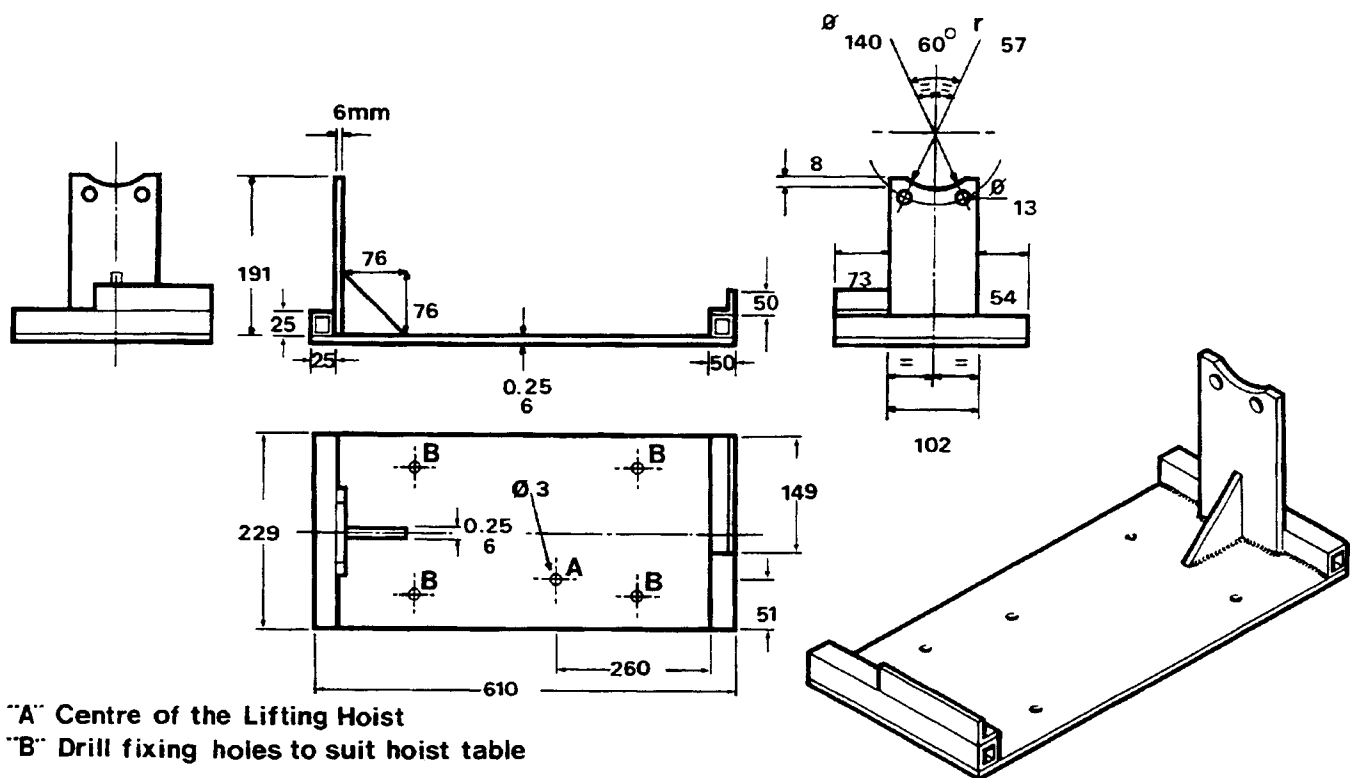


## LT230T TRANSFER GEARBOX WITH AUTOMATIC GEARBOX ASSEMBLY - V8

### Removal from V8 engine

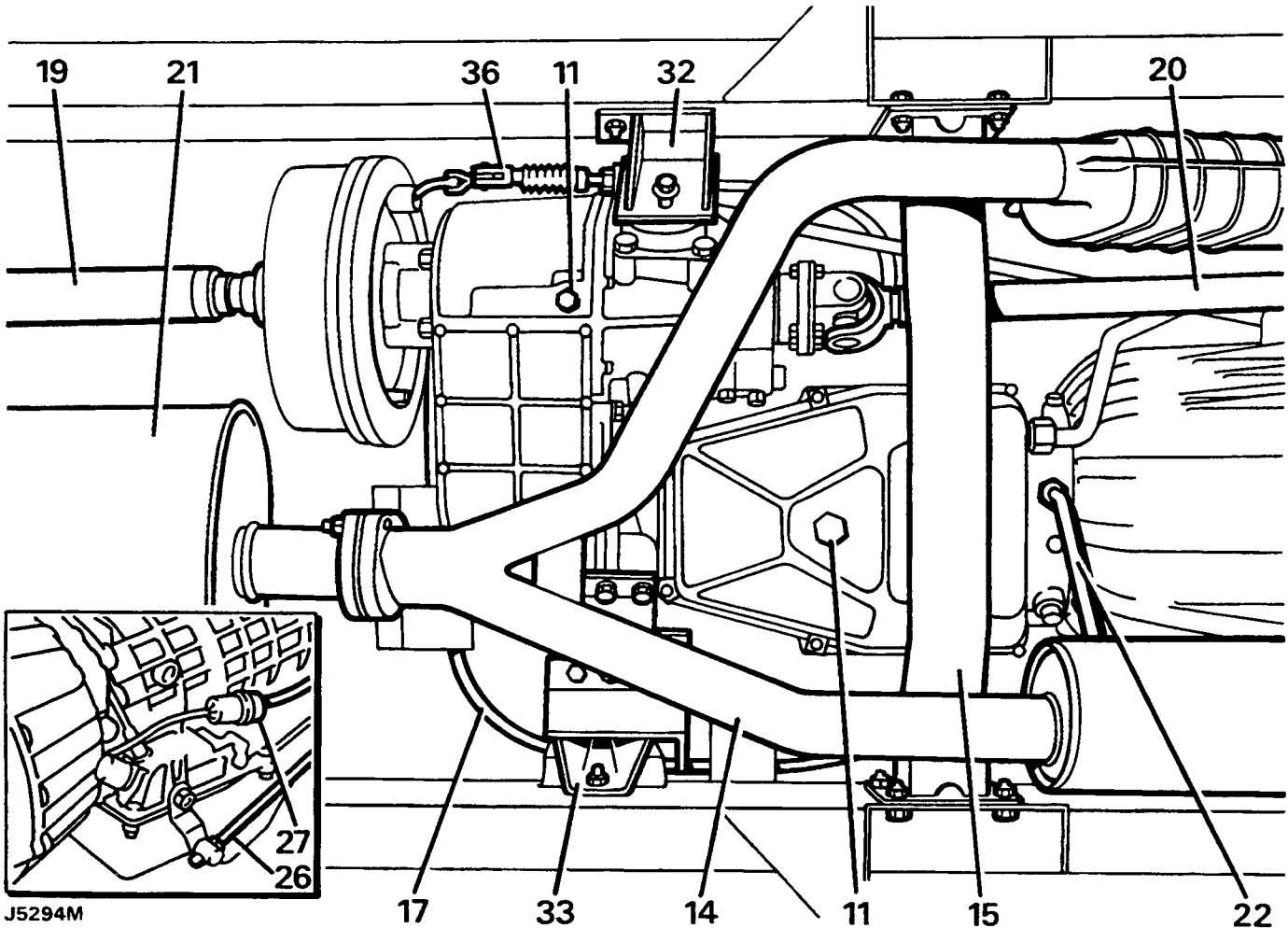
The assembled transfer gearbox, automatic gearbox and torque converter is removed from underneath the vehicle. Using a transmission hoist with an adaptor plate for securing the assembly to the hoist. The adaptor can be manufactured locally to the drawing below or purchased from:- Straight Set Engineering, England. Tel.0909 480055

