

**ROLLS-ROYCE AUTOMATIC GEARBOX**

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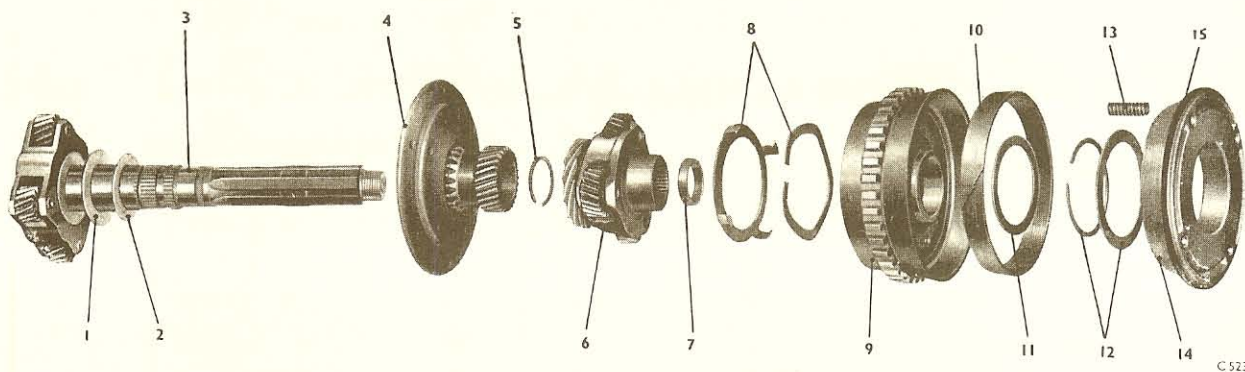
**SECTION 8 — REVERSE EPICYCLIC UNIT**

The reverse unit contains three planet gears only (see Fig. 11). They rotate on needle roller bearings and hardened pins riveted into a planet carrier which is splined onto the gearbox output shaft. As the rear unit planet carrier is integral with this shaft, the rear and reverse planet carriers rotate as one. The reverse planet carrier serves also to support the skew gear driving the rear pump and governor.

The reverse annulus gear is an integral part of the reverse clutch cone. The cone surfaces run between an

outer friction cone fitted to the gearbox rear casing and an inner cone which forms part of the clutch piston. The piston moves axially on four guide pins which prevent its rotation.

When Reverse is selected, hydraulic pressure drives the clutch piston forward to trap the reverse cone between the inner and outer friction rings, thus holding the reverse annulus gear stationary. At the same time, both the rear clutch and the rear band are released, allowing the drum to rotate freely.



**Fig. 11 Reverse epicyclic unit — exploded**

- |                                     |                                |                                  |
|-------------------------------------|--------------------------------|----------------------------------|
| 1 THRUST WASHER                     | 6 REVERSE PLANET CARRIER       | 11 THRUST WASHER                 |
| 2 BACKING WASHER                    | 7 SPACER                       | 12 SPRING RETAINER AND SNAP RING |
| 3 OUTPUT SHAFT                      | 8 CUSHIONING RING AND RETAINER | 13 CLUTCH RETURN SPRING (4)      |
| 4 REVERSE DRIVE FLANGE AND SUN GEAR | 9 REVERSE ANNULUS GEAR         | 14 REVERSE CLUTCH PISTON         |
| 5 SNAP RING                         | 10 STATIONARY CONE             | 15 PISTON OUTER SEAL             |

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As driving torque is applied to the rear sun gear, the planet gears are forced to revolve and drive the rear drum and reverse sun gear in the reverse direction to the applied torque. The reverse planet gears are thus forced to revolve around the stationary annulus to follow the rotating sun gear. The reverse epicyclic unit is therefore in reduction and the entire assembly of rear and reverse planet carriers and output shaft are driven in reverse.

The cone clutch is disengaged by six springs and oil leakage past the piston is prevented by annular seals.

If Reverse is selected when the engine is switched off, a spring-loaded pawl is caused to engage with a second (external) annulus gear on the reverse clutch cone. This has the effect of locking the transmission so that the car cannot move, even, for example, when parked on steep gradients. When the engine is running, main line pressure from the pump causes a parking

blocker piston to protrude from the parking bracket so as to prevent the pawl from moving into engagement with the parking lock annulus. Thus the pawl can only be engaged when Reverse is selected with the engine switched off.

In a similar manner, the reverse blocker piston is acted upon by governor pressure and forced to protrude from the parking bracket so as to prevent the selection of reverse gear when the car is moving forward at more than 8 m.p.h. to 10 m.p.h.

The gearbox output shaft is carried in a pair of ball bearings in the rear extension casing. On the output shaft is the skew gear which drives the speedometer and the road wheel brake servo, and finally, the driving flange for the propeller shaft universal joint. With 'R' series cars the front bearing is retained in the rear extension by a circlip and, apart from driving the brake servo, the servo drive supplies the means to drive the ride control unit.