

Transmission Overhaul

Types 220 and 220a

Operation No.
G 3

The transmissions for both Type 220 and Type 220a come with steering column gear shift and all four speeds positively synchronized. However, the two transmissions differ in several respects. The deviations will be seen from the description of the respective operations. Give the section "Checking and Reconditioning of Transmission" your particular attention, even if only a part has to be exchanged.

Gear Set for Type 220

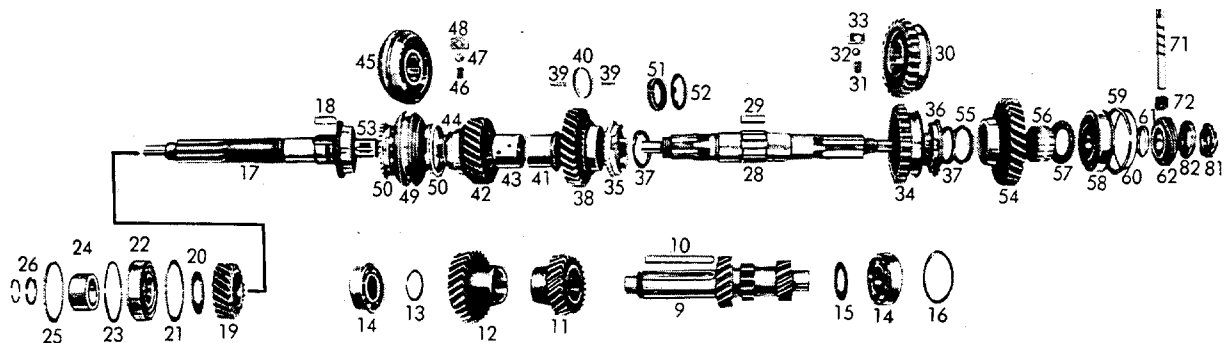


Fig. G 3/01

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|-----------------------------------|---|---|-----------------------------|
| 9 Countershaft | 23 Snap ring | 38 Second speed helical gear | 53 Kling roller bearing |
| 10 Key | 24 Spacer sleeve | 39 Bearing needle | 54 First speed helical gear |
| 11 Countershaft third speed gear | 25 Adjusting washer | 40 Spacer ring | 55 Contact washer |
| 12 Countershaft fourth speed gear | 26 Snap ring | 41 Bushing | 56 Roller assembly |
| 13 Lock ring | 27 Sealing ring | 42 Third speed helical gear | 57 Contact washer |
| 14 Grooved collar bearing | 28 Mainshaft | 43 Bushing | 58 Grooved collar bearing |
| 15 Guard washer | 29 Key | 44 Contact washer | 59 Snap ring |
| 16 Adjusting washer | 30 First and second speed synchronizer unit | 45 Third and fourth speed synchronizer unit | 60 Adjusting washer |
| 17 Driveshaft | 31 Pressure spring | 46 Pressure spring | 61 Spacer ring |
| 18 Key | 32 Steel ball | 47 Steel ball | 62 Speedometer drive gear |
| 19 Helical gear | 33 Follower | 48 Follower | 71 Driveshaft |
| 20 Oil thrower | 34 Gear sleeve | 49 Gear sleeve | 72 Small drive gear |
| 21 Spacer ring | 35 Synchronizer ring | 50 Synchronizer ring | 81 Slotted nut |
| 22 Grooved collar bearing | 36 Contact washer | 51 Slotted nut | 82 Lock plate |
| | | 52 Lock plate | |

