

# Rover 2000-2200

P6 ROVER OWNERS CLUB



## Automatic Transmission

The automatic gearbox fitted to the Rover 2000 is the Borg Warner model 135. It is coupled to the engine by a single phase torque converter. The torque converter converts the engine power, providing smooth application of driving torque. The gears are operated automatically by the engagement of clutch and/or the application of brake bands in various combinations. The hydraulic control system and the torque converter are supplied with oil under pressure by a gear type oil pump driven by the converter impeller. A second pump located at the rear of the transmission drive shaft, supplements the front pump at speeds above 25 mph (40 kph). The rear pump enables the engine to be started through the transmission.

The gears are selected by a control lever with a centre button in it. This button must be depressed before a gear can be selected, except between 'D2' and 'D1'. Or from 'L' to 'D1' or 'D2' and from 'R' into 'N'. The kickdown mechanism is actuated by depressing the accelerator pedal to the floor and should be used for overtaking, and hill climbing. Kicking down will not damage the engine as the speeds are pre-set to give the best performance without over revving. Lower road speed change ups can be made by releasing the accelerator pedal during acceleration after kickdown.

Overhaul of the automatic gearbox is a specialist job requiring the right tools and knowledge. In view of this factor any overhaul procedures have been omitted from this section. If the gearbox requires overhaul take it to your Rover main dealer or automatic specialist.

### EMERGENCY STARTING

The Rover 2000 earlier models can be tow started by selecting 'L' turning on the ignition, setting the mixture control and releasing the handbrake. Tow the car until the engine fires and starts. This should occur at under 25 mph (40 km).

Later models such as the 2200 do not have this facility. If the car breaks down and is to be towed to the garage, disconnect the propeller shaft, or lift the rear wheels clear of the ground. This is because the oil pump will not operate unless the engine is running and lack of lubrication could cause damage to the transmission.

*NOTE: For reference see Figures H:1 and 2 for both types of selector lever.*

Adjustments thought to be within the scope of the home mechanic are detailed in the following paragraphs.

### GEAR SELECTOR LINKAGE

Correctly adjusted linkage is essential to the smooth operation of the transmission. See Fig.H:3 for the linkage layout.

1. To check for correct operation of the linkage in relation to the position of the selector lever, first place the selector lever in 'P'. Now move the lever back through the range to 'L' or '1' as applicable. At each position a click should be felt indicating the correct position of the lever. The 'click' is also an indication that the manual valve (detent) is operating.
2. Check that the linkage is adjusted to the correct length as follows. Loosen the locknuts and turn the centre bar until the correct dimension is achieved. Repeat this operation with the other linkage, as necessary.
3. Select neutral 'N' at the selector arm on the transmission as shown in Fig.H:4. Set the selector lever in the 'N' position. Check that the ball joint at the lower end of the vertical rod can be connected to the transmission unit selector lever without strain, Fig.H:5. Adjust as necessary.
4. Check that the linkage does not override the detent by operating the selector lever in all positions as in paragraph 1.

### STARTER INHIBITOR SWITCH

The inhibitor switch operates the reversing lights when 'R' is selected, it also enables the car to be started in the 'P' position and the 'N' position. Check the inhibitor switch for operation as follows.

1. The linkage must be correctly adjusted as detailed previously.
2. Detach the front exhaust pipe to allow access to the switch.
3. Set the gear selector lever in the 'D2', 'D1' or 'D', '1' as applicable and disconnect the leads from the inhibitor switch.

