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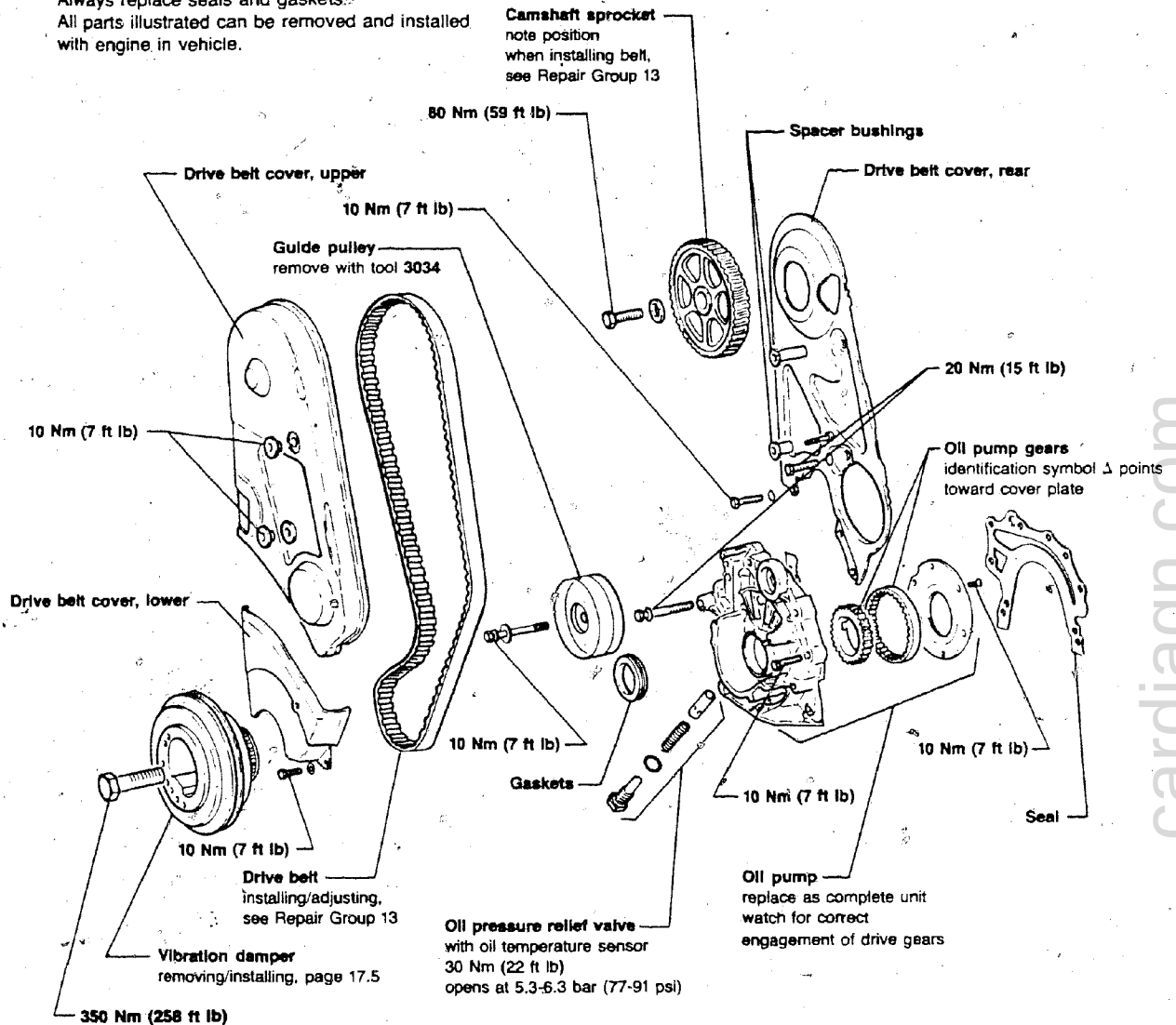
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Engine – Lubrication System

Note

Always replace seals and gaskets.
All parts illustrated can be removed and installed with engine in vehicle.



