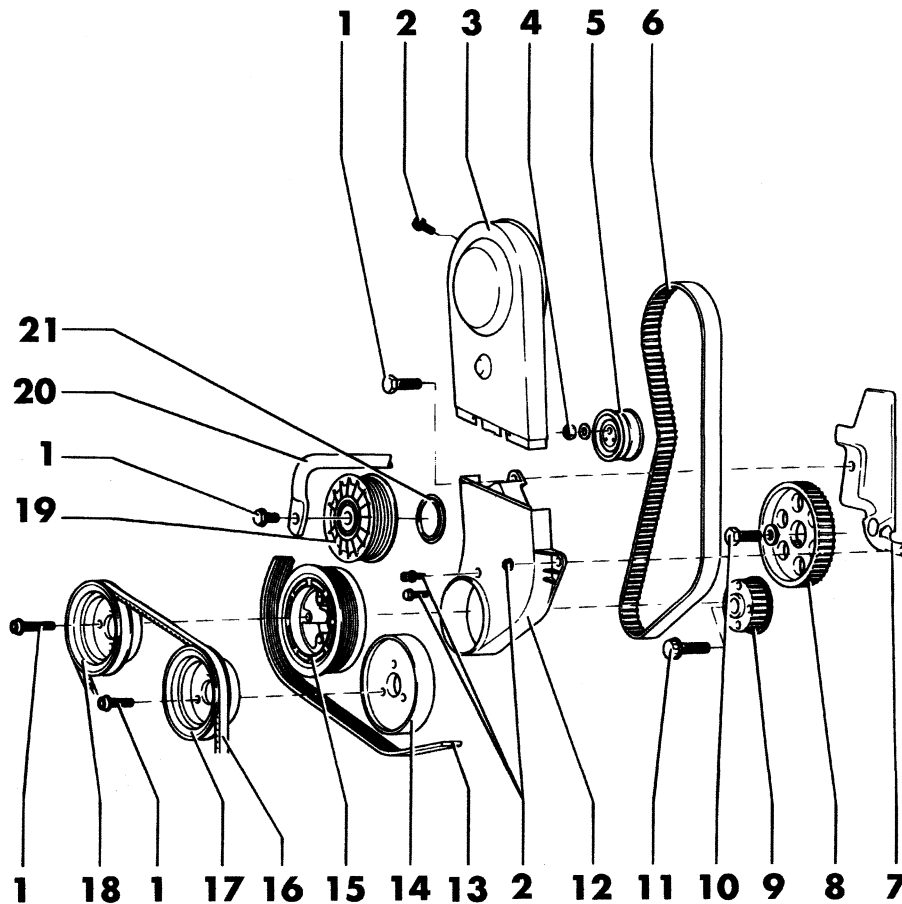


Engine 13

Crankshaft assembly: 2.0 I 16 V engine

ENGINE: EXPLODED VIEW



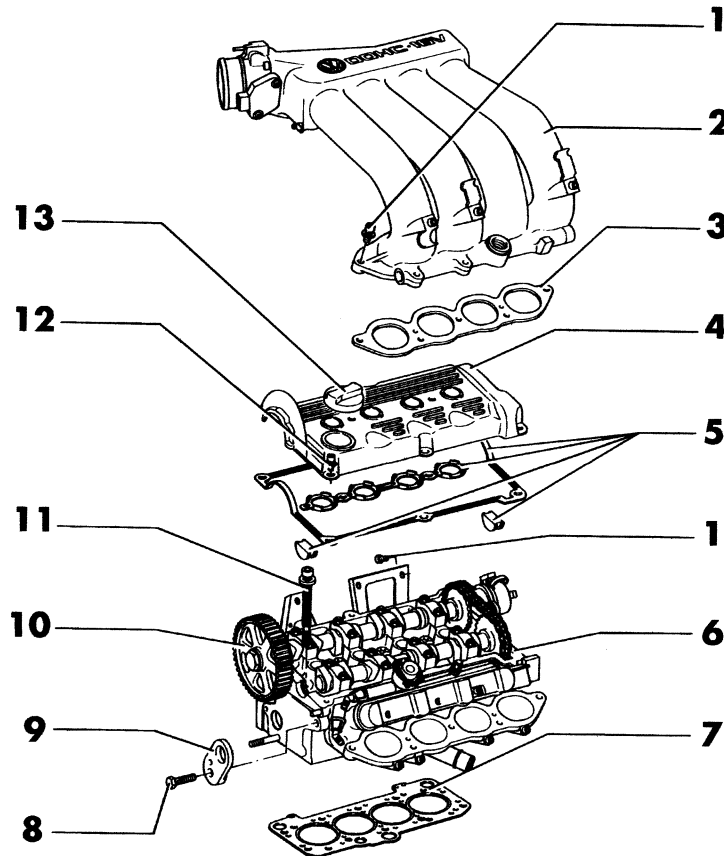
13BD17

- | | |
|---|--|
| 1. 20 Nm. | 12. Timing belt lower cover. |
| 2. Timing belt cover attachment. 10 Nm. | 13. Poly-V belt. |
| 3. Timing belt upper cover. | Remove and refit using tool U-40010. |
| 4. Tension roller fixing nut. 45 Nm. | Mark the direction of rotation before removing it. |
| 5. Timing belt tension roller. | 14. Pulley for Poly-V belt. |
| 6. Timing belt. | 15. Vibration dampener. |
| Before disassembling, mark the direction of rotation. | Note the mounting position. |
| Do not bend. | 16. V belt. |
| 7. Inner cover. | 17. Pulley for V belt. |
| 8. Intermediate shaft drive pinion. | 18. Pulley. |
| 9. Crankshaft pinion. | 19. Poly-V belt tensioning pulley. |
| 10. Intermediate shaft pinion fixing bolt. 65 Nm. | 20. Tensioning pulley bracket. |
| 11. Crankshaft pinion fixing bolt. 90 Nm + 90°. | 21. Tensioning pulley rear lid. |
| Remove and refit using tool U-30027. | |
| Replace the bolt and oil before fitting. | |

Engine 13

Crankshaft assembly: 2.0 I 16 V engine

ENGINE: EXPLODED VIEW



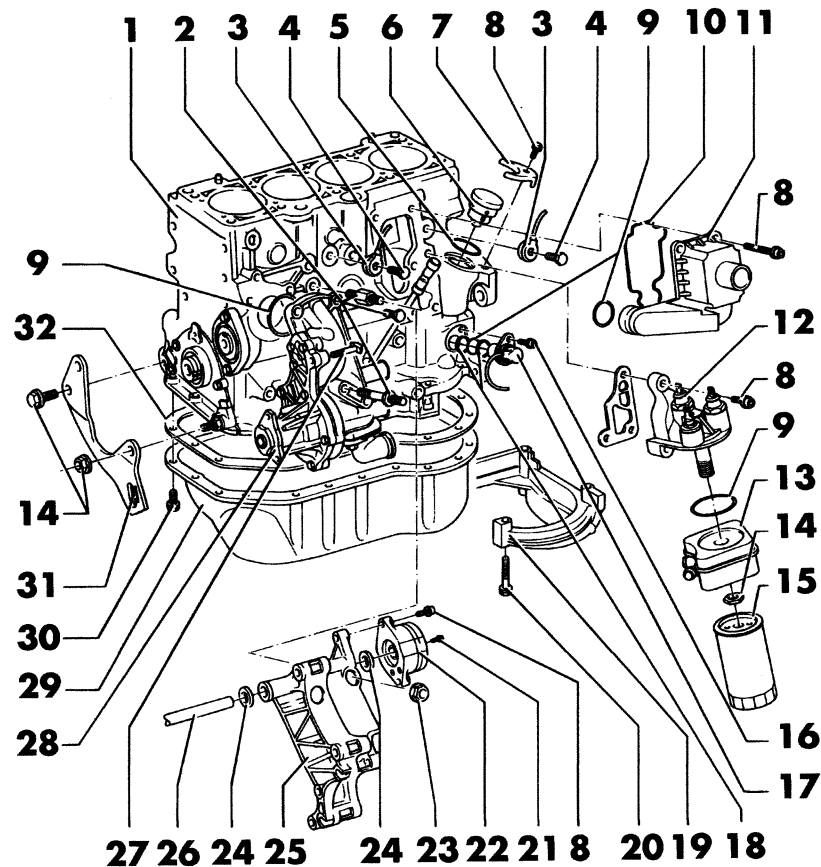
13BD18

- | | |
|---|--|
| <p>1. Fixing bolt. 20 Nm.</p> <p>2. Manifold intake, top.</p> <p>3. Gasket.
Replace.</p> <p>4. Cylinder head cover.</p> <p>5. Cylinder head cover gasket.
Replace if damaged.</p> <p>6. Cylinder head.
Disassembly and reassembly (refer to Group 15).</p> <p>7. Cylinder head gasket.
Replace.</p> | <p>8. Bracket fixing bolt. 45 Nm.</p> <p>9. Support.</p> <p>10. Camshaft drive pinion.
Note the position when assembling the timing belt.
Remove and refit using the tool U-20002/1.</p> <p>11. Cylinder head bolt.
For removal and refitting, take into account the proper
sequence (refer to Group 15).</p> <p>12. Cylinder head cover fixing. 10 Nm.</p> <p>13. Plug.</p> |
|---|--|

Engine 13

Crankshaft assembly: 2.0 I 16 V engine

ENGINE: EXPLODED VIEW



13BD19

- | | |
|---|---|
| 1. Cylinder block. | 16. Fixing bolt. 10 Nm. |
| 2. Cooling liquid pump fixing bolts.
20 Nm + 90°.
Replace. | 17. Engine speed transmitter. |
| 3. Pinking sensor. | 18. Support rings. |
| 4. Pinking sensor fixing bolt. 20 Nm.
The tightening torque affects the sensor operation. | 19. Support. |
| 5. O-ring.
Replace. | 20. Fixing bolt. 45 Nm. |
| 6. Plug. | 21. Tension device fixing bolt. 10 Nm. |
| 7. Attachment flanges. | 22. Tensioner. |
| 8. Fixing bolt. 25 Nm. | 23. Support fixing nuts. 30 Nm. |
| 9. O-ring.
Replace. | 24. Oil seal.
Replace if damaged. |
| 10. Gasket.
Replace if damaged. | 25. Support. |
| 11. Crankshaft sump vent. | 26. Tensioning pulley bracket. |
| 12. Oil filter support. | 27. Hammer head bolt to fix the cooling liquid pump. |
| 13. Oil cooler. | 28. Cooling liquid pump.
Disassembly and reassembly (refer to Group 19). |
| 14. 25 Nm. | 29. Oil sump. |
| 15. Oil filter.
Detach using the tool U-40078 or the universal filter remover.
Tighten by hand. | 30. Oil sump fixing bolt. 25 Nm.
Remove the bolts on the flywheel side with the corresponding spanner (see Repair Group 17). |
| | 31. Vane pump support. |
| | 32. Oil sump gasket.
Do not stick the gasket, note the mounting position. |

