PORSCHE

914

SERVICE and TRAINING

INFORMATION

MODEL 75

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PORSCHE+AUDI
A DIVISION OF VOLKSWAGEN OF AMERICA INC.

914-1.8/2.0 MODEL 75

The main changes to the 914/2.0 and 914/1.8 for 1975 were made to comply with exhaust emission and safety regulations in various countries.

The modifications are as follows:

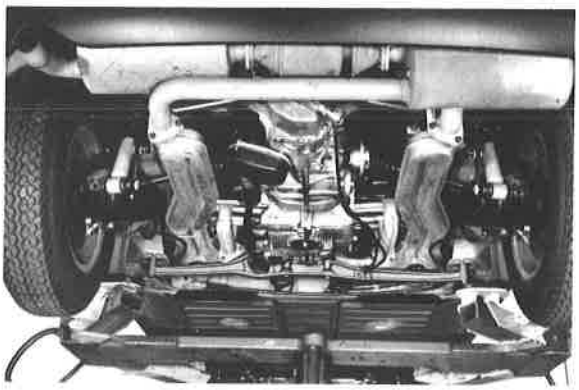
1.8 liter engines (US model) (AFC injection)		modified exhaust system
1.8 liter engines (California model) (AFC injection)		modified exhaust system exhaust gas recirculation catalytic converter
2.0 liter engines (US model) (MPC injection)		modified exhaust system air injection fuel feed cut-out
2.0 liter engines (California model) additional to US model		exhaust gas recirculation catalytic converter

Vehicle modifications:

Fuel system		external shape and mounting location of fuel pump changed
Bodywork	USA	redesigned bumpers, front and rear impact absorbers in addition
	California	as USA, but with additional bumper horns, front and rear
Electrical:		modified wiring harness at front and rear of vehicle; necessary because of changed fuel pump and horn location. Plug connexions provided for additional headlamps and registration plate light (to facilitate assembly)

ENGINE

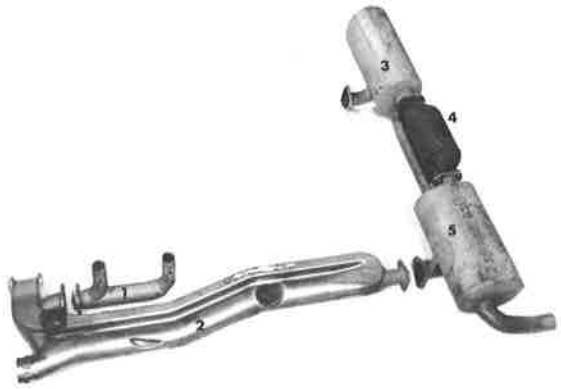
Engines intended for the USA and California have been modified to comply with new regulations; these modifications are mainly designed to improve the exhaust emission characteristics and therefore primarily concern the exhaust system.
As already indicated in the summary, there are some major differences between engines intended for California and other US states.
The detailed changes are as follows.

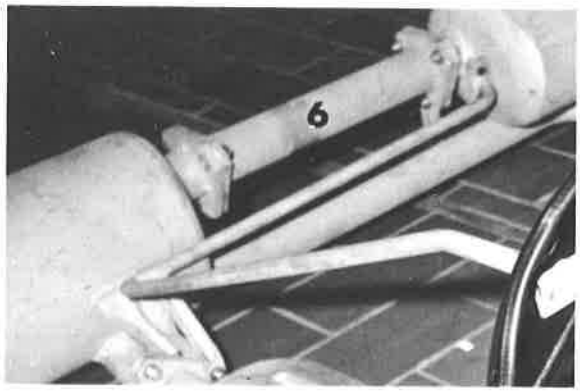


Exhaust system — California

The exhaust system consists of a reaction tube (1), new heat exchangers (2) and a general division into secondary muffler (3), catalyst (4) and primary muffler (5).

The two exhaust manifolds (heat exchangers) of cylinders 1/2 and 3/4 run together in secondary muffler, establishing the connection with the subsequent catalyst and primary muffler.



