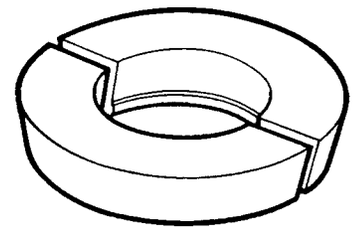
LT230T TRANSFER GEARBOX OVERHAUL

Service Tools:

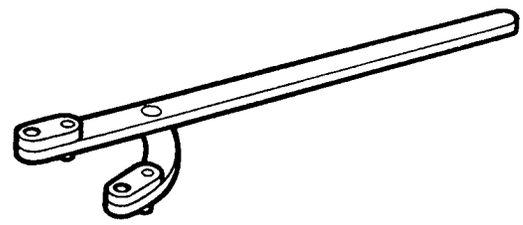
18G47 - 7	Input gear cluster bearing cones remover/replacer
18G47BB - 1	Adaptor centre differential bearing remover
18G47BB - 3	Adaptor centre differential bearing remover button
18G1205	Drive flange wrench
18G1271	Oil seal remover (optional)
18G1422	Mainshaft rear oil seal replacer
18G1423	Adaptor/socket centre differential Locknut remover/replacer
18G1424	Centre differential bearing replacer
MS47	Hand press
MS550	Bearing and oil seal replacer handle
LST47 - 1	Adaptor centre differential bearing remover
LST104	Intermediate gear dummy shaft
LST105	Input gear mandrel
LST550 - 4	Intermediate gear bearing replacer

NOTE: Where the use of special service tools is specified, only these tools should be used to avoid the possibility of personnal injury and or damage to components.

LST 47-1

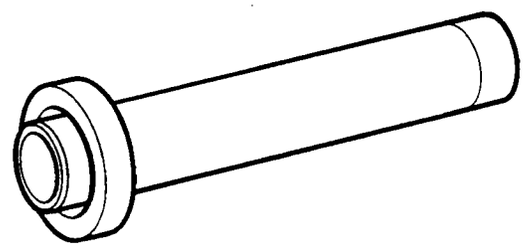


18G.1205 (RG.421)

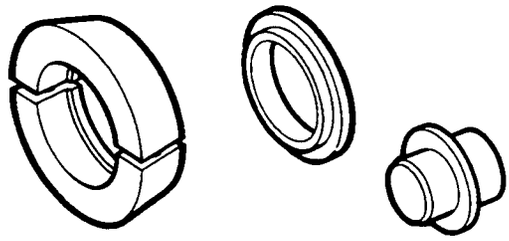


Max. PCD 6"

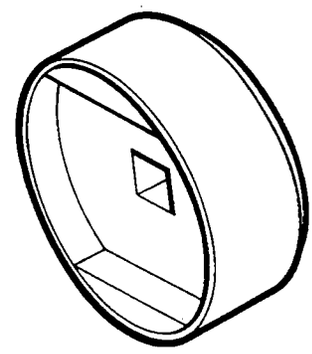
18G.1422



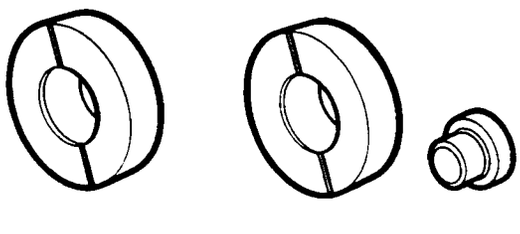
18G.47-7



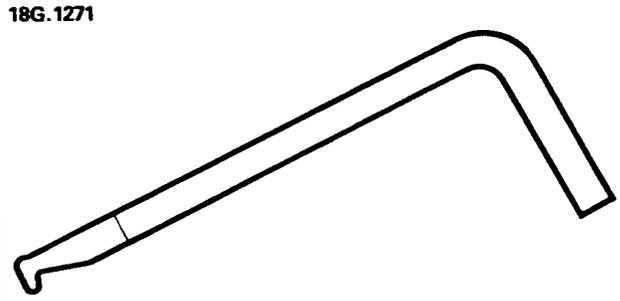
18G.1423



18G.47BB

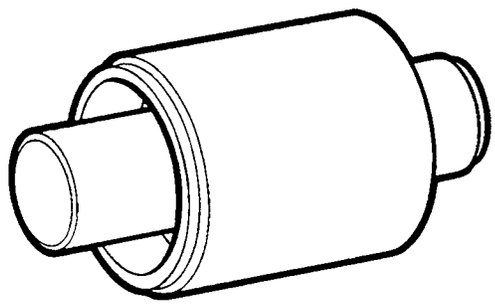


18G.1271

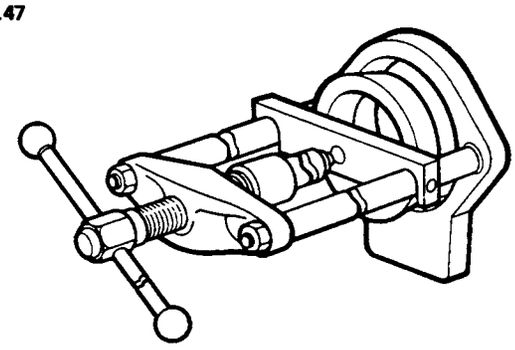


ST2464M

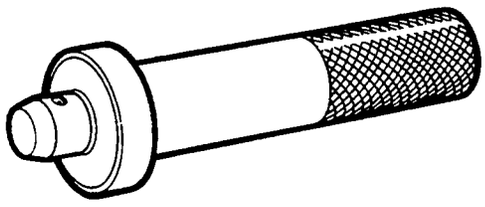
18G.1424



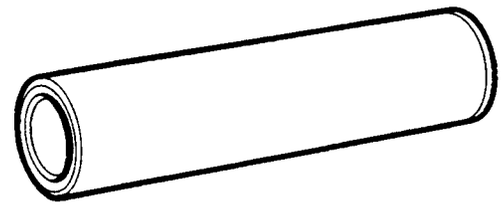
MS.47



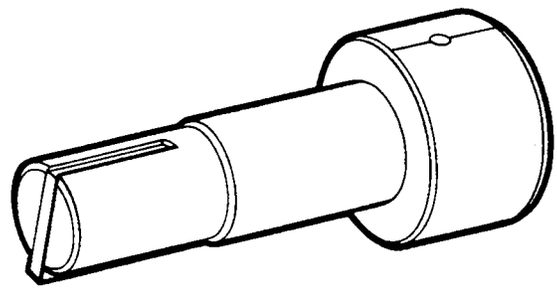
MS.550



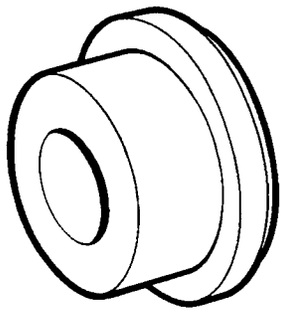
LST 104



LST 105



LST 550-4



ST2465M

TORQUE WRENCH SETTING

WARNING: Components in bold type must not be re-used.

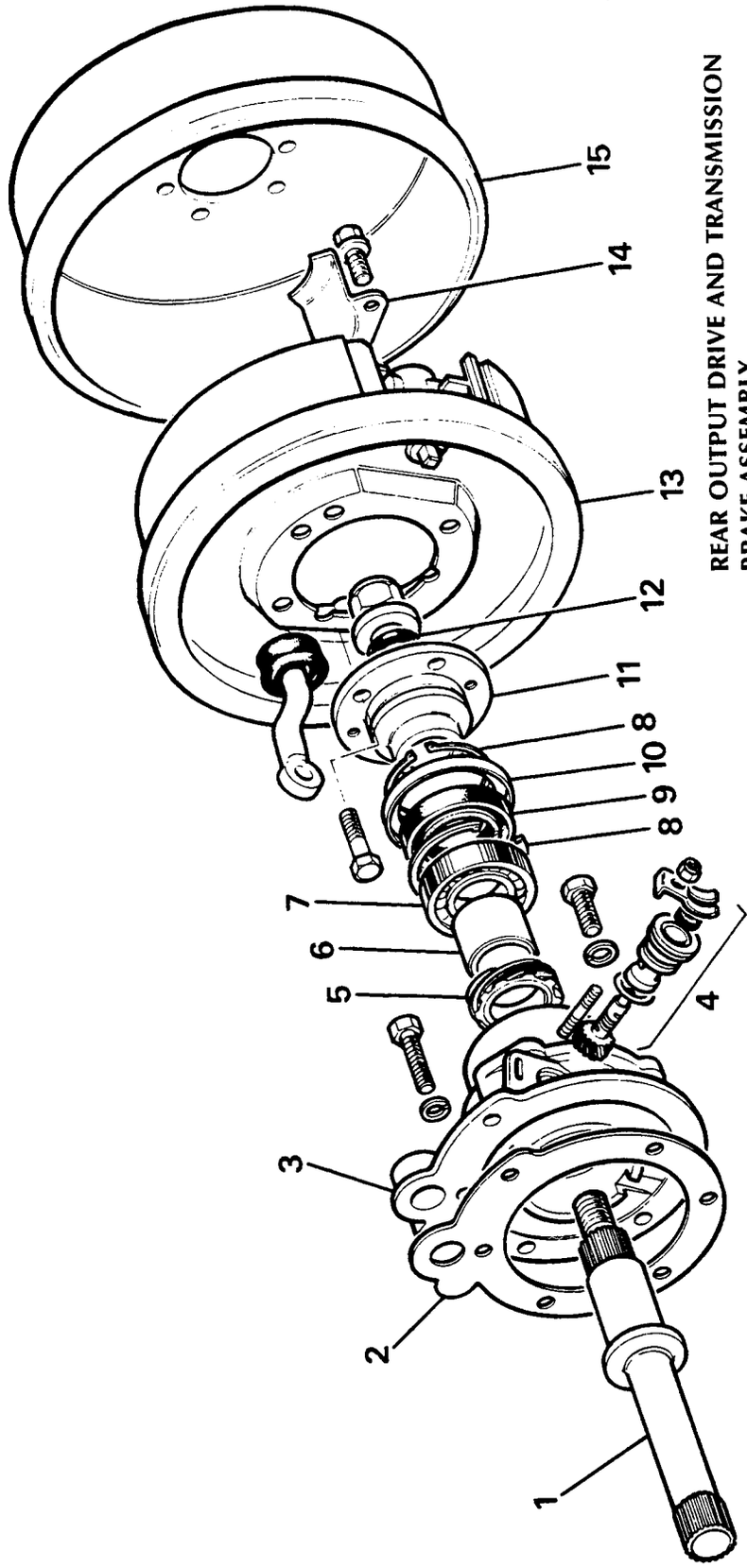
COMPONENT	Nm	ft lb
Pinch bolt - operating arm to crank arm	7 to 10	5 to 7
End cover gear change housing	7 to 10	5 to 7
Speedometer cable retainer	7 to 10	5 to 7
Rear output/speedometer housing		See note
Bottom cover to transfer case	22 to 28	16 to 21*
Front output housing to transfer case	22 to 28	16 to 21*
Cross shaft housing to front output housing	22 to 28	16 to 21
Gear change housing	22 to 28	16 to 21
Pivot shaft to link arm	22 to 28	16 to 21
Connecting rod to adjustable clevis	22 to 28	16 to 21
Anti-rotation plate intermediate shaft	22 to 28	16 to 21*
Front output housing cover	22 to 28	16 to 21*
Pivot bracket to extension housing	22 to 28	16 to 21*
Finger housing to front output housing	22 to 28	16 to 21*
Bearing housing to transfer case	22 to 28	16 to 21
Brake drum to coupling flange	22 to 28	16 to 21
Bearing housing cover to transfer gearbox	40 to 50	29 to 37*
Rear output speedometer housing to transfer gearbox	40 to 50	29 to 37*
Selector finger to cross shaft high/low	22 to 28	16 to 21*
Selector fork, high/low to shaft	22 to 28	16 to 21*
Transmission brake to speedometer housing	65 to 80	48 to 59
Intermediate shaft stake nut		See text
Gate plate to grommet plate	7 to 10	5 to 7
Plunger switch setting	6.75 max	4.82 max
Gearbox to transfer case	40 to 50	9 to 37
Gearbox to transfer case		See note
Oil drain plug	25 to 35	19 to 26
Differential case (front to rear)	55 to 64	40 to 47
Output flanges	146 to 179	108 to 132
Differential case rear stake nut	66 to 80	50 to 59
Oil filler/level plug	25 to 35	19 to 26
Transfer breather	14 to 16	10 to 12
Transfer box front drive flange to drive shaft	41 to 52	30 to 38
Transfer box rear drive flange to drive shaft	41 to 52	30 to 38
Transfer gearbox mounting brackets to chassis	33 to 27	24 to 20
Mounting brackets to transfer gearbox	52	38
Mounting rubbers to mounting brackets	20 to 22	13 to 16

NOTE: Studs to be assembled into casting with sufficient torque to wind them fully home, but this torque must not exceed the maximum figure quoted for the associated nut on final assembly.

