

## CHAPTER 2

# SERVICING

## SECTION 1 — PERIODIC MAINTENANCE

Careful and regular maintenance is necessary to ensure maximum reliability; the table below gives the recommended periods.

Cleanliness is vital, as the smallest particle of dirt in the oil may interfere with the correct operation of the hydraulic valves in the gearbox.

It is recommended that all work on the automatic gearbox whether it be periodic servicing or the rectification of a suspected fault, should follow the systematic procedure outlined below.

- 1 Check gearbox oil level.
- 2 Check for oil leaks.
- 3 Lubricate control joints.
- 4 Ascertain that the engine is correctly tuned, then test change points and for slip and noise.

If any faults are discovered, further checks may be necessary to assist diagnosis. The checks to be made will depend on the symptoms but with the majority of faults, checks should be made in the following order

- 1 Check control linkage.
- 2 Check oil pressure.
- 3 Check band adjustment.
- 4 Partially dismantle to isolate faulty unit by air pressure check.

### Warning

To check the gearbox with the engine running and the car stationary, **do not** move the selector lever from Neutral unless the hand brake is fully applied or the rear wheels are jacked up clear of the ground. This is particularly important if the engine is running faster than the correct 'hot' idling r.p.m. Chock the wheels and use the foot brake when using high engine r.p.m.

## SERVICING PERIODS

| MAINTENANCE                                  | PERIOD             |
|--|--------------------|
| Check oil level first 3,000 then             | Every 6,000 miles  |
| Check for leaks first 3,000 then             |                    |
| Lubricate control linkage                    |                    |
| Road test to check gear changes              |                    |
| Drain transmission and refill with new fluid | Every 24,000 miles |
| Clean oil breather in top of dipstick        |                    |

## ROLLS-ROYCE AUTOMATIC GEARBOX

### Oil level — To check

The oil level can be checked accurately only when the engine is running and the gearbox has warmed up to its correct operating temperature.

If the oil level is near or below the 'L' mark on the dipstick, top-up to the 'F' mark while the engine is still running and check for oil leakage as described under 'To check for leaks'.

The following transmission fluids are recommended for topping-up the Rolls-Royce automatic gearbox in service and for use when refilling the gearbox in accordance with the Service Maintenance Schedules.

|         |    |    |                                    |
|---------|----|----|------------------------------------|
| B.P.    | .. | .. | Energol ATF Type A.                |
| Castrol | .. | .. | Castrol TQ.                        |
| Esso    | .. | .. | Esso Automatic Transmission Fluid. |
| Mobil   | .. | .. | Mobilfluid 200.                    |
| Shell   | .. | .. | Donax T6.                          |

Automatic Transmission Fluid WA-389 should be considered as an 'initial fill' fluid only and should be used in all new and reconditioned gearboxes.

Quantities of this oil are supplied with each new or reconditioned gearbox supplied by the Rolls-Royce Spares Department. At the first oil change (normally 24,000 miles) any one of the above recommended fluids can be used.

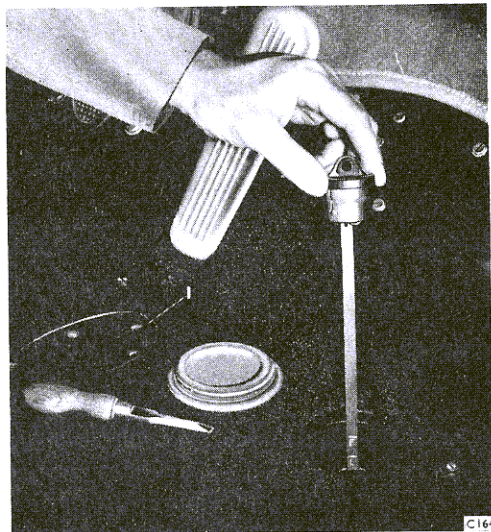


Fig. 21 Checking the oil level

1 BAND ADJUSTMENT ACCESS PLATE

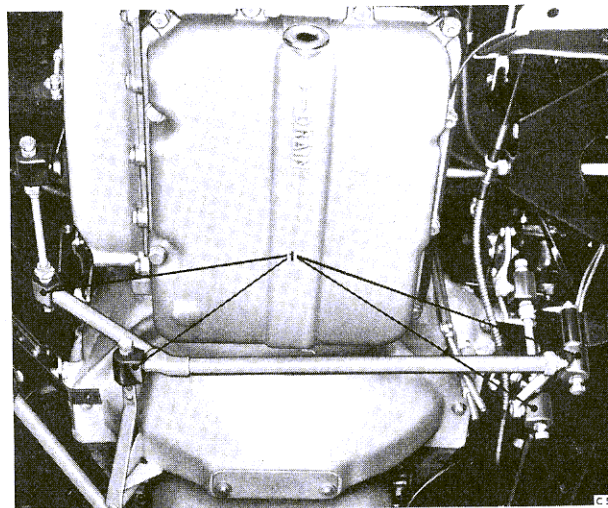


Fig. 22 Selector cross shaft disconnecting points

1 DISCONNECTING POINTS

Transmission Fluid WA-389 can be used for topping-up and refilling in service but this fluid will be available for this purpose only at Rolls-Royce Service Stations at Crewe and Willesden.

