complete with blower by pulling up.

7. Remove blower mounting bolts.



Note:

The temperature-operated switch is installed at the top of the oil cooler.



Tightening torque: 30 Nm (22 ftlb)

The temperature-operated switch actuates the blower when the oil temperature reaches 118°C.

Installing

1. Apply a coat of Optimoly TA to the connections for the oil hoses.

2. Use a suitable open-ended wrench to counter when tightening the oil-hose connections.

   Tightening torque: 80-100 Nm (58-67 ftlb)

3. Check connections for leaks. The regulator for the front oil cooler must be open for this check (engine-oil temperature above 83°C).

No oil-cooler blower is installed in cars fitted with type 930/26 engines.

CLEANING THE ENTIRE ENGINE-OIL SYSTEM AFTER ENGINE FAILURE (BEARING FAILURE)

Practical cleaning sequence:

1. Thoroughly clean bores in crankcase halves and holes of injection valves for piston cooling.
See page 13 - 8

2. Clean intermediate shaft, removing and reinstalling aluminum plug.
See page 13 - 24

3. Disassemble oil pump and clean.

4. Rinse crankshaft and oil ducts several times.

5. Clean engine thermostat thoroughly.

6. Fit replacement engine-oil cooler. It is impossible to remove all particles of metal.

7. Renew spray tubes for camshaft housing.
See page 15 - 12

8. Chain tensioners cannot be disassembled or cleaned. However, they may be reused.

9. Remove oil filter, oil tank and oil-supply sensor. Rinse oil tank with engine cleaner. See Item 13

10. Check air-bleed system between oil tank and air filter system and clean if necessary.

11. Remove regulator housing for front oil cooler (in rear right-hand wheel well), disassemble and clean.

12. Remove front oil cooler. Cars with coil coolers and tubular oil coolers can be rinsed.
It is not possible to remove all particles of metal from vane-type oil coolers. Remove vane-type oil cooler if fitted.

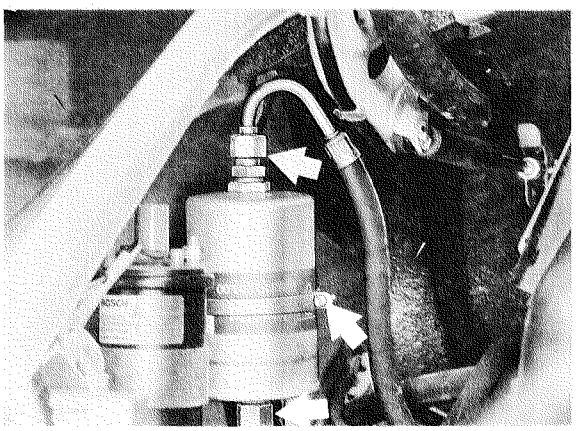
13. Spray engine cleaner, e.g. SILVER STAR manufactured by Kock Chemie, Unna, into the disconnected oil lines and allow to penetrate. Then thoroughly clean oil lines with steam cleaner and blow through with compressed air.

14. Change oil filter and engine oil after approx. 500 km.

REPLACING FUEL FILTER

1. Detach fuel lines, not forgetting to counterhold. Catch escaping fuel.

2. Loosen clamp and take off fuel filter.



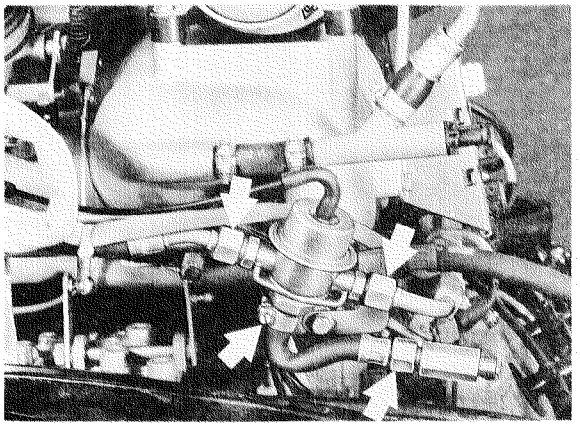
3. Install new filter. Note direction of flow (arrow facing in correct direction).

4. Start engine and check fuel lines as well as fuel filter for leaks.

CHECKING FUEL AND INJECTION LINES FOR LEAKS AND CORRECT TIGHTNESS

1. Inspect visually for leaks.

2. Tighten coupling nuts and hose clamps.



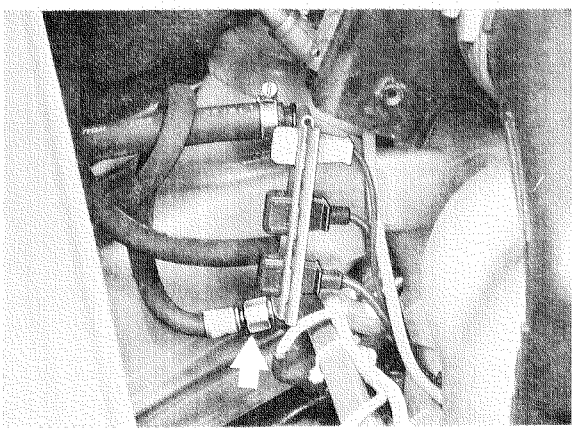
Picture shows fuel lines and fuel hoses with engine removed.

CHECKING FUEL PUMP DELIVERY RATE

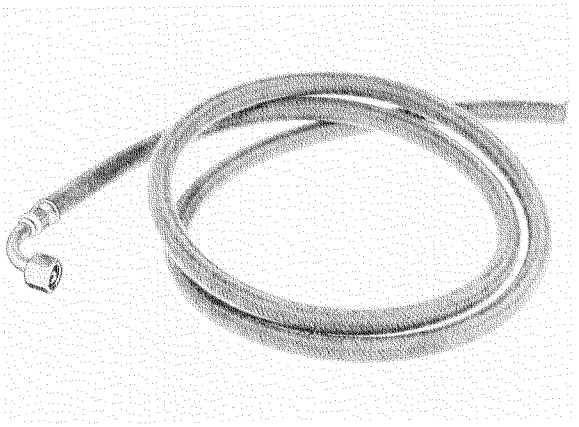
Requirements:

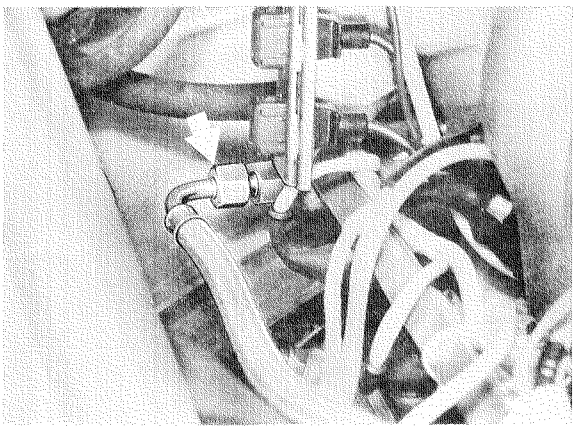
Fuel filter and electric power supply okay.

1. Unscrew fuel return hose on branch, not forgetting to counterhold. Catch escaping fuel.

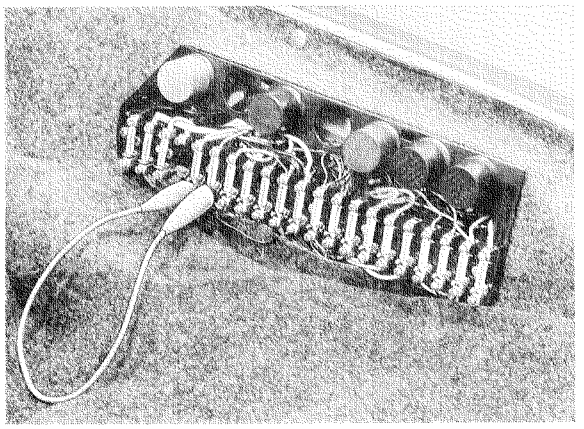


2. Hold end of test hose, consisting of 1.5 meter long low pressure hose NW 6 with NW 6 elbow hose nipple and M 14 x 1.5 connection threads, in a measuring glass.





3. Bridge fuses 16 (fuel pump) and 17 (terminal 30) on inlet side of fuse box with a piece of wire. Fuel pump should now run.



Let fuel run into measuring glass 30 seconds.

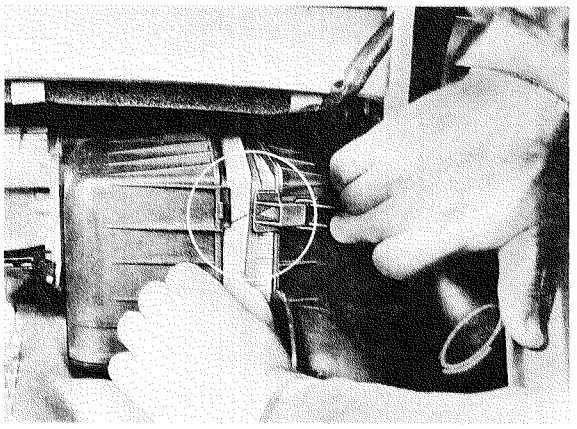
REPLACING AIR FILTER CARTRIDGE

1. Disconnect retainers and take off housing cover with filter cartridge.

2. Remove filter cartridge and clean inside of filter housing with a cloth which does not lose lint.

3. Install new filter cartridge as described below.

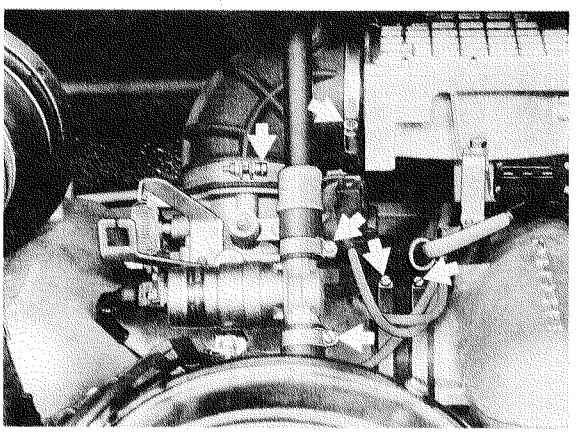
   Arrow on housing cover must point to arrow on filter cartridge (plates in horizontal position). Filter cartridge is also marked with the word "TOP".



CHECKING TIGHTNESS OF ALL INTAKE SYSTEM HOSE CONNECTIONS

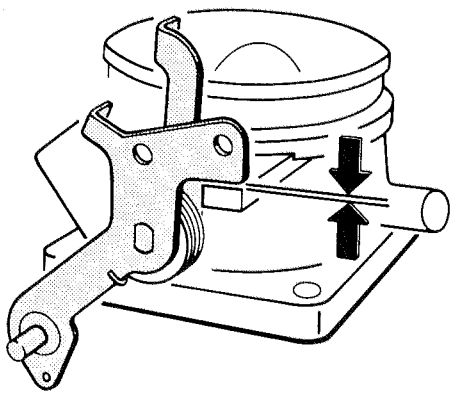
1. Check tightness of all hoses of the intake system.

2. Tighten hose clamps.



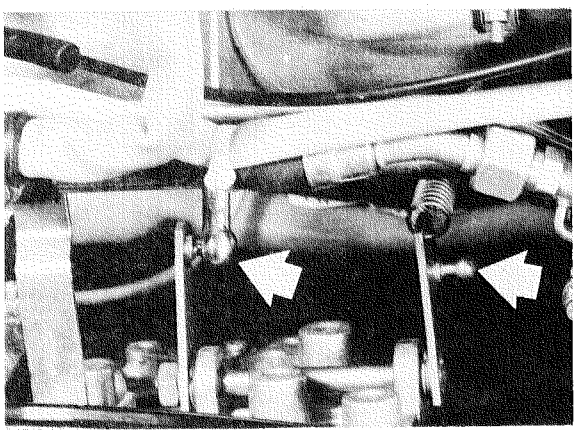
ADJUSTING FULL-LOAD SETTING OF THROTTLE VALVE

The actuating linkage must be adjusted such that when the accelerator pedal is fully depressed there is at least 1 mm clearance at the throttle-valve lever.

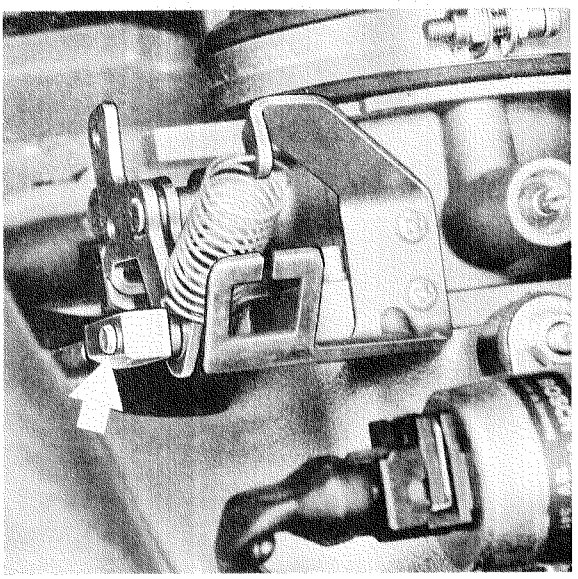


CHECKING MOVEMENT OF THROTTLE OPERATING LINKAGE

Check whether operating linkage for throttle moves easily enough, lubricating joints with grease if necessary.



Never lubricate upper bearing on operating linkage regardless of circumstances, since a special sleeve is installed.

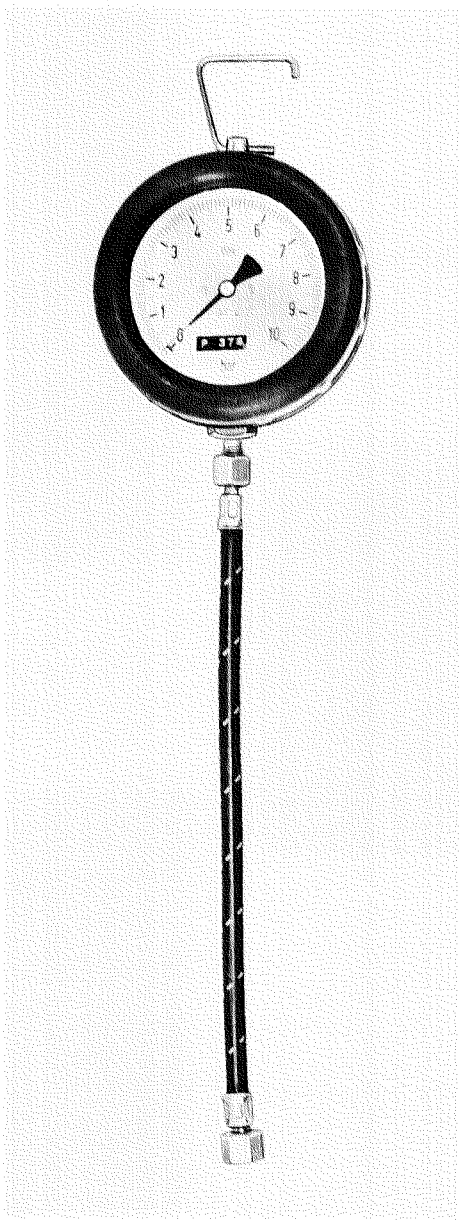


TESTING AND ADJUSTING SPECIFICATIONS

Test Point	Specifications			Remarks
Electric fuel pump delivery rate	min. 850 cc/30 sec.			
Fuel pressure (engine stopped) Fuel pump bridged	2.5 ± 0.2 bar			
Check value for idle	approx. 2 bar			
Leak test min. pressure after 20 min.	1 bar			
Idle settings	Europe	USA/Canada Japan	Australia Switzerland Sweden	Adjust idle speed with intake air temperature approx. +15 to 35°C/59 95°F
Idle speed (rpm)	800±40 800±40**	800±40 880±40**	800±40 880±40**	
CO level %	1.0-1.5	0.6-1.0*	1.5-1.0*	* Measured upstream of catalytic converter with oxygen sensor plug disconnected
HC level	without cat. converter		≦ 300 ppm	
	with cat. converter		≦ 300 ppm*	** As of 87 models In conjunction with control unit 911 618 111 18 911 618 111 19 911 618 111 20

CHECKING FUEL PRESSURE

TOOLS



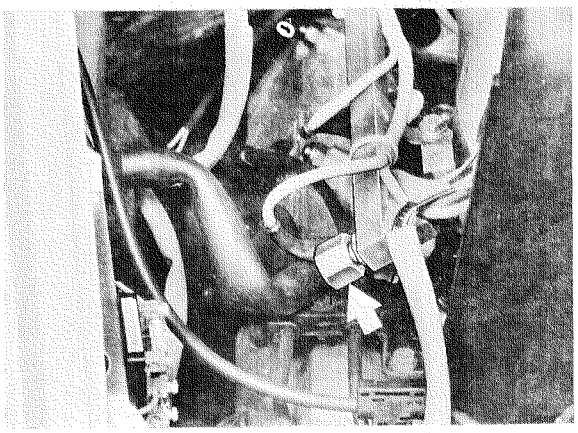
No.	Description	Special Tool	Remarks
	Pressure gauge with hose from pressure tester	P 378	

CHECKING FUEL PRESSURE

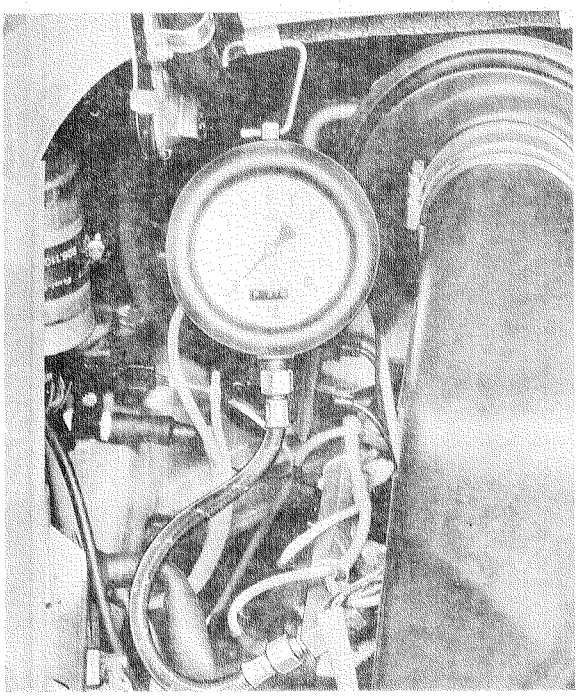
1. Unscrew and remove capped nut on test connection of fuel distribution line. Catch escaping fuel.

Note:

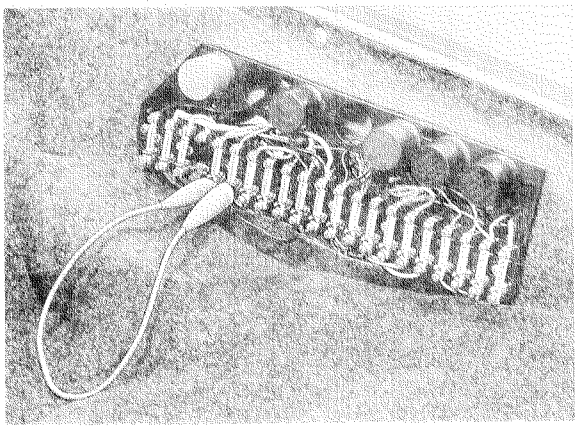
Use caution so as not to allow fuel to contact hot engine or electric sparks.
Make sure sealing ball does not fall out when removing capped nut.



2. Connect pressure gauge with hose from pressure tester P 378 on test connection.



3. Bridge fuses 16 (fuel pump) and 17 (terminal 30) on inlet side of fuse box with a piece of wire. Fuel pump should now run.

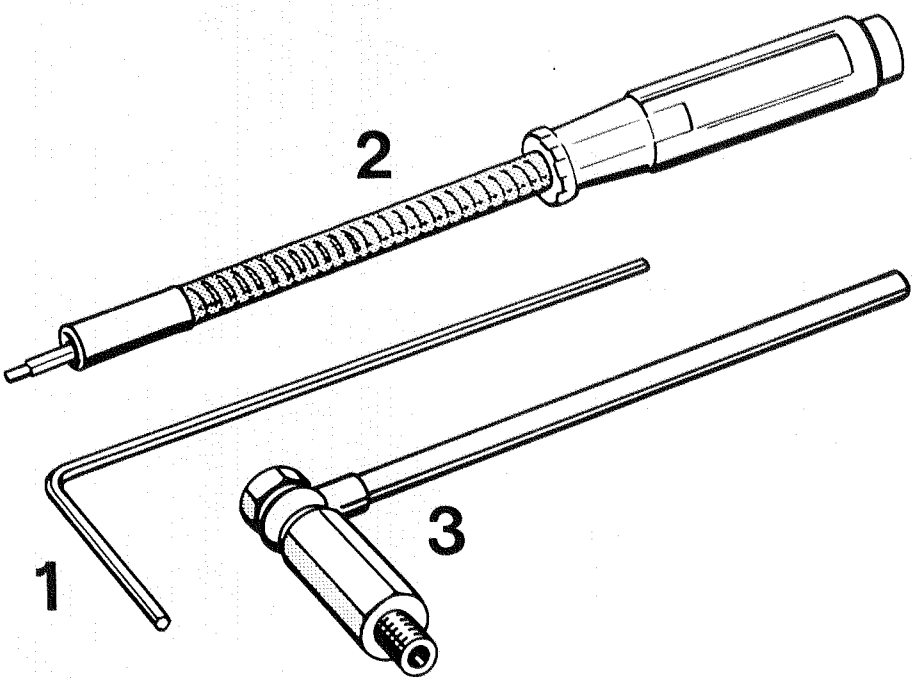


4. See page 24 - 3 for specifications.

5. Torque for capped nut = 12 Nm (9 ftlb).

Idle speed, adjusting

Tools



56-24

No.	Description	Special Tool	Remarks
1	Adjusting wrench	9156	
2	Flexible screwdriver (with adapter for 3 mm socket head screws)		Commercially available from: e.g. Hahn & Kolb, Stuttgart, No. 52 850 - 100 and accessories No. 52 852 - 130
3	Exhaust adapter		Commercially available from: e.g. Sun Electric Bosch See workshop manual

MAKING IDLE ADJUSTMENTS

Adjusting Requirement:

Engine in perfect running condition.

Note:

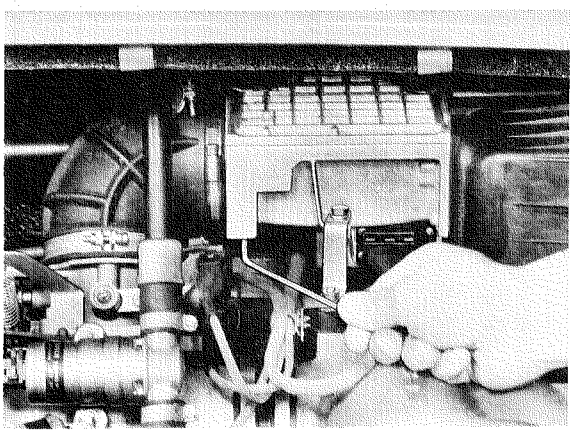
Procedures must be performed in given sequence.

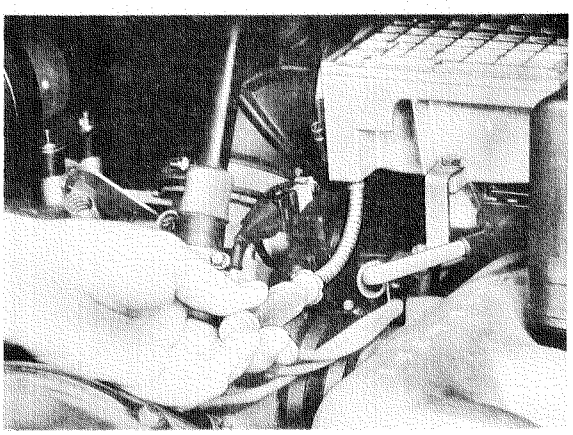
1. Connect CO tester according to instructions supplied with equipment.

2. Run engine to operating temperature (oil temperature approx. 90 °C).

3. Check CO. If CO is not as specified, make correction on air flow sensor.
   Insert Special Tool 9156 or a standard flexible screwdriver.

   Turning clockwise = richer mixture
   Turning anticlockwise = leaner mixture





4. Check idle speed, correcting if necessary. This requires stopping function of the idle volumetric control.

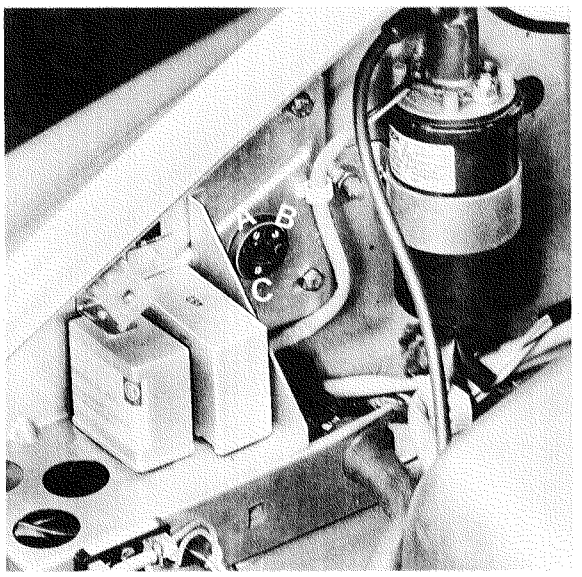
   a) A test socket is located on engine central electric board in engine compartment on left-hand side.

Note:

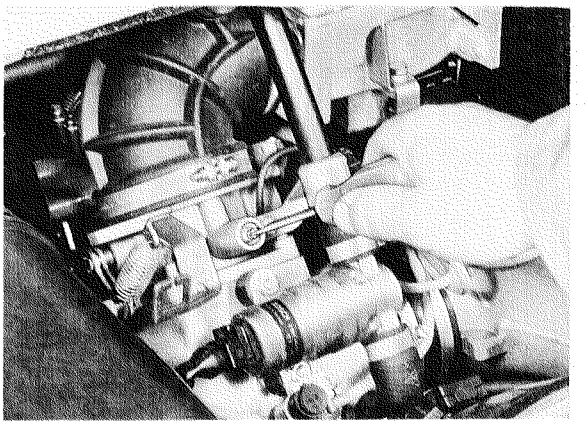
Switch off electric equipment while making adjustments.

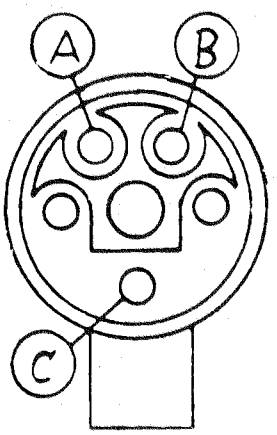
Make adjustments as quickly as possible to avoid excessive heat in intake ports, which would cause wrong CO values.

Intake air temperature:
approx. + 15 to + 35° C /
approx. + 59 to + 95° F



Turn control screw (bypass) on throttle housing until specified speed is reached.





5. Start function of idle volumetric control after completing adjustments (remove locally made wire).

6. Recheck adjustments, correcting if necessary.

Bridge test jacks B and C with a locally made wire.

(This stops function of the idle volumetric control.)

b) Check and adjust speed with, for example, VAG tester 1367.

MAKING IDLE ADJUSTMENTS – USA CARS

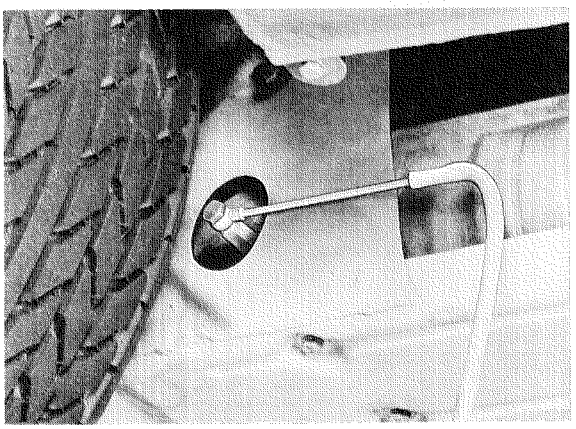
Adjusting Requirement:

Engine in perfect running condition.

Note:

Procedures must be performed in given sequence.

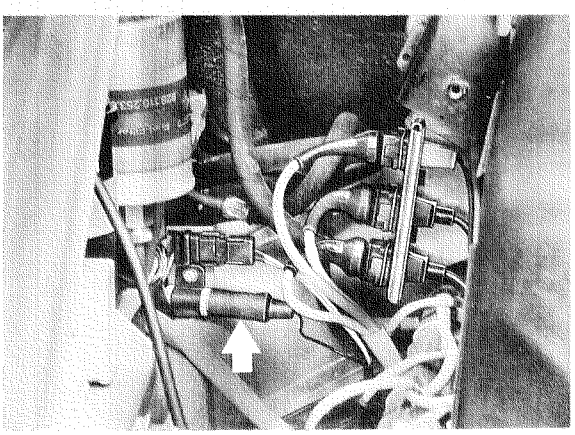
1. Connect exhaust test line on test connection of catalytic converter.



2. Connect CO tester according to instructions supplied with equipment.

3. Run engine to operating temperature (oil temperature approx. 90 °C).

4. Disconnect oxygen sensor plug in engine compartment on left-hand side.



5. Check CO. If CO is not as specified, make correction on air flow sensor.

Note:

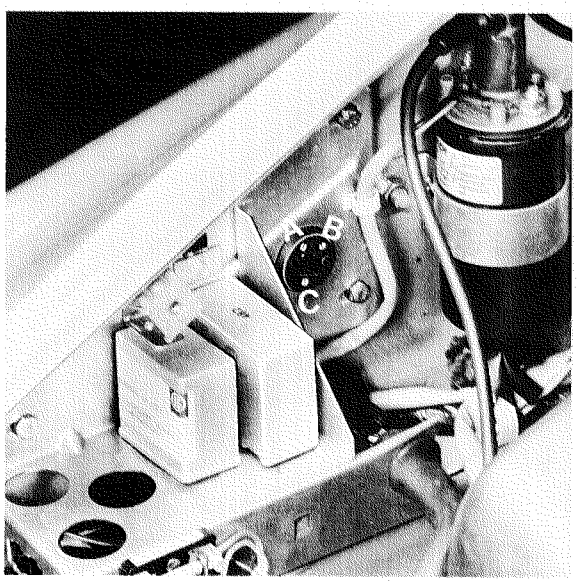
Switch off electric equipment while making adjustments.
Make adjustments as quickly as possible to avoid excessive heat in intake ports, which would cause wrong CO values.

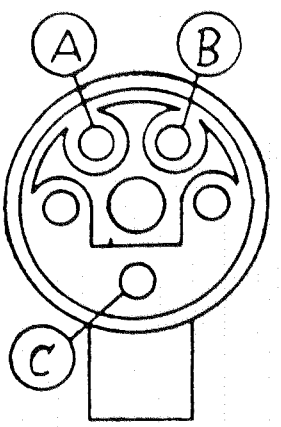
Intake air temperature:
approx. + 15 to 35° C/
approx. + 59 to 95°F

6. Connect oxygen sensor plug after completing adjustments.

7. Check idle speed, correcting if necessary. This requires stopping function of the idle volumetric control.

   a) A test socket is located on engine central electric board in engine compartment on left-hand side.

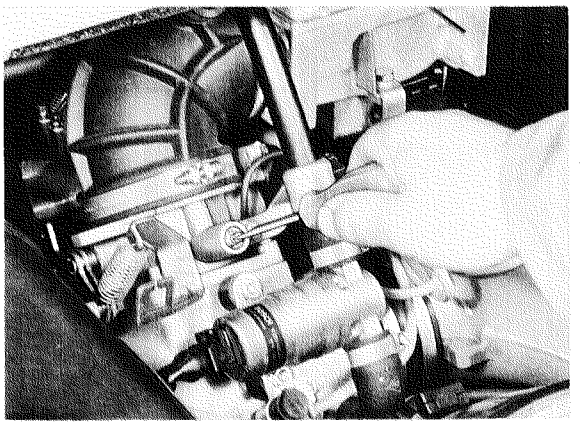




Bridge test jacks B and C with a locally made wire.

(This stops function of the idle volumetric control.)

   b) Check and adjust speed.
   Turn control screw (bypass) on throttle housing until specified speed is reached.



5. Start function of idle volumetric control after completing adjustments (remove locally made wire).

6. Recheck adjustments, correcting if necessary.

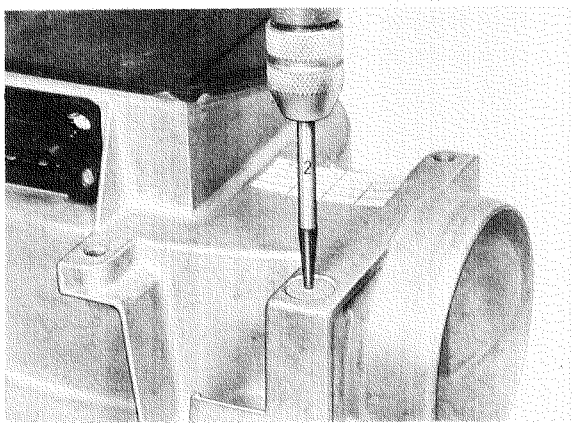
CORRECTING CO ADJUSTMENT ON AIR FLOW SENSOR – USA CARS

Note:

If CO is not as specified, remove plug from bore providing access to mixture control screw, after removing air flow sensor.

Removing

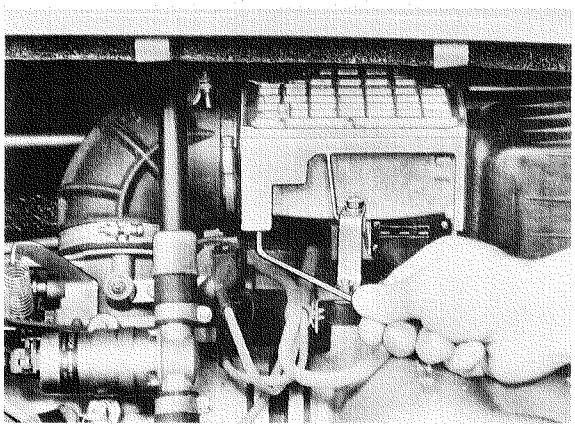
1. Remove air flow sensor.
2. Drill hole in plug with a 2 mm dia. drill bit (until drill bit stops on steel insert).
3. Pull out plug with a left-hand spiral drill (no. 2).

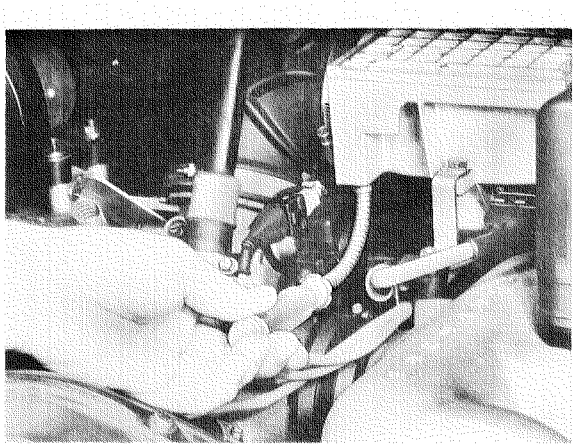


Installing

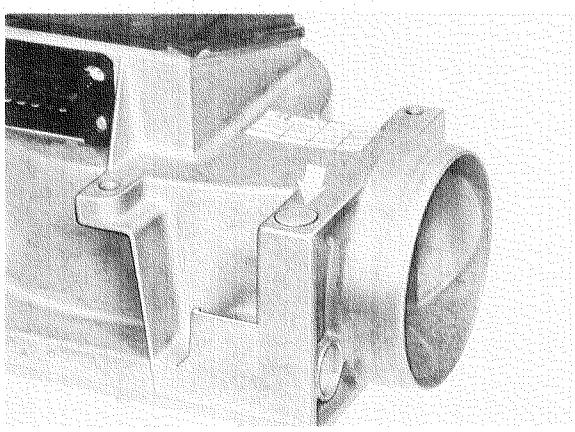
1. Install air flow sensor.
2. Adjust CO and make idle adjustment.
   Turn mixture control screw accordingly with Special Tool 9156 or a standard flexible screwdriver.

   Turning clockwise = richer mixture
   Turning anticlockwise = leaner mixture





3. Insert a new plug in bore providing access to mixture control screw after finishing adjustments. Press in plug flush.



Note:

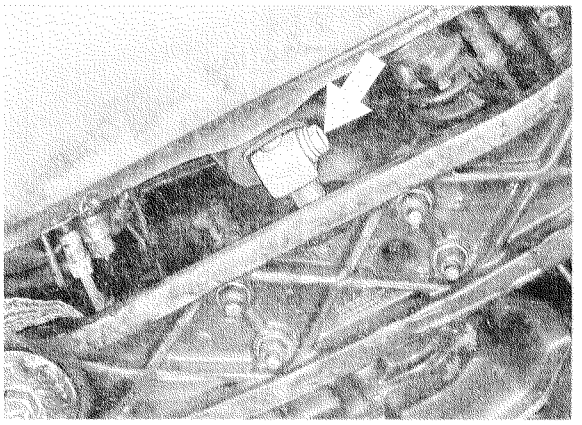
Never reuse a drilled (removed) plug.

STARTER, REMOVING AND INSTALLING
87 MODELS ONWARD

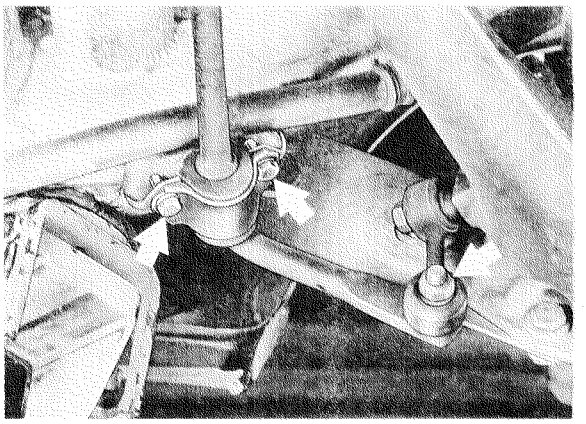
1. Disconnect battery.

2. Disconnect all three leads from starter.

3. Unscrew hex head bolt from selector rod coupling and disengage from internal selector arm.



4. Unbolt rear stabilizer and allow to hang down.



5. Disconnect ground strap from body.

6. Unscrew heater hoses from heat exchangers and pull off.

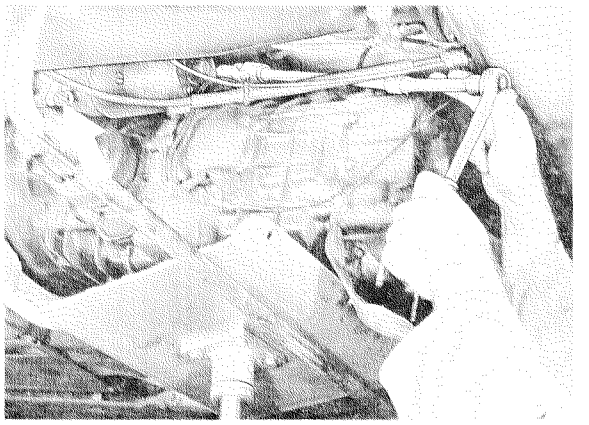
7. Remove retaining clip and detach accelerator linkage.

8. Place transmission jack beneath transmission.

9. Unbolt and remove transmission carrier.

10. Carefully lower transmission by approx. 15 cm.

11. Using special tool P 119, unscrew starter retaining nuts.



Note:

When installing, take care to ensure that engine compartment seal is correctly seated.
Tightening torque for transmission carrier hex bolts = 80 Nm (58 ftlb).

TROUBLESHOOTING, CRUISE CONTROL

If the cruise control is defective, check the following points:

1. Fuse No. 4 in the 10-pole fuse box. This fuse also carries current to the stop light.

2. Check for leaks and kinks in the vacuum hoses.

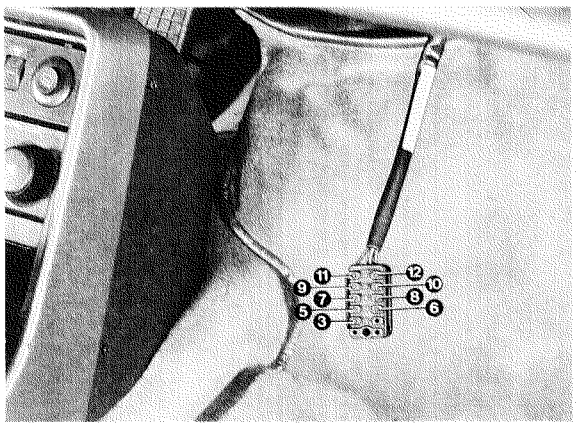
If no faults are detected, continue by checking multi-pole plug of the control unit of the cruise control.

N o t e :

Location of control unit:

86 models and earlier, in the luggage compartment beside the brake booster. 87 models onward, in the passenger compartment beneath the instrument panel in the vicinity of the central console.

Remove the play housing and check with a multimeter or oscilloscope.



3. Ignition key at position X.

4. Connect voltmeter to ter.5 (plus) and ter.12 (minus)

   Reading: battery voltage

5. Connect voltmeter to ter.6 and 12

   Reading: 0 volts
   Depress brake pedal
   Reading: battery voltage

6. Connect voltmeter to ter.8 and 12

   Reading: battery voltage
   Press switch toward "Off"
   Reading: 0 volts

7. Connect voltmeter to ter.9 and 12

   Reading: 0 volts
   Press switch toward "Set/ accelerate"
   Reading: battery voltage

8. Connect voltmeter to ter. 10 and 12

   Reading: 0 volts
   Press switch toward "Reset"
   Reading: battery voltage

9.To end of 87 models:

Connect ohmmeter to ter. 11 and 12.

Measuring range x 1 Move car; the ohmmeter needle must move periodically.

88 models onward:

Connect oscilloscope to ter. 11 and 12. Move car. Narrow rectangular-pulse signals < 12 V must appear on the oscilloscope.

10.Connect ohmmeter to ter.3 and 7

Reading: 11-17 ohm
If this reading is not attained, measure directly at actuator

Depress clutch

Reading: ∞ ohm

If reading does not change check clutch switch and relay.

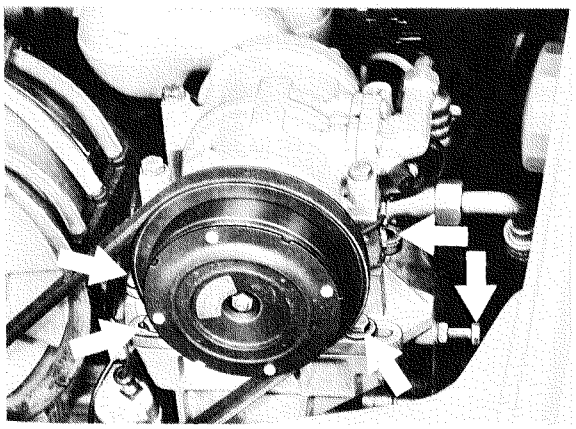
If these measurements fail to reveal a defect the control unit must be replaced.

Alternator, removing and installing

Removing

1. Unscrew the negative pole from the battery.

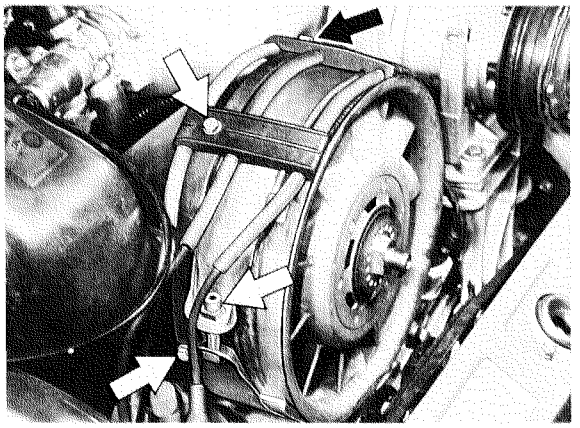
2. For vehicles with air conditioning: loosen, but do not remove, fastening screws and nuts on the compressor plate. Loosen lock nut from clamping screw and undo clamping screw. Remove V-belt.



85/336

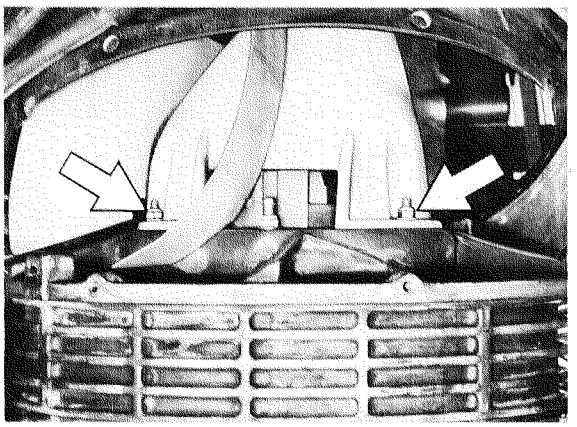
3. Remove protective cap and loosen hexagon nut (24 mm), countering with hook wrench Part No. 911 721 703 00 or 999 571 047 02. Remove V-belt.

4. Loosen three fastening screws on the air guide and fillister-head screw of the wide clamp.



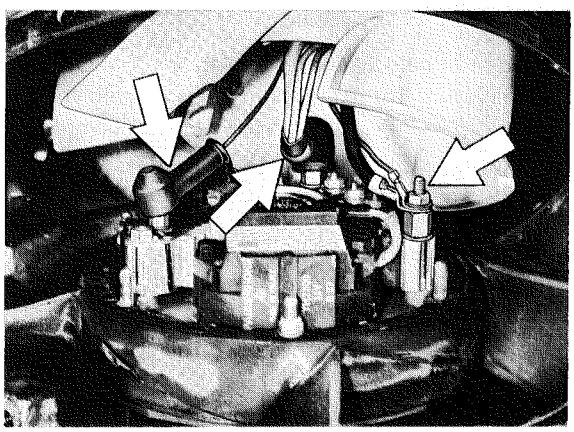
88/41

5. Pull cooling fan with alternator out to the rear, loosen fastening nuts (3 each) of air box and slide box forwards.



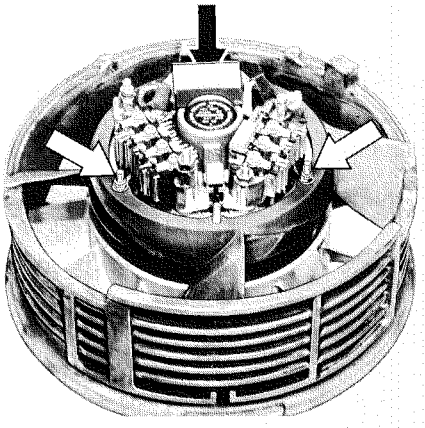
88/42

6. Undo electrical connections and remove the blower to the rear.



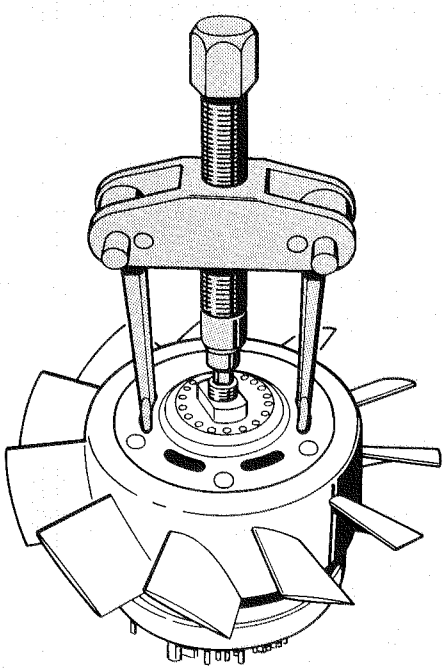
88/45

7. Remove alternator with fan from the blower housing.



88/44

8. Pull fan from the alternator, use puller VW202 if necessary. Adjust both puller hooks accordingly. Remove disk.

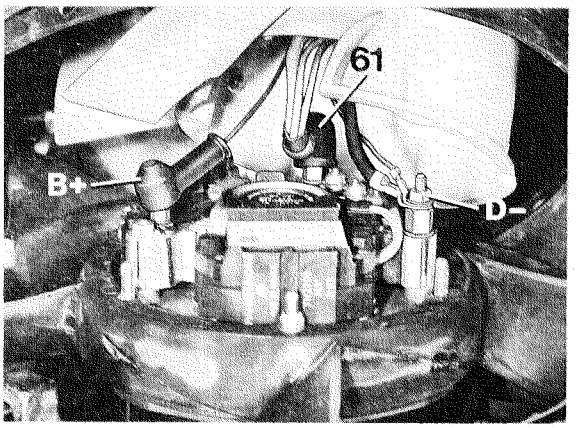


57-27

Installing

1. Place disk between fan and alternator. Shouldered side points to the front alternator - shaft bearing.

2. Fasten electrical connections B +, D - 61. Ensure that the cables are laid correctly. See figure.

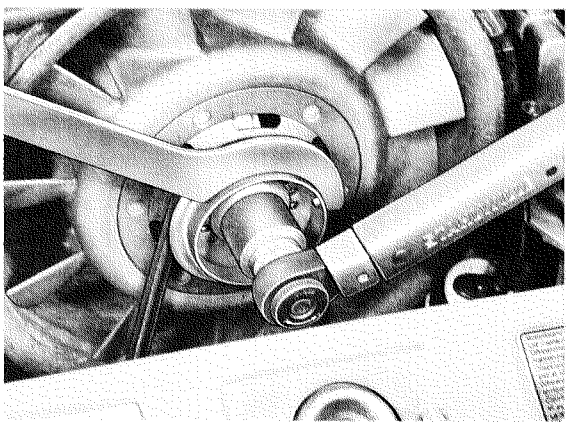


88/45

3. Insert blower housing in the fitting pin on the crank case.

4. Tighten wide clamp, at the same time pressing the housing to the stop (in the direction of travel).

5. Fasten pulley. Tightening torque 40 Nm.



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6. Check V-belt tension and adjust, see Page 13 - 47.

COMPONENT SURVEY BEGINNING WITH 1984 MODELS

Ignition Coil

Type/Model	Version	Remarks
911 Carrera	944.602.115.00 Bosch No. 0 221 118 322	

Distributor

Type/Model	Version	Remarks
911 Carrera	930.602.023.00 Bosch No. 0 237 505 001	Only high voltage distribution

Spark Plugs

Type/Model	Version	Remarks
911 Carrera	Bosch WR 4 CC	0.7 mm plug gap
911 Carrera USA/Japan	Bosch WR 7 DC W 7 DC Champion N 7 YC	0.7 mm plug gap

DME CONTROL UNIT

Type/Model	Version	Remarks
911 Carrera Rest of World	911.618.111.04 Bosch No. 0 261 200 051	
911 Carrera Sweden Switzerland Australia New Zealand Hong Kong	911.618.111.06 Bosch No. 0 261 200 052	
911 Carrera Great Britain France Luxemburg Spain Portugal Greece Saudi Arabia	911.618.111.07 Bosch No. 0 261 200 051	
911 Carrera USA Canada Japan	911.618.111.05 Bosch No. 0 261 200 050	

COMPONENT SURVEY, 87 MODELS ONWARD

Ignition coil

Type/Model	Version	Remarks
911 Carrera	944.602.115.00 Bosch No. 0 221 118 322	

Distributor

Type/Model	Version	Remarks
911 Carrera	930.602.023.00 Bosch No. 0 237 505 001	High-voltage distribution only

Spark plugs

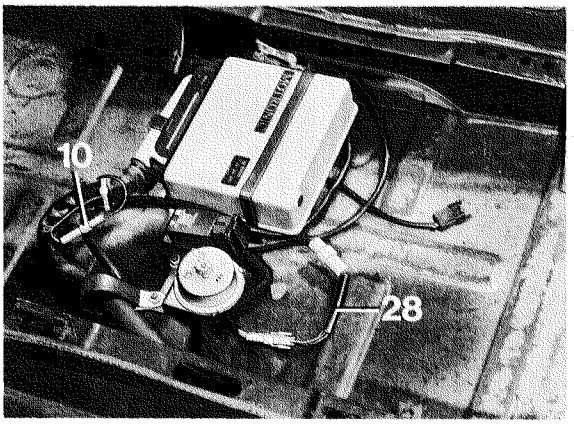
Type/Model	Version	Remarks
911 Carrera Rest of the world	Bosch WR 4 CC	Spark-plug gap 0.7 + 0.1 mm
911 Carrera USA Japan Australia	Bosch WR 7 DC Champion RN 7 YC	Spark-plug gap 0.7 + 0.1 mm

DME CONTROL UNIT

Type/Model	Version	Remarks
911 Carrera	911.618.111.18 Bosch No. 0 261 200 078	High-compression engines worldwide.
911 Carrera	911.618.111.19 Bosch No. 0 261 200 078	Cars with M 240. P.C. board switch to position 4.*
911 Carrera	911.618.111.20 Bosch No. 0 261 200 082	USA, California, Japan, Canada, Austria, Switzerland, Australia Cars with M 298.
911 Carrera	911.618.111.15 Bosch No. 0 261 200 084	High-compression engines worldwide with M 637.
911 Carrera	911.618.111.16 Bosch No. 0 261 200 085	USA, California, Japan, Canada, Austria, Switzerland, Australia with M 637.
911 Carrera	911.618.111.17 Bosch No. 0 261 200 084	Cars with M 240 and M 637. P.C. board switch at position 4.*

* See Technical Information No. 1/87 dated 20 June 1985

CODING OF CONTROL UNITS



Control units 911.618.111.15, 17, 18 and 19.

Country	Connector Terminal 10	Jumper Terminal 28
Rest of the world	connected	installed
Sweden	disconnected	installed

Control units 911.618.111.16 and 20

Country	Connector Terminal 10	Jumper Terminal 28
USA, FRG, Austria, Canada	disconnected	not installed
California, Japan	connected	not installed
Switzerland	disconnected	installed
Australia	connected	installed

Jumper terminal 28: 911.612.421.00

CAUTIONS WHEN REPAIRING ELECTRONIC IGNITION SYSTEMS

CAUTIONS WHEN REPAIRING ELECTRONIC IGNITION SYSTEMS

Modern engines requiring more from ignition systems and the objective of limited (or no) maintenance have led to the application of electronic ignition systems in standard production some time ago. Normally the ignition output of an electronic system will be higher than that of a conventional system, whereby even greater ignition output is feasible. Consequently electronic ignition systems are in an output range, where touching current carrying parts or terminals on both primary and secondary sides could be dangerous.

In conjunction with this matter we must point out to you that there must be conformance with pertinent legislation of your country when repairing and testing ignition systems.

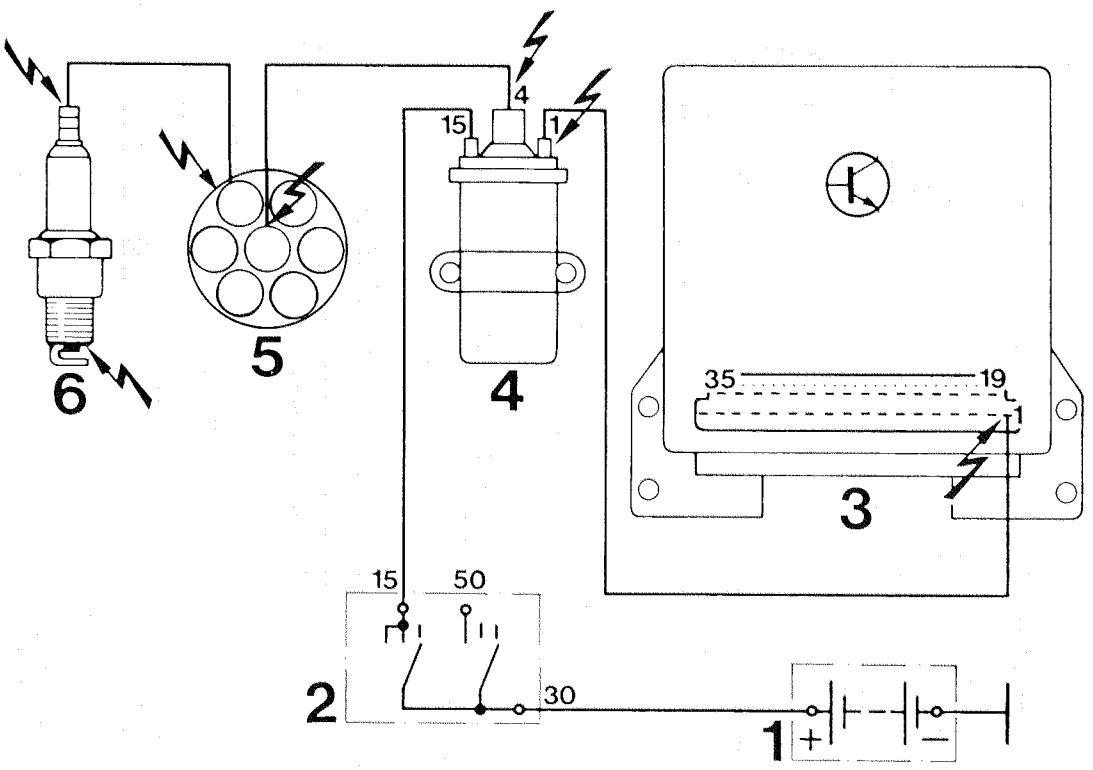
Always turn off the ignition or disconnect the battery when working on the ignition system. Such jobs include the following.

- Connecting engine testing equipment (timing light, dwell angle/speed tester, ignition oscilloscope, etc.).

- Replacement of ignition system parts (spark plugs, ignition coils, distributor, ignition cables, etc.).

If testing the ignition system or making engine adjustments requires turning on the ignition, the mentioned dangerous voltage will be in the entire system.

Thus the danger is not only present at the individual parts of the ignition system (for example, distributor, ignition coil, control unit, ignition cables, etc.), but even on the wire harness (as for example, tachometer connection, diagnosis plug), plug connections and any testing equipment connected.



1 – Battery

2 – Ignition lock

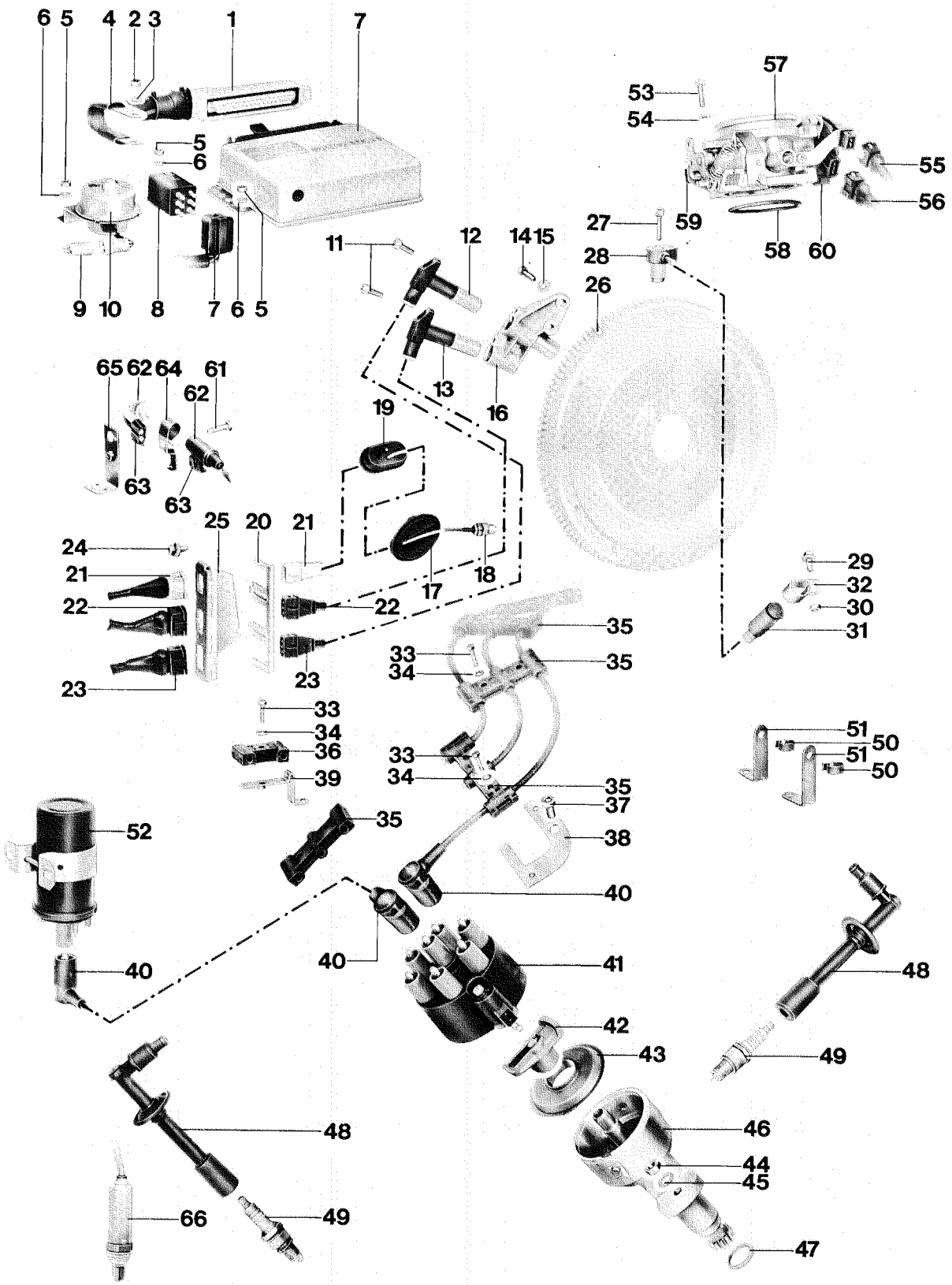
3 – DME control unit

4 – Ignition coil

5 – Distributor

6 – Spark plugs

DME (IGNITION CONTROL)

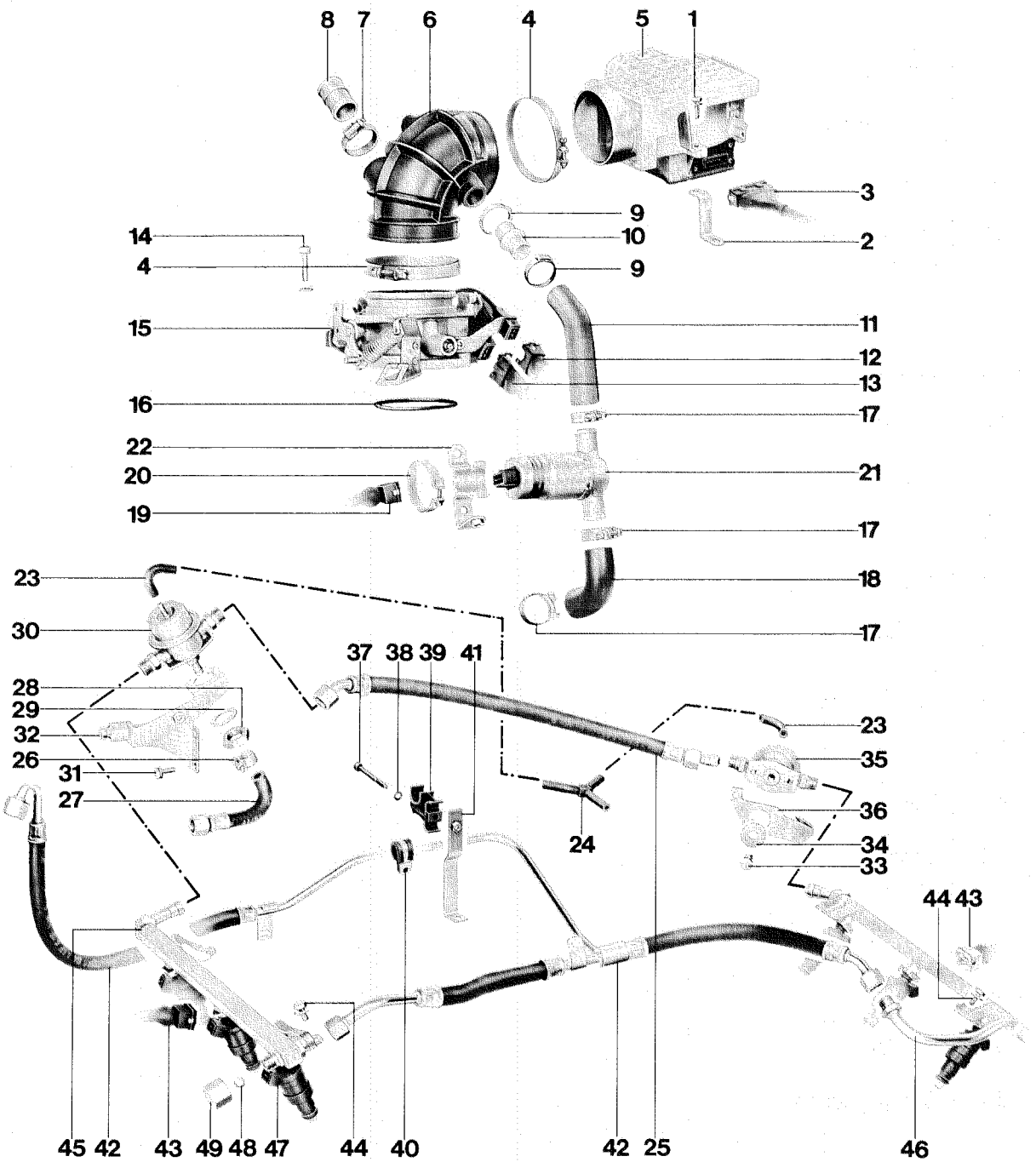


No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
1	Multiple-pin plug for DME control unit	1			
2	Nut	1			
3	Washer	1			
4	Holder	1			
5	Nut	6			
6	Washer	6			
7	Plug	1			
8	DME relay	1			
9	Plug	1			
10	Altitude correction box	1			
11	Screw	2			
12	Reference mark sensor	1			
13	Speed sensor	1			
14	Screw	2			
15	Washer	2			
16	Holder	1			
17	Grommet	1			
18	Temperature sensor II	1			
19	Grommet	1			
20	Arrest	1			
21	Plug	2			
22	Plug DG	2			
23	Plug BG	2			

No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
24	Bolt	2			
25	Holder	1			
26	Reference mark	1			
27	Screw	1			
28	TDC sensor	1			
29	Bolt	1			
30	Nut	1			
31	TDC sensor test conn.	1			
32	Clamp	1			
33	Bolt	11			
34	Washer	11			
35	Holder	4			
36	Holder	1			
37	Screw	1			
38	Holder	1			
39	Holder	1			
40	Ignition lead	7			
41	Distributor cap	1			
42	Distributor rotor	1			
43	Dust cap	1			
44	Nut	1			
45	Washer	1			
46	Distributor	1			

No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
47	Seal	1			
48	Spark plug connector	6			
49	Spark plug	6			
50	Clip	2			
51	Ignition lead holder	2			
52	Ignition coil	1			
53	Screw	4			
54	Washer	4			
55	Plug	1			
56	Plug	1			
57	Throttle housing	1			
58	O-ring	1			
59	Idle switch	1			
60	Full load switch	1			
61	Bolt	1			
62	Oxygen sensor plug	2			
63	Heating plug	2			
64	Holder	1			
65	Holder	1			
66	Oxygen sensor	1			

DME (FUEL INJECTION CONTROL)



No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
1	Bolt	1			
2	Holder	1			
3	Plug	1			
4	Hose clamp	2			
5	Air flow sensor	1			
6	Connector	1			
7	Hose clamp	2			
8	Connector	1			
9	Hose clamp	2			
10	Connector	1			
11	Hose	1			
12	Plug	1			
13	Plug	1			
14	Screw	4			
15	Idle switch	1			
16	O-ring	1			
17	Hose clamp	2			
18	Hose	1			
19	Plug	1			
20	Hose clamp	1			

No.	Description	Qty.	Note When: Removing	Installing
21	Idle positioner	1		
22	Holder	1		
23	Elbow hose	2		
24	Y-piece	1		
25	Fuel line	1		
26	Hose clamp	1		
27	Fuel line	1		
28	Nut	1		
29	Washer	1		
30	Pressure regulator	1		
31	Bolt	2		
32	Holder	1		
33	Bolt	1		
34	Washer	1		
35	Pressure damper	1		
36	Holder	1		
37	Panhead bolt	1		
38	Washer	1		
39	Holder	1		
40	Clamp	1		

No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
41	Holder	1			
42	Fuel line	1			
43	Plug	6			
44	Bolt	4			
45	Fuel collection pipe, left	1			
46	Fuel collection pipe, right	1			
47	Fuel injector	6			
48	Sealing ball	1			
49	Capped nut	1			

IMPORTANT CAR INFORMATION

Conformance with following safety measures is necessary to avoid damaging the electronic ignition system.

1. Never start engine without a firmly connected battery.

2. Mixing up power supply connections, e.g. wrong connection of battery, could lead to destruction of the control units.

3. Never disconnect battery while engine is running.

4. Never use a boost battery charger to start the engine. Only use a second 12 V battery with jump leads.

5. Disconnect battery from car network before boost charging.

6. Only measure resistance values after turning off ignition or disconnecting battery.

7. Pull off both control unit plugs or make a firm connection between ignition coil ter. 4 and ground with a cable before checking the compression (dangerous high voltage, insulation damage to ignition coil, high voltage distributor, ignition cables, etc.). Cable must be interference suppressed with a shielding sleeve of at least 2 kohms.

8. When testing the compression of cars with catalytic converters, always disconnect the fuel-pump relay.

9. Never replace specified ignition coil with a different ignition coil.

10. Never connect a shielded capacitor on ignition coil terminals 1 and 15.

11. Ignition coil terminal 1 must not be used for ground connection when installing a burglar alarm system (ignition coil would be destroyed when key was turned to "ignition on").

12. Never connect battery positive (+) or a test lamp to ignition coil terminal 1.

13. Never disconnect ignition lead between ignition coil terminal 4 and high voltage distributor terminal 4 while engine is running.

14. To avoid destruction of the ignition control unit, secondary side of ignition system must be shielded with at least 4 kohms, whereby the original distributor rotor with a 1 kohm shielded resistor must be installed (do not use a 5 kohm distributor rotor even for radio and communication equipment suppression).

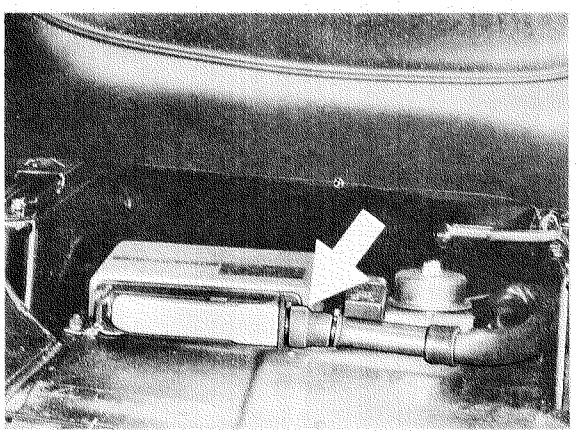
REMOVING AND INSTALLING DME CONTROL UNIT

Removing

1. Turn off ignition.

2. Push back driver's seat and fold floor mat forward.
   Seat does not have to be removed.

3. Unlock catch on control unit and pull off multiple pin plug.

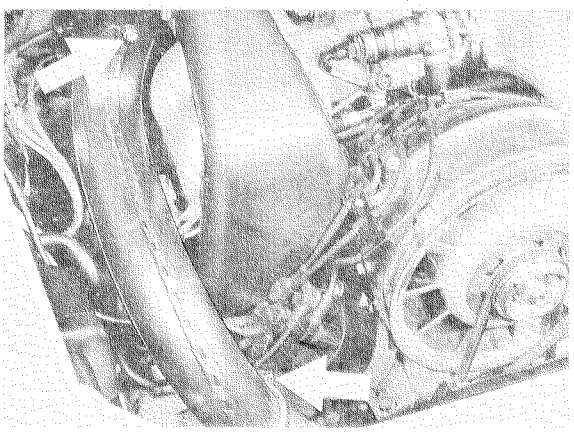


4. Unscrew mounting nuts on left and right sides of control unit.

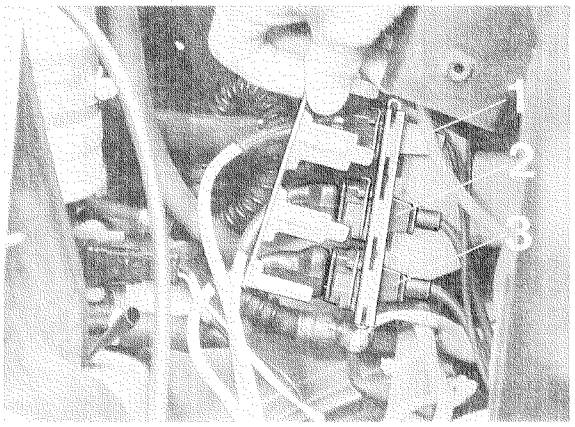
REMOVING AND INSTALLING SPEED AND REFERENCE MARK SENSORS

Removing

1. Remove heated air elbow.

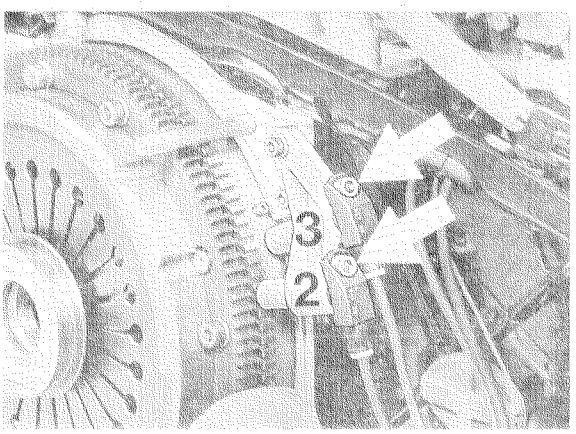


2. Pull out arrest on holder of plugs and disconnect pertinent plug.



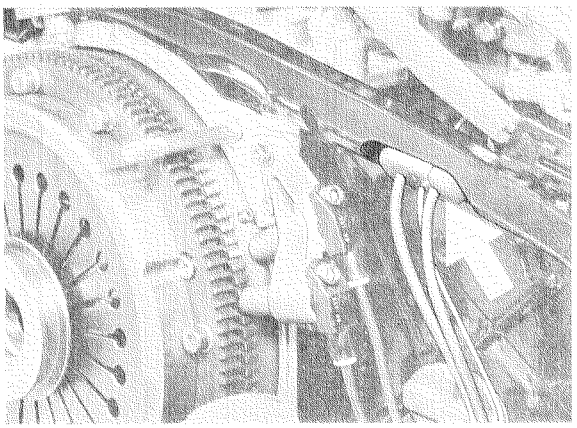
1 — Temperature sensor II
2 — Speed sensor DG
3 — Reference mark sensor BG

3. Unscrew screw and pull out sensor while turning it back and forth at same time.



2 — Speed sensor DG
3 — Reference mark sensor BG

4. Remove grommet.
Pull out sensor wires from slotted end of grommet.
Grommet remains on wire of temperature sensor.



5. Pull plug through opening of grommet and loosen clamp.

Adjusting Clearance on Speed and Reference Mark Sensors

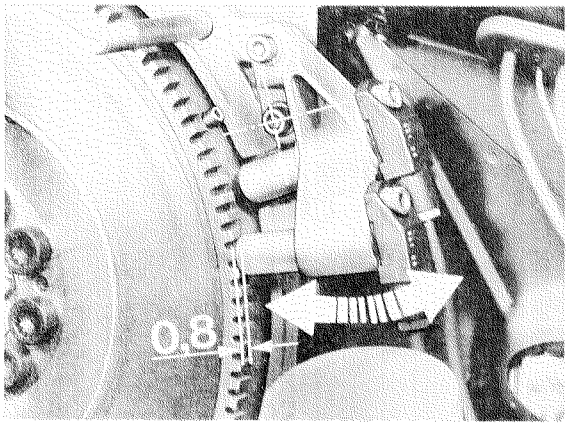
Note:

Clearance between speed sensor and gear ring must be 0.8 mm.
The reference mark sensor will also be positioned correctly, if this value is adjusted correctly.

Adjusting on Removed Engine

1. Screw in speed sensor tight in holder.

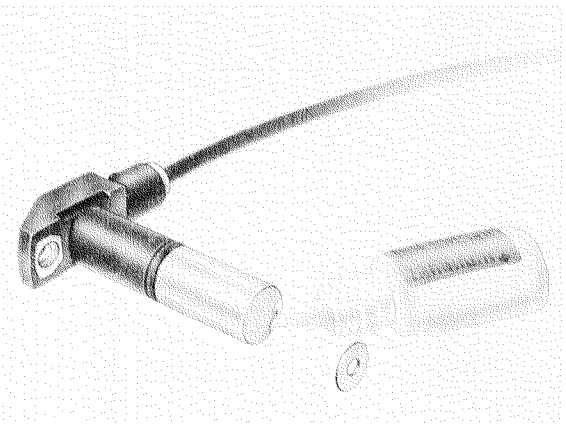
2. Loosen mounting screws on holder. Adjust clearance between gear ring and speed sensor to 0.8 mm with a feeler gage blade.



Adjusting on Installed Engine

1. Remove speed sensor.

2. If available, a faulty sensor can be used as an adjusting tool. Then glue a 0.8 mm thick washer on the sensor with a quick-drying glue as a clearance gage. The sensor installed in the car could also be used if procedures are carried out carefully. Then the glued surface must be kept as small as possible or an easy-to-remove glue must be used.



3. Loosen screws on holder and screw in finger tight so that the holder can still be moved on its pivot point (bottom screw).

4. Install extended sensor in speed sensor opening and tighten.

5. Move holder with extended sensor against stop (gear ring) and then tighten holder screws.

6. Remove extended sensor.
   If original sensor had been used, press off washer carefully and remove glue.

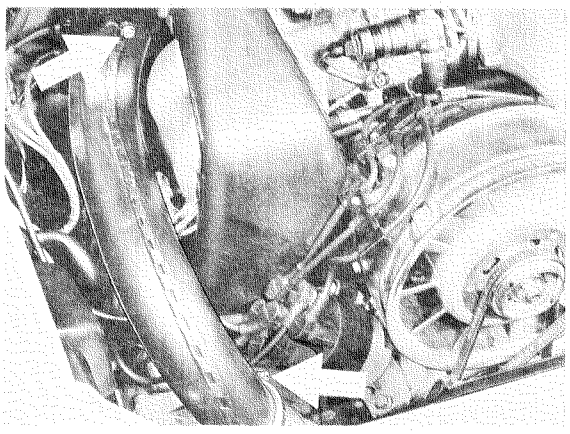
7. Install speed sensor.
   Tightening torque: 8 Nm (6 ftlb).

REMOVING AND INSTALLING DISTRIBUTOR

Removing

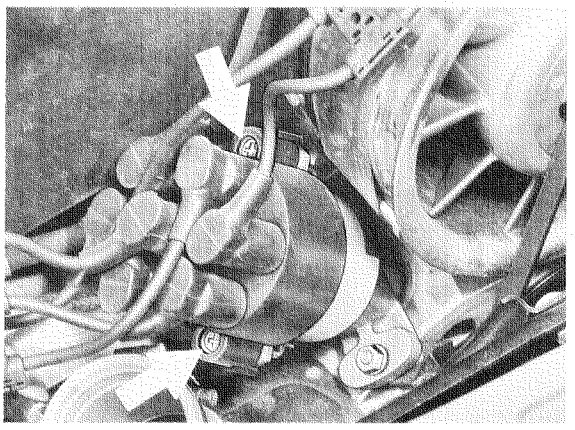
1. Set cylinder 1 at TDC.

2. Remove heated air elbow.



3. Take ignition leads out of holders.

4. Unscrew and take off distributor cap.



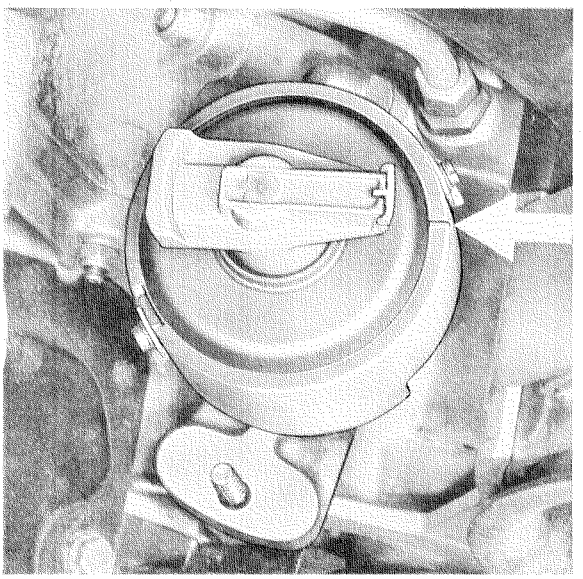
5. Unscrew distributor and pull it out of engine block.

Installing

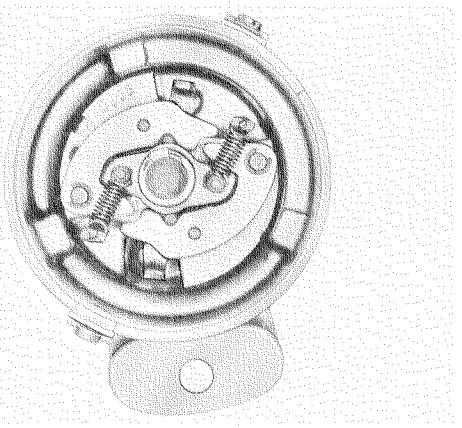
1. Set cylinder 1 at TDC.

2. Check seal on distributor shaft, replacing if necessary.

3. Turn distributor rotor that after installation of the distributor center of rotor is aligned with notch in housing.



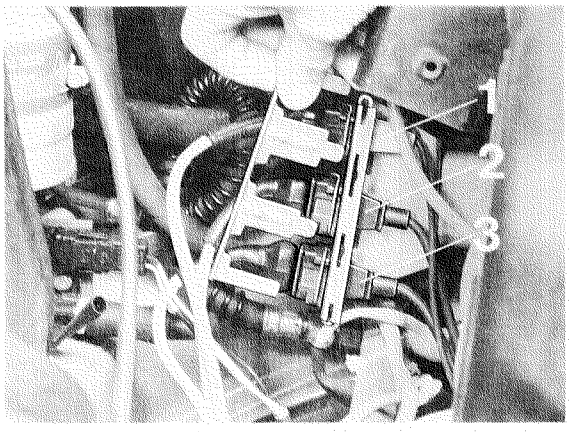
Note:
Basic ignition adjustments are not necessary. The distributor only has the task of distributing high voltage. Centrifugal control only effects the distributor rotor and prevents ignition in a different cylinder with max. ignition timing control.



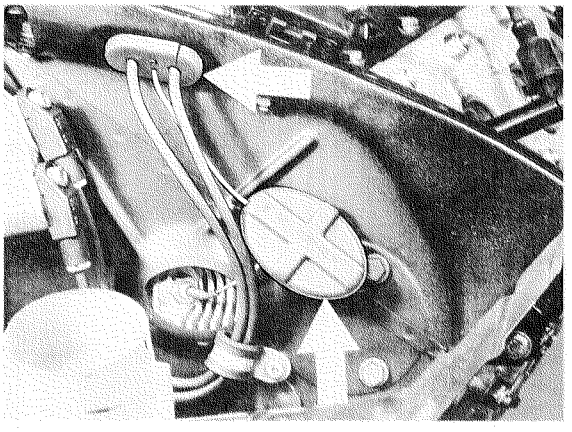
REMOVING AND INSTALLING TEMPERATURE SENSOR II (ENGINE TEMPERATURE)

Removing

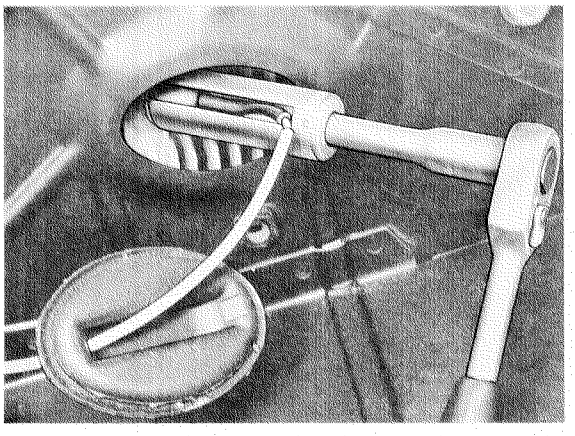
1. Pull out arrest on holder of plugs and disconnect upper plug (1).



2. Remove upper grommet.
   Pull out sensor wires from slotted end of grommet.
   Remove lower grommet.



3. Unscrew temperature sensor with Special Tool 9222. Wire is connected permanently on sensor and consequently will also be turned while unscrewing the sensor.



Installing

Note:

Apply a light coat of white Molykote HTP Paste on threads of temperature sensor.

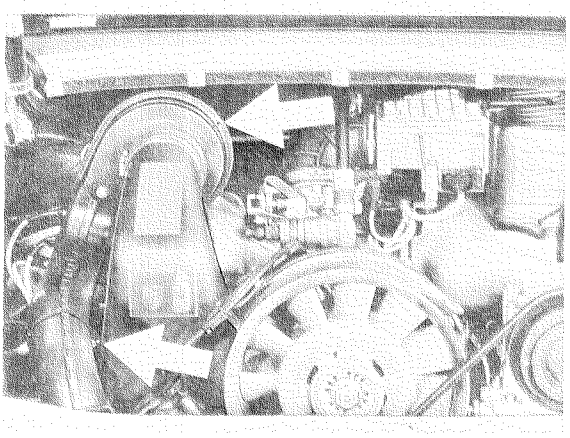
Tightening torque = 15 Nm (11 ftlb).

A loud "click" must be heard when connecting the plug.

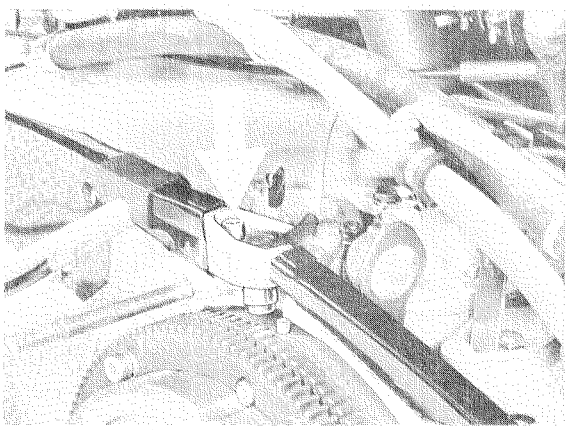
REMOVING AND INSTALLING TDC SENSOR

Removing

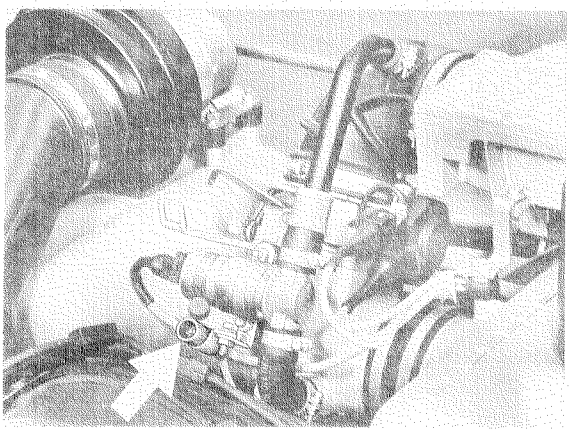
1. Remove heated air elbow and blower.



2. Unscrew TDC sensor and pull it out of holder.



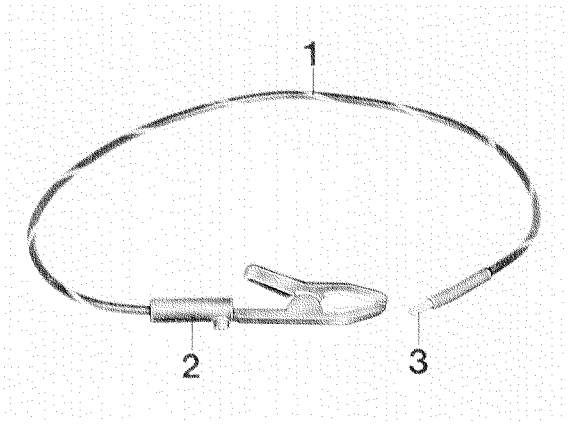
3. Unscrew and remove test connection.



TROUBLESHOOTING

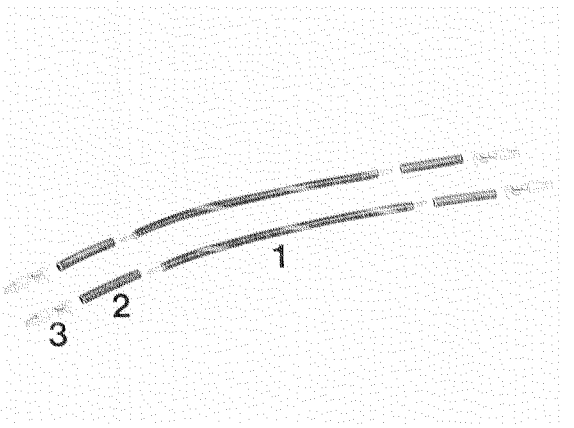
TESTERS AND TOOLS

- Engine tester with oscilloscope, e. g. 1010/1019, Bosch Mot 300/400
- Multi-tester (internal resistance at least 20 k-ohms/V)
- Two test leads (made locally) for tests on multiple pin plugs of control units and plug connections with contact version (flat contacts).



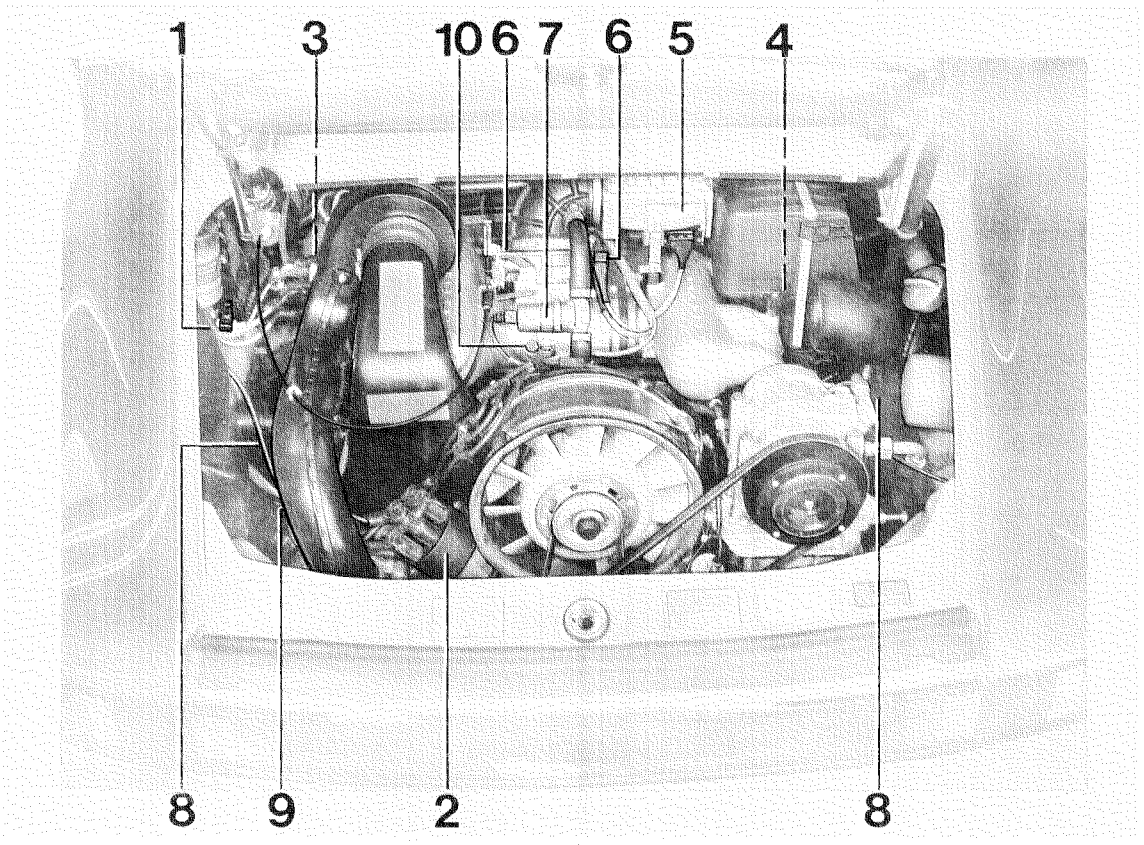
1 – Highly flexible lead
2 – Alligator clips (standard)
3 – Flat male plug 2.8 (N 17.457.2)

- Two adapter test leads (made locally)



1 – Highly flexible lead, approx. 10 cm long
2 – Insulating sleeve
3 – Flat contact N 17.182.2

INSTALLED POSITION OF COMPONENTS



1 – Ignition coil

2 – Distributor

3 – Pressure regulator

4 – Pressure damper

5 – Air flow sensor

6 – Throttle switch

7 – Idle positioner

8 – Fuel injectors

9 – Fuel pressure test connection

10 – TDC sensor test connection

– DME control unit
(underneath driver's seat)

– DME relay
(underneath driver's seat)

– Altitude correction box
(underneath driver's seat)

– Speed sensor/reference mark sensor
(accessible from below,
to the left of the flywheel)

– Engine temperature sensor II
(accessible from below,
on cylinder head at cyl. 3)

– TDC sensor
(accessible from engine compartment,
above flywheel)

TESTING REQUIREMENTS	POSSIBLE DEFECTS							
Engine in perfect running condition Battery charged Starter turns	See test point	Engine does not or is hard to start	Erratic idle	Poor engine pickup	Engine misfiring	High fuel consumption	Poor engine output	Engine hesitation
POSSIBLE CAUSES								
Ground connections, plug connections	1	X	X	X	X		X	X
Power supply for control unit/ fuel pump	2	X		X				X
Speed sensor	3	X	X	X	X	X	X	X
Reference mark sensor	4	X	X	X	X	X	X	X
Ignition system	5	X	X	X	X	X	X	X
Air flow sensor	6	X	X	X	X	X	X	X
Fuel pressure	7	X	X	X	X	X	X	X
Idle positioner	8		X	X				
Throttle switch	9		X	X		X	X	X
Temperature sensor II	10	X	X	X	X	X	X	X
Fuel injectors	11	X	X	X	X	X	X	X
Intake system leakage	12	X	X	X	X		X	X
Altitude correction box	13			X			X	
Alternator/regulator	14				X			X

X = Check with suitable tester

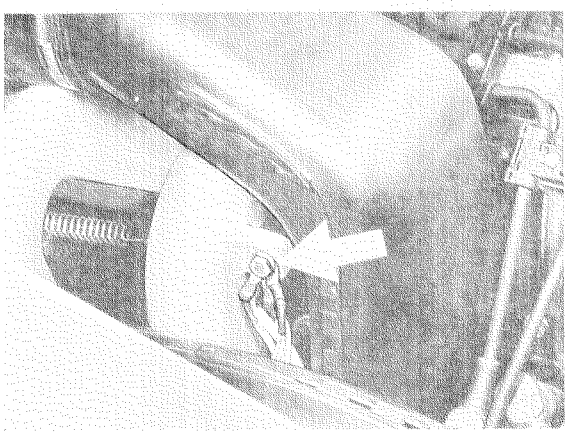
TEST POINT 1

Ground Connections

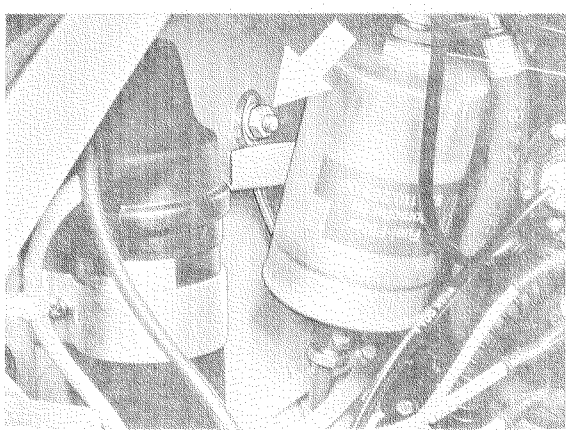
Note:

Test points should be performed in specified order, especially if engine does not run or runs erratically.

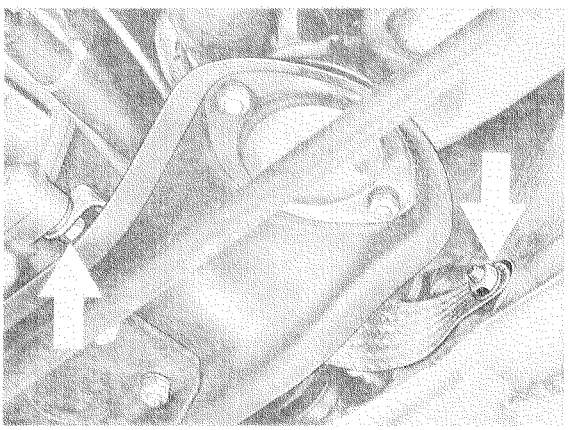
1. Ground point on intake pipe of cyl. 1.



2. Ground point next to fuel filter.



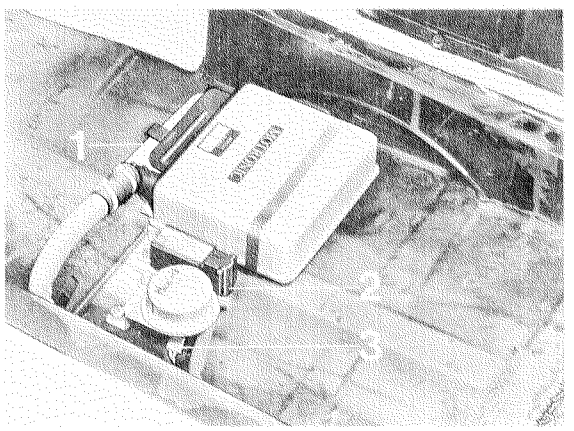
3. Ground connection between body and engine/transmission.



Plug Connections

Check following plugs for correct fit, bent female plugs and corrosion thoroughly.

1.

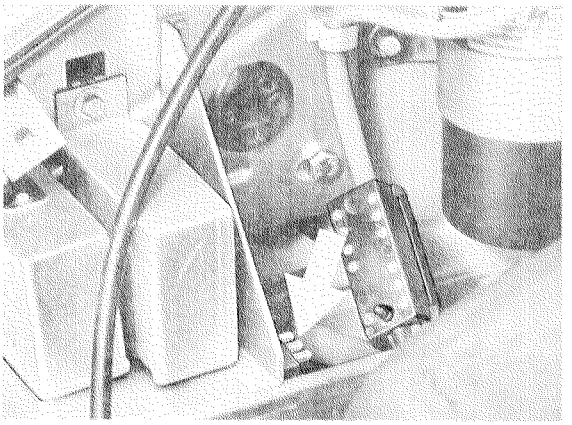


Plug 1 = DME control unit

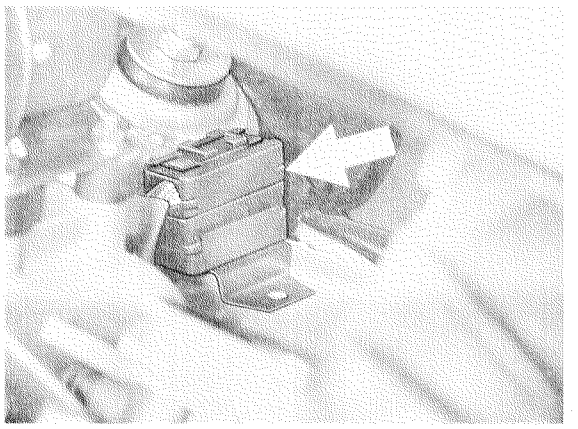
Plug 2 = DME relay

Plug 3 = Altitude correction box

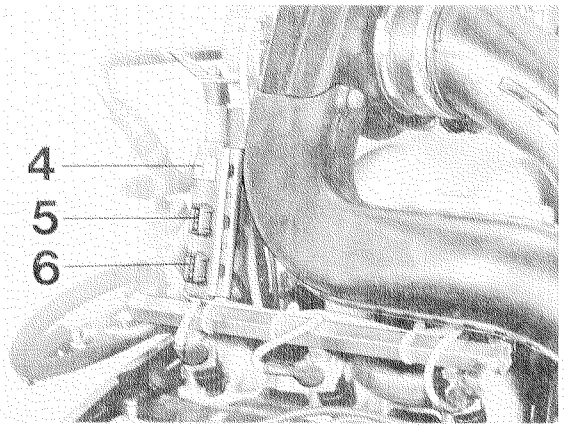
2. Plug on regulator plate.



3. Plug in engine compartment on front cross member.



4.

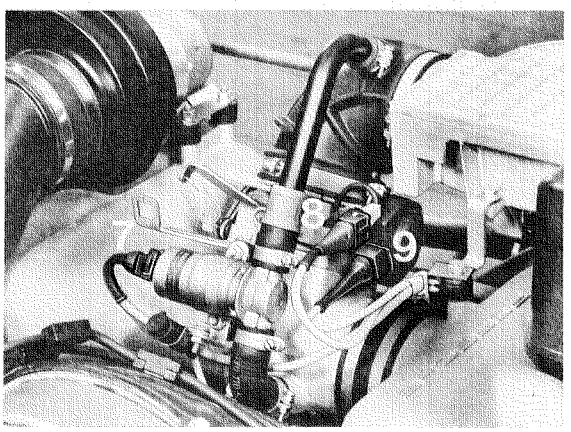


Plug 4 = Temperature sensor II (engine temperature)

Plug 5 = Speed sensor DG

Plug 6 = Reference mark sensor BG

5.

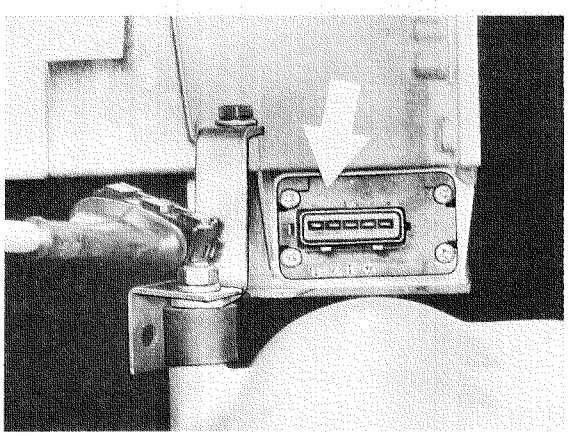


Plug 7 = Idle positioner

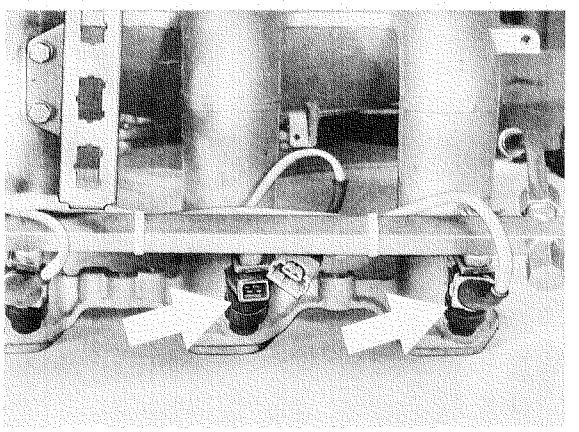
Plug 8 = Throttle switch/
Idle contact

Plug 9 = Full load contact

6. Air flow sensor plug.



7. Plugs of fuel injectors.

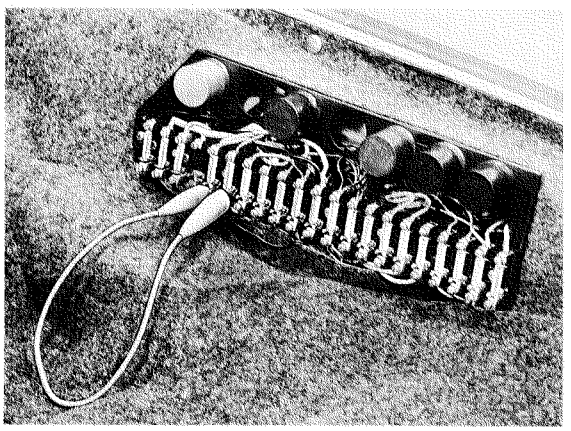


TEST POINT 2

Fuel Pump Power Supply

1. Fuel pump must run already while starting engine.
   If not, check fuse 16 (16 amps).

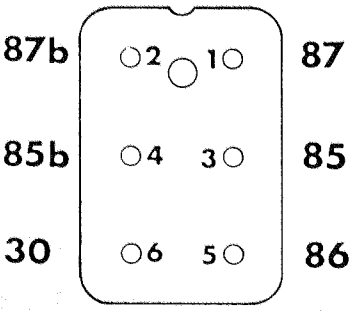
2. If fuse is okay, bridge voltage with a test lead from fuse 17 to fuse 16.
   Fuel pump must run.

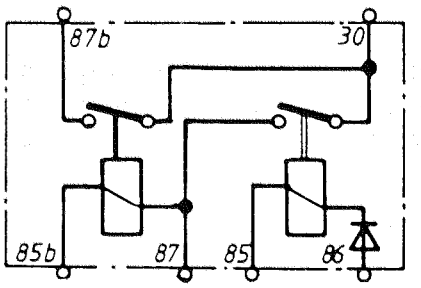


3. If fuel pump does not run, fault is either in power supply wire or pump itself.

DME Relay

1. Pull off plug on DME relay.
   Bridge terminals 30 and 87 b on plug.



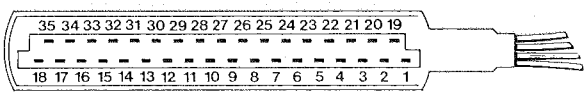


Fuel pump must run.

2. Turn on ignition.
   Terminal 86 must have positive (15) and terminal 85 must have ground (31).

3. Activation of DME control unit with ground potential takes place on terminal 85 b.
   Bridge terminals 30 and 87.
   Terminal 85 b must have ground while starting engine.

2. Turn on ignition and measure voltage between terminals 35 and 5 as well as 18 and 5 with a voltmeter.



DME Control Unit Power Supply

Note:

This test should only be made, if no fault was found in previous points of Test Point 2 and engine cannot be started.

1. Turn off ignition and pull off multiple pin plug on DME control unit.
   Connect DME relay.

(Tester only connected with help of test leads.)

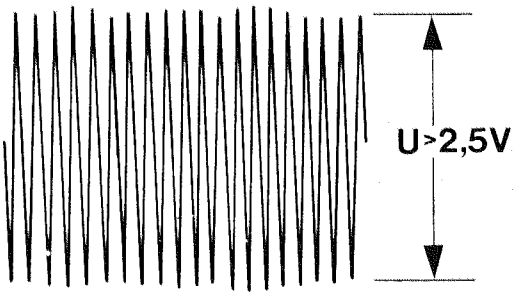
Specification: battery voltage

TEST POINT 3

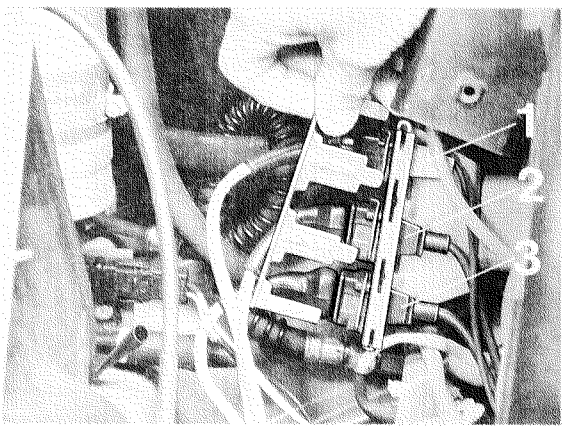
Speed Sensor

Note:

This test is only possible with help of an oscilloscope.
Tune in oscilloscope to supplier's instructions.



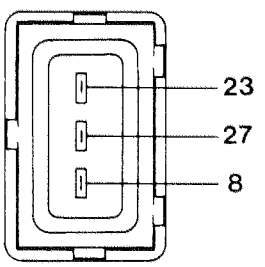
1. Disconnect center plug (2) in engine compartment at left side on plug plate.



If sensor signal is weaker than 2.5 volts or no signal is displayed, check connections, sensor and distance to gear ring.

Measure internal resistance of term. 8 against term. 27 on DME multiple pin plug or on speed sensor plug section.

2. Connect oscilloscope on center and lower flat male plugs of engine end plug section with help of test leads.



3. Crank engine with starter.
Screen should display sine oscillation, the amplitude of which must be greater than 2.5 volts from peak to peak.

Specification: 0.6 to 1.6 k-ohms

Replace speed sensor, if necessary.

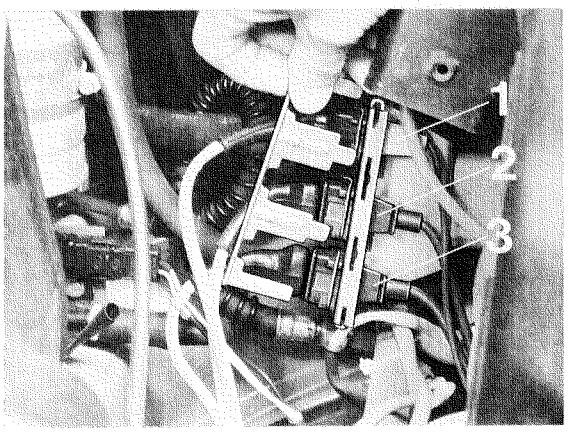
TEST POINT 4

Reference Mark Sensor

Note:

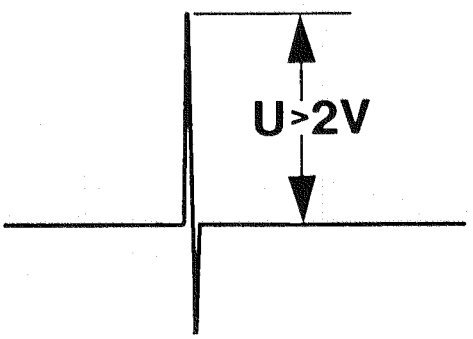
Reference mark sensor can only be tested with help of an oscilloscope.
Tune in oscilloscope as described in Test Point 3.

1. Disconnect lower plug (3) in engine compartment at left side on plug plate.



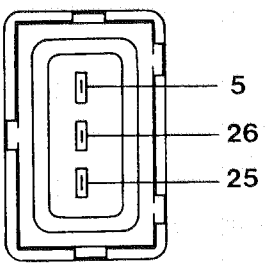
2. Connect oscilloscope on center and lower flat male plugs of engine end plug section with test leads.

3. Crank engine with starter.
Screen should display single sine oscillation.
Oscillation must begin with a positive flank and more than 2 volts must be displayed on the screen at a starter speed of at least 200 rpm (amount of amplitude depends on speed).



If sensor signal is weaker than 2 volts or no signal is displayed, check connections, sensor and distance.

Measure internal resistance of term. 25 against term. 26 on DME multiple pin plug or speed sensor plug section.



Specification: 0.6 to 1.6 k-ohms

Replace reference mark sensor, if necessary.

TEST POINT 5

Ignition System

1. Adjust secondary image on oscilloscope. Connect tester leads to supplier's instructions.



Note:

If a fault is displayed for all cylinders, it will be in the primary or secondary circuit between the ignition coil and distributor rotor.
If a fault is displayed for only one cylinder, it will be after the distributor rotor.

2. Check distributor cap for damage, dirt and signs of burning.

   Resistance: 1 k-ohm

   Retaining hooks must engage firmly when installing.

3. Check distributor rotor.

   Shielded resistance: 1 k-ohm

   Inspect visually for damage and tight fit.

4. Check spark plug connectors for damage and traces of burning.

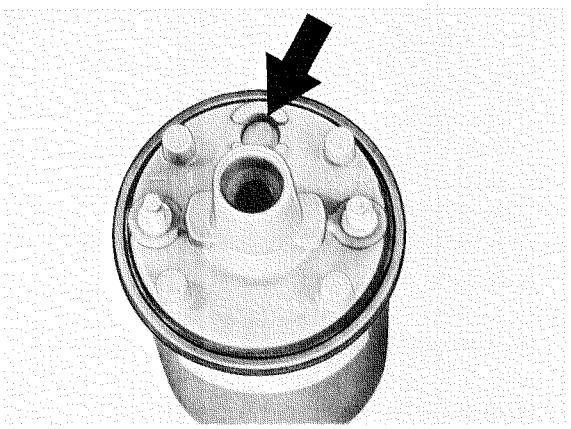
   Shielded resistance: 3 kohms

5. Check ignition coil.

   Primary resistance between ter. 1 and 15:
   0.4 to 0.7 ohm

   Secondary resistance between ter. 1 and 4:
   5.0 to 8.7 kohms

   Check that plugs are not missing.



If plug is missing or casting compound has run out, replace ignition coil and control unit.

Note:

Pull of spark plug connector to avoid ignition testing via spark gap.
This could destroy the ignition coil and control unit.

6. Ignition timing is not adjusted. Check ignition timing with engine warm and running at idle speed.

   Ignition timing at 800 ± 40 rpm:

   3 ± 3° after TDC

87 models onward, with control units 911.618.111.18, 19 and 20

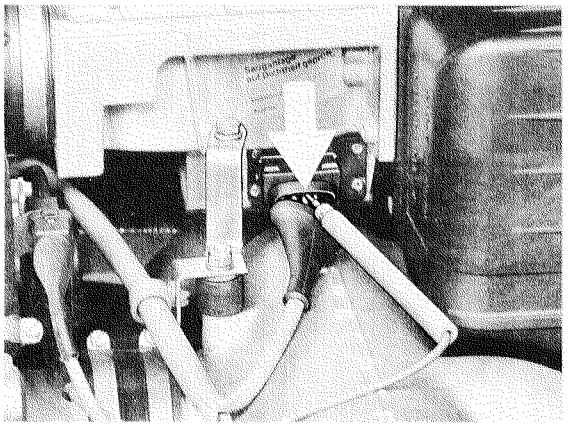
   Ignition timing at 880 ± 40 rpm:

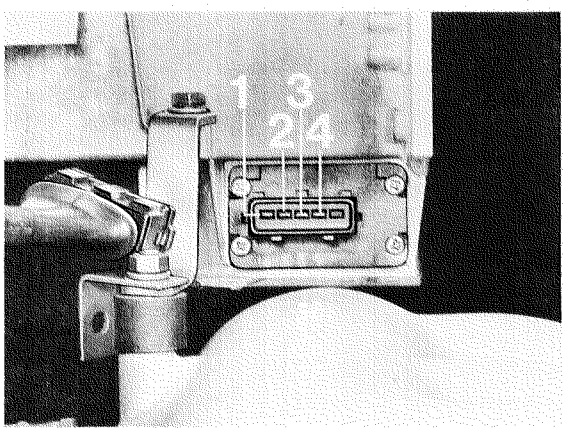
   3.5° ± 3° before TDC

TEST POINT 6

Air Flow Sensor

1. Push back protective sleeve of plug on air flow sensor.
   Plug remains connected.
   Connect voltmeter on term. 3 on back of plug and ground.
   Turn on ignition.





Specification: 5 ± 0.5 volts

2. Remove air cleaner.
   Connect voltmeter on term. 2 and ground.

   Specification: approx. 260 mV (0.26 V)

   Move sensor plate to full load position.

   Specification: approx. 4.6 V

   Sensor plate must move easily, without hesitation.

3. Check temperature sensor I (intake air temperature).
   Turn off ignition and pull off plug on air flow sensor.
   Connect ohmmeter between term. 1 and 4 on air flow sensor.

   Specification at

   0 °C/ 32 °F = 4.4 to 6.8 k-ohms

   15 to 30 °C/ 59 to 86 °F = 1.4 to 3.6 k-ohms

   40 °C/104 °F = 0.9 to 1.3 k-ohms

Note:

Break in temperature sensor causes richer mixture.
Short circuit in temperature sensor causes leaner mixture.

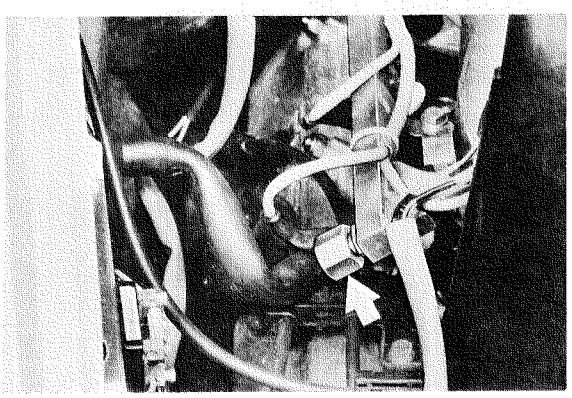
TEST POINT 7

Fuel Pressure

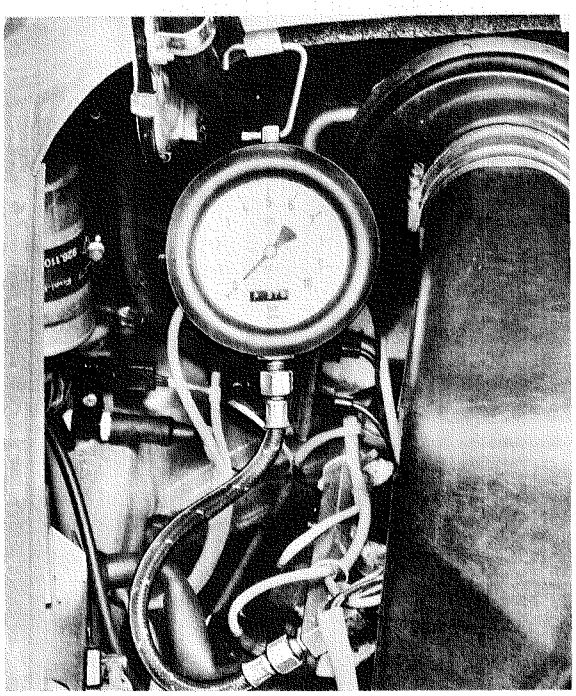
1. Unscrew capped nut on test connection. Catch escaping fuel.

Note:

Be careful that sealing ball does not fall out when unscrewing capped nut.
Escaping fuel could catch fire on a hot engine!



2. Connect pressure tester P 378 on distributor pipe.



3. Start engine and measure fuel pressure at idle speed.

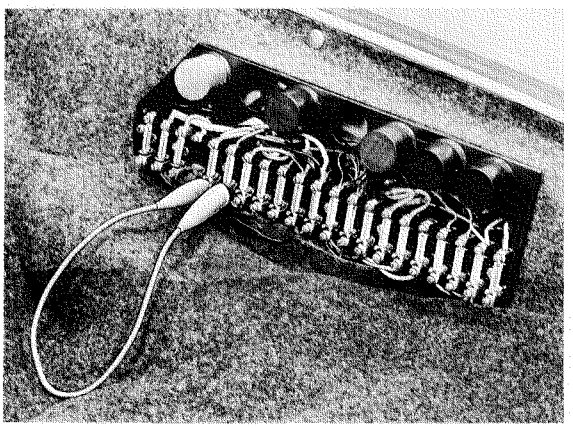
   Specification: 2.0 bar

4. Pull off vacuum hose on throttle housing.
   Fuel pressure must rise.

   Specification: 2.3 to 2.7 bar

5. Slowly pinch return line of pressure regulator with a clamp. If pressure remains below 4 bar, check fuel filter or replace fuel pump if necessary.

   If engine cannot be run, bridge fuses 16 and 17 on fuse box.



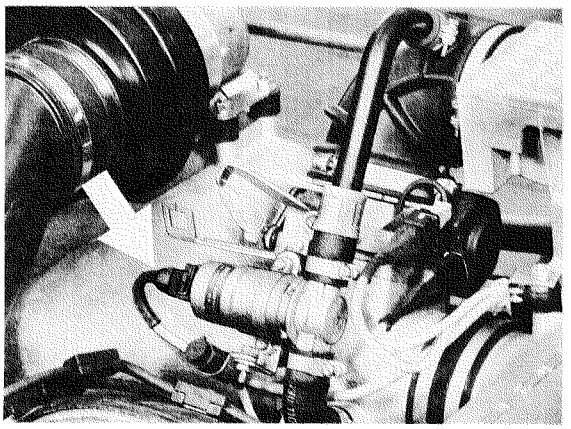
Fuel pump must run.

Specified testing pressure: 2.3 to 2.7 bar

TEST POINT 8

Idle Positioner

1. Pull off plug on idle positioner.



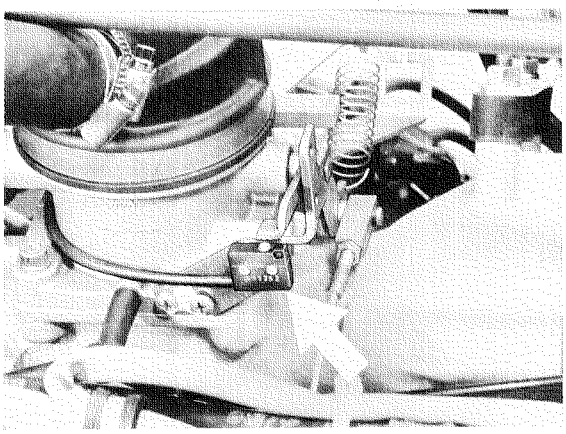
2. Connect center flat male plug of idle positioner on 12 V source.
   Connect both outside flat male plugs on ground alternately (use insulated test tips).
   Positioner must move to other stop each time.

3. Connect plug on idle positioner and turn on ignition.
   Idle positioner must be felt to vibrate because of frequency input.

4. Connect engine tester for speed test.
   Start engine and turn air bypass screw when engine is running at steady idle speed.
   The idle positioner must correct the briefly changed idle speed.

TEST POINT 9

Throttle Switch – Idle Contact



The idle switch is operated by a drag lever via the accelerator linkage. When operated, the idle switch must have already switched before the throttle valve opens after a specified dead travel of approx. 1 mm.

1. Start and run engine at idle speed.

   Press accelerator linkage by hand approx. 1 mm (dead travel) slowly, without that the throttle valve opens.

   Idle speed should now increase approx. 500 rpm and ignition timing must be advanced (approx. 12° before TDC).

   If not, check microswitch and its adjustment.

2. Check idle switch with a power flow tester or ohmmeter.

   Pull off idle switch plug and connect tester.

   Display: 0 ohm (power flow)

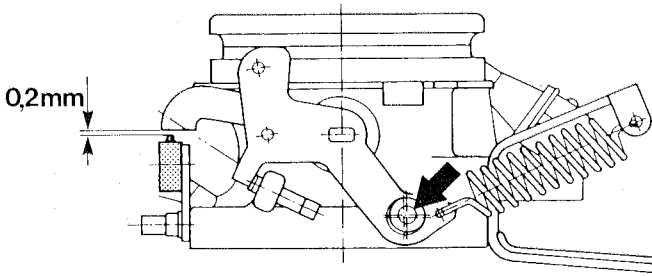
   Move throttle valve by hand (approx. 1 mm) slowly.

   Display: ∞ ohm (switch open)

3. Adjust idle switch.

   Push drag lever down until it rests on throttle valve lever (dead travel). Throttle valve must not yet be moved.

   Adjust distance between switch and drag lever to 0.2 mm with a feeler gage blade.



4. Check coasting shutoff.

   Run engine at idle speed.

   Bridge contacts on idle switch plug with a test lead.

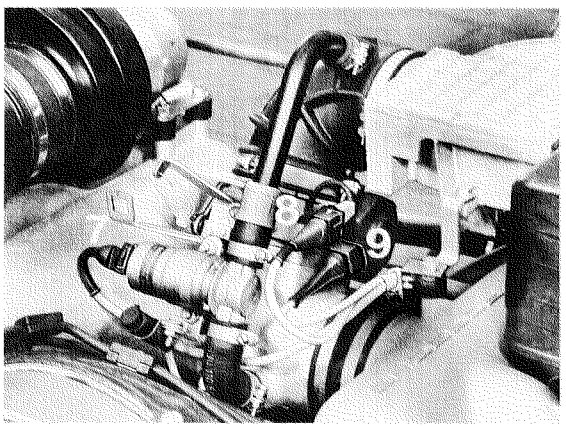
   Increase engine speed to approx. 1300 rpm.

   Engine begins to surge (cutting off of injection signal).

   If not, check wires to control unit according to wiring diagram or replace control unit if necessary.

Throttle Switch – Full Load Contact

1. Start and run engine at idle speed.



   Pull off plug (9) on full load switch and bridge contacts on plug with a test lead.

   Engine speed should drop.

   If not, check wires according to wiring diagram.

2. Check full load switch with power flow tester or an ohmmeter.

   Pull off plug on full load switch and connect tester.

   Display: ∞ ohm (switch open)

   Move throttle valve to full load (wide open).

   Display: 0 ohm (power flow)

3. Replace full load switch.

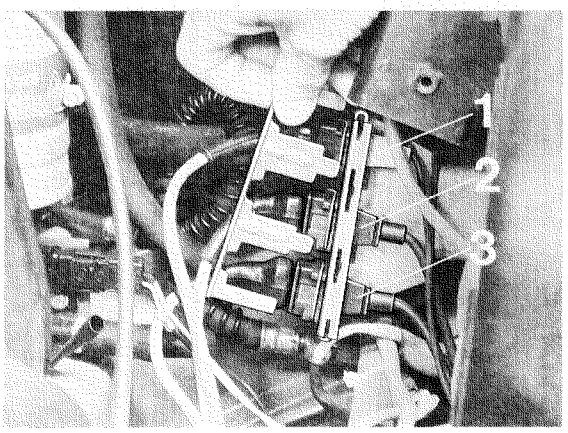
   Switch does not have to be adjusted.

   When installing switch, turn against left lock in slots and tighten mounting screws.

TEST POINT 10

Temperature Sensor II
(Engine Temperature)

1. Disconnect upper plug (1) in engine compartment at left side on plug plate.



Make sure contacts are clean.

2. Connect ohmmeter on engine end plug section and ground.

Specification at

0 °C/ 32 °F = 4.4 to 6.8 k-ohms
15 to 30 °C/ 59 to 86 °F = 1.4 to 3.6 k-ohms
40 °C/104 °F = 1.0 to 1.3 k-ohms
80 °C/176 °F = 250 to 390 ohms
100 °C/212 °F = 160 to 210 ohms
130 °C/265 °F = 90 ohms

Note:

Cylinder head and sensor temperature is approx. 130 °C/265 °F with an oil temperature of 90 °C/194 °F.

Sensor resistance value is then about 90 ohms.

If specified values are not reached, check wires or replace temperature sensor if necessary.

Break in temperature sensor causes richer mixtures.
Short circuit in temperature sensor causes leaner mixtures.

TEST POINT 11

Fuel Injectors

1. If engine can be run, pull off plugs on fuel injectors separately.
   Engine speed should drop each time if injectors are in perfect operating condition.

2. If engine cannot be run, measure voltage on plug connection of injectors.
   One of both female plugs must have battery voltage.

3. Measure coil resistance of fuel injector.

   Specification: 2 to 3 ohms.

4. Check injection timing.

   Tune in oscilloscope to supplier's instructions.

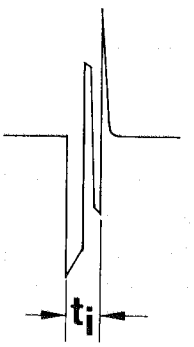
   Connect adapter lead (Bosch "L-Jetronic", No. 1 684 463 093) between a fuel injector and corresponding plug connection.

   Caution!

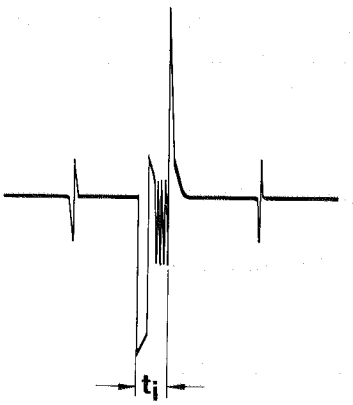
   Tester leads must not contact ground.

Start engine. Oscilloscope will display following oscillographs, if fuel injection timing is in perfect operating condition.

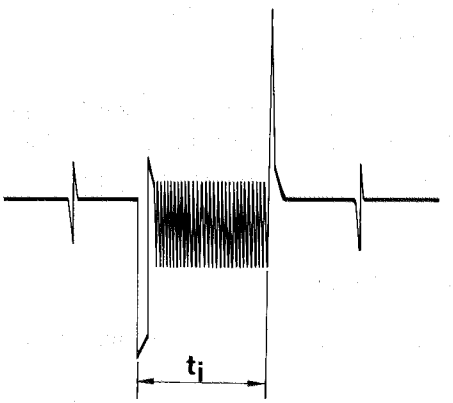
STARTER SPEED



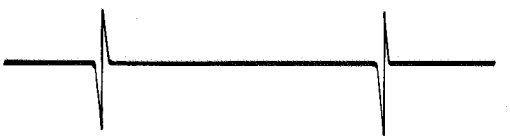
IDLE



ACCELERATION



DECELERATION



Note:

If the engine does not start or the idle speed drops, change test connections on adapter lead and check tester tuning.

TEST POINT 12

Leak in Intake System

1. Check all hoses and connections after air flow sensor for tight fit and leaks.

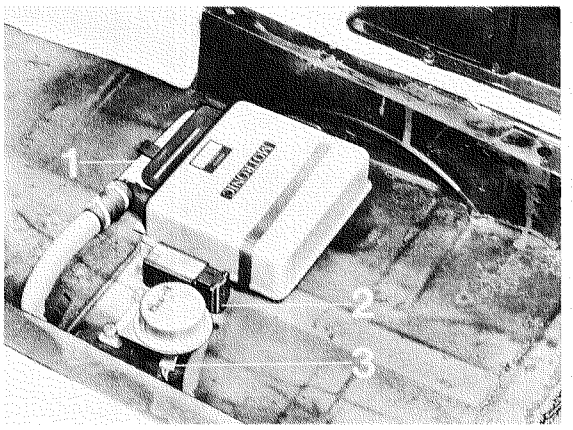
2. Tighten hose clamps.

TEST POINT 13

Altitude Correction Box (Tested Below 1000 Meters Above Sea Level)

1. Check CO level.

2. Pull off plug (3) on altitude correction box.



CO test value must not be changed.

3. Bridge plug with a suitable test lead.

CO test value must change in lean direction by about 0.5 to 1.0 %.

4. Connect plug on altitude correction box with power flow tester or ohmmeter.

Specification: ∞ ohm (switch open)

Switch of altitude correction box is closed at altitudes higher than 1,000 meters above sea level.

Specification: 0 ohm

TEST POINT 14

Alternator/Regulator

Engine misfiring could be caused by the peak voltage of an alternator.

1. Take off drive belt on alternator.

2. Run engine briefly.

   Check alternator and regulator if this has eliminated the fault.

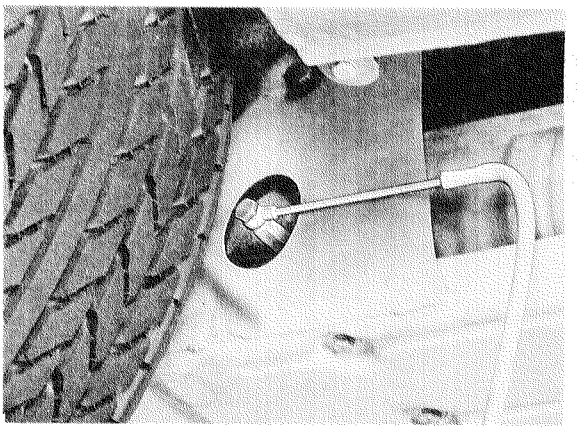
TEST POINT 15

Oxygen Sensor Operation

Brief test

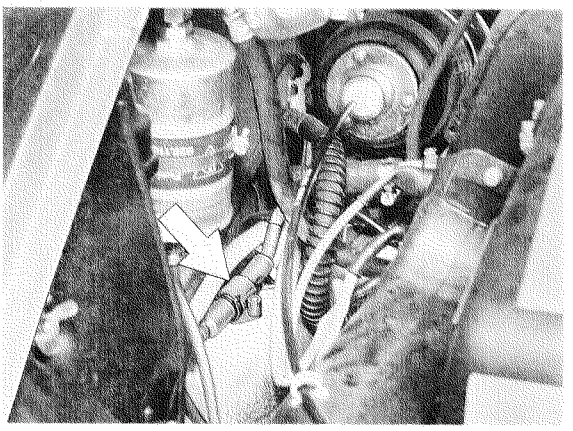
- Engine at operational temperature
- Idle speed correctly adjusted

1. Connect exhaust sampling line to test socket of catalytic converter



2. Connect emission testing device to exhaust sampling line.

3. Disconnect oxygen sensor connector and note CO-value.



4. Disconnect vacuum line from fuel pressure regulator and block line with a suitable plug.

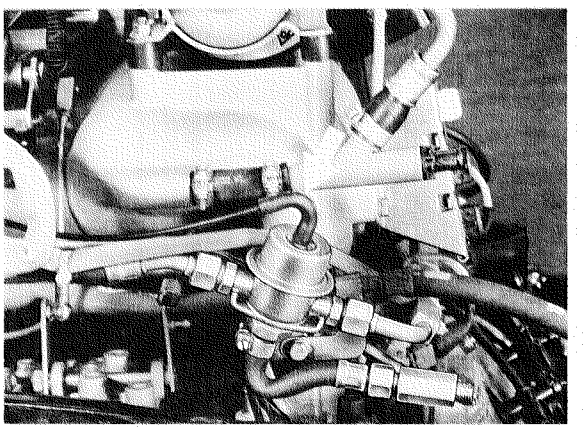


Figure shows pressure regulator with engine removed.

The CO-value must increase.

5. Reconnect oxygen sensor connector. The CO-value must reset automatically to the specified value 0.6 ±0.2%.

If the CO-value does not change, either the oxygen sensor or the DME control unit is defective.

DME Control Unit (Oxygen Control Function)

1. Same preconditions as for oxygen sensor operation test.

2. Use an extra lead to briefly connect terminal 1 of the oxygen sensor plug-in connector (control-unit half of plug) to ground.

The CO-value must increase.

If the CO value does not change, check the connection to the DME control unit (terminal 24) and replace control unit if necessary.

Testing Oxygen Sensor (Sensor Voltage)

1. Same preconditions as for test of oxygen sensor operation.

2. Disconnect oxygen sensor connector.

3. Connect voltmeter to ground and terminal 1 (oxygen-sensor half of connector).

The voltage must be between 0.1 V and 1.0 V.

(Sensor voltage depending on oxygen content in exhaust gas.)

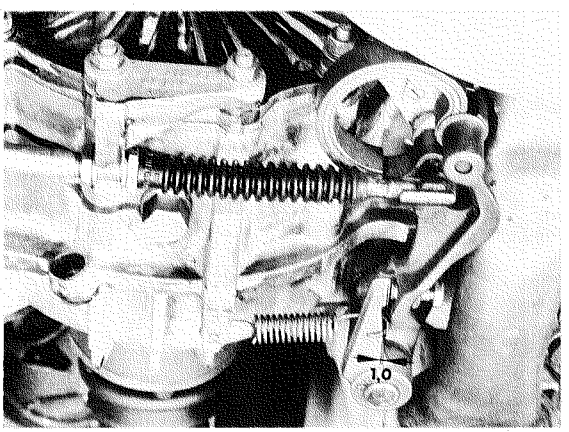
CHECKING CLUTCH PLAY AND RELEASE TRAVEL

Checking Clutch Play

The clutch play cannot be checked at the clutch pedal because of the automatic hydraulic clutch adjustment on the release lever. Consequently the clutch play must be checked on the positioning lever, which fits on the spline of the release shaft.

1. Check whether clutch cable is tight (then the release lever will just be lifted off of the console stop in engaged state).

2. If cable is tight enough, check clutch play with a feeler gage blade and, if necessary, correct to 1.0 + 0.1 mm with the adjusting screw.



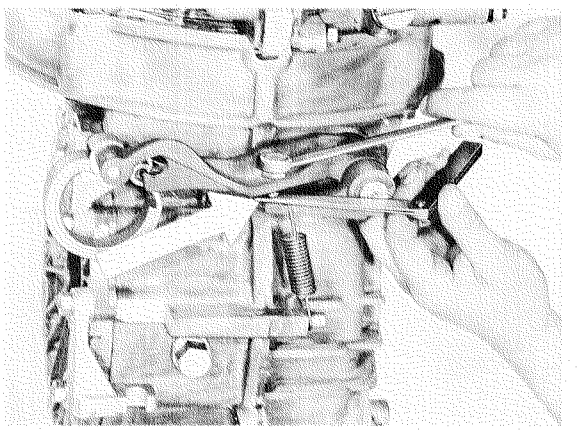
Note:

Make basic adjustment if cable is loose (after settling).

Basic Adjustment

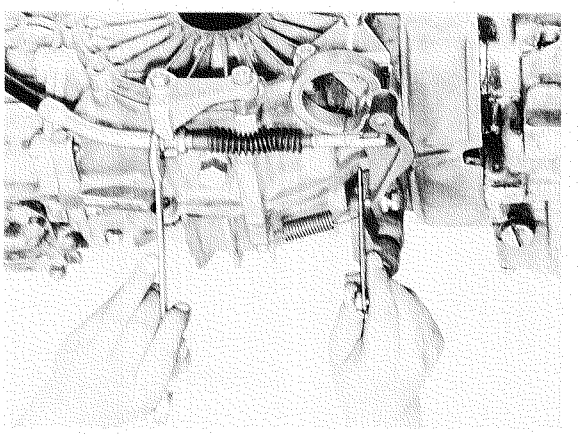
1. Disconnect clutch cable or loosen fully on holder.

2. Adjust clutch play to 1.2 mm with a feeler gage blade and lock adjusting screw.



3. Connect clutch cable.

4. Tighten clutch cable until clutch play is 1.0 mm.



Note:

If clutch cable holder does not provide sufficient travel for adjustment, also adjust clutch cable at front on pivot of pedal.

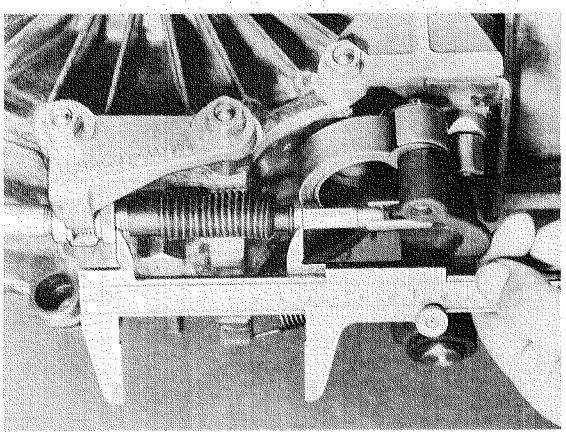
Checking Release Travel

Release travel of the release lever is limited by an adjustable stop on floor plate of the pedal assembly.
Specification: 25 ± 0.5 mm.

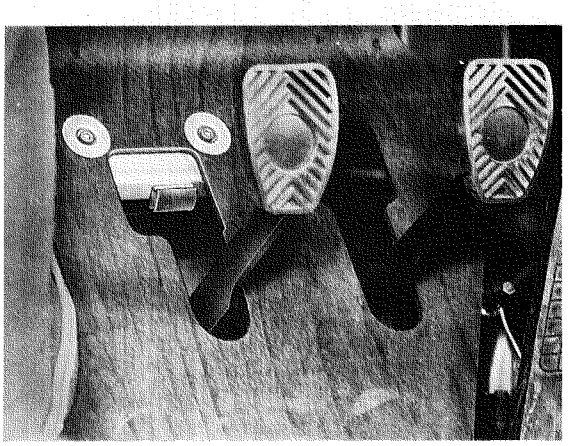
1. a) Apply sliding calipers as shown in figure and read distance I (e. g. 95.3 mm).

   b) Declutch and measure distance II (e. g. 69.9 mm) with a sliding calipers as shown in figure.

   c) Release travel results from distance I minus distance II (in example: 95.3 minus 69.9 = 25.4 mm).

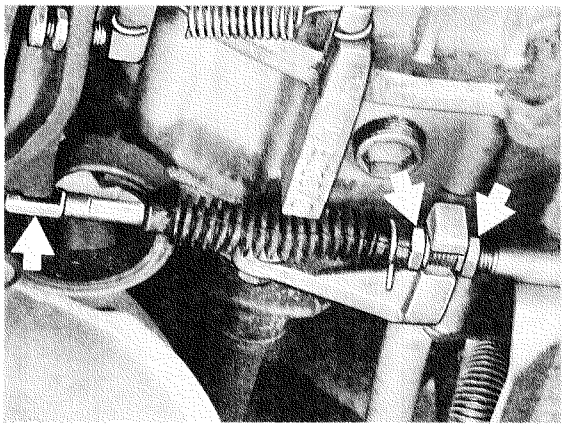


2. Adjust stop on floor plate accordingly if travel is not within tolerances.

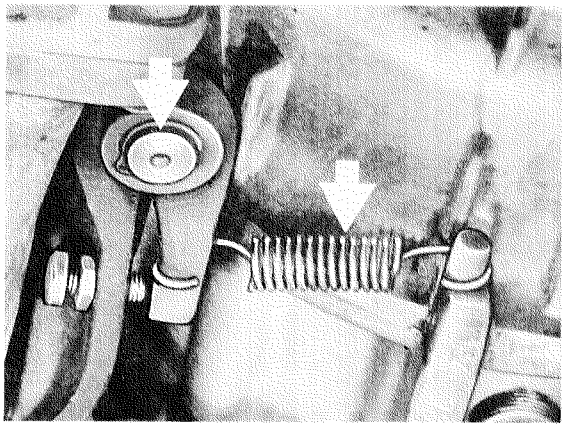


LUBRICATING CLUTCH RELEASE LEVER AND AUXILIARY SPRING

1. Disconnect clutch cable on release lever after loosening cable on holder.



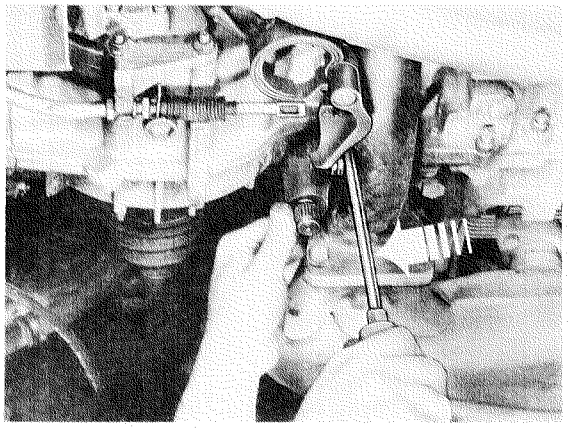
2. Disconnect positioning lever spring on transmission. Remove circlip and positioning lever.



3. Press release lever forward with a suitable tool.

Note:

The auxiliary spring stretches and the release lever snaps forward after passing a certain point.



4. Take release lever off of lever shaft (release shaft).

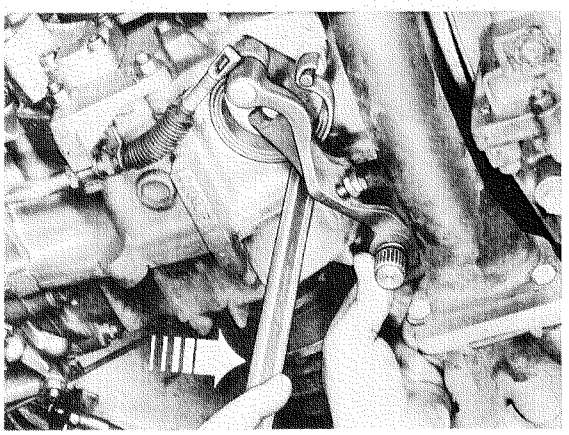
5. Check whether following parts move easily, correcting if necessary.

   - Release lever on lever shaft (release shaft).
   - Auxiliary spring shaft in release lever (if necessary, replace needle sleeves in release lever, see page 30 - 13).

6. Lubricate following sliding and bearing surfaces with a water-proof lubricant, such as for example Staburags NBU 12/300 KB from Klüber, or a multi-purpose grease.

   — Release lever bore.
   — Lever shaft (including splines for positioning lever).
   — Auxiliary spring bearing surface on console shaft.
   — Clutch cable mount on release lever.

7. Install seal and release lever on lever shaft. Place auxiliary spring on console shaft. Push back release lever until auxiliary spring exceeds the dead point (lever snaps in on console stop).



8. Mount positioning lever (with seal) in correct position. Keep distance between adjusting screw and positioning lever with spring attached as small as possible.

9. Make basic clutch adjustment.

REMOVING AND INSTALLING CLUTCH

Removing

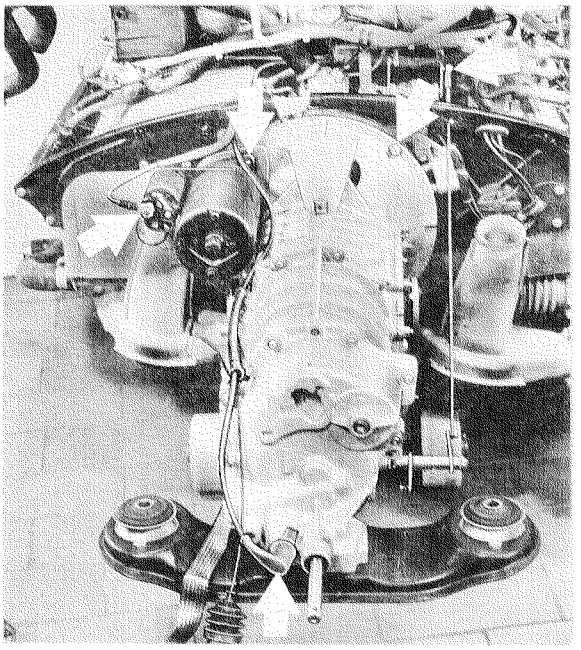
1. Remove engine with transmission.

2. Unscrew transmission on engine by performing the following jobs.

   – Take off wires on starter and wires for backup light switch.

   – Remove accelerator linkage circlip at top and disconnect accelerator linkage.

   – Unscrew four mounting nuts and take transmission off of engine.



3. Unscrew clutch mounting bolts uniformly. Take clutch off of flywheel. Use Special Tool P 238 a for holding, if flywheel has to be removed.

Inspecting Components

Check following components for wear and damage, replacing if necessary. Prepare parts for installation. Lubricate bearing and sliding surfaces.

– Flywheel:
scoring and burns, machining on page.

– Needle bearing in flywheel:
if necessary, lubricate with multi-purpose grease containing MoS_2
(new packing 1 cm^3)

– Clutch disc:
see page 30 - 21.

– Clutch pressure plate:
see page 30 - 21.

– Starter gear ring:
damaged teeth, wear.

– Clutch operation:
wear/release pivot, easy movement
a) of lever shaft
b) of release lever on shaft
c) shaft of auxiliary spring in release lever

– Bearing and sliding surfaces lubricated only with specified lubricants (pages 30 - 10, 30 - 11 and 30 - 15).

– Release bearing:
see page 30 - 17.

– Guide tube:
wear, release bearing must slide easily on guide tube. Coat sliding surfaces with multi-purpose grease containing MoS_2.

– Seals:
(crankshaft and input shaft).

Installing

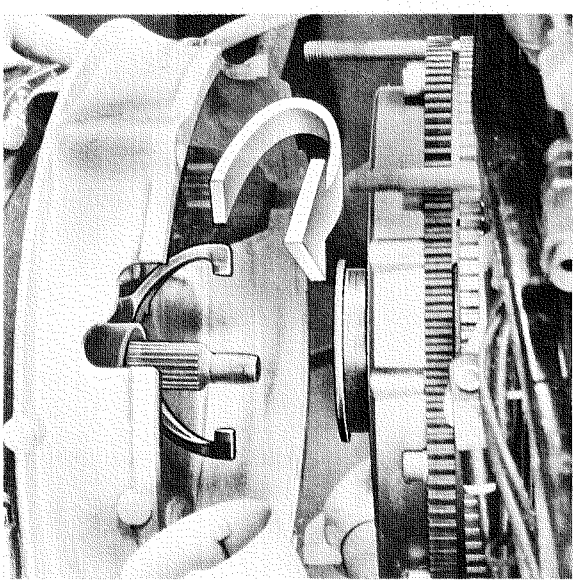
1. Mount clutch on flywheel, which requires that friction surfaces be clean and without grease. Use Special Tool P 370 (or shortened input shaft) to center the clutch disc. Screw in bolts crosswise uniformly. Tightening torque: 25 Nm (18 ftlb).

2. Lubricate sliding surfaces of clutch release with multi-purpose grease containing MoS_2 and splines of input shaft with Optimoly HT.

Note:

Keep grease containing MoS_2 off of sleeves of lever shaft (release shaft).

3. Bolt transmission on engine. Attach release pivot when bolting on release bearing. Check for correct position through opening in transmission case. Tighten mounting nuts with 45 Nm (32 ftlb).

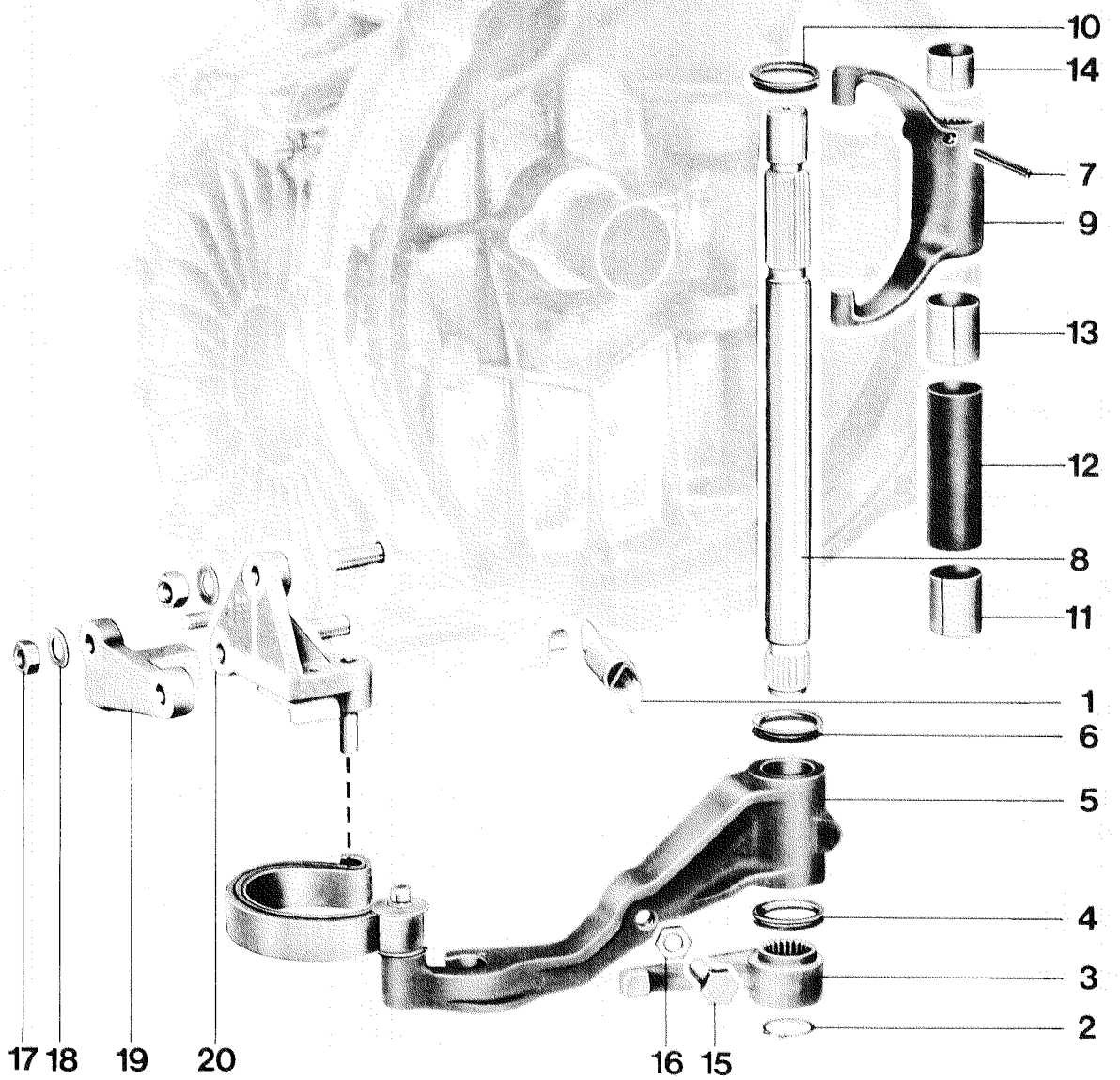


4. Install engine with transmission.

5. Coat release and positioning levers with specified grease and install.
See page 30 - 4.

6. Make basic clutch adjustment.
See page 30 - 1.

CLUTCH CONTROLS



No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Spring	1			
2	Circlip	1		Replace, if necessary	
3	Positioning lever	1		Adjust	
4	Seal	1		Replace, if necessary	
5	Release lever	1		Coat with specified grease, page 30 - 11. Shaft of auxiliary spring must move easily; replace needle sleeves, if necessary, page 30 - 13.	
6	Seal	1		Replace, if necessary	
7	Dowel sleeve	1		Replace, if necessary	
8	Lever shaft	1			
9	Release pivot	1			
10	Seal	1		Replace, if necessary	
11	Sleeve	1	Drive out with P 375	Drive in to correct position with P 375	30 - 10
12	Protective tube	1			
13	Sleeve	1	Drive out with P 375	Drive in to correct position with P 375	30 - 10
14	Sleeve	1		Replace, if necessary. Drive in with suitable mandrel.	

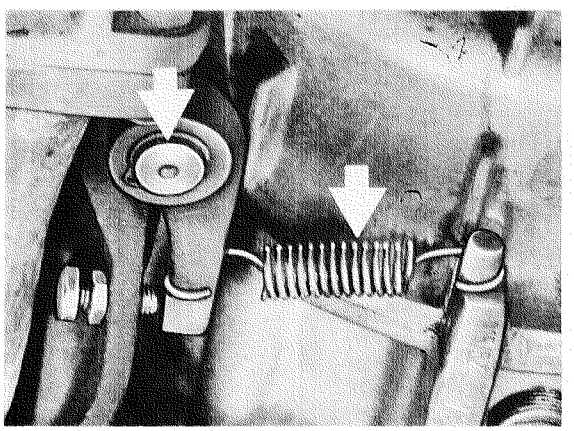
No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
15	Adjusting screw	1		Make basic adjustment, page 30 - 1	
16	Nut	1			
17	Nut	4		Torque: 23 Nm (16 ftlb)	
18	Washer	4		Replace, if necessary	
19	Holder	1			
20	Console	1		Lubricate bearing surface for auxiliary spring, see page 30 - 11.	

DISASSEMBLING AND ASSEMBLING CLUTCH CONTROLS

Disassembling

Transmission has to be removed to replace lever shaft, bearing sleeves and release pivot.

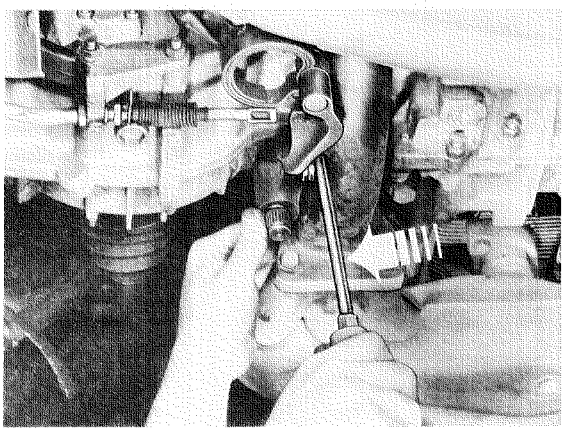
1. Disconnect positioning lever spring on transmission. Remove circlip and pull positioning lever off of splines on lever shaft.



2. Push release lever forward with a suitable tool and take off of lever shaft.

Note:

Auxiliary spring stretches and release lever snaps forward after passing the slack point.



3. Remove engine with transmission.

4. Unscrew transmission on engine (page 30 - 5).

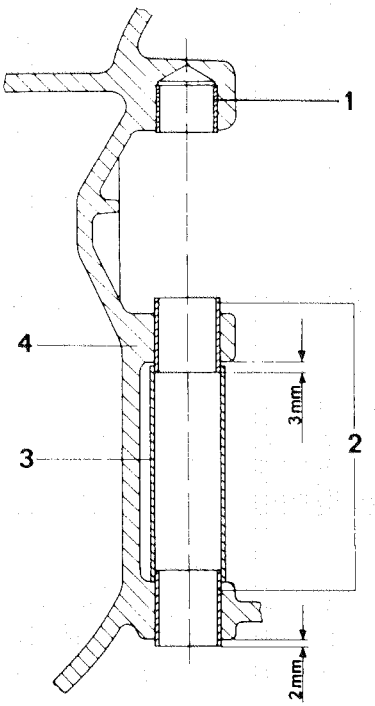
5. Drive out dowel sleeve and move out lever shaft.

Assembling

1. Drive in sleeves for lever shaft (see drawing) and coat with Staburags NBU 12 300 KB from Klüber or a multi-purpose grease without MoS_2. Use a suitable mandrel for sleeve no. 1 and Special Tool P 375 for sleeve no. 2.

Note:

Insert protective tube no. 3 before driving in sleeve no. 2 fully.



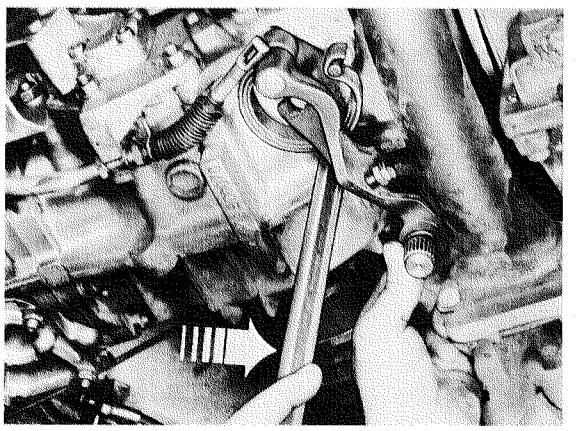
1 – Bearing sleeve
2 – Lever shaft sleeve
3 – Protective tube
4 – Transmission case

2. Mount release pivot and lever shaft. Drive in dowel sleeve (don't forget the seal).

3. Check movement of following parts, correcting if necessary.

   – Release lever on lever shaft.

   – Auxiliary spring shaft in release lever (if necessary, replace needle sleeves in release lever, see page 30 - 13).



4. Bolt transmission on engine and install both in car. See page 30 - 6 for important bolting points.

5. Coat following sliding and bearing surfaces with a water-proof lubricant, for example Staburags NBU 12/300 KB from Klüber, or a multi-purpose grease.

   – Release lever bore.

   – Lever shaft (including splines for positioning lever).

   – Auxiliary spring bearing surface on console shaft.

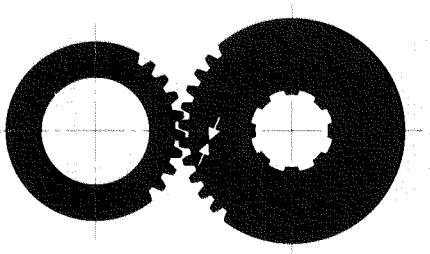
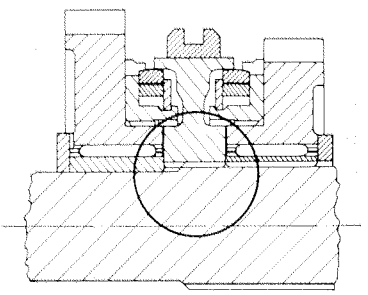
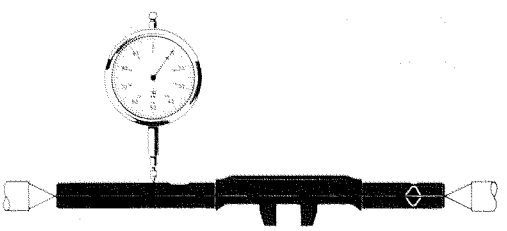
   – Clutch cable connection on release lever.

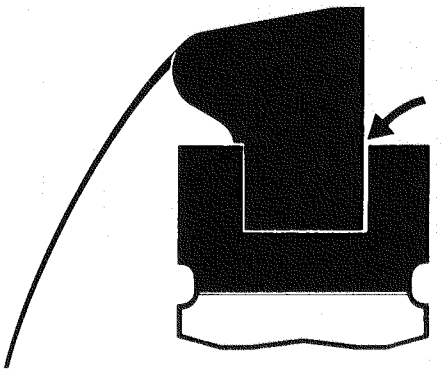
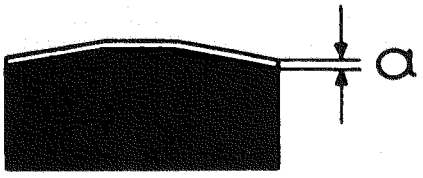
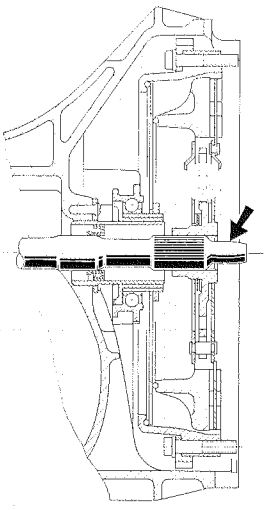
6. Install seal and release lever on lever shaft. Place auxiliary spring on console shaft.
   Press release lever back until auxiliary spring passes the slack point (lever snaps in on console stop).

7. Mount positioning lever (with seal) in correct position. Keep distance between adjusting screw and positioning lever with attached spring as small as possible.

8. Make basic clutch adjustment (page 30 - 1).

Tolerances for Transmission Type 915

Location	New Part Tolerance mm	Wear Limit mm	
1. Backlash between gears I and II 1st gear 2nd gear 3rd gear 4th gear 5th gear	0.06 – 0.12	0.22	
2. Axial play of loose gears on drive pinion and input shaft 1st gear 2nd gear 3rd gear 4th gear 5th gear	 0.3 – 0.4 0.2 – 0.3 0.2 – 0.3 0.2 – 0.3 0.2 – 0.3	 0.5 0.4 0.4 0.4 0.4	
3. Selector rods a) Radial play in guides	0.195 – 0.236	0.4	
b) Runout	–	0.10	

Location	New Part Tolerance mm	Wear Limit mm	
4. Axial play of selector forks in operating sleeve			
5th and reverse gear	0.1–0.3	0.5	
1st and 2nd gear	0.1–0.3	0.5	
3rd and 4th gear	0.1–0.3	0.5	
5. Outside diameter of installed synchromesh rings			
1st gear	86.37±0.17	Depending on local wear of molybdenum coat (a)	
2nd gear	86.37±0.17		
3rd gear	76.3 ±0.18		
4th gear	76.3 ±0.18		
5th gear	76.3 ±0.18		
6. Input shaft			
a) Runout on guide pin	max. 0.1	max. 0.1 (straighten)	

TORQUE SPECIFICATIONS FOR MANUAL TRANSMISSION

Location	Description	Threads	Material	Torque Nm (ftlb)
Transmission case (oil drain)	Plug with magnet	M 24 x 1.5 tapered	MUK 7	24 (17)
Gearbox (oil filler)	Plug	M 24 x 1.5 tapered	MUK 7	24 (17)
Gearbox and transmission case side and front covers, shift cover, tensioning plate, transmission mounts	Nut	M 8 x 1.25	22 H	24 (17)
Front cover	Backup light switch	M 18 x 1.5	Ms	35 (25)
Input shaft	Collar nut	M 30 x 1.5	C 35	230 (166)
Input shaft	Castle nut	M 18 x 1.5	22 H	160 (116)
Drive pinion	Collar nut	M 24 x 1.5	8.8	250 (181)
Shift pivot	Nut	M 6 x 1.0	22 H	10 (7)
Shift arrest, transm. case	Bolt	M 10 x 1.5	8.8	17 (12)
Transmission case	Breather	M 14 x 1.5	9 S 20 K	25 (18)
Selector forks, selector rod forks	Bolt	M 8 x 1.25	8.8	25 (18)
Ring gear with differential or limited slip differential	Bolt	M 12 x 1.25	12.9	160 (116)
Axle flange	Bolt	M 10 x 1.25	8.8	44 (32)
Starter	Cyl. head nut	M 10 x 1.5	CK 35	48 (35)

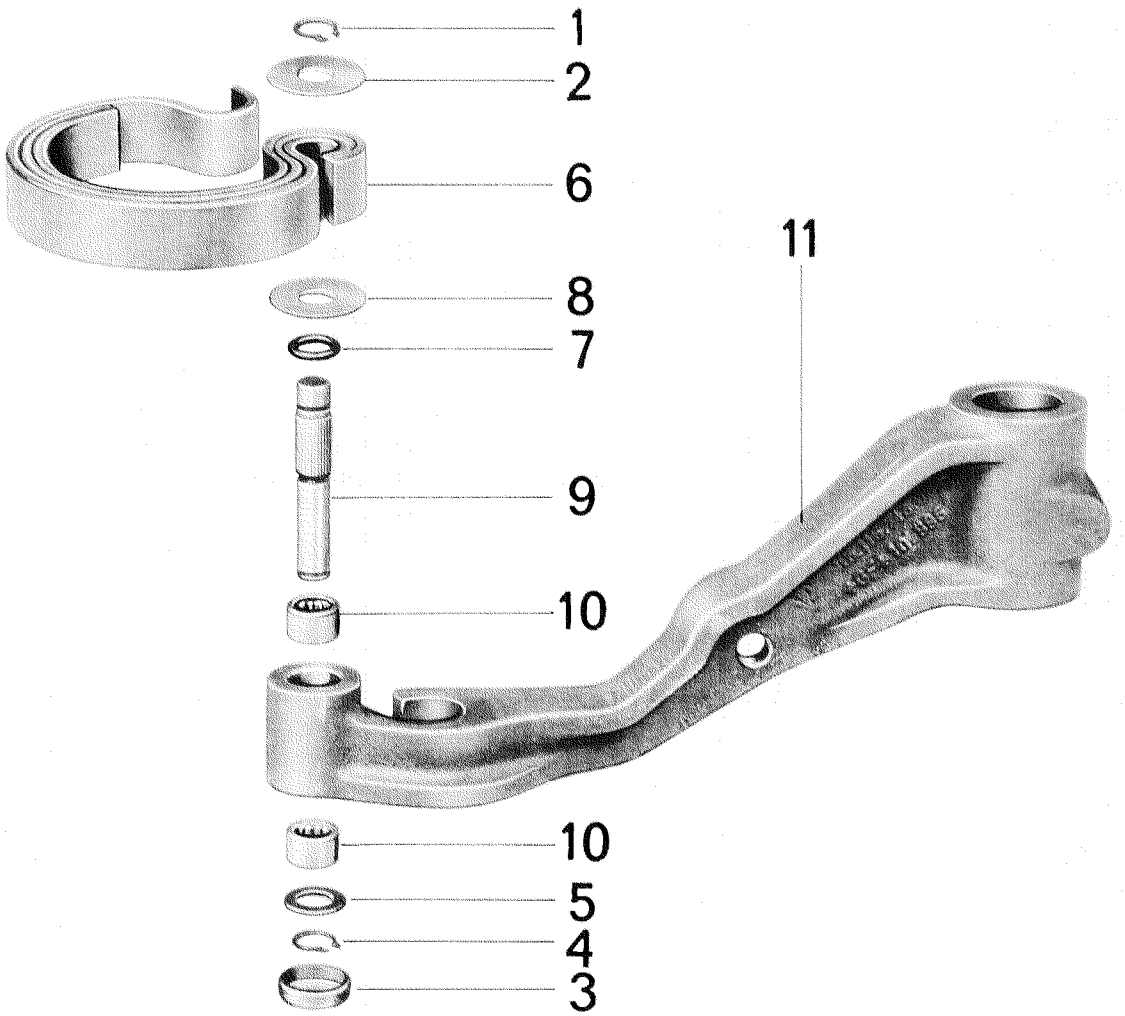
Location	Description	Threads	Material	Torque Nm (ftlb)
Crankcase/ transmission	Nut	M 10 x 1.5	H 22	48 (35)
Release lever/ adjusting screw	Nut	M 8 x 1.25	04	11 (8)
Spring/ speed sensor	Screw	M 6 x 1	8.8	9 (6.5)
Reversing lever/ gearbox shaft	Shaft	M 8 x 1.25	9S 20 K	25 (18)
Oil cooling pipe/ oil pump	Bolt	M 8	8.8	22 (16)
Oil cooling pipe/ gearbox	Bolt	M 6	8.8	9 (6.5)
Release bearing guide tube	Screw	M 6 x 1.0	8.8	9 (6.5)
Oil pump cover/ side transmission cover	Screw	M 6	8.8	9 (6.5)
Shield/ side transmission cover	Screw	M 6	8.8	9 (6.5)
Drive gear/ differential	Screw	M 5	8.8	5.6 (4)

General Data	Clutch
Design	Single disc, dry clutch in pulled version
Pressure plate	MFZ 225 K Contact force 7800 to 8500 N
Clutch disc	TD 225 (springs – torsion damper)

TORQUE SPECIFICATIONS FOR CLUTCH AND GEAR SHIFT

Location	Description	Threads	Material	Torque Nm (ftlb)
Clutch				
Flywheel	Bolt	M 10 x 1.25	10.9	90 (65)
Sleeve with needle bearing on crankshaft	Screw	M 6		10 (7)
Clutch and gear ring	Bolt	M 8	8.8	20 – 25 (14 – 18)
Guide tube/ transm. case	Screw	M 6	8.8	8 – 9 (6 – 6.5)
Transmission/ engine	Nut	M 10	8	45 (32)
Starter	Nut	M 10	8	45 – 48 (32 – 35)
Engine/ transmission	Bolt	M 12 x 1.5		80 (58)
Axle shaft	Bolt	M 8 M 10	12.9 12.9	42 (30) 83 (60)
Gear shift				
Bracket/ shift base	Screw	M 6	8.8	6 (4)
Shift base/ tunnel	Bolt	M 8	8.8	21 (15)
Selector rod end	Bolt	M 8	8.8	15 (11)
Shift coupling	Bolt	M 8	8.8	15 (11)
Clamp	Bolt	M 8	8.8	25 (18)

RELEASE LEVER



No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Circlip	1		Replace, if necessary	
2	Washer	1			
3	Plug	1		Replace	
4	Circlip	1		Replace, if necessary	
5	Washer	1			
6	Spring	1			
7	O-ring	1		Replace	
8	Washer	1		Replace	
9	Shaft	1			
10	Needle sleeve	2	Drive out with 9153	Drive in to correct position with 9153	30 - 15
11	Release lever	1			

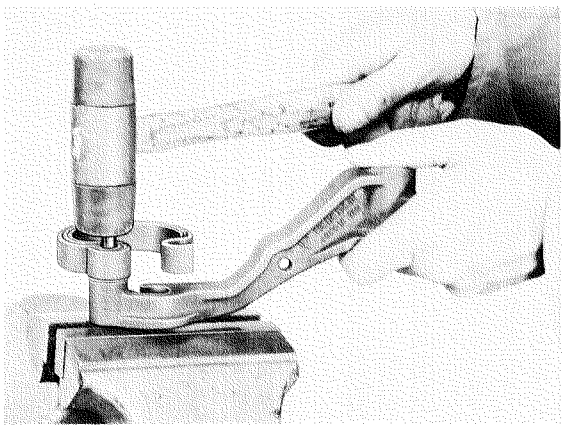
DISASSEMBLING AND ASSEMBLING RELEASE LEVER

Disassembling

1. Remove upper circlip and drive down shaft only far enough that plug can fall out.

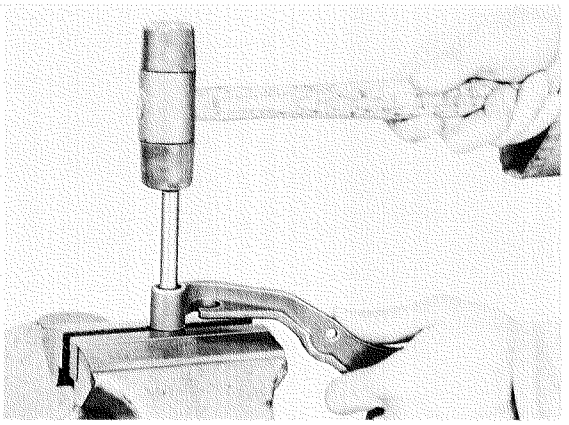
Note:

This will deform the washer (item 8).



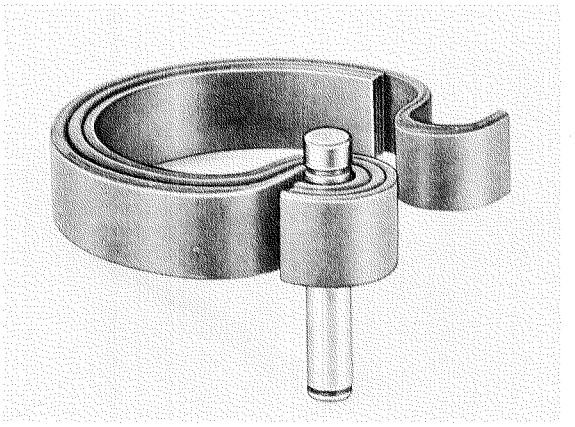
2. Remove lower circlip and pull out shaft with spring.

3. Drive out needle sleeves with Special Tool 9153.



Assembling

1. Drive shaft into spring only far enough that washer and circlip can just be installed.

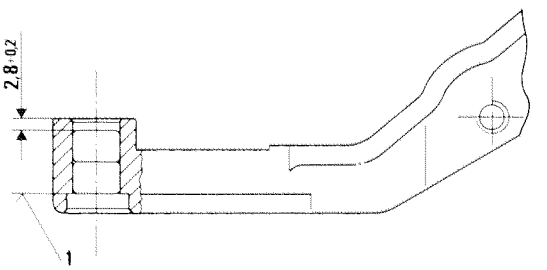


2. Drive in bearing sleeves to correct position with Special Tool 9153.

Note:
Lubricate needle sleeves and bore in release lever with a water-proof lubricant prior to installation. For example with:

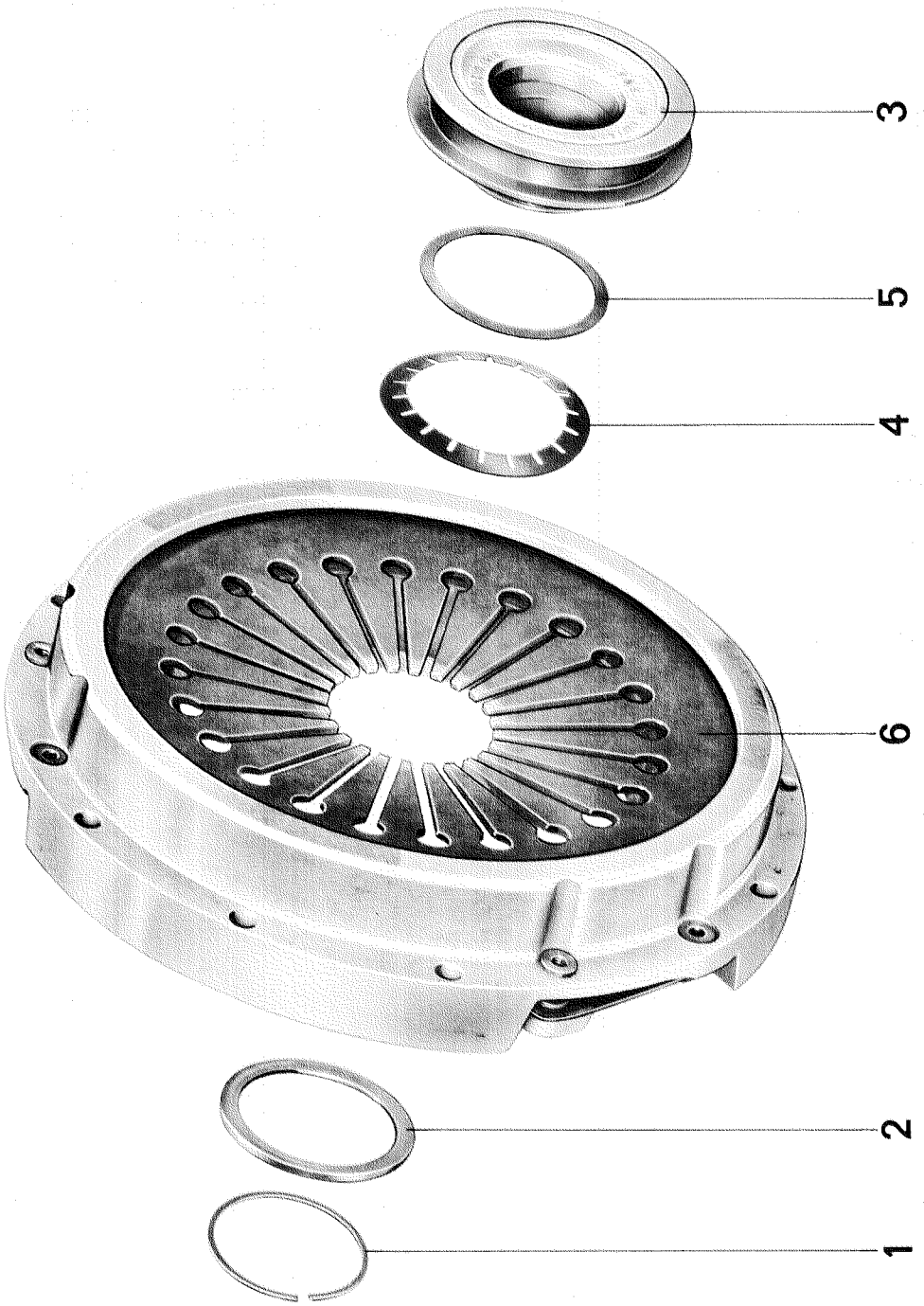
Staburags NBU 12/300 KB	Klüber
Energrease HTB 2	BP
Darina 2	Shell
Norva 275	Esso
HTR	Aral

Or with a multi-purpose grease not containing MoS_2.



1 – Flush

RELEASE BEARING



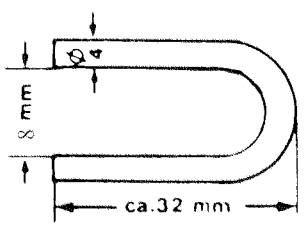
No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Snap ring	1	Remove with pointed pliers, pressing down on pressure plate.	Position correctly	30 - 19 30 - 20
2	Thrust washer	1		Groove faces snap ring	30 - 20
3	Release bearing	1		Do not wash, only wipe off dry. Coat sliding surfaces for guide tube with multi-purpose grease containing MoS_2.	
4	Washer	1		Position correctly	30 - 19
5	Washer	1			
6	Pressure plate	1		Check for wear, replacing if necessary	30 - 21

REMOVING AND INSTALLING RELEASE BEARING ON PRESSURE PLATE

Due to differences in tolerances it could happen that the release bearing can only be installed with a preloaded pressure plate.

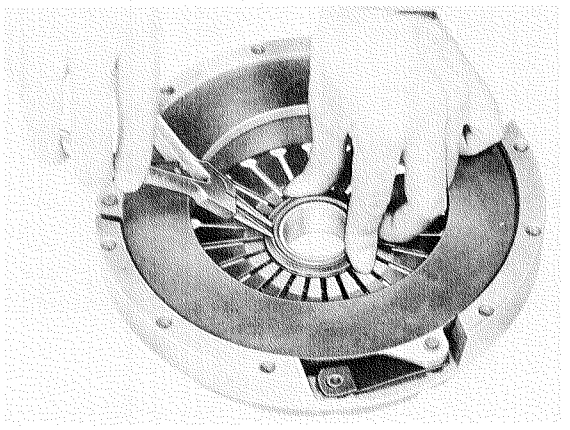
Removing

1. If the snap ring on the release bearing cannot be removed (see point 2), the pressure plate has to be preloaded. This is accomplished by placing the pressure plate under a press in such a manner that the release bearing can be run out without interference when applying pressure on the plate. Press pressure plate carefully enough that 4 mm thick wire locks (made locally) can be placed underneath the bolt heads.



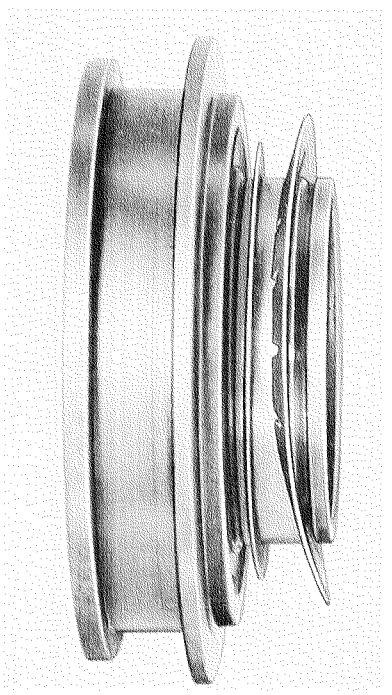
2. Place pressure plate on release bearing and press down together with the thrust washer far enough that pressure is removed from the snap ring and it can be removed with a pointed pliers.

Note:
Release bearings are filled with a special grease and consequently must not be washed out.



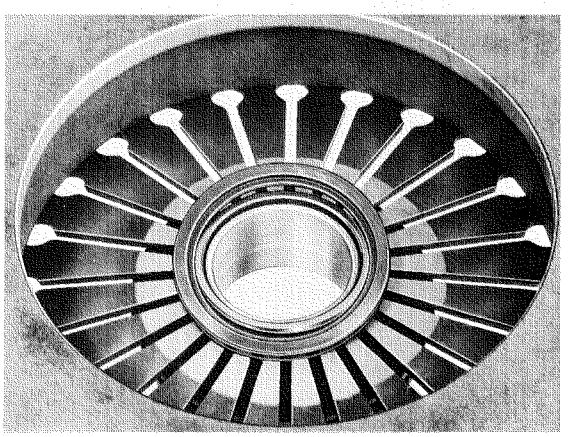
Installing

1. Place spacer and washer on release bearing in correct position.



2. Insert release bearing in to diaphragm springs of pressure plate.

3. Install thrust washer with groove facing snap ring and mount snap ring, while pressing down on pressure plate and thrust washer.



4. Release pressure on pressure plate in a press before installing (remove wire locks).

CHECKING CLUTCH DISC

1. Inspect splines. Clutch disc must slide easily on drive shaft in axial direction without radial play.

2. Inspect rivets, springs and torsion elements for tight fit, cracks or damage. Replace disc when in doubt.

3. Inspect clutch linings. If clutch linings are covered with oil, burnt, damaged or worn at spots, install a new clutch disc.

4. Check lining thickness of clutch disc.
   Clutch disc with riveted linings:
   Thickness (released) =
   8.1 ± 0.3 mm.
   Wear limit (released) =
   6.3 mm with symmetric wear.

Note:

Clutch linings cannot be replaced.

5. Check clutch disc with lining for lateral runout. Max. permissible lateral runout about 2 to 3 mm away from outside diameter = 0.6 mm.

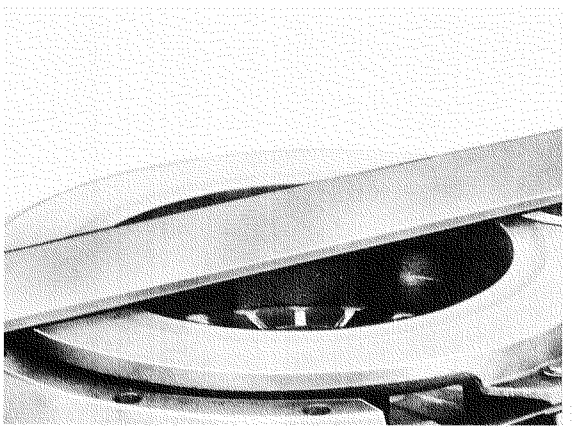
CHECKING CLUTCH PRESSURE PLATE

Clutch pressure plates have not been designed to permit overhauling or repairing. Checking is limited to dry cleaning and removing of dust with compressed air and emery cloth as well as a thorough visual inspection.

1. Clean clutch. Clean bearing surface of pressure plate with emery cloth, if necessary. Polish out burnt spots. Then blow out entire mechanism thoroughly with compressed air.

2. Check tips of diaphragm springs for traces of wear from clutch release bearing. Scoring to a depth of 0.3 mm is not significant.

3. Inspect bearing surface of pressure plate for cracks, burnt spots and wear. Check deflection with a steel ruler. Pressure plates with up to 0.3 mm deflection inward (measured with a feeler gage blade) can still be used.



4. Inspect spring connections between pressure plate and cover for cracks. Check tightness of rivets. Replace pressure plates with damaged or loose rivets.

PEDAL ASSEMBLY MAINTENANCE, 87 MODELS ONWARD

General

As of model year 87, the clutch of the 911 Carrera is hydraulically actuated.

This change has necessitated a modification of the pedal bracket (bearing bracket).

The clutch pedal stop is no longer fitted. The pedal is at its final position when the clutch master cylinder is at the rest position (clutch engaged).

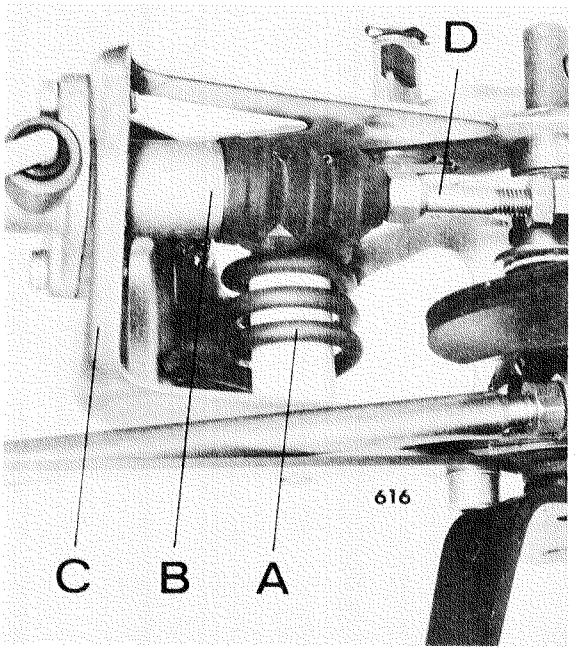
A servo spring which discharges 2 functions is integrated in the pedal bracket.

a) Reduction of the force which must be applied to the clutch pedal when the clutch is depressed, because the servo spring increases the actuating force.

b) Returns the clutch pedal with pressure rod and piston of master cylinder to initial position (no pressure spring in clutch master cylinder).

For some jobs on the pedal assembly it is advisable to remove the pedal bracket. This should be decided on a case-to-case basis, depending on the scale of repair work. The notes below will serve as a guide in making this decision.

Note clutch adjustment overview, page 30 - 109.



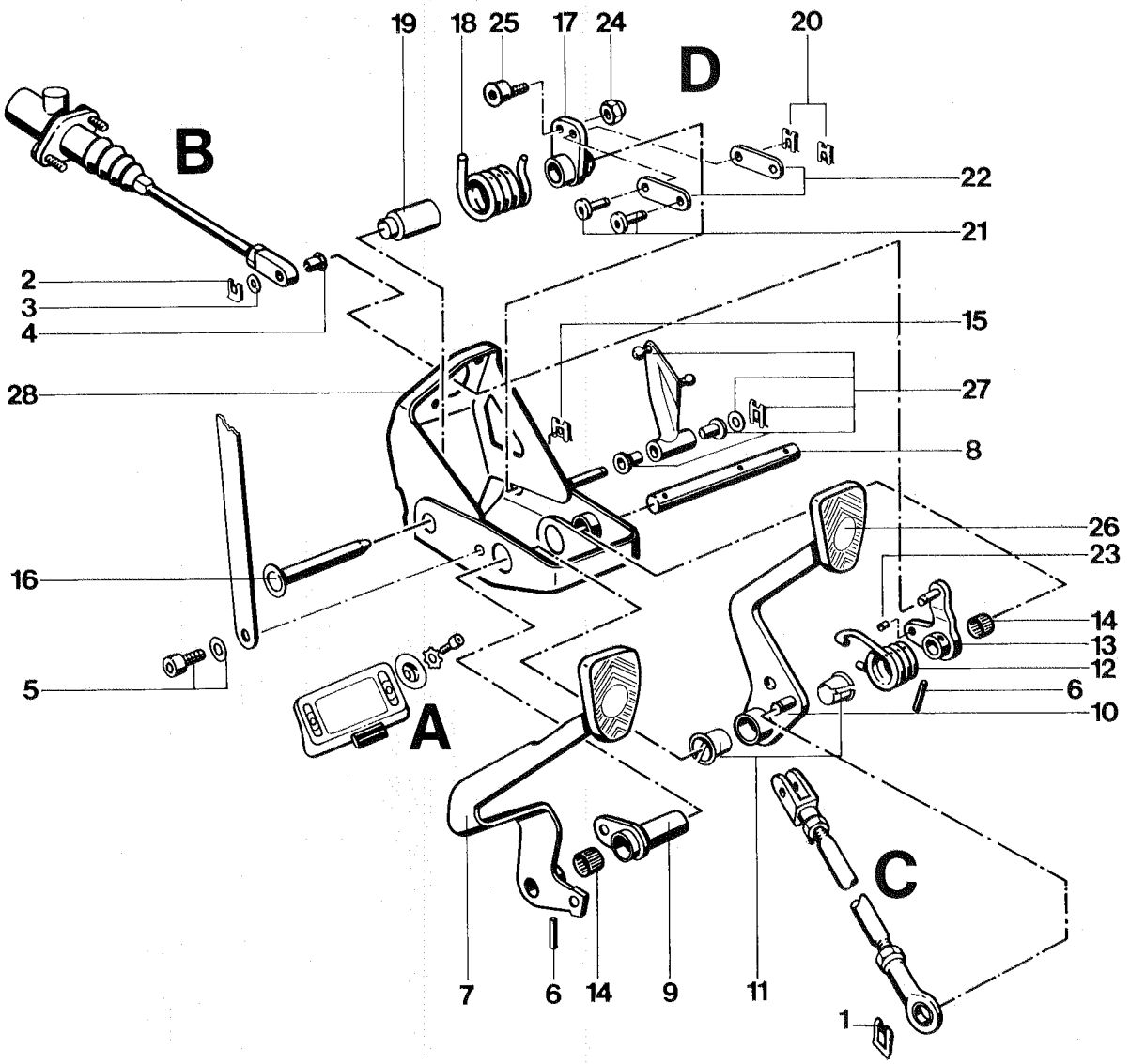
A - Servo spring

B - Clutch master cylinder

C - Pedal bracket (bearing bracket)

D - Clutch pressure rod

(Left-hand drive cars)



A = Stop on floor plate

B = Clutch master cylinder

C = Brake pressure rod

D = Lever lugs for servo spring

No.	Description	Qty.	Note When: Removing	Installing
1	Circlip	1		Replace if necessary
2	Circlip	1		Replace if necessary
3	Washer	1		
4	Sleeve	1		Replace if necessary
5	Panhead screw with lock washer	1		Tightening torque: 35 Nm (25 ftlb)
6	Dowel sleeve	2		Replace
7	Clutch pedal	1		
8	Clutch-pedal shaft	1		Install with universal low-temperature grease*
9	Bearing tube	1		Apply universal low-temperature grease*
10	Footbrake lever	1		
11	Sleeve	2		Install with universal low-temperature grease* replace if necessary. Install sleeves with grooves opposite each other
12	Return spring for footbrake lever	1		
13	Actuating lever for master cylinder	1		
14	Needle bearing	2		Replace, page 30-107, pack with universal low-temperature grease*
15	Circlip	1		Replace if necessary
16	Bearing shaft for servo spring with lever lugs	1		Install with universal low-temperature grease*

* E.g. from Texaco. See Materials Table (TI Group X) for other permissible greases.

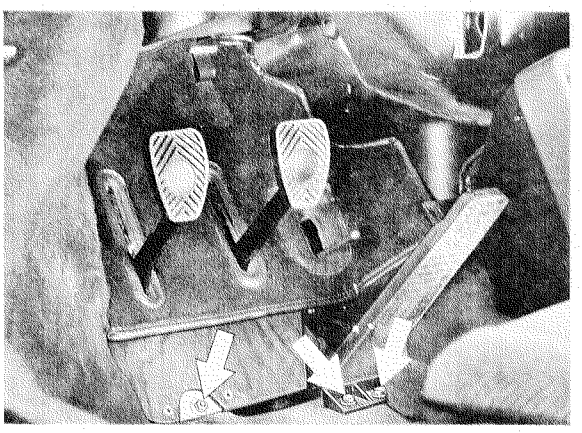
No.	Description	Qty.	Note When: Removing	Installing
17	Lever	1		
18	Servo spring	1		
19	Bearing	1		
20	Circlip	2		Replace if necessary
21	Pin	2		Replace if necessary
22	Lever	2		
23	Sleeve	1		Replace if necessary
24	Lock nut	1		Tightening torque 17 Nm (12 ftlb)
25	Cam	1		Note adjustment position (pretension for servo-spring installation) page 30 - 112
26	Pedal rubber	2		Replace if necessary
27	Reversing lever for throttle valve actuation with bearing sleeves washer circlip	1		
28	Pedal bracket	1		

NOTES ON REMOVAL AND INSTALLATION, DISASSEMBLY AND ASSEMBLY
(left-hand drive cars)

Removing Pedal Assembly
(Pedal Bracket)

1. Move seat to rearmost position (to facilitate work) and remove carpet.
   Accelerator pedal pressure rod, pulling accelerator pedal backward.

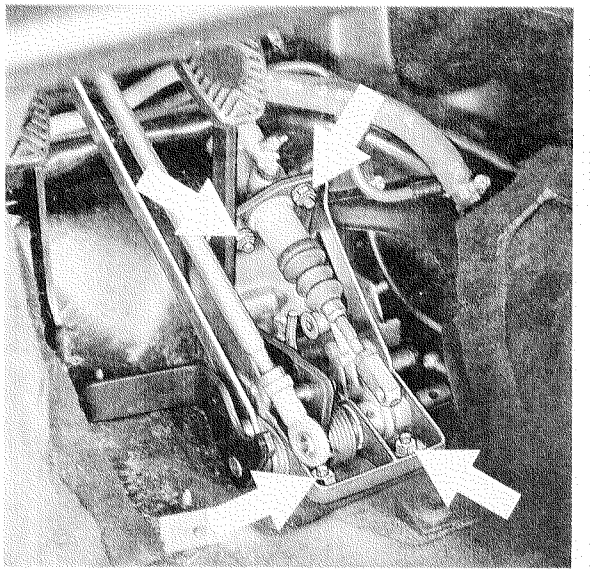
2. Remove floor plate. Mark installation position of accelerator pedal and remove accelerator pedal (to facilitate work).



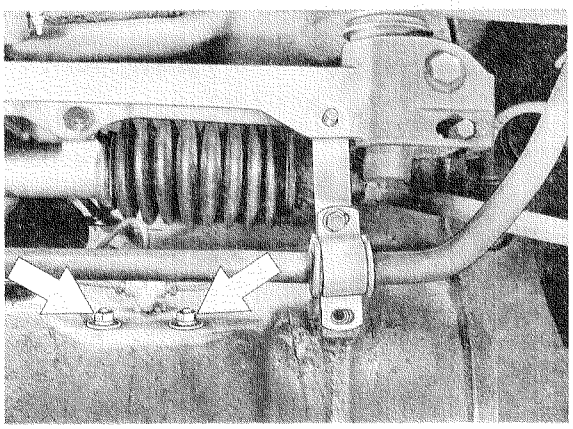
3. Remove circlip and disengage throttle pull rod from reversing lever.
   Disconnect brake pressure rod from footbrake lever.
   Relieve pressure on footbrake-lever return spring.

4. Remove clutch pressure rod from actuating lever. Relieve pressure on clutch servo spring, moving clutch pedal forward slowly holding pedal pad. This prevents the servo spring forcing the pedal forward suddenly.
   Push servo spring to the left out of the adjuster cam range.

5. Disconnect pull bar and clutch master cylinder from pedal bracket (hydraulic line remains connected). Remove mounting nuts of pedal bracket.



6.Remove guard from auxiliary front-axle support. Remove the two front securing nuts of the pedal bracket.



7.Remove pedal bracket.

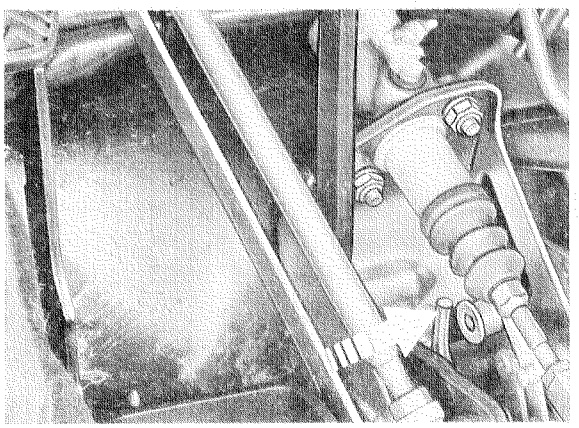
Installing Pedal Assembly (Pedal Bracket)

1.Position pedal bracket in car. Tightening torque of the 4 securing nuts, 17 Nm (12 ftlb). Tighten the 2 front nuts first.

2.Attach pull bar and bearing tube for footbrake lever to pedal bracket.

3.Attach return spring for footbrake lever. Attach brake pressure rod to footbrake lever and throttle pull rod to reversing lever.

4.Push servo spring into correct position (arm behind collar of adjusting cam) and pretension servo spring, pulling clutch lever to the rear.
Attach clutch pressure rod to actuating lever.



5.Once cylinder has been aligned, tighten master-cylinder securing nuts or pressure rod to actuating lever (depress clutch).

6.Install pedal plate. If necessary (if parts concerned have been renewed) check pedal travel and correct if necessary (page 30 - 111). Check full-load position of throttle valve (min. 1 mm play when accelerator pedal fully depressed) and correct if necessary (page 24 - 2a).

Disassembling Pedal Assembly (Pedal Bracket)

1. Drive dowels out of clutch pedal shaft. If necessary (if dowels very tight), support lever shaft to prevent deformation.

2. Remove clutch pedal shaft.

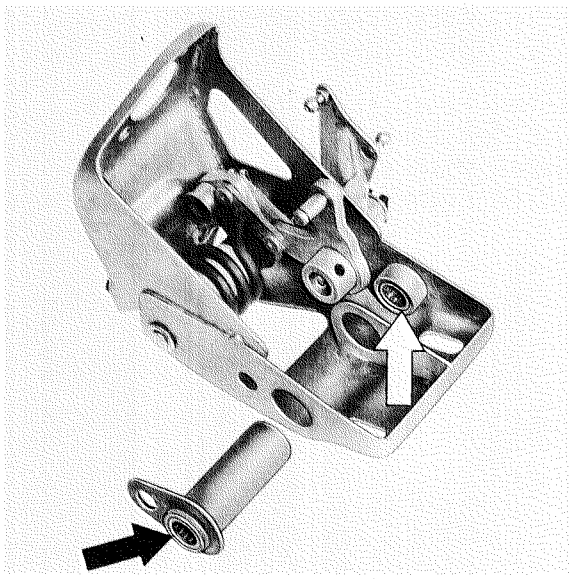
3. Remove bearing tube for footbrake lever.

4. Remove servo spring bearing shaft.

Assembling Pedal Assembly (Pedal Bracket)

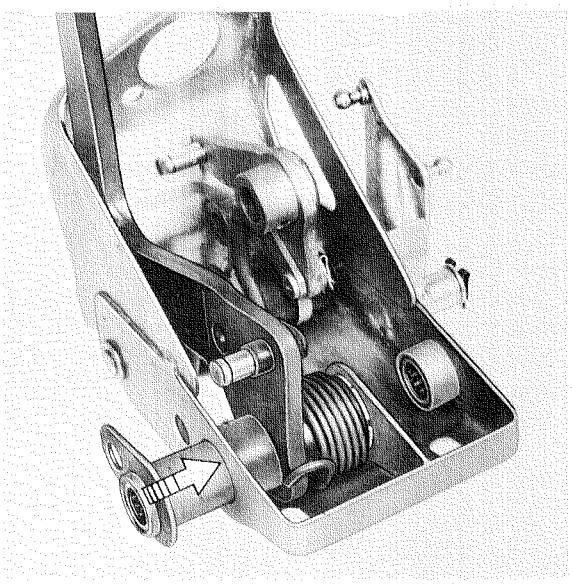
1. Check levers, bearing shafts, bearings, circlips, springs, all sleeves and pins, replace if necessary.
   Lubricate all bearings and sliding surfaces with universal low-temperature grease, e.g. from Texaco.
   See Materials Table (TI, Group X) for other permissible greases.

2. If necessary, use a suitable mandrel to press or drive bearing for clutch pedal shaft slightly deeper than flush (arrows).

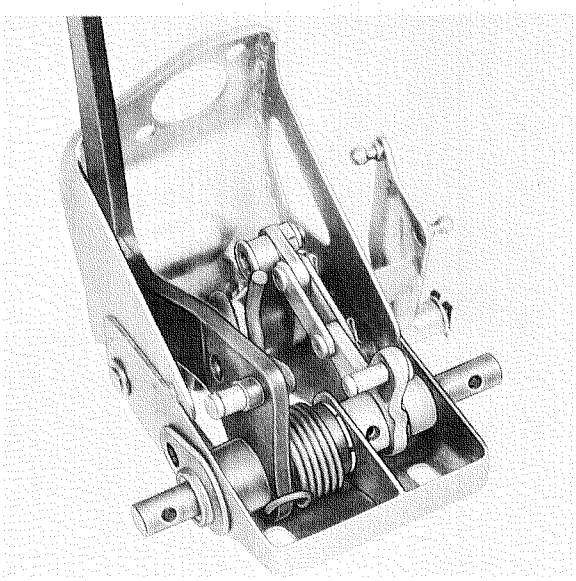


3. Install servo spring with lever lugs in pedal bracket.

4. Install footbrake lever with sleeves and return spring. Push bearing tube into position.



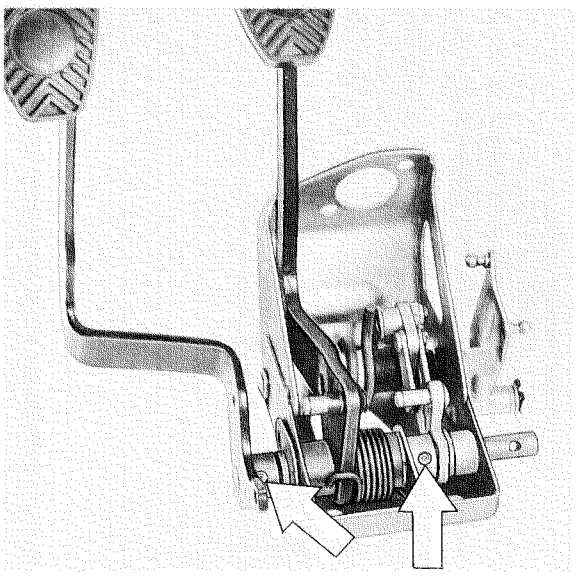
5. Align lever for clutch pressure rod for installation of clutch pedal shaft. Insert clutch pedal shaft right way round.



6. Mount clutch pedal on pedal shaft. Drive in dowels. Install dowel in clutch lever first, countering to prevent deformation of the shaft. The clutch lever may also be mounted on the shaft before the clutch pedal shaft is installed (better support for driving in the dowel)

Note:

Use only double rolled dowels (spare part for 911 Carrera, 87 models onward).
It is not permissible to use single-rolled dowels from other cars or from earlier models.



CLUTCH ADJUSTMENT OVERVIEW, 87 MODELS ONWARD
(HYDRAULIC CLUTCH ACTUATION)

1. Length of clutch pressure rod (master-cylinder rod):
   Distance from threaded cylinder face to center of eye = 158 ± 1 mm

   Adjusting, see page 30 - 110

2. Limiting release travel = 150 mm of pedal travel measured at middle of pedal pad (middle = refers to the height of the pedal pad).

   Adjusting, see page 30 - 111

3. Cam adjusting position for servo spring pretension:
   The marks on adjusting cam and lever must be aligned (basic setting).

   Adjusting, see page 30 - 112

4. Checking final position of clutch master cylinder.
   (Piston rod must be pulled back from clutch pedal with a force of at least 30 N.)

   Checking, see page 30 - 113/114

ADJUSTING CLUTCH PRESSURE ROD
(HYDRAULIC CLUTCH ACTUATION)

Note:

The criteria below define the only conditions in which it is necessary to adjust the clutch pressure rod (master-cylinder pressure rod):

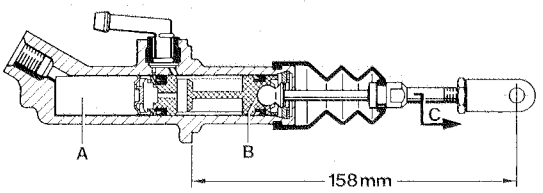
- when the clutch master cylinder is replaced
- if the clutch pressure rod adapter has been removed
- if pressure rod or adapter has been turned.

The clutch pedal does not have a stop.
The clutch pedal has reached its final position when the clutch master cylinder is in the released position (clutch engaged). The released position of the clutch master cylinder is assured by the servo spring (double function). If the clutch pressure rod is correctly adjusted the clutch pedal is not supported in the released position. This entails the following factors:

- correct position of clutch pedal
- adequate release travel of clutch pedal is possible (travel is later limited to some extent by the adjustable stop on the floor panel, see page 30 - 111).
- automatic hydraulic readjustment of the clutch

Adjusting

1. Turn adapter or clutch pressure rod to adjust length of rod. The length must be 158 ± 1 mm measured from threaded face of cylinder to center of pin boss.



2. Tighten lock nut.
3. If necessary, correct position of brake pedal pad relative to clutch pedal pad (see page 46 - 8).
4. Check release travel and correct if necessary (see page 30 - 111).

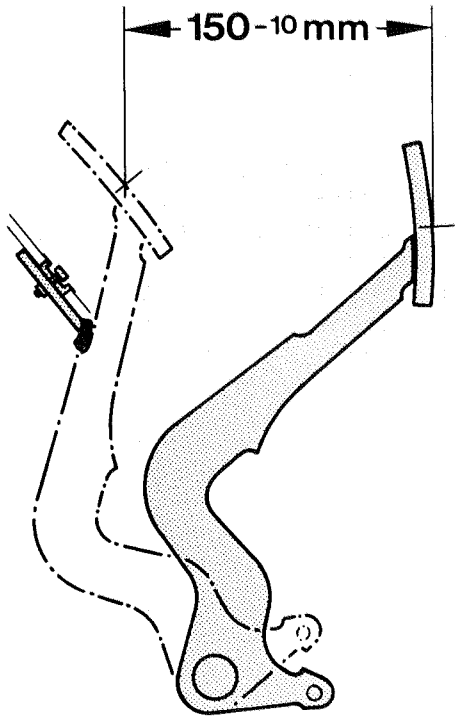
CHECKING CLUTCH RELEASE TRAVEL (HYDRAULIC CLUTCH ACTUATION)

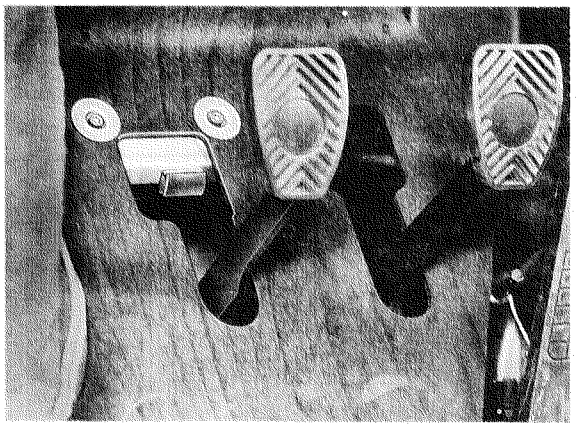
The travel of the clutch release lever is limited by an adjustable stop on the floor panel of the pedal assembly.

The release travel is correct when the pedal travel is 150 - 10 mm. The measurement is taken at the side of the pedal pad. Begin by marking a measuring point half way up the pedal pad.

Press clutch pedal down to stop. Place end of measuring tape on floor panel and align with measuring point on pedal pad. Allow clutch pedal to return to original position. Allow tape to follow measuring point on pedal pad without altering position of tape end. The difference between the two values must be 150 - 10 mm.

If the value is incorrect, adjust stop on floor panel accordingly.





ADJUSTING SERVO SPRING PRETENSION (HYDRAULIC CLUTCH ACTUATION)

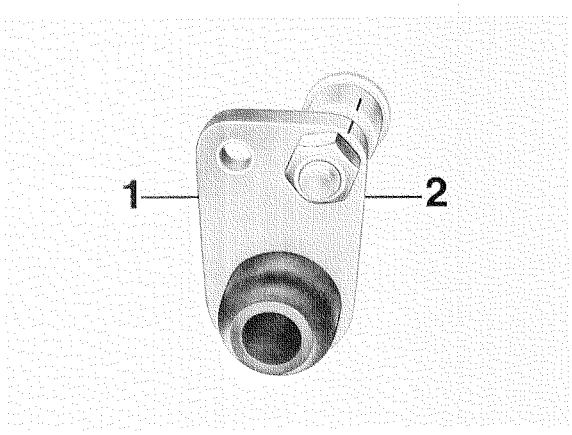
A servo spring which discharges two functions is installed in the pedal bracket.

a) Reduction of force required to actuate the clutch, because the servo spring increases the force applied to the pedal.

b) Returns clutch pedal with pressure rod and piston of master cylinder to original position (no pressure spring installed in clutch master cylinder).

The servo spring must be pretensioned correctly. Pretension is correct when the marks on the adjusting cam and the lever are aligned (basic setting).
See note for fine adjustment.

If necessary, slacken the locknut and turn the cam accordingly with the servo spring relaxed (see page 30 - 105, Point 4).



1 Rear 2 Front

Note:

If necessary, carry out fine adjustment under the following conditions (caused by an accumulation of unfavorable tolerances). This adjustment involves turning the cam 1-2 mm away from the basic setting.

-Clutch pedal returns too slowly or tends to stick:
Turn cam approx. 1-2 mm (measured at mark) to rear (toward driver).

-Subjectively, rather too much force required to actuate clutch:
Turn cam approx. 1 mm forward (toward front axle).

The earliest model year 87 cars did not have a mark. If necessary, install replacement lever and cam or inscribe mark.
Mark on cam: highest point of cam.
Mark on lever: middle of radius between upper and front edge.

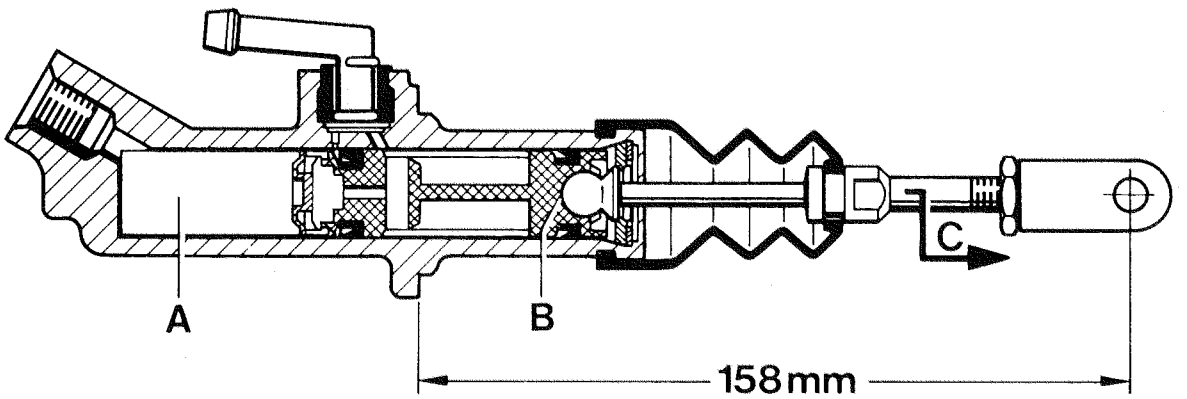
CHECKING FINAL POSITION OF CLUTCH MASTER CYLINDER

Notes:

- The job familiar from other hydraulically actuated clutches and listed as "Checking Clearance Between Pressure Rod and Master Cylinder" under the heading "Checking Clutch Clearance" is not applicable. The reasons: for reasons of design, there is no clearance at the pressure rod and the clutch pedal has no end stop.

  The clutch pedal is thus at its final position when the master cylinder is in the released position (clutch engaged). The master cylinder has no pressure spring and its piston rod (pressure rod) must be pulled back by the servo spring of the clutch pedal (double function of the spring) with at least 30 N.

  It is thus necessary to check the final position of the master cylinder to assure automatic hydraulic readjustment and perfect operation of the clutch.



A Without spring

B Without clearance at the pressure rod (piston rod)

C Pressure rod (piston rod) must be pulled back by the clutch pedal with at least 30 N.

Checking final position: see page 30 - 114

Checking Final Position

Depress clutch pedal a few millimeters and release. The pedal must return automatically all the way to its original position (final position of the clutch master cylinder).

Pull pedal pad back to check whether the final position has been reached.

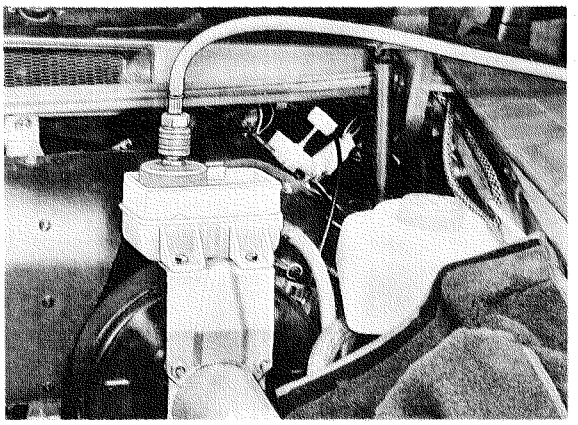
If necessary (if the pedal can be pulled back slightly), rectify the cause. Check servo spring, servo-spring pretension and the freedom of travel of the clutch pedal shaft. Increased force required to depress the pedal is a further sign of a damaged servo spring (lack of servo back-up force).

BLEEDING CLUTCH HYDRAULICS

General

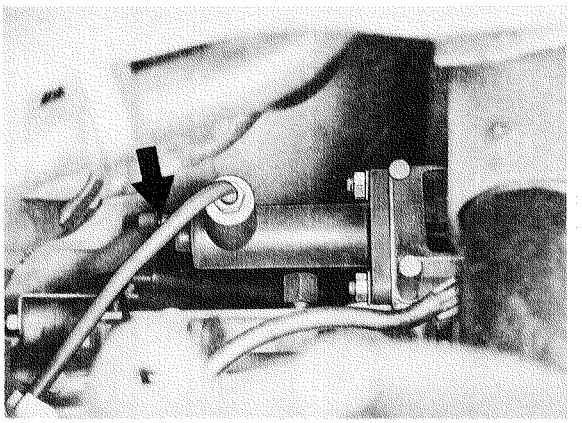
To assure speedy, professional work, it is advisable to use an electric filling and bleeding device.

1. Top up expansion tank to brim with brake fluid. Remove screen. Connect air-bleed device. Close overflow hose with hose clamp.



2. With the air-bleed device switched on, open air-bleed screw of clutch actuating cylinder until no more air bubbles escape. With air-bleed screw open, depress clutch pedal fully several times.

Position of air-bleed valve



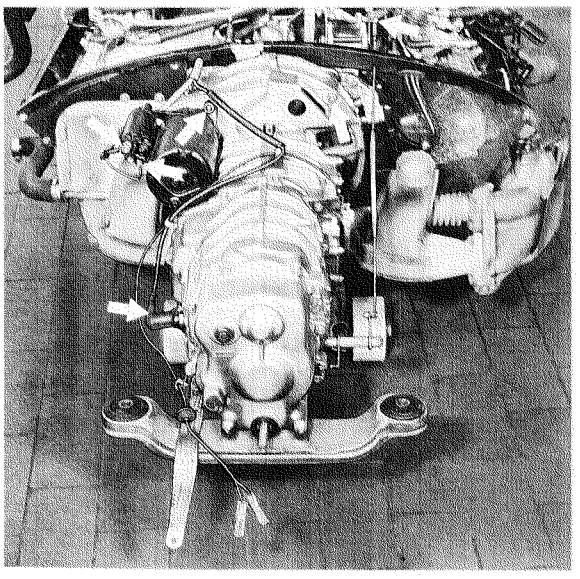
REMOVING AND INSTALLING CLUTCH, HYDRAULIC CLUTCH ACTUATION, 87 MODELS ONWARD

Removing

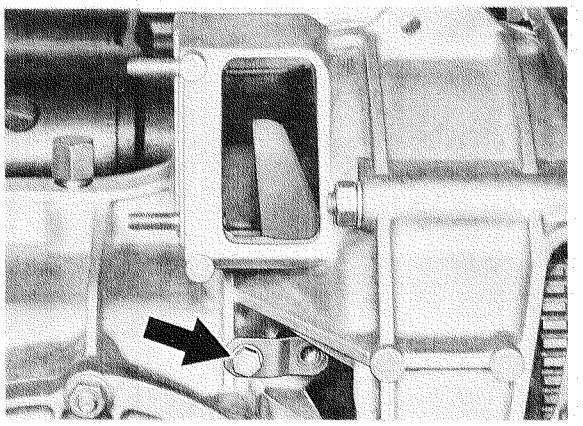
1. Remove engine with transmission.

2. Unbolt transmission from engine. Proceed as follows:

a. Remove cable from starter and cable from switch for back-up light.
Detach retainer from top ball socket and remove throttle pull rod.



b. Unscrew hex bolt from release shaft and pull out shaft.



c. Disconnect transmission by removing the 4 securing nuts. Use Special Tool P 119 for the upper securing nut at starter.

d. Remove clutch retaining bolts by slackening bolts uniformly. Remove clutch from flywheel. If the flywheel must be removed, use Special Tool P 238 a to counter.

Inspecting the Individual Parts

Inspect the following individual parts for wear and damage and replace if necessary. Have parts on hand ready for installation. Lubricate bearings and sliding surfaces.

- Flywheel: Scoring and scorching. Remachining no longer possible, as clutch release bearing may contact damper of driven plate, depending on tolerances.

Needle bearing in flywheel: If necessary, repack with MoS_2 multipurpose grease (new filling 1 cc)

Clutch plate, page 30 - 119

Clutch pressure plate page 30-119

Flywheel ring gear damaged teeth, signs of wear

Clutch controls: check release fork for ease of travel and signs of wear.

- Lubricate bearings and sliding surfaces with the specified lubricants (page 30 - 10, 30 - 11, 30 - 15)

Release bearing: as before (models earlier than model year 87) page 30 - 17

Guide tube: signs of wear, release bearing must move smoothly on guide tube. Coat sliding surface with multipurpose grease with MoS_2.

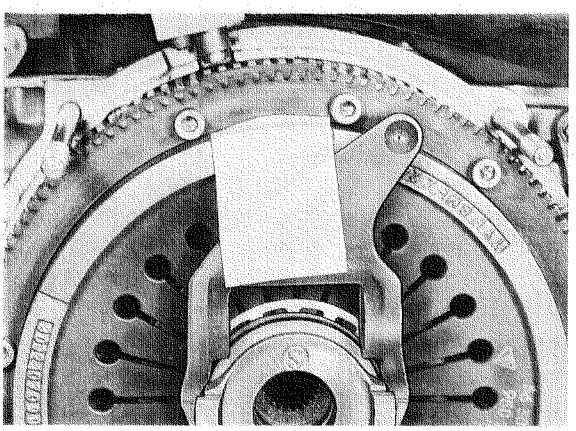
Seal rings: crankshaft and transmission shaft

Installing

1. Mount clutch on flywheel. The friction surfaces must be clean and free of grease. Use mandrel P 370 (or shortened transmission shaft) to center clutch plate. Tighten bolts uniformly in diagonally opposite sequence. Tightening torque 25 Nm (18 ftlb).

2. Lubricate sliding surfaces of clutch release mechanism with MoS_2 multipurpose grease and splines of transmission shaft with Optimoly HT.

3. Insert release fork in release bearing and use a suitable piece of adhesive tape to hold fork provisionally in installation position.



4. Bolt transmission to engine.

5. Insert release shaft in release fork from outside.

6. Remove adhesive tape through assembly aperture.

7. Tighten securing bolt for release shaft (M6 x 16).

INSPECTING CLUTCH PLATE (Driven Plate) 87 Models Onward

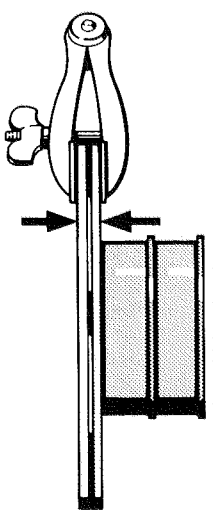
1. Inspect splines. The clutch plate must move easily on the transmission shaft without any radial play.

2. Check rivets, spring plates and torsion elements for secureness, cracks or signs of damage. In case of doubt, replace clutch plate.

3. Inspect clutch lining. If the lining is oily, burnt, cracked or unevenly worn, install a new clutch plate.

4. Check thickness of clutch plate lining.
   Size new (compressed) 9.3 ±0.3 mm

   Size worn (compressed) 7.5 mm with symmetrical wear.



Note:

Clutch linings cannot be replaced.

5. Check clutch plate for lateral run-out at lining. Permissible lateral run-out max. 0.6 mm, measured approx. 2-3 mm from circumference.

INSPECTING CLUTCH PRESSURE PLATE, 87 Models Onward

The design makes no provision for overhauling or repair of the clutch pressure plate. Inspection is restricted to dry cleaning and removal of dust with compressed air and emery cloth and a close visual inspection.

Note:

Never wash pressure plate.

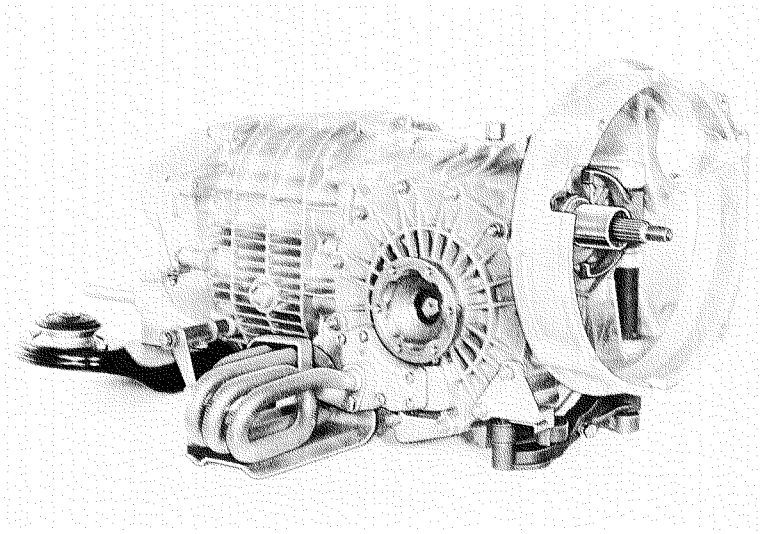
1. Clean clutch. If necessary, clean contact surface of pressure plate with emery cloth, remove scorch marks by polishing. Blow entire mechanism clean with compressed air.

2. Check ends of diaphragm springs for marks indicating contact with the clutch release bearing. Marks of a depth of up to 0.3 mm are insignificant.

3. Inspect contact surface of pressure plate for cracks, scorching and wear. Check deformation with a steel ruler. Pressure plates with an inward deformation of up to 0.3 mm (use feeler gage to measure) are still usable.

4. Check spring connection between pressure plate and cover for cracks. Check that rivets are secure. Replace pressure plates with damaged or loose rivets.

FIVE SPEED MANUAL TRANSMISSION



1984 Model Transmission Types

Transmission Type	Technical Data	Installed in Vehicle Type	Transmission Number Range
915/67	5 speed with oil cooling	911 Europe/R. o. W.	73 E 00001 – 10 000
915/68	5 speed without oil cooling	911 USA/Japan	74 E 00001 – 10 000
915/69	5 speed with oil cooling	911 Europe/R. o. W. (Turbo-Look)	73 E 10001 – 11 000
915/70	5 speed without oil cooling	911 USA/Japan (Turbo-Look)	74 E 10001 – 11 000

1985 Model Transmission Types

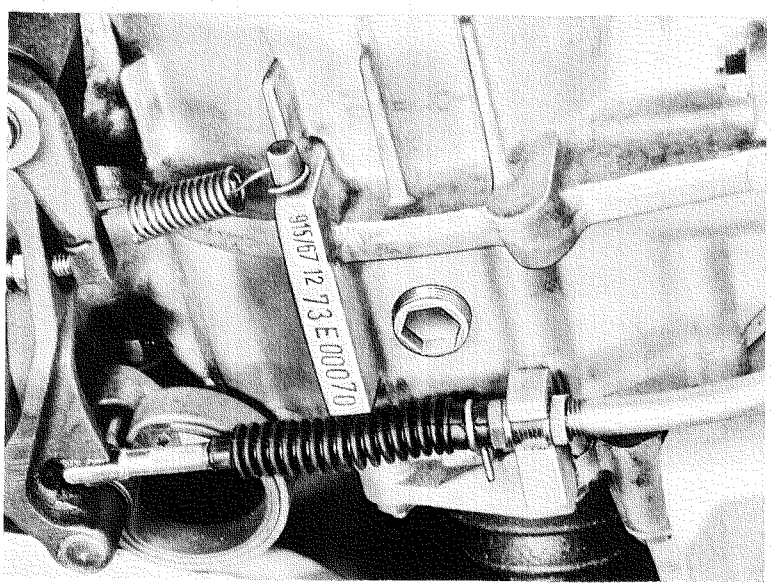
Transmission Type	Technical Data	Installed in Vehicle Type	Transmission Number Range
915/72	5 speed with oil cooling	911 Europe/R. o. W.	73 F 00001 – 10 000
915/73	5 speed without oil cooling	911 USA/Japan	74 F 00001 – 10 000
		911 Europe/R. o. W. (M 298 unleaded)	

Transmission Numbers (Explanation)

7	3	E	00070
Engine Type	Transmission Types	Model	Series Number
7 = Transmission for 6 cyl. engine	3 = 5-speed 911 Europe/R. o. W. 4 = 5-speed 911 USA/Japan	E = 1984 F = 1985	00001 ... 10000

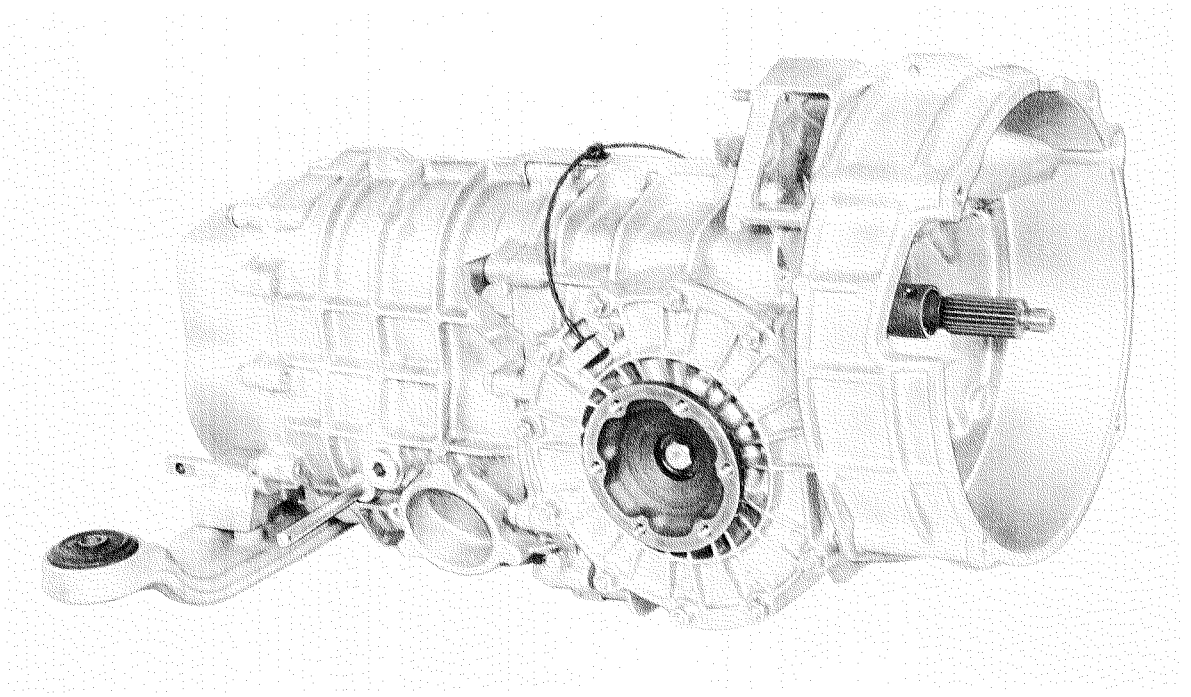
Note:

A twelve (12) between the type and transmission numbers means that the transmission has a limited slip differential (40 %).



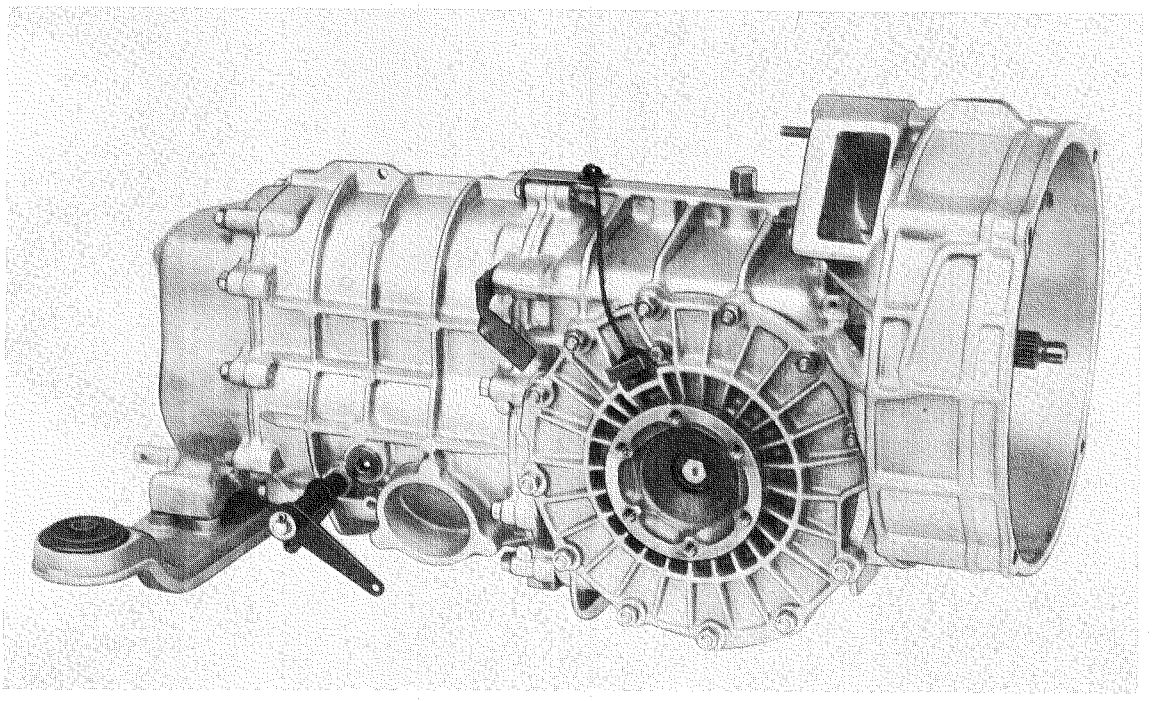
General Data	Manual Transmission 915	
Ratios	915/67, 915/69, 915/72	915/68, 915/70, 915/73
1st gear	11 : 35 i = 3.1818	11 : 35 i = 3.1818
2nd gear	18 : 33 i = 1.8333	18 : 32 i = 1.7777
3rd gear	23 : 29 i = 1.2608	23 : 29 i = 1.2608
4th gear	29 : 28 i = 0.9655	26 : 26 i = 1.0000
5th gear	38 : 29 i = 0.7631	38 : 30 i = 0.7895
Reverse gear	12 : 21 – 20 : 38 i = 3.3250	12 : 21 – 20 : 38 i = 3.3250
Final drive ratio	8 : 31 = 3.8750	
Transmission oil	approx. 3.1 liters (or approx. 3.0 liters without oil cooling pipe) of SAE 90 gear lube in API Classification GL 5 (or MIL-L 2105 B)	

Five Speed Manual Transmission (Typ G 50)



Type	Key-	Equipment	installed in:	Model Year
G50/00		5 Speed	911 R.o.W.	since '87 Model
G 50/01	–	5 Speed	911 USA/J/CND/AUS	since '87 Model
G 50/02	–	5 Speed	911 Switzerland	since '87 Model

5-speed manual transmission for the 911 turbo



88/227

Type	Ident. code	Version	Installed in	Model year
G50/50	-	5 speed	911 Turbo world-wide	1989

The G50/50 turbo gearbox corresponds to the G50/00 Carrera gearboxwith regard to construction and repair. The gearbox has been reinforced, however, and the transmission ratios modified to suit the higher engine performance of the turbo engine. Any repair procedures differing from those for the Carrera gearbox have been incorporated into this workshop manual.

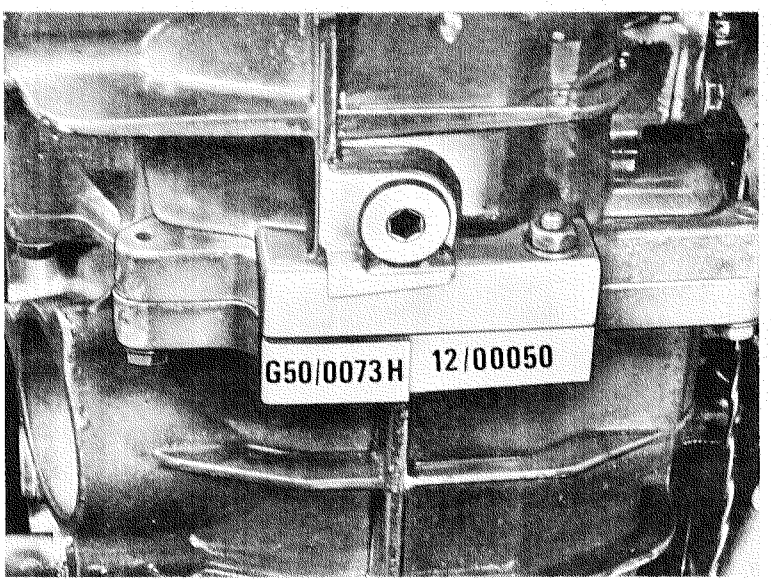
Printed in Germany – XII, 1988

Transmission numbers (8 digits)

7	3	H	00050
Unit type	**Transmission types**	**Model year**	**Serial number**
7 = Transmission for 6 cyl.	3 = 5-speed 911 R.o.W. 4 = 5-speed 911 USA/Japan and M 298	H = 1987	z.B. 00050

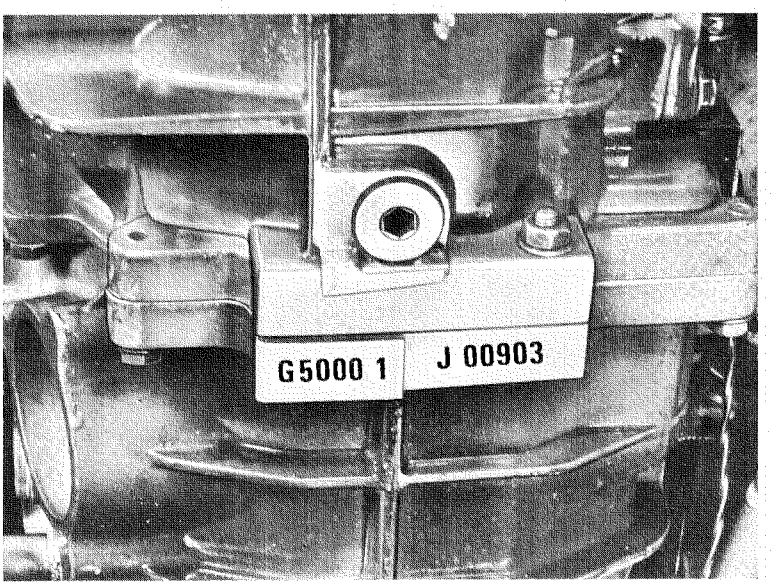
Information

A twelve between type and transmission numbers indicates that transmission is fitted with a limited slip differential (40 %).



Transmission Numbers (12 digits)

G5000	1	J	00903
Transmission Type	**Index for variants within the assembly number** 0 = no differential 1 = normal differential 2 = ZF limited-slip differential	**Model Year** J = 1988 K = 1989	**Serial number** z.B. 00903



Printed in Germany – X, 1988

General data	Manual transmission G 50/00 - G50/01 - G50/02		
Transmission ratios $Z_2 : Z_1 = i$	G50/00	G50/01	G50/02
1st gear	42:12 = 3.500	42:12 = 3.500	41:13 = 3.154
2nd gear	35:17 = 2.059	35:17 = 2.059	36:19 = 1.895
3rd gear	31:22 = 1.409	31:22 = 1.409	32:24 = 1.333
4th gear	29:27 = 1.074	36:32 = 1.125	29:28 = 1.036
5th gear up to Mod. '88	31:36 = 0.861	32:36 = 0.889	31:36 = 0.861
5th gear as from Mod. '89	33:38 0.868	33:37 0.892	33:38 = 0.868
R. gear	40:14 = 2.857	40:14 = 2.857	40:14 = 2.857
Final drive	Hypoid bevel-gear drive with 16 mm offset		
Transmission ratio Final drive	31:9 = 3.444	31:9 = 3.444	31:9 = 3.444
Capacity	approx. 3.4 l Hypoid oil SAE 75 W 90 of API classification GL 5 (or MIL-L 2105 B)		

Printed in Germany - XII, 1988

General data 911 Turbo

General data	Manual transmission G50/50
Transmission ratios $Z_2:Z_1 = i$	
1st gear	41:13 = 3.154
2nd gear	34:19 = 1.789
3rd gear	33:26 = 1.269
4th gear	29:30 = 0.967
5th gear	31:41 = 0.756
R. gear	40:14 = 2.857
Final drive	Hypoid bevel-gear drive with 10 mm offset
Transmission ratio Final drive	31:9 = 3.444
Capacity	approx. 3.7 l Hypoid oil SAE 75 W 90 of API classification GL 5 (or MIL-L 2105 B)

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TIGHTENING TORQUES FOR TYPE 950 MANUAL TRANSMISSION

Location	Description	Thread	Material	Torque Nm (ftlb)
Transmission case (oil drain plug)	Plug with magnet	M 22 x 1.5	6.8	30 (22)
Transmission case (oil filler)	Plug	M 22 x 1.5	6.8	30 (22)
Gearbox and transmission case, side and front covers, clamping plate	Hex nut	M 8	8	23 (16)
Gearbox cover	Backup light switch	M 18 x 1.5	-	35 (25)
Input shaft	Collar nut	M 30 x 1.5	-	250 (181)
Input shaft	Collar nut	M 14 x 1.5	-	140 (103)
Drive pinion	Collar nut	M 30 x 1.5	-	250 (181)
Transmission casing	Breather	M 14 x 1.5	-	35 (25)
Selector fork	Hex bolt	M 8 x 30	8.8	23 (16)
Ring gear	Hex bolt	M 12 x 1.25	12.9	165 (120)
Axle flange	Hex bolt	M 10 x 85	-	44 (32)
Return gear II	Collar bolt	M 8	8.8	23 (16)

Location	Description	Thread	Material	Torque Nm (ftlb)
Gearshift gate (clamping plate)	Hex screw	M 6 x 12	8.8	10 (7)
Tensioning spring (speedometer sensor)	Screw	M 6 x 12	8.8	10 (7)
Stud Reverse-transfer lever	Stud	M 8 x 1.25	-	23 (16)
Guide tube Release bearing	Oval-head countersunk screw	M 6	-	10 (7)
Transmission case cover	Hex screw	M 8 x 30	8.8	23 (16)
Transmission case screw plug	Hex screw	M 12 x 1.5	-	23 (16)
Transmission carrier	Locknut	M 8	8	23 (16)

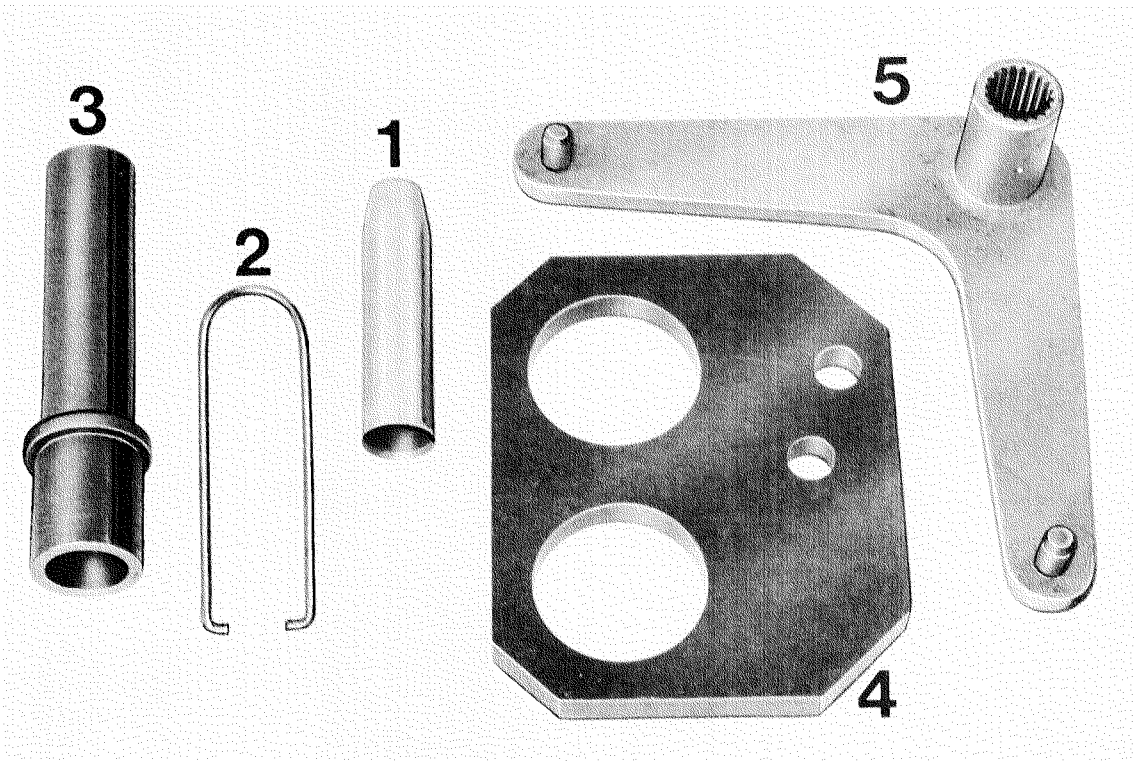
General Data	Clutch
Design	Single disc, dry clutch in pulled version, hydraulically actuated
Pressure plate	GMFZ 240 Contact force 7400 to 8200 N
Clutch disc	240 GUD (rubber damper)

TIGHTENING TORQUES FOR CLUTCH AND GEARSHIFT, 87 MODELS ONWARD
(HYDRAULIC CLUTCH ACTUATION)

Location	Description	Threads	Material	Torque Mn (ftlb)
Clutch				
Flywheel mounting	Panhead bolt	M 10x1.25	10.9	90 (65)
Sleeve with needle bearing to crankshaft	Panhead bolt	M 6		10 (7)
Clutch and ring gear mounting	Panhead bolt	M 8	8.8	20-25 (14-18)
Guide tube to transmission case	Cross-recessed countersunk bolt	M 6	8.8	10 (7)
Transmission to engine	Hex nut	M 10	8	45 (33)
Starter mounting	Hex nut	M 10	8	45 (33)
Engine/transmission unit mounting	Hex bolt	M 12x1.5		80 (56)
Drive shaft mounting	Panhead bolt	M 10	12.9	83 (57)
Master cylinder to pedal bracket	lock nut	M 8		23 (16)
Actuating cylinder to transmission casing	Hex nut	M 8		23 (16)
Pedal bracket to body	Hex but	M 8		17 (12)

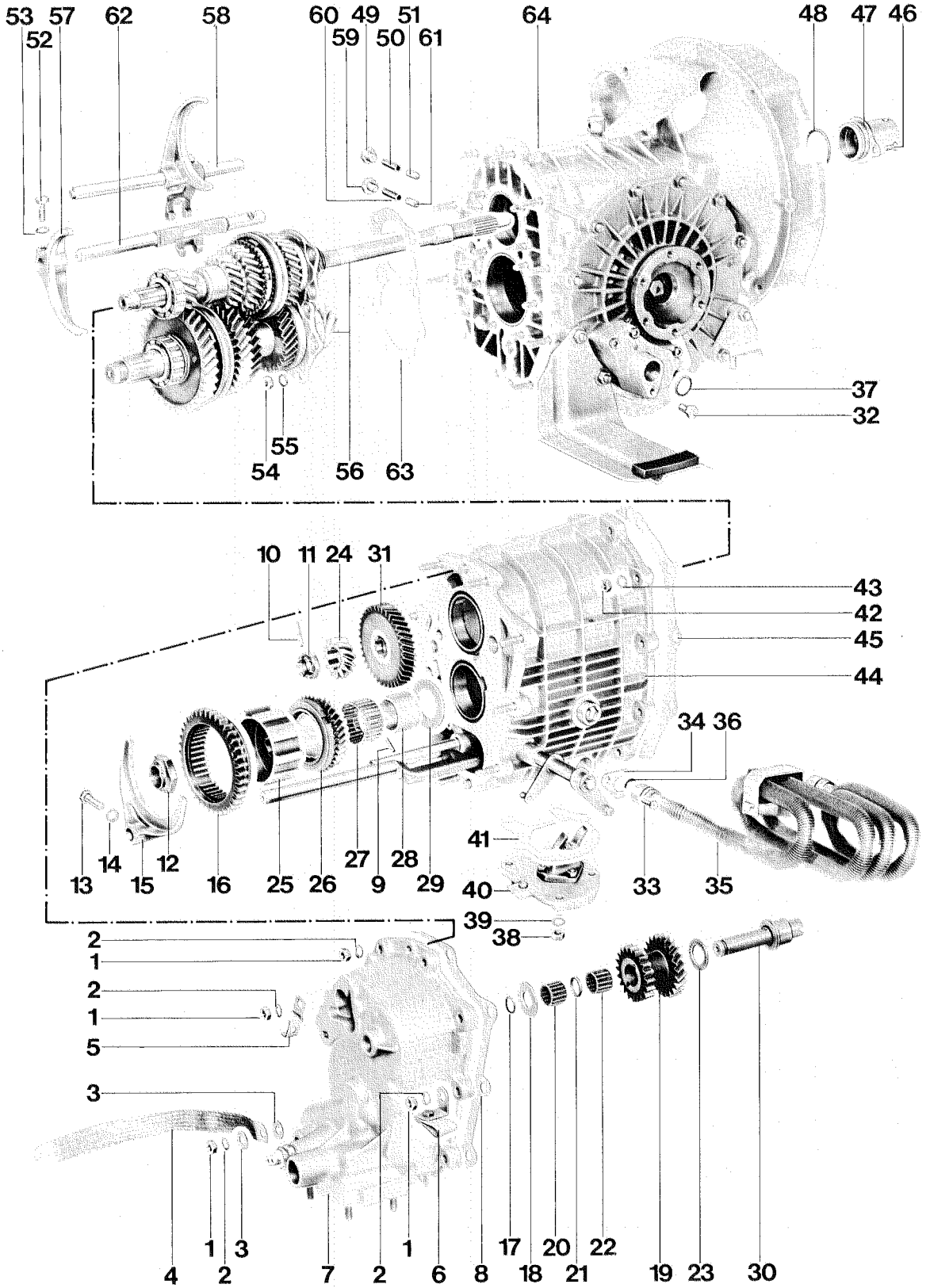
Location	Description	Threads	Material	Torque Nm (ftlb)
Clutch hose to clutch operating cylinder/adapter to clutch hose/ clutch tube to master cylinder	Union nut	M 14		28 (20)
Tie to pedal bracket	Panhead bolt	M 10		35 (25) (left-hand drive cars)
	Hex bolt	M 10		46 (34) (right-hand drive cars)
Cam for servo spring pre-tensioning	Lock nut	M 8		17 (12)
Gearshift				
Knob to gearshift lever	Panhead bolt	M 8		10 (7)
Shift bracket to body	Hex bolt	M 8		23 (16)
Gearshift lever to gearshift-lever bearing	Threaded stud/ hex nut	M 10		23 (16)
Selector rod head (gearshift lever) to selector rod	Locating bolt (hex bolt)	M 8		23 (16)
Bearing (selector rod coupling) to transmission	Locating bolt (hex bolt)	M 8		23 (16)
Bearing (selector rod coupling) to selector rod	Hex bolt	M 8		14 (10)

TOOLS



No.	Description	Special Tools	Remarks
1	Assembly sleeve	P 382	
2	Hook	—	Made locally of 4 mm welding wire
3	Mandrel	P 381	
4	Holding plate	P 260 a	
5	Holding bracket	P 37 a	

DISASSEMBLING AND ASSEMBLING TRANSMISSION



No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
1	Nut	9		Torque: 24 Nm (17 ftlb)	
2	Washer	9			
3	Washer	2			
4	Ground strap	1			
5	Holder	1			
6	Bracket	1			
7	Front transmission cover	1	Do not lose contact plunger for backup light switch.	Install contact plunger for backup light switch with stepped end facing switch.	
8	Gasket	1		Replace	
9	Spiral pin	1			
10	Spiral pin	1			
11	Castle nut	1	Engage 5th gear and stop input shaft with P 37 a.	Torque: 160 Nm (116 ftlb) Lock with spiral pin.	
12	Collar nut	1	Engage 5th gear and stop input shaft with P 37 a.	Torque: 250 Nm (181 ftlb) Lock by punching collar.	
13	Bolt	1		Torque: 25 Nm (18 ftlb)	
14	Washer	1			
15	Selector fork for 5th and reverse gear	1		Adjust	
16	Operating gear for 5th and reverse gear	1			

No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
17	O-ring	1		Replace; light coat of oil	
18	Thrust washer	1			
19	Double reverse gear	1			
20	Needle cage	1			
21	Intermediate ring	1			
22	Needle cage	1			
23	Axial needle cage	1			
24	Reverse gear set I	1		Only replace in pairs	
25	Guide sleeve	1			
26	Loose 5th gear II	1		Check synchronization; only replace in pairs	
27	Needle cage	1	Mark for installing later	Mount with same gear	
28	Sleeve	1	Mark for installing later	Mount with same gear	
29	Thrust washer	1			
30	Shaft	1			
31	Fixed 5th gear I	1		Narrow collar faces gearbox; only replace in pairs	
32	Bolt	1		Torque: 22 Nm (16 ftlb)	
33	Bolt	1		Torque: 9 Nm (6.5 ftlb)	
34	Holder	1			

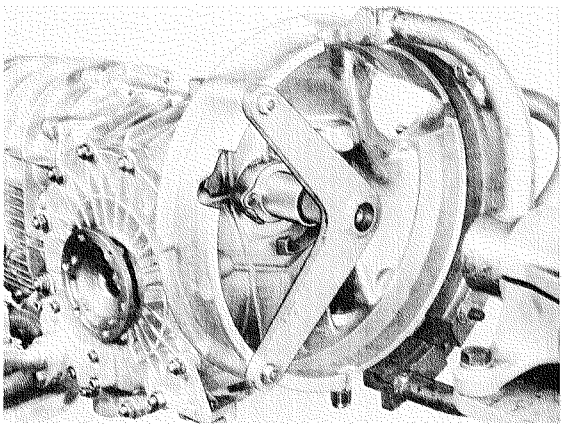
No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
35	Cooling pipe	1			
36	O-ring	1		Replace; light coat of oil	
37	O-ring	1		Replace; light coat of oil	
38	Nut	4		Torque: 24 Nm (17 ftlb)	
39	Washer	4			
40	Shift cover with pivot	1			
41	Gasket	1		Replace	
42	Nut	10		Torque: 24 Nm (17 ftlb)	
43	Washer	10			
44	Gearbox	1	Move 5th gear and reverse gear selector rod to neutral position and remove.		
45	Gasket	1		Replace	
46	Screw	2		Torque: 9 Nm (6.5 ftlb)	
47	Guide tube	1	Pull out with locally made hooks	Install with P 382 only after installing gear assembly	
48	O-ring	1		Replace; light coat of oil	
49	Bolt	1		Torque: 17 Nm (12 ftlb)	
50	Spring	1			

No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
51	Lock	1			
52	Bolt	1		Torque: 25 Nm (18 ftlb)	
53	Washer	1			
54	Nut	10		Torque: 24 Nm (17 ftlb)	
55	Lock washer	10			
56	Gear assembly	1	Remove together with 1st and 2nd gear selector fork as well as complete 3rd and 4th gear selector rod.		
57	1st and 2nd gear selector fork	1			
58	3rd and 4th gear selector rod and selector fork	1			
59	Bolt	1		Torque: 17 Nm (12 ftlb)	
60	Spring	1			
61	Lock	1			
62	1st and 2nd gear selector rod	1			
63	Shim	X	Note number and thickness	Determine thickness again if necessary	
64	Transmission case	1			

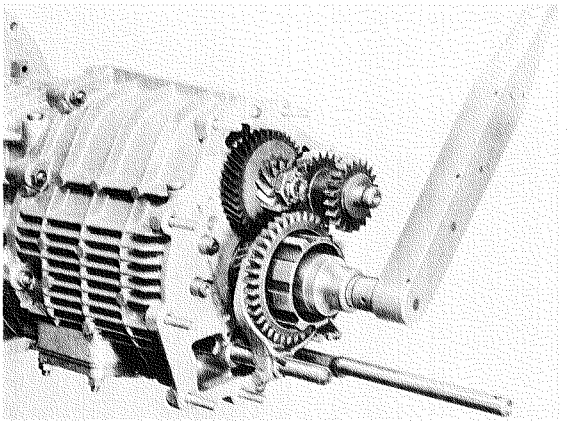
DISASSEMBLING AND ASSEMBLING TRANSMISSION

Removing

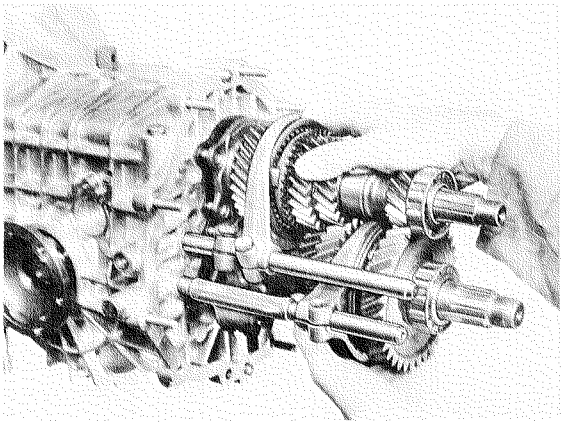
1. Stop input shaft with Special Tool P 37 a and engage 5th gear.



2. Unscrew castle nut of input shaft and collar nut of drive pinion.



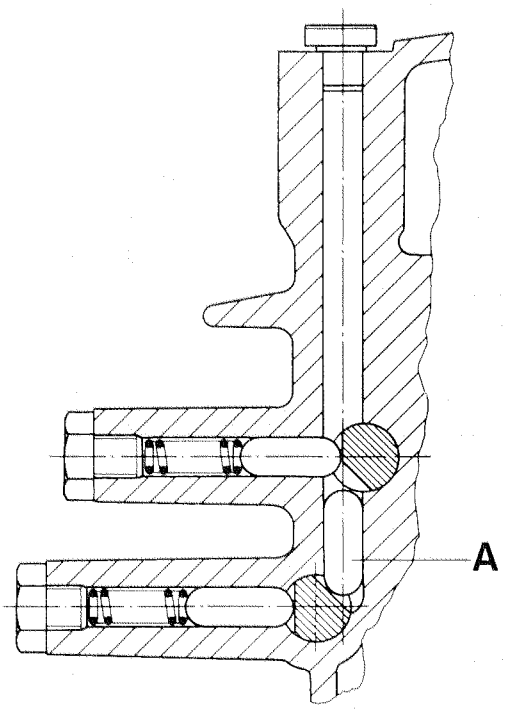
3. Remove drive pinion and input shaft together with complete selector rod (3rd and 4th gear) as well as selector fork (1st and 2nd gear).



Installing

1. Install shims of same quantity noted while removing or in thickness and quantity calculated for adjustment of the drive pinion on studs of the transmission case.

2. Insert selector rod for 1st and 2nd gears, moving lock to installed position.

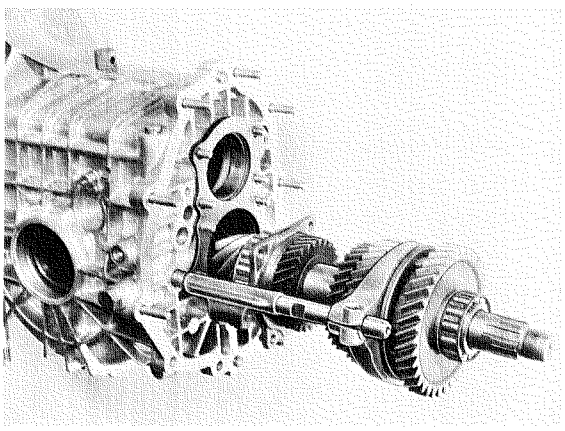


A = Lock

3. Insert lock and spring for 1st and 2nd gears.

4. Tighten screw with 17 Nm (12 ftlb).

5. Insert drive pinion with selector fork (1st and 2nd gears) in such a manner that drive pinion head is straight in bearing bore of transmission case.



Note:

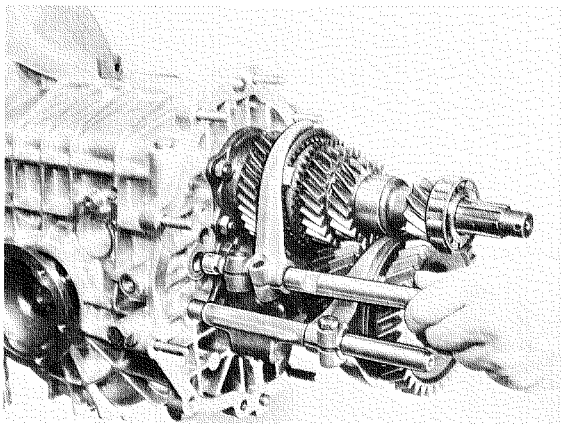
It is recommended to slightly spread the clamp of the fork with a chisel to avoid clamping of the selector fork on the selector rod.

6. Insert input shaft and push in together with drive pinion against stop.

7. Tighten nut for clamping plates with 24 Nm (17 ftlb).

8. Screw in bolt for selector fork (1st and 2nd gears) finger tight.

9. Unscrew bolts for 3rd and 4th gear selector fork and fork clamp. Push back both parts far enough that selector fork and selector rod can be installed.



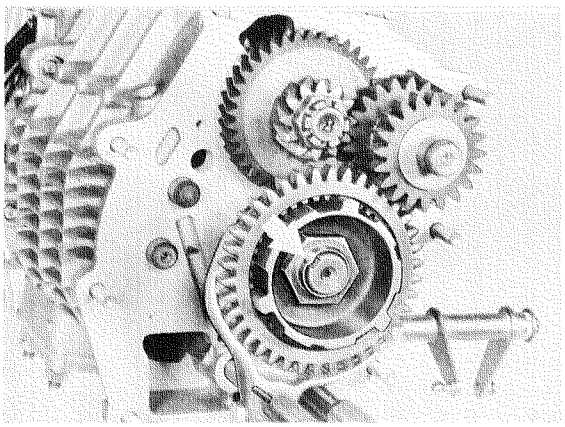
10. Screw in bolts for selector fork and fork clamp finger tight.

11. Insert lock and spring for 3rd and 4th gears.

12. Tighten bolt with 17 Nm (12 ftlb).

13. Adjust selector forks (see page 34 - 9).

14. Lock collar nut on drive pinion by punching the collar.

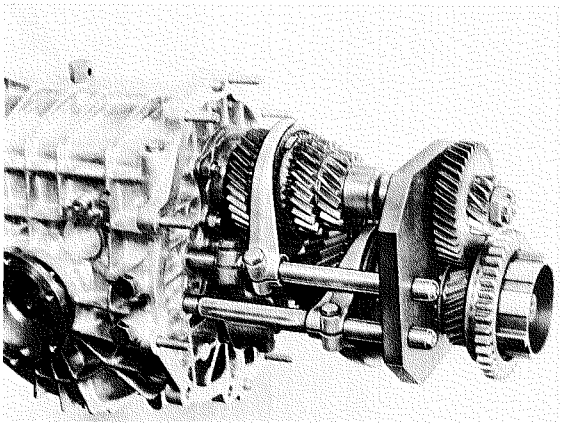


ADJUSTING SELECTOR FORKS

Note:

Tighten collar nut on drive pinion with 250 Nm (181 ftlb) to adjust selector forks.

1. Apply Special Tool P 260 a and mount 5th gear, guide sleeve as well as 5th gear and reverse gear.



2. Stop input shaft with P 37 a, engage 5th gear and tighten collar nut on drive pinion with 250 Nm (181 ftlb).

3. Turn selector rod for 1st and 2nd gears to the left (looking forward in car) against stop. Then turn back small distance until the unmachined flat inside surface is almost vertical.

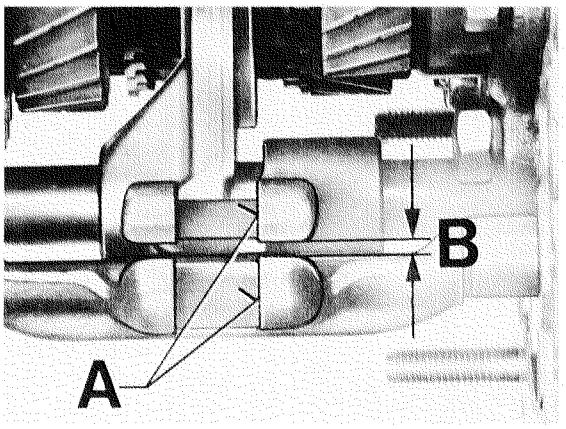
Note:

Do not turn selector rod back past the center position or even against the right stop.

4. Adjust operating sleeve with help of 1st and 2nd gear selector fork, that in neutral position it is located exactly in the middle between synchronizing rings. Tighten bolt with 25 Nm (18 ftlb).

5. Adjust operating sleeve for 3rd and 4th gears just as accurately as described for 1st and 2nd gears.
Tighten bolt with 25 Nm (18 ftlb).

6. Adjust fork clamp for 3rd and 4th gears to be aligned with fork of 1st and 2nd gears with a play of 2 to 3 mm.



A – Aligned installation
B – 2 to 3 mm play

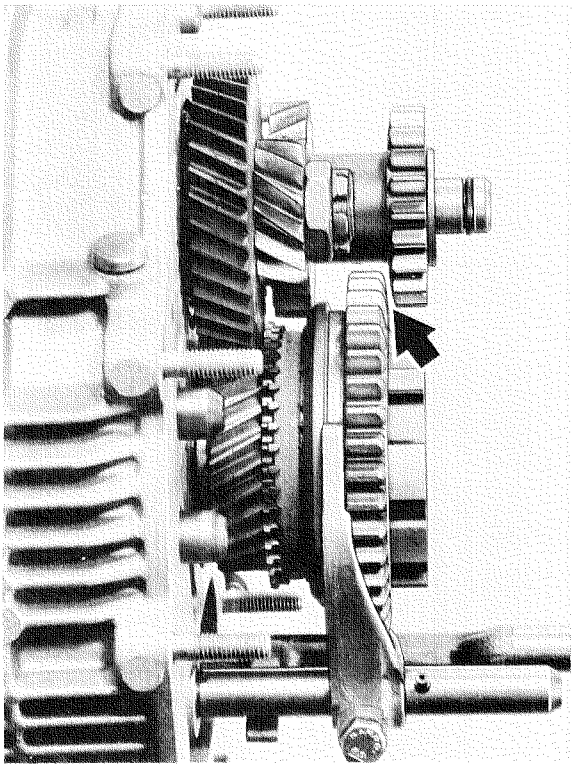
Note:

Fork clamp for 3rd and 4th gears must not scrape or rest on selector rod for 1st and 2nd gears.

Correct any deviation in adjustment when checking shifts, since the operating condition of synchronization depends on this.

Adjust selector fork for 5th and reverse gears.

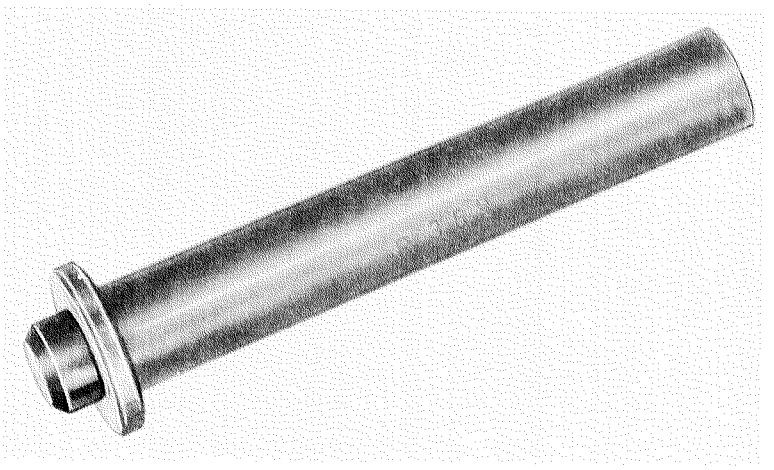
1. Press back reverse gear on shaft completely (against fixed 5th gear I) and adjust play between reverse gear and operating gear in neutral position.
   It should be 1 mm.



In addition, the play between the operating gear and selector fork must be eliminated by pressing on the operating gear in forward direction at the adjustment, so that in case of unfavorable circumstances the operating gear will not scrape on reverse gear.

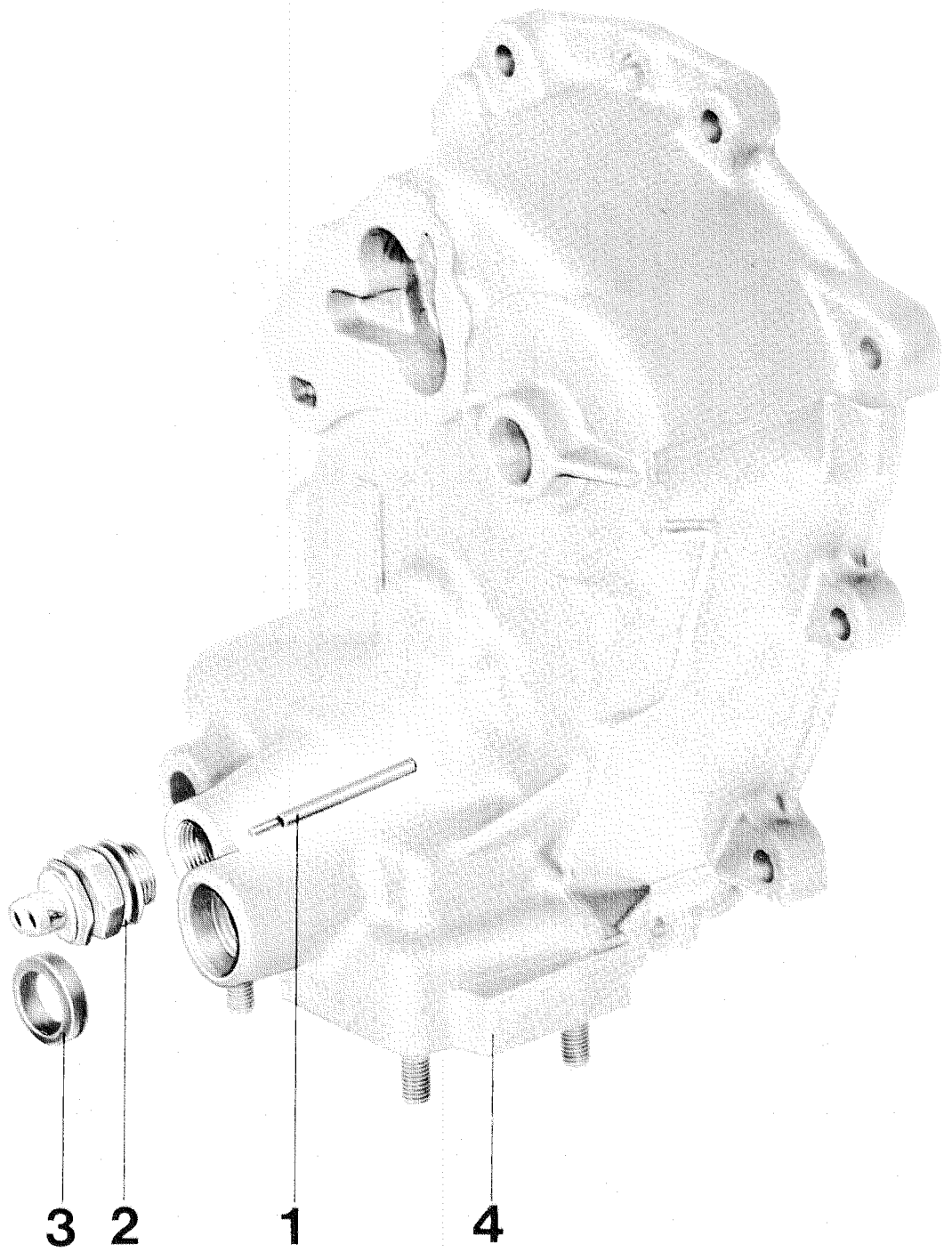
2. Tighten bolt for selector fork with 25 Nm (18 ftlb).

TOOLS



No.	Description	Special Tool	Remarks
	Mandrel	P 369	

DISASSEMBLING AND ASSEMBLING FRONT TRANSMISSION COVER

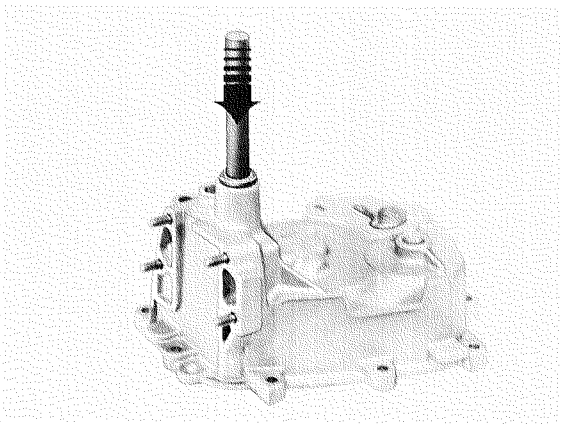


No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Plunger	1		Stepped end faces switch	
2	Backup light switch	1		Torque: 35 Nm (25 ftlb)	
3	Seal	1	Press out with suitable screw-driver	Drive in to position with P 369	
4	Front transmission cover	1			

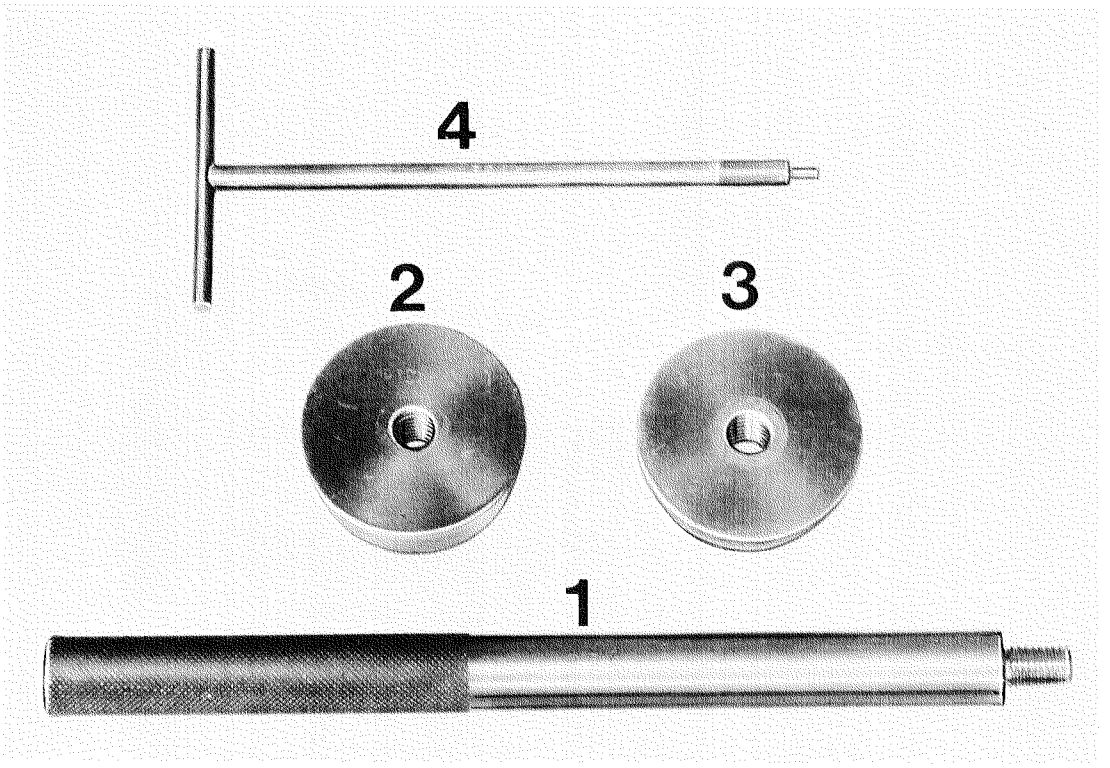
ASSEMBLING FRONT TRANSMISSION COVER

Assembling

Drive in seal for selector rod to correct position with Special Tool P 369.

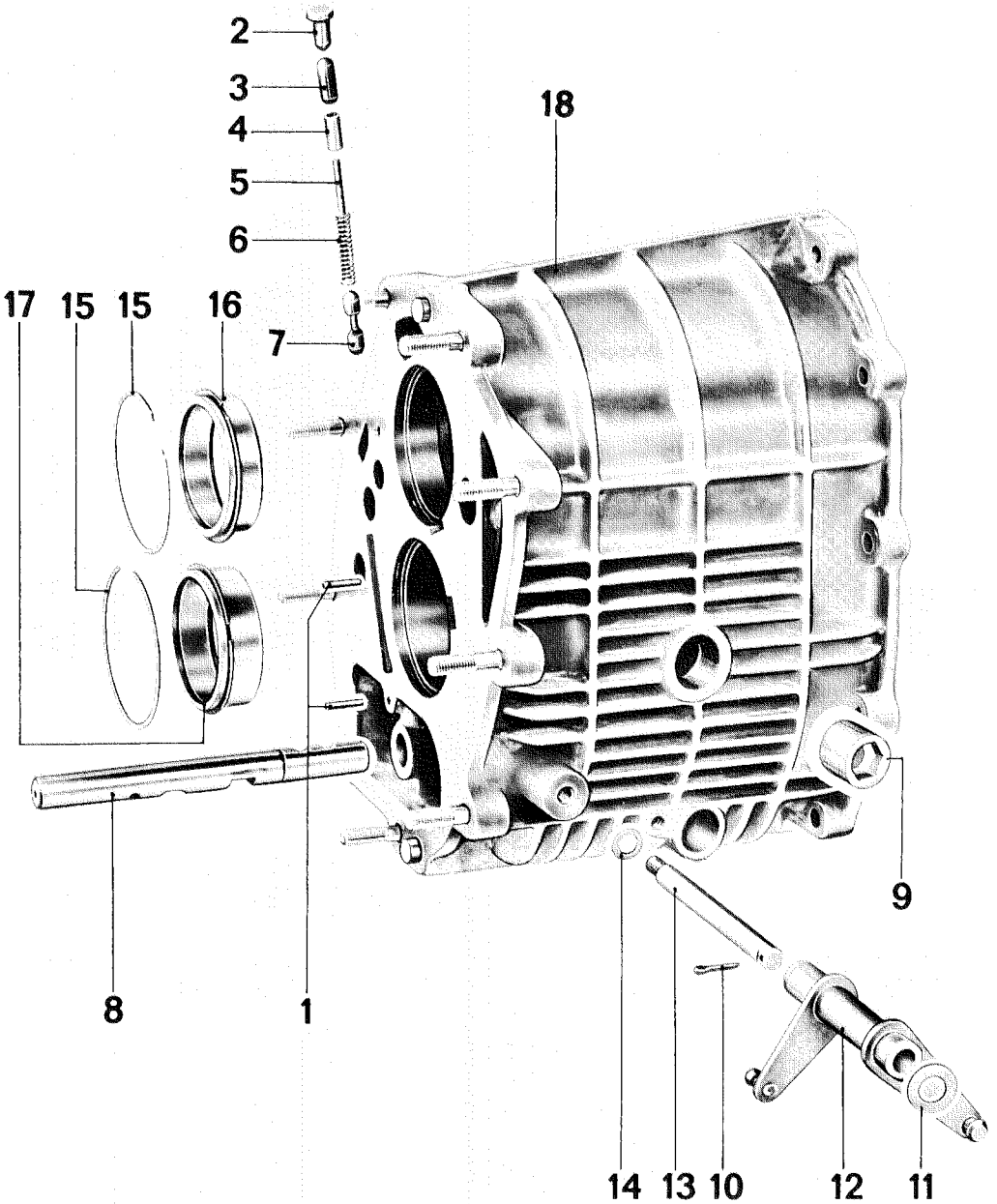


TOOLS



No.	Description	Special Tool	Remarks
1	Mandrel	—	from P 254
2	Thrust piece	P 254 b	
3	Thrust piece	P 254 c	
4	T-handle	P 366	

DISASSEMBLING AND ASSEMBLING GEARBOX



No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Spiral pin	2	Drive out	Compress spring with P 366 and drive in pin	
2	Plug	1	Drive out with a flat chisel	Replace, if necessary	
3	Lock (short)	1			
4	Sleeve	1			
5	Pin	1			
6	Spring	1			
7	Lock (long)	1			
8	Selector rod for 5th and reverse gear	1			
9	Plug	1		Torque: 24 Nm (17 ftlb)	
10	Cotter pin	1		Replace	
11	Washer	1			
12	Reversing lever	1			
13	Reversing lever shaft	1			
14	Washer	1			
15	Circlip	2	Remove with a small screw-driver		
16	Bearing outer race	1	Heat gearbox to 120 °C/250 °F and drive out with P 254 b.	Do not mix up with outer race no. 17. Heat gearbox to 120 °C/250 °F and drive in with P 254 b.	

No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
17	Bearing outer race	1	Heat gearbox to approx. 120°C/ 250° F and drive out with P 254 c.	Do not mix up with outer race no. 16. Heat gearbox to approx. 120 °C/ 250 °F and drive in with P 254 c.	
18	Gearbox	1			

DISASSEMBLING AND ASSEMBLING GEARBOX

Disassembling

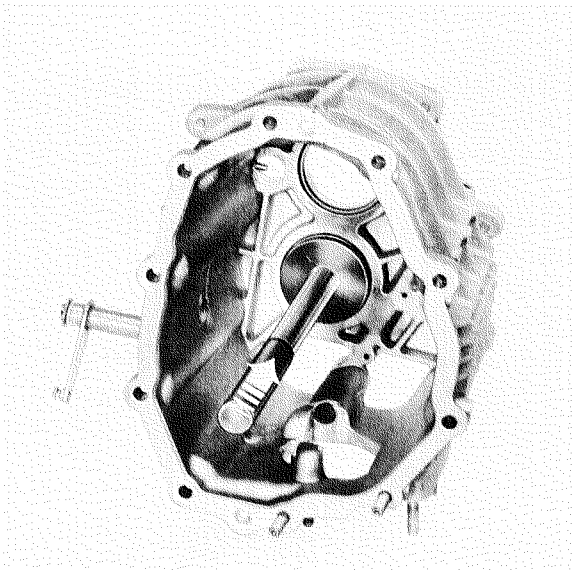
1. Drive out spiral pins for gear locks.

2. Drive out plug.

Note:

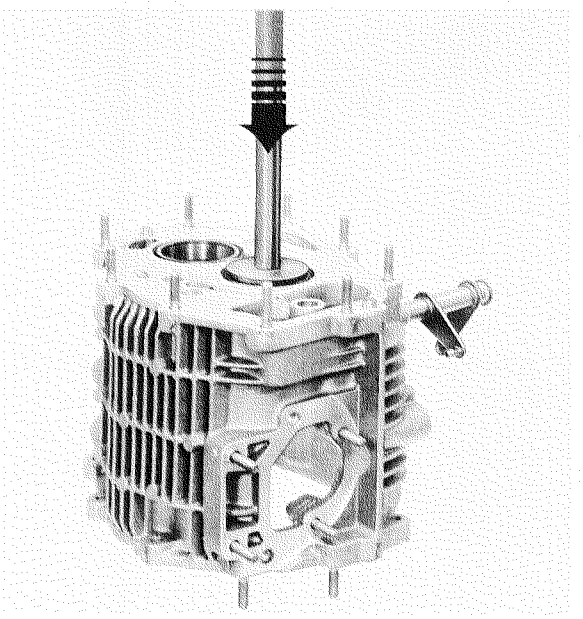
Locks are spring-loaded, so that it is always necessary to first drive out the spiral pins and then the plug.

3. Heat gearbox to approx. 120 °C/250 °F and drive out bearing outer races with Special Tools P 254 b and P 254 c.



Assembling

1. Heat gearbox to approx. 120 °C/ 250 °F and drive in bearing outer races with Special Tools P 254 b and P 254 c.



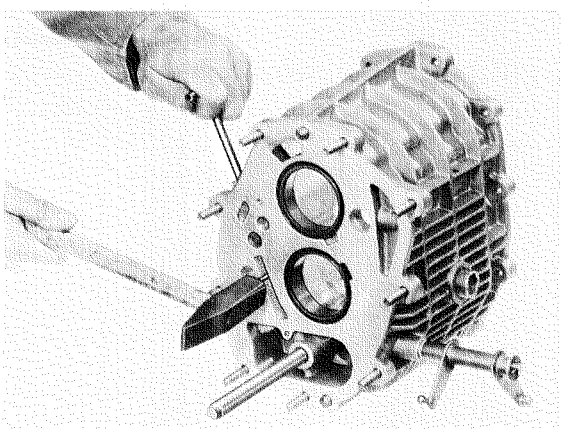
Note:

Bearing outer races differ in inside diameter. The outer race with the larger inside diameter belongs to the drive pinion.

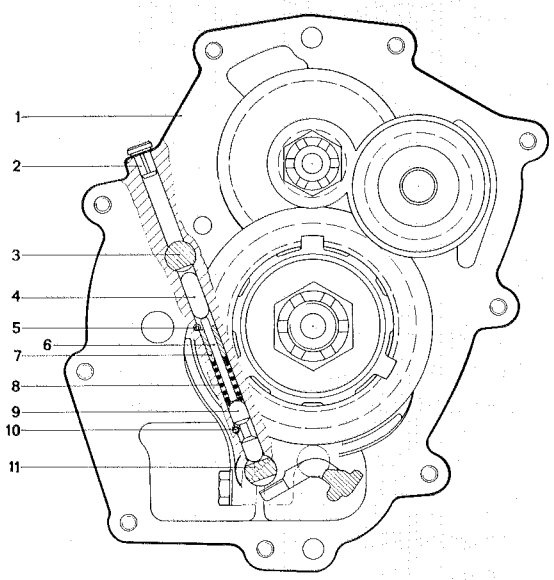
2. Insert selector rod for 5th and reverse gears.

3. Insert (long) lock and drive in spiral pin.

4. Insert spring and sleeve, compress both with Special Tool P 366 and drive in spiral pin.

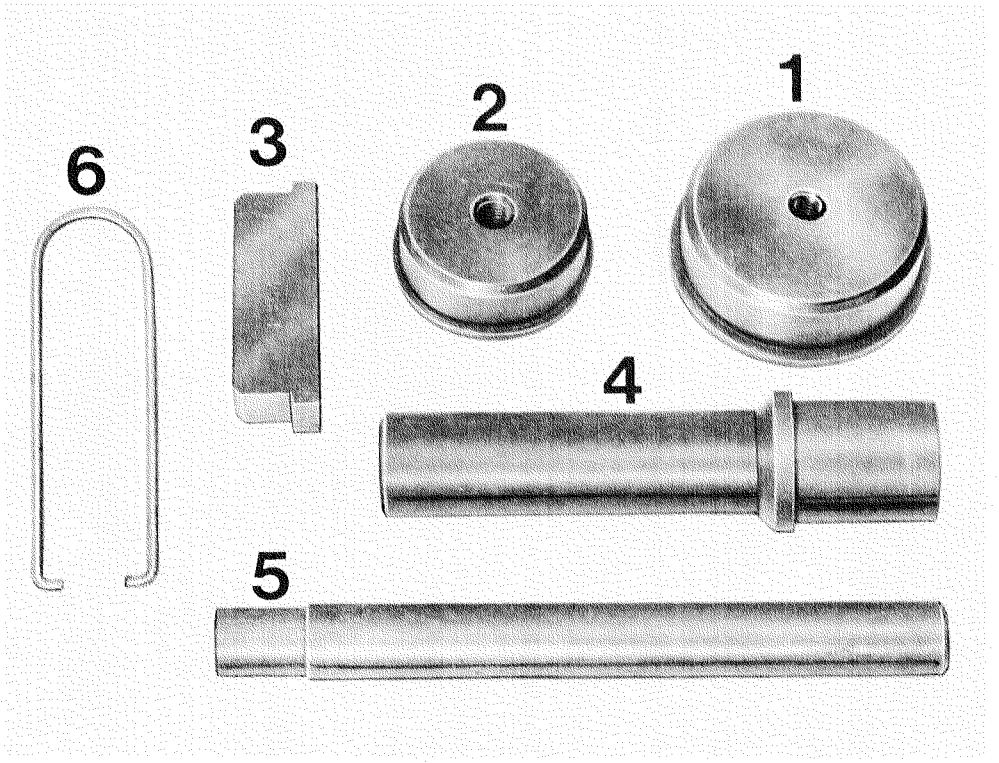


5. Insert pin and (short) lock, and drive in plug.



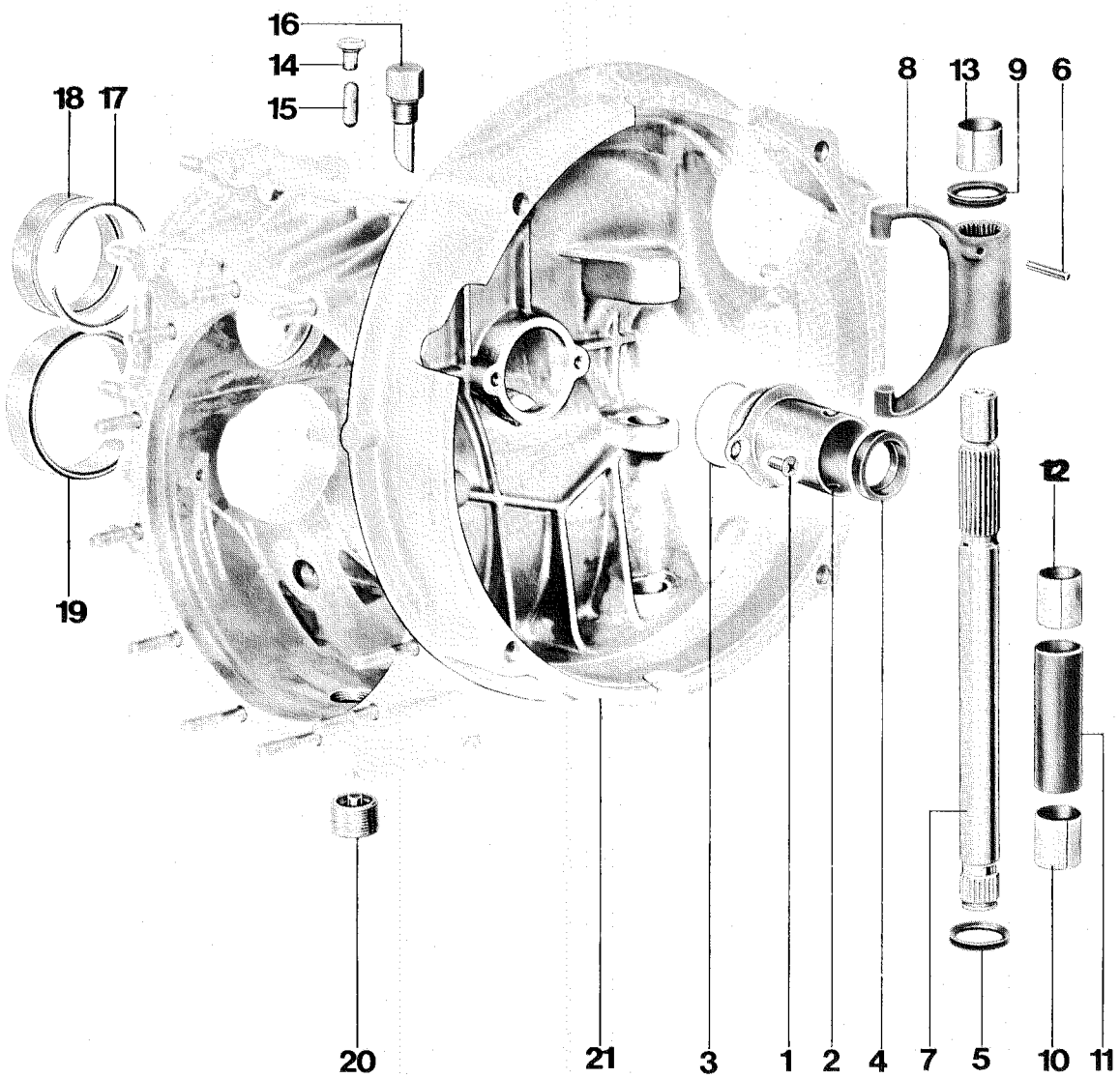
1 – Gearbox
2 – Plug
3 – Selector rod for 3rd and 4th gears
4 – Lock (short)
5 – Spiral pin
6 – Pin
7 – Sleeve
8 – Spring
9 – Lock (long)
10 – Spiral pin
11 – Selector rod for 5th and reverse gears

TOOLS



No.	Description	Special Tools	Remarks
1	Thrust piece	P 254 a	
2	Thrust piece	P 254 b	
3	Thrust piece	P 254 d	
4	Mandrel	P 381	
5	Mandrel	P 375	
6	Hook	—	Made locally of 4 mm welding wire

DISASSEMBLING AND ASSEMBLING TRANSMISSION CASE



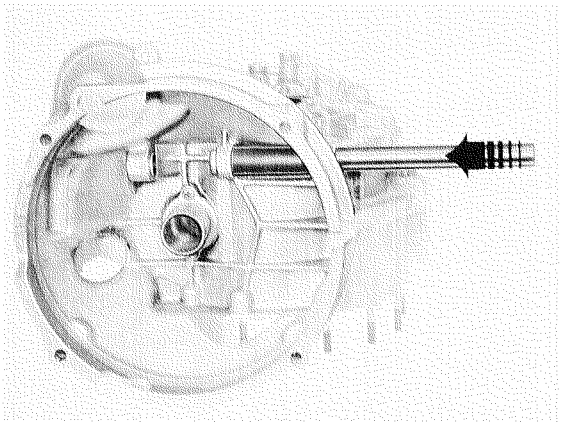
No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Screw	2		Torque: 9 Nm (6.5 ftlb)	
2	Guide tube	1	Remove with locally made hook.	Install with P 382 only after installation of gear assembly. Coat bearing surface for release bearing with multi-purpose grease containing MoS_2.	
3	O-ring	1		Replace; light coat of oil	
4	Seal	1	Drive out with P 381	Drive in with P 381	
5	Seal	1		Replace, if necessary	
6	Dowel sleeve	1			
7	Lever shaft	1		Coat with water-proof lubricant, e. g. Staburags NBU 12/300 KB from Klüber (or multi-purpose grease).	
8	Release fork	1			
9	Seal	1		Replace, if necessary	
10	Sleeve	1	Drive out with P 375	Drive in to correct position with P 375	
11	Protective tube	1			
12	Sleeve	1	Drive out with P 375	Drive in to correct position with P 375	

No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
13	Sleeve	1		Drive in with a suitable mandrel	
14	Plug	1	Drive out with a chisel	Replace, if necessary	
15	Lock	1			
16	Breather	1		Insert in correct position and tighten with 25 Nm (18 ftlb)	
17	Circlip	1	First loosen bearing outer race on circlip with a suitable punch		
18	Bearing outer race	1	Heat case to approx. 120 °C/ 250 °F and drive out with P 254 b.	Heat case to approx. 120 °C/ 250 °F and drive in with P 254 b.	
19	Bearing outer race	1	Heat case to approx. 120 °C/ 250 °F and drive out with P 254 d.	Heat case to approx. 120 °C/ 250 °F and drive in with P 254 a.	
20	Plug	1		Clean and tighten with 24 Nm (17 ftlb).	
21	Transmission case	1			

DISASSEMBLING AND ASSEMBLING TRANSMISSION CASE

Disassembling

1. Drive out sleeves for lever shaft with P 375.

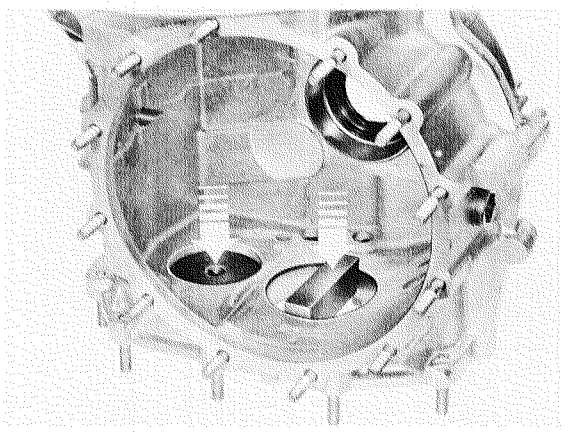


2. Remove circlip for input shaft bearing in case web with a small screwdriver.

Note:

Bearing race presses the circlip against the case, so that it is recommended to first loosen the bearing race on the circlip with a punch.

3. Heat transmission case to approx. 120 °C/250 °F and drive out bearing outer race with Special Tools P 254 d and P 254 b applied alternately.

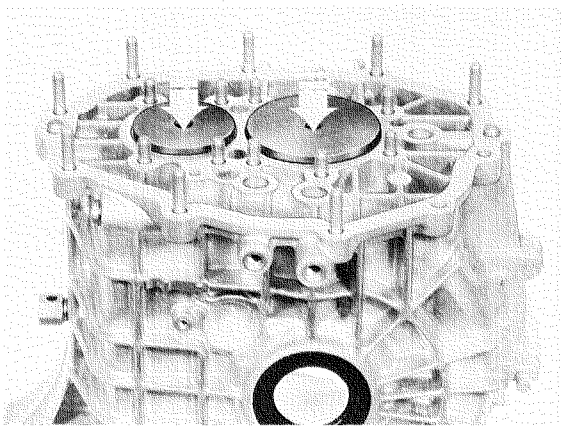


Assembling

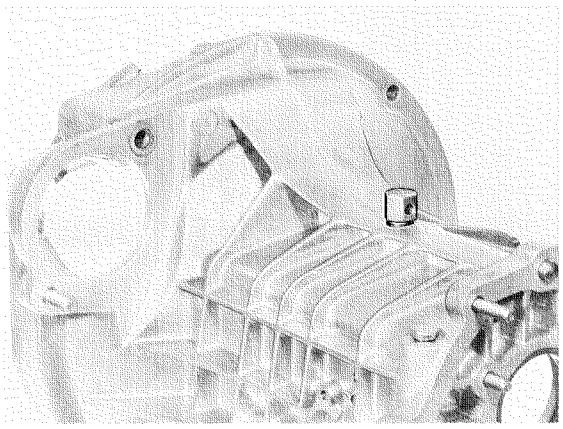
1. Clean transmission case and inspect for wear, external damage and cracks. In case of drive pinion or ring gear damage (e. g. breaks), also check whether bearing bores in the center case web had been damaged. Replace transmission case, if necessary.

2. Insert circlip of input shaft bearing in groove of transmission case.

3. Heat transmission case to approx. 120 °C/250 °F and drive in both bearing outer races with Special Tools P 254 a and P 254 b.



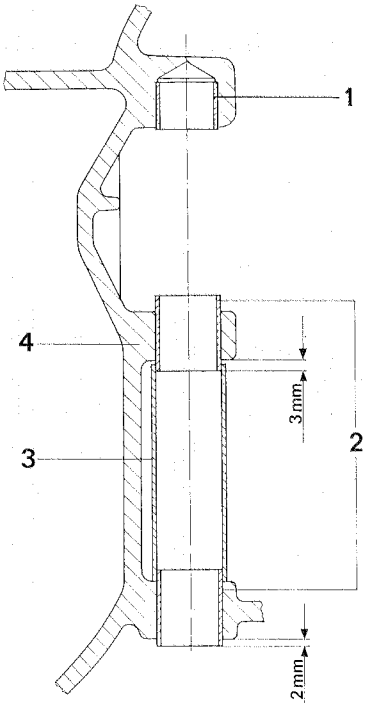
4. Screw in breather in correct position and tighten with 25 Nm (18 ftlb).



Note:

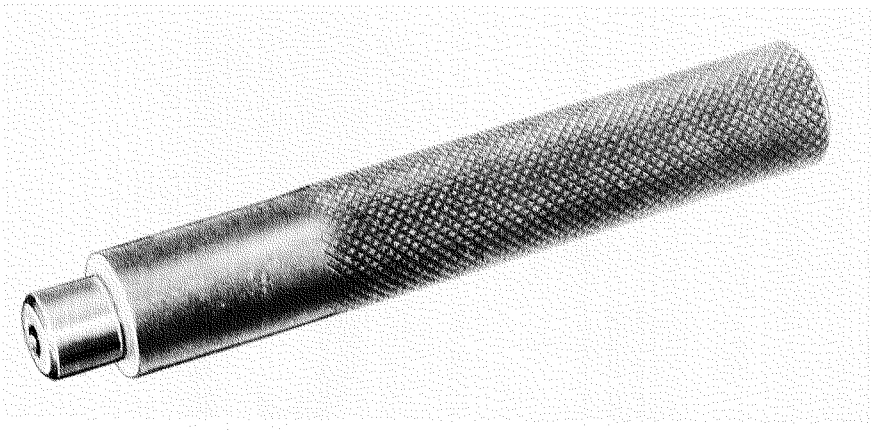
Bore in hexagon of breather faces forward (toward front transmission cover).

5. Drive in sleeves for lever shaft to correct position with Special Tool P 375 (see drawing).



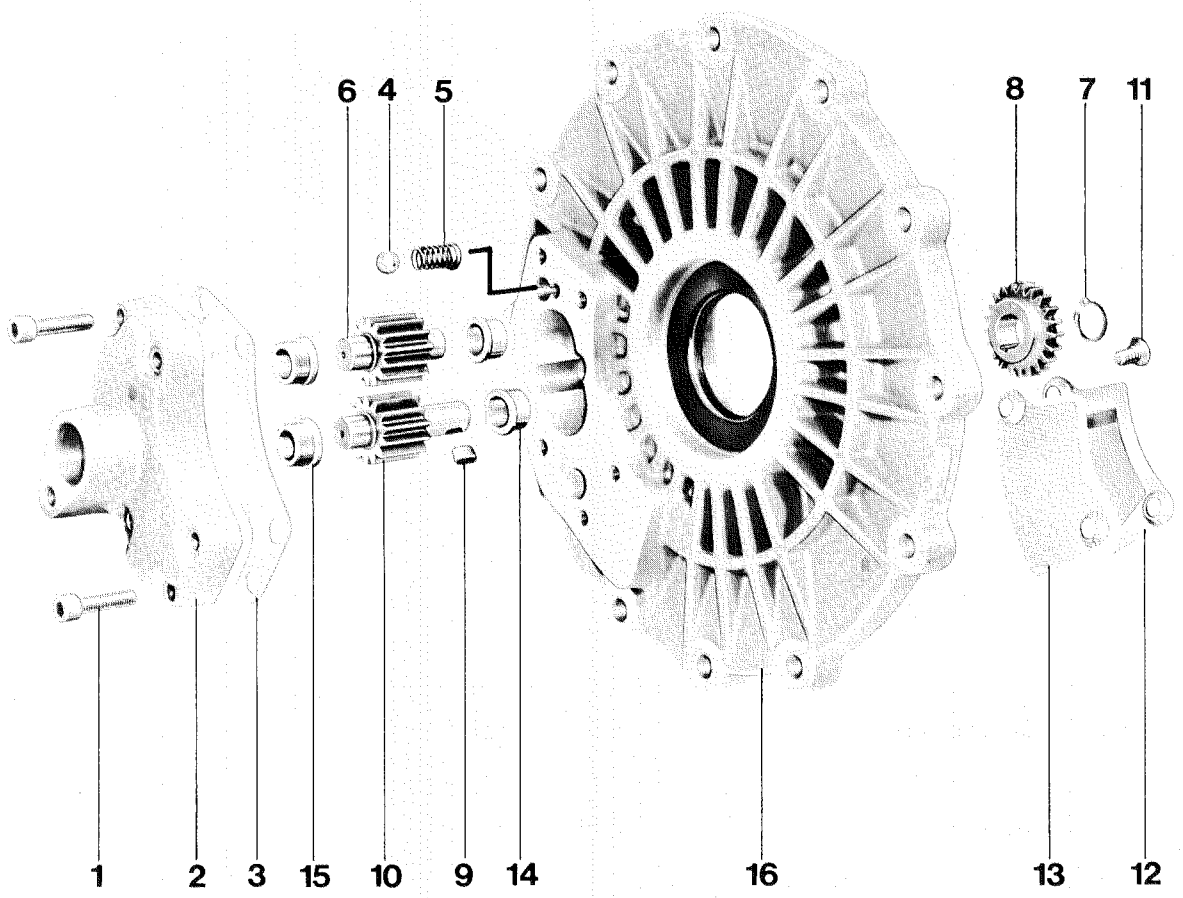
1 — Bearing sleeve
2 — Lever shaft sleeve
3 — Protective tube
4 — Transmission case

TOOLS



No.	Description	Special Tools	Remarks
	Mandrel	P 361	

DISASSEMBLING AND ASSEMBLING OIL PUMP



No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Screw	5		Tighten alternately with 9 Nm (6.5 ftlb). Check that oil pump moves easily.	
2	Cover	1			
3	Gasket	1		Replace	
4	Ball	1			
5	Spring	1			
6	Oil pump gear	1			
7	Circlip	1			
8	Drive gear	1			
9	Woodruff key	1			
10	Impeller	1			
11	Screw	2		Torque: 9 Nm (6.5 ftlb)	
12	Shield	1			
13	Filter screen	1			
14	Bearing sleeve	2	Drive out from inside with a suitable mandrel	Drive in to correct position against stop with P 361	
15	Bearing sleeve	2	Pull out with Kukko extractor (12 – 14.5)	Drive in to correct position against stop with P 361	
16	Side transmission cover	1			

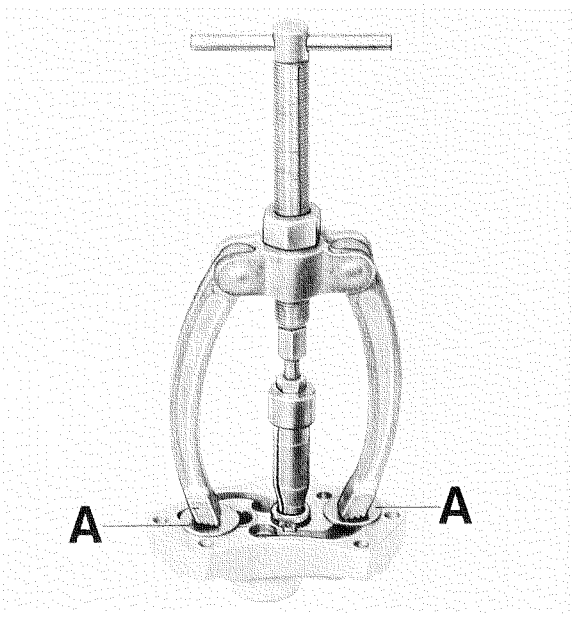
DISASSEMBLING AND ASSEMBLING OIL PUMP

Disassembling

1. Mark installed position of bearing sleeves for installation later.

2. Drive bearing sleeves out of side transmission cover from inside with a suitable mandrel.

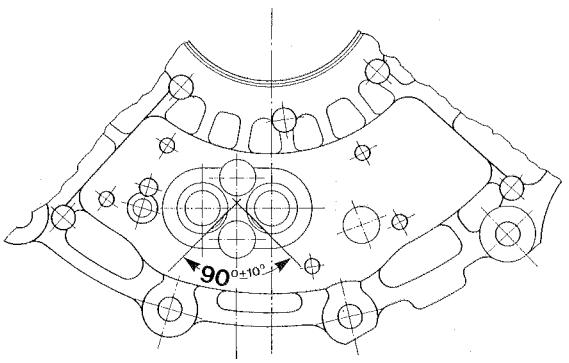
3. Pull bearing sleeves out of oil pump cover with a suitable extractor (e. g. Kukko 12 - 14.5). To avoid damage on sealing surface it is necessary to apply the support of the extractor.