NOTE: * These bolts must have threads coated with Loctite 290 prior to assembly.

LT230T TRANSFER GEARBOX 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 (5 to 15 in lb)
Input gear bearing pre - load	0.56 to 2.25 Nm (5 to 20 in lb)
Intermediate shaft bearing pre - load	0.56 to 1.69 Nm (5 to 15 lb)

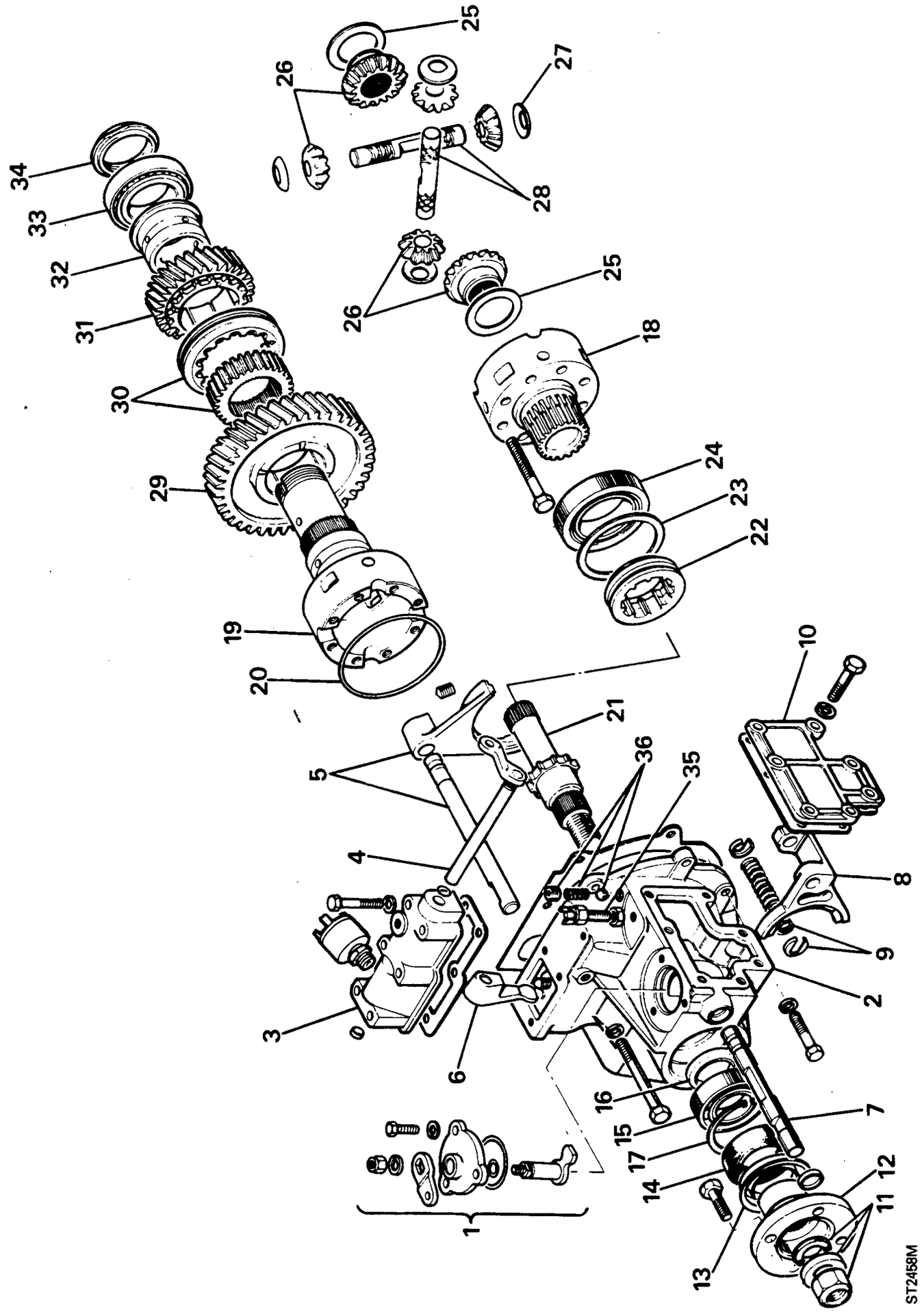


ST2459M

REAR OUTPUT DRIVE AND TRANSMISSION BRAKE ASSEMBLY

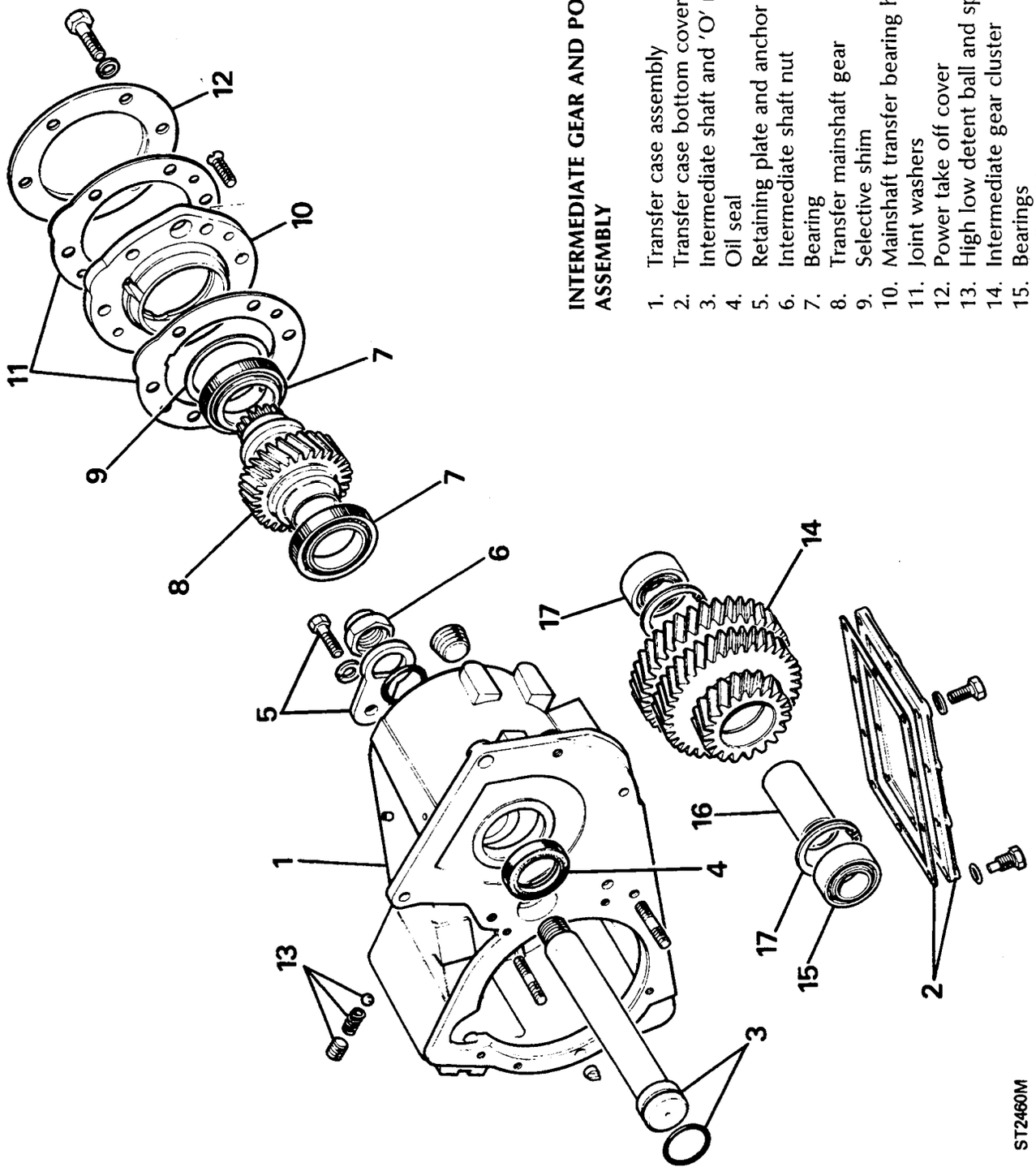
1. Rear output shaft
2. Joint washer
3. Speedometer drive housing
4. Speedometer drive pinion assembly
5. Speedometer worm drive
6. Spacer
7. Ball bearing
8. Circlip
9. Oil seal
10. Oil shield
11. Rear output flange
12. Sealing washer
13. Transmission brake assembly
14. Oil catcher
15. Brake drum

DIFFERENTIAL AND OUTPUT DRIVE ASSEMBLY



DIFFERENTIAL AND OUTPUT DRIVE ASSEMBLY

1. Differential selector assembly
2. Front output housing
3. High-low ratio cross shaft assembly
4. High-low selector shaft and lever
5. High-low selector fork and shaft
6. High-low selector finger
7. Differential lock selector shaft
8. Differential lock selector fork
9. Differential lock spring and clips
10. Front output housing cover and housing
11. Felt washer, steel washer and flange nut
12. Front output flange
13. Mud sheild
14. Oil seal
15. Bearing
16. Spacer
17. Circlip
18. Differential carrier, front half
19. Differential carrier, rear half
20. Retaining ring
21. Front output shaft
22. Dog clutch, front drive lock-up
23. Selective shim
24. Bearing
25. Selective thrust washers
26. Sun and planet gears
27. Thrust washers
28. Cross shafts
30. Hub and sleeve assembly
31. High output gear
32. Bush
33. Bearing
34. Bearing retaining nut
35. Differential lock switch
36. Differential lock detent ball and spring



INTERMEDIATE GEAR AND POWER TAKE OFF ASSEMBLY

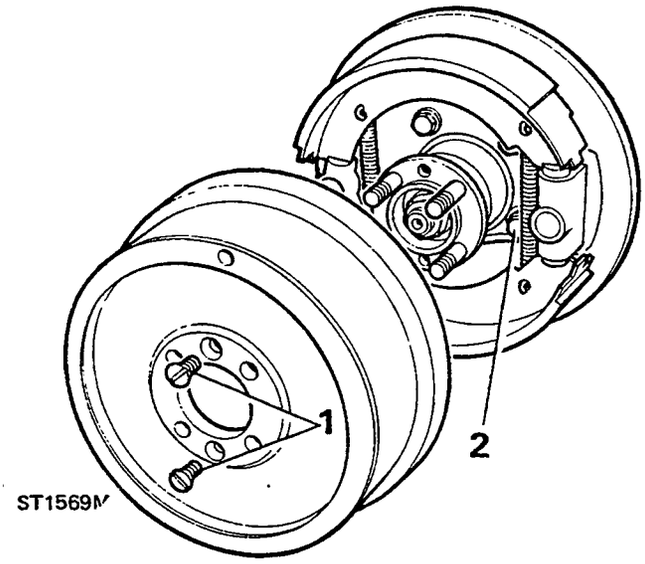
1. Transfer case assembly
2. Transfer case bottom cover and gasket
3. Intermediate shaft and 'O' ring
4. Oil seal
5. Retaining plate and anchor screw
6. Intermediate shaft nut
7. Bearing
8. Transfer mainshaft gear
9. Selective shim
10. Mainshaft transfer bearing housing
11. Joint washers
12. Power take off cover
13. High low detent ball and spring
14. Intermediate gear cluster
15. Bearings
16. Collapsible spacer
17. Circlip

DISMANTLE

Transmission brake removal

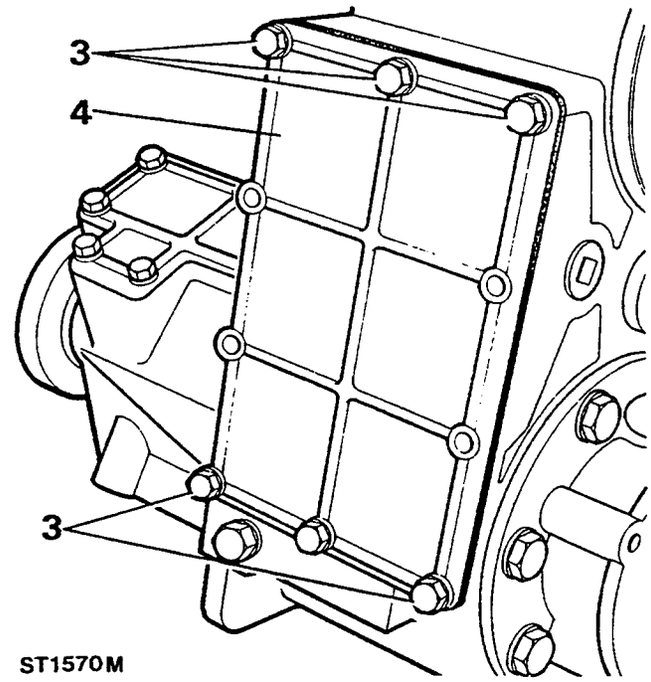
1. Remove two countersunk screws and withdraw brake drum.
2. Remove four bolts securing the brake back - plate; the two bottom fixings retain the oil catcher.

