

N. Removal and Installation of Counterweight and Vibration Damper on Crankshaft

Repair procedures for the vibration damper see Job No. 03-5, Section I.

I. Counterweight on Models 180 a, 180 b, and 190 SL

On Models 180 a, 180 b, and 190 SL a counterweight is mounted on the front crankshaft end as in the case of Model 190 (Fig. 01-4/59). Removal and installation procedures are the same as for Model 190.

On recent cars of Models 190 and 190 SL the counterweight with long hub has been replaced by a counterweight with a short hub and a spacer ring. As a result, the crankshaft is no longer sealed at the front by the hub of the counterweight, but by the spacer ring which has been installed in all cars of Models 180 a and 180 b and in all 6-cylinder engines (see Fig. 01-4/60).

The advantage of this modification is that when the sealing surface is worn only the spacer ring has to be replaced and not the whole counterweight.

The spacer ring Part No. 121 031 00 51 can also be installed subsequently; in this case, the counterweight with long hub Part No.

121 031 01 07 must be replaced by a counterweight with short hub Part No. 121 031 03 07.

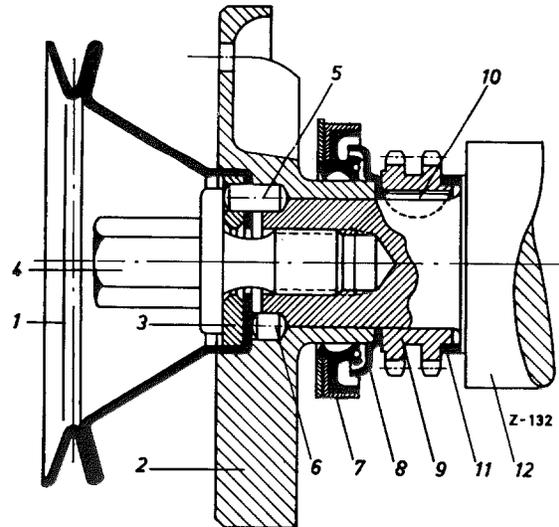


Fig. 01-4/59

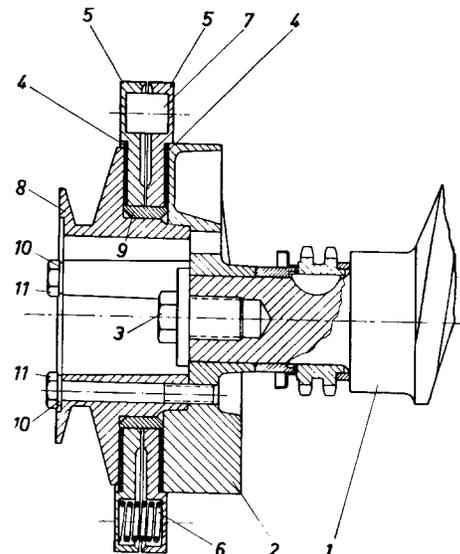
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|------------------|---------------|-----------------------|
| 1 Pulley | 5 Dowel pin | 9 Crankshaft sprocket |
| 2 Counterweight | 6 Dowel pin | 10 Woodruff key |
| 3 Washer | 7 Oil seal | 11 Compensating ring |
| 4 Shoulder screw | 8 Oil thrower | 12 Crankshaft |

II. Counterweight and Vibration Damper on Models 220 a, 219, 220 S, and 220 SE

On Models 220 a, 219, 220 S, and 220 SE a vibration damper is installed between the counterweight (2) and the pulley (8) Fig. 01-4/60).

Fig. 01-4/60

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|--------------------------|
| 1 Crankshaft |
| 2 Counterweight |
| 3 Shoulder screw |
| 4 Contact disk |
| 5 Flywheel ring |
| 6 Pressure spring |
| 7 Shear block |
| 8 Pulley |
| 9 Contact ring on pulley |
| 10 Spring washer |
| 11 Hexagon screw |



Removal:

1. If the vibration damper and the counterweight are removed with the engine in the vehicle, the radiator must be removed beforehand (see Job No. 50-1).
2. Unscrew the fan, release the tension of the fan belt at the belt tensioner and remove the belt.
3. Fit the two Clamps 187 589 04 31 over the flywheel rings and slightly compress the vibration damper (Fig. 01-4/61).