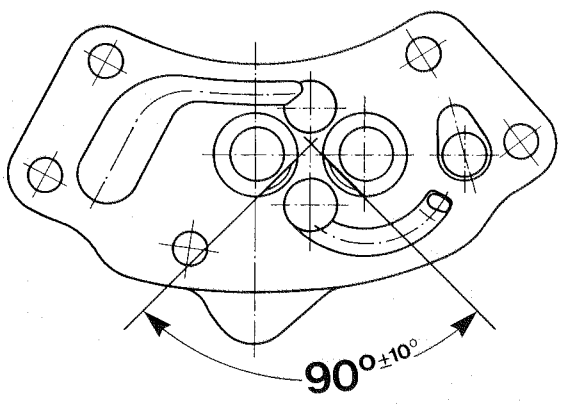
A – Suitable base ring

Assembling

1. Install sleeves in side transmission cover in correct position and drive in against stop with P 361.



2. Install sleeves in oil pump cover in correct position and drive in against stop with P 361.



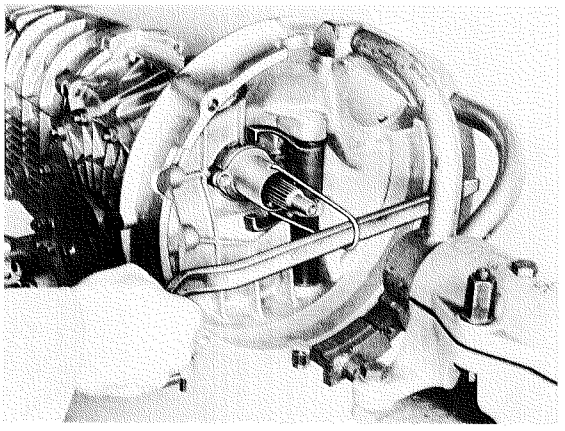
3. Tighten cover mounting screws alternately with 9 Nm (6.5 ftlb). Check whether oil pump moves easily.

REMOVING AND INSTALLING INPUT SHAFT SEAL

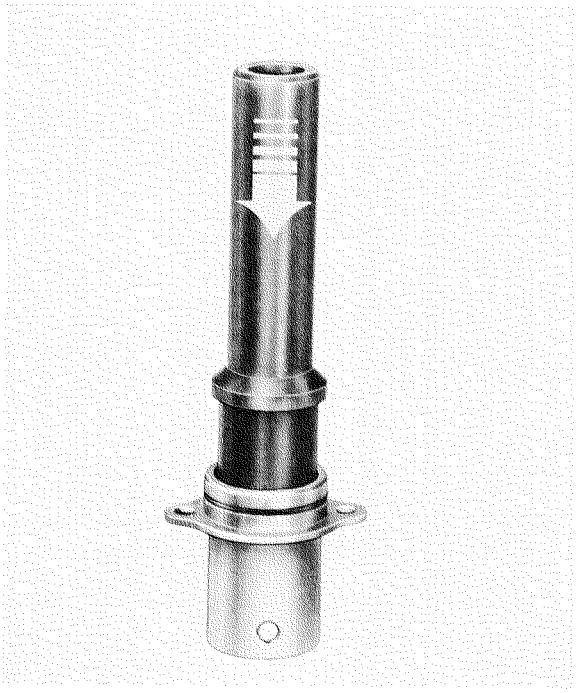
Removing

1. Remove engine/transmission assembly and unscrew transmission on engine.

2. Remove both oval head countersunk screws on guide tube. Pull out guide tube with a locally made hook.



3. Drive out seal with Special Tool P 381.



Installing

1. Drive in new seal against stop with Special Tool P 381.

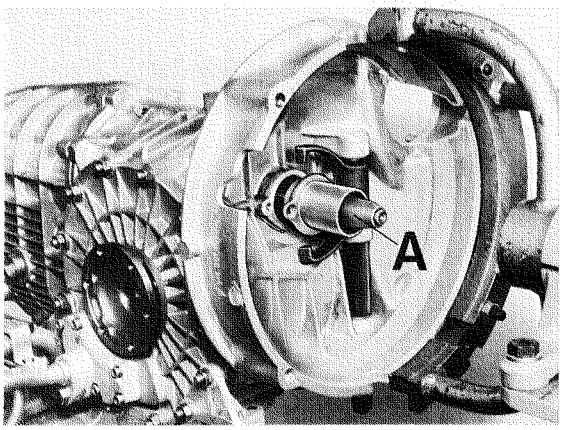


2. Install new O-ring on neck of guide tube.

3. Place assembly sleeve P 382 on splines of input shaft.

4. Give sealing lip of seal in guide tube and O-ring on neck of guide tube a light coat of oil.

5. Insert guide tube in correct position to the mounting screws.

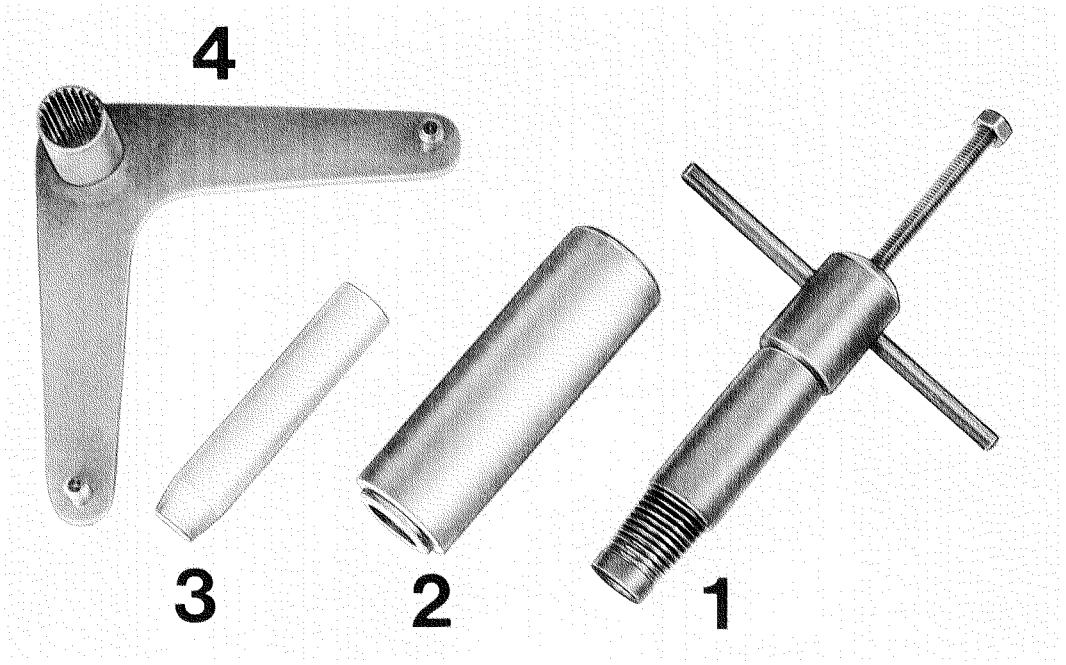


A – Assembly sleeve P 382

6. Screw in and tighten mounting screws with 9 Nm (6.5 ftlb).

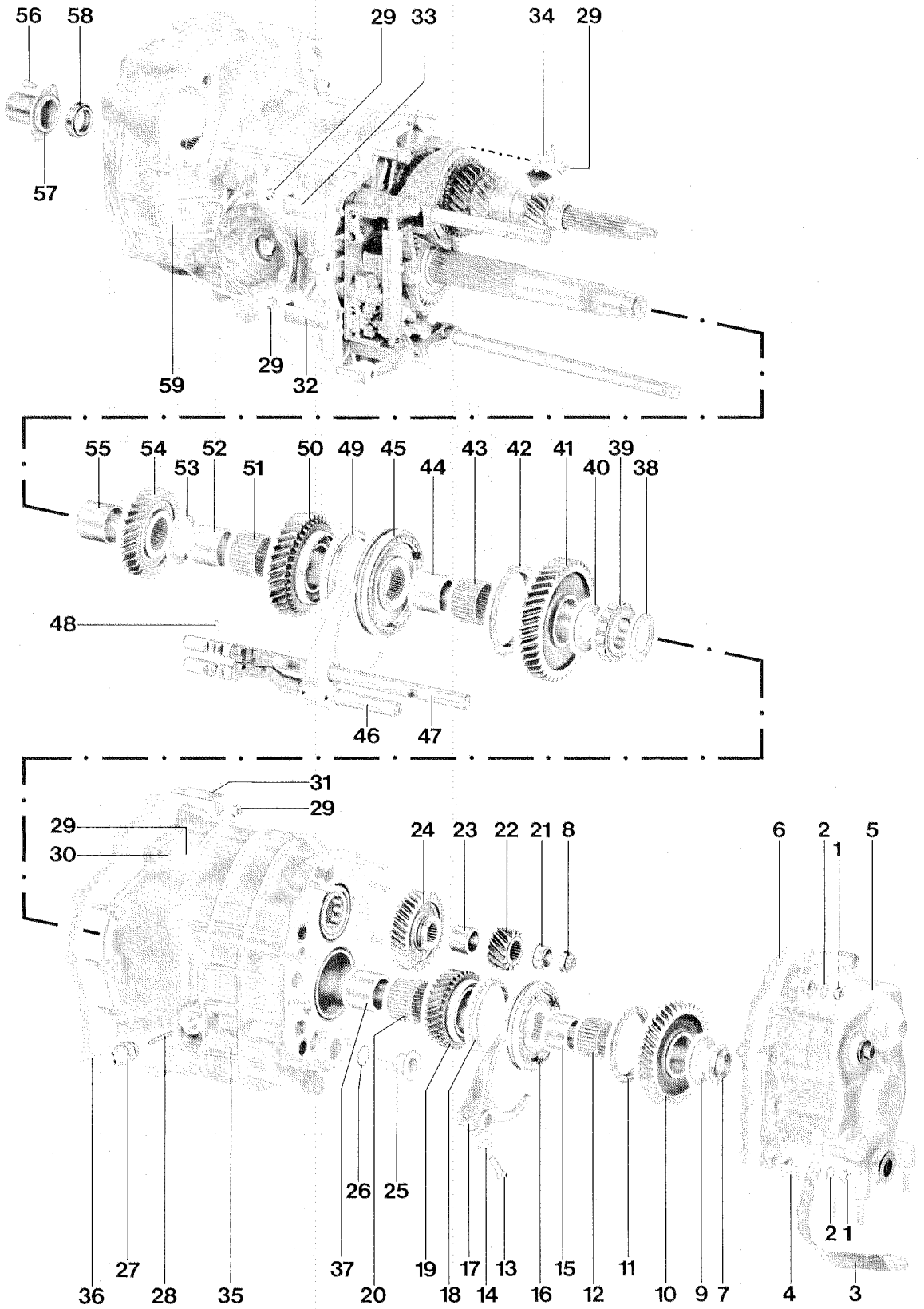
7. Coat release bearing guide tube with multi-purpose grease containing MoS_2.

TOOLS



No.	Description	Special Tools	Remarks
1	Puller	9251	
2	Thrust piece	9256	
3	Sleeve	9255	
4	Holder	9253	

TRANSMISSION, DISASSEMBLING AND ASSEMBLING



No.	Description	Qty.	Note When: Removing	Installing
1	Hex nut	10		torque: 23 Nm (17 ftlb)
2	Washer	10		
3	Ground strap	1		
4	Holder	1		
5	Front transmission cover	1		
6	Gasket	1		fit replacement
7	Collar nut	1	lock input shaft with special tool 9253 and engage 5th gear	torque: 250 Nm (181 ftlb). Punch collar to lock.
8	Collar nut	1	lock input shaft with special tool 9253 and engage 5th gear	torque: 140 Nm (103 ftlb). Punch collar to lock.
9	Thrust washer	1		
10	Reverse gear free gear	1		always renew as set
11	Synchronizing ring	1	mark for reinstallation	check for wear, reassemble in correct position with original gearwheel. (Nubs toward intercept stops)
12	Needle cage	1		
13	Hex bolt	1		torque: 23 Nm (17 ftlb)

No.	Description	Qty.	Note When: Removing	Installing
14	Washer	1		
15	Bushing	1		heat to approx. 120°C
16	Guide sleeve with selector sleeve and synchronizing parts	1	remove together with selector fork, mark for reinstallation	guide sleeve and selector sleeve are paired
17	Selector fork	1	remove together with selector sleeve and guide sleeve	adjust
18	Synchronizing ring	1	mark for reinstallation	check for wear, reinstall in correct position with the original gear (nubs toward intercept stops)
19	Free gear, 5th gear	1		always replace as a pair
20	Needle cage	1	mark for reinstallation	reinstall with the original gear
21	Bearing inner race	1	remove with suitable hooked bearing puller	heat to approx. 120° C
22	Fixed gear, reverse gear	1		always replace as a set
23	Spacer	1		
24	Fixed gear, 5th gear	1		always replace as a pair
25	Oil delivery tube	1		install in correct position
26	O-ring	1		fit replacement

No.	Description	Qty.	Note When: Removing	Installing
27	Backup light-switch	1		torque: 35 Nm (25 ftlb)
28	Plunger	1		stepped end faces toward switch
29	Hex nut	12		torque: 23 Nm (16 ftlb)
30	Washer	8		
31	Bracket	1		
32	Bracket	1		
33	Bracket	1		
34	Bracket	1		
35	Gearbox	1		
36	Gasket	1		fit new gasket
37	Sleeve	1	mark for reinstallation	heat to approx. 120° C, reinstall with the original gear
38	Thrust washer (2.6 mm)*	1	mark for reinstallation	do not confuse with washer part No. 40
39	Cylindrical roller bearing	1	pull off with suitable claw bearing puller	heat to approx. 120° C
40	Thrust washer (3.0 mm)*	1	mark for reinstallation	do not confuse with washer part No. 38
41	Free gear, 1st gear	1		always replace as a set

* Modification see page 34 - 107

No.	Description	Qty.	Note When: Removing	Installing
42	Synchronizing ring	1	mark for reinstallation	check for wear, reassemble in correct position with original gear (nubs toward intercept stops)
43	Needle bearing	1	mark for reinstallation	assemble with the original gear
44	Sleeve	1	mark for reinstallation	heat to approx. 120° C, reassemble with the original gear
45	Guide sleeve with selector sleeve and synchronizing parts 1st + 2nd gear	1	remove together with selector fork and selector rod	always renew as a pair
46	Selector fork with selector rod	1	Selector rod in idle position, remove together with selector sleeve and guide sleeve	
47	Selector rod for 5th and reverse gears	1		
48	Locking dowel	1		grease lightly and insert in selector rod
49	Synchronizing-ring	1	mark for reinstallation	check for wear, reassemble in correct position with original gear (nubs toward intercept stops)
50	Free gear, 2nd gear	1		always renew as a pair

No.	Description	Qty.	Note When: Removing	Installing
51	Needle bearing	1	mark for reinstallation	reassemble with the original gear
52	Sleeve	1	mark for reinstallation	heat to approx. 120° C, reassemble with the original gear
53	Thrust washer	1		
54	Fixed gear, 3rd gear	1		always renew as a pair, install in correct position
55	Spacer	1		
56	Oval-head countersunk screw	2		torque: 10 Nm (7 ftlb)
57	Guide tube	1		
58	Seal ring	1	withdraw using special tool 9251	drive in to correct position using mandrel 9255 and drift 9256 once gears are fully assembled (see also Page 34-113).
59	Transmission case	1		

* From 1.3.88 friction washers 2.8 mm thick. Only the new friction washers (2.8 mm) shall be installed in case of repair. A combination of old and new friction washers is not permissible.

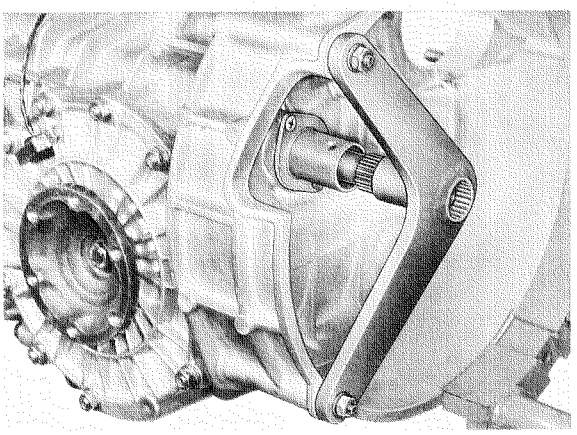
INSTRUCTIONS FOR DISASSEMBLING AND ASSEMBLING

Disassembling

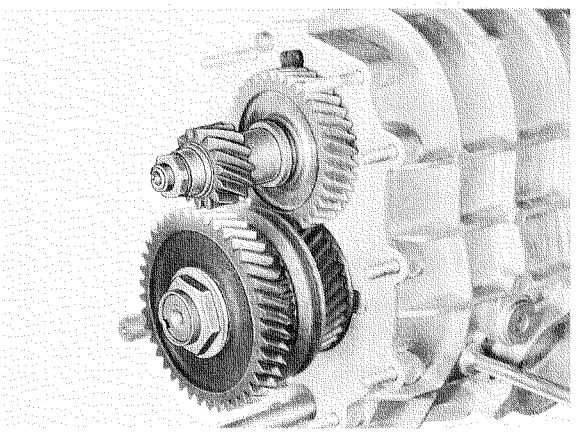
Note

To facilitate assembly, the complete gear set is not removed; instead, the input shaft is partially disassembled with the transmission in the car.

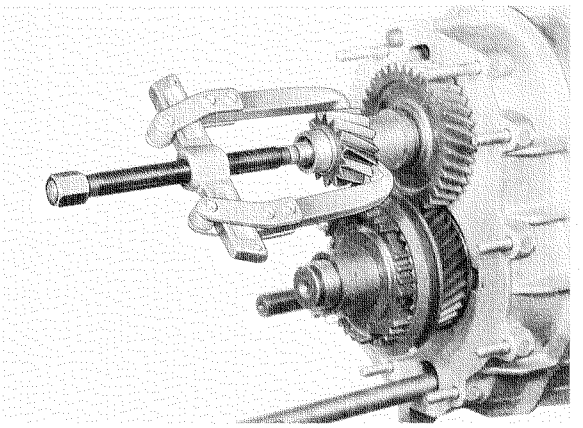
1. Lock input shaft with special tool 9253 and engage 5th gear.



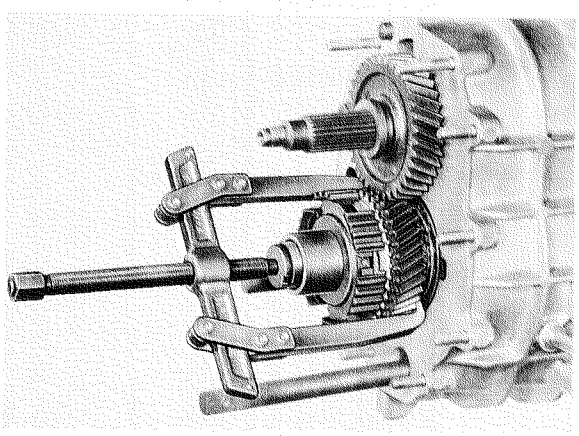
2. Unscrew collar nuts of input and output shafts.



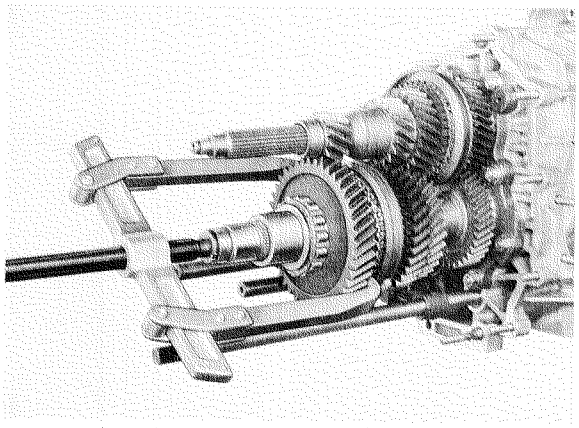
3. Pull off inner bearing race of input shaft cylindrical roller bearing.

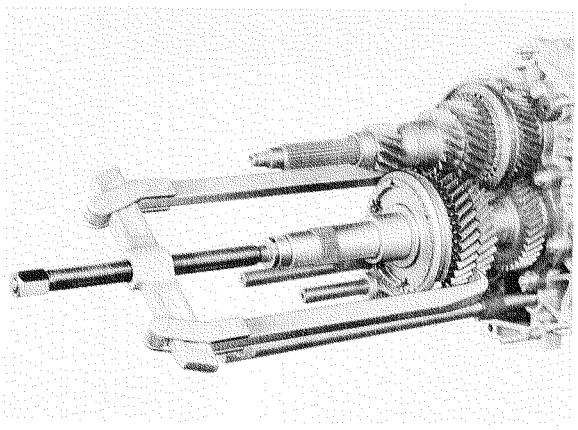


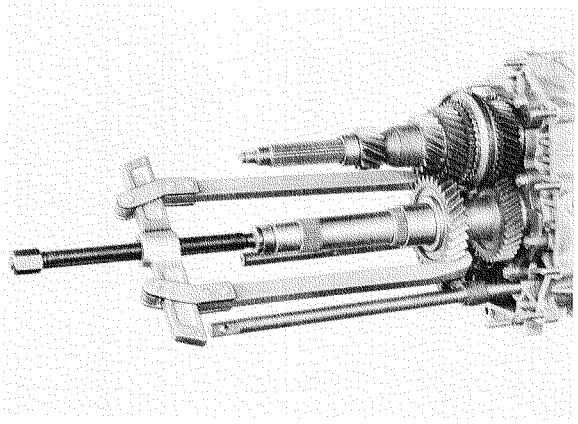
4. Use a suitable puller to remove sleeve of reverse gear needle bearing. If necessary, rework the claws of the puller or push the 5th gearwheel forward a few millimeters with two tire levers.



5. Use a suitable claw puller to disassemble drive pinion (see also Drive Pinion, Disassembling and Assembling, page 35-109).

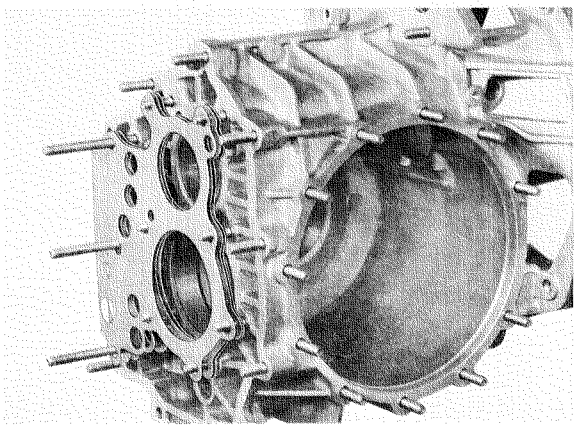




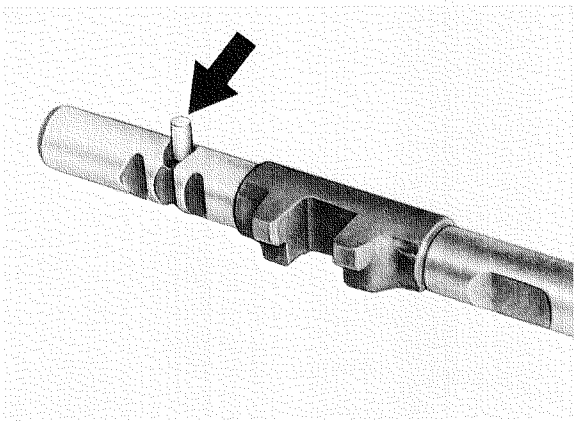


Assembling

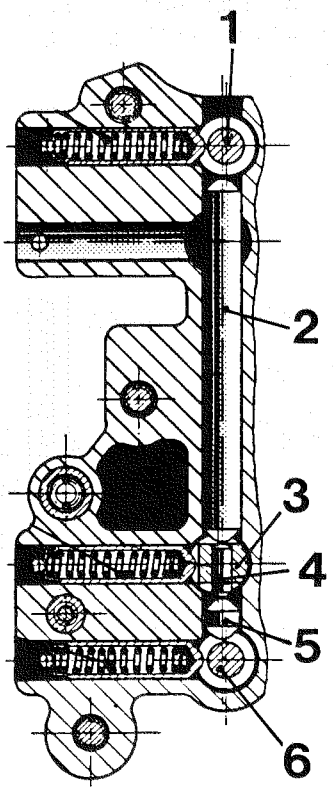
1. Place the number "S_3" of shims of the correct thickness as noted during disassembly or calculated during adjustment of the drive pinion over the stud bolts of the case.



2. Lightly grease small locking dowel and insert in selector rod 5/R and mount rod in clamping plate.

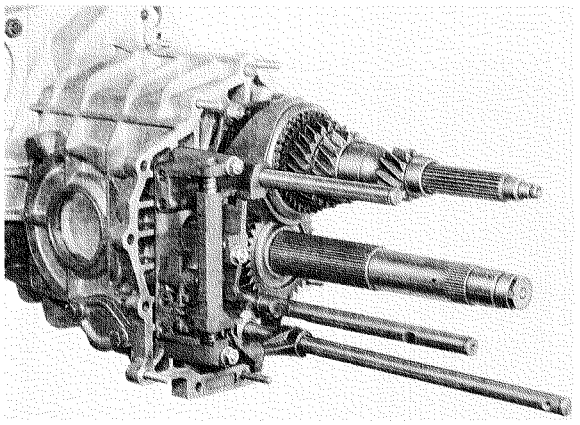


3. Installation position of locks:



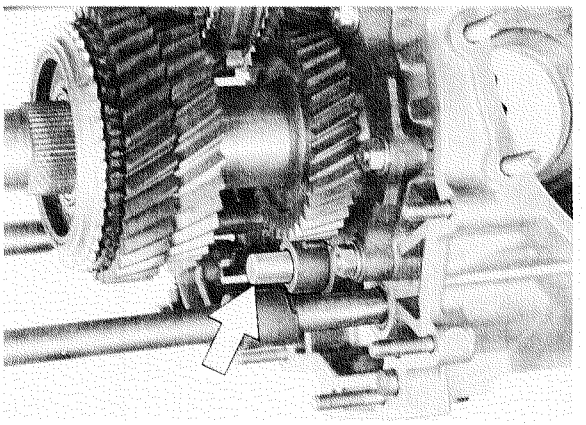
1 = Selector rod 3/4
2 = Lock
3 = Selector rod 5/R
4 = Locking dowel
5 = Lock
6 = Selector rod 1/2

4. Install preassembled gear set with internal selector arm. Tighten clamping plate securing nuts with 23 Nm (16 ftlb).



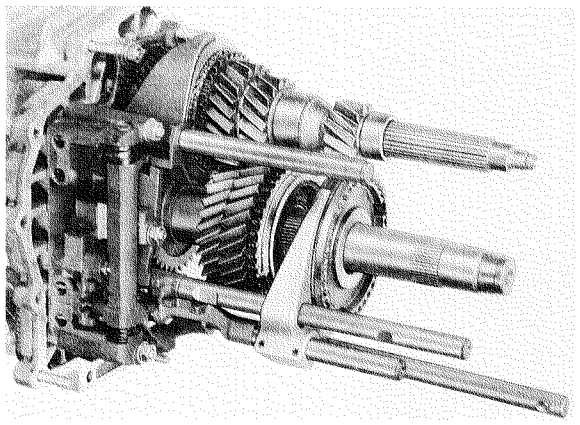
Note:

Use an approx. 50 mm long stud (improvised tool, 16 mm dia.) to guide the spring-loaded detent sleeve to its installation position.



5. Assemble drive pinion (see also page 35-109).

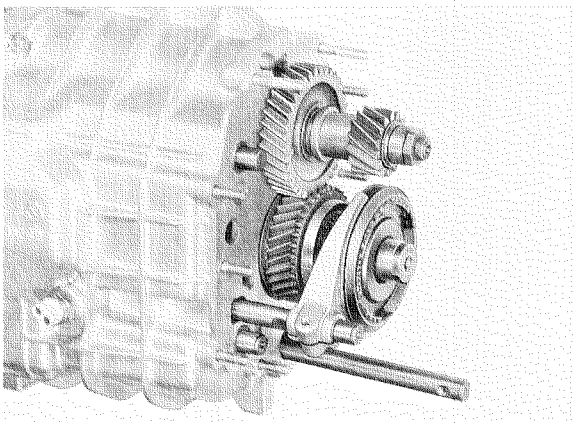
6. Install selector fork / selector rod with dowels in place together with complete guide sleeve.



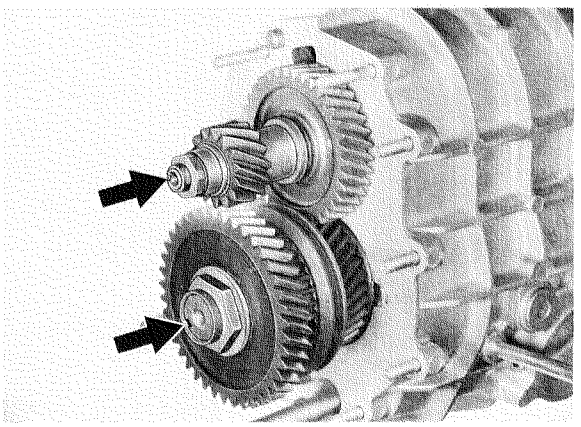
Note:

With differential installed, a 0.20 ... 0.25 mm feeler gauge can also be used to mount the selector rod.

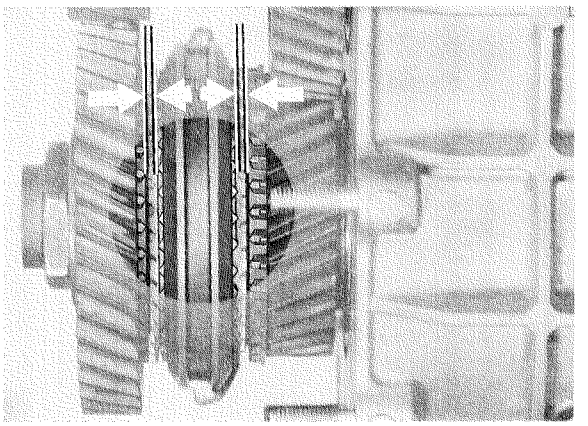
7. Install complete guide sleeve with selector fork (if fork does not move freely on selector rod, use a cold chisel to expand clamp slightly).



8. Tighten collar nut on drive pinion and output shaft to specified torque setting and lock by punching collar.



9. Adjust selector fork for 5th and reverse gears. Set selector sleeve above the 5/R fork so that in the neutral position, the sleeve is located exactly in the middle between synchronizing rings.



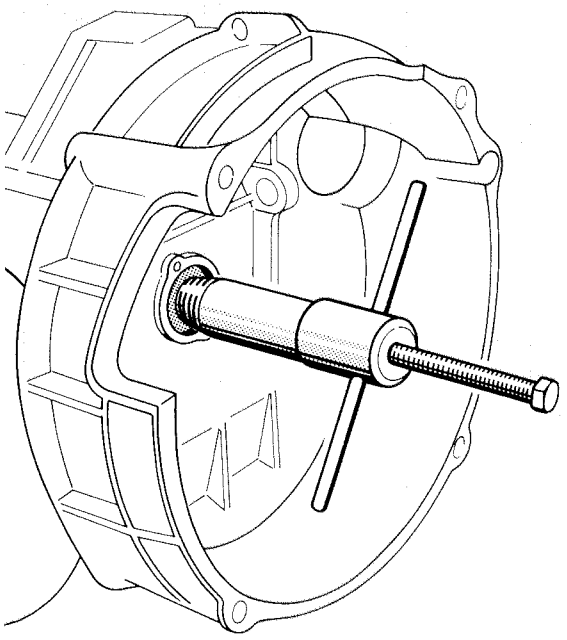
INPUT SHAFT SEAL RING, REMOVING AND INSTALLING

Removing

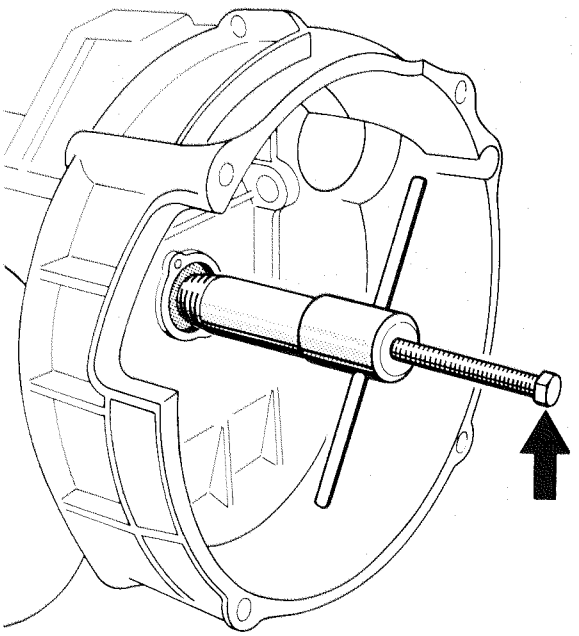
1. Remove engine-transmission unit, unbolt transmission from engine.

2. Remove guide tube for release bearing.

3. Screw special tool 9251 tightly into seal ring.



4. Withdraw seal ring by torquing hex screw.

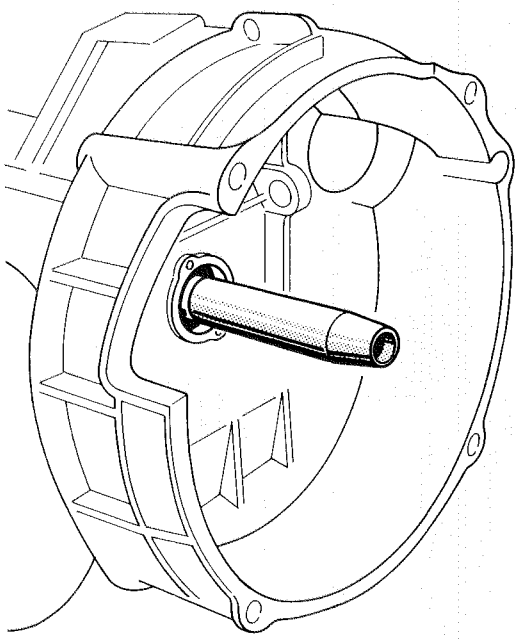


Note:

If the coil tensioning spring is dislodged during removal of the seal ring, a piece of wire bent into a hook can be used to remove it from the input shaft.

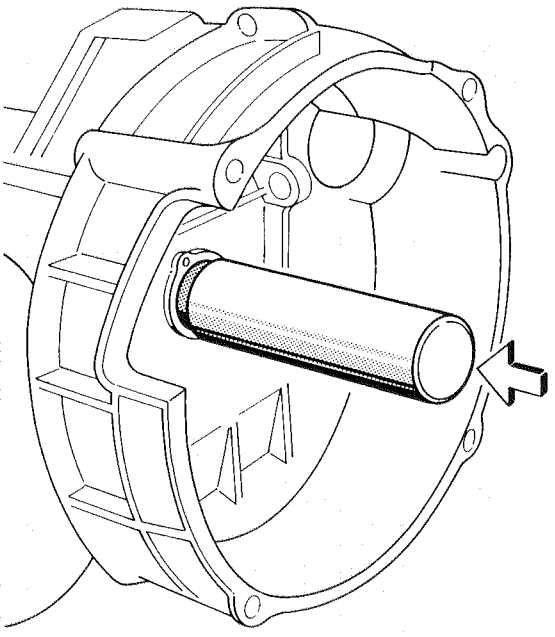
Installing

1. Press assembly sleeve 9255 onto input shaft splines.



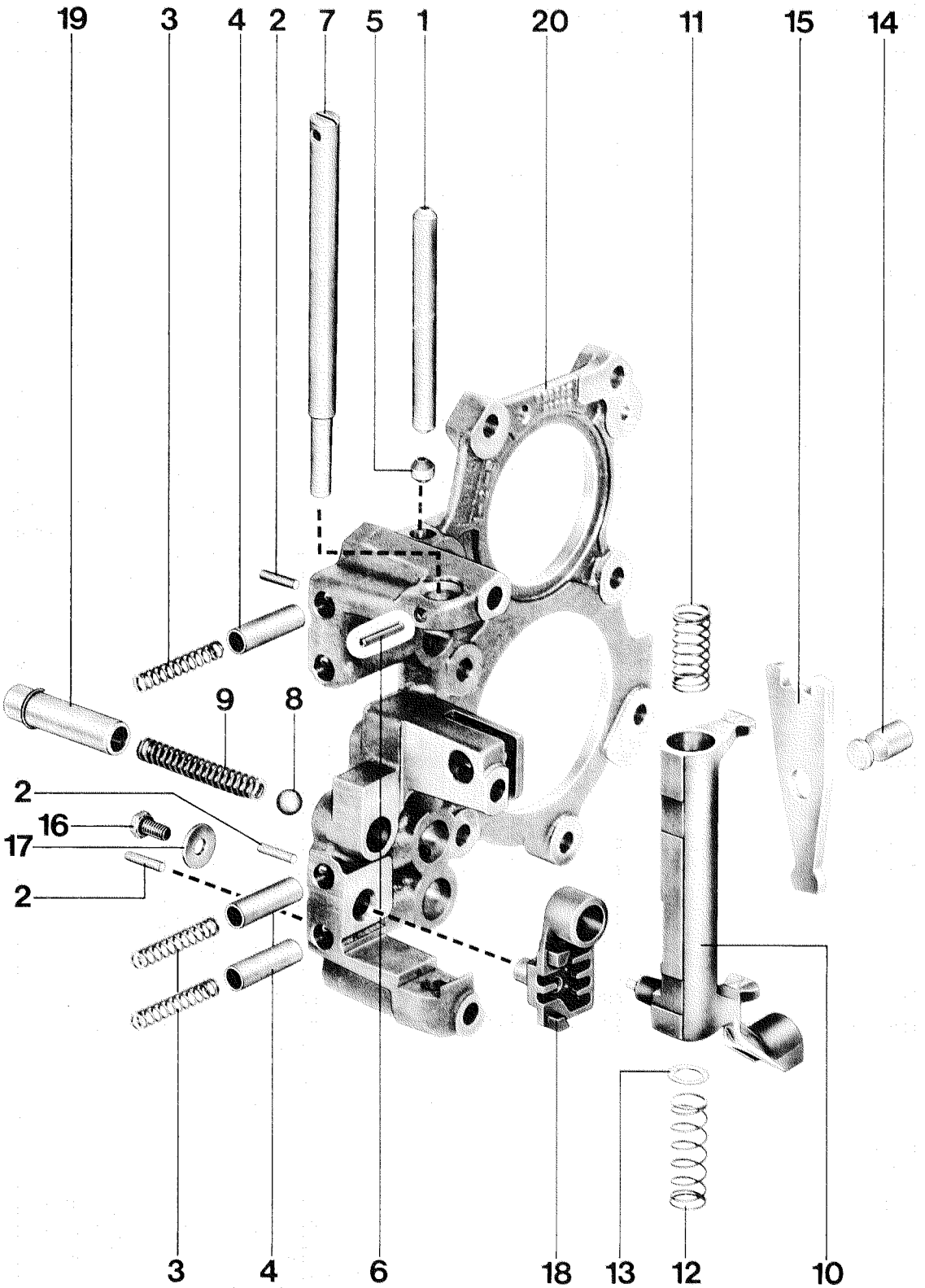
2. Pack space between seal ring dust excluder and sealing lip with Silubrin Grease S manufactured by Klüber.

3. Drive seal ring onto seat with special tool 9256.



4. Install guide tube and tighten securing screws to 10 Nm (7 ftlb).

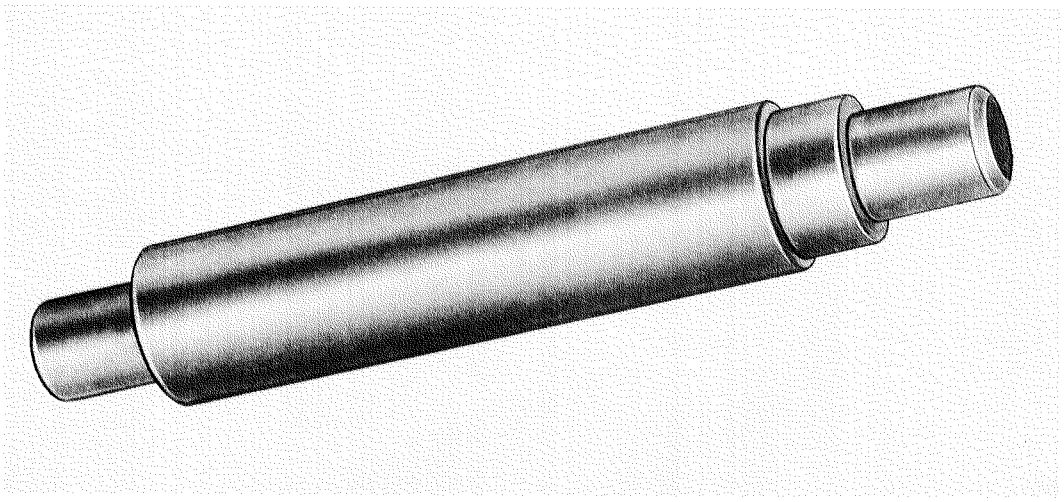
CLAMPING PLATE, DISASSEMBLING AND ASSEMBLING



No.	Description	Qty.	Note When Removing	Installing
1	Lock	1		
2	Straight pin	3	with selector rod installed spring (No. 3) is tensioned	
3	Pressure spring	3		
4	Locking sleeve	3		
5	Lock	1		
6	Locking dowel	1		
7	Pivot shaft	1		install right way round, fix with 8 mm dia. dowel in hole in clamping plate.
8	Ball	1		
9	Pressure spring	1		
10	Reverse-transfer lever	1		
11	Pressure spring	1	mark for reinstallation	free length = 32.8 + 0.5 mm, thickness of wire = 1.6 mm. Do not confuse with spring No. 12
12	Pressure spring	1	mark for reinstallation	free length = 44.9 + + 0.5 mm, thickness of wire = 1.25 mm. Do not confuse with spring No. 11
13	Shim	1		
14	Shaft	1		install right way round, fix to hole in clamping plate with dia. 8 mm dowel.

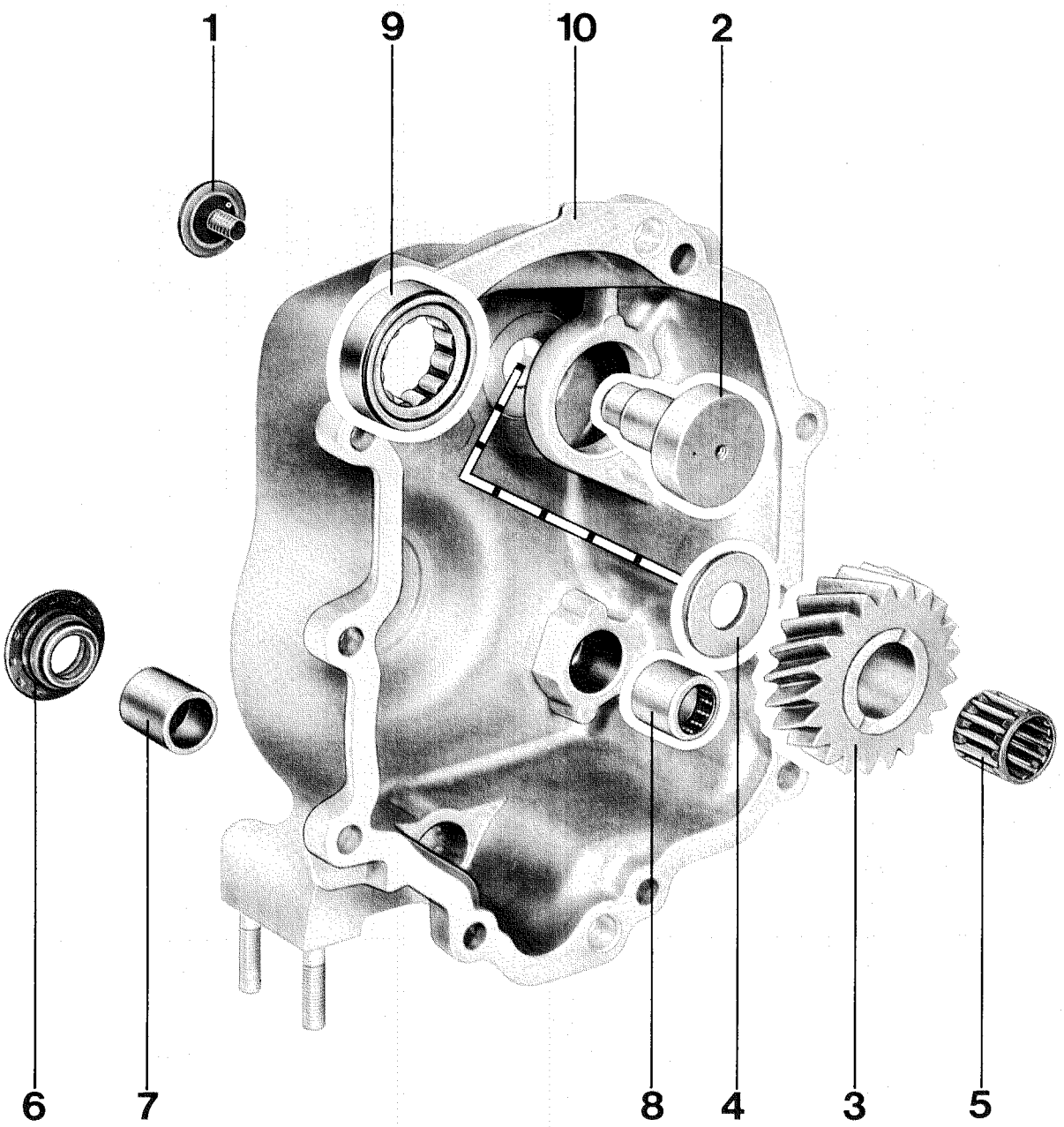
No.	Description	Qty.	Note When: Removing	Installing
15	Reverse-transfer lever	1		
16	Hex screw	1		torque: 10 Nm (7 ftlb)
17	Washer	1		
18	Shift gate	1		
19	Adapter sleeve with snap ring	1	press out with suitable mandrel	press onto seat with suitable mandrel
20	Clamping plate	1		

TOOLS



No.	Description	Special Tools	Remarks
	Mandrel	9254	

FRONT TRANSMISSION COVER, DISASSEMBLING AND ASSEMBLING

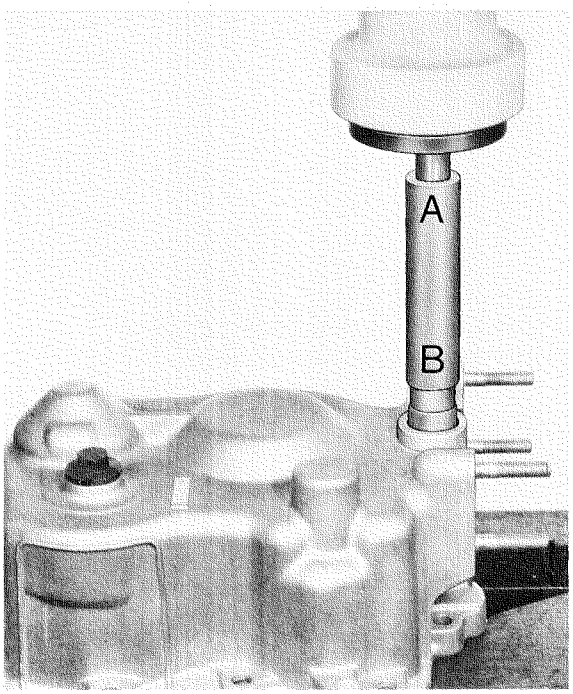


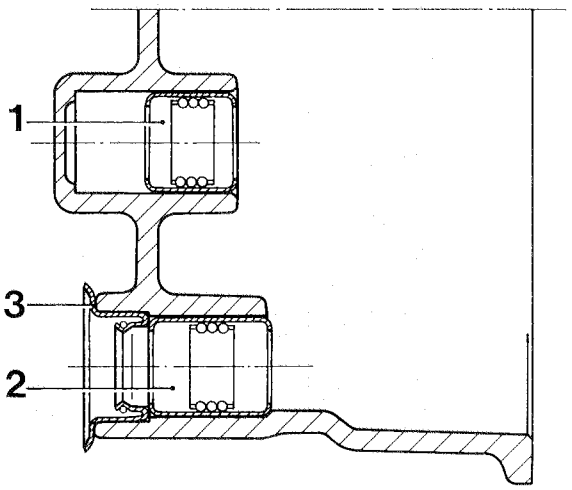
No.	Description	Qty.	Note When: Removing	Installing
1	Hex screw	1		torque 23 Nm (16 ftlb)
2	Pin	1		install right way round
3	Return gear II	1		
4	Thrust washer	1		
5	Needle bearing	1		
6	Shaft sealing ring	1	lever out with two suitable screwdrivers	pack space between dust excluder and sealing lip with Silubrin Grease S manufacted by Klüber
7	Ball sleeve (long)	1	remove with suitable internal puller (e.g. Schrem 14-20)	press in with special tool 9254
8	Ball sleeve (short)	1	remove with suitable internal puller (e.g. Schrem 14-20)	press in flush with special tool 9254
9	Cylindrical roller bearing	1	remove with suitable internal puller (e.g. Kukko 21/4)	press in to correct position with suitable drift (e.g VW 484)
10	Transmission cover	1		

ASSEMBLING FRONT TRANSMISSION COVER

Assembling:

Press ball sleeves in right way round with special tool 9254





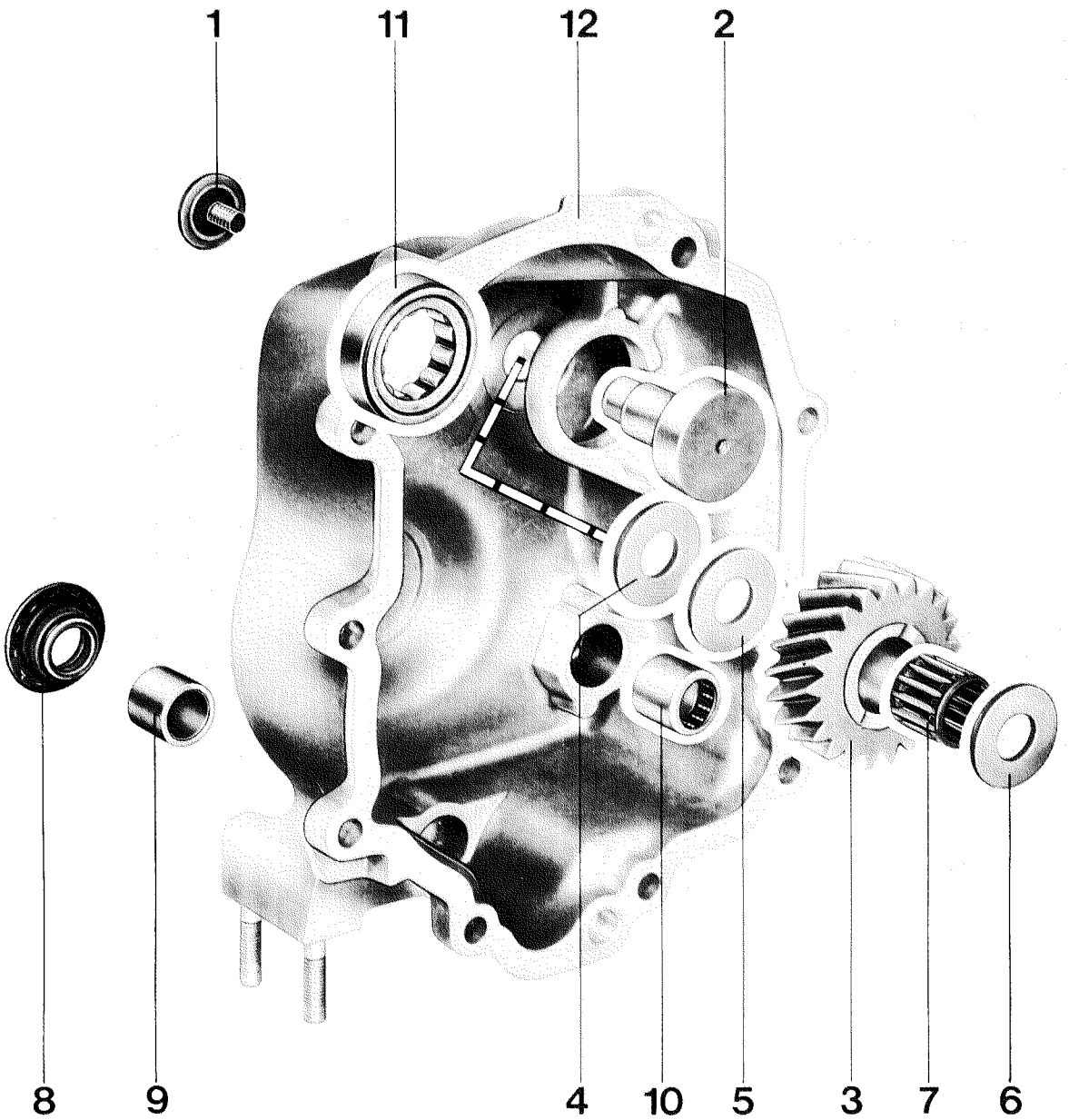
1 - Press in short ball sleeve until flush (with end A of mandrel)

2 - Press long ball sleeve in until seated (with end B of mandrel)

3 - Shaft sealing ring

Disassembling and assembling front transmission cover

Turbo gearbox G50/50



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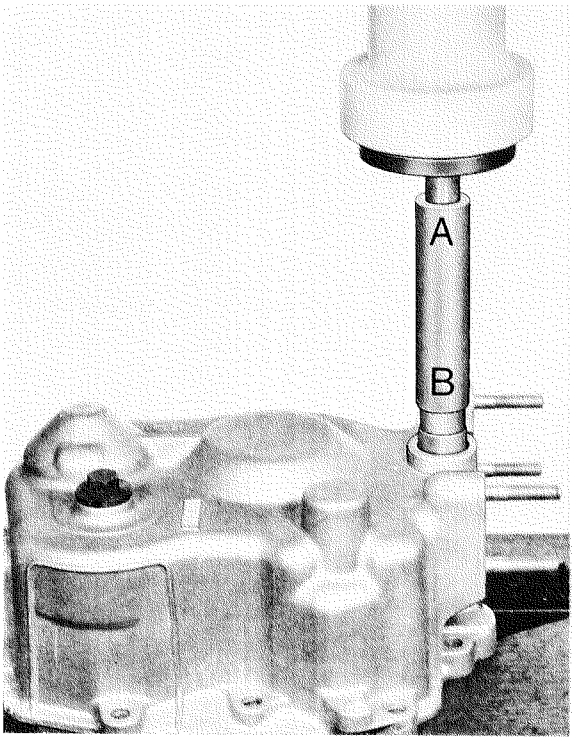
No.	Description	Qty.	Note when: Removing	Installing
1	Hexagon head screw	1		Tighten with 23 Nm
2	Bolt	1		Insert in the correct position
3	Reverse idler gear II	1		
4	Friction washer (2.0 mm thick)	1		Do not mix up with washers No. 5 and 6
5	Friction washer (1.5 mm thick)	1		Do not mix up with washer No. 4
6	Friction washer (1.5 mm thick)	1		Do not mix up with washer No. 4
7	Needle-roller assembly	1		
8	Rotary shaft seal	1	Lever out with two suitable screwdrivers	Pack the area between sealing lips with grease (e.g. Olista Longtime 3 EP)
9	Bush	1	Pull out with a suitable internal puller (e.g. Schrem 14-20)	Press in with special tool 9254 in correct position
10	Spherical sleeve	1	Pull out with a suitable internal puller (e.g. Schrem 14-20)	Press in flush with special tool 9254
11	Cylindrical roller bearing	1	Pull out with a suitable internal puller (e.g. Kukko 21/4)	Press in to the stop with a suitable pipe section (e.g. VW 484)
12	Transmission cover	1		

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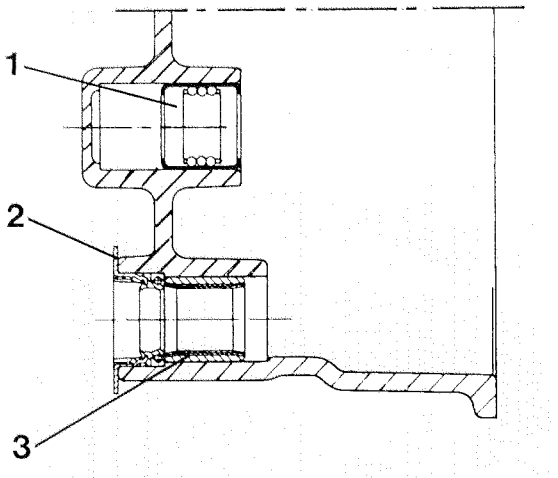
Installation instructions.

Assembling

1. Using special tool 9254, press in the spherical sleeve and bearingbush in the correct position.



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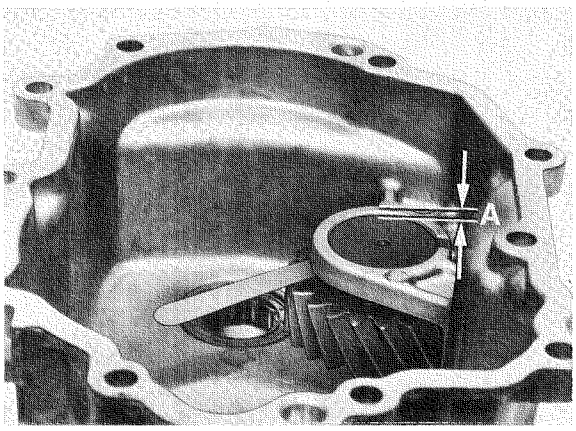
1 - Press in the short spherical sleeve flush (with mandrel end A)

2 - Rotary shaft seal

3 - Press in the bearing bush in the correct position (with mandrel end B)

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2. Install the idler reverse gear with friction washers and bolt in the correct position (see exploded drawing). When the friction washer-sand bolt are installed correctly, the face area of the bolt is approx.1.5 mm below the housing box and there is 0.15...0.35 mm axial play in the reverse idler gear.

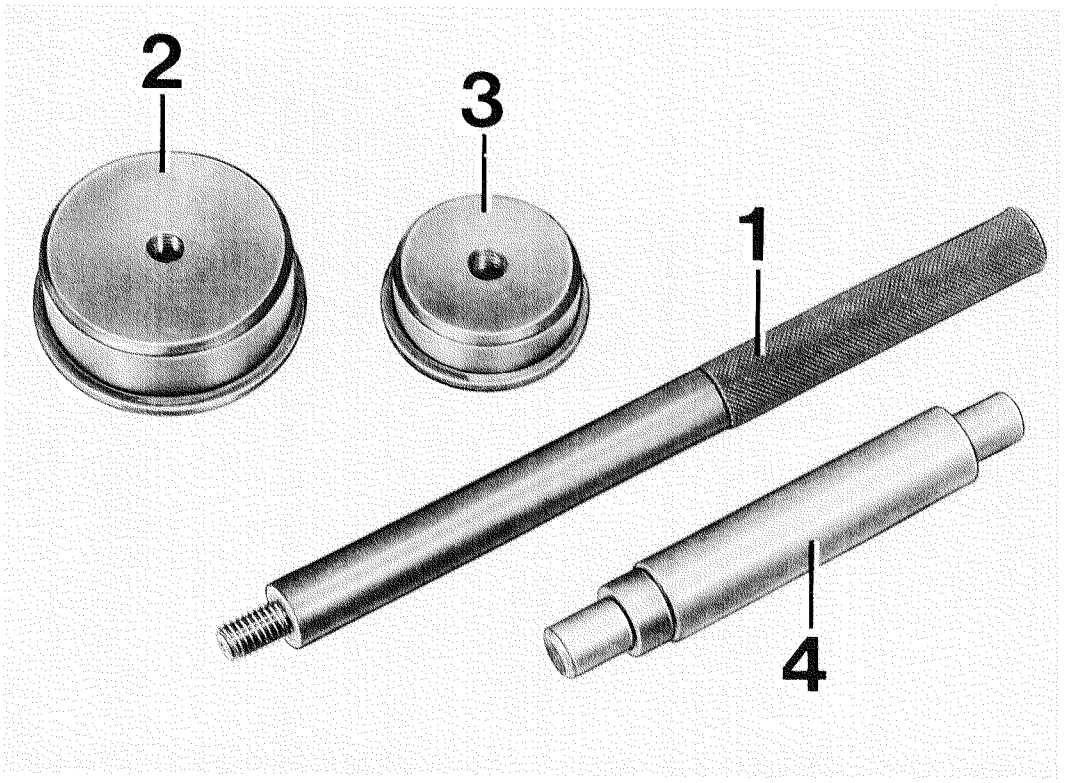


88/340

A = approx. 1.5 mm

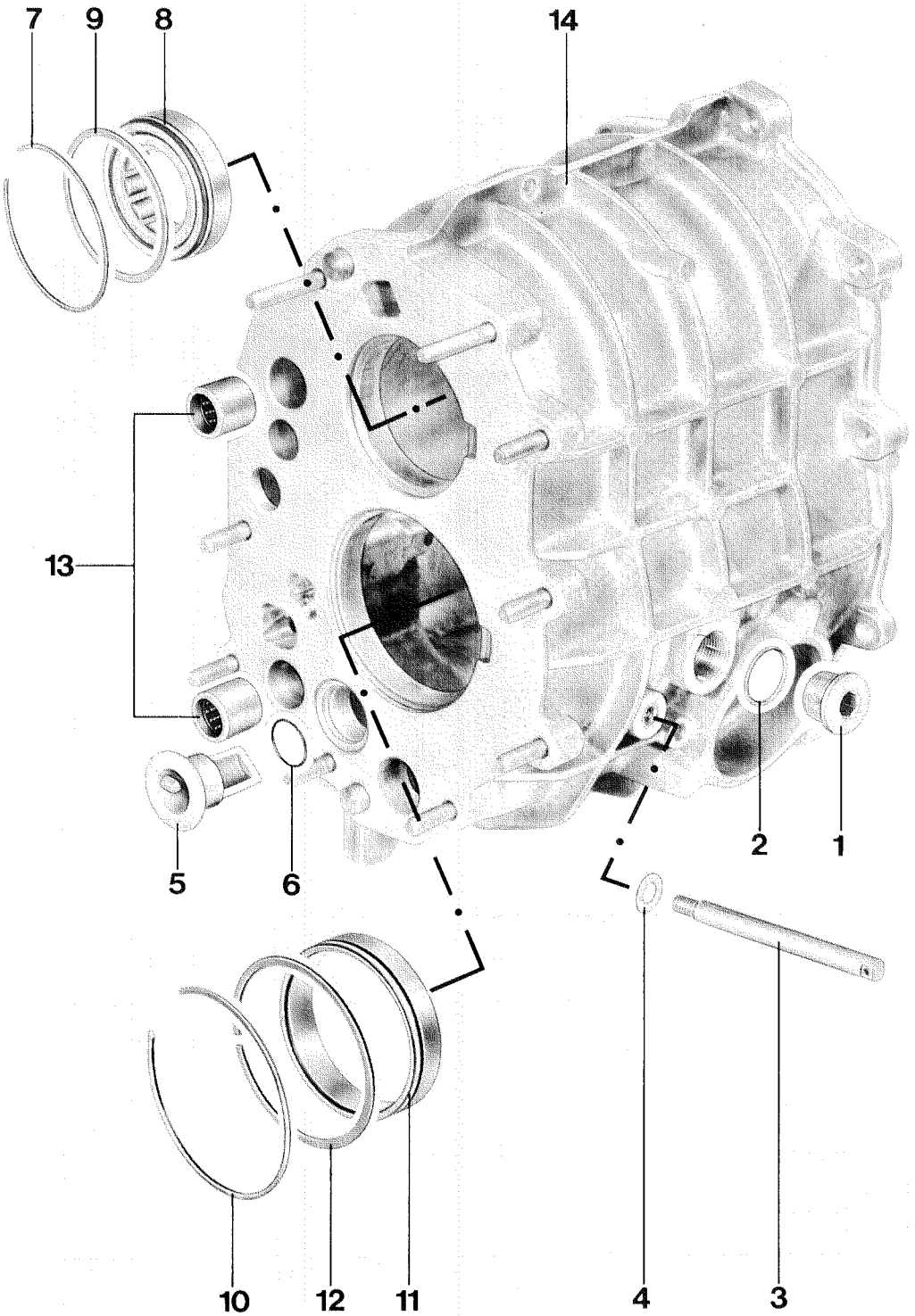
Printed in Germany – XII, 1988

TOOLS



No.	Description	Special Tool	Remarks
1	Mandrel	-	of P 254
2	Thrust piece	P 254 a	
3	Thrust piece	P 254 b	
4	Mandrel	9254	

GEARBOX, DISASSEMBLING AND ASSEMBLING

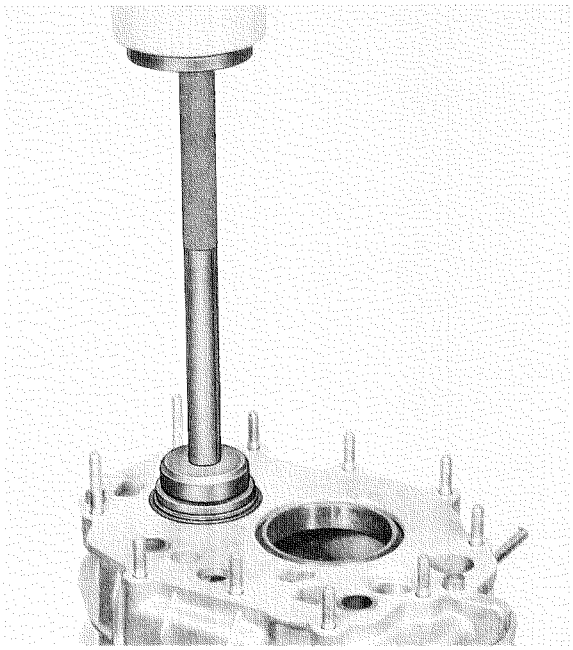


No.	Description	Qty.	Note When: Removing	Installing
1	Plug	1		torque: 30 Nm (22 ftlb)
2	Seal ring	1		fit replacement
3	Bolt	1		apply Loctite 640, screw in and torque to 23 Nm (16 ftlb)
4	Washer	1		
5	Oil guide cube	1		install right way round
6	O-ring	1		fit replacement
7	Retaining ring	1	remove with a suitable screwdriver	
8	Cylindrical roller bearing	1	heat gearbox to approx. 120°C and using special tools P 254 and P 254 b, press out of outer race	heat gearbox to approx. 120°C and using special tools P 254 and P 254 b, press in over outer race
9	Snap ring	1		
10	Retaining ring	1	remove with suitable screwdriver	
11	Bearing outer race	1	working from inside, press out with special tools P 254 and P 254 a	press in with special tools P 254 and P 254 a
12	Snap ring	1		
13	Ball sleeve	2	press out with suitable mandrel	fit replacement, press in flush with special tool 9254
14	Gearbox	1		

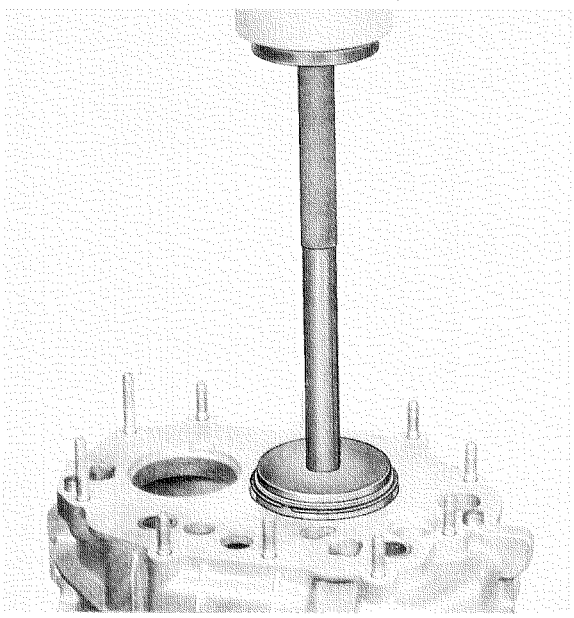
NOTES ON ASSEMBLING

Assembling:

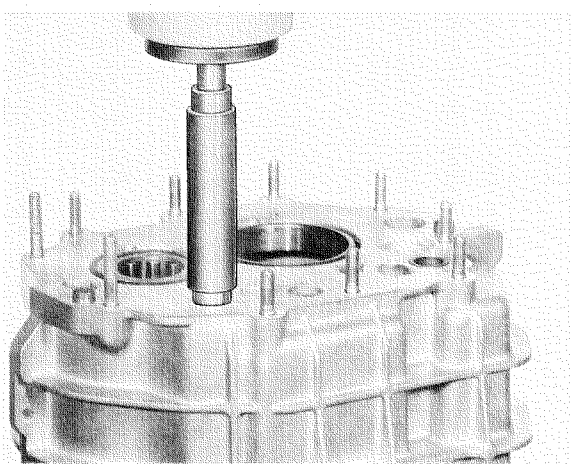
1. Heat gearbox to approx. 120°C and, using special tools P254 and P 254 b, press cylindrical roller bearing outer race for input shaft in until correctly seated.



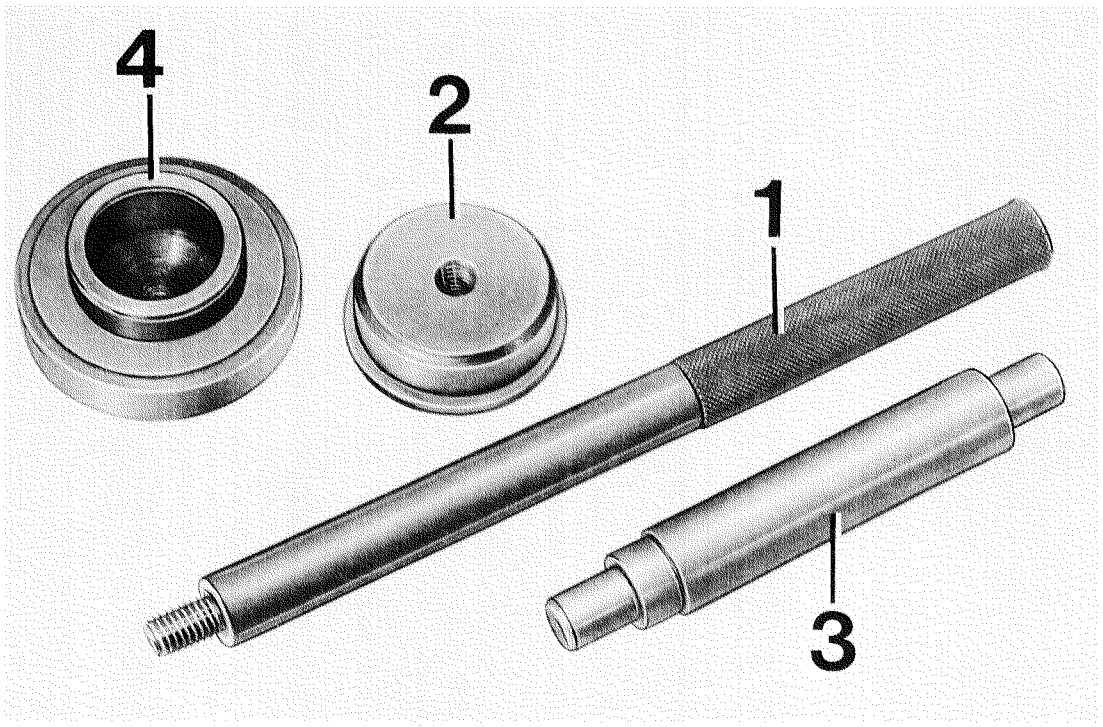
2. Heat gearbox to approx. 120°C and using special tool P 254 and P 254 a, press in cylindrical roller bearing outer race for drive pinion until seated.



3. Using special tool 9254, press in bearing sleeves until flush.

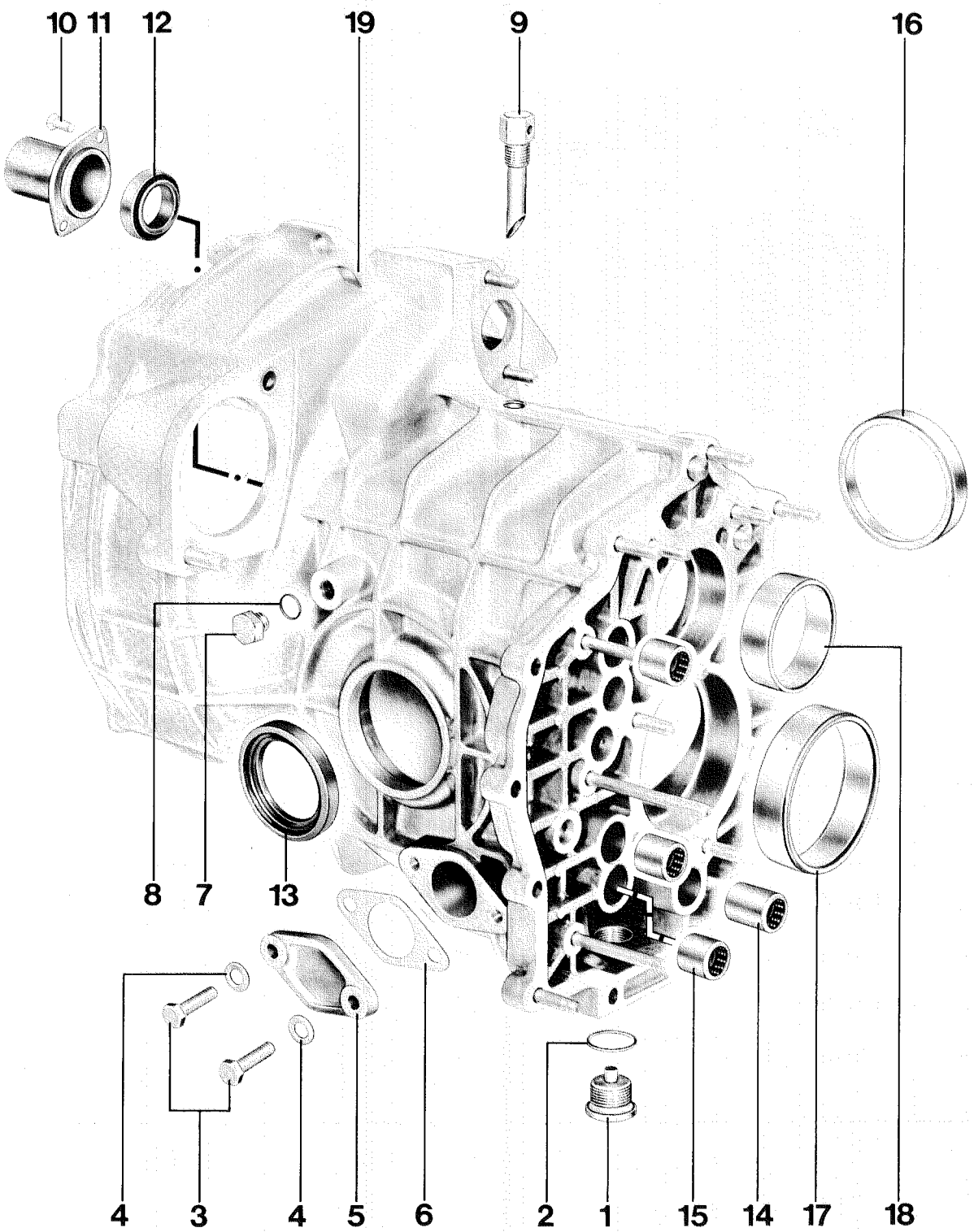


TOOLS



No.	Description	Special Tools	Remarks
1	Mandrel	-	of P 254
2	Thrust piece	P 254 b	
3	Mandrel	9254	
4	Thrust piece	9252	

DISASSEMBLING AND ASSEMBLING TRANSMISSION CASE



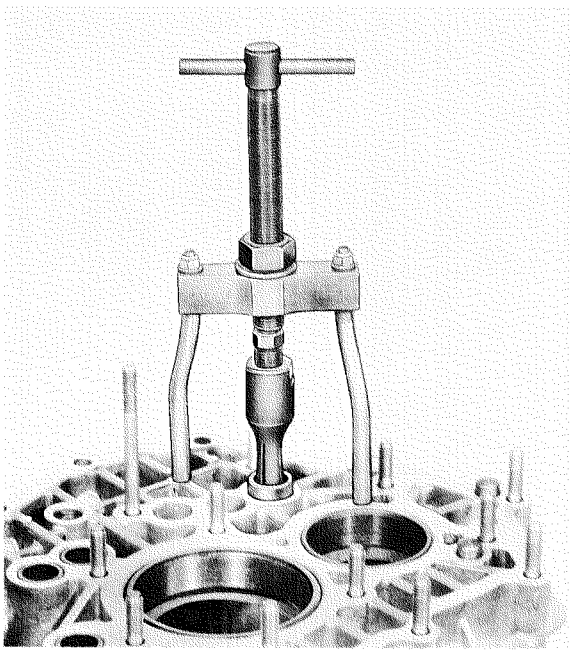
No.	Description	Qty.	Note When: Removing	Installing
1	Threaded plug	1		clean, torque to 30 Nm (22 ftlb)
2	Seal ring	1		fit replacement
3	Hex. screw	2		torque: 23 Nm (16 ftlb)
4	Washer	2		
5	Flange	1		
6	Gasket	1		fit replacement
7	Threaded plug	1		torque: 23 Nm (16 ftlb)
8	Seal ring	1		fit replacement
9	Breather	1		torque: 35 Nm (26 ftlb). Note installation position
10	Cap screw	2		torque: 10 Nm (7 ftlb)
11	Guide tube	1		
12	Shaft sealing ring	1		do not install until after assembly of gear set (see also Page 34-113)
13	Shaft sealing ring	1		drive in until seated using special tool 9252. Pack space between dust excluder and sealing lip with Silubrin Grease S, manu. Klüber
14	Bearing sleeve	1	remove with suitable internal puller (e.g. Schrem 14-20)	press in flush with special tool 9254

No.	Description	Qty.	Note When: Removing	Installing
15	Bearing sleeve	3	remove with suitable internal puller (e.g. Schrem 14-20)	press in flush with special tool 9254
16	Bearing outer race	1	heat transmission case to approx. 120°C and drive out with suitable mandrel	heat transmission case to approx. 120°C and press in with suitable thrust piece
17	Bearing outer race	1	heat transmission case to approx. 120°C and drive out with suitable mandrel	heat transmission case to approx. 120°C and using suitable thrust piece (e.g. VW 204 b) press in until seated
18	Bearing outer race	1	Heat transmission case to approx. 120°C and remove with suitable internal puller (e.g. Schrem 50-60)	heat transmission case to approx. 120°C and using special tools P 254 and 254 b, press in until seated
19	Transmission case	1		

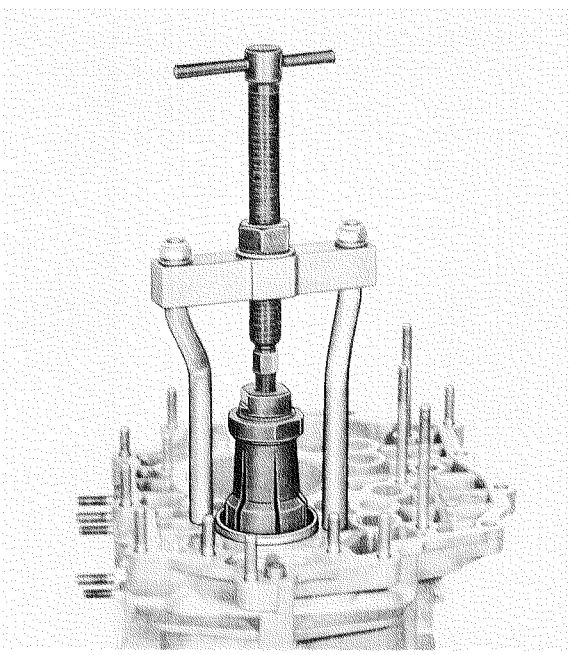
INSTRUCTIONS FOR DISASSEMBLY AND ASSEMBLY

Disassembling:

1. Remove bearing sleeves with suitable internal puller (e.g. Schrem 14-20).



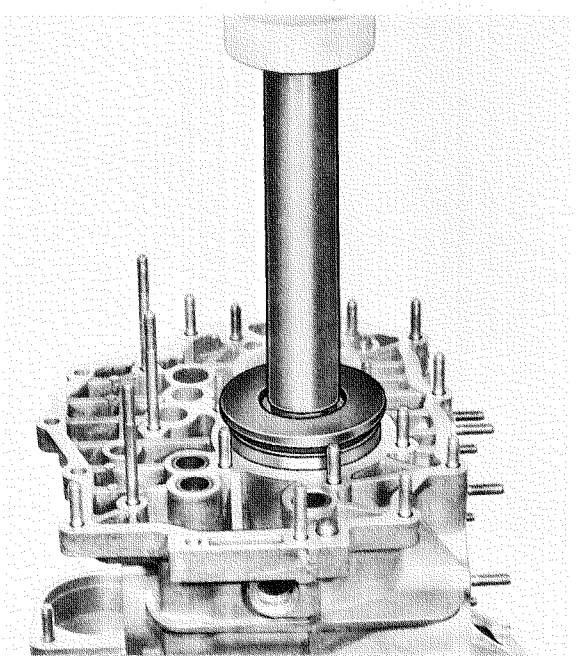
2. Remove outer race of input shaft cylindrical roller bearing with suitable internal puller (e. g. Schrem 50-60).



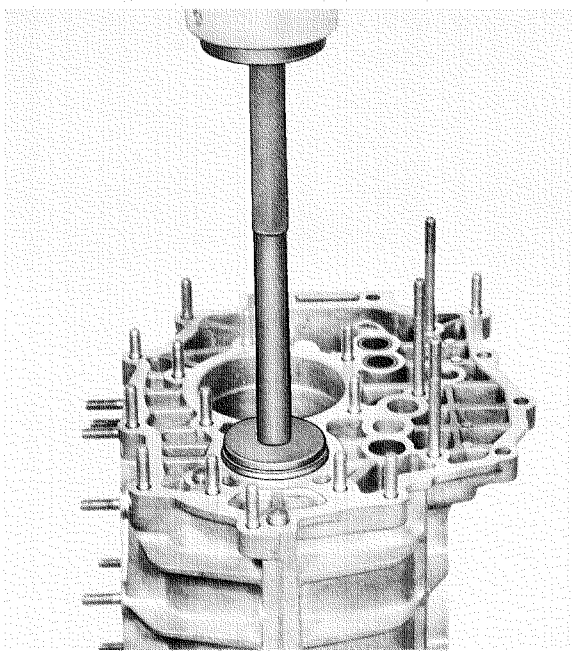
Assembling:

1. Clean transmission case and inspect for wear, external damage and cracks. In the case of drive pinion or ring gear damage (e.g. fracture), check bearing holes in centre case web for damage. Replace transmission case, if necessary.

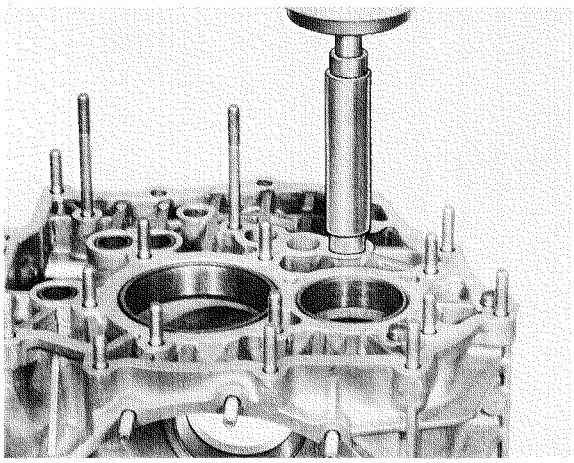
2. Heat transmission case to approx. 120°C and using suitable thrust piece (e.g. VW 204 b), press outer race of drive pinion bearing in until seated.



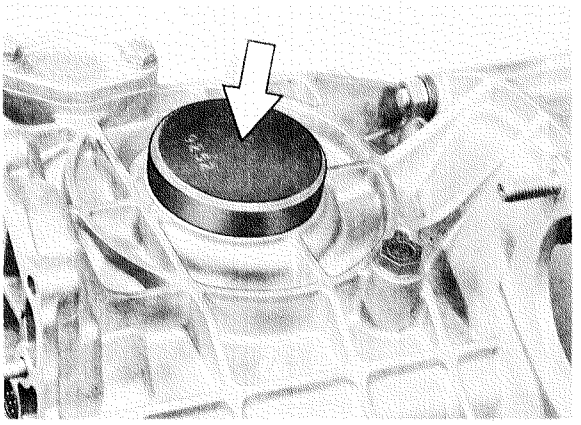
3. Heat transmission case to approx. 120°C and using special tools P 254 and 254 b, press outer race of input shaft bearing in until seated.



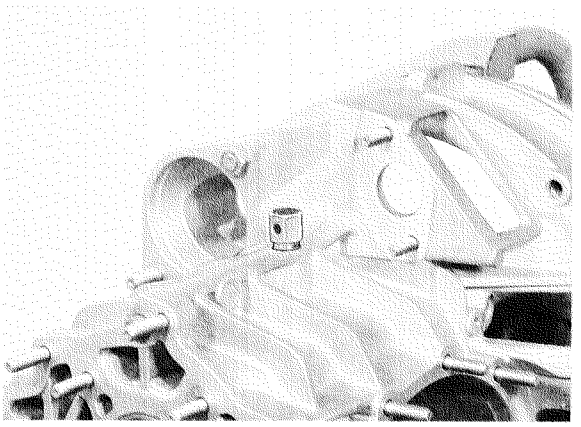
4. Using special tool 9254, press in bearing sleeves flush.



5. With special tool 9252, press seal ring into case until seated.



6. Screw in breather right way round and tighten with 35 Nm (26 ftlb).



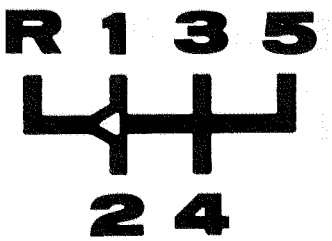
Note:
The hole in one of the faces of the breather head must face forward (toward front transmission cover) in forward direction of travel.

DISASSEMBLING AND ASSEMBLING SHIFT LINKAGE, 87 MODELS ONWARD

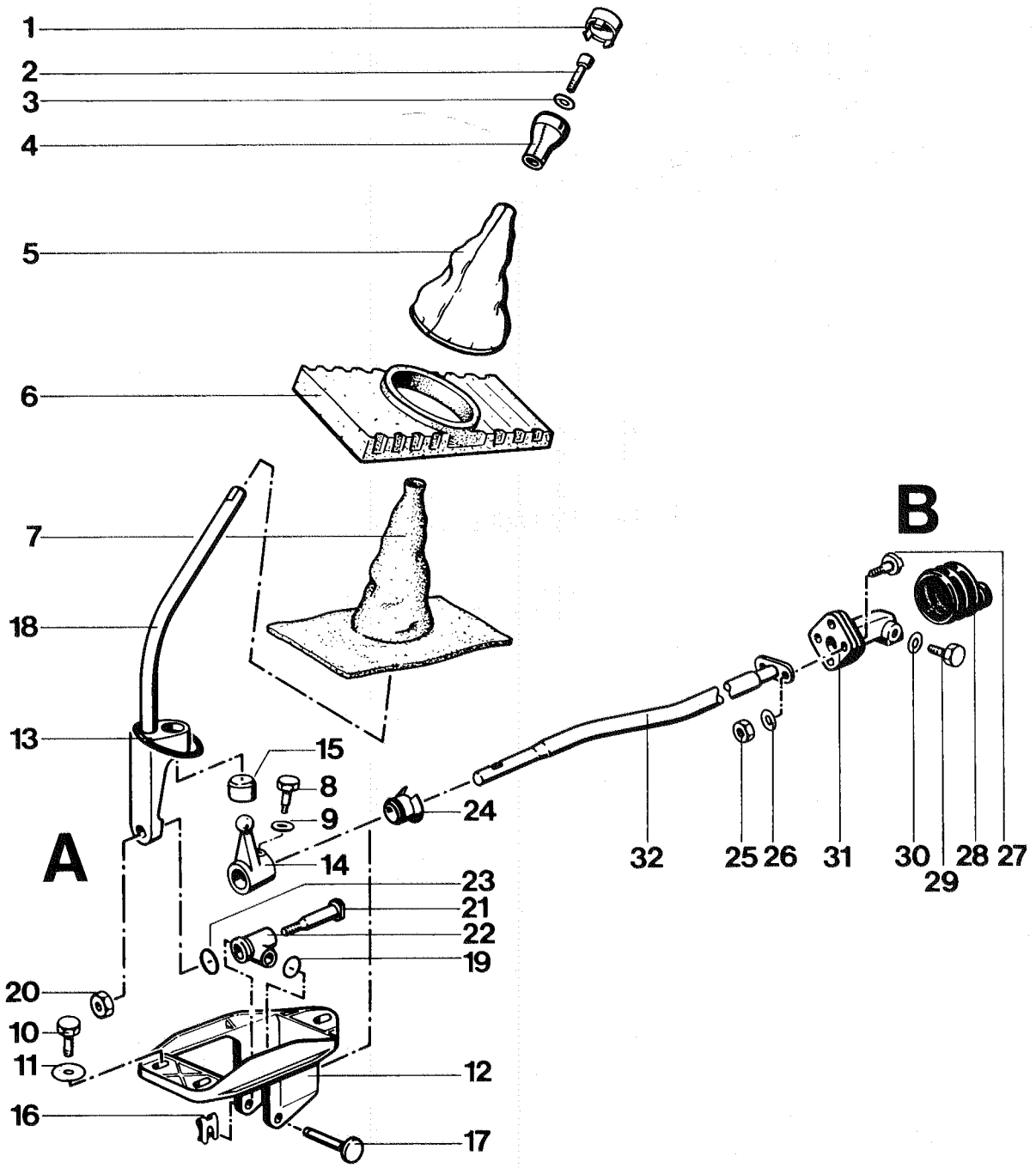
General

The completely new transmission (type G 50)* installed in 87 models onward has entailed modification of the shift lever bracket and the shift linkage.

The shift lever is moved to the left and forward to engage reverse gear.
A gate in the transmission facilitates precise shifts.



* Also designated Type 950 in some cases in the technical documents.


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No.	Description	Qty.	Note When: Removing	Installing
1	Cover with symbol	1		
2	Panhead screw	1		Tightening torque 10 Nm (7 ftlb)
3	Washer	1		
4	Shift lever knob	1	Pull, do not turn	Install right way round
5	Leather boot	1		Align
6	Support (foam plastic) for leather boot	1		Replace if necessary
7	Inner boot	1		
8	Locating bolt	1		Tightening torque 23 Nm (16 ftlb). Same part as No. 29
9	Washer	1		
10	Hex bolt	3		Before tightening (torque 23 Nm, 16 ftlb) adjust gear shift, p. 34 - 156
11	Washer	3		
12	Shift lever bracket	1		
13	Rubber ring (only cars without catalytic converter as of 28 Aug. 86)**	1		Lubricate shift lever and other rubber parts with universal low-temperature grease*
14	Selector rod head	1		
15	Ball joint	1		Install with universal low-temperature grease*
16	Circlip	1		Replace if necessary

* E.g. from Texaco. See Materials Table (TI Group X) for other permissible greases. Remove all traces of original grease.

** See Quality Information Group 3 for retrofitting.

No.	Description	Qty.	Note When: Removing	Installing
17	Bearing pin	1		Coat with universal low-temperature grease*
18	Shift lever	1		
19	O-ring	1		Replace if necessary
20	Hex nut	1		Torque: 23 Nm (16 ftlb)
21	Threaded stud	1		Use universal low-temperature grease*
22	Shift-lever bearing	1		
23	O-ring	1		Replace if necessary
24	Slide ring	1		Use universal low-temperature grease* Recess faces upward
25	Hex nut	2		Torque: 14 Nm (10 ftlb)
26	Washer	2		
27	Special screw	2		
28	Sealing sleeve with O-ring	1		
29	Locating bolt	1		Torque: 23 Nm (16 ftlb) Same part as No. 8
30	Washer	1		
31	Bearing unit rubber washer	1		
32	Selector rod as of 28 Aug. 86 with external insulating hose**	1		Coat with universal low-temperature grease* in area of slide ring No. 24

* E.g. from Texaco. See Materials Table (TI Group X) for other permissible greases. Remove all traces of original grease.

** See Quality Information Group 3 for retrofitting.

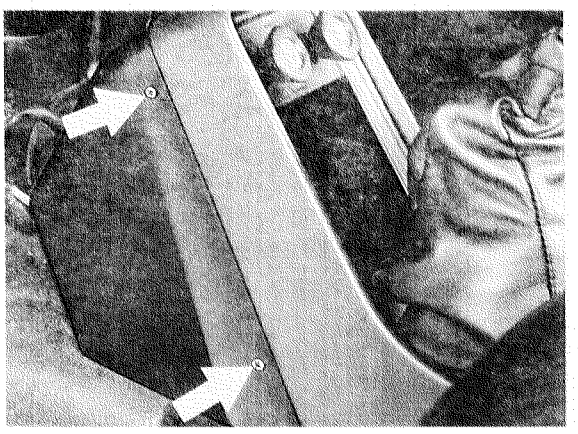
NOTES ON DISASSEMBLING AND ASSEMBLING

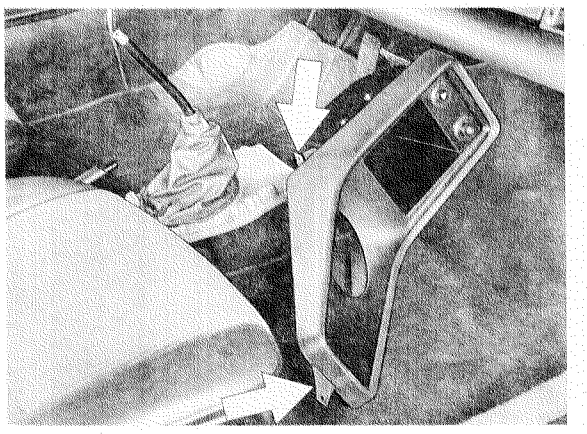
Disassembling

1. Carefully ease cap with symbol (cover with gearshift diagram) out of shift-lever knob.

2. Remove mounting screw from shift-lever knob and remove knob (pull knob, do not turn).

3. Remove center console and place to one side without disconnecting electrics.
Console is held in place by 3 screws. Remove the center console panel to gain access to the 2 front screws.

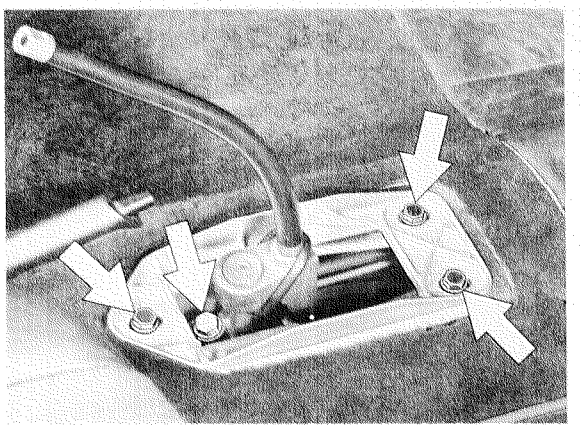




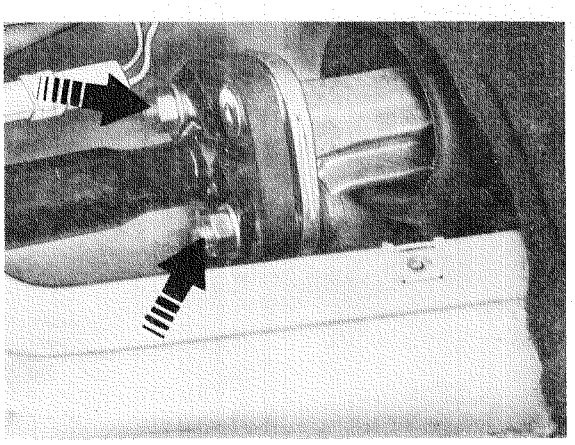
4. Remove boot and foam-plastic support.

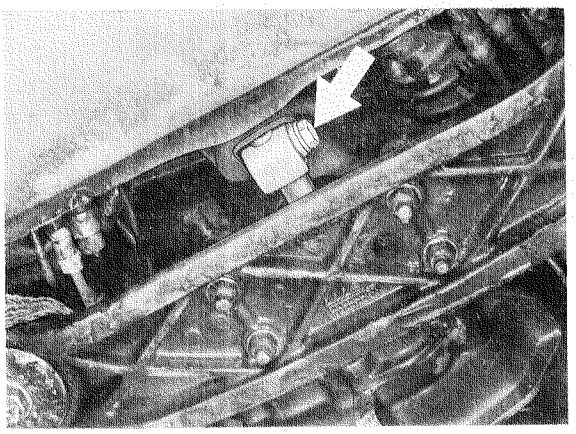
5. Remove shift-lever bracket complete with shift lever (A).
To do so, select 4th gear (to gain space for removing) and remove the selector rod securing bolt (locating bolt) and the three shift-lever bracket securing bolts.

Beforehand, remove bearing unit (B) as described below (6.), if this step is necessary.



6.To remove bearing unit (B), remove tunnel cover in front of rear seat and undo connection to selector rod (2 hex nuts).
After removing the locating bolt, separate bearing unit from transmission.





Assembling

1.Note lubricating instructions and tightening torques (p. 34 - 153/154).

2.If bearing unit (B) has been removed, begin by installing shift-lever bracket with shift lever (A) in car.

If bearing unit was not removed, check that the following parts are correctly seated after the shift-lever bracket has been positioned:

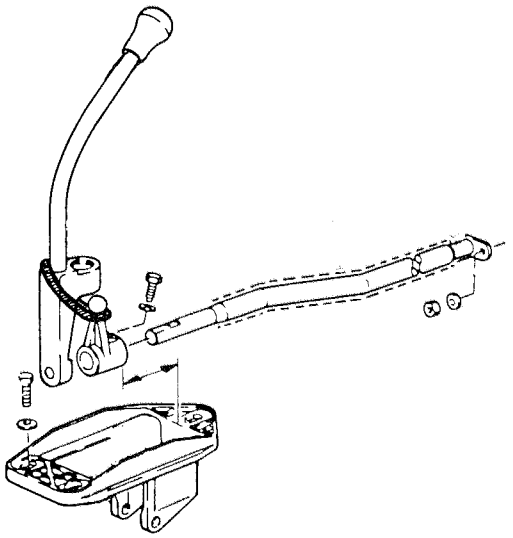
- Circlip No. 16 of bearing pin
- Slide ring No. 24 of selector rod

3.Adjusting gear shift:

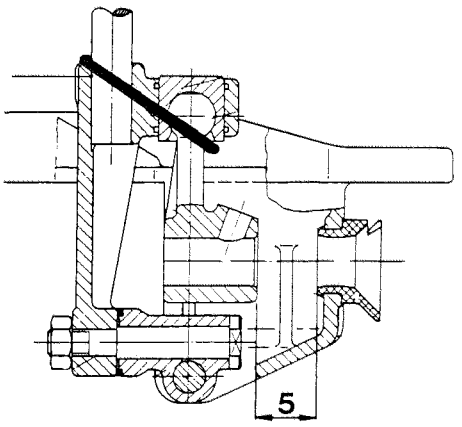
- all other bolts except the 3 shift-lever bracket securing bolts tightened.

- 4th gear selected.

- installation gap between slide ring (No. 24) in shift-lever bracket and selector rod head (No. 14) of shift lever 5 mm. If necessary, correct by moving shift-lever bracket. When gap is correct (a 5 mm twist drill can be used to check gap) tighten shift-lever bracket securing bolts. Torque: 23 Nm (16 ftlb).

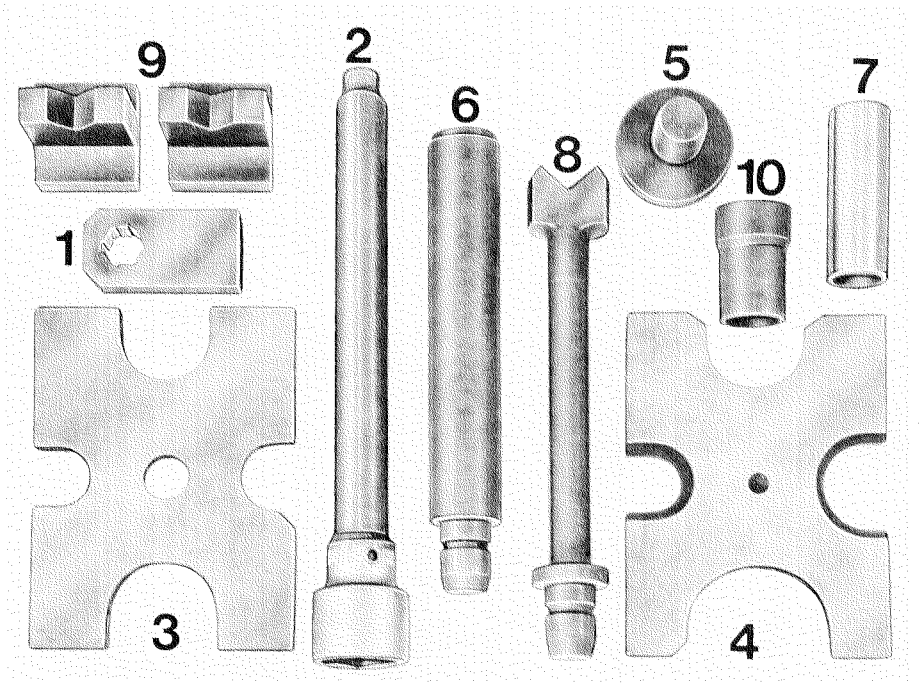


Detail:
Setting gap 5 mm
4th gear selected



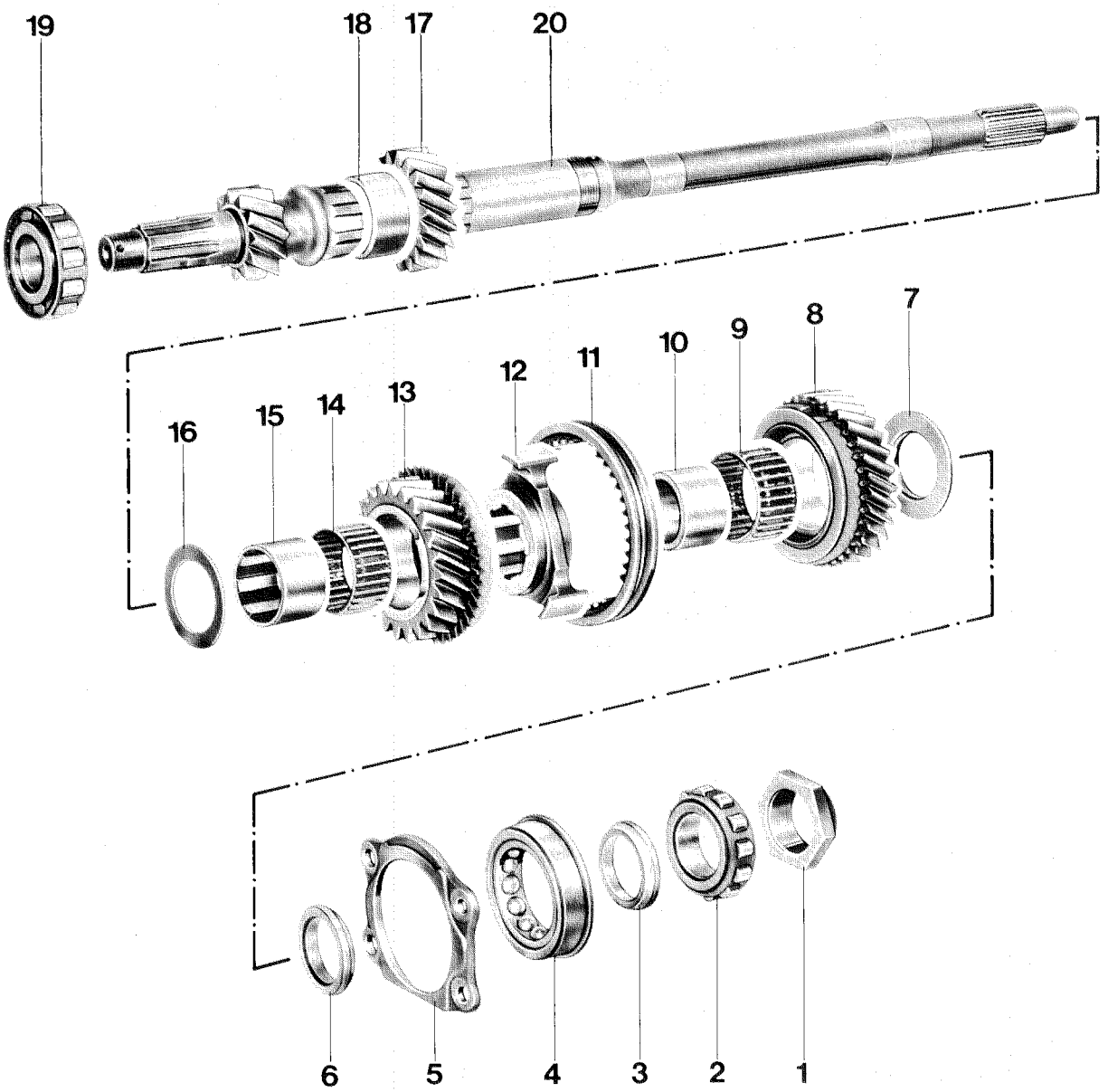
4.Install remaining parts.

TOOLS



No.	Description	Special Tools	Remarks
1	Holder	P 355 a	
2	Socket wrench	9105	
3	Pressure plate	VW 401	
4	Pressure plate	VW 402	
5	Pressure pad	VW 412	
6	Pressure pad	VW 407	
7	Pipe	VW 416 b	
8	Pressure pad	VW 406	
9	Take-up	VW 405	Two pieces
10	Thrust piece	VW 454	

DISASSEMBLING AND ASSEMBLING DRIVE SHAFT



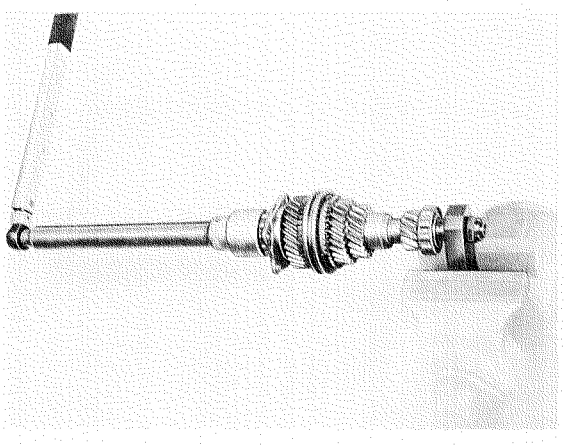
No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Collar nut	1	Loosen with P 252 a	Torque: 230 Nm (166 ftlb) Lock by punching collar.	
2	Cyl. roller bearing	1	Press off with VW 401, VW 402 and VW 412	Heat to approx. 120 °C/250 °F and press on with VW 401, VW 402 and VW 407.	
3	Bearing inner race	1		Heat to approx. 120 °C/250 °F and press on.	
4	Four point bearing	1			
5	Clamping plate	1			
6	Bearing inner race	1		Heat to approx. 120 °C/250 °F and press on.	
7	Thrust washer	1		Large, ground side faces needle cage	
8	Gear, 4th speed	1		Check synchronization; replace only in pairs	
9	Needle cage	1	Mark	Install with same gear	
10	Sleeve	1	Mark	Install with same gear	
11	Operating sleeve	1		Check for wear	
12	Guide sleeve	1		Check for wear	

No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
13	Gear, 3rd speed	1		Check synchronization; replace only in pairs	
14	Needle cage	1	Mark	Install with same gear	
15	Sleeve	1	Mark	Install with same gear	
16	Thrust washer	1			
17	Gear, 2nd speed	1		Replace only in pairs. Mark and set code face 1st gear.	
18	Spacer	1			
19	Cyl. roller bearing	1	Press off with a piece of suitable pipe and VW 407.	Heat to approx. 120 °C/250 °F and press on with VW 407 and a piece of suitable pipe.	
20	Drive shaft	1			

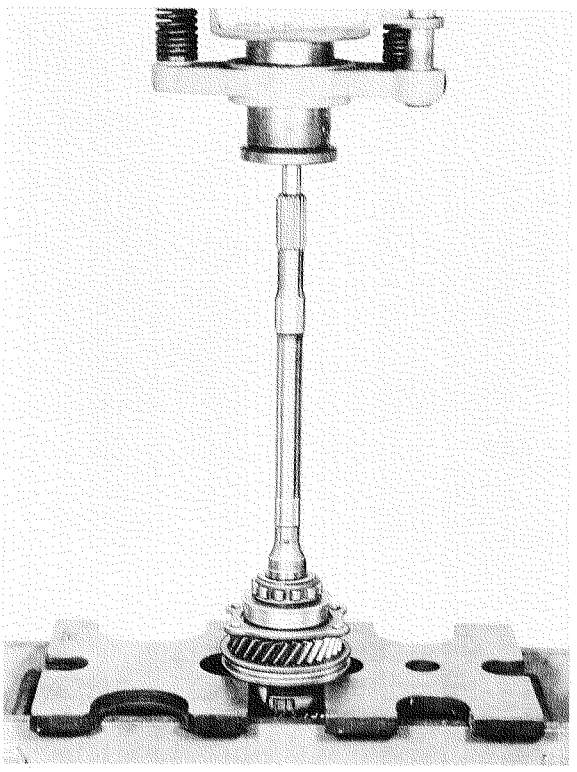
DISASSEMBLING AND ASSEMBLING DRIVE SHAFT

Disassembling

1. Clamp Special Tool P 355 a in a vise, mount drive shaft and unscrew collar nut with P 252 a.

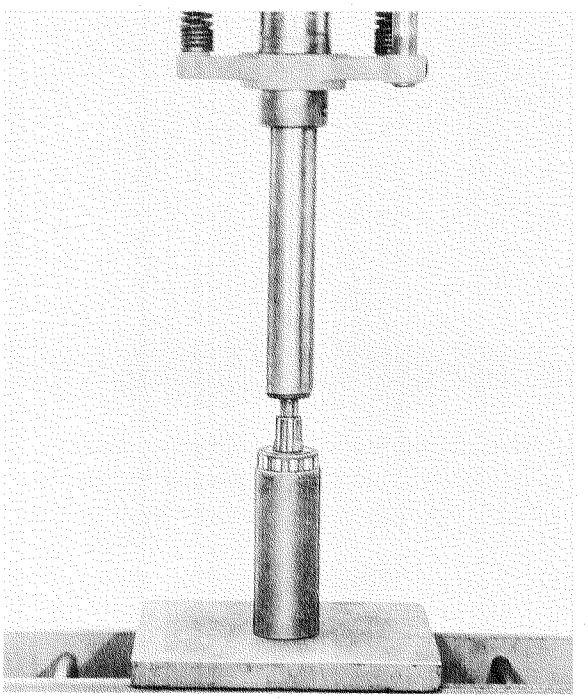


2. Press cylindrical roller bearing off of drive shaft with Special Tools VW 401, VW 402 and VW 412.



3. Mark needle bearings for re-installation later when pulling off the remaining parts.

4. Press cylindrical roller bearing off of drive shaft with a piece of suitable pipe and Special Tool VW 407.



Assembling

Note:

All drive shaft parts must be installed dry to keep oil away from the bearing surfaces.

1. Heat cylindrical roller bearing to approx. 120 °C/250 °F and press on with Special Tools VW 412 and VW 416 b.



2. Heat cylindrical roller bearing to approx. 120 °C/250 °F and press on with Special Tools VW 401, VW 454 and VW 407.

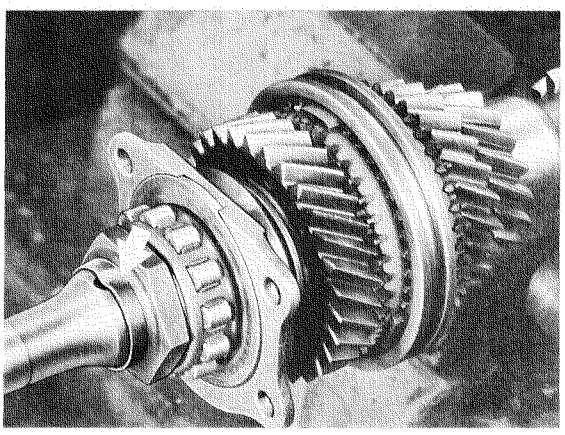


Note:

Used needle cages must be re-installed with the same gears.

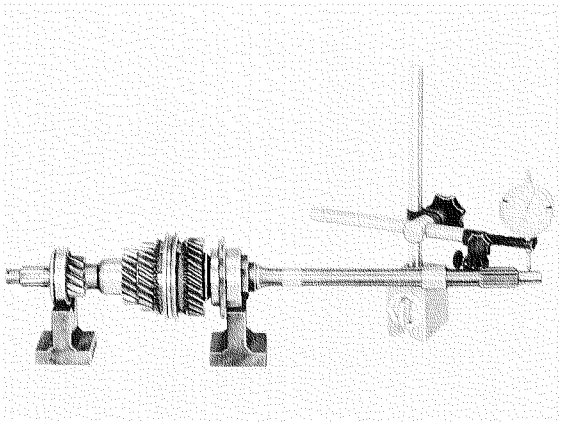
3. Tighten collar nut to torque of 230 Nm (166 ftlb) with Special Tools P 355 a and P 252 a.

4. Lock collar nut by punching collar.



CHECKING DRIVE SHAFT FOR RUNOUT

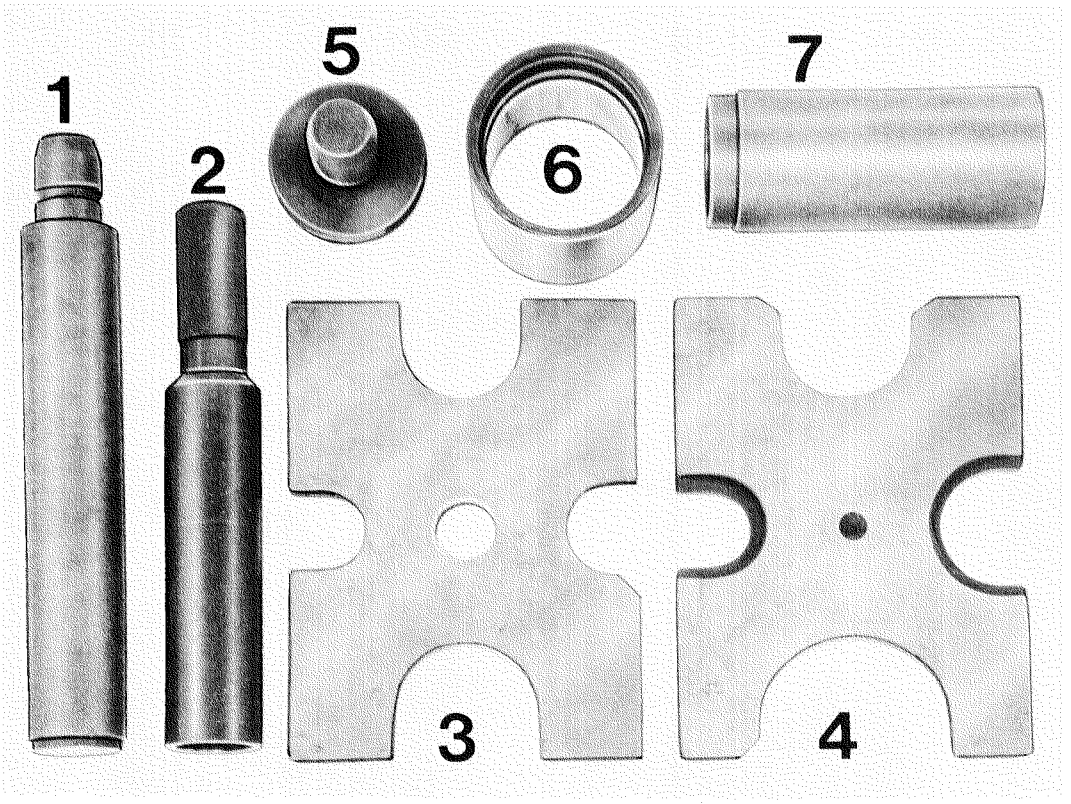
1. Always check runout on an installed drive shaft, since tightening the collar nut could produce a certain amount of runout on the shaft. Press outer races for roller bearings out of transmission case and gearbox to check runout. Testing is also possible with auxiliary bearings.



a) Place assembled drive shaft with mounted bearings on take-up rails and check runout on bearing journal for sleeve in flywheel. Max. runout: 0.1 mm.

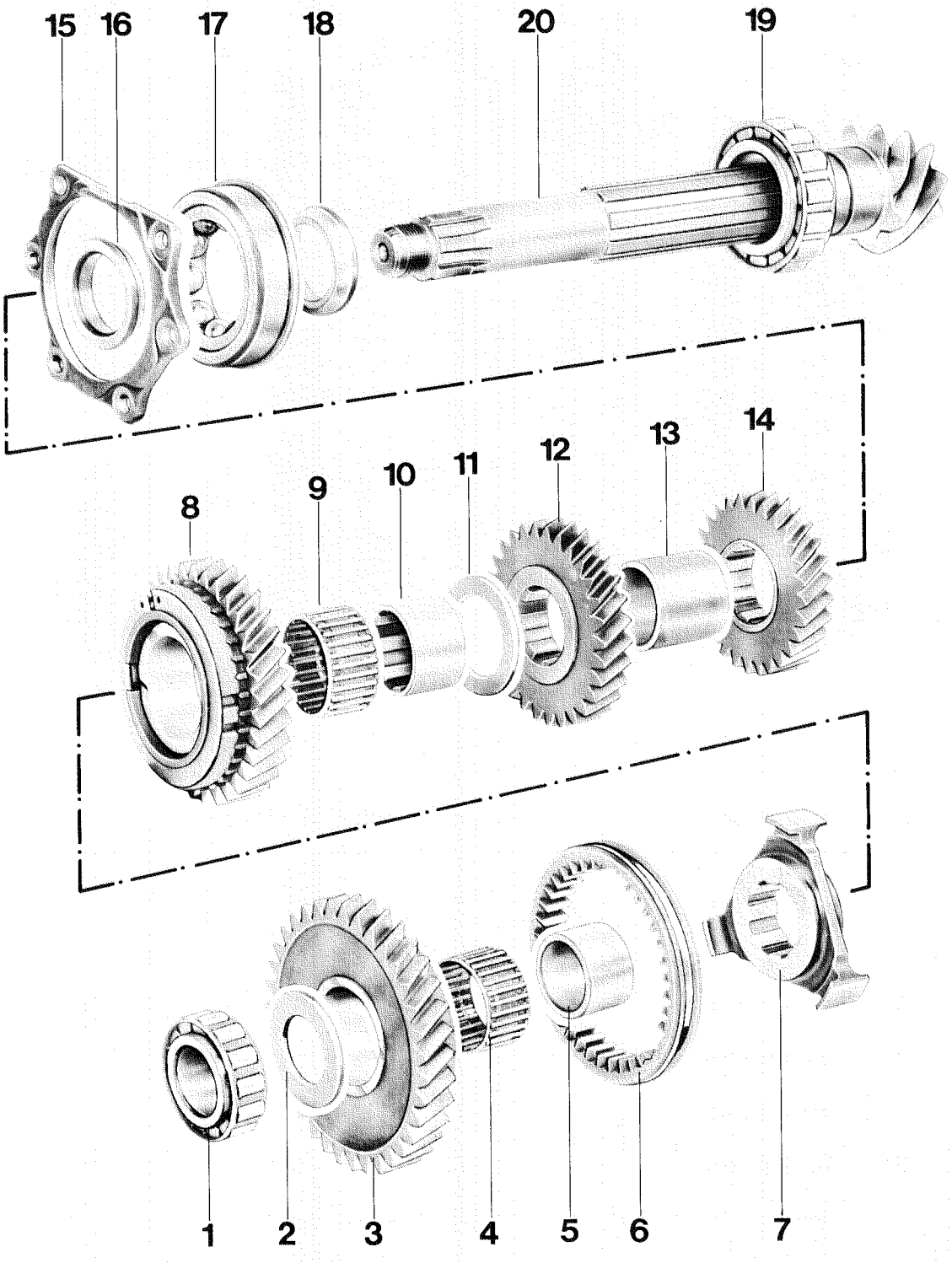
b) A drive shaft with excessive runout up to 0.3 mm can be straightened cold in a repair press with application of Special Tools VW 405 and VW 406.

TOOLS



No.	Description	Special Tools	Remarks
1	Pressure pad	VW 407	
2	Driving sleeve	VW 244 b	
3	Pressure plate	VW 401	
4	Pressure plate	VW 402	
5	Pressure pad	VW 412	
6	Guiding sleeve	P 255 a	
7	Pipe	VW 415 a	

DISASSEMBLING AND ASSEMBLING DRIVE PINION



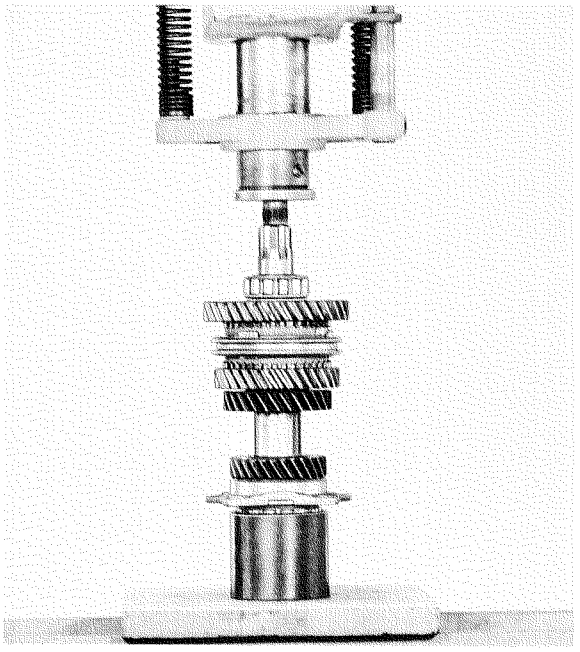
No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Cyl. roller bearing	1	Press off of pinion with VW 412 and P 255 a	Heat to approx. 120 °C/250 °F and drive on with VW 401, VW 412 and VW 244 b	
2	Thrust washer	1			
3	Gear, 1st speed	1		Check synchronization; replace only in pairs	
4	Needle bearing	1	Mark for reassembly	Install with same gear	
5	Sleeve	1	Mark for reassembly	Install with same gear	
6	Operating sleeve	1		Check for wear. Asymmetric tooth tip and recess face 1st gear	
7	Guide sleeve	1		Check for wear	
8	Gear, 2nd speed	1		Check synchronization; replace only in pairs	
9	Needle cage	1	Mark for reassembly	Install with same gear	
10	Sleeve	1	Mark for reassembly	Install with same gear	
11	Thrust washer	1			

No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
12	Gear, 3rd speed	1		Large, ground surface faces thrust washer. Replace only in pairs.	
13	Spacer	1			
14	Gear, 4th speed	1		Large, ground surface faces four point bearing. Replace only in pairs.	
15	Clamping plate	1			
16	Bearing inner race	1	Press off with VW 412 and P 255 a	Heat to approx. 120 °C/250 °F and press on	
17	Four point bearing	1			
18	Bearing inner race	1	Press off with VW 412 and P 255 a	Heat to approx. 120 °C/250 °F and press on	
19	Cyl. roller bearing	1	Press off with VW 412 and P 255 a	Heat to approx. 120 °C/250 °F and press on with VW 407 and VW 415 a	
20	Drive pinion	1		Note pair number; adjust if necessary	

DISASSEMBLING AND ASSEMBLING DRIVE PINION

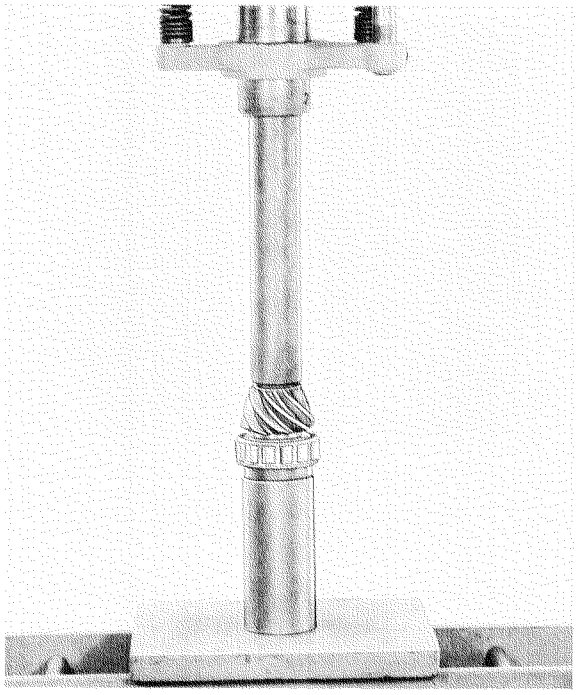
Disassembling

1. Press all parts off of drive pinion with Special Tools VW 412 and P 255 a.



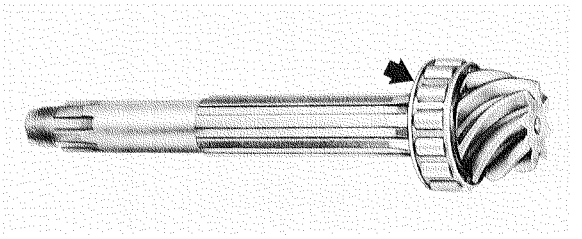
Note:

Mark needle bearings for reassembly.



Note:

Install bearing that collar of needle cage faces gear set.

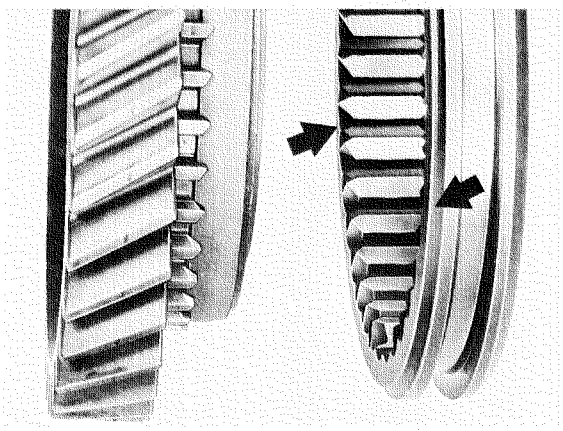


Assembling

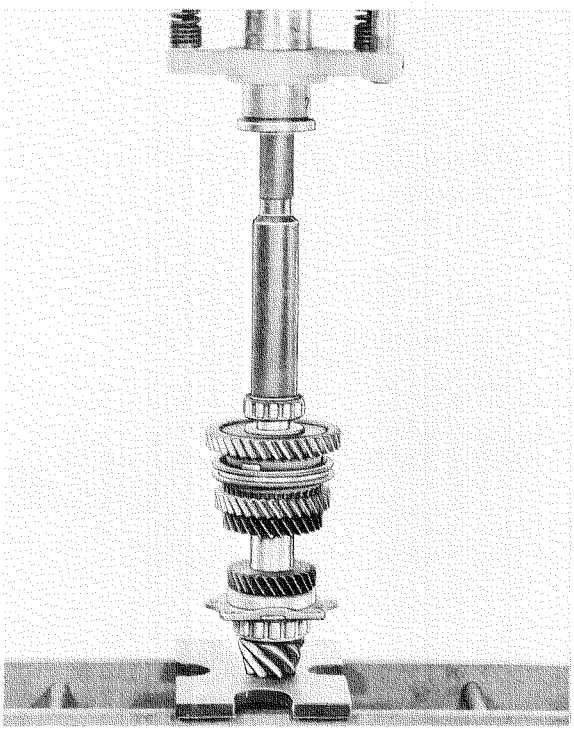
All drive pinion parts must be installed dry to prevent oil between the bearing surfaces. Drive pinion and ring gears have pair numbers, which must correspond with each other when assembling.

1. Press on cylindrical roller bearing with Special Tools VW 407 and VW 415 a.

2. Asymmetric tooth tip and recess of 1st/2nd gear operating sleeve must face the 1st gear wheel.



3. Press on small cylindrical roller bearing with Special Tools VW 401, VW 412 and VW 244 b.



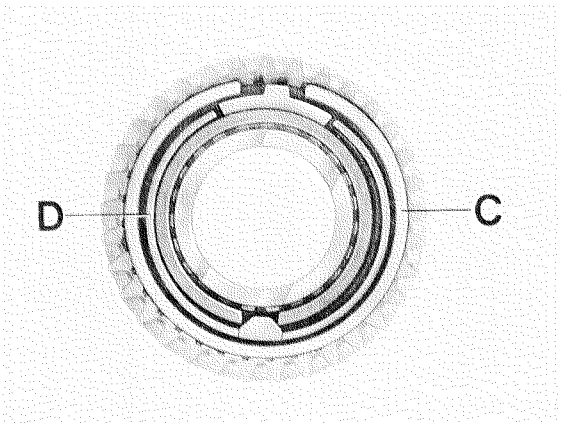
DISASSEMBLING AND ASSEMBLING SYNCHRONIZERS

Disassembling

1. Remove circlip and take out synchronizer ring with stops.



2nd gear synchronizing parts

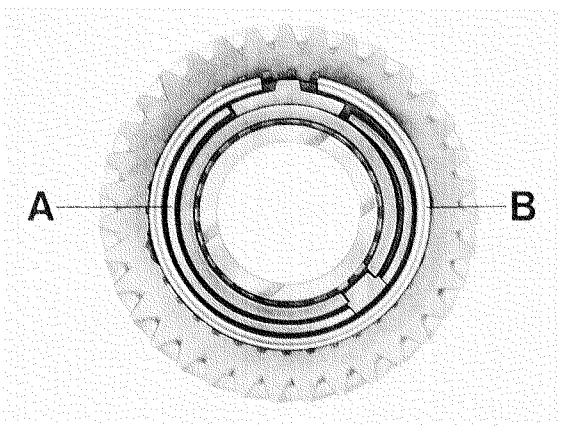


C – Synchronizer ring without groove
D – Symmetrical double shift band

Assembling

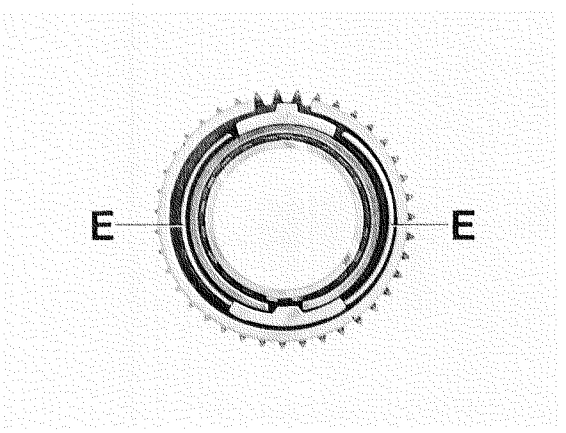
1. Insert stops and synchronizer ring.

1st gear synchronizing parts



A – Asymmetric double shift band
B – Synchronizer ring with groove

3rd, 4th and 5th gear synchronizing parts

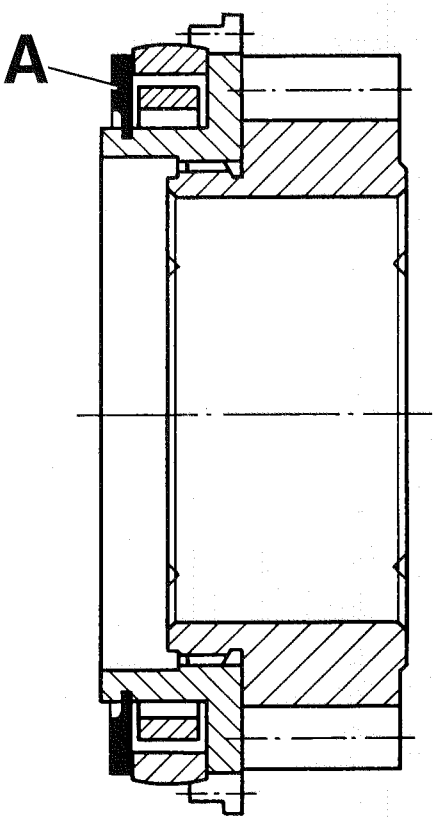


E – Split shift band

Note:

A coat of molybdenum is sprayed on the rough surface of a synchronizer ring. Different loads are applied to both sides of a synchronizer ring during a shift. Consequently when repairing the synchronizer ring should always be turned that the rough side faces the operating sleeve.

2. Install circlips.
   Circlip for 3rd, 4th and 5th gears must be inserted that stepped end faces the guide sleeve.

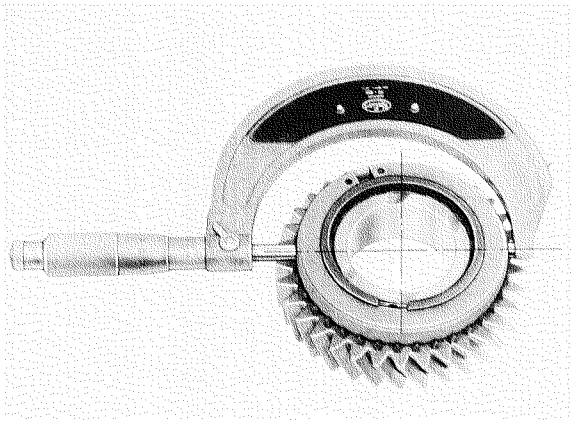


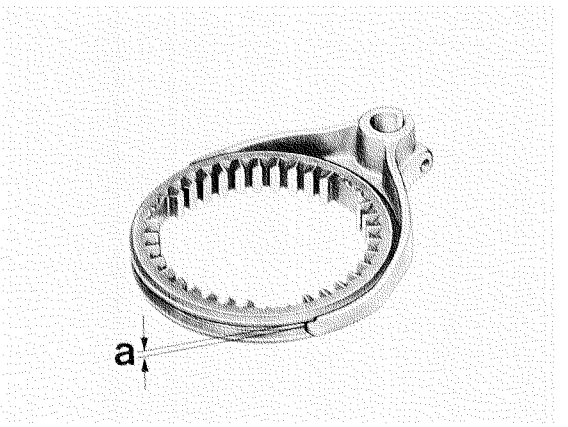
A – Circlip

Checking Synchronization

Check the following points to guarantee perfect synchronization.

1. Check installed diameter of synchronizer ring with a micrometer.



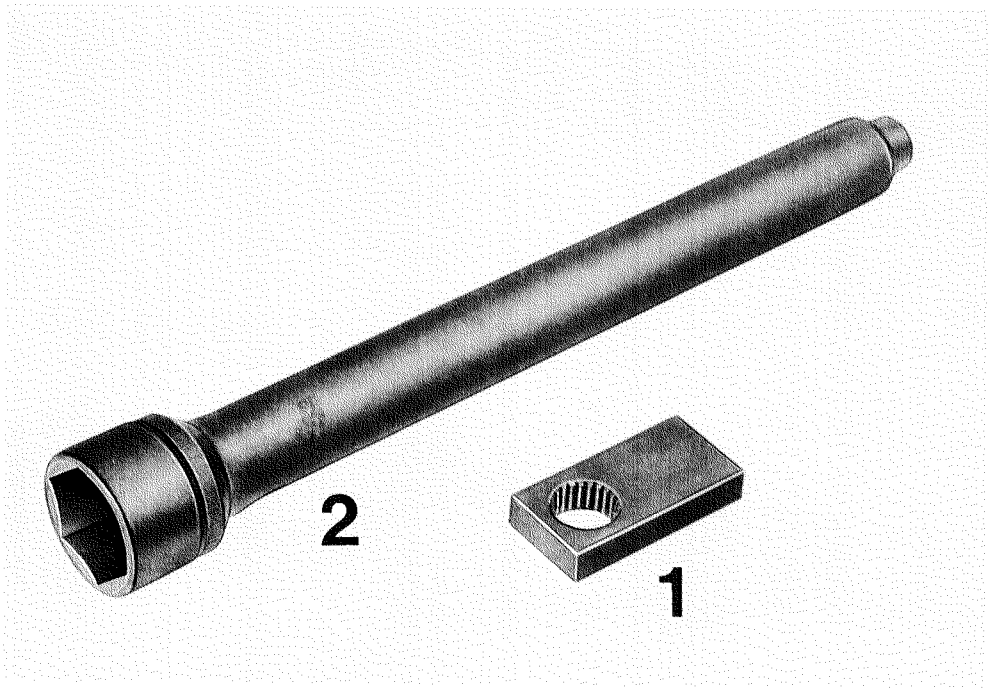


Diameters:

3rd, 4th and 5th gears = 76.3 ± 0.18 mm
1st and 2nd gears = 86.37 ± 0.17 mm

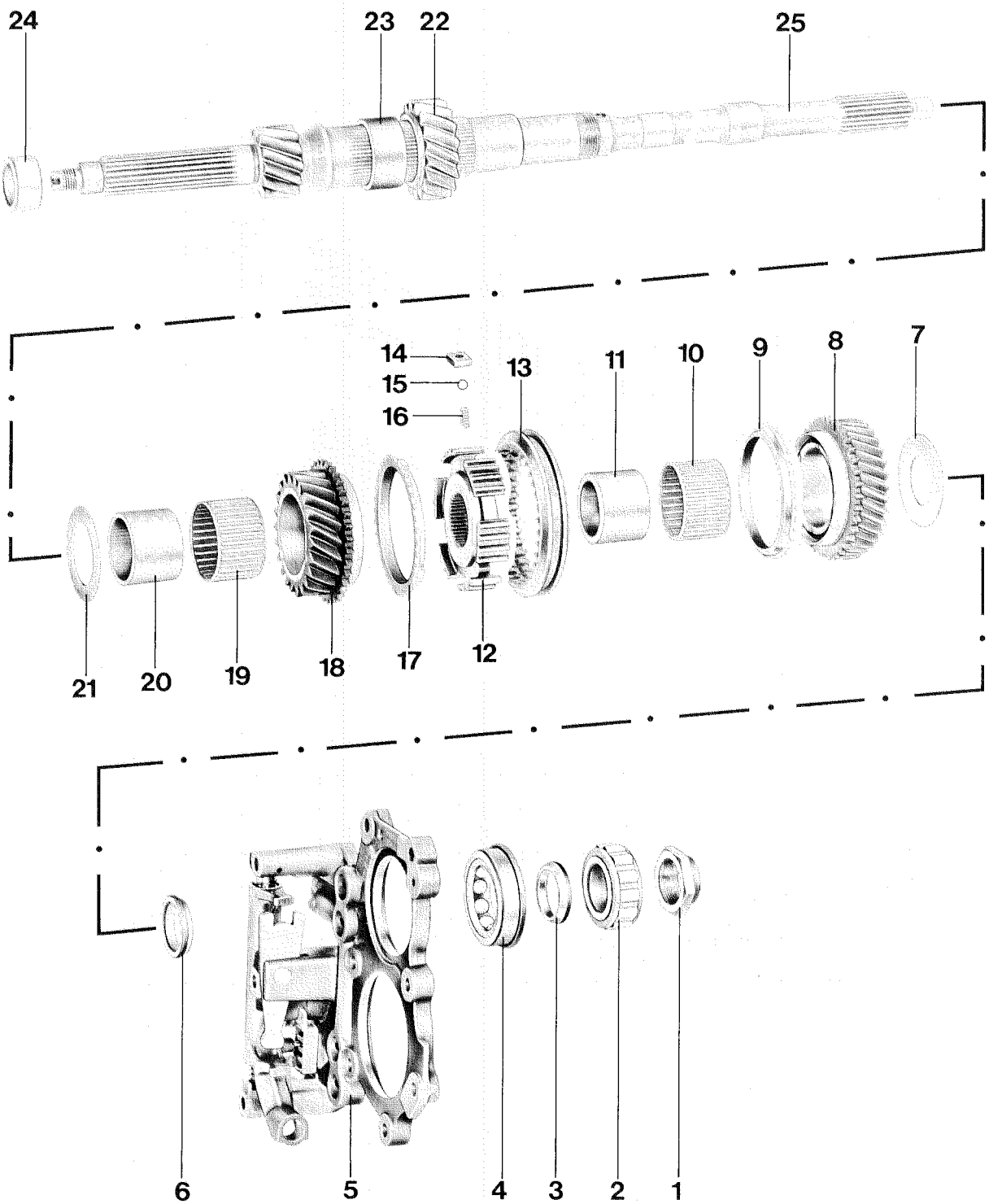
2. Check play between selector fork and operating sleeve of 1st through 5th gears. Distance "a" = max. 0.5 mm.

TOOLS



No.	Description	Special Tools	Remarks
1	Holder	9177	
2	Socket wrench	9105	

DISASSEMBLING AND ASSEMBLING INPUT SHAFT



No.	Description	Qty.	Note When: Removing	Installing
1	Collar nut	1	remove with special tools 9177 and 9105	Use special tools 9177 and 9105. Torque: 250 Nm (182 ftlb). Lock by punching collar.
2	Cylindrical roller bearing	1	press off with suitable tool (e.g. Kukko 17-1)	heat to approx. 120°C and press on with suitable drift
3	Bearing inner race	1	press off with suitable tool (e.g. Kukko 17-1)	heat to approx. 120°C and press on with suitable drift
4	Four-point bearing	1		
5	Clamping plate	1		install long locking piece, with dowels in place, push selector rod/fork for the 3rd and 4th gears into selector sleeve and mount clamping plate (note position of locking pieces, see page 34-110)
6	Bearing inner race	1	press off with suitable tool (e.g. Kukko 17-1)	heat to approx. 120°C and press in with suitable drift
7	Thrust washer	1		large, ground side faces needle cage
8	Free gear (4th gear)	1		always replace as a pair
9	Synchronizing ring	1	mark for reinstallation	inspect for wear, install right way round with original gear (nubs toward intercept stops)
10	Needle cage	1	mark	install with original gear

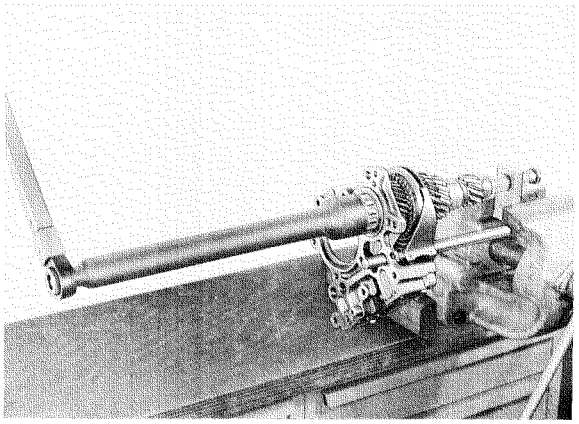
No.	Description	Qty.	Note When: Removing	Installing
11	Inner race	1		heat to approx. 120°C and press on
12	Guide sleeve	1	remove together with operating sleeve	guide sleeve + operat. sleeve are paired, install together with operating sleeve and synchronizing parts
13	Operating sleeve (3rd + 4th gear)	1	spring-loaded synchronizing parts may jump out, mark for reinstallation	check installing position, install together with guide sleeve and synchronizing parts always renew as a pair
14	Intercept stops	3		install right way round
15	Ball	3		
16	Spring	3		free length = 11.8 ± 0.2 mm, thickness of wire = 0.8 mm. Do not confuse with springs for 1st and 2nd gears
17	Synchronizing ring	1	mark for reinstallation	inspect for wear, assemble right way round with original gear (nubs toward intercept stops)
18	Free gear (3rd gear)	1		always replace as a pair
19	Needle cage	1	mark for reinstallation	assemble with original gear
20	Inner race	1		heat to approx. 120°C and press on
21	Thurst washer (1.85 mm thick)	1		
22	Fixed gear (2nd gear)	1		always replace as a pair. Collar faces toward spacer

No.	Description	Qty.	Note When: Removing	Installing
23	Spacer	1		
24	Cylindrical roller bearing inner race	1	press off with suitable tool (e.g. Kukko 17-0)	heat to approx. 120°C and press on
25	Input shaft	1		

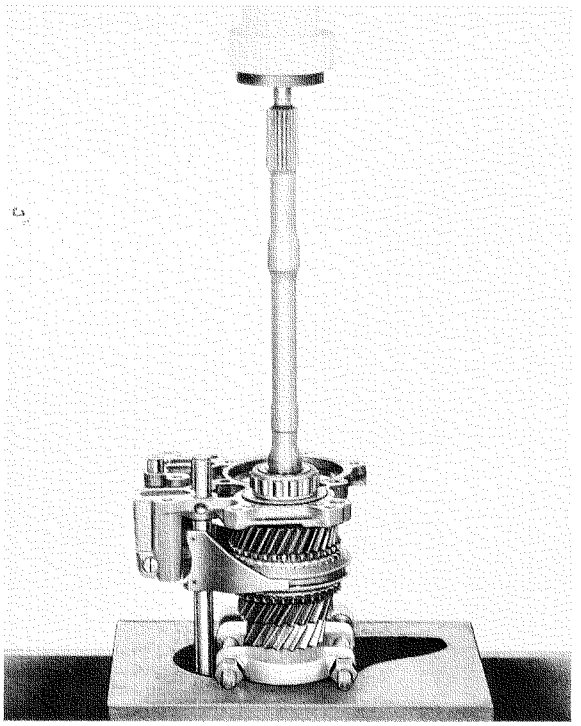
DISASSEMBLING AND ASSEMBLING INPUT SHAFT

Disassembling:

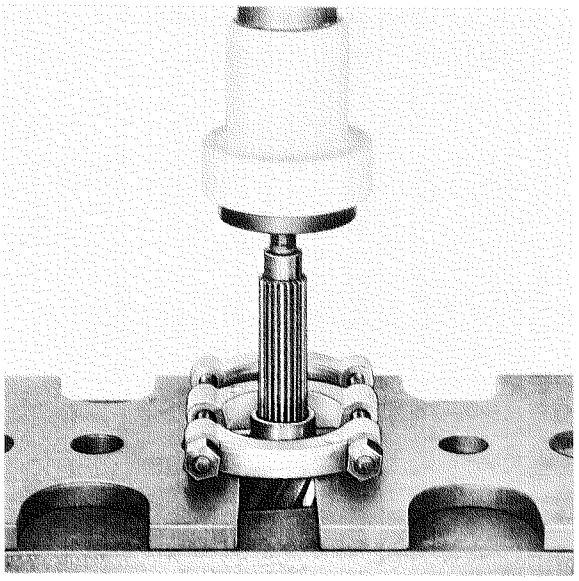
1. Clamp holder 9177 in vise, mount input shaft and unscrew collar nut with special tool 9105.



2. Press all components off input shaft with a suitable tool (e.g. Kukko 17-1).



3. Press off bearing inner race with suitable tool (e.g. Kukko 17-0).

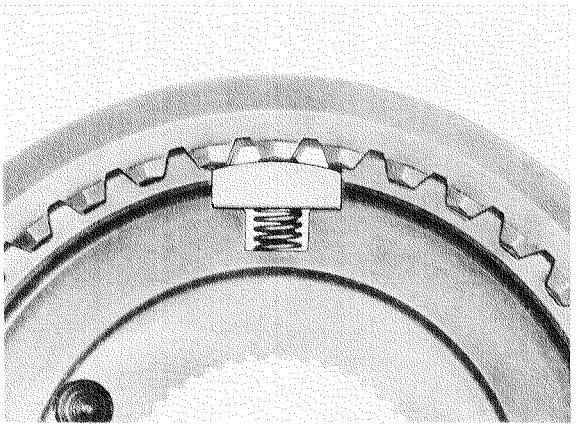


Assembling:

Note:

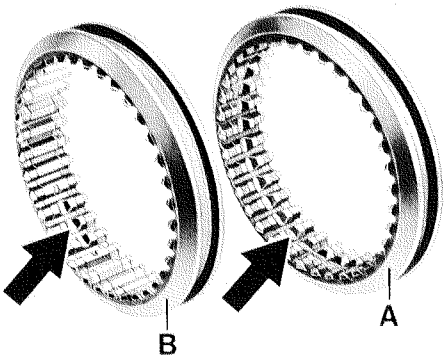
Install all input shaft components dry, to prevent oil from reaching the contact surfaces.

1. Install intercept stops for synchronization right way round (convex side toward operating sleeve).



Note:

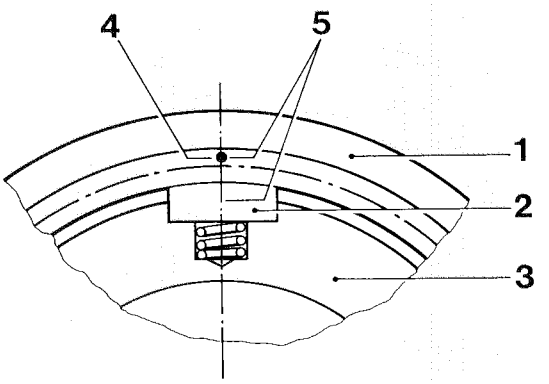
A modified gear shift sleeve will be installed as from 13.01.87 (3 cut-in pockets instead of the rotary groove).



87-852

A - with rotary groove
B - with 3 pockets

The new gear shift sleeve has center marks in the area of the pockets for installation, which must be mounted concentric to the driving dogs.

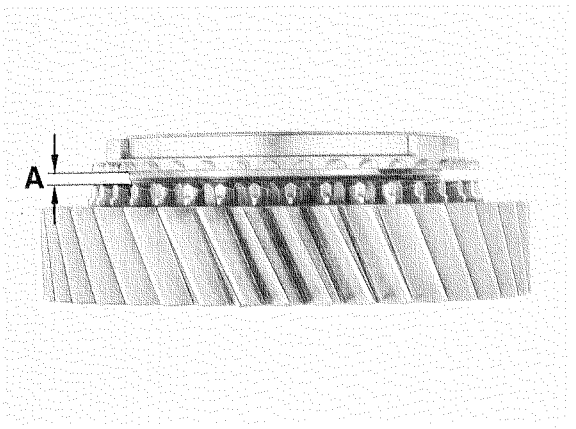


55-35

1 - Gear shift sleeve
2 - Driving dog
3 - Guide sleeve
4 - Center mark
5 - Installation position

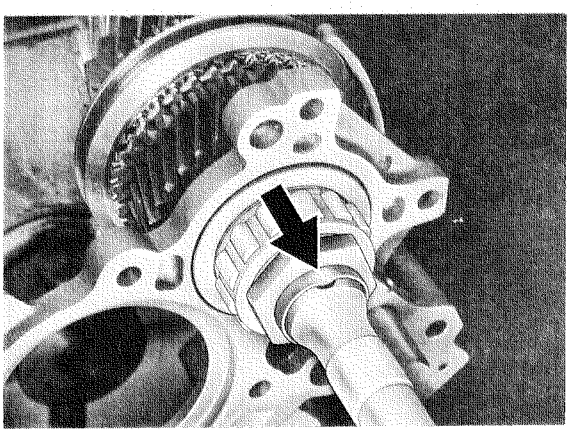
2. Check synchronizing rings by pressing rings onto cones of gearwheels and measuring gap "A" with a feeler gauge.

   Specified gap (new) = min. 0.9 mm
   Wear limit = 0.6...0.7 mm

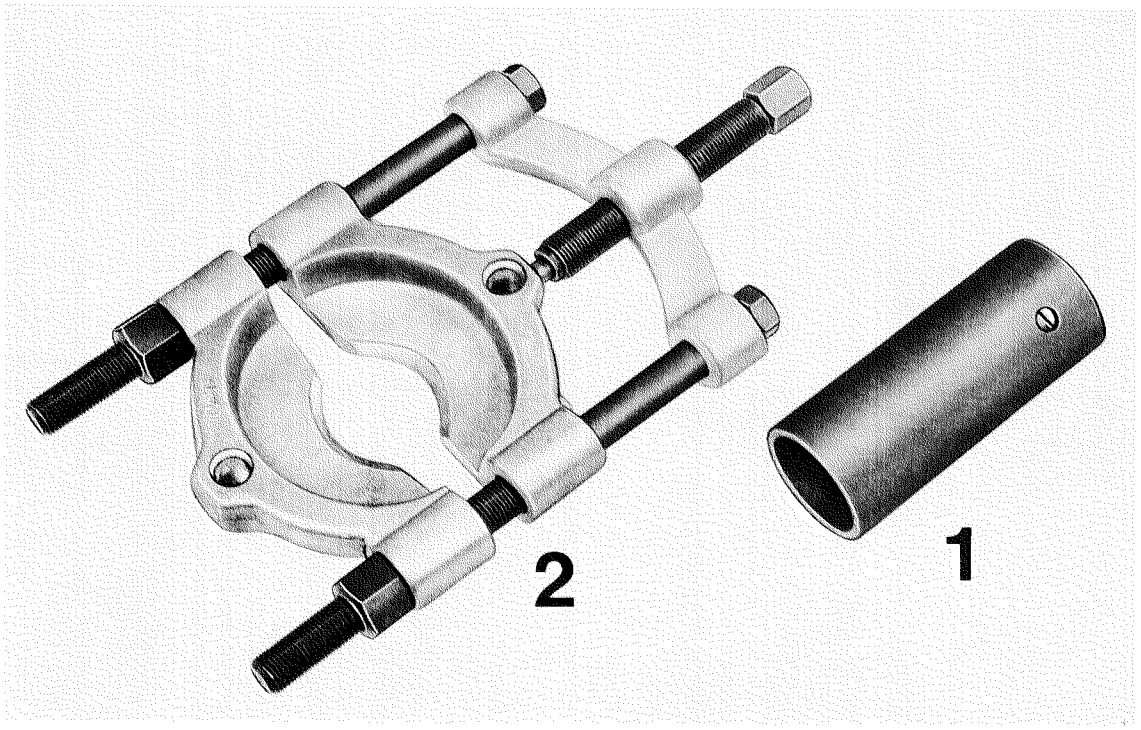


3. Using special tools 9177 and 9105, tighten collar nut to 250 Nm (182 ftlb).

4. Lock collar nut by punching collar.

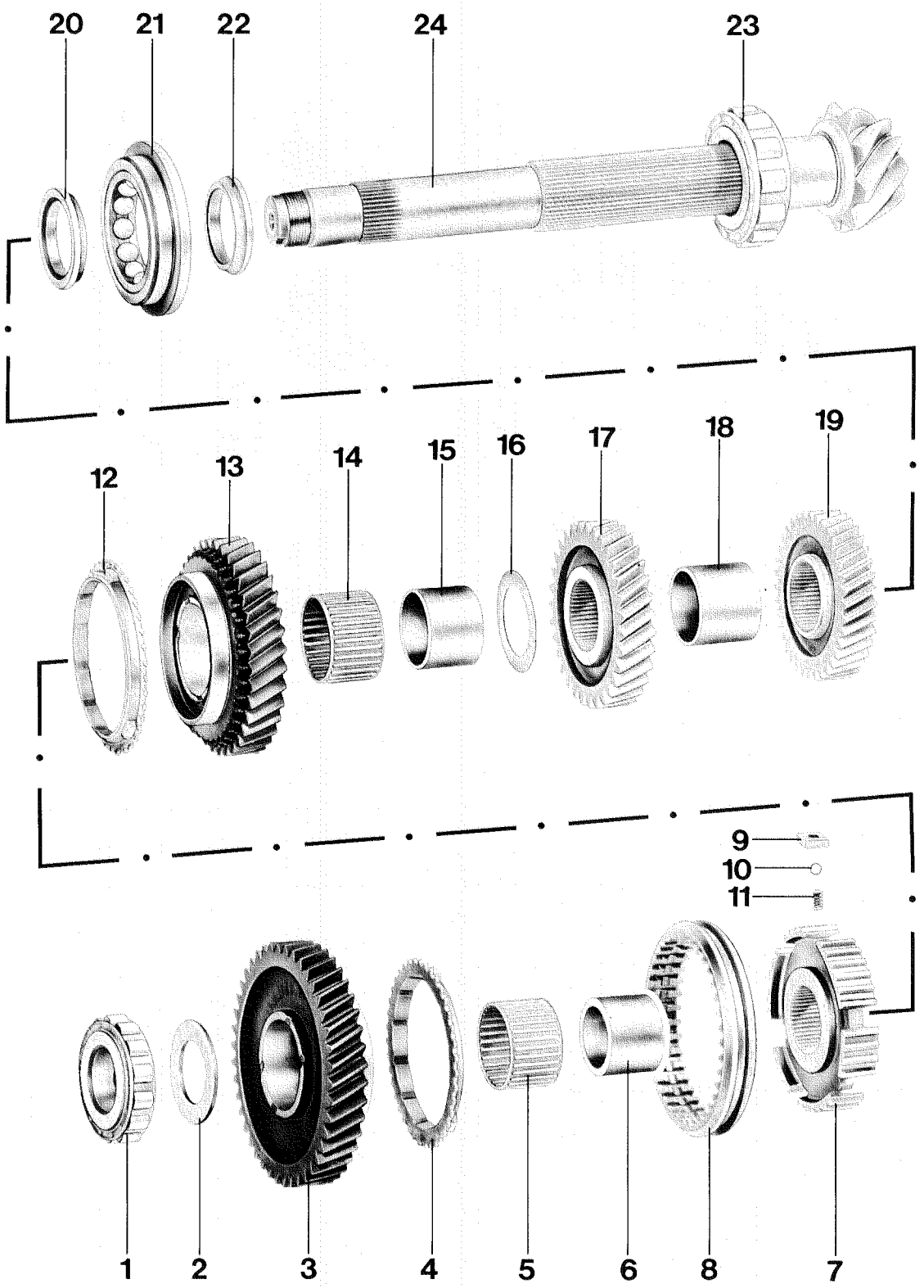


TOOLS



No.	Description	Special Tools	Remarks
1	Drift	VW 519	
2	Separating tool	-	commercially available (e.g. Kukko 15-17)

DISASSEMBLING AND ASSEMBLING DRIVE PINION



No.	Description	Qty.	Note When: Removing	Installing
1	Cyl. roller bearing	1		heat to approx. 120°C
2	Thrust washer (3 mm thick)*	1		always check thickness of washer. Do not confuse with washer No. 38 on page 34-105
3	Free gear (1st gear)	1		always renew as a pair
4	Synchronizing ring	1	mark for reinstallation	check for wear, install right way round with original gear (nubs toward intercept stops)
5	Needle cage	1	mark for reinstallation	reinstall with original gear
6	Inner race	1	mark for reinstallation	reassemble with original gear. Heat to approx. 120°C
7	Guide sleeve	1	remove with operating sleeve	always renew as a pair install together with operating sleeve and synchronizing parts
8	Operating sleeve (1st + 2nd gear)	1	spring-loaded synchronizing parts may jump out	always renew as a pair install together with guide sleeve and synchronizing parts
9	Intercept stop (with guide nose)	3		do not confuse with stop for 3rd to 5th and reverse gears
10	Ball	3		
11	Spring	3	mark for reinstallation	free length, 10.7 ± 0.2 mm, thickness of wire 0.9 mm. Do not confuse with springs for 3rd to 5th and reverse gears

* Consider modification on page 34 - 107!

No.	Description	Qty.	Note When: Removing	Installing
12	Synchronizing ring	1	mark for reinstallation	check for wear, re-assemble right way round with original gear (nubs toward intercept stops)
13	Free gear (2nd gear)	1		always renew as a pair
14	Needle cage	1	mark for reinstallation	reassemble with original gear
15	Inner race	1	mark for reinstallation	reassemble with original gear
16	Thrust washer (1.4 mm thick)	1		
17	Fixed gear (3rd gear)	1		always renew as a pair. Larger collar faces toward thrust washer
18	Spacer	1		
19	Fixed gear (4th gear)	1		always renew as a pair. Larger collar faces toward four-point bearing
20	Bearing inner race**	1	press off with suitable separating tool (e.g. Kukko 15-17)	heat to approx. 120°C and press on
21	Four-point bearing	1		

No.	Description	Qty.	Note When: Removing	Installing
22	Bearing inner race**	1	press off with suitable separating tool (e.g. Kukko 15-17)	heat to approx. 120°C and press on
23	Cyl. roller bearing	1	press off with suitable separating tool (e.g. Kukko 15-17)	heat to approx. 120°C and, using a suitable drift (e.g. VW 519) press on right way round
24	Drive pinion	1		check pairing number, readjust if necessary

Note:

Items 1 through 18 are removed and installed without removing the drive pinion (see page 34-105).

** Different inner races on the G50/50 turbo gearbox. Observe the installation position (see page 35 - 116).

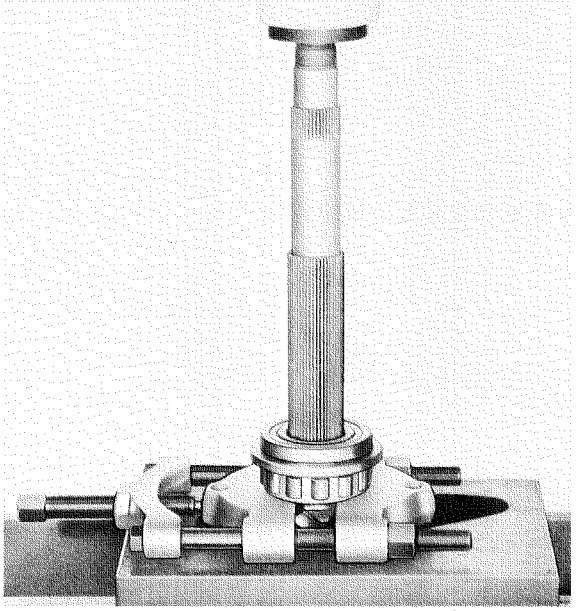
DISASSEMBLING AND ASSEMBLING DRIVE PINION

Disassembling

Note:

To facilitate work, the drive pinion is partially disassembled before removal (see "Disassembling and Assembling Transmission", page 34-101).

1. Remove cylindrical roller bearing and four-point bearing with suitable separating tool (e.g. Kukko 15-17).



Assembling

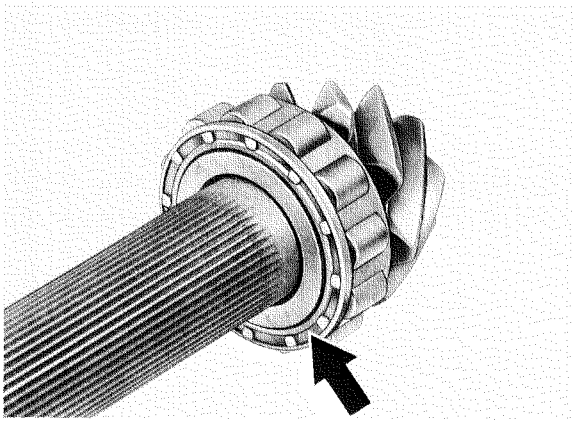
Note:

Assemble all drive-pinion components dry to prevent oil penetrating between the contact surfaces. Drive pinion and ring gear are marked with pairing numbers which must correspond when the components are assembled.

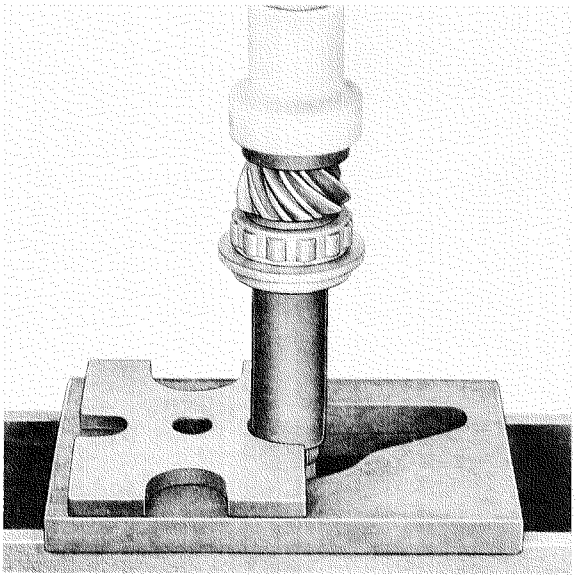
1. Heat cylindrical roller bearing to approx. 120°C and press on right way round.

Note:

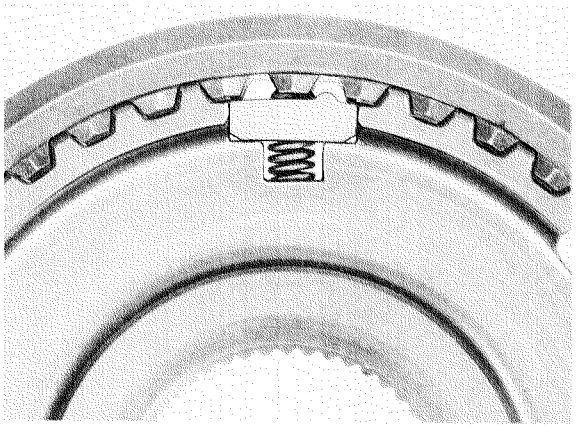
Install bearing with collar of roller cage facing gear set.



2. Heat the inner race for the four-point bearing to approx. 120 °C (250 °F) and press on the suitable pipe section (e.g. VW 519).

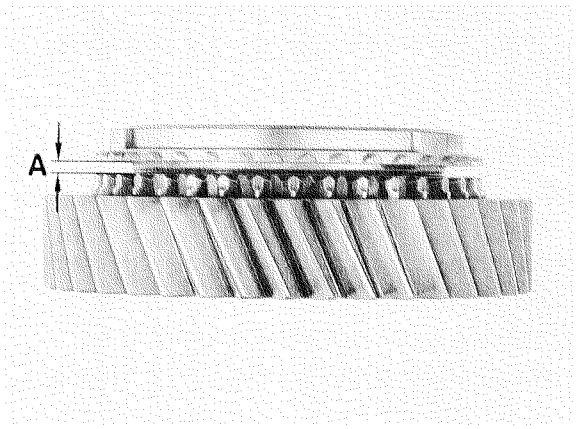


3. Mount the driving dogs for the synchronization with the lug towards the gear shift sleeve, whereby the lug may point to either left or right.



4. Check the synchronizer disks by pressing them on to the cones of the gear wheels and measuring distance "A" with a feeler gauge.

Installation dimension (new) = min. 1.1 mm
Wear limit = 0.6....0.7 mm



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Deviations for the G50/50 turbo gearbox

Note

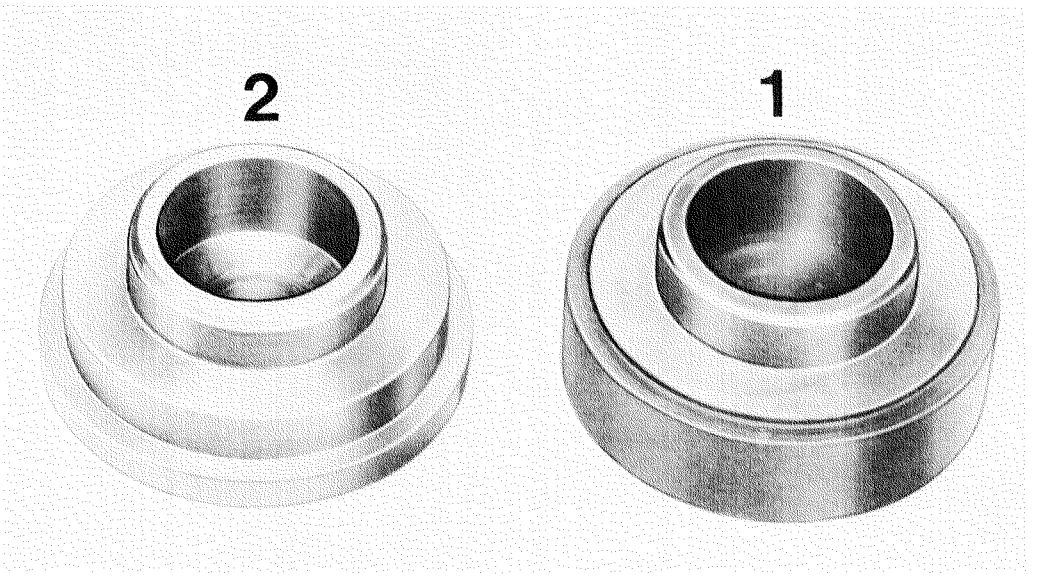
The tension plate and the four-point bearing have been reinforced for the G50/50 turbo gearbox. The differences between this bearing and that used in the G50 Carrera gearbox up to now are the varying outer diameters of the inner bearing races (exploded drawing No. 20 and 22) and a 2 mm larger outer bearing diameter.

The different inner races must not be mixed up.

Inner race with large outer diameter (56 mm) points towards the head of the driver shaft
Inner race with small outer diameter (53.5 mm) points towards the fixed wheel 4th gear.

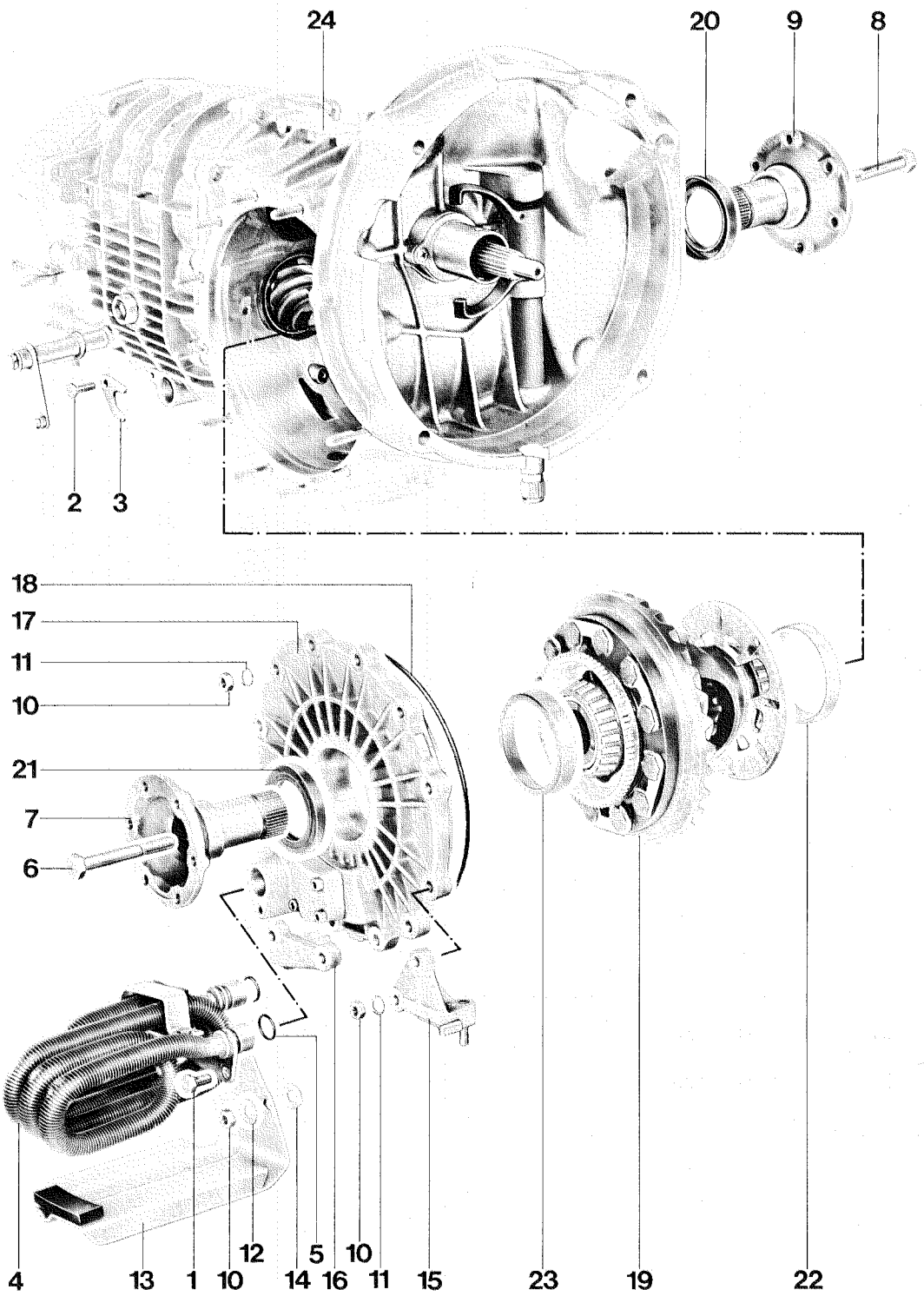
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TOOLS



No.	Description	Special Tools	Remarks
1	Pressure piece	P 265 c	
2	Pressure piece	P 265 d	

REMOVING AND INSTALLING DIFFERENTIAL



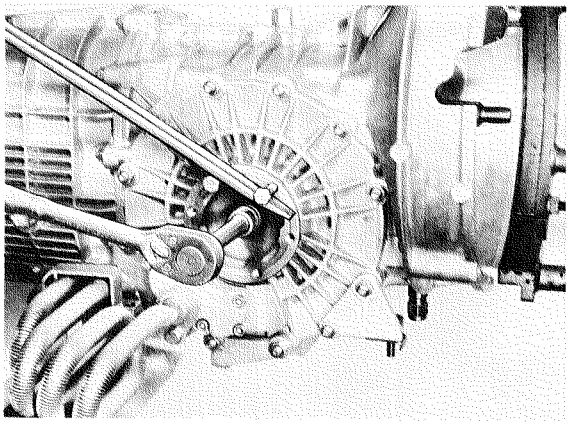
No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
1	Bolt	1		Torque: 22 Nm (16 ftlb)	
2	Bolt	1		Torque: 9 Nm (6.5 ftlb)	
3	Holder	1			
4	Cooling pipe	1			
5	O-ring	2		Replace; light coat of oil	
6	Bolt	1		Torque: 44 Nm (32 ftlb)	
7	Joint flange	1			
8	Bolt	1		Torque: 44 Nm (32 ftlb)	
9	Joint flange	1			
10	Nut	12		Torque: 24 Nm (17 ftlb)	
11	Washer	10			
12	Washer	2			
13	Guard	1			
14	Washer	2			
15	Console	1			
16	Holder	1			
17	Side transmission cover	1			
18	O-ring	1		Replace; light coat of oil	
19	Differential	1		Adjust if necessary	

No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
20	Seal	1	Drive out with a suitable tool	Drive in to correct position with P 265 c	
21	Seal	1	Drive out with a suitable tool	Drive in to correct position with P 265 d	
22	Bearing outer race	1	Drive out with a suitable punch	Heat transmission case to approx. 120 °C/ 250 °F and drive in with a piece of suitable pipe	
23	Bearing outer race	1	Drive out with a suitable punch	Heat side transmission cover to approx. 120 °C/250 °F and drive in with a piece of suitable pipe	
24	Transmission case	1			

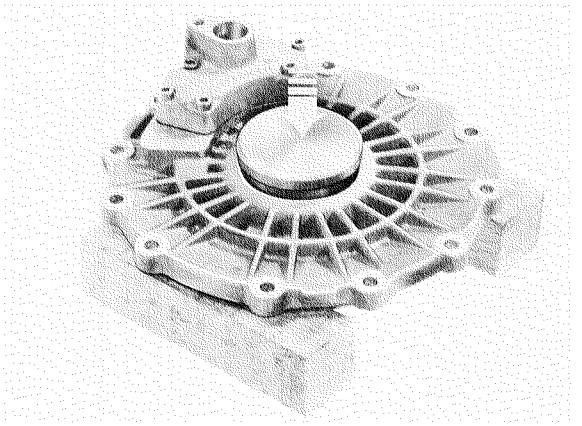
REMOVING AND INSTALLING DIFFERENTIAL

Removing

1. Unscrew joint flange mounting bolt and take off flange.

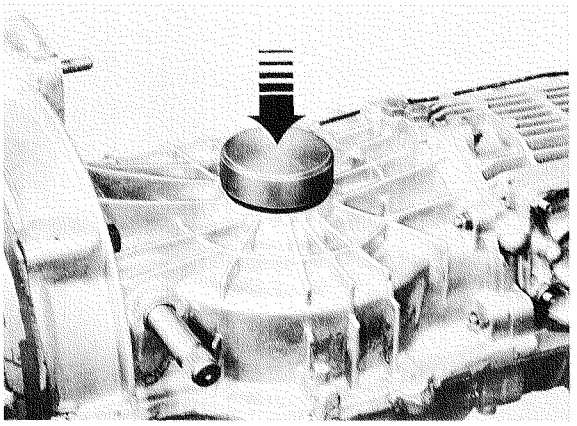


2. Drive seal into side transmission cover against stop with Special Tool P 265 d. Use Special Tool P 265 c if side transmission cover does not have an oil pump.

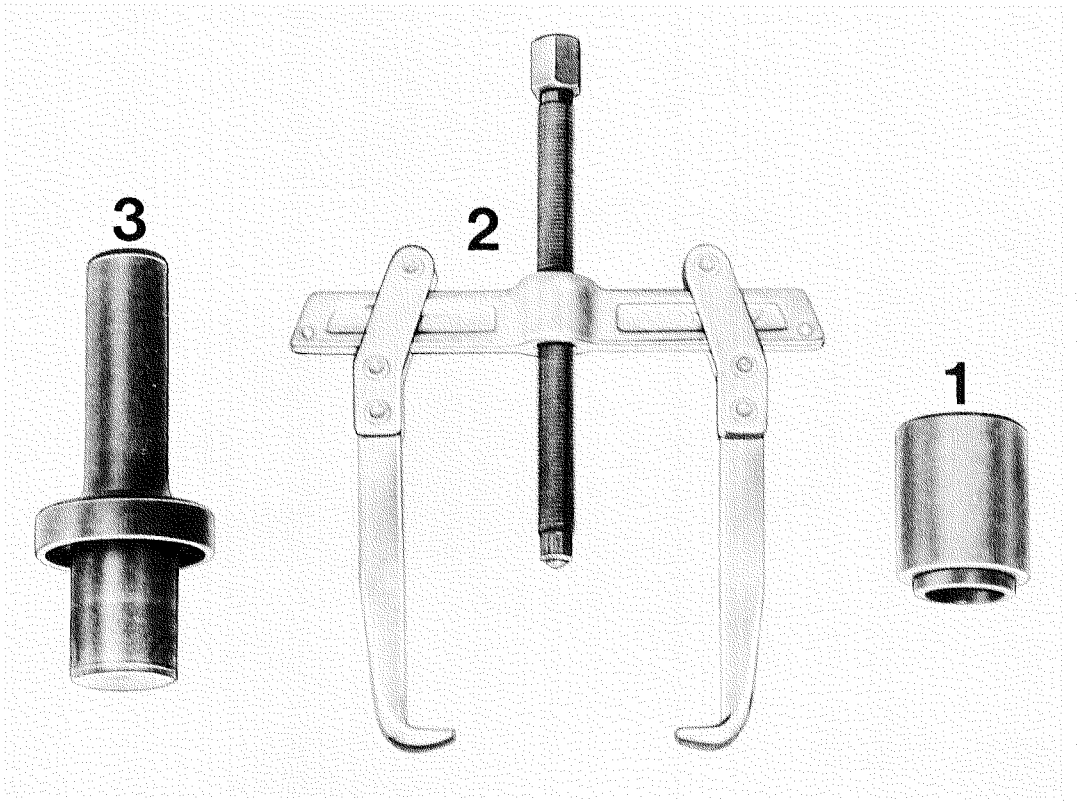


Installing

1. Drive seal into transmission case against stop with Special Tool P 265 c.

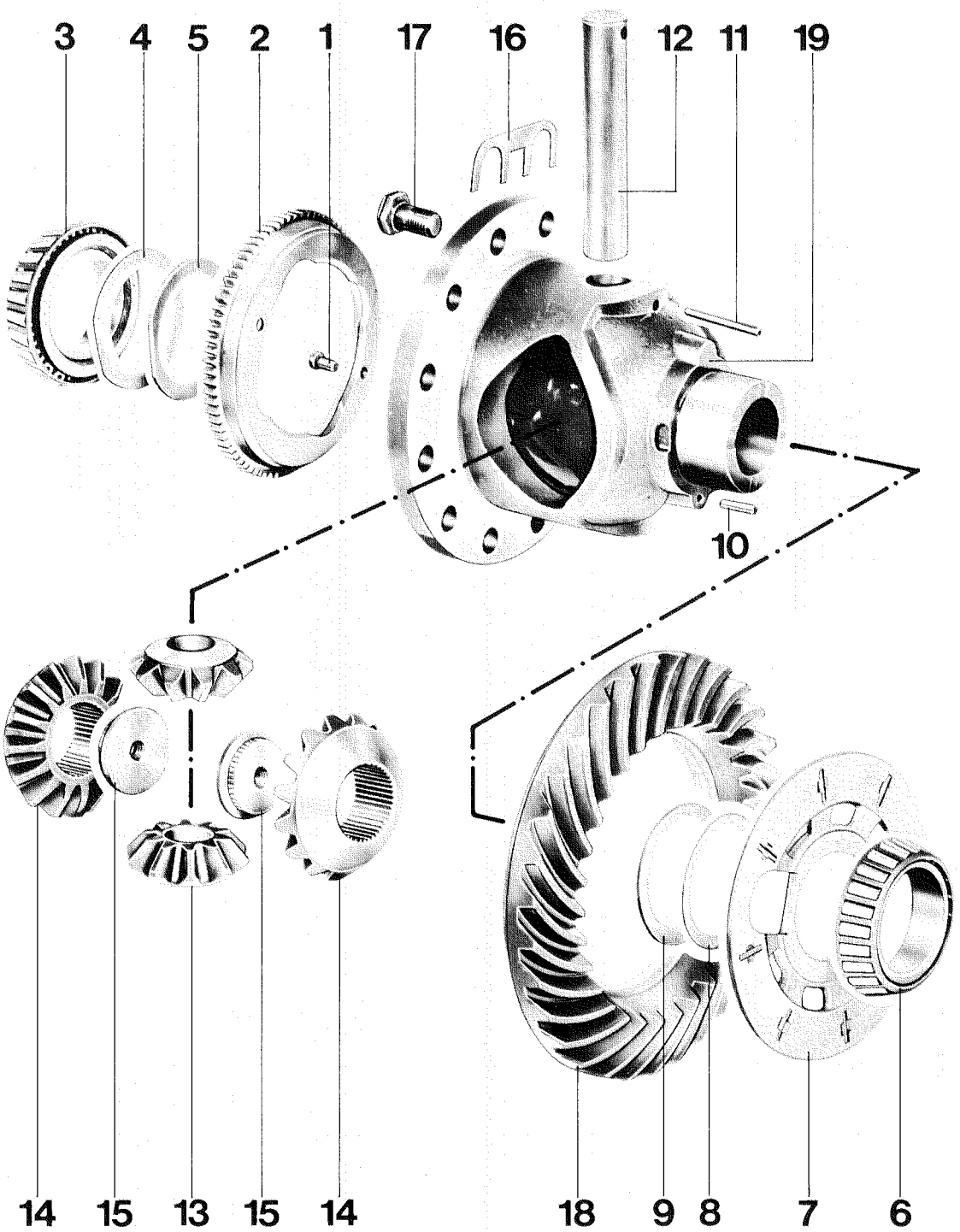


TOOLS



No.	Description	Special Tools	Remarks
1	Pressure pad	P 263	
2	Extractor	—	Standard
3	Pressure pad	P 264 b	

DISASSEMBLING AND ASSEMBLING DIFFERENTIAL



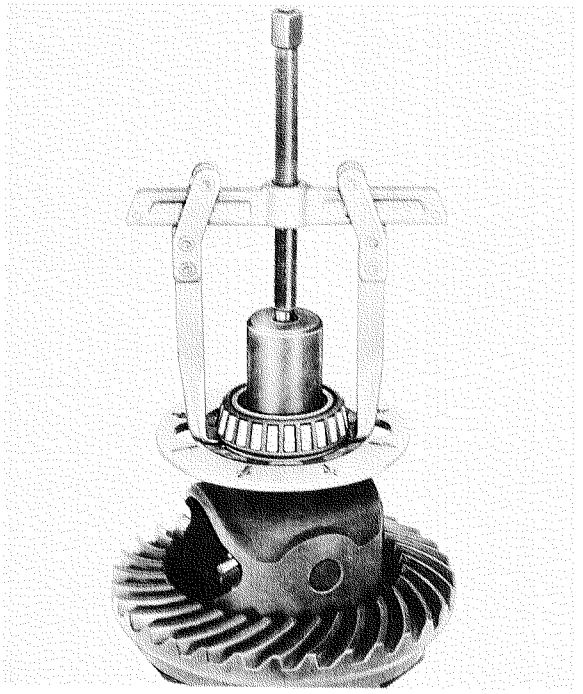
No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Screw	2		Screw in with Loctite 274 and torque to 5.6 Nm (4 ftlb)	
2	Drive gear	1			
3	Taper roller bearing inner race	1	Pull off with suitable extractor and P 263	Drive on with P 264 b	
4	Shim	X	Mark for reassembly	Determine thickness again if necessary	
5	Shim	X	Mark for reassembly	Determine thickness again if necessary	
6	Taper roller bearing inner race	1	Pull off with suitable extractor and P 263	Drive on with P 264 b	
7	Magnet carrier plate	1			
8	Shim	X	Mark for reassembly	Determine thickness again if necessary	
9	Shim	X	Mark for reassembly	Determine thickness again if necessary	
10	Dowel sleeve	1			
11	Spiral pin	1			
12	Shaft	1			
13	Small differential gear	2		Coat with graphite grease. Only replace in sets (with large differential gears)	

No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
14	Large differential gear	2		Coat with graphite grease. Only replace in sets (with small differential gears)	
15	Threaded piece	2			
16	Lockplate	6		Replace. Slide into grooves of bolts, squeeze front with a pliers for firm connection of lockplate on bolts and bend down over a hexagon surface	
17	Bolt	12		Threads must be dry and without grease. Torque: 160 Nm (116 ftlb)	
18	Ring gear	1		Tapped bores for ring gear bolts must be dry and without grease. Note pair number. Adjust, if necessary	
19	Case	1			

DISASSEMBLING AND ASSEMBLING DIFFERENTIAL

Disassembling

1. Pull off taper roller bearing inner race with a suitable extractor and Special Tool P 263.



Note:

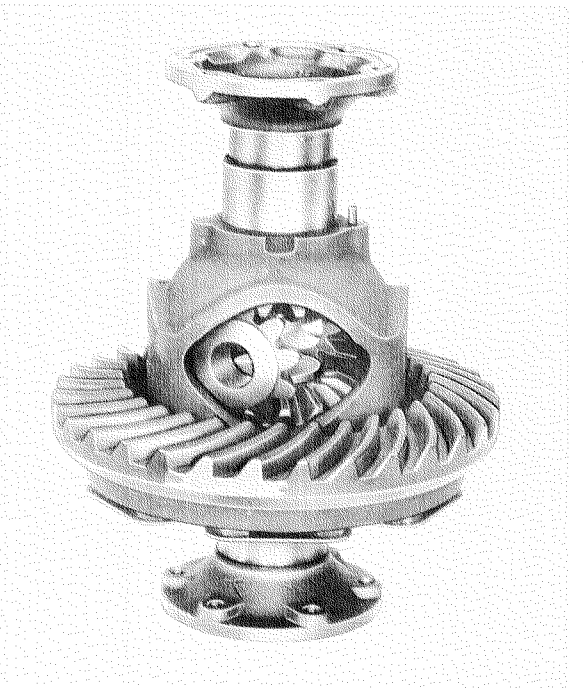
It could be necessary to machine the claws of both extractor arms.

Assembling

1. Insert large differential gears with press-fit threaded plates through large opening in differential case and hold in position with joint flanges.



2. Place small differential gears between the large differential gears and turn, until bores of gears are aligned with bores in case.

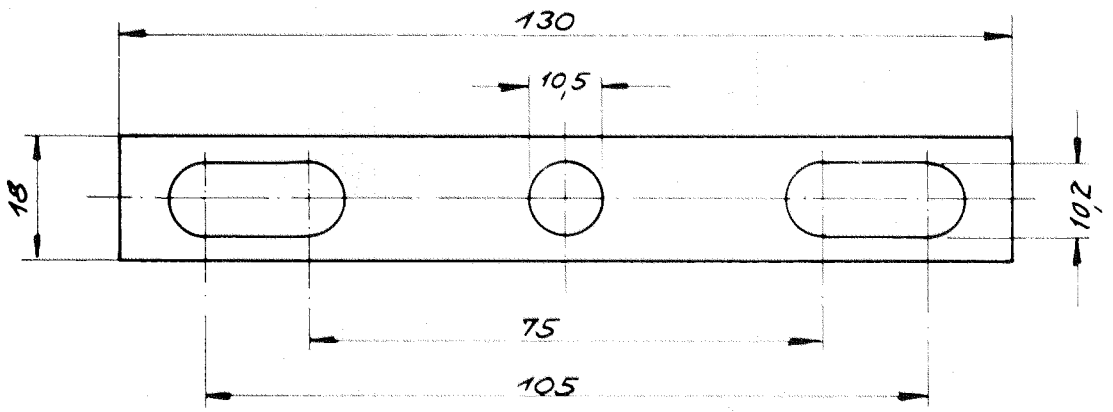


3. Drive in differential gear shafts in correct position and lock with spiral pins.

4. Drive on taper roller bearing inner races with P 264 b.

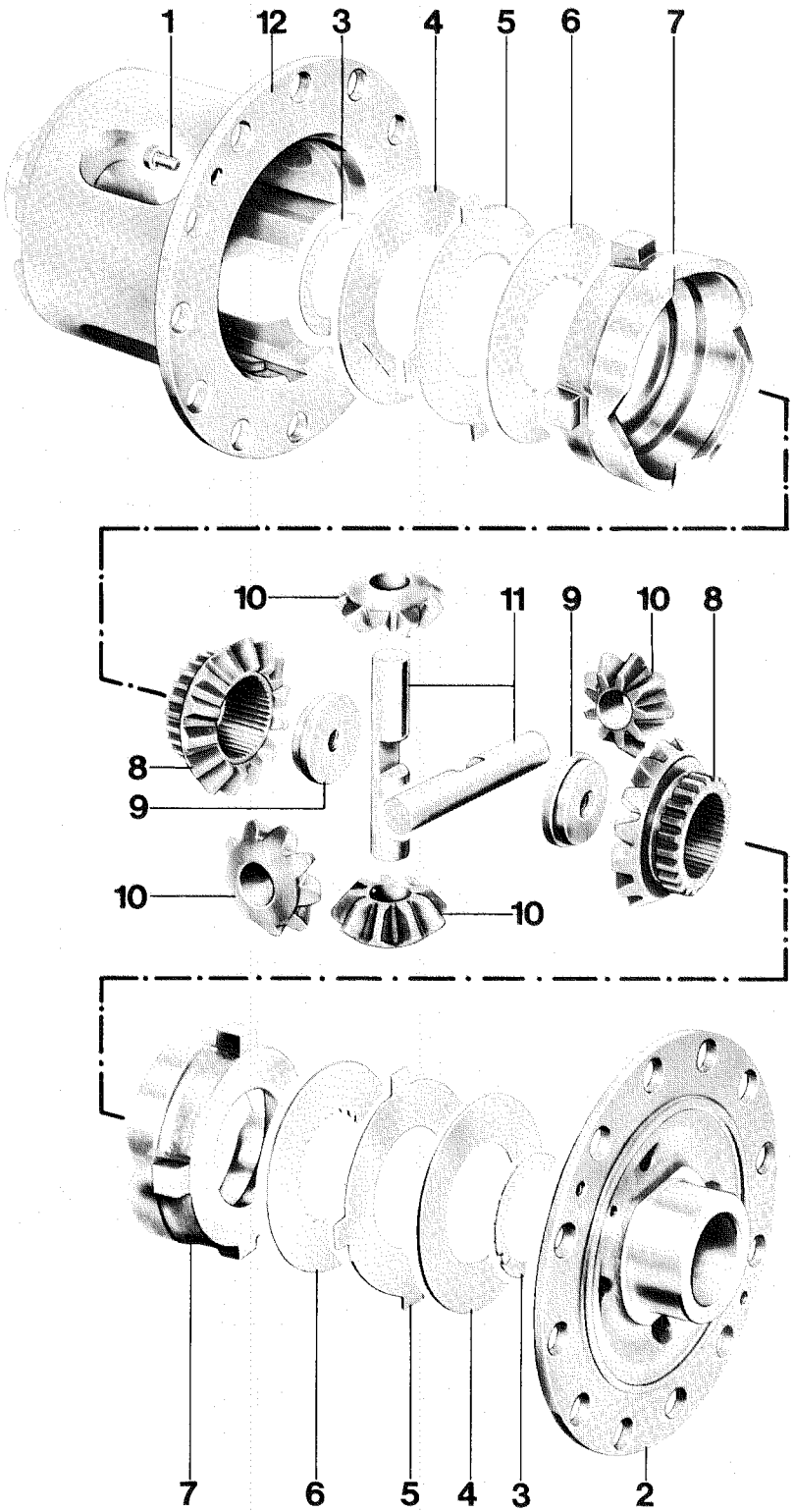


TOOLS



No.	Description	Special Tool	Remarks
1	Connector	—	Made locally. Connector of joint flange can be made of 6 x 18 mm flat steel.

DISASSEMBLING AND ASSEMBLING LIMITED SLIP DIFFERENTIAL

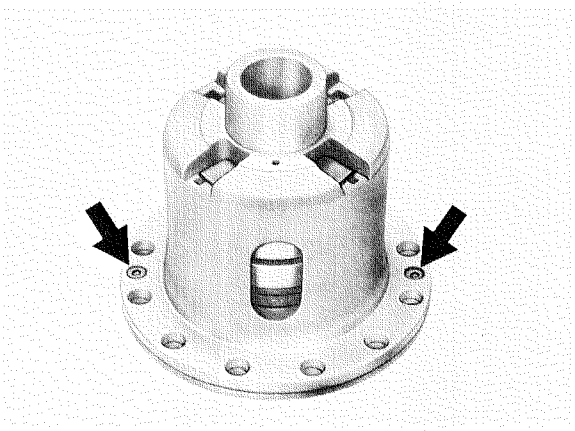


No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Bolt	2		Torque: 14 Nm (10 ftlb)	
2	Case cover	1			
3	Thrust washer	2		Position correctly	
4	Diaphragm spring	2		Position correctly	
5	Outer plate	2			
6	Inner plate (molybdenum coated)	2			
7	Thrust ring	2			
8	Pinion gear	2			
9	Threaded plate	2	Press out of pinion gear	Press in to correct position	
10	Pinion	4			
11	Differential shaft	2			
12	Differential case	1			

DISASSEMBLING AND ASSEMBLING LIMITED SLIP DIFFERENTIAL (40 %)

Disassembling

1. Unscrew case cover bolts and take off cover.



2. Remove all parts inside.

Assembling

1. Inspect all parts for wear or damage, replacing if necessary.

   a) Differential Case:
   Check for wear in guide grooves for outer plates and thrust rings.

   b) Thrust Rings:
   Guides and bearing surfaces must not be worn or scored excessively. In addition, thrust rings must move easily in differential case.

   c) Gears:
   Bearing surfaces for thrust washers must not be worn and inner plates must move easily on splines of gears.

   d) Plates:
   Check inner and outer plates for wear. Guides of outer plates and splines of inner plates must not be worn.

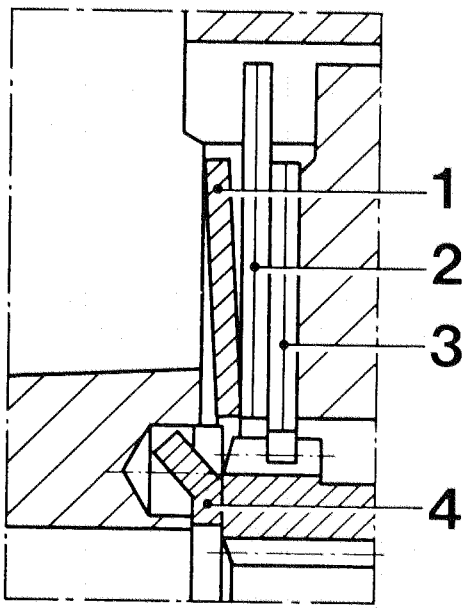
2. Lubricate all sliding surfaces of plates, thrust rings and differential shafts with SAE 90 hypoid gear lube before assembling.

3. Insert thrust washers that retainers engage in bore of case or cover. Holding washers with a little grease is recommended to make assembling easier.

4. Install remaining parts as shown in figure.

Note:

Diaphragm springs must be installed that domed surface faces in toward plate set.



1 – Diaphragm spring

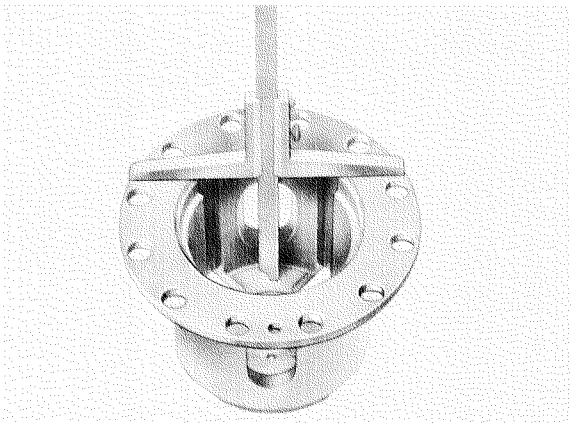
2 – Outer plate

3 – Inner plate

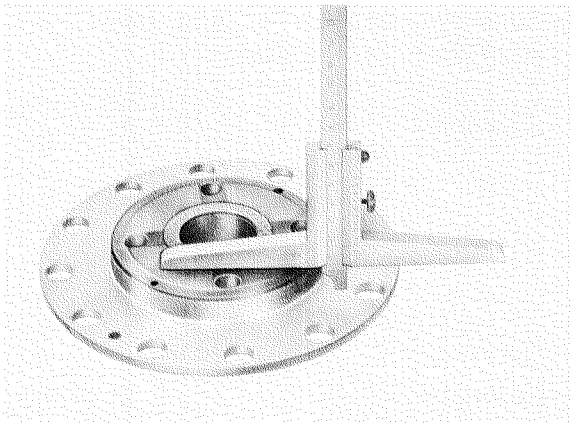
4 – Thrust washer

Determine thickness of plate set:
The thickness of the plate set has to be determined again when new parts are used.

1. Measure case depth "a" with a depth gage.
Example: "a" = 95.5 mm



2. Measure distance "b" of cover.
Example: "b" = 13.8 mm

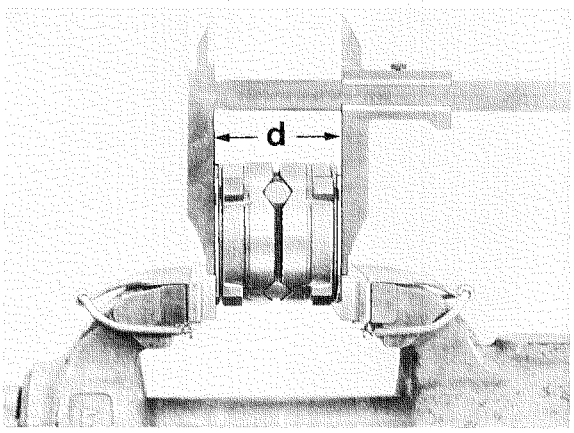


3. Determine clearance "c" in case.
"c" = a – b

Example:

"c"	=	a – b
"a"	=	95.5 mm
"b"	=	– 13.8 mm
"c"	=	81.7 mm

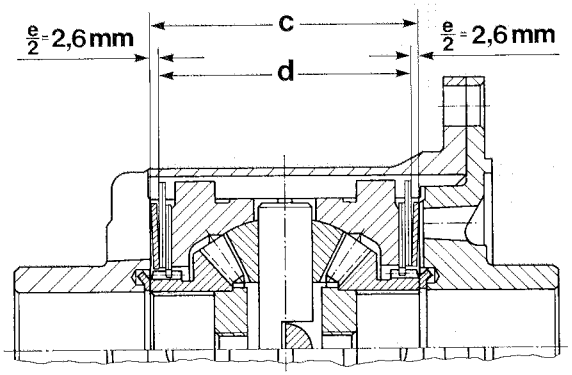
4. Determine thickness of plate set – distance "d" (with 2.0 mm thick outer plates, but without diaphragm springs). Clamp plate set in a vise lightly and measure distance "d" with a sliding calipers.
   Example: "d" = 76.50 mm



5. Determine distance "e" (must be 5.20 mm). "e" = c – d

   Example:

"c"	=	81.70 mm
"d"	=	– 76.50 mm
"e"	=	5.20 mm



$e_2 + e_2 = e = 5.2$ mm

Note:

If actual distance "e" is less or more than specified value, install thicker or thinner outer plates.

"e" more than 5.20 mm – install thinner plates.

"e" less than 5.20 mm – install thicker plates.

Outer plates are available in thicknesses of 1.9 mm, 2.0 mm and 2.1 mm.

6. After finishing assembly, check slip torque with one each side differential gear held tight and driven.
   Clamp a flange with two bolts in a vise and mount differential. Insert second flange with a locally made connector and turn differential with a torque wrench.
   A torque of 10 to 35 Nm (7 to 25 ftlb) must be reached.



A – Connector (made locally)

Note:

If the specified torque is not reached with the thickest outer plates, all plates are worn and must be replaced.

Recommended Sequence of Adjusting Drive Pinion and Ring Gear

When it becomes necessary to adjust the drive pinion and ring gear, it would be in the interest of economical procedures to keep to the following sequence.

1. Determine the total shim thickness "$S_{tot.}$" (S_1 plus S_2) for the specified pre-load of the taper roller bearing/differential.

2. Determine shim thickness "S_3".

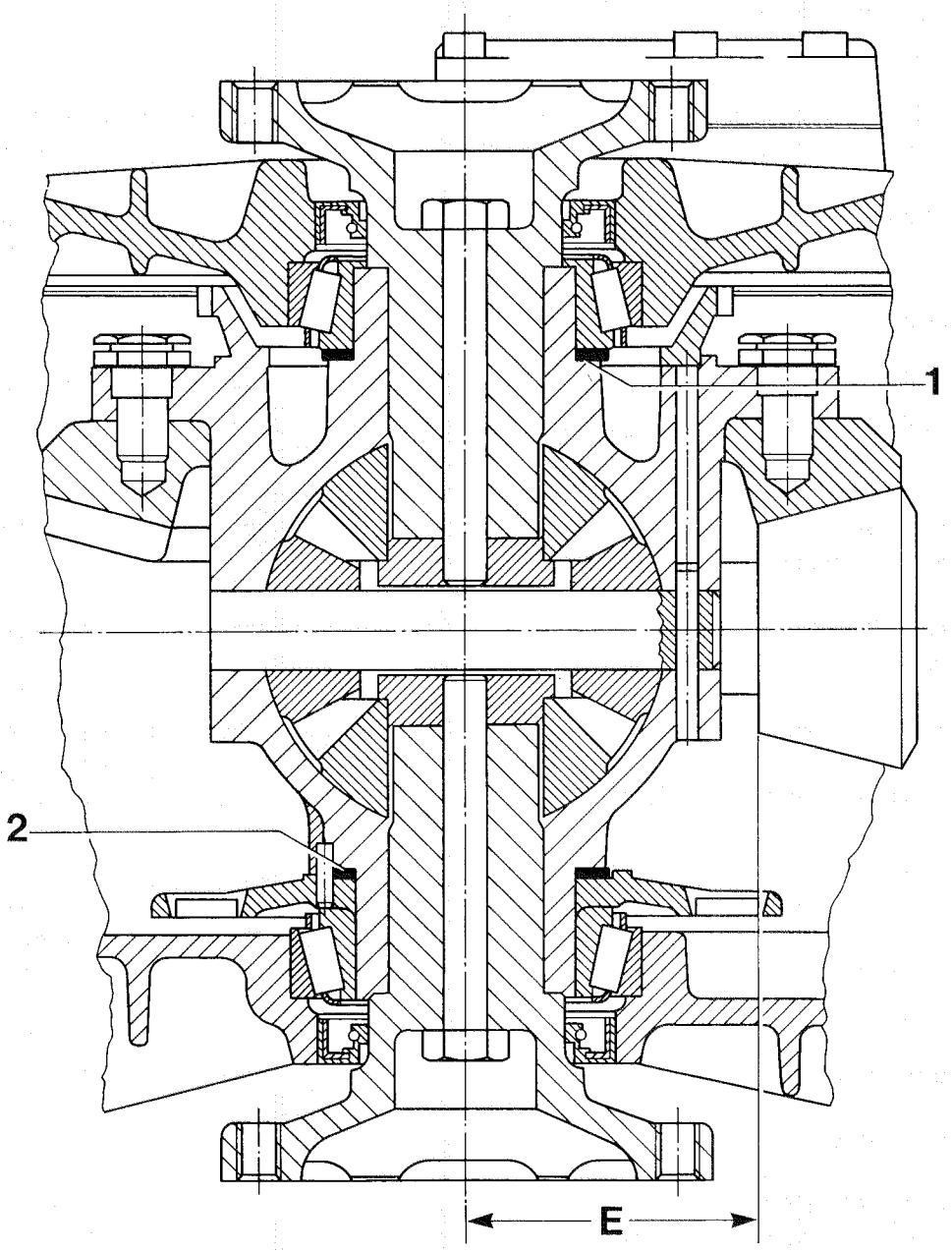
3. Divide total shim thickness "$S_{tot.}$" into S_1 and S_2 so that there is the specified amount of backlash between the ring gear and drive pinion.

The goal of adjustments is to relocate the point of optimal quiet running as was determined in the special testing machine during production.

Perfect results require absolute care and cleanliness during all assembly and measuring operations.

The drive pinion and ring gear only have to be adjusted when jobs on the final drive require the replacement of parts having direct influence on the adjustment. Refer to the following table to avoid unnecessary adjustments!

Replaced Part / Adjust:	Ring Gear ($S_1 + S_2$)	Drive Pinion Deviation "r" (S_3)
Transmission case	X	X
Side transmission cover	X	
Large cyl. roller bearing and four point bearing for drive pinion	X	X
Drive pinion/ ring gear	X	X
Differential case	X	
Taper roller bearing for differential	X	



1 – Shim S_1
2 – Shim S_2
E – Adjusting distance

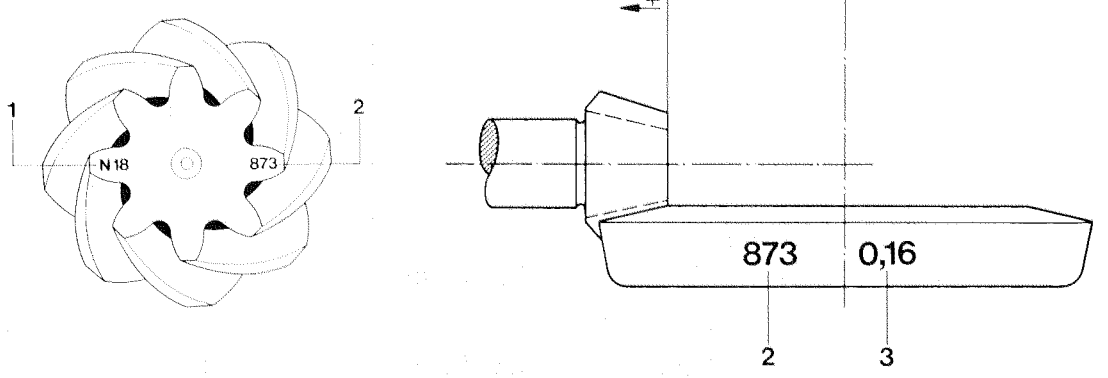
Perfect results require absolute care and cleanliness during all assembly and measuring operations.

ADJUSTING DRIVE PINION AND RING GEAR

General

Careful adjustment of the pinion and ring gear is important to guarantee a long service life and quiet running for the final drive. This is why pinions and ring gears are matched during production and checked on special testing machines for the most favorable surface appearance and low noise levels in both directions of rotation. The position of quietest running is determined by moving the pinion in an axial direction, keeping the ring gear within specified backlash tolerances.
The deviation "r" from the design distance "R_0" is measured and inscribed on the face of the pinion. Ring gears and pinions are designed in such a manner that deviation "r" is always added to design distance "R_0"; it is always given with a + sign.

To make a difference to older pinion/ring gear sets, of which deviation "r" had been + or —, a capital "N" is placed in front of the "r" value on the end of the drive pinion of these pinion/ring gear sets.

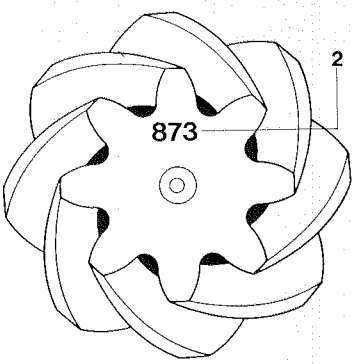


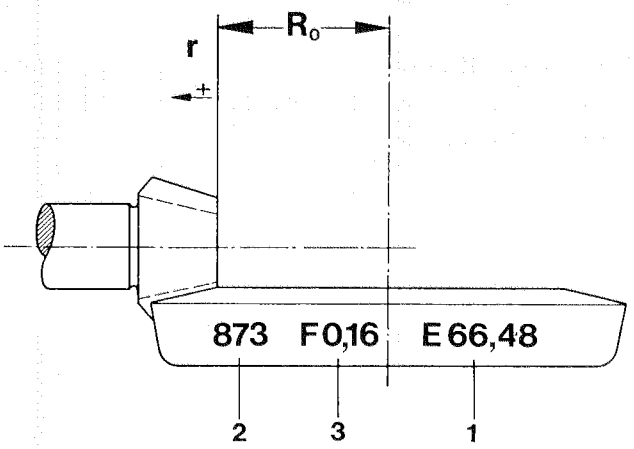
R_0	=	Design distance (66.30 mm)
r	=	Deviation from R_0 given in 1/100 mm
1	=	Deviation r
2	=	Pair code
3	=	Backlash

Changes on Drive Pinion / Ring Gear

Beginning with 1985 models pinions/ring gears are installed, on which value E (e. g. E 66.48) is inscribed instead of deviation "r" (N).

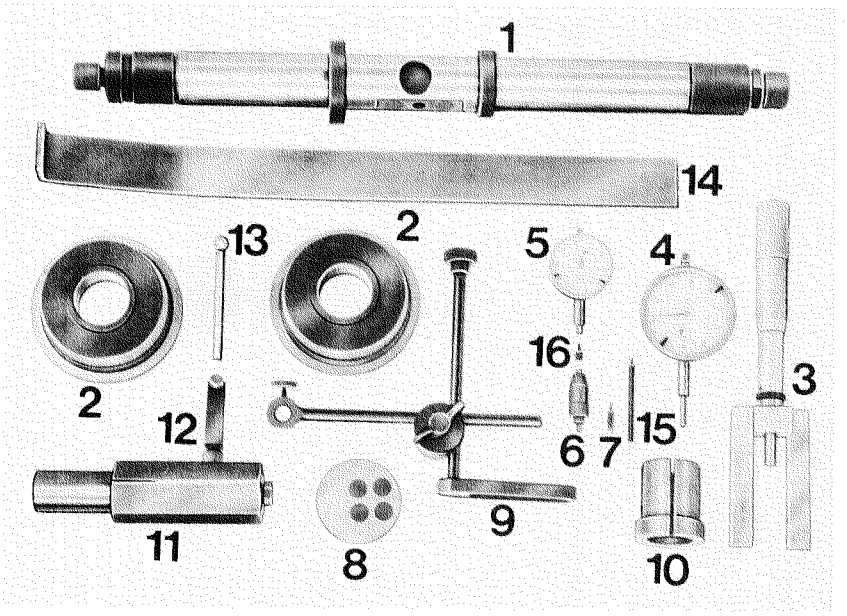
Calculations are not necessary for adjustment of these drive pinions/ring gears, since this value E is adjusting distance E (R_0 + r).





R_0	=	Design distance (66.30 mm)
r	=	Deviation r
1	=	Adjusting distance (R_0 + r), e. g. 66.48 mm
2	=	Pair code
3	=	Backlash, e. g. 0.16 mm

TOOLS

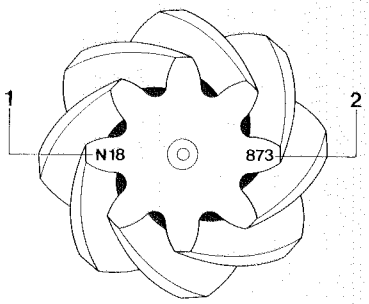


No.	Description	Special Tools	Remarks
1	Universal gage	VW 385/1	
2	Centering discs	VW 385/4	
3	Master gage	VW 385/30	
4	Dial gage	—	Standard
5	Dial gage	—	Standard, 3 mm range
6	Gage plunger	VW 385/14	
7	Dial gage extension	VW 385/53	14 mm long
8	Gage plate	VW 385/17	
9	Dial gage holder	VW 387	
10	Bushing	P 9145	
11	Locking sleeve	VW 521/4	
12	Adjustable lever	VW 388	
13	Gage plunger	9196	
14	Hook	—	made locally
15	Dial gage extension	—	standard, 30 to 40 mm long
16	Dial gage extension	VW 382/10	

ADJUSTING DRIVE PINION

Distance "E" must be calculated from the given design distance "R_0 + deviation r" inscribed on face of pinion.

R_0 = 66.30 mm



1 = Deviation "r" in 1/100 mm
2 = Pair code

Example:

Deviation "r" on face of pinion is N 18.

R_0 = Design distance	66.30 mm
r = Deviation	+ 0.18 mm
E = Adjusting distance	66.48 mm

Note:

Calculations are not necessary for pinions/ ring gears with an "E" value.

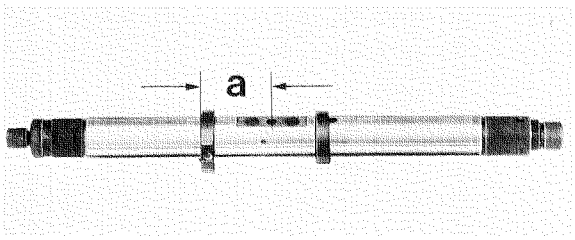
1. Install gear set without selector forks and without shims.
   Tighten hexagon nuts of clamping plates with 24 Nm (17 ftlb).

Note:

Collar nut on drive pinion must be tightened to specified torque before measuring.
This is done by mounting gearbox with two nuts, installing 5th gear wheel and guide sleeve, stopping drive shaft with Special Tool P 37 a, engaging 5th gear and tightening collar nut with 250 Nm (181 ftlb).

2. Check that taper roller bearing outer races fit tight in transmission case and side transmission cover.

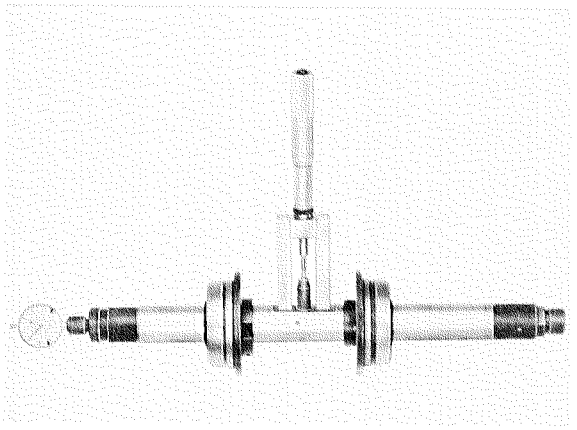
3. Set adjusting ring on universal gage VW 385/1 to distance "a".



a = approx. 52 mm

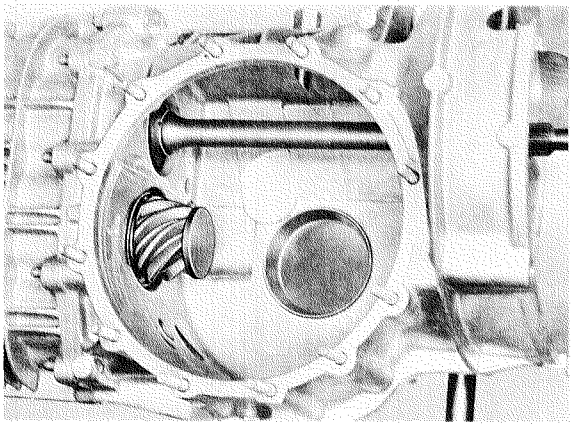
4. Install centering discs VW 385/4 on gage and screw in gage plunger VW 385/14 with dial gage extension VW 385/53 (14 mm). Turn back adjustable ring against stop.

5. Adjust master gage VW 385/30 to adjusting distance (66.48 mm in example) and place on universal gage. Set dial gage (3 mm range) to zero with 1 mm pre-load.

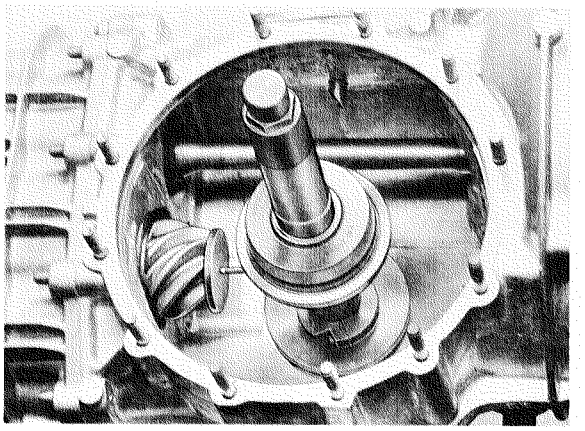


6. Take off master gage after setting dial gage.

7. Place gage plate VW 385/17 in pinion head.



8. Insert universal gage in transmission case. Dial gage extension is in area of gage plate.

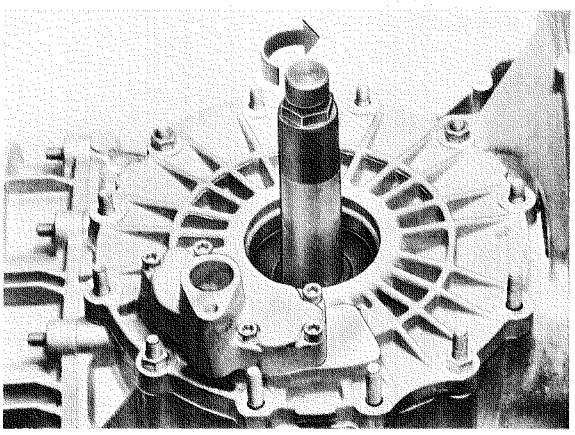


9. Mount side transmission cover without O-ring and tighten four nuts crosswise.

Note:

Do not apply a hammer to mount the side transmission cover (gage plate held by magnets could fall down). Move cover to correct installed position by tightening nuts uniformly.

10. Pull second centering disc toward outside with the spindle, that the universal gage can just be turned by hand.



11. Turn universal gage carefully until dial gage extension is perpendicular to face of drive pinion head. In this moment the dial gage needle reaches its maximum deflection (point of return), at which value must be read from dial gage.

Note:

Measured value always deviates from the set distance in clockwise direction (small dial gage needle then between 1 and 2), i. e. in case of a 1 mm pre-load dial gage setting the value deviating from 1 is the shim thickness S_3.

Example:

If the small dial gage needle is between 1 and 2, while the large needle points to 0.37 mm, shims in thickness of 0.37 mm must be installed (with 1 mm dial gage pre-load). However, the shim thickness value must always be rounded off to the next 0.05 mm (e. g. 0.37 mm rounded off to 0.35 mm).

12. Recheck distance "E" after installing shims in determined thickness. Deviations of ± 0.03 mm can be accepted.

ADJUSTING RING GEAR

Determine total shim thickness "$S_{tot.}$" ($S_1 + S_2$).

Ring gear has to be adjusted, if

transmission case,
side transmission cover,
taper roller bearing for differential,
differential case or
drive pinion/ring gear

are replaced.

Note:

Drive pinion has to be removed to determine pre-load of taper roller bearings on differential.

1. Make sure outer races of taper roller bearings seat well in differential case and side transmission cover.

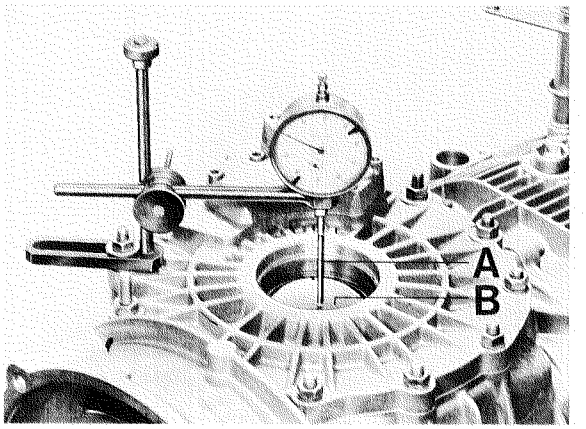
2. Install one each 2.5 mm thick shim on the ring gear end and opposite end of the differential being used.

3. Install differential in transmission case and turn several times.

4. Install side transmission cover without seal and tighten all nuts with 24 Nm (17 ftlb).

5. Place gage plate VW 385/17 on collar of transmission.

6. Mount dial gage holder VW 387 with dial gage and extension on case and set dial gage to zero with 2 mm pre-load.



A – Dial gage extension (approx. 30 to 40 mm long)
B – Gage plate VW 385/17

7. Move differential up and down. Read play from dial gage and note value.

Note:

Do not turn differential while measuring, since this would produce wrong results.

8. Calculate "$S_{tot.}$".

"$S_{tot.}$" = Installed shim thickness
+ measured value
+ pre-load of taper roller bearings

Example:

Installed shim thickness	5.00 mm
Measured value	0.75 mm
Pre-load (constant value)	0.40 mm
"$S_{tot.}$"	6.15 mm

9. Remove differential, pull off both taper roller bearings and divide calculated shim thickness "$S_{tot.}$" as follows.
Shim S_1 is selected about 0.20 mm thinner than shim S_2 in order to have reserve for backlash adjustments later.

Example:

Total shim thickness of shims
$S_1 + S_2 = 6.15$ mm

Thickness of shim S_1

$$\frac{6.15 \text{ mm}}{2} = 3.075 \text{ mm}$$
$$- \ 0.200 \text{ mm}$$
$$2.875 \text{ mm}$$

Thickness of shim S_2

$$\frac{6.15 \text{ mm}}{2} = 3.075 \text{ mm}$$
$$+ \ 0.200 \text{ mm}$$
$$3.275 \text{ mm}$$

Note:

Shims are available in thickness steps of 0.10 mm from 2.4 to 3.7 mm.
One 0.25 mm thick shim permits shim thickness steps of 0.05 mm.

The calculated shim thicknesses must be rounded off to available sizes in such a manner, that the total shim thickness S_1 and S_2 is not changed.

Example:

Calculated shim thicknesses

$S_1 + S_2 = 2.875 + 3.275 = 6.15$ mm

Rounded-off shim thicknesses

$S_1 + S_2 = 2.85 + 3.30 = 6.15$ mm

Measure thickness of shims at several points with a micro-meter. Permissible deviation: 0.02 mm. Also inspect shims for burrs and damage.

ADJUSTING BACKLASH

Backlash should be 0.12 to 0.18 mm.

1. Install pinion/ring gear, using shims "S_3" determined for the drive pinion adjustment.

Note:

Collar nut on drive pinion must first have been tightened with 250 Nm (181 ftlb).

2. Install differential with taper roller bearings and determined shims ($S_1 + S_2$) in case.

3. Mount side transmission cover and tighten all nuts with 24 Nm (17 ftlb).

Note:

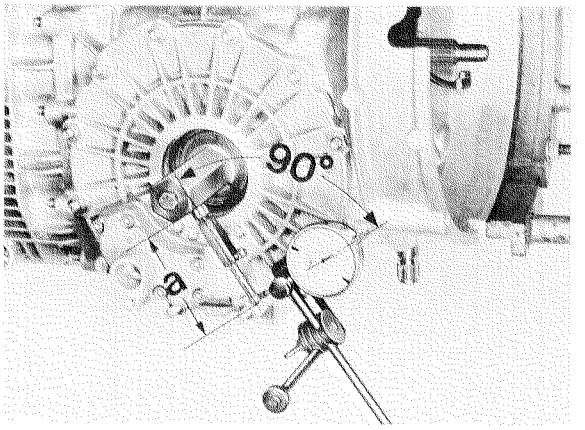
Make sure there is always a certain amount of backlash while tightening the nuts. Drive pinion must never be permitted to seize.

4. Screw adjustable lever VW 388 and adjusting device VW 521/4 together and set the lever length to 83 mm with the gauge plunger (see Figure dimension "a").

5. Install locking sleeve with bushing (Special Tool 9145) in differential and clamp.

6. Turn differential several times in both directions to settle the taper roller bearings.

7. Mount dial gage holder VW 387 with dial gage and level extension in such a manner to have a right angle between the dial gage shaft and lever.

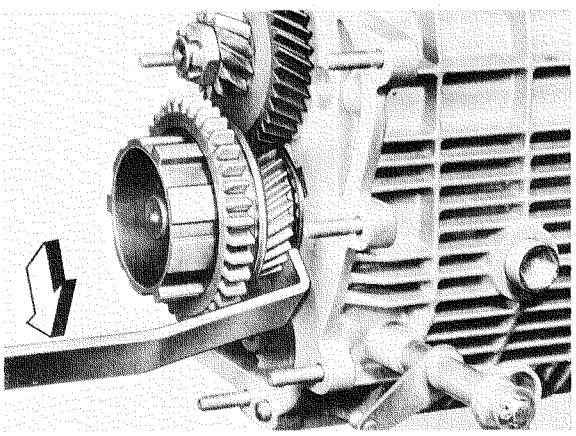


Distance "a" = approx. 83mm

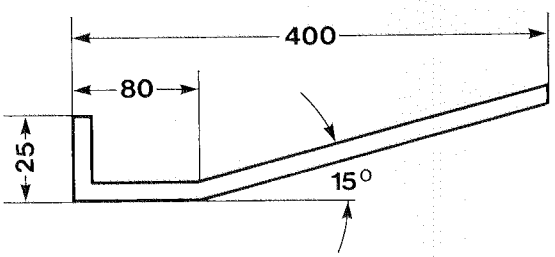
8. Turn ring gear carefully on hexagon of locking sleeve against stop and set dial gage to zero.
Then turn back ring gear and read backlash from dial gage. Note value.

Note:

Drive pinion must be stopped while measuring. This is done by clamping locally made hook between transmission case and loose 5th gear wheel.



Hook made locally of 30 x 5 mm flat steel



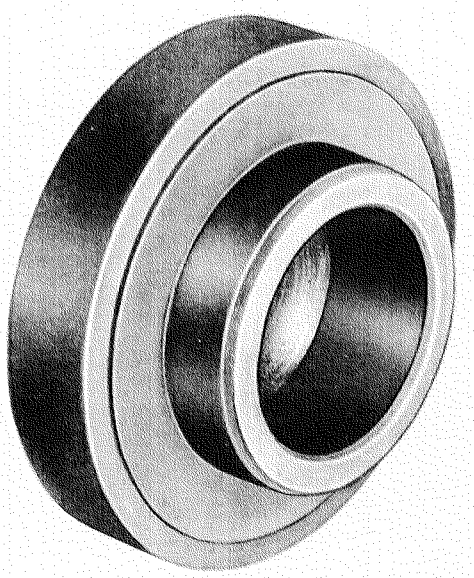
9. Repeat measurement three times turning the ring gear 90° each time. Measured values must not deviate from each other by more than 0.05 mm.

Note:

Backlash adjustment value is inscribed in the ring gear. Actual adjustment could be less than this value by up to 0.05 mm. Backlash must never exceed the inscribed value.

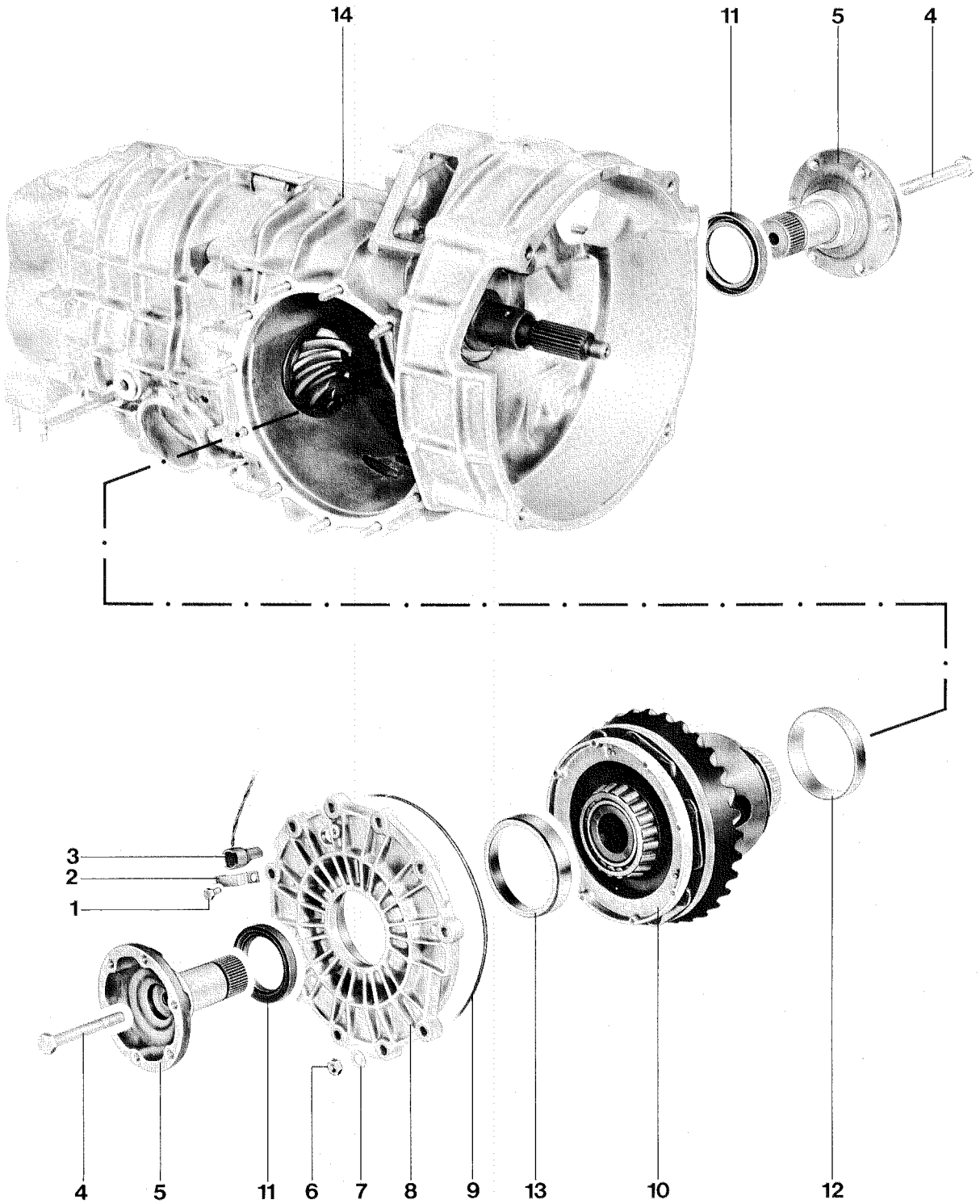
10. If specified backlash is not reached, shims ($S_1 + S_2$) must be changed again. However, make sure that the total shim thickness ($S_{tot.}$) is not changed.

TOOLS



No.	Description	Special Tools	Remarks
	Pressure piece	9252	

REMOVING AND INSTALLING DIFFERENTIAL



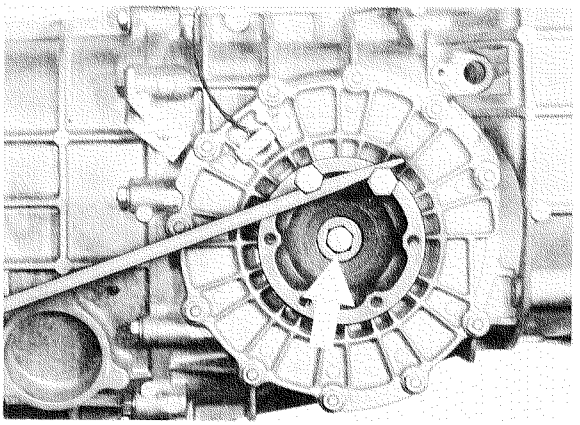
No.	Description	Qty.	Note When: Removing	Installing
1	Hex. screw	1		torque: 10 Nm (7 ftlb)
2	Holder	1		
3	Reed contact	1		
4	Hex. screw	2		torque: 44 Nm (32 ftlb)
5	Joint flange	2		
6	Hex. nut	11		torque: 23 Nm (16 ftlb)
7	Washer	11		
8	Cover	1		
9	O-ring	1		fit replacement, oil lightly
10	Differential or limited-slip differential	1		adjust if necessary
11	Seal ring	2		pack space between dust excluder and sealing lip with Silubrin grease S manufactured by Klüber. Drive in with pressure piece 9252 until seated

No.	Description	Qty.	Note When: Removing	Installing
12	Bearing outer race	1	heat transmission case to approx. 120°C and drive out with suitable drift	heat transmission case to approx. 120°C and drive in with suitable pressure piece
13	Bearing outer race	1	heat transmission cover to approx. 120°C and remove with suitable internal puller (e.g. Kukko 21-9)	heat transmission side cover to approx. 120°C and press in with suitable pressure piece
14	Transmission case	1		

REMOVING AND INSTALLING DIFFERENTIAL

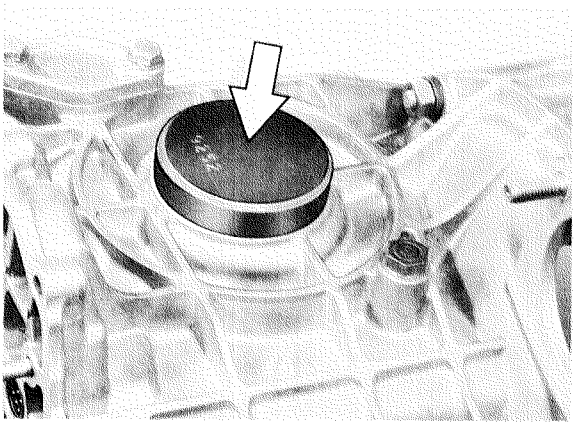
R e m o v i n g:

1. Unscrew joint flange mounting bolt and remove flange.

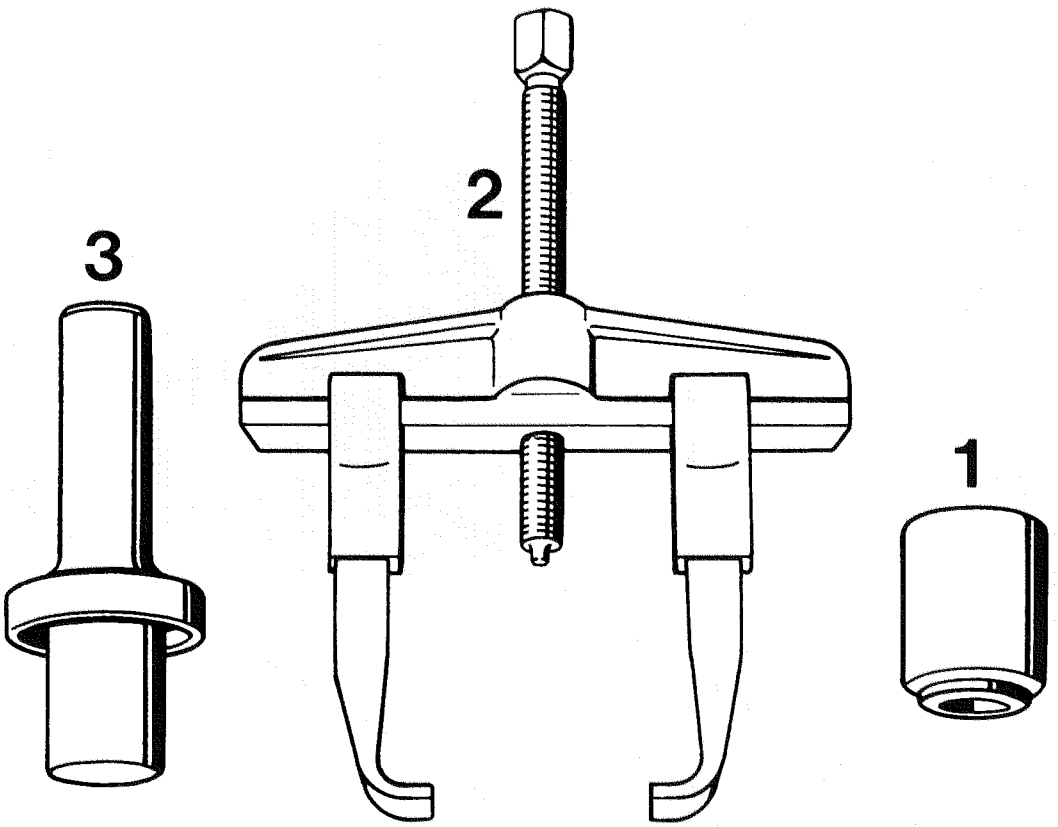


I n s t a l l i n g:

1. With special tool 9252, drive seal rings into transmission case and transmission side cover until seated.

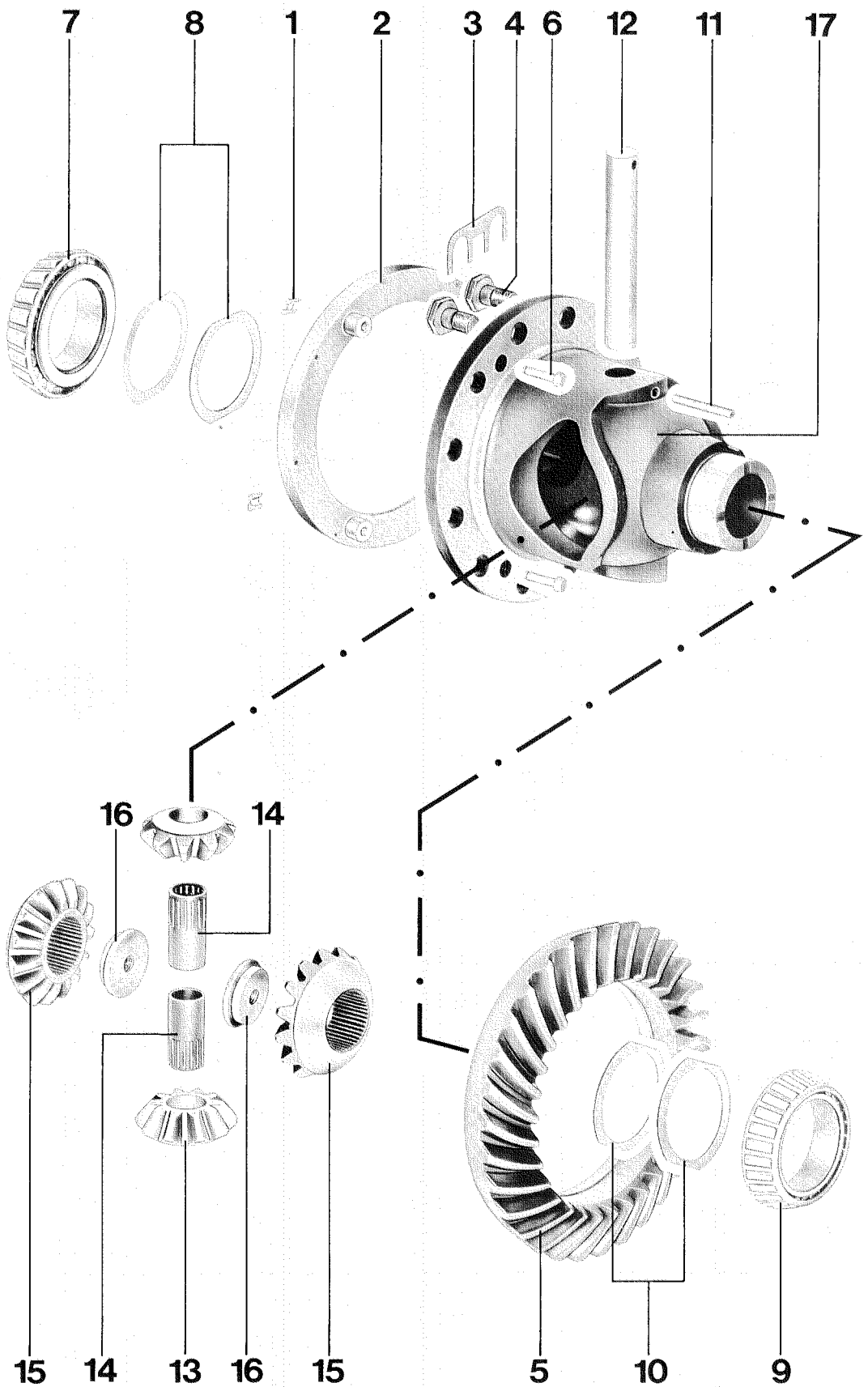


TOOLS



No.	Description	Special Tools	Remarks
1	Pressure piece	P 263	
2	Puller	-	commerically available
3	Pressure piece	P 264 b	

DISASSEMBLING AND ASSEMBLING DIFFERENTIAL



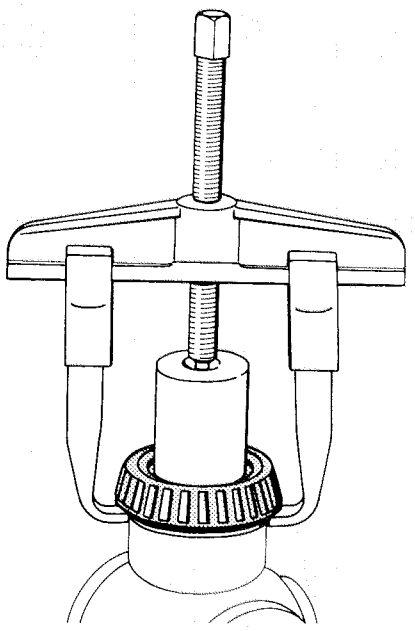
No.	Description	Qty.	Note When: Removing	Installing
1	Retainer	3		
2	Magnet carrier plate	1		
3	Lockplate	6		Fit replacement. Push into groove of two adjacent bolts, pinch tabs with pliers (to lock plate around bolt) and bend down over a flat.
4	Hex bolt	12		Threads must be dry and free of grease. Torque: 165 Nm (120 ftlb).
5	Ring gear	1		Threaded holes for ring-gear bolts must be dry and free of grease. Note pairing numbers. Readjust if necessary.
6	Pin	3		
7	Taper roller bearing - inner race	1	Remove with suitable puller and P 263	Press on with P 264 b

No.	Description	Qty.	Note When: Removing	Installing
8	Shim	X	mark for reinstallation	redetermine thickness if necessary
9	Taper roller bearing - inner race	1	remove with suitable puller and P 263	press on with P 264 b
10	Shim	X	mark for reinstallation	redetermine thickness if necessary
11	Spiral pin	1		drive in right way round
12	Pin	1		
13	Small differential gear	2		apply MoS_2 paste to curved surface. Always renew as a set (with large differential gears)
14	Needle bearing sleeve	2		
15	Large differential gear	2		apply MoS_2 paste to curved surface. Always renew as a set (with small differential gears)
16	Threaded piece	2		
17	Case	1		

DISASSEMBLING AND ASSEMBLING DIFFERENTIAL

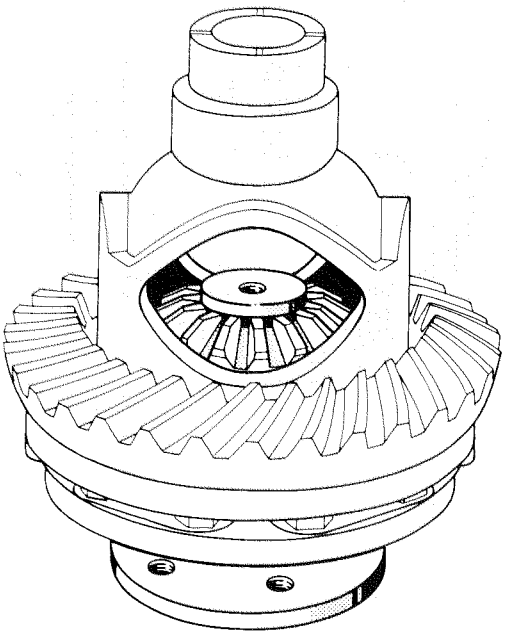
Disassembling

1. Remove inner race of taper roller bearing with a suitable puller and pressure piece P263.



Assembling

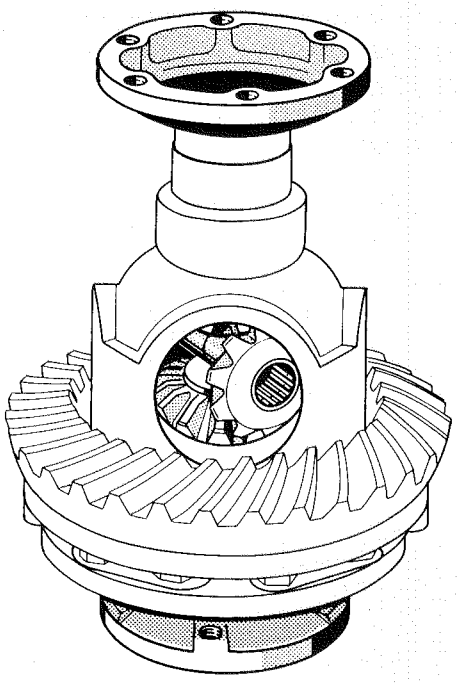
1. With threaded plates pressed in, insert large differential gears through large opening in differential case and hold in position with joint flanges.



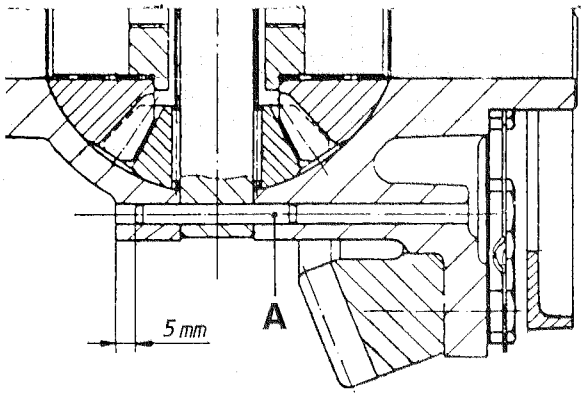
Note:

Remachine the claws of both puller arms if necessary.

2. Place small differential gears with needle bearing sleeves between the large differential gears and turn until holes in case are aligned.

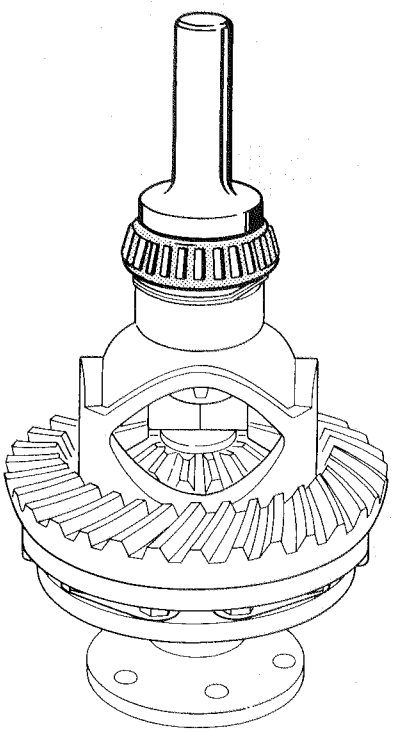


3. Press in differential gear shaft right way round and lock with spiral pin.



A = Spiral pin

4. Press on inner races of taper roller bearing with P 264 b.



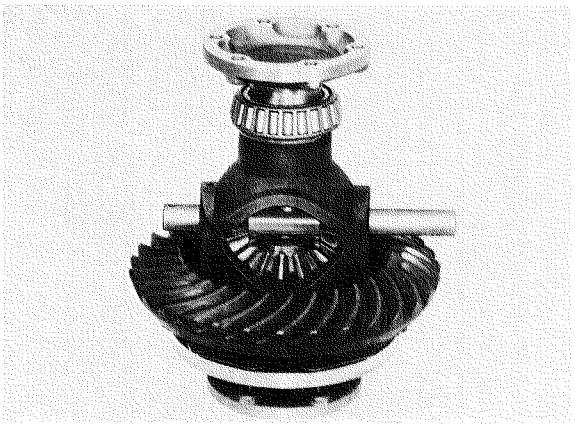
Variations for the G50/50 turbo gearbox

Note

The mounting of the small differential bevel gears has been modified. 31 individual needle rollers with a spacer sleeve have been installed on each side instead of the two needle sleeves.

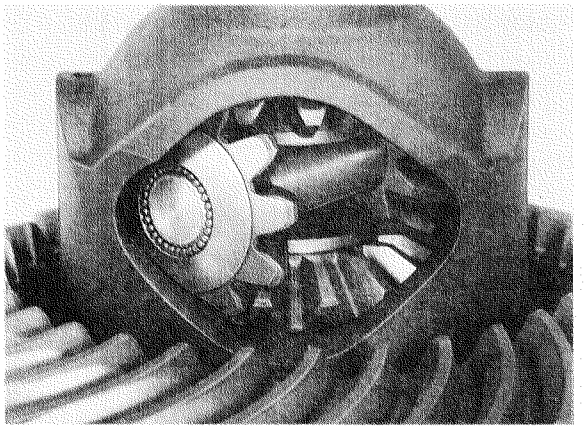
Disassembling

1. Press out the bolt with centering mandrel 9289.



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2. Using the centering mandrel, turn the small differential bevel gearstowards the openings in the housing and take out carefully. Do not loseany of the needle rollers.

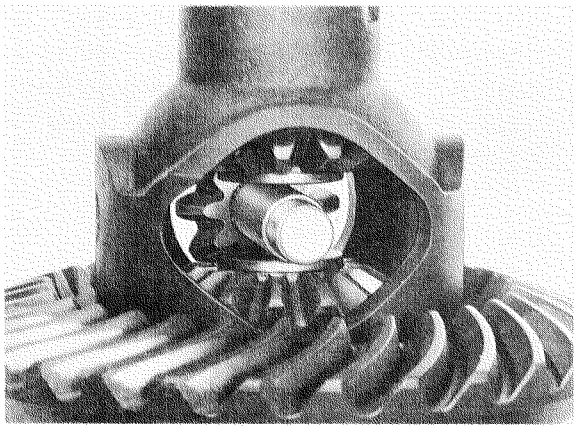


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Assembling

1. Insert the large differential bevel gears with pressed-in threaded disks through the large opening in the differential housing and secure with the flexible flanges.

2. Preassemble a small differential bevel gear with 31 needle rollers, centering mandrel 9289 and spacer sleeve, and insert through an opening in the housing.



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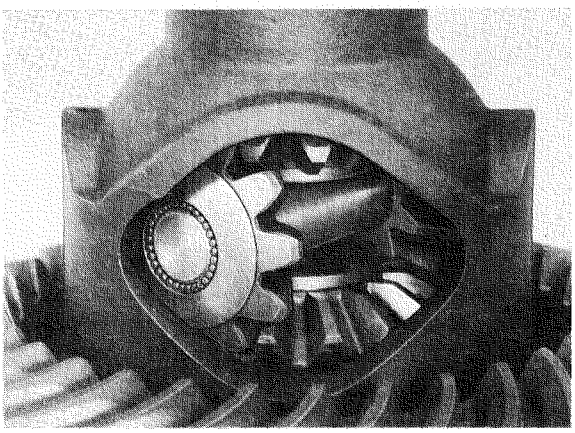
Printed in Germany – XII, 1988

3. Assemble the second differential bevel gear with 31 needle rollers and slide onto the centering mandrel carefully. Do not lose any of the needle rollers.

Note

To make installation easier, assemble the needle rollers with a viscous grease.

4. Using the centering mandrel, turn the small differential bevel gears until the holes are in alignment in the housing.

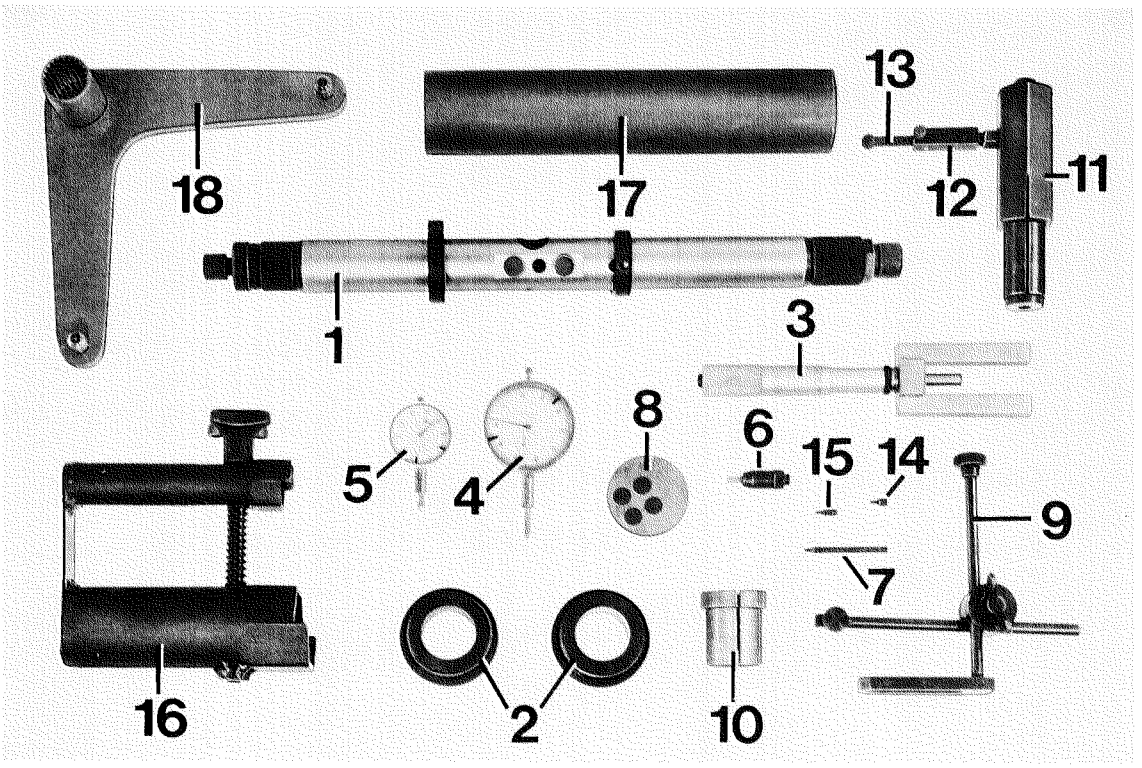


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5. Press in the differential bolts in the correct position, remove the centering mandrel and secure the bolts in the prescribed manner (see Page 39 - 112).

Printed in Germany – XII, 1988

TOOLS



TOOLS

No.	Description	Special Tools	Remarks
1	Universal gauge	VW 385/1	
2	Centering disks	9109	
3	Master gauge	VW 385/30	
4	Dial gauge	-	commercially available
5	Dial gauge	-	commercially available, measuring range 3 mm
6	Gauge plunger	VW 385/14	
7	Dial gauge extension	VW 385/56	30 mm long
8	Gauge plate	VW 385/17	
9	Dial gauge holder	VW 387	
10	Bushing	9145	
11	Locking sleeve	VW 521/4	
12	Adjustable lever	VW 388	
13	Gauge plunger	9196	
14	Dial gauge extension	VW 382/10	6.0 mm long
15	Dial gauge extension	VW 385/15	9.3 mm long
16	Holder	9260	
17	Sleeve	9263	
18	Holder	9253	

RECOMMENDED PROCEDURE FOR ADJUSTING DRIVE PINION AND RING GEAR

When it becomes necessary to adjust the drive pinion and ring gear, the following sequence is the most rational:

1. Determine the total shim thickness "S_{tot}" ($S_1 + S_2$) for the specified pre-load of the taper roller bearing/differential.

2. Determine shim thickness "S_3".

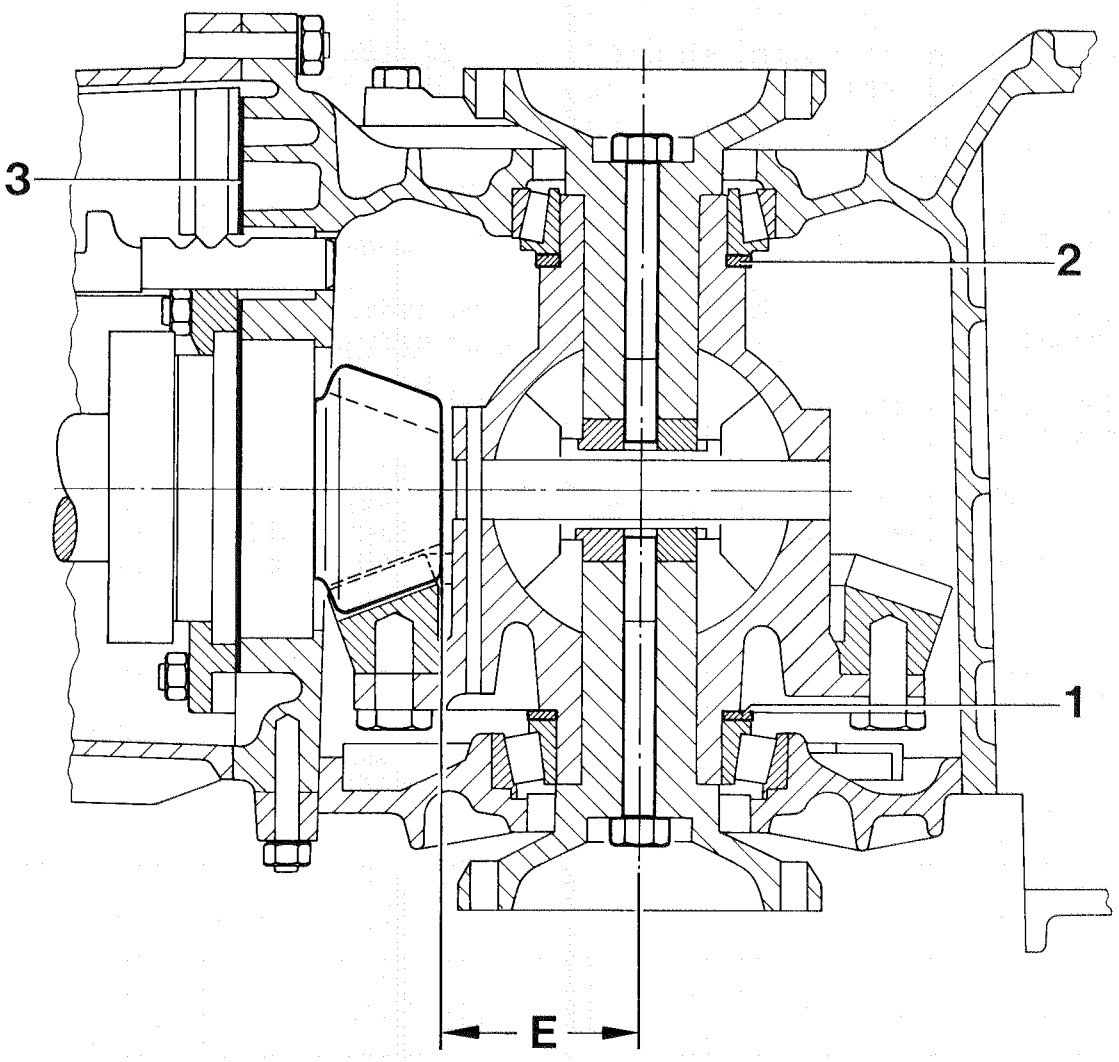
3. Divide total shim thickness "S_{tot}" into S_1 and S_2 so there is the specified amount of backlash between ring gear and drive pinion.

This adjustment is intended to re-optimize smooth operation as it was determined on the special test stand during production.

Absolute cleanliness during all assembly and measuring operations is essential for perfect results.

The drive pinion and ring gear or gear set need only be readjusted if work on the axle drive involves the replacement of parts which have a direct influence on the setting. Refer to the table below to avoid unnecessary adjustment.

Adjust: / Part replaced	Ring gear ($S_1 + S_2$)	Drive pinion (S_3)
Transmission case	x	x
Transmission side cover	x	
Large cylindrical roller bearing and four-point bearing for drive pinion	x	x
Drive pinion/ring gear	x	x
Differential case	x	
Taper roller bearing for differential	x	



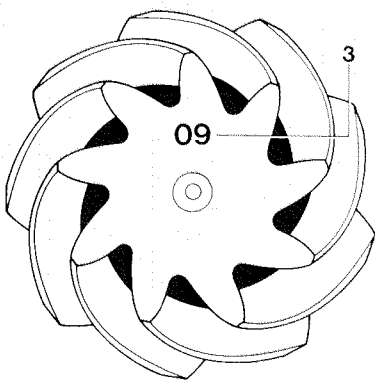
1 - Spacer S_1
2 - Spacer S_2
3 - Shim S_3
E - Setting dimension

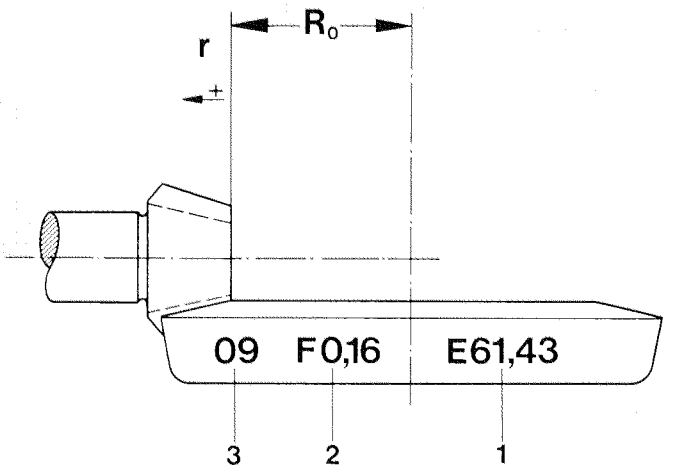
Perfect results require absolute care and cleanliness during all assembly and measuring operations.

ADJUSTING DRIVE PINION AND RING GEAR

General

The setting of the drive pinion and ring gear is essential to long service life and smooth operation of the final drive. This is why pinions and ring gears are matched during production and checked on special testing machines for good intermeshing and low noise levels in both directions of rotation. The position at which the assembly operates most smoothly is established by moving the pinion in the axial direction while the ring gear is kept within the specified backlash tolerance. The deviation "r" from the design dimension "R_o" is determined, added to the design dimension "R_o" and inscribed on the ring gear as the setting dimension "E".



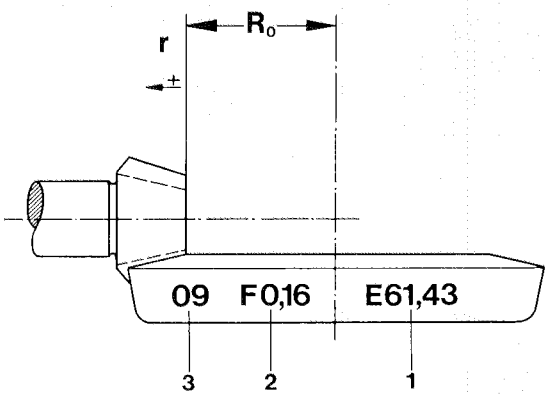


R_o = Design dimension (911 Carrera = 61,00 mm, 911 Turbo = 70,20 mm)
r_o = Deviation r
1 = Setting dimension (R_o + r) = e.g. E 61.43
2 = Backlash, e.g. F 0.16
3 = Pairing code

ADJUSTING DRIVE PINION

Note:

The setting dimension "E" is inscribed on the ring gear.

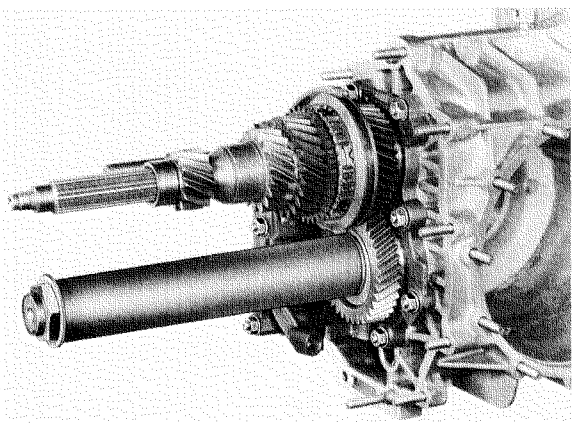


1 = Setting dimension "E"

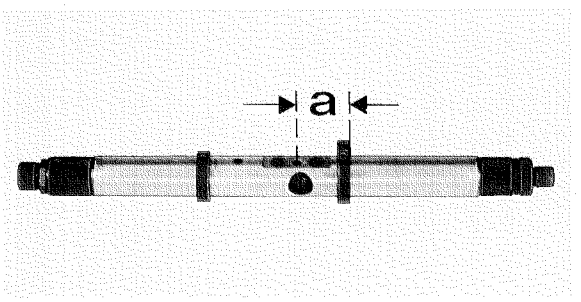
1. Install preassembled drive pinion and input shaft without shims "S_3" and tighten all hex. nuts of clamping plate to 23 Nm (16 ftlb).

Note:

It is essential to tighten collar nut of drive pinion to specified torque setting before measuring. Push special tool 9263 onto drive pinion, place 3 mm thrust washer in position, block input shaft with special tool 9253, engage 4th gear and tighten collar nut to 250 Nm (182 ftlb).



2. Set adjusting ring of universal gauge VW 385/1 to dimension "a".

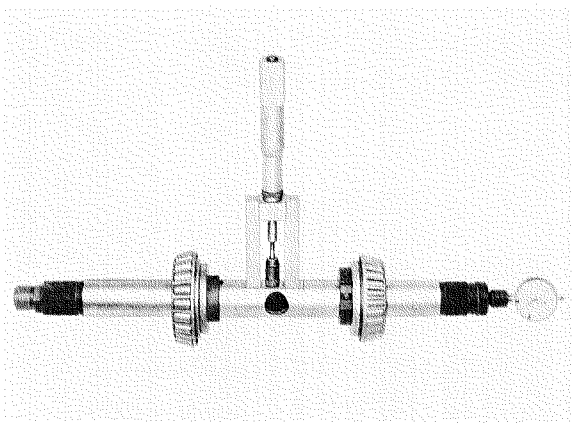


a = approx. 65 mm

3. Assemble barrel gauge with centering disks 9109, gauge plunger VW 385/14 and gauge extension VW 385 (9.3 mm) or 9150 (20 mm) for the 911 Turbo.

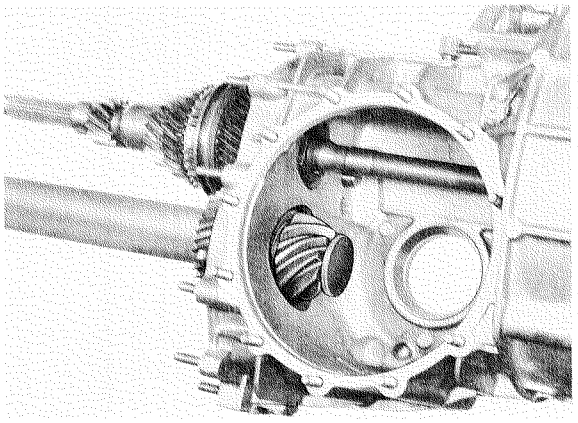
4. Push differential taper roller bearing (or replacement taper roller bearing) on centering disks).

5. Adjust master gauge VW 385/30 to setting dimension (61.43 mm in this example) and place on universal gauge. Set dial gauge (3 mm measuring range) to zero with 1 mm pre-load.

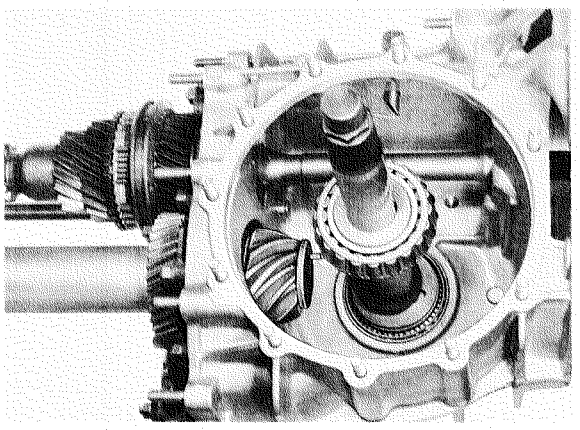


6. Remove master gauge after setting dial gauge.

7. Place gauge plate VW 385/17 on head of drive pinion.



8. Insert universal gauge in transmission housing. Dial gauge extension is in area of gauge plate.

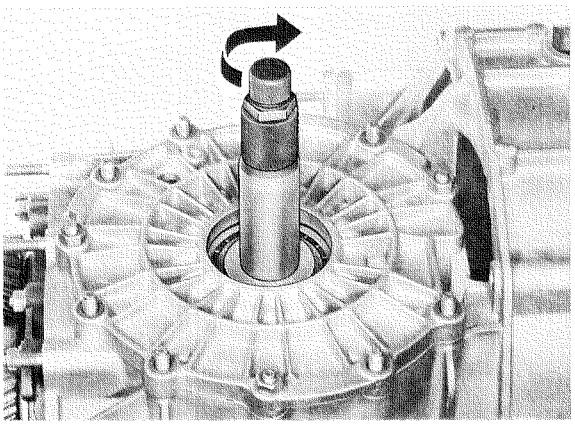


9. Mount transmission side cover without O-ring and tighten four nuts crosswise.

Note:

Do not use a hammer when mounting the transmission side cover (gauge plate is held by magnets and may be dislodged). Tighten nuts uniformly to bring cover to correct installation position.

10. Pull second centering disk toward outside with spindle, so that universal gauge can just be turned by hand.



11. Turn universal gauge carefully until dial gauge extension is perpendicular to face of drive pinion head. At this moment, the dial gauge needle reaches its maximum reading (point of return), and this value must be read.

Note:

The measured value always deviates clockwise from the set distance (small dial gauge needle is between 1 and 2), i.e., when the dial gauge is set with 1 mm pre-load, the amount by which the reading deviates from 1 is the shim thickness "S_3".

Example:

If the small dial gauge needle is between 1 and 2 and the large needle points to 0.37 mm, the required shim thickness is 0.37 mm (with 1 mm dial gauge pre-load). In practice, this thickness is always rounded off to the nearest 0.05 mm (e.g. 0.37 mm rounded down to 0.35 mm).

12. Recheck setting dimension "E" after installing shims as determined. A deviation of $\pm$ 0.03 mm is permissible.

ADJUSTING RING GEAR

Determine total shim thickness "S_{tot}" ($S_1 + S_2$).

The ring gear must be readjusted if,

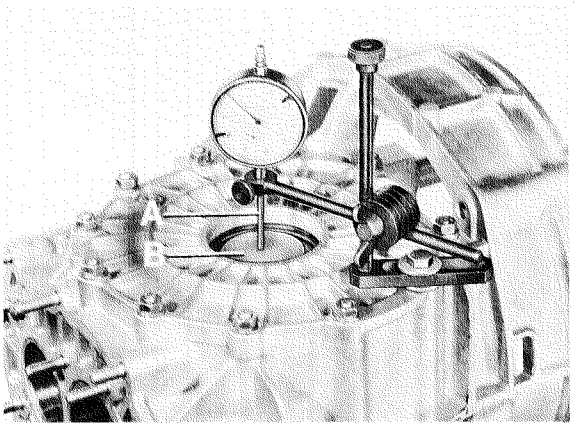
transmission case,
transmission side cover,
taper roller bearing for differential,
differential case for drive pinion/ring gear

are replaced.

Note:

The drive pinion must be removed in order to determine pre-load of taper roller bearings on differential.

1. Ensure that outer races of taper roller bearings are well seated in differential case and transmission side cover.
2. Install a 2.5 mm thick spacer on the ring-gear end of the differential being used, and another spacer on the opposite end.
3. Install differential in transmission case and turn several times.
4. Install transmission side cover without seal ring and tighten all hex nuts to 23 Nm (16 ftlb).
5. Place gauge plate VW 385/17 on collar of differential.
6. Mount dial gauge holder VW 387 with dial gauge and extension on case and set to zero with 2 mm pre-load.



A = Dial gauge extension (approx. 30...40 mm long)
B = Gauge plate, VW 385/17

7. Move differential up and down. Read play as shown on dial gauge and note value.

Note:

Do not turn differential while measuring as this would produce wrong results.

8. Calculate "S_{tot}".
"S_{tot}" = Thickness of shims installed + measured value + pressure of taper roller bearings

Example:

Thickness of shims installed	5.00 mm
Measured value	0.75 mm
Contact (constant value)	0.40 mm
"S_{tot}"	6.15 mm

9. Remove differential, pull off both taper roller bearings and divide calculated shim thickness "S_{tot}" as follows:

Shim S_1 is selected 0.70 mm thinner, shim S_2 0,70 mm thicker in order to have reserve for subsequent backlash adjustments.

Example:

Total shim thickness of shims
$S_1 + S_2 = 6.15$ mm
Thickness of shim S_1

$\frac{6.15 \text{ mm}}{2} = 3.075$ mm
$- 0.70$ mm
2.375 mm

Thickness of shim S_2

$\frac{6.15 \text{ mm}}{2} = 3.075$ mm
$+ 0.70$ mm
3.775 mm

Note:

Shims are available in 0.10 mm gradations from 1.6...3.1 mm.

One 0.25 mm thick shim permits shim thickness steps of 0.05 mm.

The calculated shim thicknesses must be rounded off to available sizes in such a manner than the total shim thickness S_1 and S_2 is not changed.

Example:

Calculated shim thicknesses

$S_1 + S_2 = 2.375 + 3.775 = 6.15$ mm

Rounded-off shim thicknesses

$S1 + S_2 = 2.35 + 3.80 = 6.15$ mm

Check thickness of shims at several points with a micrometer. Permissible deviation 0.02 mm. Also inspect shims for burrs and damage.

ADJUSTING BACKLASH

Note:

The backlash is inscribed on the ring gear.

1. Install pinion/ring gear using shims "S_3" determined for the drive pinion setting.

Note:

It is essential to tighten collar nut on drive pinion to 250 Nm (182 ftlb) before measuring.

2. Install differential with taper roller bearings and shims as calculated (S_1 + S_2) in case.

3. Mount transmission side cover and tighten all nuts to 23 Nm (16 ftlb).

Note:

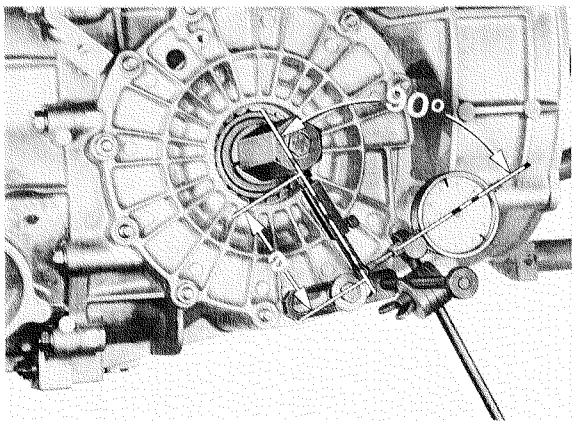
When tightening the nuts, make sure that a certain amount of backlash is maintained. The drive pinion must never be allowed to seize.

4. Screw adjustable lever VW 388 and adjusting device VW 521/4 together and set the lever length to 80 mm (or 92 mm for G50/50 turbo gearbox) with the gauge plunger. See figure dimension "a".

5. Install locking sleeve with bushing (special tool 9145) in differential and clamp.

6. Turn differential several times in both directions to settle the taper roller bearings.

7. Mount dial gauge holder with smooth extension so that there is an angle of 90° between dial gauge axis and lever.



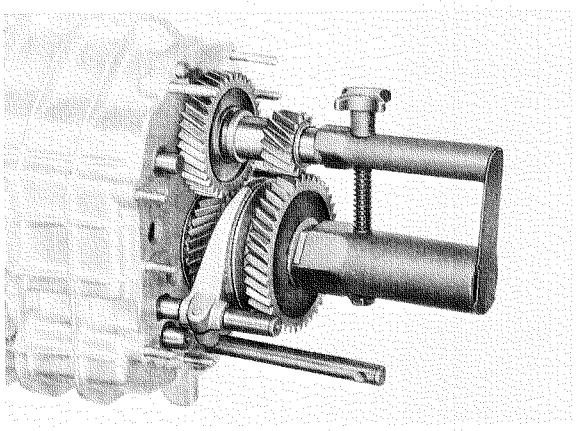
Dimension "a"

911 Carrera = ca. 80 mm
911 Turbo = ca. 92 mm

8. Carefully turn ring gear by turning hexagon of locking sleeve to stop and set dial gauge to zero. Then turn back ring gear and read backlash from dial gauge. Note value.

Note:

It is essential to block the drive pinion with special tool 9260 for this measurement.



9. Repeat measurement three times, turning the ring gear through 90° for each measurement. Measured values must not deviate from each other by more than 0.05 mm.

Note:

Backlash adjustment value is inscribed on the ring gear. Actual setting may be -0.05 mm less than this value. Under no circumstances may backlash ever exceed the inscribed value.

10. If specified backlash is not attained, shims (S_1 + S_2) must be changed again. However, make sure that the total shim thickness (S_{tot}) remains unchanged.

CHECKING PROTECTIVE CAPS OF CONTROL ARM AND TIE ROD JOINTS

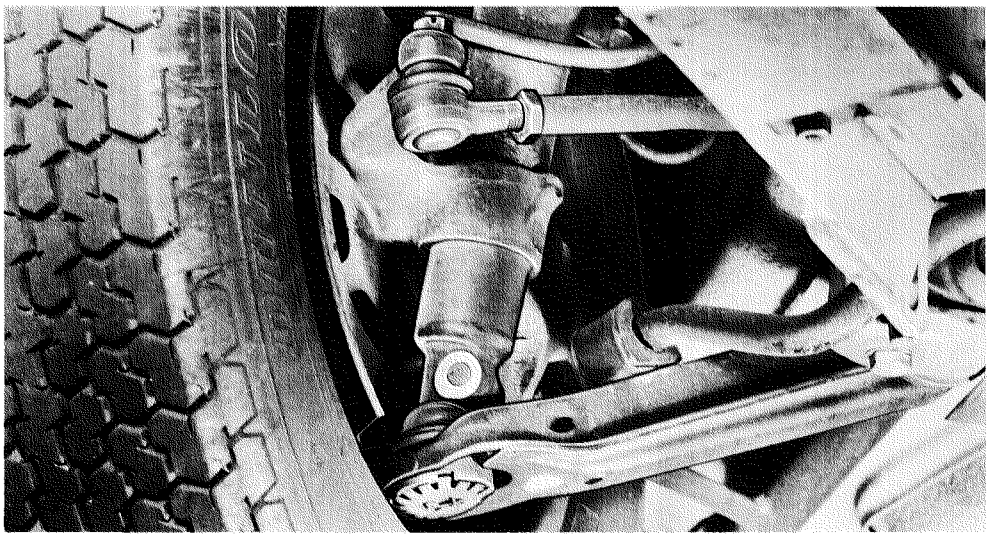
Protective rubber caps on front axle joints could be damaged by stones or during assembly work.
If a protective rubber cap leaks, the pertinent joint must be replaced since penetrating dirt or moisture would destroy the joint. This segment of the vehicle maintenance is reviewed below.

"Check tightness and function of all connections on steering gear, tie rods, steering arms and joints as well as protective caps for leaks."

Checking Protective Rubber Caps on Control Arm Joints

1. Lift car on a hoist. Disengage steering lock.
2. Turn front wheels against lock.
3. Visually inspect visible surfaces on left and right sides after cleaning. Squeeze rubber caps with fingers to be able to recognize hidden tears.
4. Check other half of rubber caps after turning front wheels to other steering lock.

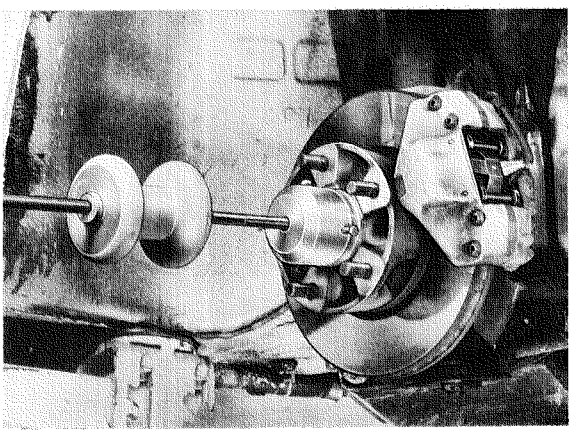
Visual inspection will not be possible in a small area near the brake disc guards. Check this area by feeling.



ADJUSTING FRONT WHEEL BEARINGS

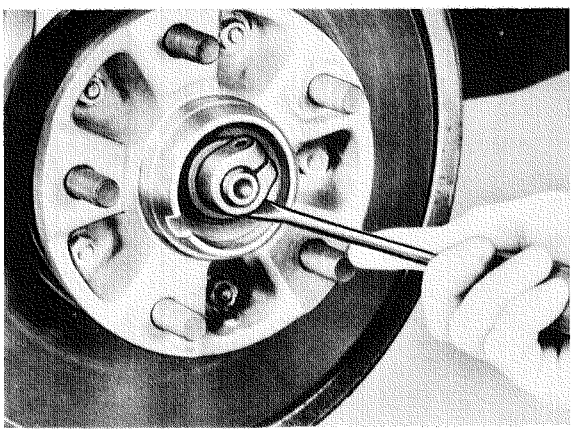
Wheel bearing play is adjusted correctly as long as pressure plate can still be moved by finger pressure applied to a screwdriver (never by turning or with leverage).

1. Take off wheel. Pry off hub cap with all-purpose tool VW 771 used together with 9165.



2. Loosen fillister head bolt of clamping nut. Tighten clamping nut slightly, turning the hub at the same time.

3. Loosen clamping nut until pressure plate can just be moved by finger pressure applied to a screwdriver.
   Do not support screwdriver on hub.



4. Tighten fillister head bolt of clamping nut to 15 Nm, without turning the clamping nut.

5. Recheck adjustment by moving pressure plate, correcting if necessary.

Shock Absorber Survey, Identification and Differences

	Front Axle	Rear Axle	System: 1 Pipe	System: 2 Pipes	System: Pressureless	System: Gas Pressure	Make: Boge	Make: Bilstein				Paint, Code
911 Carrera standard	X			X	X		X					black-blue dot**
until end of '85 mod.		O		O	O		O					black-green ring
911 Carrera standard	X			X		X	X					black-blue dot***
since 1986 model		O		O		O	O					black-blue ring
911 Carrera optional extra + Turbo-Look 1984 model*	X		X			X		X				green
		O	O			O		O				green-blue ring
911 Carrera optional extra, Club-Sport, Turbo-Look + Speedster since 1985 model	X			X		X	X					black-brown dot***
		O		O		O	O					black-brown ring
alternative* until end of '88 mod.	X		X			X		X				green
		O	O			O		O				green-blue ring
911 Turbo* until end of '88 mod.	X		X			X		X				green
		O	O			O		O				green-blue ring
911 Turbo since 1989 model	X		X			X		X				green-yellow ring
		O	O			O		O				green-yellow ring

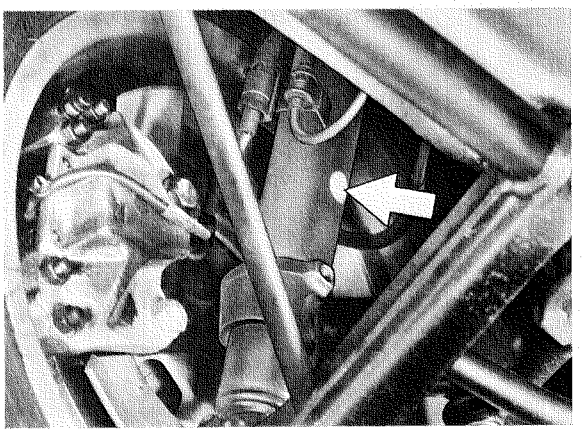
* Identical parts.

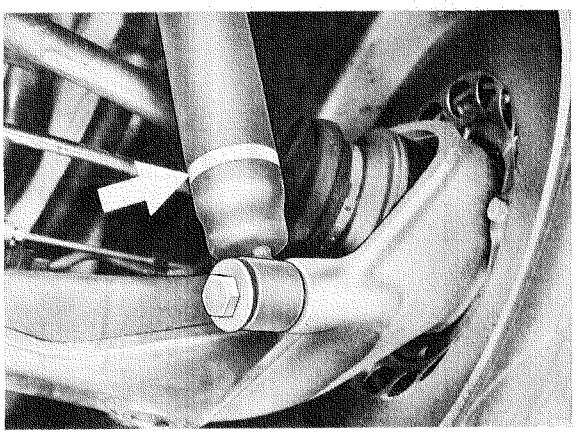
** Absorber cartridge holding pipe connection with internal threads.

*** Absorber cartridge holding pipe connection with external threads.

Printed in Germany – XIII, 1989

Identification of dampers on front and rear axles (colored dot / ring).



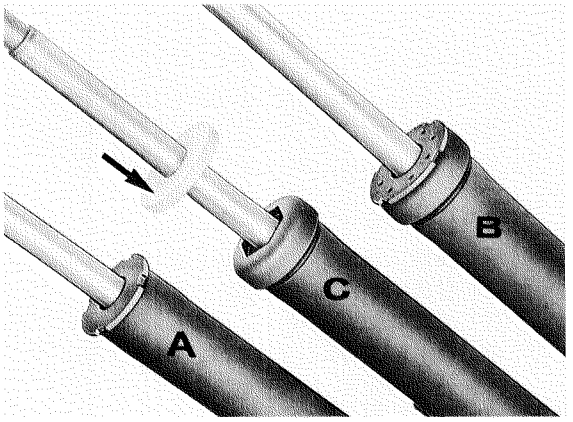


N o t e

The pressureless damper will remain in any desired position when removed. In the case of the gas-pressure version, the damper is all the way out.

DAMPER CARTRIDGE SCREW CONNECTION FOR BOGE DAMPER STRUTS

3 versions of damper-cartridge screw connection have been installed (once with screw plug and twice with screw caps). Only 2 versions (A and C) are available as spare parts. Version B is, where applicable, to be replaced by version C. Damper cartridges for version A have different dimensions from those for versions B and C.



Version	Damper Cartridge Tube Screw Connection With	Damper Cartridge (tuning) Model Year	Notes
A	Female thread Screw plug	As standard-pressureless up to end of 85 model	Conversion to optional extra (sports) tuning possible (page 40 - 6)
B	Male thread Screw cap with welded-on (spot-welded) disk	Optional extra gas pressure 85 model	Screw cap not available as spare part. If necessary, use screw cap with hex socket head (version C). Be sure also to use plastic disk (arrow).
C	Male thread Screw cap with hex socket head. Plastic disk (arrow) on screw cap.	As standard and optional extra gas pressure as of 86 model	For loosening and tightening the screw cap, use tube wrench for damper cartridge e.g. VW part number 2069.

BOGE DAMPERS - CONVERSION POSSIBILITY

1. For the standard pressureless Boge damper struts up to end of 85 model there are also 2-tube gas-pressure damper cartridges in an optional-extra version (sports tuning).

   After removing the standard damper cartridges, the optional-extra cartridges can be mounted.
   After conversion, the damper struts must be marked / brown dot dia. approx. 20 mm, as page 40 - 4).
   It is then necessary also to mount optional-extra dampers on the rear axle. The rear-axle dampers are exchanged complete.

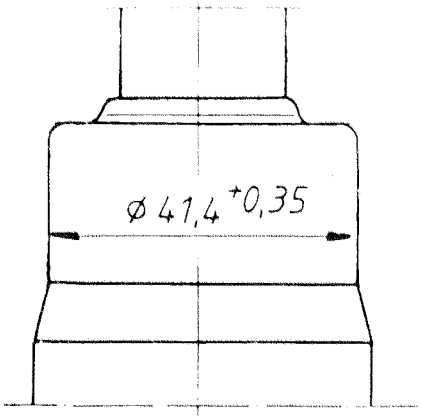
2. The following vehicles can be retrofitted (applies only to Boge dampers):

- 911 Carrera 85 model with standard dampers
- 911 Carrera 84 model
- 911 SC 78 - 83 models

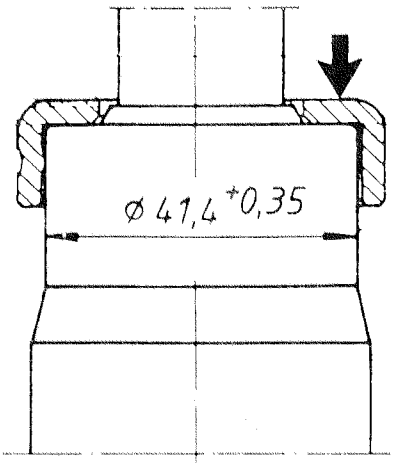
   As well as all 911s, 73 - 77 model years, equipped with Boge dampers.
   See spare-part information under Section 4 below.

3. The standard Boge gas-pressure damper struts as of 86 model can, of course, also be equipped with optional-extra (sports tuning) gas-pressure damper cartridges (marking and conversion on rear axle likewise necessary).
   These damper cartridges differ, however, dimensionally from damper cartridges for pressureless damper struts due to the different screw connection (page 40-5).

Damper cartridge for screw connection A



Damper cartridge (with pressed-on spacer ring arrow dia. 48.7 mm) for screw connections B and C.



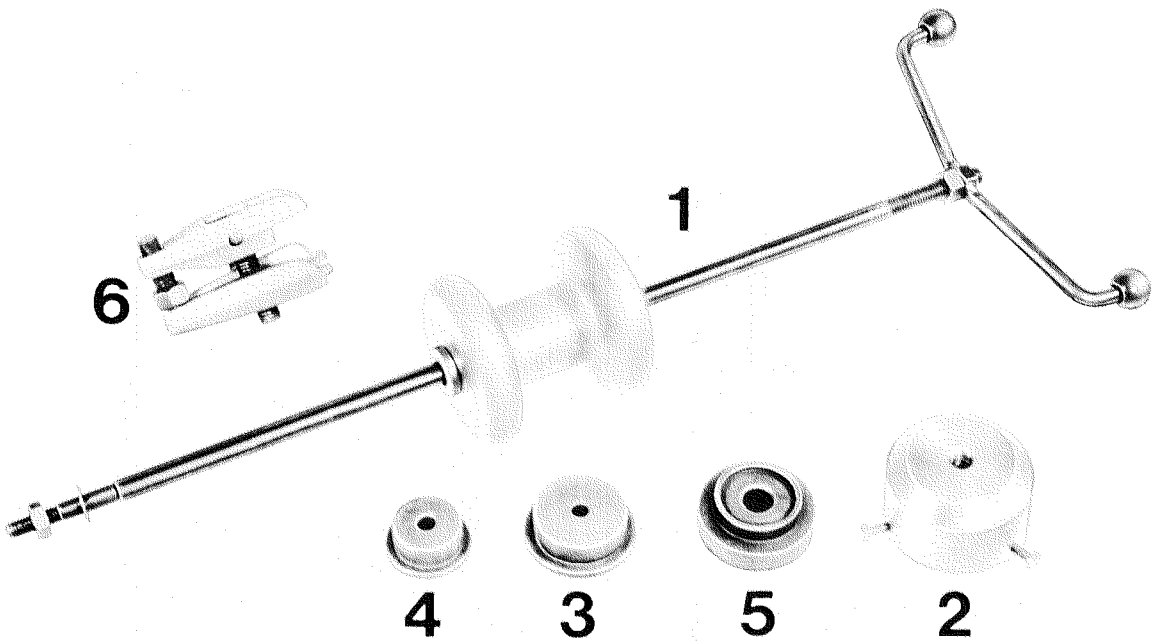
4. The part numbers of the corresponding dampers and cartridges (also for the older models quoted under Section 2 above) should be taken from the spare parts catalog for the 911 as of 84 model.
Spare-part damper-strut cartridges are likewise marked with the spare-part number and the appropriate colored dot. The color is also different depending on the kind of screw connection.

Color of gas-pressure damper cartridges:

Optional-extra version:	Screw connection A - red with brown sticker Screw connections B and C - gray with brown sticker
Standard version:	Screw connections B and C - gray with blue sticker

Wheel bearings, disassembling and assembling

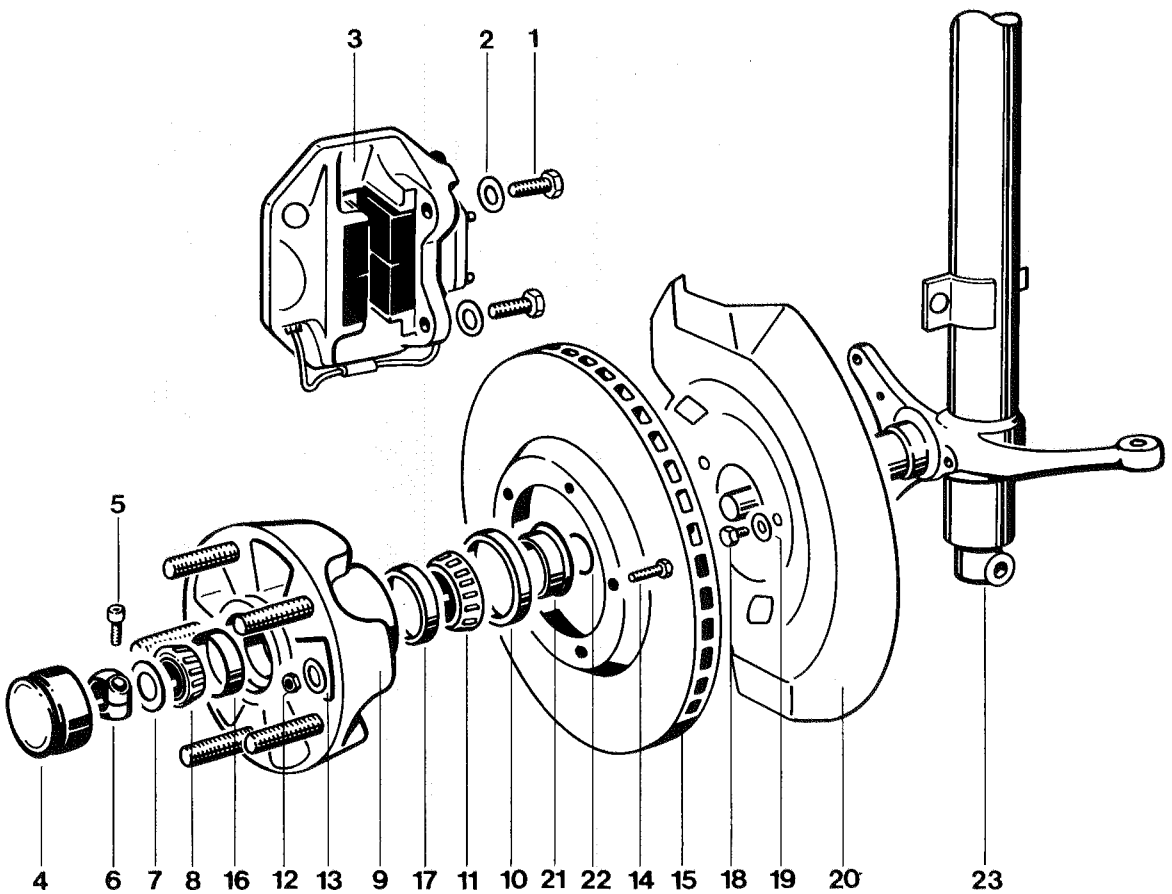
Tools



87/1009

No.	Description	Special Tool	Remarks
1	Multi-purpose tool	VW 771	
2	Puller	9165	
3	Press tool	VW 447 i	
4	Press tool	VW 447 h	
5	Press tool	VW 433	
6	Tie-rod puller		e.g. Nexus 168 - 1

Wheel bearings, disassembling and assembling



46 - 40

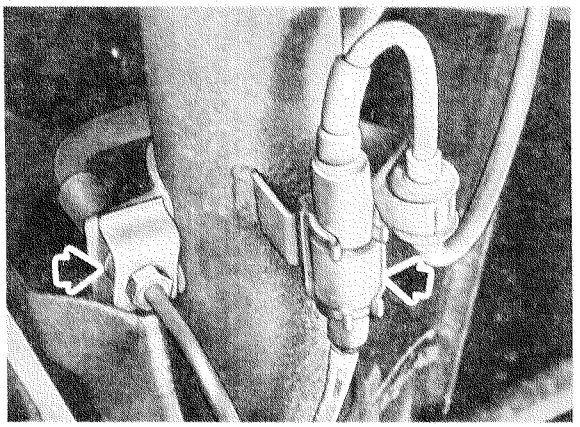
No.	Description	Qty.	Note when: Removing	Installing
1	Fastening bolt	2		Lubricate bolt thread with Optimoly HT
2	Spring washer	2		replace
3	Brake caliper	1	Remove brake caliper when working on the front suspension, undo brake line at the strut holder	
4	Grease cap	1	Drive out with multi-purpose tool VW 771 together with 9165	
5	Clamping bolt	1		Tightening torque 15 Nm
6	Clamping nut	1		
7	Thrust ring	1		
8	Wheel bearing, outer	1		Check, replace if necessary. Fill with multi-purpose grease e.g. Shell Retinax A
9	Front wheel hub	1		Clean locating surface for brake disk and apply a fine film of mounting paste Optimoly TA. Pack wheel bearings and wheel hub with multi-purpose grease.
10	Radial oil seal	1	Press out with a screwdriver, do not damage the contact area. Replace, observe installation position, pack space between the sealing lips with wheel-bearing grease. Press in with press tool VW433.	
11	Wheel bearing, inner	1		Check, replace if necessary. Lubricate with multi-purpose grease.

No.	Description	Qty.	Note when: Removing	Installing
12	Hexagon nut	5		Tightening torque 23 Nm
13	Spring washer	5		replace
14	Hexagon head bolt	5		
15	Brake disk	1		
16	Bearing race for outer wheel bearing	1	Heat wheel hub to 120 ... 150 °C (250 ... 300 °F). Drive out, alternating sides, with a punch.	Heat wheel hub to 120 ... 150 °C (250 ... 300 °F). Insert and press in with press tool VW447 h.
17	Bearing race for inner wheel bearing	1	Heat wheel hub to 120 .. 150 °C (250 ... 300 °F). Drive out, alternating sides, with a punch.	Heat wheel hub to 120 ... 150 °C (250 ... 300 °F). Insert and press in with press tool VW447 i.
18	Hexagon-head bolt	3		Tighten with 25 Nm, lubricate with Optimoly HT
19	Spring lock washer	3		
20	Protective plate	1	Removal only necessary to replace spacer ring No. 21.	
21	Spacer ring	1		
22	O-Ring	1		replace
23	Shock-absorber strut	1		Check front wheel-bearing seat for wear. Adjustments are not permissible.

Assembly instructions

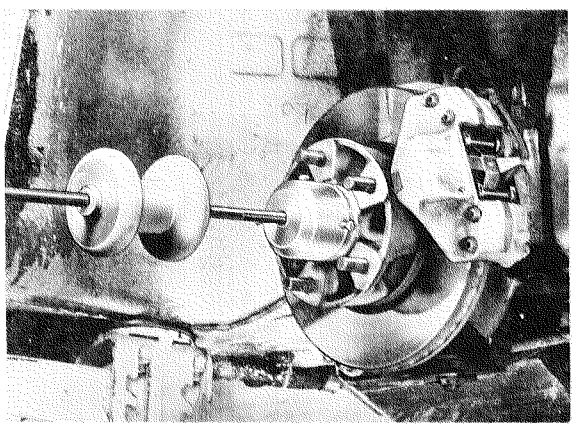
Disassembling

1. Disconnect brake-pad wear cable and brake line. Press in brake pedal with pedal arrester beforehand to avoid brake fluid running out of the reservoir. Dismantle brake caliper.



