

LT230 TRANSFER BOX

The following operations can be carried out with the gearbox in the vehicle. For ease of working, the vehicle should be raised on a suitable hoist or placed over a pit.

SPEEDOMETER DRIVE PINION

Remove and refit

Removing

1. Disconnect the battery.
2. Raise the vehicle on a suitable hoist.
3. Remove the speedometer drive clamp and nut and withdraw the cable.
4. Pry out the drive pinion assembly.

Refitting

5. Push in a new assembly and fit the speedometer cable and secure with the clamp and nut.

REAR OUTPUT SHAFT OIL SEAL

Service tool:

18G1422-Mainshaft rear oil seal replacer

Remove and refit

Removing

1. Disconnect the battery.
2. Raise the vehicle on a suitable hoist.
3. Disconnect the rear drive shaft from the output flange and tie to one side of the chassis.
4. Remove the brake drum retaining screws and withdraw the drum.
5. Remove the four back plate bolts that also retain the oil catcher and remove the brake back plate and catcher.

NOTE: An hexagonal type socket should be used for these bolts.

6. Remove the output shaft nut, steel washer, felt washer and withdraw the flange.
7. Using the slot provided, lever off the dust cover.
8. Pry out the output shaft oil seal(s).

Refitting

9. Pre-grease between the seal lips. Insert the double lipped oil seal, open side inwards, using service tool 18G1422 until contact is made with the bearing circlip. Take care not to touch the seal lips while fitting.
10. Fit the dust cover.
11. Lubricate the surface of the flange which runs in the seal and carefully fit the flange.

NOTE: To replace the flange bolts first remove the circlip before fitting the flange.

12. Secure the flange with the nut and washer and tighten to the specified torque (see section 06-Torque values).
13. Fit the back plate to the output housing using the 4 bolts and plain washers.

NOTE: The two lower fixings also hold the oil catcher which before fitting is coated with a silicone rubber sealant on the mating face.

14. Fit the brake drum and retain with the two screws.
15. Reconnect the drive shaft and tighten to the specified torque (see section 06-Torque values).

FRONT OUTPUT SHAFT OIL SEAL

Service tool:

18G1422-mainshaft rear oil seal replacer

Remove, refit and adjust

Removing

1. Disconnect the battery.
2. Raise the vehicle on a suitable hoist.
3. Disconnect the front drive shaft from the flange and tie to one side of the chassis.
4. Remove the output shaft nut, steel washer, felt washer and withdraw the flange.
5. Remove the oil seal shield.
6. Pry out the oil seal(s).

Refitting

7. Pre-grease between the seal lips. Insert the new double lipped oil seal, open side inwards, using service tool 18G1422 until contact is made with the bearing circlip. Take care not to touch the seal lip while fitting.
8. Lubricate the running surface of the flange and fit it together with the oil seal shield.
9. Secure the flange with the nut and washer and tighten to the specified torque.
10. Refit the drive shaft and tighten to the specified torque (see section 06-Torque values).

TRANSFER BOX NEUTRAL WARNING SWITCH

Remove and refit

Removing

1. Disconnect the battery.
2. Raise the vehicle on a suitable hoist.
3. Disconnect the rear drive shaft from the output flange and tie to one side of the chassis.
4. Remove the brake drum retaining screws and withdraw the drum.
5. Remove the four back plate bolts that also retain the oil catcher and remove the brake back plate and catcher.

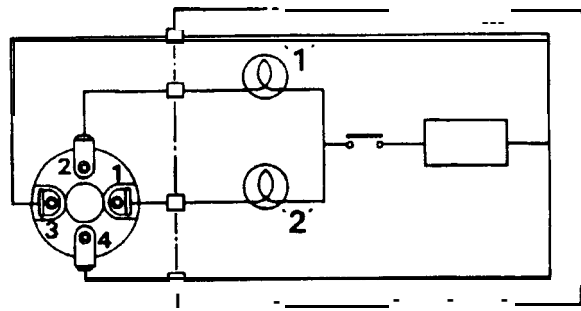
NOTE: An hexagonal type socket should be used for these bolts.

6. Disconnect the four wiring connections to the switch.
7. Loosen the lock nut using a suitable wrench and unscrew the warning light switch.

Refitting and adjusting

NOTE: Adjust switch position ONLY with transfer box neutral selected.

8. Connect suitable test equipment as shown.
9. Refit the switch and screw in until test lamp 1 is extinguished.
10. Screw in switch a further 1/3 to 1/2 turn.
11. Lock switch in position using the locknut.
12. Select 'Low Range' test lamp 1 should illuminate. Select 'High Range' test lamp 2 should illuminate. Select neutral, both test lamps should extinguish.



RR1990E

13. If adjustment is satisfactory, remove the test equipment and reconnect wiring leads correctly and check operation of the audible warning unit.
14. Fit the back plate to the output housing using the 4 bolts and plain washers.

NOTE: The two lower fixings also hold the oil catcher which before fitting is coated with a silicone rubber sealant on the mating face.

15. Fit the brake drum and retain with the two screws.
16. Reconnect the drive shaft and tighten to the specified torque (see section 06-Torque values).

LT230 TRANSFER GEARBOX

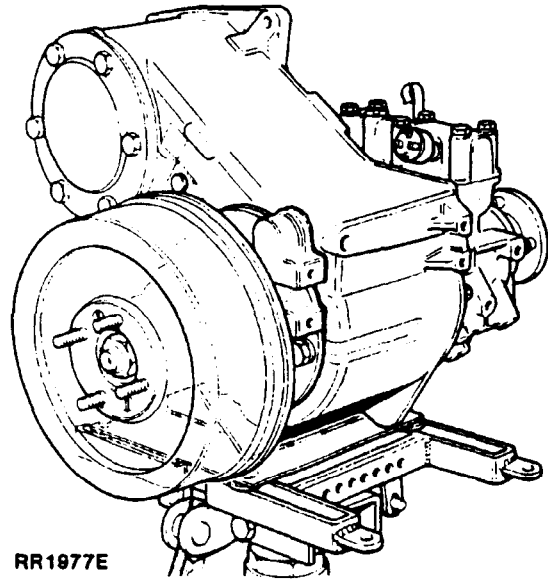
Service tool: 18G 1425 . Guide studs (3) Also, locally manufactured adaptor plate, see below.

Remove and refit

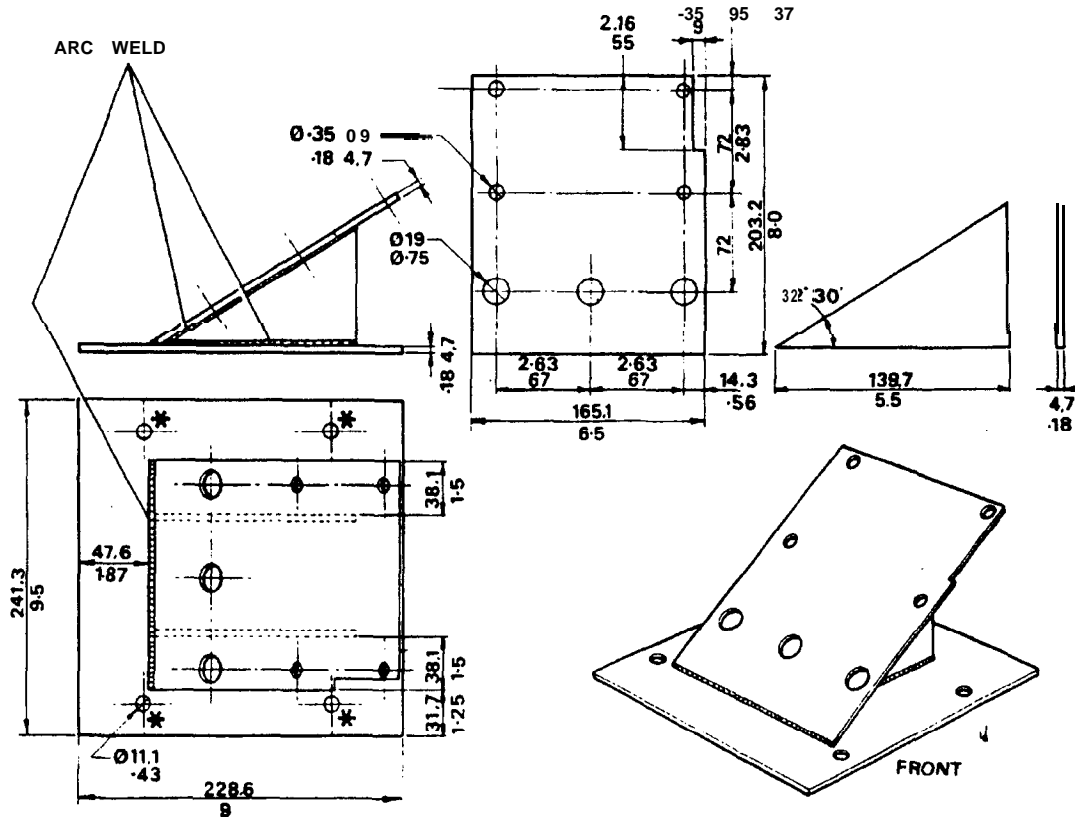
Adaptor plate for removing transfer gearbox

The transfer gearbox should be removed from underneath the vehicle, using a suitable transmission jack. An adaptor plate for locating the transfer gearbox onto the jack can be manufactured locally to the drawing RR2195E.

WARNING: Where the use of a transmission hoist is necessary, it is **ABSOLUTELY ESSENTIAL** to follow the hoist manufacturer's instructions to ensure safe and effective use of the equipment.



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MATERIAL: STEEL PLATE

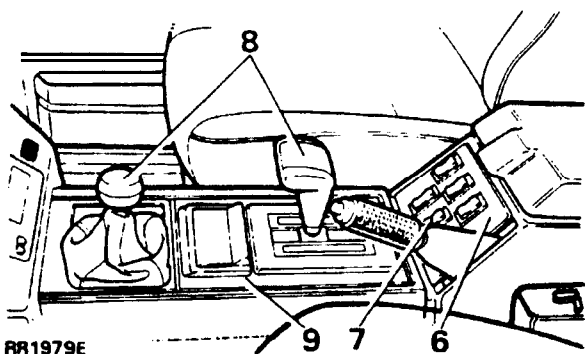
*= TO BE DRILLED TO FIT TRANSMISSION JACK BEING USED

RR2195E

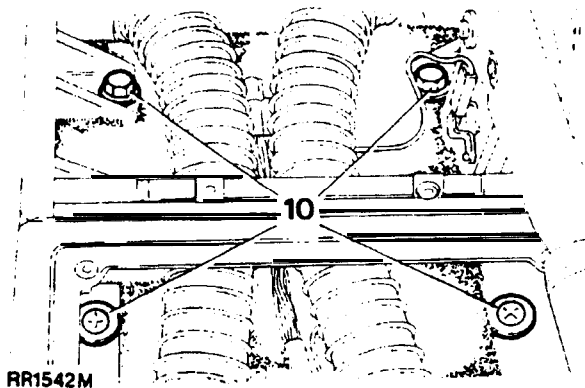
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Removing

1. Install the vehicle on a suitable hoist.
2. Open the hood.
3. Disconnect the battery.
4. Release the airflow meter to plenum chamber hose.
5. Remove the four screws securing the glove box liner to the glove box and lift out the liner.
6. Carefully pry the window lift switch panel away from the front of the glove box.
7. Identify each switch connection for re-assembly, disconnect the plugs and remove the switch panel.
8. Remove the main and transfer gearbox knobs.
9. Carefully pry the centre panel out of the floor mounted console and remove it from the vehicle.



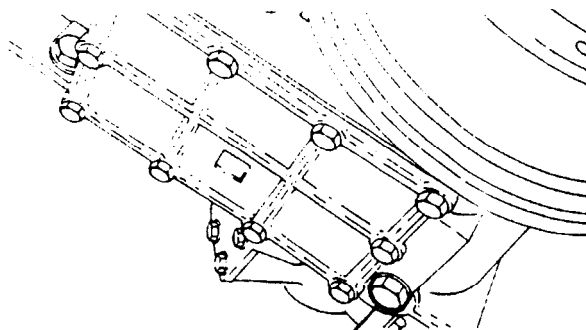
10. Release the two bolts and two screws securing the console assembly to the gearbox tunnel.



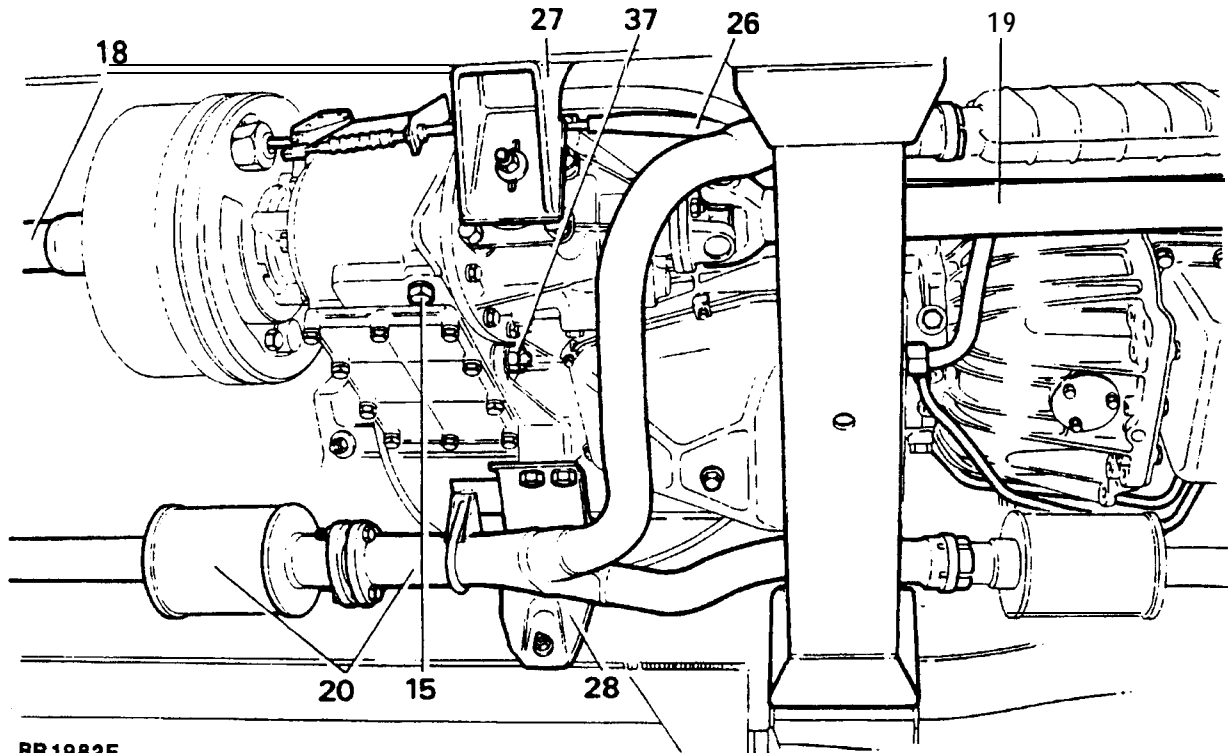
11. Release the parking brake and remove the cotter pin, clevis pin and washer securing the parking brake cable to the parking brake lever.
12. Carefully maneuver the assembly away from the radio housing and remove it from the vehicle.
13. Release the large nut retaining the parking brake outer cable to the top of the gearbox tunnel.
14. Remove the nut and feed the cable through the hole to the underside of the vehicle.

NOTE: The illustration for the following removal instructions is located at the top of the following page.

15. Raise the vehicle on the hoist and drain the transfer gearbox.
16. Release the nut and clamp securing the speedometer cable to the rear of the transfer box.
17. Withdraw the cable from the speedometer drive pinion.



18. Release the four nuts securing the rear drive shaft to the rear output flange and tie to one side of the chassis.
19. Remove the four nuts securing the front drive shaft to the front output flange and tie to one side of the chassis.