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



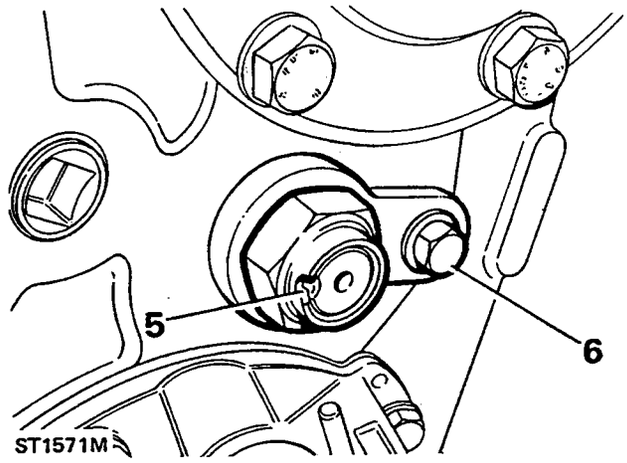
Bottom cover removal

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

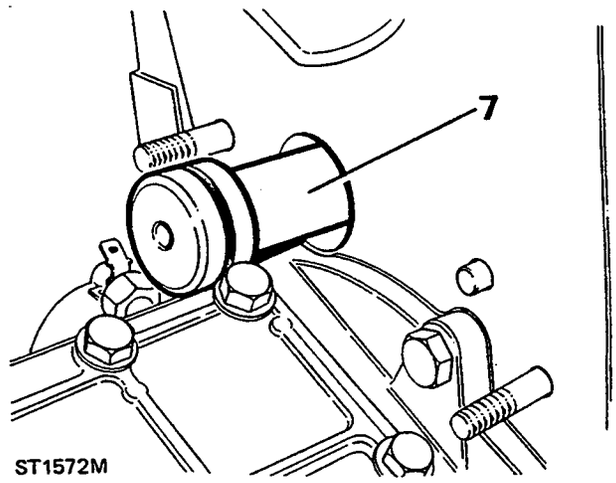


Intermediate shaft and gear cluster removal

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

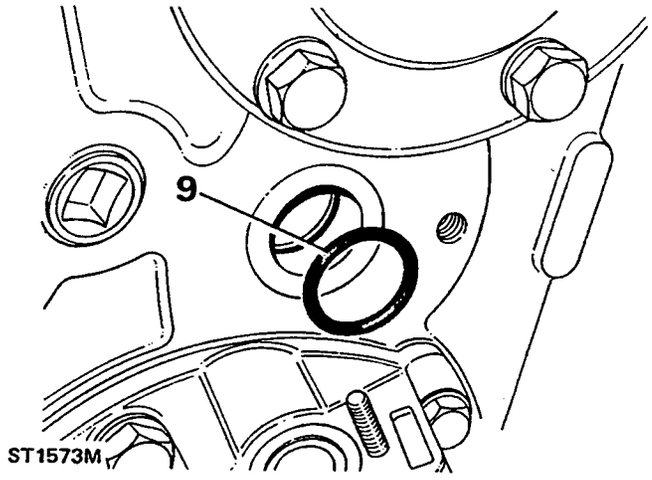


7. Tap the intermediate gear shaft from the transfer box.

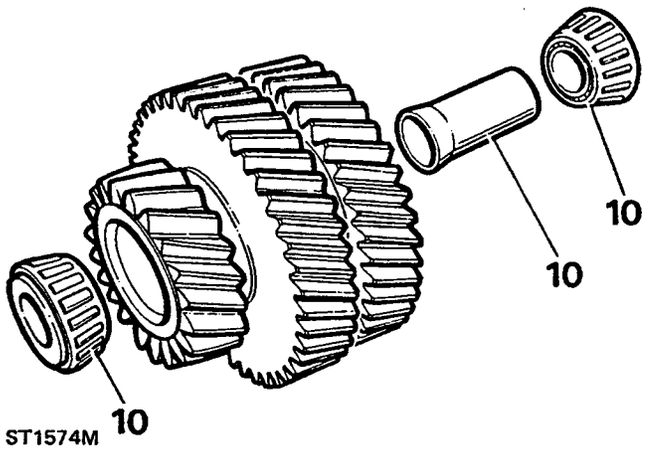


8. Lift out the intermediate gear cluster and bearing assembly.

9. Remove the 'O' rings from the intermediate gear shaft and from inside the transfer box and discard.

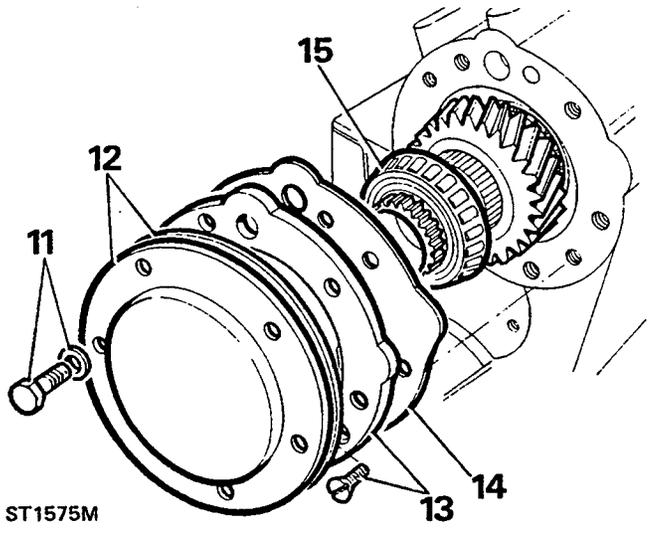


10. Remove taper roller bearings and bearing spacer from the intermediate gear cluster assembly.

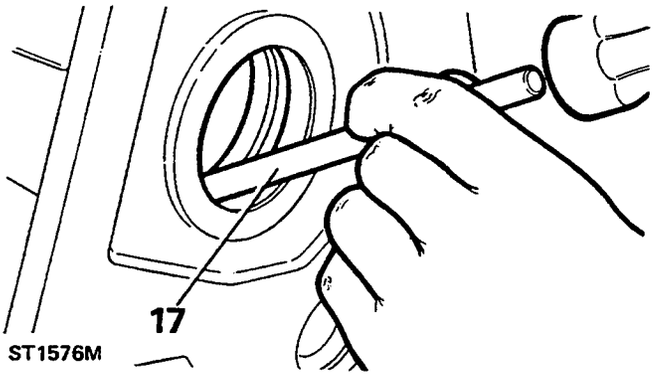


Input gear removal

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

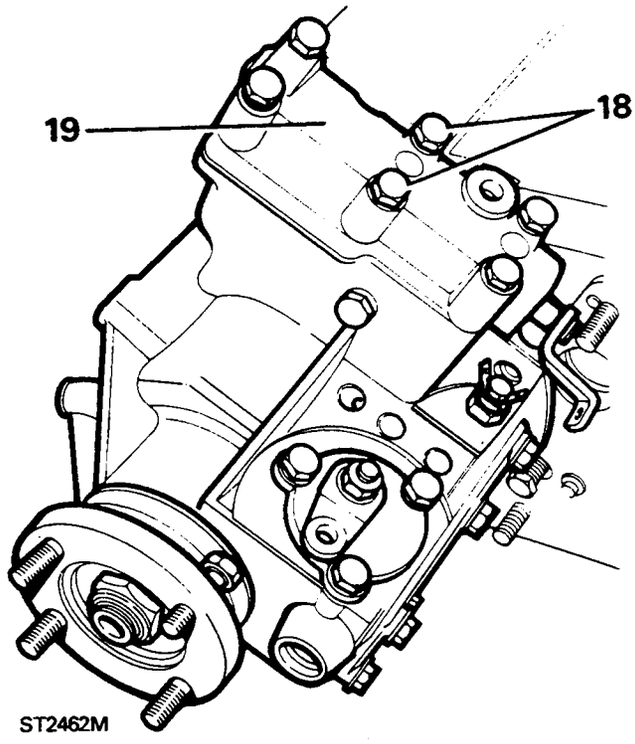


16. Remove and discard the oil seal at the front of the transfer box casing using service tool 18G 1271 to prevent damage to the housing.
17. Drive out the input gear front bearing track.



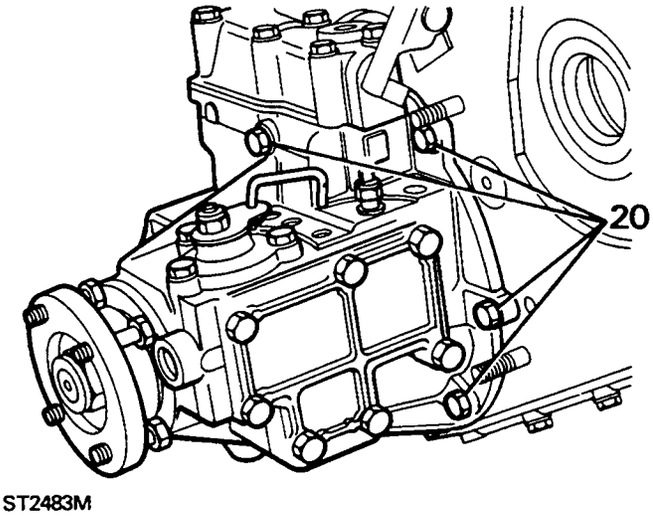
High/low cross - shaft housing removal

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.



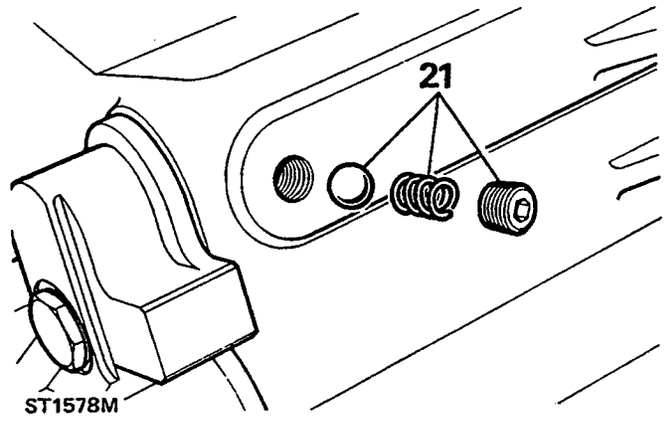
Front output housing removal

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.

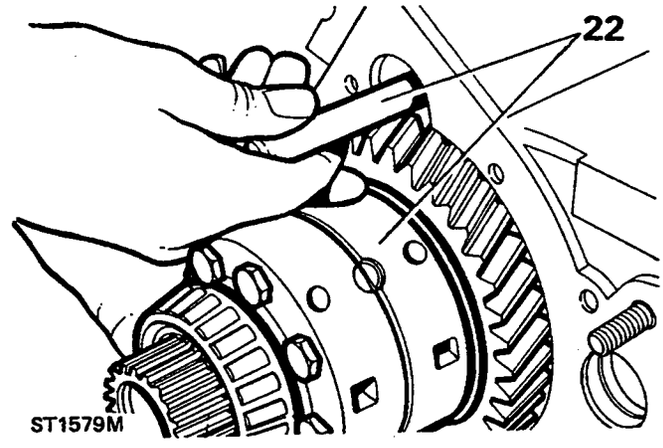


Centre differential removal

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

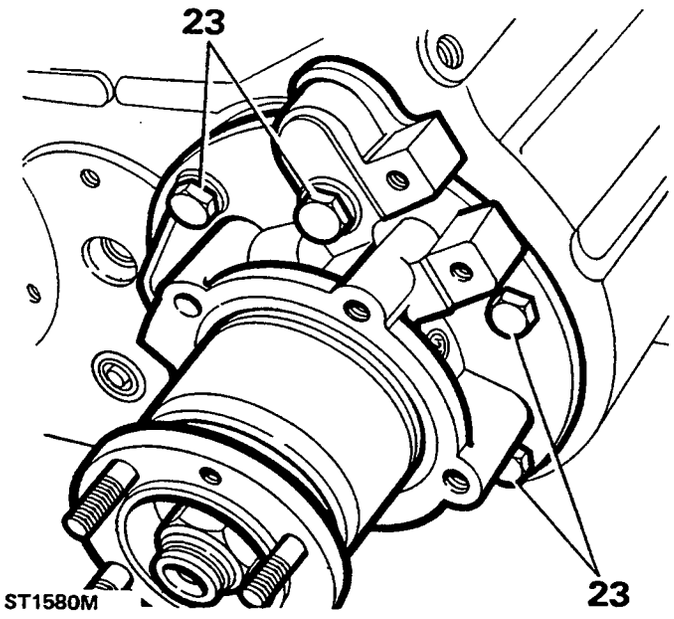


22. Withdraw the centre differential and selector shaft/fork assembly.



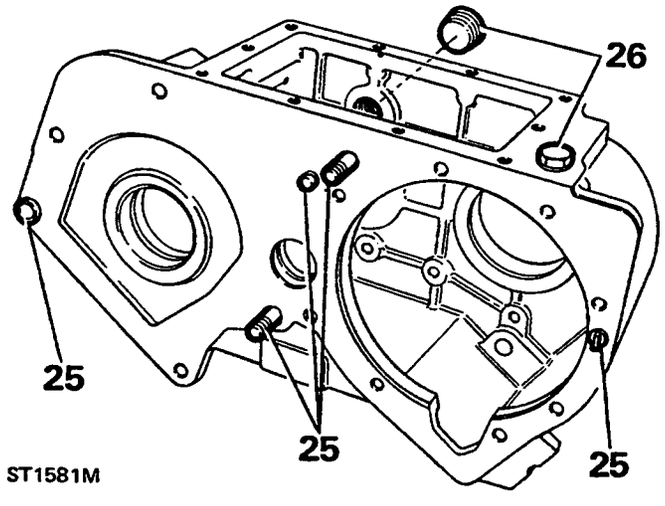
Rear output housing removal

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.