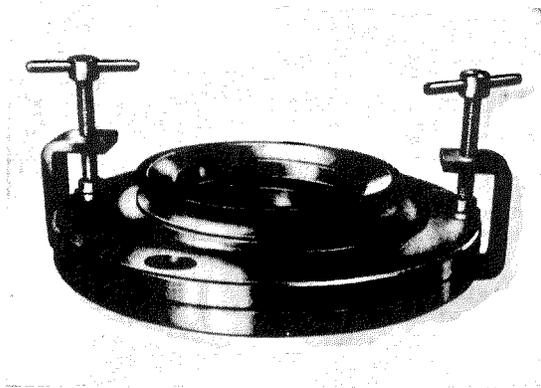


Fig. 01-4/61

4. Detach the connecting rod of the front engine brace, if installed. Then detach the front engine support at the rubber mountings and lift the engine at the front until the lower edge of the vibration damper is above the upper edge of the front axle support.
5. Unscrew the hexagon screws (11) for fastening the pulley and take off the pulley together with the vibration damper (Fig. 01-4/60).
6. Unscrew the wing nuts of both clamps evenly and disassemble the vibration damper. Check all parts and, if necessary, repair or replace them.
7. Unscrew the shoulder screw (3) which fixes the counterweight to the crankshaft,

and pull the counterweight of the crankshaft, using Puller 000 589 17 33.

Note: If the counterweight has to be replaced, **remove the crankshaft and re-balance it together with the new counterweight and the flywheel** (see Job No. 03-5, Section G).

Installation:

8. Fit the counterweight (2) to the crankshaft extension pin and turn it until the bores for the dowel pins are lined up.

Attention! The bores are slightly offset with respect to each other in order to prevent the counterweight from being installed incorrectly.

Then drive in the two dowel pins. They must be seated firmly in the bores; if that is not the case, the bores must be bored and reamed to a diameter of 9.930-9.966 mm ($10 \phi \times 9$) with a maximum depth of 9 mm; use thicker dowel pins $10 h 8 \times 8$ DIN 7 (9.978-10.000 mm ϕ) (Fig. 01-4/62).

Now firmly tighten the counterweight (2) on the crankshaft by means of the shoulder screw (3).

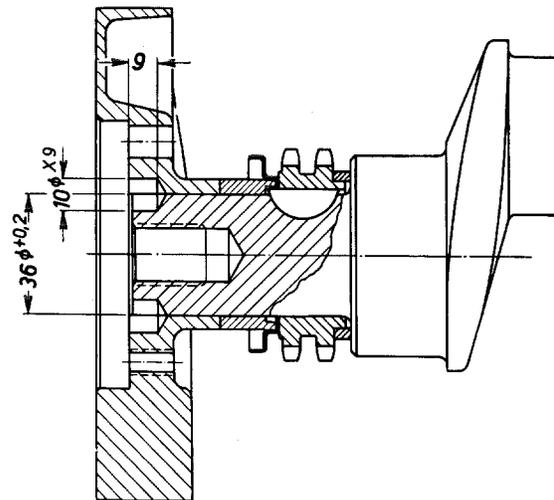


Fig. 01-4/62

9. Assemble vibration damper. Insert the 8 pressure springs and 2 shear rubbers into flywheel and clamp uniformly by means of the two clamps 187 589 04 31 (Fig. 01-4/61).
10. Place outer contact disk (4), the compressed flywheel rings (5) and the inner contact disk (4) onto contact ring (9) of the pulley and attach by means of hexagon screws (11) to counterweight. Use spring washers with hexagon screws. Then remove the two clamps from vibration damper.
11. Lower engine, attach front engine supports to rubber mountings and fasten connecting rod of engine brace. Attach fan belt and tighten, then mount fan.
12. Install radiator and top up with cooling water (refer to Job No. 50-1).

O. Removal and Installation of Crankshaft with Counterweight and Flywheel

Repair procedures see Job No. 03-5, Sections A, B and G.

Removal and installation of the crankshaft for models 180 a, 180 b, 180 c, 190 SL, 220 a, 219, 220 S, 220 SE is the same as for model 190, except that the front seal of the crankshaft is no longer, as before, on the hub of the counterweight, but on a specially attached spacer ring (refer to Section N, page 01-4/47).

In addition, model 190 SL is provided as from engine, end No. 65 00 795 with a flywheel having a larger attaching flange. The bolt hole circle has been enlarged from 56 ± 0.2 mm to 78 ± 0.1 mm. For replacements, only crankshafts of the 2nd version with the matching flywheel will be available.

Instead of the former thrust washers fixing the crankshaft in axial direction, which are in part still used today, all our engines will in future be provided with a fitted bearing and collar in the cylinder crankcase (upper bearing shell section), and in some cases also in the crankshaft bearing cap (lower bearing shell section). (For details refer to Job No. 03-5, Section B.)

The bolts for the crankshaft bearing cap are now for all types uniformly assembled with spring washers B 12 DIN 137. For engines, where the second crankshaft bearing cap is used to attach the bracket for the oil pump, these bolts are assembled without spring washers.