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20. Release the bolts securing the intermediate exhaust pipe to the centre catalyst and separate the pipes. Retrieve the doughnut.
21. Remove the clamp at the tailpipe bracket, carefully tie the exhaust to the chassis side member.
22. Manufacture an adaptor plate in accordance with the drawing, to attach to the transmission jack and transfer box to facilitate removal (RR2195E).
23. Place four, 30mm (1.250 in) long spacers between the top of the hoist and the adaptor plate at the securing points and secure the adaptor plate to the hoist.
24. Remove the four central bolts from the transfer box bottom cover, move the jack into position and secure the adaptor plate to the transfer box.
25. Adjust the jack to take the weight of the transfer box.
26. Remove the tie bar from the transfer gearbox.
27. Remove the right-hand side mounting bracket to chassis nuts and bolts.
28. Remove the rear left-hand side mounting bracket to chassis nuts and bolts.
29. Remove right-hand side mounting bracket to flexible mounting rubber retaining nut and place bracket aside.
30. Lower the jack until the rear brake drum clears the rear passenger footwell.
31. Remove the cotter pin and washers securing the differential lock lever to the connecting rod, and disconnect the lever from the rod.
32. Disconnect the electrical leads from the differential lock switch and neutral warning switch.
33. Remove the breather pipe from the top of the transfer gearbox.
34. Select low range transfer box gear position.
35. Release the high/low rod lower lock nut and remove the rod from the yoke.

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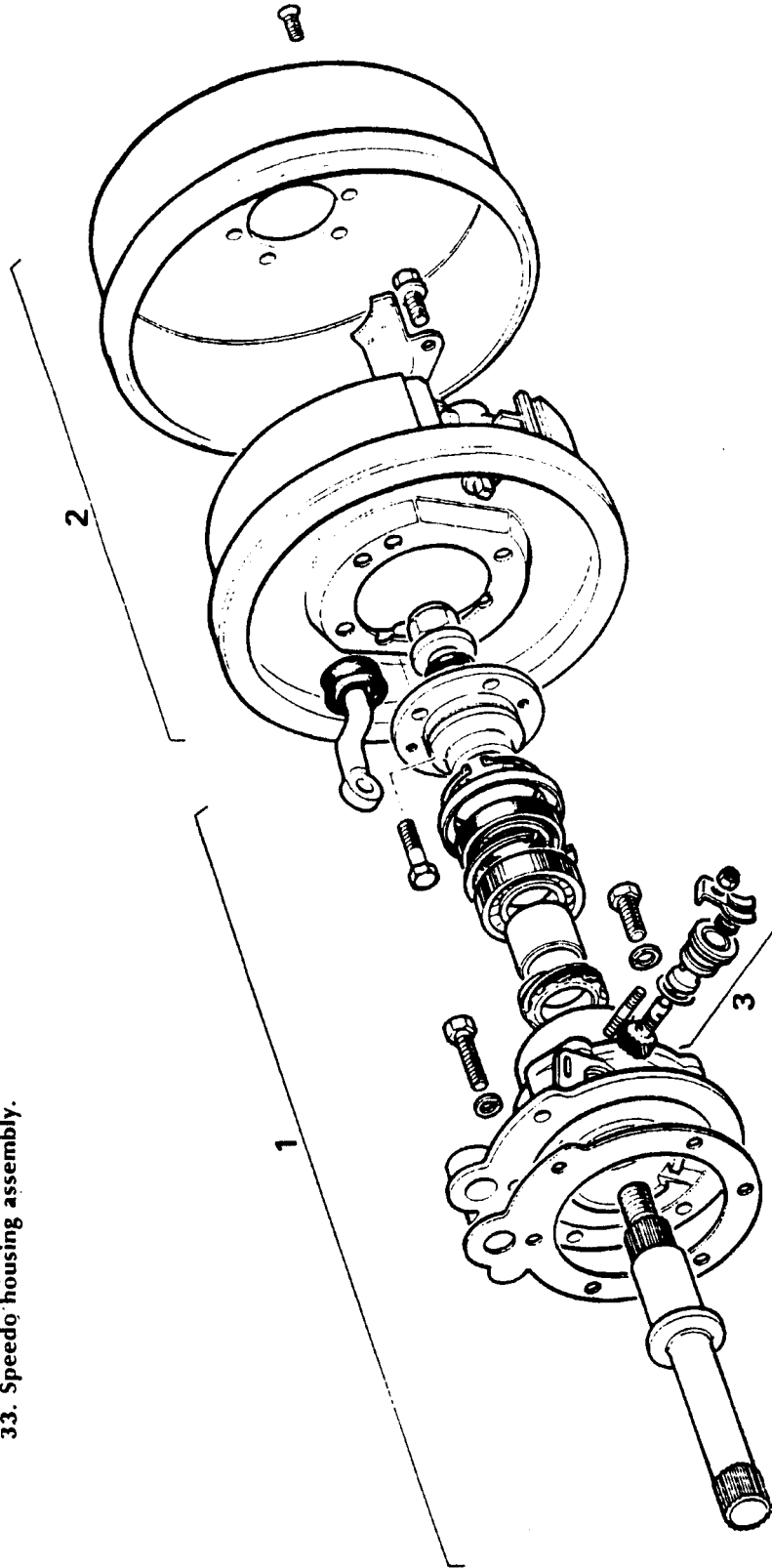
36. Place a suitable wooden block between the main gearbox and chassis cross-member, then lower the jack until the gearbox contacts the wooden block.
37. Remove the upper and lower bolts securing the transfer box to the main gearbox.
38. Fit three guide studs to the main gearbox 18C 1425 and maneuver the transfer gearbox rearwards to detach it from the main gearbox.

Refitting

39. Make sure that the joint faces of the transfer box and main gearbox extension case are clean and that the three guide studs, 18C 1425, are fitted to the extension case.
40. Lubricate the oil seal in the joint face of transfer box, secure the transfer box to the adaptor plate on the lifting hoist and raise the hoist until the transfer box can be located over the guide studs.
41. Remove the guide studs and secure the transfer box to the main gearbox extension case. Tighten the nuts and bolts to the correct torque (see section 06-Torque values).
42. Complete the refitting procedure by reversing the removal sequence, noting the following important points.
43. After removing the lifting hoist and adaptor plate from the transfer box, clean the threads of the four bolts for the transfer box bottom cover, coat them with Loctite 290 and fit them together with spring washers. Tighten to the specified torque.
44. Refill the transfer box with the correct grade oil to the oil level plug hole. (See Section 09).
45. Check, and if necessary top-up the oil level in the main gearbox. Use the correct grade oil. (see section 09).
46. Check the operation of the parking brake and adjust as necessary. (see section 10).

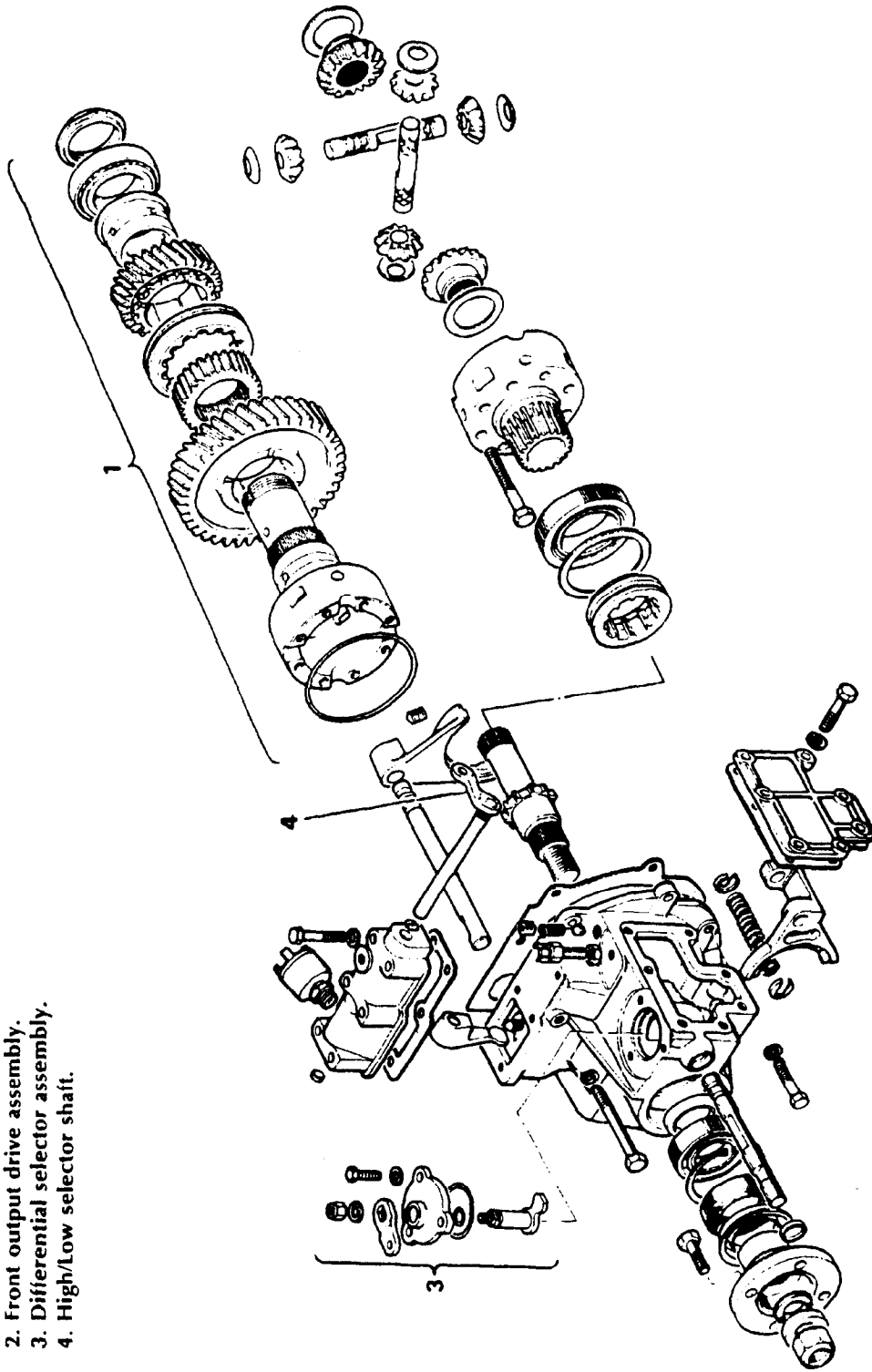


- 1. Rear output drive assembly.
- 2. Transmission brake drum assembly.
- 33. Speedo housing assembly.



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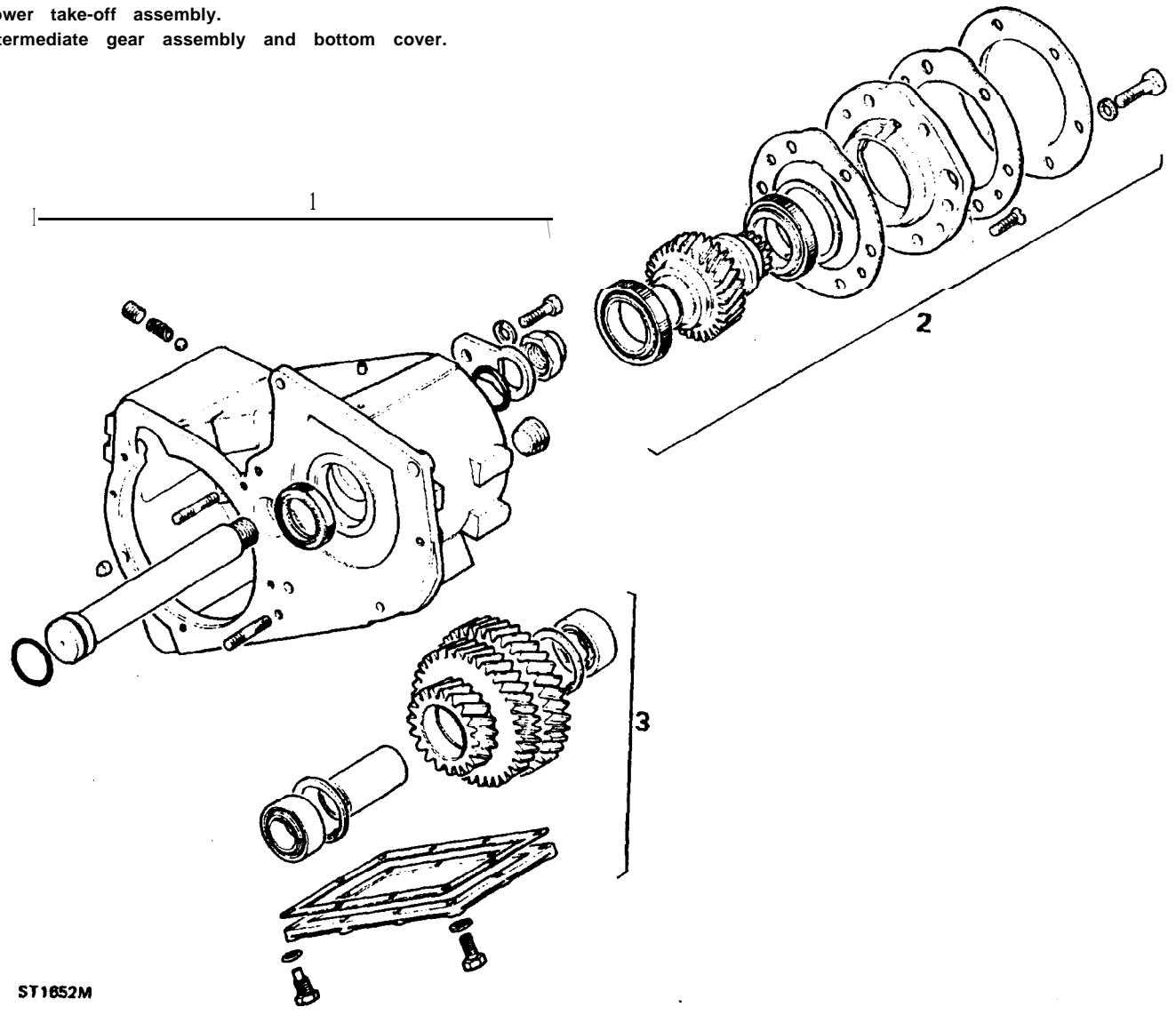
1. Centre differential assembly.
2. Front output drive assembly.
3. Differential selector assembly.
4. High/Low selector shaft.



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RR1983E

1. Transfer box. Case assembly.
2. Power take-off assembly.
3. Intermediate gear assembly and bottom cover.



ST16S2M

LT230 TRANSFER GEARBOX OVERHAUL

Service Tools:

- 18G 47-7 -input gear cluster bearing cones remover/replacer
- 18G 47BB-1 -Adaptor centre differential bearing remover
- 18C 47BB-3 -Adaptor centre differential bearing remover button
- 18G 257 -Circlip pliers
- 18G 1205 -Drive flange wrench
- 18G 1271 -Oil seal remover
- 18G 1422 -Mainshaft rear oil seal replacer

- 18G 1423 -Adaptor/socket centre differential locknut remover/replacer
- 18G 1424 -Centre differential bearing replacer
- MS 47 -Hand press
- MS 550 -Bearing and oil seal replacer handle
- LST 47-1 -Adaptor centre differential bearing remover
- LST 104 -Intermediate gear dummy shaft
- LST 105 -Input gear mandrel
- LST 550-4 -Intermediate gear bearing races replacer

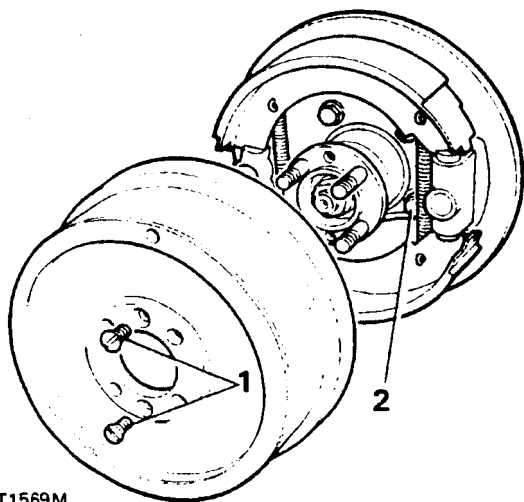
TRANSFER BOX DATA

Front and rear bevel gear pre-load	See text
High range gear end-float	0.05 to 0.15 mm (0.002 to 0.006 in)
Front differential bearing pre-load	0.56 to 1.69 Nm (S-15 in lb)
Input Rear bearing pre-load	0.56 to 2.25 Nm (S-20 in lb)
Intermediate shaft bearing pre-load	0.56 to 1.69 Nm (S-15 in lb)

Parking brake removal

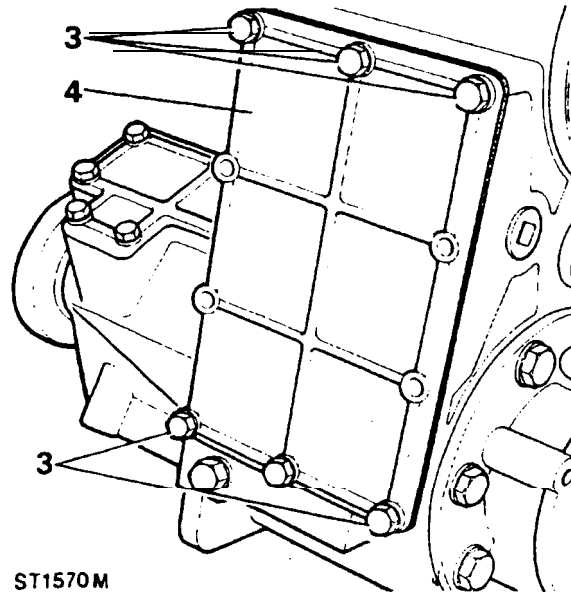
1. Remove two countersunk screws and withdraw brake drum.
2. Remove four bolts securing the brake back-plate; the two bottom fixings retain the oil catcher.

