Power Kit (I-no. X51)

Revisions: This bulletin replaces bulletin Group 1, #45/12, dated October 20, 2015.

Model Year: **As of 2012 up to 2016**

Vehicle Type: **911 Carrera S (991) / 911 Carrera 4S (991) / 911 Targa S (991) / 911 Targa 4S (991) / 911 "50 Years" (991)**

Information: **Subsequent performance increase to 316 kW (430 HP)**

Engine Type: Standard engine MA103 with engine power of 294 kW (400 hp)

General: A parts kit is available for increasing the performance of the standard engine.
Increased performance is achieved by implementing the following measures on the engine:

- New cylinder heads with flow-optimized intake ports, valves and valve springs.
- New intake camshafts.
- New resonance intake manifold with switching flaps (material: aluminum sand cast).
- Modified maps for the DME control unit.

The following additional modifications are also required and the following preconditions must be met on the vehicle side:

- New engine cover with carbon inserts, painted Titanium Grey.
- Sports exhaust system incl. tailpipes (if not already fitted).
- Radiator –middle– (I-no. 153).

The higher-performance engine is also available as factory installed option for the new vehicles mentioned above under Exclusive option No "X51".

Software:
- Minimum version 11.200 (updated on September 27, 2012)

Engine run-in: Engine speeds greater than 5,000 rpmare not permitted over a distance of 310 miles (500 km). The maximum engine power of 430 hp (316 kW) depends on the total mileage of the engine at the time of the retrofit and is achieved from a total mileage of approx. 6,250 miles (10,000 km) or higher.

Warranty:

Information

In order to provide a warranty for the retrofit, the dealer must create "Power Kit (I-no. X51)" documentation for the relevant vehicle in the "Porsche Quality Information System = PQIS".

Retrofitting:
Warranty in accordance with the Repair Conditions and the Warranty Conditions for Original Porsche Parts.

If the engine to be converted has a mileage of over 25,000 miles (40,000 km), the crankshaft main bearings and connecting-rod bearings must also be replaced.
If there is obvious wear on the connecting-rod bushings (scores), the connecting rods must also be replaced.

New vehicle with Power Kit (I-no. "X51"):
Vehicle warranty in accordance with Porsche guidelines.

Diagram:

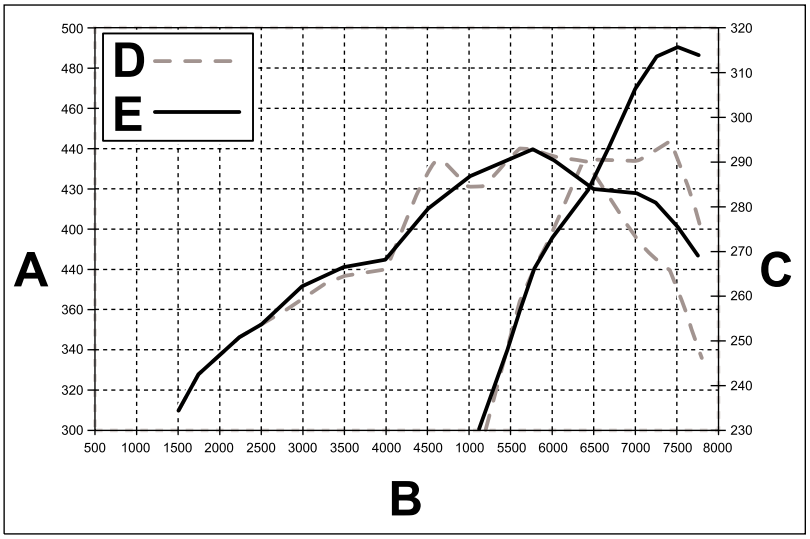

Figure 1

A – Torque (Nm)
B – Engine speed (rpm)
C – Power (kW)
D – Standard engine
E – Engine with increased performance – 430 hp (316 kW at 7,500 rpm and 440 Nm at 5,750 rpm

Technical Description:

	Standard-production engine	Increased performance engine
Engine type:	MA103	MA103 S
No. of cylinders:	6	6
Bore:	102 mm	102 mm
Stroke:	77.5 mm	77.5 mm
Displacement:	3,800 ccm	3,800 ccm
Compression ratio:	12.5 : 1 (-0.5)	12.5 : 1 (-0.5)

Max. engine power at engine speed:	294 kW (400 hp) 7,400 rpm	316 kW (430 hp) 7,500 rpm
Max. torque at engine speed:	440 Nm 5,600 rpm	440 Nm 5,750 rpm
Max. power output per litre:	77.4 kW/l	83.2 kW/l
Engine speed limitation at:[1]	7,800 rpm	7,800 rpm
Idle speed:	680 ± 25	680 ± 25
v_{max}.[2]	304 km/h (188 mph)	308 km/h (191 mph)

[1] Engine speed at operating temperature

[2] Value for 911 Carrera 2 Coupé (manual transmission)

Information

Please inform your sales staff and customers about the engine “break-in” precautions.
Copy the first three pages of these Installation and Modification Instructions and give them to your customers!

Parts Info:

991.044.100.00[3] ⇒ Power Kit, 316 kW (430 hp), set

991.044.100.01[4] ⇒ Power Kit, 316 kW (430 hp) incl. sport exhaust system (I-no. 176), set

991.044.100.02[5] ⇒ Power Kit, 316 kW (430 hp) incl. sport exhaust system (I-no. 176), set

[3] **ONLY** for vehicles with sports exhaust system (I-no. 176)!

[4] **ONLY** for Japan/Porsche Asia Pacific (= PAP) vehicles!

[5] **ONLY** for RoW/USA and Canada vehicles!

Order the following as required for set “Power Kit WITHOUT sport exhaust system (991.044.100.00)”:

991.111.481.01 2 x ⇒ Clamp for muffler
997.111.520.00 2 x ⇒ Clamping sleeve for main muffler

ONLY order for vehicles WITHOUT connector (6-pin, see Step 5.4) in the vehicle:

991.612.957.00 1 x ⇒ Dummy connector, 6-pin

ONLY order for vehicles from model year 2015 (see Step 5.5):

991.612.944.00 1 x ⇒ Adapter wiring harness

Parts List:

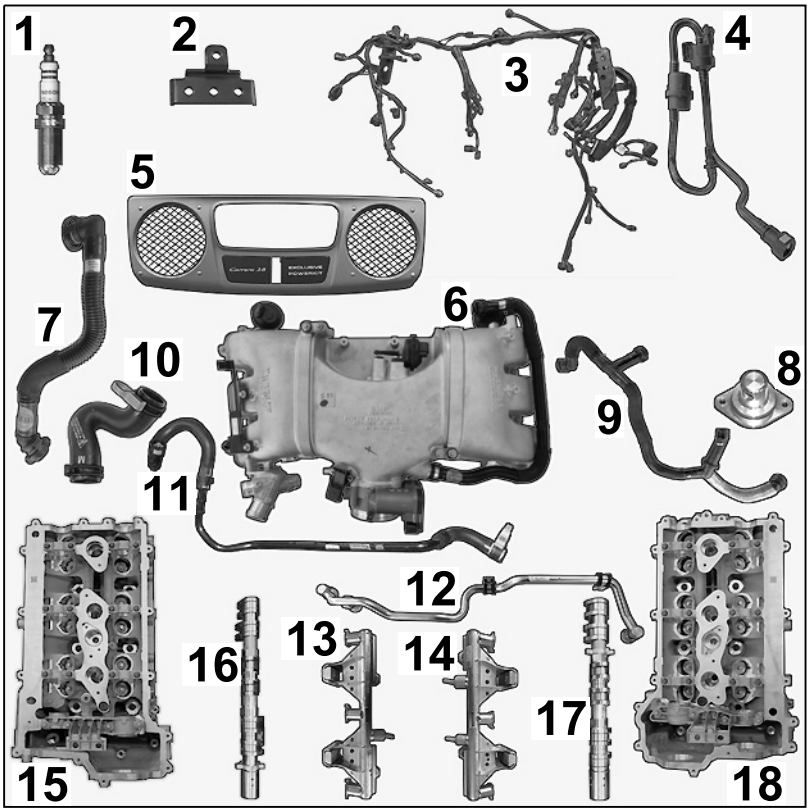

Figure 2

Parts included for engine (⇒*Figure 2*):

999.170.151.90	6 x	Spark plug FGR 5NQE ⇒*Figure 2* **-1-**
9A1.607.167.41	1 x	Holder for wiring harness on lower part of intake-air distributor (cylinder 4–6) ⇒*Figure 2* **-2-**
9A1.607.091.00	1 x	Wiring harness for engine (with connection for transmission input shaft sensor for manual transmission = I-no. 487) ⇒*Figure 2* **-3-**
9A1.110.061.46	1 x	Vent line (fuel tank) ⇒*Figure 2* **-4-**
991.504.990.00	1 x	Engine compartment cover with carbon badges, painted Titanium Grey ⇒*Figure 2* **-5-**
— — —	1 x	Intake-air distributor (ASSemblY = ASSY) ⇒*Figure 2* **-6-**
9A1.107.506.45	1 x	Vent line to cylinder head 1–3 ⇒*Figure 2* **-7-**
9A1.107.017.45	1 x	Engine oil filler neck ⇒*Figure 2* **-8-**
9A1.107.505.47	1 x	Crankcase vent line ⇒*Figure 2* **-9-**
991.107.264.45	1 x	Oil filling hose ⇒*Figure 2* **-10-**
9A1.106.550.45	1 x	Cooling water compensation line ⇒*Figure 2* **-11-**
9A1.110.092.41	1 x	Pressure line (connecting line for fuel collection pipe, ASSY) ⇒*Figure 2* **-12-**
9A1.110.859.41	1 x	Fuel collection pipe for cylinder 1–3 ⇒*Figure 2* **-13-**