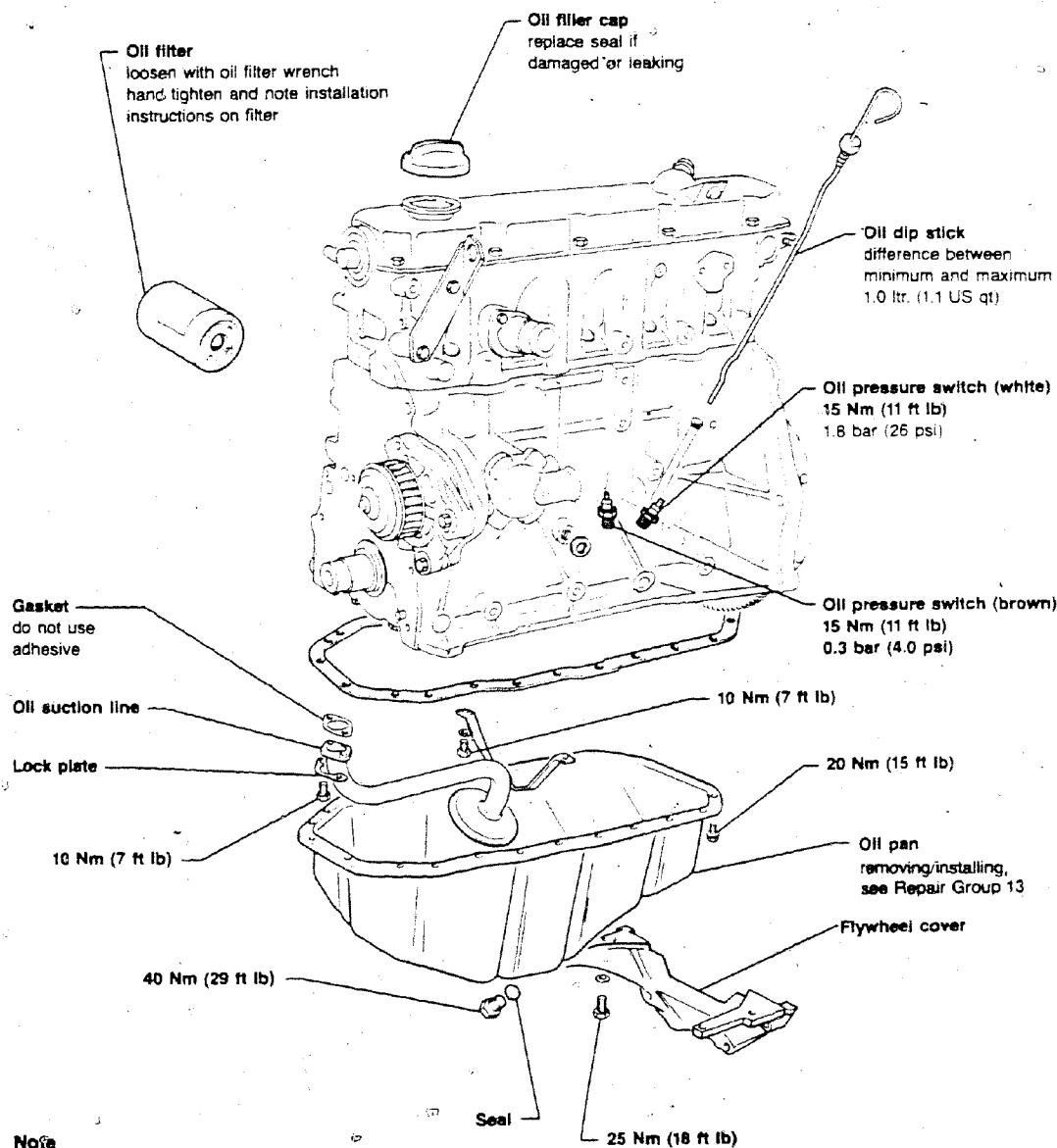
17-458

Engine – Lubrication System 17

Engine oil capacity
specification, page 17.8

Note

Always replace seals and gaskets.



Note

2.30L CIS-E III engines have an oil cooler with a separate thermostat housing.

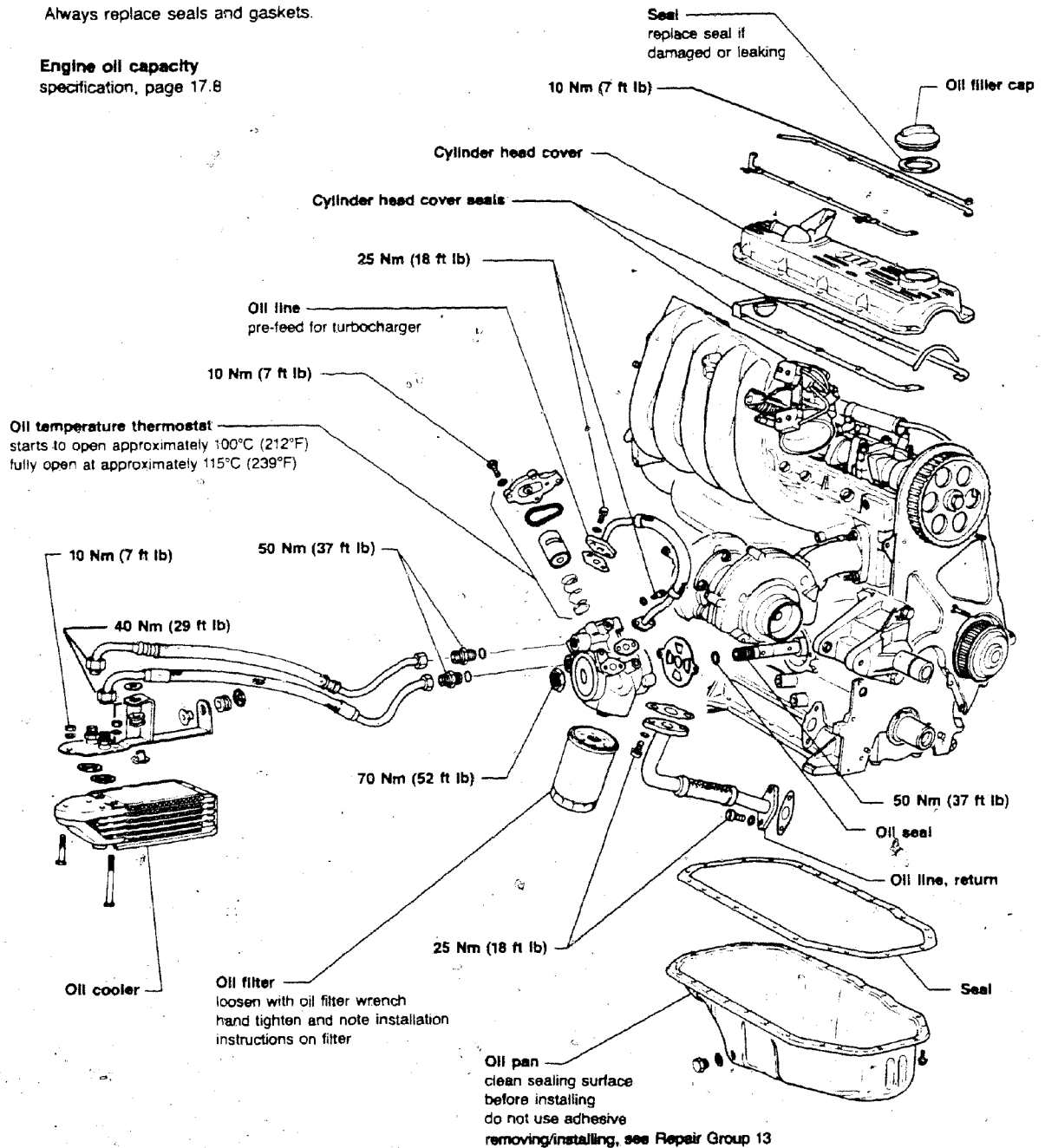
17-255

Engine – Lubrication System

Note

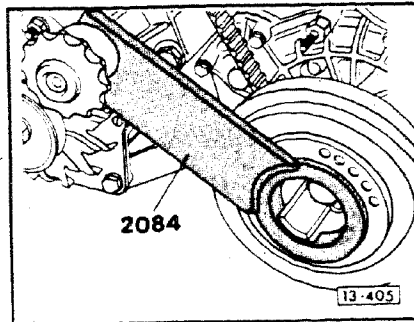
Always replace seals and gaskets.