NOTE: An hexagonal type socket should be used for these bolts.



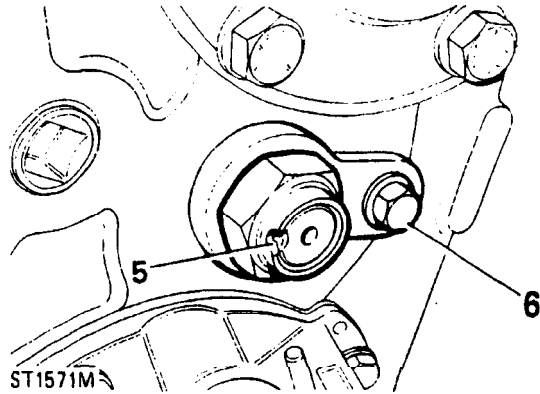
Bottom cover removal

3. Remove the six bolts and washers retaining the bottom cover.
4. Remove the bottom cover and gasket, discard the gasket.

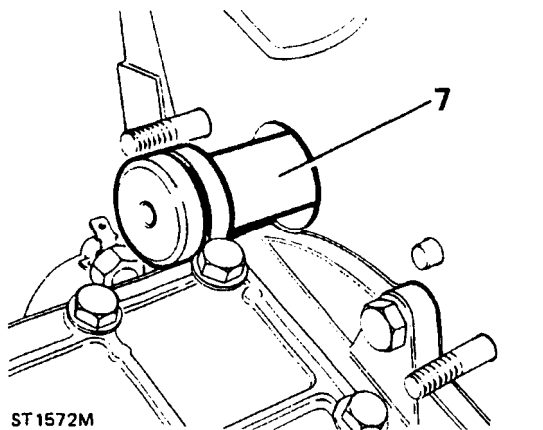


intermediate shaft and gear cluster removal

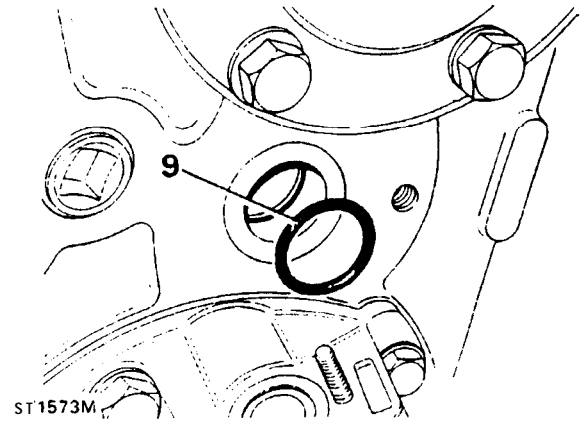
5. Release stake nut from recess in intermediate shaft, remove stake nut and discard.
6. Unscrew the single bolt and remove anti-rotation plate at the rear face of the transfer box.



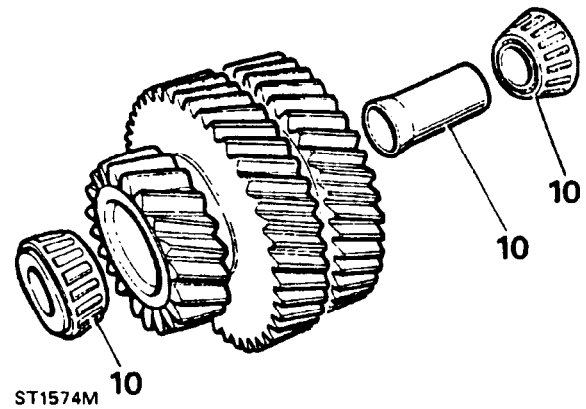
7. Tap the intermediate gear shaft from the transfer box.



8. Lift out the intermediate gear cluster and bearing assembly.
9. Remove the 'O' rings from the intermediate gear shaft and from inside the transfer box and discard.

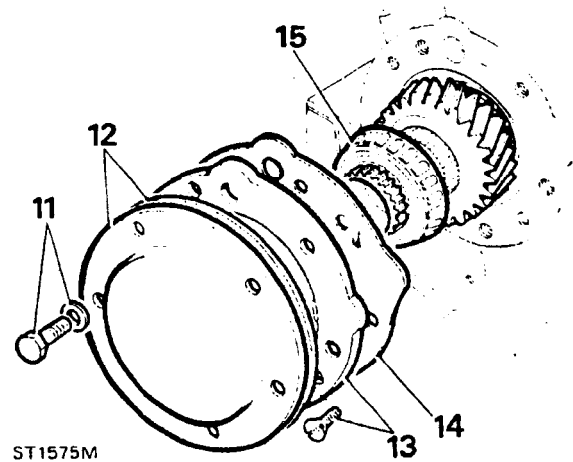


10. Remove the taper roller bearings and bearing spacer from the intermediate gear cluster assembly.



Power take-off cover removal

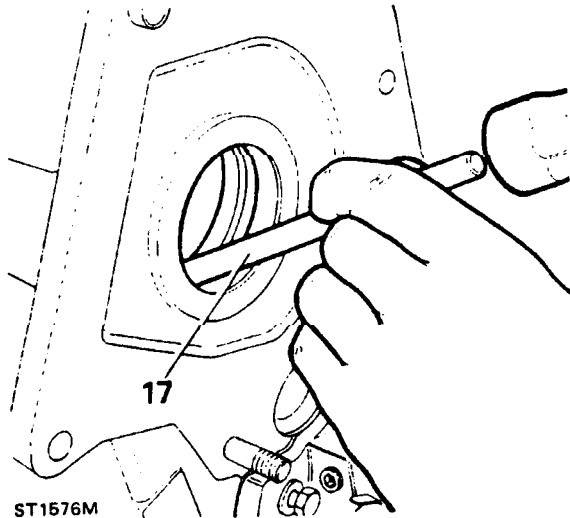
11. Remove five bolts and washers retaining the take-off cover
12. Remove the cover and gasket, discard the gasket.



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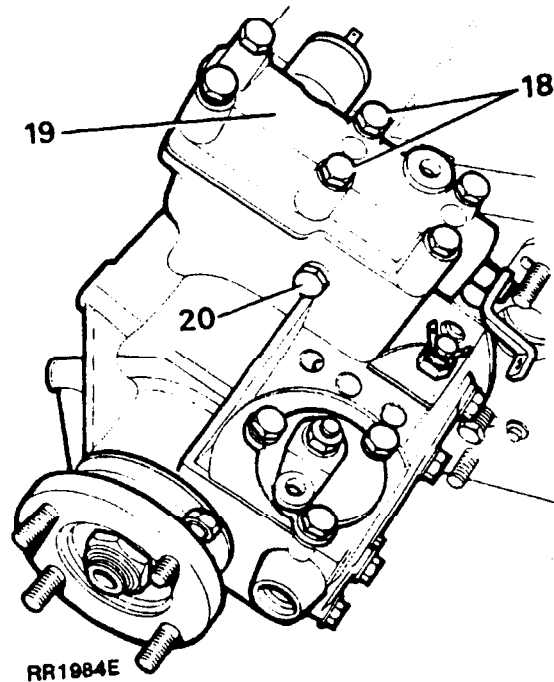
input gear removal

13. Remove the two countersunk screws and detach the main shaft bearing housing.
14. Remove the gasket and discard.
15. Withdraw the input gear assembly.
16. Pry out and discard the oil seal at the front of the transfer box casing using service tool 18C 1271.
17. Drive out the input gear front bearing track.



High/low cross-shaft housing removal

18. Remove the six bolts and washers retaining the cross-shaft housing, ground lead and retaining clip.
19. Remove the cross-shaft housing and gasket, discard the gasket.

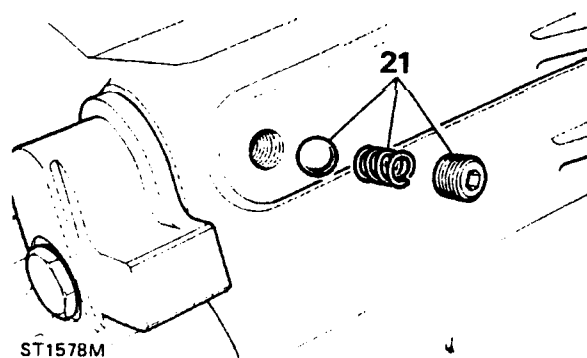


Front output housing removal

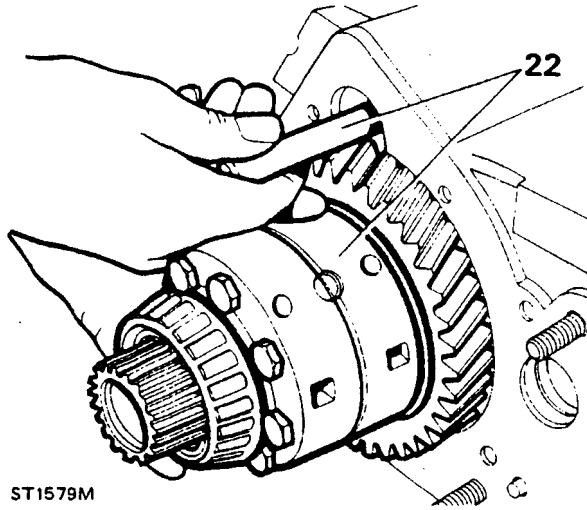
20. Remove the eight bolts and washers and detach the output housing from the transfer box casing, taking care not to mislay the dowel. Remove the gasket and discard.

Centre differential removal

21. Remove high/low selector shaft detent plug, spring and retrieve the ball with a suitable magnet.



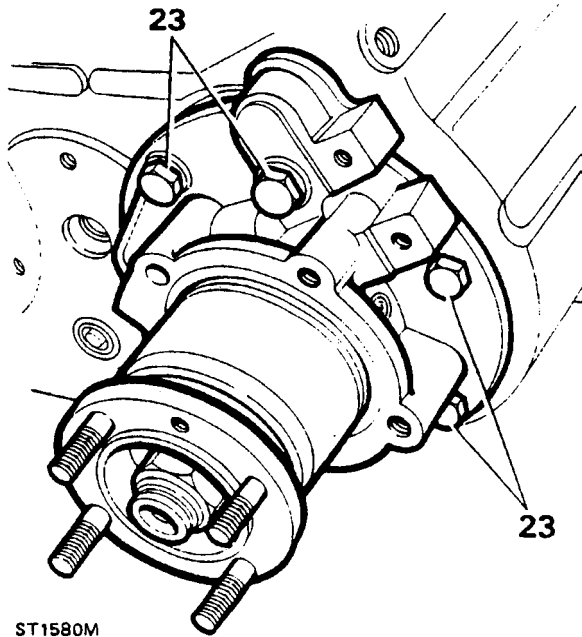
22. Withdraw the centre differential and selector shaft/fork assembly.



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Rear output housing removal

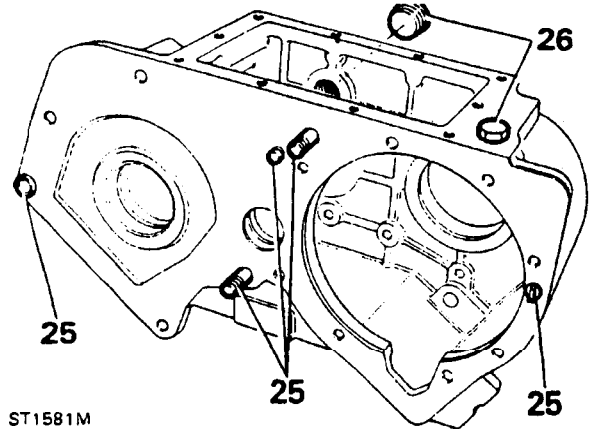
23. Remove six bolts and washers and detach the rear output housing and shaft assembly from the transfer casing.
24. Remove the gasket and discard.



ST1580M

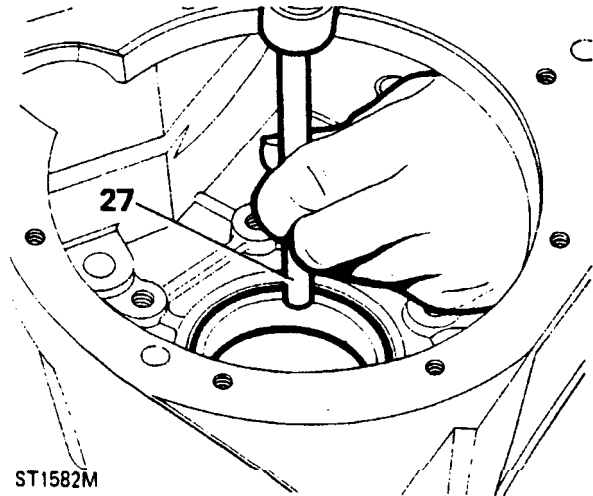
Transfer case overhaul - dismantling

25. Inspect the studs and dowels for wear or damage. Remove if replacements are required.
26. Remove the magnetic drain plug, copper washer and filler/level plug. Discard the washer.



ST1581M

27. Drive out differential rear bearing track.
28. Clean all areas of the transfer casing ensuring all traces of 'Loctite' are removed from faces and threads.



ST1582M

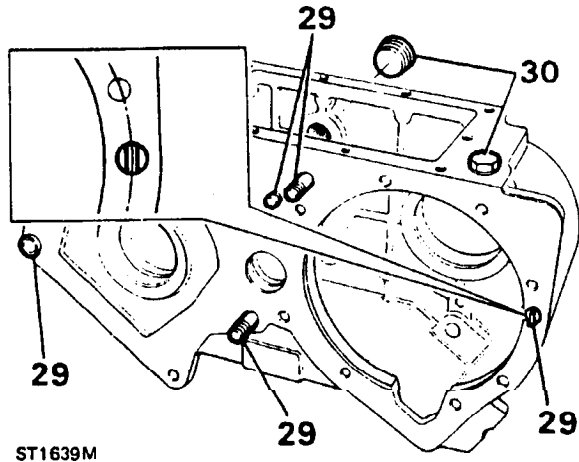
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Transfer case overhaul • re-assembling

29. If previously removed, fit studs and dowels to front face of the transfer casing. Use new components where necessary.

NOTE: The position of the radial dowel blade is set in line with the circle which is formed by the front output housing fixing holes.

30. Refit magnetic drain plug with new copper washer and tighten to the specified torque, loosely fit the filler/level plug.

