

SECTION F

THE GEARBOX

To Remove the Gearbox with the Engine in the Chassis.

Remove the floor mats and take up the floorboards. Take up the gearbox cowl.

Disconnect the propeller shaft at its forward end, marking the flanges so that they can be replaced in the same relative position on reassembly.

Jack up the engine unit under the rear of the sump, using a large piece of wood between the jack and the sump to spread the load, and disconnect the speedometer drive at the gearbox end.

Disconnect the clutch operating lever from its connecting rod and release the rear engine unit mounting by removing the two nuts and bolts of the rubber mounting.

Undo all the retaining screws holding the bell housing to the crankcase and lift out the gearbox, taking care not to place any load on the drive gear shaft and clutch centre.

To Dismantle the Gearbox.

Support the gearbox in a vice by means of a piece of steel bar approximately $1\frac{1}{2}$ square by 5.00 long, this being suitably machined and threaded at one end to enable it to be screwed into the gearbox drain plug hole.

Remove the dipstick from the gearbox and drain off the oil.

Release the clutch housing by removing the fixing bolts and spring washers. Extract the split pin from the nut retaining the drive flange at the rear of the gearbox sliding shaft and remove the nut and plain washer.

Remove the six nuts securing the top cover assembly to the gearbox and the four bolts and spring washers securing the remote control cover assembly to the gearbox extension.

Pick out the three selector springs.

Using the extractor, Tool No. T.108, withdraw the propeller shaft driving flange. It is advisable to use an extractor of this type to avoid distortion of the flange face. Before doing so it is advisable to mark both the flange and the shaft so that it can be replaced in exactly the same position.

Detach the speedometer drive housing from the gearbox. Care should be exercised not to damage the paper gasket on the joint face of the housing.

Extract the lock-wire from the eight square-headed screws locking the gear shifters and stops to the selector shafts and remove the screws.

Slacken the nuts and set bolts securing the gearbox rear casing to the gearbox and withdraw sufficiently to allow the gear shifters to be removed from the ends of the selector shafts. Remove the nuts and set bolts completely and withdraw the gearbox rear casing from the gearbox.

On the early type gearboxes withdraw the selector shafts one at a time taking care not to lose the selector lock balls in the process. Later models have a 3rd and top selector shaft extended at its front end and fitted with a circlip to prevent accidental withdrawal and the loss of the synchromesh balls. In this case the circlip must of course, be removed before the shaft can be withdrawn. This also makes it imperative to remove the gearbox from the engine before dismantling. Now lift out the selector forks. Observe the correct position of the gear shifters and stops on the selector spindles.

Remove the layshaft spindle locating screw from the rear of the gearbox.

Extract the layshaft spindle by tapping it at the forward end with a suitable copper or brass drift.

Remove the drive gear with its journal bearing by tapping the mainshaft towards the front of the gearbox.

Before the mainshaft can be removed it is necessary to extract the journal bearing from its housing. The mainshaft assembly can then be withdrawn from the gearbox.

Extract the layshaft gear unit observing that the tabs on the thrust pads line up with the slots cut in the boss at the front and rear walls of the gearbox.

To Dismantle the Mainshaft.

Withdraw the top and third gear synchromesh hub from the forward end of the shaft, observing that the plain side of the hub goes to the rear of the gearbox.

Remove the third speed gear collar by pressing down the spring-loaded locking plunger and rotating the collar until the female splines register with the male splines on the mainshaft. The third gear can now be withdrawn.

Care must be exercised to prevent the loss of the plunger and spring or the thirty-two needle rollers on which the third gear is mounted.

Extract the circlip from the rear end of the mainshaft and remove the first and second gear synchromesh hub; the conical lining end of the hub faces to the front of the gearbox.

The withdrawal of the second gear from the mainshaft is executed in a similar manner to that for the third gear, namely by pressing down the locking plunger through the hole provided and rotating the collar until the two sets of splines coincide. Again, care must be exercised not to lose the spring and plunger or the twenty-eight needle rollers. It must be noted that next to the second gear collar is a thrust washer, which is in two halves, having tongues which engage with slots in the forward face of the collar. It is important that this washer is correctly replaced on reassembly to centralise the collar.

