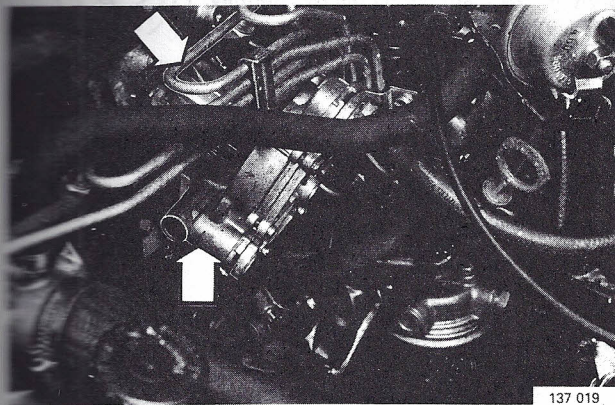


Cylinder head, re-torquing of bolts

To be carried out after 600-1200 miles (1000-2000 km)
on cold or nearly cold engine.

H26

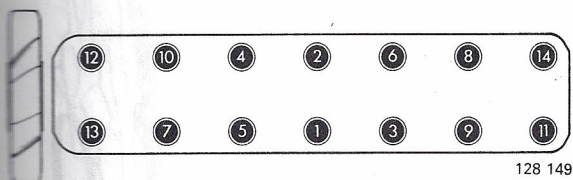


Remove:

- hose from intercooler (D 24 TIC)
- hose extension on intake manifold (D 24 TIC)
- valve cover
- vacuum pump
- pump plunger

Access to one of the cylinder head bolts is restricted by the pump plunger, which must be removed.

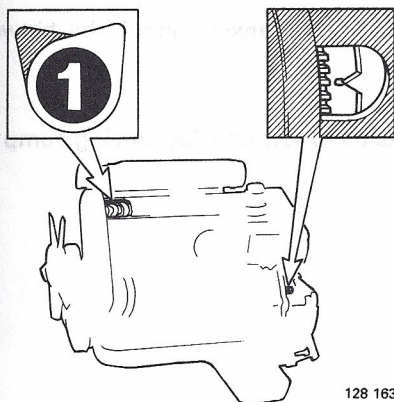
H27



Tighten each bolt in turn as indicated

Angle-tighten bolts 90°. Note! Tighten the bolts in one movement without stopping. Do not slacken bolt first.

H28



Install:

- valve cover
- pump plunger – vacuum pump
- hose extension on intake manifold (D 24 TIC)
- hose from intercooler (D 24 TIC)

Change the pump O-ring if necessary.

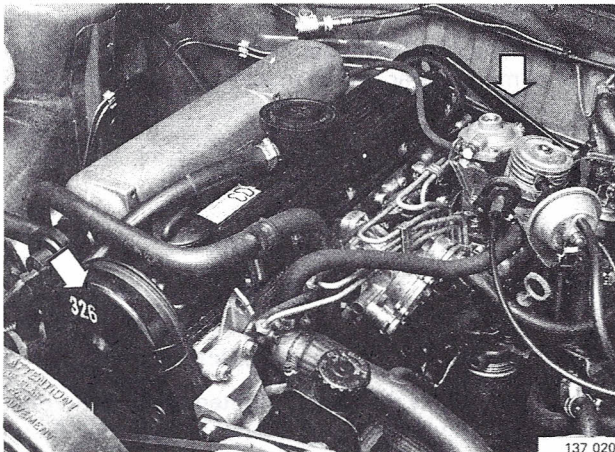
Check that cylinder No. 1 is at T.D.C-injection. Assembly marks in pump gear and mounting bracket should be opposite each other.

O-mark in flywheel opposite mark in flywheel casing.

J. Timing gear and pump belts, adjustment

Special tool: 5197

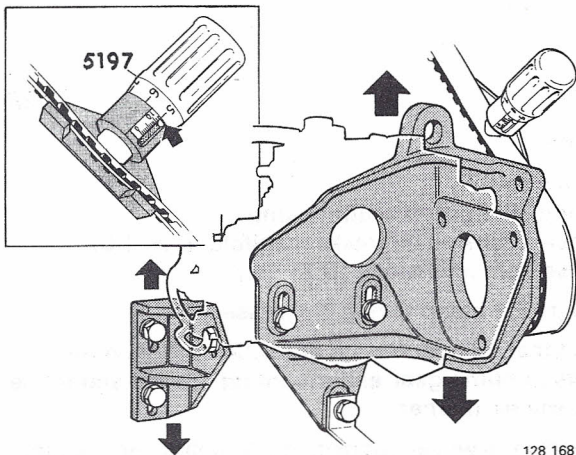
Tension of belts affects injection timing. Consequently follow instructions below carefully. Both the timing gear and pump belts may squeal if they are too tight.



Remove alternator
(cars with a high alternator)

J1

Remove front and rear gear covers



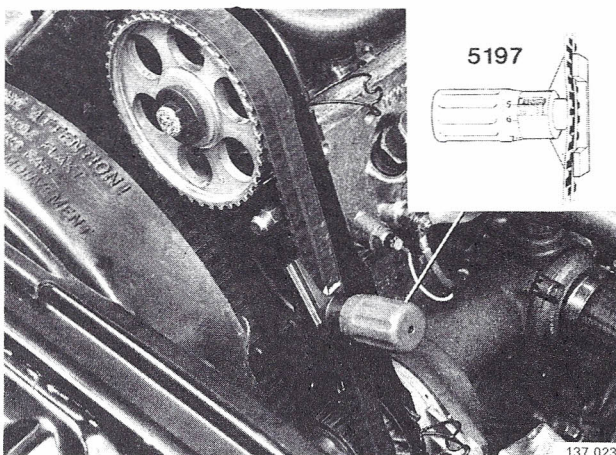
J2

Check belt tension

Use gauge **5197** . Tension should be between **12-13** units.

If incorrect

Adjust tension to 12.5 units by moving pump mounting brackets.

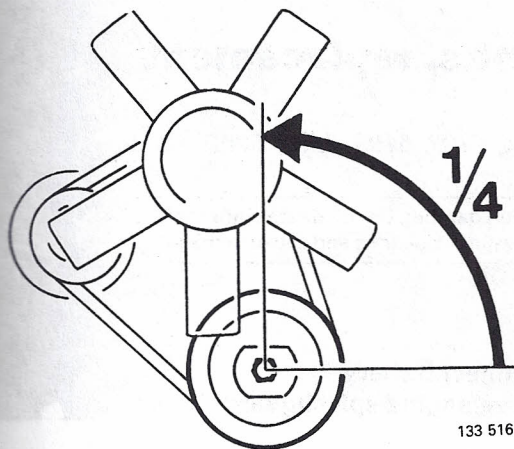


J3

Check timing gear belt tension

Use gauge **5197** . Tension should be between **12-13** units.

J4



Incorrect belt tension:

Unscrew expansion tank cap to release pressure from cooling system.

Turn engine approx. turn anti-clockwise to obtain slack part of belt on driving side. (If this is not done injection pump setting will be false.)

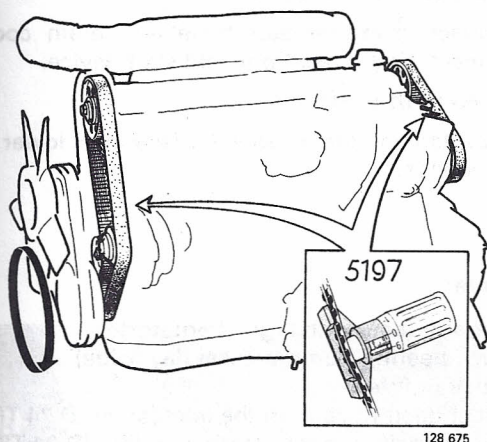
Turn crankshaft with 27 mm socket or special tool **5188**.

Adjust tension to 12.5 units on gauge 5197 by moving coolant pump.

J5

If belt tension has been adjusted on any belt

Turn engine at least one turn clockwise and check that belt tension is **12-13** units on tool 5197. Adjust if necessary according to operation J4 and recheck tension.



J6

Install timing gear covers

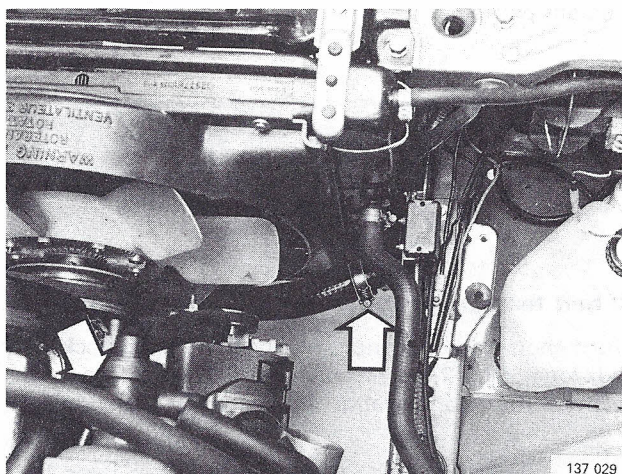
Install power steering pump plus bracket. Install alternator in cars with high alternator.

After work which requires the removal/installation of the alternator, always check that the protective cover has been replaced in D 24 TIC and other cars with a high alternator.

K. Timing gear and pump belts, replacement

Special tools: 5187, 5188, 5190, 5193, 5194, 5197, 5199, 5201, 5202

Important! Engine may only be turned by means of vibration damper. Do not rotate crankshaft or camshaft when timing gear belt is removed or valves may strike pistons and cause damage.



K1

Disconnect battery
Remove engine splashguard

K2

Drain coolant

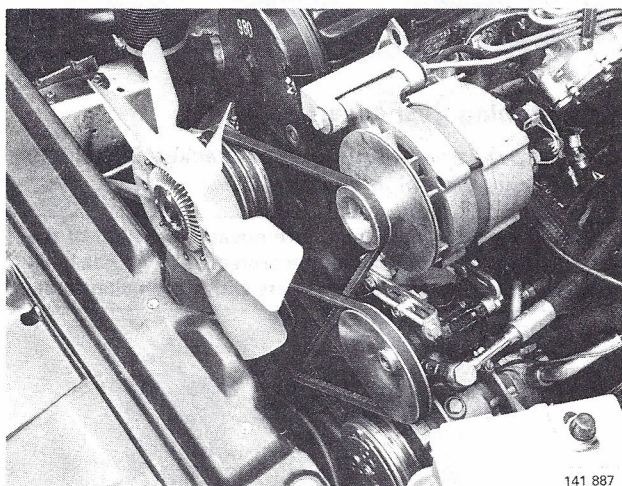
Unscrew expansion tank cap.

Vehicles without drain tap:

Disconnect lower radiator hose and drain coolant.
Disconnect lower hose from cold start device.

Vehicles with drain tap:

Unscrew tap and drain coolant. Disconnect lower hose from radiator.



Remove:

- alternator (cars with high alternator)
- power steering-pump bracket (lay aside)
- AC belt (if fitted)
- right and left hose from the intercooler (D 24 TIC)
- hose extension on the intake manifold (D 24 TIC)

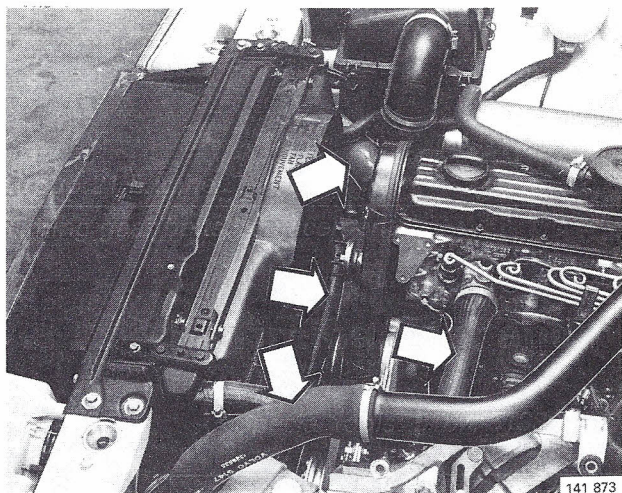
K3

Remove:

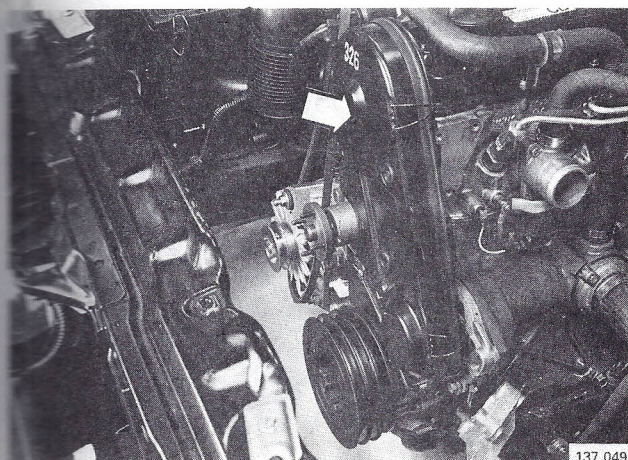
- radiator fan with spacing ring and pulley
- radiator hoses
- electrical connections to the radiator hose

Lift out radiator.

Important! D 24 TIC : leave the intercooler in place.

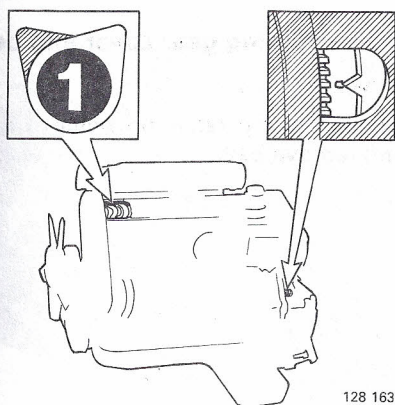


K4



Remove:

- valve cover
- forward and rear timing gear covers



Turn engine until cyl. 1 is at T.D.C.-injection

Always use vibration damper centre bolt to turn engine.
27 mm socket or wrench 5188.

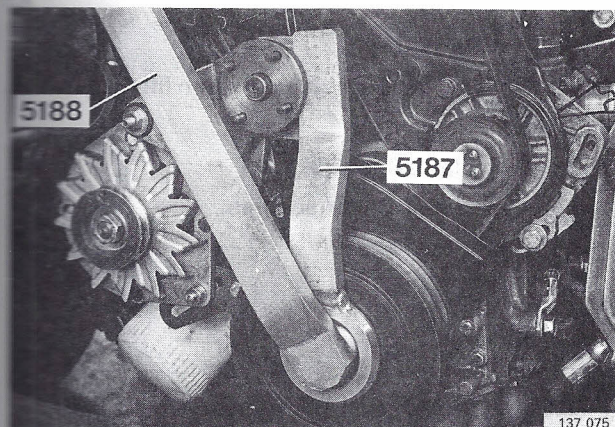
Both cyl. 1 cams should point obliquely upwards.
Flywheel at zero.

K5

Remove vibration damper centre bolt

Use 5187 to prevent pulley from rotating, and socket 5188 to unscrew bolt.

It may be necessary to turn engine **slightly** so that 5187 rests on fan bearing.

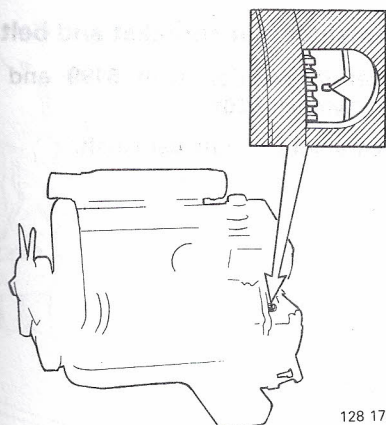


K6

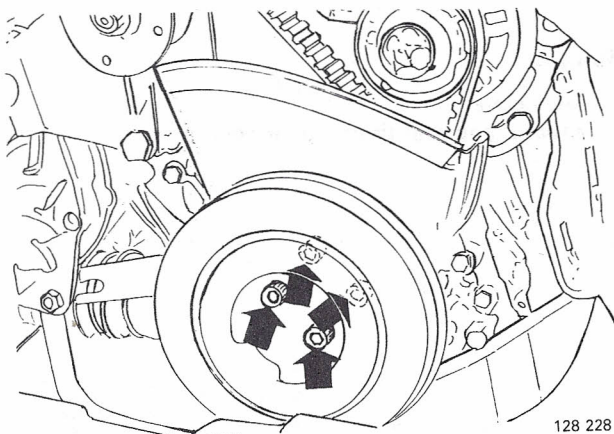
Check that cyl. 1 is at T.D.C.-injection

Check O-mark on flywheel.

Adjust if necessary. Use 5187 to turn engine.



K7

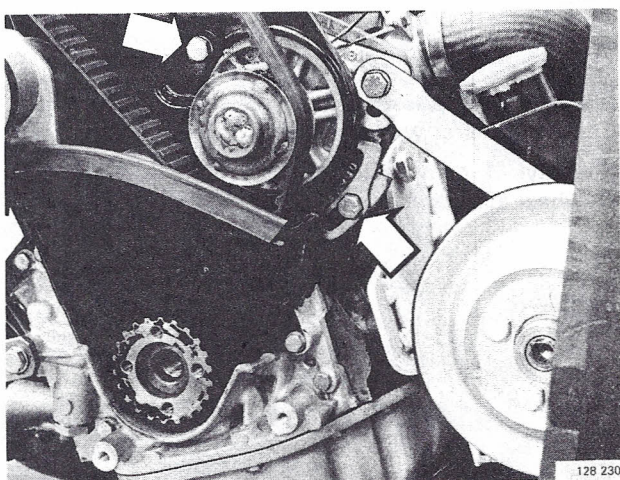


Remove vibration damper

Remove four in-hex screws (6 mm).