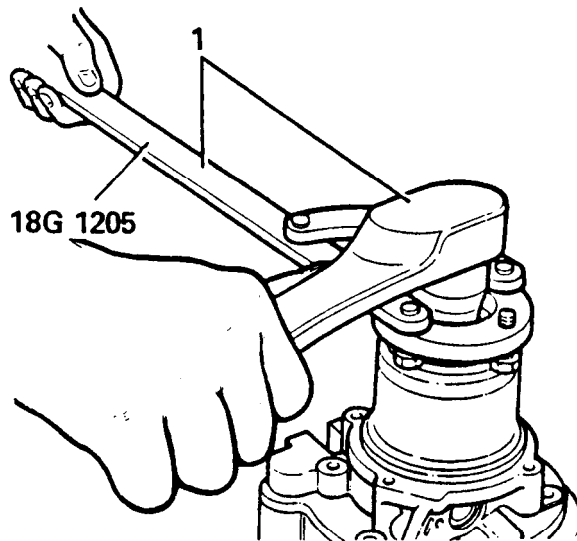


ST1639M

Rear output housing overhaul-dismantling

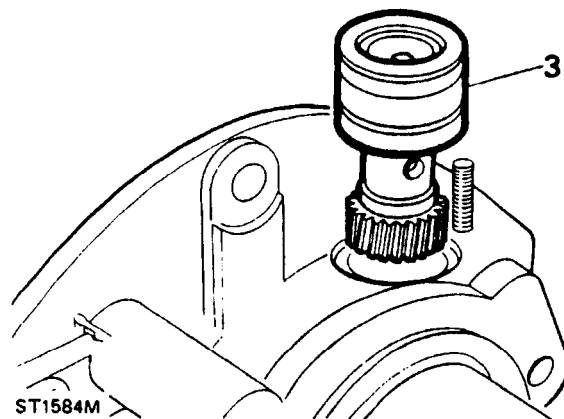
1. Using flange wrench 18G1205 and socket wrench remove the flange nut, steel and felt washers, Ensure flange bolts are fully engaged in the wrench.
2. Remove output flange with circlip attached. If necessary, use a two-legged puller.

NOTE: The circlip need only be released if the flange bolts are to be replaced.



ST1583M

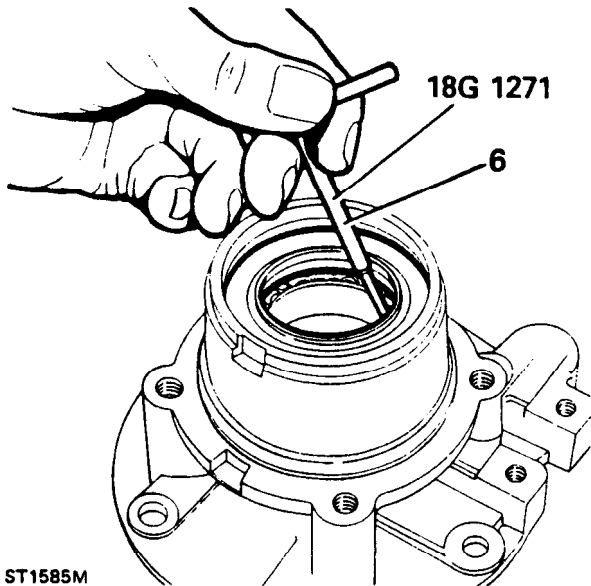
3. Remove speedo-drive housing. This can be eased out with a screwdriver.



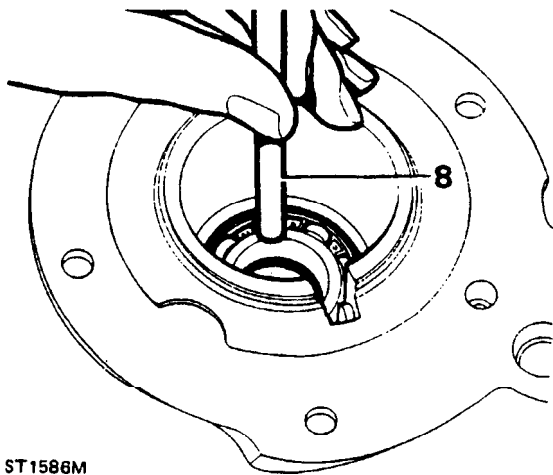
ST1584M

4. Remove housing from the vice and drive out the output shaft, by striking the flange end of the shaft.
5. Carefully pry off the oil catch ring using a screwdriver in the slot provided.

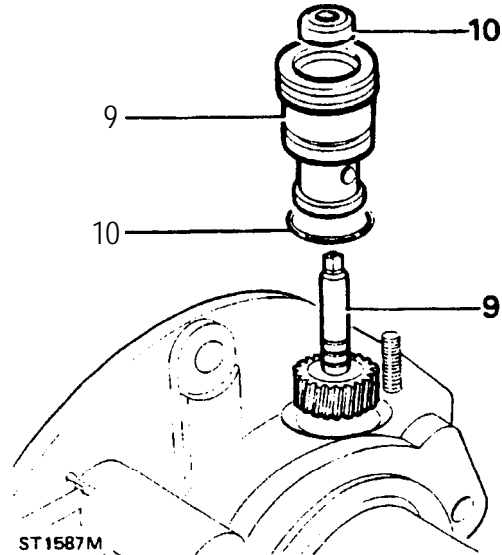
6. Pry out and discard the seal from the output housing using tool 18G1271.



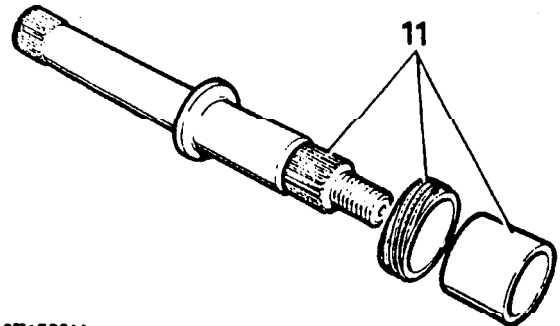
7. Using circlip pliers 18G257, remove the circlip retaining the bearing.
8. Drive the bearing from the rear of the housing.



9. Remove speedometer gear (driven) from its housing.
10. Remove the 'O' ring and oil seal and discard.



11. Slide off spacer and speedometer drive gear from output shaft.
12. Clean all parts, replace the 'O' ring, oil seals, felt seal and flange nut. Examine all other parts for wear or damage and replace, if necessary.

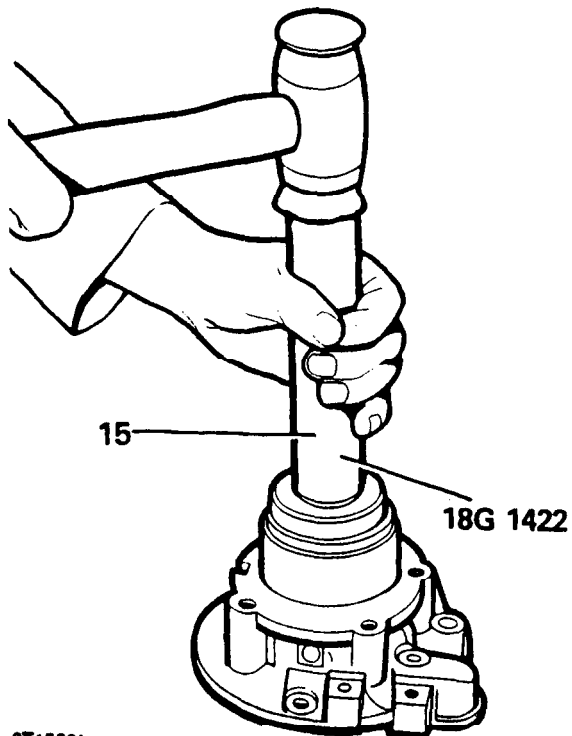


Re-assembling

13. Press output bearing into the housing. Do not use excessive force. To facilitate fitting the bearing, heat the output housing case. This is not to exceed 100°C (212°F).
14. Retain bearing with circlip, using circlip pliers 18G257.

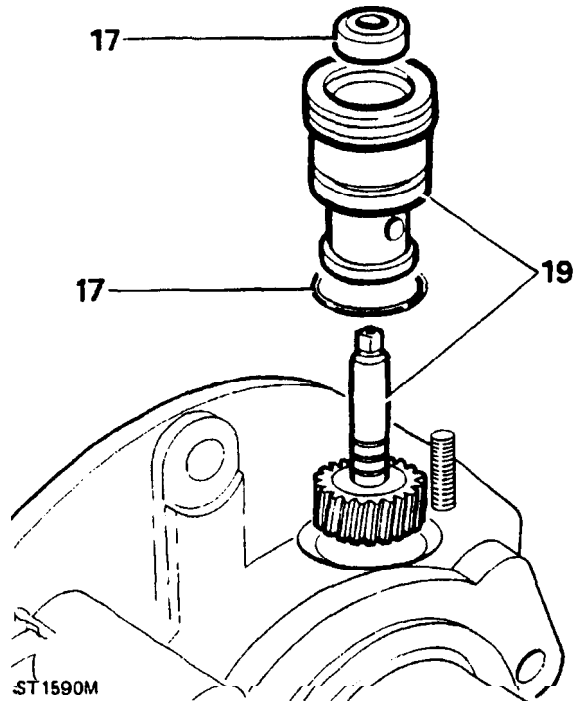
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15. Pre-grease between the seal lips and fit new seal (open side inwards) using tool 18G1422. The seal should just make contact with the bearing circlip.



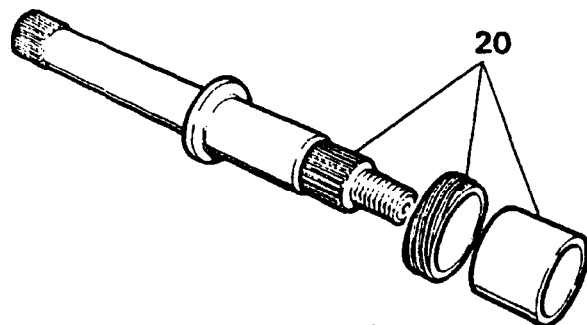
ST1589M

16. Carefully coat the lips of the seal with clean grease and refit oil catch ring onto output housing.
17. Fit the 'O' ring and oil seal (open side inwards) to speedometer housing.
18. Lubricate the 'O' ring and seal with oil.
19. Locate speedometer gear (driven) in housing and press into position.



ST1590M

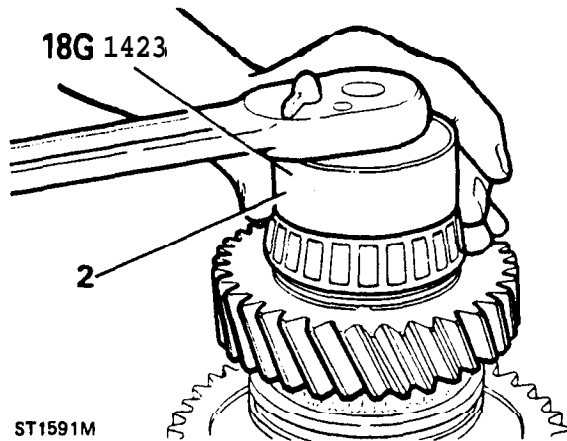
20. Slide drive gear and spacer on to the output shaft.
21. Locate output shaft into the bearing in the housing and drive into position.
22. Locate speedometer gear (driven) housing assembly into the output housing and press in until flush with the housing face.



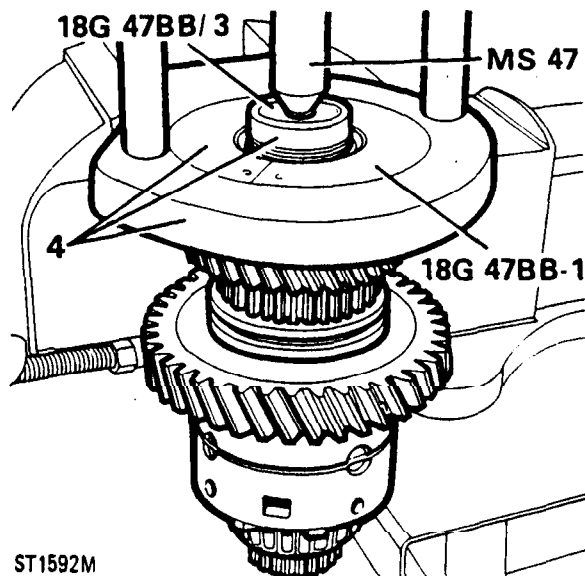
ST1640M

Centre differential unit overhaul -dismantling

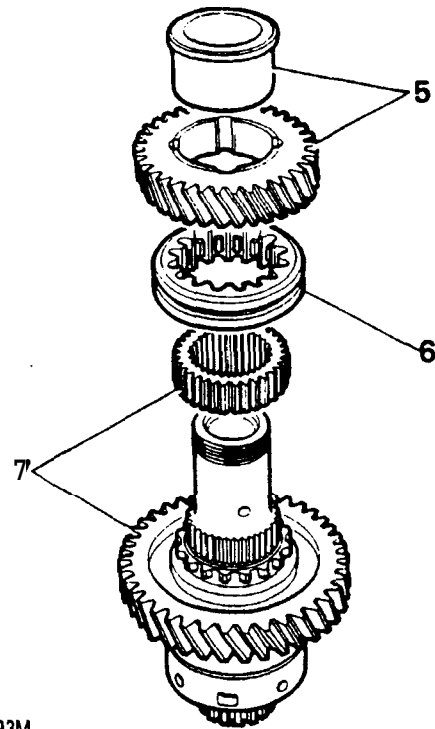
1. Secure centre differential unit to a vice fitted with soft jaws, and release stake nut from recess.
2. Remove stake nut using tool 18G1423 and suitable socket wrench and discard stake nut.
3. Remove the differential unit from the vice.



4. Secure hand press MS47 in vice with collars 18G47BB-1 and using button 18G47BB/3 remove the rear taper bearing and collars.

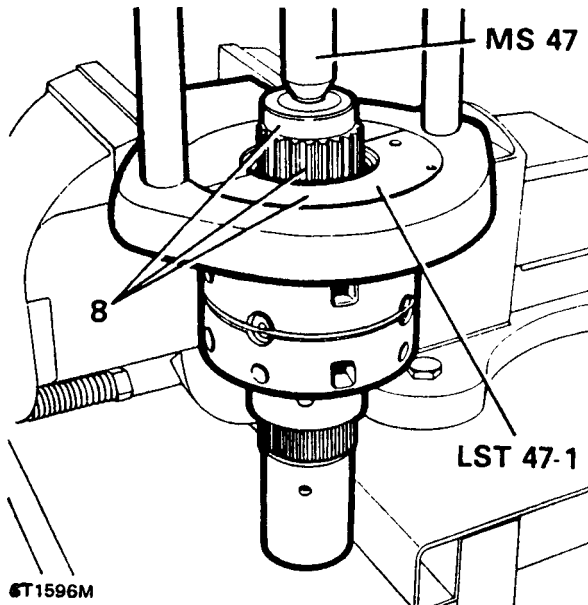


5. Remove the high range gear and bush, taking care not to disturb the high/low sleeve.
6. Mark the relationship of the high/low sleeve to the hub and then remove the sleeve.
7. Using a suitable press behind the **low range** gear carefully remove the high/low hub and low range gear.

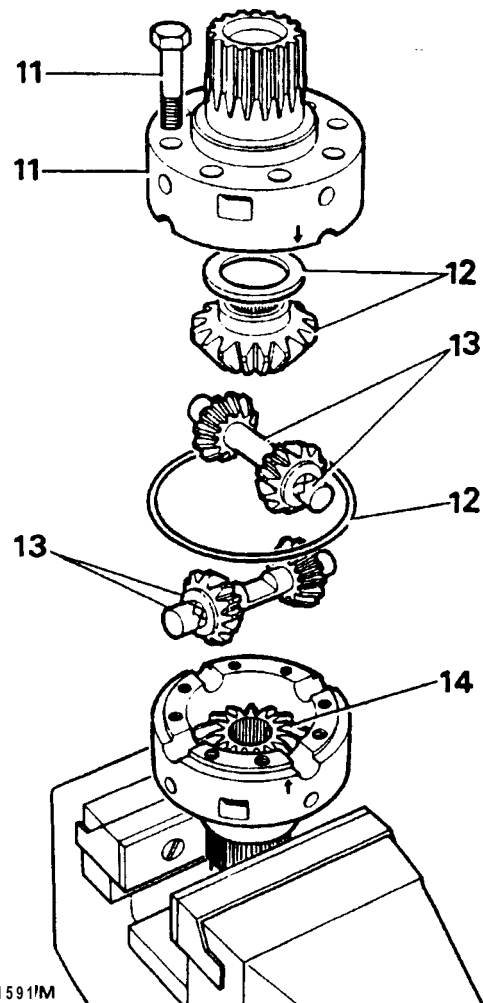


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8. Substituting collar LST47-1 remove front taper roller bearing.
9. Remove hand press from the vice.
10. Using soft jaws secure the differential unit in the vice by gripping the hub splines.

