

Crankshaft assembly 03



Job No.

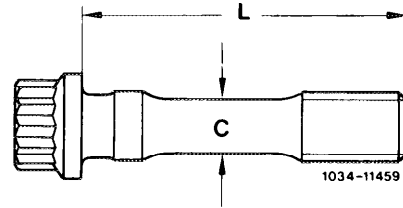
| | |
|---|----------|
| Checking, renewing and tightening conrod bolts | 03 - 310 |
| Renewing front crankshaft radial seal | - 324 |
| Renewing rear crankshaft radial seal | - 327 |
| Removing, installing belt pulley, flywheel damper and hub | - 342 |
| Removing, installing flywheel or driven plate | - 410 |
| Machining flywheel | - 420 |

03-310 Checking, Renewing and Tightening Conrod Bolts

Job No. of job texts and job values or standard
texts and fiat rates 03-4341, 03-4351

Conrod bolts

| | |
|------------------------------|---------------|
| Part No. | 102 038 00 71 |
| Thread 0 (d) | M9 × 1 |
| Stretch shaft 0 (c) when new | 7.4 - 0.1 |
| Minimum stretch shaft 0 (c) | 7.1 |
| Length (L) when new | 52 - 0.3 |
| Initial tightening torque | 30 Nm |
| Angle of rotation torque | 90 - 100° |



Conrod bolts

measure minimum stretch shaft 0 (c). If the minimum stretch shaft 0 has been reached or no longer exists, renew conrod bolt.

Thread and contact surface of conrod bolts

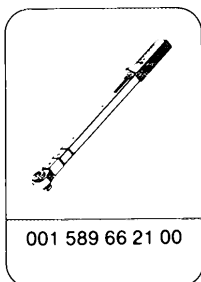
oil before installing.

Conrod bolt initial and angle of rotation torque ...

initial torque 30 Nm.

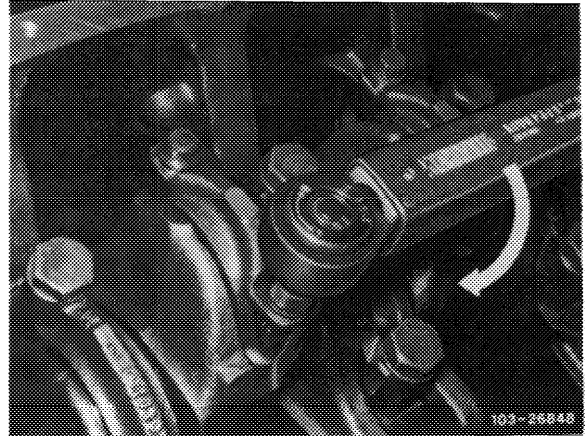
Angle of rotation torque 90 - 100°. Use special tool 001 589 66 21 00 (see Note).

Special tool



Note

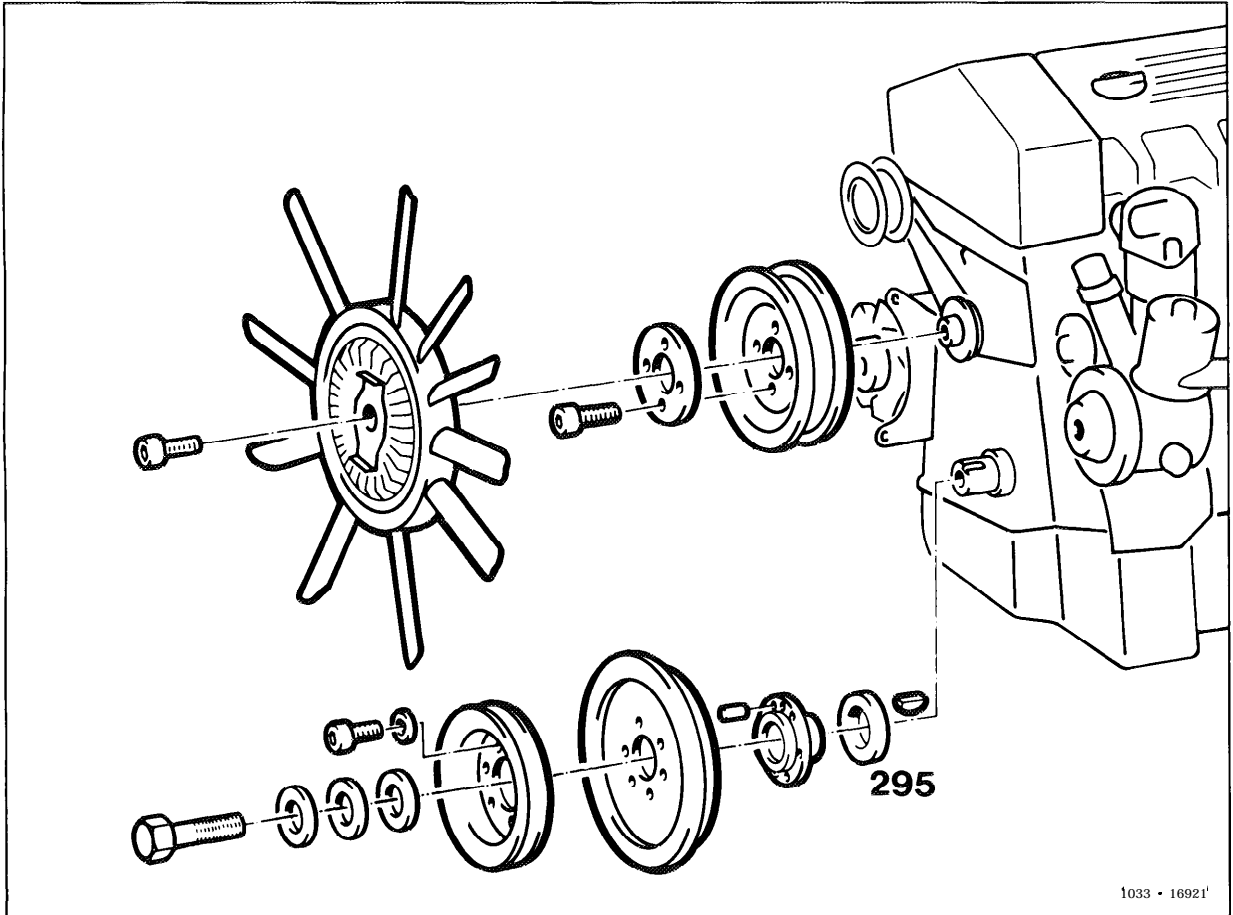
If no torquing wrench is available, the conrod bolt can be torqued on by the specified angle with a socket wrench and tommy in a single step. To rule out any possible angle errors, do not use a bending rod torque wrench for tightening according to degrees of angle.