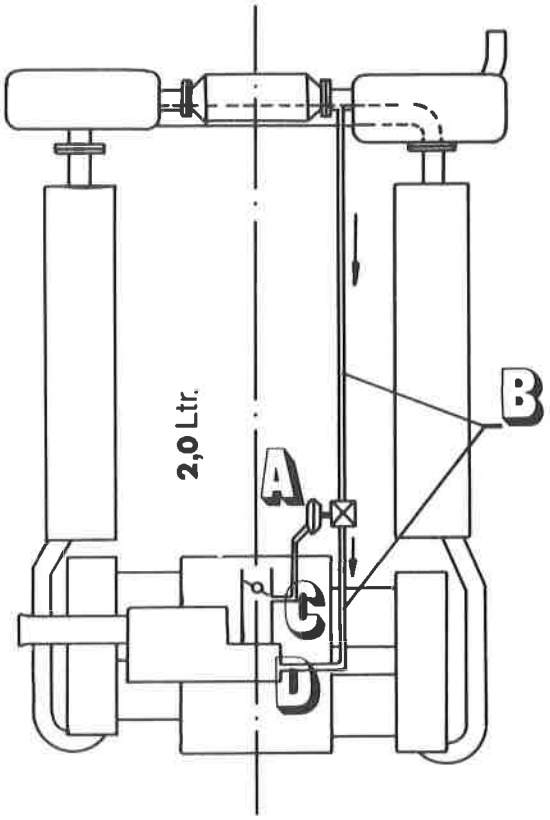


Exhaust system — USA

For other US states, the catalyst is replaced by a simple connexion tube (6) between the secondary and primary muffler.

Exhaust gas recirculation – California only

Exhaust gas recirculation is necessary to reduce nitrogen oxide emissions (NO_X).



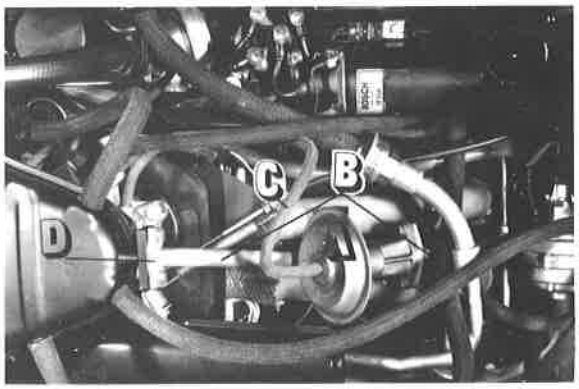
Basic design:

The illustration shows the principle of the exhaust gas recirculation system for the 2.0 liter MFC injection engine.

The system consists of a diaphragm-type control valve A,
the exhaust gas recirculation tubes B,
the vacuum tube C and the connection to the air filter D.

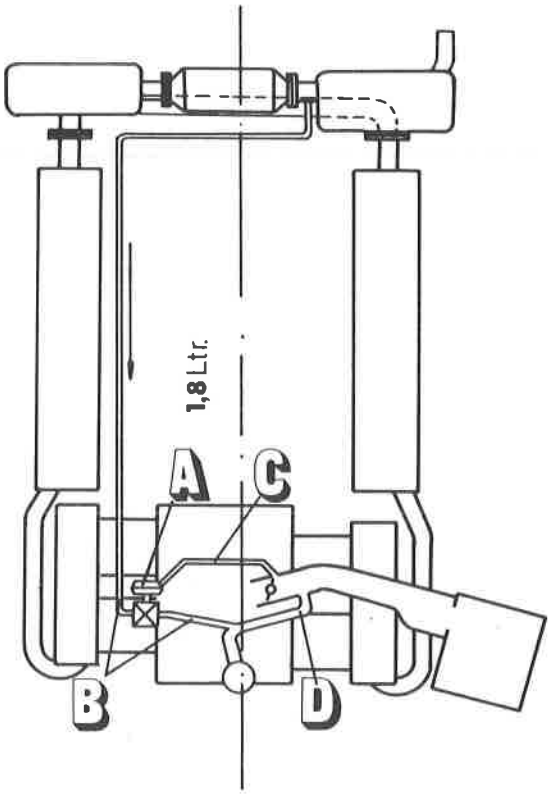
Mode of operation:

In the partial load range, the control valve membrane is raised by the vacuum in the intake tube. This opens a slide and established the connection from the muffler to the air filter.
Part of the exhaust gas is added to the fresh air.
This controlled exhaust gas injection prevents NO_X formation.



View of 2.0 liter engine compartment:

A control valve
B return tubes
C vacuum tube
D connection to air filter

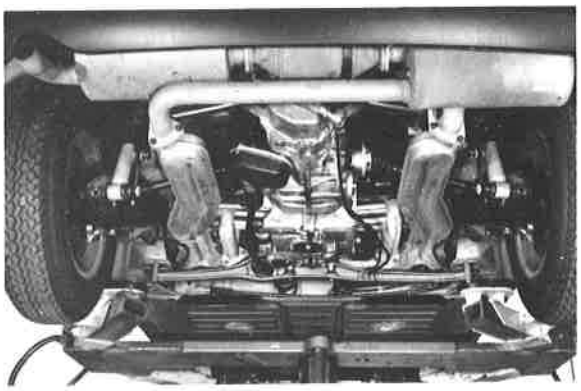


On the 1.8 liter engine, the recirculation tube (control valve for air filter) is combined with the crankcase ventilation.