**WARNING: When using a transmission hoist it is essential to follow the hoist manufacturers instructions.**



RR739M

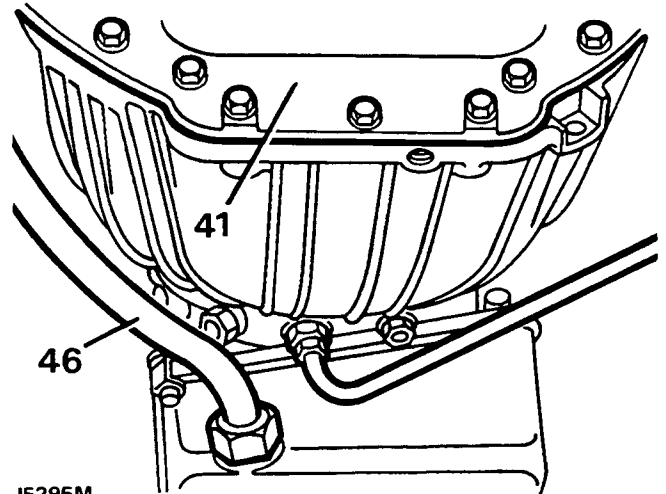
1. Site vehicle on a four post ramp.
2. Disconnect the battery negative lead.
3. Remove fan cowl securing screws and release cowl from radiator.
4. Slacken securing clip and disconnect air flow hose from plenum chamber.
5. Disconnect stepper motor hose from top of plenum chamber.
6. Disconnect kickdown cable from throttle linkage and release from clipping.
7. Release two gearbox breather pipes from clip located on lifting eye at rear of right hand cylinder head.
8. Remove dipstick from main gearbox oil filler tube.
9. Working inside vehicle detach transfer gear lever gaiter from console, unscrew knob and withdraw gaiter and knob.
10. Raise vehicle on ramp.



J5294M

11. Remove drain plugs and drain oil from transfer gearbox and main gearbox. Refit plugs.
12. Detach heat shield at front exhaust pipe to manifold.
13. Disconnect electrics to Lambda sensors.
14. Remove catalytic converter assembly.
15. Remove chassis crossmember from under gearbox.
16. Remove heat shield from speedometer cable at transfer gearbox.
17. Remove clamp and disconnect speedometer cable from transfer gearbox. Tie cable to one side.
18. Mark for reassembly propeller shaft to transfer gearbox mating flanges.
19. Disconnect rear propeller shaft to output flange, and tie to one side.
20. Repeat instructions 18 and 19 on front propeller shaft to main gearbox.
21. Remove bolts retaining silencer front and rear securing brackets and tie silencer to one side.
22. Disconnect oil cooler feed and return pipes from bottom and side of main gearbox.
23. Release cooler pipes from clamp at engine sump and remove distance piece.
24. Blank pipe ends and unions.
25. Move oil cooler pipes clear of transmission and tie aside.
26. Disconnect selector cable from operating lever.
27. Disconnect inhibitor switch at multiplug.
28. Attach adaptor plate to hoist.
29. Remove two bolts from transfer gearbox rear cover.
30. Raise hoist to align adaptor plate with transfer gearbox and transmission. Secure to transfer gearbox at rear cover with two bolts removed.
31. Adjust hoist to take weight of transmission.
32. Remove nuts and bolts securing right transfer gearbox mounting bracket to chassis.
33. Repeat for the left mounting bracket. Removal of these fixings will also free speedometer transducer bracket
34. Remove right side mounting bracket to flexible mounting rubber retaining nut.
35. Lower hoist until rear brake drum clears passenger footwell. Check engine does not crush any components while lowering.
36. Remove split pin and withdraw hand brake clevis pin.

37. Slacken hand brake cable adjuster nut and release cable from bracket.
38. Release hand brake cable from clip on high/low selector housing.
39. Disconnect leads from transfer gearbox temperature sensor and differential lock warning light switch.
40. Remove ties securing breather pipes to harness.



J5295M

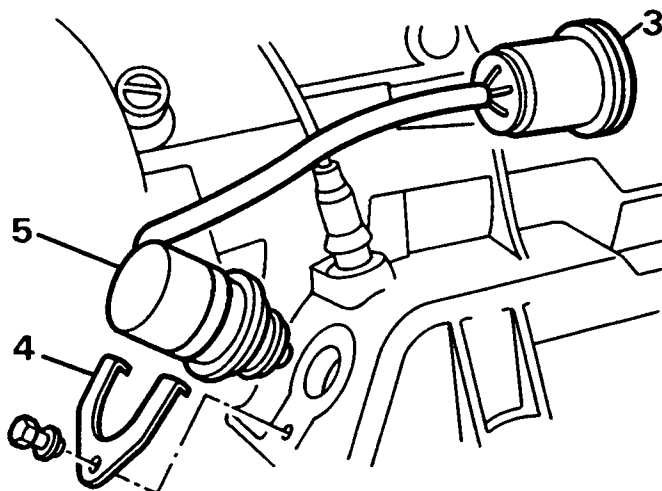
41. Remove bellhousing access plate complete with gasket.
42. Rotate engine, using crankshaft pulley, until two access holes are visible in drive plate/ring gear assembly through bell housing bottom cover opening.
43. Identify an access hole and bolt hole to aid reassembly.
44. Remove bolts securing drive plate to convertor through access holes.
45. Rotate crankshaft half turn to access and remove remaining bolts.
46. Disconnect oil dipstick tube at main gearbox.
47. Remove bolt at bell housing and detach dipstick tube. Blank pipe end and union.
48. Position hoist jack channel under engine and support using a wooden block.
49. Remove bell housing to engine securing bolts, also detach harness bracket from bell housing.
50. Ease transmission rearwards to allow access to secure torque converter in bell housing.
51. Lower hoist and complete removal of transmission.

**Refit**

52. Ensure torque converter is retained in bell housing.
53. Secure transmission to adaptor plate on lifting hoist.
54. Raise hoist and locate transmission with engine.
55. Remove torque converter retainer.
56. Complete attachment of transmission to engine and fit bell housing bolts. Fit the dipstick tube bracket and harness bracket to their respective bolts.
57. Complete refitting by reversing removal procedure. Note the following important points.
58. Drive plate to torque converter bolts are to be coated with Loctite 290 prior to assembly.
59. Refill transfer and main gearboxes with correct grade oil, Section 09.
60. Check operation of parking brake and adjust as necessary, Section 10.