Pull off vibration damper. **Note!** Crankshaft gear may sometimes stick to vibration damper. If necessary, tap slightly to separate.

K8

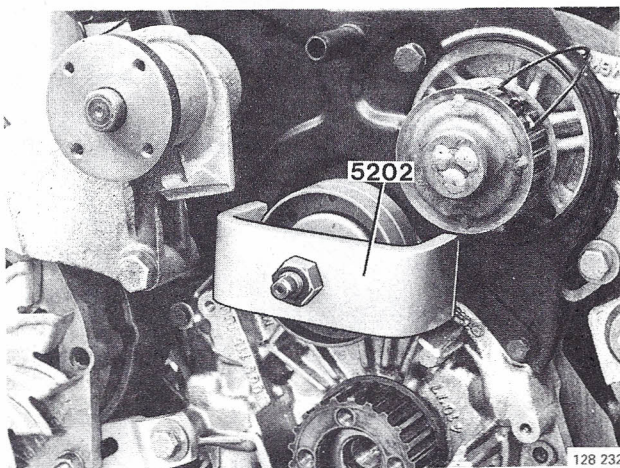


Remove lower timing gear cover and belt

Remove cover.

Slacken coolant pump retaining bolts to release belt tension and remove belt.

K9



Replace idler pulley

Pulley should always be replaced when fitting new belt.

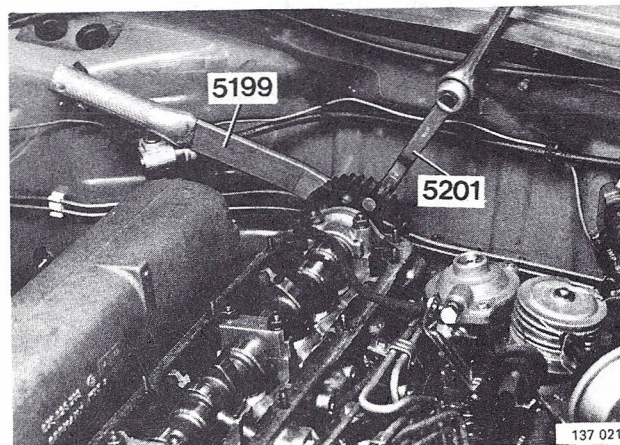
Remove centre bolt.

Withdraw pulley using **5202**.

Tap on new pulley. Check position.

Install centre bolt.

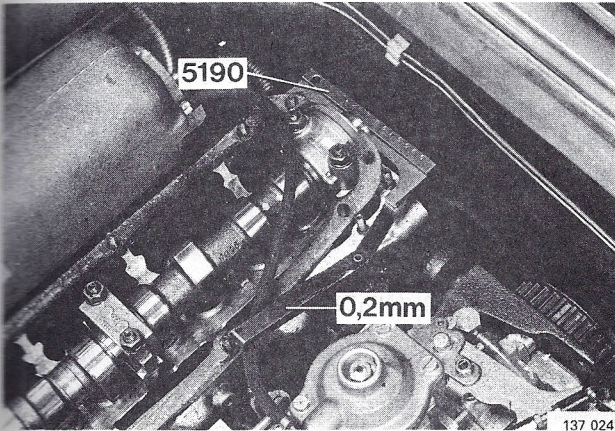
K10



Remove camshaft rear sprocket and belt

Hold sprocket in position with **5199** and unscrew sprocket with wrench **5201**.

Note! Take care not to rotate camshaft.

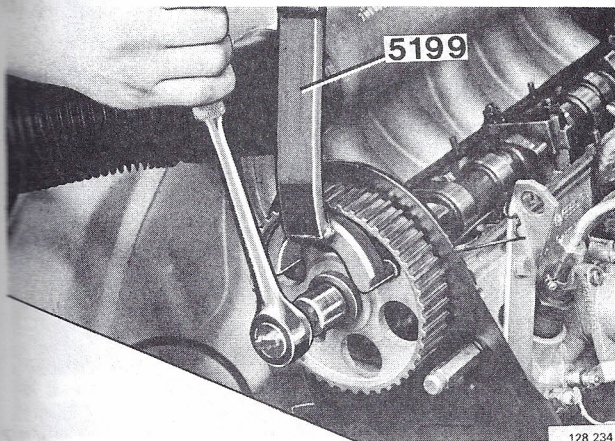


K11

Lock camshaft in position

Lift valve cover gasket.

Place gauge **5190** at rear of camshaft. Insert a **0.2 mm** (0.008 in) feeler gauge beneath left side of gauge to compensate for timing gear clearance.



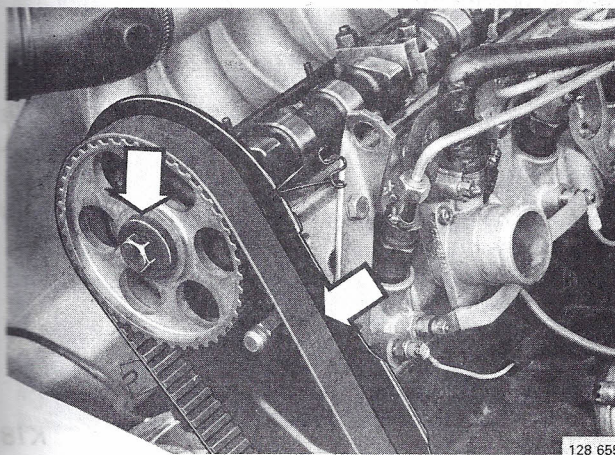
K12

Remove camshaft front sprocket

Use **5199m** to hold sprocket in position when loosening bolts.

Tap sprocket to free it from camshaft.

It is advisable on high mileage vehicles (eg. 75,000 miles = 120,000 km) to replace the coolant pump O-ring. See pages 213 operations BJ11-14.

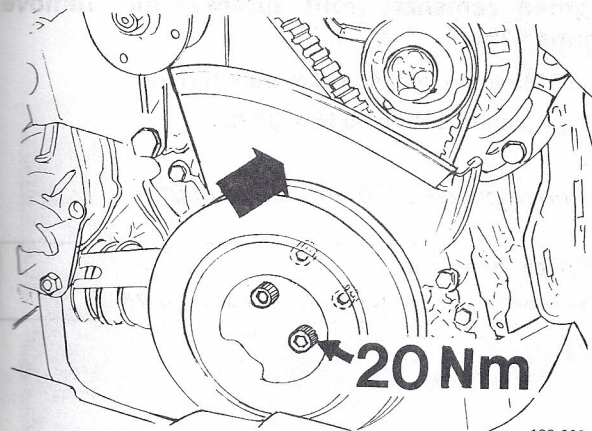


K13

Install gear belt and camshaft front sprocket

Make sure that belts fit properly on all gears.

Install centre bolt, hand tight. It should be possible to turn sprocket on camshaft without camshaft rotating.

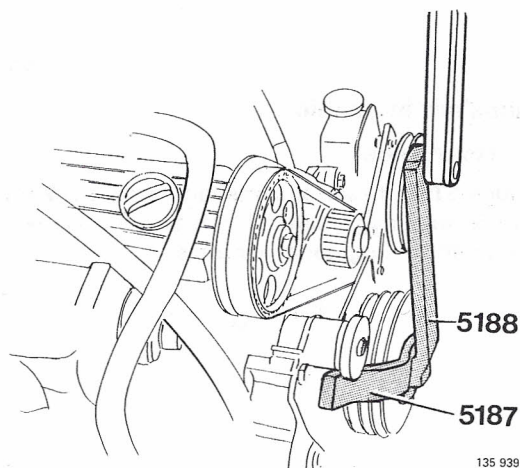


K14

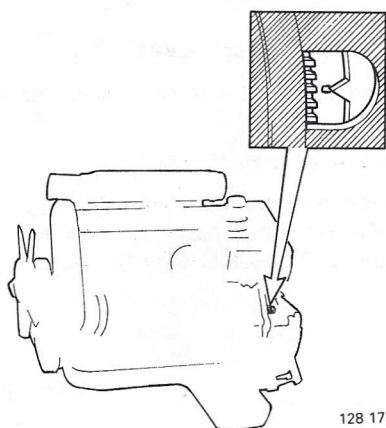
Install lower timing gear cover and vibration damper

Damper can be installed in only one way. Pin on crankshaft gear must fit in vibration damper.

Torque inhex bolts to **20 Nm** (15 ft. lbs.).



135 939



128 175

K15

Install centre bolt

Smear threads and mating surface with sealer P/N 277 961-9.

Use wrench **5187** (rest on cooling fan journal) to hold vibration damper and torque centre bolt to **350 Nm** (255 ft. lbs.) with wrench **5188**.

Note! Torque of 350 Nm (255 ft. lbs.) applies only if wrench 5188 is used. Also, torque wrench must be in line with wrench 5188.

K16

Check that cyl. 1 is at T.D.C.-injection

Check O-mark on flywheel.

Adjust if necessary.

K17

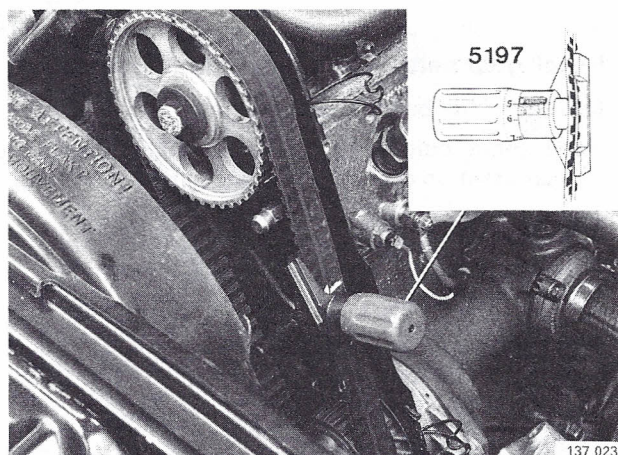
Set belt tension

Adjust tension by moving coolant pump.

Use gauge **5197** to check tension.

Attach gauge to belt and set to **12.5** units. Stretch belt until mark on gauge plunger is flush with sleeve. Tighten nut.

Depress belt with strong hand pressure and recheck/adjust tension.



137 023

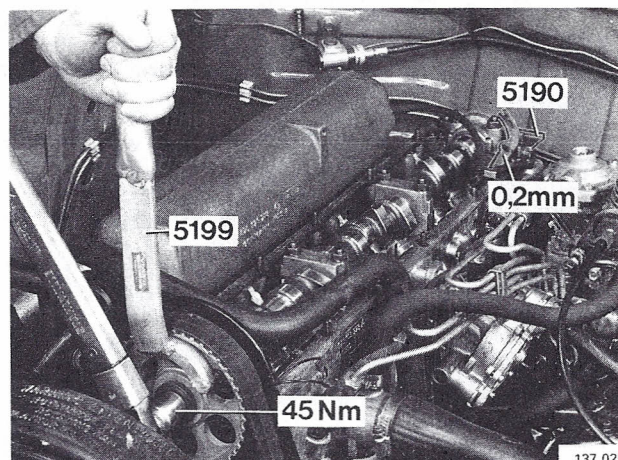
K18

Tighten camshaft front sprocket and remove gauge 5190

Use **5199** to prevent sprocket from turning.

Torque centre bolt to **45 Nm** (33 ft. lbs.).

Remove gauge 5190 and feeler gauge.

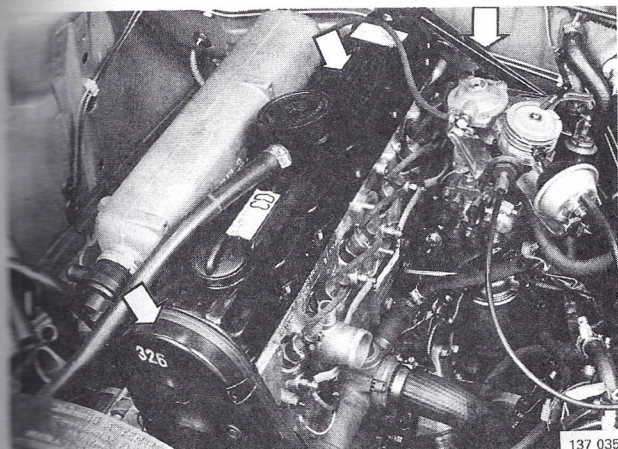


137 025

Set injection pump

See "Setting of injection pump" page 32, C12-C22.

K19

**Install valve cover**

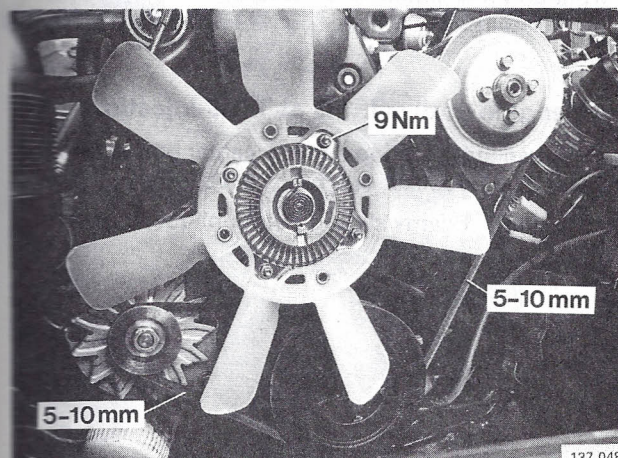
Use new gaskets if necessary.

K20

Install timing gear covers (front and rear)

Use new gaskets if necessary

K21

**Install:**

- AC belt
- alternator in cars with high alternator
- power steering-pump and bracket
- radiator
- radiator fan with belt disk
- radiator hoses and electrical connections to the thermostat
- hose extension to the intake manifold (D 24 TIC)
- hoses to intercooler (D 24 TIC)

Connect the battery

After work which requires the removal/installation of the alternator, always check that the protective cover has been replaced in D 24 TIC and other cars with a high alternator.

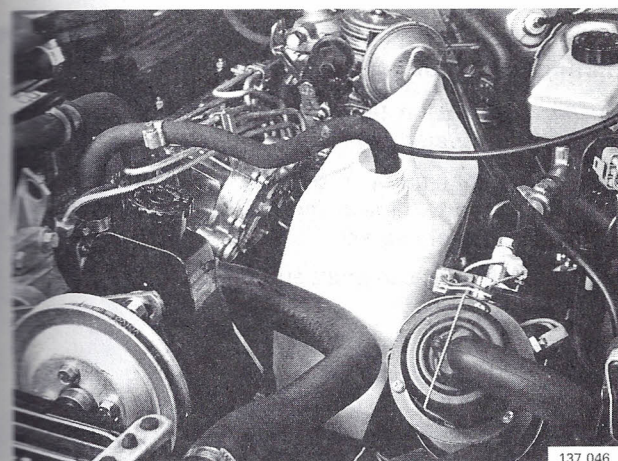
K22

Prepare for bleeding of of cooling system

Disconnect upper hose from cold start device. Place drip pan beneath hose. Hold end of hose at approximately same level as expansion tank.

(By following this method air locks in the cooling system will be avoided.)

K23

**Filling coolant:**

	D 24	D 24 T	D 24 TIC
Capacity, (approx. litres)			
with manual transm.	9.4	11.0	10.7
with automatic transm.	9.2	10.9	10.6

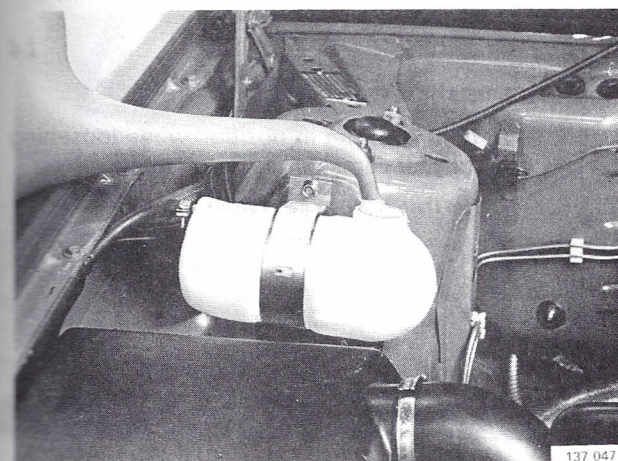
(For tropical use add approx. 0.6 litres)

Use only type C coolant (blue-green).

Vehicles with CU: set heat control to give max heat. Mode selector must not be set in MAX.

Vehicles with ACC: set mode selector in OFF.

Start engine and run at above idle for 5 minutes to warm-up engine. Add coolant during this time. Reconnect hose to cold start device. Top up expansion tank to above MAX and screw on cap.



L. Camshaft, removal

Special tools: 5199, 5201

L1

Remove:

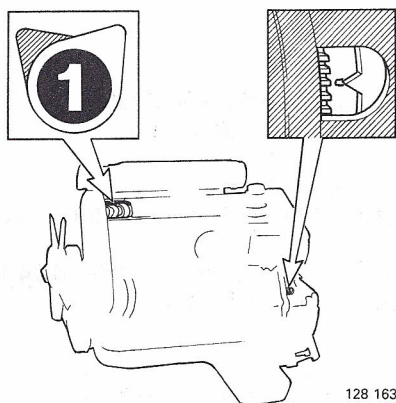
- alternator in cars with high alternator
- hose from intercooler (D 24 TIC)
- hose extension on intake manifold (D 24 TIC)
- power steering pump with bracket
- hose for crankcase ventilation
- valve cover
- front and rear timing gear covers

L2

Turn engine until cyl. 1 is at T.D.C-injection

Always use the vibration damper center bolt to turn the engine. 27 mm socket or wrench **5188**.

Both cylinder 1 cams should point obliquely upwards.
Flywheel at 'O'.