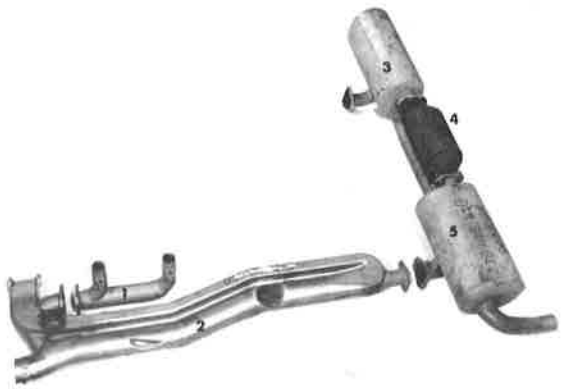
View of engine compartment:

A control valve
B return tubes
C vacuum tube
D connection to air filter

Catalytic converter – California only



As a further step towards cleaner exhaust gases (lower CO values), "California engines" are fitted with catalytic converter.



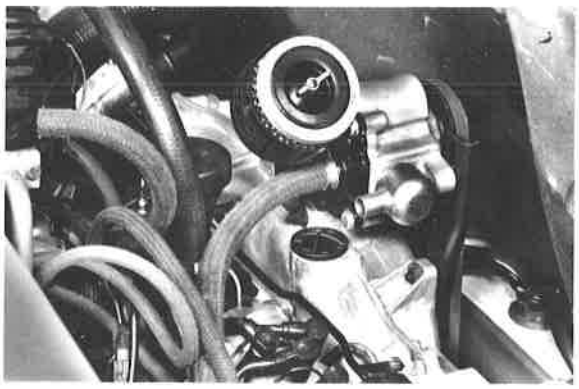
The catalyst triggers a chemical reaction which substantially reduces the CO content of the exhaust gases.

Vehicles equipped with catalytic converters must be run on **lead-free** fuel only.
On these vehicles the tank filler neck has a special reducing piece; this prevents filling with leaded fuel (pumps for lead-free fuel have a different filler nozzle).

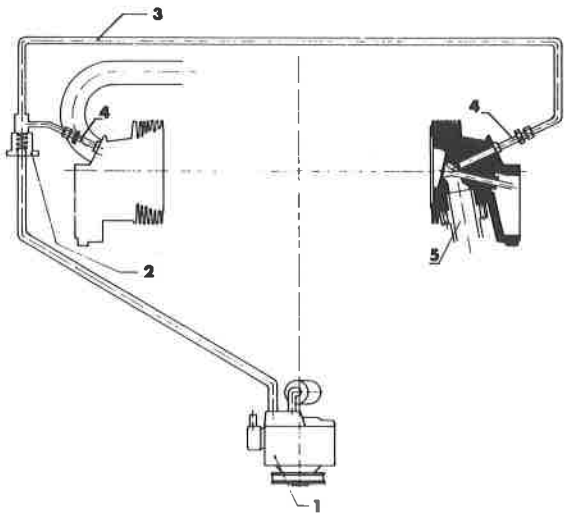
An "UNLEADED FUEL ONLY" sticker is also provided.

Secondary air injection – 2.0 liter engines only (USA and California)

The purpose of air injection is to reduce CO and HC emission in the exhaust gas by after-burning.



An engine-driven secondary air pump delivers the air required for after-burning to the cylinder head exhaust port.



The air travels from the pump (1) through a check valve (2) and a distributor line (3) to the injection valves (4), located directly behind the exhaust valves. The hot exhaust gases undergo afterburning in the reaction tube (5).

The 1.8 liter engines are equipped with AFC injection. These engines require no air injection.

