Power Kit (I-no. X51)

Revision: This bulletin replaces bulletin Group 1, #8/17, dated July 20, 2017.

This revision includes two additional kit part numbers and related information.

Model Year: **As of 2017**

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

Concern: **Subsequent performance increase to 331 kW (450 HP)**

Engine Type: Standard engine MDC.HA with engine power of 309 kW (420 hp)

Subject: **ONLY** for vehicles with Sport Chrono Package (I-no. QR5)

Restrictions: **ONLY** approved in conjunction with sport exhaust system (176).

ONLY approved in conjunction with optimized ventilation of rear axle.
Comes as standard on vehicles with Porsche Ceramic Composite Brake (PCCB = 450) or rear axle steering (470).

General information: 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 exhaust turbochargers (referred to hereafter as turbochargers) with larger turbine/compressor wheel diameters and a higher volume.
- 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 compartment cover with carbon inserts, painted Titanium Grey.
- Sport exhaust system incl. tailpipes (if not already fitted).
- New wheel carriers with ventilation openings and spoilers on the rear axle (if not already fitted ⇒ vehicles with PCCB or rear axle steering).

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

Information

All remote controls (keys) are required for teaching a DME, front-end electronics (front BCM), rear-end electronics (rear BCM), electronic steering lock (ELV) control unit or remote controls (keys) for example.

Remote controls (keys) that are not taught during this teaching procedure will no longer be recognized by the vehicle.

Information

Please inform the customer of this accordingly.

Engine Break-in:

Engine speeds greater than 5,000 rpm are not permitted over a distance of 310 miles (500 km). The maximum engine power of 331 kW (450 hp) depends on the total mileage of the engine at the time of the retrofit and is achieved at 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.

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

Diagram:

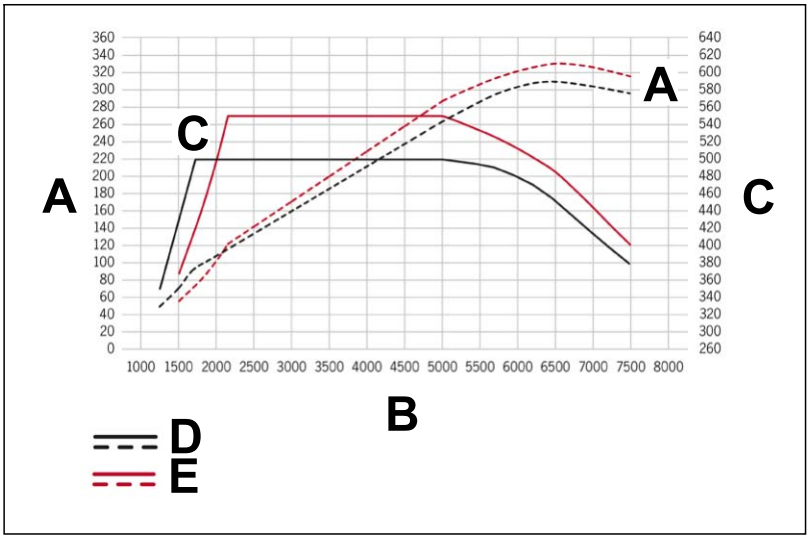

Figure 1

A – Power (kW)

B – Engine speed (rpm)
C – Torque (Nm)
D – Standard engine: 500 Nm at 1,700 rpm or higher and 309 kW (420 hp) at 6,500 rpm
E – Increased performance engine: 550 Nm at 2,150 rpm or higher and 331 kW (450 hp) at 6,500 rpm

Technical Description:

	Standard-production engine	Increased performance engine
Engine Type:	MDC.HA	MDC.HA
No. of cylinders:	6	6
Bore:	91 mm	91 mm
Lifting height:	76.4 mm	76.4 mm
Displacement:	2,981.4 ccm	2,981.4 ccm
Compression ratio:	10.0 : 1 (-0.5)	10.0 : 1 (-0.5)
Max. engine power at engine speed:	309 kW (420 hp) 6,500 rpm	331 kW (450 hp) 6,500 rpm
Max. torque at engine speed:	500 Nm from 1,700 – 5,000 rpm	550 Nm from 2,150 – 5,000 rpm
Engine speed limitation at:[1]	7,500 rpm	7,500 rpm
Idle speed:	650 ± 80	650 ± 80
Acceleration 0–100 km/h (0–62 mph):[2]	4.3 s	4.1 s
Acceleration 0–200 km/h (0–124 mph):[2]	13.7 s	13.1 s
v_{max}.[2]	191 mph (308 km/h)	194 mph (313 km/h)

[1] Engine speed at operating temperature

[2] Values 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!

Software:

- **9900 - PIWIS Tester 3**: Minimum version 35.600.010 (update from 30 May 2017)

Ordering Process:

Information

Before programming the "Engine immobilizer" and "Digital engine electronics = DME" control units, the performance class (P class) must be changed for the vehicle to be converted. This is done by PORSCHE AG!

When ordering a Power Kit, it is important therefore to send the following vehicle data to Porsche by submitting a TLAR:

- Part number of the retrofit kit
- Vehicle identification number (VIN) of the vehicle to be converted
- Order number used for ordering parts

For further information: see also ⇒ Figure 2.

A – Porsche dealer
B – PCNA
C – Porsche AG
I – Requesting change of performance class (P class) directly via TLAR
II – Checking and forwarding data via TLAR
III – Changing the performance class (P class) by Porsche AG. Then providing information to importers via TLAR
IV – Providing information to dealers via TLAR

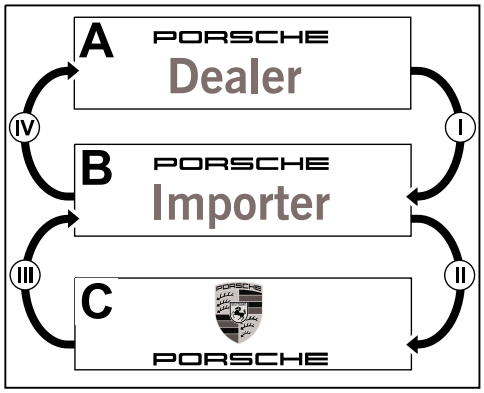

Figure 2

Information

If you do not have the necessary data or if the data you have is incorrect, Porsche AG will **NOT** be able to change the performance class.

Parts Info:

991.044.100.10[3]	⇒ Power Kit, 331 kW (450 hp), set
991.044.100.11	⇒ Power Kit, 331 kW (450 hp) incl. sports exhaust system (I-no. 176), set
991.044.100.15[3 4]	⇒ Power Kit, 331 kW (450 hp) incl. rear-axle brake ventilation system, set
991.044.100.16[4]	⇒ Power Kit, 331 kW (450 hp) incl. sports exhaust system (I-no. 176) and rear-axle brake ventilation system, set

991.504.990.02[5] ⇒ "Exclusive Powerkit" engine compartment cover – Carrera, complete

991.504.990.04[5] ⇒ "Exclusive Powerkit" engine compartment cover – Targa, complete

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

[4] **ONLY** for vehicles **WITHOUT** PCCB (450) and/or **WITHOUT** rear axle steering (470)!

[5] Also order according to vehicle!

Parts list:

Figure 3

Parts included with Power Kit:

9A2.123.031.52	1 x	Turbocharger, cylinders 1–3 ⇒*Figure 3* **-1-**
9A2.123.032.52	1 x	Turbocharger, cylinders 4–6 ⇒*Figure 3* **-2-**
9A2.111.215.00	2 x	Turbocharger/exhaust manifold seal ⇒*Figure 3* **-3-**
9P1.251.263	2 x	Turbocharger/catalytic converter seal ⇒*Figure 3* **-4-**
999.707.612.42	4 x	O-ring, 12 x 2.5 (turbocharger pressure line) ⇒*Figure 3* **-5-**
999.707.692.40	20 x	O-ring, 10 x 3 (turbocharger oil line) ⇒*Figure 3* **-6-**

999.707.387.40	2 x	O-ring, 15 x 2.5 (turbocharger oil tank) ⇒*Figure 3* **-7-**
999.707.603.40	4 x	O-ring, 10 x 3 (turbocharger coolant line) ⇒*Figure 3* **-8-**
999.084.642.02	14	Hexagon nut, M8 (turbocharger/catalytic converter) ⇒*Figure 3* **-9-**
9P1.129.260.A	2 x	Clip, ∅ 75 (intake pipe) ⇒*Figure 3* **-10-**
999.512.779.01	2 x	Hose clamp, 50 x 70 (intake pipe) ⇒*Figure 3* **-11-**
N 105.188.01	2 x	Hose clamp, 40 - 60 x 12 (charge-air hose) ⇒*Figure 3* **-12-**
N 105.189.01	2 x	Hose clamp, 50 - 70 x 12 (charge-air hose, not shown)
999.707.694.40	2 x	O-ring, 45 x 3 (intake pipe) ⇒*Figure 3* **-13-**
9A7.008.755.00	2 x	O-ring, 13 x 3 (tank ventilation line) ⇒*Figure 3* **-14-**
9P1.251.571	2 x	Clamp (main muffler) ⇒*Figure 3* **-15-**
900.123.007.30	1 x	Sealing ring, 14 x 18 (drain plug on thermostat housing, not shown)
991.504.990.02[6]	1 x	"Exclusive Powerkit" engine compartment cover ASSY – Carrera ⇒*Figure 3* **-16-**
991.504.990.04[6]	1 x	"Exclusive Powerkit" engine compartment cover ASSY – Targa (not shown)

[6] **NOT** contained in the set. Also order separately according to vehicle!