The recommended procedure for topping-up is as follows

- 1 Select 'N', ensure that the hand brake is applied, then start the engine and run at idling speed to warm up the transmission.
- 2 Whilst the transmission is warming up, remove the dipstick access cover and thoroughly clean around the dipstick.
- 3 Remove and clean the dipstick before checking the oil level (see Fig. 21).
- 4 If topping-up is necessary, pour in the correct oil in small quantities checking frequently to ensure that the level does not exceed the 'F' mark. Overfilling, which may itself result in oil loss through the breather due to excessive frothing, may also be indicated by a continuous 'patter' noise when the car is moving.

### To drain and refill

Efficient draining of the oil from the fluid coupling is assisted by warming up the gearbox prior to draining. Do not flush the transmission but ensure that it has drained thoroughly.



# ROLLS-ROYCE AUTOMATIC GEARBOX

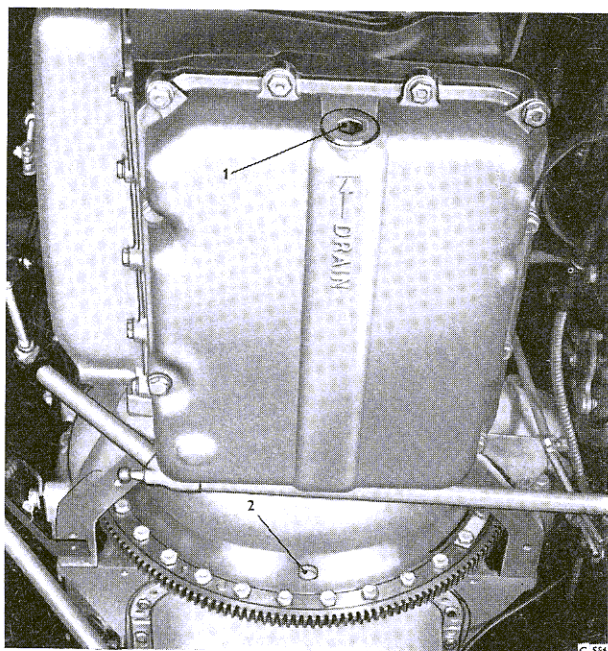


Fig. 23 Drain plugs

- 1 GEARBOX SUMP DRAIN PLUG
- 2 TORUS COVER DRAIN PLUG

Proceed as follows

- 1 Clean the area around the sump drain plug and remove the plug.
- 2 Remove the lower bell housing cover. On right-hand drive cars it would facilitate removal of the cover if the control cross-shaft is removed first (see Fig. 22 for removal points). Turn the fly-wheel to bring the fluid coupling drain plug to the lowest point, remove the plug and drain the fluid into a clean container (see Fig. 23). Do not use the drained fluid again, but after disposing of the fluid examine the residue carefully for evidence of gearbox wear, i.e. particles of clutch plate lining, servo band lining, white metal and bronze bushes and cast iron dust.
- 3 Refit both plugs, together with new sealing washers; tighten the sump plug to 35 lb.ft. to 45 lb.ft. and the fluid coupling drain plug to 6 lb.ft. to 7 lb.ft. When filling, ensure that the fluid and containers are scrupulously clean; the