Measuring exhaust gases

Warm engine – oil temperature (176° F)
Idling speed: 850 – 950 rpm

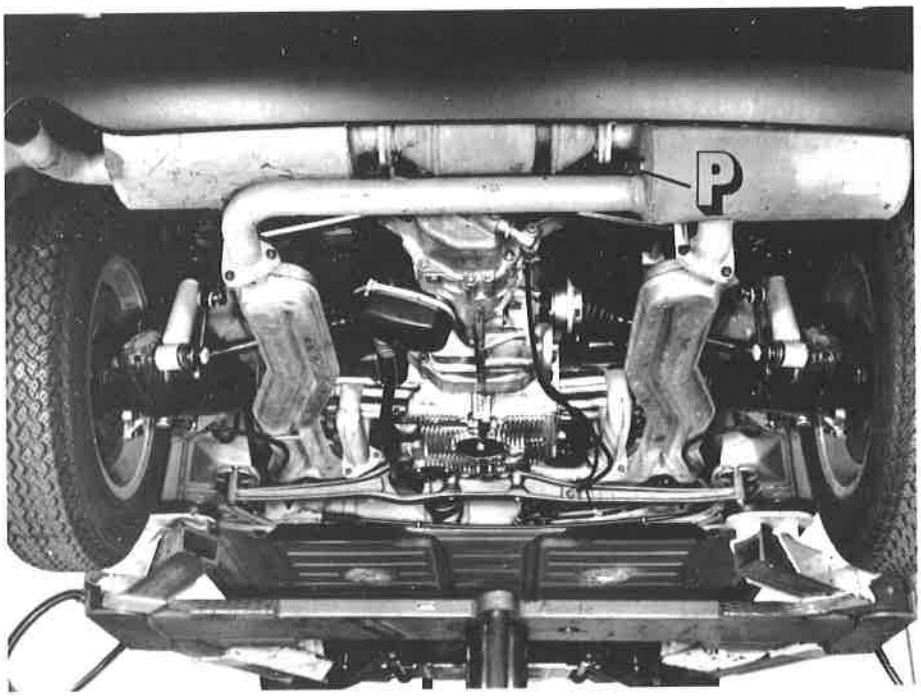
2.0 liter engine

With air injection, without catalyst (USA)

Remove pressure hose from pump.
Set exhaust gas value to 2.0 ± 1.0 CO.
Replace pressure hose.
The CO value must now drop below 1 %.

With air injection and catalyst (California)

Remove pressure hose from pump.
Measure CO content without air injection in front of catalyst (test connexion P).
CO value 1.0 to 5.0 %.



Replace pressure hose.
Measure CO content behind catalyst.
The CO value must now be 0 %.

1.8 liter AFC injection

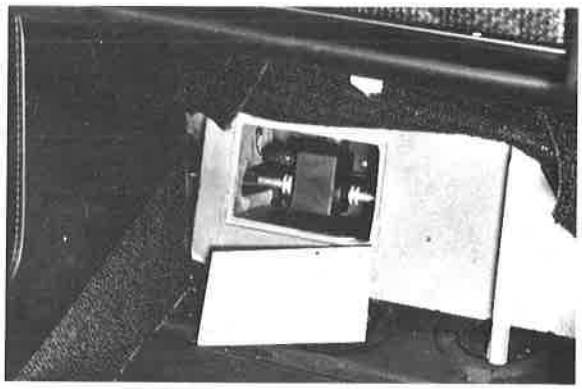
Without catalyst (USA)

CO value 2.5 ± 0.5 %

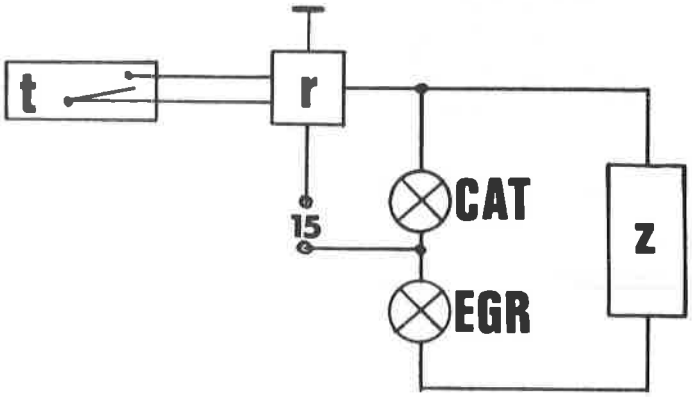
With catalyst (California)

Test values: in front of catalyst with air injection connected 0.6 – 0.8 % CO
behind catalyst with air injection connected 0 % CO

Service interval warning light switch for catalyst and exhaust gas recirculation – California only



The catalyst and exhaust gas recirculation system must be checked at 30,000 mile intervals (this is a legal requirement). A trip switch mounted in the speedometer drive shaft monitors the distance covered; once the 30,000 miles are reached, an integrated contact actuates warning lights on the instrument panel (Cat = Catalyst/ EGR = Exhaust Gas Recirculation). The operation of the catalyst or exhaust gas recirculation system must then be checked. The trip switch is mounted below the floor on the passenger seat side. It will be reset by the workshop after checking the exhaust system. The switch can only be reset in the workshop.



In addition to the service interval warning light switch (z), a temperature-sensitive probe (t) is mounted on the outlet side of the catalyst housing to monitor the catalyst temperature. This probe triggers a relay (r) fitted on the rear traverse wall in the vicinity of the left-hand rear light and actuates the CAT pilot light in a flashing cycle when the exhaust gas temperature is too high for the catalyst.
If the CAT pilot light flashes, the catalyst function must be checked immediately by taking a CO measurement.