03-324 Renewing Front Crankshaft Radial Seal

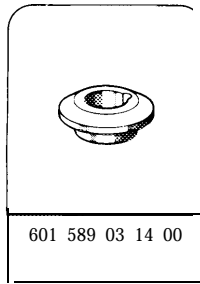
Job No. of job texts and job values or standard
 texts and flat rates 03-3000 - 01-3112

Model 124



| | |
|---|--|
| Belt pulley, vibration damper and hub | remove, install (03-342). |
| Radial seal (295) | remove, renew and install (step 2, use special tool 601 589 03 14 00). |
| Mounting hole | clean, check. |
| Sealing lip | oil (step 3). |

Special tool

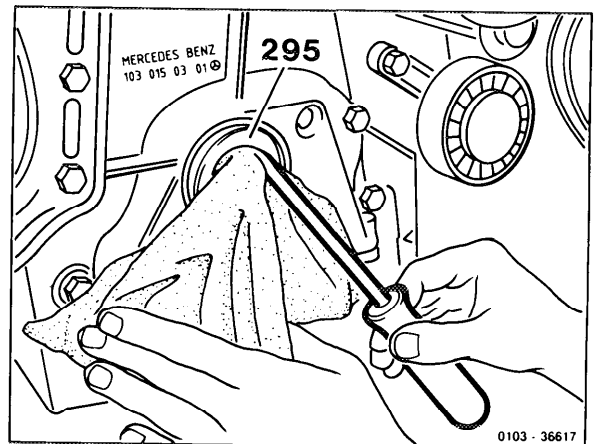


Note

An oil leak can be detected by spraying around the cleaned and dried area with Mercedes-Benz white contrast spray 000 989 03 59.

The radial seal has a sealing lip offset by 2 mm to the inside for the repair.

- 1 Remove belt pulley, vibration damper and hub (03-342).
- 2 Use a screwdriver to press radial seal (295) out of the timing case cover. Ensure that the crankshaft journal and the mounting hole in the timing case cover are not damaged. Cover crankshaft journal with a cloth. If necessary, deburr mounting hole.



- 3 Oil sealing lip of radial seal (295).



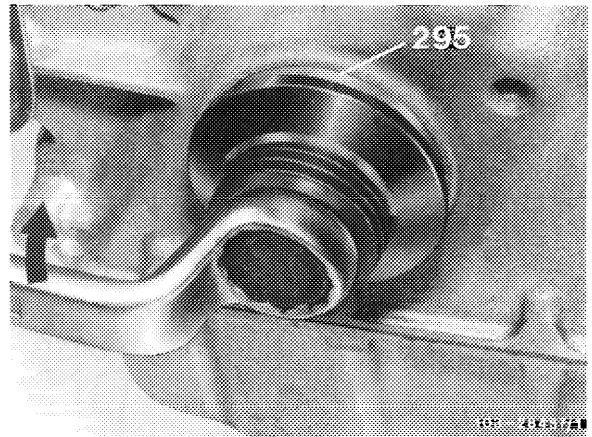
Do not use any grease. Grease prevents the inclined webs on the sealing lip from transporting back the engine oil.

4 Press in radial seal (295) with the installation tool 601 589 03 14 00.

Note

The radial seal must be at right angles to the crankshaft journal otherwise it will not provide a proper seal.

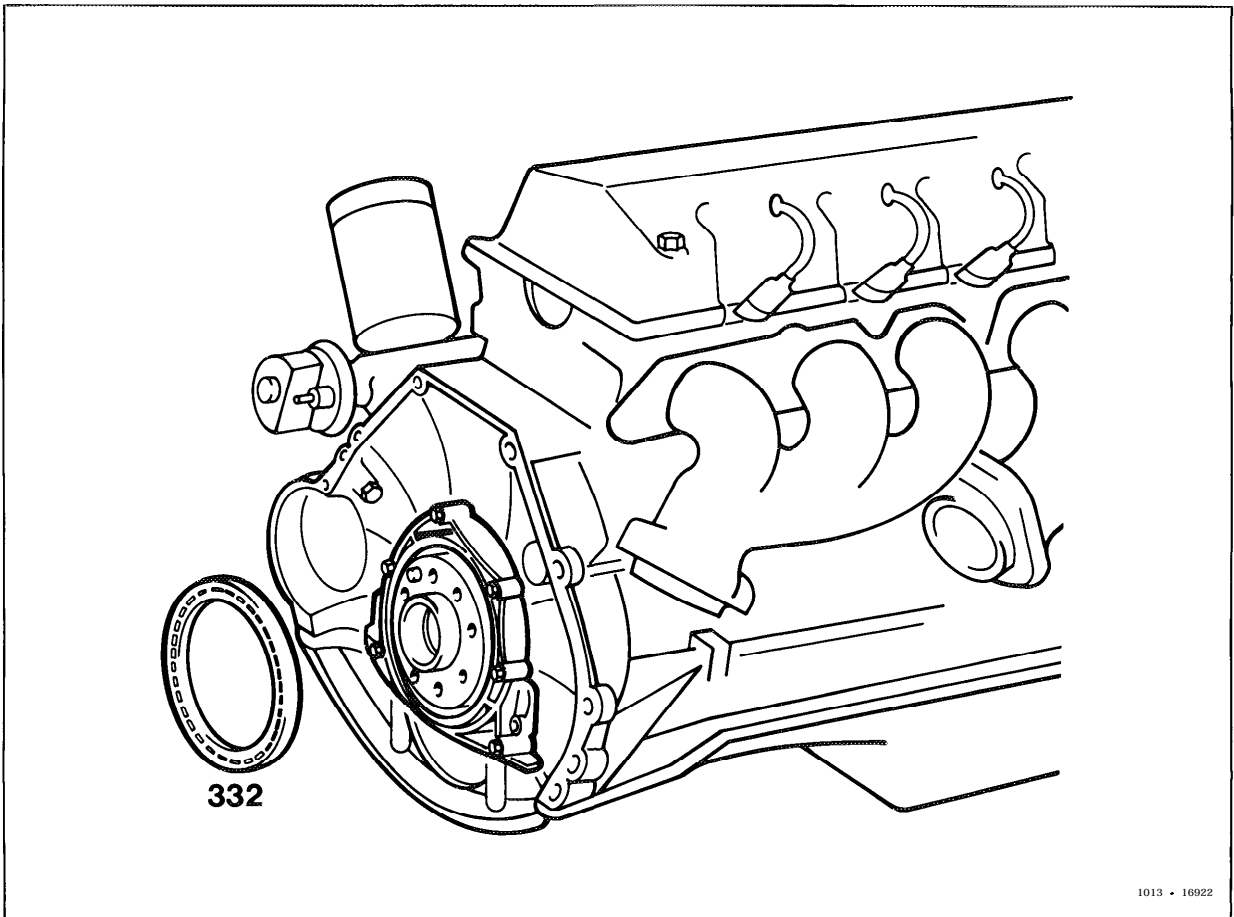
Install in the reverse order.