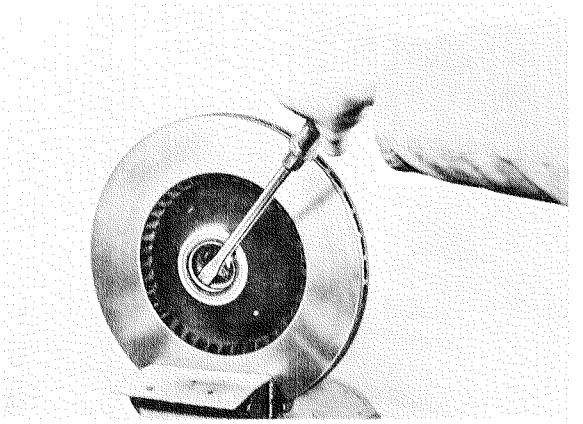
87/998

2. Drive out hub cap with multi-purpose tool VW771 together with 9165.



10013

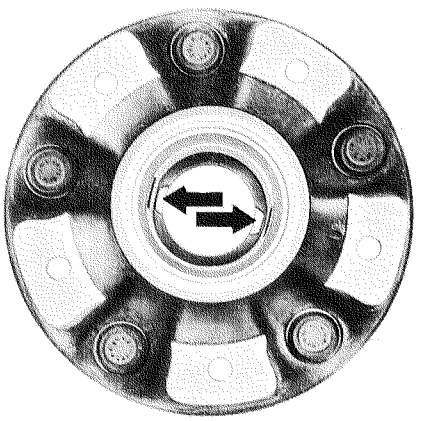
3. Pry out radial oil seal with a large screwdriver. Be careful not to damage contact surface for seal.



5923

4. Remove brake disk from wheel hub and heat wheel hub to 120 - 150 °C (250 - 300 °F).

5. Drive out bearing races, alternating sides, with a punch.



87/1000

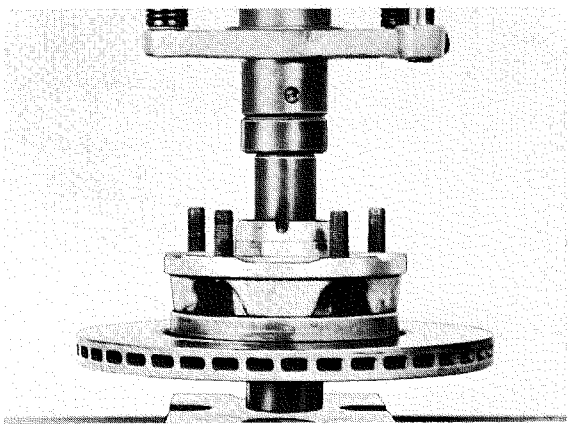
Assembling

Note:

Lubricate wheel bearing and seal with multi-purpose grease e.g. Shell Retinax A.

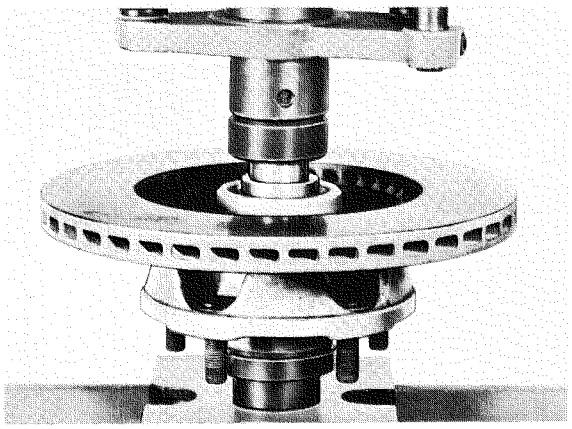
1. Heat wheel hub to 120 - 150 °C (250 - 300 °F).

2. Insert outer bearing race and press in to the stop with press tool VW 447 h.



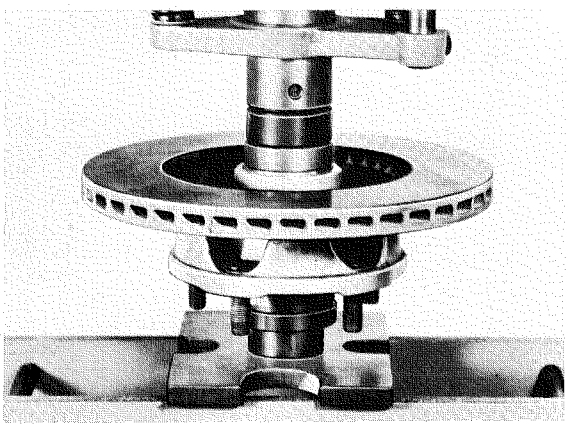
6311

3. Insert inner bearing race and press in to the stop with press tool VW 447 i.



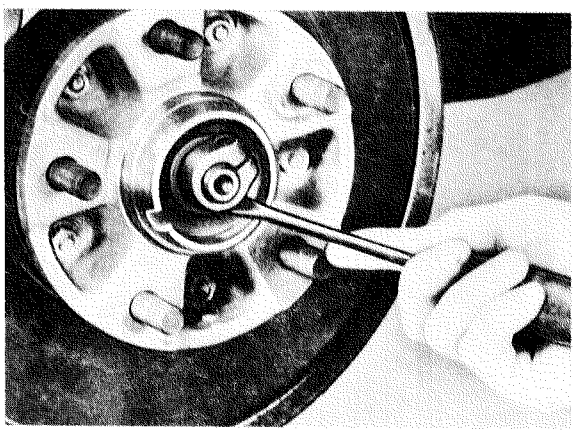
6309

4. Insert the inner wheel bearing and press in the seal ring using special tool VW 433 until the seal ring is flush with the hub. Observe the installation position of the seal ring.



6310

5. Adjust front wheel bearings, taking the following points into consideration:
   Tighten the lock nut slightly, for which the hub must be turned. Loosen the lock nut until it is just still possible to move the thrust plate with a screwdriver with finger pressure. Do not support the screwdriver on the hub.



5963

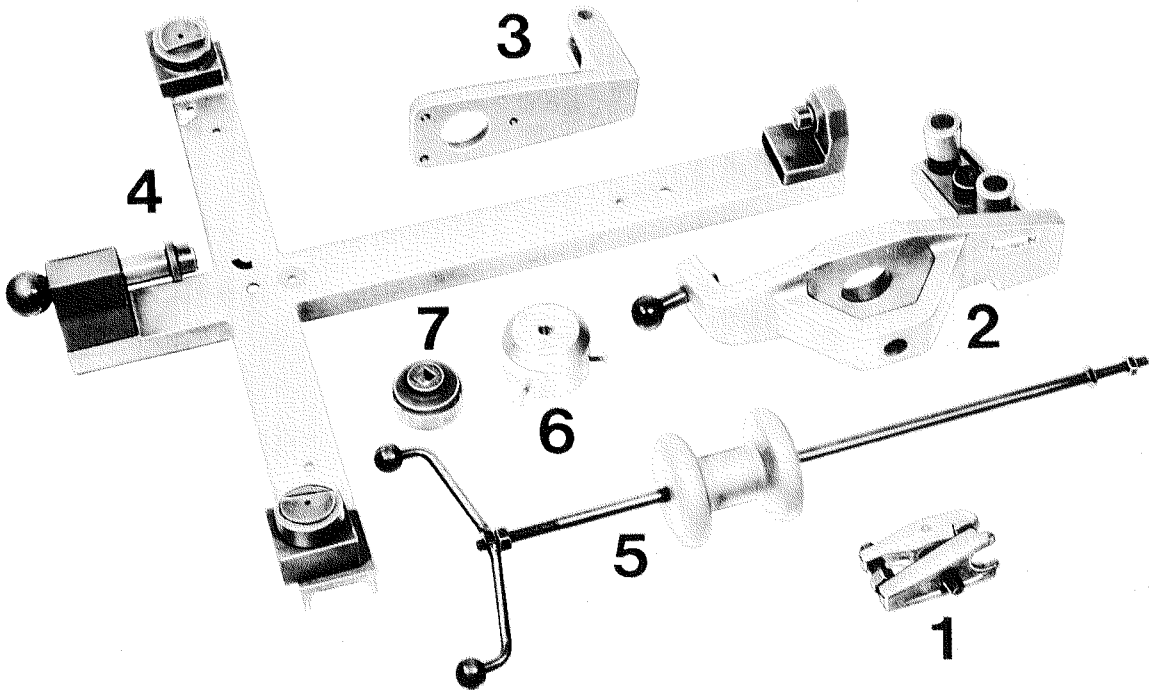
6. Tighten fillister-head screw of the lock nut with 50 Nm, without turning the lock nut.

7. Recheck the adjustment by moving the thrust plate, correct if necessary.

8. Connect brake line and brake-pad wear cable. Bleed brake system.

Wheel suspension disassembling and assembling

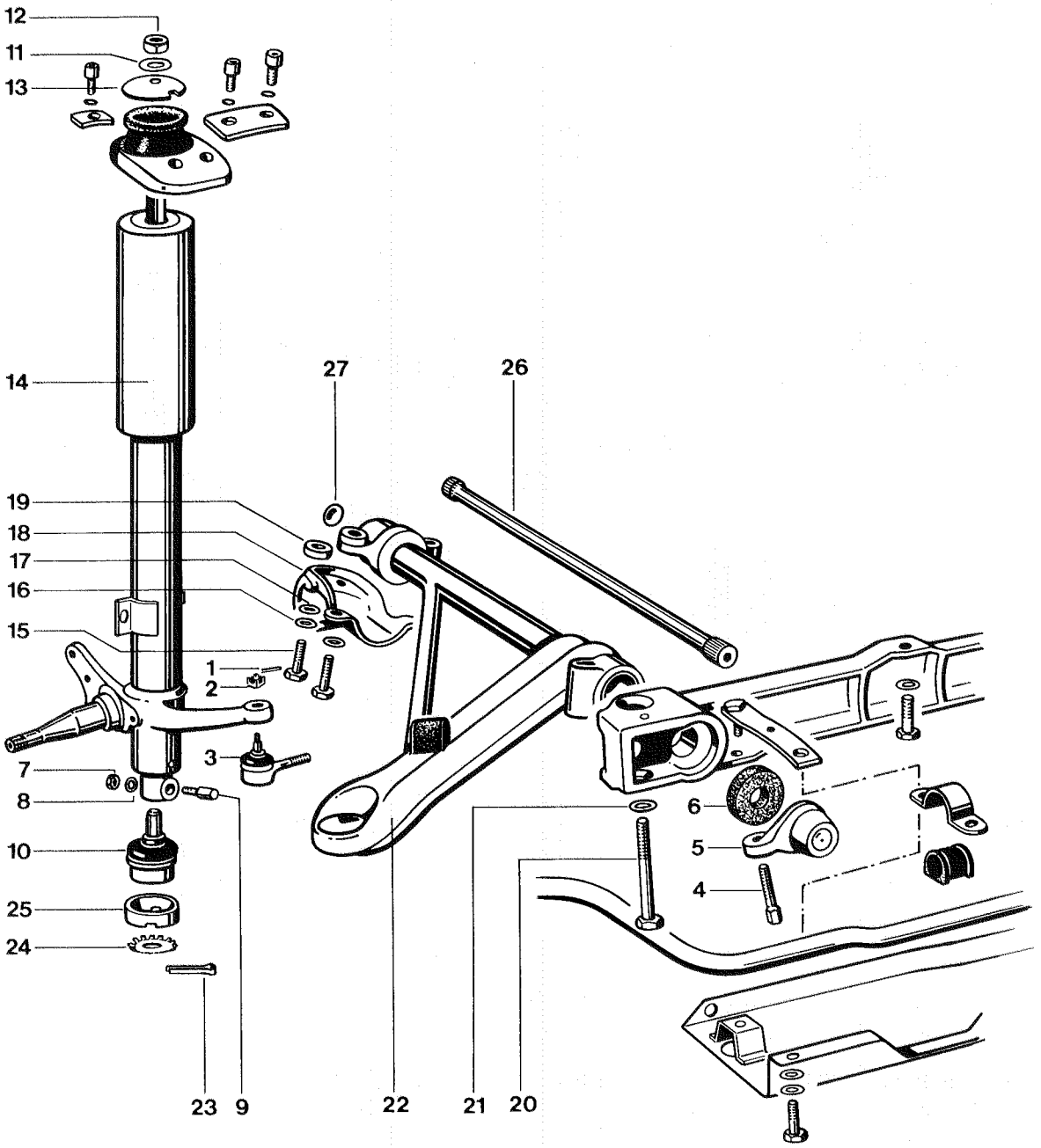
Tools



87/1008

No.	Description	Special Tools	Remarks
1	Tie-rod puller		e.g. Nexus 168-1
2	Test equipment for shock-absorber strut	P 286b	
3	Test equipment for pitman arm	P 284b	
4	Test equipment for control arm	P 288b	
5	Multi-purpose tool	VW 771	
6	Puller	9165	
7	Wrench	P 280b	

Front wheel suspension, disassembling and assembling



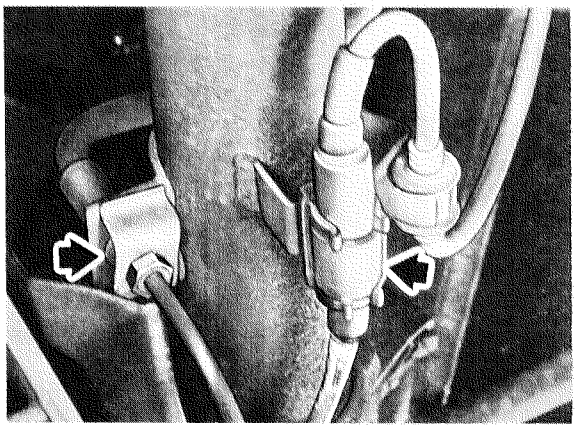
47 - 40

No.	Description	Qty.	Note when: Removing	Installing
1	Splint	1		replace
2	Castle nut	1		Tightening torque 45 Nm
3	Steering knuckle	1	Remove with puller, e.g. Nexus 168-1	Check play, check rubber for cracks
4	Adjusting bolt	1		
5	Adjusting lever	1		
6	OWA seal	1		
7	Lock nut	1		Tightening torque 22 Nm
8	Washer	1		
9	Thread spindle	1	drive out	Replace and install with Optimoly HT. Make sure it is seated correctly.
10	Ball joint	1		Check for wear, replace if necessary.
11	Tab washer	1		replace
12	Hexagon nut	1		Tightening torque 80 Nm
13	Supporting plate	1		
14	Shock-absorber strut	1		Check shock absorber strut with steering knuckle, using special tool P 286b. Check pitman arm with special tool P 284b, replace if necessary.
15	Hexagon-head bolt	3		Tightening torque 46 Nm
16	Spring lock washer	3		replace
17	Washer	3		
18	Protection bar	1		
19	Shim	1		

No.	Description	Qty.	Note when: Removing	Installing
20	Hexagon-head bolt	1		Tightening torque 90 Nm.
21	Spring washer	1		replace
22	Control arm	1		Check for distortion with special tool P 288b.
23	Splint	1		replace
24	Locking washer	1		replace
25	Cap nut	1		Tightening torque 250 Nm
26	Spring rod	1		lubricate, check for damage to serrations and paint, replace if necessary.
27	Cover	1		

Wheel suspension, disassembling

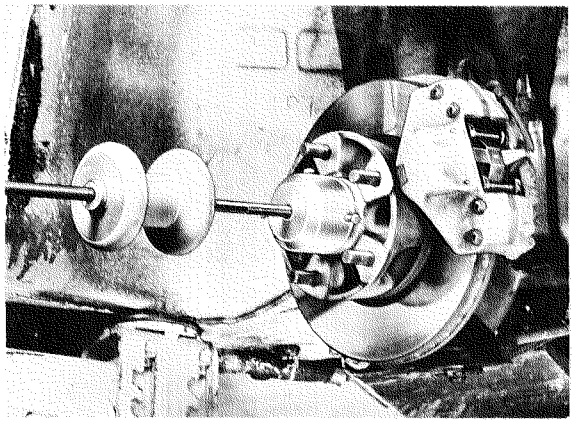
1. Disconnect brake-pad wear cable and brake line from the shock-absorber strut. Press brake pedal with pedal arrester inwards slightly beforehand to prevent brake fluid running out of the reservoir.



87/998

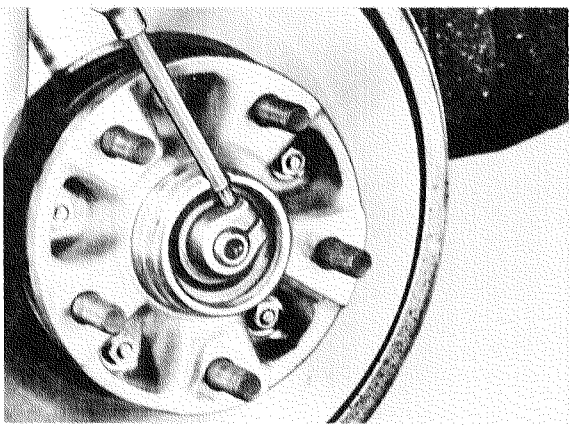
2. Remove brake caliper.

3. Drive off grease cap with multi-purpose tool VW 771 together with 9165.



10013

4. Loosen fillister-head screw of the wheel-bearing clamping nut, undo clamping nut and remove nose plate.

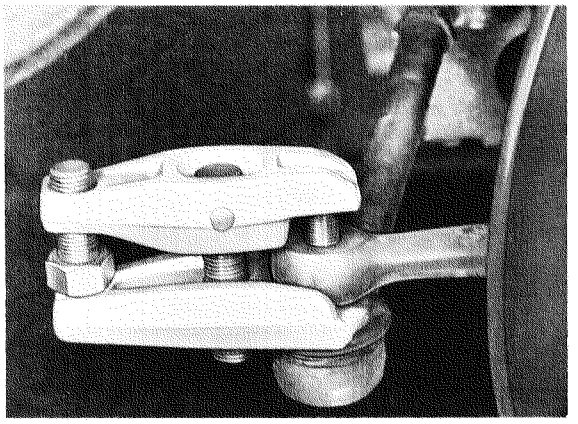


5964

5. Remove front wheel mount with brake disk and bearing.

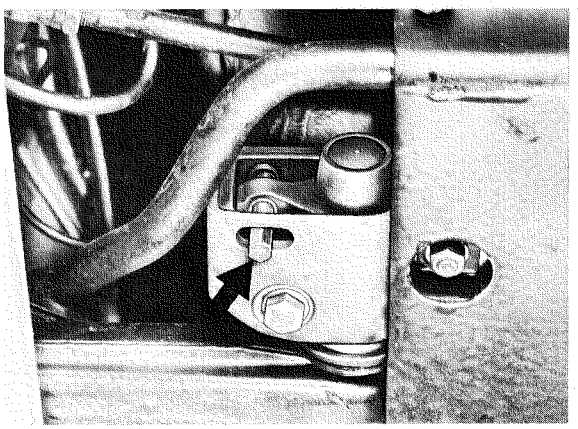
6. Undo and remove hexagon-head screws of protection plate.

7. Release and undo castle nut of the steering knuckle. Pull out ball joint with special tool, e.g. Nexus 168-1.



87/997

8. Undo adjusting screw of the spring rod and remove adjusting lever with OWA seal.

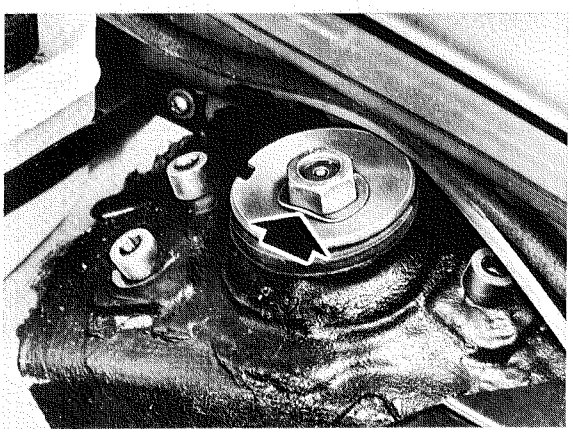


85/653

9. Undo hexagon nut for the ball joint of the shock-absorber strut and drive out the thread spindle.

10. Pull the ball joint from the shock- absorber strut by pressing the strut upwards.

11. Release and undo the hexagon nut on the strut (top) and remove protection plate, supporting plate and shock-absorber strut.

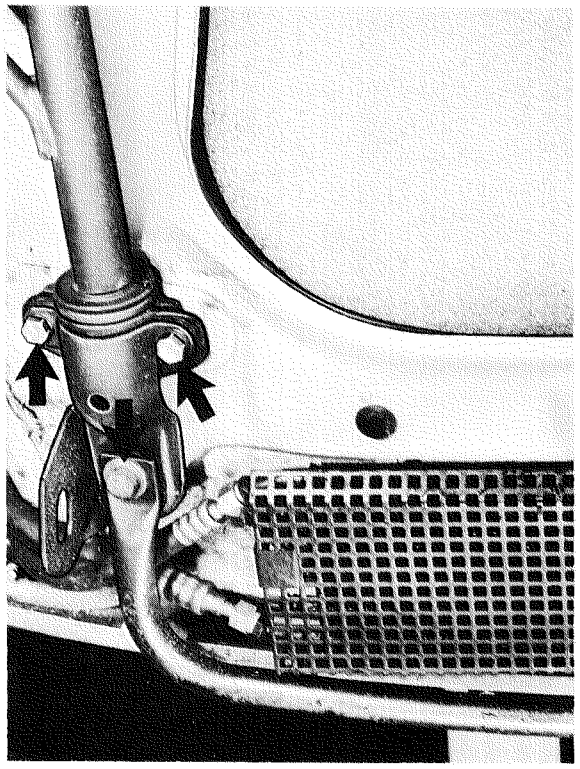


2416

Note:

When removing the support bearing, make a drawing of the one-hole and two-hole pressure plate positions. Undo fillister-head screws and remove support bearing with bearing rubber. When installing, tighten fillister-head screws for support bearing with 46 Nm and seal with permanently flexible sealing compound.

12. Undo hexagon-head bolts on the protection bar and front control-arm bearings and remove protection bar.

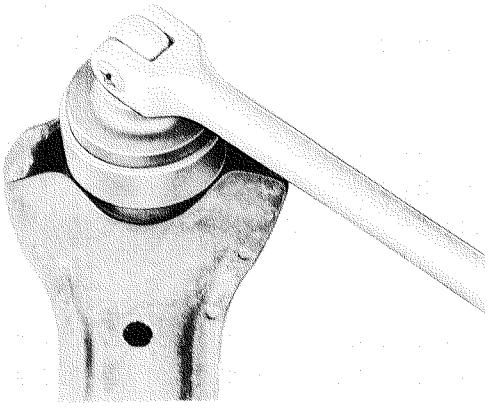


11822

13. Dismantle stabilizer by removing front guard and pulling stabilizer from rubber bearing (see Page 40 - 29).

14. Undo hexagon-head bolts from control arms at auxiliary carrier and take control arm out forwards.

15. Clamp control arm in vice (use protective jaws), release the slotted round nut on the ball joint and remove using special tool P 280b.



87/1006

Note:

If it necessary to remove both control arms, first remove one control arm and tighten the hexagon-head bolt for control arm and auxiliary carrier again slightly to retain the auxiliary carrier.

Checking wheel suspension parts

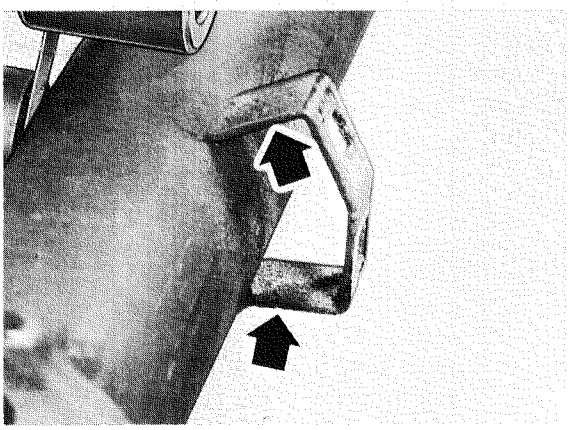
1. Check shock-absorber strut with steering knuckle using special tool P 286b

Prepare special tools as follows: For Boge shock- absorber struts (outside pipe diameter 52 mm) attach 34 mm sleeves and 10 mm cap.

For Bilstein shock-absorber struts (outside pipe diameter 50 mm) attach sleeves (32 mm) and cap (13 mm) with No. P 286d.

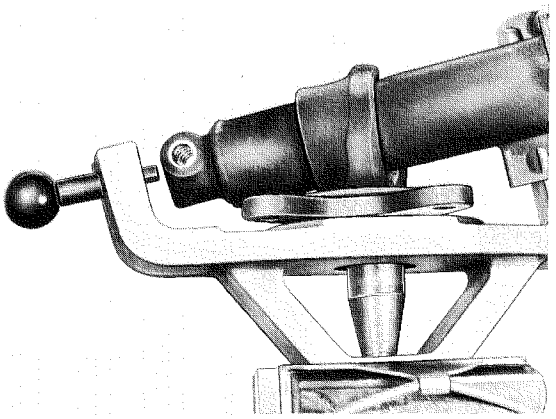
Note:

To check the right-hand shock absorber strut, the bracket for the brake-pad wear cable must be separated approx. 1 cm from the strut and welded on again afterwards (inert gas). Rust prevention measures must be taken after welding under all circumstances.



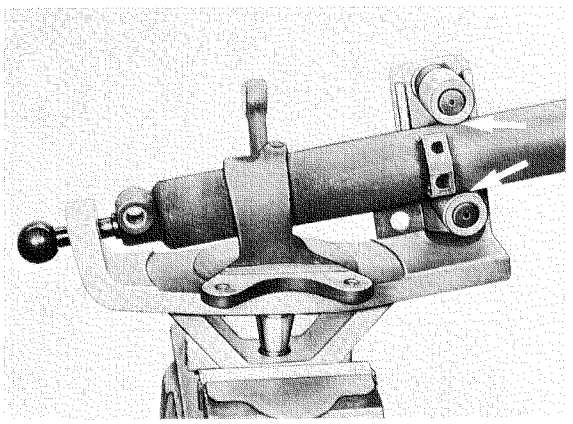
87/1002A

a) Clamp special tool in vice. Slide the strut journal with mounted distance ring into the test hole. If it is not possible to slide the journal as far as the assembly on the flange, the journal is bent and the shock-absorber strut must be replaced.



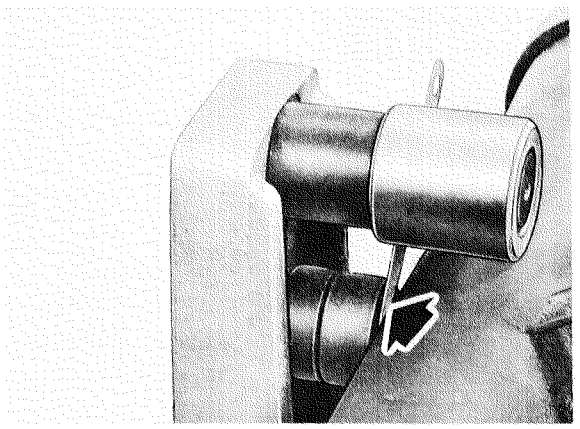
87/1003

b) Turn the struts between the measuring bolt and fasten with the retaining bolt. If it is not possible to turn the strut between both measuring bolts the shock-absorber strut must be replaced.



87/1004

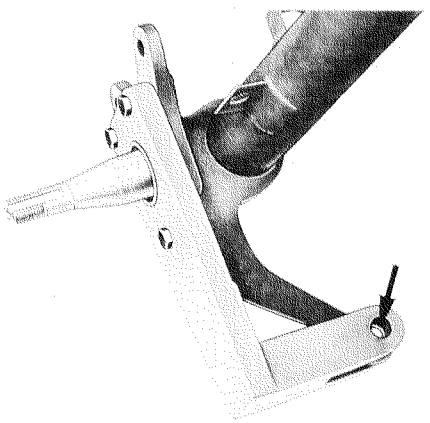
c) Furthermore, only a distance of max. 2.2 mm is permissible between the shock-absorber outer tube and the frontal measuring surface. The shock absorber strut must also be replaced if this dimension is exceeded.



87/1002B

2. Check pitman arm using special tool P 284b

a) It must be possible to attach special tool P 284b to the steering knuckle with three screws (M 8 x 25) easily so that the steering arm is located in the test cutout.



87/1001

b) The bore diameter for the steering knuckle in the steering arm may not exceed the test bore of the special tool. The shock-absorber strut must be replaced if the deviations are excessive.

3. Check vibration shock absorber

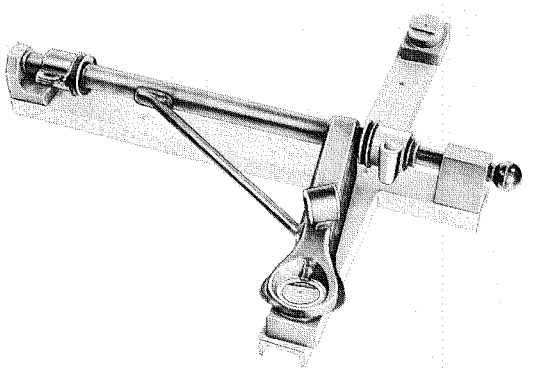
It is only possible to check vibration shock absorbers correctly with a test machine. Visual or functional testing will, however, show completely defective shock absorbers, whose performance is not reduced.

Pull apart and push together installed vibration shock absorbers manually. The shock absorber must be moveable over its complete stroke without sticking. The graduated tension and compression damping must be clearly evident right up to the final stop.

Note:

Boge pressurized shock absorbers (two pipe): by virtue of the gas pressure, the piston rod becomes more difficult to move as the shock absorber is pushed in further. Pump through shock absorbers which have been stored for a long time once or twice if necessary when installed. Replace very leaky vibration shock absorbers. Shock absorbers whose gas pressure has fallen (do not automatically go to the stop in the tension stage), but show no signs of oily evaporation (oil mist) and which fulfill all other requirements, can be used further. Shock absorbers which show signs of both factors - oily evaporation (oil mist) and no more available gas pressure - must be replaced.

4. Check control arm with special tool P 288b



87/1010

a) Remove the spring rod from the control arm and drive out the cover of the spring-rod gear teeth out of the control arm with a suitable piece of pipe.

b) Fit control arm in special tool P 288b.

c) It must be possible to turn the control arm with the locating hole for the ball joint on the test spindle of special tool P 288b and the seating surface for the ball joint must make contact with the test spindle flange all round. Deformed or damaged control arms must be replaced.

d) With the rounded side upwards, install the cover in the control arm and drive it in with a suitable punch to the stop.

e) Check the rubber bush of the control arm for apparent wear. If the rubber bushes are defective, the control arm must be replaced.

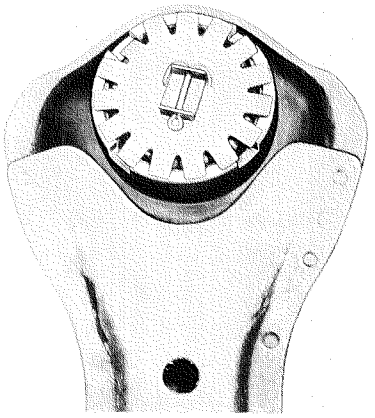
5. Check ball joint

A certain amount of friction must be evident when moving the ball spindle. It it is possible to move the ball spindle without resistance and there is axial play, the ball joint must be replaced. The ball joint must also be replaced if the sealing boot is damaged.

6. Check spring rod for damage to the serrations and paint, particularly for rust deposit, replace if necessary.

Assembling wheel suspension

1. Insert ball joint into control arm and tighten slotted round nut with 250 Nm. Secure the slotted round nut by bending a suitable lug of the tab washer.

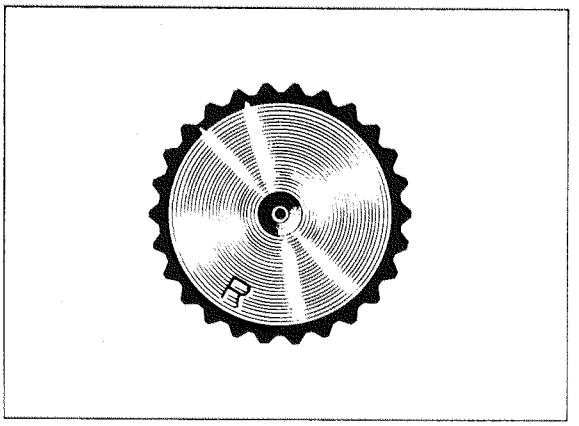


87/1005

2. Insert cover, apply a light film of multi-purpose grease to the spring rod, lubricate gear teeth well and slide spring rod into the control arm. (Do not push the cover through the control arm)

Note:

The spring rods are pretensioned during production. Right and left spring rods may not be confused under any circumstances. The end faces of the spring rods are marked with an "L" for left and an "R" for right (see Figure).



49 - 40

3. Slide control arm with spring rod into the auxiliary carrier.

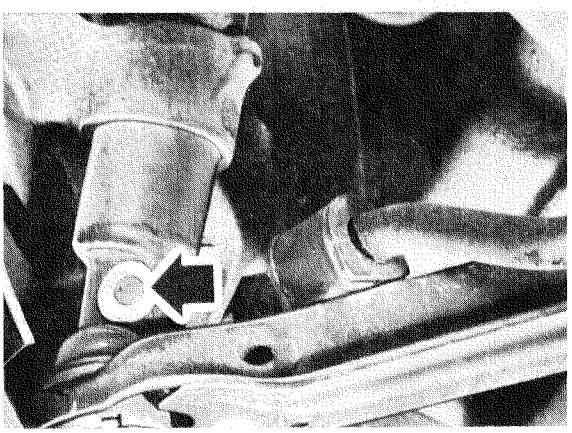
4. Tighten hexagon-head bolt for control arm (front) and protection bar with 46 Nm.

5. Tighten hexagon-head bolt for control arm and auxiliary carrier with 90 Nm.

6. Check that the cover in the control arm is seated correctly, because if the adjusting lever is badly installed the spring rod may be driven forwards out of the gear teeth of the control arm.

7. Insert shock-absorber strut, tighten hexagon nut on shock-absorber strut with 80 Nm. Use a new tab washer and ensure that it is mounted with the tab pointing upwards.

8. Apply Optimoly HT to the double wedge (thread spindle) before installation. The installation position of the double wedge is such that the retaining nut points forwards in the direction of travel.

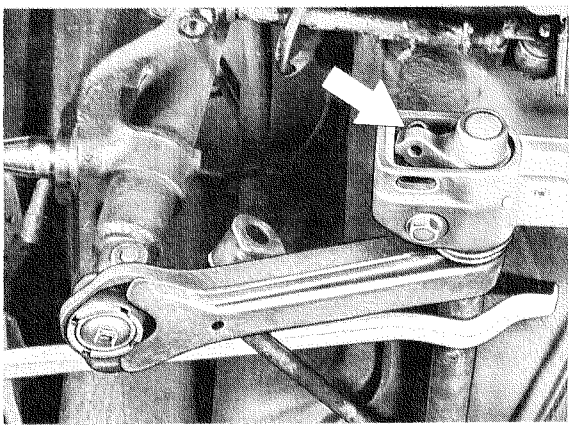


10015

The double wedge must be seated correctly by tapping lightly with a hammer before tightening the lock nut. Tighten lock nut with a tightening torque 22 Nm.

9. Mount the adjusting lever onto the spring rod as described in the following.

a) Push control arm with assembled shock-absorber strut downwards to the stop in the strut (rebound) with an assembly lever or similar and slide the adjusting lever onto the spring rod as near as possible to the stop of the auxiliary carrier for the adjusting bolt. (The adjusting lever must be fitted with a cover).



87/994

b) Lubricate thread of the adjusting bolt with Optimoly HT paste and tighten slightly.

c) Check that the cover in the control arm is seated correctly because if the adjusting lever is badly mounted the spring rod may be driven forwards out of the gear teeth of the control arm.

10. Insert steering knuckle and tighten castle nut with 45 Nm.

Note:

Carry out extended vehicle measurements.

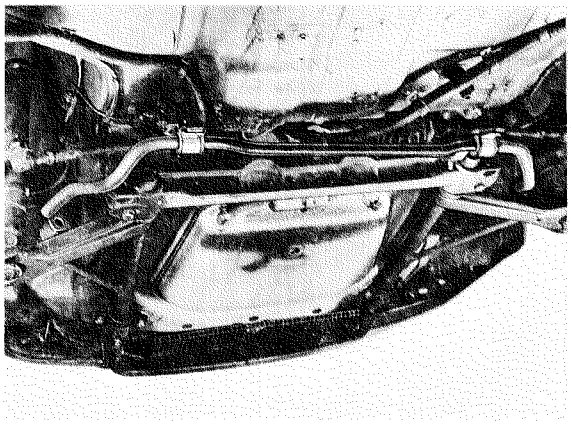
Stabilizer, removing and installing

Removing

1. Remove sump guard

2. Unscrew both retaining bars on the auxiliary carrier.

3. Pull the stabilizer out from one side towards the rear, first from one, then from the other retaining bar.



87/996

Installing

1. Press the stabilizer first into one then into the second retaining bar. Use assembly paste, e.g. "Conti-fix".

Note:

Check stabilizer rubber bush for wear.

TECHNICAL DATA

Front Axle

Wheel suspension	Independent wheel suspension on control arms and spring struts
Springs	One round torsion bar in forward direction for each wheel
Torsion bar diameter	18.8 mm
Shock absorbers Make / Cross Reference Survey	Double-action hydraulic shock absorbers See page 40 - 3
Stabilizer diameter	20 mm 22 mm (since 1986 model)

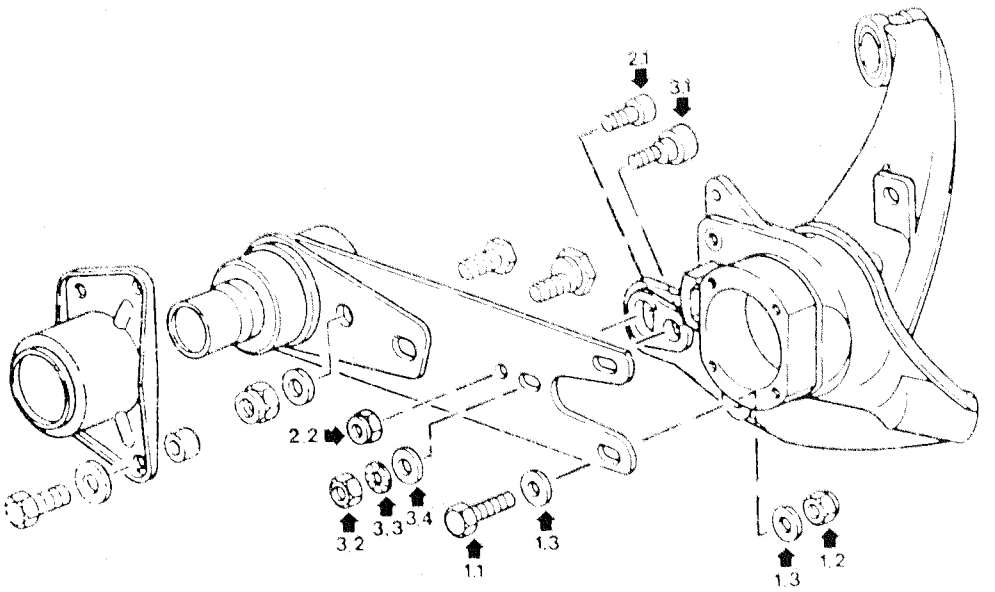
TIGHTENING TORQUE FOR FRONT AXLE

Location	Description	Threads	Material	Torque Nm (ftlb)
Mount/spring strut	Nut	M 14 x 1.5	8	80 (58)
Mount/body	Bolt	M 10	8.8	47 (34)
Plug for shock absorber cartridge	Plug			120 + 20 (87 + 14)
Steering gear	Bolt	M 10	8.8	47 (34)
Steering track arm pivot/ pivot sleeve (steering gear)	Bolt	M 10	8.8	47 (34)
Steering track arm ball joint/ steering arm	Castle nut	M 10 x 1	8	45 (33)
Ball joint and pivot/ steering track arm (lock nut)	Nut	M 14 x 1.5		45 (33)
Auxiliary member/body	Bolt	M 12 x 1.5	8.8	90 (65)
Stabilizer/auxiliary member strut	Bolt	M 8	8.8	25 (18)
Auxiliary member strut, splash guard and stabilizer/ body	Bolt	M 10	8.8	47 (34)
Auxiliary member strut and splash guard/auxiliary member	Nut	M 10	8	28 (20)
Control arm/body	Bolt	M 10	8.8	47 (34)
Ball joint/control arm	Slotted nut	M 45 x 1.5	8.8	250 (181)
Ball joint/spring strut	Uni-stop nut	M 8	8	22 (16)
Brake disc/wheel hub	Nut	M 8	8.8	23 (17)
Brake disc shield	Bolt	M 8	8.8	10 (7)
Caliper/steering knuckle	Bolt	M 12 x 1.5	8.8	70 (51)
Nut on steering knuckle	Screw	M 7	10.9	15 (11)
Brake line coupling	Nut	M 10 x 1		12 (9)
Wheel/wheel hub	Wheel nut	M 14 x 1.5		130 (94)

REAR AXLE ARM INSTALLATION ON SPRING STRUT

Self-locking nuts are used instead of lock washers (Schnorr locks) and hexagon nuts for installation of rear axle arms on spring struts and toe eccentrics since December, 1983.
The tightening torques of these connections were also changed.
The new bolts and self-locking nuts can be installed retoractively. The higher tightening torque values are applicable to both the old and new versions.
It is recommended to replace removed self-locking nuts.

Survey of Changes:



1. Rear Axle Arm / Spring Strut

	Old	New
1.1 Bolt	900.083.019.08 (M 12 x 1.5 x 35)	900.083.025.08 (M 12 x 1.5 x 40)
1.2 Nut M 12 x 1.5	900.076.035.02 (hexagon nut)	900.910.085.02 (self-locking nut)
Lock washer	999.523.109.02	none
1.3 Washer (bolt head and nut)	901.333.143.01	no change
Tightening torque	90 Nm (65 ftlb)	120 Nm (87 ftlb)

2. Toe Eccentric

	Old	New
2.1 Eccentric	901.333.133.05	no change
2.2 Nut M 12 x 1.5	900.076.035.02 (hexagon nut)	900.910.085.02 (self-locking nut)
Lock washer	999.523.109.02	none
Tightening torque	60 Nm (43 ftlb)	85 Nm (61 ftlb)

3. Camber Eccentric

	Old	New
3.1 Eccentric	901.333.133.04	no change
3.2 Nut M 12 x 1.5	900.078.017.02	no change
3.3 Lock washer	999.523.109.02	no change
3.4 Washer	901.333.143.01	no change
Tightening torque	60 Nm (43 ftlb)	85 Nm (61 ftlb)

Shock Absorber Survey, Identification and Differences

	Front Axle	Rear Axle	System: 1 Pipe	System: 2 Pipes	System: Pressureless	System: Gas Pressure	Make: Boge	Make: Bilstein				Paint, Code
911 Carrera standard	X			X	X		X					black-blue dot**
until end of '85 mod.		O		O	O		O					black-green ring
911 Carrera standard	X			X		X	X					black-blue dot***
since 1986 model		O		O		O	O					black-blue ring
911 Carrera optional extra + Turbo-Look 1984 model*	X		X			X		X				green
		O	O			O		O				green-blue ring
911 Carrera optional extra, Club-Sport, Turbo-Look + Speedster since 1985 model	X			X		X	X					black-brown dot***
		O		O		O	O					black-brown ring
alternative* until end of '88 mod.	X		X			X		X				green
		O	O			O		O				green-blue ring
911 Turbo* until end of '88 mod.	X		X			X		X				green
		O	O			O		O				green-blue ring
911 Turbo since 1989 model	X		X			X		X				green-yellow ring
		O	O			O		O				green-yellow ring

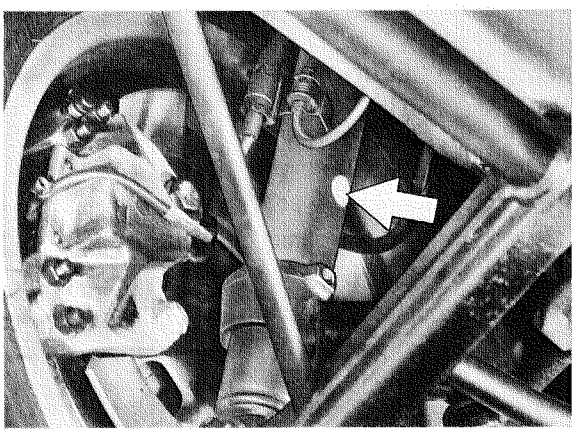
* Identical parts.

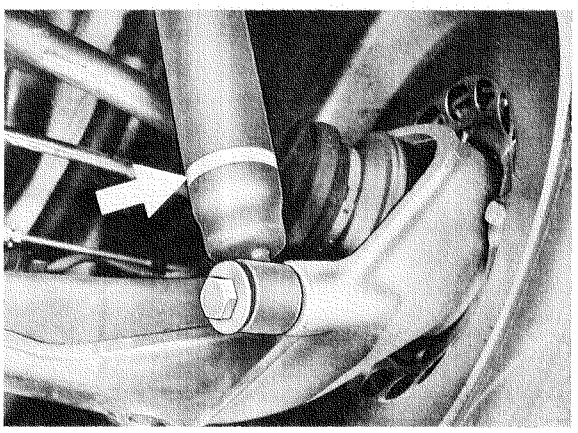
** Absorber cartridge holding pipe connection with internal threads.

*** Absorber cartridge holding pipe connection with external threads.

Printed in Germany – XIII, 1989

Identification of dampers on front and rear axles (Colored dot / ring).





N o t e

The pressureless damper will remain in any desired position when removed. In the case of the gas-pressure version, the damper is all the way out.

CHANGES TO REAR-AXLE DRIVE SHAFTS AND DRIVE FLANGES AS OF 85 MODEL

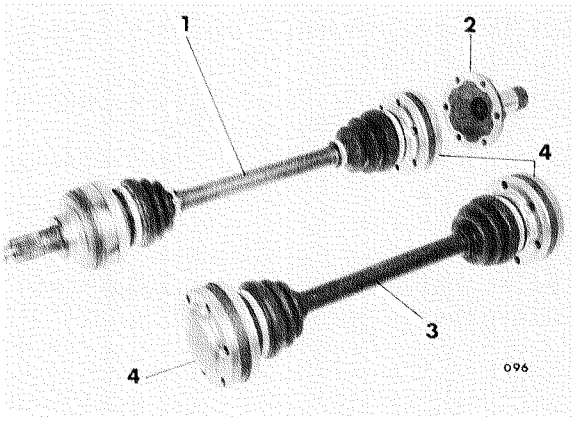
As of the 85 model, the joint diameter on the 911 Carrera has been increased from 100 to 108 mm (as already on the 928 S/911 Turbo and 911 Carrera Turbo-Look).
The joint seal is by means of a closing cover. The previously used flat gasket has been deleted. Likewise deleted are the grooves necessary for this gasket in the drive flange (transmission end) and in the drive shaft (wheel end).

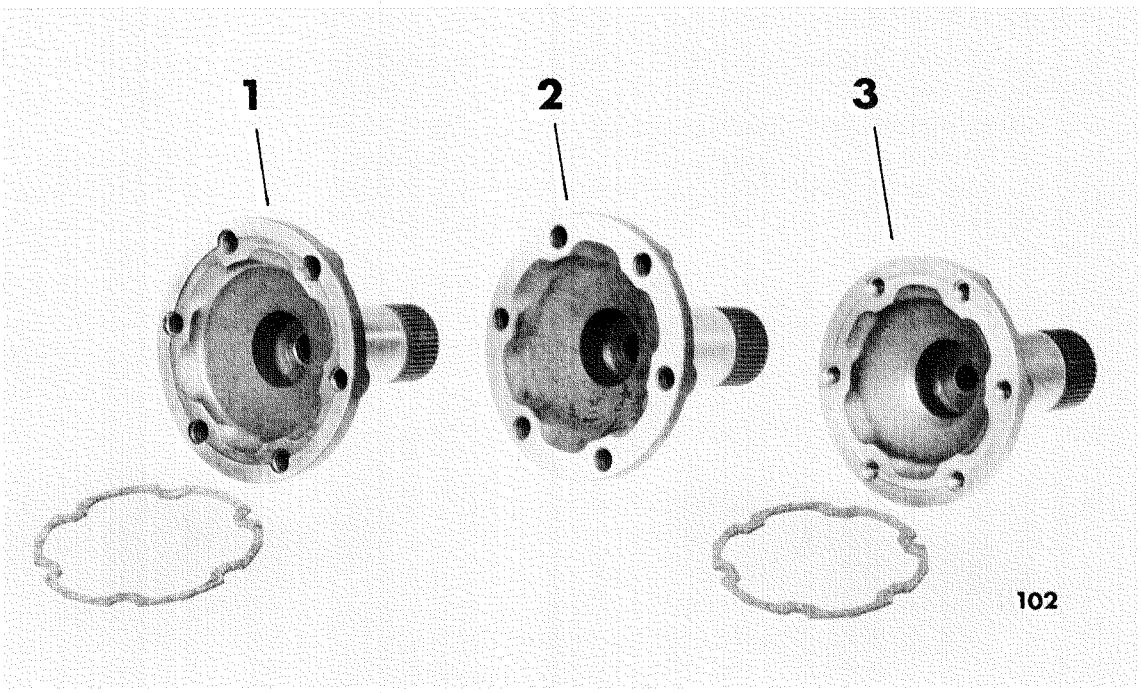
As of the 85 model, the drive shafts for the 911 Carrera have a bolted joint at the transmission end and a friction-welded joint at the wheel end (one-sided friction-welded drive shafts)

The drive shafts for the 911 Turbo and 911 Carrera Turbo-Look have bolted shafts at both ends. As of the 85 model sealing is likewise by means of a closing cover. Mounting on the rear-wheel hub in the case of the friction-welded shaft is by means of a self-locking nut (as 928 S); in the case of the shaft with a bolted joint at the wheel end, it is by means of a castellated nut with split pin.

Overview as of 85 model
(Joints and joint flanges
dia. 108 mm)

1 - Drive shaft
    911 Carrera
2 - Drive flange (without groove)
    911 Carrera
    911 Turbo
    911 Carrera Turbo-Look
3 - Drive shaft
    911 Turbo
    911 Carrera Turbo-Look
4 - Closing cover (sealed)



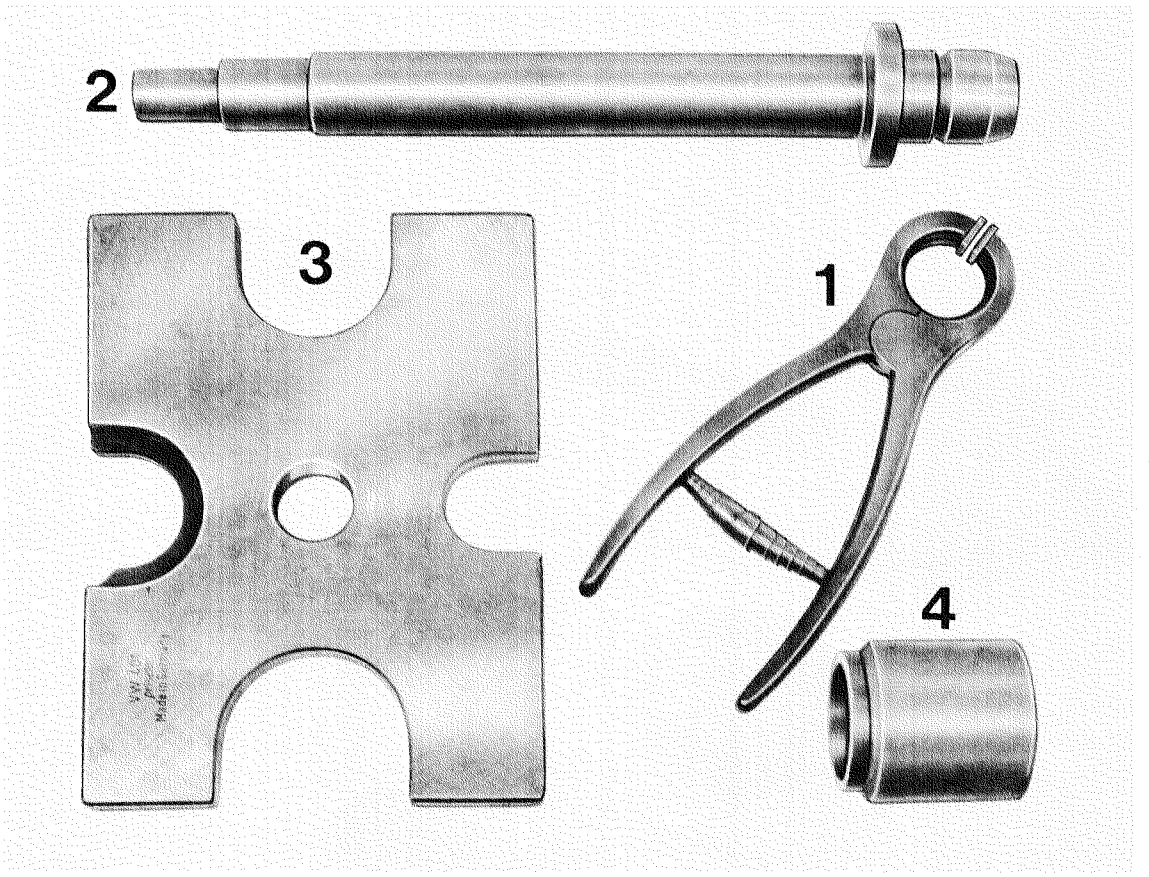


1 - Drive flange 911 Turbo/911 Carrera Turbo Look dia. 108 (until end of model year 84)
2 - Standard drive flange 911 Carrera/911 Turbo/911 Carrera Turbo Look dia. 108 (85 models onward)
3 - Drive flange 911 Carrera dia. 100 (until end of model year 84)

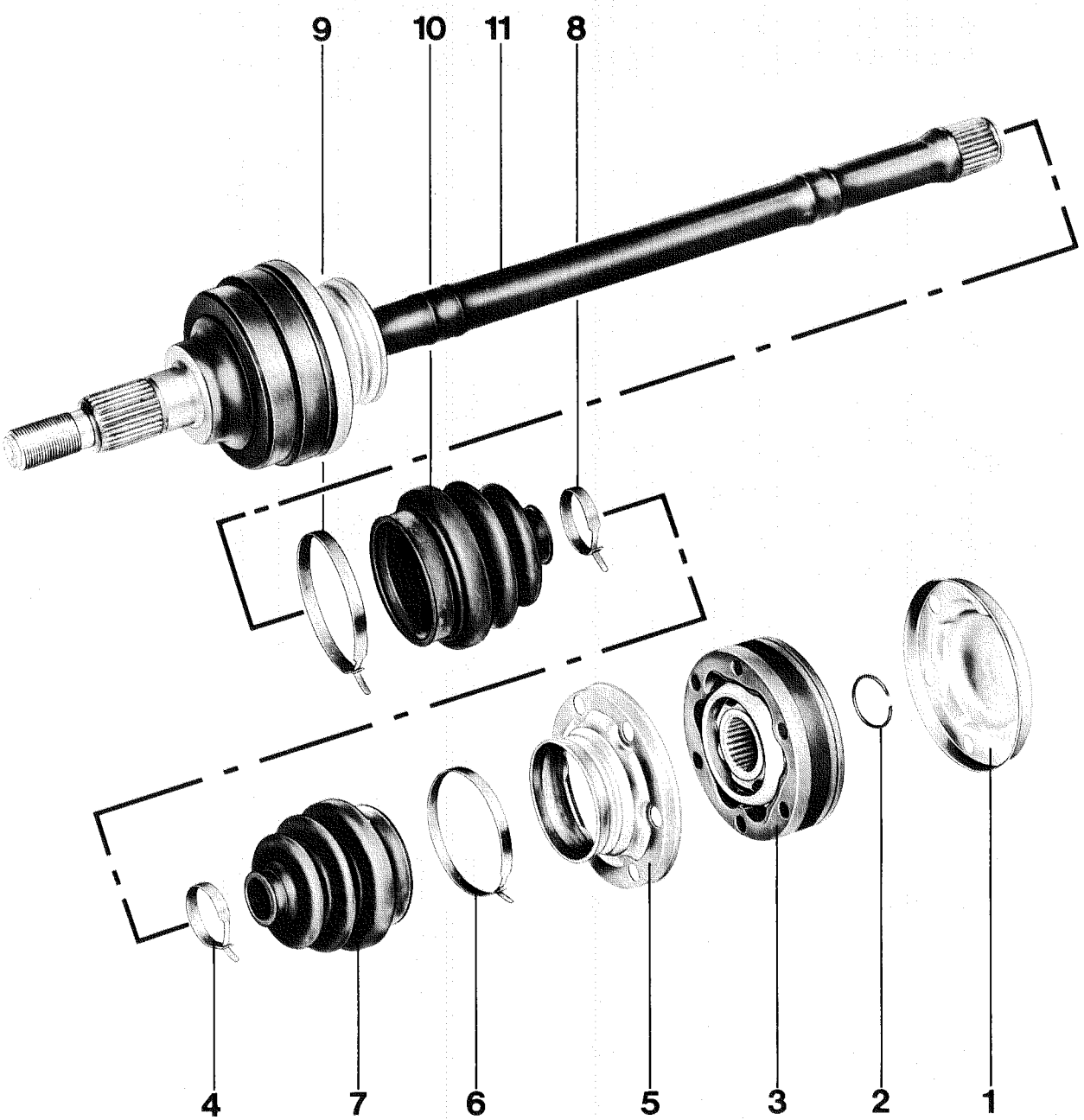
Equipping the transmissions with drive flanges has also resulted in changes to the transmission type designations. The following table may be used in determining spare parts.

	84 Model	85/86 Models	87 Models Onward
911 Carrera	915/67/68	915/72/73	G 50/00/01/02
911 Carrera Turbo Look	915/69/70	915/72/73	G 50/00/01/02
911 Turbo	930/34	930/36/37	930/36 89 models onward G 50/50

TOOLS



No.	Description	Special Tool	Explanation
1	Snap-ring pliers	VW 161 a	
2	Forcer	VW 408 a	
3	Forcing plate	VW 401	
4	Press-on sleeve	VW 455	


9
10
11
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4
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1

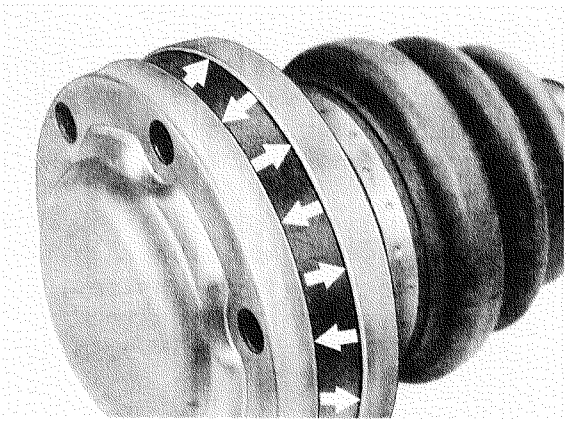
No.	Description	Qty.	Note: Removal	Installation
1	Closing cover	1	Drive off alternately with mandrel	Coat sealing surfaces with special sealant, drive on uniformly with plastic hammer
2	Circlip	1		Replace, ensure correct seating
3	Constant velocity joint	1		Mount in correct position. Quantity of grease allowable only in joints Quantity of grease: 80 g special grease
4	Nap binder	1		Mount with naps pointing to dust boot
	or			
	Perforated-tape clamp (Eye-tube clamp)	1	Cut open with side-cutters or commercially available special pliers for eye-tube clamps	Tension with VAG 1275 or commercially available special pliers for eye-tube clamp. Eye of tube clamp between 2 holes in cap
5	Cap	1	Drive off alternately with mandrel	Coat sealing surfaces with special sealant, drive on uniformly with plastic hammer

No.	Description	Qty.	Note: Removal	Installation
6	Nap binder	1		as No. 4
	or			
	Perforated-tape clamp (eye-tube clamp)	1	as No. 4	as No. 4
7	Dust boot (same part as No. 10)	1		Replace if necessary (porous, cracks, worn)
8	Nap binder	1		as No. 4
	or			
	Perforated-tape clamp (eye-tube clamp)	1	as No. 4	as No. 4
9	Nap binder	1		as No. 4
	or			
	Perforated-tape clamp (eye tube clamp)	1	as No. 4	as No. 4
10	Dust boot (same part as No. 7)	1		Replace if necessary (porous, cracks, worn)
11	Profile shaft with constant velocity joint friction-welded with drive shaft	1		Re-grease constant velocity joint if necessary. Grease splines and threads of drive shaft with Optimoly HT

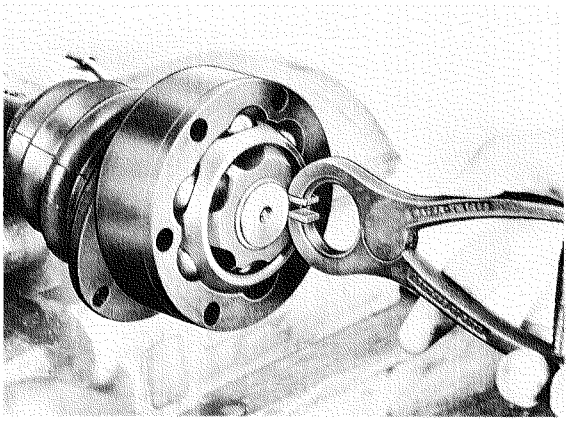
INSTRUCTIONS ON DISMANTLING AND ASSEMBLING

D i s m a n t l i n g

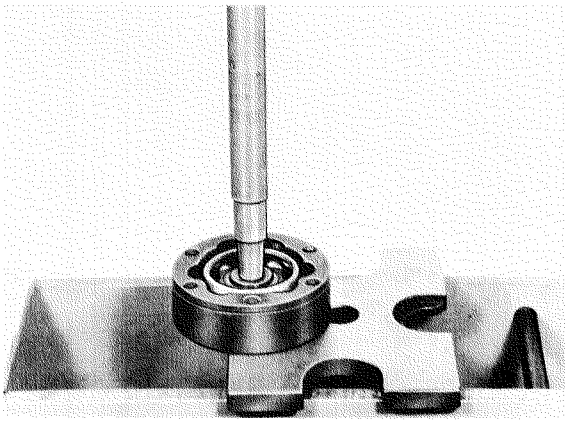
1. Drive off closing cover and cap with mandrel



2. Remove circlip with suitable pliers, e.g. VW 161 A.



3. Force off constant velocity joint using special tools VW 401 and VW 408 a. To enable the constant velocity joint to be forced off, slide dust boot with cap toward inside of drive shaft.

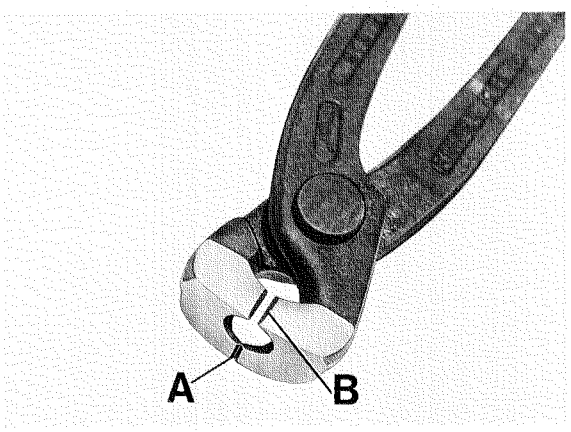


4. Remove nap binders/perforated-tape clamps (eye-tube clamps). Slide inner and outer dust boots from profile shaft.

N o t e s

- Do not remove cap from friction-welded joint.
- The outer (friction-welded) joint is not available as a spare part.
- Outer and inner dust boots are identical.

- Special pliers, obtainable as commercially available tool, are suitable for removing and mounting the eye-tube clamps.



A - Edge for cutting open

B - Edge for clamping

A s s e m b l y

1. Slide transmission-end - and, if applicable, also wheel-end - dust boots as well as cap (flange cover) onto the profile shaft.

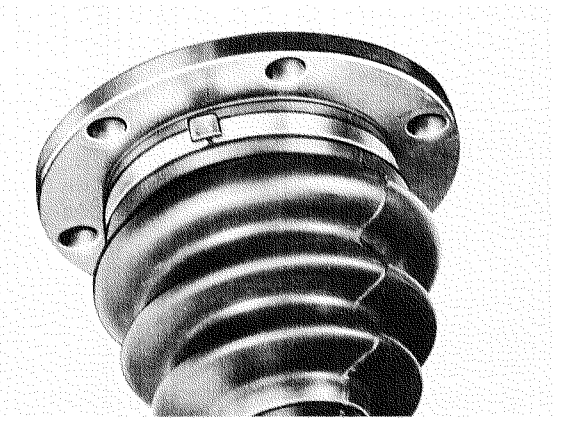
2. Press constant velocity joint, in correct position, onto the profile shaft. Mount new circlip. Pack constant velocity joint evenly from each side with approx. 40 g special grease. Total quantity 80 g. The special grease is to be packed into the joint part only. Do not put any grease into the dust boot. 90 g special grease is provided with each replacement dust boot and each replacement constant velocity joint.

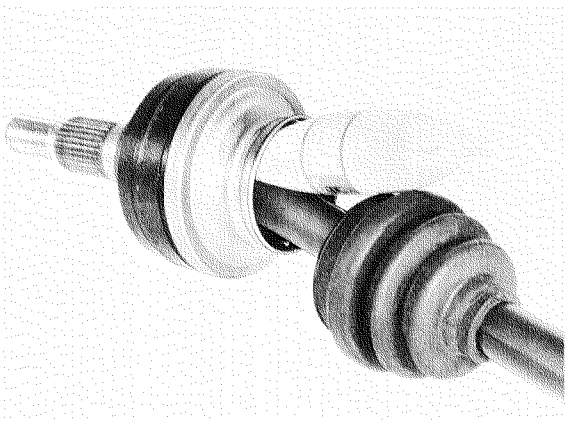


3. If necessary (e.g. if replacing the dust boot) re-grease the friction-welded (wheel-end) joint. To do this, force the special grease through the cap (do not remove cap) into the joint.

N o t e

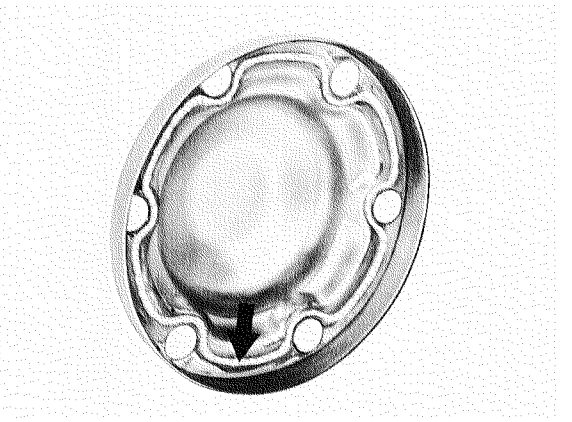
The constant velocity joints must be able to move slightly in the axial direction (longitudinal compensation).





4. Bring transmission-end - and, applicable, also wheel-end - dust boots into the correct positions. Mount nap binders/perforated-tape clamps (eye-tube clamps). If perforated-tape clamps are used, tighten clamping eye between 2 holes of the cap (flange cover) with commercially available special pliers or VAG 1275.

5. Coat sealing surfaces of closing cover and of cap with special sealant (contained in repair kit).



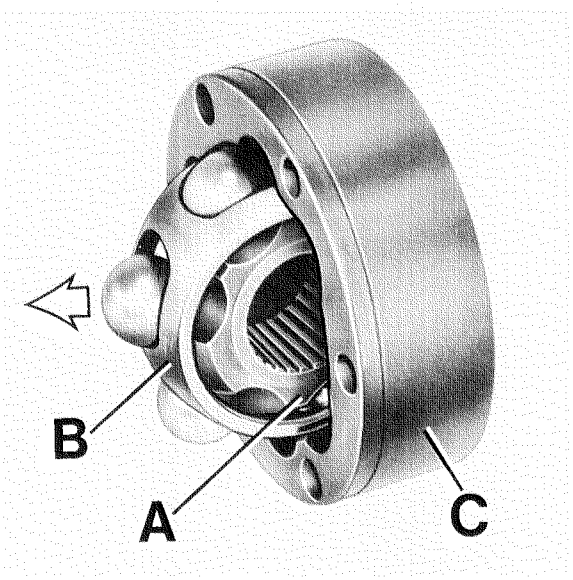
6. Ensuring that holes for fastening screws are in alignment, drive closing cover and cap uniformly (without using force) onto the constant velocity joint.

Dismantling and Assembling Transmission-end Constant Velocity Joint

Dismantling

Dismantle the joint to replace the grease if heavily soiled or if the bearing surfaces and balls are to be inspected for wear and damage.

1. Pivot ball hub and ball cage out of the joint piece and press out in direction of arrow.

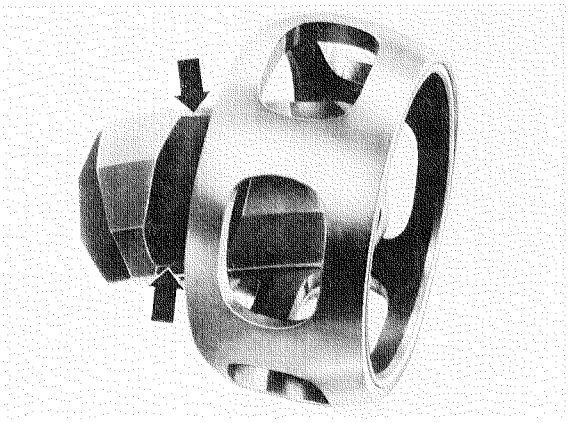


Note

Ball hub and joint piece are mated. Do not mix up. The 6 balls for each joint likewise belong to one tolerance group.

A - Ball hub
B - Ball cage
C - Joint piece

2. Tilt ball hub out of ball cage across the bearing surface of the ball (arrows).

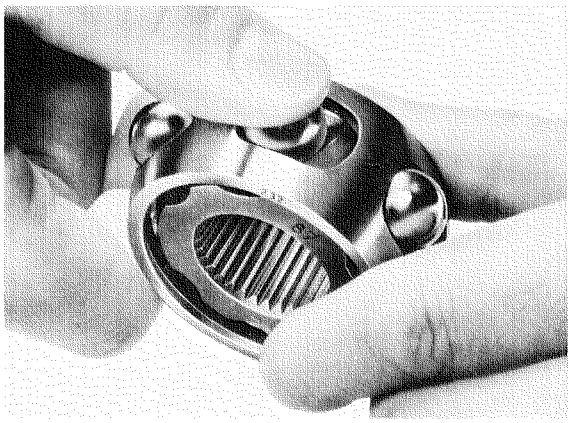


Assembly

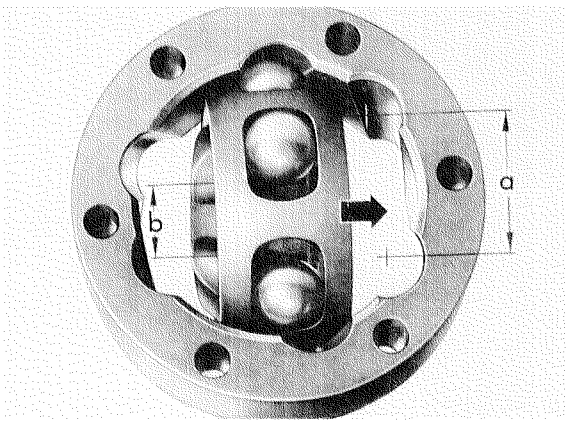
1. Check joint piece, ball hub, ball cage and balls for small indentations (pitting) and seizure marks.
   Too much radial play in the joint is noticeable due to knocking on changes of engine load. In such cases, replace the joint. Smoothing and ball wear marks are no reason for replacing the joint.

2. Insert ball hub into ball cage. Any installation position will do.

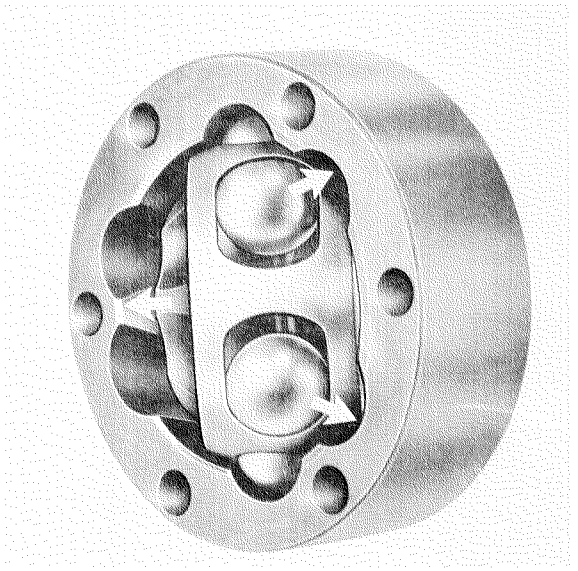
3. Press balls into cage.



4. Insert hub with cage and balls upright into the joint piece. Make sure that, after pivoting the hub into the joint piece, there is on each side one wide ball track "a" on the joint piece with one narrow track "b" of the hub.

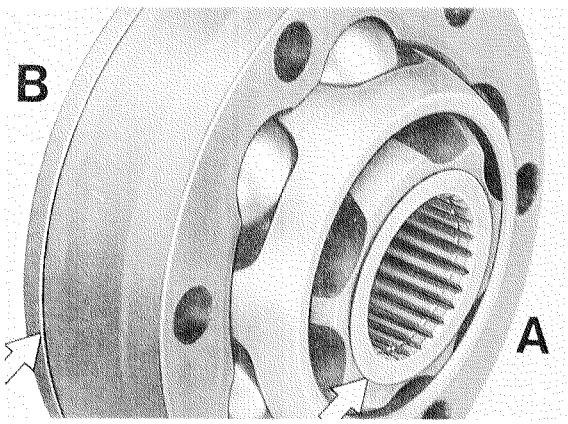


5. Pivot in ball hub with cage. To do this, pivot hub out of cage so that the balls are spaced apart like the tracks (arrows).



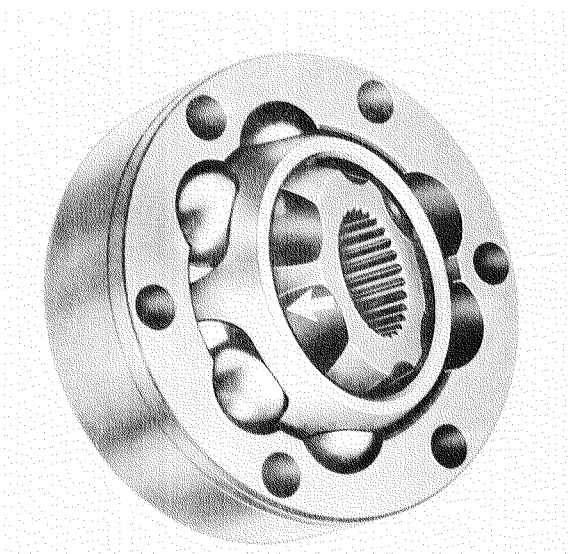
N o t e

Collar of ball hub (arrow) must point toward inside of drive shaft and the continuous groove on the outer diameter of the joint piece (arrow) must point toward outside of drive shaft.



A - Inside of drive shaft (wheel end)
B - Outside of drive shaft (transmission end)

6. Press hub with balls into joint (arrow).

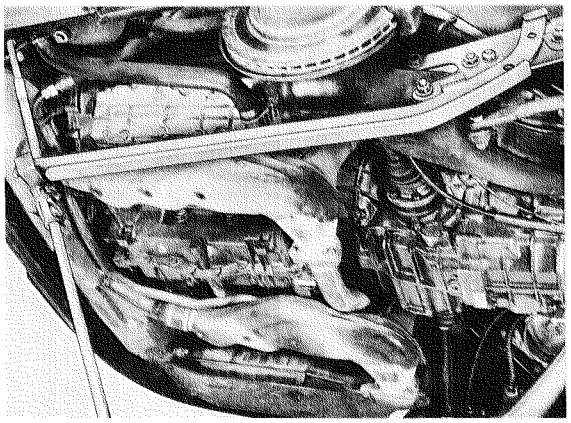


7. Check operation of joint. The constant velocity joint is correctly assembled if the ball hub can be slid to and fro by hand over the entire longitudinal compensation distance.

REMOVING AND INSTALLING REAR TORSION BAR

Installing

1. Use Special Tool P 289 to raise rear spring strut.



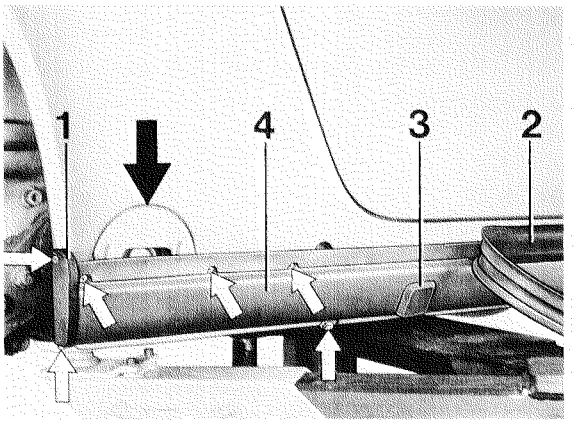
2. Detatch damper from rear axle arm.

3. Unbolt rear axle arm from spring strut. (Also remove track eccentric)

4. Remove bearing cover of spring strut.

5. Remove spring tensioning device P 289

6. Remove cover from body panel after removing side cover strip. (Remove end pieces and rubber strip first.)



Note:

only for cars earlier than model year 87

It is not necessary to remove the side cover if only the tilt of the spring strut is to be adjusted.

7.Lever off spring strut. Withdraw torsion bar.

Notes:

To avoid consequential damage (fracture of torsion bar), do not damage the protective finish of the torsion bar.

In cars built before end of model year 86, a suitable steel bar can be used to drive the stump of a broken torsion bar out of the internal-toothed centerpiece once the torsion bar on the other side of the car has been removed.

As of model year 87 (modified axle tube, see page 42 - 05), the stump of a fractured torsion bar can only be driven out from inside once the transmission has been removed. (It is essential to ensure that the hole provided for this purpose is re-plugged and watertight after this job has been done.)

Installing

Notes:

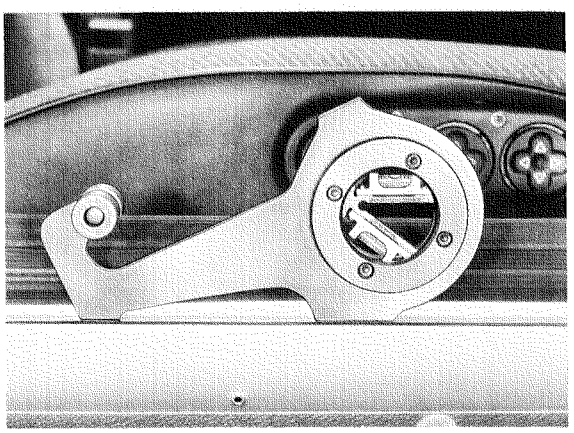
- Subject all parts to a visual inspection: check the spring strut for damage (paint, signs of corrosion, serrations), and replace if necessary.

- Do not interchange torsion bars (bars are marked with R for right and L for left on the end faces).

- Coat the complete torsion bar with multipurpose grease. Coat the toothing particularly well.

- Coat the rubber part of the spring strut with parting agent such as Contifix or Capella.

1.Check the position of the car against the horizontal by positioning Special Tool VW 261 at the lower edge of the door opening.
Turn the angle measuring device to center the bubble in the spirit level.



2.Move spirit level from this position by the specified setting value (tilt) of spring strut. Setting values, see R. Gr.44

Example:

Setting, spring strut	32°	32°
Car angle	-1°10'*	+1°10'**
Setting on measuring device	30°50'	33°10'

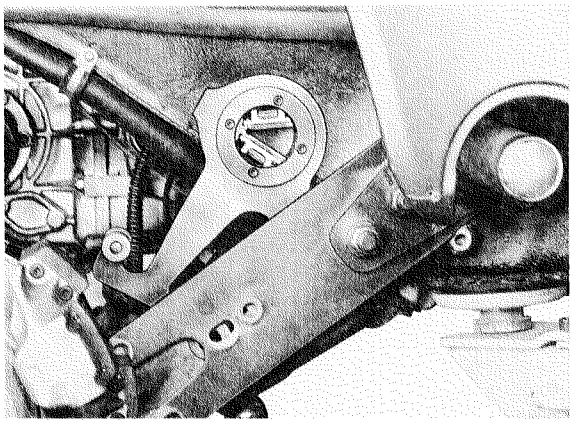
* Means car tilted forward from the horizontal.

** Means car tilted back from the horizontal.

3.Turn spring strut or torsion bar until with spring strut unloaded, the bubble in the spirit level is centered.
To remove the load from spring strut, detach stabilizer linkage from stabilizer and rest rear axle arm on stabilzer.
Ensure that the setting of the angle measuring device is not changed.

Note:

The smallest possible adjustment depends on the model year. Note Table on Page 42 - 06. Ensure that the specified settings are attained as accurately as possible.



4.Install bearing cover for spring strut with parting agent, e.g. Contifix or Capella. Screw in the three hex bolts without spacers.

5.Using Special Tool P 289, raise rear strut until spacer and fourth hex bolt can be installed.
Tightening torque of all 4 bolts: 47 Nm (34 ftlb).

6.Complete installation.

7.Check all alignment parameters (R. Gr.44).

Rear wheel bearings, removing and installation

Removing

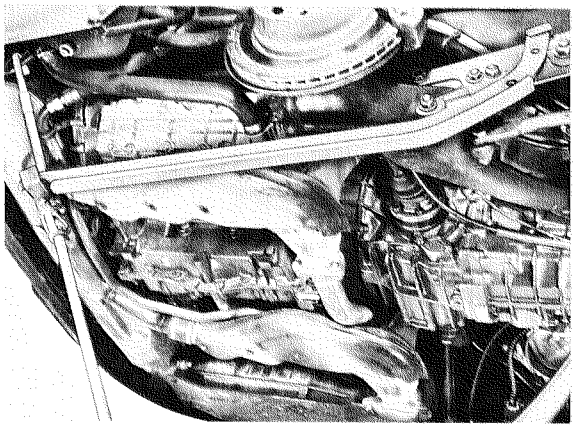
1. Undo lock nut on driveshaft.

2. Disconnect brake line at rear-axle link and remove brake caliper. Press down brake pedal with pedal arrester beforehand to prevent brake fluid flowing from the reservoir.

3. Disconnect stabilizer from rear-axle link.

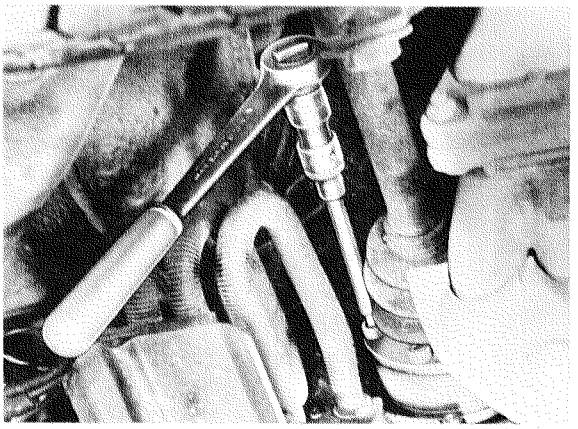
4. Remove brake disk.

5. Lift rear-axle strut using special tool P 289. Undo shock absorber at rear-axle link.



87/317

6. Remove special tool P 289. Remove the driveshaft from the flange on the gearbox and pull out towards the inner side of the vehicle.

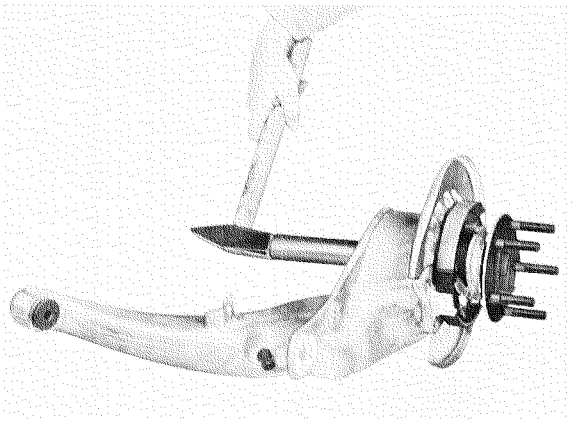


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7. Remove splint and castle nut from handbrake cable. Pull out handbrake cable towards the inner side of the vehicle.

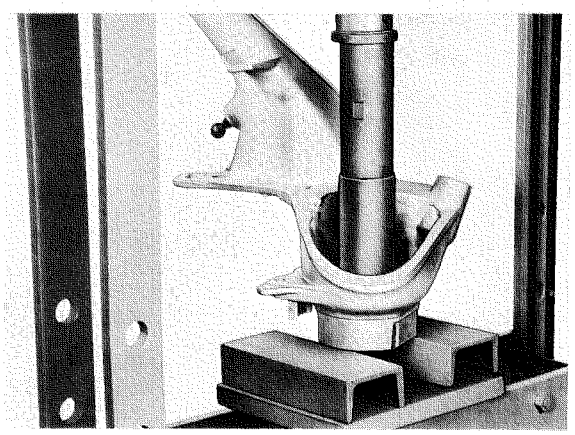
8. Undo rear-axle link at rear-axle cross tube and at the spring strut, remove.

9. Drive out rear wheel hub with special tool P 297 a.



75/2600

10. Heat rear-axle link to 120 - 150 °C (250 - 300 °F). Press out angular-contact ball bearing with suitable pressing tool.



73/1746

Note:

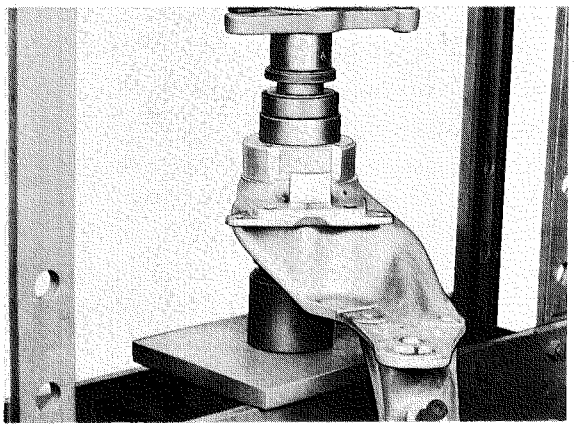
Remove bearing race from wheel hub with puller if necessary.

Installing

1. Heat rear-axle link up to 120 - 150 °C (250 - 300 °F). Press in angular-contact ball bearing with suitable pressing tool as far as the stop, pressing on the outer bearing race.

Note:

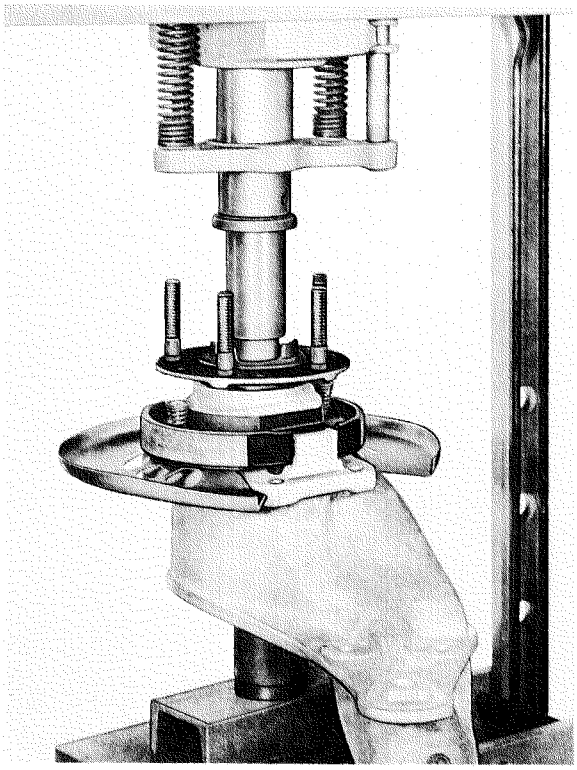
The angular-contact ball bearing must always be replaced as it is damaged when removed from the rear-axle link.



73/1744

2. Mount handbrake with brake carrying plate and protection plate onto the rear-axle link.

3. Press wheel hub into wheel bearing.



75/2596

4. Insert rear-axle link. Slide in driveshaft and assemble.

5. Adjust handbrake and bleed brake system.

6. Carry out vehicle measurements.

TECHNICAL DATA

Rear Axle

Wheel suspension	Independent wheel suspension on light alloy semi-trailing arms
Springs	One transverse round torsion bar for each wheel
Torsion bar diameter	24.1 mm 25 mm (since 1986 model)
Shock absorbers Make / Cross Reference Survey	Double-action hydraulic shock absorbers See page 42 - 3
Stabilizer diameter	18 mm 21 mm (since 1986 model)
Spring strut inclination (spring strut adjustment)	See page 44 - 03
Spacers	28 mm for each wheel (only Turbo-Look cars)

TIGHTENING TORQUES FOR REAR AXLE

Location	Description	Threads	Material	Torque Nm (ftlb)
Bearing cap/body	Bolt	M 10	8.8	47 (34)
Rear axle arm/ cross tube	Self-locking nut	M 14 x 1.5	10	100 (72)
Spring strut/arm	Eccentric	M 12 x 1.5	8.8/10.9	85 (61)
Spring strut/arm	Bolt	M 12 x 1.5	10.9/12,9	120 (87)
Caliper/arm	Bolt	M 12 x 1.5	8.8	60 (43)
Shock absorber/arm	Bolt	M 14 x 1.5	8.8/10.9	125 (90)
Shock absorber/body	Nut	M 10 x 1	8	25 (18)
Brake line coupling	Bolt	M 10 x 1		12 (9)
Stabilizer/body	Bolt	M 8	8.8	25 (18)
Axle shaft	Bolt	M 10 M 8	12.9 12.9	83 (60) 42 (30)
Shield/brake backplate	Bolt	M 8	8.8	25 (18)
Shield and brake backplate/ rear axle arm	Bolt	M 8	8.8	25 (18)
Wheel/wheel hub	Wheel nut	M 14 x 1.5		130 (94)

Location	Description	Threads	Material	Torque Nm (ftlb)
Wheel hub/drive shaft	Castle nut	M 20 x 1.5	10.9	300 to 320 (217 to 231)
Brake disc/wheel hub	Screw	M 6	8.8	5 (3.6)
Stabilizer/stabilizer suspension	Bolt	M 12 x 1.5	8/8.8	85 (61)
Stabilizer suspension/ rear axle arm	Bolt	M 16 x 1.5	10.9	85 (61)
Adjusting lever/spring strut	Bolt	M 16 x 1.5	10.9	245 (177)
Adjusting lever/spring strut	Eccentric bolt	M 16 x 1.5	10.9	245 (177)
Friction-welded axle shaft/ wheel hub	Self-locking nut	M 22 x 1.5		460 (333)

REAR AXLE FOR 911 CARRERA IN TURBO-LOOK

The 911 Carrera in Turbo-Look is equipped with the rear axle arms of the Turbo 3.3.

Refer to 930 Turbo Repair Manual for repair job descriptions concerning the rear wheel suspension.

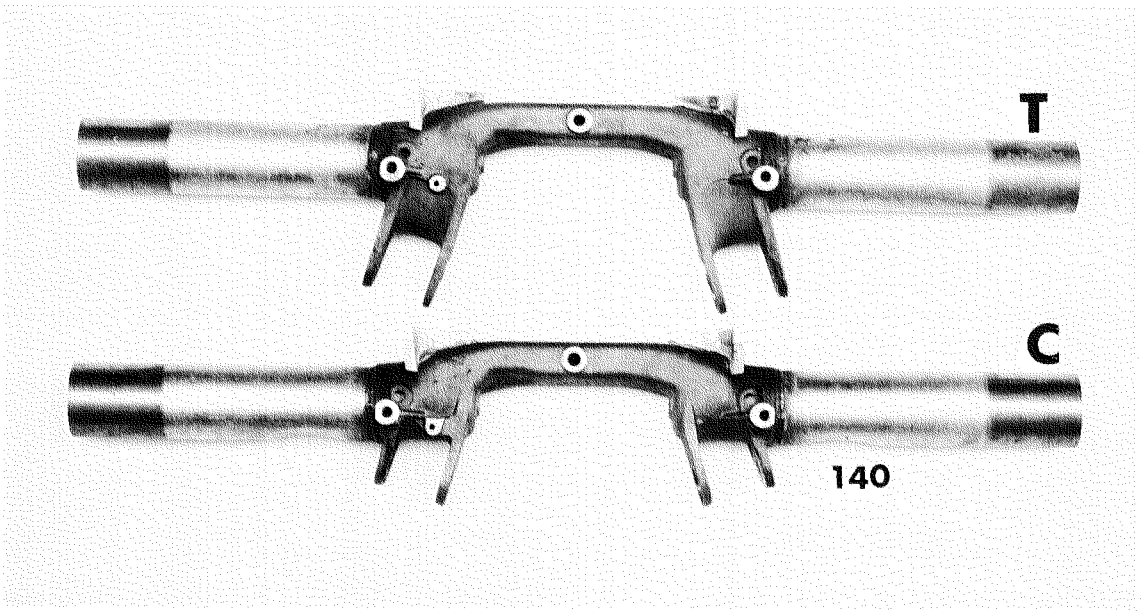
MODIFICATIONS TO REAR AXLE, 87 MODELS ONWARD

1.Axle tube (911 Carrera and Turbo Look)

Installation of the new type G 50 transmission with extended case has entailed modifications to the central section of the rear axle tube. The control arm-to-axle tube mountings and the control arms themselves remain unchanged. The transmission bearing mountings have been modified (moved foward by 25 mm), as has the transmission carrier which is made of an aluminum alloy.

T = 911 Carrera Turbo Look

C = 911 Carrera



2.Torsion bar (911 Carrera and Turbo Look)

With the modified axle tube installed as of model year 87, an SAE profile has been adopted for the toothing of the rear torsion bars. The number of teeth and the diameter of the toothing have been changed. Diameter and length of the torsion bar remain unchanged.

Advantages gained: - even more precise adjustment of the spring struts
- improved head-shaft ratio

The modified axle tube means that, although unchanged in length, the torsion bars are moved closer to the body panels.

The removable covers in the body panels have been enlarged to facilitate work on the torsion-bar suspension. (The Turbo Look car received enlarged covers in model year 1986.)

The smallest possible adjustment of the torsion bar and the tilt of the spring strut are determined by the differing number of teeth of the inner and outer serrations.

Comparison of torsion bars

	87 models onward	until end of model year 86
Number of teeth inside	46	40
outside	47	44
Smallest possible change of spring strut tilt	10'	50'
corresponds to		
a change in vehicle height of	approx. 1.4 mm	approx. 6.5 mm
entailing		
torsion bar and spring strut turned in opposite directions by a distance corresponding to 1 tooth		

Explanation of the smallest possible change in tilt of spring strut (values for cars before model year 87 in parentheses).

If the torsion bar inside is turned one tooth, the adjustment is (9°) or 7°50' (360°: 40 or 46 teeth).

If the spring strut is turned one tooth, the adjustment is (8°10') or 7°14'.

The smallest possible adjustment of the spring strut is thus (50') or 10'.

VEHICLE ALIGNMENT, GENERAL INFORMATION

Tires have decisive influence on handling qualities (directional stability, cornering, Ferraria effect). In order for the tires to retain their full performance, and to ensure normal tire wear, the wheels must be correctly aligned. In addition, the pressure of the wheels (tires) on the roadway, the so-called wheel load, must be approximately equivalent per axle on the left and right (small wheel-load difference).

The maximum allowable wheel-load difference from left to right on rear and front axles is 20 kg (911 turbo 10 kg). Wheel-load difference is adjusted by altering vehicle height within height tolerances. The smallest possible wheel-load difference from the left to the right has priority.

In order to avoid unnecessary adjustment work, vehicle alignment has been subdivided. This applies as of immediately, including for older 911 vehicles. A distinction has been made between simple and extended vehicle alignment. Vehicle height checking, which until now was generally carried out before alteration or checking of wheel alignment values, is now necessary only for extended vehicle alignment.

Carry out vehicle alignment with a wheel-alignment analyzer. Measurement procedures will follow the operating instructions of the wheel-alignment analyzer used. The following prerequisites must be met before alignment:

- Vehicle at curb weight per DIN 70020, i.e. vehicle ready to drive with full tank and spare wheel.
- Joint and bearing play OK, suspension in good working order.
- Tires at specified inflation pressure, tire tread approximately uniform.
- Steering wheel and steering gear in center position when adjusting toe.

IMPORTANT INFORMATION FOR ALIGNMENT

Alignment procedure is determined by the reason for alignment. A distinction is made between basic and extended alignment.

Basic vehicle alignment comprises only a check and if necessary correction of wheel alignment.

Extended vehicle alignment includes height adjustment as well as a check and if necessary correction of wheel alignment.

Basic Vehicle Alignment

Basic vehicle alignment is used:

- When replacing running gear components which cause no alteration in height or wheel alignment.
- In cases of excessive or uneven tire wear.
- After the natural slight settling which occurs with new vehicles.
- In case of complaints with regard to handling.

Extended Vehicle Alignment

Extended vehicle alignment is required:

- After work which alters vehicle height, or in case of incorrect vehicle height.

- In case of complaints with regard to handling qualities, where basic alignment has already been carried out and the tires are in good shape.

It is advisable to use wheel-load scales for height adjustment in extended vehicle alignment. If no wheel-load scales are available, height adjustment can also be carried out with the use of an aligning balance (special tool 9243), in consideration of acceptable wheel-load differences. This eliminates the influencing variable of one axle. However, due to various other components, friction in rubber pads, and possible tolerances, results will not be as good as those obtained with wheel-load scales.

IMPORTANT INFORMATION FOR VEHICLE ALIGNMENT WORK

When carrying out vehicle alignment the following must be observed:

Height Adjustment / Wheel-Load Changes

Changing the height on one side causes a simultaneous change in wheel loading. When the wheel loading on one wheel is changed, this also changes the loadings of the other wheels.

Increasing the initial tension of the springs on one side (raising vehicle) increases wheel load.

Decreasing the initial tension of the springs on one side (lowering vehicle) decreases wheel load.

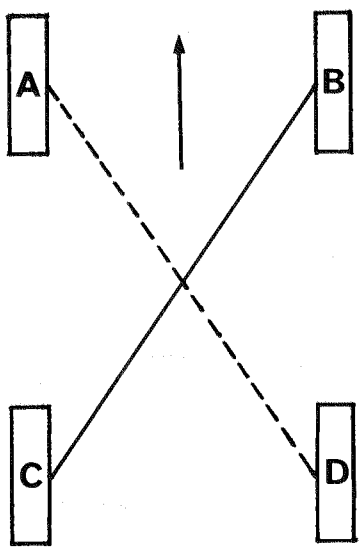
A change in wheel load always has an effect diagonally to the other axle side, i.e., if the wheel load at one wheel is decreased or increased, the same happens on the wheel diagonal from it.

Example:

Spring initial tension at right front B is increased.

This causes wheel loading to:

- increase at right front B and rear left C _____
- decrease at front left A and rear right D ----------



The wheel-load difference from left to right on the front and rear axle may not exceed 20 kg (911 turbo max. 10 kg).

Setting Camber on Rear Axle

A change in the camber of the rear axle via the camber eccentric causes a change in height and thereby wheel load. There is also an alteration in toe

Setting Toe on Rear Axle

A change in the toe of the rear axle via the toe eccentric and the resulting simultaneous slight change in camber cause no change or only an insignificant change in height and wheel load.

Changing Height on Rear Axle via Height-Adjustment Eccentric

The two-piece spring strutt is set at the factory so that the vehicle can be raised with the height-adjustment eccentric, but not lowered. Raising the vehicle on one side results in higher wheel load.

Change in Height on Front Axle (Special Case)

With a vehicle that is slightly too low on the front axle (special case), as long as there has been no complaint with regard to handling, the vehicle can be raised at the front without causing an excessive alteration in wheel-load difference. To do this, evenly turn the front axle height-adjustment screws to the right (clockwise).

Height-Adjustment Specifications

The height-adjustment specifications apply to new vehicles. Vehicles which have been operated can be up to 10 mm lower, i.e. downward tolerance can be 15 mm. Of course this must be the case for both axles.

Ascertaining that Surface is Level

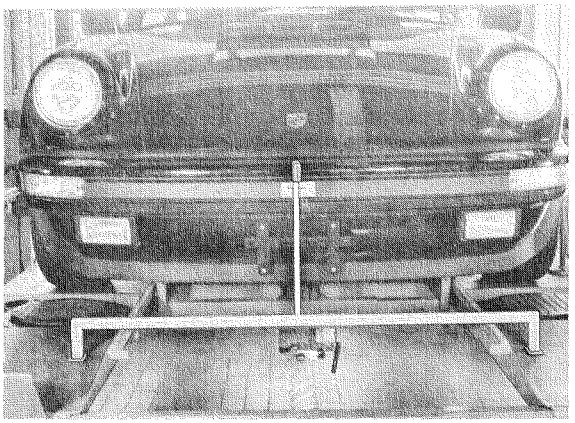
Use a hose leveling instrument to determine whether the work surface or test platform is level.

Determining Vehicle Driving Position on Vehicles with Bilstein Shock Absorbers

To do this, determine the middle position between a limited compression and rebound on rear and front axles as follows:

a. Press vehicle downwards on rear axle (compression) and allow to come back up under its own power. Measure from fixed point or measuring station to a suitable measuring point on the vehicle. Pull vehicle upwards at the rear (rebound) and allow it to sink by its own weight. Repeat measurement at the previously-chosen measuring points. Calculate the mean value between compression and rebound and bring vehicle into this mean position at the rear.

b. Push vehicle downwards at front axle (compression) and allow it to rise by its own power. Measure from a fixed point or measuring station to a suitable measuring point on the vehicle (a suitable measuring point is tape on the bumper approximately at vehicle center). Pull vehicle up at the front (rebound) and allow it to sink by its own weight. Repeat measurement at the previously-selected points. Calculate the mean value between compression and rebound and bring vehicle into this mean position at the front.



CHECKING VEHICLE HEIGHT (MEASURING AND ADJUSTMENT POINTS)

P r e l i m i n a r y W o r k / G e n e r a l

- If necessary (if wheel suspension has been disassembled or if the vehicle has been raised for a significant period of time) take a test drive before measuring, in order to avoid measurement results which do not correspond to actual vehicle height.

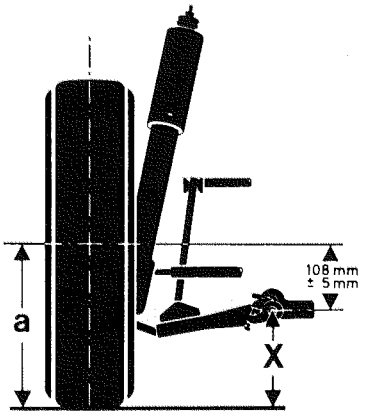
- Drive vehicle onto measuring station or other level surface (use a hose leveling instrument to determine whether surface is level).

- Achieve vehicle driving position by eliminating hysteresis. To do this, depress vehicle at rear and front axles 2-3 times and allow it to rise up by its own power. This is not sufficient with vehicles having Bilstein shock absorbers, for which it is necessary to bring about a middle position between limited rebound and compression. (Page 44-2d).

- If no special measuring device is available, use a calibrated scribing block to check height.

Checking Height on Front Axle

1. Measure dimension a and dimension X.



Dimension a = Floor to center of wheel (center of grease cap)

Dimension X = Floor to center of spring strut (gauge point).

2. Nominal dimension X is found by subtracting the height setting value from dimension a. (911 Carrera height setting value 108 + 5 mm* under center of wheel)

Example

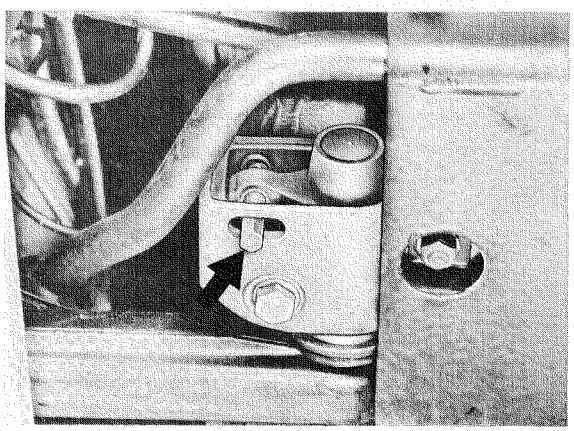
Dimension a	= 303 mm
- Height adjustment value	= 108 ± 5 mm*
Nominal dim. X	= 195 ± 5 mm*

*Height setting values apply to new vehicles. Vehicles that have been operated may be up to 10 mm lower, i.e. downward tolerance may be 15 mm. However, this must be the case for both axles.

3. Nominal dimension X is attained by turning the screw on the spring strut adjustment lever (arrow) the correct amount, under consideration of wheel-load differences.

Adjustment procedure/adjustment sequence:

- With the use of wheel-load scales, page 44 - 2j
- With the use of special tool 9243, page 44 - 3
- Controlled height alteration (special case), page 44 - 2c



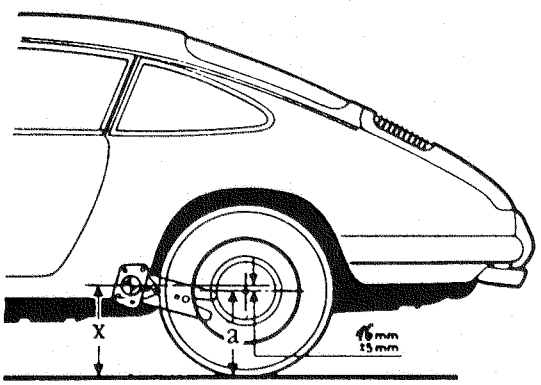
N o t e

The height difference between the right and left sides may not exceed 5 mm.

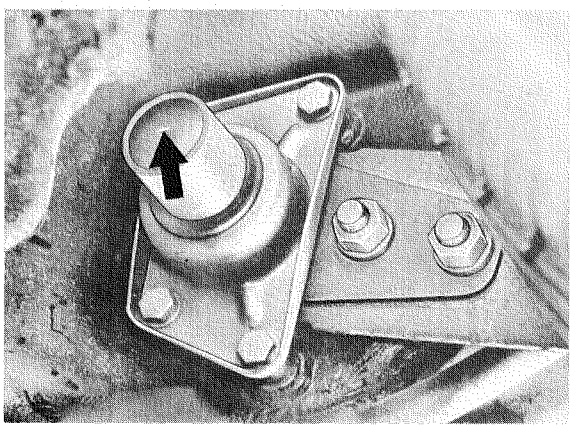
Height-adjustment screw
- turn to the right (clockwise), raises vehicles and increases wheel load
- turn to the left (counter-clockwise, lowers vehicle and reduces wheel load

Checking Height on Rear Axle

1. Measure dimensions a and x.



Dimension a = Floor to center of wheel
Dimension X = Floor to torsion spring middle (middle of spring strut cover)
Measure out middle of spring strut cover (arrow) and mark.



2. Nominal dimension X is found by adding dimension a to the height adjustment value (911 Carrera 16 ± 5 mm* over wheel center).

Example

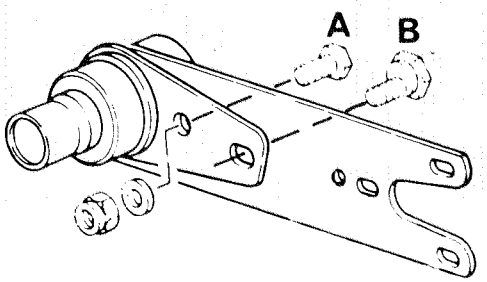
Dimension a	= 302 mm
+Height adjustment value	= 16 ± 5 mm*
Nominal dimension X	=318 ± 5 mm*

3. Nominal dimension X is set taking into consideration admissible wheel-load differences. To do this, turn the eccentric on the two-piece spring strut appropriately, after loosening the clamping screw (tightening torque for eccentric and clamping screw 245 Nm).

Adjustment procedure / adjustment sequence:

- With wheel-load scales, page 44 - 2j.

- With special tool 9243, page 44 - 3.



A Clamping screw
B Height-adjustment eccentric

N o t e

The difference in dimension X between the right and left sides may not exceed 8 mm.

The two-piece spring strut is set at the factory so that the vehicle can be raised with the height-adjustment eccentric, but not lowered.

Increasing vehicle height on one side results in greater wheel load.

*Height adjustment values apply to new vehicles. Vehicles that have been operated can be up to 10 mm lower, i.e. downward tolerance may be 15 mm. However, this must be the case for both axles.

BASIC ALIGNMENT (CHECKING AND ADJUSTING WHEEL ALIGNMENT)

General

- Before inspecting or correcting wheel alignment, bring about vehicle driving position by eliminating hysteresis. To do this, depress the vehicle on the rear and front axle 2-3 times and allow it to come back up again by its own power. With vehicles having Bilstein shock absorbers, this is insufficient, and a middle position between a limited compression and rebound must be fixed (page 44-2d).

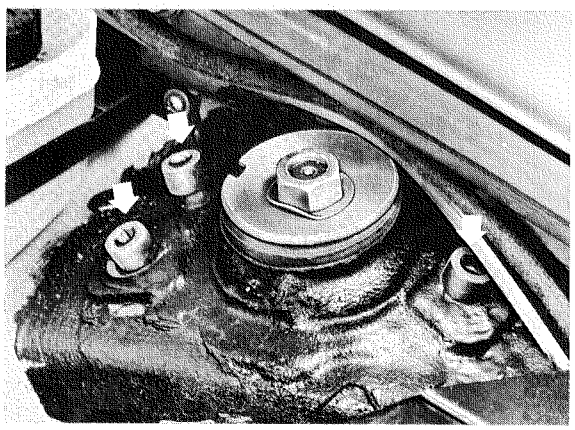
- If wheel alignment is to be checked and adjusted on the rear and front axles, begin with the rear axle.

- If the camber on the rear axle must be adjusted, the following must be observed: any great change in camber on the rear axle by means of the camber eccentric (page 44-2c) causes a change in height. If the height is changed to an extent causing the maximum allowable height difference from left to right to be exceeded, the wheel-load difference on rear and front axles will change to an unacceptable degree. In such cases, extended vehicle alignment is required.

FRONT AXLE

Adjusting Camber

The shock absorber strut is fastened to the body with 3 bolts. Slightly loosen these bolts and push the shock absorber strut inwards (negative camber) or outwards (positive camber). Be careful not to change the caster (by movement in axial direction). Be careful not to change the caster (by movement in axial direction). Bolt tightening torque is 47 Nm. If necessary, reseal shock absorber strut with permanently-elastic sealing compound.



Adjusting Caster

Caster can be adjusted by moving shock absorber strut with or against the direction of vehicle travel. Watch out for changes in camber! See "Adjusting Camber".

Adjusting Toe

Adjust toe on the tie rods with the steering wheel (steering gear) in center position. First, check to see that steering gear is actually in center position when the steering wheel is turned to center position. To do this, turn the steering wheel from center position to left and right stop (use light pressure). If travel is not equal to left and right stop, reposition steering wheel accordingly.

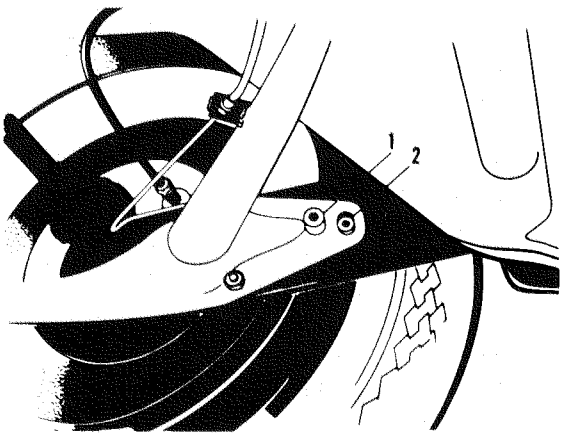
Toe Difference Angle

The toe difference angle cannot be adjusted (if difference is excessive, steering and/or suspension parts are deformed).

REAR AXLE

Adjusting Camber

Unscrew bolted connection between spring strut and trailing arm and set to specified value by turning camber eccentric no. 1.
Observe note on page 44-2c. For tightening torques, see under "Adjusting Toe".



Adjusting Toe

Set to specified value by turning toe eccentric no. 2. Observe note on page 44-2c.

Tightening torques:

Camber and toe eccentrics	= 85 Nm
Connection trailing arm/spring strut.	= 120 Nm

EXTENDED VEHICLE ALIGNMENT WITH WHEEL-LOAD SCALES

N o t e

- Extended vehicle alignment includes checking and correction of height and wheel alignment. When adjusting height, besides the correct vehicle height the decisive factor for good handling is the smallest possible wheel-load difference from left to right. With 4 wheel-load scales, the wheel-load differences from left to right on the front and rear axles can be precisely checked or adjusted (max. 20 kg, 911 Turbo max. 10 kg). When using only two wheel-load scales, it is repeatedly necessary to reposition the vehicle or the scales. This can easily lead to incorrect measurement results, in addition to taking up time. When weighing with only 2 scales, it is naturally also vital to ensure that the vehicle is completely level by using appropriate inserts underneath the free wheels.

- Operating instructions for Maha wheel-load scales, see 44 - 2L.

- If necessary (where a wheel suspension has been disassembled or the vehicle has been raised for an extended period) take a test drive before starting measurements, so that:

a. no height measurement results will be obtained which do not correspond to the actual vehicle height, and

b. when correcting wheel adjustment, no toe-in is set which then fails to correspond to specifications due to axle kinematics when the vehicle is at its proper height.

E x t e n d e d V e h i c l e A l i g n m e n t P r o c e d u r e U s i n g W h e e l - L o a d S c a l e s

1. Drive vehicle onto measuring station or a level surface.

2. Bring about vehicle driving position by eliminating hysteresis. To do this, depress vehicle on rear and front axles 2-3 times, and allow to come back up by its own power. With vehicles having Bilstein shock absorbers, this is insufficient, and it is necessary to fix a middle position between a limited compression and runout (page 44 - 2d).

3. Check vehicle height (see 44 - 2e to 44 - 2g), and if values are outside of tolerances, adjust. The tolerance for height adjustment (dimension X) can be utilized, the difference between the right and left side may not exceed 8 mm on the rear axle and 5 mm on the front axle.

N o t e

Before altering height or wheel loading (points 3 and 5), determine the best work sequence for the vehicle in question, based on measured values and taking into consideration the notes on pages 44 - 2b and 44 - 2c.

After every alteration in height, return the vehicle to driving position.

4. Check and if necessary adjust camber and toe on the rear axle.

5. Using the wheel-load scales (page 44 - 2L), bring the wheel-load difference to within the maximum acceptable tolerance of 20 kg (911 turbo 10 kg) from left to right on the rear and front axles.

N o t e

Before undertaking adjustments on the rear axle, attempt to bring the wheel-load tolerance on the rear and forward axles into the tolerance range via the front axle height adjustment screw.

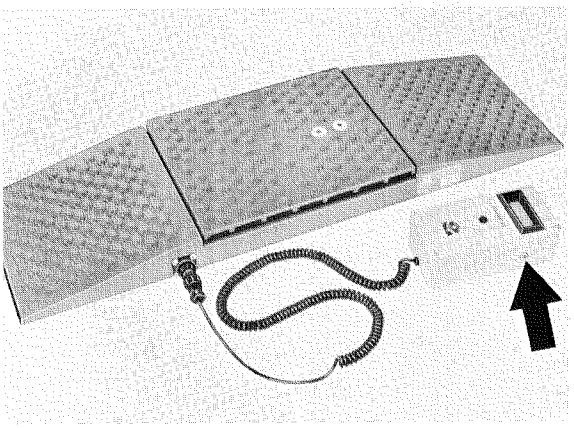
6. If the rear-axle spring strut is adjusted in order to limit wheel-load differences, recheck rear-axle wheel alignment values and correct if necessary.

7. Check wheel-alignment values on the front axle, and if necessary adjust. To do this, bring the vehicle into driving position. This is of decisive importance, especially for adjusting toe.

Operating Instructions for Maha Wheel-Load Scales RWA 2 U (above floor level version)

Testing

1. Adjust scales to zero, press button on indicator. The indicator becomes operational (min. up to 800 kg). This is the battery test. Automatic zeroing follows after approx. 3 seconds. If the indicator does not show zero, it can be set to zero with the potentiometer on the side of the indicator unit (arrow).



2. Wheel-load scale is ready for use. Set the sensor units in front of wheels and drive or push the vehicle onto them. Push, do not drive, if the sensor units against the drive wheels are not anchored or secured against slippage (danger of accident and damage).

Note

Position sensor units on measuring station or a level surface.

3. Press button on indicator. After an initial battery test, after approx. 3 seconds the wheel load (wheel weight) is displayed. The display lasts only as long as the button is depressed.

Note

There are 8 batteries in the indicator unit (Mignon 1.5 V alkaline LR6). If the display remains under 800 kg during the battery test, the batteries must be changed in order to guarantee exact functioning. This is done by screwing off the upper part of the indicator unit and loosening the retaining band around the battery receptacle (push lug on catch).

When the unit is not in use, take care that the button on the indicator unit is free of contact. If this is not observed, the batteries will run down prematurely.

If battery test is negative, check battery seating.

Technical Data

Maximum weighing load	600 kg
Digital display	0 to 600 kg
Resolution	1 kg
Accuracy	± 1 %
Dimensions: L x W x H...	730 mm x 220 mm x 60 mm
Weight	10 kg
Power supply	4 batteries, Type R 6 E, 1.5 Volt

EXTENDED VEHICLE ALIGNMENT WITH ALIGNING BALANCE (SPECIAL TOOL 9243)

N o t e

- Extended alignment includes checking and correcting height and wheel alignment values. In the case of height adjustment, besides the correct vehicle height, the smallest possible wheel-load difference from left to right is of decisive importance for good handling. The method described below for adjusting height by means of an aligning balance (special tool 9243) takes into consideration wheel-load differences. Due to various influence variables and possible tolerances, it is impossible to get the quality of results obtainable with wheel-load scales. If there is still criticism of handling qualities after adjustment with the aligning balance, an adjustment with wheel-load scales is required.

- If necessary (if a wheel suspension has been disassembled or if the vehicle was raised for an extended period), take a test drive prior to measuring, so that:

a) No height measurement results are obtained which do not correspond to the actual vehicle height, and

b) when correcting wheel alignment values, no toe-in is set which then does not correspond to specifications, due to axle kinematics when the vehicle is at its proper height.

E x t e n d e d V e h i c l e A l i g n m e n t P r o c e d u r e U s i n g t h e A l i g n i n g B a l a n c e (S p e c i a l T o o l 9243)

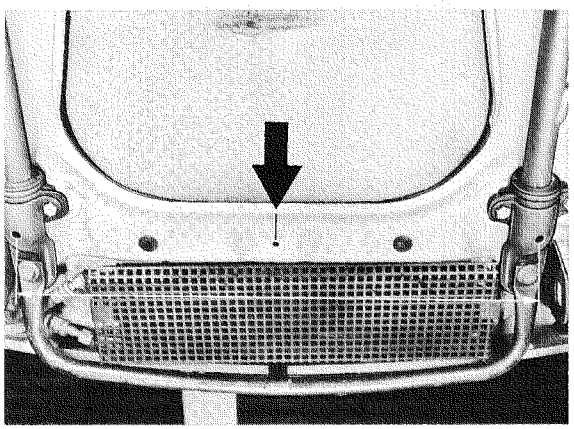
1. Bring into driving position (vehicle on measuring station or level surface). To do this, press down on the vehicle on the rear and front axles 2-3 times, and allow it to come back up by its own power. With vehicles having Bilstein shock absorbers this is insufficient, and it is necessary to fix a middle point between a limited compression and rebound (page 44 - 2d).

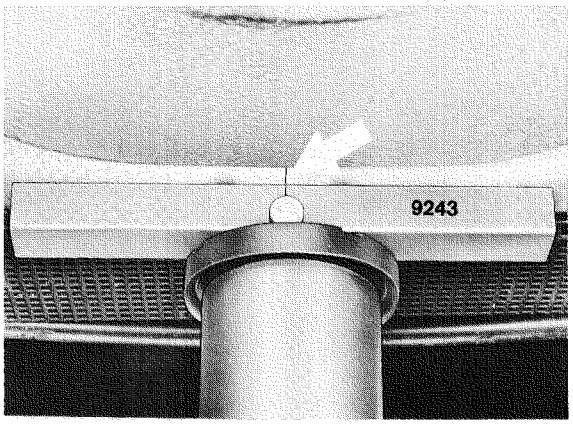
2. Carry out height check on rear axle (page 44 - 2f). If the actual dimension X is outside of the tolerances for the nominal dimension, correct.

3. Limit the wheel-load difference on the rear axle via the height difference from left to right. The front axle as an influencing variable is eliminated by lifting. The stabilizer on the rear axle must be removed.

- Lift the vehicle in the front center with special tool 9243 (alignment balance), until the front wheels are barely free.

- Forward vehicle center: The reference point is provided by the left and right control arm suspension. The middle hole in the cross member corresponds approximately to the vehicle center.





- With the vehicle raised at the front in the center, measure from the footprint to the torsion spring center (center of spring strut cover), dimension X.

- The difference between dimension X on the right and left sides must not exceed 8 mm, under consideration of dimension a. Only the difference is definitive, not the height.
  If necessary, bring the two-piece spring struts into allowable tolerances left to right.

4. Remove special tool 9243. Bring vehicle into driving position on rear and front axles.

5. Check height of front axle (page 44 -2e). If the actual dimension X is outside of nominal dimension tolerances, correct. If the height difference from right to left is within specifications (max. 5 mm), the wheel-load difference will be within acceptable limits.

6. Adjust wheel alignment values on rear and front axles (pages 44 - 2h and 44 - 2i). Start with the rear axle. It is vitally important that the vehicle be in driving position, especially when adjusting the toe on the front axle.

REMOVING AND INSTALLING WHEELS ON CAR

General Information

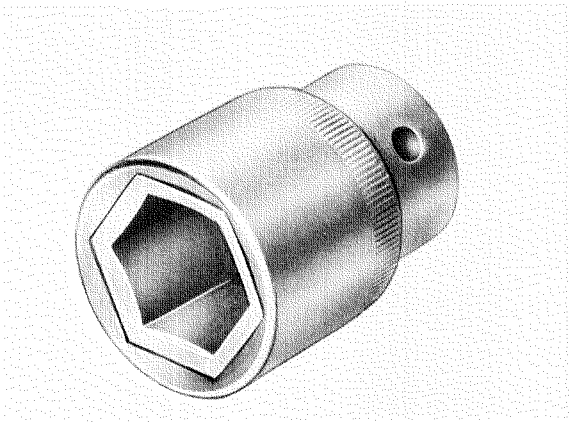
Aluminum wheel nuts may only be loosened and tightened with Special Tool P 300.

Aluminum wheel nuts could be damaged or sheared off through
- use of unsuitable tools (wheel nuts held by only about 2/3rds of total depth),
- excessive tightening torque,
- erratic loosening (impact tool) and
- missing or unsuitable lubricant.

In this case the nut contact base would shear off at the wheel nut hexagon exactly at the point of transition to make removal of rim very difficult.

Installing and Removing

1. Always use Special Tool P 300 in perfect condition. Other socket wrenches, wrench sockets or wheel bolt wrenches may not be used. Impact tools must never be used.

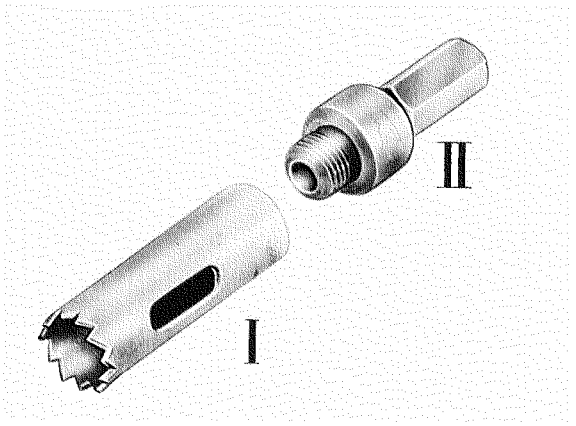


2. Lubricate threads and nut contact base with Optimoly TA.

3. Always tighten nuts to specified torque of 130 Nm (94 ftlb).

Removal with Sheared Off Nut(s)

The rim can be taken off of the wheel hub without damage with the tools listed below. However, damaging the wheel bolt(s) cannot be avoided.



I. Circular saw, 17.5 mm diameter. This tool can be used after grinding off and smoothing inside diameter (welding seam must be removed).

II. Arbor for mounting circular saw.

III. Standard portable drill.

Suppliers:

Sauer-Werkzeug GmbH & Co. KG
Humboldstr. 53

2000 Hamburg 76

Tel.: 040/22 33 22
22 96 66 6
Telex: 214120

Order No.
303 017 – 17.5 mm dia. circular saw
303 161 – Adapter, size 1

or through retail outlets

Manufacturer: The Cooper Group
Deutschland GmbH

7122 Besigheim

Order No.
261 110 00 – 17.5 mm dia. circular saw – H 111
264 020 00 – Adapter M 402 H

1. Grind off nut contact base with the mentioned tools. Work with speed of approx. 450 rpm to guarantee good chip removal. Also cool tool with compressed air.
   The nut contact base will jump off of the wheel bolt after complete removal of threads from the sheared off wheel nut.

Note:

The wheel rim might be cut slightly during this step, but this should not be harmful.

2. Replace respective wheel bolt(s) on removed wheel hub.
   Use a proper size drift for removal and installation.
   Front wheel hub must be heated to 120 – 150 °C/250 – 300 °F for this step.

CHECKING WHEEL RIMS

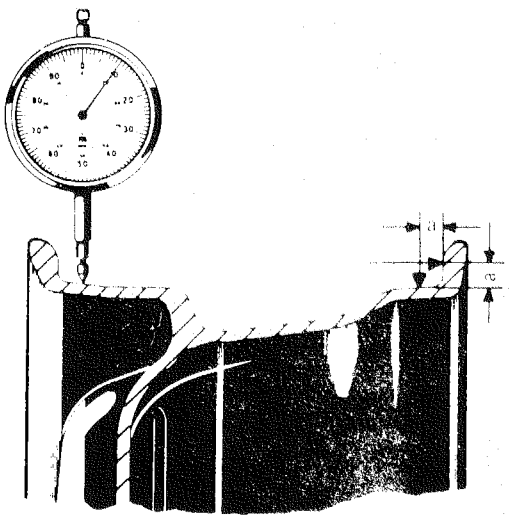
Refer to drawing for lateral and radial runout measuring points on inside of rim.

Max. permissible lateral and radial runout on aluminum rims = 1.0 mm.

Max. permissible lateral and radial runout on rim/tire assembly = 1.5 mm.
Also refer to page 44 - 10.

Note:

Damaged rims should never be straightened.

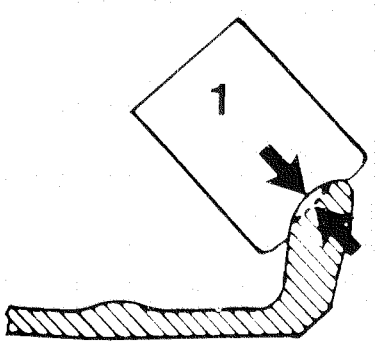


Distance "a" = 8 mm

Check flanges of aluminum wheel rims for wear. The inside flange is more subject to wear. Use a standard 8 mm radius gage for checking, but first remove any sharp edges or burrs.
Wear limit: 1 mm.
Replace wheel rim if necessary.

Checking Rim Flange Contour

——— New condition
- - - - - - Worn condition
→ ← Wear max. 1 mm
1 Radius gage 8 mm



General assembly information - tires

Always use new rubber valves when replacing tires.

Only fit tubes to 185/70 R 15 and 215/60 R 15 "tubeless" tires in an emergency.

There are no tubes available for 50 and 55 series tires. When fitting tubeless tires, check that the sealing areas of the tire and disk wheel are clean and look for any damage. In this respect, always bear in mind that a tubeless tire is sealed by the bead base. If the side wall of the bead were used for sealing, it may be possible for air to escape under extreme driving conditions.

Check the rim flange of light alloy disk wheels for wear (refer to Page 44 - 8).

When fitting tires, always comply with any instructions on the side walls with regard to direction of rotation or side-specific assembly (e.g. arrow or "outer/inner").

When fitting, apply Contifix assembly paste sparingly to the tire bead (to prevent the tire twisting on the rim). Use of an unsuitable assembly paste can cause the following: the tire may twist on the rim, the bead core may break during fitting, or the rim surface may be damaged by agressive agents. The vehicle should not be driven, wherever possible, for 24 hours after fitting or matching tires.

Tell your clients to avoid extreme driving behavior (acceleration, braking) during the first 60 to 120 miles (100 to 200 km) with new or newly fitted tires to prevent the tire twisting on the rim under driving conditions. Mark the tires if necessary.

A maximum of 20 mm twisting of the tire on the rim must be regarded as the ultimate limit value. In such cases, this will have a detrimental effect on an optimally balanced wheel.

Mark the tire in a beneficial position in relation to the rim (matching) in order to achieve optimum smooth running. The following text describes both uncontrolled matching and controlled matching with identification markings orusing a wheel-balancing machine with matching program.

After fitting, inflate tubeless tires to approx. 4 bar (58 psi) without valve inserts to ensure that they are correctly seated on the rims. At 3.3 bar (48 psi), at the latest, the tire bead must jump from the well base over the hump of the bead seat to avoid breaking the bead core. Screw in the valve insert and inflate to the prescribed tire pressure.

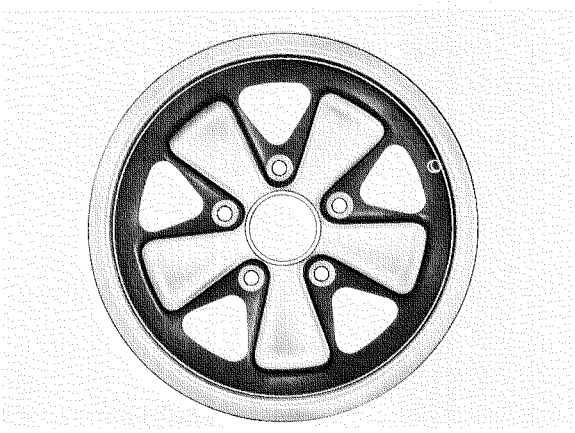
Printed in Germany – XIII, 1989

The max. permitted radial and lateral run-out of the wheel (tire plus rim) is 1.5 mm. Try to achieve values less than 1.0 mm - 0.5 mm is better

If necessary, turn the tire on the rim by 180° to obtain an acceptable value (uncontrolled matching).
Controlled matching: align the highest point of the rim with the green or white dot on the side wall of the tires. The highest point of the rim must be determined beforehand. If forged 16 inch disc wheels are fitted, however, this point is identified by a milled recess in the rim well as well as by a red dot glued to the outer side.

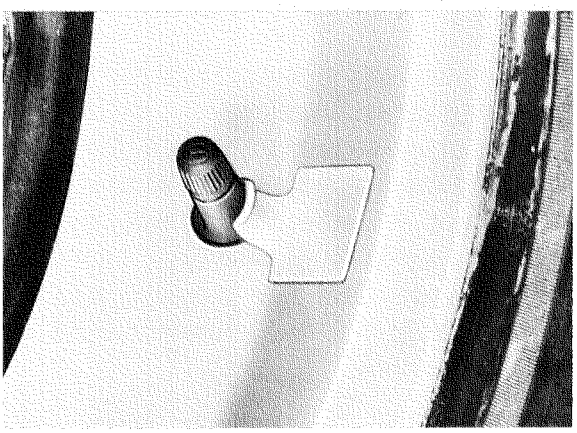
Bear in mind that in some cases it is possible to get even better results from the point of view of smooth running using a wheel-balancing machine with matching program (smooth running, imbalance and weight distribution of the balancing weights).

Forged 16 inch disc wheels with milled recess in the rim well.



10363

The specified valve support must be fitted to forged 7", 8" and 9" Porsche rims in order to prevent excessive alternating bending stress on the rubber valve caused by the design position of the valve hole.



7250

When replacing a defective tire, bear in mind that the deviation in tread depth must not be greater than 30% on one axle. The prescribed inflation pressures on Page
44-02 apply to cold tires.

New tires have a so-called curing skin. The driving behavior must therefore not be overrated immediately after new tires have been fitted. This is particularly valid if new tires have been fitted to the rear axle as stability of the rear axle is more critical.

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Research has shown that the driving behavior of a new tire improves considerably during the "running-in distance" up to 600 miles (1000 km). New tires should therefore be run in carefully for the first 600 miles (1000 km). **This will be of benefit to the safety and service life of the tires.**
It is advisable to check the wheel balance after the running-in period. This running-in phase will depend on the way the vehicle is driven, the road surface and the rubber composition used by the manufacturer.

It is a known fact that flexing energy increases the air pressure in warm tires. Tell your clients not to reduce this increase in pressure. Dangerous tire damage may be caused if the inflation pressure is too low. In many cases, this type of damage is not immediately obvious.

If a wheel is removed from the vehicle during assembly work, mark the wheel stud closest to the valve with red paint. (Identical position of the wheel in relation to the hub or brake disc when re-fitting.) **In addition to this, turn the valve upwards when re-fitting before tightening to the hub (also refer to Page 44-15). This will prevent losing the optimum balance result achieved by stationary balancing or supplementary final balancing. The lockable wheel nut must be fitted to the wheel stud in closest proximity to the valve (marked).**

Tire specification codes:
Specification code **N 0** or **N 1** distinguishes those summer tires specifically approved by Porsche from other versions of the same type of tire and of the same size. A distinction is also made within the Porsche types with respect to the prescribed tire specification codes.
N 1 is not permitted for the 911 Carrera.
Example:
(permitted / affected tires). The same applies to both vehicles: identical size of tire, identical make and identical type of tire.

Specification code
911 Carrera N 0
911 Carrera 4 N 1
(restricted exception in the U.S.A.)

The specification code for the respective make of tire must be located on the side wall in the vicinity of the type designation and may be written in a variety of ways. **N 0** may be given as **N - 0** or **N Ø**.

Refer to the Technical Information, Gr. 4 for the exact assignment (tire specification, approved tire, tire replacement).

Tire age:
High-speed tires VR/ZR in particular, must not be too old, under no circumstances older than 6 years. The age of a tire can be determined from the manufacturer's code which follows the DOT code on the tire wall. The date of manufacture is at the end of the code number.

Example:
DOT DM CP 05 Y 276
27 = Production week 27
6 = Production year 1986

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Wheel balancing

General

- If the wheels are too unbalanced, this not only causes vibration and shaking of the steering wheel, but also increases the wear on various chassis components.
- **Even if wheels are balanced correctly, uneven running and steering may be caused by excessive geometry faults (radial and lateral run-out) and irregularities in the tires, e.g. material accumulating in one place (when rolling under diverse suspension conditions).**
- Extreme care, compliance with instructions and procedures, as well as the attempt to eliminate even the last gramme of imbalance are necessary to achieve a good result.

Notes / prerequisites

- Wheel suspension components must be technically sound.
- Wheels must be clean, without foreign bodies in the tires.
- Check radial and lateral run-out of wheels *without flat spots* using a radial run-out measurement gauge, e.g. VAG 1435. *Try to achievevalues of less than 1 mm - 0.5 mm is better.*
- Tires must be matched to achieve minimum out-of-true characteristics or to optimize smooth running. Tips and information on this, as well as tire mounting paste, can be found on Page 44 - 9/10
- If disc wheels (rims) run absolutely true but there is extreme radial and lateral run-out (caused by breaking flat-spots, cord breaks, other damage) replace the tire if necessary.
- **Only balance used wheels when warm as flat spots may otherwise simulate an imbalance. Never match if there are flat spots.**
- Correct inflation pressure is a crucial prerequisite

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Procedure for optimizing wheels

The complete procedure is subdivided into 4 working steps

1. Fitting the tire to the rim

2. Stationary balancing of the wheel (eliminating static and dynamic inbalance) with optimization of smooth running

3. Fitting the wheel to the vehicle

4. Electronic fine balancing (static balancing) of the wheel on the vehicle *(if required after stationary balancing / not usually necessary)*

Further to 1: (Fitting the tire to the rim)

- Clean the rim; above all remove residual rubber and dried-on tire paste from the bead seat and the hump.

- Inspect the rim for damage, remove old balance weights.

- Apply tire paste (Contifix) sparingly to prevent the tire twisting on the rim during initial driving and ruining all the careful work (even if the tire only twists by 20 mm on the rim, this can have a detrimental effect on a good balancing result).

- Mark the tire on the rim, aligning matching points (if available) of tire and rim. Bear in mind that in some cases it is possible to achieve an even better result as far as smooth running and imbalance are concerned by using a wheel-balancing machine with matching program (refer to Page 44 - 9/10)

- Inflate the tire to 4 bar (58 psi); the bead must jump over the hump of the bead seat at 3.3 bar (48 psi) at the latest.

- Use the bead centering line to check that the tire is seated correctly on the rim.

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Further to 2: (Stationary balancing, optimizing smooth running)

- Clamp the wheel onto a stationary balancing machine, observing the following under all circumstances:

a) Follow the operating instructions for the respective balancing machine, adjusting the machine from time to time if necessary.

b) The contact surface of the wheel at the bead flange (level surface) and the middle centering device must be clean.

c) *Center from the inside outwards using a stepped ring (cylindrical ring - standard Porsche version, e.g. available from Schenck or Hofmann).*
Do not center from the outside as well.

d) *Clamp the wheel onto the balancing machine as specified* (valve always pointing upwards, the wheel will then drop downwards through the small amount of play necessary when centering before tightening) *and then fit to the vehicle in the same position* (otherwise there may be a shift of up to 1/2 oz. (15 g)
If the balancing machine has a horizontal wheel fixture (wheel lying), position the valve opposite the mechanic then pull the wheel in this position towards the mechanic and clamp firmly.

- Check the radial and lateral run-out during the 1st measurement procedure. *Try to achieve values less than 1.0 mm - 0.5 mm is better.*

- Be critical with regard to the size of the measured balance weights and their distribution on the inner and outer rim flange.

- An even distribution of low values (e.g. 3/4 / 7/8 oz (20/25 g)) indicates that the tires are correctly fitted and that the quality of tires and rims are in good order.

- Do not exceed a value of 1 3/4 / 1 3/4 oz. (50/50 g), a widely deviating distribution, e.g. 1 / 2 1/2 oz. (30/70 g) is very unfavorable and usually indicates a fitting fault. Such problem wheels frequently have obvious radial and lateral run-out.

- Only individual weights of max. 1 3/8 oz. (40 g) may be fitted to the inner side of 15" disc wheels because of the brake-pad wear indicator. If the imbalance is greater than this, use two individual weights.

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- Remedy by "matching" (use correct fitting paste sparingly / Page 44 - 9/10)
  a) manual improvements are possible
  b) considerable improvements possible in virtually all cases using smooth-running optimization program.

- When balancing, the tire pressure should not be less than 1.5 bar (22 psi).

- Permissible residual inbalance less than / or max. 1/10 oz. (3 g) per side

Further to 3: (Fitting the wheel to the vehicle)

- Fasten the wheel to the wheel hub as specified (also refer to Page 44 - 11 - General assembly instructions - tires).

- Valve pointing upwards (same position as for the balancing machine)

- **Align the wheel-mounting hole nearest to the valve with the wheel stud marked with paint and secure with the lockable wheel nut. Start the nuts, tighten evenly, starting at the top. Tighten the wheel with 130 Nm before lowering the vehicle onto its wheels to prevent it moving from its defined position on the hub.**

- Tire pressure according to specification

Further to 4: (Electronic fine balancing)

- Use a final balancer recommended by Porsche for electronic fine balancing of the wheels on the vehicle. Refer to the unit's operating instructions for procedure. As long as the listed points are observed, the rear wheels do not require fine balancing.

- **The following generally applies: the measurement jacks must stand on a firm foundation, the measurement fixture must be situated as close to the wheel as possible, doors and hood must be closed and the vehicle must not be touched during the measurement run. Ensure that the lifting equipment (jack, platform) has no contact with the vehicle.**

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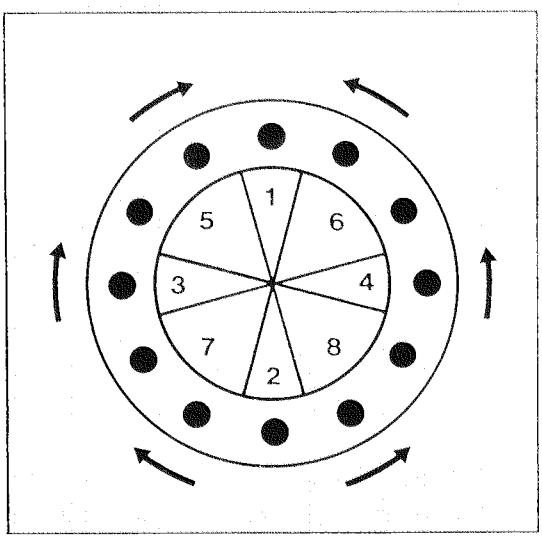
- Adjust the sensitivity controllers according to the operating instructions (approx. Position 5) when finely balancing the front wheels.Carry out a measurement run.

- Attach balance weights to the outside if necessary (may also be distributed - or fitted to the inside / uniform procedure).
  Under no circumstances remove the weights fitted during stationary balancing.
  Identify balance weights from electronic fine balancing with a center punch.

- Then carry out a check run. If the result is not acceptable, calibrate the final balancer, i.e. adapt the sensitivity controller to actual conditions.

- If the balancing result is still not quite satisfactory (e.g. 2/16 oz. (5 g)) following calibration, eliminate residual imbalance by altering the balance weight according to the balancing correction table.

Balance weight in section	Modification of the balance weight
1	enlarge at the same position
2	reduce at the same position
3 or 5	place in arrow direction in case of same size
5 or 6	enlarging and place in arrow direction
7 or 8	reducing and place in arrow direction



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Notes on fitting the self-adhesive weights

- Determine the exact position of the balance weight (possibly by fitting balance weights provisionally with tape until the correct position has been established).

- Prepare the contact area on the rim. This area must be absolutely clean and free of grease.

- Remove the protective paper from the contact surface of the weight and press on firmly.

Note.

Only remove the protective foil immediately before fitting the weight as the adhesive capacity is reduced when exposed to air and there is also the risk of contamination.

- The self-adhesive weight must be fitted carefully to the smooth rim surface of the wheel. It must fit evenly over the entire contact area.



- Check that the balance weight is fitted securely. The newly fitted weight must not come away from the rim.

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Overview - wheels and tires

Type	Standard Rims	Tires***	Optional Rims	Tires
911 Carrera	front 6 J x 15*	185/70 or 195/65 VR 15 (Mod. 87 onward)	front 7 J x 15**	185/70 or 195/65 VR 15 (Mod. 87 onward)
	rear 7 J x 15*	215/60 VR 15	rear 8 J x 15**	215/60 VR 15
			front 6 J x 16**	205/55 VR 16
			rear 7 J x 16**	225/50 VR 16
Mod. 88 onward	front 7 J x 15**	195/65 VR 15	front 6 J x 16**	205/55 VR 16
	rear 8 J x 15**	215/60 VR 15	rear 7 J x 16**	225/50 VR 16
Mod. 89 onward	front 6 J x 16**	205/55 ZR 16		
	rear 8 J x 16**	225/50 ZR 16		
911 Carrera Turbo look	front 7 J x 16**	205/55 VR 16		
	rear 8 J x 16**	225/50 VR 16		
Mod. 86 onward and Speedster Turbo look	front 7 J x 16**	205/55 VR 16		
	rear 9 J x 16**	245/45 VR 16		

Refer to Page 44 - 02 for tire pressures and winter tyres

* Cast light alloy

** Forged light alloy

*** ZR for current Model year 1989. Refer to Technical Information Group 4 for information on replacement

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Winter tires*

Tires**		Possible and recommended rim sizes. Recommended sizes are underlined. Refer to the current TI for further details on offset and rim design.	
		911 Carrera and Club Sport model	Turbo look (also possible for Speedster Turbo look)
195/65 R 15 front and rear	91 T	6 J x 15 front and 7 J x 15 rear	6 J x 15 front and 7 J x 15 rear
195/65 R 15 215/60 R 15	91 T front 93 T rear	6 J x 15 front and 7 J x 15 rear or 7 J x 15 front and 8 J x 15 rear	7 J x 15 front and 8 J x 15 rear or 6 J x 15 front and 7 J x 15 rear
205/55 R 16 front and rear	88 T	6 J x 16 front and 7 J x 16 rear	7 J x 16 front and 8 J x 16 rear or 6 J x 16 front and 7 J x 16 rear
205/55 R 16 225/50 R 16	88 T front 92 T rear	6 J x 16 front and 7 J x 16 rear or 6 J x 16 front and 8 J x 16 rear	7 J x 16 front and 8 J x 16 rear or 6 J x 16 front and 7 J x 16 rear

Inflation pressure for cold tires (summer and winter tires)

front	2.0 bar (2.5 bar for summer tires on Slant nose version)
rear	2.5 bar 3.0 bar for Turbo look and Speedster Turbo look
Folded spare tire*** (front and rear)	2.5 bar or 2.2 bar

* Refer to Technical Information, Group 4 for information and recommendations concerning winter tires and snow chains.

** The H version winter tires listed in the recommendation (TI) may also be fitted. The maximum permitted speeds are as follows: H = 210 km/h / T = 190 km/h (Q = 160 km/h).

*** 2.2 bar for 165 - 15 4 PR 83 P tires
2.5 bar for 165 - 15 8 PR 89 P 2.5 tires

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Wheel alignment specifications

The following values apply to a vehicle at curb weight per DIN 70020 (vehicle with full tank, spare wheel and tools).

	Specification and Tolerances	Max. Difference, Left to Right
Front Axle		
Height:		
Center of wheel to above center of torsion bar	911 Carrera und Turbo-Look 108 mm ±5 mm*	5 mm
	Speedster 128 mm ±5 mm	5 mm
Toe (not pressed)	+ 15' ± 5'	
Toe difference angle 20° lock	0° bis + 30' (0° bis – 50' electronic axle measuring instrument	Can be influenced only by replacing steering arms
Camber of front wheels in straight-ahead position	0° ± 10'	10'
Caster	6°5' ± 15'	30'

* Specifications for height apply to new vehicles. Vechicles which have been operated ca be up to 10 mm lower, i.e. tolerance downwards can be 15 mm. Of course, this must be the case for both axles.

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The following specifications apply to vehicles at curb weight per DIN 70020 (vehicle with full tank, spare wheel, and tools).

		Specification and Tolerances	Max. Difference, Left to Right
Rear Axle			
Height:		911 Carrera and Turbo-Look	
Center of cross tube to above center of rear wheel		16 mm ± 5 mm*	8 mm
Center of cross tube to below center of rear wheel		Speedster 4 mm ± 5mm	8 mm
Spring strut setting**			
Spring strut inclination			
Torsion bar dia. 24.1 mm		35° (34°***)	0,5°
(until end of 85 models)	Turbo-Look	36°	0,5°
Torsion bar dia. 25 mm		33°	0,5°
(from 86 models)	Turbo-Look	35°	0,5°
	Speedster****	32°	0,5°
	Turbo-Look		
Targa and Cabriolet		+ 0,5°	
With air conditioner		+ 0,5°	
Toe per wheel		+ 10 ' ± 10'	20'
Camber		− 1° ± 10'	20'
	Turbo-Look and Speedster Turbo-Look	− 30' ± 10'	20'

* Height specifications apply to new vehicles. Vehicles which have been operated can be up to 10 mm lower, i.e. downward tolerance can be 15 mm. Of course, this must be the case for both axles.

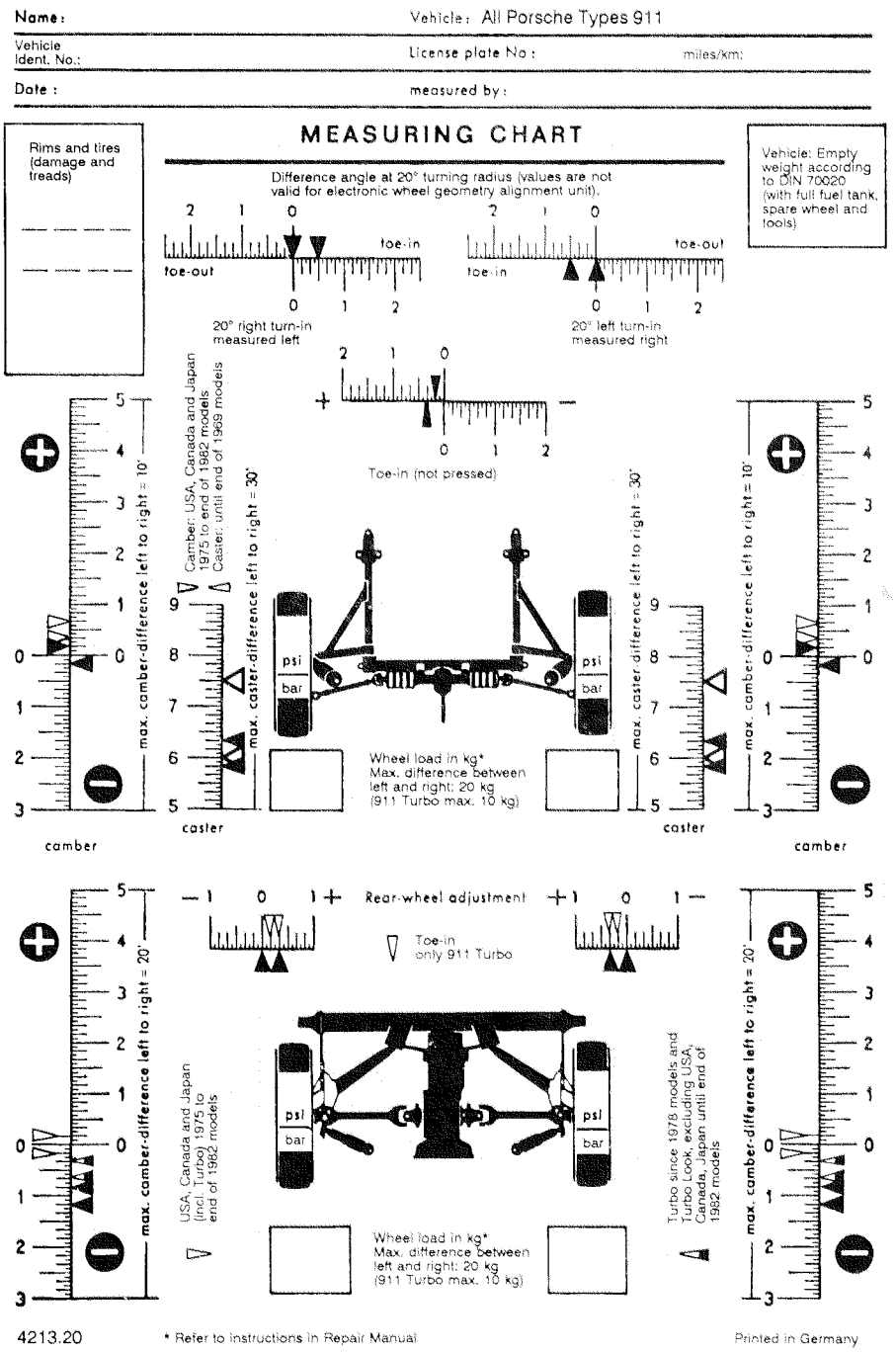
** 1° change in spring strut inclination corresponds to a vehicle height change of approx. 8 - 9 mm.

*** With gas pressure shock absorbers. See page 42-3 for cross-reference, identification, and differences.

**** Speedster normal 31°.

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SAMPLE TEST CARD



4213.20 * Refer to instructions in Repair Manual Printed in Germany

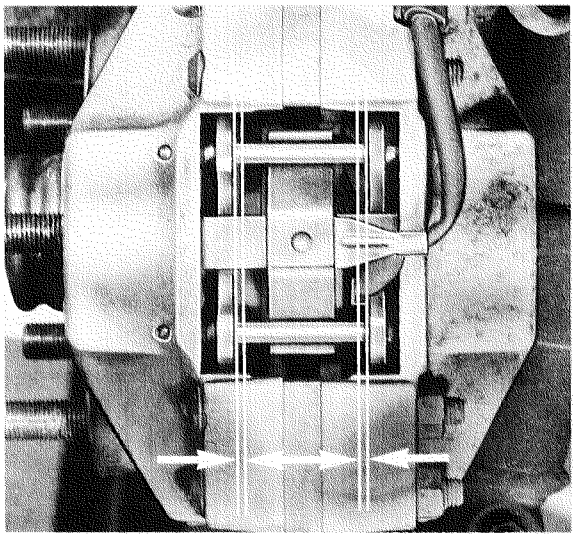
CHECKING THICKNESS OF BRAKE PADS

Note:

Brake pads must be replaced when brake pad wear indicator lamp comes on, however at latest when worn to a thickness of 2 mm. All pads of one axle must be replaced. If brake pad wear is signaled by indicator lamp, warning contact (sensor incl. wire and plug) must be replaced.
Replacement of warning contacts can be avoided by replacing brake pads when worn to thickness of 2.5 mm.
Warning contacts with grounded wire cores have to be replaced. Remplacement is not necessary, however, if only the plastic part of the warning contact is worn.

1. Remove wheels to check brake pad thickness.

2. Visually inspect brake pads for wear.



Wear limit is reached, when pad has a remaining thickness of 2 mm.

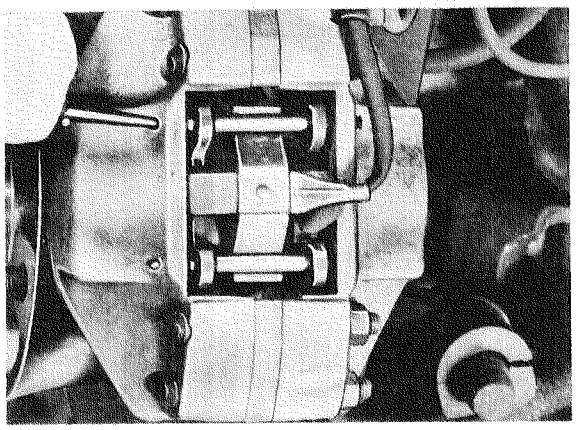
REMOVING AND INSTALLING BRAKE PADS

Removing

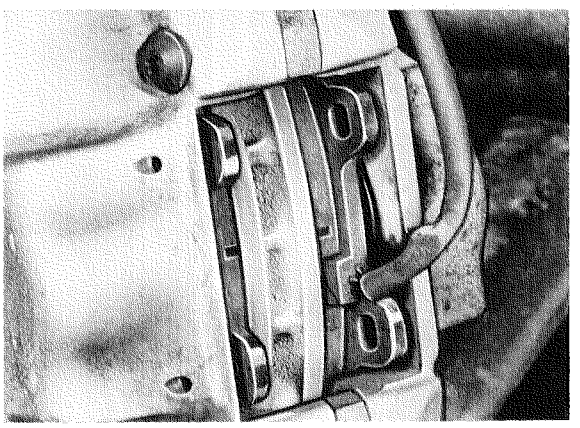
Note:

Brake pads, which can be re-used, must be installed in same position (to avoid uneven braking).

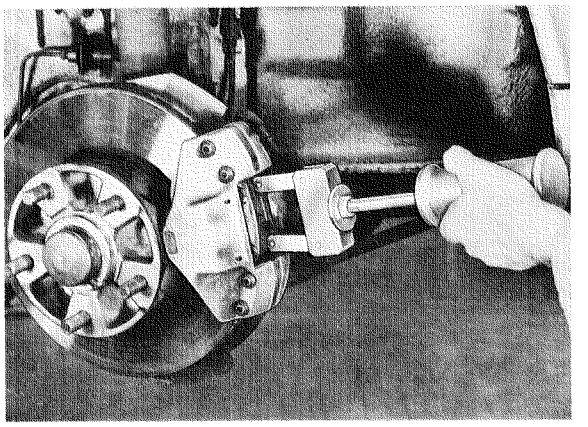
1. Drive out retaining pins for brake pads with a mandrel.



2. Pull warning contact out of pad plate.



3. Pull out brake pads with a suitable tool, e. g. impact puller ATE 3.9314-6100.3 or Hazet 1966-2.

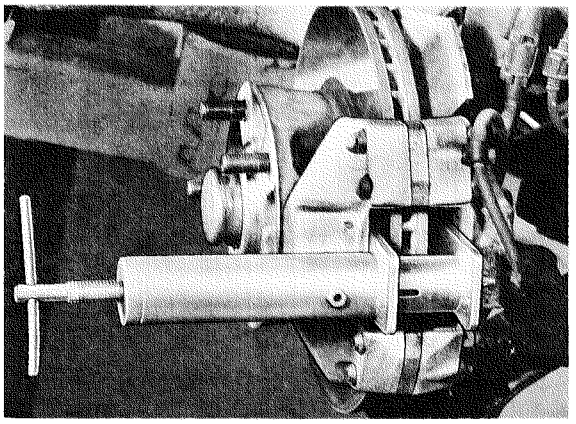


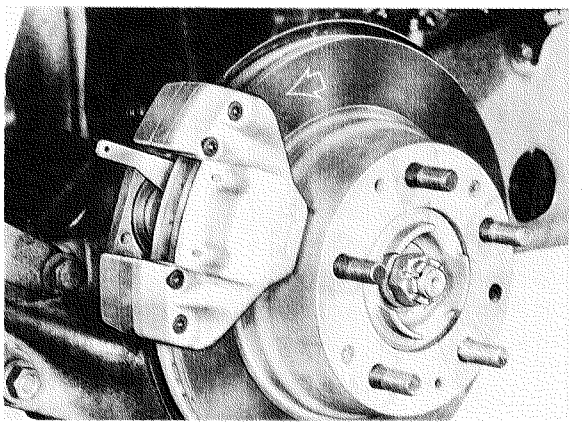
Installing

Note:

Always replace brake pads, which show deep cracks, have become loose from back plate or are covered with oil. Also then replace all four pads of one axle.

1. Press back piston to initial position with special tool.





Note:

To prevent brake fluid from overflowing, draw off small amount of brake fluid before pressing back piston. Use syringe reserved exclusively for brake fluids.
Brake fluids are poisonous and must not by syphoned off through a hose.

2. Clean brake pad bearing and sliding surfaces in brake calipers with methylated spirits or a cylindrical brush. Never use solutions containing mineral oils or sharp edged metal tools.

3. Check 20° piston position.
If necessary, adjust with piston turning pliers.
Hold piston gauge on upper guide surface of front and rear brake calipers.

4. Insert brake pads (inner brake pad with opening for warning contact).

Note:

Apply a thin coat of grease on seat and guide surfaces to prevent seizure of brake pads in brake calipers.
Use Optimoly HT (Cu Paste) or Plastilube.

5. Install cross spring and retaining pins, driving in retaining pins against stop.

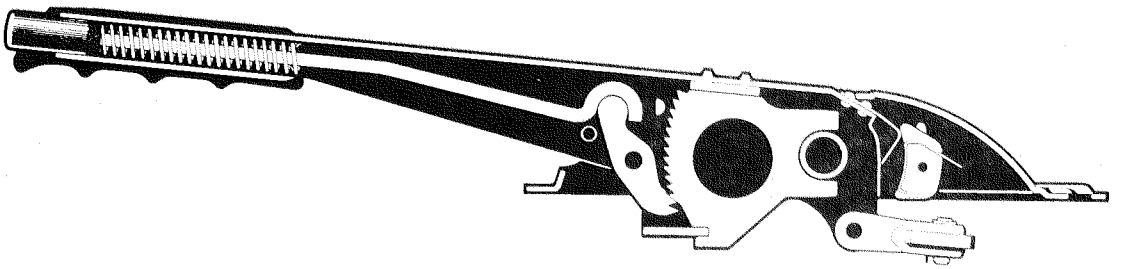
6. Press warning contact into pad plate in correct position and insert warning contact wire into holder on cross spring.

7. Depress brake pedal of stationary car hard several times to move brake pads to their normal operating position. Now check level of brake fluid in tank, adding more if necessary.

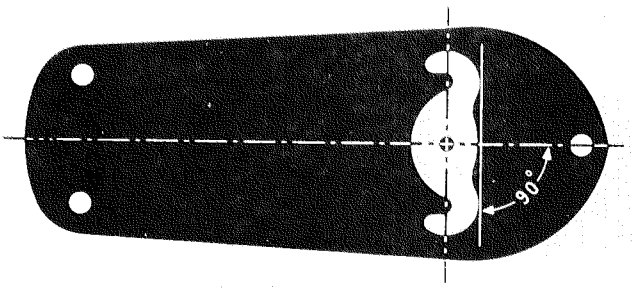
Breaking In Brake Pads

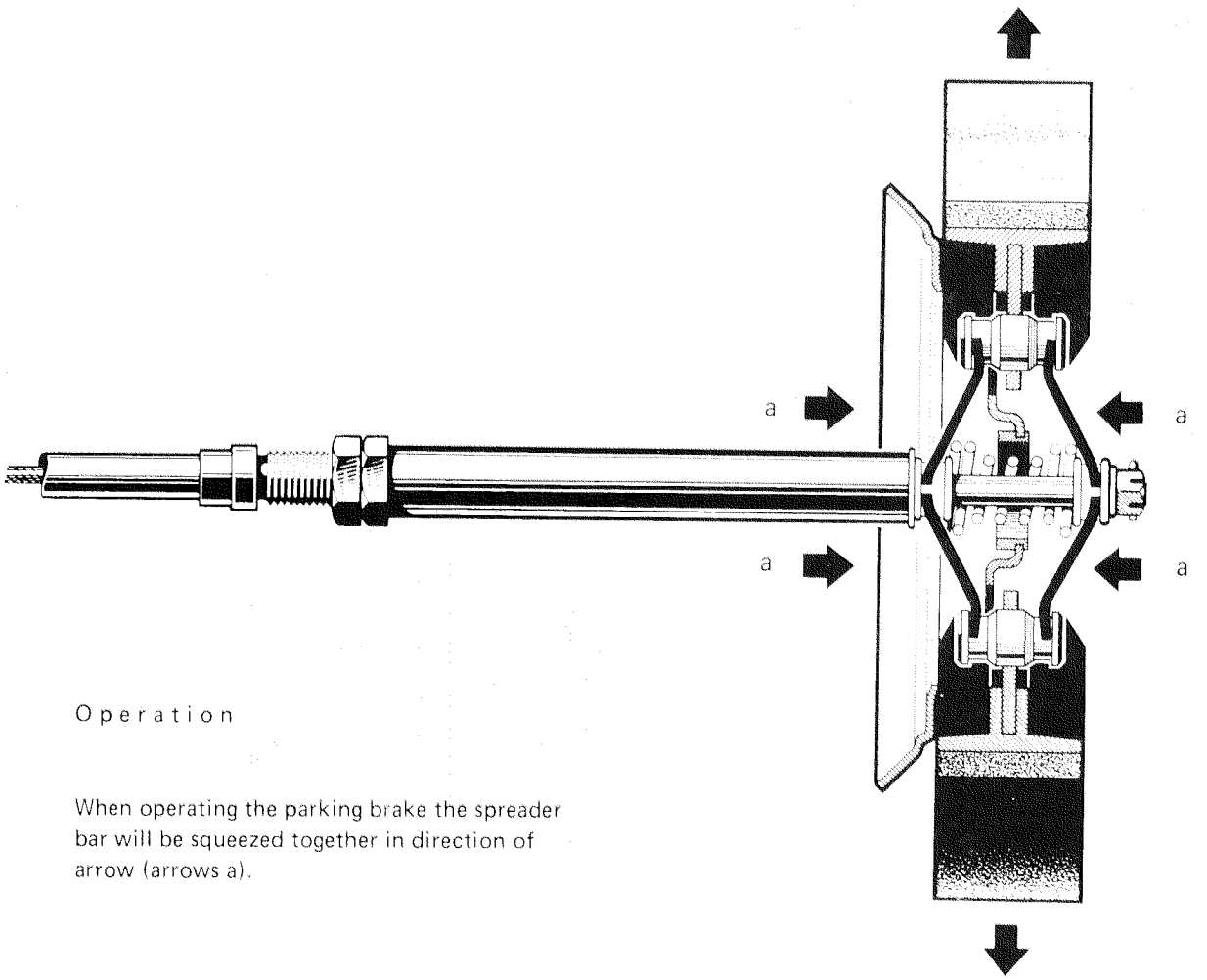
New brake pads must be broken in during first 200 km to guarantee reaching maximum friction and wear values. During this time full stops from top speeds should be limited to emergency situations.

CHECKING AND ADJUSTING PARKING BRAKE



Parking brake must be adjusted when parking brake lever can be pulled up by more than 4 teeth by applying average force (max. 5 teeth with greater force) and/or parking brake efficiency is irregular.
To have uniform braking effect, cable holder on parking brake lever must be exactly transverse to car when pulling up parking brake lever.



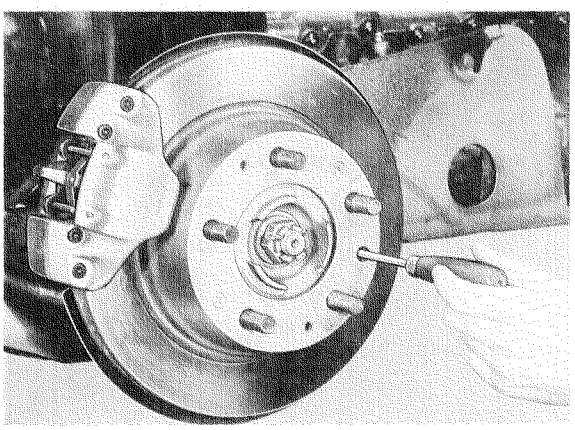


Operation

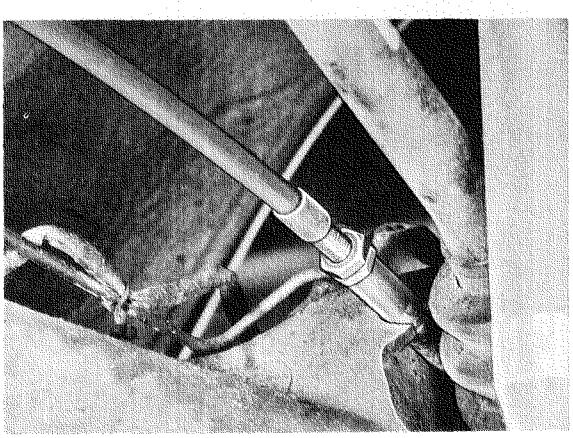
When operating the parking brake the spreader bar will be squeezed together in direction of arrow (arrows a).

Adjusting

1. Remove rear wheels. Release parking brake and push back disc brake pads until brake discs can be turned easily.



2. Check whether parking brake cables are without tension (axial play).
   If necessary, loosen nuts accordingly.



4. Adjust parking brake cables by tightening or loosening nuts in two steps.

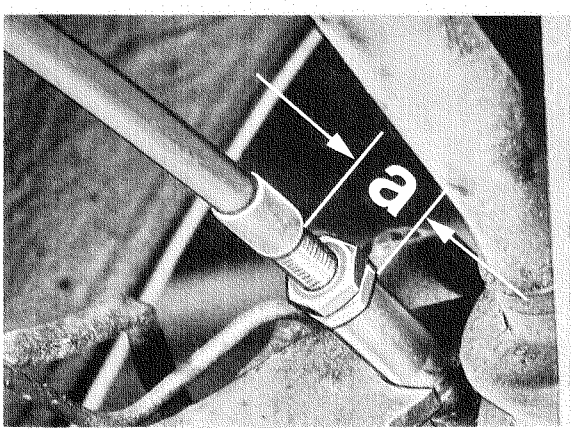
   Step 1: With parking brake released there should still be slight axial play on both sides (free of tension) and threads of cables should protrude from sleeves by approximately the same distance (distance a because of horizontal position of cable holder on parking brake lever).

   Step 2: It should be difficult to turn both wheels when parking brake lever is pulled up by 2 teeth.

3. Tighten adjusting nut of brake shoes with a screwdriver until brake disc can no longer be turned by hand.
   Loosen adjusting nut by 4 turns so that brake disc can be turned easily.
   Repeat adjusting procedures on other wheel.

Note:

If parking brake had been disassembled and/or new parts were installed, pull up and release parking brake several times (settling).



5. Check whether both wheels can be turned easily after releasing parking brake. Tighten nuts on parking brake cables.

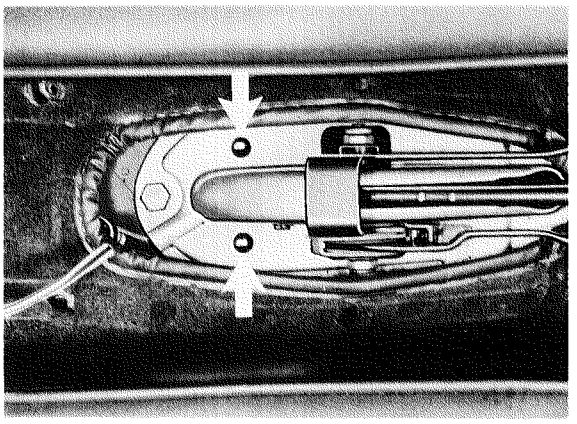
Note:

Operate brake pedal several times before driving car to position disc brake pads according to operating condition.

6. Fine adjustment will be necessary when irregular braking effect because of varying settling is reported.
   Make fine adjustment by loosening or tightening nuts on parking brake cables while conforming with following points.

   – It should be difficult to turn both wheels after pulling up parking brake lever by 2 teeth.

   – Cable bar should be exactly transverse to car when pulling up parking brake lever.
   Position of cable bar can be checked through both inspection holes in parking brake console after removal of control unit for automatic heating regulation or console with extra fan switch.



ADJUSTING BRAKE PRESSURE ROD

Note:

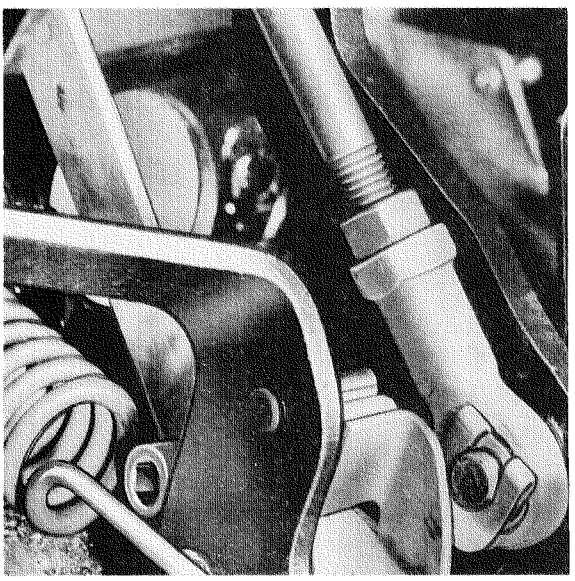
Brake pedal does not have a stop. Its initial position is reached when brake booster (brake booster + brake master cylinder) is in released position.

Since with a correctly adjusted brake pressure rod the brake pedal will not have any support in initial position, the permanently set clearances in the brake booster are guaranteed. A pressure rod play of approx. 10 mm can be felt by hand operation on the brake pedal plate when engine is stopped and brakes have been bled.

Brake pressure rod adjustment is correct when brake pedal pad and clutch pedal pad are at same height (clutch pedal at initial position).

Adjusting

1. Loosen nuts of pressure rod and turn pressure rod until brake and clutch pedal plates are at same height (clutch pedal at initial position)
2. Tighten upper nut of pressure rod. Align pivot head and tighten lower nut while holding pivot head.



Specifications

Description	Remarks, Specifications		Wear Limits	
	911 Carrera	911 Carrera Turbo-Look	911 Carrera	911 Carrera Turbo-Look
Service brakes (foot-operated)	Hydraulic, dual circuit brake system with front/rear brake circuit division (black/white) Brake booster, inboard vented brake discs with brake calipers on front and rear wheels			
Brake booster dia.	8"	8"		
Boosting factor	2,25	2,25 3,0***		
Master cylinder dia.	20,64 mm	23,81 mm		
Stroke	20/12 mm	18/14 mm		
Brake force regulator -switching-over pressure- reducing factor	33 bar - 0,46	33 bar - 0,46 55 bar - 0,46***		
Brake disc dia.				
front	282,5 mm	304 mm perf.		
rear	290 mm	309 mm perf.		
Effective brake disc dia.				
front	228 mm	247 mm		
rear	244 mm	251 mm		
Piston diameter in brake caliper				
front	48 mm*	38 mm **		
rear	42 mm*	30 mm **		
Brake pad surface each front wheel	76 cm^2	94 cm^2		
Brake pad surface each rear wheel	52,5 cm^2	94 cm^2		
Total brake pad surface	257 cm^2	376 cm^2		
Pad thickness front	10 mm	13 mm	2 mm	2 mm
Pad thickness rear	10 mm	13 mm	2 mm	2 mm

* 2 pistons each brake caliper
** 4 pistons each brake caliper
*** since 1985 models

Description	Remarks and Specifications 911 Carrera	911 Carrera Turbo-Look	Wear Limits 911 Carrera	911 Carrera Turbo-Look
New brake disc thickness				
Front	24 mm	32 mm		
Rear	24 mm	28 mm		
Min. brake disc thickness * after machining				
Front	22.6 mm	30.6 mm	22.0 mm	30 mm
Rear	22.6 mm	26.6 mm	22.0 mm	26 mm
Max. brake disc thickness tolerance	0.02 mm	0.02 mm		
Max. brake disc lateral runout	0.05 mm	0.05 mm		
Max. lateral runout for installed brake discs	0.1 mm	0.1 mm		
Max. surface finish after machining	0.006 mm	0.006 mm		
Play on brake pedal with brakes bled and engine stopped	approx. 10 mm	approx. 10 mm		
Hand brakes (parking)	Mechanical action on both rear wheels (drum brakes)			
Brake drum dia.	180 mm	180 mm	181 mm	181 mm
Brake shoe width	25 mm	25 mm		
Brake liner surface area per wheel	85 cm^2	85 cm^2		
Brake liner thickness	4.5 mm	4.5 mm	2 mm	2 mm

* Brake discs may only be machined symmetrically, i. e. evenly on both sides.

TORQUE SPECIFICATIONS FOR MECHANICAL BRAKE PARTS

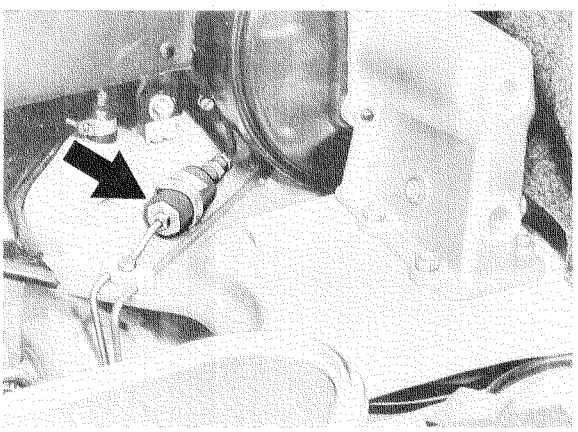
Location	Description	Threads	Material	Torque Nm (ftlb)
Nut on steering knuckle	Bolt	M 7	10.9	15 (11)
Brake caliper/ steering knuckle	Bolt	M 12 x 1.5	8.8	70 (51)
Brake disc/wheel hub	Bolt	M 8	8.8	23 (17)
Guard/steering knuckle	Bolt	M 8	8.8	10 (7)
Guard/brake backplate	Bolt	M 8	8.8	25 (18)
Guard and brake backplate/ rear axle arm	Bolt	M 8	8.8	25 (18)
Brake disc/wheel hub	Screw	M 6	8.8	5 (3.6)
Brake caliper/ rear axle arm	Bolt	M 12 x 1.5	8.8	60 (43)
Wheel/wheel hub	Wheel nut	M 14 x 1.5		130 (94)

Notes on the braking system - 911 Carrera Turbo look / Speedster Turbo look

The Turbo look Carrera and the Turbo look Speedster are equipped with the braking system from the 911 Turbo 3.3.

A brake power controller has been installed for the rear-axle braking circuit, however, as for the 911 Carrera. The brake power controller is located just behind the master cylinder on the floor of the luggage compartment.

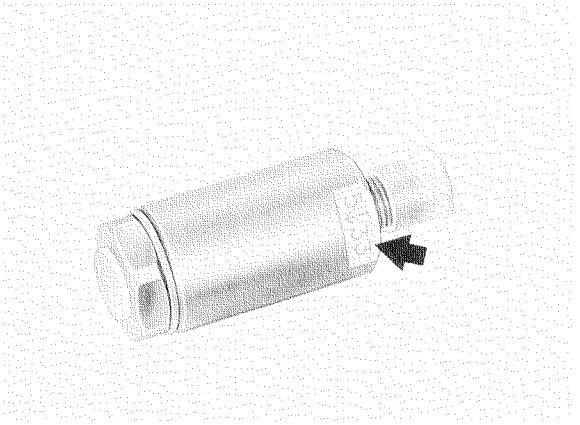
It is directly fitted to the master cylinder of vehicles with right-hand drive.



The change-over pressure of the brake power controler up to end of Mod. 84 = 33 bar (as standard for the 911 Carrera). The change-over pressure has been increased to 55 bar for Model 85 onward. The brake power controller with 55 bar change-over pressure may also be installed in Turbo look vehicles prior to Model 85. The change-over pressure is embossed on the brake power controller.

Change-over pressure of Speedster Turbo look is also 55 bar.

The reduction factor for both brake power controllers (33 bar and 55 bar)
046 = identification code 5. (Identification code 3 indicates reduction factor 0.3).
Only the brake power controller with identification code 5 may be installed.



The repair procedures for the Turbo look / Speedster Turbo look braking system are described in the 911 Turbo Workshop Manual.

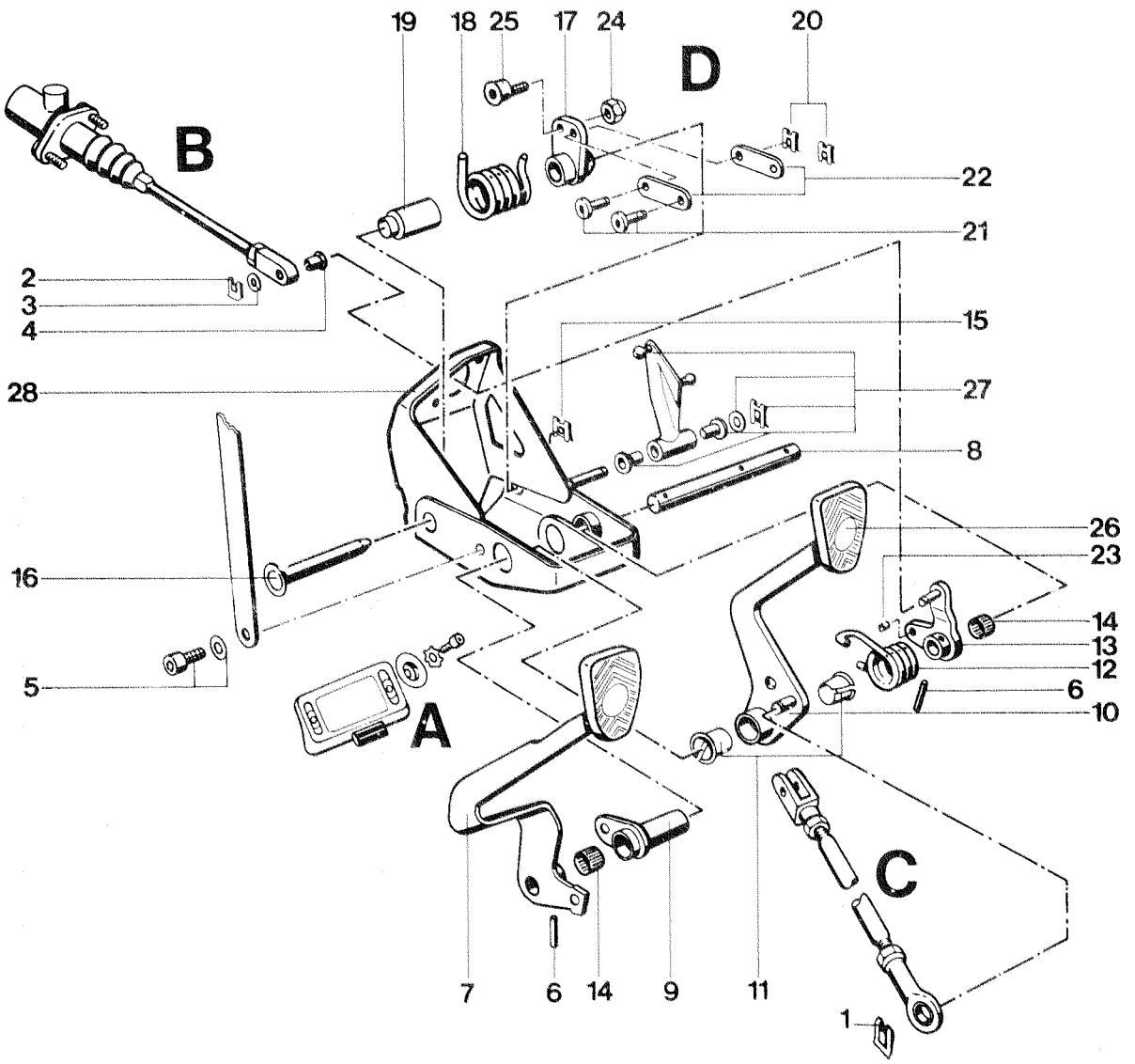
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NOTES ON FOOTBRAKE PEDAL/PEDAL ASSEMBLY, 87 MODELS ONWARD

The installation of an hydraulically actuated clutch in the 911 Carrera as of model year 87 and the accompanying new pedal bracket (bearing bracket) has also entailed modification of the footbrake pedal (see exploded drawing below for left-hand drive cars).

In contrast, the brake pressure rod and the brake booster remain unchanged. The method of adjusting the brake pressure rod also remains unchanged.

Repair procedures for the pedal assembly as of model year 87 (clutch and footbrake pedals) are described in Repair Group 30.



BLEEDING BRAKES/CHANGING BRAKE FLUID

General

To assure speedy, professional work, it is advisable to use an electric filling and air-bleeding device. The work described below was carried out using equipment manufactured by Alfred Teves GmbH. Please refer to the Operating Instructions for a precise description of the equipment.

Brake Fluid

Brake fluid is hygroscopic; in other words it absorbs moisture from the air. This lowers the boiling point of the fluid.

Example: With a water content of 2%, the boiling point of the brake fluid drops by approximately 60°C (minimum requirement for brake fluid to SAE J 1703 or DOT 3 or DOT 4 min. 190°C or 230°C respectively).

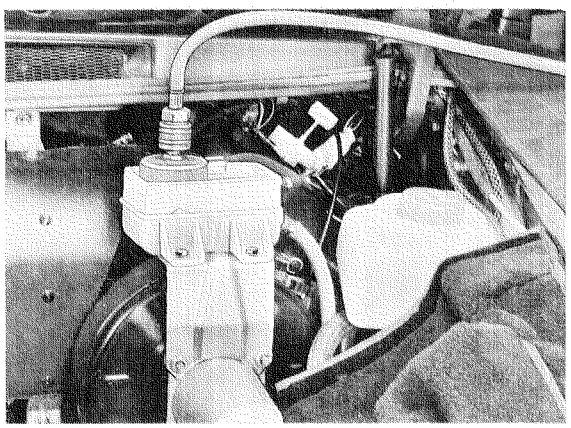
Dirty brake fluid or fluid containing water may lead to failure of the hydraulic braking system. Never reuse brake fluid which has been drained from a system.

The brake fluid must be renewed at least every 2 years. Use DOT 3 or DOT 4 (SAE J 1703) brake fluid.
Capacity: 1 liter total system (1000 cc), approx. 250 cc per wheel.

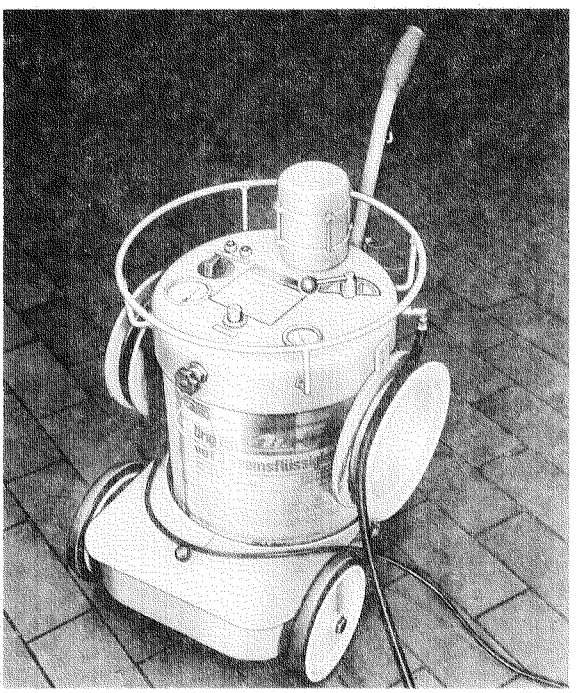
Bleeding Brakes/Changing Brake Fluid

1. Fill brake-fluid reservoir to brim with brake fluid. Remove screen. Close overflow hose with a hose clamp.

2. Mount bleed nozzle on brake-fluid reservior and attach coupler of filler hose to stem of bleed nozzle.



3. Switch equipment on. Set selector lever to "Filling and bleeding" position.



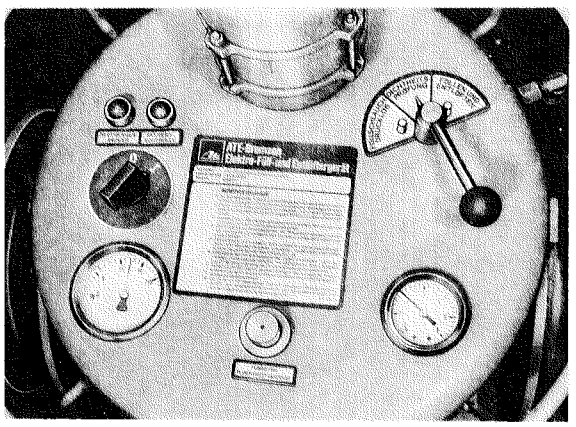
4. Open each bleed valve until clear, bubble-free brake fluid exits.

5. Use a glass receptacle to catch brake fluid for a precise check of cleanliness, freedom from bubbles and determination of the quantity used.

6. To drive all air bubbles from the master cylinder, depress the brake pedal fully several times in the course of the bleeding process with the bleed valves open.

7. Once bleeding/brake-fluid change has been completed, it is advisable to conduct a low-pressure leaktightness test. The precondition, of course, is that bleed nozzle, filler hose and overflow hose (bleed hose) are also 100% pressure-tight. If necessary, connect the overflow hose (bleed hose) so that it is pressure-tight.
All bleed valves of the system must be closed. With the selector lever still in the "Fill and bleed" position, read the overpressure on the working-pressure manometer.

8. Now set selector lever to leak-tightness test. The working-pressure manometer reading must not drop for a period of approx. 5 minutes. If the pressure drops within this period there is a leak in the braking or clutch* system.



9. Push dust caps onto bleed valves. Correct excessive level of brake fluid in reservoir (vacuum extraction). Insert screen and screw down cover of brake-fluid reservoir.

Brake Fluid Level (max.):

- until end of model year 86: approx. 18 mm above upper edge of retaining strip

- 87 models onward (larger reservoir): up to max. mark.

* As of model year 87, clutch is hydraulically actuated (exception 911 Turbo).

TIGHTENING TORQUES FOR CLUTCH AND GEARSHIFT, 87 MODELS ONWARD
(HYDRAULIC CLUTCH ACTUATION)

Location	Description	Threads	Material	Torque Nm (ftlb)
Master cylinder/vacuum booster	Nut	M 8	8	25 (18)
Stop light switch/master	Stoplight switch	M 10x1		15+4 (11+3)
Booster/bearing bracket	Nut	M 8	8	25 (18)
Brake fluid reservoir	Bolt	M 6	8.8	2 (1.5)
Pivot and joint/push rod	Nut	M 10	8	35 (25)
Brake booster/trunk floor	Nut	M 8	8	25 (18)
Pull bar/bearing bracket	Hex bolt/ panhead bolt	M 10	8.8	35 (25) 46 (33)*
Brake lines/master cylinder, branch, brake hoses and brake calipers	Union stem	M 10x1		12 (9)
Branch/bracket and rear axle tube	Bolt	M 6	8.8	6 (4)
Bleeder screws in brake calipers	Bleeder screw			3 (2)
Bleeder screws in brake calipers (Turbo Look cars)	Bleeder screw	M 10		8-11 (6-8)

* Right-hand drive cars

Location	Description	Threads	Material	Torque Nm (ftlb)
Ring adaptor/brake master cylinder	Hollow union bolt	M 10x1	5.6	16 (12)
Brake pressure regulator/connector or ring adapter		M 10x1		14 (10)
Brake caliper sections/ bridge (Turbo Look cars)	Panhead bolt	M 12x1.5	8.8	60 (43)
Spring plate/bridge (Turbo Look cars)	Countersunk bolt	M 5		4 (3)
Ring adaptor/brake caliper (Turbo Look cars)	Hollow union bolt	M 10x1		16 (12)

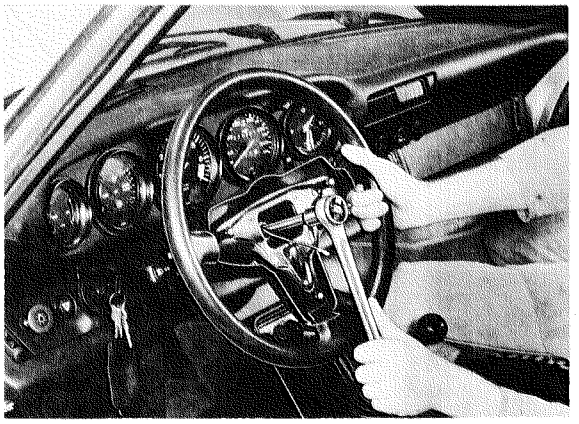
REMOVING AND INSTALLING STEERING WHEEL

Removing

1. Pull off impact pad on steering wheel. Pull off horn wires.

2. Mark position of steering wheel to steering shaft for reinstallation.

3. Unscrew hexagon nut and take off steering wheel with spring washer.



Installing

1. Install steering wheel with road wheels pointing straight ahead or according to disassembly mark in such a manner that steering wheel spokes are horizontal.

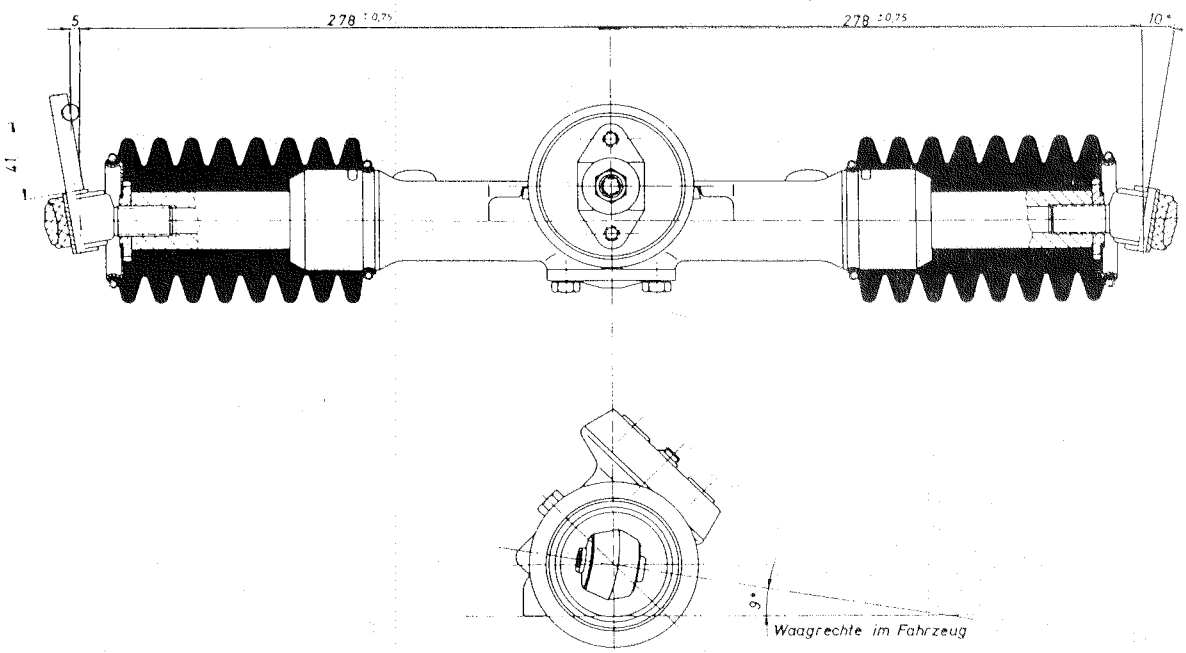
2. Install hexagon nut with spring washer and torque nut to 50 Nm.

3. Mount horn wires on impact pad and press impact pad on to retaining pins.

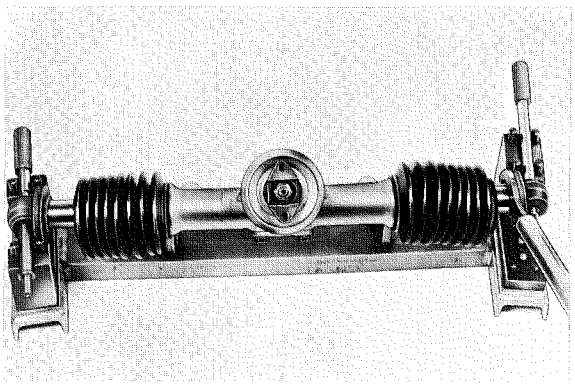
4. Check function of horns and return motion of turn signal switch.

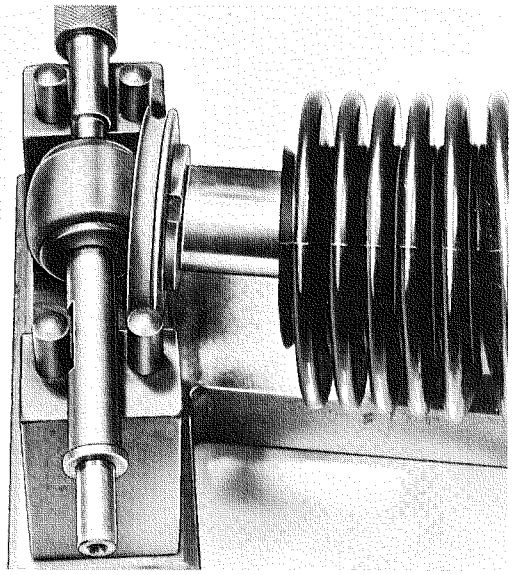
INSTALLING JOINT SLEEVES

The joint sleeves must be in a certain installed position to guarantee steering cinematics and precise guiding of tie rods.
Adjustments are made with Special Tool P 285 b*.



Bolt steering gear on Special Tool P 285 b. Joint sleeves must be screwed in rack far enough, that locating pins of special tool are easy to slide into joint sleeve. Flat side of locating pins rests on special tool. Tighten bellows holder in this position with 70 Nm (51 ftlb).



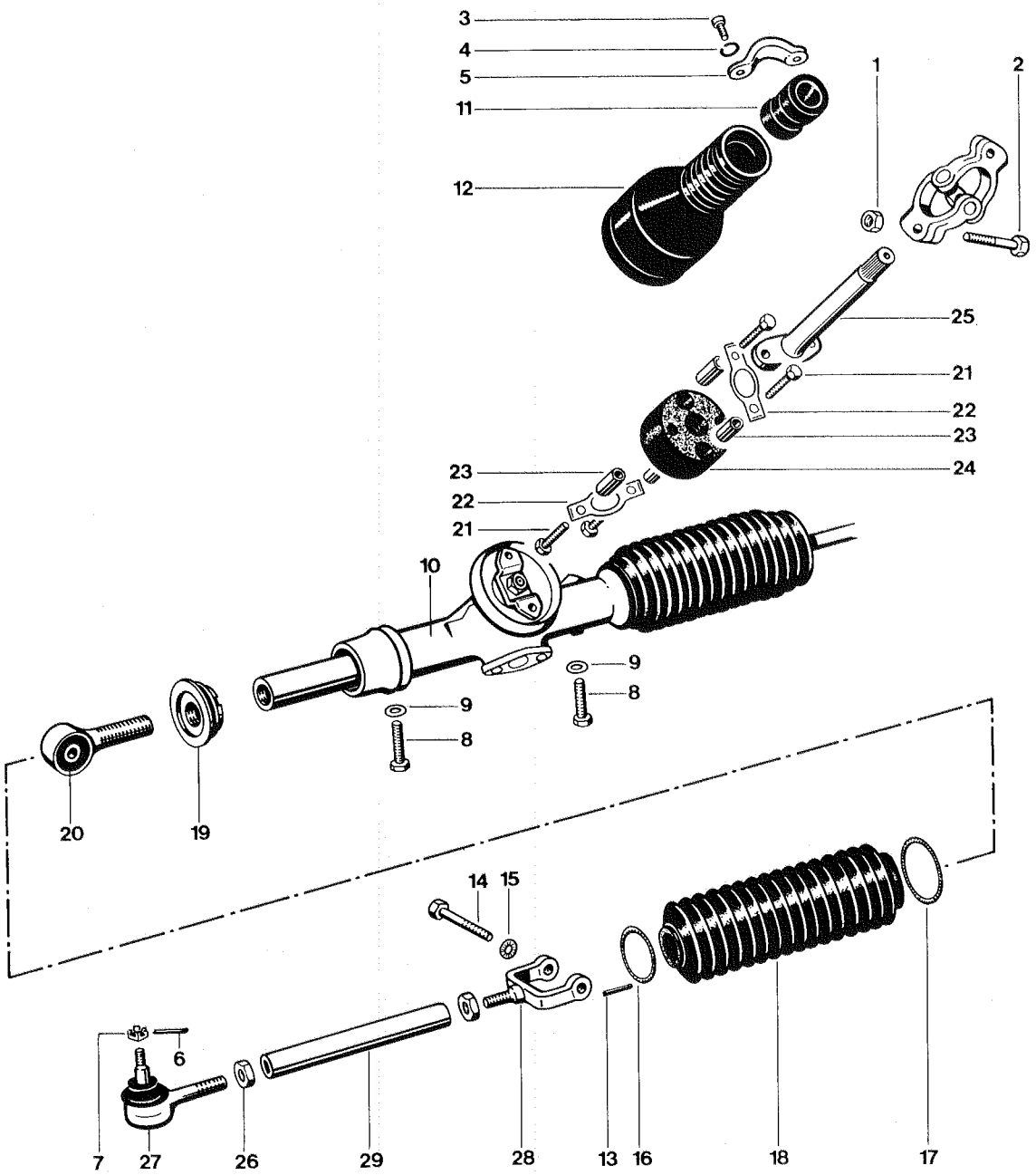


* Special Tool P 285 b is no longer available. If this tool is not available, move joint sleeves to installed position according to the above drawing.

Steering gear, removing and installing, disassembling and assembling

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Steering gear, removing and installing, disassembling and assembling



48 - 48

No.	Description	Qty.	Note when: Removing	Installing
1	Lock nut	1		replace, tightening torque 20 Nm
2	Hexagon-head bolt	1		Lubricate thread with Optimoly HT
3	Fillister-head bolt	2		Tightening torque 25 Nm
4	Spring lock washer	2		replace
5	Bearing cover	1		Ensure correct seating on the steering-shaft bearing
6	Splint	2		replace
7	Castle nut	2		Tightening torque 45 Nm
8	Hexagon-head bolt	2		Tightening torque 47 Nm
9	Spring lock washer	2		replace
10	Steering gear	1		Check frictional torque (80 - 140 Nm), replace if necessary
11	Steering-shaft bearing with bearing rubber	1		Check, replace if necessary
12	Gaiter seal	1		Ensure correct seating
13	Splint	2		replace
14	Hexagon-head bolt	2		Tightening torque 47 Nm
15	Washer	2		replace
16	Retaining spring	2		Replace if necessary
17	Retaining spring	2		Replace if necessary
18	Gaiter seal	2		Check for damage, replace if necessary
19	Gaiter holder	2		Tightening torque 70 Nm
20	Joint sleeve	2		Adjustment see Page 48 - 2
21	Hexagon-head bolt	4		Tightening torque 25 Nm
22	Tab washer	2		replace

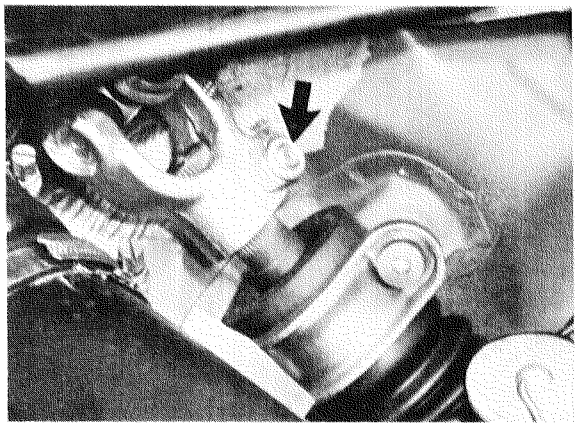
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No.	Description	Qty.	Note when: Removingu	Installing
23	Stop pipe	4		
24	Steering coupling	1		Check, replace if necessary
25	Steering shaft	1		
26	Hexagon nut	4		Tightening torque 45 Nm
27	Ball joint	2		Check, replace if necessary. Check gaiter seal for damage and secure seating. Ball joints must show a certain amount of friction when moved. Replace if there is axial play or no friction.
28	Link fork	2		
29	Steering tie-rod	2		

Assembly instructions

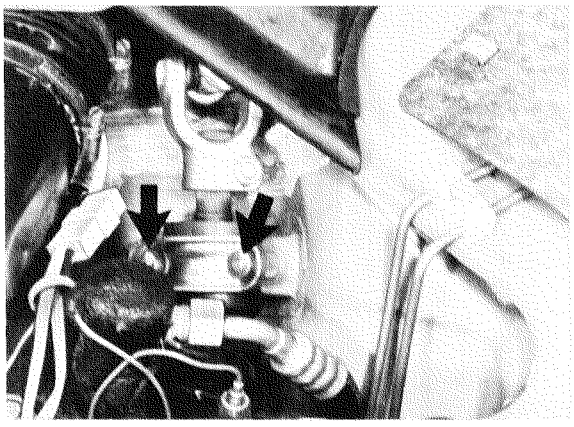
Removing

1. Remove sump guard and stabilizer. Undo lock nut from universal joint.



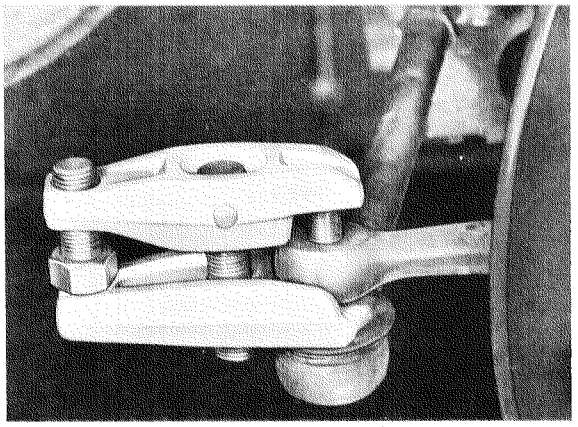
85/333

2. Undo fillister-head bolts on bearing cover of the steering shaft and remove bearing cover.



85/327

3. Release and undo castle nut tie-rod joint. Remove ball joint with tie-rod puller, e.g. Nexus.

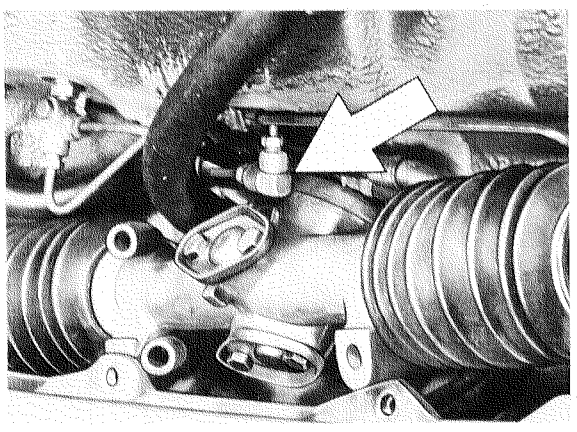


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4. Remove the horn of the alarm system. Undo bolts on the auxiliary carrier retaining steering gear and remove steering gear, pulling steering shaft from universal joint.

Note:

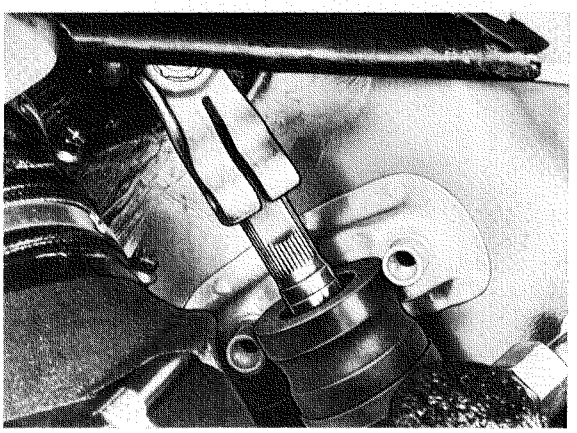
Do not damage brake lines when removing steering gear.



87/995

Installing

1. Guide steering shaft with steering gear into the universal joint, correctly located. (steering and steering wheel in the middle position.)



87/999

2. Assemble bearing cover of steering shaft and tighten with 25 Nm.

3. Tighten universal joint with 20 Nm, free of tension, lubricating the thread of the securing bolt with Optimoly HT beforehand.

4. Mount and secure tie-rod joint.

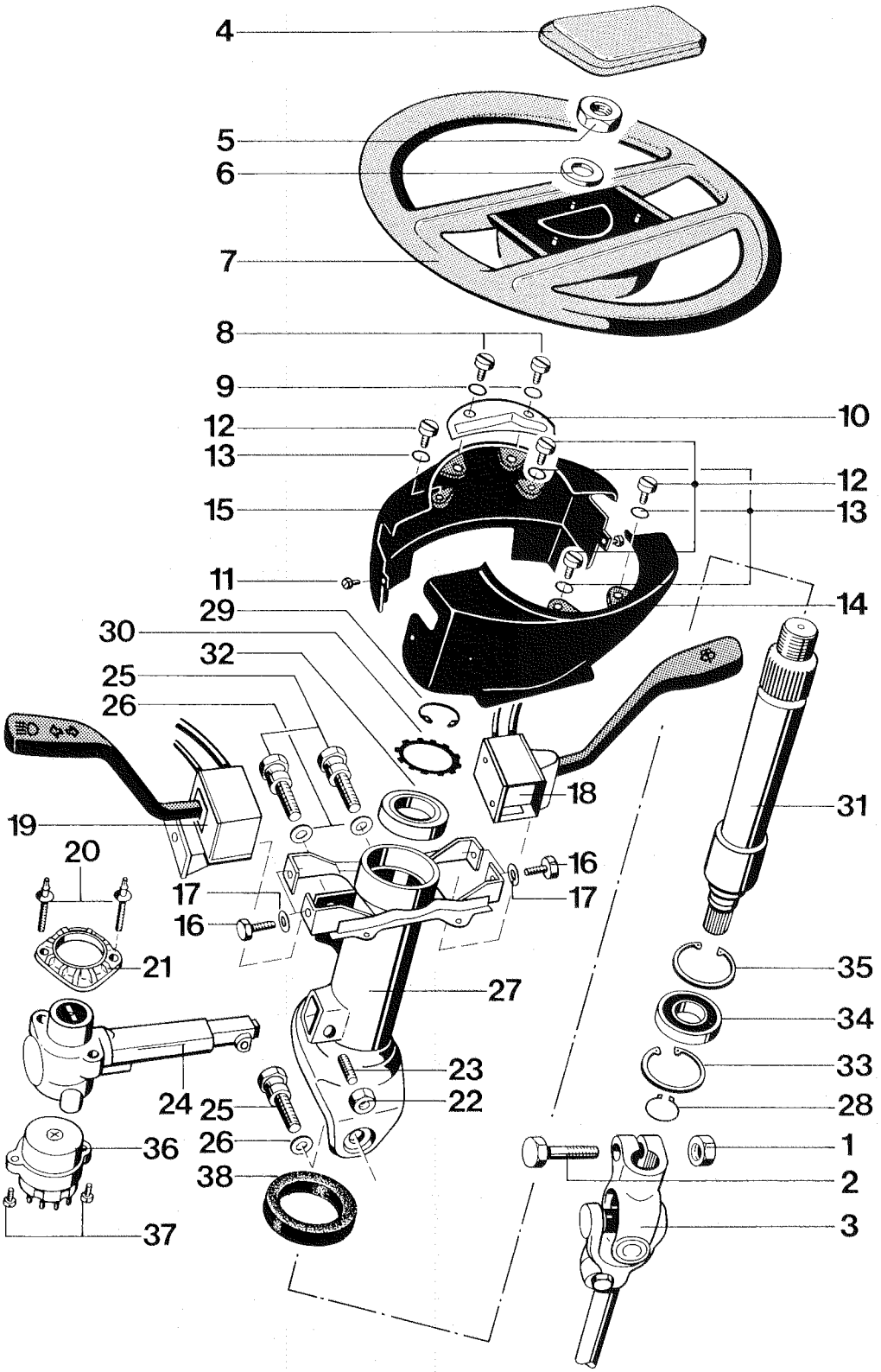
Note:

Carry out simple vehicle measurement.

Steering shaft with protective tube, removing and installing

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Steering shaft with protective tube, removing and installing



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No.	Description	Qty.	Note when : Removing	Installing
1	Lock nut	1		Replace, tightening torque 20 Nm
2	Screw	1		Lubricate the thread with Optimoly HT
3	Universal joint	1		Lubricate the gearing with Optimoly HT
4	Horn switch	1		
5	Nut	1		Tightening torque 50 Nm
6	Spring washer	1		Renew if necessary
7	Steering wheel	1	See Page 48 - 1	
8	Screw	2		
9	Toothed lock washer	2		
10	Horn contact	1		
11	Screw	2		
12	Screw	4		
13	Toothed lock washer	4		
14	Cover	1		
15	Cover	1		
16	Screw	4		
17	Toothed lock washer	4		
18	Wisher/washer switch	1		
19	Turn-signal and main beam switch	1		
20	Breakaway screw	2	Bore open	
21	Reinforcement	1		
22	Counter nut	1		Tightening torque 18 Nm
23	Set screw	1		Tightening torque 2 - 3 Nm
24	Ignition steering lock	1		

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No.	Description	Qty.	Note when : Removing	Installing
25	Break away screws	3	Open with a chisel	
26	Washser	3		
27	Protective tube	1		
28	Circlip	1		Replace
29	Circlip	1		Replace
30	Serrated circlip	1		Replace
31	Steering shaft	1		Install without stresses
32	Ball bearing	1		Replace
33	Circlip	1		Replace
34	Ball bearing	1		Replace
35	Circlip	1		Replace
36	Ignition-starter switch	1		
37	Screw	1		
38	Seal	1		Replace if necessary

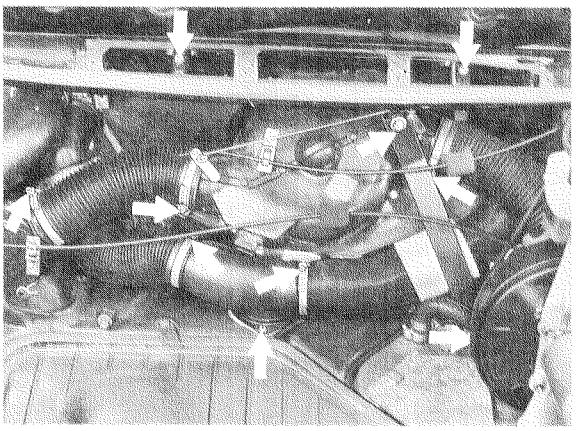
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Installation instructions

Disassembling

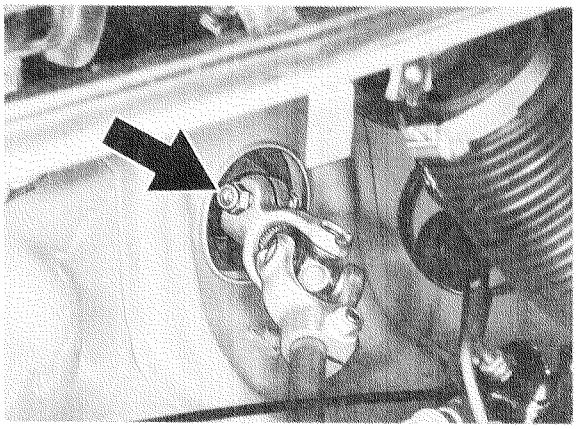
1. Disconnect the battery.

2. Loosen the blower and swing to one side.



86/164

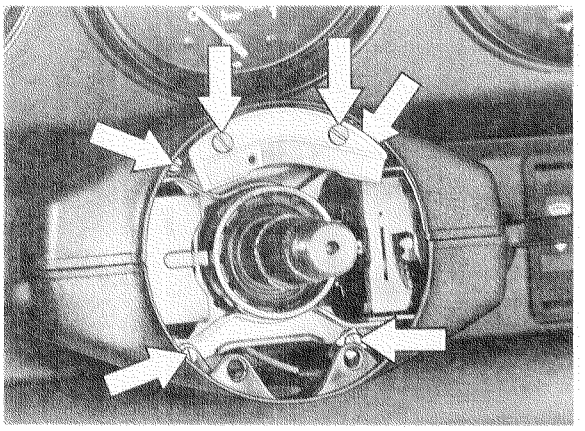
3. Remove the cover from the steering shaft and undo the fastening screw for the ball joint.



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4. Remove the steering wheel.

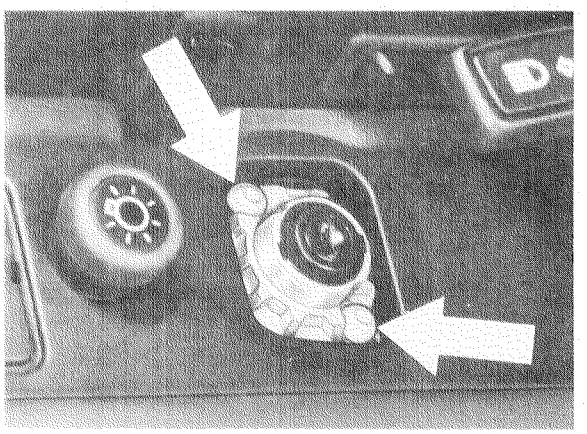
5. Remove the horn contact and trim panels.



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6. Remove the combination switch.

7. Bore out the breakaway screws for the ignition steering lock.



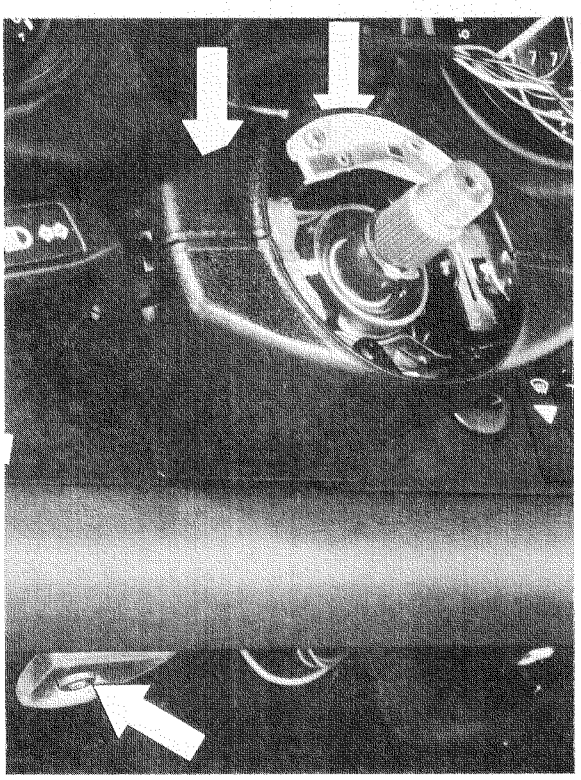
88/269B

8. Undo the fastening nut and set screw and remove the ignition steering lock.

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9. Remove the rev-counter.

10. Chisel open the breakaway screws for the protective tube.



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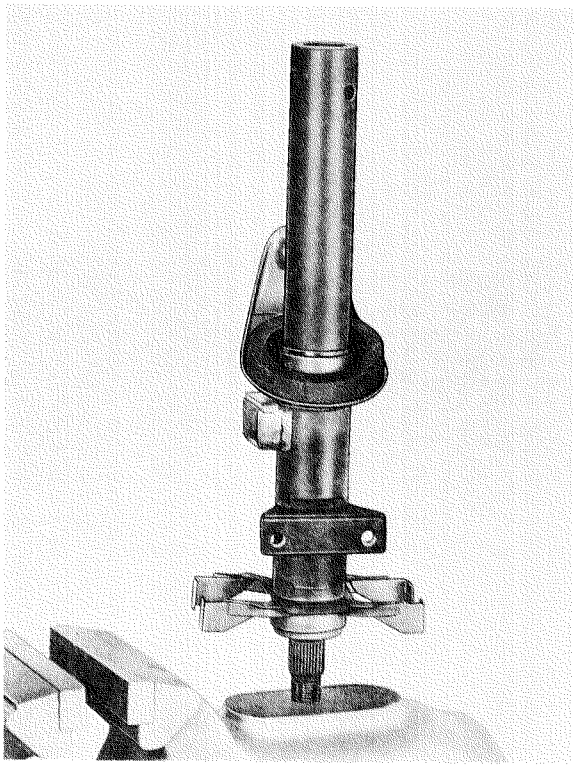
11. Take the protective tube out of the switchboard.

12. Remove the circlips and press out the steering shaft downwards. Remove the lower bearing first and then the upper bearing.

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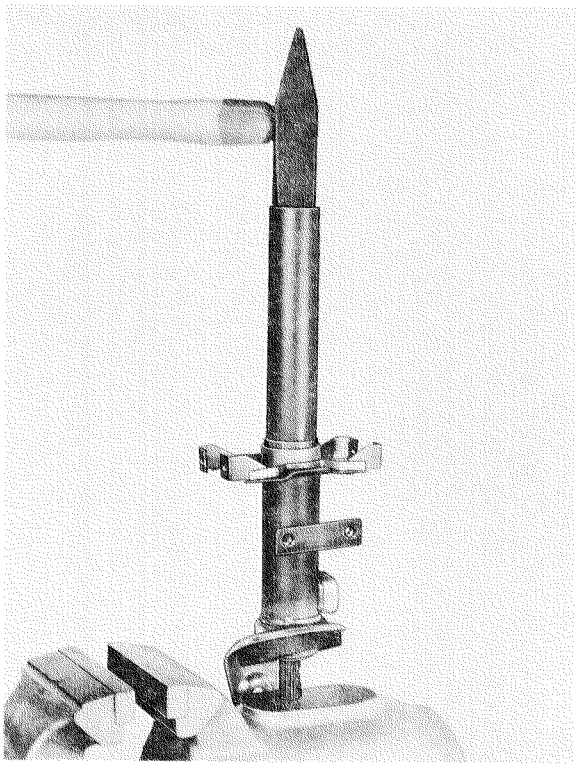
Assembling

1. Insert the circlip in the protective tube and drive in the lower bearing to the stop with a suitable pipe section. Secure the lower bearing.



88/270

2. Insert the upper bearing and drive into the stop. Then install circlip.



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3. Mount the protective tube into the vehicle sliding the steering shaft onto the ball joint in the correct position, mount breakaway screws.

4. Install steering ignition lock.

5. First secure the ball joint then break off the breakaway screws of protective tube and ignition steering lock.

6. Install the combination switch and mount trim panels with horn contact.

7. Install rev-counter and mount the steering wheel.

8. Install the blower and reconnect the battery.

9. Check all components for correct function.

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TECHNICAL DATA

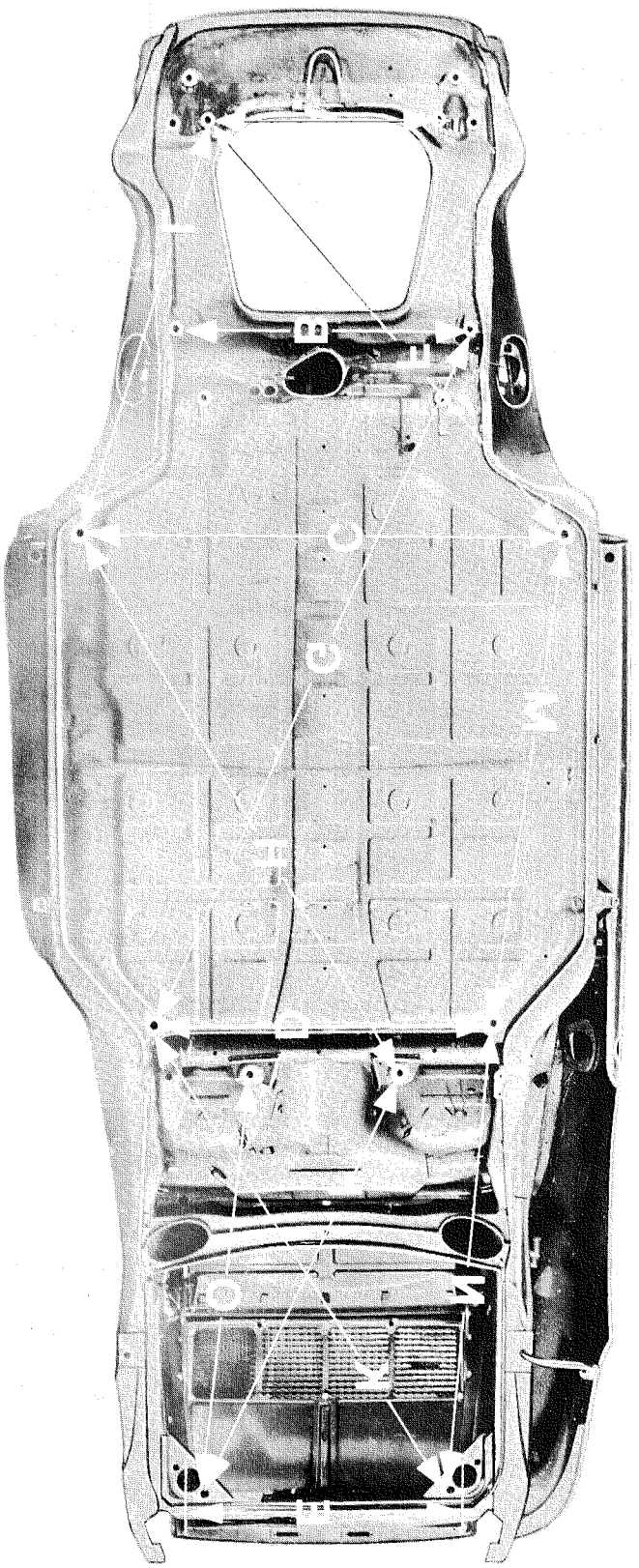
Steering	Rack-and-pinion type
Steering wheel dia.	380 mm (optional extra with higher hub)
Steering wheel ratio at center Steering wheel angle to wheel angle	17.78 : 1
Turning circle dia. (wall-to-wall)	10.95 m
Turning circle dia. (curb-to-curb)	10.35 m
Steering wheel turns from lock to lock	approx. 3.0
Steering friction torque — measured on steering gear flange with tie rods disconnected	80 to 140 Ncm (6 to 12 in.lbs)

TORQUE SPECIFICATIONS FOR STEERING

Location	Description	Threads	Material	Torque Nm (ftlb)
Steering gear	Bolt	M 10	8.8	47 (34)
Pivot sleeve/rack	Slotted nut	M 16 x 1.5		70 (51)
Pivot (tie rod)/ pivot sleeve	Bolt	M 10	8.8	47 (34)
Ball joint/steering arm	Castle nut	M 10 x 1	8	45 (33)
Ball joint and pivot/ tie rod (lock nut)	Nut	M 14 x 1.5		45 (33)
Steering coupling/ steering shaft	Bolt	M 8	8.8	25 (18)
Steering shaft/ steering gear	Bolt	M 8	8.8	25 (18)
Steering shaft bearing	Bolt	M 8	8.8	25 (18)
Universal joint/ steering shaft (lubricated with Optimoly HT)	Bolt	M 8	8.8	20 (14)
Coupling flange/ drive pinion	Self-locking nut	M 10	8	45 (33)
Case cover/steering gear	Bolt	M 8	8.8	15 (11)
Steering wheel	Nut	M 18 x 1.5	8	50 (36)
Centering bolt/ steering lock	Stud	M 8	10.9	2 – 3 (1.5 – 2)
Lock nut for centering bolt	Nut	M 8	8	18 (13)

SPECIAL TOOLS AND EQUIPMENT FOR BODY REPAIRS

Hydraulic 10 ton straightener with accessories	
Celette alignment/assembly stand	
Set of attachments	ENS 77.360
Universal anchor	ENS 976.900
Front end gage	P 863 + P 863 a
Inert gas welder	
Spot welder	
Autogen welder	
Disc grinder with attachments (grinding discs, grinding stones, steel brushes, cutters)	
Vibration grinder	
Angle grinder with attachments (cutting disc 180 mm dia. and grinding discs)	
Pneumatic gun with attachments	
Beam compass	
Water level	
Shouldering pliers	
Pneumatic guns	
Equipment and material	for long term undercoating
	for cavity sealing
	for sealing



Distance	Description	mm
A	Front inside control arm take-up	565.5 ± 1
B	Auxiliary platform take-up	726 ± 1
C	Front floor plate checkpoints	1200 ± 2
D	Rear floor plate checkpoints	850 ± 2
E	Engine mount	752 ± 1
F	Front floor/inside control arm take-up checkpoint	1327 ± 3
G	Rear floor/auxiliary platform take-up checkpoint	1868 ± 3
H	Axle tube/transmission take-up/front floor checkpoint	1550 ± 3
I	Axle tube/transmission take-up/inside engine mount bolt	1323 ± 5
K	Rear floor/inside engine mount bolt checkpoint	1557 ± 5
L	Front floor/inside control arm take-up checkpoint	1041 ± 3
M	Front floor checkpoint/rear floor checkpoint	1215 ± 2
N	Rear floor/engine mount bolt checkpoint	1355 ± 3
O	Axle tube/transmission take-up/inside engine mount bolt	1220 ± 3

All distances are measured horizontally from center of hole.

Note:

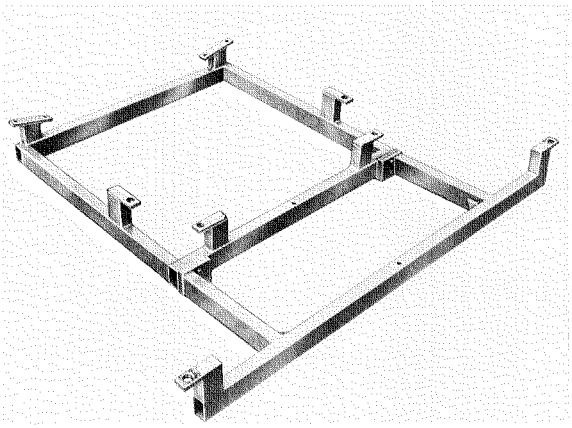
Distances to engine mount bolts are measured direct (angular dimensions).

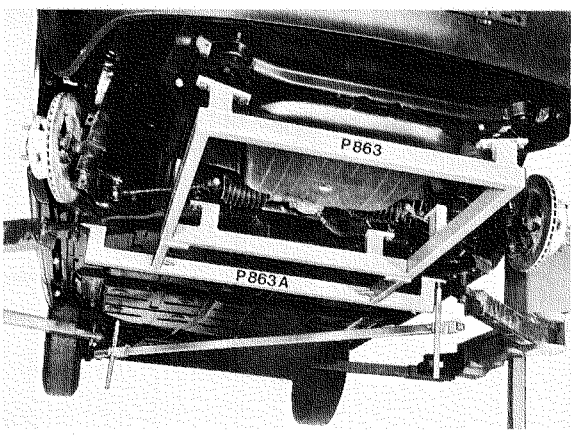
Important!

The deviation between left and right of lengths must not exceed the specified tolerances.

FLOOR ASSEMBLY CHECKPOINTS AND FRONT END GAGES P 863 AND 863 a

Quick damage diagnosing is possible with the help of these checkpoints and in conjunction with front end gage P 863 a (comprising the old gage P 863 + an extra adapter).





The gages are also suitable to repair minor front end damage (fractures up to approx. 10 mm). It is no longer necessary to set up a car with this type of damage on a straightening bench.

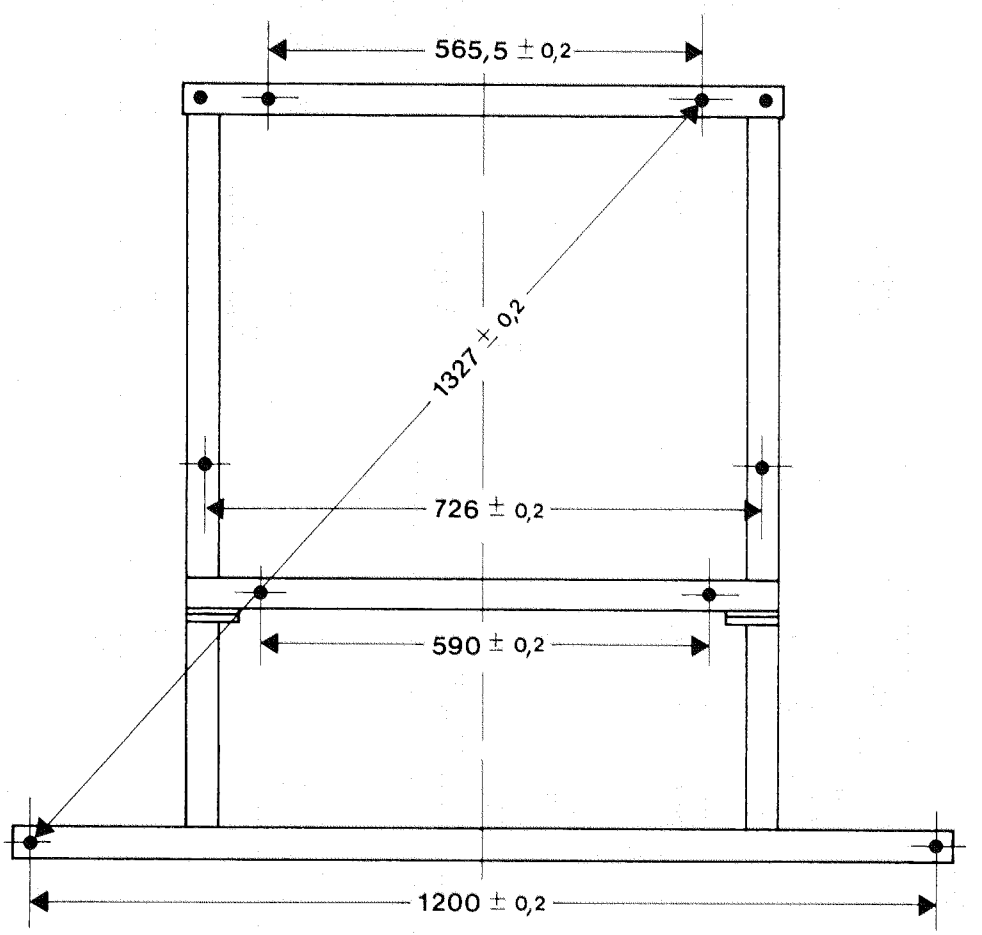
It is necessary to remove the front wheels, splash guard, engine platform and control arms for application of this gage. The gage is then bolted on the front axle take-up points and front floor assembly checkpoints, as shown in the figure.

The distances behind the floor assembly checkpoints and the transmission take-up points on the rear axle tube are checked with a measuring bar to the engine mounts.

N o t e : The gage is designed only for inspection work. It must be removed for straightening and welding jobs, so that body tension cannot distort it.

The engine platform pin is installed 21 mm higher for the Type 911 Turbo. When measuring distances with front end gage P 863 the distance between the upper edge of the gage and collar on the engine platform pin must be 21 mm (or 13 mm when an adapter is mounted on the engine platform pin).

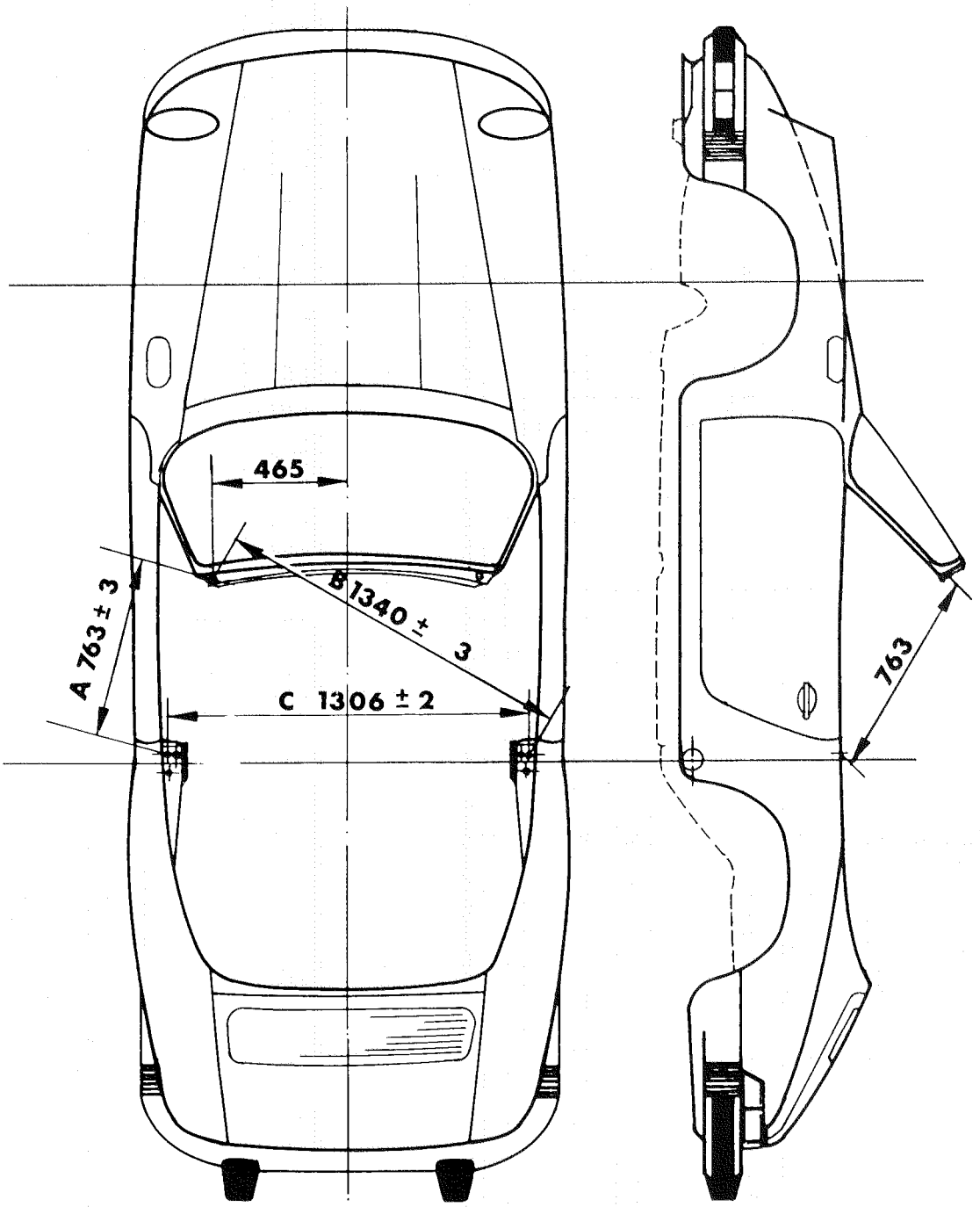
CHECKING ACCURACY OF GAGES P 863 AND 863 a



Place gage on inspection plate and check accuracy.

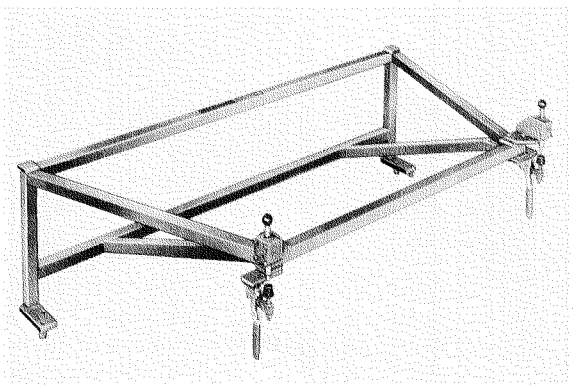
CABRIOLET INSPECTION DISTANCES

Distance A – Front wall:	Take-up for pin and B pillar outer bolt point
Distance B – Front wall diagonally:	Take-up for pin and B pillar outer bolt point
Distance C	B pillar outer bolt point left to right

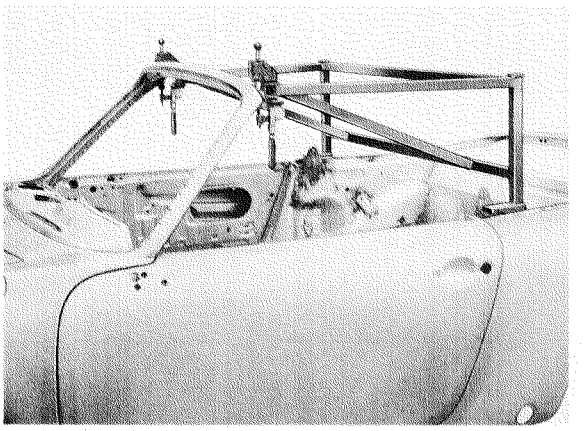


INSPECTION GAGE P 9212 FOR CABRIOLET

Gage P 9212 was developed for the diagnosis of damage and accident damage repairs. It is a frame tubing design.

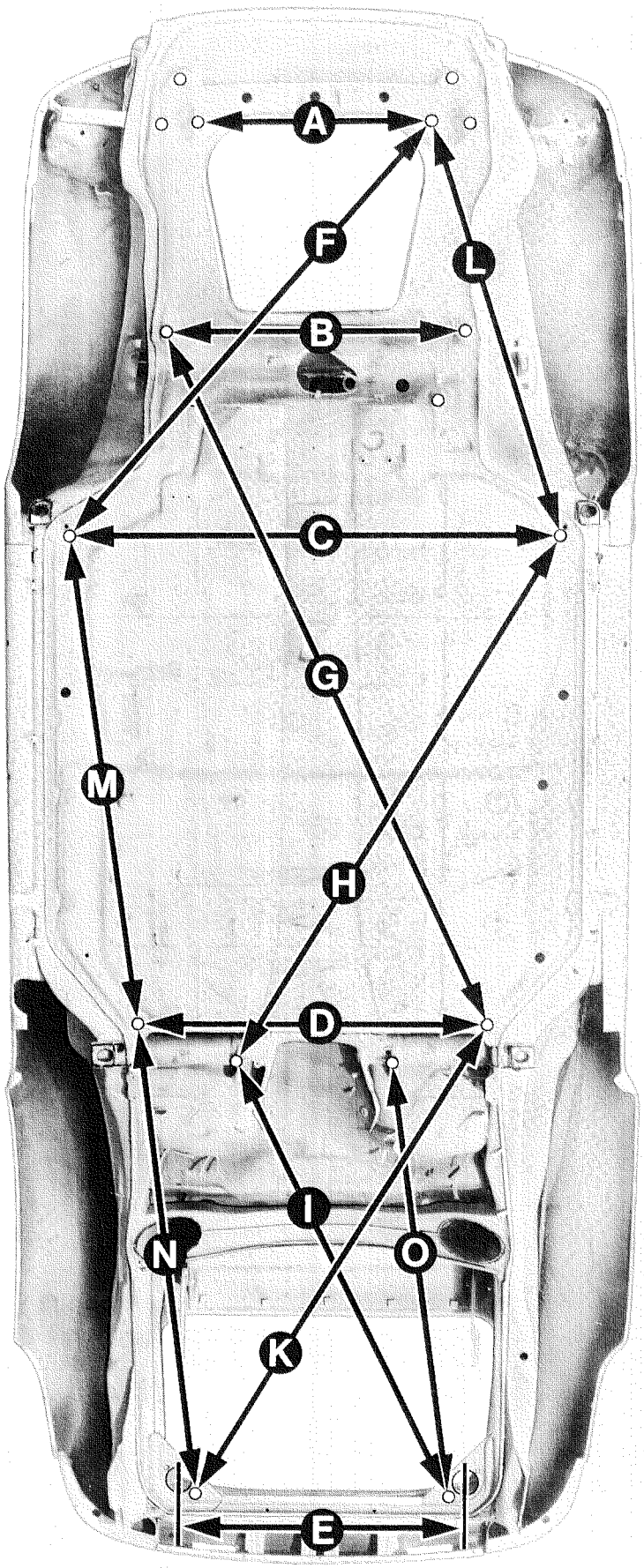


The bolted points of the top on the bearing plates and take-up points on the front wall are checked with this gage.



a) It gives the width on the front wall for taking the locating pins of the top. Two pins with a mark are used for centering. Two tensioners with rubber pads are used for holding at this point.
b) The second control distance is the distance from these take-ups to the bearing plates of the top on the B pillar.
c) The third distance checked is the cleared distance of the bearing plates. The drilled holes are slightly larger, so that tolerance deviations must also be considered.
d) The gage has two bearing surfaces on top. They are used to check the height of these bearing plates with help of a water level.

Gage P 9212 is also required for the conversion of Targa cars to Cabriolets, since with it the bearing plates can be positioned accurately and welded in.


A
F
L
B
C
G
M
H
D
I
N
O
K
E

Distance	Description	mm
A	Control arm mounting points from inside	565.5 ± 1
B	Auxiliary platform mounting points	726 ± 1
C	Front floor pan checkpoints	1200 ± 2
D	Rear floor pan checkpoints	850 ± 2
E	Engine mounts	752 ± 1
F	Front floor checkpoint - inner control arm mounting	1327 ± 3
G	Rear floor checkpoint - auxiliary platform mounting	1868 ± 3
H	Axle tube/transmission mounting - front floor checkpoint	1518 ± 3
I	Axle tube/transmission mounting - inner threaded hole, engine mount	1357 ± 5
K	Rear floor checkpoint - engine mount, inner threaded hole	1557 ± 5
L	Front floor checkpoint - inner control arm mounting	1041 ± 3
M	Front floor checkpoint - rear floor checkpoint	1215 ± 2
N	Rear floor checkpoint - engine mount, threaded hole	1355 ± 3
O	Axle tube/transmission mounting - engine mount, inner threaded hole	1257 ± 3

All distances measured vertically from hole center to hole center.

Note:

The distances to the engine mount threaded holes are measured directly (inclined plane).

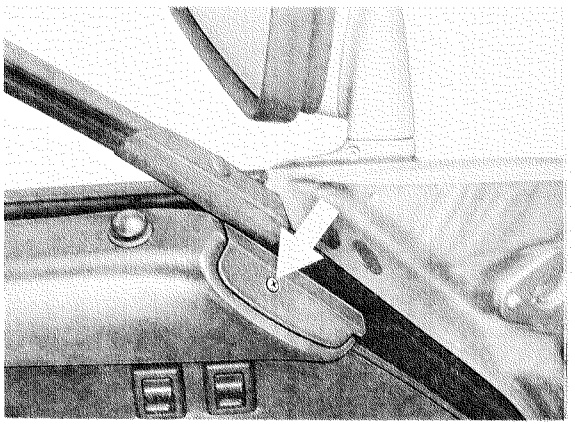
Caution

The left to right deviation of the longitudinal dimensions must be within the specified tolerance.

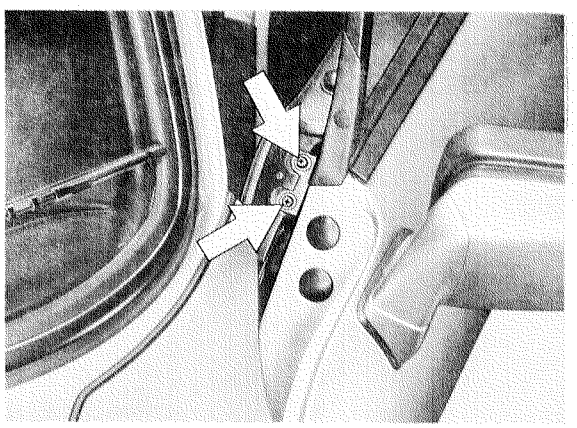
REMOVING AND INSTALLING KEY STRIP AND DOOR TRIM PANEL

Removing

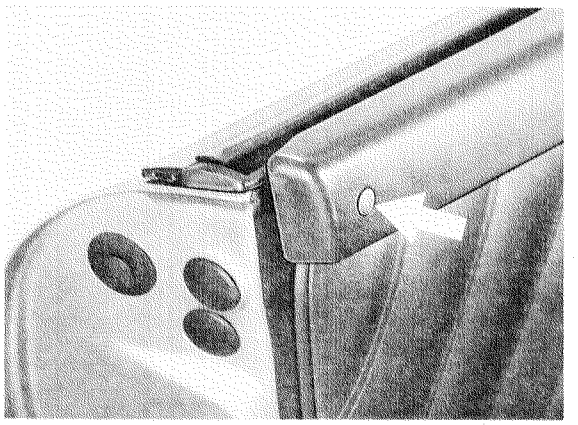
1. Remove trip cover retaining screw and lift off trim cover.



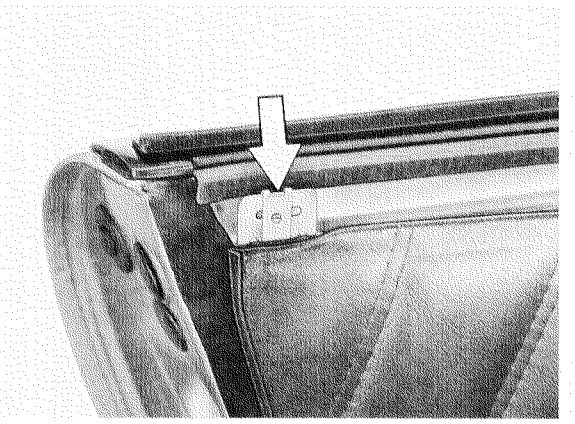
2. Remove securing screws and adjusting screws of key strip.

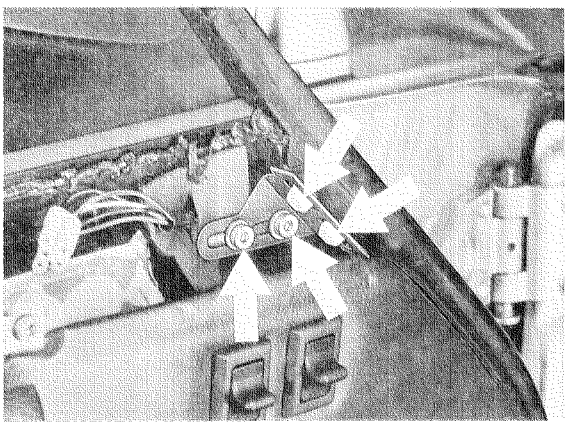


3. With a suitable tool, lift off trim cover and remove securing screw of key strip. Lift key strip slightly and disconnect electrical plug-in connector.

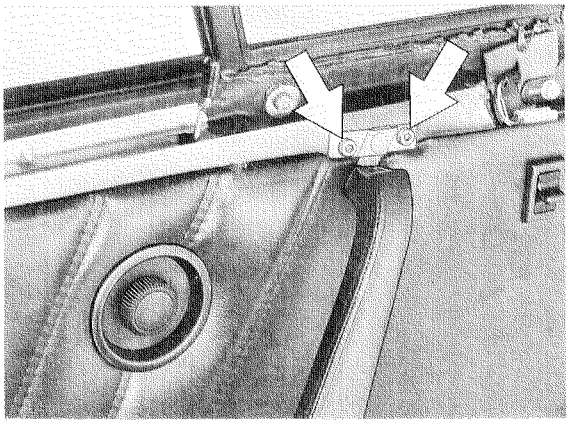


4. Inspect securing and adjusting elements and replace if necessary.

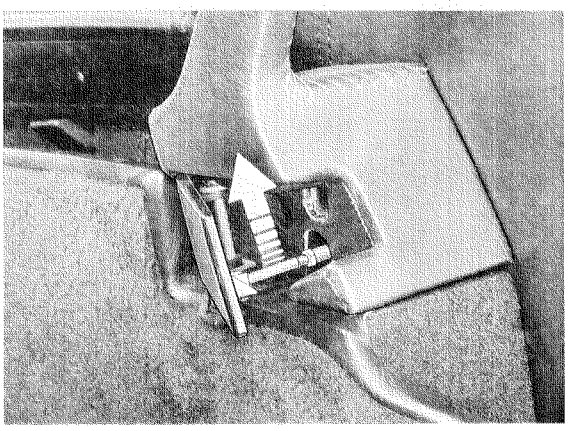




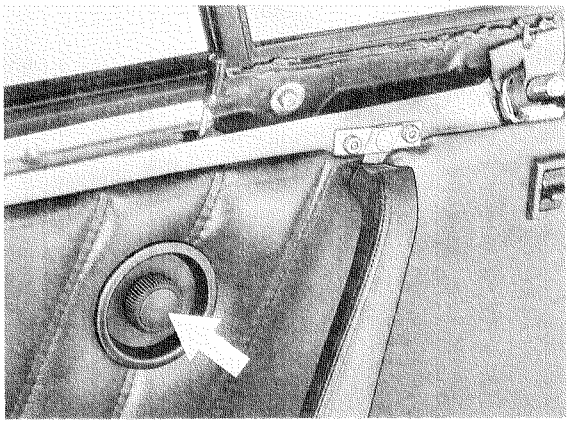
5.Pull door opener and pull actuating linkage up to unclip.

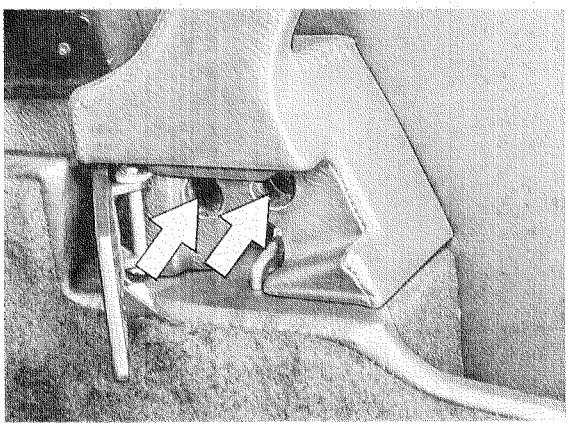


7.With a suitable tool, remove trim cover from knob.

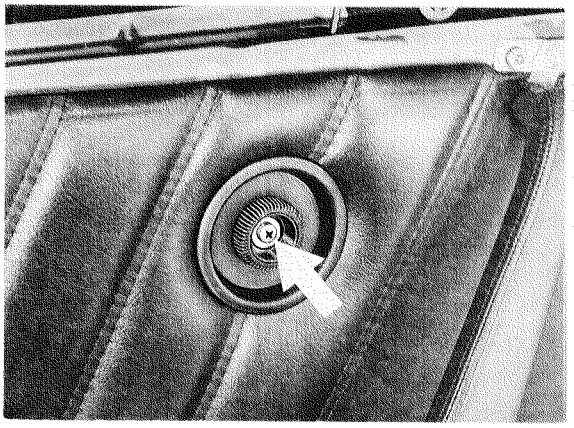


6.Remove retaining screws of handle.

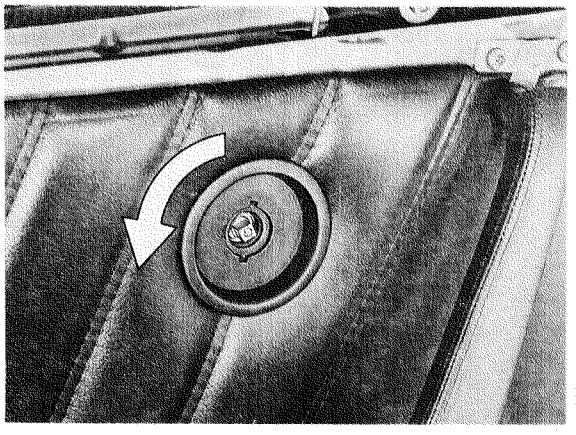




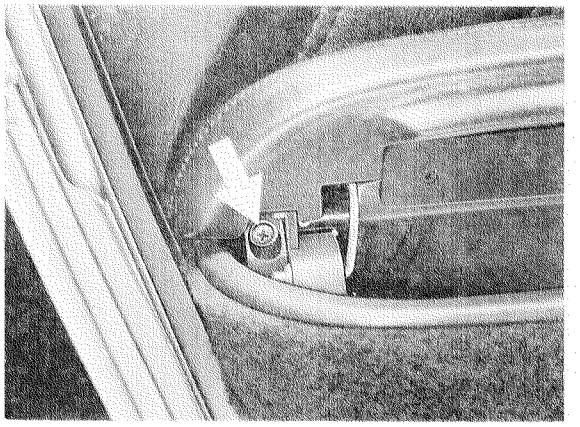
8. Remove retaining screw of knob and pull off knob.

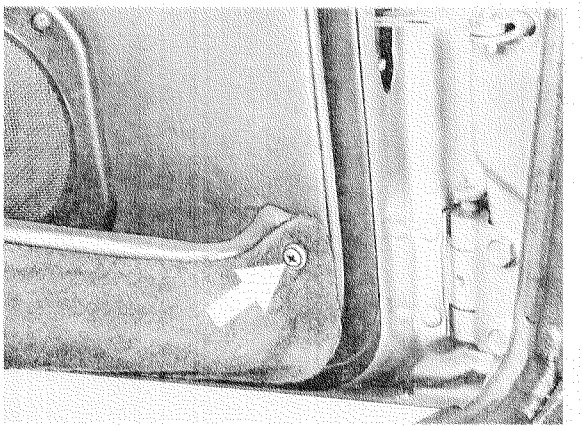


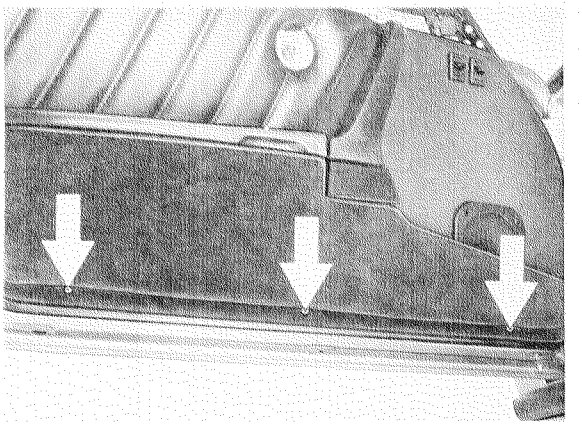
9. Unscrew bearing shell from knob bearing.



10. Remove oddments tray and door trim panel securing screws.

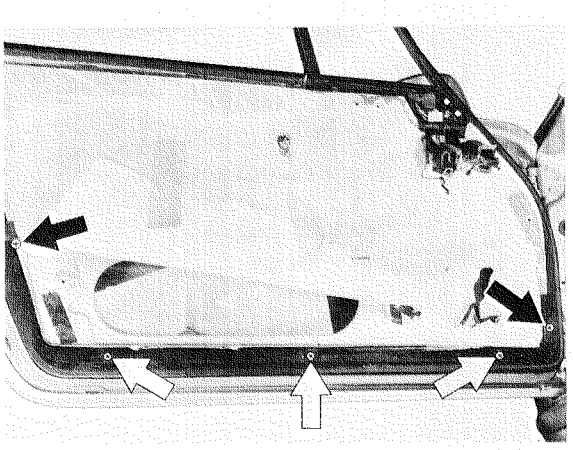


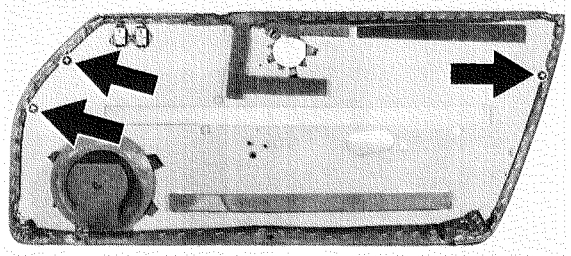




11. Unclip door trim panel complete with oddments tray and handle from door and disconnect electrical plug-in connectors from loudspeaker and electric window lift switch.

12. Check all securing points, replace if necessary.



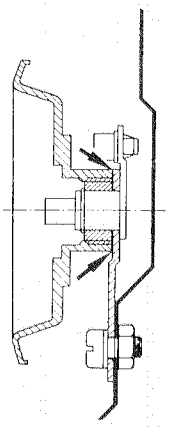


Installing

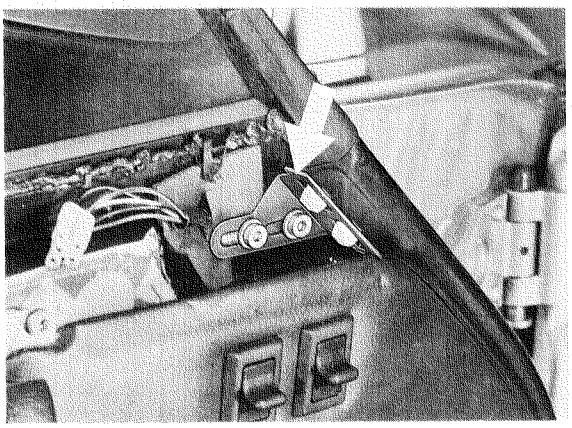
Installation is the reverse of the above sequence.

Notes:

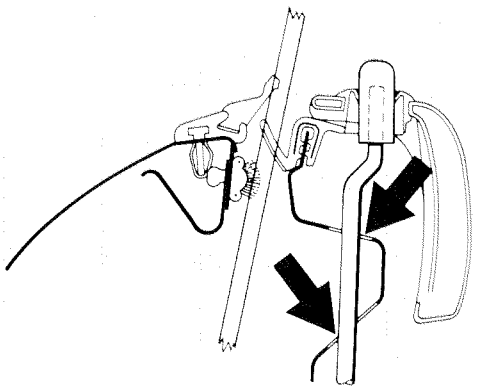
1. When installing the bearing shell for the knob bearing, ensure that the shell is screwed as far as possible into the bearing.



2. When installing the adjusting angle for the key strip at the front of the door, note that the setting range of the key strip must not be enlarged by distortion of the adjusting angle.



3. The setting range of the key strip is designed such that the lock rod cannot jam when the setting travel is exploited to the full.



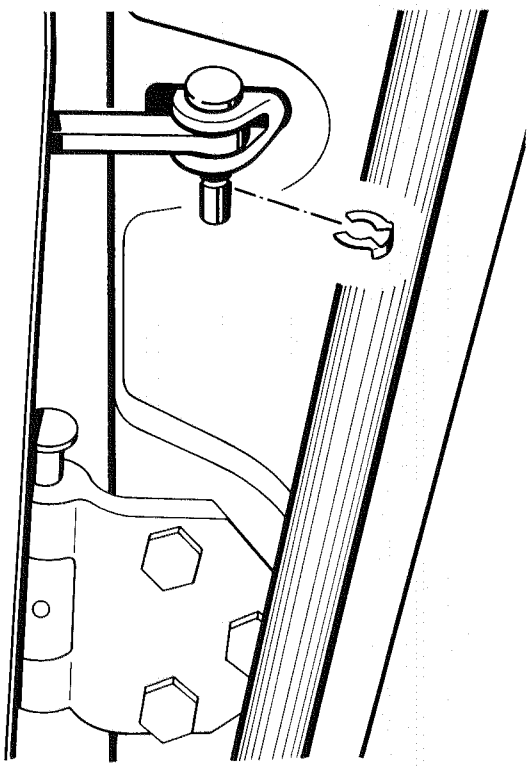
Door arrester, removing and installing

New door arresters are used as from October 1987.

Removing

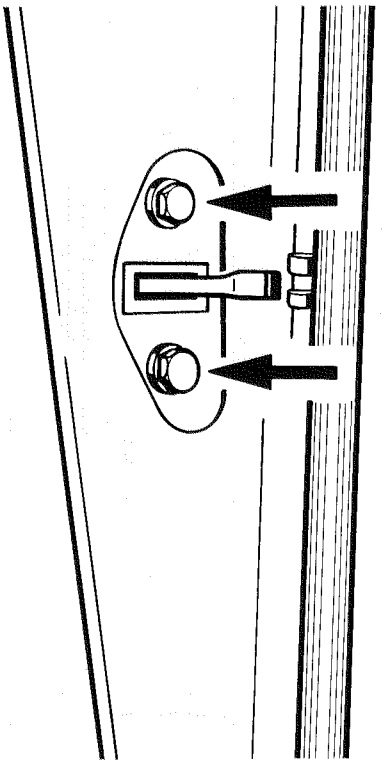
1. Remove key strip and door panel. Pull sealing foil away from inner door panel.

2. Pull tab washer from bolt and knock bolt out from below.



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3. Undo securing screws of the door arrester.



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4. Remove door arrester between inner and outer door panels.

Installing

Install in reverse order.

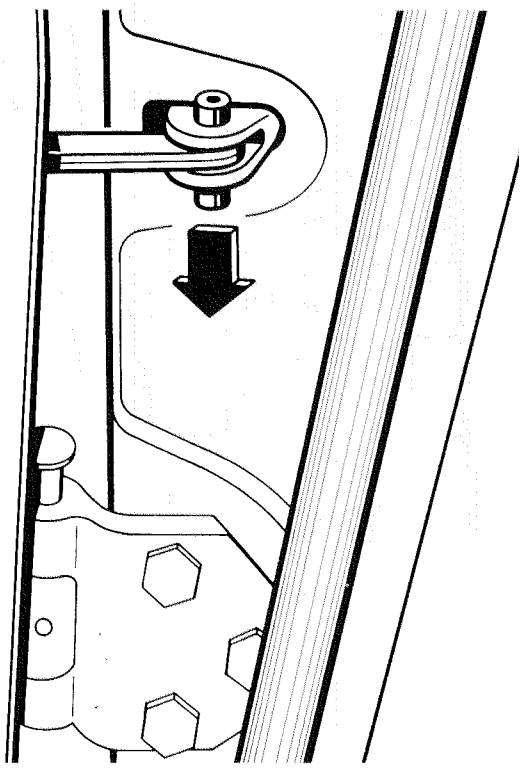
Replacing door arrester

The new door arrester can be installed in all vehicles as from 1970 models.

Removing

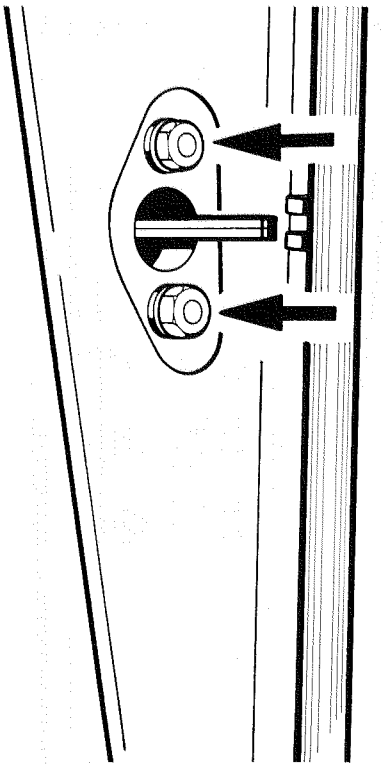
1. Remove keystrip and door panel. Pull sealing foil away from inner door panel.

2. Drive out coiled spring pin with suitable tool.



52/57

3. Undo fastening nuts of door arrester.

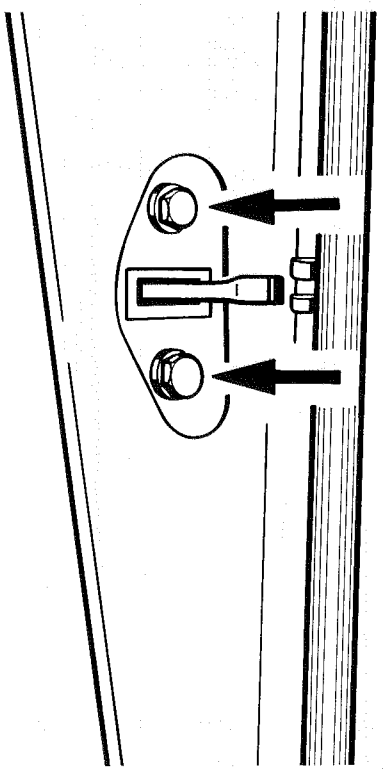


53/57

4. Remove door arrester between inner and outer door panels.

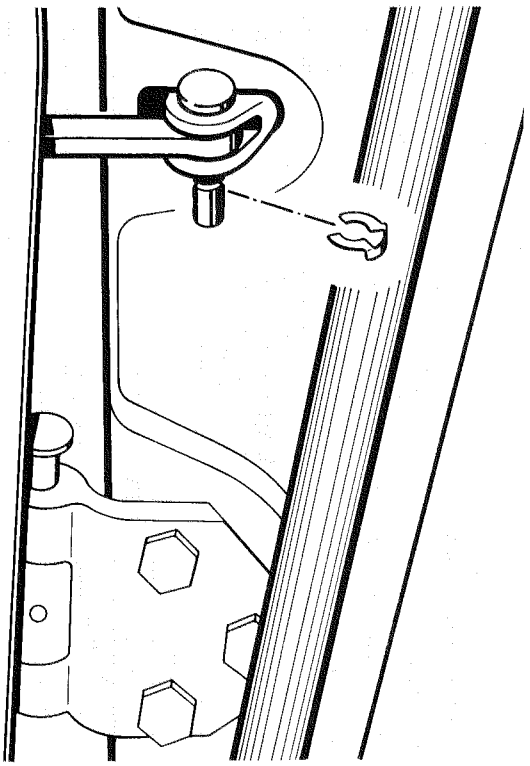
Installing

1. Insert new door arrester between inner and outer door panels and fasten with washers and hexagon-head screws to the inner door panel.



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2. Insert new bolts from above and drive downwards until the groove is visible. Then attach protective plate.

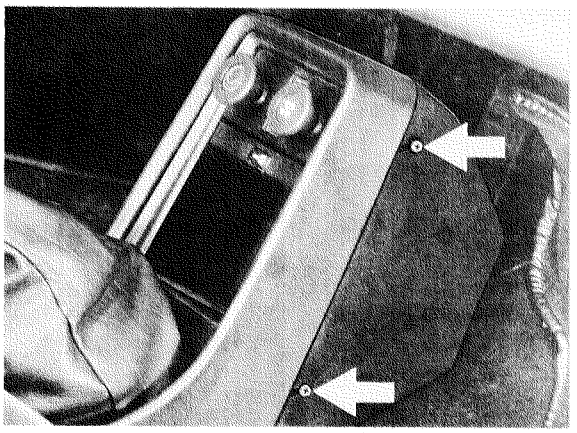


50/57

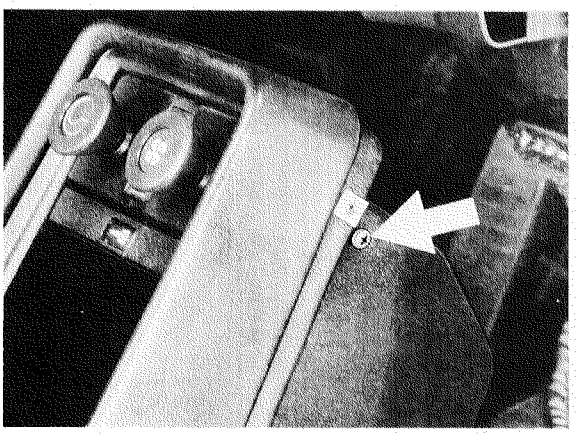
CENTRAL LOCKING SYSTEM

Removing and Installing Central Locking Button

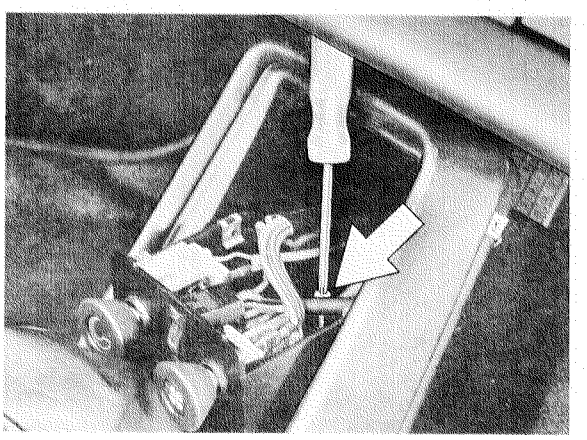
1. Unscrew cap on console.



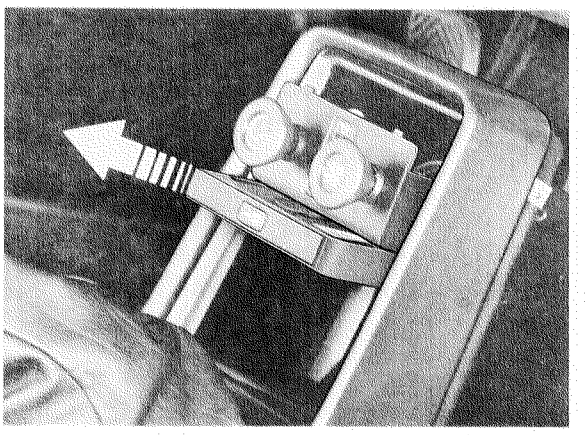
2. Loosen and press down switch mask.



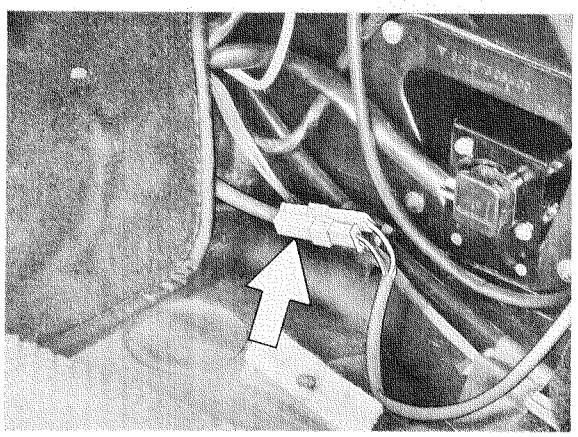
3. Unscrew central locking button housing screw.



4. Pull out central locking button together with housing. Mounting parts of housing are identical with those for the cassette box.



5. Unscrew and remove footrest. Disconnect plug and remove wire harness together with central locking button.

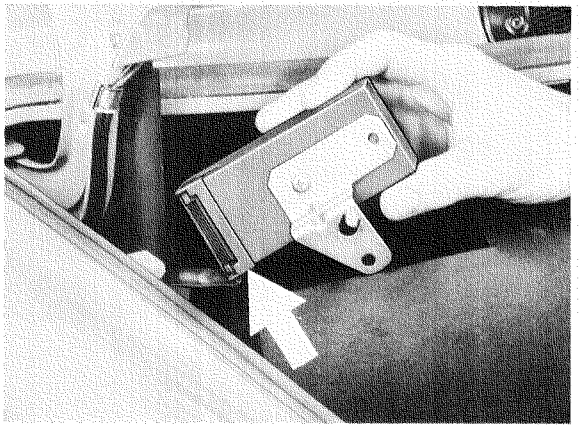


Removing and Installing Central Locking Control Unit

Control unit is located behind the instrument panel on right-hand side and is accessible from the luggage compartment. It is installed with a M 6 hexagon nut.

1. Unscrew nut.

2. Pull out control unit and take off multiple pin plug.

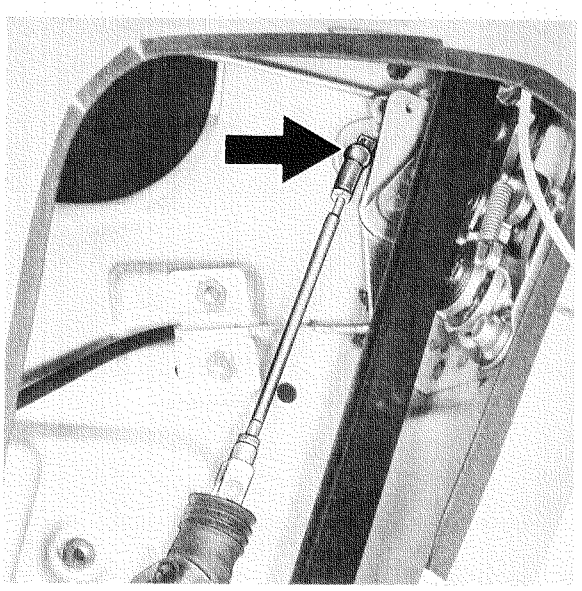


Removing and Installing Drive

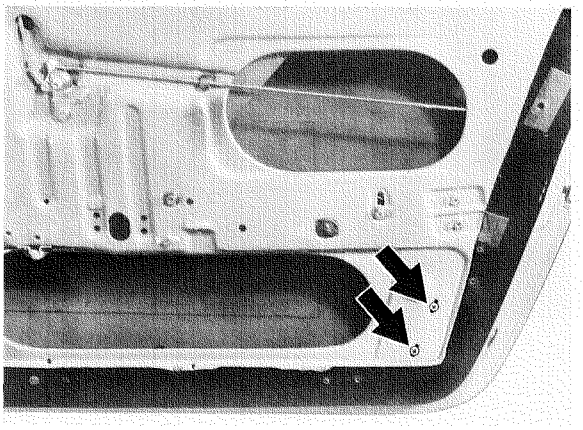
Removing:

1. Remove door trim panel.

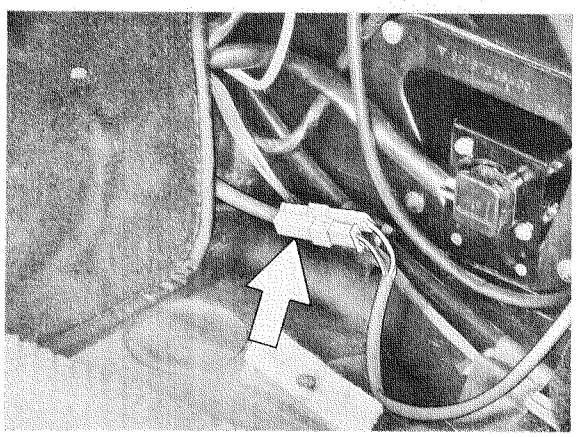
2. Disconnect connecting rod on ball head (door lock).



3. Unscrew drive mounting screws.



5. Unscrew and remove footrest. Disconnect plug and remove wire harness together with central locking button.

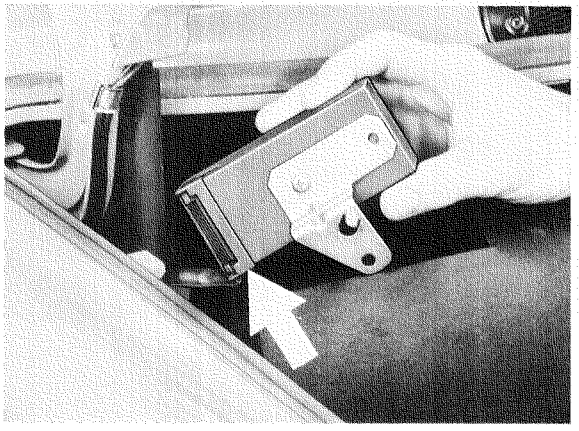


Removing and Installing Central Locking Control Unit

Control unit is located behind the instrument panel on right-hand side and is accessible from the luggage compartment. It is installed with a M 6 hexagon nut.

1. Unscrew nut.

2. Pull out control unit and take off multiple pin plug.

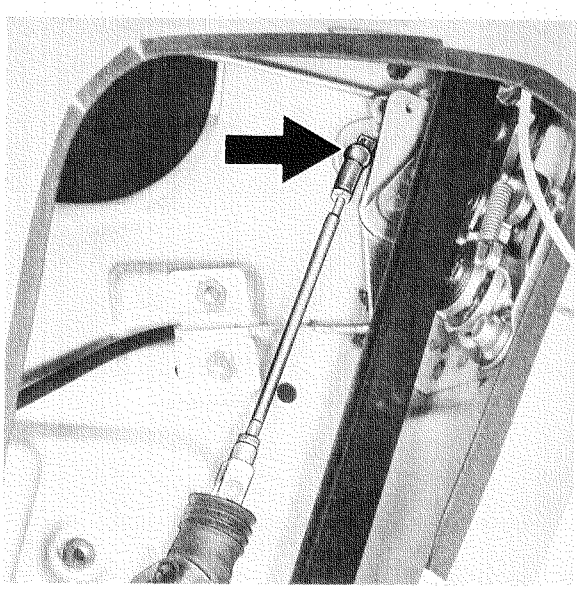


Removing and Installing Drive

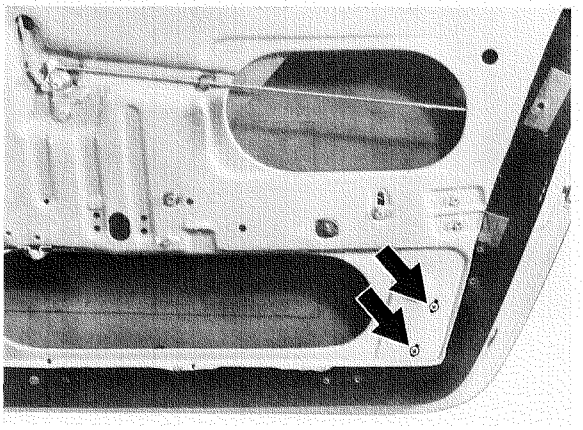
Removing:

1. Remove door trim panel.

2. Disconnect connecting rod on ball head (door lock).



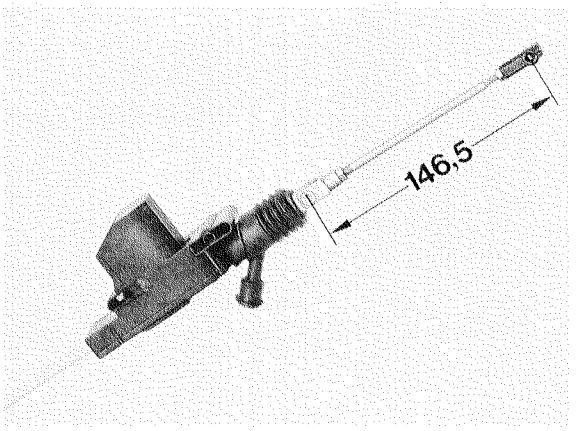
3. Unscrew drive mounting screws.



4. Take plug out of holder and disconnect.

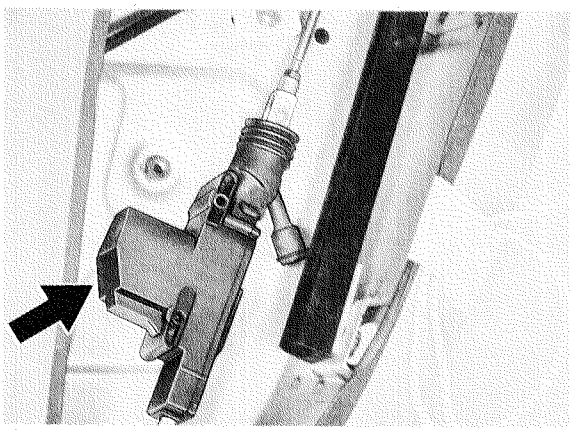
Installing

1. Check adjustment of connecting rod, correcting if necessary. Distance from center of hole to center of ball head = 146.5 mm.

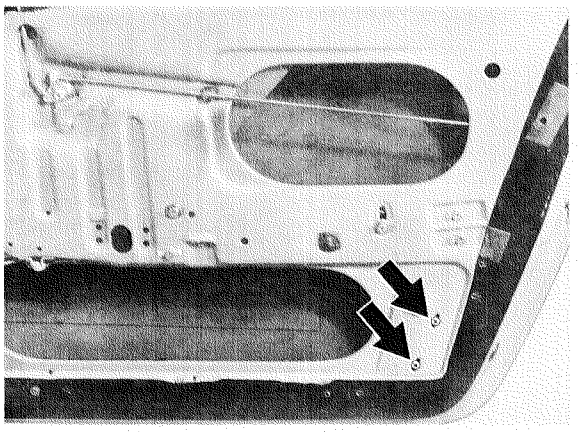


2. Clip in connecting rod with drive on door lock. Counterhold while clipping in to avoid bending the lock baseplate.

3. Position drive that single-sided cast boss (motor) faces forward.



4. Only tighten mounting screws enough that drive can still be adjusted in the slots.



5. Set door lock to unlocked position. Pull drive down to final position. Door lock must not be moved during this step.

   Push up drive 2 to 3 mm from this position to maintain reserve travel in the unlocking direction. Tighten mounting screws.

6. Connect plug on plug of door wire harness and secure in holder.

7. Check function.

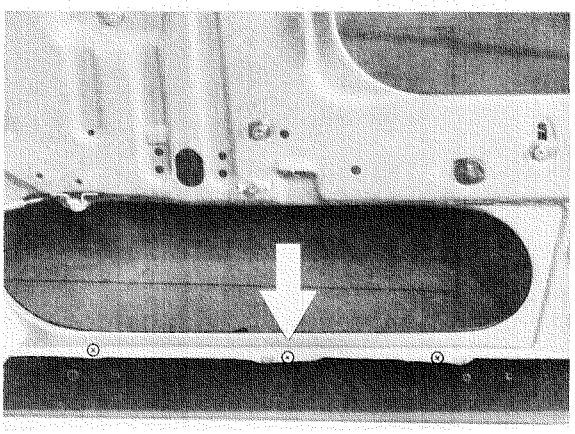
Note:

Cover door lock thoroughly before performing grinding or painting jobs, in order to prevent failure of the locking mechanism due to dirt.

Removing and Installing Microswitch on Door Lock Cylinder

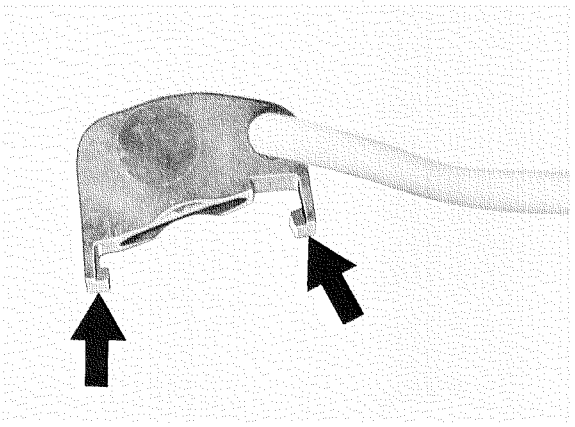
1. Remove door trim panel.

2. Take microswitch plug out of holder and disconnect.

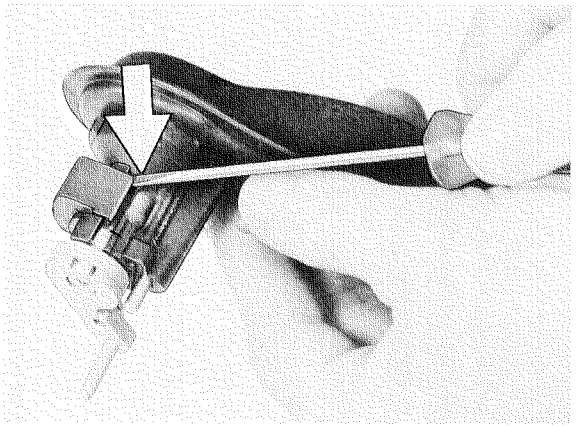


3. Unscrew and remove outside door handle.

4. The microswitch has a small opening on each mounting boss on the wire opening side.



5. Pry off microswitch carefully with a small screwdriver.



Note:

Locks must engage firmly when pressing microswitch on the lock cylinder. Pulling force must not be applied on the microswitch feed wire.

CENTRAL LOCK OPERATION TABLE

		Manual Operation	Ignition Turned Off	Ignition Turned On
Left Door	Key	E – unlocking	Z – unlocking Z – locking	Z – unlocking Z – locking
	Knob	E – unlocking E – locking (always only with closed door)	Z – unlocking	Z – unlocking
Right Door	Key	E – unlocking	Z – unlocking Z – locking	Z – unlocking Z – locking
	Knob	E – unlocking E – locking	Z – unlocking	Z – unlocking
Central locking button with display		no function	Z – locking without display	Z – unlocking Z – locking each with display

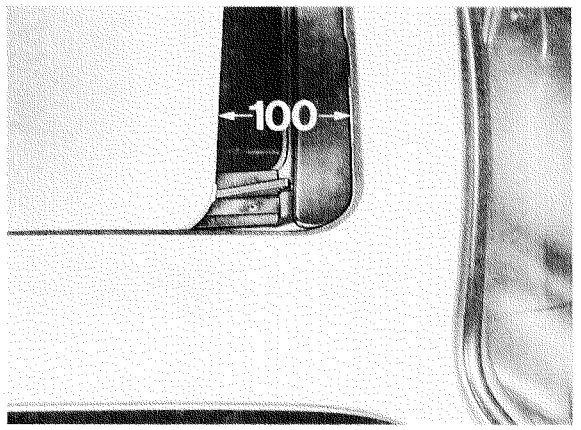
E = Single door

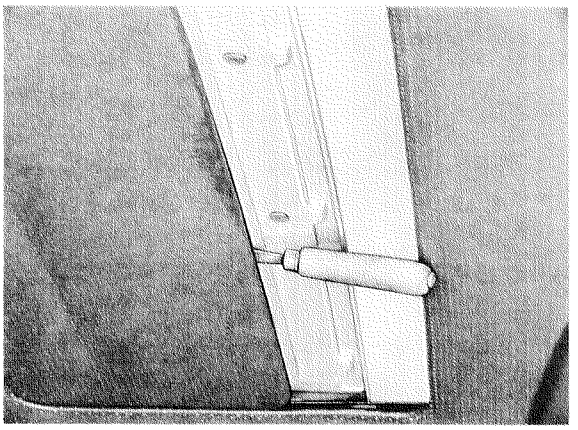
Z = Central operation

REMOVING AND INSTALLING ELECTRIC SUNROOF

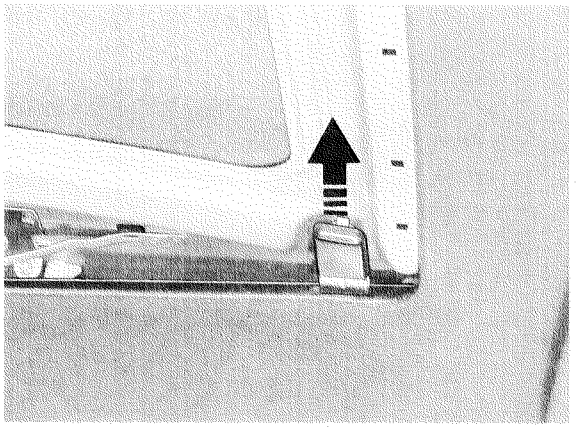
Removing

1. Open sunroof lid approx. 100 mm. Loosen clips on front edge of sunroof liner on sunroof.

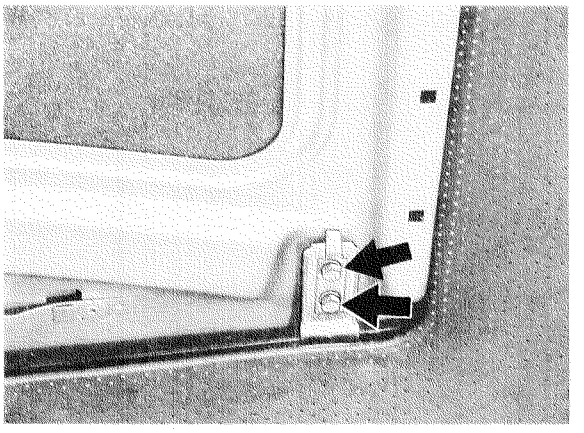




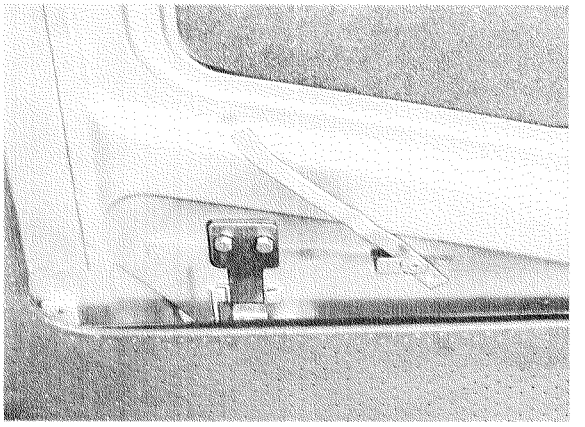
2. Push back sunroof liner completely and close sunroof lid. Remove edge guard caps of front guides.



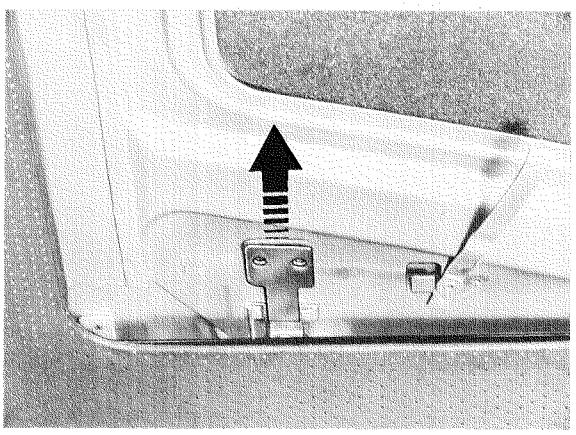
3. Take off front guides from sunroof after loosening screws.



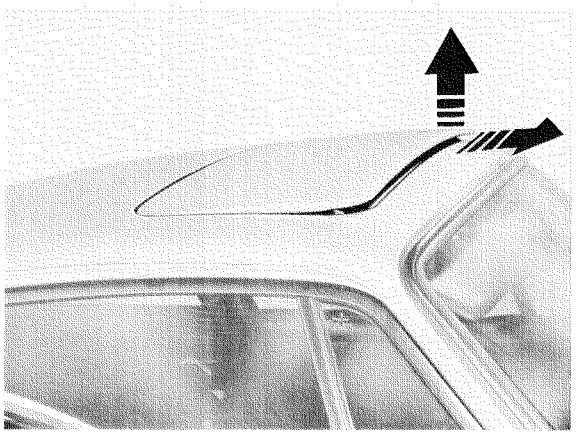
4. Lift spring locks off of rear guides and turn aside.



5. Unscrew screws of rear guides and take off reinforcements.

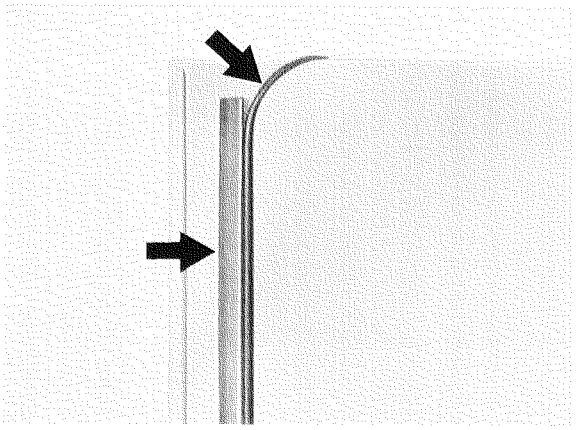


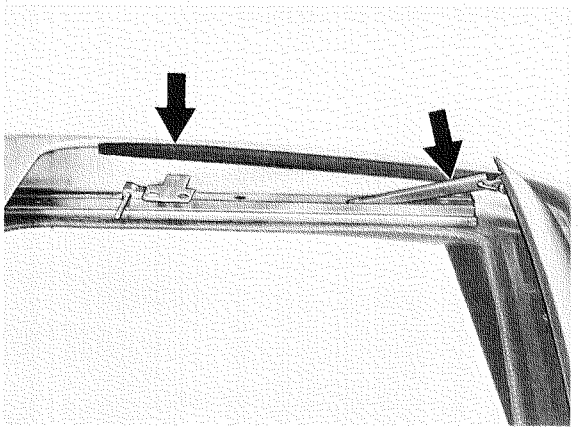
6. Lift and remove sunroof lid toward front.

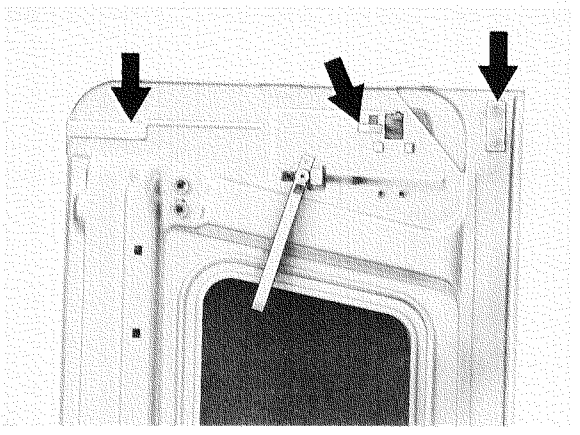


Installing

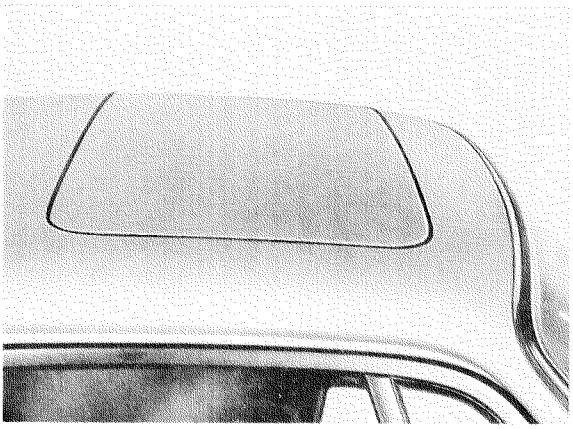
1. Inspect all components before installing sunroof lid (velvet strips, rubber seals, holders, slides and felt for claw plates), replacing parts if necessary.



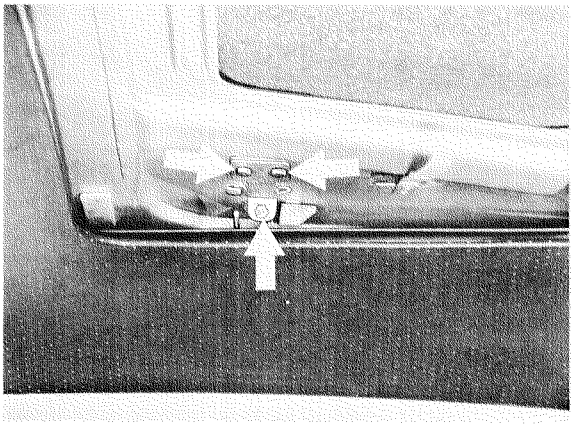




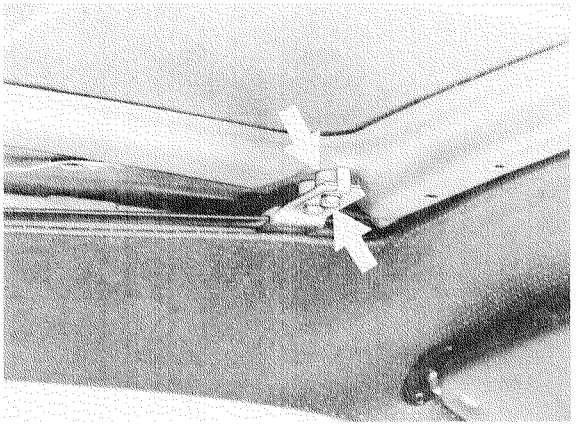
2. Run in sunroof lid toward rear and position in same plane with car roof.

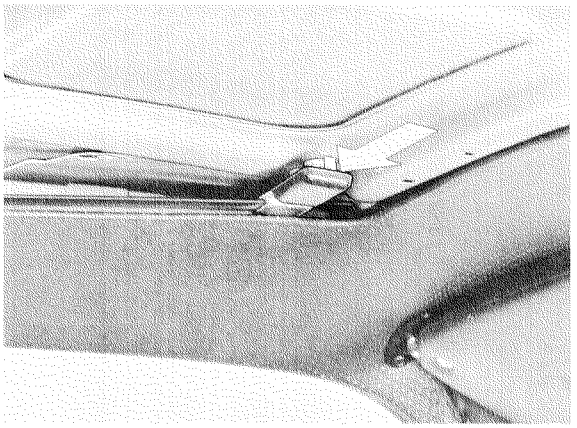


3. Insert rear reinforcements and bolt on sunroof lid together with guides.
Height adjustments are made with slotted hexagon head screws.
Connect spring lock.



4. Place front guides on rail and mount on sunroof lid with lockplates and screws.
Adjust height with knurled nuts.
Insert edge guard caps.



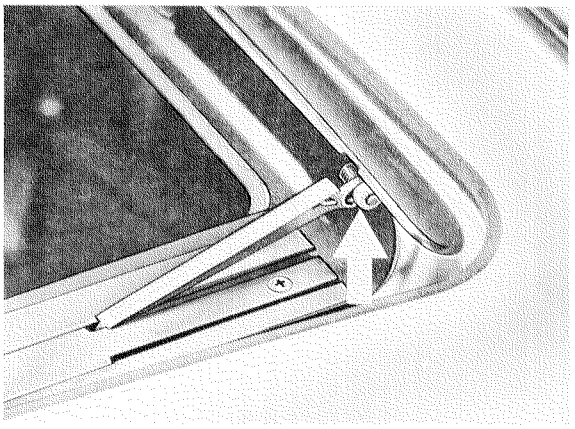


5. Open sunroof lid approx. 100 mm, pull roof liner forward and install in clips.

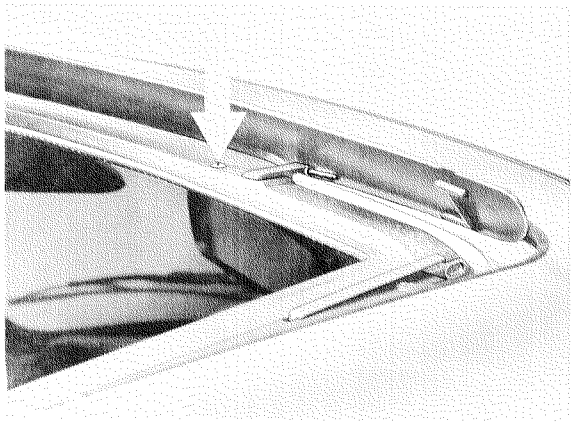
REMOVING AND INSTALLING WIND DEFLECTOR

Removing

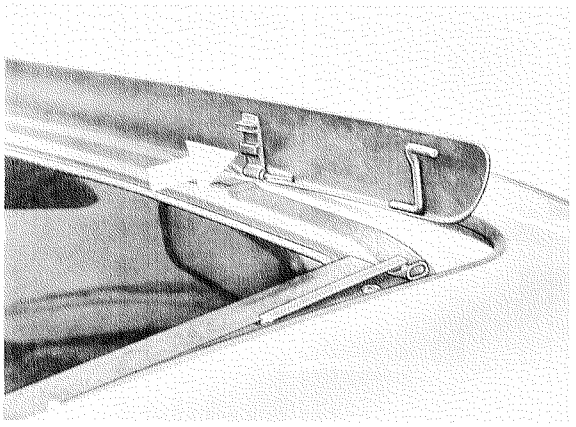
1. Open sunroof lid, remove rubber stops and disengage opener with spring.



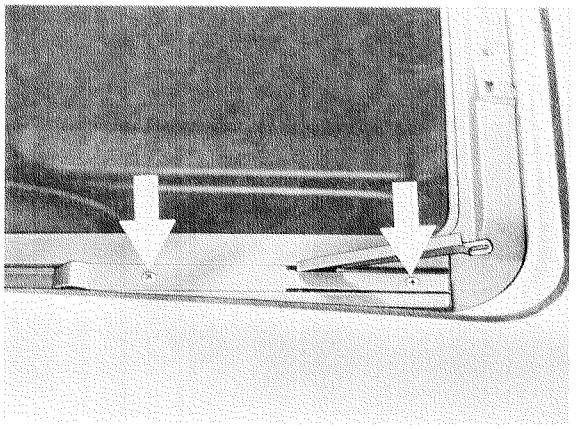
2. Move wind deflector blade forward and unscrew screws of cover strip.



3. Unclip clips of cover strip.



4. If opener has to be removed, unscrew adapter on guide rail.



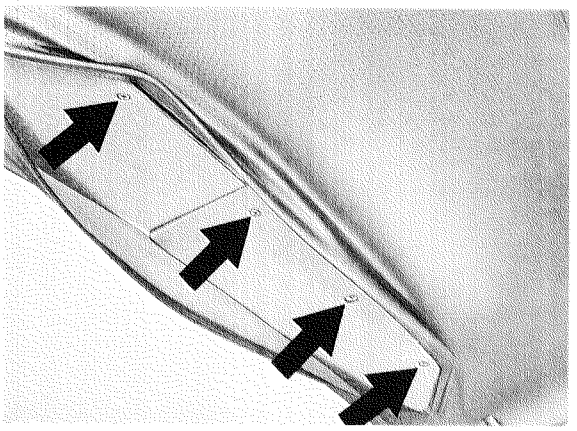
Installing

Installation is in reverse order.

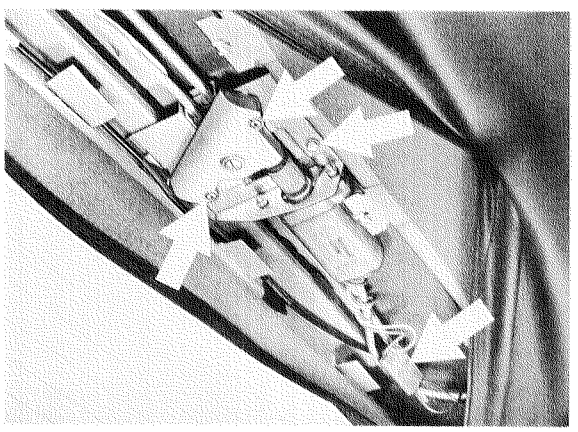
REMOVING AND INSTALLING GEARBOX, MOTOR, CABLES AND GUIDE RAILS FOR ELECTRIC SUNROOF

Removing

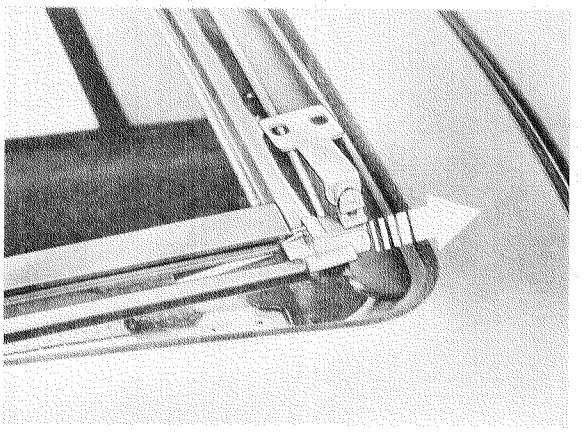
1. Open zipper and unscrew cover screws.