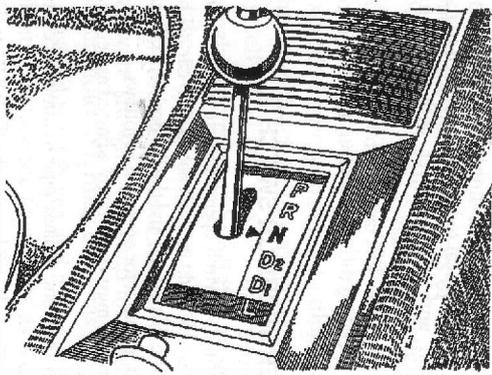


Fig. H:1 Gear selector early transmission

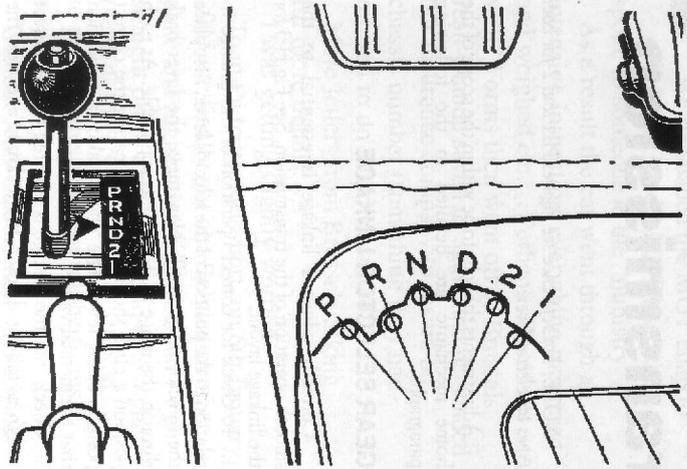
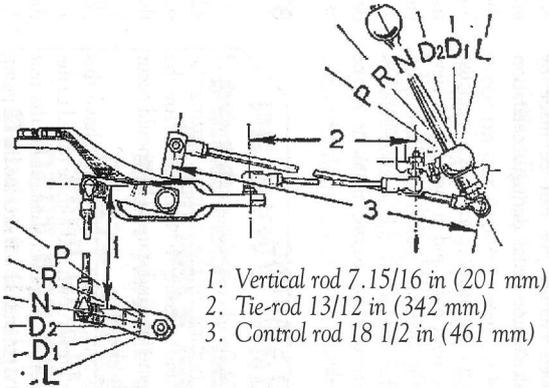


Fig. H:2 Gear selector later transmission



1. Vertical rod 7.15/16 in (201 mm)
2. Tie-rod 13/12 in (342 mm)
3. Control rod 18 1/2 in (461 mm)

Fig. H:3 Gear selector rod dimensions

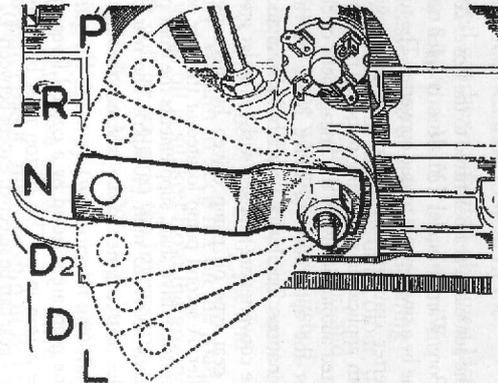
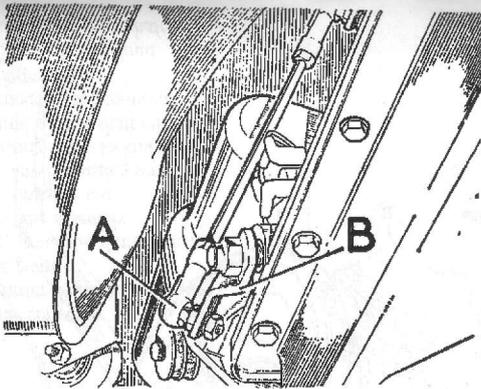
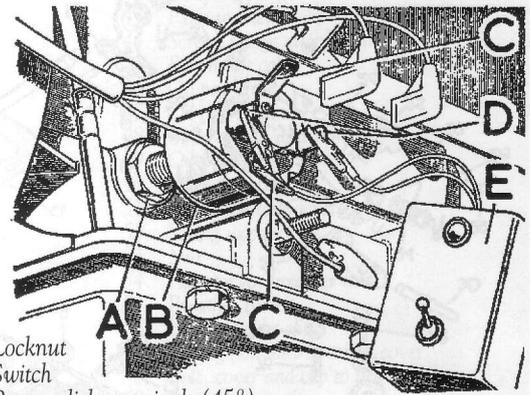


Fig. H:4 Selector lever on the transmission set at the 'N' position



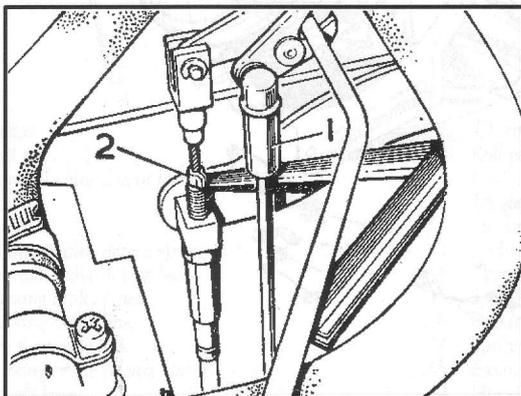
- A. Vertical rod lower ball joint
- B. Selector lever