03-327 Renewing Rear Crankshaft Radial Seal

Transmission removed.

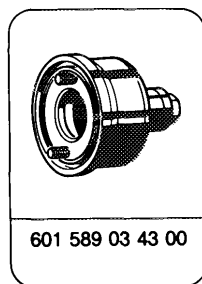
Job No. of job texts and job values or standard
texts and flat rates 03-3063 - 03-3301



1013 • 16922

| | |
|---|--------------------------------------|
| Wood | raise to vertical position (01-008). |
| Ground cable to battery | detach, attach. |
| Flywheel or driven plate | remove (03-410). |
| Radial seal (322) | remove, renew and install. |
| Mounting hole | clean, check. |
| Sealing lip | coat with engine oil. |
| Oil level in engine | check, correct. |
| Engine in installation position | support, secure. |
| Leaktightness with engine running | check. |
| Flywheel or driven plate | install. |

Special tool



Note

The radial seal is press-fitted flush in the closing cover without sealant. The closing cover is fixed to the crankcase with 2 fit pins and bolted on.

An oil leak can be detected after spraying the cleaned and dried area with Mercedes-Benz white contrast spray 000 989 03 59.

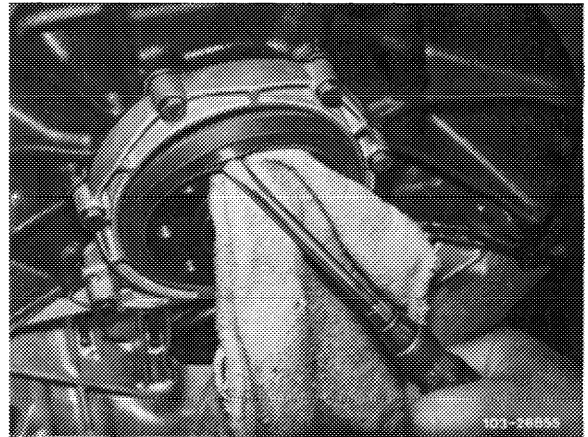
The radial seal has a sealing lip offset by 3 mm to the inside for the repair.

The mounting holes in the crankshaft are designed as blind holes.

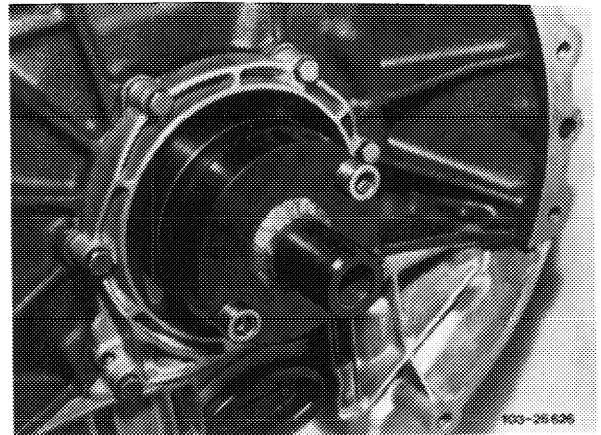
- 1 Raise hood to vertical position (01-008).
- 2 Detach ground cable at battery.
- 3 Remove flywheel or driven plate (03-410).

4 Use a screwdriver to press the radial seal out of the closing cover. Ensure that the crankshaft flange and the mounting hole in the closing cover are not damaged when performing this step.

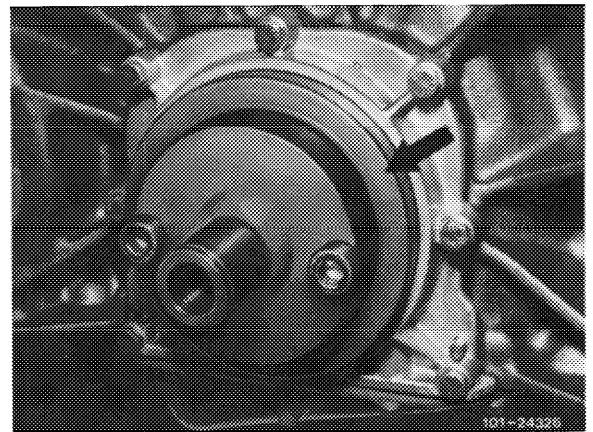
Cover over crankshaft flange with a cloth.
If necessary, deburr mounting hole.



5 Bolt inner section of installation tool 601 589 03 43 02 to the crankshaft flange.



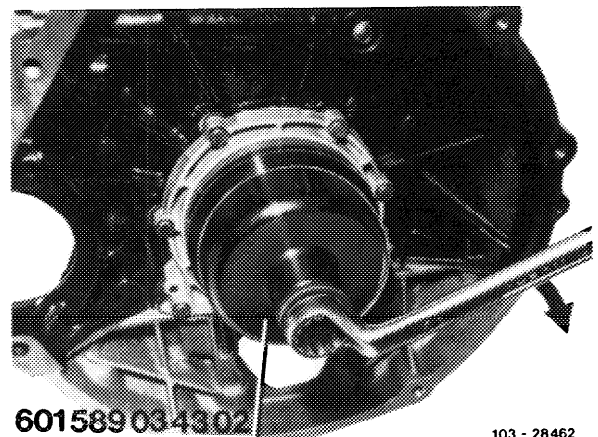
6 Push radial seal (arrow) over the inner section of the installation tool.



7 Press radial seal into the closing cover as far as the stop until flush using the outer section of the installation tool 601 589 03 43 02.

Note

The radial seal must be at right angles to the crankshaft flange otherwise it will not provide a proper seal.



103 - 28462

8 Coat sealing lip of radial seal with engine oil.



Do not use any grease. Grease prevents the inclined webs on the sealing lip from transporting back the engine oil.

9 Check oil level in engine and adjust to correct level.



Before starting engine, move into installation position and secure at the rear by supporting.