Engine oil capacity
specification, page 17.8



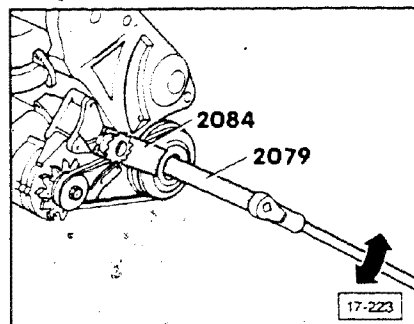
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Engine – Lubrication System



Vibration damper, removing

- insert holder **2084** in vibration damper



- loosen and remove vibration damper with extension **2079** in alignment with torque wrench

Vibration damper, installing

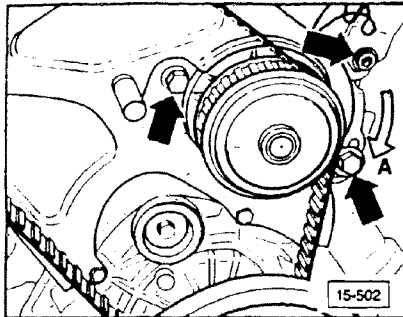
- coat threads and contact surfaces of bolt head with anti-corrosion compound
AMV 188 100 02
 - torque 350 Nm (258 ft lb)

Engine – Lubrication System

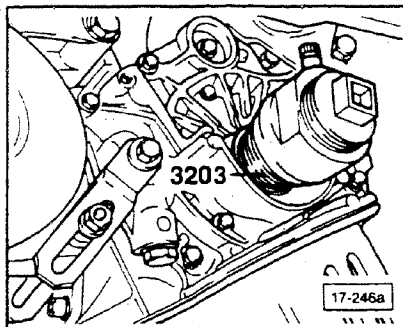
Crankshaft oil seal (timing belt side)

Removing

- turn coolant pump in direction **arrow A** to remove drive belt, sprocket and pulley

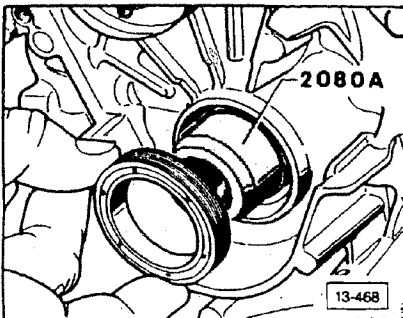


- remove seal with tool **3203**

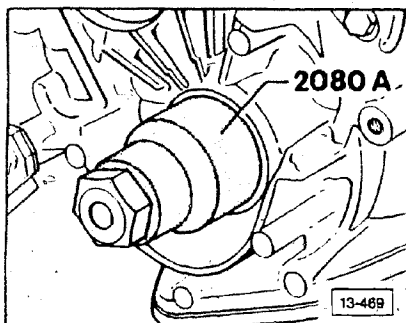


Installing

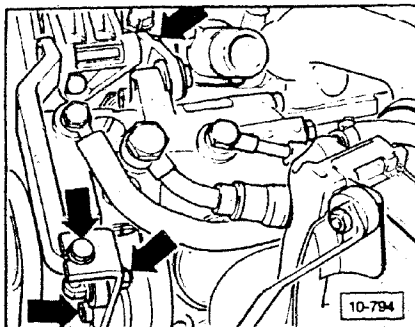
- attach guide to crankshaft
- coat oil seal lip and outer surface lightly with oil
- push oil seal over oil seal guide



- slide sleeve over seal guide
- tighten sleeve with drive belt sprocket bolt until seal is seated

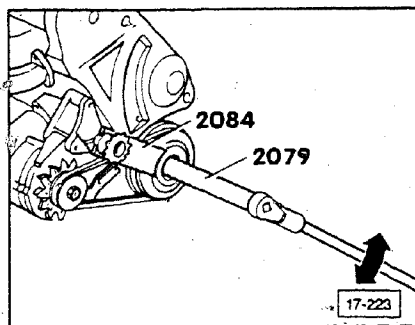


Engine – Lubrication System



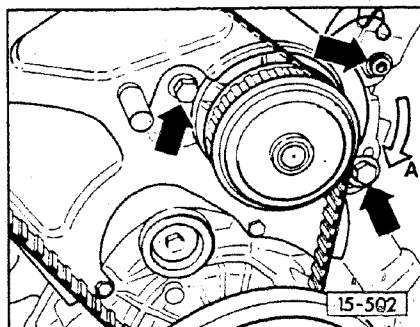
Oil pump, removing

- loosen and remove belts for alternator, A/C compressor, power steering pump (arrows)
- unbolt power steering pump, and lay to one side
 - do not disconnect hoses



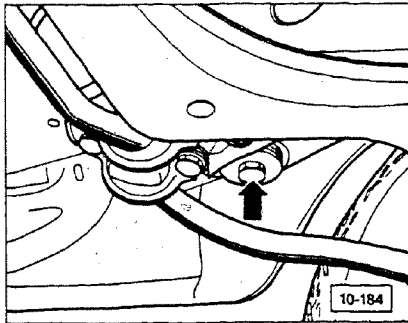
CAUTION

Do not turn crankshaft.