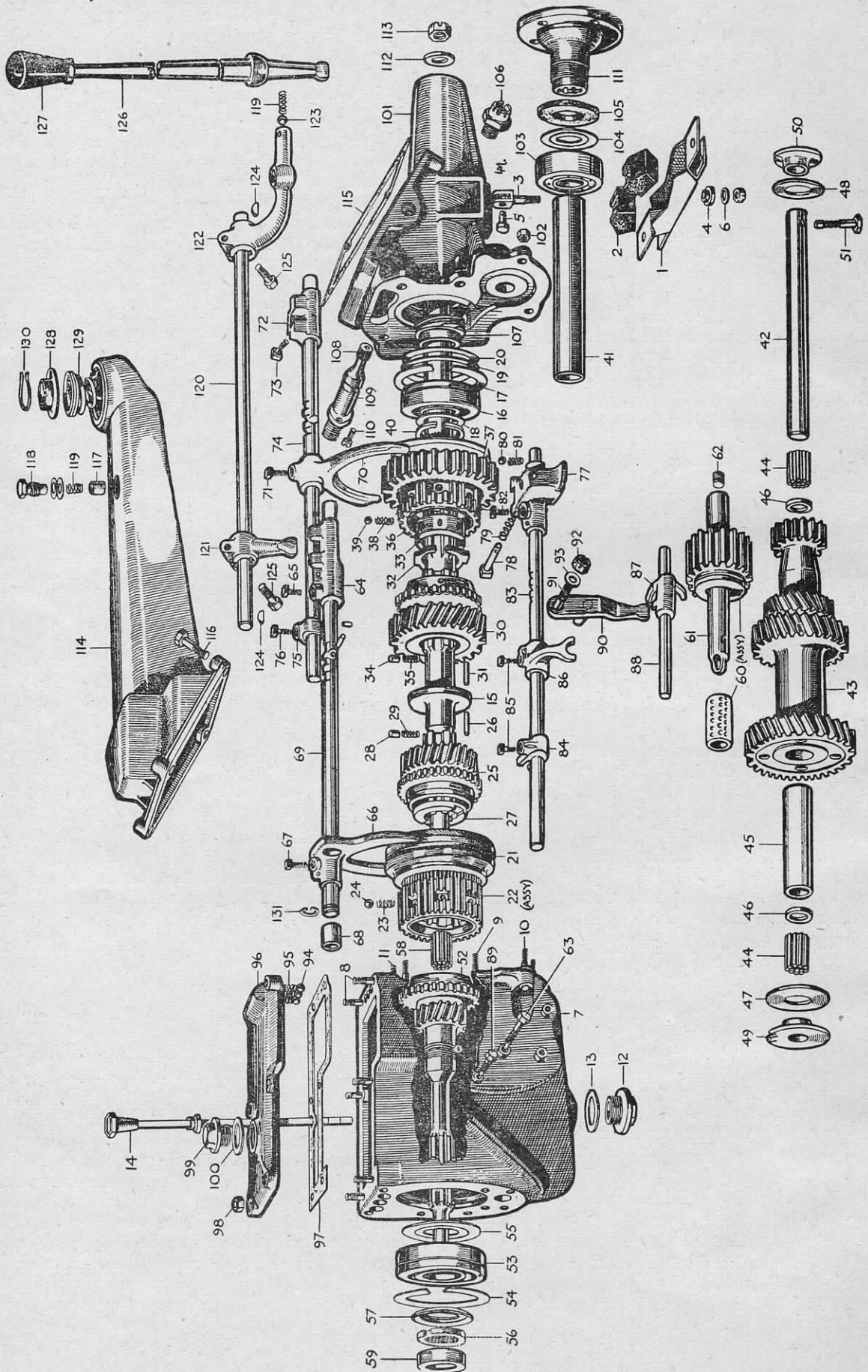


FIG. 25.—The gearbox components.