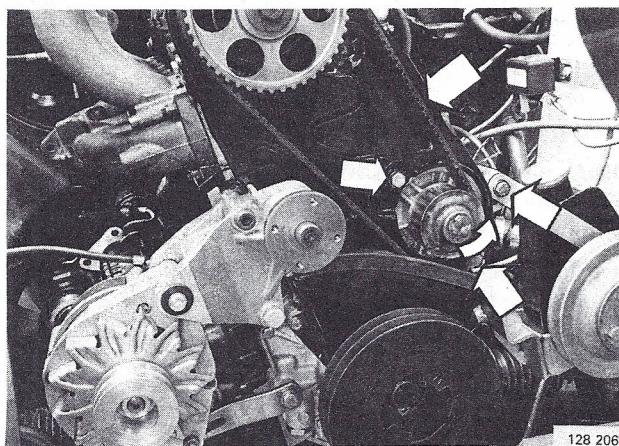
L3

Remove belt from camshaft sprocket

Unscrew expansion tank cap to release overpressure from cooling system.

Slacken coolant pump mounting bolts and belt tensioner. Tighten two lower mounting bolts to avoid unnecessary loss of coolant.

Remove belt from camshaft sprocket.

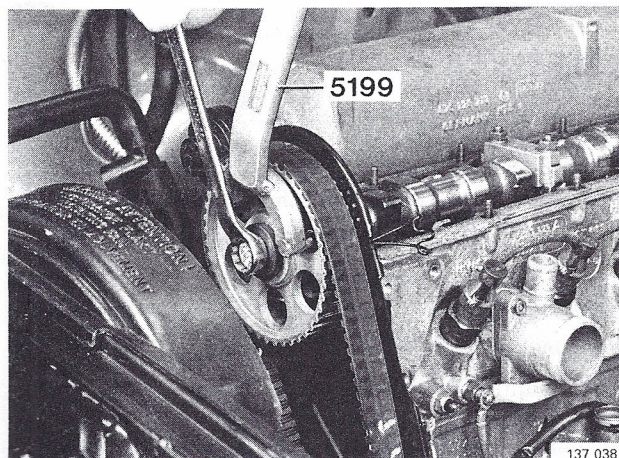


L4

Remove camshaft front sprocket

Use **5199** to hold sprocket in position when loosening bolt. Make sure that camshaft does not rotate.

Tap sprocket to free it from camshaft.



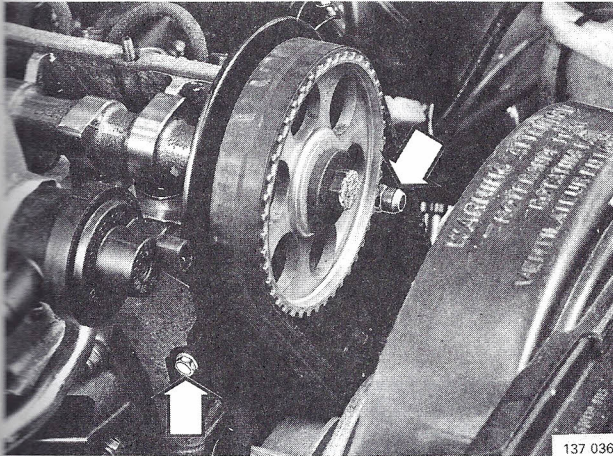
L5

Detach belt shield from cylinder head

Remove two upper retaining bolts.

Bend out shield to free it from camshaft. If necessary slacken coolant pump upper bolt.

Keep shield in outer position with a piece of wood.



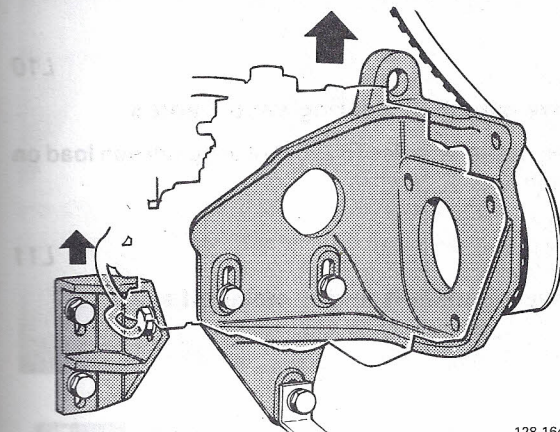
L6

Lift off pump belt

Slacken mounting bolts for injection pump bracket to release belt tension.

Tighten one bolt so that pump remains in upper position.

Lift off belt.

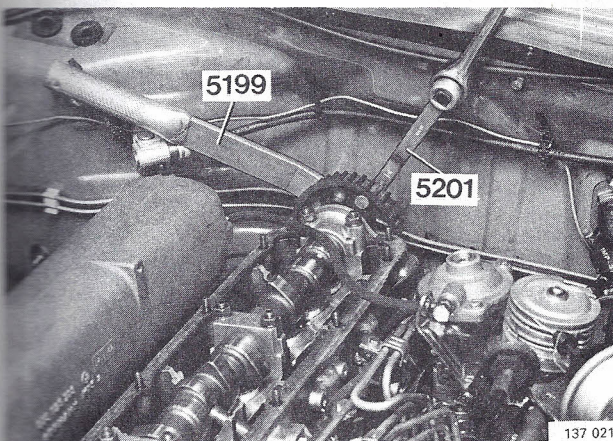


L7

Remove camshaft rear sprocket

Hold sprocket in position with **5199** and unscrew sprocket with wrench **5201**.

Note! Take care not to rotate camshaft.

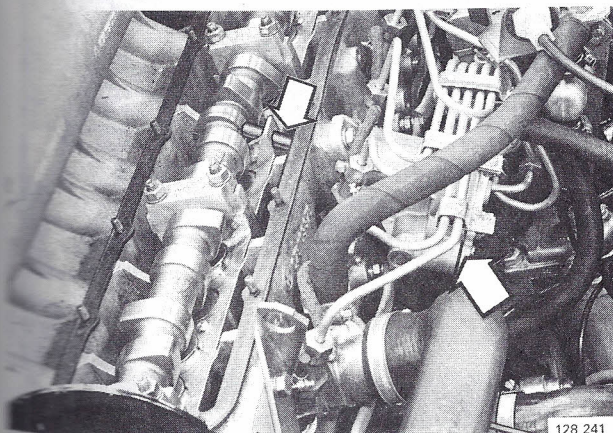


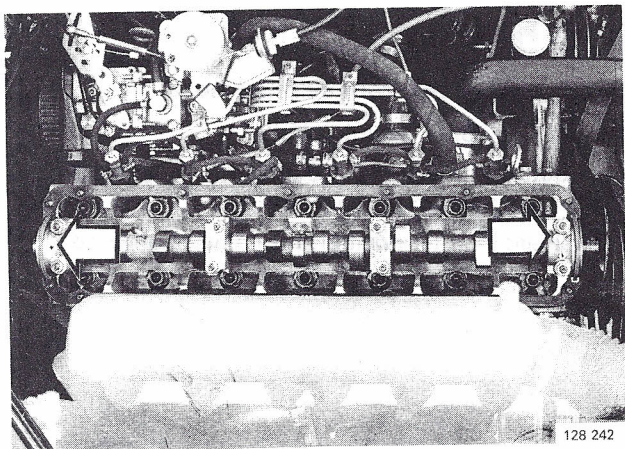
L8

Remove vacuum pump and pump plunger

Remove pump retaining nuts and place pump on wheelarch.

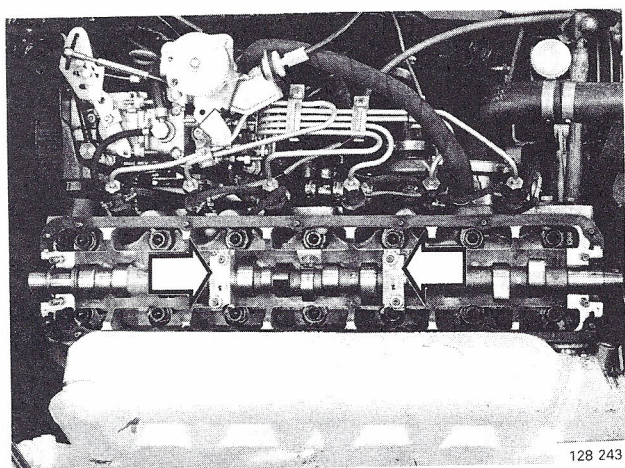
Withdraw plunger from cylinder head.





L9

Remove camshaft bearing caps 1 and 4



L10

Remove camshaft bearing caps 2 and 3

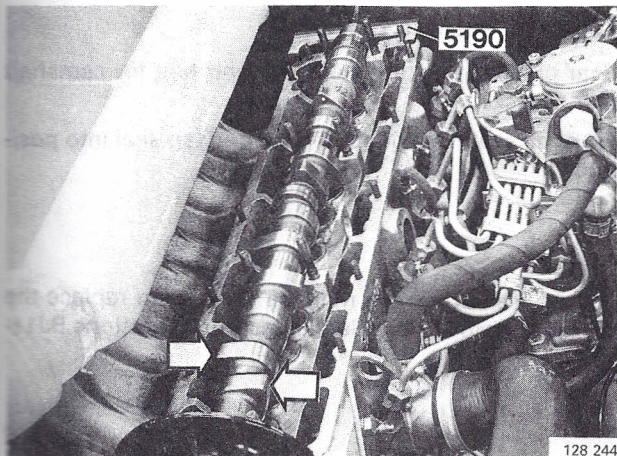
Slacken nuts crosswise to avoid placing uneven load on camshaft.

L11

Lift away camshaft and remove oil seals

M. Camshaft, installing

Special tools: 5190, 5193, 5194, 5195, 5196, 5197, 5199, 5200, 5201



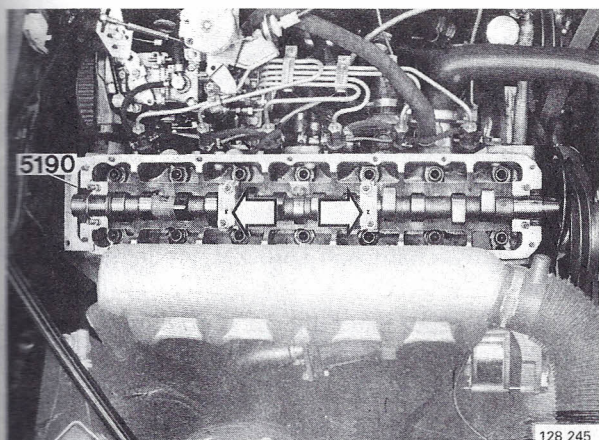
M1

Place camshaft in cylinder head

Lubricate contact surfaces of camshaft and bearings.

Place gauge **5190** at rear of camshaft.

Important: Both cams for number 1 cylinder must point diagonally up, see arrows.

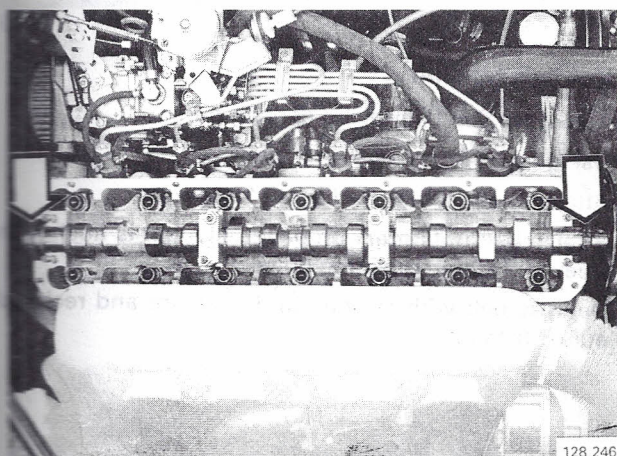


M2

Install camshaft caps 2 and 3

Install caps correctly, center is off-set.

Tighten nuts crosswise to avoid warp. Keep camshaft in position with gauge **5190** at rear when tightening caps.



M3

Remove gauge 5190

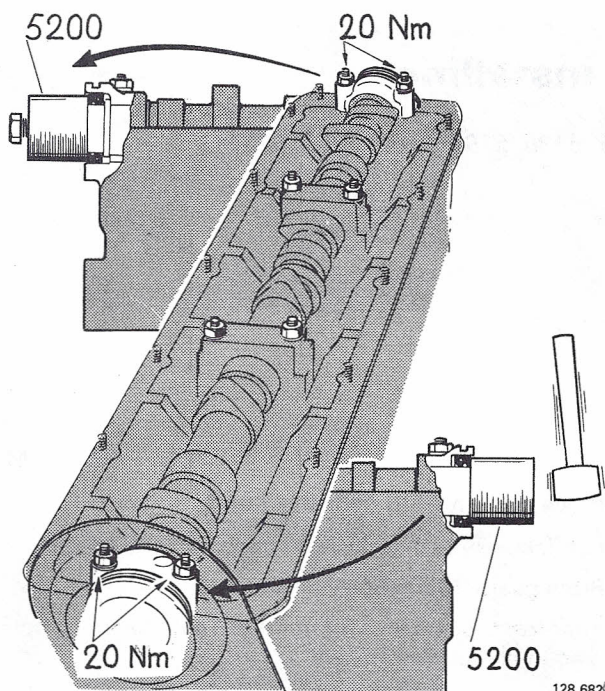
M4

Press in new camshaft oil seals

Oil the seals.

Do not push in seals to bottom position. Make sure that seals are fitted properly.

Camshaft, installing



M5

Install camshaft caps 1 and 4

Make sure that the thrust washer for camshaft cap 4 sits correctly.

M6

Torque all four caps

Torque = 20 Nm (15 ft. lbs.).

M7

Tap in oil seals to bottom

Rear oil seal: Use adapter 5200 and bolt for camshaft rear sprocket.

Front oil seal: Use adapter 5200 and tap seal into position.

It is advisable on high mileage vehicles to replace the coolant pump O-ring. See pages 213 operations BJ11-14.

M8

Install bolts for belt cover

M9

Install gear belt and camshaft front sprocket

Pull belt to ensure that it is seated correctly on crankshaft gear.

Place belt over camshaft sprocket and install sprocket and belt.

Install center bolt hand tight. It should be possible for sprocket to turn on camshaft without camshaft rotating.

M10

Set belt tension

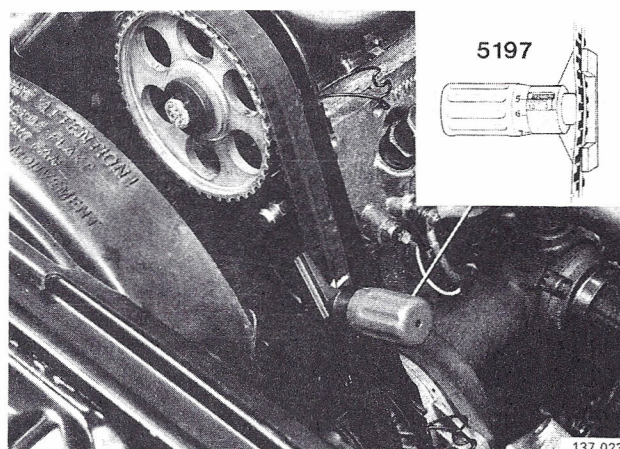
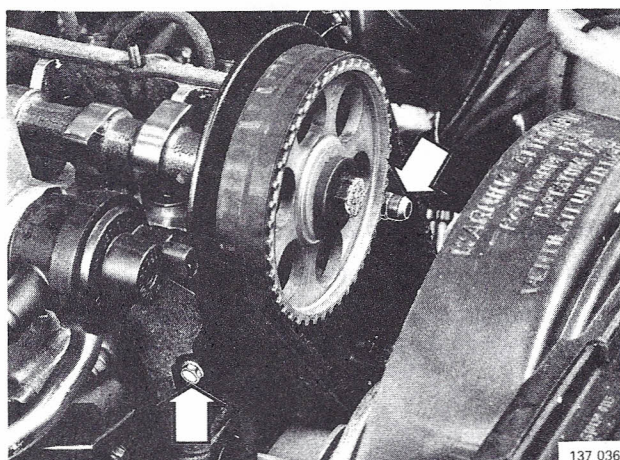
Adjust tension by moving cooling pump.

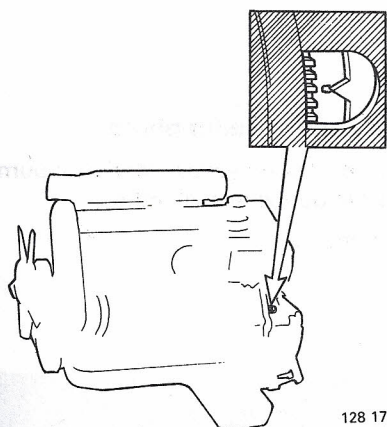
Use gauge 5197 to check tension.

Attach gauge to belt and set to 12.5 units.

Stretch belt until mark on gauge plunger is flush with sleeves. Tighten retaining bolts.

Depress belt with strong hand pressure and recheck/adjust tension.





M11

Make sure cyl. 1 is at T.D.C.

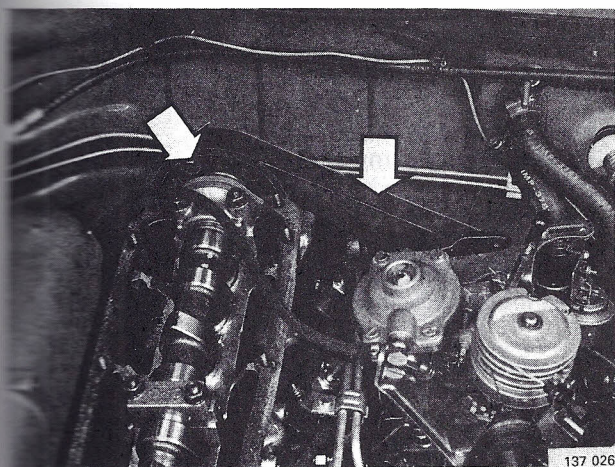
Check 'O' mark on flywheel.