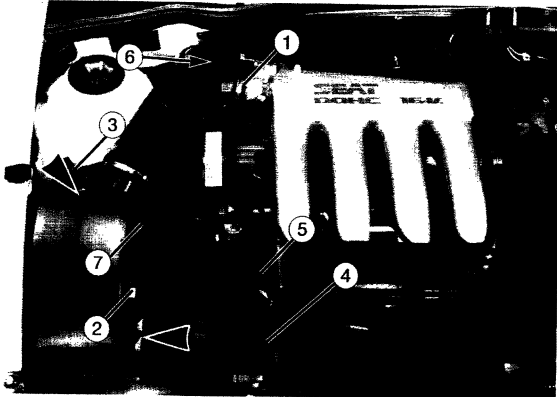
Engine 13

Crankshaft assembly: 2.0 I 16 V engine

DISTRIBUTION TIMING BELT DRIVE Removal and refitting

The following operations can be carried out with the engine fitted into the vehicle or with the engine attached to a rotary trestle.

Disassembly

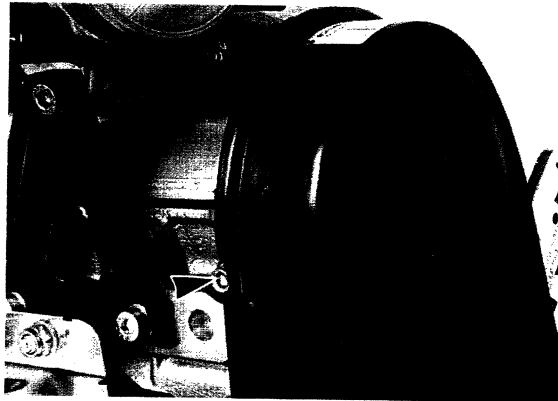


10B113

If the disassembly is carried out in the vehicle, disconnect the negative terminal on the battery and partially remove the air filter/inlet tube assembly, for which the following items must be removed:

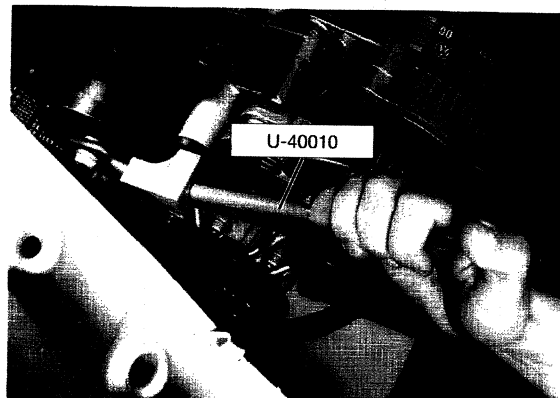
1. Junction clip between inlet tube and inlet manifold.
2. Suction take-off from its fixing to the inlet air thermo-regulator.
3. Inlet air temperature transmitter connector.
4. Sump gasses ventilation tube from its fixing to the pressure regulating valve.
5. Idling stabilizer valve tube from its fixing to the valve.
6. Hot air tube from its fixing to the exhaust manifold heat shield.
7. Air intake muffler bushing from its housing to the air filter assembly.

Remove the O-rings which connect the air filter assembly to the bodywork and remove the filter.



13A102

Remove the upper cover after removing the fixing bolts.



10B005

IN VEHICLE

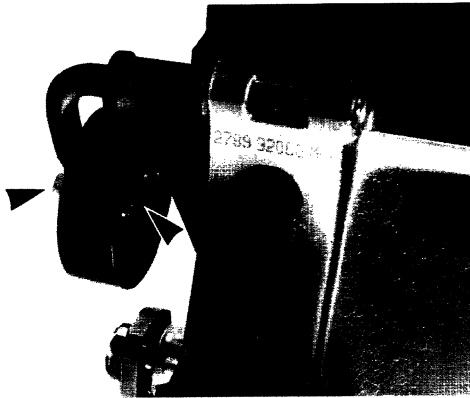
Remove the Poly-V belt using the appropriate tool:

- Models with tensioning roller **U-40010.**
- Models without tensioning roller **U-40050.**

When removing the belt, mark the turning direction; this mark should be taken into account when re-assembling.

Engine 13

Crankshaft assembly: 2.0 I 16 V engine



13B002

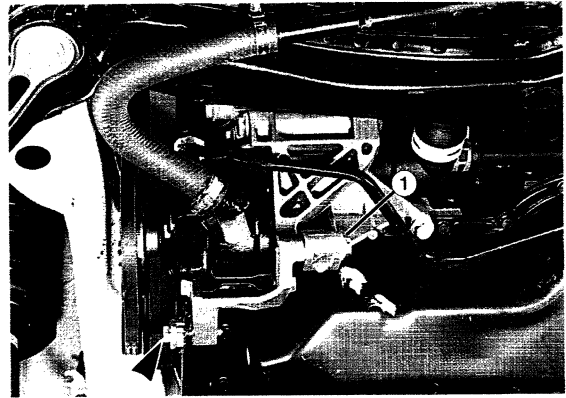
IN VEHICLE (models with Poly-V and tensioning roller)

Remove the bolt fixing the Poly-V belt tension roller; to hold the nut, the roller rear cover must be removed by prying with a screwdriver.



13A103

Remove the upper bolts or nuts which hold the lower cover.



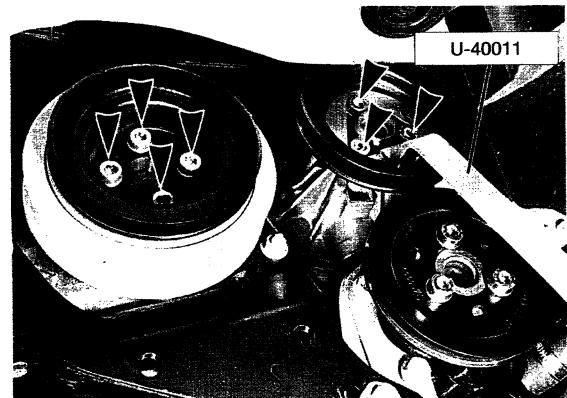
48B016

IN VEHICLE

Raise the vehicle and remove the lower engine protection.

Remove the power steering drive pulley by loosening the fixing bolt 1 and the bolt of the tensioning nut.

Remove the Poly-V belt.



13B071

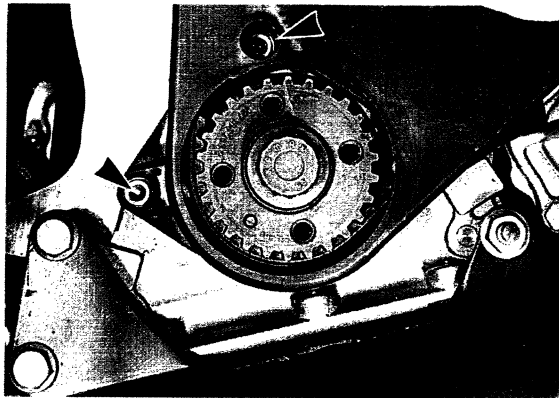
IN VEHICLE

Remove the crankshaft drive pulley together with the vibration damper.

If necessary to remove the lower guard, remove the cooling liquid pump pulley. To carry out this operation, tool **U-40011** must be used.

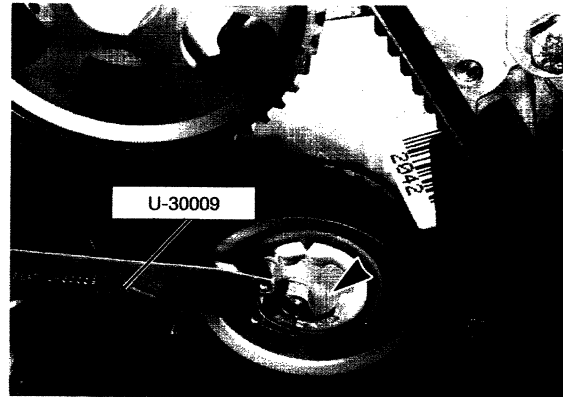
Engine 13

Crankshaft assembly: 2.0 I 16 V engine



13B072

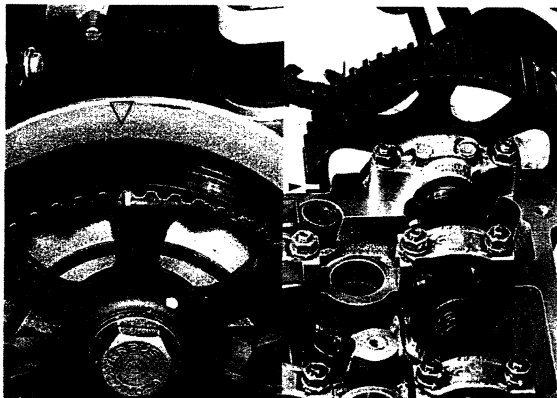
Remove the remaining bolts fixing the lower guard and remove the lower guard.



13B107

Loosen the timing belt by loosening the tension roller fixing nut and turning the roller counterclockwise using tool **U-30009**.

Remove the timing belt and mark the direction of movement if the belt is to be reused.



13B073

13B074

Align the mark on the distributor drive shaft pinion with the arrow on the cylinder head cover.

If the cylinder head cover has been removed, the mark on the back of the distributor drive shaft pinion must be flush with the cylinder head.