Gear Set for Type 220a

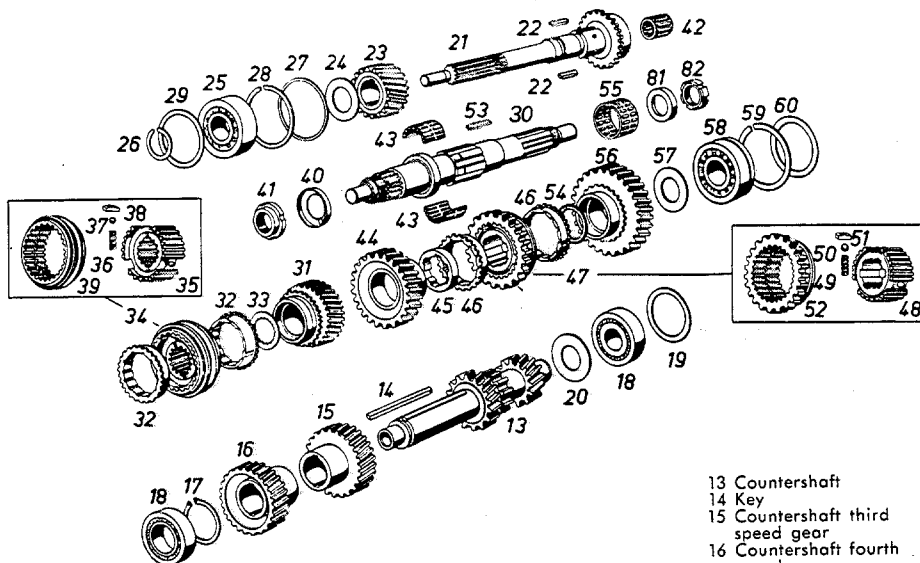


Fig. G 3/02

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|-----------------------------------|---|---|-----------------------------|
| 13 Countershaft | 23 Helical gear | 38 Second speed helical gear | 53 Kling roller bearing |
| 14 Key | 24 Oil thrower | 39 Bearing needle | 54 First speed helical gear |
| 15 Countershaft third speed gear | 25 Grooved collar bearing | 40 Spacer ring | 55 Contact washer |
| 16 Countershaft fourth speed gear | 26 Snap ring | 41 Bushing | 56 Roller assembly |
| 17 Lock ring | 27 Spacer ring | 42 Third speed helical gear | 57 Contact washer |
| 18 Grooved collar bearing | 28 Snap ring | 43 Bushing | 58 Grooved collar bearing |
| 19 Adjusting washer | 29 Adjusting washer | 44 Contact washer | 59 Snap ring |
| 20 Guard washer | 30 Mainshaft | 45 Third and fourth speed synchronizer unit | 60 Adjusting washer |
| 21 Driveshaft | 31 Third speed helical gear | 46 Pressure spring | 61 Spacer ring |
| 22 Key | 32 Synchronizer ring | 47 Steel ball | 62 Speedometer drive gear |
| | 33 Contact washer | 48 Follower | 71 Driveshaft |
| | 34 Third and fourth speed synchronizer unit | 49 Gear sleeve | 72 Small drive gear |
| | 35 Synchronizer unit | 50 Synchronizer ring | 81 Slotted nut |
| | 36 Pressure spring | 51 Slotted nut | 82 Lock plate |
| | 37 Steel ball | 52 Lock plate | |
| | 38 Follower | | |
| | 39 Gear sleeve | | |
| | 40 Lock plate | | |
| | 41 Slotted nut | | |
| | 42 Roller assembly | | |
| | 43 Split roller assembly | | |
| | 44 Second speed helical gear | | |
| | 45 Contact ring | | |
| | 46 Synchronizer ring | | |
| | 47 First and second speed synchronizer unit | | |
| | 48 Synchronizer unit | | |
| | 49 Pressure spring | | |
| | 50 Steel ball | | |
| | 51 Follower | | |
| | 52 Gear sleeve | | |
| | 53 Key | | |
| | 54 Contact washer | | |
| | 55 Roller assembly | | |
| | 56 First speed helical gear | | |
| | 57 Contact washer | | |
| | 58 Grooved collar bearing | | |
| | 59 Snap ring | | |
| | 60 Adjusting washer | | |

Special Tools:

Holding wrench for three-arm flange	187 589 08 07	Puller for ball bearing of main-shaft	136 589 02 33
Pin wrench for slotted nut (4 teeth) at mainshaft front end and Type 220 also rear end	120 589 04 07	Holding yoke for first and second speed gear	136 589 38 61
Pin wrench for slotted nut (6 teeth) at rear end of mainshaft (Type 220)	136 589 05 07	Mounting device for locking plate	191 589 02 31
Pin wrench for slotted nut at rear end of mainshaft (Type 220a), with 6 teeth	186 589 05 07	Mounting pin for needle bearing	187 589 02 39
with 4 teeth	186 589 07 07	Insertion sleeve for grease retainer	187 589 05 61
Bell-type puller for three-arm flange	136 589 03 33	Mounting pin for grease retainer	187 589 03 39
Pliers for mainshaft snap ring	136 589 00 37	Mounting pin for cover plate	187 589 01 39
Two levers for removing ball bearing from countershaft	136 589 00 35	Mounting pin for shifting rail	136 589 09 61
Mounting sleeve $31 \times 40 \times 93$ mm ($1.22 \times 1.57 \times 3.66$ "") for removing and installing the gear set (for Type 220 only)	136 589 07 61	Installing punch for ball bearing on mainshaft	136 589 07 39
Punch for ball bearing on countershaft	136 589 06 39	Mounting sleeve $31 \times 40 \times 75$ mm ($1.22 \times 1.57 \times 2.95$ "") for arresting the gear set (for Type 220 only)	136 589 08 51
Support angle for countershaft	136 589 11 61	Mounting sleeve $31 \times 40 \times 62$ mm ($1.22 \times 1.57 \times 2.44$ "") for arresting the gear set (for Type 220a only)	198 589 02 61
Puller for reverse shaft	136 589 27 33	Test device for checking true run of three-arm flange at transmission	136 589 04 21

I. Disassembly of Transmission

Procedure:

Removal of Gear Set:

1. Remove clutch throwout collar with bearing.

In Type 220 remove snap ring on front cover of transmission case and take off throwout collar with bearing including pressure spring and spring retainer.

In Type 220a press the two wire clips out of the throwout fork towards the rear, turn to the side and pull out as indicated in Fig. G 3/1. Take off throwout collar with bearing.

Note: The clutch throwout bearing of Type 220a requires no maintenance. **The bearing must in no case be washed out!**

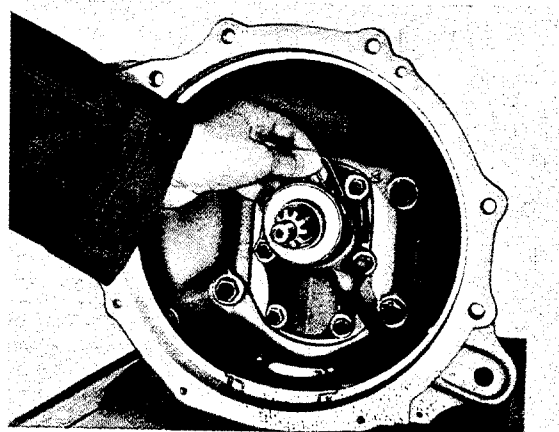


Fig. G 3/1