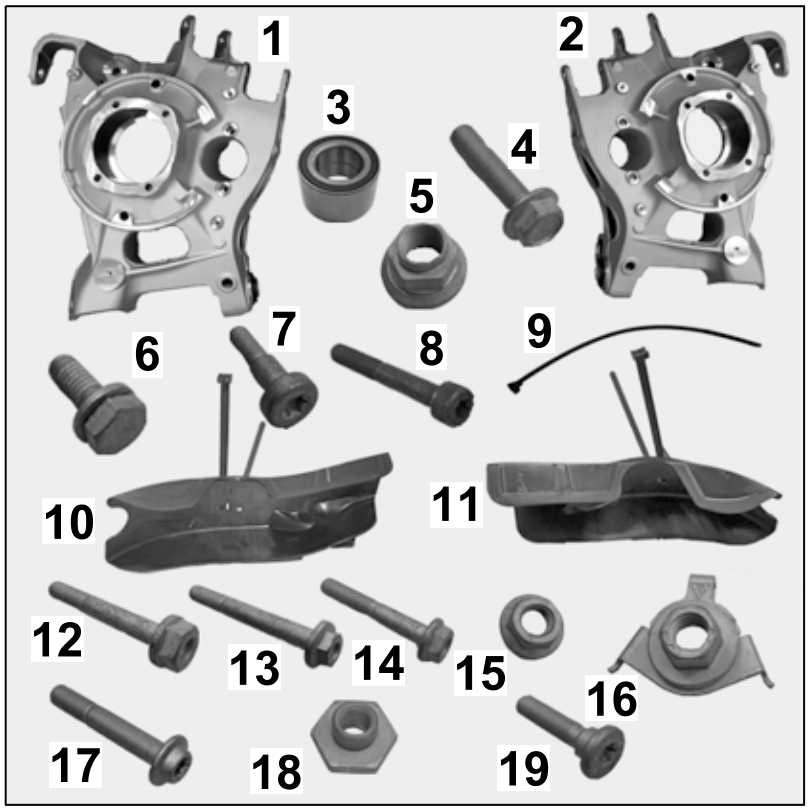

Figure 4

Parts included with rear-axle brake ventilation system (**ONLY** contained in the sets 991.044.100.15/.16):

991.331.111.33	1 x	Rear-axle wheel carrier – left ⇒*Figure 4* **-1-**
991.331.112.33	1 x	Rear-axle wheel carrier – right ⇒*Figure 4* **-2-**
298.407.621	2 x	Angular-contact ball bearing (wheel bearing) ⇒*Figure 4* **-3-**
999.217.042.04	8 x	Hexagon-head bolt, M8 x 53 (wheel bearing cover) ⇒*Figure 4* **-4-**
WHT.007.021	2 x	Hexagon nut, M22 x 1.5 (rear-axle drive shaft) ⇒*Figure 4* **-5-**
999.217.116.01	12 x	Hexagon-head bolt, M6 x 16 (brake anchoring plate, etc.) ⇒*Figure 4* **-6-**
999.073.452.01	4 x	Screw, M8 x 38 (spreader device (actuator/servo motor)) ⇒*Figure 4* **-7-**
999.067.053.09	4 x	Cheese head bolt, M12 x 1.5 x 85 (fixed-caliper brake) ⇒*Figure 4* **-8-**
9A7.008.379.00	4 x	Tie-wrap, A8.0 x 337 ⇒*Figure 4* **-9-**
991.331.483.04	1 x	Rear-axle trailing arm spoiler – left ⇒*Figure 4* **-10-**
991.331.484.04	1 x	Rear-axle trailing arm spoiler – right ⇒*Figure 4* **-11-**
999.072.920.01	2 x	Hexagon-head bolt, M12 x 1.5 x 90 (lower control arm)⇒*Figure 4* **-12-**
999.072.930.01	2 x	Hexagon-head bolt, M12 x 1.5 x 105 (lower wishbone) ⇒*Figure 4* **-13-**
999.072.868.01	10 x	Hexagon-head bolt, M12 x 1.5 x 80 (upper control arm) ⇒*Figure 4* **-14-**
999.084.445.01	14 x	Lock nut, M12 x 1.5 (control arm, anti-roll bar) ⇒*Figure 4* **-15-**
991.331.221.01	2 x	Hexagon nut lock, M12 x 1.5 (lower control arm) ⇒*Figure 4* **-16-**
999.073.530.01	2 x	Cheese head bolt, M12 x 1.5 x 72 (rear-axle shock absorber) ⇒*Figure 4* **-17-**
991.331.231.00	2 x	Hexagon nut, M12 x 1.5 (rear-axle shock absorber) ⇒*Figure 4* **-18-**
991.331.230.01	2 x	Cheese head bolt, M12 x 1.5 (rear-axle shock absorber) ⇒*Figure 4* **-19-**

Parts included with sport exhaust system (see separate Installation and Conversion Instructions ⇒ *Installation and Conversion Instructions '260100 Sports exhaust system (I-no. 176)'*):

991.044.200.30	1 x	Sport exhaust system, set

Materials:	000.043.305.15[7]	2 x	Antifreeze, BASF Glysantin G40–91 EF; 1-litre container
	000.043.305.21[7]	2 x	Engine oil, EXXON Mobil 1 0W-40, 1-liter container (see also Technical Bulletin ⇒*Manufacturer's Certificate '170100 Overview of approved Porsche A40 engine oils (07/17)'*)
	000.043.305.01	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)
000.043.306.27	1 x	Optitemp LG2, 25 ml spraying can

[7] As much as required.

Tools: **9900 - PIWIS Tester 3**

WE1223 - Transmission and unit jack Junior Jack 2.0

Also **ONLY** for vehicles **WITHOUT** PCCB (450) and/or rear axle steering (470):

VAS 6961 - Separating device
9694/3 - Press-on sleeve
T10230/14-16 - Supplementary set
VW 454 - Pressure piece
9229/1 - Puller hook
30-205 - Pressure piece
T10205 - Attachments
T10473 - Test card
VW 457 - Holding rails
VAS 6927 - Tie-wrap pliers

Work Procedure: 1 Preparatory work

1.1 Drive the vehicle onto a lifting platform, extend the rear spoiler manually and connect a battery charger (⇒ *Workshop Manual '2X00IN Battery trickle charging'*).

1.2 **ONLY** for Cabriolet: Move convertible-top compartment lid into service position.

1.3 **ONLY** for vehicles **WITHOUT** Porsche Ceramic Composite Brake (PCCB = 450) and/or rear axle steering (470):

1.3.1 Switch on ignition and apply electric parking brake.

1.3.2 Remove hub cap from wheel (left/right) on the rear axle using the relevant **9229/1 - puller hook**.

1.3.3 Loosen hexagon nut, M22 x 1.5 on the rear-axle drive shaft (left/right).

1.3.4 Move electric parking brake (EPB) into "assembly position" using **9900 - PIWIS Tester 3**.

- Select "Parking brake" in the control unit overview. Press •F12 “ to continue.
- Select "Move to assembly position" under Maintenance/repairs. Press •F12 “ to continue.
- When the parking brake has successfully moved to assembly position, the message "The parking brake has successfully moved to assembly position" appears.
- Exit the menu and switch off and disconnect **9900 - PIWIS Tester 3**.