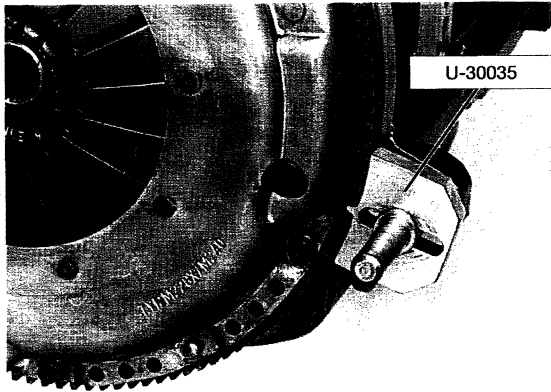
13B108

Remove the camshaft and the intermediate shaft drive gears using tool **U-20002/1**.

Remove the crankshaft pinion. To remove the fixing bolt, the crankshaft must be prevented from turning.

Engine 13

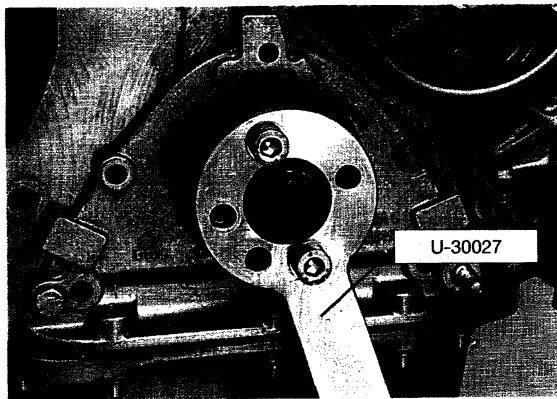
Crankshaft assembly: 2.0 I 16 V engine



13A105

ON THE WORK BENCH

With the engine attached to a rotary trestle, lock the flywheel using the tool **U-30035** to prevent the crankshaft from turning.



13A106

ON THE VEHICLE

With the engine installed in the vehicle, use the **U-30027** spanner to prevent the engine from turning by fixing it to the pinion using suitable bolts.

The power-assisted steering tension support must be removed in order to fit the spanner.

Reassembly

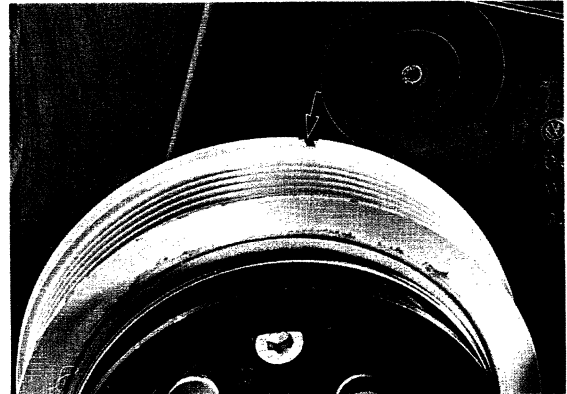
To reassemble, reverse the above operations taking the following into account:

Refit the crankshaft pinion and tighten the bolt to the specified torque.

Refit the camshaft and intermediate shaft drive pinions. To prevent the above shafts from turning, use tool **U-20002/1**.

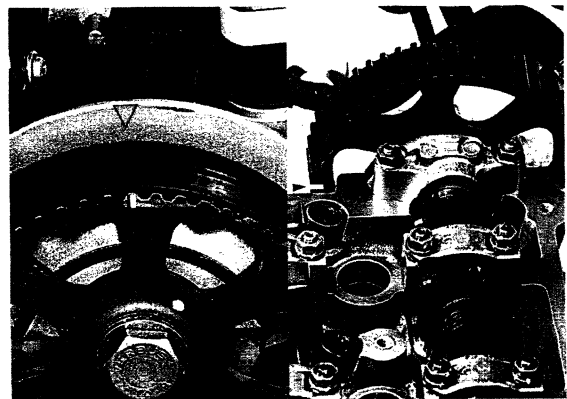
Fit the timing belt on the crankshaft pinion and on the intermediate shaft gear.

Fit the lower cover of the toothed belt.



13B076

Place the crankshaft drive pulley together with the vibration damper. The mark on the vibration damper must align with the mark on the lower cover of the toothed belt.



13B073

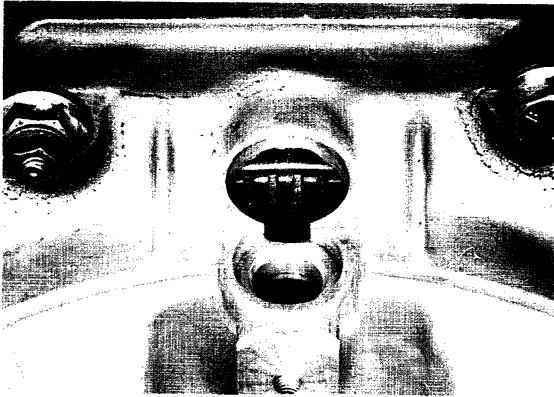
13B074

Align the mark on the distributor drive shaft pinion with the arrow on the cylinder head cover.

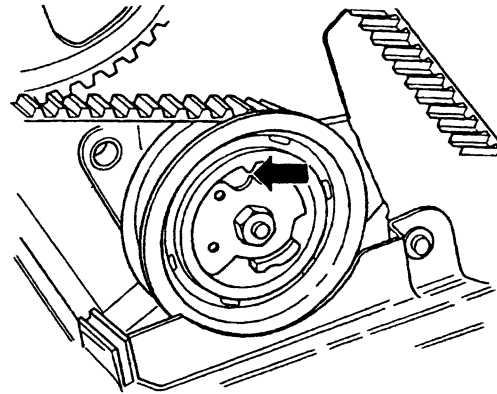
If the cylinder head cover has been removed, the mark on the back of the distributor drive shaft pinion must be flush with the cylinder head.

Engine 13

Crankshaft assembly: 2.0 I 16 V engine



Check that the engine flywheel mark matches with the mark on the clutch housing.



Check that the tautness of the gear-tooth belt is correct matching the marks on the tension roller. If not, loosen the tension roller nut and, using the tool **U-30009**, turn the roller anticlockwise as far as it will go, then turn the roller anticlockwise until the marks match.

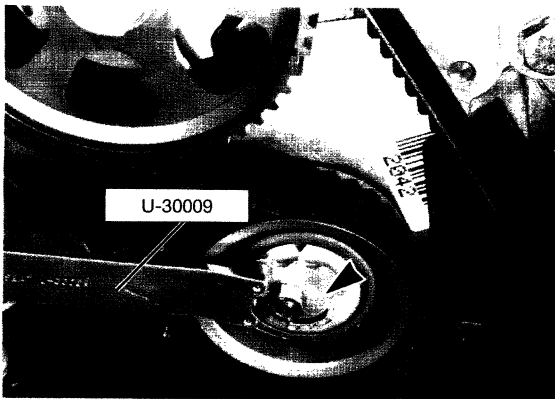
Tighten the tension roller with the fastening nut.

Turn the crankshaft two turns, until the marks are again on TDC and recheck the adjustment.

Fit the plug into the clutch housing.

Place the upper cover, the Poly-V belt tensioning pulley and the belt. Pay attention to the direction indicating mark on the Poly-V belt.

Fit and tighten the power steering drive belt (Running gear, Group 48).

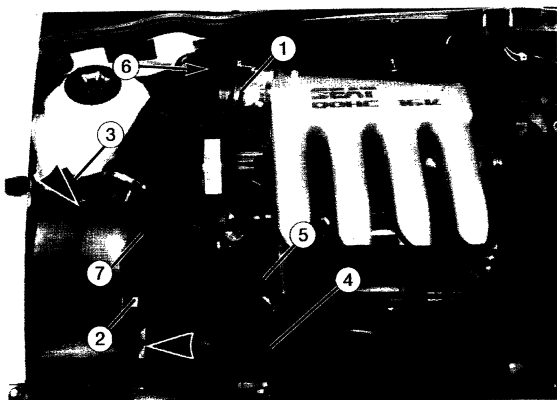


After the distribution marks are matched, fit the timing belt and tighten the belt to the proper tension, by turning the tension roller clockwise using tool **U-30009** (the toothed belt must only be tensioned with the engine cold).

Engine 13

Crankshaft assembly: 2.0 I 16 V engine

TIMING BELT Tightening

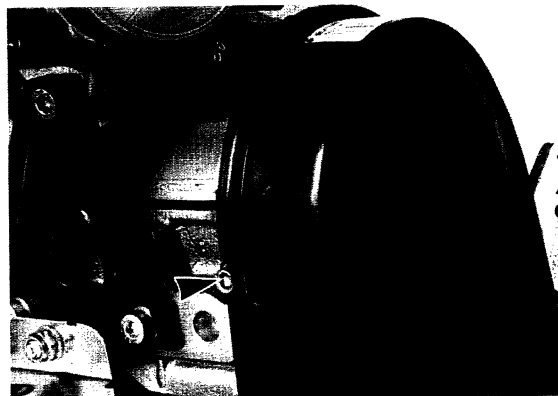


10B113

If tensioning is carried out in the vehicle, disconnect the negative cable of the battery and partially remove the air filter/inlet tube assembly, for which the following items must be removed:

1. Junction clip between inlet tube and inlet manifold.
2. Suction take-off from its fixing to the inlet air thermo-regulator.
3. Inlet air temperature transmitter connector.
4. Sump gasses ventilation tube from its fixing to the pressure regulating valve.
5. Idling stabilizer valve tube from its fixing to the valve.
6. Hot air tube from its fixing to the exhaust manifold heat shield.
7. Air intake muffler bushing from its housing to the air filter assembly.

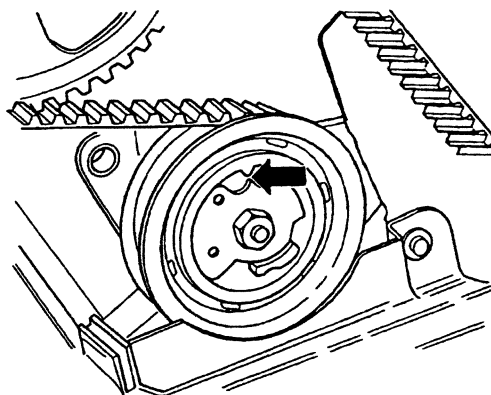
Remove the O-rings which connect the air filter assembly to the bodywork and remove the filter.



