

# Workshop Manual



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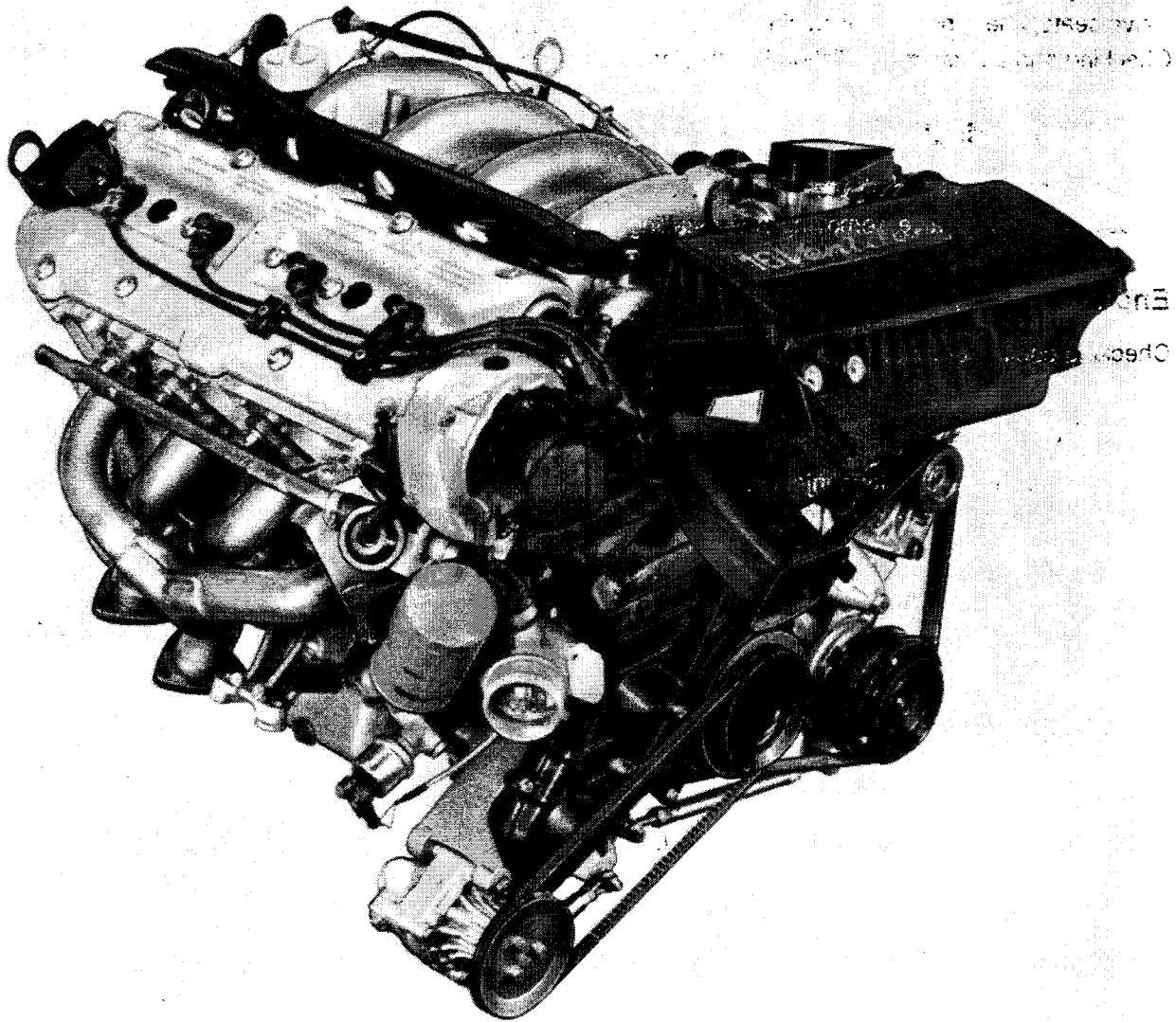
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TYPE 944 S (16-VALVE ENGINES) - '87 MODELS ONWARD



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 TECHNICAL DATA

(Adjustment specifications and wear data are stated in the appropriate Repair Groups)