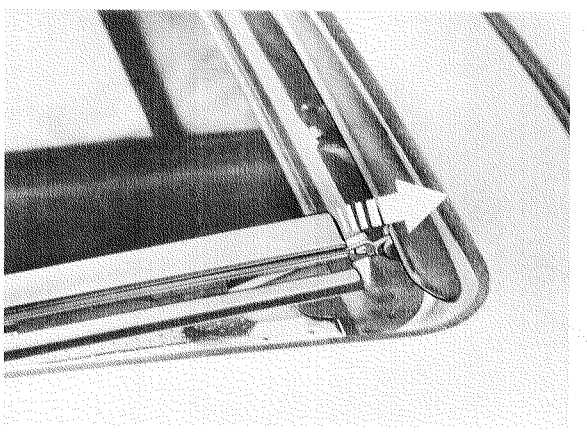
2. Disconnect electric plug.
   Unscrew mounting screws for gearbox and motor.
   Take gearbox and motor out of car.



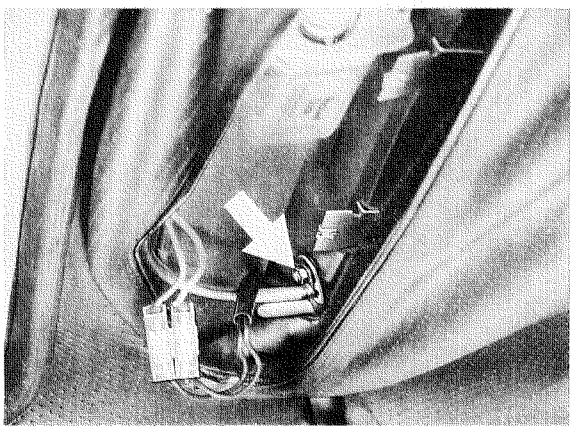
3. Unscrew screws of adapters.
   Lift guide rail slightly and pull out cables forward.



4. Pull out guide rails forward.



5. Unscrew guide tube mounting nuts and take guide tube out of car.

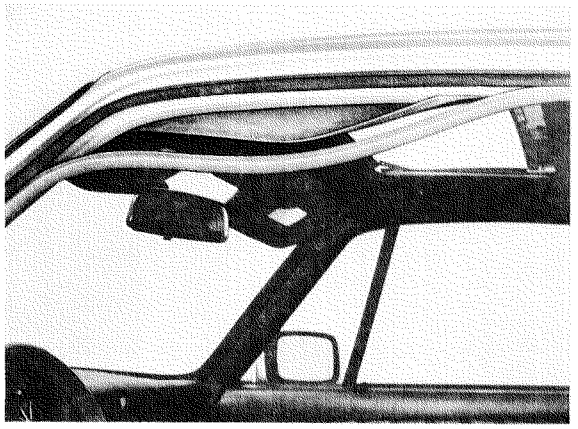


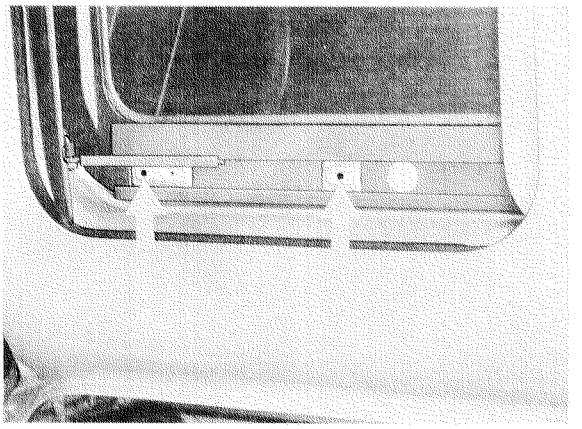
Installing

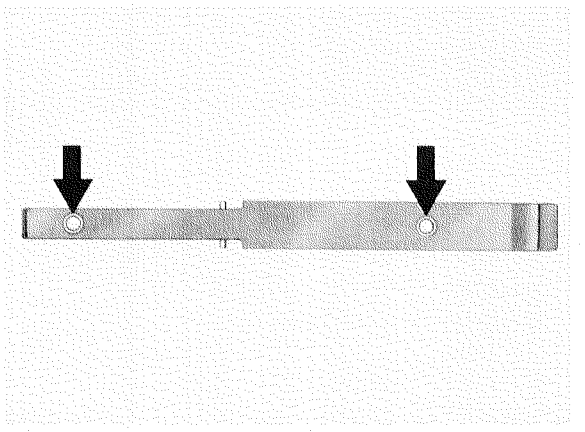
Check all parts for damage before installing, replacing if necessary.
Installation is in reverse order.

SERVICE INSTALLING GUIDE RAILS

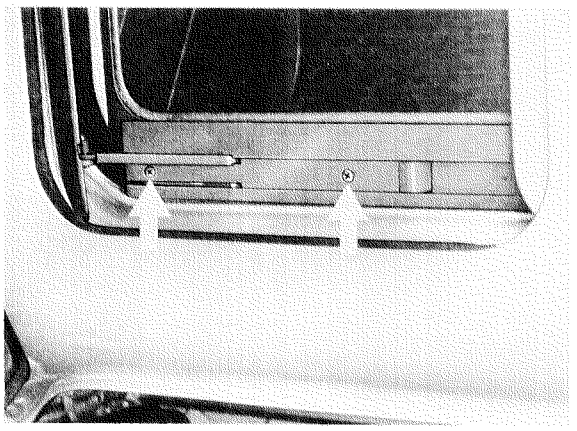
1. Detach door seals and roof trim in area of door opening.





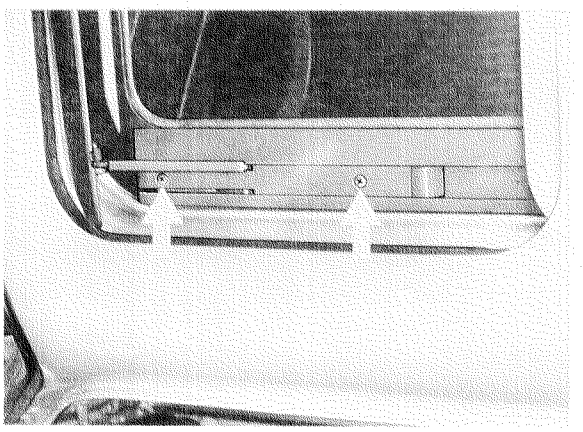


2. Unscrew mounting screws of guide rails.

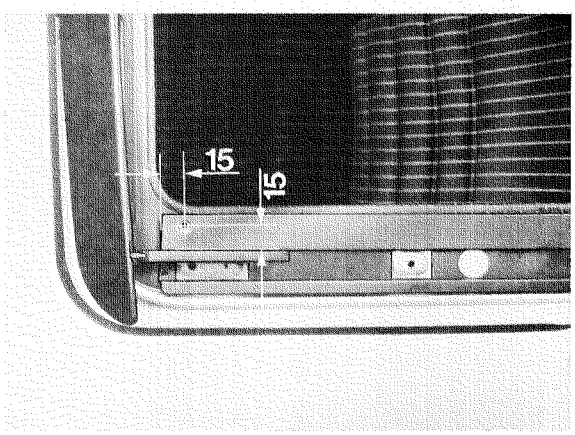


3. Open up holes in roof frame and adapters to diameter of 4.5 mm.

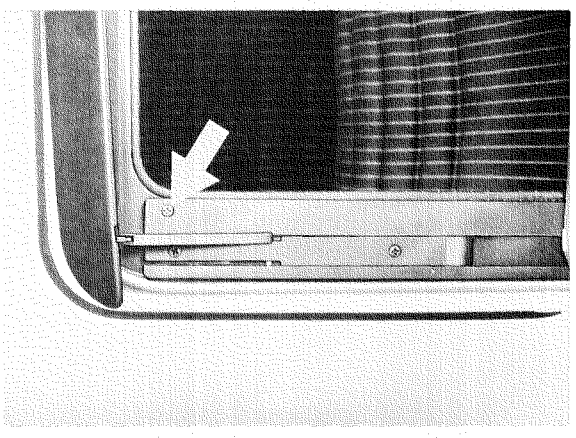
4. Guide in adapters and guide rails with M 4 x 10 countersunk screws on top and secure from bottom with lock washers and nuts.



5. Drill 4.5 mm dia. holes in guide rails and front area of roof frame according to given dimensions.
   Open up upper section of guide rail from 4.5 mm dia. to 8.5 mm dia. with a drill and deburr edges.



6. Bolt guide rails on roof frame, using M 4 x 10 flat head screws and lock washers.
   Cover front nuts with felt.

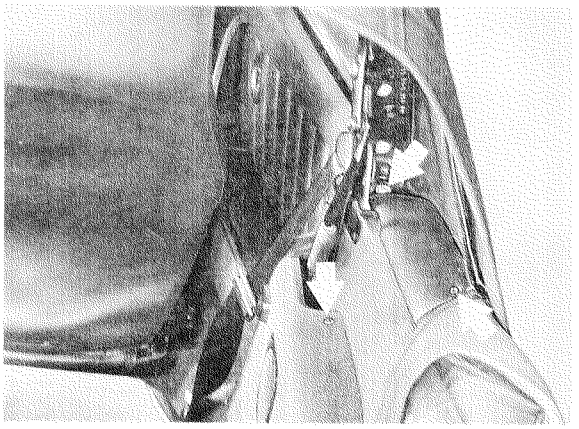


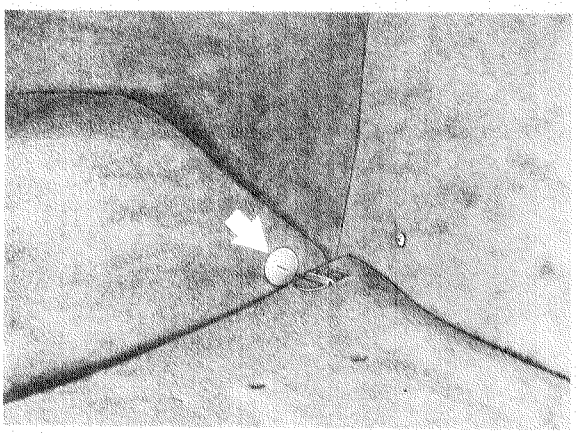
7. Install roof trim and door seals.

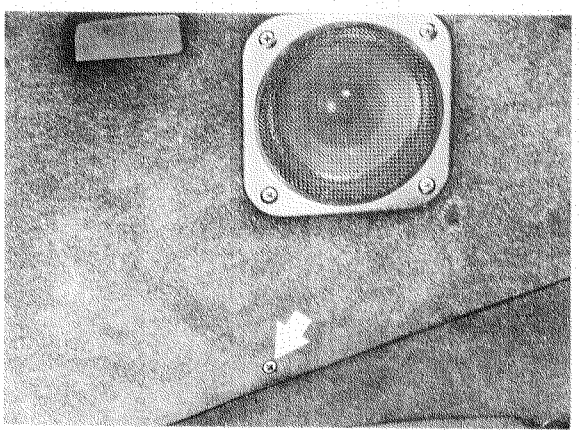
REMOVING AND INSTALLING CABRIOLET TOP

Removing

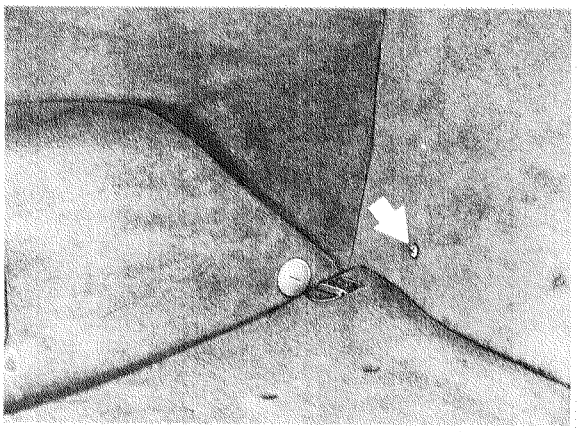
1. Remove mounting screws and push buttons on key boards and side trim panels.
   Pull off plugs on radio speakers and remove all parts.



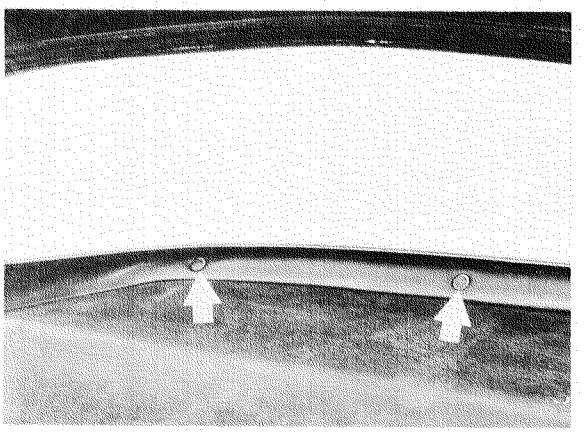




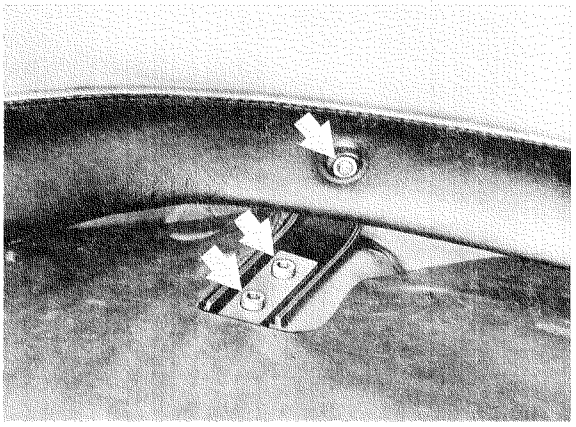
2. Remove screws on rear wall trim panel at bottom on left and right sides. Push up and pull out rear wall trim panel forward.



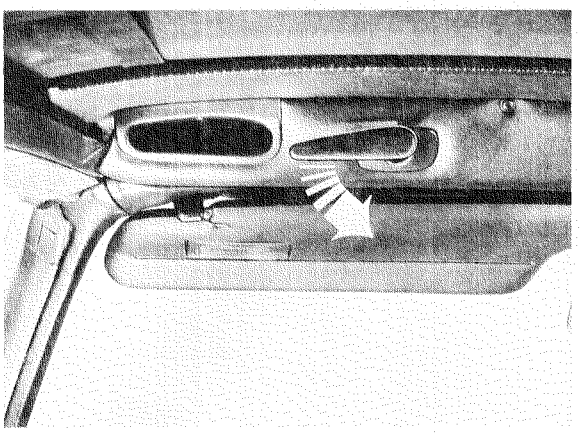
3. Remove caps on tensioning bar with a suitable tool.

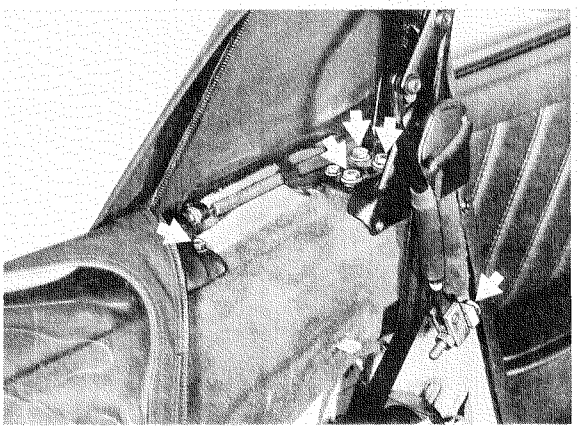


4. Remove mounting screws on tensioning bar and bracket.



5. Open top locks. Remove mounting nuts and screws on top mounts, guide arms tensioning bar. Lift top off of car.



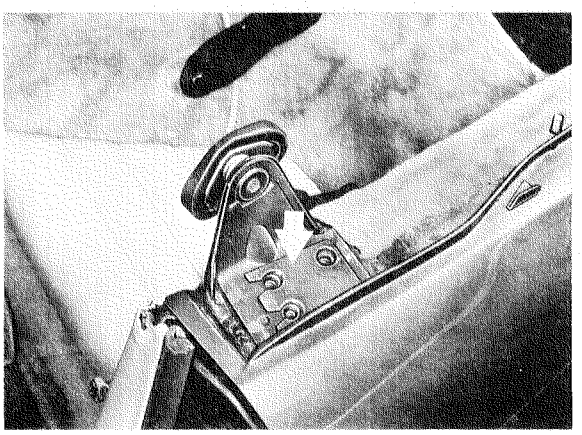


Installing

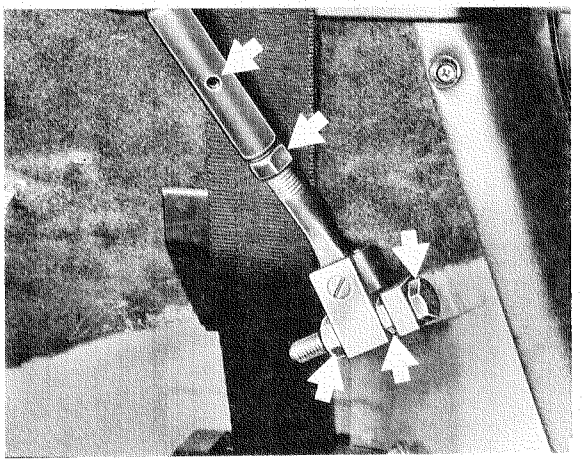
Installation is in reverse sequence.

Adjusting

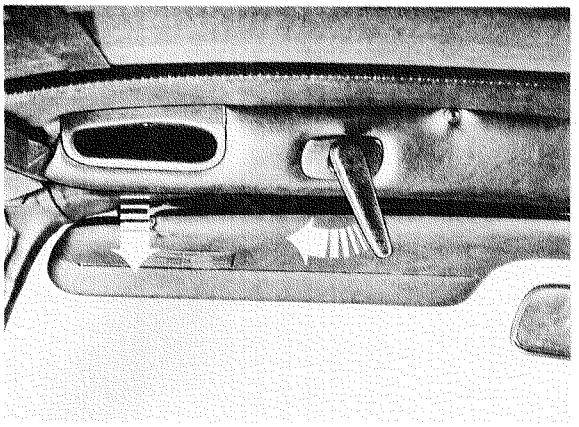
1. 1 and 2 mm thick shims (max. 4 mm) can be used underneath the top hinges for correction of height.

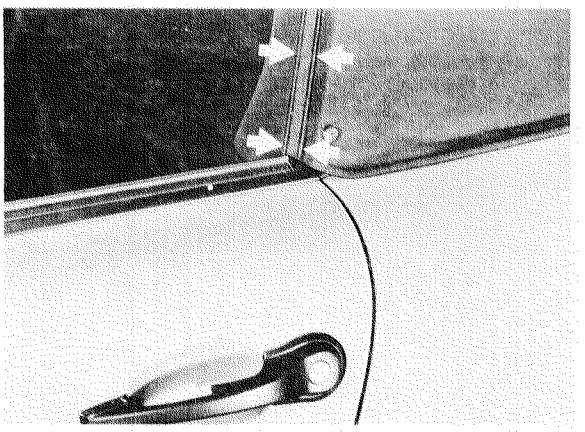


2. The forward motion can be corrected slightly on the supports of the operating levers, so that the guide pins and locking hooks on the windshield frame engage exactly.

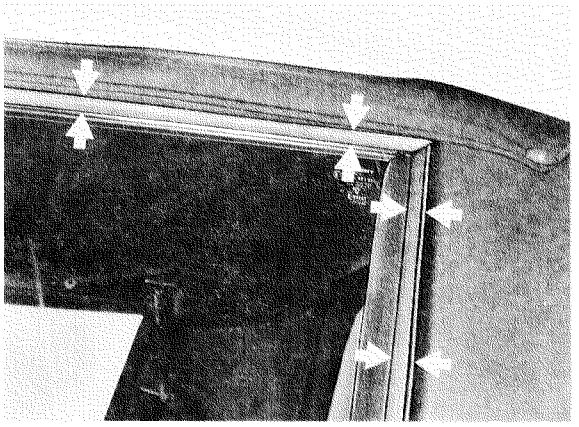


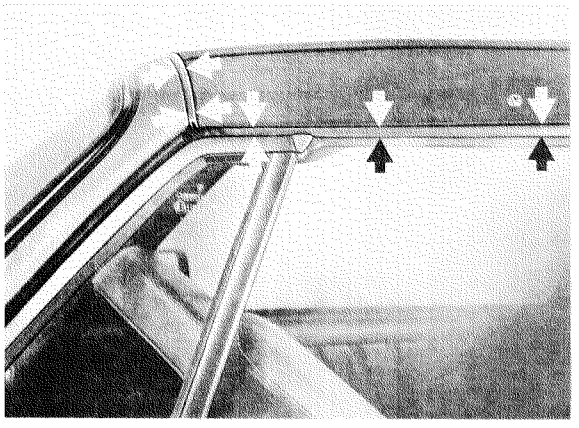
3. Close top, pull down on grip plate with one hand and lock lock simultaneously.
   Repeat this step on the other side.



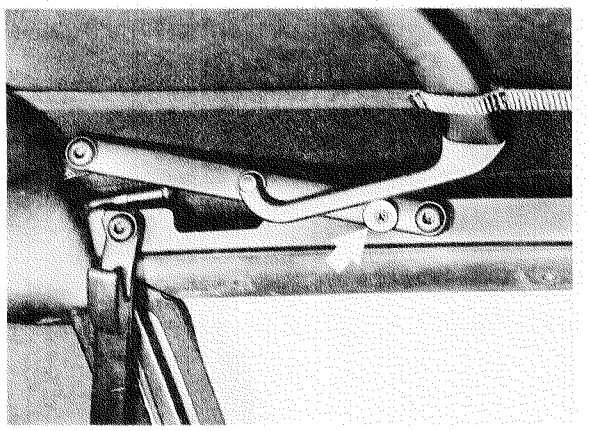


4. If the top is closed, make sure that there is equal distance from the top frame to the windows. If not, center door frames and windows to the top frame.

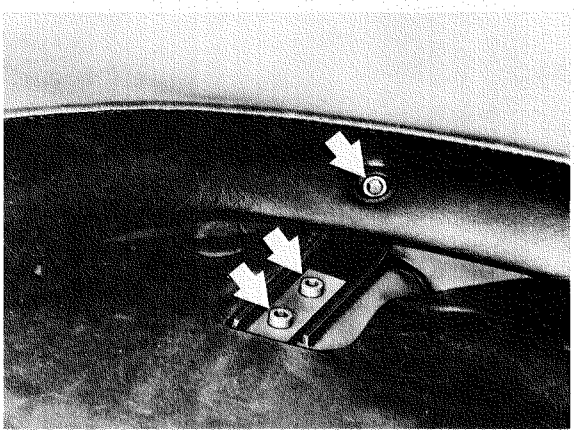


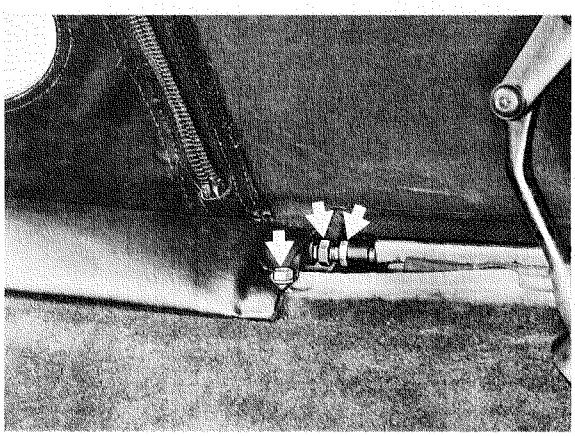


5. In order to have a smooth contour on the front top canvas cover between the front and rear hoops, the eccentric has to be adjusted accordingly.



6. To adjust the tension of the rear window, loosen the mounting screws and then adjust the rear window tension with the tensioning screws on left and right sides.

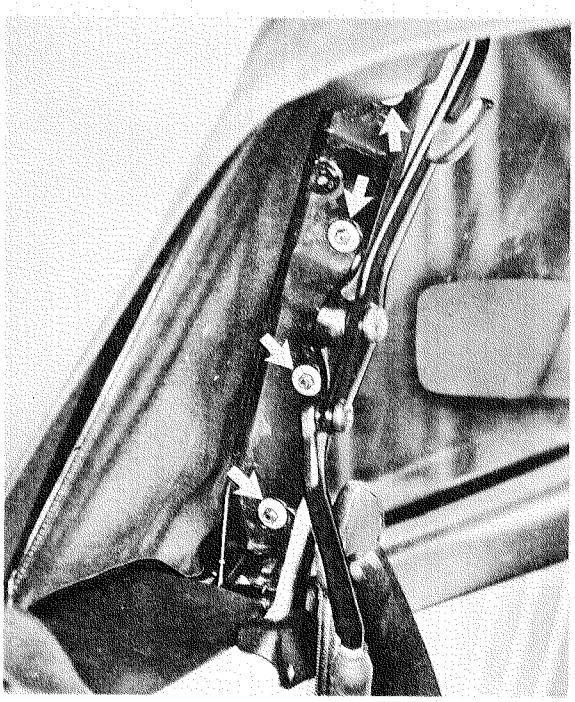


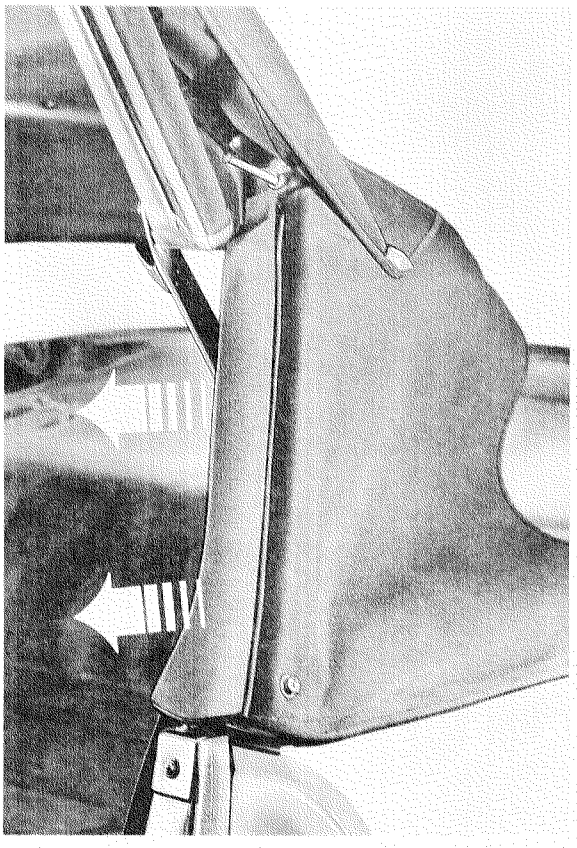


REMOVING AND INSTALLING TOP SEALS

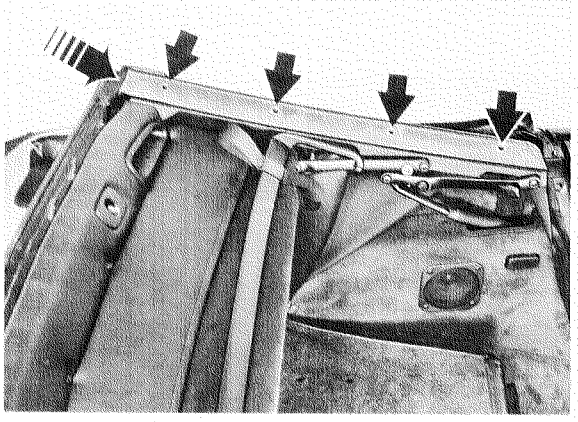
Removing

1. Open top locks and unzip the zipper. Remove nuts and washers on the B pillars and lift off seals with profile section rails and trim forward.

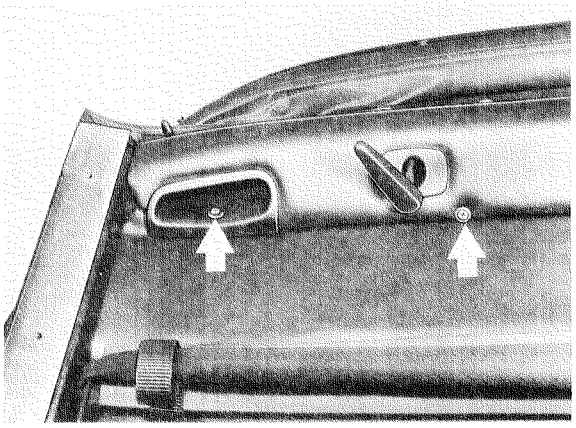




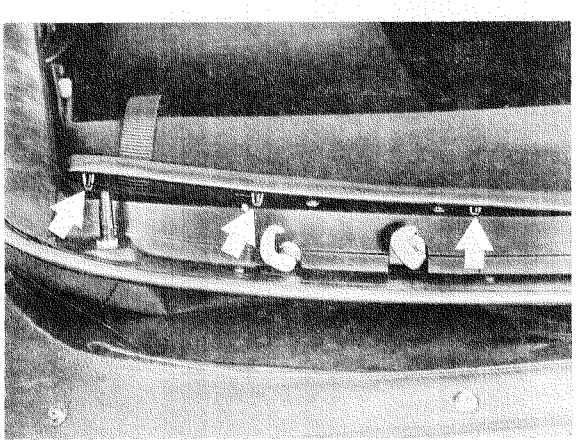
2. Lay back top, loosen screws of top frame seals, disconnect gluing on front hoop tips and take off seals.

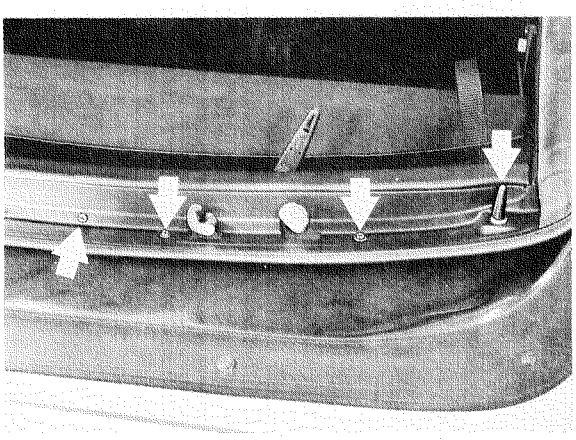


3. Remove rivets of grip plates and mounting screws of hoop trim.

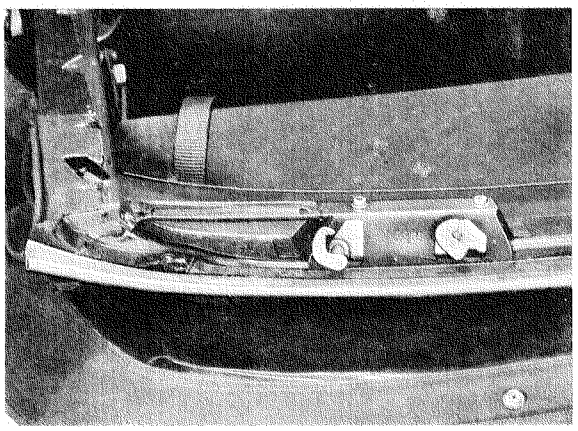


4. Remove grip plates, unclip hoop trim and unscrew locating pins and screws.



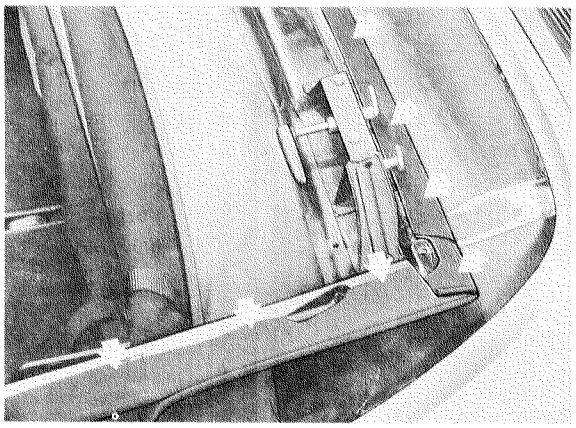


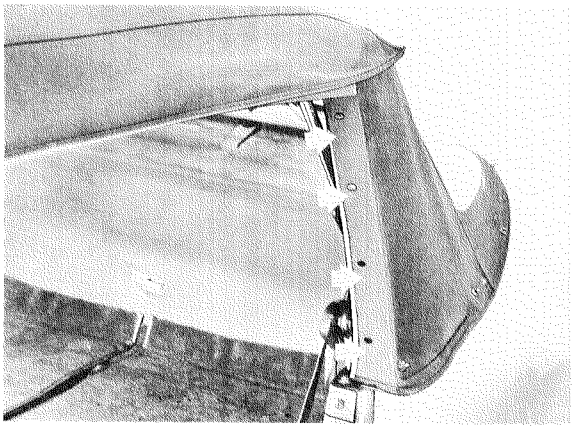
5. Loosen seal on hoop carefully.

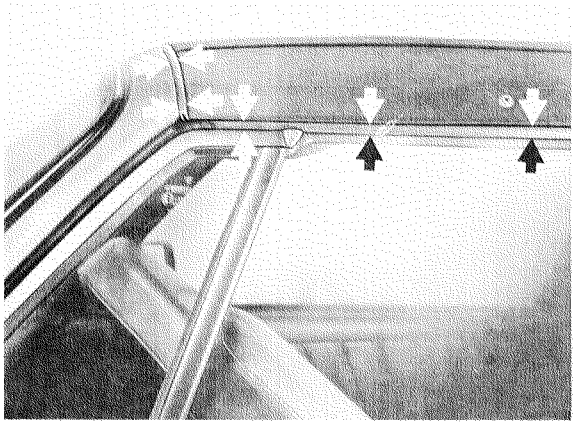


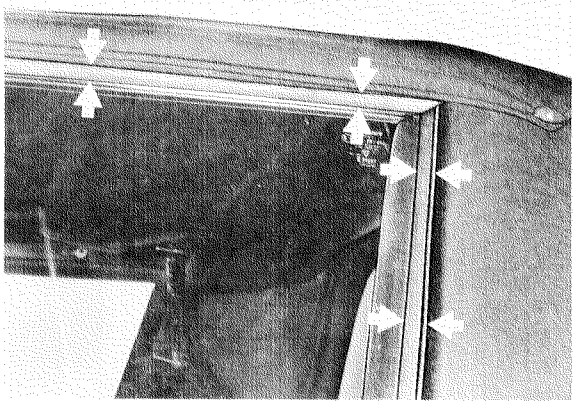
Installing

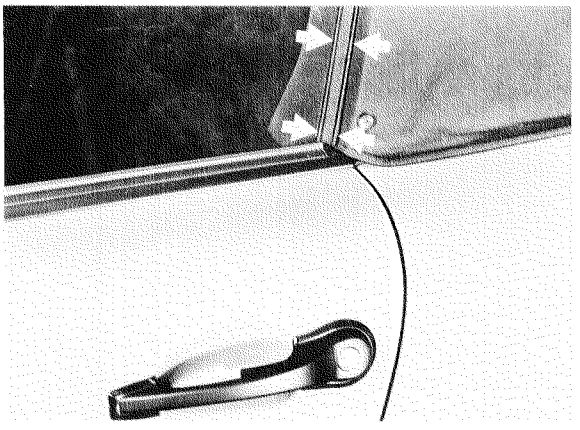
Installation is in reverse sequence.
All bearing surfaces for seals must be cleaned to remove sealing and adhesive compound.











Adjusting

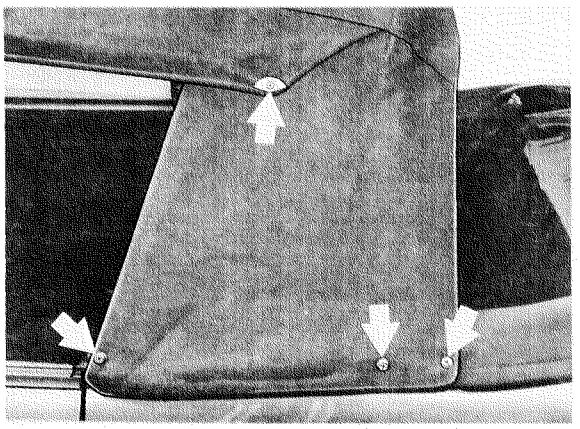
Seals have to be adjusted after closing the top.
Adjust top frame seals so that door windows run up into the provided sealing lips accurately.
Adjust B pillar seals so that door windows have tight contact.

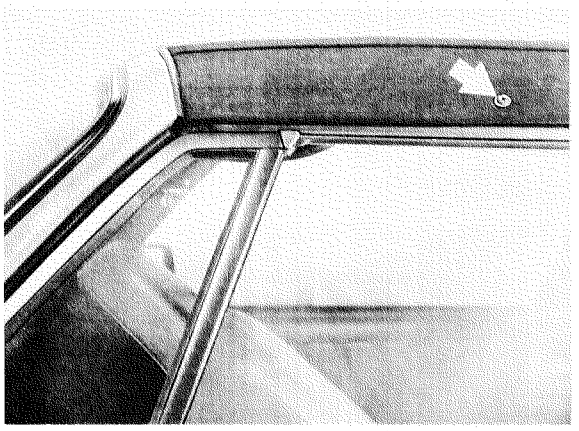
REMOVING AND INSTALLING FRONT TOP CANVAS COVER

Removing

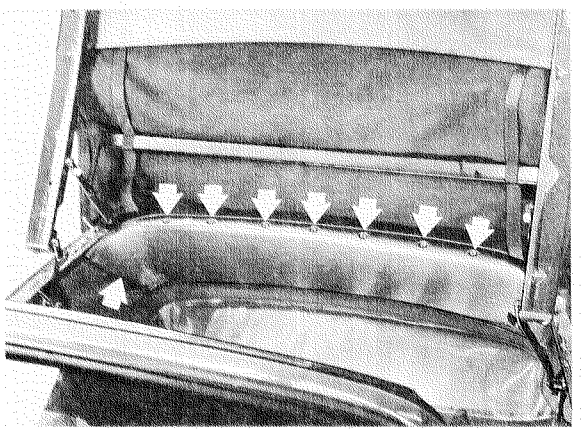
1. Remove key boards, B pillar seals, top frame seals and seal on hoop.
   See "Removing Top and Top Seals".

2. Remove snaps or Tenax bases, mounting screws, corners for tensioning cables and screws for tensioning cable guides.

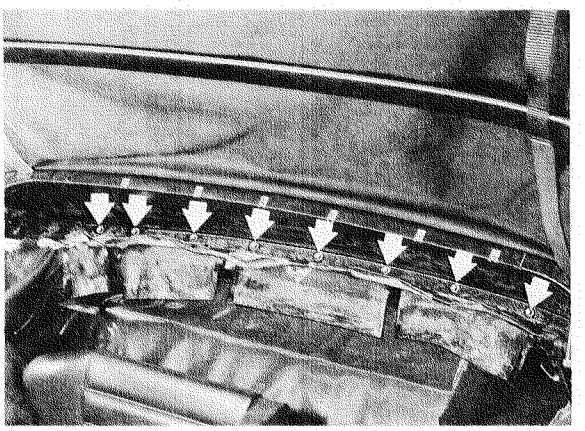




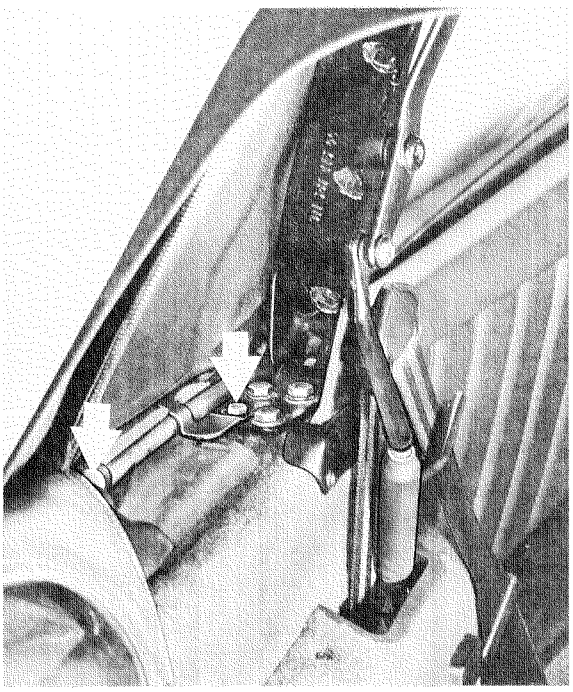
3. Unscrew mounting screws on rear top trim.



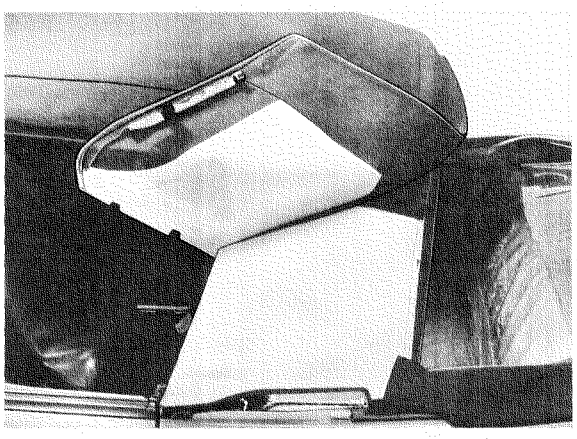
4. Disconnect front and rear cemented top canvas cover and remove screws of mounting rails.



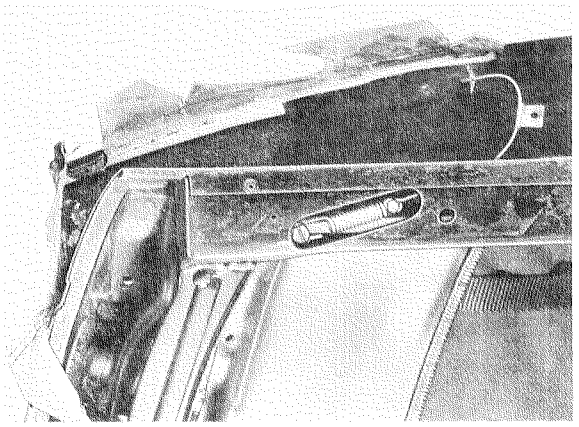
5. Loosen tensioning screws of tooth rails and remove screws.



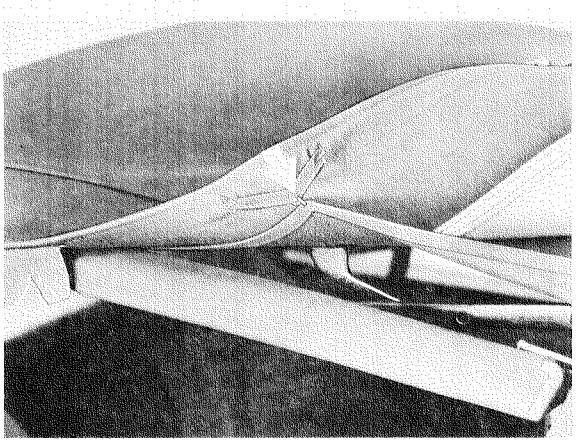
6. Disconnect cemented top canvas cover on B pillars and main hoop.



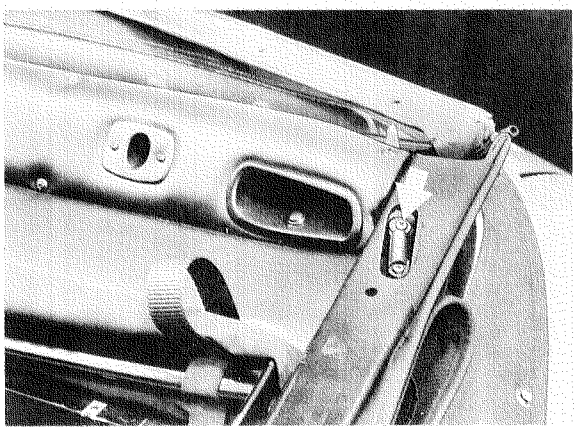
7. Disconnect cemented canvas cover on front hoop.



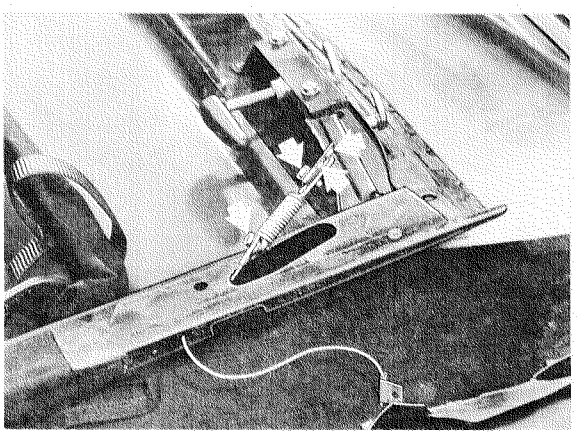
8. Disconnect rubber strap on roof liner.



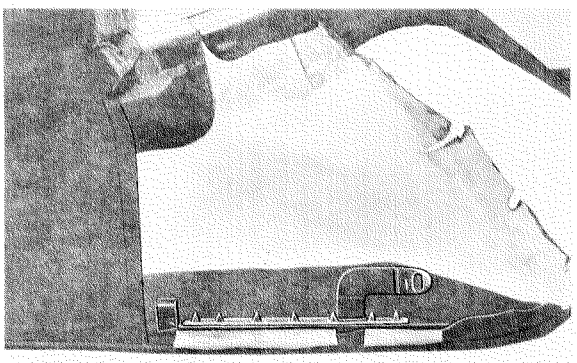
9. Unscrew screws of tensioning springs on top frame.



10. Unscrew tensioning springs on tensioning cables. Pull tensioning cables out of top frame and take off top canvas cover.

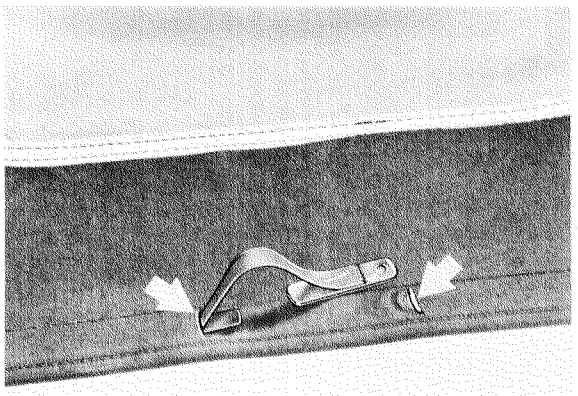


11. Disconnect tooth rails on top canvas cover and remove tooth rails.

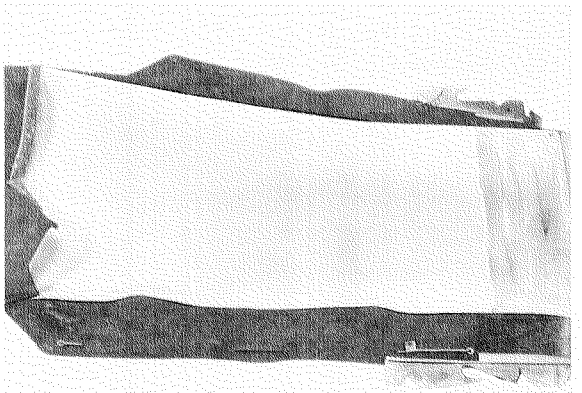


Installing

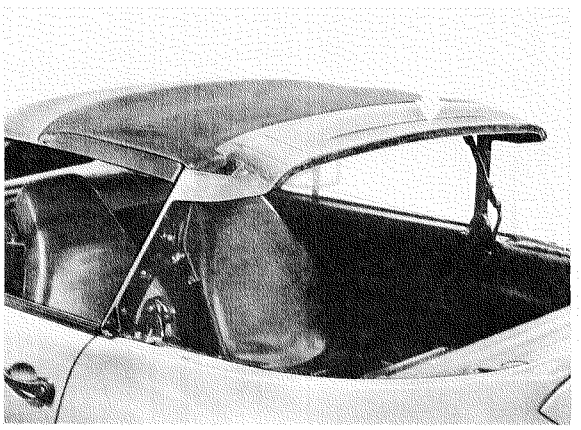
1. Guide rubber strap into top canvas cover.



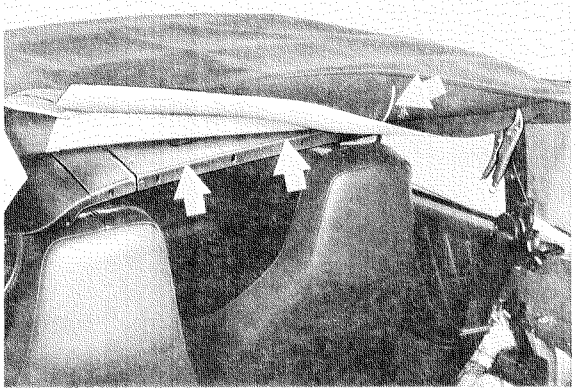
2. Guide tensioning cables into openings in top canvas cover from front end.

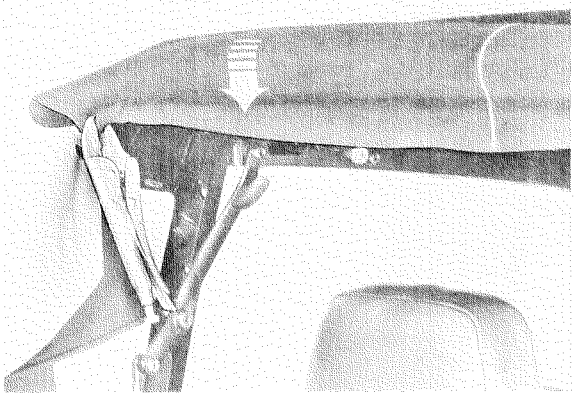


3. Mark center on rear hoop.

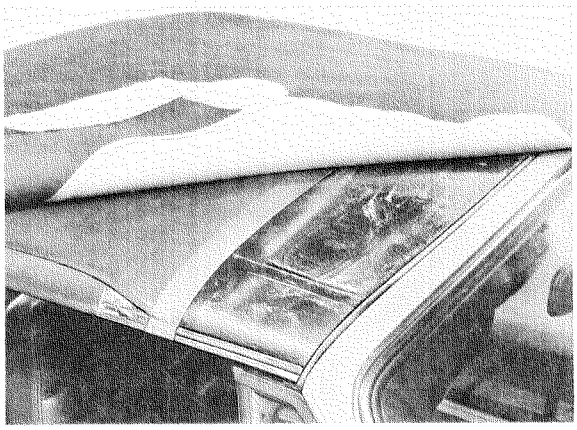


4. Mark center on rear end of top canvas cover. Install and align top canvas cover that marks are aligned. Canvas cover seam must run in groove of hoop edge. Only cement top canvas cover on threaded flange.

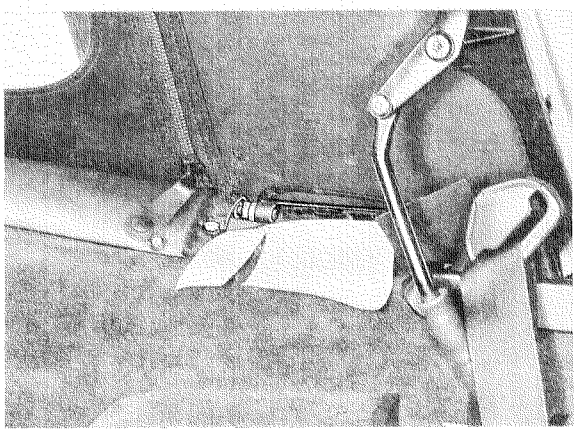


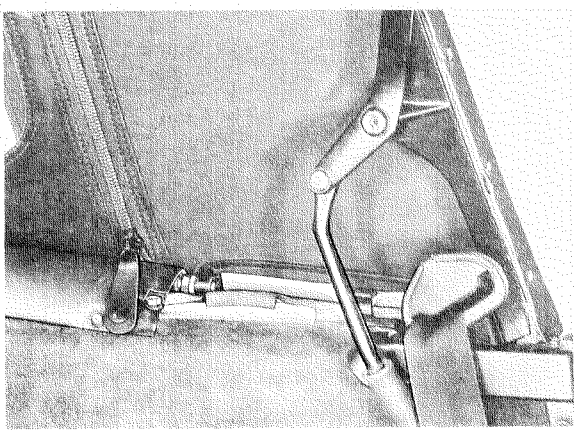


5. Cement top canvas cover on front hoop after stretching it.

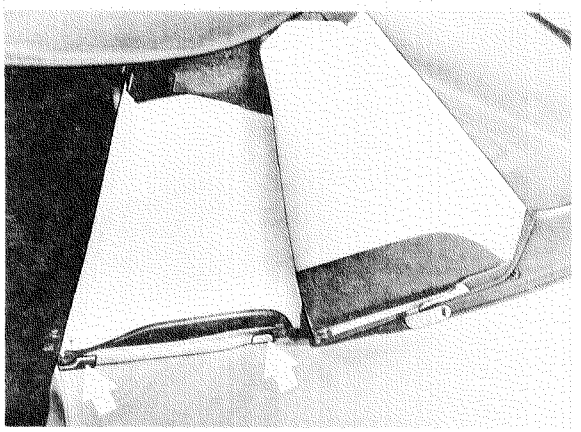


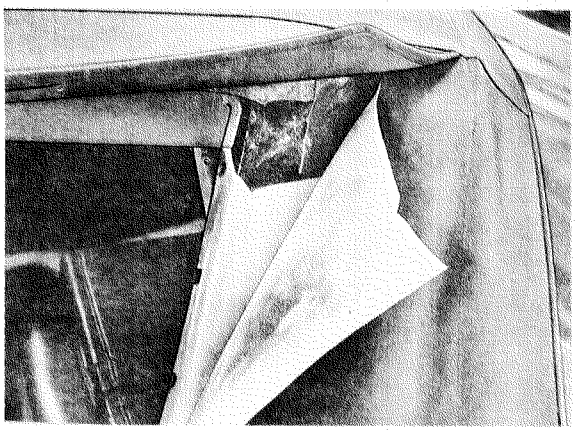
6. Mount tooth rails. Guide mounting strips of top canvas cover underneath tooth rails, cut to size, apply coat of cement, stretch, connect doubled in teeth and bend down teeth.



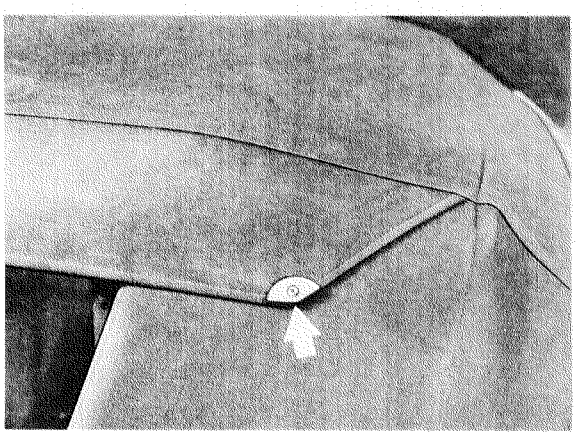


7. Loosen tooth rails and fold back top canvas cover. Insert seals and coat canvas cover with cement.
Mount tooth rails and cement canvas cover on the B pillars.

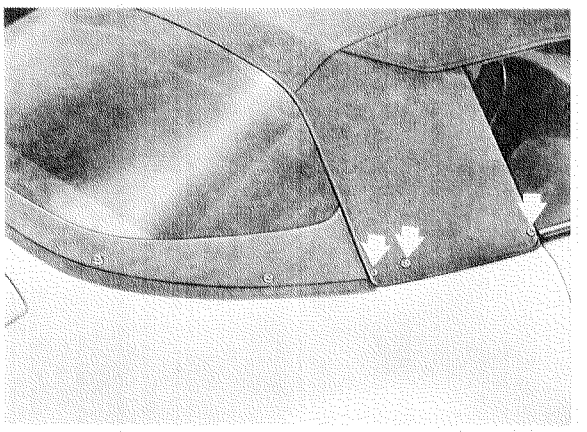


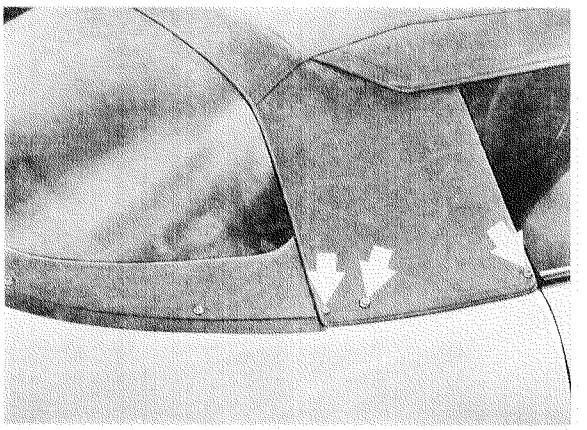


8. Stretch side canvas cover. Make a hole in the cover with a pointed punch and mount corners and tensioning cables with screws.

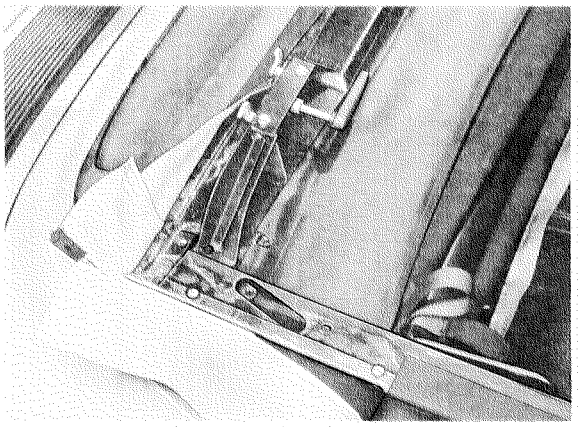


9. Install snaps or Tenax bases and screws with cloth protection washers.

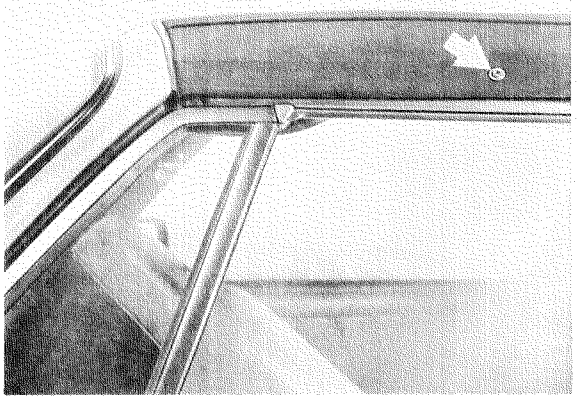




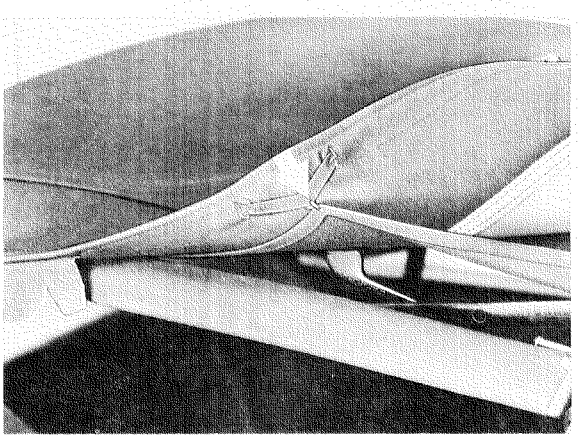
10. Cut front end of top canvas cover to size and cement on top frame.



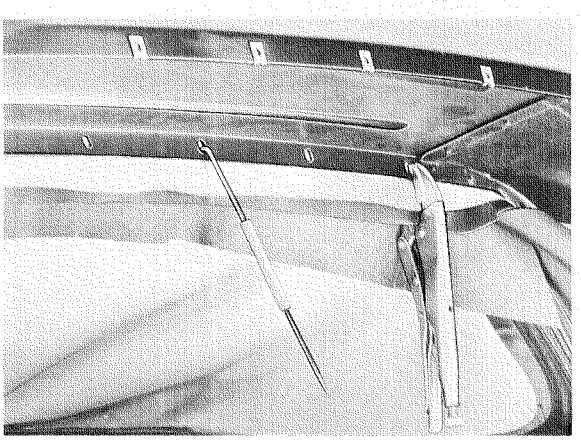
11. Guide tensioning cables into top frame. Mount tensioning cable guides and canvas cover with screws and cloth protection washers.



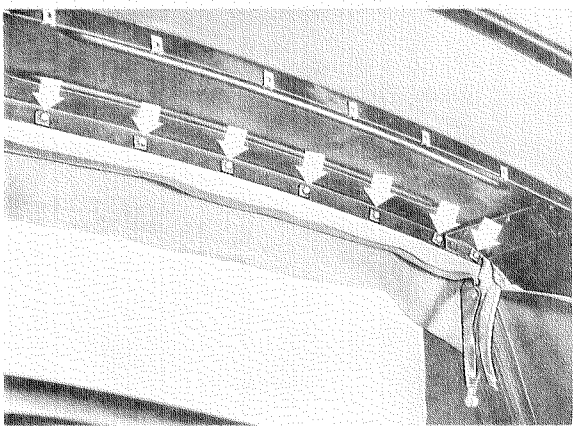
12. Sew rubber strap on roof liner.



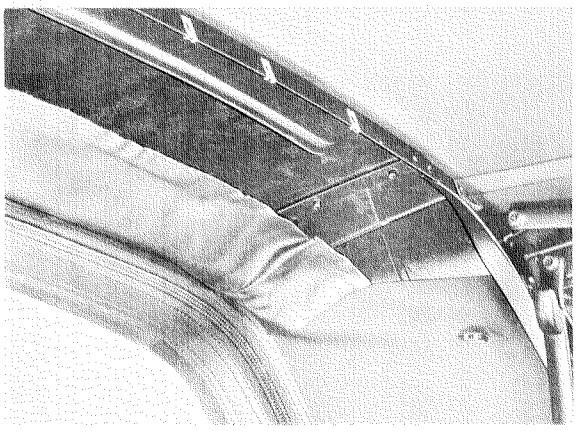
13. Clamp rear canvas cover on rear hoop with mounting rail and make hole in canvas cover with a suitable tool.



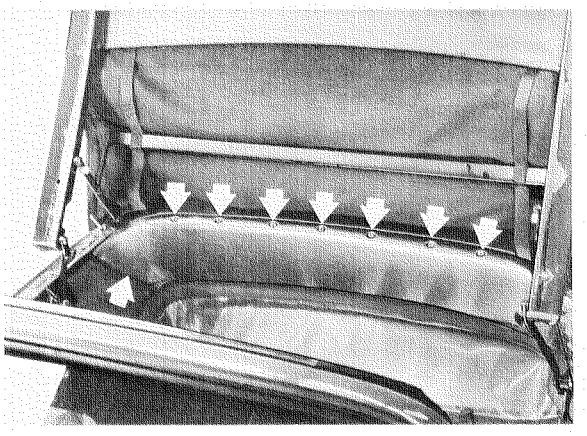
14. Mount shim wedges with screws.



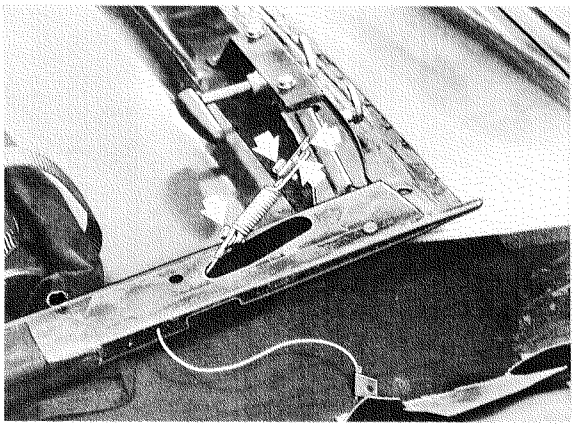
15. Cement rear and front canvas cover on rear hoop.



16. Install rear top trim.



17. Screw on tensioning springs with tensioning cables. The bracket has two raised bosses, with which the tensioning force of the tensioning cables can be adjusted. Mount tensioning springs with bracket on the top frame.

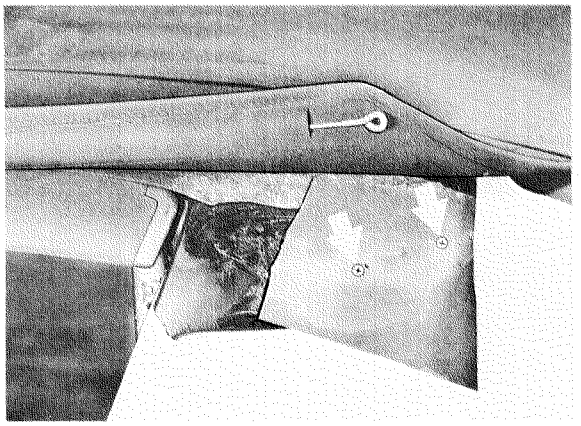


18. See "Installing Top and Top Seals" for rest of installing procedures.

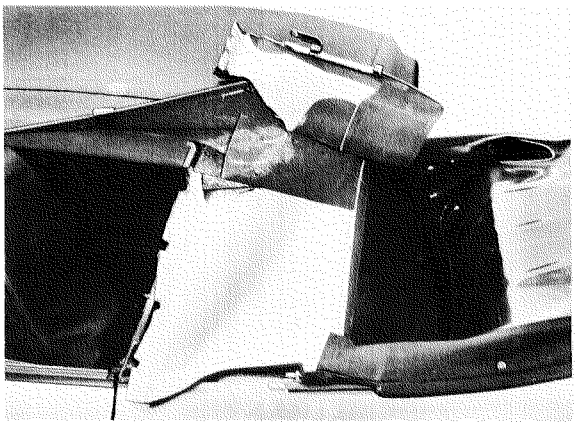
REMOVING AND INSTALLING REAR TOP CANVAS COVER WITH TENSIONING BAR AND MOUNTING RAIL

Removing

1. Remove the key boards, side wall trim panels, rear wall trim panel, B pillar seals and front top canvas cover on B pillars. See "Removing Top Canvas Cover Seals and Front Top Canvas Cover". Remove screws on main hoop and disconnect cemented points.



2. Disconnect canvas cover on B pillars and take off canvas cover.



Installing

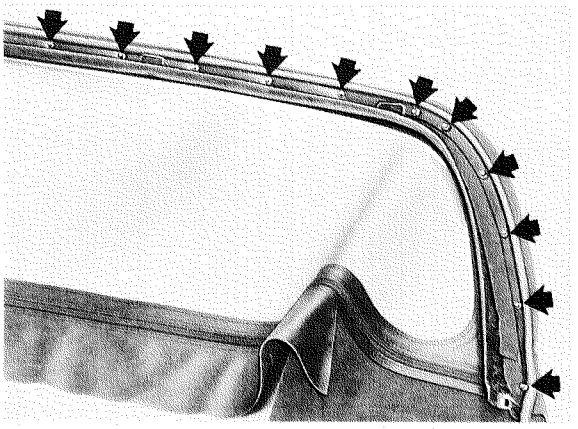
Installation is in reverse sequence.

REMOVING AND INSTALLING REAR TOP CANVAS COVER WITHOUT TENSIONING BAR AND MOUNTING RAIL

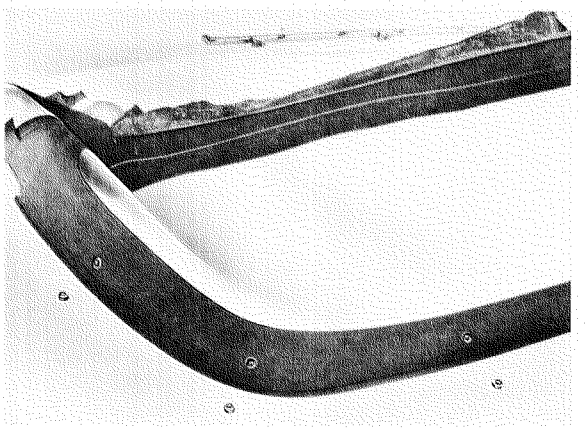
Removing

1. Remove key boards, side wall trim panels, rear wall trim panel, B pillar seals, front canvas cover and rear canvas cover on B pillars. See "Removing Top Canvas Cover Seals, Front and Rear Canvas Covers with Tensioning Bar and Mounting Rail".

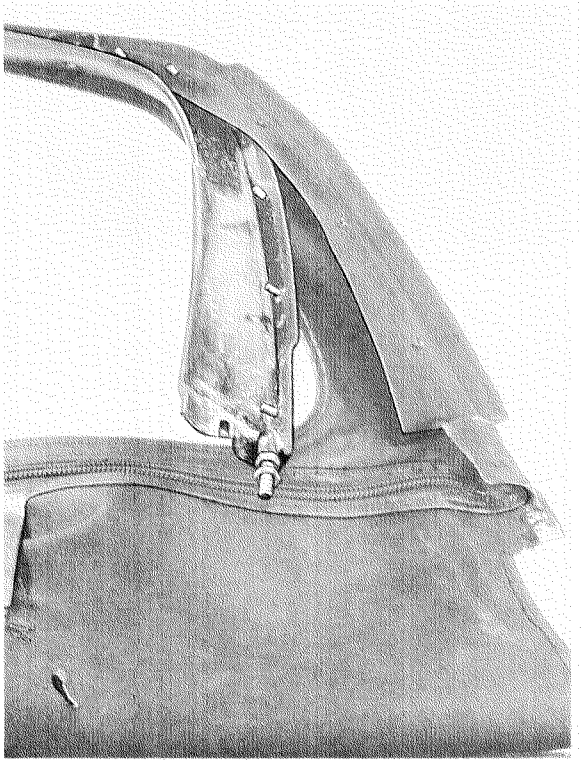
2. Remove nuts on tensioning bar. Lift off shims, clamping rails and seal.



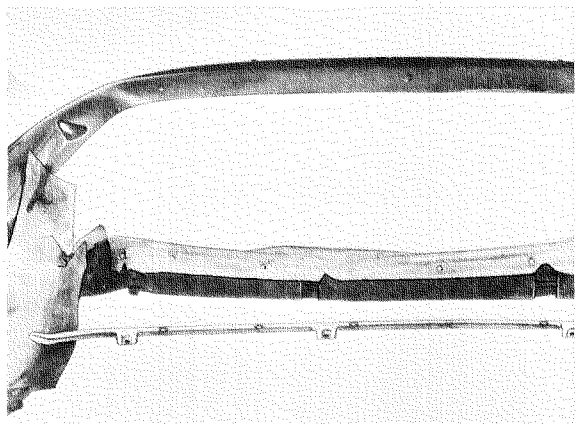
3. Unscrew snap heads and Tenax bases on tensioning bar.



4. Disconnect cemented canvas cover on tensioning bar.

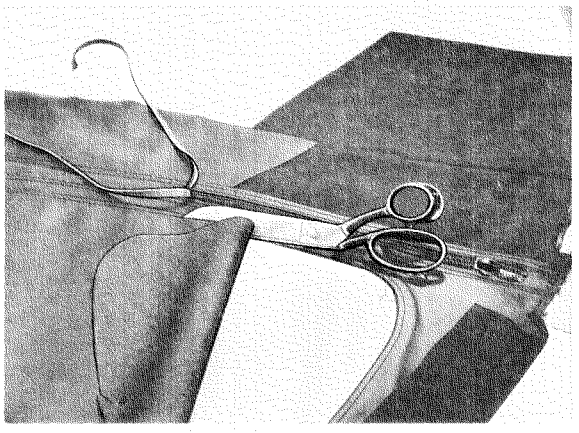


5. Disconnect and remove cemented mounting rail.

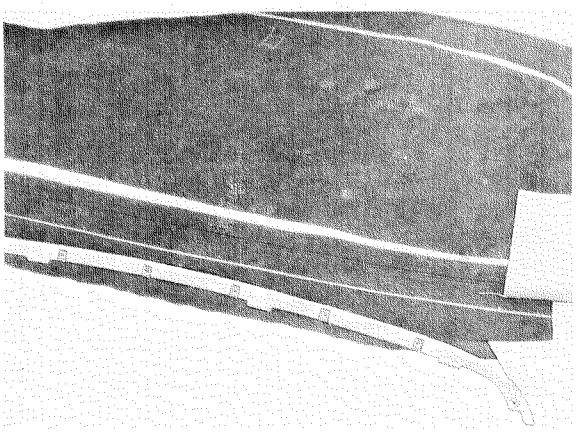


Installing

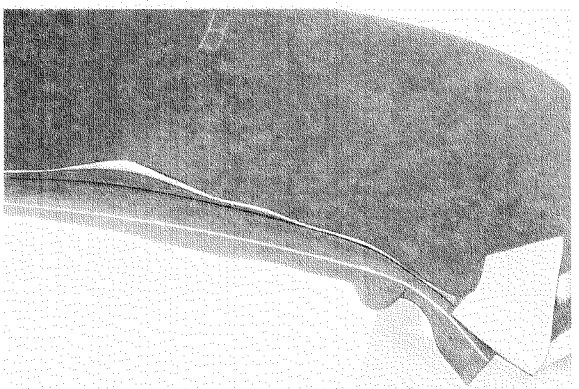
1. Cut out protective coat on inside of top canvas cover and zipper with a scissors.

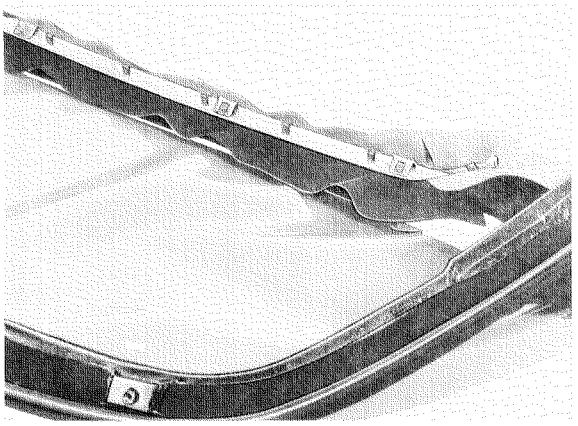


2. Mark distance from rear window to cementing edge of mounting rail on top canvas cover; approx. 80 mm.

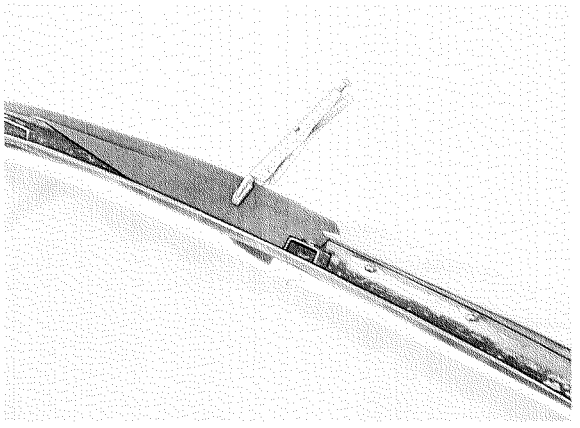


3. Cement mounting rail on top canvas cover according to marks.

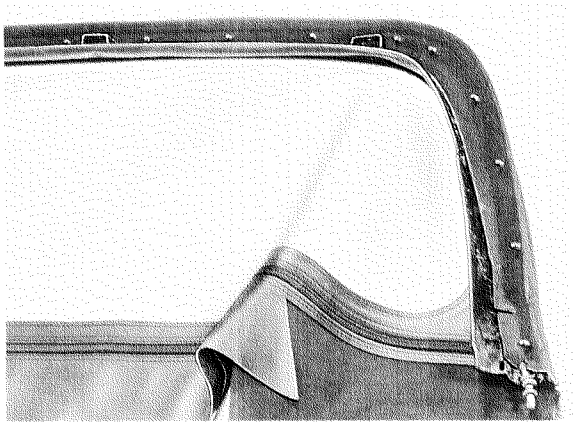




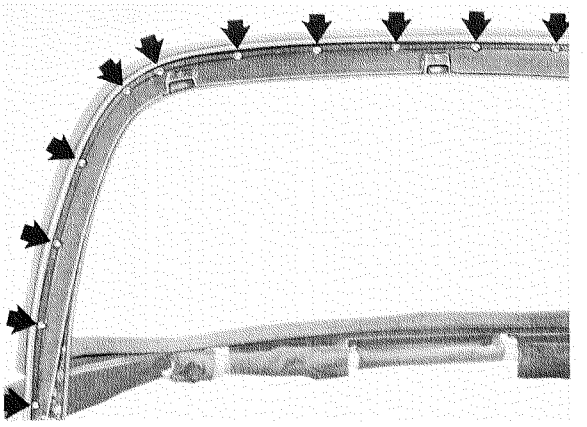
4. Fit canvas cover on tensioning bar and cut to size. Cement canvas cover on outside of tensioning bar from the center to left and right sides. Seam of canvas cover must run slightly higher than lower edge of the tensioning bar.



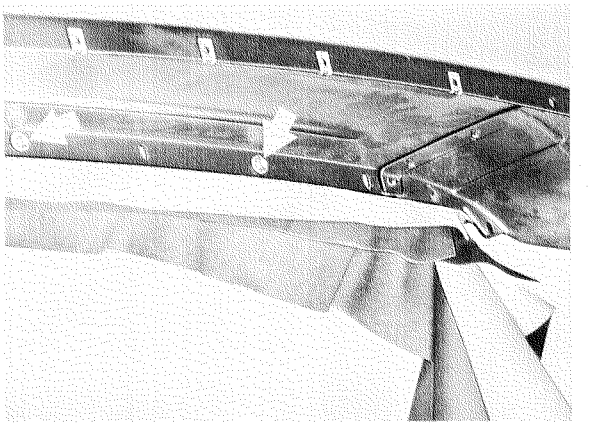
5. Cut holes in canvas cover for the staybolts and cement canvas cover on inside of tensioning bar.



6. Fit in seal and clamping rails, and mount with washers and nuts.



7. Place rear end of canvas cover on car. Place mounting rail with canvas cover on main hoop and install screws. Press down on rear of tensioning bar. If polyglass window does not have sufficient tension, disconnect canvas cover on the main hoop again. Disconnect cemented mounting rail and stretch the canvas cover.

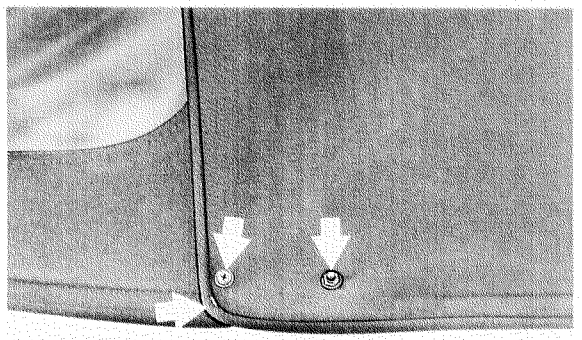


8. For remaining installation procedures refer to "Installing Rear Canvas Cover with Tensioning Bar and Mounting Rail".
Install top canvas cover seals.

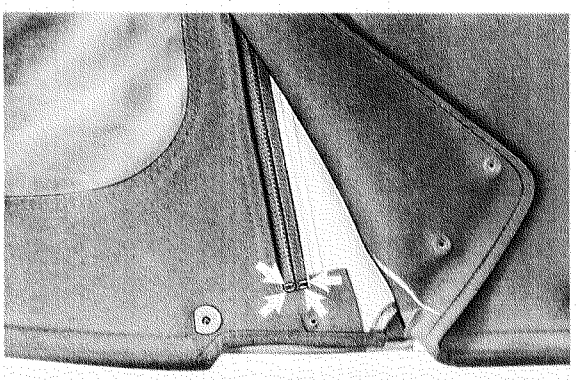
REPLACING ZIPPER SLIDE

Removing

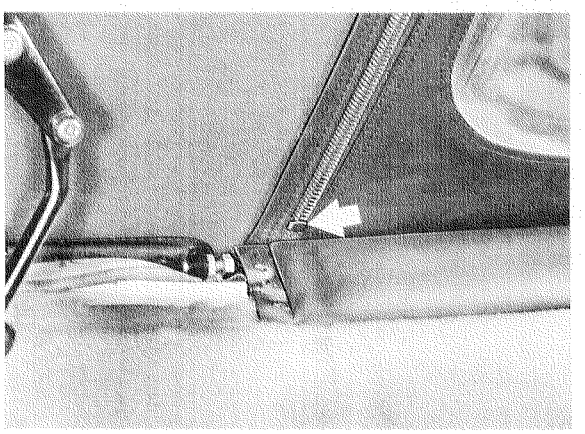
1. Remove Tenax base and self-tapping screw with cloth protection washer on the side, where the end hook is located (on rear end of front canvas cover) and open up sewn seam.



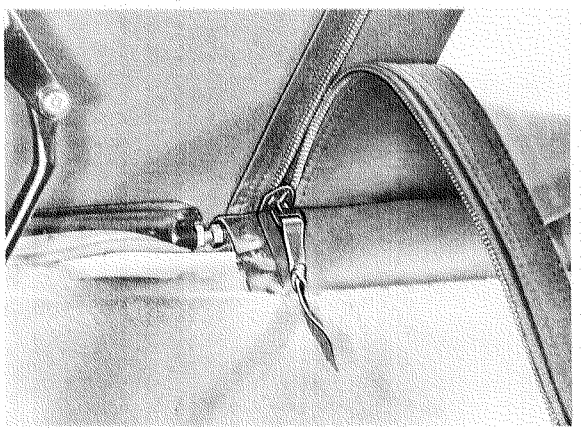
2. Fold open canvas cover and bend open claws of end hook.

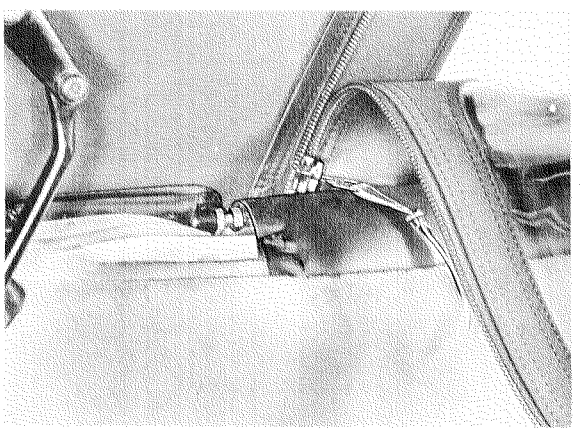


3. Lift off end hook towards inside.



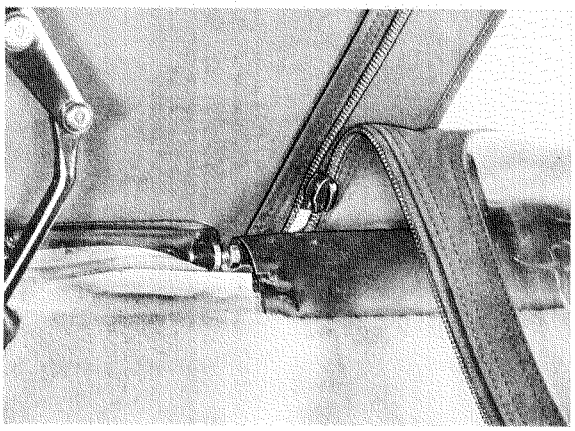
4. Remove key board. Slide zipper slide down and remove.



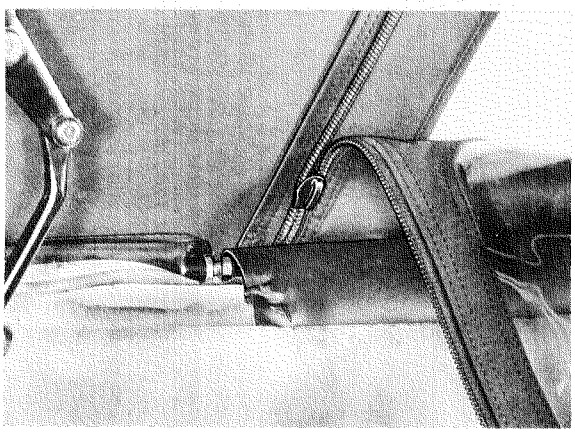


Installing

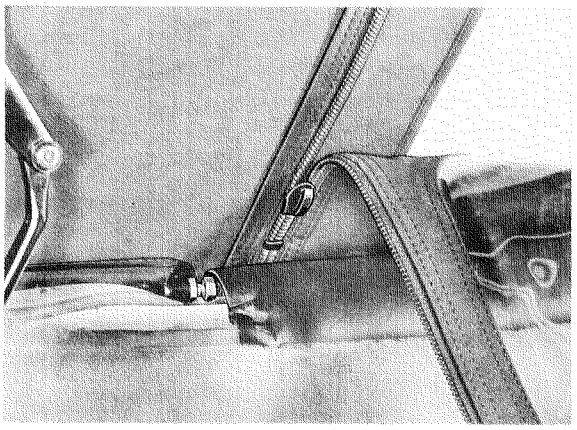
1. Press new zipper slide into rear zipper section.



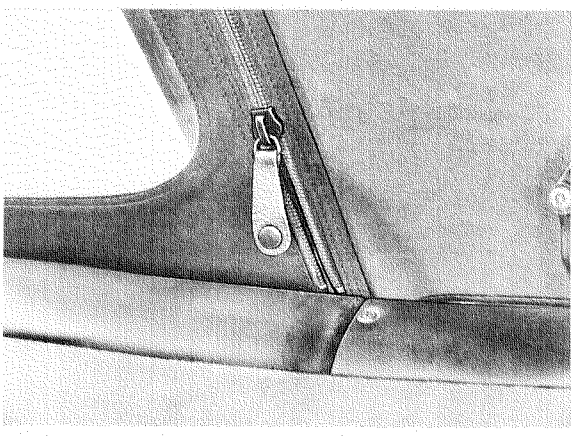
2. Insert zipper slide in front zipper section.



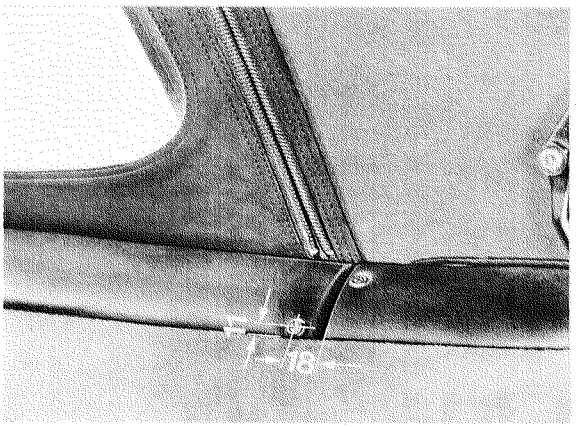
3. Insert end hook and bend down claws from the outside.



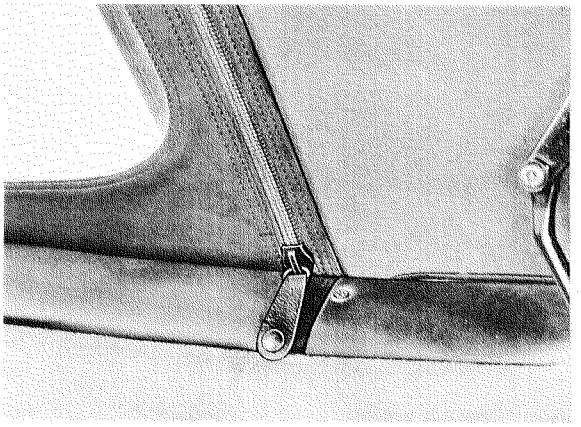
4. Mount pulling strap and snap head with eye on zipper slide.



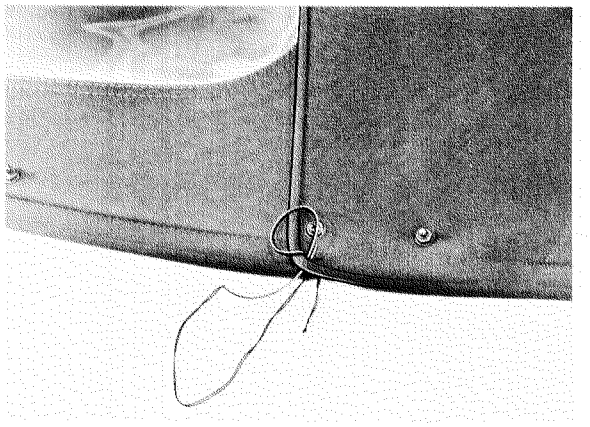
5. If applicable, drill a hole in the front of the key board, where the snap base is mounted with a self-tapping screw (see figure).



6. Press snap head into snap base.



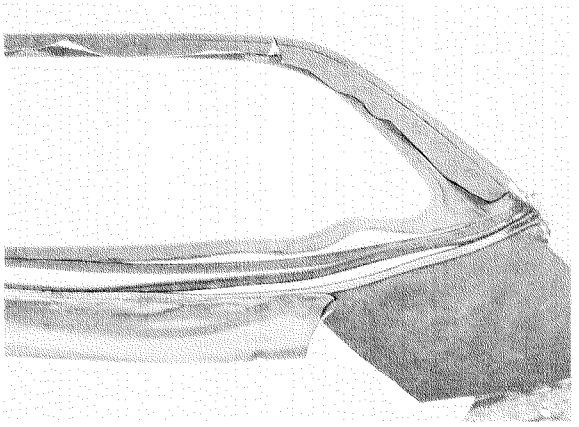
7. Install key board, Tenax base and self-tapping screw with cloth protection washer as well as front and rear canvas covers with two seam stitches.



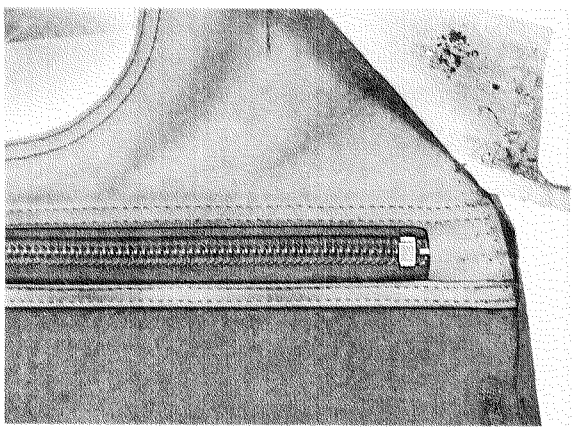
REMOVING AND INSTALLING ZIPPER

Removing

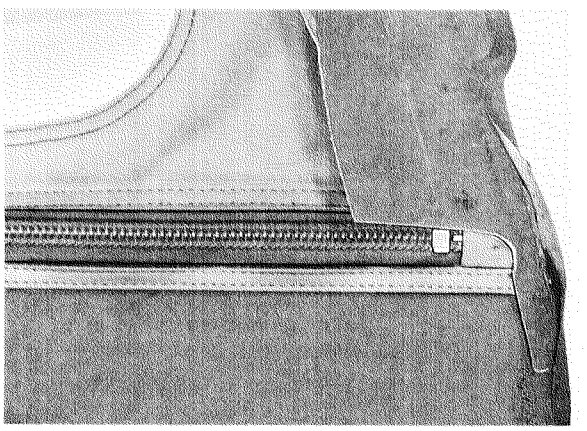
1. After removal of the rear top canvas cover without tensioning bar and without mounting rail, cut out zipper from rear canvas cover.



2. Cement canvas cover on zipper from above.



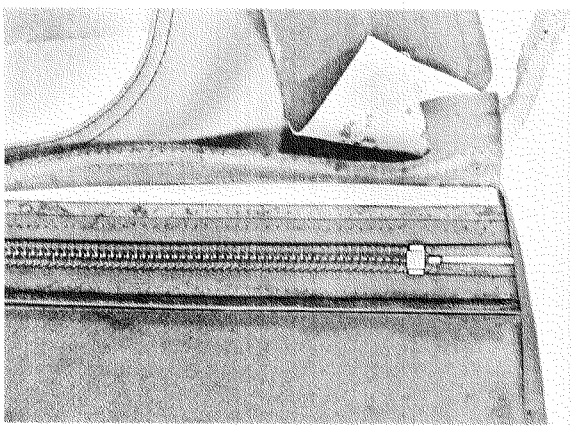
3. Cement tensioning section.



4. Wait until cement is dry and then sew zipper and border. Cement tensioning bar and mounting rail on canvas cover and install complete part in car.

Installing

1. Canvas cover must be free of sewing yarn at cut surfaces. Apply coat of cement on zipper and canvas cover. Cement bottom of zipper on canvas cover on one side.



RECOMMENDED CEMENTS OR ADHESIVES

Cements/Adhesives:

Terocal 2444 for cementing seals

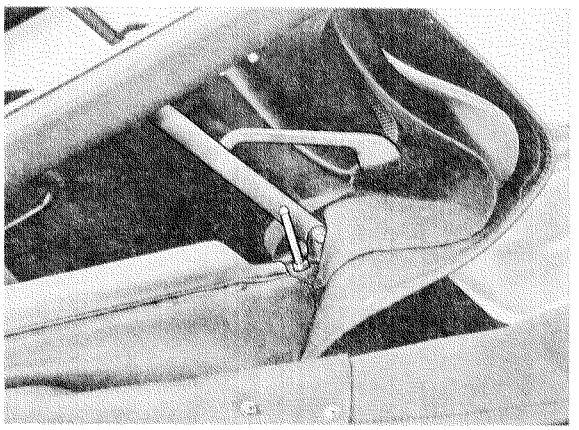
Manufacturer: Teroson Werke GmbH
6900 Heidelberg 1

Dekalin 3649 for installation of canvas on metal or plastic

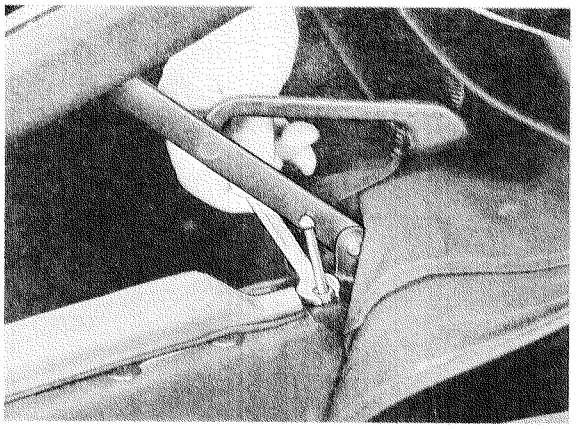
Manufacturer: Deutsche Klebestoffwerke GmbH
Rödiger & Sohn
6450 Hanau/Main

CONVERTING RETAINING PINS FOR TOP LOCK FROM M 6 TO M 8

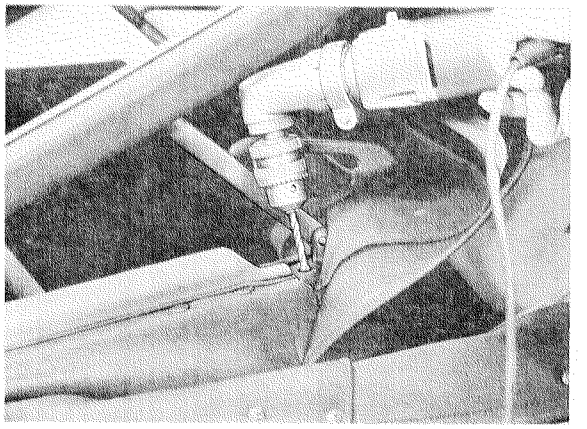
1. Open top only enough that retaining pins can be unscrewed.



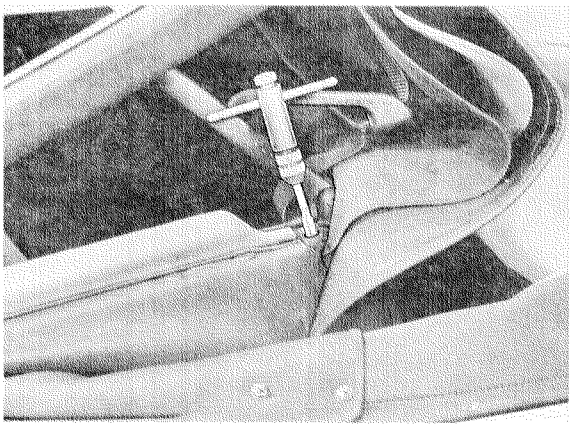
2. Unscrew lock nuts on retaining pins and remove retaining pins from main hoopstick.

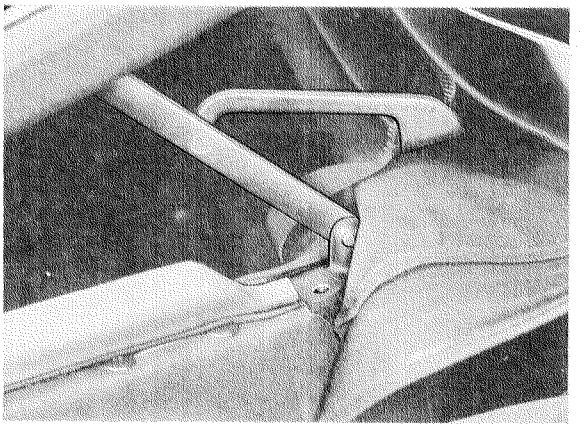


3. Drill out threads with an angle drill and 6.5 mm dia. drill bit. Remove burrs thoroughly.

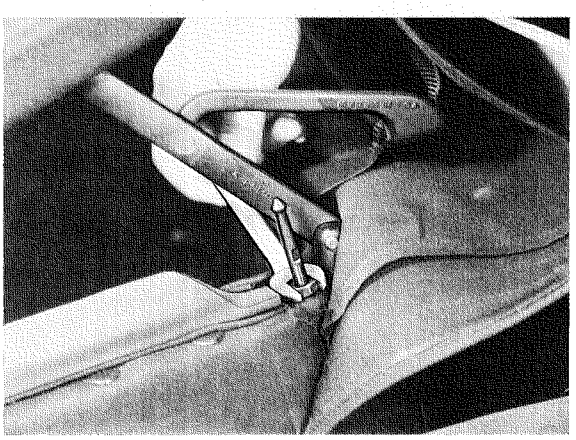


4. Cut M 8 threads in drilled holes. When tapping make sure burrs are not trapped in tapper. Lubricate with petroleum. Clean threads thoroughly after tapping bores.





5. Install lock nuts on retaining pins. Screw retaining pins in main hoopstick, adjust retaining pins and tighten lock nuts.



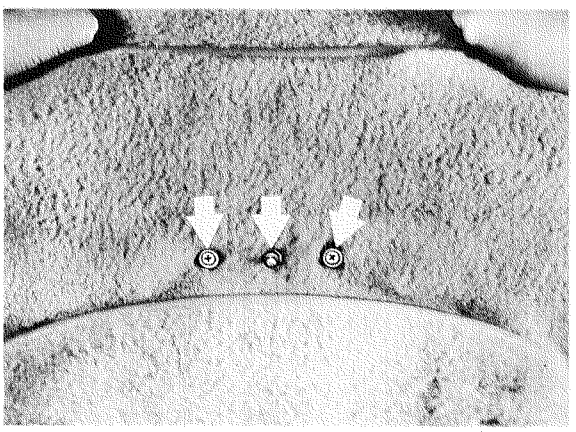
SERVICE INSTALLING STANDARD PERSENNING

Note:

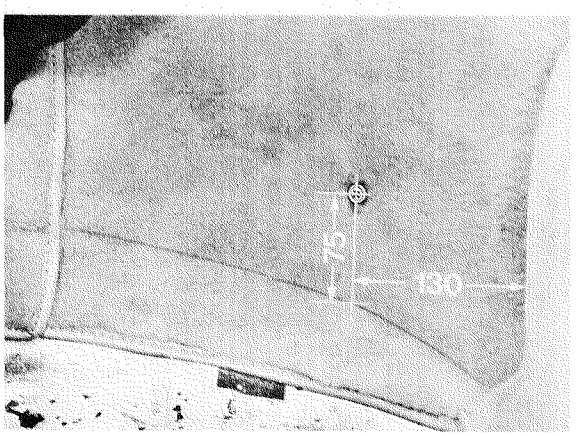
1985 model cars have mounting points for the standard persenning.

Installing

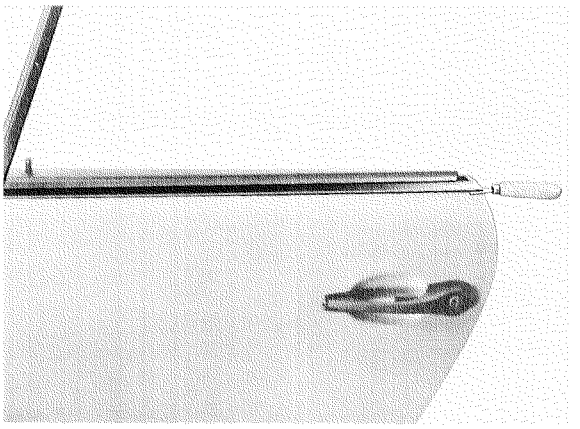
1. Puncture holes through trim on heel plate with a suitable tool and screw Tenax and snap bases on console.



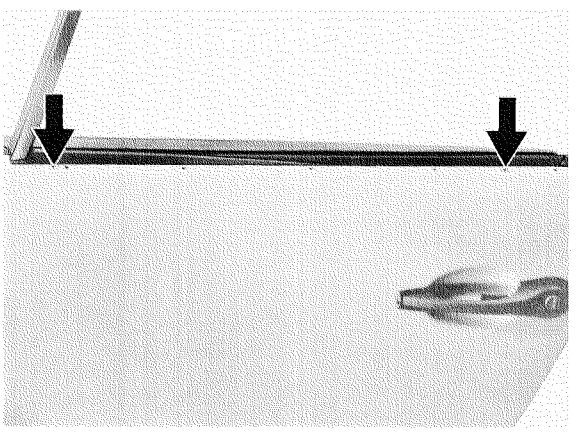
2. Mount snap bases on side members at specified distances.



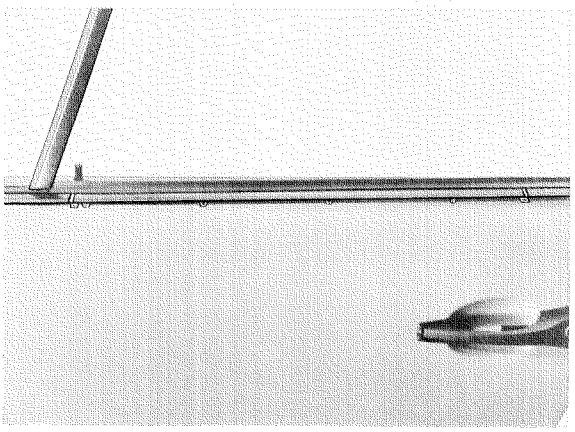
3. Lift ornamental strips off of doors.



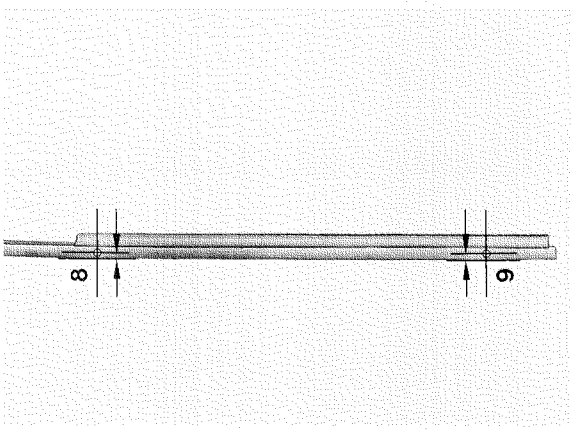
4. Clip Pretole cages in square holes of doors.



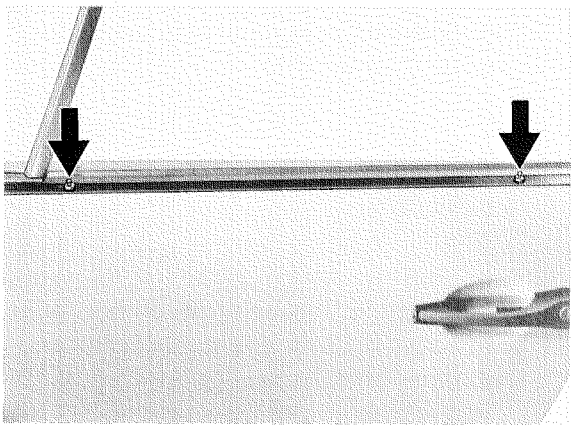
5. Place ornamental strips on doors to be flush at rear and mark center of Prestole cages on ornamental strips.



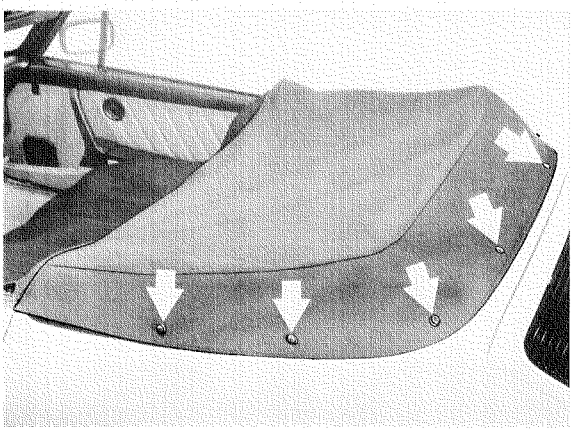
6. Mark ornamental strips according to given distances and drill 6 mm dia. holes.



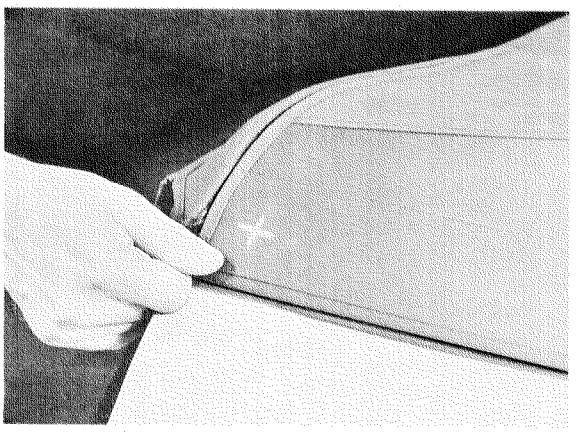
7. Clip in ornamental strips on doors and screw on Tenax bases.

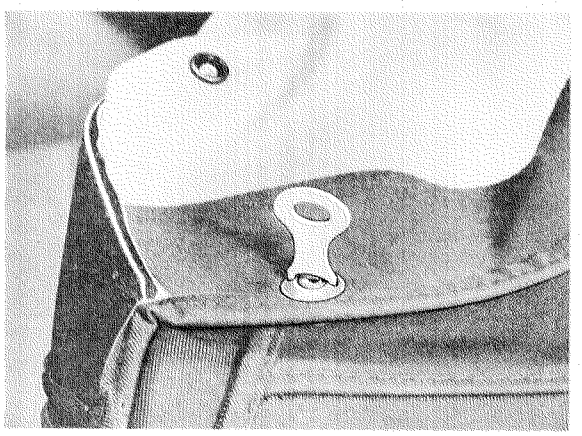


8. Mount persenning on rear end of car with snaps and Tenax heads.

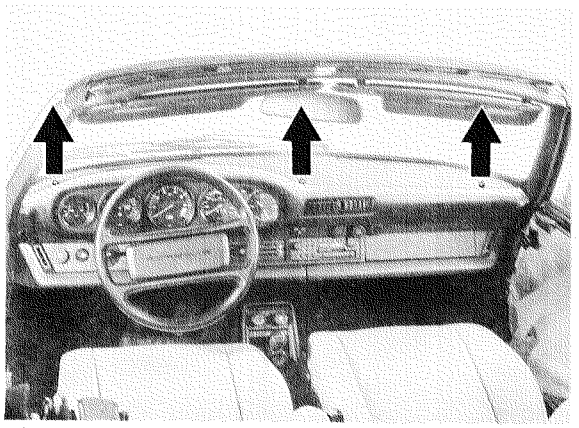


9. Stretch persenning forward and down. Mark mounting points, drill 9 mm dia. holes and mount Tenax heads on persenning (using supplied special wrench).

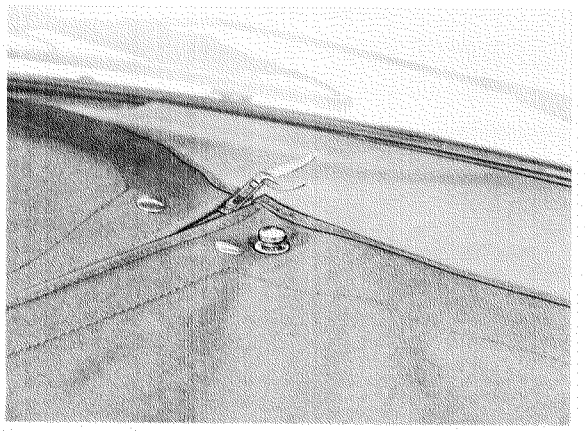




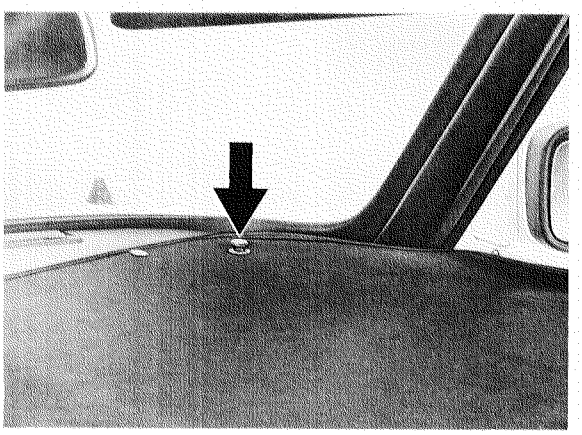
10. Take off caps on instrument panel.



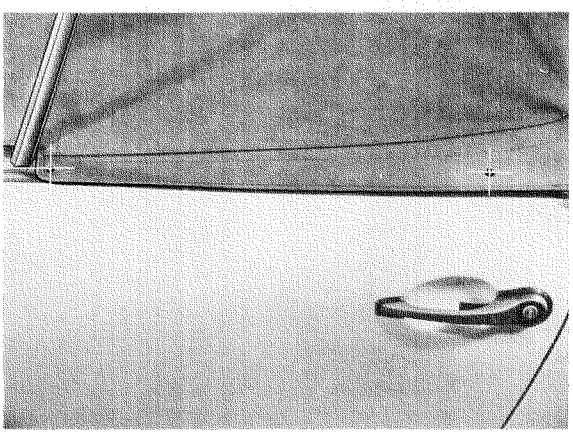
11. Stretch middle of persenning forward. Mark mounting points, make holes, mount Tenax heads on persenning and clip in Tenax bases on instrument panel.

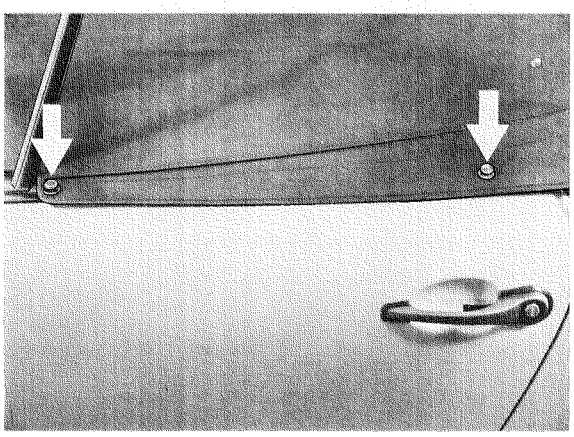


12. Stretch persenning toward outside and forward. Mark mounting points, make holes, mount Tenax heads on persenning and clip in Tenax bases.



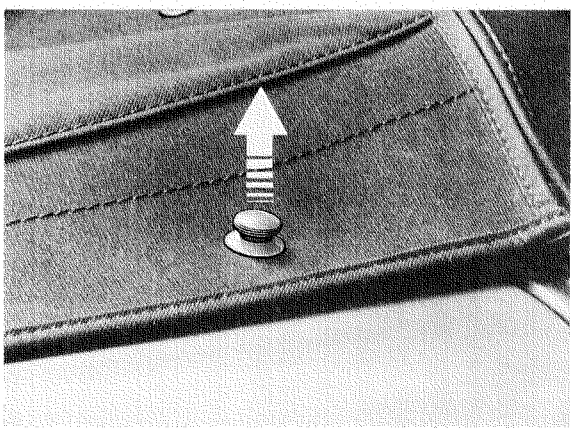
13. Mark mounting points on doors and persenning, make holes, mount Tenax heads on persenning and clip in Tenax bases.





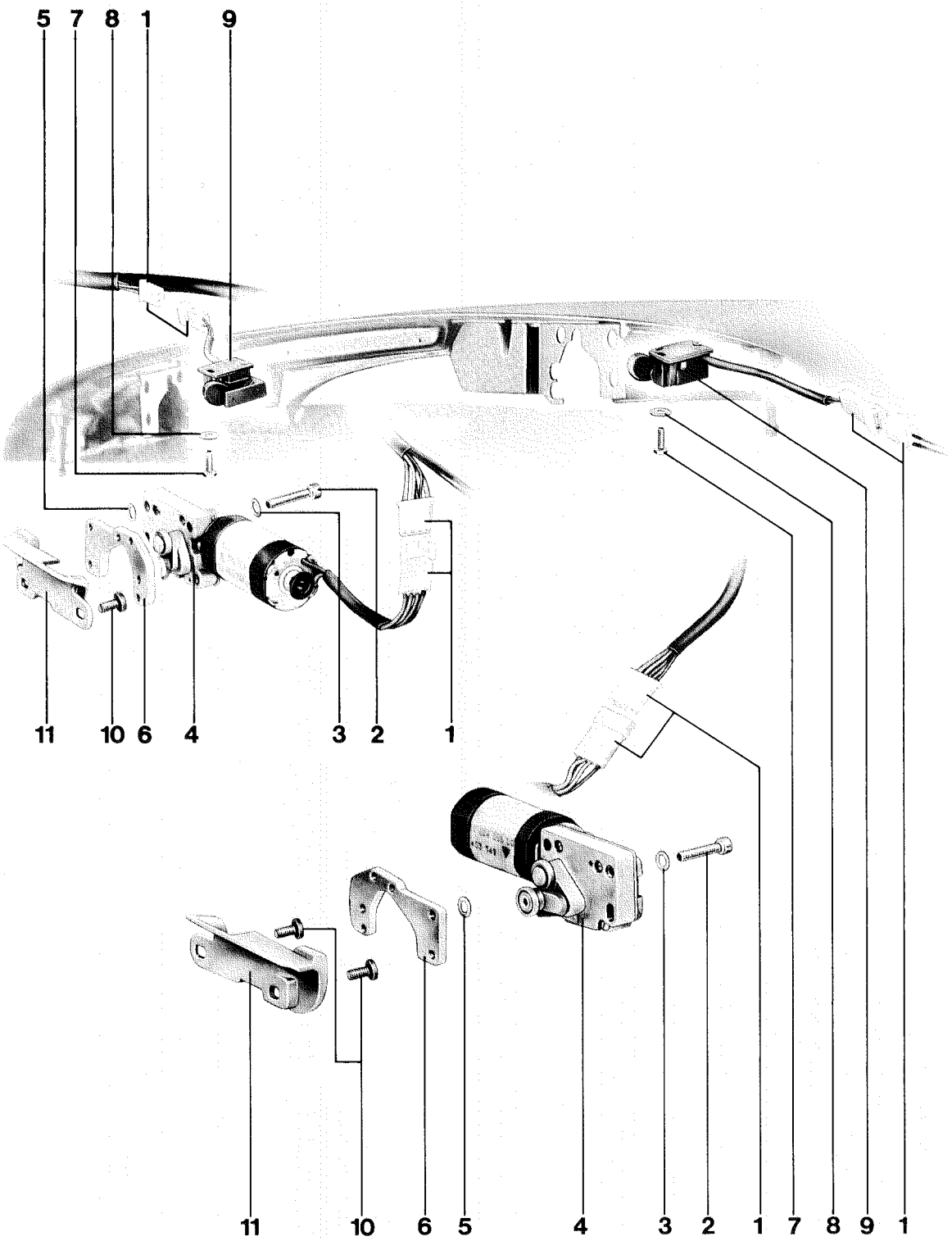
Note:

Only unclip and clip in Tenax heads in pulled state.



REMOVING AND INSTALLING ELECTRIC CONVERTIBLE TOP LOCKING MECHANISM

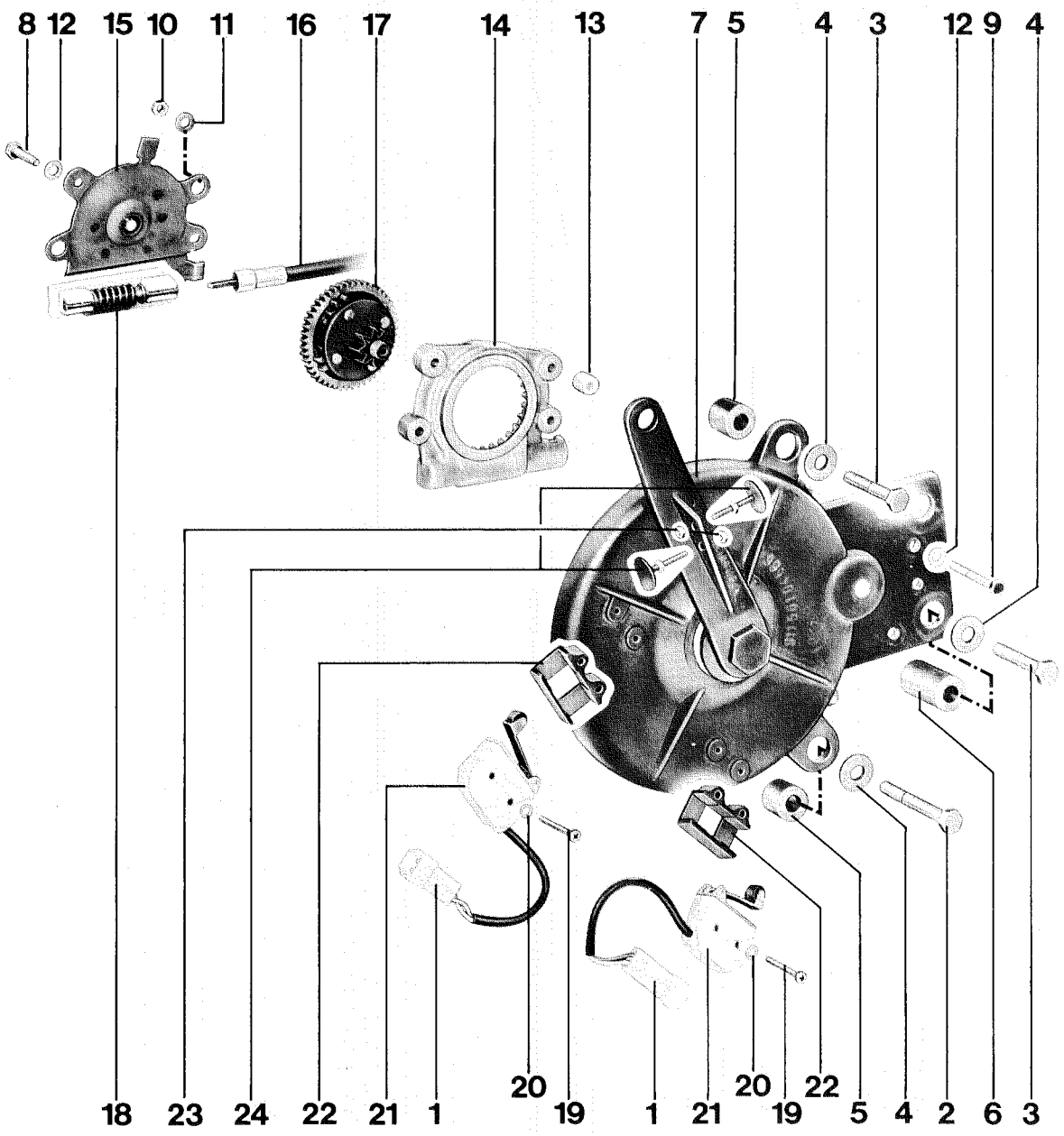
REMOVING AND INSTALLING ELECTRIC CONVERTIBLE TOP LOCKING MECHANISM



No.	Description	Qty.	Note: Removal	Installation
1	Electric plug	4	Take apart plug connector	Re-connect plug connector
2	Fillister-head screw M 6 x 30	4		
3	Plain washer A 6.4	4		
4	Electric motor	2		
5	Spacer	4		
6	Threaded plate	2		
7	Hexagon screw M 4 x 10	4		
8	Plain washer B 4.3	4		
9	Microswitch	2		
10	Fillister-head screw M 6 x 12	4		
11	Guide sleeve	2		

REMOVING AND INSTALLING SWIVEL DRIVE

REMOVING AND INSTALLING SWIVEL DRIVE

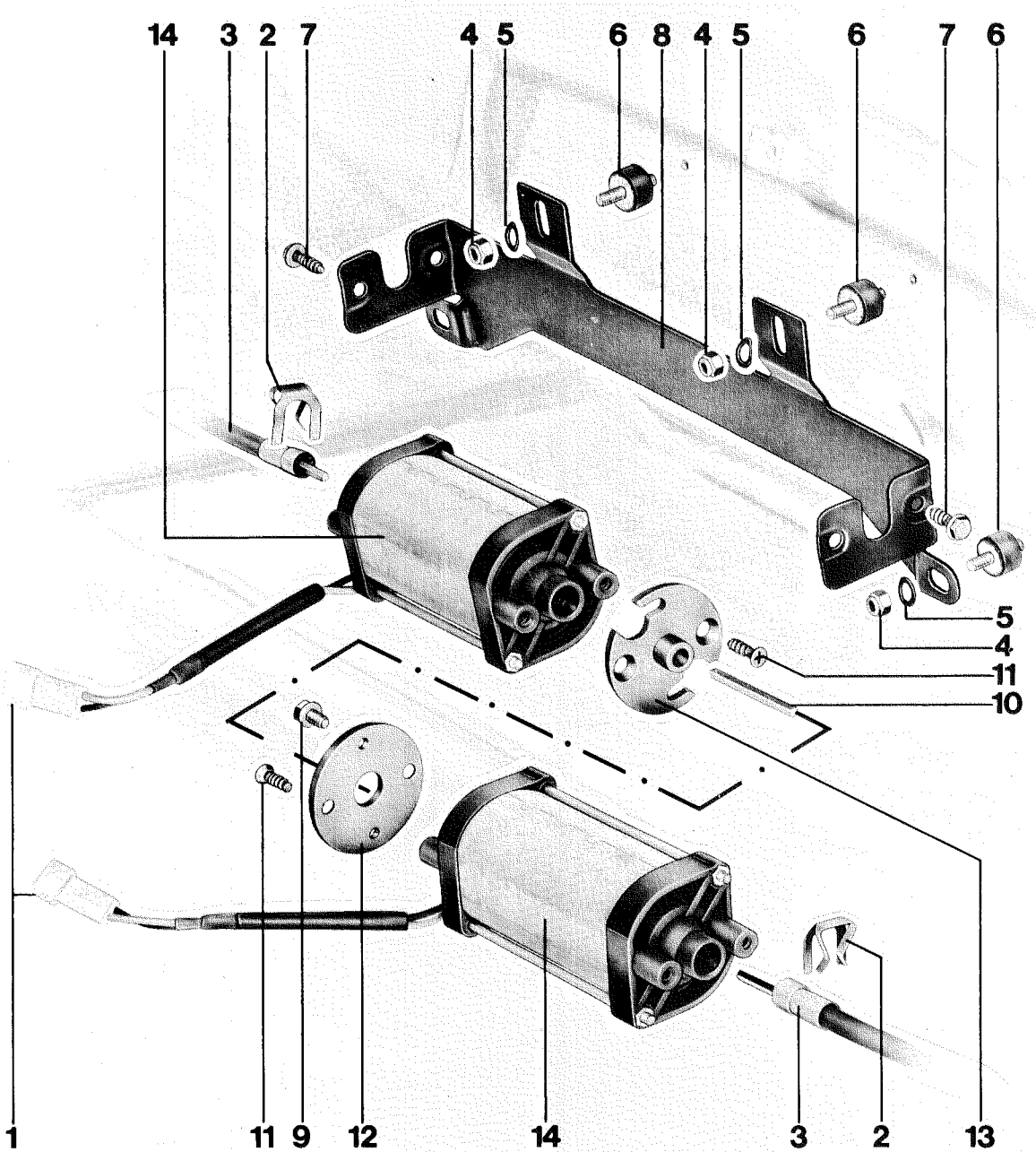


No.	Description	Qty.	Note: Removal	Installation
1	Electric plug	2	Take apart plug connector	Re-connect plug connector
2	Hexagon screw M 6 x 50	2		
3	Hexagon screw M 6 x 35	4		
4	Plain washer A 6.4	6		
5	Bushing	4		
6	Bushing	2		
7	Swivel drive	2		
8	Hexagon screw M 4 x 20	2		
9	Hexagon screw M 4 x 35	2		
10	Locking nut M 4	2		
11	Spacer	4		
12	Plain washer A 4.3	4		
13	Spacer piece	4		
14	Planetary-gear housing	2		

No.	Description	Qty.	Note: Removal	Installation
15	Cover for planetary gear	2		
16	Drive shaft	2		
17	Planetary gear	2		
18	Worm	2		
19	Oval-head screw	4		
20	Plain - washer A 3.2	4		
21	Microswitch	2		
22	Microswitch holder	2		
23	Hexagon nut M 3	4		
24	Headless screw M 3 x 20	2		

REMOVING AND INSTALLING ELECTRIC CONVERTIBLE TOP DRIVE

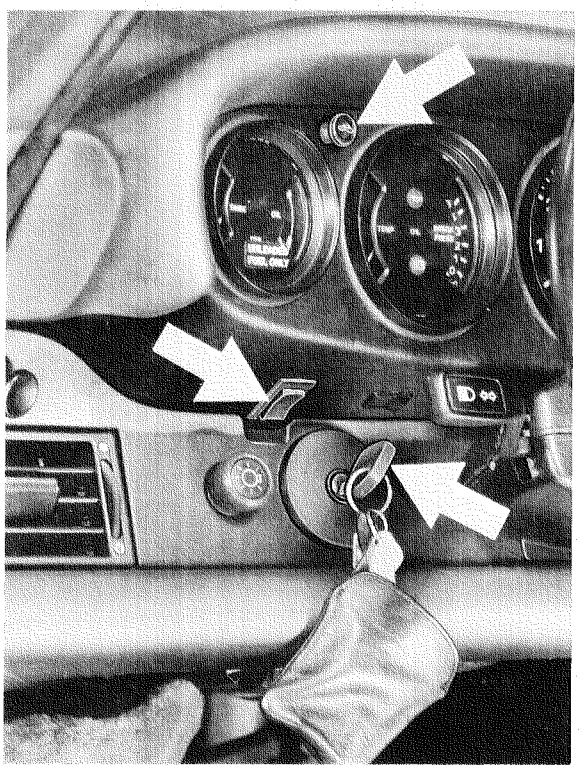
REMOVING AND INSTALLING ELECTRIC CONVERTIBLE TOP DRIVE



No.	Description	Qty.	Note: Removal	Installation
1	Electric plug	2	Take apart plug connector	Re-connect plug connector
2	Spring clamp	2	Unclip	Clip in
3	Drive shaft	2	Pull out	Grease square section of drive shaft and introduce into corresponding hole in motor
4	Hexagon nut M 5	4		
5	Washer A5.3	4		
6	Bonded-rubber metal bearing	4		
7	Locking screw M 5 x 16	4		
8	Bracket	1		
9	Hexagon screw M 5 x 10	2		
10	Connecting piece	1		
11	Locking screw	4		
12	Connecting disk	1		
13	Connecting disk	1		
14	Electric motor	2		

ADJUSTING ELECTRIC CONVERTIBLE TOP

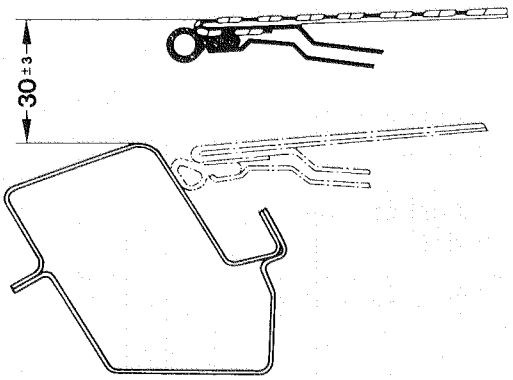
1. To operate the convertible top, the ignition key must be turned to the radio position. When opening and closing the top, the indicator lamp must come on until the opening or closing operation is completed. The rocker switch must be kept pressed throughout the entire operation.



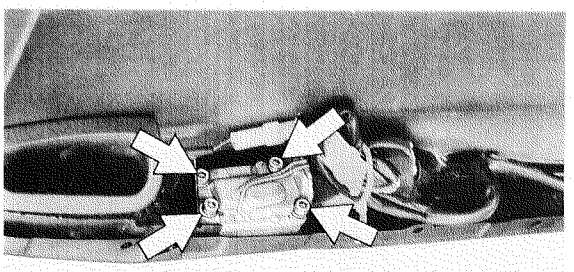
2. Adjust the centering pegs so that they come up against the rear edge of the guide sleeves and engage them centrally.



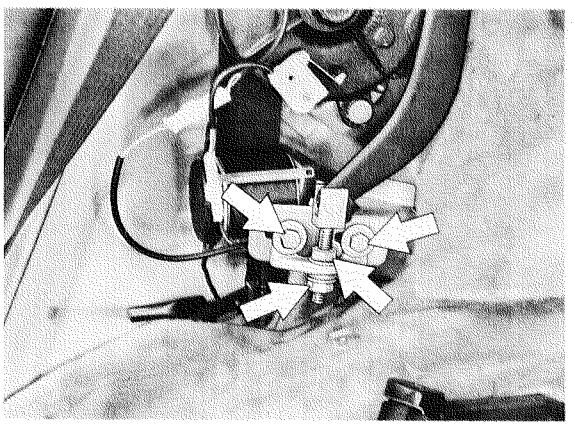
3. To adjust the microswitches, the convertible top must be at a distance of 30 ± 3 mm from the top edge of the windshield frame. The microswitches are adjusted so that, at this distance, they touch the guide sleeves.



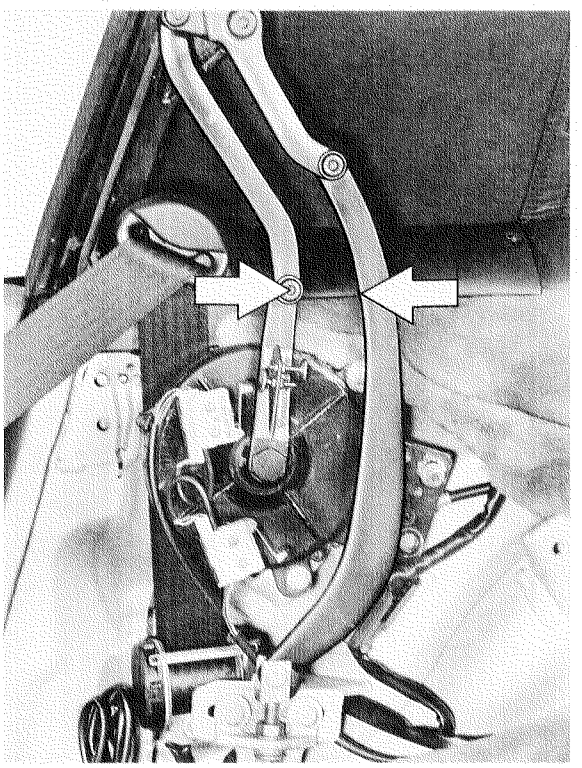
4. To adjust the locking motors, loosen the fastening screws, set the convertible top flush with the top edge of the windshield frame and re-tighten fastening screws.



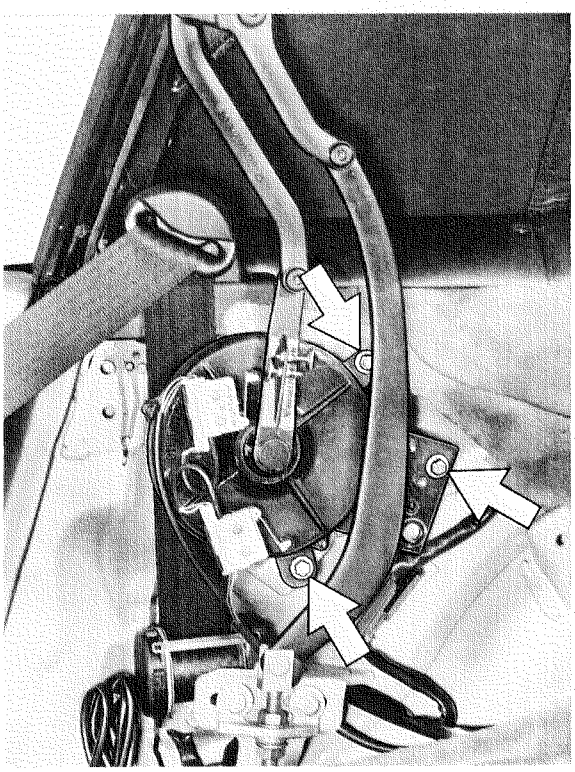
5. The forward-movement and height adjustment can be made at the bearing blocks of the reverse-transfer levers by means of minor corrections so that the guide pegs latch into the windshield frame exactly.

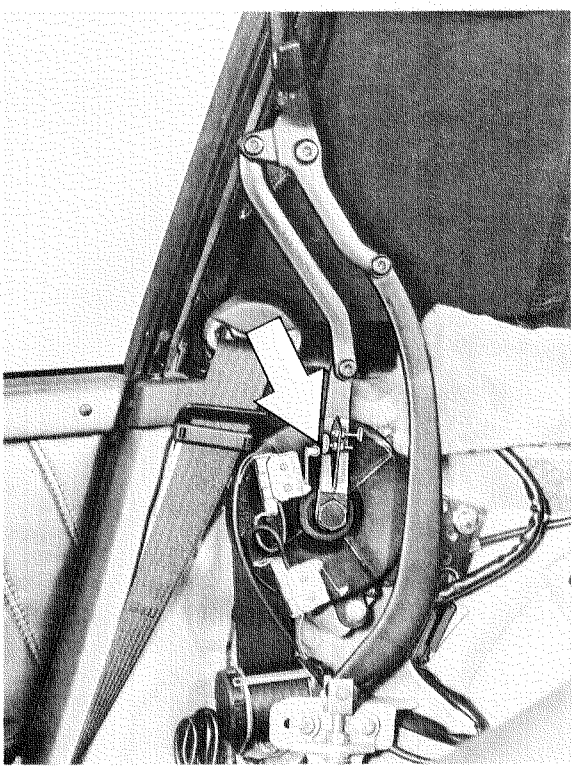


6. The dimension at the screwing point - push-rod guide lever to lever of convertible-top frame - must be identical on left and right.



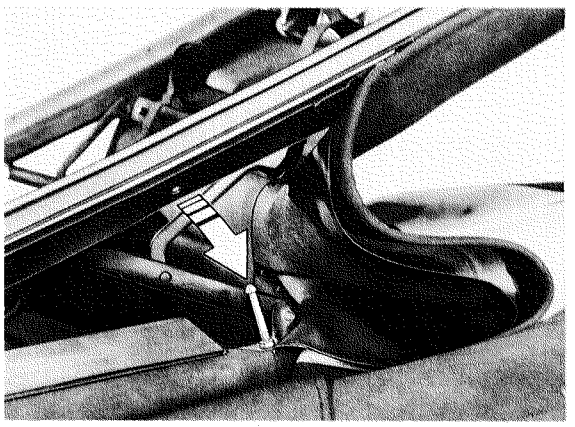
7. If necessary, loosen the fastening screws of the swivel drives and set the gap on both sides to the same dimension.

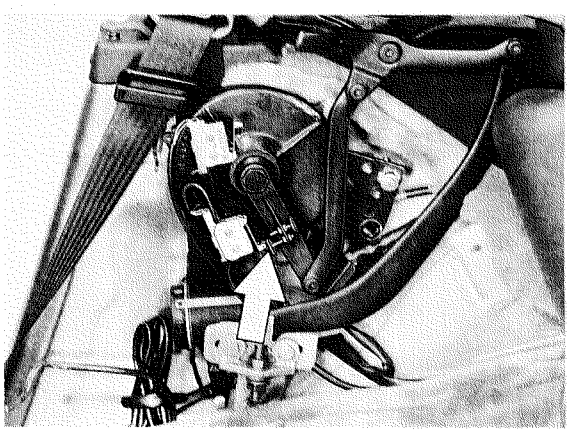




8. The upper microswitch is adjusted with the convertible top closed. The gap between the adjusting screw and the microswitch must be 3 mm.

9. The lower microswitch is adjusted with the convertible top open. Adjust the adjusting screw so that the microswitch switches off when the top engages the holding pegs.

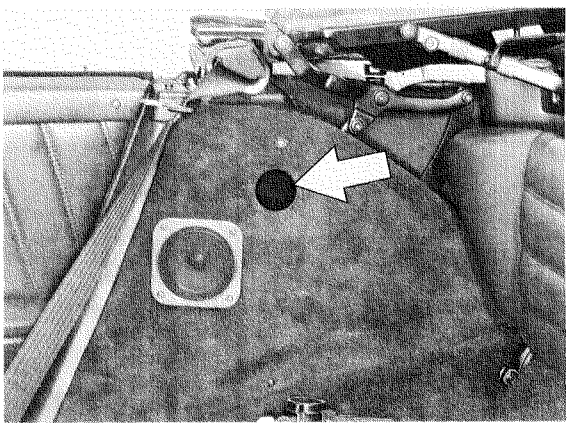




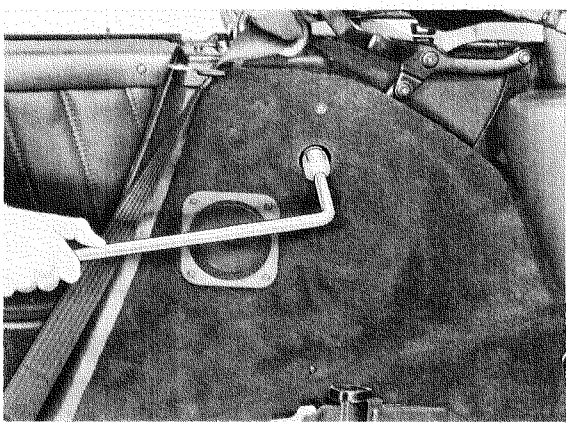
EMERGENCY OPERATION OF ELECTRIC CONVERTIBLE TOP

In the case of the failure of the electric drive, the convertible top can be operated by hand.

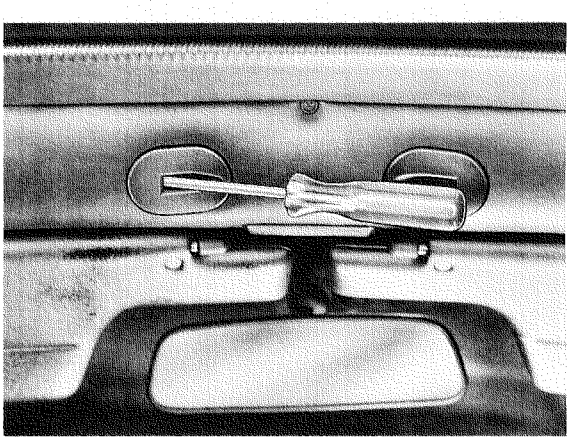
1. Remove the cover caps in the sidewall panels on left and right.



2. With the wheel-nut wrench, loosen the screws on the left-hand and right-hand drives by 4 turns.



3. Fold up convertible top and lay on windshield frame, operate rocker switch and lock convertible top. If the locking motors are not running, use a screw driver to turn the locking motors alternately until the closing cranks engage the guides.



Main stanchion for electric folding roof, replacing

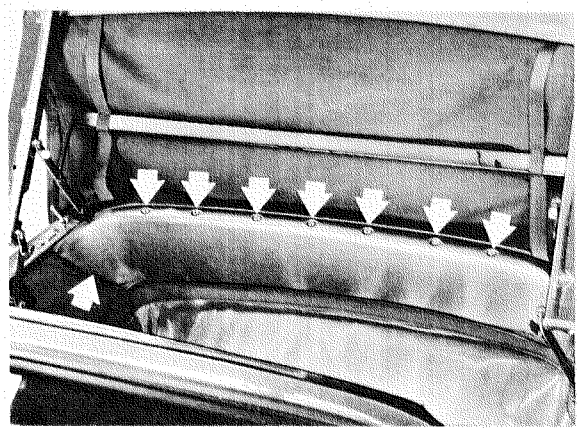
Note:

Even when both main stanchions are broken, they must be replaced one after the other, i.e. completely carry out work on one side before starting on the other side.

Removing

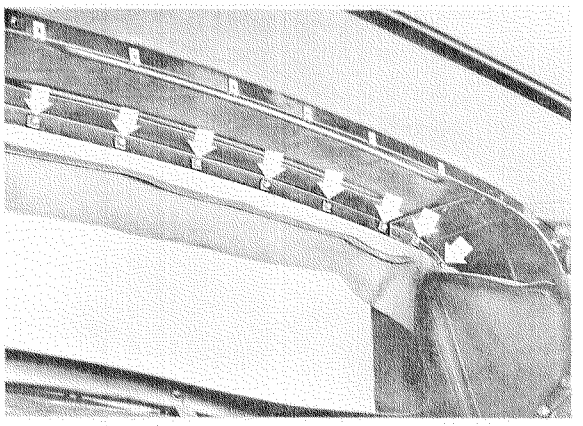
1. Remove cover from the mounting points of the mains stanchion bearing and side wall panel.

2. Remove rear folding-roof panel.



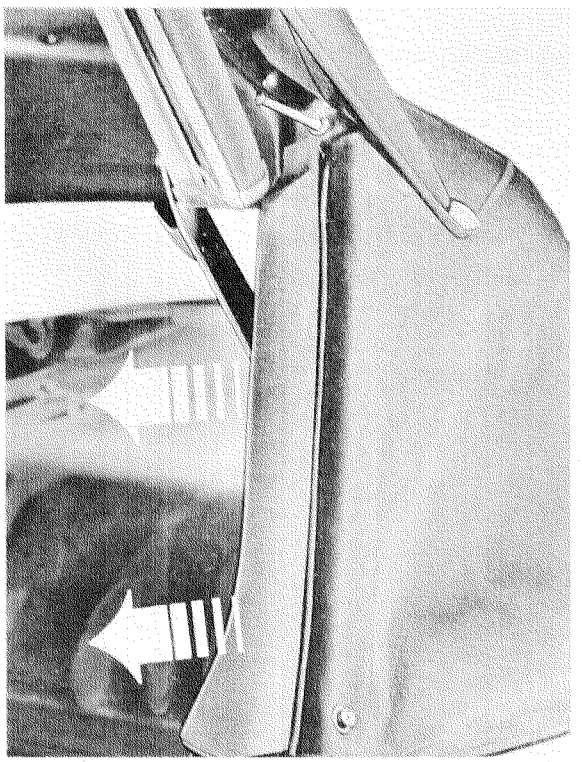
83/10167

3. Loosen the adhesive of the front and rear folding roof cover and undo screws of the fastening rails.



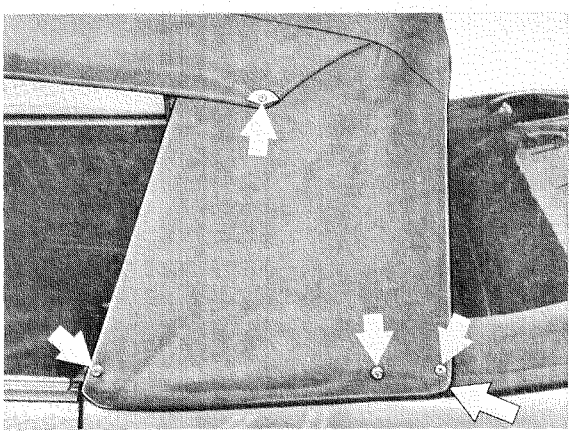
83/10222

4. Remove nuts and washers from the B-column seal and lift these forwards, half opening the folding roof.



83/10115

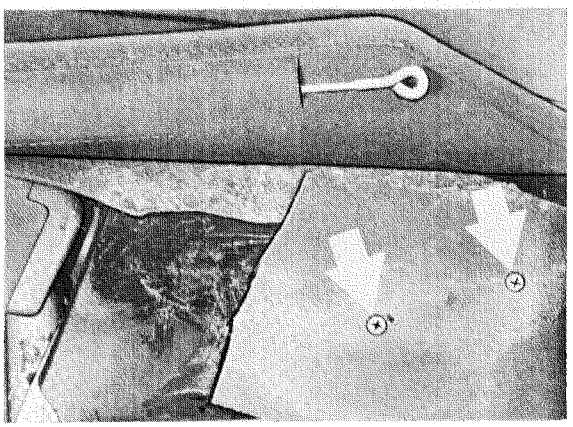
5. Dismantle pushbutton, lower Tenax parts, fastening bolts and corner piece for tension cable. Separate the seam between front and rear roof cover.



83/10171

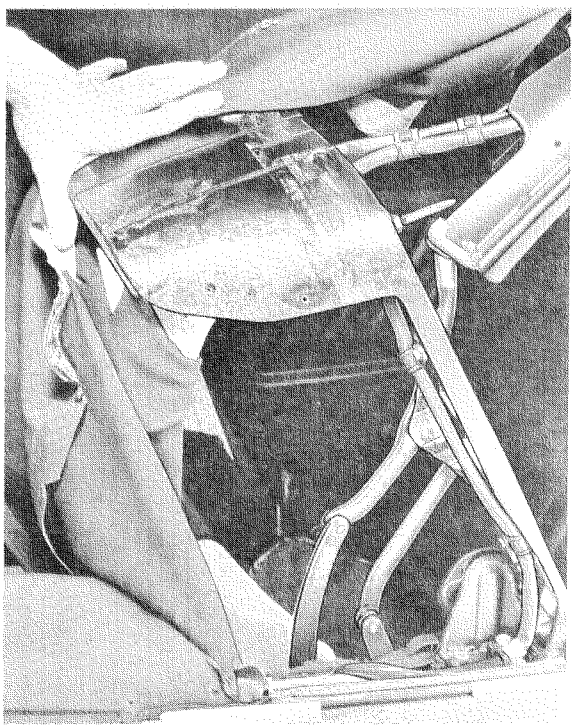
6. Loosen seal with clamping plate and folding roof cover adhesive at the main stanchion. Remove fastening screw from serrated strip and pull this away from the location bolt.

7. Remove screws from the roof tensioning strips and loosen adhesion.



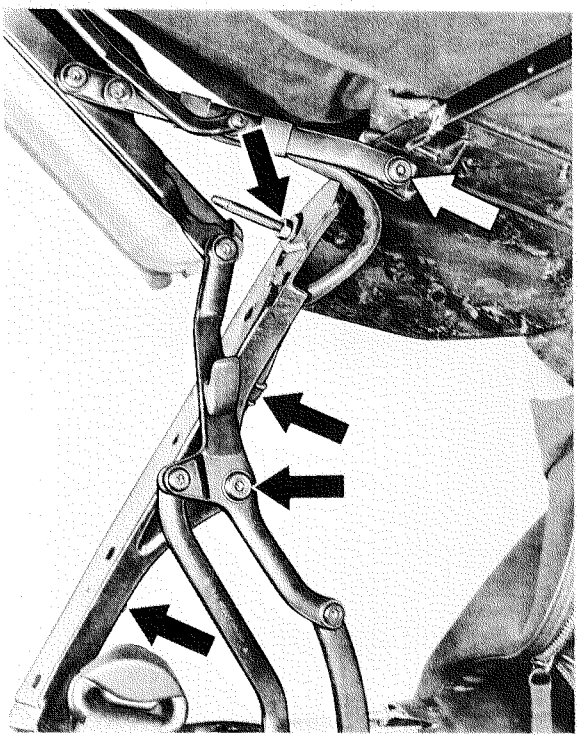
83/10220

8. Remove tensioning rubber fastening wire. Loosen remaining adhesive of folding roof cover from main stanchion.



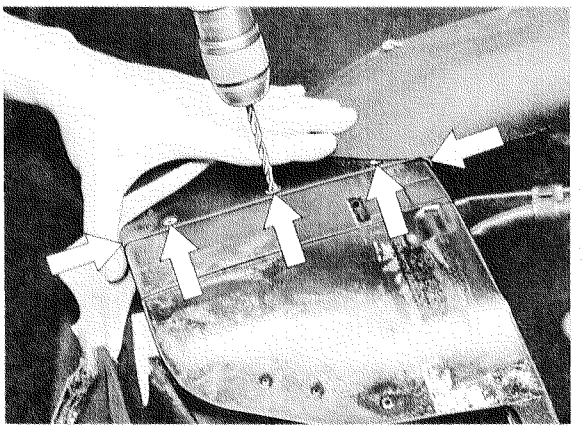
87/856

9. Remove wiring harness, retaining pins and headless screws of steering lever from main stanchion.



87/854

10. Drill through rivets between main stanchion and roof frame (drill 6 mm).



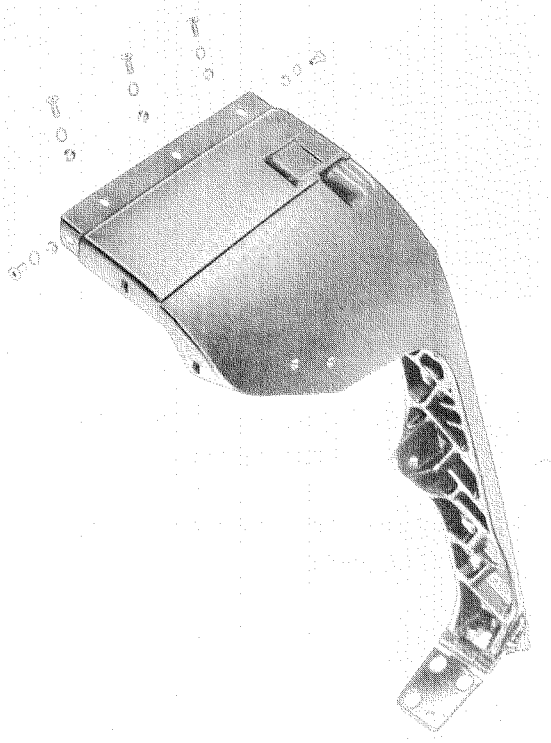
87/855

11. Undo fastening screws on main stanchion mounting and remove main stanchion.

12. Countersink all drill holes on roof frame to 90 from outside.

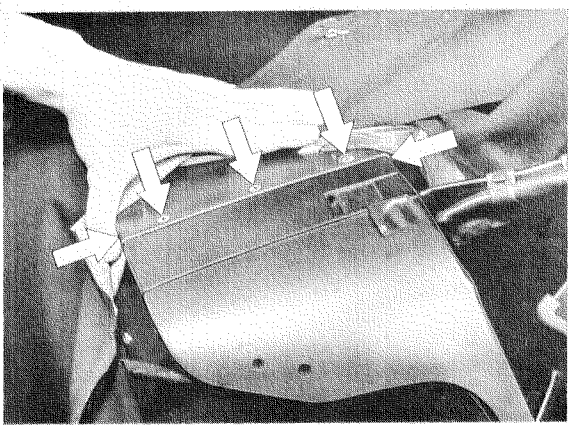
Installing

Right-hand main stanchion, complete with main stanchion mounting, bolts, washers and nuts.

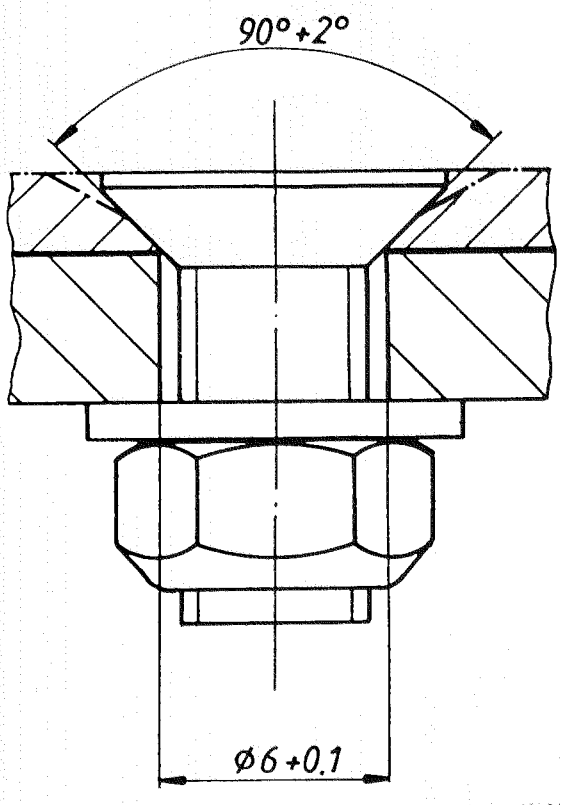


87/857

1. Insert seal in the U profile of the roof frame, insert main stanchion and fasten with bolts.



87/853



40 -61

2. Assemble main stanchion mounting so that the front edges of the main stanchion are flush with the B column.

3. Install steering lever, retaining pins and wiring harness on the main stanchion.

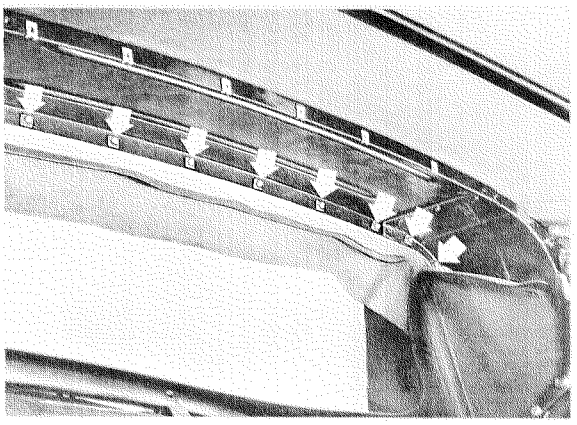
Note:

The headless screws for the steering lever must be replaced with new ones because of their micro-encapsulation.

4. Cover the join from main stanchion to roof frame with a strip of adhesive tape, including the screw heads.

5. Suspend tension-rubber of the folding roof with the fastening wire on the main stanchion.

6. Attach fastening rails inside with screws and glue front and rear roof cover.

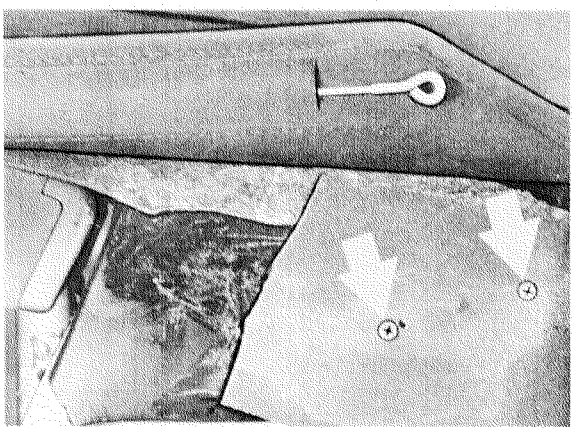


83/10222

7. Tension roof cover with the roof closed and mark the position of the hole for the tension wire on the main stanchion.

8. Drill the marking (drill 4 mm).

9. Glue front and rear roof cover and screw in screws.



83/10220

Note:

Glue the front roof cover in such a way that the visible outer seam runs under the edge of the main stanchion.

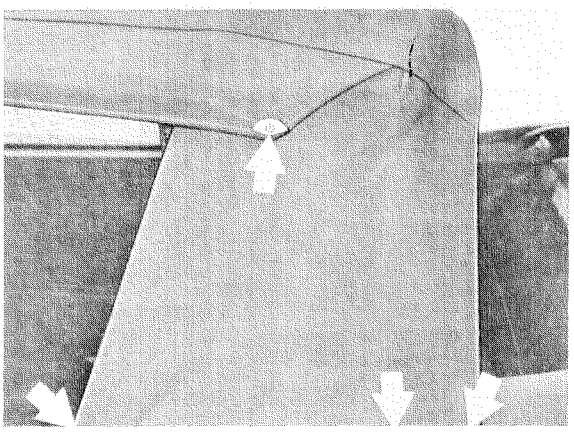
10. Guide serrated strip over the location bolts and fasten with screws. Mount roof cover with pushbutton, lower Tenax parts and fastening screws.

11. Tension roof cover and glue to main stanchion.

12. Install seal with clamping plate.

13. Mount B - column seal and fasten with screws.

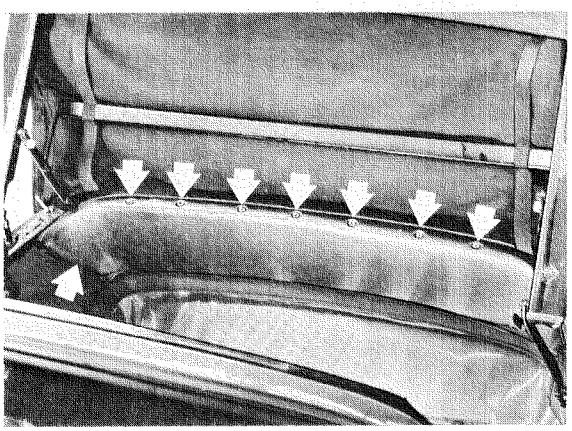
14. Fasten corner piece with tension cable to main stanchion.



83/10171 a

15. Join front and rear roof cover with two stiches.

16. Mount rear folding roof panel.



83/10167

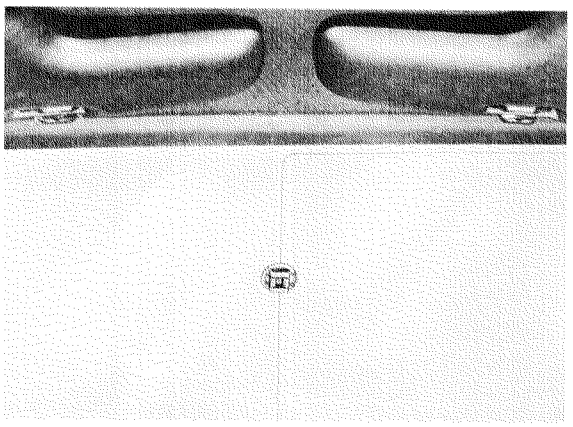
17. Install sidewall panel and cover for the mounting points of the main stanchion mounting.

Note:

When the main stanchion has been replaced the locking motors must be checked for synchronous running (see adjusting instructions electric folding roof).

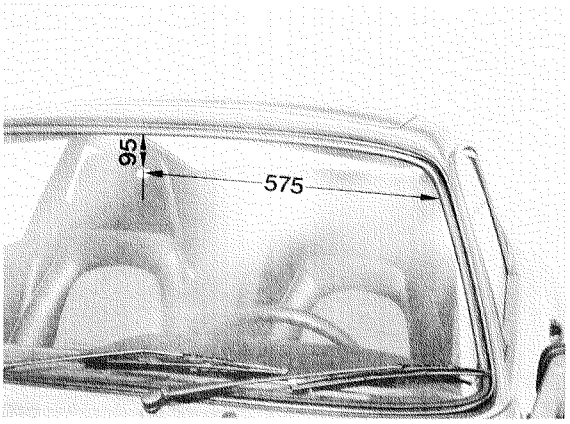
INSTALLING ADHESIVE PLATE FOR INSIDE MIRROR

A fallen off inside mirror can be re-cemented, if the adhesive plate (Part No. 477 845 043) and window have not been damaged.
Also applicable to "sekuriflex" windshields.



Installing Mirror Base

1. Mark installed position on outside of window. Distances: 95 mm from rubber frame to mirror base and approx. 575 mm from A pillar rubber seal to middle of window.



2. Clean windshield and adhesive plate thoroughly to remove remainders of cement, using fresh washing gasoline 80/110.

3. Spray a thin coat of Activator 312 NF on the windshield where the mirror will be installed and let it dry about 2 minutes.

4. Apply one drop of Loctite No. 312 on the adhesive plate and press it on the windshield without delay. Turn the adhesive plate until a little Loctite is forced out on the edges.

5. Press on the adhesive plate firmly about 30 to 40 seconds in the correct position – holding groove perpendicular.

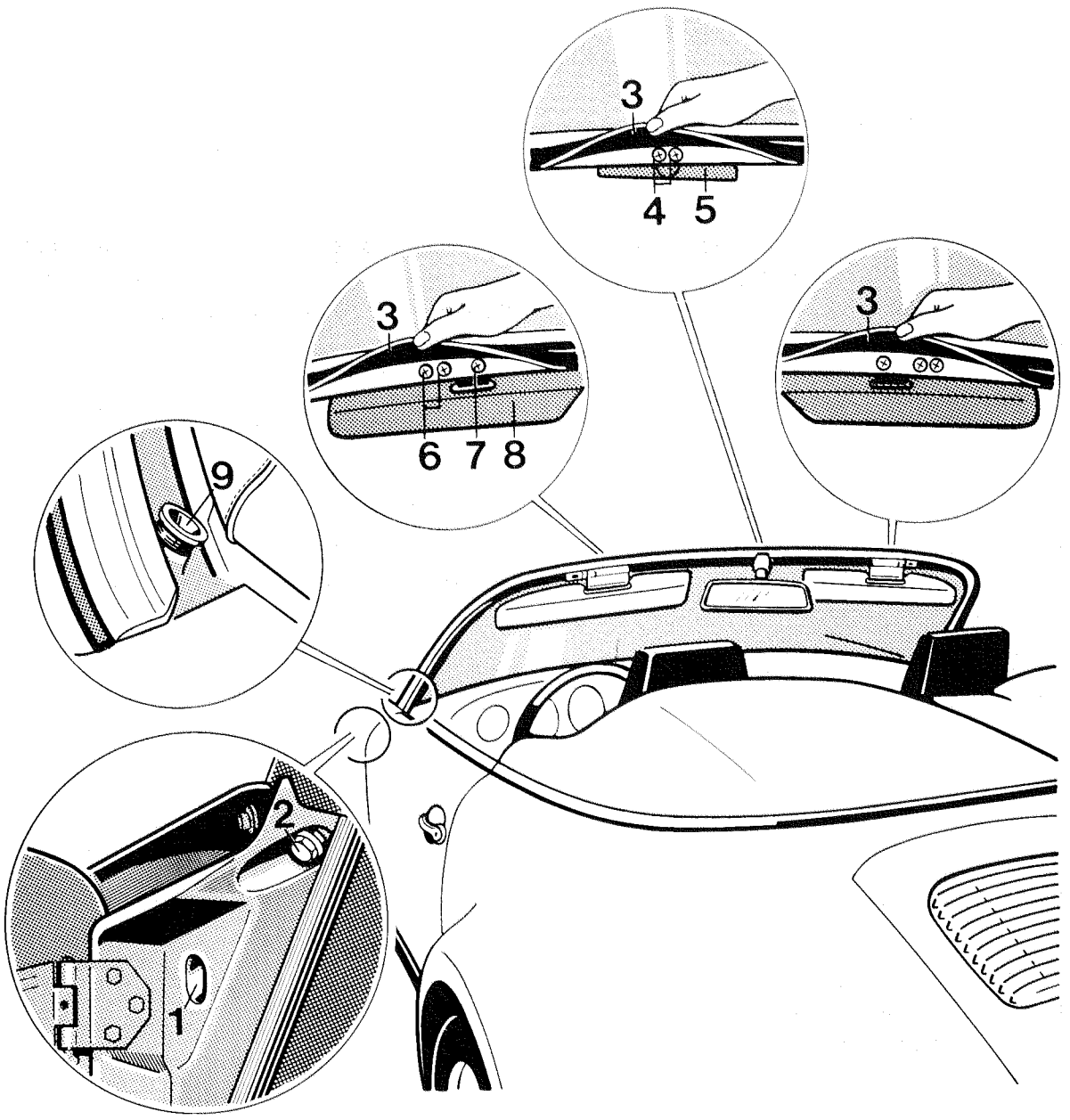
6. Mount inside mirror carefully after about one hour.

Note

About 60 % of the adhesive strength is reached after 1 hour and 100 % after 24 hours.

Requirements:
Loctite No. 312, Part No. 000 043 051 00.
Loctite Activator NF, Part No. 000 043 052 00.

Windshield, removing and installing



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Printed in Germany – XIII, 1989

Windshield, removing and installing

No.	Procedure	Instructions
	Open the trim cover	
	Lift up wiper arms	
	Undo the hexagon head screws holding the windshield	Undo 2 hexagon head screws, both right and left, from the fastening points located at the lower edge of the windshield frame in the area of the A pillar.
1	- front screws	
2	- rear screws	
	Remove windshield	Tip windshield forwards and take out of the body.
3	Remove the *windshield frame seal* from the windshield frame	Pull the frame seal out of the profile of the windshield frame in the areas of the interior mirror and the sun visors.
	Unscrew interior mirror	
4	- *Countersunk screw*	
5	- *Interior mirror*	
	Unscrew guides	
6	- *Oval-head screw*	
	Unscrew sun visors	
7	- *Oval-head screw*	
8	- *Sun visor*	

Printed in Germany – XIII, 1989

No.	Procedure	Instructions
	Position windshield on the body	Place windshield in such a way that the fastening points of the windshield frame are aligned with the screw guides in the body.
	Screw fit the windshield frame to the body at the front screw guide	Fit one hexagon head screw M 8 x 80 each with washer to the right and left fastening points of the windshield frame.
9	Adjust the angle of inclination of the windshield frame by means of *the rear moveable screw guide*	Align the angle of the windshield frame to the outline of the door window by turning the rear, adjustable screw guides.
	Screw fit the windshield frame to the body at the rear screwguides	Fit one hexagon head screw M 8 x 40 with washer to the right and left fastening points of the windshield frame.
	Tighten all hexagon head screws holding the windshield with 10 Nm	
	Fit sun visors and guides	6 oval-head screws M 4 x 8
	Fit interior mirror	2 countersunk screws M 5 x 12
	Press the windshield frame seal into the windshield frame	Use a spatula to ease the windshield frame seal carefully into the profile of the windshield frame.
	Lower wiper arm	

Printed in Germany – XIII, 1989

Assignment - Window/seal/body

Employing welding robots in the white body production line has made it necessary to increase the width of the spot-welded flanges around the window cutouts of white bodies from 9 mm to 13 mm. It was therefore necessary to modify the seal profiles and dimensions of the windows (windshield, rear side window and rear windows) for bodies welded by robots. As far as repair work is concerned, this means that when replacing parts, the width of the spot-welded flange round the window cutout in the body determines the assignment of the appropriate seal and window.

Seal and window according to body:

Window / Seal	Spot-welded flange 13 mm wide	Spot-welded flange 9 mm wide
Windshield	964.541.011...	911.541.011...
Seal	964.541.225.00	911.541.225.00
Rear side window	964.543.101.00	911.543.101...
Seal	964.543.035.00	911.543.035.01
Rear window	964.545.107.04	911.545.107.00
Seal	964.545.225.00	911.545.225.00

Printed in Germany – XIII, 1989

RANGE OF BODY PAINT COLORS AS FROM 1982 MODELS

Standard Colors:		Special Colors:	
grand prix white	908	met. minerva blue	304
india red	027	met. black	708
black	700	met. light blue	30T
arrow blue	305	met. pewter	956
mocha black	451	met. platinum	655
chiffon white	182	met. pacific blue	31G
bamboo beige	523	met. rosewood	474
caramel brown	524	met. moss green	20C
mint green	20A	met. wine red	895

RANGE OF BODY PAINT COLORS FOR 1983 AND 1984 MODELS

Standard Colors:		Special Colors:	
grand prix white	908	met. pewter	956
india red	027	met. platinum	655
black	700	met. moss green	20C
glacier blue	32Z	met. slate blue	661
chiffon white	182	met. quartz gray	662
		met. kiln red	811
		met. ruby red	810
		met. light bronze	966

RANGE OF BODY PAINT COLORS FOR 1985 AND 1986 MODELS

Standard Colors:		Special Colors:	
grand prix white	908	met. nutmeg brown	492
india red	027	met. garnet red	822
black	700	met. iris blue	33P
marble gray	673	met. prussian blue	33X
pastel beige	536	met. crystal green	33N
dark blue	347	met. white gold	539
		met. silver	936
		met. moss green	20C
		met. meteor gray	961

Color range as from models 1987 and 1988

Standard colors:	
Grand prix white	908
Black	700
Dark blue	347
Cherry red	80F
Citrus yellow	10W
Ceramic beige	499
Turquoise	21M
Indian red	80K

Special colors:	
Silver metallic	980
Lagune green metallic	35Y
Granite green metallic	699
Nougat brown metallic	40B
Diamond blue metallic	697
Espresso brown metallic	40D
Navy blue metallic	35V
Venetian blue metallic	35U
Cassis red metallic	80D

Printed in Germany – X,1988

Color range as from model 1989

Standard colors:	
Grand prix white	908
Black	700
Dark blue	347
Indian red	80K
Linen	60M
Apricot beige	548
Murano green	22C

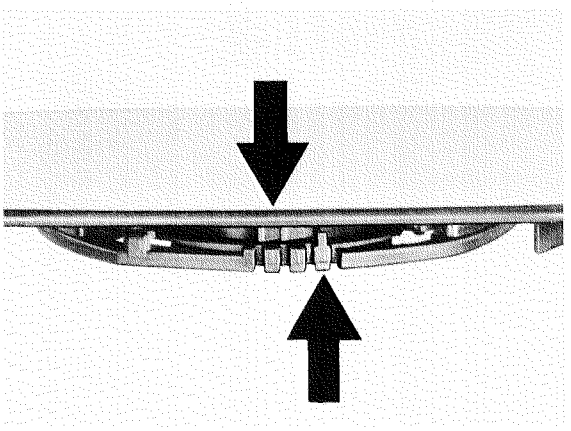
Special colors:	
Silver metallic	980
Diamond blue metallic	697
Dove blue metallic	37B
Stone grey metallic	693
Slate metallic	22D
Velvet red metallic	81L
Linen metallic	550
Pine green metallic	22E
Cognac brown metallic	40L
Salmon silver metallic	81K

Printed in Germany – X,1988

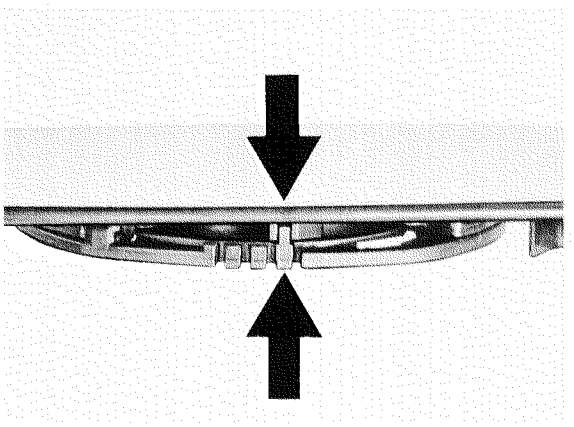
REMOVING AND INSTALLING OUTSIDE MIRROR, 87 MODELS ONWARD

Note:

The modified attachment which holds the mirror glass is similar to a bayonet socket. The retaining ring on the mirror glass can be turned with the aid of a screwdriver and thus engaged or disengaged.

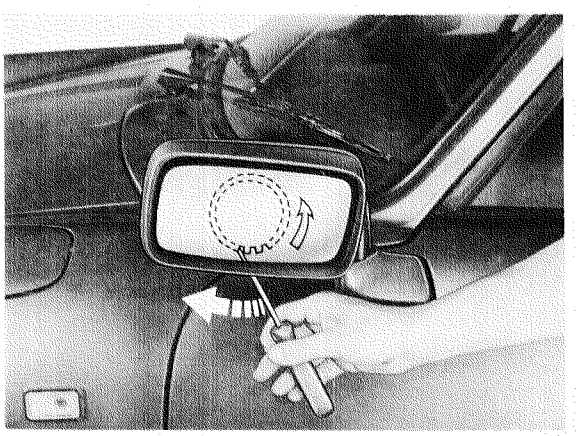


Retaining ring disengaged

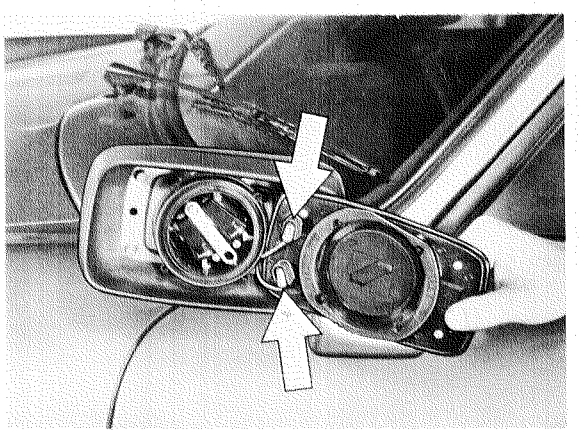


Retaining ring engaged

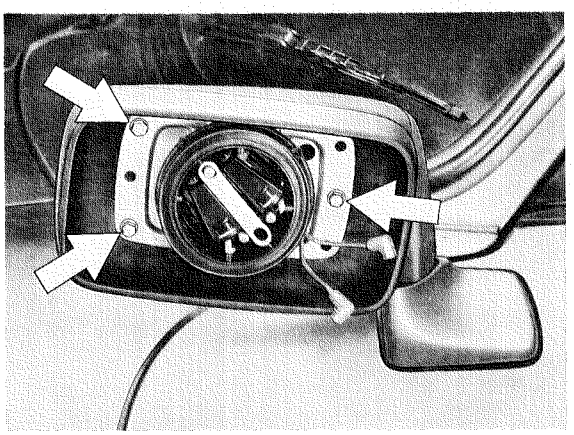
1. Press mirror glass in at bottom. Insert a screwdriver through the lower aperture and turn toothing of retaining ring (disengage). The left-hand and right-hand mirror glasses are identical.



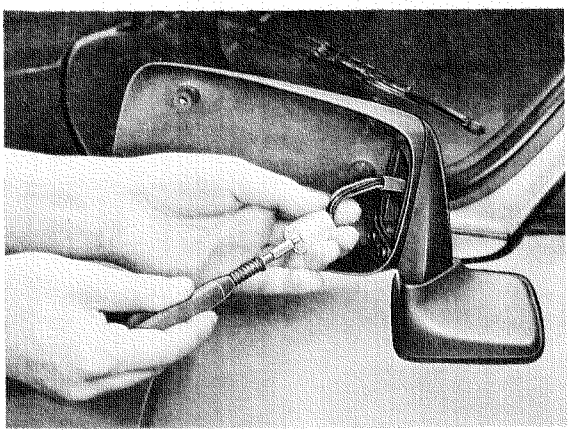
2. Remove mirror glass and disconnect cable plug of mirror heating.



3.Remove mirror drive.

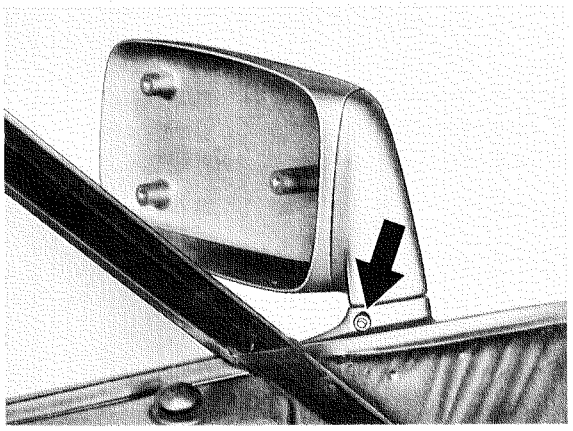


4.With the press-out tool, press round receptacles out of plug half.

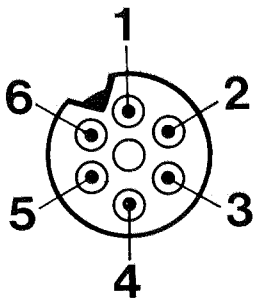


5.Remove cover from mounting bolt.

6.Remove mounting bolt from base of mirror and remove mirror housing.



Pin assignment (view from rear).



Terminal 1 = white - green

Terminal 2 = white/brown

Terminal 3 = black

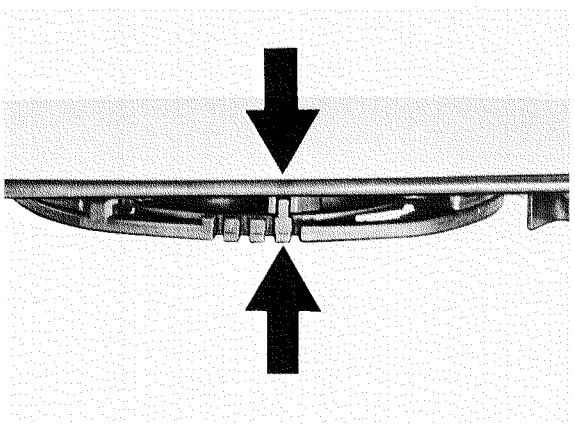
Terminal 4 = green - white/green

Terminal 5 = grey/green

Terminal 6 = brown

Note:

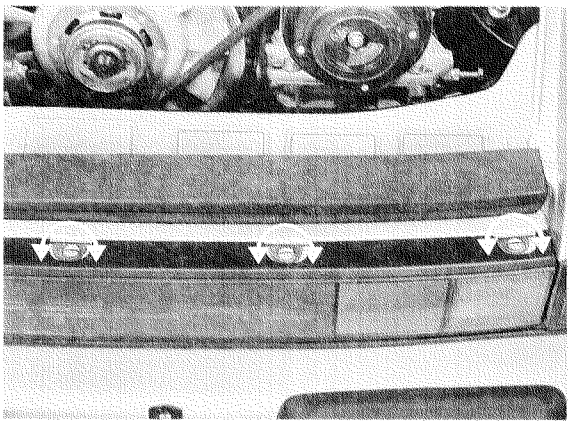
Once the mirror glass is installed, check that the retaining ring is correctly engaged.
To check, press top of mirror glass inward and check retaining ring through lower gap.



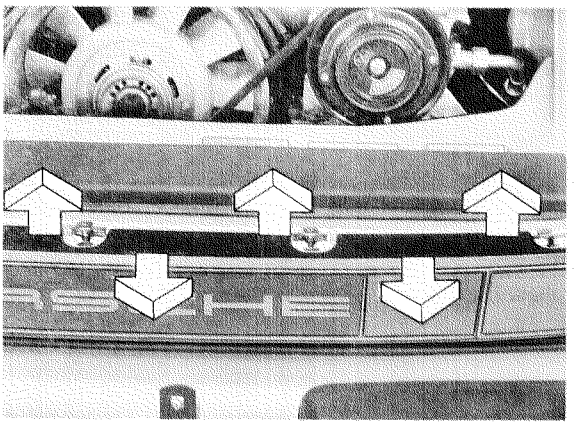
REMOVING AND INSTALLING REAR PANEL

Removing

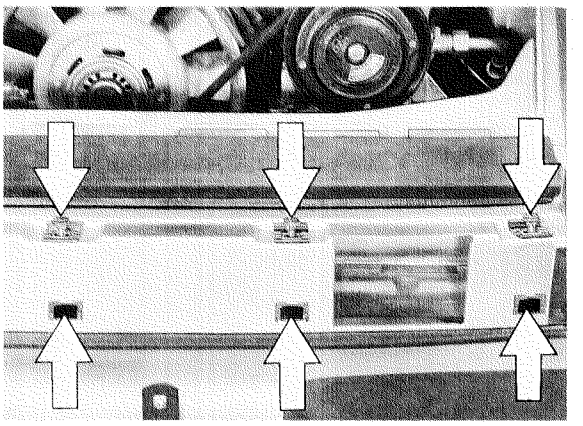
1. Open lid of engine compartment, raise seal and remove securing elements.



2. Tip panel to rear and lift out of lower retainers; disconnect electric connectors, if fitted.



3. Check fasteners and fastening elements, replace if necessary.



Installing

Installation is the reverse of the above sequence.

CLUB SPORT emblem, fitting

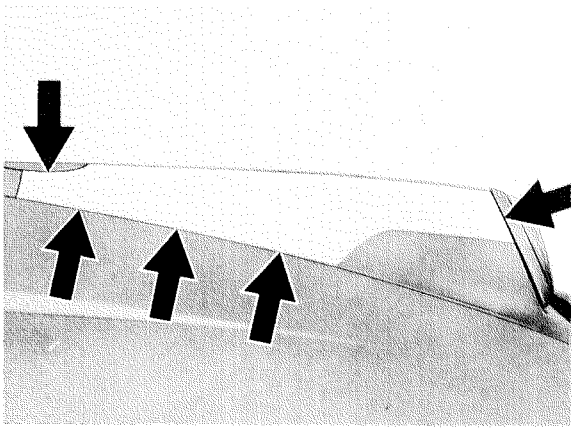
Note:

When fitting the emblem, the vehicle temperature and that of the foil must be at least 20 °C.

1. Remove dirt from the surface and clean with methylated spirits.

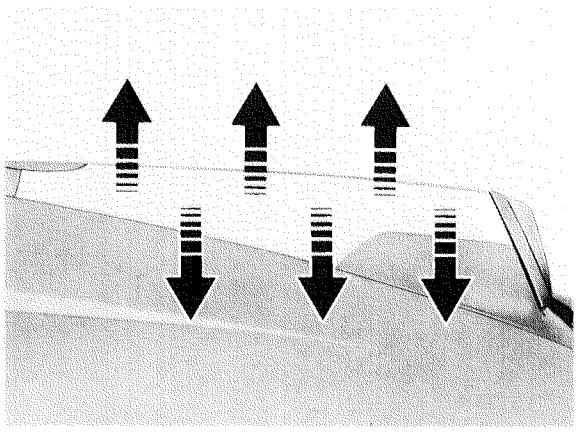
2. Dampen the area on the fender with 50% alcohol/water mixture to ensure that the foil does not stick fast when positioning.

3. Pull off the beige protective paper from the foil and lay the foil between filler cap and headlight cover parallel to the edge of the fender.



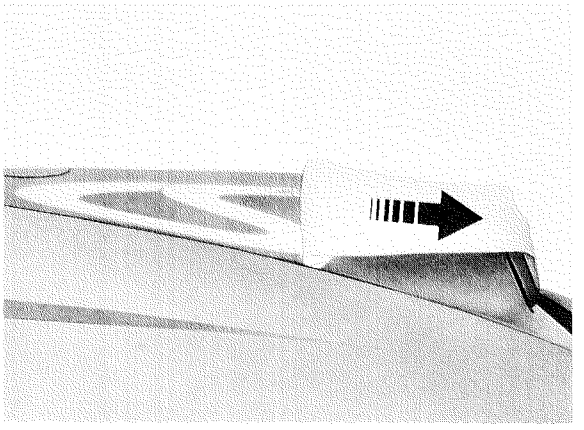
88/40A

4. Using a plastic spatula or similar, stroke the moisture from the middle outwards. There must no air bubbles.



88/40B

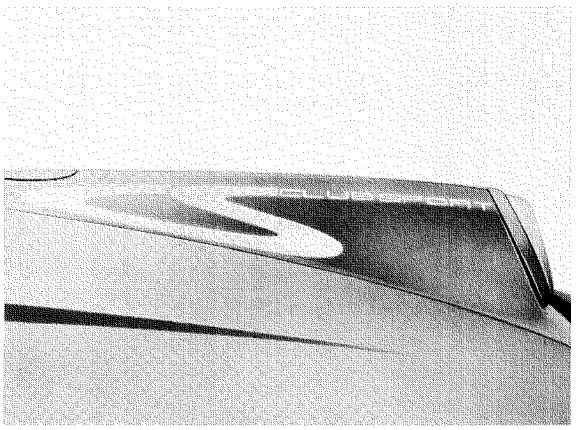
5. Pull off the outer protective paper from the foil.



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Printed in Germany – XII, 1988

6. Pierce any remaining air bubbles with a needle and press down on the foil.

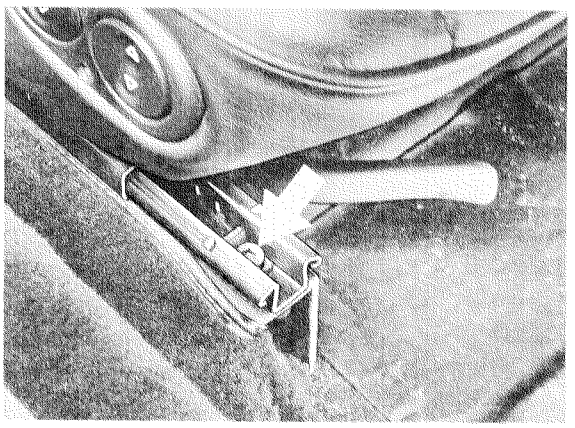


88/38

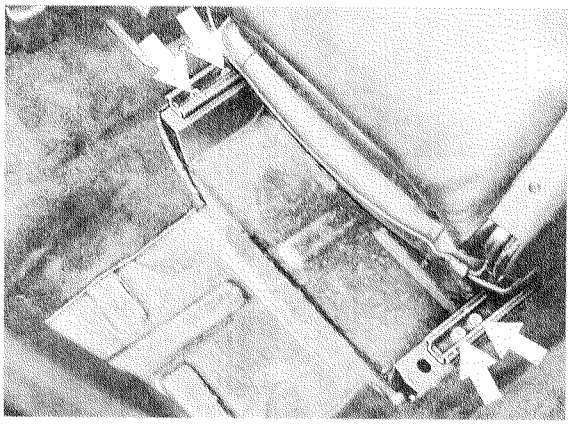
REMOVING AND INSTALLING FRONT SEAT

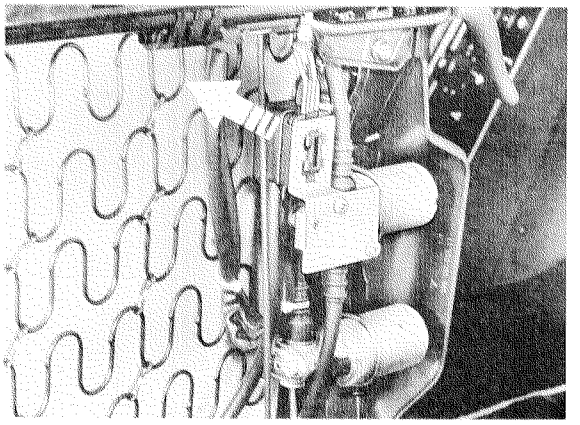
Removing

1. Slide back the seat and unscrew the front bolts.



2. Slide seat forward and unscrew the rear bolts (disconnect plug in case of power seats). Take seat out of car.

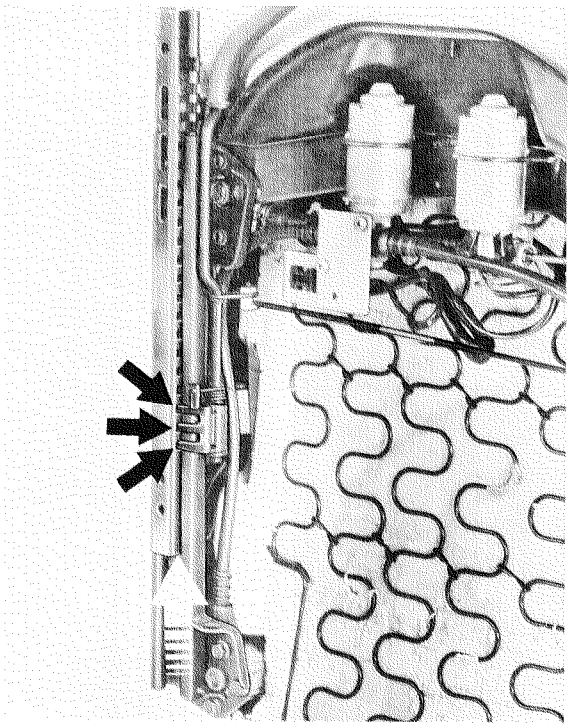




Installing

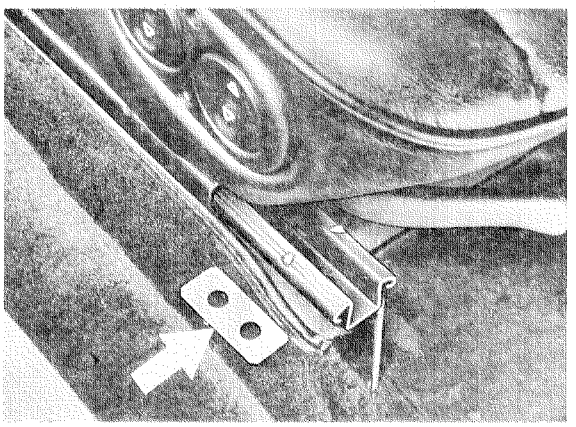
1. Check seat rails for wear, replacing if necessary, prior to installation of seat. Lubricate seat rails with grease.

2. Run out seat rails on seat forward and lock fully on both sides.

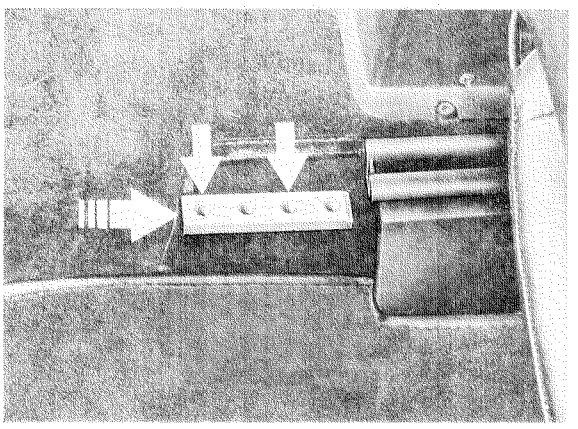


3. Place seat on the seat rail carriers (connect plug of a power seat) and align front with the hole pattern. Insert front bolts without threaded plates.

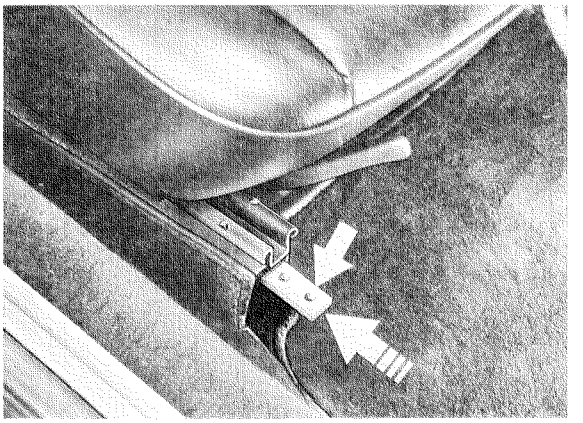
4. A perforated plate may be used between the seat rail and seat rail carrier as necessary for compensation of height tolerances.



5. Slide seat forward and lock fully (check visually). Guide threaded plate into the seat rail carrier from underneath, insert washers and bolts on the threaded plates and tighten the bolts.



6. Slide seat back and lock fully (check visually). Guide threaded plates into seat rail carriers from underneath. Install stop brackets and bolts on threaded plates and tighten.
Tightening torque for seat mounting bolts: 23 Nm (17 ft. lbs.).



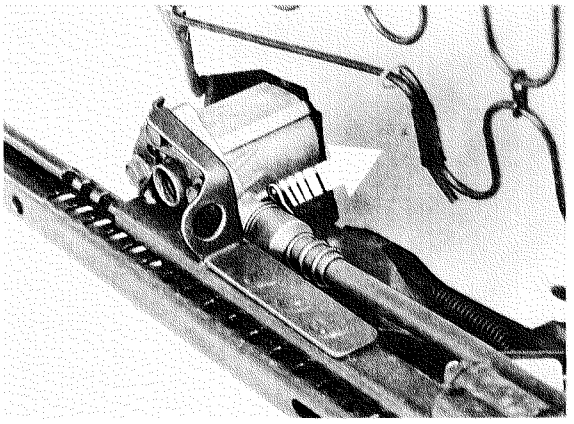
Note

If the seat catches do not engage simultaneously, loosen the front bolts and remove the stop bracket. Slide seat forward and lock fully (check visually). Loosen the rear inside bolts and eliminate residual tension by moving the seat. Tighten the rear bolts. Slide seat back and lock fully (check visually). Install front bolts with brackets and tighten.
Check whether the seat rail locks engage correctly in all locking positions.

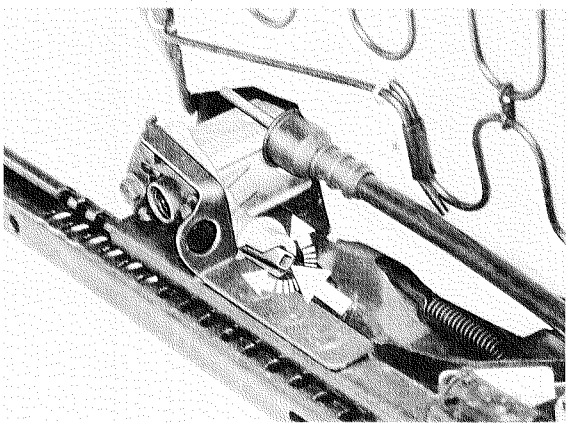
ADJUSTING POWER SEAT HEIGHT CONTROL

Make corrections as described below, if the rear of the seat lowers non-uniformly to the final stops when operating the power seat height control.

1. Determine the after-running lifting element while lowering the seat.
2. Operate the height control to approximately middle position.
3. Remove seat.
4. Unclip flexible shaft spring clip on the after-running lifting element.



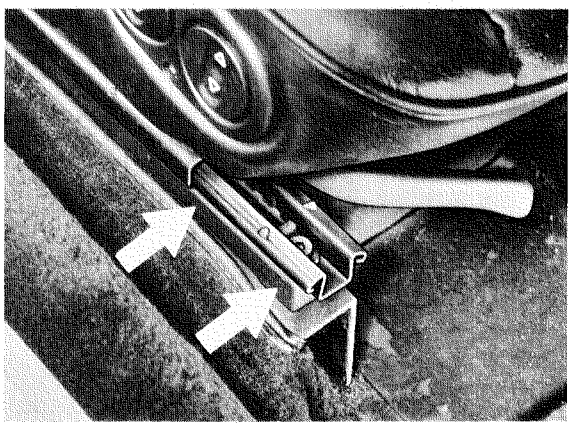
5. Disconnect the flexible shaft.
6. Adjust the after-running lifting element by one turn with a square wrench socket or screwdriver as described below. Depending on which lifting element has to be adjusted and as seen looking forward in car, turn the right lifting element clockwise or the left lifting element anticlockwise.



7. Connect the flexible shaft.
8. Clip in the spring clip.
9. Install seat.
10. Check function and uniformity, repeating the adjusting procedures if necessary. (Maybe less than one complete turn could be sufficient.)

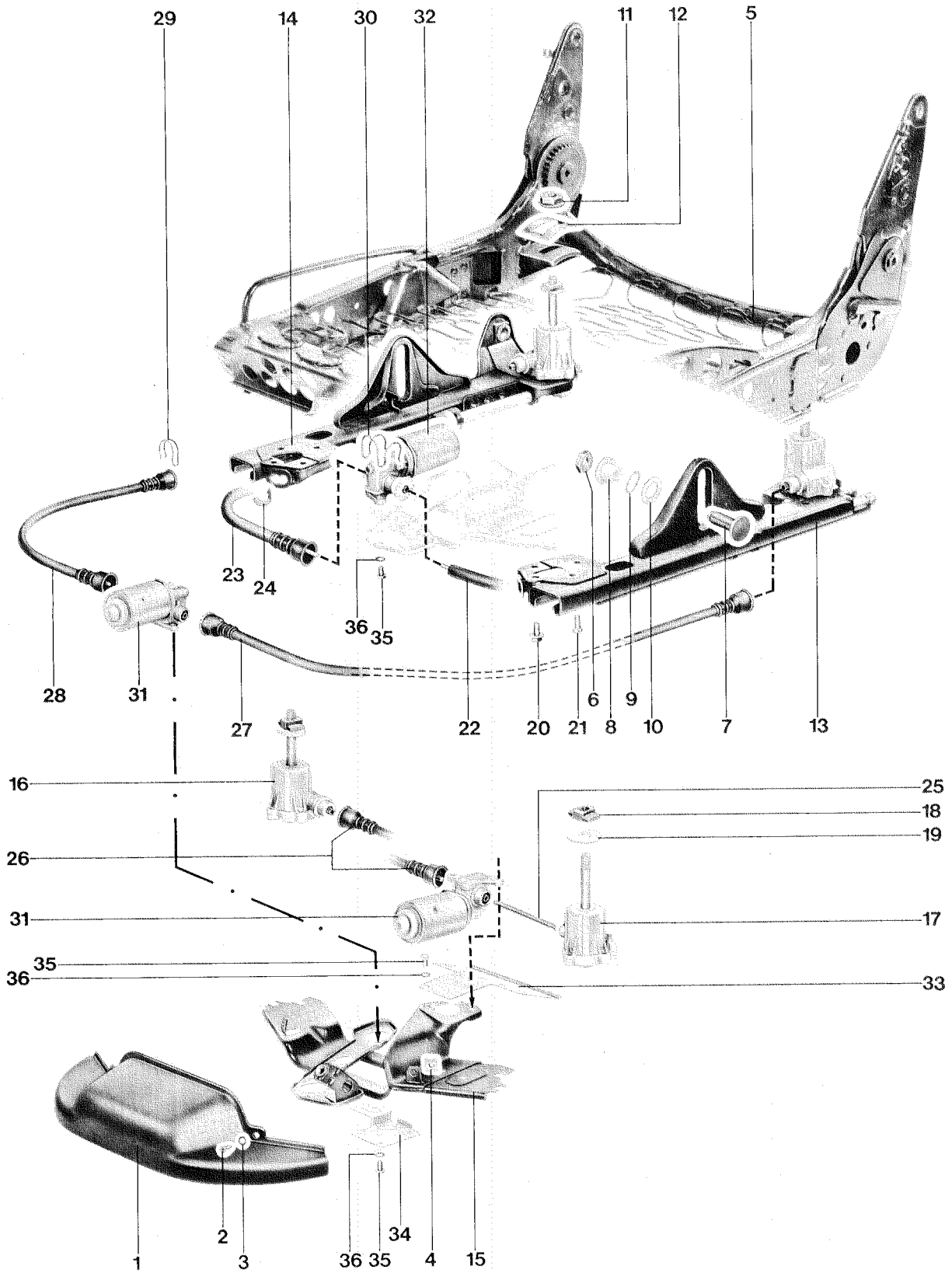
SEAT HEIGHT

The manually operated passenger's seat has profile rails between the seat consoles and seat, in order to adjust the height to the driver's seat.



SEAT FRAME

SEAT FRAME

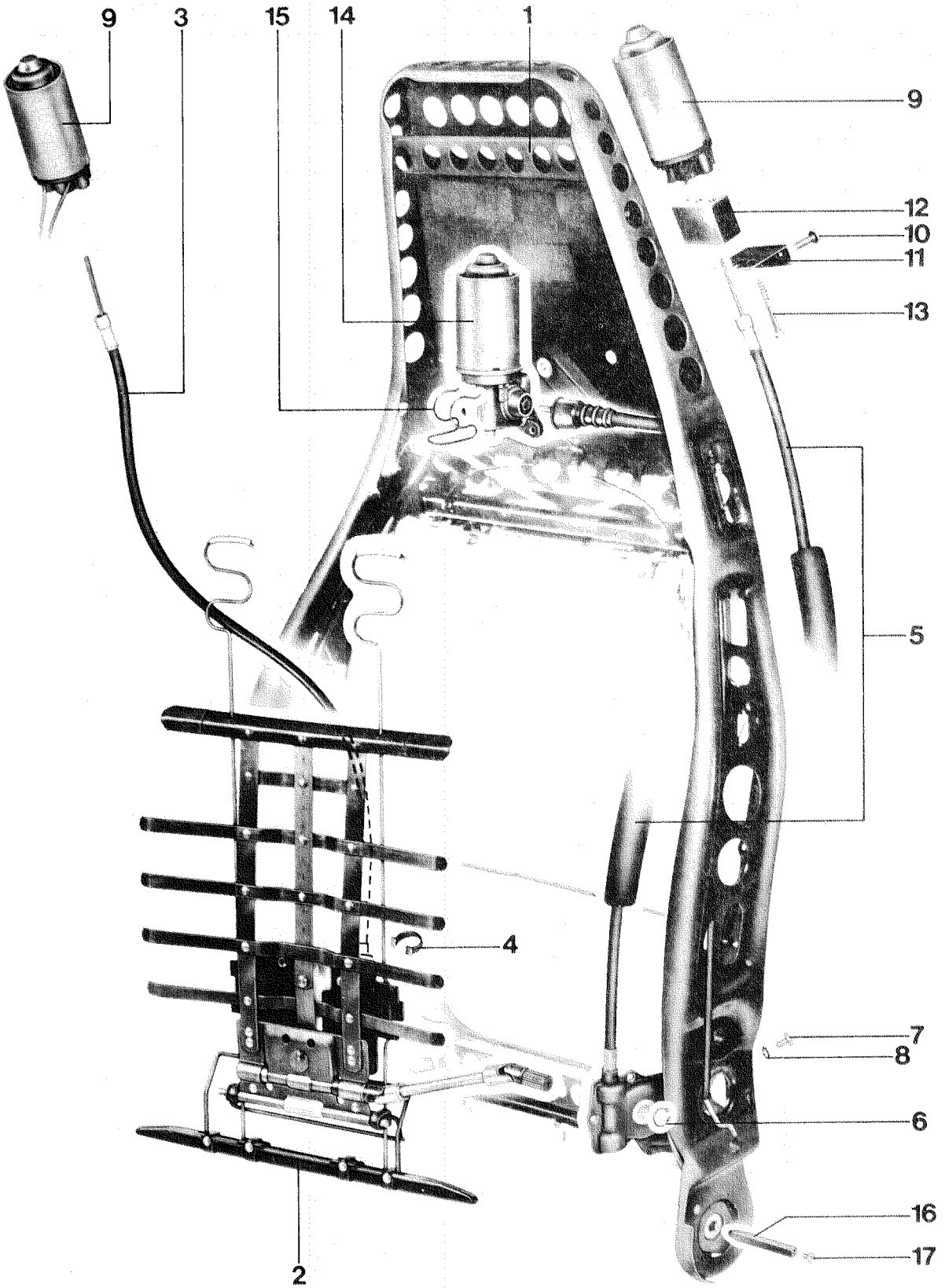

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No.	Description	Qty.	Note When: Removing	Installing
1	Cover	1		
2	Self-tapping screw	2		
3	Washer	2		
4	Sheet-metal nut	2		
5	Seat frame	1		
6	Hex nut	2		
7	Pin	2		
8	Slide bush	2		
9	Spring washer	2		
10	Plastic washer	2		
11	Hex nut	4		
12	Guide spring	4		
13	Seat rail, left	1		
14	Seat rail, right	1		
15	Cross member	1		
16	Lift mechanism front right and rear left	2		
17	Lift mechanism front left and rear right	2		

No.	Description	Qty.	Note When: Removing	Installing
18	Slider	4		
19	Washer	4		
20	Hex bolt	8		
21	Socket-head bolt	4		
22	Shaft, seat adjustment, left	1		
23	Shaft, seat adjustment, right	1		
24	Clamp	3		
25	Shaft, height adjustment front left	1		
26	Shaft, height adjustment front right			
27	Shaft, height adjustment rear left	1		
28	Shaft, height adjustment rear right	1		
29	Shaped spring	3		
30	Shaped spring	3		
31	Electric motor	2		
32	Electric motor	1		
33	Holder	1		
34	Holder	1		

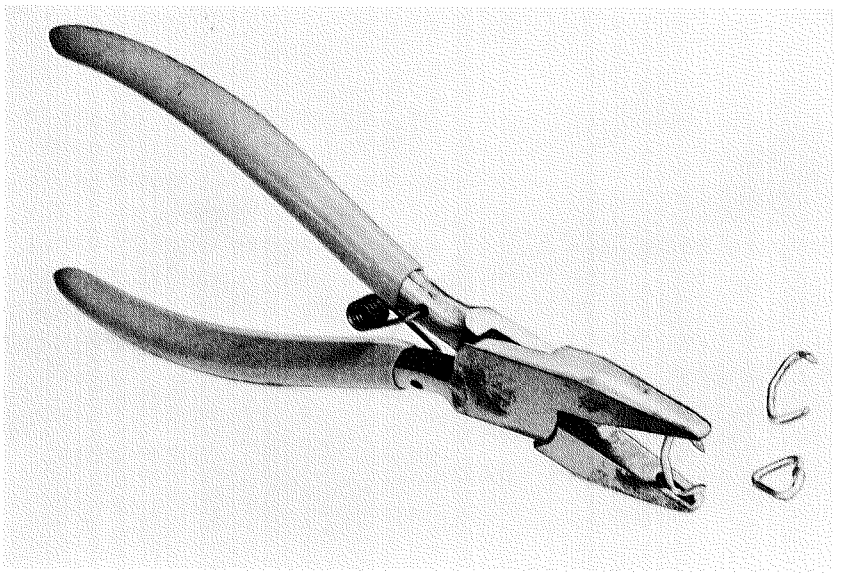
No.	Description	Qty.	Note When: Removing	Installing
35	Hex bolt	6		
36	Toothed lock washer	6		

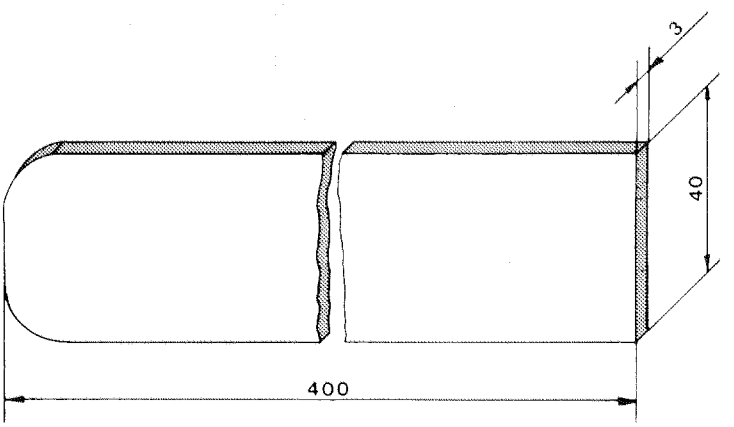
BACKREST



No.	Description	Qty.	Note When: Removing	Installing
1	Backrest frame	1		
2	Lumbar support	1		
3	Shaft, lumbar support height adjustment	1		
4	Locking ring	1		
5	Shaft, lumbar support curvature	1		
6	Locking ring	1		
7	Cross-recess bolt M 5 x 8	2		
8	Toothed lock washer	2		
9	Electric motor	2		
10	Cross recess bolt M 5 x 16	6		
11	Angle holder	2		
12	Spacer	2		
13	Hex bolt	4		
14	Electric motor, backrest adjustment	1		
15	Shaped spring	1		
16	Guide	2		
17	Countersunk screw with inside hexagon head	2		

TOOLS





No.	Description	Special Tool	Remarks
1	Upholsterer's pliers		Commercially available, e.g. Binder
2	Pulling tool	Improvised tool	

REPLACING HEATING ELEMENT FOR SEAT CUSHION HEATING

1. Move seat to highest position.

2. Remove seat.
   (See Repair Manual, page 72 - 1).

3. Disconnect plug of seat heating (backrest and cushion). Use ohmmeter to check conductance of heating element. If element is defective, resistance is infinity.

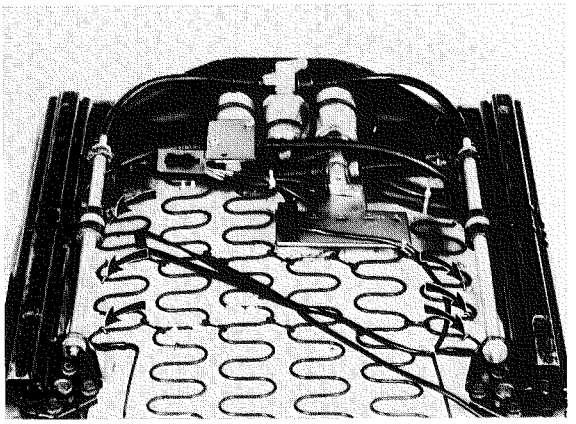
Note:

The cushion and backrest heating elements are connected in series: do not apply more than 6 V to either part (see also Quality Information Group 7, 1/86 dated 18 April 1986).

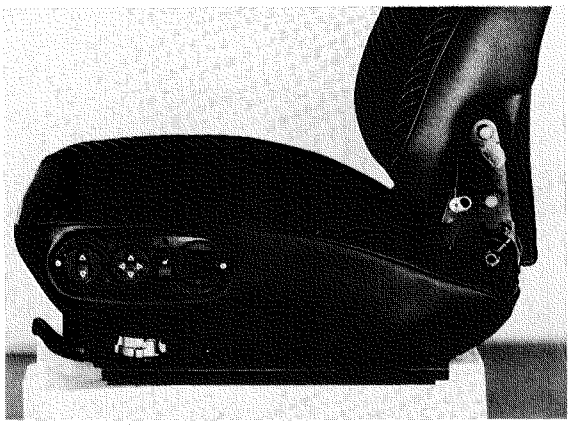
4. Remove switch cover. Remove attachment screws of backrest hinge covers and remove covers by pulling toward rear.



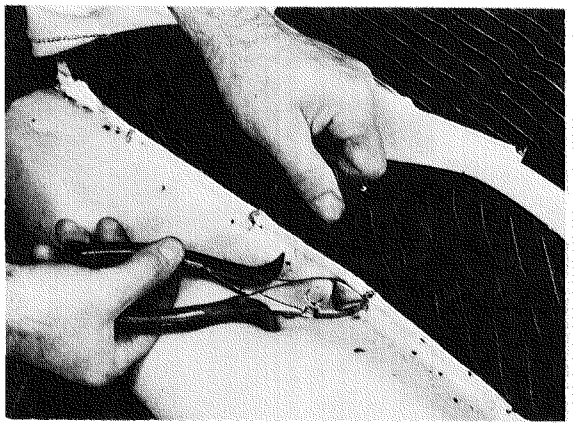
5. Lay seat on backrest and use side nippers to cut through staples beneath seat cushion. Straighten tabs on frame and remove tensioning wire. Unhook seat cover and pull up. Disconnect cable holder and retainer.



6. Remove cushion complete with upholstered cover from frame. Push switch unit through cushion opening.

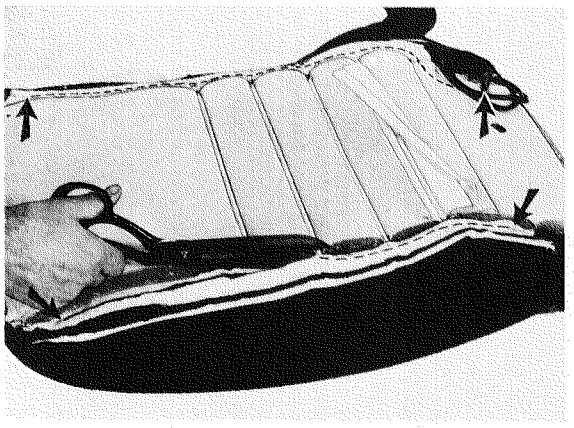


7. Cut through remaining staples. Break adhesive bond between upholstered cover and cushion. Remove cover.



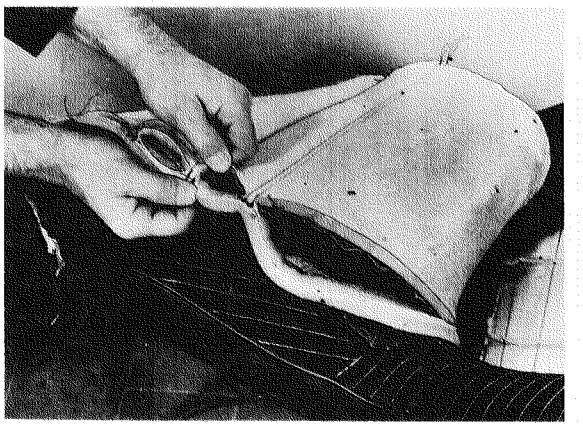
8. Cut through inside of cover beside right-hand and left-hand seams.

Caution: Do not damage outer cover.

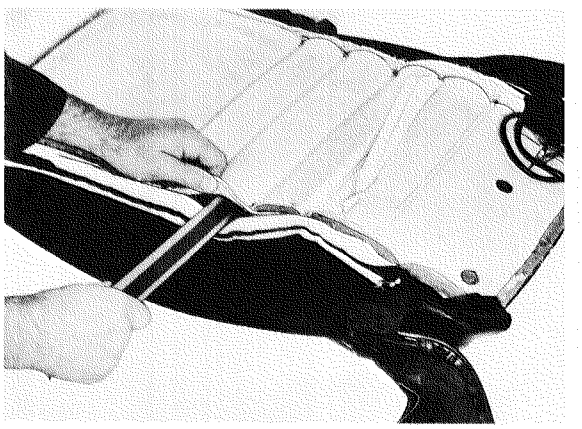


Note:

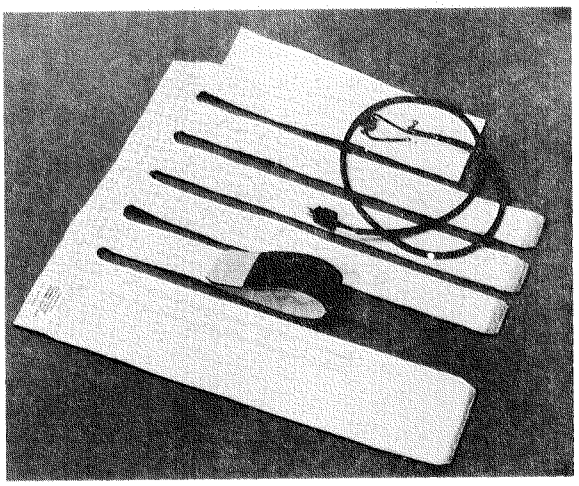
Do not cut past the cross seams. Do not cut through the cross seams.



9. By twisting and pushing with the improvised tool, carefully break adhesive bond between outer cover and padding material or heating element.
Sever cable of defective heating element.



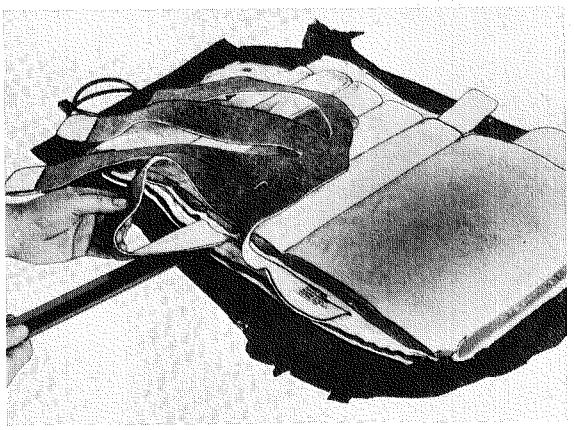
Heating element for seat cushion.



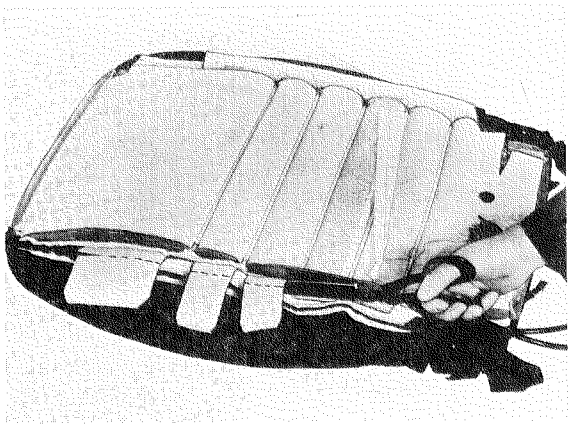
Note:

Install with grey felt liner facing toward outer cover.

10. With improvised tool, push heating element between outer and inner covers (or defective heating element) into the pocket.

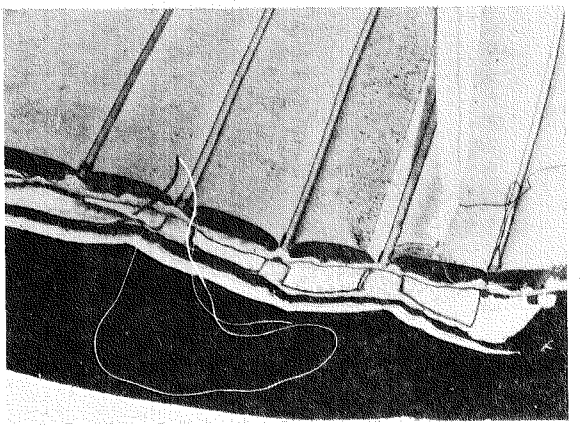


11. Cut off excess material (push-in loops).
Caution: Do not damage heating wire

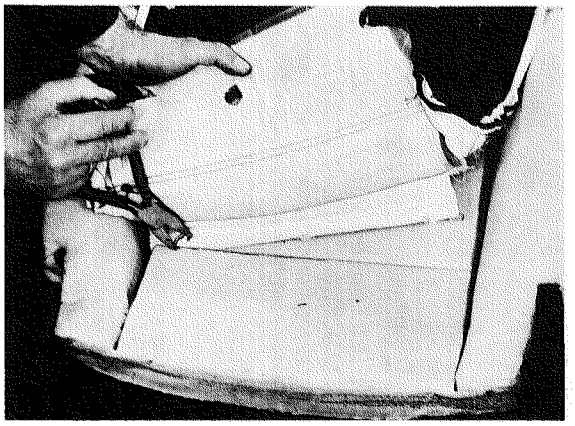


12. Check conductance of heating element.

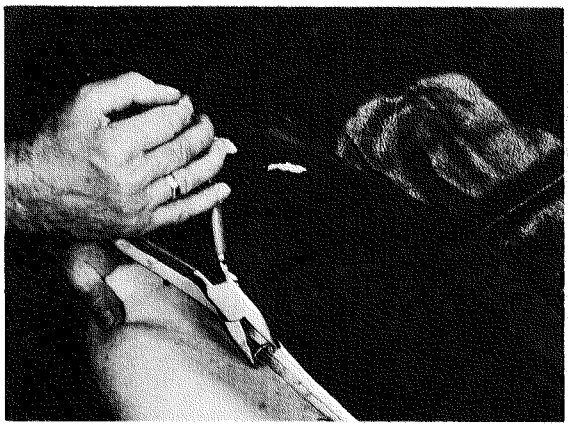
13. Stitch or glue (latex) new heating element to outer cover on right and left.



14. Lay cover on cushion and, starting at the cross strip, tack in place with 3 staples.



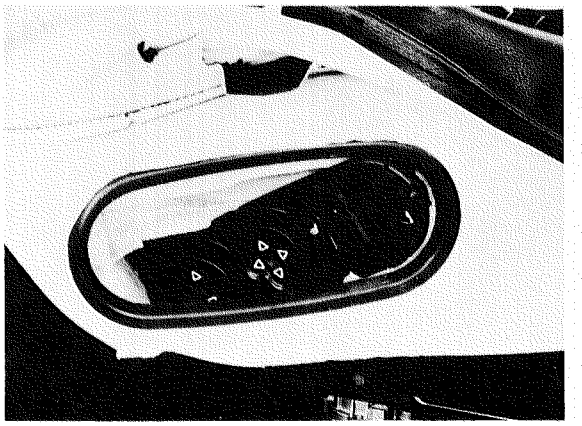
15. Insert 5 staples in each lengthwise strip to hold cover at sides. Use glue to fix cover at backrest hinge.



Note:

To improve accessibility to the tabs and for attaching the cover, place the seat frame in the highest position.

16. Place cover with seat cushion on frame and push switch unit through cushion opening.



17. Hook cover over tabs at front and sides. Bend tabs slightly to hold cover in this position.

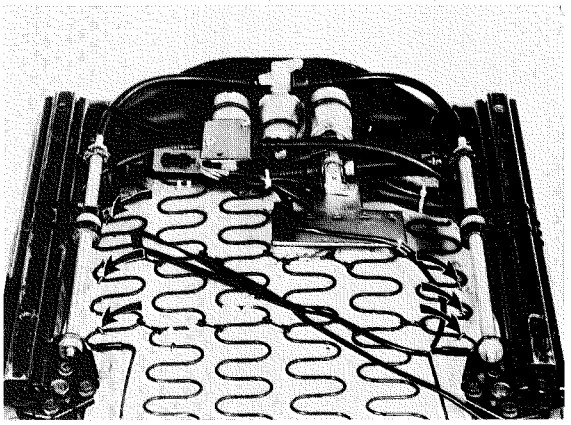
18. Attach tensioning wire to seat springs.

19. Insert two staples, one at the rear left and one at the rear right of the cover.

20. Hook cover over tabs at rear.

21. Press all tabs down fully.

22.Route cable and attach retainer.



23.Install switch cover and backrest hinge cover.

24.Install seat
(see Repair Manual, page 72 - 1).

REPLACING HEATING ELEMENT FOR BACKREST HEATING

1. Move seat to highest position.

2. Remove seat (see Repair Manual, page 72 - 1).

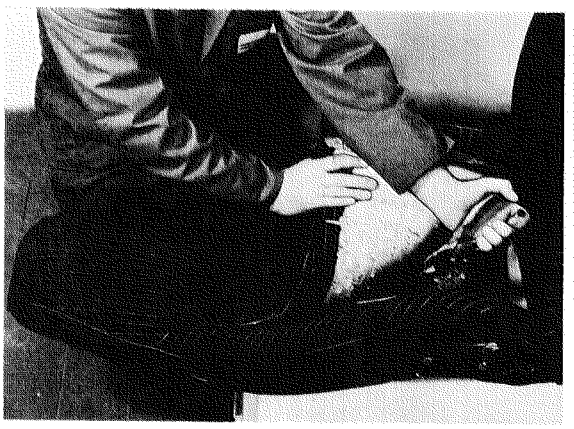
3. Disconnect plug of seat heating (backrest and cushion). Use ohmmeter to check conductance of heating element. If element is defective, resistance is infinity.

Note:

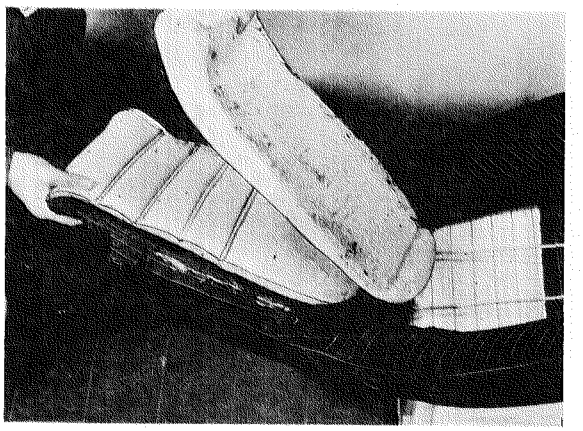
The cushion and backrest heating elements are connected in series: do not apply more than 6 V to either part (see also Quality Information Group 7, 1/86 dated 18 April 1986.

4. Straighten tabs on seat frame and unhook cover.

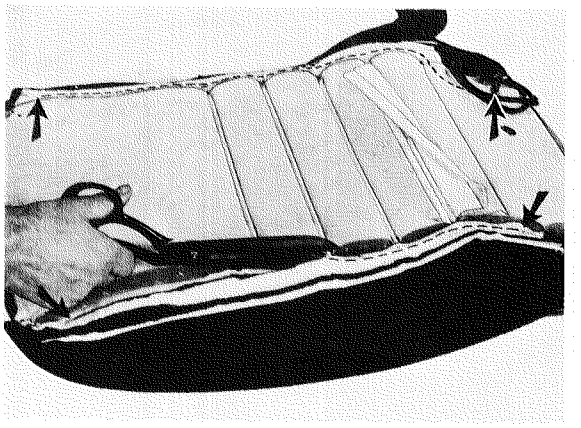
5. Pull up cover with backrest padding and cut staples with side nippers.



6. Break adhesive bond between cover and backrest padding. Remove padding.

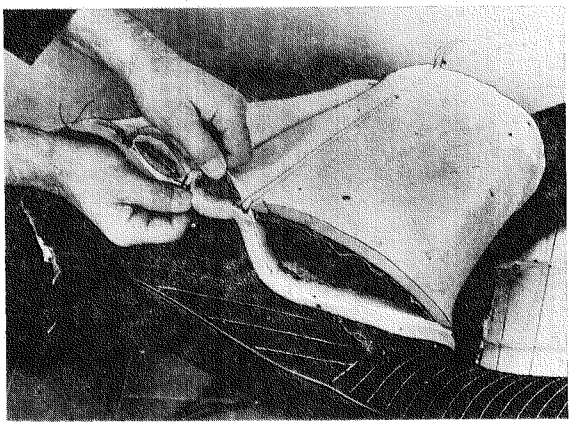


7. Cut open inside of cover beside right-hand and left-hand seams. Caution: Do not damage outer cover.

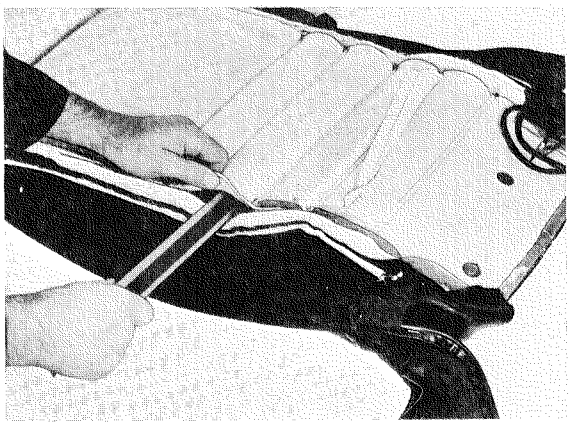


Note:

Do not cut the cover past the cross seams. Do not cut through the cross seams.



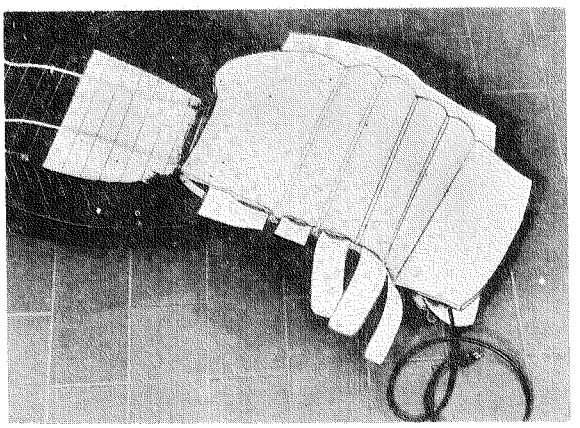
8. By twisting and pushing with the improvised tool, carefully break the adhesive bond between outer cover and padding or heating element. Cut off cable from defective heating element.



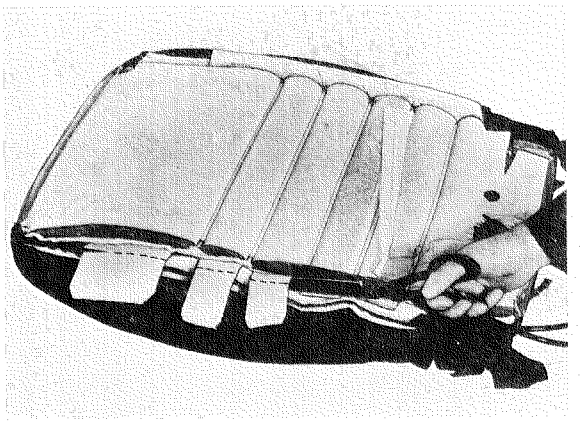
Note:

Install the heating element with the grey felt liner facing the outer cover.

9. With the improvised tool, push heating element between outer and inner covers (or defective heating element) into the pocket.

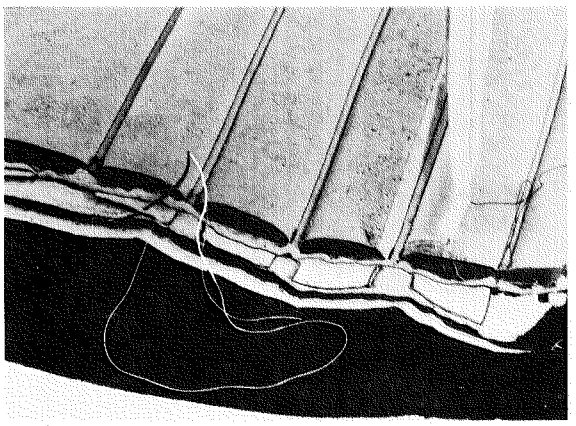


10. Cut off excess material (push-in loops).
Caution: Do not damage heating wire.



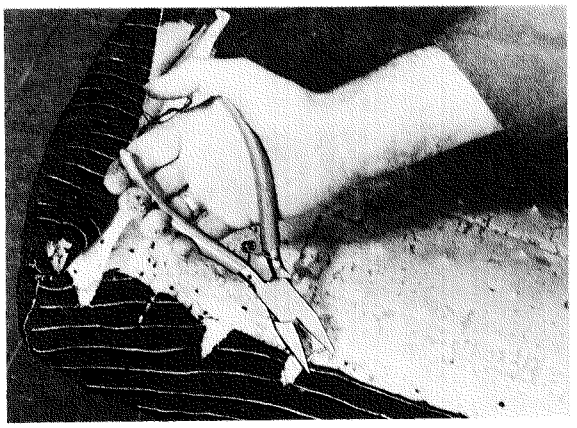
11. Check heating element for conductance.

12.Stitch or glue (latex) new heating element to outer cover on left and right.

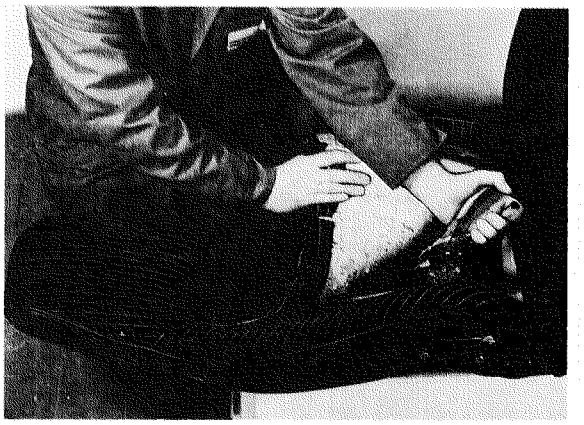


13.Glue cover and padding together at top.

14.Attach cover at the sides and bottom without creases and insert staples.



15.Attach padding to backrest springs with 4 staples.



16.Route cable and attach.

17.Hook cover over tabs.

18.Press tabs down.

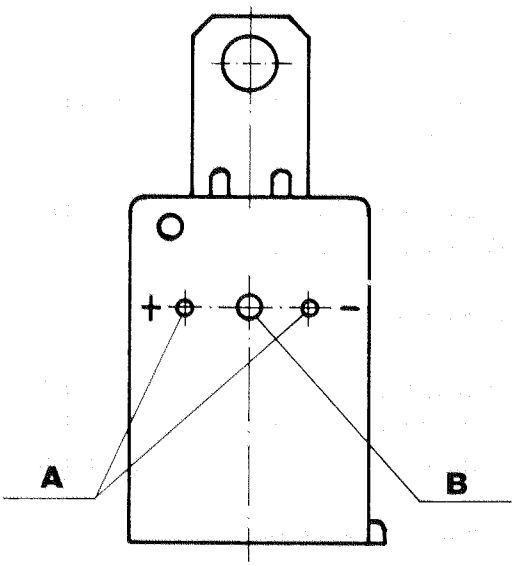
19.Install seat
(see Repair Manual, page 72 - 1).

Calibrating controllable seat heating

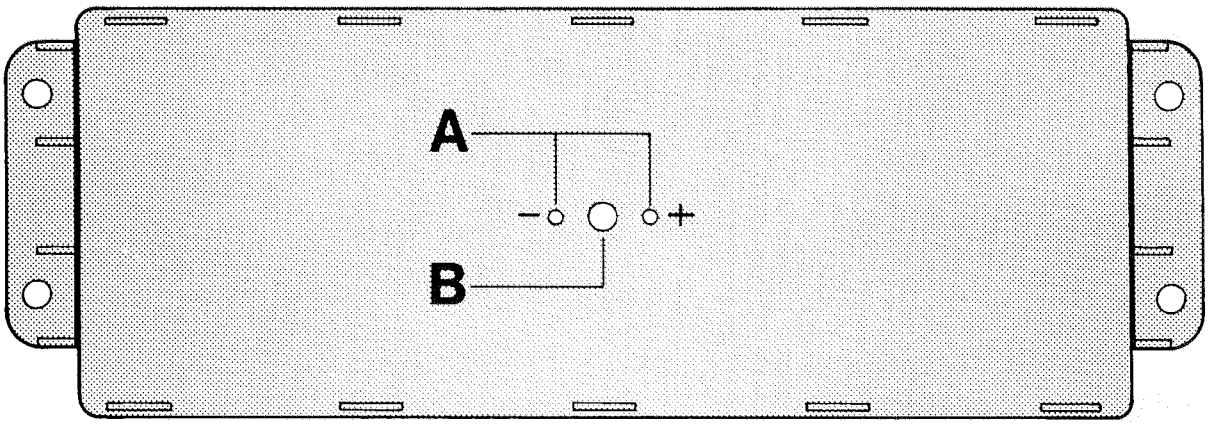
From Model 89 onwards
Control units

Note

The seat heating must be calibrated after the control unit or heating elements have been replaced.



Control unit for seat heating without seat-position control 165 - 72



Control unit for seat heating with seat-position control 163 - 72

A - measuring point (V)
B - Calibration potentiometer

Printed in Germany – XIII, 1989

Tools

1. Digital voltmeter with an internal resistance (Ri) ≥ 1 MΩ.
2. Two measuring probes with a maximum diameter of 2 mm.
3. Thermometer (as recommended in the Workshop Handbook).
4. 2 mm wrench.
5. Two auxiliary cables to supply voltage to the removed seat (terminals 15 and 31). Use adapter cable 9269 for seat-position control.

Calibration procedure

1. Store the seat to be calibrated in the working area until it has assumed the ambient temperature.
2. Provide power supply.

Note

Do not switch on the seat heating. If switched on unintentionally, the seat must cool down until the heating elements have again adopted the ambient temperature.

3. Measure the ambient temperature and refer to the table for the relevant voltage value.
4. Connect the voltmeter to the control unit (A).
5. Set the voltage value on the calibration potentiometer (B) so that it corresponds to the appropriate value for the ambient temperature.

Table

Ambient temperature in °C	Voltage in V
0	1.50
2	1.55
4	1.60
6	1.65
8	1.70
10	1.75
12	1.80
14	1.85
16	1.90
18	1.95
20	2.00
22	2.05
24	2.10
26	2.15
28	2.20
30	2.25
32	2.30
34	2.35
36	2.40
38	2.45
40	2.50
42	2.55
44	2.60
46	2.65
48	2.70

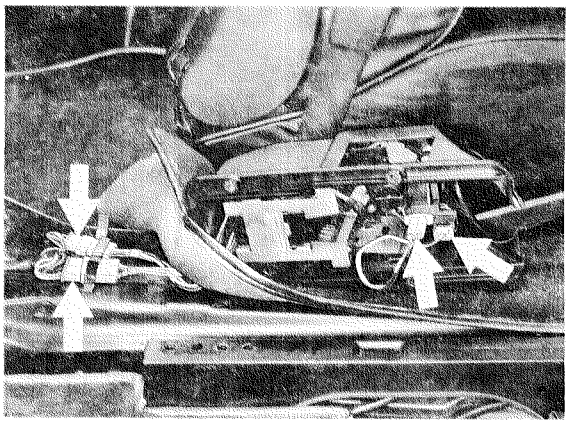
Function check

Switch on seat heating for approx. 10 seconds with maximum heating power. After switching off, measure the voltage at the control unit. The value measured now must be considerably higher.

Printed in Germany – XIII, 1989

AUTOMATIC HEATING CONTROL

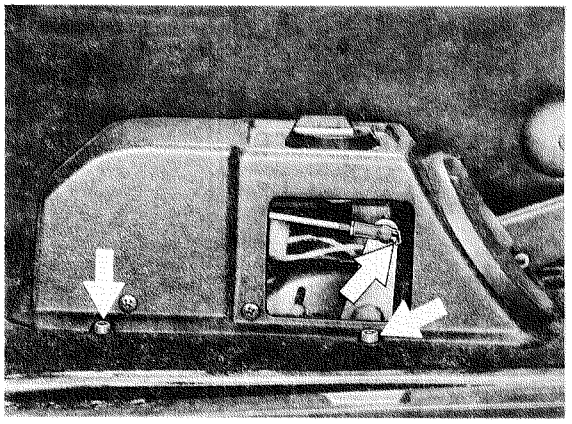
Removing and Installing Control Unit



1. Remove front-passenger seat.

2. Press out the right-hand side cover.

3. Open ball socket and unhook linkage.



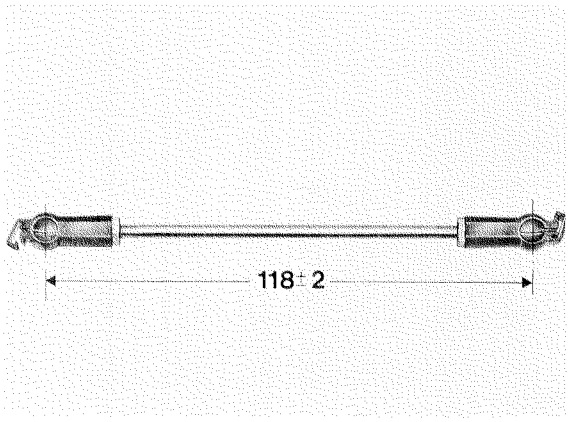
4. Unscrew the four fastening screws.

5. Take off rubber sleeve.

6. Take apart plug connectors.

Note

When replacing the ball sockets, set the gap of 118 ± 2 mm. Up to 83 model, the gap is 124 ± 2 mm.



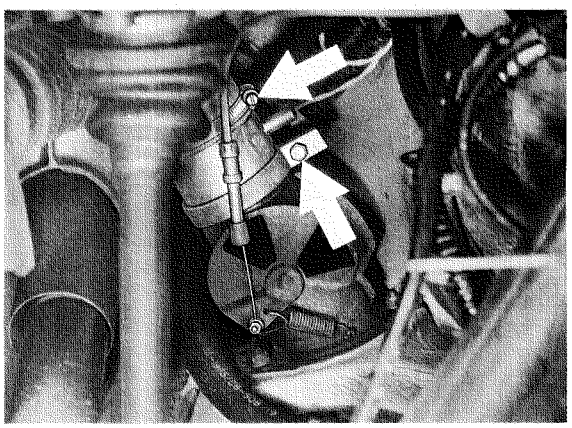
Removing and Installing Heat Sensor

1. Remove control unit and disconnect the front two-pin plug.

2. Loosen carpet along the center tunnel and uncover cable as far as grommet in heel plate.

3. Unlatch both leads out of the plug housing and press grommet outward.

4. Remove tube fitting on left-hand heating flap box.



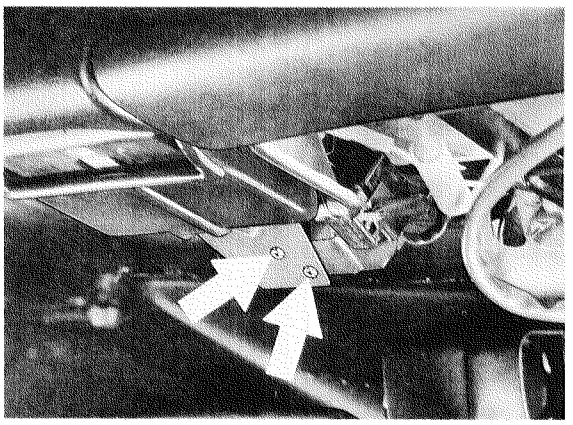
5. Pull cable outward and remove the rivets.

6. Rivet on new heat sensor.

Removing and Installing Inside Sensor Blower

1.Disconnect hose from inside sensor blower.

2.Unscrew fastening screws.



3.Take apart plug connector.

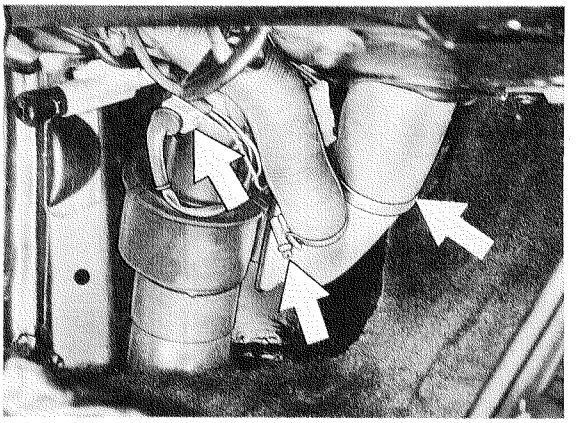
Removing and Installing Auxiliary Blowers

Note

The auxiliary blowers are located left and right in the footwell heating shafts.

1.Unscrew cover.

2.Loosen air hoses.



3.Take apart plug connector.

4.Take out blower.

Removing and Installing Series Resistors for Auxiliary Blowers

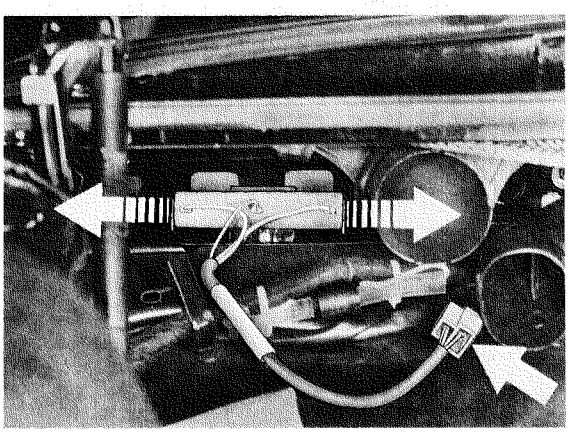
Note

The series resistors for the auxiliary blowers are located in the luggage compartment on the right next to the fresh-air blower.

1.Fold back luggage-compartment mat.

2.Unscrew cover.

3.Take apart plug connector.

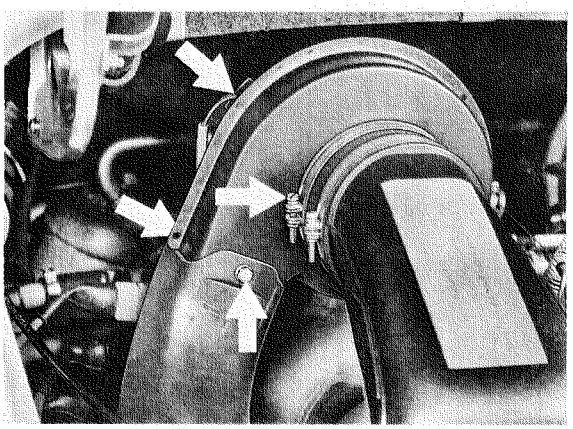


4.Bend up bracket and remove resistors.

Removing and Installing Motor Blower

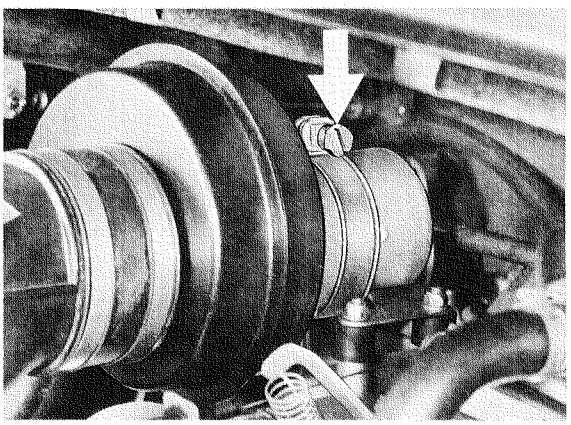
1.Take apart plug connector.

2.Remove heating-air elbow between motor blower and heat exchanger.



3.Loosen hose clamp.

4.Entirely unscrew screw on clamping band.



5.Bend up clamping band.

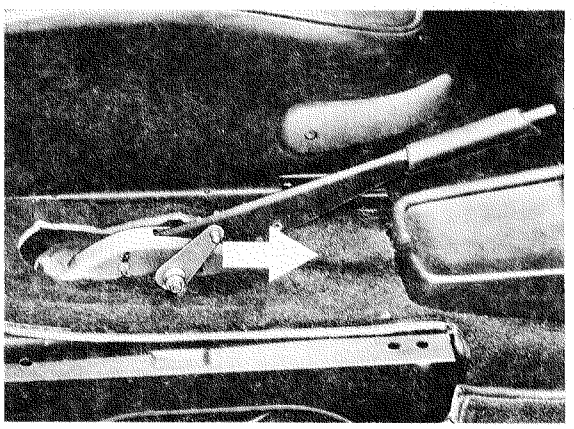
Adjusting Bowden Cables on Heating Flap Boxes

Note

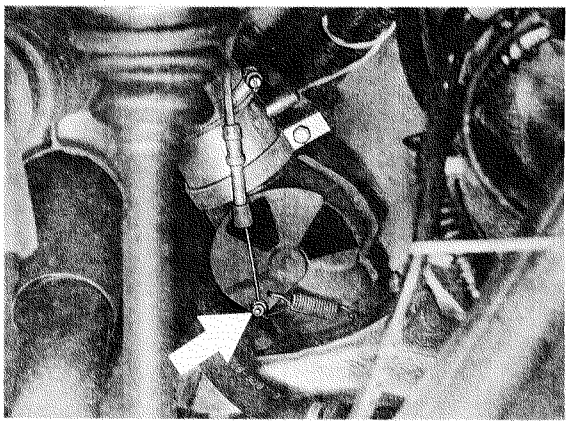
The flaps are held in the open position by a spring.

1. Unhook linkage on servo motor.

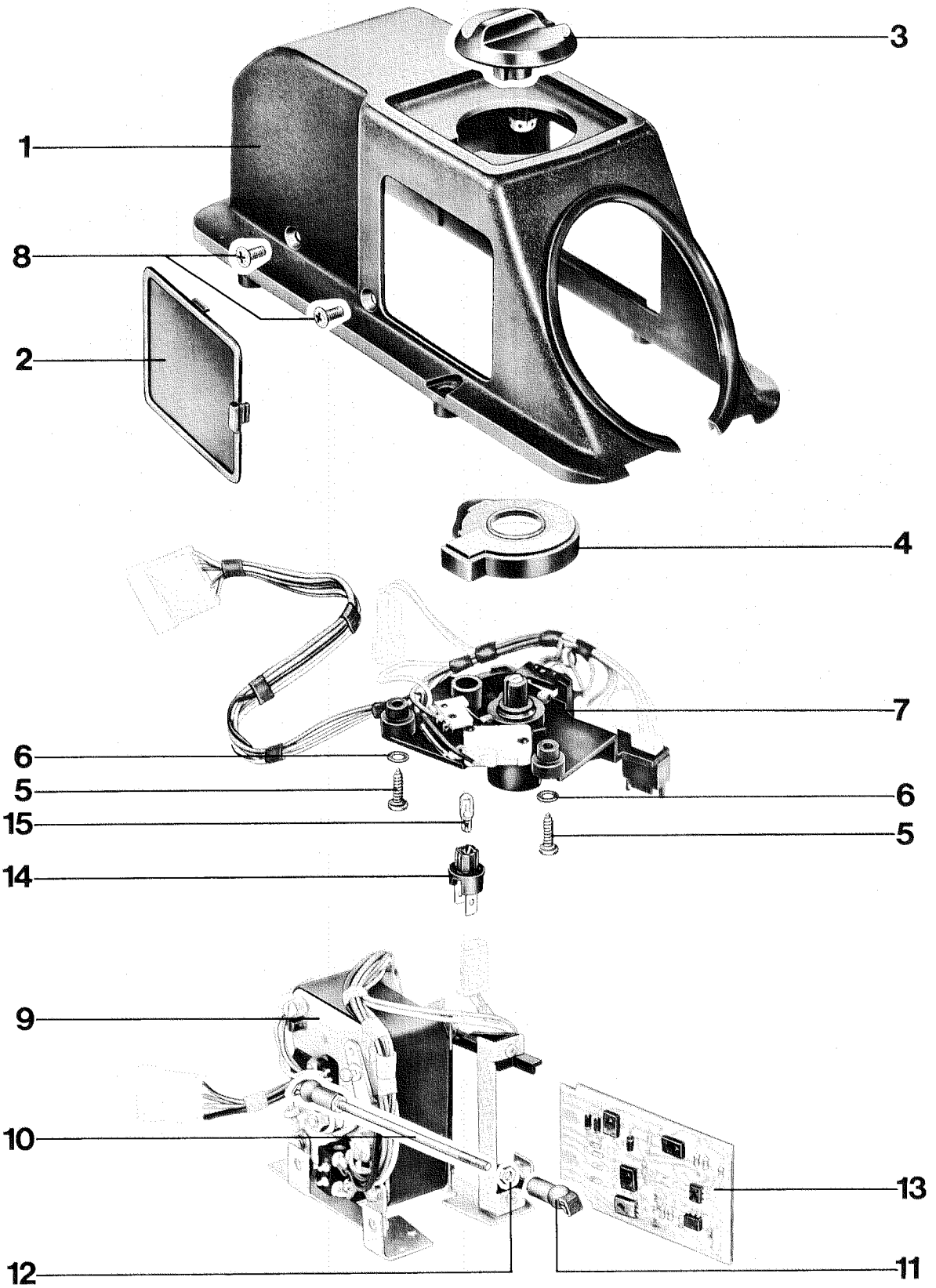
2. Pull cables to rear until lever is up against stop.



3. In this position, clamp down bowden cables on right and left.



Dismantling and Assembling Control Unit



No.	Description	Qty.	Note: Removal	Installation
1	Housing	1		
2	Cover	2		
3	Knob	1	remove	
4	Illuminated prism	1		
5	Screw	3		
6	Plain washer	3		
7	Switch	1		
8	Screw	4		
9	Control unit	1		
10	Linkage	1		
11	Ball socket	2		
12	Nut	2		
13	Printed-circuit board	1		Push in completely
14	Bulb holder	1		
15	Bulb	1		

TROUBLESHOOTING ON AUTOMATIC HEATING CONTROL

1. Starting at switch position 1, control unit regulates to max. heating.

   Open circuit in inside sensor.

   ➔Check inside sensor.

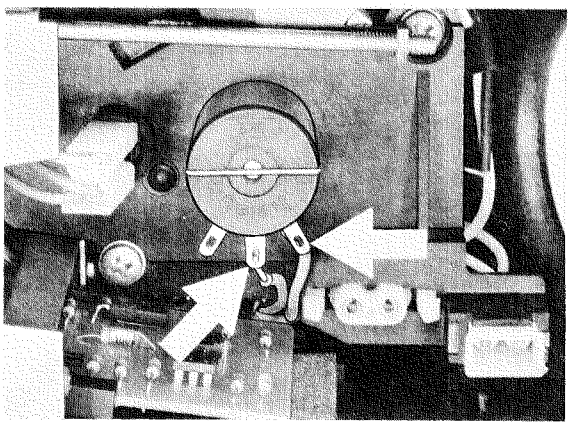
   Remove control unit and disconnect plug 2. Measure resistance with an ohmmeter.

   Specification: approx. 1.9 kohm at 20°C.

   or

   Open circuit in temperature-adjusting potentiometer.

   ➔Check potentiometer.



Specification: In switch position 5 = 950 ± 20 ohm.

2. Control unit regulates to max. heating in DEF switch position only.

   Short circuit in inside sensor.

   ➔Check inside sensor, see Section 1.

   or

   Short circuit in temperature-adjusting potentiometer.

   ➔Check potentiometer, see Section 1.

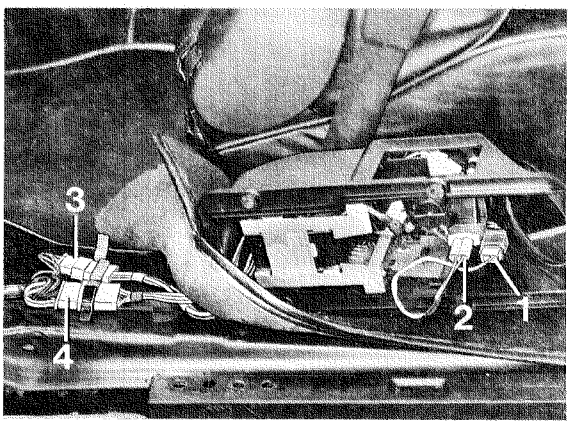
3. Control unit regulating too much toward heating.

   Open circuit in heat sensor.

   ➔Check heat sensor.

   Remove control unit and disconnect plug 1. Measure resistance with an ohmmeter.

   Specification: approx. 1.7 kohm at 20°C.



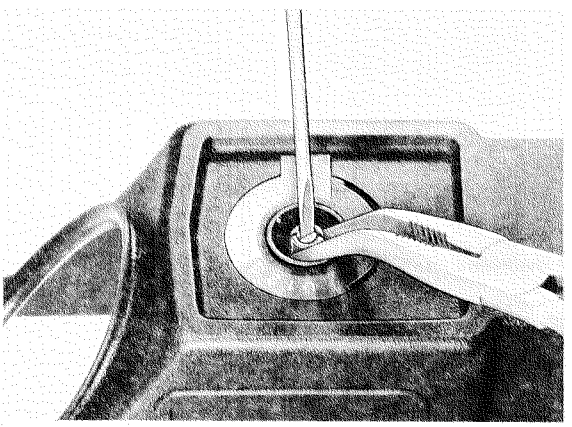
or

Temperature-adjusting potentiometer incorrectly set.

➡ Check potentiometer und and adjust.

Set switch to position 5.

Remove switch knob.
Connect ohmmeter to potentiometer.
Hold shaft of switch with pliers and adjust potentiometer with a screwdriver to the specification of 950 ± 20 ohm.



4. Control unit regulating too little toward heating.

Short circuit in heat sensor.

➡ Check heat sensor, see Section 3.

or

Temperature-adjusting potentiometer incorrectly set.

➡ Check potentiometer and adjust, see Section 3.

5. Control unit not regulating.

Open circuit in power supply.

➡ Check voltage at plug 3.

1 - term. 15

2 - term. 31

or

Printed-circuit board defective.
Replace printed-circuit board.

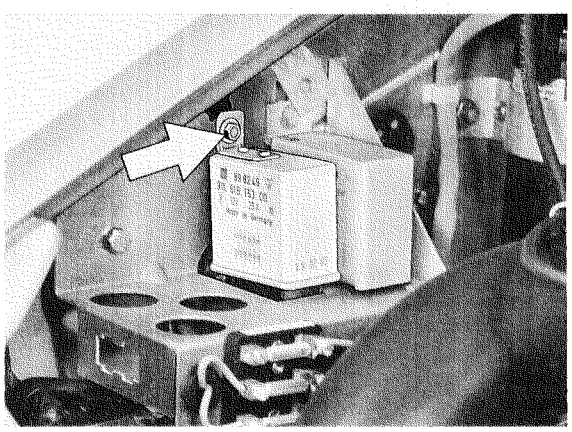
or

Control unit defective.
➡ Replace control unit.

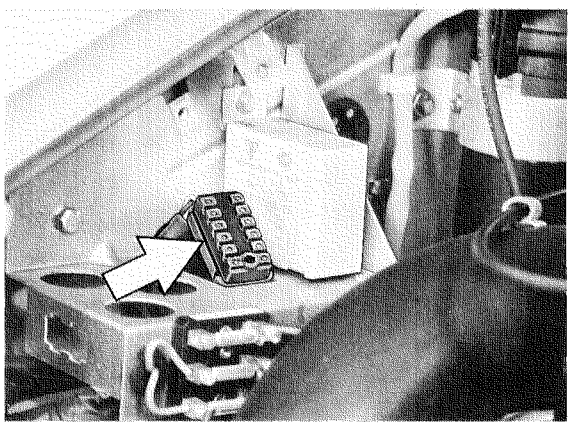
Check Heating Control Relay

Note

The heating control relay is located on the controller board in the engine compartment.



Checking is performed with the plug disconnected.



1. Connect test buzzer to term. 1 and ground. Switch on ignition and turn wheels. The test buzzer must periodically indicate continuity.

2. Voltmeter to fuse no. 1 and control-relay plug term. 2
   Readout: Battery voltage

3. Voltmeter to plug term. 3 and ground.
   Readout: Battery voltage

4. Using an auxiliary cable, connect term. 4 to positive.

   a) The auxiliary blowers must run at speed 1 when the heater switch is in positions 1-7.

   b) The auxiliary blowers must run at speed 2 when the heater switch is in positions 8-9.

5. Using an auxiliary cable, connect term. 5 and term. 6 to positive. The motor blower must run.

6.Connect voltmeter to term. 7 and ground.
Readout: Battery voltage

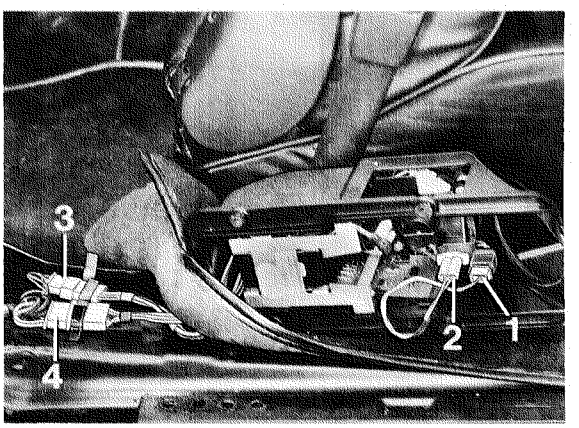
7.Connect voltmeter to term. 8 and ground.
Readout: Battery voltage

8.Connect voltmeter to term. 9 and ground.
Briefly crank engine.
Readout: Battery voltage

9.Connect voltmeter to term. 11 and ground.
Switch on ignition.
Readout: Battery voltage

If the specifications are not obtained, check the wiring with the wiring diagrams.

Checking Auxiliary Blowers



1.Switch on ignition.
Set heater switch to position 3.

Connect voltmeter to plug 4 term. 3 and ground. Readout: Battery voltage

If no voltage:
Check heating control relay.

2.Set heater switch to position 8.
Connect voltmeter to plug 4 term. 5 and ground.
Readout: Battery voltage

If no voltage:
replace switch.

3.Set heater switch to position DEF

Connect voltmeter to plug 4
term. 6 and positive.

Readout: Battery voltage.

If no voltage:
Replace switch.

If voltage present and auxiliary blowers not running, check relay on fuse box in luggage compartment.

REMOVING AND INSTALLING FRESH-AIR BLOWER

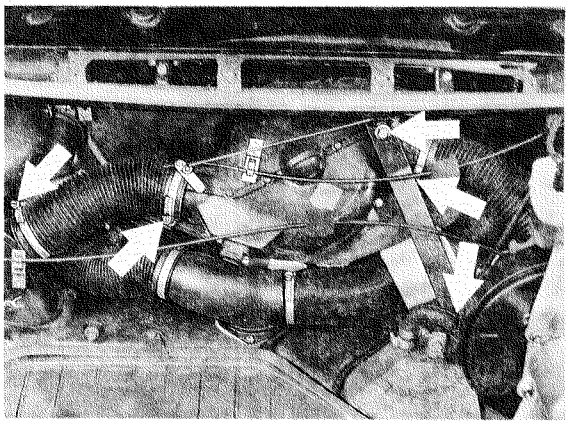
1. Fold back luggage compartment mat.

2. Unscrew cover.

3. Unscrew flyguard.

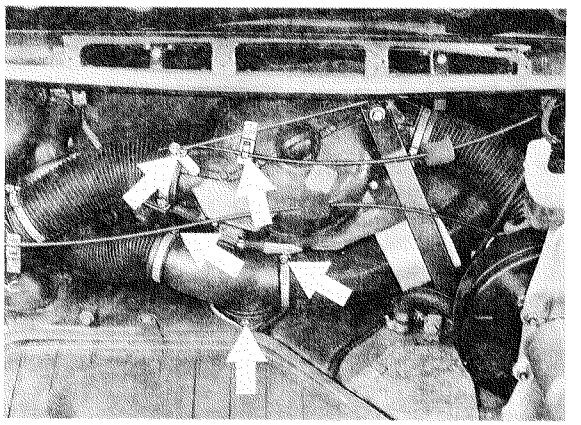
4. Unscrew bracket.

5. Remove air hoses.



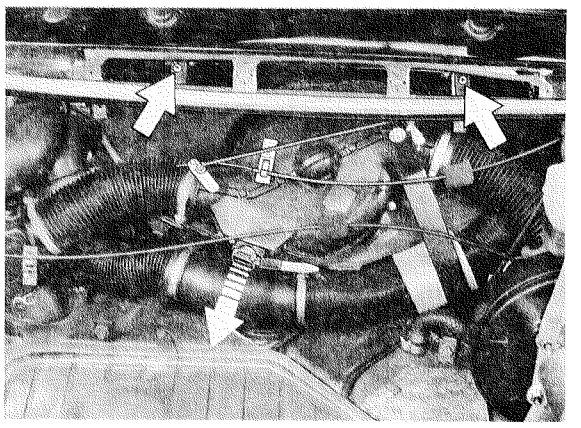
6. Loosen bowden cable and unclip sleeve.

7. On vehicles with air conditioner, remove air distributor.



8. Disconnect plug.

9. Loosen fastening screws.



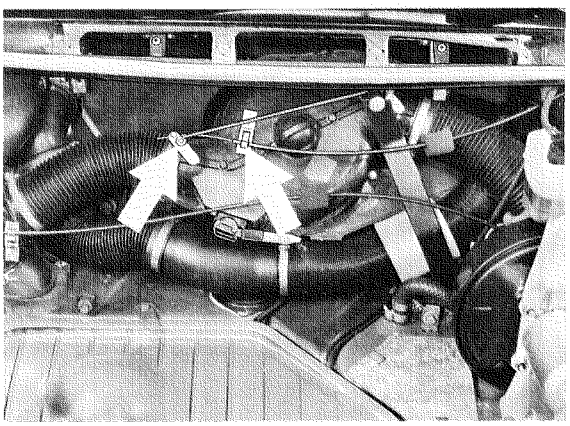
10. Disconnect water-drain hose.

ADJUSTING BOWDEN CABLE FOR FRESH-AIR FLAPS

1.Close fresh-air flaps.

2.Set lever for fresh-air flaps on control switch all the way to the left.

3.Guide cable through hole in screw and tighten nut.

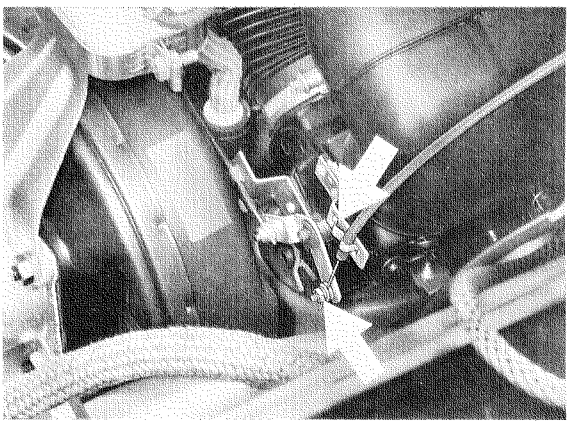


4.Clip down sleeve.

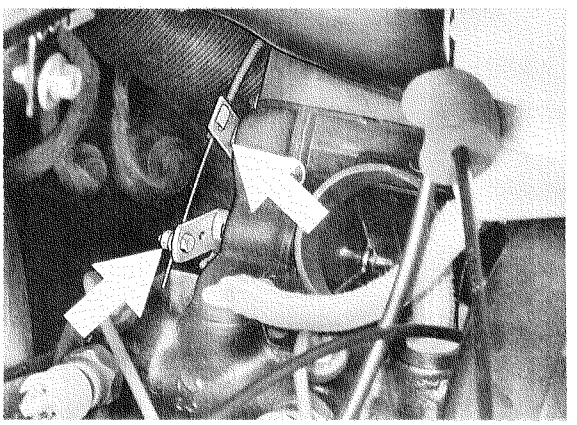
REMOVING AND INSTALLING CONTROL SWITCH

1.Remove fresh-air blower.

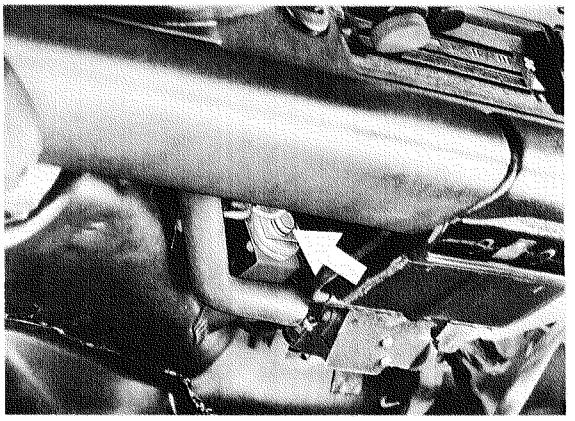
2.Loosen bowden cable for fresh-air distribution on left-hand air-distributor box and unclip sleeve.



3.Loosen bowden cable for hot-air distribution on left-hand air-distributor box and unclip sleeve.



4.Loosen fastening nut.



5.Take apart cable at plug connector.

6.Disconnect ground cable from ground terminal.

7.Disconnect control switch illumination.

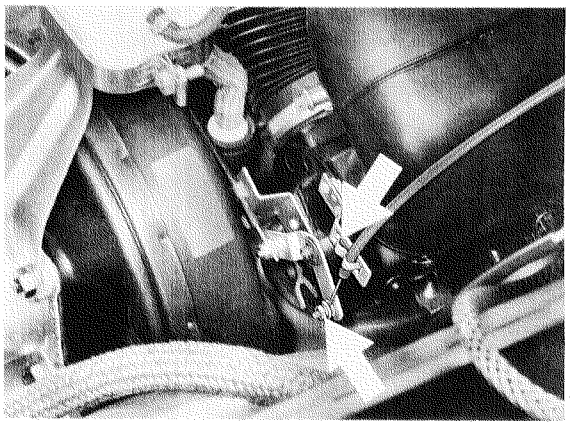
8.Remove control switch with cables.

ADJUSTING BOWDEN CABLE FOR COLD-AIR DISTRIBUTION

1.Set flap on left-hand air-distributor box so that the air flows into the footwell.

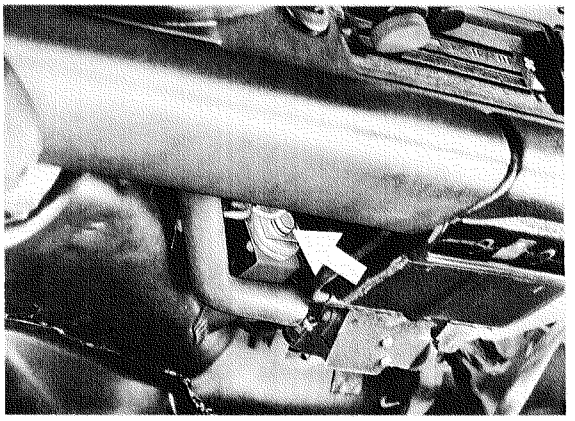
2.Set lever for cold-air distribution on control switch all the way to the left.

3.Guide cable through hole in screw and tighten nut.



4.Clamp down sleeve.

4.Loosen fastening nut.



5.Take apart cable at plug connector.

6.Disconnect ground cable from ground terminal.

7.Disconnect control switch illumination.

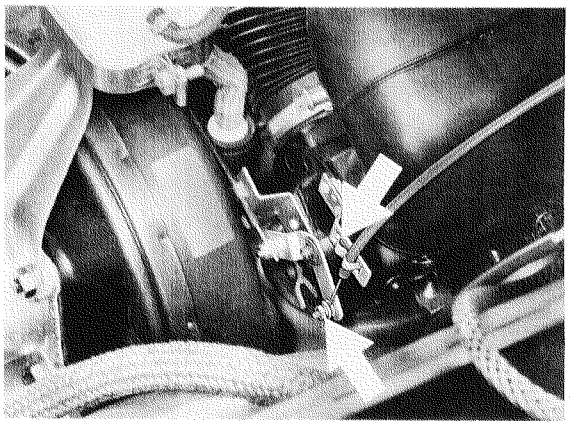
8.Remove control switch with cables.

ADJUSTING BOWDEN CABLE FOR COLD-AIR DISTRIBUTION

1.Set flap on left-hand air-distributor box so that the air flows into the footwell.

2.Set lever for cold-air distribution on control switch all the way to the left.

3.Guide cable through hole in screw and tighten nut.



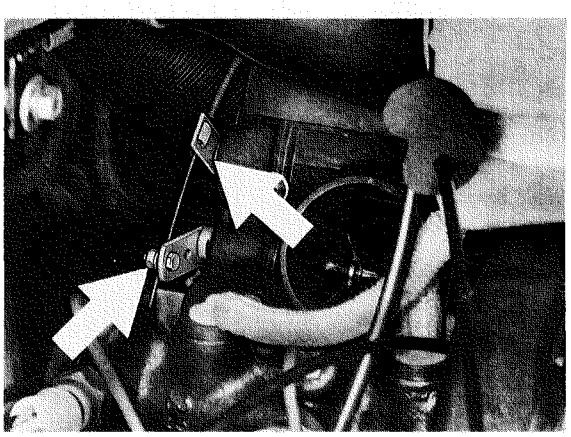
4.Clamp down sleeve.

ADJUSTING BOWDEN CABLE FOR HOT-AIR DISTRIBUTION

1. Set flap on left-hand air-distributor box so that the air flows into the footwell.

2. Set lever for hot-air distribution on control switch all the way to the left.

3. Guide cable through hole in screw and tighten nut.



4. Clip down sleeve.

SAFETY REGULATIONS FOR HANDLING R 12 REFRIGERANT

The applied refrigerant "R 12" is known as a safety refrigerant. In other words this refrigerant is not combustible, non-explosive, non-poisonous, non-toxic, odorless and tasteless. Conformance with the following points is mandatory in spite of this.

1. Avoid any contact with liquid or gaseous refrigerant. Concerned skin must be treated as for frostbite. Wear protective goggles to protect the eyes. Look up a physician immediately, if refrigerant is still splashed in the eyes.

2. The system has to be discharged when repairing the air conditioner. Refrigerant gas must never be discharged in a closed room. There would be danger of asphyxiation in work pits, since it is heavier than air.

3. Never weld on parts of a closed air conditioning system or in their immediate vicinity.
   Regardless of whether the air conditioner is charged with refrigerant or not, heating would produce excessive pressure which in turn could cause damage on the system or even lead to an explosion.
   R 12 is completely non-poisonous at normal temperatures. However, it decomposes into hydrochloric gas and hydrogen fluoride when confronted with an open flame or high temperature. These decomposition products contain, among others, chloric gas and phosgene. Pertinent precautions are necessary, since these products are dangerous to health.

4. Refrigerant cylinders must not be thrown or, when filled, subjected to sunshine or other sources of heat for long periods of time. The maximum permissible temperature of a filled refrigerant cylinder must not exceed 45^{o} C.

JOBS REQUIRING OPENING THE REFRIGERANT SYSTEM

The system must be discharged in the specified manner for all jobs on the air conditioner, which require opening the refrigerant system. Conformance with the safety regulations is also mandatory.

Dirt and moisture must be kept out of the system of air conditioner lines. This is why absolute cleanliness is essential for all jobs. The inside of air conditioner components must never be cleaned with hot steam. Always only clean with nitrogen or refrigerant.

When replacing a component, always insert suitable plugs in all openings.

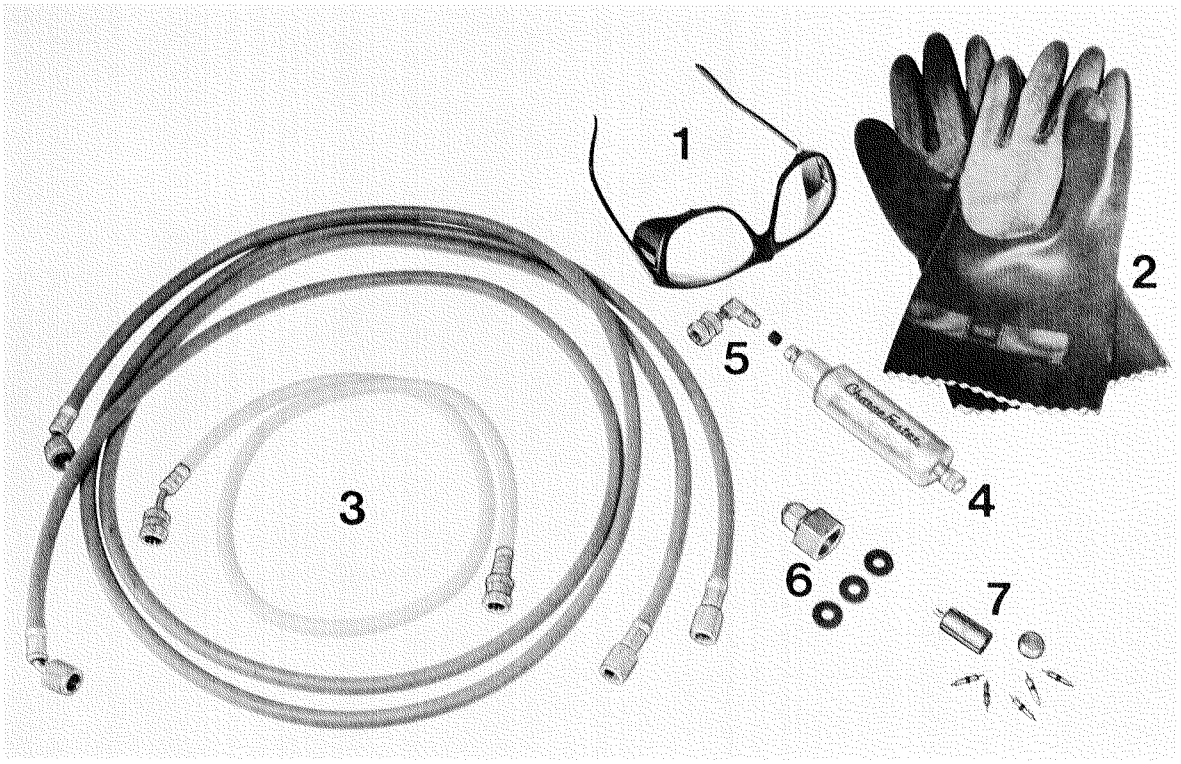
General Job Sequence

1. Discharge air conditioner.
2. Remove faulty component.
3. Discharge.
4. Flush with refrigerant.
5. Discharge.
6. Charge.

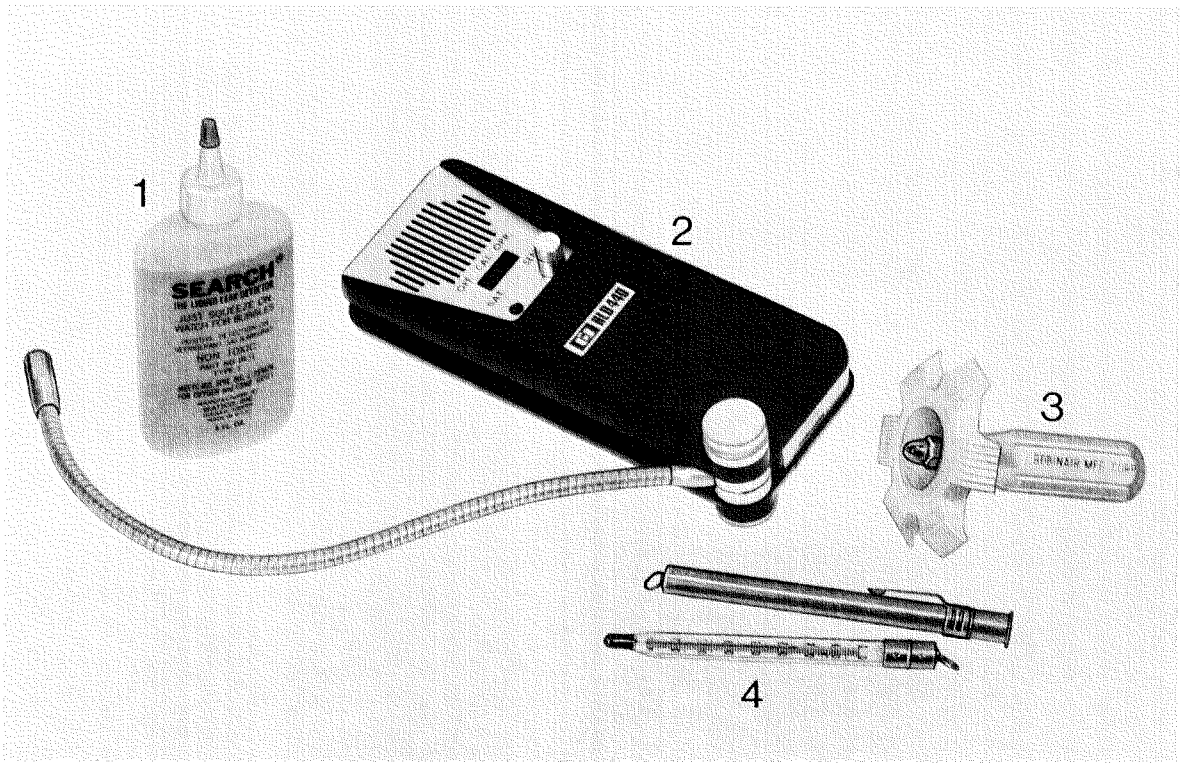
Note

Check seals when disconnecting and connecting hoses.

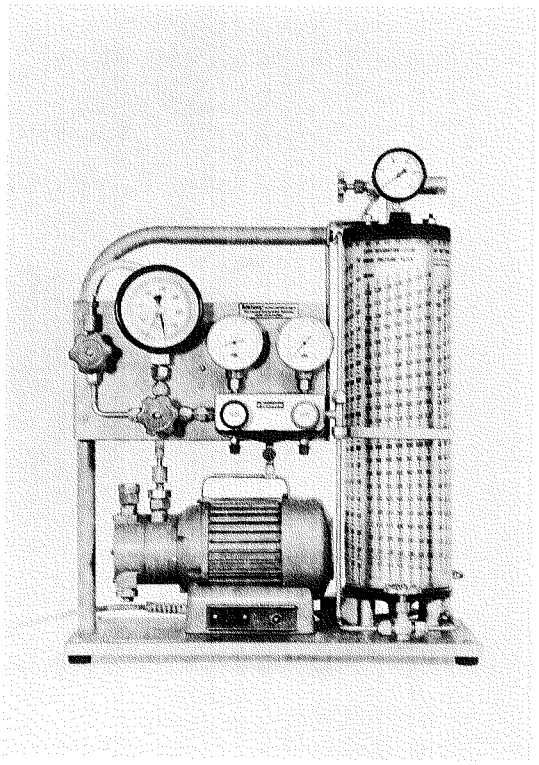
TOOLS

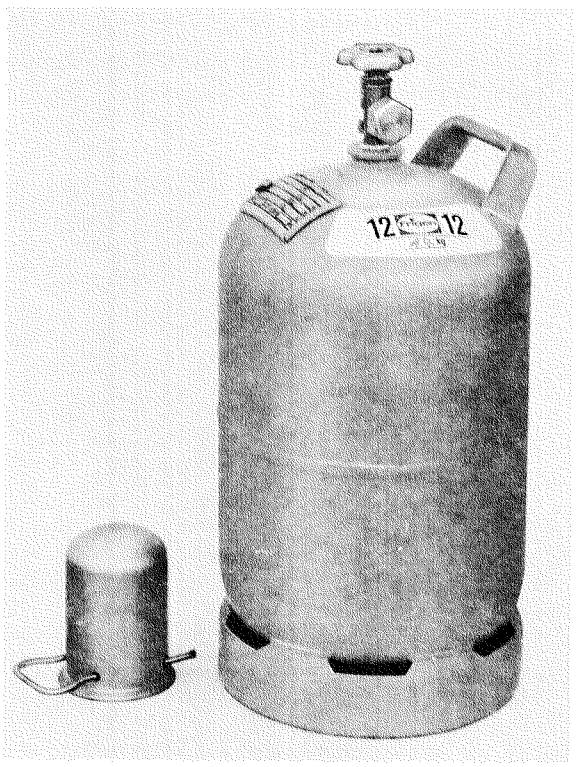


No.	Description	Special Tool	Remarks
1	Protective goggles	–	Standard item
2	Rubber gloves	–	Standard item
3	Charging hoses	–	Standard items 2 x 1200 mm long 1 x 500 mm long 7/16" UNF threads
4	"Chargefaster"	–	Standard item
5	Adapter for charge-faster with spare seal	–	Standard item
6	Cylinder connector with spare seals	–	Standard item
7	Spring valve opener with spare spring valves	–	Standard item



No.	Description	Special Tool	Remarks
1	Leak detecting fluid	–	Standard item
2	Electronic leak detector	–	Standard item
3	Plate comb	–	Standard item
4	Thermometer	–	Standard item





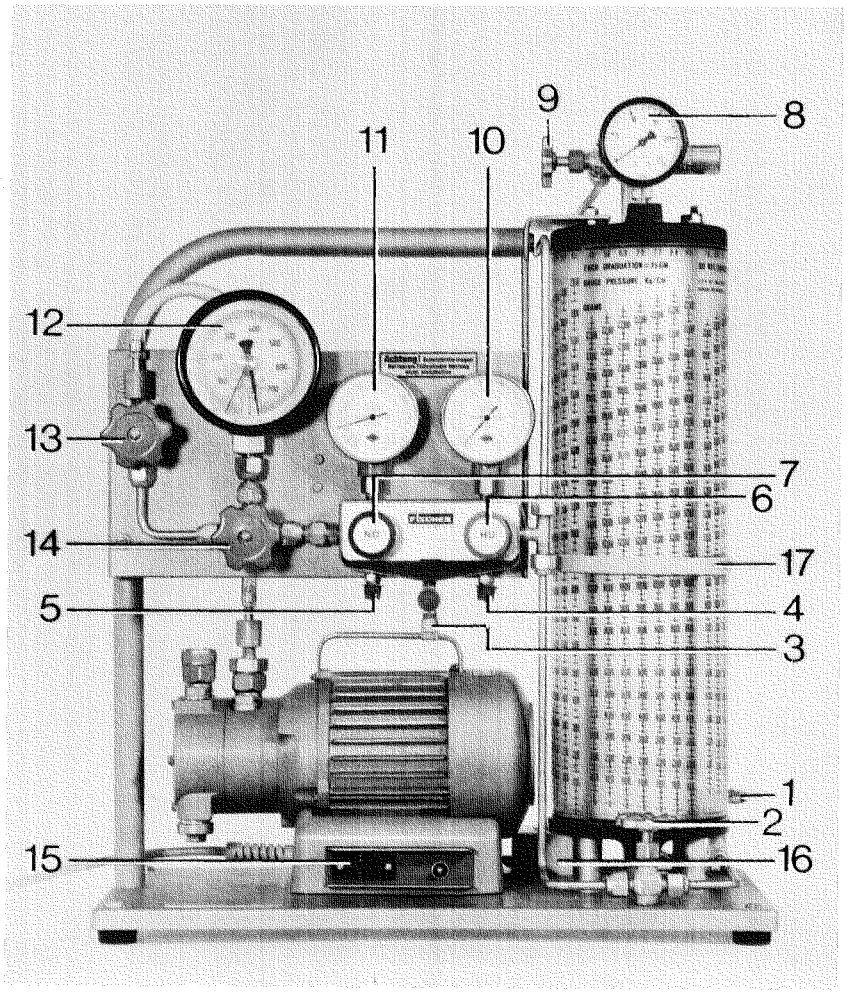
No.	Description	Special Tool	Remarks
1	Discharging and charging machine FSV - 102	—	Standard item
2	Steel cylinder for R 12 refrigerant	—	Standard item 14 kg full weight

Remarks

All of the listed tools and equipment can be ordered from refrigerant companies and will be required, if the refrigerant system has to be opened for repairs on the air conditioner.

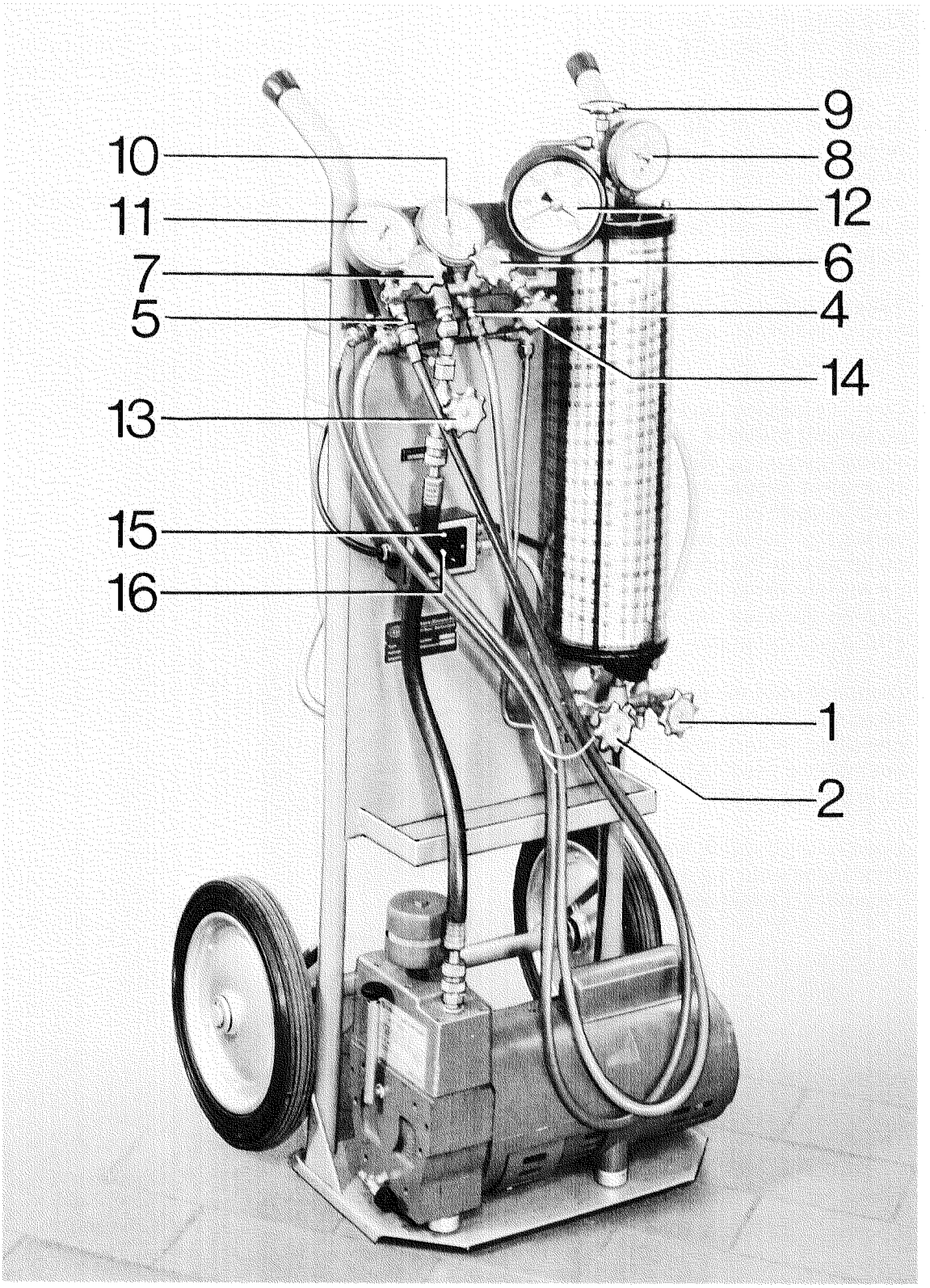
WORKING WITH THE FSV 102 SERVICE MACHINE

This machine is applied for checking, discharging, flushing and charging air conditioners. The machine consists chiefly of the vacuum pump, electrically heated charging cylinder, gaging instruments and a battery of valves.



1 - Cylinder connecting valve
2 - Charging valve (liquid)
3 - Charging adapter
4 - High pressure connector
5 - Low pressure connector
6 - High pressure shut-off valve
7 - Low pressure shut-off valve
8 - Pressure gage (charging cylinder)
9 - Charging valve (gas)
10 - Pressure gage (high pressure)
11 - Pressure gage (low pressure)
12 - Torrmeter
13 - Discharging valve
14 - Torrmeter shut-off valve
15 - Pump switch
16 - Heater switch
17 - Setring for refrigerant level

TYPE 95 302 ROBINAIR SERVICE MACHINE



OPERATION

1. Plug in the electric lead (220 V, 50 Hz). Switch off switches 16 and 17, and close all valves.

2. Screw the cylinder connector on the refrigerant cylinder. Install charging hose between the refrigerant cylinder and cylinder connecting valve 1. Close cylinder valve and open cylinder connecting valve 1.

3. Take off cap on charging adapter 3 briefly and install again, to discharge any pressure.

4. Open discharging valve 13 and torrmeter shut-off valve 14. Switch on the vacuum pump with switch 16. If ambient temperature is below + 10° C (50° F), loosen the quick connection before switching on the pump so that the pump can warm up without drawing in vacuum. Tighten the quick connection again after 1 to 2 minutes.

5. Discharge until the maximum final vacuum is reached (depends on the prevailing atmospheric pressure). Set marking needle of the torrmeter to this value.

6. Open valves 2 and 9, and continue discharging until the maximum vacuum is reached again.

CHECKING SERVICE MACHINE FOR LEAKS

1. Close discharging valve 13. Pressure on the torrmeter should not rise, since then there would be a leak on the machine or refrigerant cylinder valve. If applicable, eliminate the leak.

2. Switch off the pump and close valves 2, 9 and 14.

OPERATION

1. Plug in the electric lead (220 V, 50 Hz). Switch off switches 16 and 17, and close all valves.

2. Screw the cylinder connector on the refrigerant cylinder. Install charging hose between the refrigerant cylinder and cylinder connecting valve 1. Close cylinder valve and open cylinder connecting valve 1.

3. Take off cap on charging adapter 3 briefly and install again, to discharge any pressure.

4. Open discharging valve 13 and torrmeter shut-off valve 14. Switch on the vacuum pump with switch 16. If ambient temperature is below + 10° C (50° F), loosen the quick connection before switching on the pump so that the pump can warm up without drawing in vacuum. Tighten the quick connection again after 1 to 2 minutes.

5. Discharge until the maximum final vacuum is reached (depends on the prevailing atmospheric pressure). Set marking needle of the torrmeter to this value.

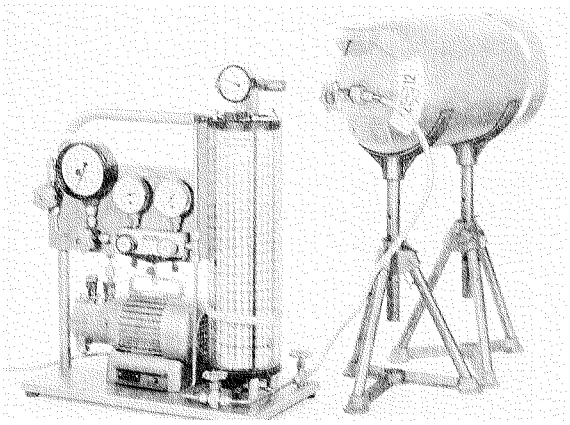
6. Open valves 2 and 9, and continue discharging until the maximum vacuum is reached again.

CHECKING SERVICE MACHINE FOR LEAKS

1. Close discharging valve 13. Pressure on the torrmeter should not rise, since then there would be a leak on the machine or refrigerant cylinder valve. If applicable, eliminate the leak.

2. Switch off the pump and close valves 2, 9 and 14.

FILLING SERVICE MACHINE



1. Set up the refrigerant cylinder at higher level; upside down on a locally made stand is recommended. Open the cylinder valve and let liquid refrigerant flow into the charging cylinder. The charging volume must not exceed the maximum value (2200 gr.) on the lowest scale.

2. If the cylinder pressure is not sufficient to fill the cylinder, the pressure building up in the cylinder can be discharged by opening valves 9 and 6 or 9 and 7.

3. Close the cylinder valve and valve 1, if the cylinder is full. The machine is now ready for use,

4. Discharging is not necessary again when refilling the cylinder, if refrigerant flows through the charging hose already when connecting on valve 1 (open the cylinder valve slightly first).

CONNECTING SERVICE MACHINE ON AIR CONDITIONER

1. Connect both long charging hoses on adapters 4 and 5 of the service machine. All valves on the service machine must be closed.

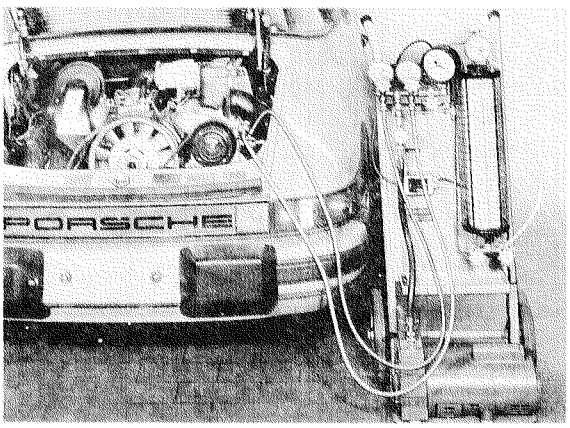
Note

If the "chargefaster" is already mounted on adapter 5, the charging hose has to be connected on the "chargefaster".

2. Unscrew caps of valves on the compressor.

3. Connect the charging hose from adapter 4 on valve D (pressure line).

4. Connect the charging hose from adapter 5 on valve S (suction line).



DRAINING AIR CONDITIONER

1. Connect the service machine.
2. Unscrew cap on charging adapter 3.
3. Open valve 7 only enough that the refrigerant can be heard or felt with a finger to flow on charging adapter 3.
4. If the air conditioner does not have to be filled again immediately after draining, the draining procedures could also be carried out without a service machine. This requires unscrewing the cap on the suction line (low pressure side) and loosening the valve insert carefully with a spring valve opener. Never unscrew the valve completely.

Note

The discharging procedures should last at least one half hour. If the refrigerant were drained too quickly, the escaping gas would also remove the refrigerating oil in the system required for lubrication of the compressor. This must always be prevented!

Never switch on an emtied air conditioner!

DISCHARGING AIR CONDITIONER

1. Connect the service machine.
2. Discharge any possible pressure still in the circuit.
3. Switch on the vacuum pump.
4. Open low pressure valve 7, high pressure valve 6, torrmeter shut-off valve 14 and discharging valve 13.
5. Close discharging valve 13 and the torrmeter shut-off valve when reaching an absolute pressure of approx. 0.1 bar. The latter is especially important, since otherwise the torrmeter would be destroyed during the following flushing procedures.
6. Switch off the vacuum pump.

Note

There is a leak in the circuit and it must be eliminated, if the vacuum is not reached or reached only after a very long time or rises again after switching off the pump so that the absolute pressure is more than 0.2 bar.

FLUSHING AIR CONDITIONER

1. Connect the service machine.

2. Discharge.

3. Open charging valve 2 and high pressure valve 6. Let enough liquid refrigerant flow in to have a pressure reading of approx. 2 bar (absolute). The liquid refrigerant will evaporate in the circuit and can therefore absorb any traces of water.

4. Drain the air conditioner.

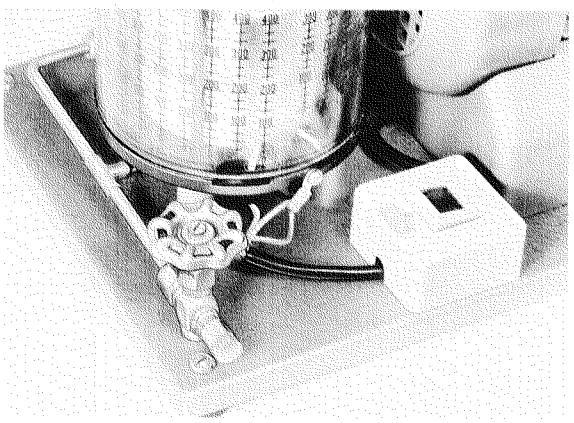
5. Discharge.

CHARGING AIR CONDITIONER

1. All previously jobs must have been completed, i.e. the system must have been discharged, flushed, discharged again and be without leaks.

2. Close all valves on the service machine. The charging cylinder must have sufficient refrigerant. Refill if necessary.

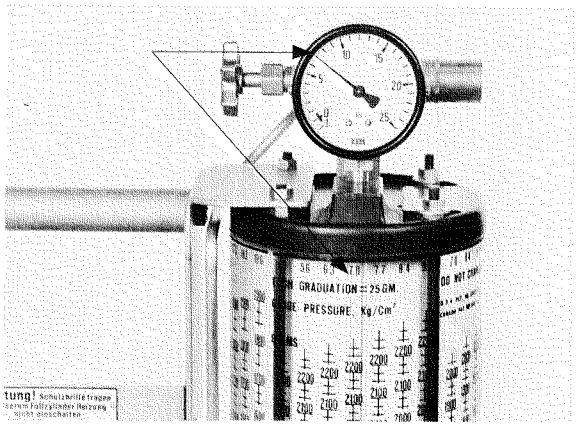
3. A pressure of approx. 7 bar is required in the charging cylinder to charge the air conditioner. Switch on the heater integrated in the charging cylinder to reach this pressure.



Note

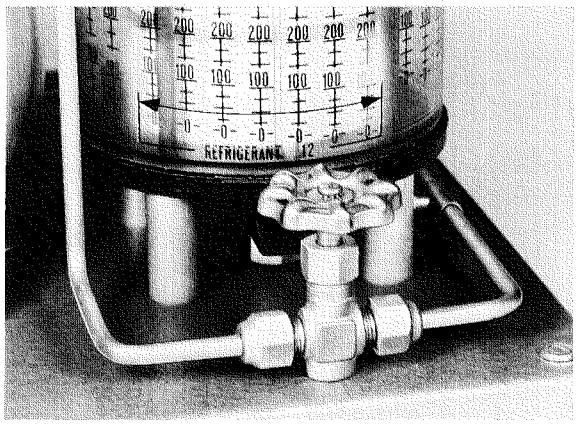
About 10 minutes are required to increase the pressure by 1 bar.

4. Set the scale of the charging cylinder according to the reading on the pressure gauge (e.g. 7 bar) in such a manner than the value given on the upper edge of the scale is positioned above the inspection glass.



Remember that the scale is designed for use with a number of refrigerants. The refrigerant codes are marked on the lower edge of the scale.

Only scales for R12 are used for the air conditioners installed in cars.



5. Set the required volume of refrigerant with the sliding ring on the charging cylinder (difference from previous refrigerant level).

6. Recheck that all valves are closed, especially torrmeter shut-off valve 14.

7. Open charging valve 2 and high-pressure valve 6.

8. Observe the liquid display in the inspection glass of the charging cylinder. Close valve 2 when the liquid level reaches the set ring. Open charging valve 9 briefly to force the refrigerant still in the charging hose into the air conditioner. Close high-pressure valve 6.

9. Switch off heater. Disconnect charging hoses from compressor. Screw dust caps onto valves.

Note:

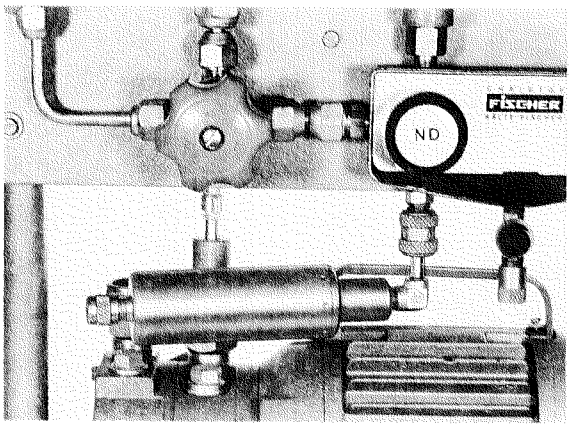
When the air conditioner has been recharged, the compressor must be switched on for the first time with the engine idling. After this initial operation, the compressor can be fully loaded under all operating conditions.

RECHARGING AIR CONDITIONER

The system has insufficient refrigerant, if the ball does not float in the inspection glass of the liquid tank with the air conditioner switched on.
The air conditioner does not have to be discharged for recharging.

1. Eliminate any leaks first.

2. Mount the "chargefaster" on adapter 5 (low pressure) with help of an elbow connector.



The "chargefaster" can remain connected on the service machine as a permanent component.

3. Connect the charging hose between "chargefaster" on the service machine and valve on the suction line.
Open valves 2 and 7 on the service machine briefly to discharge the charging hose with flowing refrigerant.
All other valves on the service machine must be closed.

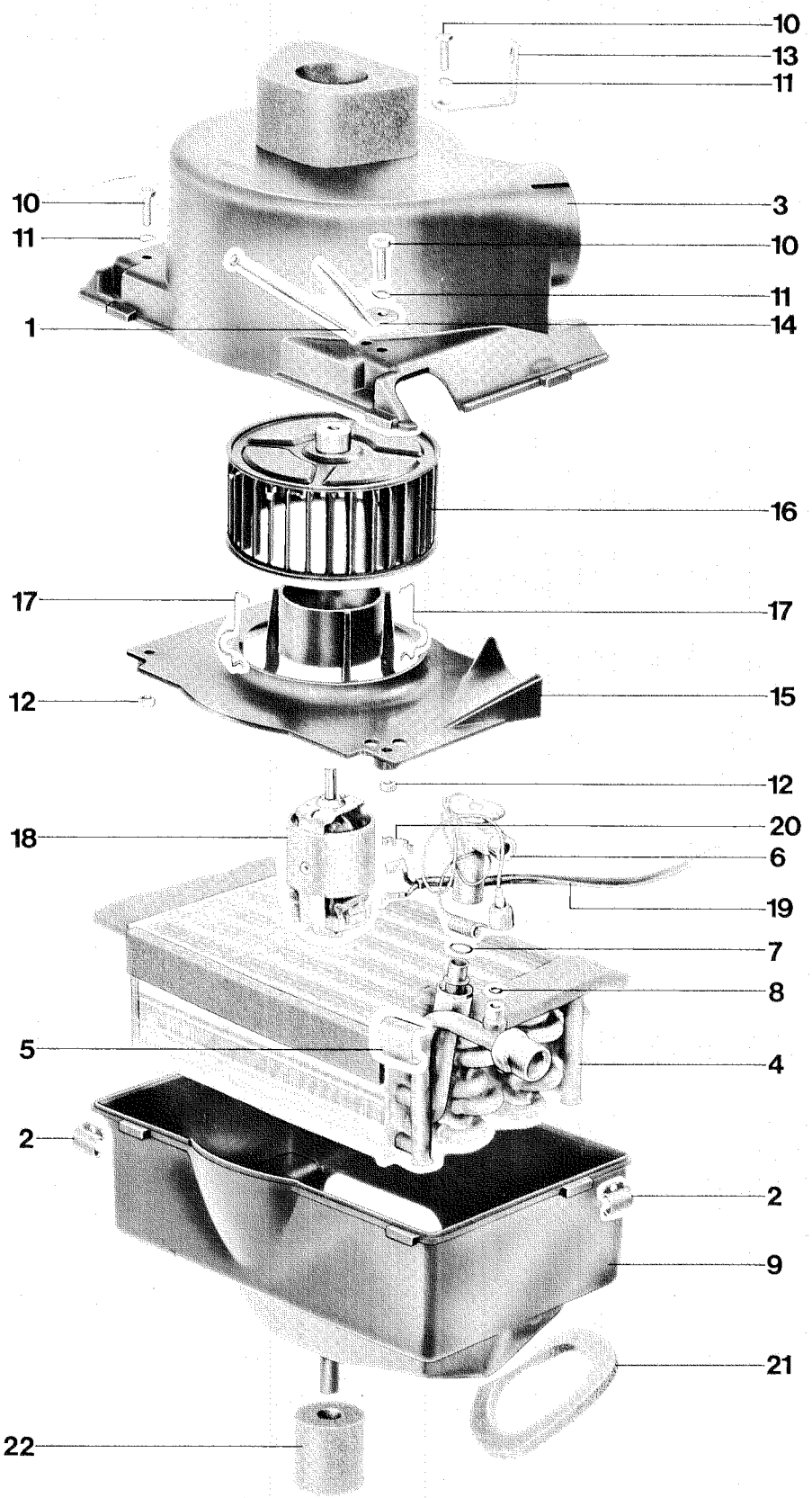
4. Switch on the air conditioner and set to maximum refrigeration. Run engine at approx. 2,000 rpm. Open charging valve 2 and low pressure valve 7.