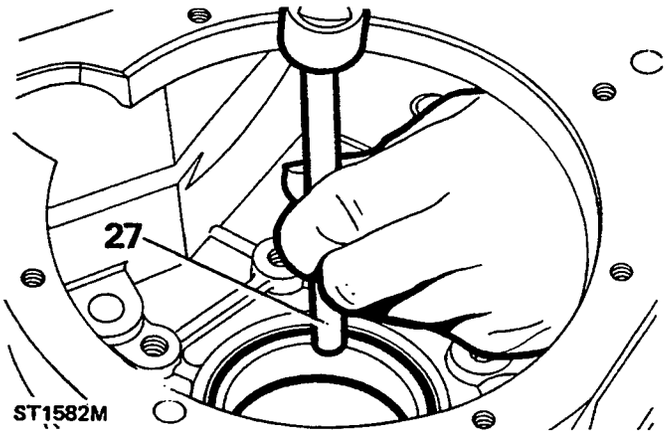


Transfer case, dismantle and overhaul

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.



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.

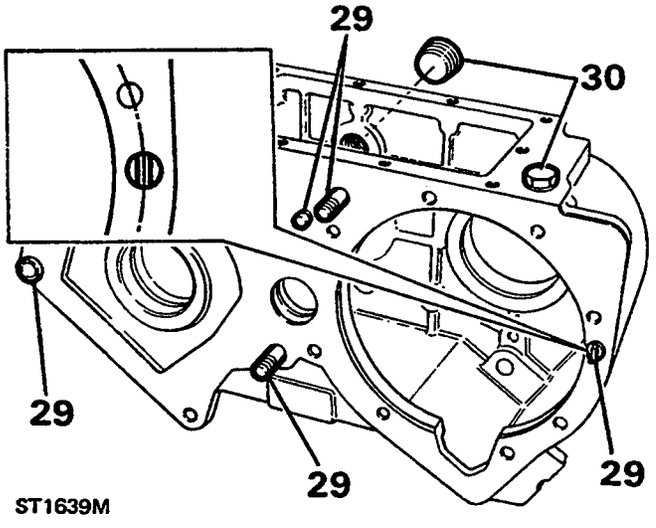


Transfer case overhaul - reassembling

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.

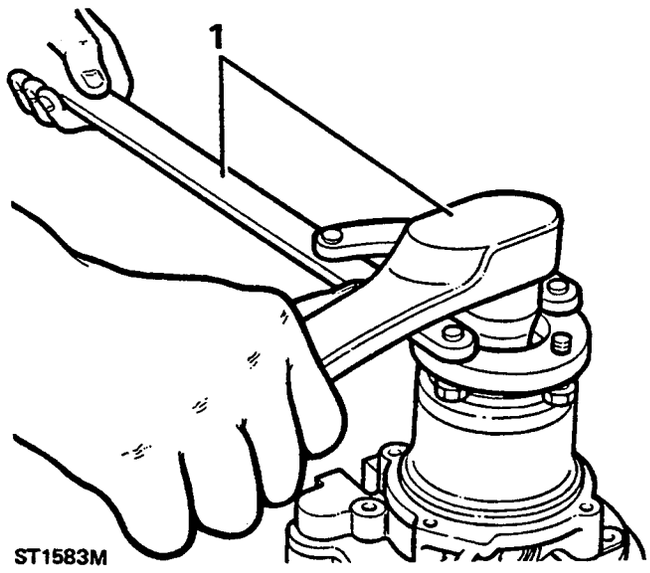
30. Refit magnetic drain plug with new copper washer and tighten to the specified torque, loosely fit the filler/level plug.



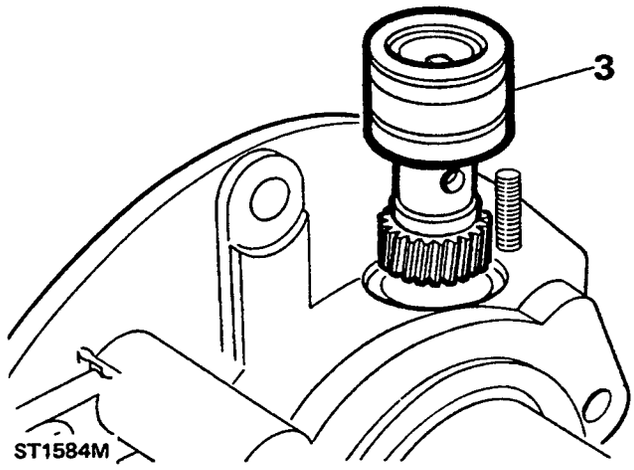
Rear output housing dismantle and overhaul

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.

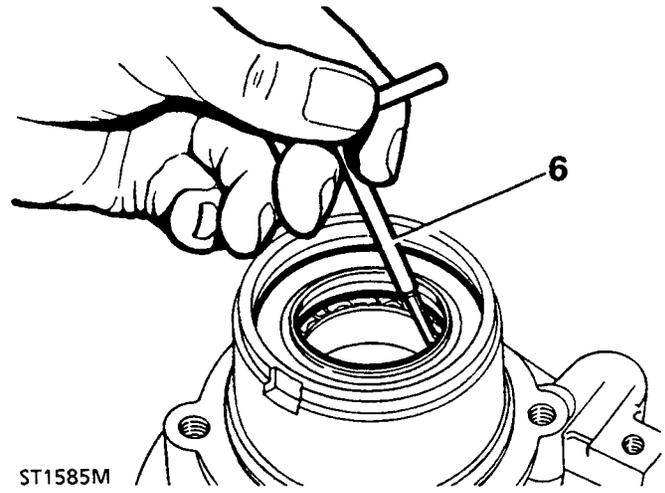
NOTE: The circlip need only be released if the flange bolts are to be replaced.



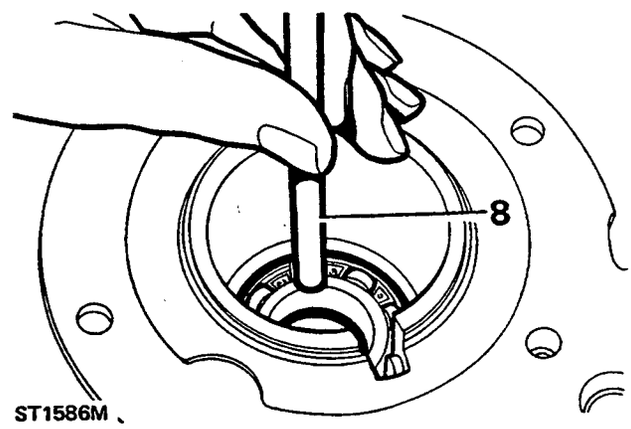
3. Remove speedo - drive housing. This can be eased out with a screwdriver.



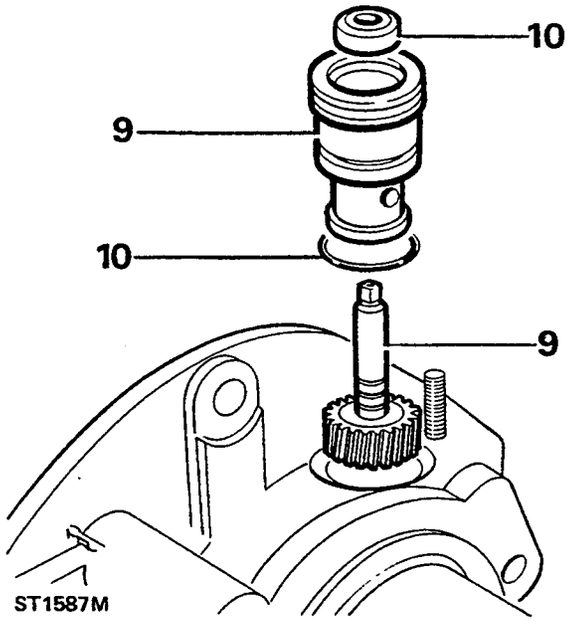
4. Remove housing from the vice and drive out the output shaft, by striking the flange end of the shaft.
5. Carefully lever off the oil catch ring using a screwdriver in the slot provided.
6. Remove and discard the seal from the output housing using tool 18G 1271 to avoid damaging the housing.



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

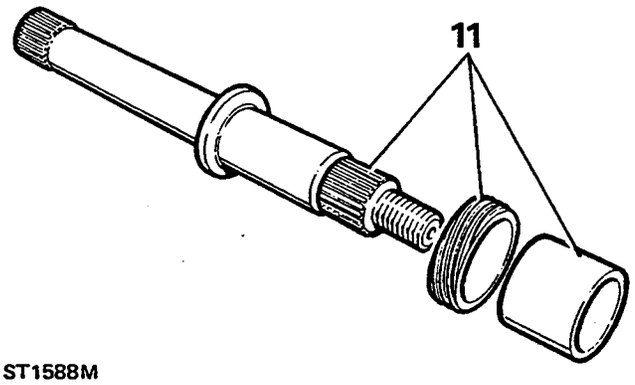


9. Remove speedometer gear (driven) from its housing.
10. Remove the 'O' ring and oil seal and discard.



ST1587M

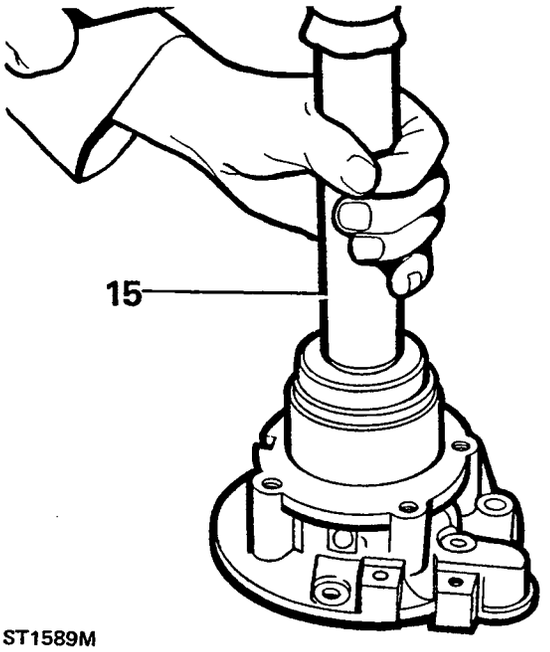
11. Slide off spacer and speedometer drive gear from output shaft.
12. Clean all parts, replace the 'O' ring, oil seals, felt seal and flange nut. Examine all other parts for wear or damage and renew, if necessary.