	Control units 473.906.021 1.8 liters	**Control units 039.906.021 A USA/Calif. 039.906.021 Europe 2.0 liters**
Europe	–	unchanged
USA	Speed limitation by fuel cut-off	1. Fuel cut-off in pulsed operation 2. Speed limitation by distributor rotor
California	Speed limitation by fuel cut-off	1. Fuel cut-off in pulsed operation 2. Speed limitation by fuel cut-off triggered by additional rpm switch

Control units for 2.0 liter engines (USA and California)

These control units now have additional functions and a new spare part No. 039.906.021 **A**.

The additional functions are as follows:
On US engines:
fuel feed cut-out (pulsed)

On California engines:
1. Fuel feed cut-out (pulsed).
2. Fuel cut-out to limit engine speed.

For the fuel cut-out to limit engine speed an additional rpm switch is needed; it is mounted below the battery support.

Fuel system

The fuel pump is now mounted at the front, directly below the fuel tank.

The pump is secured on a metal bracket, which also serves as a support, by means of hose clamps.
It is not interchangeable with the previous model.
Technical data:

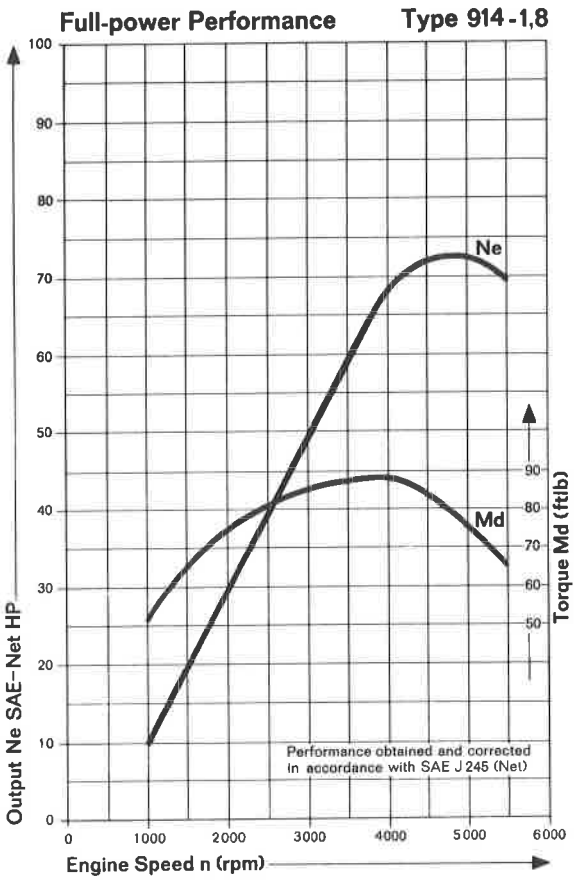
power supply	12 V
power consumption	4.5 A
delivery	62 l/h

The design and material of the fuel tank expansion reservoir is changed.

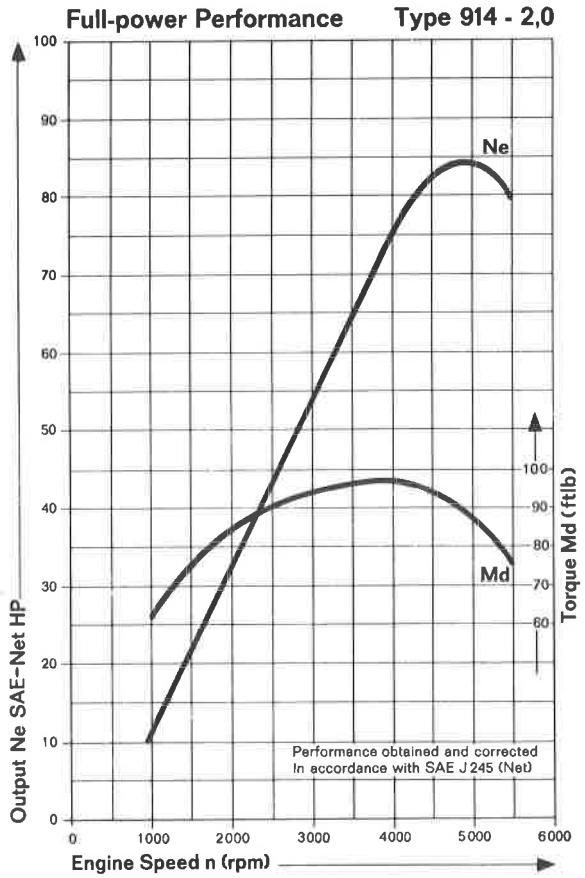
Cold-Start valve thermo-switch

The thermo-switch controlling the cold-start injection valve (on **all** 2 liter engines) has been replaced by a thermo **time** switch.

