

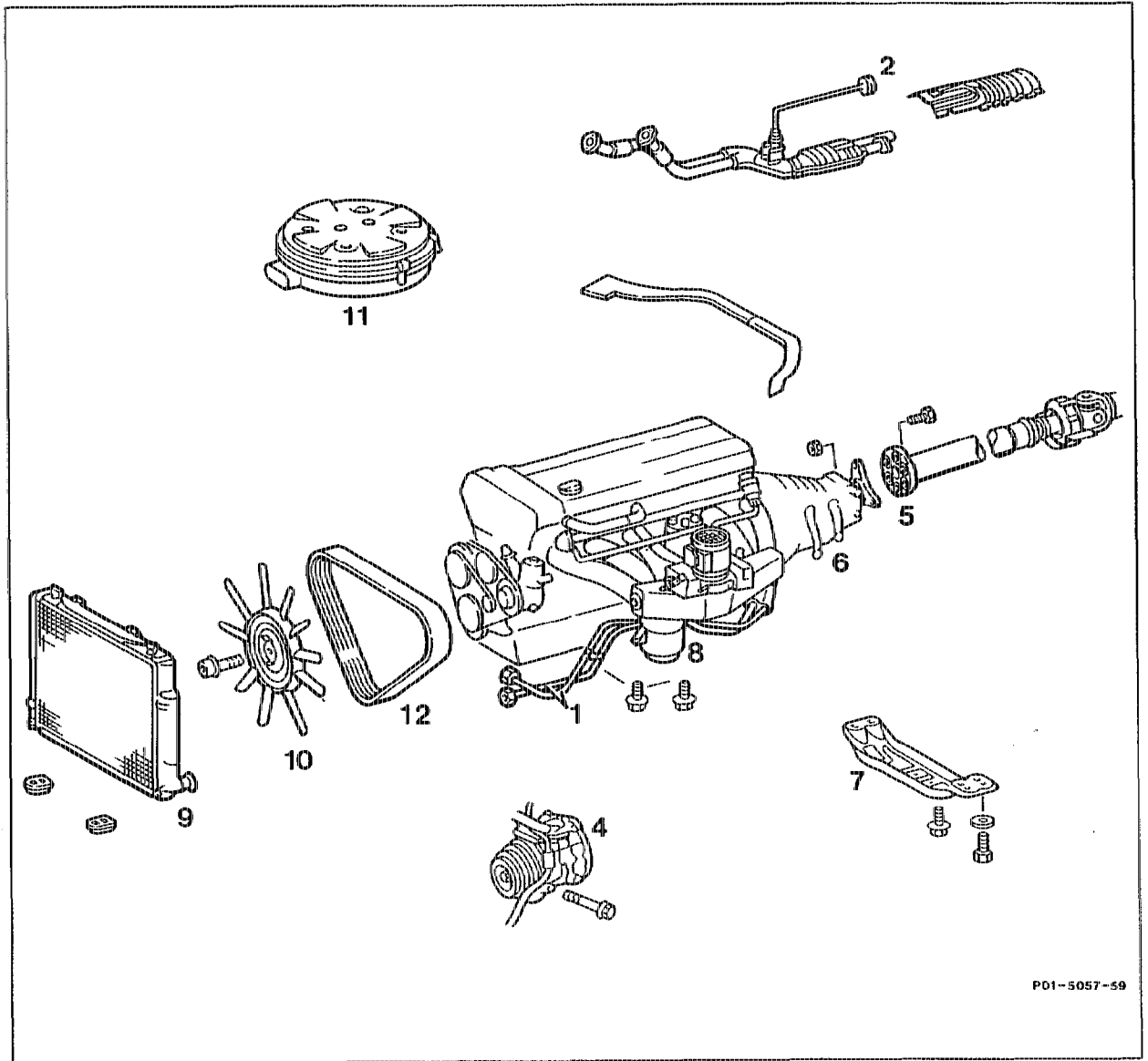
01-0300 Removing and installing engine

Preceding work:

Warning instructions when hood open (01-0085)
 Bottom engine compartment panel removed (Maint. Manual)
 Air cleaner removed (AR09.10-1050D)
 Radiator removed (20-4200)
 Viscous fan coupling removed (20-3120)

Operation no. of operation texts and work units or standard texts
 and flat rates:
 01-2400, 2800

A. Models 124, 129, 140



P01-5057-59

Engine with transmission
 Ground cable at battery

remove, install.

disconnect, connect, encode radio, model 140
 normalize power windows.

Coolant	drain at crankcase.
If AC fitted	attach guard plate to condenser.
Air-to-oil cooler pipes (1) at air-to-oil cooler ...	disconnect, connect (step 3).
If AC fitted:	take off poly V-belt, fit on (13-3200).
Power steering pump	extract oil from reservoir, adjust oil lto correct level (step 5).
AC compressor (4)	remove with piping connected, place to the side, fit on.
Oil pipes of power steering pump, automatic transmission	take off, seal and fit on (steps 7-8).
Fuel pipes	take off, seal, open fuel filler cap briefly first of all, fit on (step 9).
Bowden cable (accelerator control)	take off, fit on (30-1010, step 10).
Heating water return pipe	detach, attach.
Component compartment cover	remove, install model 140 (step 14).
Right cable duct	remove, install model 140 (step 14).
Electrical connections	disconnect, connect (steps 15 to 21).
Electrical connections, starter	disconnect, connect (steps 23, 24).
Vacuum pipes for brake pressure regulator etc.	detach, attach.
Exhaust system	remove, install (49-0045, 49-0170).
Flexible disc (5) of transmission (6)	detach, attach, replace self-locking nuts (step 25).
Clamping nut and intermediate bearing fixture .	slacken, tighten (steps 26, 27).
Shift rods at transmission	detach, attach (step 28).
If manual transmission fitted:	unbolt hydraulic pipes for clutch, bolt on (step 29).
If automatic transmission fitted:	disconnect starter lockoutswitch, transmission overload protection,electric wiring, connect (steps 30, 32, 33, 34).
Engine hoist	attach to lifting lugs, detach (step 35).
Transmission	support.
Rear engine support (7) without engine mounts	remove, install (step 37).
Exhaust bracket at transmission	unbolt, bolt on (step 38).
Front engine mounts (8), left and right	unbolt from below, bolt on (step 39).
Guard plate at component compartment wall ..	insert, take off.
Engine	raise with engine hoist, lower (step 41).
Front and rear engine mounts	examine.
Coolant, oil and fuel hoses	examine.
If automatic transmission fitted	adjust Bowden cable for control pressure (27-100).

Oil drain plugs
 Oil level in engine and transmission
 Coolant
 Idle speed
 Fault memory

check tightening torque.
 adjust to correct level (18-0020).
 pour in, check anticorrosion/antifreeze agent
 and adjust to correct ratio (20-0100).
 check, adjust (07-2056).
 read, erase (step 52).

Note

Faults stored in the fault memories must be rectified after completing the work and erased.

See Diagnosis Manual Volume 2:
 Index 0: Connecting and using test equipment.
 check after test run of engine.

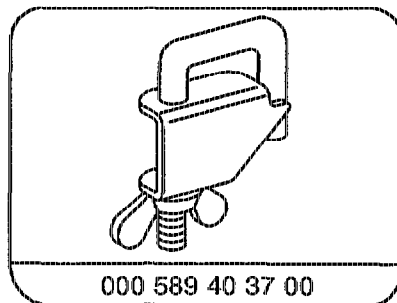
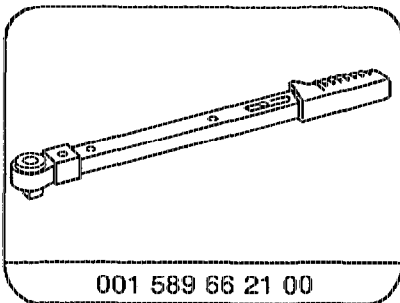
Leak tightness

Tightening torques in Nm

Oil pipes to air-to-oil cooler	30
Knock sensors to crankcase 1)	20

1) Bolt head contact surface and thread oiled

Special tools



Commercially available tools and testers

Removal device components model 3188
(lifting capacity 500 kg)

e. g. Wilbär GmbH & Co KG
Herder Str.
42895 Remscheid

Shop-made tools

Guard plate for radiator/condenser

sizes approx. 400 × 680 × 1 mm

Metal plate for component compartment wall

sizes approx. 320 × 380 × 1 mm

Note



In the case of engine damage involving damage to the pistons, valves etc., parts may have got in as far as the catalytic converter, or pre-catalytic converter.

When replacing the engine, it is essential to remove such parts otherwise they will be pulsed back into the cylinders as a result of the gas vibrations in the exhaust system and may once again cause engine damage.

In addition, these parts may cause mechanical damage to the catalytic converter.

It is therefore essential to remove any foreign bodies in the exhaust system in the case of such engine damage.

Catalytic converters which have been damaged must be replaced.

Engine 104.990 in model 140

When replacing the crankcase or installing a reconditioned engine, the matched ignition control module (DI) should be used, see (01-1000).

Removing and installing engine with transmission.

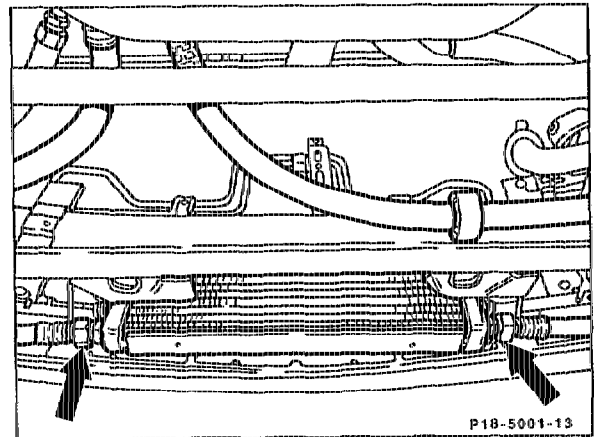
- 1 Disconnect ground cable at battery.

Installation note

Encode radio, model 140 normalize power windows.