5. Observe the inspection glass in the liquid tank. Recharging has been completed when the ball floats.

N o t e

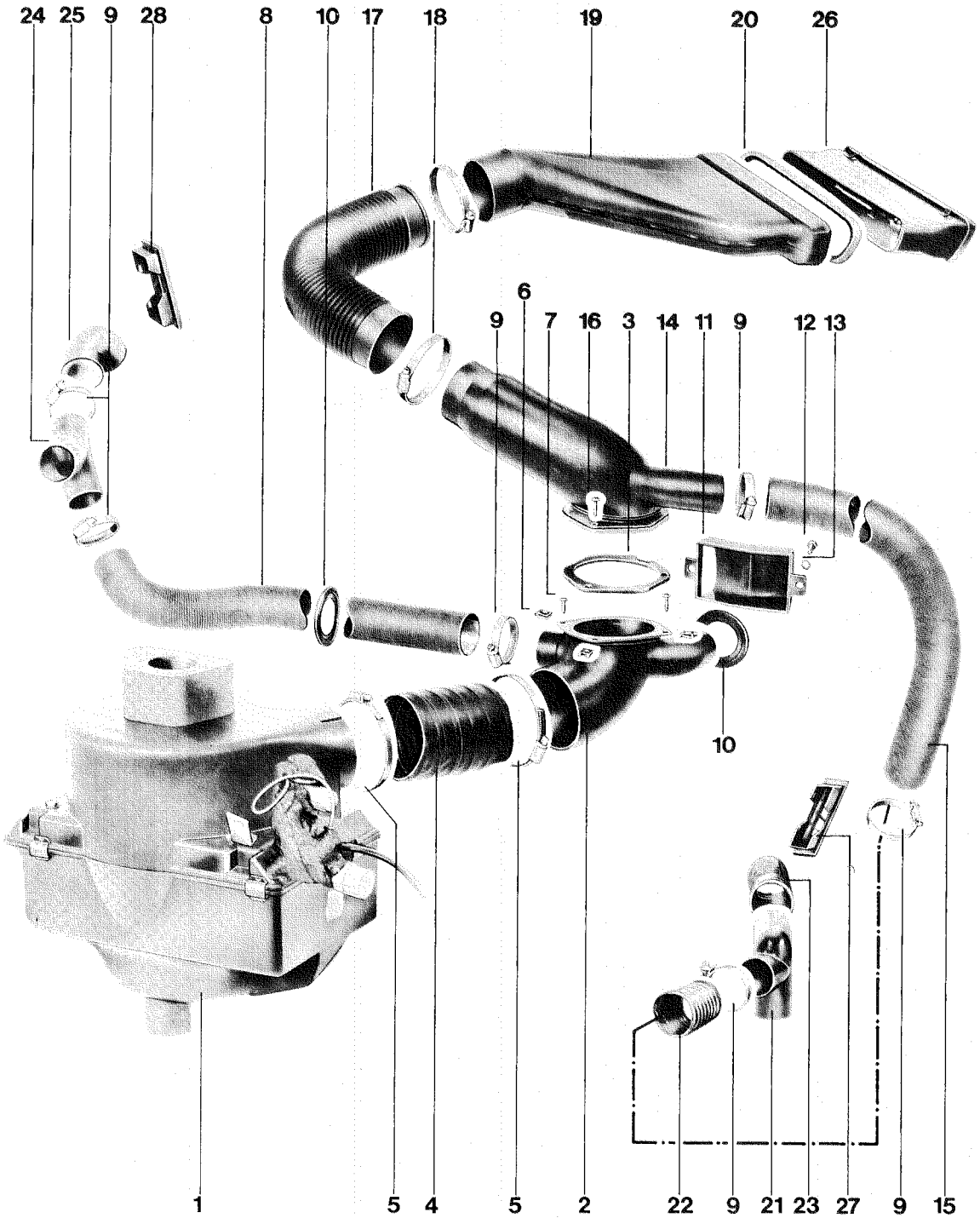
Never open valves 6 and 7 simultaneously while the engine is running.

DISASSEMBLING AND ASSEMBLING AIR CONDITIONER



No.	Description	Qty.	Note When: Removing	Installing	Special Instructions
1	Guide tube	1			
2	Spring clamp	4	Sliding off only possible in one direction		
3	Housing upper section	1			
4	Evaporator	1	Do not damage plates		
5	Clamp	1			
6	Expansion valve	1			
7	Gasket 3/4	1		Replace	
8	Gasket 7/16	1		Replace	
9	Housing lower section	1			
10	Screw M 6 x 20	4			
11	Corrugated washer	4			
12	Nut M 6	4			
13	Bracket	1			
14	Bracket	1			
15	Holder	1			
16	Fan wheel	1			
17	Clamp	4			
18	Electric motor	1			
19	Wire harness	1			
20	Clamp	1			
21	Foam rubber part	1			
22	Foam rubber part	1			

AIR FLOW SYSTEM – AIR CONDITIONER



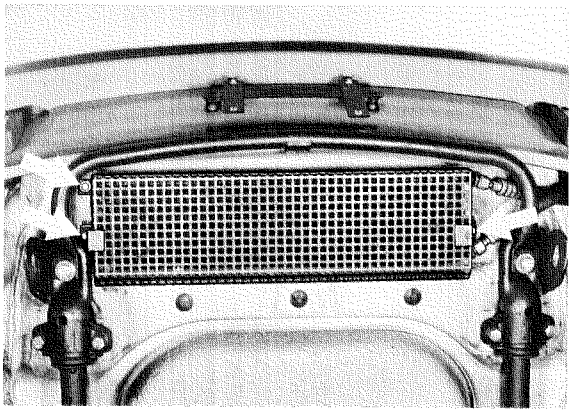
No.	Description	Qty.	Note When: Removing	Note When: Installing	Special Instructions
1	Air conditioner	1			
2	Pipe adapter	1			
3	Gasket	2			
4	Air hose	1			
5	Hose clamp 76 - 92	2			
6	Self-tapping nut 4.2	3			
7	Self-tapping screw	2			
8	Air hose	1			
9	Hose clamp 25 - 40	6			
10	Rubber grommet	2			
11	Footwell nozzle	1			
12	Screw M 5 x 12	2			
13	Lock washer	2			
14	Pipe adapter	1			
15	Air hose	1			
16	Self-tapping screw	1			
17	Air hose	1			
18	Hose clamp	2			
19	Air duct	1			
20	Gasket	1			
21	Air branch	1			
22	Air hose	1			
23	Air hose	1			
24	Air branch	1			
25	Air hose	1			
26	Center nozzle	1			
27	Side nozzle	1			
28	Side nozzle	1			

REMOVING AND INSTALLING REAR CONDENSER

1. Discharge the air conditioner.

2. Unscrew hoses.

3. Unscrew mounting bracket on center plate.

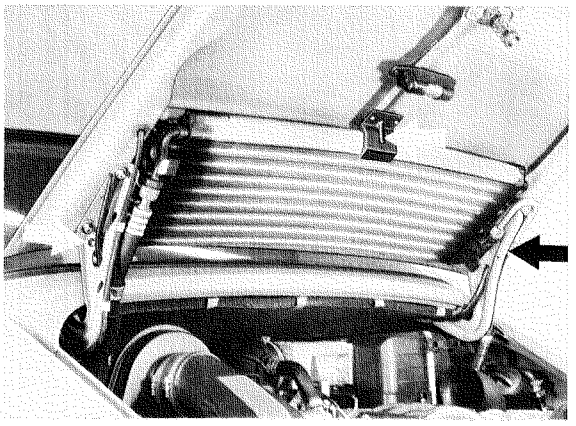


4. Loosen screws on the cover hinges and take off the condenser.

REMOVING AND INSTALLING FRONT CONDENSER

1. Discharge the air conditioner.

2. Unscrew hoses.

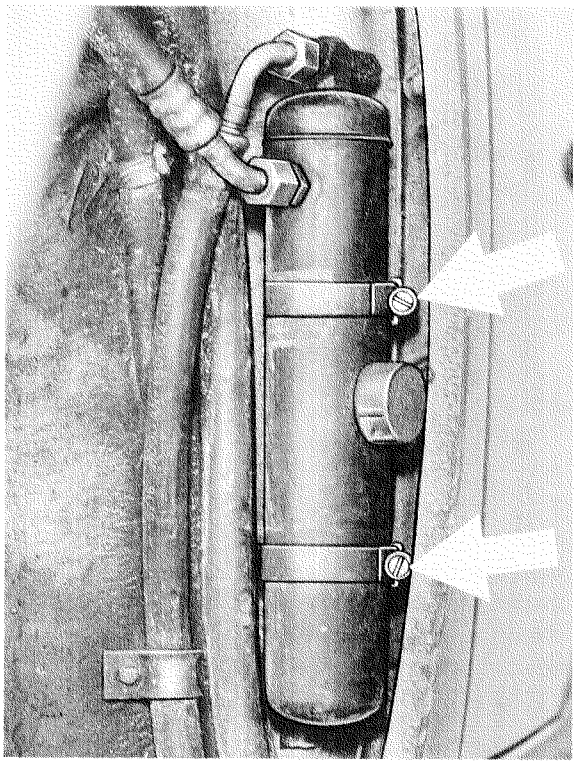


3. Unscrew hexagon head screws and take off the condenser together with the stone guard.

REMOVING AND INSTALLING LIQUID TANK

1. Discharge air conditioner.

2. Unscrew hose connections.



3. Open hose clamps completely and remove liquid tank.

Note:

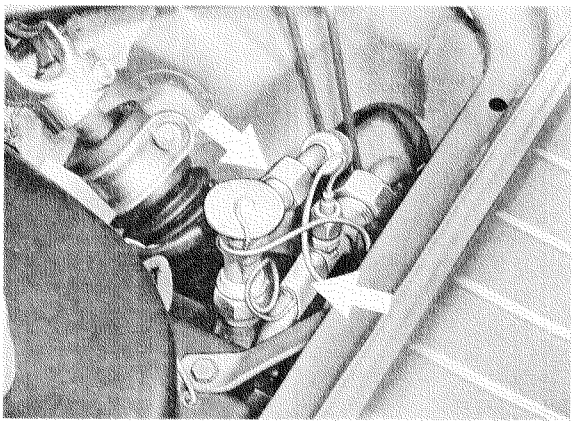
A replacement liquid tank must be fitted if the system develops a fault or if the refrigerant circuit is opened.

REMOVING AND INSTALLING EXPANSION VALVE

1. Discharge air conditioner.

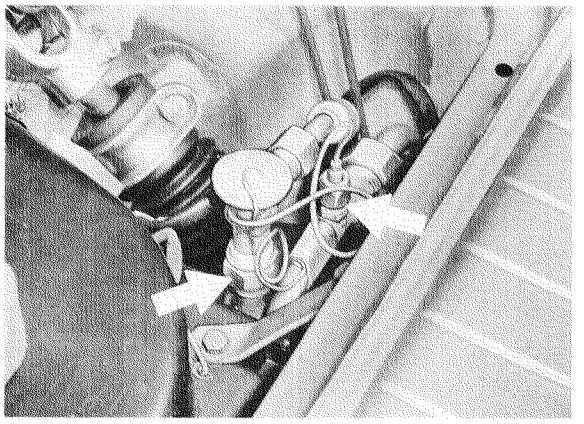
2. Pull refrigeration insulating tape off expansion valve.

3. Press off holder for capillary tube.



4. Unscrew connection.

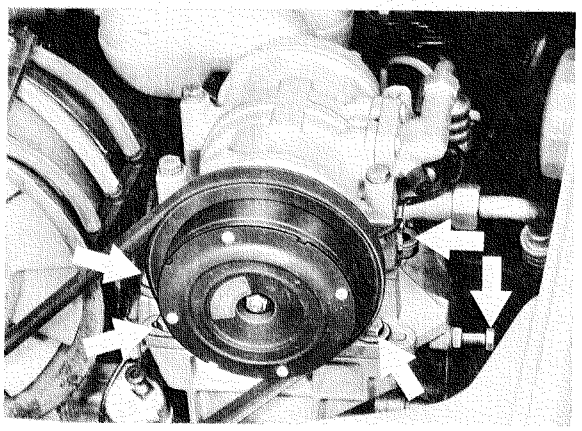
5. Unscrew pressure-compensating tube from evaporator outlet.



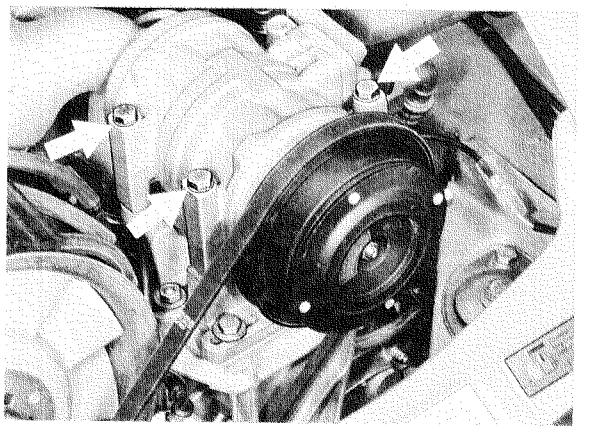
6. Unscrew union nut from evaporator inlet and remove expansion valve.

REMOVING AND INSTALLING COMPRESSOR

1. Discharge the air conditioner.
2. Disconnect plug.
3. Unscrew hoses and insert plugs in open connections and lines.
4. Only loosen mounting bolts and nuts of the compressor plate (do not remove).



5. Loosen the drive belt by unscrewing the locknut on the tensioning bolt, and remove the tensioning bolt. Push the compressor to the left far enough, that the drive belt can be taken off.
6. Unscrew compressor mounting bolts.



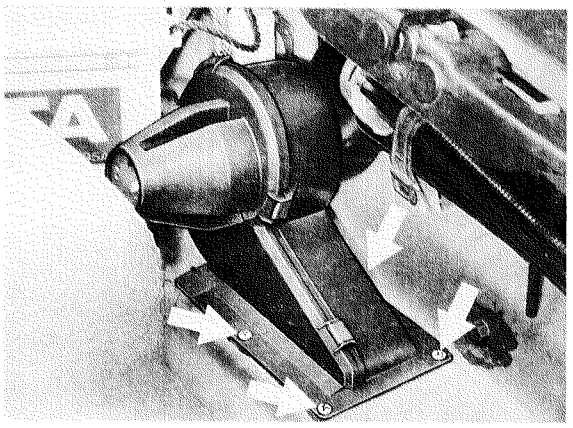
Note

New compressors are under pressure. Consequently unscrew the caps slowly until the refrigerant is heard to escape. Remove the caps only after the unit has been discharged.

REMOVING AND INSTALLING BLOWER FOR FRONT CONDENSER

1. Remove battery, if a 88 Ah battery is installed.

2. Disconnect plug.



3. Unscrew mounting bolts.

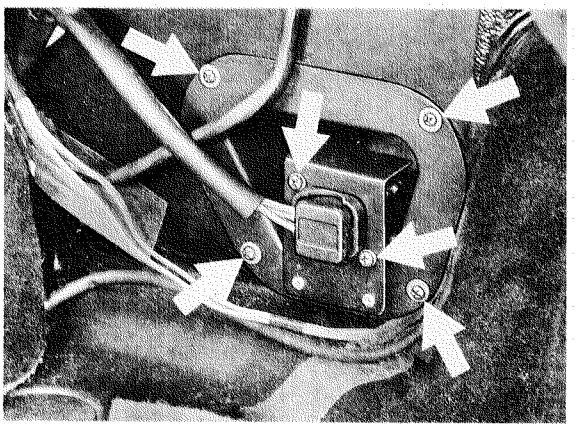
4. Pull out blower through opening in the front lock cross panel.

REMOVING AND INSTALLING THERMO BIMETAL SWITCH

1. Unscrew floor plate on the passenger's side.

2. Pull off plug receptacle.

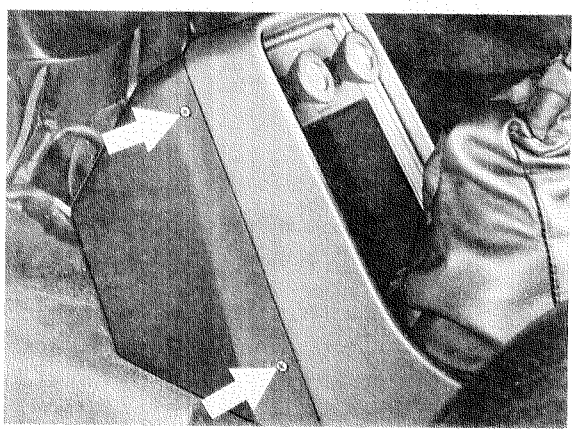
3. Unscrew neck mounting screws and take out the neck.



4. Unscrew mounting screws of the thermo bimetal switch.

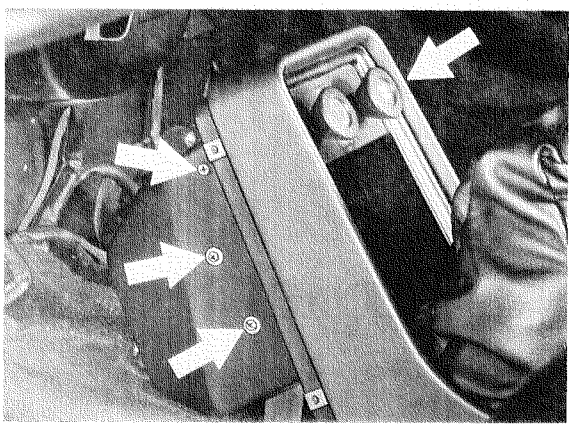
REMOVING AND INSTALLING TEMPERATURE REGULATOR

1. Unscrew center console cover (four screws).

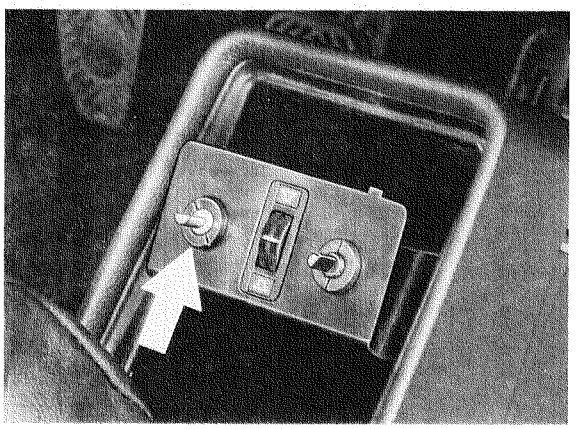


2. Unscrew stop (two screws).

3. Unscrew switch frame (2 screws) and press down.

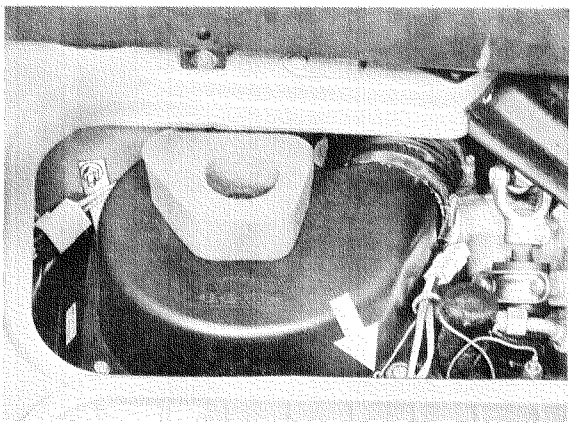


4. Unscrew the escutcheon with Special Tool 9245.



Pull off wires on switch.

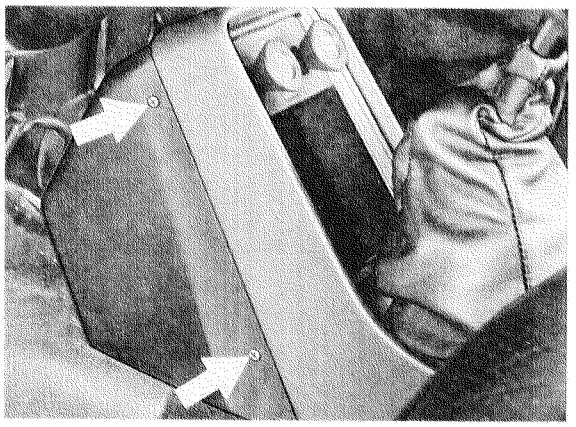
5. Pull temperature sensor wire out of guide tube in the evaporator housing carefully.

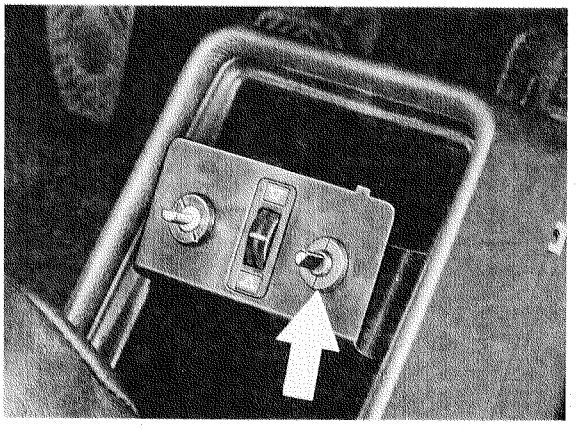


6. Pull temperature sensor wire into inside of car carefully.

REMOVING AND INSTALLING BLOWER SWITCH

1. Unscrew center console cover (four screws).

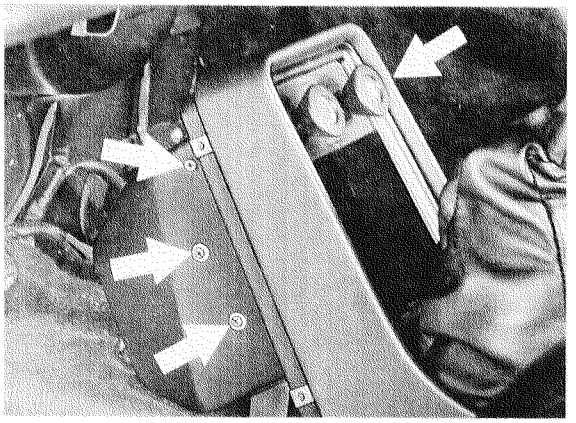




Pull off wires on switch.

2. Unscrew stop (two screws).

3. Unscrew switch frame (two screws) and press down.



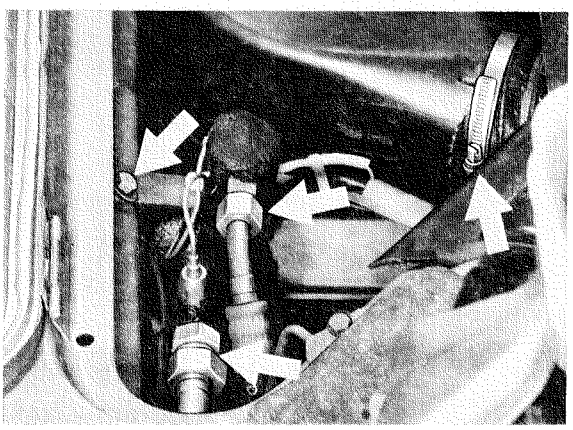
4. Unscrew the escutcheon with Special Tool 9245.

REMOVING AND INSTALLING AIR CONDITIONER

1. Discharge the air conditioner.

2. Remove the thermo bimetal switch (see page 87 - 21).

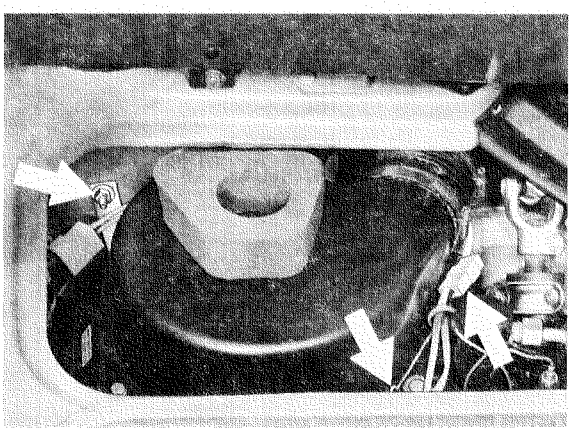
3. Loosen hose clamp on the air guide hose and press hose off of neck on the evaporator housing.



4. Unscrew hoses on the expansion valve.

5. Disconnect plug for the blower motor.

6. Pull temperature sensor wire out of guide tube in the evaporator housing carefully.



7. Remove mounting bracket bolts on the body.

N o t e

The bolts of the air conditioner mounting brackets should be tightened only after installation of the thermo bimetal switch.

OIL DISTRIBUTION IN THE REFRIGERATING CIRCUIT

Compressor

40 % = approx. 50 cm^3

Evaporator

35 % = approx. 40 cm^3

Condensers front / rear

15 % = approx. 20 cm^3 together

Fluid tank / lines

10 % = approx. 10 cm^3

These figures are approximations.

If a replacement component is fitted, the oil must be topped up by an amount equal to that which remains in the part removed.

The correct quantity of oil can be poured directly into the new components.

If a replacement compressor is fitted, 60 % = approx. 70 cm^3 of oil must be drained from the new compressor, which contains the quantity for the entire system.

TROUBLESHOOTING AIR CONDITIONER

General Testing Requirements:

Blower motor runs in all three speeds. Heater is switched off. Compressor drive belt is tightened. Magnetic clutch switches (if not, see page 87 - 26).

The following pressure values must be reached at an engine speed of 2000 rpm, an ambient temperature of approx. 25° C (77° F) and with the compressor running.

Low pressure: 0.5 to 1.5 bar.

High pressure: 8 to 14 bar.

Note

The engine hood must be closed after connection of the high and low pressure hoses, since otherwise the values would deviate.

Cooling Has Failed Completely

1. Burst seal on the liquid tank has been bursted.

The system had been overheated. Check the turning direction of the condenser blower. Check the fuse and/or relay, if the condenser blower does not work.

2. Connect the service machine and read the pressure values.

Low pressure: too low.
High pressure: too low.

No refrigerant in the system. Detect the position of leaks. Charge the air conditioner.

3. Switch on the air conditioner and read the pressure values.

Low pressure: too high.
High pressure: too low.

Compressor is faulty.

Low pressure: too low.
High pressure: too high.

Expansion valve is faulty.

Insufficient Cooling

1. Low pressure: normal.
High pressure: too high.

System is overfilled. Discharge and charge the air conditioner.

2. Low pressure: too low.
High pressure: too low.

Insufficient refrigerant in the system. Check for leaks. Charge air conditioner.

3. Low pressure: too high.
High pressure: normal.

Expansion valve is faulty.

Insufficient Cooling After Brief Period of Operation

The cooling effect is okay at first, but gives as operating time progresses.

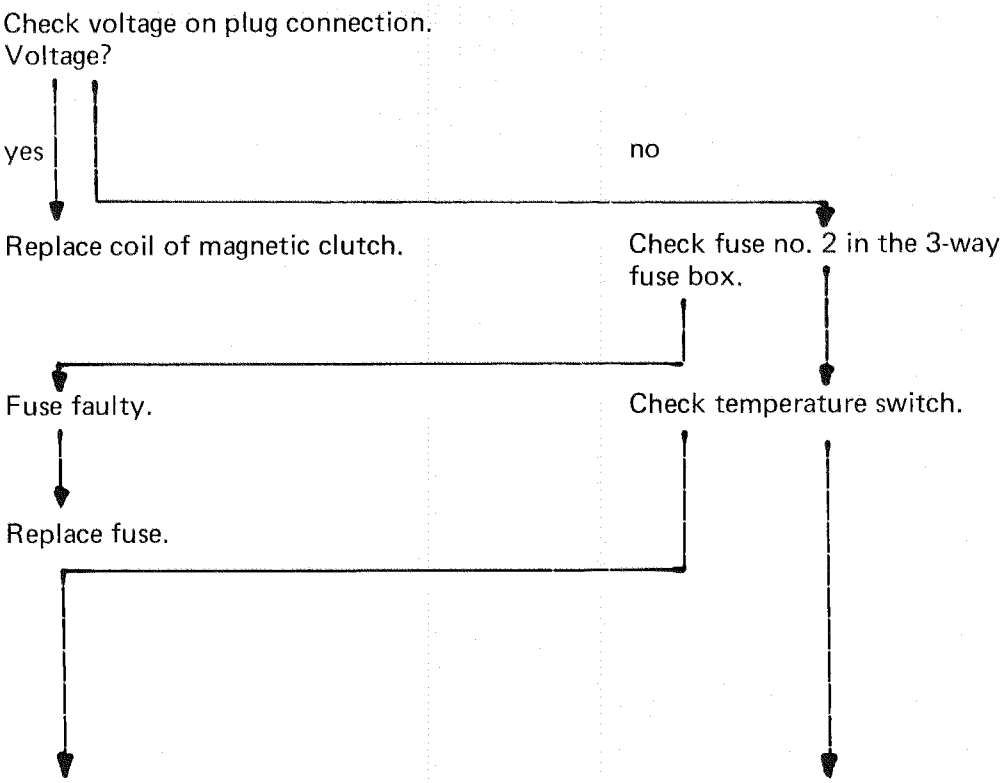
The evaporator is iced. The icing-up protection switch does not switch off the air conditioner. Check the capillary tube for damage and correct seating.

or

The expansion valve is iced. Heat the expansion valve. The cooling effect of the air conditioner must start up again.

Cause:
Moisture in the refrigerant. Replace the liquid tank. Charge the air conditioner.

Magnetic Clutch Does Not Switch



Temperature switch does not switch.

Replace temperature switch.

There is no voltage on the temperature switch.

Check blower switch. There should be voltage on terminal C when the air conditioner is switched on.

Is there voltage?

Check whether terminal B has voltage.

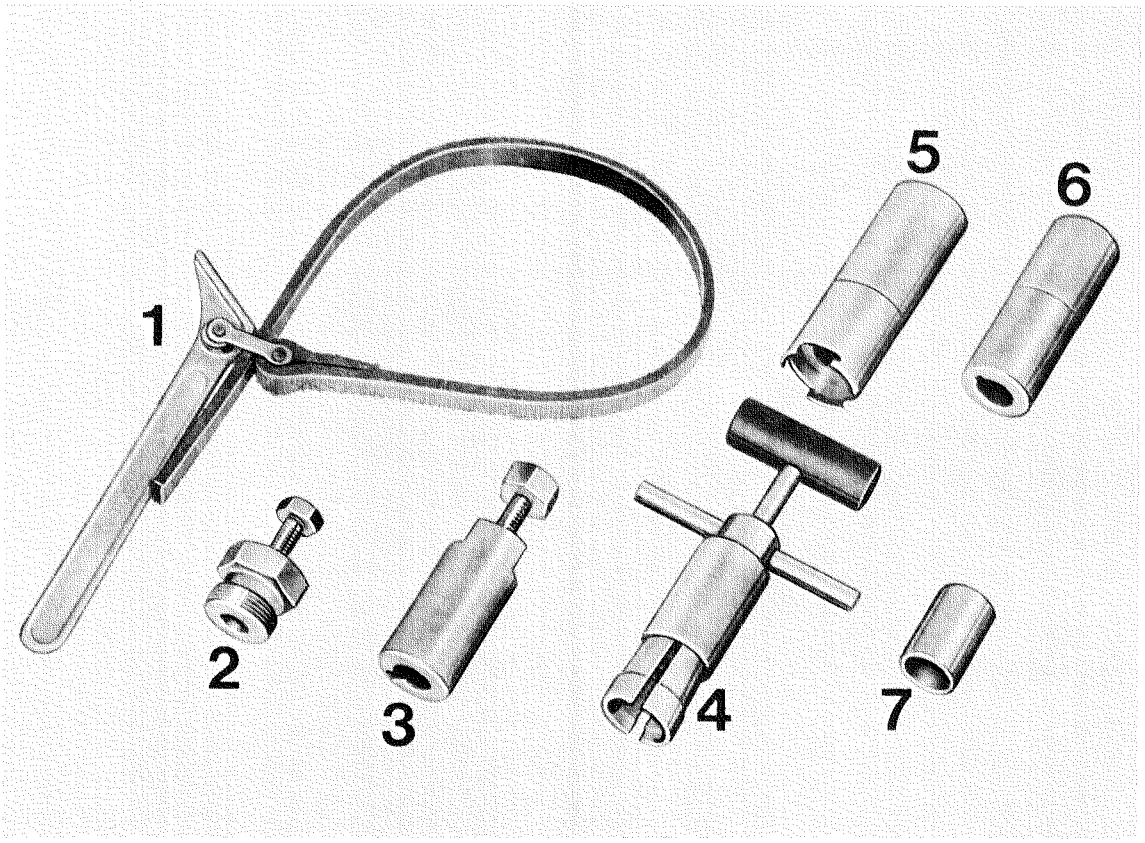
yes

Replace blower switch.

no

Check air conditioner relay.

TOOLS

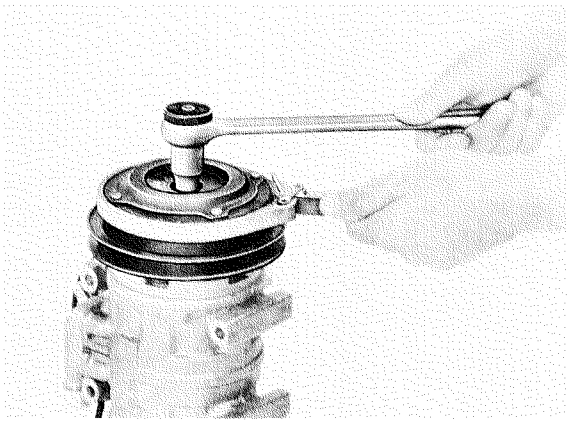


No.	Description	Special Tool	Remarks
1	Strap wrench	–	Standard item
2	Clutch plate puller	95458 - 03064	Refer to the workshop manual for the source of supply
3	Woodruff key puller	95042 - 10160	
4	Thrust washer puller	95042 - 10150	
5	Seal puller	95042 - 10130	
6	Woodruff key installer	95042 - 10190	
7	Thrust piece	95456 - 09010	

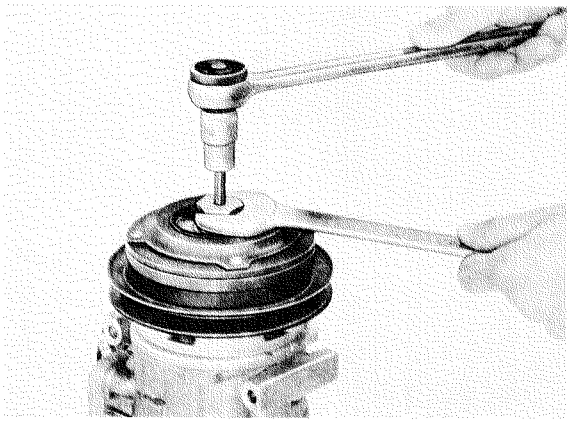
REMOVING AND INSTALLING MAGNETIC CLUTCH

1. Counterhold with the strap wrench when loosening or tightening the mounting nut.

Tightening torque: 16 Nm (12 ft. lbs.).



2. Remove clutch plate with the puller.



3. Remove shims.

4. Remove circlip and take off the pulley.



5. Remove circlip and take off the magnetic coil.

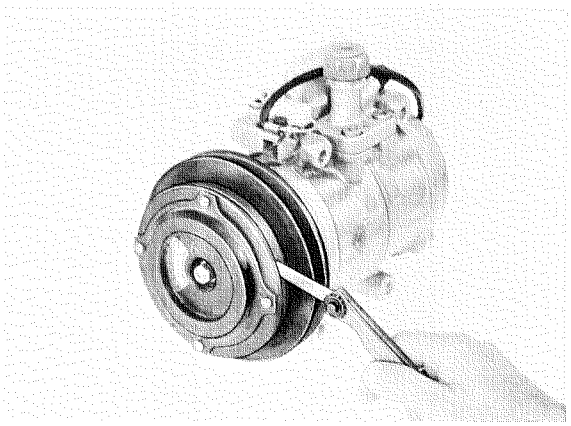


N o t e

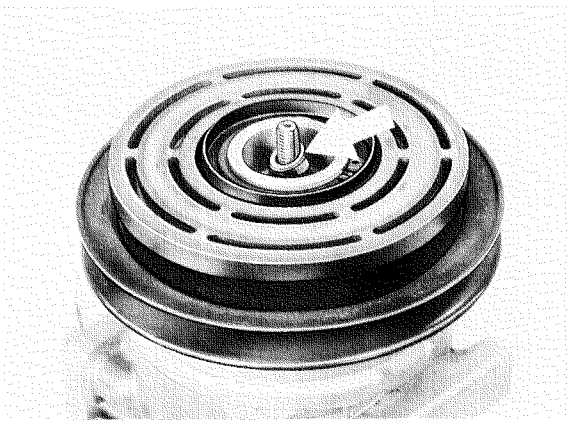
Resistance of the coil is 3.8 ± 0.2 ohms.

Installing

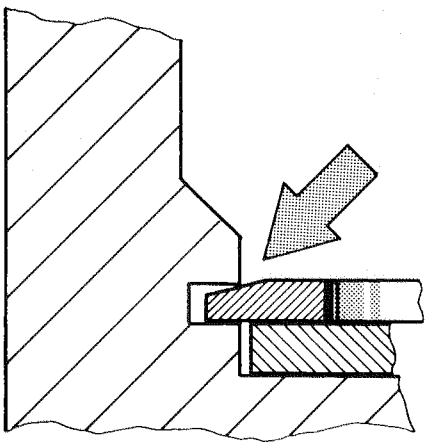
The clearance between the clutch plate and pulley is 0.4 to 0.7 mm.



If necessary, correct the clearance with shims.



Install both circlips that the bevelled edges face up.



REMOVING SHAFT SEAL

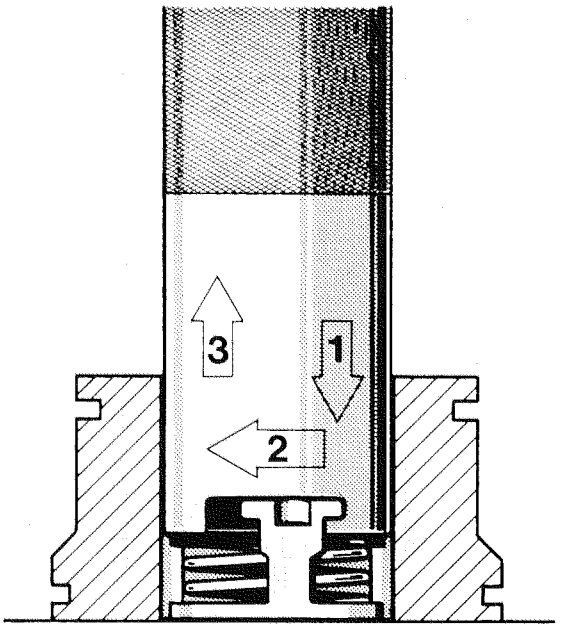
Note

Unscrew plugs on line connections briefly, so that any residual gas can escape.

1. Remove the clutch plate.
2. Remove the dust seal with a blunt item.
3. Remove the woodruff key with the woodruff key puller.
4. Remove circlip for the shaft seal.
5. Pull out the thrust washer with a puller.



6. Remove the seal with a puller. Insert the puller, press down the spring of the seal and turn the puller clockwise simultaneously, until the seal engages.



INSTALLING SHAFT SEAL

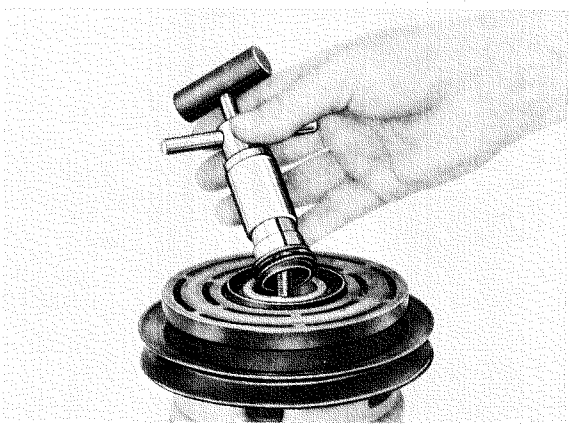
Note

Lubricate the seal and thrust washer with refrigerating oil prior to installation.

Be careful not to damage the sealing surface of the shaft seal.

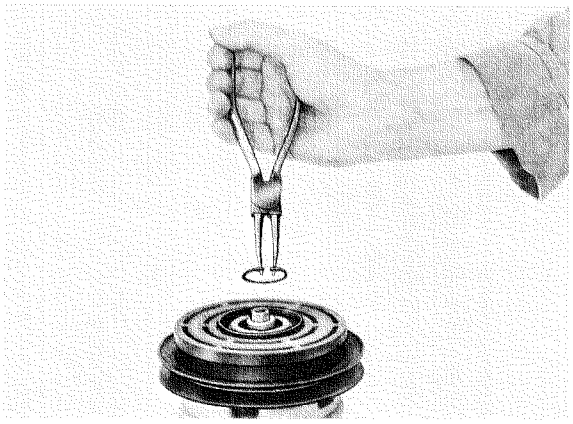
1. Install the seal with the puller.

2. Install the thrust washer with the puller.

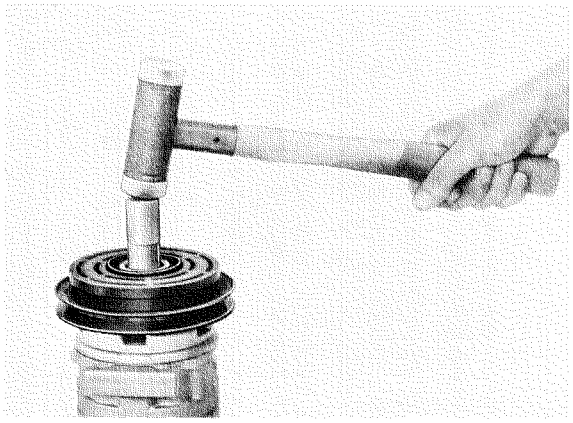


3. Press in the thrust washer with the thrust piece and a nut far enough, that the complete groove for the circlip can be seen.

4. Install circlip and remove the thrust piece.



5. Insert the woodruff key, apply the woodruff key installer and drive in the woodruff key.



6. Insert dust seal.

7. Install clutch plate.

Tightening torque: 16 Nm (12 ft. lbs.).

TECHNICAL DATA OF AIR CONDITIONER

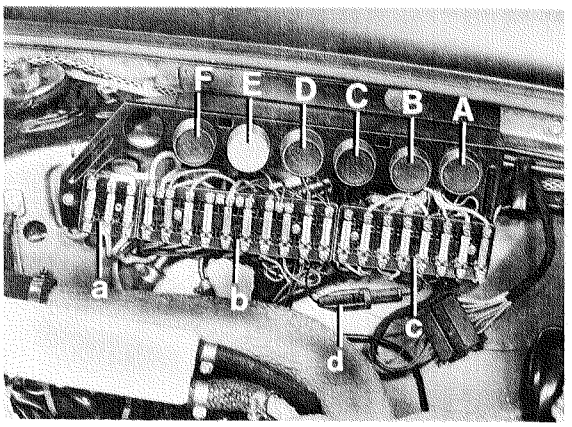
Refrigerant volume	1350 gr. of Frigen R 12
Refrigerating oil in compressor	120 cm^3 ± 20 cm^3 of Suniso No. 5 GS
Burst seal on fluid tank	Seal bursts open at pressure of approx. 40 bar
Power requirement of compressor clutch	approx. 50 watts

Tightening Torque

Location	Threads	Torque in Nm (ft. lbs.)
Compressor - suction conn. press. conn.	7/8" x 14 UNF 3/4" x 16 UNF	29 - 37 (21 - 27) 20 - 28 (14 - 20)
Condenser, rear	3/4" x 16 UNF	20 - 28 (14 - 20)
Condenser, front	5/8" x 18 UNF	14 - 20 (10 - 14)
Fluid tank	5/8" x 18 UNF	14 - 20 (10 - 14)
Expansion valve Pressure connection	5/8" x 18 UNF	14 - 20 (10 - 14)
Expansion valve Evaporator connection	3/4" x 16 UNF	20 - 28 (14 - 20)
Evaporator Intake line	7/8" x 14 UNF	29 - 37 (21 - 27)

POSITIONS OF RELAYS AND ELECTRONIC CONTROL UNITS IN THE CAR, 87 MODELS ONWARD

1. Backplate for relays and fuse boxes.



A - Condenser blower (air conditioning)

B - Fog light

C - Twin horns

D - Cruise control

E - Oil cooler blower

F - Auxiliary blower (heating)

a - 3-pole fuse box

Assignment

1 - Power windows, sunroof, seat heating

2 - Air conditioning, auxiliary blowers, power seat adjustment

3 - Headlight cleaner system, convertible top

b - 10-pole fuse box

Assignment

1 - Interior lighting, clock, radio

2 - Warning light, central locking system

3 - Fuel pump

4 - Brake light, cruise control

5 - Mirror, heating regulation

6 - Fresh-air blower, rear window defogger relay, cigar lighter

7 - Wipers, rear window wiper, heated spray jets

8 - Turn signal, backup light

9 - Turn signal, front left

10 - Turn signal, front right

c - 8-pole fuse box

Assignment

1 - High beam left

2 - High beam right

3 - Headlight left

4 - Headlight right

5 - Side marker light left

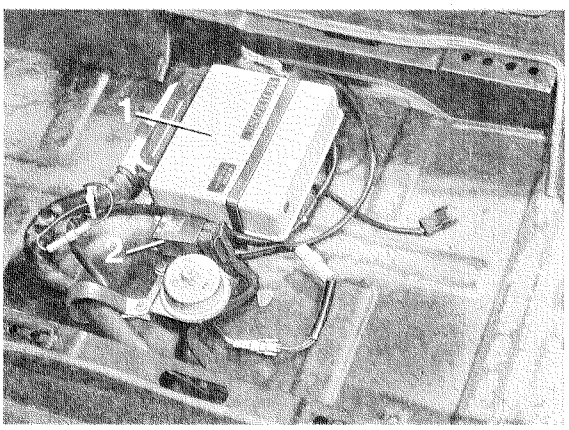
6 - Side marker light right

7 - Licence plate light

8 - Fog light, rear fog light

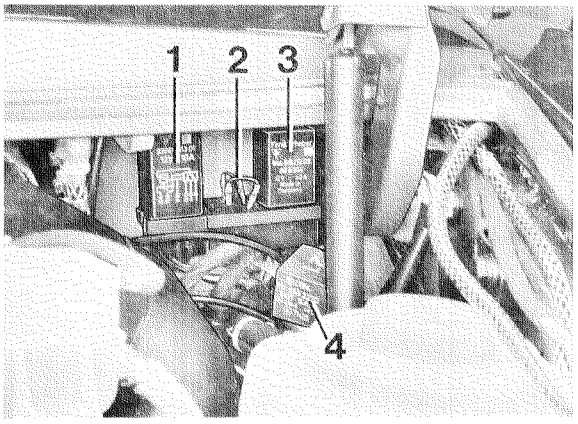
d - Moveable fuse for convertible top control unit

2.DME control unit and DME relay.



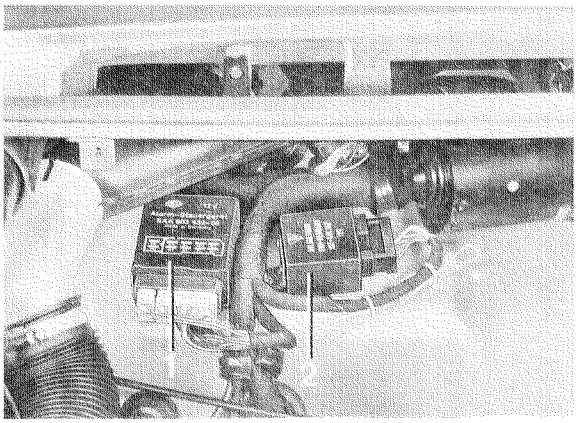
The DME control unit (1) and the DME relay (2) are located beneath the driver's seat.

3.Relays for intensive cleaning, seat belt, power windows and flasher unit.



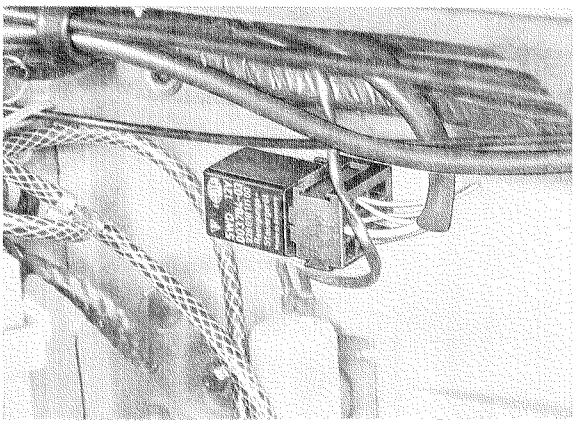
The relays for intensive cleaning (1), seat belt (2), power windows (3) and flasher unit (4) are located in the luggage compartment on the left in front of the instruments. Relay 2 is only occupied in cars for USA and Saudi Arabia. For the rest of the world terminals L and G and 86 and 31 are jumpered.

4.Control unit for burglar alarm and intermittent wipe.



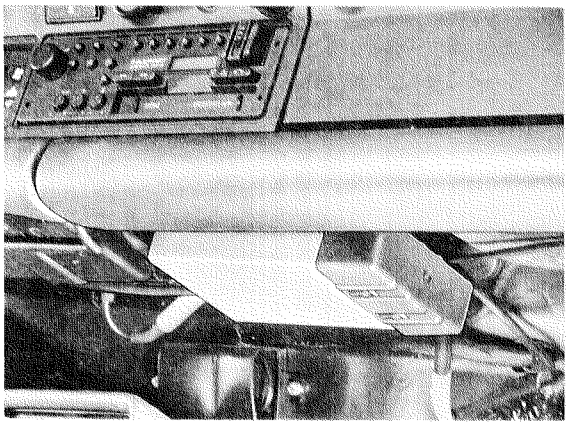
The control units for burglar alarm (1) and intermittent wipe (2) are located in the luggage compartment behind the fresh-air blower.

5.Control unit for headlight wash system.



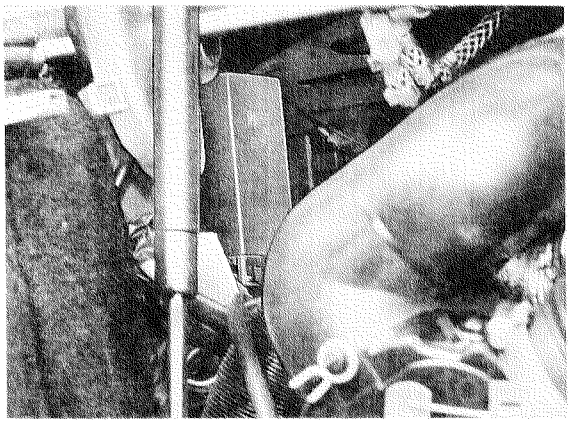
The control unit for the headlight wash system is located inside the luggage compartment at the front left above the headlight wash pump.

6.Control unit for cruise control

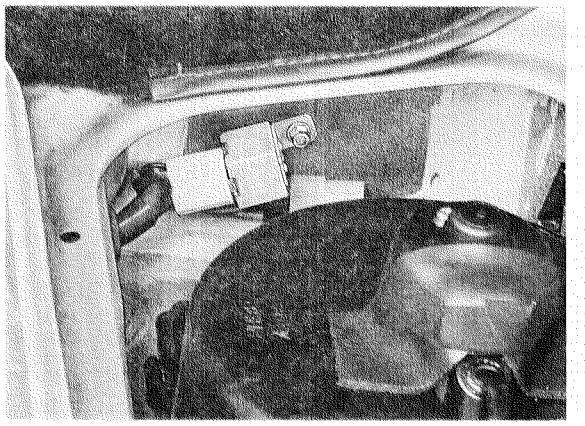


The control unit for cruise control is located in the passenger compartment beneath the instrument panel near the central console. In cars earlier than model year 87, the control unit is located in the luggage compartment beside the brake booster.

7.Control unit for central locking.
The control unit for central locking is on the right inside the luggage compartment near the luggage-compartment lid hinge.

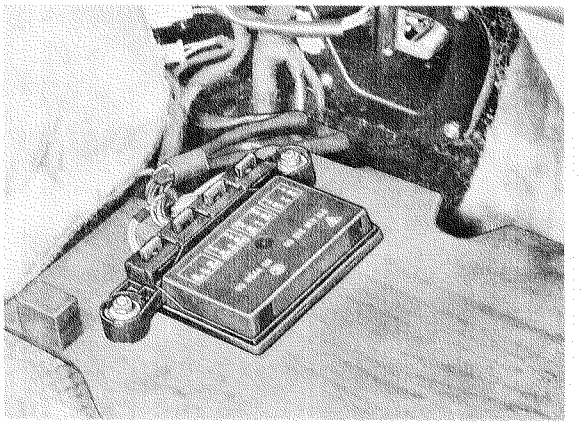


8.Relay for air-conditioning blower.



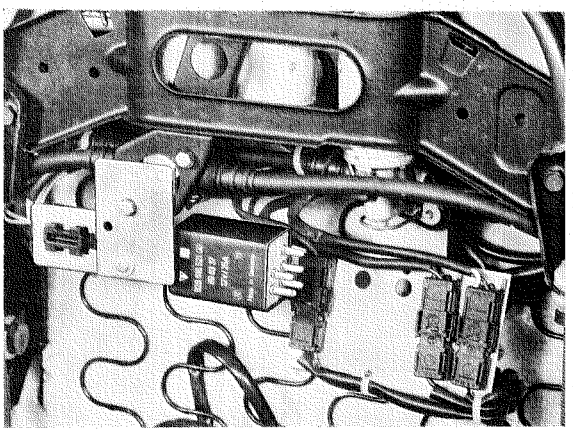
The relay for the air-conditioning blower is located in the right beside the air-conditioning unit.

9.Control unit for convertible top and dim-dip lighting (UK only).



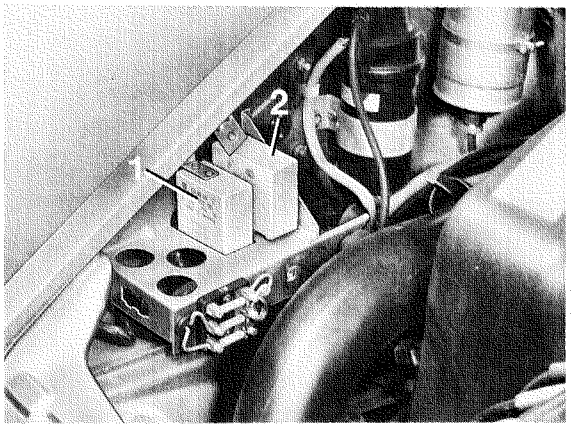
The control unit for the electrically operated convertible top is located beneath the passenger-side footrest. In UK cars, the control unit for dim-dip lighting is also located here.

10.Seat heating relay.



The relay for the seat heating is located on the underside of the seat.

11.Control unit for engine-compartment blower and rear defogger.



The control units for the engine-compartment blower (1) and the rear defogger (2) are in the engine compartment, mounted on the left-hand side of the relay backplate.

Retrofitting CD player

Model 89 onward

Note

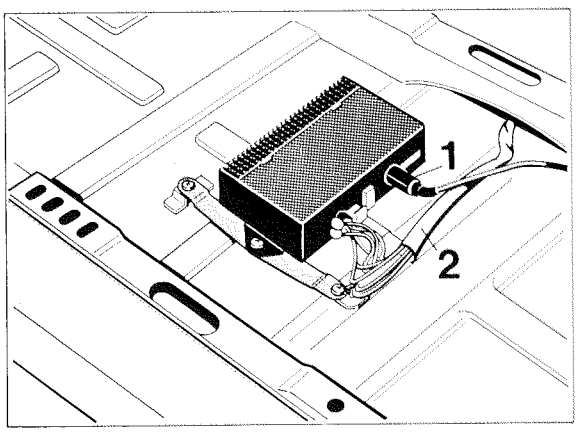
The CD player can only be operated with an amplifier.

1. Clip the holder for the CD player into the fire wall.

2. Fit mounting frame.

3. Remove passenger seat (amplifier is fitted under the passenger seat).

4. Install amplifier.



157/91

1 - LF line
2 - Cable harness No. 196

5. Install 8-pole connection line (LF line; from CD player to amplifier) and cable harness No. 196 (speaker connections and amplifier power supply; refer to circuit diagram). Lay cables parallel to existing cable harness.

6. Connect CD player and amplifier.

Note

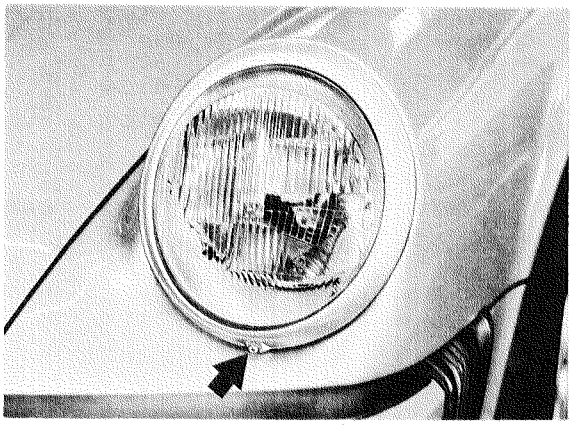
The plug assignment is quoted on the CD player and amplifier.

7. Slide CD player into place and latch.

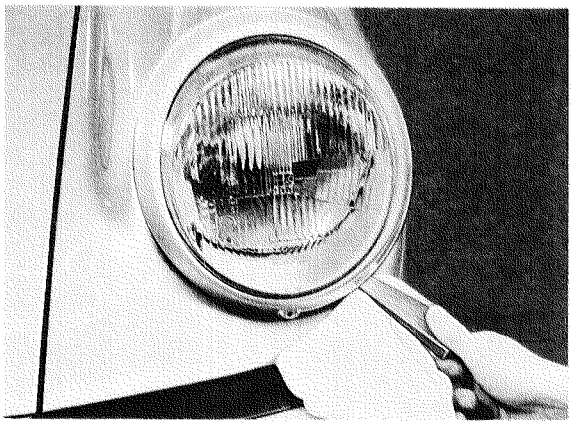
Printed in Germany – XIII, 1989

AIMING MAIN HEADLIGHT BEAMS

1. Unscrew headlight trim mounting screw.

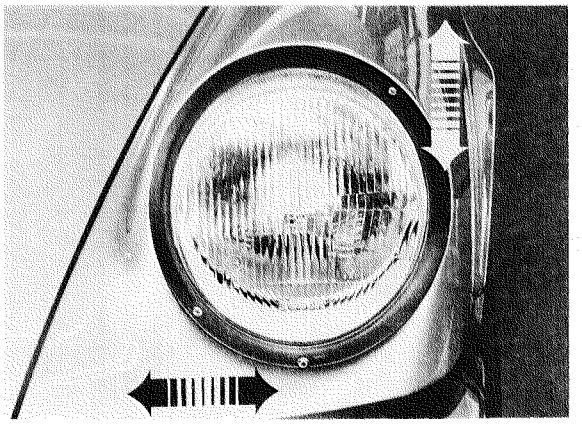


2. Press off headlight trim with a hard wood spatula or similar tool applied in bottom area.

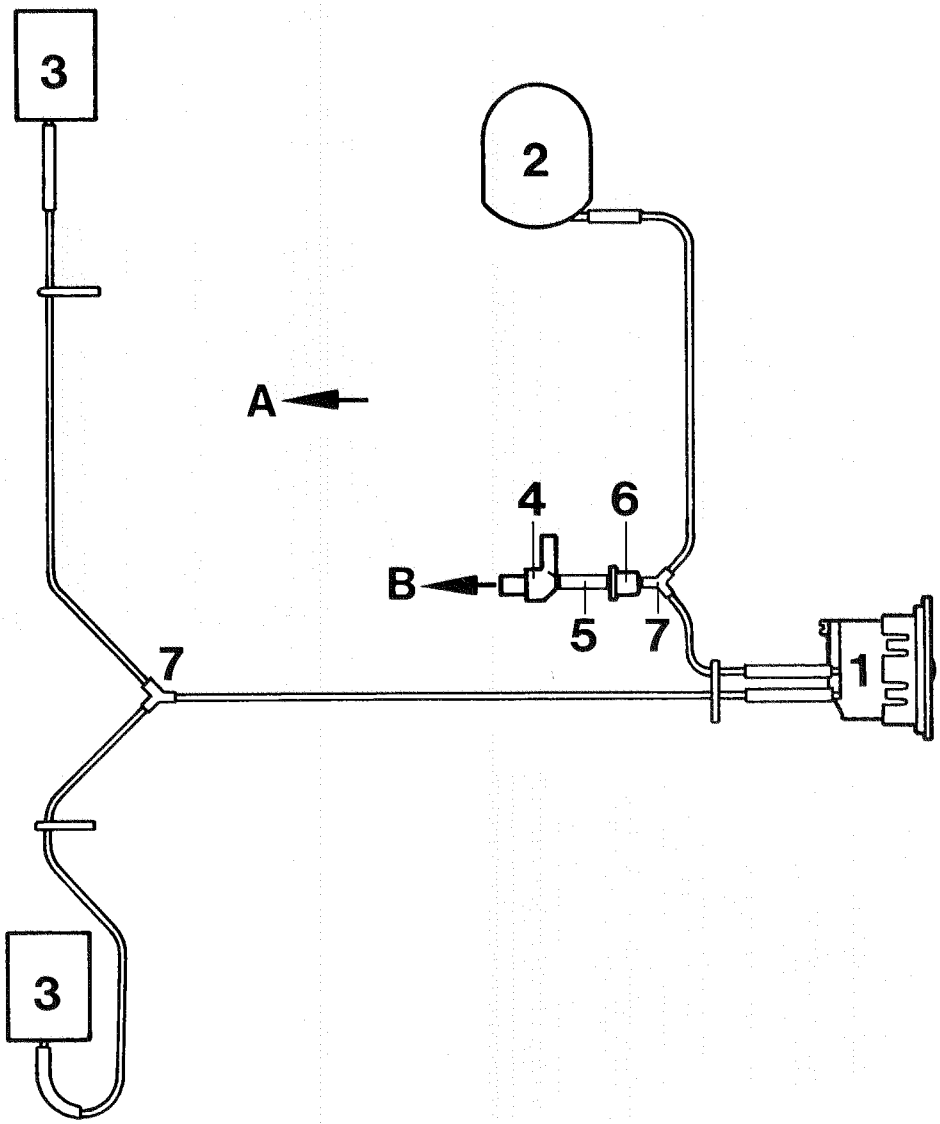


3. Clean lens and turn on low beams.

4. Make adjustments on a ready-to-drive car with a headlight aimer.
   Ready-to-drive car = full fuel tank, driver's seat loaded by one person or 75 kg and correct tire inflation pressure.



HEADLIGHT RANGE ADJUSTMENT



1 - Regulating switch

2 - Vacuum tank

3 - Actuator

4 - Check valve to brake booster

5 - Connecting hose

6 - Check valve

7 - Branch

A - Direction of travel

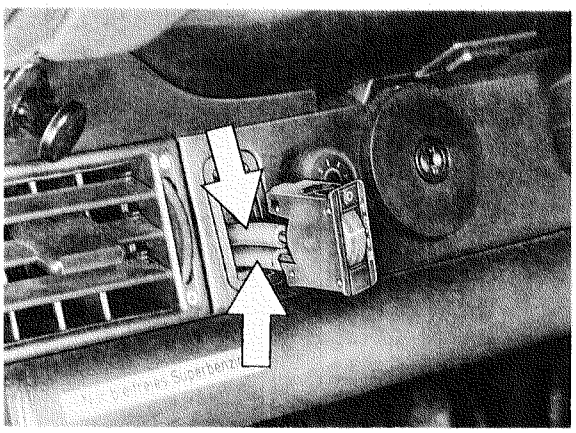
B - To brake booster

REMOVING AND INSTALLING REGULATING SWITCH

1.Press switch out by hand from below.

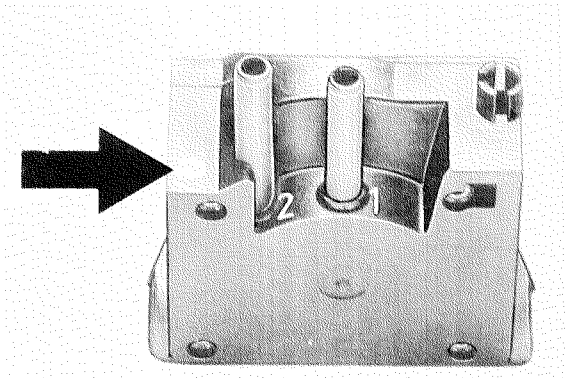
2.Disconnect optical fiber.

3.Disconnect vacuum hoses.



Note:

Connection 2 of the switch and the corresponding vacuum hose are marked with a yellow dot.



1 - To vacuum tank/brake booster

2 - To the actuators

REMOVING AND INSTALLING VACUUM TANK

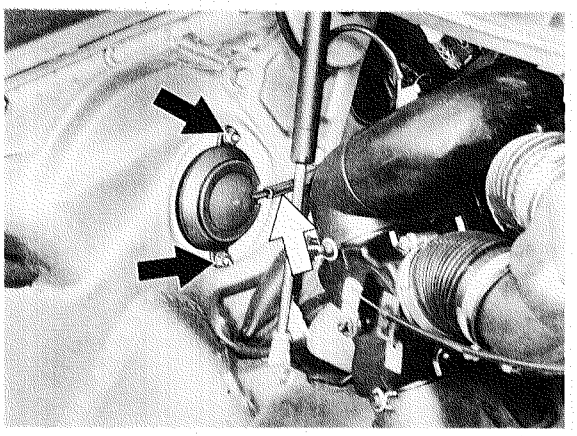
Note:

The vacuum tank is mounted on the right inside the luggage compartment in front of the luggage-compartment lid hinge.

1.Fold back carpet.

2.Disconnect vacuum hose.

3.Remove securing nuts.

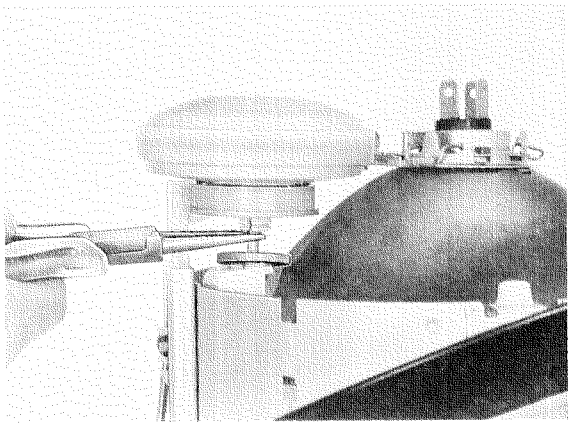


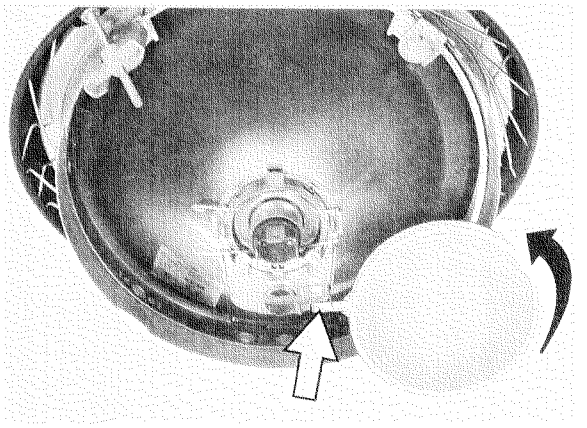
REMOVING AND INSTALLING ACTUATOR

1.Remove headlight.

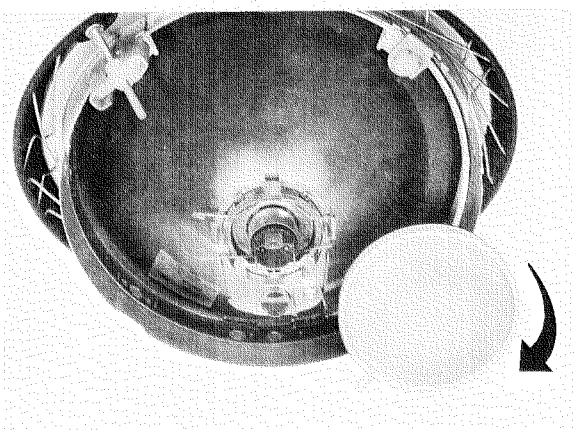
2.Disengage locking ring.

3.Disengage actuating rod.





4.Turn actuator clockwise (bayonet connection).



Note:

When installing, insert actuator with vacuum connection facing interior of headlight. To engage, turn actuator anticlockwise.

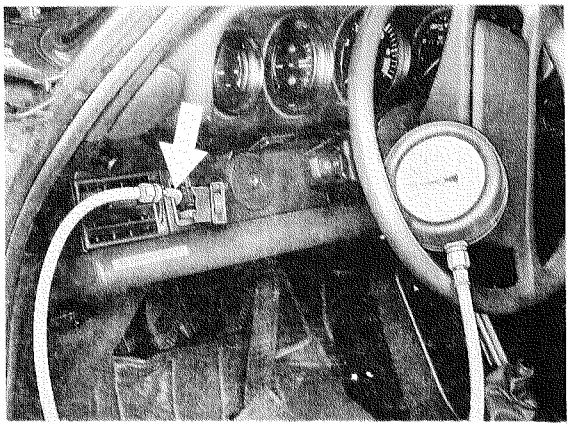
CHECKING REGULATING SWITCH

Note:

Use Special Tool 9103/2 to check the control pressure. The check is conducted with the engine running.

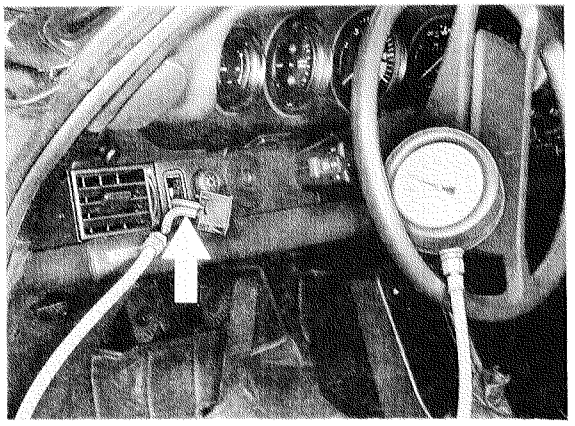
1. Disconnect vacuum hose from connection 1 and connect to Special Tool 9103/2.

   Reading: approx. -0.55 bar at idle speed.



2. With an adaptor, connect Special Tool 9103/2 to connection 2. Set switch to position 1 (set light higher).

   Reading: -0.37 ± 0.03 bar



3. Set switch to position 0.

   Reading: -0.25 ± 0.03 bar.

4. Set switch to position 1 (set light lower).

   Reading: -0.16 ± 0.03 bar.

5. Set switch to position 2.

   Reading: -0.08 ± 0.03 bar.

Note:

When production commenced, regulating switches with other values were installed in a small number of cars.

Position 1 (light higher): -0.33 ± 0.03 bar

Position 0: -0.25 ± 0.03 bar

Position 1 (light lower):

-0.17 ± 0.03 bar

Position 2: -0.11 ± 0.03 bar

The values can also be checked directly at the actuator connection.

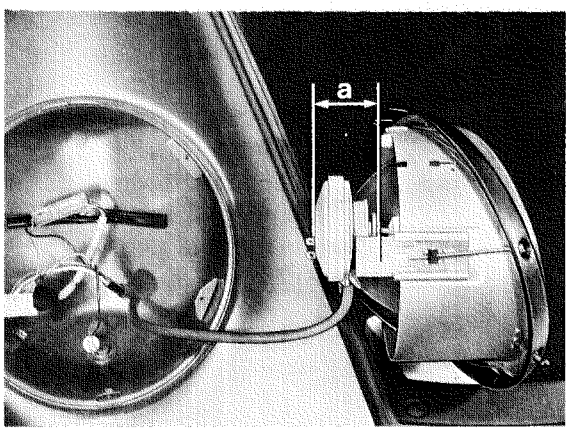
INSPECTING ACTUATOR

Precondition:
- Vacuum applied.

1. Set switch to position 1 (set light higher).

2. Remove headlight. Leave vacuum line connected.

3. Measure distance a.



4. Set regulating switch to position 2.

5. Measure distance a'.

6. The difference a' - a is the adjustment distance.

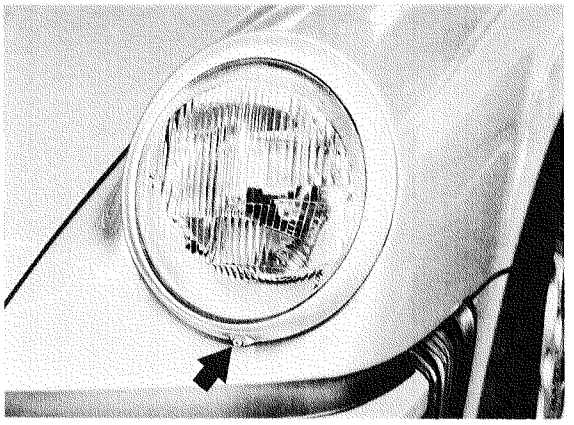
Specification: 3.2 mm $^{+\ 0.3\ mm}_{-\ 0.15\ mm}$

ADJUSTING MAIN HEADLIGHTS WITH HEADLIGHT RANGE ADJUSTMENT

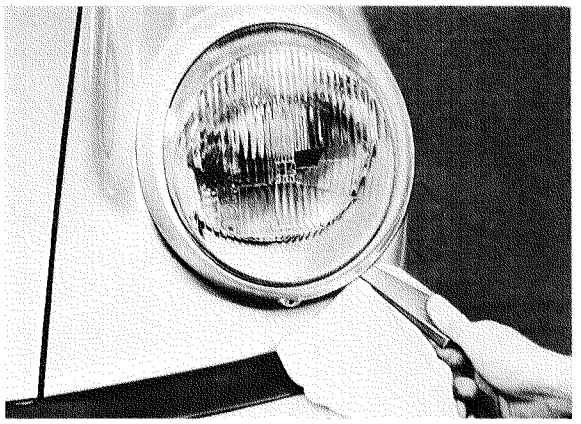
Note:

The headlights are set to the basic position with the regulating switch in position 0. Start engine briefly to create a vacuum.

1. Remove securing screw from trim ring.

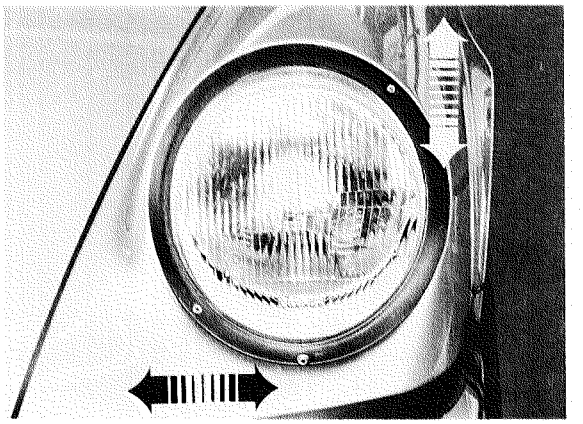


2. Insert a hardwood spatula or similar instrument near bottom of trim ring and press off.



3. Clean lens and switch on low beam.

4. Use a headlight aimer to make adjustments with the car ready for the road (fuel tank full, one person or 75 kg weight on driver's seat. The tire inflation pressure must be as specified).



Drop in position 0:

10 cm for 10 m.

Control value in position 2:

Drop 12.5 cm ±4.5 cm for 10 m, based on position 0.

Wiring Diagram Type 911 Carrera Model 84

PAGE 1	CODES
PAGE 2	CONNECTION AND EQUIPMENT FUSES
PAGE 3	ILLUMINATION
PAGE 4	ILLUMINATION (USA, JAPAN)
PAGE 5	MOTOR AND BODY
PAGE 6	DIGITAL MOTOR ELECTRONIC (DME)
PAGE 7	DIGITAL MOTOR ELECTRONIC (DME) (USA, JAPAN)
PAGE 8	K-JETRONIC TURBO
PAGE 9	INSTRUMENTS, TRANSMITTER
PAGE 10	FRESH AIR BLOWER AND HEATER
PAGE 11	FRESH AIR BLOWER AND HEATER TURBO

Wiring Diagram Type 911 Carrera
Model 84
Explanations

1 – COORDINATES

2 – WIRE CROSS SECTION SIZE WITH WIRE COLOR (E.G. 6,0 MM², RED)

3 – TERMINAL DESIGNATION (E.G. TERMINAL 30)

4 – PART DESIGNATION AND CONNECTION OF WIRE (SEE CODES)

5 – COORDINATE TO WHICH WIRE LEADS

6 – UNCONNECTABLE CONNECTIONS

7 – PERMANENT CONNECTIONS

8 – WIRE HARNESS (E.G. NO. 3 = 911.612.003)

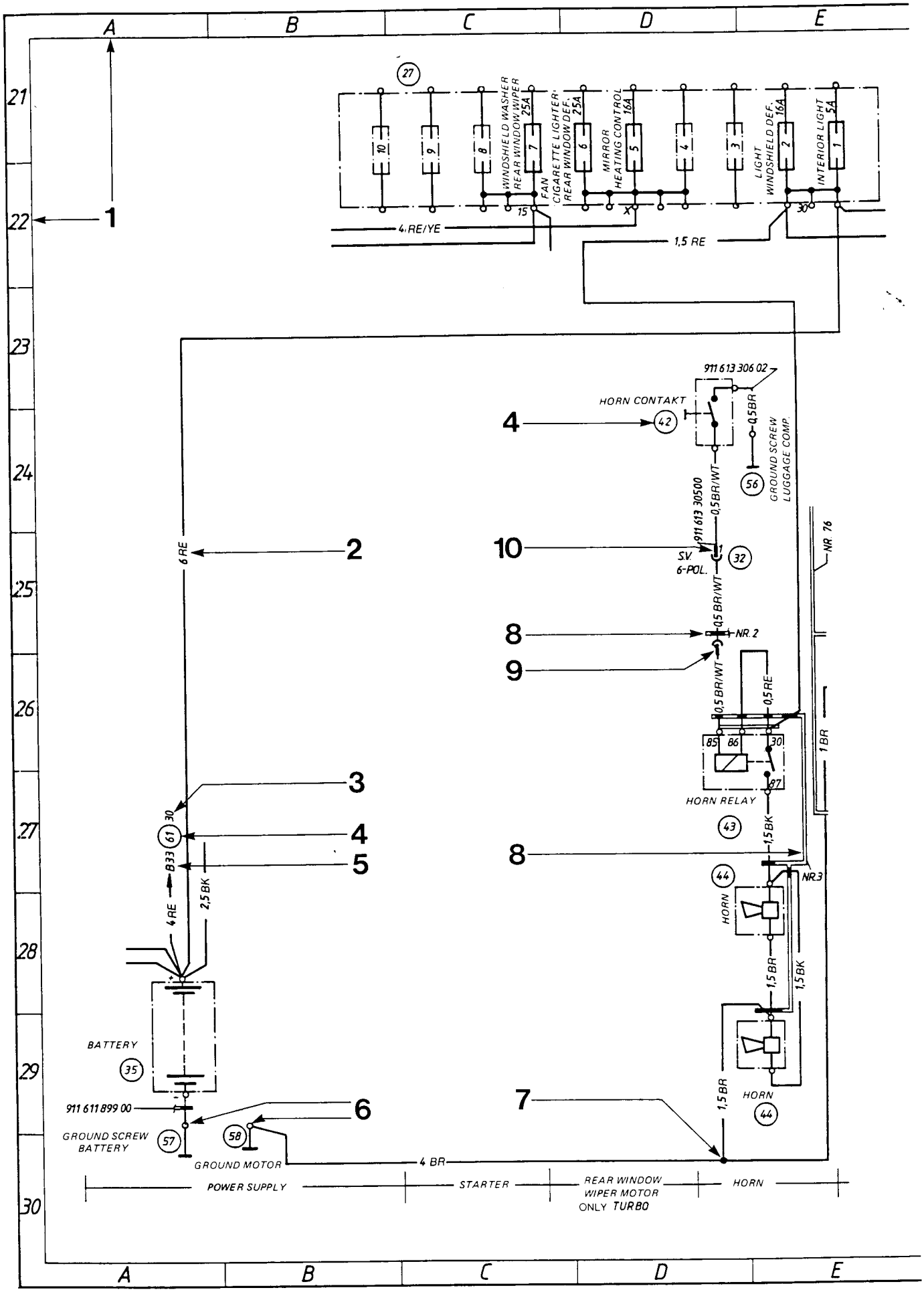
9 – SINGLE PLUG CONNECTION

10 – MULTIPLE PLUG CONNECTION (E.G. 6 PIN, TERMINAL 1)

WIRE COLOURS

BK – BLACK	GN – GREEN	BR – BROWN
WT – WHITE	YE – YELLOW	BL – BLUE
RE – RED	GR – GREY	VI – VIOLET

Printed in Germany


A
B
C
D
E
21
22
23
24
25
26
27
28
29
30
1
2
3
4
5
6
7
8
9
10
27
10
9
8
7
6
5
4
3
2
1
WINDSHIELD WASHER
REAR WINDOW WIPER
25A
FAN
CIGARETTE LIGHTER
REAR WINDOW DEF.
25A
MIRROR
HEATING CONTROL
16A
LIGHT
WINDSHIELD DEF.
16A
INTERIOR LIGHT
5A
15
X
30
4 RE/YE
1,5 RE
911 613 306 02
HORN CONTAKT
42
0,5 BR
56
GROUND SCREW
LUGGAGE COMP.
911 613 30500
0,5 BR/WT
SV
6-POL.
32
NR. 76
NR. 2
0,5 BR/WT
0,5 RE
85
86
30
87
HORN RELAY
43
1,5 BK
1 BR
NR. 3
44
HORN
1,5 BR
1,5 BK
6 RE
61
30
B 33
4 RE
2,5 BK
BATTERY
35
911 611 899 00
GROUND SCREW
BATTERY
57
58
GROUND MOTOR
4 BR
POWER SUPPLY
STARTER
REAR WINDOW
WIPER MOTOR
ONLY TURBO
HORN

Wiring Diagram Type 911 Carrera Model 84 page 1

CODES

Wiring Diagram Type 911 Carrera Mo

SERIAL NR.	DESCRIPTION	FIELD	PAGE
1	HEADLIGHT	A 2, A 9	3
2	TURN SIGNAL	A 1, A 10	3
3	ADDITIONAL TURN SIGNAL	A 1, A 10	3
4	FRONT LIGHT ASSEMBLY	A 1, A 10	4
5	SIDE MARKER LIGHT	A 1, A 10	4
6	FOG LIGHT	A 4, A 5	3/4
7	FOG LIGHT RELAY	C 7	3/4
8	TURN SIGNAL/HEADLIGHT DIMMER SWITCH	C 2	3/4
9	EMERGENZY FLASHER SWITCH	D 2	3/4
10	LIGHT SWITCH	E 2	3/4
11	FOG LIGHT SWITCH	G 2	3/4
12	ASHTRAY LIGHT	E 4	3/4
13	BACK-UP LIGHT SWITCH	G 7	3/4
14	TURN SIGNAL SWITCH	E 6	3/4
15	DOOR CONTACT SWITCH	H 2, H 6	3/4
16	INTERIOR LIGHT	K 3, G 4, K 4	3/4
17	DOOR CONTACT SWITCH	I 6	3/4
	LUGGAGE COMPARTMENT LIGHT		
18	LUGGAGE COMPARTMENT LIGHT	H 6	3/4
19	CLOVE COMPARTMENT LIGHT SWITCH	H 5	3/4
20	CLOVE COMPARTMENT LIGHT	K 5	3/4
21	BRAKE LIGHT SWITCH I	H 8	3/4
22	BRAKE LIGHT SWITCH II	H 7	3/4
23	ENGINE COMPARTMENT LIGHT	I 8	3/4
24	TAIL LIGHT ASSEMBLY	K 1, K 10	3/4
25	LICENCE PLATE LIGHT	K 5, K 6	3/4
26	FOG LIGHT REAR	K 7	3/4
27	FUSE BOX I 10	F 9	
28	FUSE BOX II 8	C 9	
29	FUSE BOX GROUND SCREW		
30	TRUNK FLOOR PLATE GROUND PLUG		
31	GROUND SCREW ENGINE COMP.		
32	WIRE CONNECTORS 6 PIN		
33	WIRE CONNECTORS 14 PIN		
34	FUSE BOX 3 PIN		
35	BATTERY	A 29	5
36	GENERATOR	B 29	5
37	STARTER	C 29	5
38	DISTRIBUTOR	E 33	6/7
39	SPARK PLUG	E 33	6/7
40	IGNITION COIL	D 33	6/7
41	IGNITION STARTER SWITCH	A 25	5
42	HORN CONTACT	D 24	5
43	HORN RELAY	E 27	5
44	HORN	D 28, D 29	5
45	SWITCH HEADLIGHT WASHER	E 24	5
46	RELAY " "	E 26	5
47	PUMP " "	E 29	5
48	WINDSHIELD WIPER SWITCH	F 24	5
49	PULSE TRANSMITTER	G 27	5
50	WINDSHIELD WIPER MOTOR	F 29	5
51	POTENTIOMETER	G 29	5
52	WINDSHIELD WASHER PUMP	H 29	5
53	POWER WINDOW RELAY	I 22	5
54	POWER WINDOW SWITCH	I 24, K 24	5
55	POWER WINDOW MOTOR	K 27	
56	GROUND SCREW LUGGAGE COMP.		
57	GROUND SCREW BATTERY		
58	GROUND MOTOR		
59	WIRE CONNECTORS 3 PIN		
60	DME CONTROL UNIT	F 35	6/7
61	DME-RELAY	B 34	6/7
62	OXYGEN SENSOR HEATING	B 34	6/7
63	ALTITUDE CORRECTION BOX	C 34	6/7
64	FUEL INJECTORS	A, B, C 39	6/7
65	IDLE POSITIONER	E 39	6/7
66	THROTTLE VALVE SWITCH	E 39	6/7
67	NTC II	G 39	6/7
68	REFERENCE MARK TRANSMITTER	H 39	6/7
69	SPEED TRANSMITTER	H 39	6/7

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Model 84 page 1

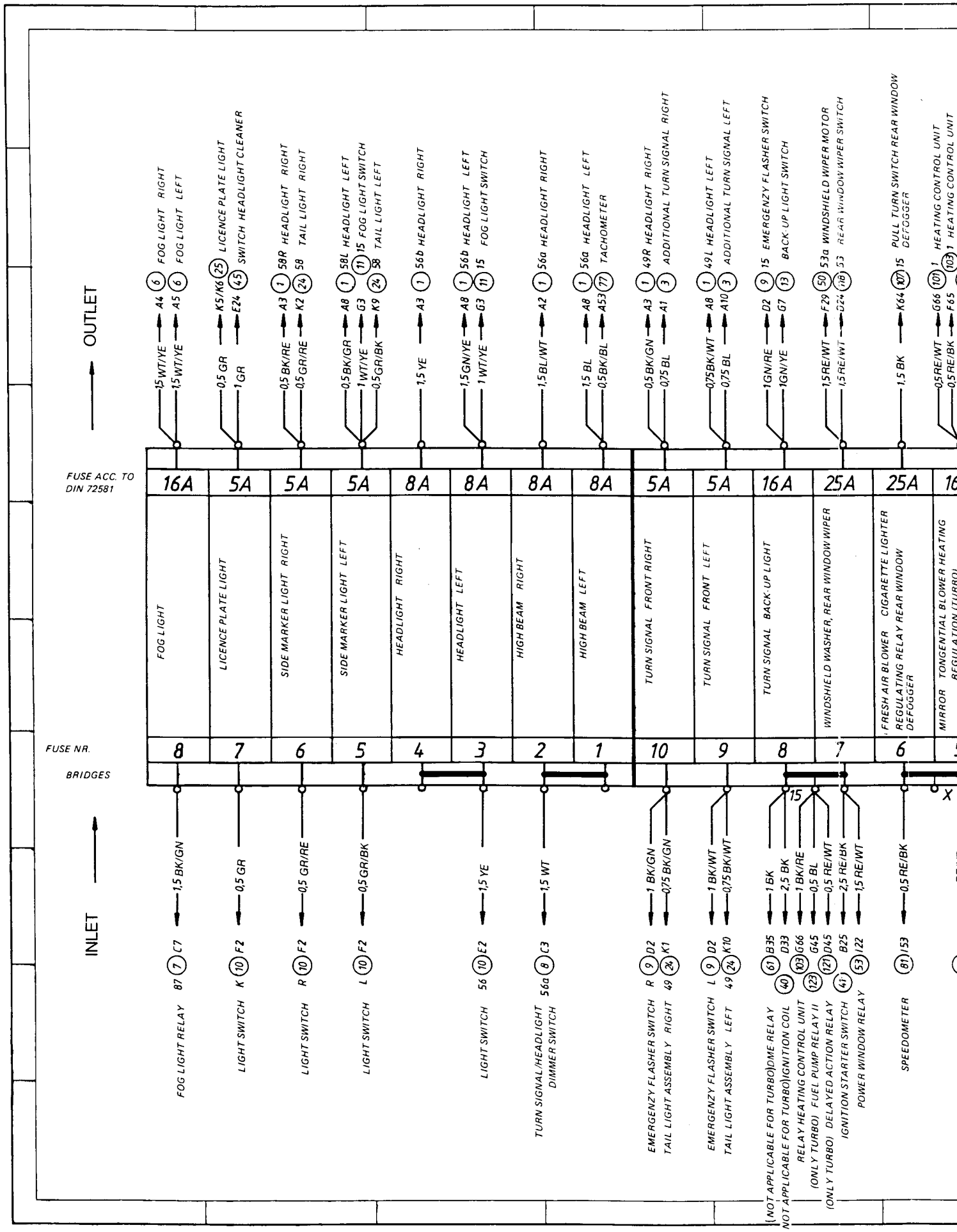
SERIAL NR.	DESCRIPTION	FIELD	PAGE
70	AIR FLOW SENSOR	I 39	6/7
71	FUEL PUMP	K 39	6/7
72	CARRIER PLATE GROUND SCREW		
73	OXYGEN SENSOR	D 33	6/7
74	WIRE CONNECTORS		7
75	GROUND SCREW BODY		
76	WIRE CONNECTORS		
77	TACHOMETER	A 54	9
78	3 WARNING LIGHT	C 54	9
79	COMBINATION INSTRUMENTS ϕ 100	E 54	9
80	COMBINATION INSTRUMENTS ϕ 80	G 54	9
81	SPEEDOMETER	I 54	9
82	CLOCK	K 54	9
83	CLOCK RELAY	C 56	9
84	BRAKE PAD WEAR LEAD	A 58, B 59	9
85	PARKING BRAKE CONTACT	C 59	9
86	BRAKE FLUID LEVEL WARNING SWITCH	C 59	9
87	OIL PRESSURE SENDER UNIT	D 59	9
88	OIL PRESSURE SWITCH	E 59	9
89	OIL TEMPERATURE SENSOR	F 59	9
90	FUEL SENDER UNIT	G 59	9
91	OIL LEVEL SWITCH	H 59	9
92	SPEED TRANSMITTER	I 59	9
93	TEMPERATURE SWITCH FAN	G 69	10
94	OUTSIDE MIRROR SWITCH	A 64	10/11
95	OUTSIDE MIRROR	A 69	10/11
96		C 64	10/11
97	FRESH AIR BLOWER	B 69	10/11
98	CIGARETTE LIGHTER	C 69	10/11
99	ADDITIONAL FAN RELAY	D 66	10/11
100	ADDITIONAL FAN	D 69	10/11
101	HEATING CONTROL UNIT	E 64	10
102	RESISTOR	E 69	10
103	RELAY HEATING CONTROL UNIT	F 66	10/11
104	ENGINE COMPARTMENT FAN	F 69	10
105	WINDSHIELD DEFOGGER RELAY	H 67	11
106	WINDSHIELD DEFOGGER	H 69	11
107	PULL TURN SWITCH REAR WINDOW DEFOGGER	I 64	10/11
108	REGULATING RELAY REAR WINDOW DEFOGGER	I 67	10/11
109	REAR WINDOW DEFOGGER	K 69	10/11
110	GROUND CARRIER PLATE UPPER		
111	INSIDE TEMP. SENSOR	H 69, G 69	10/11
112	TEMPERATURE SENSOR ON HEATER FLAP BOX	H 69	10/11
113	ADDITIONAL FAN SWITCH	E 64	11
114	MICROSWITCH	F 69	11
115	WIRE CONNECTORS 5 PIN		
116	SIGN LIGHT	E 5	4
117	BELT CONTACT	C 57	9
118	REAR WINDOW WIPER SWITCH	D 25	5
119	REAR WINDOW WIPER MOTOR	D 29	5
120	ELECTRONIC IGNITION UNIT HKZ	B 42	8
121	DELAYED ACTION RELAY	C 45	8
122	FUEL PUMP RELAY I	H 45	8
123	FUEL PUMP RELAY II	G 45	8
124	AIR FLOW SENSOR MANIFOLD PRESSURE RELAY	F 46	8
125	PRESSURE TRANSMITTER MANIFOLD PRESSURE	C 49	8
126	START VALVE	D 49	8
127	THERMO SWITCH FOR COLD START VALVE	E 49	8
128	SUPPLEMENTARY AIR VALVE	E 49	8
129	WARM-UP REGULATOR	F 49	8
130	AIR FLOW SENSO SWITCH	F 49	8
131	MANIFOLD PRESSURE LIMITING SWITCH	G 49	8
132	CONTROL UNIT	K 55	9
133	TEMPERATURE SENSOR	K 59	9
134	WARNING LIGHT EX	K 57	9
135	CONNECTION RAIL	G, K 22	5

SERIAL NR.	DESCRIPTION

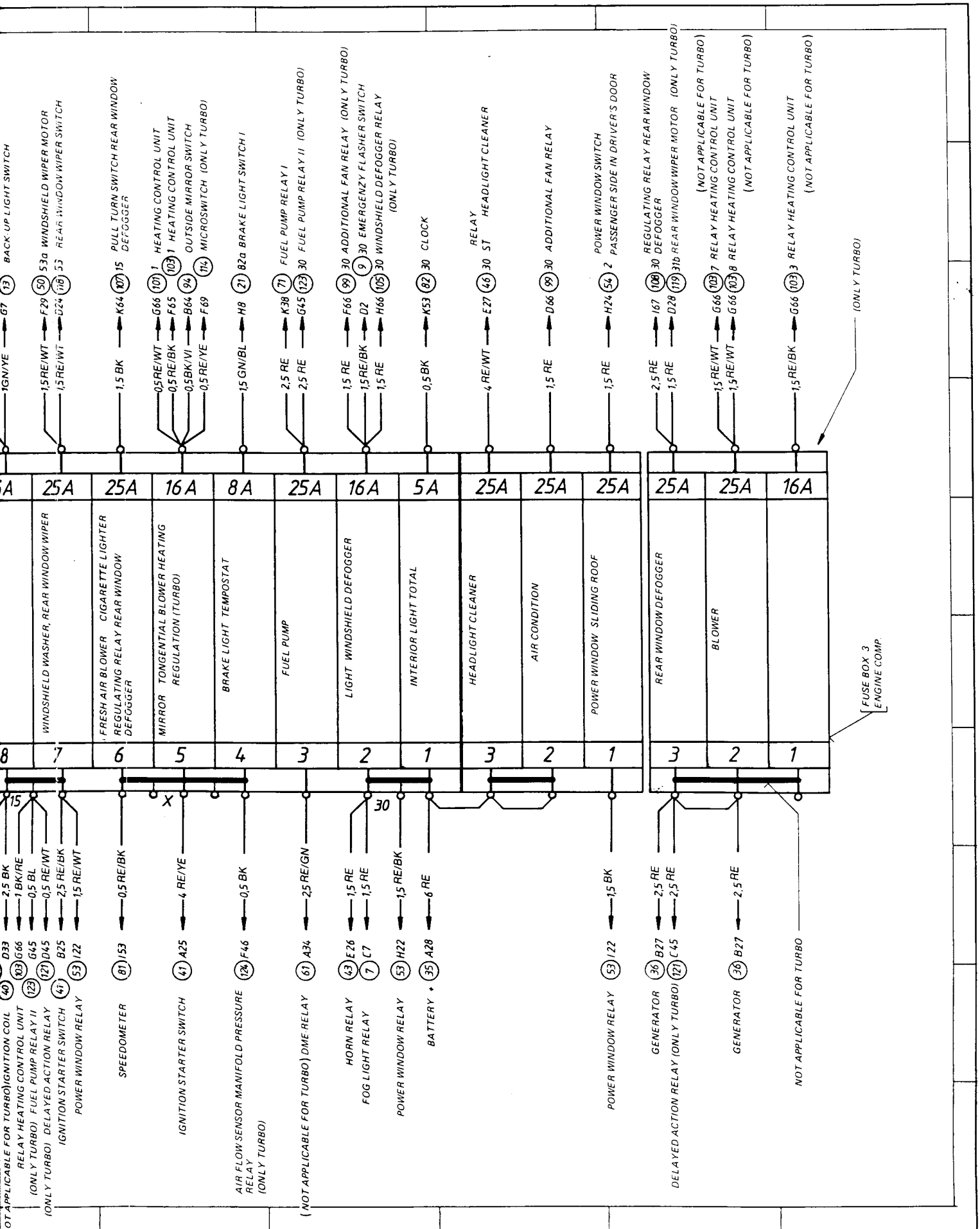
Wiring Diagram Type 911 Carrera Model 84 page 2

CONNECTION AND EQUIPMENT FUSES

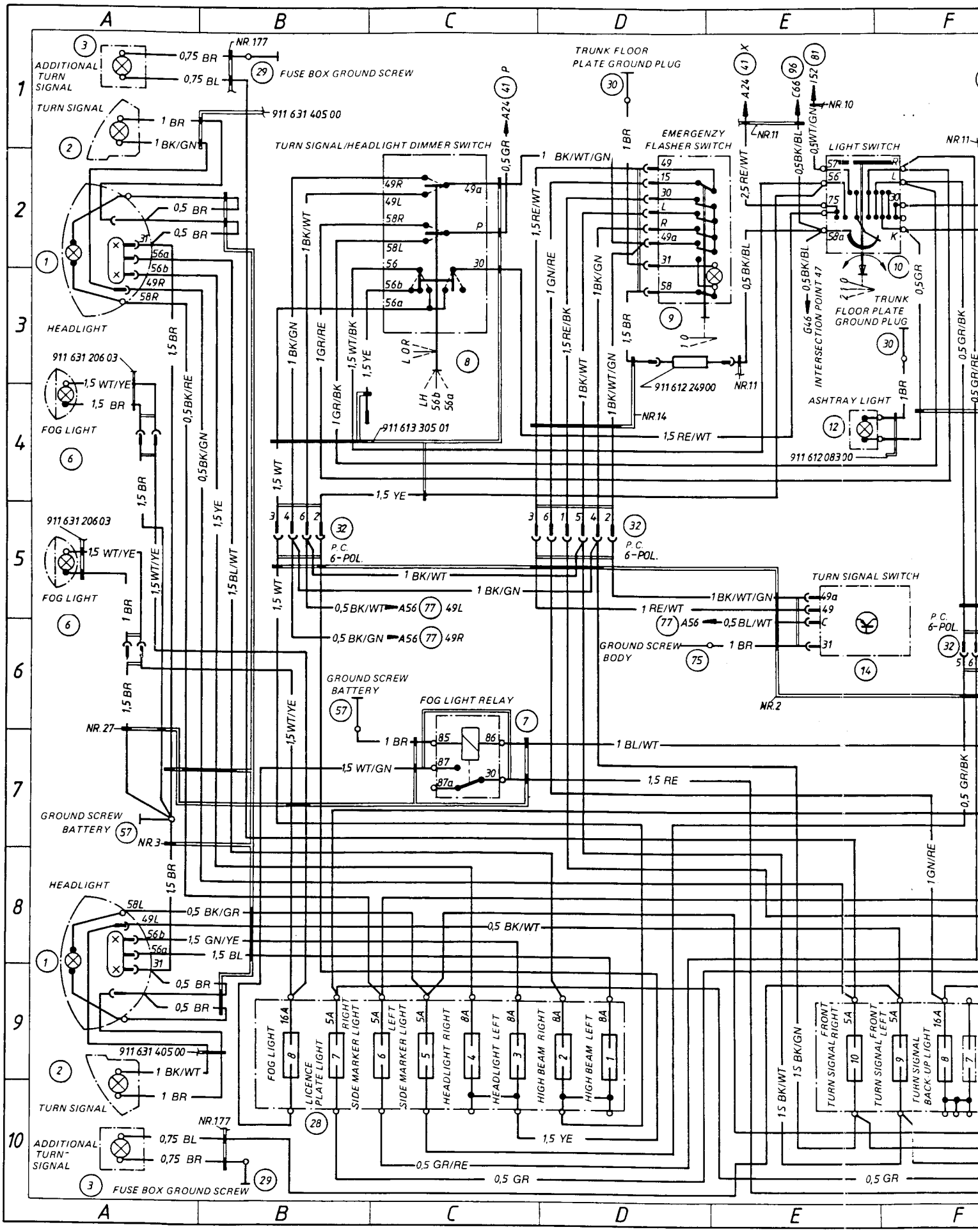
Wiring Diagram Type 911 Carrera Model 84 page 2

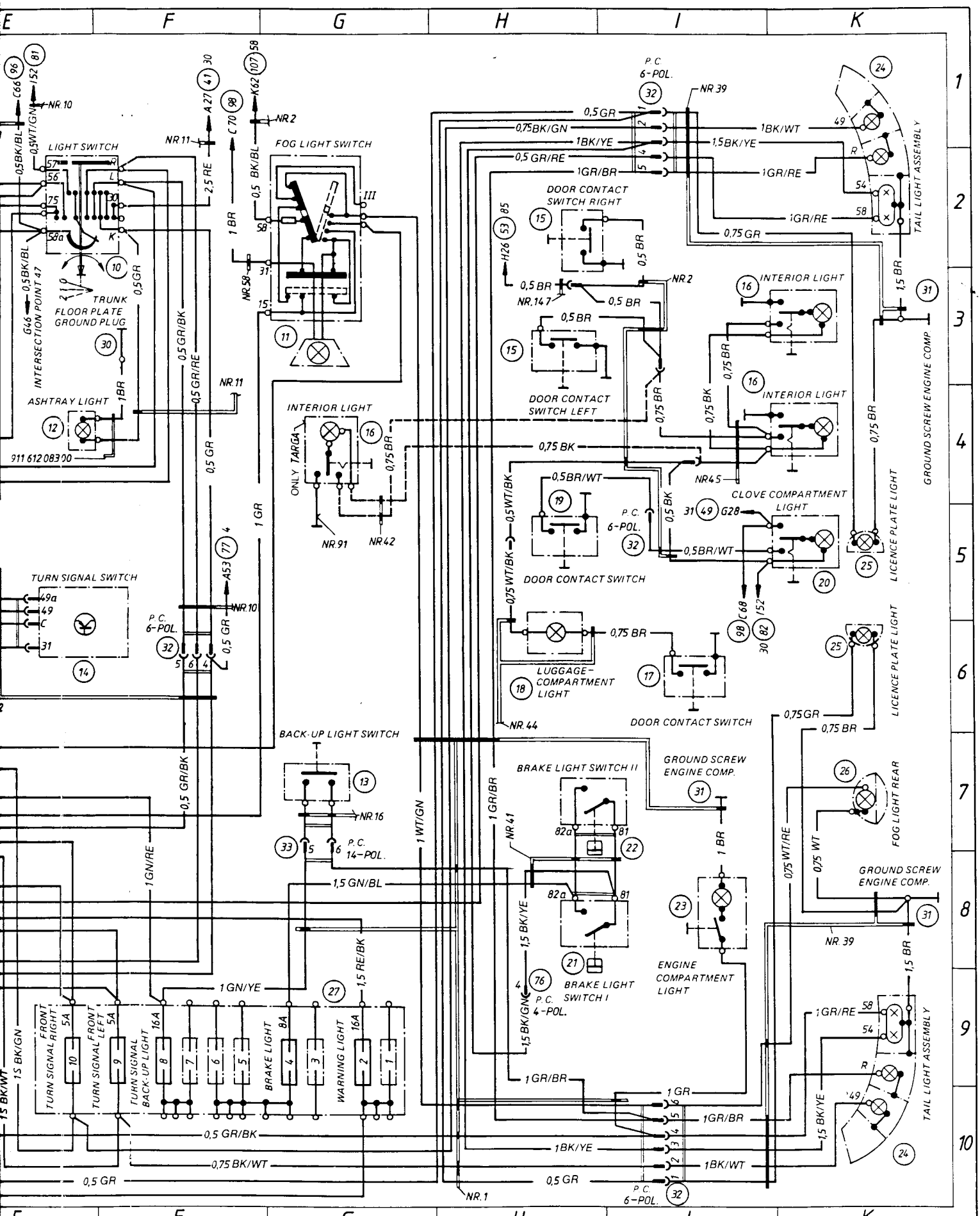


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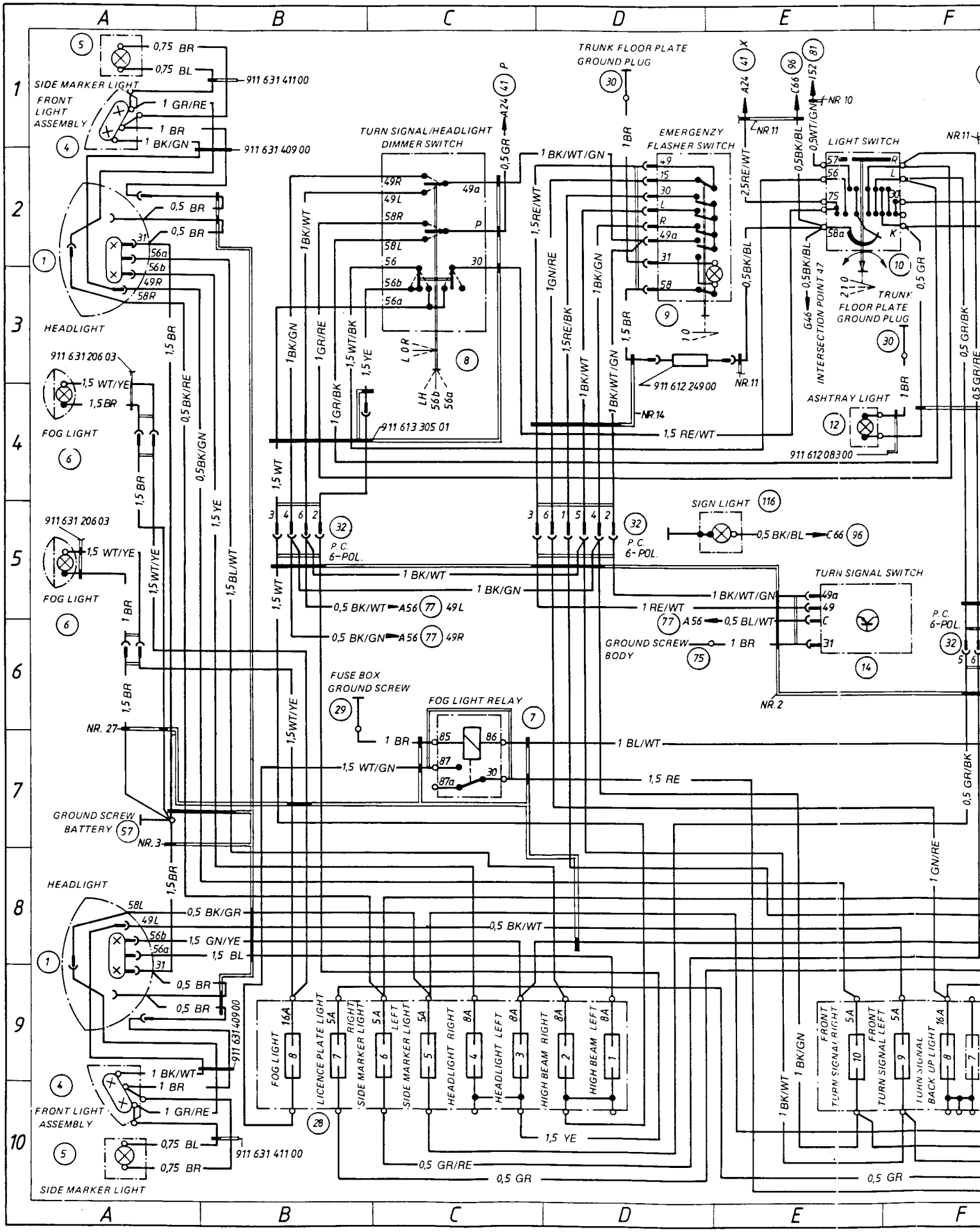

BACK-UP LIGHT SWITCH
WINDSHIELD WIPER MOTOR
REAR WINDOW WIPER SWITCH
PULL TURN SWITCH REAR WINDOW DEFOGGER
HEATING CONTROL UNIT
HEATING CONTROL UNIT
OUTSIDE MIRROR SWITCH
MICROSWITCH (ONLY TURBO)
BRAKE LIGHT SWITCH I
FUEL PUMP RELAY I
FUEL PUMP RELAY II (ONLY TURBO)
ADDITIONAL FAN RELAY (ONLY TURBO)
EMERGENZY FLASHER SWITCH
WINDSHIELD DEFOGGER RELAY (ONLY TURBO)
CLOCK
RELAY HEADLIGHT CLEANER
ADDITIONAL FAN RELAY
POWER WINDOW SWITCH PASSENGER SIDE IN DRIVER'S DOOR
REGULATING RELAY REAR WINDOW DEFOGGER
REAR WINDOW WIPER MOTOR (ONLY TURBO)
(NOT APPLICABLE FOR TURBO) RELAY HEATING CONTROL UNIT
(NOT APPLICABLE FOR TURBO) RELAY HEATING CONTROL UNIT
(NOT APPLICABLE FOR TURBO) RELAY HEATING CONTROL UNIT
(ONLY TURBO)
25A
25A
25A
16 A
8 A
25A
16A
5A
25A
25A
25A
25A
25A
16A
WINDSHIELD WASHER, REAR WINDOW WIPER
FRESH AIR BLOWER CIGARETTE LIGHTER REGULATING RELAY REAR WINDOW DEFOGGER
MIRROR TONGENTIAL BLOWER HEATING REGULATION (TURBO)
BRAKE LIGHT TEMPOSTAT
FUEL PUMP
LIGHT WINDSHIELD DEFOGGER
INTERIOR LIGHT TOTAL
HEADLIGHT CLEANER
AIR CONDITION
POWER WINDOW SLIDING ROOF
REAR WINDOW DEFOGGER
BLOWER
FUSE BOX 3 ENGINE COMP.
8
7
6
5
4
3
2
1
3
2
1
3
2
1
30
X
15
SPEEDOMETER
IGNITION STARTER SWITCH
AIR FLOW SENSOR MANIFOLD PRESSURE RELAY (ONLY TURBO)
(NOT APPLICABLE FOR TURBO) DME RELAY
HORN RELAY
FOG LIGHT RELAY
POWER WINDOW RELAY
BATTERY +
POWER WINDOW RELAY
GENERATOR
DELAYED ACTION RELAY (ONLY TURBO)
GENERATOR
NOT APPLICABLE FOR TURBO
(NOT APPLICABLE FOR TURBO) IGNITION COIL
RELAY HEATING CONTROL UNIT
(ONLY TURBO) FUEL PUMP RELAY II
(ONLY TURBO) DELAYED ACTION RELAY
IGNITION STARTER SWITCH
POWER WINDOW RELAY
(ONLY TURBO)

Wiring Diagram Type 911 Carrera Model 84 page 3

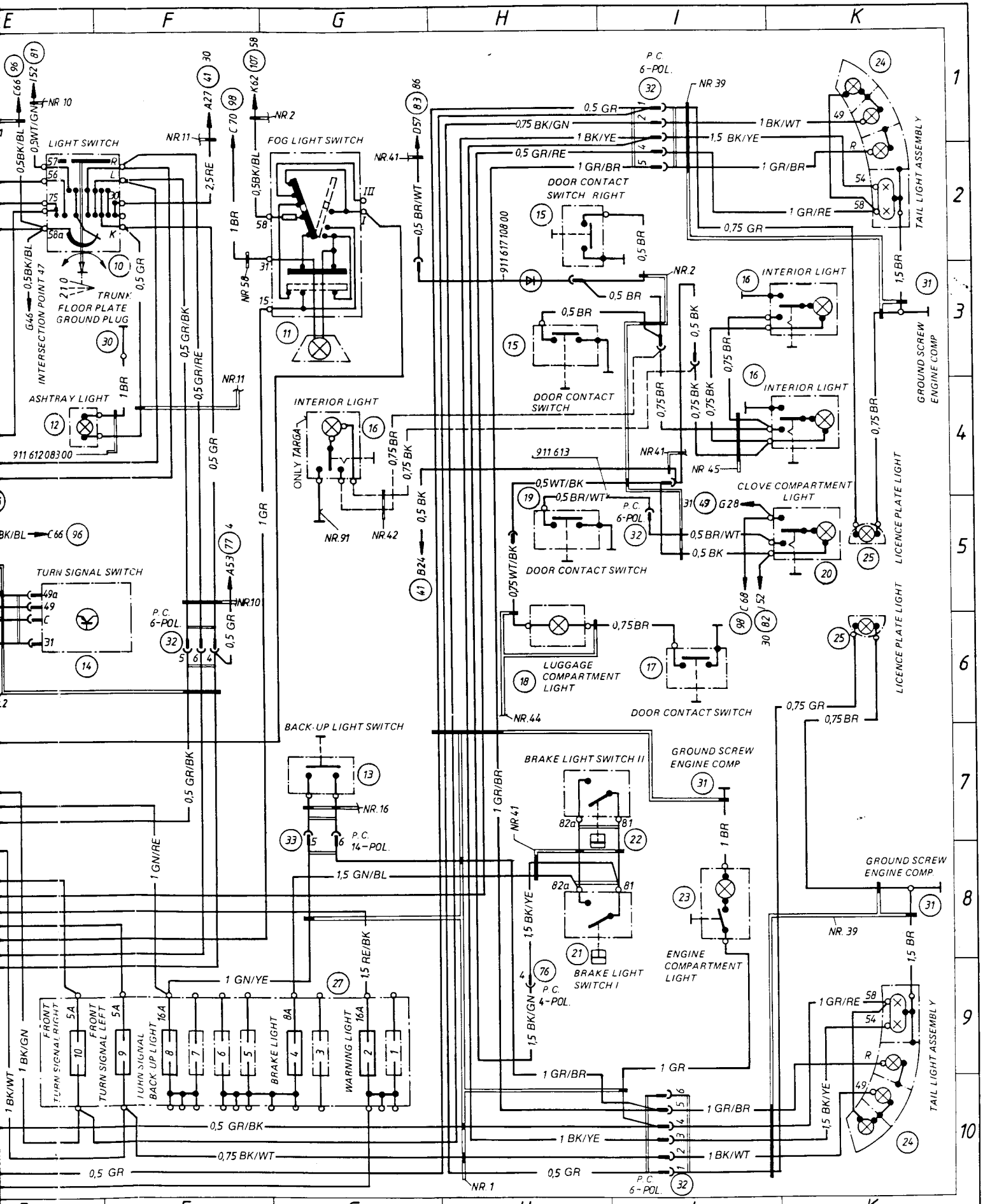



E F G H I K
1 2 3 4 5 6 7 8 9 10
LIGHT SWITCH
FOG LIGHT SWITCH
TRUNK FLOOR PLATE GROUND PLUG
INTERSECTION POINT 47
ASHTRAY LIGHT
911 612 083 00
INTERIOR LIGHT
ONLY TARGA
TURN SIGNAL SWITCH
BACK-UP LIGHT SWITCH
DOOR CONTACT SWITCH RIGHT
DOOR CONTACT SWITCH LEFT
DOOR CONTACT SWITCH
INTERIOR LIGHT
CLOVE COMPARTMENT LIGHT
LUGGAGE-COMPARTMENT LIGHT
LICENCE PLATE LIGHT
GROUND SCREW ENGINE COMP
TAIL LIGHT ASSEMBLY
FOG LIGHT REAR
BRAKE LIGHT SWITCH II
BRAKE LIGHT SWITCH I
ENGINE COMPARTMENT LIGHT
P.C. 6-POL.
P.C. 14-POL.
P.C. 4-POL.
TURN SIGNAL RIGHT FRONT 5A
TURN SIGNAL LEFT FRONT 5A
TURN SIGNAL BACK-UP LIGHT 16A
BRAKE LIGHT 8A
WARNING LIGHT 16A
0,5 GR/BK
0,75 BK/WT
0,5 GR
1BK/YE
1BK/WT
1GR/BR
1GR/RE
1,5 GN/BL
1 GN/RE
1 WT/GN
1,5 BK/YE
1,5 BK/GN
1,5 RE/BK
1 GN/YE
0,5 BK/BL
0,5 GR/RE
0,5 GR/BK
0,5 BR
0,75 BR
0,75 BK
0,5 BR/WT
0,5 WT/BK
0,75 WT/BK
0,75 GR
0,75 WT/RE
0,75 WT
1,5 BR
1 BR
2,5 RE
1 GR
1,5 BK/WT
1,5 BK/YE
NR.1
NR.2
NR.10
NR.11
NR.16
NR.39
NR.41
NR.42
NR.44
NR.58
NR.91
NR.147

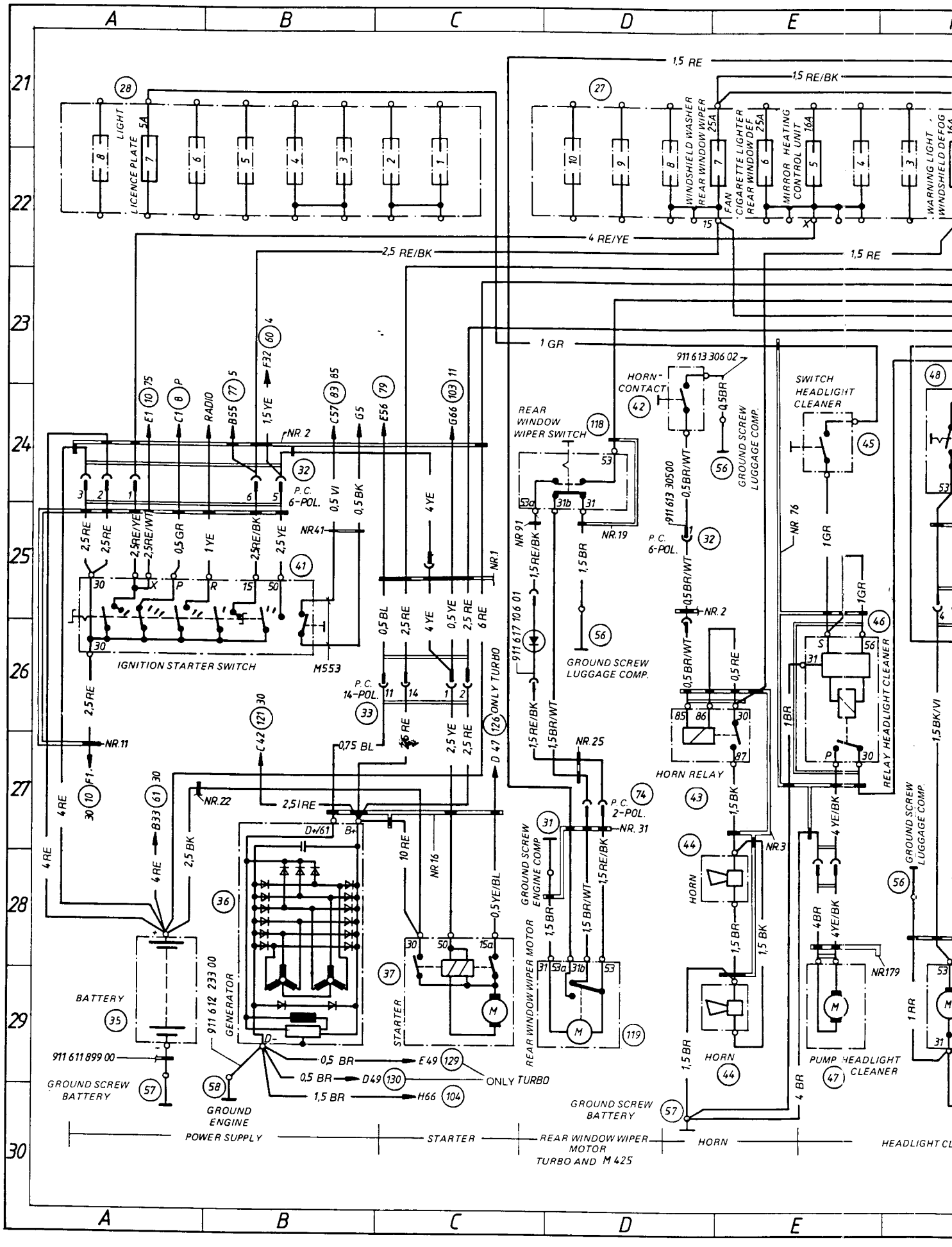
Wiring Diagram Type 911 Carrera Model 84 page 4 (USA, JA



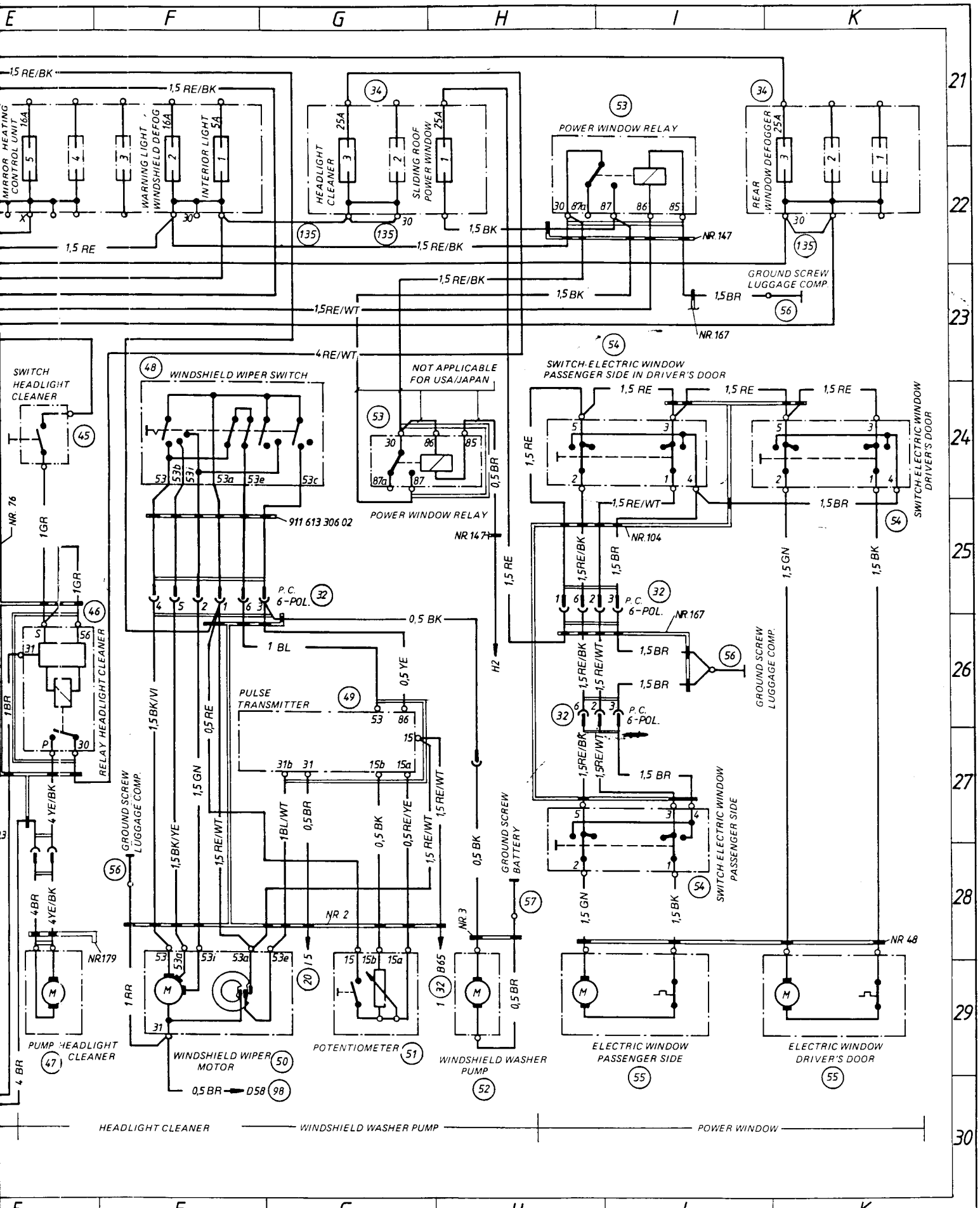
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E
F
G
H
I
K
1
2
3
4
5
6
7
8
9
10
LIGHT SWITCH
FOG LIGHT SWITCH
TRUNK FLOOR PLATE GROUND PLUG
INTERSECTION POINT 47
ASHTRAY LIGHT
911 612 083 00
TURN SIGNAL SWITCH
P.C. 6-POL.
INTERIOR LIGHT
ONLY TARGA
911 613
DOOR CONTACT SWITCH RIGHT
911 617 108 00
DOOR CONTACT SWITCH
INTERIOR LIGHT
CLOVE COMPARTMENT LIGHT
LUGGAGE COMPARTMENT LIGHT
DOOR CONTACT SWITCH
LICENCE PLATE LIGHT
LICENCE PLATE LIGHT
GROUND SCREW ENGINE COMP
TAIL LIGHT ASSEMBLY
BACK-UP LIGHT SWITCH
P.C. 14-POL.
BRAKE LIGHT SWITCH II
BRAKE LIGHT SWITCH I
P.C. 4-POL.
ENGINE COMPARTMENT LIGHT
GROUND SCREW ENGINE COMP
TAIL LIGHT ASSEMBLY
FRONT TURN SIGNAL RIGHT 5A
FRONT TURN SIGNAL LEFT 5A
TURN SIGNAL BACK UP LIGHT 16A
BRAKE LIGHT 8A
WARNING LIGHT 16A
0,5 GR
0,75 BK/WT
0,5 GR/BK
1 BK/YE
1 GR/BR
1 BK/WT
1 BK/GN
1 GN/YE
1,5 GN/BL
1 GN/RE
1,5 RE/BK
1,5 BK/YE
1,5 BK/GN
0,75 BK/GN
0,5 GR/RE
1,5 BK/YE
1 GR/RE
0,75 GR
0,5 BR/WT
0,5 WT/BK
0,5 BR/WT
0,5 BK
0,75 WT/BK
0,75 BR
0,5 BK
0,5 BK/BL
0,5 WT/GN
0,5 GR/BK
2,5 RE
1 BR
1,5 BR
0,75 BK
NR 10
NR 11
NR 2
NR 41
NR 39
NR 45
NR 91
NR 42
NR 44
NR 16
NR 1
NR 58
NR 10

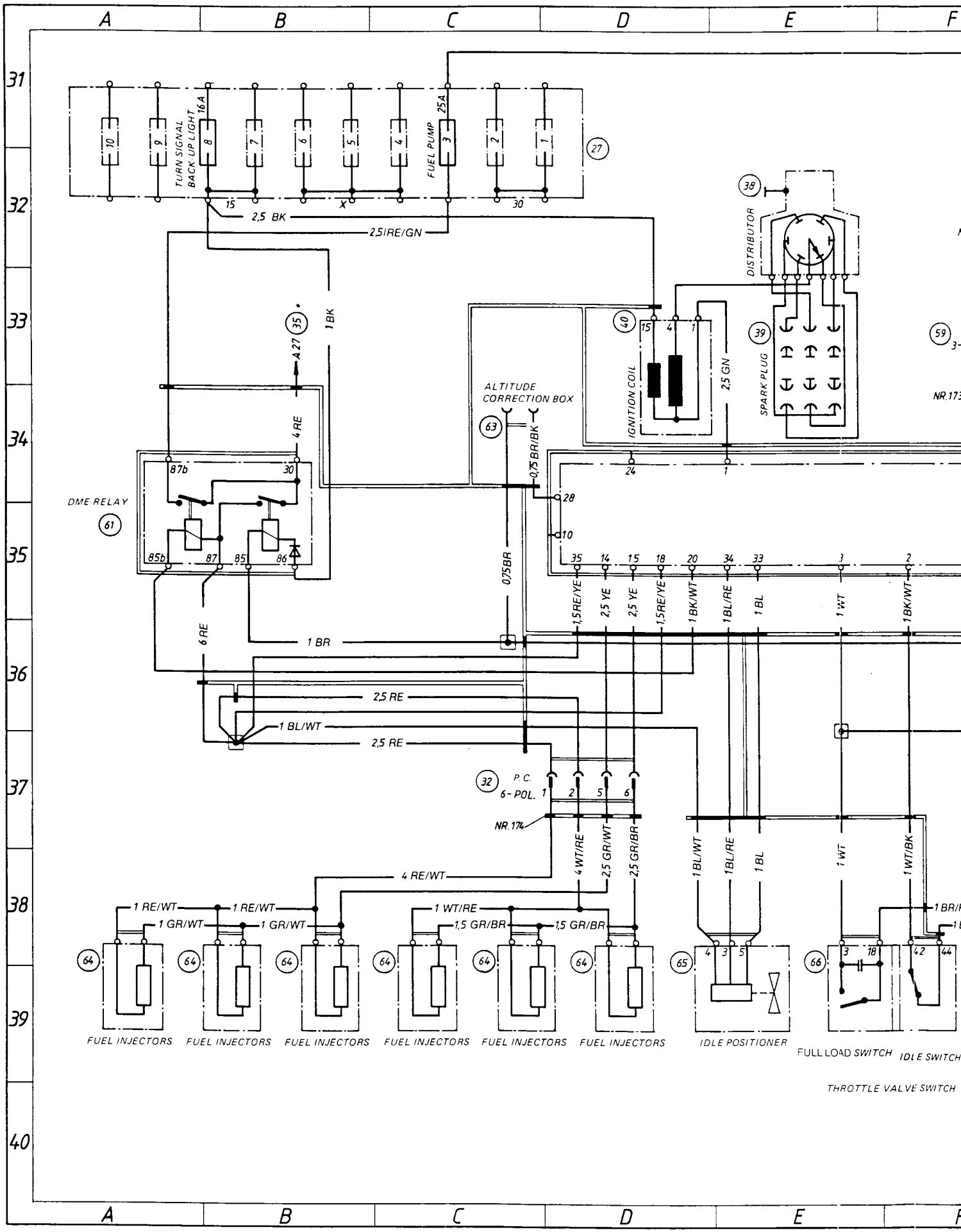
Wiring Diagram Type 911 Carrera Model 84 page 5



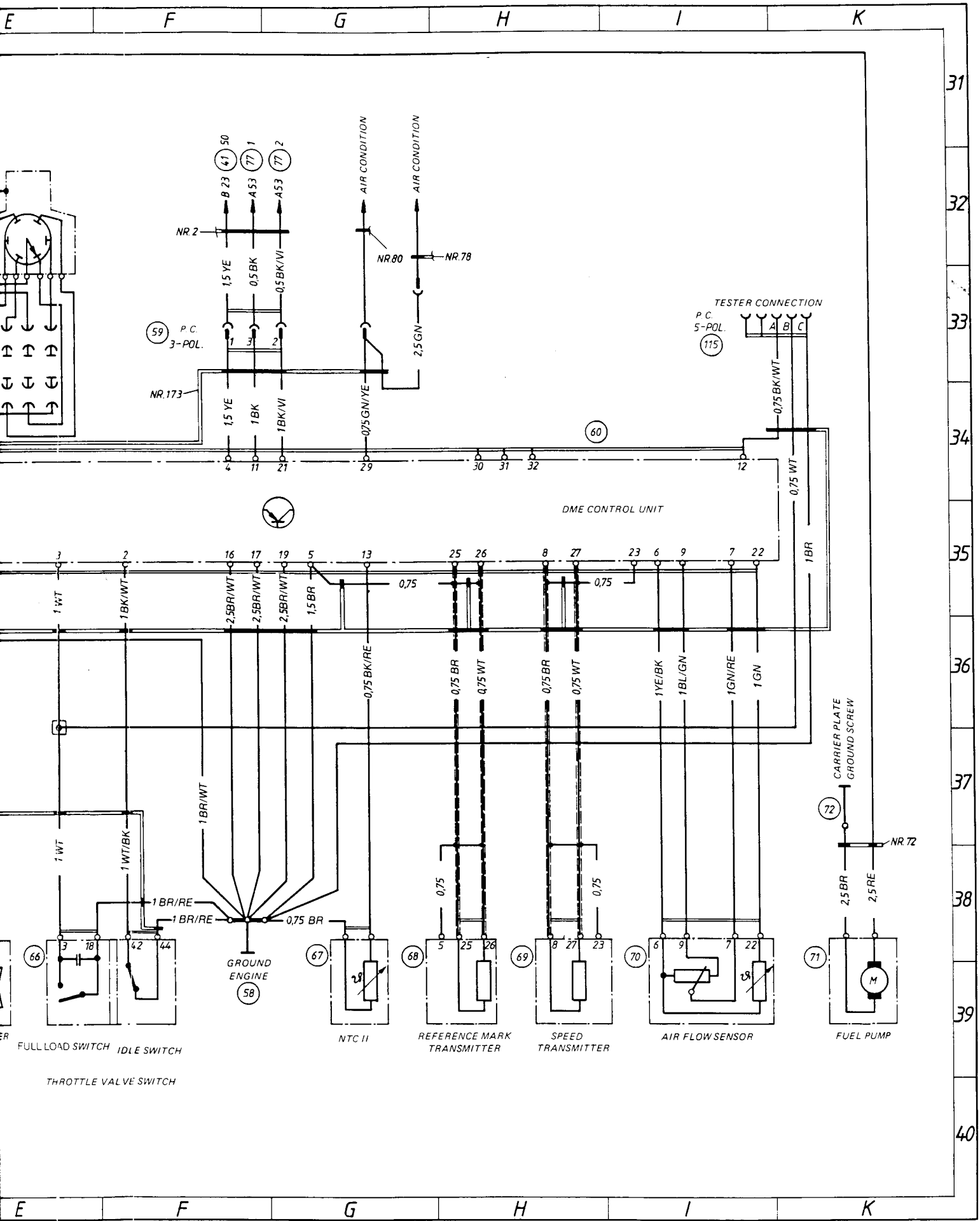
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E F G H I K
21 22 23 24 25 26 27 28 29 30
1,5 RE/BK
1,5 RE
1,5 BK
1,5 RE/WT
1,5 BR
0,5 BK
0,5 BR
0,5 YE
0,5 RE
1 BL
1 BR
1,5 BK/VI
1,5 GN
1,5 RE/BK
1,5 RE/WT
1BL/WT
0,5 RE/YE
4 RE/WT
4 YE/BK
4 BR
1GR
MIRROR HEATING CONTROL UNIT 16A
WARNING LIGHT, WINDSHIELD DEFOG 16A
INTERIOR LIGHT 5A
HEADLIGHT CLEANER 25A
SLIDING ROOF POWER WINDOW 25A
REAR WINDOW DEFOGGER 25A
POWER WINDOW RELAY
NR. 147
NR. 167
NR. 104
NR. 76
NR. 179
NR. 48
NR 2
NR 3
GROUND SCREW LUGGAGE COMP.
GROUND SCREW BATTERY
SWITCH HEADLIGHT CLEANER
WINDSHIELD WIPER SWITCH
NOT APPLICABLE FOR USA/JAPAN
SWITCH-ELECTRIC WINDOW PASSENGER SIDE IN DRIVER'S DOOR
SWITCH-ELECTRIC WINDOW DRIVER'S DOOR
SWITCH-ELECTRIC WINDOW PASSENGER SIDE
RELAY HEADLIGHT CLEANER
PULSE TRANSMITTER
P.C. 6-POL.
911 613 306 02
0,5 BR → D58
PUMP HEADLIGHT CLEANER
WINDSHIELD WIPER MOTOR
POTENTIOMETER
WINDSHIELD WASHER PUMP
ELECTRIC WINDOW PASSENGER SIDE
ELECTRIC WINDOW DRIVER'S DOOR
HEADLIGHT CLEANER
WINDSHIELD WASHER PUMP
POWER WINDOW

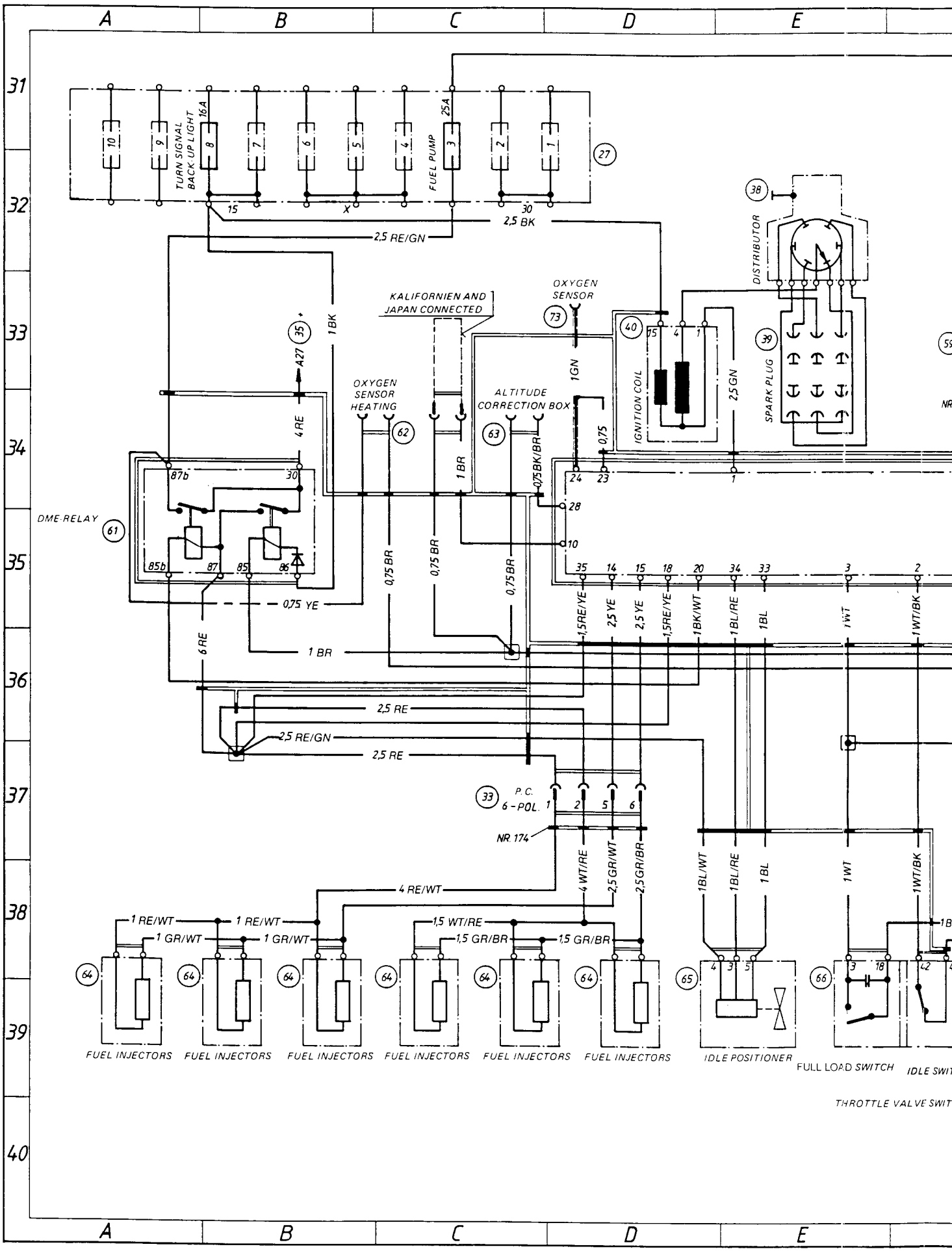
Wiring Diagram Type 911 Carrera Model 84 page 6

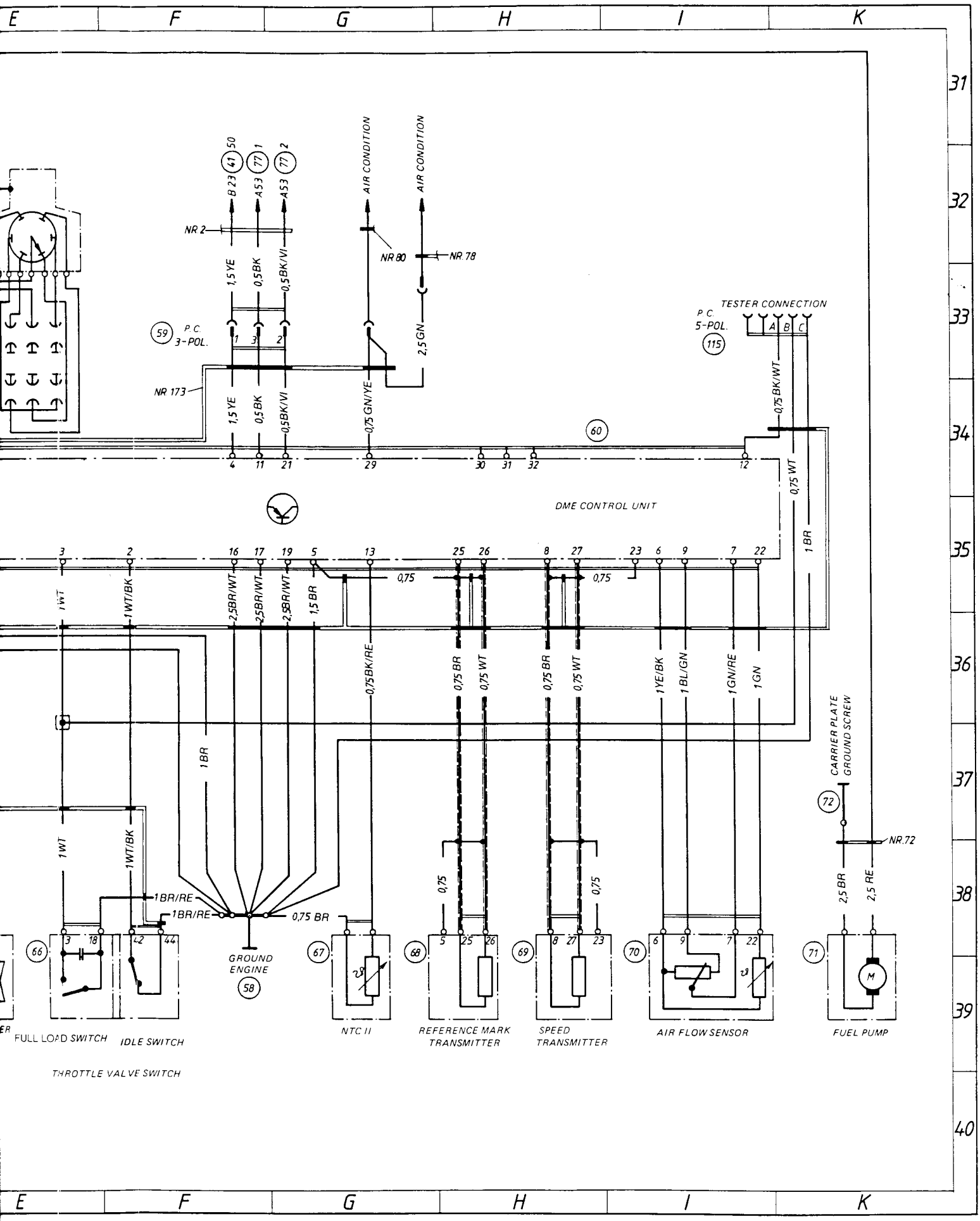


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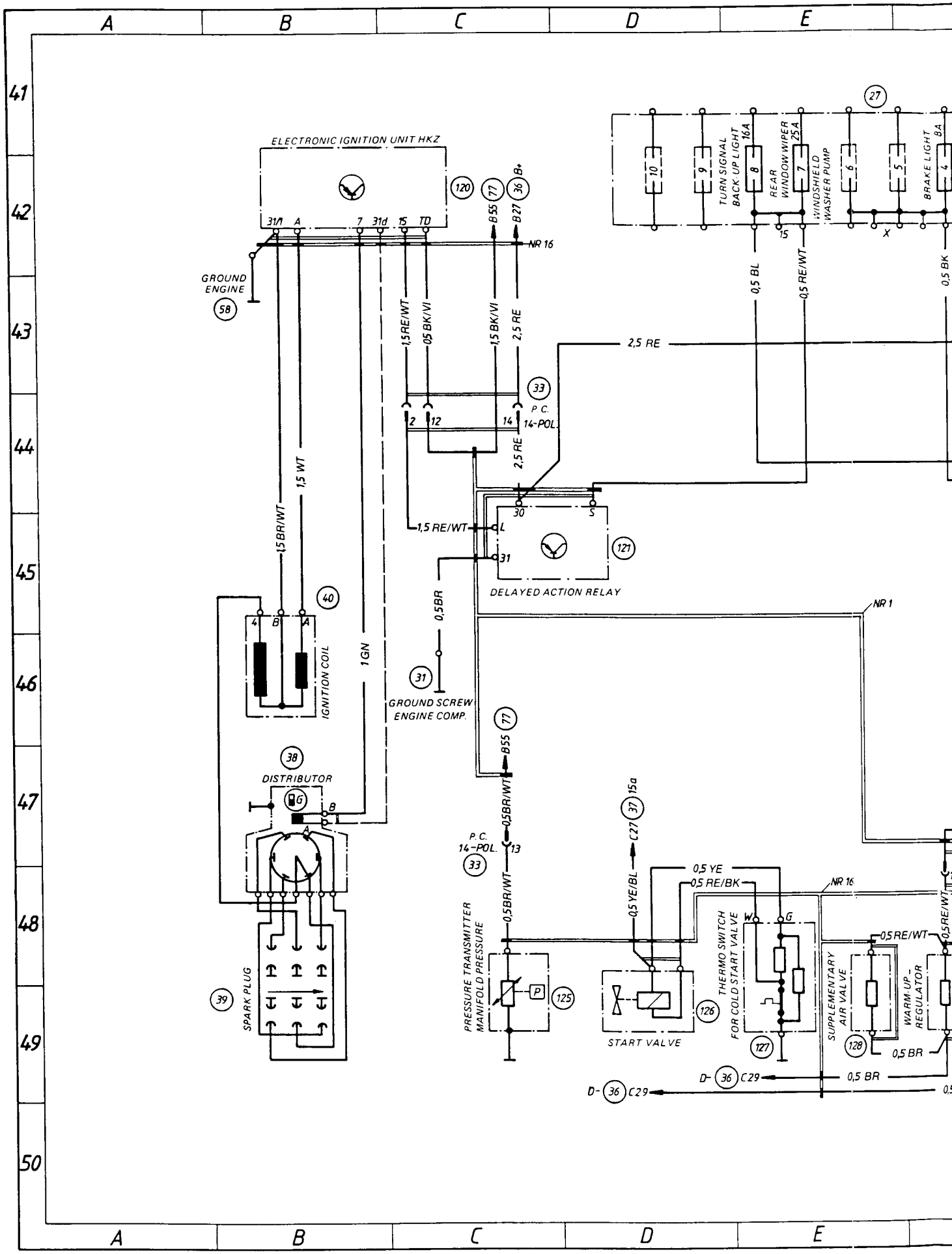

E F G H I K
31 32 33 34 35 36 37 38 39 40
(41) S0
(77) 1
(77) 2
B 23
A53
A53
AIR CONDITION
AIR CONDITION
NR.2
NR.80
NR.78
1,5 YE
0,5 BK
0,5 BK/VI
2,5 GN
(59) P.C. 3-POL.
1 3 2
NR.173
1,5 YE
1 BK
1 BK/VI
0,75 GN/YE
4 11 21 29 30 31 32
(60)
TESTER CONNECTION
P.C. 5-POL. (115)
A B C
0,75 BK/WT
12
0,75 WT
1 BR
DME CONTROL UNIT
3 2 16 17 19 5 13 25 26 8 27 23 6 9 7 22
1 WT
1 BK/WT
2,5 BR/WT
2,5 BR/WT
2,5 BR/WT
1,5 BR
0,75
0,75
0,75 BK/RE
0,75 BR
0,75 WT
0,75 BR
0,75 WT
1 YE/BK
1 BL/GN
1 GN/RE
1 GN
1 BR/WT
1 WT
1 WT/BK
1 BR/RE
1 BR/RE
0,75 BR
GROUND ENGINE (58)
0,75
0,75
CARRIER PLATE GROUND SCREW
(72)
NR.72
2,5 BR
2,5 RE
(66) 3 18 42 44
(67)
(68) 5 25 26
(69) 8 27 23
(70) 6 9 7 22
(71)
M
FULL LOAD SWITCH
IDLE SWITCH
THROTTLE VALVE SWITCH
NTC II
REFERENCE MARK TRANSMITTER
SPEED TRANSMITTER
AIR FLOW SENSOR
FUEL PUMP

Wiring Diagram Type 911 Carrera Model 84 page 7 (USA,

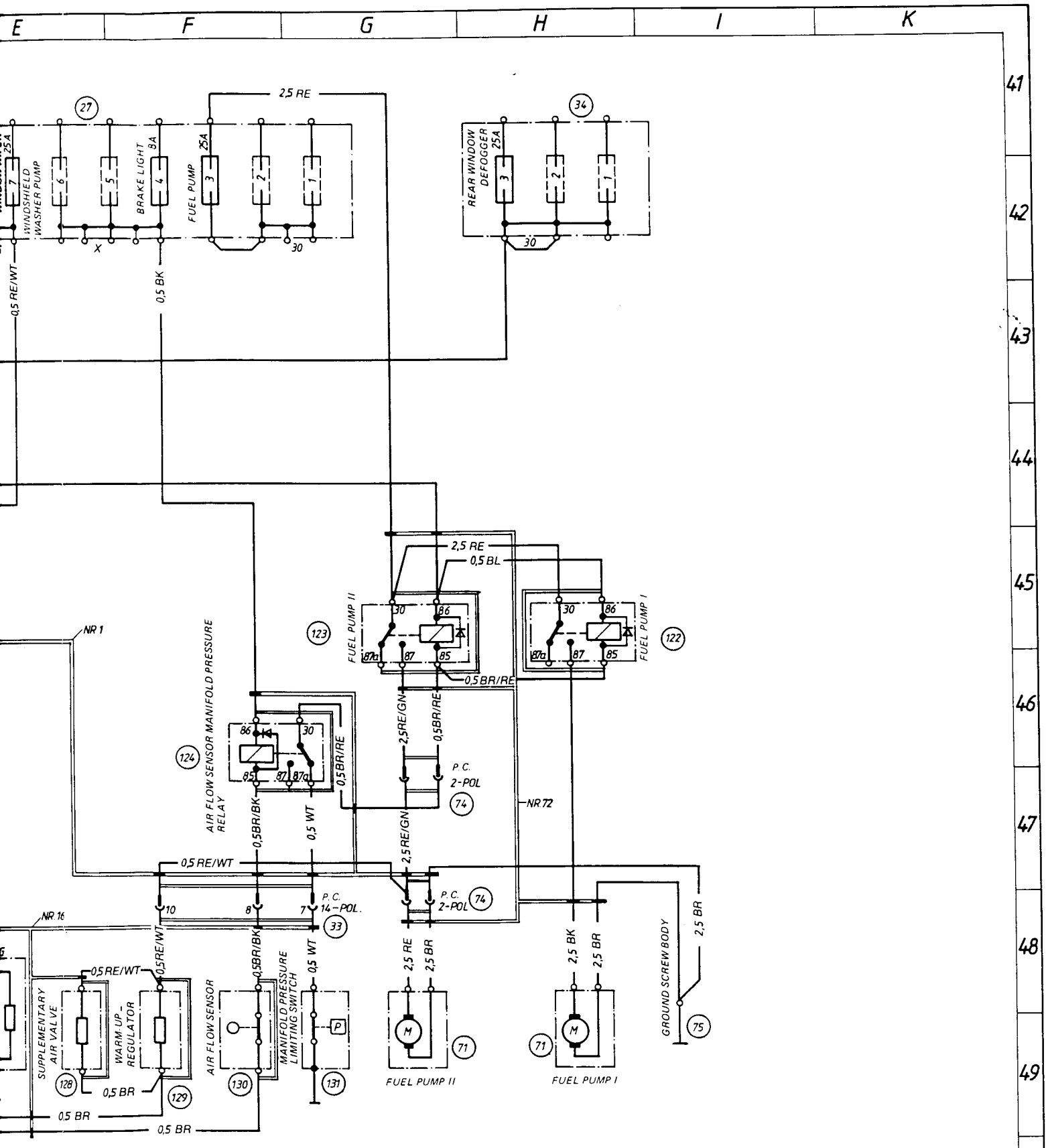



E F G H I K
31 32 33 34 35 36 37 38 39 40
B 23 (41) 50
A53 (77) 1
A53 (77) 2
AIR CONDITION
AIR CONDITION
NR 2
NR 80
NR 78
1,5 YE
0,5 BK
0,5 BK/VI
2,5 GN
59 P.C. 3-POL.
NR 173
0,75 GN/YE
60
TESTER CONNECTION
P.C. 5-POL. 115
A B C
0,75 BK/WT
0,75 WT
1 BR
DME CONTROL UNIT
4 11 21 29 30 31 32 12
3 2 16 17 19 5 13 25 26 8 27 23 6 9 7 22
1 WT
1 WT/BK
2,5 BR/WT
1,5 BR
0,75
0,75 BK/RE
0,75 BR
0,75 WT
1 YE/BK
1 BL/GN
1 GN/RE
1 GN
CARRIER PLATE GROUND SCREW
72
NR.72
2,5 BR
2,5 RE
1 BR/RE
GROUND ENGINE
58
66 67 68 69 70 71
FULL LOAD SWITCH
IDLE SWITCH
THROTTLE VALVE SWITCH
NTC II
REFERENCE MARK TRANSMITTER
SPEED TRANSMITTER
AIR FLOW SENSOR
FUEL PUMP

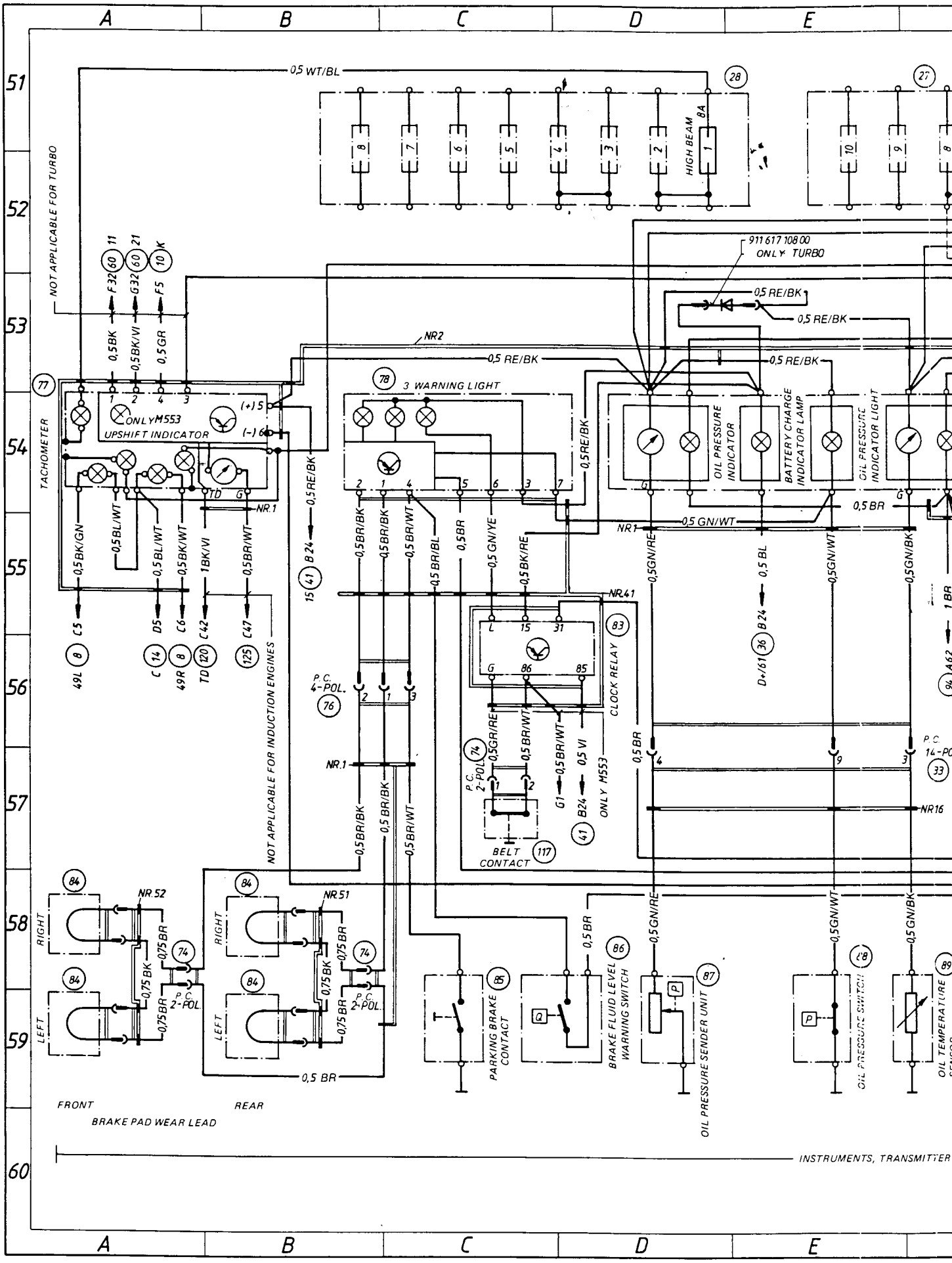
Wiring Diagram Type 911 Carrera Model 84 page 8



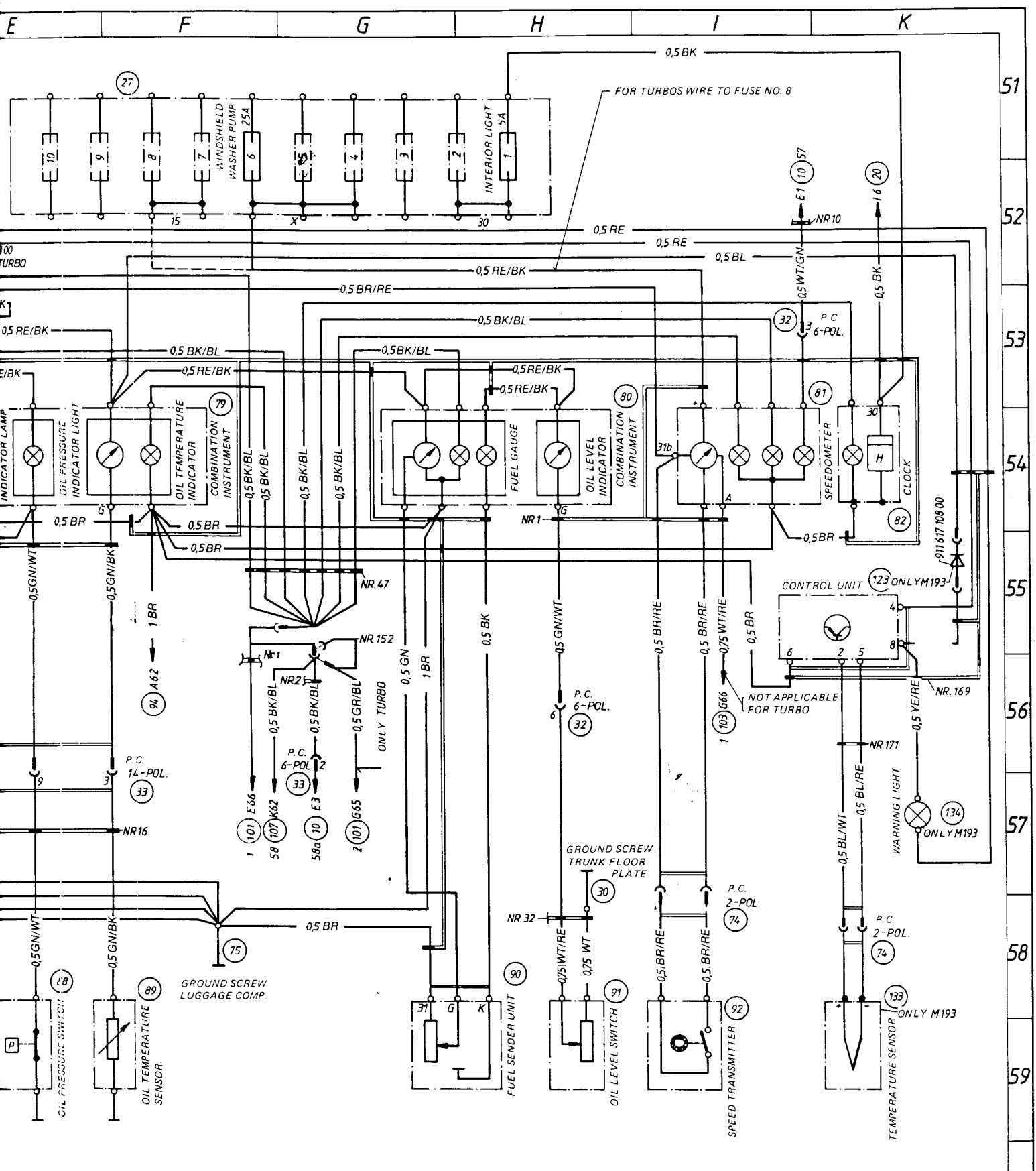
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E
F
G
H
I
K
41
42
43
44
45
46
47
48
49
50
27
2,5 RE
WINDSHIELD WASHER PUMP 25A
BRAKE LIGHT 8A
FUEL PUMP 25A
REAR WINDOW DEFOGGER 25A
34
0,5 RE/WT
0,5 BK
30
X
123
FUEL PUMP II
122
FUEL PUMP I
2,5 RE
0,5 BL
0,5 BR/RE
2,5 RE/GN
124
AIR FLOW SENSOR MANIFOLD PRESSURE RELAY
0,5 BR/BK
0,5 WT
P.C. 2-POL
74
NR.72
NR.1
NR.16
P.C. 14-POL.
33
10
8
7
SUPPLEMENTARY AIR VALVE
128
WARM UP-REGULATOR
129
0,5 BR
AIR FLOW SENSOR
130
MANIFOLD PRESSURE LIMITING SWITCH
131
71
2,5 BR
2,5 BK
GROUND SCREW BODY
75

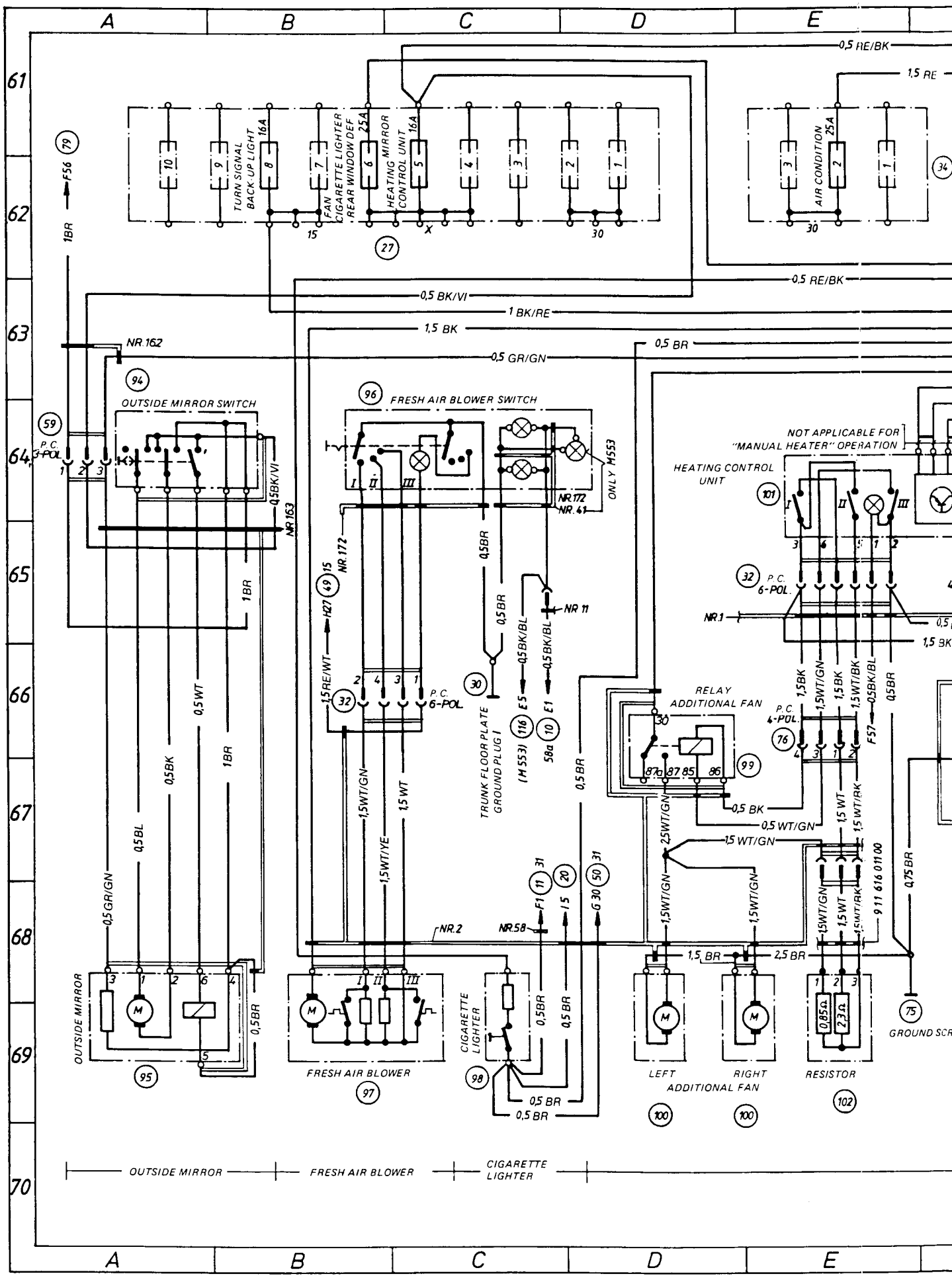
Wiring Diagram Type 911 Carrera Model 84 page 9



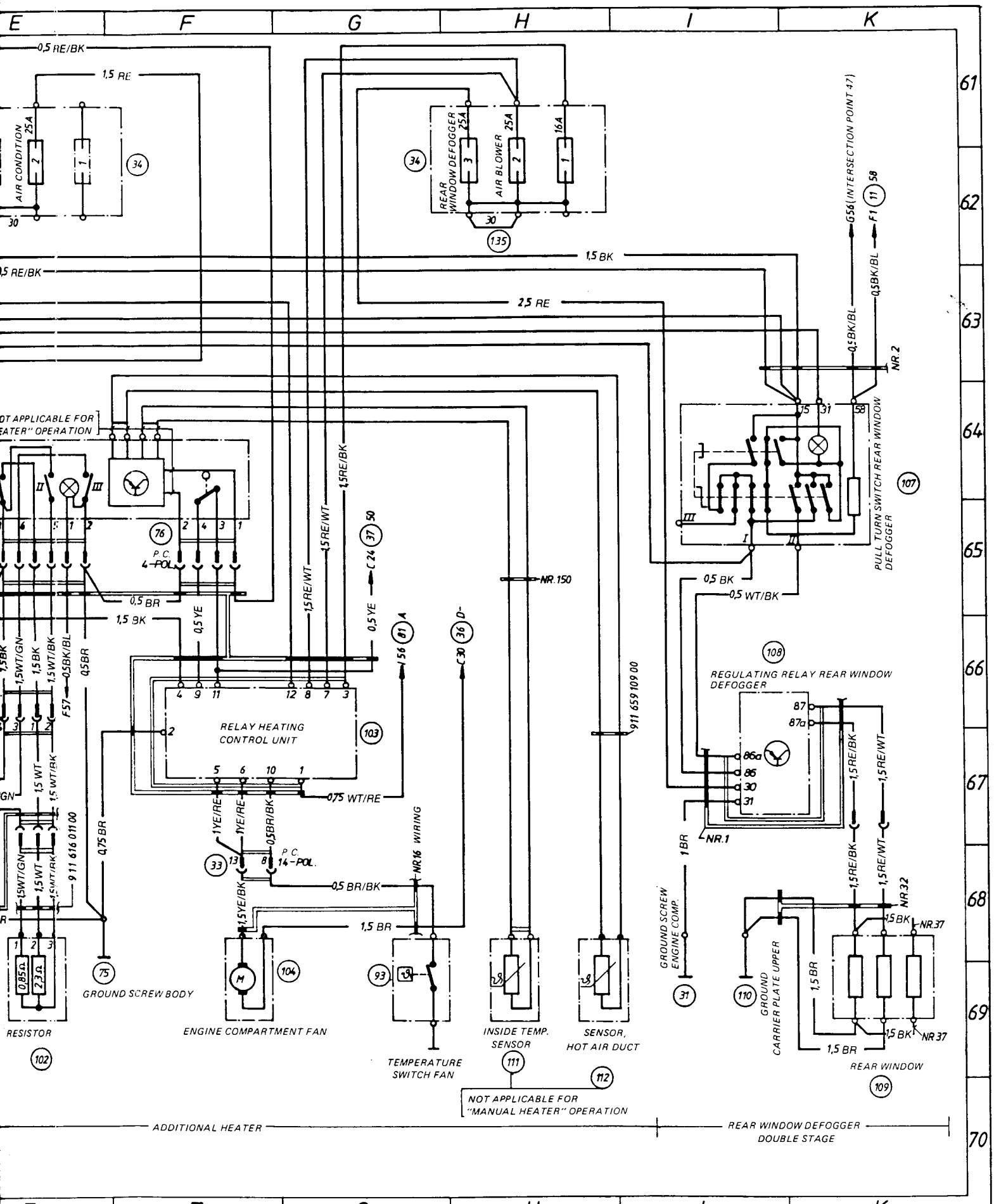
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E F G H I K
51 52 53 54 55 56 57 58 59 60
0,5 BK
FOR TURBOS WIRE TO FUSE NO. 8
27
10 9 8 7 WINDSHIELD WASHER PUMP 25A 6 5 4 3 2 INTERIOR LIGHT 5A 1
15 X 30
0,5 RE
0,5 RE
0,5 BL
0,5 RE/BK
0,5 BR/RE
0,5 BK/BL
0,5 RE/BK
0,5 BK/BL
0,5 RE/BK
0,5 RE/BK
0,5 BR
0,5 BR
0,5 BR
0,5 BR
0,5 BR
0,5 BR
0,5 WT/GN
0,5 BK
E1 10 57
NR 10
I 6 20
32 3 P.C. 6-POL.
79 OIL PRESSURE INDICATOR LIGHT
OIL TEMPERATURE INDICATOR
COMBINATION INSTRUMENT
0,5 BK/BL
0,5 BK/BL
0,5 BK/BL
0,5 BK/BL
80 FUEL GAUGE
OIL LEVEL INDICATOR
COMBINATION INSTRUMENT
81 31b SPEEDOMETER 30 H CLOCK
82
NR 1
911 617 108 00
CONTROL UNIT 123 ONLY M193
4 6 2 5 8
NR. 169
NR 47
NR 152
NR 1
NR 2
0,5 GN/WT
0,5 GN/BK
1 BR
94 A62
0,5 BK/BL
0,5 BK/BL
0,5 GR/BL
ONLY TURBO
0,5 GN
1 BR
0,5 BK
0,5 GN/WT
0,5 BR/RE
0,5 BR/RE
0,75 WT/RE
0,5 BR
P.C. 6-POL. 32
103 G66 1
NOT APPLICABLE FOR TURBO
P.C. 14-POL. 33
9 3
P.C. 6-POL. 33
12
NR 16
101 E66 1
107 K62 58
10 E3 58a
101 G65 2
0,5 YE/RE
NR 171
0,5 BL/WT
0,5 BL/RE
WARNING LIGHT
134 ONLY M193
GROUND SCREW TRUNK FLOOR PLATE
30
NR 32
P.C. 2-POL. 74
P.C. 2-POL. 74
0,5 GN/WT
0,5 GN/BK
0,5 BR
75
GROUND SCREW LUGGAGE COMP.
88
89
OIL PRESSURE SWITCH
OIL TEMPERATURE SENSOR
90 31 G K
FUEL SENDER UNIT
0,75 WT/RE
0,75 WT
91
OIL LEVEL SWITCH
0,5 BR/RE
0,5 BR/RE
92
SPEED TRANSMITTER
133 ONLY M193
TEMPERATURE SENSOR
INSTRUMENTS, TRANSMITTER

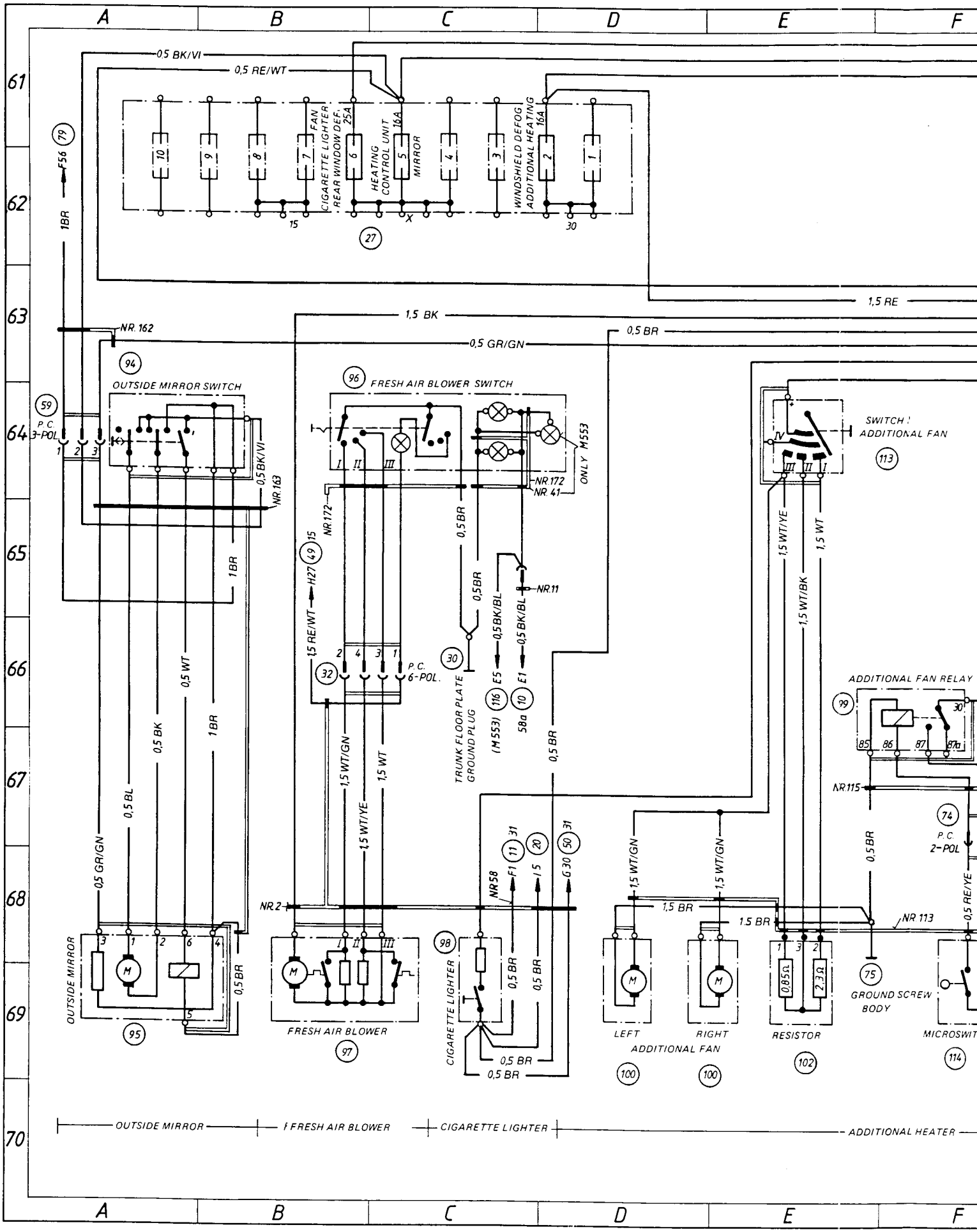
Wiring Diagram Type 911 Carrera Model 84 page 10



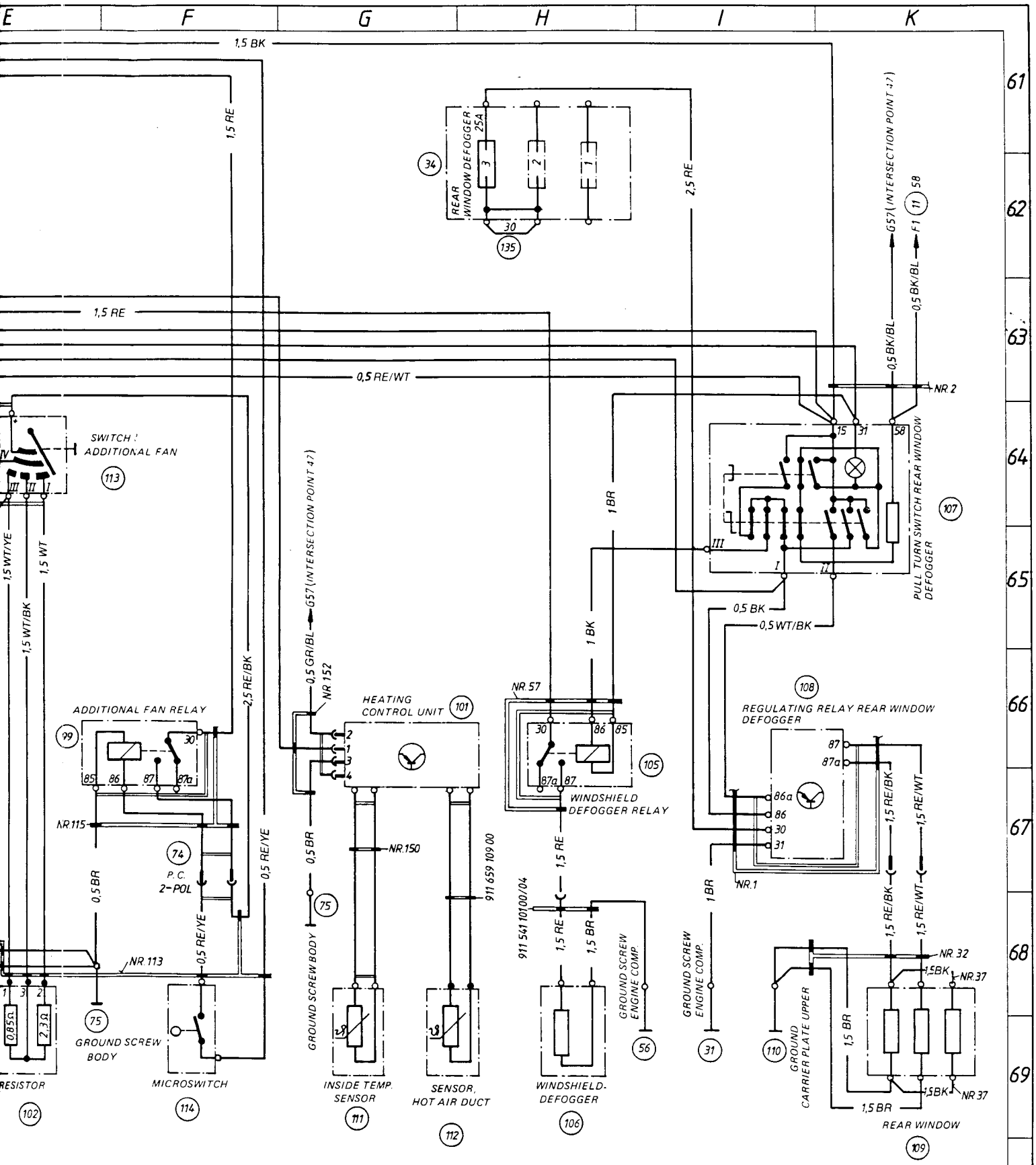
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E F G H I K
61 62 63 64 65 66 67 68 69 70
0,5 RE/BK
1,5 RE
AIR CONDITION 25A
REAR WINDOW DEFOGGER 25A
AIR BLOWER 25A 16A
1,5 BK
2,5 RE
G56 (INTERSECTION POINT 47)
0,5BK/BL
NR.2
PULL TURN SWITCH REAR WINDOW DEFOGGER
0,5 BK
0,5 WT/BK
NOT APPLICABLE FOR "HEATER" OPERATION
P.C. 4-POL.
0,5 BR
1,5 BK
0,5 YE
1,5RE/WT
1,5RE/BK
C24 50
NR.150
911 659 109 00
RELAY HEATING CONTROL UNIT
0,75 WT/RE
1YE/RE
0,5BR/BK
P.C. 14-POL.
NR16 WIRING
0,5 BR/BK
1,5YE/BK
1,5 BR
911 616 011 00
0,75 BR
REGULATING RELAY REAR WINDOW DEFOGGER
NR.1
1 BR
GROUND SCREW ENGINE COMP.
NR32
1,5 BK
NR.37
GROUND CARRIER PLATE UPPER
REAR WINDOW
RESISTOR
GROUND SCREW BODY
ENGINE COMPARTMENT FAN
TEMPERATURE SWITCH FAN
INSIDE TEMP. SENSOR
SENSOR, HOT AIR DUCT
NOT APPLICABLE FOR "MANUAL HEATER" OPERATION
ADDITIONAL HEATER
REAR WINDOW DEFOGGER DOUBLE STAGE

Wiring Diagram Type 911 Carrera Model 84 page 11



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E F G H I K
1,5 BK
1,5 RE
1,5 RE
0,5 RE/WT
2,5 RE
REAR WINDOW DEFOGGER 25A
34
135
30
3
2
1
G57 (INTERSECTION POINT 47)
F1 58
11
0,5 BK/BL
0,5 BK/BL
NR.2
15
31
58
107
PULL TURN SWITCH REAR WINDOW DEFOGGER
SWITCH ADDITIONAL FAN
113
1,5 WT/YE
1,5 WT
1,5 WT/BK
2,5 RE/BK
0,5 RE/YE
1 BR
1 BK
0,5 BK
0,5 WT/BK
0,5 GR/BL
G57 (INTERSECTION POINT 47)
NR.152
HEATING CONTROL UNIT
101
NR.57
30
86
85
87a
87
105
WINDSHIELD DEFOGGER RELAY
108
REGULATING RELAY REAR WINDOW DEFOGGER
87
87a
86a
86
30
31
NR.1
ADDITIONAL FAN RELAY
99
85
86
87
87a
30
NR.115
74
P.C.
2-POL
0,5 BR
0,5 RE/YE
NR.113
0,5 BR
NR.150
911 659 109 00
911 541 10100/04
1,5 RE
1,5 BR
1,5 RE
1,5 RE/BK
1,5 RE/WT
1,5 RE/BK
1,5 RE/WT
NR.32
1,5BK
NR.37
1,5BK
NR.37
1,5 BR
1,5 BR
75
GROUND SCREW BODY
75
GROUND SCREW BODY
GROUND SCREW ENGINE COMP.
56
GROUND SCREW ENGINE COMP.
31
110
GROUND CARRIER PLATE UPPER
0,85Ω
2,3Ω
RESISTOR
102
MICROSWITCH
114
INSIDE TEMP. SENSOR
111
SENSOR, HOT AIR DUCT
112
WINDSHIELD-DEFOGGER
106
REAR WINDOW
109
ADDITIONAL HEATER
WINDSHIELD DEFOGGER SINGLE STAGE
REAR WINDOW DEFOGGER DOUBLE STAGE
61
62
63
64
65
66
67
68
69
70
E F G H I K

Wiring Diagram Type 911 Carrera Model 85

PAGE 1	CODES
PAGE 2	CONNECTION AND EQUIPMENT FUSES
PAGE 3	ILLUMINATION
PAGE 4	ILLUMINATION (USA, JAPAN)
PAGE 5	MOTOR AND BODY
PAGE 6	DIGITAL MOTOR ELECTRONIC (DME)
PAGE 7	DIGITAL MOTOR ELECTRONIC (DME) (USA, JAPAN)
PAGE 8	K-JETRONIC TURBO
PAGE 9	INSTRUMENTS, TRANSMITTER
PAGE 10	FRESH AIR BLOWER AND HEATER
PAGE 11	FRESH AIR BLOWER AND HEATER TURBO
PAGE 12	SEAT OPERATION AND SEAT HEATING
PAGE 13	OUTSIDE MIRROR
PAGE 14	AIR CONDITION
PAGE 15	TEMPOSTAT
PAGE 16	CENTRAL LOCKING SYSTEM

Wiring Diagram Type 911 Carrera
Model 85
Explanations

1 – COORDINATES

2 – WIRE CROSS SECTION SIZE WITH WIRE COLOR (E.G. 6,0 MM^2, RED)

3 – TERMINAL DESIGNATION (E.G. TERMINAL 30)

4 – PART DESIGNATION AND CONNECTION OF WIRE (SEE CODES)

5 – COORDINATE TO WHICH WIRE LEADS

6 – UNCONNECTABLE CONNECTIONS

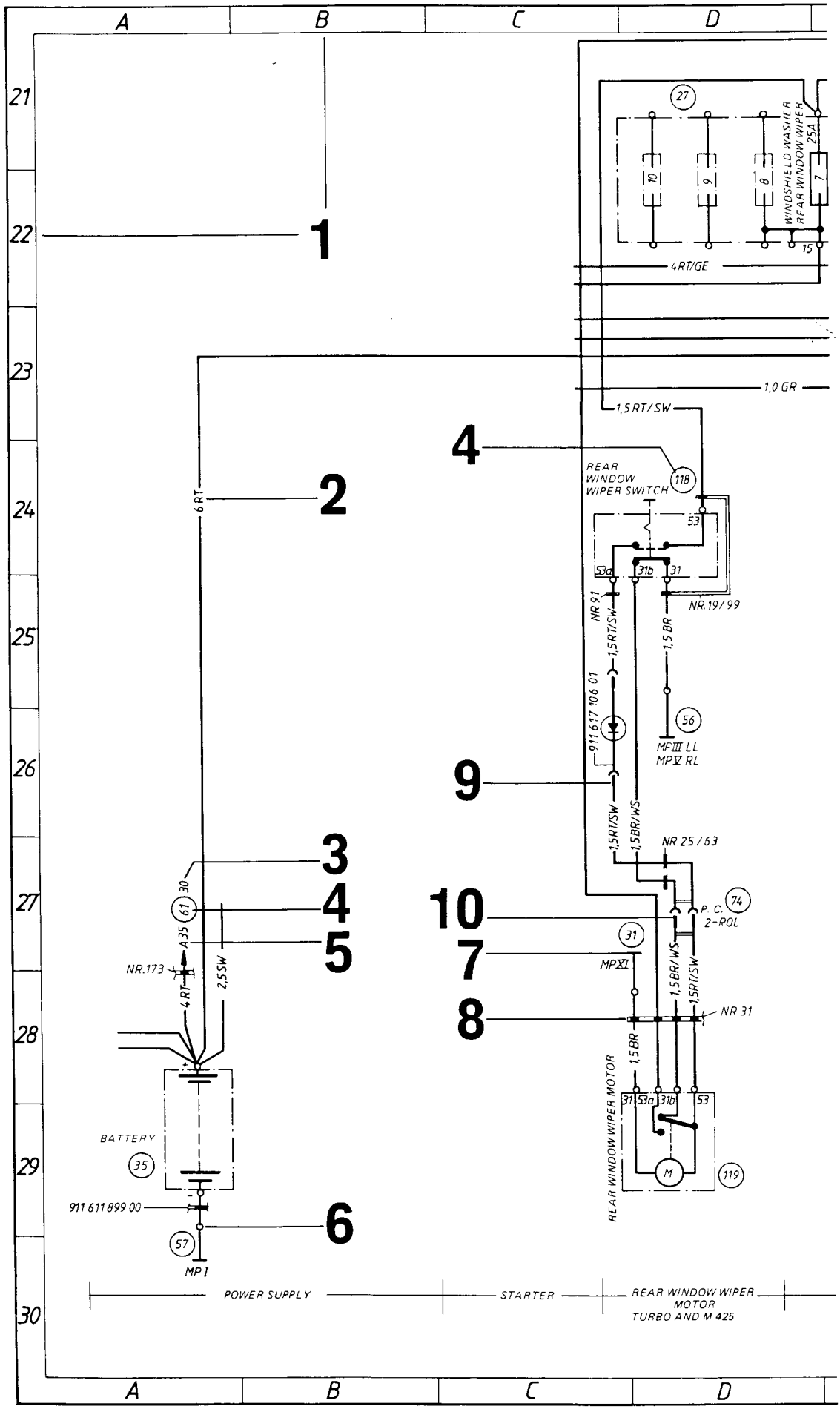
7 – GROUND POINT

8 – WIRE HARNESS

9 – SINGLE PLUG CONNECTION

10 – MULTIPLE PLUG CONNECTION

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SW = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW

GR = GREY BR = BROWN BL = BLUE LI = VIOLET

Wiring Diagram Type 911 Carrera Mo

SERIAL NR.	DESCRIPTION	FIELD	PAGE
1	HEADLIGHT	A 2, A 8	3/4
2	TURN SIGNAL	A 1, A 9	3
3	ADDITIONAL TURN SIGNAL	A 1, A 10	3
4	FRONT LIGHT ASSEMBLY	A 1, A 9	4
5	SIDE MARKER LIGHT	A 1, A 10	4
6	FOG LIGHT	A 4, A 3	3/4
7	FOG LIGHT RELAY	F 6	3/4
8	TURN SIGNAL/HEADLIGHT DIMMER SWITCH	C 3	3/4
9	EMERGENZY FLASHER SWITCH	D 2	3/4
10	LIGHT SWITCH	E 3	3/4
11	FOG LIGHT SWITCH	G 1	3/4
12	ASHTRAY LIGHT	G 4	3/4
13	BACK-UP LIGHT SWITCH	H 8	3/4
14	TURN SIGNAL SWITCH	E 4	3/4
15	DOOR CONTACT SWITCH	H 5/	3/4
16	INTERIOR LIGHT	K 4/K 5/K 6	3/4
17	DOOR CONTACT SWITCH	H 7	3/4
	LUGGAGE COMPARTMENT LIGHT		
18	LUGGAGE COMPARTMENT LIGHT	I 7	3/4
19	CLOVE COMPARTMENT LIGHT SWITCH	H 3	3/4
20	CLOVE COMPARTMENT LIGHT	K 5	3/4
21	BRAKE LIGHT SWITCH I	G 6	3/4
22	BRAKE LIGHT SWITCH II	G 4	3/4
23	ENGINE COMPARTMENT LIGHT	I 9	3/4
24	TAIL LIGHT ASSEMBLY	K 1, K 10	3/4
25	LICENCE PLATE LIGHT	K 5	3/4
26	FOG LIGHT REAR	K 7	3/4
27	FUSE BOX I 10		
28	FUSE BOX II 8		
29	FUSE BOX GROUND SCREW		
30	TRUNK FLOOR PLATE GROUND PLUG		
31	GROUND SCREW ENGINE COMP.		
32	WIRE CONNECTORS 6		
33	WIRE CONNECTORS 14		
34	FUSE BOX 3		
35	BATTERY	A 29	5
36	GENERATOR	B 28	5
37	STARTER	C 29	5
38	DISTRIBUTOR	E 32/B 47	6/7/8
39	SPARK PLUG	E 33	6/7
40	IGNITION COIL	D 33/B 45	6/7/8
41	IGNITION STARTER SWITCH	B 26	5
42	HORN CONTACT	C 5	3/4
43	HORN RELAY	C 6	3/4
44	HORN	A 5/A 7	3/4
45	SWITCH HEADLIGHT WASHER	E 24	5
46	RELAY " "	E 26	5
47	PUMP " "	E 29	5
48	WINDSHIELD WIPER SWITCH	F 24	5
49	PULSE TRANSMITTER	G 26	5
50	WINDSHIELD WIPER MOTOR	G 29	5
51	POTENTIOMETER	G 29	5
52	WINDSHIELD WASHER PUMP	H 29	5
53	POWER WINDOW RELAY	H 21	5
54	POWER WINDOW SWITCH	I 24, K 28 K 25	5
55	POWER WINDOW MOTOR	I 30/K 30	
56	GROUND SCREW LUGGAGE COMP.		
57	GROUND SCREW BATTERY		
58	GROUND MOTOR		
59	WIRE CONNECTORS		
60	DME CONTROL UNIT	H 34	6/7
61	DME-RELAY	A 35	6/7
62	OXYGEN SENSOR HEATING	C 34	7
63	ALTITUDE CORRECTION BOX	C 34	6/7
64	FUEL INJECTORS	A, B, C 38	6/7
65	IDLE POSITIONER	D 38	6/7
66	THROTTLE VALVE SWITCH	E 38	6/7
67	NTC II	G 38	6/7
68	REFERENCE MARK TRANSMITTER	G 38	6/7
69	SPEED TRANSMITTER	H 38	6/7

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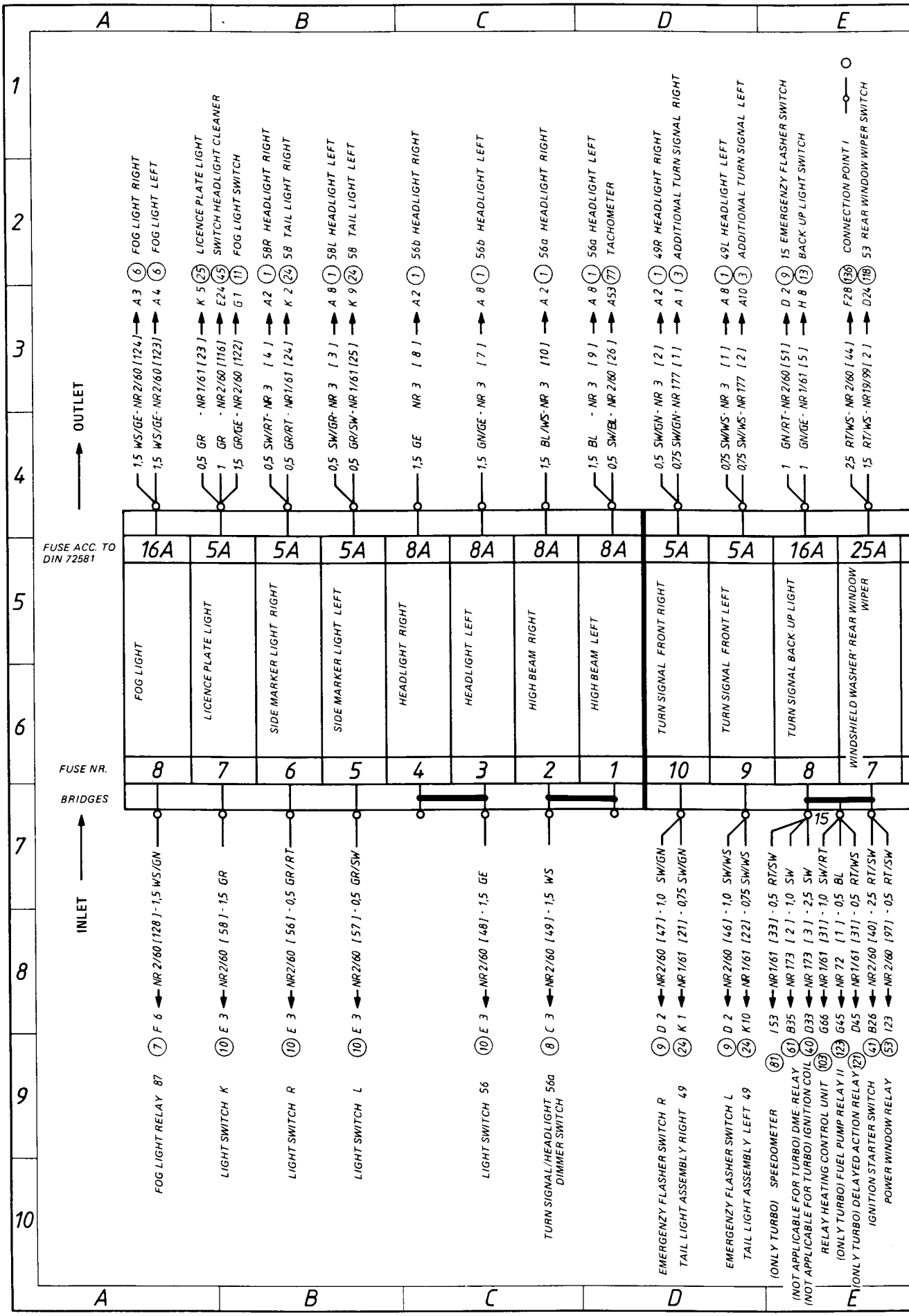
FIELD	PAGE	SERIAL NR.	DESCRIPTION	FIELD	PAGE
2, A 8	3/4	70	AIR FLOW SENSOR	I 38	6/7
1, A 9	3	71	FUEL PUMP	GH 49/K 38	6/7/8
1, A 10	3	72	CARRIER PLATE GROUND SCREW		
1, A 9	4	73	OXYGEN SENSOR	D 33	7
1, A 10	4	74	WIRE CONNECTORS		
4, A 3	3/4	75	GROUND SCREW BODY		
6	3/4	76	WIRE CONNECTORS		
3	3/4	77	TACHOMETER	A 53	9
2	3/4	78	3 WARNING LIGHT	E 53	9
3	3/4	79	COMBINATION INSTRUMENTS ϕ 100	F 53	9
1	3/4	80	COMBINATION INSTRUMENTS ϕ 80	H 53	9
4	3/4	81	SPEEDOMETER	I 53	9
8	3/4	82	CLOCK	K 54	9
4	3/4	83	CLOCK RELAY	D 55	9
5/	3/4	84	BRAKE PAD WEAR LEAD	A 58, B 58	9
4/K 5/K 6	3/4	85	PARKING BRAKE CONTACT	C 58	9
7	3/4	86	BRAKE FLUID LEVEL WARNING SWITCH	C 58	9
		87	OIL PRESSURE SENDER UNIT	D 58	9
7	3/4	88	OIL PRESSURE SWITCH	E 58	9
3	3/4	89	OIL TEMPERATURE SENSOR	F 58	9
5	3/4	90	FUEL SENDER UNIT	H 58	9
6	3/4	91	OIL LEVEL SWITCH	H 58	9
4	3/4	92	SPEED TRANSMITTER	I 58	9
9	3/4	93	TEMPERATURE SWITCH FAN	G 69	10
1, K 10	3/4	94	OUTSIDE MIRROR SWITCH	A 97	13
5	3/4	95	OUTSIDE MIRROR	B 99/F 99	13
7	3/4	96	FRESH AIR BLOWER SWITCH	A 64	10/11
		97	FRESH AIR BLOWER	A 69	10/11
		98	CIGARETTE LIGHTER	C 69	10/11
		99	ADDITIONAL FAN RELAY	D 66 /F 64	10/11
		100	ADDITIONAL FAN	D 69	10/11
		101	HEATING CONTROL UNIT	D 65/G 64	10/11
		102	RESISTOR	E 69	10/11
		103	RELAY HEATING CONTROL UNIT	G 66	10
		104	ENGINE COMPARTMENT FAN	G 69	10
29	5	105	WINDSHIELD DEFOGGER RELAY	H 67	11
28	5	106	WINDSHIELD DEFOGGER	H 69	11
29	5	107	PULL TURN SWITCH REAR WINDOW DEFOGGER	K 64	10/11
32/B 47	6/7/8				
33	6/7	108	REGULATING RELAY REAR WINDOW DEFOGGER	I 67	10/11
33/B 45	6/7/8				
26	5	109	REAR WINDOW DEFOGGER	K 70	10/11
5	3/4	110	GROUND CARRIER PLATE UPPER		
6	3/4	111	INSIDE TEMP. SENSOR	H 69, G 69	10/11
5/A 7	3/4	112	TEMPERATURE SENSOR ON HEATER FLAP BOX	I 69/G 69	10/11
24	5				
26	5	113	ADDITIONAL FAN SWITCH	D 63	11
29	5	114	MICROSWITCH	G 65	11
24	5	115	WIRE CONNECTORS 5		
26	5	116	SIGN LIGHT	C 67	10/11
29	5	117	BELT CONTACT	C 57	9
29	5	118	REAR WINDOW WIPER SWITCH	D 24	5
29	5	119	REAR WINDOW WIPER MOTOR	D 29	5
21	5	120	ELECTRONIC IGNITION UNIT HKZ	C 42	8
24, K 28 K 25	5	121	DELAYED ACTION RELAY	D 45	8
30/K 30		122	FUEL PUMP RELAY I	H 45	8
		123	FUEL PUMP RELAY II	G 45	8
		124	AIR FLOW SENSOR MANIFOLD PRESSURE RELAY	F 46	8
		125	PRESSURE TRANSMITTER MANIFOLD PRESSURE	C 49	8
34	6/7	126	START VALVE	D 49	8
35	6/7	127	THERMO SWITCH FOR COLD START VALVE	E 49	8
34	7	128	SUPPLEMENTARY AIR VALVE	E 49	8
34	6/7	129	WARM-UP REGULATOR	F 49	8
A, B, C 38	6/7	130	AIR FLOW SENSOR	F 49	8
38	6/7	131	MANIFOLD PRESSURE LIMITING SWITCH	G 49	8
38	6/7	132	CONTROL UNIT	K 55	9
38	6/7	133	TEMPERATURE SENSOR	K 58	9
38	6/7	134	WARNING LIGHT	K 57	9
38	6/7	135	CONNECTION RAIL	G, K 22	5

PAGE
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38 — 6/7/8
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58 — 9
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2 — 5

SERIAL NR.	DESCRIPTION	FIELD	PAGE
136	CONNECTION POINT I		
137	CONNECTION POINT II		
138	CONNECTION POINT III	F 69	10/11
139	CONNECTION POINT IV		
140	CHANGE-OVER SWITCH (LEFT/RIGTH)	C 96	13
141	HEATING NOZZLE	C 69/B 69	10/11
142	CONNECTION POINT V	E 63	10
143	WIRINGS	D 63	10
144	CONNECTION POINT VI	G 24	5
145	WIRINGS	H 25	5
146	WIRE CONNECTORS 1 PIN	G 55	9

Wiring Diagram Type 911 Carrera Model 85 page 2

CONNECTION AND EQUIPMENT FUSES



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SW = BLACK WS = WHITE RT = RED GN = GREEN GE

POWER WINDOW RELAY (53) I23 ← NR 2/60 [97] - 0,5 RT/SW

(NOT APPLICABLE FOR TURBO) SPEEDOMETER (81) I53 ← NR 1/61 [47] - 0,5 RT/SW

IGNITION STARTER SWITCH (41) B26 ← NR 2/60 [41] - 4,0 RT/GE

POWER WINDOW RELAY (53) H21 ← NR 2/60 [97] - 0,75 RT/SW

AIR FLOW SENSOR MANIFOLD PRESSURE RELAY (ONLY TURBO) (124) F46 ← NR 1/61 [44] - 0,5 SW

(NOT APPLICABLE FOR TURBO) DME-RELAY (61) A35 ← NR 173 [6] - 2,5 RT/GN

HORN RELAY (43) C 6 ← NR 3 [14] - 1,5 RT

FOG LIGHT RELAY (7) F 6 ← NR 2/60 [130] - 1,5 RT

POWER WINDOW RELAY (53) H 21 ← NR 2/60 [98] - 2,5 RT

BATTERY + (35) A29 ← NR 2/60 [72] - 6,0 RT

POWER WINDOW RELAY (53) H 21 ← NR 2/60 [99] - 2,5 SW

6	FRESH AIR BLOWER CIGARETTE LIGHTER REGULATING RELAY REAR WINDOW DEFOGGER	25A	2,5 RT/SW - NR 2/60 [1] → K62 (137)	CONNECTION POINT II
X 5	MIRROR TONGENTIAL BLOWER HEATING REGULATION (TURBO)	16A	0,5 RT/WS - NR 1/61 [7] → G66 (101)	1 HEATING CONTROL UNIT (FOR TURBO) (NOT APPLICABLE)
			0,5 SW/VI - NR 2/60 [131] → B86 (94)	OUTSIDE MIRROR SWITCH
			0,5 RT/GE - NR 113 [11] → F69 (114)	MICROSWITCH (ONLY TURBO)
			0,75 RT/WS - NR 152 [1] → G64 (101)	HEATING CONTROL UNIT (ONLY TURBO)
4	BRAKE LIGHT TEMPOSTAT	8A	1,5 GN/BL - NR 41 [15] → G 6 (21)	82a BRAKE LIGHT SWITCH I
3	FUEL PUMP	25A	2,5 RT - NR 72 [1] → K38 (71)	FUEL PUMP
			2,5 RT - NR 72 [1] → G45 (123)	30 FUEL PUMP RELAY II (ONLY TURBO)
30 2	LIGHT WINDSHIELD DEFOGGER	16A	1,5 RT - NR 2/60 [84] → F66 (99)	30 ADDITIONAL FAN RELAY (ONLY TURBO)
			1,5 RT/SW - NR 2/60 [50] → D 2 (9)	30 EMERGENZY FLASHER SWITCH
			0,75 RT - NR 263 [1] →	CENTRAL LOCKING SYSTEM
			1,5 RT - NR 115 [2] →	30 ADDITIONAL FAN RELAY (ONLY TURBO)
1	INTERIOR LIGHT TOTAL	5A	0,5 SW - NR 2/60 [24] → I 5 (16)	INTERIOR LIGHT
3	HEADLIGHT CLEANER	25A	4,0 RT/WS - NR 2/60 [112] → E 27 (46)	30 HEADLIGHT CLEANER RELAY
2	AIR CONDITION	25A	6,0 RT - NR 2/60 [150] → E63 (142)	CONNECTION POINT V
1	POWER WINDOW SLIDING ROOF	25A	6,0 RT/BL - NR 2/60 [152] → H24 (144)	CONNECTION POINT VI

GENERATOR (36) B28 ← NR 1/61 [30] - 2,5 RT

DELAYED ACTION RELAY (ONLY TURBO) (121) D45 ← NR 1/61 [47] - 2,5 RT

GENERATOR (36) B28 ← NR 1/61 [14] - 2,5 RT

NOT APPLICABLE FOR TURBO

3	REAR WINDOW DEFOGGER	25A	2,5 RT - NR 1/61 [57] → I67 (108)	30 REGULATING RELAY REAR WINDOW DEFOGGER
			1,5 RT - NR 31 [4] → D29 (119)	31b REAR WINDOW WIPER MOTOR (ONLY TURBO)
2	BLOWER	25A	1,5 RT/WS - NR 1/61 [43] → G66 (103)	7 (NOT APPLICABLE FOR TURBO) RELAY HEATING CONTROL UNIT
			1,5 RT/WS - NR 1/61 [44] → G66 (103)	8 RELAY HEATING CONTROL UNIT (NOT APPLICABLE FOR TURBO)
1		16A	1,5 RT/SW - NR 1/61 [56] → G66 (103)	3 RELAY HEATING CONTROL UNIT (NOT APPLICABLE FOR TURBO)

FUSE BOX 3 ENGINE COMP.

(ONLY TURBO) 5A

FUSE 7
- 1,0 RT/WS → F 23 (48) 53a WINDSHIELD WIPER SWITCH
- 1,5 RT/WS → G 26 (49) 15 PULSE TRANSMITTER
- 0,5 RT/WS → G29 (51) 15 POTENTIOMETER
- 1,5 RT/WS → G29 (50) 53a WINDSHIELD WIPER MOTOR
- 1,5 RT/WS → A64 (96) WARNING LIGHT BLOWER
- 1,0 RT/WS → D70 (141) HEATING NOZZLE LEFT
- 1,0 RT/WS → C70 (141) HEATING NOZZLE RIGHT

FUSE 6
- 1,5 RT/SW → A69 (97) FRESH AIR BLOWER
- 2,5 RT/SW → C69 (98) CIGARETTE LIGHTER
- 0,75 RT/SW → H64 (107) 15 PULL TURN SWITCH REAR WINDOW DEFOGGER

FUSE 2
- 1,5 RT → F66 (99) 30 ADDITIONAL FAN RELAY (NOT APPLICABLE FOR TURBO)
- 4,0 RT → D63 (143) LTV 4-POL
  - 2,5 RT SEAT OPERATION
  - 2,5 RT AIR CONDITION

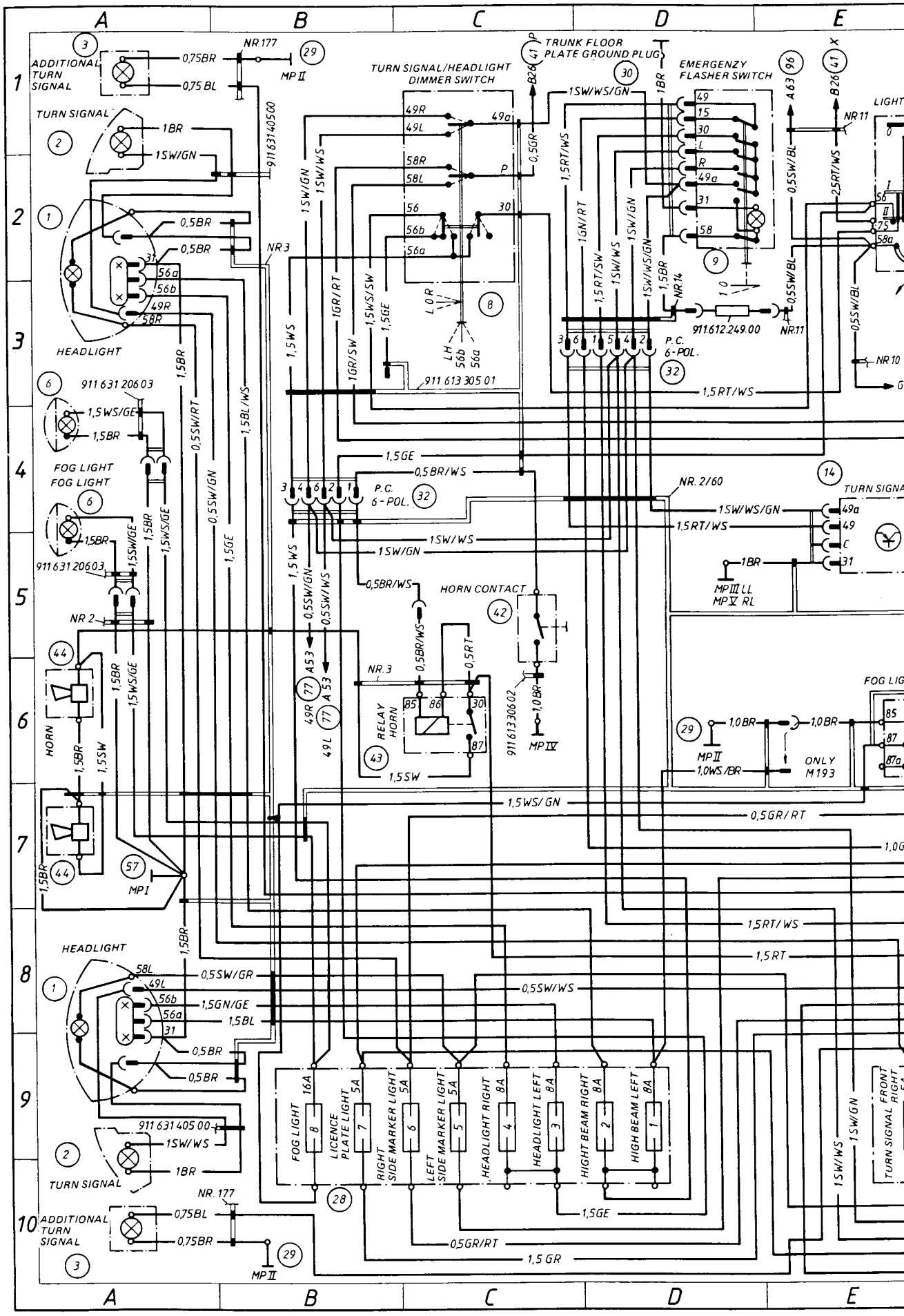
FUSE 1
- 2,5 RT/BL → H24 (54) POWER WINDOW SWITCH
- 4,0 RT/BL → H24 (145) LTV 4-POL
  - 1,5 RT/BL HEATING SEAT
  - 2,5 RT/BL SLIDING ROOF

1,5 WS/GE NR 2/60 [123] → A4 (6) FOG LIGHT

ø COLOUR | WIRE NR. | HARNESS NR. | WIRING NR. | FIELD NR. | SERIAL NR. | NAME

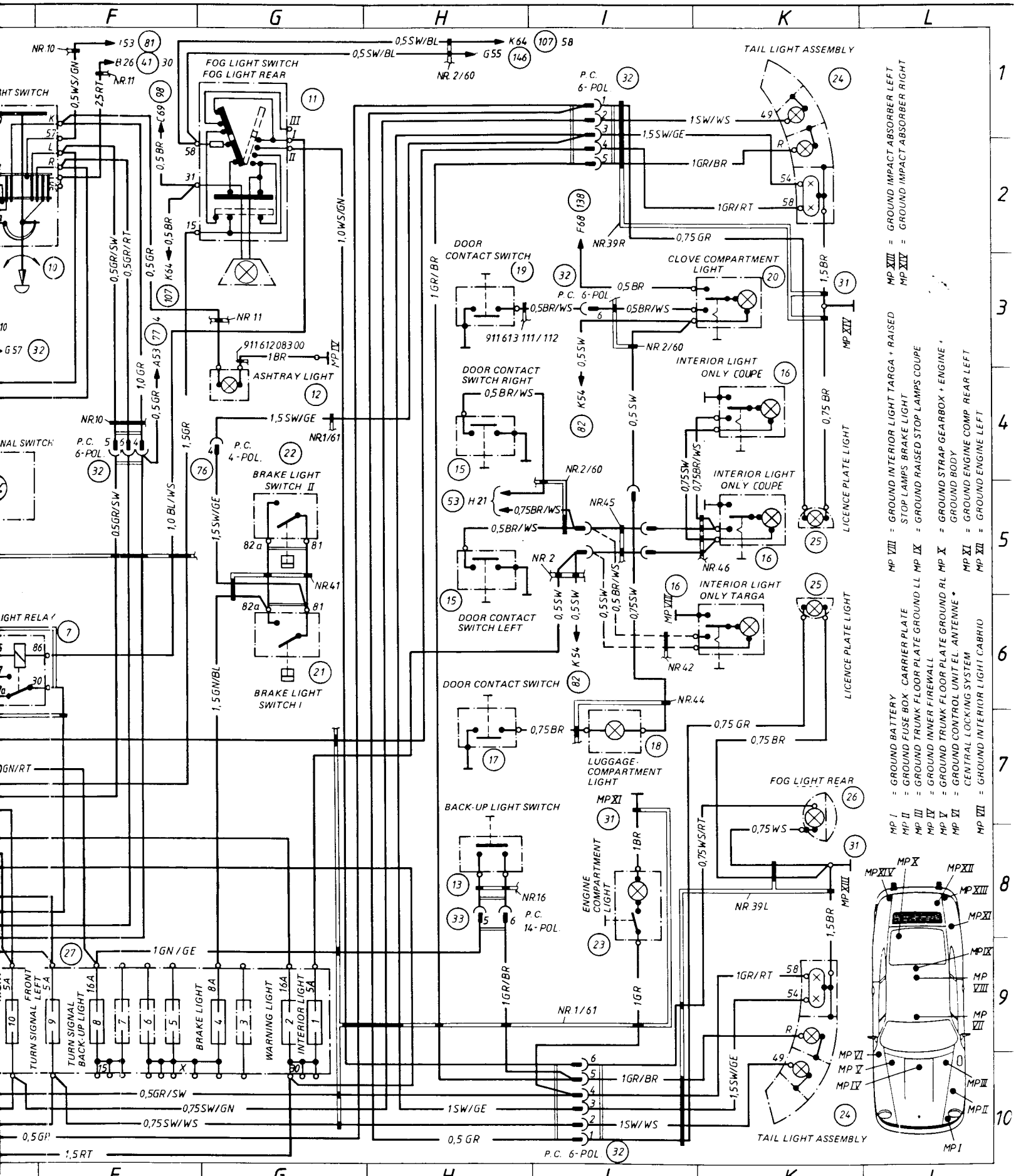
Wiring Diagram Type 911 Carrera Model 85 page 3

ILLUMINATION



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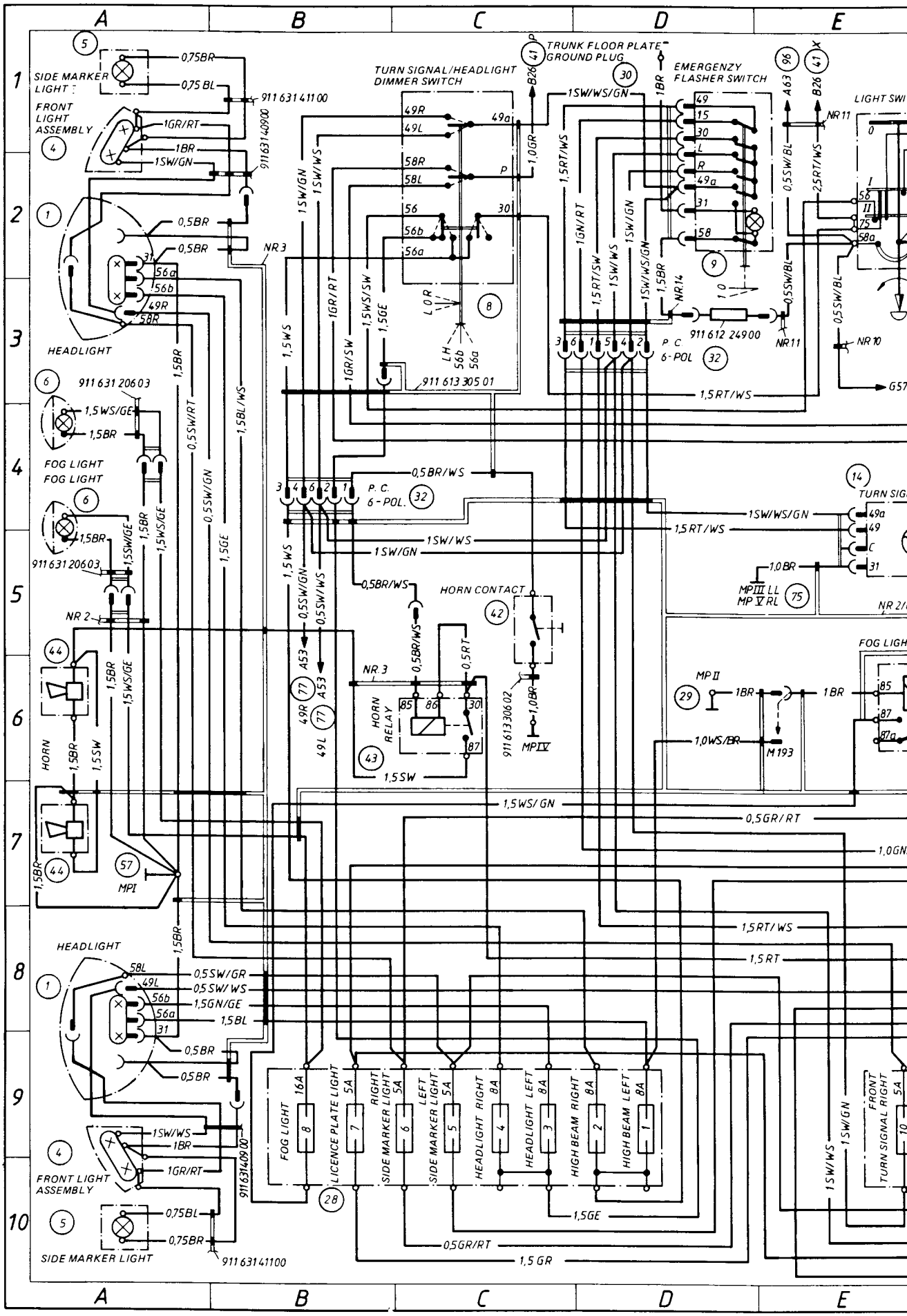
SW = BLACK WS = WHITE RT = RED GN = GREEN GE



E = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET

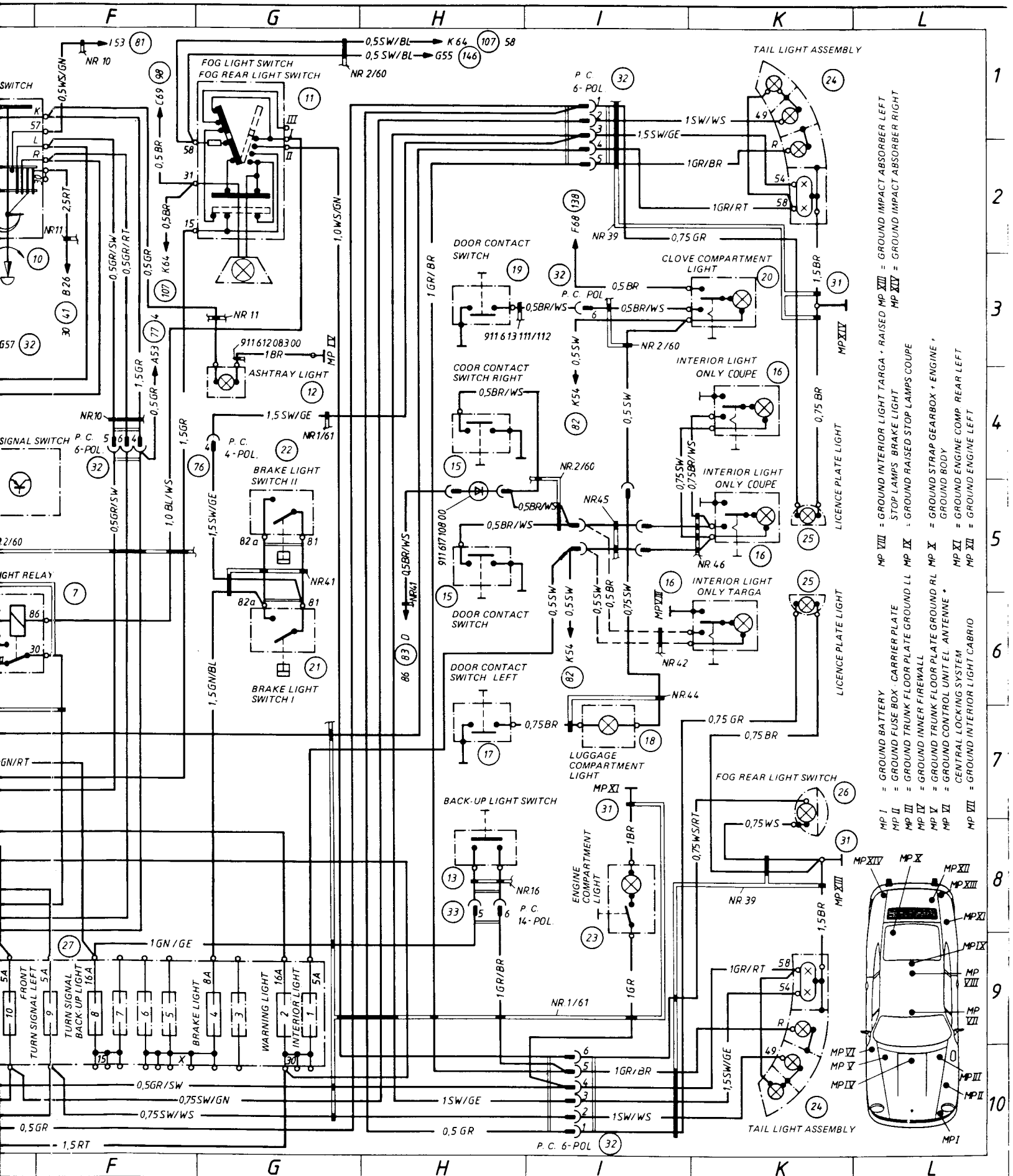
Wiring Diagram Type 911 Carrera Model 85 page 4

ILLUMINATION (USA, JAPAN)



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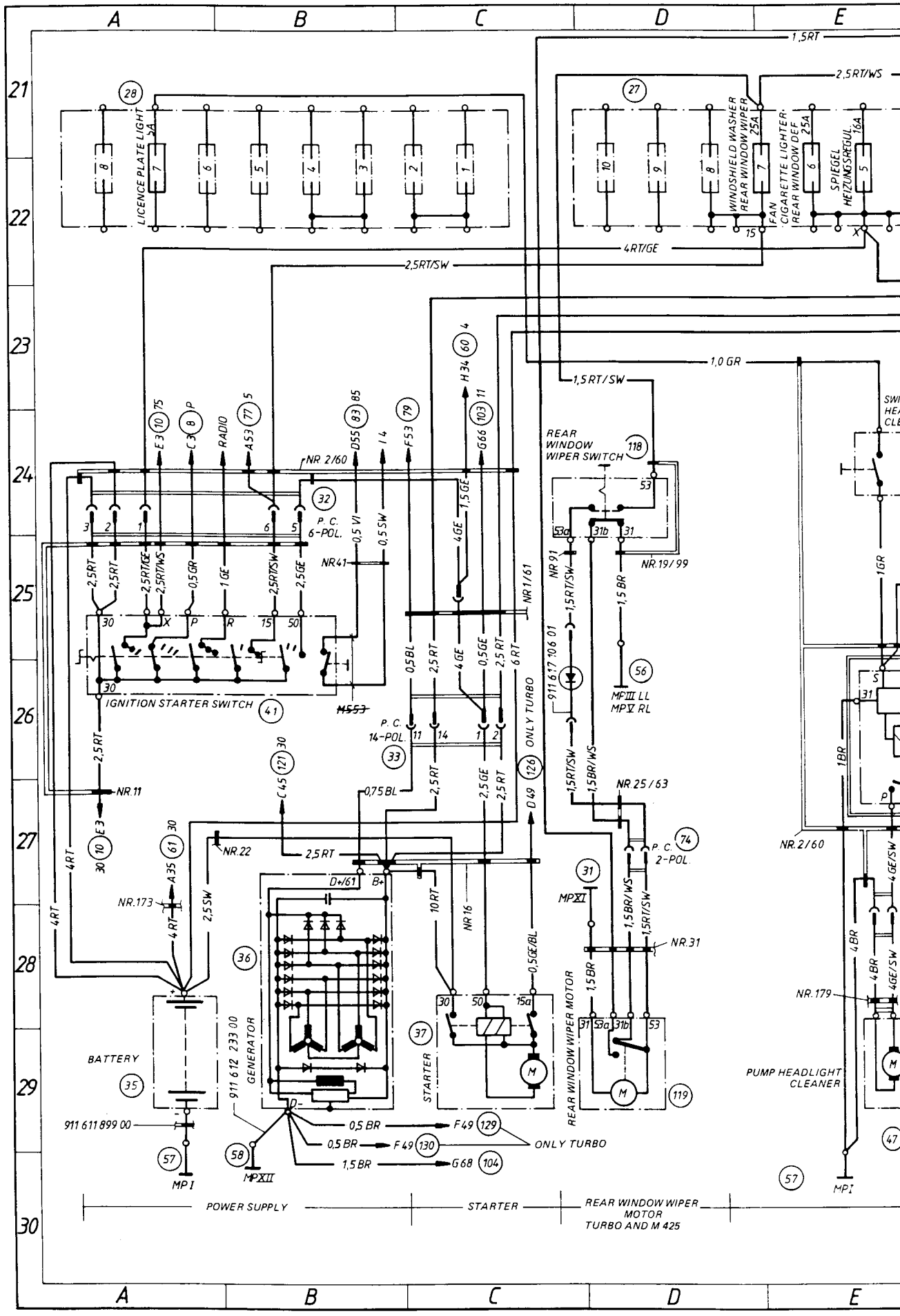
SW = BLACK WS = WHITE RT = RED GN = GREEN GE



GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET

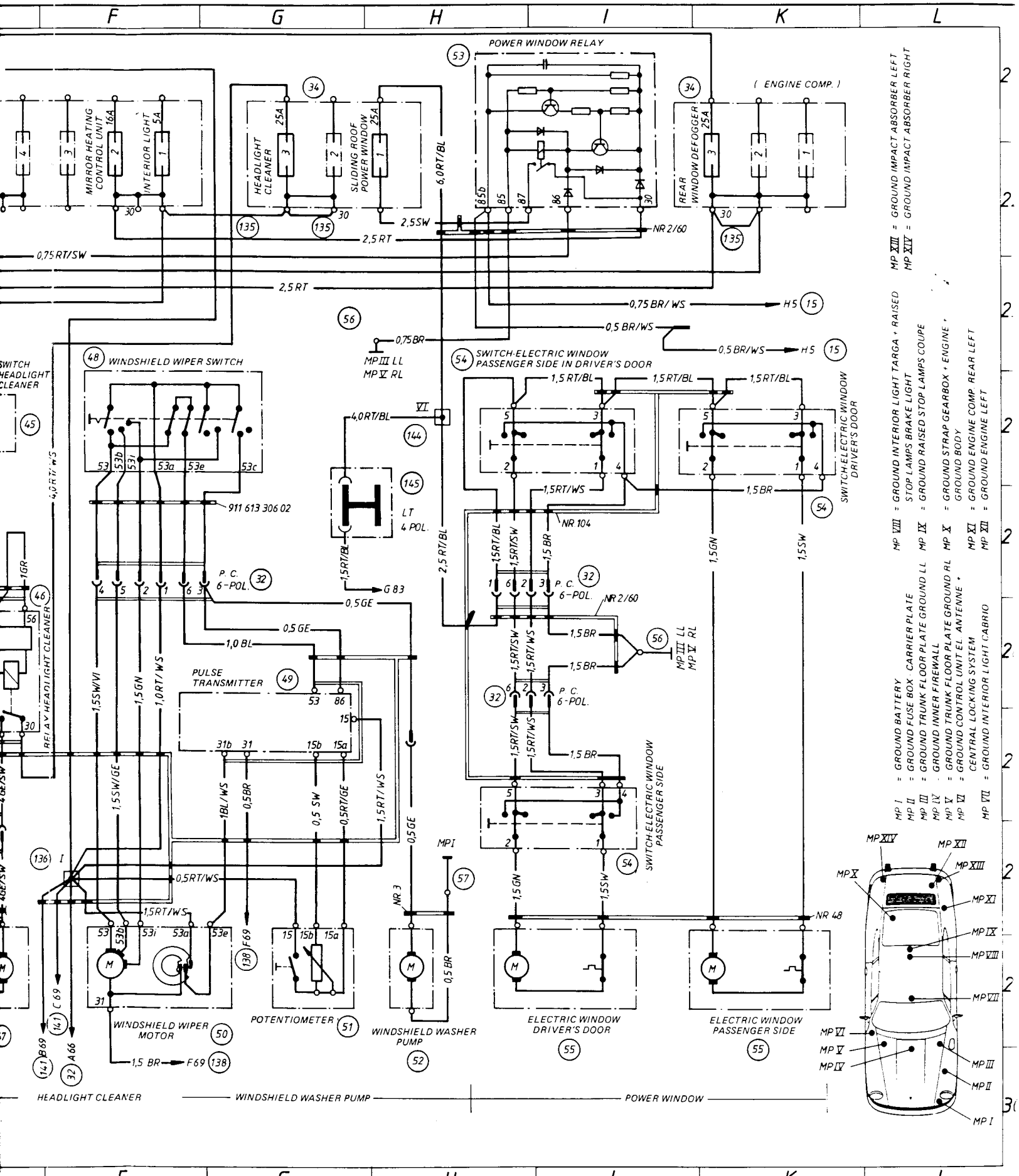
Wiring Diagram Type 911 Carrera Model 85 page 5

MOTOR AND BODY



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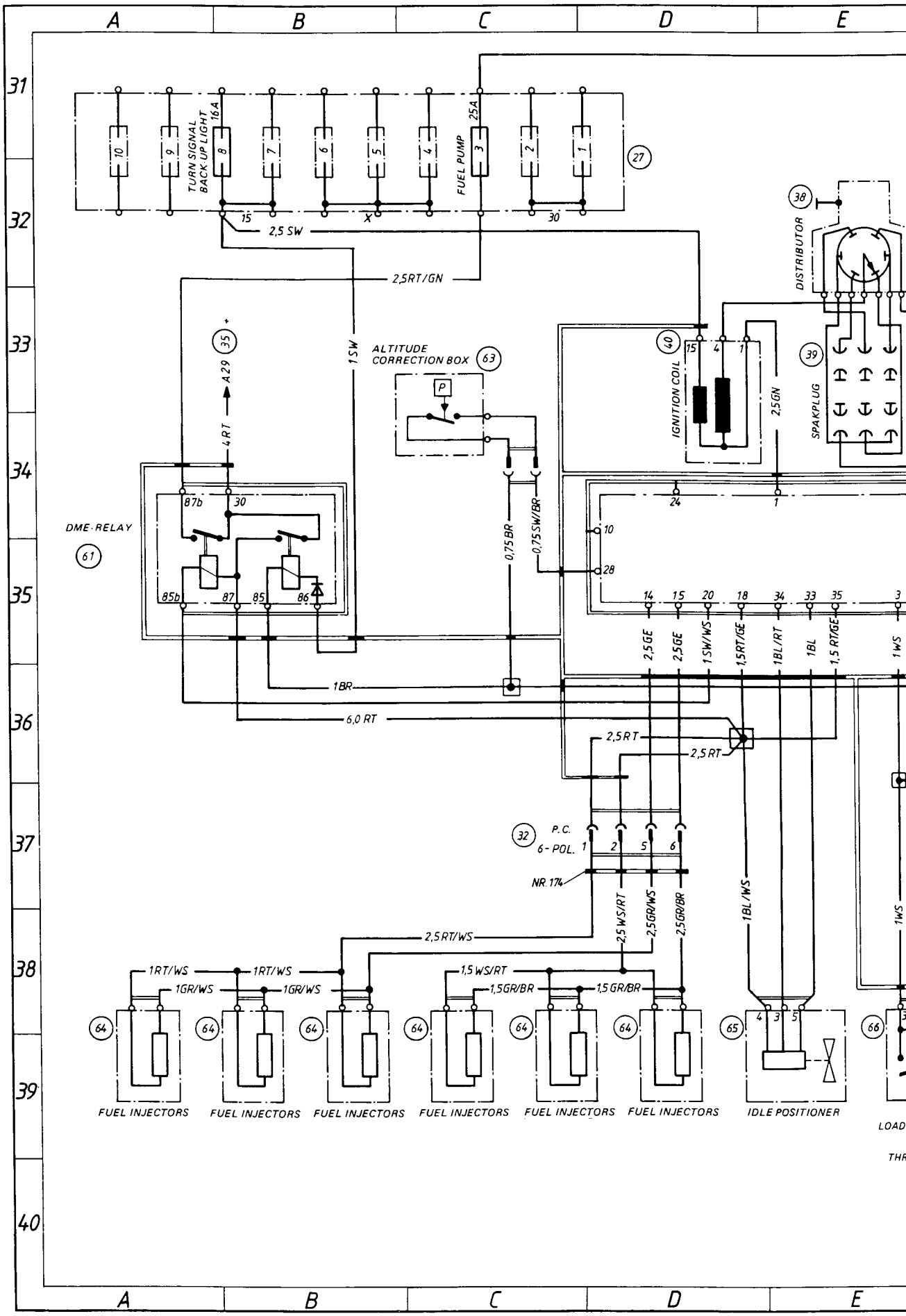
SW = BLACK WS = WHITE RT = RED GN = GREEN



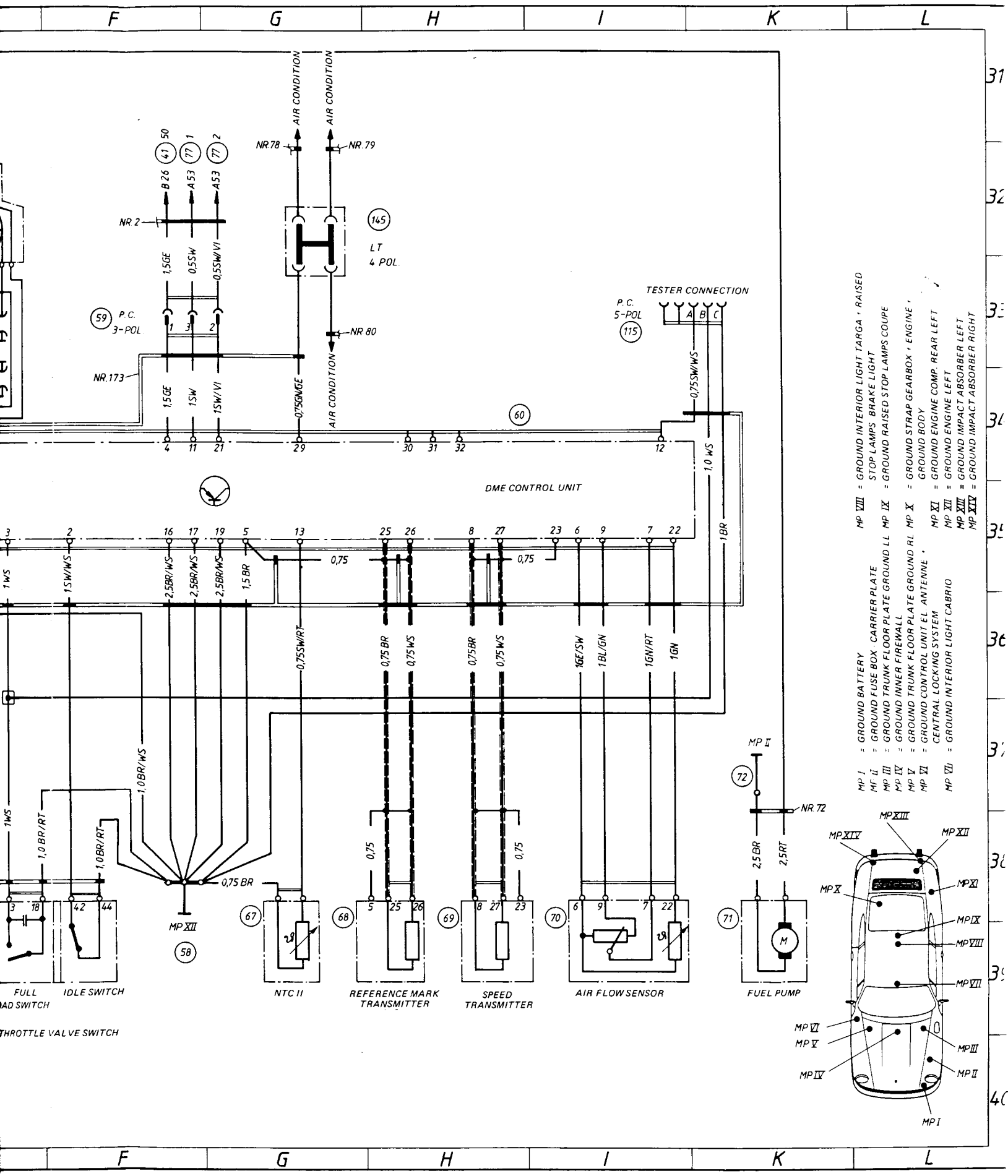
GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET

Wiring Diagram Type 911 Carrera Model 85 page 6

DIGITAL MOTOR ELECTRONIC (DME)

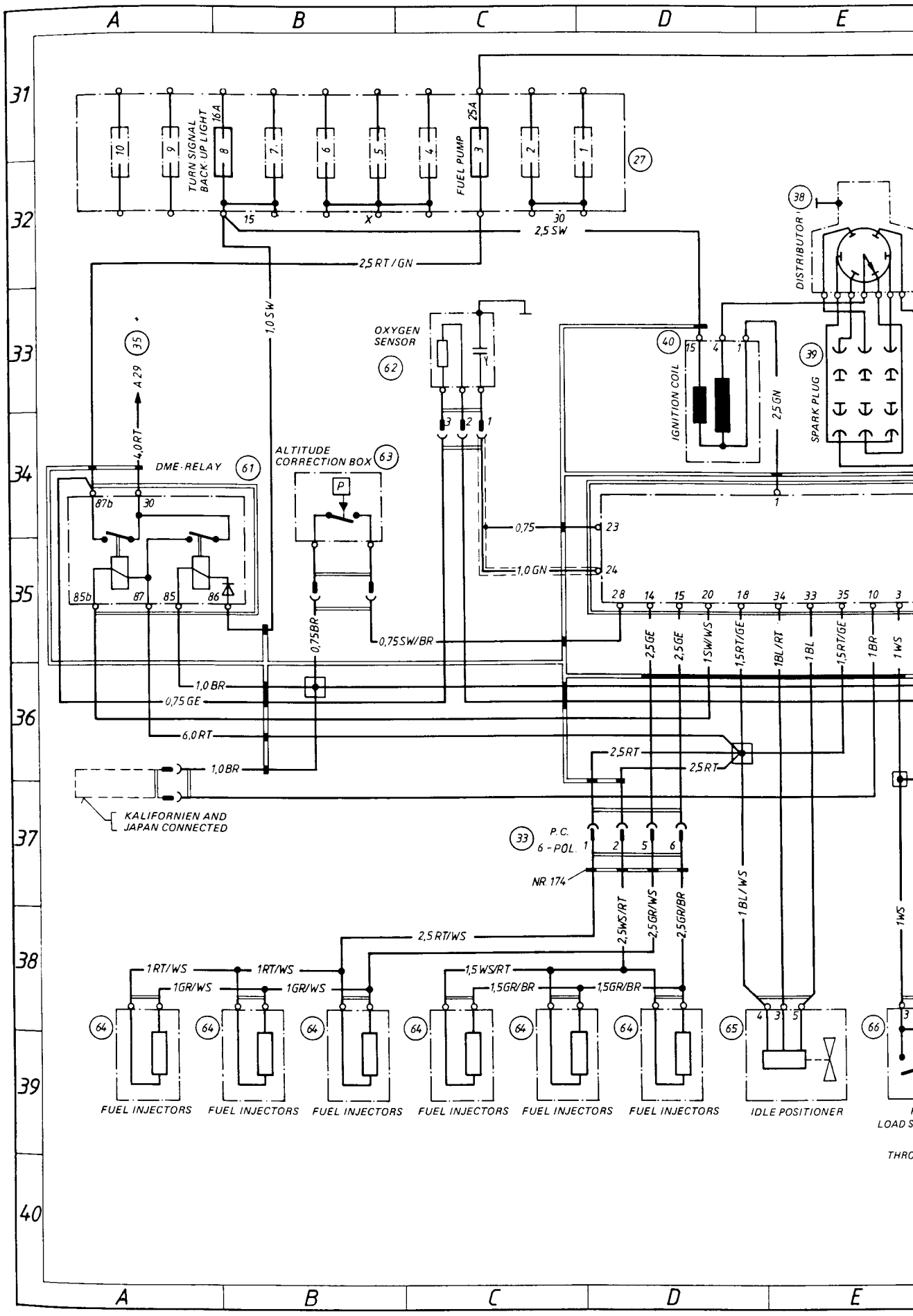


SW = BLACK WS = WHITE RT = RED GN = GREEN GE =


F G H I K L
AIR CONDITION
AIR CONDITION
NR 78
NR 79
B 26
A 53
A 53
NR 2
1,5GE
0,5SW
0,5SW/VI
145
LT
4 POL
59
P.C.
3-POL
NR 80
NR 173
1,5GE
1SW
1SW/VI
0,75GN/GE
AIR CONDITION
60
TESTER CONNECTION
P.C.
5-POL
115
0,75SW/WS
DME CONTROL UNIT
1,0 WS
1BR
0,75
0,75
2,5BR/WS
2,5BR/WS
2,5BR/WS
1,5 BR
0,75SW/RT
0,75 BR
0,75 WS
0,75 BR
0,75 WS
1GE/SW
1BL/GN
1GN/RT
1GN
1,0 BR/WS
1,0 BR/RT
1,0 BR/RT
0,75 BR
MP XII
58
67
68
69
70
71
72
MP II
NR 72
2,5 BR
2,5 RT
FULL
IDLE SWITCH
NTC II
REFERENCE MARK TRANSMITTER
SPEED TRANSMITTER
AIR FLOW SENSOR
FUEL PUMP
THROTTLE VALVE SWITCH
MP I = GROUND BATTERY
MP II = GROUND FUSE BOX · CARRIER PLATE
MP III = GROUND TRUNK FLOOR PLATE GROUND LL
MP IV = GROUND INNER FIREWALL
MP V = GROUND TRUNK FLOOR PLATE GROUND RL
MP VI = GROUND CONTROL UNIT EL. ANTENNE · CENTRAL LOCKING SYSTEM
MP VII = GROUND INTERIOR LIGHT CABRIO
MP VIII = GROUND INTERIOR LIGHT TARGA · RAISED STOP LAMPS · BRAKE LIGHT
MP IX = GROUND RAISED STOP LAMPS COUPE
MP X = GROUND STRAP GEARBOX · ENGINE · GROUND BODY
MP XI = GROUND ENGINE COMP. REAR LEFT
MP XII = GROUND ENGINE LEFT
MP XIII = GROUND IMPACT ABSORBER LEFT
MP XIV = GROUND IMPACT ABSORBER RIGHT
MP XIII
MP XIV
MP XII
MP X
MP XI
MP IX
MP VIII
MP VII
MP VI
MP V
MP IV
MP III
MP II
MP I

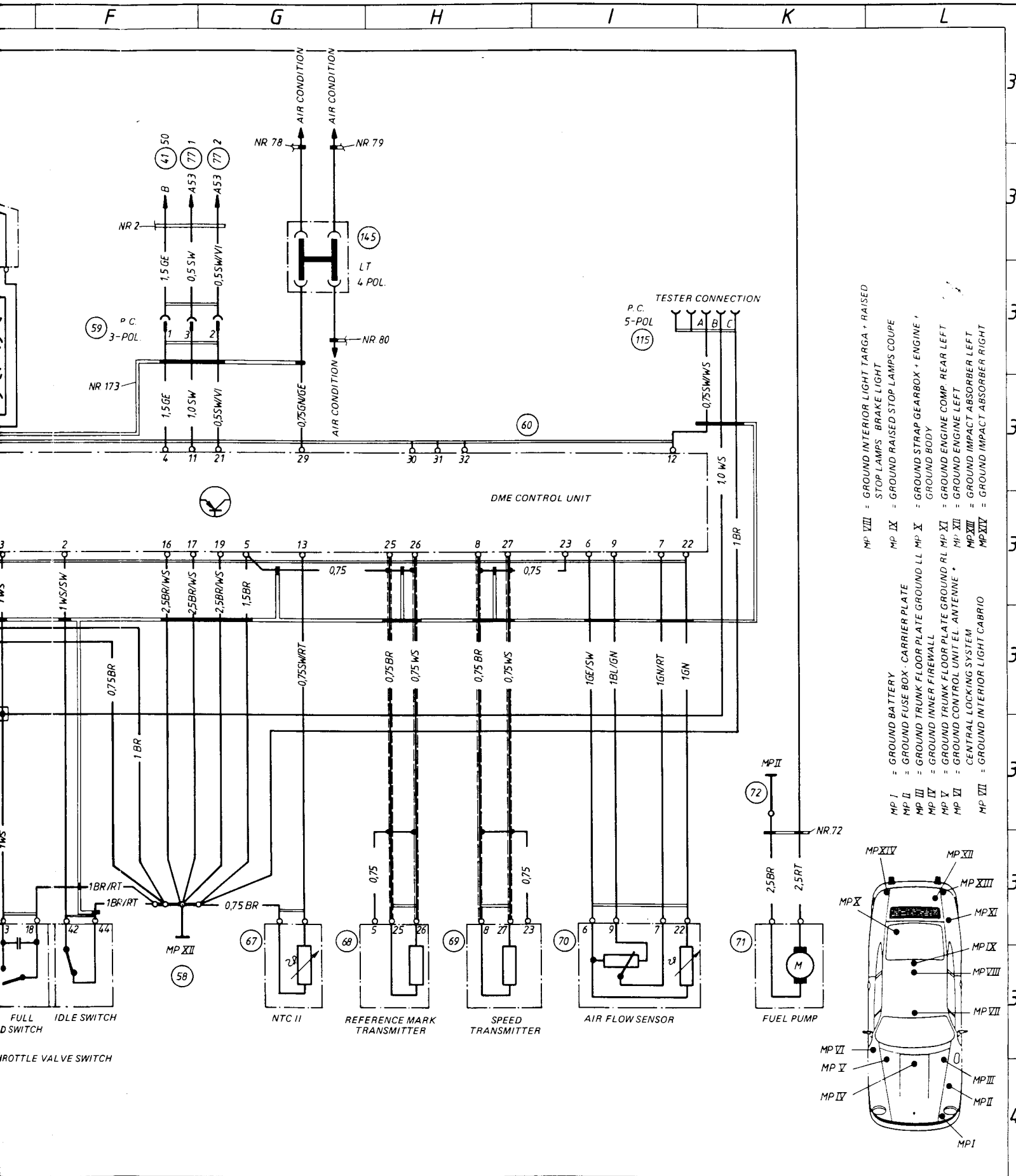
Wiring Diagram Type 911 Carrera Model 85 page 7

DIGITAL MOTOR ELECTRONIC (DME) (USA, JAPAN)



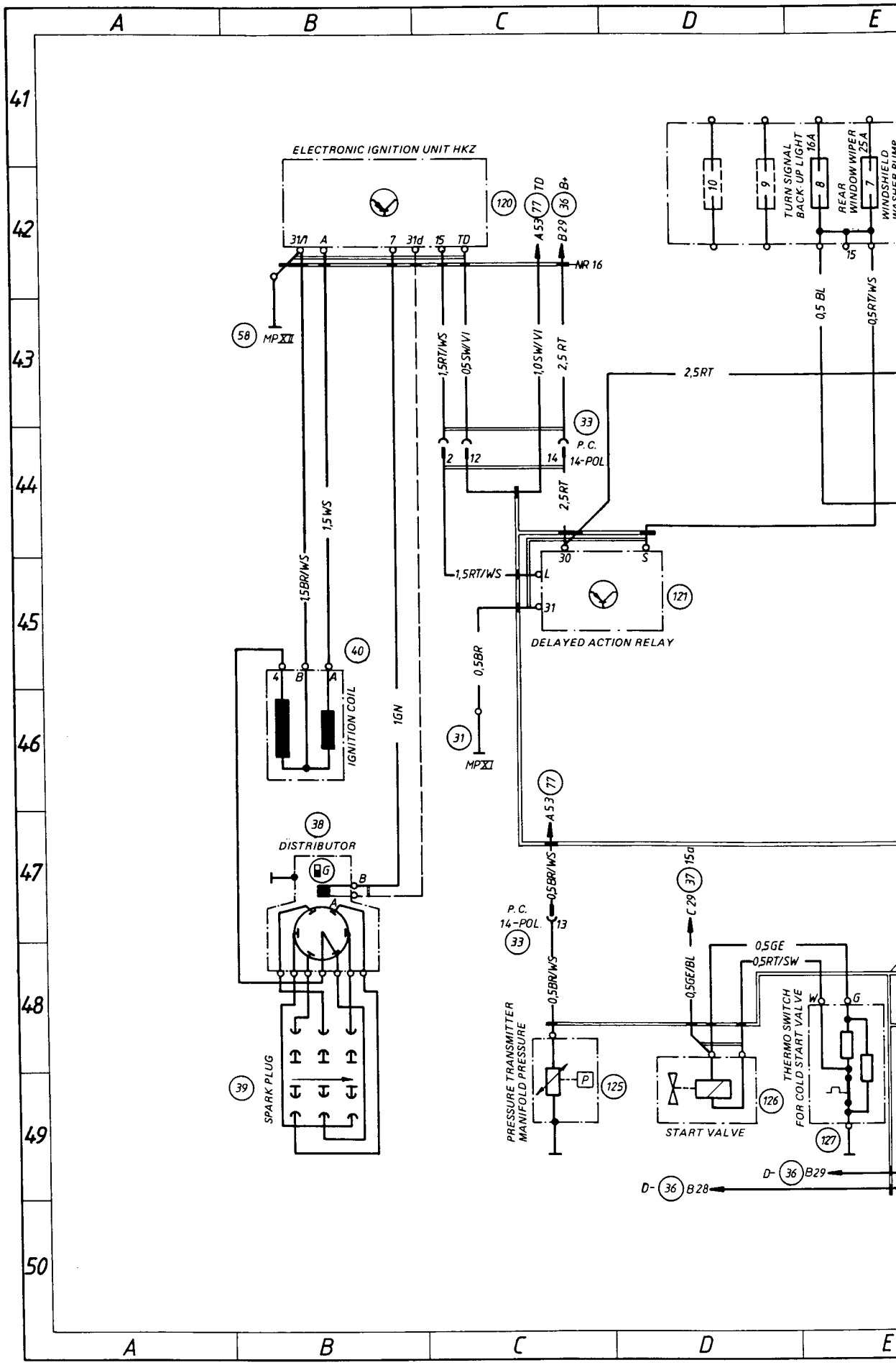
Printed in Germany - I, 1985

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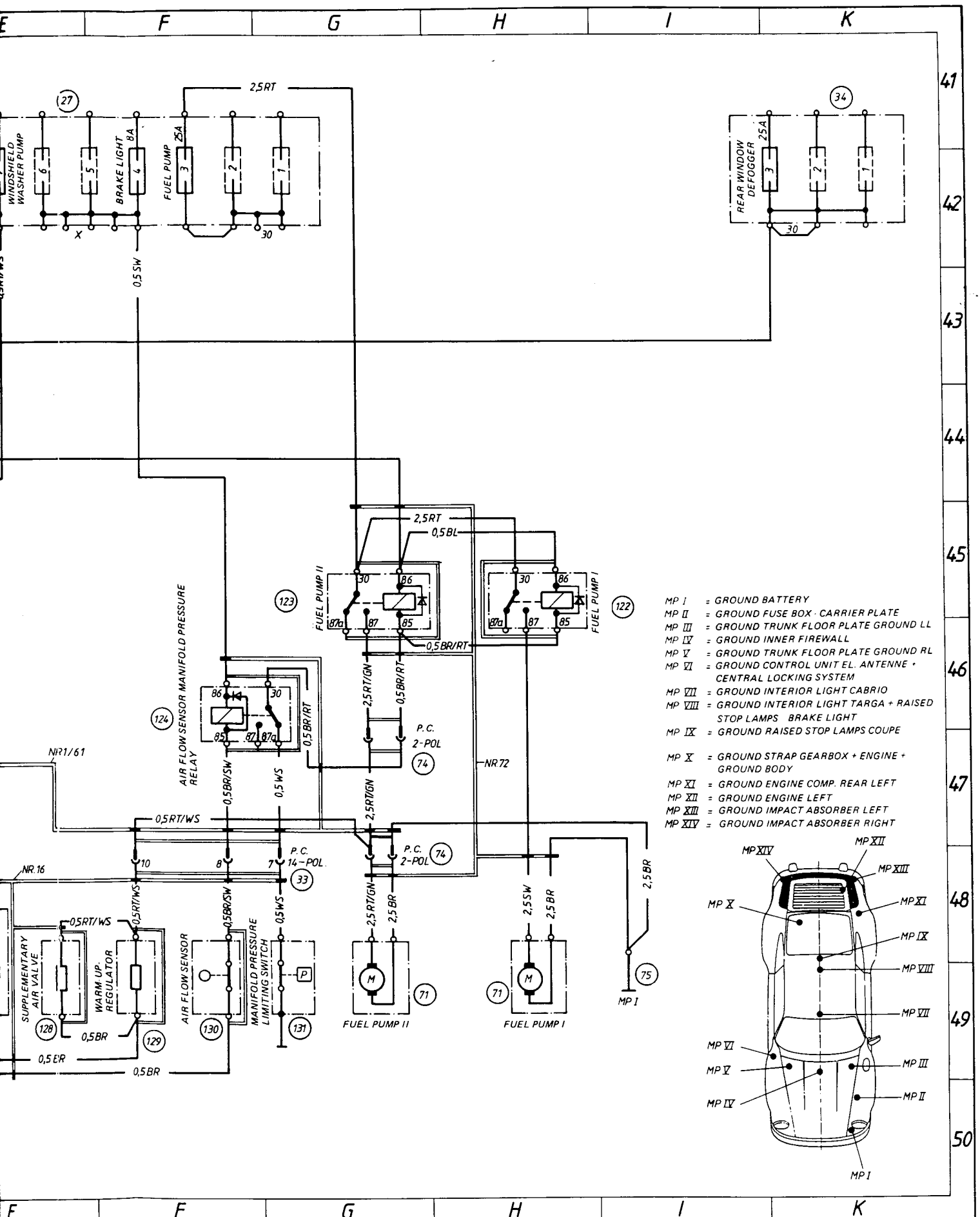

F G H I K L
31
32
33
34
35
36
37
38
39
40
AIR CONDITION
AIR CONDITION
NR 78
NR 79
NR 2
NR 80
NR 173
NR 72
(41) 50
(77) 1
(77) 2
B
453
453
1,5 GE
0,5 SW
0,5SW/VI
(145)
LT
4 POL.
(59)
P.C.
3-POL.
1 3 2
4 11 21 29 30 31 32 12
0,75GN/GE
AIR CONDITION
1,5GE
1,0 SW
0,5SW/VI
(60)
TESTER CONNECTION
P.C.
5-POL
(115)
A B C
0,75SW/WS
1,0 WS
1BR
DME CONTROL UNIT
3 2 16 17 19 5 13 25 26 8 27 23 6 9 7 22
0,75
0,75
1WS/SW
2,5BR/WS
2,5BR/WS
2,5BR/WS
1,5BR
0,75SW/RT
0,75BR
0,75 WS
0,75 BR
0,75 WS
1GE/SW
1BL/GN
1GN/RT
1GN
0,75BR
1BR
1BR/RT
1BR/RT
0,75 BR
MP XII
(58)
3 18 42 44
FULL
D SWITCH
IDLE SWITCH
ROTTLE VALVE SWITCH
(67)
NTC II
(68)
5 25 26
REFERENCE MARK
TRANSMITTER
(69)
8 27 23
SPEED
TRANSMITTER
(70)
6 9 7 22
AIR FLOW SENSOR
(71)
M
FUEL PUMP
MP II
(72)
2,5BR
2,5RT
MP I = GROUND BATTERY
MP II = GROUND FUSE BOX · CARRIER PLATE
MP III = GROUND TRUNK FLOOR PLATE GROUND LL
MP IV = GROUND INNER FIREWALL
MP V = GROUND TRUNK FLOOR PLATE GROUND RL
MP VI = GROUND CONTROL UNIT EL. ANTENNE *
CENTRAL LOCKING SYSTEM
MP VII = GROUND INTERIOR LIGHT CABRIO
MP VIII = GROUND INTERIOR LIGHT TARGA + RAISED STOP LAMPS BRAKE LIGHT
MP IX = GROUND RAISED STOP LAMPS COUPE
MP X = GROUND STRAP GEARBOX + ENGINE + GROUND BODY
MP XI = GROUND ENGINE COMP. REAR LEFT
MP XII = GROUND ENGINE LEFT
MP XIII = GROUND IMPACT ABSORBER LEFT
MP XIV = GROUND IMPACT ABSORBER RIGHT
MP XIV
MP XII
MP XIII
MP X
MP XI
MP IX
MP VIII
MP VII
MP VI
MP V
MP IV
MP III
MP II
MP I

Wiring Diagram Type 911 Carrera Model 85 page

K-JETRONIC TURBO

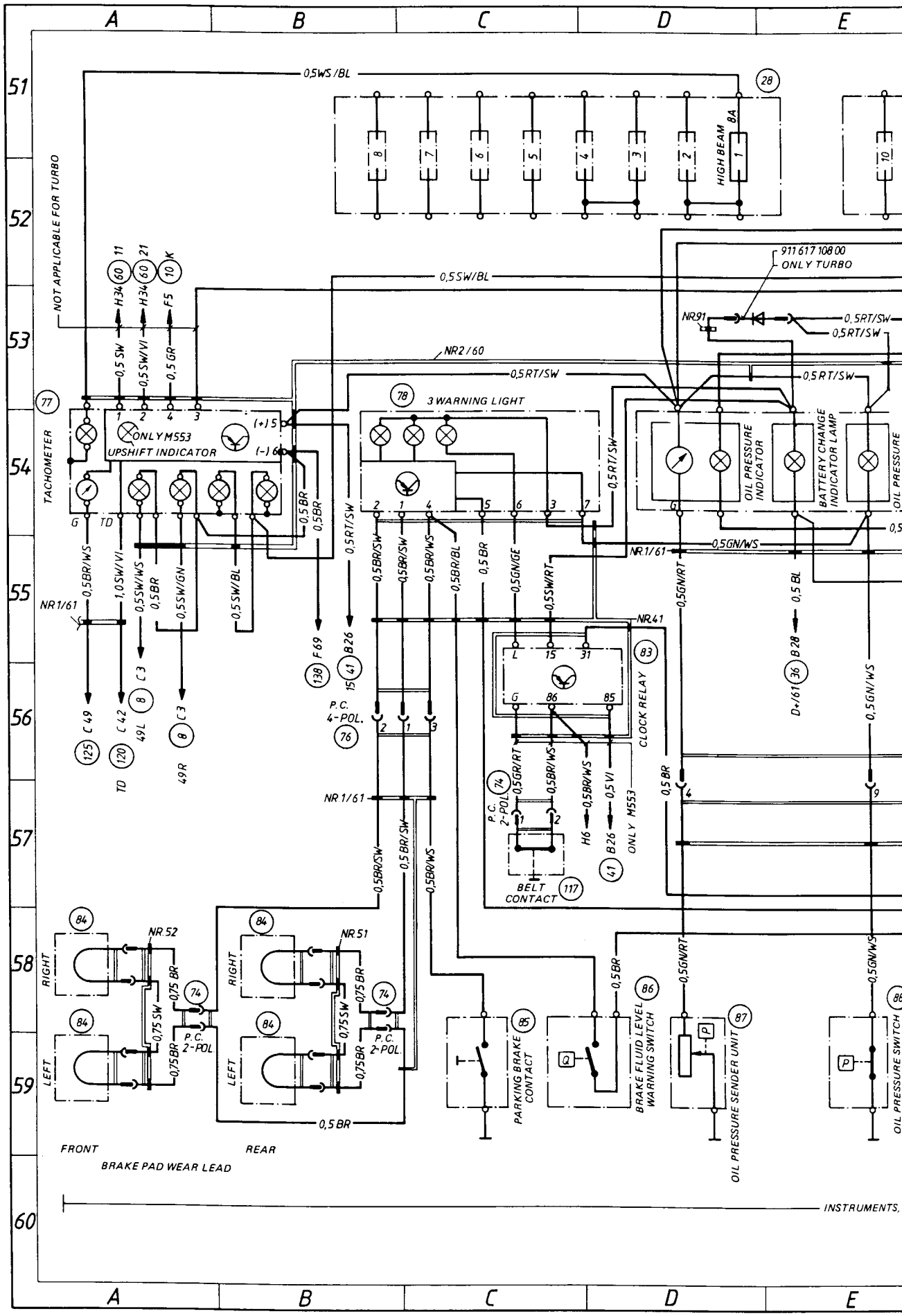


SW = BLACK WS = WHITE RT = RED GN = GREE


E F G H I K
41 42 43 44 45 46 47 48 49 50
27
2,5RT
WINDSHIELD WASHER PUMP
BRAKE LIGHT 8A
FUEL PUMP 25A
6 5 4 3 2 1
X 30
0,5SW
34
REAR WINDOW DEFOGGER 25A
3 2 1
30
123
FUEL PUMP II
122
FUEL PUMP I
2,5RT
0,5BL
30 86 87a 87 85
0,5BR/RT
124
AIR FLOW SENSOR MANIFOLD PRESSURE RELAY
86 30 85 87 87a
0,5BR/SW
0,5WS
2,5RT/GN
P.C. 2-POL
74
NR.72
NR.1/61
0,5RT/WS
P.C. 14-POL
33
NR.16
10 8 7
0,5RT/WS
0,5BR/SW
0,5WS
2,5RT/GN
2,5BR
2,5SW
2,5BR
75
MP I
SUPPLEMENTARY AIR VALVE
WARM UP-REGULATOR
AIR FLOW SENSOR
MANIFOLD PRESSURE LIMITING SWITCH
P
M
128
129
130
131
71
0,5BR
0,5BR
FUEL PUMP II
FUEL PUMP I
MP I = GROUND BATTERY
MP II = GROUND FUSE BOX · CARRIER PLATE
MP III = GROUND TRUNK FLOOR PLATE GROUND LL
MP IV = GROUND INNER FIREWALL
MP V = GROUND TRUNK FLOOR PLATE GROUND RL
MP VI = GROUND CONTROL UNIT EL. ANTENNE + CENTRAL LOCKING SYSTEM
MP VII = GROUND INTERIOR LIGHT CABRIO
MP VIII = GROUND INTERIOR LIGHT TARGA + RAISED STOP LAMPS BRAKE LIGHT
MP IX = GROUND RAISED STOP LAMPS COUPE
MP X = GROUND STRAP GEARBOX + ENGINE + GROUND BODY
MP XI = GROUND ENGINE COMP. REAR LEFT
MP XII = GROUND ENGINE LEFT
MP XIII = GROUND IMPACT ABSORBER LEFT
MP XIV = GROUND IMPACT ABSORBER RIGHT
MP XIV
MP XII
MP XIII
MP X
MP XI
MP IX
MP VIII
MP VII
MP VI
MP V
MP IV
MP III
MP II
MP I

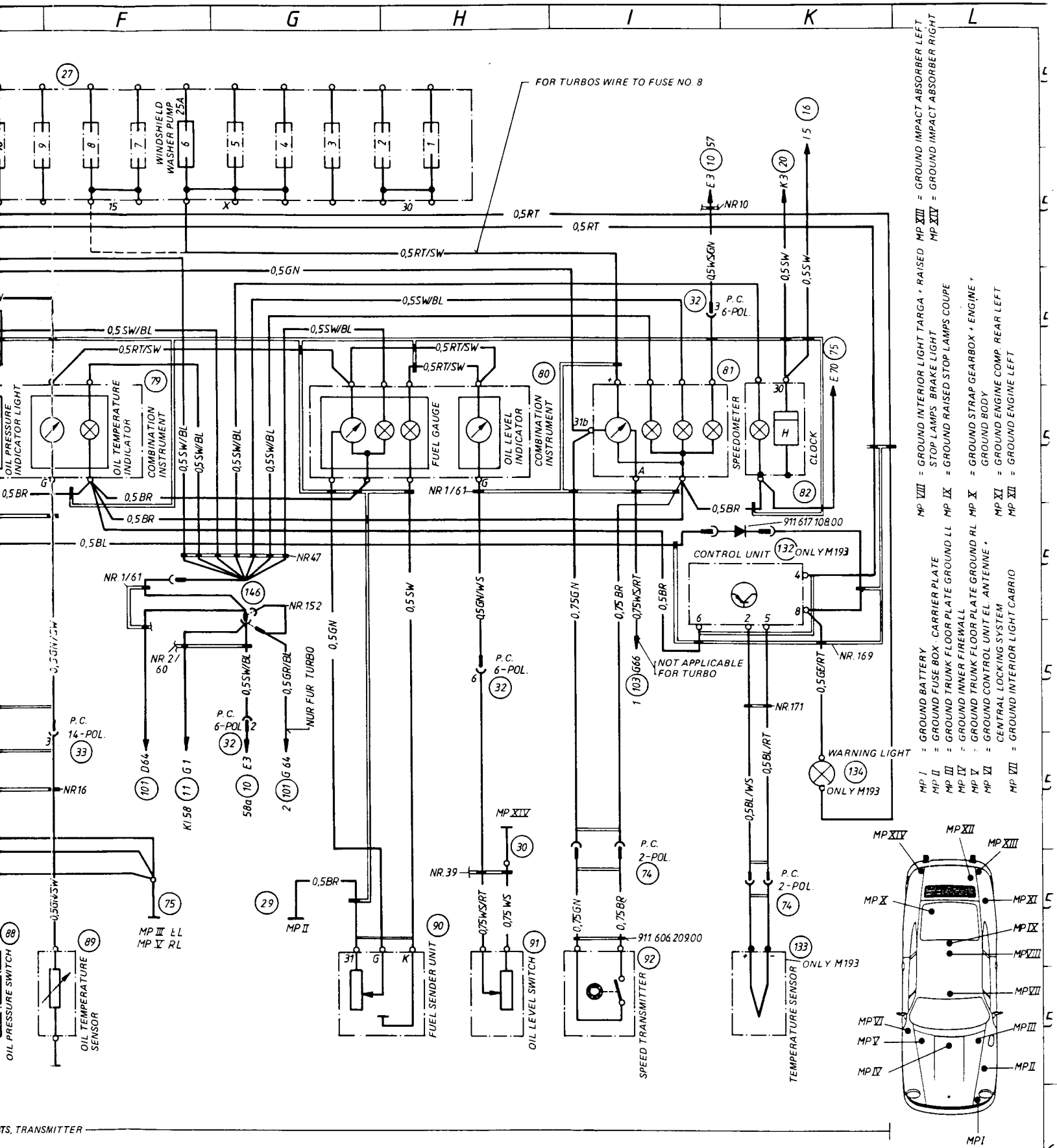
Wiring Diagram Type 911 Carrera Model 85 page 9

INSTRUMENTS, TRANSMITTER



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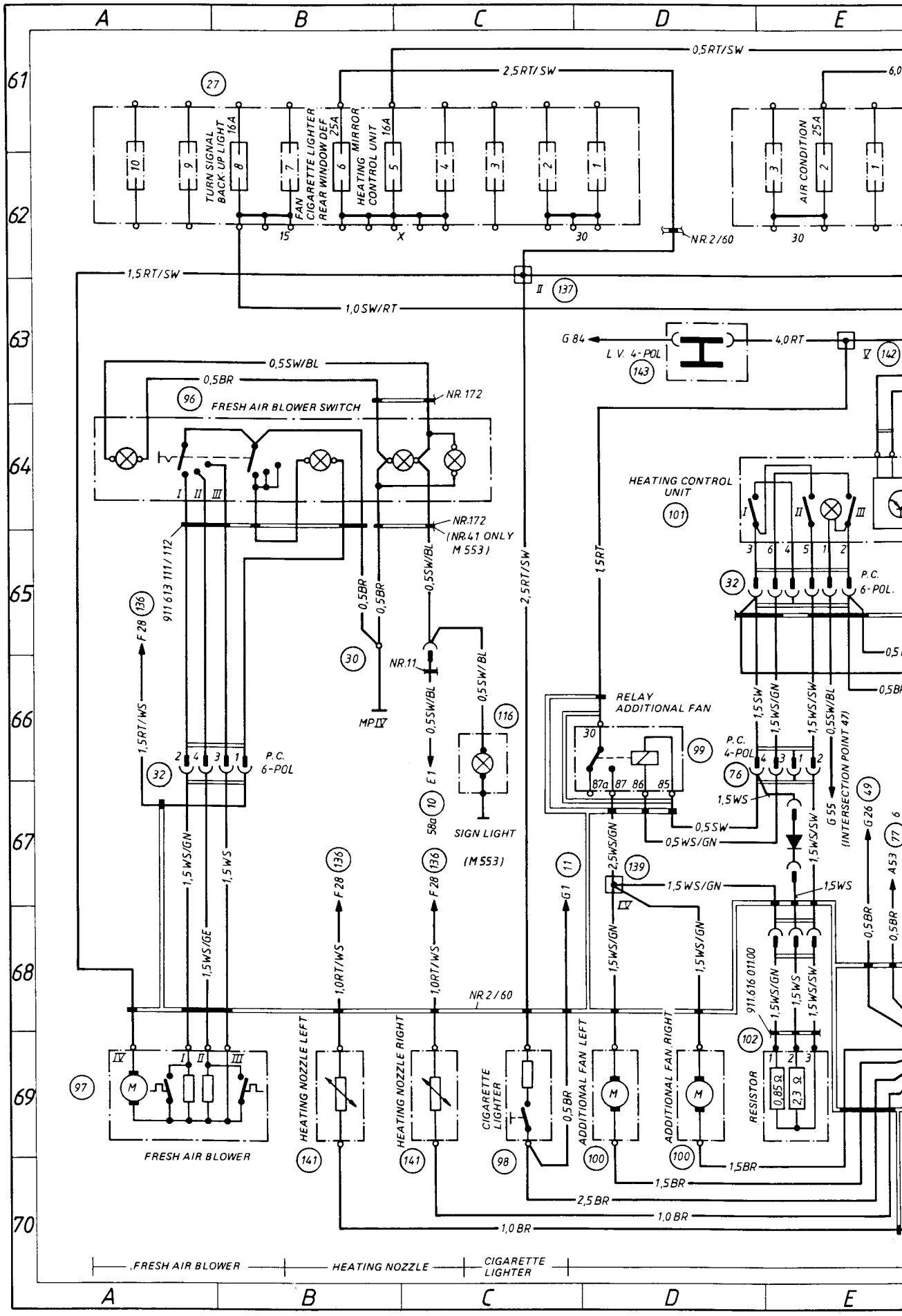
SW = BLACK WS = WHITE RT = RED GN = GREEN GE



GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET

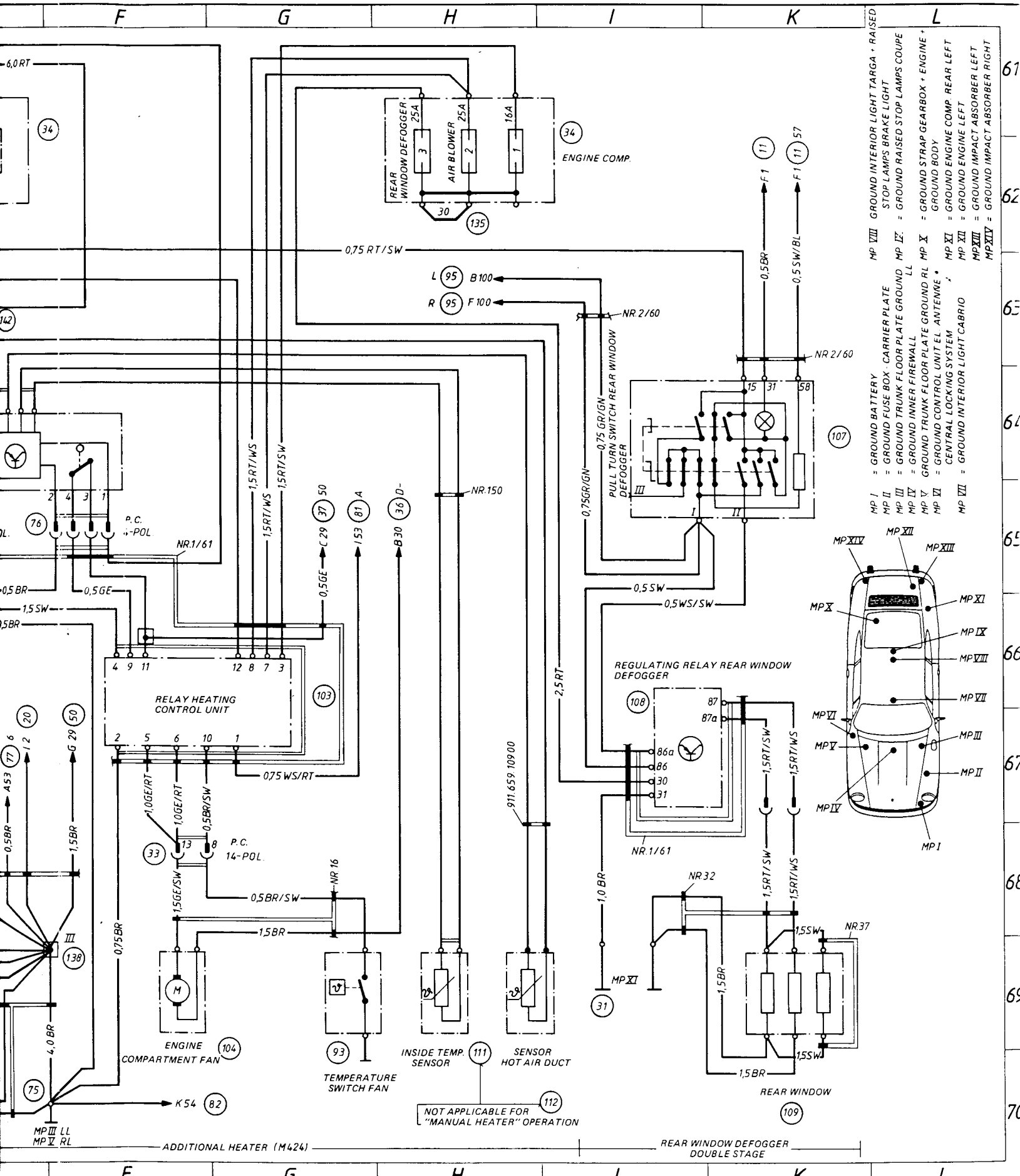
Wiring Diagram Type 911 Carrera Model 85 page 1

FRESH AIR BLOWER AND HEATER



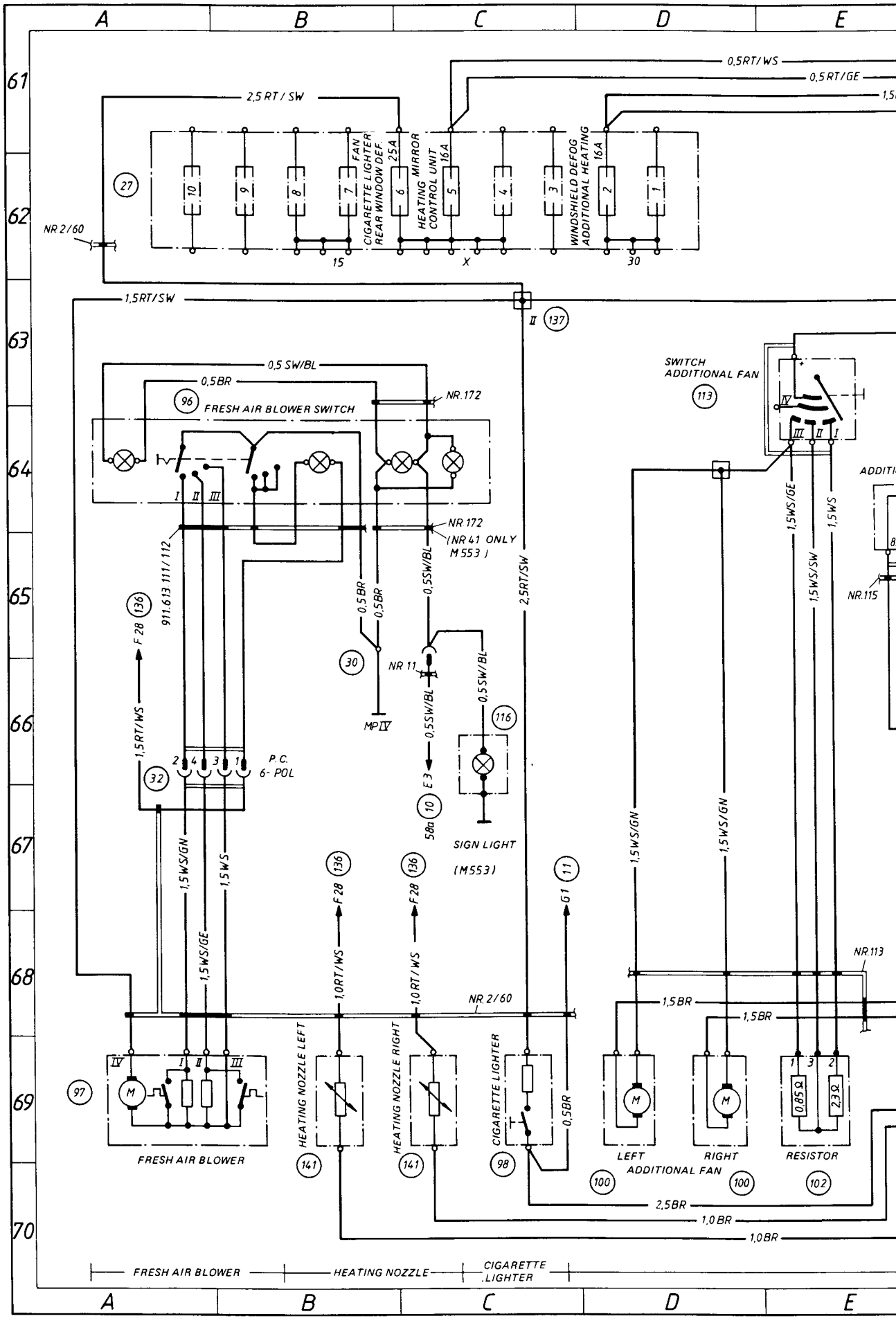
Printed in Germany - I, 1985

SW = BLACK WS = WHITE RT = RED GN = GREEN GE


F G H I K L
REAR WINDOW DEFOGGER 25A
AIR BLOWER 25A
16A
ENGINE COMP.
30
135
0,75 RT/SW
L 95 B100
R 95 F100
NR.2/60
0,5BR
0,5 SW/BL
F1 11
F1 11 57
NR.2/60
15 31 58
107
0,75GR/GN
PULL TURN SWITCH REAR WINDOW DEFOGGER
NR.150
1,5RT/WS
1,5RT/SW
0,5GE
C29 50
153 A
830 D-
0,5 SW
0,5WS/SW
2,5RT
REGULATING RELAY REAR WINDOW DEFOGGER
108
87
87a
86a
86
30
31
NR.1/61
911.659.10900
RELAY HEATING CONTROL UNIT
103
4 9 11
12 8 7 3
2 5 6 10 1
0,75 WS/RT
1,0GE/RT
1,0GE/RT
0,5BR/SW
P.C. 14-POL
33
13 8
1,5GE/SW
NR.16
0,5BR/SW
1,5BR
0,75BR
1,0 BR
NR.32
1,5RT/SW
1,5RT/WS
1,5SW
NR.37
1,5BR
REAR WINDOW
109
ENGINE COMPARTMENT FAN
104
TEMPERATURE SWITCH FAN
93
INSIDE TEMP. SENSOR
111
SENSOR HOT AIR DUCT
NOT APPLICABLE FOR "MANUAL HEATER" OPERATION
112
4,0 BR
75
K54 82
MP III LL
MP V RL
ADDITIONAL HEATER (M424)
REAR WINDOW DEFOGGER DOUBLE STAGE
MP I = GROUND BATTERY
MP II = GROUND FUSE BOX · CARRIER PLATE
MP III = GROUND TRUNK FLOOR PLATE GROUND LL
MP IV = GROUND INNER FIREWALL
MP V = GROUND TRUNK FLOOR PLATE GROUND RL
MP VI = GROUND CONTROL UNIT EL. ANTENNE · CENTRAL LOCKING SYSTEM
MP VII = GROUND INTERIOR LIGHT CABRIO
MP VIII GROUND INTERIOR LIGHT TARGA + RAISED STOP LAMPS BRAKE LIGHT
MP IX = GROUND RAISED STOP LAMPS COUPE
MP X = GROUND STRAP GEARBOX + ENGINE + GROUND BODY
MP XI = GROUND ENGINE COMP. REAR LEFT
MP XII = GROUND ENGINE LEFT
MP XIII = GROUND IMPACT ABSORBER LEFT
MP XIV = GROUND IMPACT ABSORBER RIGHT
MP I MP II MP III MP IV MP V MP VI MP VII MP VIII MP IX MP X MP XI MP XII MP XIII MP XIV
F G H I K L

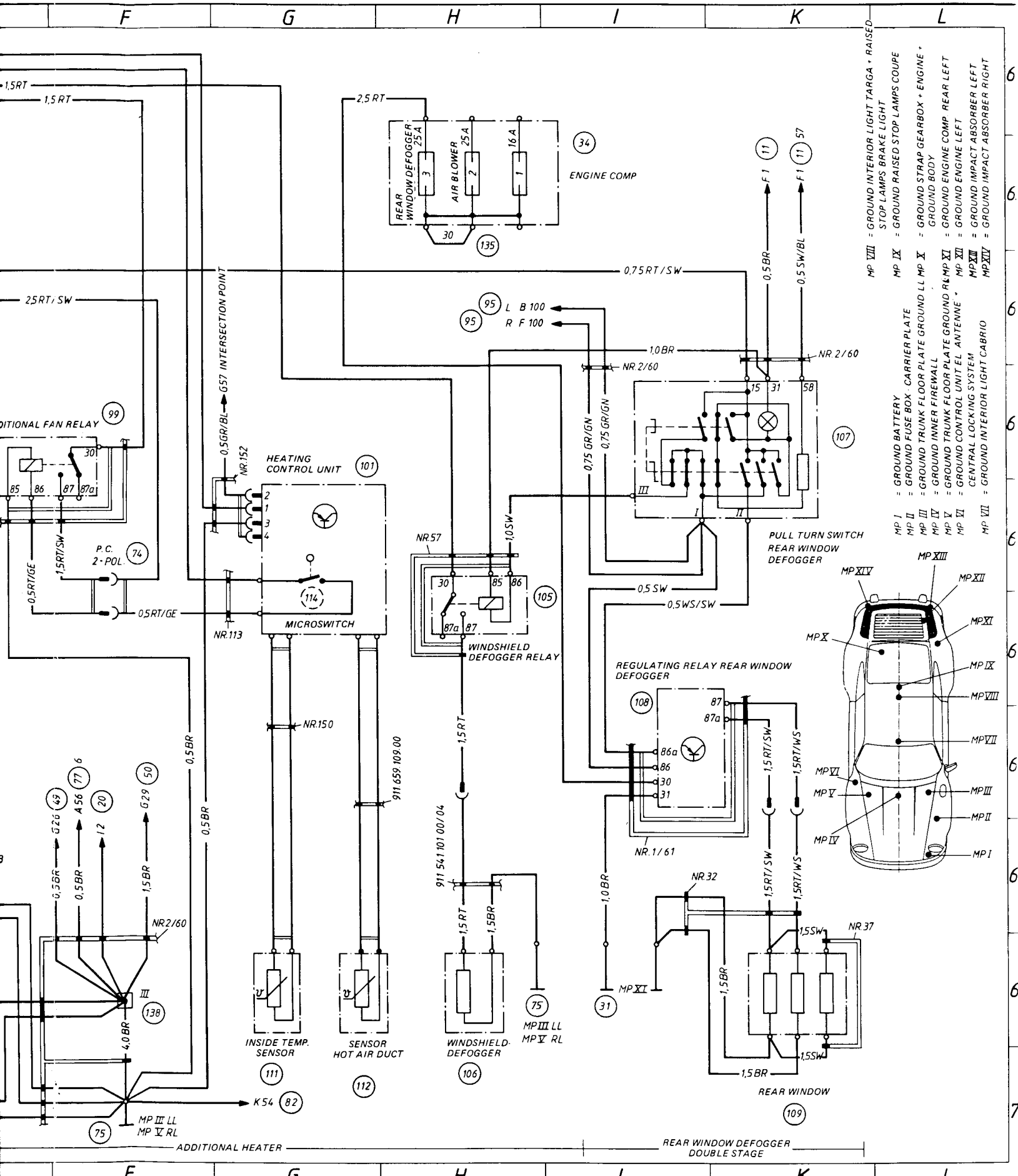
Wiring Diagram Type 911 Carrera Model 85 page 1

FRESH AIR BLOWER AND HEATER TURBO



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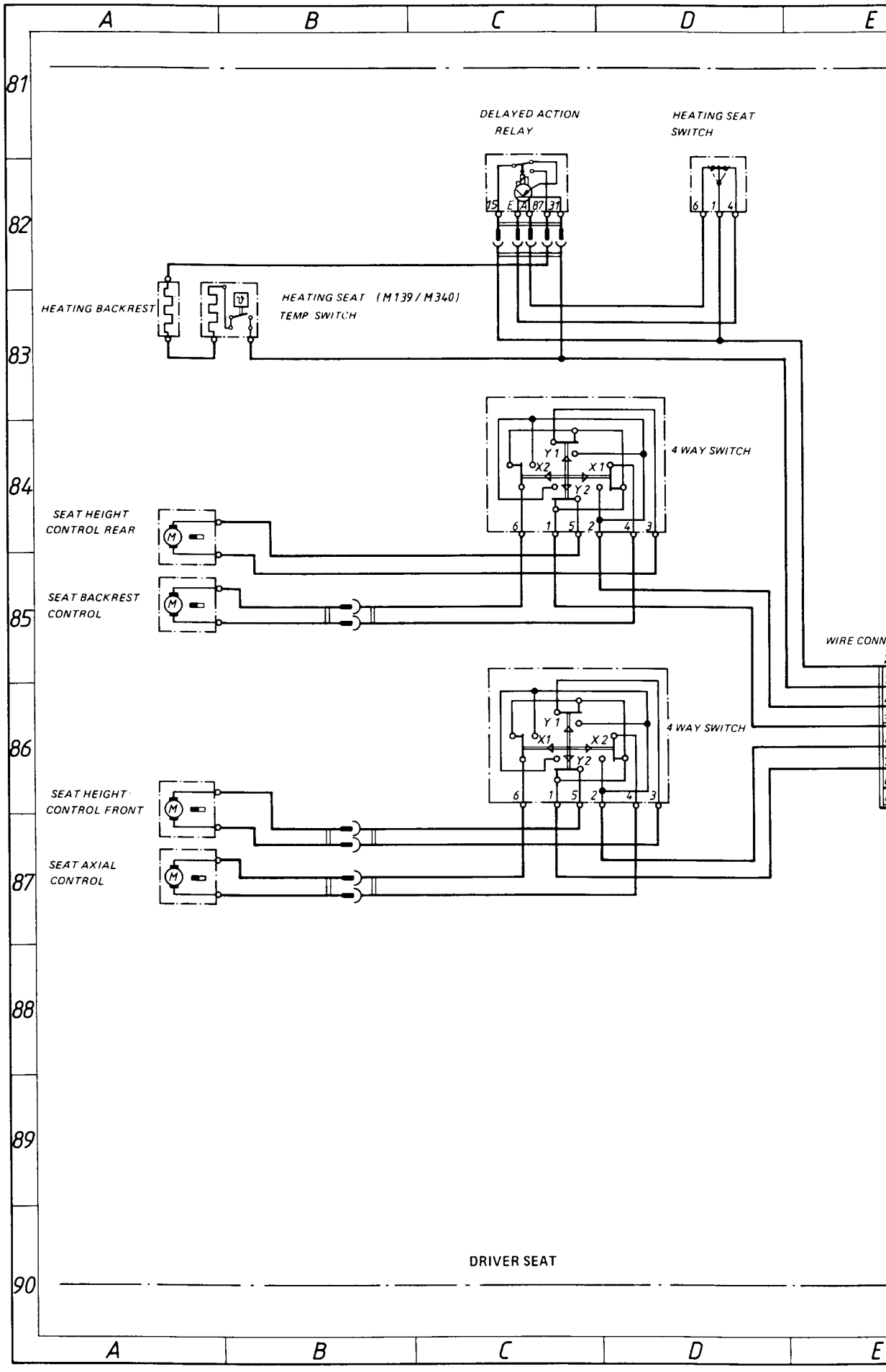
SW = BLACK WS = WHITE RT = RED GN = GREEN



GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET

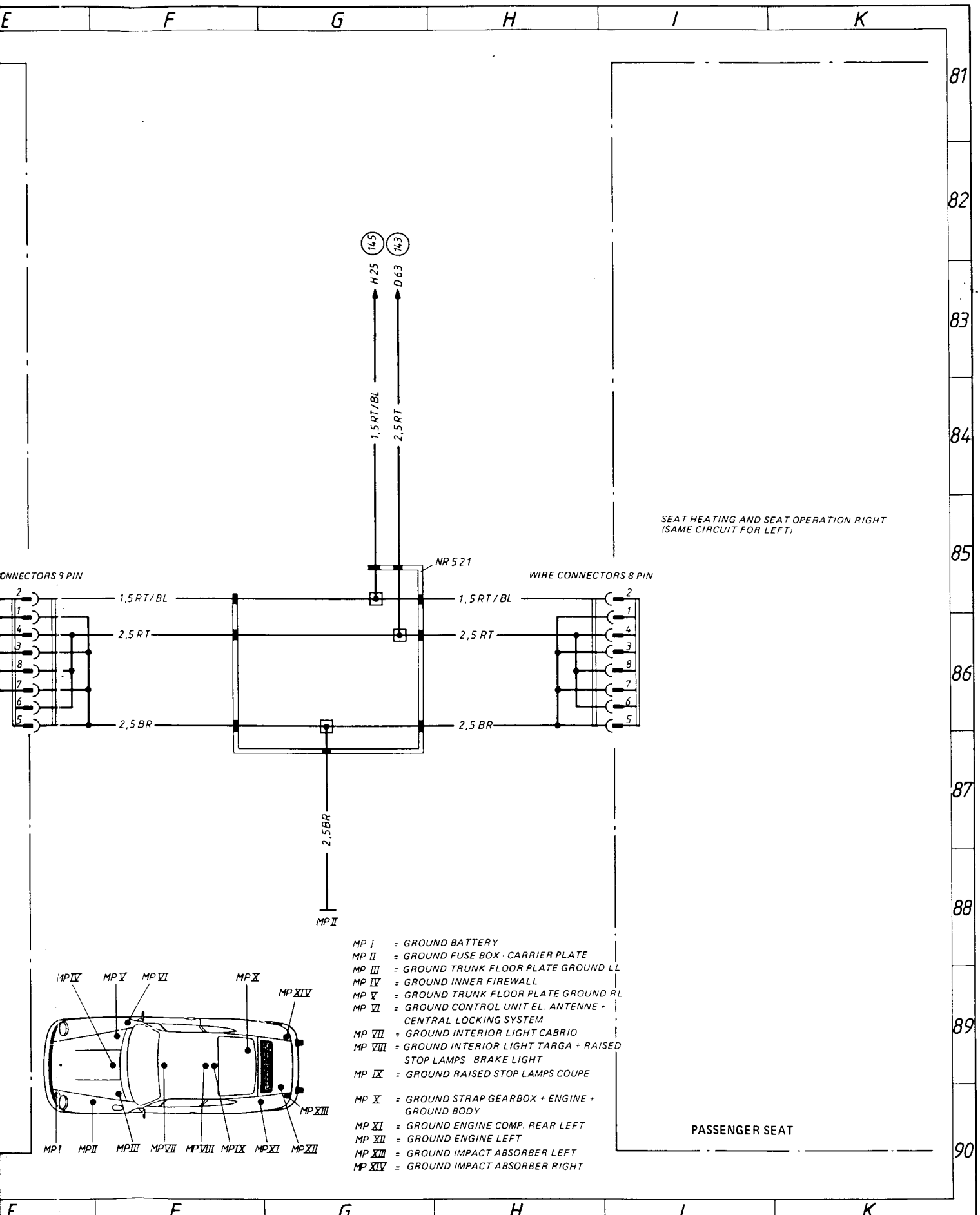
Wiring Diagram Type 911 Carrera Model 85 pag

SEAT OPERATION AND SEAT HEATING



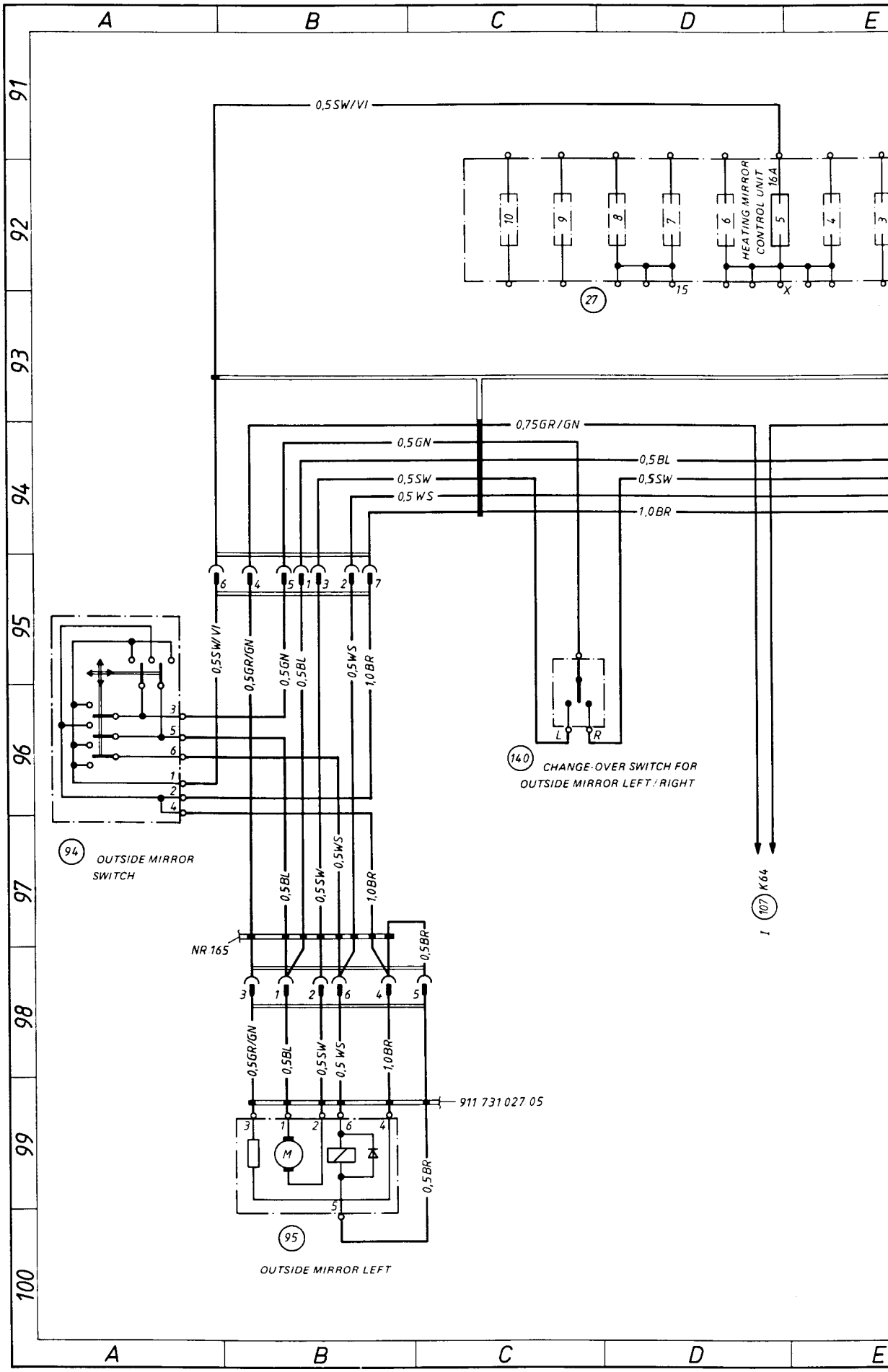
Printed in Germany - I, 1985

SW = BLACK WS = WHITE RT = RED GN = GREEN

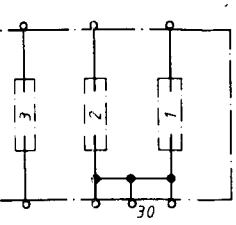

E
F
G
H
I
K
81
82
83
84
85
86
87
88
89
90
(145)
(143)
H 25
D 63
1,5 RT/BL
2,5 RT
NR.521
SEAT HEATING AND SEAT OPERATION RIGHT
(SAME CIRCUIT FOR LEFT)
ONNECTORS 9 PIN
WIRE CONNECTORS 8 PIN
1,5 RT/BL
2,5 RT
2,5 BR
2,5BR
MP II
MP I = GROUND BATTERY
MP II = GROUND FUSE BOX · CARRIER PLATE
MP III = GROUND TRUNK FLOOR PLATE GROUND LL
MP IV = GROUND INNER FIREWALL
MP V = GROUND TRUNK FLOOR PLATE GROUND RL
MP VI = GROUND CONTROL UNIT EL. ANTENNE + CENTRAL LOCKING SYSTEM
MP VII = GROUND INTERIOR LIGHT CABRIO
MP VIII = GROUND INTERIOR LIGHT TARGA + RAISED STOP LAMPS BRAKE LIGHT
MP IX = GROUND RAISED STOP LAMPS COUPE
MP X = GROUND STRAP GEARBOX + ENGINE + GROUND BODY
MP XI = GROUND ENGINE COMP. REAR LEFT
MP XII = GROUND ENGINE LEFT
MP XIII = GROUND IMPACT ABSORBER LEFT
MP XIV = GROUND IMPACT ABSORBER RIGHT
PASSENGER SEAT