**INHIBITOR SWITCH****Remove**

1. Site vehicle on a four post ramp.
2. Disconnect battery negative lead and raise vehicle.
3. Disconnect inhibitor switch multi plug.
4. Remove inhibitor switch retaining plate.
5. Remove inhibitor switch.



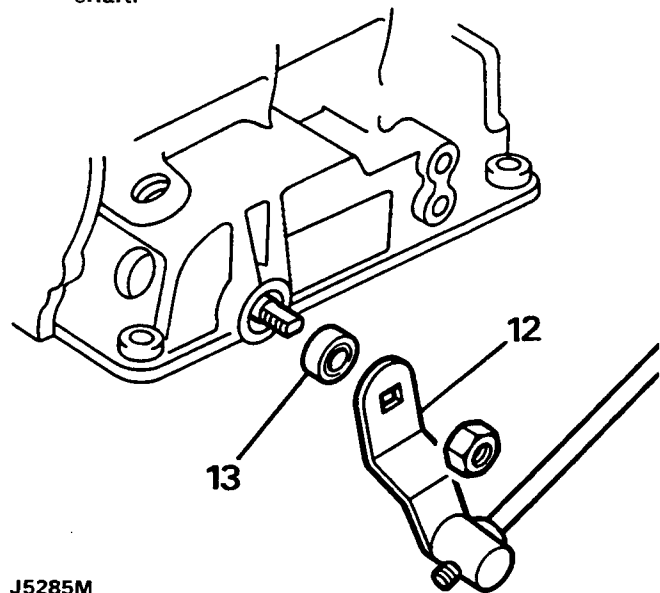
6. Remove 'O' ring seal.
7. Clean inhibitor switch.

**Refit**

8. Clean mating face on casing.
9. Fit and lubricate new 'O' ring seal to switch.
10. Fit switch to casing.
11. Secure with retaining plate and bolt.
12. Connect multiplug to harness.
13. Reconnect battery and remove vehicle from ramp.

**SELECTOR SHAFT OIL SEAL****Renew**

1. Site vehicle on a four post ramp.
2. Disconnect battery negative lead.
3. Raise vehicle.
4. Detach heat shield at front exhaust pipe to manifold.
5. Disconnect electrics from Lambda sensors.
6. Remove catalytic converter assembly.
7. Remove chassis crossmember from under gearbox.
8. Engage low range gear in the transfer gearbox.
9. Support transfer gearbox with a jack or transmission hoist.
10. Remove transfer gearbox chassis mounting bracket nuts and bolts. Note location of speedometer cable bracket for refit.
11. Lower transmission to allow access to selector shaft.



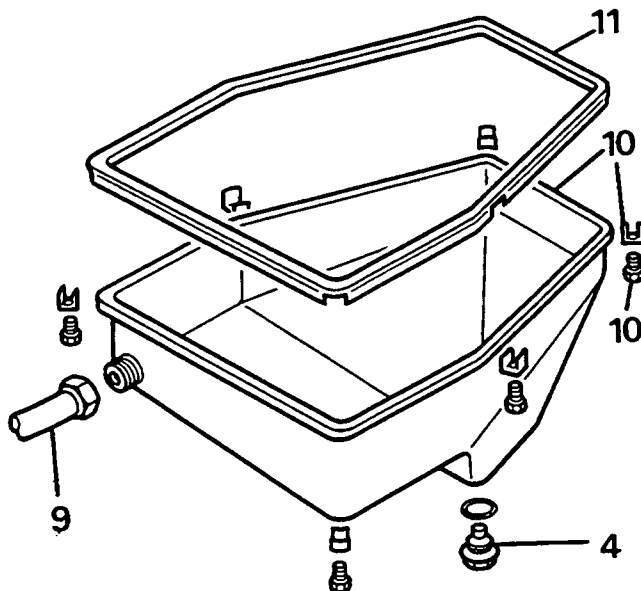
12. Remove selector lever from shaft.
13. Remove selector shaft seal from casing.
14. Clean selector shaft and seal mating faces.

15. Fit centre section of special tool LST 114 over selector shaft.
16. Lubricate new oil seal and position seal on tool.
17. Fit tool outer sleeve and screw on wing nut to drive seal into housing.
18. Remove tool from shaft.
19. Refit selector lever to shaft.
20. Raise transmission and secure mounting brackets to chassis. Ensure speedometer cable bracket is secured. Tighten bolts to 30Nm.
21. Remove support jack.
22. Refit chassis crossmember.
23. Refit catalytic converter assembly.
24. Connect electrics to Lambda sensors.
25. Connect heat shield front pipe to manifold.
26. Connect battery.
27. Check/top up gearbox oil level.

### OIL SUMP

#### Remove

1. Site vehicle on a four post ramp.
2. Disconnect battery negative lead.
3. Raise vehicle.
4. Drain oil and refit plug with new seal.
5. Detach heat shield at front exhaust pipe to manifold.
6. Disconnect electrics from Lambda sensors.
7. Remove catalytic converter assembly.
8. Remove chassis crossmember from under gearbox.



J5286M

9. Disconnect dipstick tube at oil sump. Loosen securing bolt at bellhousing and move dipstick aside.
10. Remove clamps securing oil sump. Note their locations for refit and withdraw sump.
11. Remove gasket and clean gasket mating faces.

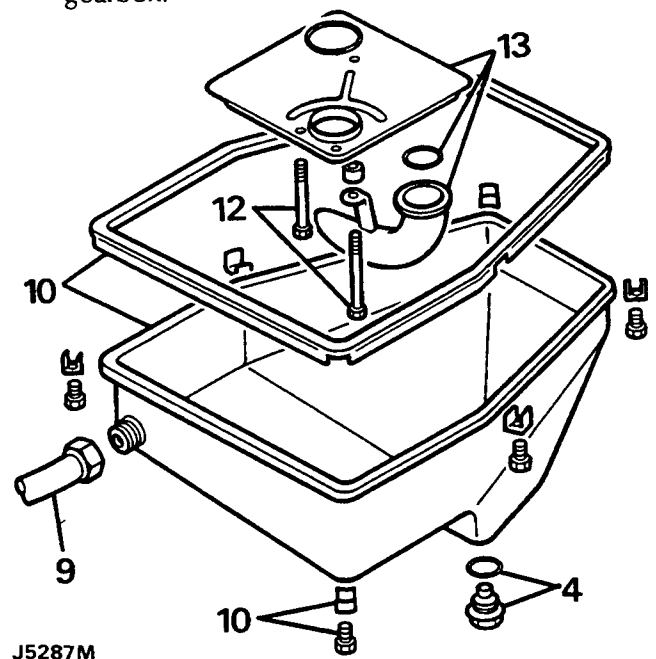
#### Refit

12. Refit oil sump using a new gasket.
13. Connect dipstick tube to oil sump and tighten bolt at bell housing.
14. Refit chassis cross member.
15. Refit catalytic converter assembly
16. Connect electrics to Lambda sensors.
17. Connect heat shield front pipe to manifold.
18. Connect battery.
19. Refill gearbox using correct grade of oil see Section 09.

