

---



---

**ROLLS-ROYCE AUTOMATIC GEARBOX**


---



---

Printed in England

SEPTEMBER 1963

TSD 2/42

**SECTION 2 — MECHANICAL ARRANGEMENT**

The four forward gears are obtained by using two epicyclic gear trains of differing ratios. Reverse gear is obtained through the rear epicyclic unit. The reverse unit idles when the forward ranges are selected, but when engaged, it revolves in a reverse direction and provides a further slight gear reduction.

The forward gears are obtained as follows

- First—Front and rear epicyclic trains both in reduction.
- Second—Front train in direct drive, rear train in reduction.
- Third—Front train in reduction, rear train in direct drive.
- Fourth—Front and rear trains both in direct drive.

The line of drive through each epicyclic unit is dependent upon hydraulically controlled friction bands and clutches. When the friction bands hold the drums stationary, the clutches are disengaged and the unit is in reduction. When the bands are released the clutches are engaged, locking two elements of each gear train together and thus providing a direct drive through the unit.

The clutch in the front unit locks together the sun gear and the planet gear carrier, thus preventing rotation of the planet gears and effectively locking the unit in direct drive.

The clutch in the rear unit locks the annulus gear to the intermediate shaft. If there were no slip in the fluid coupling this would be equivalent to locking together the annulus and sun gears, so preventing rotation of the planet gears and enforcing direct drive through the unit. In fact, slight slip is always present in the fluid coupling and therefore the planet gears revolve slowly around the annulus to accommodate it, similar in principle to a differential. The subsequent result nevertheless, is direct drive through the unit with slight loss in the fluid coupling.

In Reverse, both the band and the clutch of the rear epicyclic unit are freed, permitting all the gears to rotate. The rear unit annulus and the reverse unit sun gears are solidly connected and rotate together in the opposite direction to that of the input torque. The reverse unit annulus gear is held stationary by its cone clutch and the reverse unit planet gears therefore revolve inside it, transmitting the reversed torque through the planet gear carrier to the output shaft.

The fluid coupling is not directly driven by the engine flywheel; the torus cover is bolted to the flywheel and drives the rear torus member at a reduced speed in first gear through the gear train of the front epicyclic unit. This speed reduction allows the coupling to slip at higher engine speeds than would otherwise be possible and reduces the tendency of the car to creep forward when a forward range is selected.