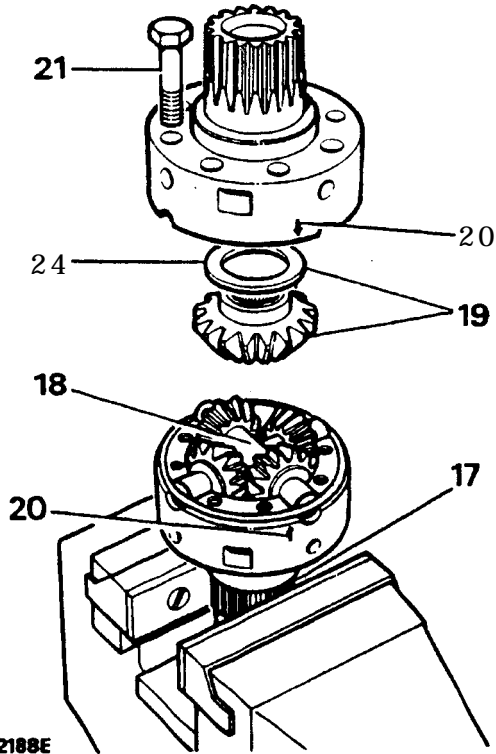


11. Remove the eight retaining bolts and lift off the front part of the differential unit.
12. Release the retaining ring and remove front upper bevel gear and thrust washer.
13. Remove the pinion gears and dished washers along with the cross shafts.
14. Remove the rear lower bevel gear and thrust washer from the rear part of the differential unit.
15. Remove the rear differential unit from the vice and clean all components.



16. Inspect all components for damage or wear, fit new components if necessary.
17. Using soft jaws secure the rear (longest half) of the differential unit in the vice by gripping the hub splines.
18. Lubricate and install the cross shafts and pinion gears with new dished washers. **DO NOT** fit the rear bevel gear at this stage.

19. Lubricate and fit the front bevel gear and thinnest thrust washer (FRC6956 1.05 mm).
20. Fit front half of the differential casing ensuring that the two engraved arrows are aligned.
21. Fit securing bolts and tighten to the correct torque (see section 06 - Torque values).
22. Lubricate and insert the rear output shaft into the bevel gear and check that the gears are free to rotate.



RR2188E

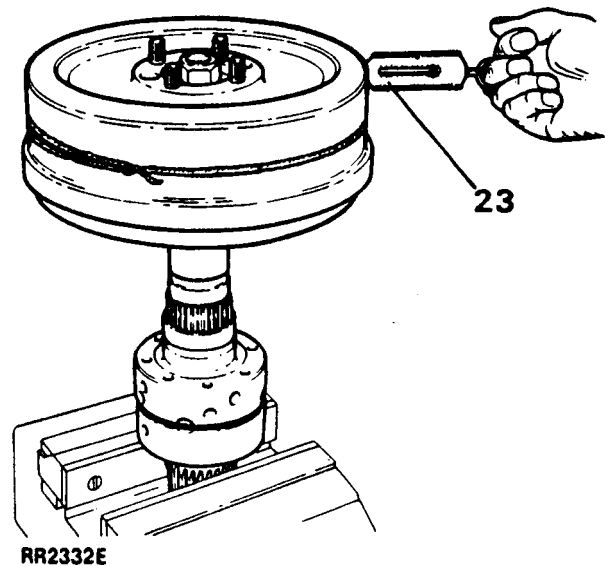
23. Fit the parkbrake drum to the output drive flange and check the torque required to rotate the gears. Tie a length of string around the brake drum, attach a spring balance to the string and carefully tension the string until a load to turn is obtained. Alternatively use a torque wrench applied to the brake drum flange nut. Rotate the drum slowly by hand to overcome initial load when using either method. Note that illustration RR2332E shows checking torque at rear bevel gear.

NOTE: Gears that have been run will rotate smoothly and will require a torque of 0.56 Nm (5 in lb). Equivalent force using spring balance: 0.45 kg (1 lb).

New gears will rotate with a notchy feel and will require a torque of not more than 2.26 Nm (20 in lb). Equivalent force using spring balance: 1.72 kg (3.8 lb).

Keep all components well lubricated when carrying out these adjustments.

24. Change the thrust washer for a thicker one if the torque reading is too low. Five thrust washers are available in 0.10 mm steps ranging from 1.05 mm to 1.45 mm.
25. Dismantle the unit when the front bevel gear thrust washer is selected.
26. Remove and retain the front bevel and thrust washer combination.
27. Reassemble the unit with the rear bevel gear and thinnest thrust washer in position.
28. Using soft jaws secure the front (shortest half) of the differential unit in the vice by gripping the hub splines.
29. Repeat the above procedure to obtain the correct thrust washer for the rear bevel gear.

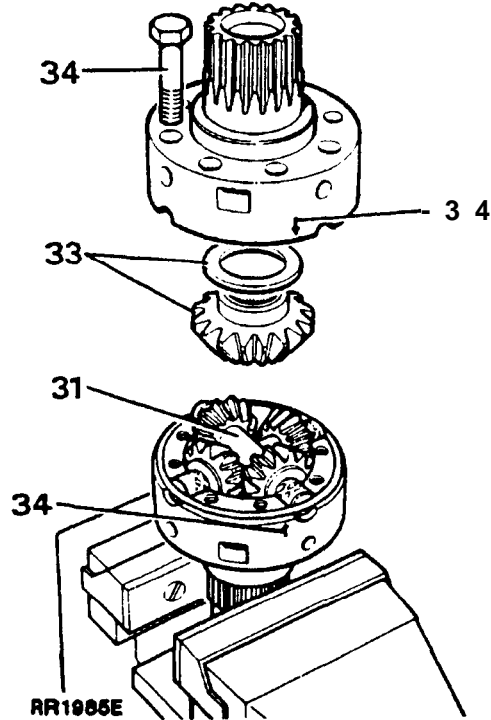


RR2332E

Continued ↓

Re-assembling

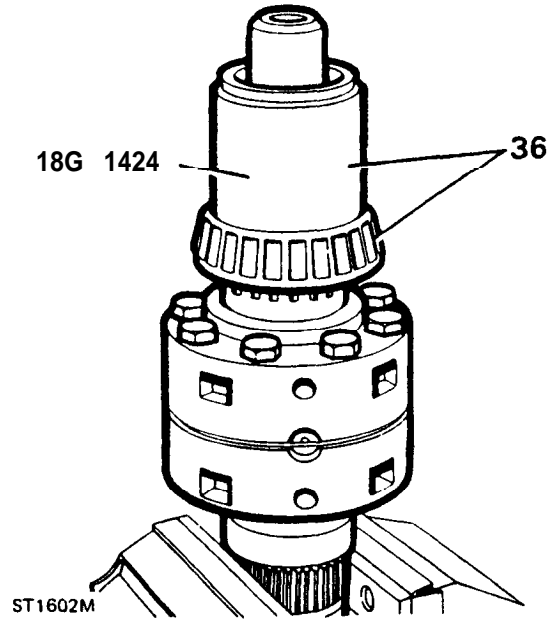
- 30. Fit the selected thrust washer and bevel gear into the rear differential unit.



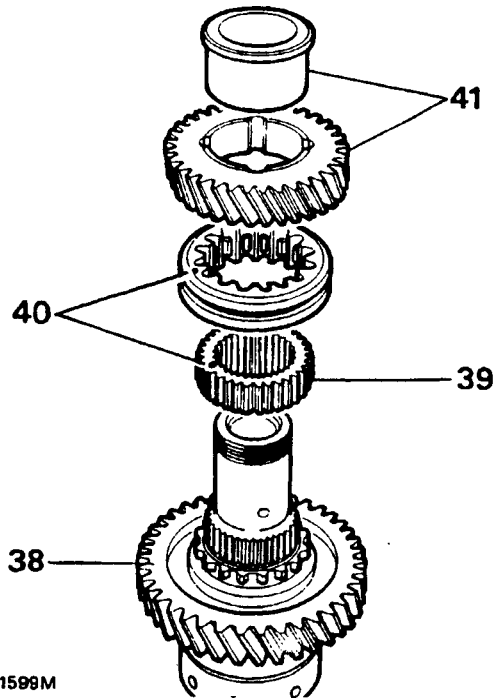
- 31. Assemble both pinion assemblies and dished washers on to their respective shafts and fit the rear differential unit. Secure the assemblies with the retaining ring.
- 32. Lubricate all the components.
- 33. Fit the selected thrust washer and bevel gear into the front upper differential unit.
- 34. Align both units as previously described and secure with the eight bolts to the specified torque (see Section 06 - Torque values).
- 35. Check the overall torque required to turn the differential. This should be approximately equal to the resistance of both bevel gears added together.
- 36. Locate the front differential bearing onto the front, upper differential shaft and press into position using larger end of tool 18G1424 as shown.

- 37. Invert the differential unit and secure in the vice.

NOTE: During the following sequences all parts should be lubricated as they are fitted.

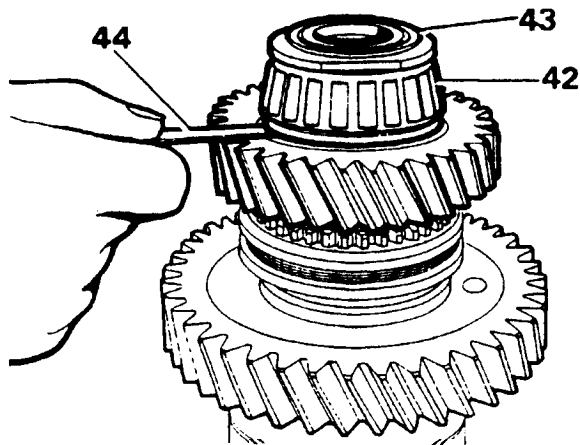


- 38. Fit the low range gear, with its **dog** teeth away from the differential assembly.
- 39. Press the high/low hub on to the differential splines.
- 40. Slide the high/low selector sleeve on to the high/low hub ensuring that the alignment marks are opposite each other.
- 41. Fit the bush into the high range gear so that the flange is fitted on the opposite side of the gear to the dog teeth. Slide the bushed gear on to the differential assembly with the dog teeth down.



ST1598M

- 42. Locate the rear differential bearing on to the hub and press it into position using the smaller end of tool 18G1424.
- 43. Fit the stake nut and tighten to the specified torque using tool 18G1423 (see section 06-Torque values).
- 44. Check the end float of the high and low range gears 0.05 to 0.15 mm (0.002 to 0.006 in).

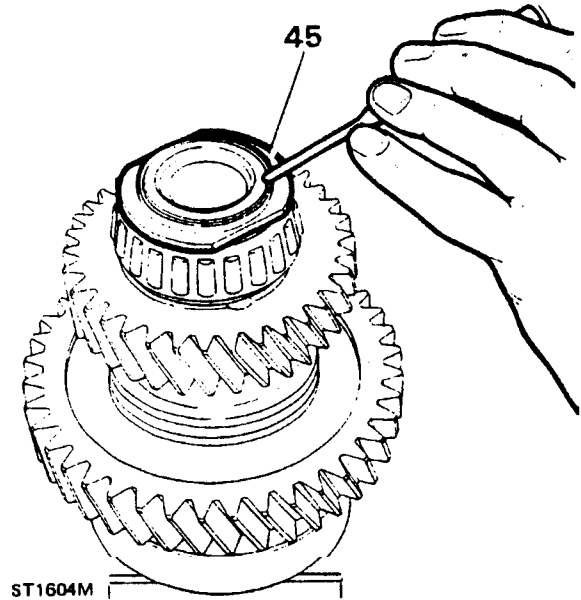


ST1603M

NOTE: If the clearances vary from those specified in the data, at the beginning of the overhaul: the assembly must be rebuilt using the relevant new parts.

- 45. Peen the stake nut collar by carefully forming the collar of the nut into the slot as illustrated.

CAUTION: A round nose tool must be used for this operation to avoid splitting the collar of the nut.

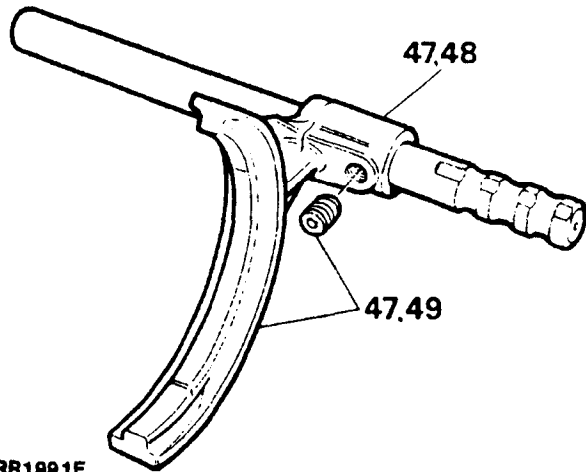


ST1604M

- 46. Clean and check high/low selector fork assembly for wear and replace if necessary.

Continued

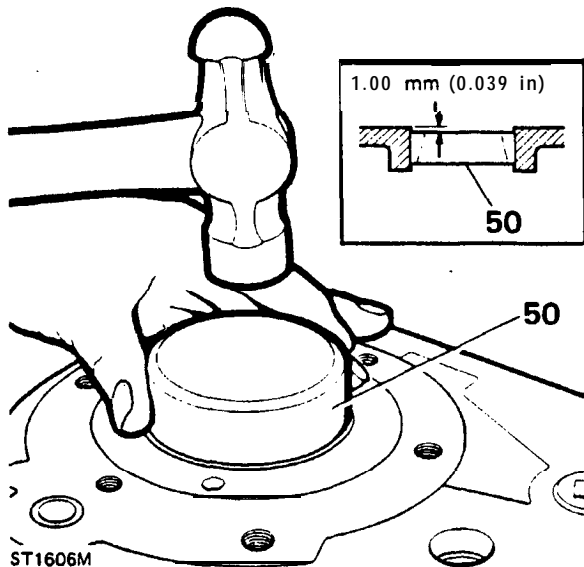
47. To replace the selector fork remove the set screw and slide the fork from the shaft.
48. Fit the new selector fork with its boss towards the three detent grooves. Align the tapped hole in the fork boss with the indent in the shaft nearest to the detent grooves.
49. **Apply** Loctite 290 to the set screw threads and fit the set screw and tighten to the specified torque (see section **06-Torque** values).



RR1991E

Centre differential rear bearing track

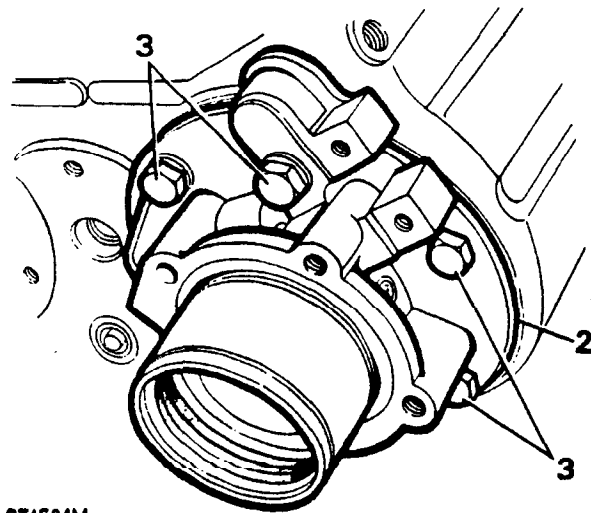
50. Fit the differential rear bearing track 1.00 mm (0.039 in) below the outer face of casing using a suitable tool as shown.