9A1.110.860.41	1 x	Fuel collection pipe for cylinder 4–6 ⇒*Figure 2* **-14-**
9A1.104.911.45	1 x	Cylinder head 1–3, complete, ASSY (incl. valves and bearing saddles for camshafts) ⇒*Figure 2* **-15-**
9A1.105.275.45	1 x	Intake camshaft for cylinder 1–3 ⇒*Figure 2* **-16-**
9A1.105.403.02	2 x	Washer, 34.0 x 0.1 (exhaust camshaft sprocket, not shown)
9A1.105.403.10	2 x	Washer, 33.4 x 0.5 (camshaft controller, not shown)
9A1.105.276.45	1 x	Intake camshaft for cylinder 4–6 ⇒*Figure 2* **-17-**
9A1.104.912.45	1 x	Cylinder head 4–6, complete, ASSY (incl. valves and bearing saddles for camshafts) ⇒*Figure 2* **-18-**

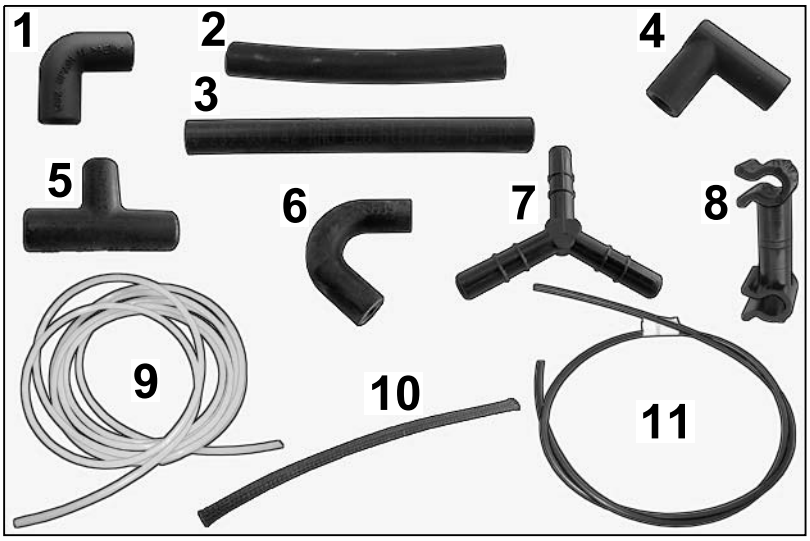

Figure 3

Parts included for vacuum and fresh-air system (engine area ⇒*Figure 3*):

9A1.110.666.00	1 x	Connecting piece (angled pipe) ⇒*Figure 3* **-1-**
999.239.045.40	3 x	Hose, 3.5 x 2.0 x 60 ⇒*Figure 3* **-2-**
999.239.042.40	1 x	Hose, 3.5 x 2.0 x 75 ⇒*Figure 3* **-3-**
948.110.126.00	1 x	Connecting piece (elbow) ⇒*Figure 3* **-4-**
06E.133.794	9 x	T-piece ⇒*Figure 3* **-5-**
928.574.717.05	5 x	Moulded hose (protective tube, bent) ⇒*Figure 3* **-6-**
928.573.727.05	3 x	Y-piece ⇒*Figure 3* **-7-**
999.507.866.40	2 x	Line bracket, 5.0 x 5.0 (Raymond) ⇒*Figure 3* **-8-**
900.918.005.40	4 m	Pipe, 5.0 x 1.0 x 4 m (running meter) ⇒*Figure 3* **-9-**
999.181.445.40	6 x	Protective tube, 5.0 x 200 ⇒*Figure 3* **-10-**
000.043.205.01	1 m	Pipe, 4.0 x 1.0 x 1 m (running meter) ⇒*Figure 3* **-11-**
7PP.906.283.B	2 x	Change-over valve (not shown)

Gaskets/seals and small parts (not shown):

900.385.041.01	4 x	Torx screw, M6 x 12
999.073.535.01	18 x	Torx screw, M8 x 21
9A1.104.141.04	1 x	Cylinder-head gasket (cylinder 1–3)
9A1.104.140.04	1 x	Cylinder-head gasket (cylinder 4–6)
9A1.105.731.03	1 x	Cylinder head cover seal (cylinder 1–3)
9A1.105.732.03	1 x	Cylinder head cover seal (cylinder 4–6)
999.707.446.40	2 x	O-ring, 18 x 2.5 (camshaft control valve actuator)
900.331.057.40	2 x	O-ring, 11.2 x 2.65 (valve lift adjustment actuator)
999.707.576.40	1 x	O-ring, 7.0 x 2.5 (oil pipe for cylinder 4–6)
999.707.346.40	6 x	O-ring, 15.0 x 3.0 (screw for chain tensioner tensioning rail)
900.123.106.30	1 x	Sealing ring, A 18 x 24 (oil drain plug)
9A1.105.339.00	1 x	Seal for crankcase cover (positive crankcase ventilation)
999.707.636.40	2 x	O-ring, 44.0 x 3.5 N (positive crankcase ventilation)
999.701.504.40	1 x	O-ring, 10.0 x 2.5 (vacuum pump)
999.701.505.40	1 x	O-ring, 54.0 x 2.5 (vacuum pump)
999.701.789.40	1 x	O-ring, 12.0 x 2.0 (vacuum line)
999.707.639.40	2 x	O-ring, 24.0 x 2.5 N (crankcase vent line)
999.707.657.40	2 x	O-ring, 31 x 3 (water tube)
999.707.658.40	2 x	O-ring, 23 x 3 (water line)
999.707.643.40	1 x	O-ring, 55.25 x 2.62 (high-pressure pump)
999.704.020.90	6 x	Sealing ring, 6.3 x 2.8 (high-pressure injector)
999.701.112.41	6 x	O-ring, 7.52 x 3.51 (high-pressure injector)
997.111.107.31	2 x	Exhaust manifold seal
991.111.482.00	2 x	Seal for front muffler
999.072.841.01	2 x	Combination screw, M10 x 50 (transmission mount)
999.072.866.01	4 x	Hexagon-head bolt, M12 x 1.5 x 95 (cross member)
999.072.930.01	2 x	Hexagon-head bolt, M12 x 1.5 x 100 (lower control arm)
999.073.517.01	12 x	Cheese head bolt, M10 x 1.0 x 46.5 (rear drive shaft)
999.084.445.01	4 x	Lock nut, M12 x 1.5 (rear-axle trailing arm)
997.331.217.02	2 x	Eccentric screw, M12 x 1.5 x 83 (lower rear-axle trailing arm)
900.910.003.03	6 x	Hexagon nut, M8 (front muffler/strut)
999.073.458.01	6 x	Screw, M8 x 16 (automatic clutch)
N 908.484.05	2 x	Hexagon nut, M12 x 1.5 (hydraulic mount)
999.513.076.40	20 x	Tie-wrap, 1.5 - 85
900.123.111.21	3 x	Sealing ring, 14 x 20
948.107.222.00	1 x	Oil filter
948.107.322.00	1 x	Sealing ring, 91.0 x 4.0

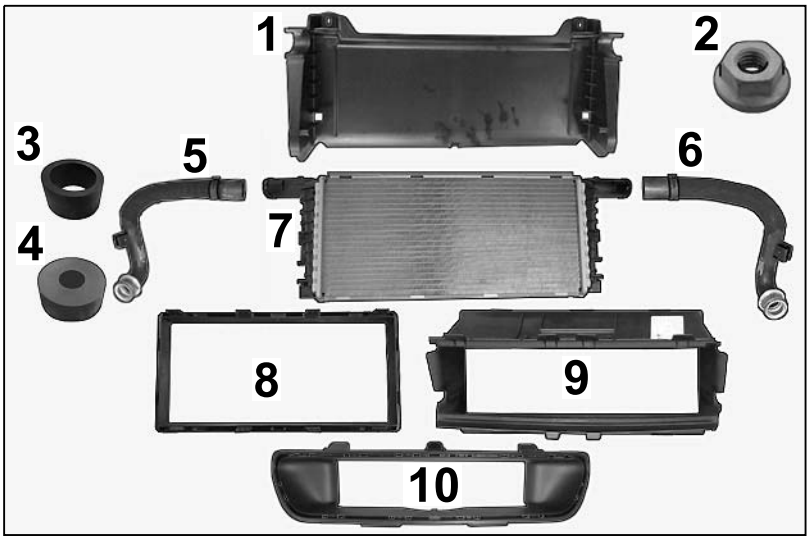

Figure 4

Parts included for radiator –middle– (I-no. 153 ⇒*Figure 4*):

991.106.237.01	1 x	Retaining frame ⇒*Figure 4* **-1-**
999.084.638.01	4 x	Hexagon nut, M6 ⇒*Figure 4* **-2-**
991.106.537.01	2 x	Rubber mounting, upper ⇒*Figure 4* **-3-**
991.106.538.01	2 x	Rubber mounting, lower ⇒*Figure 4* **-4-**
991.106.638.02	1 x	Water supply hose ⇒*Figure 4* **-5-**
991.106.639.01	1 x	Water return hose ⇒*Figure 4* **-6-**
991.106.137.02	1 x	Radiator (middle) ⇒*Figure 4* **-7-**
991.106.337.01	1 x	Sealing frame ⇒*Figure 4* **-8-**
991.575.141.00.1E0	1 x	Air guide (centre) ⇒*Figure 4* **-9-**
991.505.569.01.1E0	1 x	Retaining frame, center, Black (standard front apron) ⇒*Figure 4* **-10-**
991.505.989.02.1E0	1 x	Retaining frame, center, Black (front apron I-nos. XAA/XAT/XAS, not shown)

Materials:	000.043.301.47[6]	X x	Antifreeze, BASF Glysantin G40–91 EF; 1-liter container
	000.043.204.68	1 x	“SYNTHESO GLEP” grease; 50g tube (for fitting O-rings, moulded seals, etc.)
	000.043.205.93	1 x	“KLUEBERPLUS S 06-100” grease; 100g tube (for fitting O-rings in cooling system)
	000.043.303.27	1 x	Lubricant for injection line, 50-ml container
	000.043.301.19[6]	~ 7.5 l	Engine oil, EXXON Mobil 1 0W-40, 1-liter container (see also Manufacturer's Certificate ⇒*Manufacturer's Certificate '170100 Overview of approved Porsche A40 engine oils (04/12)'*)

6 Quantity, as required.

Tools:

Information

Only work tools that were not described in the Workshop Manual are listed here. For details of special tools, e.g. for removing and installing the engine, please refer to the relevant description!