ST1588M

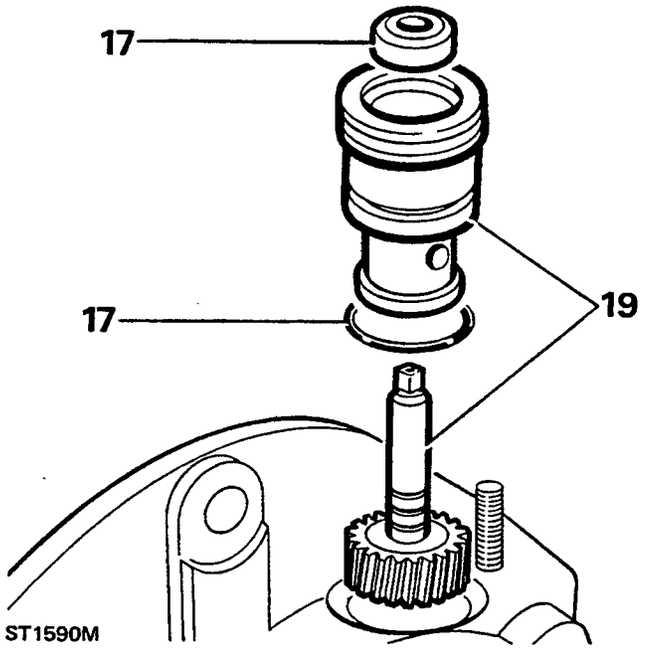
Re-assembling rear output housing

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.
15. Pre-grease between the seal lips and fit new seal, lip side leading, using tool 18G1422. The seal should just make contact with the bearing circlip.



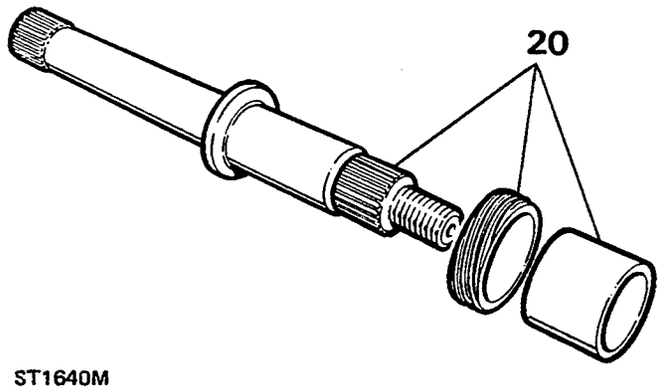
ST1589M

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 (lip 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.



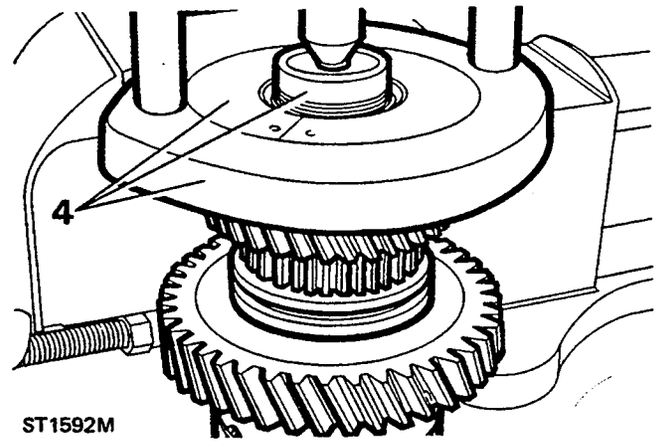
ST1590M

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

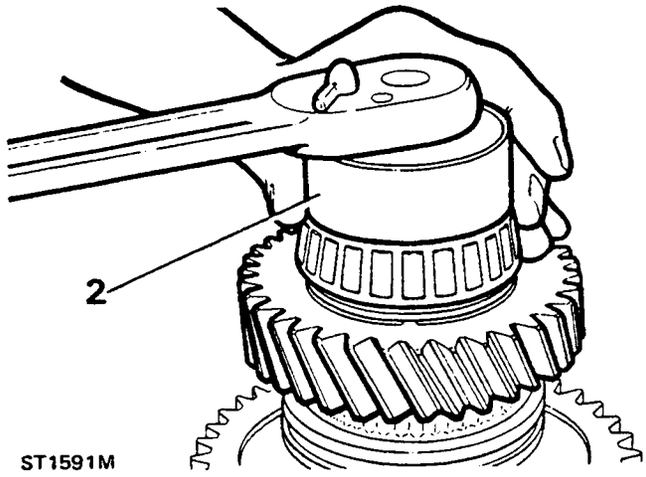
4. Secure hand press MS47 in vice with collars 18G47BB - 1 and using button 18G47BB/3 remove the rear taper bearing and collars.



ST1592M

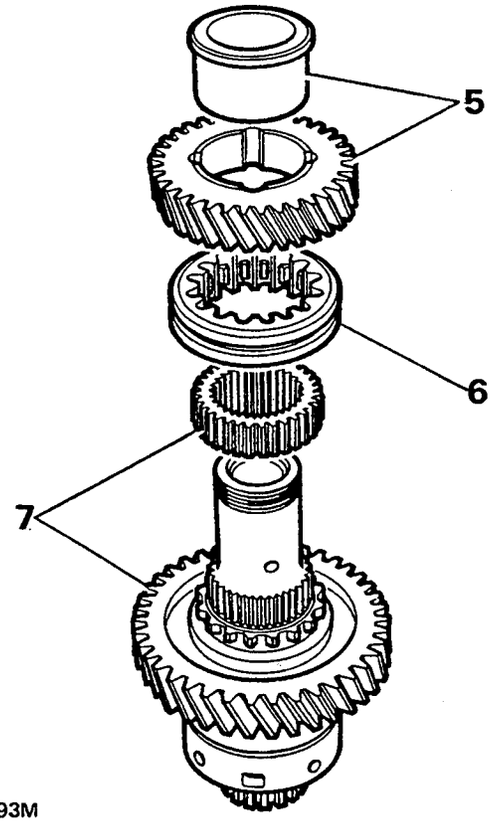
Centre differential unit dismantle and overhaul

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.



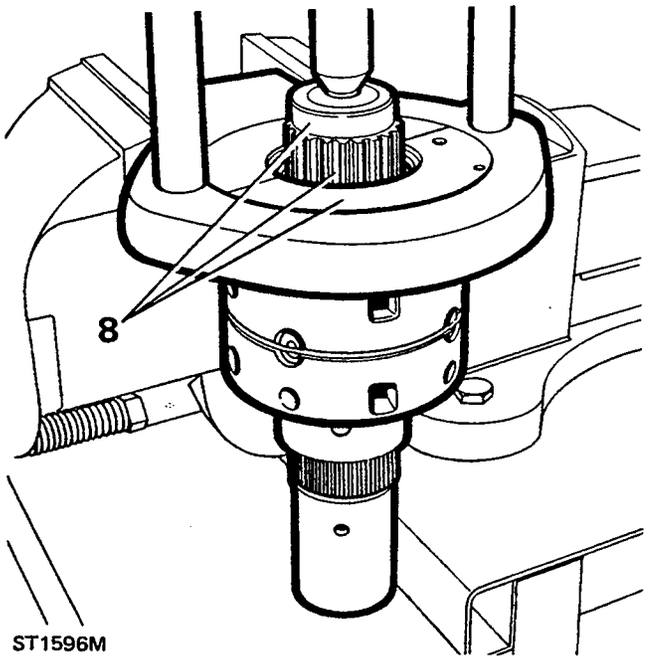
ST1591M

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.

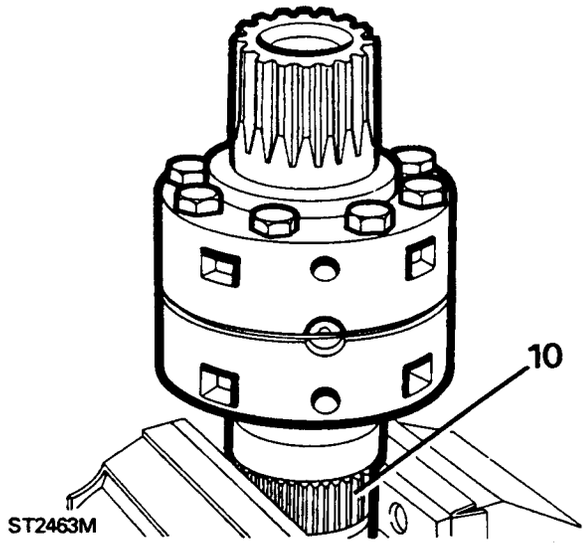


ST1593M

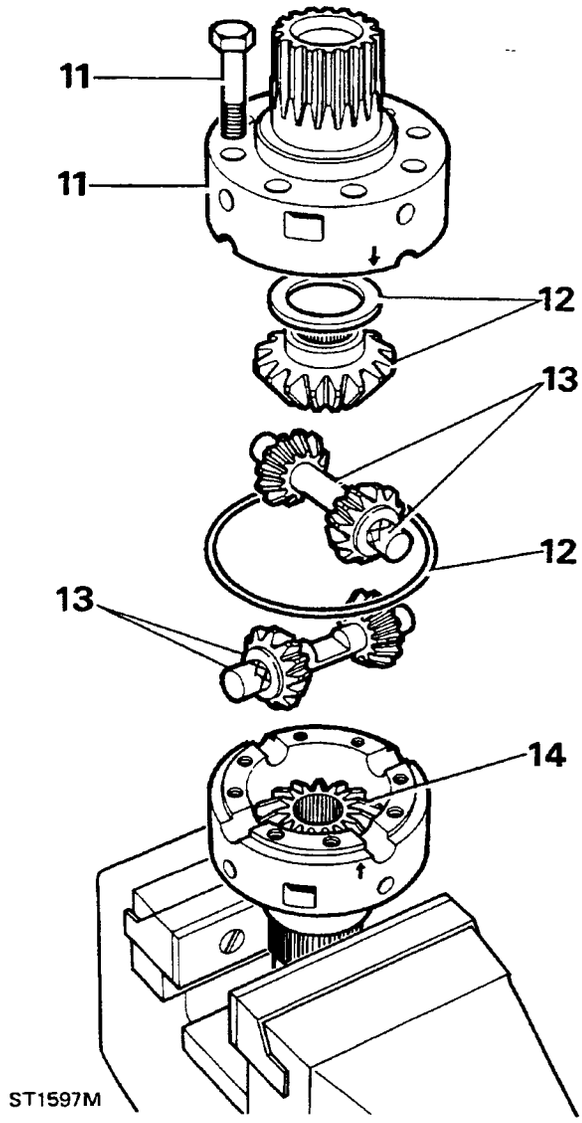
8. Substituting collar LST47 - 1 remove front taper roller bearing from the differential.
9. Remove hand press from the vice.



10. Using soft jaws secure the differential unit in the vice by gripping the hub splines.

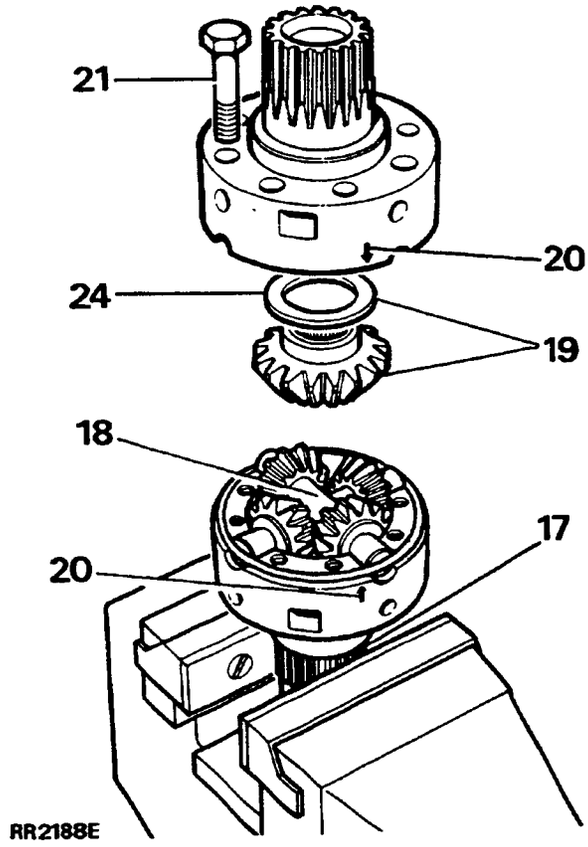


11. Remove the eight retaining bolts and lift off the front part of the differential unit.
12. Release the retaining ring and remove front upper sun gear and thrust washer.
13. Remove the planet gears and dished washers along with the cross shafts.
14. Remove the rear lower sun gear and thrust washer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



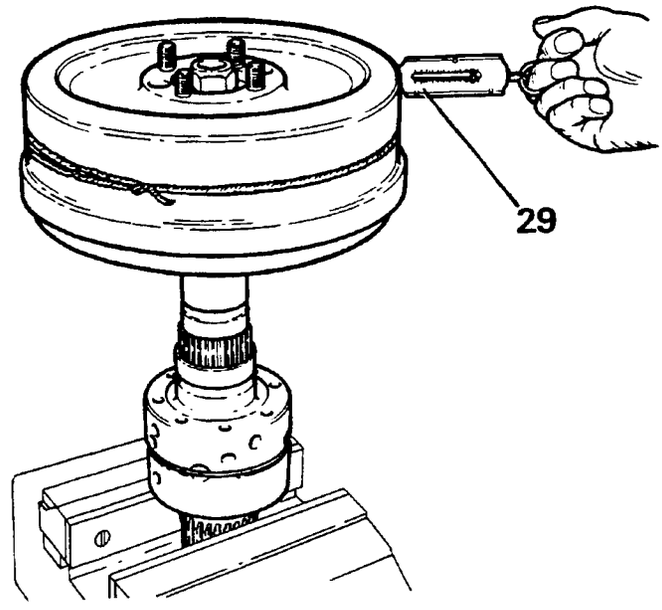
16. Inspect all components for damage or wear, fit new components if necessary.
17. Using soft jaws secure the rear (longest half) of the differential unit in the vice by gripping the hub splines.
18. Lubricate and install the cross shafts and pinion gears with new dished washers **DO NOT** fit the rear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

19. Lubricate and fit the front bevel gear and thinnest thrust washer (FRC6956 1.05mm).
20. Fit the 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 VALVES).
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 transmission brake drum to the output drive flange and check the torque required to rotate the gears. Tie a lenght 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 the illustration RR2332E shows checking torque at rear bevel gear.