10 Attach ground cable to the battery.

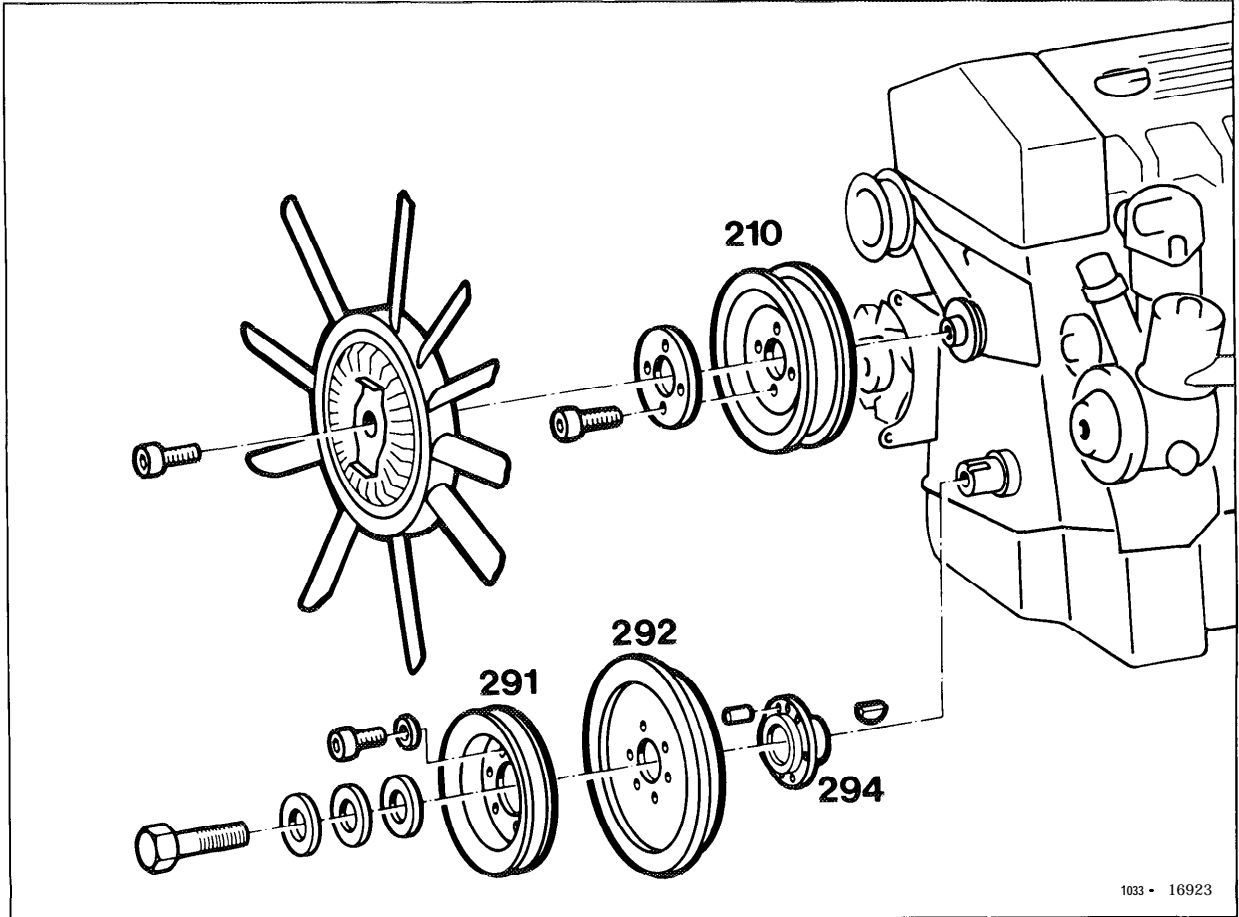
11 With the engine running, check for signs of leaks before installing transmission.

12 Install flywheel or driven plate (03-410).

03-342 Removing, Installing Belt Pulley, Flywheel Damper and Hub

Job No. of job texts and job values or standard
 texts and flat rates 03-I 320 - 03-I 911

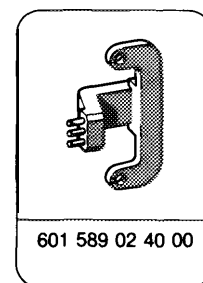
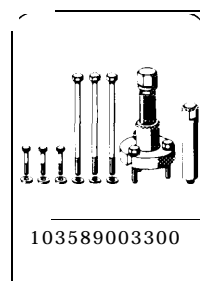
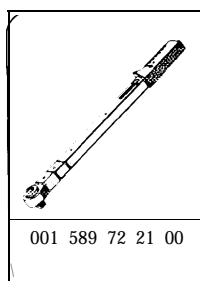
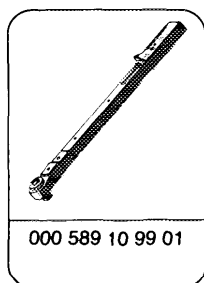
Model 124



1033 - 16923

| | |
|--|--|
| Hood | raise to vertical position (01-008). |
| Ground cable to battery | detach, attach. |
| Engine compartment covering below | remove, install. |
| Poly V-belt | remove, install (13-342). |
| Guard plate in front of radiator | attach (step 6). |
| Belt pulley (210) | remove, install, tightening torque 10 Nm. |
| Retaining lock | install, remove, special tool 601 589 02 40 00 (steps 8 and 9). |
| Vibration damper (292) and belt pulley (291) | remove, install (step 10), tightening torque 23 Nm. |
| Hub (294) | pull off, press on, tightening torque 300 Nm. |

Special tools



Shop-made tool

Guard plate for radiator/condenser

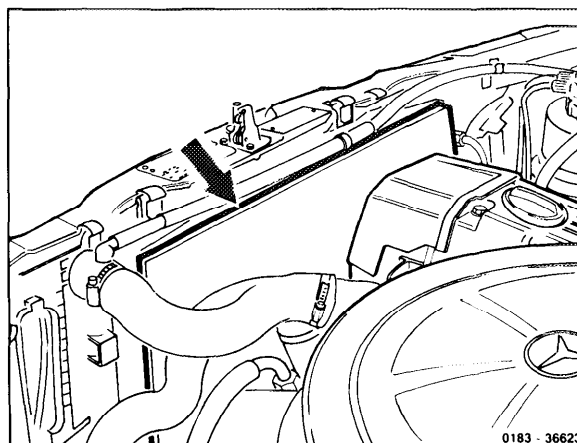
Dimensions approx. 600 × 480 × 1

Note

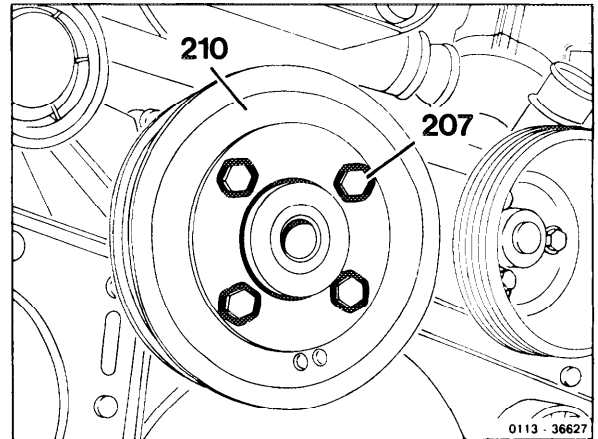
Belt pulley, vibration damper and hub can be renewed without balancing.