ST1606M

Rear output housing-refit

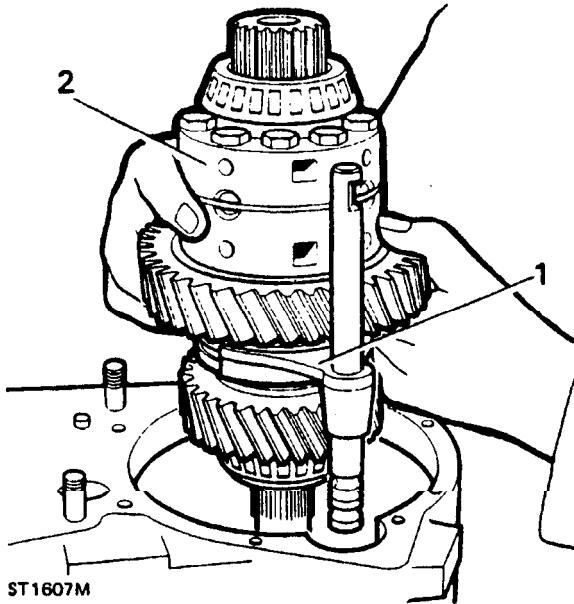
1. Grease output housing gasket and position on to the rear face of the transfer box casing.
2. Fit output housing and ensure clearance of 1.00 mm (0.039 in) between housing face and gasket.
3. Fit the six output housing bolts with Loctite 290 on the threads, with washers and tighten evenly to the specified torque, which will pull the rear bearing into position (see section **06-Torque** values).



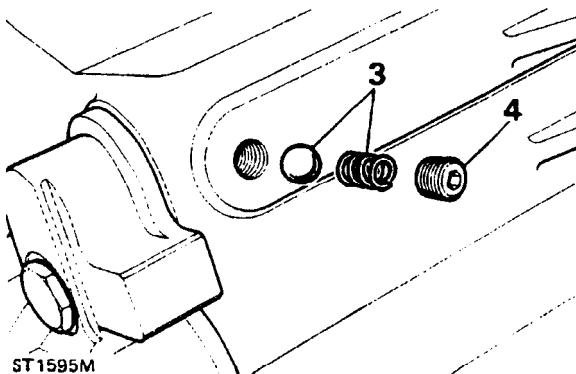
ST1694M

Centre differential unit refit

1. Fit the selector fork/shaft assembly to the high/low selector sleeve on the differential assembly, with detent groove to the rear of the differential assembly.
2. Locate the differential assembly complete with selector fork into the transfer box casing. It may be necessary to rotate the output shaft to ease fitment, and guide selector shaft into its hole.

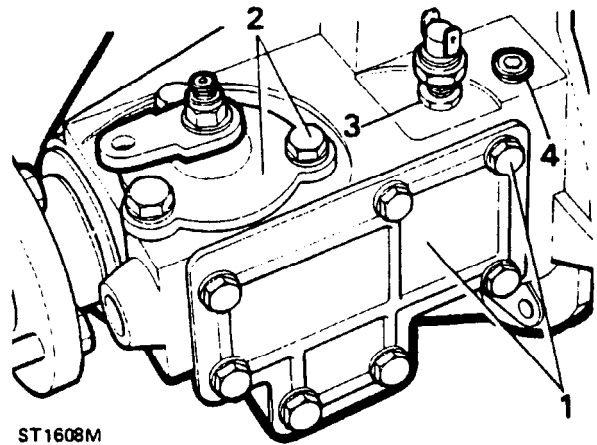


3. Fit selector shaft ball and spring through the side of the transfer box casing.
4. Apply Loctite 290 to detent plug; fit and locate, by screwing gently fully home and then unscrewing two turns.

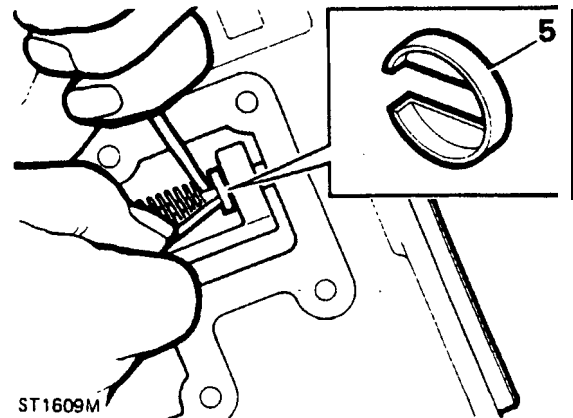


Front output housing overhaul -dismantling

1. Unscrew seven retaining bolts and washers and remove the differential lock selector side cover and gasket, discard the gasket.
2. Unscrew three retaining bolts and washers and lift the differential lock finger housing and actuator assembly from the front output housing.
3. Loosen the locknut and unscrew the differential lock warning light switch.
4. Remove selector shaft detent plug, spring and ball using a suitable magnet.

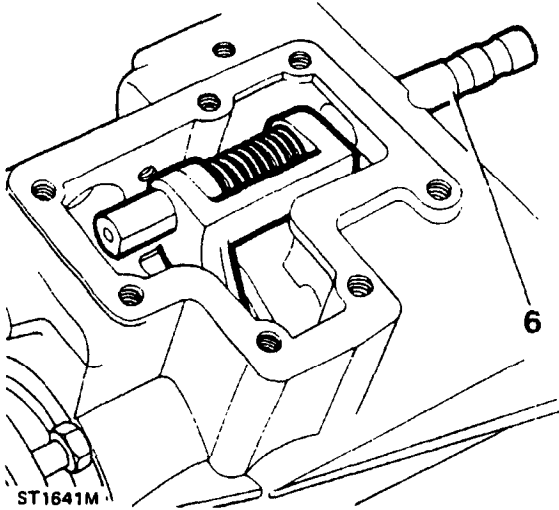


5. Compress the selector fork spring, and remove the two spring retaining clips.



Continued

6. Withdraw the selector shaft from the rear of the output housing.
7. Remove the selector fork and spring through the side cover aperture.
8. Remove lock-up sleeve from the rear of the output housing.



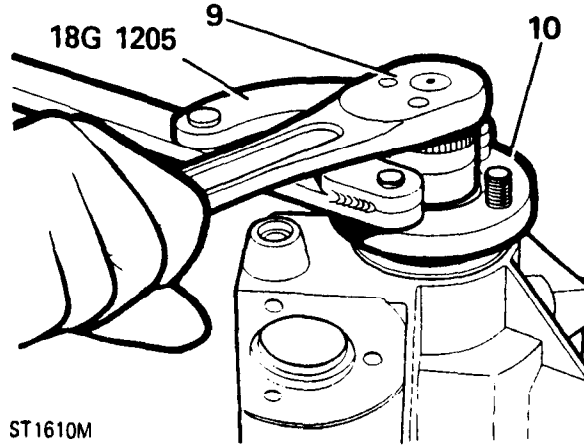
9. Using flange wrench **18G1205** and socket wrench, remove the flange nut, steel and felt washers.

NOTE: Ensure that flange bolts are fully engaged in the wrench.

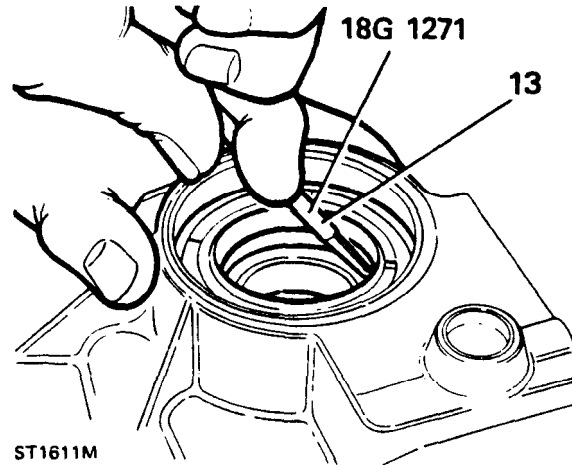
10. Remove the output flange with oil seal shield.

NOTE: These parts need not be separated unless the flange bolts are to be replaced.

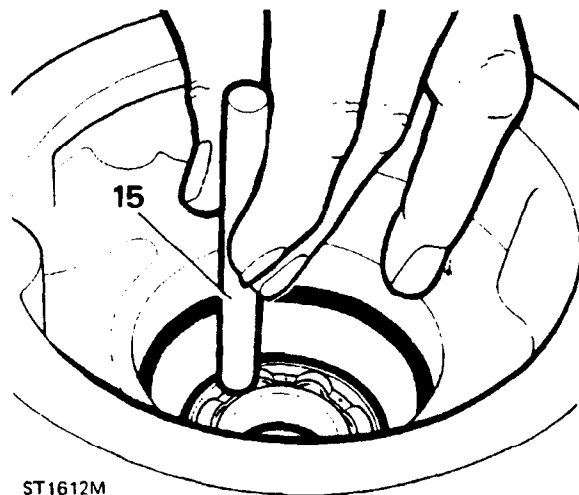
11. Drive output shaft **rearwards** from housing using a soft headed mallet.
12. Slide off the collar from the output shaft.



13. Pry out and discard oil seal from output housing using service tool **1861271**.
14. Remove circlip with circlip pliers **18G257**.

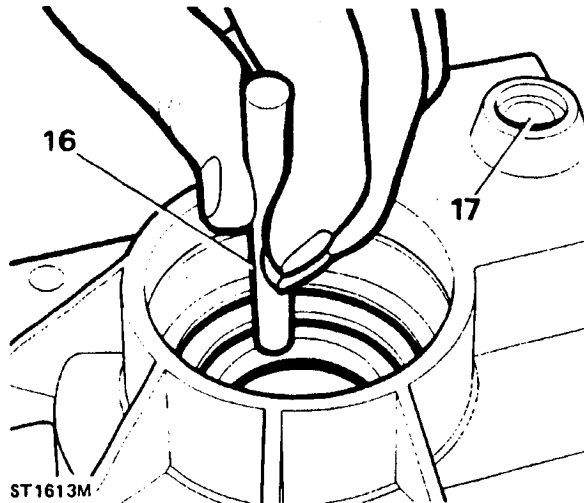


15. Invert housing and drive out bearing from inside the case as shown.



16. Drive out centre differential front taper roller bearing track and shim.
17. Drive out selector shaft cup plug from housing.
18. Clean all components ensuring all traces of 'Loctite' are removed from faces and threads.
19. Examine components for wear or damage and replace if necessary.

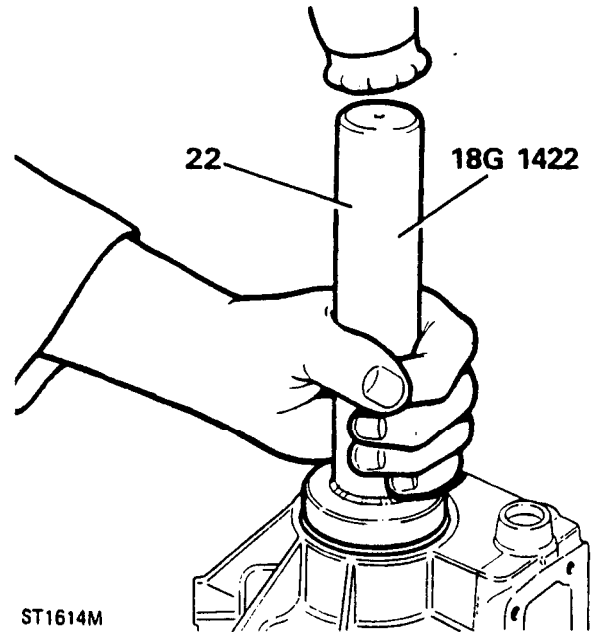
NOTE: Replace oil seal, felt seal and flange nut.



ST1613M

Re-assembling

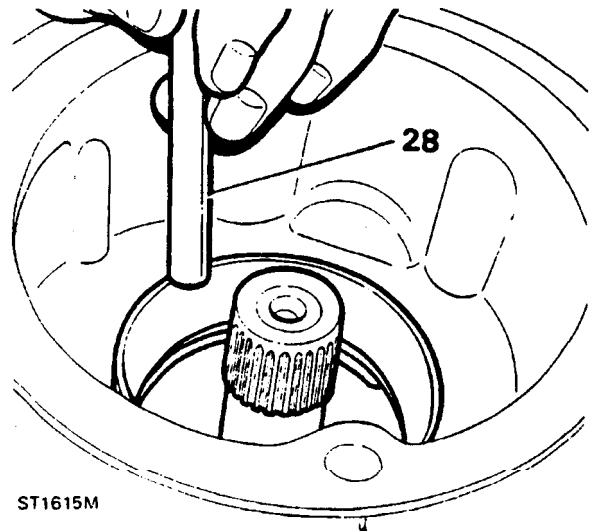
20. Press the bearing into the housing; do not use excessive force. To facilitate fitting the bearing, heat the front output housing. This is not to exceed 100°C (212°F).
21. Using circlip pliers **18G257**, fit the bearing retaining clips.
22. Pre-grease and fit a new oil seal (open side inwards) using replacer tool **18G1422**, until the seal just makes contact with the circlip.
23. Carefully coat the lips of the seal with clean grease.
24. Slide collar on to the output shaft, with its chamfered edge away from the dog teeth.
25. Fit the output shaft through the bearing and drive home.



ST1614M

Adjusting front differential bearing pre-load

26. Measure original differential front bearing track shim.
27. Refit original shim into the output housing.
28. Drift differential front bearing track into the housing using a soft driver.

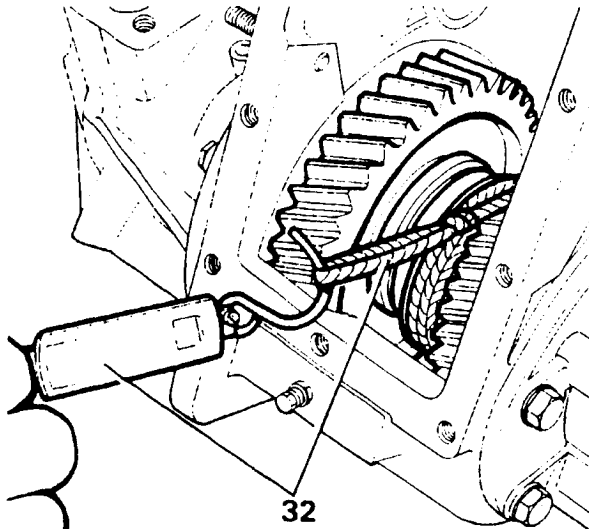


ST1615M

29. Grease and fit new gasket and locate the front output housing on the transfer box casing.

Continued

30. Fit the eight housing retaining bolts and washers, the upper middle bolt being longer than the rest. Do not tighten at this stage.
31. Engage high or low gear.
32. Check the rolling resistance of the differential using a spring balance and a length of string wound around the exposed splines of the high/low hub. With the bolts finger tight, little or no resistance should register.



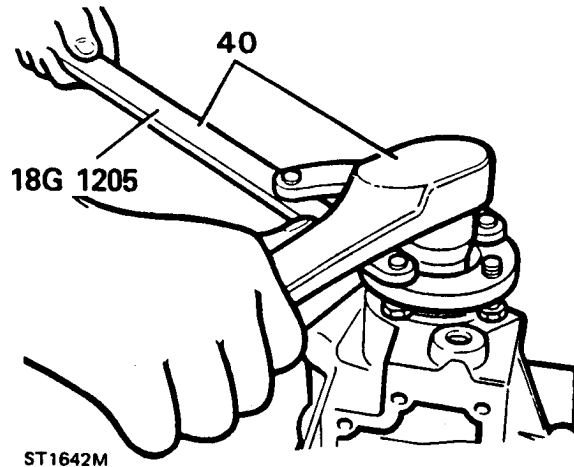
ST1616M

33. Tighten the bolts a little at a time, occasionally checking the rolling resistance. With the correct shim fitted and the bolts tightened to the specified torque the load to turn should be 1.36 kg to 4.53 kg (3lb to 10 lb).

NOTE: Alternatively, using a suitable torque wrench to achieve the torque to turn, the readings should be as follows: 0.56 to 1.69 Nm (5 to 15 in lb). The flange nut must be fitted to enable the use of a torque wrench. This applies to new or used bearings. (New bearings will register at the top end and used bearings will register at the low end).

34. If the reading is in excess of the above measurements, remove the front output housing assembly from the transfer box casing.