- 2 If AC fitted: attach guard plate to condenser of AC system.
- 3 Unbolt air-to-oil cooler pipes at air-to-oil cooler (arrows)

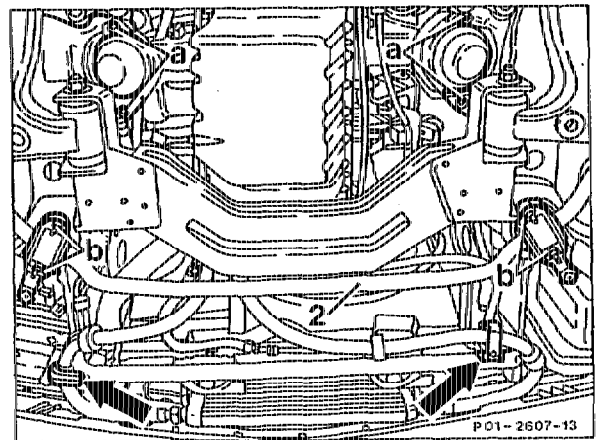
Model 140



Model 140

- Unbolt oil cooler pipes at body (arrows).
- 4 If AC fitted: remove poly V-belt (13-3420).

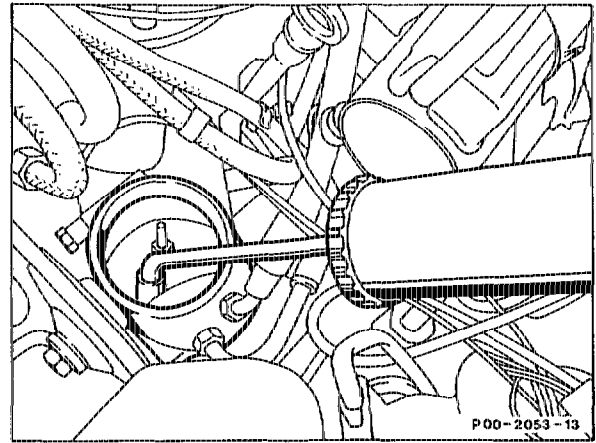
Model 140



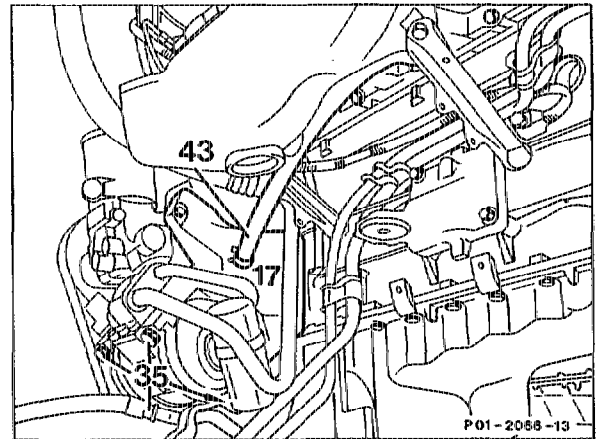
- 5 Extract oil from the reservoir of the power steering pump with the priming pump for extracting oil.

Installation note

Check fluid level of power steering system. Fill up power steering with the specified fluid. Top up fluid to the marking with the engine running. Turn steering several times from full left to full right lock. When fluid is at normal operating temperature, it must extend to about 20 mm below the edge of the reservoir; when fluid is cold to 6–8 mm below the marking.



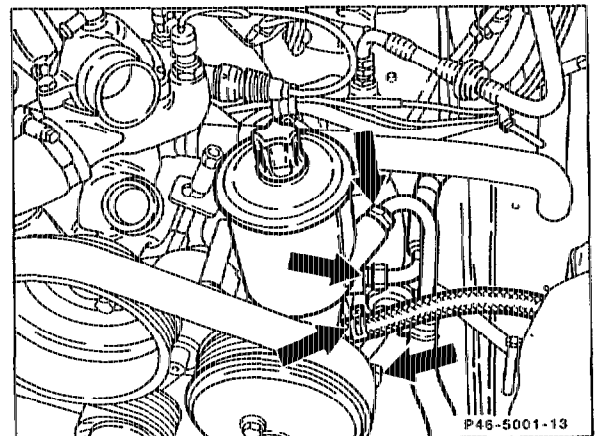
- 6 Detach AC compressor of air conditioning system from the engine. Unscrew bolts (35) and nuts (for attaching pipe assy); attach AC compressor to the side at the bottom of the engine compartment with the pipes connected.



- 7 Unbolt suction and pressure oil pipes at power steering pump and tandem high pressure pump, respectively (arrows).

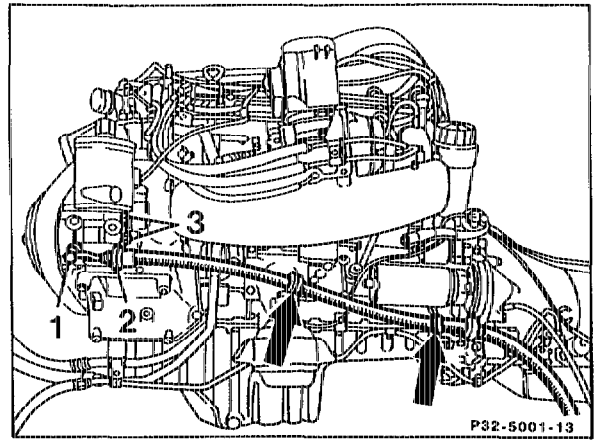
Installation note for tandem pump

Bleed pressure oil pump (level section) of tandem pump (32-6300).



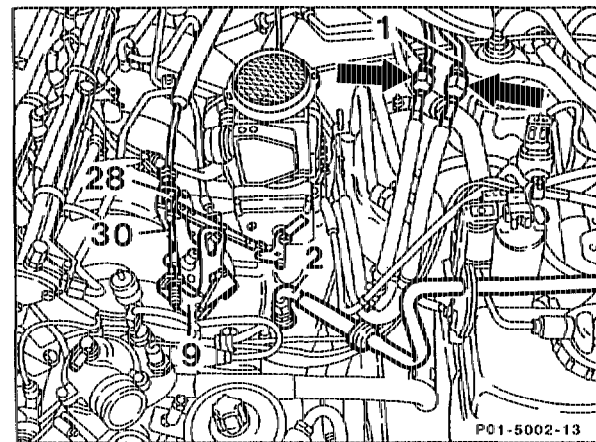
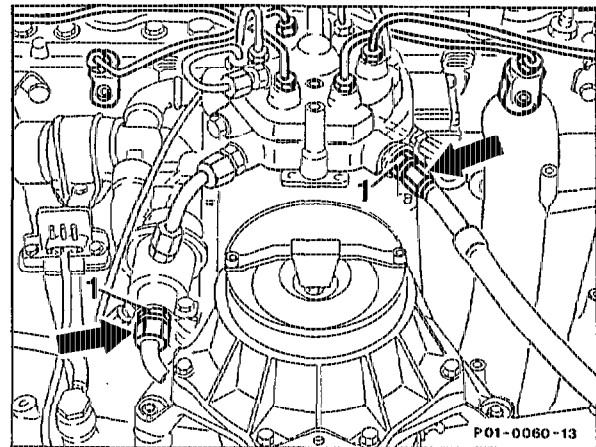
- 8 Unbolt delivery pipe of level pump (1), unscrew M8 bolts (3) of metal bracket (2) and press pressure pipe out of the metal brackets (arrows).

Model 140



- 9 Briefly open filler cap in the fuel tank to release the pressure. Unbolt fuel pipes (arrow) and seal with special tool 000 589 40 37 00. Counter-hold the connection fitting (1) when slackening the fuel pipe.

Engine 104.98, models 124, 129



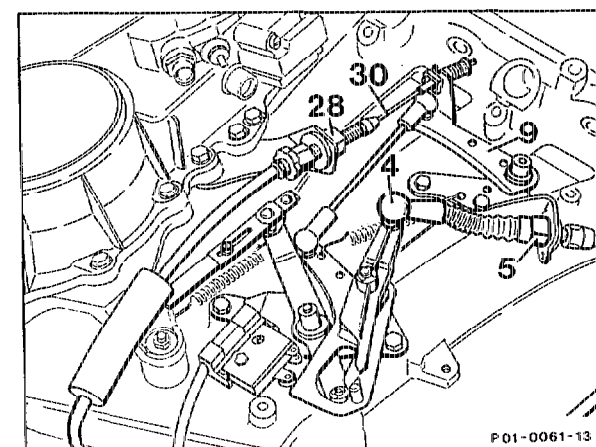
Engine 104.99

- 10 Detach Bowden cable (30) from accelerator control lever (9). Compress plastic clip (28) and pull out Bowden cable.

Installation note

Adjusting Bowden cable (30-1010).

Engine 104.98

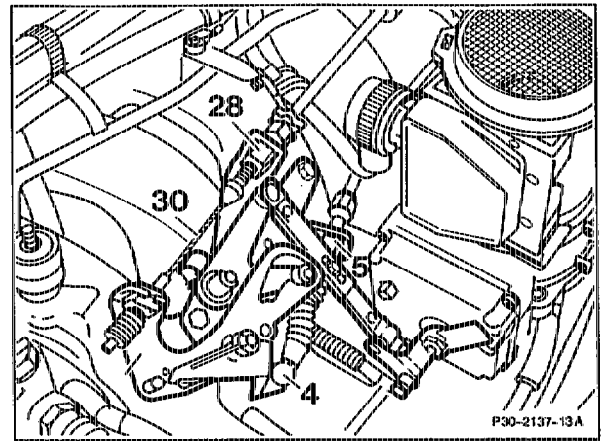


- 11 Detach Bowden cable (30) from accelerator control lever (9). Compress plastic clip (28) and pull out Bowden cable.

Installation note

Adjusting Bowden cable (30-300).

Engine 104.99



- 12 Detach heater hoses and vacuum pipes in the engine compartment. If automatic transmission fitted, pull off vacuum pipe at 2-way valve.