M12

Set camshaft position

Place gauge 5190 at rear of camshaft.

Insert a 0.2 mm (0.008in) feeler gauge beneath left side of gauge to compensate for timing gear clearance.



M13

Tighten camshaft front sprocket

Use 5199 to prevent sprocket from turning.

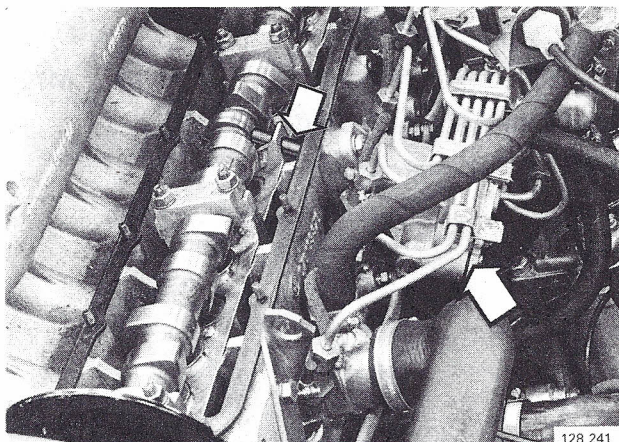
Torque center bolt to 45 Nm (33 ft. lbs.).

M14

Remove gauge 5190 and feeler gauge

Set injection pump

See "Setting of injection pump" page 32, C12-C22.

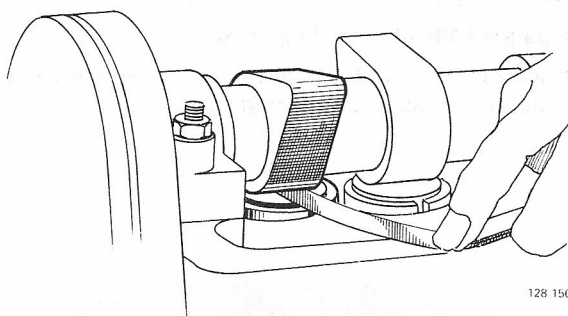


M15

Install plunger and vacuum pump

Ensure cyl. 1 is at T.D.C-injection. Marks on pump gear-mounting bracket opposite each other.

Flywheel at 'O' mark.

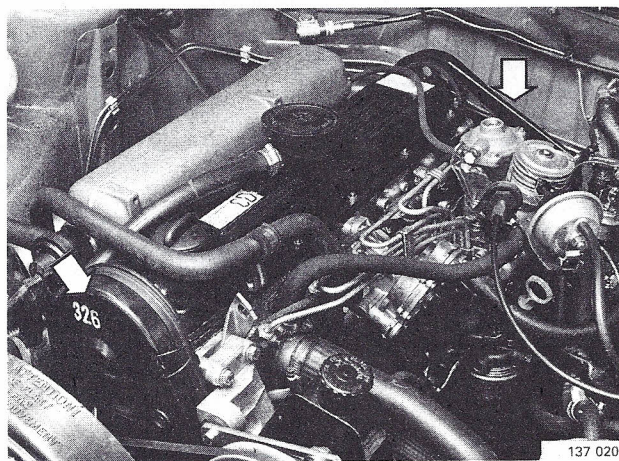


M16

Adjust valve clearance:

See page 27.

Important: Valve clearance must be rechecked after 600-1,200 miles (1,000- 2,000 km).



M17

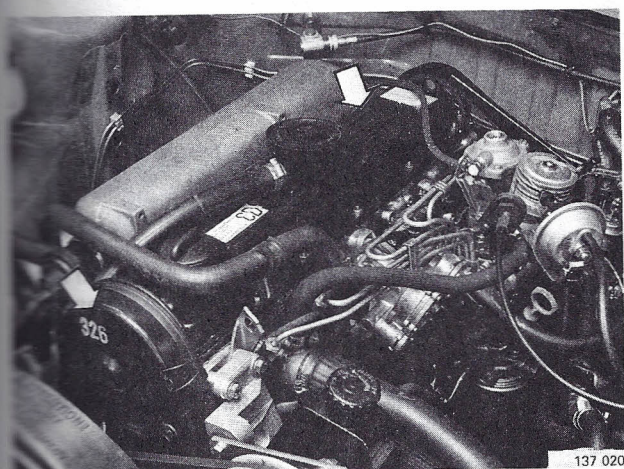
Install:

- front and rear timing gear covers
- power steering pump with bracket
- alternator in cars with high alternator
- valve cover
- hose extension on intake manifold (D 24 TIC)
- hose from intercooler (D 24 TIC)
- hose for crankcase ventilation

After work which requires the removal/installation of the alternator, always check that the protective cover has been replaced in D 24 TIC and other cars with a high alternator.

N. Camshaft front seal, replacement

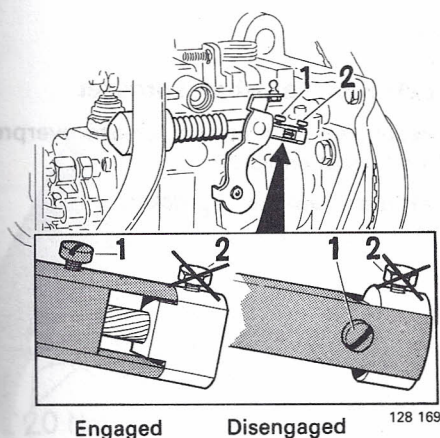
Special tools: 5194, 5197, 5199, 5200



N1

Remove:

- power steering pump with bracket
- alternator in cars with high alternator
- hose from intercooler (D 24 TIC)
- hose extension on intake manifold (D 24 TIC)
- hose for crankcase ventilation
- valve cover
- front timing gear covers



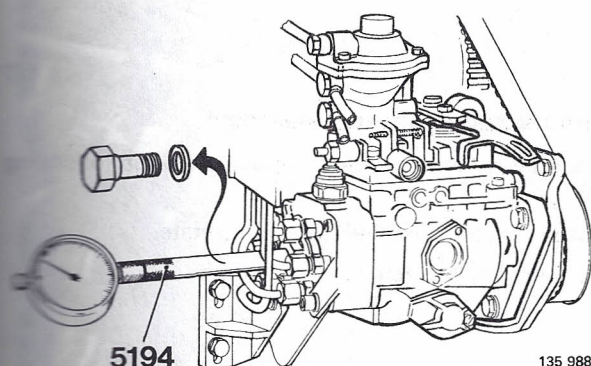
N2

Disconnect cold start device

Slacken screw 1. Push lever forward and rotate sleeve 90°.

Note: Do not turn screw 2. Otherwise it will be necessary to remove cold start device and reset it on a test bench.

Press back lever against stop.

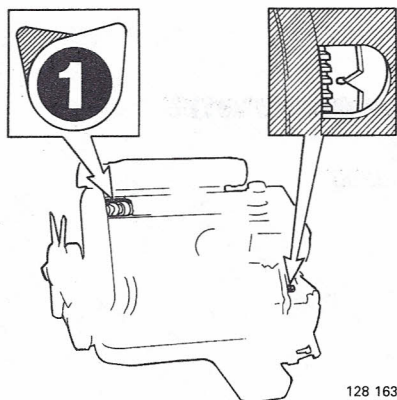


N3

Install dial indicator

Unscrew and remove plug from injection pump distributor.

Install holder 5194 and dial indicator (range 0-3 mm or 0-0.1 in). Set gauge to approx. 2 mm.



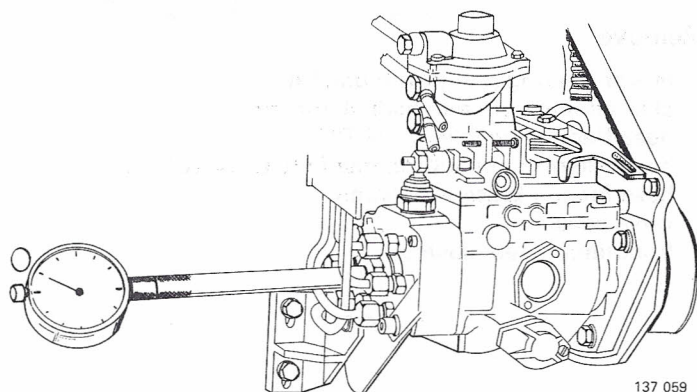
N4

Turn engine until cyl. 1 at T.D.C.-injection

Always use the vibration damper center bolt to turn the engine. 27 mm socket.

Both cylinder 1 cams should point obliquely upwards.

Turn engine approx. turn clockwise past '0' and then back to '0' again, to obtain slack part of belt on driving side. If this is not done injection pump setting will be incorrect.



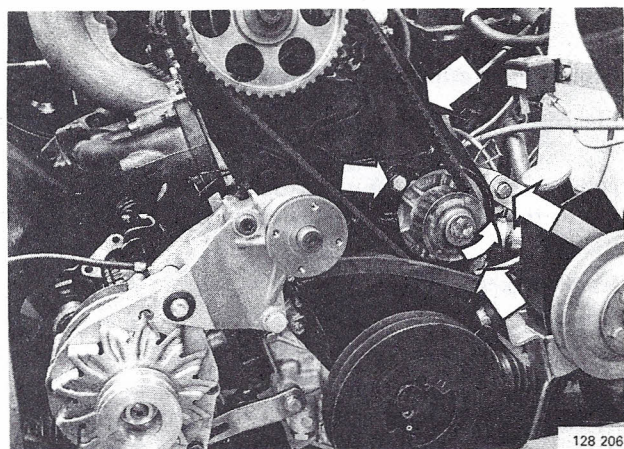
N5

Set dial indicator zero

Important:

Gauge pointer must not move during installation of new oil seal otherwise it will be necessary to basic-set engine since camshaft will have moved in relation to crankshaft.

If pointer does not move, check/adjust injection pump setting.

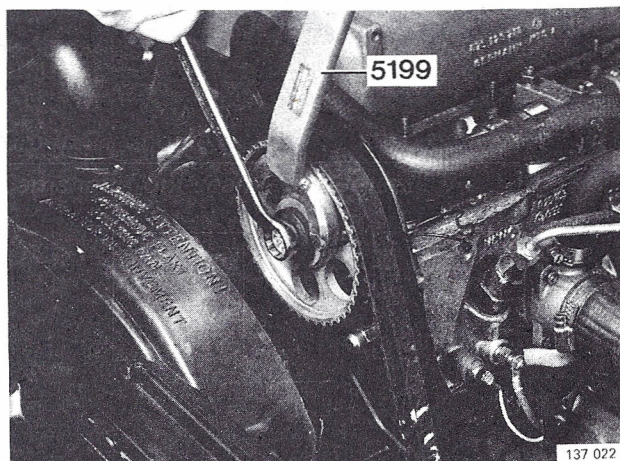


N6

Remove belt from camshaft sprocket

Unscrew expansion tank cap to release overpressure from cooling loss of coolant.

Remove belt from camshaft sprocket.



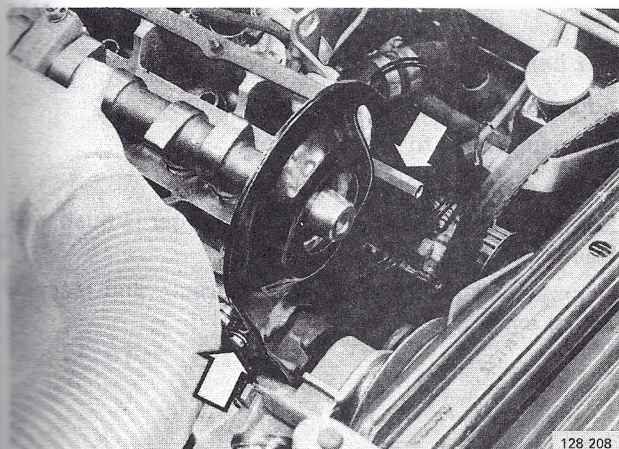
N7

Remove camshaft front sprocket

Use 5199 to hold sprocket in position when loosening bolt.

Make sure that camshaft does not rotate.

Tap sprocket to free it from camshaft.



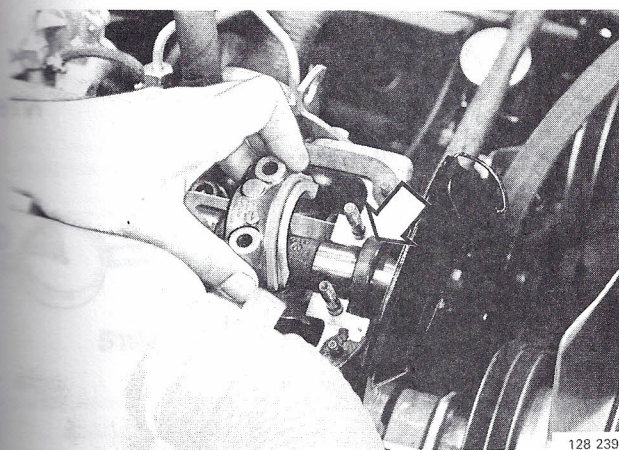
N8

Detach belt shield from cylinder head

Remove two upper retaining bolts.

Bend out shield to free it from camshaft. If necessary slacken coolant pump upper bolt.

Keep shield in position with a piece of wood.



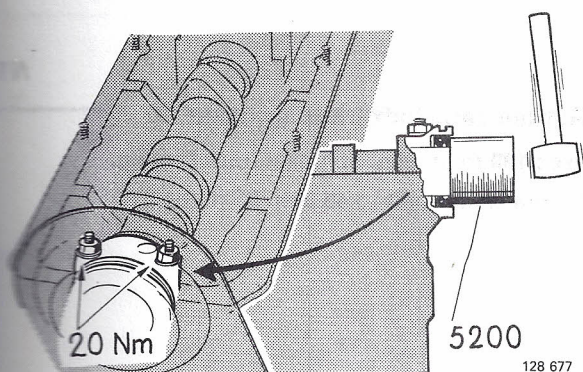
N9

Remove No. 1 camshaft cap and oil seal

N10

Press in new camshaft oil seal

Oil the seal. Do not push in seal to bottom position. Make sure that seal is fitted properly.



N11

Install camshaft No. 1 cap

Torque to 20 Nm (15 ft. lbs.).

N12

Press in seal to bottom position

Release cover.

Use adapter 5200 to tap in oil seal.

N13

Install bolts for belt cover

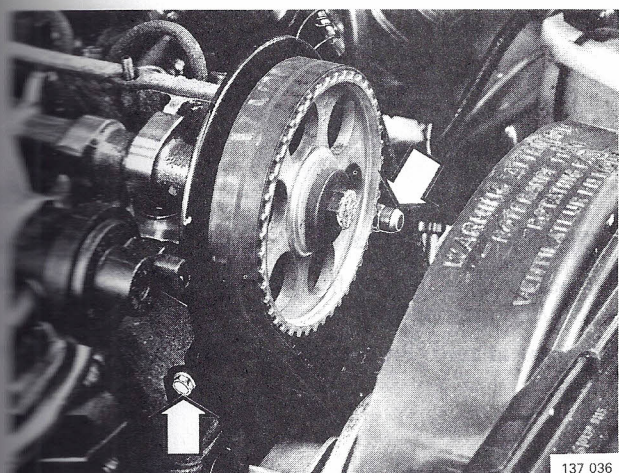
N14

Install gear belt and camshaft front sprocket

Pull belt to ensure that it is seated correctly on crankshaft gear.

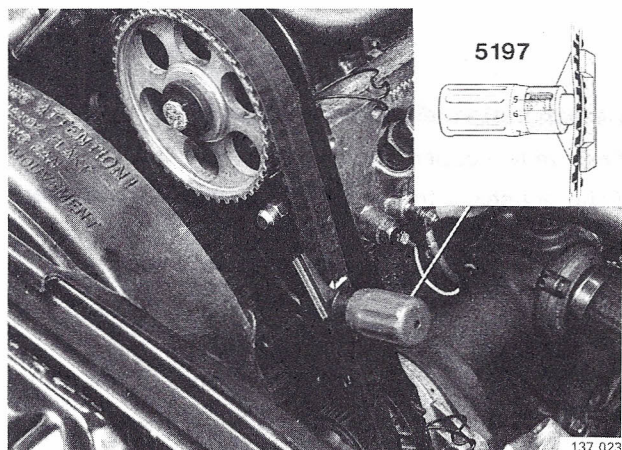
Place belt over camshaft sprocket and install sprocket and belt.

Install center bolt and tighten hand-tight. It should be possible for sprocket to turn on camshaft without camshaft rotating.



Group 21 Engine

Camshaft front seal, replacement



N15

Set belt tension

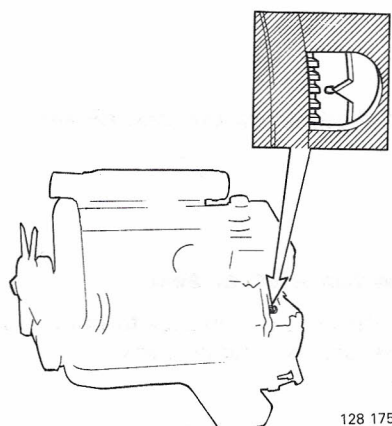
Adjust tension by moving coolant pump.

Use gauge **5197** to check tension.

Attach gauge to belt and set to 12.5 units.

Stretch belt until mark on gauge plunger is flush with sleeve. Tighten mounting bolts.