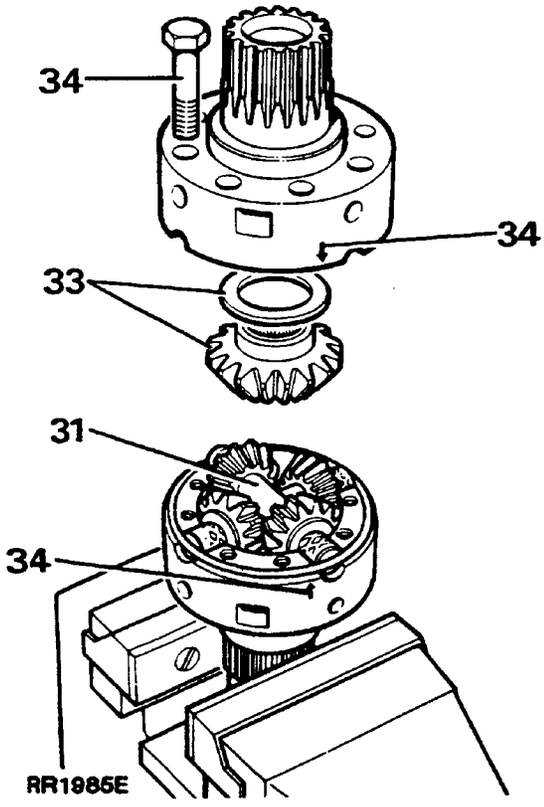
RR2332E

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

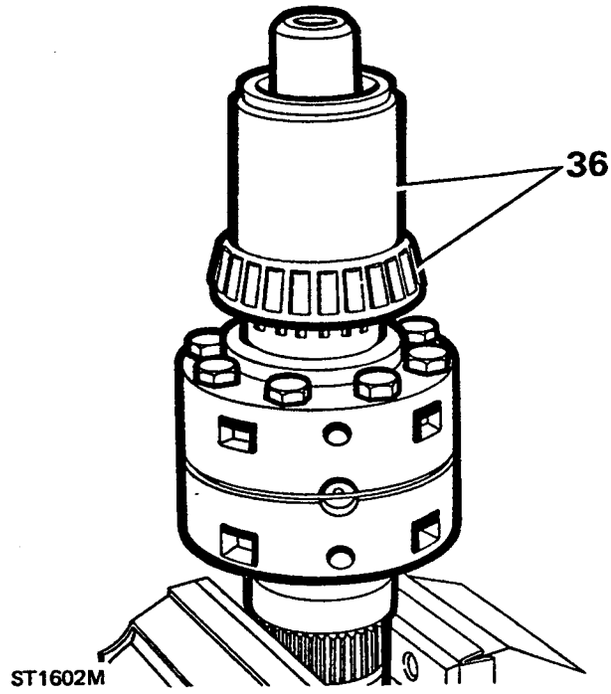
Re-assembling centre differential

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

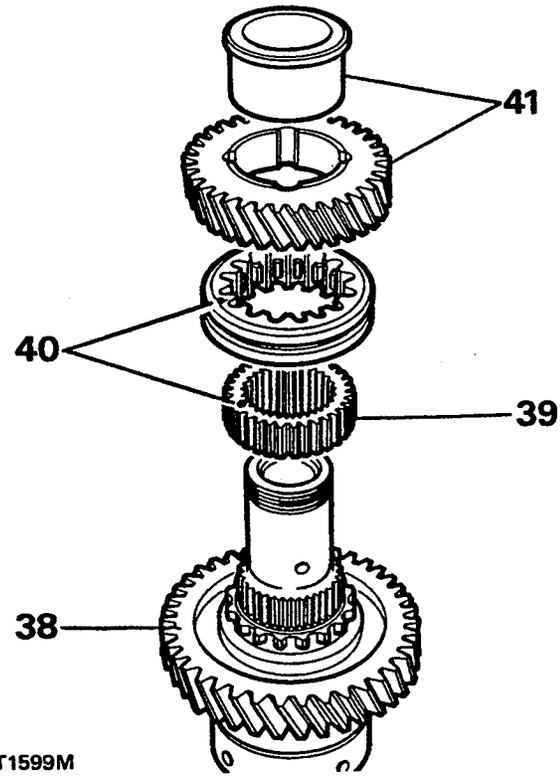


31. Assemble both pinion assemblies and dished washers onto their respective shafts and fit the rear differential unit. Secure the assemblies with the retaining ring.
32. Lubricate all the components.
33. Fit the selected thrust washer and bevel gear into the front upper differential unit.
34. Align both units as previously described and secure with the eight bolts to the specified torque.
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.

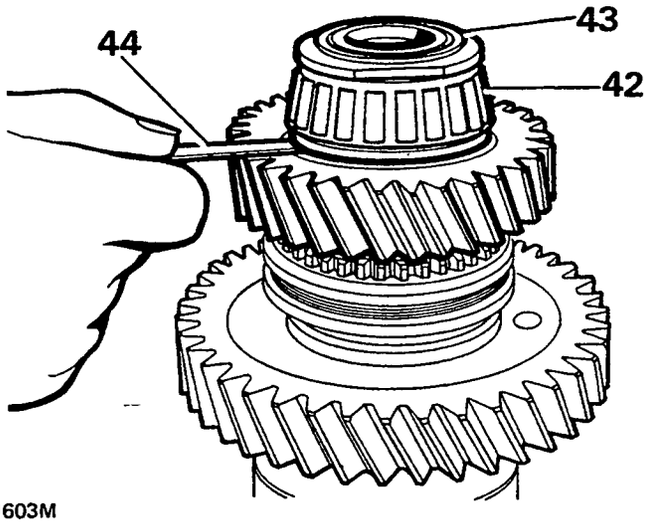
NOTE: During the following sequences all parts should be lubricated as they are fitted.



38. Fit the low range gear, with its dog teeth uppermost to 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.



42. Locate the rear differential bearing on to the hub and press it into position using the smaller end of tool 18G1424, see instruction 36.
43. Fit the stake nut and tighten to the specified torque using tool 18G1423.
44. Check the end float of the high and low range gears 0,05 to 0,15 mm (0.002 to 0.005 in).

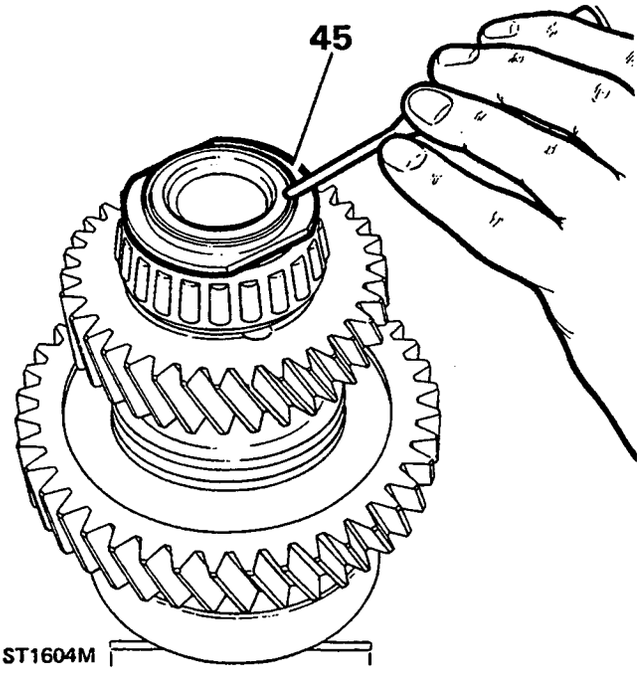


ST1603M

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.

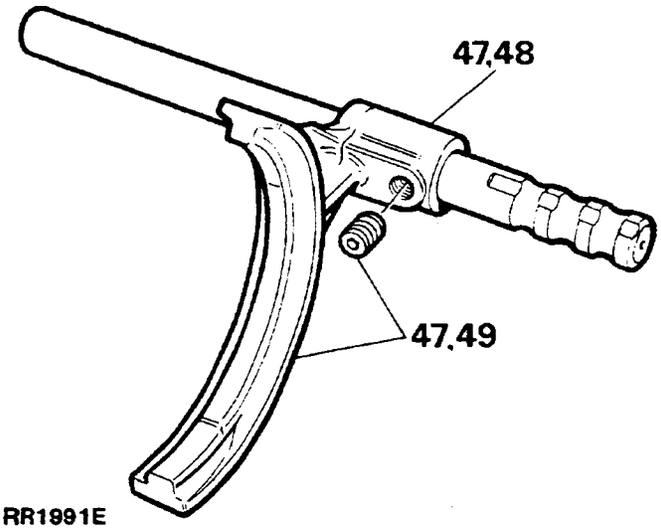
45. Peen the stake nut collar by carefully forming the collar of the nut into the slot as illustrated.

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



ST1604M

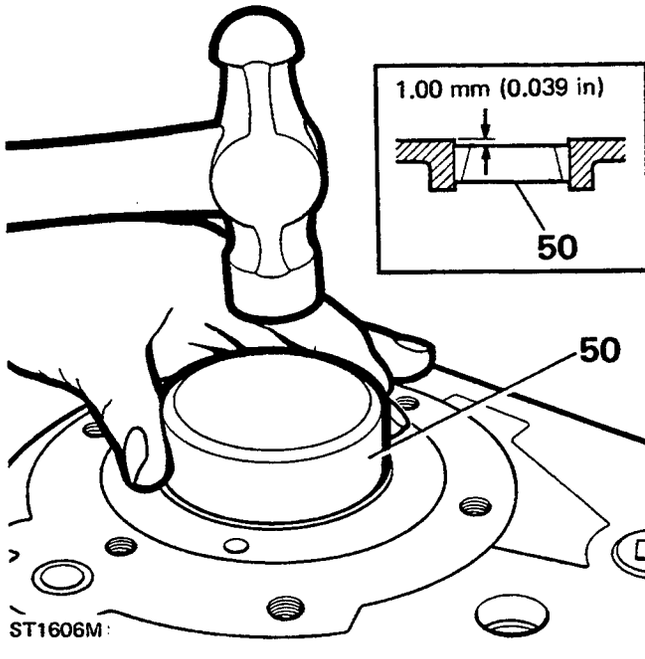
46. Clean and check high/low selector fork assembly for wear and renew if necessary.
47. To renew the selector fork remove the set screw and slide the fork from the shaft.
48. Fit the new selector fork with its boss towards the three detent grooves. Align the tapped hole in the fork boss with the indent 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.



RR1991E

Centre differential rear bearing track

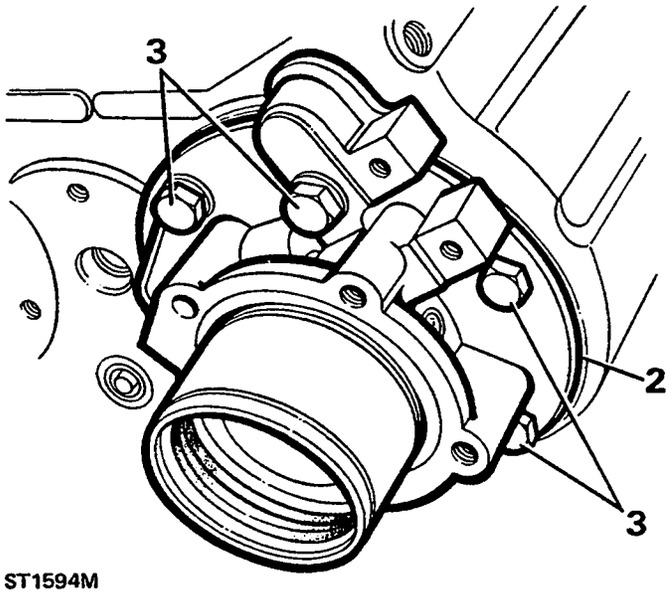
50. Fit the differential rear bearing track 1,00 mm (0.039 in) below the outer face of casing using a suitable tool as shown.