KEY TO FIG. 25—THE GEARBOX COMPONENTS:

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|--|--|---|---|
| 1—Rear engine bearer bracket. | 35—Spring—plunger. | 69—Shaft—top and third shifter. | 103—Ball bearing. |
| 2—Support rubber. | 36—Sliding hub (first and second). | 70—First and second gear shifter. | 104—Guard. |
| 3—Fork end. | 37—First speed gear. | 71—Locating screw. | 105—Oil retaining washer. |
| 4—Engine rebound rubber. | 38—Spring—first speed gear. | 72—First and second gear selector. | 106—Hole plug—reverse light. |
| 5—Clevis pin—fork end. | 39—Ball—first speed gear. | 73—Locating screw. | 107—Speedometer gear. |
| 6—Washer. | 40—Circlip. | 74—Shaft—first and second shifter. | 108—Speedometer pinion and shaft. |
| 7—Gearbox casing (with studs). | 41—Distance piece. | 75—Stop—shaft. | 109—Bearing—pinion. |
| 8—Stud—gearbox top cover. | 42—Layshaft. | 76—Locating screw—stop. | 110—Screw—pinion bearing. |
| 9—Stud—speedometer casing (medium). | 43—Gear unit—layshaft. | 77—Reverse gear selector. | 111—Flange—universal joint. |
| 10—Stud—speedometer casing (long). | 44—Rollers—layshaft gear unit. | 78—Plunger—reverse gear selector. | 112—Washer—flange nut. |
| 11—Stud—speedometer casing (short). | 45—Spacer—layshaft gear unit. | 79—Spring—plunger. | 113—Nut—flange to mainshaft. |
| 12—Plug—oil drain. | 46—Washer—layshaft. | 80—Ball—reverse plunger. | 114—Remote control cover. |
| 13—Washer—drain plug. | 47—Thrust washer—front. | 81—Spring—ball. | 115—Gasket—cover. |
| 14—Oil level indicator. | 48—Thrust washer—rear. | 82—Locating screw. | 116—Cover bolt—to rear casing |
| 15—Mainshaft. | 49—Bearing plate—front. | 83—Shaft—reverse selector. | 117—Housing cover plunger. |
| 16—Mainshaft bearing. | 50—Bearing plate—rear. | 84—Steady—reverse selector shaft. | 118—Plug—operating shaft. |
| 17—Guard—bearing—first motion shaft. | 51—Screw—layshaft. | 85—Locating screw—steady. | 119—Spring—operating shaft. |
| 18—Guard—bearing—first motion shaft. | 52—First motion shaft. | 86—Gear shifter—reverse selector shaft. | 120—Remote control shaft. |
| 19—Plate—guard. | 53—Bearing—first motion shaft. | 87—Gear shifter—reverse gear. | 121—Selector lever (front). |
| 20—Spring plate—guard. | 54—Circlip—first motion shaft. | 88—Shaft—reverse gear shifter. | 122—Selector lever (rear). |
| 21—Striking dog. | 55—Guard—bearing (first motion shaft). | 89—Locating screw—shaft. | 123—Ball—lever. |
| 22—Sliding hub assembly (top and third). | 56—Nut—first motion shaft bearing. | 90—Reverse link assembly. | 124—Key—actuating shaft and selector levers. |
| 23—Spring—sliding hub. | 57—Lock washer—bearing. | 91—Fulcrum pin—link. | 125—Bolt—actuating shaft and selector levers. |
| 24—Ball—sliding hub. | 58—Spigot bearing rollers. | 92—Nut—fulcrum pin. | 126—Change speed lever. |
| 25—Third speed gear. | 59—Oil seal—first motion shaft. | 93—Washer—fulcrum pin. | 127—Knob—change-speed lever. |
| 26—Rollers—third speed gear. | 60—Reverse gear (with bush). | 94—Ball—shaft. | 128—Cover lever. |
| 27—Collar—third speed gear. | 61—Shaft—reverse gear. | 95—Spring—shifter shaft. | 129—Spring—anti-rattle change speed lever. |
| 28—Plunger—third speed gear. | 62—Plug—reverse shaft. | 96—Gearbox cover. | |
| 29—Spring—plunger. | 63—Screw—reverse shaft. | 97—Gasket—cover. | |
| 30—Second speed gear. | 64—Top and third gear selector. | 98—Nut—cover. | |
| 31—Rollers—second speed gear. | 65—Locating screw—selector. | 99—Filler plug—gearbox. | |
| 32—Washer—second speed gear. | 66—Top and third gear shifter. | 100—Washer for plug. | |
| 33—Collar—second speed gear. | 67—Locating screw—shifter. | 101—Rear casing. | |
| 34—Plunger—second speed gear. | 68—Distance tube—top and third. | 102—Nut—rear casing. | |