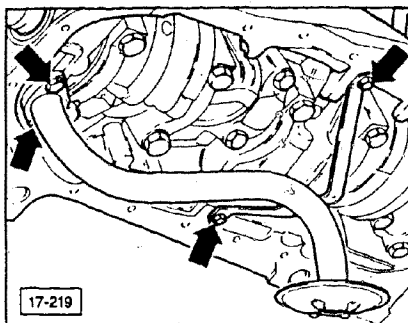


- remove drive belt cover
- turn coolant pump in direction arrow A to loosen and remove drive belt
- remove vibration damper, drive belt sprocket
- remove oil dipstick
- drain engine oil

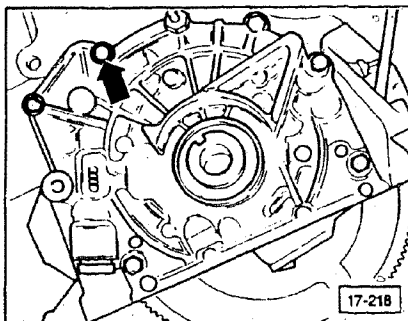
Engine – Lubrication System



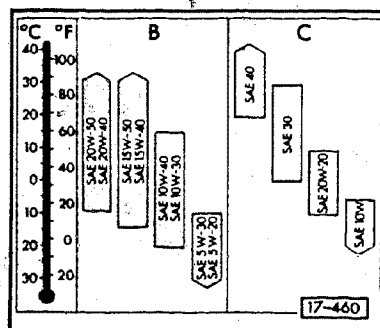
- remove both front bolts (arrow) on subframe
- turn flywheel so that recesses are pointing down vertically and remove both rear oil pan bolts
- remove oil pan



- remove oil pickup tube (arrow)



- unscrew and remove oil pump (arrow)



Oil capacity, specifications

Oil specifications

Use only oil marked API Service SF

B = multi-grade oil

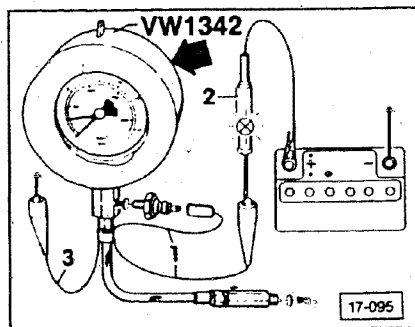
C = single grade oil

Oil capacity

with filter 4.5L (5.0 US qts)

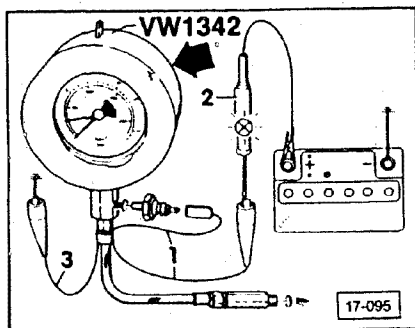
without filter 4.0L (4.5 US qts)

Engine – Lubrication System



Oil pressure switch 0.3 bar (brown housing), checking

- remove oil pressure switch, install in gauge and connect wire 1 (blue) to switch
- install test device **VW 1342** (arrow) in place of oil pressure switch
- connect test lamp 2 to wire 1 (blue) and battery positive terminal
- connect wire 3 (brown) to suitable ground point on car
 - test light must come on, if **NOT**, replace oil pressure switch
- start engine and increase RPM slowly
 - at pressure over 0.3 ± 0.15 bar (4.4 ± 2.2 psi) light must go out, if **NOT**, replace oil pressure switch