Nr.197 - Pneumatic marking pen
Template, 0.5 (5 mm)
Drill
Tenon saw

9900 - PIWIS Tester 3
Shop light
Drill bit, ∅ 8 mm
File

Work Procedure: 1 Preparatory work

1.1 Remove engine (⇒ *Workshop Manual '100119 Removing and installing engine - section on "Removing"'*).

1.2 Remove transmission (⇒ *Workshop Manual '343527 Removing and mounting transmission'* or ⇒ *Workshop Manual '373427 Removing and mounting Porsche Doppelkupplung (PDK)'*).

1.3 Carry out subsequent work on the engine assembly support (⇒ *Workshop Manual '1001IN Tools for removing units and working on the engine assembly support'*).

1.4 Remove intake-air distributor (⇒ *Workshop Manual '244619 Removing and installing intake-air distributor'*).

1.5 Remove generator (⇒ *Workshop Manual '272219 Removing and installing generator'*).

1.6 Remove camshafts (⇒ *Workshop Manual '150520 Removing and installing camshafts (includes setting timing)'*).

1.7 Remove cylinder head (2 x) (⇒ *Workshop Manual '157019 Removing and installing cylinder head - section on "Removing"'*).

1.8 Carefully inspect the cylinder walls, pistons and re-used parts for wear and clean them (⇒ *Workshop Manual '1310IN Piston wear, weight groups and identification markings'*).

If signs of wear are detected on the components, these must also be replaced.

2 Convert engine

2.1 Install new cylinder head (2 x) (⇒ *Workshop Manual '1001Z2 Assembling engine'*).

2.1.1 Check that all stoppers are fitted on the new cylinder head. If not, fit missing stoppers.

2.1.2 Install new cylinder head (2 x) with the relevant new cylinder-head gasket (2 x) (⇒ *Workshop Manual '157019 Removing and installing cylinder head'*).

2.1.3 Fit oil supply valve for vacuum pump (brake booster) with a new O-ring on the cylinder head and suspend timing chain at the valve (⇒ *Workshop Manual '1001Z2 Assembling engine'*).

2.1.4 Secure guide rail in the cylinder head (1–3 and 4–6) with bearing pins (2 x) (⇒ *Workshop Manual '1001Z2 Assembling engine'*).

2.1.5 Remove solenoid hydraulic valve for camshaft control (one on each cylinder head, cylinder 1–3: ⇒*Figure 5* **-1-**) from the old cylinder head and install on the new cylinder head with a new O-ring (⇒ *Workshop Manual '153719 Removing and installing solenoid hydraulic valve for camshaft control'*).

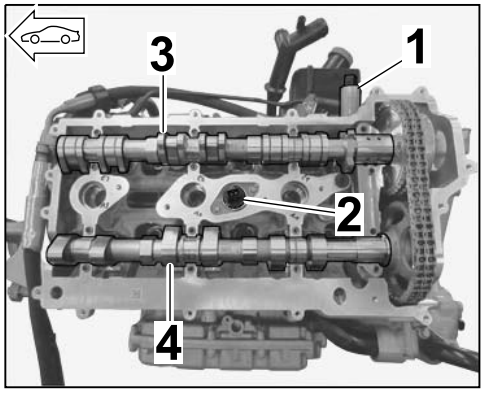

Figure 5

1 – Solenoid hydraulic valve for camshaft control (cylinder 1–3)
2 – Solenoid hydraulic valve for valve lift control (cylinder 1–3)
3 – New intake camshaft (cylinder 1–3)
4 – Exhaust camshaft (cylinder 1–3)

2.1.6 Remove solenoid hydraulic valve for valve lift control (one on each cylinder head, cylinder 1–3:⇒*Figure 5* **-2-**) from the old cylinder head and install on the new cylinder head with a new O-ring (⇒ *Workshop Manual '155519 Removing and installing solenoid hydraulic valve for valve lift adjustment'*).

2.1.7 Install new intake camshaft (one on each cylinder head, cylinder 1–3: ⇒*Figure 5* **-3-**) and old exhaust camshaft (one on each cylinder head, cylinder 1–3: ⇒*Figure 5* **-4-**) with a new washer (34.0 x 0.1) for the camshaft controller (⇒ *Workshop Manual '150520 Removing and installing camshaft - section on "Installing"'*).

Set the timing.

2.1.8 Unclip guide rail (one on each cylinder head ⇒*Figure 6* **-1-**) from upper part of bearing saddle on the removed cylinder head and install it on the new upper part of bearing saddle (new cylinder head, cylinder 1–3: ⇒*Figure 6* **-2-**) (⇒*Workshop Manual '150520 Removing and installing camshaft – section on "Installing"'*).

1 – Guide rail
2 – New upper part of bearing saddle (cylinder 1–3)

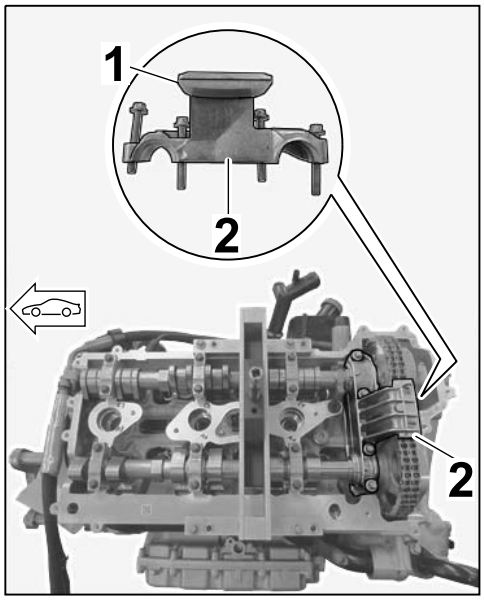

Figure 6

2.1.9 Position new seal in each cylinder head cover and install cylinder head cover (cylinder head 1–3 and 4–6) (⇒*Workshop Manual '158219 Removing and installing cylinder head cover - engine removed'*).

Information

- Do not use steel stamping numbers to mark the engine number on direct fuel injection engines.

- Due to the material composition, the engine number must be engraved using the specified tool.

2.2 Add the letter “S” to the engine type on the standard engine

1 – Clip
2 – Lower coolant pipe
3 – Engine type “MA103”
4 – Engine type “MA103 S”

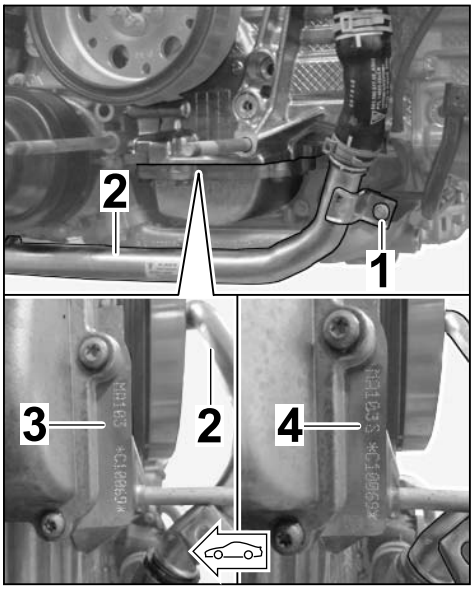

Figure 7

2.2.1 Loosen clip on lower coolant pipe (⇒*Figure 7* **-1-**) and swivel the coolant pipe aside (⇒*Workshop Manual '195019 Removing and installing coolant pump'*).

2.2.2 Turn the engine 90° to the right.

2.2.3 Engrave the letter "S" immediately after the engine type MA103 (⇒*Figure 7* **-4-**; ⇒*Workshop Manual '1001IN Position and marking of engine number'*).

2.2.4 Position and secure lower coolant pipe (⇒*Workshop Manual '195019 Removing and installing coolant pump'*).

2.3 Convert or install positive crankcase ventilation, ignition system and fuel supply

1 – Fuel high-pressure pump
2 – Positive crankcase ventilation cover, cylinder 1–3

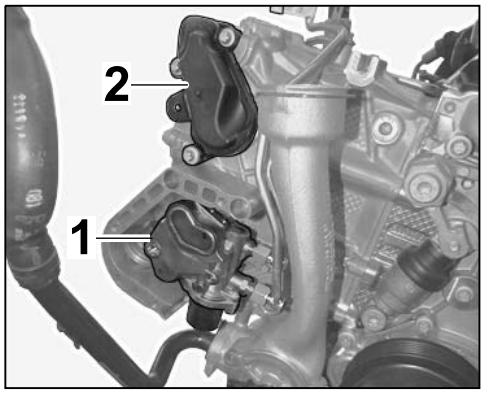

Figure 8

2.3.1 Install fuel high-pressure pump (⇒*Figure 8* **-1-**) with a new O-ring (⇒*Workshop Manual '246319 Removing and installing high-pressure pump'*).

2.3.2 Fit cover for positive crankcase ventilation (2 x, cylinder head 1–3 ⇒*Figure 8* **-2-**/cylinder head 4–6 ⇒*Figure 9* **-1-**) with a new O-ring and new moulded seal (⇒*Workshop Manual '150520 Removing and installing camshaft - section on "Installing"'*).