### OIL SCREEN

#### Renew

1. Site vehicle on a four post ramp.
2. Disconnect battery negative lead.
3. Raise vehicle.
4. Drain oil and refit plug with new seal.
5. Detach heat shield at front exhaust pipe to manifold.
6. Disconnect electrics from Lambda sensors.
7. Remove catalytic converter assembly.
8. Remove chassis crossmember from under gearbox.

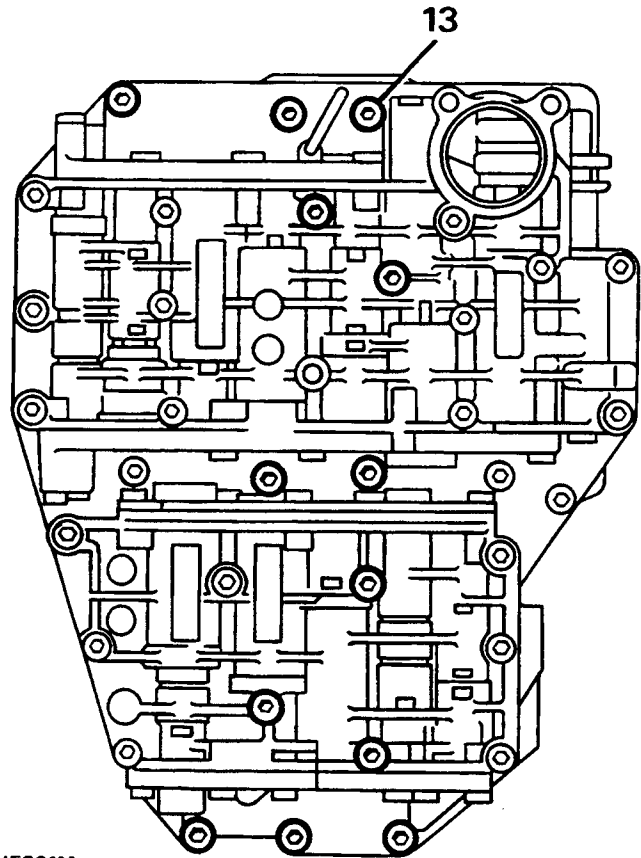


J5287M

9. Disconnect dipstick tube at oil sump. Loosen securing bolt at bellhousing and move dipstick aside.
10. Remove clamps securing oil sump. Note their locations for refit and withdraw sump.
11. Remove gasket and clean gasket mating faces.
12. Remove securing screws and detach oil screen and suction pipe, taking care to retain suction pipe spacer, discard 'O' ring seal.
13. Detach suction pipe from oil screen, discard 'O' ring seal.

14. Clean oil screen and blow out with a airline.
15. Clean suction pipe.
16. Fit new 'O' ring seals to oil screen using light grease to aid assembly.
17. Fit oil screen and suction pipe with spacer and secure with three bolts.
18. Refit oil sump using a new gasket.
19. Connect dipstick tube to oil sump and tighten bolt at bell housing.
20. Refit chassis crossmember.
21. Refit catalytic converter assembly
22. Connect electrics to Lambda sensors.
23. Connect heat shield front pipe to manifold.
24. Connect battery.
25. Refill gearbox oil system using correct grade of oil see Section 09.

11. Remove gasket and clean gasket mating faces.
12. Remove securing screws and detach oil screen and suction pipe, taking care to retain suction pipe spacer, discard 'O' ring seal.
13. Remove securing screws and detach control unit from casing.

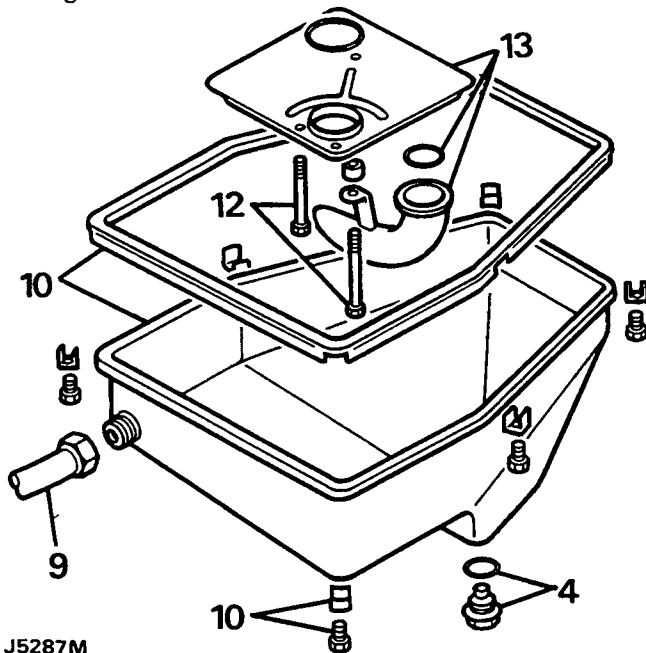


J5291M

## CONTROL UNIT

### Remove

1. Site vehicle on a four post ramp.
2. Disconnect battery negative lead.
3. Raise vehicle.
4. Drain oil and refit plug with new seal.
5. Detach heat shield at front exhaust pipe to manifold.
6. Disconnect electrics from Lambda sensors.
7. Remove catalytic converter assembly.
8. Remove chassis crossmember from under gearbox.

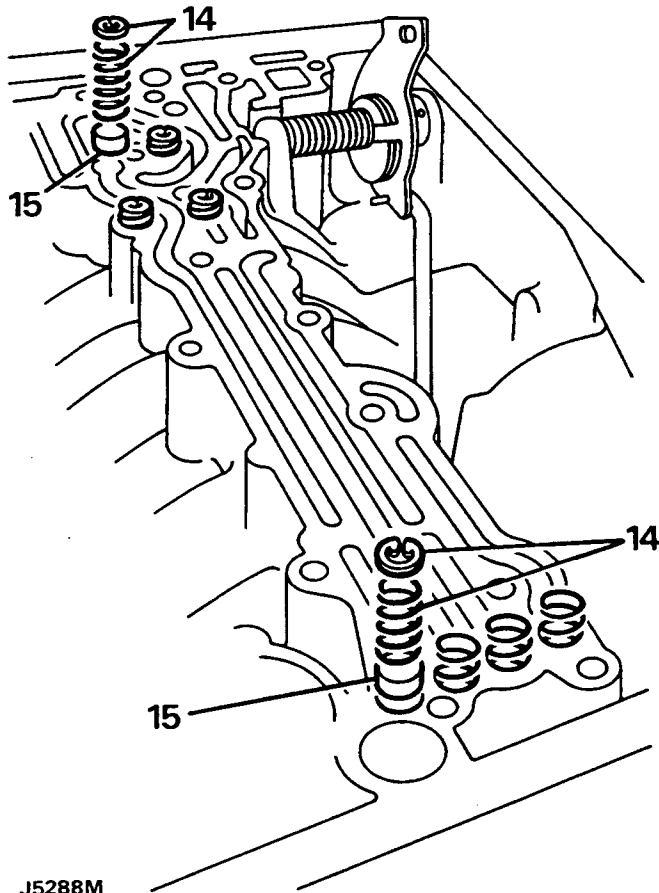


J5287M

9. Disconnect dipstick tube at oil sump. Loosen securing bolt at bellhousing and move dipstick aside.
10. Remove clamps securing oil sump. Note their locations for refit and withdraw sump.