13A102

Remove the upper cover after removing the fixing bolts.

Match the distributor marks and, when they are in the TDC position, check the tautness of the gear-tooth belt (this can only be tensioned with the engine cold).



13BD23

Check that the marks on the tension roller match. If not, loosen the tension roller nut and, using the tool **U-30009**, turn the tension roller anticlockwise as far as it will go and then turn the roller clockwise until the marks match.

Tighten the tension roller with the fastening nut.

Turn the crankshaft two turns, until the marks are again on TDC and recheck the adjustment.

Strongly press the timing belt with the index finger; the marks on the tensioner should move apart. Release the pressure on the belt; the tensioner roller should return to its original position (the marks on the tensioner should realign).

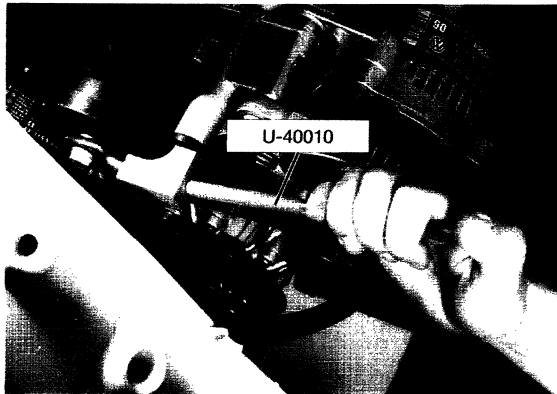
Engine 13

Crankshaft assembly: 2.0 I 16 V engine

POLY-V BELT Removal and refitting

Removal

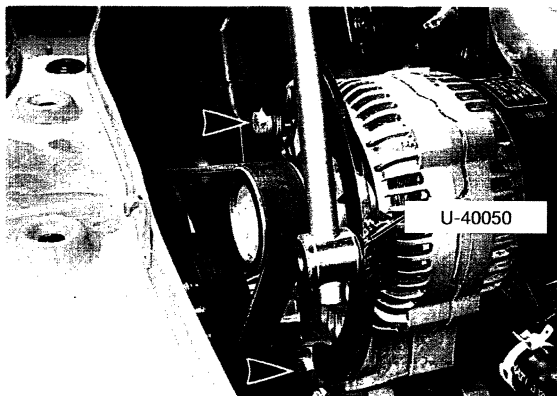
If the belt is to be reused, the direction of rotation must be marked before removing the belt; the mark must be taken into account when refitting.



10B005

VERSION WITH POLY-V BELT AND TENSIONING ROLLER

Detach the Poly-V belt from the alternator pulley using tool **U-40010**.



27B026

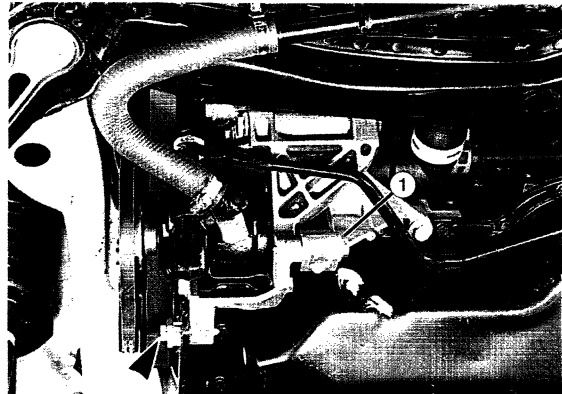
VERSION WITH POLY-V BELT, WITHOUT TENSIONING ROLLER

Remove the Poly-V belt.

Remove the belt by loosening the bolts holding the alternator bracket.

Place the **U-40050** tool as shown in the photograph and use a spanner to move the tool until the tensioning spring is overcome.

Once detensioned, remove the Poly-V belt from its fixing to the engine (the cooling liquid pump pulley should be removed first).



48B016

Raise the vehicle and remove the power steering drive belt. To do this, the fixing bolt 1 and the tensioning nut bolt must be loosened.

Remove the Poly-V belt.

Refitting

To reassemble, reverse the above operations taking the following into account:

When refitting the Poly-V belt (only if it is being reused), take into account the direction of rotation mark.

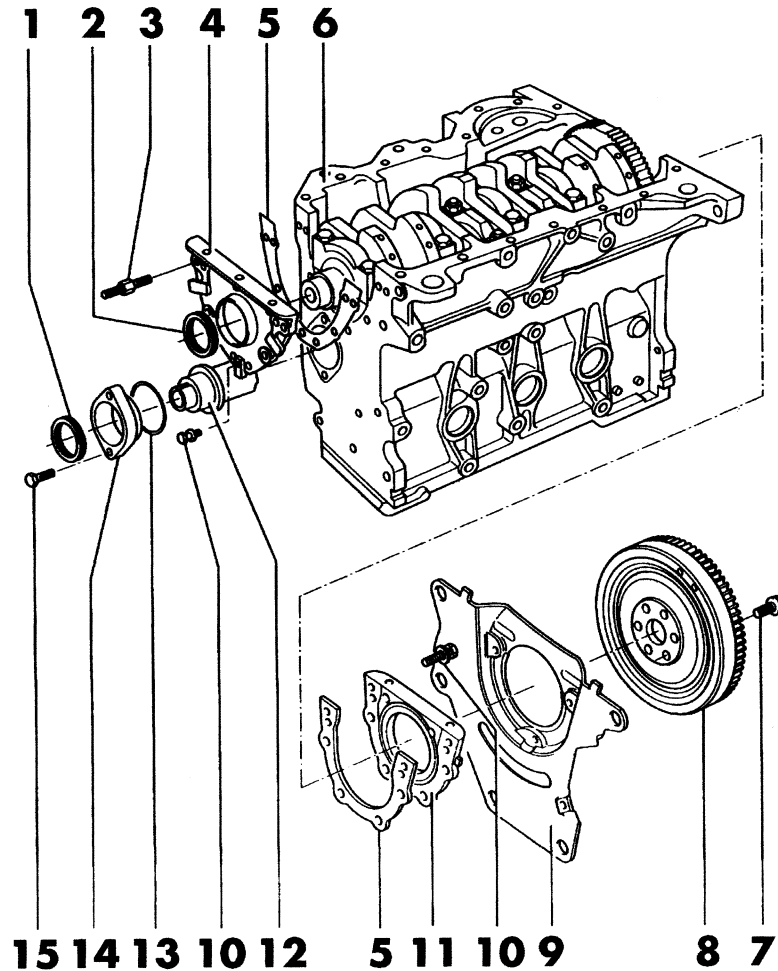
n models with a Poly-V belt without tensioning roller, once the belt is refitted and before the alternator securing bolts are tightened, the engine must be run at idling speed (approx. 10 seconds); the alternator fixing bolts must then be tightened (starting with the lower bolt).

Fit and tighten the power steering drive belt (Running gear, Group 48).

Engine 13

Crankshaft assembly: 2.0 I 16 V engine

CYLINDER BLOCK, SEALS AND ENGINE FLYWHEEL: EXPLODED VIEW



13AD22

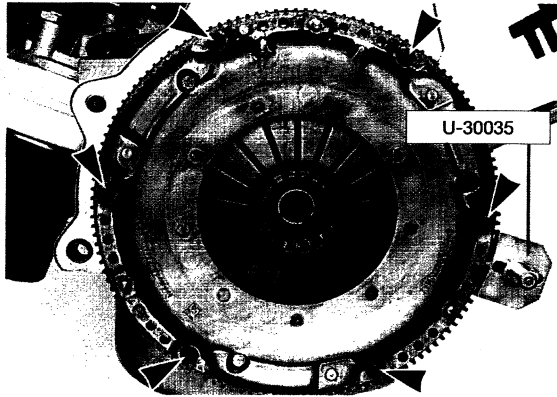
- | | |
|---|--|
| <p>1. Intermediate shaft oil seal.
Remove using the tool U-10080 and refit using the tool U-30002.</p> <p>2. Crankshaft oil seal.
Remove using tool U-10080 and refit using tool U-20019.</p> <p>3. Cover fixing bolt. 25 Nm.</p> <p>4. Front cover.</p> <p>5. Gasket.
Replace.</p> <p>6. Cylinder block.
Check the cylinder bores.</p> <p>7. Engine flywheel fixing bolt. 60 Nm + 90°.
Replace. The additional tightening by 90°, can be carried out in several stages.</p> <p>8. Engine flywheel.
Use the U-30035 retainer tool to remove and install.</p> | <p>Can be removed with the engine fitted into the vehicle by removing the gearbox.
The clutch disc contact area must be free from grooves, oil or grease.</p> <p>9. Intermediate plate.
Check that there is a proper seat on the centering bushings.</p> <p>10. Cover fixing bolt. 10 Nm.</p> <p>11. Rear cover with seal.
Removal and replacement.</p> <p>12. Intermediate shaft.
Removal and refitting. Check the axial play.</p> <p>13. O-ring.
Replace if damaged.</p> <p>14. Oil seal holding cover.</p> <p>15. Intermediate shaft oil seal holder fixing bolt. 25 Nm.</p> |
|---|--|

Engine 13

Crankshaft assembly: 2.0 I 16 V engine

CRANKSHAFT OIL SEAL, FLYWHEEL SIDE Replacement

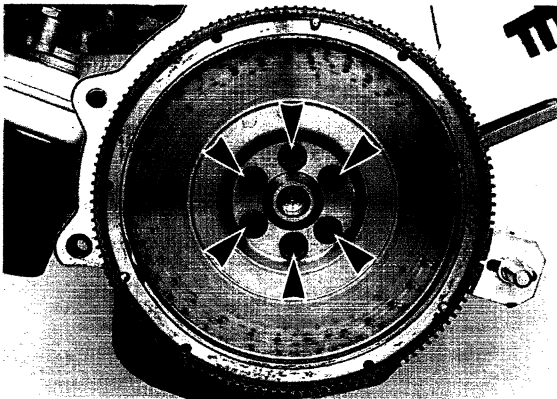
To replace the oil seal, it is necessary to remove first the gearbox-differential assembly.