1.4 Raise the vehicle (⇒ *Workshop Manual '4X00IN Lifting the vehicle'*).

1.5 Remove rear wheels (⇒ *Workshop Manual '440519 Removing and installing wheel'*).

CAUTION

Hot components

- **Risk of burns**

⇒ **Let hot components cool down.**

⇒ **Wear personal protective gear.**

1.6 Remove (sports) exhaust system

1.6.1 Remove rear apron (⇒*Workshop Manual '635519 Removing and installing rear apron'*).

1.6.2 Remove bumper and heat protection panels (⇒*Workshop Manual '635019 Removing and installing rear bumper'*).

1.6.3 Remove heat shield on turbocharger (cyl. 1–3/cyl. 4–6) (⇒*Workshop Manual '261219 Removing and installing heat shield'*).

1.6.4 Remove (sport) exhaust system (⇒*Workshop Manual '260119 Removing and installing exhaust system'*).

1 – (Sport) exhaust system
2 – Transmission and engine jack

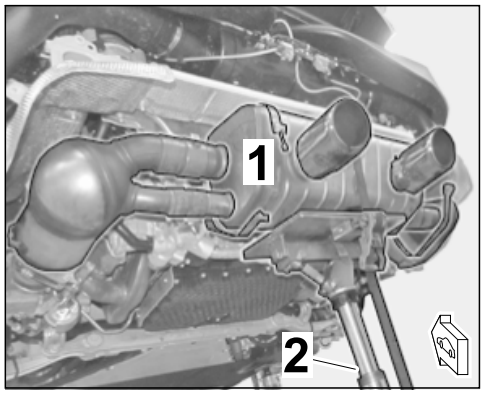

Figure 5

1.7 Drain oil from turbocharger (⇒*Workshop Manual '213019 Removing and installing turbocharger'*)

1.7.1 Remove charge-air hose from turbocharger (cyl. 1–3 ⇒*Figure 6* **-1-**/cyl. 4–6).

1.7.2 Remove intake pipe from turbocharger (cyl. 1–3).

1.7.3 Loosen clip (2 x) on intake pipe for turbocharger (cyl. 4–6) and disconnect plug connection.

Release coupling on branching pipe (positive crankcase ventilation) and remove intake pipe on turbocharger (cyl. 4–6).

1.7.4 Position oil drip tray under the respective turbocharger (cyl. 1–3/cyl. 4–6).

1 – Charge-air hose connection on turbocharger (cyl. 1–3)
2 – Torx screw, M6 x 12
3 – Oil return line (cyl. 1–3)
4 – Oil tank for turbocharger (cyl. 1–3)
5 – Oil drip pan

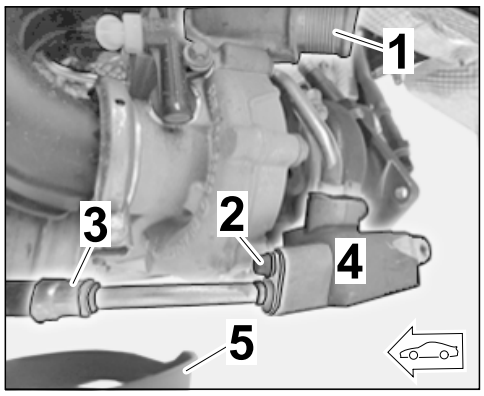

Figure 6

WARNING

Hot fluid

- **Danger of scalding**

⇒ **Let the fluid cool down.**

⇒ **Wear personal protective gear.**

1.7.5 Remove Torx screw (M6 x 12) on oil return line/turbocharger oil tank flange (cyl. 1–3 ⇒*Figure 6* **-4-**/cyl. 4–6).

Information

- Only use engine oils that have been tested and approved by Porsche AG.
- Dispose of used oil and oil filter in accordance with environmental regulations.

1.7.6 Disconnect plug-in coupling for oil return line/oil tank and collect oil using the oil drip pan.

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.**

1.8 Draining coolant from turbocharger

1 – Drain plug, M14 x 1.5 x 15
2 – Thermostat housing

1.8.1 Position coolant drip pan under the engine oil pan.

1.8.2 Remove drain plug on thermostat housing and collect coolant (⇒*Figure 7*).

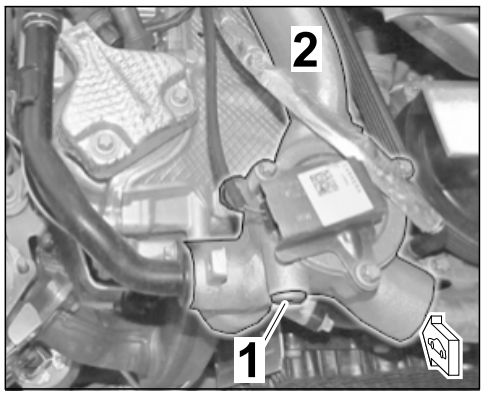

Figure 7

1.8.3 Remove flange with turbocharger coolant lines (cyl. 1–3/cyl. 4–6) (⇒*Figure 8*) and collect coolant.

1 – Turbocharger coolant lines (cyl. 1–3)
2 – Flange with turbocharger coolant lines (cyl. 4–6)

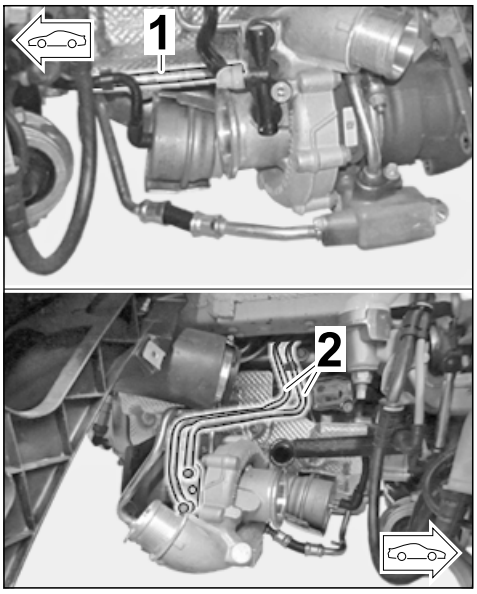

Figure 8

2 **ONLY** for vehicles **WITHOUT** Porsche Ceramic Composite Brake (PCCB = 450) and/or rear axle steering (470):
Convert rear-axle wheel carriers (see also ⇒ *Workshop Manual '425219 Removing and installing rear wheel bearing housing'*)

2.1 Remove rear-axle brake system

2.1.1 Switch on ignition, release the parking brake and switch off ignition.

2.1.2 Unscrew brake caliper (at the left ⇒ *Figure 9* **-1-**/right) from the relevant wheel carrier and suspend it in the wheel arch (⇒ *Workshop Manual '474119 Removing and installing rear brake calliper'*). Do not open the brake system!

1 – Brake caliper (left)
2 – Hexagon nut, M22 x 1.5
3 – Brake disc (left)

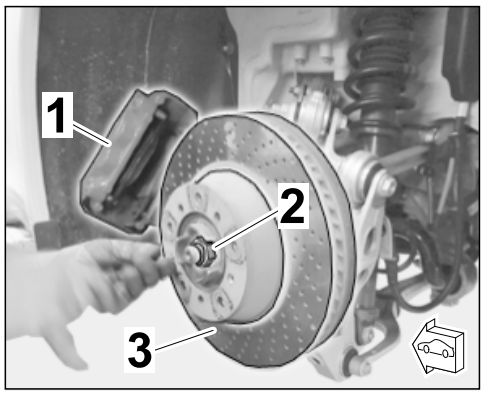

Figure 9

2.1.3 Loosen hexagon nut (M22 x 1.5) on the drive shaft (at the left/right) as far as the last thread.

Carefully loosen the drive shaft (at the left/right) in the wheel carrier using **VAS 6926 - puller set** until you can push the drive shaft (at the left/right) with your hand.

2.1.4 Remove brake disc (at the left ⇒ *Figure 9* **-3-**/right) (⇒ *Workshop Manual '465319 Removing and installing rear brake disc'*).

WARNING

Preloaded or pressurised components

- **Risk of injury (e.g. crushing or bruising) when removing and installing springs.**

⇒ **Do not reach into the danger area.**

⇒ **Relieve the tension on components before starting work.**

⇒ **Secure components to prevent them from loosening suddenly.**

⇒ **Wear protective gloves and goggles.**

⇒ **Be very careful when working on the brake system.**

2.1.5 Remove brake anchoring plate (at the left/right) and parking brake shoes (⇒ *Workshop Manual '468320 Removing and installing brake shoes'*).