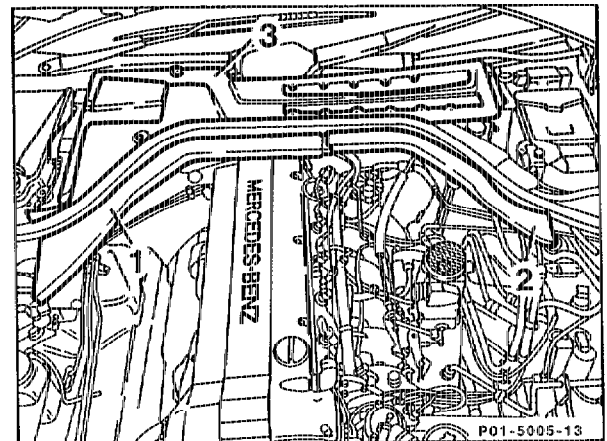
Models 124, 129

- 13 Detach connector from the oil level gauge and from the oil pressure sensor. Slacken all cable straps of the engine wiring harness. Detach all connectors along the engine wiring harness. Remove engine wiring harness

Model 140

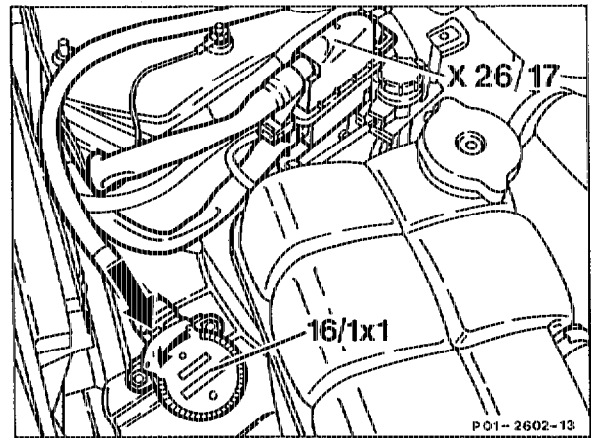
- 14 Remove component compartment cover (3), open cable duct (1) and remove right-hand side.

Model 140



- 15 Unplug connectors (items X26/17 and M16/1x1) of the engine wiring harnesses. Press ratchet (arrow) and turn to release the connector (16/1x1).

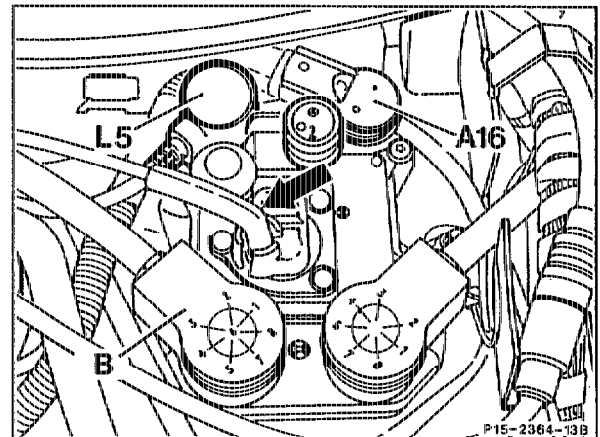
- 16 Place engine wiring harnesses on the engine.



Model 140

- 17 At the ignition control module, unplug crankshaft position sensor connector (L5), LH control module connector (B), knock sensors connector (A16) and detach vacuum pipe (arrow).

- 18 Detach suction pipe of the evaporative emission control system from the connector on the left-hand wheelhouse.

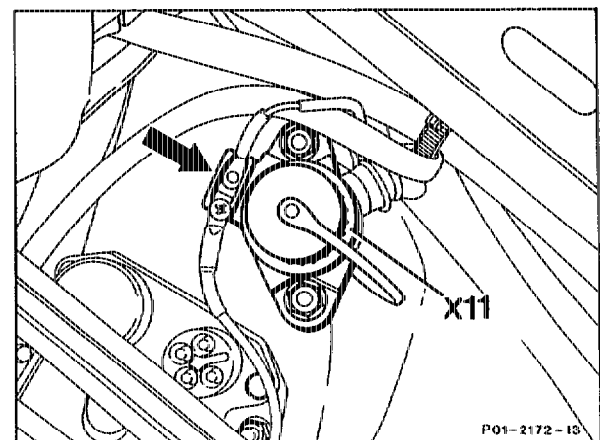


Model 124

- 19 Detach cable connector terminal TD (arrow) next to diagnostic socket (X11).

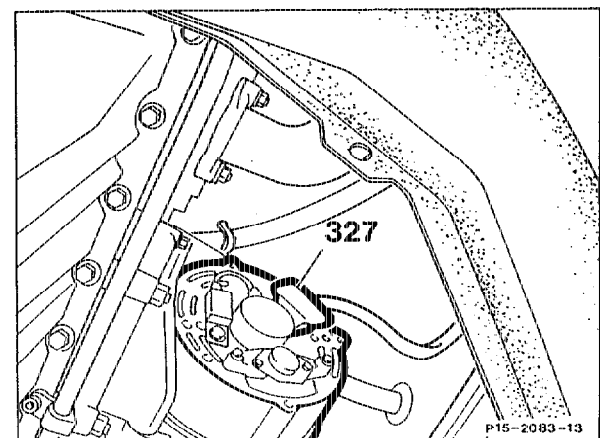
Models 124, 129, 140

- 20 Unbolt diagnostic socket (X11), detach cable from TD sensor on rear of diagnostic socket.



Models 124, 129

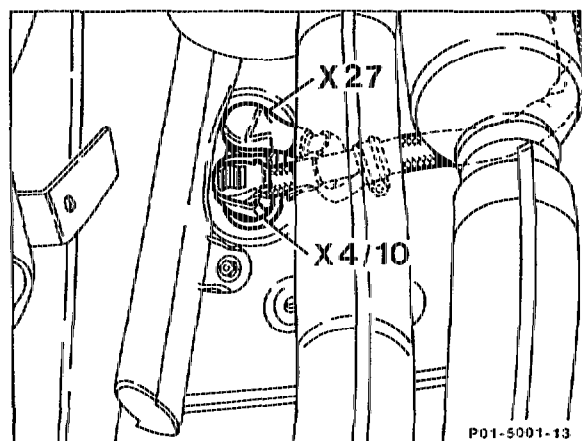
- 21 Disconnect wiring (327) at the generator.



- 22 Remove exhaust system (40-0045, 49-0170).
- 23 Remove heat shields above front and under-floor catalytic converter (model 140 only).

Model 140

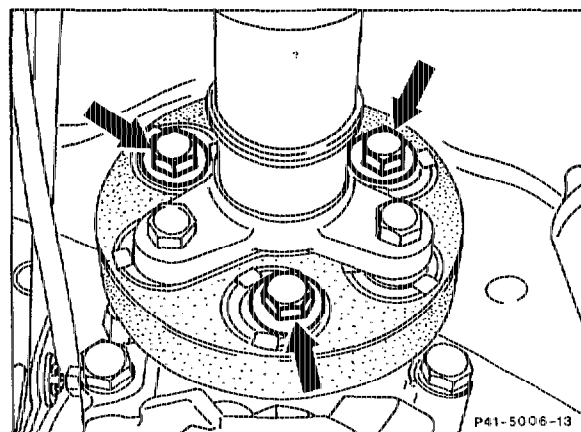
- 24 Unbolt starter wiring harness X27 and terminal 30 at screw connection X4/10 on front right of firewall from below.



- 25 Detach propeller shaft by unscrewing bolts (arrows).

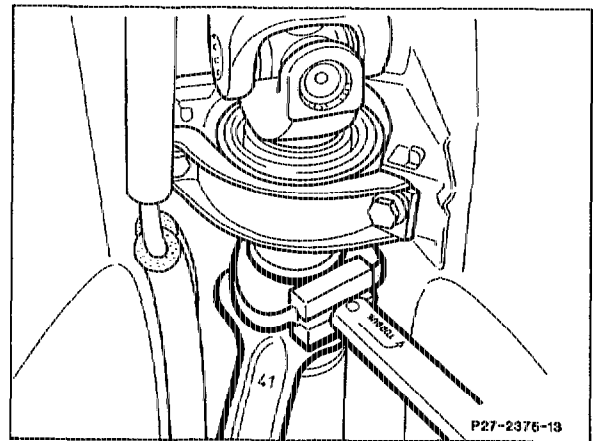
Note

The propeller shaft is balanced together with the flexible joint.



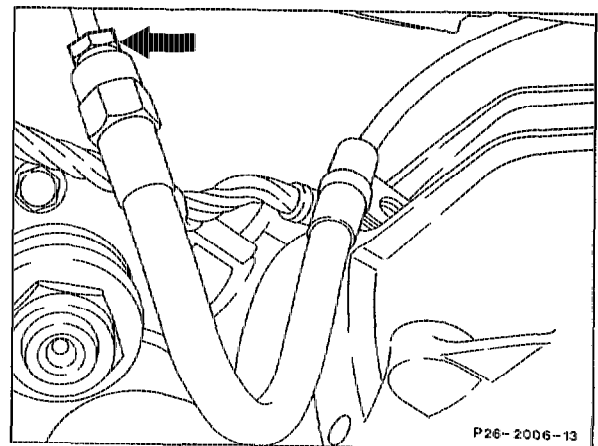
- 26 Slacken bolts for propeller shaft intermediate bearing but do not remove.

- 27 Slacken clamping nut (waf 41/46) of propeller shaft. Push back propeller shaft as far as possible. Tightening torque 30–40 Nm.

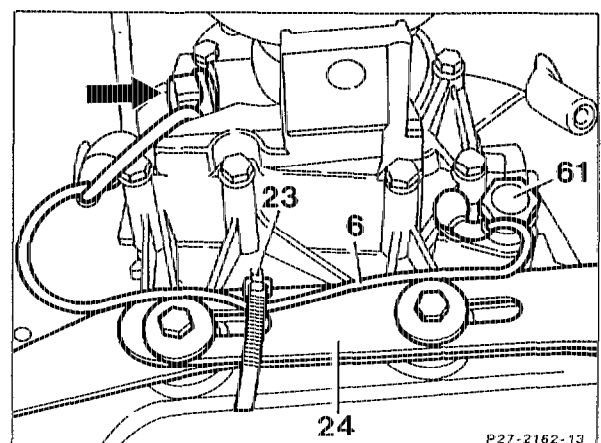


- 28 If manual transmission fitted: take shift rods off the transmission shift levers after pressing off the clip locks.