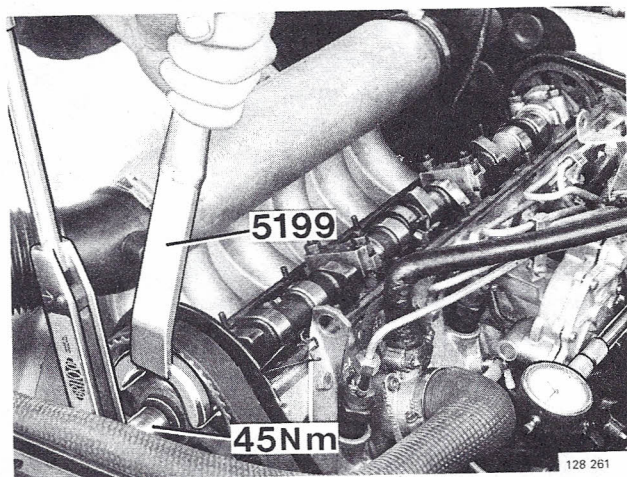
Depress belt with strong hand pressure and recheck/adjust tension.



N16

Make sure cyl. 1 at T.D.C.

Check '0' mark on flywheel.

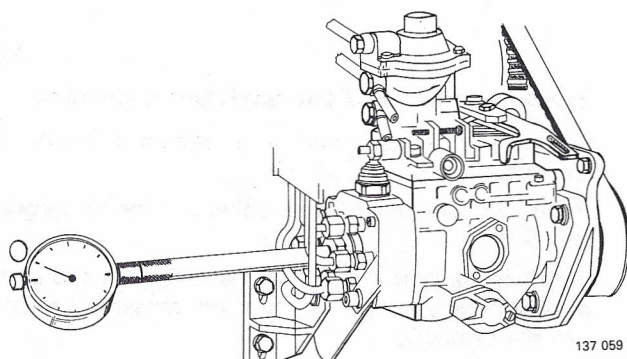


N17

Tighten camshaft front sprocket

Use **5199** to prevent sprocket from turning.

Torque center bolt to **45 Nm** (33 ft. lbs.).



N18

Check dial indicator

If pointer has moved from zero position: Set engine according to page 30.

Pointer at zero: Proceed to operation N19 on the next page.

N19

Zero injection pump and dial indicator

Slowly turn engine backwards until min. reading is reached on dial indicator.

Set to zero.

N20

Check pump setting

Slowly turn engine forwards until flywheel reaches 'O' mark.

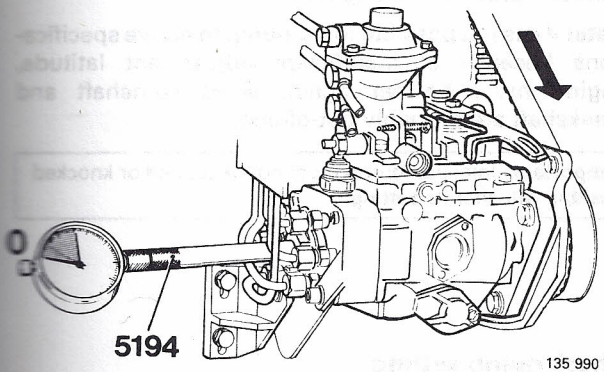
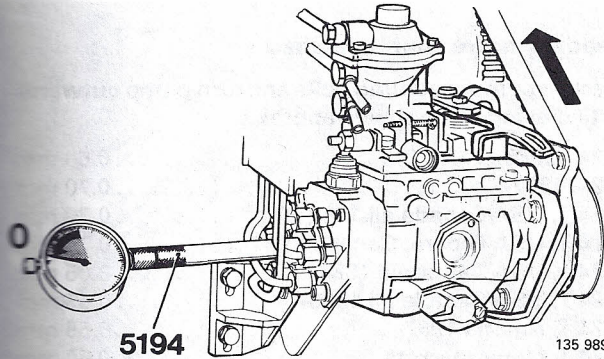
Note! If engine is turned too far it must be turned back approx. and then to 'O' mark otherwise setting will be incorrect.

Dial indicator should show:

D 24, -1986.....	0.65-0.73 mm
D 24, 1987-.....	0.77-0.85 mm
D 24 T, USA/Canada all 1982-83.....	0.77-0.85 mm
D 24 T, USA Federal/Canada 1984.....	0.82-0.90 mm
D 24 T, USA California 1984.....	0.72-0.80 mm
D 24 T, USA/Canada all 1985-.....	0.72-0.80 mm
D 24 T, Austria 1987-.....	0.72-0.80 mm
D 24 T, Other markets.....	0.87-0.95 mm
D 24 TIC.....	0.87-0.95 mm

Correct reading: Proceed to N22.

Incorrect reading: Readjust according to below.



N21

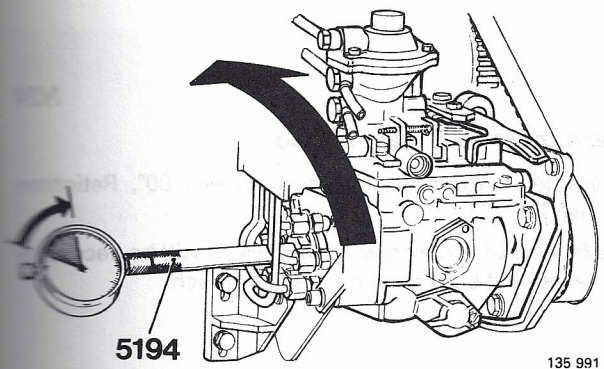
Check/adjust pump setting

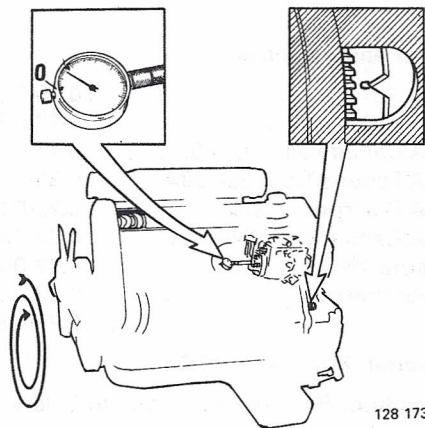
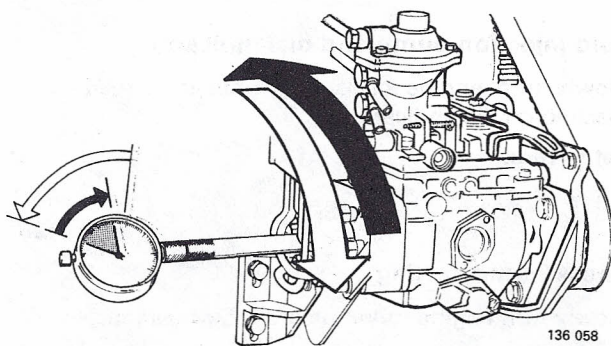
Pump setting should read:

D 24, -1986.....	0.70 mm
D 24, 1987-.....	0.80 mm
D 24 T, USA/Canada all 1982-83.....	0.80 mm
D 24 T, USA Federal/Canada 1984.....	0.85 mm
D 24 T, USA California 1984.....	0.75 mm
D 24 T, USA/Canada all 1985-.....	0.75 mm
D 24 T, Austria 1987-.....	0.75 mm
D 24 T, Other markets.....	0.90 mm
D 24 TIC.....	0.90 mm

Reading less than specified:

Slacken pump mounting bolts and turn pump **inwards** to obtain specified value. Tighten mounting bolts and repeat check of pump setting.





Reading more than specified:

Slacken pump mounting bolts and turn pump **outwards** until dial indicator shows approx.:

D 24, -1986	0.60 mm
D 24, 1987-	0.70 mm
D 24 T, USA/Canada all 1982-83	0.70 mm
D 24 T, USA Federal/Canada 1984	0.75 mm
D 24 T, USA California 1984	0.65 mm
D 24 T, USA/Canada all 1985-	0.65 mm
D 24 T, Austria 1987-	0.65 mm
D 24 T, Other markets	0.80 mm
D 24 TIC	0.80 mm

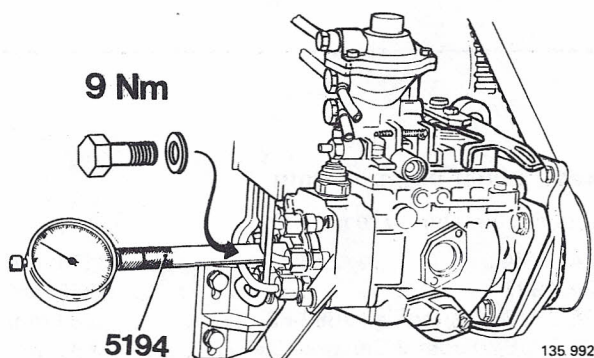
Then turn pump **inwards** until specified value is obtained. Tighten mounting bolts.

Note! If it is not possible to set pump to above specifications because of insufficient adjustment latitude, engine must be set again, since camshaft and crankshaft are probably out-of-line.

Important: Injection pump must not be tapped or knocked as this will alter its setting.

Check pump setting

Turn engine round twice and check setting, see operation N19. Readjust if necessary and repeat check.



N22

Remove dial indicator and holder

N23

Install plug with new seal

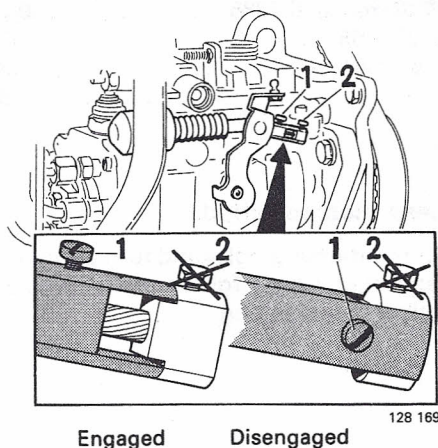
Tightening torque 9 Nm (6.5 ft. lbs.).

N24

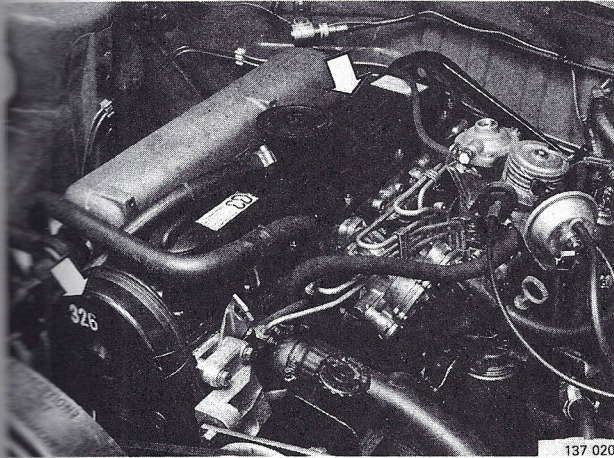
Reconnect cold start device

Press lever forwards and turn sleeve 90°. Retighten screw 1.

Note: Do not turn screw 2 otherwise it will be necessary to reset cold start device on a test bench.



N25



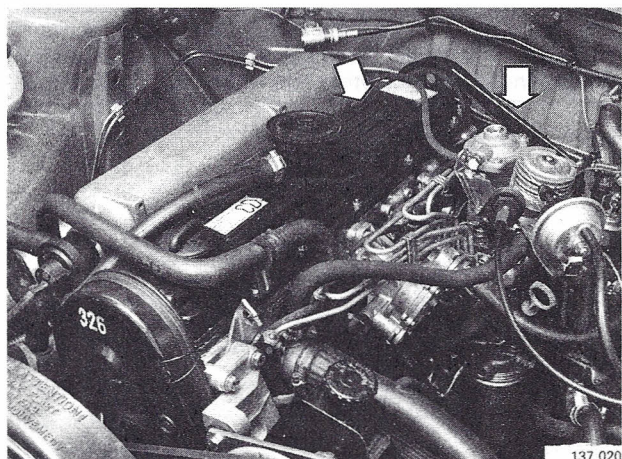
Install:

- valve cover (new gaskets as needed)
- front timing gear cover
- power steering pump with bracket
- alternator in cars with high alternator
- hose for crankcase ventilation
- hose extension on intake manifold (D 24 TIC)
- hose from intercooler (D 24 TIC)

After work which requires the removal/installation of the alternator, always check that the protective cover has been replaced in D 24 TIC and other cars with a high alternator.

O. Camshaft rear seal, replacement

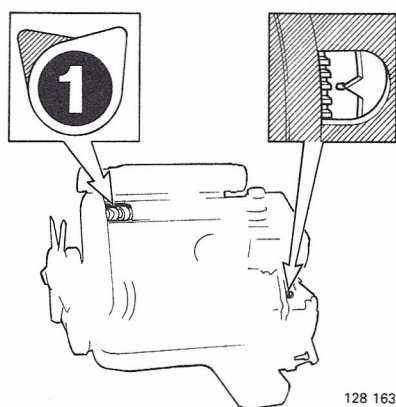
Special tools: 5190, 5193, 5194, 5199, 5200, 5201



01

Remove:

- hose for crankcase ventilation
- hose from intercooler (D 24 TIC)
- hose extension on intake manifold (D 24 TIC)
- valve cover
- rear timing gear covers

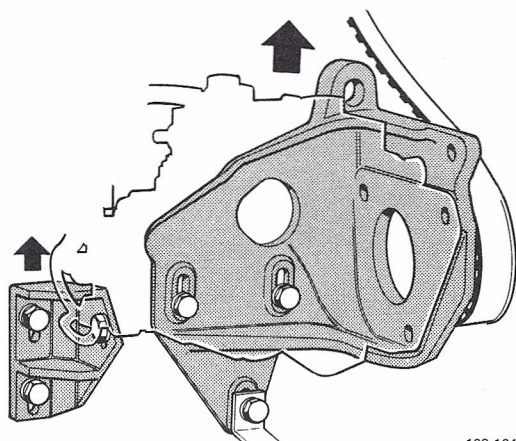


02

Turn engine until cyl. 1 is at T.D.C.-injection

Always use the vibration damper center bolt to turn the engine. 27 mm socket

Both cylinder 1 cams should point obliquely upwards. Flywheel at 'O'.

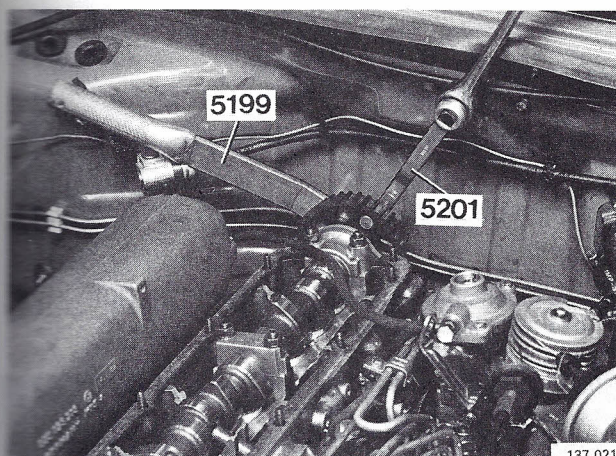


03

Lift off pump belt

Slacken mounting bolts for injection pump bracket release belt tension. Tighten one bolt so that pump remains in position.

Lift off belt.

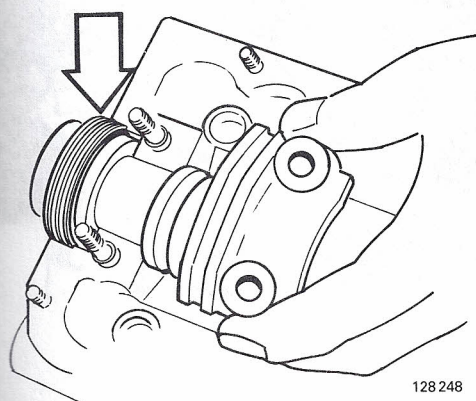


04

Remove camshaft rear sprocket

Hold sprocket in position with **5199** and unscrew sprocket with wrench **5201**.

Note: Take care not to rotate camshaft.



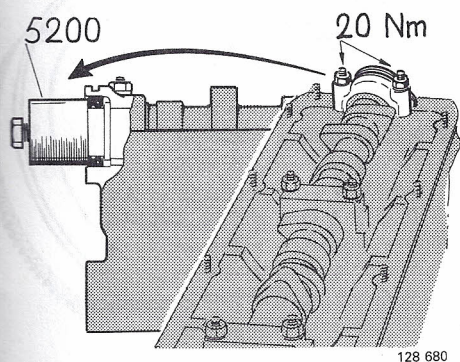
05

Remove camshaft cap 4 and old oil seal

06

Press in new oil seal

Oil the seal and press it in. Do not push in seal to bottom position. Make sure that seal is fitted properly.



07

Install camshaft cap 4

Make sure that thrust washer for camshaft cap 4 sits correctly.

Tightening torque **20 Nm** (15 ft. lbs.).

08

Tap in oil seal to bottom

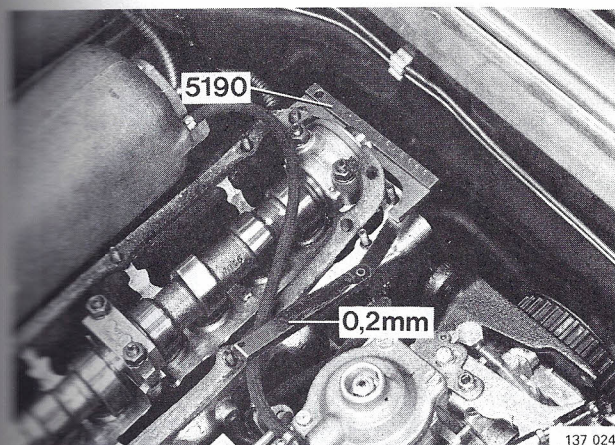
Use adapter **5200** and bolt for rear camshaft sprocket.