1 – Positive crankcase ventilation cover, cylinder 4–6
2 – Vacuum pump (solo pump) for brake booster

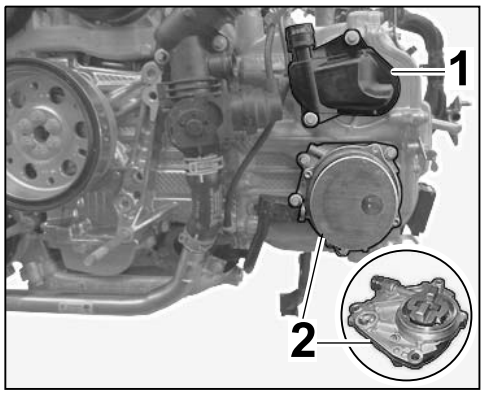

Figure 9

2.3.3 Install vacuum pump (solo pump) for brake booster with new O-rings (2 x) on cylinder head 4–6 (⇒*Workshop Manual '477619 Removing and installing vacuum pump'*, ⇒*Figure 9*).

Fit coolant pipe for vacuum pump (solo pump) for brake booster with new O-rings (2 x) in the vacuum pump and secure it to the bottom of the coolant guide.

2.3.4 Install new spark plugs (⇒*Workshop Manual '287020 Removing and installing spark plugs'*).

2.3.5 Install ignition coils (⇒*Workshop Manual '282020 Removing and installing ignition coils'*).

2.3.6 Convert coolant temperature sensor (cylinder 3) with a new sealing ring (⇒*Workshop Manual '197819 Removing and installing coolant temperature sensor (cylinder 3)'*).

1 – Coolant temperature sensor (cylinder 3)
2 – Coolant compensation line

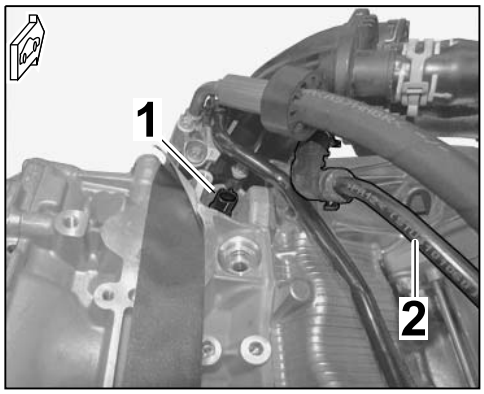

Figure 10

2.3.7 Remove old coolant compensation line (⇒*Figure 10* **-2-**) and install new coolant compensation line (⇒*Figure 11* **-2-**).

2.3.8 Remove lower part of oil filler neck (⇒ *Workshop Manual '171519 Removing and installing oil filler neck'*).

1 – Coolant temperature sensor (cylinder 3)
2 – New coolant compensation line
3 – New engine oil filler neck
4 – New fuel collection pipe, cylinder 1-3
5 – New fuel collection pipe, cylinder 4-6
6 – New pressure line (high-pressure connecting line for fuel collection pipe)

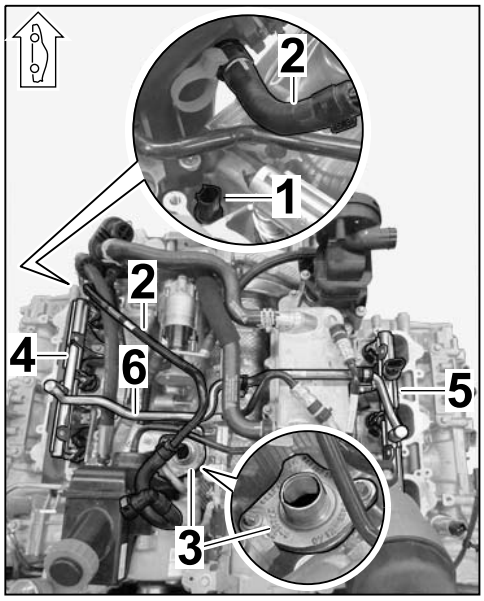

Figure 11

Coat O-ring (underside of connection piece) with Klüber Syntheso Glep.

Position and fit new oil filler neck on the crankcase (⇒ *Figure 11* **-3-**).

2.3.9 Install fuel collection pipe and fuel injectors (6 x) with new Teflon seals (6 x) (⇒ *Workshop Manual '243019 Removing and installing fuel collection pipe with fuel injectors'*, ⇒ *Figure 11*).

2.4 Convert or install engine electrics, exhaust system holder and positive crankcase ventilation.

2.4.1 Install generator (⇒ *Workshop Manual '272219 Removing and installing generator'*).

2.4.2 Convert bracket for silencer holder (2 x).
Tightening torque 23 Nm (17 ftlb.)

2.4.3 Install lower part of heat shield (2 x, ⇒ *Workshop Manual '261219 Removing and installing heat shield'*) and rear silencer holder (2 x, ⇒ *Workshop Manual '2601IN Components and arrangement of exhaust system'*) (⇒ *Figure 12*).

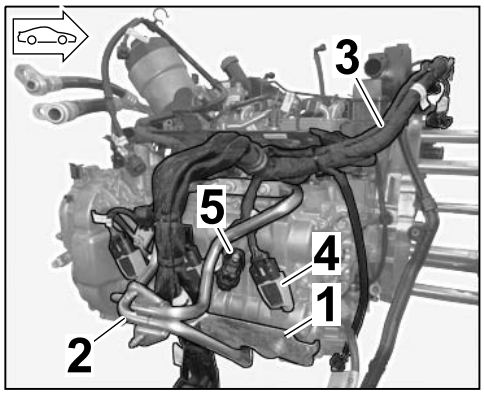

Figure 12

1 – Lower part of heat shield, cylinder 4–6
2 – Rear silencer holder, cylinder 4–6
3 – Engine wire harness
4 – Ignition coil, cylinder 6
5 – Hall sender, cylinder 4–6

2.4.4 Position new engine wire harness on the engine (⇒ *Workshop Manual '975219 Removing and installing wire harness for engine'*).

2.4.5 Connect plug connections to ignition coils (6 x) and sensors/senders/hydraulic valves (engine body/cylinder head area) (⇒ *Figure 12*).

2.4.6 Fit new crankcase vent line (⇒ *Workshop Manual '1001Z2 Assembling engine'* ⇒ *Figure 13*)

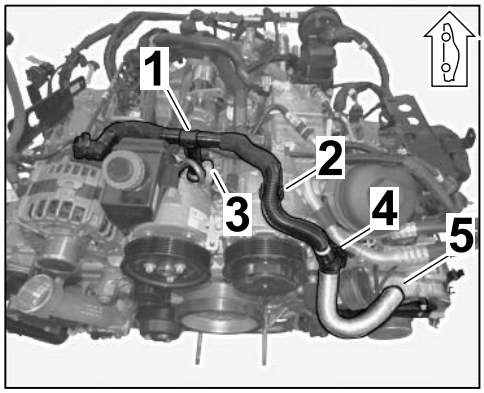

Figure 13

1 – Crankcase vent line
2 – Retaining clip for air-conditioning compressor
3 – Connection for engine oil filler neck
4 – Connection for oil-filter housing
5 – Connection for positive crankcase ventilation cover, cylinder 4–6

2.4.7 Route new engine wire harness to the starter, secure it to existing lines and connect it to the starter (⇒ *Workshop Manual '276019 Removing and installing starter'*).

1 – B+ line terminal
2 – Line 50 terminal
3 – Cap on starter

Fit cap on the starter.

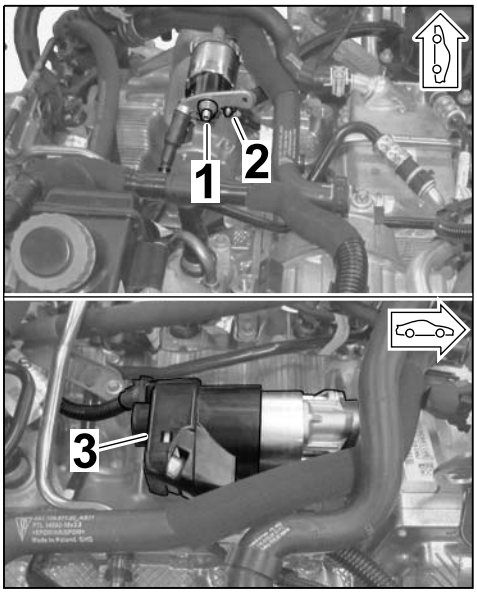

Figure 14

2.5 Install and complete new intake-air distributor.

1 – New intake-air distributor (ASSY)
2 – Holder for wiring harness on distributor tube (pre-fitted)
3 – Holder for wiring harness on lower part of intake-air distributor (cylinder 4–6)
4 – Torx screw, M6 x 12
5 – Connection piece for vent connections (cylinder head 1–3)

2.5.1 Grease connection piece (vent connections on cylinder head 1–3, ⇒ *Figure 15* **-5-**) on the new intake-air distributor with Optimol.

2.5.2 Fit new engine wire harness holder (⇒ *Figure 15* **-3-**) on the new lower part of intake-air distributor (cylinder 4–9) using Torx screws (M6 x 12).
Tightening torque 10 Nm (7.5 ftlb.)

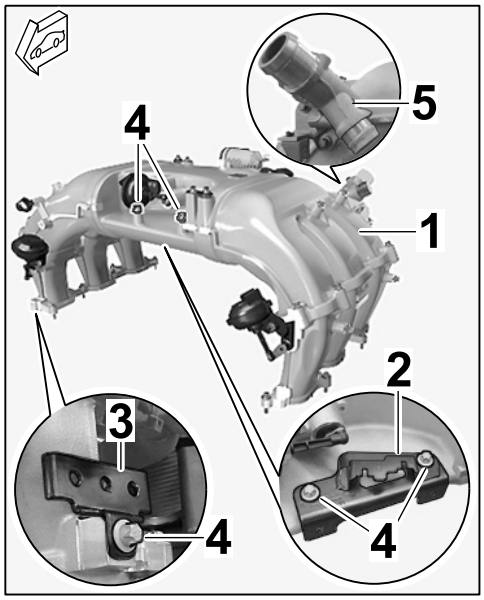

Figure 15

Information

Do NOT remove plastic locks (color: red) on the 12 screws (M6 x 25) on the lower part of the intake-air distributor flange. They are used to center the intake-air distributor on the cylinder heads.