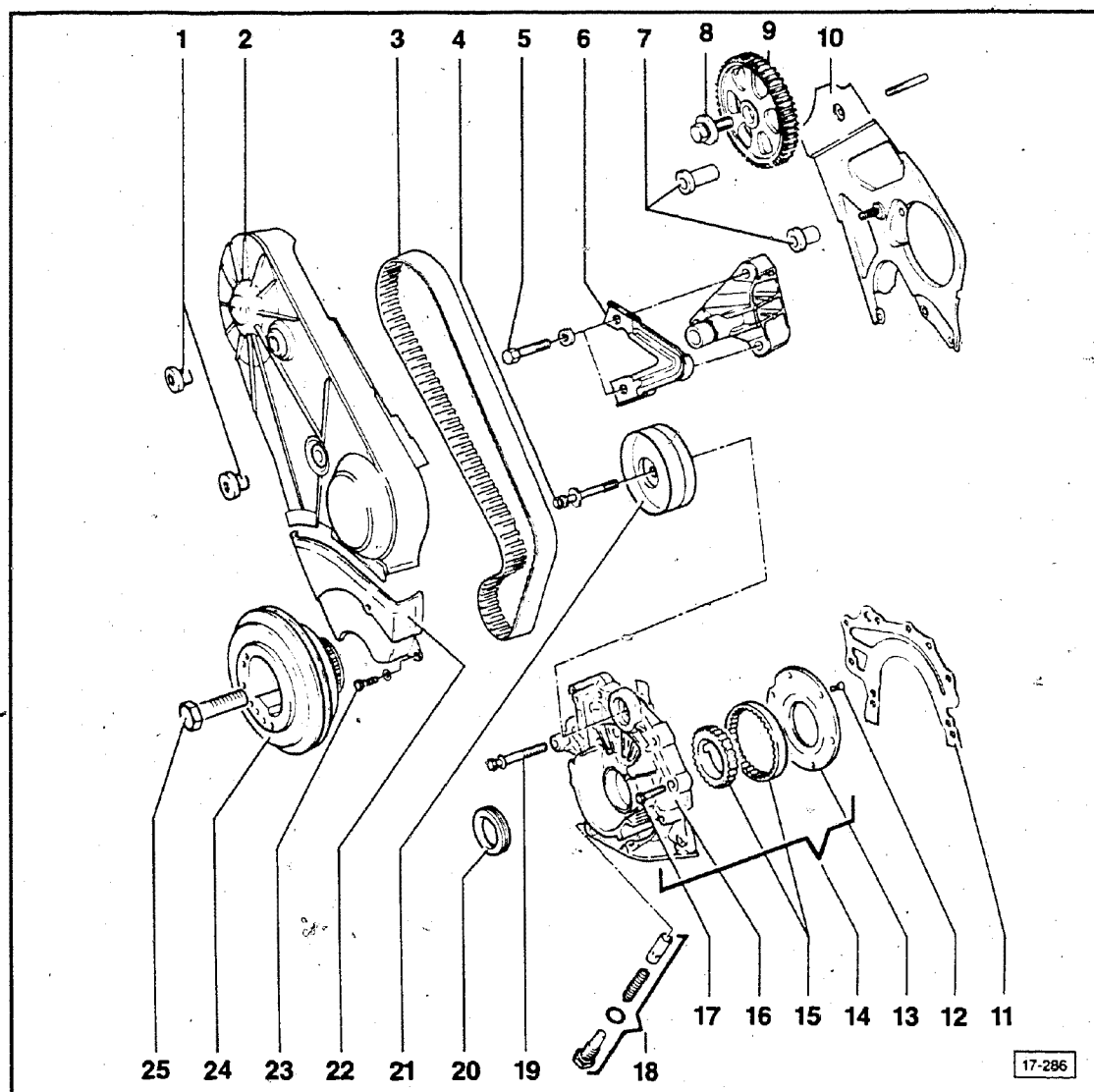


Oil pressure switch 1.8 bar (white housing), checking

- remove oil pressure switch, install in gauge and connect wire 1 (blue) to switch
- install test device **VW 1342** (arrow) in place of oil pressure switch
- connect test lamp 2 to wire 1 (blue) and battery positive terminal
- connect wire 3 (brown) to suitable ground point on car
 - test light must **NOT** be on
- start engine and increase RPM slowly
 - at pressure of 1.6-2.0 bar (23-29 psi) test light must come on, if **NOT**, replace switch

Note

Refer to Repair Group 96, for electrical troubleshooting of Auto-Check System.



Note

All parts illustrated can be removed and installed with engine in vehicle.

Always replace seals and gaskets.

1 — 10 Nm (7 ft lb)

2 — Drive belt cover, upper

3 — Drive belt
removing/installing, see Repair Group 13

4 — 10 Nm (7 ft lb)

5 — 43 Nm (32 ft lb)

6 — V-belt deflection limiter, right

7 — Spacer bushings

- long spacer bushing on top
- short spacer bushing on bottom

8 — 67 Nm (47 ft lb)

9 — Camshaft sprocket
note installation position, see Repair Group 13

10 — Drive belt cover, rear

11 — Oil pump gasket
always replace

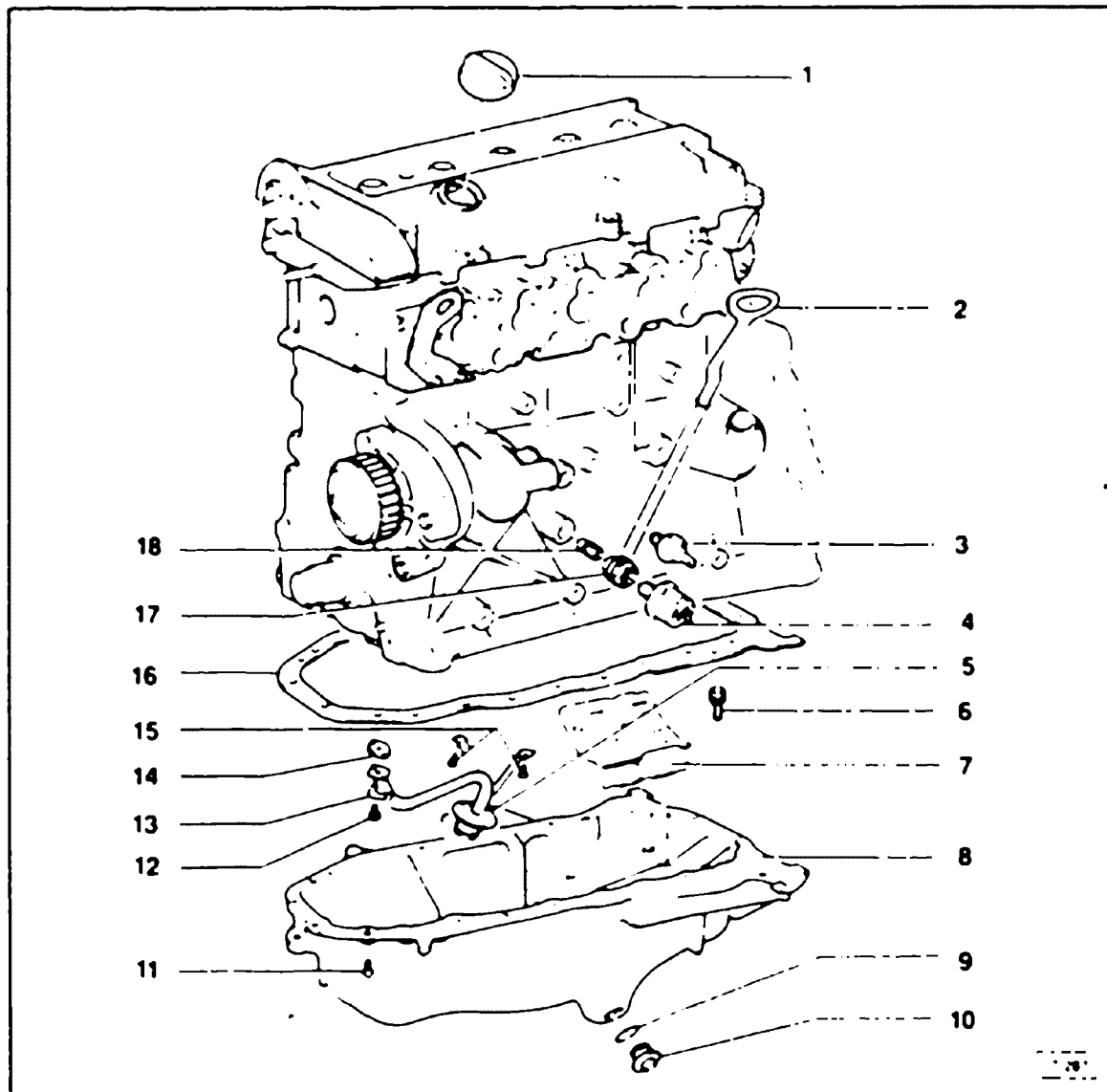
12 — 10 Nm (7 ft lb)