09

Check camshaft setting

Check with gauge **5190** that camshaft is correctly set in relation to crankshaft.

Gauge should fit in groove in back end of crankshaft. If not, engine must be set as described on page 30.

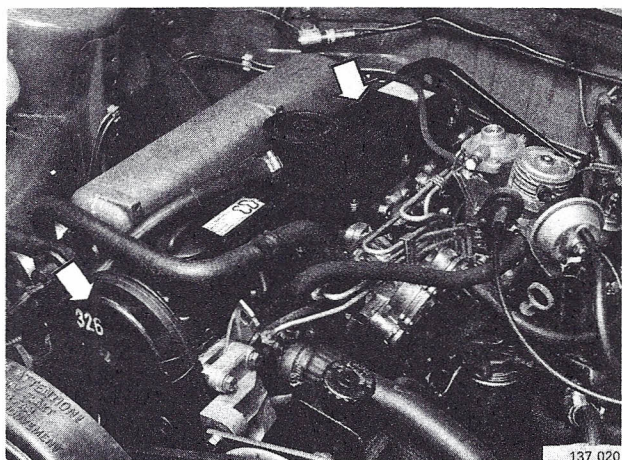


Set injection pump

See "Setting of injection pump" page 32, C12-C22.

Group 21 Engine

Camshaft rear seal, replacement



O10

Install valve cover

Use new gaskets if necessary.

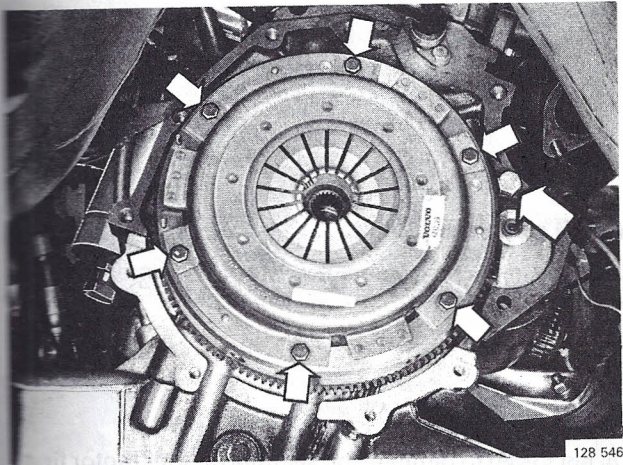
O11

Install:

- hose extension on intake manifold (D 24 TIC)
- hose from intercooler (D 24 TIC)
- rear timing gear cover
- hose for crankcase ventilation

P. Pilot bearing in crankshaft, replacement

Special tools: 1801, 4090, 5203, 5207



P1

Remove gearbox

See separate service manual.

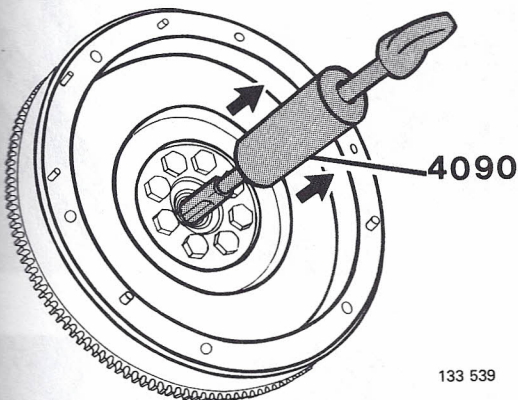
Secure starter motor with a bolt.

Manual gearboxes

P2

Remove pressure plate and driven plate

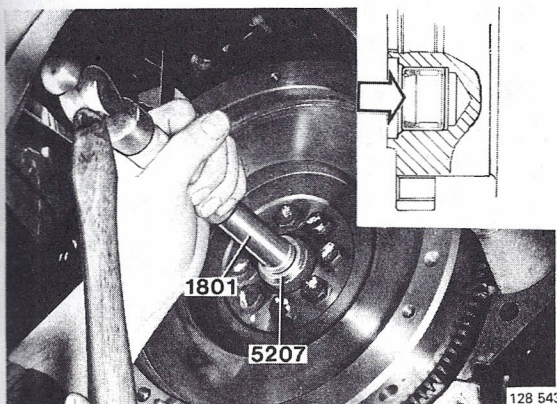
Unscrew pressure plate mounting bolts crosswise a few turns at a time to prevent warp.



P3

Remove bearing

Use extractor 4090 .



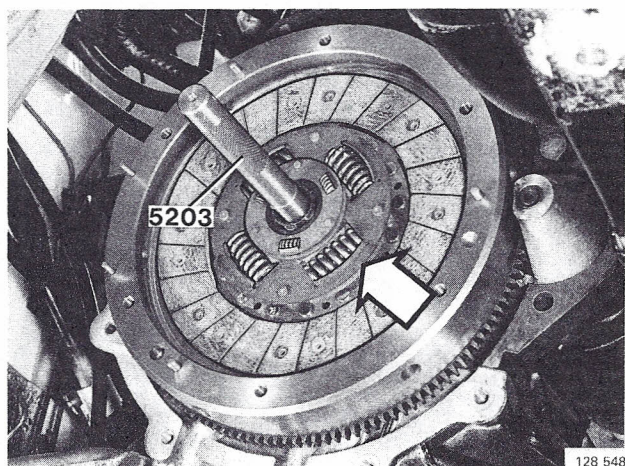
P4

Install bearing

Install bearing and seal with text on outer ring facing out, away from flywheel.

Use standard handle 1801 and drift 5207 to tap in bearing until it abuts crankshaft.

Pack space behind bearing with 1.3-1.5 grams grease.

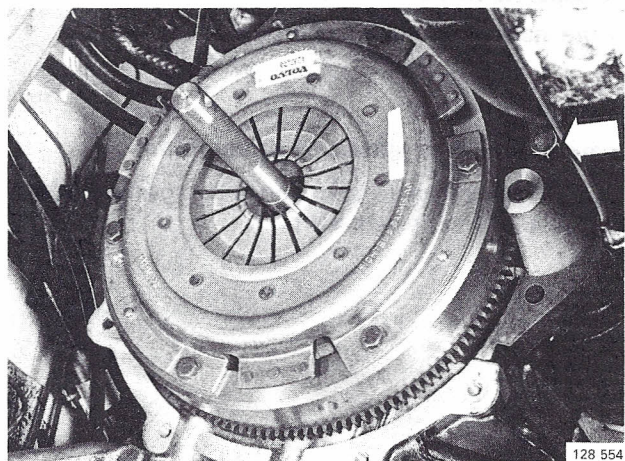


P5

Install driven plate

Use centering shaft 5203

Turn driven plate with hub facing out, away from flywheel.



P6

Install pressure plate

Tighten bolts crosswise a few turns at a time to avoid warp.

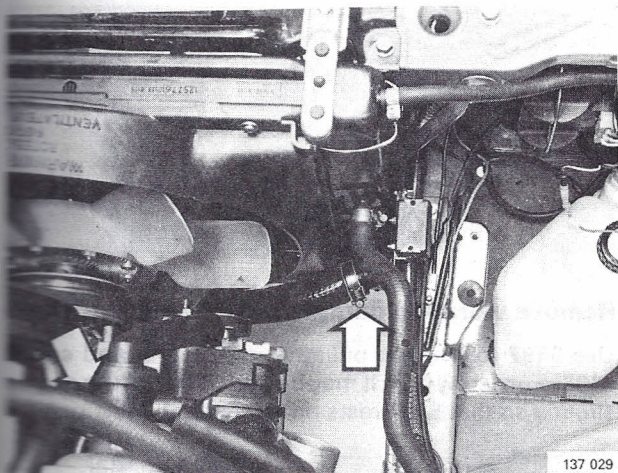
P7

Install gearbox

Do not forget to remove bolt securing starter motor first.

R. Crankshaft front seal, replacement

Special tools: 5187, 5188, 5197, 5200, 5205



Disconnect battery

R1

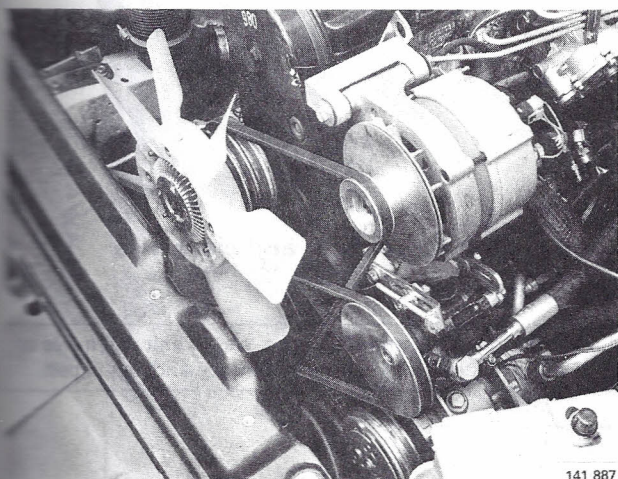
Drain coolant Remove expansion tank cap.

Vehicles without drain tap:

Disconnect lower hose from radiator and drain coolant.

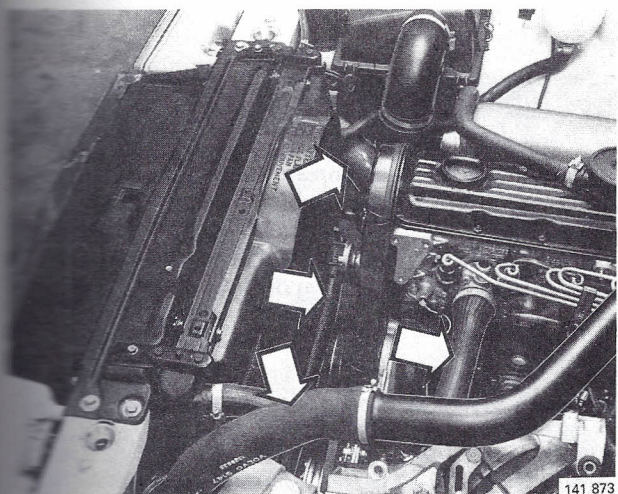
Vehicles with drain tap:

Unscrew tap to drain coolant.



Remove:

- alternator, when high placed
- power steering pump and bracket
- hoses from intercooler (D 24 TIC)
- AC-belt, as applicable.

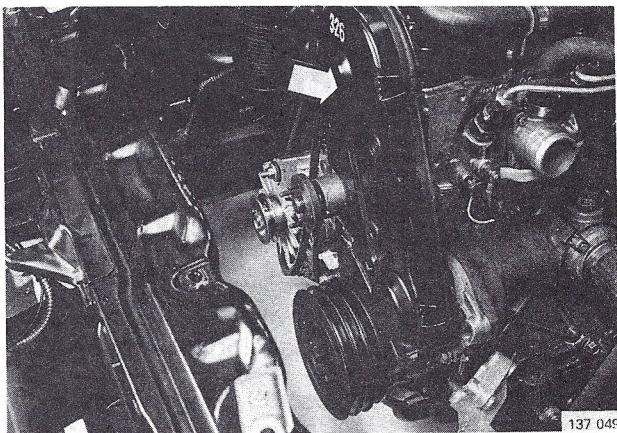


Remove:

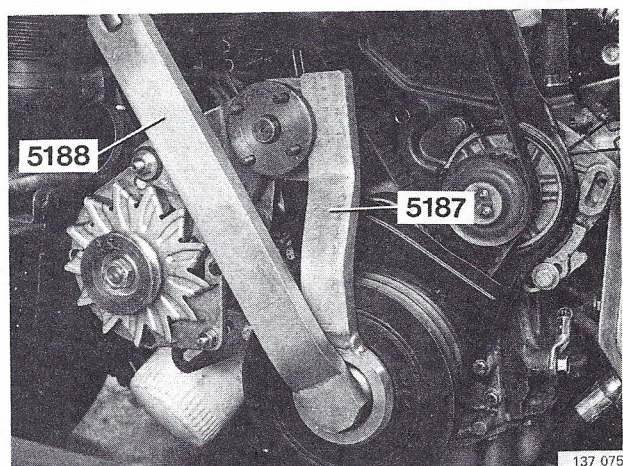
- radiator fan, spacer and pulley
- radiator hoses
- electrical connections to radiator fan thermostat

Note! D 24 TIC: Leave the intercooler.

Remove radiator



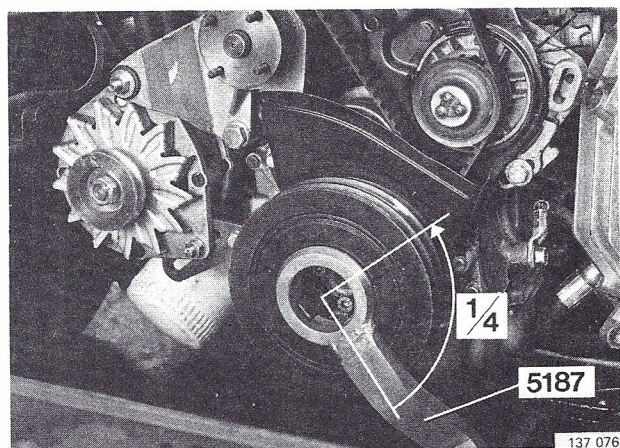
Remove front timing gear cover



Remove vibration damper centre bolt

Use 5187 to prevent pulley from rotating and socket 5188 to unscrew bolt. It may be necessary to turn engine slightly so that 5187 rests on fan bearing.

R2

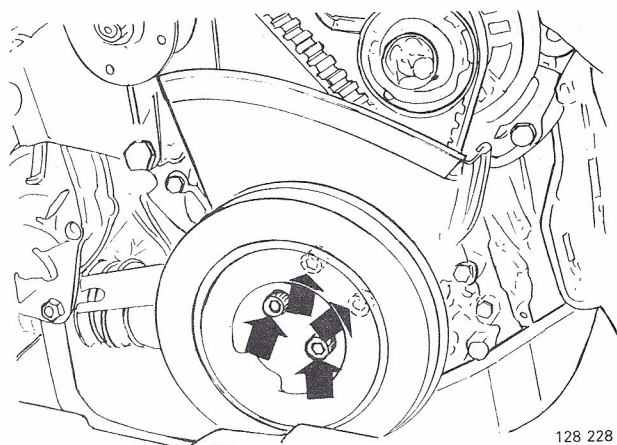


Turn engine approx turn anti-clockwise

Use wrench 5187.

By turning engine anti-clockwise, sag in belt will move to driving side, making it easier to remove and install belt.

R3



Remove vibration damper

Remove four inhex bolts.

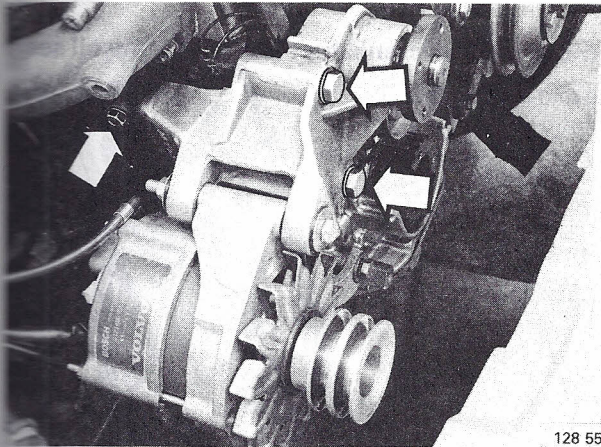
Pull off vibration damper. Note that crankshaft gear may sometimes stick to vibration damper. Tap to remove.

R4

Remove lower timing gear cover

R5

R6



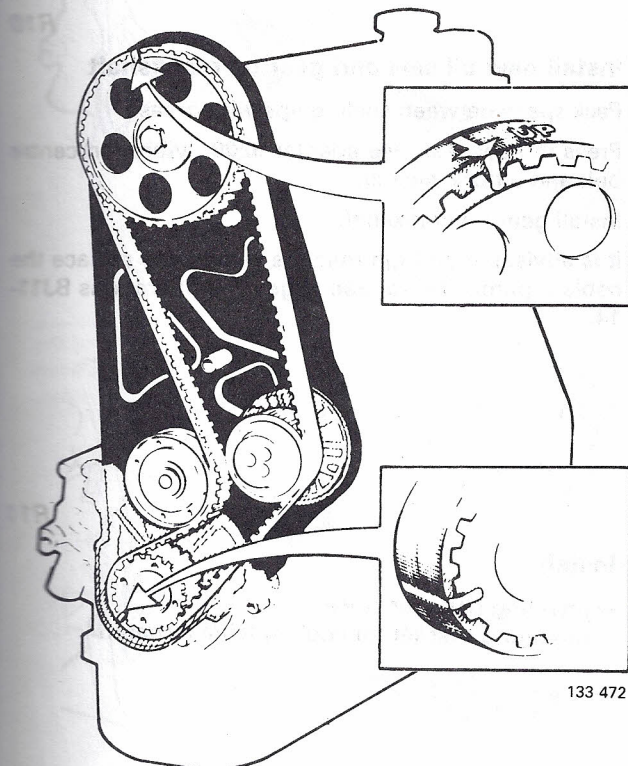
128 558

Detach radiator fan bracket

Detach bracket for radiator fan and alternator and place it to one side. (On the D 24 TIC and all other D 24 from 1987 the alternator is on the left side.)

Remove the three bracket mounting bolts and press bracket outwards.