ST1606M

Rear output housing - refit

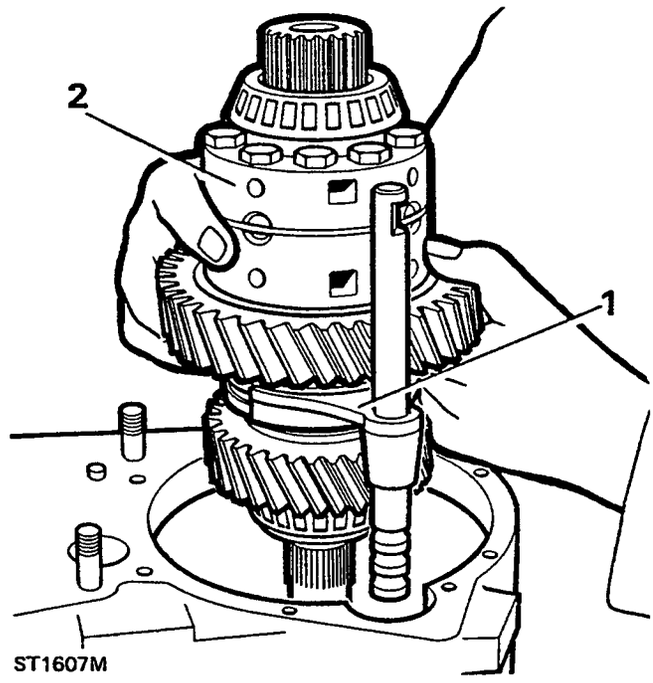
1. Grease output housing gasket and position on to the rear face of the transfer box casing.
2. Fit output housing and ensure clearance of 100 mm (0.039 in) between housing face and gasket.
3. Fit the six output housing bolts with Loctite 290 on the threads, with washers and tighten evenly to the correct torque, which will pull the rear bearing into position.



ST1594M

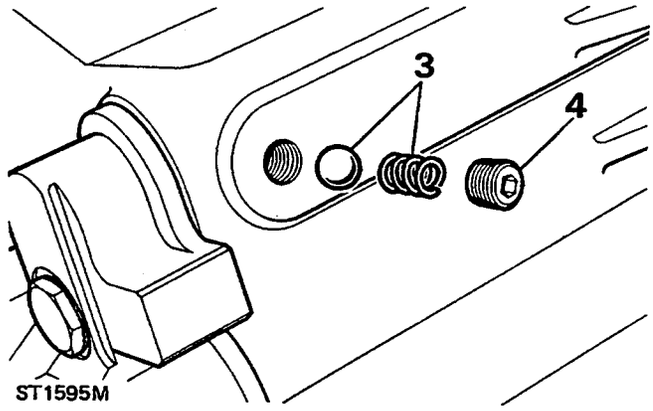
Centre differential unit refit

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 engage selector shaft into its hole.



ST1607M

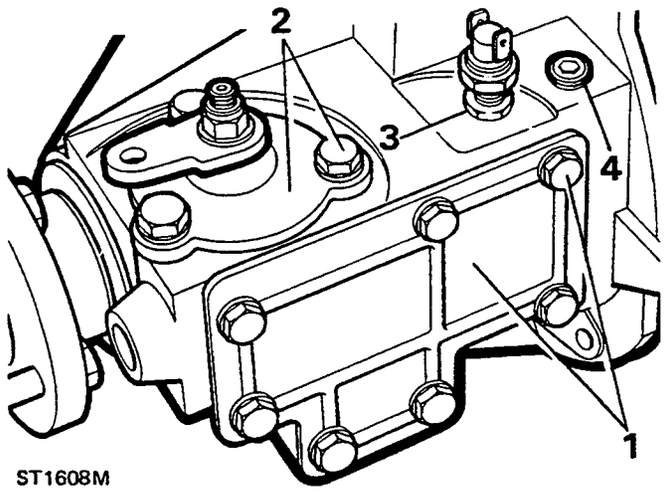
3. Fit selector shaft ball and spring through the side of the transfer box casing.
4. Apply Loctite 290 to detent plug; fit and locate, by screwing gently fully home and then unscrewing two turns.



ST1595M

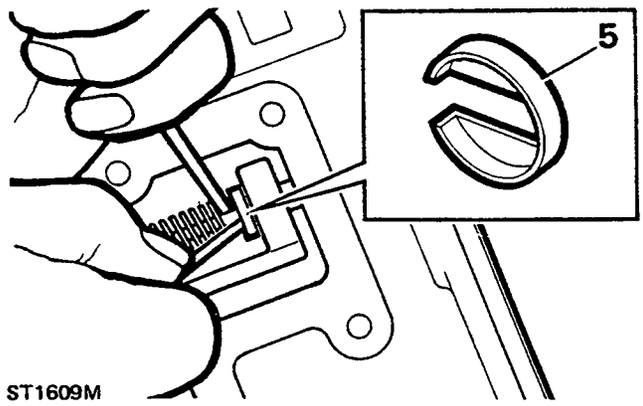
Front output housing dismantle and overhaul

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



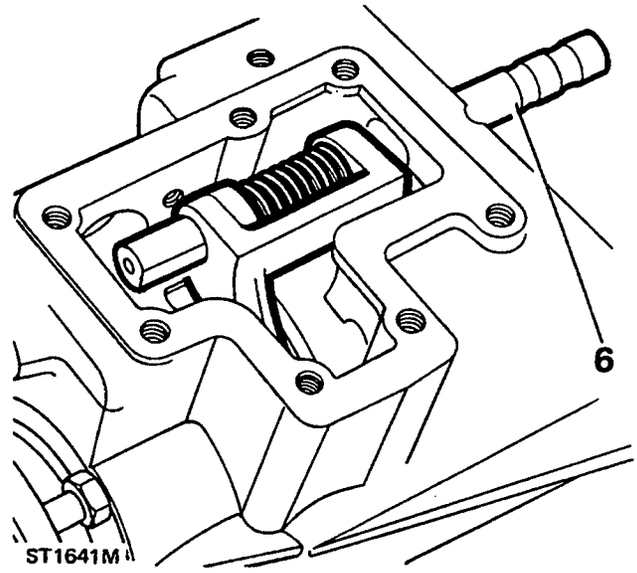
ST1608M

5. Compress the selector fork spring and remove the two spring retaining caps.



ST1609M

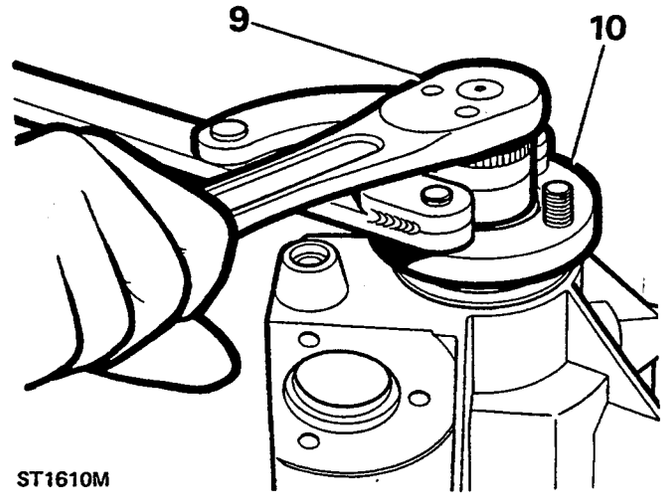
6. Withdraw the selector shaft from the rear of the output housing.
7. Remove the selector fork and spring through the side cover aperture.
8. Remove lock - up sleeve from the rear of the output housing.



ST1641M

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.

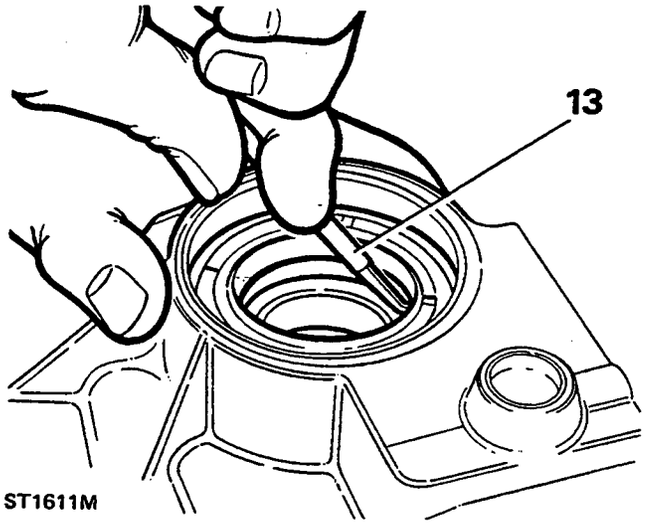


ST1610M

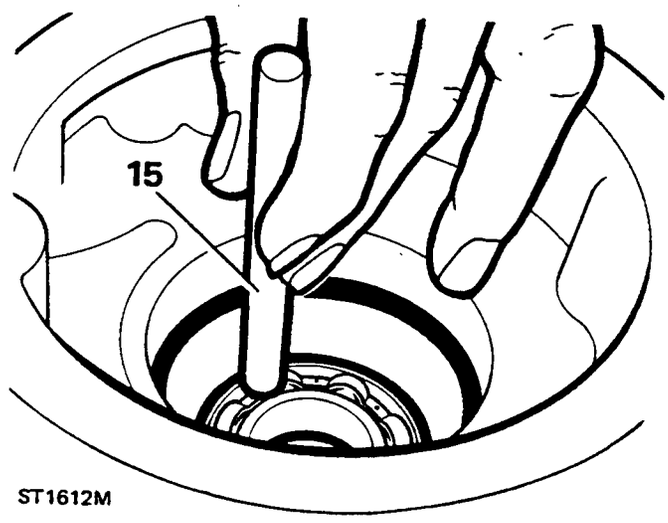
10. Remove the output flange with oil seal shield.

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

11. Drift output shaft rearwards from housing using a soft headed mallet.
12. Slide off the collar from the output shaft.
13. Remove and discard oil seal from output housing using service tool 18G1271 to avoid damaging the housing.
14. Remove circlip with circlip pliers 18G257.

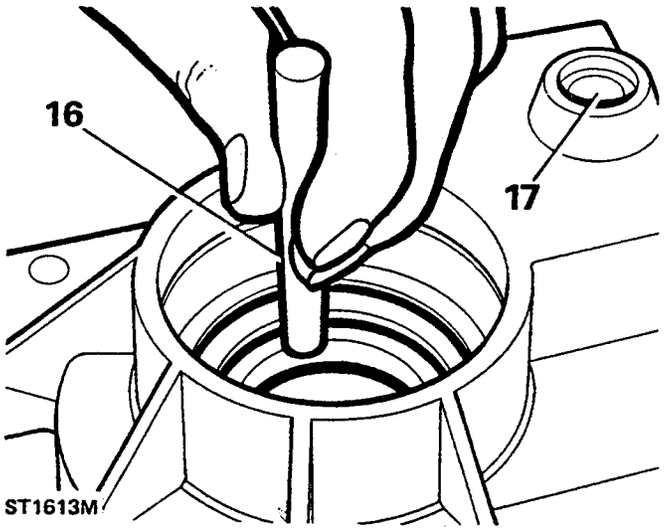


15. Invert housing and drift out bearing from inside the case as shown.



16. Drift out centre differential front taper roller bearing track and shim.
17. Drift 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 renew if necessary.

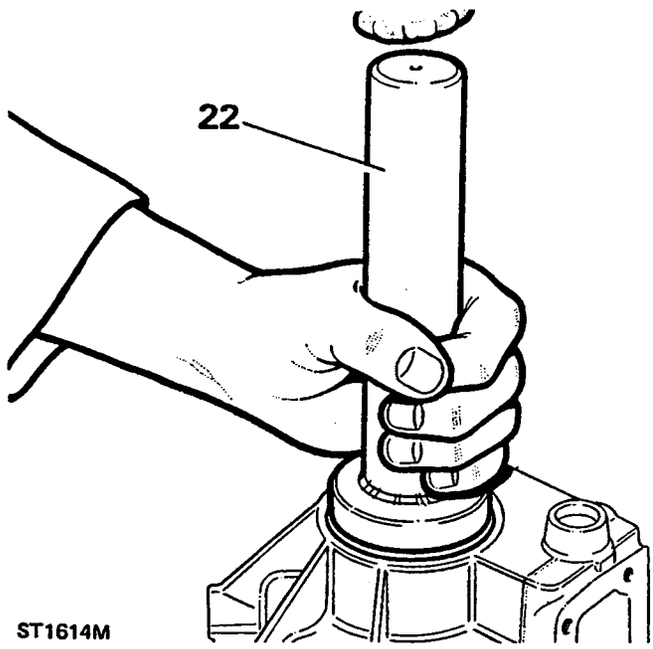
NOTE: Renew oil seal and felt seal and flange nut.