Note: US values are stated in parentheses

## DRIVE UNIT

Internal engine designation		M 44/40
Number of cylinders		4
Bore	mm/in.	100/3.94
Stroke	mm/in.	78.9/3.11
Displacement (actual)	cc/in. <sup>3</sup>	2479/151
Compression ratio		10.9 : 1
Max. engine output to 80/1269/EC	kW/PS	140/190 - 135/184 Australia
Net power, SAE J 1349	kW/HP	140/188
at engine speed	rpm	6000
Max. torque to 80/1269/EC	Nm/kpm	230/23.5 - 225/22.9 Australia
at engine speed	rpm	4300
Net torque, SAE J 1349	Nm/lbft	230/170
Max. spec. power output	kW 1/HP 1	56.5/76.6-54.5/74.2 Australia
Net power, SAE J 1349	kW 1/HPI	56.5/75.8
Fuel octane rating	RON/MON	95/85 - 92/82 unleaded Australia (95/85 premium unleaded)
Max. perm. engine speed	rpm	6840
Engine weight (dry)	kg/lbs	175/386

## ENGINE DESIGN

Type 4-cylinder, 4-stroke in-line spark ignition engine with two balance shafts

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Crankcase	Two-part light alloy crankcase
Crankshaft	Forged, 5 bearings
Crankshaft bearings	Plain
Connecting rods	Cast, opt. sinter-forged
Connecting rod-bearings	Plain
Pistons	Light alloy, cast
Balance shafts	Forged
Balance-shaft bearings	Plain bearings with bearing shells
Cylinders	Light alloy
Cylinder head	Light alloy
Valve guide	Press-fit, special brass
Valve arrangement	2 intake, 2 exhaust overhead V
Valve timing	Two overhead camshafts, hydraulic bucket tappets
Camshaft	Without bearing shells, carried in cylinder head
Camshaft drive	Toothed belt and internal chain
Balance-shaft drive	Toothed belt
Valve clearance	Self-adjusting (hydraulic)
Timing	Intake opens      4° after TDC Intake closes     40° after BDC Exhaust opens     36° before BDC Exhaust closes    4° before TDC

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ENGINE COOLING		Sealed cooling system, electric fan with thermoswitch, antifreeze effective to - 25°C
ENGINE LUBRICATION		
Lubrication		Forced-feed lubrication with sickle-type pump, oil filter and oil-water heat exchanger in main oil flow and secondary water flow integrated in crankcase
Oil pressure	n = 5000 rpm	Approx. 4 bar, at operating temperature
Oil-pressure indicator		Pilot lamp and pressure gage
Max. oil temperature		140°C
Oil consumption	l/1000 km	Up to 1.5
EXHAUST SYSTEM		Standard 2 double-wall manifolds, branch pipe to primary muffler, 1st and 2nd secondary mufflers Option: M298 or M299 and USA and Australia as standard, catalytic converter instead of primary muffler
EMISSION CONTROL		Standard: engine-internal Option: M298 or M299 and Australia heated oxygen sensor with 3-way catalytic converter
HEATING		Hot-water heating with heat exchanger and blower

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 FUEL SYSTEM

Injection		DME Digital Motor Electronics
Fuel delivery		1 electric fuel pump
Fuel octane rating	RON/MON	Standard: 95/85 - European standard premium unleaded possible Opt./M298: 95/85 unleaded - European standard premium - Australia: 91/82 unleaded
Fuel consumption to 80/1268/EC or ECE R 15/04		Standard:
Constant 90 km/h	1/100 km	6.7
Constant 120 km/h	1/100 km	8.3
EC exhaust urban cycle	1/100 km	12.5

## ELECTRICAL SYSTEM

Suppression		ECE-R 10 and 72/245/EC
Battery voltage	V	12
Battery capacity	Ah	50 - optional 63, sports package 36
Alternator (output)	A/W	115/1610 - sports package: 90/1260
Ignition		By DME
Firing sequence		1-3-4-2
Ignition timing		By DME



## BODY DESIGNS

Integral all-steel body with front air dam and rear spoiler  
 - as coupé, opt.: removable hardtop panel, also available with fog lamps set in PU front air dam as optional extra.