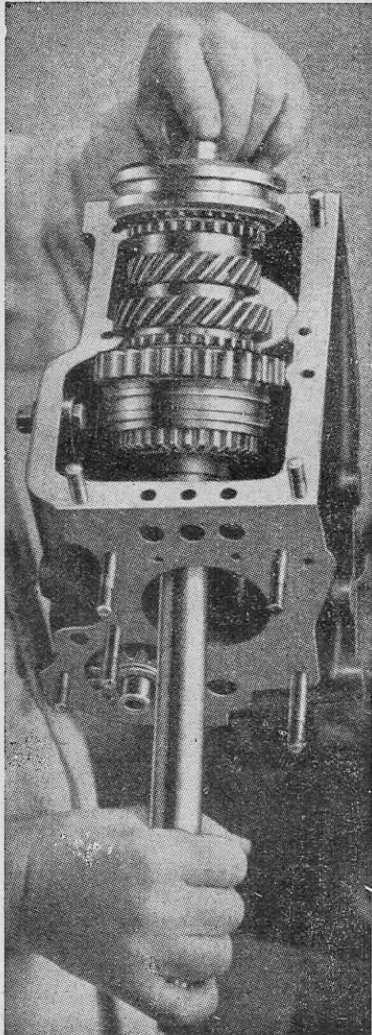


FIG. 26.—Showing the method of withdrawing the gearbox mainshaft assembly.

Dismantling the Synchronesh Mechanism.

The striking dogs for top, third and second gears are retained on sliding hubs by balls and springs which are housed within the sliding hubs and registered with a central groove in the internally cut teeth of the striking dogs. Each sliding hub, therefore can be pushed out from its striking dog when sufficient effort is applied to overcome the springs.

Ball housing openings are peened over to retain balls in position.

Reassembly of the Synchronesh Mechanism.

The striking dog is placed against the end of the sliding hub and pushed through into engagement with it, when the balls will spring into an indentation ground in the centre of the teeth and the assembly is completed.

Reassembly of Gearbox.

The reassembly of the gearbox, mainshaft and other items is carried out in the reverse manner to that detailed for dismantling, but care must be taken when fitting the layshaft to see that the tags on the thrust washers at each end fit into the grooves in the bosses in the gearbox.

NOTE: For easy assembly of the layshaft with its bearings, it is recommended that a dummy shaft 9/16 diameter by 6-11/32 long be used.

Care must also be taken in the case of the later boxes to replace the circlip on the forward end of the third and top selector shaft.

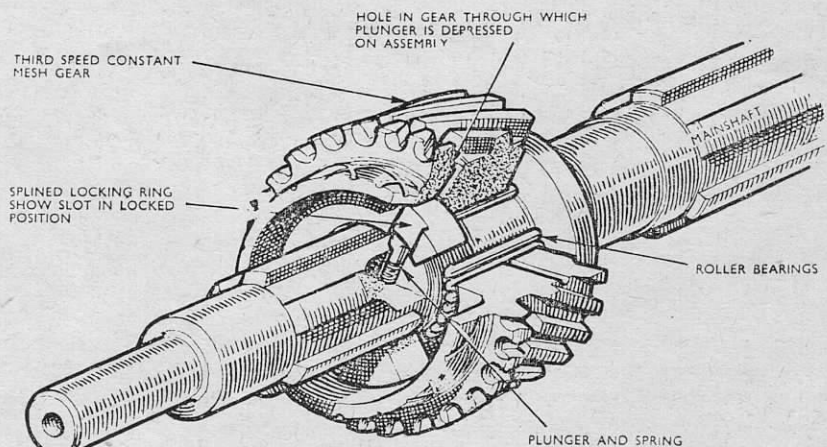


FIG. 27.—Showing the method of securing the third speed constant mesh wheel to the mainshaft.