Fig. H:5 Selector linkage at the transmission



- A. Locknut
- B. Switch
- C. Reverse light terminals (45°)
- D. Engine isolation terminals (90°)
- E. Test lamp (dry battery and bulb)

Fig. H:7 Adjusting the inhibitor switch



- 1. Accelerator coupling shaft
- 2. Crimped stop

Fig. H:8 Downshift cable check

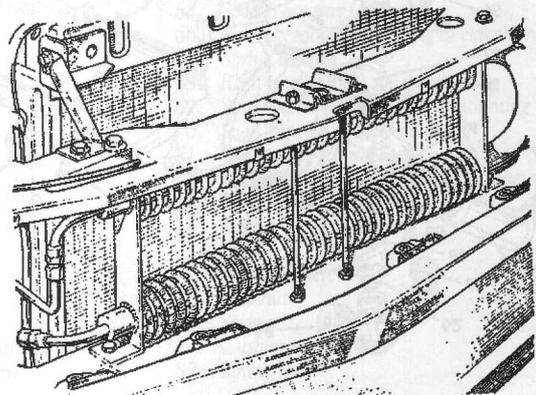
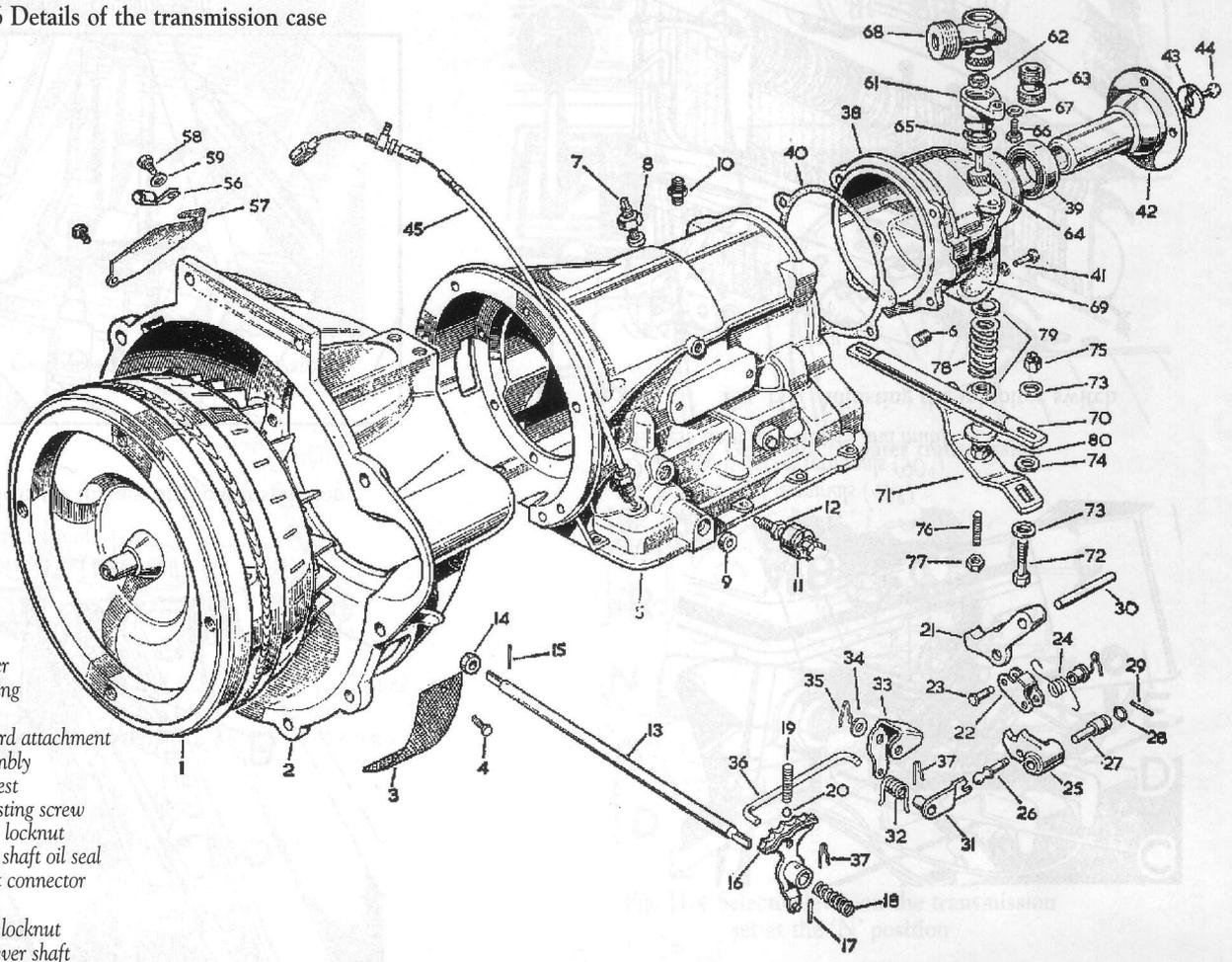
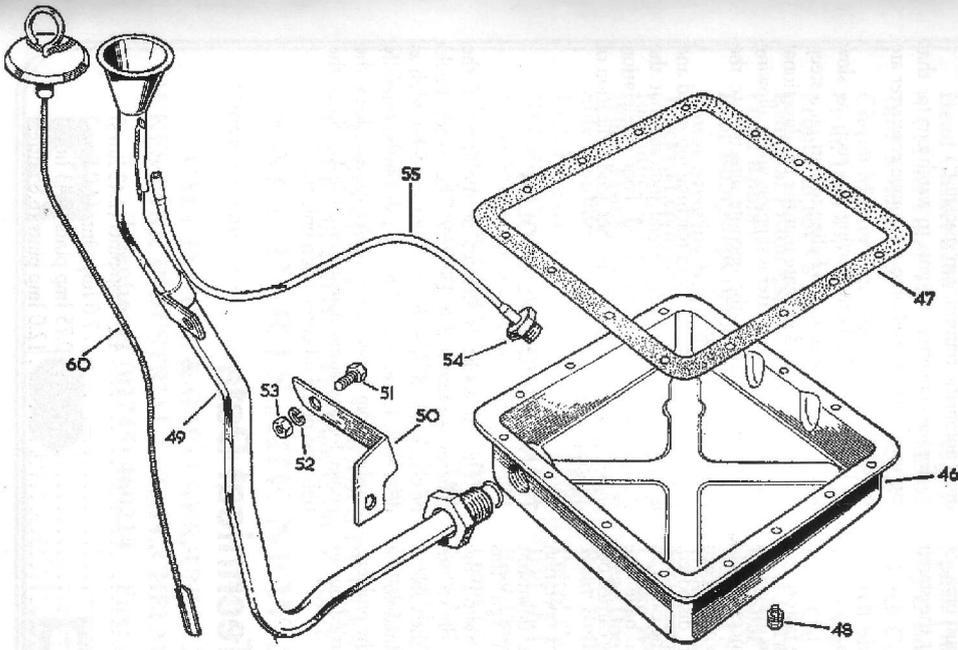