- 1 Raise hood to vertical position (01-008).
- 2 Detach ground cable at battery.
- 3 Remove engine compartment covering below.
- 4 Slacken bolts of the belt pulley-fan coupling.
- 5 Remove V-belt (13-342).

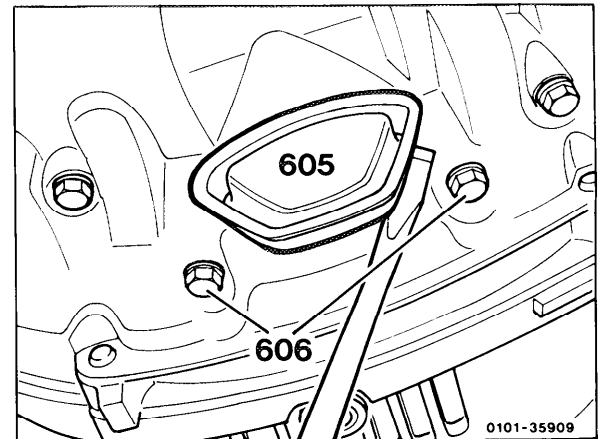
- 6 Fit guard plate (arrow) in front of radiator.



7 Unscrew bolts (207) and take off belt pulley-fan coupling (210), tightening torque 10 Nm.



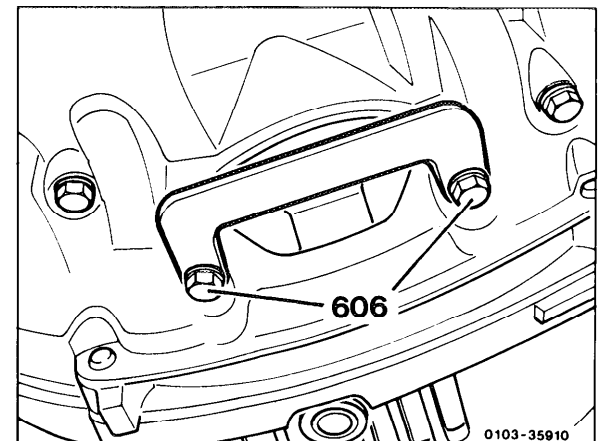
8 Take off plastic cap (605) on rear of oil sump. Unscrew bolts (606).



9 Attach retaining lock 601 589 02 40 00 with both bolts (606).

Note

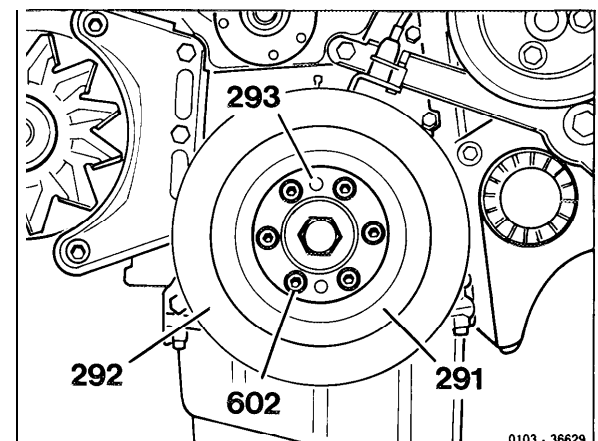
Pins of the retaining lock must engage into the ring gear teeth.



10 Unscrew bolts (602). Take off belt pulley (291) and vibration damper (292).

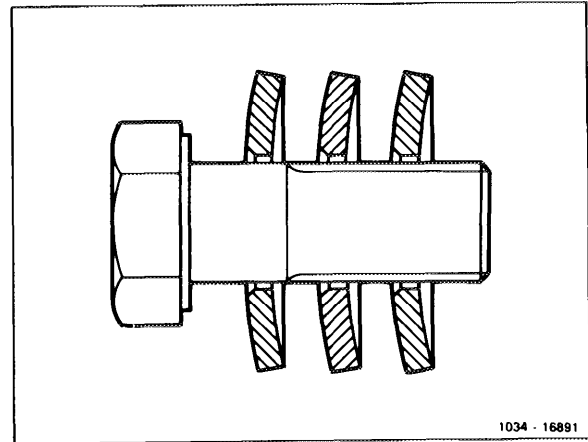
Installation instruction

The vibration damper (292) is located with a fit pin (293). Install bolts (602) with washers, tightening torque 23 Nm.



Installation instruction

Oil bolt threads and Belleville spring washers. Fit Belleville spring washers with the curved face pointing toward the bolt head. Tighten bolt to 300 Nm.

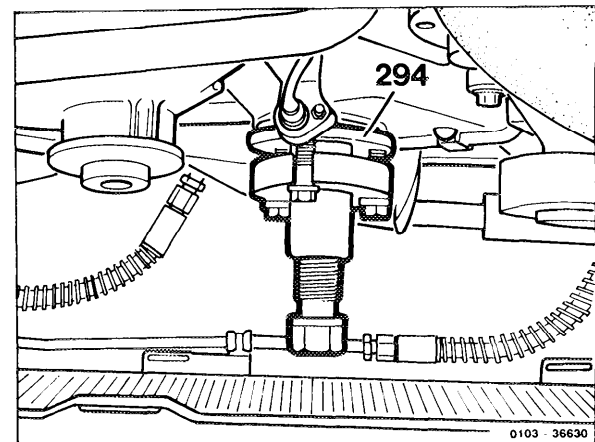


11 Pull off hub (294) with puller
103 589 00 33 00.

Installation instruction

Heat hub (294) to approx. 50 °C so that it can be easily fitted onto the crankshaft. When fitting on, perform turning movements to determine whether the slot of the hub (294) is aligned with the Woodruff key in the crankshaft.

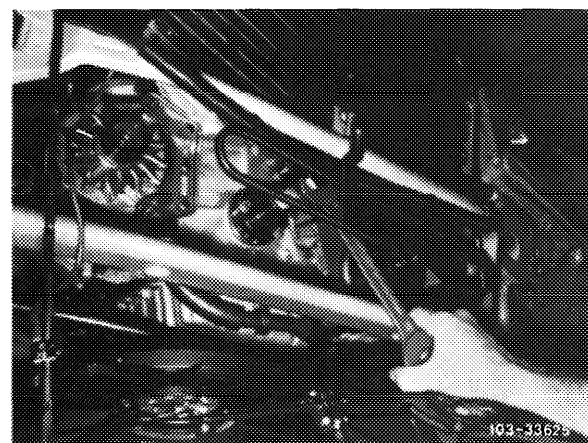
Install in the reverse order.