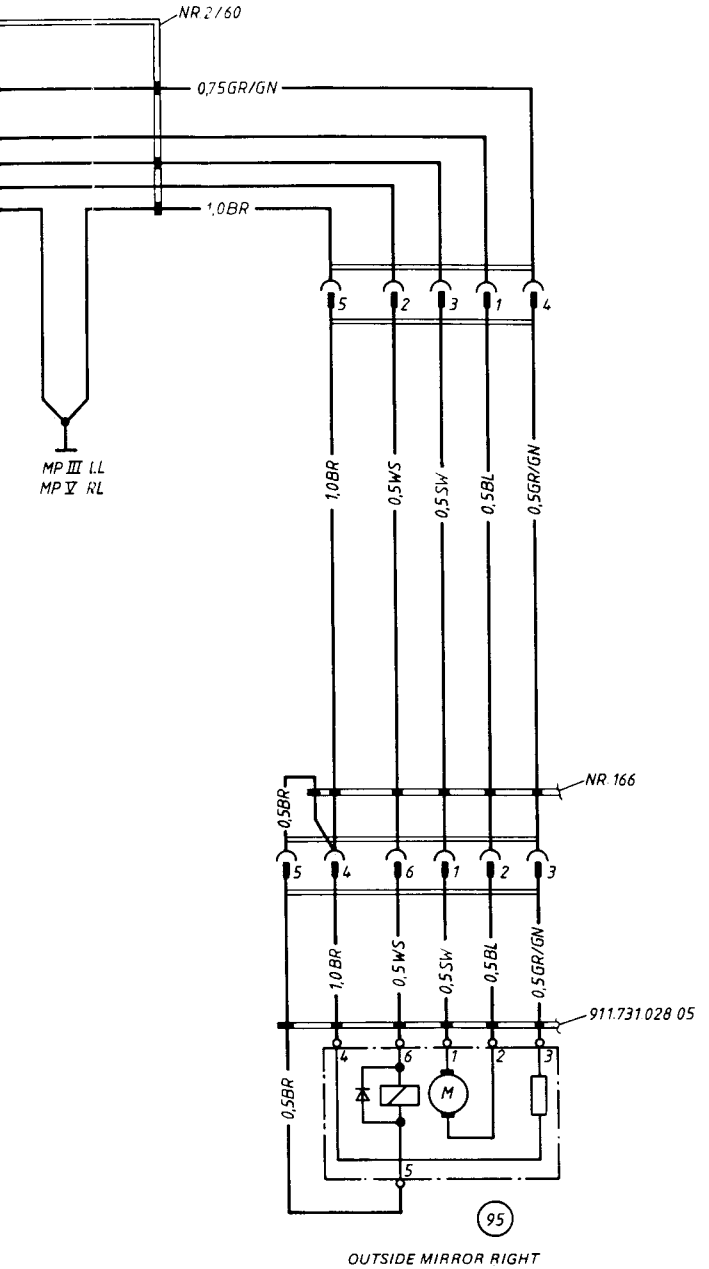
Wiring Diagram Type 911 Carrera Model 85 page

OUTSIDE MIRROR



SW = BLACK WS = WHITE RT = RED GN = GREEN

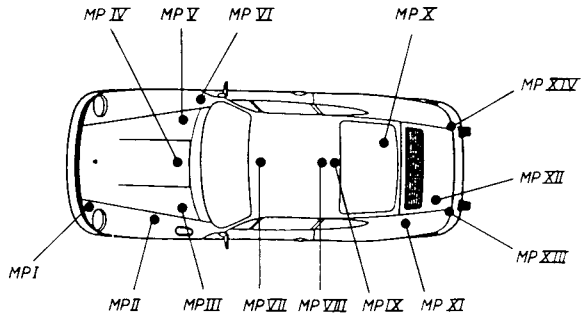




OUTSIDE MIRROR RIGHT

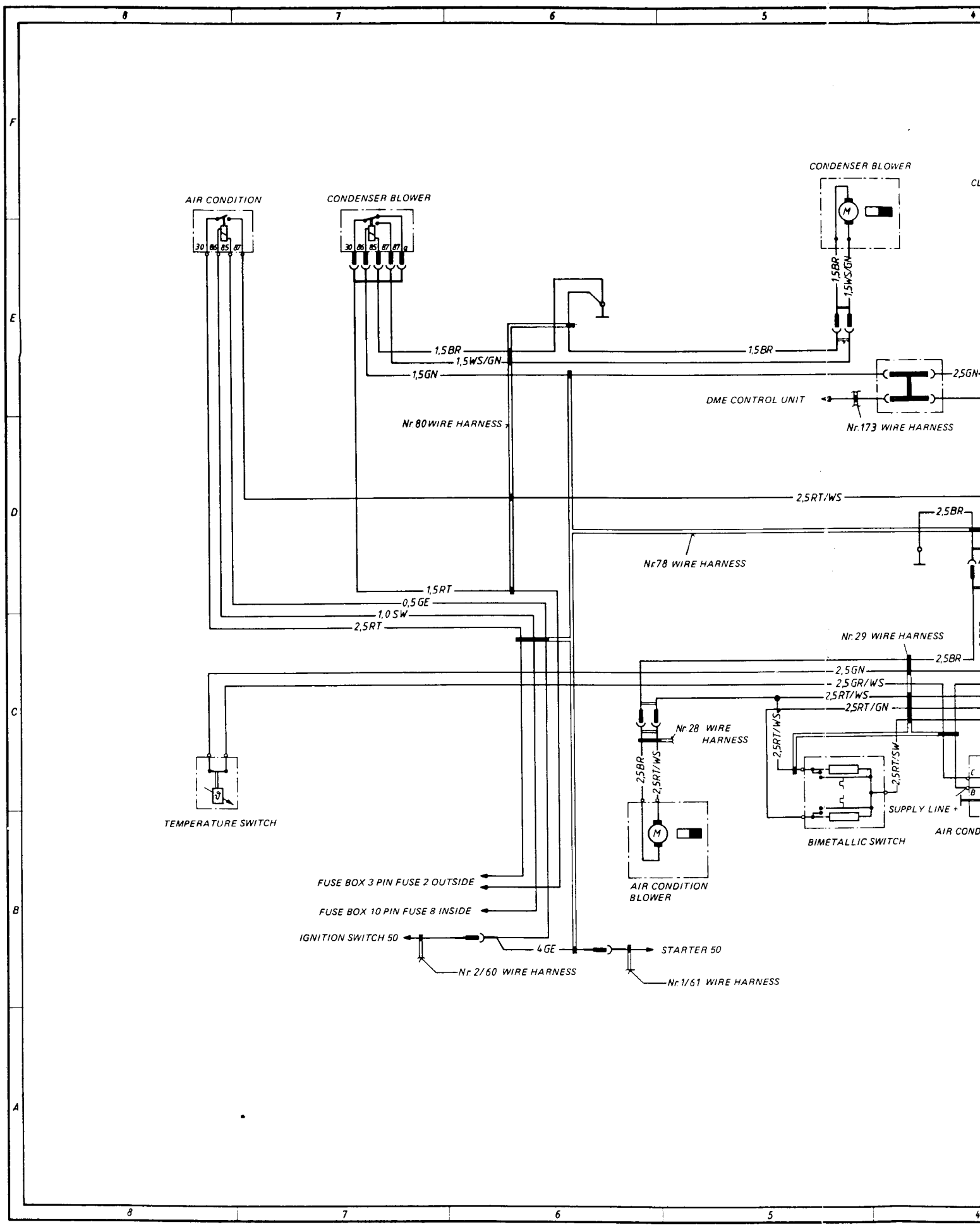
MP I = GROUND BATTERY
MP II = GROUND FUSE BOX - CARRIER PLATE
MP III = GROUND TRUNK FLOOR PLATE GROUND LL
MP IV = GROUND INNER FIREWALL
MP V = GROUND TRUNK FLOOR PLATE GROUND RL
MP VI = GROUND CONTROL UNIT EL. ANTENNE + CENTRAL LOCKING SYSTEM
MP VII = GROUND INTERIOR LIGHT CABRIO
MP VIII = GROUND INTERIOR LIGHT TARGA + RAISED STOP LAMPS BRAKE LIGHT
MP IX = GROUND RAISED STOP LAMPS COUPE

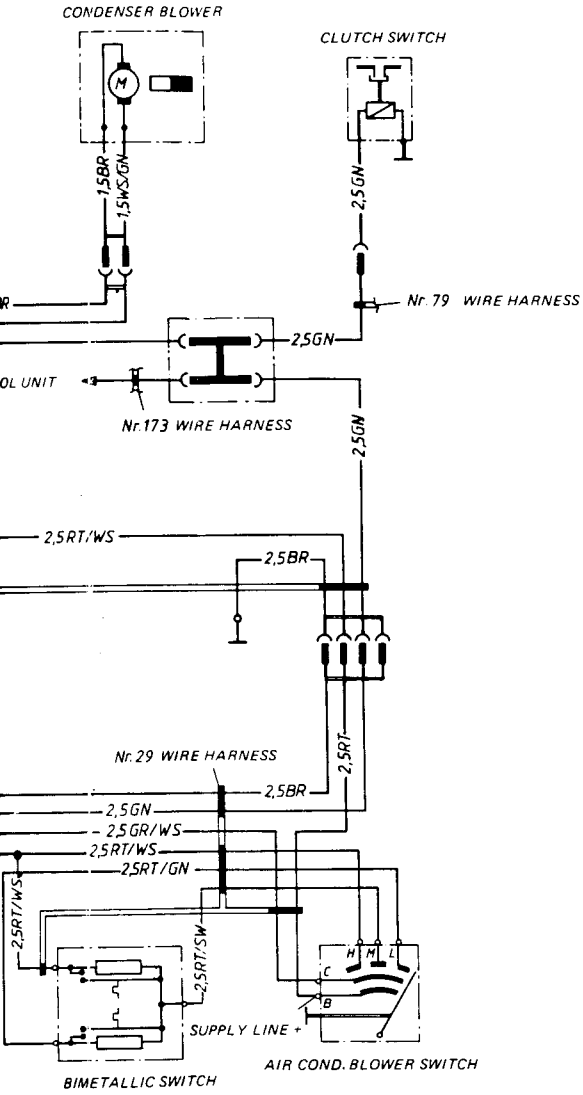
MP X = GROUND STRAP GEARBOX + ENGINE + GROUND BODY
MP XI = GROUND ENGINE COMP. REAR LEFT
MP XII = GROUND ENGINE LEFT
MP XIII = GROUND IMPACT ABSORBER LEFT
MP XIV = GROUND IMPACT ABSORBER RIGHT



Wiring Diagram Type 911 Carrera Model 85 page 14

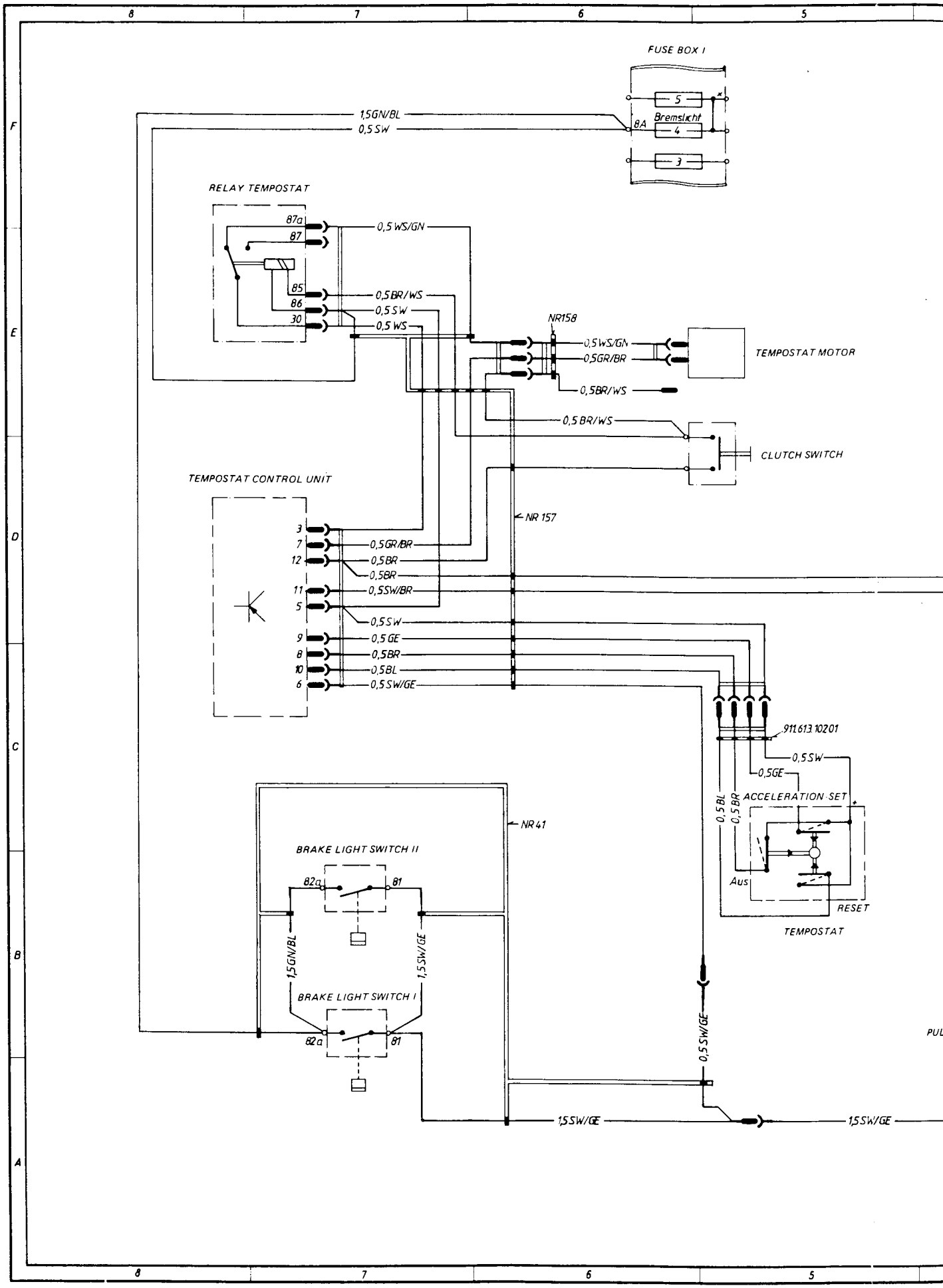
AIR CONDITION

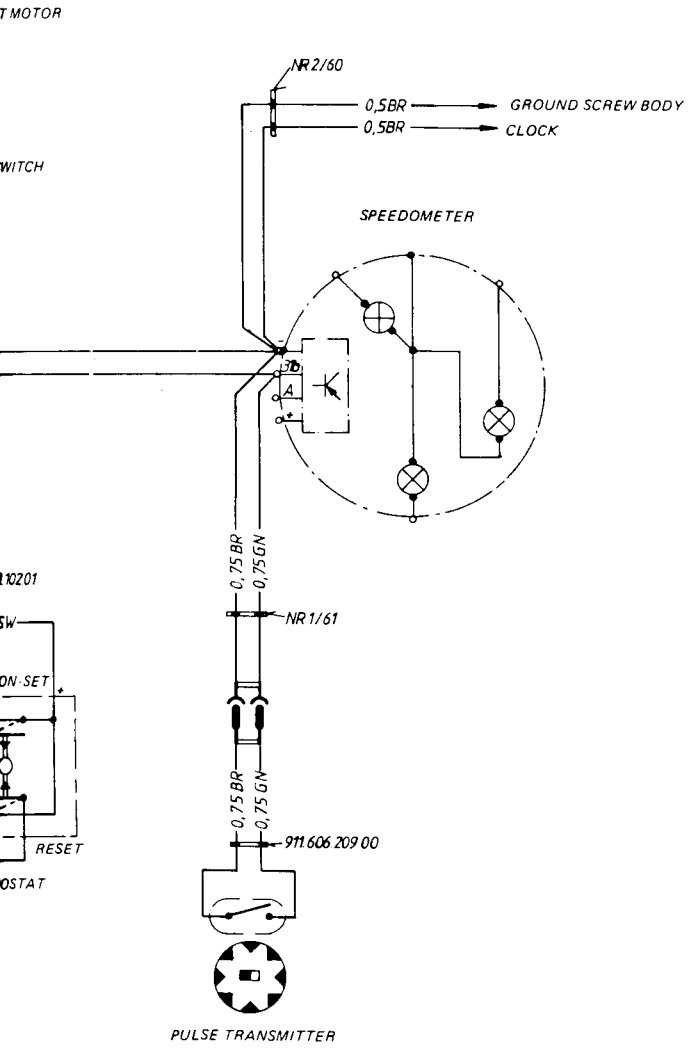



CONDENSER BLOWER
CLUTCH SWITCH
1,5BR
1,5WS/GN
2,5GN
Nr. 79 WIRE HARNESS
2,5GN
OL UNIT
Nr.173 WIRE HARNESS
2,5GN
2,5RT/WS
2,5BR
Nr. 29 WIRE HARNESS
2,5BR
2,5RT
2,5GN
2,5GR/WS
2,5RT/WS
2,5RT/GN
2,5RT/WS
2,5RT/SW
H
M
L
C
B
SUPPLY LINE +
BIMETALLIC SWITCH
AIR COND. BLOWER SWITCH

Wiring Diagram Type 911 Carrera Model 85 page 15

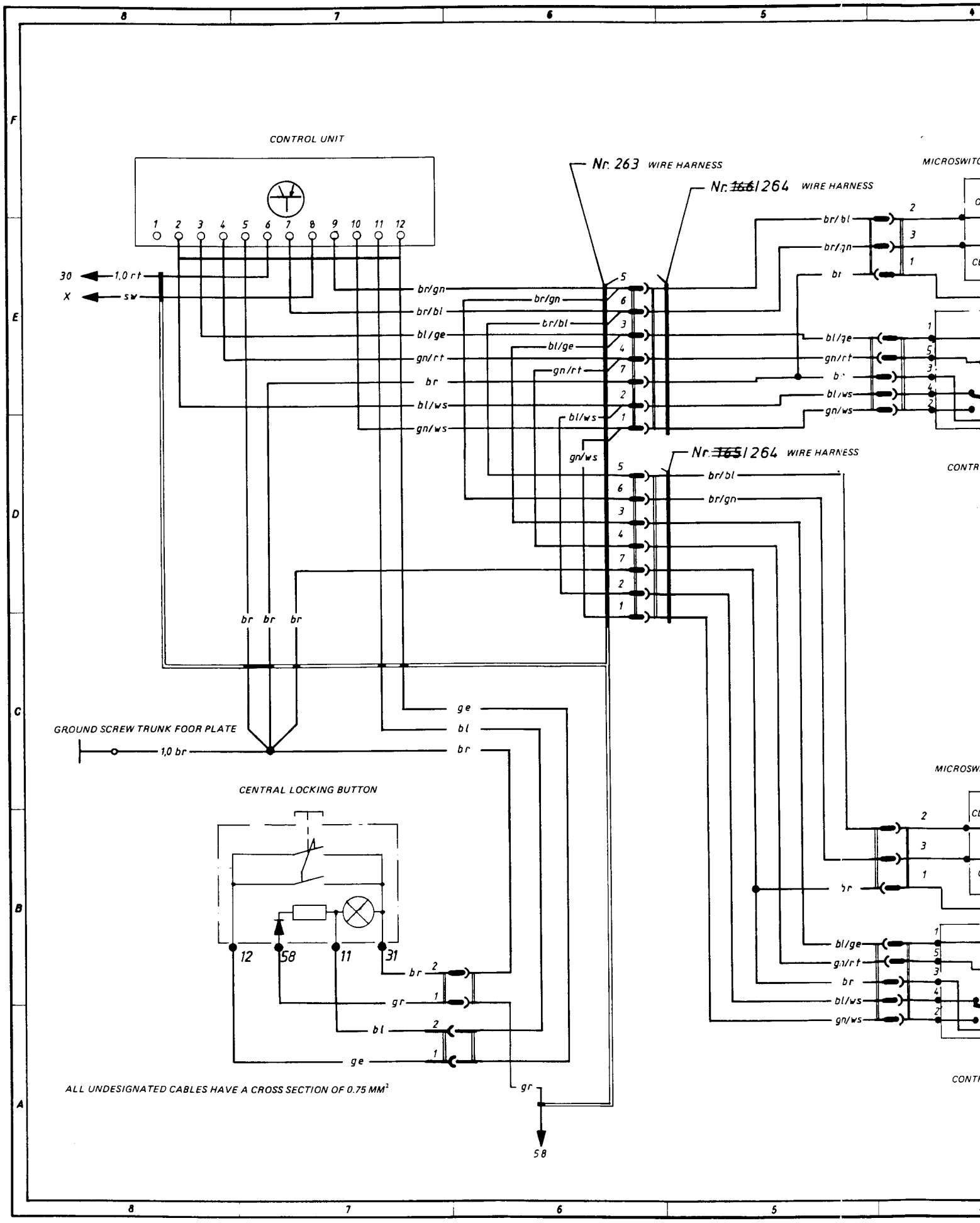
TEMPOSTAT



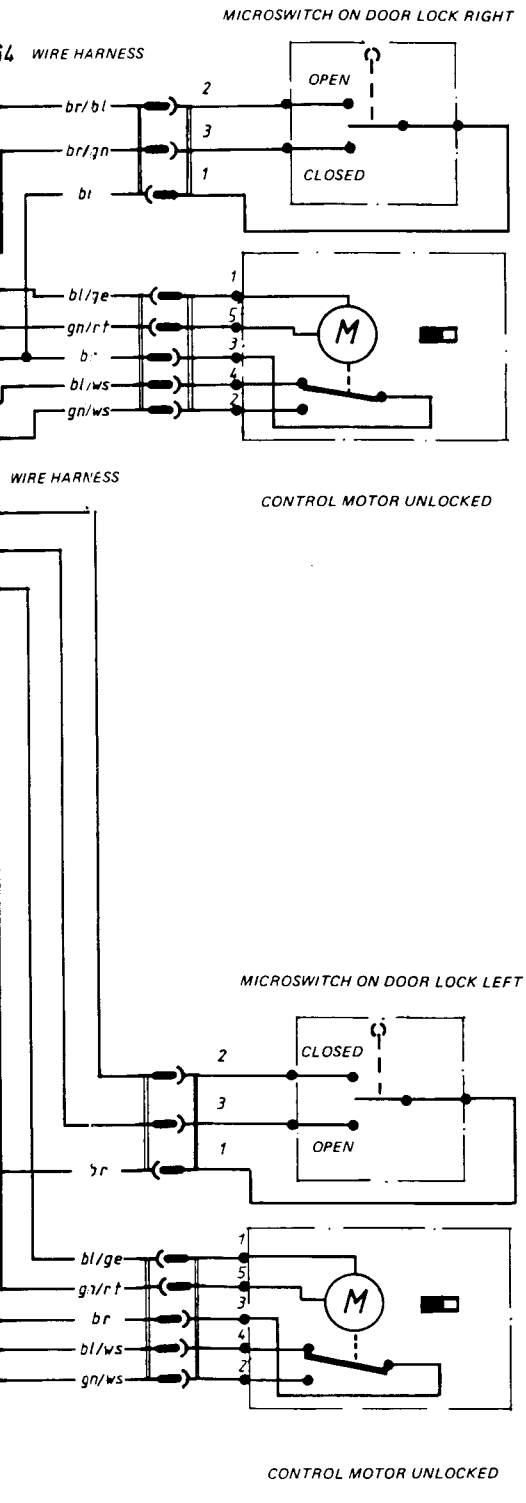


1,5 SW/GE — TAIL LIGHT (BRAKE LIGHT)

CENTRAL LOCKING SYSTEM

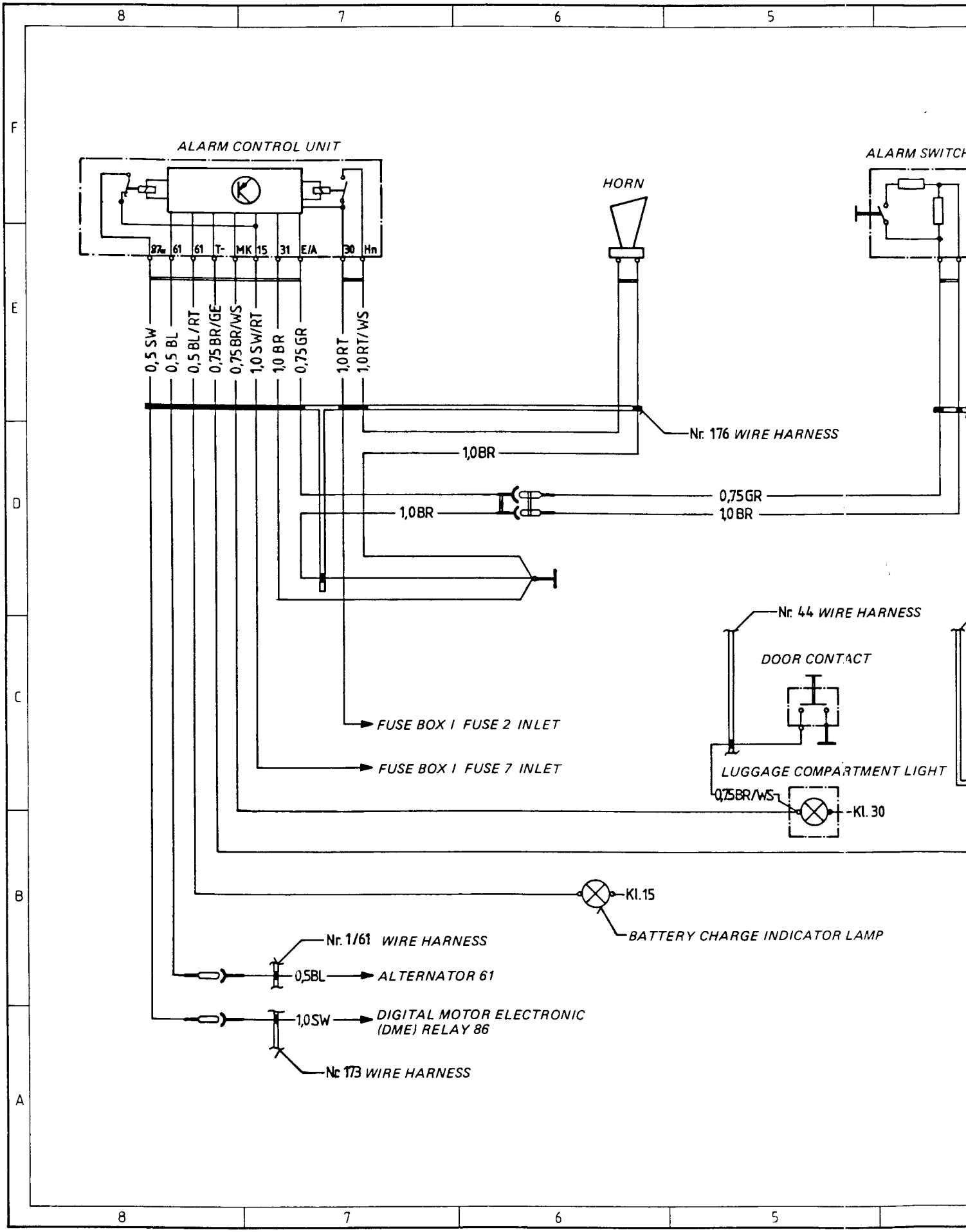


SW = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY

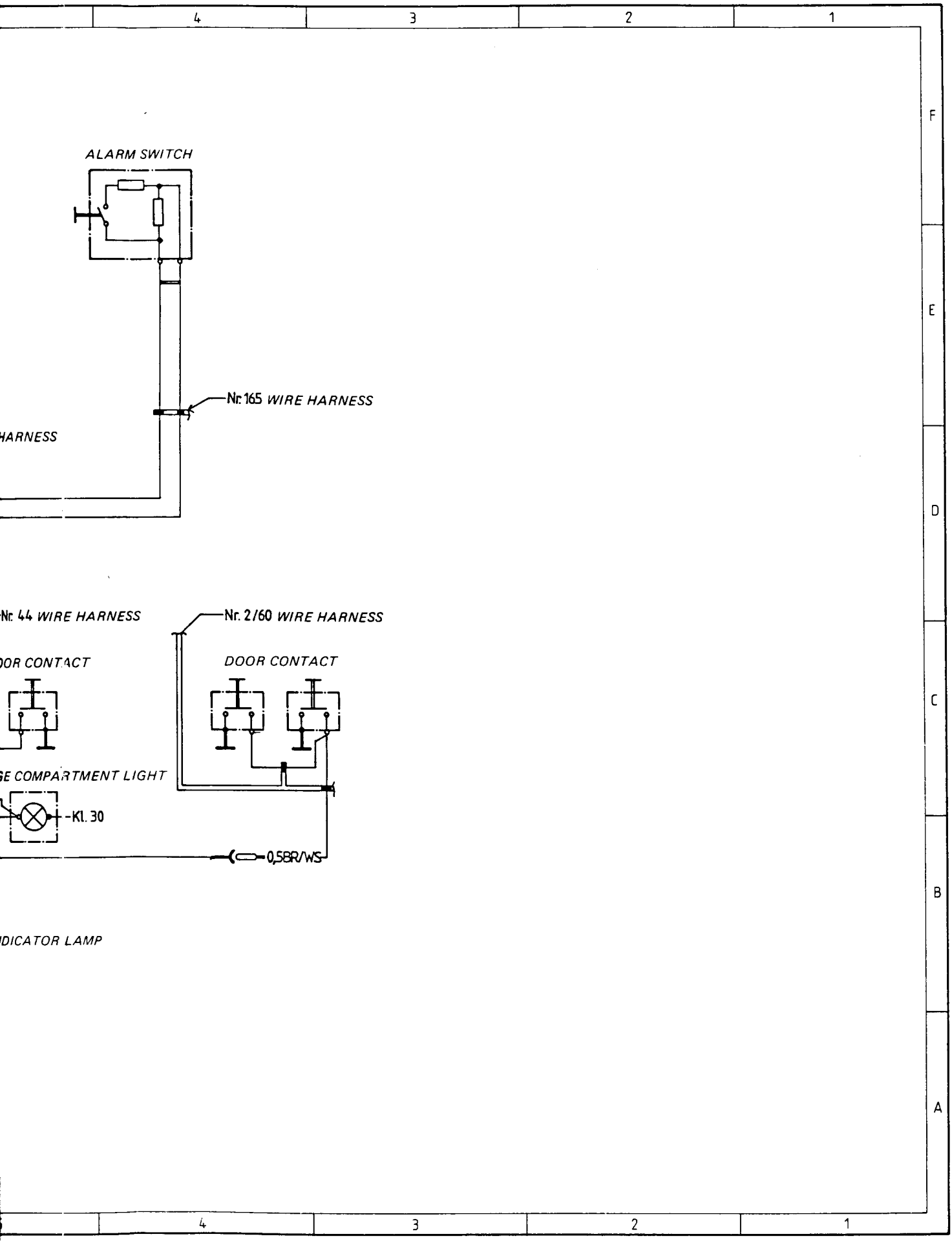

MICROSWITCH ON DOOR LOCK RIGHT
WIRE HARNESS
OPEN
CLOSED
br/bl
br/gn
bl
bl/ge
gn/rt
bl/ws
gn/ws
M
WIRE HARNESS
CONTROL MOTOR UNLOCKED
MICROSWITCH ON DOOR LOCK LEFT
CLOSED
OPEN
br
bl/ge
gn/rt
bl/ws
gn/ws
M
CONTROL MOTOR UNLOCKED

Additional Wiring Diagram Type 911 Carrera Model 85

Alarm System



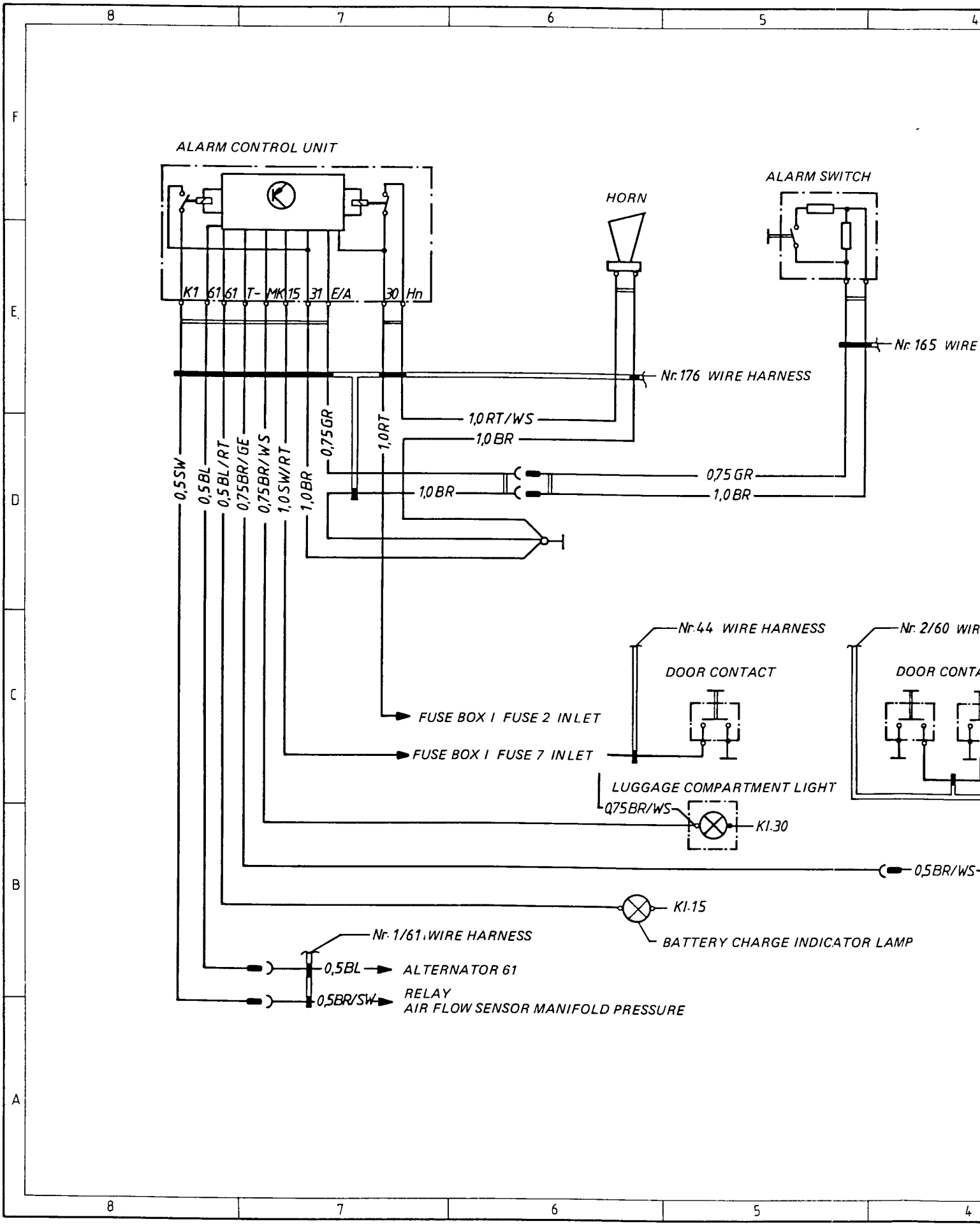
SW = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET



BL = BLUE LI = VIOLET

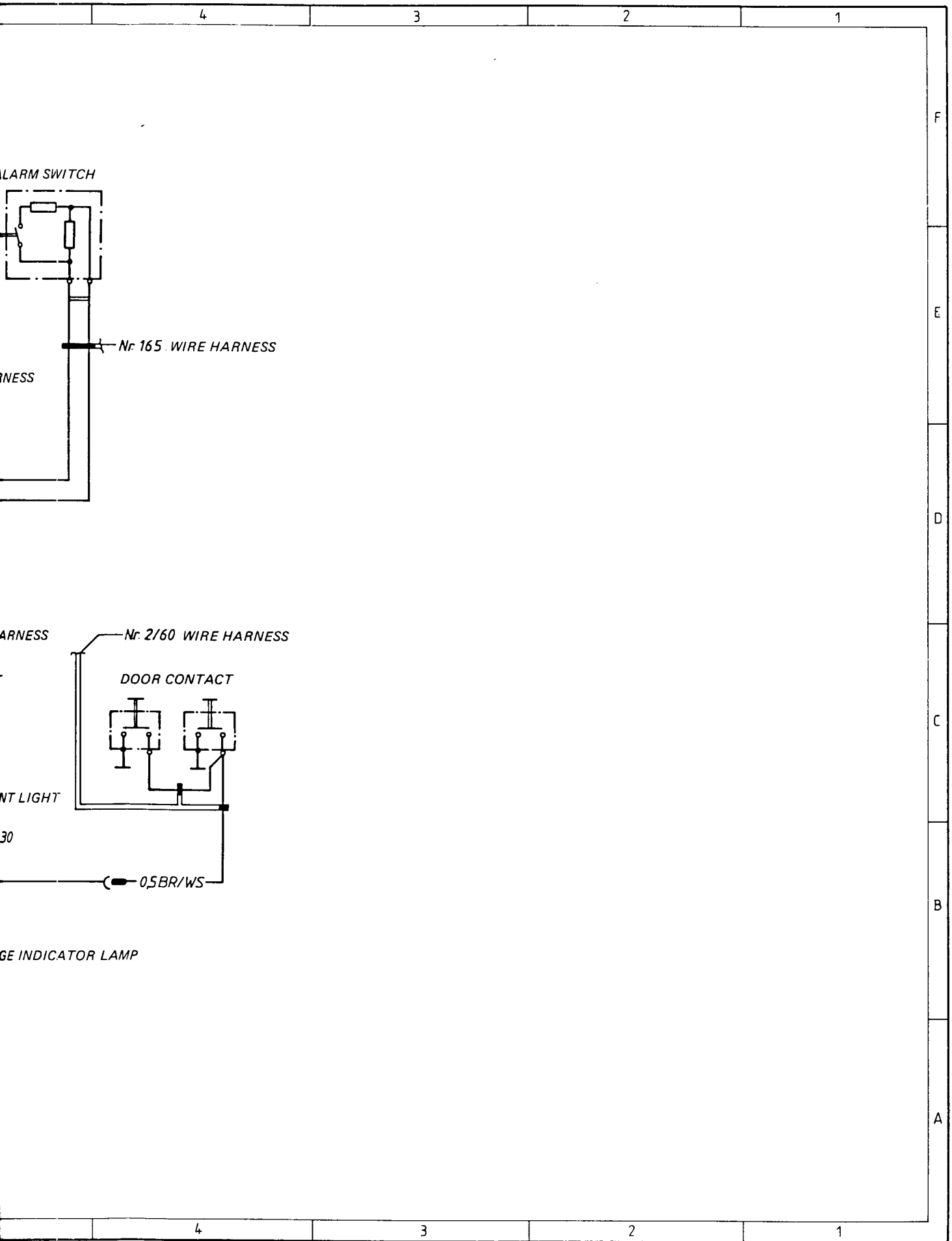
Additional Wiring Diagram Type 911 turbo Model 85

Alarm System



SW = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET

Printed in Germany - II. 1985



BL = BLUE LI = VIOLET

Wiring Diagram Type 911 Carrera Model 86

SHEET	**1**	GROUND TERMINALS
SHEET	**2**	LAMPS
SHEET	**3**	BODY
SHEET	**4**	HEATING AND VENTILATION
SHEET	**5**	RADIO, ALARM SYSTEM, CONVERTIBLE TOP, LIFTING ROOF
SHEET	**6**	ENGINE (DME) TEMPOSTAT
SHEET	**7**	INSTRUMENTS AND INDICATORS
SHEET	**8**	CONNECTION AND EQUIPMENT FUSES

Wiring Diagram Type 911 Carrera Model 86

WIRE COLOURS

SW = BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET

⊡ = WELDING POINT
▭ = CONNECTION WITH FIELD INDICATION
MP = GROUND CONNECTING POINT

Wiring Diagram Type 911 Carrera Model 86 Sheet 1

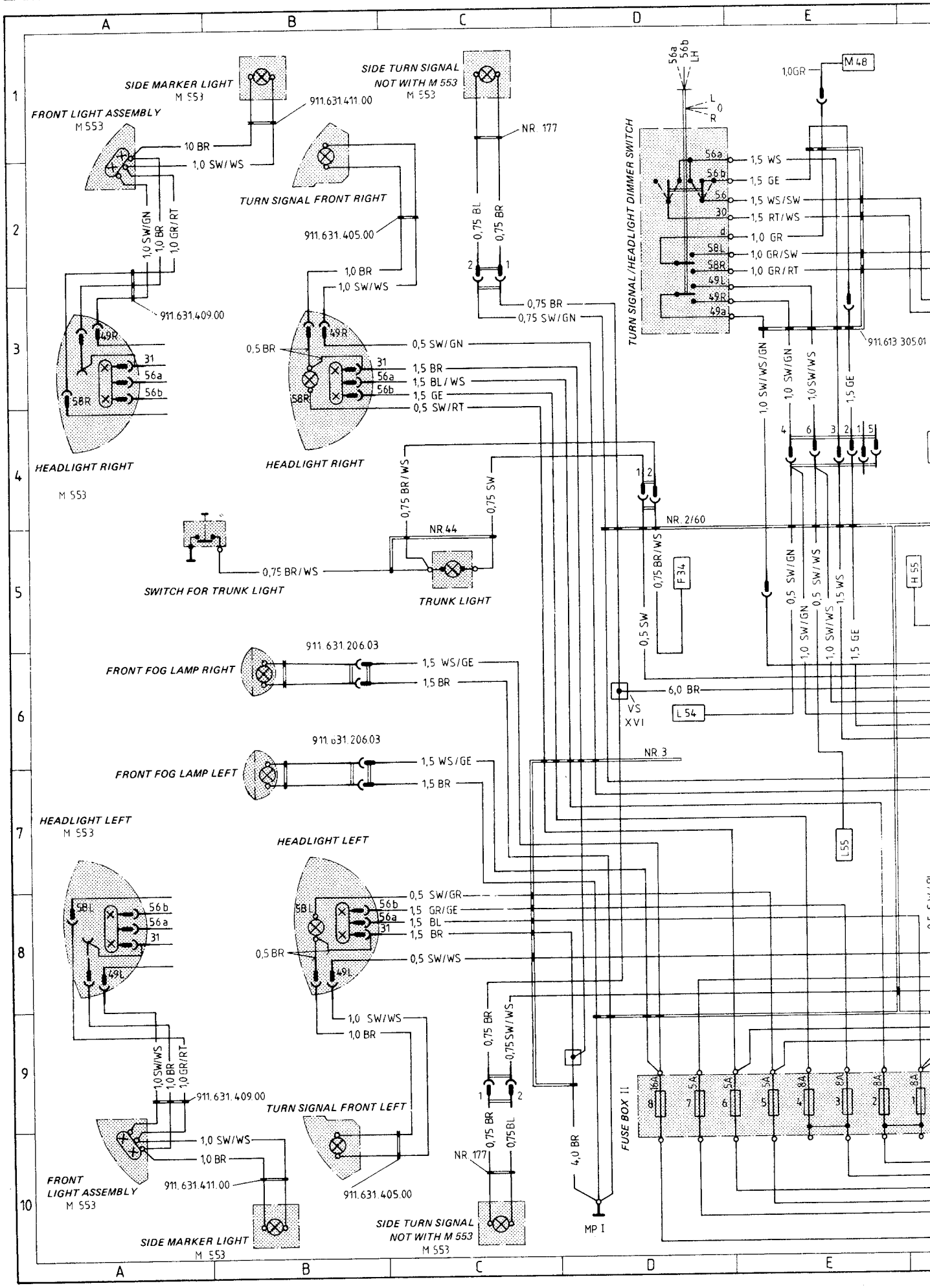
GROUND TERMINALS

Ground Terminals

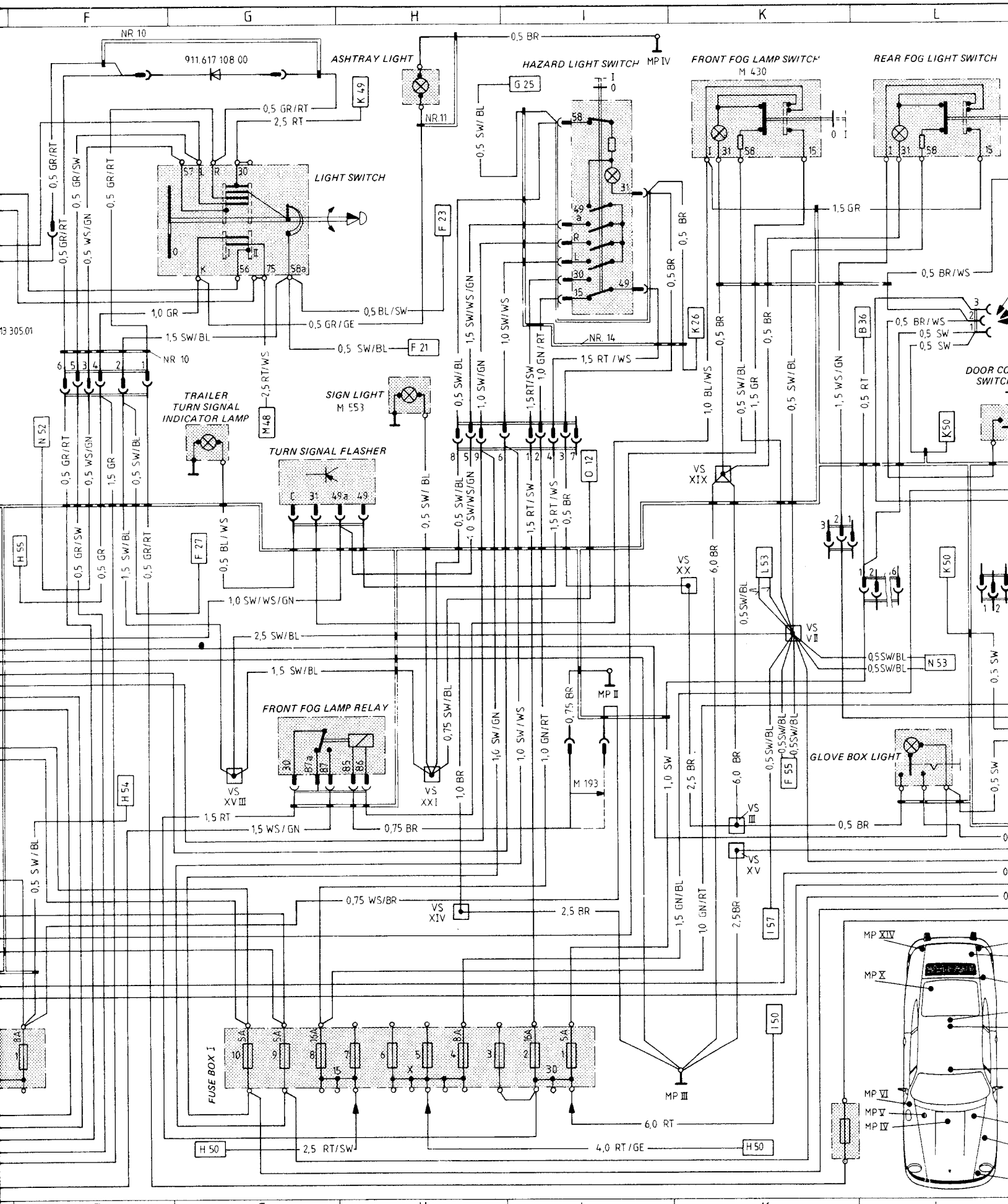
I Ground - battery
II Ground - fuse box carrier
III Ground - luggage compartment floor LHD
IV Ground - firewall inside
V Ground - luggage compartment floor RHD
VI Ground - electric antenna + central lock control unit
VII Ground - inside light Cabriolet
VIII Ground - inside light Targa + high mounted stop light
IX Ground - high mounted stop light Coupe
X Ground strap - transmission + engine + body
XI Ground - engine compartment rear left
XII Ground - engine left
XIII Ground - impact damper left
XIV Ground - impact damper right

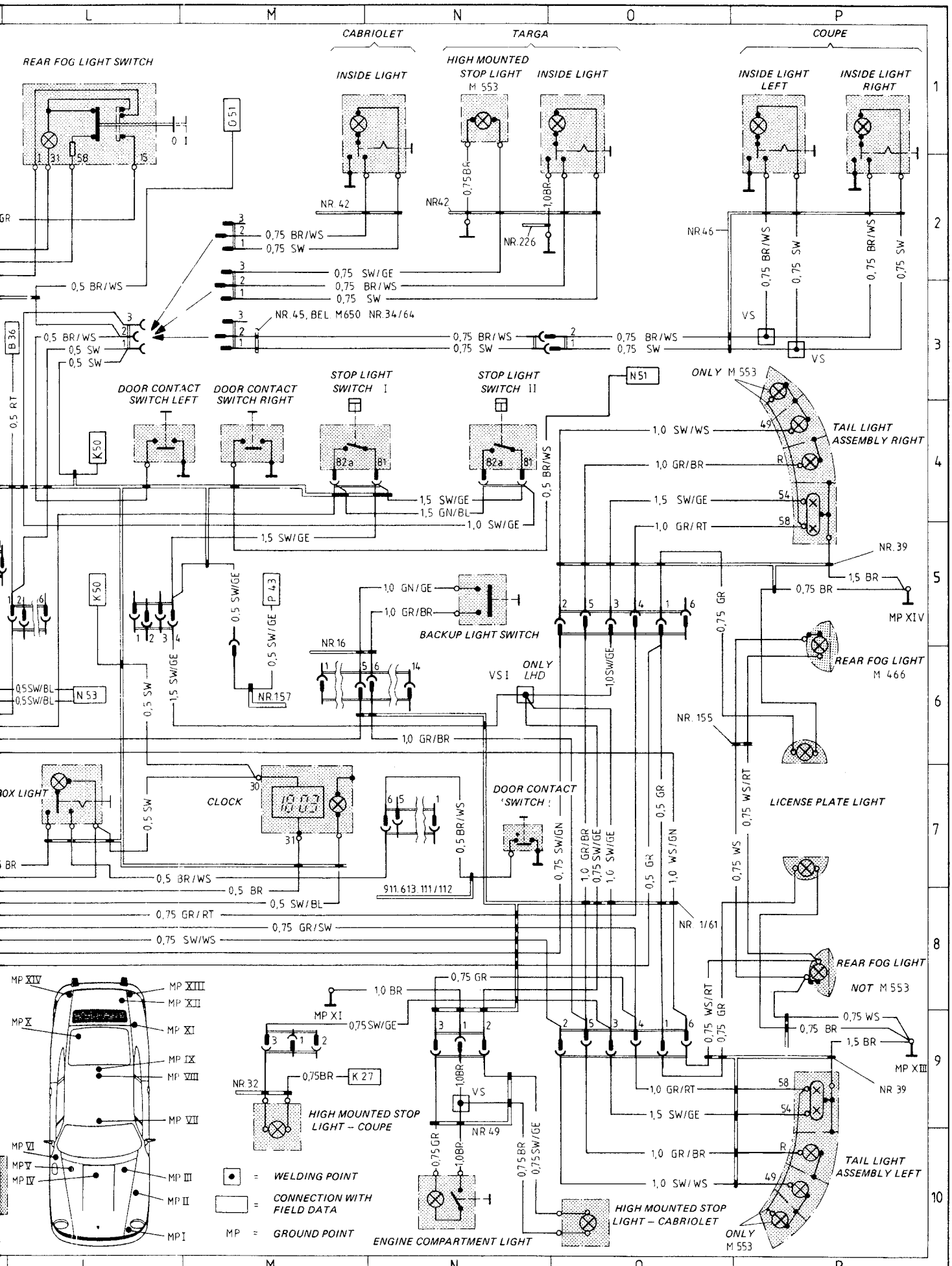
Wiring Diagram Type 911 Carrera Model 86 Sheet 2

LAMPS



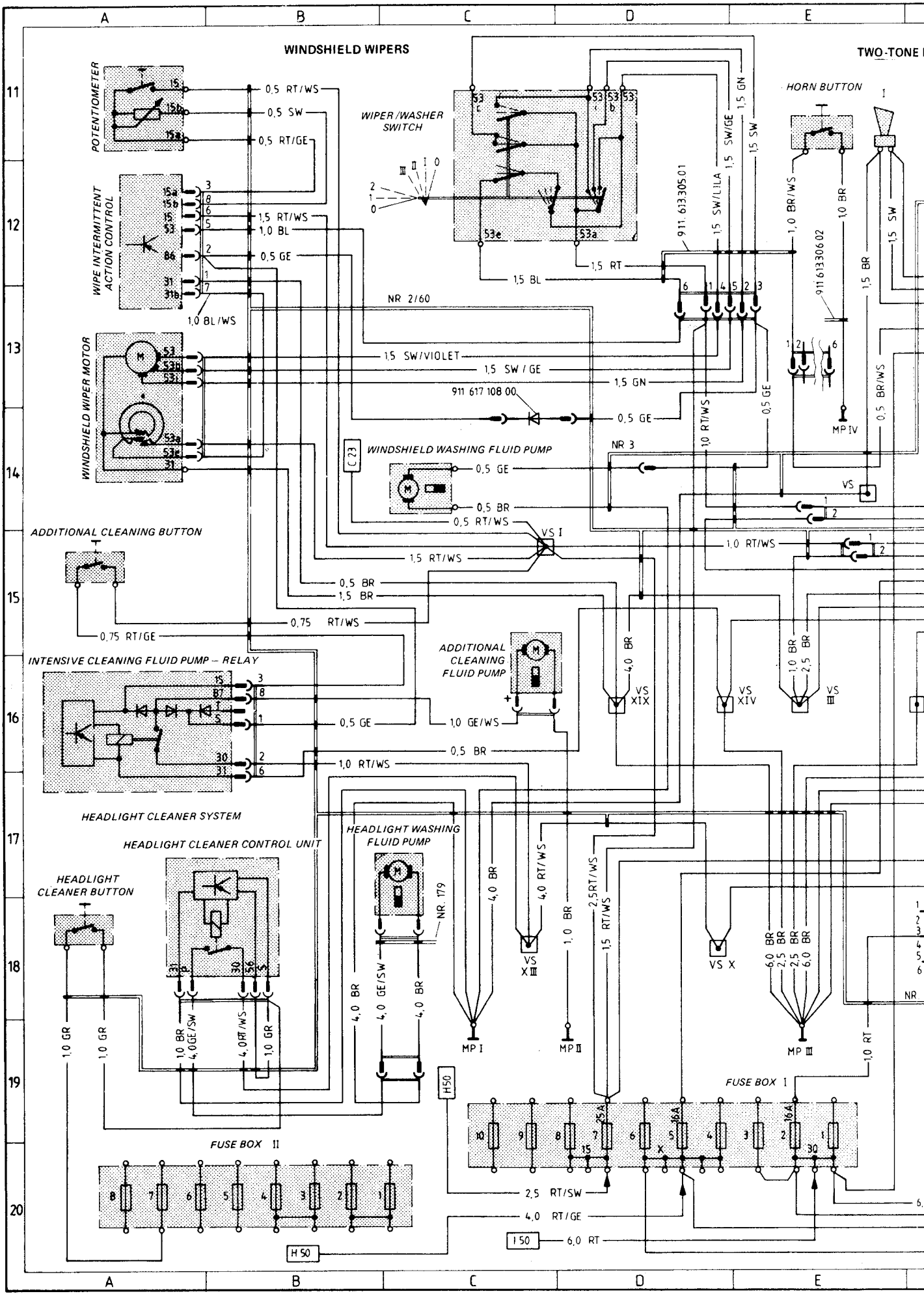
Printed in Germany - III, 1985


F
G
H
I
K
L
NR 10
911.617 108 00
ASHTRAY LIGHT
K 49
NR 11
0,5 BR
HAZARD LIGHT SWITCH
MP IV
G 25
FRONT FOG LAMP SWITCH
M 430
REAR FOG LIGHT SWITCH
LIGHT SWITCH
F 23
0,5 GR/RT
0,5 GR/SW
0,5 WS/GN
2,5 RT
0,5 SW/BL
1,5 GR
1,5 SW/BL
0,5 BR/WS
0,5 SW
1,0 GR
0,5 BL/SW
0,5 GR/GE
0,5 SW/BL
F 21
NR 10
NR. 14
K 26
1,5 RT/WS
1,5 SW/WS/GN
1,0 SW/WS
1,5 RT/SW
1,0 GN/RT
1,0 BL/WS
1,5 WS/GN
0,5 RT
B 36
K 50
TRAILER
TURN SIGNAL
INDICATOR LAMP
M 48
2,5 RT/WS
SIGN LIGHT
M 553
TURN SIGNAL FLASHER
N 52
O 12
VS
XIX
VS
XX
VS
VII
L 53
N 53
H 55
F 27
0,5 BL/WS
1,0 SW/WS/GN
2,5 SW/BL
1,5 SW/BL
FRONT FOG LAMP RELAY
VS
XVIII
VS
XXI
0,75 SW/BL
1,0 BR
1,6 SW/GN
1,0 SW/WS
1,0 GN/RT
0,75 BR
MP II
M 193
H 54
1,5 RT
1,5 WS/GN
0,75 BR
1,0 SW
2,5 BR
6,0 BR
0,5 Sw/BL
F 55
GLOVE BOX LIGHT
VS
III
VS
XV
0,5 SW/BL
0,75 WS/BR
VS
XIV
2,5 BR
1,5 GN/BL
1,0 GN/RT
2,5 BR
I 57
I 50
MP XIV
MP X
MP VI
MP V
MP IV
MP III
FUSE BOX 1
8A
5A
16A
6,0 RT
H 50
2,5 RT/SW
4,0 RT/GE
H 50
SW = BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET


L
M
N
O
P
1
2
3
4
5
6
7
8
9
10
REAR FOG LIGHT SWITCH
CABRIOLET
TARGA
COUPE
INSIDE LIGHT
HIGH MOUNTED STOP LIGHT M 553
INSIDE LIGHT
INSIDE LIGHT LEFT
INSIDE LIGHT RIGHT
DOOR CONTACT SWITCH LEFT
DOOR CONTACT SWITCH RIGHT
STOP LIGHT SWITCH I
STOP LIGHT SWITCH II
ONLY M 553
TAIL LIGHT ASSEMBLY RIGHT
TAIL LIGHT ASSEMBLY LEFT
BACKUP LIGHT SWITCH
ONLY LHD
REAR FOG LIGHT M 466
REAR FOG LIGHT NOT M 553
LICENSE PLATE LIGHT
CLOCK
DOOR CONTACT SWITCH
HIGH MOUNTED STOP LIGHT – COUPE
HIGH MOUNTED STOP LIGHT – CABRIOLET
ENGINE COMPARTMENT LIGHT
911.613.111/112
WELDING POINT
CONNECTION WITH FIELD DATA
GROUND POINT

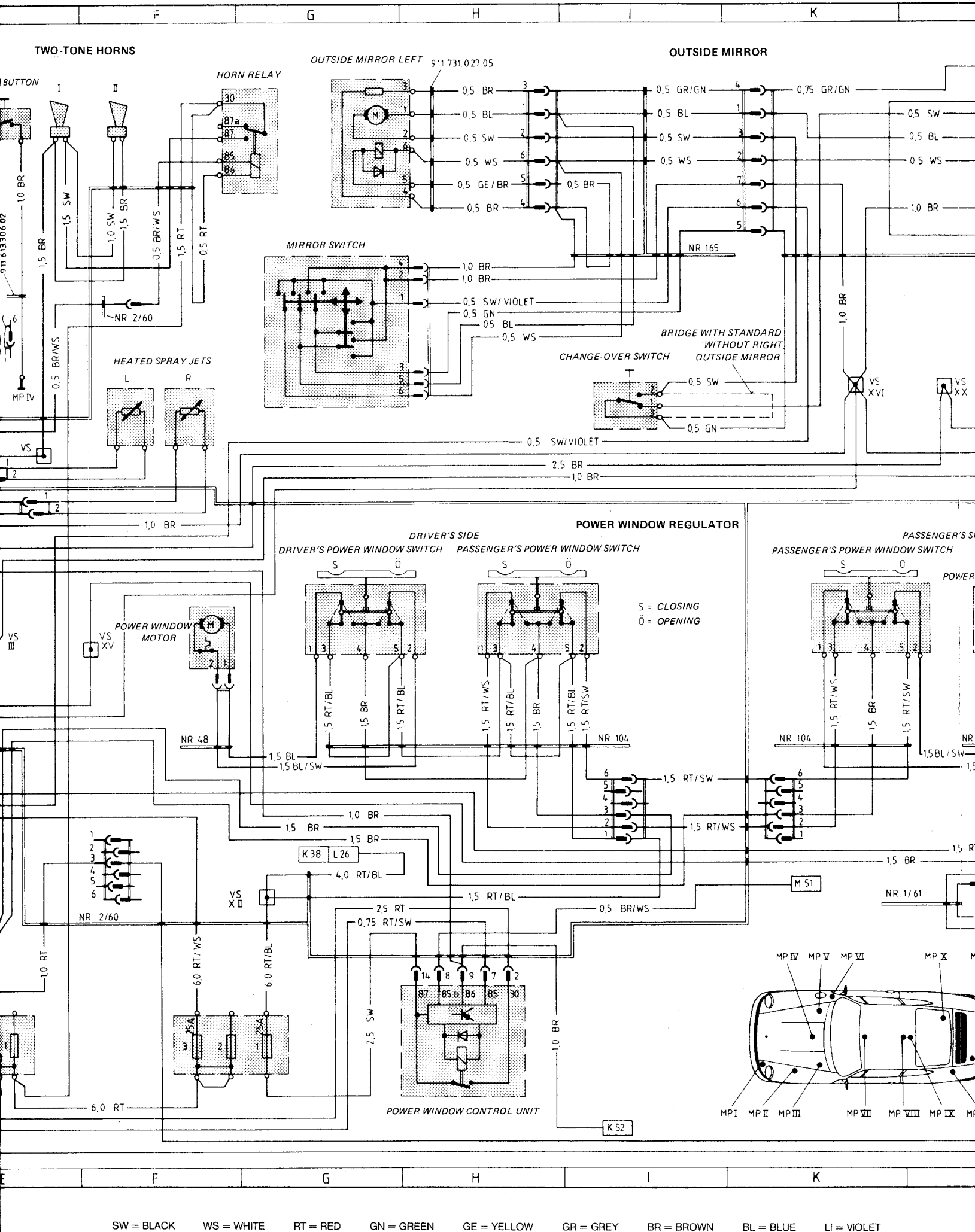
Wiring Diagram Type 911 Carrera Model 86 Sheet 3

BODY

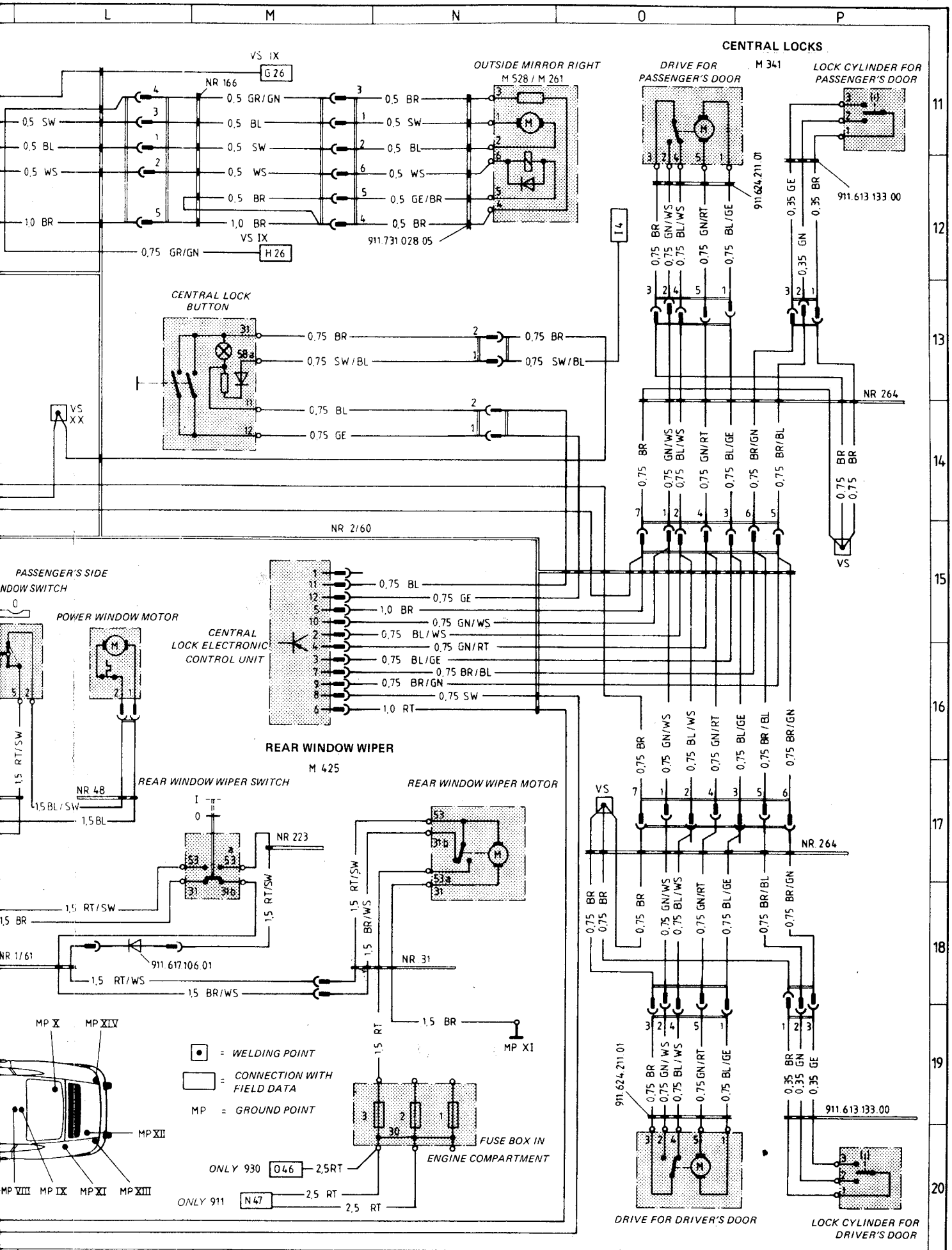


Printed in Germany - III, 1985

eet 3

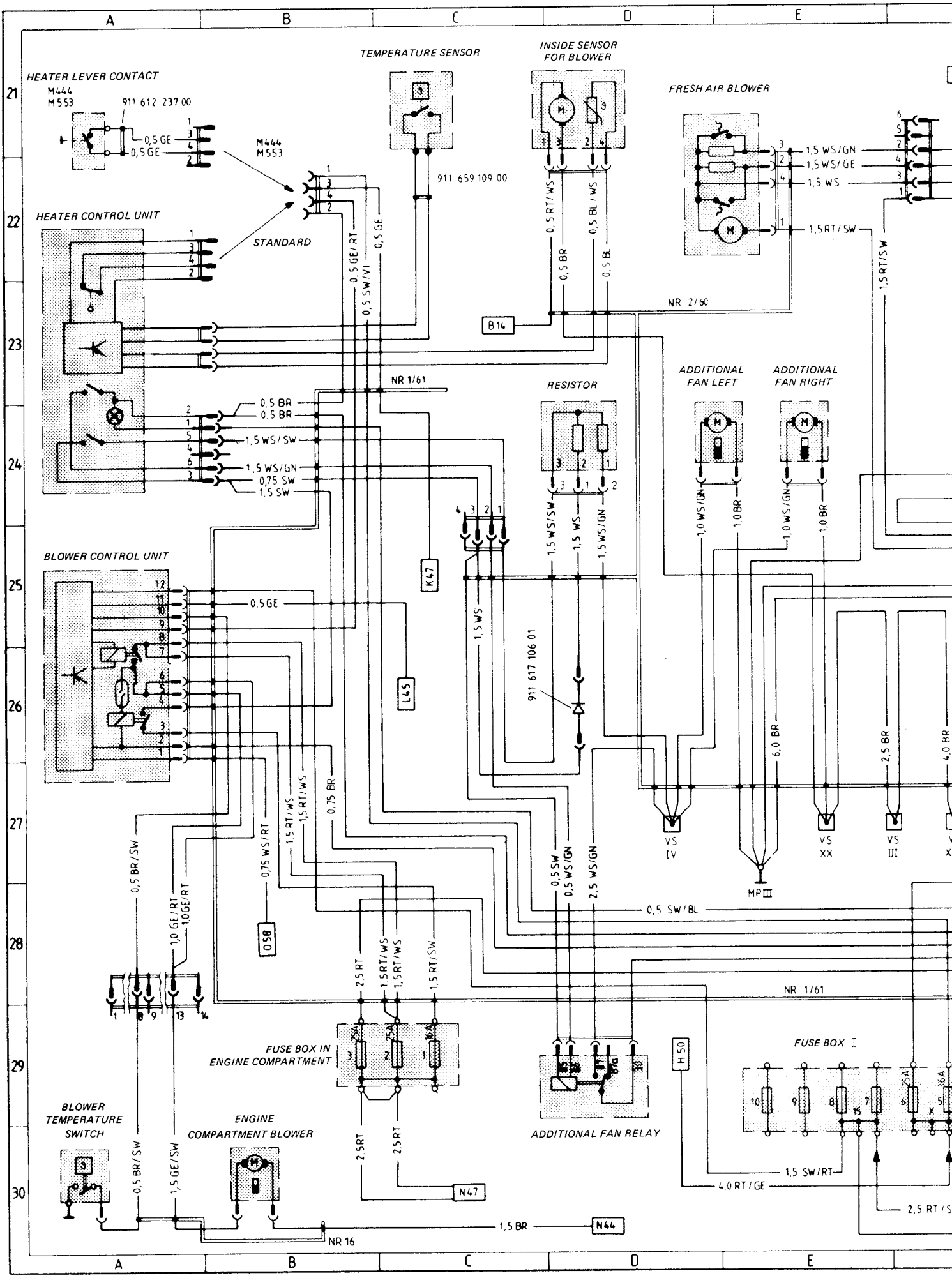


SW = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET


CENTRAL LOCKS
VS IX
G 26
NR 166
0,5 GR/GN
0,5 BR
OUTSIDE MIRROR RIGHT
M 528 / M 261
0,5 SW
0,5 BL
0,5 WS
1,0 BR
0,75 GR/GN
H 26
911.731.028 05
DRIVE FOR PASSENGER'S DOOR
M 341
LOCK CYLINDER FOR PASSENGER'S DOOR
911.624.211 01
911.613.133.00
I 4
CENTRAL LOCK BUTTON
0,75 BR
0,75 SW/BL
0,75 BL
0,75 GE
VS XX
NR 264
BR
GN/WS
BL/WS
GN/RT
BL/GE
BR/GN
BR/BL
NR 2/60
PASSENGER'S SIDE WINDOW SWITCH
POWER WINDOW MOTOR
CENTRAL LOCK ELECTRONIC CONTROL UNIT
1,0 RT
REAR WINDOW WIPER
M 425
REAR WINDOW WIPER SWITCH
REAR WINDOW WIPER MOTOR
NR 48
NR 223
NR 31
NR 1/61
1,5 RT/SW
1,5 BR
1,5 BL/SW
1,5 BL
1,5 BR/WS
1,5 RT/WS
911.617.106 01
MP X
MP XIV
MP XII
MP VIII
MP IX
MP XI
MP XIII
MP XI
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
FUSE BOX IN ENGINE COMPARTMENT
ONLY 930 046 2,5RT
ONLY 911 N 47 2,5 RT
DRIVE FOR DRIVER'S DOOR
LOCK CYLINDER FOR DRIVER'S DOOR
0,35 BR
0,35 GN
0,35 GE

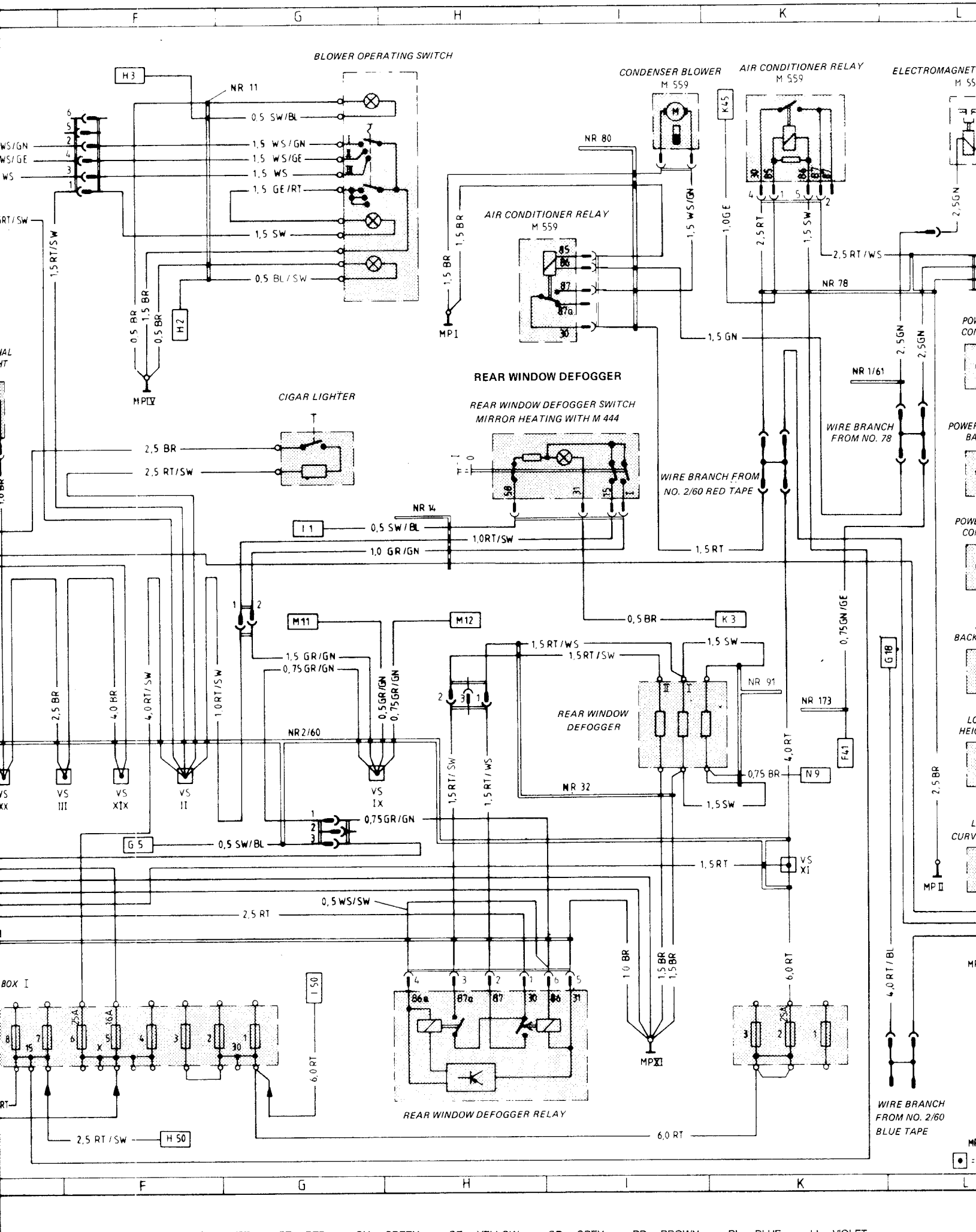
Wiring Diagram Type 911 Carrera Model 86 Sheet 4

HEATING AND VENTILATION

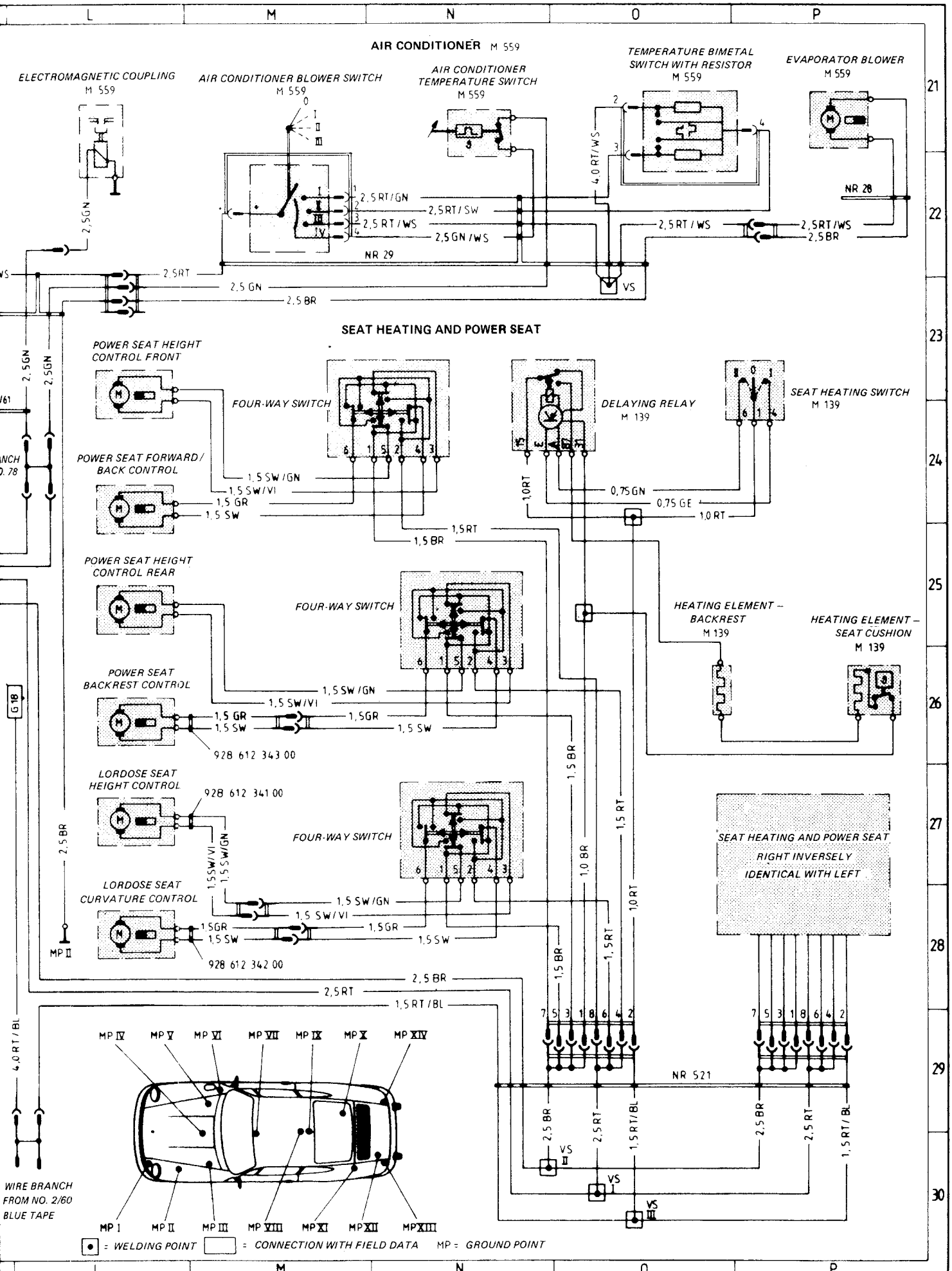


SW =

et 4

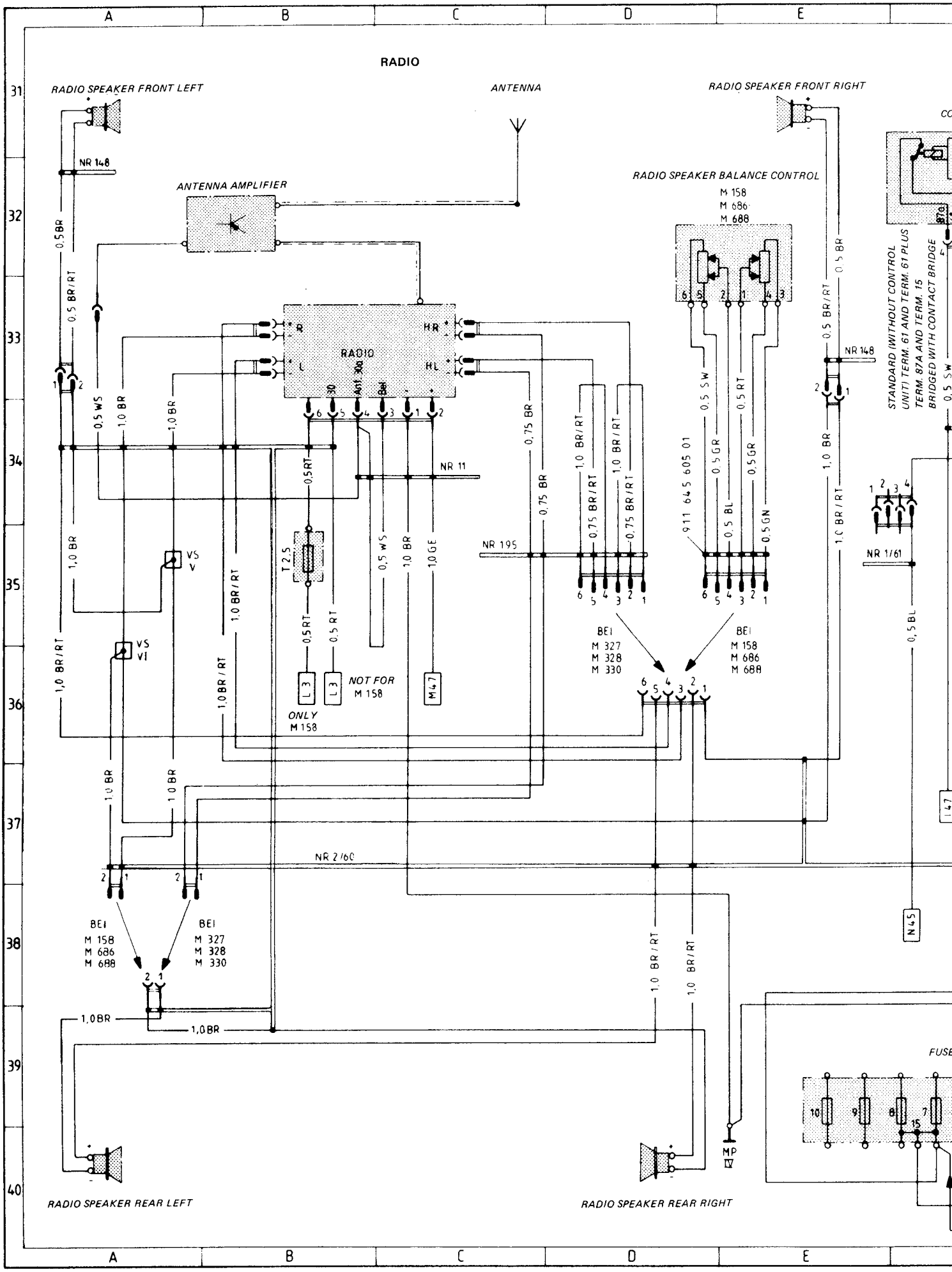


SW = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET


L
M
N
O
P
21
22
23
24
25
26
27
28
29
30
AIR CONDITIONER M 559
ELECTROMAGNETIC COUPLING M 559
AIR CONDITIONER BLOWER SWITCH M 559
AIR CONDITIONER TEMPERATURE SWITCH M 559
TEMPERATURE BIMETAL SWITCH WITH RESISTOR M 559
EVAPORATOR BLOWER M 559
2,5 GN
2,5 RT/GN
2,5 RT/SW
2,5 RT/WS
2,5 GN/WS
4,0 RT/WS
NR 29
NR 28
2,5 RT/WS
2,5 BR
2,5 RT
2,5 GN
2,5 BR
VS
SEAT HEATING AND POWER SEAT
POWER SEAT HEIGHT CONTROL FRONT
FOUR-WAY SWITCH
DELAYING RELAY M 139
SEAT HEATING SWITCH M 139
POWER SEAT FORWARD/ BACK CONTROL
1,5 SW/GN
1,5 SW/VI
1,5 GR
1,5 SW
1,0 RT
0,75 GN
0,75 GE
1,0 RT
1,5 RT
1,5 BR
POWER SEAT HEIGHT CONTROL REAR
FOUR-WAY SWITCH
HEATING ELEMENT – BACKREST M 139
HEATING ELEMENT – SEAT CUSHION M 139
POWER SEAT BACKREST CONTROL
G 18
1,5 SW/GN
1,5 SW/VI
1,5 GR
1,5 SW
1,5 GR
1,5 SW
928 612 343 00
LORDOSE SEAT HEIGHT CONTROL
928 612 341 00
FOUR-WAY SWITCH
LORDOSE SEAT CURVATURE CONTROL
1,5 SW/VI
1,5 SW/GN
1,5 SW/GN
1,5 SW/VI
1,5 GR
1,5 SW
1,5 GR
1,5 SW
928 612 342 00
MP II
SEAT HEATING AND POWER SEAT RIGHT INVERSELY IDENTICAL WITH LEFT
1,5 BR
1,5 RT
1,0 BR
1,0 RT
1,5 BR
1,5 RT
2,5 BR
2,5 RT
1,5 RT/BL
4,0 RT/BL
NR 521
2,5 BR
2,5 RT
1,5 RT/BL
2,5 BR
2,5 RT
1,5 RT/BL
VS II
VS I
VS III
WIRE BRANCH FROM NO. 2/60 BLUE TAPE
MP IV
MP V
MP VI
MP VII
MP IX
MP X
MP XIV
MP I
MP II
MP III
MP VIII
MP XI
MP XII
MP XIII
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT

Wiring Diagram Type 911 Carrera Model 86 Sheet 5

RADIO, ALARM SYSTEM, CONVERTIBLE TOP, LIFTING ROOF



SW =

F G H I K L

BURGLAR ALARM
M 533

NT RIGHT

CONTROL SWITCH

ALARM SWITCH

ALARM HORN

ENGINE HOOD CONTROL LEFT

ENGINE HOOD CONTROL RIGHT

MICROSWITCH – UPPER POINT

MICROSWITCH – HOOD C

STANDARD (WITHOUT CONTROL UNIT) TERM. 61 AND TERM. 61 PLUS TERM. 87A AND TERM. 15 BRIDGED WITH CONTACT BRIDGE

CONVERTIBLE TOP CONTROL UNIT

SUN RO
M 65

WIRE BRANCH FROM NO. 2/60 BLUE TAPE

MOTOR

FUSE BOX 1

FUSE HOLDER WITH FUSE

NR 148

NR 1/61

NR 165

VS XVI

VS X

MP III

MP II

DS

PS1

C54

I 47

N 45

G 18

P 58

I 50

H 50

901 612 835 01

0,5 BR/RT

1,0 BR/RT

0,5 SW

0,5 BL

0,75 BR/WS

1,0 SW/RT

0,75 GR

1,0 RT

1,0 RT/WS

1,0 BR

1,0 RT/WS

1,5 SW

1,5 GN

0,5 BL/GE

0,5 BR/SW

0,5 BR

1,5 RT/BL

0,5 BR/GR

0,5 BR/GE

0,5 BR/GN

2,5 BR

1,0 RT

0,5 WS/RT

2,5 SW

2,5 GN

1,5 BL

1,5 SW

0,5 GE

0,5 BR/WS

1,5 RT/WS

2,5 RT/WS

4,0 RT/WS

4,0 RT/BL

6,0 RT/WS

2,5 BL

2,5 GE

2,5 RT/SW

0,5 GE

0,5 GE/BR

M1 31 L 15 30 T

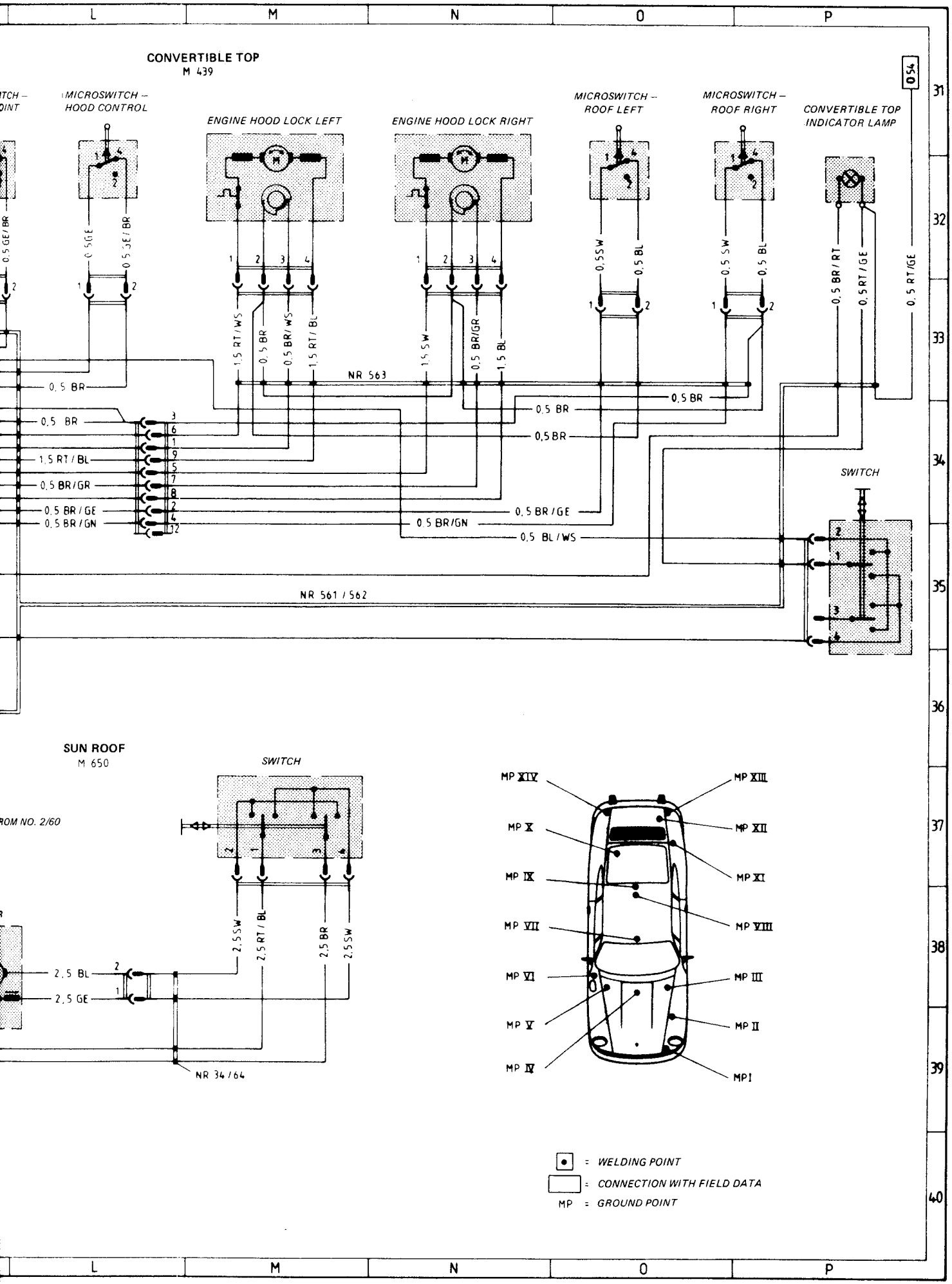
K ZL MO O ZR MS

M3 Z MER SR MVR A

M2 MEL SL MVL

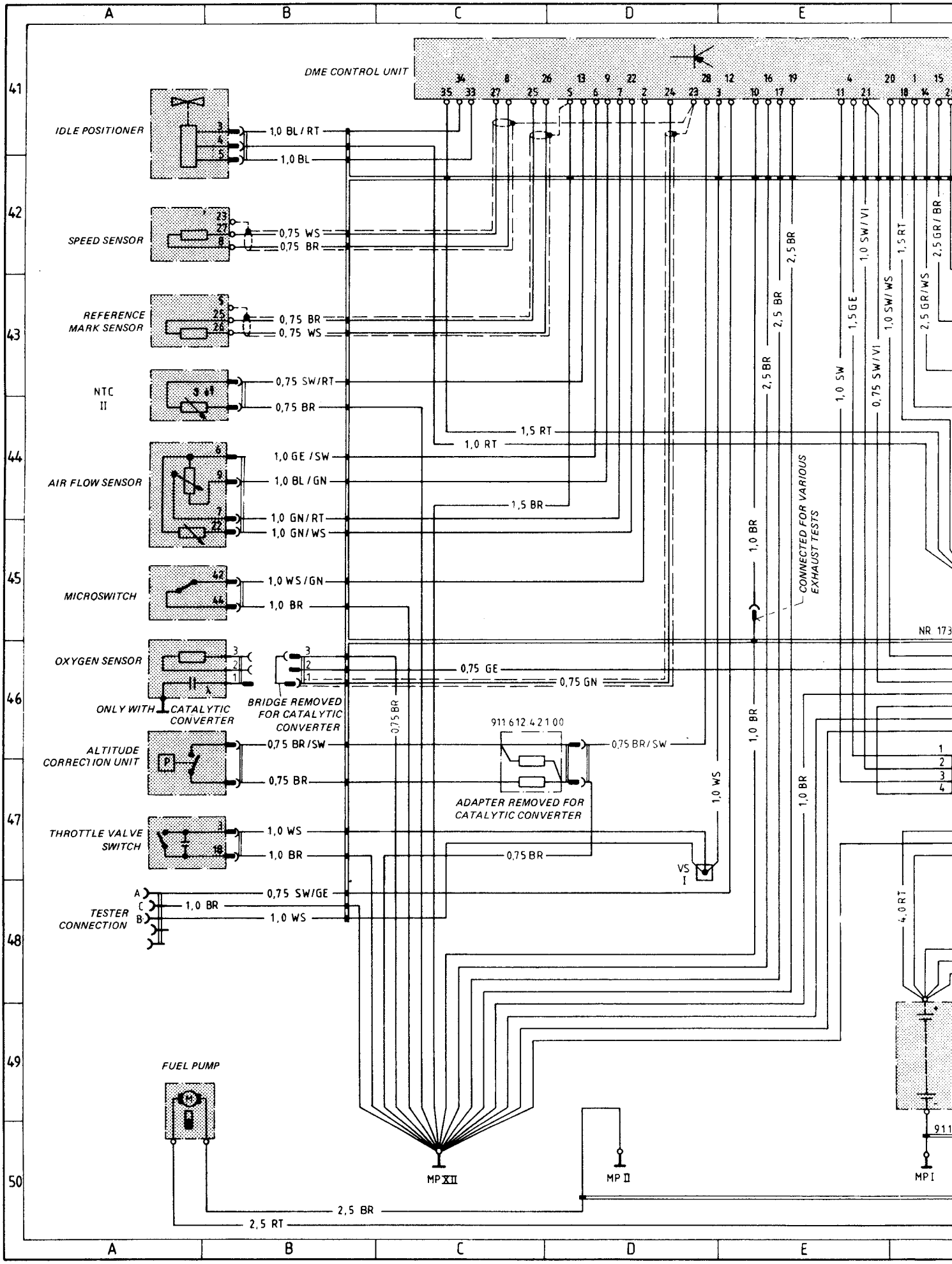
F G H I K L

SW = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET


L
M
N
O
P
CONVERTIBLE TOP
M 439
MICROSWITCH – HOOD CONTROL
ENGINE HOOD LOCK LEFT
ENGINE HOOD LOCK RIGHT
MICROSWITCH – ROOF LEFT
MICROSWITCH – ROOF RIGHT
CONVERTIBLE TOP INDICATOR LAMP
054
0,5 GE/BR
0,5 GE
0,5 GE/BR
1,5 RT/WS
0,5 BR
0,5 BR/WS
1,5 RT/BL
1,5 SW
0,5 BR/GR
1,5 BL
0,5 SW
0,5 BL
0,5 SW
0,5 BL
0,5 BR/RT
0,5 RT/GE
0,5 RT/GE
NR 563
0,5 BR
0,5 BR
0,5 BR
0,5 BR
0,5 BR/GE
0,5 BR/GN
0,5 BR/GE
0,5 BR/GN
0,5 BL/WS
1,5 RT/BL
0,5 BR/GR
0,5 BR/GE
0,5 BR/GN
SWITCH
NR 561/562
SUN ROOF
M 650
SWITCH
FROM NO. 2/60
2,5 SW
2,5 RT/BL
2,5 BR
2,5 SW
2,5 BL
2,5 GE
NR 34/64
MP XIV
MP XIII
MP X
MP XII
MP IX
MP XI
MP VII
MP VIII
MP VI
MP III
MP V
MP II
MP IV
MP I
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
31
32
33
34
35
36
37
38
39
40

Wiring Diagram Type 911 Carrera Model 86 Sheet 6

ENGINE (DME) TEMPOSTAT



Printed in Germany - III, 1985

SW =

et 6

F | G | H | I | K | L

FUEL INJECTORS

CYLINDER VI | CYLINDER V | CYLINDER IV | CYLINDER III | CYLINDEF II | CYLINDER I

SPARK P

DISTR

K 27

0,75 GN/GE

1,0 SW

1,5 GE

1,0 SW/VI

0,75 SW/VI

1,0 SW/WS

1,5 RT

2,5 GR/BR

2,5 GR/WS

1,5 WS/RT

1,5 GR/BR

1,0 RT/WS

1,0 GR/WS

NR. 174

2,5 WS/RT

2,5 GR/BR

2,5 RT/WS

2,5 GR/WS

2,5 RT

VS II

DME CONTROL UNIT

B7 b | 85 b | B7 | 85 | 86 | 30

6,0 RT

0,75 RT

SPEED SHUTOFF RELAY
M 277 M 062

31b | 15 | 31 | 30 | B7 a

VACUUM CONTROL VALVE
M 277 M 062

IGNITION TRANSFORMER

NR. 173

0,75 RT/BL

1,0 SW

0,75 BR

0,75 BR

1,5 GE

WIRE BRANCH
FROM NO. 2/60
STARTER TERM. 50

1,0 GE

0,5 GE

K 21

C 26

NR. 78

4,0 GE

0,5 GE

4,0 GE

VS II
STARTER

C 25

0,5 SW/VI

I 55

0,5 SW

K 55

0,5 SW

F 37

4,0 GE

4,0 RT

B 55

1,0 RT/SW

2,5 RT/SW

1,0 RT/SW

4,0 RT/GE

4,0 RT

4,0 RT

5 | 6 | 4 | 1 | 2 | 3

2,5 GE

2,5 RT/SW

0,5 RT/SW

2,5 RT/GE

2,5 RT

2,5 RT

NR. 2/60

NR. 11

H 1

2,5 RT

30 | X | P | R

BATTERY

911.611.899.00

MPI

NR. 2/60

6,0 RT

2,5 RT/GN

O 53

FUSE BOX I

10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

15 | X | 30 | 8A | 25A

L 5

0,5 SW

L 4

SW = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET

L M N O P

SPARK PLUGS

6 5 4 3 2 1

174

DISTRIBUTOR

2,5 GN

TRANSFORMER 1 4 15

2,5 SW

C 26

NR. 1/61

0,5 GE

4,0 GE

VS II
STARTER 50

NR. 22

35,0 SW

C 36

1,0 GE

2,5 RT/WS G 4

1,0 GR E 1

30 X P R 15 50

IGNITION LOCK

BUZZER CONTACT ONLY
M 533, M 215

W

L 4 0,5 SW

0,5 VI H 53

ALTERNATOR

NR. 233

6,0 BR

B+ D+ 61

B-

10,0 RT

STARTER

15

50

30

M

1,5 BR

NR. 16

D 30

2,5 GE 2,5 RT 0,75 BL 2,5 RT

1 2 11 12 13 14

F 38

0,5 BL

2,5 RT

2,5 RT

M 20 C 30

CLUTCH SWITCH

NR. 157

TEMPOSTAT
M 454

CRUISE CONTROL REGULATOR

12 3 11 1 10 9
2 7 4 6 5 8

CRUISE CONTROL SWITCH

Be Pus

0,5 BR
0,5 BR
0,5 GR/BR
0,5 SW/BR
0,5 SW
0,5 BL
0,5 GE

911 613 102 01

0,5 GE
0,5 BR
0,5 BL
0,5 SW

3 4 1 2

M 5

O 52

N 58

CRUISE CONTROL RELAY

0,5 SW
0,5 BR/WS
0,5 WS/GN

86 85 87 87a 30

2 1

NR. 158

CRUISE CONTROL DRIVE

0,5 WS/GN
0,5 GR/BR

MP XIV MP XII MP XIII MP XI MP X MP IX MP VIII MP VII MP VI MP V MP IV MP III MP II MP I

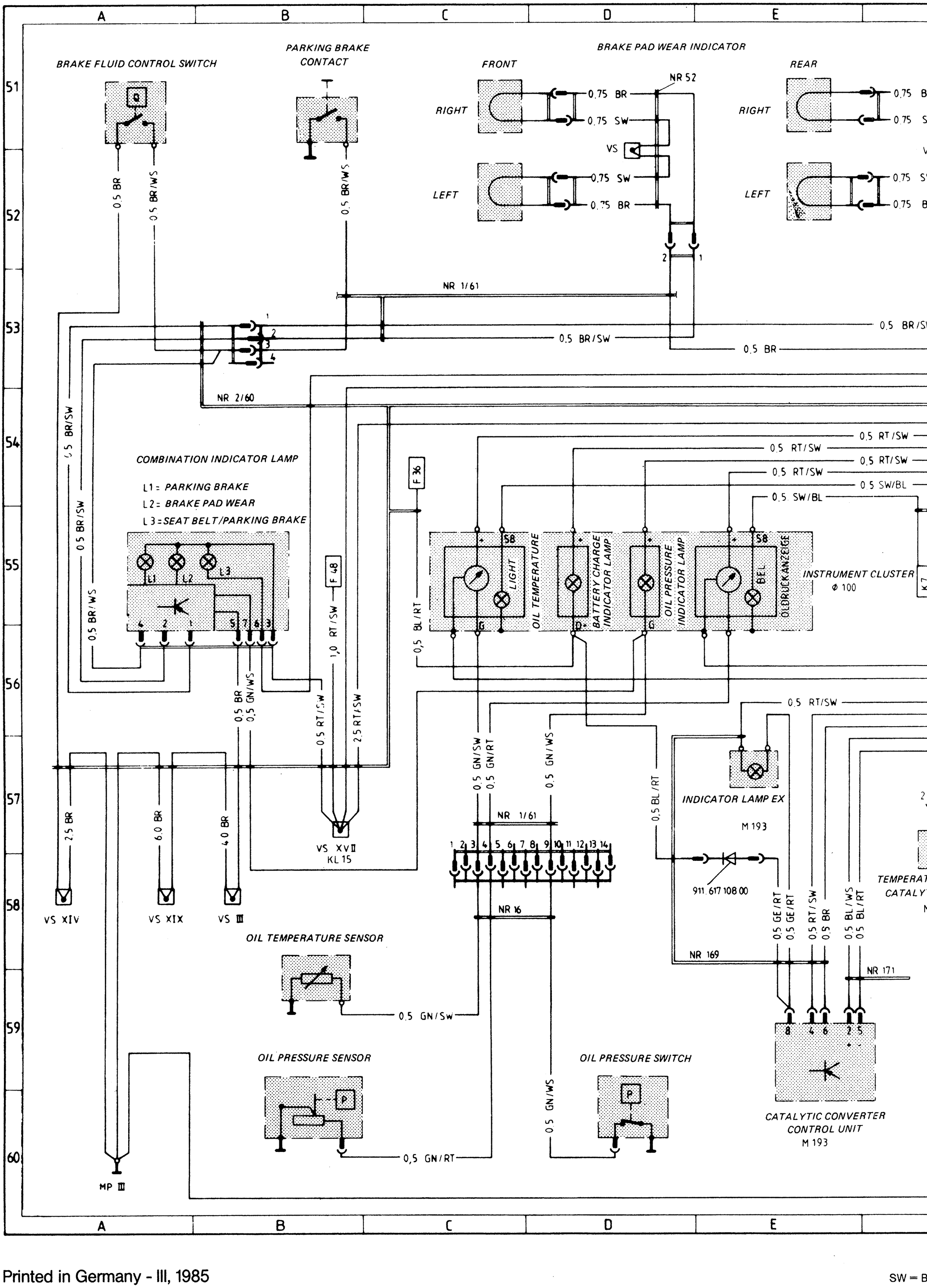
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT

41 42 43 44 45 46 47 48 49 50

L M N O P

Wiring Diagram Type 911 Carrera Model 86 Sheet 7

INSTRUMENTS AND INDICATORS



Printed in Germany - III, 1985

SW = B

et 7

F | G | H | I | K | L

EAR

0.75 BR — NR 51
0.75 SW
VS
0.75 SW
0.75 BR
1 2
0.5 BR/SW

0.5 GR/RT
0.5 BR/WS
0.5 GN/GE
0.5 BR/WS
1.0 BR
0.5 RT/SW
911 617 108 00

SEAT BELT CONTACT

5 17 11 4 10 12
85 86 L G 31 15
120
0.5 GN
0.5 VIOLET
M 50

SEAT BELT CONTROL UNIT WITH M 553, M 215
FOR REST OF WORLD { TERMINALS L AND G BRIDGED (BRIDGE 911 612 816 00)
TERMINALS 86 AND 31 BRIDGED (BRIDGE 911 612 916 00)

0.5 RT/SW
/SW
0.5 RT/SW
T/SW
0.5 SW/BL
W/BL

F 7 — 0.5 SW/BL
H 47 — 0.5 SW
G 47 — 0.5 SW/VIOLET
E 5 — 0.5 GR

INSTRUMENT CLUSTER
Ø 100
K 7
VS VIII
KL 15
0,5 RT/SW
0,5 RT/SW
0,5 RT/SW

0,5 RT/SW
1,0 BR
1,0 BR
1,0 BR
0,5 SW/BL
0,5 BR

RT/SW

2 1
TEMPERATURE SENSOR FOR CATALYTIC CONVERTER
M 193

RESERVE LIGHT
FUEL GAGE
OIL LEVEL GAGE
INSTRUMENT CLUSTER
Ø 80
K 8
VS VII
NR 2/60

8 7 6 5 4 3 2 1
(31) (15) (TD)
M 553
UPSHIFT INDICATOR
HIGH BEAMS
TURN SIGNALS LEFT

0,5 BR
0,5 BR

OIL TANK LEVEL TRANSMITTER
NR 39
Q
0,5 GN/BL
0,75 WS/RT
0,75 WS
1 2 3 4 5 6
NR 1/61

0,5 GN
0,5 SW
0,5 BR

FUEL LEVEL TRANSMITTER
W
31
G
2
3
1

VS XV

MP IV
MPI

0.5 RT/SW
0.5 BR
0.5 BL/WS
0.5 BL/RT
NR 171
4 6 2 5
YTIC CONVERTER
ONTROL UNIT
M 193

MP II
MP XIV
2,5 BR

F | G | H | I | K | L

SW = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET

911 617 108 00

0.75 BR/WS — F 35

0.5 BR/WS — M 1

0.5 BR/WS — 03

0.5 BR/WS — K 18

NR 2/60

0.5 GN

NR 157 — P 44

F 4

SPEED TRANSMITTER

VS VII — K 5

0.75 BR

0.75 GN

VS VII — L 6

G 49

NR 561/562 — P 31

D 6

0,75 BR

0,75 GN

0,5 WS/GN

0,5 SW/BL

0,5 SW/BL

0,5 SW/BR

1,0 RT/SW

0,5 RT/GE

E 7

0,5 SW/WS

0,5 SW/GN

0,5 SW/BL

0,5 SW/BL

NR 1/61

MARKER LIGHT

LIGHT

LIGHT

SPEEDOMETER

TURN SIGNALS LEFT

TURN SIGNALS RIGHT

LIGHT

LIGHT

TACHOMETER

HIGH BEAMS

M 553

SPEED WARNING BUZZER
M 215
M 193

NR 157

0,5 BR

P 45

0,5 BR

0,5 BR

NR 561/562

0,75 WS/RT

0.5 WS/RT — I 40

B 28

MP IV MP V MP VI MP X MP XIV

MP XII

MP XIII

MP I MP II MP III MP VII MP VIII MP IX MP XI

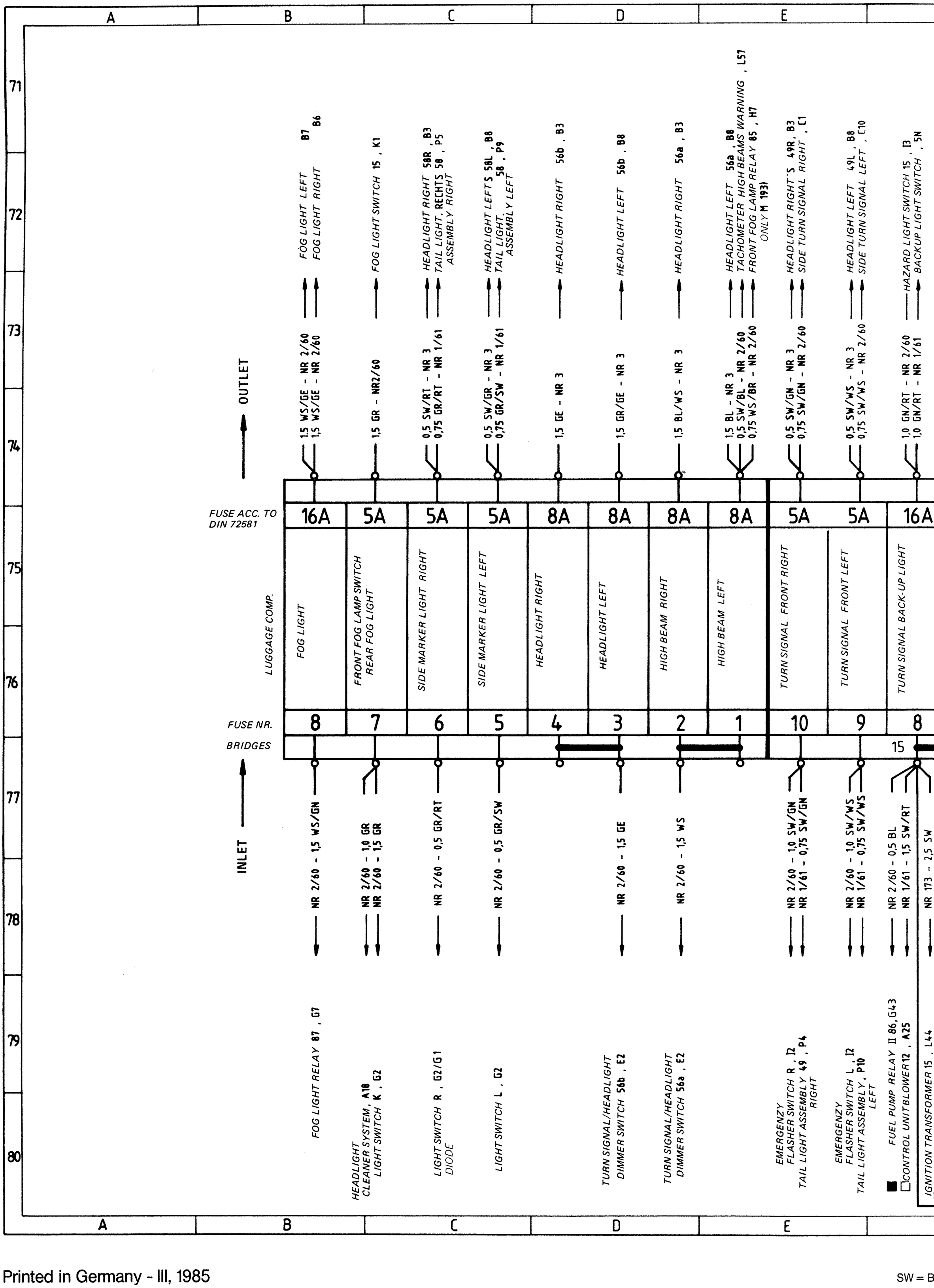
= WELDING POINT

= CONNECTION WITH FIELD DATA

MP = GROUND POINT

Wiring Diagram Type 911 Carrera Model 86 Sheet 8

CONNECTION AND EQUIPMENT FUSES



Printed in Germany - III, 1985

SW = B

Sheet 8

SW = BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET

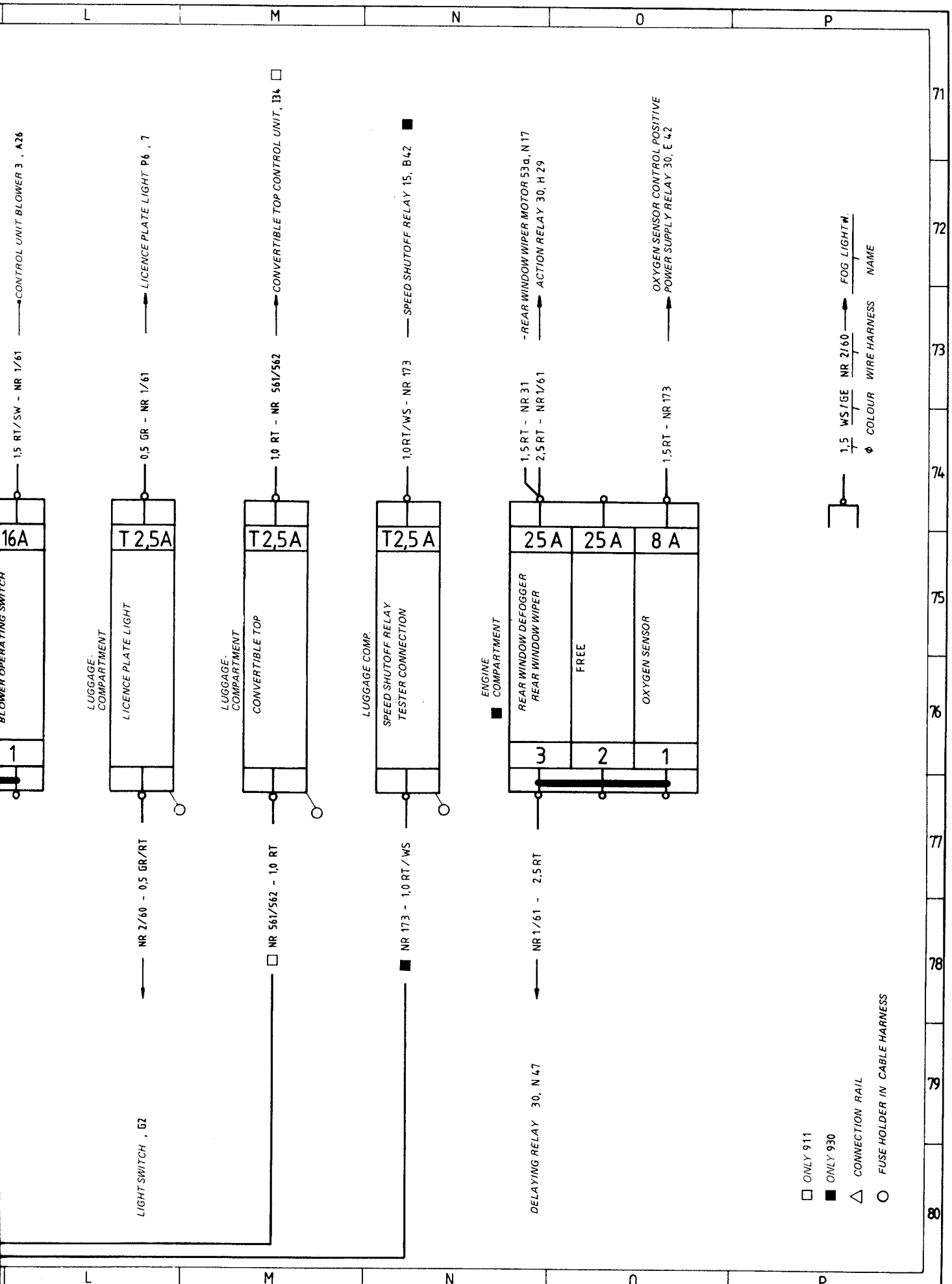
F G H I K L

							RIGHT
EMERGENZY FLASHER SWITCH L , I2 TAIL LIGHT ASSEMBLY , P10 LEFT	NR 2/60 - 1,0 SW/WS NR 1/61 - 0,75 SW/WS		9	TURN SIGNAL FRONT LEFT	5A	0,5 SW/WS - NR 3 0,75 SW/WS - NR 2/60	HEADLIGHT LEFT 49L , B8 SIDE TURN SIGNAL LEFT , C10
■ FUEL PUMP RELAY II 86, G43 □ CONTROL UNIT BLOWER 12 , A25	NR 2/60 - 0,5 BL NR 1/61 - 1,5 SW/RT	15	8	TURN SIGNAL BACK-UP LIGHT	16A	1,0 GN/RT - NR 2/60 1,0 GN/RT - NR 1/61	HAZARD LIGHT SWITCH 15 , I3 BACKUP LIGHT SWITCH , 5N
IGNITION TRANSFORMER 15 , L44	NR 173 - 2,5 SW						
□ AIR CONDITIONER RELAY 86 , K22	NR 78 - 1,5 SW						
IGNITION LOCK 15 , L49 CONTROL UNIT ALARM 15 , F32 ■ DELAYING RELAY S , N 47	NR 2/60 - 2,5 RT/SW NR 2 /60 - 1,0 SW/RT NR 1/61 - 0,5 RT/WS		7	WIPE INTERMITTENT ACTION CONTROL REAR WINDOW WIPER HEATED SPRAY JETS	25A	2,5 RT/WS - NR 2/60 1,5 RT/WS - NR 2/60 1,5 RT/SW - NR 2/60	WELDING POINT KL 15 , C15 WINDSHIELD WIPER SWITCH 53a , D12 REAR WINDOW WIPER 53 , L17 SWITCH
CENTRAL LOCK CONTROL UNIT 8 , M16	NR 2/60 - 0,75 SW	X	6	FRESH AIR BLOWER REAR WINDOW DEFOGGER RELAY CIGAR LIGHTER	25A	4,0 RT/SW - NR 2/60	WELDING POINT KL X , F27
IGNITION LOCK X , L49 POWER WINDOW CONTROL UNIT 85 , H19	NR 2/60 - 4,0 RT/GE NR 2/60 - 0,75 RT/SW		5	MIRROR HEATING REGULATION	16A	0,5 SW/VIOLETT - NR 2/60 0,5 SW/VIOLETT - NR 1/61 1,5 SW/VIOLETT - NR 1/61	SCHALTER MIRROR SWITCH NG 1 , H13 HEATING CONTROL UNIT 1 , B22 □ HEATING CONTROL UNIT 3 , B22 ■
AIR FLOW SENSOR MANIFOLD PRESSURE , I43 RELAY	NR 1/61 - 0,5 SW		4	BRAKE LIGHT TEMPOSTAT	8A	0,5 SW - NR 157 1,5 GN/BL - NR 2/60	RELAY TEMPOSTAT 86 , P45 □ BRAKE LIGHT SWITCH I 82a , M4
IGNITION □ CONTROL UNIT 87b , G45	NR 173 - 2,5 RT/GN		3	FUEL PUMP	25A	2,5 RT - NR 2/60 2,5 RT - NR 2/60	FUEL PUMP , A50 □ FUEL PUMP RELAY II 30, G43 ■
CONTROL UNIT ALARM 30 , G32 HORN RELAY 30 , F11	NR 2/60 - 1,0 RT NR 3 - 1,5 RT	30	2	WARNING LIGHT CENTRAL LOCKING SYSTEM	16A	1,0 RT - NR 2/60 1,5 RT/SW - NR 2/60	CENTRAL LOCK CONTROL UNIT . 6 , M16 HAZARD LIGHT SWITCH , I3
FOG LIGHT RELAY 30 , G7 CONTROL UNIT POWER WINDOW 30 , H19	NR 2/60 - 1,5 RT NR 2/60 - 2,5 RT						
BATTERY + , F49	NR 2/60 - 6,0 RT		1	INTERIOR LIGHT CLOCK RADIO	5A	1,0 SW - NR 2/60	INSIDE LIGHT NOP1
			3	HEADLIGHT CLEANER SYSTEM CONVERTIBLE TOP	25A	6,0 RT/WS - NR 2/60	WELDING POINT X , H37 , D18
			2	AIR CONDITION ADDITIONAL FAN POWER SEAT CONTROL	25A	6,0 RT - NR 2/60	WELDING POINT XI , K28
POWER WINDOW CONTROL UNIT 87 , H19	NR 2/60 - 2,5 SW		1	POWER WINDOW, SUN ROOF SEAT HEATING	25A	6,0 RT/BL - NR 2/60	WELDING POINT XII , G18

ENGINE COMPARTMENT

			3	REAR WINDOW DEFOGGER REAR WINDOW WIPER	25A	1,5 RT - NR 31 2,5 RT - NR 1/61	MOTOR REAR WINDOW WIPER 53a , N17 ACTION RELAY 30 , H29
GENERATOR B+ , M42	NR 1/61 - 2,5 RT		2	ENGINE COMPARTMENT BLOWER	25A	1,5 RT/WS - NR 1/61 1,5 RT/WS - NR 1/61	CONTROL UNIT BLOWER 7 , A26 CONTROL UNIT BLOWER 8 , A26
GENERATOR B+ , M42	NR 1/61 - 2,5 RT		1	BLOWER OPERATING SWITCH	16A	1,5 RT/SW - NR 1/61	CONTROL UNIT BLOWER 3 , A26

LUGGAGE-COMPARTMENT


L
M
N
O
P
71
72
73
74
75
76
77
78
79
80
CONTROL UNIT BLOWER 3 , A26
1,5 RT/SW - NR 1/61
16A
BLOWER OPERATING SWITCH
1
LIGHT SWITCH , G2
LUGGAGE-COMPARTMENT
LICENCE PLATE LIGHT
T 2,5A
LICENCE PLATE LIGHT P6 , 7
0,5 GR - NR 1/61
NR 2/60 - 0,5 GR/RT
LUGGAGE-COMPARTMENT
CONVERTIBLE TOP
T2,5A
CONVERTIBLE TOP CONTROL UNIT, 134
1,0 RT - NR 561/562
NR 561/562 - 1,0 RT
LUGGAGE COMP.
SPEED SHUTOFF RELAY
TESTER CONNECTION
T2,5 A
SPEED SHUTOFF RELAY 15, B42
1,0 RT/WS - NR 173
NR 173 - 1,0 RT/WS
ENGINE COMPARTMENT
REAR WINDOW DEFOGGER
REAR WINDOW WIPER
25 A
FREE
25 A
OXYGEN SENSOR
8 A
3
2
1
DELAYING RELAY 30, N 47
-REAR WINDOW WIPER MOTOR 53a, N 17
ACTION RELAY 30, H 29
1,5 RT - NR 31
2,5 RT - NR 1/61
NR 1/61 - 2,5 RT
OXYGEN SENSOR CONTROL POSITIVE
POWER SUPPLY RELAY 30, E 42
1,5 RT - NR 173
1,5 WS/GE NR 2/60 FOG LIGHT W.
COLOUR WIRE HARNESS NAME
ONLY 911
ONLY 930
CONNECTION RAIL
FUSE HOLDER IN CABLE HARNESS

Wiring Diagram Type 911 turbo Model 86

SHEET	**1**	GROUND TERMINALS
SHEET	**2**	LAMPS
SHEET	**3**	BODY
SHEET	**4**	HEATING AND VENTILATION
SHEET	**5**	RADIO, ALARM SYSTEM, LIFTING ROOF
SHEET	**6**	ENGINE (K-JETRONIK) OXYGEN SENSOR SYSTEM
SHEET	**7**	INSTRUMENTS AND INDICATORS
SHEET	**8**	CONNECTION AND EQUIPMENT FUSES

Wiring Diagram Type 911 turbo
Model 86

WIRE COLOURS

SW = BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET

⊡ = WELDING POINT
▭ = CONNECTION WITH FIELD INDICATION
MP = GROUND CONNECTING POINT

Wiring Diagram Type 911 turbo Model 86 Sheet 1

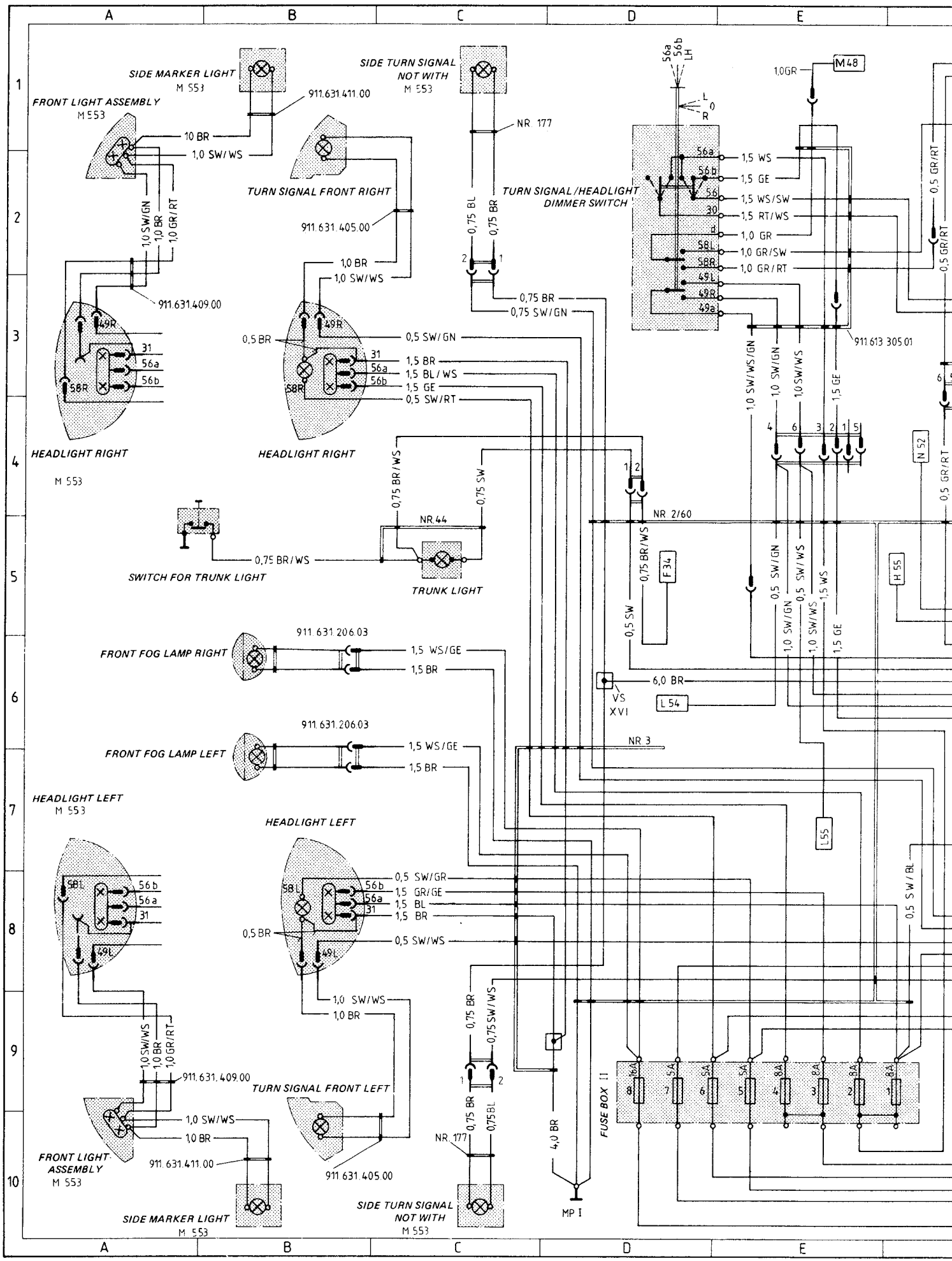
GROUND TERMINALS

Ground Terminals

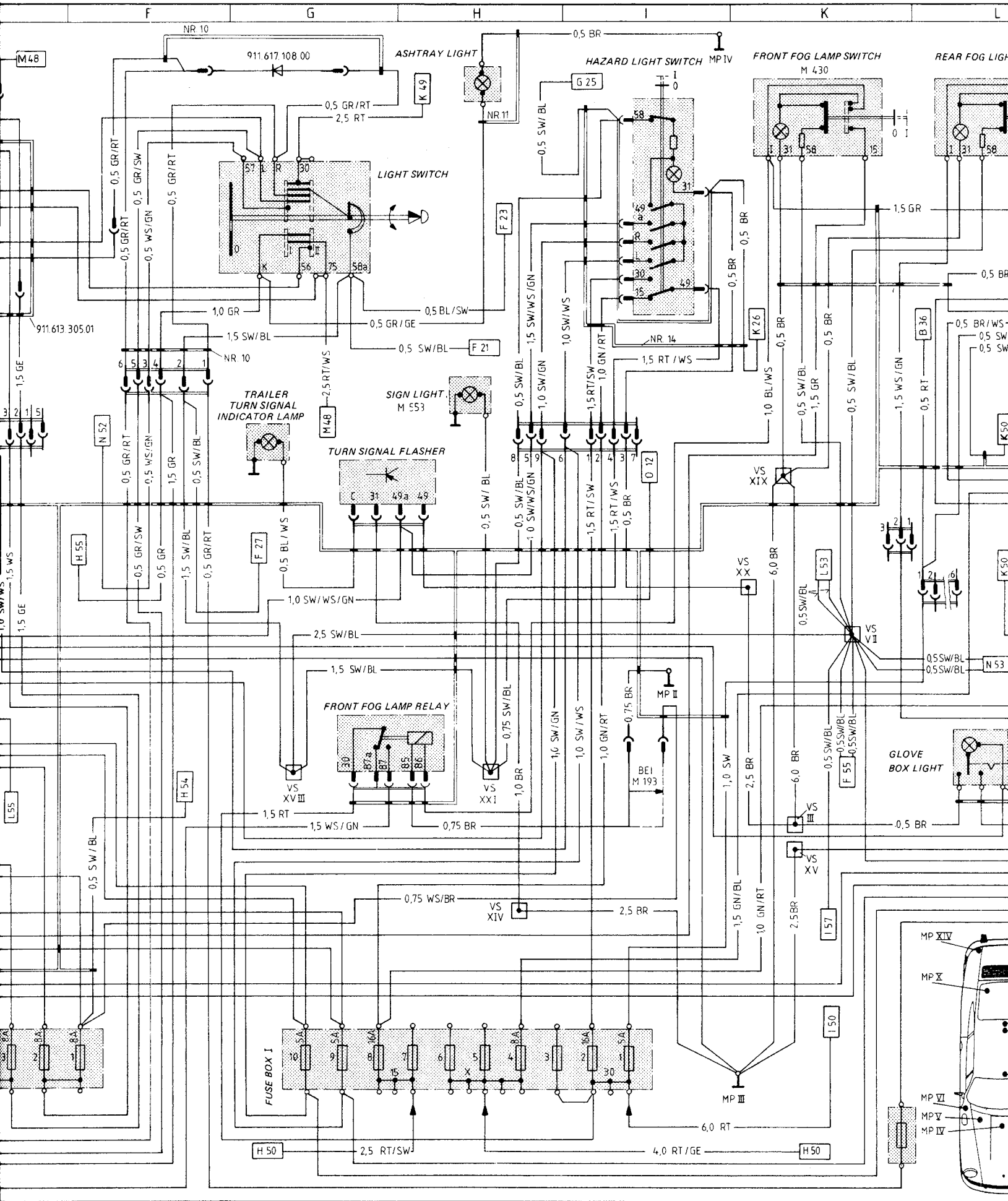
I Ground - battery
II Ground - fuse box carrier
III Ground - luggage compartment floor LHD
IV Ground - firewall inside
V Ground - luggage compartment floor RHD
VI Ground - electric antenna + central lock control unit
VII Ground - inside light Cabriolet
VIII Ground - inside light Targa + high mounted stop light
IX Ground - high mounted stop light Coupe
X Ground strap - transmission + engine + body
XI Ground - engine compartment rear left
XII Ground - engine left
XIII Ground - impact damper left
XIV Ground - impact damper right

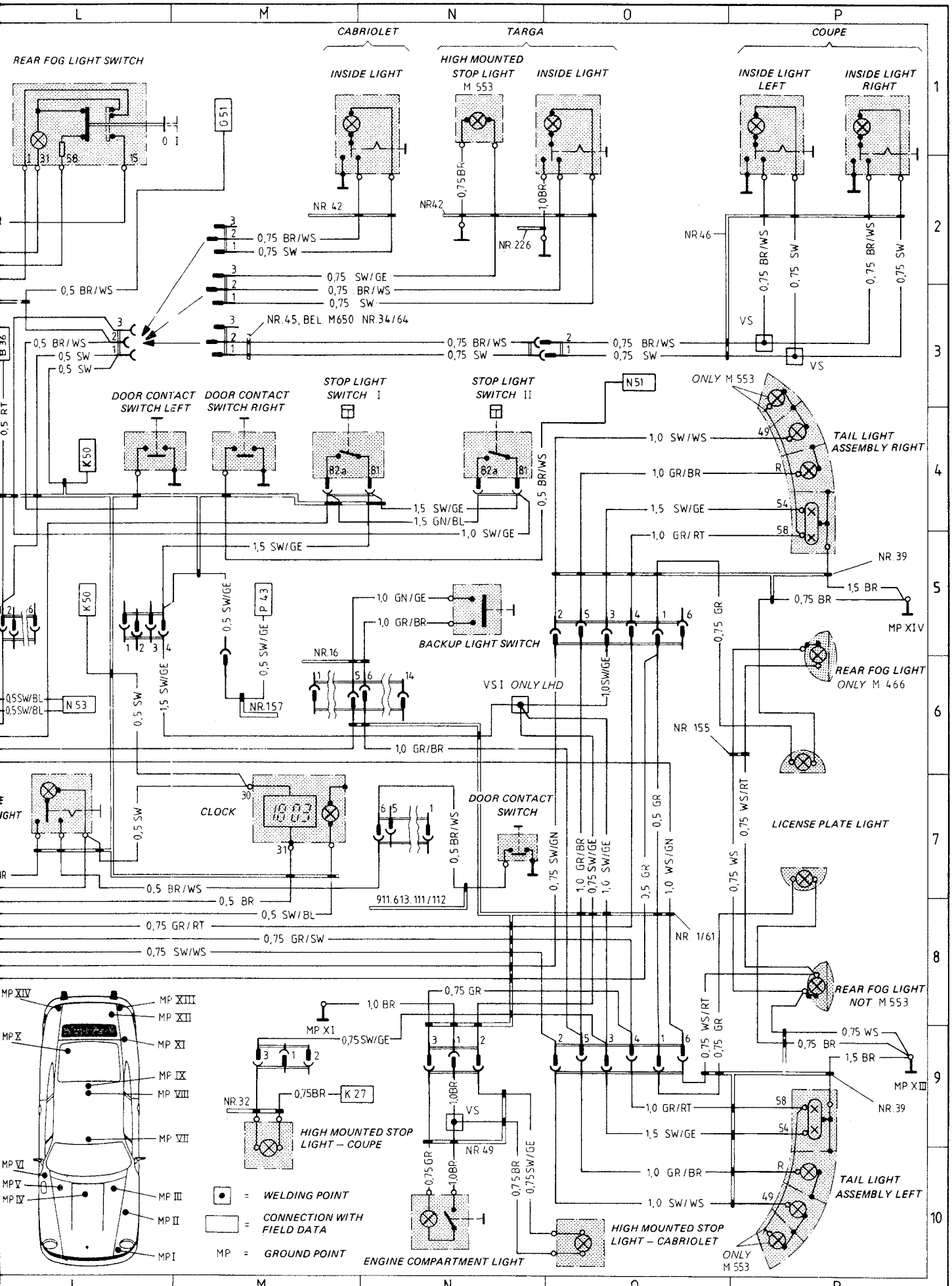
Wiring Diagram Type 911 turbo Model 86 Sheet 2

LAMPS



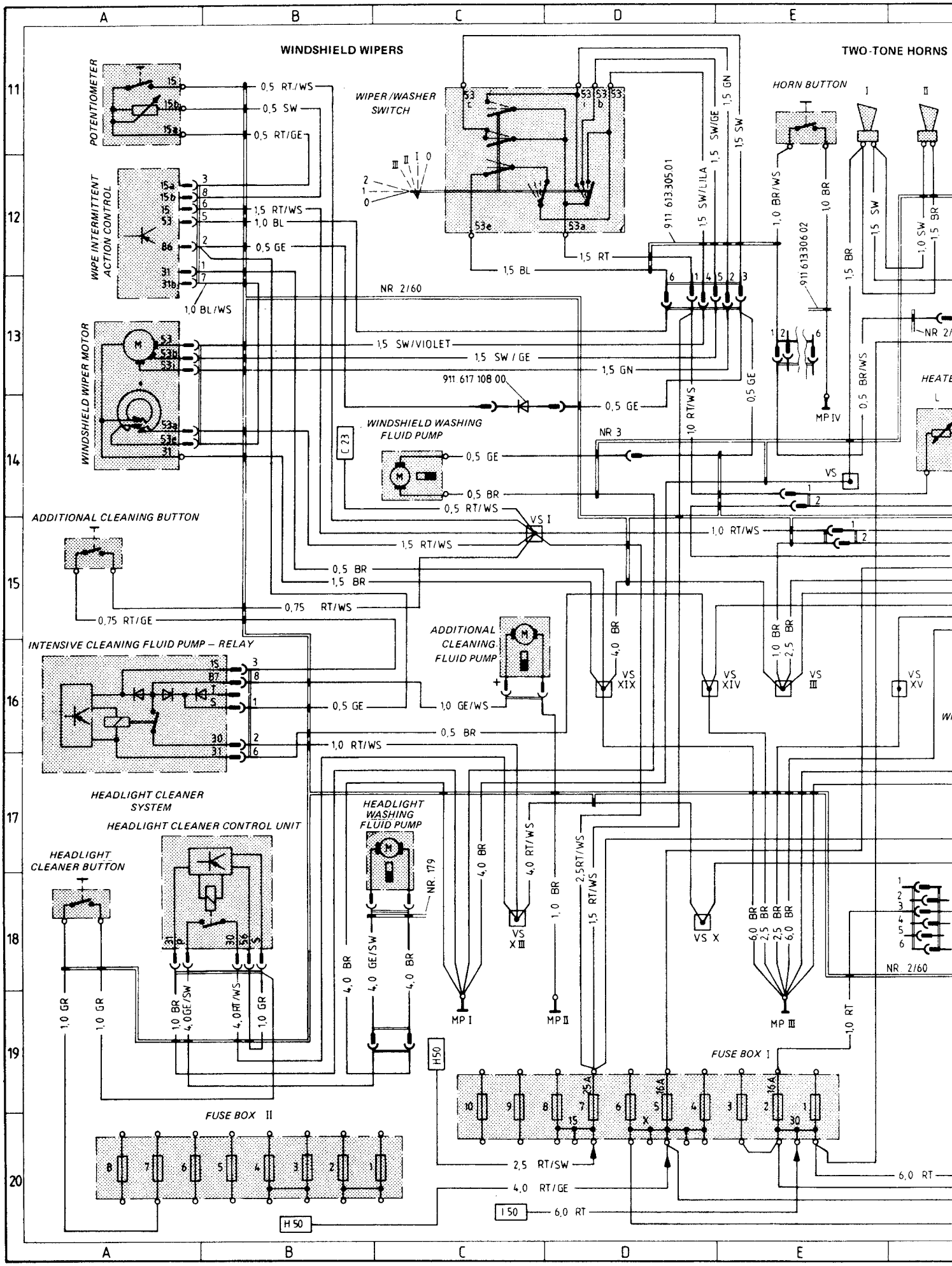
SW = B


F
G
H
I
K
L
NR 10
911.617.108.00
M48
ASHTRAY LIGHT
K 49
NR 11
0,5 BR
MP IV
HAZARD LIGHT SWITCH
G 25
FRONT FOG LAMP SWITCH
M 430
REAR FOG LIGH
0,5 GR/RT
2,5 RT
0,5 GR/SW
0,5 WS/GN
LIGHT SWITCH
F 23
0,5 SW/BL
1,5 GR
0,5 BR
1,0 GR
0,5 BL/SW
0,5 GR/GE
911.613.305.01
1,5 SW/BL
0,5 SW/BL
F 21
NR 14
K 26
1,5 RT/WS
1,5 GE
TRAILER
TURN SIGNAL
INDICATOR LAMP
SIGN LIGHT
M 553
2,5 RT/WS
TURN SIGNAL FLASHER
1,5 SW/WS/GN
1,0 SW/WS/GN
1,5 RT/SW
1,0 GN/RT
0,5 BR/WS
0,5 SW
0,5 RT
B 36
K50
N 52
0,5 GR/RT
0,5 WS/GN
1,5 GR
0,5 SW/BL
0,5 BL/WS
0 12
VS XIX
VS XX
VS VII
L 53
6,0 BR
H 55
F 27
1,0 SW/WS/GN
2,5 SW/BL
1,5 SW/BL
0,5SW/BL
N 53
FRONT FOG LAMP RELAY
0,75 SW/BL
0,75 BR
MP II
1,0 SW/GN
1,0 SW/WS
1,0 GN/RT
BEI M 193
1,0 SW
2,5 BR
6,0 BR
F 55
GLOVE
BOX LIGHT
VS XVIII
VS XXI
1,0 BR
H 54
L 55
1,5 RT
1,5 WS/GN
0,75 BR
VS III
VS XV
0,5 SW/BL
0,75 WS/BR
VS XIV
2,5 BR
1,5 GN/BL
1,0 GN/RT
2,5 BR
I 57
MP XIV
MP X
I 50
FUSE BOX I
MP III
MP VI
MP V
MP IV
6,0 RT
H 50
2,5 RT/SW
4,0 RT/GE
H 50
SW = BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET


L
M
N
O
P
CABRIOLET
TARGA
COUPE
REAR FOG LIGHT SWITCH
INSIDE LIGHT
HIGH MOUNTED STOP LIGHT M 553
INSIDE LIGHT
INSIDE LIGHT LEFT
INSIDE LIGHT RIGHT
DOOR CONTACT SWITCH LEFT
DOOR CONTACT SWITCH RIGHT
STOP LIGHT SWITCH I
STOP LIGHT SWITCH II
ONLY M 553
TAIL LIGHT ASSEMBLY RIGHT
BACKUP LIGHT SWITCH
REAR FOG LIGHT ONLY M 466
VSI ONLY LHD
CLOCK
DOOR CONTACT SWITCH
LICENSE PLATE LIGHT
REAR FOG LIGHT NOT M 553
HIGH MOUNTED STOP LIGHT – COUPE
HIGH MOUNTED STOP LIGHT – CABRIOLET
TAIL LIGHT ASSEMBLY LEFT
ENGINE COMPARTMENT LIGHT
ONLY M 553
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT

Wiring Diagram Type 911 turbo Model 86 Sheet 3

BODY



SW =

F G H I K L

TWO-TONE HORNS

HORN RELAY

OUTSIDE MIRROR LEFT 911 731.027.05

OUTSIDE MIRROR

MIRROR SWITCH

HEATED SPRAY JETS

BRIDGE WITH STANDARD WITHOUT RIGHT OUTSIDE MIRROR

CHANGE-OVER SWITCH

POWER WINDOW REGULATOR

DRIVER'S SIDE

DRIVER'S POWER WINDOW SWITCH

PASSENGER'S POWER WINDOW SWITCH

PASSENGER'S SIDE

PASSENGER'S POWER WINDOW SWITCH

S = CLOSING
O = OPENING

POWER WINDOW MOTOR

POWER WINDOW CONTROL UNIT

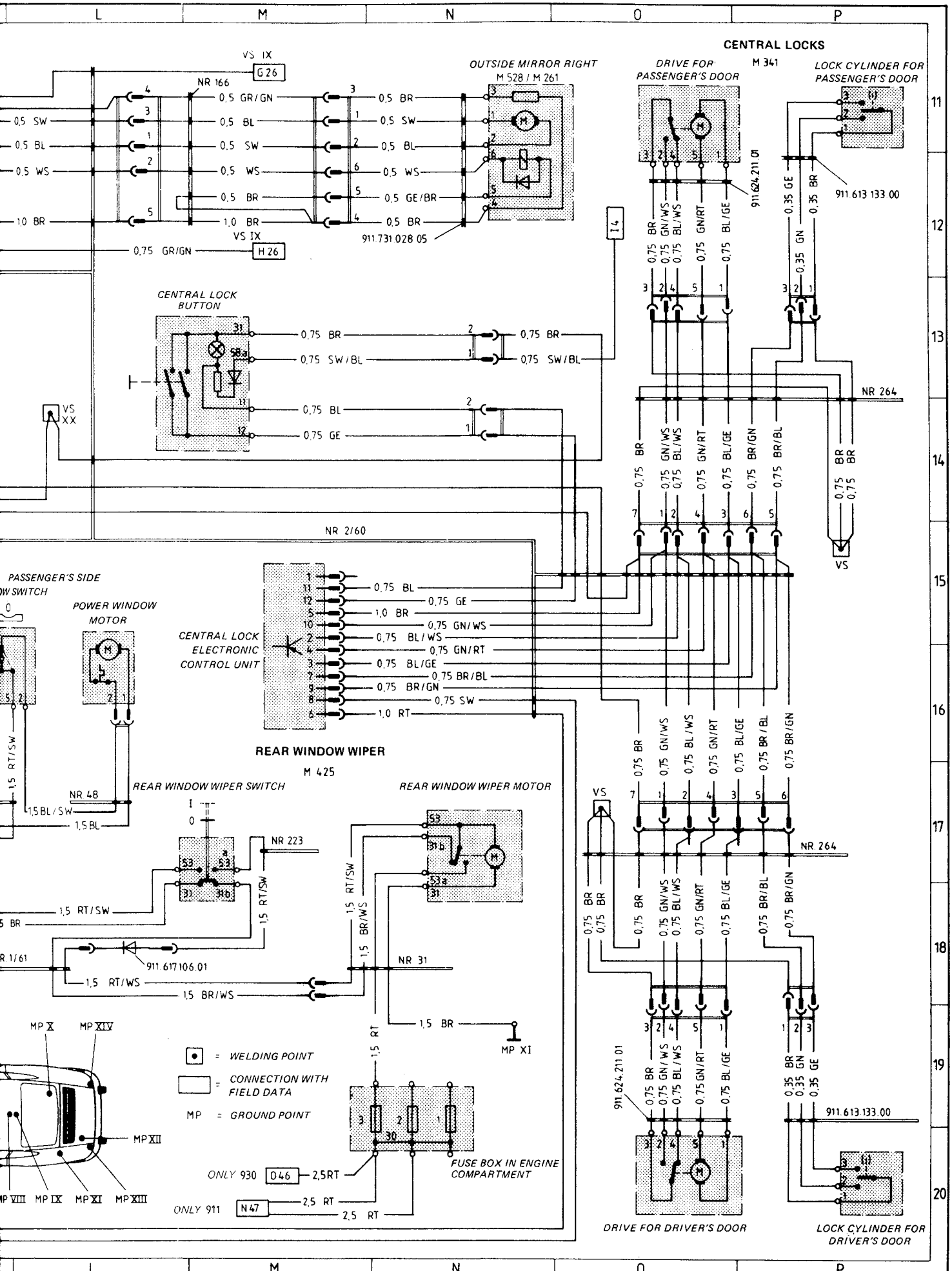
NR 2/60 NR 48 NR 104 NR 165 NR 1/61

K 38 L 26 K 52 M 51

VS XV VS XVI VS XX VS XII

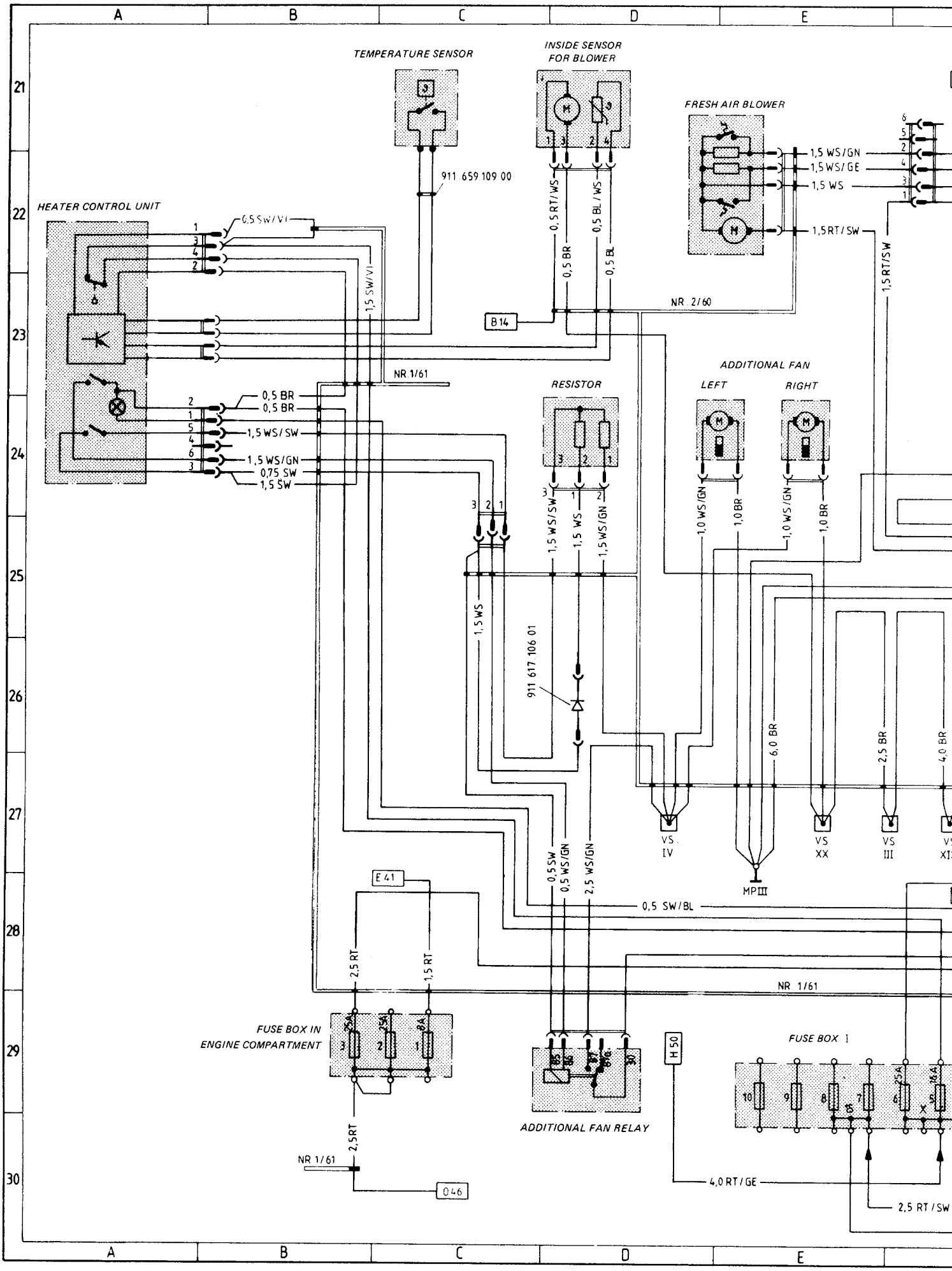
MP I MP II MP III MP IV MP V MP VI MP VII MP VIII MP IX MP X MP XI

SW = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET


CENTRAL LOCKS
OUTSIDE MIRROR RIGHT
M 528 / M 261
DRIVE FOR PASSENGER'S DOOR
M 341
LOCK CYLINDER FOR PASSENGER'S DOOR
VS IX
G 26
NR 166
0,5 GR/GN
0,5 BR
0,5 SW
0,5 BL
0,5 WS
0,5 GE/BR
1,0 BR
911.731 028 05
911.624 211 01
911.613 133 00
0,75 GR/GN
H 26
T4
CENTRAL LOCK BUTTON
0,75 BR
0,75 SW/BL
0,75 BL
0,75 GE
VS XX
NR 264
NR 2/60
PASSENGER'S SIDE
POWER WINDOW MOTOR
CENTRAL LOCK ELECTRONIC CONTROL UNIT
0,75 BL
0,75 GE
1,0 BR
0,75 GN/WS
0,75 BL/WS
0,75 GN/RT
0,75 BL/GE
0,75 BR/GN
0,75 BR/BL
0,75 SW
1,0 RT
REAR WINDOW WIPER
M 425
REAR WINDOW WIPER SWITCH
REAR WINDOW WIPER MOTOR
NR 48
NR 223
NR 31
1,5 RT/SW
1,5 BL/SW
1,5 BL
1,5 BR/WS
1,5 RT/WS
1,5 BR
911.617.106.01
MP X
MP XIV
MP XII
MP VIII
MP IX
MP XI
MP XIII
MP XI
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
FUSE BOX IN ENGINE COMPARTMENT
ONLY 930 046 2,5RT
ONLY 911 N47 2,5 RT
2,5 RT
DRIVE FOR DRIVER'S DOOR
LOCK CYLINDER FOR DRIVER'S DOOR
0,35 GE
0,35 BR
0,35 GN
0,35 GE
L
M
N
O
P
11
12
13
14
15
16
17
18
19
20

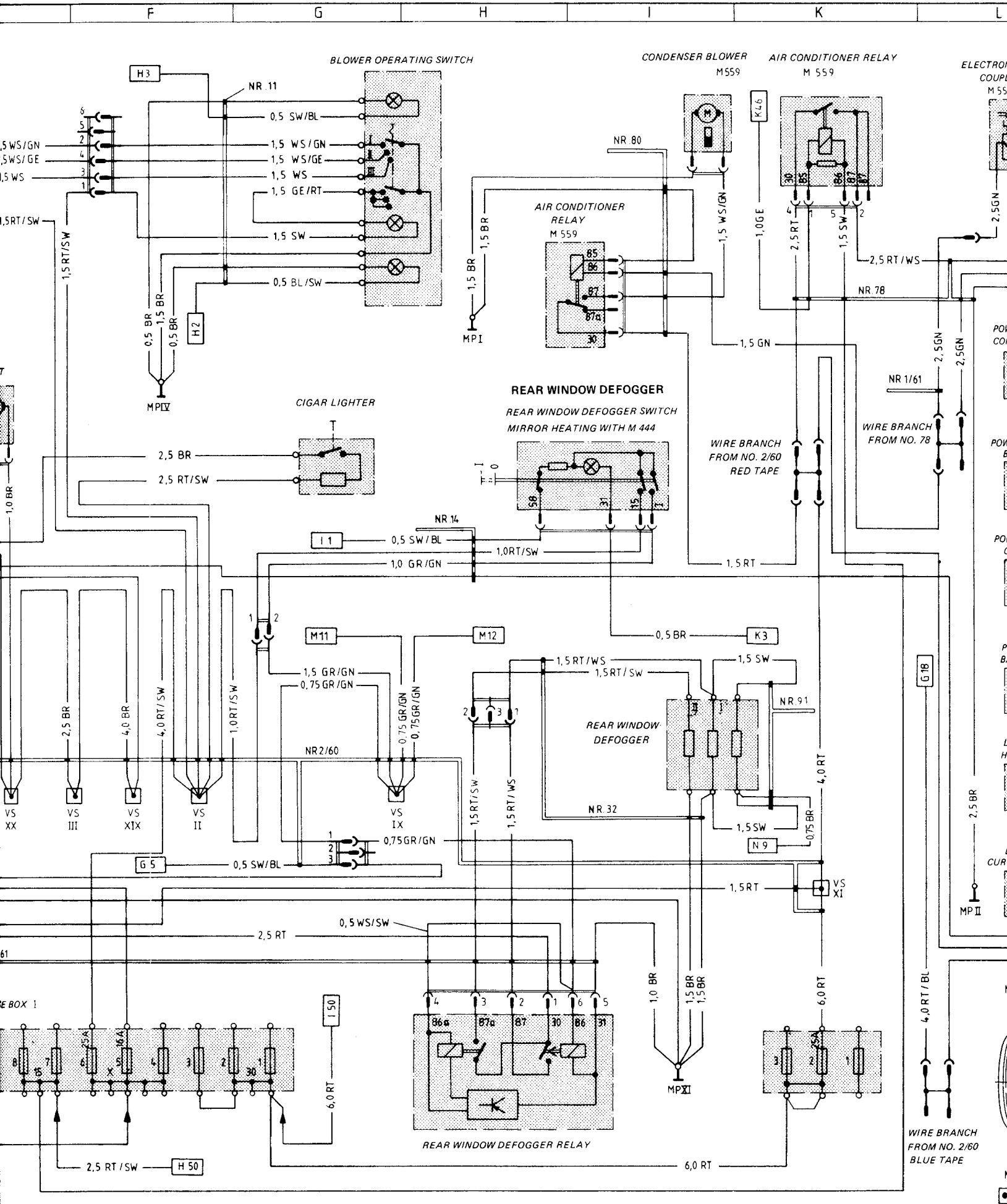
Wiring Diagram Type 911 turbo Model 86 Sheet 4

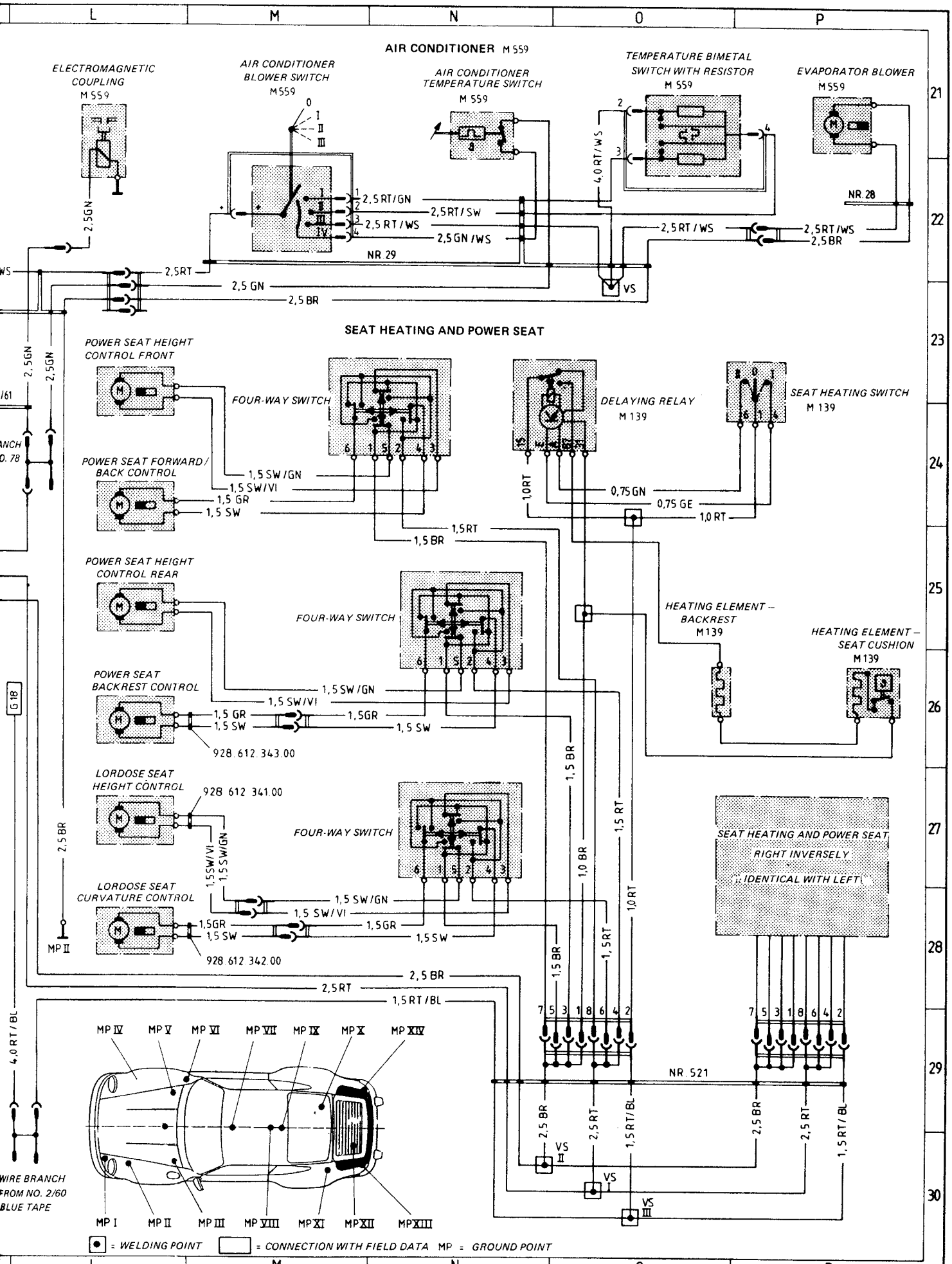
HEATING AND VENTILATION



Printed in Germany - III, 1985

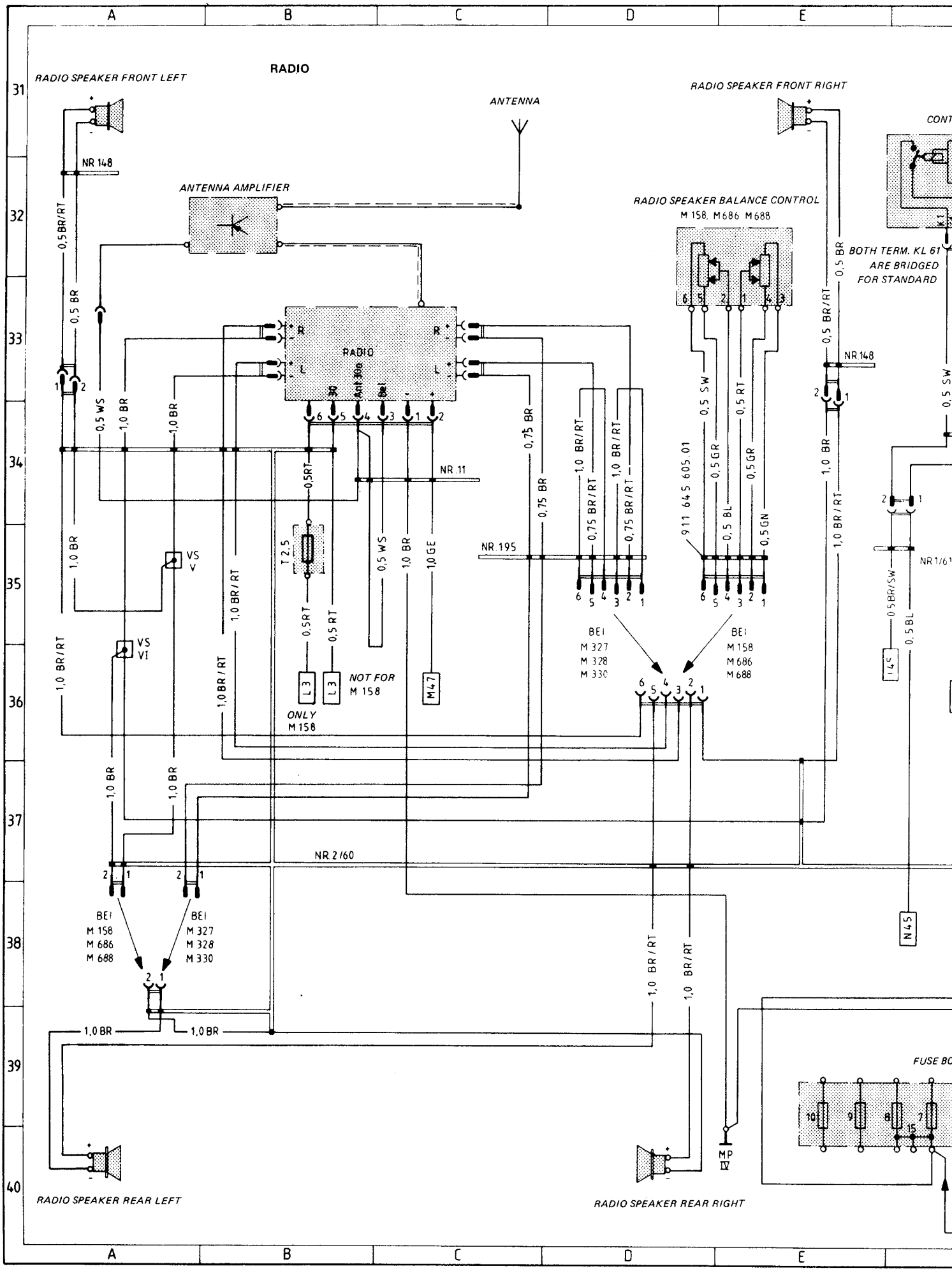
SW = B


F
G
H
I
K
L
BLOWER OPERATING SWITCH
CONDENSER BLOWER M 559
AIR CONDITIONER RELAY M 559
AIR CONDITIONER RELAY M 559
REAR WINDOW DEFOGGER
REAR WINDOW DEFOGGER SWITCH
MIRROR HEATING WITH M 444
CIGAR LIGHTER
REAR WINDOW DEFOGGER
REAR WINDOW DEFOGGER RELAY
WIRE BRANCH FROM NO. 2/60 RED TAPE
WIRE BRANCH FROM NO. 78
WIRE BRANCH FROM NO. 2/60 BLUE TAPE
H3
NR 11
0,5 SW/BL
1,5 WS/GN
1,5 WS/GE
1,5 WS
1,5 GE/RT
1,5 SW
0,5 BL/SW
H2
MP IV
NR 80
MP I
NR 78
NR 1/61
2,5 BR
2,5 RT/SW
NR 14
I 1
0,5 SW/BL
1,0 RT/SW
1,0 GR/GN
1,5 RT
M11
M12
1,5 GR/GN
0,75 GR/GN
NR 2/60
K3
1,5 RT/WS
1,5 RT/SW
1,5 SW
NR 91
NR 32
N 9
G 5
0,5 SW/BL
1,5 RT
VS XI
MP II
G 18
0,5 WS/SW
2,5 RT
I 50
6,0 RT
MP XI
4,0 RT/BL
H 50
2,5 RT/SW
6,0 RT
VS XX
VS III
VS XIX
VS II
VS IX
4,0 BR
4,0 RT/SW
1,0 RT/SW
1,0 BR
1,5 BR
0,5 BR
2,5 GN
1,0 GE
1,5 WS/GN
1,5 RT/SW
1,5 RT/WS
1,5 SW
0,75 BR
4,0 RT
6,0 RT
1,0 BR
1,5 BR
1,5 BR
0,5 BR
0,5 BR
0,5 BR
2,5 GN
2,5 GN
2,5 BR
2,5 BR
2,5 RT/WS
2,5 RT
1,5 SW
1,5 WS/GN
1,5 WS/GE
1,5 WS
1,5 RT/SW
1,0 BR
1,5 BR
1,5 WS/GN
1,0 GE
2,5 RT
1,5 SW
2,5 GN
2,5 GN
2,5 BR
2,5 BR
4,0 RT/BL
6,0 RT
6,0 RT
SW = BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET


L
M
N
O
P
AIR CONDITIONER M 559
ELECTROMAGNETIC COUPLING M 559
AIR CONDITIONER BLOWER SWITCH M559
AIR CONDITIONER TEMPERATURE SWITCH M 559
TEMPERATURE BIMETAL SWITCH WITH RESISTOR M 559
EVAPORATOR BLOWER M 559
NR. 28
NR. 29
2,5 RT/GN
2,5 RT/SW
2,5 RT/WS
2,5 GN/WS
4,0 RT/WS
2,5 RT/WS
2,5 RT/WS
2,5 BR
2,5 RT
2,5 GN
2,5 BR
VS
SEAT HEATING AND POWER SEAT
POWER SEAT HEIGHT CONTROL FRONT
FOUR-WAY SWITCH
DELAYING RELAY M 139
SEAT HEATING SWITCH M 139
POWER SEAT FORWARD / BACK CONTROL
1,5 SW/GN
1,5 SW/VI
1,5 GR
1,5 SW
1,0 RT
0,75 GN
0,75 GE
1,0 RT
1,5 RT
1,5 BR
POWER SEAT HEIGHT CONTROL REAR
FOUR-WAY SWITCH
HEATING ELEMENT – BACKREST M139
HEATING ELEMENT – SEAT CUSHION M139
POWER SEAT BACKREST CONTROL
1,5 SW/GN
1,5 SW/VI
1,5 GR
1,5 SW
1,5 GR
1,5 SW
928.612.343.00
LORDOSE SEAT HEIGHT CONTROL
928 612 341.00
FOUR-WAY SWITCH
SEAT HEATING AND POWER SEAT RIGHT INVERSELY (IDENTICAL WITH LEFT)
LORDOSE SEAT CURVATURE CONTROL
1,5 SW/GN
1,5 SW/VI
1,5 GR
1,5 SW
1,5 GR
1,5 SW
928.612.342.00
MP II
2,5 BR
2,5 RT
1,5 RT/BL
4,0 RT/BL
1,5 BR
1,0 BR
1,5 RT
1,0 RT
1,5 SRT
NR. 521
2,5 BR
2,5 RT
1,5 RT/BL
VS II
VS I
VS III
MP IV MP V MP VI MP VII MP IX MP X MP XIV
MP I MP II MP III MP VIII MP XI MP XII MP XIII
WIRE BRANCH FROM NO. 2/60 BLUE TAPE
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT

Wiring Diagram Type 911 turbo Model 86 Sheet 5

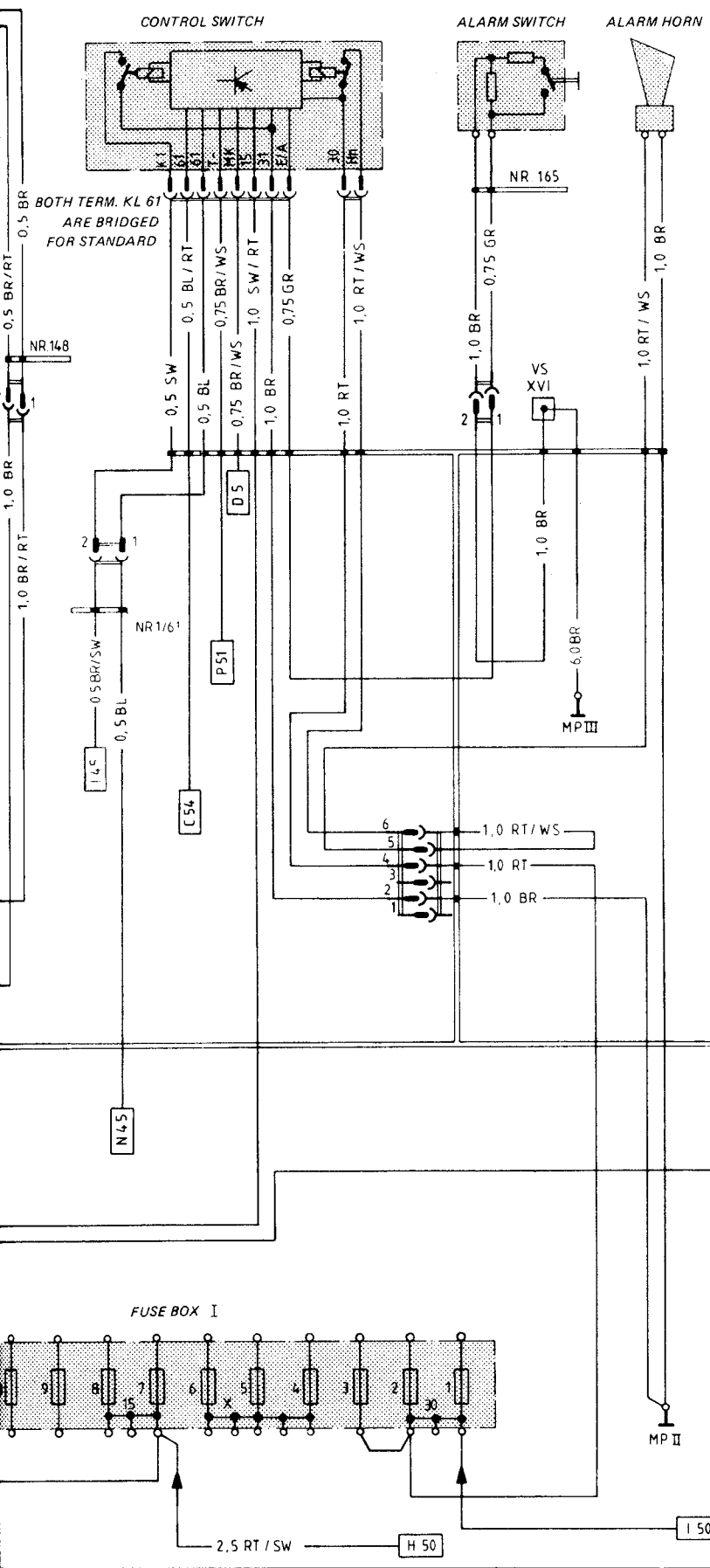
RADIO, ALARM SYSTEM, LIFTING ROOF



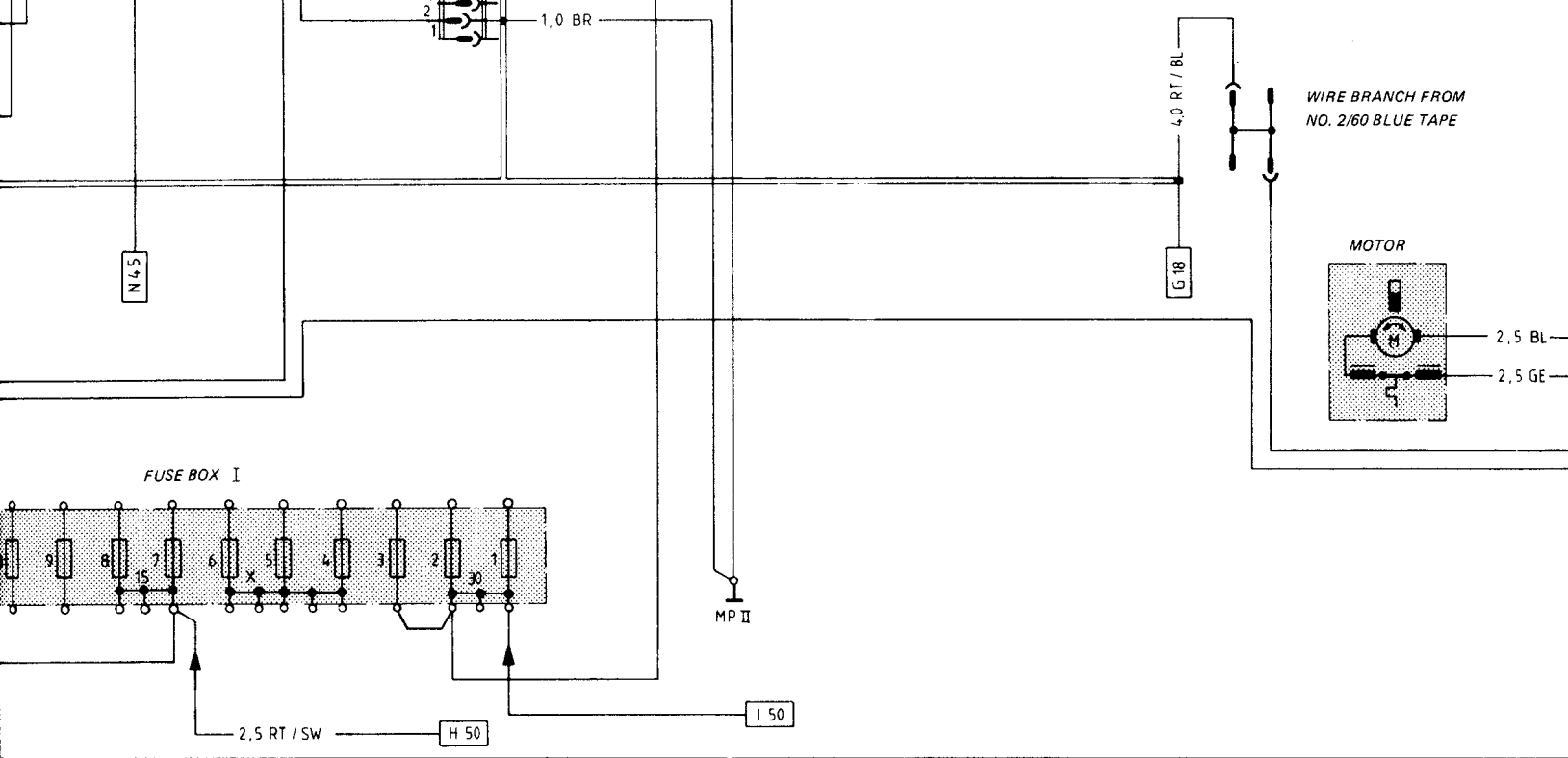
SW = B

F G H I K L

BURGLAR ALARM
M 533



SUN ROOF
M 650



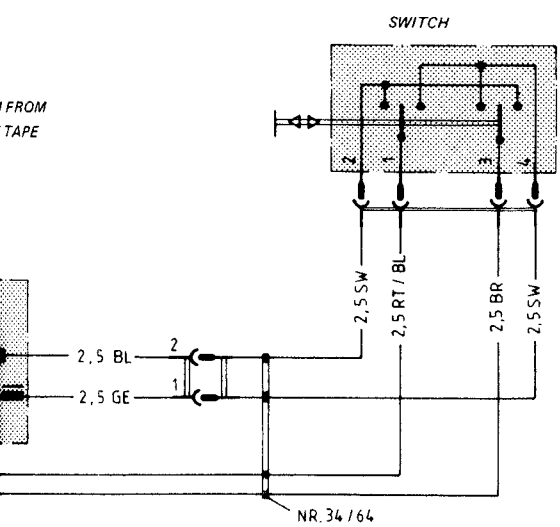
F G H I K L

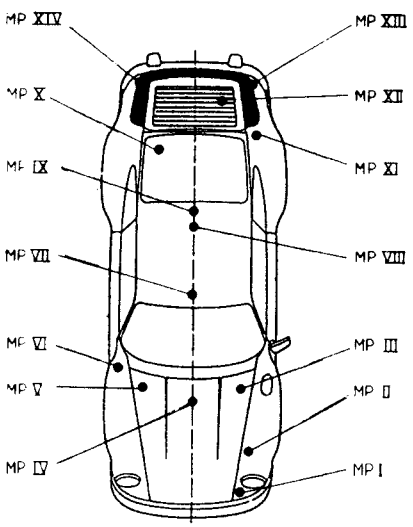
SW = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET

L M N O P

31 32 33 34 35 36 37 38 39 40

SUN ROOF
M 650





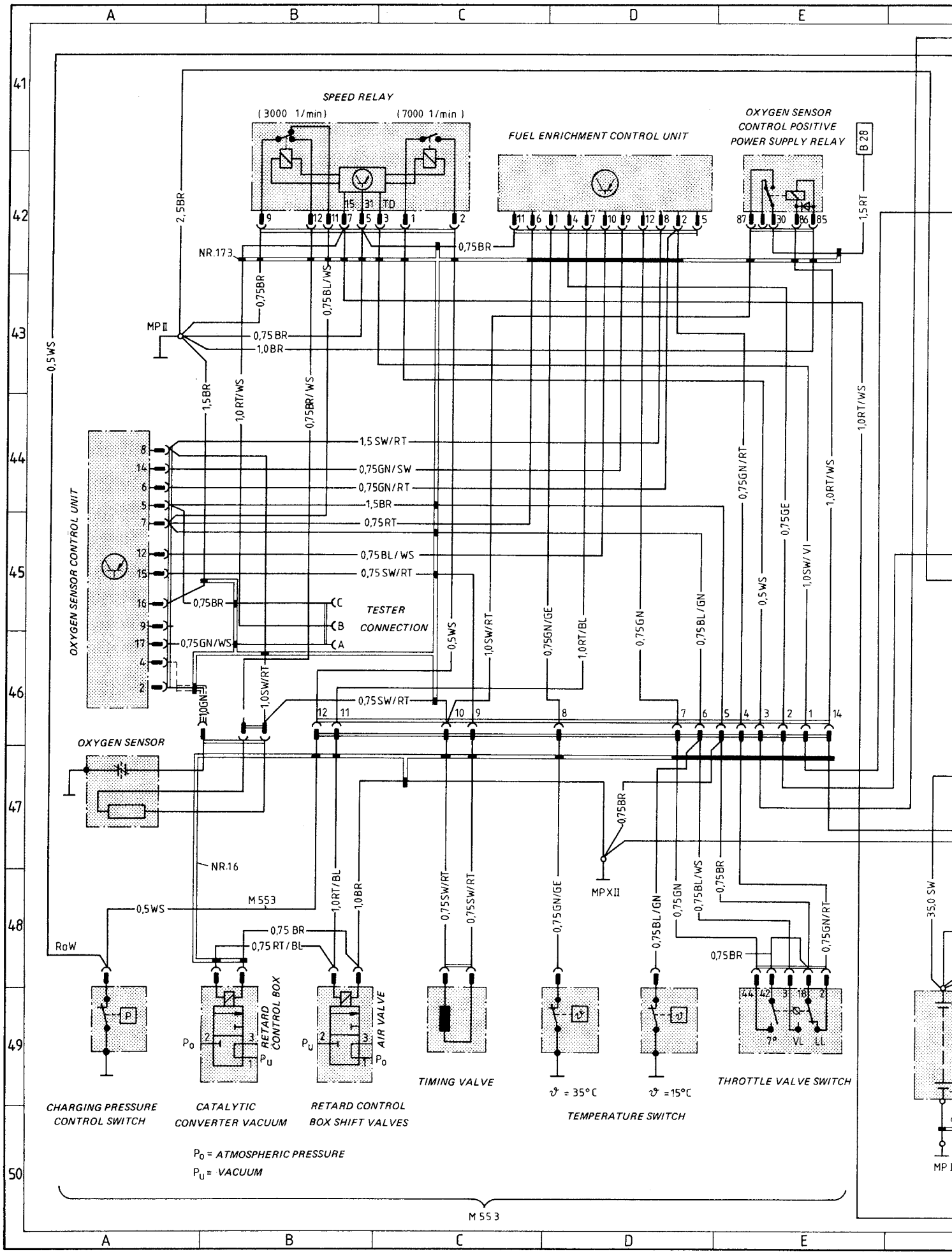
= WELDING POINT

= CONNECTION WITH FIELD DATA

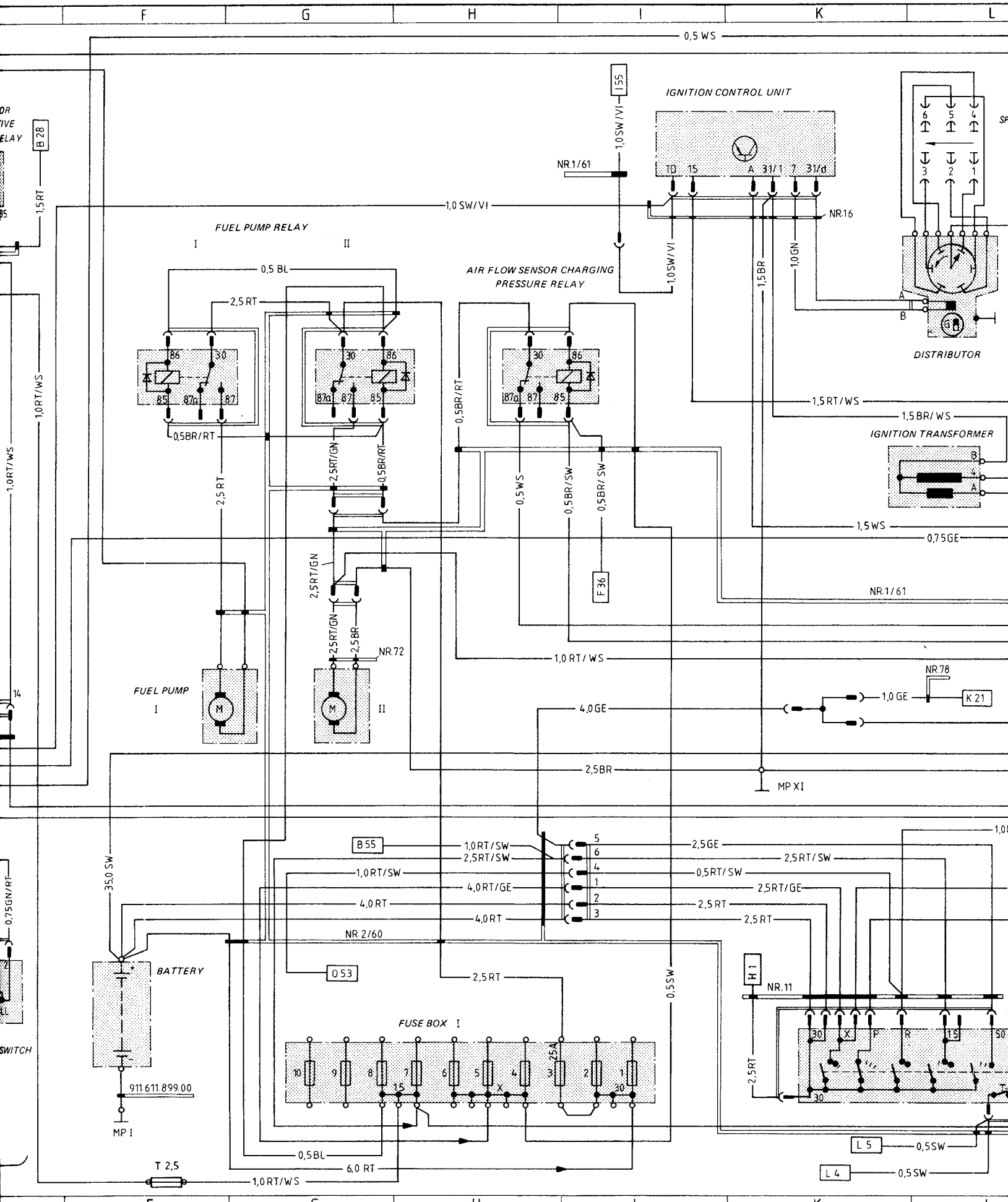
MP = GROUND POINT

Wiring Diagram Type 911 turbo Model 86 Sheet 6

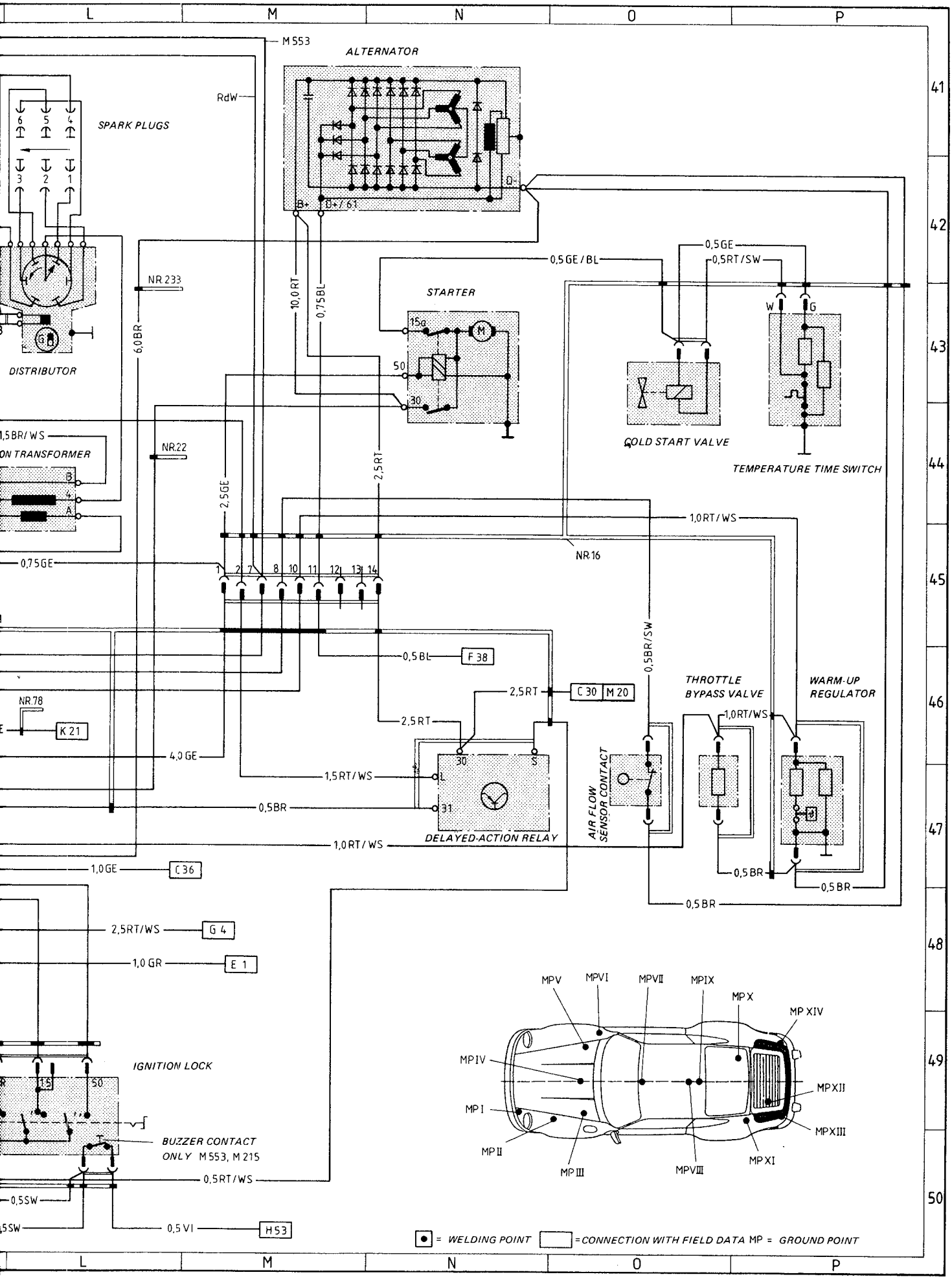
ENGINE (K-JETRONIK) OXYGEN SENSOR SYSTEM



SW = B

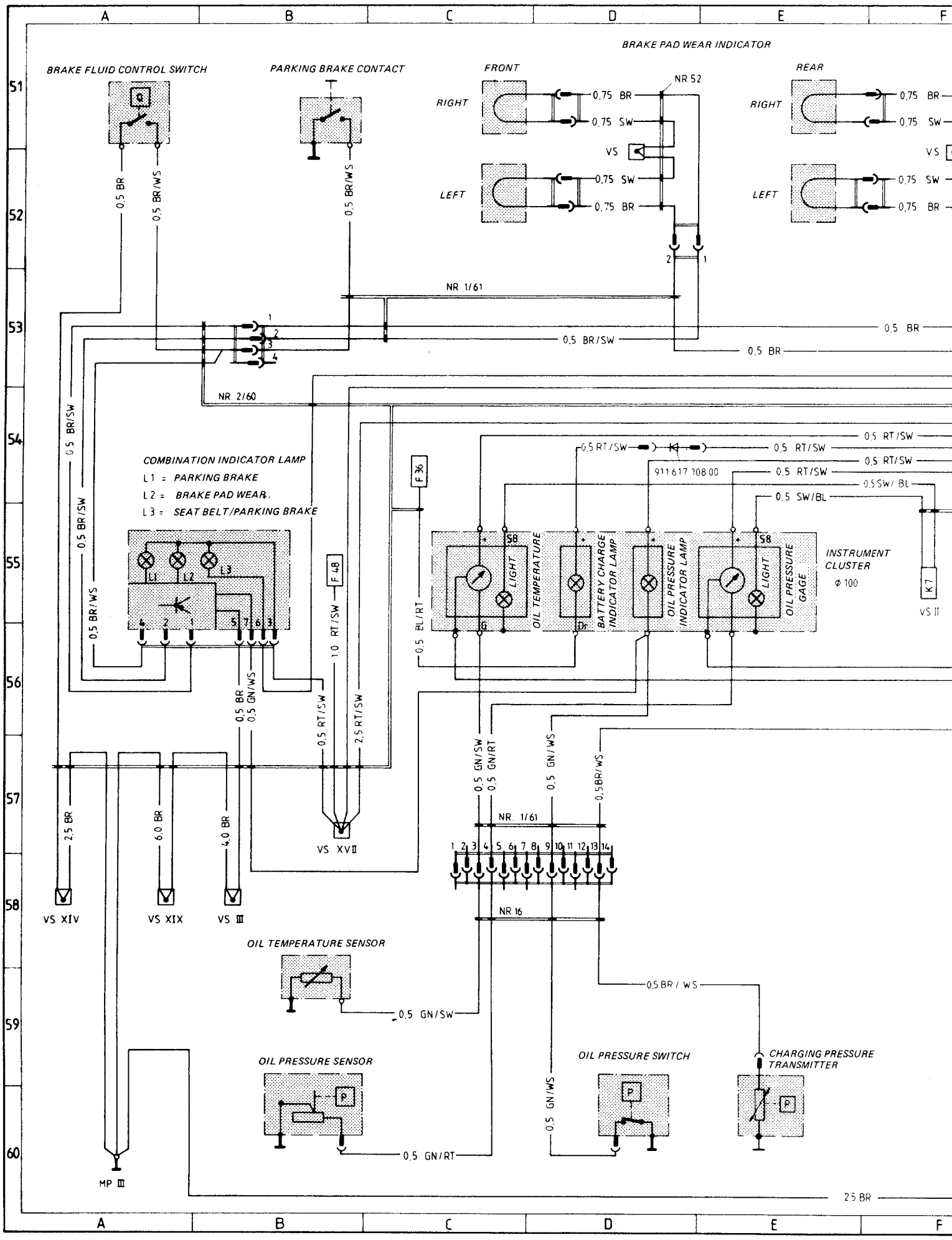


SW = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET

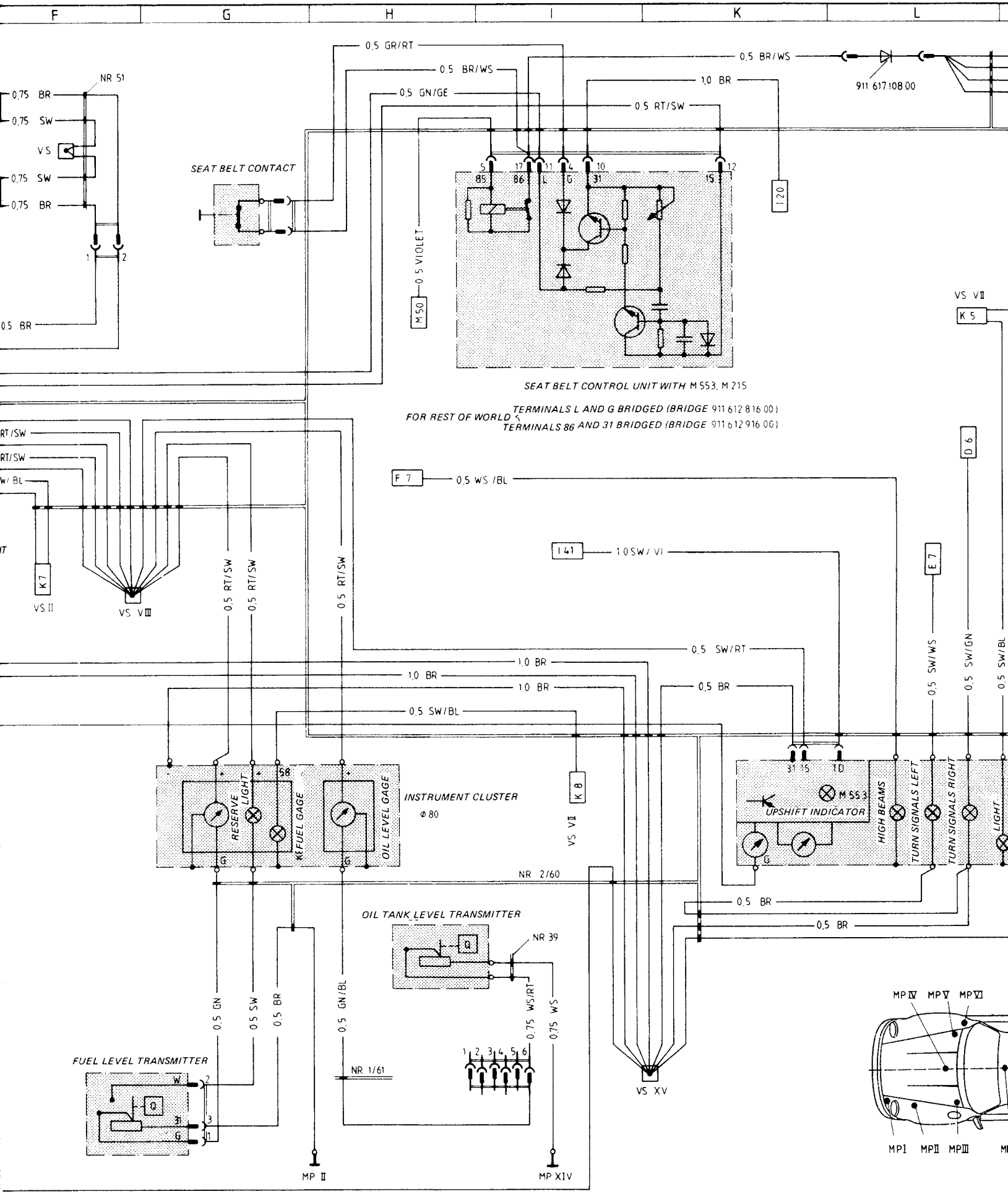

L
M
N
O
P
41
42
43
44
45
46
47
48
49
50
M553
ALTERNATOR
B+
D+/61
D-
RdW
SPARK PLUGS
DISTRIBUTOR
NR.233
6,0BR
10,0RT
0,75BL
STARTER
15q
50
30
0,5GE/BL
0,5GE
0,5RT/SW
W
G
COLD START VALVE
TEMPERATURE TIME SWITCH
1,5BR/WS
ON TRANSFORMER
NR.22
2,5GE
2,5RT
1,0RT/WS
NR.16
0,75GE
1 2 7 8 10 11 12 13 14
0,5BL
F 38
2,5RT
C 30
M 20
NR.78
K 21
4,0GE
2,5RT
30
S
1,5RT/WS
L
31
0,5BR
DELAYED-ACTION RELAY
1,0RT/WS
0,5BR/SW
AIR FLOW SENSOR CONTACT
THROTTLE BYPASS VALVE
WARM-UP REGULATOR
1,0RT/WS
0,5BR
0,5BR
0,5BR
1,0GE
C 36
2,5RT/WS
G 4
1,0GR
E 1
IGNITION LOCK
15
50
BUZZER CONTACT
ONLY M553, M215
0,5RT/WS
0,5SW
0,5SW
0,5VI
H53
MPV
MPVI
MPVII
MPIX
MPX
MPXIV
MPIV
MPXII
MPI
MPXIII
MPII
MPIII
MPVIII
MPXI
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT

Wiring Diagram Type 911 turbo Model 86 Sheet 7

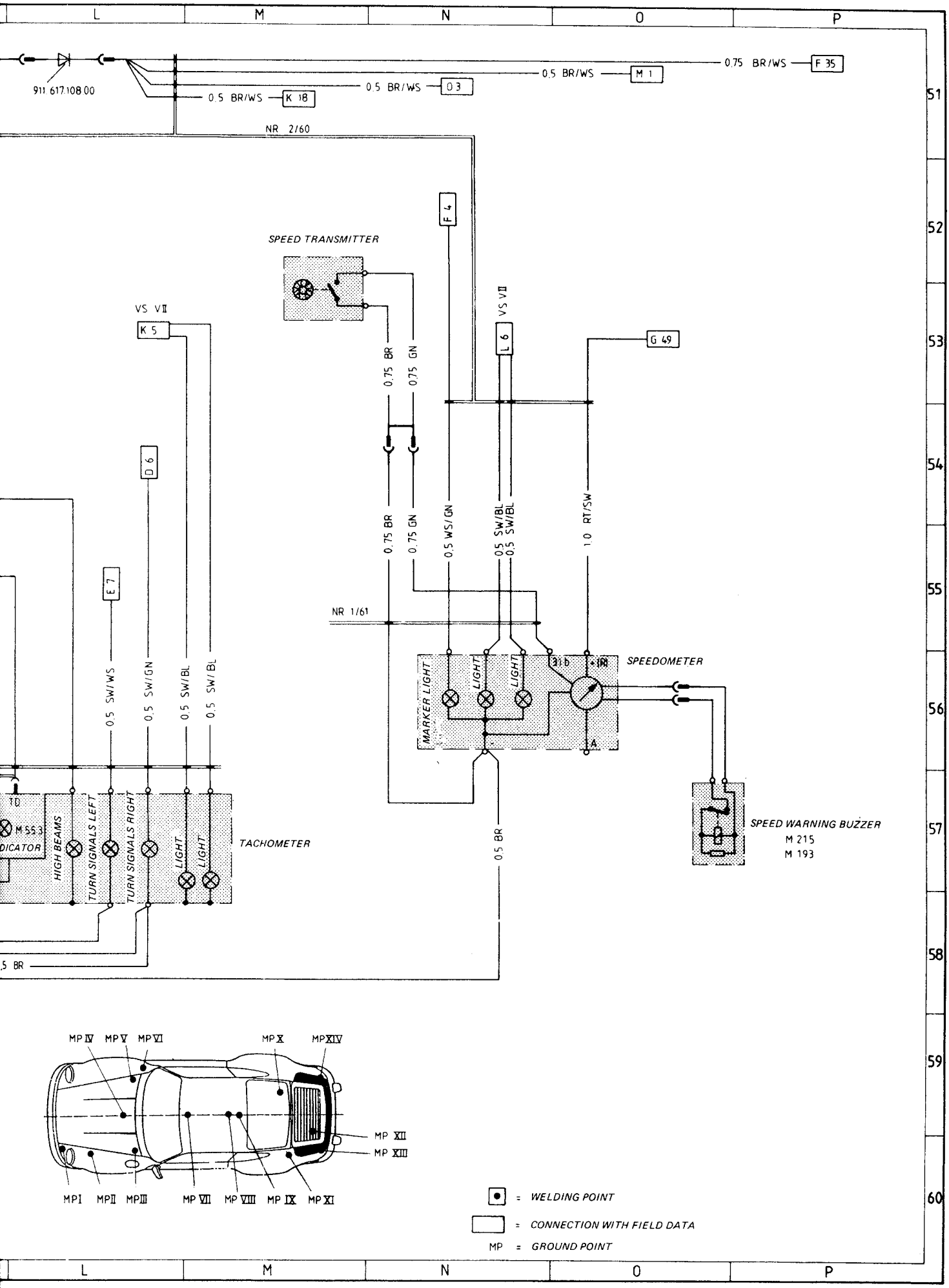
INSTRUMENTS AND INDICATORS



SW = BLACK

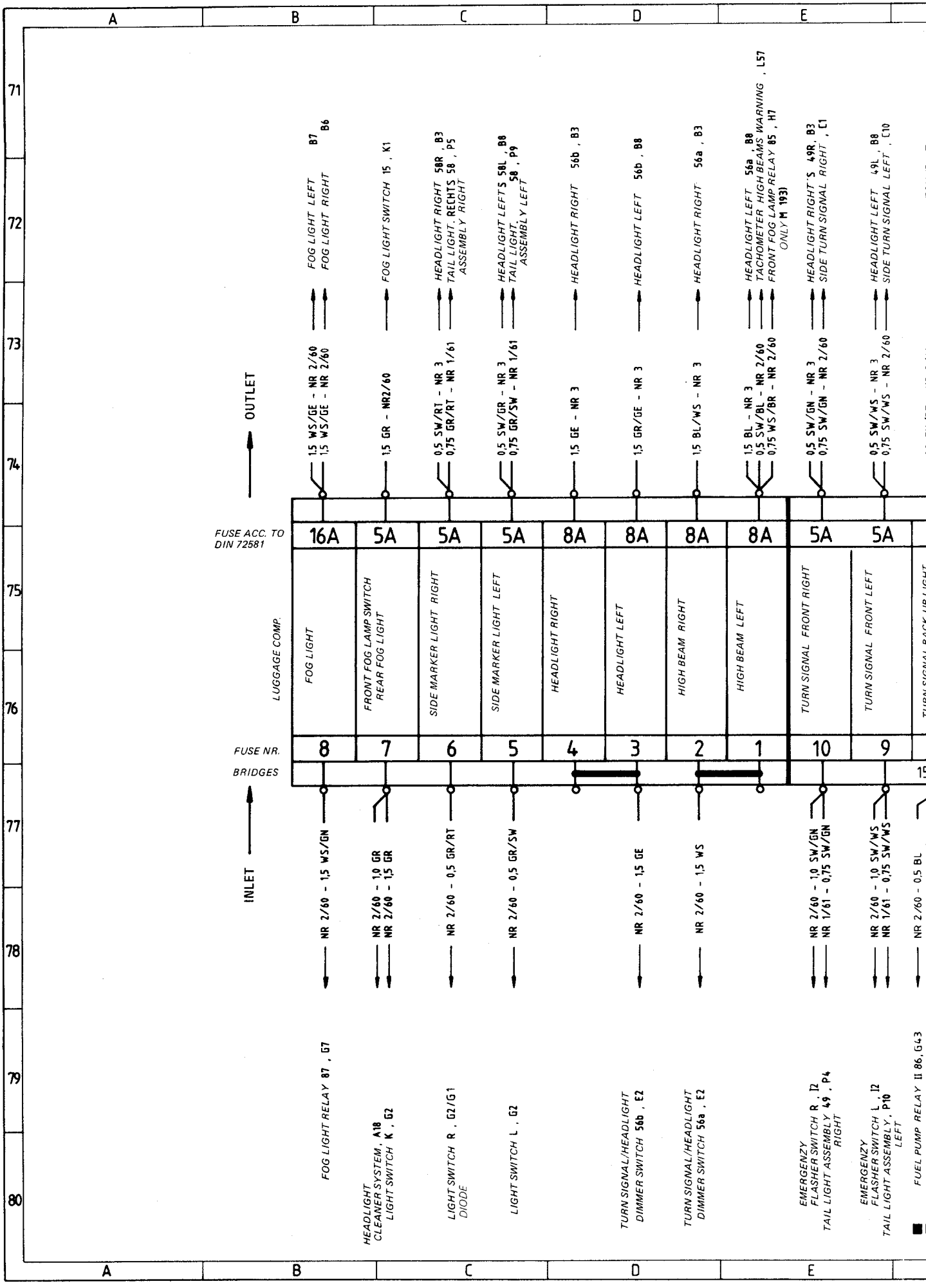


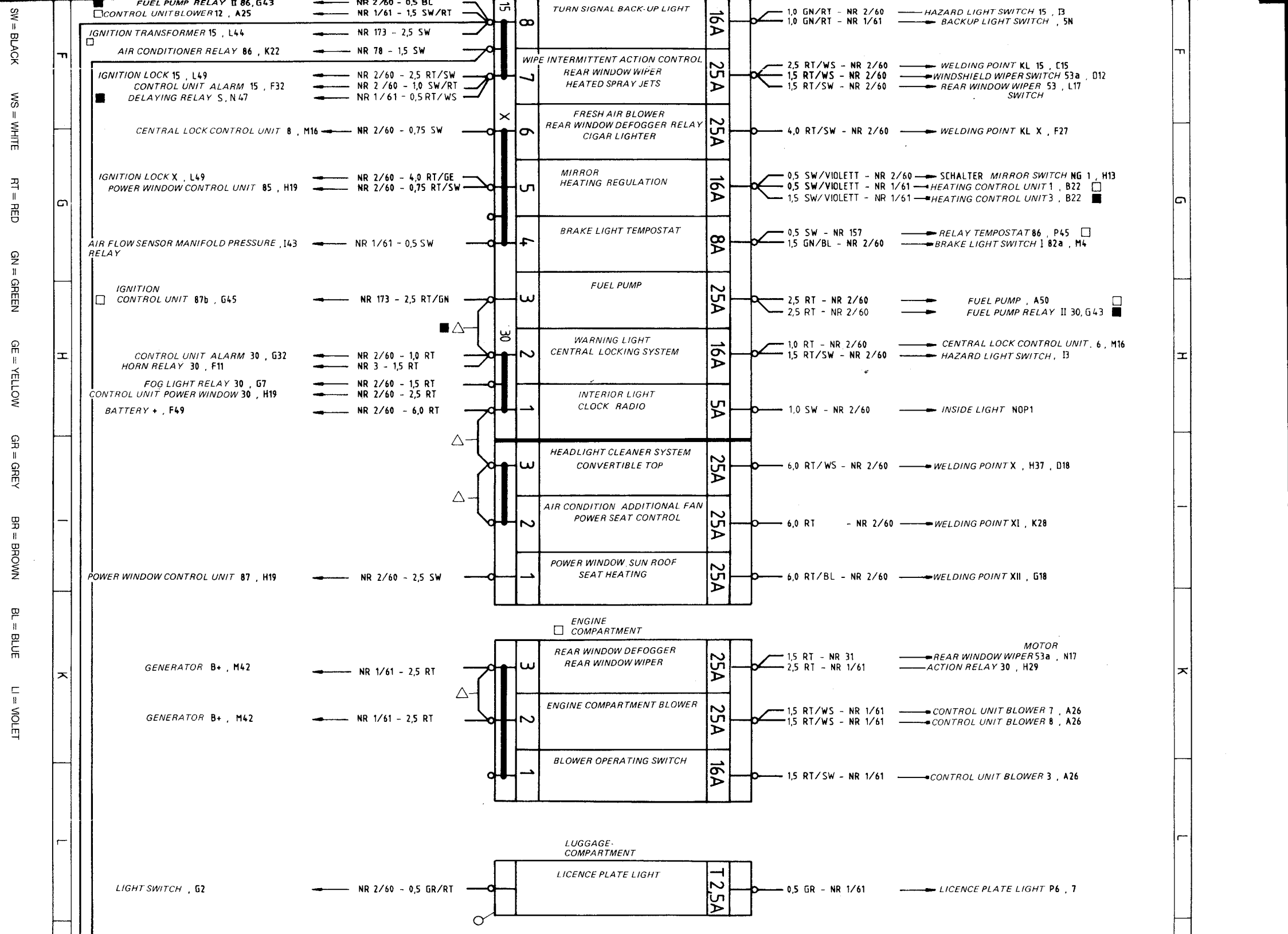
SW = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET

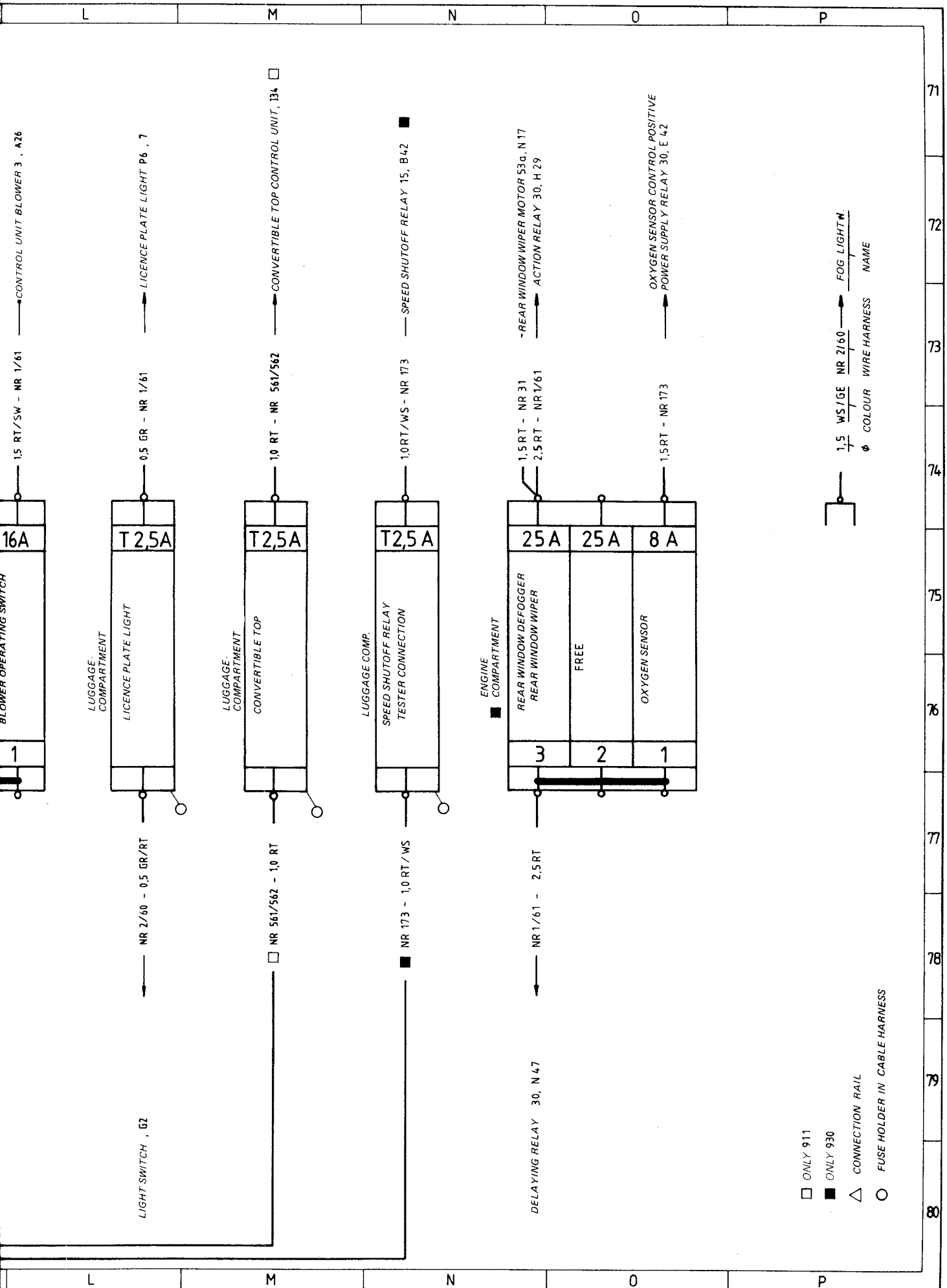

L
M
N
O
P
911 617.108.00
0.75 BR/WS
F 35
0.5 BR/WS
M 1
0.5 BR/WS
0.3
0.5 BR/WS
K 18
NR 2/60
51
52
53
54
55
56
57
58
59
60
SPEED TRANSMITTER
F 4
VS VII
K 5
VS VII
L 6
G 49
0.75 BR
0.75 GN
D 6
E 7
0.5 SW/WS
0.5 SW/GN
0.5 SW/BL
0.5 SW/BL
0.75 BR
0.75 GN
0.5 WS/GN
0.5 SW/BL
0.5 SW/BL
1.0 RT/SW
NR 1/61
MARKER LIGHT
LIGHT
LIGHT
31 b
+ IR
A
SPEEDOMETER
SPEED WARNING BUZZER
M 215
M 193
0.5 BR
TACHOMETER
HIGH BEAMS
TURN SIGNALS LEFT
TURN SIGNALS RIGHT
LIGHT
LIGHT
MP IV MP V MP VI
MP X
MP XIV
MP XII
MP XIII
MP I MP II MP III
MP VII
MP VIII
MP IX
MP XI
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT

Wiring Diagram Type 911 turbo Model 86 Sheet 8

CONNECTION AND EQUIPMENT FUSES




SW = BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET
FUEL PUMP RELAY II 86, G43
CONTROL UNIT BLOWER 12 , A25
IGNITION TRANSFORMER 15 , L44
AIR CONDITIONER RELAY 86 , K22
IGNITION LOCK 15 , L49
CONTROL UNIT ALARM 15 , F32
DELAYING RELAY S , N47
CENTRAL LOCK CONTROL UNIT 8 , M16
IGNITION LOCK X , L49
POWER WINDOW CONTROL UNIT 85 , H19
AIR FLOW SENSOR MANIFOLD PRESSURE , I43
RELAY
IGNITION
CONTROL UNIT 87b , G45
CONTROL UNIT ALARM 30 , G32
HORN RELAY 30 , F11
FOG LIGHT RELAY 30 , G7
CONTROL UNIT POWER WINDOW 30 , H19
BATTERY + , F49
POWER WINDOW CONTROL UNIT 87 , H19
NR 1/61 - 1,5 SW/RT
NR 173 - 2,5 SW
NR 78 - 1,5 SW
NR 2/60 - 2,5 RT/SW
NR 2 /60 - 1,0 SW/RT
NR 1/61 - 0,5 RT/WS
NR 2/60 - 0,75 SW
NR 2/60 - 4,0 RT/GE
NR 2/60 - 0,75 RT/SW
NR 1/61 - 0,5 SW
NR 173 - 2,5 RT/GN
NR 2/60 - 1,0 RT
NR 3 - 1,5 RT
NR 2/60 - 1,5 RT
NR 2/60 - 2,5 RT
NR 2/60 - 6,0 RT
NR 2/60 - 2,5 SW
15
X
30
8 TURN SIGNAL BACK-UP LIGHT 16A
7 WIPE INTERMITTENT ACTION CONTROL REAR WINDOW WIPER HEATED SPRAY JETS 25A
6 FRESH AIR BLOWER REAR WINDOW DEFOGGER RELAY CIGAR LIGHTER 25A
5 MIRROR HEATING REGULATION 16A
4 BRAKE LIGHT TEMPOSTAT 8A
3 FUEL PUMP 25A
2 WARNING LIGHT CENTRAL LOCKING SYSTEM 16A
1 INTERIOR LIGHT CLOCK RADIO 5A
3 HEADLIGHT CLEANER SYSTEM CONVERTIBLE TOP 25A
2 AIR CONDITION ADDITIONAL FAN POWER SEAT CONTROL 25A
1 POWER WINDOW SUN ROOF SEAT HEATING 25A
1,0 GN/RT - NR 2/60
1,0 GN/RT - NR 1/61
HAZARD LIGHT SWITCH 15 , I3
BACKUP LIGHT SWITCH , 5N
2,5 RT/WS - NR 2/60
1,5 RT/WS - NR 2/60
1,5 RT/SW - NR 2/60
WELDING POINT KL 15 , C15
WINDSHIELD WIPER SWITCH 53a , D12
REAR WINDOW WIPER 53 , L17
SWITCH
4,0 RT/SW - NR 2/60
WELDING POINT KL X , F27
0,5 SW/VIOLETT - NR 2/60
0,5 SW/VIOLETT - NR 1/61
1,5 SW/VIOLETT - NR 1/61
SCHALTER MIRROR SWITCH NG 1 , H13
HEATING CONTROL UNIT 1 , B22
HEATING CONTROL UNIT 3 , B22
0,5 SW - NR 157
1,5 GN/BL - NR 2/60
RELAY TEMPOSTAT 86 , P45
BRAKE LIGHT SWITCH 1 82a , M4
2,5 RT - NR 2/60
2,5 RT - NR 2/60
FUEL PUMP , A50
FUEL PUMP RELAY II 30, G43
1,0 RT - NR 2/60
1,5 RT/SW - NR 2/60
CENTRAL LOCK CONTROL UNIT. 6 , M16
HAZARD LIGHT SWITCH , I3
1,0 SW - NR 2/60
INSIDE LIGHT NOP1
6,0 RT/WS - NR 2/60
WELDING POINT X , H37 , D18
6,0 RT - NR 2/60
WELDING POINT XI , K28
6,0 RT/BL - NR 2/60
WELDING POINT XII , G18
ENGINE COMPARTMENT
GENERATOR B+ , M42
GENERATOR B+ , M42
NR 1/61 - 2,5 RT
NR 1/61 - 2,5 RT
3 REAR WINDOW DEFOGGER REAR WINDOW WIPER 25A
2 ENGINE COMPARTMENT BLOWER 25A
1 BLOWER OPERATING SWITCH 16A
MOTOR
1,5 RT - NR 31
2,5 RT - NR 1/61
REAR WINDOW WIPER 53a , N17
ACTION RELAY 30 , H29
1,5 RT/WS - NR 1/61
1,5 RT/WS - NR 1/61
CONTROL UNIT BLOWER 7 , A26
CONTROL UNIT BLOWER 8 , A26
1,5 RT/SW - NR 1/61
CONTROL UNIT BLOWER 3 , A26
LUGGAGE-COMPARTMENT
LIGHT SWITCH , G2
NR 2/60 - 0,5 GR/RT
LICENCE PLATE LIGHT T 2,5A
0,5 GR - NR 1/61
LICENCE PLATE LIGHT P6 , 7
F
G
H
I
K
L


L
M
N
O
P
71
72
73
74
75
76
77
78
79
80
CONTROL UNIT BLOWER 3 , A26
1,5 RT/SW - NR 1/61
16A
BLOWER OPERATING SWITCH
1
LIGHT SWITCH , G2
LICENCE PLATE LIGHT P6 , 7
0,5 GR - NR 1/61
NR 2/60 - 0,5 GR/RT
LUGGAGE COMPARTMENT
LICENCE PLATE LIGHT
T2,5A
CONVERTIBLE TOP CONTROL UNIT, 134
1,0 RT - NR 561/562
NR 561/562 - 1,0 RT
LUGGAGE COMPARTMENT
CONVERTIBLE TOP
T2,5A
SPEED SHUTOFF RELAY 15, B42
1,0 RT/WS - NR 173
NR 173 - 1,0 RT/WS
LUGGAGE COMP.
SPEED SHUTOFF RELAY
TESTER CONNECTION
T2,5 A
REAR WINDOW WIPER MOTOR 53a, N 17
ACTION RELAY 30, H 29
1,5 RT - NR 31
2,5 RT - NR 1/61
NR 1/61 - 2,5 RT
ENGINE COMPARTMENT
REAR WINDOW DEFOGGER
REAR WINDOW WIPER
FREE
OXYGEN SENSOR
25 A
25 A
8 A
3
2
1
DELAYING RELAY 30, N 47
OXYGEN SENSOR CONTROL POSITIVE
POWER SUPPLY RELAY 30, E 42
1,5 RT - NR 173
FOG LIGHT
NAME
NR 2/60
WS/GE
1,5
COLOUR
WIRE HARNESS
ONLY 911
ONLY 930
CONNECTION RAIL
FUSE HOLDER IN CABLE HARNESS

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Wiring diagrams - 85 models	97 - 25
Wiring diagrams - 86 911 Carrera	97 - 63
Wiring diagrams - 86 911 Turbo	97 - 79
Wiring diagrams - 87 911 Carrera	97 – 97
Wiring diagrams - 87 911 Turbo	97 - 115
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Wiring Diagram Type 911 Carrera Model 87

SHEET 1	GROUND TERMINALS
SHEET 2	LAMPS
SHEET 3	BODY
SHEET 4	HEATING AND VENTILATION
SHEET 5	RADIO, ALARM SYSTEM, CONVERTIBLE TOP, LIFTING ROOF
SHEET 6	ENGINE (DME) TEMPOSTAT
SHEET 7	INSTRUMENTS AND INDICATORS
SHEET 8	CONNECTION AND EQUIPMENT FUSES

Wiring Diagram Type 911 Carrera Model 87

WIRE COLOURS

SW = BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET

⊡ = WELDING POINT
▭ = CONNECTION WITH FIELD INDICATION
MP = GROUND CONNECTING POINT

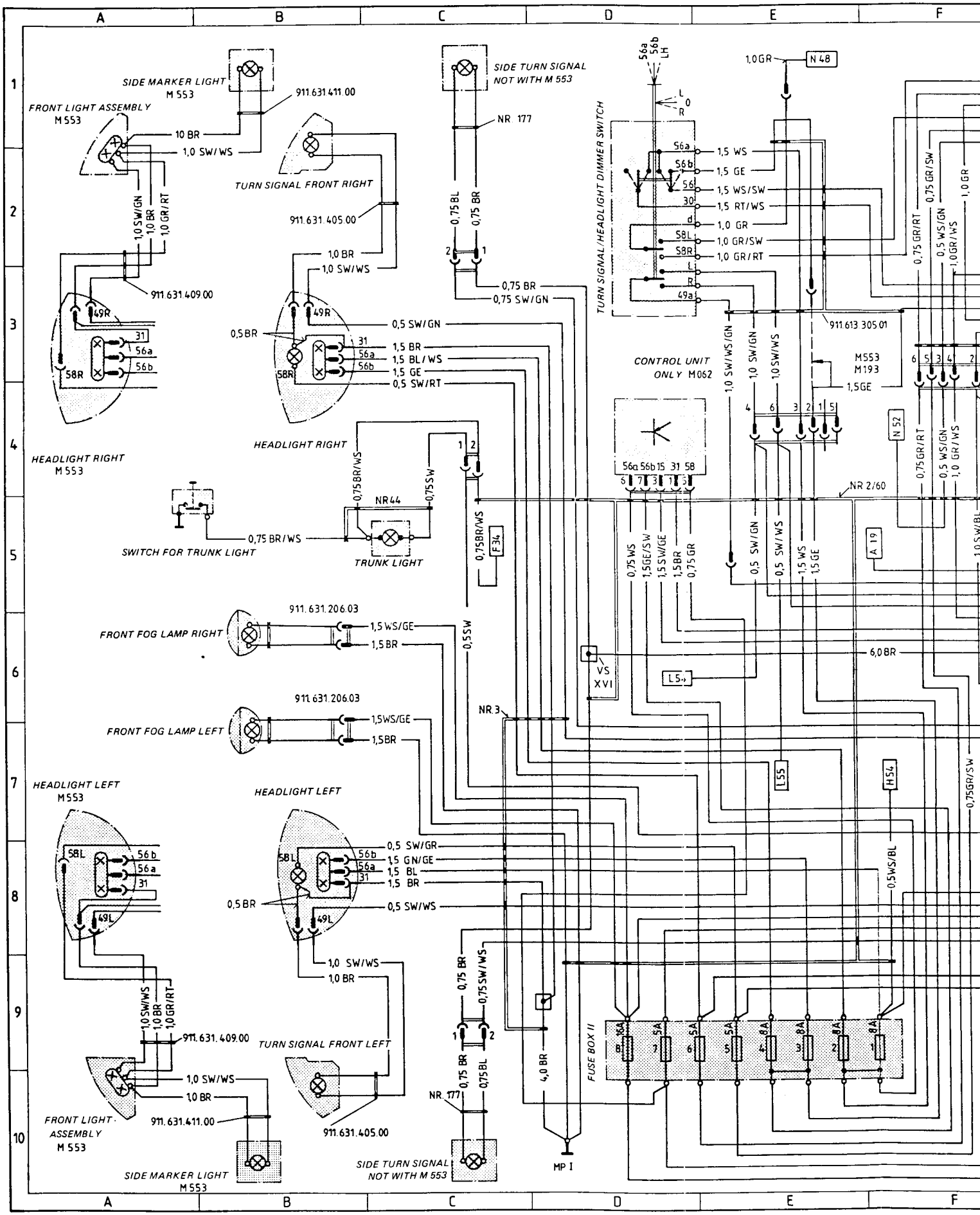
Wiring Diagram Type 911 Carrera Model 87 Sheet 1

GROUND TERMINALS

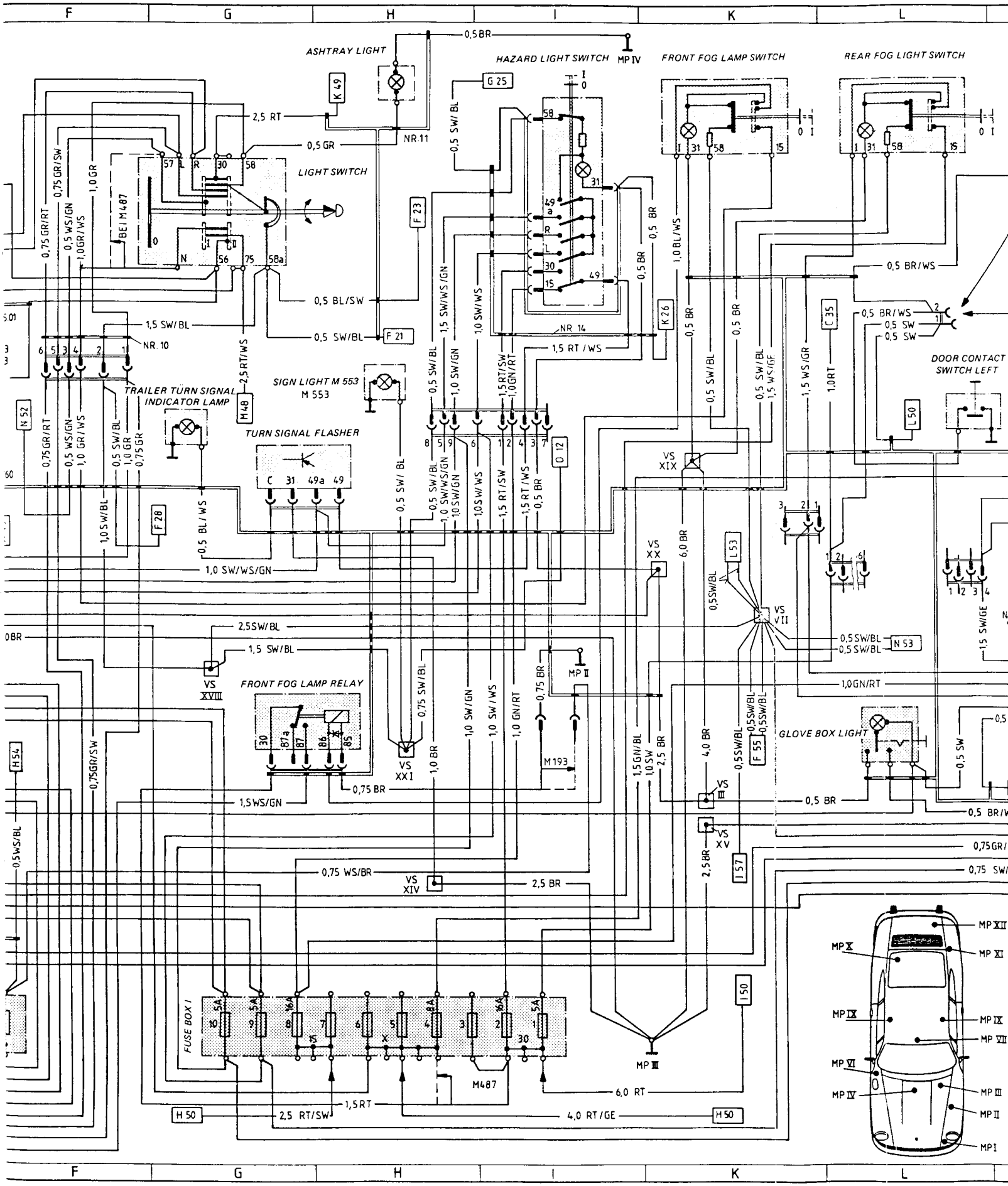
	Ground Terminals
I	Ground - battery
II	Ground - fuse box carrier
III	Ground - luggage compartment floor LHD
IV	Ground - firewall inside
VI	Ground - electric antenna
VII	Ground - inside light Cabriolet
IX	Ground - inside light Coupe
X	Ground strap - transmission + engine + body
XI	Ground - engine compartment rear left
XII	Ground - engine left

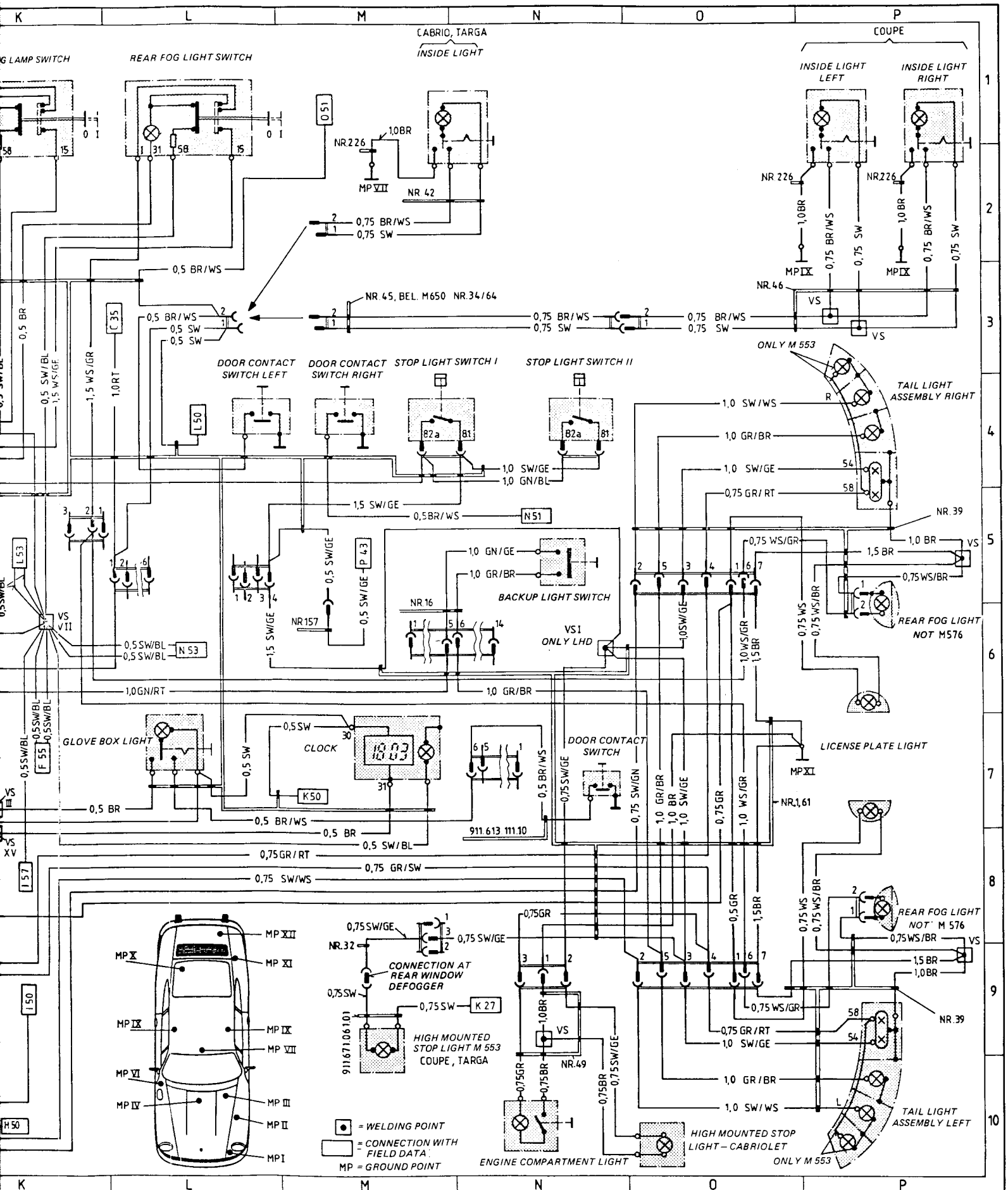
Wiring Diagram Type 911 Carrera Model 87 Sheet 2

LAMPS



SW = BLACK WS

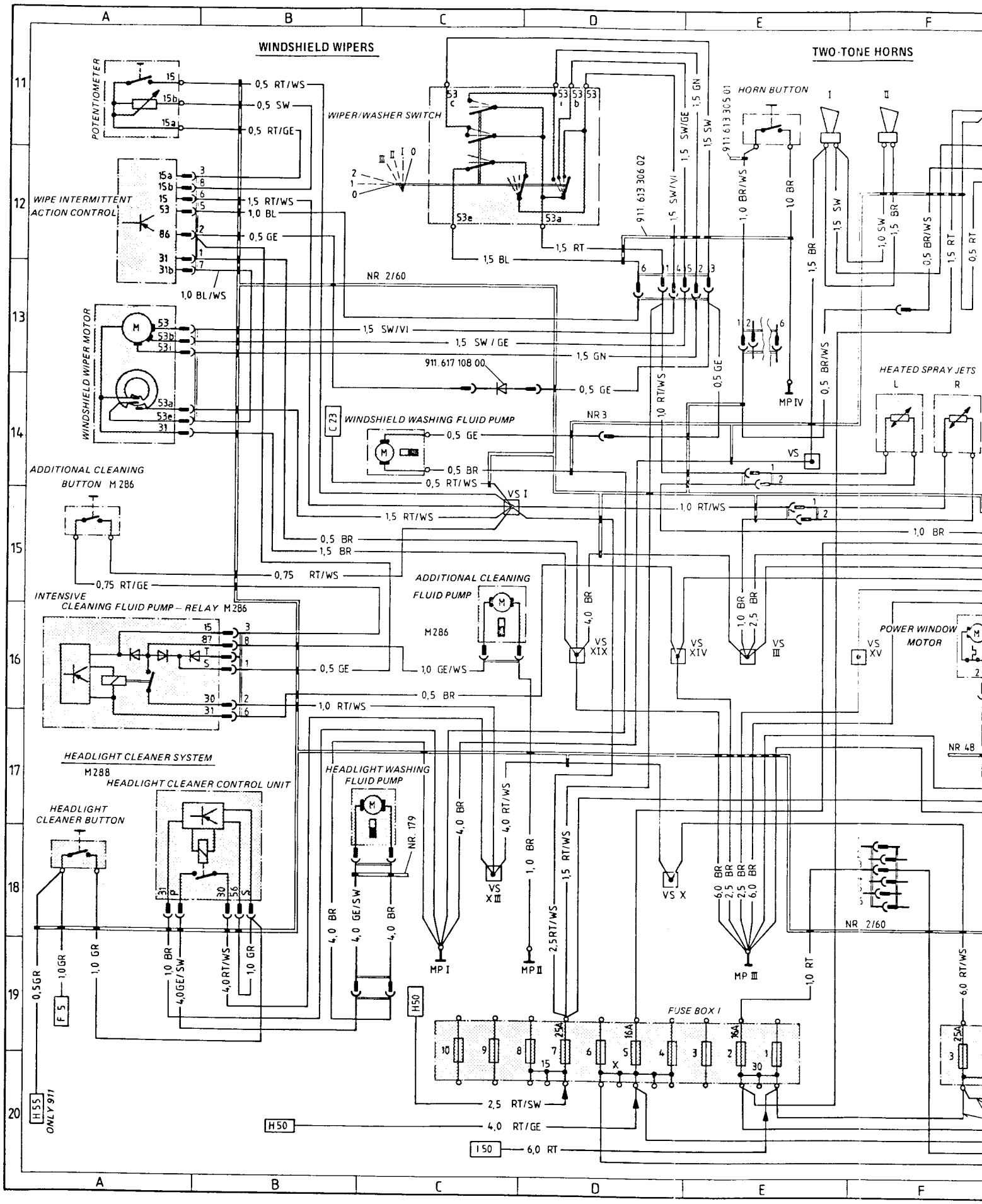

F
G
H
I
K
L
ASHTRAY LIGHT
HAZARD LIGHT SWITCH
FRONT FOG LAMP SWITCH
REAR FOG LIGHT SWITCH
LIGHT SWITCH
SIGN LIGHT M 553
TRAILER TURN SIGNAL INDICATOR LAMP
TURN SIGNAL FLASHER
FRONT FOG LAMP RELAY
DOOR CONTACT SWITCH LEFT
GLOVE BOX LIGHT
FUSE BOX I
0,5 BR
2,5 RT
0,5 GR
1,5 SW/BL
0,5 SW/BL
0,5 BL/SW
1,5 RT/WS
0,5 BR/WS
0,5 SW
1,0 SW/GN
1,0 SW/WS
1,0 SW/WS/GN
0,75 SW/BL
1,0 BR
0,75 BR
1,5 WS/GN
0,75 WS/BR
2,5 BR
6,0 BR
4,0 BR
6,0 RT
1,5 RT
2,5 RT/SW
4,0 RT/GE
M 487
M 193
MP I
MP II
MP III
MP IV
MP V
MP VI
MP VII
MP IX
MP X
MP XI
MP XII
= BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET


K
L
M
N
O
P
CABRIO, TARGA
INSIDE LIGHT
COUPE
INSIDE LIGHT LEFT
INSIDE LIGHT RIGHT
REAR FOG LIGHT SWITCH
G LAMP SWITCH
NR.226
1,0BR
MP VIII
NR 42
0,75 BR/WS
0,75 SW
0,5 BR/WS
NR 226
MP IX
NR.46
VS
NR.45, BEL. M650 NR.34/64
0,5 SW
0,5 BR
1,5 WS/GR
1,0 RT
C 35
L 50
DOOR CONTACT SWITCH LEFT
DOOR CONTACT SWITCH RIGHT
STOP LIGHT SWITCH I
STOP LIGHT SWITCH II
82a
81
ONLY M 553
TAIL LIGHT ASSEMBLY RIGHT
1,0 SW/WS
1,0 GR/BR
1,0 SW/GE
1,0 GN/BL
0,75 GR/RT
54
58
R
NR. 39
1,5 SW/GE
0,5BR/WS
N 51
L 53
P 43
0,5 SW/GE
NR 157
NR 16
1,0 GN/GE
BACKUP LIGHT SWITCH
VS I
ONLY LHD
0,75 WS/GR
1,0 BR
1,5 BR
0,75WS/BR
REAR FOG LIGHT NOT M576
0,75 WS
0,75 WS/BR
1,0SW/GE
1,0WS/GR
1,5BR
VS II
0,5SW/BL
N 53
1,0GN/RT
GLOVE BOX LIGHT
F 55
CLOCK
K50
0,5 SW
0,5 BR
0,5 BR/WS
0,5 SW/BL
911.613 111.10
DOOR CONTACT SWITCH
0,75 SW/GN
0,75SW/GE
LICENSE PLATE LIGHT
MP XI
NR.1,61
0,75GR
1,0 GR/BR
1,0 BR
1,0 SW/GE
1,0 WS/GR
0,75GR/RT
0,75 GR/SW
0,75 SW/WS
I 57
I 50
H 50
MP X
MP XII
MP XI
MP IX
MP VII
MP VI
MP IV
MP III
MP II
MP I
0,75SW/GE
NR.32
CONNECTION AT REAR WINDOW DEFOGGER
0,75SW
K 27
911.671.061.01
HIGH MOUNTED STOP LIGHT M 553
COUPE, TARGA
0,75GR
1,0BR
NR.49
0,75BR
ENGINE COMPARTMENT LIGHT
HIGH MOUNTED STOP LIGHT – CABRIOLET
ONLY M 553
TAIL LIGHT ASSEMBLY LEFT
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
1
2
3
4
5
6
7
8
9
10

LI = VIOLET

Wiring Diagram Type 911 Carrera Model 87 Sheet 3

BODY



SW = BLACK WS = WH

F G H I K L

JE HORNS

OUTSIDE MIRROR

HORN RELAY

OUTSIDE MIRROR LEFT

HORIZONTAL

VERTIKAL

944 731 027 00

MIRROR SWITCH

HEATED SPRAY JETS

L R

NR 165

BRIDGE WITH STANDARD 928.612.325.00 KL.1 WITH KL.3 AND KL.2 KL.5 BRIDGE WITH

CHANGE-OVER SWITCH M 528/M 261

POWER WINDOW

DRIVER'S SIDE

DRIVER'S POWER WINDOW SWITCH

PASSENGER'S POWER WINDOW SWITCH

PASSENGER'S SIDE

PASSENGER'S POWER WINDOW SWITCH

POWER WINDOW MOTOR

S = CLOSING
O = OPENING

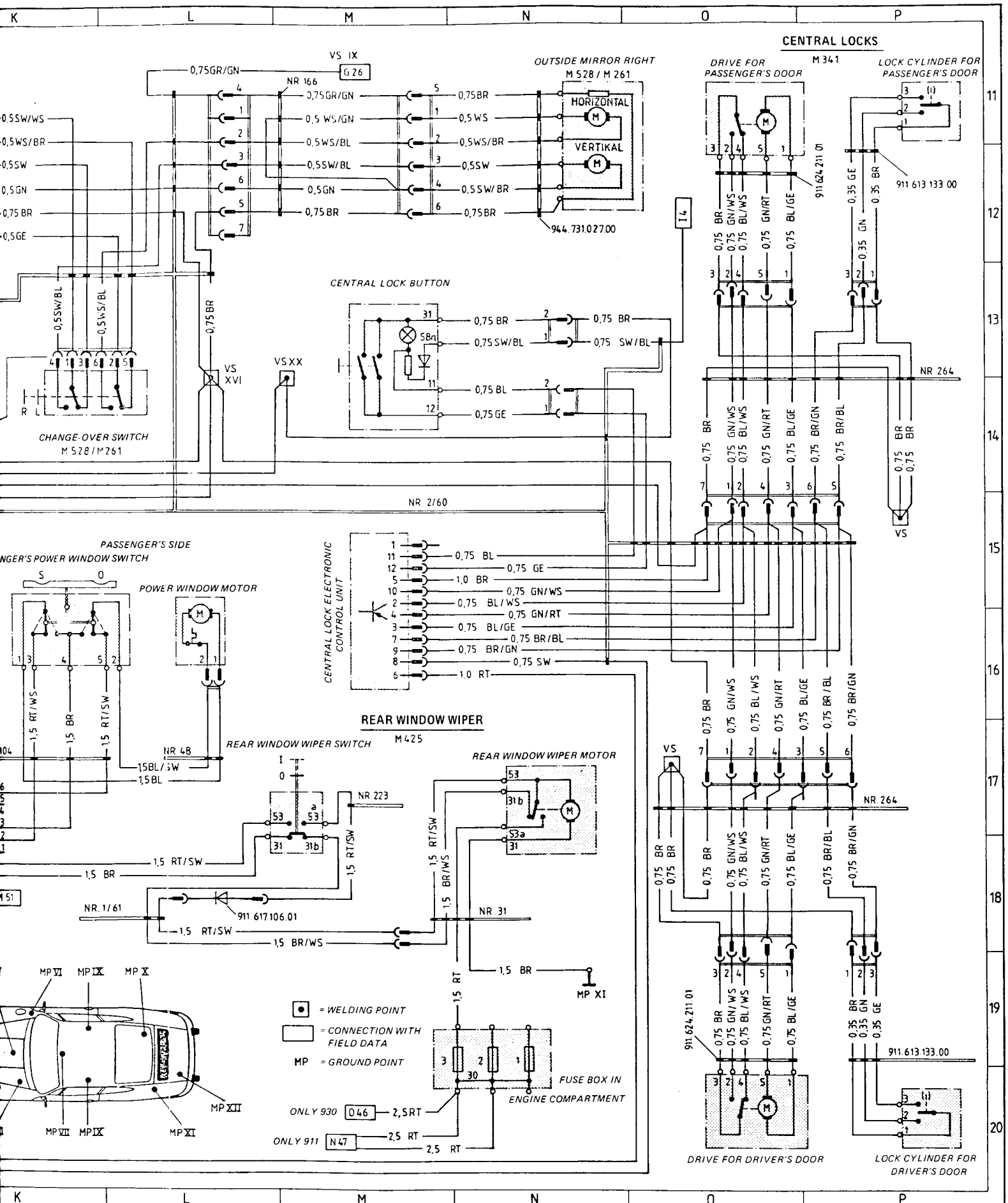
CONNECTION RAIL

POWER WINDOW CONTROL UNIT

MP I MP II MP III MP IV MP VI MP VII MP IX MP X MP XI MP XII

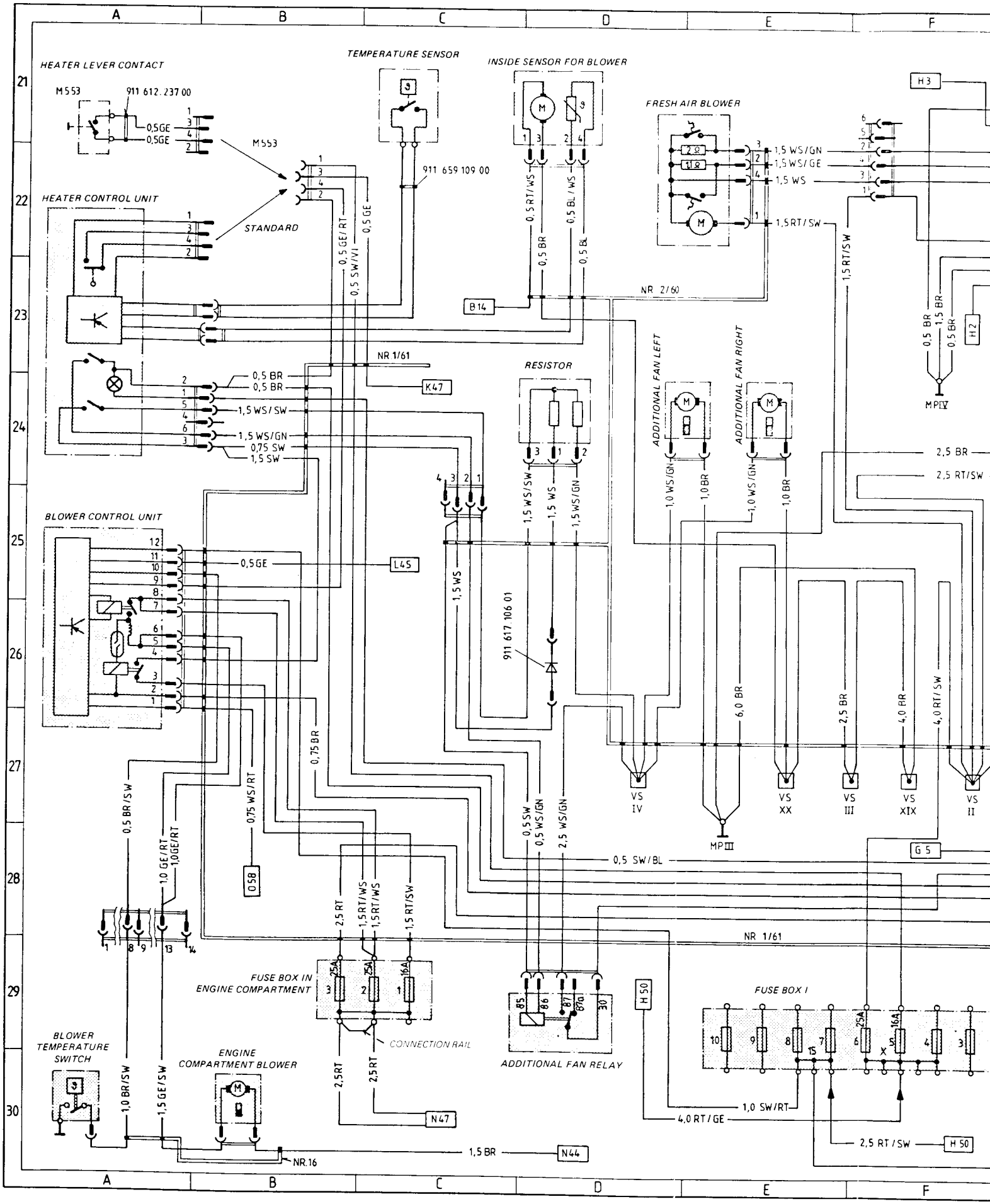
F G H I K L

BK = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET


K
L
M
N
O
P
CENTRAL LOCKS
M 341
OUTSIDE MIRROR RIGHT
M 528 / M 261
HORIZONTAL
VERTIKAL
944.731.027.00
DRIVE FOR PASSENGER'S DOOR
LOCK CYLINDER FOR PASSENGER'S DOOR
911.624.211.01
911.613.133.00
VS IX
G 26
0,75GR/GN
NR 166
0,5SW/WS
0,5WS/BR
0,5SW
0,5GN
0,75BR
0,5GE
0,5SW/BL
0,5WS/BL
CHANGE-OVER SWITCH
M 528/M 261
VS XVI
VS XX
CENTRAL LOCK BUTTON
5Bq
0,75 SW/BL
0,75 BL
0,75 GE
NR 264
NR 2/60
VS
PASSENGER'S SIDE
POWER WINDOW SWITCH
POWER WINDOW MOTOR
CENTRAL LOCK ELECTRONIC CONTROL UNIT
1,0 BR
0,75 GN/WS
0,75 BL/WS
0,75 GN/RT
0,75 BL/GE
0,75 BR/GN
0,75 BR/BL
0,75 SW
1,0 RT
REAR WINDOW WIPER
M 425
REAR WINDOW WIPER SWITCH
REAR WINDOW WIPER MOTOR
NR 48
NR 223
NR 31
NR 1/61
911.617.106.01
1,5 RT/SW
1,5 BR
1,5 BR/WS
1,5 RT
1,5 BL/SW
1,5 BL
MP XI
MP VI
MP IX
MP X
MP XII
MP VII
MP IX
MP XI
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
FUSE BOX IN ENGINE COMPARTMENT
ONLY 930
046
2,5 RT
ONLY 911
N47
2,5 RT
2,5 RT
DRIVE FOR DRIVER'S DOOR
LOCK CYLINDER FOR DRIVER'S DOOR
911.624.211.01
911.613.133.00
11
12
13
14
15
16
17
18
19
20

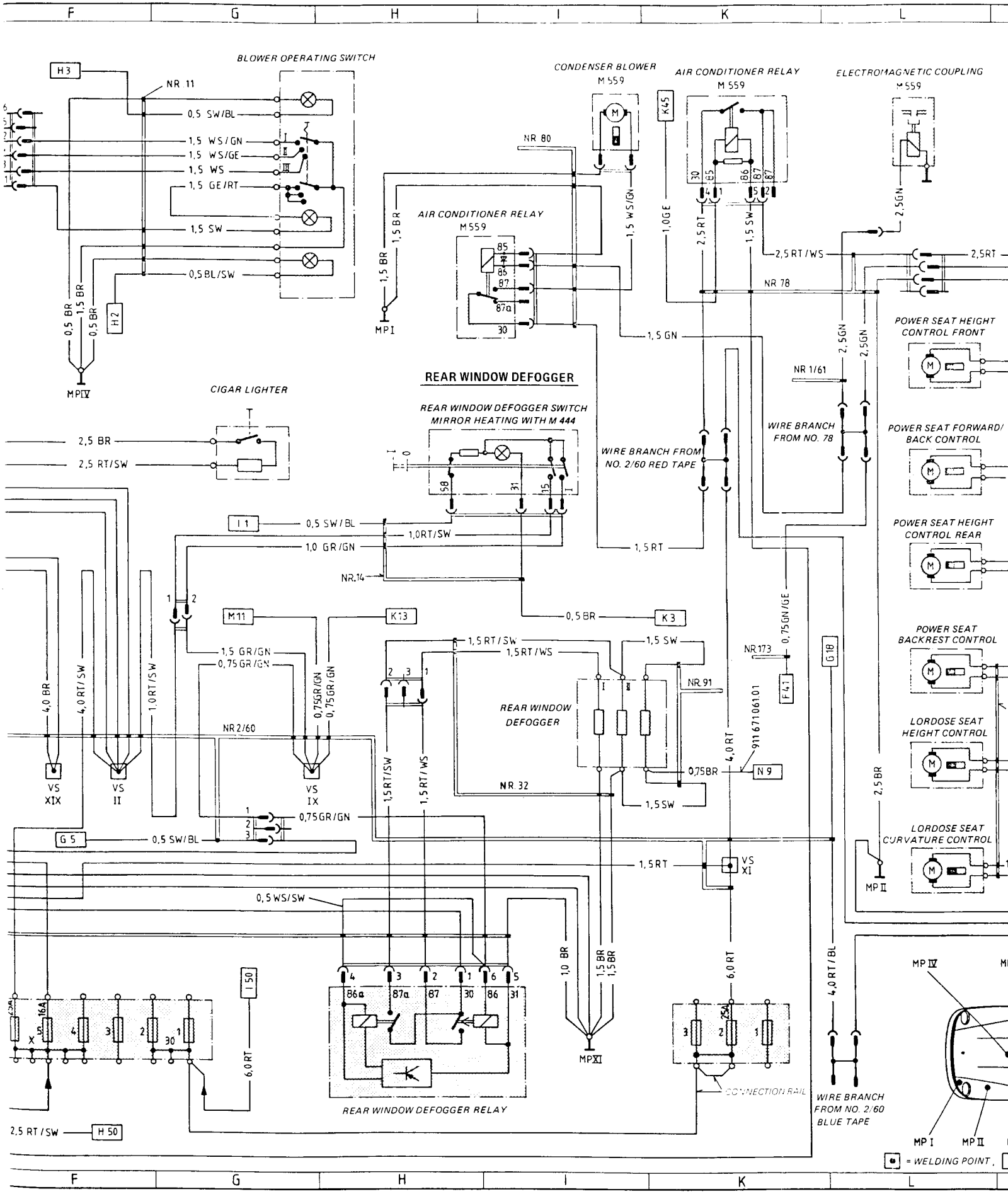
Wiring Diagram Type 911 Carrera Model 87 Sheet 4

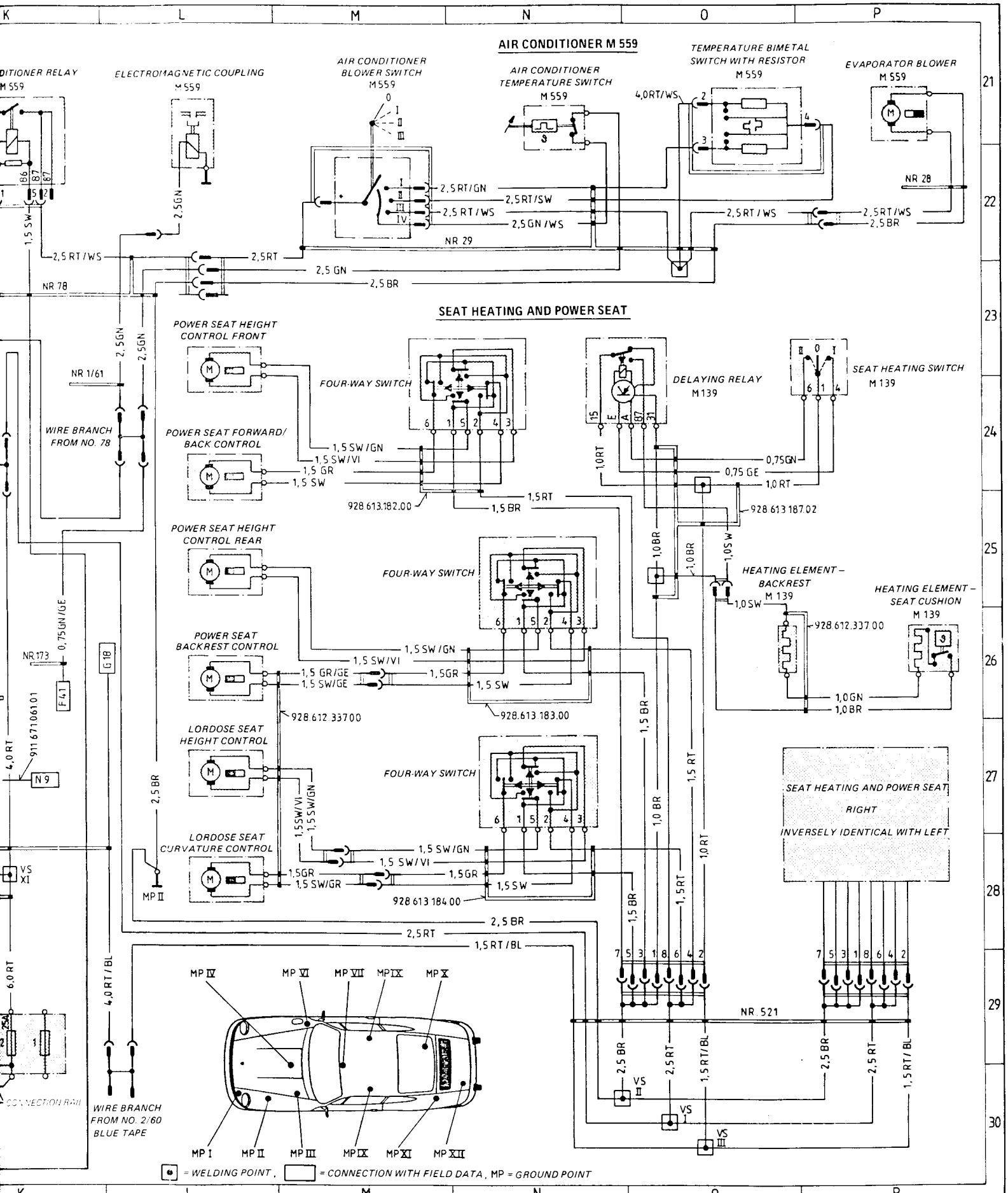
HEATING AND VENTILATION



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SW = BLACK WS = WHITE

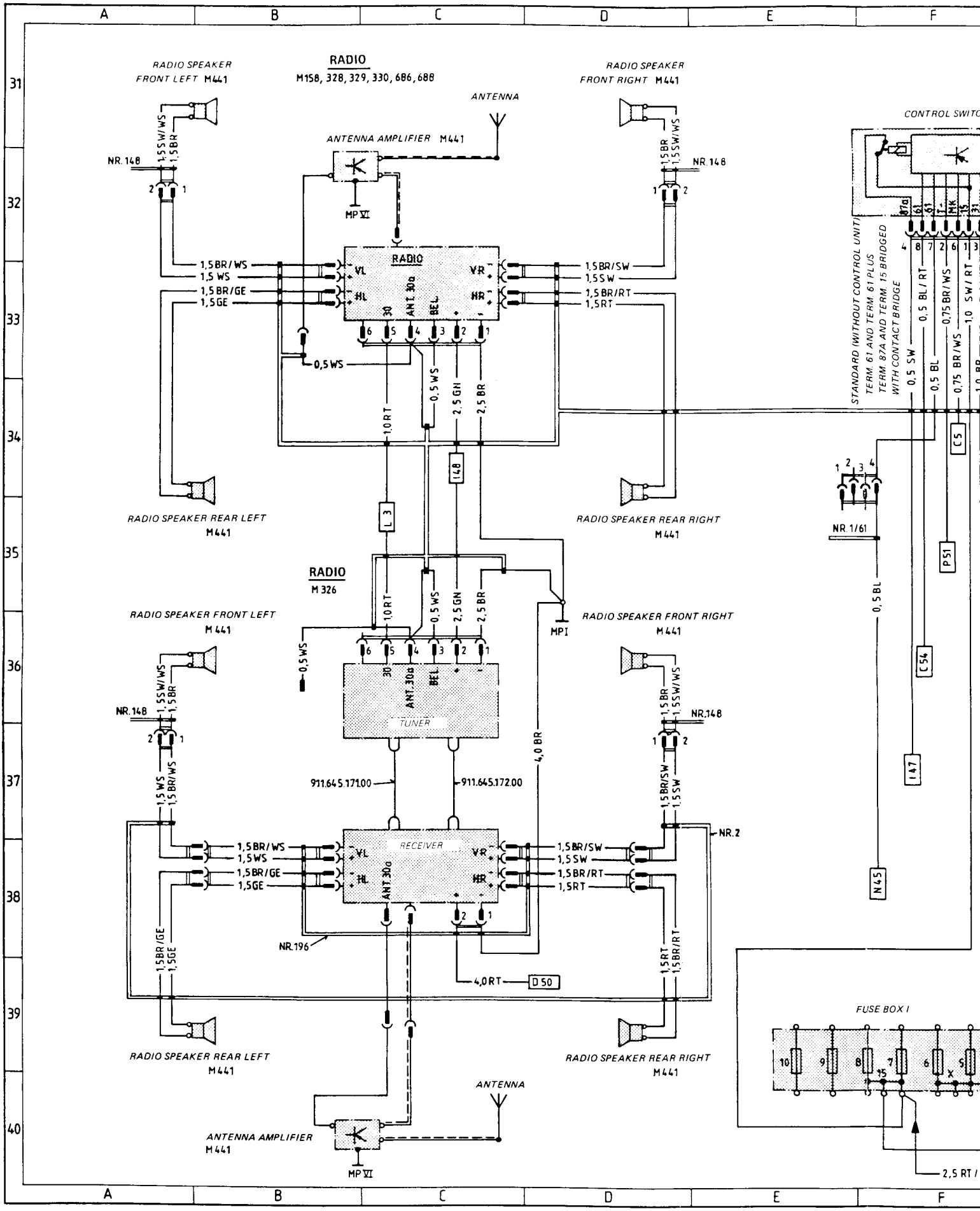

F
G
H
I
K
L
BLOWER OPERATING SWITCH
CONDENSER BLOWER M 559
AIR CONDITIONER RELAY M 559
ELECTROMAGNETIC COUPLING M 559
AIR CONDITIONER RELAY M 559
CIGAR LIGHTER
REAR WINDOW DEFOGGER
REAR WINDOW DEFOGGER SWITCH MIRROR HEATING WITH M 444
REAR WINDOW DEFOGGER
REAR WINDOW DEFOGGER RELAY
WIRE BRANCH FROM NO. 2/60 RED TAPE
WIRE BRANCH FROM NO. 78
WIRE BRANCH FROM NO. 2/60 BLUE TAPE
CONNECTION RAIL
POWER SEAT HEIGHT CONTROL FRONT
POWER SEAT FORWARD/ BACK CONTROL
POWER SEAT HEIGHT CONTROL REAR
POWER SEAT BACKREST CONTROL
LORDOSE SEAT HEIGHT CONTROL
LORDOSE SEAT CURVATURE CONTROL
NR 11
NR 80
NR 78
NR 1/61
NR 14
NR 2/60
NR 32
NR 91
NR 173
0,5 SW/BL
1,5 WS/GN
1,5 WS/GE
1,5 WS
1,5 GE/RT
1,5 SW
0,5 BL/SW
0,5 BR
1,5 BR
1,5 WS/GN
1,0 GE
2,5 RT
2,5 GN
2,5 RT/WS
2,5 BR
2,5 RT/SW
1,0 RT/SW
1,0 GR/GN
1,5 RT
0,5 BR
1,5 GR/GN
0,75 GR/GN
1,5 RT/SW
1,5 RT/WS
0,75 GN/GE
4,0 BR
4,0 RT/SW
1,0 RT/SW
0,75 BR
4,0 RT
6,0 RT
1,0 BR
4,0 RT/BL
0,5 WS/SW
911 671 061 01
MPI
MPII
MPIII
MPIV
MPXI
H 3
H 2
H 50
I 1
I 50
M 11
K 13
K 3
K 45
G 5
G 18
F 41
N 9
VS XIX
VS II
VS IX
VS XI
16A
25A
= WELDING POINT
BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET


AIR CONDITIONER M 559
AIR CONDITIONER BLOWER SWITCH M559
AIR CONDITIONER TEMPERATURE SWITCH M 559
TEMPERATURE BIMETAL SWITCH WITH RESISTOR M 559
EVAPORATOR BLOWER M 559
ELECTROMAGNETIC COUPLING M 559
SEAT HEATING AND POWER SEAT
POWER SEAT HEIGHT CONTROL FRONT
FOUR-WAY SWITCH
DELAYING RELAY M139
SEAT HEATING SWITCH M 139
POWER SEAT FORWARD/ BACK CONTROL
WIRE BRANCH FROM NO. 78
POWER SEAT HEIGHT CONTROL REAR
POWER SEAT BACKREST CONTROL
LORDOSE SEAT HEIGHT CONTROL
LORDOSE SEAT CURVATURE CONTROL
HEATING ELEMENT – BACKREST M 139
HEATING ELEMENT – SEAT CUSHION M 139
928.613.182.00
928.613.187.02
928.612.337.00
928.613.183.00
928.613.184.00
SEAT HEATING AND POWER SEAT RIGHT INVERSELY IDENTICAL WITH LEFT
NR 78
NR 29
NR 28
NR 1/61
NR 173
NR 521
N 9
G 18
F 41
WIRE BRANCH FROM NO. 2/60 BLUE TAPE
MP I MP II MP III MP IV MP VI MP VII MP IX MP X MP XI MP XII
= WELDING POINT, = CONNECTION WITH FIELD DATA, MP = GROUND POINT

LI = VIOLET

Wiring Diagram Type 911 Carrera Model 87 Sheet 5

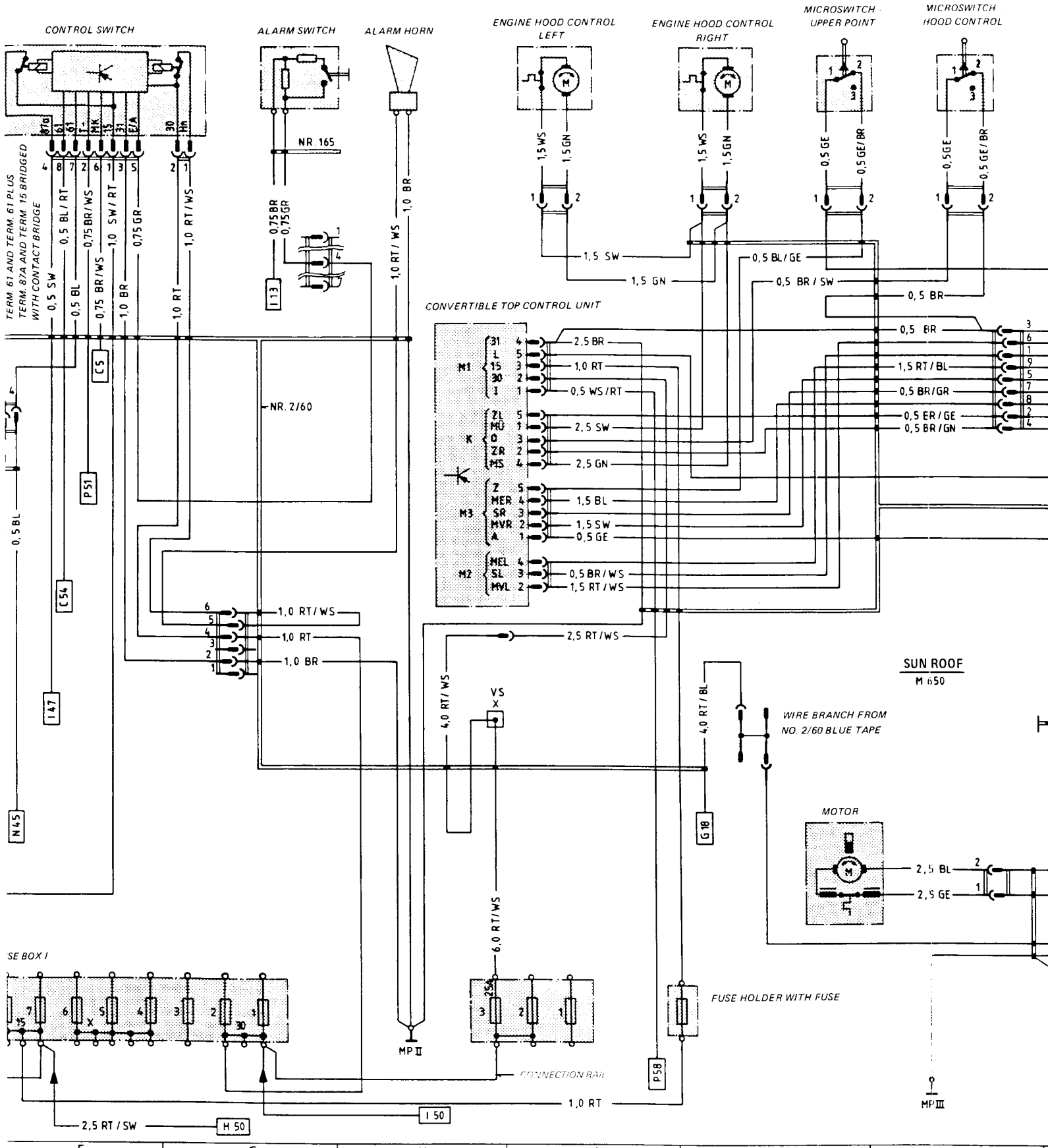
RADIO, ALARM SYSTEM, CONVERTIBLE TOP, LIFTING ROOF



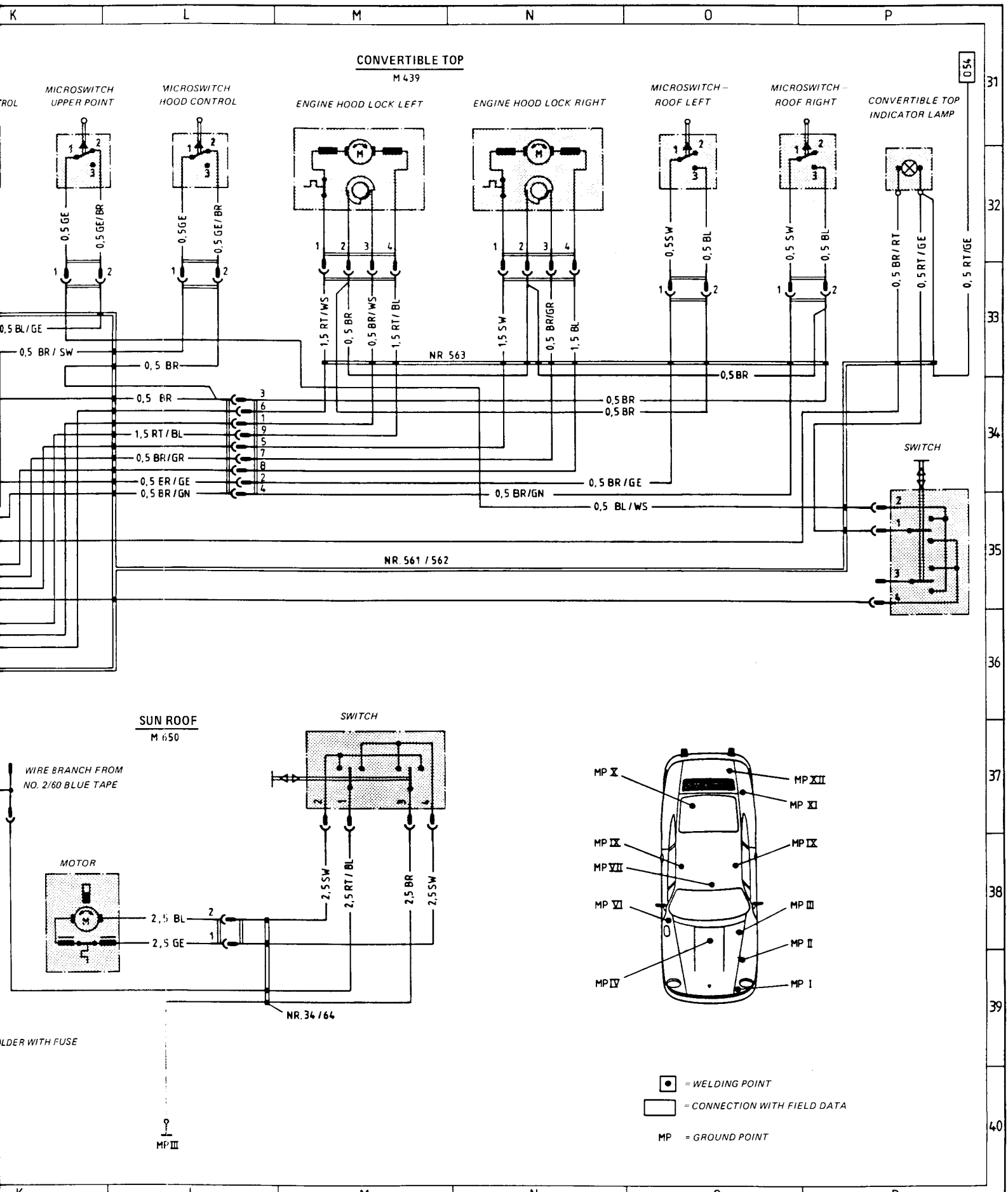
Printed in Germany - VI, 1986

SW = BLACK WS = WH

BURGLAR ALARM
M 533

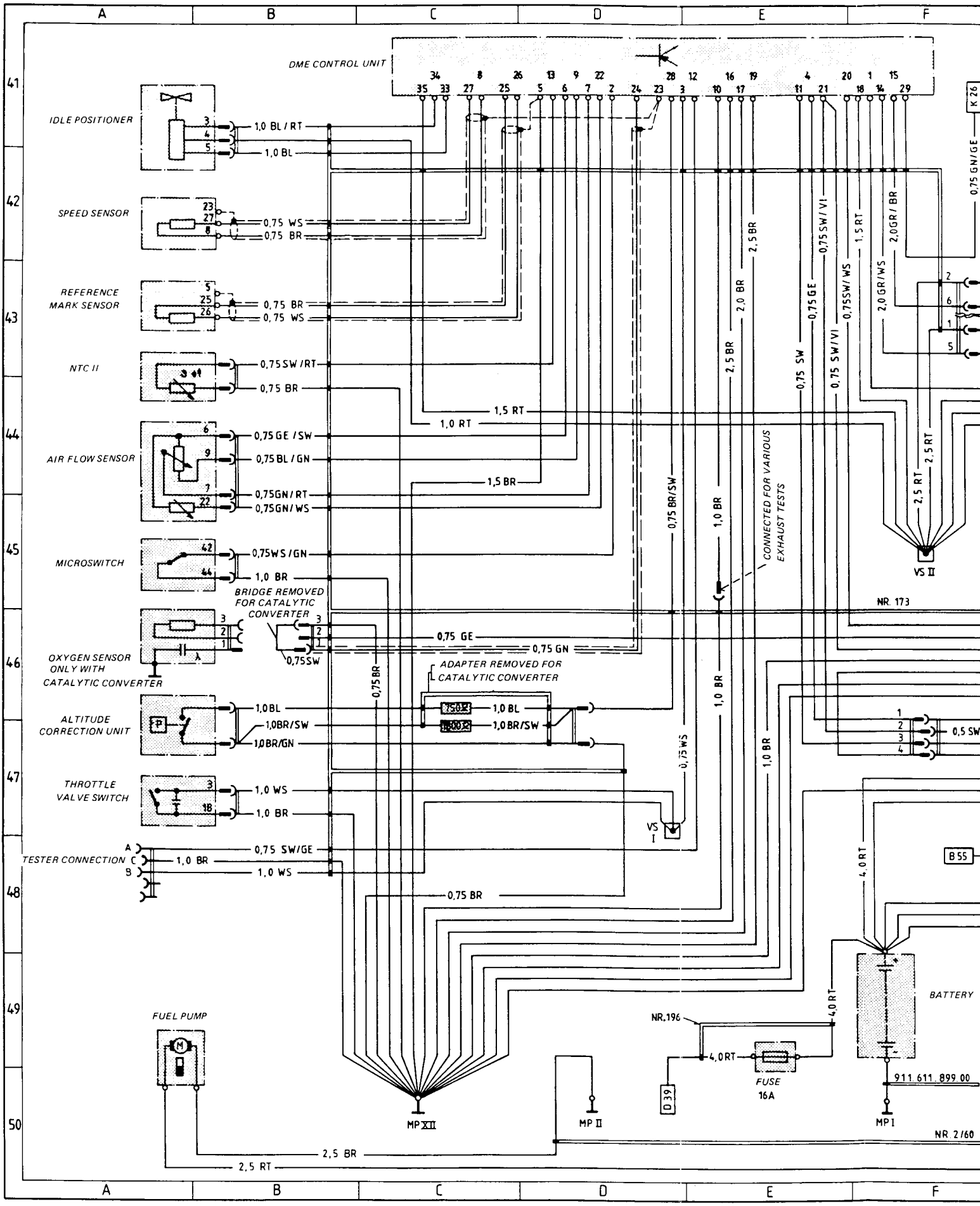


BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET


K
L
M
N
O
P
CONVERTIBLE TOP
M 439
MICROSWITCH UPPER POINT
MICROSWITCH HOOD CONTROL
ENGINE HOOD LOCK LEFT
ENGINE HOOD LOCK RIGHT
MICROSWITCH – ROOF LEFT
MICROSWITCH – ROOF RIGHT
CONVERTIBLE TOP INDICATOR LAMP
054
0,5 GE
0,5 GE/BR
0,5 GE
0,5 GE/BR
1,5 RT/WS
0,5 BR
0,5 BR/WS
1,5 RT/BL
1,5 SW
0,5 BR/GR
1,5 BL
0,5 SW
0,5 BL
0,5 SW
0,5 BL
0,5 BR/RT
0,5 RT/GE
0,5 RT/GE
0,5 BL/GE
0,5 BR/SW
0,5 BR
NR. 563
0,5 BR
0,5 BR
0,5 BR
0,5 BR
1,5 RT/BL
0,5 BR/GR
0,5 BR/GE
0,5 BR/GN
0,5 BR/GN
0,5 BL/WS
SWITCH
NR. 561 / 562
SUN ROOF
M 650
SWITCH
WIRE BRANCH FROM NO. 2/60 BLUE TAPE
MOTOR
2,5 BL
2,5 GE
2,5 SW
2,5 RT/BL
2,5 BR
2,5 SW
NR. 34 / 64
MP III
MP X
MP XII
MP XI
MP IX
MP IX
MP VIII
MP VI
MP III
MP II
MP IV
MP I
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
K
L
M
N
O
P

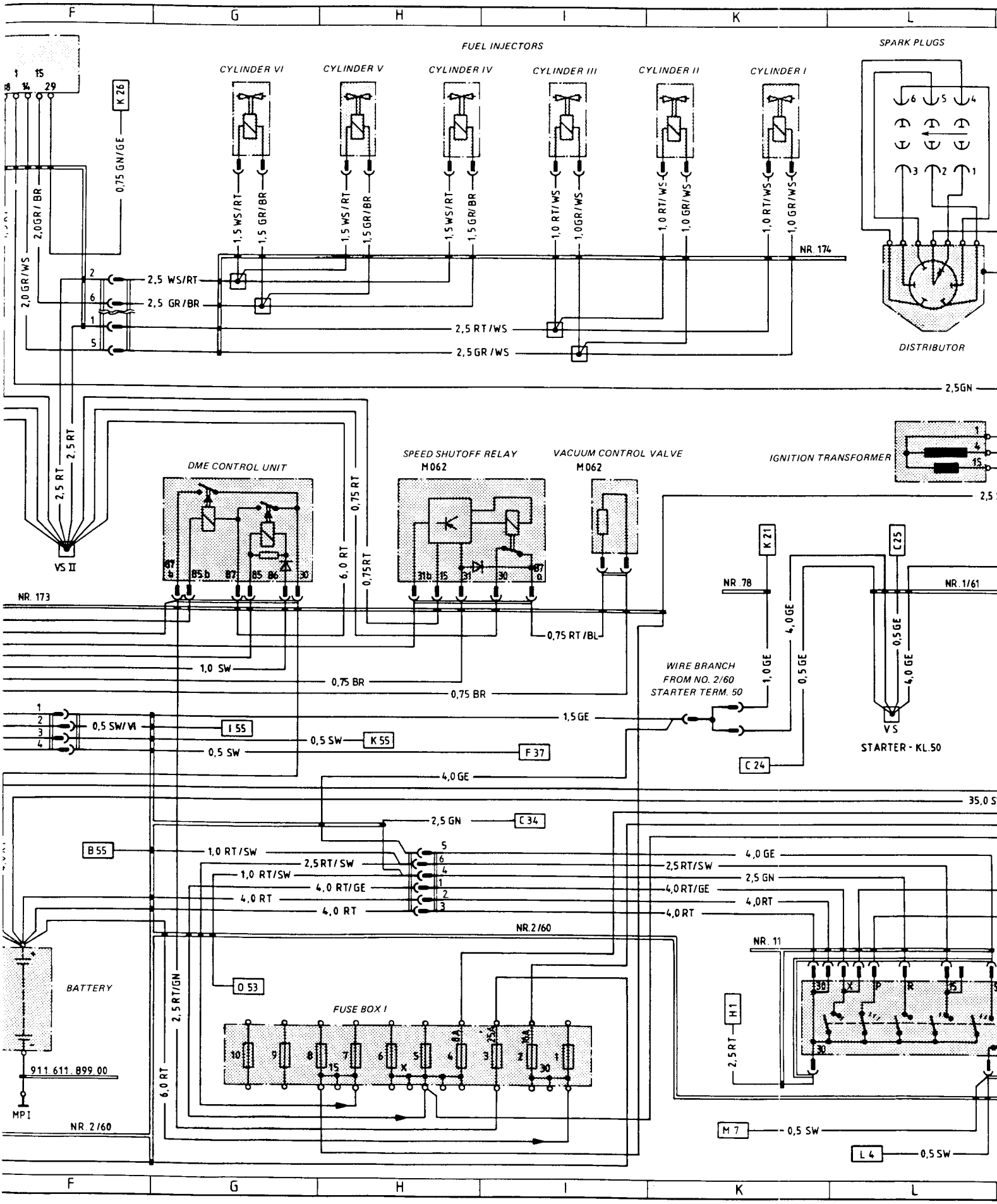
Wiring Diagram Type 911 Carrera Model 87 Sheet 6

ENGINE (DME) TEMPOSTAT

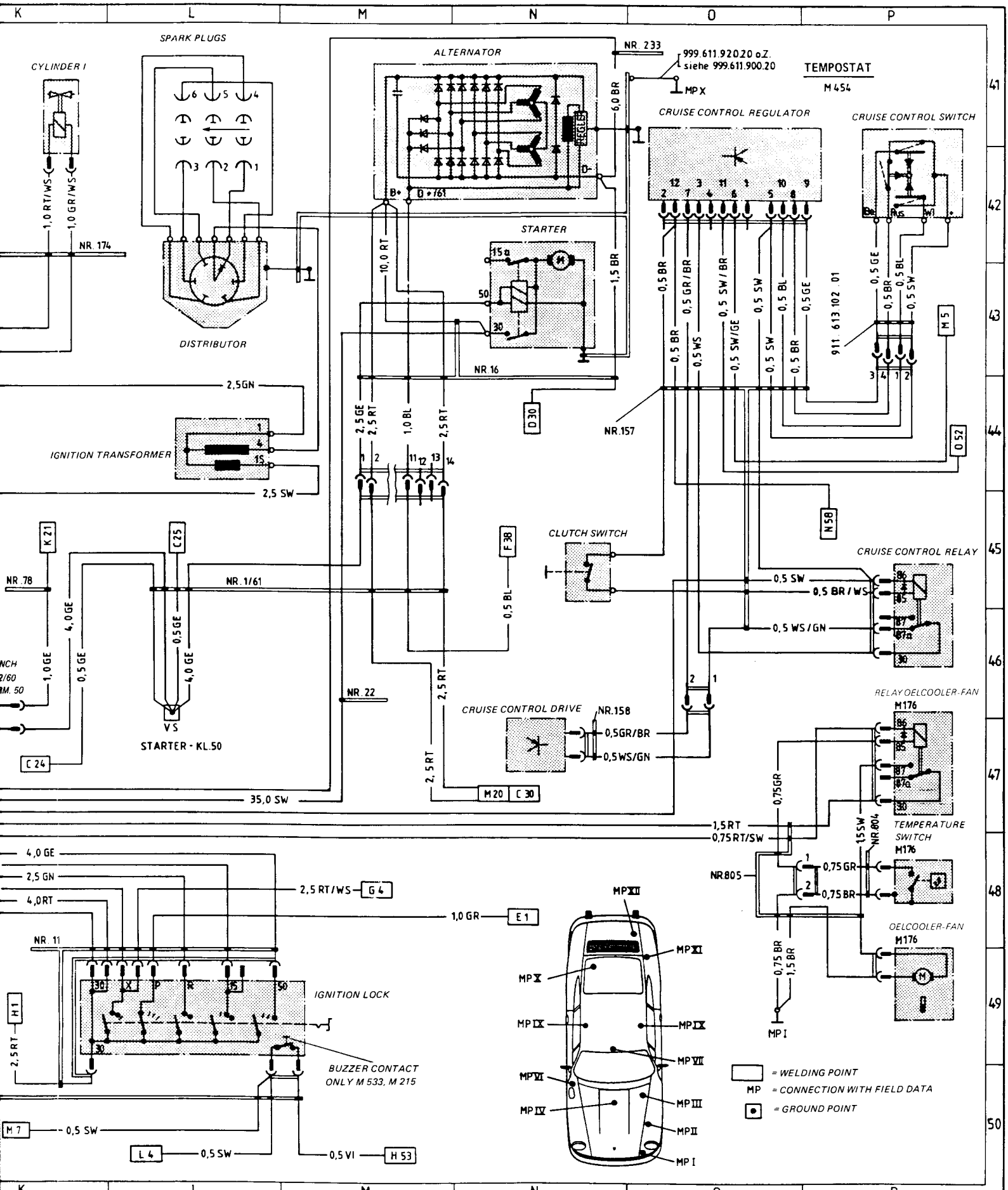


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SW = BLACK WS = W



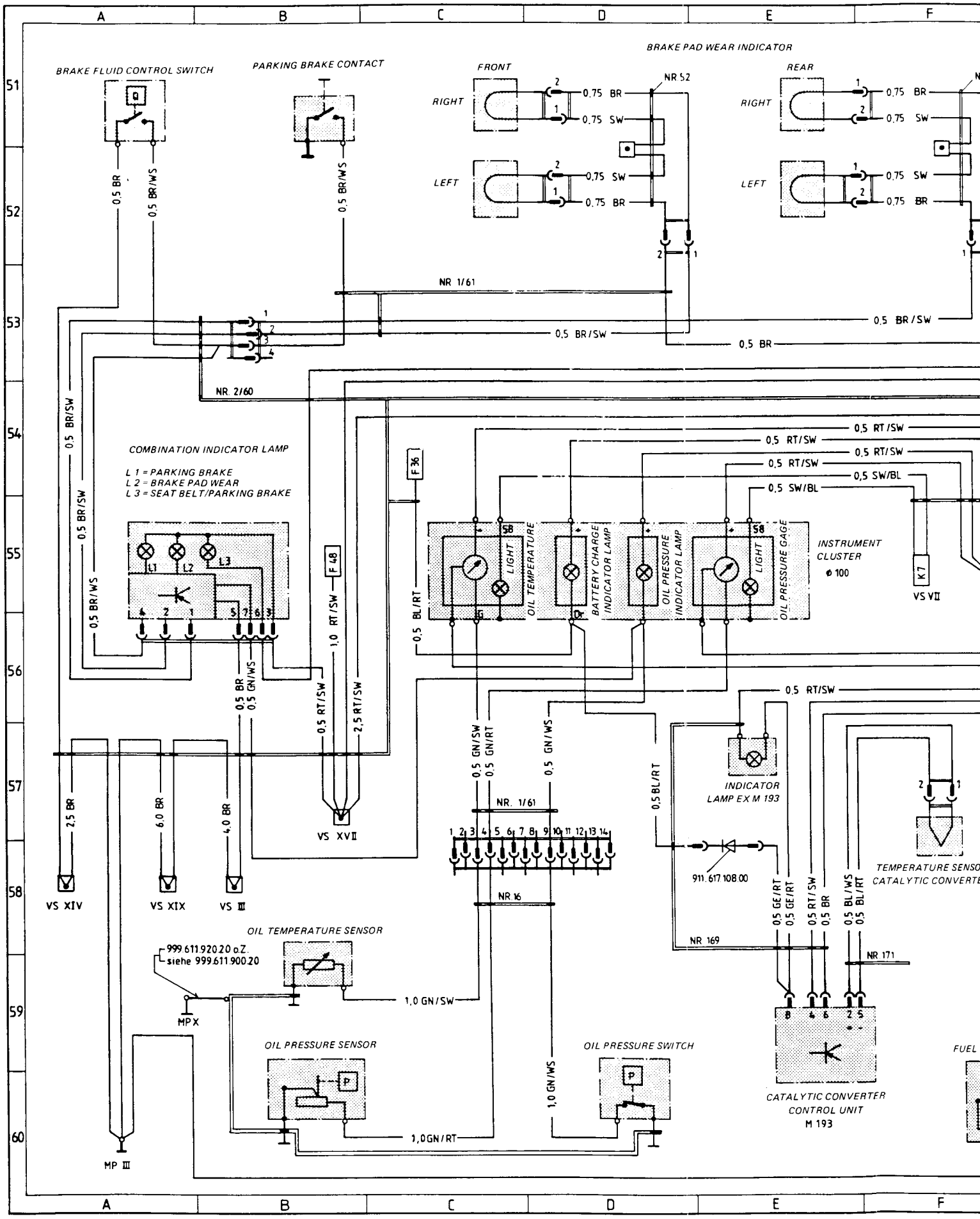
/ = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET


K
L
M
N
O
P
SPARK PLUGS
CYLINDER I
1,0 RT/WS
1,0 GR/WS
NR. 174
DISTRIBUTOR
ALTERNATOR
NR. 233
999.611.920.20 oZ.
siehe 999.611.900.20
MP X
TEMPOSTAT
M 454
CRUISE CONTROL REGULATOR
CRUISE CONTROL SWITCH
6,0 BR
B+
D+/61
D-
REGLER
STARTER
15a
50
30
10,0 RT
1,5 BR
NR. 16
D 30
NR. 157
0,5 BR
0,5 GR/BR
0,5 WS
0,5 SW/GE
0,5 SW
0,5 BL
0,5 GE
0,5 SW/BR
911 613 102 .01
M 5
O 52
2,5 GN
IGNITION TRANSFORMER
2,5 SW
2,5 GE
2,5 RT
1,0 BL
2,5 RT
K 21
C 25
F 38
NR. 78
NR. 1/61
4,0 GE
0,5 GE
1,0 GE
0,5 GE
4,0 GE
0,5 BL
CLUTCH SWITCH
CRUISE CONTROL RELAY
0,5 SW
0,5 BR/WS
0,5 WS/GN
N 58
VS
STARTER - KL.50
C 24
NR. 22
2,5 RT
CRUISE CONTROL DRIVE
NR.158
0,5GR/BR
0,5WS/GN
M20
C 30
35,0 SW
RELAY OELCOOLER-FAN
M176
0,75GR
1,5RT
0,75RT/SW
15SW
NR.804
TEMPERATURE SWITCH
NR.805
0,75 GR
0,75 BR
OELCOOLER-FAN
0,75 BR
1,5 BR
MP I
4,0 GE
2,5 GN
4,0 RT
2,5 RT/WS
G 4
1,0 GR
E 1
NR. 11
IGNITION LOCK
H 1
2,5 RT
BUZZER CONTACT
ONLY M 533, M 215
M 7
0,5 SW
L 4
0,5 SW
0,5 VI
H 53
MP XII
MP XI
MP X
MP IX
MP VII
MP VI
MP IV
MP III
MP II
MP I
= WELDING POINT
MP = CONNECTION WITH FIELD DATA
= GROUND POINT
41
42
43
44
45
46
47
48
49
50

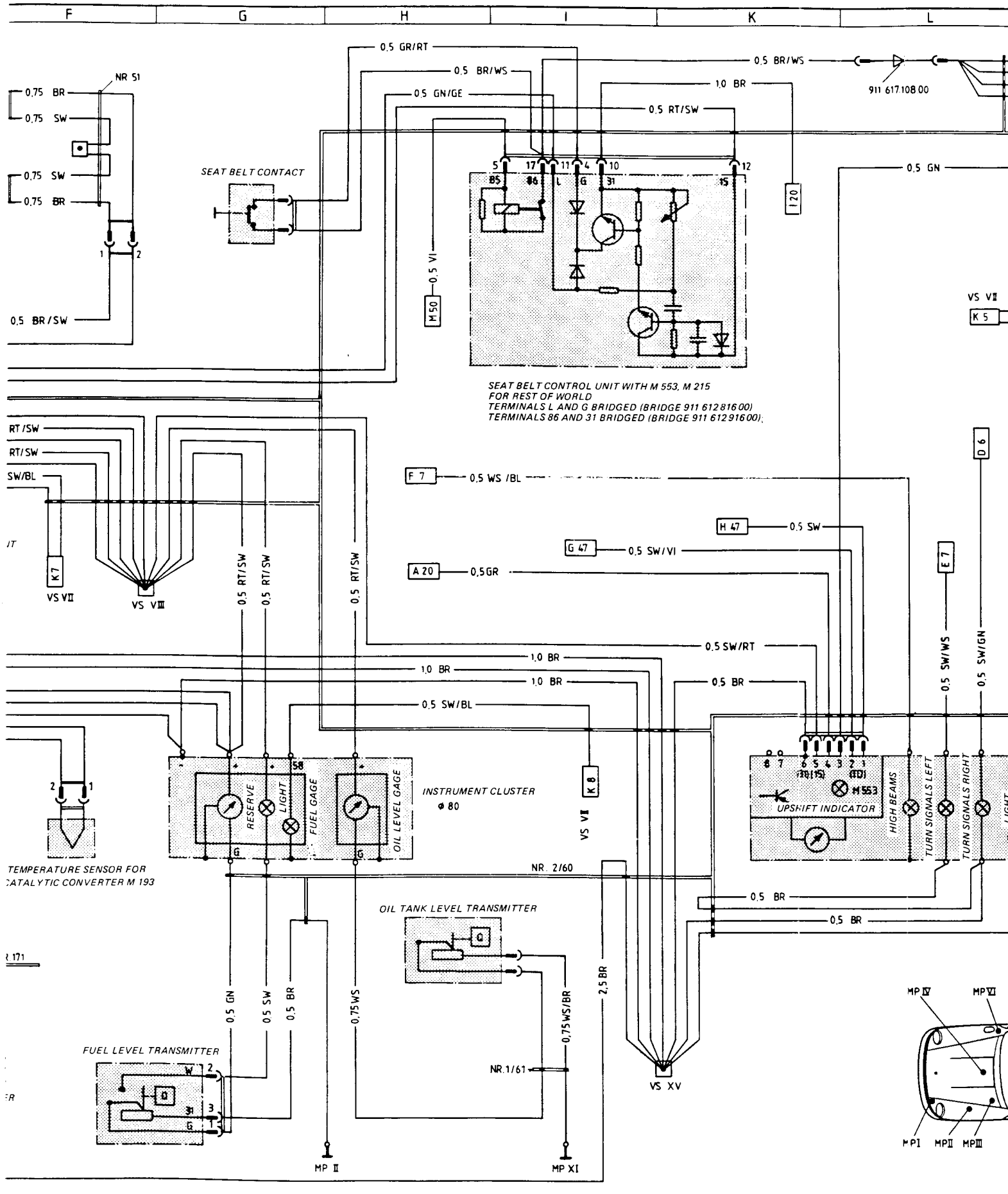
LI = VIOLET

Wiring Diagram Type 911 Carrera Model 87 Sheet 7

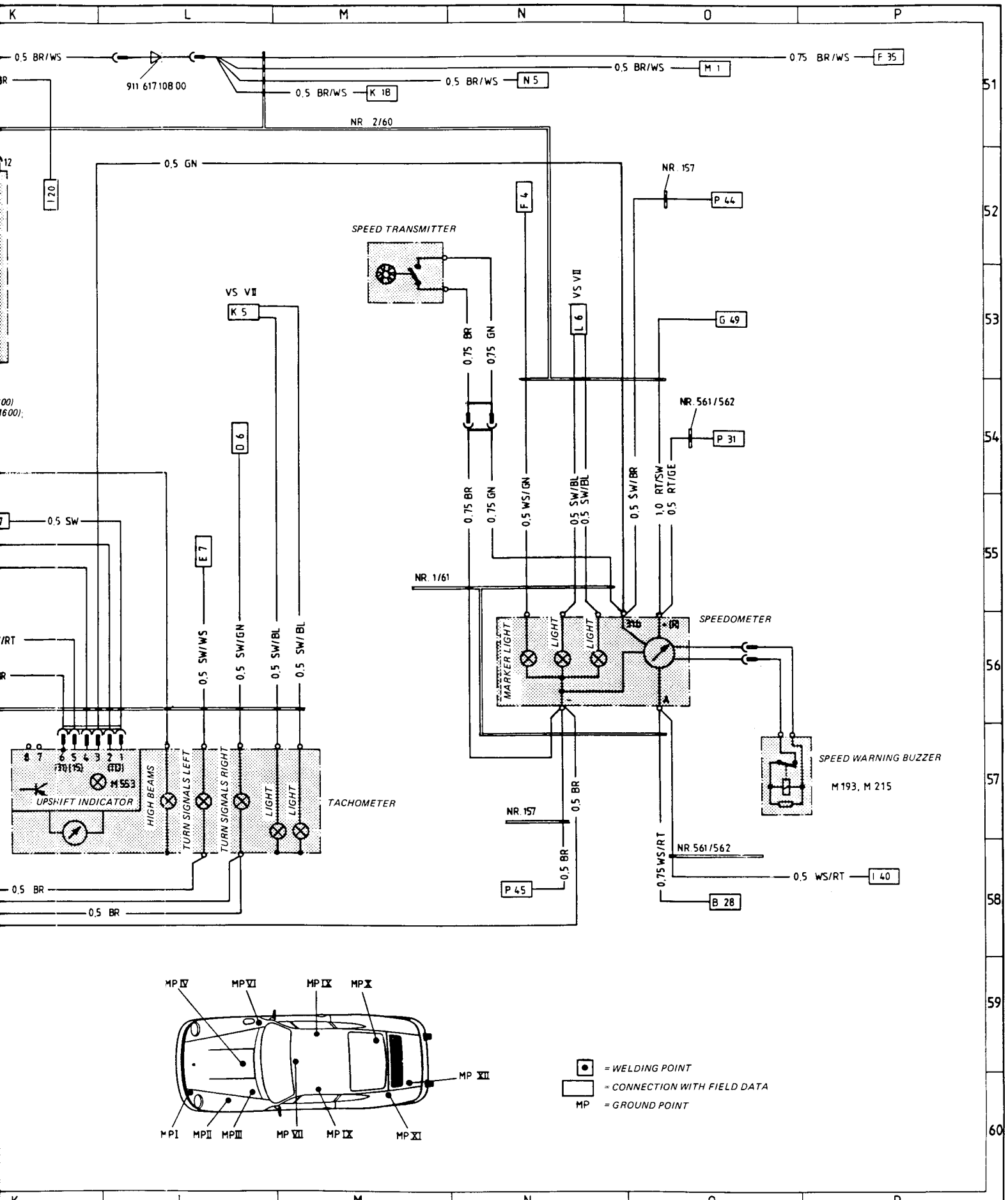
INSTRUMENTS AND INDICATORS



SW = BLACK WS =

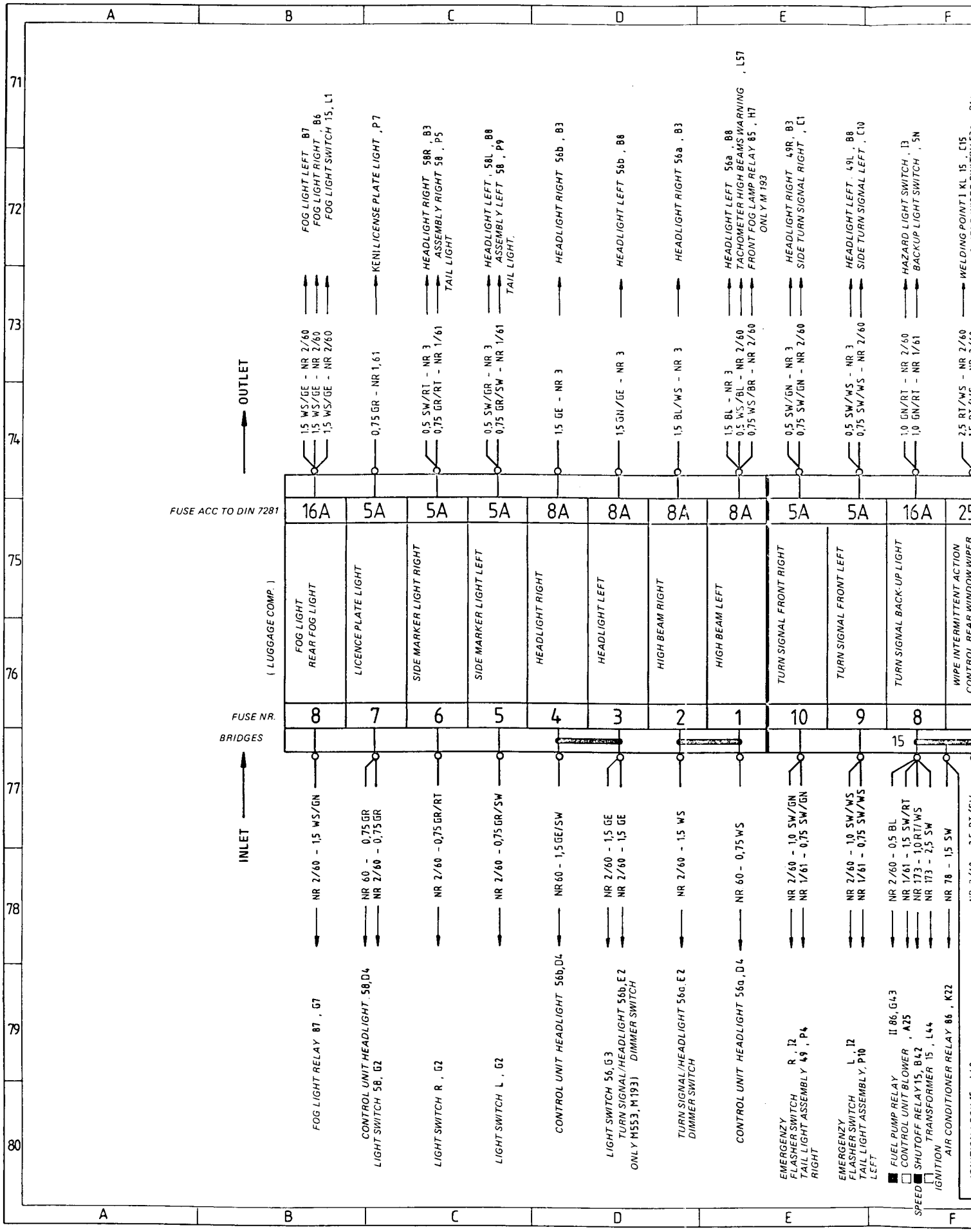


= BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET

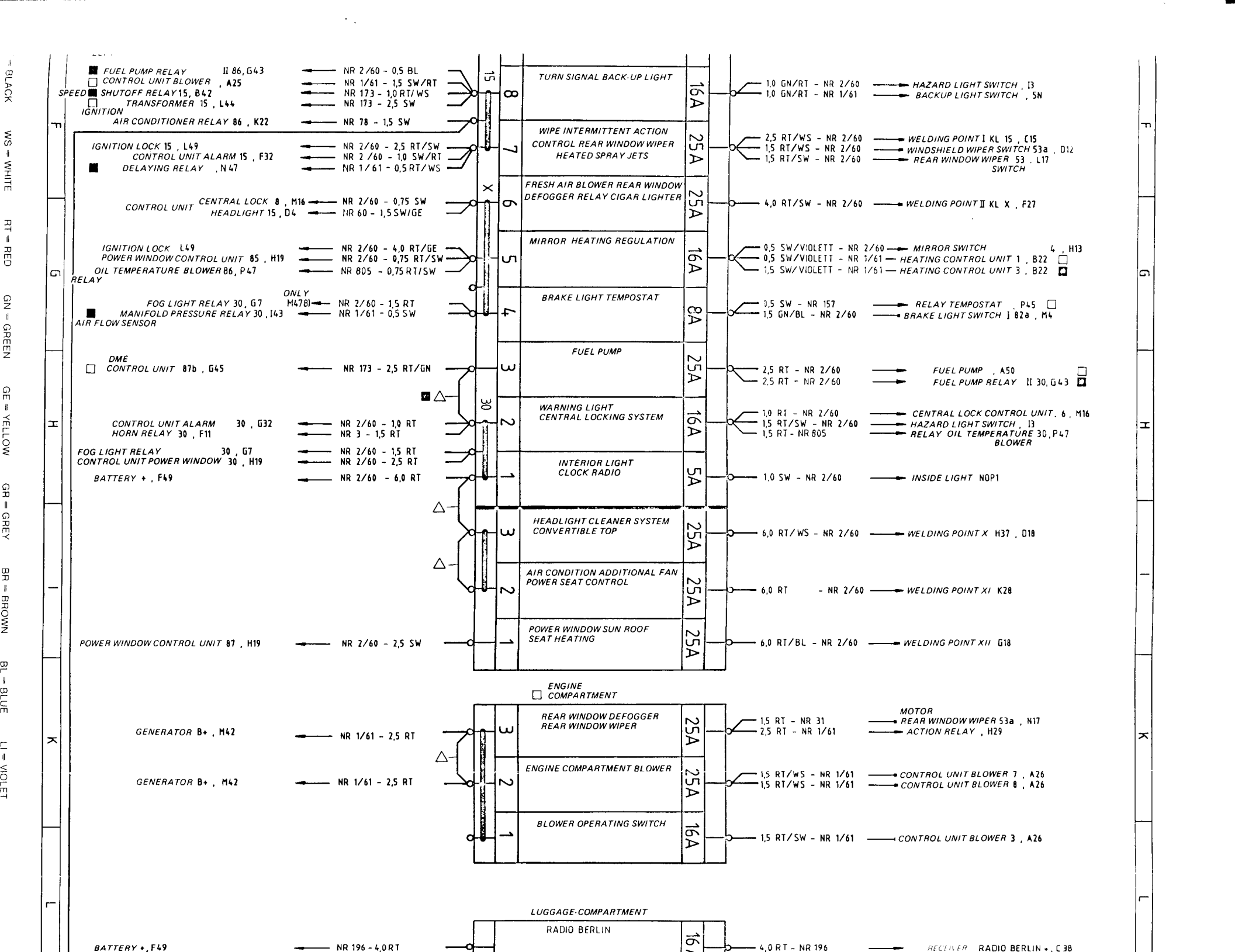

K
L
M
N
O
P
0.5 BR/WS
911 617.108.00
0.5 BR/WS
K 18
0.5 BR/WS
N 5
0.5 BR/WS
M 1
0.75 BR/WS
F 35
NR. 2/60
0.5 GN
I 20
NR. 157
P 44
SPEED TRANSMITTER
F 4
VS VII
K 5
VS VII
L 6
G 49
0.75 BR
0.75 GN
NR. 561/562
P 31
D 6
0.5 SW
E 7
0.75 BR
0.75 GN
0.5 WS/GN
0.5 SW/BL
0.5 SW/BL
0.5 SW/BR
1.0 RT/SW
0.5 RT/GE
NR. 1/61
0.5 SW/WS
0.5 SW/GN
0.5 SW/BL
0.5 SW/BL
MARKER LIGHT
LIGHT
LIGHT
SPEEDOMETER
UPSHIFT INDICATOR
M 55.3
HIGH BEAMS
TURN SIGNALS LEFT
TURN SIGNALS RIGHT
LIGHT
LIGHT
TACHOMETER
SPEED WARNING BUZZER
M 193, M 215
NR. 157
0.5 BR
0.5 BR
0.5 BR
P 45
0.75 WS/RT
NR. 561/562
0.5 WS/RT
I 40
B 28
MP IV
MP VI
MP IX
MP X
MP XII
MP I
MP II
MP III
MP VIII
MP IX
MP XI
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
51
52
53
54
55
56
57
58
59
60