2.5.3 Fit new intake-air distributor complete with restraining strap, new seals (6 x) and pre-fitted screws (M6 x 25, 12 ea.) on the cylinder heads.

1 – New intake-air distributor
2 – Restraining strap
3 – Torx screw, M6 x 12

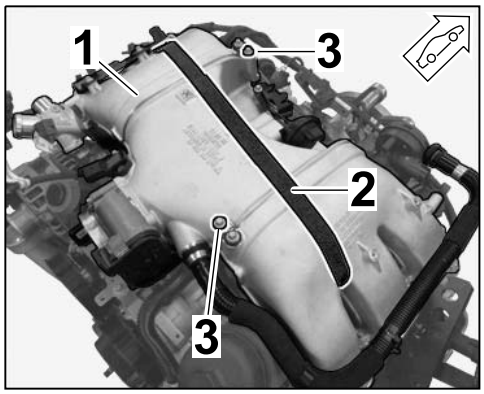

Figure 16

2.5.4 Connect new crankcase vent line to the ventilation adapter (cylinders 1–3) (⇒*Figure 17*).

1 – Crankcase vent line and cylinders 4–6
2 – Connection piece for intake-air distributor

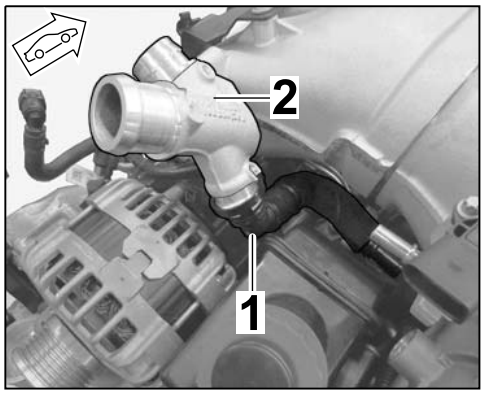

Figure 17

2.5.5 Secure new intake-air distributor to the cylinder heads with M6 x 25 screws (12 x) according to the specified tightening sequence (⇒*Workshop Manual '244619 Removing and installing intake-air distributor'*).

Tighten pre-fitted M6 x 12 screws (2 x for tabs on distributor tube ⇒*Figure 16* **-3-**).
Tightening torque 10 Nm (7.5 ftlb.) +1 Nm (+0.5 ftlb.)

Open restraining strap (⇒*Figure 16* **-2-**) and pull it out to the side.

2.5.6 Fit new vent line for cylinder head 1–3 (⇒*Figure 18*).

1 – Vent line for cylinder head 1–3
2 – Connection piece for intake-air distributor
3 – Connection piece for ventilation, cylinder head 1–3
4 – Holder for engine wire harness (side, cylinder 1–3)

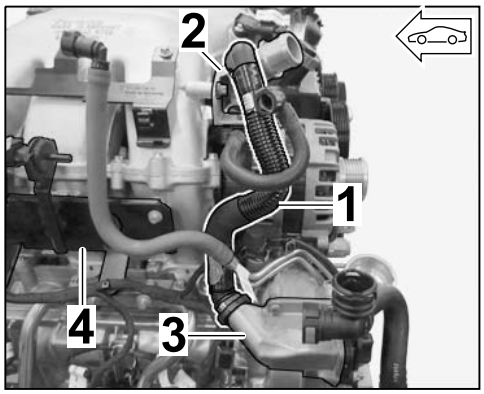

Figure 18

2.5.7 Fit holder for engine wire harness (2 x, side) on lower part of intake-air distributor for cylinder 1–3 (⇒*Figure 18* **-4-**)/cylinder 4–6 (⇒*Workshop Manual '975219 Removing and installing wire harness for engine'*).

2.5.8 Fit new fuel tank vent line on holder for intake-air distributor for cylinder 1–3 and connect plug connections (⇒*Figure 19*).

1 – New fuel tank vent line
2 – Holder for intake-air distributor, cylinder 1–3
3 – Resonance tube connection
4 – Electric plug connection

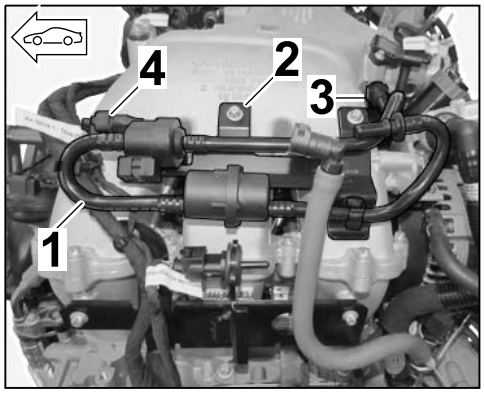

Figure 19

2.6 Adapt and connect vacuum system

- Vacuum system; top view: ⇒*Figure 20*

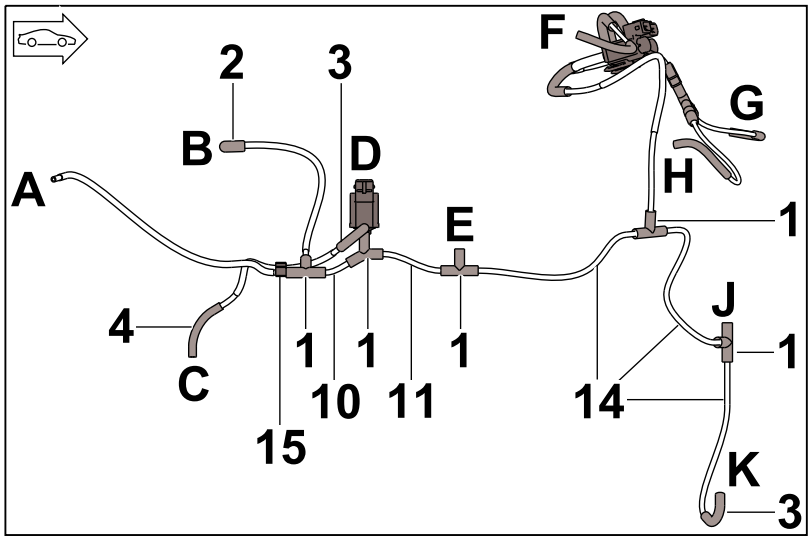

Figure 20

1 – T-piece
2 – Angled pipe
3 – Protective tube
4 – Molded hose (protective tube, bent)
10 – Pipe, 5.0 x 1.0 x 30.0
11 – Pipe, 5.0 x 1.0 x 85.0
14 – Pipe, 5.0 x 1.0 x 185.0
15 – Line bracket, 5.0 x 5.0 (Raymond)
A – Connection for air cleaner control valve
B – Connection for vehicle thermal management control valve
C – Connection for engine thermal management vacuum unit
D – Connection for thermal management control valve
E – Connection for sports exhaust system control valve
F – Vacuum unit for resonance tube switching flap
G – Connection for vacuum unit on switching flap shaft, cylinder 1–3
H – Connection for vacuum unit on switching flap shaft, cylinder 4–6
J – Connection for transmission control valve
K – Connection for vehicle

- Vacuum system; side view (cylinder 4–6): ⇒*Figure 21*

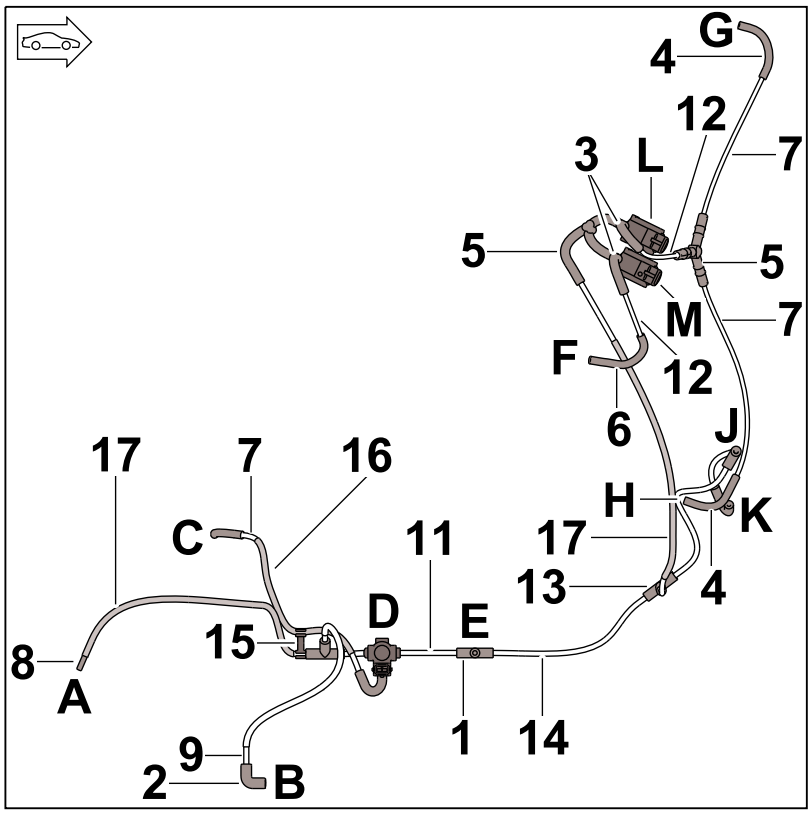

Figure 21

1 – T-piece
2 – Angled pipe
3 – Protective tube
4 – Molded hose (protective tube, bent)
5 – Y-piece
6 – Hose, 3.5 x 2.0 x 75.0
7 – Pipe, 4.0 x 1.0 x 230.0
8 – Pipe, 5.0 x 1.0 x 350.0
9 – Pipe, 5.0 x 1.0 x 280.0
11 – Pipe, 5.0 x 1.0 x 85.0
12 – Pipe, 4.0 x 1.0 x 75.0
13 – Pipe, 5.0 x 1.0 x 510.0
14 – Pipe, 5.0 x 1.0 x 185.0
15 – Line bracket, 5.0 x 5.0 (Raymond)
16 – Protective tube, 5.0 x 200.0
17 – Protective tube, 5.0 x 300.0
A – Connection for air cleaner control valve
B – Connection for vehicle thermal management control valve
C – Connection for engine thermal management vacuum unit
D – Thermal management control valve
E – Connection for sports exhaust system control valve

F – Vacuum unit for resonance tube switching flap
G – Connection for vacuum unit on switching flap shaft, cylinder 1–3
H – Connection for vacuum unit on switching flap shaft, cylinder 4–6
J – Connection for transmission control valve
K – Connection for vehicle
L – Vacuum unit control valve on switching flap shaft, cylinder 1–3 and cylinder 4–6
M – Vacuum unit control valve for resonance distributor switching flap

Information

Specified lengths are minimum lengths!