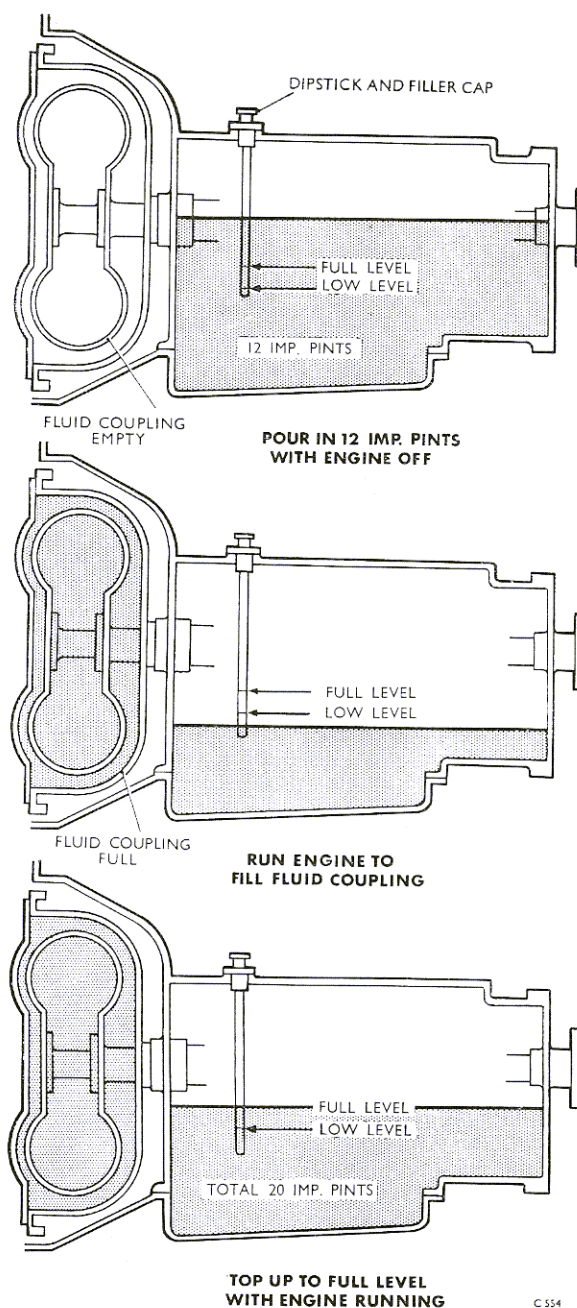


Fig. 24 Filling and topping-up with oil

fluid coupling and sump are filled through the same orifice. A new, or overhauled gearbox requires 20 Imperial pints or 24 U.S. pints of fluid. A gearbox just drained of fluid will require approximately  $\frac{3}{4}$  Imperial pint or 1 U.S. pint less

## ROLLS-ROYCE AUTOMATIC GEARBOX

to reach the full mark. Fill up as follows (see Fig. 24)

- 1 Remove the dipstick and pour in 12 Imperial pints (14 U.S. pints) of fluid.
- 2 With the control lever in Neutral and the hand brake applied, start the engine and run it at fast idle for a few minutes.
- 3 Stop the engine and add a further 6 Imperial pints (7 U.S. pints).
- 4 Whilst running the engine at slow idle, check the fluid level with the dipstick; if necessary add sufficient fluid to bring the level to the 'F' mark. Do not overfill.

### Ride control oil pump — To prime

'R' type cars are fitted with a ride control oil pump which is driven from the gearbox rear extension. As some of the gearbox oil is pumped by the ride control oil pump into the rear dampers, the ride control oil system should always be bled to remove air whenever the gearbox has been drained and refilled. To do this proceed as follows

- 1 Jack up the rear wheels.
- 2 Remove the blank from the four-way connection on the ride control oil delivery pipe (see Fig. 25).
- 3 Run the engine at a fast idle speed with the selector lever in range '4', or, alternatively, turn the rear wheel in a forward direction to prime the ride control pump by forcing air and oil through the open connection.

