

## SECTION FF

### THE GEARBOX (SECOND TYPE)

General Description.

Lubrication.

Section No. FF.1 Removing the gearbox.

Section No. FF.2 Dismantling the gearbox.

Section No. FF.3 Dismantling the mainshaft.

Section No. FF.4 Reassembly.

#### GENERAL DESCRIPTION

The gearbox has four forward speeds and one reverse, and synchromesh is incorporated in second, third and top gears.

Top gear is a direct drive; third and second are in constant mesh; first and reverse are obtained by sliding spur pinions.

#### LUBRICATION

See Section P.8

#### Section FF.1

##### REMOVING THE GEARBOX

Remove the power unit (Section A.29).

Unscrew the bell housing bolts and set screws and withdraw the gearbox.

#### Section FF.2

##### DISMANTLING THE GEARBOX

Remove the dipstick.

Unscrew the breather from the rear extension.

Unscrew the speedometer drive from the right-hand side of the rear extension.

Remove the reverse light switch from the left-hand side of the clutch housing.

Extract the split pins and clevis pins from the selector and shifter arms on the gearbox side cover; knock up the locking tabs, unscrew the nuts and withdraw the arms from the side cover.

Unscrew the eight bolts and remove the rear extension. Note the spring and plain bearing plates.

Unscrew the one long and seven short bolts and remove the clutch housing. Note the spring and plain bearing plates.

Unscrew the two domed nuts in the gearbox side cover to expose the ends of the two cross-shafts.

Remove the circlip from the end of each shaft to release the distance-pieces.

Unscrew the thirteen bolts securing the side cover to the gearbox housing and remove the cover; there are two dowels locating the cover. Take care not to lose the three selector balls and springs which will be released as the cover is withdrawn and push out the cross-shafts and selector and shifter mechanism. Note the felt washers and oil seals in the gearbox housing, which should not be removed unless they require replacement. The longer lever is the shifter and the shorter the selector.

Cut the locking wires and unscrew the fork retaining screws. Remove the shifter shafts and forks in the following order:—

1. The reverse shaft and fork.
2. Top gear shifter shaft only.
3. First and second shaft and fork.
4. Top gear fork.

Take care not to lose the two interlock balls, normally located one at each side of the centre shifter shaft, which will be released when the shaft is removed.

Unscrew the reverse shaft locating screw and push out the shaft; lift the gear from the box.

Tap out the layshaft and allow the gear to rest in the bottom of the box.

Withdraw the drive gear assembly; note that there are 16 spigot rollers.

Withdraw the main shaft rearwards.

Lift out the layshaft gear and thrust washers.

## Section FF.3

### DISMANTLING THE MAINSHAFT

Slide the top and third gear hub and interceptors from the forward end.

Depress the plunger locating the third gear locking plate, rotate the plate to line up the splines and slide it from the shaft. Extract the plunger and spring, and slide off the third speed gear and its 32 rollers.

Unscrew the main shaft nut; remove the nut, locking washer, speedometer drive gear, bearing with housing and distance collar.

Slide the first and second speed hub, second speed interceptor and first speed gear rearwards from the shaft; if the first speed gear is withdrawn from the hub, take care to hold the balls and springs located in holes in the hub.

Depress the second gear locking collar plunger and rotate the collar to line up the splines; slide the collar from the shaft and extract the two halves of the second gear washer.

Withdraw the second speed gear and its 33 rollers from the shaft.

To dismantle the drive gear assembly, tap up the locking tab, unscrew the nut and remove the bearing.

## Section FF.4

### REASSEMBLY

#### *Mainshaft*

Smear the shaft with grease and assemble the 33 second speed gear rollers; slide the gear into position.

Replace the plunger and spring. Fit the two halves of the second gear washer and slide the collar on to the splines. Depress the plunger and push the collar into position, locating the lugs of the washer in the cut-outs of the collar; rotate the collar to bring the splines out of line.

Replace the balls and springs in the second and first speed hub; depress the balls and slide the first speed gear on to the hub; refit the assembly to the shaft.

Refit the bearing distance collar, the bearing and housing, the speedometer drive gear key and gear, locking washer and nut. Tighten the nut and tap over the locking washer.

Fit the third gear and its 32 rollers to the shaft; replace the plunger and spring and the third speed

locking plate; rotate the plate to bring the splines out of line.

Fit the balls and springs to the top and third speed hub and slide the striking dog into position on the hub.

Replace the hub, striking dog and interceptors on the shaft.

#### *Layshaft*

Fit the distance tube to the layshaft gear with a washer at each end of the tube.

Smear the rollers with grease and position them in the gear. Place the thrust washers and plates in position at each end of the gear.

To retain the rollers in position, a length of round bar of layshaft diameter ( $\frac{3}{4}$  in. (19.05 mm.)) and just long enough ( $7\frac{1}{4}$  in. (184.15 mm.)) to hold the thrust washers and plates, should be inserted in the gear assembly.

Place the gear in the box and allow it to rest at the bottom.

#### *Gearbox*

Insert the mainshaft assembly from the rear of the box and start the bearing in the housing; locate the bearing housing dowel with the rear extension gasket and drive the bearing and housing into position.

Position the drive gear rollers and the drive gear assembly in the box.

Lift the layshaft gear into position, locating the thrust washer tags in the grooves provided. Push the layshaft through the housing and gear and withdraw the retaining bar as the shaft pushes it out of the gear. The cut-away portion of the shaft must be aligned to fit the groove in the bell housing provided to prevent the layshaft from turning.

Refit the reverse gear and shaft and tighten the set-screw.

Place the top gear shifter fork in the box.

Replace the first and second gear shifter fork and shaft.

Replace one interlock ball above the first and second shifter shaft and insert the top gear shifter shaft.

Position the remaining interlock ball, holding it with grease, and refit the reverse fork and shaft.

Screw in the fork set screws, tighten up and wire.

Renew the cross-shaft oil seals and felt washers as necessary.

Fit the cross-shafts with the shifter and selector mechanism to the box.

Refit the selector balls to the holes in the gearbox housing and the springs in the holes in the side cover.

Refit the cover, fitting a new gasket as required.

Refit the distance tubes and circlips to the cross-shafts and screw in the domed nuts with their fibre washers.

Refit the operating arms to the cross-shafts.

Bolt the rear extension into position, using a new gasket if necessary. Note that the plain bearing plate is fitted against the bearing.

Refit the selector and shifter arms on the gearbox side cover.

Refit the clutch housing with plain bearing plate against the bearing.

Refit the reverse light switch, speedometer drive, breather and dipstick.