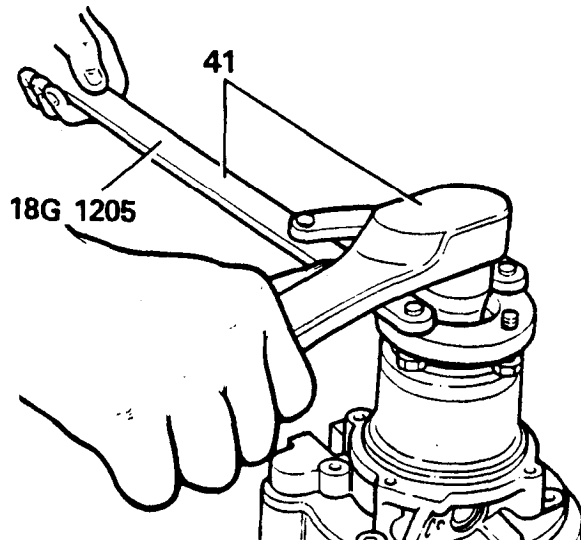
35. Using a suitable extractor, withdraw the centre differential bearing track and change the shim for one of a suitable thickness. (A thinner shim will reduce the rolling resistance).
36. Fit the new shim and drift the differential bearing track back into its housing until fully home.
37. Having obtained the load to turn, prop-up the transfer box casing on the bench with the front face uppermost.
38. Apply Loctite 290 to the threads of the housing retaining bolts and fit the eight bolts and washers into the front output housing and tighten to the specified torque (see section 06-Torque values).
39. Fit front output flange, felt washers, steel washers and flange nut.
40. Using flange wrench 18G1205 and torque wrench, pull the output shaft up to the correct position. Check that the oil seal shield does not foul the housing. Ensure the nut is tightened to the specified torque (see section 06-Torque values).



ST1642M

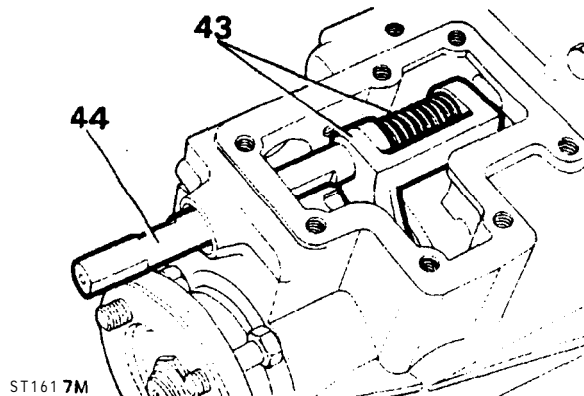
NOTE: Ensure that the flange bolts are fully engaged in the wrench.

41. Repeat the above operation for the rear output flange.



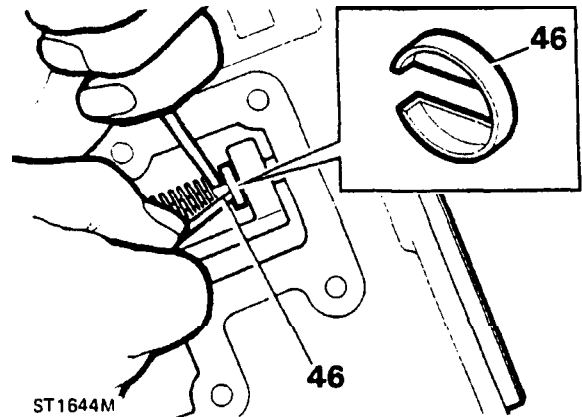
ST1643M

42. Compress the selector shaft spring and fit to the selector fork.
 43. Locate selector fork through front output housing side cover aperture, ensuring that the fork engages in the groove of the lock-up sleeve.
 44. Fit selector shaft through the aperture in the front of the output housing and pass it through the selector fork lugs and spring into the rear part of the housing.
 45. Rotate the selector shaft until the two flats for the spring retaining caps are at right angles to the side cover plate face.



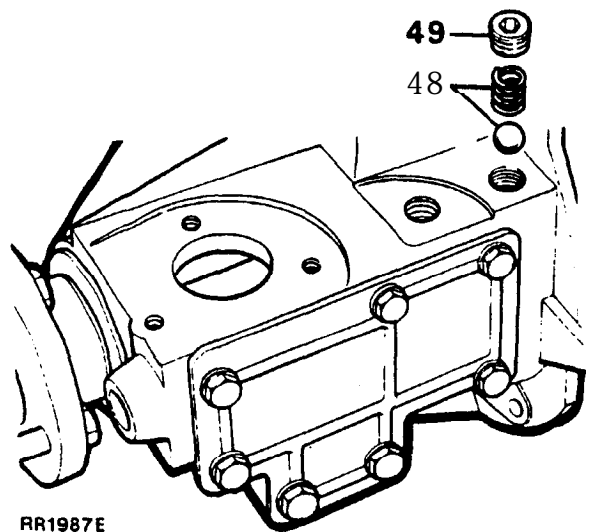
ST1617M

46. Compress the spring between the fork lugs and slide the retaining caps on to the shaft ensuring the spring is seated in the 'cupped' side of the caps.
 47. Apply a suitable sealant, a new seal cup, and drive the cup into position.



ST1644M

48. Fit selector shaft detent ball and spring in the tapped hole on top of the output housing.
 49. Apply Loctite 290 to detent plug threads. Screw detent plug gently home and then unscrew two turns.



RR1987E

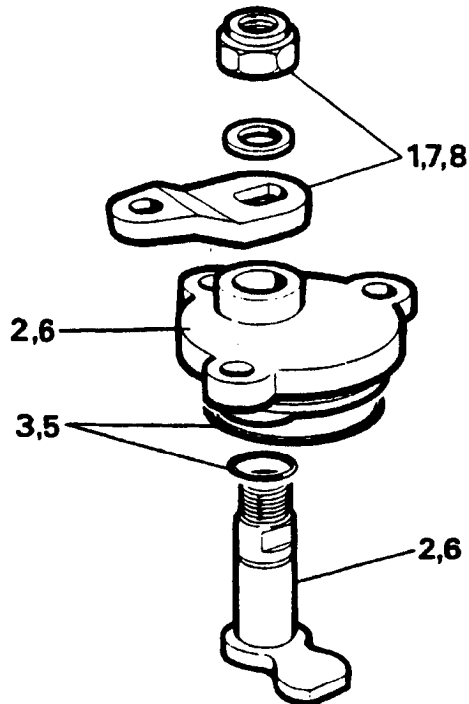
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Differential lock finger housing overhaul-dismantling

1. Unscrew and discard the 'Nyloc' nut and remove the operating lever and washer.
2. Remove the pivot shaft from differential lock finger housing.
3. Remove the 'O' rings from the pivot shaft and housing and discard.
4. Clean all components; examine for wear or damage and replace if necessary.

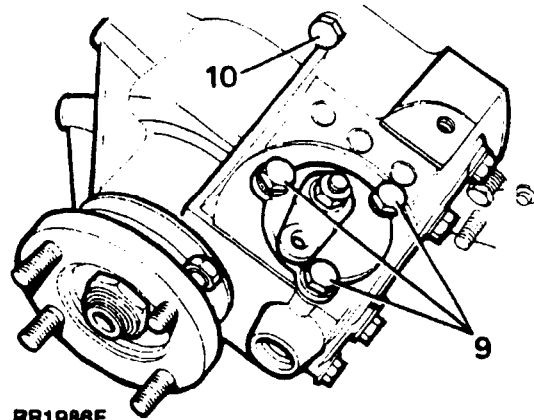
Re-assembling

5. Fit new 'O' rings on to pivot shaft and lock finger housing and lubricate with oil.
6. Locate the pivot shaft in the housing.
7. Fit the differential lock lever over the pivot shaft so that the lever will point forward as shown. This lever is then in the correct operating position.
8. Retain the lever with a plain washer and new 'Nyloc' nut.



ST1618M

9. Fit the differential lock finger housing into its seating on the front output housing, ensuring that the selector finger is located in the flat of the selector shaft.
10. Apply Loctite 290 to the bolt threads and retain the lock finger housing with the three bolts and washers to the specified torque (see section 06-Torque values).

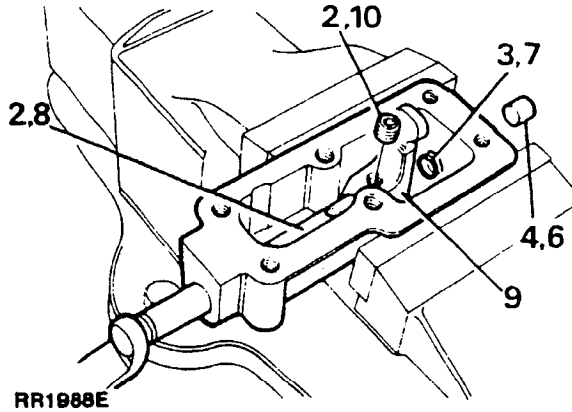


RR1986E

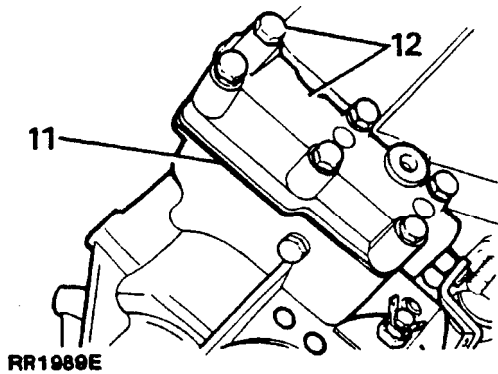
High/low cross-shaft housing overhaul

1. Release the locknut and remove the neutral warning switch.
2. Remove the selector finger set screw and withdraw the cross-shaft from the cross-shaft housing and remove the selector finger.
3. Remove the 'O' ring from the cross-shaft.
4. Drive out selector housing cup plug if necessary.
5. Clean all the components and check for damage or wear, replace if necessary.
6. Apply sealant to a new cup plug and fit so that the cup is just below the chamfer for the cross-shaft bore.
7. Fit new 'O' ring to cross-shaft.
8. Lubricate the shaft and insert into the cross-shaft housing.

- Fit selector finger ensuring that it aligns with the recess in the cross-shaft.

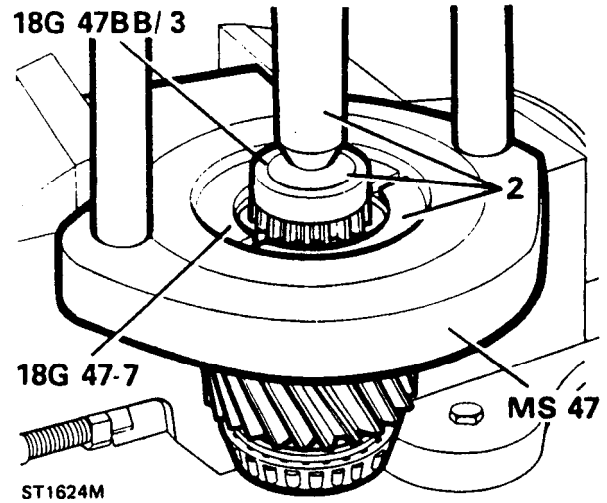


- Apply Loctite 290 to the set screw and secure the selector finger to the cross-shaft and fully tighten to the specified torque (see section 06-Torque values).
- Grease and fit the high/low selector housing gasket on the front output housing.
- Fit high/low cross-shaft housing, ensuring that the selector finger locates in the slot of the selector shaft, and secure with six bolts and washers to the specified torque (see section 06-Torque values).



Input gear overhaul-dismantling

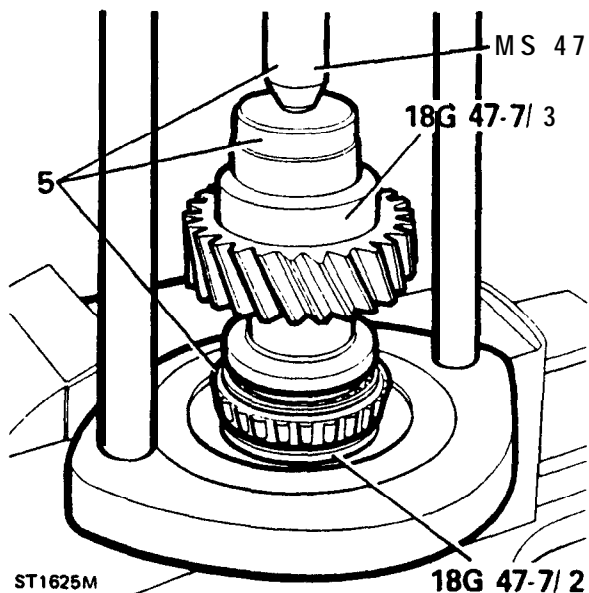
- Clean the input gear assembly and examine for wear or damage. Remove the bearings only if they are to be replaced.
- Secure hand press MS47 in the vice and using collars 18G47-7 and button 18G47BB3, remove rear taper roller bearing from input gear assembly.
- Invert input gear assembly in hand press and remove front taper roller bearing.
- Clean input gear.



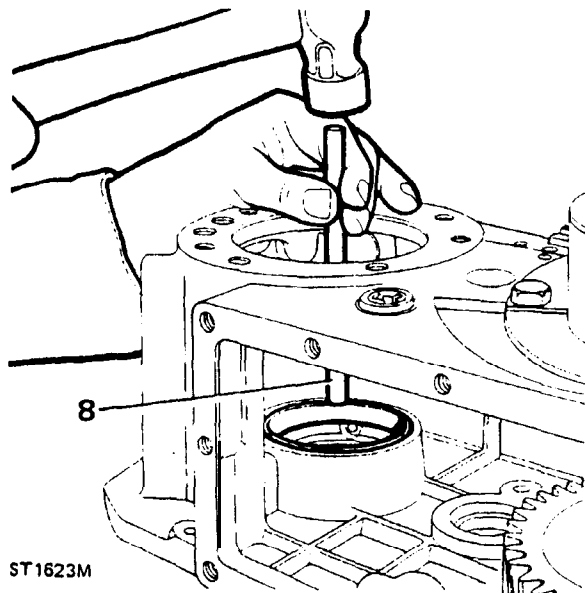
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Re-assembling

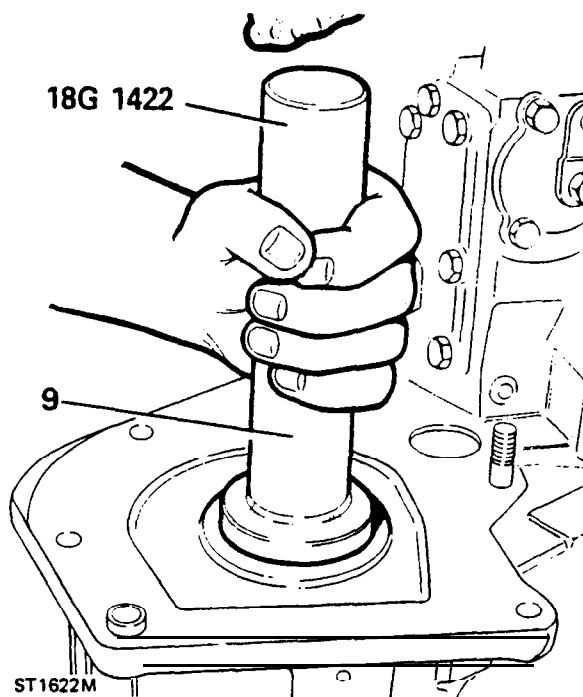
5. Position rear taper roller bearing on input gear and using hand press MS47 and collars 18G47-7 press the bearing fully home.
6. Invert input gear and fit the front taper roller bearing using the press and collars.



7. Prop up the transfer box casing on the bench with the rear face uppermost.
8. Drive in the front taper bearing track.



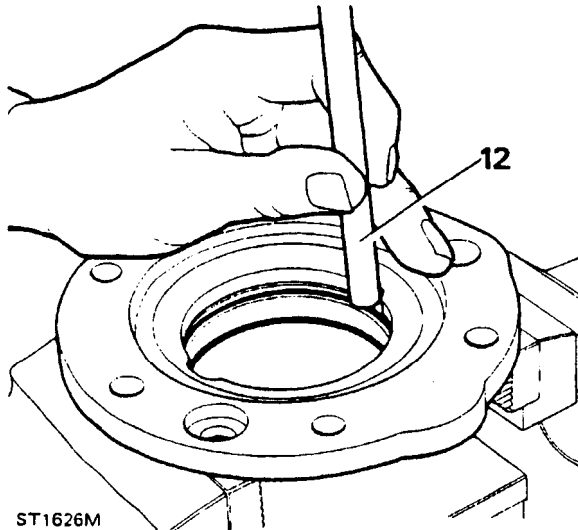
9. Reposition transfer box casing so the front face is uppermost and fit oil seal (open side inwards) using replacer tool 18G1422.