**Oil seal replacement**

14. Remove circlips and springs from control unit. Note locations of long and short springs.
15. Using seal replacer/remover LST113 remove and discard seals.



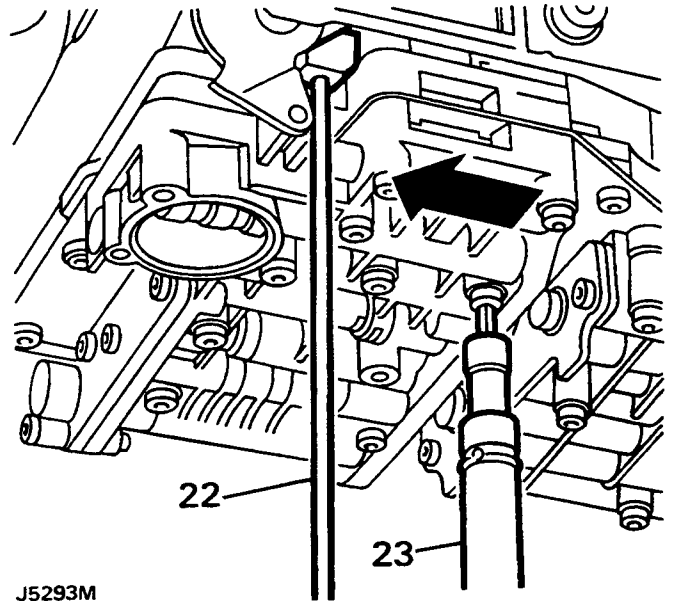
J5288M

16. Clean control unit, springs and circlips and check that they are satisfactory for further use.
17. Fit new seals to control unit using LST113, ensure seals are fully seated.
18. Fit springs to locations noted during removal and secure with circlips.

**Refit**

19. Fit control unit to gearbox, locating throttle valve behind cam and engaging selector quadrant with manual valve.
20. Loosely fit securing screws.

21. Manually open throttle linkage to full throttle position.



J5293M

22. Engage special tool LST 109 between control unit and throttle valve pin.
23. Set correct distance between control unit and cam.
24. Remove special tool and close throttle.
25. Fit new 'O' ring seals to oil screen using light grease to aid assembly.
26. Fit oil screen and suction pipe with spacer and secure with three bolts.
27. Refit oil pan using a new gasket.
28. Connect dipstick tube to oil sump and tighten bolt at bell housing.
29. Refit chassis cross member.
30. Refit catalytic converter assembly
31. Connect electrics to Lambda sensors.
32. Connect heat shield front pipe to manifold.
33. Connect battery.
34. Refill gearbox oil system using correct grade of oil see Section 09.

## KICKDOWN CABLE

## Removal

1. Site vehicle on a four post ramp.
2. Select neutral 'N' gear lever.
3. Disconnect battery negative lead.
4. Disconnect kickdown cable at throttle linkage.
5. Release outer cable locknut.
6. Disconnect cable from mounting bracket.
7. Release cable from bracket attached to cylinder head.
8. Feed cable through to underside of vehicle.
9. Raise vehicle on ramp.
10. Drain oil and refit plug with new seal.
11. Detach heat shield at front exhaust pipe to manifold.
12. Disconnect electrics from Lambda sensors.
13. Remove catalytic converter assembly.
14. Remove chassis crossmember from under gearbox.
15. Disconnect dipstick tube at oil sump. Loosen securing bolt at bell housing and move dipstick aside.
16. Remove clamps securing oil sump. Note their locations for refit, and withdraw sump.
17. Pull kickdown inner cable to fully open valve cam. Wedge cam in this position.
18. Release cable from cam by pushing inner cable into outer casing and detaching cable nipple from cam.
19. Using special tool LST112 compress cable tangs and remove cable from gearbox.
20. If cable is to be refitted remove 'O' ring seal and clean cable assembly.

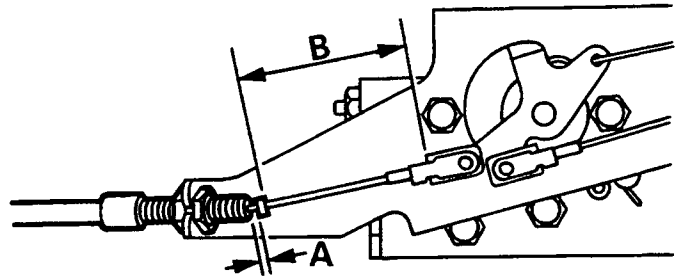
## Refit

21. Fit new 'O' ring seal to cable and lubricate seal.
22. Fit cable to gearbox casing ensuring it is correctly seated.
23. Fit inner cable nipple to its location on cam.

**NOTE: When a new cable is fitted, to help locate nipple to cam, introduce a curve into the cable. Do not bend or kink cable.**

24. Remove wedge from cam and ensure nipple remains engaged.
25. Feed free end of cable assembly into engine compartment.
26. Refit oil pan using a new gasket.
27. Connect dipstick tube to oil sump and tighten bolt at bell housing.
28. Refit chassis crossmember

29. Refit catalytic converter assembly
30. Connect electrics to Lambda sensors.
31. Connect heat shield front pipe to manifold.
32. Lower vehicle on ramp.
33. Fit cable to bracket at cylinder head.
34. Locate cable in mounting bracket, do not tighten locknut.
35. Fit cable to throttle linkage.
36. Ensure throttle linkage is fully closed.
37. Adjust outer cable to achieve a gap of 0,25 to 1,25mm (dimension 'A') between end of outer cable and crimped collar on inner cable.
38. Tighten locknuts and recheck gap.



J5292M

**NOTE: If fitting a new cable, and collar on inner cable is loose, measure distance 'B' on old cable. Crimp collar on new cable to this dimension.**

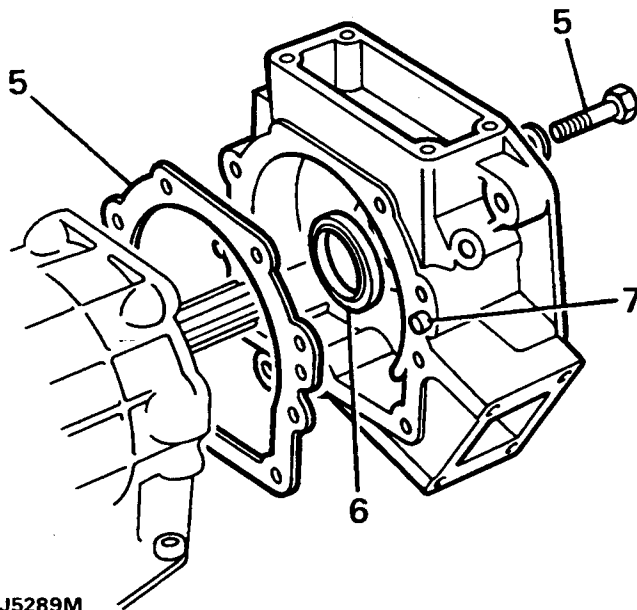
39. Connect battery.
40. Refill gearbox oil using correct grade of oil Section 09.