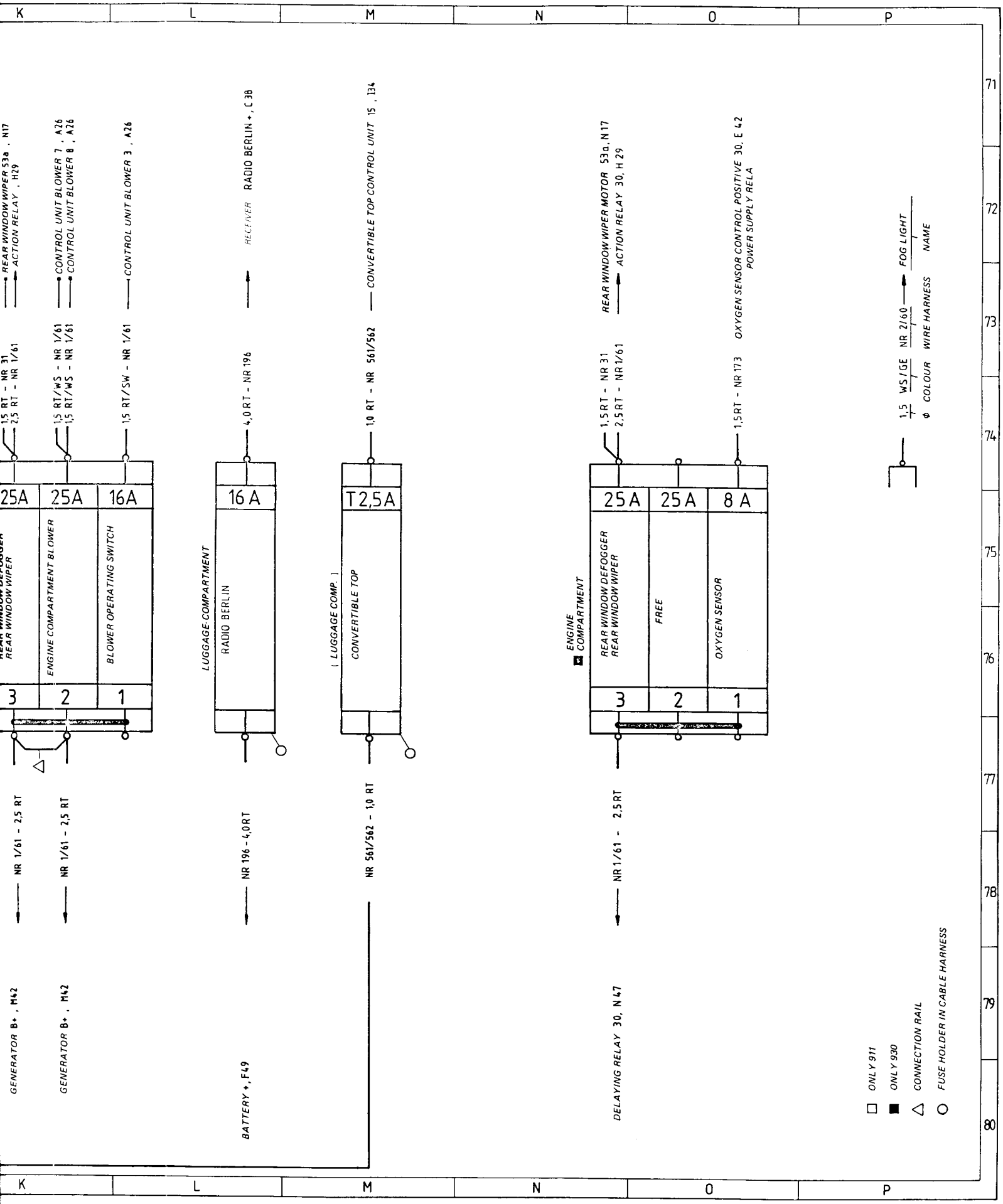
Wiring Diagram Type 911 Carrera Model 87 Sheet 8

CONNECTION AND EQUIPMENT FUSES



SW = BLACK WS


SB = BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET
FUEL PUMP RELAY II 86, G43
CONTROL UNIT BLOWER , A25
SPEED SHUTOFF RELAY 15, B42
TRANSFORMER 15 , L44
IGNITION
AIR CONDITIONER RELAY 86 , K22
IGNITION LOCK 15 , L49
CONTROL UNIT ALARM 15 , F32
DELAYING RELAY , N 47
CONTROL UNIT CENTRAL LOCK 8 , M16
HEADLIGHT 15 , D4
IGNITION LOCK L49
POWER WINDOW CONTROL UNIT 85 , H19
OIL TEMPERATURE BLOWER 86, P47 RELAY
FOG LIGHT RELAY 30, G7
MANIFOLD PRESSURE RELAY 30 , I43
AIR FLOW SENSOR
ONLY M478
DME
CONTROL UNIT 87b , G45
CONTROL UNIT ALARM 30 , G32
HORN RELAY 30 , F11
FOG LIGHT RELAY 30 , G7
CONTROL UNIT POWER WINDOW 30 , H19
BATTERY + , F49
POWER WINDOW CONTROL UNIT 87 , H19
GENERATOR B+ , M42
GENERATOR B+ , M42
BATTERY + , F49
NR 2/60 - 0,5 BL
NR 1/61 - 1,5 SW/RT
NR 173 - 1,0 RT/WS
NR 173 - 2,5 SW
NR 78 - 1,5 SW
NR 2/60 - 2,5 RT/SW
NR 2/60 - 1,0 SW/RT
NR 1/61 - 0,5 RT/WS
NR 2/60 - 0,75 SW
NR 60 - 1,5 SW/GE
NR 2/60 - 4,0 RT/GE
NR 2/60 - 0,75 RT/SW
NR 805 - 0,75 RT/SW
NR 2/60 - 1,5 RT
NR 1/61 - 0,5 SW
NR 173 - 2,5 RT/GN
NR 2/60 - 1,0 RT
NR 3 - 1,5 RT
NR 2/60 - 1,5 RT
NR 2/60 - 2,5 RT
NR 2/60 - 6,0 RT
NR 2/60 - 2,5 SW
NR 1/61 - 2,5 RT
NR 1/61 - 2,5 RT
NR 196 - 4,0 RT
15
X
30
8 TURN SIGNAL BACK-UP LIGHT 16A
7 WIPE INTERMITTENT ACTION CONTROL REAR WINDOW WIPER HEATED SPRAY JETS 25A
6 FRESH AIR BLOWER REAR WINDOW DEFOGGER RELAY CIGAR LIGHTER 25A
5 MIRROR HEATING REGULATION 16A
4 BRAKE LIGHT TEMPOSTAT 8A
3 FUEL PUMP 25A
2 WARNING LIGHT CENTRAL LOCKING SYSTEM 16A
1 INTERIOR LIGHT CLOCK RADIO 5A
3 HEADLIGHT CLEANER SYSTEM CONVERTIBLE TOP 25A
2 AIR CONDITION ADDITIONAL FAN POWER SEAT CONTROL 25A
1 POWER WINDOW SUN ROOF SEAT HEATING 25A
ENGINE COMPARTMENT
3 REAR WINDOW DEFOGGER REAR WINDOW WIPER 25A
2 ENGINE COMPARTMENT BLOWER 25A
1 BLOWER OPERATING SWITCH 16A
LUGGAGE-COMPARTMENT
RADIO BERLIN
1,0 GN/RT - NR 2/60
1,0 GN/RT - NR 1/61
HAZARD LIGHT SWITCH , I3
BACKUP LIGHT SWITCH , 5N
2,5 RT/WS - NR 2/60
1,5 RT/WS - NR 2/60
1,5 RT/SW - NR 2/60
WELDING POINT I KL 15 , C15
WINDSHIELD WIPER SWITCH 53a , D12
REAR WINDOW WIPER 53 , L17 SWITCH
4,0 RT/SW - NR 2/60
WELDING POINT II KL X , F27
0,5 SW/VIOLETT - NR 2/60
0,5 SW/VIOLETT - NR 1/61
1,5 SW/VIOLETT - NR 1/61
MIRROR SWITCH 4 , H13
HEATING CONTROL UNIT 1 , B22
HEATING CONTROL UNIT 3 , B22
0,5 SW - NR 157
1,5 GN/BL - NR 2/60
RELAY TEMPOSTAT , P45
BRAKE LIGHT SWITCH 1 82a , M4
2,5 RT - NR 2/60
2,5 RT - NR 2/60
FUEL PUMP , A50
FUEL PUMP RELAY II 30, G43
1,0 RT - NR 2/60
1,5 RT/SW - NR 2/60
1,5 RT - NR 805
CENTRAL LOCK CONTROL UNIT, 6 , M16
HAZARD LIGHT SWITCH , I3
RELAY OIL TEMPERATURE BLOWER 30, P47
1,0 SW - NR 2/60
INSIDE LIGHT N0P1
6,0 RT/WS - NR 2/60
WELDING POINT X H37 , D18
6,0 RT - NR 2/60
WELDING POINT XI K28
6,0 RT/BL - NR 2/60
WELDING POINT XII G18
MOTOR
1,5 RT - NR 31
2,5 RT - NR 1/61
REAR WINDOW WIPER 53a , N17
ACTION RELAY , H29
1,5 RT/WS - NR 1/61
1,5 RT/WS - NR 1/61
CONTROL UNIT BLOWER 7 , A26
CONTROL UNIT BLOWER 8 , A26
1,5 RT/SW - NR 1/61
CONTROL UNIT BLOWER 3 , A26
4,0 RT - NR 196
RECEIVER RADIO BERLIN + , C38
F
G
H
I
K
L


K
L
M
N
O
P
71
72
73
74
75
76
77
78
79
80
REAR WINDOW WIPER 53a , N17
ACTION RELAY , H29
CONTROL UNIT BLOWER 7 , A26
CONTROL UNIT BLOWER 8 , A26
CONTROL UNIT BLOWER 3 , A26
RECEIVER RADIO BERLIN +, C38
CONVERTIBLE TOP CONTROL UNIT 15 , 134
REAR WINDOW WIPER MOTOR 53a, N17
ACTION RELAY 30, H29
OXYGEN SENSOR CONTROL POSITIVE 30, E42
POWER SUPPLY RELA
1,5 RT - NR 31
2,5 RT - NR 1/61
1,5 RT/WS - NR 1/61
1,5 RT/WS - NR 1/61
1,5 RT/SW - NR 1/61
4,0 RT - NR 196
1,0 RT - NR 561/562
1,5 RT - NR 31
2,5 RT - NR1/61
1,5 RT - NR 173
25A
25A
16A
16 A
T2,5A
25A
25A
8 A
REAR WINDOW DEFOGGER
REAR WINDOW WIPER
ENGINE COMPARTMENT BLOWER
BLOWER OPERATING SWITCH
LUGGAGE COMPARTMENT
RADIO BERLIN
(LUGGAGE COMP.)
CONVERTIBLE TOP
ENGINE COMPARTMENT
REAR WINDOW DEFOGGER
REAR WINDOW WIPER
FREE
OXYGEN SENSOR
3
2
1
3
2
1
GENERATOR B+ , M42
GENERATOR B+ , M42
BATTERY +, F49
DELAYING RELAY 30, N47
NR 1/61 - 2,5 RT
NR 1/61 - 2,5 RT
NR 196 - 4,0 RT
NR 561/562 - 1,0 RT
NR1/61 - 2,5 RT
1,5 WS/GE NR 2160 FOG LIGHT
ϕ COLOUR WIRE HARNESS NAME
ONLY 911
ONLY 930
CONNECTION RAIL
FUSE HOLDER IN CABLE HARNESS

LI = VIOLET

Wiring Diagram Type 911 turbo Model 87

SHEET	**1**	GROUND TERMINALS
SHEET	**2**	LAMPS
SHEET	**3**	BODY
SHEET	**4**	HEATING AND VENTILATION
SHEET	**5**	RADIO, ALARM SYSTEM, LIFTING ROOF
SHEET	**6**	ENGINE (K-JETRONIK) OXYGEN SENSOR SYSTEM
SHEET	**7**	INSTRUMENTS AND INDICATORS
SHEET	**8**	CONNECTION AND EQUIPMENT FUSES

Wiring Diagram Type 911 turbo
Model 87

WIRE COLOURS

SW = BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET

⊡ = WELDING POINT
▭ = CONNECTION WITH FIELD INDICATION
MP = GROUND CONNECTING POINT

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Wiring Diagram Type 911 turbo Model 87 Sheet 1

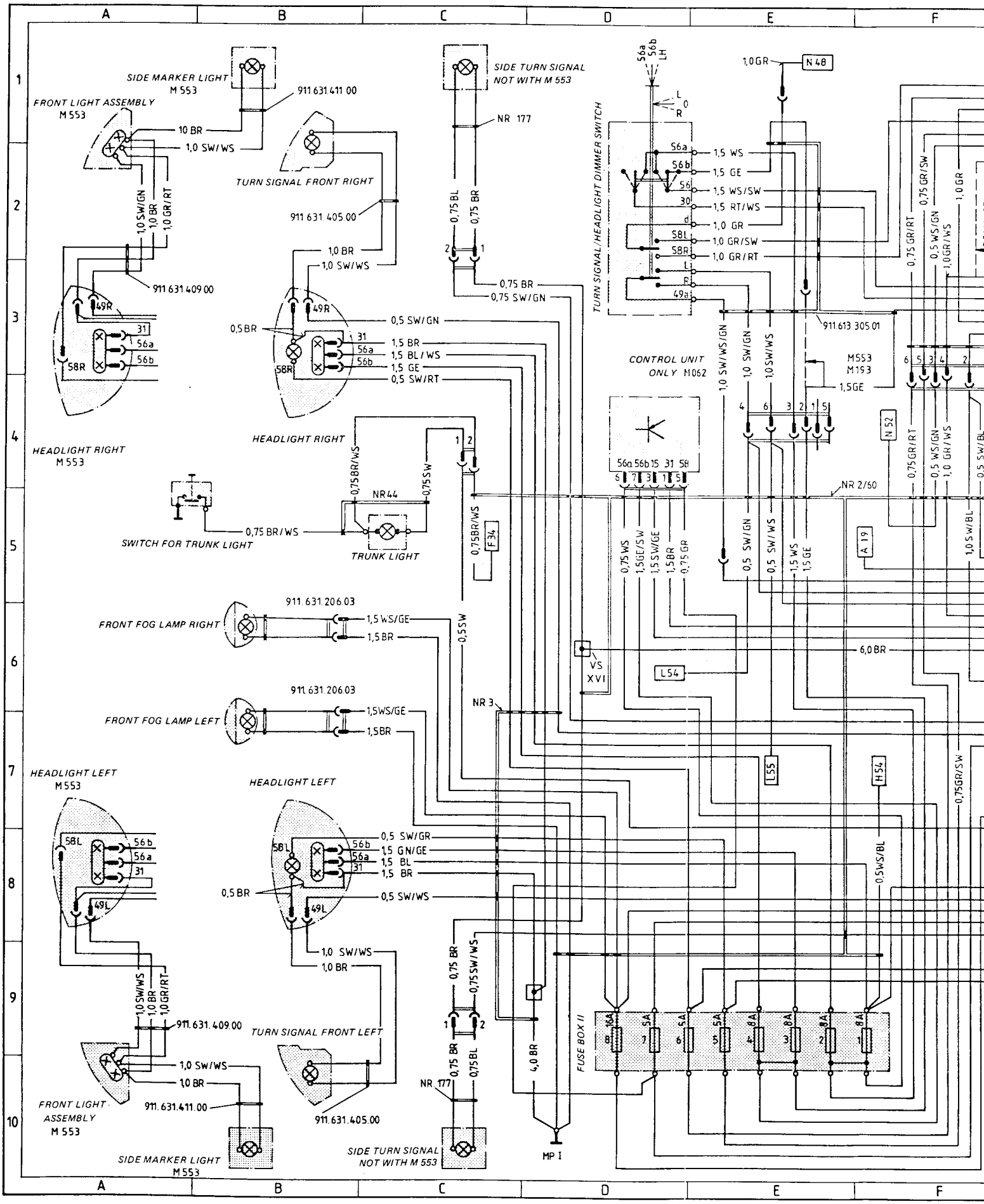
GROUND TERMINALS

Ground Terminals

I Ground - battery
II Ground - fuse box carrier
III Ground - luggage compartment floor LHD
IV Ground - firewall inside
VI Ground - electric antenna
VII Ground - inside light Cabriolet
IX Ground - inside light Coupe
X Ground strap - transmission + engine + body
XI Ground - engine compartment rear left
XII Ground - engine left

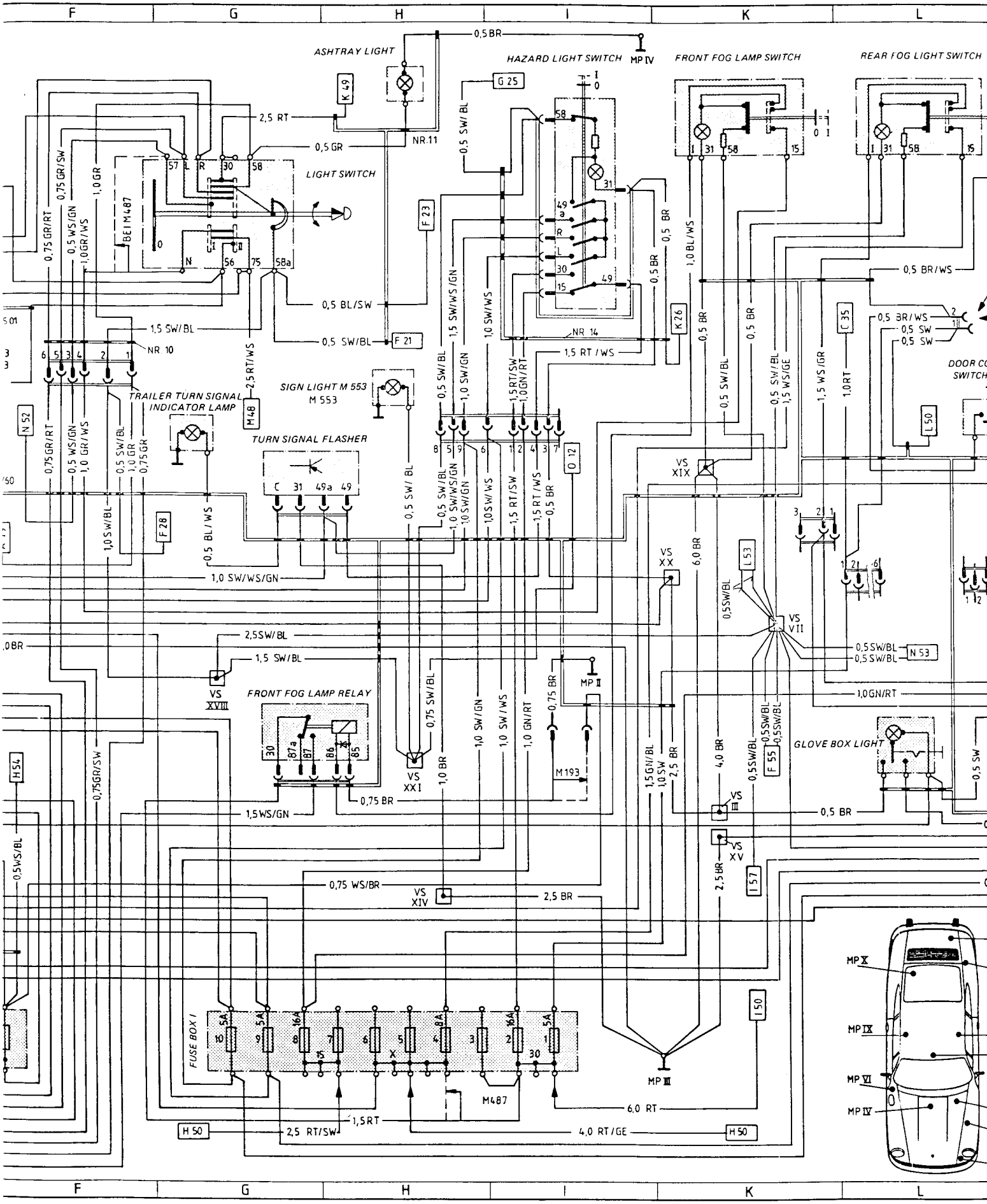
Wiring Diagram Type 911 turbo Model 87 Sheet 2

LAMPS

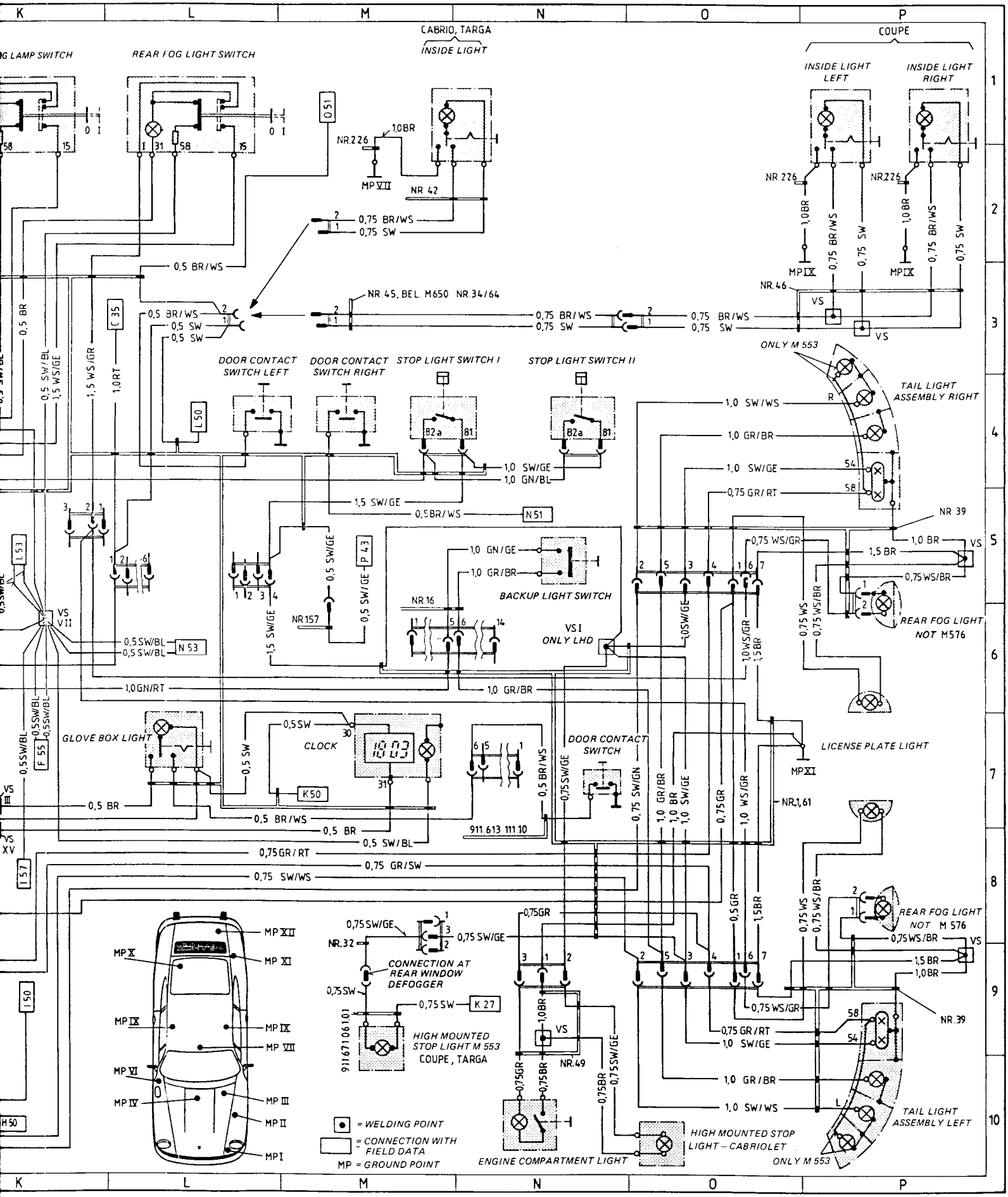


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SW = BLACK WS = W



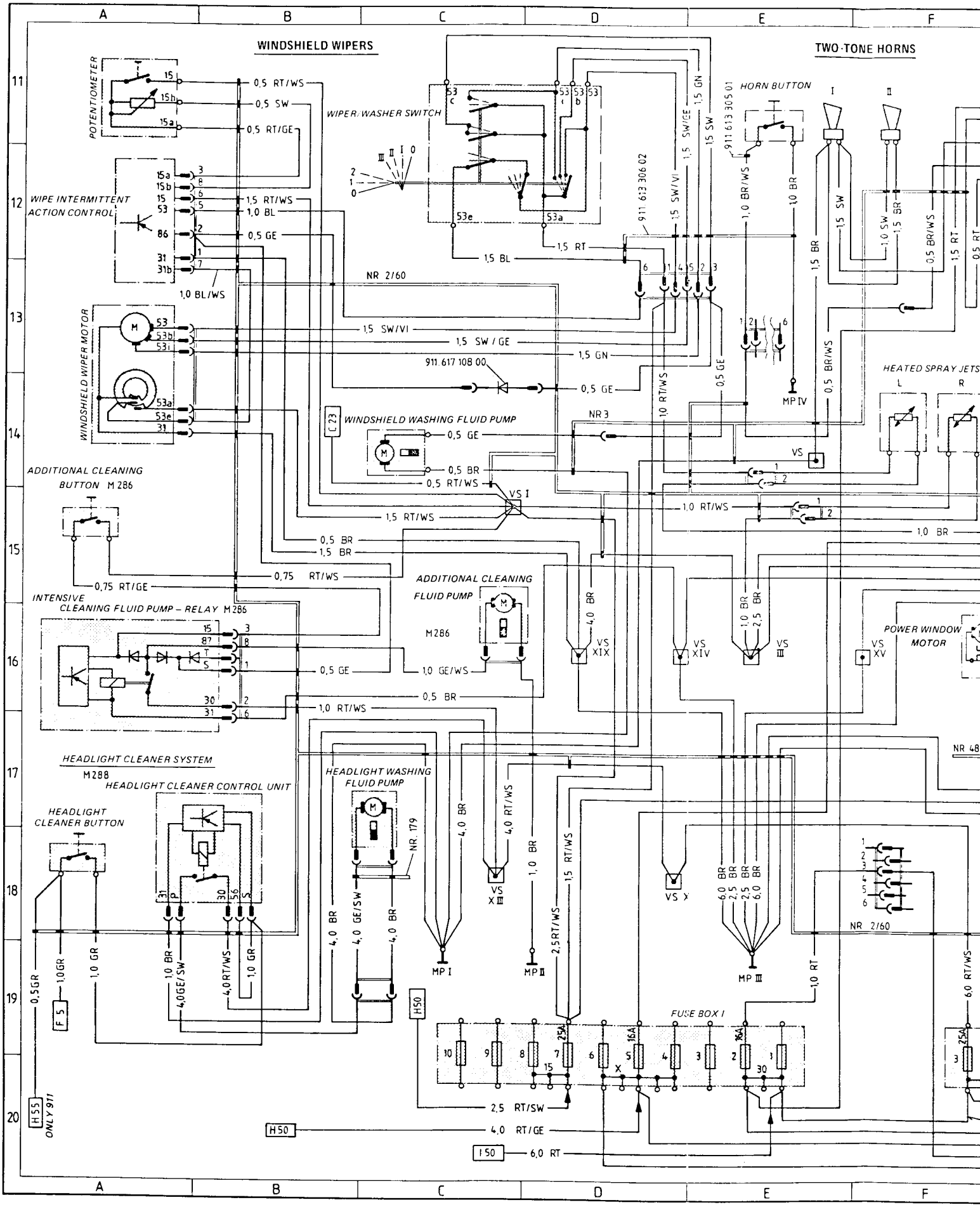
V = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET


K
L
M
N
O
P
CABRIO, TARGA
INSIDE LIGHT
COUPE
INSIDE LIGHT LEFT
INSIDE LIGHT RIGHT
REAR FOG LIGHT SWITCH
NR 226
1,0 BR
0,75 BR/WS
0,75 SW
0,5 BR/WS
NR 45, BEL. M650 NR 34/64
NR 46
ONLY M 553
DOOR CONTACT SWITCH LEFT
DOOR CONTACT SWITCH RIGHT
STOP LIGHT SWITCH I
STOP LIGHT SWITCH II
TAIL LIGHT ASSEMBLY RIGHT
1,0 SW/WS
1,0 GR/BR
1,0 SW/GE
1,0 GN/BL
0,75 GR/RT
NR 39
1,5 SW/GE
0,5 BR/WS
N 51
BACKUP LIGHT SWITCH
NR 16
NR 157
VS I
ONLY LHD
1,5 BR
0,75 WS/BR
REAR FOG LIGHT
NOT M 576
GLOVE BOX LIGHT
CLOCK
DOOR CONTACT SWITCH
LICENSE PLATE LIGHT
NR 1,61
911 613 111 10
1,0 GN/RT
0,5 SW/BL
0,75 GR/SW
0,75 SW/WS
CONNECTION AT REAR WINDOW DEFOGGER
K 27
HIGH MOUNTED STOP LIGHT M 553
COUPE, TARGA
911 671 061 01
NR 32
NR 49
ENGINE COMPARTMENT LIGHT
HIGH MOUNTED STOP LIGHT – CABRIOLET
TAIL LIGHT ASSEMBLY LEFT
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
MP I
MP II
MP III
MP IV
MP V
MP VI
MP VII
MP IX
MP X
MP XI
MP XII

LI = VIOLET

Wiring Diagram Type 911 turbo Model 87 Sheet 3

BODY



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SW = BLACK WS = W

F | G | H | I | K | L

VE HORNS

OUTSIDE MIRROR

HORN RELAY

OUTSIDE MIRROR LEFT

HORIZONTAL

VERTIKAL

944.731.027.00

NR 165

MIRROR SWITCH

HEATED SPRAY JETS

L R

BRIDGE WITH STANDARD
928.612.325.00 KL 1 WITH KL 3 AND
KL 2 KL 5 BRIDGE
WITH

CHANGE-OVER SWITCH
M 528 / M 261

VS XVI

VS IX

H 26

G 33

POWER WINDOW

DRIVER'S SIDE

DRIVER'S POWER WINDOW SWITCH PASSENGER'S POWER WINDOW SWITCH

PASSENGER'S SIDE

PASSENGER'S POWER WINDOW SWITCH

POWER WINDOW MOTOR

POWER WINDOW MOTOR

VS XV

S = CLOSING
O = OPENING

NR 48

NR 104

REAR

VS XII

K 38 | L 26

M 51

NR 1/61

2/60

CONNECTION RAIL

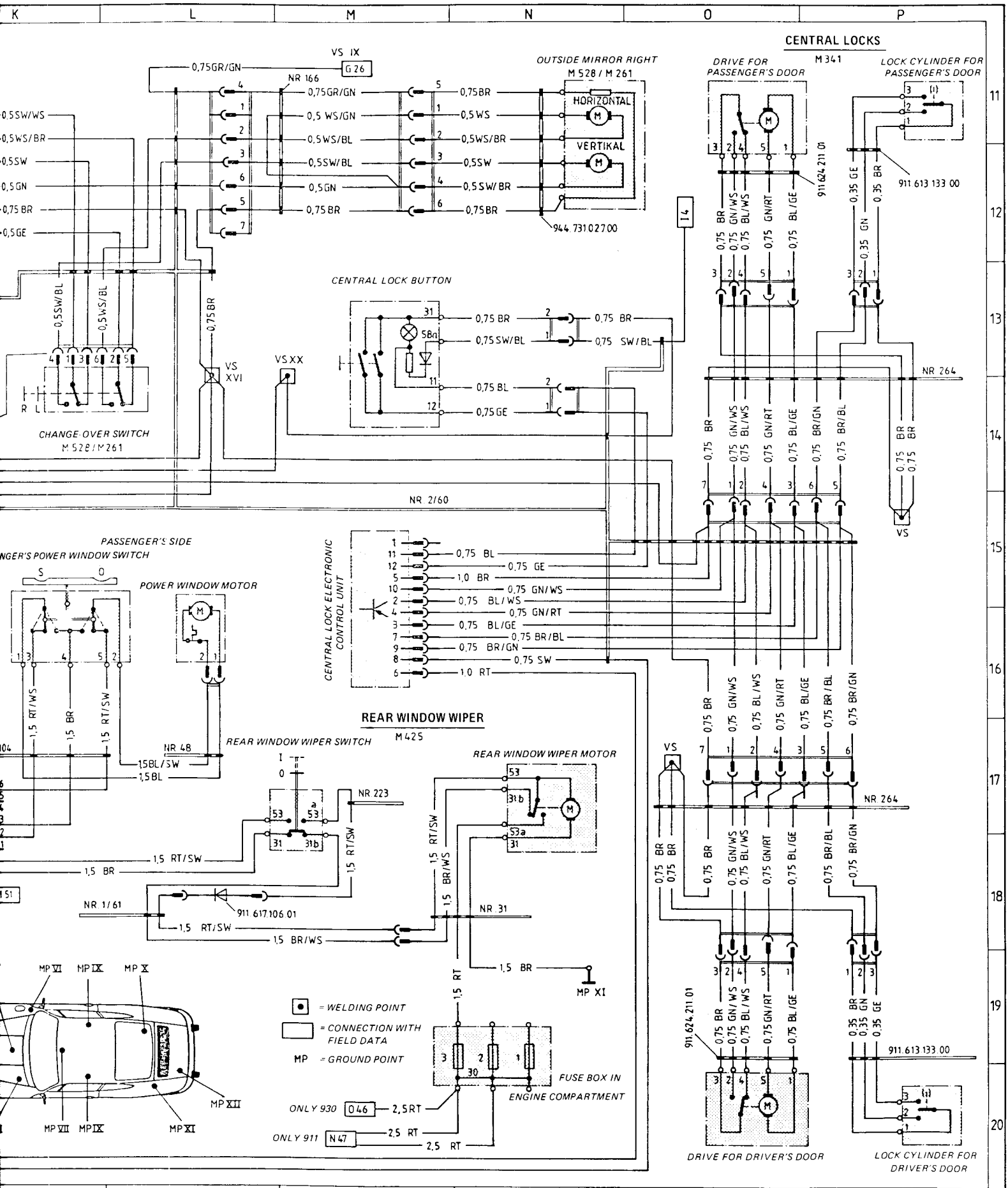
POWER WINDOW CONTROL UNIT

K 52

MP I MP II MP III MP IV MP VI MP VII MP IX MP X MP XI MP XII

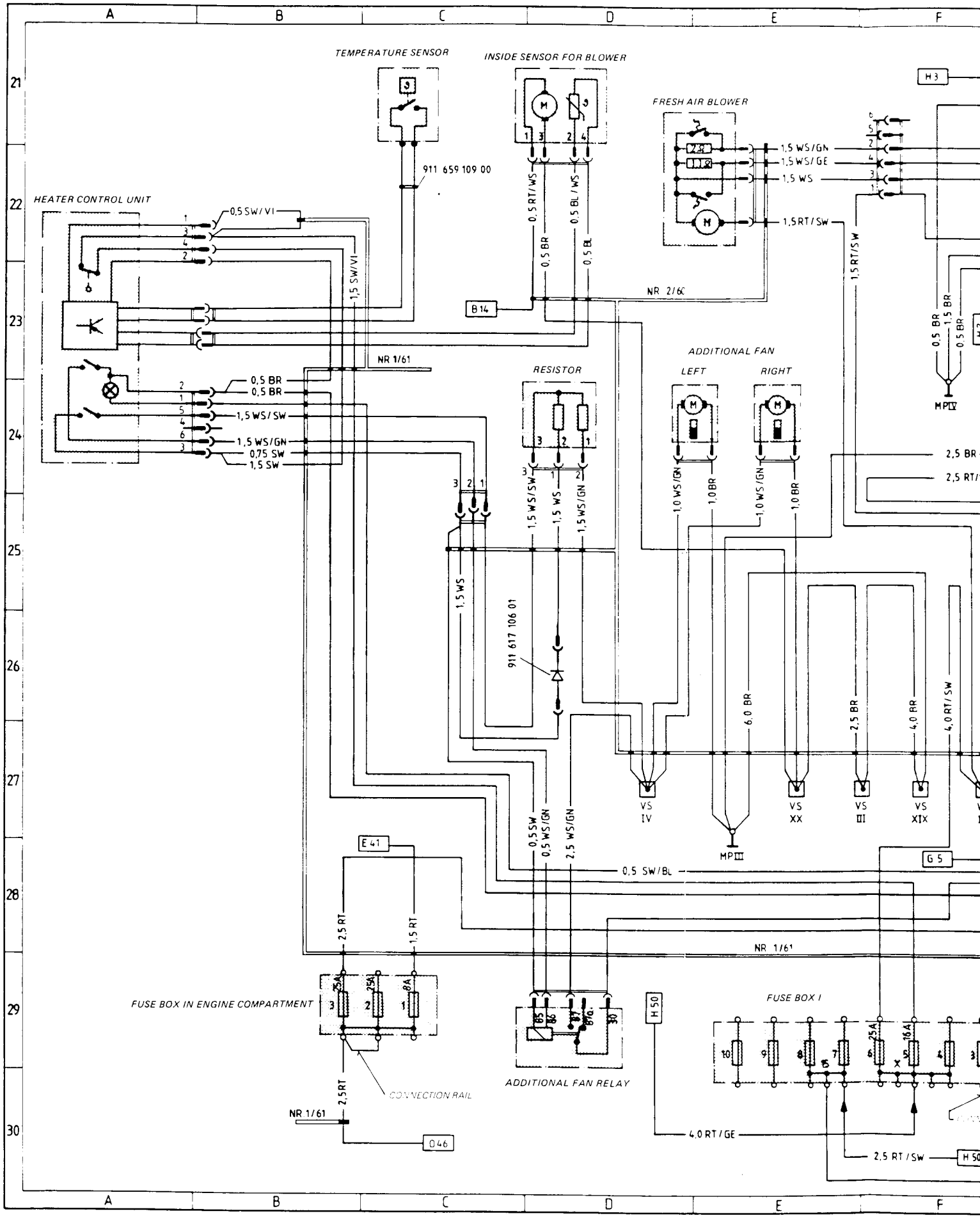
F | G | H | I | K | L

= BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET

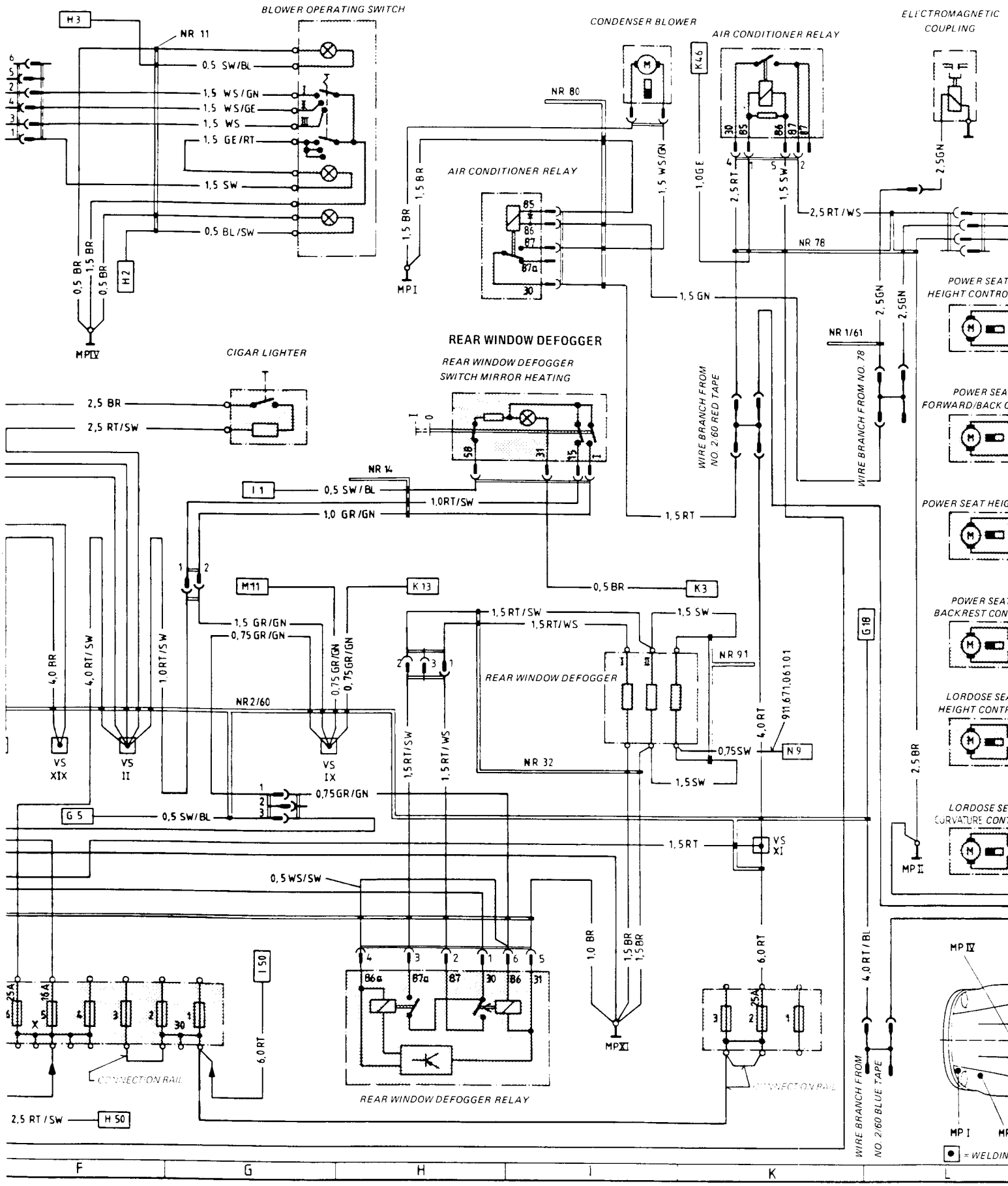

K
L
M
N
O
P
CENTRAL LOCKS
M 341
VS IX
G 26
0,75GR/GN
NR 166
OUTSIDE MIRROR RIGHT
M 528 / M 261
HORIZONTAL
VERTIKAL
944.731.027.00
DRIVE FOR PASSENGER'S DOOR
LOCK CYLINDER FOR PASSENGER'S DOOR
911.624.211.01
911.613.133.00
CENTRAL LOCK BUTTON
58a
CHANGE-OVER SWITCH
M 528 / M 261
VS XVI
VS XX
I 4
NR 264
NR 2/60
VS
PASSENGER'S SIDE
NGER'S POWER WINDOW SWITCH
POWER WINDOW MOTOR
CENTRAL LOCK ELECTRONIC CONTROL UNIT
REAR WINDOW WIPER
M 425
REAR WINDOW WIPER SWITCH
REAR WINDOW WIPER MOTOR
NR 48
NR 223
NR 1/61
NR 31
911.617.106.01
MP XI
MP VI
MP IX
MP X
MP XII
MP VII
MP IX
MP XI
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
FUSE BOX IN ENGINE COMPARTMENT
ONLY 930
046
2,5 RT
ONLY 911
N 47
2,5 RT
DRIVE FOR DRIVER'S DOOR
LOCK CYLINDER FOR DRIVER'S DOOR
11
12
13
14
15
16
17
18
19
20

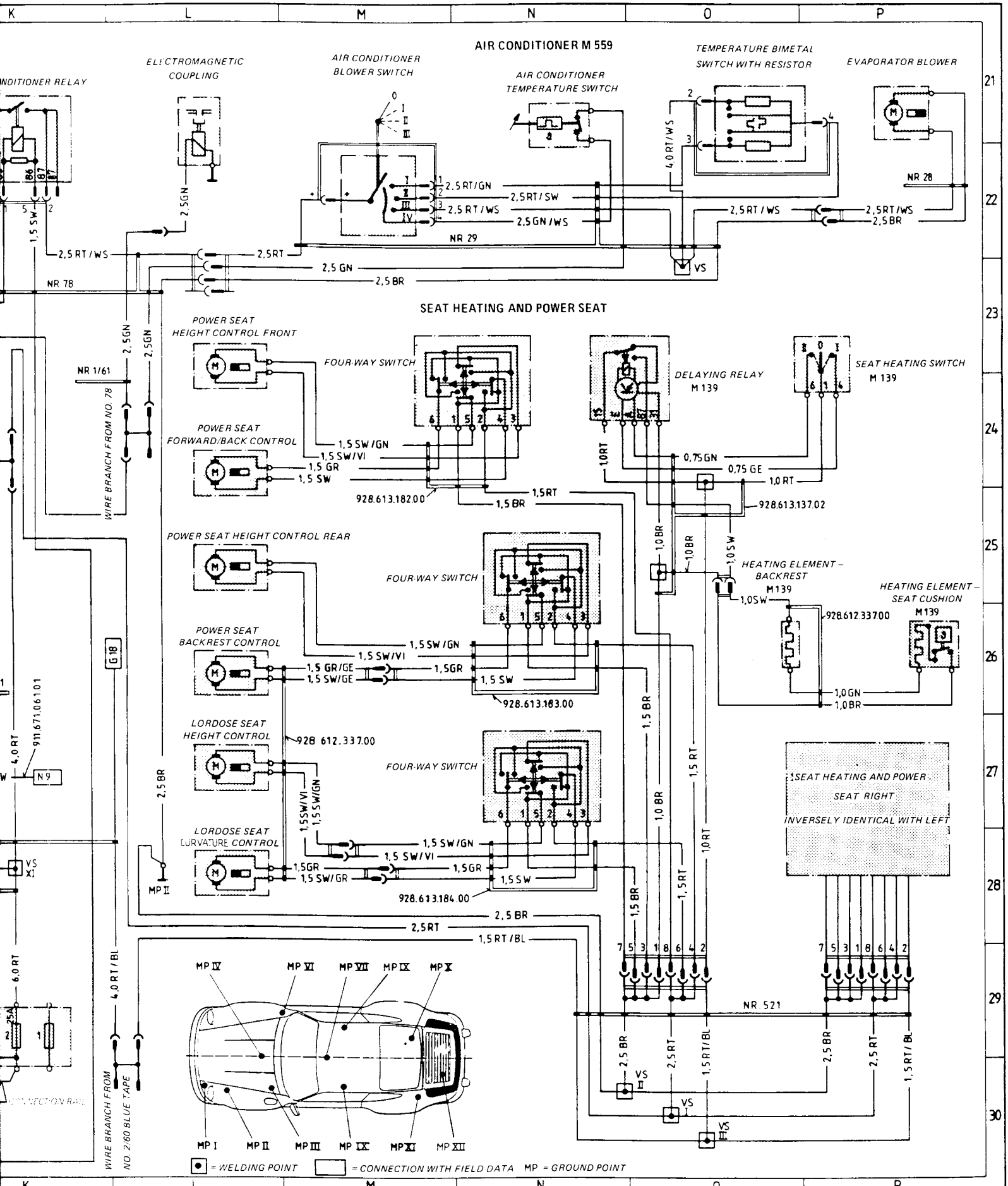
Wiring Diagram Type 911 turbo Model 87 Sheet 4

HEATING AND VENTILATION



SW = BLACK WS = WH

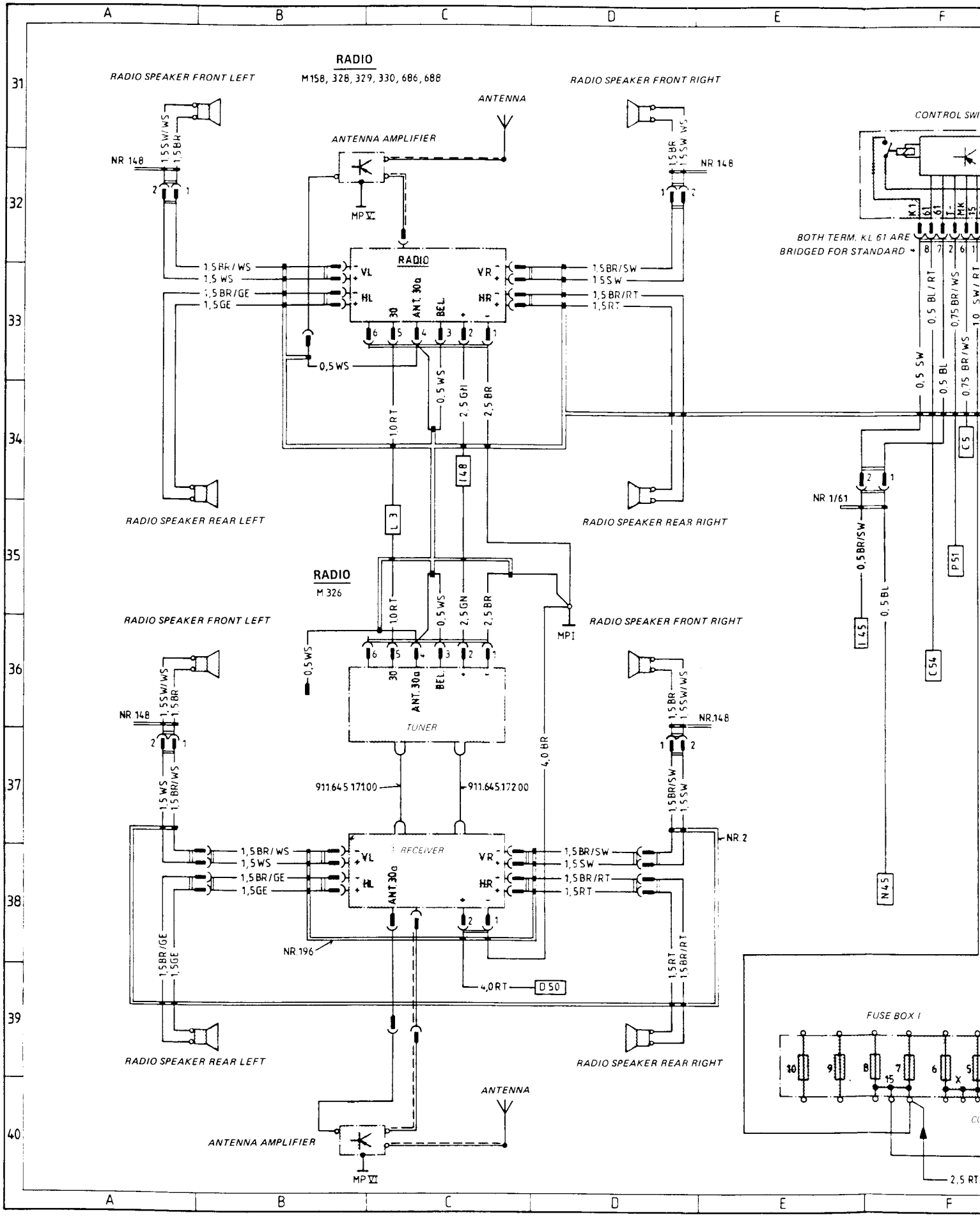

F
G
H
I
K
L
BLOWER OPERATING SWITCH
H3
NR 11
0.5 SW/BL
1,5 WS/GN
1,5 WS/GE
1,5 WS
1,5 GE/RT
1,5 SW
0,5 BL/SW
0,5 BR
1,5 BR
H2
MP IV
CONDENSER BLOWER
AIR CONDITIONER RELAY
K46
NR 80
1,5 WS/GN
1,5 BR
MP I
1,0 GE
2,5 RT
1,5 SW
2,5 RT/WS
NR 78
2,5 GN
ELECTROMAGNETIC COUPLING
POWER SEAT HEIGHT CONTRO
NR 1/61
CIGAR LIGHTER
2,5 BR
2,5 RT/SW
REAR WINDOW DEFOGGER
REAR WINDOW DEFOGGER SWITCH MIRROR HEATING
WIRE BRANCH FROM NO. 2/60 RED TAPE
WIRE BRANCH FROM NO. 78
POWER SEA FORWARD/BACK
POWER SEAT HEIG
NR 14
I 1
0,5 SW/BL
1,0 RT/SW
1,0 GR/GN
1,5 RT
M11
K 13
K3
0,5 BR
1,5 GR/GN
0,75 GR/GN
1,5 RT/SW
1,5 RT/WS
1,5 SW
NR 91
REAR WINDOW DEFOGGER
G18
POWER SEA BACKREST CON
LORDOSE SEA HEIGHT CONTR
4,0 BR
4,0 RT/SW
1,0 RT/SW
NR 2/60
VS XIX
VS II
VS IX
0,75 SW
N9
911.671.061.01
NR 32
LORDOSE SE CURVATURE CON
G 5
0,5 SW/BL
VS XI
MP II
0,5 WS/SW
1,0 BR
1,5 BR
6,0 RT
4,0 RT/BL
MP IV
MP I
25 A
16 A
I 50
CONNECTION RAIL
REAR WINDOW DEFOGGER RELAY
2,5 RT/SW
H 50
WIRE BRANCH FROM NO. 2/60 BLUE TAPE
= WELDIN
BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET


AIR CONDITIONER M 559
ELECTROMAGNETIC COUPLING
AIR CONDITIONER BLOWER SWITCH
AIR CONDITIONER TEMPERATURE SWITCH
TEMPERATURE BIMETAL SWITCH WITH RESISTOR
EVAPORATOR BLOWER
SEAT HEATING AND POWER SEAT
POWER SEAT HEIGHT CONTROL FRONT
FOUR-WAY SWITCH
DELAYING RELAY M 139
SEAT HEATING SWITCH M 139
POWER SEAT FORWARD/BACK CONTROL
POWER SEAT HEIGHT CONTROL REAR
POWER SEAT BACKREST CONTROL
LORDOSE SEAT HEIGHT CONTROL
LORDOSE SEAT CURVATURE CONTROL
HEATING ELEMENT - BACKREST M 139
HEATING ELEMENT - SEAT CUSHION M 139
SEAT HEATING AND POWER SEAT RIGHT
INVERSELY IDENTICAL WITH LEFT
WIRE BRANCH FROM NO. 78
WIRE BRANCH FROM NO. 260 BLUE TAPE
NR 78
NR 29
NR 28
NR 1/61
NR 521
928.613.182.00
928.613.183.00
928.613.184.00
928.613.137.02
928.612.337.00
911.671.061.01
MP I MP II MP III MP IV MP V MP VI MP VII MP VIII MP IX MP X MP XI MP XII
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT

= VIOLET

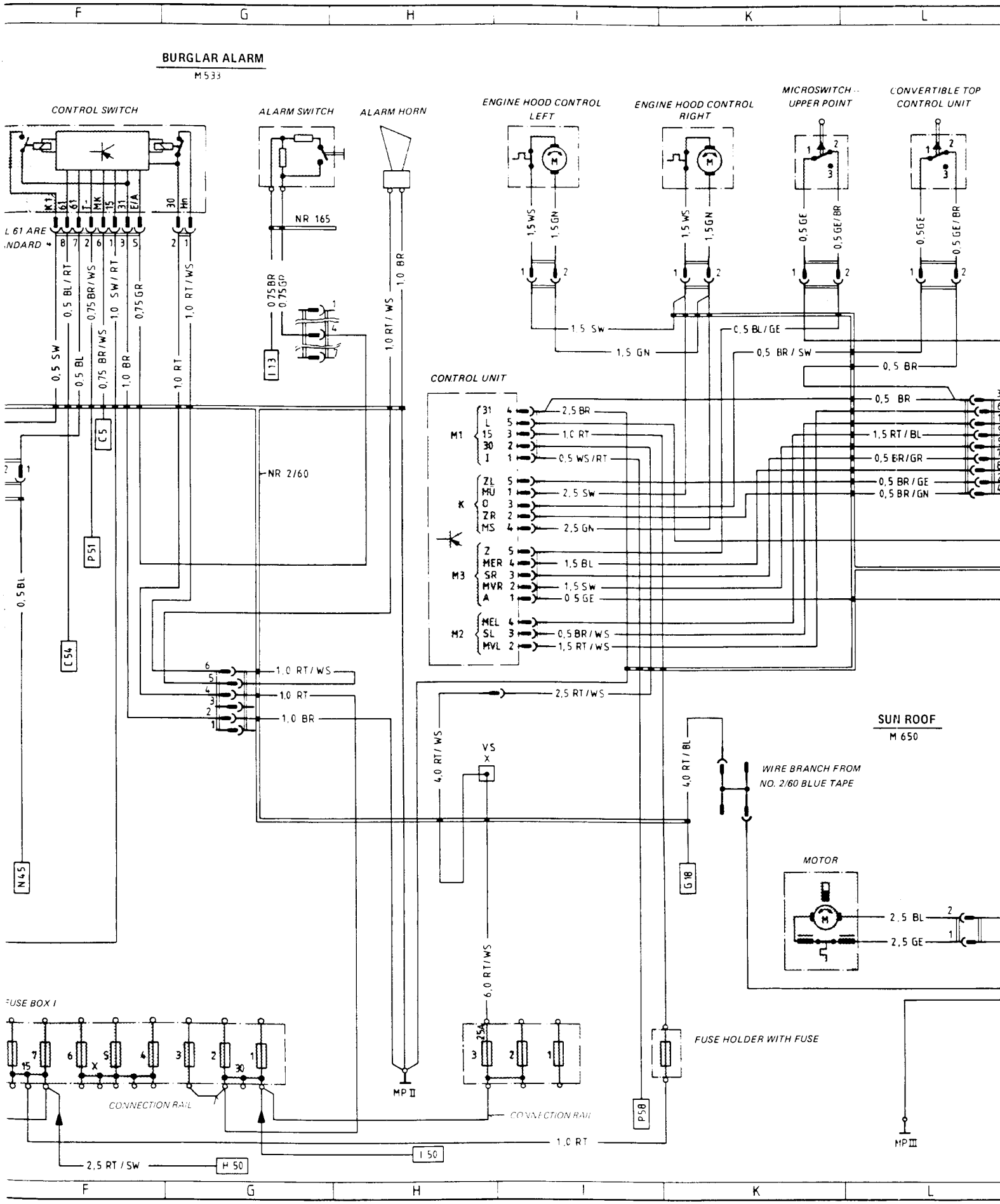
Wiring Diagram Type 911 turbo Model 87 Sheet 5

RADIO, ALARM SYSTEM, LIFTING ROOF

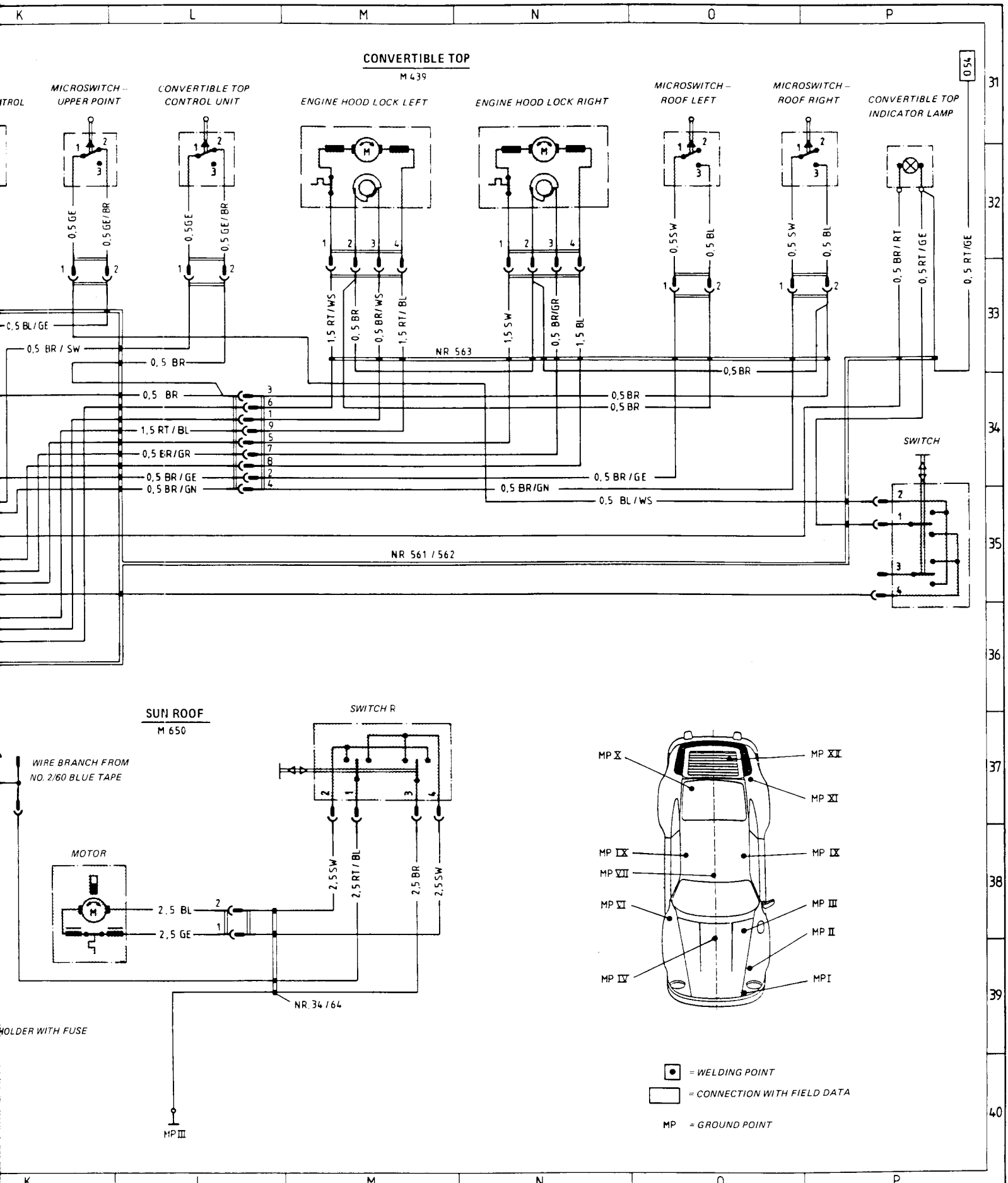


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SW = BLACK WS =



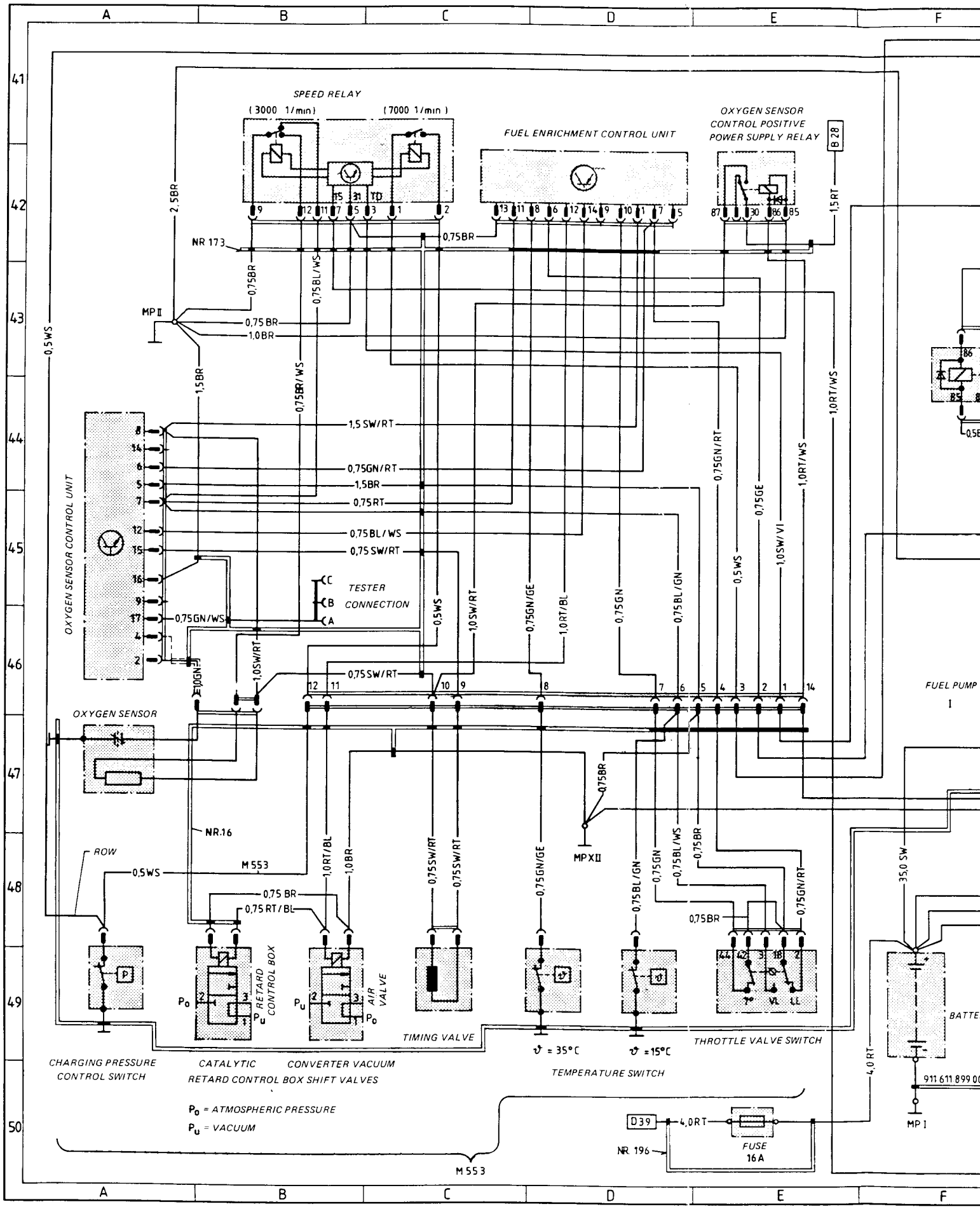
W = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET


K
L
M
N
O
P
CONVERTIBLE TOP
M 439
MICROSWITCH – UPPER POINT
CONVERTIBLE TOP CONTROL UNIT
ENGINE HOOD LOCK LEFT
ENGINE HOOD LOCK RIGHT
MICROSWITCH – ROOF LEFT
MICROSWITCH – ROOF RIGHT
CONVERTIBLE TOP INDICATOR LAMP
054
0,5 GE
0,5 GE/BR
0,5 BL/GE
0,5 BR/SW
0,5 BR
1,5 RT/BL
0,5 BR/GR
0,5 BR/GE
0,5 BR/GN
1,5 RT/WS
0,5 BR/WS
1,5 SW
0,5 BR/GR
1,5 BL
0,5 SW
0,5 BL
0,5 BR/RT
0,5 RT/GE
0,5 RT/GE
NR 563
NR 561/562
SWITCH
SUN ROOF
M 650
WIRE BRANCH FROM NO. 2/60 BLUE TAPE
MOTOR
2,5 BL
2,5 GE
SWITCH R
2,5 SW
2,5 RT/BL
2,5 BR
2,5 SW
NR 34/64
HOLDER WITH FUSE
MP III
MP X
MP XII
MP XI
MP IX
MP VII
MP VI
MP III
MP II
MP IV
MP I
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
31
32
33
34
35
36
37
38
39
40

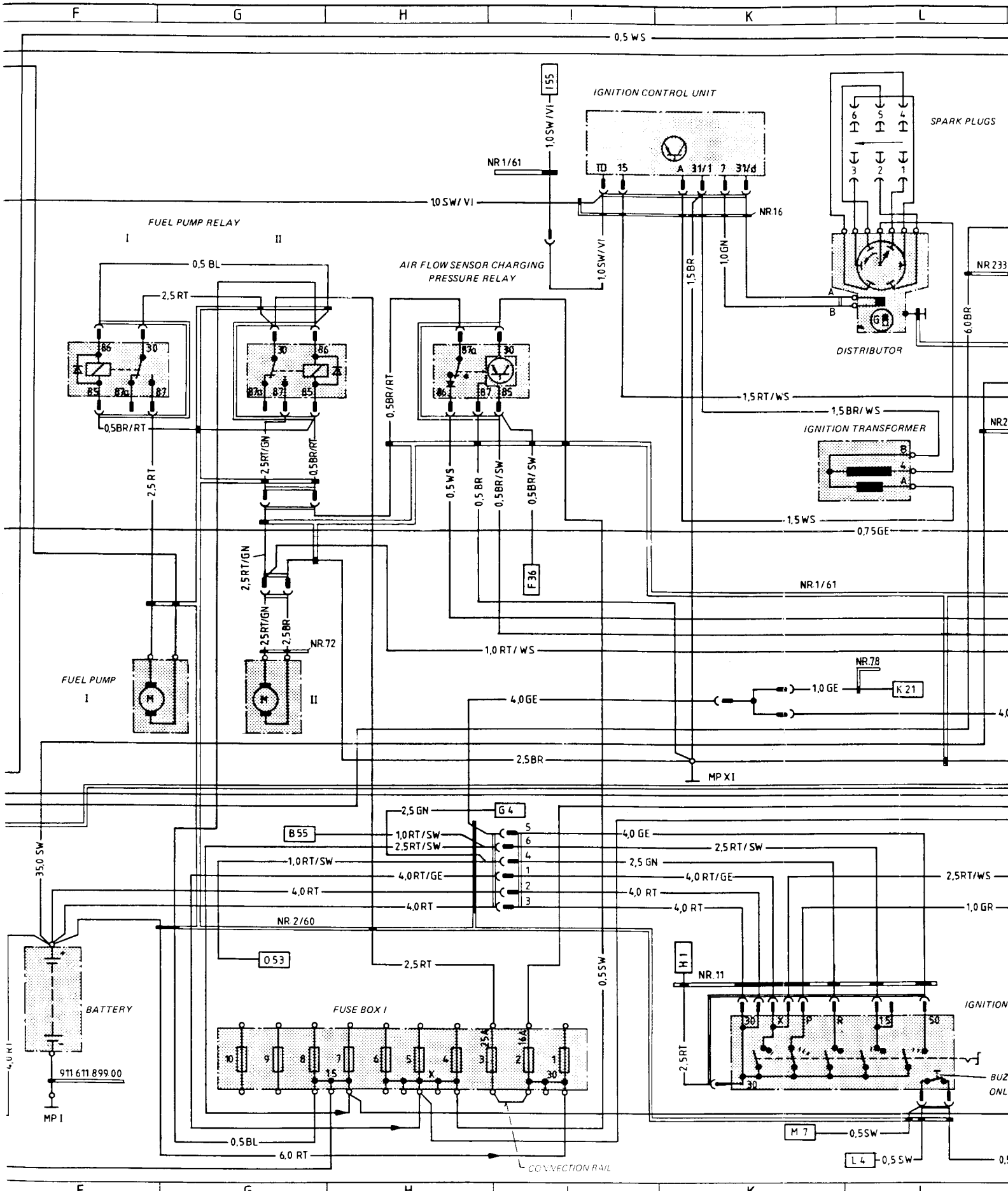
LI = VIOLET

Wiring Diagram Type 911 turbo Model 87 Sheet 6

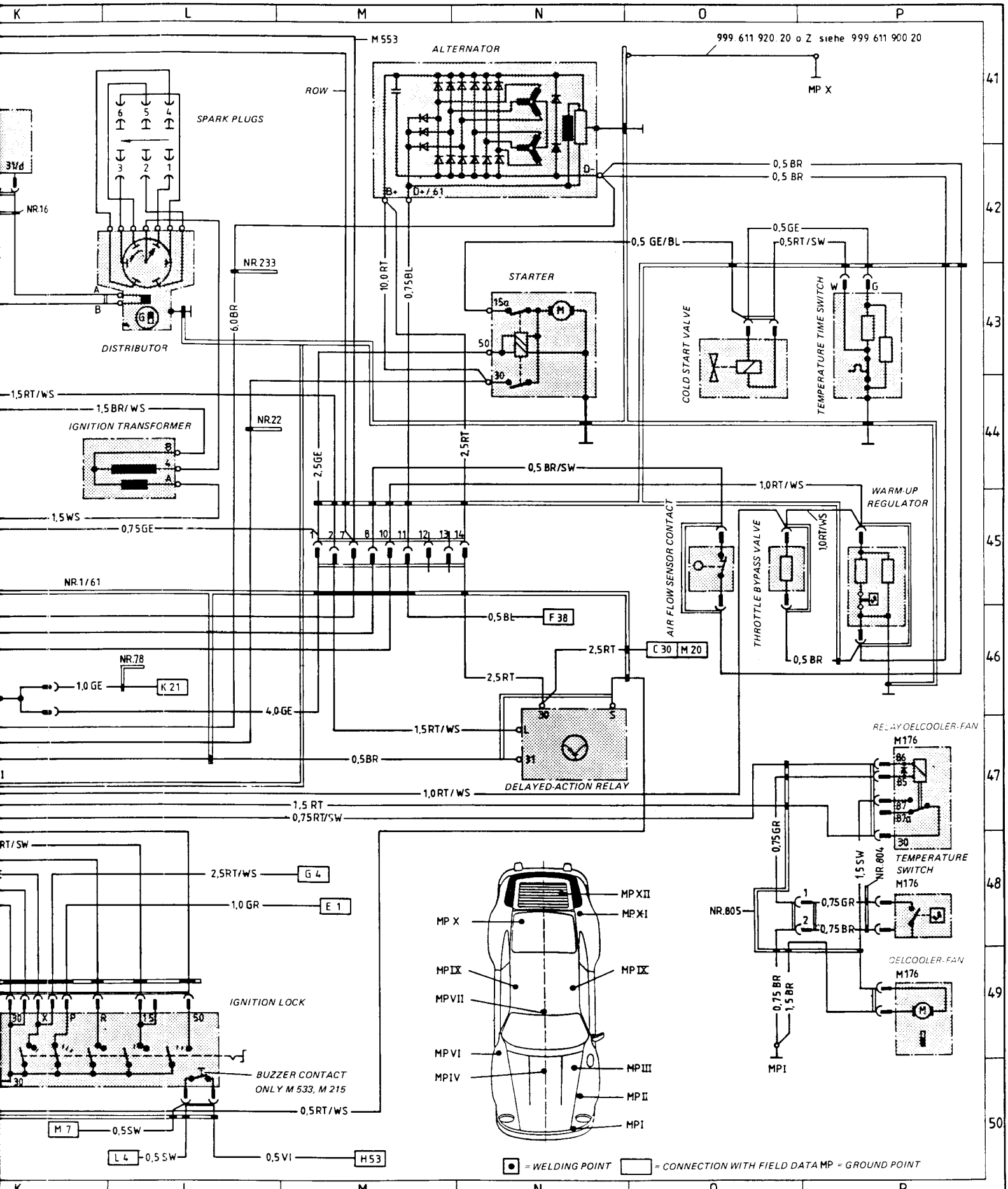
ENGINE (K-JETRONIK) OXYGEN SENSOR SYSTEM



SW = BLACK WS =



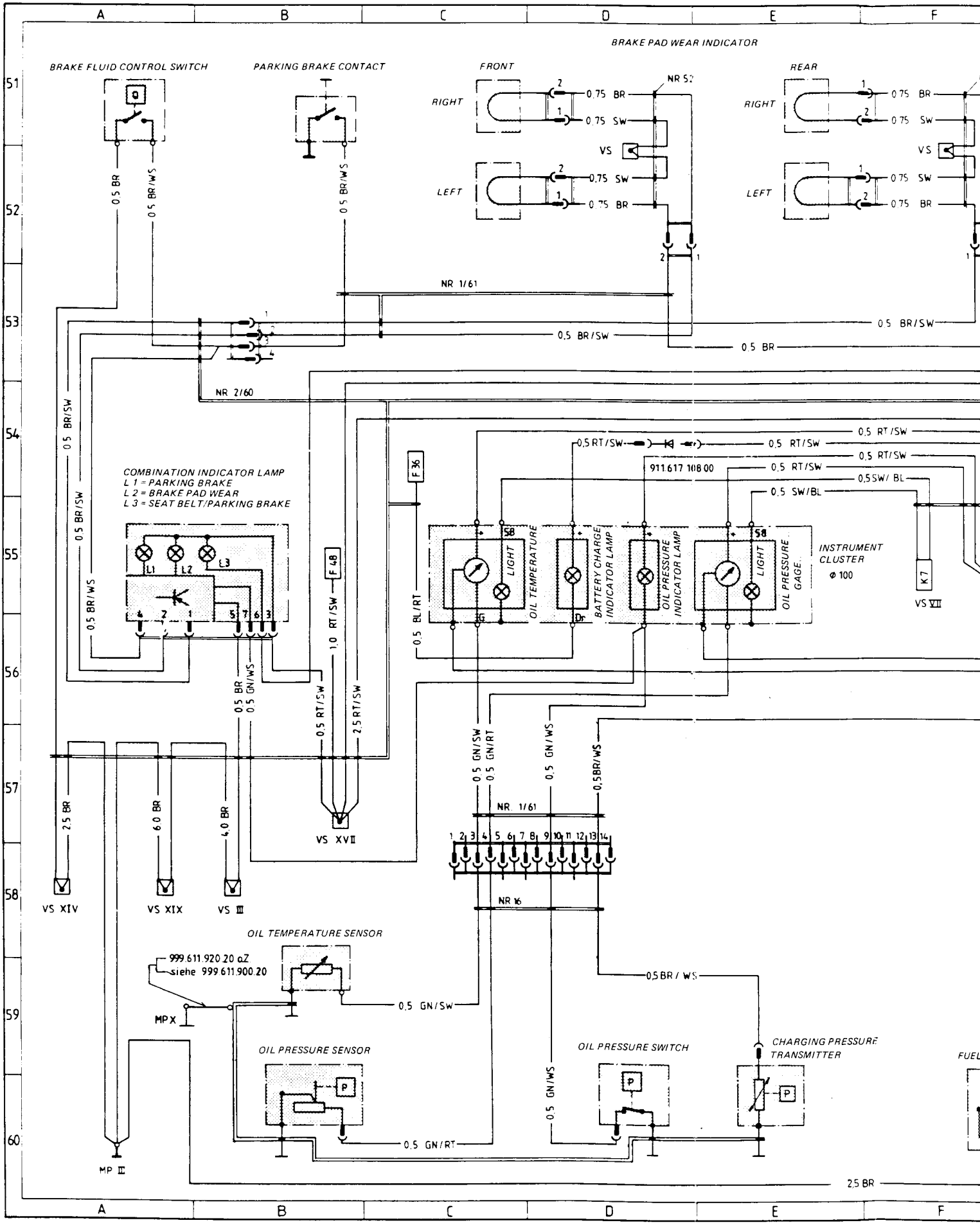
V = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET


K
L
M
N
O
P
41
42
43
44
45
46
47
48
49
50
M 553
ALTERNATOR
999 611 920 20 o Z siehe 999 611 900 20
MP X
ROW
SPARK PLUGS
NR.16
NR.233
DISTRIBUTOR
6,0 BR
10,0 RT
0,75 BL
0,5 BR
0,5 BR
B+
D+/61
D-
STARTER
15a
50
30
0,5 GE/BL
0,5 GE
0,5 RT/SW
COLD START VALVE
TEMPERATURE TIME SWITCH
W
G
1,5 RT/WS
1,5 BR/WS
IGNITION TRANSFORMER
NR.22
2,5 GE
2,5 RT
0,5 BR/SW
1,0 RT/WS
WARM-UP REGULATOR
AIR FLOW SENSOR CONTACT
THROTTLE BYPASS VALVE
1,0 RT/WS
1,5 WS
0,75 GE
1 2 7 8 10 11 12 13 14
NR.1/61
0,5 BL
F 38
2,5 RT
C 30 M 20
0,5 BR
NR.78
1,0 GE
K 21
4,0 GE
2,5 RT
30
S
1,5 RT/WS
L
31
0,5 BR
DELAYED-ACTION RELAY
1,0 RT/WS
1,5 RT
0,75 RT/SW
RELAY OELCOOLER-FAN
M176
86
85
87
87a
30
0,75 GR
1,5 SW
NR.804
TEMPERATURE SWITCH
M176
NR.805
1
2
0,75 GR
0,75 BR
OELCOOLER-FAN
M176
0,75 BR
1,5 BR
MPI
2,5 RT/WS
G 4
1,0 GR
E 1
IGNITION LOCK
30
X
P
R
15
50
BUZZER CONTACT
ONLY M 533, M 215
0,5 RT/WS
M 7
0,5 SW
L 4
0,5 SW
0,5 VI
H 53
MP XII
MP XI
MP X
MP IX
MP IX
MP VII
MP VI
MP IV
MP III
MP II
MP I
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT

LI = VIOLET

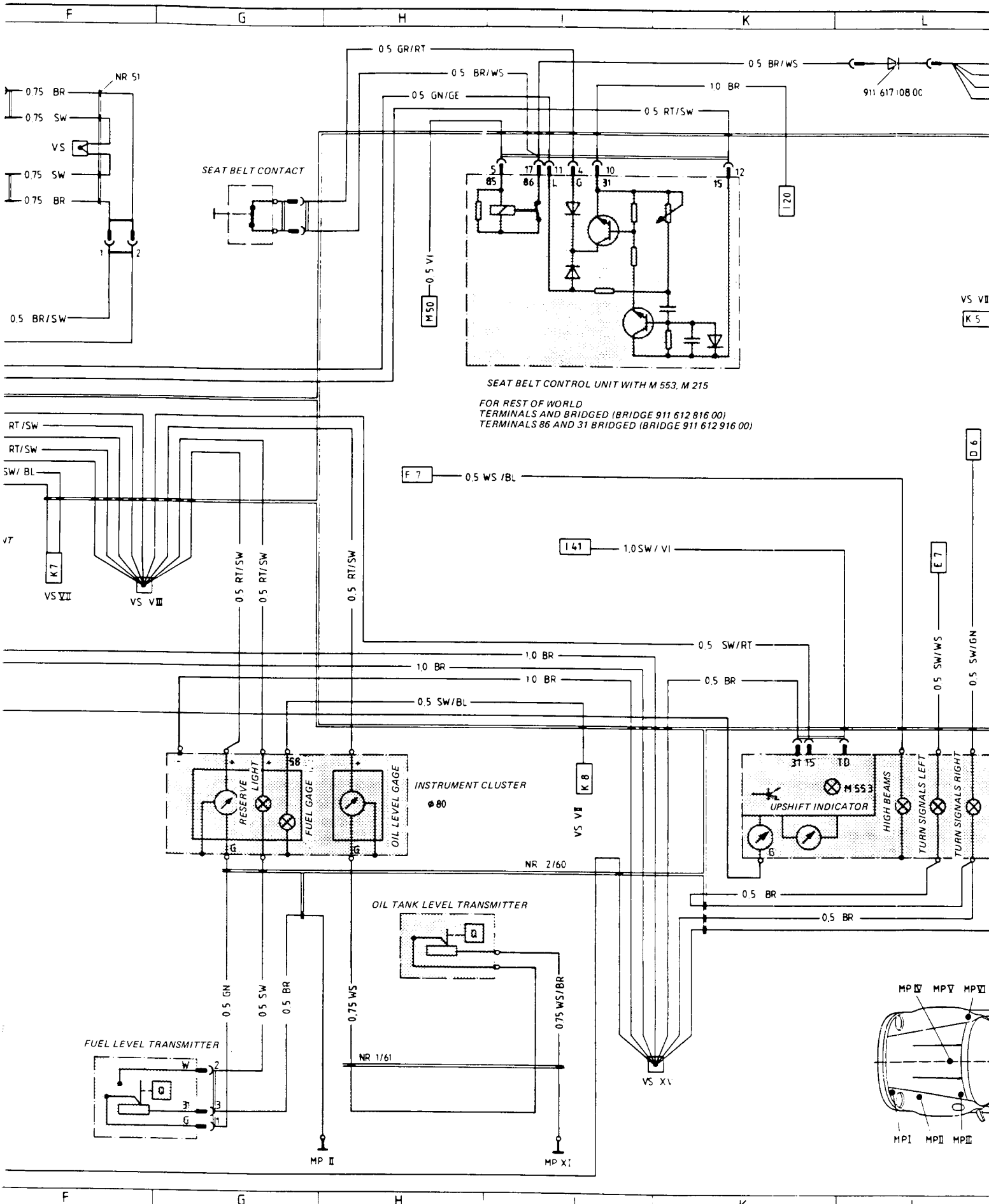
Wiring Diagram Type 911 turbo Model 87 Sheet 7

INSTRUMENTS AND INDICATORS



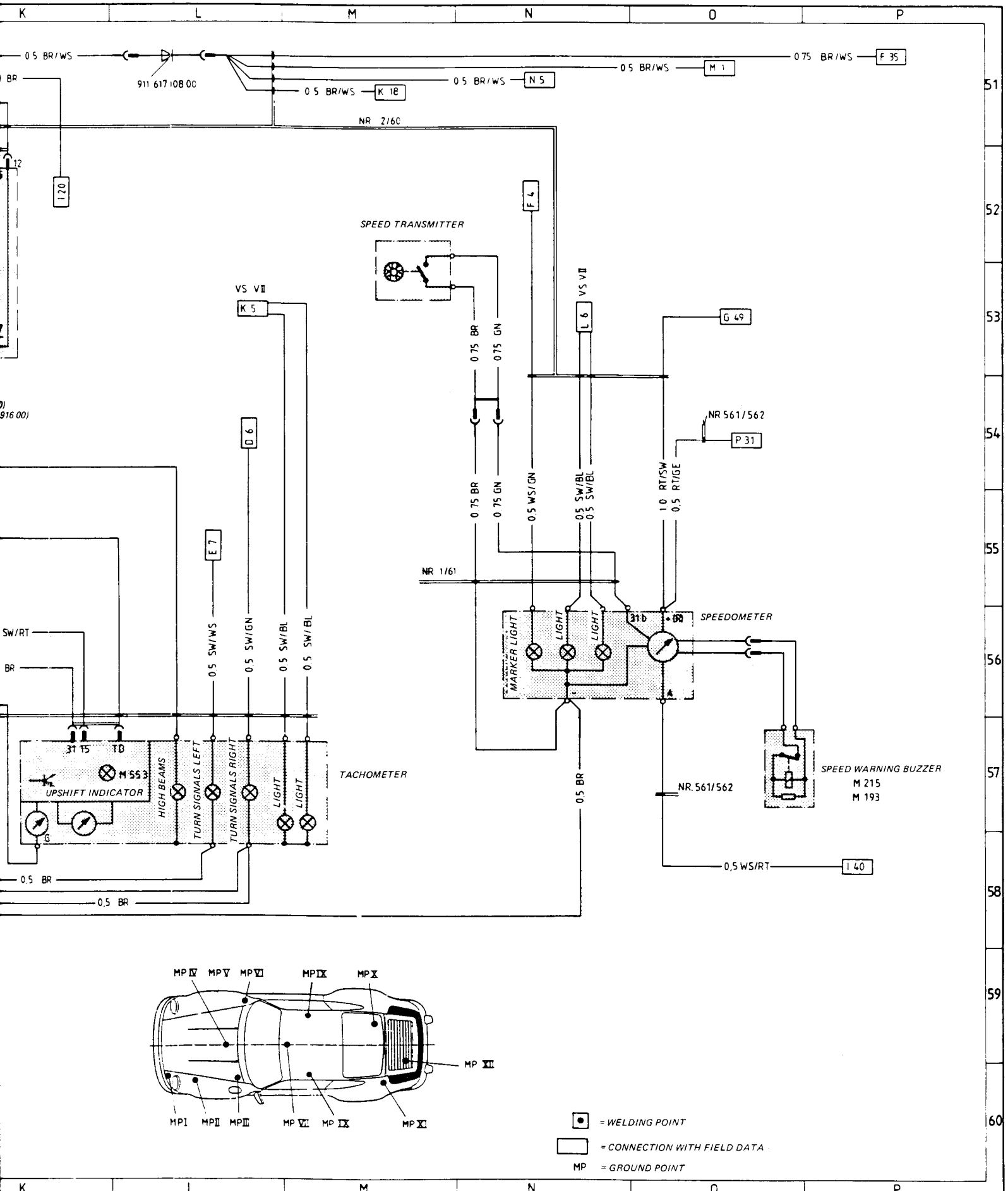
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SW = BLACK WS =



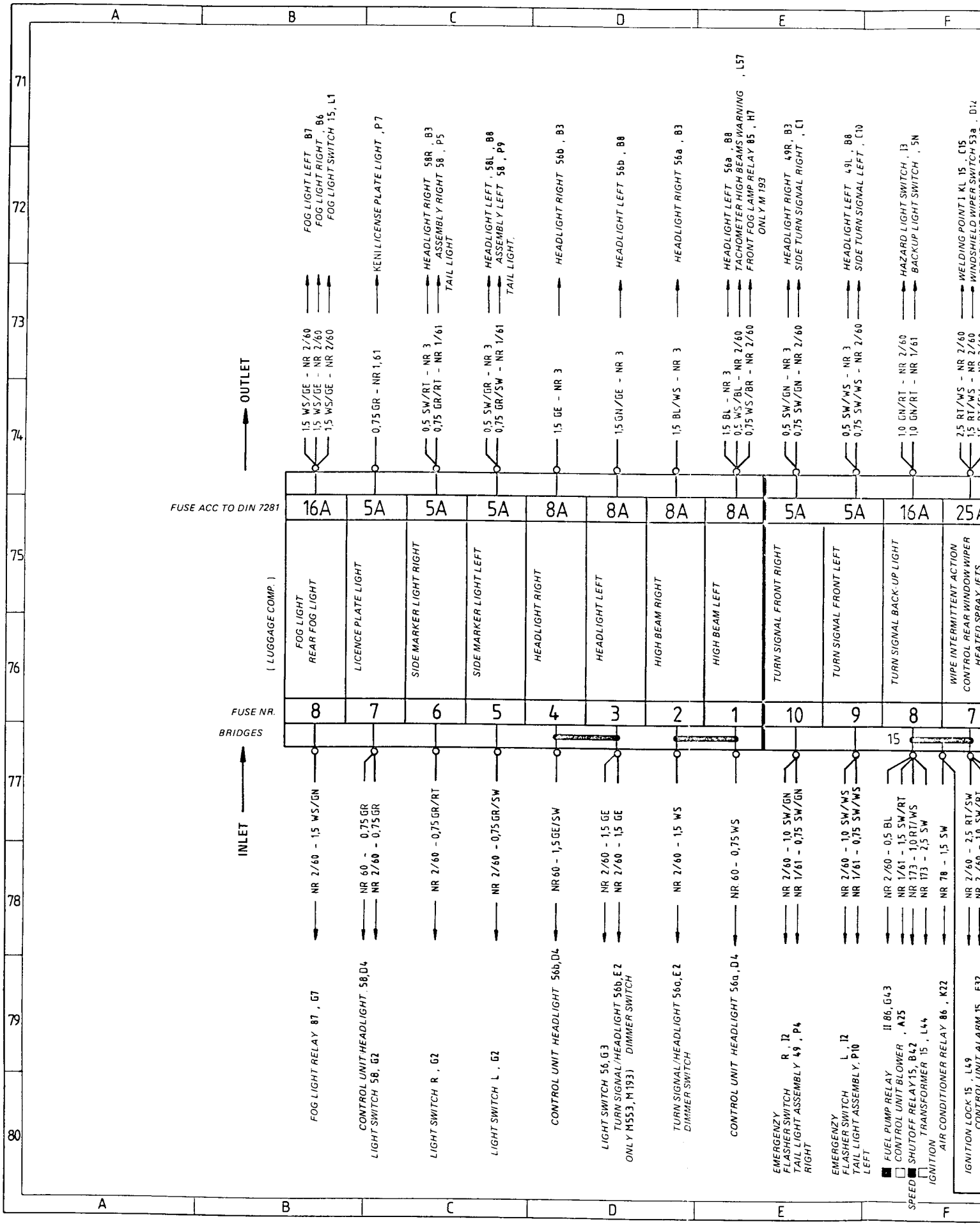
F G H I K L

I = BLACK WS = WHITE RT = RED GN = GREEN GE = YELLOW GR = GREY BR = BROWN BL = BLUE LI = VIOLET


K
L
M
N
O
P
0.5 BR/WS
911 617 108 00
0.5 BR/WS
M 1
0.75 BR/WS
F 35
0.5 BR/WS
N 5
0.5 BR/WS
K 18
NR 2/60
I 20
SPEED TRANSMITTER
F 4
VS VII
K 5
0.75 BR
0.75 GN
VS VII
L 6
G 49
D 6
NR 561/562
P 31
0.75 BR
0.75 GN
0.5 WS/GN
0.5 SW/BL
0.5 SW/BL
1.0 RT/SW
0.5 RT/GE
E 7
NR 1/61
0.5 SW/WS
0.5 SW/GN
0.5 SW/BL
0.5 SW/BL
SW/RT
BR
MARKER LIGHT
LIGHT
LIGHT
31b
SPEEDOMETER
31
15
TD
M 553
UPSHIFT INDICATOR
HIGH BEAMS
TURN SIGNALS LEFT
TURN SIGNALS RIGHT
LIGHT
LIGHT
TACHOMETER
0.5 BR
NR. 561/562
SPEED WARNING BUZZER
M 215
M 193
0.5 WS/RT
I 40
0.5 BR
0.5 BR
MP IV
MP V
MP VI
MP IX
MP X
MP XII
MP I
MP II
MP III
MP VII
MP IX
MP XI
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
51
52
53
54
55
56
57
58
59
60

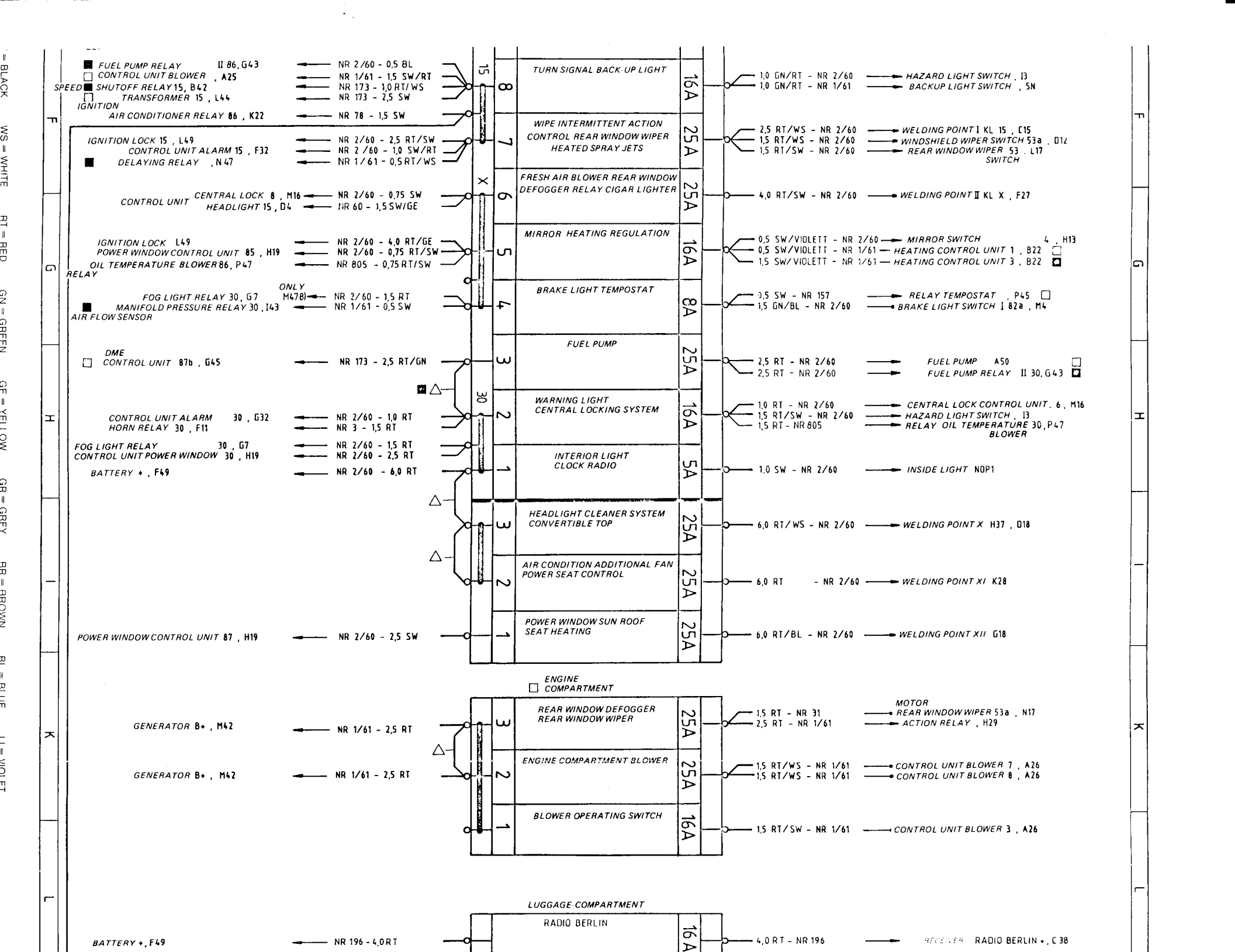
Wiring Diagram Type 911 turbo Model 87 Sheet 8

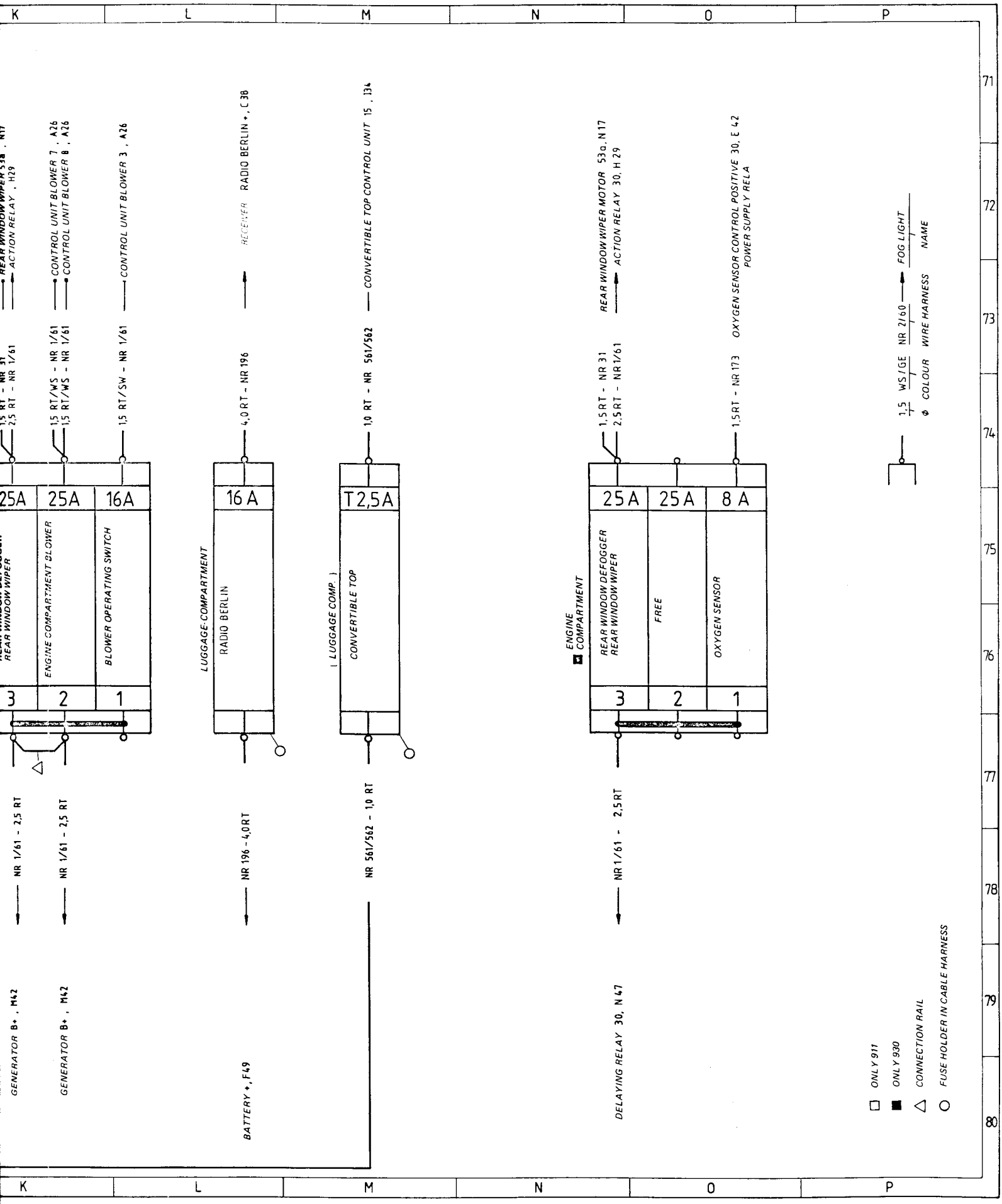
CONNECTION AND EQUIPMENT FUSES



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SW = BLACK WS =


FUEL PUMP RELAY II 86, G43
CONTROL UNIT BLOWER , A25
SPEED SHUTOFF RELAY 15, B42
TRANSFORMER 15 , L44
IGNITION
AIR CONDITIONER RELAY 86 , K22
IGNITION LOCK 15 , L49
CONTROL UNIT ALARM 15 , F32
DELAYING RELAY , N47
CONTROL UNIT CENTRAL LOCK 8 , M16
HEADLIGHT 15 , D4
IGNITION LOCK L49
POWER WINDOW CONTROL UNIT 85 , H19
OIL TEMPERATURE BLOWER 86, P47
RELAY
ONLY M47(8)
FOG LIGHT RELAY 30, G7
MANIFOLD PRESSURE RELAY 30 , I43
AIR FLOW SENSOR
DME
CONTROL UNIT 87b , G45
CONTROL UNIT ALARM 30 , G32
HORN RELAY 30 , F11
FOG LIGHT RELAY 30 , G7
CONTROL UNIT POWER WINDOW 30 , H19
BATTERY + , F49
POWER WINDOW CONTROL UNIT 87 , H19
GENERATOR B+ , M42
GENERATOR B+ , M42
BATTERY +, F49
NR 2/60 - 0,5 BL
NR 1/61 - 1,5 SW/RT
NR 173 - 1,0 RT/WS
NR 173 - 2,5 SW
NR 78 - 1,5 SW
NR 2/60 - 2,5 RT/SW
NR 2/60 - 1,0 SW/RT
NR 1/61 - 0,5 RT/WS
NR 2/60 - 0,75 SW
NR 60 - 1,5 SW/GE
NR 2/60 - 4,0 RT/GE
NR 2/60 - 0,75 RT/SW
NR 805 - 0,75 RT/SW
NR 2/60 - 1,5 RT
NR 1/61 - 0,5 SW
NR 173 - 2,5 RT/GN
NR 2/60 - 1,0 RT
NR 3 - 1,5 RT
NR 2/60 - 1,5 RT
NR 2/60 - 2,5 RT
NR 2/60 - 6,0 RT
NR 2/60 - 2,5 SW
NR 1/61 - 2,5 RT
NR 1/61 - 2,5 RT
NR 196 - 4,0 RT
15
X
30
8
7
6
5
4
3
2
1
TURN SIGNAL BACK-UP LIGHT
WIPE INTERMITTENT ACTION
CONTROL REAR WINDOW WIPER
HEATED SPRAY JETS
FRESH AIR BLOWER REAR WINDOW
DEFOGGER RELAY CIGAR LIGHTER
MIRROR HEATING REGULATION
BRAKE LIGHT TEMPOSTAT
FUEL PUMP
WARNING LIGHT
CENTRAL LOCKING SYSTEM
INTERIOR LIGHT
CLOCK RADIO
HEADLIGHT CLEANER SYSTEM
CONVERTIBLE TOP
AIR CONDITION ADDITIONAL FAN
POWER SEAT CONTROL
POWER WINDOW SUN ROOF
SEAT HEATING
16A
25A
25A
25A
16A
8A
25A
16A
5A
25A
25A
25A
1,0 GN/RT - NR 2/60 — HAZARD LIGHT SWITCH , I3
1,0 GN/RT - NR 1/61 — BACKUP LIGHT SWITCH , 5N
2,5 RT/WS - NR 2/60 — WELDING POINT I KL 15 , C15
1,5 RT/WS - NR 2/60 — WINDSHIELD WIPER SWITCH 53a , D12
1,5 RT/SW - NR 2/60 — REAR WINDOW WIPER 53 , L17 SWITCH
4,0 RT/SW - NR 2/60 — WELDING POINT II KL X , F27
0,5 SW/VIOLETT - NR 2/60 — MIRROR SWITCH 4 , H13
0,5 SW/VIOLETT - NR 1/61 — HEATING CONTROL UNIT 1 , B22
1,5 SW/VIOLETT - NR 1/61 — HEATING CONTROL UNIT 3 , B22
0,5 SW - NR 157 — RELAY TEMPOSTAT , P45
1,5 GN/BL - NR 2/60 — BRAKE LIGHT SWITCH 1 82a , M4
2,5 RT - NR 2/60 — FUEL PUMP A50
2,5 RT - NR 2/60 — FUEL PUMP RELAY II 30, G43
1,0 RT - NR 2/60 — CENTRAL LOCK CONTROL UNIT, 6 , M16
1,5 RT/SW - NR 2/60 — HAZARD LIGHT SWITCH , I3
1,5 RT - NR 805 — RELAY OIL TEMPERATURE BLOWER 30, P47
1,0 SW - NR 2/60 — INSIDE LIGHT NOP1
6,0 RT/WS - NR 2/60 — WELDING POINT X H37 , D18
6,0 RT - NR 2/60 — WELDING POINT XI K28
6,0 RT/BL - NR 2/60 — WELDING POINT XII G18
ENGINE COMPARTMENT
REAR WINDOW DEFOGGER
REAR WINDOW WIPER
ENGINE COMPARTMENT BLOWER
BLOWER OPERATING SWITCH
25A
25A
16A
1,5 RT - NR 31 — MOTOR REAR WINDOW WIPER 53a , N17
2,5 RT - NR 1/61 — ACTION RELAY , H29
1,5 RT/WS - NR 1/61 — CONTROL UNIT BLOWER 7 , A26
1,5 RT/WS - NR 1/61 — CONTROL UNIT BLOWER 8 , A26
1,5 RT/SW - NR 1/61 — CONTROL UNIT BLOWER 3 , A26
LUGGAGE COMPARTMENT
RADIO BERLIN
16A
4,0 RT - NR 196 — RECEIVER RADIO BERLIN +, C38
BLACK
WS = WHITE
RT = RED
GN = GREEN
GE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
LI = VIOLET


K
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P
71
72
73
74
75
76
77
78
79
80
REAR WINDOW WIPER 53a , N17
ACTION RELAY , H29
CONTROL UNIT BLOWER 7 , A26
CONTROL UNIT BLOWER 8 , A26
CONTROL UNIT BLOWER 3 , A26
RECEIVER RADIO BERLIN + , C38
CONVERTIBLE TOP CONTROL UNIT 15 , 134
REAR WINDOW WIPER MOTOR 53a , N17
ACTION RELAY 30, H29
OXYGEN SENSOR CONTROL POSITIVE 30, E42
POWER SUPPLY RELA
1,5 RT - NR 31
2,5 RT - NR 1/61
1,5 RT/WS - NR 1/61
1,5 RT/WS - NR 1/61
1,5 RT/SW - NR 1/61
4,0 RT - NR 196
1,0 RT - NR 561/562
1,5 RT - NR 31
2,5 RT - NR1/61
1,5 RT - NR 173
25A
25A
16A
16 A
T2,5A
25 A
25 A
8 A
REAR WINDOW DEFOGGER
REAR WINDOW WIPER
ENGINE COMPARTMENT BLOWER
BLOWER OPERATING SWITCH
LUGGAGE COMPARTMENT
RADIO BERLIN
LUGGAGE COMP.
CONVERTIBLE TOP
ENGINE COMPARTMENT
FREE
OXYGEN SENSOR
3
2
1
GENERATOR B+ , M42
GENERATOR B+ , M42
BATTERY + , F49
DELAYING RELAY 30, N47
NR 1/61 - 2,5 RT
NR 1/61 - 2,5 RT
NR 196 - 4,0 RT
NR 561/562 - 1,0 RT
NR1/61 - 2,5 RT
1,5 WS/GE NR 2160 FOG LIGHT
COLOUR WIRE HARNESS NAME
ONLY 911
ONLY 930
CONNECTION RAIL
FUSE HOLDER IN CABLE HARNESS

Wiring Diagram Type 911 Carrera
Model 88

	COORDINATES	
PAGE 1	1-10	LIGHTS
PAGE 2	11-20	BODY
PAGE 3	21-30	HEATER AND VENTILATION
PAGE 4	31-40	POWER TOP, ALARM SYSTEM, SUN ROOF
PAGE 5	41-50	DIGITAL MOTOR ELECTRONICS, ENGINE, TEMPOSTAT
PAGE 6	51-60	INSTRUMENTS AND SENDER
PAGE 7	61-70	RADIO
PAGE 8	71-80	FUSE ASSIGNMENTS AND POSITIONS
PAGE 9		CONSTR. COMPONENTS, PLUG CONNECTION, GROUND POINTS

Wiring Diagram Type 911 Carrera
Model 88

WIRE COLOURS

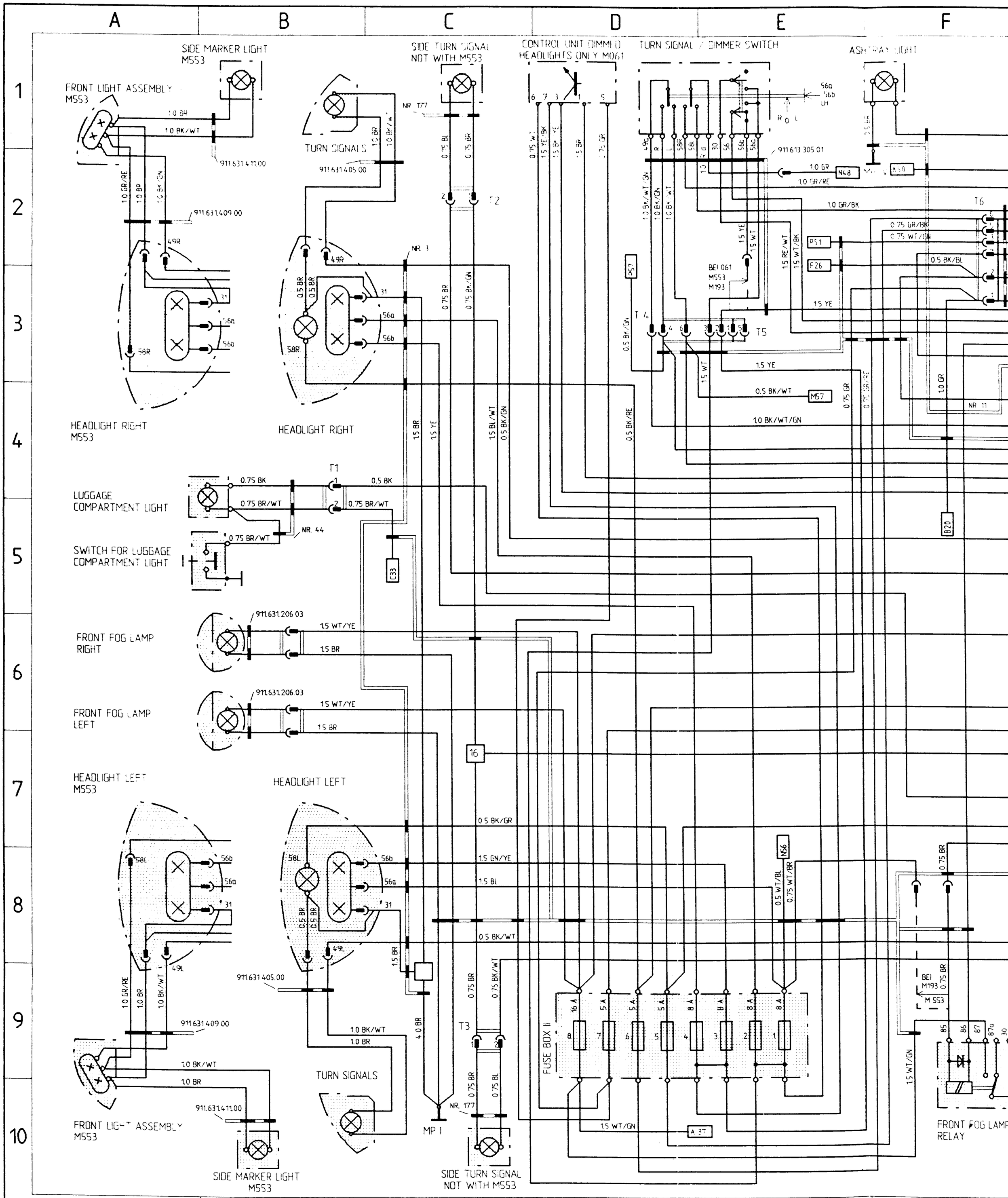
BK = BLACK
WT = WHITE
RE = RED
GN = GREEN
YE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
VI = VIOLET

⊡ = WELDING POINT
▭ = CONNECTION WITH FIELD INDICATION
MP = GROUND CONNECTING POINT

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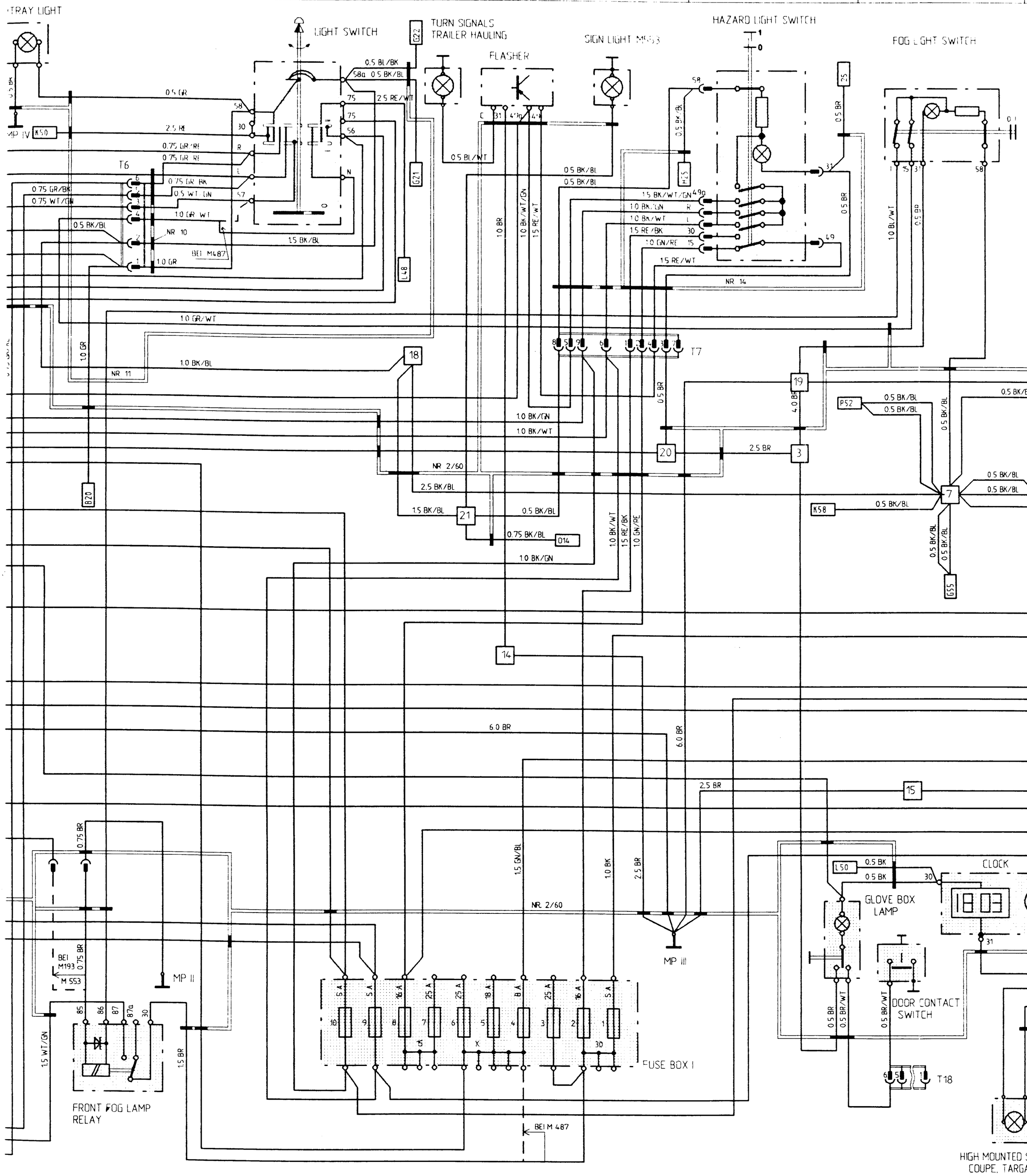
Wiring Diagram Type 911 Carrera Model 88 page 1

LIGHTS



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BK = BLACK WT = WHI



BK = BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET

K L M N O P

RD LIGHT SWITCH

FOG LIGHT SWITCH

REAR FOG LIGHT SWITCH

STOP LIGHT SWITCH I

STOP LIGHT SWITCH II

INSIDE LIGHTS TARGA CONVERTIBLE

INSIDE LIGHTS LEFT COUPE

INSIDE LIGHTS RIGHT COUPE

TAIL LIGHT ASSEMBLY RIGHT

REAR FOG LIGHT NOT M576

LICENSE PLATE LIGHTS

REAR FOG LIGHT NOT M576

TAIL LIGHT ASSEMBLY LEFT

CLOCK

GLOVE BOX LAMP

DOOR CONTACT SWITCH

BACKUP LIGHT SWITCH

HIGH MOUNTED STOP LIGHT COUPE, TARGA M553

ENGINE COMPARTMENT LIGHT

HIGH MOUNTED STOP LIGHT CONVERTIBLE

MP VII

MP IX

MP IX

MP XI

T8 T9 T10 T11 T12 T13 T14 T15 T16 T17 T18 T19

NR 2/60 NR. 42 NR 226 NR 45 BEI M650 NR. 34/64 NR 46 NR 157 NR. 32 NR. 91 NR. 49 NR. 16 NR. 39 NR. 161

NUR M553 NUR LL

L50 L53 L55 M50 A38 N45 P52 K58 K28 G55 G57 G62

VI = VIOLET

Wiring Diagram Type 911 Carrera Model 86 page 2

BODY

WINDSHIELD WIPERS

WIPE/WASH SWITCH

WINDSHIELD WASHING FLUID PUMP

HORN BUTTON

HEATED SPRAY JETS

TWO-TONE H

POTENTIOMETER

WIPER INTERMITTENT CONTROL

WINDSHIELD WIPER MOTOR

ADDITIONAL CLEANING FLUID BUTTON M286

ADDITIONAL CLEANING FLUID PUMP RELAY M286

ADDITIONAL CLEANING FLUID PUMP

HEADLIGHT CLEANERS

M 288

CONTROL UNIT HEADLIGHT CLEANERS

T39

HEADLIGHT CLEANER PUMP

HEADLIGHT CLEANER BUTTON

FUSE BOX 1

CONNECTION RAIL

= WELDING POINT

= CONNECTION WITH FIELD DATA

MP = GROUND POINT

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BK = BLACK WT =

F | G | H | J | K | L

TWO-TONE HORN

RELAY TWO-TONE HORN

JETS

OUTSIDE MIRROR LEFT

OUTSIDE MIRROR

MIRROR CHANGEOVER SWITCH M528 / M261

STANDARD BY BRIDGING INPUT 928 612 325 00 TERM 1 WITH TERM 3 AND TERM 2 WITH TERM 5 BRIDGED

944 731 027 00

T23

T24

T26

D33

H25

NR 166

HORIZONTAL

VERTICAL

SWITCH POWER WINDOW

NR. 165

T22

T38

T37

NR 48

NR 104

NR 223

SWITCH FOR REAR WINDOW WIPER

REAR WIND

ELECTRONIC CONTROL UNIT CENTRAL LOCKS

MP I

MP III

NR. 2/60

G53

K55

NUR 930 046

POWER WINDOW REGULATOR

POWER WINDOW REGULATOR CONTROL UNIT

POWER WINDOW REGULATOR MOTOR

DRIVER'S POWER WINDOW SWITCH

PASSENGER'S POWER WINDOW SWITCH

DRIVER'S SIDE

POWER WINDOW REGULATOR MOTOR

PASSENGER'S POWER WINDOW SWITCH

PASSENGER'S SIDE

F | G | H | J | K | L

BK = BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET

K L M N O P

MIRROR CHANGEOVER SWITCH M528 / M261

L R

5 2 6 3 1 4

0.5 WT/BL

0.5 BK/BL

0.75 GR/GN

G25

0.75 BR

T26

NR. 166

OUTSIDE MIRROR RIGHT M528/M261

0.75 GR/GN

0.5 WT/GN

0.5 WT/BL

0.5 BK/BL

0.5 GN

0.75 BR

0.5 WT

0.5 WT/BR

0.5 BK

0.5 BK/BR

0.75 BR

HORIZONTAL

VERTICAL

T27

944.731.027.00

CENTRAL LOCKS

M 341

CENTRAL LOCK BUTTON

DRIVE FOR PASSENGER'S DOOR

LOCK CYLINDER FOR PASSENGER'S DOOR

12 11 58a 31

0.75 YE 0.75 BL 0.75 BK/BL 0.75 BR

T28 T29

911.624.211.01

0.5 GN 0.5 BR 0.5 YE 0.5 BK 0.5 BL

T30

911.613.133.00

0.35 GN 0.35 YE 0.35 BR

T31

0.75 BL/YE 0.75 GN/RE 0.75 BL/WT 0.75 GN/WT 0.75 BR

0.75 BR

0.75 BR/BL

0.75 BR/GN

NR 264

15

T32

20

16

0.75 BR

1.0 BR

ELECTRONIC CONTROL UNIT CENTRAL LOCKS

1 11 12 5 10 2 4 3 7 9 8 6

0.75 BL
0.75 YE
1.0 BR
0.75 GN/WT
0.75 BL/WT
0.75 GN/RE
0.75 BL/YE
0.75 BR/BL
0.75 BR/GN
0.75 BK
1.0 RE

T33

0.75 BR

0.75 BL/YE 0.75 GN/RE 0.75 BL/WT 0.75 GN/WT 0.75 BR/GN 0.75 BR/BL

NR 264

0.75 BR

0.75 BR

T34 T35

911.624.211.01

0.5 GN 0.5 BR 0.5 YE 0.5 BK 0.5 BL

911.613.133.00

0.35 BR 0.35 YE 0.35 GN

DRIVE FOR DRIVER'S DOOR

LOCK CYLINDER FOR DRIVER'S DOOR

NR. 223

911.617.106.01

53 53a 1.5 RE/BK 1.5 RE/BK

15 1.5 BR 31 31b 1.5 BR/WT

NR. 1/61

SWITCH FOR REAR WINDOW WIPER

T36

T37

REAR WINDOW WIPER

M 425

1.5 BR/BK 1.5 RE/BK

53 31b 53a 31

REAR WINDOW WIPER MOTOR

RE/WT 1.5 BR

1.5 RE/BK

1.5 BL/BK

1.5 BL

1.5 RE

NR. 31

NR 104

ENGINE COMPARTMENT

25A

1.5 BR

2.5 RE

MP XI

NUR 930 046

2.5 RE 2.5 RE

NUR 911 N46

ER WINDOW ULATOR MOTOR

PASSENGER'S POWER WINDOW SWITCH

PASSENGER'S SIDE

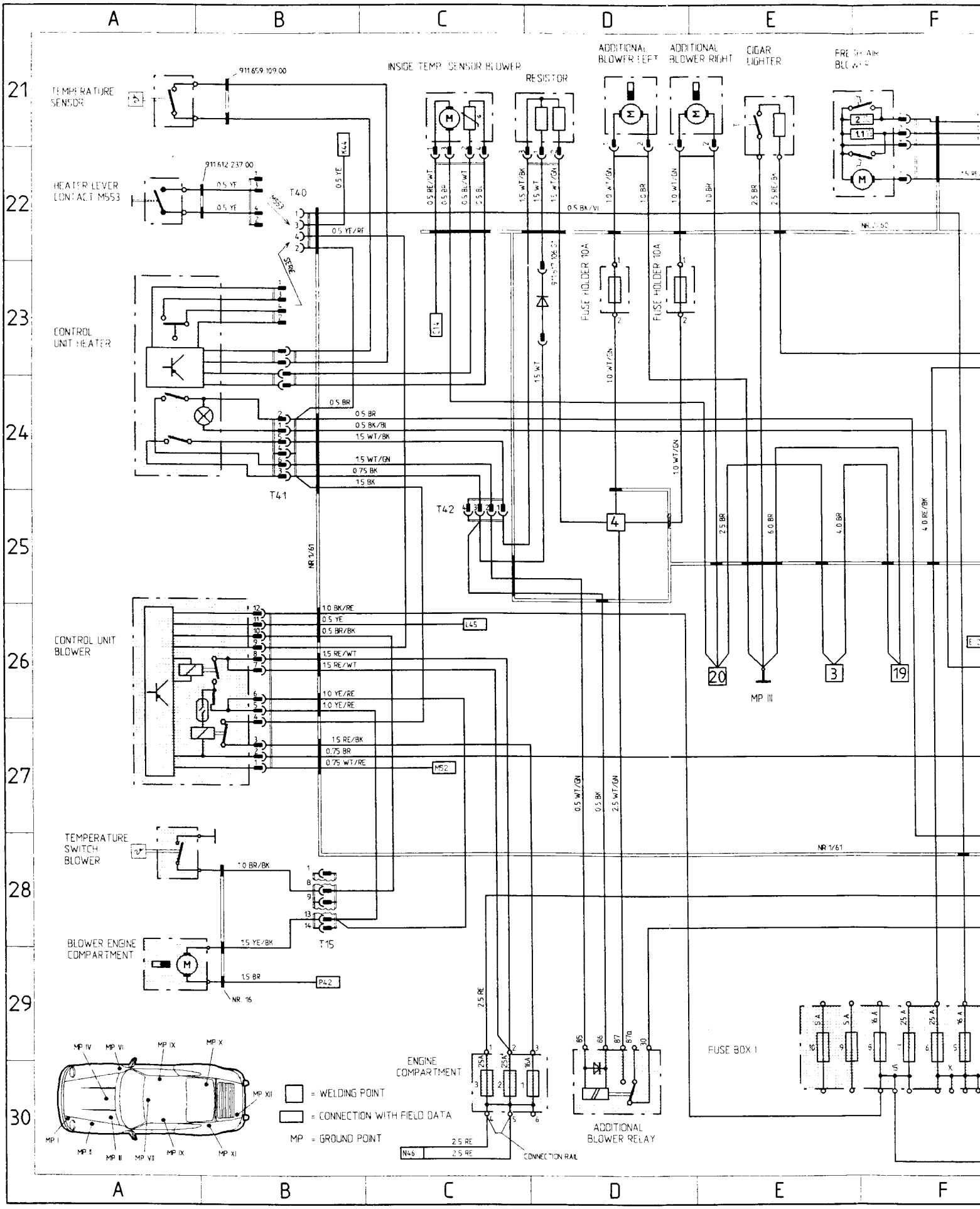
11 12 13 14 15 16 17 18 19 20

K L M N O P

VI = VIOLET

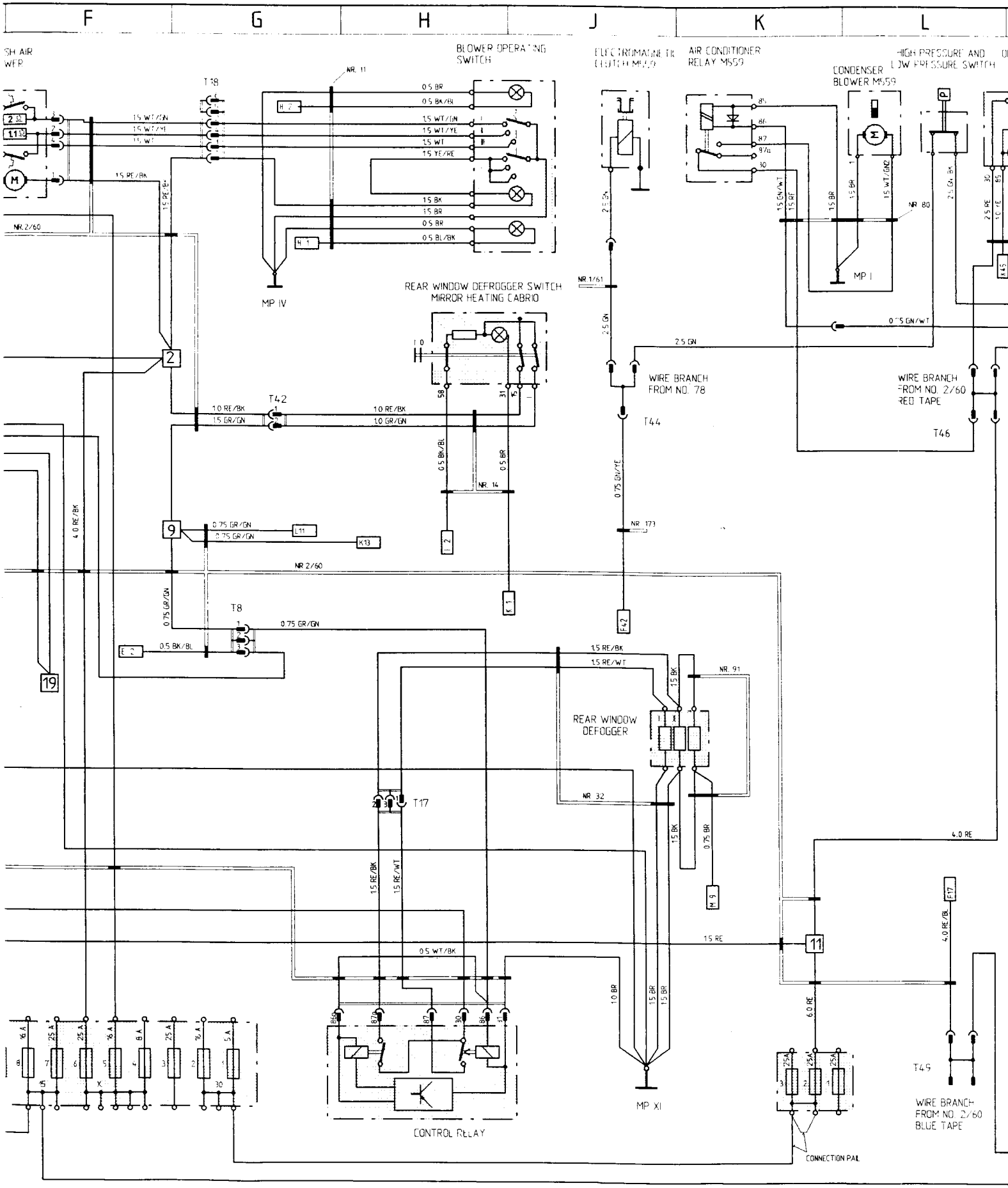
Wiring Diagram Type 911 Carrera Model 88 page 3

HEATER AND VENTILATION

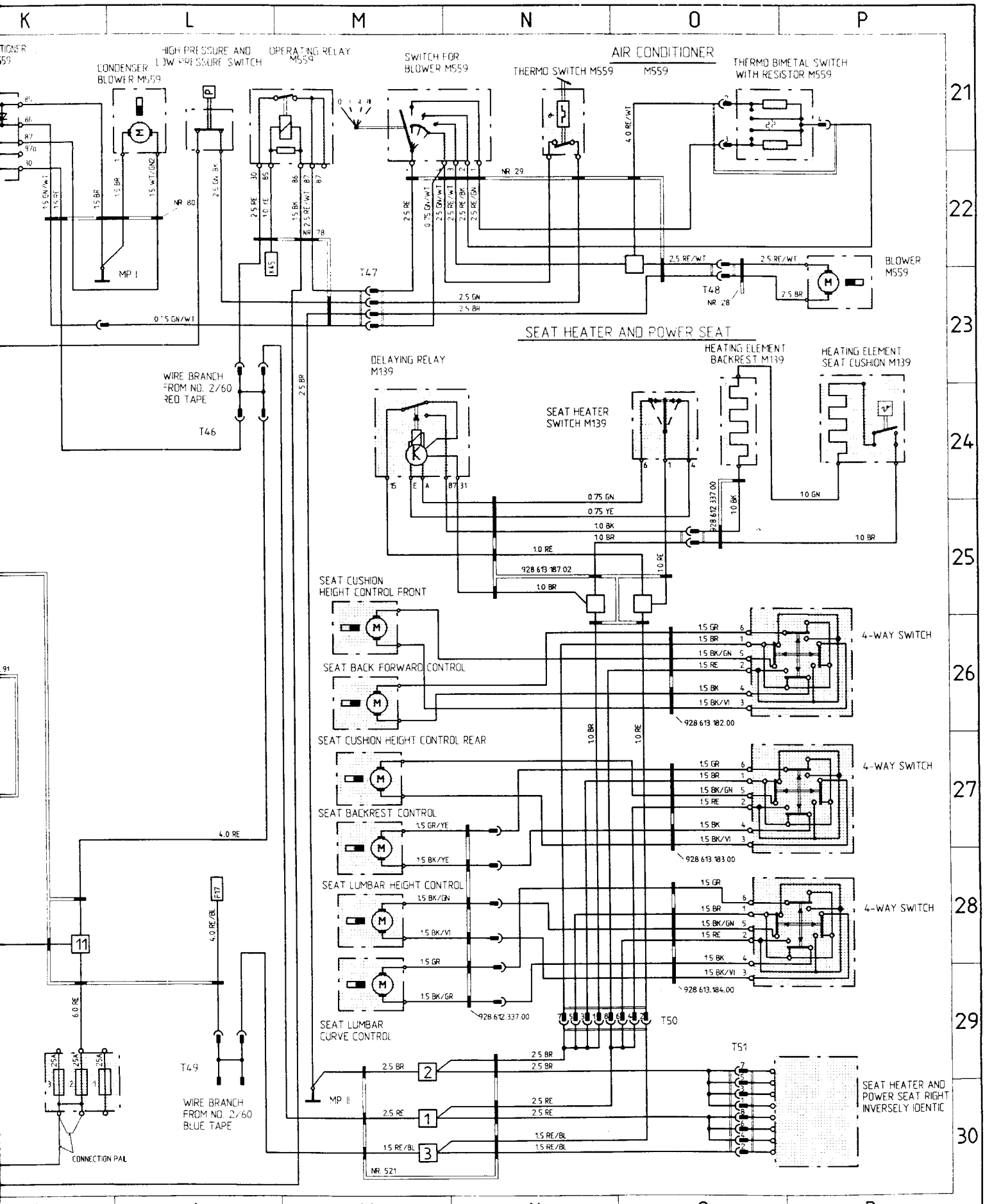


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BK = BLACK WT

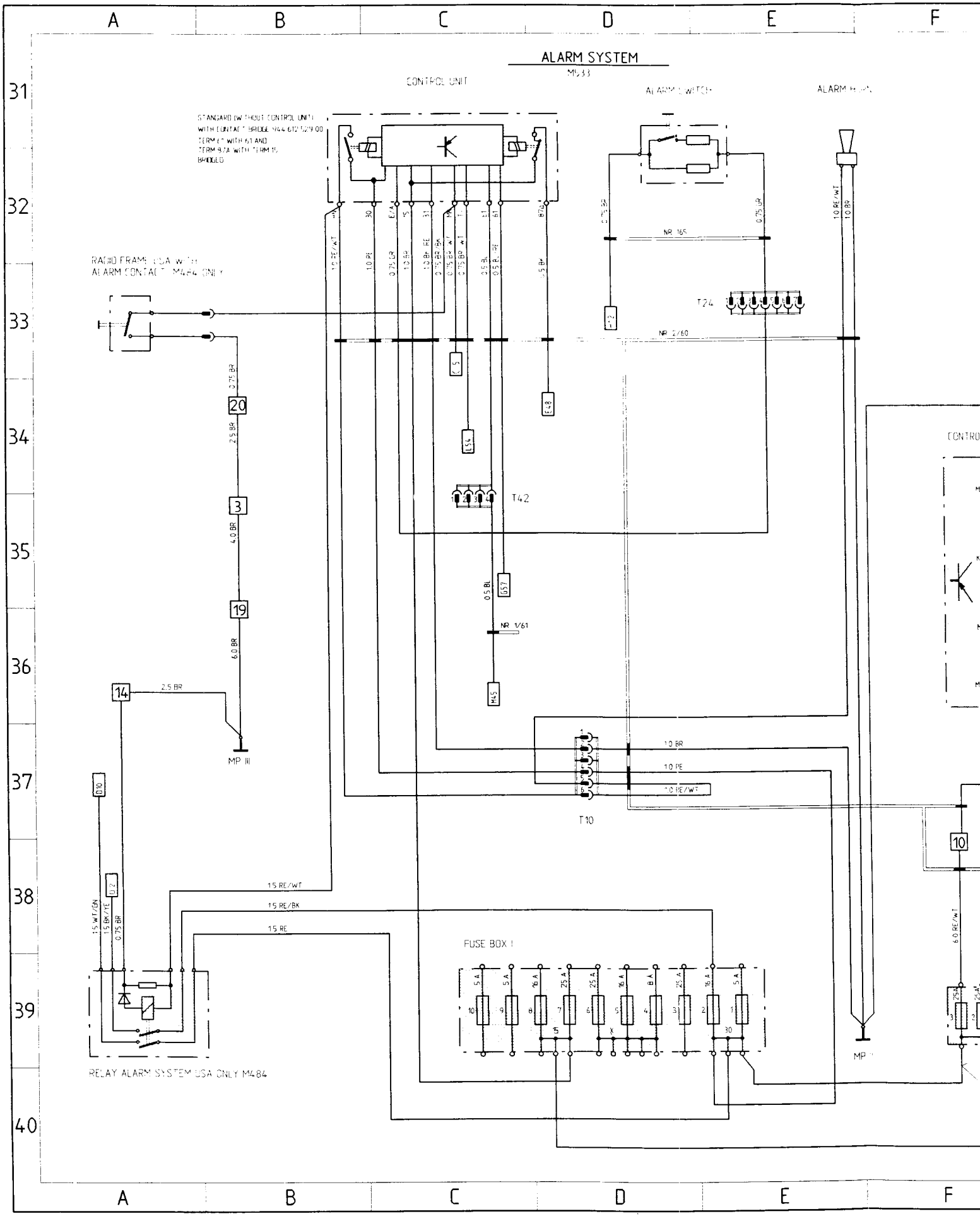


BK = BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET


K
L
M
N
O
P
21
22
23
24
25
26
27
28
29
30
AIR CONDITIONER
M559
CONDENSER BLOWER M559
HIGH PRESSURE AND LOW PRESSURE SWITCH
OPERATING RELAY M559
SWITCH FOR BLOWER M559
THERMO SWITCH M559
THERMO BIMETAL SWITCH WITH RESISTOR M559
BLOWER M559
MP I
T47
T48
NR 29
NR 80
NR 78
NR 28
SEAT HEATER AND POWER SEAT
DELAYING RELAY M139
SEAT HEATER SWITCH M139
HEATING ELEMENT BACKREST M139
HEATING ELEMENT SEAT CUSHION M139
WIRE BRANCH FROM NO. 2/60 RED TAPE
T46
SEAT CUSHION HEIGHT CONTROL FRONT
SEAT BACK FORWARD CONTROL
SEAT CUSHION HEIGHT CONTROL REAR
SEAT BACKREST CONTROL
SEAT LUMBAR HEIGHT CONTROL
SEAT LUMBAR CURVE CONTROL
4-WAY SWITCH
928 613 182.00
928 613 183.00
928 613 184.00
928 612 337.00
T50
T51
MP II
NR. 521
SEAT HEATER AND POWER SEAT RIGHT INVERSELY IDENTIC
T49
WIRE BRANCH FROM NO. 2/60 BLUE TAPE
CONNECTION PAL
0.75 GN/WT
2.5 GN
2.5 BR
2.5 BP
4.0 RE
6.0 RE
4.0 RE/BL
2.5 RE
2.5 RE/WT
2.5 BR
1.5 RE/BL
0.75 GN
0.75 YE
1.0 BK
1.0 BR
1.0 RE
1.0 GN
928 613 187.02
928 612 337.00
1.5 GR
1.5 BR
1.5 BK/GN
1.5 RE
1.5 BK
1.5 BK/VI
1.5 GR/YE
1.5 BK/YE
1.5 BK/GN
1.5 BK/VI
1.5 GR
1.5 BK/GR
25A

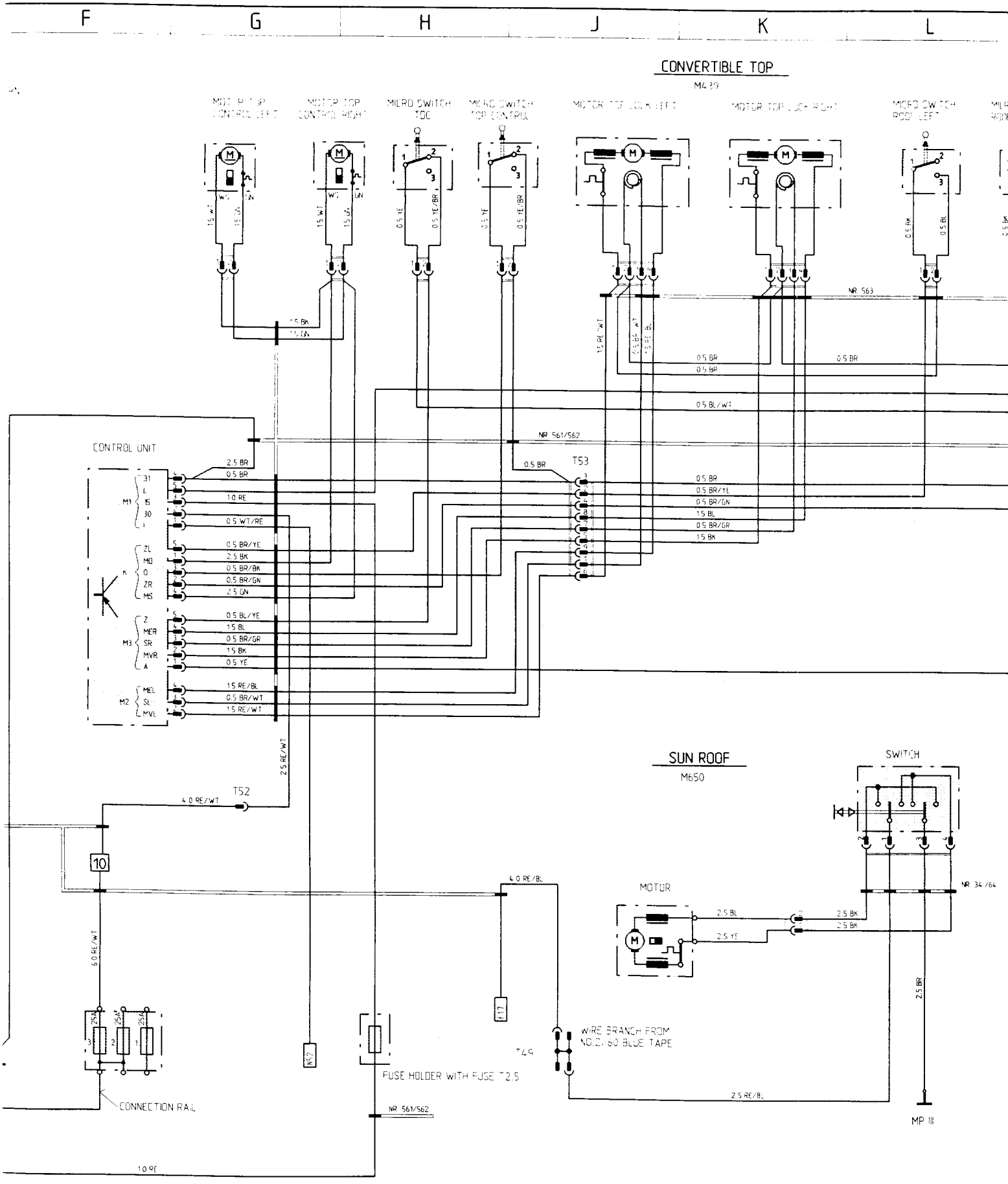
Wiring Diagram Type 911 Carrera Model 88 page 4

POWER TOP, ALARM SYSTEM, SUN ROOF

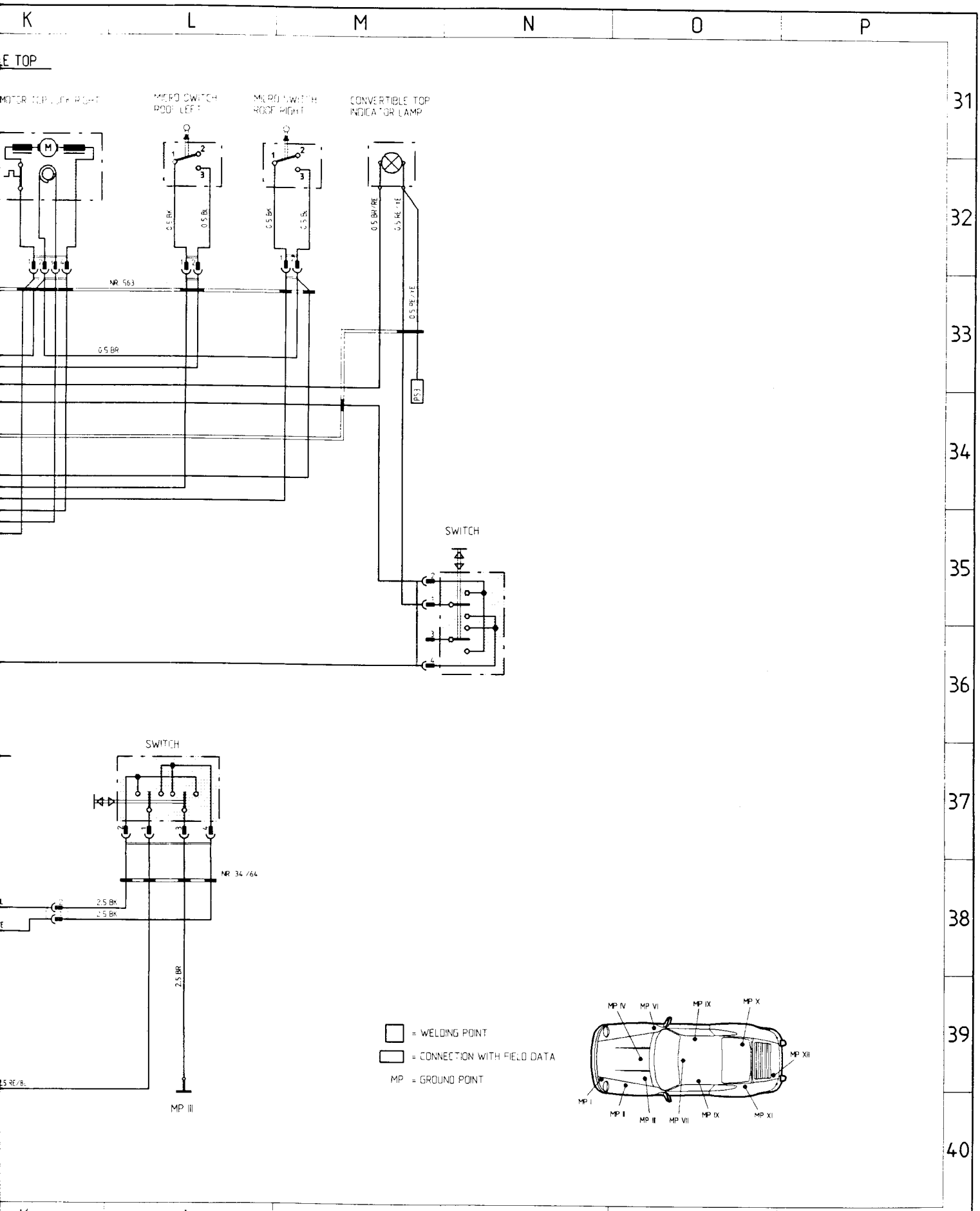


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BK=BLACK WT

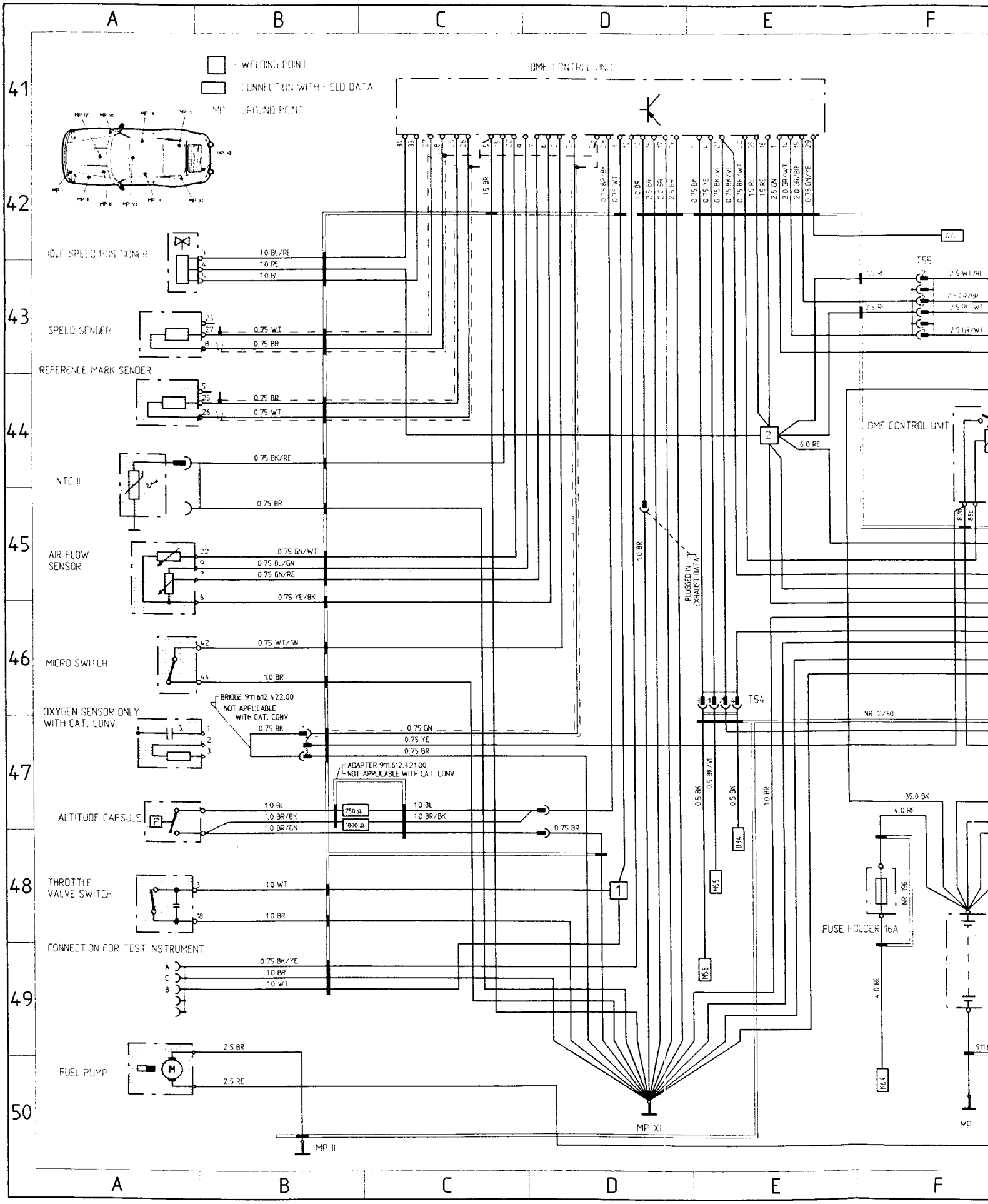


BK = BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET


K
L
M
N
O
P
E TOP
MOTOR TOP UP/DOWN RIGHT
MICRO SWITCH ROOF LEFT
MICRO SWITCH ROOF RIGHT
CONVERTIBLE TOP INDICATOR LAMP
NR. 563
0.5 BR
0.5 BK
0.5 BR/RE
0.5 RE/VI
PS 3
SWITCH
SWITCH
NR. 34/64
2.5 BK
2.5 BK
2.5 BR
2.5 RE/BL
MP III
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
MP I
MP II
MP III
MP IV
MP V
MP VI
MP VII
MP VIII
MP IX
MP X
MP XI
MP XII
31
32
33
34
35
36
37
38
39
40

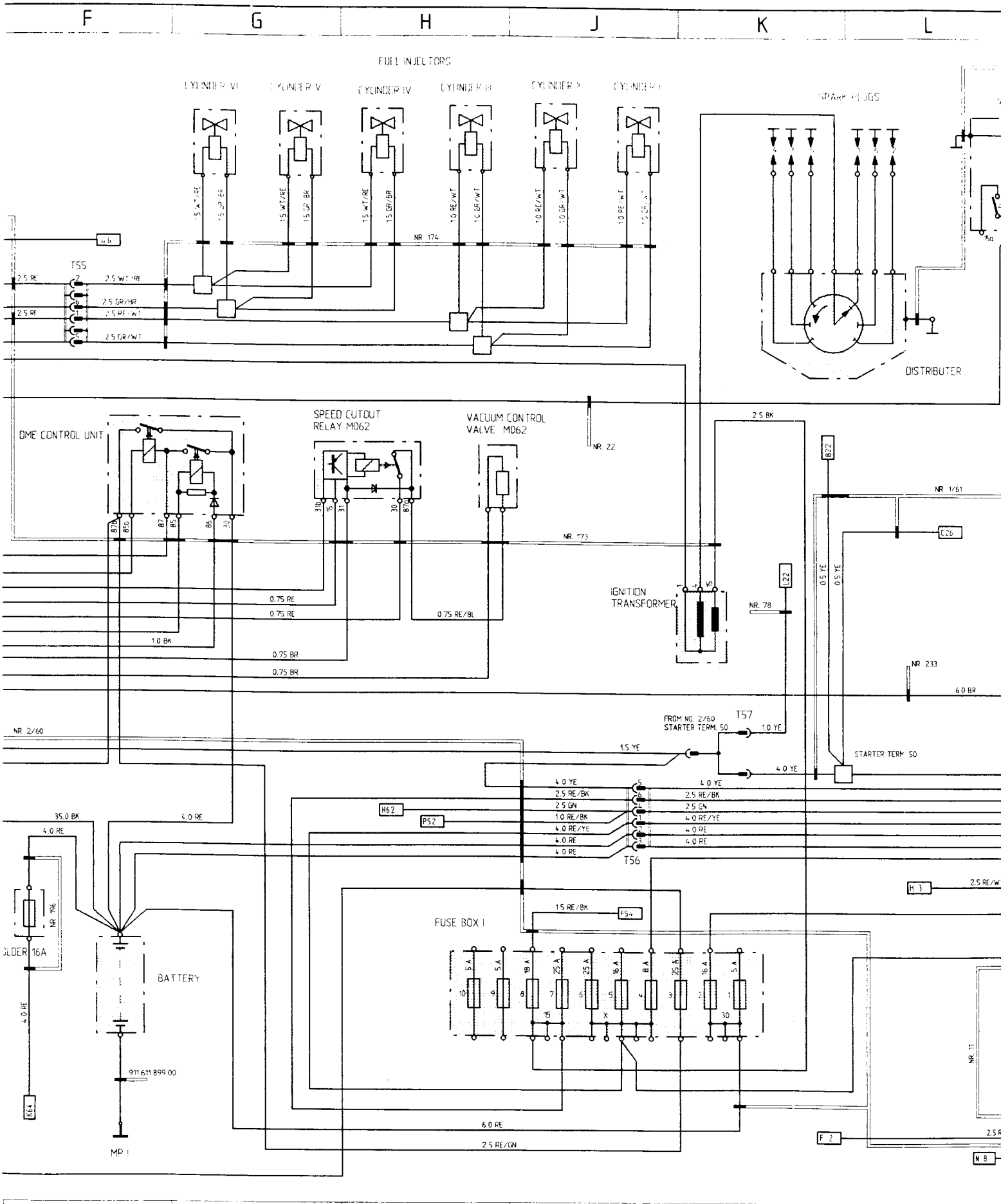
Wiring Diagram Type 911 Carrera Model 88 page 5

DIGITAL MOTOR ELECTRONICS, ENGINE, TEMPOSTAT

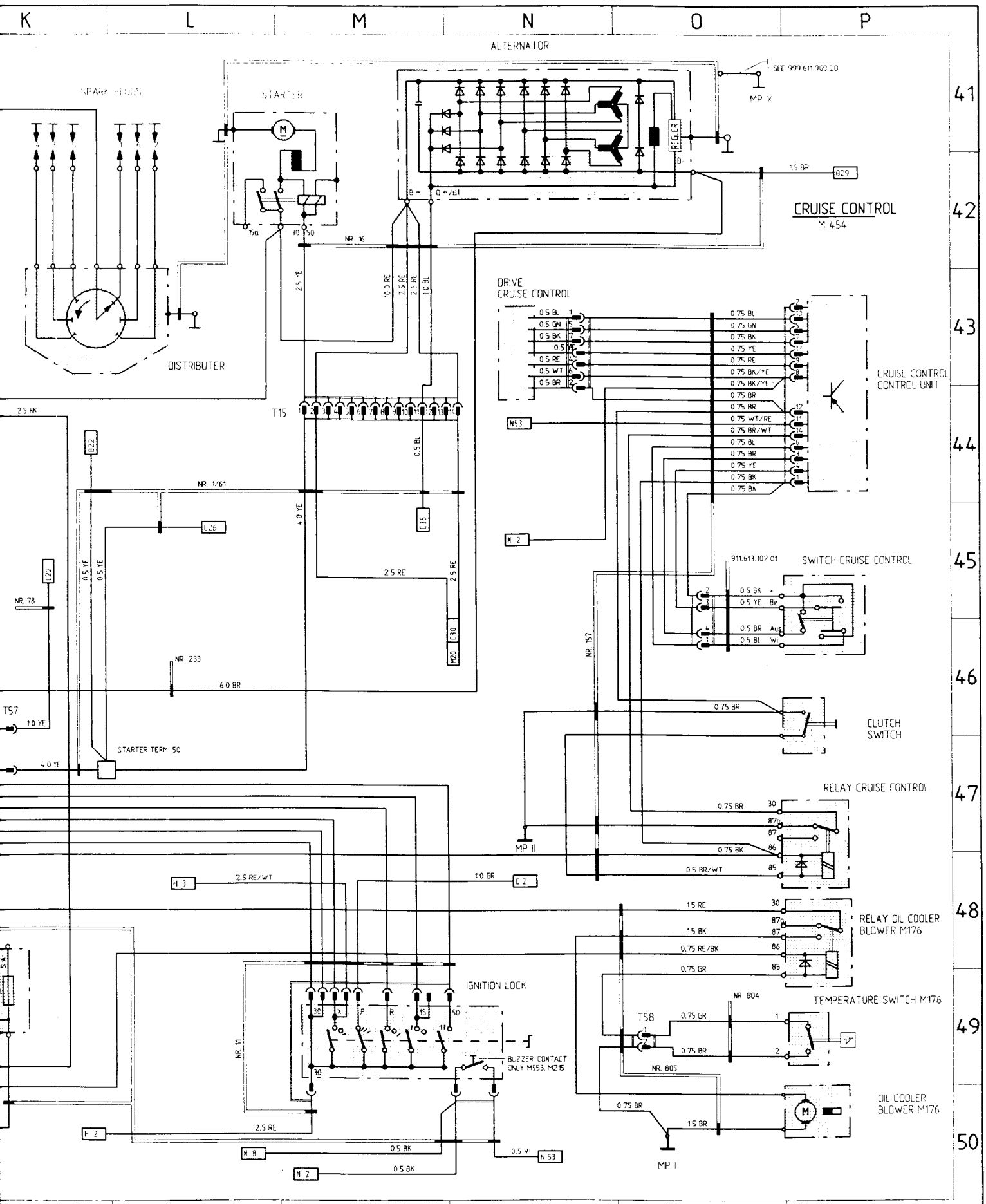


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BK = BLACK WT = WH



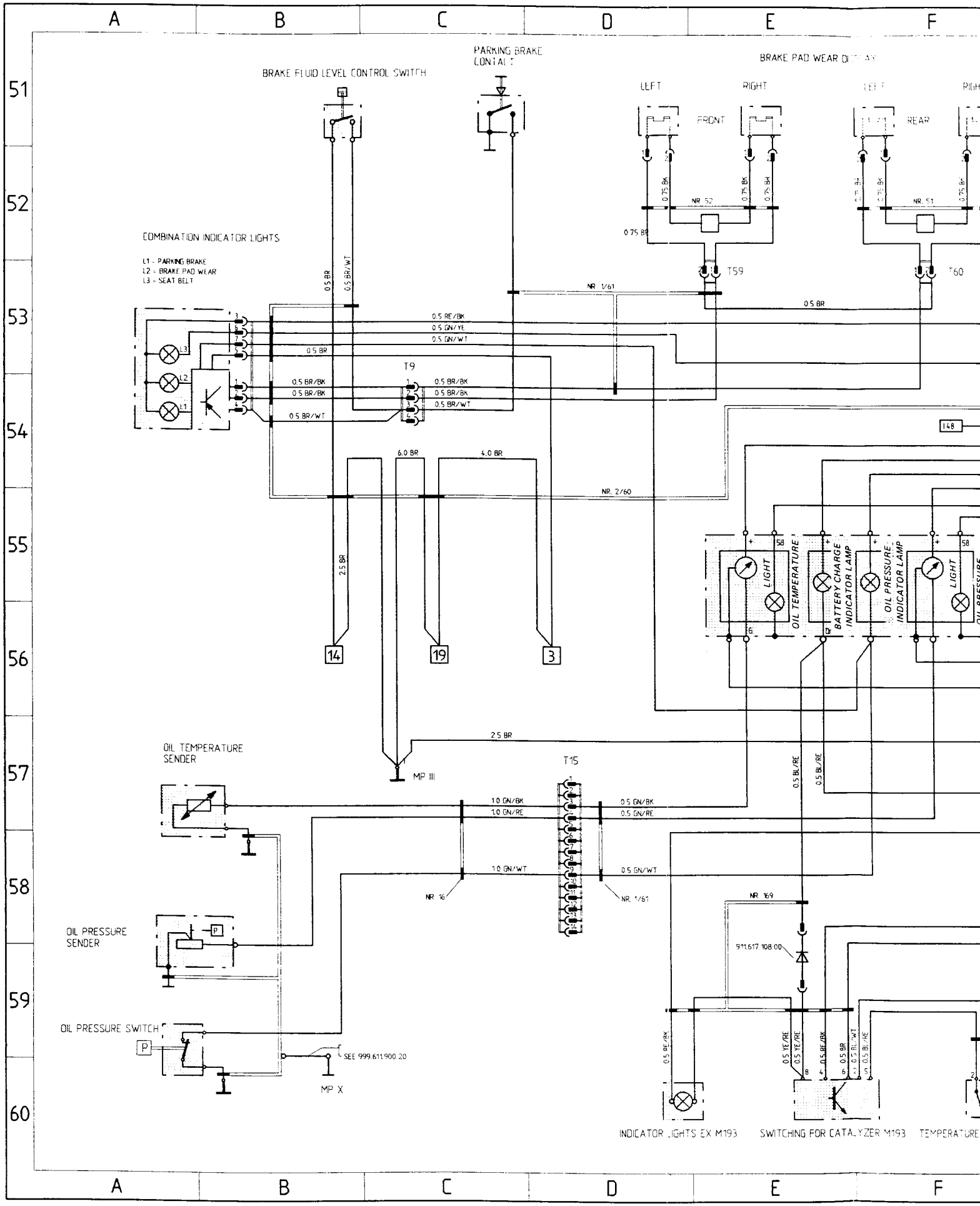
BK = BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET


K
L
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41
42
43
44
45
46
47
48
49
50
ALTERNATOR
SPARK PLUGS
STARTER
DISTRIBUTER
REGLER
MP X
SIE 999 611 900 20
15 RD
B29
CRUISE CONTROL
M 454
DRIVE
CRUISE CONTROL
CRUISE CONTROL
CONTROL UNIT
N53
N 2
T15
B22
NR 1/61
C26
C16
C30
M20
L22
NR 78
NR 233
6.0 BR
TS7
10 YE
4.0 YE
STARTER TERM 50
911.613.102.01
SWITCH CRUISE CONTROL
NR 157
CLUTCH
SWITCH
RELAY CRUISE CONTROL
MP II
H 3
2.5 RE/WT
10 GR
E 2
RELAY OIL COOLER
BLOWER M176
IGNITION LOCK
NR 11
BUZZER CONTACT
ONLY M553, M275
TEMPERATURE SWITCH M176
NR 804
TS8
NR. 805
OIL COOLER
BLOWER M176
MP I
F 2
N 8
0.5 VI
0.5 BK
2.5 RE
2.5 YE
10.0 RE
2.5 RE
2.5 RE
10 BL
0.5 BL
4.0 YE
2.5 RE
2.5 RE
0.5 YE
0.5 YE
2.5 BK
0.5 BL
0.5 GN
0.5 BK
0.5
0.5 RE
0.5 WT
0.5 BR
0.75 BL
0.75 GN
0.75 BK
0.75 YE
0.75 RE
0.75 BK/YE
0.75 BK/YE
0.75 BR
0.75 BR
0.75 WT/RE
0.75 BR/WT
0.75 BL
0.75 BR
0.75 YE
0.75 BK
0.75 BR
0.5 BK
0.5 YE Be
0.5 BR Aus
0.5 BL Wi
0.75 BR
0.75 BR
0.75 BK
0.5 BR/WT
15 RE
15 BK
0.75 RE/BK
0.75 GR
0.75 GR
0.75 BR
0.75 BR
15 BR

VI = VIOLET

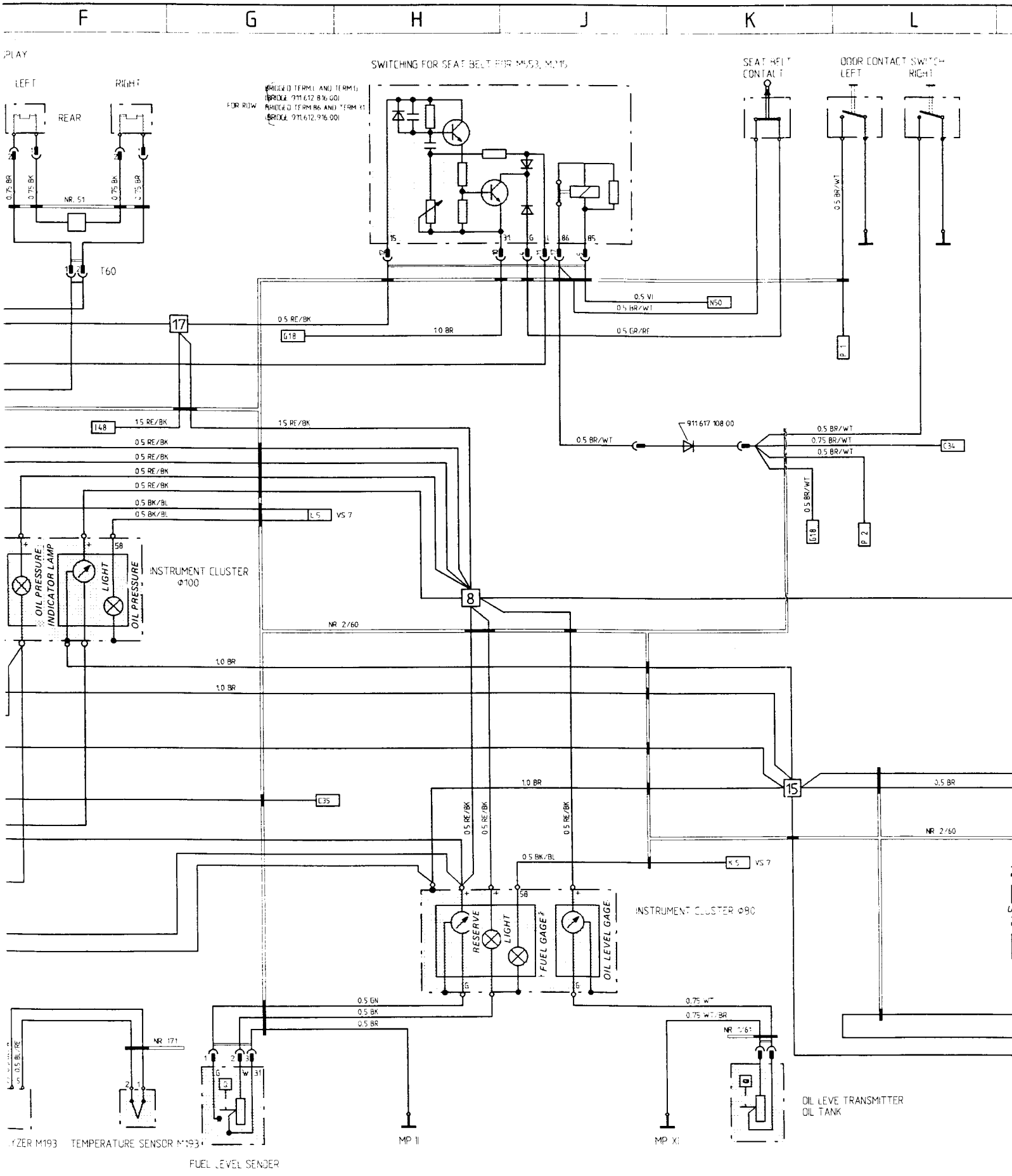
Wiring Diagram Type 911 Carrera Model 88 page 6

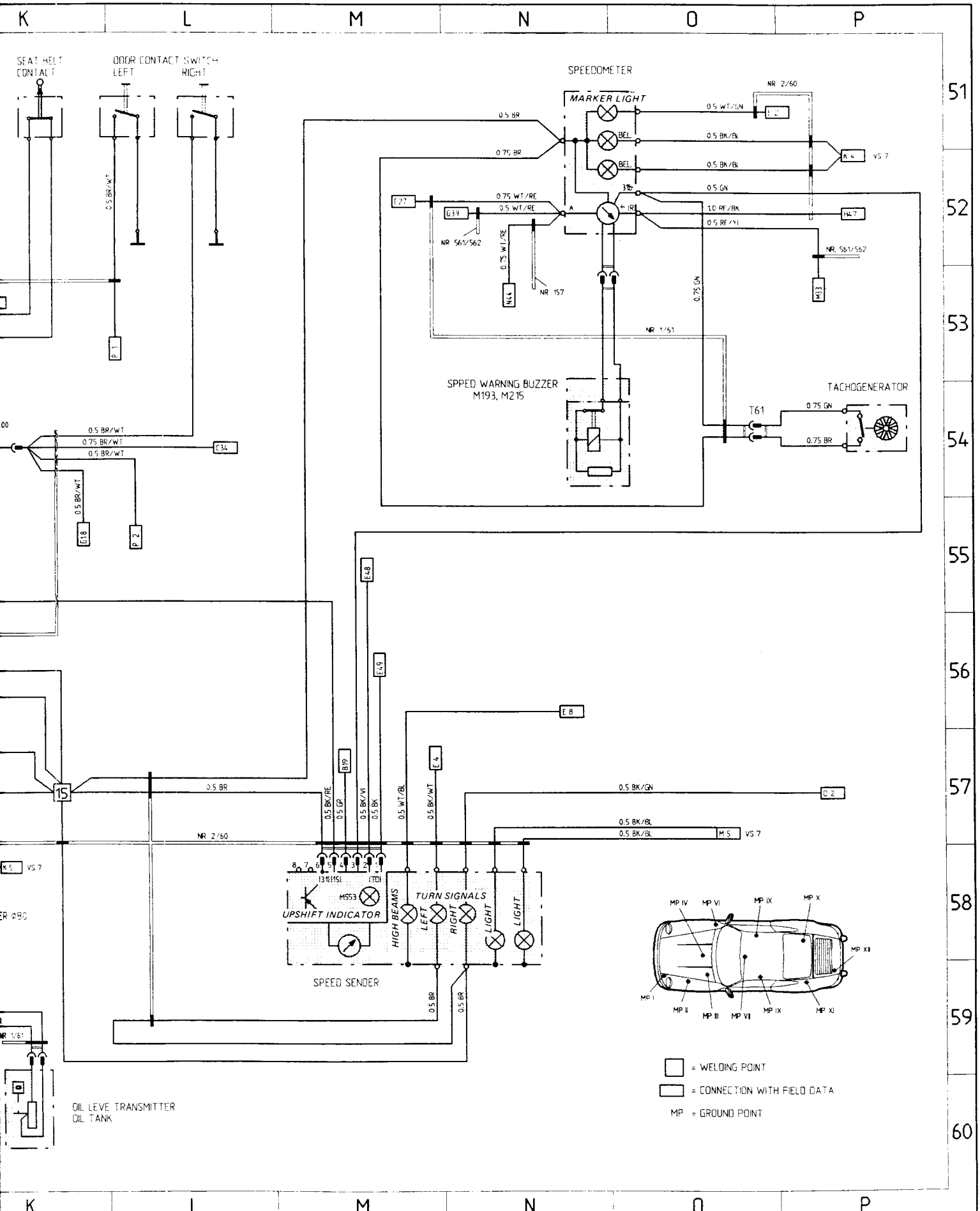
INSTRUMENTS AND SENDER



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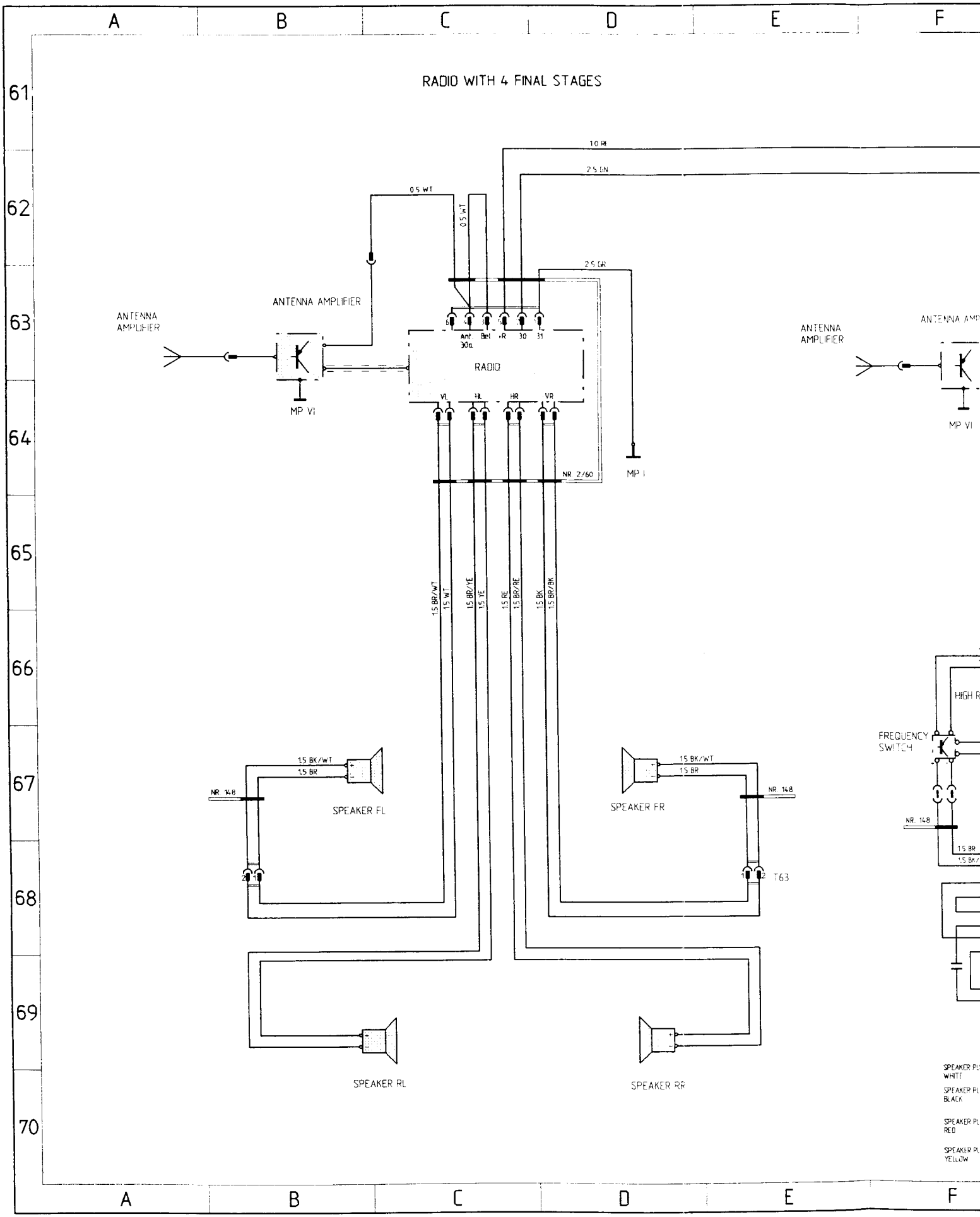
BK = BLACK WT =


F
G
H
J
K
L
SWITCHING FOR SEAT BELT FOR M.5.3, M.1.5
SEAT BELT CONTACT
DOOR CONTACT SWITCH LEFT
RIGHT
LEFT
RIGHT
REAR
NR. 51
T60
17
G18
0.5 RE/BK
1.0 BR
0.5 VI
0.5 BR/WT
N50
P 1
148
1.5 RE/BK
0.5 BK/BL
VS 7
911 617 108 00
0.75 BR/WT
C34
P 2
INSTRUMENT CLUSTER Ø100
OIL PRESSURE INDICATOR LAMP
LIGHT
OIL PRESSURE
8
NR 2/60
C35
15
0.5 BR
INSTRUMENT CLUSTER Ø80
RESERVE
LIGHT
FUEL GAGE
OIL LEVEL GAGE
0.5 GN
0.5 BK
0.75 WT
0.75 WT/BR
NR 171
TEMPERATURE SENSOR M193
FUEL LEVEL SENDER
MP II
MP X
OIL LEVE TRANSMITTER
OIL TANK


K
L
M
N
O
P
51
52
53
54
55
56
57
58
59
60
SEAT BELT CONTACT
DOOR CONTACT SWITCH LEFT
RIGHT
SPEEDOMETER
MARKER LIGHT
NR 2/60
0.5 WT/GN
0.5 BK/BL
0.5 BR
0.75 BR
0.5 GN
0.75 WT/RE
0.5 WT/RE
0.5 BR/WT
0.75 BR/WT
NR 561/562
NR 157
0.75 GN
NR 1/61
SPPED WARNING BUZZER
M193, M215
TACHOGENERATOR
T61
0.75 GN
0.75 BR
C34
G18
P 2
E48
E49
E8
E4
G19
15
0.5 BK/RE
0.5 GN
0.5 BK/VI
0.5 BK
0.5 WT/BL
0.5 BK/WT
0.5 BK/GN
C 2
M 5
VS 7
K 5
M553
UPSHIFT INDICATOR
HIGH BEAMS
TURN SIGNALS
LEFT
RIGHT
LIGHT
LIGHT
SPEED SENDER
MP I
MP II
MP III
MP IV
MP VI
MP VII
MP IX
MP X
MP XI
MP XII
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
OIL LEVE TRANSMITTER
OIL TANK

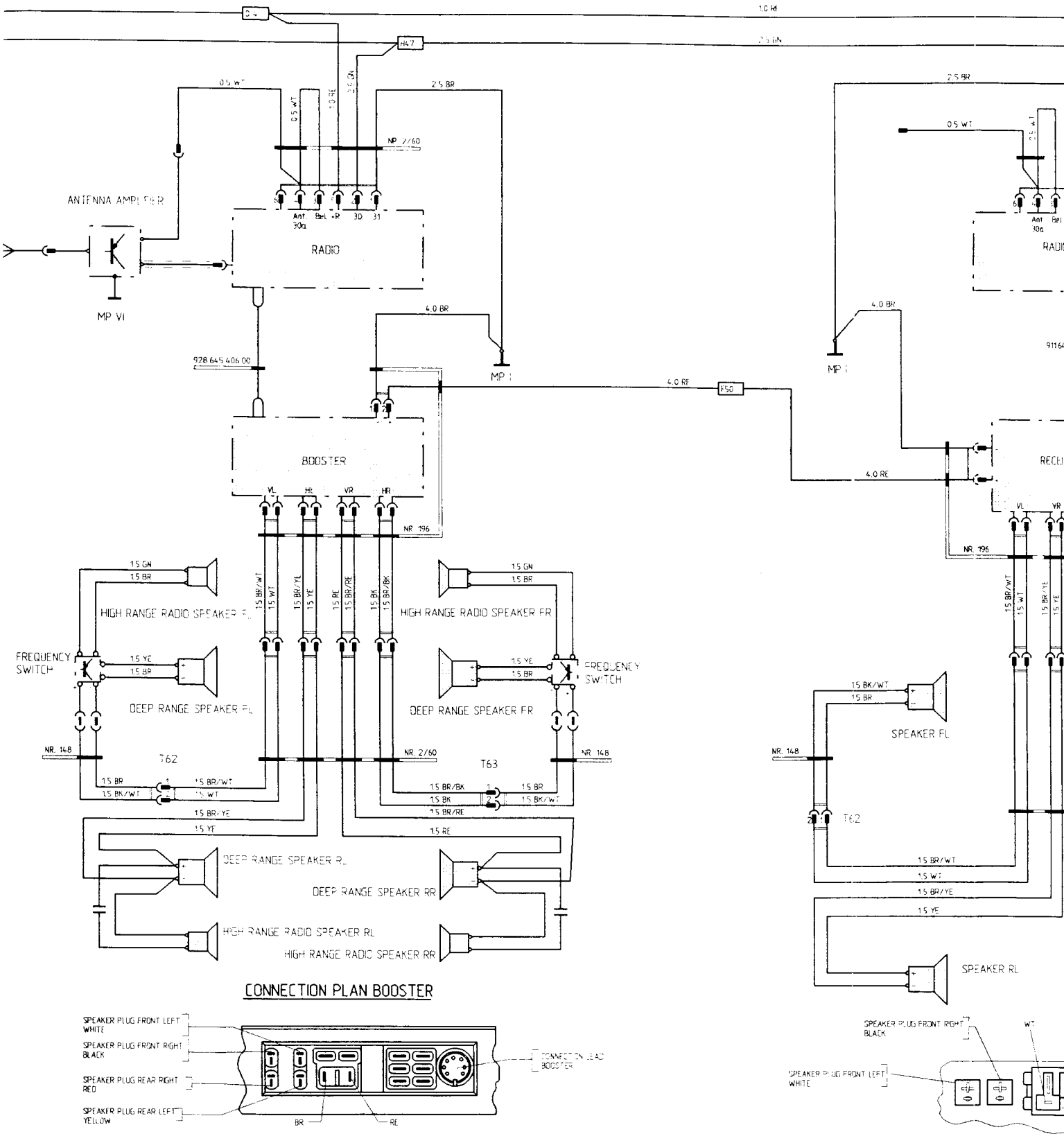
Wiring Diagram Type 911 Carrera Model 88 page 7

RADIO



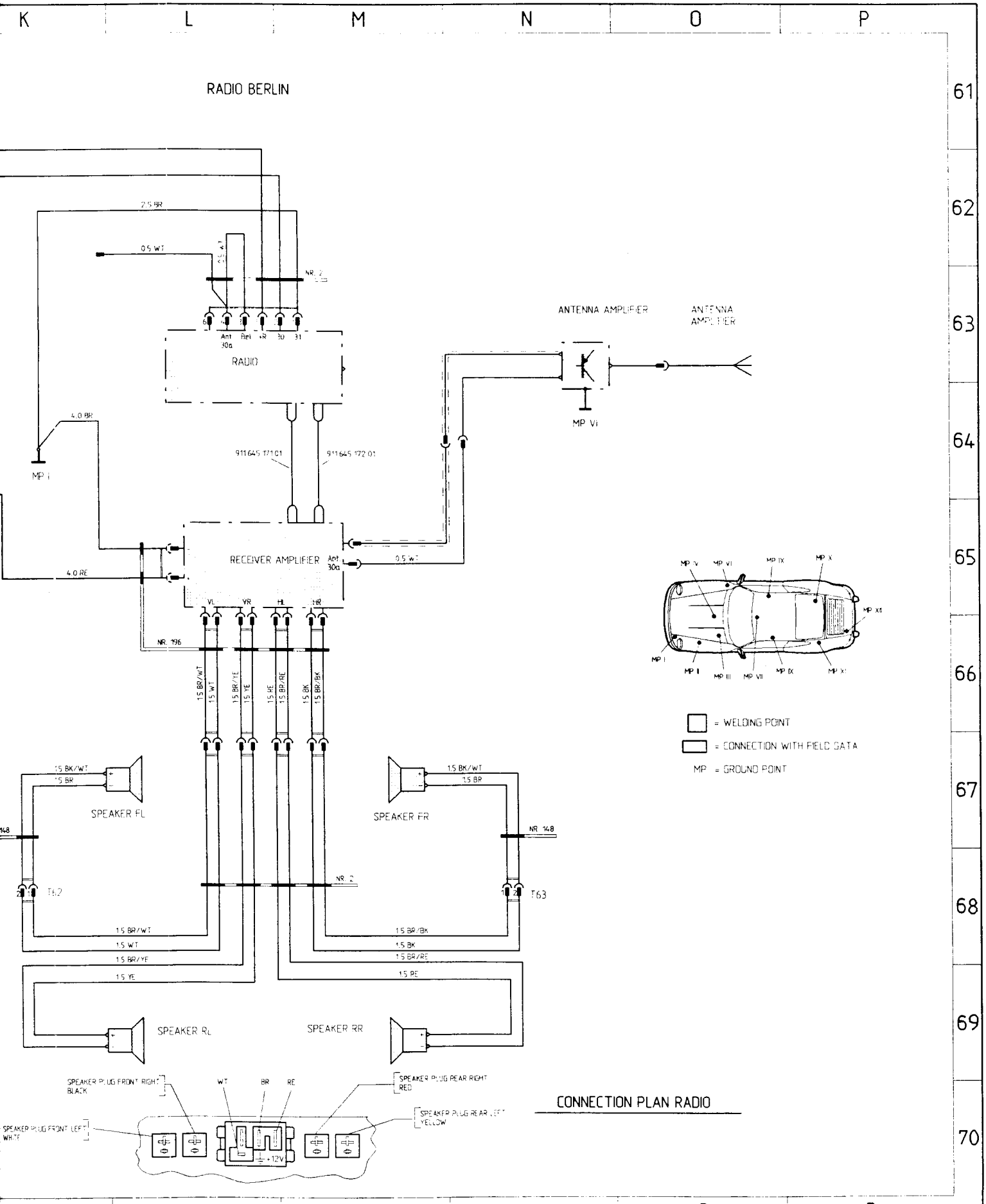
BK = BLACK WT =

RADIO WITH 4 FINAL STAGES
AND AUDIO OPTION PACK



CONNECTION PLAN BOOSTER

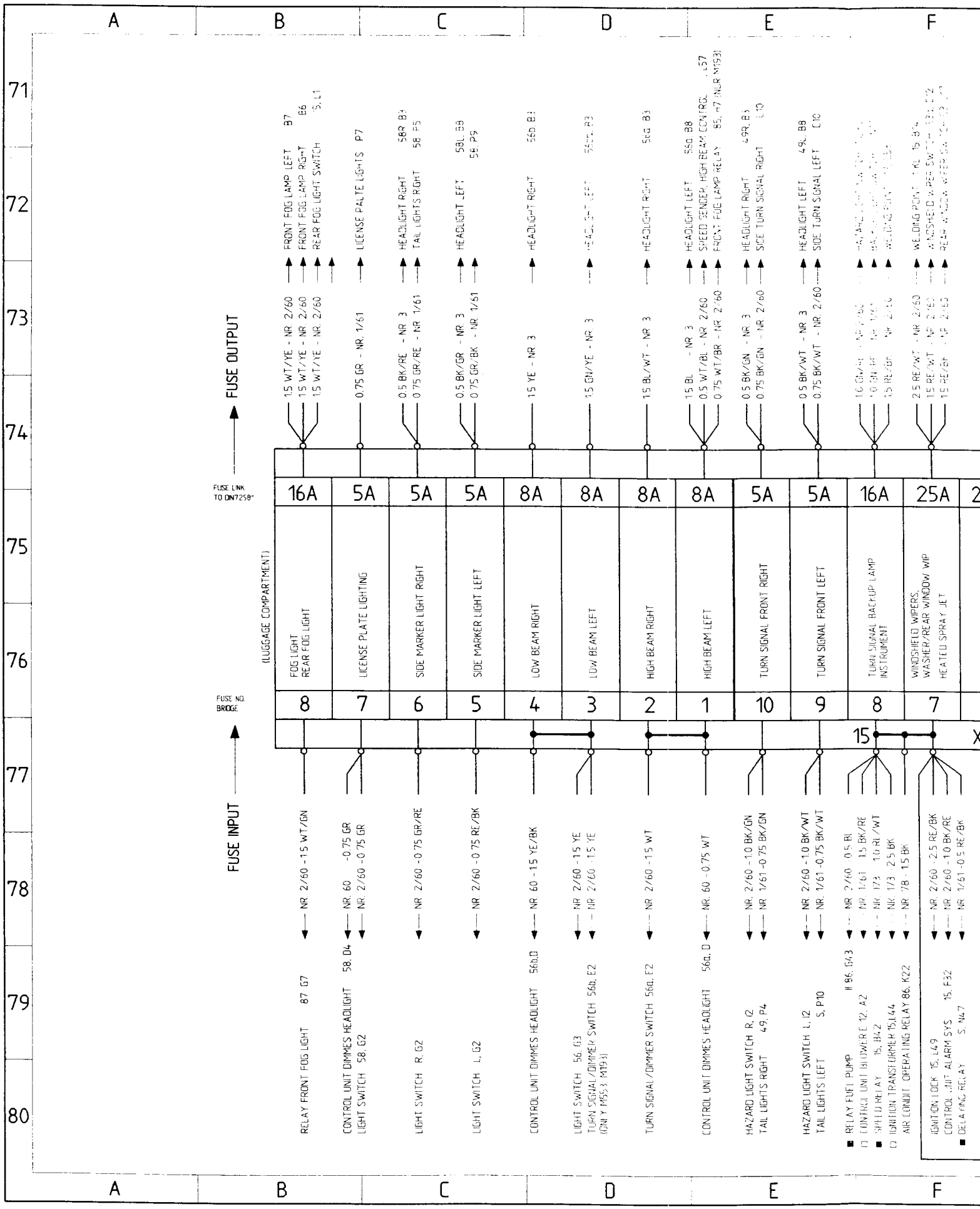
BK = BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET


K
L
M
N
O
P
61
62
63
64
65
66
67
68
69
70
RADIO BERLIN
2.5 BR
0.5 WT
NR. 2
Ant 30a
Bat
+R
30
31
RADIO
ANTENNA AMPLIFIER
ANTENNA AMPLIFIER
MP VI
4.0 BR
MP I
911 645 171 01
911 645 172 01
RECEIVER AMPLIFIER
Ant 30a
0.5 WT
4.0 RE
VL
VR
HL
HR
NR. 196
1.5 BR/WT
1.5 WT
1.5 BR/YE
1.5 YE
1.5 RE
1.5 BR/RE
1.5 BK
1.5 BR/BK
MP IV
MP VI
MP IX
MP X
MP XI
MP I
MP II
MP III
MP VII
MP IX
MP XI
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
1.5 BK/WT
1.5 BR
SPEAKER FL
SPEAKER FR
NR. 148
T62
T63
NR. 2
1.5 BR/WT
1.5 WT
1.5 BR/YE
1.5 YE
1.5 BR/BK
1.5 BK
1.5 BR/RE
1.5 RE
SPEAKER RL
SPEAKER RR
SPEAKER PLUG FRONT RIGHT BLACK
WT
BR
RE
SPEAKER PLUG REAR RIGHT RED
SPEAKER PLUG FRONT LEFT WHITE
SPEAKER PLUG REAR LEFT YELLOW
+12V
CONNECTION PLAN RADIO

VI = VIOLET

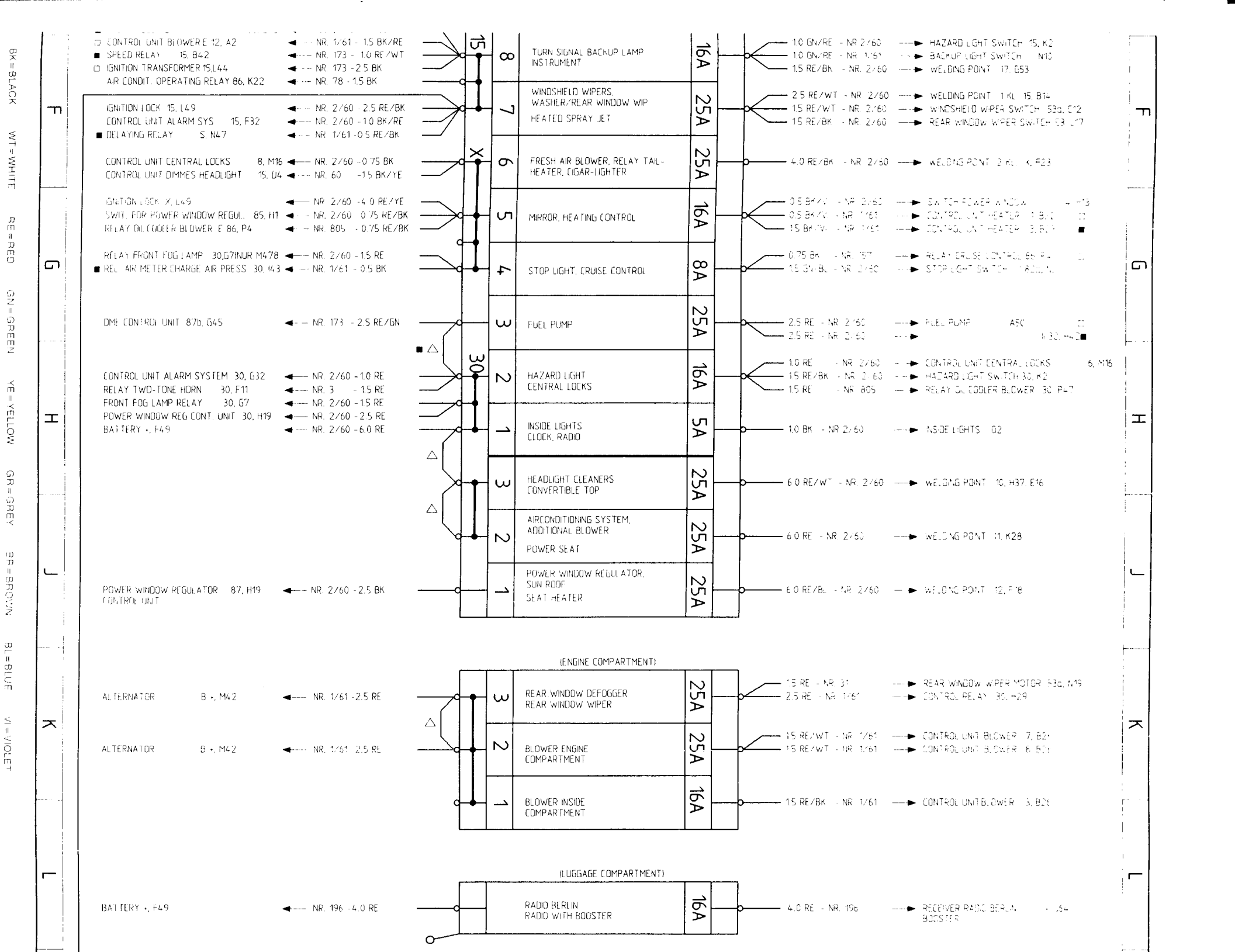
Wiring Diagram Type 911 Carrera Model 88 page 8

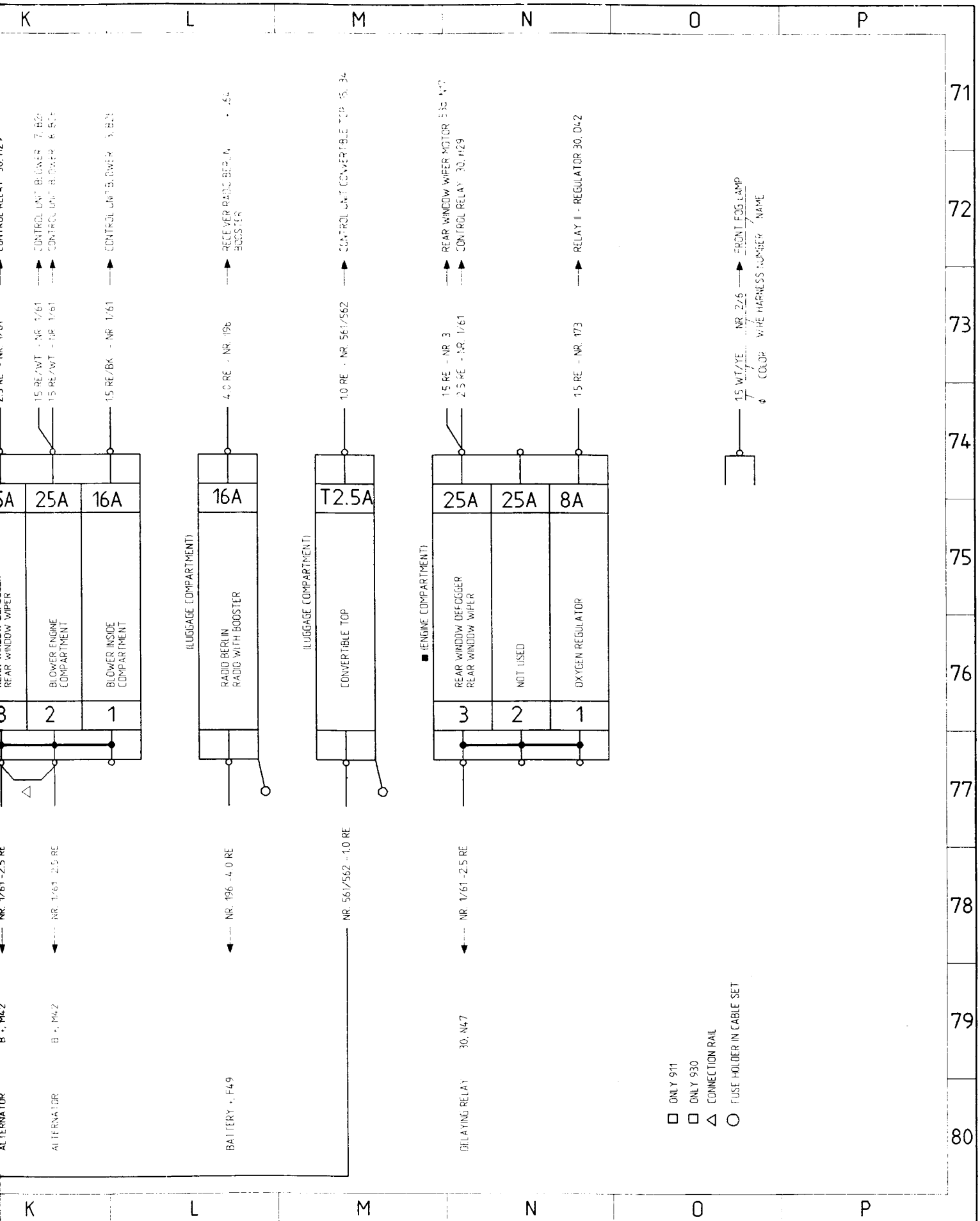
FUSE ASSIGNMENTS AND POSITIONS



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BK = BLACK WT =


BK = BLACK
WT = WHITE
RE = RED
GN = GREEN
YE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
VI = VIOLET
F
G
H
J
K
L
CONTROL UNIT BLOWER E 12, A2 ◄ NR. 1/61 - 1.5 BK/RE
SPEED RELAY 15, B42 ◄ NR. 173 - 1.0 RE/WT
IGNITION TRANSFORMER 15,L44 ◄ NR. 173 - 2.5 BK
AIR CONDIT. OPERATING RELAY 86, K22 ◄ NR. 78 - 1.5 BK
IGNITION LOCK 15, L49 ◄ NR. 2/60 - 2.5 RE/BK
CONTROL UNIT ALARM SYS 15, F32 ◄ NR. 2/60 - 1.0 BK/RE
DELAYING RELAY S, N47 ◄ NR. 1/61 - 0.5 RE/BK
CONTROL UNIT CENTRAL LOCKS 8, M16 ◄ NR. 2/60 - 0.75 BK
CONTROL UNIT DIMMES HEADLIGHT 15, D4 ◄ NR. 60 - 1.5 BK/YE
IGNITION LOCK X, L49 ◄ NR. 2/60 - 4.0 RE/YE
SWITCH FOR POWER WINDOW REGUL. 85, H1 ◄ NR. 2/60 - 0.75 RE/BK
RELAY OIL COOLER BLOWER E 86, P4 ◄ NR. 805 - 0.75 RE/BK
RELAY FRONT FOG LAMP 30,G7INUR M478 ◄ NR. 2/60 - 1.5 RE
REL. AIR METER CHARGE AIR PRESS 30, M3 ◄ NR. 1/61 - 0.5 BK
DME CONTROL UNIT 87b, G45 ◄ NR. 173 - 2.5 RE/GN
CONTROL UNIT ALARM SYSTEM 30, G32 ◄ NR. 2/60 - 1.0 RE
RELAY TWO-TONE HORN 30, F11 ◄ NR. 3 - 1.5 RE
FRONT FOG LAMP RELAY 30, G7 ◄ NR. 2/60 - 1.5 RE
POWER WINDOW REG CONT. UNIT 30, H19 ◄ NR. 2/60 - 2.5 RE
BATTERY +, F49 ◄ NR. 2/60 - 6.0 RE
POWER WINDOW REGULATOR 87, H19 ◄ NR. 2/60 - 2.5 BK
CONTROL UNIT
15
X
30
8 TURN SIGNAL BACKUP LAMP INSTRUMENT 16A
7 WINDSHIELD WIPERS, WASHER/REAR WINDOW WIP HEATED SPRAY JET 25A
6 FRESH AIR BLOWER, RELAY TAIL-HEATER, CIGAR-LIGHTER 25A
5 MIRROR, HEATING CONTROL 16A
4 STOP LIGHT, CRUISE CONTROL 8A
3 FUEL PUMP 25A
2 HAZARD LIGHT CENTRAL LOCKS 16A
1 INSIDE LIGHTS CLOCK, RADIO 5A
3 HEADLIGHT CLEANERS CONVERTIBLE TOP 25A
2 AIRCONDITIONING SYSTEM, ADDITIONAL BLOWER POWER SEAT 25A
1 POWER WINDOW REGULATOR, SUN ROOF SEAT HEATER 25A
1.0 GN/RE - NR 2/60 ► HAZARD LIGHT SWITCH 15, K2
1.0 GN/RE - NR 1/61 ► BACKUP LIGHT SWITCH N10
1.5 RE/BK - NR. 2/60 ► WELDING POINT 17, B53
2.5 RE/WT - NR 2/60 ► WELDING POINT 1 KL 15, B14
1.5 RE/WT - NR. 2/60 ► WINDSHIELD WIPER SWITCH 53a, D12
1.5 RE/BK - NR. 2/60 ► REAR WINDOW WIPER SWITCH 53, D7
4.0 RE/BK - NR 2/60 ► WELDING POINT 2 KL X, F23
0.5 BK/YE - NR 2/60 ► SWITCH POWER WINDOW
0.5 BK/YE - NR 1/61 ► CONTROL UNIT HEATER
1.5 BK/YE - NR 1/61 ► CONTROL UNIT HEATER
0.75 BK - NR. 157 ► RELAY CRUISE CONTROL 86, P4
1.5 GN/BL - NR 2/60 ► STOP LIGHT SWITCH
2.5 RE - NR 2/60 ► FUEL PUMP A50
2.5 RE - NR 2/60 ►
1.0 RE - NR 2/60 ► CONTROL UNIT CENTRAL LOCKS 6, M16
1.5 RE/BK - NR 2/60 ► HAZARD LIGHT SWITCH 30, K2
1.5 RE - NR 805 ► RELAY OIL COOLER BLOWER 30, P47
1.0 BK - NR 2/60 ► INSIDE LIGHTS G2
6.0 RE/WT - NR. 2/60 ► WELDING POINT 10, H37, E16
6.0 RE - NR. 2/60 ► WELDING POINT 11, K28
6.0 RE/BL - NR 2/60 ► WELDING POINT 12, F18
(ENGINE COMPARTMENT)
ALTERNATOR B +, M42 ◄ NR. 1/61 - 2.5 RE
ALTERNATOR B +, M42 ◄ NR. 1/61 - 2.5 RE
3 REAR WINDOW DEFOGGER REAR WINDOW WIPER 25A
2 BLOWER ENGINE COMPARTMENT 25A
1 BLOWER INSIDE COMPARTMENT 16A
1.5 RE - NR. 31 ► REAR WINDOW WIPER MOTOR 53b, N19
2.5 RE - NR 1/61 ► CONTROL RELAY 30, H29
1.5 RE/WT - NR 1/61 ► CONTROL UNIT BLOWER 7, B2
1.5 RE/WT - NR 1/61 ► CONTROL UNIT BLOWER 6, B2
1.5 RE/BK - NR 1/61 ► CONTROL UNIT BLOWER 5, B2
(LUGGAGE COMPARTMENT)
BATTERY +, F49 ◄ NR. 196 - 4.0 RE
RADIO BERLIN RADIO WITH BOOSTER 16A
4.0 RE - NR. 196 ► RECEIVER RADIO BERLIN BOOSTER


K
L
M
N
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71
72
73
74
75
76
77
78
79
80
15 RE/WT - NR 1/61
15 RE/WT - NR 1/61
15 RE/BK - NR 1/61
4.0 RE - NR 196
1.0 RE - NR 561/562
15 RE - NR 3
2.5 RE - NR 1/61
15 RE - NR 173
15 WT/YE
NR 2/6
FRONT FOG LAMP
COLOR WIRE HARNESS NUMBER NAME
25A
25A
16A
16A
T2.5A
25A
25A
8A
REAR WINDOW WIPER
BLOWER ENGINE COMPARTMENT
BLOWER INSIDE COMPARTMENT
(LUGGAGE COMPARTMENT)
RADIO BERLIN
RADIO WITH BOOSTER
(LUGGAGE COMPARTMENT)
CONVERTIBLE TOP
(ENGINE COMPARTMENT)
REAR WINDOW DEFOGGER
REAR WINDOW WIPER
NOT USED
OXYGEN REGULATOR
3
2
1
3
2
1
REAR WINDOW WIPER MOTOR
CONTROL RELAY 30, H29
RELAY II - REGULATOR 30, D42
NR. 561/562 - 1.0 RE
NR. 196 - 4.0 RE
NR. 1/61 - 2.5 RE
NR. 1/61 - 2.5 RE
30, N47
BATTERY +, F49
ALTERNATOR
B+, M42
B+, M42
ONLY 911
ONLY 930
CONNECTION RAIL
FUSE HOLDER IN CABLE SET

Wiring Diagram Type 911 Carrera Model 88 page 9

CONSTR. COMPONENTS, PLUG CONNECTION, GROUND POINTS

CONSTRUCTION COMPONENTS

DESIGNATION, FUNCTION	POSITION IN VEHICLE LHD	POSITION IN VEHICLE RHD	NOTE	FIELD
OPERATING RELAY	cN5	cP5	UNDER THE COVER LHD — BEHIND FLOORPANEL RHD	cM21
FLASHER	cQ7	cL7	IN LUGGAGE COMPARTMENT	HJ9 / CDE29 / EFG29 / CDE39 / ...
BOOSTER	eM9	eM9	UNDER THE SEAT RIGHT	GH45
DME CONTROL UNIT	eP9	eP9	UNDER THE SEAT LEFT	FG44
DME CONTROL UNIT	eP9	eP9	UNDER THE SEAT LEFT	CDE41
SPEED RELAY	eP9	eP9	UNDER THE SEAT LEFT	B41,42
SPEED CUTOUT DEVICE	eP9	eP9	UNDER THE SEAT LEFT	GH44
RECEIVER, AMPLIFIER	eM9	eM9	UNDER THE SEAT RIGHT	LM65
FREQUENCY SWITCH FL	cR10	cR10	UNDER THE DOOR TRIM PANEL	F67
FREQUENCY SWITCH RL	cK10	cK10	UNDER THE DOOR TRIM PANEL	J67
SPEED WARNING BUZZER	bO7	bO7	ON THE SPEEDOMETER	N54
HIGH PRESSURE AND LOW PRESSURE SWITCH	cN5	cO5	UNDER THE COVER LHD — IN LUGGAGE COMPARTMENT RHD	L21,22
AIR CONDITIONER RELAY	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	K21
OXYGEN CONTROL UNIT	eP9	eP9	UNDER THE SEAT LEFT	A44,45
FRONT FOG LAMP RELAY	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	F9
CONTROL RELAY FOR REAR WINDOW DEFROGGER	dQ16	dQ16	CARRIER PLATE IN ENGINE COMPARTMENT	H29,30
RELAY ALARM SYSTEM USA	cPQ6	cPQ6	IN LUGGAGE COMPARTMENT	A39
RELAY TWO-TONE HORN	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	G11
RELAY FOR POSITIVE SUPPLY, OXYGEN REGULATOR	dQ16	dQ16	CARRIER PLATE IN ENGINE COMPARTMENT	E41
RELAY I FUEL PUMP	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	EF41
RELAY II FUEL PUMP	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	H41
RELAY AIR METER CHARGE AIR PRESS., DELAYED	dQ16	dQ16	CARRIER PLATE IN ENGINE COMPARTMENT	J41
RELAY OIL COOLER BLOWER	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	P48
RELAY CRUISE CONTROL	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	P47
SWITCHING FOR POWER WINDOW REGULATOR	cP6	cL6	IN LUGGAGE COMPARTMENT	G19,20
SWITCHING FOR CATALYZER	cPQ16	cPQ16	IN LUGGAGE COMPARTMENT	E60
SWITCHING FOR SEAT BELT	cPQ6	cPQ6	IN LUGGAGE COMPARTMENT	HJ52
FUSE BOX I	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	F9
FUSE BOX II	cP4	cP4	FUSE BOX IN LUGGAGE COMPARTMENT	DE9
FUSE BOX THREEFOLD	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	EF19 / K30 / F39
FUSE BOX THREEFOLD ENGINE COMPARTMENT	dQ16	dQ16	CARRIER PLATE IN ENGINE COMPARTMENT	LM19 / C30
FUSE HOLDER 16A	dPQ3	dPQ3	IN LUGGAGE COMPARTMENT	F48
FUSE HOLDER T2.5	cP5	cP5	BEHIND THE FUSE BOX	H39
FUSE HOLDER 10A FOR BLOWER LEFT	bQ7	bQ7	FOR ADDITIONAL BLOWER	D23
FUSE HOLDER 10A FOR BLOWER RIGHT	bL7	bL7	FOR ADDITIONAL BLOWER	D23
ELECTRONIC CONTROL UNIT CENTRAL LOCKS	bL7	bL7	IN LUGGAGE COMPARTMENT	M16
CONTROL UNIT ALARM SYSTEM	cM6	cM6	IN LUGGAGE COMPARTMENT	C32
CONTROL UNIT CONVERTIBLE TOP	dM6	dM6	BEHIND FLOORBOARD	F35,36
CONTROL UNIT FUEL ENRICHMENT	eP9	eP9	UNDER THE SEAT LEFT	CD41
CONTROL UNIT BLOWER	dQ16	dQ16		AB26
CONTROL UNIT DIMMES HEADLIGHTS	dP5	dP5	BEHIND FLOORBOARD	D1
CONTROL UNIT HEADLIGHT CLEANERS	dP2	dP2	IN LUGGAGE COMPARTMENT	A18,19
CONTROL UNIT CRUISE CONTROL	bN6	bN6	UNDER THE INSTRUMENT PANEL	P43,44
THERMO BIMETAL SWITCH WITH RESISTOR				OP21
DELAYING RELAY	dQ16	dQ16	CARRIER PLATE IN ENGINE COMPARTMENT	P47
RESISTOR	bL7	bP6	IN LUGGAGE COMPARTMENT	D21
WIPER INTERMITTENT CONTROL RELAIS	cN6	cO6	IN LUGGAGE COMPARTMENT	A13
ADDITIONAL CLEANING FLUID PUMP RELAY	cP5	cP5	IN LUGGAGE COMPARTMENT	D30
ADDITIONAL BLOWER RELAY	cP6	cL6	FUSE BOX IN LUGGAGE COMPARTMENT	AB17

PLUG

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PLUG CONNECTIONS

CODE	NUMBER OF PINS	DESIGNATION, FUNKTION	POSITION IN VEHICLE LHD	POSITION IN VEHICLE RHD	NOTE	PAGE
T1	2	LUGGAGE COMPARTMENT LIGHT	bL7	bL7	REAR RIGHT OF HEATER HOSE	B4
T2	2	SIDE TURN SIGNAL RIGHT	bL7	bL7	REAR RIGHT OF HEATER HOSE	C2
T3	2	SIDE TURN SIGNAL LEFT	bQ7	bQ7	AT SIDE OF HEATER	C9
T4	1	BAT	bP7	bM7	UNDER THE INSTRUMENT PANEL	D3
T5	6	TURN SIGNAL DIMMER SWITCH	cP6	cM6	UNDER THE INSTRUMENT PANEL	F3 / E12
T6	6	LIGHT SWITCH	cP6	cM6	UNDER THE INSTRUMENT PANEL	F2
T7	9	CENTRE CONSOLE	cND7	cND7	UNDER THE CENTRE CONSOLE	J3
T8	3	NO. 2/60 TO NO. 1/61	cP5	cP5	IN LUGGAGE COMPARTMENT	M4 / G26
T9	4	NO. 2/60 TO NO. 1/61	cP5	cP5	IN LUGGAGE COMPARTMENT	N4 / C54
T10	6	CONTINUOUS CONSUMER	cP4	cP4	IN LUGGAGE COMPARTMENT	N5 / D37
T11	2	INSIDE LIGHTS	bQ7	bD7	AT SIDE OF HEATER	D2
T12	2	INSIDE LIGHT IN THE ROOF	aP11	aP11	ON INNER ROOF	N3
T13	7	TAIL LIGHTS RIGHT	cL17	cL17	ON SIDE PANEL	N5
T14	7	TAIL LIGHTS LEFT	cQ17	cQ17	ON SIDE PANEL	D8
T15	14	NO. 16 MOTOR	cP17	cP17	RELAY PANEL REAR	N9 / B28 / M44 / D57
T16	3	TAILGATE	cL15	cL15	ENGINE COMPARTMENT	N8
T17	3	REAR WINDOW	cP15	cP15	ENGINE COMPARTMENT	M8 / H27
T18	6	BLOWER OPERATING SWITCH	cM6	cQ6	UNDER THE INSTRUMENT PANEL	L10 / G21
T19	1	CRUISE CONTROL	cP5	cP5	IN LUGGAGE COMPARTMENT	N3
T20	6	WIPE/WASH SWITCH	cP6	cM6	UNDER THE INSTRUMENT PANEL	C13
T21	1	WINDSHIELD WASHING FLUID PUMP	cP4	cP4	BEHIND THE FUSE BOX	D12
T22	1	RELAY TWO-TONE HORN	cP4	cP4	BEHIND THE FUSE BOX	F12
T23	6	MIRROR DRIVER'S SIDE	bR8	bK8	IN MIRROR	H11
T24	7	MIRROR DRIVER'S DOOR	cQ7	cL6	IN LUGGAGE COMPARTMENT	J12 / E33
T25	2	MIRROR DRIVER'S DOOR	cQ7	cL6	IN LUGGAGE COMPARTMENT	K13
T26	7	MIRROR PASSENGER'S DOOR	cL7	cQ7	IN LUGGAGE COMPARTMENT	L12
T27	6	MIRROR PASSENGER'S SIDE	bK8	bR8	IN MIRROR	M12
T28	2	CENTRAL LOCK BUTTON	dND7	dND7	UNDER THE CENTRE CONSOLE	N13
T29	2	CENTRAL LOCK BUTTON	dND7	dND7	UNDER THE CENTRE CONSOLE	D13
T30	5	DRIVE FOR PASSENGER	dK9	dR9	IN DOOR	D13
T31	3	LOCK CYLINDER FOR PASSENGER'S SIDE	dK9	dR9	IN DOOR	P13
T32	7	CENTRAL LOCK PASSENGER'S DOOR	cL7	cQ7	IN LUGGAGE COMPARTMENT	D15
T33	7	CENTRAL LOCK DRIVER'S DOOR	cQ7	cL6	IN LUGGAGE COMPARTMENT	D16
T34	5	DRIVE FOR DRIVER'S SIDE	dR9	dK9	IN DOOR	D18
T35	3	LOCK CYLINDER FOR DRIVER'S SIDE	dR9	dK9	IN DOOR	P18
T36	2x1	REAR WINDOW WIPER MOTOR	dPQ15	dPQ15	ENGINE COMPARTMENT	M18
T37	6	POWER WINDOW REGUL. PASSENGER'S SIDE	bK7	bQ7	UNDER THE FENDER	K18
T38	6	POWER WINDOW REGULATOR DRIVER'S SIDE	bQ7	bK7	UNDER THE FENDER	J18
T39	2	HEADLIGHT CLEANER BUTTON	dP2	dP2	IN LUGGAGE COMPARTMENT	B18
T40	4	HEATER LEVER	dNO11	dNO11	UNDER THE GEARBOX COVER	B22
T41	6	HEATER CONTROL	dNO11	dNO11	UNDER THE GEARBOX COVER	B24
T42	2	CENTRE CONSOLE	dNO7	dNO7	UNDER THE CENTRE CONSOLE	G24 / C34
T43	1	CLUTCH AIR	dL17	dL17	ENGINE COMPARTMENT	J22
T44	3	WIRE BRANCH	cP5	cP5	IN LUGGAGE COMPARTMENT	J24
T45	1	AIR CONDITIONING SYSTEM	cP5	cP5	IN LUGGAGE COMPARTMENT	K23
T46	4	WIRE BRANCH RED	cP5	cP5	IN LUGGAGE COMPARTMENT	L24
T47	4	AIR BLOWER SWITCH	cM5	dP6	UNDER THE AIR COND. COVER LHD – UNDER THE FOOTWELL COVER RHD	M23
T48	2	AIR BLOWER	cM5	dP6	UNDER THE AIR COND. COVER LHD – UNDER THE FOOTWELL COVER RHD	O23
T49	4	WIRE BRANCH BLUE	cP5	cP5	IN LUGGAGE COMPARTMENT	L29 / J39
T50	8	SEAT LEFT	dP10	dP10	UNDER THE SEAT	N29
T51	8	SEAT RIGHT	dM10	dM10	UNDER THE SEAT	O30
T52	1	CONTROL UNIT CABRIO	cP5	cP5	BEHIND THE FUSE BOX	G37
T53	12	POWER TOP	cL12	cL12	BEHIND THE FUSE BOX	J35
T54	4	DME	cP4	cP4	IN LUGGAGE COMPARTMENT	E46
T55	6	FUEL INJECTORS	cO14	cO14	ENGINE COMPARTMENT	F43
T56	6	IGNITION LOCK	cP6	cM6	UNDER THE INSTRUMENT PANEL	J47
T57	3	WIRE BRANCH TERM. 50	cP5	cP5	IN LUGGAGE COMPARTMENT	K47
T58	2	OIL COOLER TEMPERATURE SWITCH	dL2	dL2	IN LUGGAGE COMPARTMENT	O49
T59	2	BRAKE PAD WEAR DISPLAY FRONT	cP5	cP5	IN LUGGAGE COMPARTMENT	E53
T60	2	BRAKE PAD WEAR DISPLAY REAR	dNO11	dNO11	UNDER THE GEARBOX COVER	F53
T61	2	TACHOGENERATOR	dNO11	dNO11	UNDER THE GEARBOX COVER	O54
T62	2	SPEAKER DOOR FRONT LEFT	cQ7	cQ7	FOR ADDITIONAL BLOWER	B68
T63	2	SPEAKER DOOR FRONT RIGHT	cL7	cL7	FOR ADDITIONAL BLOWER	E68
T64	3	2/60 - 1/61	cP5	cP5	IN LUGGAGE COMPARTMENT	C25
T65	2	2/60 - 1/61	cP5	cP5	IN LUGGAGE COMPARTMENT	C34
T66	14	16 - 173	cO14	cO14	ENGINE COMPARTMENT	CDE47
T67	2	FUEL PUMP REAR	dP15	dP15	ENGINE COMPARTMENT	G43
T68	1	IGNITION CONTROL UNIT	dP15	dP15	ENGINE COMPARTMENT	J43
T69	14	NO. 16	dQ16	dQ16	ENGINE COMPARTMENT BEARER PLATE	M46

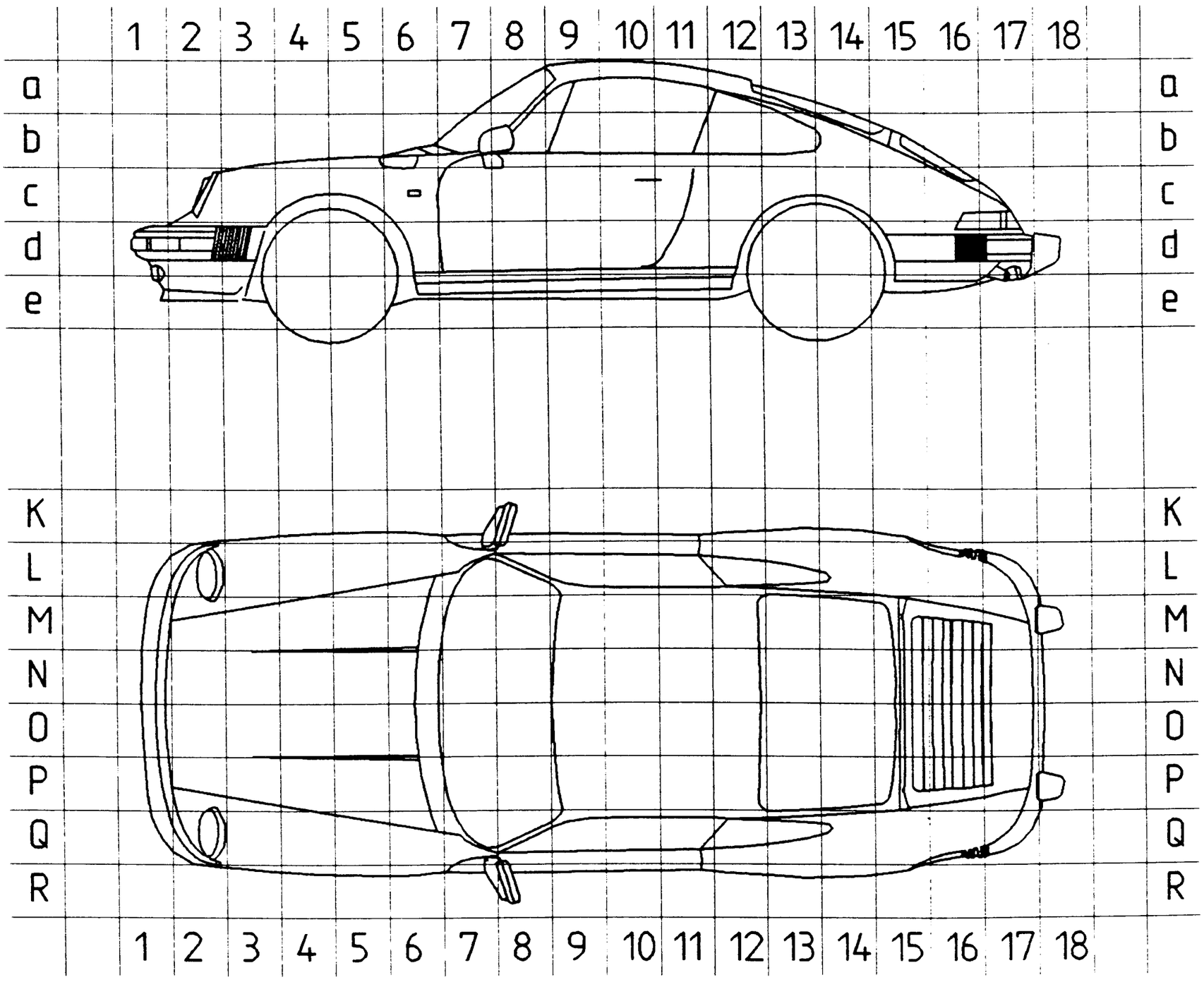
L	M	N	O	P

GROUND POINTS

CODE	DESIGNATION FUNCTION	POSITION IN VEHICLE LHD	RHD
MP I	IN LUGGAGE COMPARTMENT	cP2	dP2
MP II	IN LUGGAGE COMPARTMENT	cP5	cP5
MP III	IN LUGGAGE COMPARTMENT	cP6	cP6
MP IV	IN PASSENGER COMPARTMENT	bN07	bN07
MP V			
MP VI	IN LUGGAGE COMPARTMENT	bK6	bK6
MP VII	CABRIO, TARGA	aN09	aN09
MP VIII	IN ROOF	aL10	aL10
MP IX	IN ROOF	aQ10	aQ10
MP X	ENGINE COMPARTMENT	cP15	cP15
MP XI	ON THE GROUND	dN11	dN11
MP XII	ENGINE COMPARTMENT	cQ17	cQ17

FUSE

- B4
- C2
- C9
- D3
- E3 / E12
- F2
- J3
- M4 / G26
- N4 / C54
- N5 / D37
- O2
- N3
- N5
- O8
- N9 / B28 / M44 / D57
- N8
- M8 / H27
- L10 / G21
- N3
- C13
- D12
- F12
- H11
- J12 / E33
- K13
- L12
- M12
- N13
- O13
- O13
- O13
- P13
- O15
- O16
- O18
- P18
- M18
- K18
- J18
- B18
- B22
- B24
- G24 / C34
- J22
- J24
- K23
- L24
- WELL COVER RHD — M23
- WELL COVER RHD — O23
- L29 / J39
- N29
- O30
- G37
- J35
- E46
- F43
- J47
- K47
- O49
- E53
- F53
- O54
- B68
- E68
- C25
- C34
- CDE47
- G43
- J43
- M46



Wiring Diagram Type 911 turbo Model 88

	COORDINATES	
PAGE 1	1-10	LIGHTS
PAGE 2	11-20	BODY
PAGE 3	21-30	HEATER AND VENTILATION
PAGE 4	31-40	POWER TOP, ALARM SYSTEM, SUN ROOF
PAGE 5	41-50	K-JETRONIC, OXYGEN REGULATOR
PAGE 6	51-60	INSTRUMENTS AND SENDER
PAGE 7	61-70	RADIO
PAGE 8	71-80	FUSE ASSIGNMENTS AND POSITIONS
PAGE 9		CONSTR. COMPONENTS, PLUG CONNECTION, GROUND POINTS

Wiring Diagram Type 911 turbo
Model 88

WIRE COLOURS

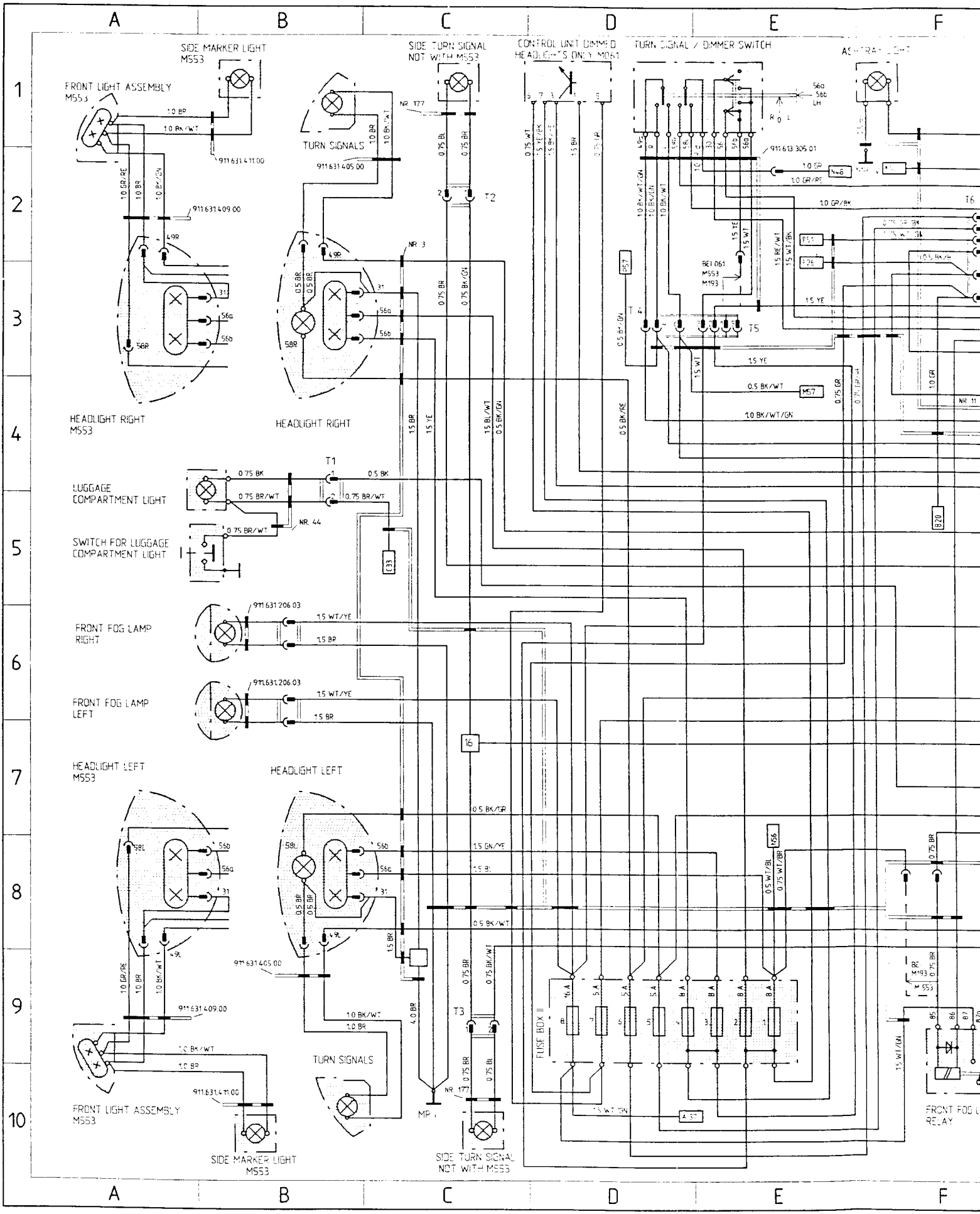
BK = BLACK
WT = WHITE
RE = RED
GN = GREEN
YE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
VI = VIOLET

⊡ = WELDING POINT
▭ = CONNECTION WITH FIELD INDICATION
MP = GROUND CONNECTING POINT

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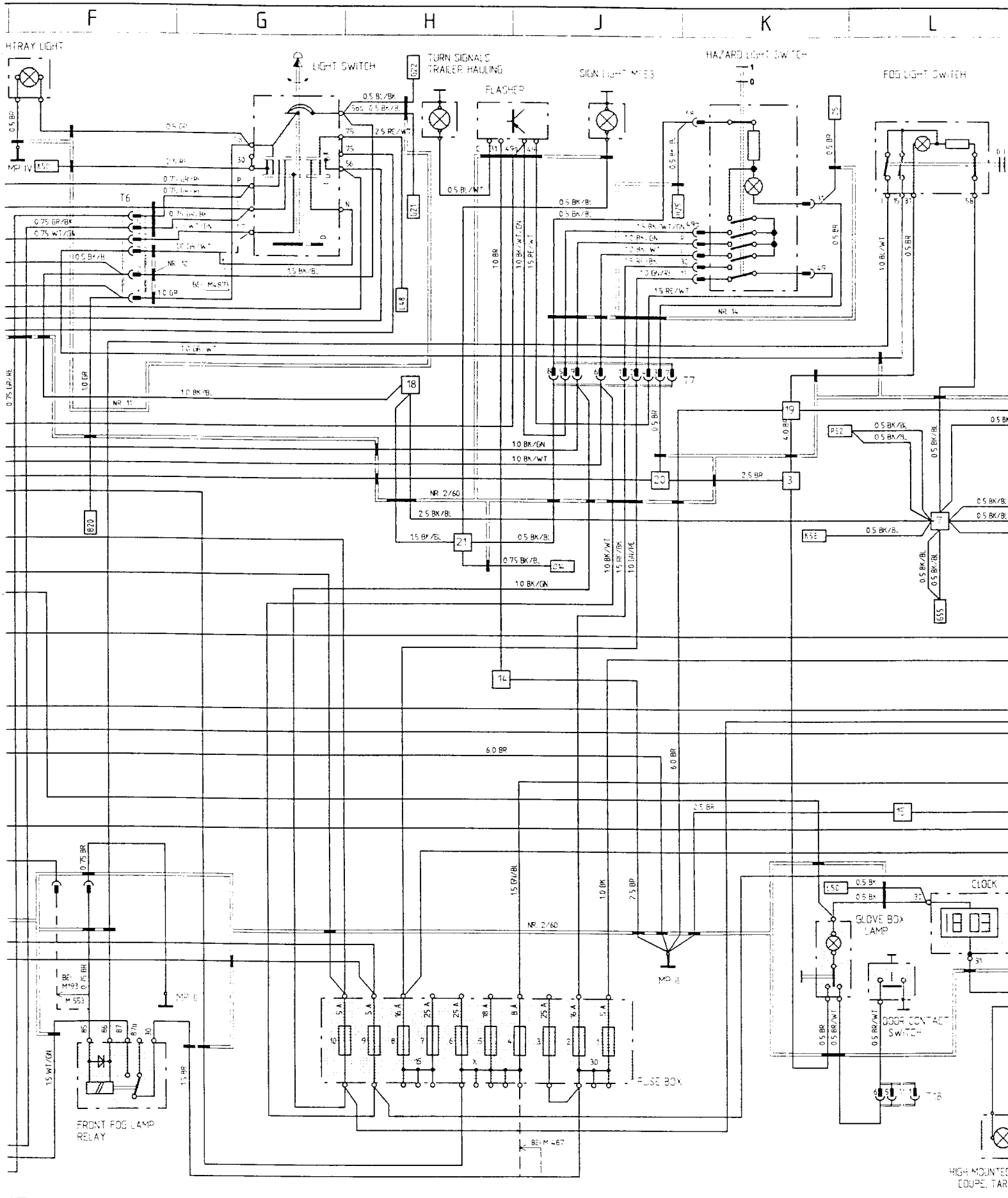
Wiring Diagram Type 911 turbo Model 88 page 1

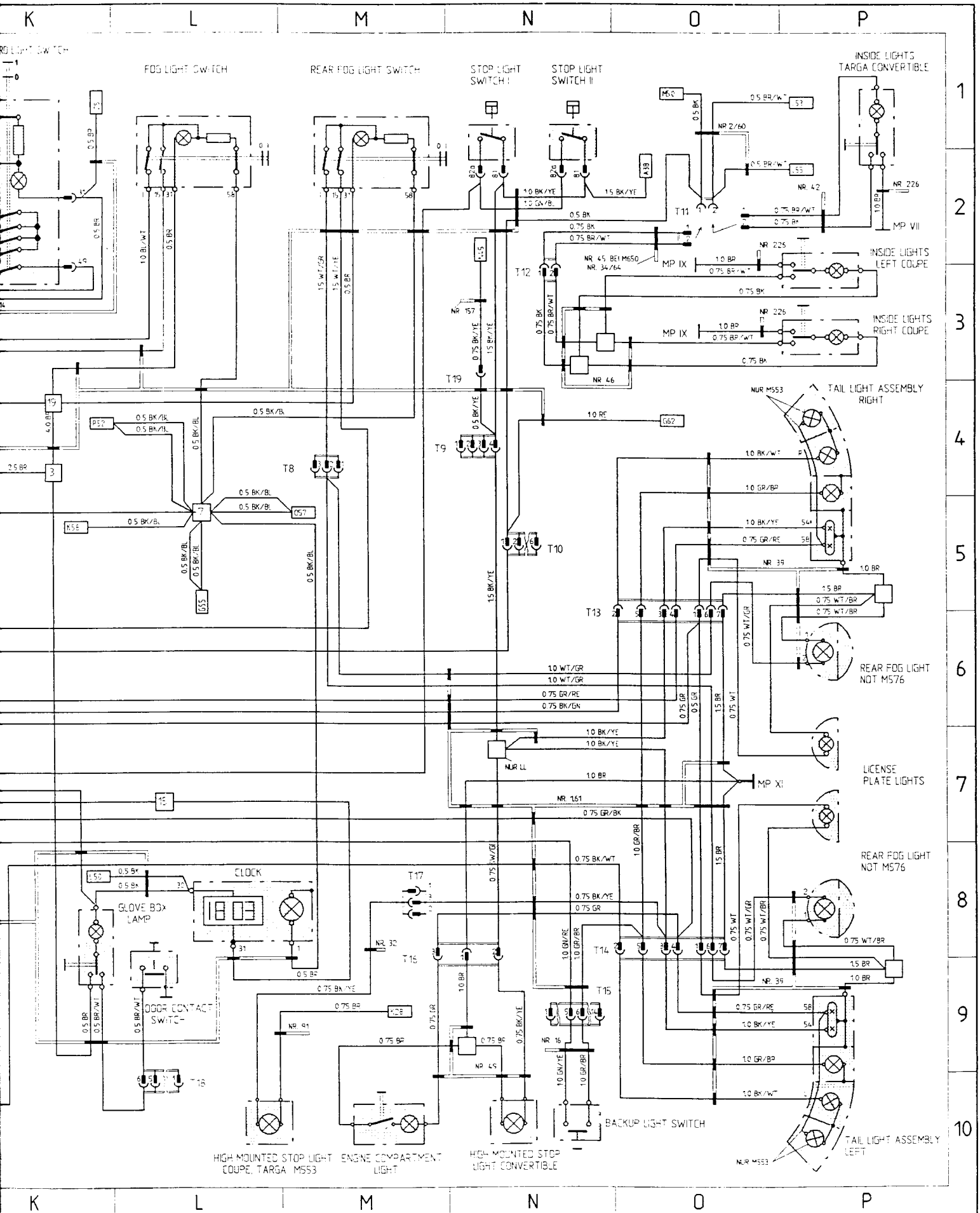
LIGHTS



Printed in Germany - IX. 1987

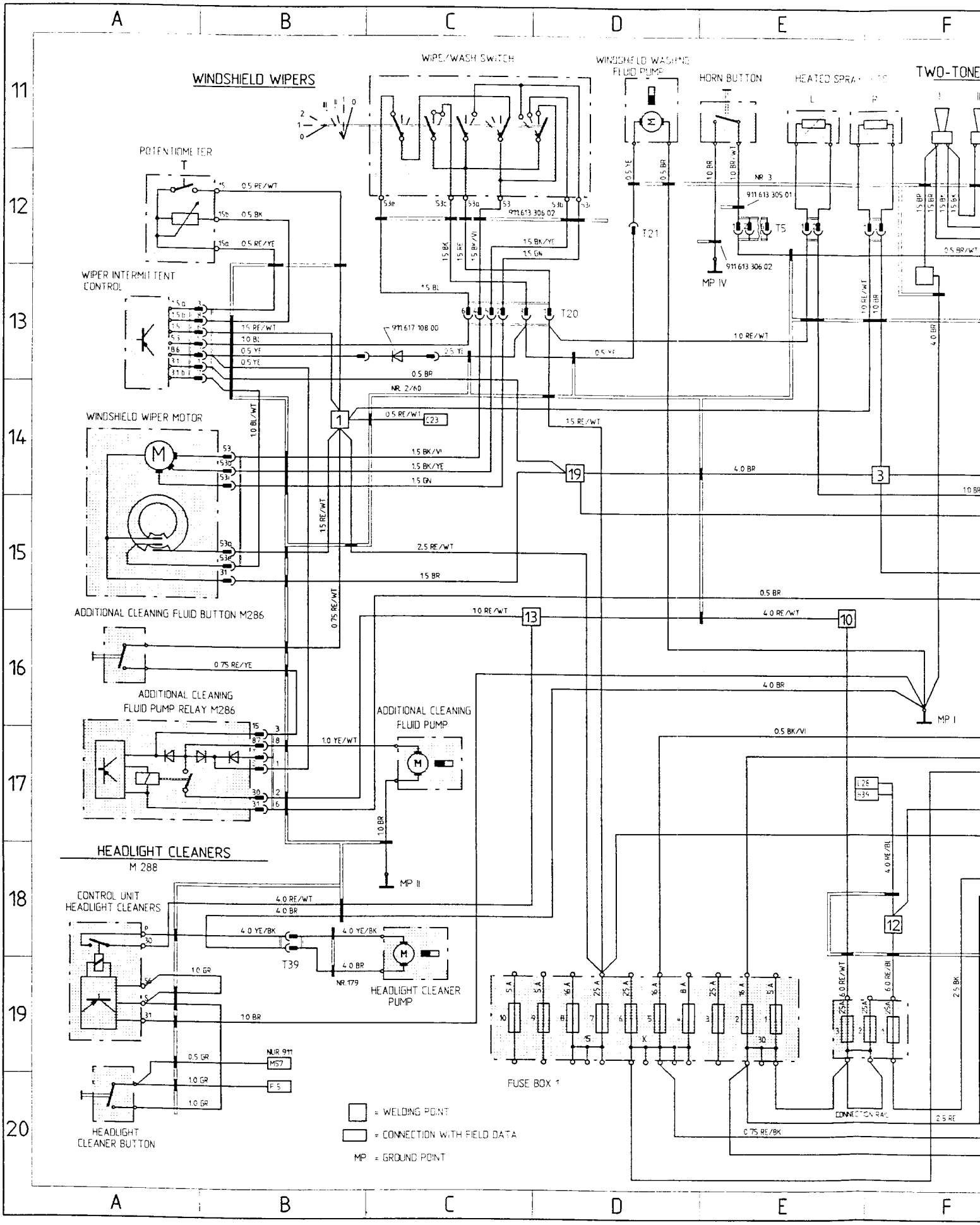
BK = BLACK WT


F
G
H
J
K
L
HTRAY LIGHT
LIGHT SWITCH
TURN SIGNALS TRAILER HAULING
FLASHER
SIGN LIGHT M93
HAZARD LIGHT SWITCH
FOG LIGHT SWITCH
T6
T7
T8
NR. 10
NR. 11
NR. 14
NR. 2/60
FUSE BOX
FRONT FOG LAMP RELAY
GLOVE BOX LAMP
CLOCK
DOOR CONTACT SWITCH
BEIM M67
HIGH MOUNTED
EDUPE, TAR
BK=BLACK
WT=WHITE
RE=RED
GN=GREEN
YE=YELLOW
GR=GREY
BR=BROWN
BL=BLUE
VI=VIOLET

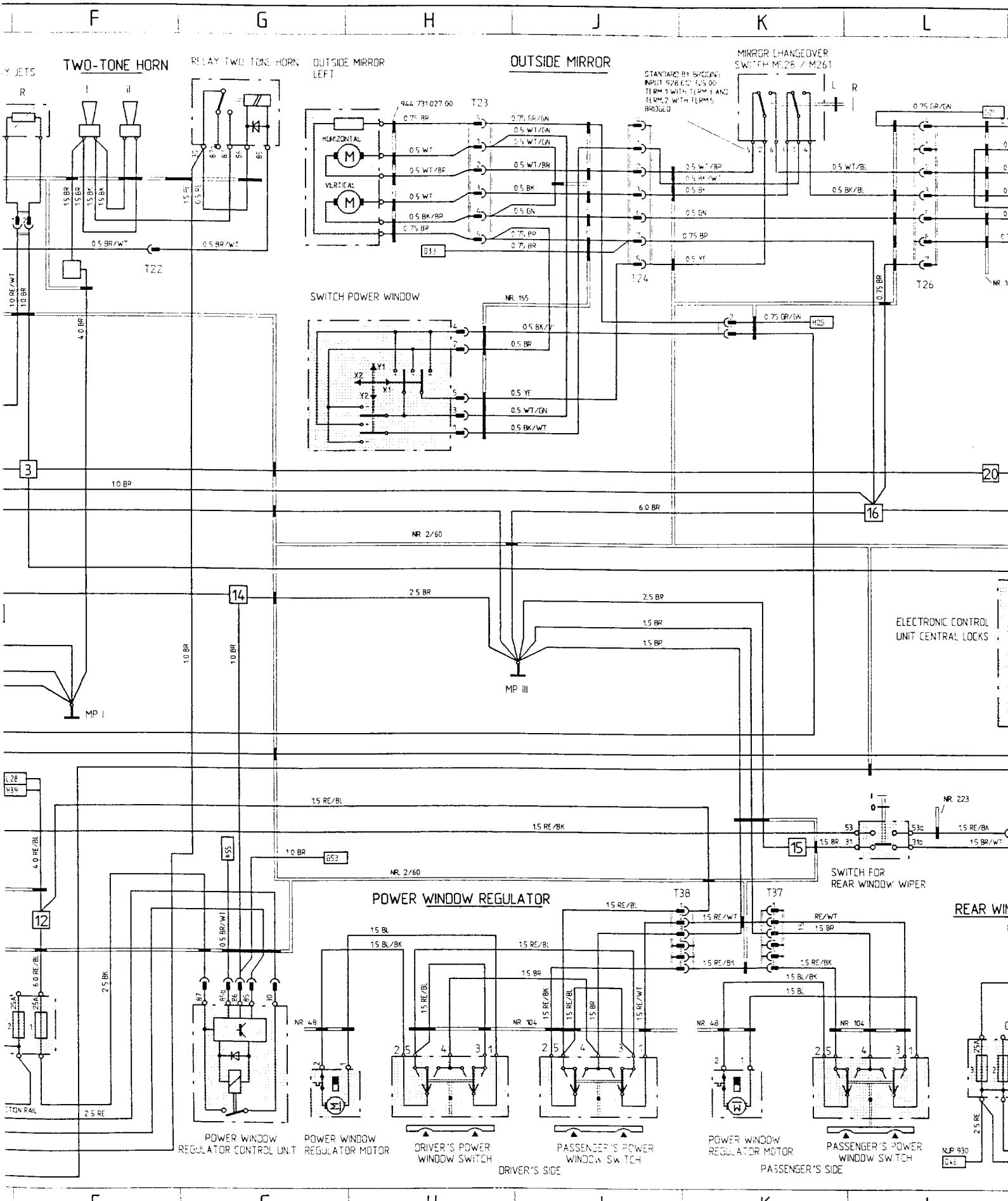

K
L
M
N
O
P
1
2
3
4
5
6
7
8
9
10
FOG LIGHT SWITCH
REAR FOG LIGHT SWITCH
STOP LIGHT SWITCH I
STOP LIGHT SWITCH II
INSIDE LIGHTS TARGA CONVERTIBLE
INSIDE LIGHTS LEFT COUPE
INSIDE LIGHTS RIGHT COUPE
TAIL LIGHT ASSEMBLY RIGHT
TAIL LIGHT ASSEMBLY LEFT
REAR FOG LIGHT NOT M576
LICENSE PLATE LIGHTS
CLOCK
GLOVE BOX LAMP
DOOR CONTACT SWITCH
BACKUP LIGHT SWITCH
HIGH MOUNTED STOP LIGHT COUPE, TARGA M553
ENGINE COMPARTMENT LIGHT
HIGH MOUNTED STOP LIGHT CONVERTIBLE
MP VII
MP IX
MP XI
T8
T9
T10
T11
T12
T13
T14
T15
T16
T17
T19

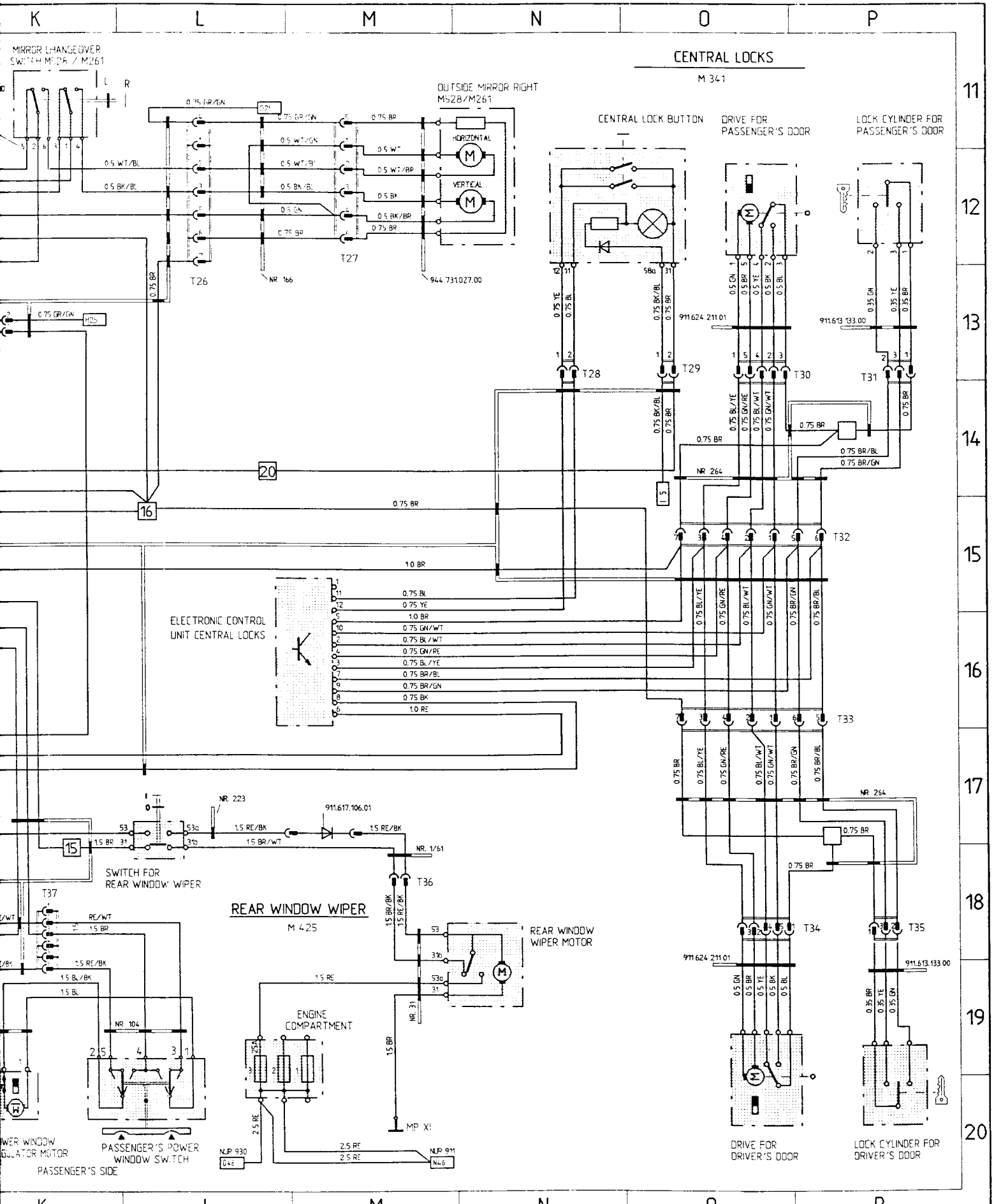
Wiring Diagram Type 911 turbo Model 88 page 2

BODY



BK = BLACK WT = W

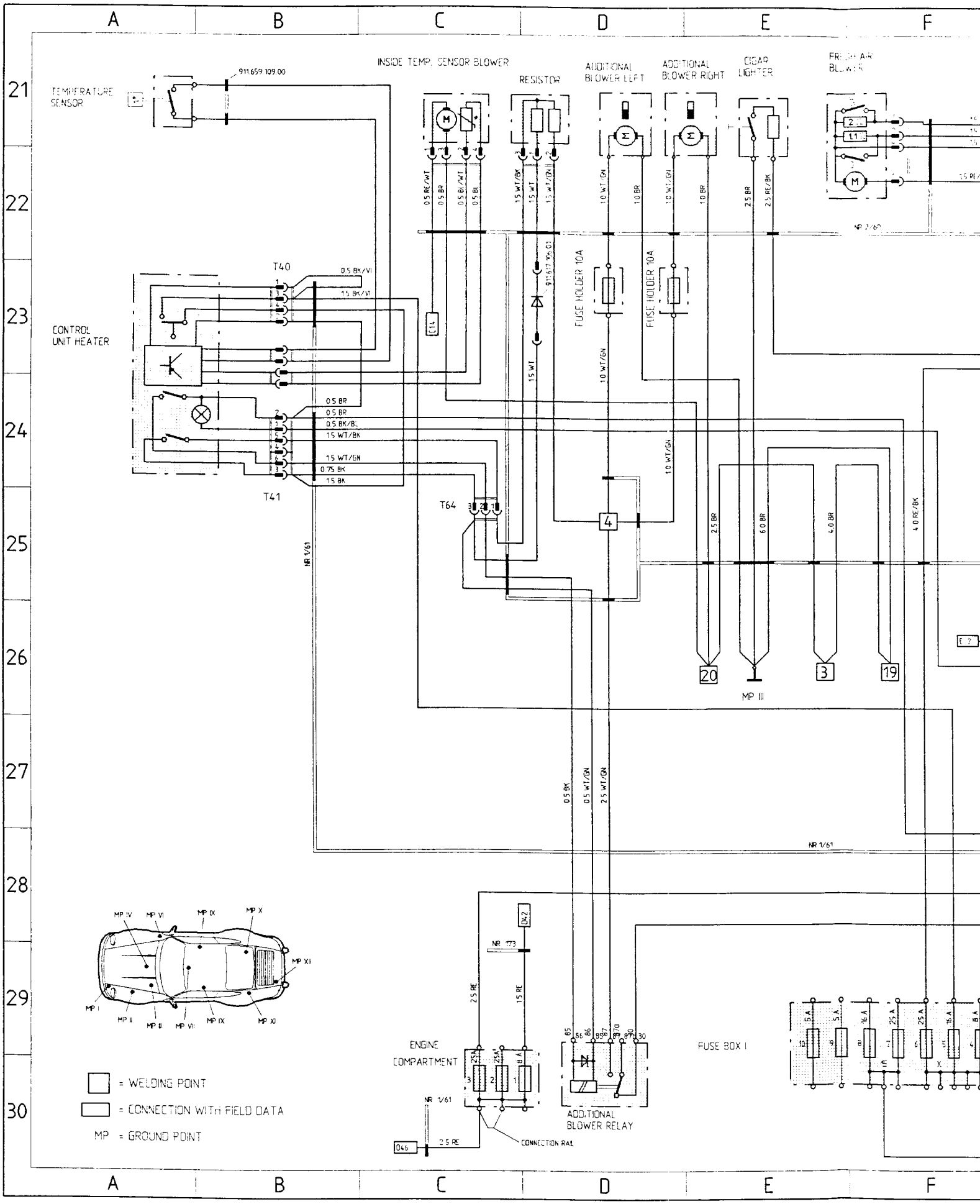

F
G
H
J
K
L
TWO-TONE HORN
RELAY TWO TONE HORN
OUTSIDE MIRROR LEFT
OUTSIDE MIRROR
MIRROR CHANGEOVER SWITCH M 28 / M 261
STANDARD BY BOSCH INPUT 928 622 505 00 TERM 3 WITH TERM 1 AND TERM 2 WITH TERM 5 BRIDGED
944 731 027 00
T23
T22
T24
T26
HORIZONTAL
VERTICAL
SWITCH POWER WINDOW
NR. 165
NR. 2/60
MP I
MP III
ELECTRONIC CONTROL UNIT CENTRAL LOCKS
SWITCH FOR REAR WINDOW WIPER
NR. 223
POWER WINDOW REGULATOR
T38
T37
POWER WINDOW REGULATOR CONTROL UNIT
POWER WINDOW REGULATOR MOTOR
DRIVER'S POWER WINDOW SWITCH
PASSENGER'S POWER WINDOW SWITCH
DRIVER'S SIDE
PASSENGER'S SIDE
BK = BLACK
WT = WHITE
RE = RED
GN = GREEN
YE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
VI = VIOLET


K
L
M
N
O
P
11
12
13
14
15
16
17
18
19
20
MIRROR CHANGEOVER SWITCH M528 / M261
L
R
OUTSIDE MIRROR RIGHT M528/M261
HORIZONTAL
VERTICAL
0.75 GR/GN
0.5 WT/GN
0.5 WT/BL
0.5 WT/BR
0.5 BK/BL
0.5 BK
0.5 BK/BR
0.75 BR
T26
T27
NR. 166
944.731027.00
CENTRAL LOCKS
M 341
CENTRAL LOCK BUTTON
DRIVE FOR PASSENGER'S DOOR
LOCK CYLINDER FOR PASSENGER'S DOOR
911.624.211.01
911.613.133.00
T28
T29
T30
T31
0.75 YE
0.75 BL
0.75 BK/BL
0.75 BR
0.5 GN
0.5 BR
0.5 YE
0.5 BK
0.5 BL
0.35 GN
0.35 YE
0.35 BR
0.75 BL/YE
0.75 GN/RE
0.75 BL/WT
0.75 GN/WT
0.75 BR/BL
0.75 BR/GN
NR. 264
20
16
1.0 BR
ELECTRONIC CONTROL UNIT CENTRAL LOCKS
0.75 BL
0.75 YE
1.0 BR
0.75 GN/WT
0.75 BL/WT
0.75 GN/RE
0.75 BL/YE
0.75 BR/BL
0.75 BR/GN
0.75 BK
1.0 RE
T32
T33
T34
T35
NR. 223
911.617.106.01
1.5 RE/BK
1.5 BR/WT
NR. 1/61
T36
15
1.5 BR
SWITCH FOR REAR WINDOW WIPER
T37
REAR WINDOW WIPER
M 425
REAR WINDOW WIPER MOTOR
1.5 BR/BK
1.5 RE/BK
1.5 BL/BK
1.5 BL
1.5 RE
NR. 104
NR. 31
ENGINE COMPARTMENT
25A
2.5 RE
MP X!
NUP 930
NUP 911
N46
PASSENGER'S POWER WINDOW SWITCH
PASSENGER'S SIDE
DRIVE FOR DRIVER'S DOOR
LOCK CYLINDER FOR DRIVER'S DOOR

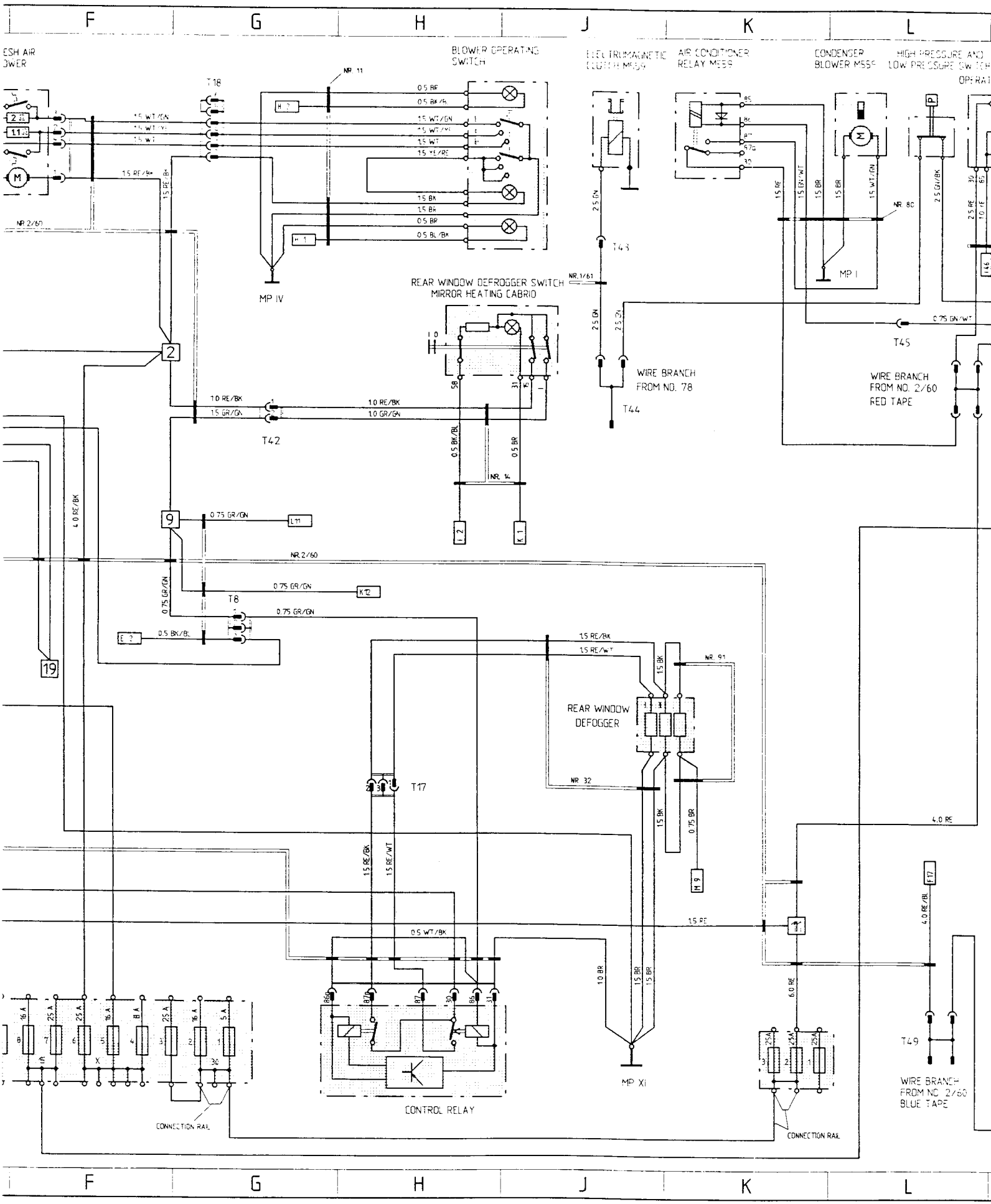
VI = VIOLET

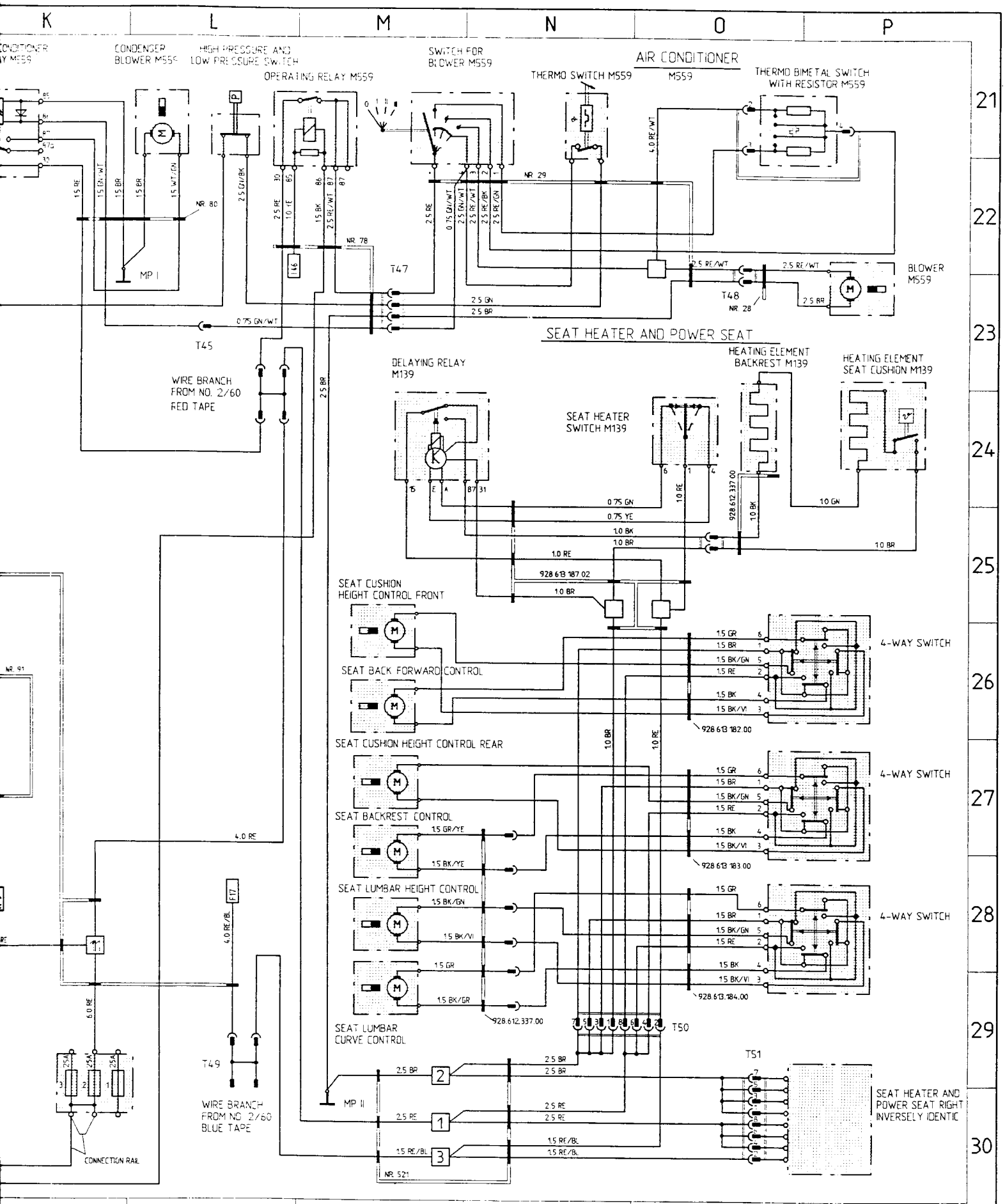
Wiring Diagram Type 911 turbo Model 88 page 3

HEATER AND VENTILATION



BK = BLACK WT = WHI

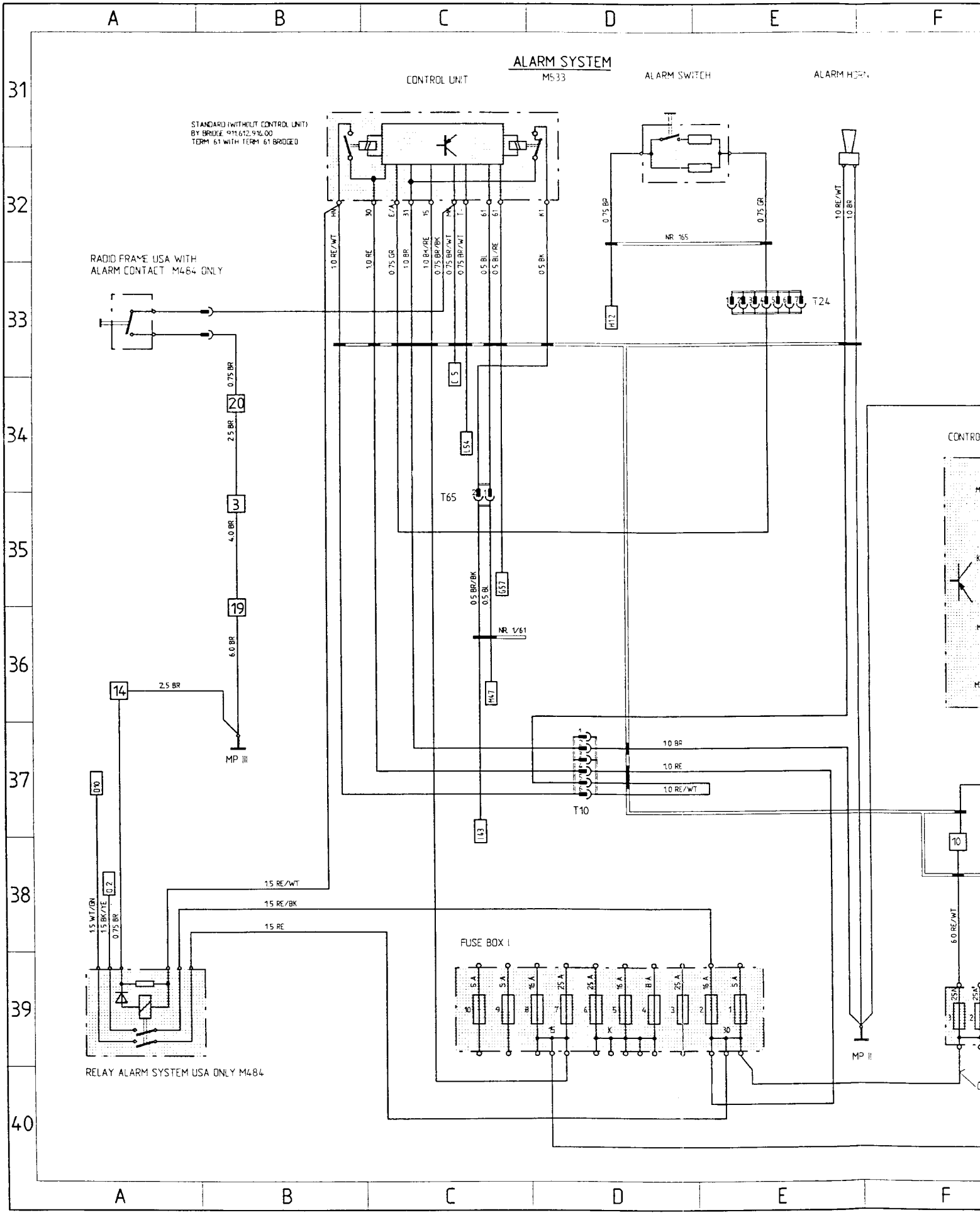

F
G
H
J
K
L
BLOWER OPERATING SWITCH
REAR WINDOW DEFROGGER SWITCH
MIRROR HEATING CABRIO
WIRE BRANCH FROM NO. 78
WIRE BRANCH FROM NO. 2/60 RED TAPE
WIRE BRANCH FROM NO. 2/60 BLUE TAPE
REAR WINDOW DEFOGGER
CONTROL RELAY
CONNECTION RAIL
CONNECTION RAIL
MP IV
MP I
MP XI
T18
T42
T44
T45
T8
T17
T49
NR. 11
NR. 2/60
NR. 80
NR. 14
NR. 91
NR. 32
NR. 1/61
2
9
19
BK = BLACK
WT = WHITE
RE = RED
GN = GREEN
YE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
VI = VIOLET


K
L
M
N
O
P
21
22
23
24
25
26
27
28
29
30
AIR CONDITIONER
M559
CONDENSER BLOWER M559
HIGH PRESSURE AND LOW PRESSURE SWITCH
OPERATING RELAY M559
SWITCH FOR BLOWER M559
THERMO SWITCH M559
THERMO BIMETAL SWITCH WITH RESISTOR M559
BLOWER M559
MP I
T47
T48
T45
NR. 80
NR. 78
NR. 29
NR. 28
SEAT HEATER AND POWER SEAT
DELAYING RELAY M139
HEATING ELEMENT BACKREST M139
HEATING ELEMENT SEAT CUSHION M139
SEAT HEATER SWITCH M139
WIRE BRANCH FROM NO. 2/60 RED TAPE
SEAT CUSHION HEIGHT CONTROL FRONT
SEAT BACK FORWARD CONTROL
SEAT CUSHION HEIGHT CONTROL REAR
SEAT BACKREST CONTROL
SEAT LUMBAR HEIGHT CONTROL
SEAT LUMBAR CURVE CONTROL
4-WAY SWITCH
928 613 182.00
928 613 183.00
928 613 184.00
928.612.337.00
928 613 187.02
T50
T51
MP II
NR. 521
WIRE BRANCH FROM NO. 2/60 BLUE TAPE
CONNECTION RAIL
SEAT HEATER AND POWER SEAT RIGHT INVERSELY IDENTIC
NR. 91
F17

VI = VIOLET

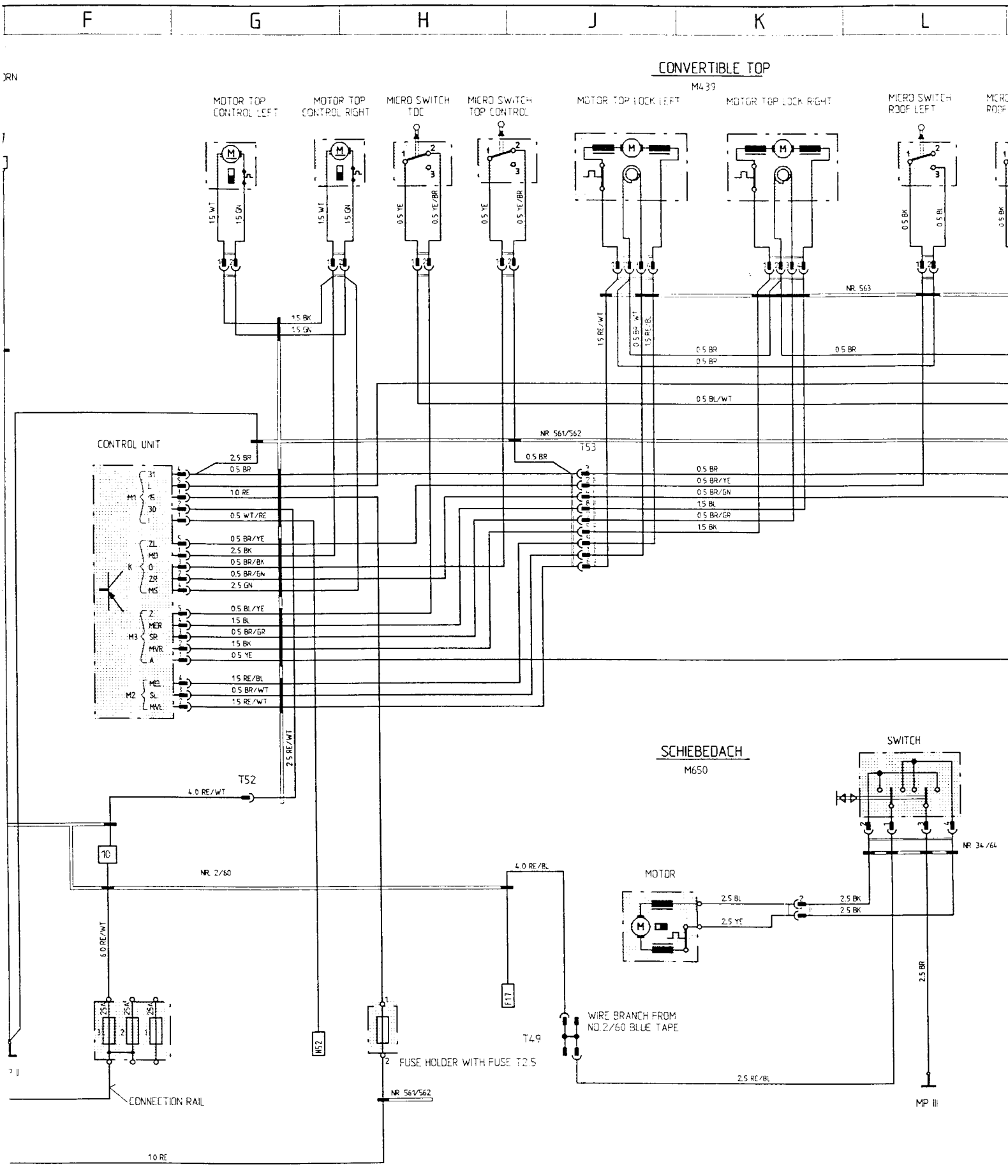
Wiring Diagram Type 911 turbo Model 88 page 4

POWER TOP, ALARM SYSTEM, SUN ROOF

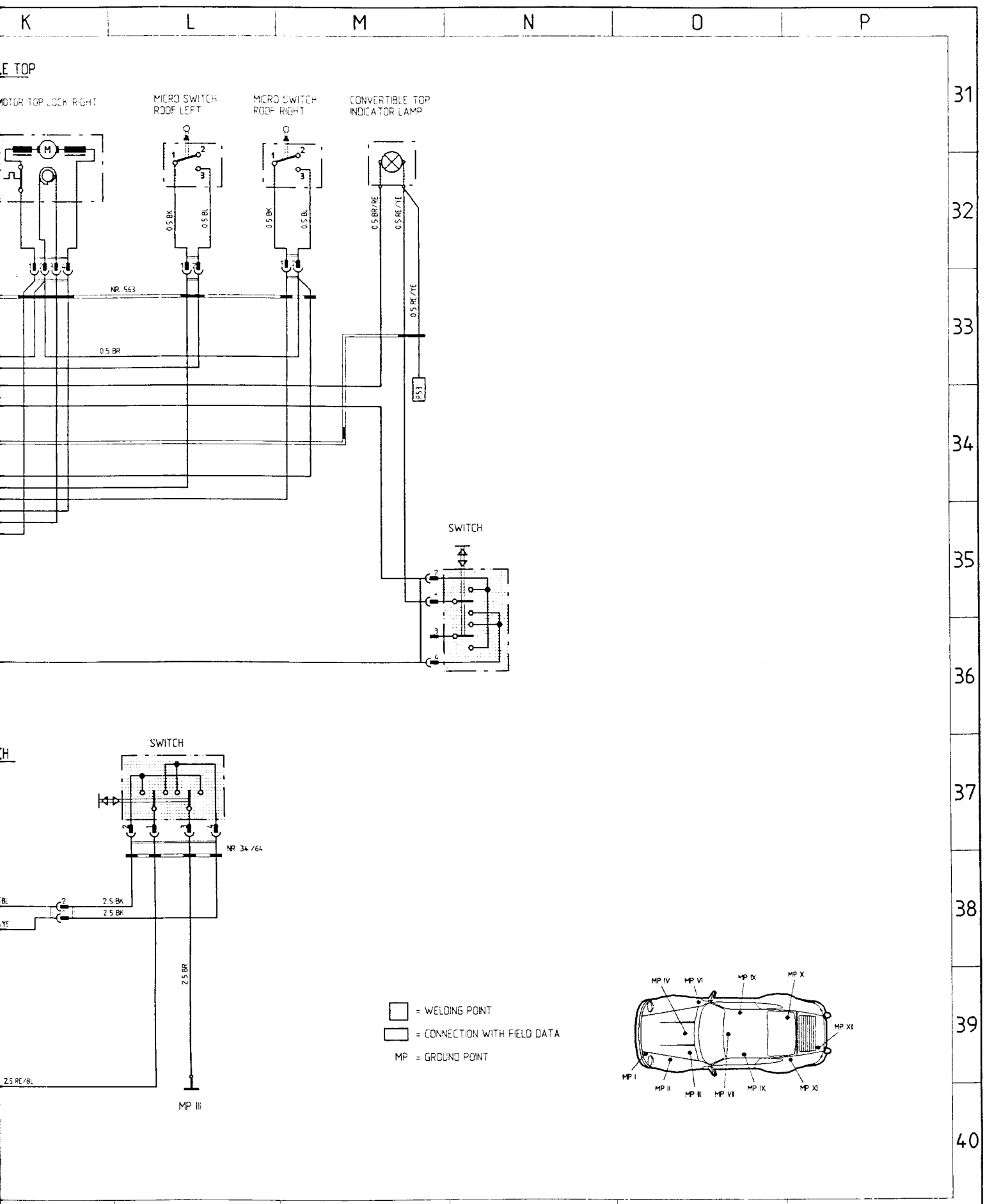


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BK = BLACK WT = W

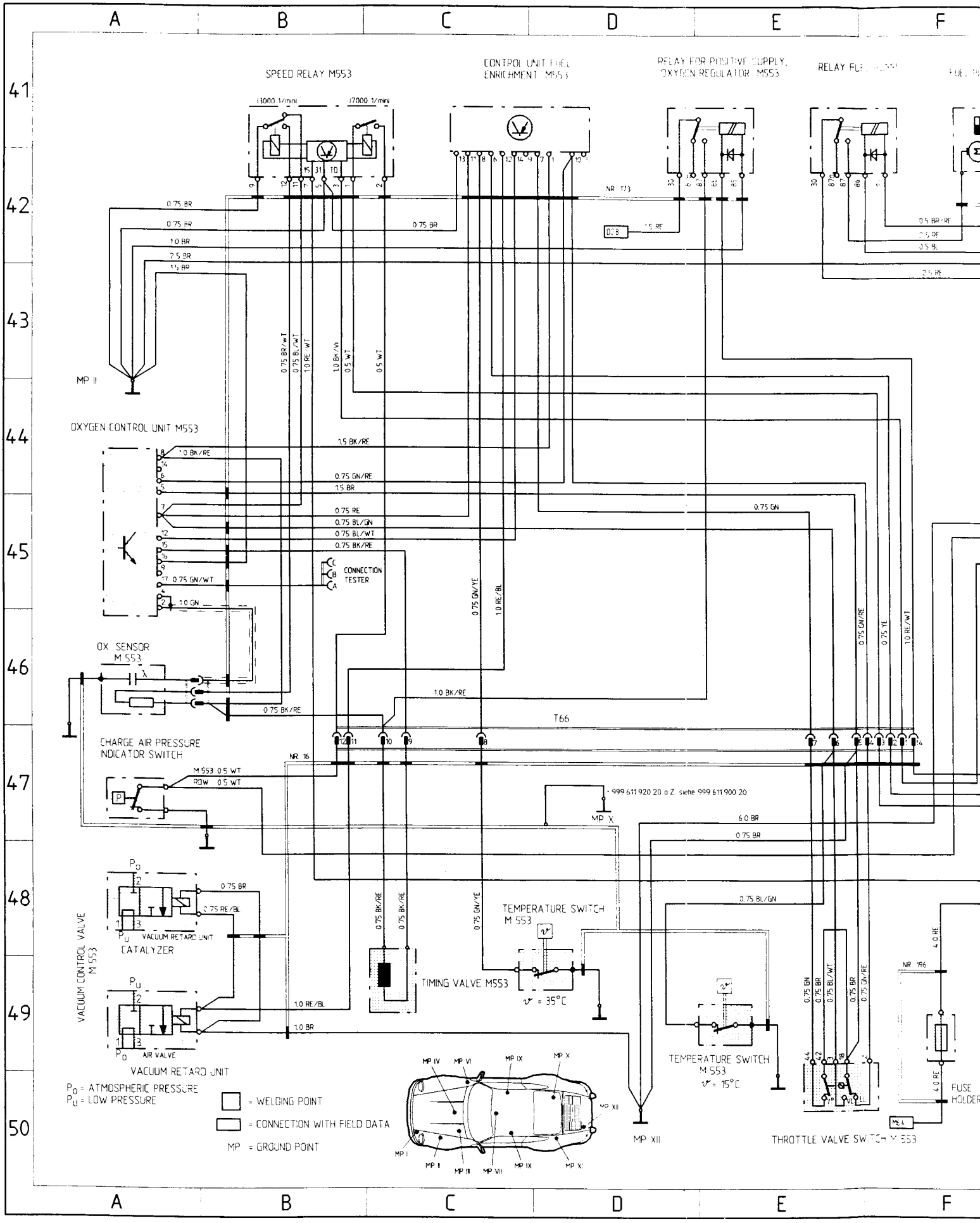


BK=BLACK WT=WHITE RE=RED GN=GREEN YE=YELLOW GR=GREY BR=BROWN BL=BLUE VI=VIOLET


K
L
M
N
O
P
31
32
33
34
35
36
37
38
39
40
E TOP
MOTOR TOP LOCK RIGHT
MICRO SWITCH ROOF LEFT
MICRO SWITCH ROOF RIGHT
CONVERTIBLE TOP INDICATOR LAMP
0.5 BK
0.5 BL
0.5 BR/RE
0.5 RE/YE
NR. 563
0.5 BR
PS1
SWITCH
SWITCH
NR 34/64
2.5 BK
2.5 BK
2.5 BR
2.5 RE/BL
MP III
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
MP I
MP II
MP III
MP IV
MP VI
MP VII
MP IX
MP X
MP XI
MP XII

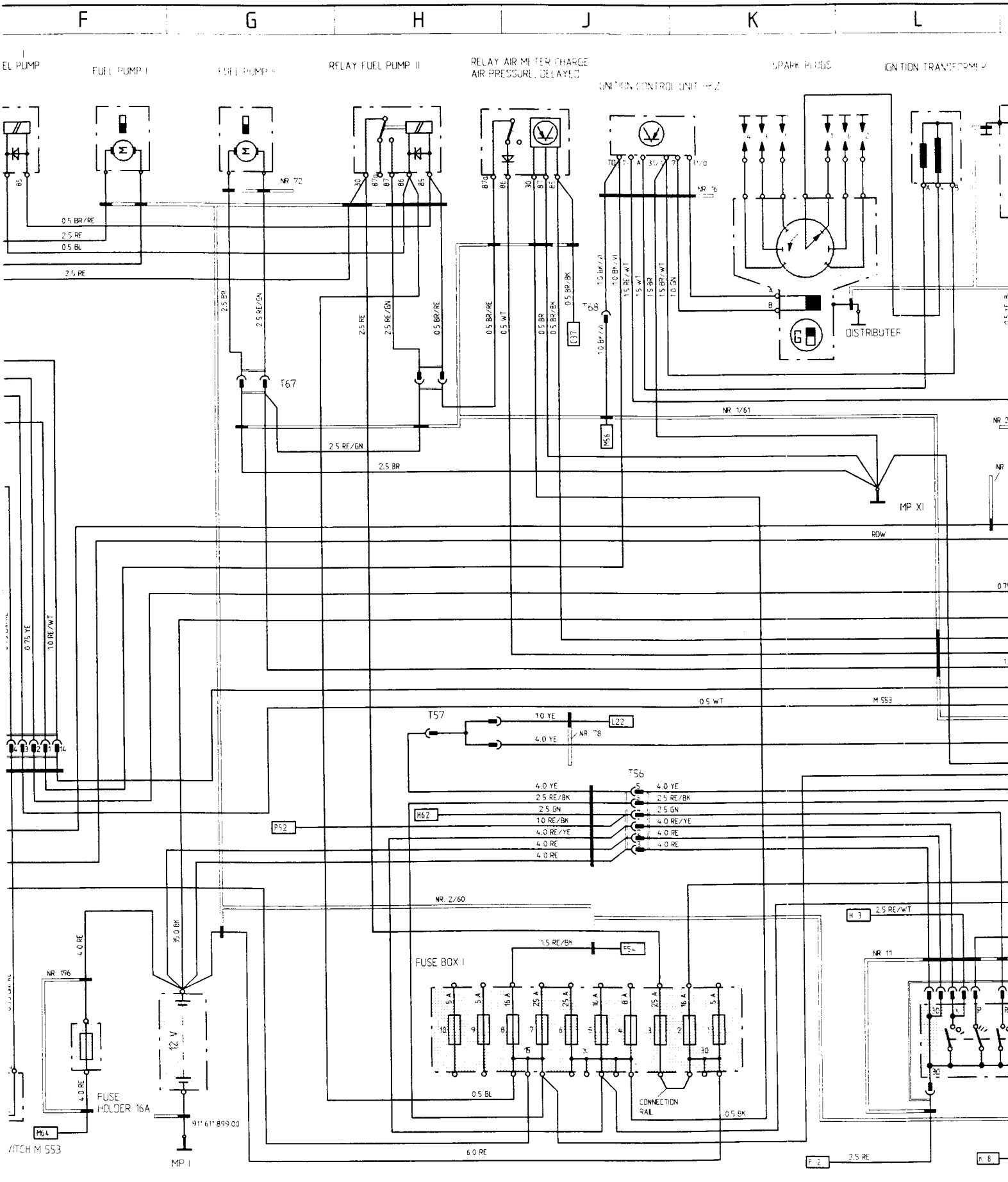
Wiring Diagram Type 911 turbo Model 88 page 5

K-JETRONIC, OXYGEN REGULATOR

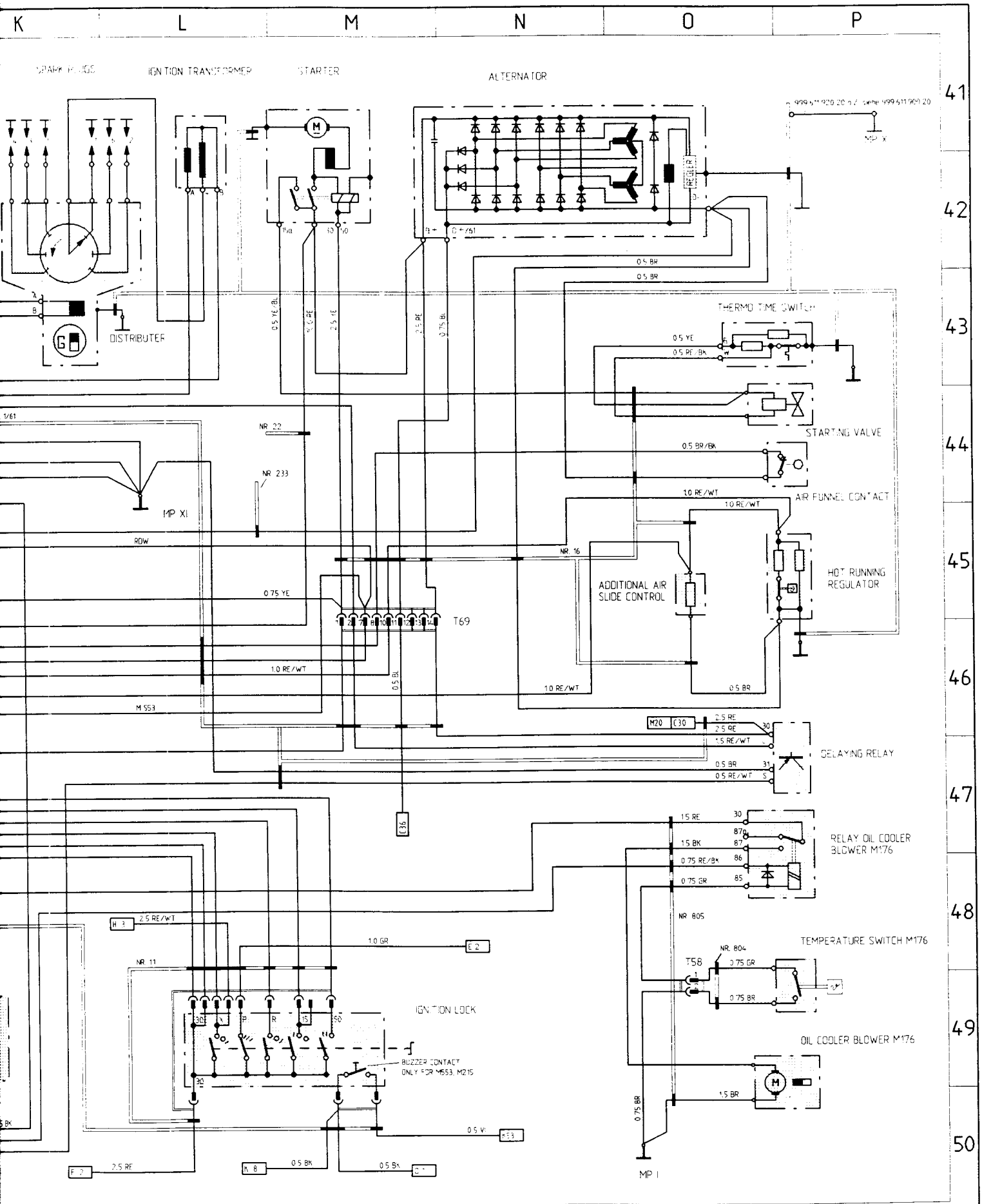


Printed in Germany - IX. 1987

BK = BLACK WT = W

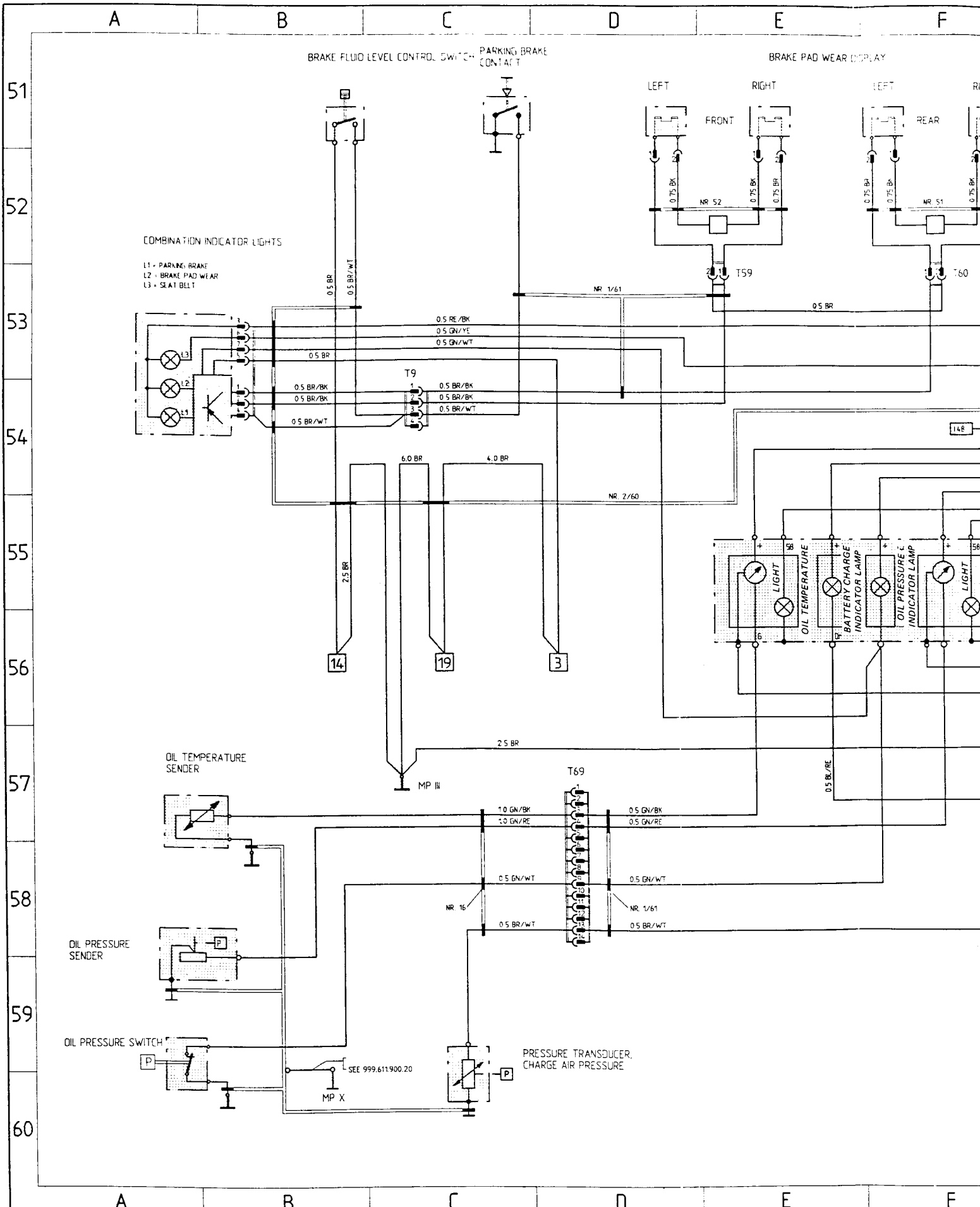


BK = BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET

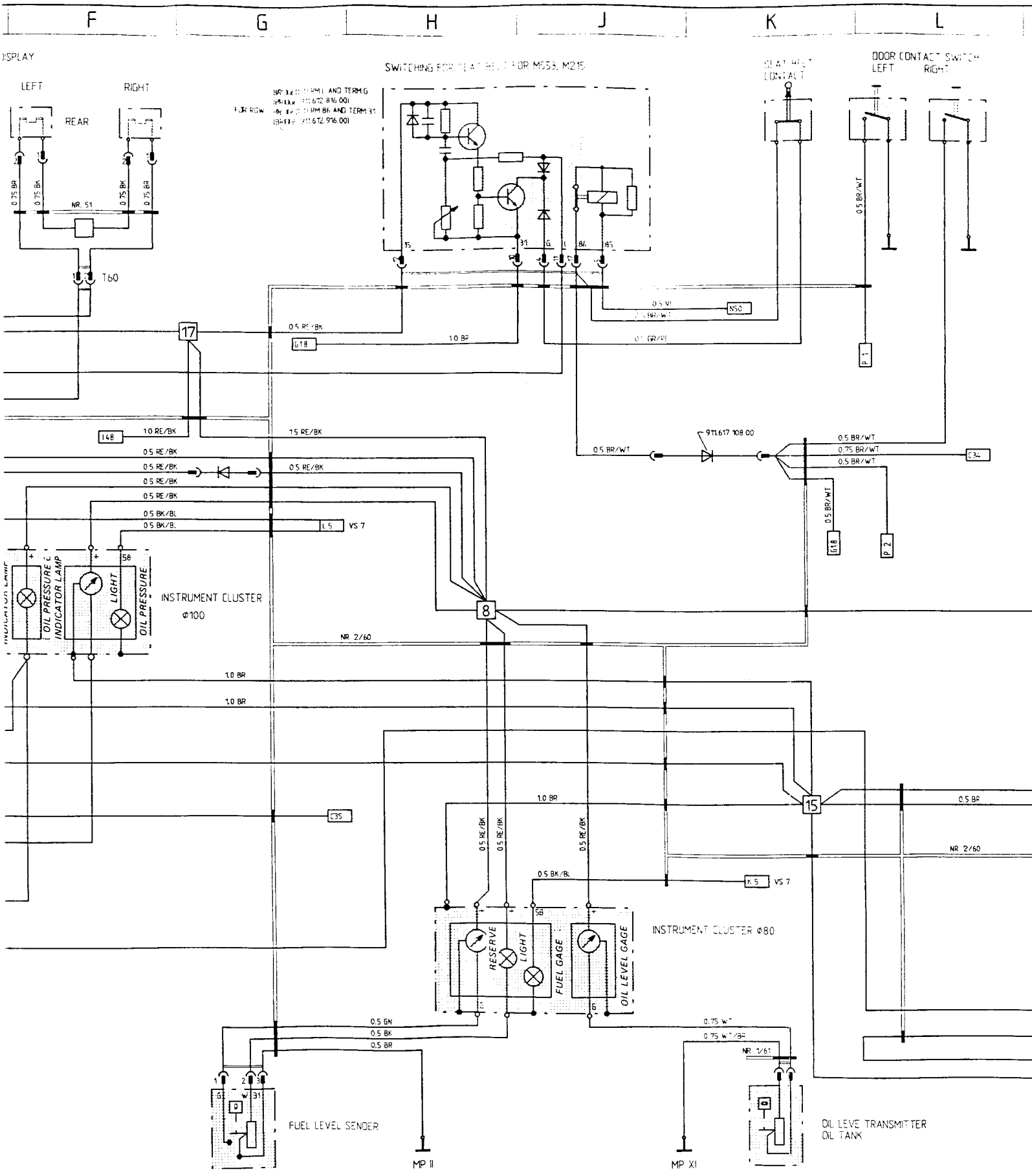

K
L
M
N
O
P
41
42
43
44
45
46
47
48
49
50
SPARK PLUGS
IGNITION TRANSFORMER
STARTER
ALTERNATOR
DISTRIBUTER
THERMO TIME SWITCH
STARTING VALVE
AIR FUNNEL CONTACT
HOT RUNNING REGULATOR
ADDITIONAL AIR SLIDE CONTROL
DELAYING RELAY
RELAY OIL COOLER BLOWER M176
TEMPERATURE SWITCH M176
OIL COOLER BLOWER M176
IGNITION LOCK
BUZZER CONTACT ONLY FOR M553, M215
MP XI
MP I
T69
T58
C36
NR 22
NR 233
NR 16
NR 11
NR 805
NR 804
RDW
M 553
0.5 BR
0.5 BR/BK
1.0 RE/WT
0.75 YE
0.5 YE
0.5 RE/BK
2.5 RE
1.5 RE/WT
1.5 RE
1.5 BK
0.75 RE/BK
0.75 GR
0.75 BR
1.5 BR
2.5 RE/WT
1.0 GR
0.5 VI
2.5 BK
0.5 BK
M20 C30
E 2
E 3
K 8
C 1
F 2
VI = VIOLET