R7



133 472

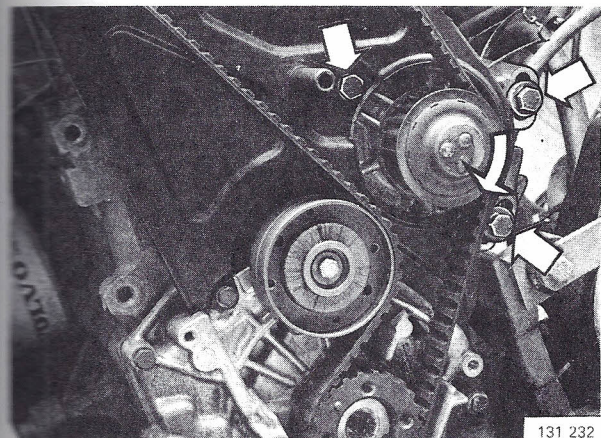
Mark position of timing gear belt

Mark belt, camshaft sprocket and crankshaft gear. Mark in front of a cog. Also identify outside and topside of gear belt.

Important!

Belt must be installed in its exact original position, otherwise valves may contact pistons and cause serious damage.

R8

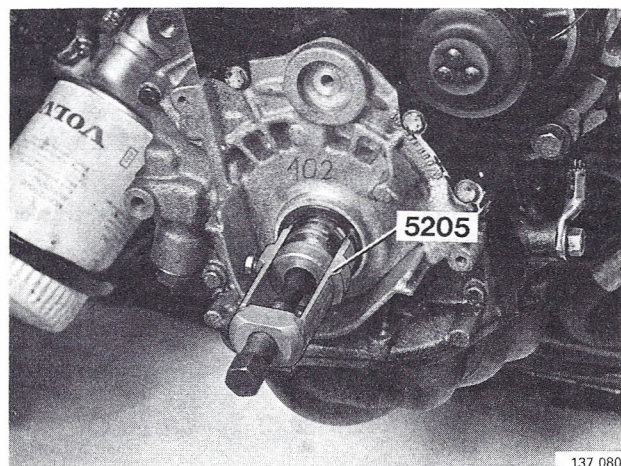


131 232

Remove gear belt

Slacken coolant pump mounting bolts and belt. Coolant may leak when bolts are slackened.

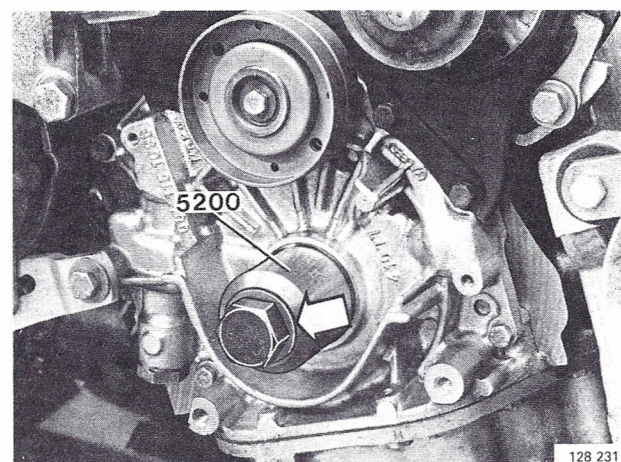
Remove belt.



R9

Remove gear on crankshaft and withdraw oil seal

Use extrator 5205



R10

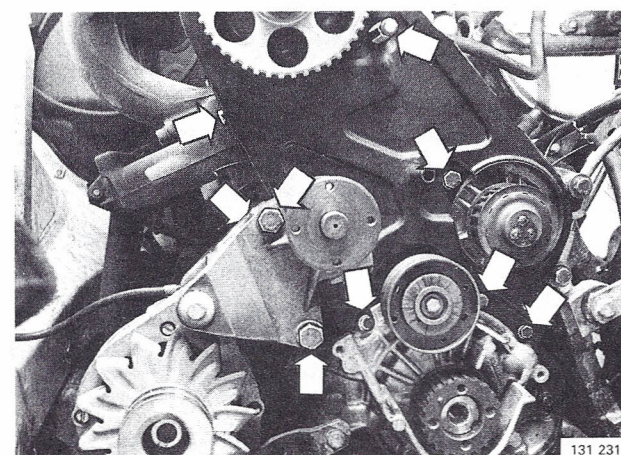
Install new oil seal and gear on crankshaft

Pack space between sealing lips with grease.

Press in new seal. use adapter 5200 , vibration centre bolt and a thick washer.

Install gear on crankshaft.

It is advisable on high mileage vehicles to replace the coolant pump O-ring. See pages 213 operations BJ11-14.

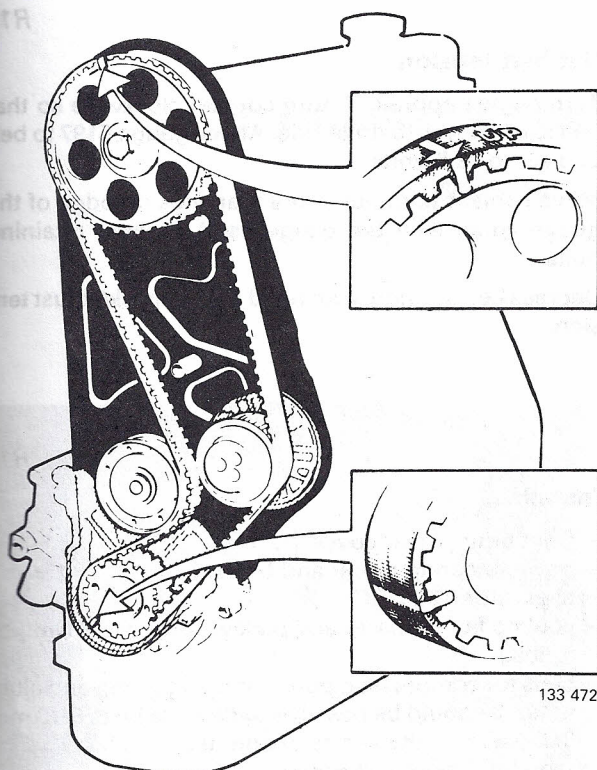


R11

Install:

- retaining bolts for cover
- mounting bracket for cooling fan/alternator.

R12



133 472

Install belt

Make sure the belt has the correct side **forward and upward**.

Align identification marks on belt, camshaft sprocket and crankshaft gear.

It is extremely important that belt is fitted in exactly same position as before.

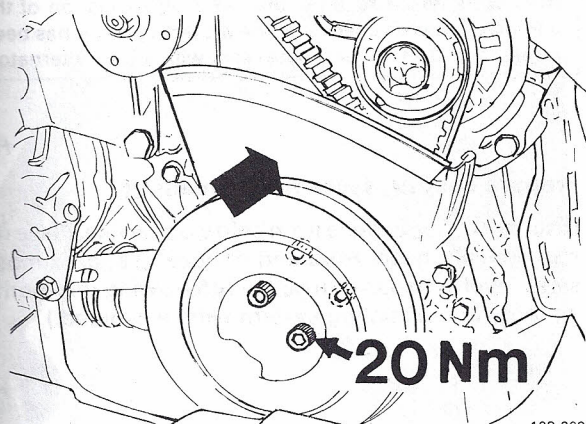
Tension belt by moving coolant pump (by hand). Tighten pump mounting bolts.

R13

Install timing gear cover and vibration damper

Damper can be installed in only one way. Pin on crankshaft gear must fit in vibration damper.

Torque inhex bolt to 20 Nm (15 ft. lbs.).



128 229

R14

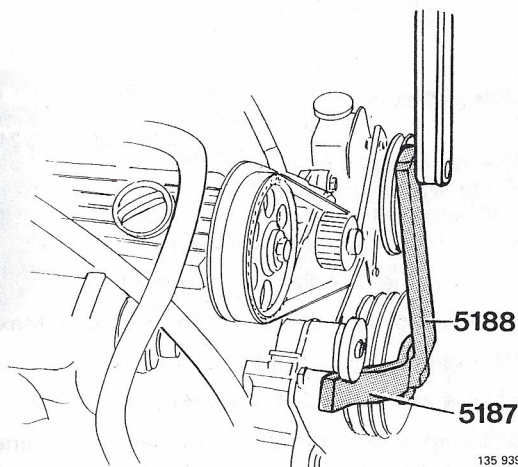
Install centre bolt

Smear threads and mating surface with sealer P/N 277 961-9.

Torque centre bolt to **350 Nm** (255 ft. lbs.) using wrench **5188** and wrench **5187** to hold vibration damper in position.

Use 5187 to hold vibration damper in position. (Rest 5187 on cooling fan bearing)

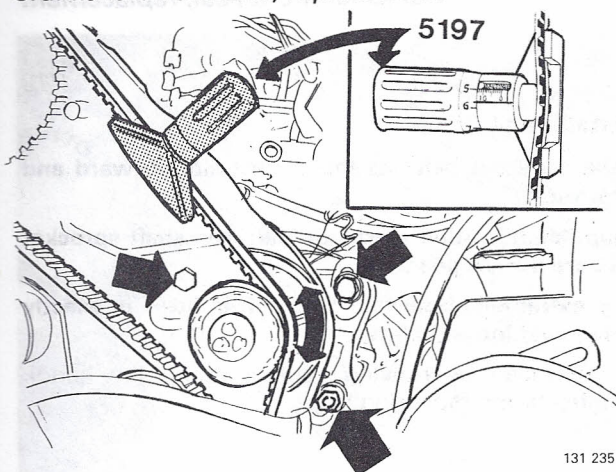
Important: Torque of 350 Nm (255 ft. lbs.) applies only if 588 is used. Also torque wrench must be in line with wrench 5188.



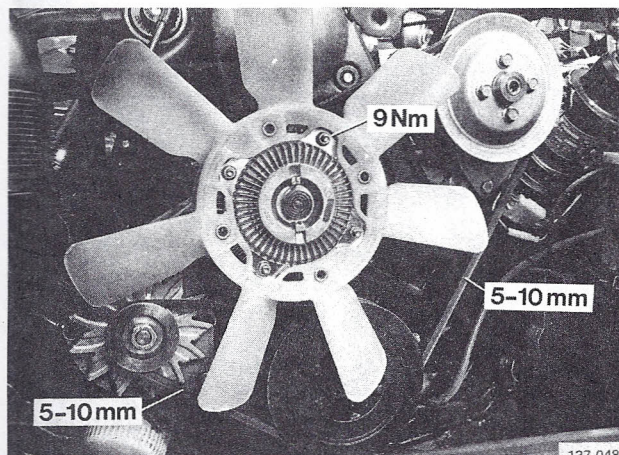
135 939

Group 21 Engine

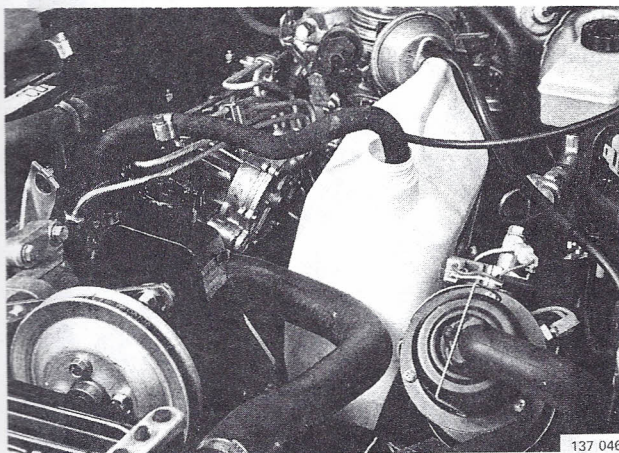
Crankshaft front seal, replacement



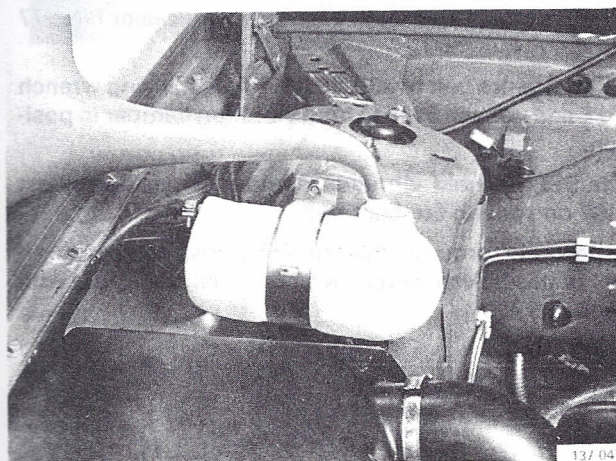
131 235



137 048



137 046



137 047

R15

Set belt tension

Turn engine approx. 1/4 turn counter clockwise so that belt slack moves to drive side. Attach gauge 5197 to belt and set to 12.5 units.

Move coolant pump until the markings on edge of the gauge agree with the gauge itself. Tighten retaining bolts.

Depress belt strongly with hand and recheck/adjust tension.

R16

Install:

- front timing gear cover
- power steering pump and bracket
- alternator (D 24 TIC)
- cooling fan + spacer and pulley. Torque to 9 Nm (6.5 ft. lbs.)
- belts for compressor, power steering pump and alternator. It should be possible to depress belts 5-10 mm (0.2-0.4 in) in the centre of one run.
- radiator. Reconnect hoses

After work which requires the removal/installation of the alternator, always check that the protective cover has been replaced in D 24 TIC and other cars with a high alternator.

R17

Prepare cooling system for bleeding

Disconnect upper hose from cold start device. Place drip pan beneath hose. Hold end of hose at approximately same level as expansion tank. (By following this method air locks in the cooling system will be avoided.)

R18

Filling coolant:

	D 24	D 24 T	D 24 TIC
Capacity, (approx. litres)			
with manual transm.....	9.4	11.0	10.7
with automatic transm.	9.2	10.9	10.6
(For tropical use add approx. 0.6 litres)			

Use only **type C** coolant (blue-green)

Vehicles with CU: Set heater control to get Max heat.

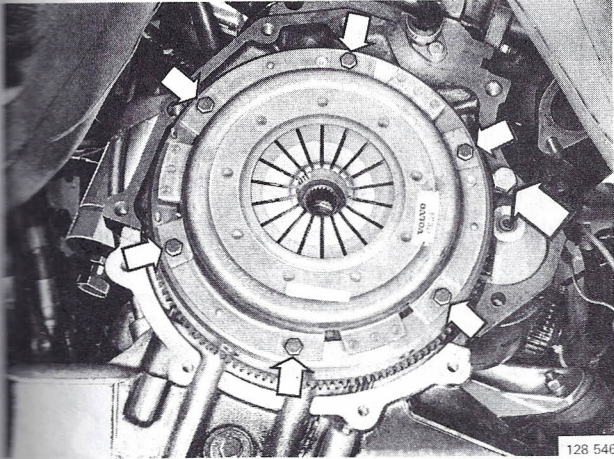
Mode selector must not be set in Max.

Vehicles with ACC: Set mode selector in OFF.

Start engine and run at above idle for 5 minutes to warm-up engine. Add coolant during this time. Reconnect hose to cold start device. Top-up expansion tank to above max and screw on cap.

S. Crankshaft rear seal, replacement

Special tools: 1801, 5112, 5203, 5208



Remove transmission

See separate Service Manual for information
Secure starter motor with a bolt.

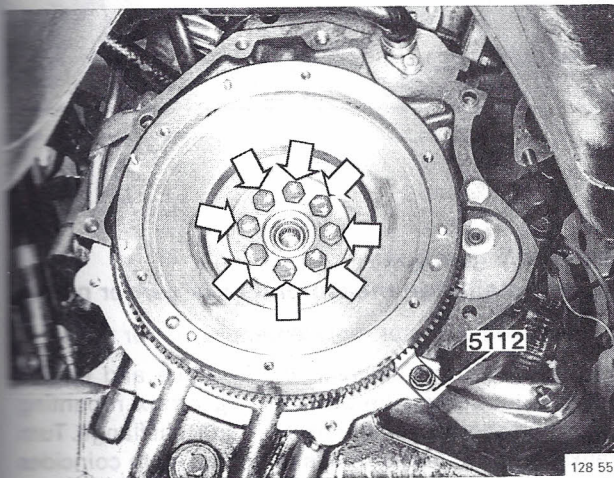
S1

Manual gearbox:

S2

Remove pressure plate and driven plate

Unscrew pressure plate mounting bolts crosswise a few turns at a time to prevent warp.



Remove flywheel

Use locking sector 5112 to prevent flywheel from moving.

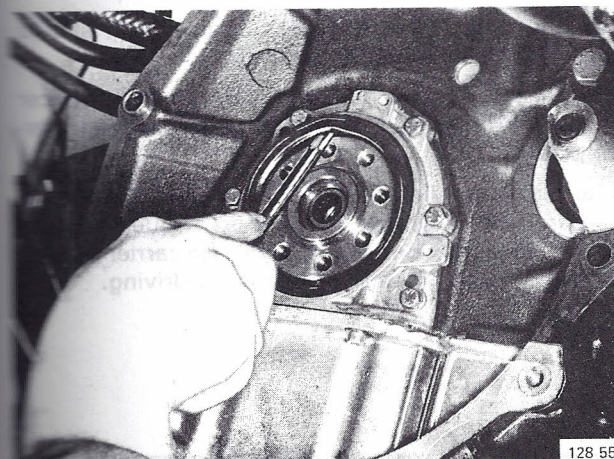
S3

Automatic gearbox:

S4

Remove carrier plate

Use locking sector 5112 to prevent flywheel from moving.