- 29 If manual transmission fitted: separate hydraulic pipe (arrow) to the slave cylinder at the hose connection. Seal pipes with dummy plugs or extract fluid from the rear chamber of the combined expansion reservoir.



- 30 If automatic transmission fitted: slacken cable strap (23) and unscrew cable (6) at the kickdown solenoid valve (61) or pull off. Unscrew fastening bolt for the pulse generator (arrow) and pull out the pulse generator.



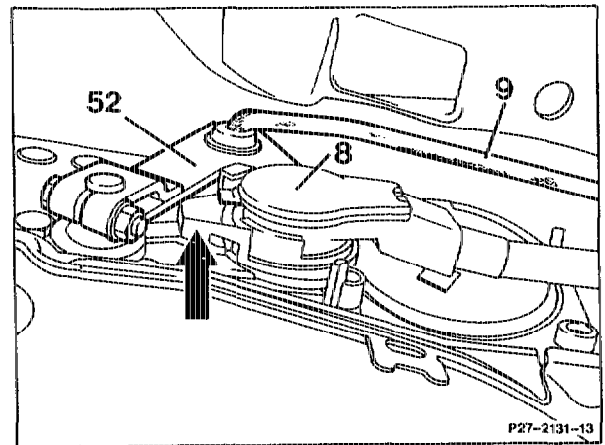
- 31 Unbolt ground cable at transmission.

32 Remove connector for starter lockout switch (8).

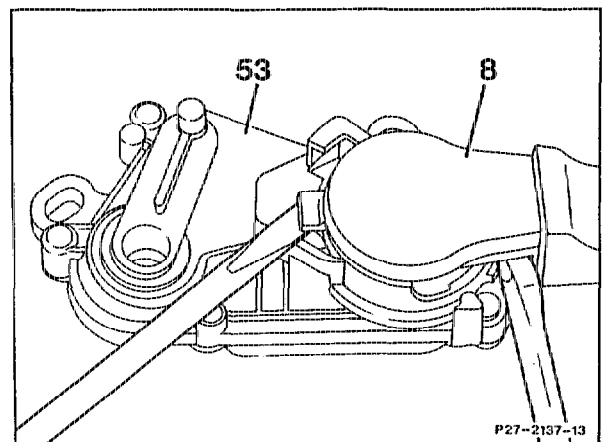


The connector for the starter lockout switch is secured by a locking element (white plastic ring, arrow).

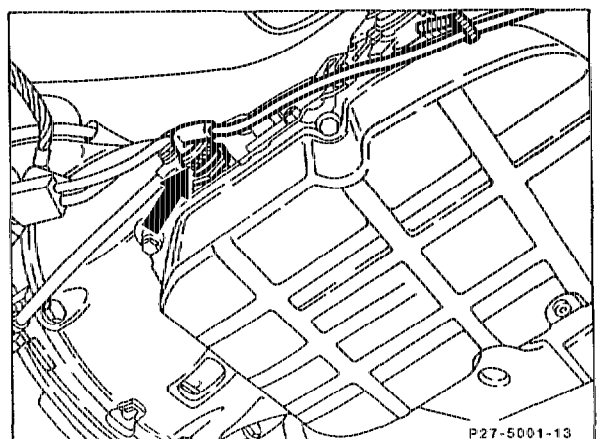
Before pressing off the connector, the locking element must be turned up (direction of arrow). Detach shift rod (9) in the range selector lever.



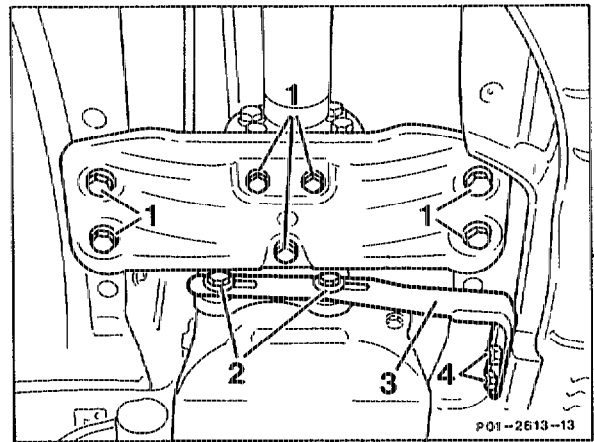
33 Use two screwdrivers to carefully press off the connector (8) at the cable outlet and at the tab.



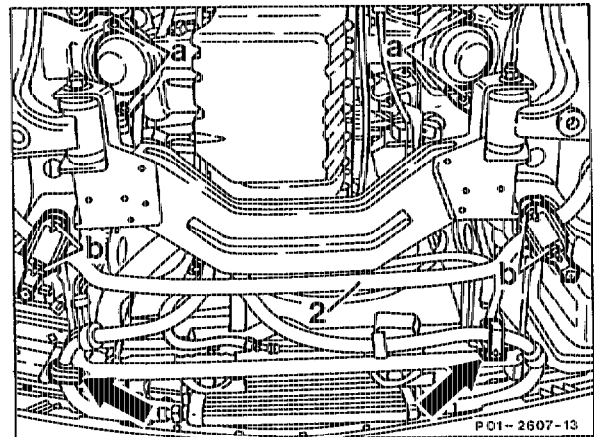
34 Unscrew connector for transmission overload protection (arrow).



- 35 Attach engine hoist to the lifting lugs of the engine.
Adjust engine hoist so that the engine can be raised horizontally.
- 36 Support transmission in trolley jack or in inspection pit lift.
- 37 Unbolt rear engine support without engine mounts. Unscrew bolts item 1.
- 38 Unscrew securing bolts (2) of the exhaust bracket (3) at the transmission.



- 39 Unscrew bolts (a) at the left and right front engine mounts from below.

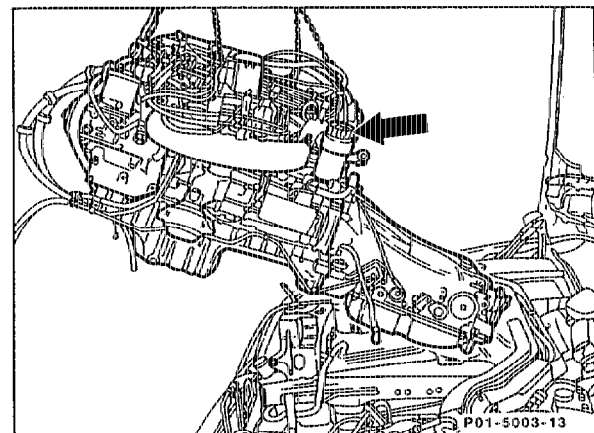


Model 140

- 40 Insert guard plate between component compartment wall and engine.
- 41 Move engine together with transmission into angled position and lift out of engine compartment by repositioning engine hoist several times, and install in the same way.

Note

When tilting engine, pay attention to rear lifting lug and to oil filter (arrow).



42 Installation is performed in the reverse order.

Installation note model 140

Before installing the engine, install right engine mount in front suspension, left engine mount can be installed with the engine.

43 Examine front and rear engine mounts.

44 Examine coolant, oil and fuel hoses.

45 If automatic transmission fitted, adjust cable for control pressure (27--100).

46 Check tightening torque of oil drain plugs.

47 Adjust oil level in engine and transmission to correct level.

48 Pour in coolant, check anticorrosion/antifreeze agent, adjust to correct ratio (20--0100).

49 Check idle speed (07--2056).

Note

If engine is replaced, read fault memory of the following control modules and erase any faults which may be stored.

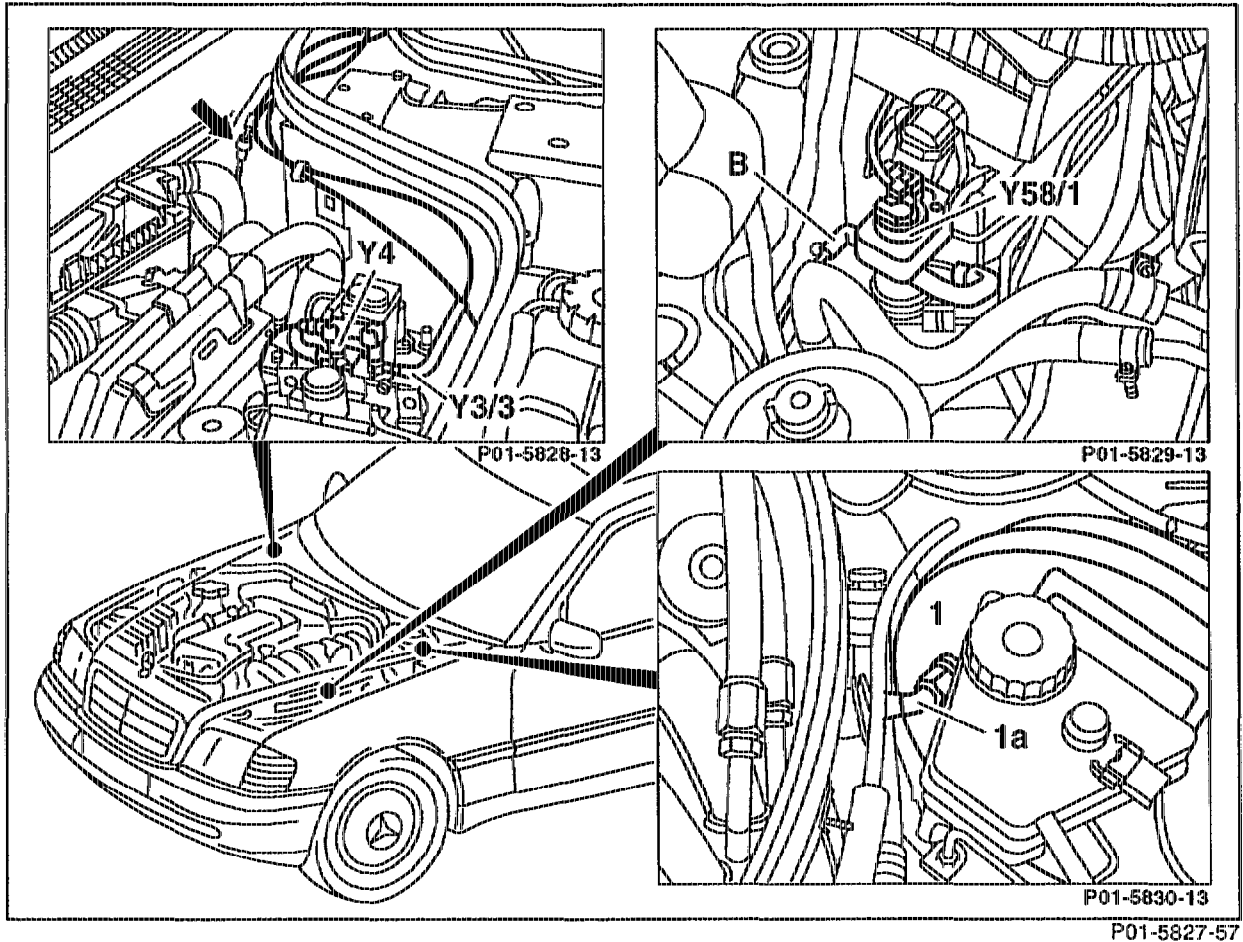
- CFI control module
- LH-SFI control module
- DI/KSS ignition control module
- Electronic accelerator (if fitted)
- Diagnostic module (California), see Diagnosis Manual Engine Volume 2.