1 – Brake anchoring plate (left)
2 – Parking brake shoes (left)
3 – Spreader device (actuator/servo motor – left)

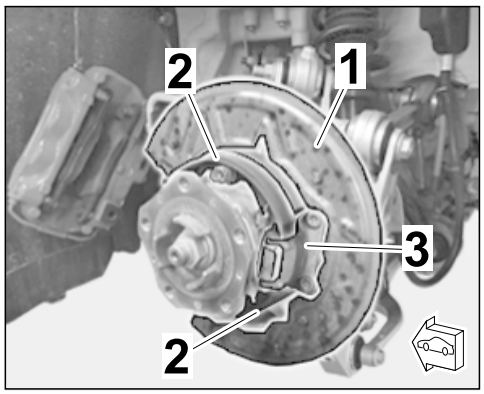

Figure 10

2.1.6 Secure the plunger in the spreader device (actuator/servo motor – at the left ⇒ *Figure 10* **-3-**/right) with a tie-wrap to prevent it from turning.

2.1.7 Remove spreader device (actuator/servo motor – at the left ⇒ *Figure 10* **-3-**/right) (⇒ *Workshop Manual '468519 Removing and installing spreader device (actuator)'*)

2.1.8 Disconnect wire harness for speed sensor (rear left/right) and electronic parking brake (at the left/right).

2.1.9 Remove rear speed sensor (at the left ⇒ *Figure 11* /right) (⇒ *Workshop Manual '451519 Removing and installing rear speed sensor'*)

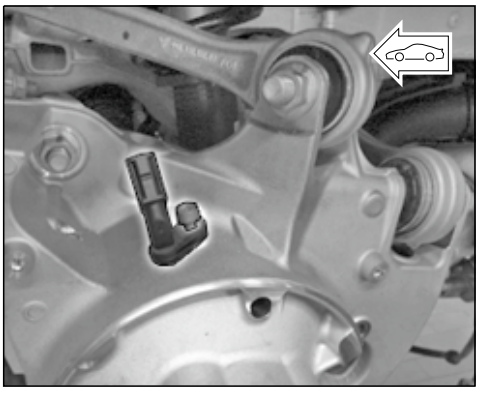

Figure 11

2.2 Remove rear-axle wheel carrier (at the left/right)

2.2.1 Remove tie rod on wheel carrier (at the left ⇒*Figure 12* **-1-**/right).

1 – Tie rod (left)
2 – Connecting link (suspension/stabilizer – left)
3 – Upper control arm – diagonal (left)
4 – Upper control arm – transverse (left)

2.2.2 Remove connecting link (suspension/stabiliser) on the wheel carrier (at the left ⇒*Figure 12* **-2-**/right).

2.2.3 Remove upper control arms (diagonal/transverse) on the wheel carrier (at the left/right) (⇒*Figure 12*).

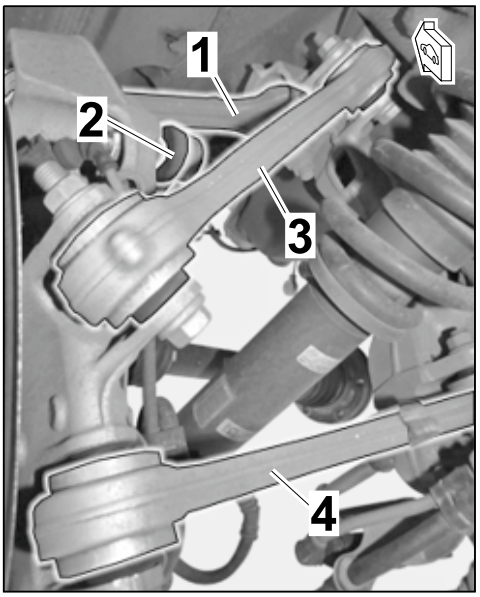

Figure 12

2.2.4 Remove lower control arms (diagonal/transverse) on the wheel carrier (at the left/right) (⇒*Figure 13*).

1 – Lower control arm – diagonal (left)
2 – Lower control arm – transverse (left)
3 – Spring strut (left)
4 – Connecting link (suspension/stabilizer – left)

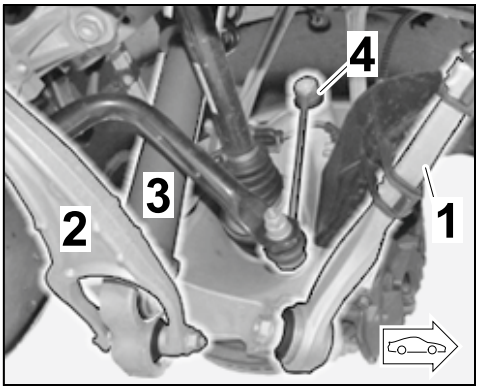

Figure 13

2.2.5 Remove lower spring strut on wheel carrier (at the left ⇒*Figure 13* **-3-**/right).

2.2.6 Carefully pull the wheel carrier (at the left/right) down off the splines on the rear-axle drive shaft.

2.2.7 Secure the rear-axle drive shaft (at the left ⇒*Figure 14*/right) with tie-wraps or similar fastening elements in the wheel housing to prevent it from falling down.

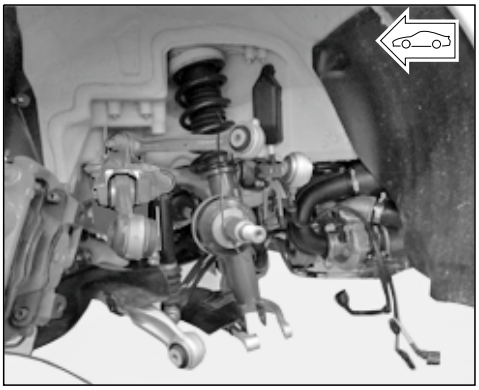

Figure 14

2.3 Press new angular-contact ball bearing (wheel bearing) into the new wheel carrier (at the left/right)

WARNING

Mechanical, hydraulic or pneumatic press

- **Risk of squashing**

⇒ **Read specific safety information for the press.**

⇒ **Check that the press is working perfectly before use, particularly the safety components.**

2.3.1 Press wheel hub out of the wheel carrier (at the left/right) (⇒*Figure 15*).

1 – Wheel hub
2 – **VW 454 - Pressure piece**
3 – Press ram

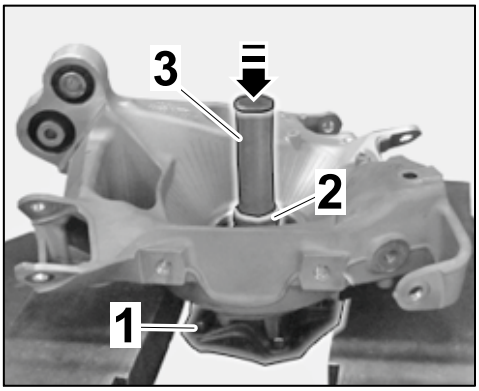

Figure 15

2.3.2 Press wheel bearing inner ring off the wheel hub shaft (at the left/right) (⇒*Figure 16*).

1 – **VAS 6961 - Separating device**
2 – Wheel bearing inner ring
3 – Wheel hub shaft

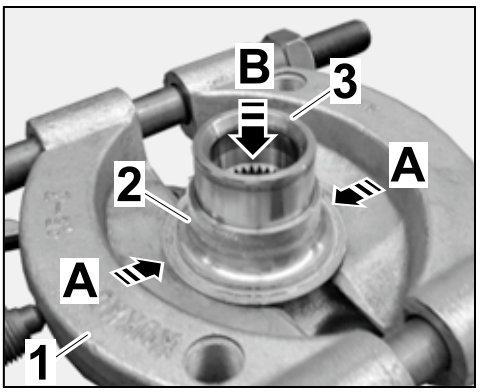

Figure 16

2.3.3 Check wheel bearing seat in the new wheel carrier (at the left/right) for sharp edges/burrs.

Remove/de-burr sharp edges/burrs if necessary.

2.3.4 Heat the wheel carrier (at the left/right) to approx. 176° F (80° C) (max. 212° F/100° C) using a heating plate.

CAUTION

Hot components

- **Risk of burns**

⇒ **Let hot components cool down.**

⇒ **Wear personal protective gear.**

Information

- The multipole seal on the wheel bearing must not come into contact with highly magnetic parts (e.g. a magnetic screwdriver or magnet).
- Installing the wheel bearing: The magnetic side must be facing the speed sensor (inside of the wheel bearing housing).
- Use the **T10473 - test card** or a paper clip to find the magnetic side.