## DIMENSIONS (at DIN curb weight)

Length	mm/in.	4230/165.354 (4290/168.90)	
Length with opt. extra US bumpers	mm/in.	4290/168.90	
Width	mm/in.	1735/68.31	
Height	mm/in.	1275/50.20	
Wheel base (in design pos.)	mm/in.	2400/94.49	
Track:			Rim size
Front	mm/in.	1477/58.2	7 J x 15
		1477/58.2	7 J x 16
		1477/58.2	8 J x 16
Rear	mm/in.	1451/57.1	7 J x 15
		1451/57.1	7 J x 16
		1451/57.1	8 J x 16
		1442	9 J x 16
Ground clearance (at per. total weight)	mm/in.	120/4.72	
Bed clearance (at per. total weight)	mm/in.	53/2.09	
Overhang angles:			
Front		14°	
Rear		15°	

WEIGHTS		- to DIN 700 20 -		
Curb weight		Standard	Sports package	Australia, standard
Front	kg/lbs	640/1411 (650/1433)	630/1389	640/1411
Rear	kg/lbs	640/1411 (650/1433)	610/1345 (630/1389)	640/1411
Total	kg/lbs	1280/2822	1240/2734 (1260/2778)	1280/2822
Per. axle load				
Front	kg/lbs	730/1609	730/1609 (720/1587)	730/1609
Rear	kg/lbs	900/1984	900/1984	920/2028
Per. total weight	kg/lbs	1600/3527	1600/3527 (1550/3417)	1620/3571
Per. trailer load				
Braked trailer	kg/lbs kg/lbs	1200/2646 1200	up to 16% gradient for Italy	
Unbraked trailer	kg/lbs kg/lbs	500/1102 500	up to 16% gradient for Italy	
Max. car/ trailer weight	kg/lbs kg/lbs	2760/6085 2760	for Italy	
Max. drawbar load	kg/lbs kg/lbs	50/110 50	for Italy up to 100 km/h	
Per. roof load	kg/lbs	35/77		
With genuine Porsche roof transport system	kg/lbs	75/165		

## CAPACITIES

Engine (measurement with dipstick as per Driver's Manual is definitive)	Proprietary HD oils to API classification SE or SF, see Driver's Manual
Engine oil	Approx. 6.0 l
Engine coolant	Approx. 8.5 l
Transmission with differential	Approx. 2.0 l hypoid oil, SAE 80 to MIL-L 2105, API classification GL 4
Fuel tank	Approx. 80 l, including approx. 8 l reserve
Brake-fluid reservoir	Approx. 0.2 l
Windshield and headlight washing fluid reservoir	Approx. 6.0 l

## PERFORMANCE

Maximum speed	km/h/mph	228/142
Acceleration from 0-100 km/h* (0-60 mph)*	s	7.9 (7.7)
(1/4 mile from standing start)*	s	(15.4)
Kilometer from standing start*	s	27.8

## CLIMBING PERFORMANCE

In % (slip limit)	1st gear	62%
	2nd gear	35.6%
	3rd gear	21.5%
	4th gear	13.3%
	5th gear	9.4%

\*DIN curb weight and half of payload

## Technical data - Type 944 S2 - Model 89

(Values for adjustment and wear are to be found in the respective repair groups)

Notes: USA values are given in brackets

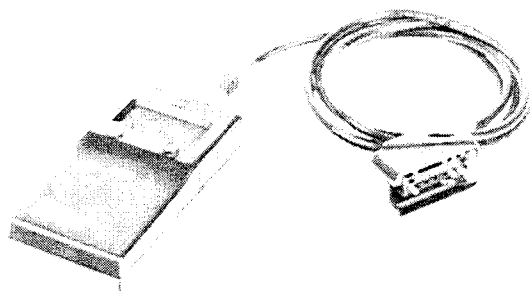
### Drive unit

Internal engine designation		Manual transmission M 44.41 (3.0 l)
Bore	mm (in.)	104 (4.09)
Stroke	mm (in.)	88 (3.46)
Displacement (actual)	cm <sup>3</sup> (in. <sup>3</sup> )	2990 (182.5)
Displacement (rounded down)	cm <sup>3</sup>	2969
Compression ratio		10.9 : 1
Max. engine power		
88/195/EEC	kW (HP)	155 (211)
Net power, SAE J 1349	kW (HP)	155 (208)
at engine speed	rpm	5800
Max. torque		
88/195 / EEC	Nm (kpm)	280 (28.5)
(Net torque, SAE J 1349)	Nm / lbft	280 (207)
at engine speed	rpm	4100
Max. output per litre		
DIN 70020	KW/l (HP/l)	51.8 (70.6)
(SAE J 1349)	KW/l (HP/l)	51.8 (69.6)
Speed governed by		
fuel cut-off	rpm	6480 ±20
Engine weight (dry)	kg	175