Engine — Lubrication System

- 13 — Cover plate
- 14 — Oil pump
 - replace as complete unit
 - ensure drive gears are correctly engaged and fitted to crankshaft
- 15 — Oil pump gears
 - identification symbol ☐ points toward cover plate
- 16 — Oil pump housing
- 17 — 10 Nm (7 ft lb)
- 18 — Oil pressure relief valve, with oil temperature sender
 - opens at 6.0-6.5 bar (87-91 psi)
- 19 — 20 Nm (15 ft lb)
- 20 — Oil seal
 - removing/installing, see page 17.18
- 21 — Idler (guide) pulley
 - removal, see page 17.17
- 22 — Drive belt cover, lower
- 23 — 10 Nm (7 ft lb)
- 24 — Vibration damper
 - see Repair Group 13
- 25 — 350 Nm (258 ft lb)
 - tightening torque applies only when using tools, 2079, 2084, see Repair Group 13
 - coat threads, bolt head seating surface with AMV 188 001 02 or equivalent

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Engine — Lubrication System



Note

Always replace all seals and gaskets during repairs.

If as a result of engine damage, large quantities of metal shavings are found in the engine oil, thoroughly clean the oil passages and replace the oil cooler. Tighten oil spray jet for piston cooling to 10Nm (7 ft lb).

1 — Oil filter cap
replace seal if damaged or leaking

2 — Oil dipstick

3 — Oil pressure switch (white) — 25 Nm (18 ft lb)
• 1.8 bar (26 psi)
• checking page 17.18

4 — Oil pressure sender — 25 Nm (18 ft lb)
checking page 17.19

5 — Oil suction line
install to oil pump first

6 — 10 Nm (7 ft lb)

7 — Baffle

8 — Oil pan
• removing/installing: remove front subframe bolts
page 17.16
• clean sealing surface before installing

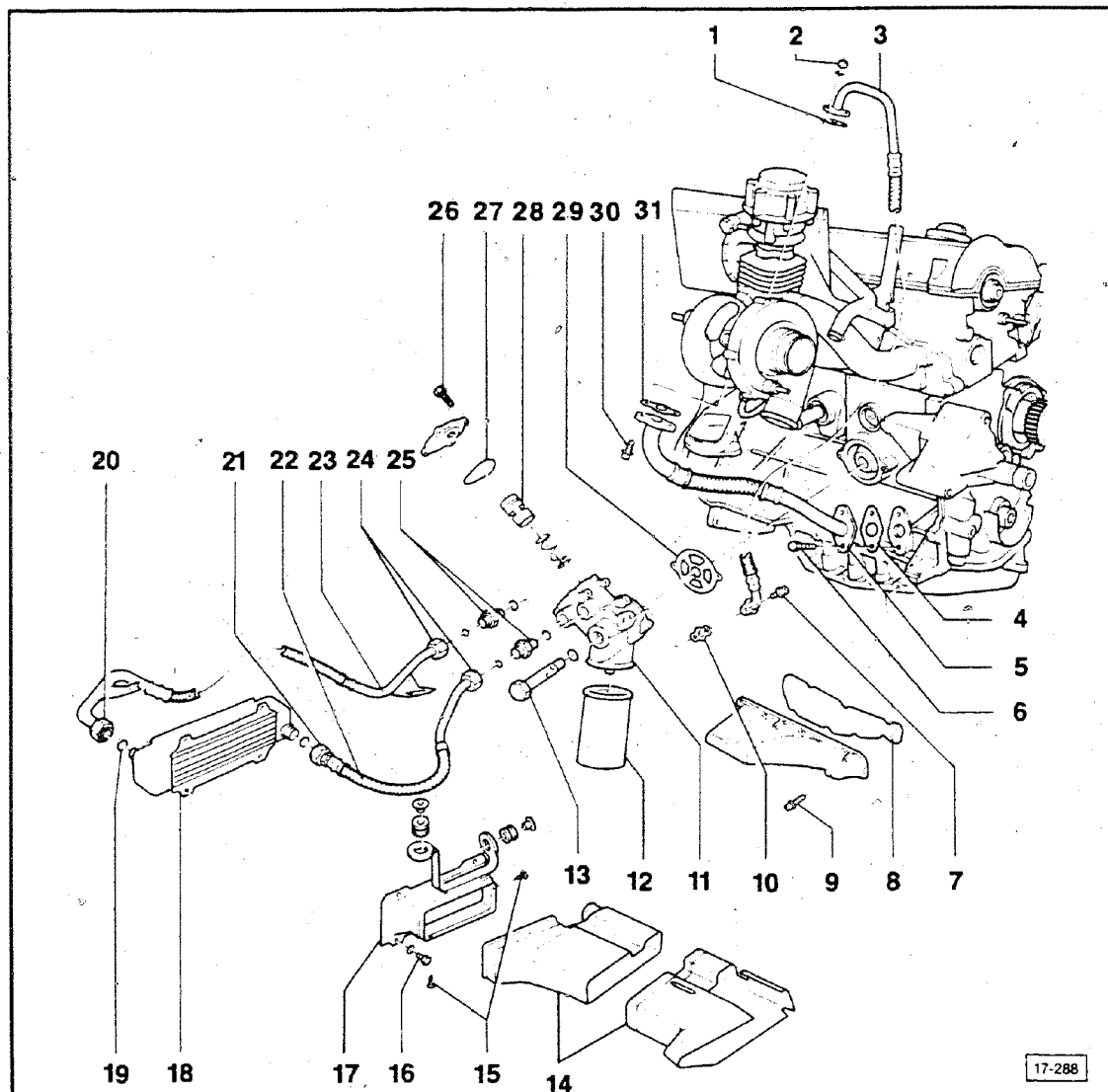
9 — Seal
Always replace

Engine — Lubrication System

- 10 — 30 Nm (22 ft lb)
- 11 — M 6 = 10 Nm (7 ft lb)
M 8 = 20 Nm (15 ft lb)
- 12 — 10 Nm (7 ft lb)
- 13 — Lock plate
Always replace
- 14 — Gasket
 - always replace
 - do not use adhesive
- 15 — 10 Nm (7 ft lb)
- 16 — Seal
 - always replace
 - do not use adhesive
- 17 — Adapter — 50 Nm (37 ft lb)
- 18 — Oil check valve
 - remove/install with 8.0 mm (5/16 in.) multipoint socket
 - install with D6 locking compound or equivalent,
torque 6 Nm (4.4 ft lb)

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Engine — Lubrication System



Note

Always replace seal and gaskets.