Model 201

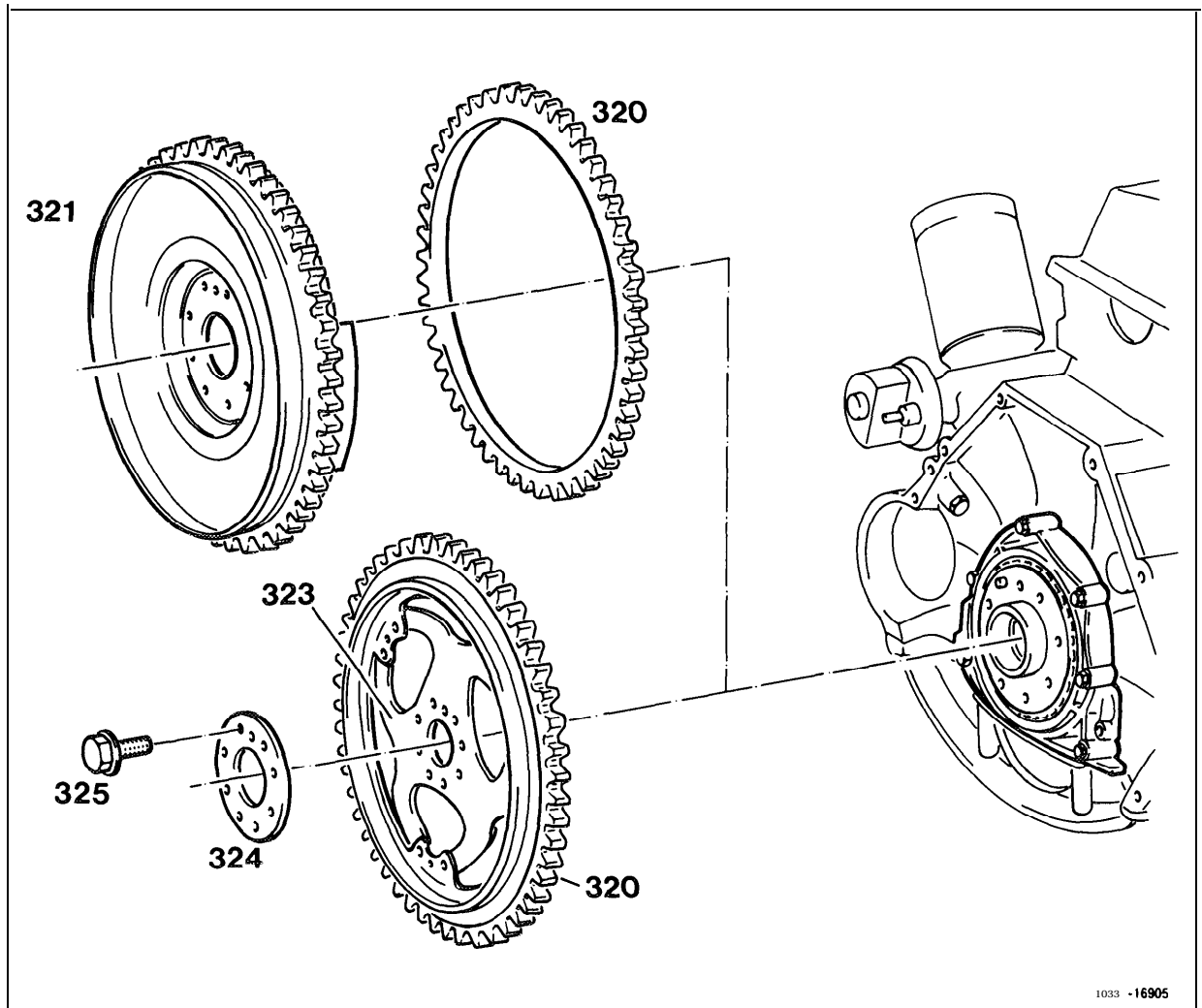
- 1 Remove visco clutch, fan and radiator.
- 2 Disconnect steering oil cooler connections.
- 3 Disconnect both electric cooling fans.

Remaining procedure as on model 124.



03-410 Removing, Installing Flywheel or Driven Plate

Job No. of job texts and job values or standard
 texts and flat rates 03-8001, 03-8201



1033 -16905

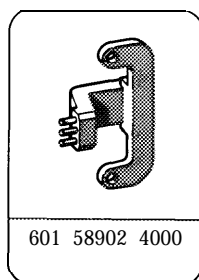
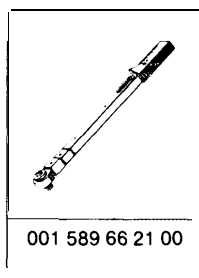
| | |
|--|---|
| Manual or automatic transmission | remove, install (26-020 or 27-600). |
| Clutch | remove, install (25050). |
| Retaining lock | install, remove. |
| | Special tool 601 589 02 40 00 (steps 1 and 2). |
| Stretch bolts (325, M10 x 22) | unscrew, check and screw in. |
| | Tightening torque: |
| | Initial torque 30 Nm. |
| | Angle of rotation torque 90° (step 4). |

Stretch bolts (325)
 Flywheel (321) or driven plate (323) with ring gear (320)

check.

detach, attach (steps 5 to 7).

Special tools



Note

The flywheels of the engines 103.94 and 103.98 differ in their dimensions and weights.

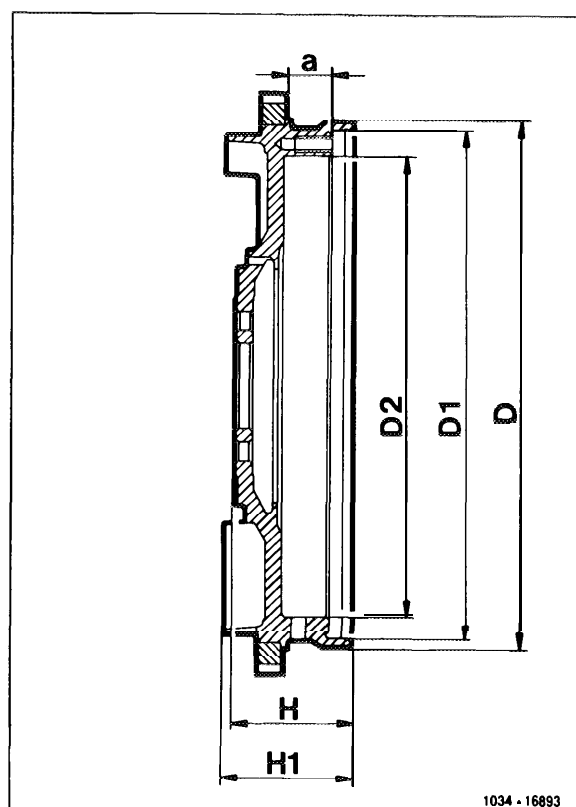
Distinguishing characteristics¹⁾

| Engine | D | D2 | H | H1 | a |
|--------|-------|-----|------|------|------|
| 103.94 | 272.0 | 237 | 55.5 | 61.5 | 24.8 |
| 103.98 | 277.5 | 244 | 60.2 | 66.2 | 27.5 |

¹⁾ except cars with 4MATIC.