This switch corresponds to the design on the 1.8 liter engine with AFC injection.

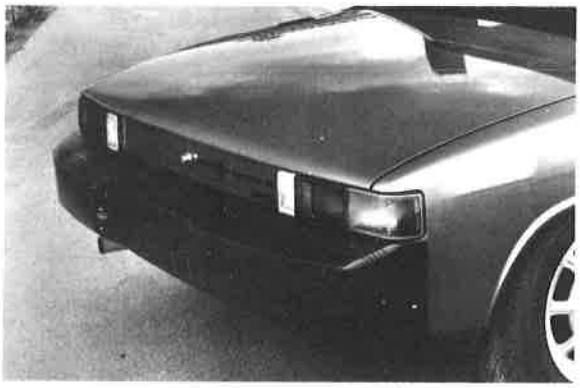


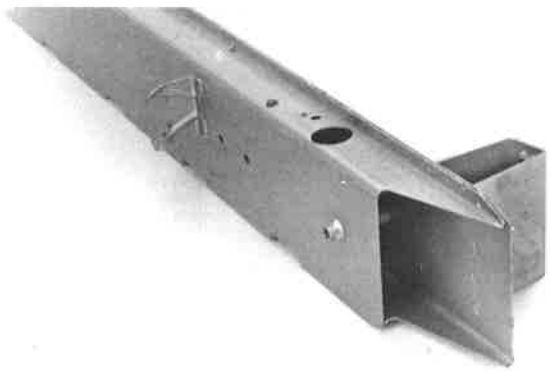
Engine	914 – 1.8 liters USA/California
Engine reference	EC-a (USA) EC-b (California)
Displacement cm^3	1795
Power: according to SAE J 245	
kW/HP	54/72.5
kW/PS	56/76
at rpm min^{-1}	4900
max. torque according to SAE J 245	
net Nm/lb ft	121/89
Nm/Kpm	125/12.7
at rpm min^{-1}	4000
Compression ratio	7.3 : 1
Mixture formation	AFC injection
Octane requirement ROZ	91



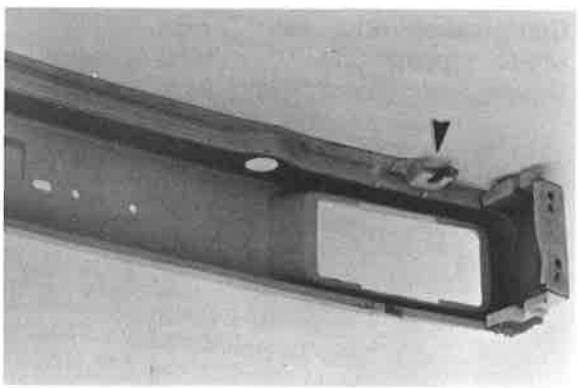
Engine	914 – 2.0 liters USA/California
Engine reference	GC-a (USA) GC-b (California)
Displacement cm^3	1971
Power: according to SAE J 245	
kW/HP	62/84
kW/PS	65/88
at rpm min^{-1}	4900
max. torque according to SAE J 245	
net Nm/lb ft	132/97
Nm/Kpm	137/14
at rpm min^{-1}	4000
Compression ratio	7.6 : 1
Mixture formation	MPC injection
Octane requirement ROZ	91

The redesigned bumpers are a distinguishing feature of the 1975 models.



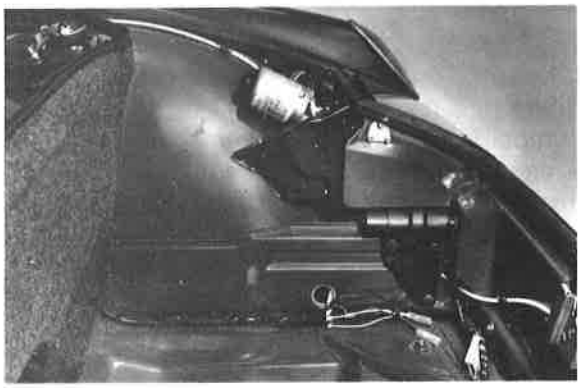


The bumpers consist of a box-profile buffer frame. The buffer frame is bolted onto the bodywork.



On vehicles with a headlamp cleaning system, an additional holder is welded on to secure the spray nozzles.

On vehicles exported to the USA and Canada, the bumpers are secured on the bodywork with impact dampers.
These dampers allow the fenders to move through approx. 60 mm. They absorb the energy generated in a collision at up to 5 mph so that important vehicle components are not damaged.