10. Lubricate both bearings with clean oil.
11. Fit the input gear assembly into the transfer box casing with the dog teeth uppermost.

Checking input gear bearing pre-load

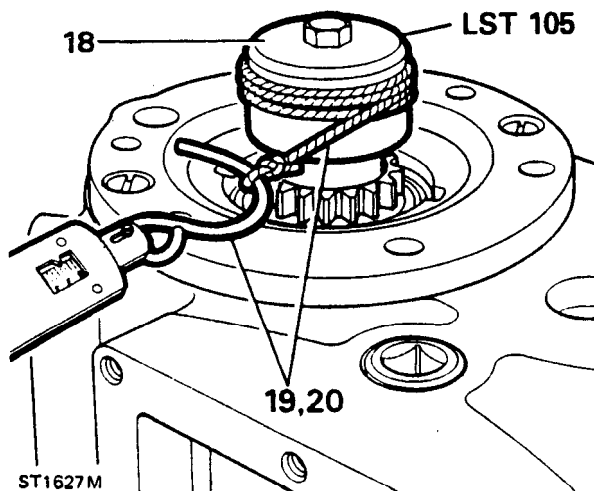
12. Secure bearing support plate in the vice. Drive out input gear bearing track, and remove shim.



13. Clean bearing support plate and shim. Measure original shim and note its thickness.
14. Fit the original shim to the support plate.
15. Locate the bearing track in the support plate and press fully home.
16. Apply grease to the gasket and fit on to the transfer box casing.
17. Fit the bearing support plate on to the transfer box casing and secure with the six bolts, but do not tighten.
18. Fit the service tool LST105 to input gear and engage the spline.

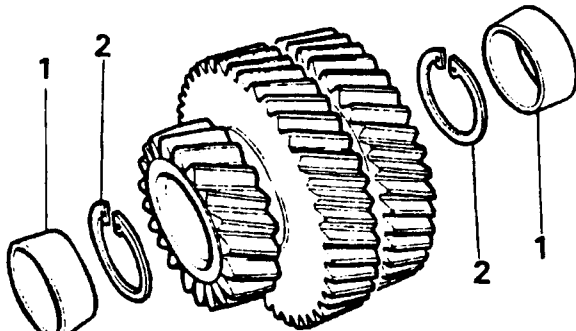
19. Tie a length of string to the cotter pin and fit it to the service tool as shown.
20. Carefully tension the string using a spring balance, little or no resistance will be felt at this stage. Tighten the bolts a little at a time, occasionally checking the rolling resistance. With the bolts tightened to the specified torque the rolling resistance should be 2.26 kg to 9 kg (5 to 20 lb). **NOTE:** Alternatively using a suitable torque wrench applied to the nut on the service tool, a reading for a torque to turn should be 0.56 to 2.25Nm (5 to 20 in lb).
21. If the reading obtained is outside the above limits, the original shim must be changed.
22. Remove the spring balance, string and service tool.
23. Remove the six bolts and the bearing support plate.
24. Drive out the input gear bearing track from the support plate and discard original shim.
25. Select the correct size shim to obtain a load to turn of 0.56-2.25Nm (5 to 20 in lb).
26. Fit shim to support plate, locate bearing track and press home.
27. Fit bearing support plate and secure to transfer box casing with the six bolts but do not tighten.
28. Repeat the rolling resistance check as previously described, and note the value obtained.

Continued



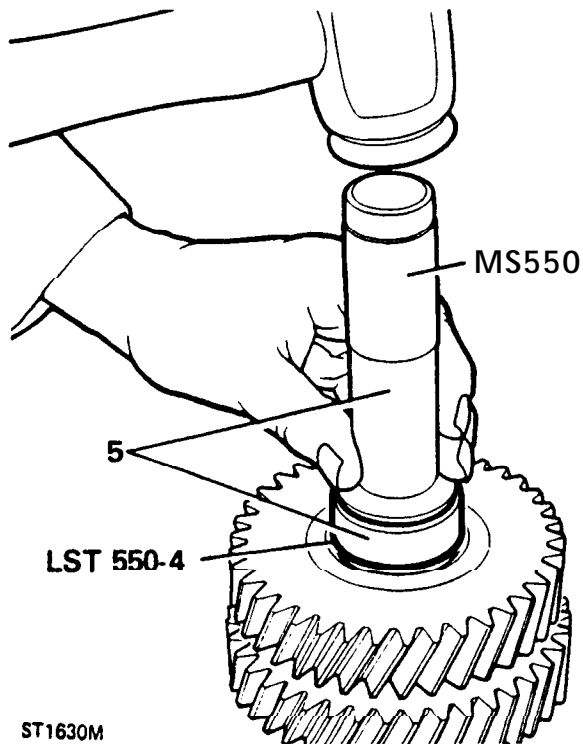
Intermediate gear assembly overhaul

1. Drive out intermediate gear bearing tracks.
2. Remove circlips.



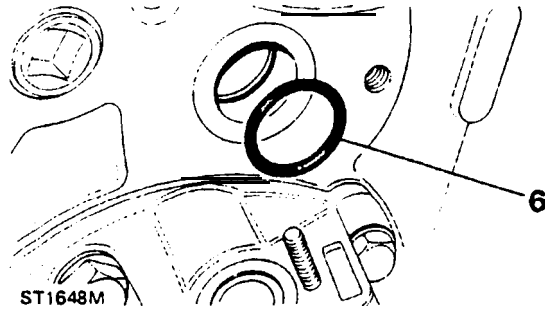
ST1628M

3. Clean all intermediate gear components and lock plate. Check for damage or wear and replace as necessary.
4. Fit new circlips into the intermediate gear cluster.
5. Using tools LST550-4 and MS550 fit bearing tracks into the intermediate gear cluster.



ST1630M

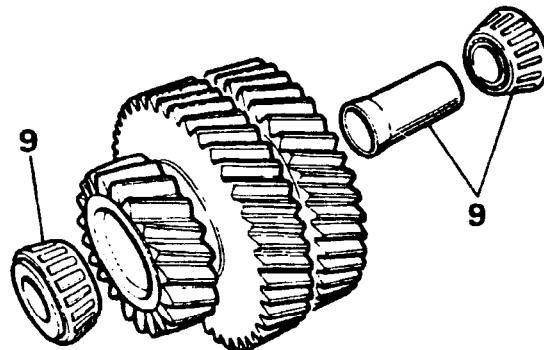
6. Fit the 'O' rings to the intermediate shaft and into the intermediate shaft bore at the front of the transfer box casing.



ST1648M

Intermediate gear re-assembly

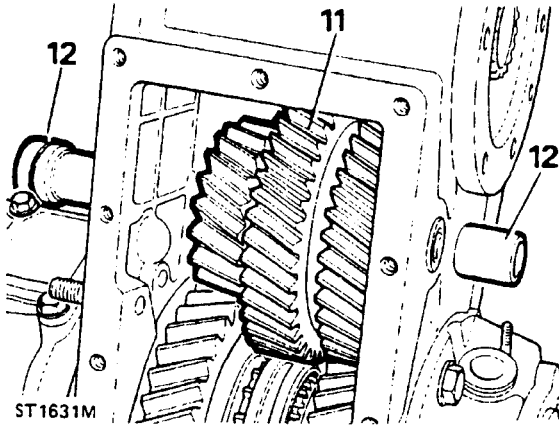
7. Check for damage to the intermediate shaft thread and if necessary clean up with a fine file or stone.
8. Lubricate the taper roller bearings and intermediate gear shaft.
9. Insert new bearing spacer to gear assembly, followed by the taper roller bearings.



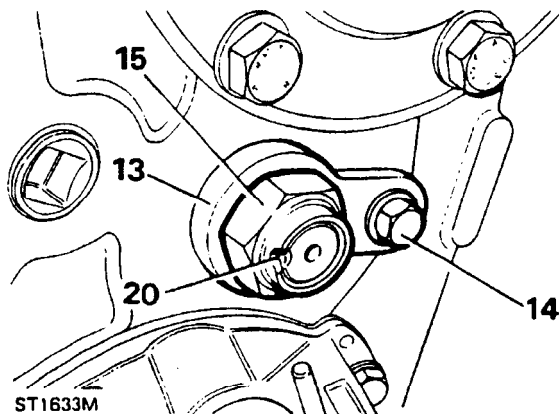
ST1 649M

10. Fit dummy shaft LST104 into the intermediate gear cluster.
11. Locate the gear assembly into the transfer box casing from the bottom cover aperture.

12. Insert intermediate shaft from the front of the transfer box casing, pushing the dummy shaft right through as shown and remove. (Making sure that the intermediate gear cluster meshes with the input gear and higher range and low range gears).



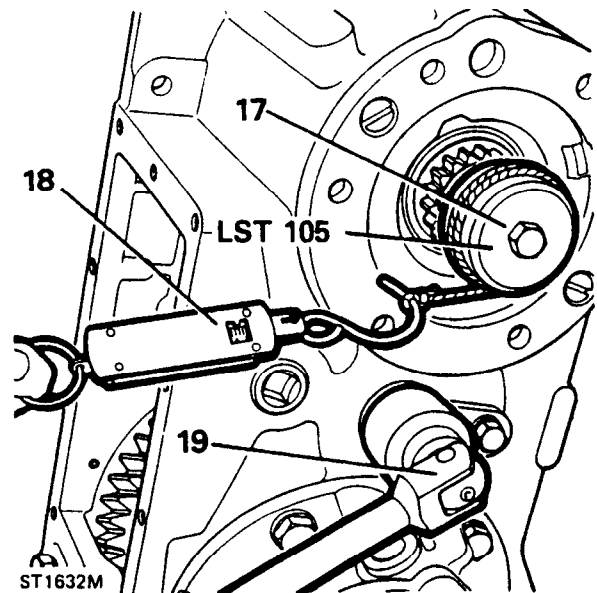
13. Turn the intermediate shaft to allow fitting of retaining plate.
14. Fit retaining plate and secure with retaining bolt and washer.
15. Fit the intermediate gear shaft retaining stake nut. Do not tighten at this stage.



Adjusting intermediate gear torque-to-turn

16. Select neutral.
17. Fit service tool LST105 to input gear and engage spline.
18. Tie a length of string to a cotter pin and fit to the service tool as shown. Attach the spring balance to the string.
19. To obtain the correct figures and to collapse the spacer within the intermediate gear cluster, tighten the intermediate shaft nut until the load-to-turn has increased by 3.7 kg (7 lb) \pm 1.63 kg (\pm 3 lb) on that noted when checking input shaft load-to-turn.
20. Peen the stake nut by carefully forming the collar of the nut into the intermediate shaft recess, as illustrated.

CAUTION: A round nose tool must be used for this operation to avoid splitting the collar of the nut.



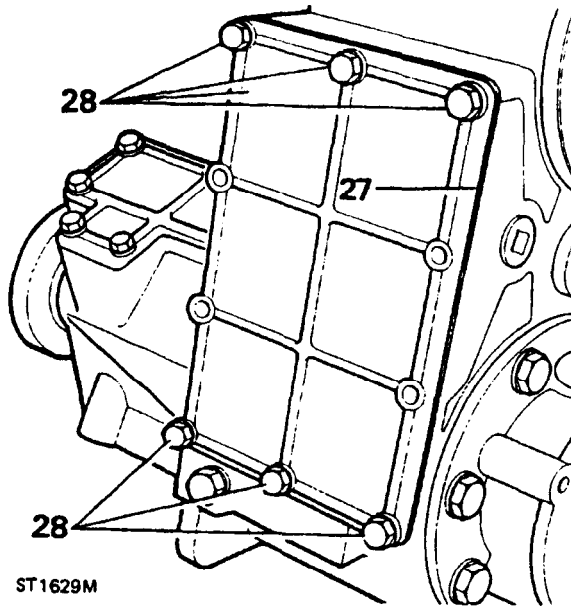
Continued

Power take-off cover-reassemble

21. Clean power take-off cover and gasket face.
22. Fit the two countersunk screws and tighten to the specified torque (see section 06-Torque values).
23. Remove the six bolts from the bearing support plate.
24. Apply sealant to the cover plate gasket and fit it to the bearing support plate.
25. Apply Loctite 290 to bolt threads and secure the power take-off cover with the six bolts and washers to the specified torque (see section 06-Torque values).

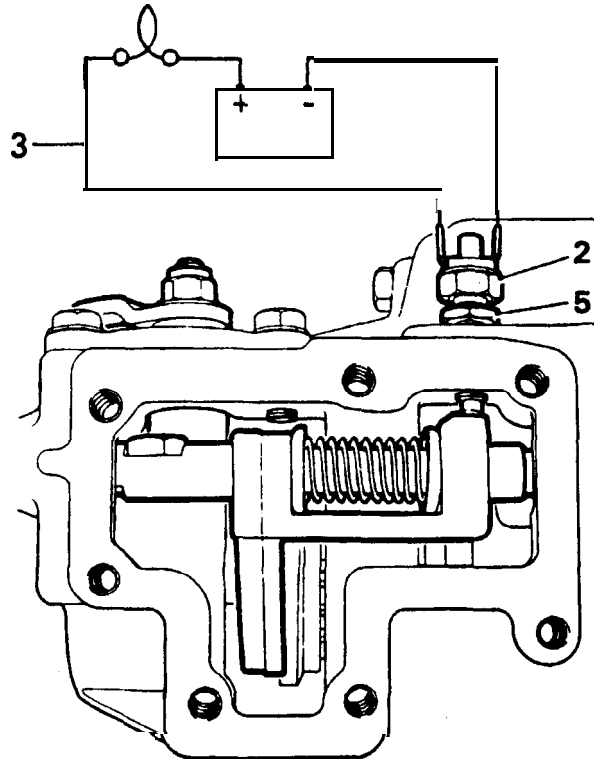
Bottom cover-reassemble

26. Clean bottom cover and gasket face.
27. Apply sealant to cover gasket and fit to transfer box casing.
28. Apply Loctite 290 to bolt threads and secure the bottom cover with six bolts and washers to the specified torque (see section 06-Torque values).



Differential lock switch adjustment

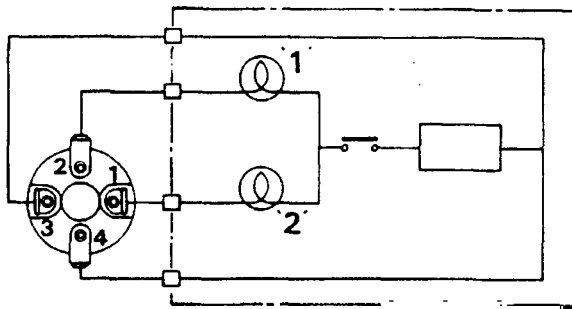
1. Select differential locked position by moving the differential lock lever towards the right side of the transfer box casing.
2. Apply sealant to the differential lock warning light switch and fit to the top of the front output housing.
3. Connect a test lamp circuit to the differential lock switch.
4. Screw in the lock switch until the bulb is illuminated.
5. Turn in the switch another half a turn and tighten with the locknut against the housing.



6. Disconnect the battery and move the differential lock lever to the left to disengage differential lock.
7. Clean the front output housing side cover.
8. Grease and fit side cover gasket.
9. Apply Loctite 290 to bolt thread & fit side cover and secure with seven bolts and washers to the specified torque (see section 06-Torque values).

Neutral warning switch adjustment

1. Connect suitable test equipment as shown.
2. Fit the switch and neutral warning switch locknut ensuring correct setting for switch.
3. To attain the correct setting the following procedure is applied:
4. Screw the switch in until test lamp 1 is extinguished.
5. Screw in switch a further 1/3 to 1/2 turn.
6. Lock switch in position using locknut.
7. Select 'Low Range' test lamp 1 should illuminate. Select 'High Range' test lamp 2 should illuminate. Select neutral both test lamps should extinguish.



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8. If adjustment is satisfactory remove the test equipment.

Parking brake drum-reassemble

1. Clean brake backplate and oil catcher and apply sealant to the catcher joint face.
2. Locate brake backplate on the rear output housing with the brake operating lever on the right side of the transfer box casing.
3. Secure the backplate (including the oil catcher) with the four special bolts and tighten using a hexagonal socket to the specified torque (see section 06-Torque values).
4. Clean and fit brake drum and secure with two countersunk screws to the specified torque (see section 06-Torque values).
5. Adjust the parking brake. (Refer to Section 70 Brakes or Section 10 Maintenance).