B. Model 202

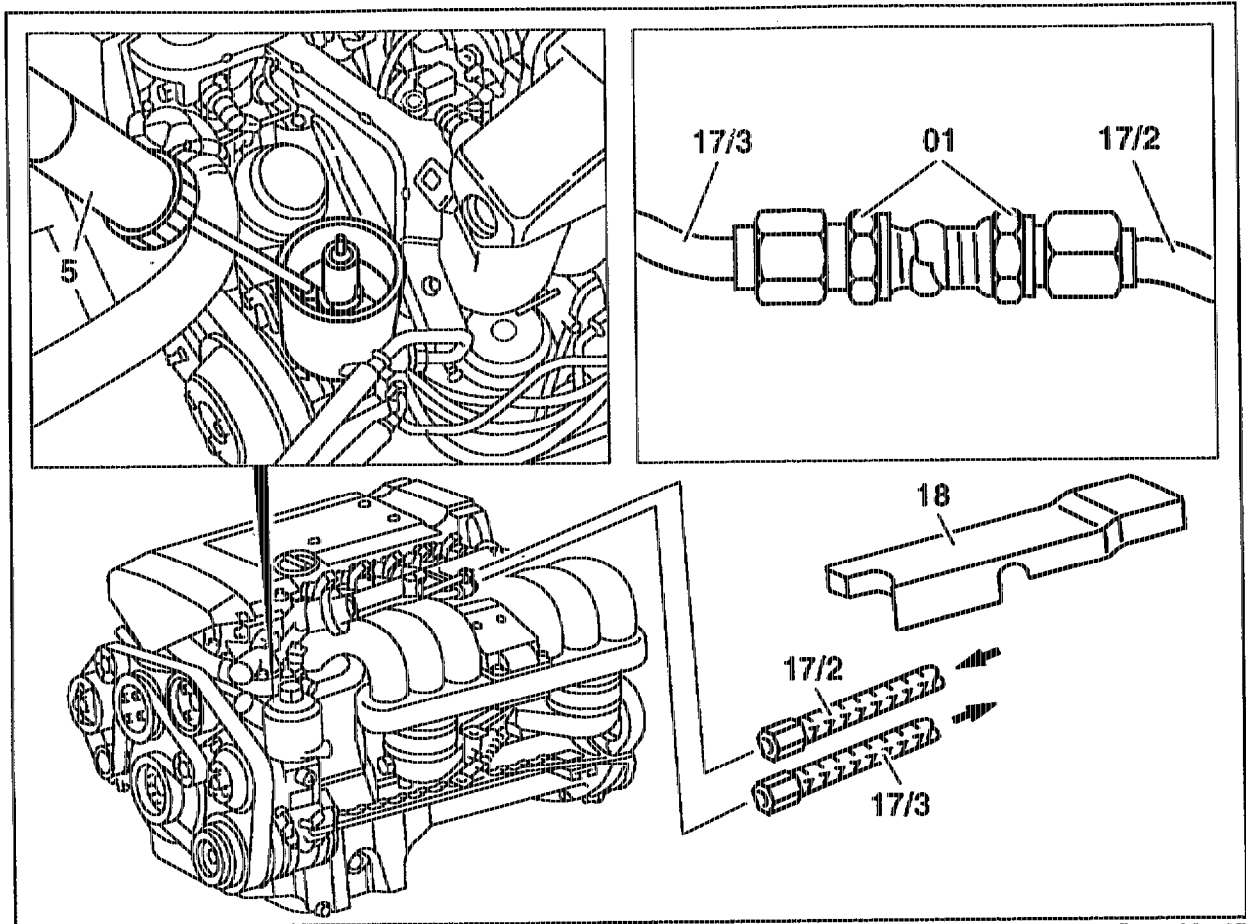
Preceding work:

Warning instructions when hood open (01-0085)
 Bottom engine compartment panel removed
 Viscous fan removed (20-3120)
 Radiator removed (20-4200)
 Hot film air mass sensor removed (AR07.51-1453D)
 Air cleaner cross pipe removed (AR09.10-8031G)
 Air cleaner removed (AR09.10-1050D)

Operation no. of operation texts and work units or standard texts
 and flat rates:
 01-2400



If AC fitted:	attach guard plate to condenser.
Engine wiring harness	disconnect, connect (01-0310).
Vacuum pipes at switchover valves (Y3/3) and (Y4)	detach, fit on.
Vacuum pipe (arrow) at connection	detach, fit on.
Line (B) at regeneration switchover valve (Y58/1)	detach, fit on.
Vacuum line (1a) at brake servo unit (1)	unbolt, bolt on.

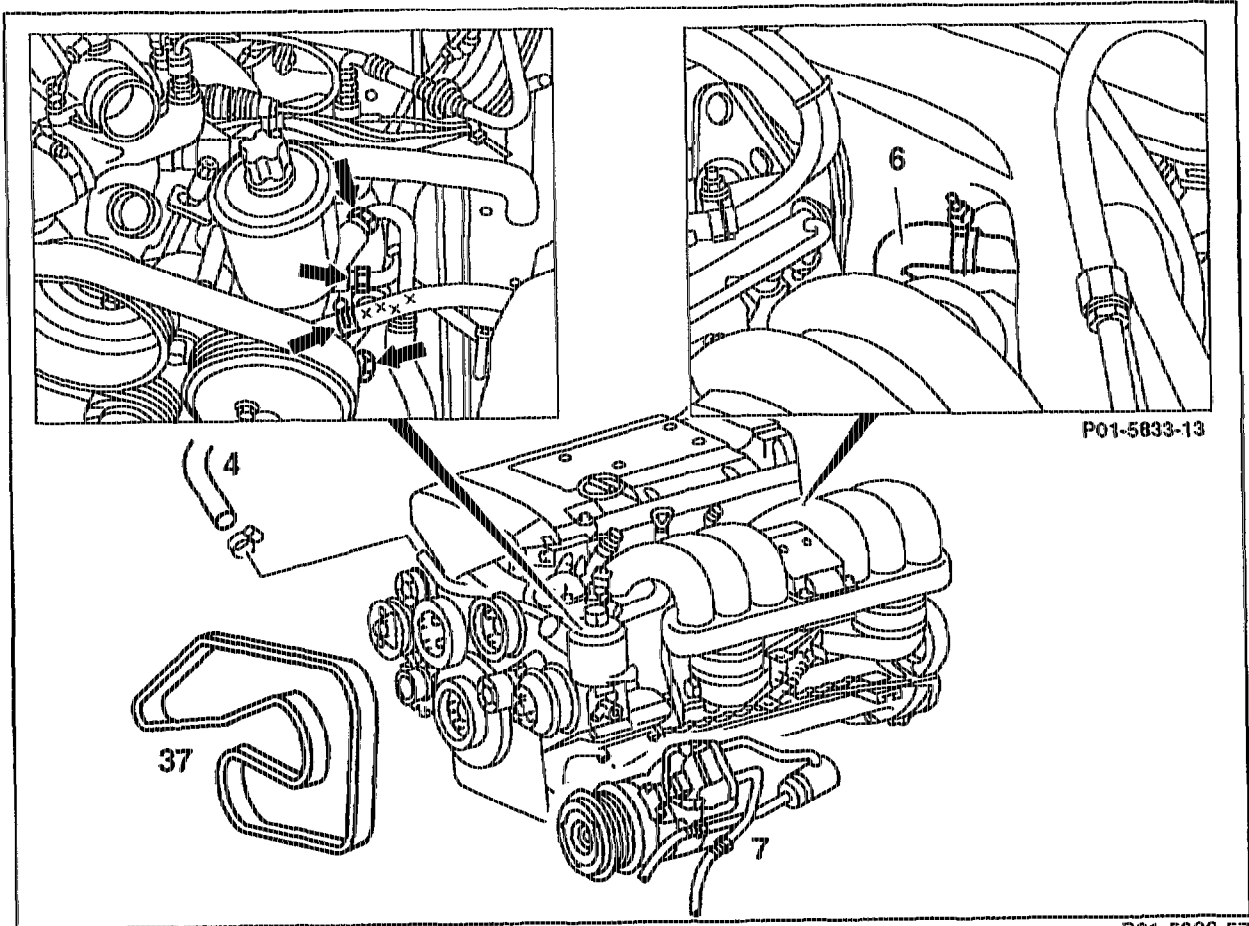


P01-5831-57

Cable duct cover (18)	remove, install.
Fuel filler cap	open, release pressure in fuel tank.
Fuel pipes (17/2) and (17/3) at fuel distributor ...	disconnect, connect (07.5-1451).
Fuel pipes (17/2) and (17/3) with union (01) (shop-made)	seal.
Bowden cable of accelerator control	detach, attach (AF46.30-0010A).
Power steering pump:	extract oil from reservoir with handpump (5) 112 589 00 72 00 for extracting oil.