## REAR EXTENSION HOUSING

## Remove

1. Remove transfer gearbox see Section 41.
2. Drain oil from automatic gearbox.
3. Remove bolts securing left hand mounting bracket to extension housing and withdraw bracket.
4. Remove transfer gear lever housing securing bolts and move housing aside.



5. Remove securing bolts and withdraw extension housing from over coupling shaft. Remove and discard gasket.
6. Place extension housing on bench and remove oil seal.
7. Ensure that all surfaces are clean and housing is free from damage. If damage is found and housing has to be renewed remove dowels from face of existing housing and fit to new housing.
8. Using special tool LST108 fit new oil seal to housing.

## Refit

9. Fit extension housing to gearbox, with a new gasket, ensuring oil seal is not damaged by extension shaft.
10. Secure housing with nine bolts tightened to correct torque Section 06.
11. Refit transfer gear lever housing to top of extension housing, tighten bolts to correct torque.
12. Refit mounting bracket to extension housing tightening bolts to correct torque.
13. Refit transfer gear box Section 41.
14. Refill automatic gearbox lubrication system with correct grade of oil Section 09.

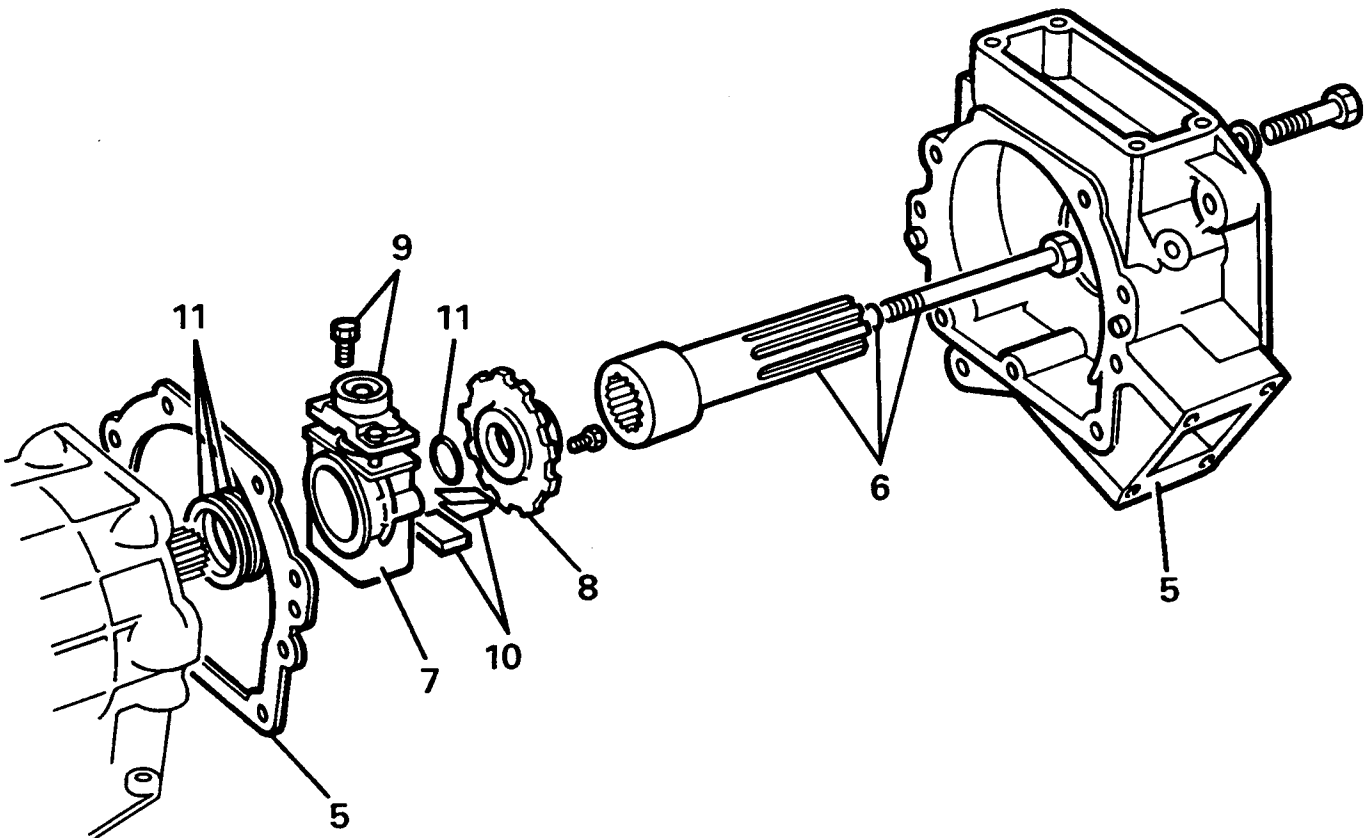
## GOVERNOR ASSEMBLY

## Remove

1. Remove transfer gearbox see Section 41.
2. Drain oil from automatic gearbox.
3. Remove bolts securing left hand mounting bracket to extension housing and withdraw bracket.
4. Remove transfer gear lever housing securing bolts and move housing aside.
5. Remove extension housing ensuring seal is not damaged, remove and discard gasket.
6. Release extension shaft retaining bolt, withdraw shaft and discard 'O' ring seal.
7. Remove governor assembly.
8. Remove park gear from governor assembly.
9. Detach governor housing.
10. Remove security clip and counter weight.
11. Remove and discard 'O' ring seal from output shaft and three seal rings from 'F' clutch housing.
12. Clean all components.
13. If necessary detach parking pawl by removing guide plates and withdrawing mechanism.

## Refit

14. Refit parking pawl mechanism if removed.
15. Fit and lubricate new seal rings to 'F' clutch housing shaft, ensure they are correctly seated.
16. Apply petroleum jelly to a new 'O' ring seal. Fit to output shaft
17. Fit park gear to governor assembly tightening screws to correct torque.
18. Fit governor assembly to output shaft.
19. Fit extension shaft with new 'O' ring under bolt head.
20. Fit extension housing, avoid damaging seal, tighten bolts to correct torque see section 06.
21. Refit transfer gear lever housing to extension housing.
22. Refit mounting bracket to extension housing, tighten bolts to correct torque.
23. Refit transfer gearbox Section 41.
24. Refill automatic gearbox with correct grade of oil Section 09.