2.3.5 Position new angular-contact ball bearings (wheel bearings) with the encoder ring (for the speed signal) facing the wheel carrier (at the left/right) in the wheel carrier (at the left/right).

Information

The press-in process for the angular-contact ball bearing (wheel bearing) must be performed continuously (without stopping) as soon as the angular-contact ball bearing (wheel bearing) is inside the wheel carrier!

2.3.6 Carefully press new angular-contact ball bearings (wheel bearings) into the wheel carriers (at the left/right).

1 – Angular-contact ball bearing (wheel bearing)
2 – Cover on angular-contact ball bearing (wheel bearing)
3 – Hexagon-head bolt, M8 x 35

2.3.7 Remove cover on angular-contact ball bearing (wheel bearing) from the old wheel carrier and fit it on the new wheel carrier (at the left/right ⇒*Figure 17*) with the inscription facing outwards.

Hexagon-head bolt, M8 x 35:
Tightening torque 37 Nm (27 ftlb.)

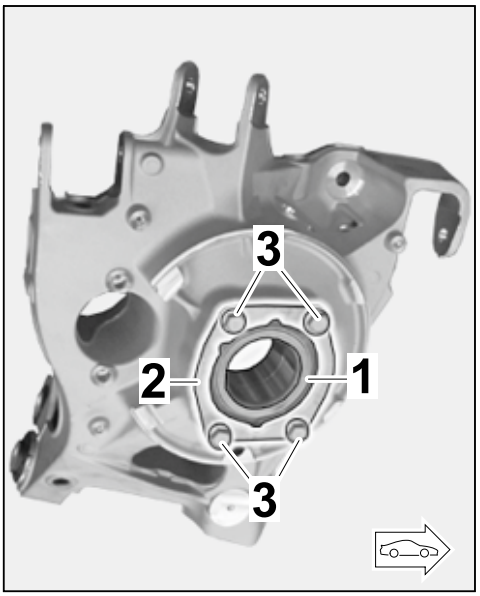

Figure 17

2.4 Carefully press the wheel hub until the pressure increases (press) into the wheel bearing (wheel carrier at the left/right) (⇒*Workshop Manual '425819 Removing and installing rear wheel bearing'*).

2.5 Complete the new wheel carriers (at the left/right)

2.5.1 Remove combination holder (at the left/right) from the old wheel carrier and fit it on the respective new wheel carrier using two new hexagon-head bolts (M6 x 16) (⇒*Figure 18*).

1 – Combination holder (left)
2 – Hexagon-head bolt, M6 x 16

Hexagon-head bolt, M6 x 16: **Tightening torque 10 Nm (7.5 ftlb.)**

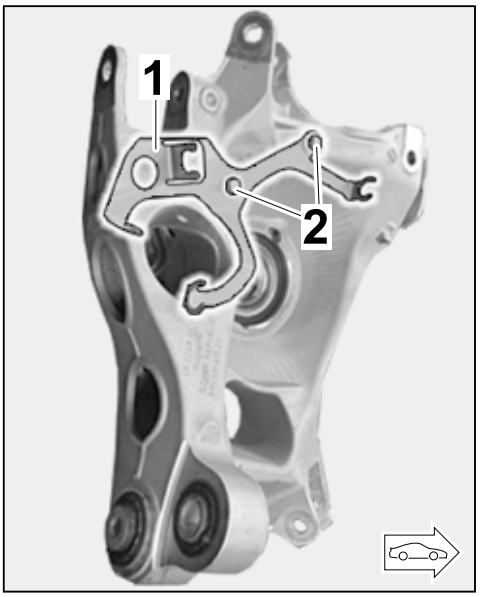

Figure 18

2.5.2 Grease the seat of the rear speed sensor on the wheel carrier (at the left/right) lightly with Optitemp LG2.

2.5.3 Insert rear speed sensor (at the left/right) and fit using a cheese head bolt (M6 x 16) (⇒*Workshop Manual '451519 Removing and installing rear speed sensor'*)

Cheese head bolt, M6 x 16: **Tightening torque 10 Nm (7.5 ftlb.)**

Information

- Use correct tightening torques and torque angle. ⇒*Workshop Manual '4X00IN Tightening torques for rear axle'*.
- Always replace fastening screws that are tightened to a torque angle.
- Use Optimoly HT to lightly grease the drive shaft toothing and axle nut thread.
- Replace lock nuts.

2.6 Install rear-axle wheel carriers (at the left/right) (⇒*Workshop Manual '425219 Removing and installing rear wheel bearing housing'*)

2.6.1 Use Optimoly HT to lightly grease the (rear-axle) drive shaft splines and axle nut thread.

2.6.2 Fit rear-axle wheel carrier (at the left/right) on the respective drive shaft and screw new hexagon nut (M22 x 1.5) loosely on the drive shaft.

Secure the rear-axle wheel carrier (at the left/right) with lifting equipment to prevent it from falling down.

2.6.3 Loosely pre-fit all control arms (upper/lower), tie rods and the lower spring strut on the respective rear-axle wheel carrier (at the left/right) using new hexagon-head bolts and hexagon nuts.

2.6.4 Move the rear-axle wheel carrier (at the left/right) up into "ZERO position" using a jack. Lower control arms are horizontal, parallel to the vehicle floor.

2.6.5 Tighten all threaded connections (control arms (upper/lower), tie rods and lower spring strut) on the rear-axle wheel carrier (at the left/right) to the correct tightening torque/torque angle.

2.7 Install rear-axle brake system

2.7.1 Install spreader device (actuator/servo motor – left/right) on the wheel carrier (at the left/right) using two new screws (M8 x 38) (⇒ *Workshop Manual '468519 Removing and installing spreader device (actuator)'*).

2.7.2 Install brake anchoring plate (left/right) on the rear-axle wheel carrier (at the left/right) using four new hexagon-head bolts (M6 x 16) (⇒ *Workshop Manual '468320 Removing and installing brake shoe'*).

2.7.3 Install parking brake shoes (⇒ *Workshop Manual '468320 Removing and installing brake shoe'*).

Information

There is **no** need to grind down the parking-brake shoes if the parking-brake shoes are not replaced.

Set the brake shoes to the basic setting if necessary and calibrate the brakes ⇒ *Workshop Manual '468315 Adjusting and calibrating parking-brake shoes'*.

- Mark the parking-brake shoes and adjustment device according to their installation position.
- Secure the adjustment device to prevent it from turning.

2.7.4 Calibrate parking brake shoes (⇒ *Workshop Manual '468316 Adjusting brake shoes'*).

2.7.5 Install brake disc (at the left ⇒ *Figure 19* **-3-**/right) using two countersunk screws (M6 x 12) (⇒ *Workshop Manual '465319 Removing and installing rear brake disc'*).

1 – Brake caliper (left)
2 – Hexagon nut, M22 x 1.5
3 – Brake disc (left)

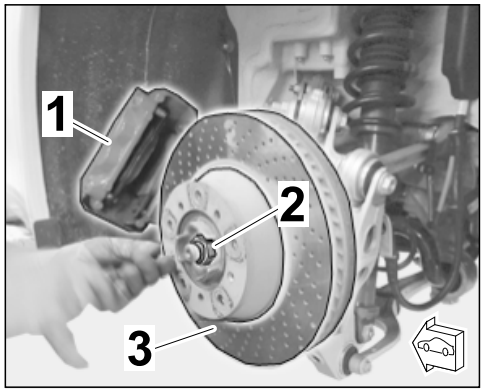

Figure 19

2.7.6 Fit brake caliper (at the left ⇒ *Figure 19* **-1-**/right) on each wheel carrier using new cheese head bolts (M12 x 1.5 x 85) (⇒ *Workshop Manual '474119 Removing and installing rear brake calliper'*).

2.7.7 Fit new rear-axle trailing arm spoiler on the lower control arm (at the left/right) (⇒ *Workshop Manual '421119 Removing and installing lower trailing arm'*)

1 – Rear-axle trailing arm spoiler (left)
2 – Lower control arm – transverse (left)

Information
The humps on the lower transverse control arm must be inside the vertical bars of the rear-axle trailing arm spoiler!