13A109

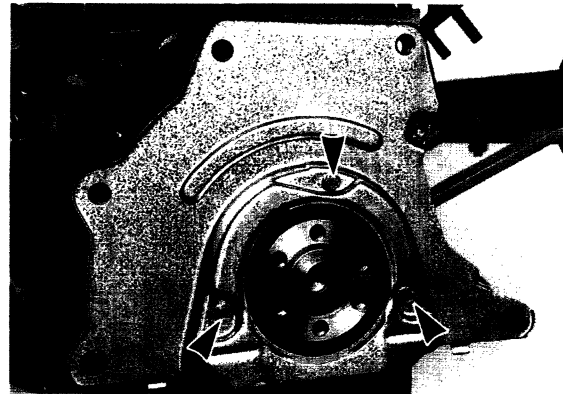
Remove the pressure assembly fixing bolts; block rotation with the **U-30035** tool.

Remove the pressure assembly together with the clutch plate.



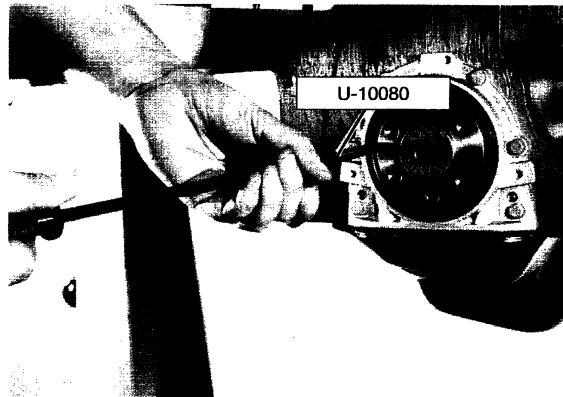
13A110

Remove the bolts fixing the engine flywheel and remove the flywheel.



13B013

Remove the intermediate plate fixing bolts and remove the intermediate plate.



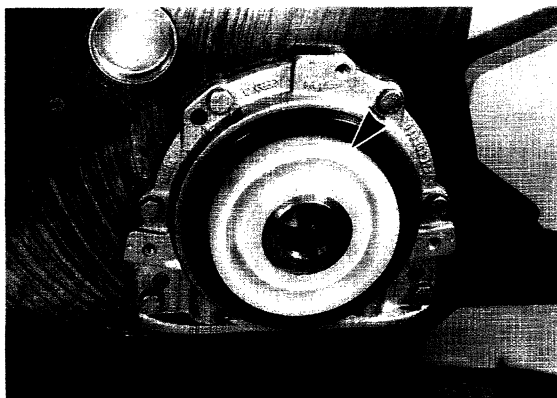
13B038

Push out the oil seal using the percussion tool **U-10080**.

Operate on different of the oil seal until pushing it out. Be very careful throughout the operation.

Engine 13

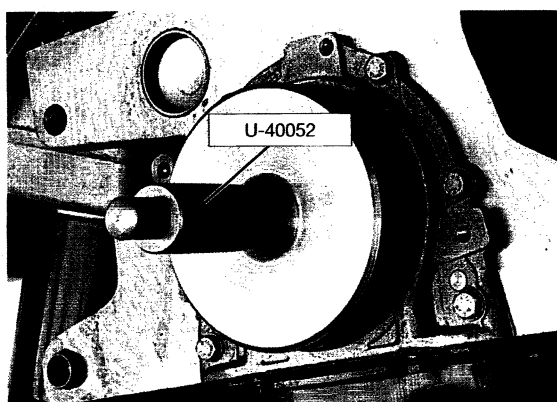
Crankshaft assembly: 2.0 I 16 V engine



13B021

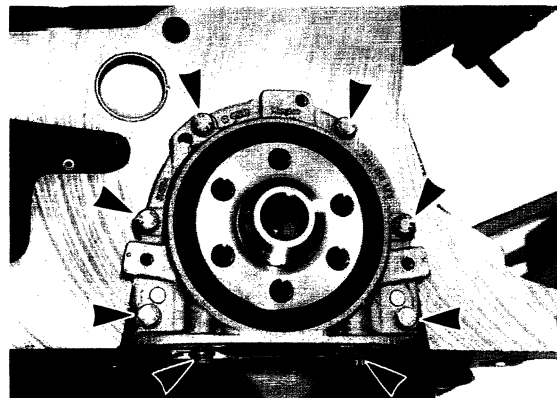
The spare oil seal is fitted with a bushing to make the fitting easier and to allow the oil seal lip slide over the crankshaft without getting damaged.

Place the bushing on the crankshaft and slide the retainer onto it.



13B090

Fully insert the retainer with the **U-40052** tool.

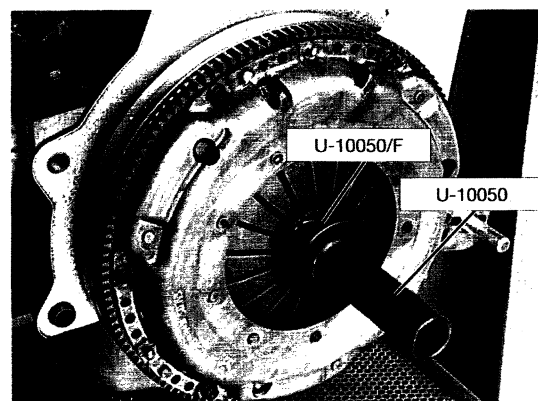


13B010

If necessary, replace the entire cover and seal assembly and tighten the bolts to the specified torque.

To refit, reverse the above operations taking the following into account:

The engine flywheel bolts must be replaced and fitted with a sealant; tighten the bolts crosswise to the specified torque.



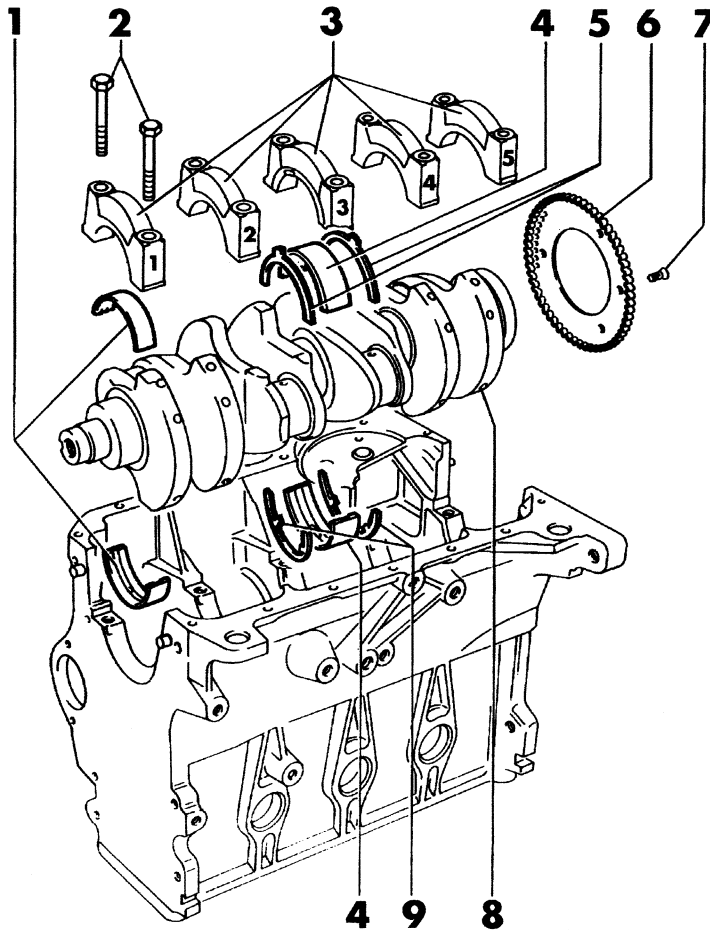
13A111

Centre the clutch plate using the **U-10050** tool and the **U-10050/F** adaptor; cross-tighten the pressure assembly fixing bolts to the specified torque.

Engine 13

Crankshaft assembly: 2.0 I 16 V engine

CRANKSHAFT ASSEMBLY: EXPLODED VIEW



13AD23

- 1. Half bearings number 1, 2, 4 and 5.**
Do not interchange used half bearings.
The half bearing number 4 with lubrication groove.
- 2. Cap fixing bolt. 65 Nm.**
- 3. Crankshaft caps.**
Follow the assembly sequence.
Cap number 1 is located on the distribution side.
Cap number 3 with grooves for friction washers.
The half bearing projections must be superimposed.
- 4. Central half bearing number 3.**
The cylinder block side half bearing with lubrication groove.
The cap side half bearing without lubrication groove.
- 5. Axial half bearing.**
For number 3 crankshaft cap.
Note the mounting position.
- 6. Toothed crown.**
For the engine speed transmitter.
- 7. Bolt fixing toothed crown. 10 Nm + 90°.**
- 8. Crankshaft.**
Check dimensions and radial and axial plays.
- 9. Axial half bearing.**
For cylinder block cap number 3.
Note the mounting position.

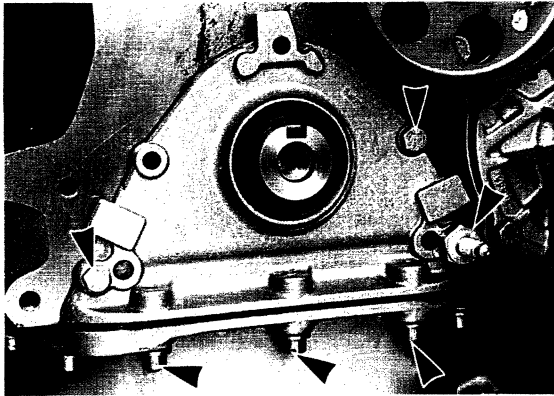
Engine 13

Crankshaft assembly: 2.0 I 16 V engine

CRANKSHAFT OIL SEAL, DISTRIBUTION SIDE Replacement

To replace the crankshaft oil seal, proceed as follows:

Remove the crankshaft pinion; the procedure is like the one described for the operation "timing belt drive, removal and refitting" but removing the camshaft and intermediate shaft drive pinions is not required.