Remove any additional parts you need from the standard vacuum/fresh-air system, which are no longer required.

2.6.1 Cut pipelines off the relevant pipe (provided = running meter) as shown in ⇒*Figure 20* and ⇒*Figure 21*.

Attach 300-mm length for protective tube 5.0 x 300 (⇒*Figure 21* **-17-**) from the parts provided.

2.6.2 Connect vacuum system as shown in ⇒*Figure 20* and ⇒*Figure 21*.

2.7 Adapt and connect fresh-air system

- Fresh-air system; side view (cylinder 4–6):

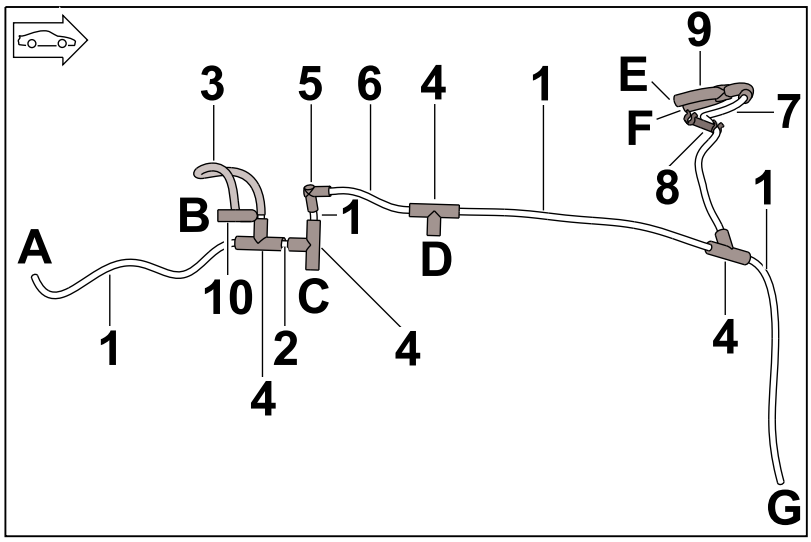

Figure 22

1 – Pipe, 5.0 x 1.0 x 220.0
2 – Pipe, 5.0 x 1.0 x 30.0
3 – Protective tube, 5.0 x 200.0
4 – T-piece

5 – Connecting piece (elbow)
6 – Pipe, 5.0 x 1.0 x 70.0
7 – Pipe, 5.0 x 1.0 x 350.0
8 – Line bracket, 5.0 x 5.0 (Raymond)
9 – Y-piece
10 – Molded hose (protective tube, bent)
A – Connection for vehicle
B – Connection for vehicle thermal management control valve
C – Connection for engine thermal management control valve
D – Connection for sports exhaust system control valve
E – Connection for tuning flap control valve
F – Connection for resonance induction manifold control valve
G – Connection for transmission

Information

Specified lengths are minimum lengths!

Remove any additional parts you need from the standard vacuum/fresh-air system, which are no longer required.

2.7.1 Cut pipelines off the relevant pipe (provided = running meter) as shown in ⇒*Figure 22*.

2.7.2 Connect vacuum system as shown in ⇒*Figure 22*.

NOTICE

Risk of damage to lines and/or hoses (vacuum)

- **due to incorrect routing.**

⇒ **Maintain a sufficient distance from components exposed to high temperatures while driving.**

⇒ **Avoid using small bending radii.**

2.8 Install vacuum/fresh-air system on the engine

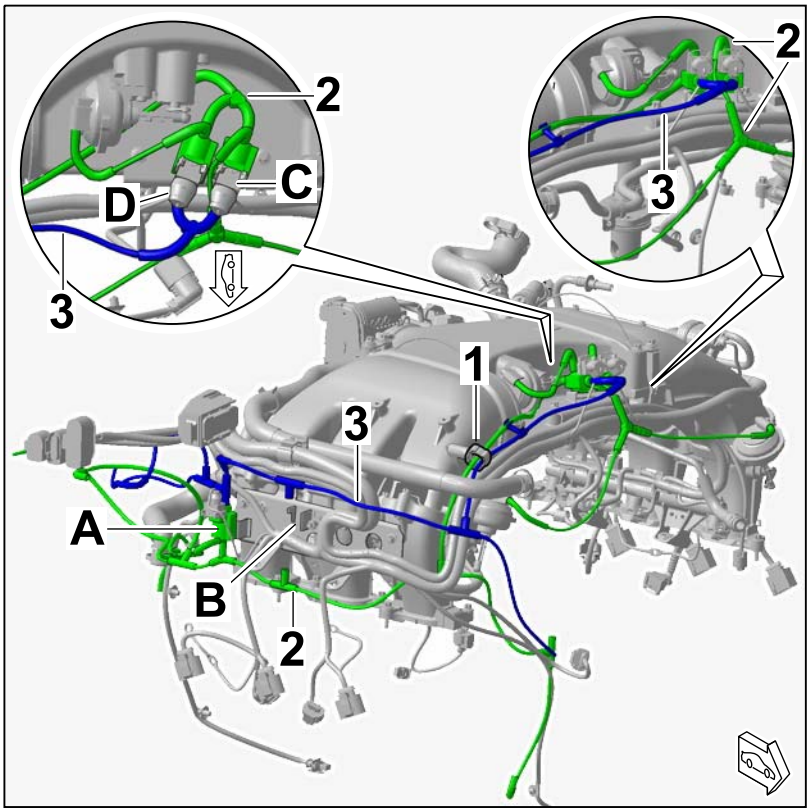

Figure 23

A – Engine thermal management control valve
B – Installation position of sports exhaust system control valve
C – Vacuum unit control valve on switching flap shaft, cylinder 1–3 and cylinder 4–6
D – Vacuum unit control valve for resonance tube switching flap
1 – Line bracket
2 – Vacuum system (green)
3 – Fresh-air system (blue)

2.8.1 Secure lines in the line bracket (⇒*Figure 23* **-1-**) on the intake-air distributor for cylinder 4–6.

2.8.2 Clip control valves (⇒*Figure 23* **-A / B / C / D-**) into the intake-air distributor holders.

2.8.3 Fit vacuum system and fresh-air system on the engine and secure in holders (⇒*Figure 23*).

2.9 Concluding work for converting engine

1 – Drive belt
2 – Lower cover
3 – Upper cover

2.9.1 Install drive belt (⇒ *Workshop Manual '137819 Removing and installing drive belt'*) and drive belt cover (⇒ *Workshop Manual '138419 Removing and installing drive belt cover'*) (⇒ *Figure 24*).

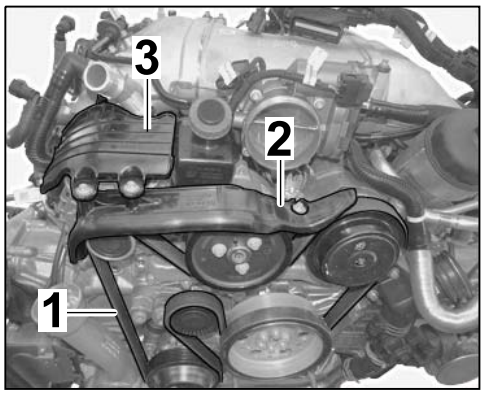

Figure 24

2.9.2 Install upper part of heat shield (2 x) (⇒ *Workshop Manual '261219 Removing and installing heat shield'*).

1 – Upper part of heat shield, cylinder 4–6
2 – Exhaust manifold with catalytic converter, cylinder 4–6
3 – Engine carrier
4 – Vacuum line (sports exhaust system)

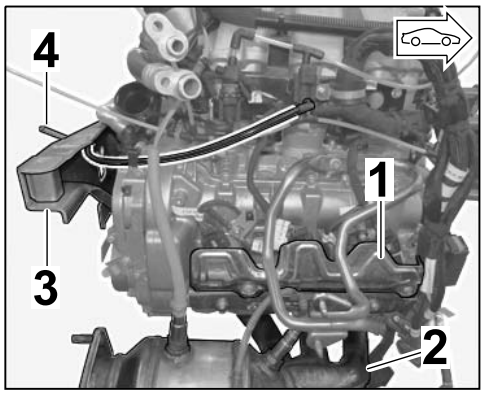

Figure 25

2.9.3 Install exhaust manifold with catalytic converter (left/right: ⇒ *Figure 25* **-2-**) with a new seal (⇒ *Workshop Manual '261019 Removing and installing exhaust manifold'*).

2.9.4 Install engine carrier (⇒ *Figure 25* **-3-**) with front muffler holder (⇒ *Workshop Manual '103019 Removing and installing engine carrier'*).