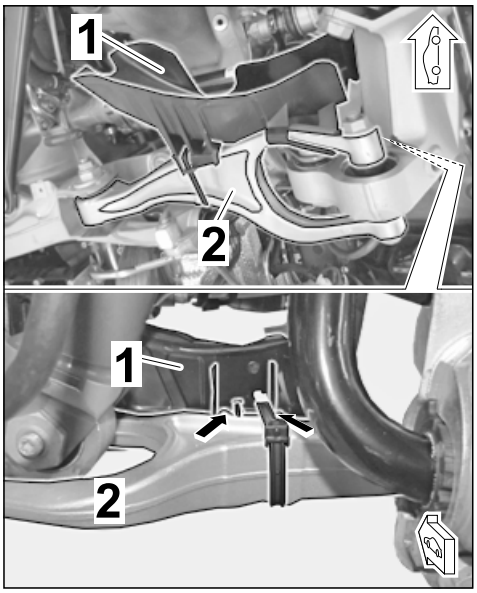

Figure 20

- Remove old rear-axle trailing arm spoiler (brake ventilation, if installed) on the lower transverse control arm (at the left/right).
- Position new rear-axle trailing arm spoiler on the humps (⇒*Figure 20* **-arrows-**) on the lower transverse control arm (at the left/right).
- Fit a tie-wrap around the lower transverse control arm (at the left/right) and fasten using **VAS 6927 - tie-wrap pliers**.

2.7.8 Fit electric wire harnesses (ABS/spreader device – actuator/servo motor) on the wheel carrier brackets (at the left/right).

3 Convert turbochargers (see also: ⇒ *Workshop Manual '213019 Removing and installing turbocharger'*).

3.1 Remove turbocharger (cyl. 1–3/cyl. 4–6)

3.1.1 Remove Torx screw (M6 x 12) on oil supply line/turbocharger oil tank flange (cyl. 1–3 ⇒*Figure 21* **-1-**/cyl. 4–6).

Information

Collect escaping fluids.

Loosen plug-in coupling for oil supply line/oil tank and collect oil using the oil drip pan.

1 – Oil supply line for turbocharger (cyl. 1–3)
2 – Oil tank for turbocharger (cyl. 1–3)
3 – Bypass control box on turbocharger (cyl. 1–3)
4 – Tank ventilation line flange (cyl. 1–3)

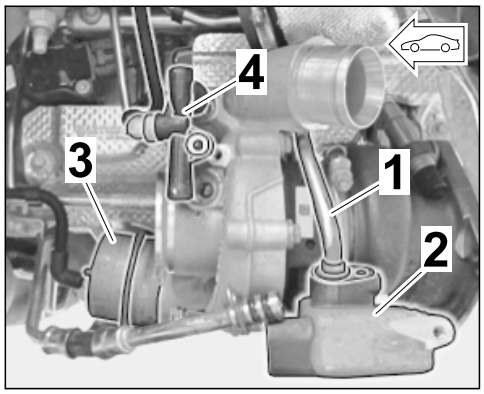

Figure 21

3.1.2 Remove Torx screw (M6 x 12) on the turbocharger oil tank (cyl. 1–3/cyl. 4–6) and remove oil tank from the respective turbocharger.

3.1.3 **ONLY** for turbocharger (cyl. 1–3):

1 – Mounting for bypass control box on turbocharger (cyl. 1–3)
2 – M8 hexagon nut on turbocharger/exhaust manifold flange (cyl. 1–3)

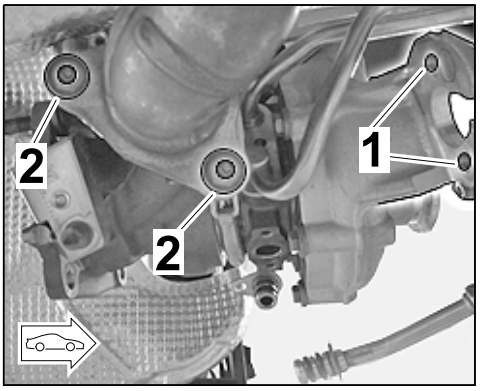

Figure 22

- Remove Torx screw (M6 x 12) on tank ventilation line flange and carefully loosen the flange (⇒*Figure 21* **-4-**).
- Remove bypass control box with linkage.
- Removing turbocharger vent line

3.1.4 Remove turbocharger bracket (cyl. 1–3/cyl. 4–6) ⇒*Figure 23* **-1-**.

1 – Bracket
2 – Turbocharger (cyl. 4–6)

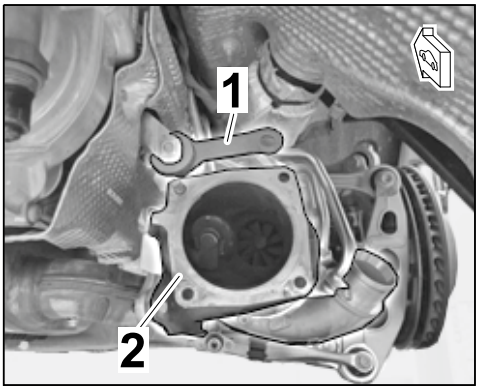

Figure 23

3.1.5 Remove turbocharger (cyl. 1–3/cyl. 4–6) from exhaust manifold (cyl. 1–3/cyl. 4–6) and carefully guide it out past the lines.

Information

The seals must always be replaced following removal.

Information

- Fit new O-rings on engine oil lines.
- Grease O-rings with a light coating of Klüber Syntheso Glep.
- Remove stoppers before fitting the engine oil lines.

Information

- Fit new O-rings on coolant lines.
- Coat O-rings lightly with Klüber Plus Gel.
- Remove stoppers before fitting the coolant lines and hoses.

3.2 Replace all seals and O-rings on the lines for the turbocharger (cyl. 1–3 ⇒*Figure 24*/cyl. 4–6).

1 – O-ring, 10 x 3 – oil return line (cyl. 1–3)
2 – O-ring, 10 x 3 – oil supply line (cyl. 1–3)
3 – O-ring, 10 x 3 – coolant return/supply line (cyl. 1–3)
4 – O-ring, 10 x 3 – oil circuit vent line (cyl. 1–3)
5 – O-ring, 13 x 3 – tank ventilation line **ONLY** for cyl. 1–3

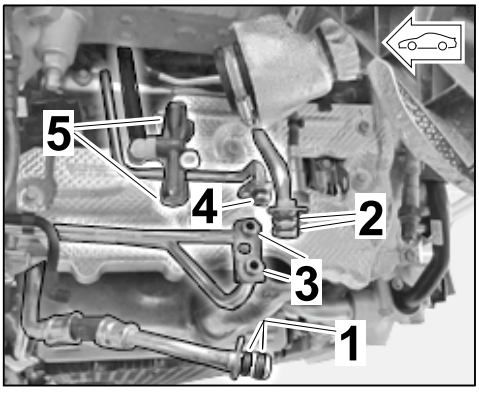

Figure 24

3.3 Install new turbocharger (cyl. 1–3/cyl. 4–6)

3.3.1 **ONLY** for turbocharger (cyl. 1–3):
Remove bypass control box on the new turbocharger (cyl. 1–3).

3.3.2 Position turbocharger (cyl. 1–3/cyl. 4–6) together with the turbocharger bracket and new seal on the respective exhaust manifold.

- Loosely fit M8 hexagon nuts (3 on each side, exhaust manifold).
- Loosely fit M8 x 35 screw (1 on each side, bracket).

3.3.3 Guide all lines into the turbocharger connections (cyl. 1–3/cyl. 4–6).

3.3.4 Replace O-ring, 15 x 2.5 (1 x) on the turbocharger oil tank (cyl. 1–3/cyl. 4–6) with a new O-ring (⇒ *Figure 25*).

1 – O-ring, 15 x 2,5
2 – Oil tank for turbocharger (cyl. 1–3)
3 – Oil tank for turbocharger (cyl. 4–6)

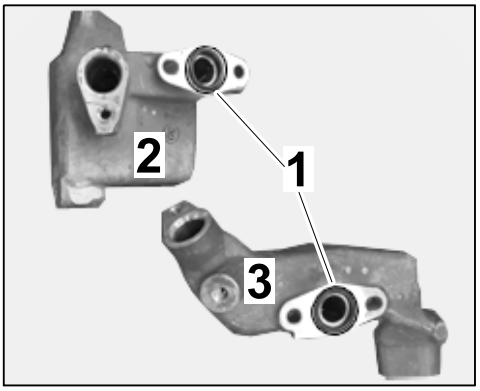

Figure 25

Fit turbocharger oil tank (cyl. 1–3/cyl. 4–6) on the respective turbocharger using two Torx screws (M6 x 20).

Tightening torque 10 Nm (7.5 ftlb.)

3.3.5 **ONLY** for turbocharger (cyl. 1–3): Install bypass control box on the new turbocharger using two M6 hexagon nuts.