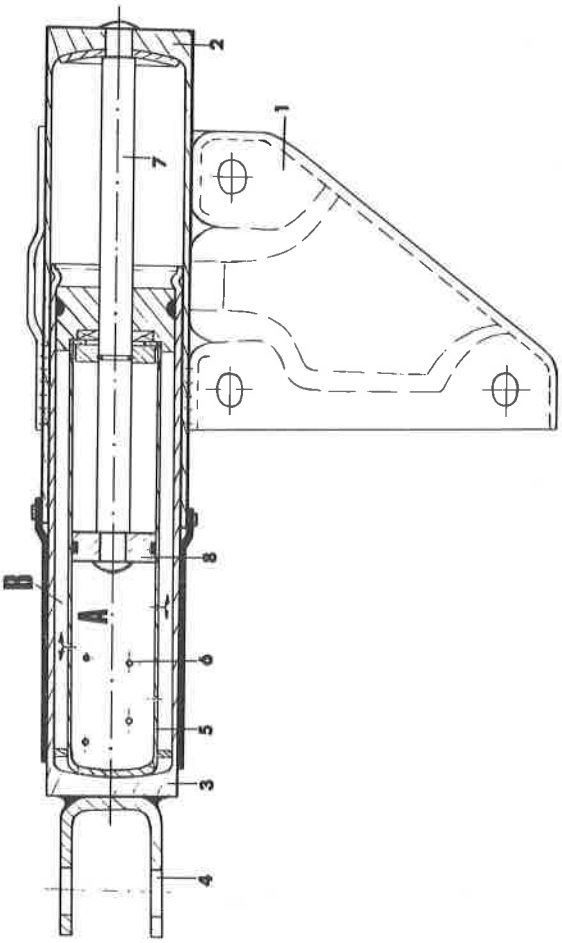


The front impact dampers are mounted laterally on the web plates. These plates have been reinforced and lengthened. The swivelling headlamp box has also been modified in the vicinity of the impact damper.

The rear impact dampers are mounted on an additional welded reinforcing plate at the base of the trunk floor.

The end plate is reinforced in the area of the trunk floor.

The right and left impact dampers are different but are interchangeable between the front and rear.



Impact damper – Design

The impact damper consists of a guide tube (2) welded onto the fixing plate (1); a slide tube (3), carrying the support fork (4) for the bumper is slide-mounted in the guide tube (2). A damper tube (5) with damping bores (6) is inserted in the slide tube (3). A piston rod (7) permanently joined to the guide tube (2) has a piston (8) mounted in the damper tube (5). The pressure chamber (A) in front of the piston is connected to the balancing chamber (B) through the damping bores (6). The chambers A/B have an oil/gas filling.

Impact damper – Function

When the slide tube (3) is compressed the pressure chamber (A) is reduced by the fixed piston (8). Oil is therefore displaced through the bores (6) into the chamber (B) and the gas filling is compressed. On further compression the piston (8) gradually closes the bores (6) so that the oil filling is able to flow through an ever-smaller number of bores and the damping force is raised with increasing stroke (stroke-dependent damping). The compressed gas re-sets the damper.

Vehicles supplied to California and Maryland have bumper horns at the front and rear.

A new, plastic front spoiler is available as an M option. It is mounted with two additional support brackets.

The signal horns are secured to a welded bracket on the front base plate.

Type table for vehicles 914/1.8/2.0 – 75 model

Order type No. Digit No. 1 2 3 4 5 6						Sales type designation	Delivery area	Engine Displacement liters	HP	Transmission Type	No of gears
Type	Model	Design	Equipm.	Engine	Gearbox						
4	7	3	4	3	4	Basic equipment	North Amer. only	1.8	76	914/12	5
4	7	3	5	3	4	Comfort equipment	North Amer. only	1.8	76	914/12	5
4	7	3	4	4	4	Basic equipment	North Amer. only	2.0	88	914/12	5
4	7	3	5	4	4	Comfort equipment	North Amer. only	2.0	88	914/12	5