Engine oil capacity

4.0L (4.2 qt.) w/o oil filter
4.5L (4.7 qt.) with oil filter

1 — Gasket, turbocharger supply line
always replace

2 — 10 Nm (7 ft lb)

3 — Supply line, turbocharger

4 — Turbocharger return line/crankcase gasket
always replace

5 — Return line, turbocharger

6 — 22 Nm (16 ft lb)

7 — 10 Nm (7 ft lb)

8 — Gasket
always replace

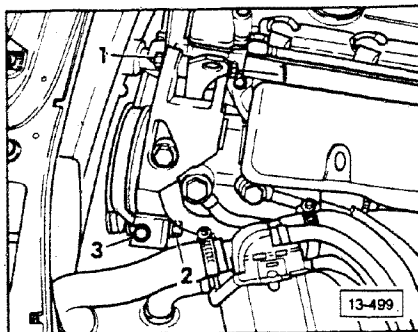
9 — 10 Nm (7 ft lb)

10 — Turbocharger supply line gasket, on oil
filter housing
always replace

Engine — Lubrication System

- 11 — Oil filter housing
- 12 — Oil filter — 20 Nm (15 ft lb)
 - loosen with oil filter wrench
 - hand tighten and note installation instructions on filter
- 13 — Banjo bolt — 70 Nm (52 ft lb)
- 14 — Air duct
- 15 — Screw
 - self tapping
 - secures air duct
- 17 — Oil cooler bracket
- 18 — Oil cooler
- 19 — O-ring
 - always replace
- 20 — 40 Nm (29 ft lb)
- 21 — 40 Nm (29 ft lb)
- 22 — Oil line to oil cooler
- 23 — Oil line from oil cooler
- 24 — 40 Nm (29 ft lb)
- 25 — Adapter — 50 Nm (37 ft lb)
- 26 — 10 Nm (7 ft lb)
- 27 — Oil thermostat seal
 - always replace
- 28 — Oil cooler thermostat
- 29 — Gasket, oil filter housing
 - always replace
- 30 — 10 Nm (7 ft lb)
- 31 — Gasket, turbocharger oil return line
 - always replace

Engine – Lubrication System



Oil pump, removing/installing

Removing

- loosen bolts 1, 2, 3
- loosen V-belt for alternator, A/C compressor, power steering pump
- unbolt power steering pump, and lay to one side
 - do not disconnect hoses
- loosen vibration damper, see Repair Group 13
- remove drive belt cover

CAUTION

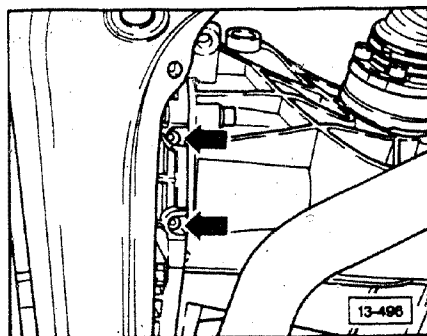
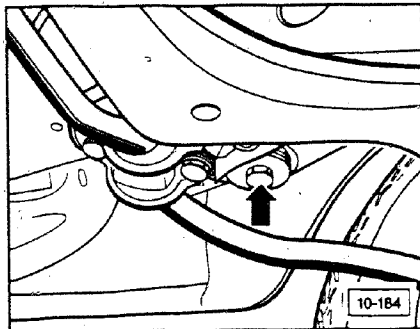
Subframe will drop approximately 100 mm (4.0 in.)

- remove oil dipstick
- drain engine oil

CAUTION

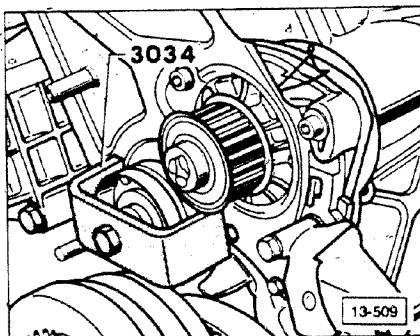
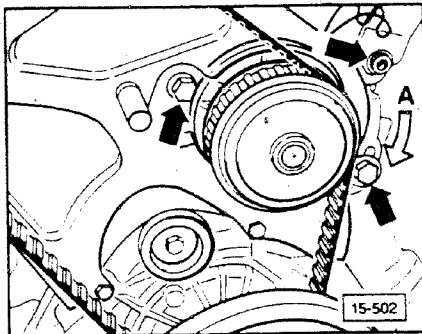
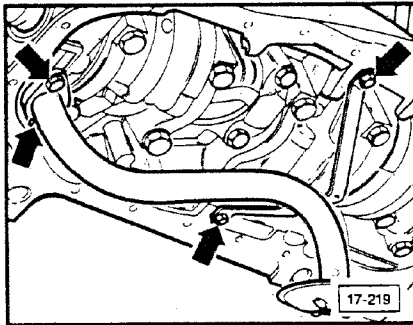
Do not reuse subframe bolts.

- remove both subframe bolts (**arrow**)



- turn flywheel so that recesses are pointing down vertically and remove both rear oil pan bolts (**arrows**)
- remove vibration damper, drive belt sprocket
- remove oil pan

Engine – Lubrication System



- remove oil pickup tube (arrows).

- turn coolant pump in direction **arrow A** to loosen and remove drive belt

CAUTION

Do not turn crankshaft.