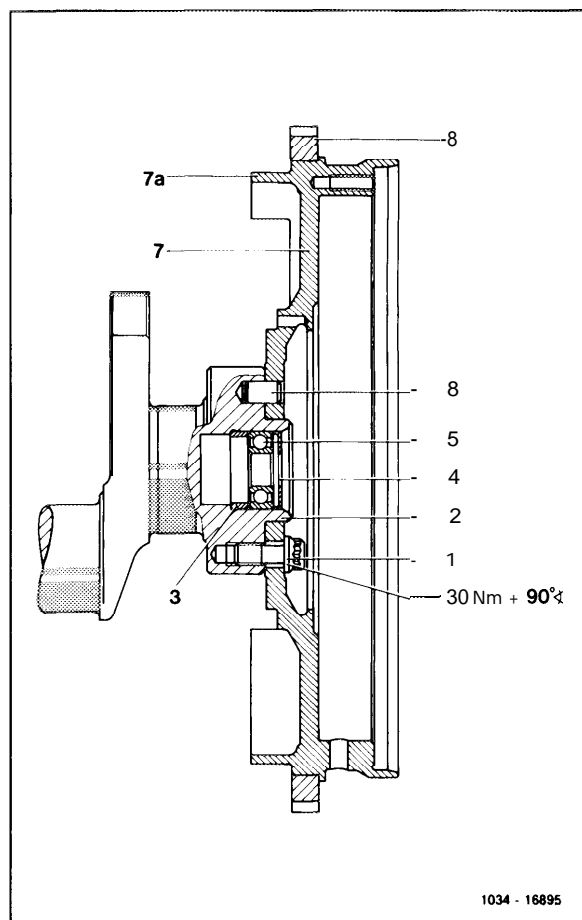
Flywheel and driven plate are guided on the crankshaft with fit holes and located each with a fit pin.

Flywheel or driven plate with ring gear are balanced individually and can be replaced without balancing.



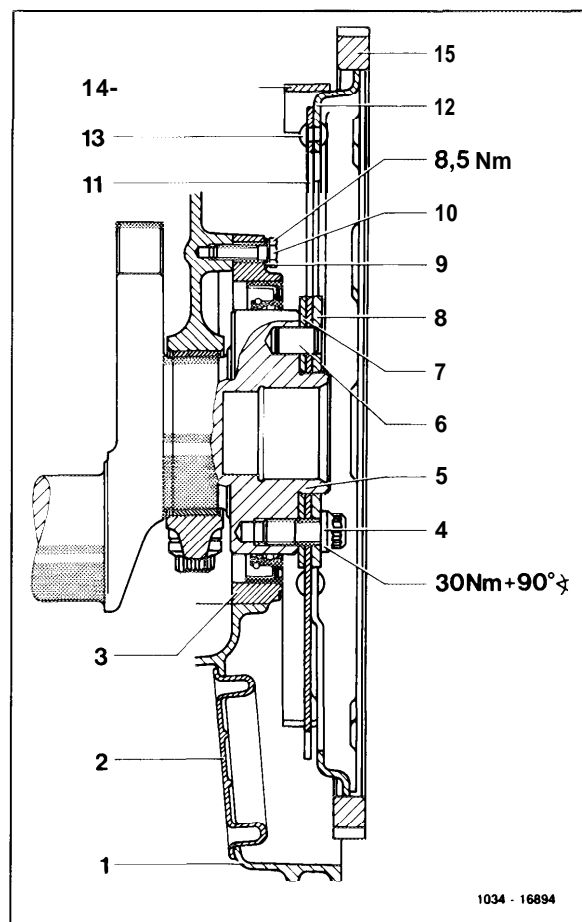
Arrangement on manual transmission

- 1 Stretch bolt M10 x 1 x 22
- 2 Crankshaft
- 3 Spacer ring
- 4 Closing cover
- 5 Grooved ball bearing
- 6 Fit pin
- 7 Flywheel
- 7a Segment
- 8 Ring gear

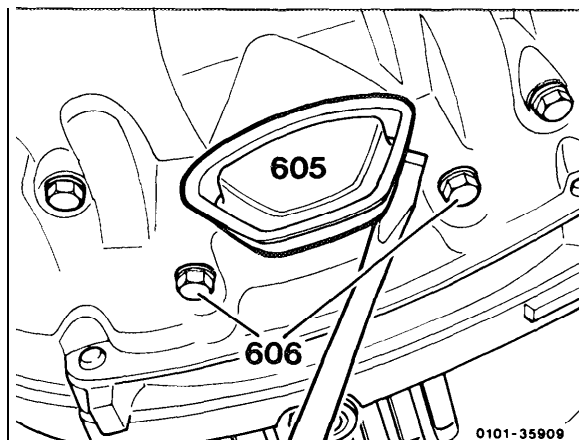


Arrangement on automatic transmission

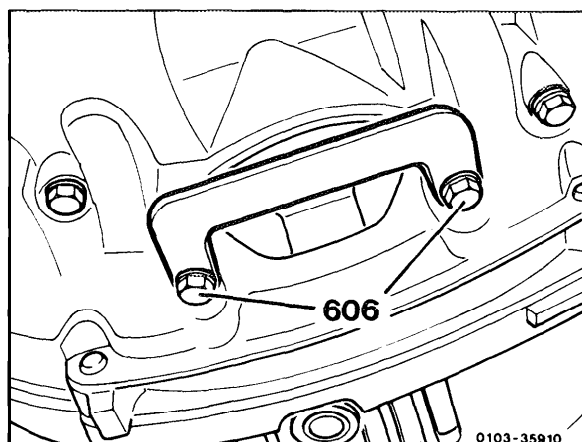
- 1 Oil sump
- 2 Cover
- 3 Closing cover with radial seal
- 4 Stretch bolt M 10 x 1 x 22
- 5 Crankshaft
- 6 Fit pin
- 7 Disk 2.6 mm (stuck on)
- 8 Disk 3.5 mm
- 9 Washer
- 10 Bolt
- 11 Driven plate
- 12 Ring for ring gear
- 13 Rivet
- 14 Segment
- 15 Ring gear