Remove crankshaft rear oil seal

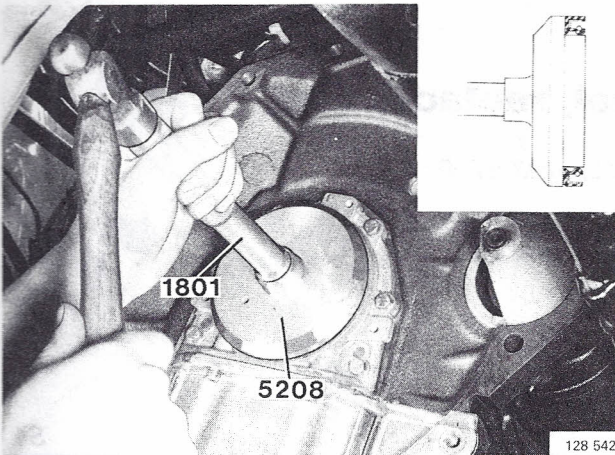
Lift out oil seal with a screwdriver as indicated.

S5

Clean and inspect sealing surfaces

on seal holder and crankshaft.

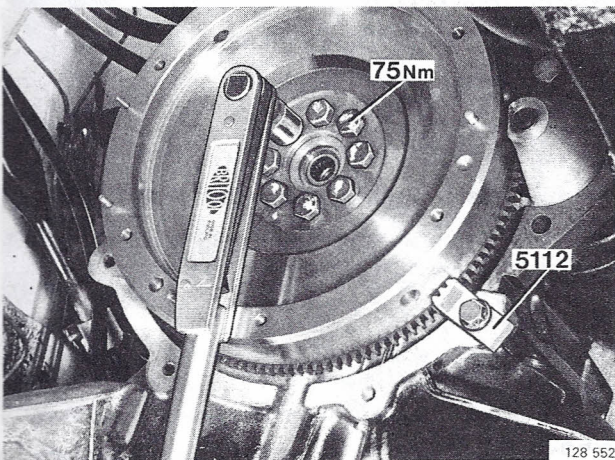
S6



S7

Install new oil seal

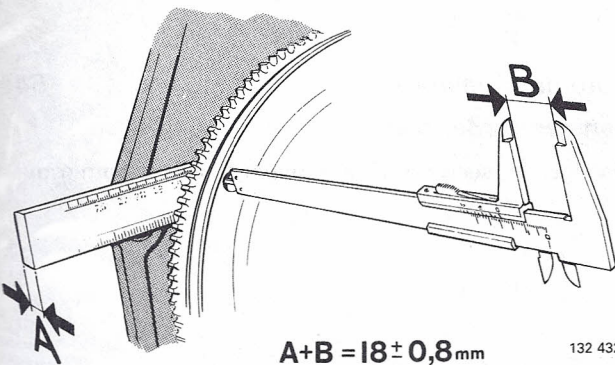
Assemble standard handle **1801** and drift **5208**.
Smear oil onto sealing surfaces and lips on seal.
Place seal on drift and tap in until drift abuts crankshaft.



S8

Install flywheel/carrier plate

Can only be fitted in one way since the bolt holes are placed off-centre.
Use new bolts, smeared with sealer P/N 277 961-9.
Torque bolts to **75 Nm** (55 ft. lbs.). Use locking sector **5112** to hold flywheel in position.



S9

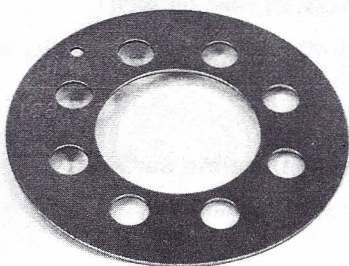
Automatic gearbox: Check installation measurement of carrier plate

To be carried out after replacement of carrier plate.
Place a steel ruler between carrier plate and engine block. Ruler should be placed on gearbox mounting flange and should rest against both sides of flange. Turn crankshaft until one of holes in carrier plate coincides with steel ruler. Measure with an outside caliper.

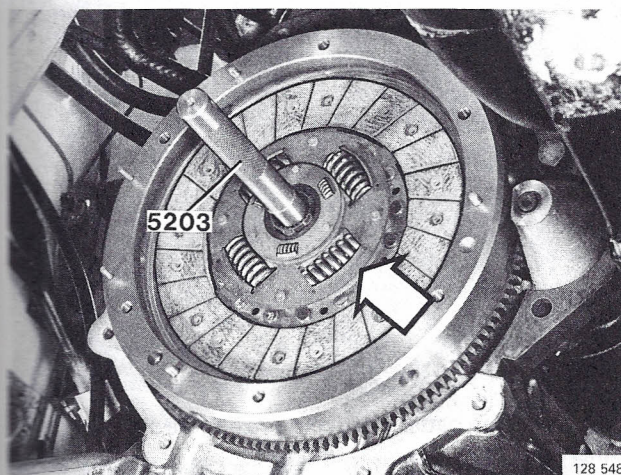
Measure value "B" + thickness of steel ruler should equal 17.2-18.8 mm (0.667- 0.740 in).

If distance is less than 17.2 mm (0.677) in use a spacer washer (P/N 1 257 377-0) between crankshaft and carrier plate.

If carrier plate is installed incorrectly (i.e. installation measurement is wrong), distance to torque converter carrier will be too long. This may cause carrier plate to crack and possibly cause a noise when driving.



132 086



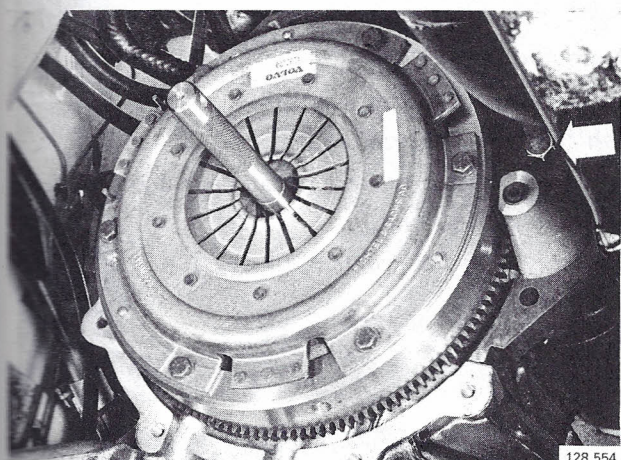
Manual gearbox:

S10

Install driven plate

Use centering shaft **5203**.

Turn disc with hub facing out, away from flywheel.



S11

Install pressure plate

Tighten bolts crosswise a few turns at time to avoid warp.

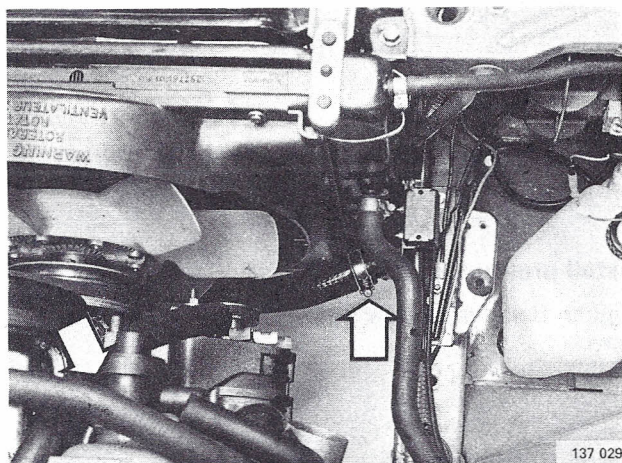
S12

Install transmission

Do not forget to remove bolt securing starter motor.

T. Vibration damper, replacement

Special tools: 5187, 5188



Disconnect the battery and remove engine splash guard if there is one.

T1

Drain coolant

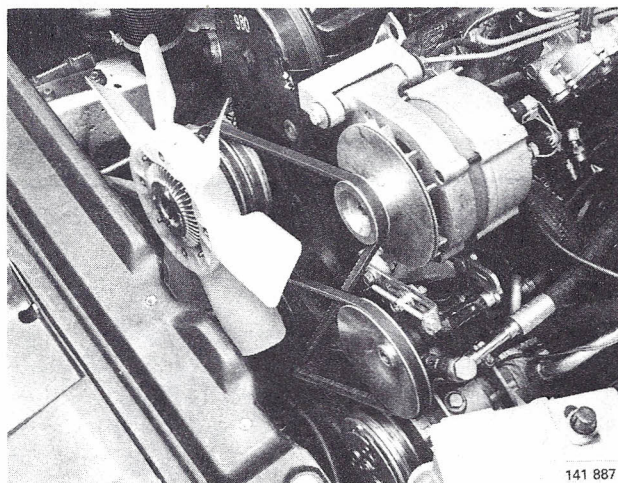
Remove expansion tank cap.

Vehicles without drain tap:

Disconnect lower hose from radiator and drain coolant.

Vehicles with drain tap:

Unscrew tap to drain coolant.



T2

Remove:

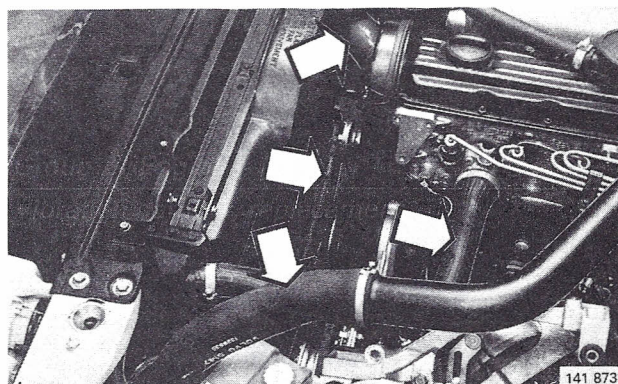
- alternator, if placed high
- power steering pump and bracket
- AC-belt as applicable

T3

Remove:

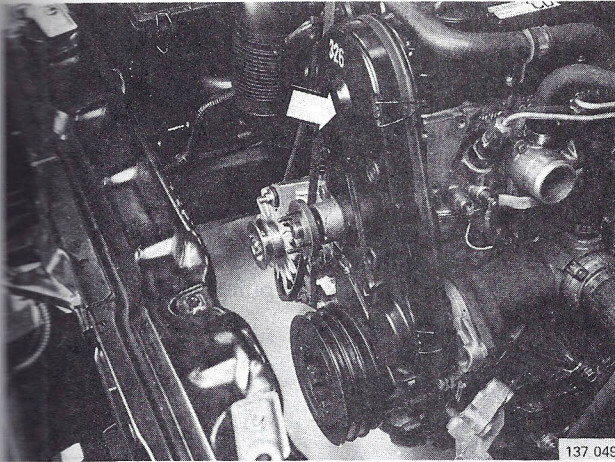
- radiator fan with spacer and pulley
- radiator hoses
- electrical connections to radiator fan thermostat

Note! D 24 TIC: Do not remove intercooler.



T4

Remove front timing gear cover

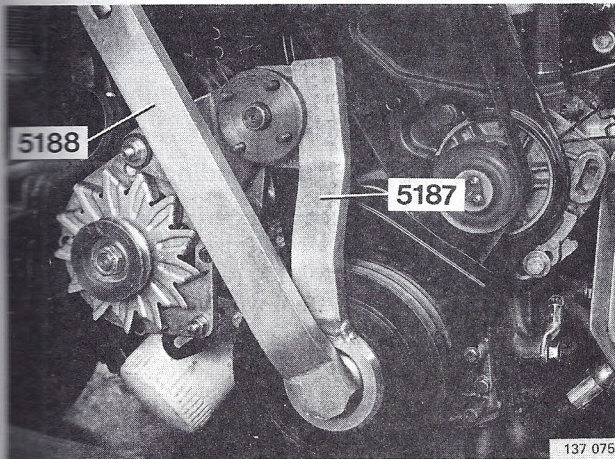


T5

Remove vibration damper centre bolt

Use **5187** to prevent pulley from rotating and socket **5188** to unscrew bolt. It may be necessary to turn engine slightly so that 5187 rests on fan bearing.

Remove four inhex bolts. Pull off vibration damper. Note that crankshaft gear may sometimes stick to vibration damper. Tap to remove.

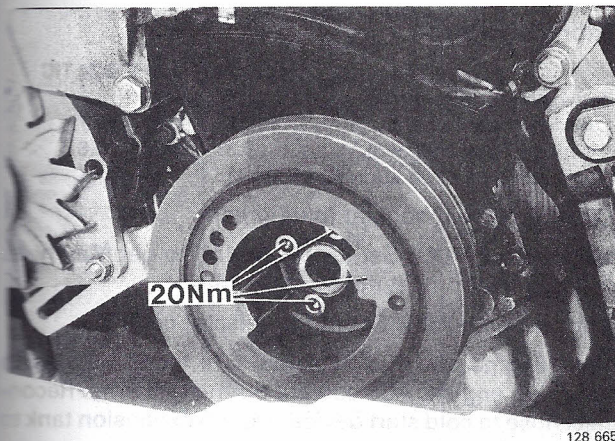


T6

Install vibration damper

Damper can be installed in only one way. Pin on crankshaft gear must fit in vibration damper.

Torque screws to **20 Nm** (15 ft. lbs.).



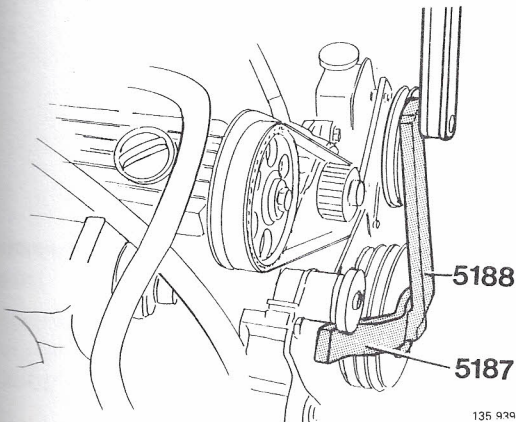
T7

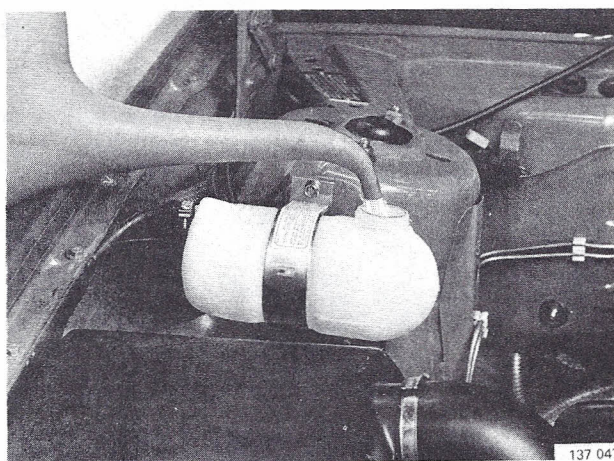
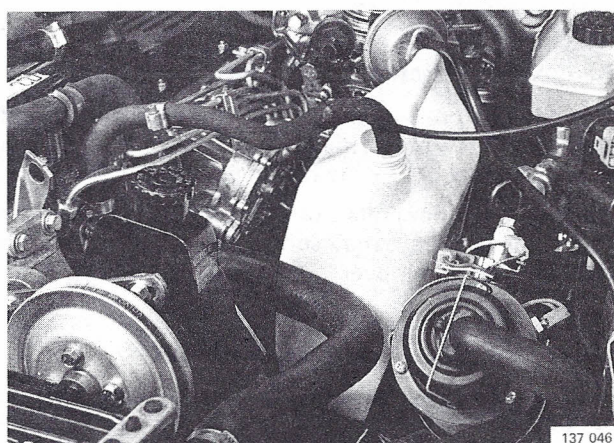
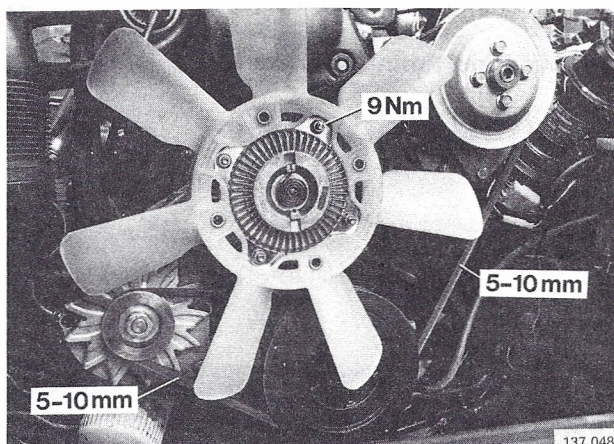
Install centre bolt

Smear threads and mating surfaces with sealer P/N 277 961-9.

Use wrench **5187** to hold vibration damper. (Rest wrench on cooling fan bearing). Use wrench **5188** to torque centre bolt to **350Nm** (255 ft. lbs.).

Important Torque of 350 Nm (255 ft. lbs.) applies only if wrench 5188 is used. Also torque wrench must be in line with wrench 5188.





T8

Install:

- front timing gear cover
- power steering pump and bracket
- high placed alternator and belts
- radiator
- radiator hoses
- electrical connections to the radiator fan thermostat
- radiator fan with spacer and pulley (tighten bolts to 9 Nm - 0.9 kpm)
- belts for power steering pump and alternator (tighten)

Connect battery

After work which requires the removal/installation of the alternator, always check that the protective cover has been replaced in D 24 TIC and other cars with a high alternator.

T9

Prepare cooling system for bleeding

Disconnect upper hose from cold start device. Place drip pan beneath hose. Hold end of hose at approximately same level as expansion tank. (By following this method air locks in the cooling system will be avoided.)

T10

Filling coolant:

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with automatic transm.	9.2	10.9	10.6
(For tropical use add approx. 0.6 litres)			

Use only **type C** coolant (blue-green)

Vehicles with CU: Set heater control to get Max heat. Mode selector must not be set in Max.

Vehicles with ACC: Set mode selector in OFF.

Start engine and run at above idle for 5 minutes to warm-up engine. Add coolant during this time. Reconnect hose to cold start device. Top-up expansion tank to above max and screw on cap.