- only remove idler pulley if pulley bearings are damaged
 - if idler pulley not damaged, remove only securing bolt
- remove oil pump

Installing

Install in reverse order, noting the following:

- install rear oil pan bolts finger tight, then tighten to:
 - M 6 = 10 Nm (7 ft lb)
 - M 8 = 22 Nm (16 ft lb)
- tighten subframe bolts to 65 Nm (48 ft lb) plus 1/4 turn (90°)

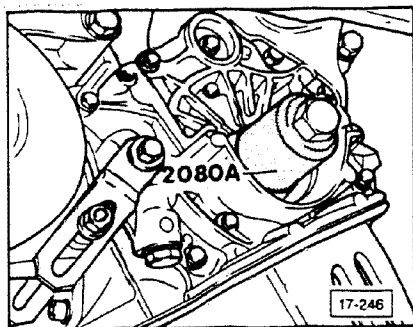
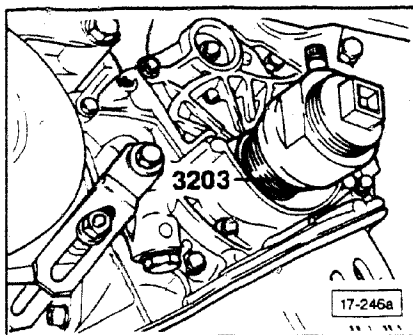
Engine – Lubrication System

Crankshaft oil seal, removing/ installing

Pulley side

Removing

- remove V-belt pulley with drive belt
- remove with tool 3203



Installing

- use vibration damper mounting bolt
- coat oil seal lip and outer surface lightly with oil
- install using locating sleeve from tool 2080A
- press in seal using thrust sleeve from tool 2080A

Note

If wear marks shown on crankshaft, press gasket in to stop.

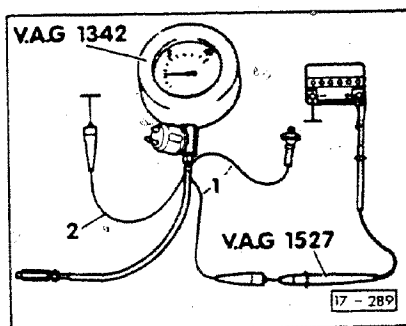
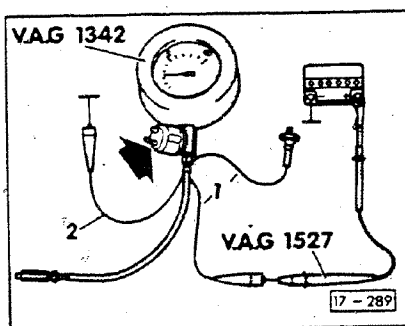
Oil pressure switch, oil pressure, checking

Dynamic oil pressure warning system

Test conditions

- engine oil level OK
 - LED oil pressure light (K3) glows with ignition switched on
 - Auto-Check system OK
 - oil temperature at least 80°C (176°F), radiator fan must have come on at least once
- remove wires from oil pressure switch and oil pressure sender

Engine – Lubrication System



- unscrew and install oil pressure sender (arrow) into VAG 1342
- install VAG 1342 in place of oil pressure sender
- connect brown wire 2 from VAG 1342 to ground
- connect blue wire 1 to oil pressure switch (white)

- connect LED tester VAG 1527 to wire 1 and positive battery terminal
- start engine and slowly increase engine speed
 - light must come on when pressure exceeds 1.6-2.0 bar (23-29 psi)

if NO,

- replace oil pressure switch

- raise engine speed to 2000 RPM
 - at 80°C (176°F) oil pressure must be at least 2.0 bar (29 psi)
- increase engine speed further
 - oil pressure relief valve starts functioning at 5.0-8.0 bar (72.5-116 psi)
 - pressure may be exceeded only slightly

Note

If oil pressure is excessive, oil pressure relief valve is improperly installed, or sticking.

If this occurs, hydraulic valve lifters will be under excessive pressure. As a result engine will cut out soon after it is started, and will crank fast due to lack of compression.

If wires to oil pressure sender are incorrectly installed the Auto-Check oil pressure warning light will come on.

Engine – Lubrication System

Oil pressure sender (G10), checking

Note

Always refer to appropriate wiring diagram.

Test conditions

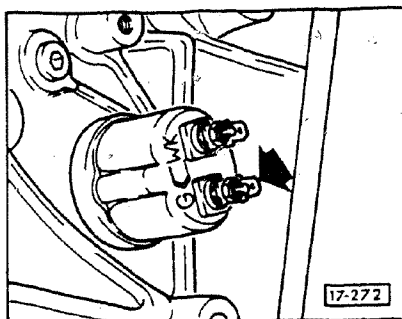
- engine oil level **OK**
- LED oil pressure light (**K3**) glows with ignition switched on
- Auto-Check system **OK**
- oil temperature at least 80°C (176°F), radiator fan must have come on at least once
- tachometer **OK**

Tools required

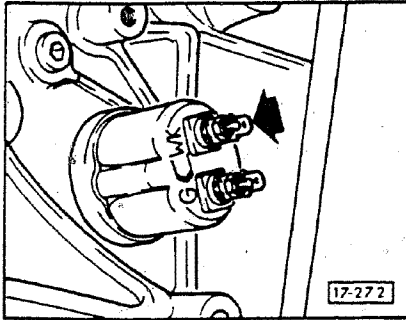
- Digital multimeter **FLUKE 83**
- adaptor **VW 1594**

Note

- Check Auto-Check system or oil pressure sender (**G10**), if LED oil pressure light (**K3**) does not light
- ensure oil pressure sender (**G10**) correctly mounted
- disconnect wire to oil pressure sender (**G10**) terminal **G** (arrow)
- connect tester **FLUKE 83** between oil pressure sender (**G10**) terminal **G** and engine ground with **VW 1594**
- set **FLUKE 83** to 200 ohm scale
specified reading 5-10 ohms
- start and let engine idle
specified reading 70-120 ohms
- increase engine speed to 3000 RPM
specified reading 170-200 ohms



Engine – Lubrication System



- connect **FLUKE 83** tester between oil pressure sender (**G10**) terminal **WK** (arrow) and engine ground with **VW 1594**
- start and let engine idle
specified reading must be ∞ ohms
- turn off engine
specified reading 0-0.5 ohms

If **NO**,

- replace oil pressure sender unit (**G10**)

Note

If wires to oil pressure sender are incorrectly installed the Auto-Check oil pressure warning light will come on.

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