## DME control unit error diagnosis

### DME control unit error diagnosis 944 S as from 88 model

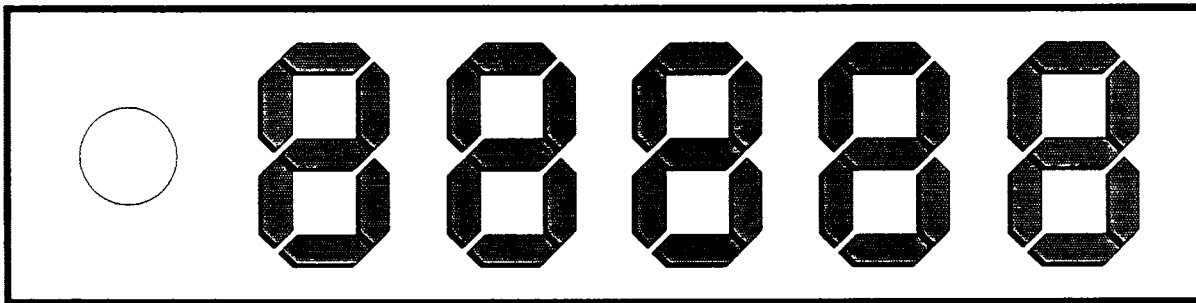
As from model year 88, the DME control unit 944 S is capable of a self-diagnosis. That is to say, the control unit is capable of detecting, storing and displaying system errors. The control unit capable of diagnosis is identified by an altered part number. A specially developed diagnostic tester (special tool No. 9268) is then used to read out the error memory and to test specific components and control signals of the fuel and ignition system.



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**Important: Before diagnosis, the battery or the connector of the DME control unit must not be disconnected as otherwise the error memory will be erased.**

## Display



LED

Control unit  
identification

1 = LH / DME  
2 = EZK

Error code  
test code

## Diagnosis mode

1 = Continuous error  
2 = Occasionally occurring  
error  
3 = Actuator / input signal  
testing  
4 = System adaption  
5 = No error

Function  
display

LED off

Test sequence terminated / igniti



Flashing LED

Error code / test code

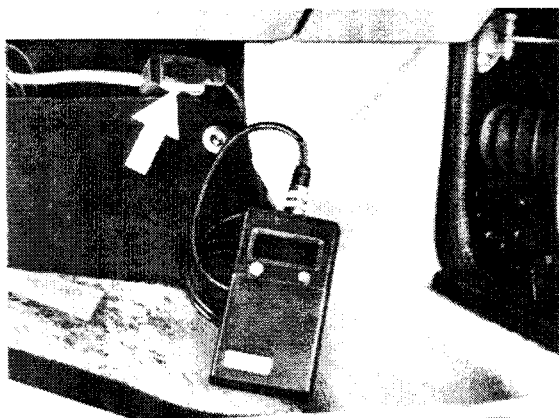


LED on

Ignition on

## Connection in the 944 S

In the 944 S, the diagnosis socket is attached to a separate cable harness located above the DME control unit.



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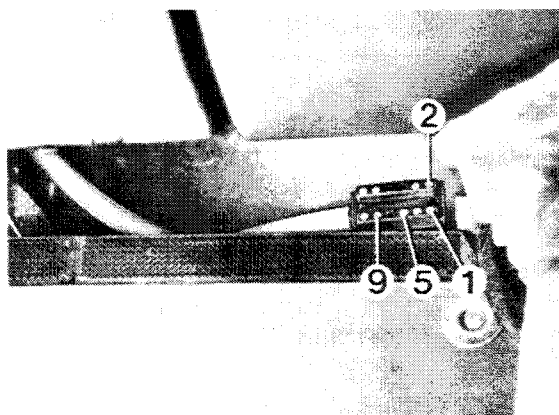
## Diagnosis socket in the car

Pin 1 = terminal 15

Pin 2 = terminal 31

Pin 5 = terminal 30

Pin 9 = Hall generator



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Ignition off

After connecting the tester, the following display must appear.