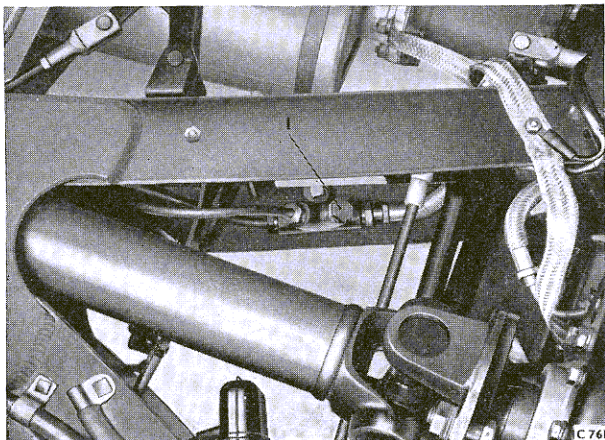


Fig. 25 Priming ride control oil pump

1 BLANKING PLUG

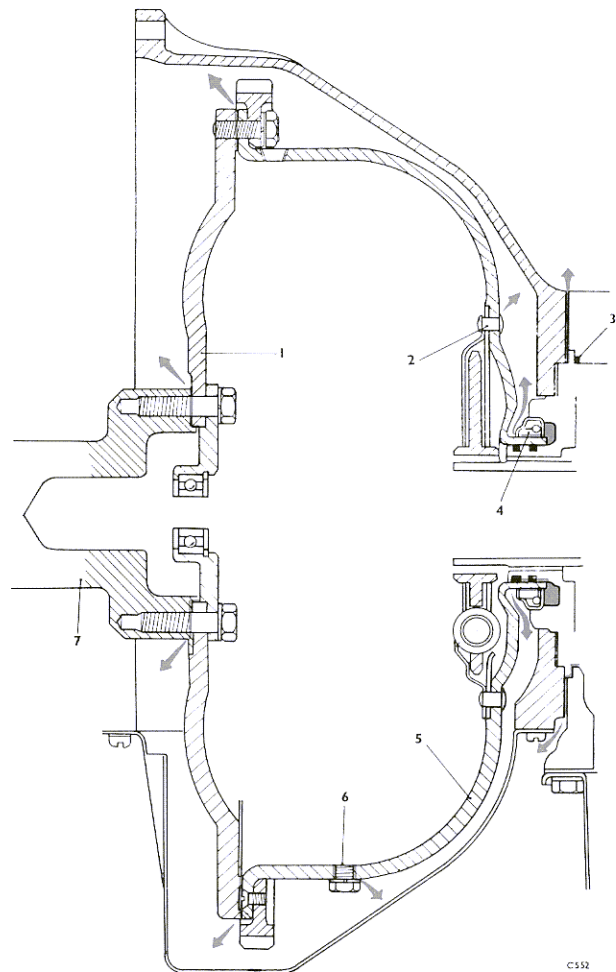


Fig. 26 Sources of leakage

- |                               |                       |
|-------------------------------|-----------------------|
| 1 FLYWHEEL                    | 4 FRONT PUMP OIL SEAL |
| 2 DAMPER RIVETS               | 5 TORUS COVER         |
| 3 GEARBOX—TO FRONT PUMP JOINT | 6 DRAIN PLUG          |
|                               | 7 CRANKSHAFT          |

- 4 When all air has been expelled, refit the blank.

If it is necessary to check the ride control system after this operation, fit a pressure gauge in place of the blank and run the engine to give a speed of approximately 20 m.p.h. with the selector lever in range '3' or '4'.

The pressure should not be more than 3 lb./sq. in. with the ride control in 'soft' or be between 30 lb./sq. in. and 35 lb./sq. in. with the control in 'hard'.

Remove the gauge and fit the blank.

If adjustment is necessary, shorten the control rod situated near the gearbox to increase the pressure.



## ROLLS-ROYCE AUTOMATIC GEARBOX

If it is suspected that air is still present in the system, each rear damper should be bled by removing the bleed plug on each damper, then run the engine as previously described until all air is expelled.

Finally top-up the gearbox to the 'F' mark.

### To check for leaks

If the oil level is low at checking periods, check for evidence of oil leakage or foaming and loss of fluid from the breather in the top of the dipstick (see Chapter 3 — Section 15 — Gearbox casing).

Possible sources of oil leakage are illustrated in Figure 26; the action to be taken when leakage is confirmed is given in the table.

If the action to be taken requires the removal of the gearbox, a road test should be made after topping-up

and before removal.

When rebuilding after leakage investigation, use of jointing compound should be restricted to a very light smear to the threads of setscrews which might allow external leakage. Jointing compound should not be used internally; if used, it may cause defective gearbox operation.

### Control joints — To lubricate

All control joints should be lubricated with grease, which should be worked well into the working surface, with the fingers. If excessive play in the joints is discovered during greasing, tighten the joint taking care to avoid upsetting the adjustment. If play in the joints is excessive it may be necessary to reset the linkage as described under 'Controls — To adjust'.

## OIL LEAKAGE SOURCES

| SOURCE                                      | ACTION   |
|---|--|
| Between flywheel and crankshaft flange ..   | Remove gearbox and flywheel to re-make the joint between the flywheel and crankshaft.  |
| Torus cover and flywheel .. .. .            | Check that torus cover plug and washer is correctly fitted. Remove gearbox and torus cover to re-make joint between torus cover and flywheel. Fit a new joint washer. Check torus cover-to-gearbox oil seals and damper rivets.                  |
| Front of transmission — behind bell housing | Remove gearbox. Remove front oil pump and re-make joint between front pump and gearbox joint by fitting a new joint washer. Check torus cover-to-gearbox oil seals.  |
| Oil sump .. .. .                            | Check drain plug and washer for correct fitting. Remove sump and re-make joint with a new joint washer.  |
| Side cover .. .. .                          | Check that the pressure line blanking plug and washer is correctly fitted. Remove side cover and re-make joint with a new joint washer ensuring that the setscrews are fitted with sealing washers. Check throttle and selector shaft oil seals. |
| Rear of transmission .. .. .                | Remove gearbox, examine rear oil seal. Re-make joint between rear extension and gearbox joint face by fitting a new joint. Check rear extension plug and sealing washer.   |
| Ride control unit and system if fitted ..   | Check pipes to rear dampers with engine running and ride control in 'hard'. Remove faulty unit or pipe and re-make joint or joints. Fitting instructions for the ride control pump are given in Chapter 3.                                       |