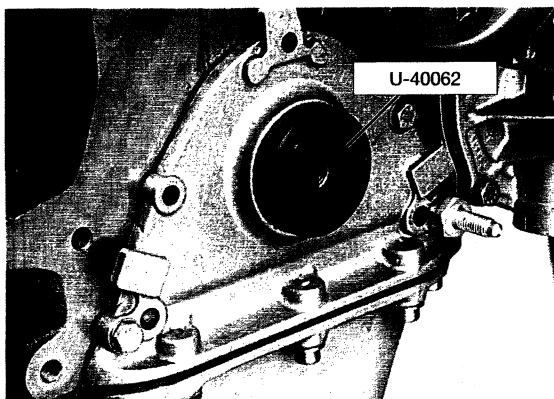


13A112

Remove the power-assisted steering tension bracket.

Remove the cover and seal and use a punch to remove the seal.

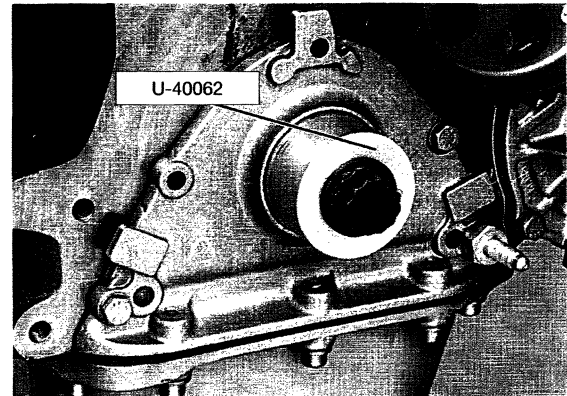
Once the seal has been removed, re-fit the cover to the block.



13A113

Place the centring part of the tool **U-40062** on the crankshaft and slide the oil seal over the centring part.

Lightly oil the oil seal lip and outer edge before fitting.



13A114

Place the pusher of the tool **U-40062** and acting on the pinion fixing bolt insert the oil seal until it stops.

After fitting the oil seal, proceed with the reassembly by reversing the procedure for disassembling.

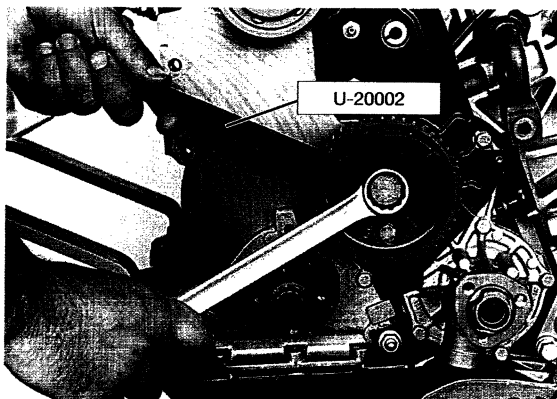
Engine 13

Crankshaft assembly: 2.0 I 16 V engine

INTERMEDIATE SHAFT OIL SEAL Replacement

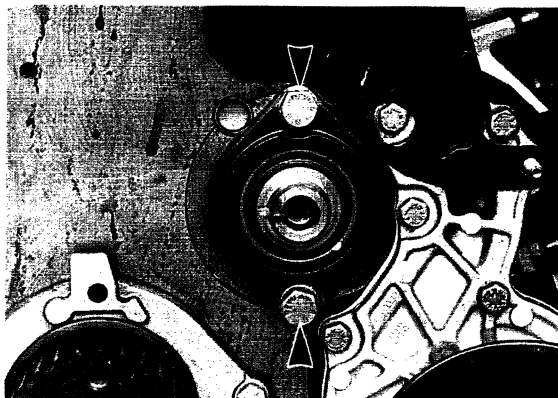
To replace the intermediate shaft oil seal, proceed as follows:

Remove the intermediate shaft pinion; the procedure is like the one described for the operation "timing belt drive, removal and refitting" but removing the camshaft and crankshaft drive pinions is not required.



13B081

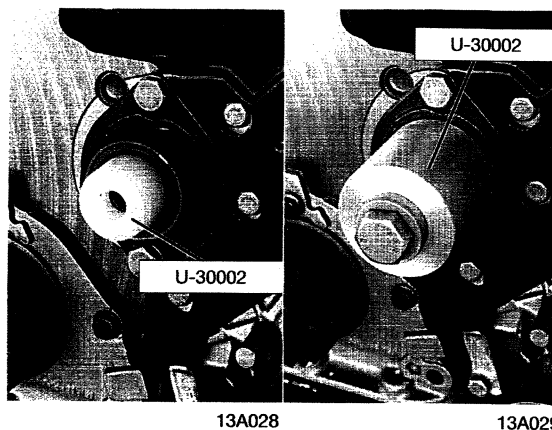
Disassemble the intermediate shaft drive pinion using the tool **U-20002/1**.



13A115

Remove the oil seal holding cover and push the seal out of the cover using a drive head.

Once the seal has been removed, refit the cover to the block.



13A028

13A029

Lightly oil the oil seal lip and outer edge.

Fit the oil seal on the centring ring of tool **U-30002**.

Insert the oil seal using the tool pusher; for pushing, a proper bolt must be used.

After fitting the oil seal, proceed with the reassembly by reversing the procedure for disassembling.

Engine 13

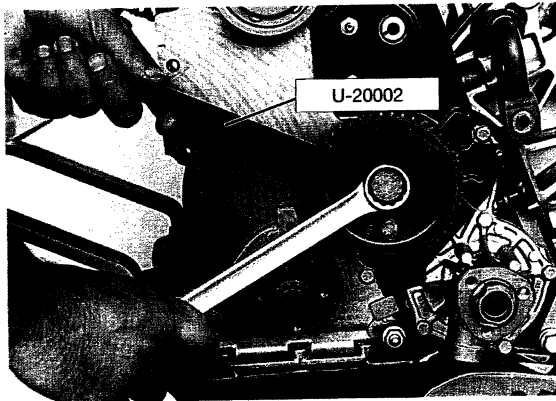
Crankshaft assembly: 2.0 I 16 V engine

INTERMEDIATE SHAFT Removal and replacement

Removal

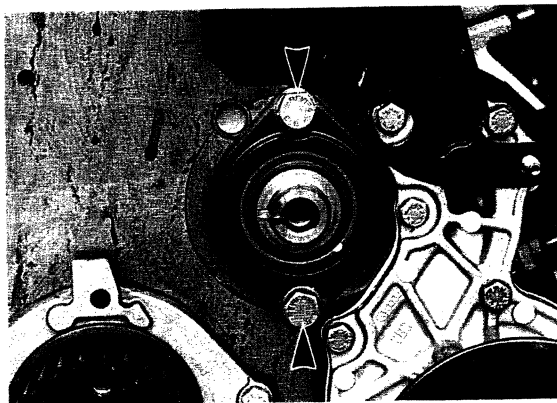
To replace the oil seal the engine must be removed from the vehicle.

Remove the timing belt.



13B081

Disassemble the intermediate shaft drive pinion using the tool **U-20002/1**.



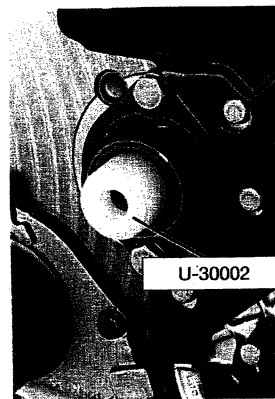
13A115

Remove the oil seal holding cover and, if the oil seal is to be replaced, remove the oil seal from the cover.

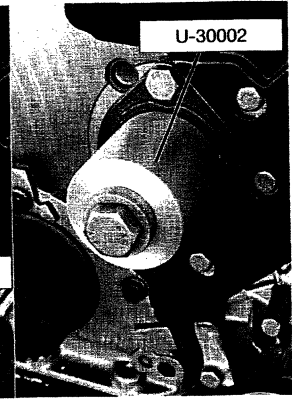
Remove the intermediate shaft.

To reassemble, reverse the above operations taking the following into account:

Refit the intermediate shaft and refit the oil seal holding cover.



13A028



13A029

If the seal has been replaced, lightly oil the sealing lip and its outer edge.

Fit the oil seal on the centring ring of tool **U-30002**.

Insert the oil seal using the tool pusher; to push the tool, a proper bolt must be used.

Before refitting the intermediate shaft drive pinion, check using a dial gauge that the shaft axial play does not exceed **0.25 mm**.

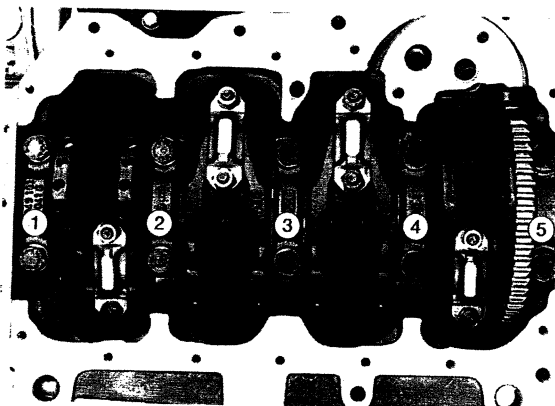
Engine 13

Crankshaft assembly: 2.0 I 16 V engine

CRANKSHAFT: Dimensions (mm)

Dimensions for grinding	Main bearing crankshaft pins Ø mm	Main bearing connecting rod pins Ø mm
Basic dimension	- 0.022 54.00 - 0.042	- 0.022 47.80 - 0.042
I Class	- 0.022 53.75 - 0.042	- 0.022 47.55 - 0.042
II Class	- 0.022 53.50 - 0.042	- 0.022 47.30 - 0.042
III Class	- 0.022 53.25 - 0.042	- 0.022 47.05 - 0.042

Crankshaft bearing cap fitting and tightening



13A117

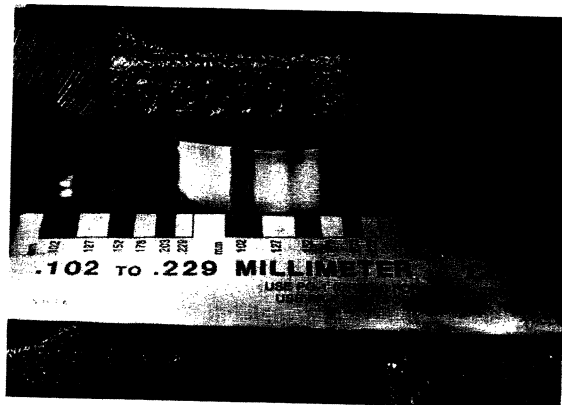
Fit the caps with the corresponding half bearings, according to the order marked on them.