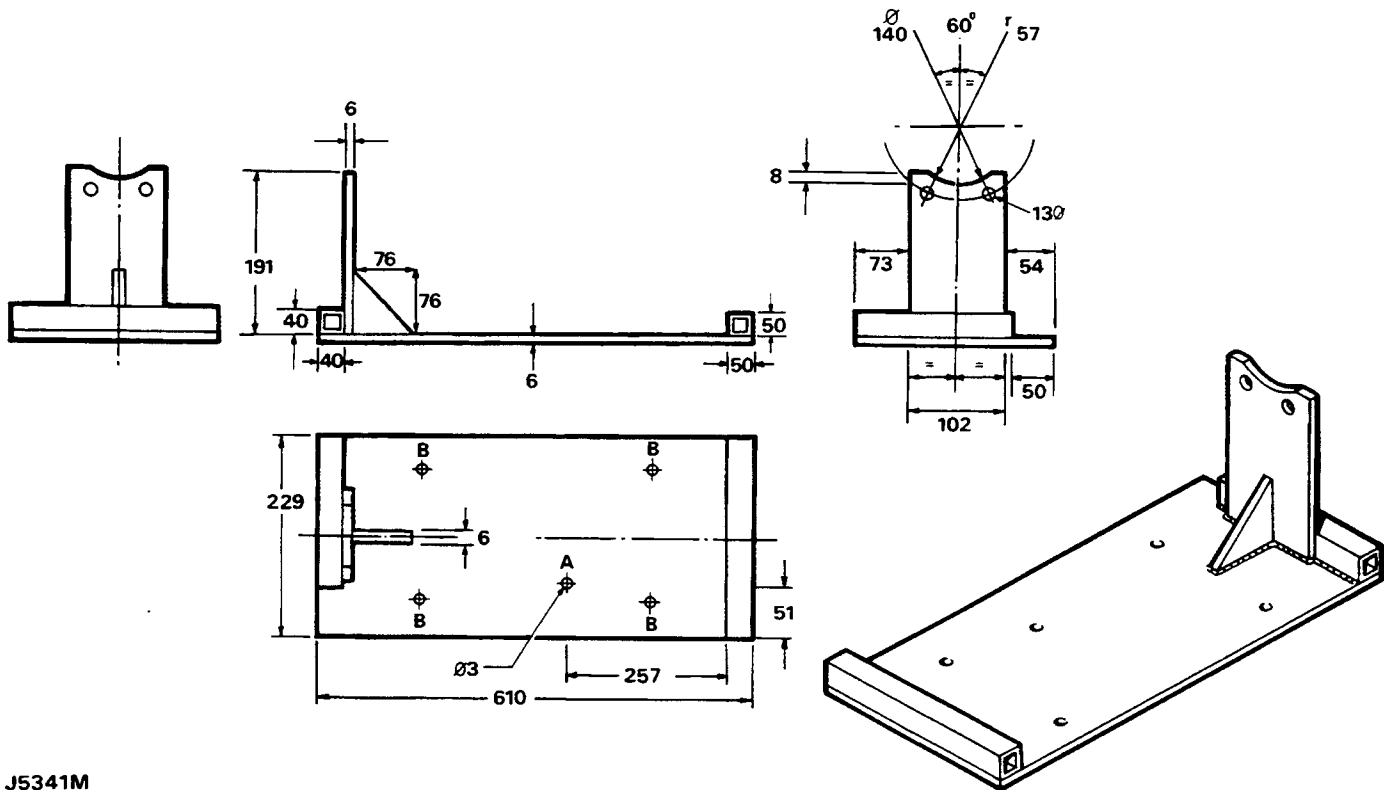
J5290M

**LT230T TRANSFER GEARBOX WITH AUTOMATIC GEARBOX ASSEMBLY - Tdi**

**Removal from Tdi engine**

The assembled transfer gearbox, automatic gearbox and torque converter is removed from underneath the vehicle. Using a transmission hoist with an adaptor plate for securing the assembly to the hoist.

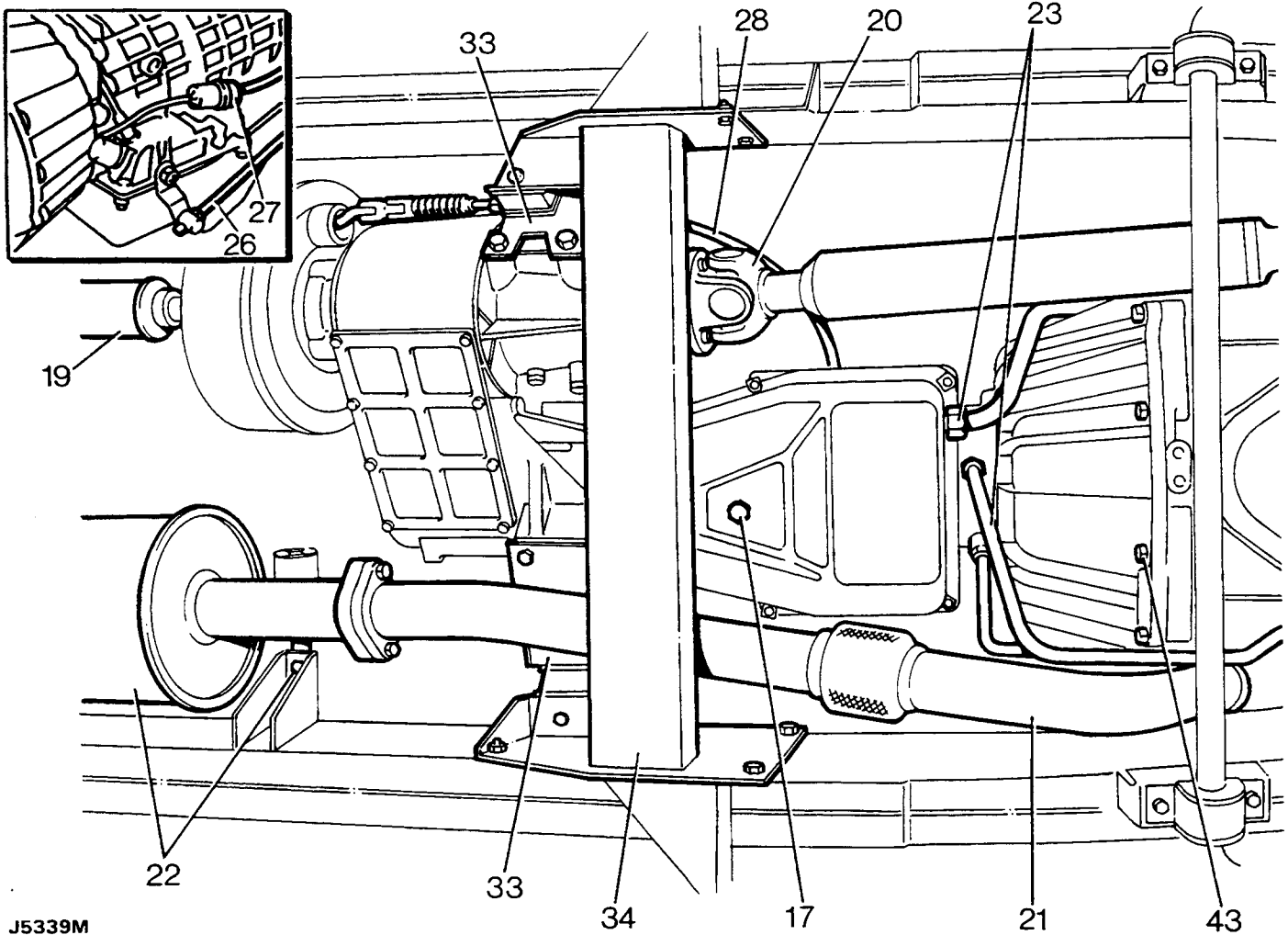
**WARNING:** When using a transmission hoist it is essential to follow the hoist manufacturers instructions.