Wiring Diagram Type 911 turbo Model 88 page 6

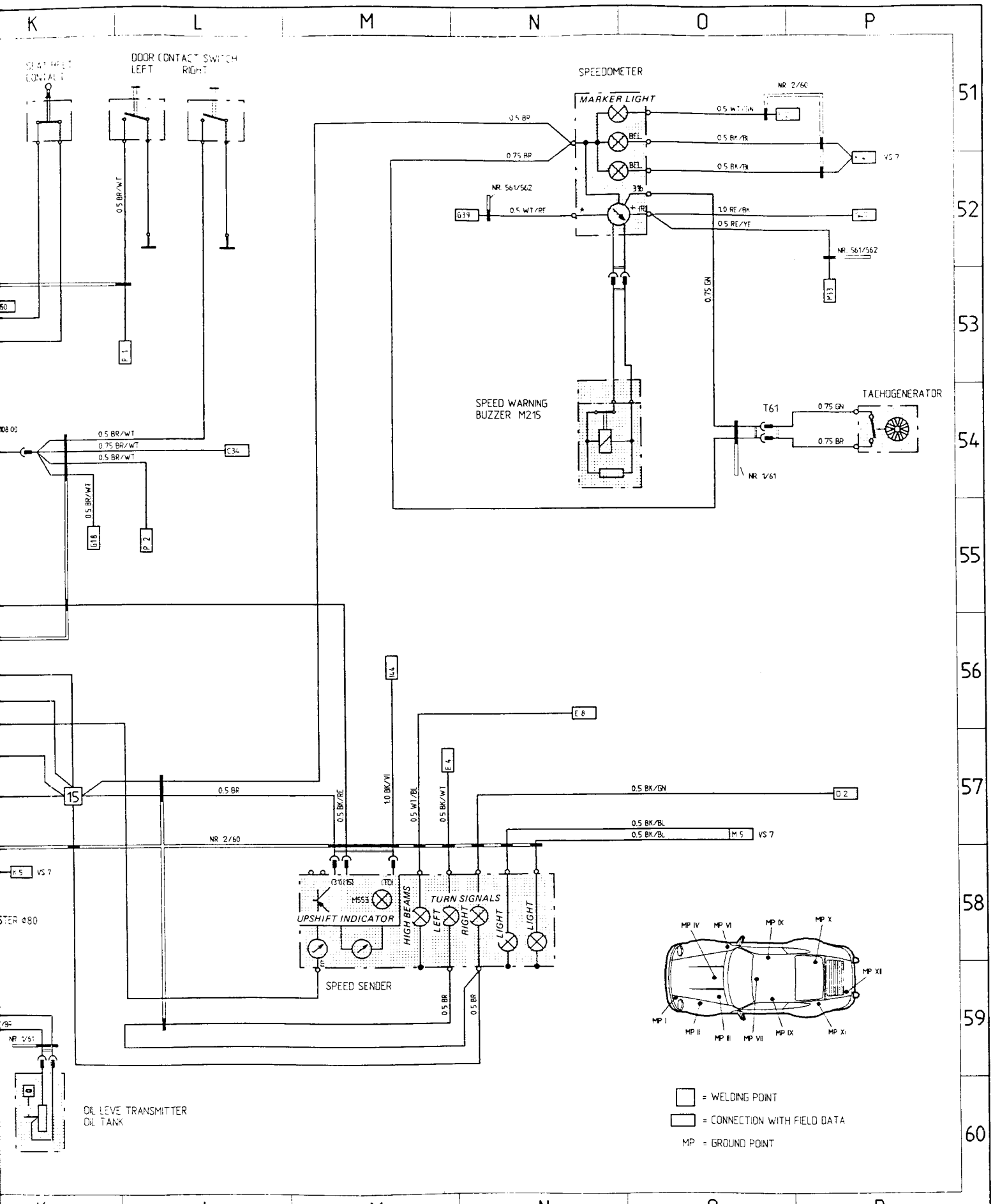
INSTRUMENTS AND SENDER



BK = BLACK WT = W



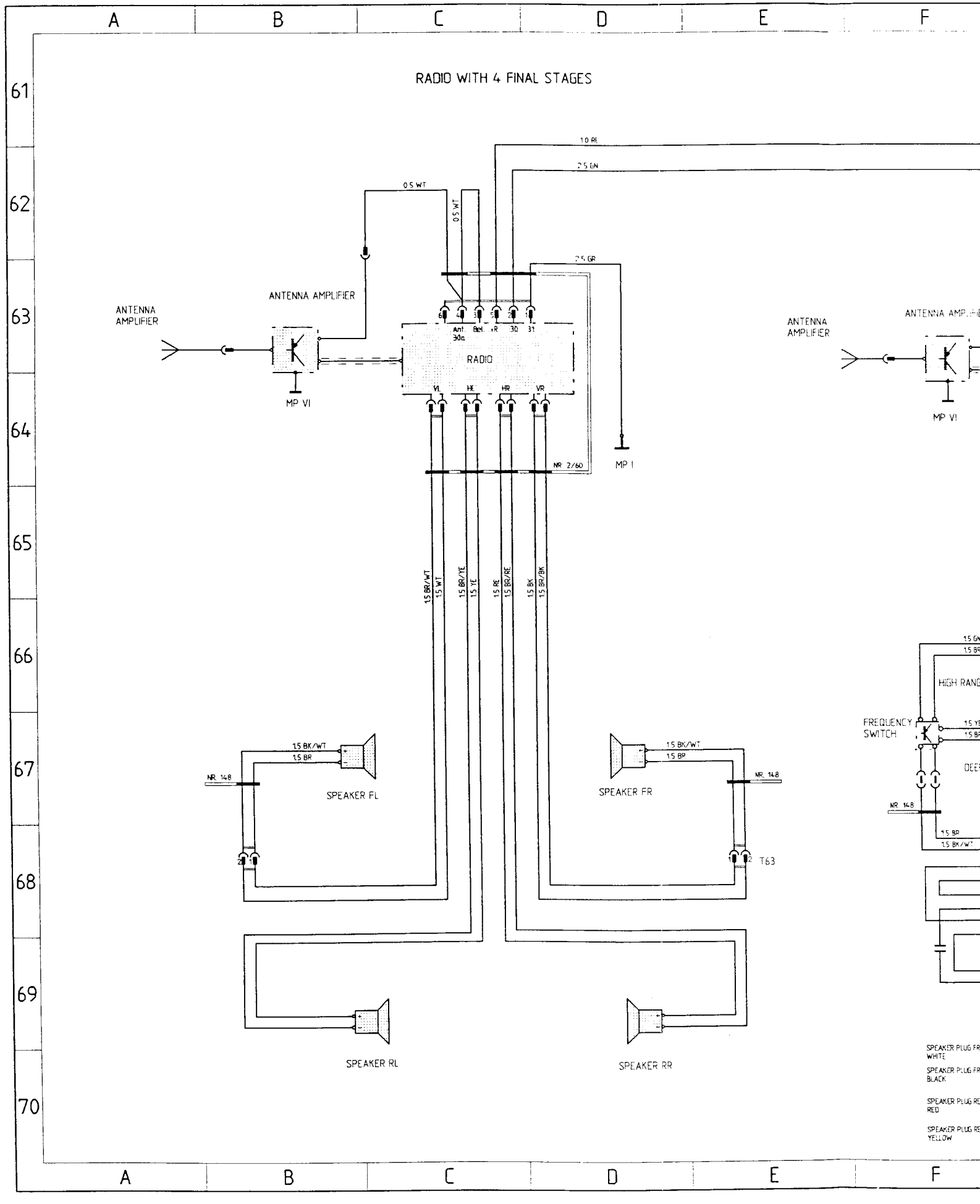
BK = BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET


K
L
M
N
O
P
51
52
53
54
55
56
57
58
59
60
SEAT BELT CONTACT
DOOR CONTACT SWITCH
LEFT
RIGHT
SPEEDOMETER
MARKER LIGHT
NR 2/60
0.5 BR
0.75 BR
0.5 WT/GN
0.5 BR/BL
0.5 BK/BL
NR 561/562
G19
0.5 WT/RE
1.0 RE/BK
0.5 RE/YE
0.75 GN
M13
VS 7
SPEED WARNING BUZZER M215
TACHOGENERATOR
T61
0.75 GN
0.75 BR
NR 1/61
0.5 BR/WT
0.75 BR/WT
C34
G18
P 2
P 1
15
0.5 BR
0.5 BK/RE
1.0 BK/VI
0.5 WT/BL
0.5 BK/WT
E 4
E 8
M 4
0.5 BK/GN
D 2
0.5 BK/BL
M 5
NR 2/60
K 5
UPSHIFT INDICATOR
M553
HIGH BEAMS
TURN SIGNALS
LEFT
RIGHT
LIGHT
LIGHT
SPEED SENDER
MP I
MP II
MP III
MP IV
MP VI
MP VII
MP IX
MP X
MP XI
OIL LEVE TRANSMITTER
OIL TANK
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT

VI = VIOLET

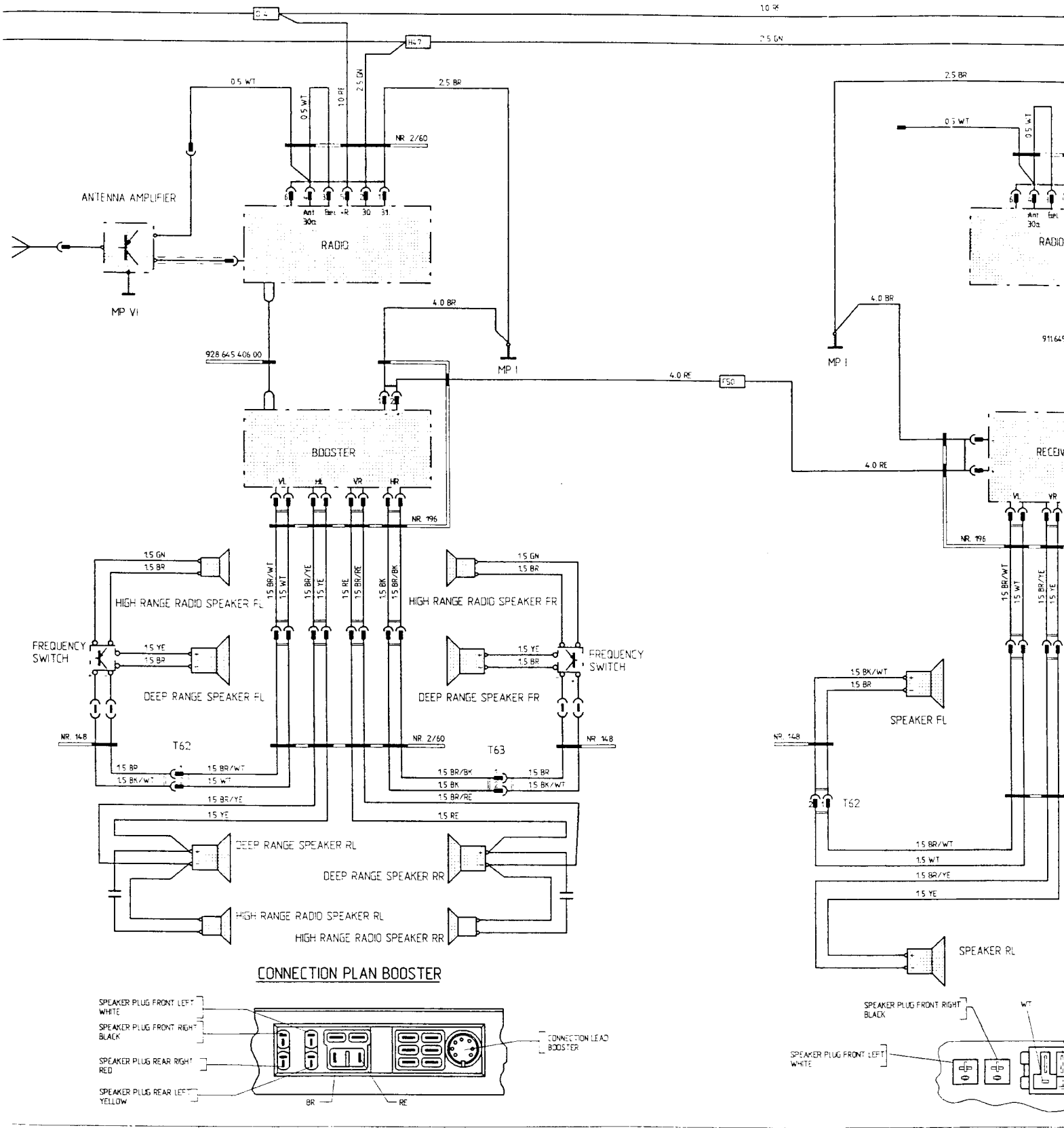
Wiring Diagram Type 911 turbo Model 88 page 7

RADIO

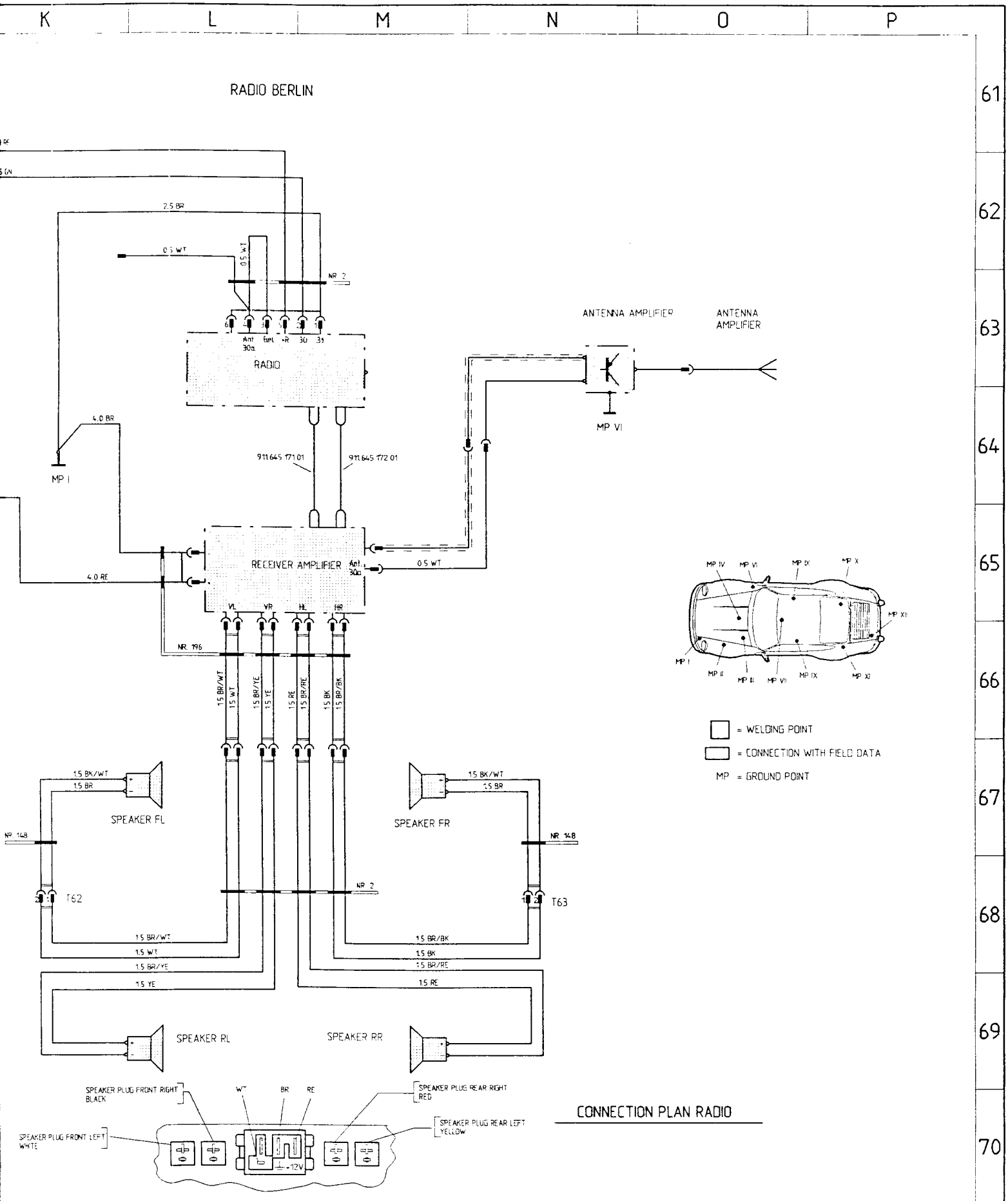


RADIO WITH 4 FINAL STAGES
AND AUDIO OPTION PACK

RADIO B

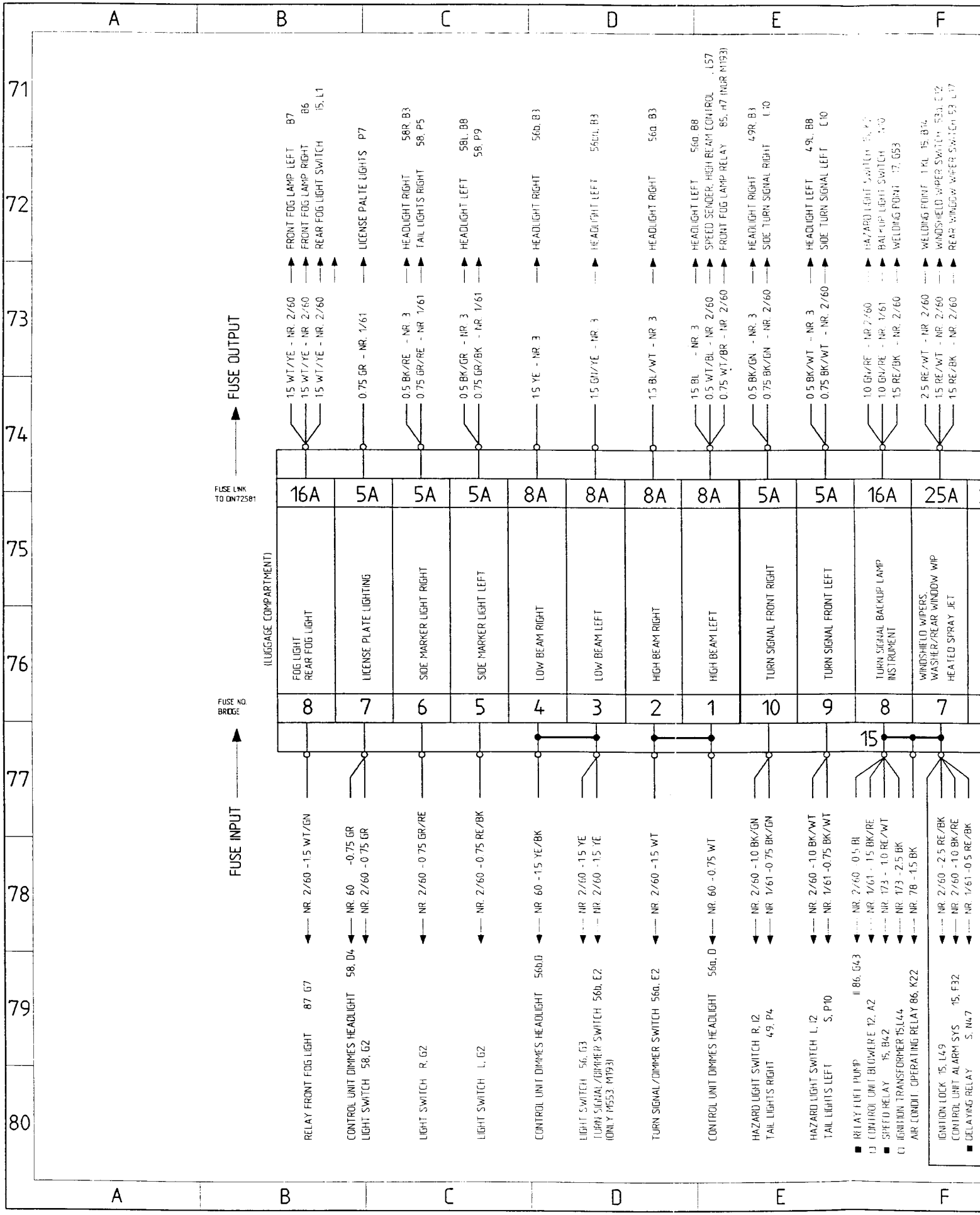


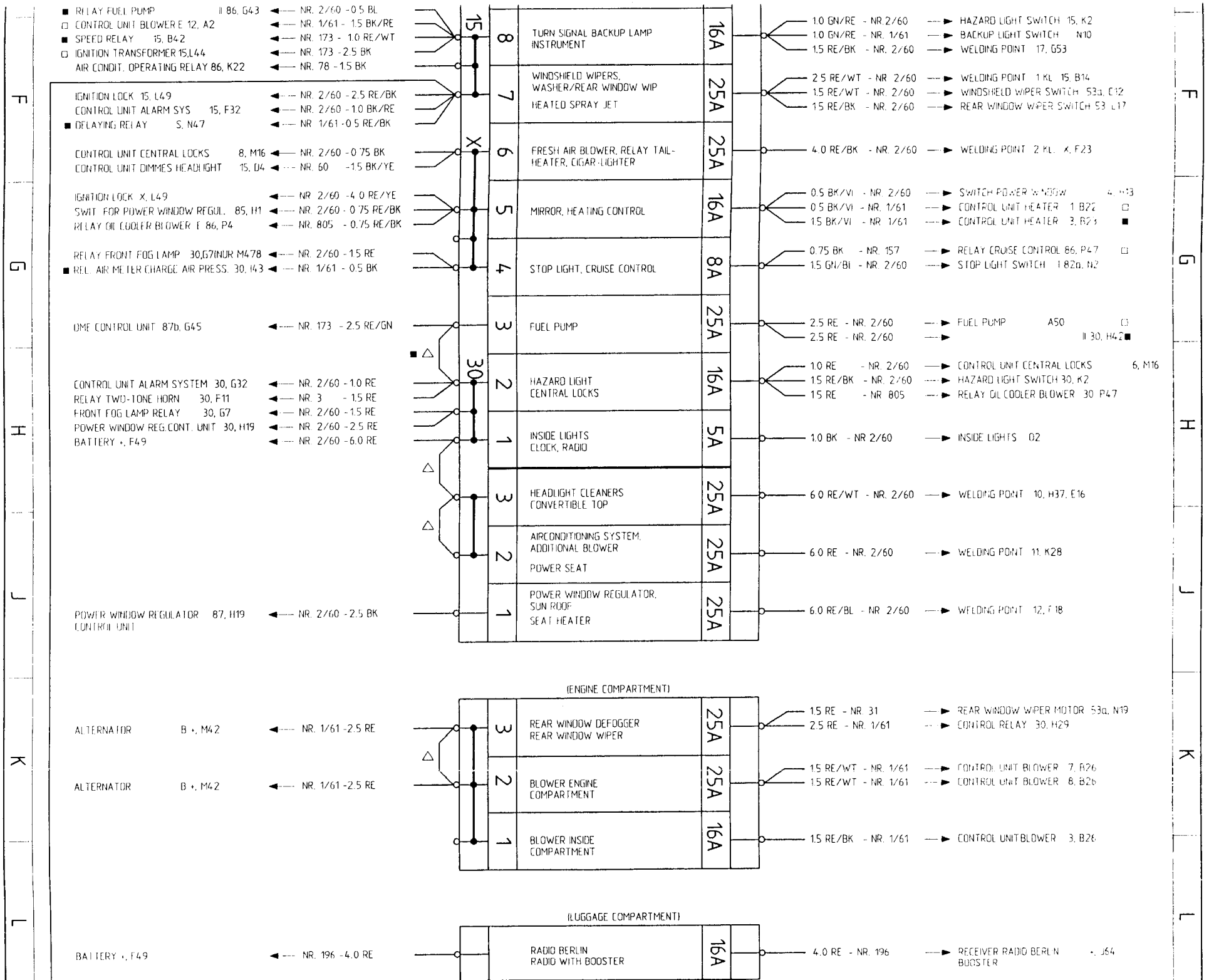
CONNECTION PLAN BOOSTER

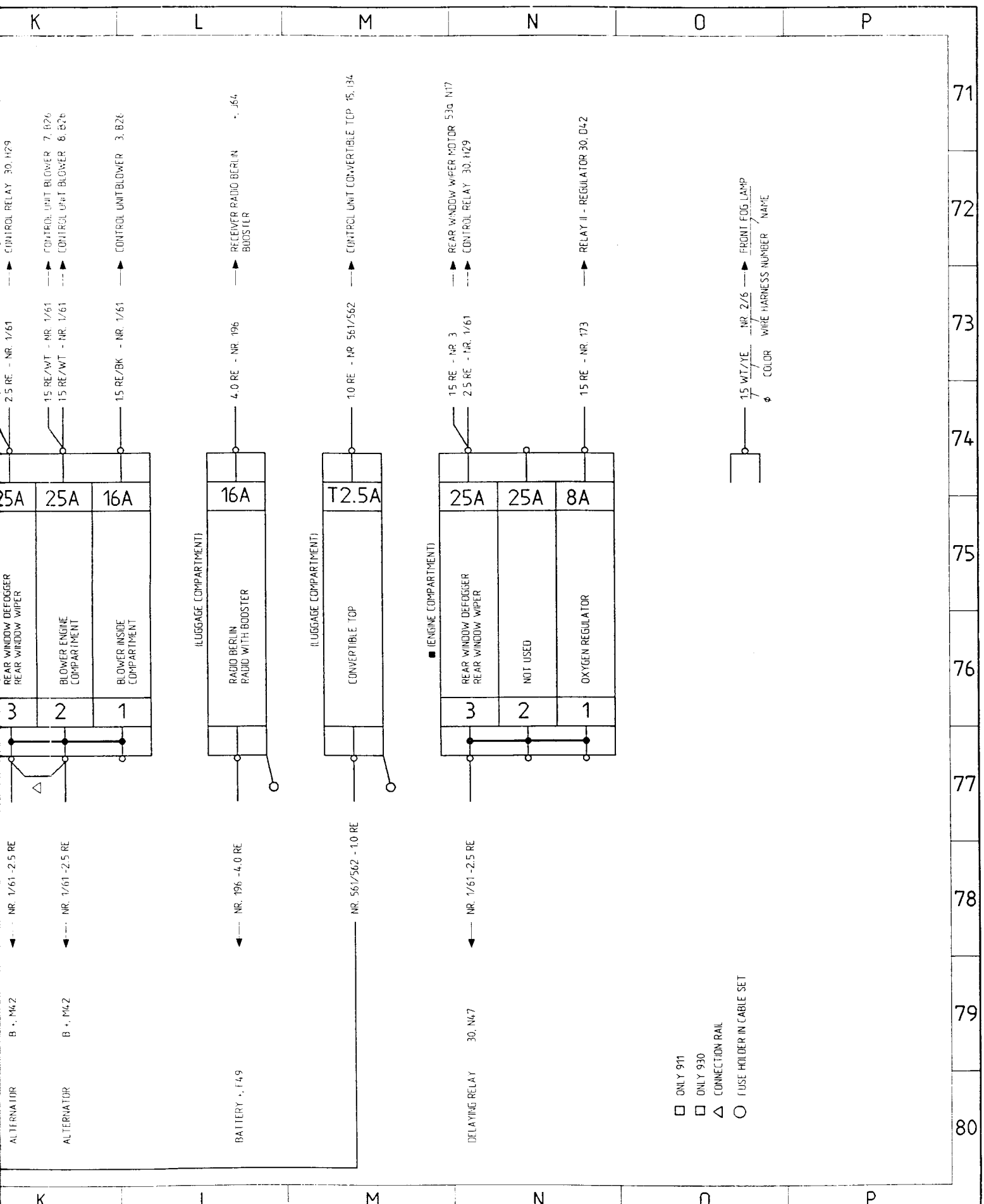

K
L
M
N
O
P
RADIO BERLIN
61
62
63
64
65
66
67
68
69
70
2.5 BR
0.5 WT
NR. 2
Ant 30Ω
Bel.
+R
30
31
RADIO
ANTENNA AMPLIFIER
ANTENNA AMPLIFIER
MP VI
4.0 BR
MP I
911.645.171.01
911.645.172.01
RECEIVER AMPLIFIER
Ant. 30Ω
0.5 WT
4.0 RE
VL
VR
HL
HR
NR. 196
1.5 BR/WT
1.5 WT
1.5 BR/YE
1.5 YE
1.5 RE
1.5 BR/RE
1.5 BK
1.5 BR/BK
MP IV
MP VI
MP IX
MP X
MP XI
MP I
MP II
MP III
MP VII
MP IX
MP XI
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
1.5 BK/WT
1.5 BR
SPEAKER FL
SPEAKER FR
NR. 148
T62
T63
NR. 2
1.5 BR/WT
1.5 WT
1.5 BR/YE
1.5 YE
1.5 BR/BK
1.5 BK
1.5 BR/RE
1.5 RE
SPEAKER RL
SPEAKER RR
SPEAKER PLUG FRONT RIGHT BLACK
SPEAKER PLUG FRONT LEFT WHITE
WT
BR
RE
SPEAKER PLUG REAR RIGHT RED
SPEAKER PLUG REAR LEFT YELLOW
+12V
CONNECTION PLAN RADIO

Wiring Diagram Type 911 turbo Model 88 page 8

FUSE ASSIGNMENTS AND POSITIONS




■ RELAY FUEL PUMP II 86, G43 ◄— NR. 2/60 - 0.5 BL
□ CONTROL UNIT BLOWER E 12, A2 ◄— NR. 1/61 - 1.5 BK/RE
■ SPEED RELAY 15, B42 ◄— NR. 173 - 1.0 RE/WT
□ IGNITION TRANSFORMER 15, L44 ◄— NR. 173 - 2.5 BK
AIR CONDIT. OPERATING RELAY 86, K22 ◄— NR. 78 - 1.5 BK
IGNITION LOCK 15, L49 ◄— NR. 2/60 - 2.5 RE/BK
CONTROL UNIT ALARM SYS 15, F32 ◄— NR. 2/60 - 1.0 BK/RE
■ DELAYING RELAY S, N47 ◄— NR. 1/61 - 0.5 RE/BK
CONTROL UNIT CENTRAL LOCKS 8, M16 ◄— NR. 2/60 - 0.75 BK
CONTROL UNIT DIMMES HEADLIGHT 15, D4 ◄— NR. 60 - 1.5 BK/YE
IGNITION LOCK X, L49 ◄— NR. 2/60 - 4.0 RE/YE
SWIT. FOR POWER WINDOW REGUL. 85, H1 ◄— NR. 2/60 - 0.75 RE/BK
RELAY OIL COOLER BLOWER E 86, P4 ◄— NR. 805 - 0.75 RE/BK
RELAY FRONT FOG LAMP 30,G7/NUR M478 ◄— NR. 2/60 - 1.5 RE
■ REL. AIR METER CHARGE AIR PRESS. 30, I43 ◄— NR. 1/61 - 0.5 BK
DME CONTROL UNIT 87b, G45 ◄— NR. 173 - 2.5 RE/GN
CONTROL UNIT ALARM SYSTEM 30, G32 ◄— NR. 2/60 - 1.0 RE
RELAY TWO-TONE HORN 30, F11 ◄— NR. 3 - 1.5 RE
FRONT FOG LAMP RELAY 30, G7 ◄— NR. 2/60 - 1.5 RE
POWER WINDOW REG.CONT. UNIT 30, H19 ◄— NR. 2/60 - 2.5 RE
BATTERY +, F49 ◄— NR. 2/60 - 6.0 RE
POWER WINDOW REGULATOR 87, H19 CONTROL UNIT ◄— NR. 2/60 - 2.5 BK
15
X
30
8 TURN SIGNAL BACKUP LAMP INSTRUMENT 16A
7 WINDSHIELD WIPERS, WASHER/REAR WINDOW WIP HEATED SPRAY JET 25A
6 FRESH AIR BLOWER, RELAY TAIL-HEATER, CIGAR-LIGHTER 25A
5 MIRROR, HEATING CONTROL 16A
4 STOP LIGHT, CRUISE CONTROL 8A
3 FUEL PUMP 25A
2 HAZARD LIGHT CENTRAL LOCKS 16A
1 INSIDE LIGHTS CLOCK, RADIO 5A
3 HEADLIGHT CLEANERS CONVERTIBLE TOP 25A
2 AIRCONDITIONING SYSTEM, ADDITIONAL BLOWER POWER SEAT 25A
1 POWER WINDOW REGULATOR, SUN ROOF SEAT HEATER 25A
1.0 GN/RE - NR.2/60 ► HAZARD LIGHT SWITCH 15, K2
1.0 GN/RE - NR. 1/61 ► BACKUP LIGHT SWITCH N10
1.5 RE/BK - NR. 2/60 ► WELDING POINT 17, G53
2.5 RE/WT - NR 2/60 ► WELDING POINT 1 KL 15, B14
1.5 RE/WT - NR. 2/60 ► WINDSHIELD WIPER SWITCH 53a, C12
1.5 RE/BK - NR. 2/60 ► REAR WINDOW WIPER SWITCH 53 c17
4.0 RE/BK - NR. 2/60 ► WELDING POINT 2 KL. X, F23
0.5 BK/VI - NR. 2/60 ► SWITCH POWER WINDOW 4, H33
0.5 BK/VI - NR. 1/61 ► CONTROL UNIT HEATER 1 B22 □
1.5 BK/VI - NR. 1/61 ► CONTROL UNIT HEATER 3, B23 ■
0.75 BK - NR. 157 ► RELAY CRUISE CONTROL 86, P47 □
1.5 GN/BL - NR. 2/60 ► STOP LIGHT SWITCH 182a, N2
2.5 RE - NR. 2/60 ► FUEL PUMP A50 □
2.5 RE - NR. 2/60 ► II 30, H42 ■
1.0 RE - NR. 2/60 ► CONTROL UNIT CENTRAL LOCKS 6, M16
1.5 RE/BK - NR. 2/60 ► HAZARD LIGHT SWITCH 30, K2
1.5 RE - NR 805 ► RELAY OIL COOLER BLOWER 30 P47
1.0 BK - NR 2/60 ► INSIDE LIGHTS 02
6.0 RE/WT - NR. 2/60 ► WELDING PONT 10, H37, E16
6.0 RE - NR. 2/60 ► WELDING PONT 11, K28
6.0 RE/BL - NR 2/60 ► WELDING PONT 12, F18
(ENGINE COMPARTMENT)
ALTERNATOR B +, M42 ◄— NR. 1/61 - 2.5 RE
ALTERNATOR B +, M42 ◄— NR. 1/61 - 2.5 RE
3 REAR WINDOW DEFOGGER REAR WINDOW WIPER 25A
2 BLOWER ENGINE COMPARTMENT 25A
1 BLOWER INSIDE COMPARTMENT 16A
1.5 RE - NR. 31 ► REAR WINDOW WIPER MOTOR 53a, N19
2.5 RE - NR. 1/61 ► CONTROL RELAY 30, H29
1.5 RE/WT - NR. 1/61 ► CONTROL UNIT BLOWER 7, B26
1.5 RE/WT - NR. 1/61 ► CONTROL UNIT BLOWER 8, B26
1.5 RE/BK - NR. 1/61 ► CONTROL UNITBLOWER 3, B26
(LUGGAGE COMPARTMENT)
BATTERY +, F49 ◄— NR. 196 - 4.0 RE
RADIO BERLIN RADIO WITH BOOSTER 16A
4.0 RE - NR. 196 ► RECEIVER RADIO BERLIN BOOSTER +, J64


K
L
M
N
O
P
71
72
73
74
75
76
77
78
79
80
CONTROL RELAY 30, H29
2.5 RE - NR. 1/61
CONTROL UNIT BLOWER 7, B26
CONTROL UNIT BLOWER 8, B26
15 RE/WT - NR. 1/61
15 RE/WT - NR. 1/61
CONTROL UNIT BLOWER 3, B26
15 RE/BK - NR. 1/61
RECEIVER RADIO BERLIN *, J64
BOOSTER
4.0 RE - NR. 196
CONTROL UNIT CONVERTIBLE TOP 15, J34
1.0 RE - NR. 561/562
REAR WINDOW WIPER MOTOR 53a, N17
CONTROL RELAY 30, H29
15 RE - NR. 3
2.5 RE - NR. 1/61
RELAY II - REGULATOR 30, D42
15 RE - NR. 173
15 WT/YE
NR. 2/6
FRONT FOG LAMP
COLOR
WIRE HARNESS NUMBER
NAME
25A
25A
16A
REAR WINDOW DEFOGGER
REAR WINDOW WIPER
BLOWER ENGINE COMPARTMENT
BLOWER INSIDE COMPARTMENT
3
2
1
(LUGGAGE COMPARTMENT)
16A
RADIO BERLIN
RADIO WITH BOOSTER
(LUGGAGE COMPARTMENT)
T2.5A
CONVERTIBLE TOP
■ (ENGINE COMPARTMENT)
25A
25A
8A
REAR WINDOW DEFOGGER
REAR WINDOW WIPER
NOT USED
OXYGEN REGULATOR
3
2
1
ALTERNATOR
B +, M42
NR. 1/61 - 2.5 RE
ALTERNATOR
B +, M42
NR. 1/61 - 2.5 RE
BATTERY +, F49
NR. 196 - 4.0 RE
NR. 561/562 - 1.0 RE
DELAYING RELAY
30, N47
NR. 1/61 - 2.5 RE
□ ONLY 911
□ ONLY 930
△ CONNECTION RAIL
○ FUSE HOLDER IN CABLE SET

Wiring Diagram Type 911 turbo Model 88 page 9

CONSTR. COMPONENTS, PLUG CONNECTION, GROUND POINTS

A B C D E

CONSTRUCTION COMPONENTS

DESIGNATION, FUNCTION	POSITION IN VEHICLE LHD	POSITION IN VEHICLE RHD	NOTE	FIELD
OPERATING RELAY	cN5	cP5	UNDER THE COVER LHD — BEHIND FLOORPANEL RHD	LM21
FLASHER	cQ7	cL7	IN LUGGAGE COMPARTMENT	HJ9 / CDE19 / EFG29 / CDE39 / HJM49
BOOSTER	eM9	eM9	UNDER THE SEAT RIGHT	GH45
DME CONTROL UNIT	eP9	eP9	UNDER THE SEAT LEFT	FG44
DME CONTROL UNIT	eP9	eP9	UNDER THE SEAT LEFT	CDE41
SPEED RELAY	eP9	eP9	UNDER THE SEAT LEFT	B41,42
SPEED CUTOUT DEVICE	eP9	eP9	UNDER THE SEAT LEFT	GH44
RECEIVER, AMPLIFIER	eM9	eM9	UNDER THE SEAT RIGHT	LM65
FREQUENCY SWITCH FL	cR10	cR10	UNDER THE DOOR TRIM PANEL	F67
FREQUENCY SWITCH RL	cK10	cK10	UNDER THE DOOR TRIM PANEL	J67
SPEED WARNING BUZZER	bO7	bO7	ON THE SPEEDOMETER	N54
HIGH PRESSURE AND LOW PRESSURE SWITCH	cN5	cO5	UNDER THE COVER LHD — IN LUGGAGE COMPARTMENT RHD	L21,22
AIR CONDITIONER RELAY	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	K21
OXYGEN CONTROL UNIT	eP9	eP9	UNDER THE SEAT LEFT	A44,45
FRONT FOG LAMP RELAY	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	F9
CONTROL RELAY FOR REAR WINDOW DEFROGGER	dQ16	dQ16	CARRIER PLATE IN ENGINE COMPARTMENT	H29,30
RELAY ALARM SYSTEM USA	cPQ6	cPQ6	IN LUGGAGE COMPARTMENT	A39
RELAY TWO-TONE HORN	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	G11
RELAY FOR POSITIVE SUPPLY, OXYGEN REGULATOR	dQ16	dQ16	CARRIER PLATE IN ENGINE COMPARTMENT	E41
RELAY I FUEL PUMP	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	EF41
RELAY II FUEL PUMP	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	H41
RELAY AIR METER CHARGE AIR PRESS., DELAYED	dQ16	dQ16	CARRIER PLATE IN ENGINE COMPARTMENT	J41
RELAY OIL COOLER BLOWER	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	P48
RELAY CRUISE CONTROL	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	P47
SWITCHING FOR POWER WINDOW REGULATOR	cP6	cL6	IN LUGGAGE COMPARTMENT	G19,20
SWITCHING FOR CATALYZER	cPQ16	cPQ16	IN LUGGAGE COMPARTMENT	E60
SWITCHING FOR SEAT BELT	cPQ6	cPQ6	IN LUGGAGE COMPARTMENT	HJ52
FUSE BOX I	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	F9
FUSE BOX II	cP4	cP4	FUSE BOX IN LUGGAGE COMPARTMENT	DE9
FUSE BOX THREEFOLD	cP5	cP5	FUSE BOX IN LUGGAGE COMPARTMENT	EF19 / K30 / F39
FUSE BOX THREEFOLD ENGINE COMPARTMENT	dQ16	dQ16	CARRIER PLATE IN ENGINE COMPARTMENT	LM19 / C30
FUSE HOLDER 16A	dPQ3	dPQ3	IN LUGGAGE COMPARTMENT	F48
FUSE HOLDER T2.5	cP5	cP5	BEHIND THE FUSE BOX	H39
FUSE HOLDER 10A FOR BLOWER LEFT	bQ7	bQ7	FOR ADDITIONAL BLOWER	D23
FUSE HOLDER 10A FOR BLOWER RIGHT	bL7	bL7	FOR ADDITIONAL BLOWER	D23
ELECTRONIC CONTROL UNIT CENTRAL LOCKS	bL7	bL7	IN LUGGAGE COMPARTMENT	M16
CONTROL UNIT ALARM SYSTEM	cM6	cM6	IN LUGGAGE COMPARTMENT	C32
CONTROL UNIT CONVERTIBLE TOP	dM6	dM6	BEHIND FLOORBOARD	F35,36
CONTROL UNIT FUEL ENRICHMENT	eP9	eP9	UNDER THE SEAT LEFT	CD41
CONTROL UNIT BLOWER	dQ16	dQ16		AB26
CONTROL UNIT DIMMES HEADLIGHTS	dP5	dP5	BEHIND FLOORBOARD	D1
CONTROL UNIT HEADLIGHT CLEANERS	dP2	dP2	IN LUGGAGE COMPARTMENT	A18,19
CONTROL UNIT CRUISE CONTROL	bN6	bN6	UNDER THE INSTRUMENT PANEL	P43,44
THERMO BIMETAL SWITCH WITH RESISTOR				DP21
DELAYING RELAY	dQ16	dQ16	CARRIER PLATE IN ENGINE COMPARTMENT	P47
RESISTOR	bL7	bP6	IN LUGGAGE COMPARTMENT	D21
WIPER INTERMITTENT CONTROL RELAIS	cN6	cO6	IN LUGGAGE COMPARTMENT	A13
ADDITIONAL CLEANING FLUID PUMP RELAY	cP5	cP5	IN LUGGAGE COMPARTMENT	D30
ADDITIONAL BLOWER RELAY	cP6	cL6	FUSE BOX IN LUGGAGE COMPARTMENT	AB17

A B C D E

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PLUG CONNECTIONS

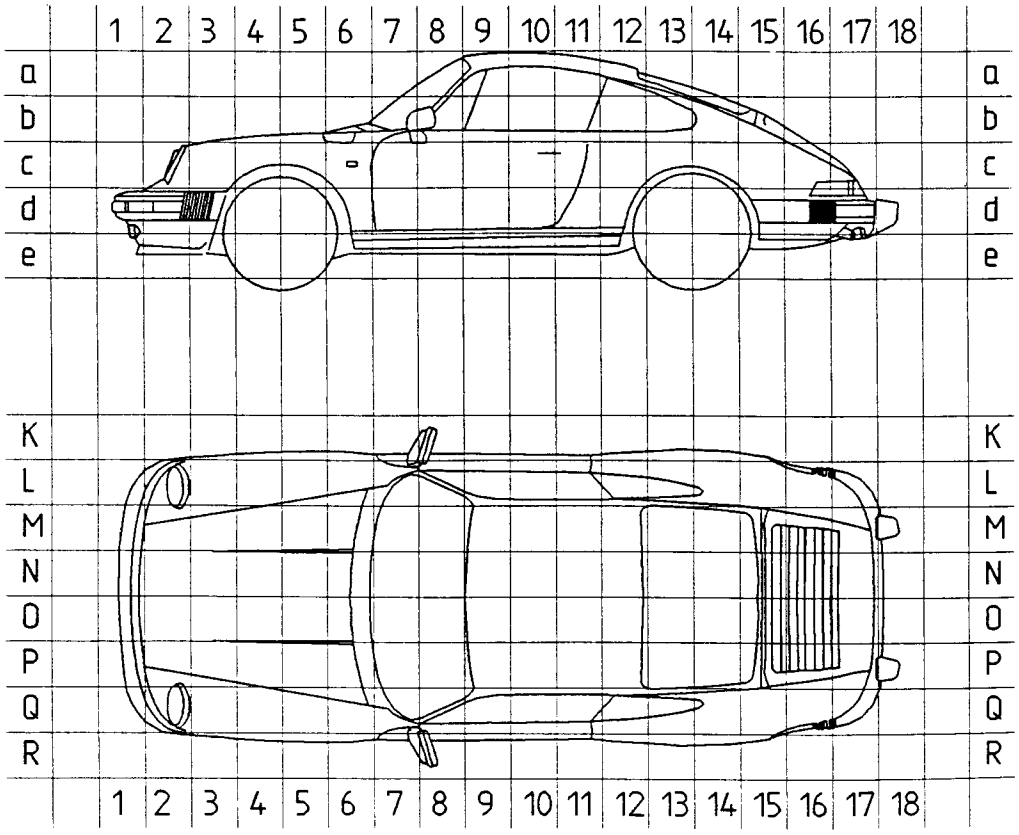
CODE	NUMBER OF PINS	DESIGNATION, FUNKTION	POSITION IN VEHICLE LHD	POSITION IN VEHICLE RHD	NOTE	FIELD
T1	2	LUGGAGE COMPARTMENT LIGHT	bL7	bL7	REAR RIGHT OF HEATER HOSE	B4
T2	2	SIDE TURN SIGNAL RIGHT	bL7	bL7	REAR RIGHT OF HEATER HOSE	C2
T3	2	SIDE TURN SIGNAL LEFT	bQ7	bQ7	AT SIDE OF HEATER	C9
T4	1	BAL	bP7	bM7	UNDER THE INSTRUMENT PANEL	D3
T5	6	TURN SIGNAL/DIMMER SWITCH	cP6	cM6	UNDER THE INSTRUMENT PANEL	E3 / E12
T6	6	LIGHT SWITCH	cP6	cM6	UNDER THE INSTRUMENT PANEL	F2
T7	9	CENTRE CONSOLE	cNO7	cNO7	UNDER THE CENTRE CONSOLE	J3
T8	3	NO. 2/60 TO NO. 1/61	cP5	cP5	IN LUGGAGE COMPARTMENT	M4 / G26
T9	4	NO. 2/60 TO NO. 1/61	cP5	cP5	IN LUGGAGE COMPARTMENT	N4 / C54
T10	6	CONTINUOUS CONSUMER	cP4	cP4	IN LUGGAGE COMPARTMENT	N5 / D37
T11	2	INSIDE LIGHTS	bQ7	bQ7	AT SIDE OF HEATER	O2
T12	2	INSIDE LIGHT IN THE ROOF	aP11	aP11	ON INNER ROOF	N3
T13	7	TAIL LIGHTS RIGHT	cL17	cL17	ON SIDE PANEL	N5
T14	7	TAIL LIGHTS LEFT	cQ17	cQ17	ON SIDE PANEL	O8
T15	14	NO. 16 MOTOR	cP17	cP17	RELAY PANEL REAR	N9 / B28 / M44 / D57
T16	3	TAILGATE	cL15	cL15	ENGINE COMPARTMENT	N8
T17	3	REAR WINDOW	cP15	cP15	ENGINE COMPARTMENT	M8 / H27
T18	6	BLOWER OPERATING SWITCH	cM6	cO6	UNDER THE INSTRUMENT PANEL	L10/ G21
T19	1	CRUISE CONTROL	cP5	cP5	IN LUGGAGE COMPARTMENT	N3
T20	6	WIPE/WASH SWITCH	cP6	cM6	UNDER THE INSTRUMENT PANEL	C13
T21	1	WINDSHIELD WASHING FLUID PUMP	cP4	cP4	BEHIND THE FUSE BOX	D12
T22	1	RELAY TWO-TONE HORN	cP4	cP4	BEHIND THE FUSE BOX	F12
T23	6	MIRROR DRIVER'S SIDE	bR8	bK8	IN MIRROR	H11
T24	7	MIRROR DRIVER'S DOOR	cQ7	cL6	IN LUGGAGE COMPARTMENT	J12 / E33
T25	2	MIRROR DRIVER'S DOOR	cQ7	cL6	IN LUGGAGE COMPARTMENT	K13
T26	7	MIRROR PASSENGER'S DOOR	cL7	cQ7	IN LUGGAGE COMPARTMENT	L12
T27	6	MIRROR PASSENGER'S SIDE	bK8	bR8	IN MIRROR	M12
T28	2	CENTRAL LOCK BUTTON	dNO7	dNO7	UNDER THE CENTRE CONSOLE	N13
T29	2	CENTRAL LOCK BUTTON	dNO7	dNO7	UNDER THE CENTRE CONSOLE	O13
T30	5	DRIVE FOR PASSENGER	dK9	dR9	IN DOOR	O13
T31	3	LOCK CYLINDER FOR PASSENGER'S SIDE	dK9	dR9	IN DOOR	P13
T32	7	CENTRAL LOCK PASSENGER'S DOOR	cL7	cQ7	IN LUGGAGE COMPARTMENT	O15
T33	7	CENTRAL LOCK DRIVER'S DOOR	cQ7	cL6	IN LUGGAGE COMPARTMENT	O16
T34	5	DRIVE FOR DRIVER'S SIDE	dR9	dK9	IN DOOR	O18
T35	3	LOCK CYLINDER FOR DRIVER'S SIDE	dR9	dK9	IN DOOR	P18
T36	2x1	REAR WINDOW WIPER MOTOR	dPQ15	dPQ15	ENGINE COMPARTMENT	M18
T37	6	POWER WINDOW REGUL. PASSENGER'S SIDE	bK7	bQ7	UNDER THE FENDER	K18
T38	6	POWER WINDOW REGULATOR DRIVER'S SIDE	bQ7	bK7	UNDER THE FENDER	J18
T39	2	HEADLIGHT CLEANER BUTTON	dP2	dP2	IN LUGGAGE COMPARTMENT	B18
T40	4	HEATER LEVER	dNO11	dNO11	UNDER THE GEARBOX COVER	B22
T41	6	HEATER CONTROL	dNO11	dNO11	UNDER THE GEARBOX COVER	B24
T42	2	CENTRE CONSOLE	dNO7	dNO7	UNDER THE CENTRE CONSOLE	G24 / E34
T43	1	CLUTCH AIR	dL17	dL17	ENGINE COMPARTMENT	J22
T44	3	WIRE BRANCH	cP5	cP5	IN LUGGAGE COMPARTMENT	J24
T45	1	AIR CONDITIONING SYSTEM	cP5	cP5	IN LUGGAGE COMPARTMENT	K23
T46	4	WIRE BRANCH RED	cP5	cP5	IN LUGGAGE COMPARTMENT	L24
T47	4	AIR BLOWER SWITCH	cM5	dP6	UNDER THE AIR COND. COVER LHD – UNDER THE FOOTWELL COVER RHD	M23
T48	2	AIR BLOWER	cM5	dP6	UNDER THE AIR COND. COVER LHD – UNDER THE FOOTWELL COVER RHD	O23
T49	4	WIRE BRANCH BLUE	cP5	cP5	IN LUGGAGE COMPARTMENT	L29 / J39
T50	8	SEAT LEFT	dP10	dP10	UNDER THE SEAT	N29
T51	8	SEAT RIGHT	dM10	dM10	UNDER THE SEAT	O30
T52	1	CONTROL UNIT CABRIO	cP5	cP5	BEHIND THE FUSE BOX	G37
T53	12	POWER TOP	cL12	cL12	BEHIND THE FUSE BOX	J35
T54	4	DME	cP4	cP4	IN LUGGAGE COMPARTMENT	E46
T55	6	FUEL INJECTORS	cO14	cO14	ENGINE COMPARTMENT	F43
T56	6	IGNITION LOCK	cP6	cM6	UNDER THE INSTRUMENT PANEL	J47
T57	3	WIRE BRANCH TERM. 50	cP5	cP5	IN LUGGAGE COMPARTMENT	K47
T58	2	OIL COOLER TEMPERATURE SWITCH	dL2	dL2	IN LUGGAGE COMPARTMENT	O49
T59	2	BRAKE PAD WEAR DISPLAY FRONT	cP5	cP5	IN LUGGAGE COMPARTMENT	E53
T60	2	BRAKE PAD WEAR DISPLAY REAR	dNO11	dNO11	UNDER THE GEARBOX COVER	F53
T61	2	TACHOGENERATOR	dNO11	dNO11	UNDER THE GEARBOX COVER	O54
T62	2	SPEAKER DOOR FRONT LEFT	cQ7	cQ7	FOR ADDITIONAL BLOWER	B68
T63	2	SPEAKER DOOR FRONT RIGHT	cL7	cL7	FOR ADDITIONAL BLOWER	E68
T64	3	2/60 - 1/61	cP5	cP5	IN LUGGAGE COMPARTMENT	C25
T65	2	2/60 - 1/61	cP5	cP5	IN LUGGAGE COMPARTMENT	C34
T66	14	16 - 173	cO14	cO14	ENGINE COMPARTMENT	COE47
T67	2	FUEL PUMP REAR	dP15	dP15	ENGINE COMPARTMENT	G43
T68	1	IGNITION CONTROL UNIT	dP15	dP15	ENGINE COMPARTMENT	J43
T69	14	No. 16	dQ16	dQ16	ENGINE COMPARTMENT BEARER PLATE	M46

M49

L	M	N	O	P

GROUND POINTS

FIELD	CODE	DESIGNATION, FUNCTION	POSITION IN VEHICLE LHD	RHD
B4	MP I	IN LUGGAGE COMPARTMENT	dP2	dP2
C2	MP II	IN LUGGAGE COMPARTMENT	cP5	cP5
C9	MP III	IN LUGGAGE COMPARTMENT	cP6	cP6
D3	MP IV	IN PASSENGER COMPARTMENT	bN07	bN07
E3 / E12	MP V			
F2	MP VI	IN LUGGAGE COMPARTMENT	bK6	bK6
J3	MP VII	CABRIO, TARGA	aN09	aN09
M4 / G26	MP VIII	IN ROOF	aL10	aL10
N4 / C54	MP IX	IN ROOF	aQ10	aQ10
N5 / D37	MP X	ENGINE COMPARTMENT	cP15	cP15
O2	MP XI	ON THE GROUND	dN11	dN11
N3	MP XII	ENGINE COMPARTMENT	cO17	cO17
N5				
O8				
N9 / B28 / M44 / D57				
N8				
M8 / H27				
L10 / G21				
N3				
C13				
D12				
F12				
H11				
J12 / E33				
K13				
L12				
M12				
N13				
O13				
O13				
P13				
O15				
O16				
O18				
P18				
M18				
K18				
J18				
B18				
B22				
B24				
G24 / C34				
J22				
J24				
K23				
L24				
ELL COVER RHD — M23				
ELL COVER RHD — O23				
L29 / J39				
N29				
O30				
G37				
J35				
E46				
F43				
J47				
K47				
O49				
E53				
F53				
O54				
B68				
E68				
C25				
C34				
CDE47				
G43				
J43				
M46				



L	M	N	O	P

Wiring Diagram Type 911 Carrera Model 89

	Coordinates	
Sheet 1	1 - 10	Lights
Sheet 2	11 - 20	Body
Sheet 3	21 - 30	Heater, Ventilation, Air Conditioner
Sheet 4	31 - 40	Power Top, Alarm System, Sun Roof
Sheet 5	41 - 50	Digital Motorelectronics, Engine, Tempostat
Sheet 6	51 - 60	Instruments and Sender
Sheet 7	61 - 70	Radio
Sheet 8	71 - 80	Fuse Assignments and Positions
Sheet 9		Constr. Components, Plug Connection, Ground Points

Wiring Diagram Type 911 Carrera
Model 89

Wire Colours

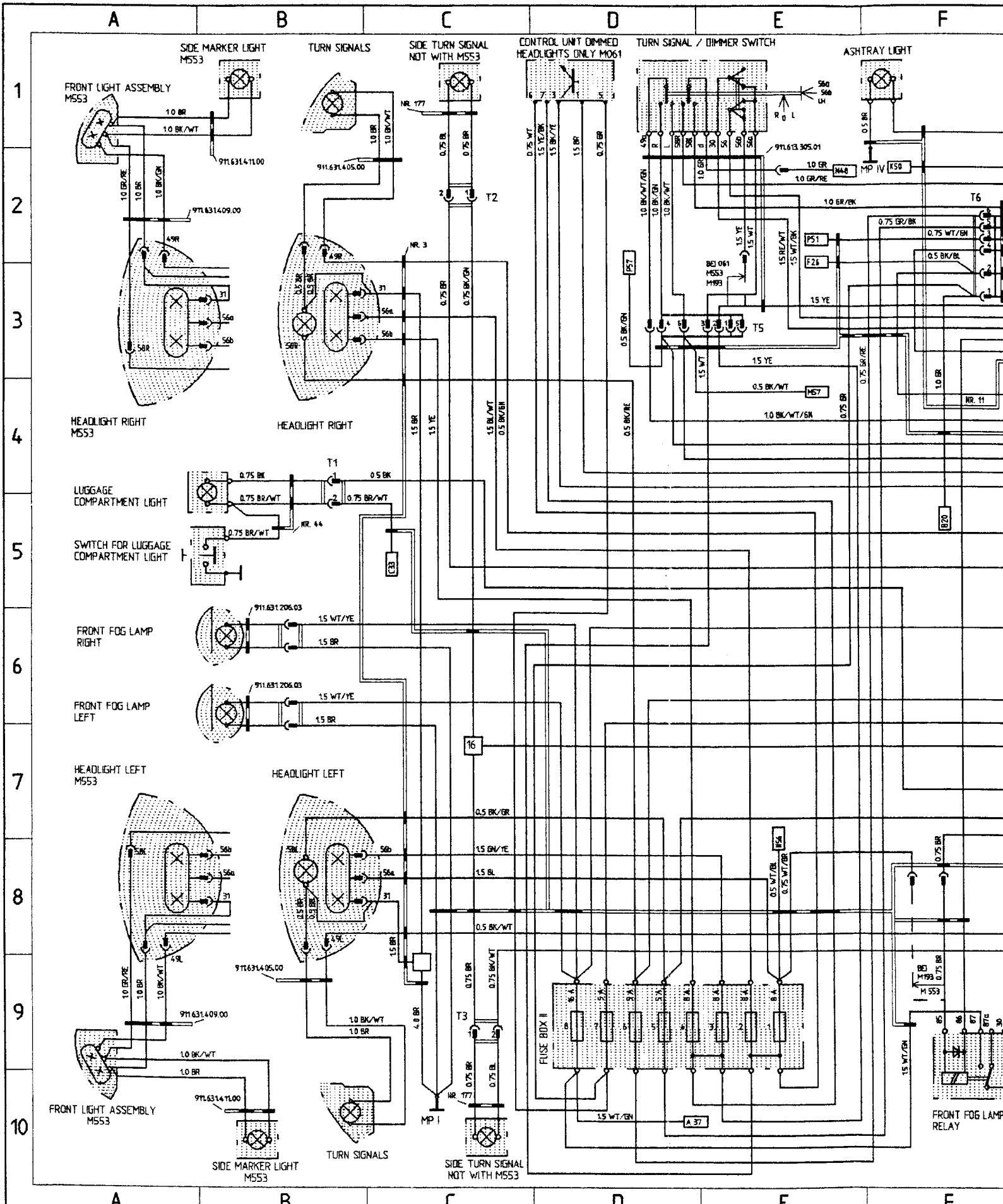
BK = Black
WT = white
RE = red
GN = green
YE = yellow
GR = grey
BR = brown
BL = blue
VI = violet

⊡ = Welding Point
▭ = Connection with field indication
MP = Ground Connecting Point

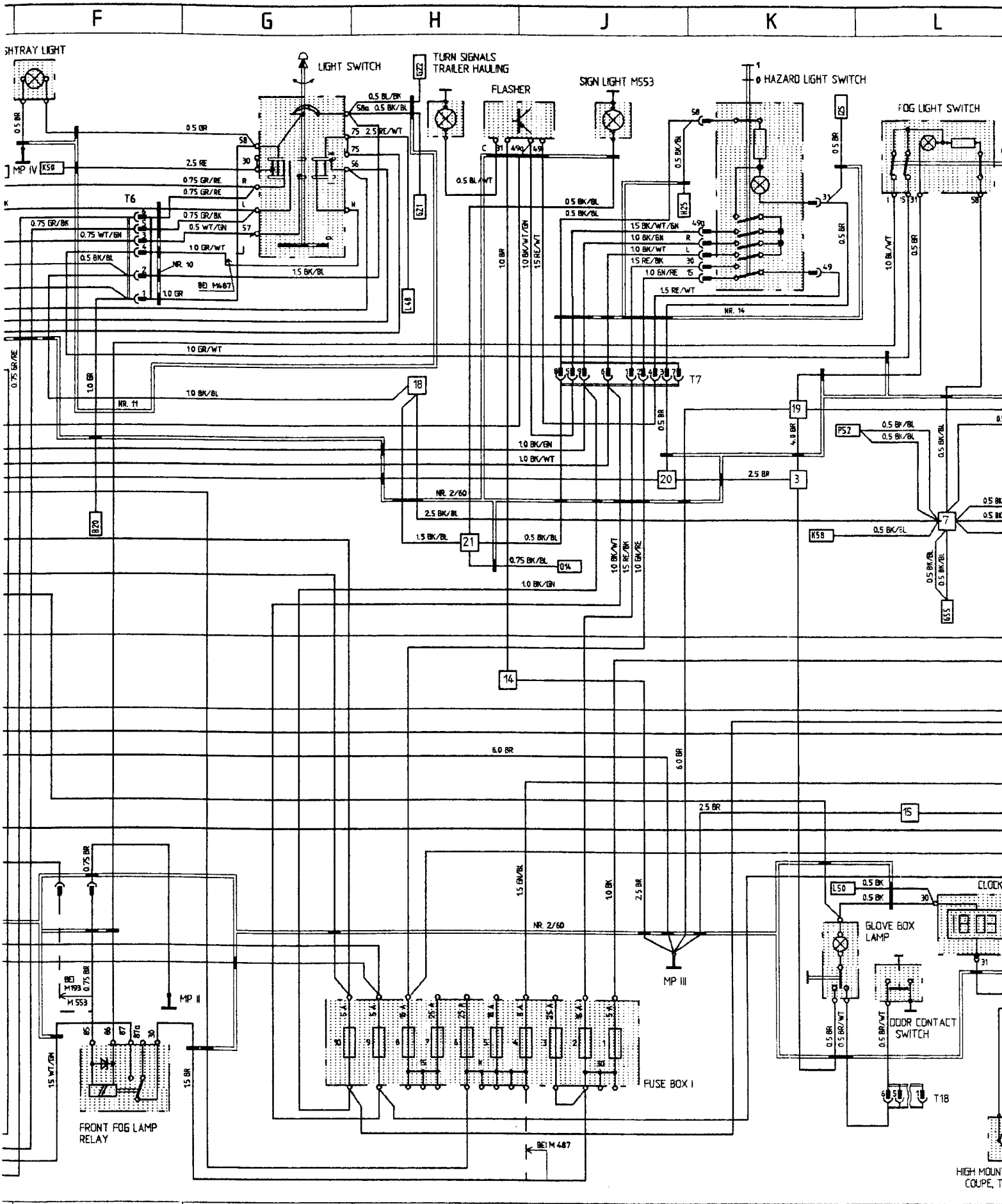
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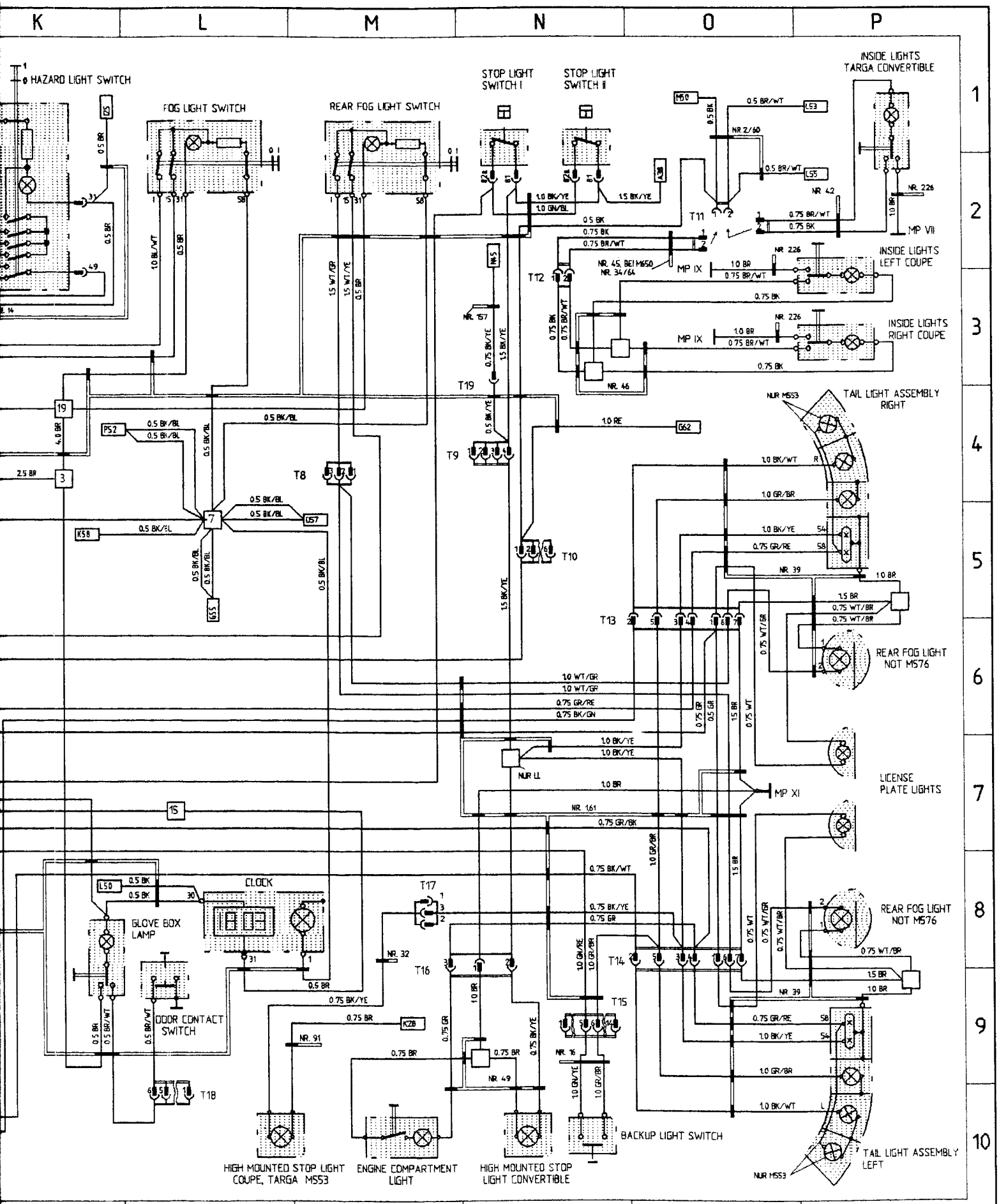
Wiring Diagram Type 911 Carrera Model 89 Sheet 1

LIGHTS



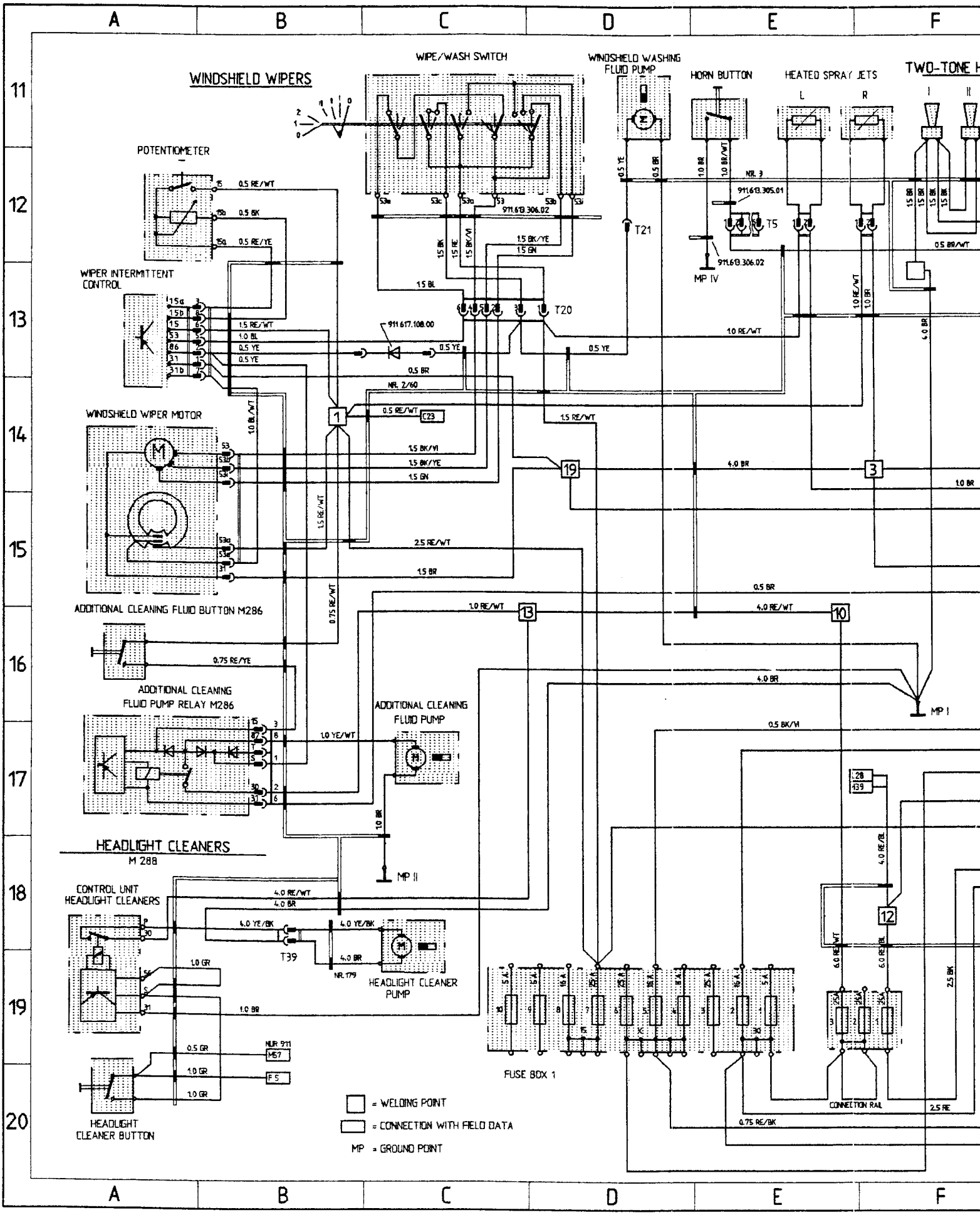
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G
H
J
K
L
SHTRAY LIGHT
LIGHT SWITCH
TURN SIGNALS
TRAILER HAULING
FLASHER
SIGN LIGHT M553
HAZARD LIGHT SWITCH
FOG LIGHT SWITCH
T6
T7
T18
NR. 10
NR. 11
NR. 14
NR. 2/60
MP IV
MP II
MP III
FUSE BOX I
FRONT FOG LAMP
RELAY
GLOVE BOX
LAMP
DOOR CONTACT
SWITCH
CLOCK
HIGH MOUNT
COUPE, T

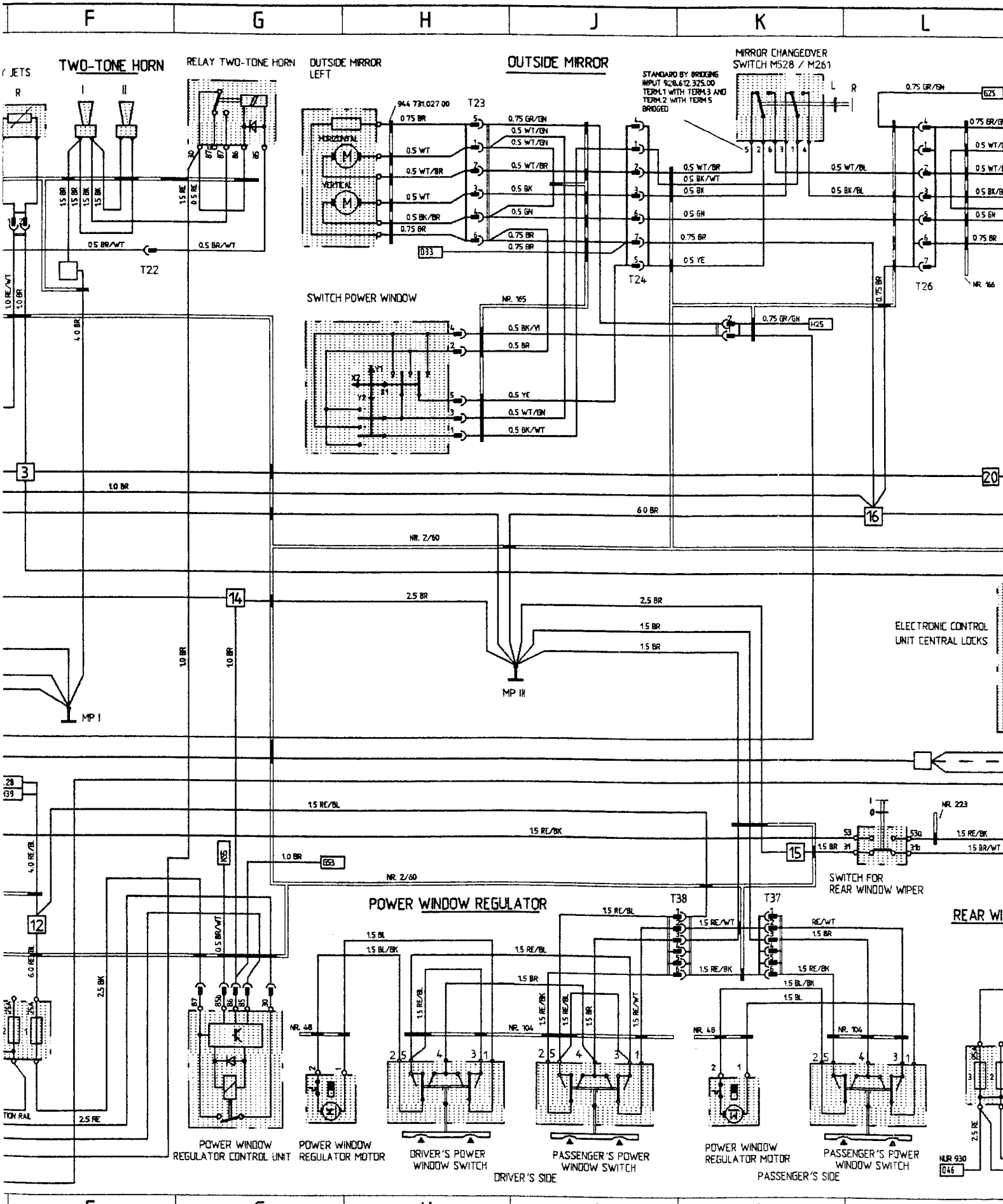

K
L
M
N
O
P
1
2
3
4
5
6
7
8
9
10
HAZARD LIGHT SWITCH
FOG LIGHT SWITCH
REAR FOG LIGHT SWITCH
STOP LIGHT SWITCH I
STOP LIGHT SWITCH II
INSIDE LIGHTS TARGA CONVERTIBLE
INSIDE LIGHTS LEFT COUPE
INSIDE LIGHTS RIGHT COUPE
TAIL LIGHT ASSEMBLY RIGHT
TAIL LIGHT ASSEMBLY LEFT
REAR FOG LIGHT NOT MS76
LICENSE PLATE LIGHTS
CLOCK
GLOVE BOX LAMP
DOOR CONTACT SWITCH
BACKUP LIGHT SWITCH
HIGH MOUNTED STOP LIGHT COUPE, TARGA MS53
ENGINE COMPARTMENT LIGHT
HIGH MOUNTED STOP LIGHT CONVERTIBLE
MP VII
MP IX
MP XI
T8
T9
T10
T11
T12
T13
T14
T15
T16
T17
T18
T19

Wiring Diagram Type 911 Carrera Model 89 Sheet 2

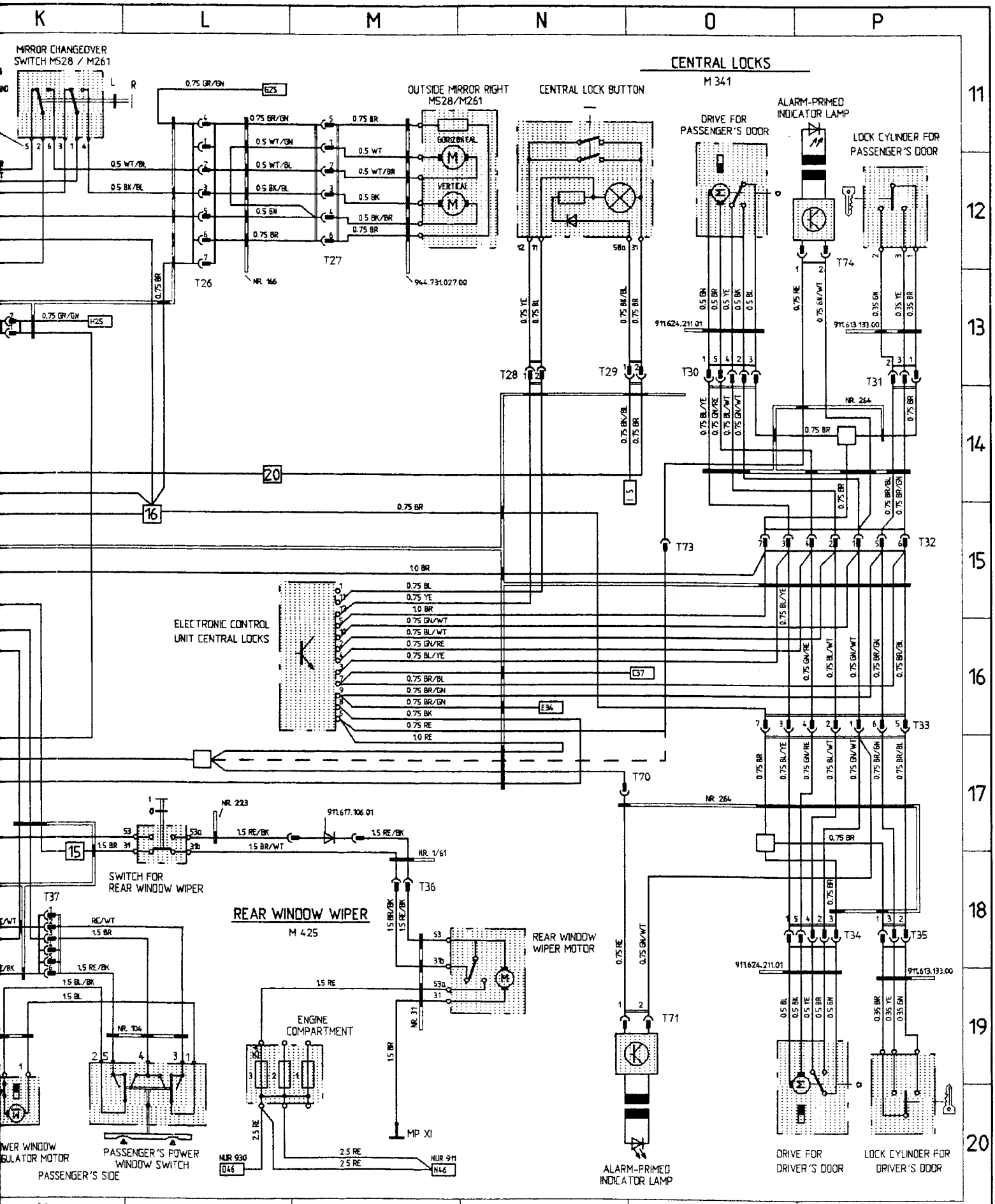
BODY



Printed in Germany XI 1988

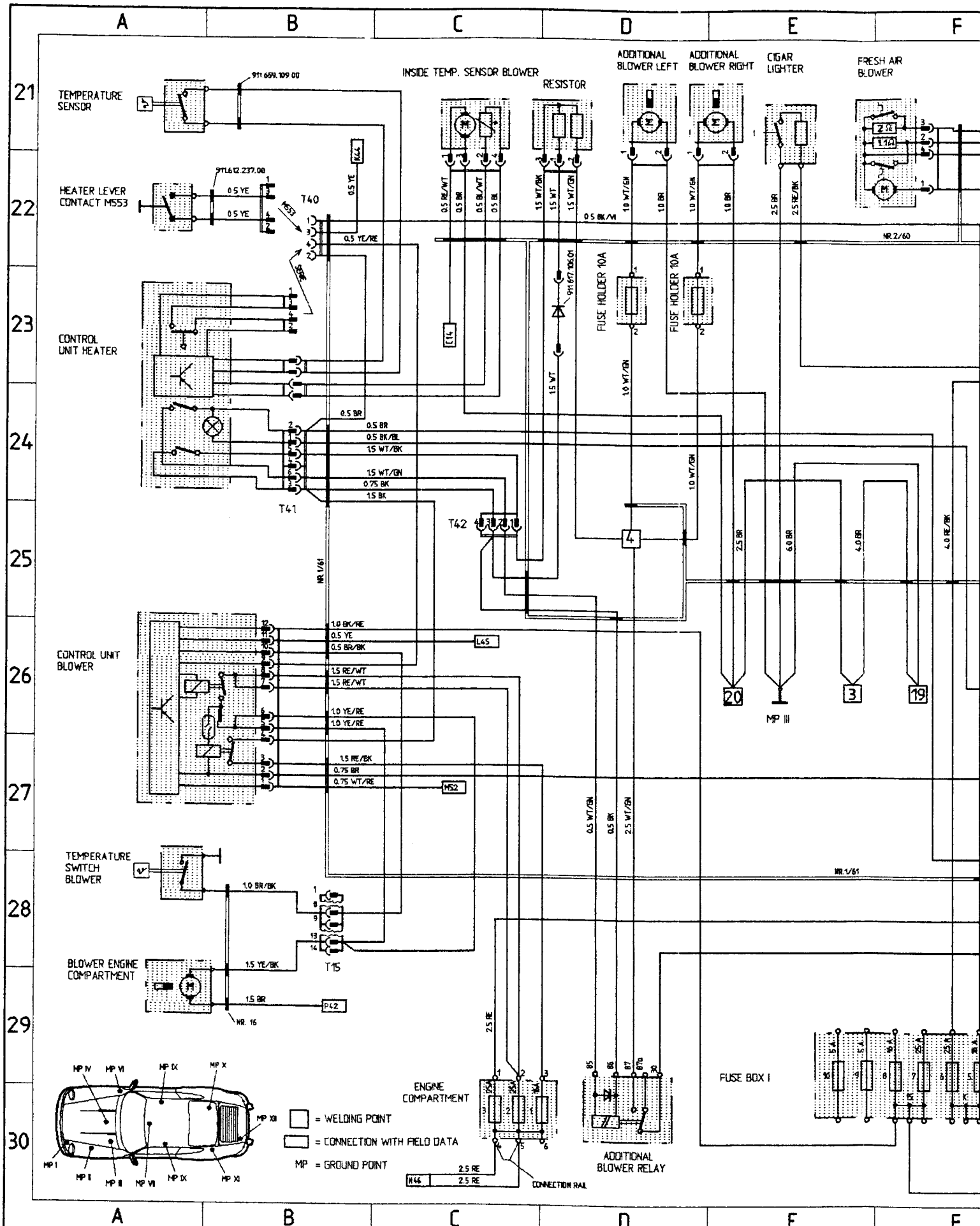


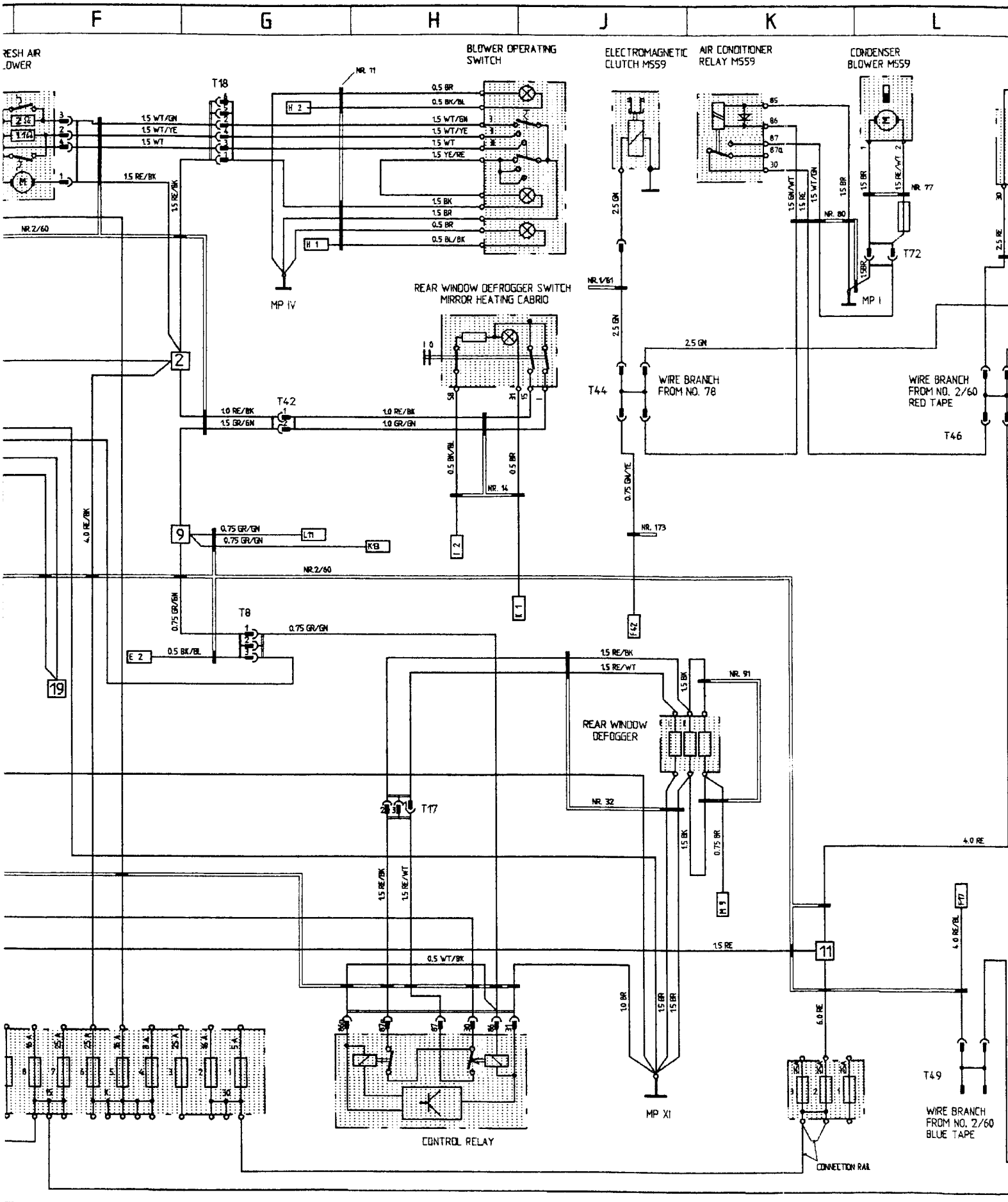
= BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET

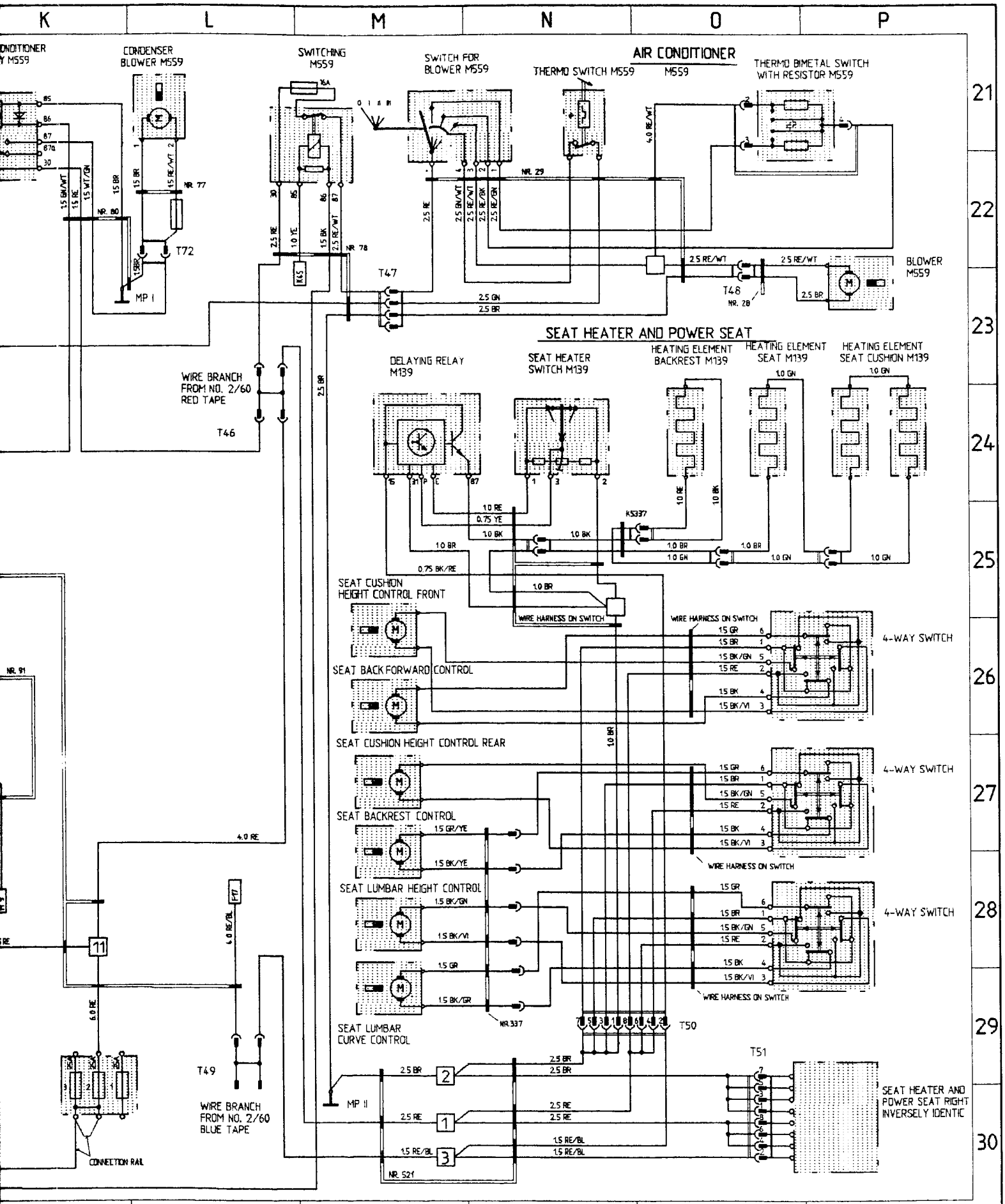

K
L
M
N
O
P
11
12
13
14
15
16
17
18
19
20
MIRROR CHANGEOVER SWITCH M528 / M261
CENTRAL LOCKS
M 341
OUTSIDE MIRROR RIGHT M528/M261
CENTRAL LOCK BUTTON
DRIVE FOR PASSENGER'S DOOR
ALARM-PRIMED INDICATOR LAMP
LOCK CYLINDER FOR PASSENGER'S DOOR
T26
T27
T28
T29
T30
T31
T74
T73
T32
T33
T34
T35
T36
T37
T70
T71
ELECTRONIC CONTROL UNIT CENTRAL LOCKS
E37
E34
SWITCH FOR REAR WINDOW WIPER
REAR WINDOW WIPER
M 425
REAR WINDOW WIPER MOTOR
ENGINE COMPARTMENT
MP XI
PASSENGER'S POWER WINDOW SWITCH
PASSENGER'S SIDE
DRIVE FOR DRIVER'S DOOR
LOCK CYLINDER FOR DRIVER'S DOOR
ALARM-PRIMED INDICATOR LAMP
NR. 166
NR. 264
NR. 223
NR. 1/61
NR. 104
NR. 31
911.624.211.01
911.613.133.00
911.617.106.01
944.731.027.00
NUR 930
NUR 911
046
N46
0.75 GR/GN
0.5 WT/BL
0.5 BK/BL
0.5 WT/GN
0.5 WT/BR
0.5 BK/GN
0.5 BK/BR
0.5 GN
0.75 BR
0.75 YE
0.75 BL
0.75 BK/BL
0.75 BK/BR
0.75 BL/YE
0.75 GN/RE
0.75 BL/WT
0.75 GN/WT
0.75 BR/BL
0.75 BR/GN
0.75 BK
0.75 RE
1.0 BR
1.0 RE
1.5 BR
1.5 RE/BK
1.5 BR/WT
1.5 RE/WT
1.5 BL/BK
1.5 BL
2.5 RE
0.5 BL
0.5 YE
0.35 YE
0.35 BR
0.35 GN
HORIZONTAL
VERTICAL

Wiring Diagram Type 911 Carrera Model 89 Sheet 3

HEATER AND VENTILATION



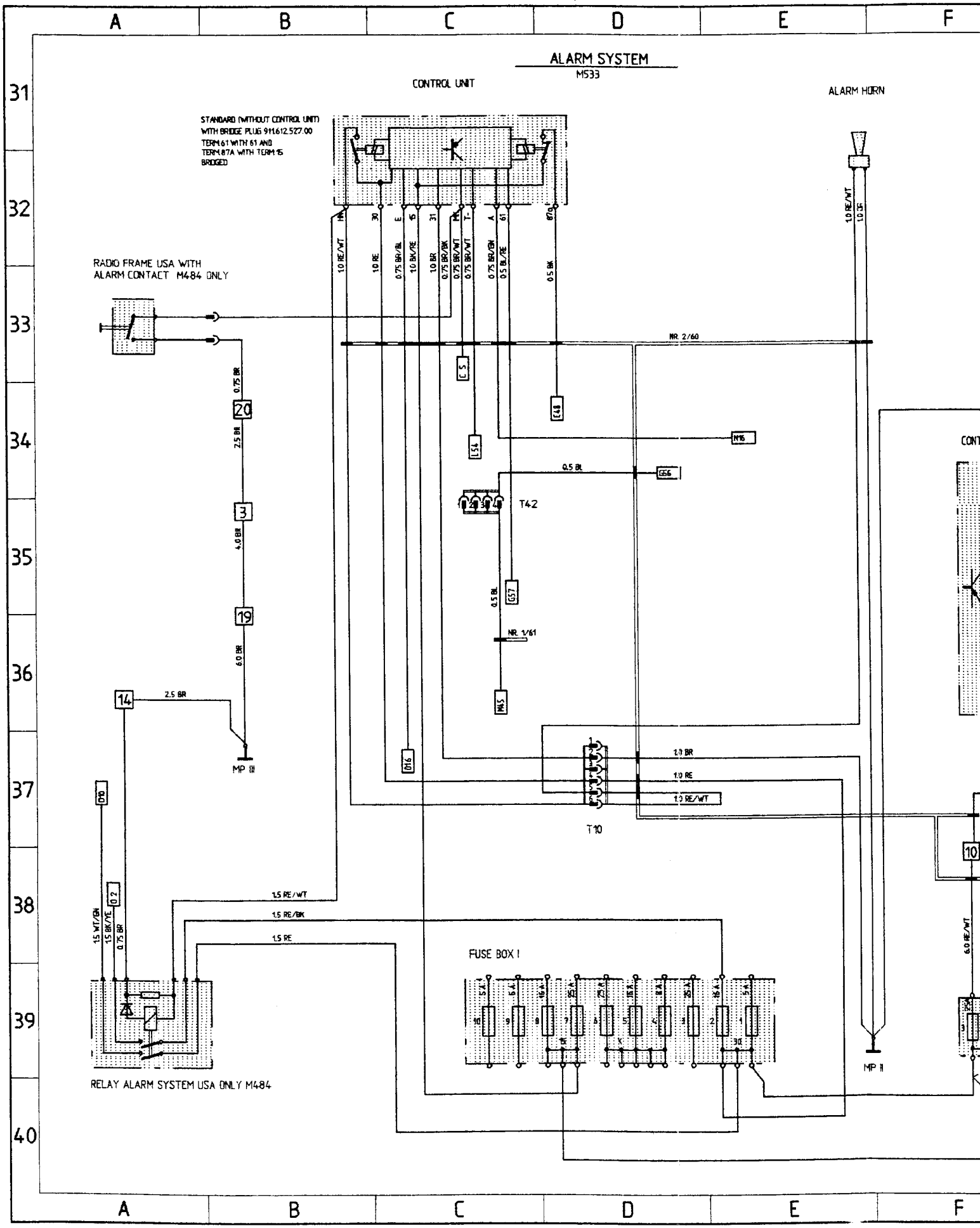

F
G
H
J
K
L
RESH AIR
LOWER
BLOWER OPERATING SWITCH
ELECTROMAGNETIC CLUTCH M559
AIR CONDITIONER RELAY M559
CONDENSER BLOWER M559
T18
NR. 11
H 2
H 1
0.5 BR
0.5 BK/BL
1.5 WT/GN
1.5 WT/YE
1.5 WT
1.5 YE/RE
1.5 BK
1.5 BR
0.5 BL/BK
1.5 RE/BK
NR.2/60
MP IV
REAR WINDOW DEFROGGER SWITCH
MIRROR HEATING CABRIO
T42
1.0 RE/BK
1.5 GR/GN
1.0 GR/GN
0.5 BK/BL
0.5 BR
NR. 14
I 2
I 1
2.5 GN
NR. 1/61
T44
WIRE BRANCH FROM NO. 78
WIRE BRANCH FROM NO. 2/60 RED TAPE
T46
T72
MP I
NR. 77
NR. 80
1.5 GN/WT
1.5 WT/GN
1.5 RE
1.5 BR
1.5 RE/WT
0.75 GN/YE
NR. 173
F 42
9
0.75 GR/GN
L 71
K 9
4.0 RE/BK
19
T8
E 2
0.5 BK/BL
1.5 RE/BK
1.5 RE/WT
NR. 91
REAR WINDOW DEFOGGER
NR. 32
T17
M 9
4.0 RE
1.5 RE
11
0.5 WT/BK
1.0 BR
6.0 RE
F 17
4.0 RE/BL
T49
WIRE BRANCH FROM NO. 2/60 BLUE TAPE
MP XI
CONTROL RELAY
CONNECTION RAIL
K = BLACK
WT = WHITE
RE = RED
GN = GREEN
YE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
VI = VIOLET

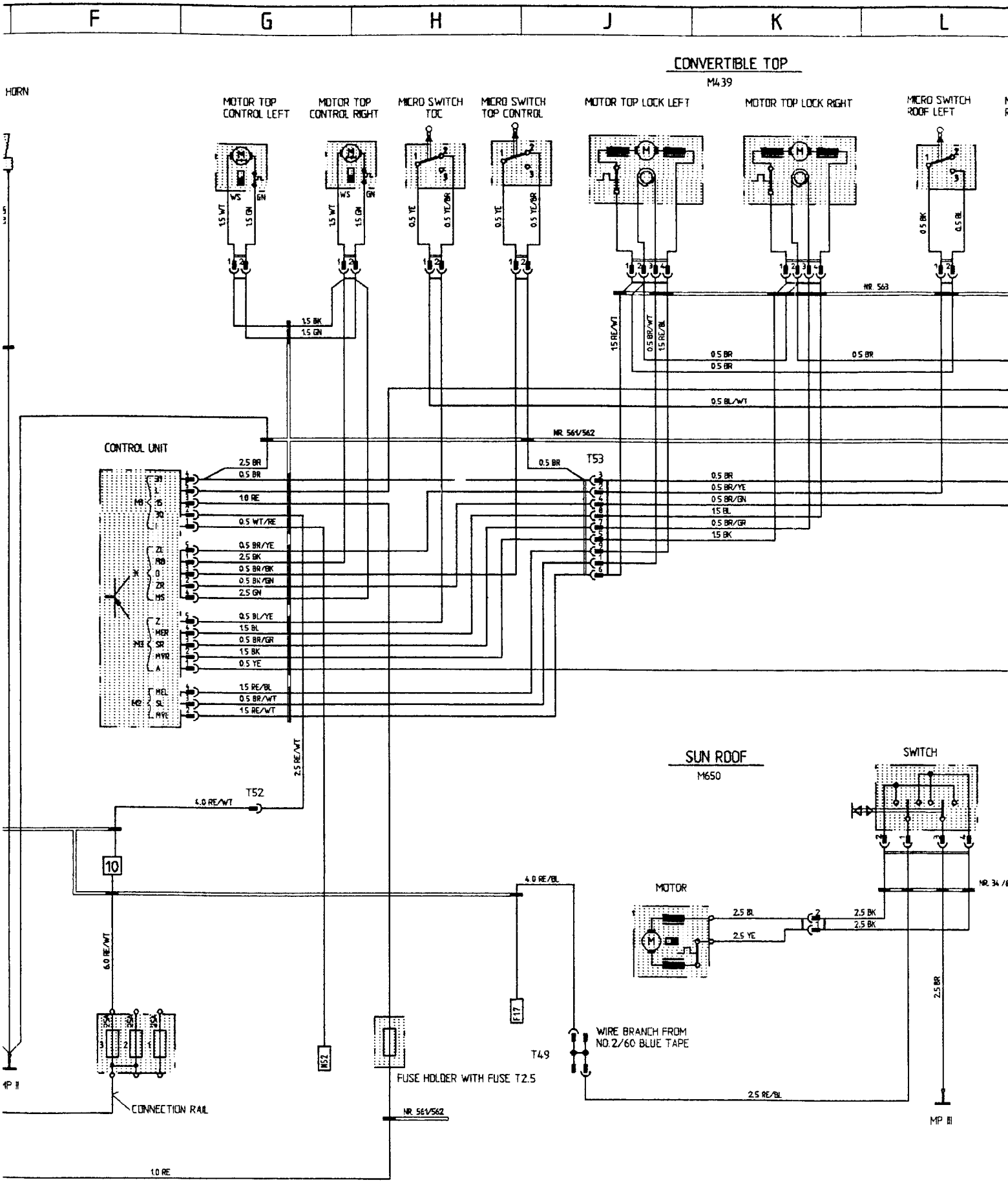


BLUE VI = VIOLET

Wiring Diagram Type 911 Carrera Model 89 Sheet 4

POWER TOP, ALARM SYSTEM, SUN ROOF

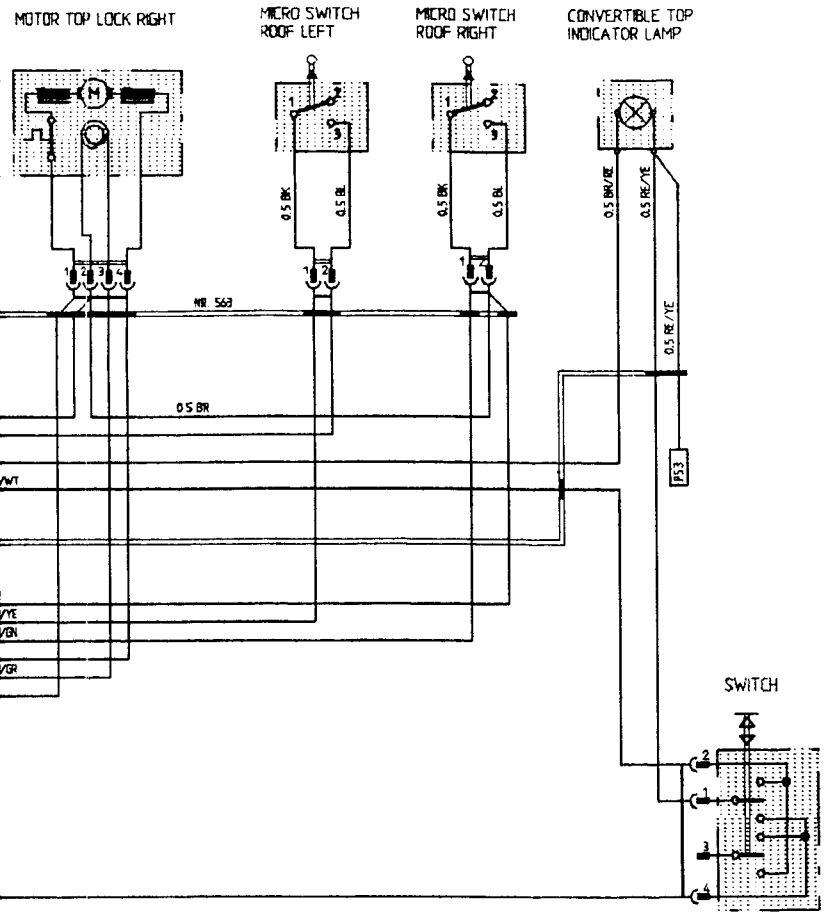




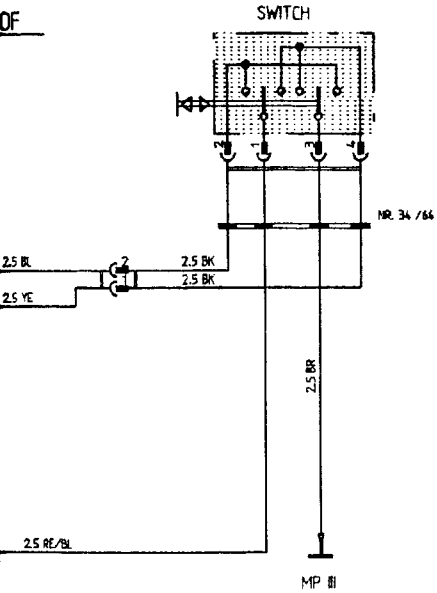
K = BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET

K L M N O P

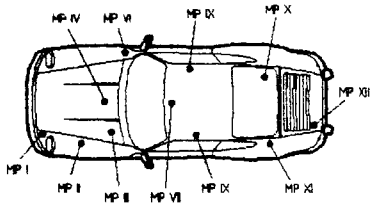
BLE TOP



OF



= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT

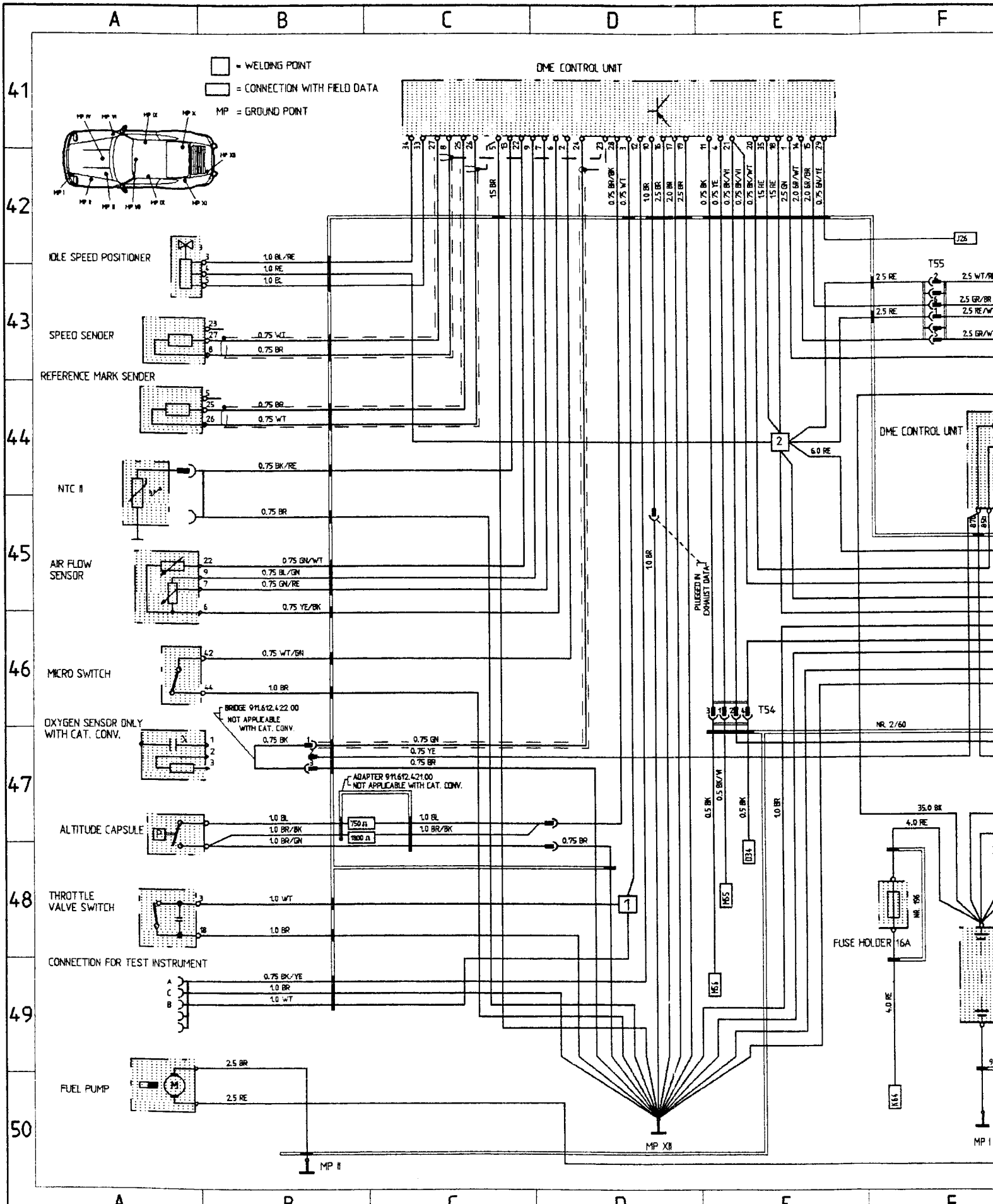


31 32 33 34 35 36 37 38 39 40

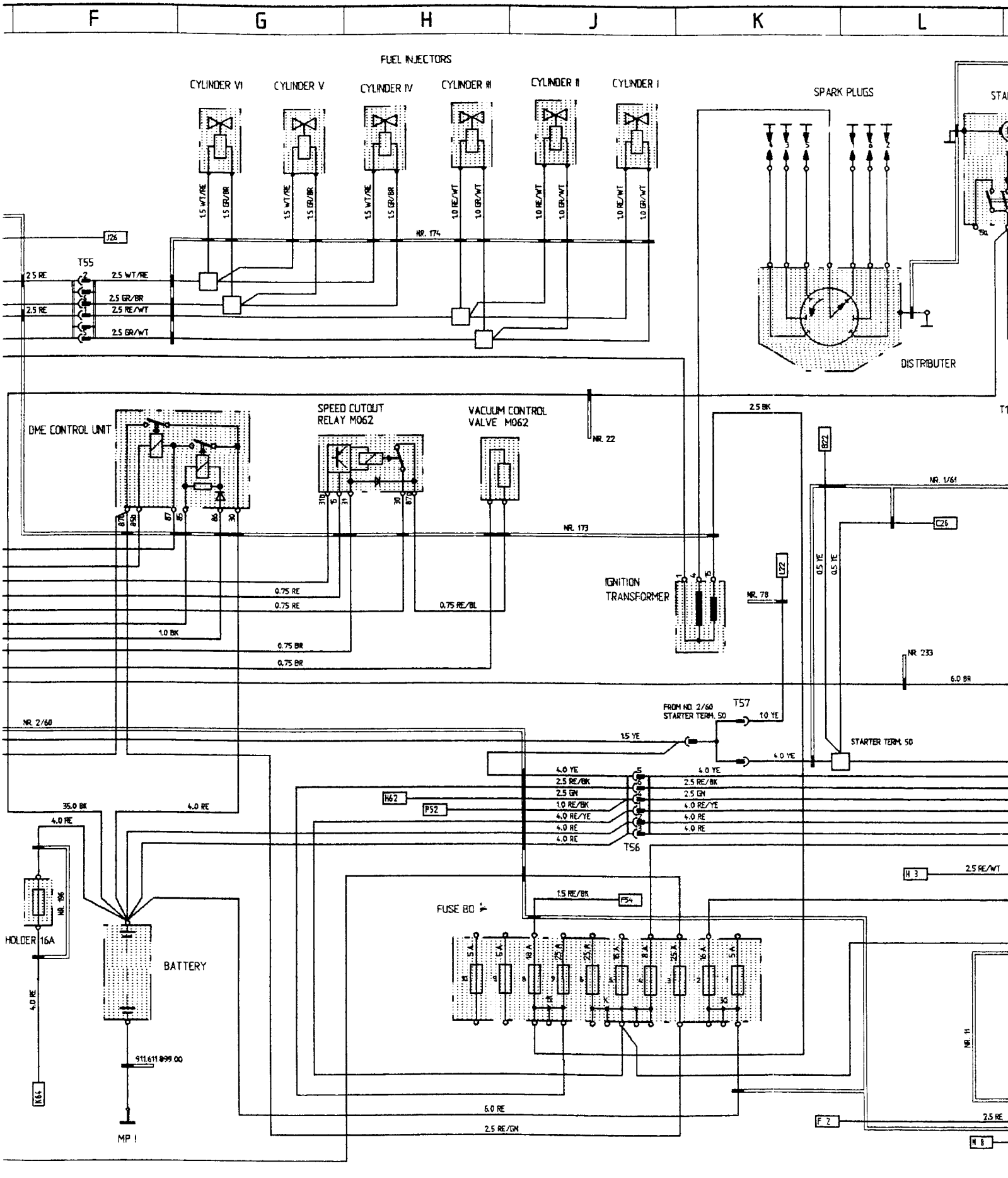
K L M N O P

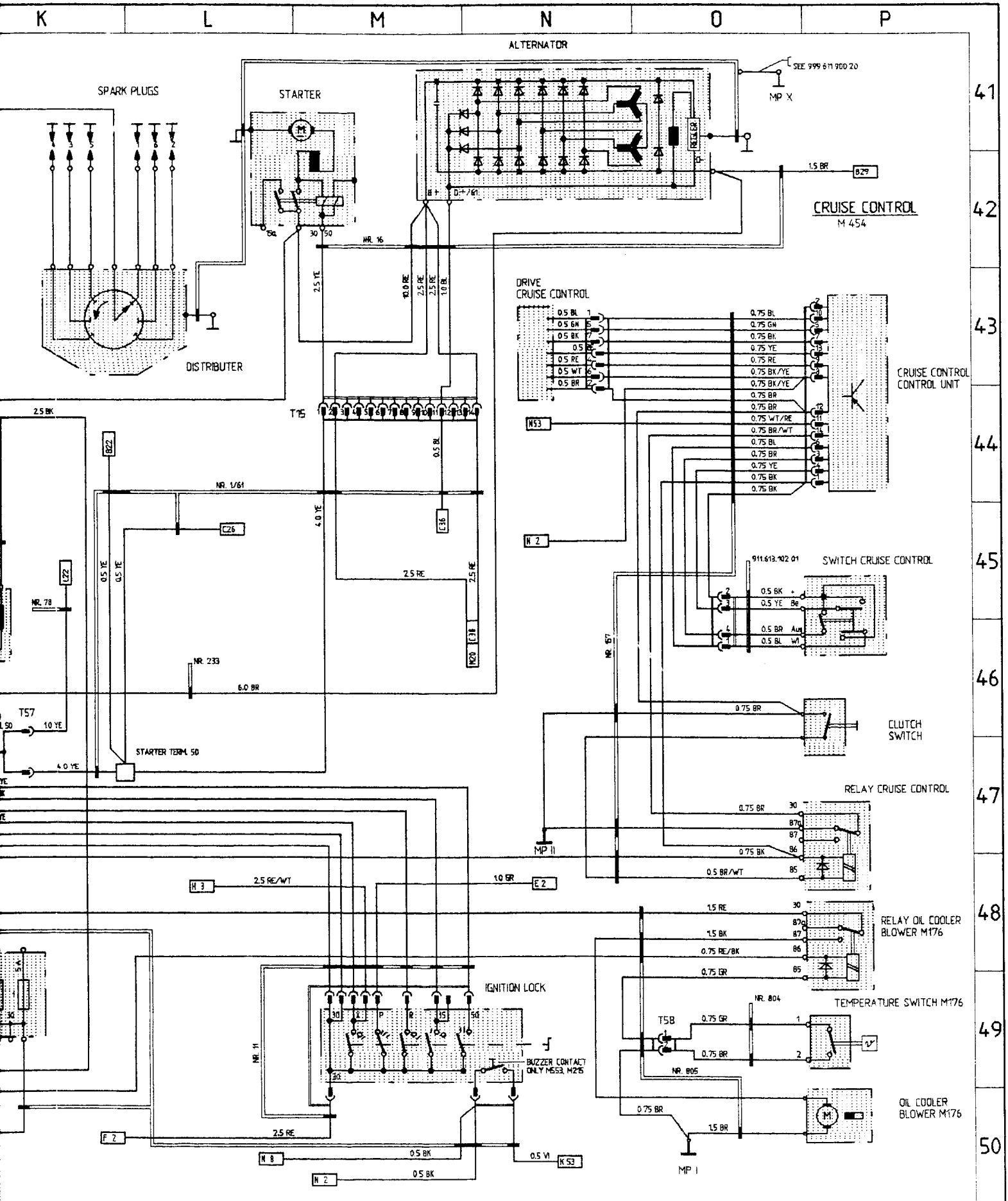
Wiring Diagram Type 911 Carrera Model 89 Sheet 5

DIGITAL MOTOR ELECTRONICS, ENGINE, TEMPOSTAT



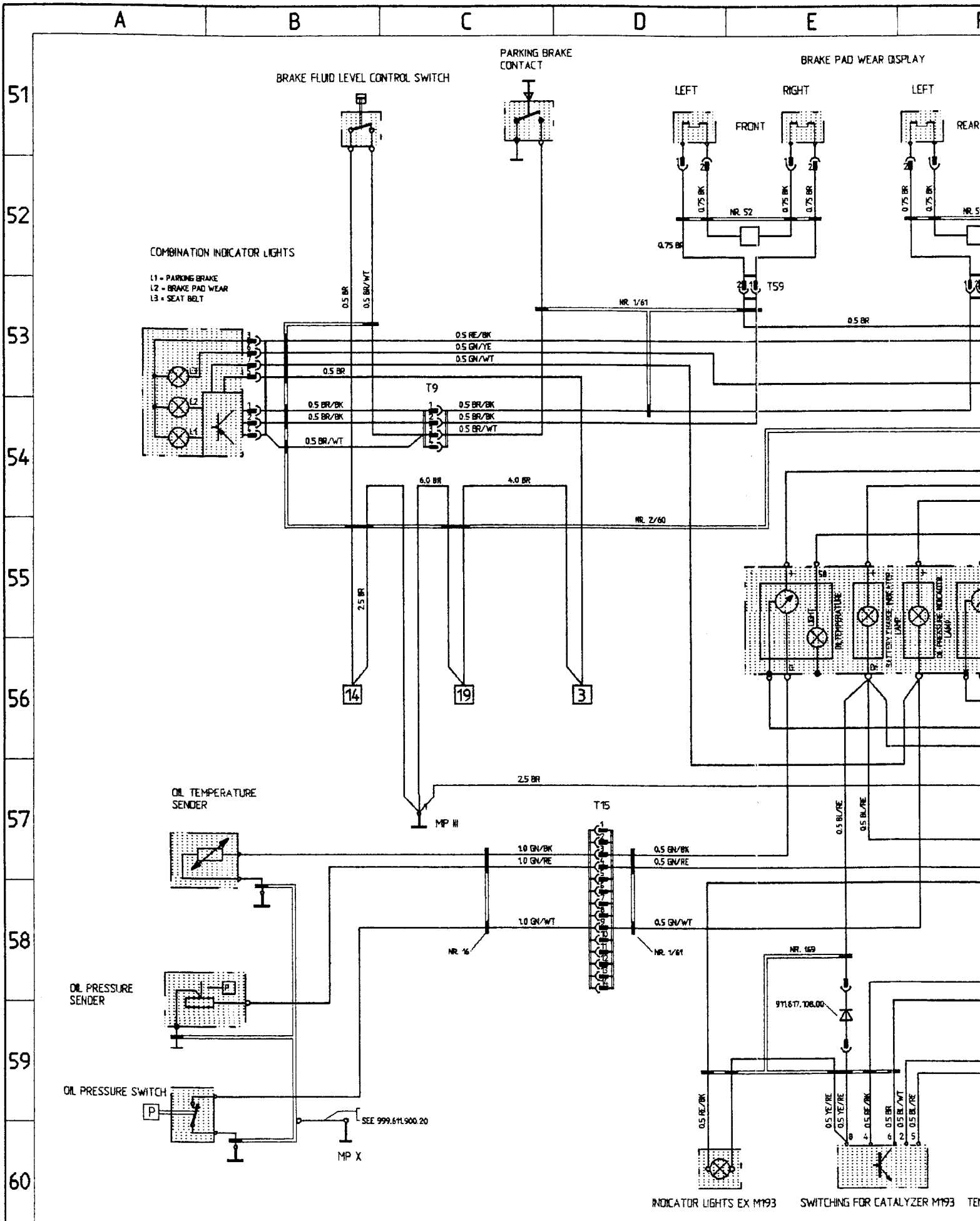
Printed in Germany XI 1988


F
G
H
J
K
L
FUEL INJECTORS
CYLINDER VI
CYLINDER V
CYLINDER IV
CYLINDER III
CYLINDER II
CYLINDER I
SPARK PLUGS
DISTRIBUTER
J26
T55
2.5 RE
2.5 WT/RE
2.5 GR/BR
2.5 RE/WT
2.5 GR/WT
1.5 WT/RE
1.5 GR/BR
1.0 RE/WT
1.0 GR/WT
NR. 174
DME CONTROL UNIT
SPEED CUTOUT RELAY M062
VACUUM CONTROL VALVE M062
NR. 22
NR. 173
2.5 BK
IGNITION TRANSFORMER
NR. 78
L22
B22
NR. 1/61
C26
0.5 YE
NR. 233
6.0 BR
0.75 RE
0.75 RE/BL
1.0 BK
0.75 BR
FROM NO. 2/60 STARTER TERM. 50
T57
1.0 YE
1.5 YE
4.0 YE
STARTER TERM. 50
NR. 2/60
35.0 BK
4.0 RE
H62
P52
2.5 RE/BK
2.5 GN
1.0 RE/BK
4.0 RE/YE
T56
H 3
2.5 RE/WT
1.5 RE/BK
F54
FUSE BO
HOLDER 16A
NR. 196
BATTERY
911.611.899.00
MP 1
K64
6.0 RE
2.5 RE/GN
F 2
N 8
NR. 11


K
L
M
N
O
P
ALTERNATOR
SEE 999 611 900 20
MP X
SPARK PLUGS
STARTER
DISTRIBUTER
1.5 BR
B29
CRUISE CONTROL
M 454
NR. 16
2.5 YE
10.0 RE
2.5 RE
2.5 RE
1.0 BL
DRIVE
CRUISE CONTROL
CRUISE CONTROL
CONTROL UNIT
T15
2.5 BK
B22
NR. 1/61
4.0 YE
C26
E36
2.5 RE
2.5 RE
C38
M20
NR. 78
Z22
0.5 YE
0.5 YE
NR. 233
6.0 BR
T57
1.0 YE
4.0 YE
STARTER TERM. 50
N53
N 2
911.613.702 01
SWITCH CRUISE CONTROL
NR. 157
CLUTCH
SWITCH
0.75 BR
RELAY CRUISE CONTROL
MP 11
0.75 BR
0.75 BK
0.5 BR/WT
H 3
2.5 RE/WT
1.0 BR
E 2
1.5 RE
1.5 BK
0.75 RE/BK
0.75 GR
RELAY OIL COOLER
BLOWER M176
IGNITION LOCK
NR. 11
BUZZER CONTACT
ONLY M553, M215
NR. 804
TEMPERATURE SWITCH M176
T5B
0.75 GR
0.75 BR
NR. 805
OIL COOLER
BLOWER M176
0.75 BR
1.5 BR
MP 1
F 2
2.5 RE
N 8
0.5 BK
0.5 VI
K53
N 2
0.5 BK
41
42
43
44
45
46
47
48
49
50

Wiring Diagram Type 911 Carrera Model 89 Sheet

INSTRUMENTS AND SENDER



F | G | H | J | K | L

DISPLAY

LEFT RIGHT REAR

NR. 51

T60

SWITCHING FOR SEAT BELT FOR M553, M215

FOR ROW: BRIDGED TERM.L AND TERM.G (BRIDGE 911.612.816.00) BRIDGED TERM.86 AND TERM.31 (BRIDGE 911.612.916.00)

SEAT BELT CONTACT

DOOR CONTACT SWITCH LEFT RIGHT

0.5 VI

0.5 BR/WT

N50

0.5 RE/BK

1.0 BR

0.5 GR/RE

618

P 1

P 2

17

148

1.5 RE/BK

911.617.108.00

0.75 BR/WT

0.5 BK/BL

L 5

VS 7

INSTRUMENT CLUSTER Ø100

8

NR. 2/60

1.0 BR

0.5 BL

034

G35

15

K 5

INSTRUMENT CLUSTER Ø80

0.5 EN

0.5 BK

0.5 BR

0.75 WT

0.75 WT/BR

NR. 1/61

NR. 171

OIL LEVE TRANSMITTER OIL TANK

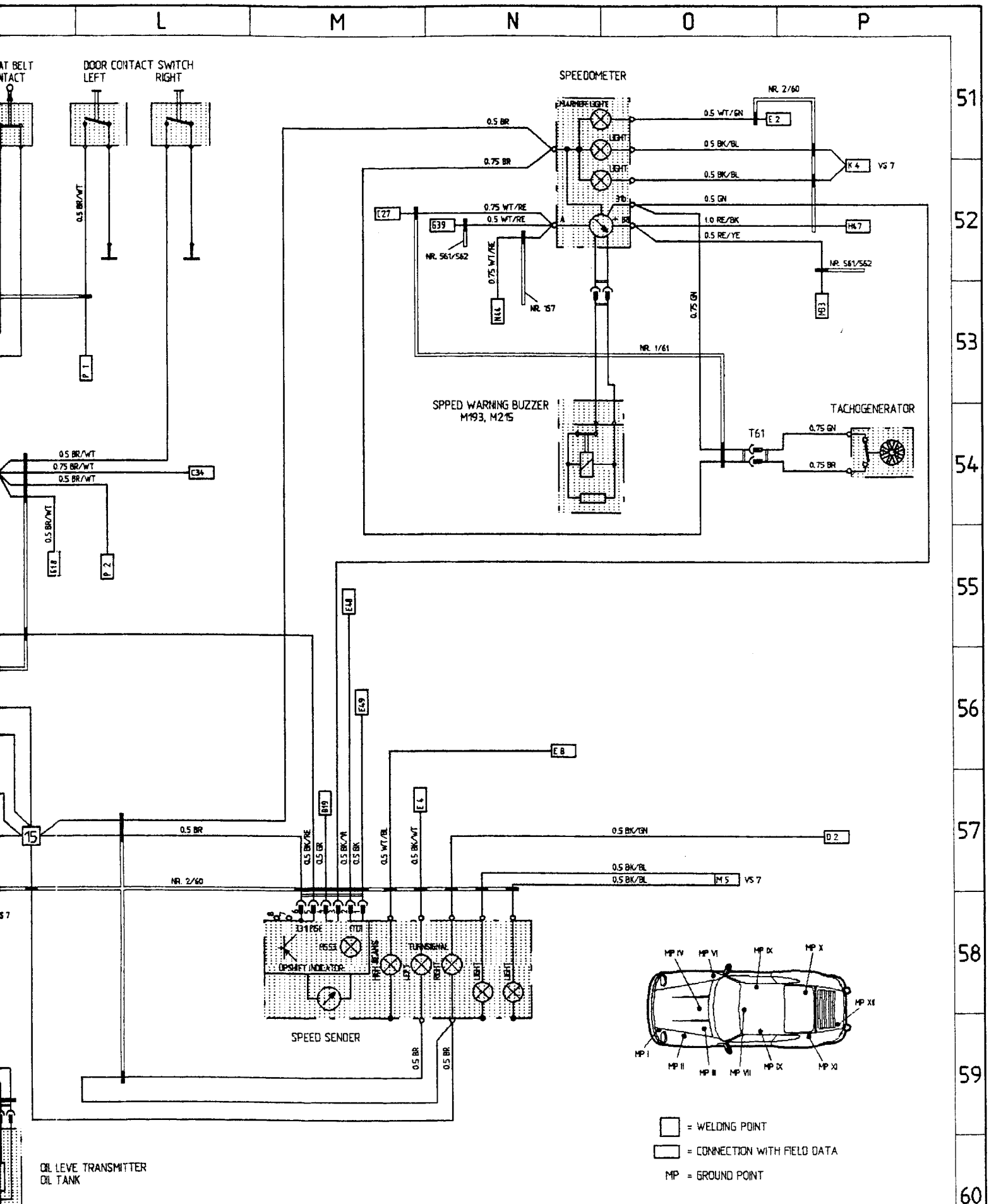
ALYZER M193

TEMPERATURE SENSOR M193

FUEL LEVEL SENDER

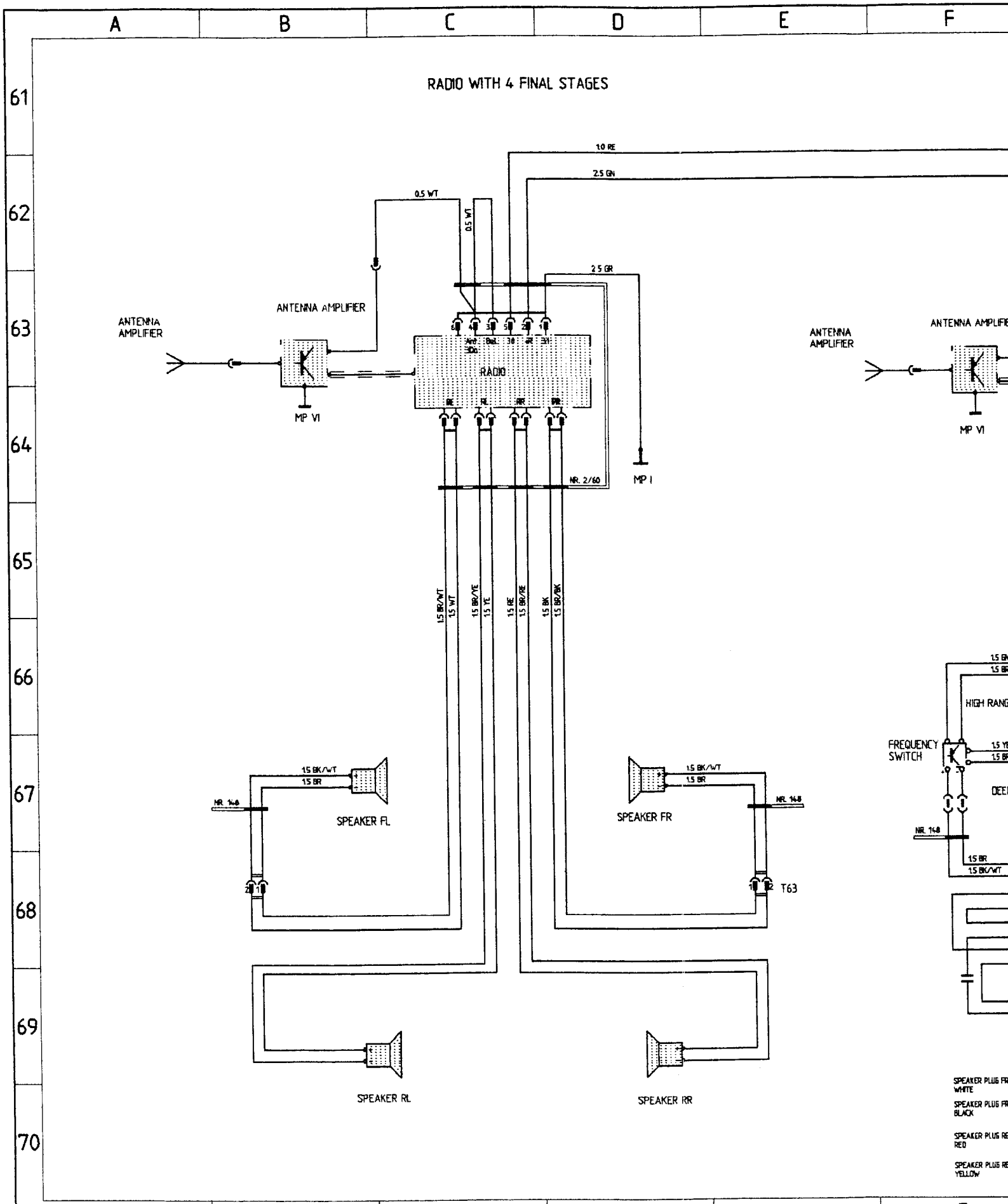
MP II

MP XI


L
M
N
O
P
51
52
53
54
55
56
57
58
59
60
SEAT BELT
DOOR CONTACT SWITCH
LEFT
RIGHT
SPEEDOMETER
WARNING LIGHT
LIGHT
LIGHT
NR. 2/60
0.5 BR
0.75 BR
0.5 WT/GN
0.5 BK/BL
0.5 BK/BL
K 4
VS 7
C27
639
0.75 WT/RE
0.5 WT/RE
0.5 GN
1.0 RE/BK
0.5 RE/YE
H47
NR. 561/562
NR. 561/562
0.75 WT/RE
N44
NR. 157
M33
0.75 GN
NR. 1/61
SPPED WARNING BUZZER
M193, M215
TACHOGENERATOR
T61
0.75 GN
0.75 BR
0.5 BR/WT
0.75 BR/WT
0.5 BR/WT
C34
0.5 BR/WT
E18
P 1
P 2
E 4
E 9
E 8
E 6
15
0.5 BR
B19
0.5 BK/RE
0.5 BR
0.5 BK/VI
0.5 BK
0.5 WT/BL
0.5 BK/WT
0.5 BK/GN
D 2
NR. 2/60
0.5 BK/BL
0.5 BK/BL
M 5
VS 7
S 7
131 PSE
OTDI
PSSE
OPSHIFT INDICATOR
HIGH BEAMS
TURNSIGNAL
LEFT
RIGHT
LIGHT
LIGHT
SPEED SENDER
0.5 BR
0.5 BR
MP IV
MP VI
MP IX
MP X
MP XI
MP I
MP II
MP III
MP VII
MP IX
MP XI
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
OIL LEVE TRANSMITTER
OIL TANK

Wiring Diagram Type 911 Carrera Model 89 Sheet 7

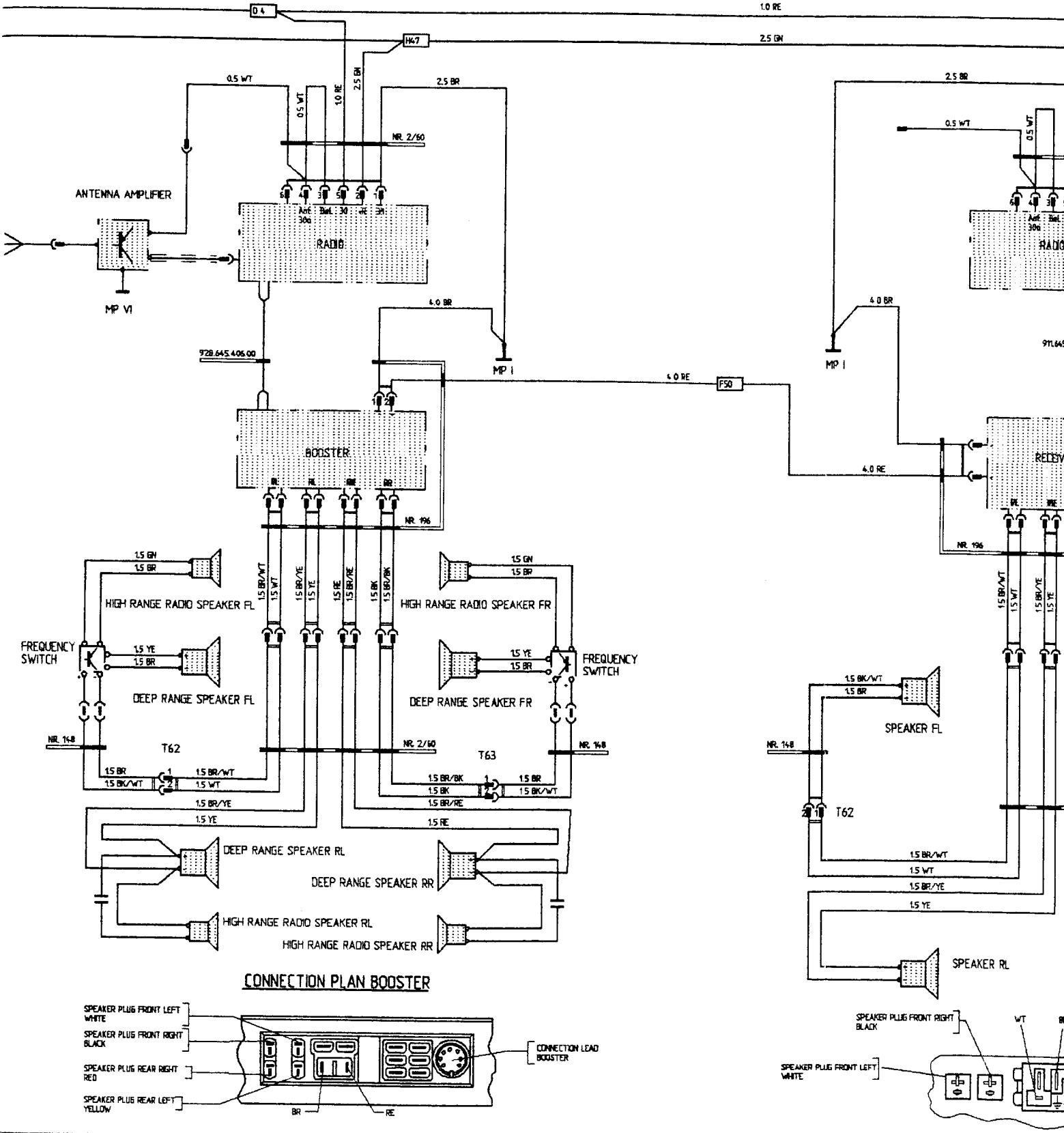
RADIO



F	G	H	J	K	L

RADIO WITH 4 FINAL STAGES
AND AUDIO OPTION PACK

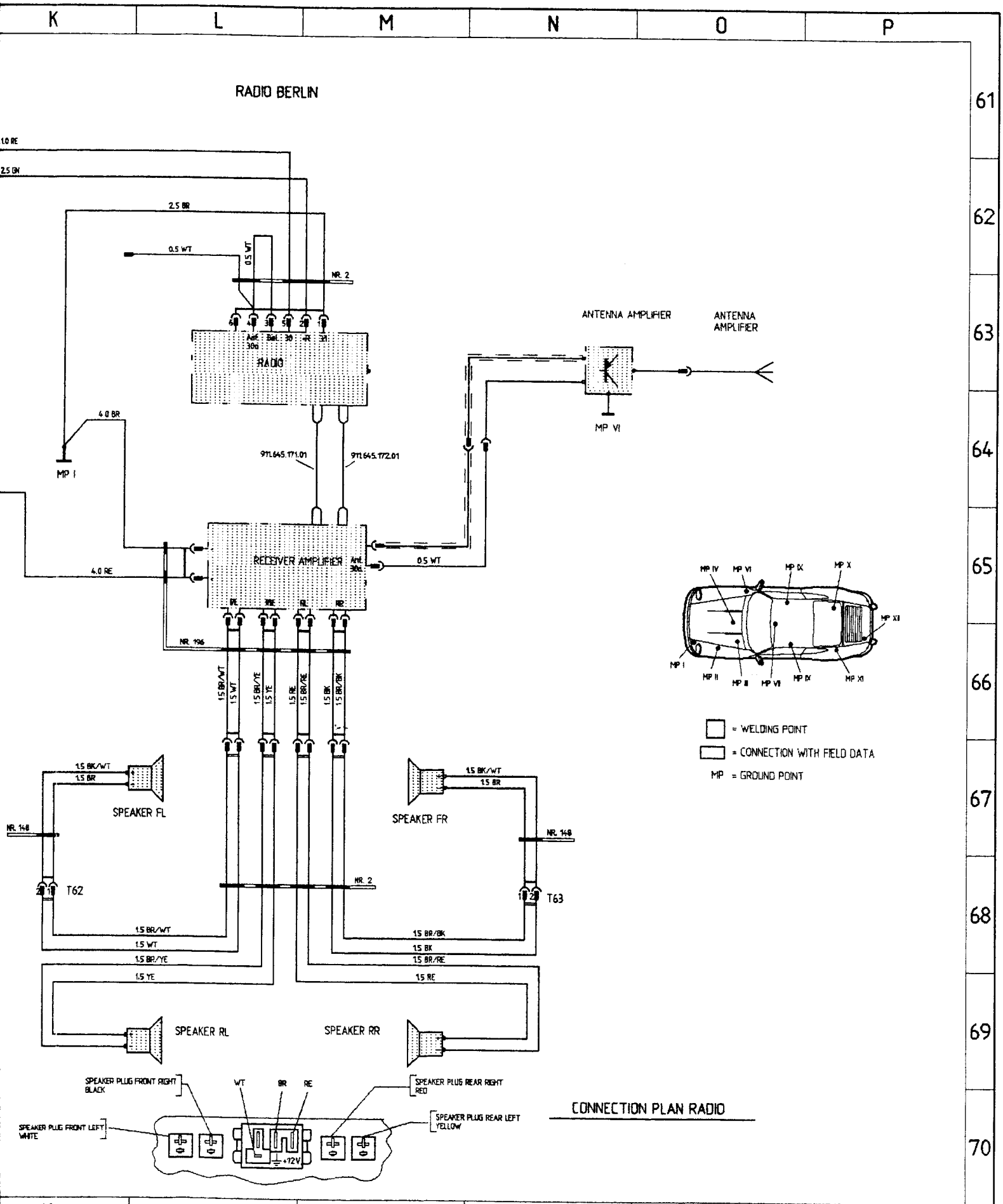
RADIO B



CONNECTION PLAN BOOSTER

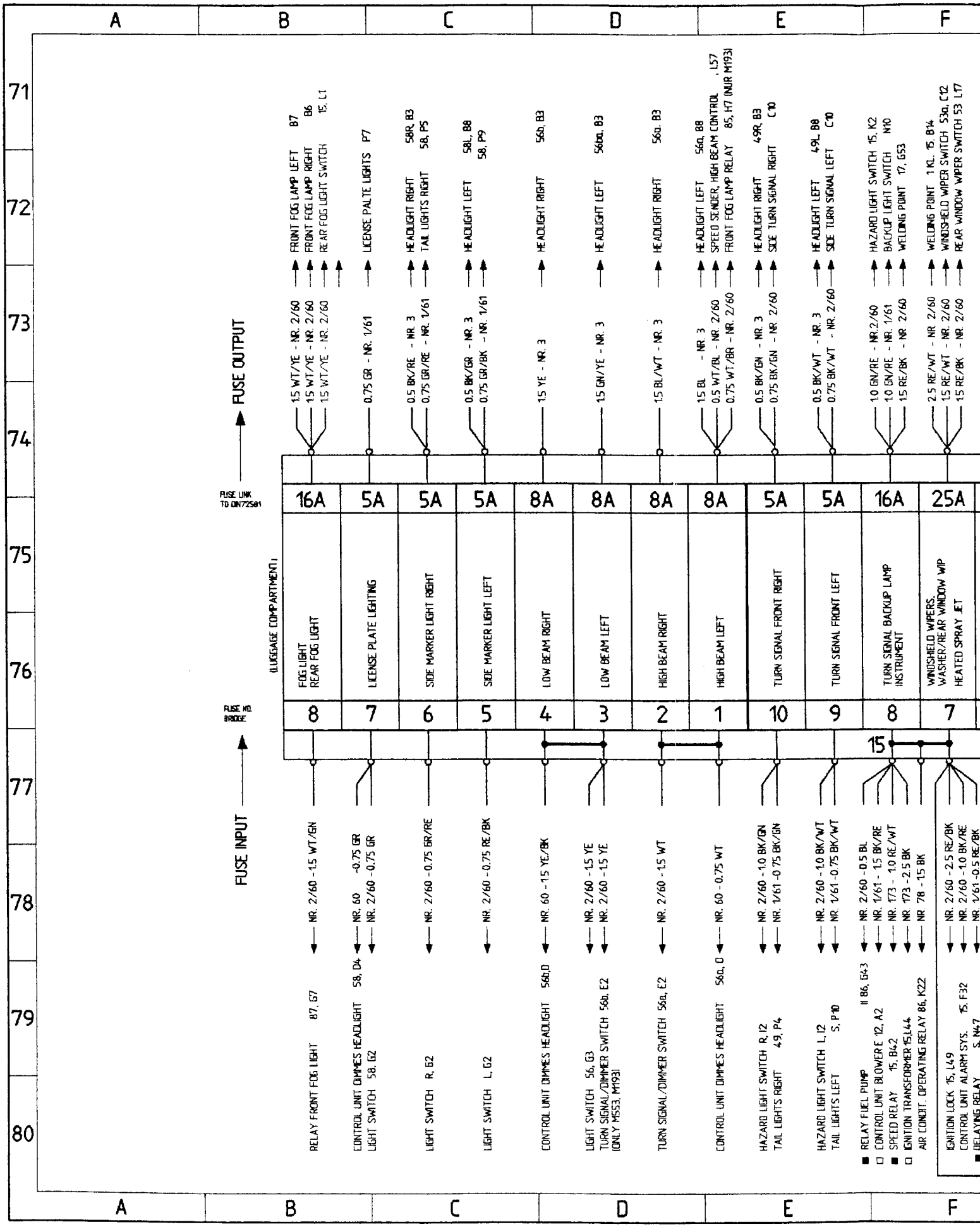
F	G	H	J	K	L

K = BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET

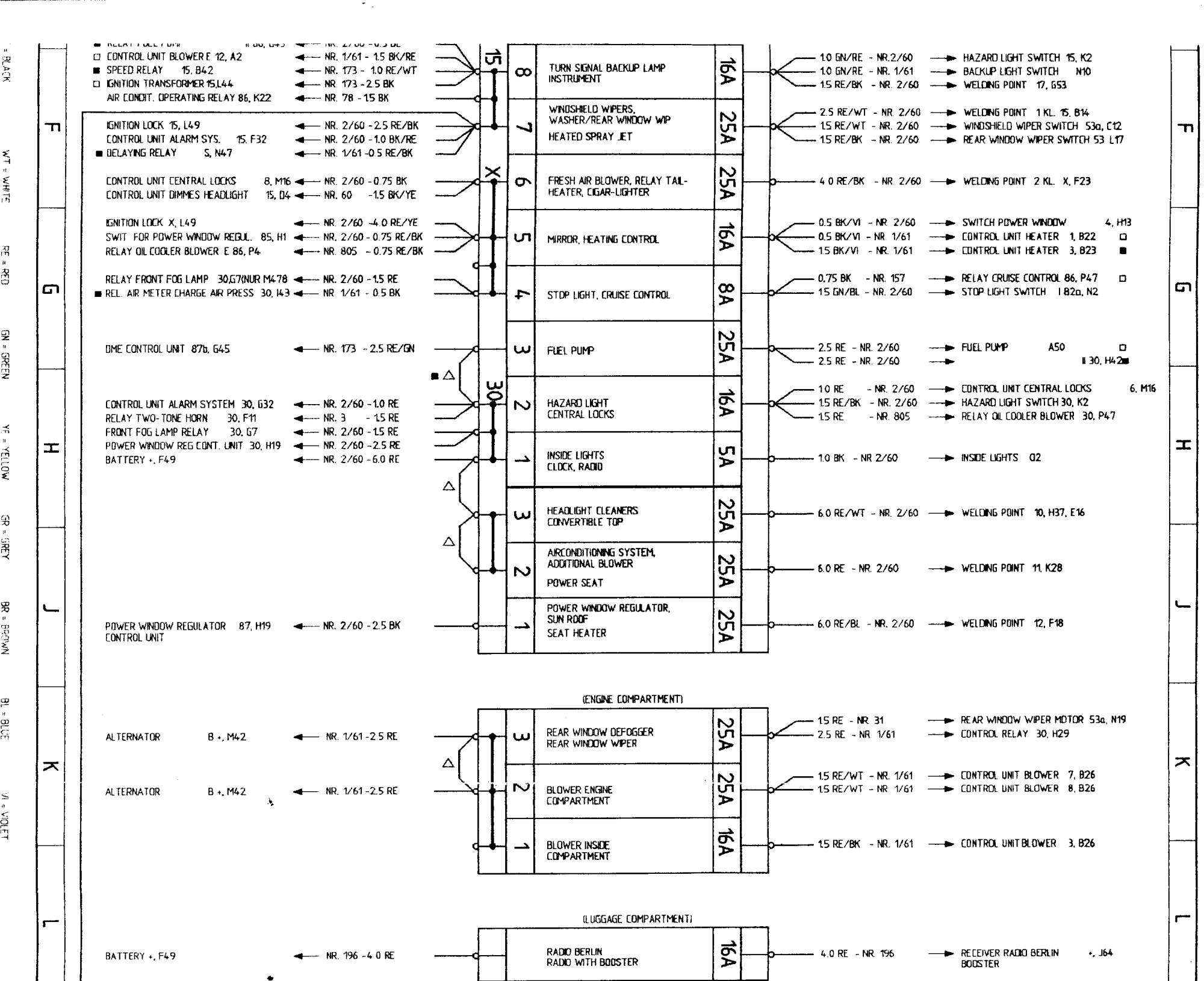

K
L
M
N
O
P
RADIO BERLIN
61
62
63
64
65
66
67
68
69
70
1.0 RE
2.5 GN
2.5 BR
0.5 WT
NR. 2
RADIO
ANTENNA AMPLIFIER
ANTENNA AMPLIFIER
MP VI
4.0 BR
MP I
971.645.171.01
971.645.172.01
RECEIVER AMPLIFIER
0.5 WT
4.0 RE
NR. 196
1.5 BR/WT
1.5 WT
1.5 BR/YE
1.5 YE
1.5 RE
1.5 BR/RE
1.5 BK
1.5 BR/BK
MP IV
MP VI
MP IX
MP X
MP XII
MP I
MP II
MP III
MP VII
MP IX
MP XI
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
1.5 BK/WT
1.5 BR
SPEAKER FL
SPEAKER FR
NR. 148
T62
T63
SPEAKER RL
SPEAKER RR
SPEAKER PLUG FRONT RIGHT BLACK
SPEAKER PLUG FRONT LEFT WHITE
SPEAKER PLUG REAR RIGHT RED
SPEAKER PLUG REAR LEFT YELLOW
WT
BR
RE
+12V
CONNECTION PLAN RADIO

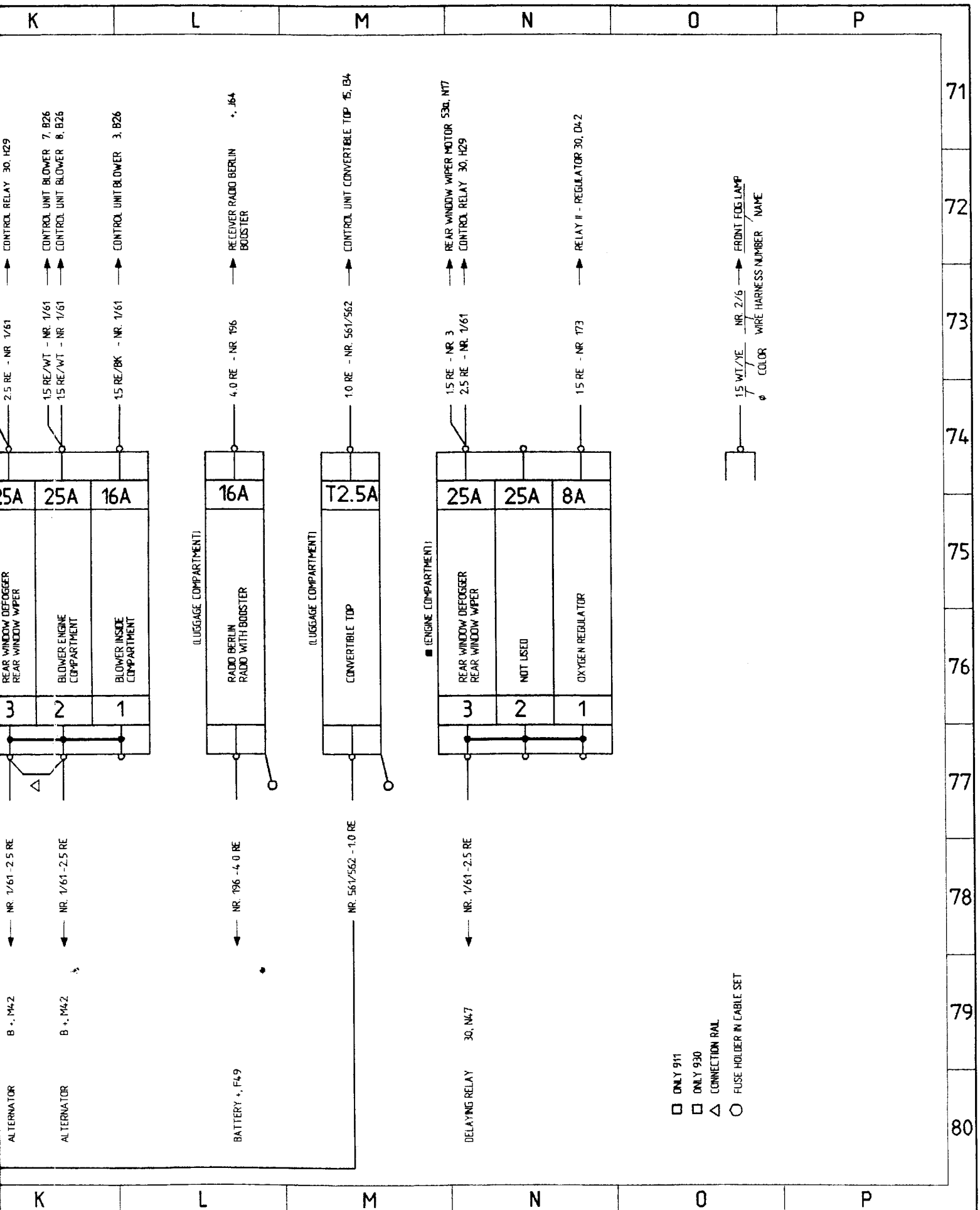
Wiring Diagram Type 911 Carrera Model 89 Sheet 8

FUSE ASSIGNMENTS AND POSITIONS



BK = BLACK


CONTROL UNIT BLOWER E 12, A2 ← NR. 1/61 - 1.5 BK/RE
SPEED RELAY 15, B42 ← NR. 173 - 1.0 RE/WT
IGNITION TRANSFORMER 15,L44 ← NR. 173 - 2.5 BK
AIR CONDIT. OPERATING RELAY 86, K22 ← NR. 78 - 1.5 BK
IGNITION LOCK 15, L49 ← NR. 2/60 - 2.5 RE/BK
CONTROL UNIT ALARM SYS. 15, F32 ← NR. 2/60 - 1.0 BK/RE
DELAYING RELAY S, N47 ← NR. 1/61 - 0.5 RE/BK
CONTROL UNIT CENTRAL LOCKS 8, M16 ← NR. 2/60 - 0.75 BK
CONTROL UNIT DIMMES HEADLIGHT 15, D4 ← NR. 60 - 1.5 BK/YE
IGNITION LOCK X, L49 ← NR. 2/60 - 4.0 RE/YE
SWIT. FOR POWER WINDOW REGUL. 85, H1 ← NR. 2/60 - 0.75 RE/BK
RELAY OIL COOLER BLOWER E 86, P4 ← NR. 805 - 0.75 RE/BK
RELAY FRONT FOG LAMP 30,G7(NUR M4.78 ← NR. 2/60 - 1.5 RE
REL. AIR METER CHARGE AIR PRESS 30, I43 ← NR. 1/61 - 0.5 BK
DME CONTROL UNIT 87b, G45 ← NR. 173 - 2.5 RE/GN
CONTROL UNIT ALARM SYSTEM 30, G32 ← NR. 2/60 - 1.0 RE
RELAY TWO-TONE HORN 30, F11 ← NR. 3 - 1.5 RE
FRONT FOG LAMP RELAY 30, G7 ← NR. 2/60 - 1.5 RE
POWER WINDOW REG CONT. UNIT 30, H19 ← NR. 2/60 - 2.5 RE
BATTERY +, F49 ← NR. 2/60 - 6.0 RE
POWER WINDOW REGULATOR 87, H19 CONTROL UNIT ← NR. 2/60 - 2.5 BK
15
X
30
8 TURN SIGNAL BACKUP LAMP INSTRUMENT 16A
7 WINDSHIELD WIPERS, WASHER/REAR WINDOW WIP HEATED SPRAY JET 25A
6 FRESH AIR BLOWER, RELAY TAIL-HEATER, CIGAR-LIGHTER 25A
5 MIRROR, HEATING CONTROL 16A
4 STOP LIGHT, CRUISE CONTROL 8A
3 FUEL PUMP 25A
2 HAZARD LIGHT CENTRAL LOCKS 16A
1 INSIDE LIGHTS CLOCK, RADIO 5A
3 HEADLIGHT CLEANERS CONVERTIBLE TOP 25A
2 AIRCONDITIONING SYSTEM, ADDITIONAL BLOWER POWER SEAT 25A
1 POWER WINDOW REGULATOR, SUN ROOF SEAT HEATER 25A
1.0 GN/RE - NR.2/60 → HAZARD LIGHT SWITCH 15, K2
1.0 GN/RE - NR. 1/61 → BACKUP LIGHT SWITCH N10
1.5 RE/BK - NR. 2/60 → WELDING POINT 17, G53
2.5 RE/WT - NR. 2/60 → WELDING POINT 1 KL. 15, B14
1.5 RE/WT - NR. 2/60 → WINDSHIELD WIPER SWITCH 53a, C12
1.5 RE/BK - NR. 2/60 → REAR WINDOW WIPER SWITCH 53 L17
4.0 RE/BK - NR. 2/60 → WELDING POINT 2 KL. X, F23
0.5 BK/VI - NR. 2/60 → SWITCH POWER WINDOW 4, H13
0.5 BK/VI - NR. 1/61 → CONTROL UNIT HEATER 1, B22
1.5 BK/VI - NR. 1/61 → CONTROL UNIT HEATER 3, B23
0.75 BK - NR. 157 → RELAY CRUISE CONTROL 86, P47
1.5 GN/BL - NR. 2/60 → STOP LIGHT SWITCH 182a, N2
2.5 RE - NR. 2/60 → FUEL PUMP A50
2.5 RE - NR. 2/60 → II 30, H42
1.0 RE - NR. 2/60 → CONTROL UNIT CENTRAL LOCKS 6, M16
1.5 RE/BK - NR. 2/60 → HAZARD LIGHT SWITCH 30, K2
1.5 RE - NR. 805 → RELAY OIL COOLER BLOWER 30, P47
1.0 BK - NR 2/60 → INSIDE LIGHTS Q2
6.0 RE/WT - NR. 2/60 → WELDING POINT 10, H37, E16
6.0 RE - NR. 2/60 → WELDING POINT 11, K28
6.0 RE/BL - NR. 2/60 → WELDING POINT 12, F18
(ENGINE COMPARTMENT)
ALTERNATOR B +, M42 ← NR. 1/61 - 2.5 RE
ALTERNATOR B +, M42 ← NR. 1/61 - 2.5 RE
3 REAR WINDOW DEFOGGER REAR WINDOW WIPER 25A
2 BLOWER ENGINE COMPARTMENT 25A
1 BLOWER INSIDE COMPARTMENT 16A
1.5 RE - NR. 31 → REAR WINDOW WIPER MOTOR 53a, N19
2.5 RE - NR. 1/61 → CONTROL RELAY 30, H29
1.5 RE/WT - NR. 1/61 → CONTROL UNIT BLOWER 7, B26
1.5 RE/WT - NR. 1/61 → CONTROL UNIT BLOWER 8, B26
1.5 RE/BK - NR. 1/61 → CONTROL UNIT BLOWER 3, B26
(LUGGAGE COMPARTMENT)
BATTERY +, F49 ← NR. 196 - 4.0 RE
RADIO BERLIN RADIO WITH BOOSTER 16A
4.0 RE - NR. 196 → RECEIVER RADIO BERLIN BOOSTER +, J64
F G H J K L
SW = BLACK
WT = WHITE
RE = RED
GN = GREEN
YE = YELLOW
GR = GREY
BR = BROWN
BL = BLUE
VI = VIOLET


K
L
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CONTROL RELAY 30, H29
2.5 RE - NR 1/61
CONTROL UNIT BLOWER 7, B26
CONTROL UNIT BLOWER 8, B26
1.5 RE/WT - NR. 1/61
1.5 RE/WT - NR 1/61
CONTROL UNIT BLOWER 3, B26
1.5 RE/BK - NR. 1/61
RECEIVER RADIO BERLIN *, J64
BOOSTER
4.0 RE - NR. 196
CONTROL UNIT CONVERTIBLE TOP 15, J34
1.0 RE - NR. 561/562
REAR WINDOW WIPER MOTOR 53b, N17
CONTROL RELAY 30, H29
1.5 RE - NR. 3
2.5 RE - NR. 1/61
RELAY II - REGULATOR 30, D42
1.5 RE - NR 173
FRONT FOG LAMP
NR. 2/6
1.5 WT/YE
COLOR
WIRE HARNESS NUMBER
NAME
25A
25A
16A
REAR WINDOW DEFOGGER
REAR WINDOW WIPER
BLOWER ENGINE COMPARTMENT
BLOWER INSIDE COMPARTMENT
3
2
1
(LUGGAGE COMPARTMENT)
16A
RADIO BERLIN
RADIO WITH BOOSTER
(LUGGAGE COMPARTMENT)
T2.5A
CONVERTIBLE TOP
(ENGINE COMPARTMENT)
25A
25A
8A
REAR WINDOW DEFOGGER
REAR WINDOW WIPER
NOT USED
OXYGEN REGULATOR
3
2
1
NR. 1/61 - 2.5 RE
NR. 1/61 - 2.5 RE
NR. 196 - 4.0 RE
NR. 561/562 - 1.0 RE
NR. 1/61 - 2.5 RE
B +, M42
B +, M42
30, N47
ALTERNATOR
ALTERNATOR
BATTERY +, F49
DELAYING RELAY
ONLY 911
ONLY 930
CONNECTION RAIL
FUSE HOLDER IN CABLE SET

Wiring Diagram Type 911 Carrera Model 89 Sheet

CONSTR. COMPONENTS, PLUG CONNECT., GROUND POINTS

CONSTRUCTION COMPONENTS

DESIGNATION, FUNCTION	POSITION IN VEHICLE LHD	POSITION IN VEHICLE RHD	NOTE	FIELD
OPERATING RELAY	5cN	5cP	UNDER THE COVER LHD — BEHIND FLOORPANEL RHD	LM21
FLASHER	7cQ	7cL	IN LUGGAGE COMPARTMENT	HJ9 / CDE19 / EFG29 / CDE39 / HJM49
BOOSTER	9eM	9eP	UNDER THE SEAT RIGHT	GH45
DME CONTROL UNIT	9eP	9eP	UNDER THE SEAT LEFT	FG44
DME CONTROL UNIT	9eP	9eP	UNDER THE SEAT LEFT	CDE41
SPEED RELAY	9eP	9eP	UNDER THE SEAT LEFT	B41,42
SPEED CUTOUT DEVICE	9eP	9eP	UNDER THE SEAT LEFT	GH44
RECEIVER, AMPLIFIER	9eP	9eM	UNDER THE SEAT RIGHT	LM65
FREQUENCY SWITCH FL	10cR	10cR	UNDER THE DOOR TRIM PANEL	F67
FREQUENCY SWITCH RL	10cK	10cK	UNDER THE DOOR TRIM PANEL	J67
SPEED WARNING BUZZER	7bO	7bO	ON THE SPEEDOMETER	N54
HIGH PRESSURE AND LOW PRESSURE SWITCH	5cN	5cO	UNDER THE COVER LHD — IN LUGGAGE COMPARTMENT RHD	L21,22
AIR CONDITIONER RELAY	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	K21
OXYGEN CONTROL UNIT	9eP	9eP	UNDER THE SEAT LEFT	A44,45
FRONT FOG LAMP	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	F9
CONTROL RELAY FOR REAR WINDOW DEFROGGER	16dQ	16dQ	CARRIER PLATE IN ENGINE COMPARTMENT	H29,30
RELAY ALARM SYSTEM USA	6cPQ	6cPQ	IN LUGGAGE COMPARTMENT	A39
RELAY TWO-TONE HORN	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	G11
RELAY FOR POSITIVE SUPPLY, OXYGEN REGULATOR	16dQ	16dQ	CARRIER PLATE IN ENGINE COMPARTMENT	E41
RELAY I FUEL PUMP	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	EF41
RELAY II FUEL PUMP	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	H41
RELAY AIR METER CHARGE AIR PRESS., DELAYED	16dQ	16dQ	CARRIER PLATE IN ENGINE COMPARTMENT	J41
RELAY OIL COOLER BLOWER	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	P48
RELAY CRUISE CONTROL	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	P47
SWITCHING FOR POWER WINDOW REGULATOR	6cP	6cP	IN LUGGAGE COMPARTMENT	G19,20
SWITCHING FOR CATALYZER	16cPQ	16cPQ	IN LUGGAGE COMPARTMENT	E60
SWITCHING FOR SEAT BELT	6cPQ	6cPQ	IN LUGGAGE COMPARTMENT	HJ52
FUSE BOX I	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	F9
FUSE BOX II	4cP	4cP	FUSE BOX IN LUGGAGE COMPARTMENT	DE9
FUSE BOX THREEFOLD	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	EF19 / K30 / F39
FUSE BOX THREEFOLD ENGINE COMPARTMENT	16dQ	16dQ	CARRIER PLATE IN ENGINE COMPARTMENT	LM19 / C30
FUSE HOLDER 16A	3dPQ	3dPQ	IN LUGGAGE COMPARTMENT	F48
FUSE HOLDER T2,5	5cP	5cP	BEHIND THE FUSE BOX	H39
FUSE HOLDER 10A FOR BLOWER LEFT	7bQ	7bQ	FOR ADDITIONAL BLOWER	D23
FUSE HOLDER 10A FOR BLOWER RIGHT	7bL	7bL	FOR ADDITIONAL BLOWER	D23
ELECTRONIC CONTROL UNIT CENTRAL LOCKS	7bL	7bL	IN LUGGAGE COMPARTMENT	M16
CONTROL UNIT ALARM SYSTEM	6cM	6cM	IN LUGGAGE COMPARTMENT	C32
CONTROL UNIT CONVERTIBLE TOP	6dM	6dM	BEHIND FLOORBOARD	F35,36
CONTROL UNIT FUEL ENRICHMENT	9eP	9eP	UNDER THE SEAT LEFT	CD41
CONTROL UNIT BLOWER	16dQ	16dQ		AB26
CONTROL UNIT DIMMES HEADLIGHTS	5dP	5dP	BEHIND FLOORBOARD	D1
CONTROL UNIT HEADLIGHT CLEANERS	2dP	2dP	IN LUGGAGE COMPARTMENT	A18,19
CONTROL UNIT CRUISE CONTROL	6bN	6bN	UNDER THE INSTRUMENT PANEL	P43,44
THERMO BIMETAL SWITCH WITH RESISTOR				OP21
DELAYING RELAY	16dQ	16dQ	CARRIER PLATE IN ENGINE COMPARTMENT	P47
RESISTOR	7bL	6bP	IN LUGGAGE COMPARTMENT	D21
WIPER INTERMITTENT CONTROL RELAIS	6cN	6cO	IN LUGGAGE COMPARTMENT	A13
ADDITIONAL CLEANING FLUID PUMP RELAY	5cP	5cP	IN LUGGAGE COMPARTMENT	D30
ADDITIONAL BLOWER RELAY	6cP	6cL	FUSE BOX IN LUGGAGE COMPARTMENT	AB17

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F	G	H	J	K	L

PLUG CONNECTIONS

CODE	NUMBER OF PINS	DESIGNATION, FUNKTION	POSITION IN VEHICLE LHD	POSITION IN VEHICLE RHD	NOTE	FIELD
T1	2	LUGGAGE COMPARTMENT LIGHT	7bL	7bL	REAR RIGHT OF HEATER HOSE	B4
T2	2	SIDE TURN SIGNAL RIGHT	7bL	7bL	REAR RIGHT OF HEATER HOSE	C2
T3	2	SIDE TURN SIGNAL LEFT	7bQ	7bQ	AT SIDE OF HEATER	C9
T4	1	BAL	7bP	7bM	UNDER THE INSTRUMENT PANEL	D3
T5	6	TURN SIGNAL/DIMMER SWITCH	6cP	6cM	UNDER THE INSTRUMENT PANEL	E3 / E12
T6	6	LIGHT SWITCH	6cP	6cM	UNDER THE INSTRUMENT PANEL	F2
T7	9	CENTRE CONSOLE	7cNO	7cNO	UNDER THE CENTRE CONSOLE	J3
T8	3	NO. 2/60 TO NO. 1/61	5cP	5cP	IN LUGGAGE COMPARTMENT	M4 / G26
T9	4	NO. 2/60 TO NO. 1/61	5cP	5cP	IN LUGGAGE COMPARTMENT	N4 / C54
T10	6	CONTINUOUS CONSUMER	4cP	4cP	IN LUGGAGE COMPARTMENT	N5 / D37
T11	2	INSIDE LIGHTS	7bQ	7bQ	AT SIDE OF HEATER	D2
T12	2	INSIDE LIGHT IN THE ROOF	11aP	11aP	ON INNER ROOF	N3
T13	7	TAIL LIGHTS RIGHT	17cL	17cL	ON SIDE PANEL	N5
T14	7	TAIL LIGHTS LEFT	17cQ	17cQ	ON SIDE PANEL	D8
T15	14	NO. 16 MOTOR	17cP	17cP	RELAY PANEL REAR	N9 / B28 / M44 / D57
T16	3	TAILGATE	15cL	15cL	ENGINE COMPARTMENT	N8
T17	3	REAR WINDOW	15cP	15cP	ENGINE COMPARTMENT	M8 / H27
T18	6	BLOWER OPERATING SWITCH	6cM	6cQ	UNDER THE INSTRUMENT PANEL	L10/ G21
T19	1	CRUISE CONTROL	5cP	5cP	IN LUGGAGE COMPARTMENT	N3
T20	6	WIPE/WASH SWITCH	6cP	6cM	UNDER THE INSTRUMENT PANEL	C13
T21	1	WINDSHIELD WASHING FLUID PUMP	4cP	4cP	BEHIND THE FUSE BOX	D12
T22	1	RELAY TWO-TONE HORN	4cP	4cP	BEHIND THE FUSE BOX	F12
T23	6	MIRROR DRIVER'S SIDE	8bR	8bK	IN MIRROR	H11
T24	7	MIRROR DRIVER'S DOOR	7cQ	6cL	IN LUGGAGE COMPARTMENT	J12 / E33
T25	2	MIRROR DRIVER'S DOOR	7cQ	6cL	IN LUGGAGE COMPARTMENT	K13
T26	7	MIRROR PASSENGER'S DOOR	7cL	7cQ	IN LUGGAGE COMPARTMENT	L12
T27	6	MIRROR PASSENGER'S SIDE	8bK	8bR	IN MIRROR	M12
T28	2	CENTRAL LOCK BUTTON	7dNO	7dNO	UNDER THE CENTRE CONSOLE	N13
T29	2	CENTRAL LOCK BUTTON	7dNO	7dNO	UNDER THE CENTRE CONSOLE	D13
T30	5	DRIVE FOR PASSENGER	9dK	9dR	IN DOOR	D13
T31	3	LOCK CYLINDER FOR PASSENGER'S SIDE	9dK	9dR	IN DOOR	P13
T32	7	CENTRAL LOCK PASSENGER'S DOOR	7cL	7cQ	IN LUGGAGE COMPARTMENT	D15
T33	7	CENTRAL LOCK DRIVER'S DOOR	7cQ	6cL	IN LUGGAGE COMPARTMENT	D16
T34	5	DRIVE FOR DRIVER'S SIDE	9dR	9dK	IN DOOR	D18
T35	3	LOCK CYLINDER FOR DRIVER'S SIDE	9dR	9dK	IN DOOR	P18
T36	2x1	REAR WINDOW WIPER MOTOR	15dPQ	15dPQ	ENGINE COMPARTMENT	M18
T37	6	POWER WINDOW REGUL. PASSENGER'S SIDE	7bK	7bQ	UNDER THE FENDER	K18
T38	6	POWER WINDOW REGULATOR DRIVER'S SIDE	7bQ	7bK	UNDER THE FENDER	J18
T39	2	HEADLIGHT CLEANER BUTTON	2dP	2dP	IN LUGGAGE COMPARTMENT	B18
T40	4	HEATER LEVER	11dNO	11dNO	UNDER THE GEARBOX COVER	B22
T41	6	HEATER CONTROL	11dNO	11dNO	UNDER THE GEARBOX COVER	B24
T42	2	CENTRE CONSOLE	7dNO	7dNO	UNDER THE CENTRE CONSOLE	G24 / C34
T43	1	CLUTCH AIR	17dL	17dL	ENGINE COMPARTMENT	J22
T44	4	WIRE BRANCH	5cP	5cP	IN LUGGAGE COMPARTMENT	J24
T45						
T46	4	WIRE BRANCH RED	5cP	5cP	IN LUGGAGE COMPARTMENT	L24
T47	4	AIR BLOWER SWITCH	5cM	6dP	UNDER THE AIR COND. COVER LHD – UNDER THE FOOTWELL COVER RHD	M23
T48	2	AIR BLOWER	5cM	6dP	UNDER THE AIR COND. COVER LHD – UNDER THE FOOTWELL COVER RHD	Q23
T49	4	WIRE BRANCH BLUE	5cP	5cP	IN LUGGAGE COMPARTMENT	L29 / J39
T50	8	SEAT LEFT	10dP	10dP	UNDER THE SEAT	N29
T51	8	SEAT RIGHT	10dM	10dM	UNDER THE SEAT	Q30
T52	1	CONTROL UNIT CABRIO	5cP	5cP	BEHIND THE FUSE BOX	G37
T53	12	POWER TOP	12cL	12cL	BEHIND THE FUSE BOX	J35
T54	4	DME	4cP	4cP	IN LUGGAGE COMPARTMENT	E46
T55	6	FUEL INJECTORS	14cQ	14cQ	ENGINE COMPARTMENT	F43
T56	6	IGNITION LOCK	6cP	6cM	UNDER THE INSTRUMENT PANEL	J47
T57	3	WIRE BRANCH TERM 50	5cP	5cP	IN LUGGAGE COMPARTMENT	K47
T58	2	OIL COOLER TEMPERATURE SWITCH	2dL	2dL	IN LUGGAGE COMPARTMENT	Q49
T59	2	BRAKE PAD WEAR DISPLAY FRONT	5cP	5cP	IN LUGGAGE COMPARTMENT	E53
T60	2	BRAKE PAD WEAR DISPLAY REAR	11dNO	11dNO	UNDER THE GEARBOX COVER	F53
T61	2	TACHOGENERATOR	11dNO	11dNO	UNDER THE GEARBOX COVER	Q54
T62	2	SPEAKER DOOR FRONT LEFT	7cQ	7cQ	FOR ADDITIONAL BLOWER	B68
T63	2	SPEAKER DOOR FRONT RIGHT	7cL	7cL	FOR ADDITIONAL BLOWER	E68
T64	3	2/60 - 1/61	5cP	5cP	IN LUGGAGE COMPARTMENT	C25
T65	2	2/60 - 1/61	5cP	5cP	IN LUGGAGE COMPARTMENT	C34
T66	14	16 - 173	14cQ	14cQ	ENGINE COMPARTMENT	CDE47
T67	2	FUEL PUMP REAR	15dR	15dR	ENGINE COMPARTMENT	G43
T68	1	IGNITION CONTROL UNIT	15dP	15dP	ENGINE COMPARTMENT	J43
T69	14	Nr. 16	16dQ	16dQ	ENGINE COMPARTMENT BEARER PLATE	M46
T70	1	FUSE ADAPTER	7cQ	6cL	IN LUGGAGE COMPARTMENT	D17
T71	2	ALARM-PRIMED INDICATOR LAMP	11cQ	11cL	IN DOOR	D18
T72	2	CONDENSER BLOWER	2dP	2dP	IN LUGGAGE COMPARTMENT	L22
T73	1	FUSE ADAPTER	7cQ	6cL	IN LUGGAGE COMPARTMENT	D15
T74	2	ALARM-PRIMED INDICATOR LAMP	11cL	11cQ	IN DOOR	P12

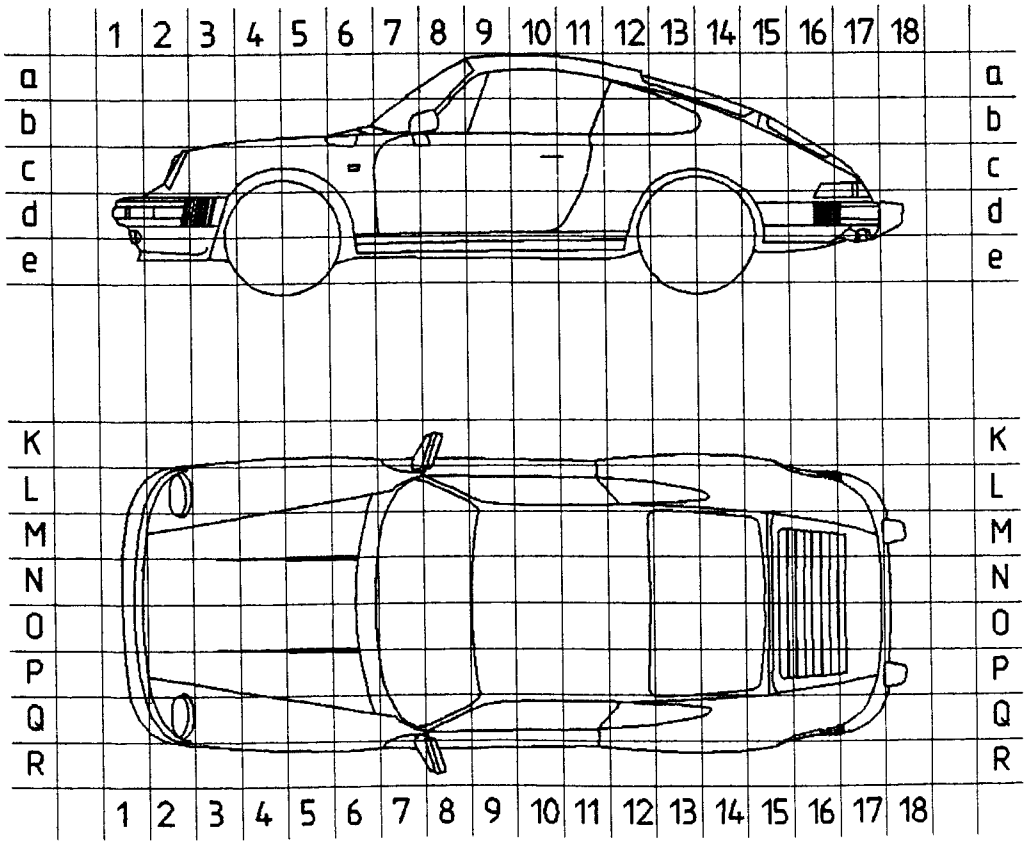
M49

F	G	H	J	K	L

L M N O P

GROUND POINTS

CODE	DESIGNATION, FUNCTION	POSITION IN VEHICLE LHD	RHD
MP I	IN LUGGAGE COMPARTMENT	2dP	2dP
MP II	IN LUGGAGE COMPARTMENT	5cP	5cP
MP III	IN LUGGAGE COMPARTMENT	6cP	6cP
MP IV	IN PASSENGER COMPARTMENT	7bNO	7bNO
MP V			
MP VI	IN LUGGAGE COMPARTMENT	6bK	6bK
MP VII	CABRIO, TARGA	9aNO	9aNO
MP VIII	IN ROOF	10aL	10aL
MP IX	IN ROOF	10aQ	10aQ
MP X	ENGINE COMPARTMENT	15cP	15cP
MP XI	ON THE GROUND	11dN	11dN
MP XII	ENGINE COMPARTMENT	17cO	17cO



81 82 83 84 85 86 87 88 89 90

L M N O P

Wiring Diagram Type 911 turbo Model 89

	Coordinates	
Sheet 1	1 - 10	Lights
Sheet 2	11 - 20	Body
Sheet 3	21 - 30	Heater, Ventilation, Air Conditioner
Sheet 4	31 - 40	Power Top, Alarm System, Sun Roof
Sheet 5	41 - 50	K-JETRONIC, Oxygen Regulator
Sheet 6	51 - 60	Instruments and Sender
Sheet 7	61 - 70	Radio
Sheet 8	71 - 80	Fuse Assignments and Positions
Sheet 9		Constr. Components, Plug Connection, Ground Points

Wiring Diagram Type 911 turbo
Model 89

Wire Colours

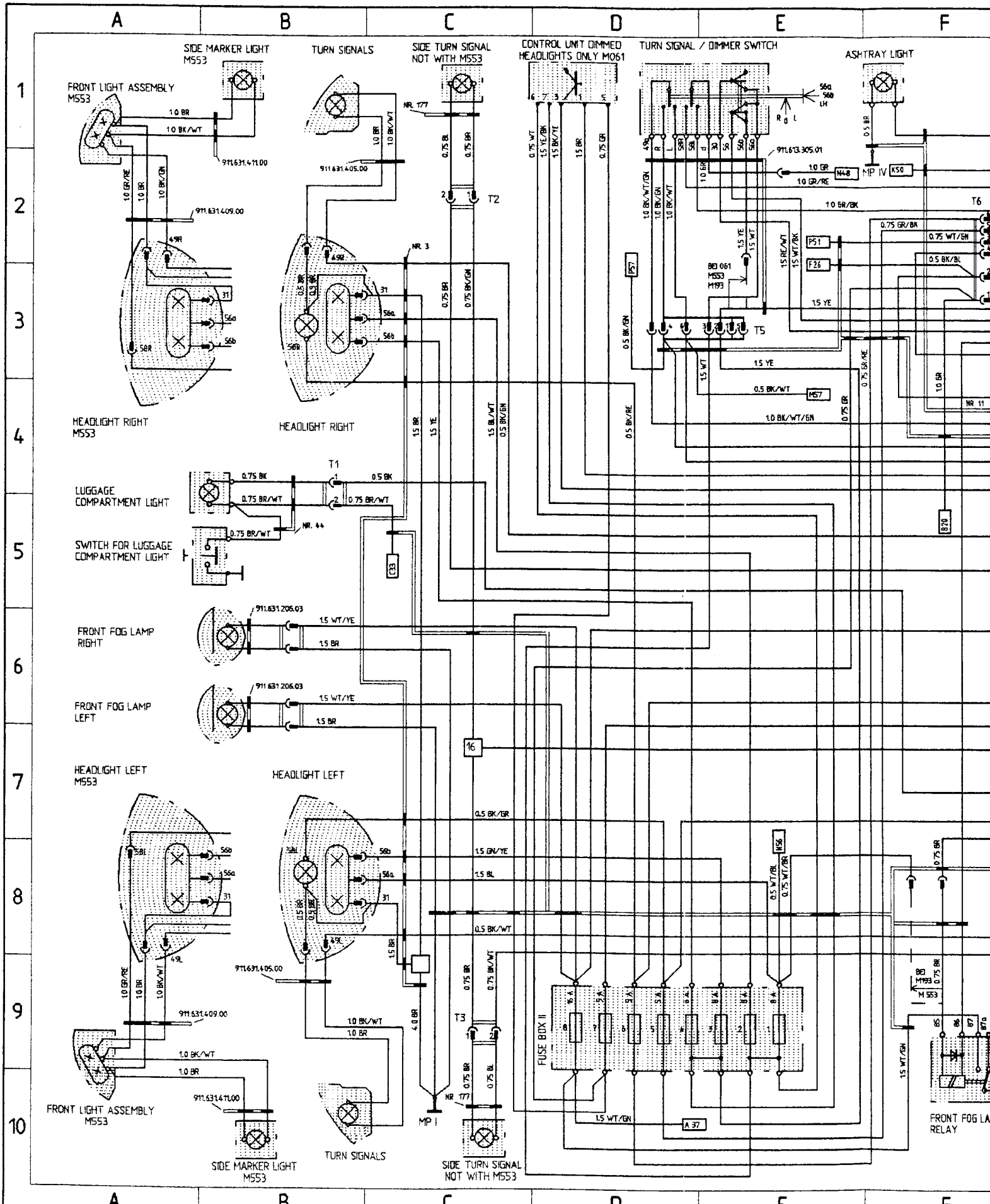
BK = Black
WT = white
RE = red
GN = green
YE = yellow
GR = grey
BR = brown
BL = blue
VI = violet

⊡ = Welding Point
▭ = Connection with field indication
MP = Ground Connecting Point

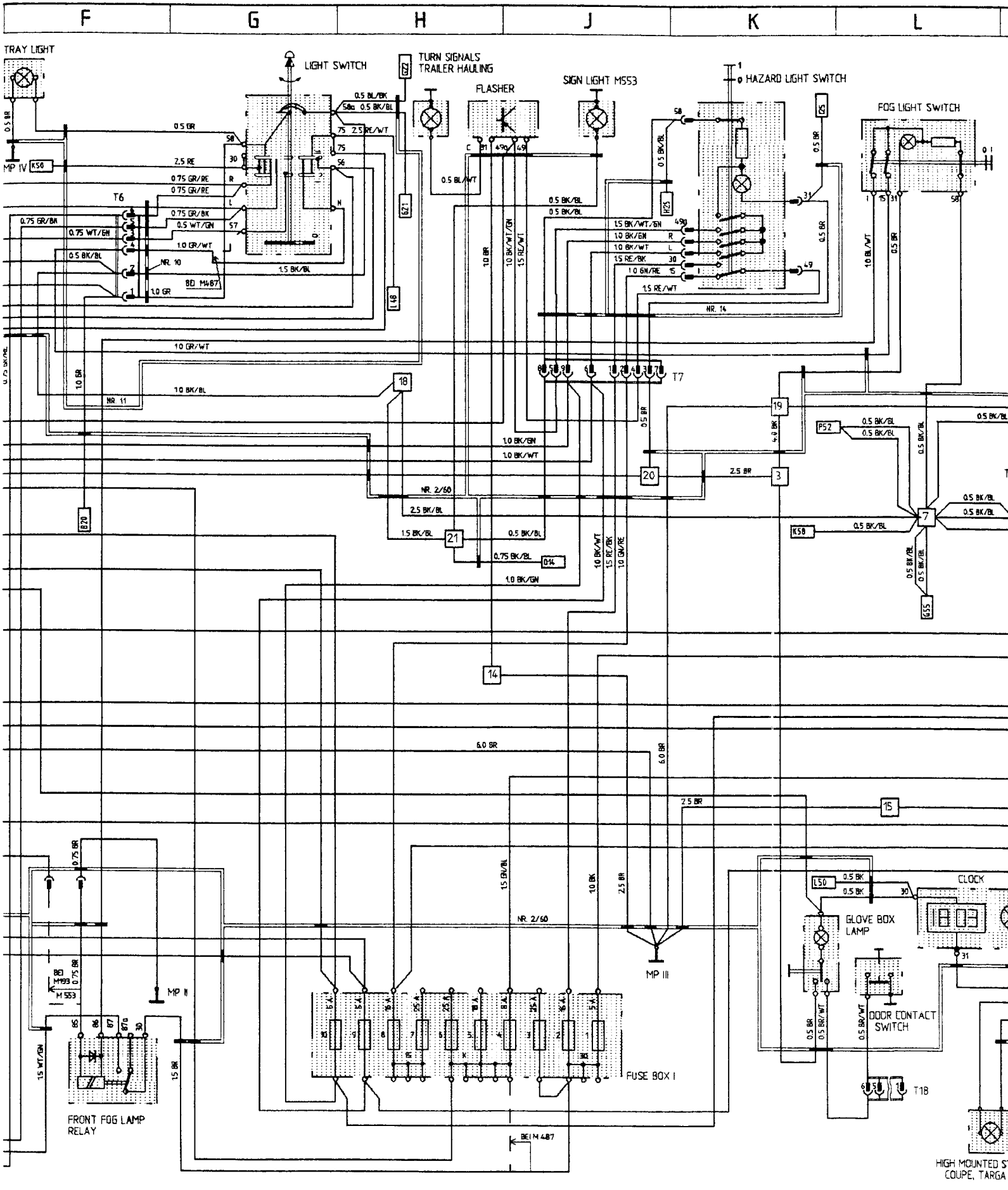
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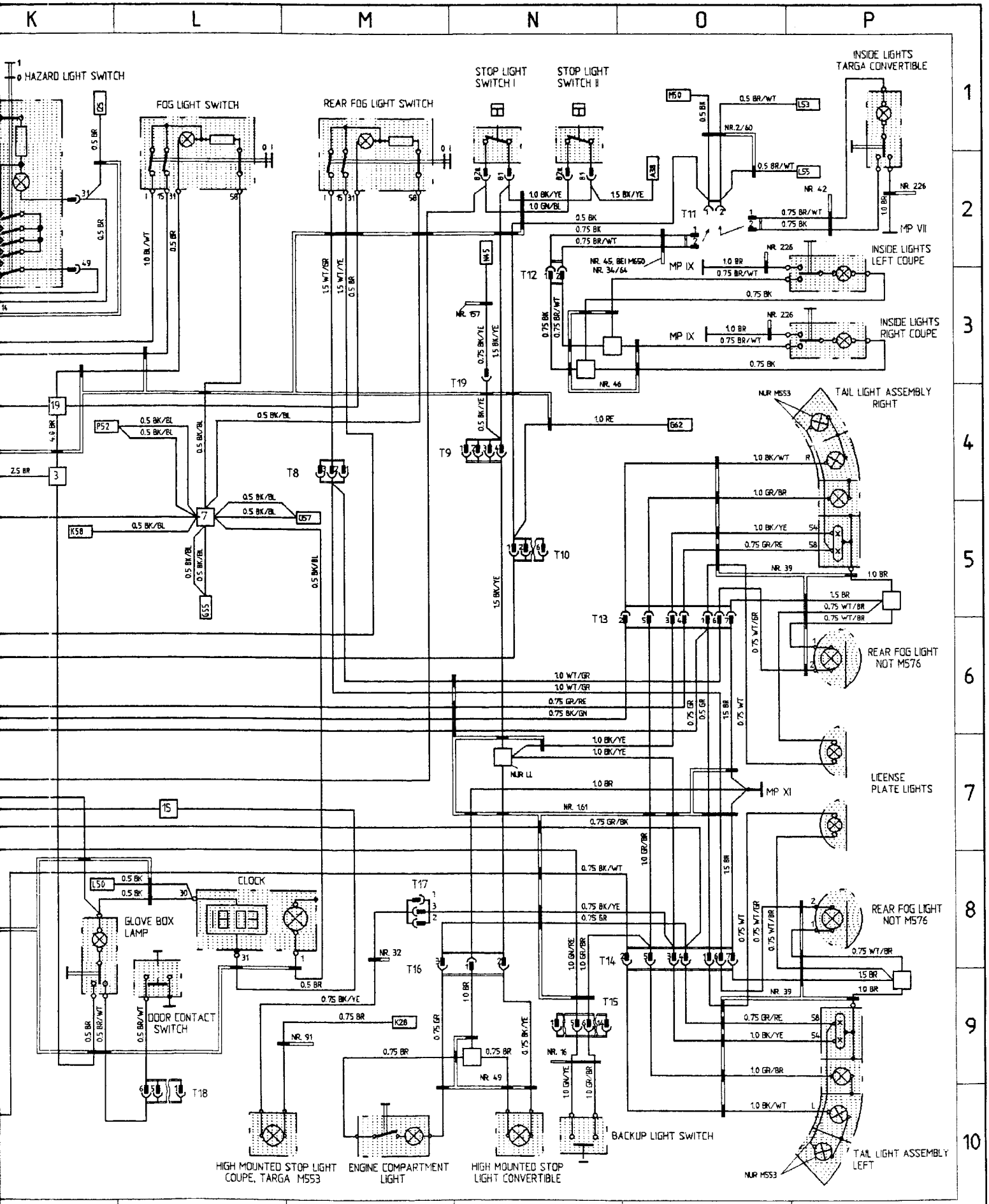
Wiring Diagram Type 911 Turbo Model 89 Sheet 1

LIGHTS



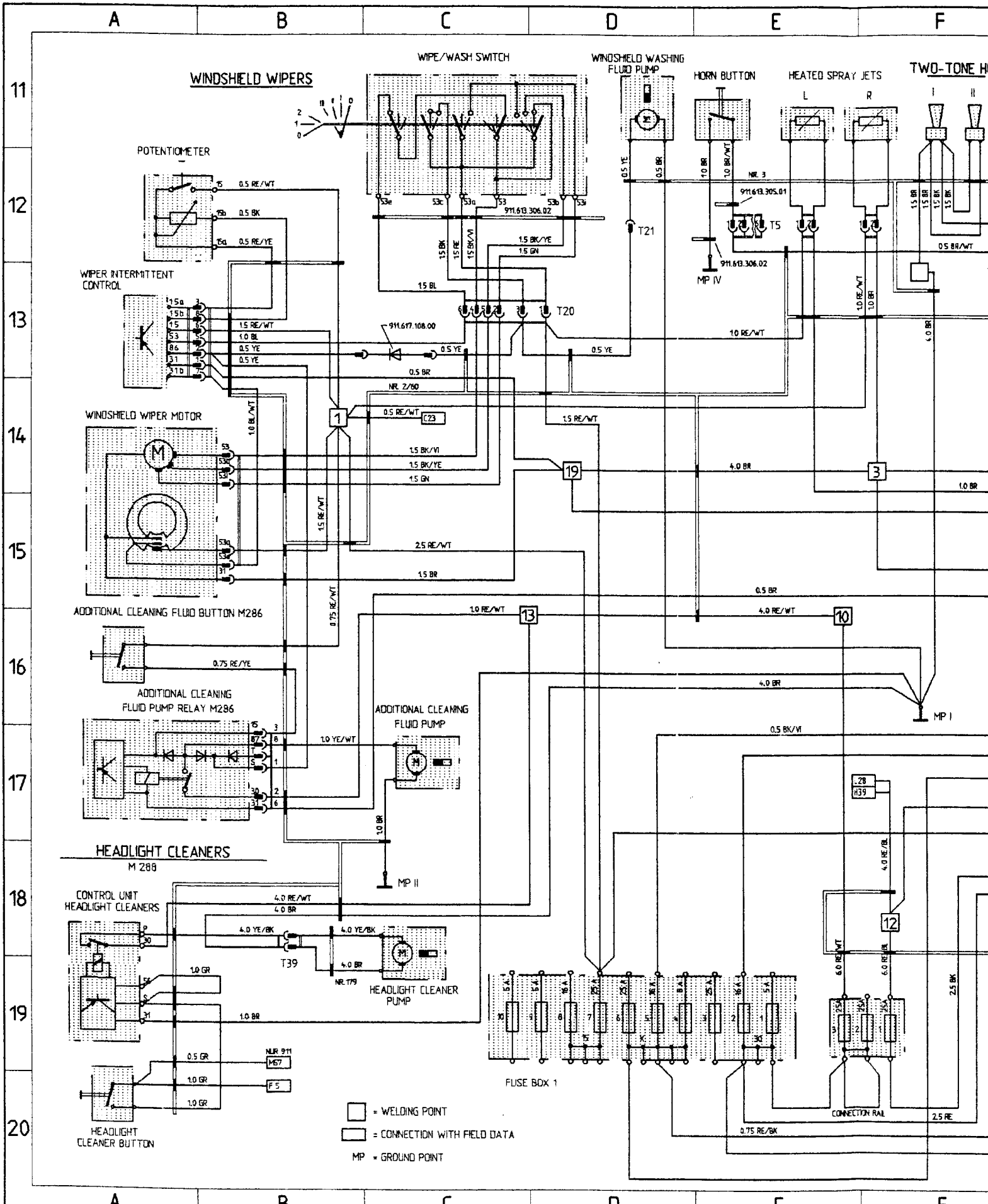
et 1


F
G
H
J
K
L
TRAY LIGHT
LIGHT SWITCH
TURN SIGNALS
TRAILER HAULING
FLASHER
SIGN LIGHT M553
HAZARD LIGHT SWITCH
FOG LIGHT SWITCH
T6
T7
T18
MP IV
MP III
MP II
NR. 10
NR. 11
NR. 14
NR. 2/60
BEI M487
BEI M493
M553
FUSE BOX I
FRONT FOG LAMP RELAY
GLOVE BOX LAMP
CLOCK
DOOR CONTACT SWITCH
HIGH MOUNTED S
COUPE, TARGA


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HAZARD LIGHT SWITCH
FOG LIGHT SWITCH
REAR FOG LIGHT SWITCH
STOP LIGHT SWITCH I
STOP LIGHT SWITCH II
INSIDE LIGHTS TARGA CONVERTIBLE
INSIDE LIGHTS LEFT COUPE
INSIDE LIGHTS RIGHT COUPE
TAIL LIGHT ASSEMBLY RIGHT
TAIL LIGHT ASSEMBLY LEFT
REAR FOG LIGHT NOT M576
LICENSE PLATE LIGHTS
CLOCK
GLOVE BOX LAMP
DOOR CONTACT SWITCH
BACKUP LIGHT SWITCH
HIGH MOUNTED STOP LIGHT COUPE, TARGA M553
ENGINE COMPARTMENT LIGHT
HIGH MOUNTED STOP LIGHT CONVERTIBLE
MP VII
MP IX
MP XI
T8
T9
T10
T11
T12
T13
T14
T15
T16
T17
T18
T19

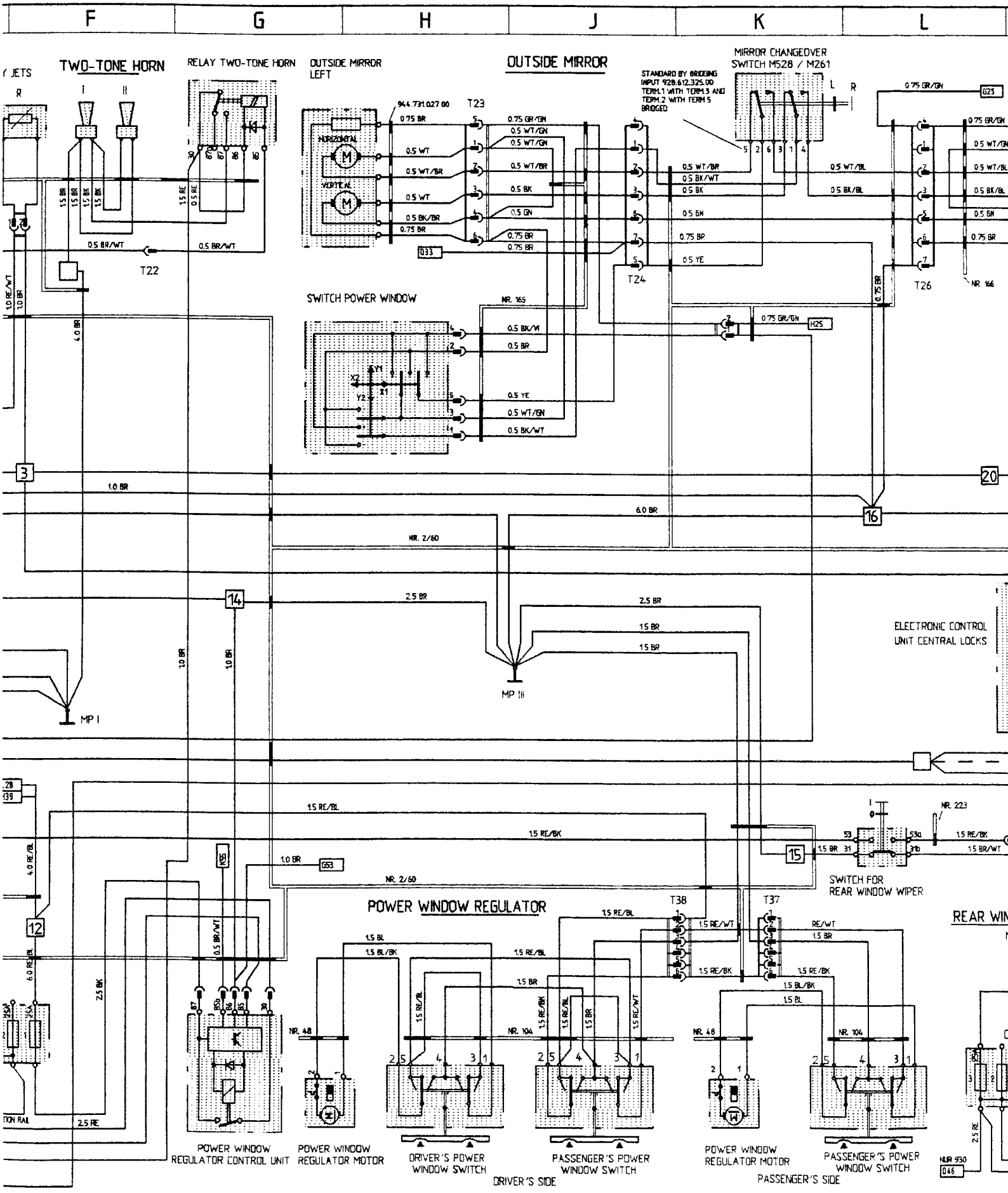
Wiring Diagram Type 911 Turbo Model 89 Sheet 2

BODY

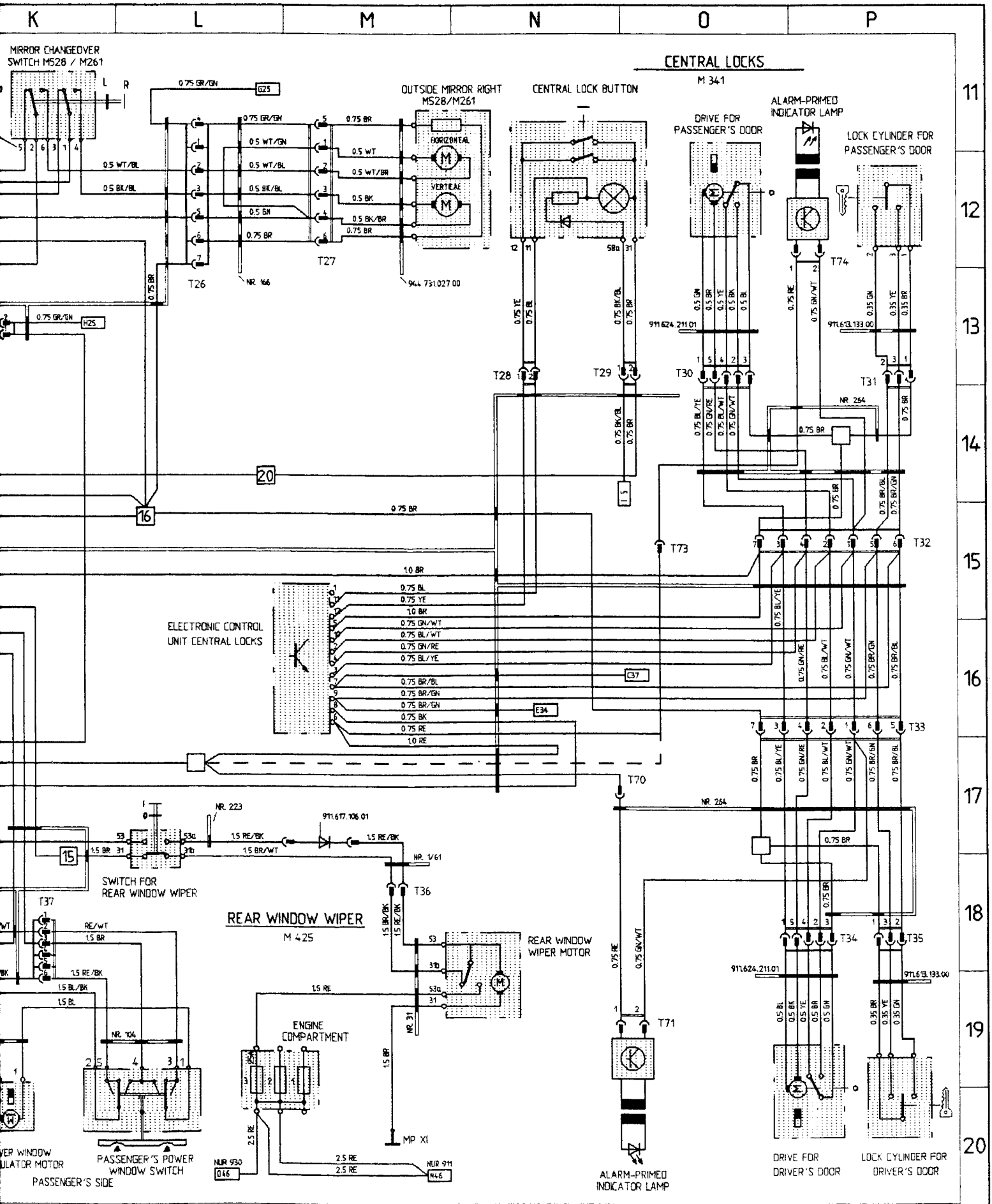


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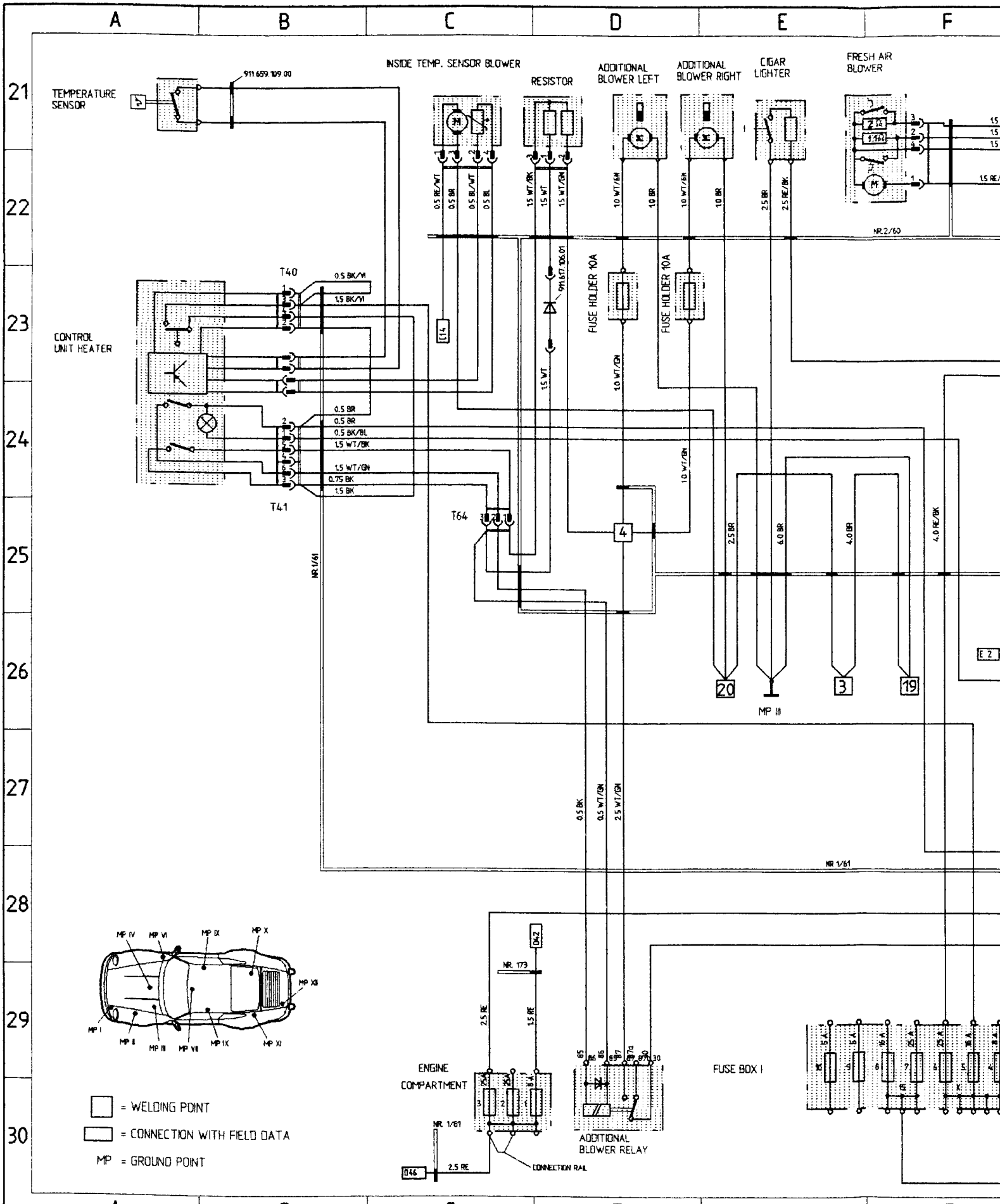


BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET

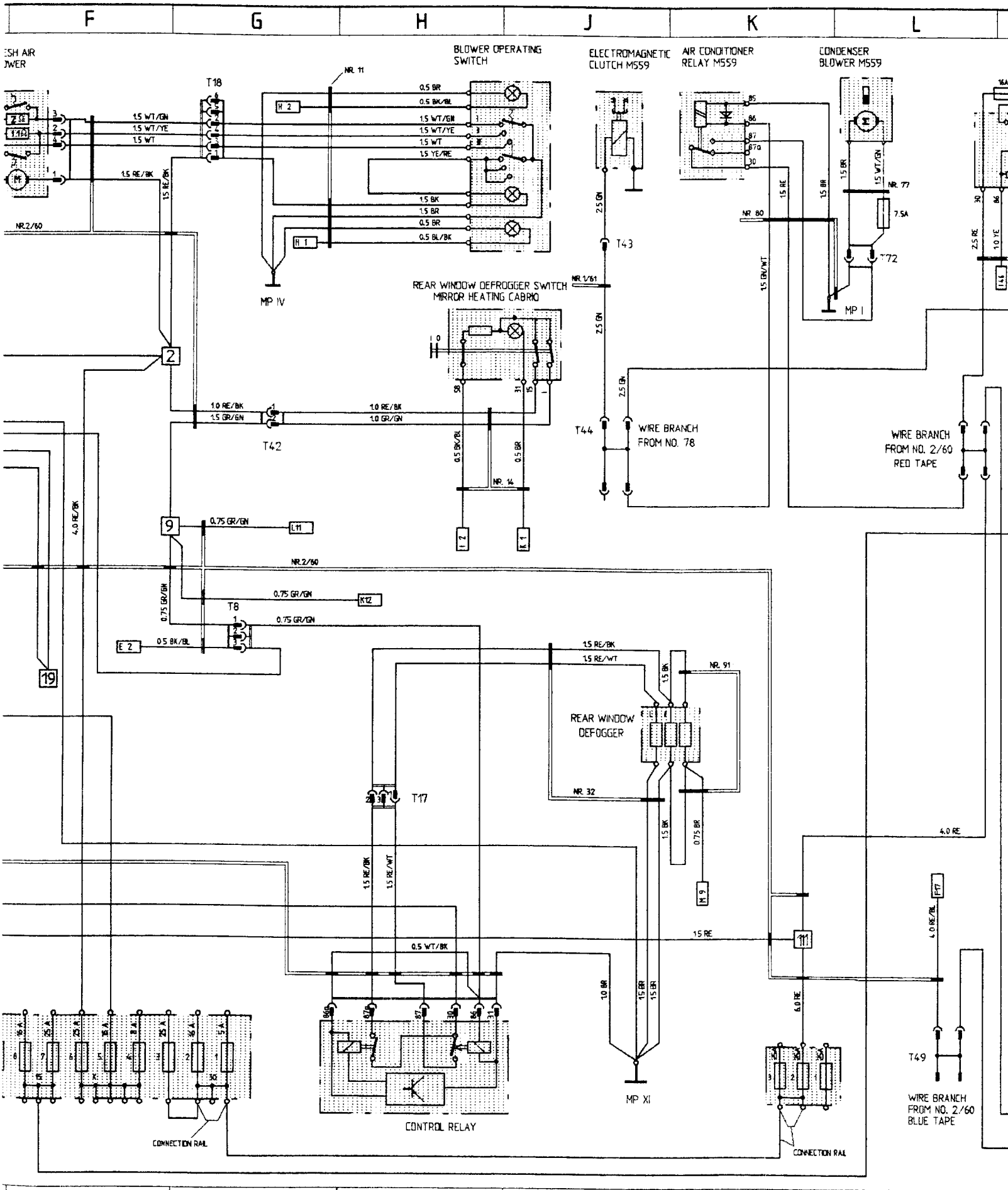

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11
12
13
14
15
16
17
18
19
20
CENTRAL LOCKS
M 341
MIRROR CHANGEOVER SWITCH M528 / M261
OUTSIDE MIRROR RIGHT M528/M261
CENTRAL LOCK BUTTON
DRIVE FOR PASSENGER'S DOOR
ALARM-PRIMED INDICATOR LAMP
LOCK CYLINDER FOR PASSENGER'S DOOR
ELECTRONIC CONTROL UNIT CENTRAL LOCKS
REAR WINDOW WIPER
M 425
SWITCH FOR REAR WINDOW WIPER
REAR WINDOW WIPER MOTOR
ENGINE COMPARTMENT
PASSENGER'S POWER WINDOW SWITCH
PASSENGER'S SIDE
ALARM-PRIMED INDICATOR LAMP
DRIVE FOR DRIVER'S DOOR
LOCK CYLINDER FOR DRIVER'S DOOR
T26
T27
T28
T29
T30
T31
T32
T33
T34
T35
T36
T37
T70
T71
T73
T74
NR. 166
NR. 223
NR. 264
NR. 104
NR. 1/61
944 731 027 00
911.624.211.01
911.613.133.00
911.617.106.01
MP XI

Wiring Diagram Type 911 Turbo Model 89 Sheet 3

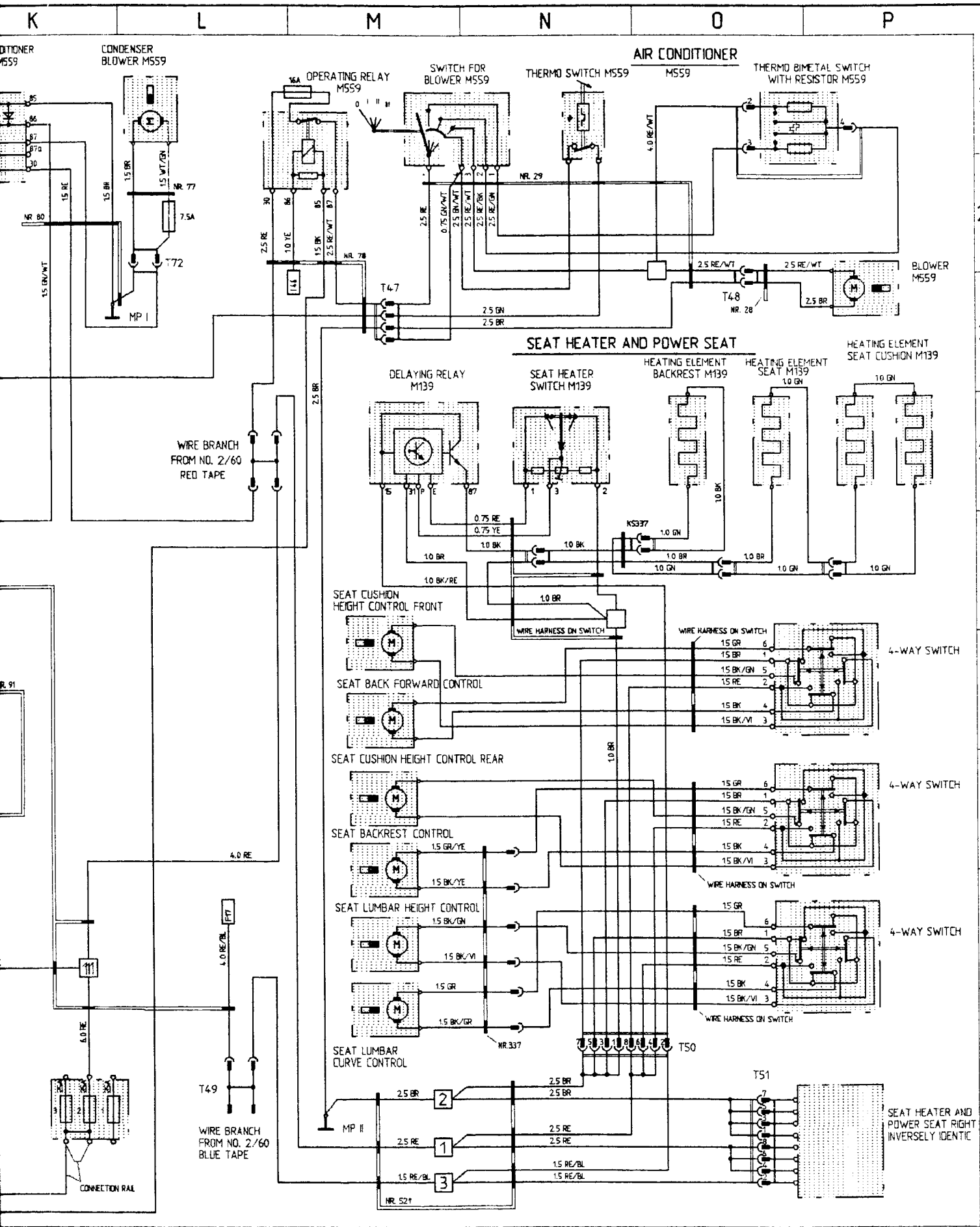
HEATER AND VENTILATION



et 3

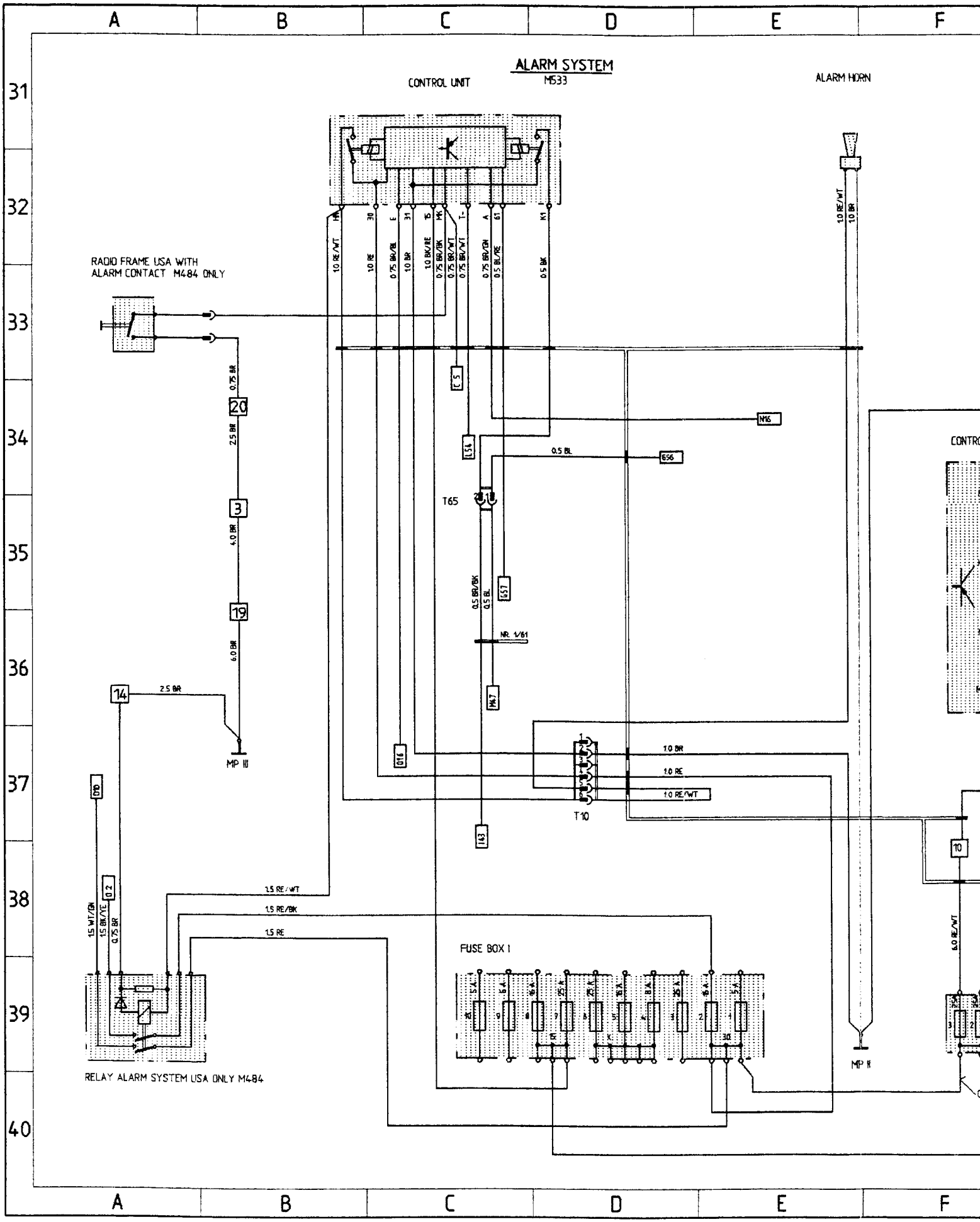


BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET


K
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21
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23
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25
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28
29
30
AIR CONDITIONER
M559
CONDENSER BLOWER M559
OPERATING RELAY M559
SWITCH FOR BLOWER M559
THERMO SWITCH M559
THERMO BIMETAL SWITCH WITH RESISTOR M559
BLOWER M559
SEAT HEATER AND POWER SEAT
DELAYING RELAY M139
SEAT HEATER SWITCH M139
HEATING ELEMENT BACKREST M139
HEATING ELEMENT SEAT M139
HEATING ELEMENT SEAT CUSHION M139
WIRE BRANCH FROM NO. 2/60 RED TAPE
SEAT CUSHION HEIGHT CONTROL FRONT
SEAT BACK FORWARD CONTROL
SEAT CUSHION HEIGHT CONTROL REAR
SEAT BACKREST CONTROL
SEAT LUMBAR HEIGHT CONTROL
SEAT LUMBAR CURVE CONTROL
4-WAY SWITCH
WIRE HARNESS ON SWITCH
WIRE BRANCH FROM NO. 2/60 BLUE TAPE
CONNECTION RAIL
SEAT HEATER AND POWER SEAT RIGHT INVERSELY IDENTIC
MP I
MP II
T47
T48
T49
T50
T51
T72
NR. 77
NR. 78
NR. 80
NR. 29
NR. 28
NR. 337
NR. 521
7.5A
16A
2.5 RE
2.5 BR
2.5 GN
1.0 BK
1.0 BR
1.0 GN
1.0 YE
0.75 RE
0.75 YE
1.5 BR
1.5 RE
1.5 BK
1.5 GN
1.5 GR
1.5 BK/GN
1.5 BK/VI
1.5 BK/YE
1.5 GR/YE
1.5 BK/GR
1.5 RE/BL
4.0 RE
4.0 RE/WT
4.0 RE/BL
K5337

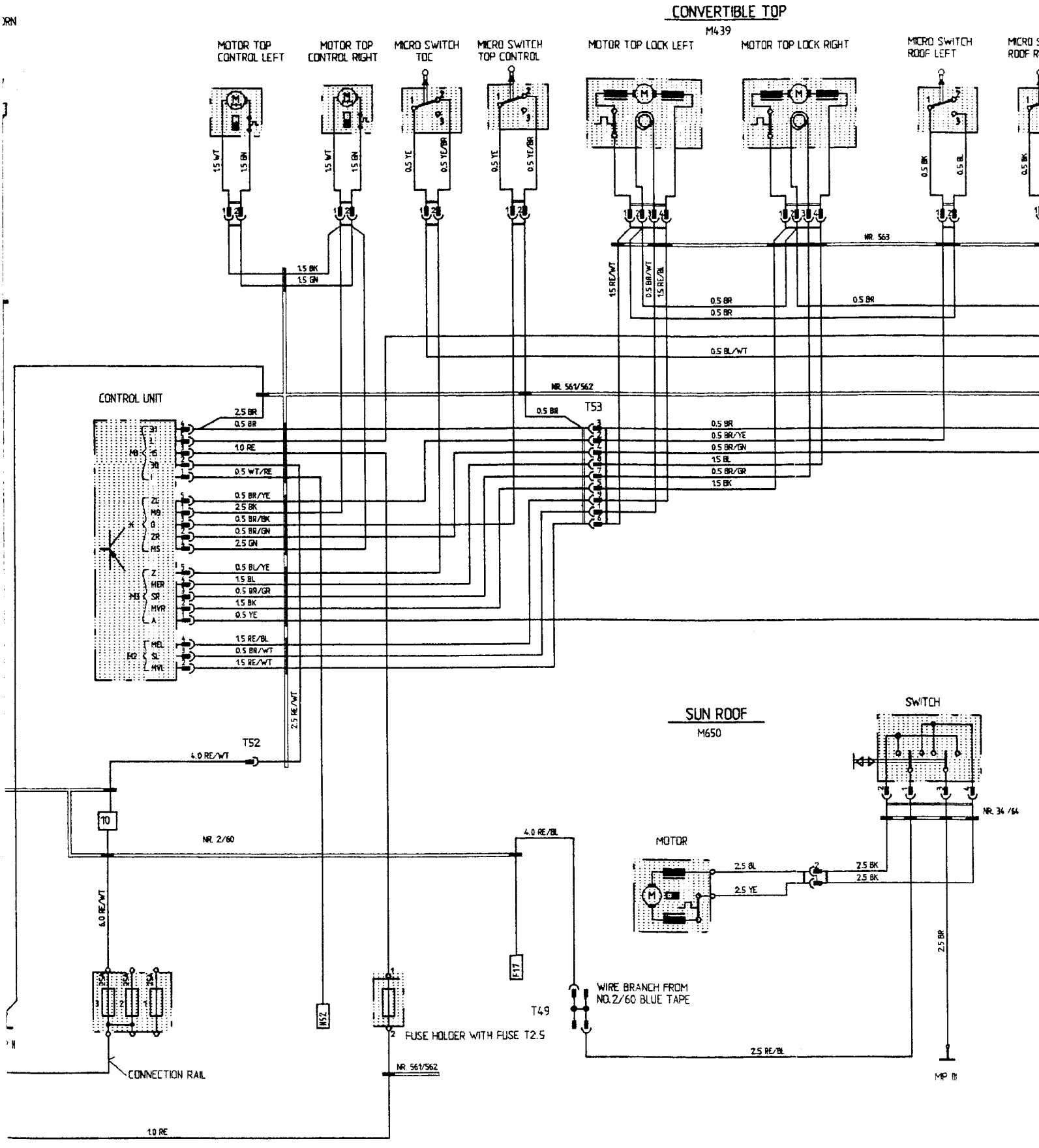
Wiring Diagram Type 911 Turbo Model 89 Sheet 4

POWER TOP, ALARM SYSTEM, SUN ROOF



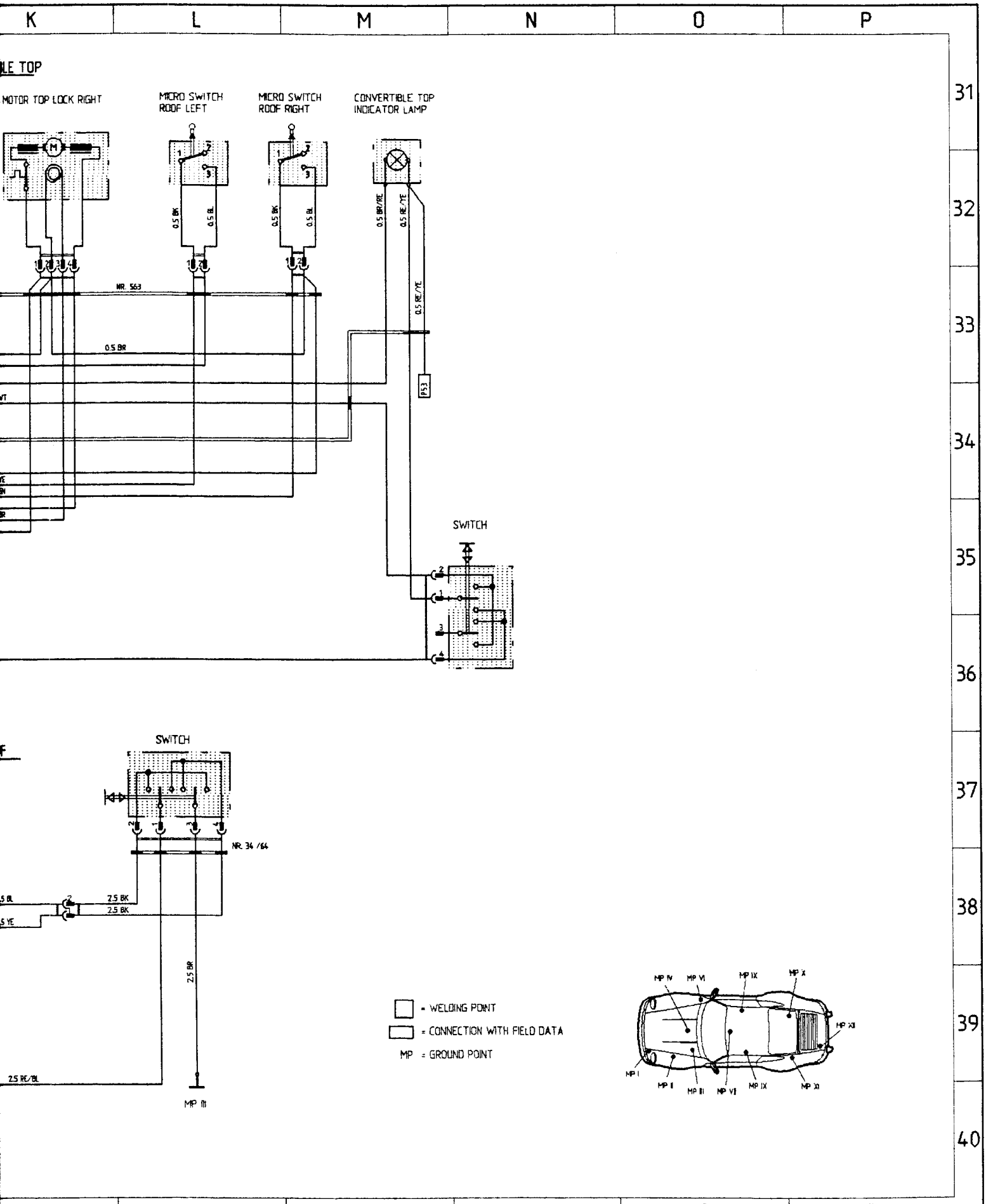
Printed in Germany XI 1988

F	G	H	J	K	L



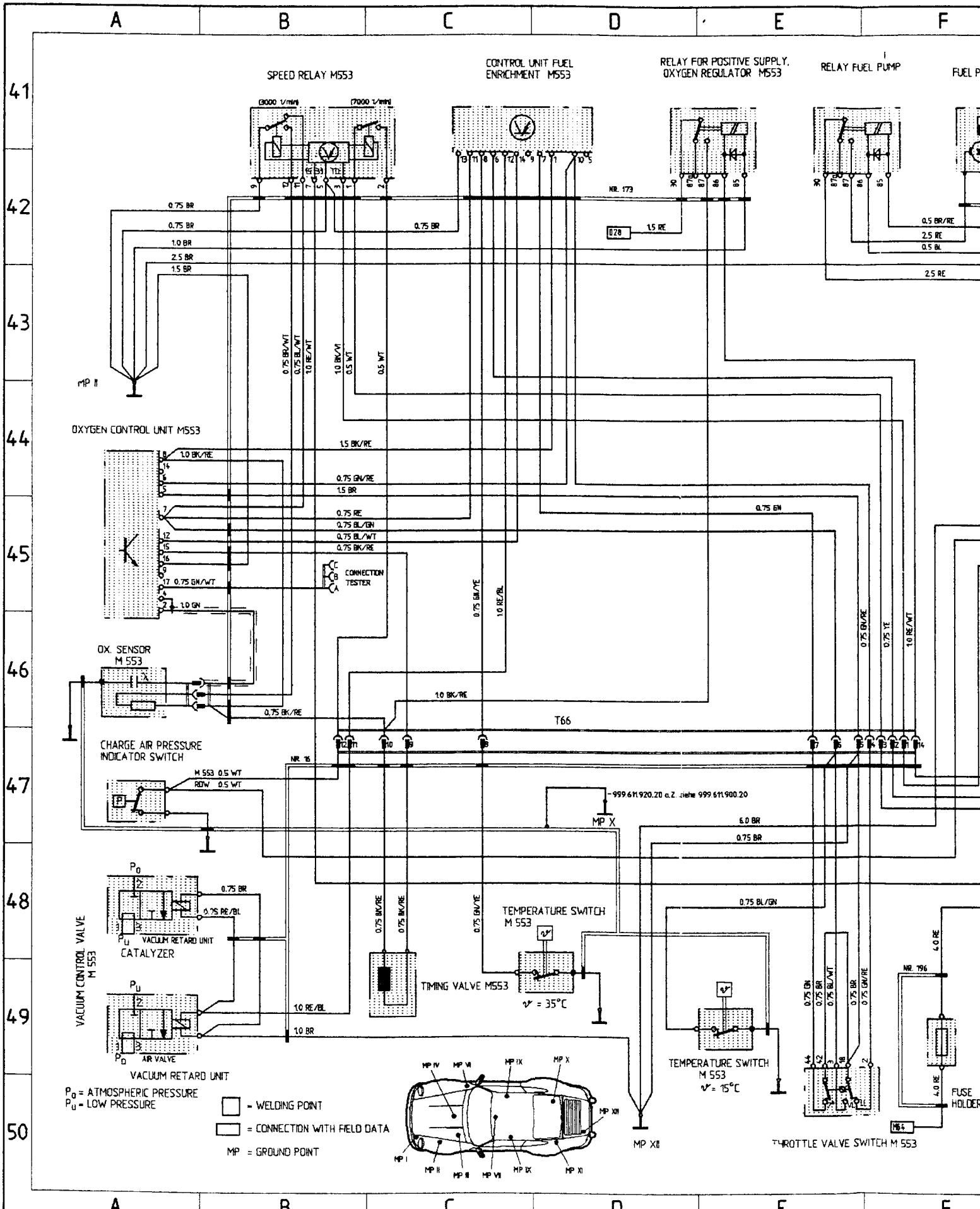
F	G	H	J	K	L

BK = BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET

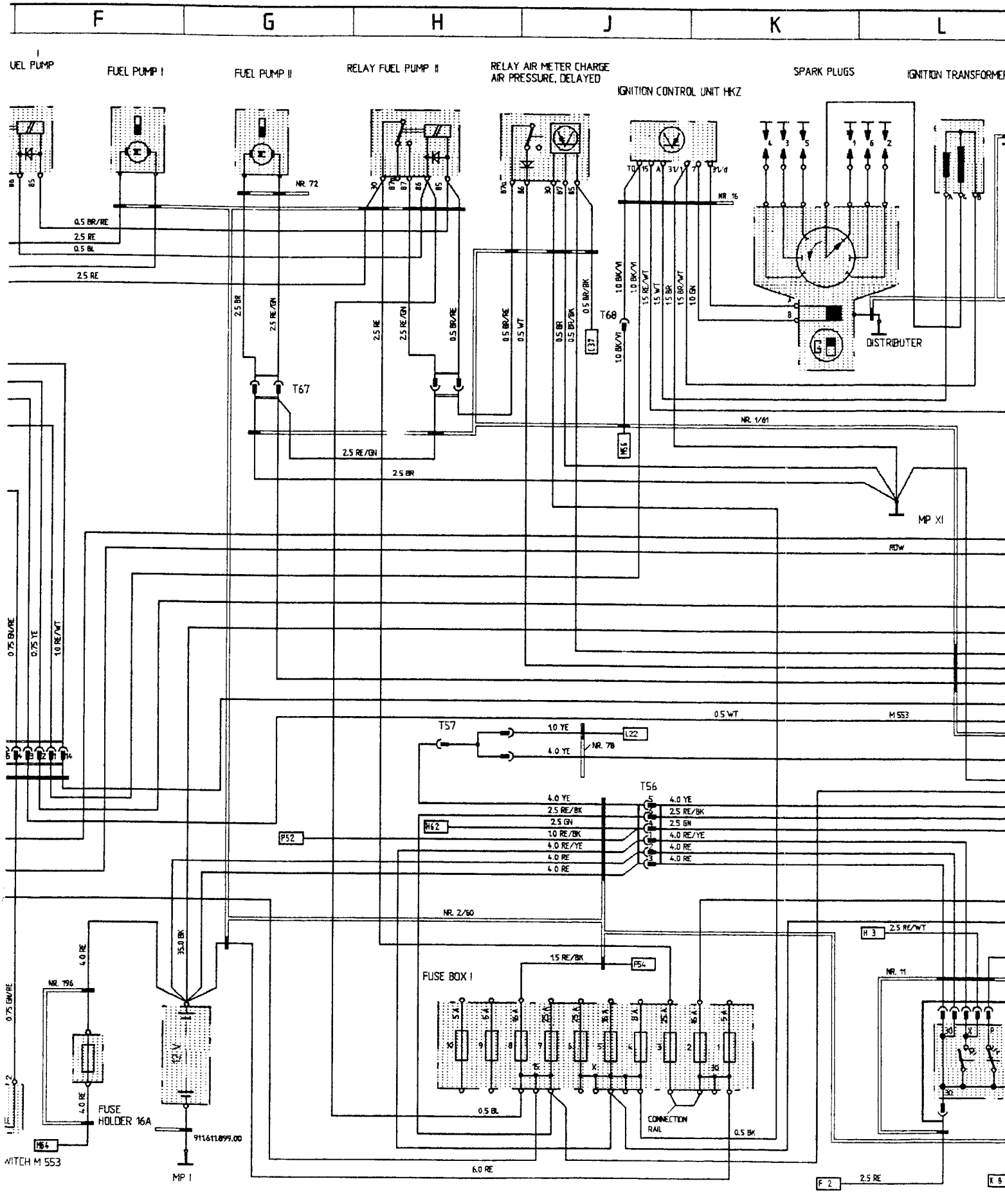

K
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31
32
33
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35
36
37
38
39
40
LE TOP
MOTOR TOP LOCK RIGHT
MICRO SWITCH ROOF LEFT
MICRO SWITCH ROOF RIGHT
CONVERTIBLE TOP INDICATOR LAMP
NR. 563
0.5 BR
0.5 BK
0.5 BL
0.5 BR/RE
0.5 RE/YE
P53
SWITCH
F
SWITCH
NR. 34 /64
2.5 BK
2.5 BK
2.5 BR
2.5 RE/BL
MP III
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
MP I
MP II
MP III
MP IV
MP VI
MP VII
MP IX
MP X
MP XI

Wiring Diagram Type 911 Turbo Model 89 Sheet 5

K-JETRONIC, OXYGEN REGULATOR

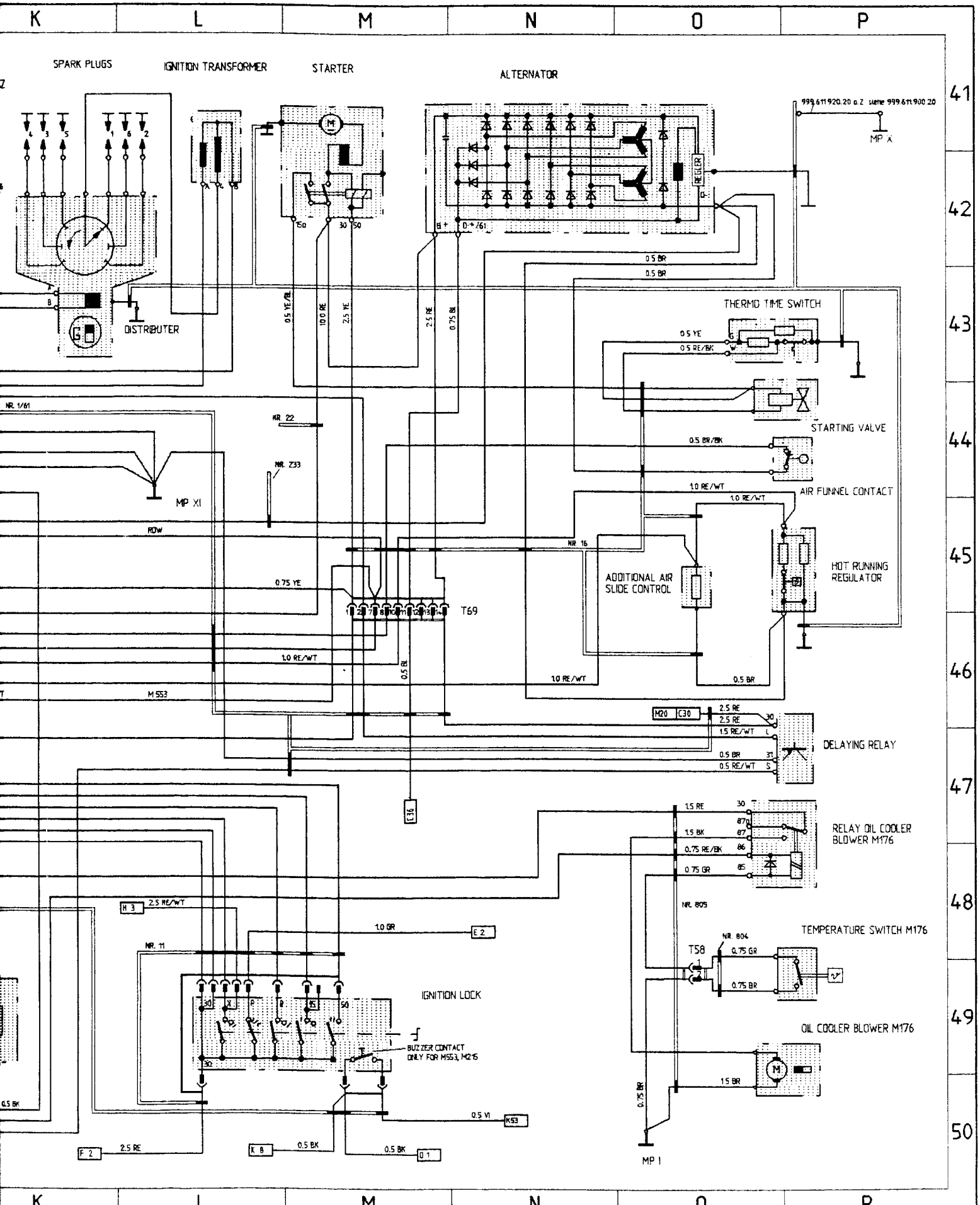


et 5



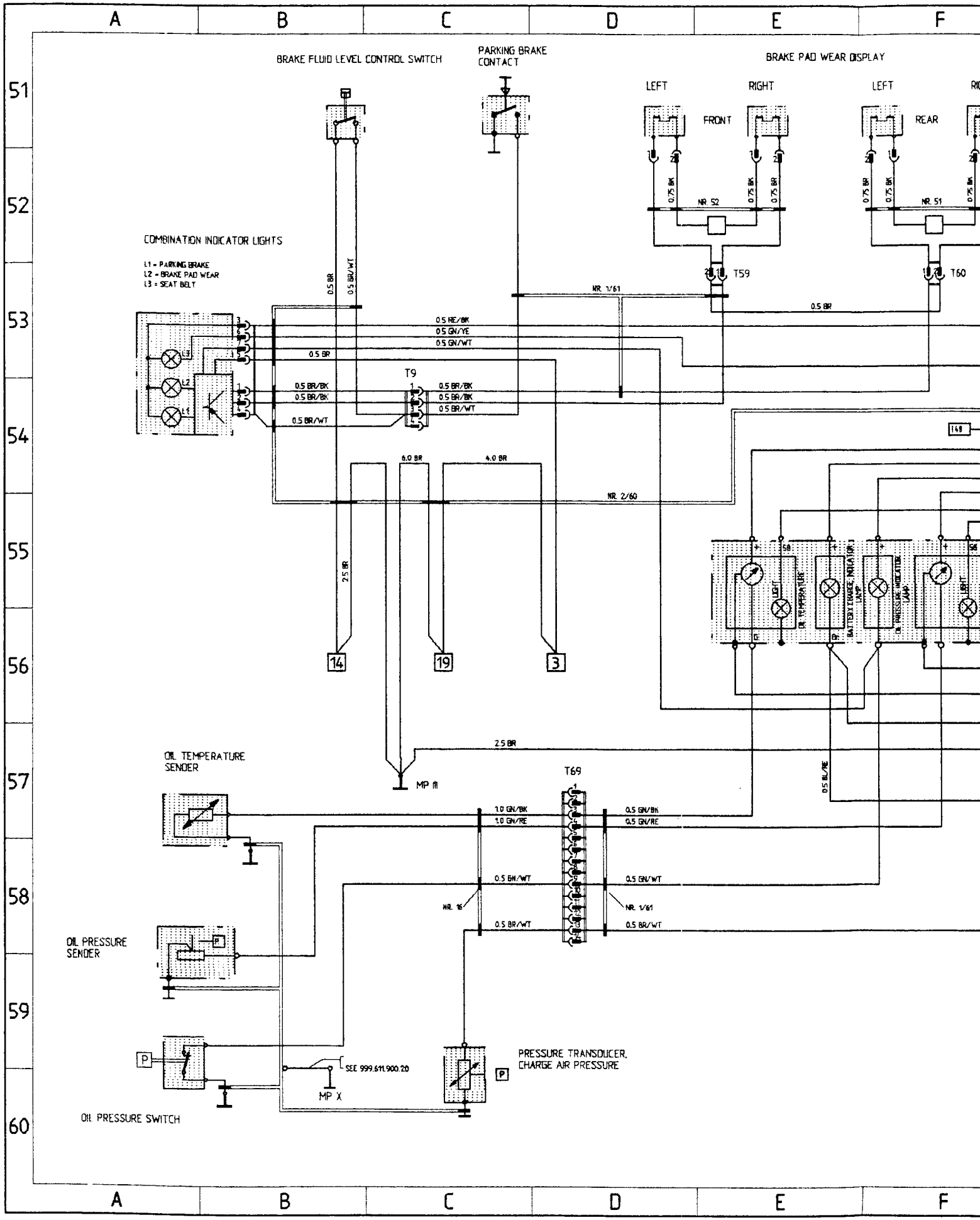
F G H J K L

BACK WT - WHITE RE - RED GN - GREEN YE - YELLOW BR - BROWN

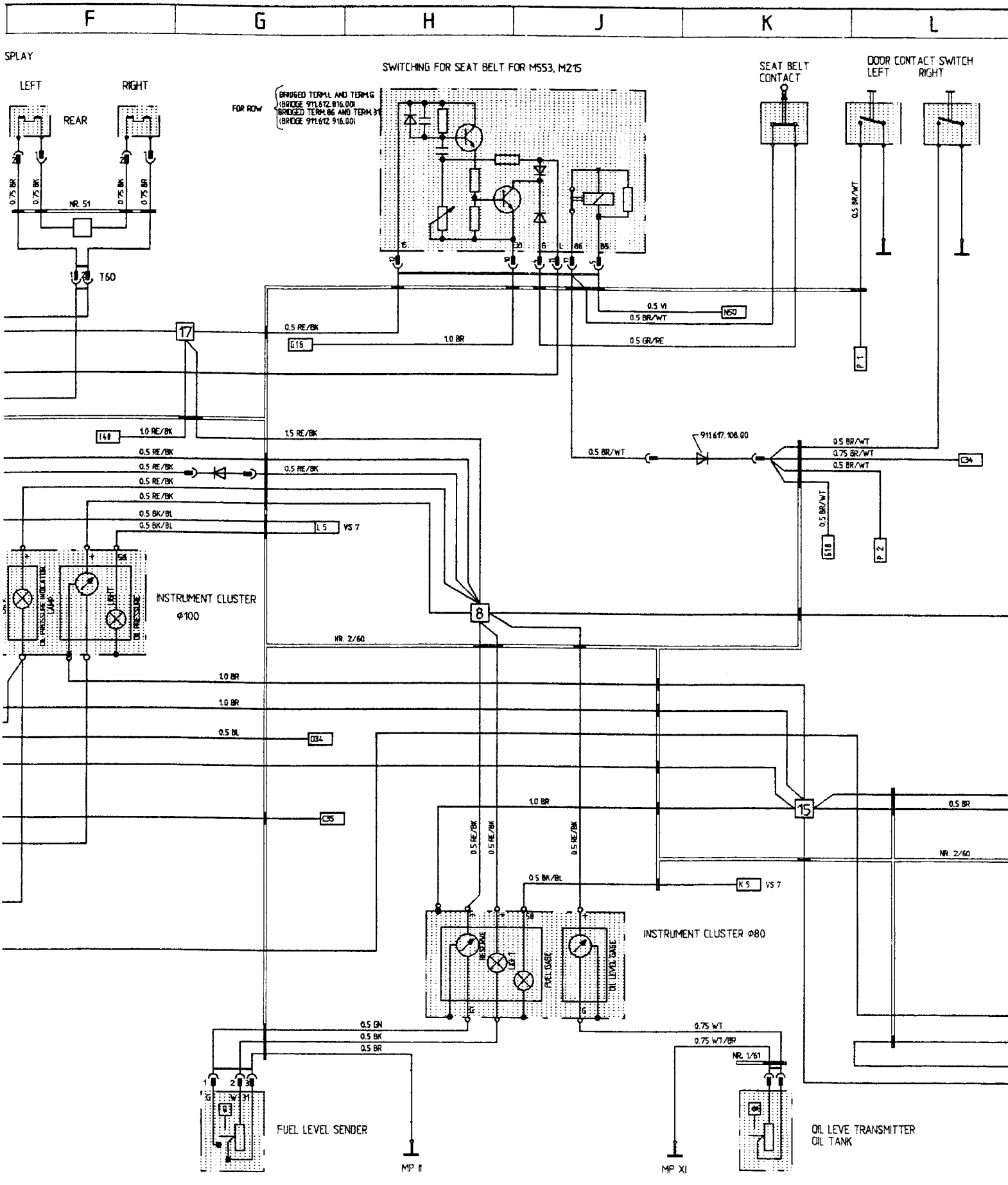

K
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M
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41
42
43
44
45
46
47
48
49
50
SPARK PLUGS
IGNITION TRANSFORMER
STARTER
ALTERNATOR
999.611.920.20 o.Z siehe 999.611.900.20
MP X
DISTRIBUTER
THERMO TIME SWITCH
STARTING VALVE
AIR FUNNEL CONTACT
HOT RUNNING REGULATOR
ADDITIONAL AIR SLIDE CONTROL
T69
MP XI
DELAYING RELAY
RELAY OIL COOLER BLOWER M176
TEMPERATURE SWITCH M176
T58
IGNITION LOCK
BUZZER CONTACT ONLY FOR M553, M215
OIL COOLER BLOWER M176
MP I
0.5 BR
0.5 YE/BL
1.0 RE
2.5 YE
2.5 RE
0.75 BL
0.5 YE
0.5 RE/BK
0.5 BR/BK
1.0 RE/WT
ROW
0.75 YE
M553
2.5 RE
2.5 RE/WT
1.5 RE/WT
1.5 RE
1.5 BK
0.75 RE/BK
0.75 GR
1.0 GR
0.5 VI
0.5 BK
1.5 BR
NR. 1/61
NR. 22
NR. 233
NR. 16
NR. 11
NR. 805
NR. 804
M20
C30
E36
E2
H3
F2
K8
Q1
K53

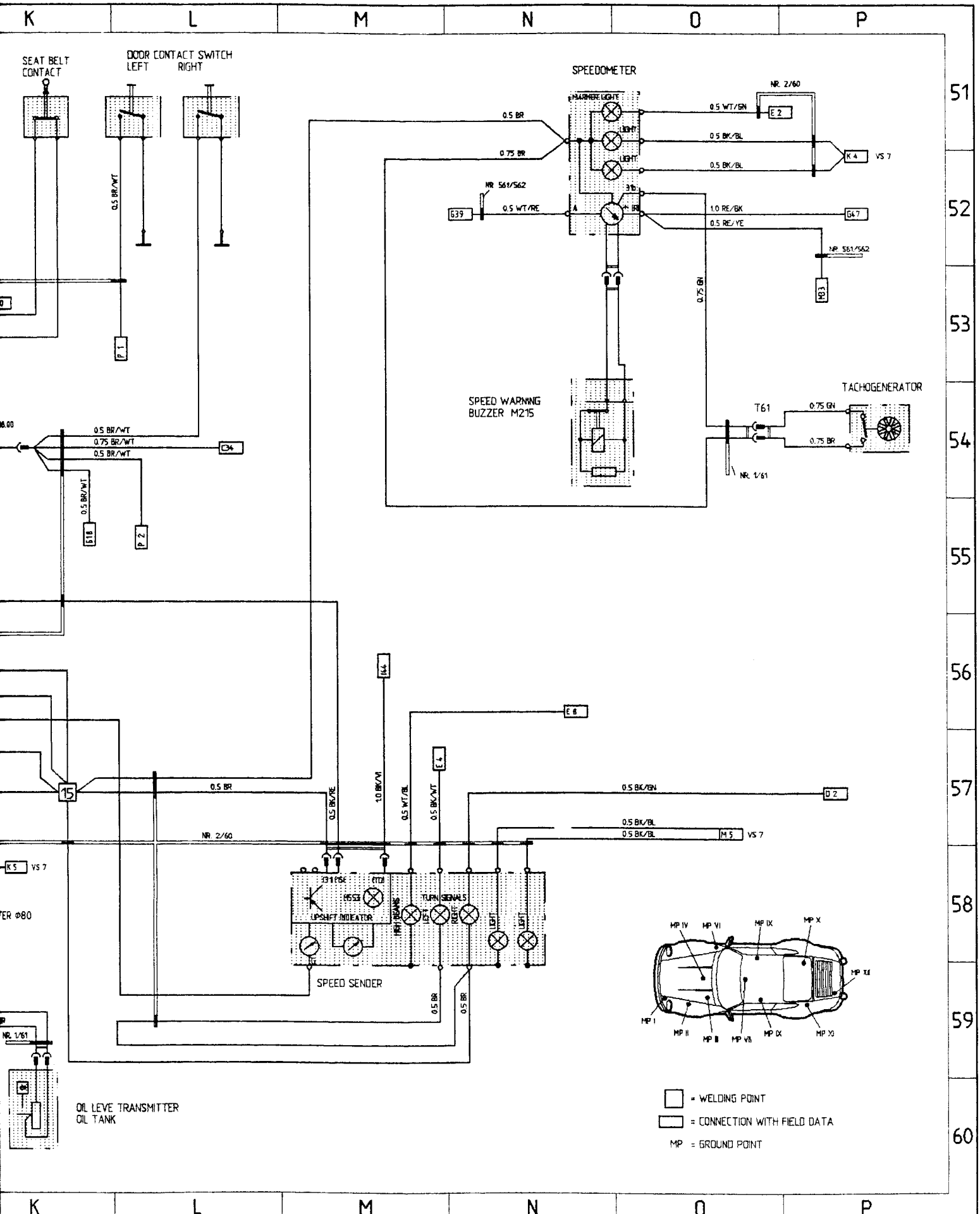
Wiring Diagram Type 911 Turbo Model 89 Sheet 6

INSTRUMENTS AND SENDER



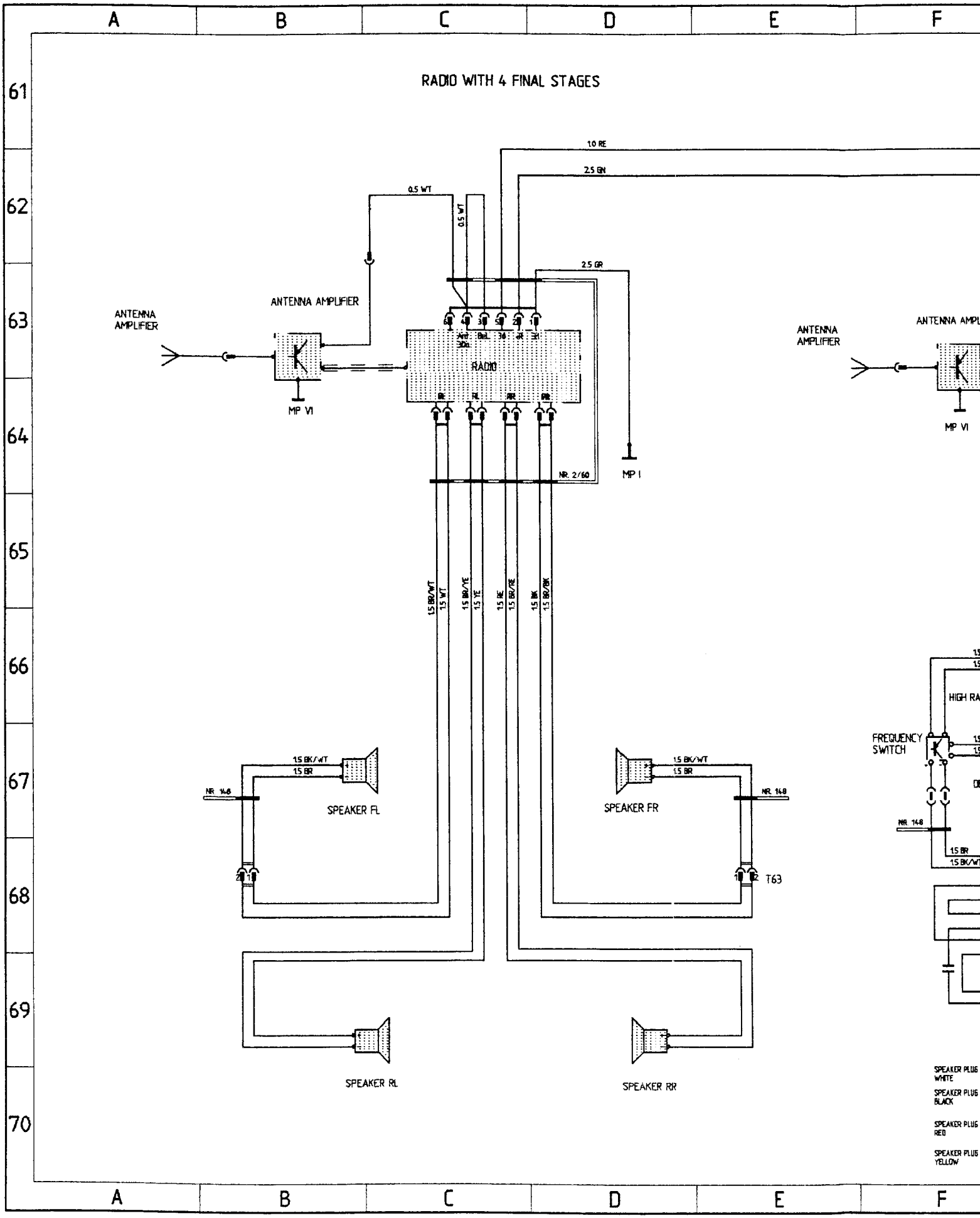
Printed in Germany XI 1988


F
G
H
J
K
L
SPLAY
LEFT
RIGHT
REAR
NR. 51
T60
SWITCHING FOR SEAT BELT FOR M553, M215
FOR ROW
BRIDGED TERM.L AND TERM.G
(BRIDGE 911.612.816.001
BRIDGED TERM.86 AND TERM.31
(BRIDGE 911.612.916.001
SEAT BELT CONTACT
DOOR CONTACT SWITCH
LEFT
RIGHT
0.5 BR/WT
0.5 VI
N50
0.5 RE/BK
G18
1.0 BR
0.5 GR/RE
P 1
P 2
1.0 RE/BK
1.5 RE/BK
911.617.108.00
C34
0.75 BR/WT
0.5 BK/BL
L 5
VS 7
INSTRUMENT CLUSTER
Φ100
OIL PRESSURE INDICATOR LAMP
LEFT
OIL PRESSURE
NR. 2/60
0.5 BL
C34
C35
K 5
INSTRUMENT CLUSTER Φ80
RESERVE
FUEL GAGE
OIL LEVEL GAGE
0.5 GN
0.5 BK
0.5 BR
0.75 WT
0.75 WT/BR
NR. 1/61
FUEL LEVEL SENDER
OIL LEVE TRANSMITTER
OIL TANK
MP II
MP XI


K
L
M
N
O
P
SEAT BELT CONTACT
DOOR CONTACT SWITCH LEFT RIGHT
SPEEDOMETER
MARKER LIGHT
LIGHT
LIGHT
NR. 2/60
0.5 WT/GN
E 2
0.5 BK/BL
0.5 BK/BL
K 4
VS 7
0.5 BR
0.75 BR
NR. 561/562
639
0.5 WT/RE
1.0 RE/BK
0.5 RE/YE
G47
NR. 561/562
M33
0.75 GN
SPEED WARNING BUZZER M215
TACHOGENERATOR
T61
0.75 GN
0.75 BR
NR. 1/61
0.5 BR/WT
0.75 BR/WT
0.5 BR/WT
C34
0.5 BR/WT
518
P 2
P 1
0.5 BR/WT
15
0.5 BR
NR. 2/60
0.5 BK/RE
1.0 BK/VI
0.5 WT/BL
0.5 BK/WT
144
E 8
E 4
0.5 BK/GN
D 2
0.5 BK/BL
0.5 BK/BL
M 5
VS 7
K 5
VS 7
UPSHIFT INDICATOR
HIGH BEAMS
TURN SIGNALS
LEFT
RIGHT
LIGHT
LIGHT
SPEED SENDER
0.5 BR
0.5 BR
MP IV
MP VI
MP IX
MP X
MP XI
MP I
MP II
MP III
MP VII
MP IX
MP XI
NR. 1/61
OIL LEVE TRANSMITTER OIL TANK
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
51
52
53
54
55
56
57
58
59
60

Wiring Diagram Type 911 Turbo Model 89 Sheet 7

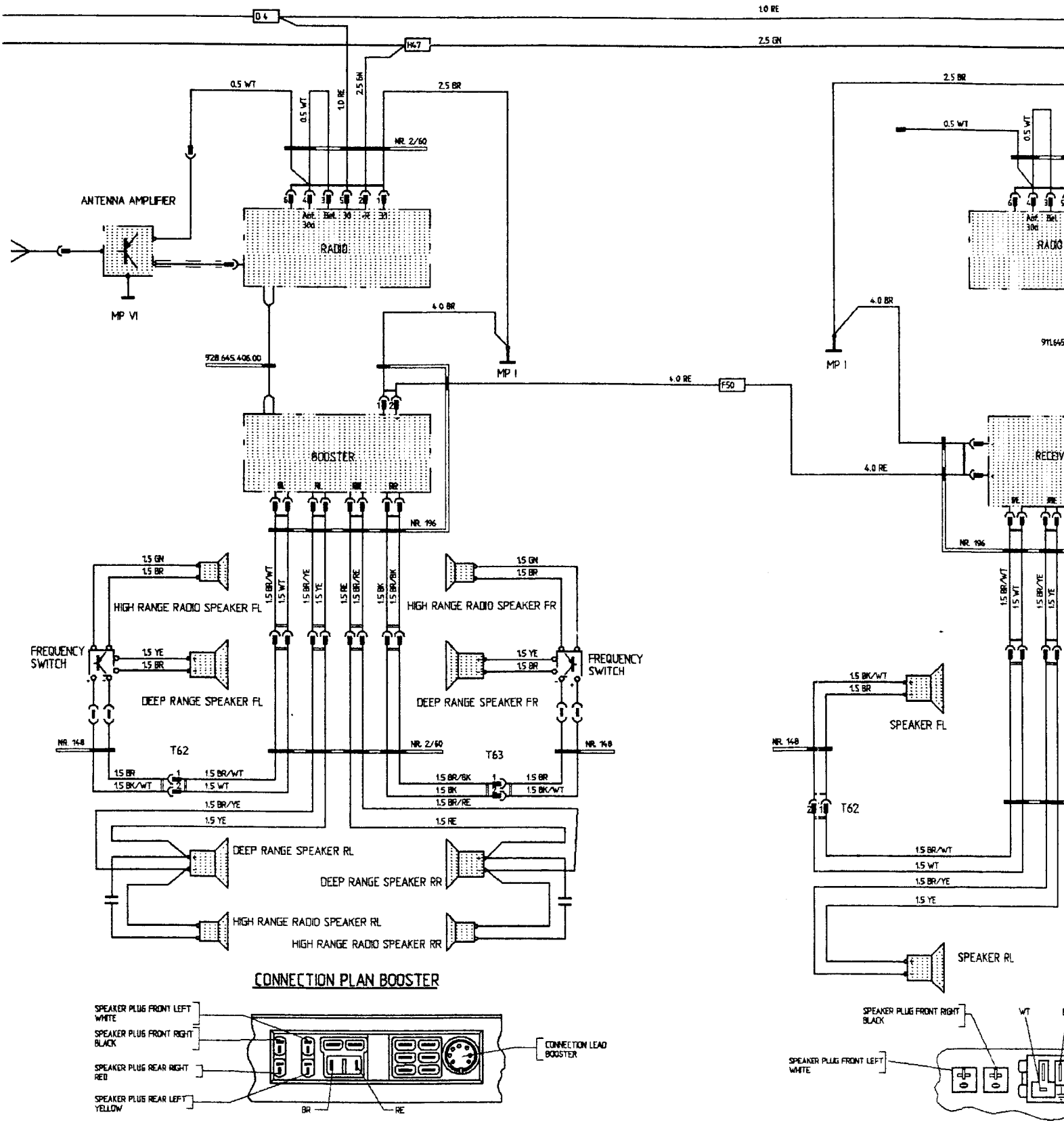
RADIO



F G H J K L

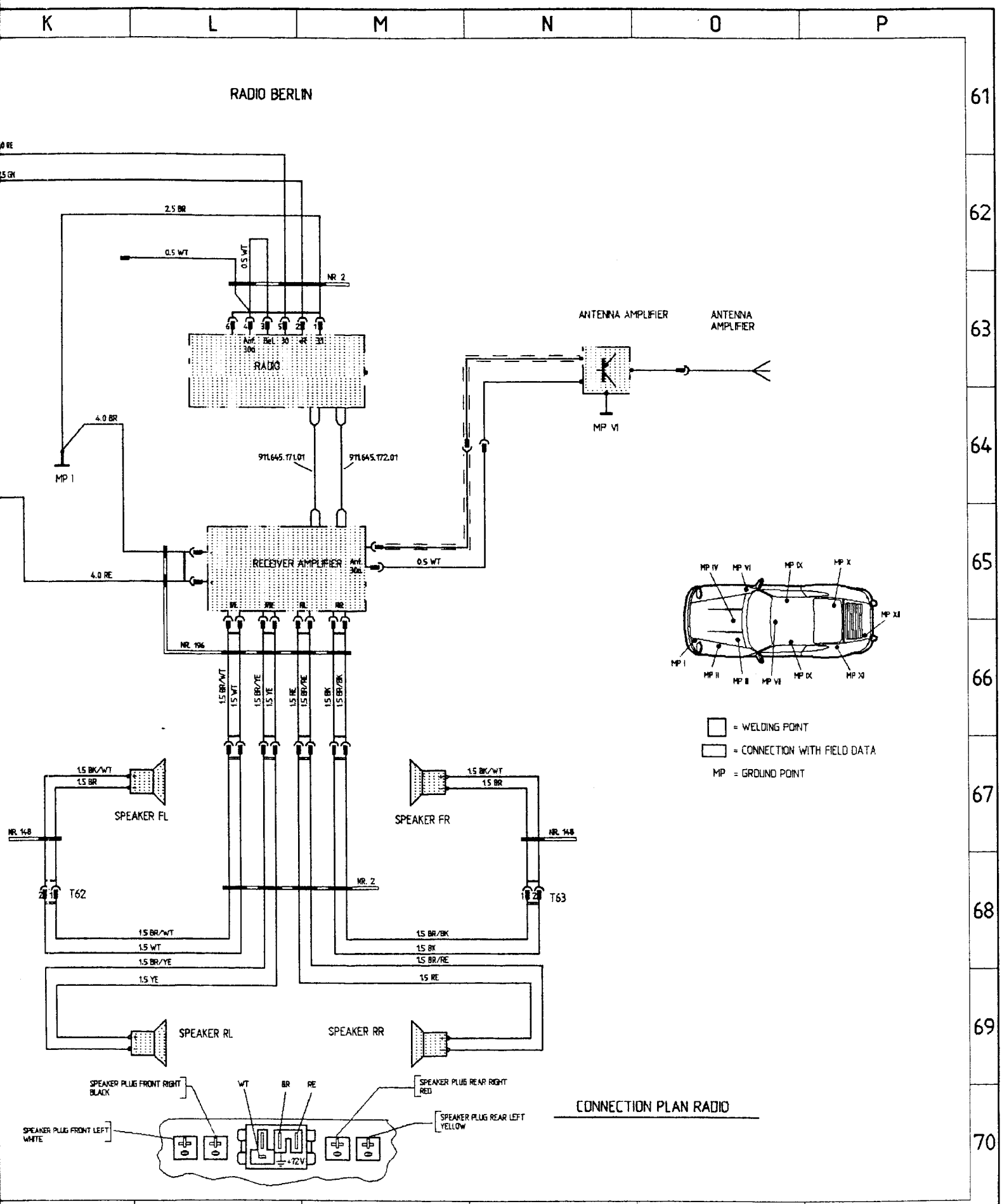
RADIO WITH 4 FINAL STAGES
AND AUDIO OPTION PACK

RADIO BI



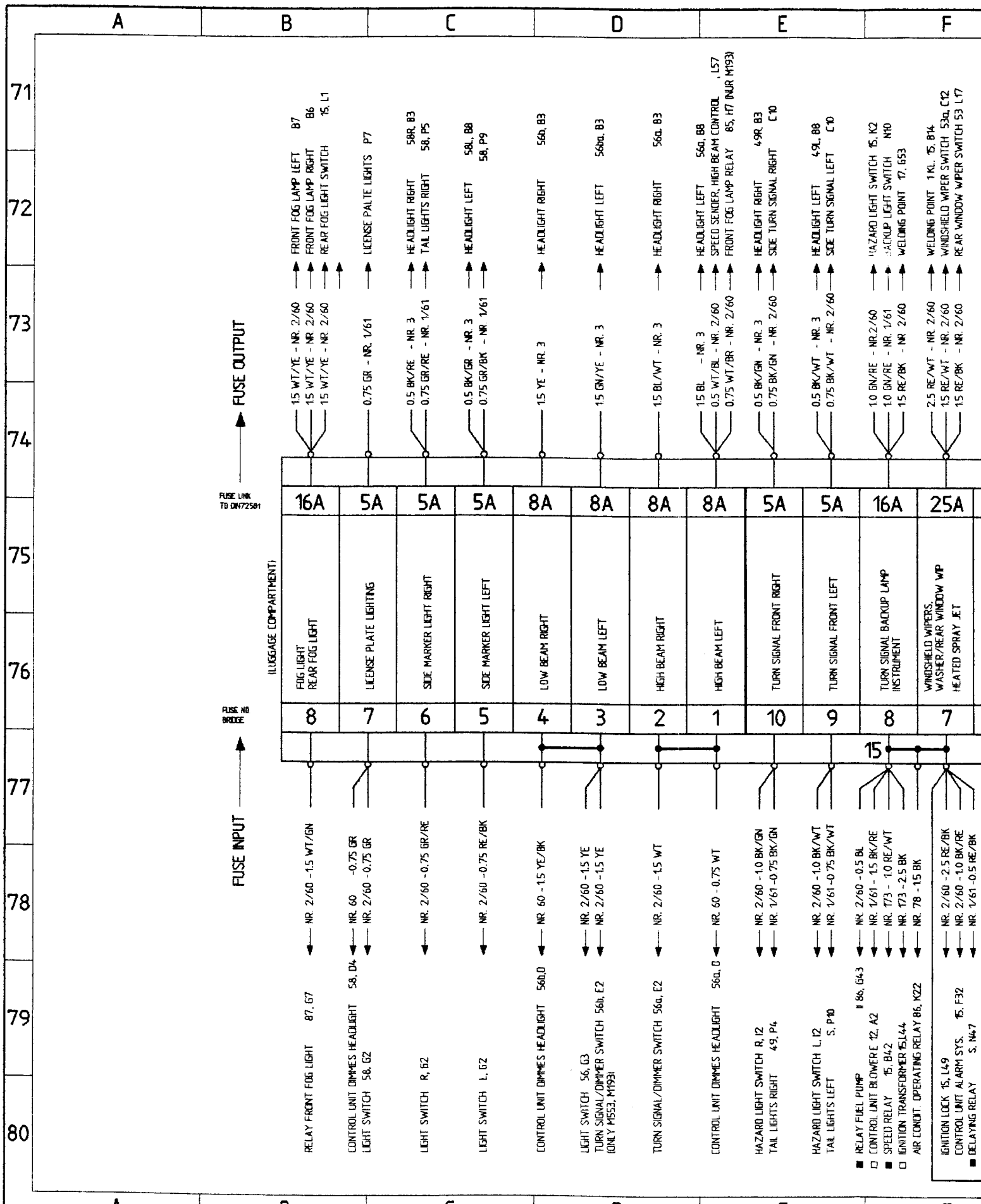
F G H J K L

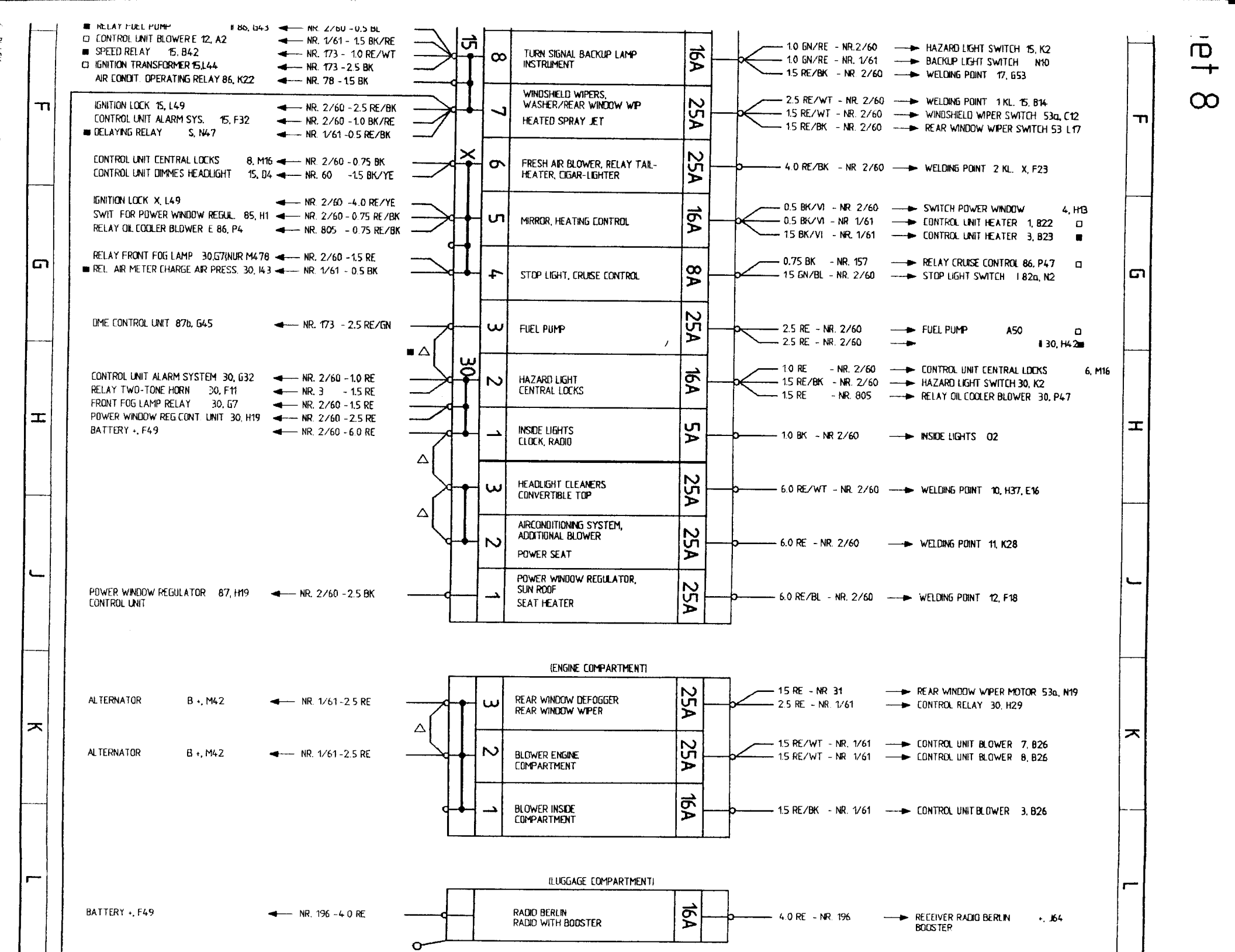
BK = BLACK WT = WHITE RE = RED GN = GREEN YE = YELLOW GR = GREY BR = BROWN BL = BLUE VI = VIOLET


K
L
M
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61
62
63
64
65
66
67
68
69
70
RADIO BERLIN
2.5 BR
0.5 WT
NR. 2
RADIO
ANTENNA AMPLIFIER
ANTENNA AMPLIFIER
MP VI
4.0 BR
MP 1
911.645.171.01
911.645.172.01
RECEIVER AMPLIFIER
0.5 WT
4.0 RE
NR. 196
1.5 BR/WT
1.5 WT
1.5 BR/YE
1.5 YE
1.5 RE
1.5 BR/RE
1.5 BK
1.5 BR/BK
1.5 BK/WT
1.5 BR
SPEAKER FL
SPEAKER FR
NR. 148
T62
T63
SPEAKER RL
SPEAKER RR
SPEAKER PLUG FRONT RIGHT BLACK
SPEAKER PLUG REAR RIGHT RED
SPEAKER PLUG FRONT LEFT WHITE
SPEAKER PLUG REAR LEFT YELLOW
WT
BR
RE
+12V
MP I
MP II
MP III
MP IV
MP VI
MP VII
MP IX
MP X
MP XI
= WELDING POINT
= CONNECTION WITH FIELD DATA
MP = GROUND POINT
CONNECTION PLAN RADIO

Wiring Diagram Type 911 Turbo Model 89 Sheet 8

FUSE ASSIGNMENTS AND POSITIONS




RELAY FUEL PUMP
CONTROL UNIT BLOWER E 12, A2
SPEED RELAY 15, B42
IGNITION TRANSFORMER 15, L44
AIR CONDIT. OPERATING RELAY 86, K22
IGNITION LOCK 15, L49
CONTROL UNIT ALARM SYS. 15, F32
DELAYING RELAY S, N47
CONTROL UNIT CENTRAL LOCKS 8, M16
CONTROL UNIT DIMMES HEADLIGHT 15, D4
IGNITION LOCK X, L49
SWIT. FOR POWER WINDOW REGUL. 85, H1
RELAY OIL COOLER BLOWER E 86, P4
RELAY FRONT FOG LAMP 30, G7
REL. AIR METER CHARGE AIR PRESS. 30, I43
DME CONTROL UNIT 87b, G45
CONTROL UNIT ALARM SYSTEM 30, G32
RELAY TWO-TONE HORN 30, F11
FRONT FOG LAMP RELAY 30, G7
POWER WINDOW REG. CONT. UNIT 30, H19
BATTERY +, F49
POWER WINDOW REGULATOR CONTROL UNIT 87, H19
15
X
30
8 TURN SIGNAL BACKUP LAMP INSTRUMENT 16A
7 WINDSHIELD WIPERS, WASHER/REAR WINDOW WIP HEATED SPRAY JET 25A
6 FRESH AIR BLOWER, RELAY TAIL-HEATER, CIGAR-LIGHTER 25A
5 MIRROR, HEATING CONTROL 16A
4 STOP LIGHT, CRUISE CONTROL 8A
3 FUEL PUMP 25A
2 HAZARD LIGHT CENTRAL LOCKS 16A
1 INSIDE LIGHTS CLOCK, RADIO 5A
3 HEADLIGHT CLEANERS CONVERTIBLE TOP 25A
2 AIRCONDITIONING SYSTEM, ADDITIONAL BLOWER POWER SEAT 25A
1 POWER WINDOW REGULATOR, SUN ROOF SEAT HEATER 25A
1.0 GN/RE - NR. 2/60 → HAZARD LIGHT SWITCH 15, K2
1.0 GN/RE - NR. 1/61 → BACKUP LIGHT SWITCH N10
1.5 RE/BK - NR. 2/60 → WELDING POINT 17, G53
2.5 RE/WT - NR. 2/60 → WELDING POINT 1 KL. 15, B14
1.5 RE/WT - NR. 2/60 → WINDSHIELD WIPER SWITCH 53a, C12
1.5 RE/BK - NR. 2/60 → REAR WINDOW WIPER SWITCH 53 L17
4.0 RE/BK - NR. 2/60 → WELDING POINT 2 KL. X, F23
0.5 BK/VI - NR. 2/60 → SWITCH POWER WINDOW 4, H13
0.5 BK/VI - NR. 1/61 → CONTROL UNIT HEATER 1, B22
1.5 BK/VI - NR. 1/61 → CONTROL UNIT HEATER 3, B23
0.75 BK - NR. 157 → RELAY CRUISE CONTROL 86, P47
1.5 GN/BL - NR. 2/60 → STOP LIGHT SWITCH 182a, N2
2.5 RE - NR. 2/60 → FUEL PUMP A50
2.5 RE - NR. 2/60 → 30, H42
1.0 RE - NR. 2/60 → CONTROL UNIT CENTRAL LOCKS 6, M16
1.5 RE/BK - NR. 2/60 → HAZARD LIGHT SWITCH 30, K2
1.5 RE - NR. 805 → RELAY OIL COOLER BLOWER 30, P47
1.0 BK - NR. 2/60 → INSIDE LIGHTS Q2
6.0 RE/WT - NR. 2/60 → WELDING POINT 10, H37, E16
6.0 RE - NR. 2/60 → WELDING POINT 11, K28
6.0 RE/BL - NR. 2/60 → WELDING POINT 12, F18
(ENGINE COMPARTMENT)
ALTERNATOR B +, M42
ALTERNATOR B +, M42
3 REAR WINDOW DEFOGGER REAR WINDOW WIPER 25A
2 BLOWER ENGINE COMPARTMENT 25A
1 BLOWER INSIDE COMPARTMENT 16A
1.5 RE - NR. 31 → REAR WINDOW WIPER MOTOR 53a, N19
2.5 RE - NR. 1/61 → CONTROL RELAY 30, H29
1.5 RE/WT - NR. 1/61 → CONTROL UNIT BLOWER 7, B26
1.5 RE/WT - NR. 1/61 → CONTROL UNIT BLOWER 8, B26
1.5 RE/BK - NR. 1/61 → CONTROL UNIT BLOWER 3, B26
(LUGGAGE COMPARTMENT)
BATTERY +, F49
RADIO BERLIN RADIO WITH BOOSTER 16A
4.0 RE - NR. 196 → RECEIVER RADIO BERLIN BOOSTER +, J64

ALTERNATOR B +, M42 ← NR. 1/61 -2.5 RE

ALTERNATOR B +, M42 ← NR. 1/61 -2.5 RE

△

3	REAR WINDOW DEFOGGER REAR WINDOW WIPER	25A	1.5 RE - NR. 3 → REAR WINDOW WIPER MOTOR 53a, N47 2.5 RE - NR. 1/61 → CONTROL RELAY 30, H29
2	BLOWER ENGINE COMPARTMENT	25A	1.5 RE/WT - NR. 1/61 → CONTROL UNIT BLOWER 7, B26 1.5 RE/WT - NR 1/61 → CONTROL UNIT BLOWER 8, B26
1	BLOWER INSIDE COMPARTMENT	16A	1.5 RE/BK - NR. 1/61 → CONTROL UNIT BLOWER 3, B26

BATTERY +, F49 ← NR. 196 -4.0 RE

(LUGGAGE COMPARTMENT)

RADIO BERLIN RADIO WITH BOOSTER	16A	4.0 RE - NR. 196 → RECEIVER RADIO BERLIN +, J64 BOOSTER

NR. 561/562 - 1.0 RE

(LUGGAGE COMPARTMENT)

CONVERTIBLE TOP	T2.5A	1.0 RE - NR. 561/562 → CONTROL UNIT CONVERTIBLE TOP 15, I34

DELAYING RELAY 30, N47 ← NR. 1/61 -2.5 RE

■ (ENGINE COMPARTMENT)

3	REAR WINDOW DEFOGGER REAR WINDOW WIPER	25A	1.5 RE - NR. 3 → REAR WINDOW WIPER MOTOR 53a, N47 2.5 RE - NR. 1/61 → CONTROL RELAY 30, H29
2	NOT USED	25A	
1	OXYGEN REGULATOR	8A	1.5 RE - NR. 173 → RELAY II - REGULATOR 30, D42

□ ONLY 911

□ ONLY 930

△ CONNECTION RAIL

○ FUSE HOLDER IN CABLE SET

15 WT/YE → NR. 2/6 → FRONT FOG LAMP

ø / COLOR / WIRE HARNESS NUMBER / NAME

K L M N O P

80 79 78 77 76 75 74 73 72 71

Wiring Diagram Type 911 Turbo Model 89 Sheet 9

CONSTR. COMPONENTS, PLUG CONNECT., GROUND POINTS

CONSTRUCTION COMPONENTS

DESIGNATION, FUNCTION	POSITION IN VEHICLE LHD	POSITION IN VEHICLE RHD	NOTE	FIELD
OPERATING RELAY	5cN	5cP	UNDER THE COVER LHD — BEHIND FLOORPANEL RHD	LM21
FLASHER	7cQ	7cL	IN LUGGAGE COMPARTMENT	HJ9 / CDE19 / EF629 / CDE39 / HJM49
BOOSTER	9eM	9eP	UNDER THE SEAT RIGHT	GH45
DME CONTROL UNIT	9eP	9eP	UNDER THE SEAT LEFT	FG44
DME CONTROL UNIT	9eP	9eP	UNDER THE SEAT LEFT	CDE41
SPEED RELAY	9eP	9eP	UNDER THE SEAT LEFT	B41,42
SPEED CUTOUT DEVICE	9eP	9eP	UNDER THE SEAT LEFT	GH44
RECEIVER, AMPLIFIER	9eP	9eM	UNDER THE SEAT RIGHT	LM65
FREQUENCY SWITCH FL	10cR	10cR	UNDER THE DOOR TRIM PANEL	F67
FREQUENCY SWITCH RL	10cK	10cK	UNDER THE DOOR TRIM PANEL	J67
SPEED WARNING BUZZER	7bO	7bO	ON THE SPEEDOMETER	N54
HIGH PRESSURE AND LOW PRESSURE SWITCH	5cN	5cO	UNDER THE COVER LHD — IN LUGGAGE COMPARTMENT RHD	L21,22
AIR CONDITIONER RELAY	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	K21
OXYGEN CONTROL UNIT	9eP	9eP	UNDER THE SEAT LEFT	A44,45
FRONT FOG LAMP RELAY	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	F9
CONTROL RELAY FOR REAR WINDOW DEFROGGER	16dQ	16dQ	CARRIER PLATE IN ENGINE COMPARTMENT	H29,30
RELAY ALARM SYSTEM USA	6cPQ	6cPQ	IN LUGGAGE COMPARTMENT	A39
RELAY TWO-TONE HORN	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	G11
RELAY FOR POSITIVE SUPPLY, OXYGEN REGULATOR	16dQ	16dQ	CARRIER PLATE IN ENGINE COMPARTMENT	E41
RELAY I FUEL PUMP	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	EF41
RELAY II FUEL PUMP	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	H41
RELAY AIR METER CHARGE AIR PRESS., DELAYED	16dQ	16dQ	CARRIER PLATE IN ENGINE COMPARTMENT	J41
RELAY OIL COOLER BLOWER	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	P48
RELAY CRUISE CONTROL	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	P47
SWITCHING FOR POWER WINDOW REGULATOR	6cP	6cP	IN LUGGAGE COMPARTMENT	G19,20
SWITCHING FOR CATALYZER	16cPQ	16cPQ	IN LUGGAGE COMPARTMENT	E60
SWITCHING FOR SEAT BELT	6cPQ	6cPQ	IN LUGGAGE COMPARTMENT	HJ52
FUSE BOX I	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	F9
FUSE BOX II	4cP	4cP	FUSE BOX IN LUGGAGE COMPARTMENT	DE9
FUSE BOX THREEFOLD	5cP	5cP	FUSE BOX IN LUGGAGE COMPARTMENT	EF19 / K30 / F39
FUSE BOX THREEFOLD ENGINE COMPARTMENT	16dQ	16dQ	CARRIER PLATE IN ENGINE COMPARTMENT	LM19 / C30
FUSE HOLDER 16A	3dPQ	3dPQ	IN LUGGAGE COMPARTMENT	F48
FUSE HOLDER T2.5	5cP	5cP	BEHIND THE FUSE BOX	H39
FUSE HOLDER 10A FOR BLOWER LEFT	7bQ	7bQ	FOR ADDITIONAL BLOWER	D23
FUSE HOLDER 10A FOR BLOWER RIGHT	7bL	7bL	FOR ADDITIONAL BLOWER	D23
ELECTRONIC CONTROL UNIT CENTRAL LOCKS	7bL	7bL	IN LUGGAGE COMPARTMENT	M16
CONTROL UNIT ALARM SYSTEM	6cM	6cM	IN LUGGAGE COMPARTMENT	C32
CONTROL UNIT CONVERTIBLE TOP	6dM	6dM	BEHIND FLOORBOARD	F35,36
CONTROL UNIT FUEL ENRICHMENT	9eP	9eP	UNDER THE SEAT LEFT	CD41
CONTROL UNIT BLOWER	16dQ	16dQ		AB26
CONTROL UNIT DIMMES HEADLIGHTS	5dP	5dP	BEHIND FLOORBOARD	D1
CONTROL UNIT HEADLIGHT CLEANERS	2dP	2dP	IN LUGGAGE COMPARTMENT	A18,19
CONTROL UNIT CRUISE CONTROL	6bN	6bN	UNDER THE INSTRUMENT PANEL	P43,44
THERMO BIMETAL SWITCH WITH RESISTOR				OP21
DELAYING RELAY	16dQ	16dQ	CARRIER PLATE IN ENGINE COMPARTMENT	P47
RESISTOR	7bL	6bP	IN LUGGAGE COMPARTMENT	D21
WIPER INTERMITTENT CONTROL RELAIS	6cN	6cO	IN LUGGAGE COMPARTMENT	A13
ADDITIONAL CLEANING FLUID PUMP RELAY	5cP	5cP	IN LUGGAGE COMPARTMENT	D30
ADDITIONAL BLOWER RELAY	6cP	6cL	FUSE BOX IN LUGGAGE COMPARTMENT	AB17

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PLUG CONNECTIONS

CODE	NUMBER OF PINS	DESIGNATION, FUNKTION	POSITION IN VEHICLE LHD	POSITION IN VEHICLE RHD	NOTE	FIELD
T1	2	LUGGAGE COMPARTMENT LIGHT	7bL	7bL	REAR RIGHT OF HEATER HOSE	B4
T2	2	SIDE TURN SIGNAL RIGHT	7bL	7bL	REAR RIGHT OF HEATER HOSE	C2
T3	2	SIDE TURN SIGNAL LEFT	7bQ	7bQ	AT SIDE OF HEATER	C9
T4	1	BAL	7bP	7bM	UNDER THE INSTRUMENT PANEL	D3
T5	6	TURN SIGNAL/DIMMER SWITCH	6cP	6cM	UNDER THE INSTRUMENT PANEL	E3 / E12
T6	6	LIGHT SWITCH	6cP	6cM	UNDER THE INSTRUMENT PANEL	F2
T7	9	CENTRE CONSOLE	7cNO	7cNO	UNDER THE CENTRE CONSOLE	J3
T8	3	NO. 2/60 TO NO. 1/61	5cP	5cP	IN LUGGAGE COMPARTMENT	M4 / G26
T9	4	NO. 2/60 TO NO. 1/61	5cP	5cP	IN LUGGAGE COMPARTMENT	N4 / C54
T10	6	CONTINUOUS CONSUMER	4cP	4cP	IN LUGGAGE COMPARTMENT	N5 / D37
T11	2	INSIDE LIGHTS	7bQ	7bQ	AT SIDE OF HEATER	O2
T12	2	INSIDE LIGHT IN THE ROOF	11aP	11aP	ON INNER ROOF	N3
T13	7	TAIL LIGHTS RIGHT	17cL	17cL	ON SIDE PANEL	N5
T14	7	TAIL LIGHTS LEFT	17cQ	17cQ	ON SIDE PANEL	O8
T15	14	NO 16 MOTOR	17cP	17cP	RELAY PANEL REAR	N9 / B28 / M44 / O57
T16	3	TAILGATE	15cL	15cL	ENGINE COMPARTMENT	N8
T17	3	REAR WINDOW	15cP	15cP	ENGINE COMPARTMENT	M8 / H27
T18	6	BLOWER OPERATING SWITCH	6cM	6cO	UNDER THE INSTRUMENT PANEL	L10/ G21
T19	1	CRUISE CONTROL	5cP	5cP	IN LUGGAGE COMPARTMENT	N3
T20	6	WIPE/WASH SWITCH	6cP	6cM	UNDER THE INSTRUMENT PANEL	C13
T21	1	WINDSHIELD WASHING FLUID PUMP	4cP	4cP	BEHIND THE FUSE BOX	D12
T22	1	RELAY TWO-TONE HORN	4cP	4cP	BEHIND THE FUSE BOX	F12
T23	6	MIRROR DRIVER'S SIDE	8bR	8bK	IN MIRROR	H11
T24	7	MIRROR DRIVER'S DOOR	7cQ	6cL	IN LUGGAGE COMPARTMENT	J12 / E33
T25	2	MIRROR DRIVER'S DOOR	7cQ	6cL	IN LUGGAGE COMPARTMENT	K13
T26	7	MIRROR PASSENGER'S DOOR	7cL	7cQ	IN LUGGAGE COMPARTMENT	L12
T27	6	MIRROR PASSENGER'S SIDE	8bK	8bR	IN MIRROR	M12
T28	2	CENTRAL LOCK BUTTON	7dNO	7dNO	UNDER THE CENTRE CONSOLE	N13
T29	2	CENTRAL LOCK BUTTON	7dNO	7dNO	UNDER THE CENTRE CONSOLE	O13
T30	5	DRIVE FOR PASSENGER	9dK	9dR	IN DOOR	O13
T31	3	LOCK CYLINDER FOR PASSENGER'S SIDE	9dK	9dR	IN DOOR	P13
T32	7	CENTRAL LOCK PASSENGER'S DOOR	7cL	7cQ	IN LUGGAGE COMPARTMENT	O15
T33	7	CENTRAL LOCK DRIVER'S DOOR	7cQ	6cL	IN LUGGAGE COMPARTMENT	O16
T34	5	DRIVE FOR DRIVER'S SIDE	9dR	9dK	IN DOOR	O18
T35	3	LOCK CYLINDER FOR DRIVER'S SIDE	9dR	9dK	IN DOOR	P18
T36	2x1	REAR WINDOW WIPER MOTOR	15dPQ	15dPQ	ENGINE COMPARTMENT	M18
T37	6	POWER WINDOW REGUL. PASSENGER'S SIDE	7bK	7bQ	UNDER THE FENDER	K18
T38	6	POWER WINDOW REGULATOR DRIVER'S SIDE	7bQ	7bK	UNDER THE FENDER	J18
T39	2	HEADLIGHT CLEANER BUTTON	2dP	2dP	IN LUGGAGE COMPARTMENT	B18
T40	4	HEATER LEVER	11dNO	11dNO	UNDER THE GEARBOX COVER	B22
T41	6	HEATER CONTROL	11dNO	11dNO	UNDER THE GEARBOX COVER	B24
T42	2	CENTRE CONSOLE	7dNO	7dNO	UNDER THE CENTRE CONSOLE	G24 / C34
T43	1	CLUTCH AIR	17dL	17dL	ENGINE COMPARTMENT	J22
T44	4	WIRE BRANCH	5cP	5cP	IN LUGGAGE COMPARTMENT	J24
T45						
T46	4	WIRE BRANCH RED	5cP	5cP	IN LUGGAGE COMPARTMENT	L24
T47	4	AIR BLOWER SWITCH	5cM	6dP	UNDER THE AIR COND. COVER LHD – UNDER THE FOOTWELL COVER RHD	M23
T48	2	AIR BLOWER	5cM	6dP	UNDER THE AIR COND. COVER LHD – UNDER THE FOOTWELL COVER RHD	O23
T49	4	WIRE BRANCH BLUE	5cP	5cP	IN LUGGAGE COMPARTMENT	L29/ J39
T50	8	SEAT LEFT	10dP	10dP	UNDER THE SEAT	N29
T51	8	SEAT RIGHT	10dM	10dM	UNDER THE SEAT	O30
T52	1	CONTROL UNIT CABRIO	5cP	5cP	BEHIND THE FUSE BOX	G37
T53	12	POWER TOP	12cL	12cL	BEHIND THE FUSE BOX	J35
T54	4	DME	4cP	4cP	IN LUGGAGE COMPARTMENT	E46
T55	6	FUEL INJECTORS	14cO	14cO	ENGINE COMPARTMENT	F43
T56	6	IGNITION LOCK	6cP	6cM	UNDER THE INSTRUMENT PANEL	J47
T57	3	WIRE BRANCH TERM 50	5cP	5cP	IN LUGGAGE COMPARTMENT	K47
T58	2	OIL COOLER TEMPERATURE SWITCH	2dL	2dL	IN LUGGAGE COMPARTMENT	O49
T59	2	BRAKE PAD WEAR DISPLAY FRONT	5cP	5cP	IN LUGGAGE COMPARTMENT	E53
T60	2	BRAKE PAD WEAR DISPLAY REAR	11dNO	11dNO	UNDER THE GEARBOX COVER	F53
T61	2	TACHOGENERATOR	11dNO	11dNO	UNDER THE GEARBOX COVER	O54
T62	2	SPEAKER DOOR FRONT LEFT	7cQ	7cQ	FOR ADDITIONAL BLOWER	B68
T63	2	SPEAKER DOOR FRONT RIGHT	7cL	7cL	FOR ADDITIONAL BLOWER	E68
T64	3	2/60 - 1/61	5cP	5cP	IN LUGGAGE COMPARTMENT	C25
T65	2	2/60 - 1/61	5cP	5cP	IN LUGGAGE COMPARTMENT	C34
T66	14	16 - 173	14cO	14cO	ENGINE COMPARTMENT	CDE47
T67	2	FUEL PUMP REAR	15dP	15dP	ENGINE COMPARTMENT	G43
T68	1	IGNITION CONTROL UNIT	15dP	15dP	ENGINE COMPARTMENT	J43
T69	14	Nr. 16	16dQ	16dQ	ENGINE COMPARTMENT BEARER PLATE	M46
T70	1	FUSE ADAPTER	7cQ	6cL	IN LUGGAGE COMPARTMENT	O17
T71	2	ALARM-PRIMED INDICATOR LAMP	11cQ	11cL	IN DOOR	O18
T72	2	CONDENSER BLOWER	2dP	2dP	IN LUGGAGE COMPARTMENT	L22
T73	1	FUSE ADAPTER	7cQ	6cL	IN LUGGAGE COMPARTMENT	O15
T74	2	ALARM-PRIMED INDICATOR LAMP	11cL	11cQ	IN DOOR	P12

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GROUND POINTS

CODE	DESIGNATION, FUNCTION	POSITION IN VEHICLE LHD	RHD
MP I	IN LUGGAGE COMPARTMENT	2dP	2dP
MP II	IN LUGGAGE COMPARTMENT	5cP	5cP
MP III	IN LUGGAGE COMPARTMENT	6cP	6cP
MP IV	IN PASSENGER COMPARTMENT	7bNO	7bNO
MP V			
MP VI	IN LUGGAGE COMPARTMENT	6bK	6bK
MP VII	CABRIO, TARGA	9aNO	9aNO
MP VIII	IN ROOF	10aL	10aL
MP IX	IN ROOF	10aQ	10aQ
MP X	ENGINE COMPARTMENT	15cP	15cP
MP XI	ON THE GROUND	11dN	11dN
MP XII	ENGINE COMPARTMENT	17cO	17cO