2.9.5 Secure vacuum line (sports exhaust system ⇒ *Figure 25* **-4-**) to the engine carrier with a clip (⇒ *Installation and Conversion Instructions '260100 Sports exhaust system, 3.8 l (l-no. 176)'*)

3 Install exhaust system on engine side

3.1 **ONLY** for vehicles WITHOUT sports exhaust system (l-no. 176), see also: ⇒ *Installation and Conversion Instructions '260100 Sports exhaust system, 3.8 l (l-no. 176)'*:

3.1.1 Install new front muffler with new seals (2 x) and new M8 hexagon nuts (6 x) (⇒ *Workshop Manual '262519 Removing and installing front silencer'*).

3.2 **ONLY** for vehicles WITH sports exhaust system (l-no. 176):

3.2.1 Install front muffler with new seals (2 x) and new M8 hexagon nuts (6 x) (⇒ *Workshop Manual '262519 Removing and installing front silencer'*).

3.2.2 Install rear silencer (left/right) (⇒ *Workshop Manual '263319 Removing and installing rear silencer'*).

4 **ONLY** for vehicles WITHOUT –middle– radiator (I-no. 153):
Install –middle– radiator

4.1 Preparatory work for –middle– radiator area

4.1.1 Remove front apron (⇒ *Workshop Manual '631519 Removing and installing front apron'*).

4.1.2 Remove air guide on side radiators (left/right; ⇒ *Workshop Manual '192419 Removing and installing air guide'*) and pedestrian protection (⇒ *Workshop Manual '697019 Removing and installing pedestrian protection'*).

1 – Air guide, right
2 – Air guide, left
3 – Pedestrian protection

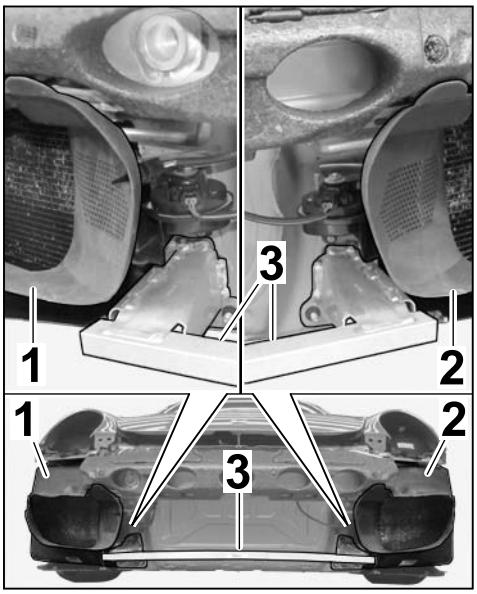

Figure 26

4.1.3 Fit retaining frame (for radiator) at the threaded bolts on the front panel using M6 hexagon nuts (4 x).

1 – Retaining frame (for radiator)
2 – Hexagon nut, M6

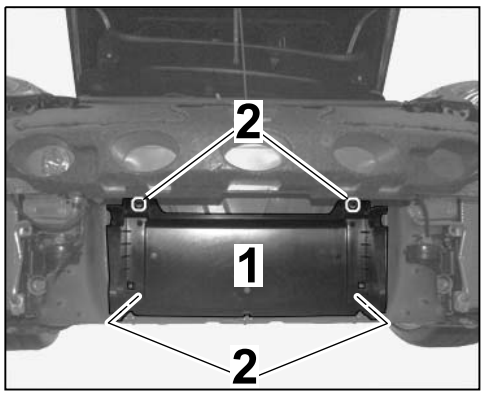

Figure 27

WARNING

Caustic fluid

- **Danger of chemical burns**

⇒ **Avoid contact with caustic fluid.**

⇒ **Wear personal protective gear.**

⇒ **Ensure that there is good ventilation.**

⇒ **If you do come into contact, wash off immediately with plenty of warm water and contact a doctor if necessary.**

4.1.4 Place a suitable container underneath the side radiators.

Remove dummy plugs on side radiators (bottom) and collect coolant.

4.2 Install –middle– radiator (⇒ *Workshop Manual '198019 Removing and installing middle radiator'*, ⇒ *Figure 28*).

1 – Retaining frame
2 – Radiator (middle)
3 – Sealing frame
4 – Air guide (center)
5 – Water hose (supply)

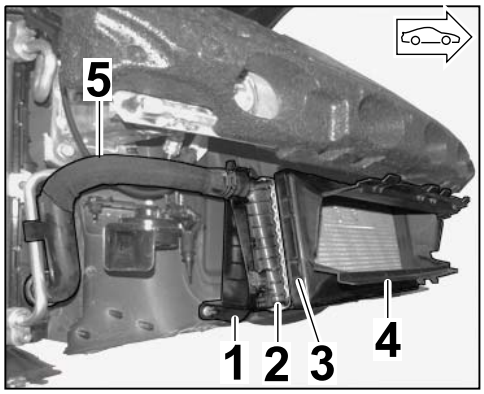

Figure 28

4.3 Replace closed retaining frame (center) for front apron with a new open retaining frame (centre) in accordance with the vehicle variant (WITH/WITHOUT I-no. XAA/XAT/XAS) (⇒ *Workshop Manual '660519 Removing and installing radiator grille'*).

1 – Retaining frame (center), open (vehicles with I-no. XAA/XAT/XAS)
2 – Front apron (vehicles with I-no. XAA/XAT/XAS)

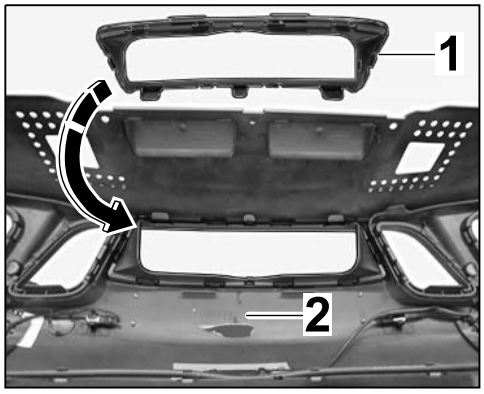

Figure 29

4.4 **ONLY** for vehicles WITHOUT I-no. XAA/XAT/XAS:
Adapt front apron

4.4.1 Make air opening (4 x, ⇒*Figure 30* **-arrows-**) on underside of the front apron.

4.4.2 Drill a hole at the radius of each of the markings/impressions.

4.4.3 Cut out air opening (4 x) using a tenon saw.

4.4.4 Remove burrs from cut edges.

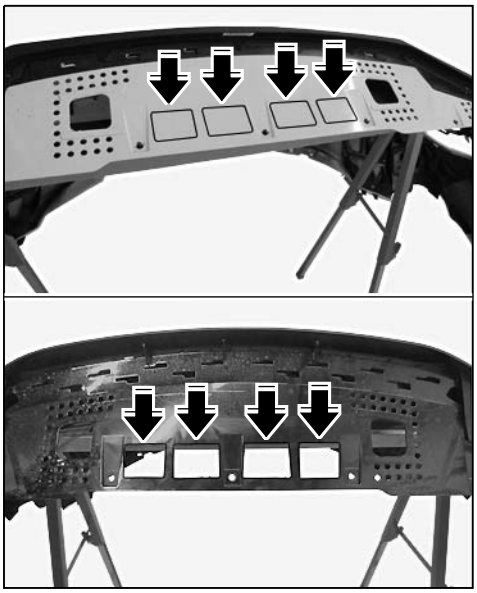

Figure 30

4.5 Concluding work for –middle– radiator area

4.5.1 Install pedestrian protection (⇒*Workshop Manual '697019 Removing and installing pedestrian protection'*) and air guide on side radiators (left/right; ⇒*Workshop Manual '192419 Removing and installing air guide'*).

4.5.2 Install front apron (⇒*Workshop Manual '631519 Removing and installing front apron'*).

5 Concluding work for engine area

5.1 **ONLY** for vehicles **WITHOUT** sports exhaust system:
Install combined switch (switch console); ⇒*Installation and Conversion Instructions '260100 Sports exhaust system (I-no. 176)'*.

5.2 Mount transmission (⇒*Workshop Manual '343527 Removing and mounting transmission - section on "Removing and mounting"'*) or Porsche Doppelkupplung (PDK) (⇒*Workshop Manual '373427 Removing and mounting Porsche Doppelkupplung (PDK)'*).

WARNING

Working on the vehicle electrical system

- **Risk of short circuit and fire.**

⇒ **Disconnect and cover the battery.**

⇒ **Route electric wires without tension so that no chafing occurs.**

⇒ **Secure electric wires to existing wires/components using tie-wraps and/or wrapping tape.**

5.3 Install engine (⇒*Workshop Manual '100119 Removing and installing engine - section on "Removing"'*).

5.4 Fit connector (6-pin, connection close to DME control unit connector) for transmission input shaft sensor

1 – Engine wire harness
2 – Connector for DME control unit
3 – Connector for transmission input shaft sensor (6-pin)

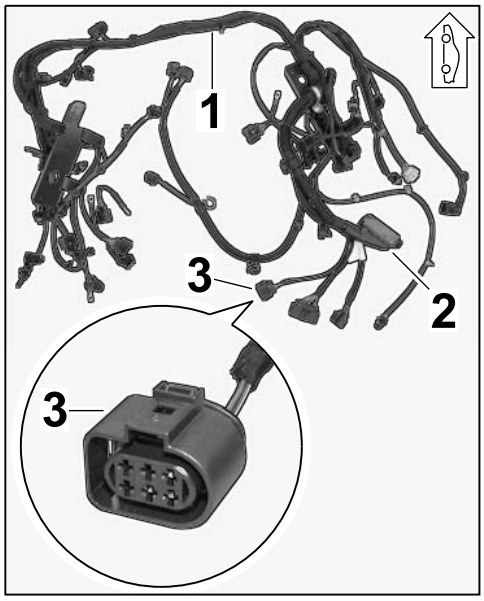

Figure 31

5.4.1 **ONLY** for vehicles WITH manual transmission (l-no. 487):
Check whether a mating connector (⇒*Figure 31* **-2-**) is fitted in the vehicle.

Yes: Connect plug connection and fit it to existing holder.

No: Protect connector from spray water using a dummy plug 991.612.957.00 if necessary and fit to existing holder.