Note

Filling, bleeding power steering pump
(46-7150).



Suction and pressure oil pipes (arrows)

unbolt at power steering pump or at tandem high pressure pump, bolt on.

Coolant hoses (4) and (6)

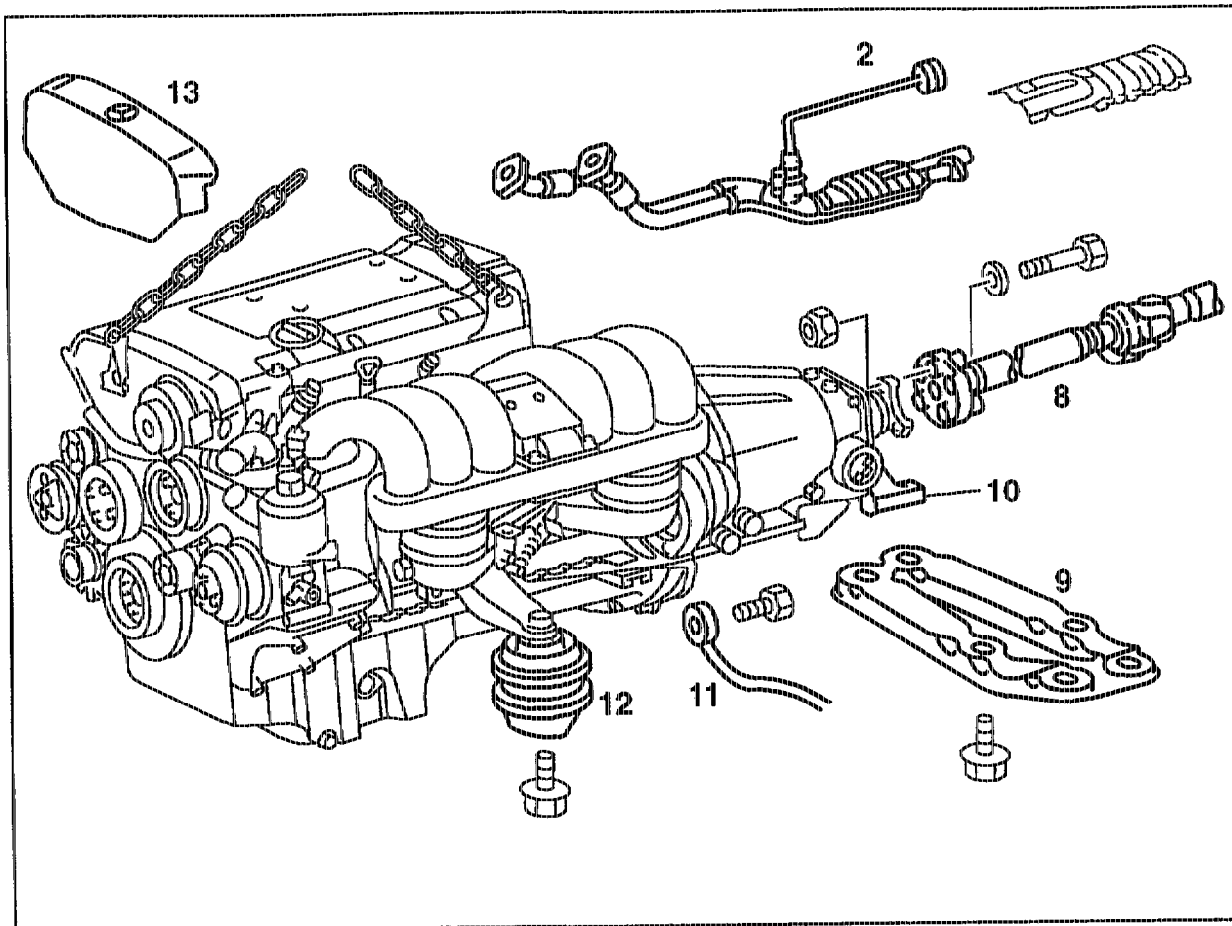
Note
Bleed pressurized oil pump (level part) of tandem pump (AR32.30-0630A).
disconnect, connect.

If AC fitted:

remove poly V-belt (37), install (13-1200).

If AC fitted:

unbolt AC compressor (7) with piping connected, attach to side of engine compartment, bolt on.



P01-5834-57

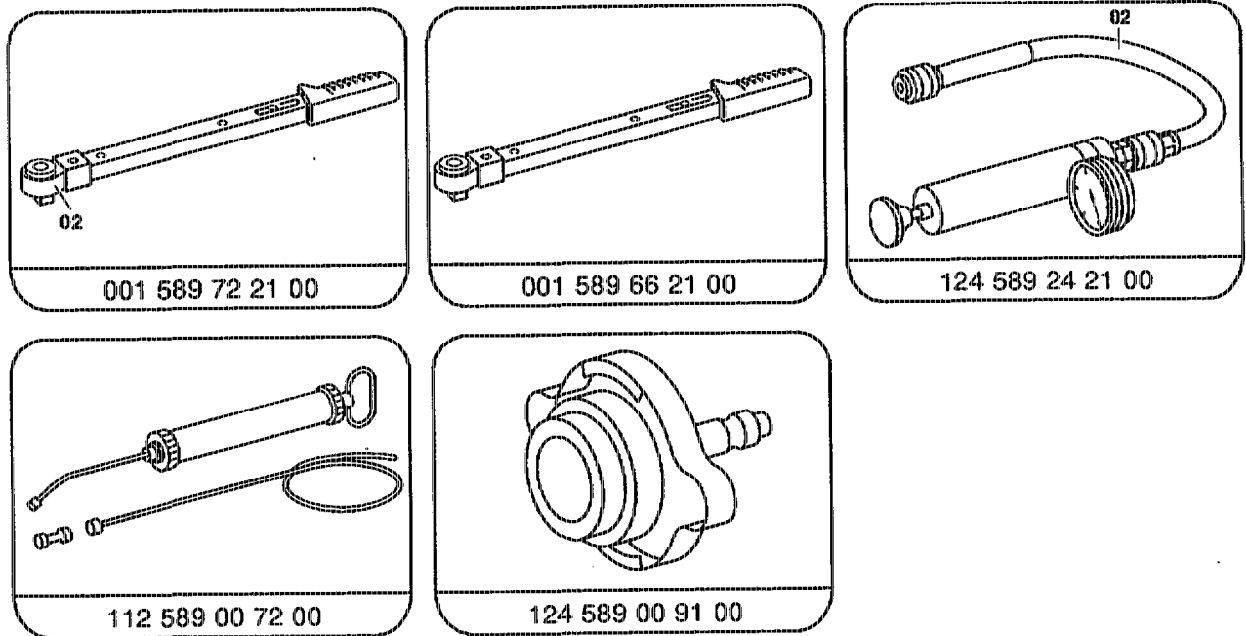
Exhaust system (2)	remove, install.
Coolant at crankcase	drain (20-0100).
Front propeller shaft (8) at transmission	unbolt, bolt on (AR41.10-0050A).
Propeller shaft (8)	push to the rear (AR41.10-0050A).
Rear engine carrier (10)	remove, install (22-2120).
Ground cable (11) at transmission	unbolt, bolt on.
Shift rod if automatic transmission fitted, or shift rods if manual transmission fitted	detach, attach.
Manual transmission:	separate hydraulic pipe to slave cylinder at hose connection.
Drag link at relay levers	detach, attach (AR46.40-0300B).
Front engine mounts (12) at body	unscrew, screw on (22-2110).
Front cover (13)	remove, install.
If automatic transmission fitted:	remove dipstick, install.
Engine hoist	attach to both lifting lugs of engine.
Engine with transmission	tilt, remove, install.
Front engine mounts (12) and rear mounts (10) ..	examine.

Note

Seal pipes with dummy plugs or extract fluid from the rear chamber of combined expansion reservoir.

If automatic transmission fitted:	adjust Bowden cable for control pressure (27–1000).
Oil drain plugs	check tightening torques.
Oil level of engine and transmission	adjust to correct level.
Coolant	pour in, check anticorrosion/antifreeze agent and adjust to correct ratio (20–0100).
Leaktightness	check.
Fault memory	read, erase; see note.

Special tools



Commercially available tool

Removal device components model 3188 (lifting capacity 500 kg)	e. g. Wilbär GmbH und CO KG 42895 Remscheid
---	---

Shop-made tool

Guard plate for radiator/condenser	sizes approx. 400 × 680 × 1mm
------------------------------------	-------------------------------

Note

Stored faults which may be caused by disconnecting cables or by simulation during removal/installation or test work, must be erased in the fault memories after completing operations.

See Diagnosis Manual 2, Index 0:
Connecting and using test equipment.



In the case of engine damage involving damage to the pistons, valves etc., parts may have got in as far as the catalytic converter, or pre-catalytic converter.

When replacing the engine, it is essential to remove such parts otherwise they will be pulsed back into the cylinders as a result of the gas vibrations in the exhaust system and may once again cause engine damage.

In addition, these parts may cause mechanical damage to the catalytic converter.

It is therefore essential to remove any foreign bodies in the exhaust system when dealing with such types of engine damage.

Catalytic converters which have been damaged must be replaced.

Model 202 up to August 1994:

A gasket 460 251 18 80 is inserted between engine and transmission and a gasket 102 151 00 80 between engine and starter to avoid water which gets in at the separation points corroding the flywheel, clutch etc. These gaskets should be replaced by the sealant 002 989 45 20 when performing repairs. As of August 1994 the water drain at the firewall has been modified.