1 – Bypass control box
2 – Hexagon nut, M6

Hexagon nut, M6: **Tightening torque 7 Nm (5 ftlb.) +1 Nm (+0.5 ftlb.)**

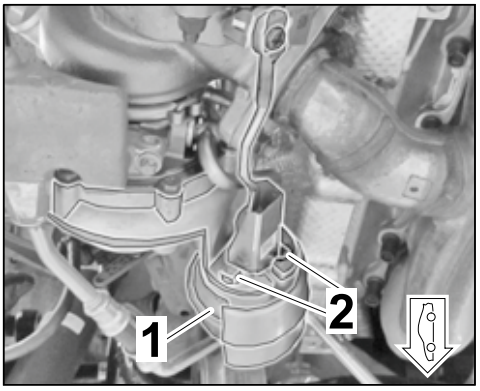

Figure 26

3.3.6 Tighten Torx screw (M6 x 12) on all lines/connections for the turbocharger (cyl. 1–3/cyl. 4–6).

Tightening torque 10 Nm (7.5 ftlb.)

3.3.7 Tighten one Torx screw (M8 x 35) on the turbocharger bracket (cyl. 1–3/cyl. 4–6).

Tightening torque 23 Nm (17 ftlb.)

3.3.8 Tighten three M8 hexagon nuts on the turbocharger (cyl. 1–3/cyl. 4–6) for the exhaust manifold flange.

Tightening torque 25 Nm (19 ftlb.)

3.3.9 Connect vacuum line to bypass control box on turbocharger (cyl. 1–3/cyl. 4–6).

3.4 Fit intake pipe on the turbocharger (cyl. 1–3/cyl. 4–6)

3.4.1 Replace one O-ring (45 x 3) on the intake pipe.

1 – O-ring, 45 x 3
2 – Intake pipe (cyl. 1–3)

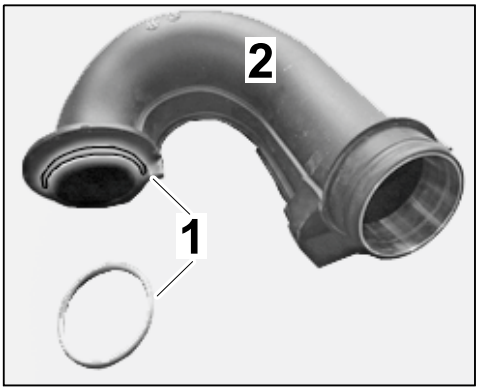

Figure 27

3.4.2 Install intake pipe on turbocharger (cyl. 1–3) using new clips (hose clamp 50–70/clip).

1 – Intake pipe on turbocharger (cyl. 1–3)
2 – Hose clamp, 50–70
3 – Clip, ∅ 75
4 – Charge air hose on turbocharger (cyl. 1–3)
5 – Hose clamp, 50 - 70 x 12
6 – Hose clamp, 40 - 60 x 12

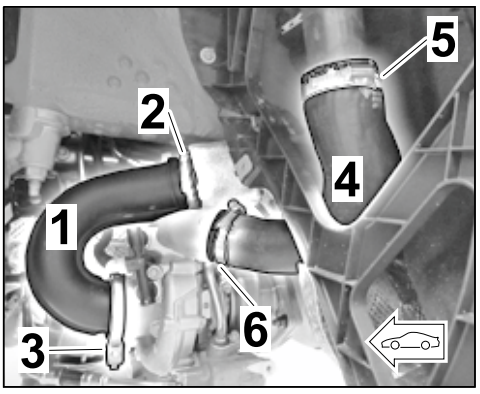

Figure 28

3.4.3 Connect plug connection at the point where the turbocharger intake pipe (cyl. 4–6) branches to the positive crankcase ventilation line.

Install intake pipe on turbocharger (cyl. 4–6) using a new clip (hose clamp 50–70 and clip).

3.4.4 Tighten clips on intake pipe.

Hose clamp, 50–70/charge-air cooler insulation: **Tightening torque 3 Nm (2 ftlb.)**

Clip/turbocharger intake connection: **Tightening torque 5 Nm (3.5 ftlb.)**

3.5 Install charge air hose on turbocharger (cyl. 1–3/cyl. 4–6) using two new hose clamps (40 - 60 x 12).

Clip/turbocharger intake connection: **Tightening torque 5.5 Nm (4 ftlb.)**

3.6 Install drain plug (M14 x 1.5) on thermostat housing with a new sealing ring (14 x 18).

Tightening torque 25 Nm (19 ftlb.)

4 Install (sport) exhaust system

4.1 **ONLY** for vehicles **WITH** sport exhaust system (I-no. 176), i.e. parts scope 991.044.100.10:
Install old sport exhaust system with new seal between turbocharger and catalytic converter (2 x) and new clamp on main silencer (2 x) (⇒ *Workshop Manual '260119 Removing and installing exhaust system'*).

4.2 **ONLY** for vehicles **WITHOUT** sport exhaust system (I-no. 176), i.e. parts scope 991.044.100.11:
Install new sport exhaust system (1 x) with new seal between turbocharger and catalytic converter (2 x) and new clamp on main silencer (2 x) (⇒ *Installation and Conversion Instructions '260100 Sports exhaust system (I-no. 176)'* and ⇒ *Workshop Manual '260119 Removing and installing exhaust system'*).

4.3 Install heat shield on turbocharger (cyl. 1–3 ⇒ *Figure 29*/cyl. 4–6) using four countersunk screws (M6 x 10) (⇒ *Workshop Manual '261219 Removing and installing heat shield'*).

1 – Heat shield on turbocharger (cyl. 1–3)
2 – Countersunk screw, M6 x 10

Tightening torque 10 Nm (7.5 ftlb.)

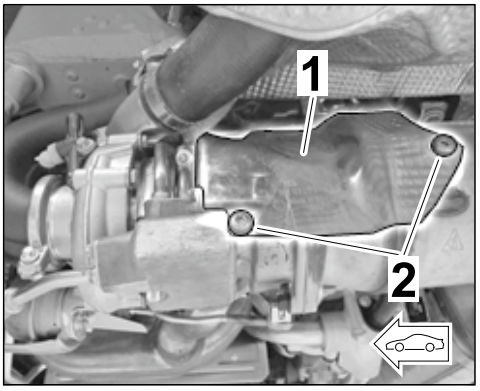

Figure 29

5 Concluding work

5.1 Fit bumper and heat protection panels (⇒ *Workshop Manual '635019 Removing and installing rear bumper'*).

5.2 Fit rear apron (⇒ *Workshop Manual '635519 Removing and installing rear apron'*).

5.3 Fit rear wheels (⇒ *Workshop Manual '440519 Removing and installing wheel'*) and lower the vehicle.

5.4 **ONLY** for Cabriolet: Move convertible-top compartment lid to normal position.

5.5 **ONLY** for vehicles **WITHOUT** Porsche Ceramic Composite Brake (PCCB = 450) and/or rear axle steering (470):

5.5.1 Move electric parking brake (EPB) out of "assembly position" into "normal position" using **9900 - PIWIS Tester 3**.

5.5.2 Tighten new hexagon nut (M22 x 1.5) on the rear-axle drive shaft (at the left/right) when the vehicle is standing on the ground.

Tightening torque 460 Nm (340 ftlb.)

5.5.3 Fit hub cap on wheel (at the left/right) on the rear axle.

5.6 Remove old engine compartment cover and replace it with the new "Exclusive Powerkit" engine compartment cover (⇒ *Workshop Manual '198119 Removing and installing engine-compartment blower'*).

1 – "Exclusive Powerkit" engine compartment cover ASSY
2 – Carbon inserts

Pull protective film off the carbon inserts (⇒ *Figure 30*).

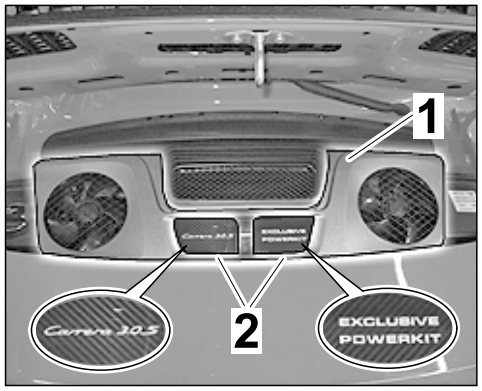

Figure 30

NOTICE

Voltage drop

- **Risk of irreparable damage to control unit**
- **Risk of damage to control unit**
- **Fault entries in the control unit**
- **Coding in the control unit is aborted**
- **Malfunctions in control unit, even during programming**

⇒ **Switch off the ignition and remove the ignition key before disconnecting the control unit.**

⇒ **Ensure that the power supply is not interrupted during programming.**

⇒ **Connect a battery charger with a current rating of at least Nominal value 70 A to the vehicle battery.**

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

Read and follow the basic instructions and procedure for control unit programming using the PIWIS Tester (⇒ *Workshop Manual '9X00IN Basic instructions and procedure for control unit programming using the PIWIS Tester'*).