Display:



If this is not the case, check the tester terminals or check the power supply of the diagnosis socket in the car by referring to the circuit diagram.

Tester cable

Switch on the ignition

Diagnosis plug

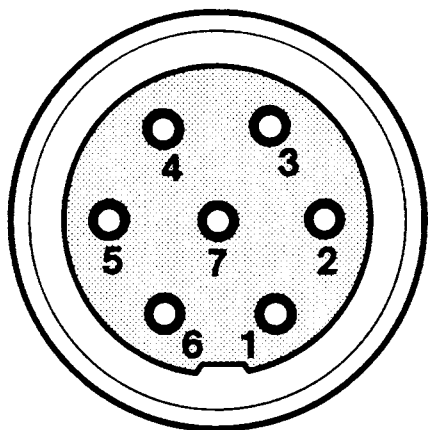
Round plug

Display:

Pin 1	—————>	Pin 4
Pin 2	—————>	Pin 1
Pin 3	—————>	Pin 7
Pin 4	—————>	Pin 6
Pin 5	—————>	Pin 2
Pin 6	unused	
Pin 7	unused	
Pin 8	unused	
Pin 9	unused	
Pin 10	unused	
Pin 11	—————>	Pin 5
Pin 12	—————>	Pin 3



The ignition must not be switched off during the entire error diagnosis procedure.





## Starting error diagnosis

### Condition:

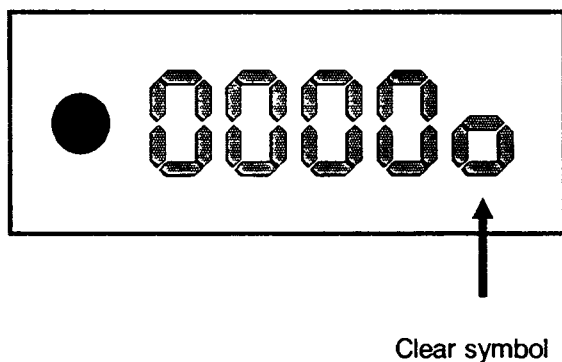
Engine off  
Ignition on

### Display:



Press the *green* key until the clear symbol appears on the function display.

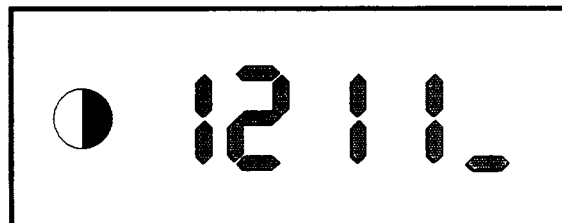
### Display:



The diagnosis sequence for the DME control unit then takes place.

If an error is displayed – take the note of the error (e.g. 1211).

### Display:

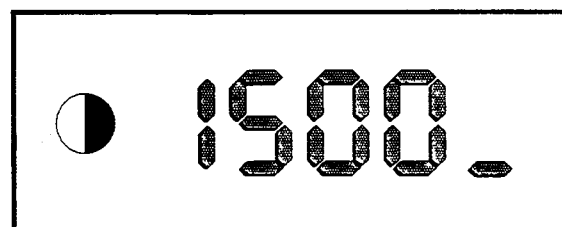


The error is displayed until the *green* key is again pressed on the tester. The next error code is then displayed, if applicable.

This must be repeated until 1000 appears on the display.

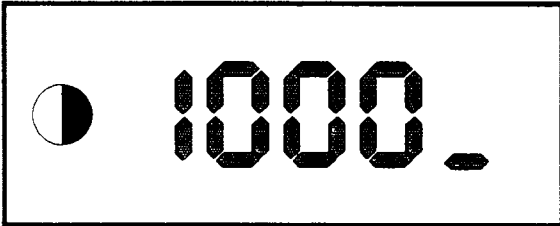
If no error has occurred, the following display appears.

### Display:



Press the *green* key until the clear symbol appears on the function display. The following display must then appear.

Display:



This now terminates diagnosis of the DME control unit.

If one or several errors (up to 5) has/have been displayed, the error memory must be reset; see chapter (Resetting the error memory).