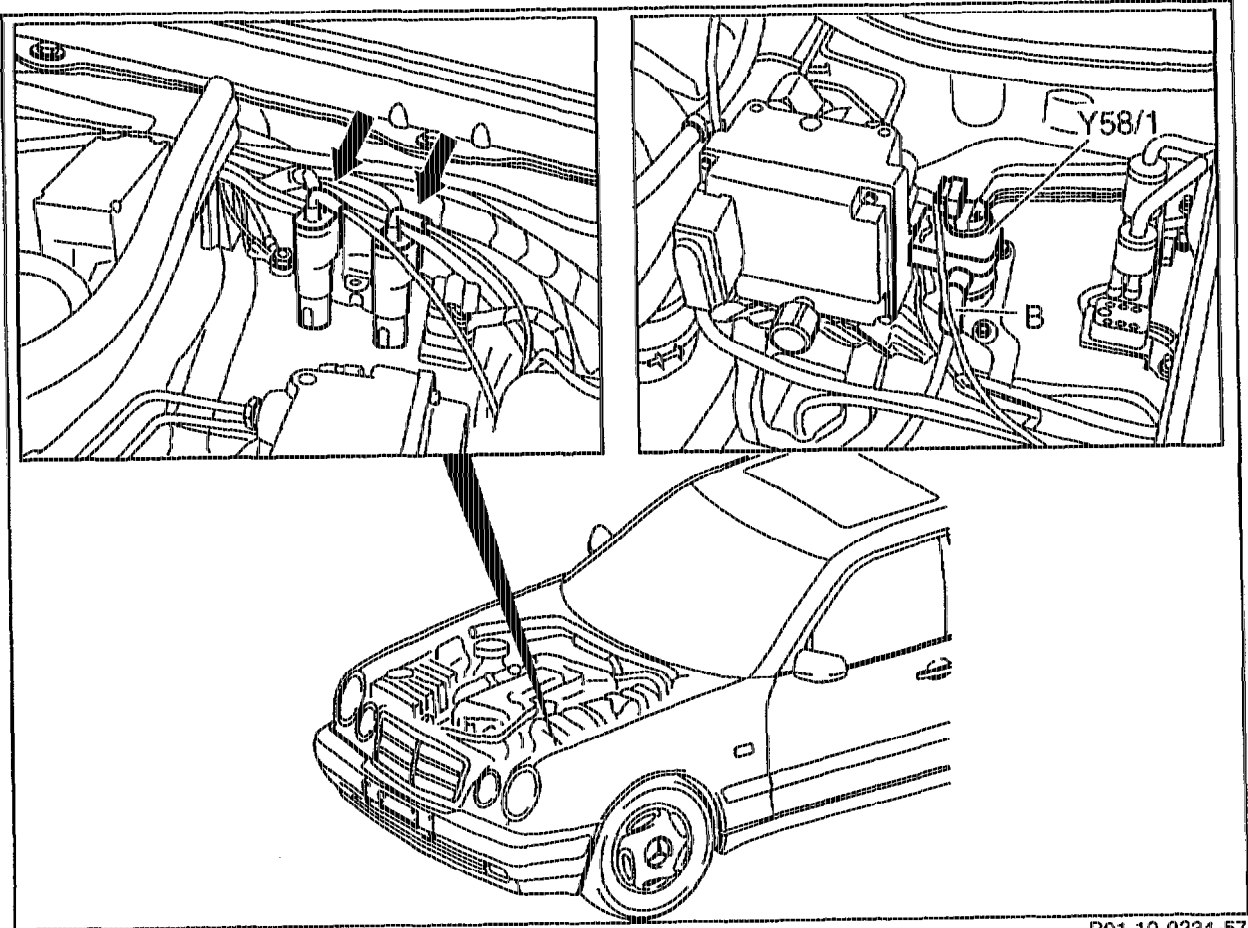


C. Model 210

Preceding work:

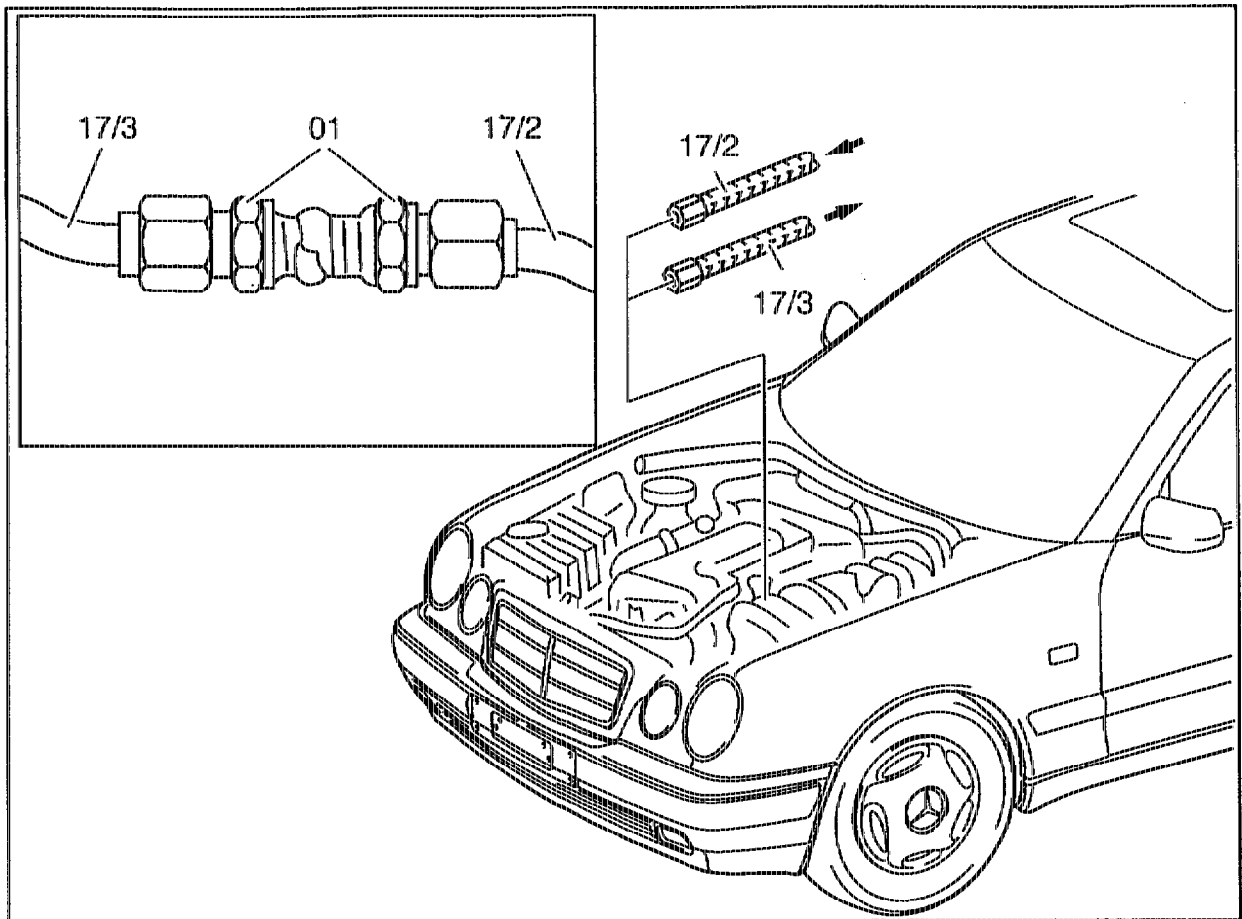
Bottom engine compartment panel removed
(Maintenance Manual 6190)
Viscous fan removed (20-3120)
Radiator removed (20-4200)
Hot film air mass filter removed (AR07.51-1453D)
Air cleaner removed

Operation no. of operation texts and work units or standard texts
and flat rates:
01-2400



P01.10-0234-57

If AC fitted:	attach guard plate to condenser.
Engine wiring harness	disconnect, connect (01-0310).
Vacuum pipes (arrows) at switchover valves	disconnect, fit on.
Pipe (B) at purge control valve (Y58/1)	disconnect, fit on.
Vacuum pipe to brake servo unit at intake manifold	unbolt, bolt on.