6.1 Preparatory work

6.1.1 Connect battery charger (⇒ *Workshop Manual '2X00IN Battery trickle charging'*).

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.**

6.1.2 **9900 - PIWIS Tester 3** must be connected to the vehicle and switched on.

6.1.3 Check PIWIS Tester software version (at least 35.600.010) in the footer on the Start screen.

6.1.4 Switch on ignition **AND** hazard warning lights on the vehicle.

Information

The **9900 - PIWIS Tester III** instructions take precedence since the description may be different with later Tester releases.

The procedure described here has been structured in general terms; different text or additions may appear on the **9900 - PIWIS Tester III**.

6.1.5 Select the "Diagnostics" menu item on the PIWIS Tester.

6.1.6 If **9900 - PIWIS Tester 3** is connected correctly, a connection to the vehicle will be established: "Model line 991" is detected.

6.2 Read out the current part number of the DME control unit

6.2.1 Select "DME (digital engine electronics)" in the control unit overview and switch to "Extended identifications".

6.2.2 All data relating to the DME control unit is displayed.

Example: DME Carrera S B6T 3.0 l RoW with “Porsche part number of DME” = 9P1.906.023.BL

6.2.3 Take a note of the Porsche part number before starting programming. Press •<< “ to go back to the higher-level menu.

6.3 Enter the new vehicle equipment in the vehicle data (see also: ⇒*Workshop Manual '247055 Replacing DME control unit'*)

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

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

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

6.3.4 **ONLY** for vehicles **WITHOUT** sport exhaust system (176) before conversion:

- Press •F12 “ to go to the "Value group = M numbers" page.
- Scroll to the “176 – SPORT EXHAUST SYSTEM” row.
- Select the option “176 – SPORT EXHAUST SYSTEM" and wait until a tick appears in the “Installed” column.

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

6.3.6 Wait until the message “Creation of vehicle data has been completed.” appears. Press •F12 “ to go to Report management.

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

NOTICE

Performance class (P class) NOT changed

- **Fault entry in digital engine electronics (DME) control unit**
- **Engine immobiliser commissioning no longer possible**
- **Engine no longer starts**

⇒ **Request change of performance class (P class) by Porsche AG (see also Ordering process)**

⇒ **Then re-teach remote controls (driver's keys)**

6.4 Code/program the new vehicle equipment.

6.4.1 Select all control units in the control unit overview (•CTRL+A “) and switch to the “Coding/programming” column.

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

6.4.3 Once "Automatic coding" is complete, the message “Coding was completed successfully. Press •F12 “ to continue.” appears in the header.

Switch to the control unit overview.

6.4.4 Select DME control unit and switch to the "Coding/programming" tab. Select “Automatic programming”. Press •F12 “ to continue.

- The affected control unit(s) - DME (PDK) - and the approximate total amount of time required for programming (approx. 12 minutes) will be displayed.
- Information about the procedure for control unit programming is displayed.
- The message “Programming …” then appears and two progress bars appear at the bottom of the screen.
- Follow the prompts on **9900 - PIWIS Tester 3** (switch ignition off and on).
- Fault memories are erased.

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

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

6.5.1 Select DME control unit and switch to the “Maintenance/repairs” tab and select “Adaptations”. Press •F12 “ to continue.

Establish the displayed conditions.

6.5.2 Select "Throttle valve adaptation" and press •F8 “ to start.

6.5.3 When a message appears confirming that the adaptation was successful, press •F12 “ to switch to the "Maintenance/repairs" tab.

6.5.4 Switch to the control unit overview.

Information

All remote controls (keys) are required for teaching a DME, front-end electronics (front BCM), rear-end electronics (rear BCM), electronic steering lock (ELV) control unit or remote controls (keys) for example.

Remote controls (keys) that are not taught during this teaching procedure will no longer be recognized by the vehicle.

6.6 Re-teach remote controls (driver's keys) (⇒ *Workshop Manual '966255 Replacing remote control'*).

6.6.1 Press •F7 “ in the control unit overview to select the Additional menu.

6.6.2 Select "Immobilizer commissioning" in the "Model line-specific tests and campaigns" menu. Press •F12 “ to continue.

6.6.3 Enter the PPN user name and password and press •F12 “ to continue.

The vehicle identification number (VIN) is displayed.

6.6.4 Enter the repair order number. Press •F12 “ to continue.

Follow the other instructions on **9900 - PIWIS Tester 3**.

6.6.5 Enter the number of keys to be taught under "Management of keys". Press •F12 “ to continue.

Follow the other instructions on **9900 - PIWIS Tester 3**.

6.6.6 When “Engine immobiliser start-up” is complete, affected control units will be scanned and a message indicating successful start-up will be displayed.

6.7 Check that the DME control unit was programmed successfully by reading out the new part number.

Porsche part no.	Exhaust emission standard / Transmission type
9P1.906.024.BF	Low Emission Vehicle 3 = LEV 3/PDK transmission
9P1.906.024.BG	Low Emission Vehicle 3 = LEV 3/Manual transmission

[7] Version: PIWIS Tester, release version: 35.600.010 for model year 2017 = H vehicles

7 Concluding work

7.1 Lower the lifting platform and check all operating fluid levels and top up if necessary.

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

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

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

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: Vehicle **WITH** sport exhaust system (176) and **WITH** PCCB (450) or rear axle steering (470):

–Engine (1 x) for 911 Carrera S (991)/911 Carrera 4S (991)/911 Targa 4S (991) with increased performance– Labor time: **659 TU**

Includes: Removing and installing turbochargers and replacing engine compartment cover.
Programming DME control unit; reading out all control units and erasing fault memories.
Adding operating fluids.

Without: Measurement of performance and test drive.

10 01 31 03: Vehicle **WITHOUT** sport exhaust system (176) but **WITH** PCCB (450) or rear axle steering (470):

–Engine (1 x) for 911 Carrera S (991)/911 Carrera 4S (991)/911 Targa 4S (991) with increased performance– Labor time: **898 TU**

Includes: Removing and installing turbochargers and replacing engine compartment cover.
Retrofitting sport exhaust system.
Programming DME control unit; coding sport exhaust system; reading out all control units and erasing fault memories.
Adding operating fluids.

Without: Measurement of performance and test drive.

10 01 31 06: Vehicle **WITH** sport exhaust system (176) and **WITHOUT** PCCB (450) or rear axle steering (470):

–Engine (1 x) for 911 Carrera S (991)/911 Carrera 4S (991)/911 Targa 4S (991) with increased performance– Labor time: **1053 TU**

Includes: Removing and installing turbochargers and replacing engine compartment cover.
Replacing wheel carriers on rear axle.
Programming DME control unit; reading out all control units and erasing fault memories.
Adding operating fluids.

Without: Measurement of performance and test drive.
Suspension alignment, complete (separate LO No.)

10 01 31 09: Vehicle **WITHOUT** sport exhaust system and **WITHOUT** PCCB (450) or rear axle steering (470):

–Engine (1 x) for 911 Carrera S (991)/911 Carrera 4S (991)/911 Targa 4S (991) with increased performance– Labor time: **1292 TU**

Includes: Removing and installing turbochargers and replacing engine compartment cover.
Replacing wheel carriers on rear axle.
Retrofitting sport exhaust system.
Programming DME control unit; coding sports exhaust system; reading out all control units and erasing fault memories.
Adding operating fluids.

Without: Measurement of performance and test drive.
Suspension alignment, complete (separate LO No.)

44 95 03 00: **ONLY** for vehicles **WITHOUT** Porsche Ceramic Composite Brake (PCCB = 450) or rear axle steering (470):

–Performing front + rear suspension alignment– Labor time: **83 TU**

91 43 25 53: **ONLY** for vehicles with reversing camera (638):

–Programming reversing camera– Labor time: **45 TU**

91 70 25 53: **ONLY** for vehicles with Lane Change Assist (457):

–Programming control unit for Lane Change Assist– Labor time: **60 TU**