5.4.2 **ONLY** for vehicles WITH Porsche Doppelkupplung (PDK) (PDK transmission = l-no. 250):

Protect connector from spray water using a dummy plug 991.612.957.00 if necessary and fit to existing holder.

5.5 **ONLY** for vehicles from MY 15:
Also use wiring harness (991.612.944.00) for plug connection for engine thermal management control valve/vehicle wiring harness.

1 – wiring harness
2 – Engine thermal management control valve connector
3 – Engine wire harness holder, cylinders 4–6 (right-hand side)

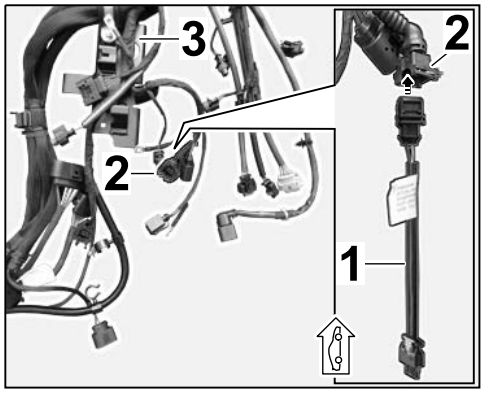

Figure 32

5.6 Check all operating fluid levels and top up if necessary.

5.6.1 Fill in coolant and bleed the cooling system (⇒*Workshop Manual '193817 Draining and filling coolant (includes bleeding)'*).

5.6.2 Fill in refrigerant (⇒*Workshop Manual '87031700 Draining and filling refrigerant'*).

5.6.3 Check engine-oil level and top up with new engine oil if necessary (⇒*Workshop Manual '170101 Checking engine-oil level'*).

5.7 Install new engine compartment cover with carbon badges (⇒*Figure 33*).

5.7.1 Install fan motors for engine-compartment blower (⇒*Workshop Manual '198119 Removing and installing engine-compartment blower'*).

5.7.2 Clip in new engine compartment cover with carbon badges.

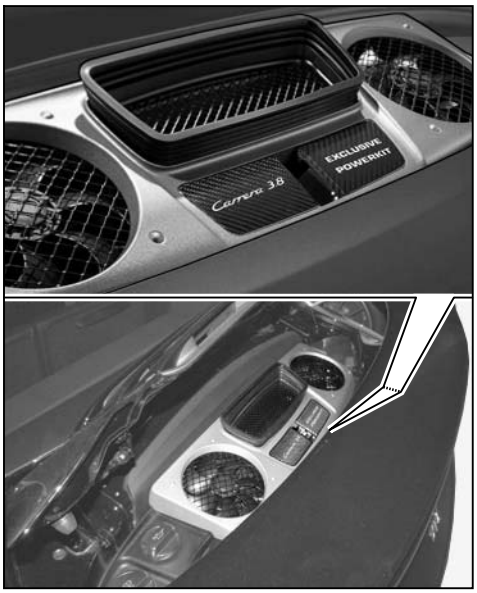

Figure 33

6 Code/program “Power Kit (I-no. X51)” and “sports exhaust system (I-no. 176)”, if not already installed

6.1 Preparatory work

6.1.1 Connect battery charger (⇒ *Workshop Manual '2X00IN Battery trickle charging'*) and connect **9900 - PIWIS Tester 3** to the vehicle and switch it on.

6.1.2 Check PIWIS Tester software version (at least 11.200) on the Start screen (above Copyright).

Information

The **9718 - PIWIS Tester** instructions take precedence and in the event of a discrepancy these are the instructions that must be followed. Deviations may occur with later software versions.

The procedure described here has been structured in general terms; different text or additions may appear in the **9718 - PIWIS Tester**.

6.1.3 Switch on ignition in the vehicle.

Select vehicle “911” and type “991” in the "Diagnostics" menu on **9900 - PIWIS Tester 3**. PIWIS Tester Diagnostics starts.

WARNING

Sudden voltage interruption of the power supply to the control module.

- **Destruction of the control module.**

⇒ **During programming, it is essential to guarantee the power supply for the PIWIS Tester. It is essential to connect a battery charger with a current rating of at least 40 A to the vehicle battery.**

⇒ **Prior to disconnecting the control module, switch off the ignition and remove the ignition key.**

NOTICE

Control unit programming will be aborted if the Internet connection is unstable.

- **An unstable Internet connection can interrupt communication between PIWIS Tester III and the vehicle communication module (VCI). As a result, control unit programming may be aborted.**

⇒ **During control unit programming, always connect PIWIS Tester III to the vehicle communication module (VCI) via the USB cable.**

6.2 Enter the new vehicle equipment in the vehicle data

(see also: ⇒*Workshop Manual '247055 Replacing DME control unit'*)

6.2.1 Select “DME” in the control unit overview. Press •>> “ to continue.

Take note of the Porsche part number before programming, e.g. 991.618.626.08 (for EU5/manual transmission – model year D vehicle).

Press •<< “ to go back to the higher-level menu.

6.2.2 Press •F7 “ in the control unit overview to switch to the “Additional menu”.

6.2.3 Select the “Maintenance of vehicle data” function. Press •F12 “ until “X numbers” appears in the Value group column.

6.2.4 Select the option “X51 – CARRERA POWER KIT” in the “Value group = X numbers” column and wait until a tick appears in the “Installed” column.

6.2.5 **ONLY** for vehicles WITHOUT sports exhaust system before conversion:
Press •F12 “ to go to the “Value group = M numbers” page.

Scroll to the “176 – SPORTS EXHAUST SYSTEM” row here, select the option “176 – SPORTS EXHAUST SYSTEM" and wait until a tick appears in the “Installed” column.

6.2.6 Press •F12 “ to go to the end of the menu and then press •F8 “ to save the selected option(s).

6.2.7 Wait until the message “Creation of vehicle order has been completed.” appears. Continue to Log management by pressing •F12 “ .

6.2.8 Press •F10 “ to open the log. Check that the selected vehicle equipment has been entered and close the log.

6.3 Code/program the new vehicle equipment.

6.3.1 Select all control units in the control unit overview (•CTRL+A “) and switch to the “Codings/adaptations” column.

6.3.2 Select "Automatic coding" in coding mode. Press •F12 “ to continue.

6.3.3 Once “Automatic coding” (takes approx. 8 minutes) is complete, switch to the control unit overview and select DME control unit.

6.3.4 Once the control unit is displayed, e.g. “DME V6 naturally aspirated EU 3.8 (X51)”, press •F8 “ .

The message “Performing programming …” will appear and two progress bars will be displayed at the bottom of the screen.

6.3.5 When programming is complete (after approx. 6 minutes), press •F12 “ to switch to the control unit overview.

6.3.6 Press •F8 “ to display all control units containing faults.

6.3.7 Check any faults that are present, work through them if necessary and then delete them by pressing •F8 “ .

6.4 Check that the DME control unit was programmed successfully by reading out the new part number[7].

Porsche Part No.[7]	**Emission standard and country or region/transmission type**
991.618.640.02	EU5/PDK transmission
991.618.641.02	EU5/manual transmission
991.618.642.02	Low Emission Vehicle = LEV/PDK transmission
991.618.643.02	Low Emission Vehicle = LEV/manual transmission
991.618.644.02	EU4 –not restricted–/PDK transmission
991.618.645.02	EU4 –not restricted–/manual transmission
991.618.646.02	EU4 –restricted–/PDK transmission
991.618.647.02	EU4 –restricted–/manual transmission
991.618.648.02	EU4 –Porsche Asia Pacific (PAP)–/PDK transmission
991.618.649.02	EU4 –Porsche Asia Pacific (PAP)–/manual transmission
991.618.650.02	EU5 –Porsche Asia Pacific (PAP)–/PDK transmission
991.618.652.02	Ultra Low Emission Vehicle (ULEV) –Porsche Asia Pacific (PAP)–/PDK transmission

[7] Version: PIWIS Tester, release version: 11.200 for model year 2013 = D vehicles

6.5 Adapt DME control unit (⇒ *Workshop Manual '247055 Replacing DME control unit'*).

7 Concluding work

7.1 Disconnect the battery charger (⇒ *Workshop Manual '2X00IN Battery trickle charging'*).

7.2 Lower the lifting platform and remove the vehicle.

7.3 Perform a test drive or adaptation drive (DME control unit [⇒*Workshop Manual '247055 Replacing DME control unit'*] and transmission control unit [⇒*Workshop Manual '373055 Replacing PDK transmission control unit'*]).

7.4 Read out the fault memory of all systems, work through any existing faults and erase the fault memory (⇒*Workshop Manual '0X03IN Diagnostic maintenance: Diagnostic system and maintenance inter...'*).

7.5 Switch off ignition and disconnect **9900 - PIWIS Tester 3**.

10 01 31 00: –Engine (1 x) for 911 Carrera S (991), increased performance– ONLY for vehicles WITHOUT sports exhaust system — Labor time: **2720 TU**

Includes: Engine removed and installed; replacing cylinder heads, intake-air distributor, oil filler neck and engine compartment cover.
Installing rear silencer for sports exhaust system and connecting vacuum lines.
Adding the letter S to the engine number.
–Middle– radiator installed and air openings made on underside of front apron
Programming DME control unit; reading out all control units and erasing fault memories.
Filling with operating fluids. Sound function test on sports exhaust system.

Without: Measurement of performance and test drive.

10 01 31 03: –Engine (1 x) for 911 Carrera S (991), increased performance– ONLY for vehicles WITH sports exhaust system — Labor time: **2610 TU**

Includes: Engine removed and installed; replacing cylinder heads, intake-air distributor, oil filler neck and engine compartment cover.
Adding the letter S to the engine number.
–Middle– radiator installed and air openings made on underside of front apron
Programming DME control unit; reading out all control units and erasing fault memories.
Filling with operating fluids. Sound function test on sports exhaust system.

Without: Measurement of performance and test drive.