J5341M

## Remove

1. Select low range with transfer gear lever.
2. Remove knob and gaiter from transfer gear lever.
3. Disconnect battery terminals.
4. Remove insulation pad from rocker cover and inlet manifold.
5. On LH drive vehicles only, disconnect multi-plug from top of brake fluid reservoir.
6. Release electrical harness from clips along top of bulkhead and pull over to one side.
7. Remove bolt securing transfer and main gearbox breather pipe clip to rear of cylinder head.
8. Disconnect kick down cable at fuel injection pump.
9. Drain coolant from cooling system.
10. Disconnect top hose from radiator.
11. Disconnect turbo charger hose from inter-cooler.
12. Remove starter heat shield.



J5339M

13. Remove starter.
14. Working through starter aperture note position of torque converter flexible drive plate to facilitate refitting.
15. Remove the four torque converter to flexible drive securing bolts, rotating engine to gain access to each individual bolt.
16. Raise vehicle on four post ramp.
17. Drain lubrication oil from transfer and main gearboxes.
18. Disconnect speedometer cable from transfer gearbox and disconnect associated clipping.
19. Remove rear propeller shaft. (New style coupling at rear differential)
20. Disconnect front propeller shaft at transfer gearbox and tie to one side.
21. Remove exhaust front pipe.
22. Remove bolts securing front and centre silencer mounting brackets and tie silencer to one side.
23. Disconnect oil cooler pipes from gearbox.
24. Blank off pipes and union connections.
25. Remove bolt securing retaining bracket to sump and move cooler pipes aside.
26. Disconnect selector cable from lever on side of gearbox.
27. Disconnect inhibitor switch multi-plug.
28. Disconnect hand brake cable from linkage at side of transfer gearbox.
29. Disconnect electrical connections from differential lock switch on transfer gearbox.
30. Remove two lower bolts from transfer gearbox input bearing support plate.
31. Assemble approved support cradle to transmission hoist.
32. Raise hoist and secure cradle to transfer gearbox input bearing support plate using bolts removed.
33. Disconnect gearbox mounting brackets from chassis cross member.
34. Remove chassis cross member.
35. Lower transmission sufficiently to allow access to items attached to top of gearbox.
36. Remove left hand gearbox mounting bracket assembly.
37. Remove ties from breather pipes and harness.
38. Remove nut securing gearbox oil filler/dip stick tube to bell housing.
39. Release union nut at gearbox sump and remove filler/dipstick tube. Fit blanking plugs.
40. Support engine using a wooden block with a suitable ramp jack.
41. Remove nut securing kick down cable bracket to bell housing.
42. Remove two bolts securing top of bell housing to flywheel housing.
43. Remove nuts securing bell housing to flywheel housing and withdraw transmission assembly from engine.
44. Fit a suitable torque converter retaining strap to the bell housing.
45. Remove hoist and transmission from under vehicle.
46. Fit lifting eyes to transmission.
47. Using suitable chains and lifting tackle take weight of transmission assembly.
48. Remove bolts securing transmission cradle to transfer box and withdraw hoist complete with cradle.
49. Refit bolts to cover plate.

**Accessories removal/fitting**

If fitting a replacement transmission assembly to the vehicle, remove the following items from the existing assembly and fit to the replacement.

50. Breather pipe union and washers from main gearbox.
51. Breather pipe, union and washers from transfer gearbox.
52. Main gearbox selector lever.
53. Hand brake linkage.
54. RH mounting bracket assembly.
55. Oil cooler pipe unions.
56. Fit blanks to all apertures where unions have been removed and blank off pipe ends.

**Refit**

57. Fit transmission to cradle and hoist.
58. Locate hoist under vehicle and remove torque convertor retaining strap.
59. Ensure low range gear is engaged.
60. Apply approved sealant to bell housing face.
61. Carefully raise assembly, align bell housing with flywheel housing and bring mating faces together.
62. Fit nuts and bolts to secure transmission to engine.
63. Locate electrical wiring and breather pipes to position.
64. Secure kick down cable clip to bell housing.
65. Raise hoist sufficiently to take weight.
66. Remove block and jack from engine sump.
67. Fit filler/dipstick tube to gearbox sump and secure bracket to bell housing.
68. Apply Loctite to torque convertor bolts
69. Working through starter aperture refit the four torque convertor to flexible drive securing bolts, rotating crankshaft to gain access to bolt locations.
70. Refit starter and heatshield.
71. Secure breather pipes and harness with ties.
72. Fit left hand mounting bracket assembly to gearbox.
73. Raise transmission and support with a suitable ramp jack.
74. Remove two bolts securing transmission to cradle, lower hoist and remove from under vehicle.
75. Apply Loctite to above bolts and fit to transfer gearbox input bearing support plate.
76. Fit chassis cross member.
77. Secure gearbox mounting brackets to chassis cross member.
78. Remove ramp jack.
79. Connect electrical leads to differential lock switch.
80. Connect hand brake linkage at side of transfer gearbox.
81. Connect inhibitor switch multi-plug.
82. Connect selector cable to lever on side of gearbox.
83. Connect oil cooler pipes to gearbox and secure retaining bracket to gearbox sump.
84. Secure silencer to chassis and refit exhaust front pipe.
85. Refit front propeller shaft to transfer gearbox.
86. Refit rear propeller shaft. (New style coupling at rear differential)
87. Connect speedometer cable to transfer gearbox.
88. Refill transfer gearbox with correct grade of lubricating oil, see Section 09.
89. Lower ramp to ground level.
90. Reconnect turbo-charger hose to inter-cooler.
91. Reconnect top hose to radiator.
92. Refill cooling system with correct mixture of coolant, see Section 09.
93. Reconnect kick down cable to fuel injection pump.
94. Secure breather pipe clip to rear of cylinder head.
95. Engage harness with clips along top of bulkhead.
96. On left hand drive vehicles only, connect multi-plug to top of brake fluid reservoir.
97. Refit insulation pad to rocker cover and inlet manifold, secure with oil filler cap.
98. Refit gaiter and knob to transfer gear lever.
99. Select high range gear.
100. Reconnect battery terminals.
101. Refill main gearbox with correct grade of lubricating oil, see Section 09.