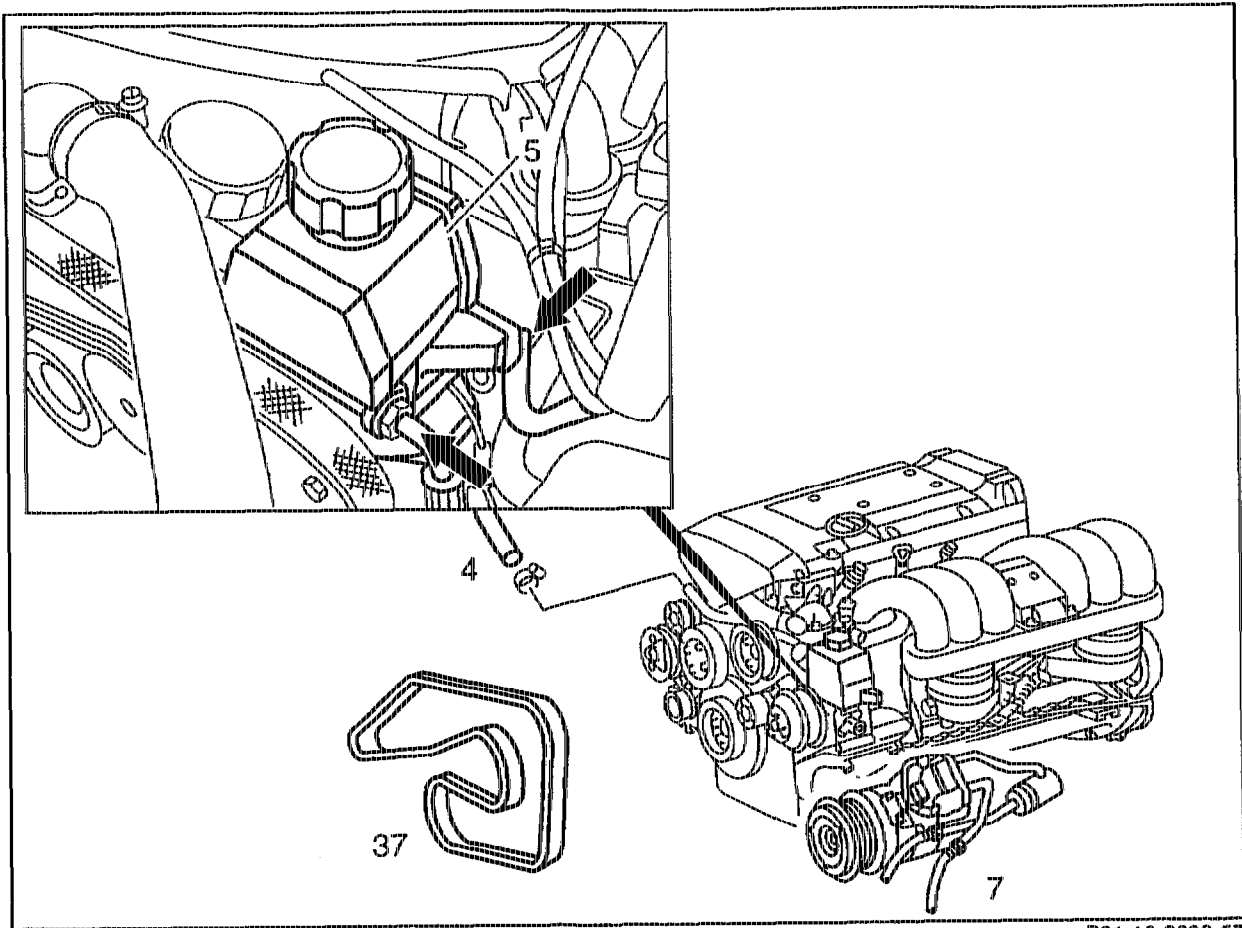


P01.10-0235-57

Fuel filler cap	open and release pressure in fuel tank.
Fuel pipes (17/2) and (17/3) at engine compartment partition	disconnect, connect.
Fuel pipes (17/2) and (17/3)	seal with pipe union (01) (shop-made).
Accelerator control Bowden cable	detach, attach.
Hydraulic fluid of power steering pump	extract from reservoir with priming pump 112 589 00 72 00 for extracting oil.

Note

Filling, bleeding power steering pump (AR46.30-0010A).



P01.10-0236-57

Suction and pressure oil pipes (arrows) at power steering pump (5)

Coolant hose (4)

If AC fitted:

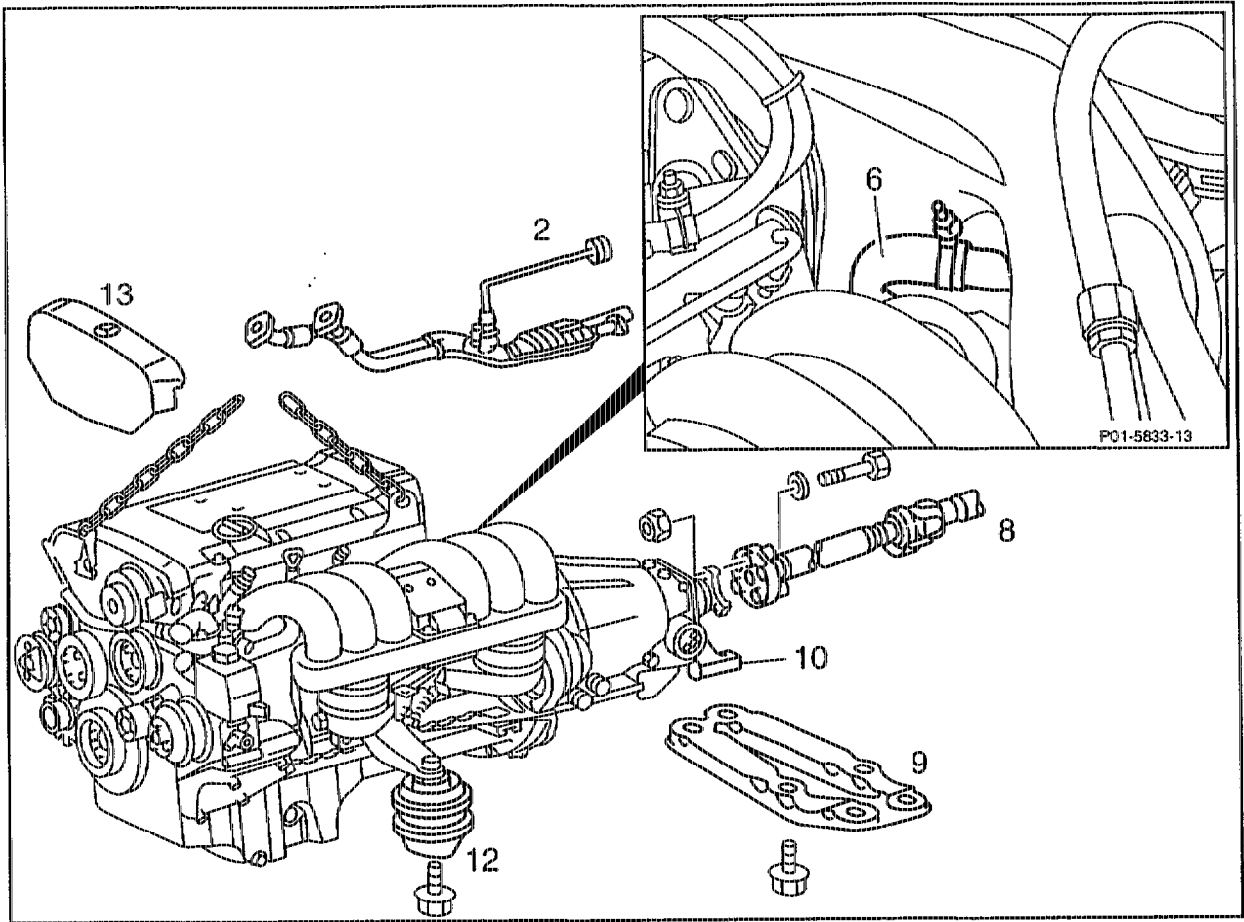
If AC fitted:

unbolt, bolt on.

disconnect, connect.

remove poly V-belt (37), install (13-1200).

unbolt AC compressor (7) with pipes connected, attach to side of engine compartment, bolt on.

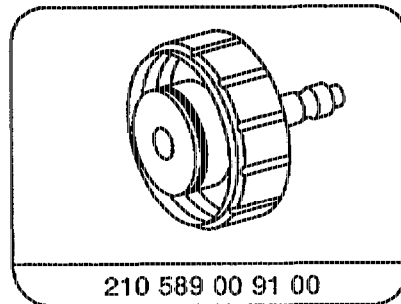
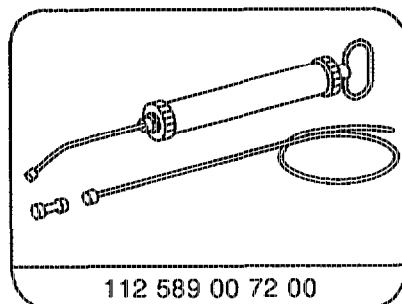
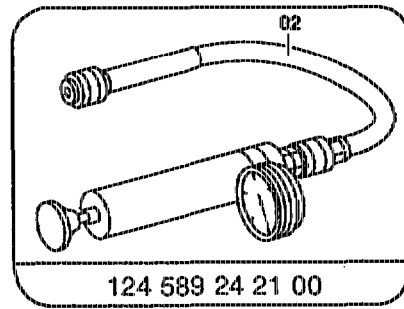
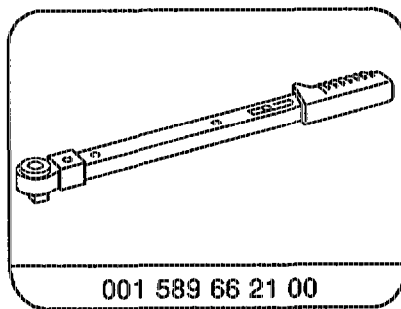
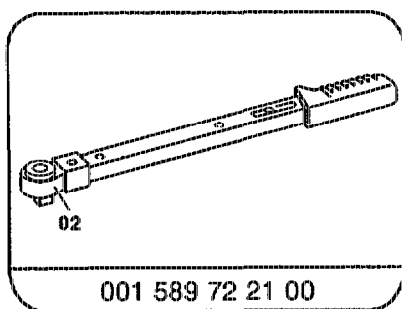


P01.10-0237-57

Rear coolant hose (6)	disconnect, connect.
Exhaust system (2)	remove, install.
Coolant at crankcase	drain (20-0100).
Front propeller shaft (8) at transmission	unbolt, bolt on (AR41.10-0050B).
Propeller shaft (8)	push to the rear.
Rear engine support (9)	remove, install (22-2120).
Shift rod of automatic transmission or shift rods of manual transmission	detach, attach.
Manual transmission:	separate hydraulic pipe to slave cylinder at hose connection.
Note	
Seal pipes with dummy plugs or extract fluid from the rear chamber of combined expansion reservoir.	
Engine mount (12) at front suspension support ..	unbolt, bolt on (22-2110).
Front cover (13)	remove, install.
Engine hoist	attach to both lifting lugs of engine; use engine supporting bar if necessary.
Engine together with transmission	tilt.

Engine	remove, install.
Front engine mounts (12) and rear engine mounts (10)	examine.
If automatic transmission fitted:	adjust Bowden cable for control pressure (27-1000).
Oil drain plugs	check tightening torques.
Oil level of engine and transmission	adjust to correct level.
Coolant	pour in, check anticorrosion/antifreeze agent and adjust to correct ratio (20-0100).
Leaktightness	examine.
Fault memory	read, erase.

Special tools



Commercially available tool

Removal device components model 3188
(lifting capacity 500 kg)

e. g. Wilbär GmbH
und CO KG
42895 Remscheid

Engine supporting bar

e. g. Schairer
Weidenstraße 5
72459 Albstadt
Order no. 0304.01.001

Shop-made tool

Guard plate for radiator/condenser

sizes approx. 400 × 680 × 1 mm

Note

Stored faults which may be caused by disconnecting cables or by simulation during removal/installation or test work, must be erased in the fault memories after completing operations.

See Diagnosis Manual 2, Index 0:
Connecting and using test equipment.



In the case of engine damage involving damage to the pistons, valves etc., parts may have got in as far as the catalytic converter, or pre-catalytic converter.

When replacing the engine, it is essential to remove such parts otherwise they will be pulsed back into the cylinders as a result of the gas vibrations in the exhaust system and may once again cause engine damage.

In addition, these parts may cause mechanical damage to the catalytic converter.

It is therefore essential to remove any foreign bodies in the exhaust system when dealing with such types of engine damage.

Catalytic converters which have been damaged must be replaced.