Technical Data

	76 HP	88 HP
1. **Engine**		
Engine reference letters	EC-a (USA) EC-b (California)	GC-a (USA) GC-b (California)
No. of cylinders	4	4
Bore in mm (inch)	93 (3.66)	94 (3.70)
Stroke in mm (inch)	66 (2.598)	71 (2.793)
Displacement, real in cm^3 ($inch^3$)	1795 (109.53)	1971 (120.27)
Compression ratio	7.3 : 1	7.6 : 1
max. engine power according to DIN 70020 in HP or kW at rpm according to SAE J 245, net power in HP or kW	 76/56 at 4900 72.5/54.0 at 4900	 88/65 at 4900 84/62 at 4900
max. torque according to DIN 70020 in kpm or Nm at rpm according to SAE J 245, net torque in lbft or Nm	 12.7/125 at 4000 89/121 at 4000	 14/137 at 4000 97/132 at 4000
max. power per liter according to DIN 70020 in HP/l or kW/l according to SAE J 245, net power, HP/l or kW/l	 42/31 40/30	 45/33 42/31
Fuel octane requirement ROZ	91	91
Standard fuel consumption (l/100 km) DIN 70030	8.6	8.7
Engine weight in kg/lbs	approx. 145/320	approx. 150/330
2. **Engine design data**		
Design	Four stroke, opposed cylinder, petrol	
Cooling	Air cooled	=
Crankcase	Light alloy	=
Cylinders	Gray cast iron	=
Cylinder head	Light alloy	=
Valve arrangement per cylinder	1 inlet valve, 1 exhaust valve, in parallel	
Valve timing	Central camshaft, through tappets	=
Camshaft drive	Toothed wheels	=

Technical Data	76 HP	88 HP
Camshaft bearings	Slide bearings	=
Crankshaft	Forged, 4 bearings	=
Big end bearings	Slide bearings	=
Blower drive	Blower on crankshaft	=
Lubrication	Pressure circulation, wet sump, thermostatically controlled oil cooling Main flow filter	
Fuel delivery	Elect. roller cell pump	Elect. roller cell pump
Mixture formation	Electronically controlled injection into intake tube (AFC injection)	Electronically controlled injection into intake tube (MPC injection)
3. **Electricals**		
Battery voltage (V)	12	=
Battery capacity (Ah)	45	=
Generator, capacity (W)	three-phase, 700 W	=
Ignition	battery ignition	=
Ignition sequence	7.5° before TDC at 800–900 min^{-1}	27° before TDC at 3500 min^{-1}
Basic ignition setting	1–4–3–2	=
Spark plug (electrode gap)	Bosch W 175 (0.7) M 30 Beru 175/14/3 L (0.7)	Bosch W 175 T2 (0.7) Beru 175/14/3 (0.7)
Interference suppression level	VDE 0879 part 1 or EEC Regulation No. 10	
4. **Power transmission**		
Clutch	Single plate dry clutch	=
Transmission	Porsche synchronized gearbox	=
No. of gears	5 forward, 1 reverse	=
Ratios: 1st gear	11/34 i = 3.091	=
2nd gear	18/34 i = 1.889	=
3rd gear	23/29 i = 1.261	=
4th gear	27/25 i = 0.926	=
5th gear	31/22 i = 0.710	=
Reverse	11/16 20/43 i = 3.127	= =

Technical Data	76 HP	88 HP
Axle drive	helical toothed bevel wheels, differential	=
Axle ratio	7/31 i = 4.429	=
Power transmission	through double jointed axle shafts to rear wheels	
Transmission weight	approx. 47 kg ready for mounting with oil and starter	

5. **Chassis, wheel suspension**

Front wheel suspension	wheels independently suspended on damper members and transverse guides round torsion bar placed longitudinally for each wheel + progressive hollow rubber spring in damper member	
Rear wheel suspension	wheels independently suspended on inclined guide rods helical spring with double-acting telescopic shock absorber and progressive hollow rubber spring for each wheel	
Foot brake	hydraulic dual circuit brake disc brakes on all four wheels, pressure reducing valve for rear brake circuit	
Hand brake	mechanical, acting on rear brake linings of foot brake	
Rims and tyres		
series	5 1/2 x 15 steel with 165 SR 15	5 1/2 x 15 steel with 165 HR 15
special option	5 1/2 x 15 forged alloy with 165 SR 15	5 1/2 x 15 forged alloy with 154 HR 15
	5 1/2 x 15 cast alloy with 165 SR 15	5 1/2 x 15 cast alloy with 165 HR 15
Winter tyres	165 SR 15 MS (E) on 5 1/2 x 15	=
Tyre pressure cold, front/rear, bar (psi)	1.8/2.0 or 1.8/2.0; for winter tyres 2.0/2.2 or 2.0/2.2	
	(26/29) or for winter tyres (29/32)	=
Steering	Rack steering	=
Steering ratio, centre (steering wheel angle to wheel angle)	17.78 : 1	=
Front wheels camber } at DIN unladen	0° ± 20′	=
toe-in } weight + 15 kp	+ 20′ ± 10′	=
castor } on front axle	6° ± 30′	=
Rear wheels camber } at DIN unladen	−30′ ± 20′	=
toe-in } weight	0° ± 15′	=