Cap No. 1 is fitted on the distribution side.

Relif the caps taking into account that the half bearing projections must be superimposed.

Tighten the bolts to a torque of **65 Nm**.

CRANKSHAFT RADIAL PLAY Checking



13A032

To check the radial play with the engine assembled, use Plastigage and proceed as follows:

Remove the crankshaft bearing cap.

Carefully clean the half bearing and the crankshaft journal.

Place a Plastigage strip in axial direction over the crankshaft journal.

Refit the cap and tighten to a torque **65 Nm**.

Note

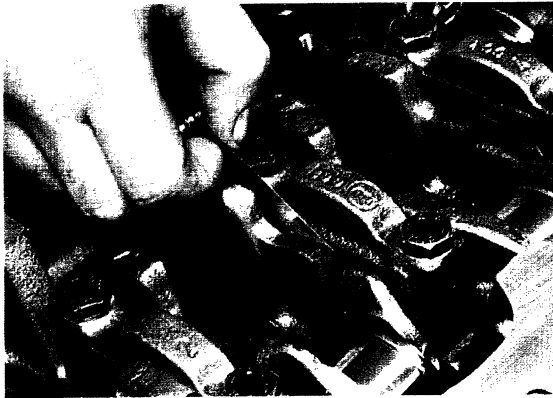
Do not turn the crankshaft while checking the radial play.

Remove the cap and check the width of the Plastigage strip with the measurement scale.

The value measured must be within the following range:

New engine **0.02 to 0.06 mm**.
LMaximum allowable wear **0.17 mm**.

CRANKSHAFT AXIAL PLAY
Ckecking



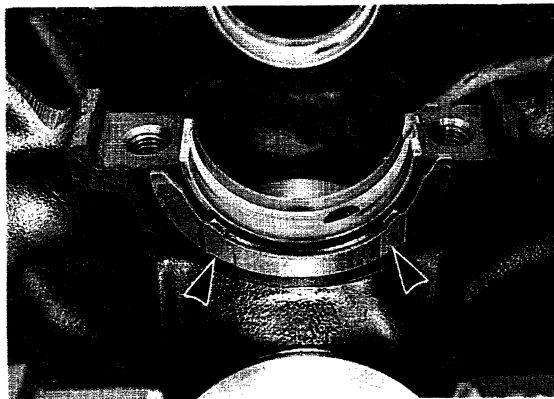
13A118

Check the bearing number 3 (adjustment bearing) axial play using a feeler gauge.

The axial play measurement must be:

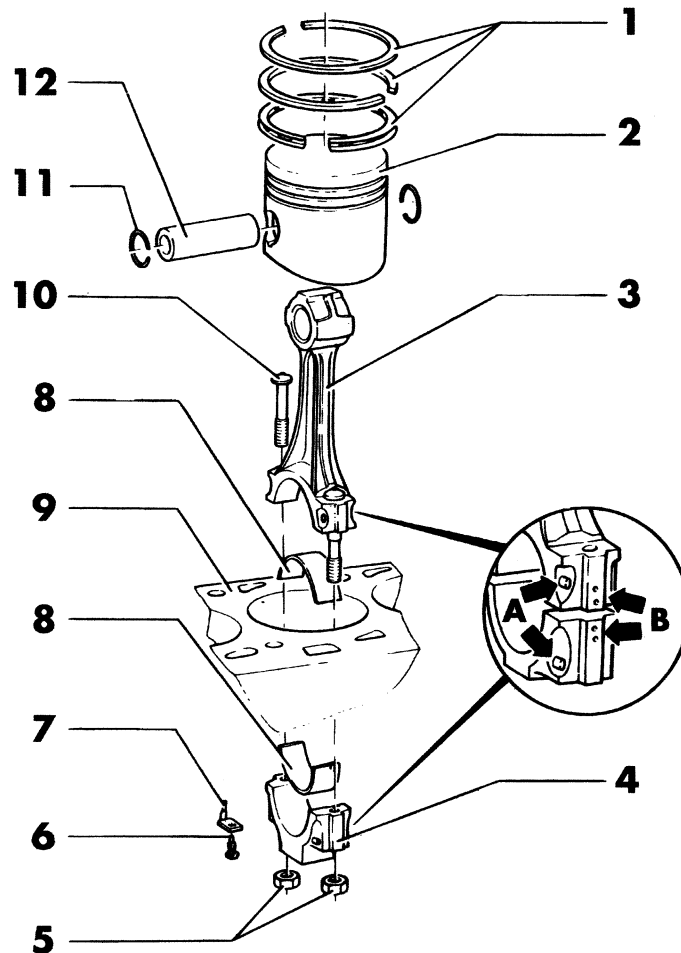
New engine 0,07 to 0,17 mm.
Maximum allowable wear 0,25 mm.

AXIAL HALF BEARINGS
Reassembly



13A033

Note the mounting position; the grooves on one of the half bearing sides must be directed towards the crankshaft.

CONNECTING ROD, PISTONS AND PISTON PINS: EXPLODED VIEW

13BD05

- | | |
|---|---|
| <p>1. Piston rings.
Remove and refit using special tweezers.
Stagger the piston ring ends by 120°.
Check the play.
The mark "TOP" must be directed towards the piston head.</p> <p>2. Piston.
Check.
Mark the mounting position and the cylinder to which it belongs.</p> <p>3. Connecting rod.
It includes a drilling to lubricate the piston pin.
Replace as complete sets only.
Mark the correspondence with the cylinder "B".
The marks "A" must be directed towards the distribution side.</p> <p>4. Connecting rod cap.
The marks "A" must be directed towards the distribution side.</p> | <p>5. Connecting rod cap fixing nut. 30 Nm + 90°.
Oil the contact surfaces.</p> <p>6. Pressure valve. 27 Nm.
Opening pressure: 2.5 ÷ 3.2 bar.</p> <p>7. Oil injector.</p> <p>8. Connecting rod big end half bearing.
It includes a drilling to lubricate the piston pin.
Note the mounting position.
Do not interchange used half bearings.
Make sure that the retaining projections are properly seated.</p> <p>9. Cylinder block.
Check the cylinder bores.</p> <p>10. Connecting rod bolt.</p> <p>11. Circlip.</p> <p>12. Piston pin.
Remove and refit using the tool U-20008.
If necessary to facilitate reassembly, heat the piston to 60 °C.</p> |
|---|---|

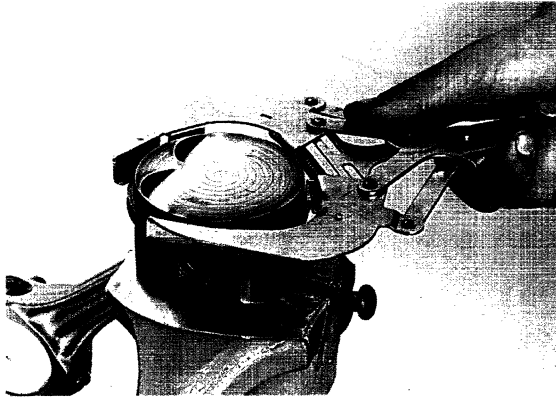
Engine 13

Crankshaft assembly: 2.0 I 16 V engine

PISTON-PISTON PIN-CONNECTING ROD ASSEMBLY

Disassembly, checking and reassembly

Disassembly



13A125

Hold the connecting rod-piston pin-piston assembly on a bench vise using guards on the jaws.

Remove the piston rings using special tweezers.



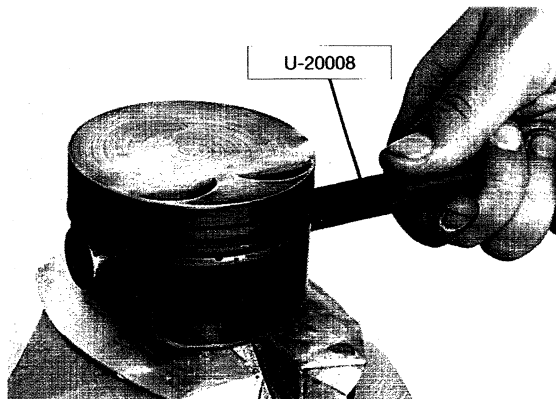
13A036

If the condition on the parts is good, the parts may be reused.

The connecting rods must be replaced by complete sets only.

Mark the correspondence between the assemblies and the cylinders and note mounting position.

Checking the pistons



13A120

Remove the circlips and remove the piston pin by pushing it out using the tool **U-20008**.

Mark the mounting position and the cylinder to which it belongs.



13A037

Take the measurements at about 10 mm from the lower edge and at 90° with the piston pin axis. The maximum allowable tolerance with regard to the rated dimension is **0.04 mm**.

Note

Whenever a repair is carried out, only pistons and piston rings of the same class will be fitted as well as only pistons of the same weight.

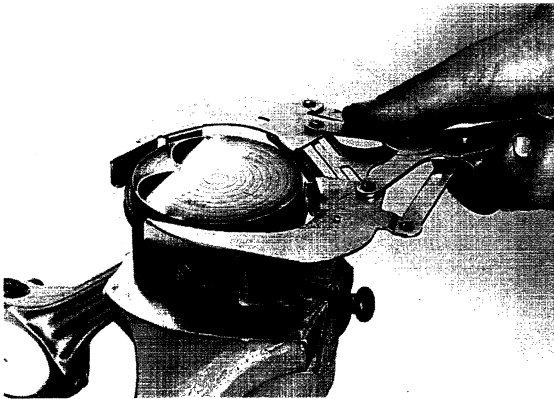
Engine 13

Crankshaft assembly: 2.0 I 16 V engine

PISTON-PISTON PIN-CONNECTING ROD ASSEMBLY

Disassembly, checking and reassembly

Disassembly



13A125

Hold the connecting rod-piston pin-piston assembly on a bench vise using guards on the jaws.