1 Take off plastic cap (605) on rear of oil sump. Unscrew bolts (606).

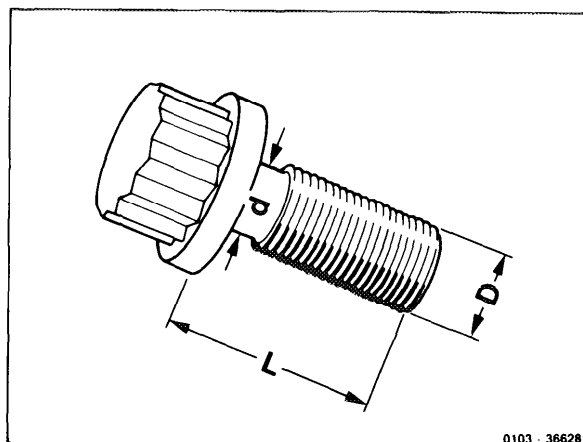


2 Fix retaining lock 601 589 02 40 00 with both bolts (606). Pins on the retaining lock must engage in the ring gear teeth.



3 Unscrew stretch bolts. Take off flywheel (321) or driven plate (320) with stuck-on disk and disk (324).

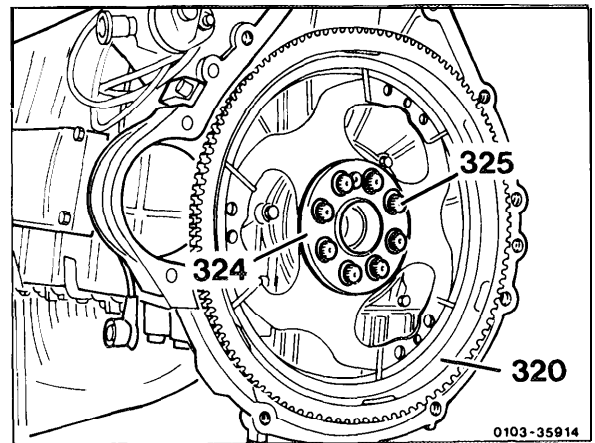
4 Check stretch bolts, measure diameter of stretch bolt shaft and length of bolts. If the specified minimum dia. «d» on the stretch shaft or if the maximum bolt length «L» is reached, the bolts must be renewed.



| Thread | D | | M10 × 1 |
|-----------------|---|------------------|-----------|
| Stretch shaft Ø | d | When new | 8.5 – 0.2 |
| | | Minimum Ø | 8.0 |
| Bolt length | L | When new | 22 ± 0.2 |
| | | Max. bolt length | 22.5 |

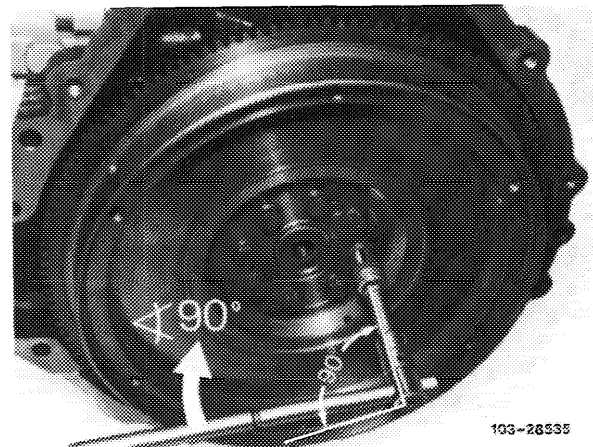
5 Attach flywheel or driven plate and ring gear (320) with stuck-on disk and disk (324).

6 Screw in stretch bolts (325) and tighten with initial tightening torque of 30 Nm.



7 Torque stretch bolts (325) on in a single step by the specified angle of rotation torque of 90°.

Do not use a torque wrench in order to rule out any possible angle error.



03-420 Machining Flywheel

Job No. of job texts and job values or standard
texts and flat rates 03-8022

| | | |
|--|-------------------|------------|
| Engine (except 103.984 and 103.985) | 103.98 | 103.94 |
| Distance a | 25.4 + 0.2 | 19.4 ± 0.1 |
| Distance b | when new | 15.2 ± 0.4 |
| | for repairs up to | 14.2 ± 0.4 |
| Permissible variation in concentricity on clutch face or clutch flange face | 0.05 | 0.05 |

Note

Flywheels for manual transmission which have scorch points, scoring or cracking in the clutch face, should be machined by precision-turning.

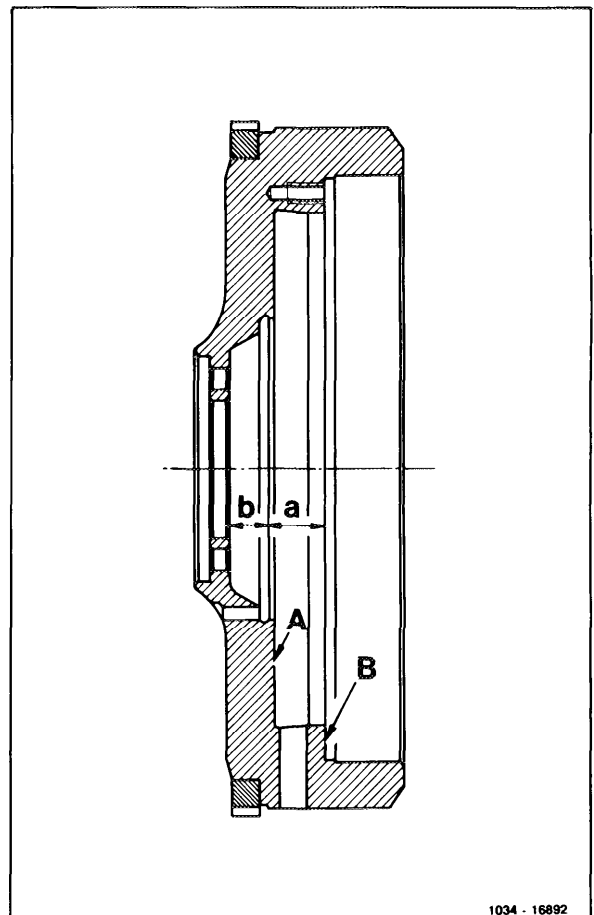
If the grooves or cracks are deeper than the maximum permissible stock removal, the flywheel must be renewed.

If the clutch face «A» is machined, the mounting face «B» must also be machined by the same amount in order to maintain the distance «a».

Size «b» must be maintained as a minimum size when performing repairs.

The flywheel must be properly clamped for machining to ensure that the permissible variation in concentricity of 0.05 mm is not exceeded.

Following machining, the clutch face must not have any shrinkholes or chatter marks.



1034 - 16892