Fig. H:9 The transmission oil cooler

Fig. H:6 Details of the transmission case



1. Torque converter
2. Converter housing
3. Stone guard
4. Bolt, stone guard attachment
5. Main case assembly
6. Plug, pressure test
7. Rear servo adjusting screw
8. Adjusting screw locknut
9. Manual control shaft oil seal
10. Oil cooler outlet connector
11. Inhibitor switch
12. Inhibitor switch locknut
13. Manual valve lever shaft



14. Collar
15. Roll pin
16. Manual valve detent lever
17. Roll pin
18. Spring
19. Manual valve detent spring
20. Manual valve detent ball
21. Parking brake pawl
22. Parking brake link
23. Pin for toggle link
24. Parking brake release spring
25. Toggle lever
26. Ball ended pin for toggle lever
27. Shouldered pin for toggle lever

28. 'O' ring
29. Roll pin, toggle lever pin attachment
30. Pawl anchor pin
31. Toggle lift lever
32. Lift lever spring
33. Parking brake torsion lever
34. Plain washer
35. Spring clip
36. Parking brake link
37. Spring clip
38. Extension housing assembly
39. Housing oil seal
40. Gasket, extension housing to main casing
41. Bolt, extension housing attachment

42. Coupling flange
43. Plain washer
44. Screw, flange attachment
45. Downshift cable
46. Oil pan
47. Oil pan gasket
48. Bolt, oil pan attachment
49. Oil filler tube
50. Filler tube bracket
51. Bolt, tube to bracket
52. Spring washer
53. Nut
54. Adaptor for breather tube
55. Breather tube
56. Breather tube clip
57. Timing pointer inspection cover
58. Bolt, cover and clip to bell housing
59. Plain washer
60. Dipstick
61. Speedometer drive housing
62. Housing oil seal (small)
63. Adaptor
64. Speedo driven gear and spindle
65. Speedo housing O-ring
66. Bolt, speedometer housing to extension case
67. Spring washer
68. Right-angled drive for speedometer
69. Snub rubber for rear engine mounting
70. Shaft for rear engine mounting
71. Spring support bracket
72. Bolt, shaft and spring support bracket to base unit
73. Plain washer
74. Spacer
75. Nut
76. Adjusting screw
77. Locknut
78. Spring
79. Cushion
80. Spring seat

4. Refer to Fig. H:6 and loosen the locknut securing the switch. This is located behind the switch. Unscrew the switch as far as it will go. Now using a test lamp made up of a small dry battery and a bulb, connect the lamp between the reverse light terminals, identifiable by their 45° set.
5. Screw the switch back into the casing until the lamp goes out and note the position.
6. Connect the test lamp to the other pair of terminals (engine isolation terminals) on the switch (Fig. H:7). Screw the switch in until the light comes on, and again note the position. This should be approximately one turn from the previous position.
7. Unscrew the switch until it is at a point midway between the two noted positions. This should be approximately half a turn. Tighten the locknut.
8. Disconnect the lamp and reconnect the leads to the inhibitor switch. Reconnect the exhaust pipe.
9. Apply the handbrake and check that the starter operates only when 'N' or 'P' is engaged.

## DOWNSHIFT CABLE

The downshift cable is adjusted at the factory and the correct position set by a crimped stop as in Fig.H:8. Only under very exceptional circumstances should the cable require adjustment. If the gearbox has been removed, or the crimped stop has been dislodged, then the best course of action is to take the car to an automatic gearbox specialist. He will have the necessary tools to do the job which will be carried out in half the time.

Points to watch out for in the gearbox operation are that if there is difficulty in obtaining downshift (kickdown) at speeds below 30 mph (50 kph) this would indicate that the outer cable is too short. If the downshift operation is a dragging and drawn out operation then this would indicate that the cable is too long. These faults should be explained to the specialist and will give him an idea as to the problem.

On later models a check can be carried out as follows:

1. Refer to Fig. H:8 and with the engine running at the correct idling speed operate the accelerator coupling shaft until the engine speed just begins to rise.
2. Hold the coupling shaft in this position and then check the gap between the crimped stop and the end of the adjuster. There should be a clearance of between 0.010 - 0.020 in (0.25 - 0.50 mm).
3. If the clearance is not as specified do not attempt to adjust the outer cable; take the car to a specialist as previously mentioned.

## Automatic Transmission Removal

Removing the automatic transmission is in itself easy enough. The setting up procedures afterwards are a job for a specialist. In view of this the transmission removal is best left to either your Rover main dealer or an automatic transmission specialist.

Torque converter – Points to watch out for that can usually be blamed onto the torque converter are as follows.

1. If the car has been playing up, such as slow acceleration from rest, and failing to start on a steep gradient, this would indicate that the uni-directional clutch inside the converter is slipping, and is allowing the stator to turn in the opposite direction to the impeller and turbine.
2. If the car has difficulty in reaching top speed and is in good tune then this would indicate that the uni-directional clutch has seized. Poor acceleration above 30 mph (50 kph) is another good indication of the same problem.

## TRANSMISSION OIL COOLER

The oil cooler is situated at the front of the radiator as illustrated in Fig. H:9. The cooler should be checked at regular intervals and any debris such as dead flies, leaves, road dirt, etc., should be carefully brushed from between the cooler vanes. Check the cooler for any stone damage or oil leaks, check the tightness of the oil connection unions.

# Technical Data

## LUBRICANT CAPACITIES

Automatic transmission .....	4.25 Imp pints (2.42 litres)
Torque converter .....	7.0 Imp pints (4.0 litres)
Oil cooler & pipes .....	0.75 Imp pints (0.43 litres)
Total capacity .....	12.0 Imp pints (6.85 litres)