Remove the piston rings using special tweezers.



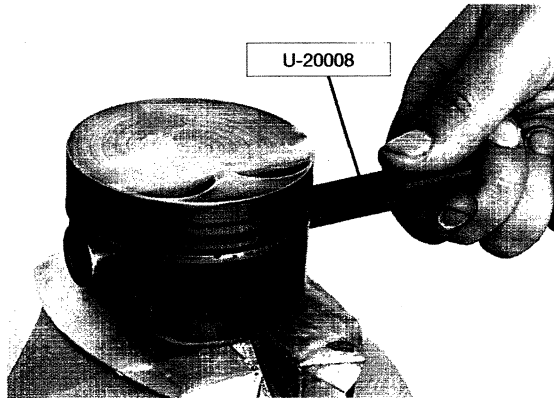
13A036

If the condition on the parts is good, the parts may be reused.

The connecting rods must be replaced by complete sets only.

Mark the correspondence between the assemblies and the cylinders and note mounting position.

Checking the pistons



13A120

Remove the circlips and remove the piston pin by pushing it out using the tool **U-20008**.

Mark the mounting position and the cylinder to which it belongs.



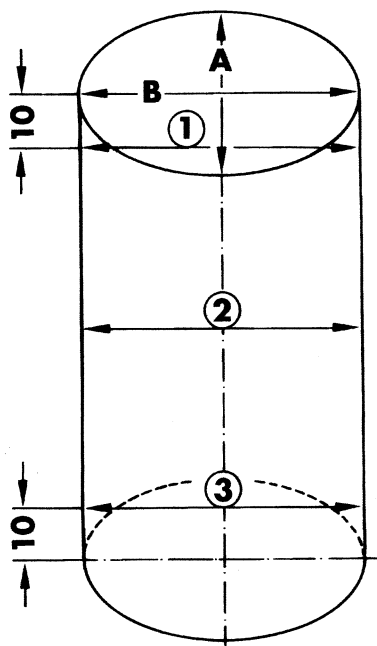
13A037

Take the measurements at about 10 mm from the lower edge and at 90° with the piston pin axis. The maximum allowable tolerance with regard to the rated dimension is **0.04 mm**.

Note

Whenever a repair is carried out, only pistons and piston rings of the same class will be fitted as well as only pistons of the same weight.

Checking the cylinder bore



13AD08

Using a precision inside caliper (50-100 mm), measure at three different points both crosswise **A** and lengthwise **B**.

Maximum allowable difference with regard to the rated dimension: **0.08 mm**.

Piston and cylinder bore dimensions

Values (in mm)

Measurement after grinding	Ø piston	Ø cylinder bore
Basic dimension	82.485	82.51
Class I	82.735	82.76
Class II	82.985	83.01

For greater values, the cylinder bore must be ground up to the allowable oversize in accordance with the scale for oversized pistons.

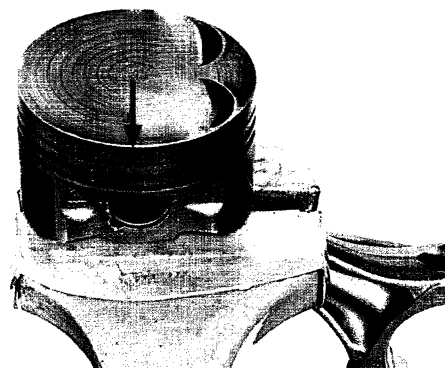
After grinding, wash and dry the cylinder bores and clean any particle from the walls using a viscous oil.

Note

The calibration must not be carried out with the cylinder block attached to the rotary trestle, as due to the stresses the measurements could be incorrect.

Reassembly

Before refitting the connecting rod-piston pin-piston assembly, carry out all the measurements and checkings required.



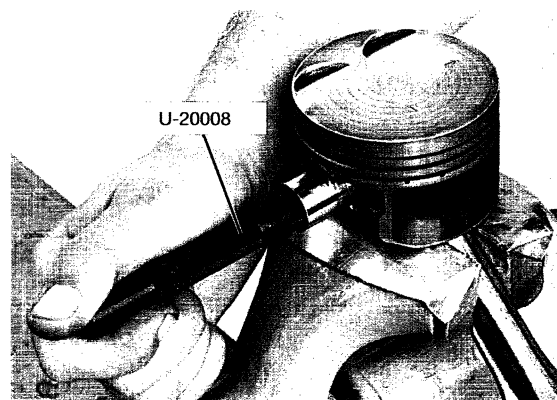
13A123

Hold the connecting rod on a bench vise using proper guards on the jaws.

Refit the piston-piston pin-connecting rod assembly.

Note the mounting position of the connecting rod with regard to the piston; the arrow engraved on the piston head must be pointing to the cast pegs on the connecting rod small end.

Check that the connecting rod and the piston belong to the same cylinder.



13A124

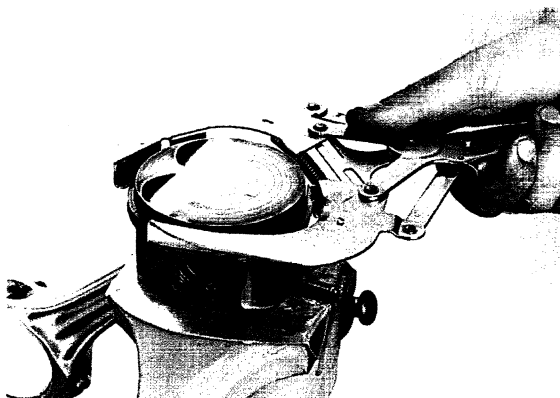
Fit the piston pin using tool **U-20008**.

If the piston pin is difficult to insert, heat the piston to about 60 °C.

Fit the circlips.

Engine 13

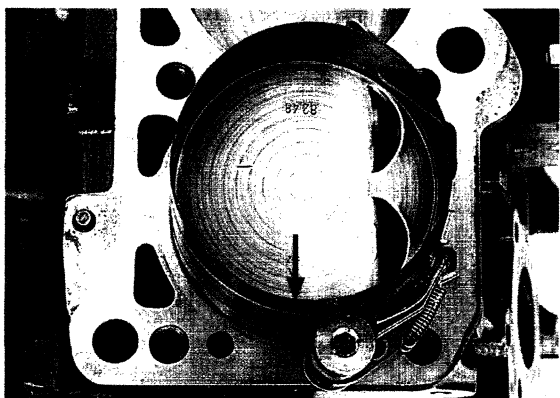
Crankshaft assembly: 2.0 I 16 V engine



13A125

Fit the piston rings on the piston using special tweezers for piston rings.

Position the piston ring ends staggered by 120° and taking into account that the mark "TOP" must be directed towards the piston head.



13A126

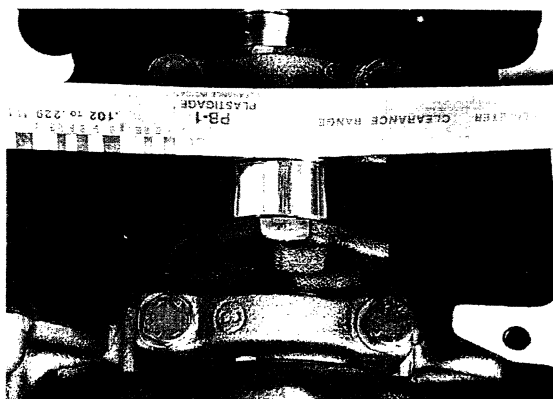
When refitting the connecting rod-piston pin-piston assembly into the cylinder block, make sure that the numbers of the assemblies match those of the cylinders.

Before refitting, lubricate the contact and friction surfaces using engine oil.

The arrows engraved on the pistons must be pointing to the distribution side.

For refitting, use an adjustable clamp.

CONNECTING ROD RADIAL PLAY CHECKING



13A045

With the engine assembled, the play checking can be carried out using Plastigage.

Remove the connecting rod cap.

Clean thoroughly the half bearing and the crankshaft pin.

Place either on the crankshaft pin or on the half bearing a Plastigage strip in axial direction.

Refit the connecting rod cap and tighten the bolts to a torque of **30 Nm**; do not turn the crankshaft during the measurement.

Remove the connecting rod cap.

Check the Plastigage strip width using the measurement scale.

The radial play must be:

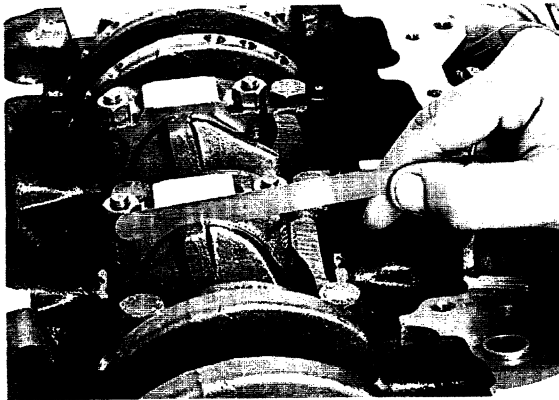
New	0.01 to 0.06 mm.
Maximum allowable wear	0.12 mm.

After checking the play, refit the connecting rod caps and tighten the bolts to the specified torque.

Engine 13

Crankshaft assembly: 2.0 I 16 V engine

CONNECTING ROD AXIAL PLAY CHECKING



13B088

Measure with a feeler gauge.

The axial play must be:

New 0.05 to 0.31 mm.
Maximum allowable wear 0.37 mm.

COMPRESSION RATIO

Test conditions

- Engine oil temperature: minimum 30 °C.
- Throttle valve fully open.
- Engine speed transmitter connector (next to the central connector), disconnected.
- Battery in good condition.
- Spark plugs removed.

Checking



13B109

Fir the **VAG 1381** or **VAG 1763** pressure meter into the spark plug hole.

Operate the starter motor until the pressure recorder does not show any further increase in pressure.

The compression ratio must be within the following ranges:

Engine	New (bars)	Maximum allowable wear (bars)
ABF	10 ÷ 13	7.5

The maximum allowable difference between any two cylinders must not exceed 3 bar.