

# Fitting Transmission to Engine

Types 220 and 220a

|                  |
|------------------|
| Operation<br>No. |
| G 2              |

For achieving quiet operation of the transmission it is of greatest importance that transmission drive-shaft and crankshaft are in alignment. Misalignment may also be responsible when the clutch plate continues to rotate after the clutch has been disengaged.

When installing the transmission watch out that the clutch housing can be pushed on the pilot pins without applying force. If this is not the case, enlarge the pin holes with the aid of fixing device 187 589 02 61 and install pilot pins having a larger diameter.

In cases where the pin holes are worn out and do not permit correct centering, the holes must also be bored to a larger diameter.

After the transmission has been installed, check whether clutch plate comes to rest when the clutch is disengaged and whether the transmission operates smoothly.

The fixing device 187 589 02 61 is available from our "Abteilung Ersatzteile".

In the following the application of the fixing device is described:

## Procedure:

1. Remove pilot pins in both crankcase and clutch housing. Bolt fixing device to intermediate plate, but do not yet tighten.
2. To center the device insert plug (2) right up to the collar. The journal of the plug will center itself in the inner race of the crankshaft ball bearing. Insert the two plug gauges (3) of 8 mm (0.315") diameter (Fig. G 2/2). Tighten the screws fastening the device to the intermediate plate. After the screws have been tightened, it must be possible to turn the two plug gauges and the center plug by hand. Enlarge offset and worn-out pilot holes with a drill.
3. For enlarging the pin holes use a well-ground drill of 8.4 mm (0.33") diameter. Bring the hole to finished size by means of a reamer (see table on page G 2/2).

**Note:** Leave the second plug gauge in its hole while you bore and ream the other hole.

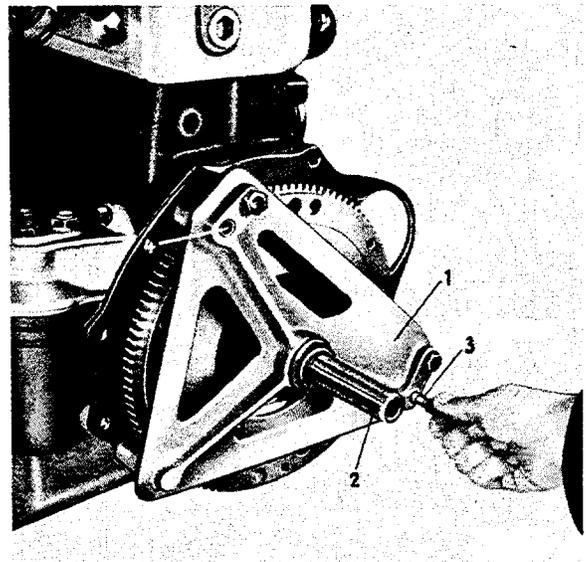


Fig. G 2/2

|                 |                              |
|-----------------|------------------------------|
| 1 Fixing device | 3 Plug gauge                 |
| 2 Plug          | 4 Hole for second plug gauge |

4. Insert plug gauge of 8.5 mm (0.335") diameter into enlarged hole and check alignment and tolerance of the hole. If necessary, bore and ream the second pin hole as well.

5. Bore and ream the opposite pin hole in the clutch housing in the same way.  
 To fix the driveshaft in center position, push sleeve (3) over driveshaft and insert its recessed end into bore of front cover of transmission.  
 To center the fixing device push plug (4) over driveshaft journal (Fig. G 2/5).

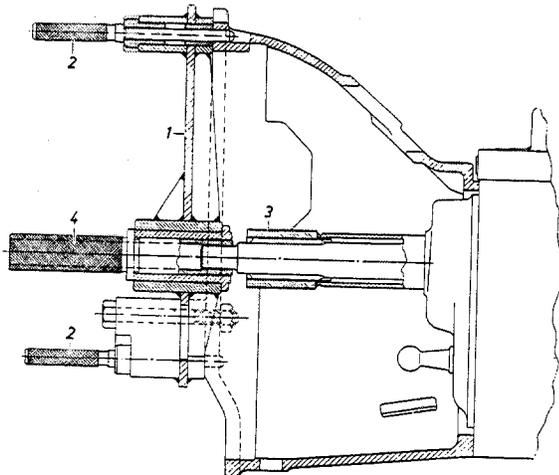


Fig. G 2/5

- 1 Fixing device      3 Sleeve  
 2 Plug gauge        4 Plug

The fixing device can also be centered with gear set removed. In the place of short sleeve (3) a long sleeve (3) is used which is pushed over the neck of front transmission case cover. The device is centered by means of plug (4) whose journal is seated in the bore of the sleeve (Fig. G 2/5a).

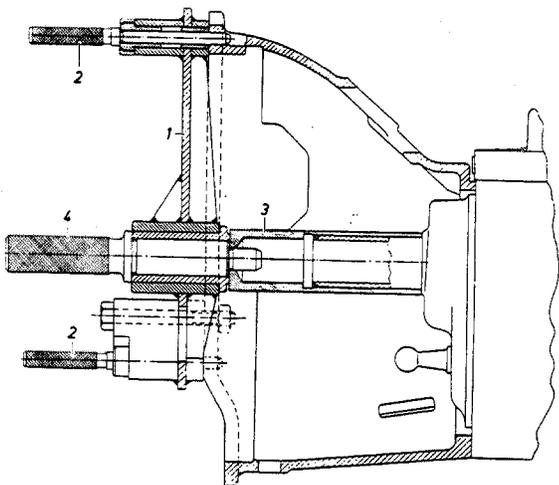


Fig. G 2/5a

- 1 Fixing device      3 Sleeve  
 2 Plug gauge        4 Plug

**Table of Pilot Holes for Clutch Housing on Engine**

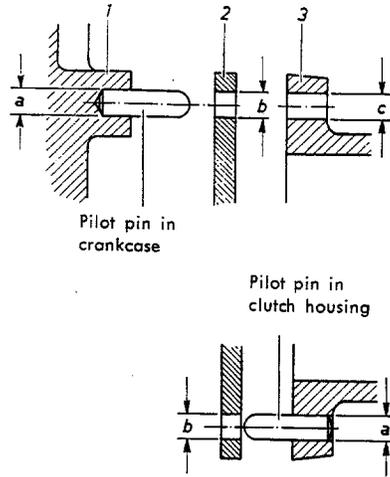


Fig. G 2/5b

- 1 Crankcase  
 2 Intermediate plate  
 3 Clutch housing

|   | Pilot hole a<br>mm (in.) | Pilot hole b<br>mm (in.) | Pilot hole c<br>mm (in.) |
|---|--------------------------|--------------------------|--------------------------|
| For pilot pin<br>with dia. 8 $+0.006$ mm<br>$+0.015$ mm<br>(0.315 $+0.00024$ in.)<br>$+0.00060$ in.)<br>(Standard size) | 7.997                    | 8.013                    | 8.000                    |
|   | 7.975                    | 8.028                    | 8.050                    |
|   | (0.313977)               | (0.315473)               | (0.314961)               |
| For pilot pin<br>with dia. 8.5 $+0.006$ mm<br>$+0.015$ mm<br>(0.335 $+0.00024$ in.)<br>$+0.00060$ in.)<br>(Oversize)    | 8.497                    | 8.513                    | 8.500                    |
|   | 8.475                    | 8.528                    | 8.550                    |
|   | (0.334528)               | (0.335158)               | (0.334646)               |
|   | (0.333662)               | (0.335748)               | (0.336614)               |

The pilot pins must be seated in the crankcase and clutch housing strictly at right angles and with sufficient overlap.