Re-assembling front output housing

20. Press the bearing into the housing; do not use excessive force. To facilitate fitting the bearing, heat the front output housing. Uniformally in a temperature that must not exceed 100°C (212°F).
21. Using circlip pliers, fit the bearing retaining clips.

22. Pre - grease and fit a new oil seal (lip side inwards) using replacer tool 18G1422, until the seal just makes contact with the circlip.

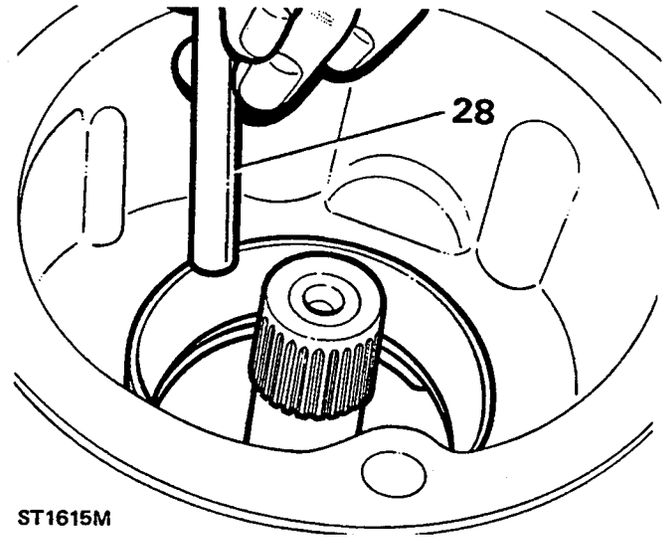


ST1614M

23. Carefully charge 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 drift home.

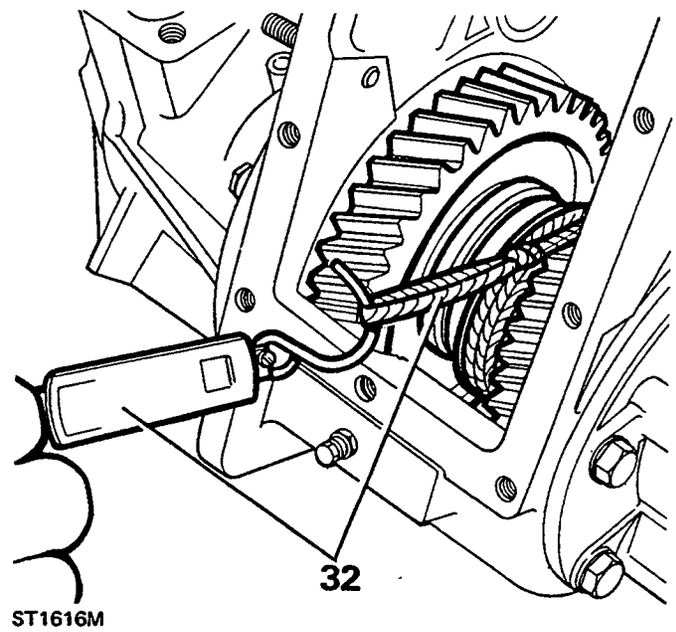
Adjusting front differential bearing pre - load

26. Measure original differential front bearing track shim.
27. Refit original shim into input housing.
28. Drift differential front bearing track into the housing.



ST1615M

29. Grease and fit new gasket and locate the front output housing on the transfer box casing.
30. Secure housing with the eight retaining bolts and washers, the upper middle bolt being longer than the rest. Do not tighten the bolts 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.



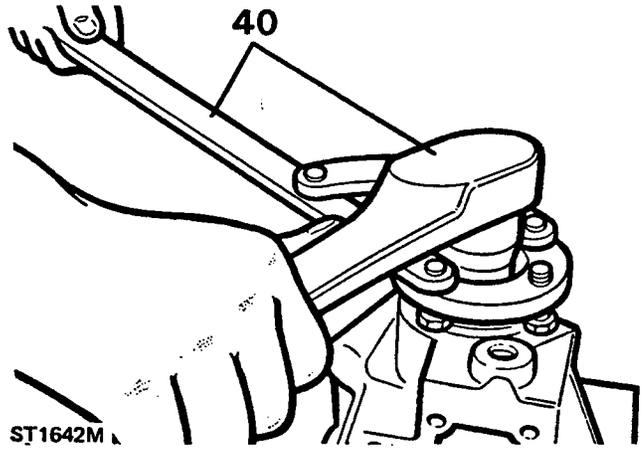
ST1616M

33. With the correct shim fitted the load to turn should be 1,36 kg to 4,53 kg (3 lb 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 top end and used bearings will register at the low end).

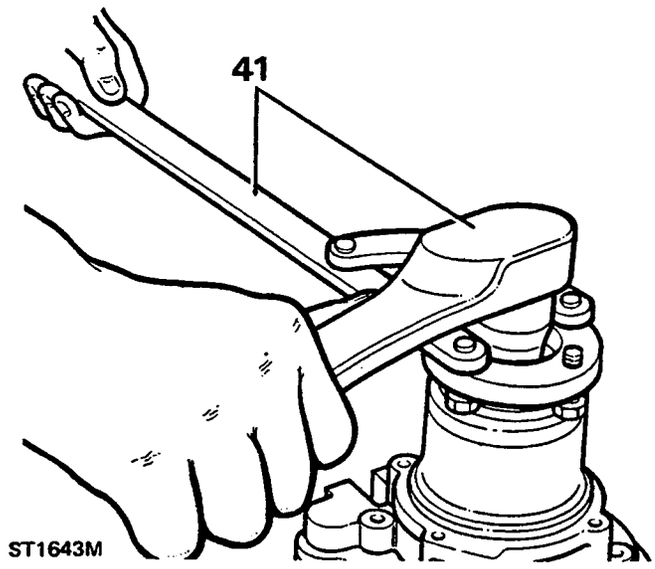
NOTE: Shims are available in 0.001 in increments.

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 secure to transfer box casing.
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.

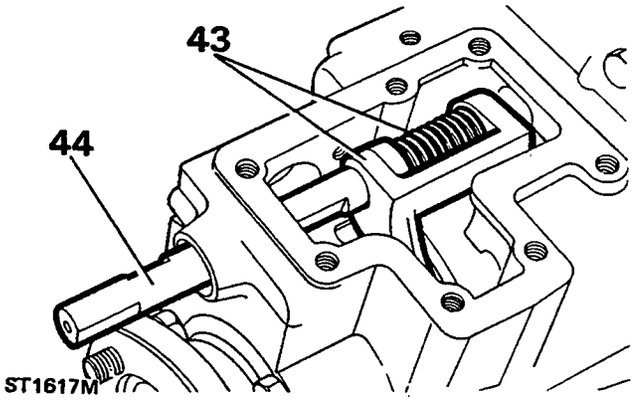


NOTE: Ensure that the flange bolts are fully engaged in the wrench.

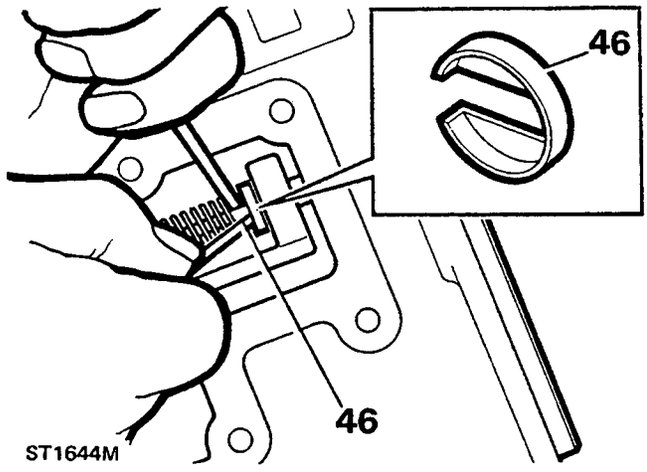
41. Repeat the above operation for the rear output flange.



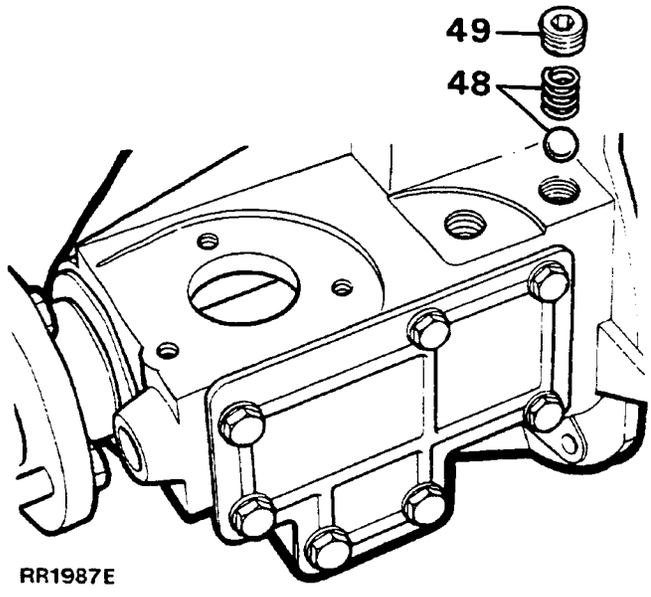
42. Compress the selector shaft spring and fit to the select fork.
43. Locate selector fork through front output housing side cover aperture, ensuring that the fork engages in the groove of the lock - up sleeve.
44. Fit selector shaft through the aperture in the front of the output housing and pass it 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.



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



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.

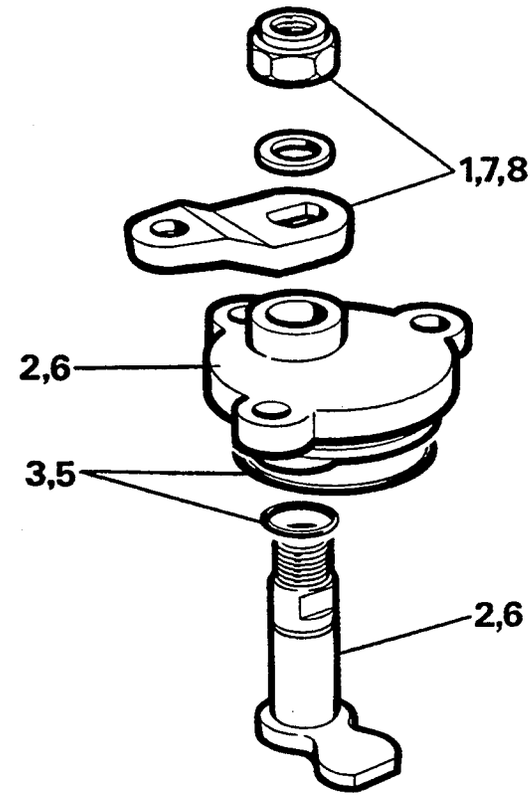


Differential lock finger housing - dismantle and overhaul

1. Unscrew and discard the 'nyloc' nut and remove the operating lever and washer.
2. Remove the pivot shaft from 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 renew if necessary.

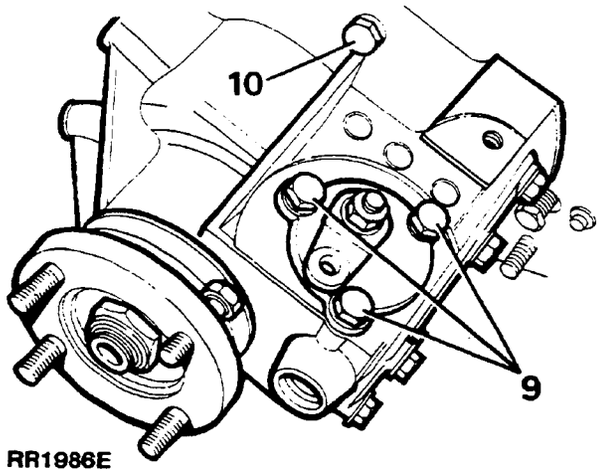
Re-assembling

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 face forward to the bend upwards.
   This lever is then in the correct operating position.
8. Retain the lever with a plain washer and new 'nyloc' nut.



Continued

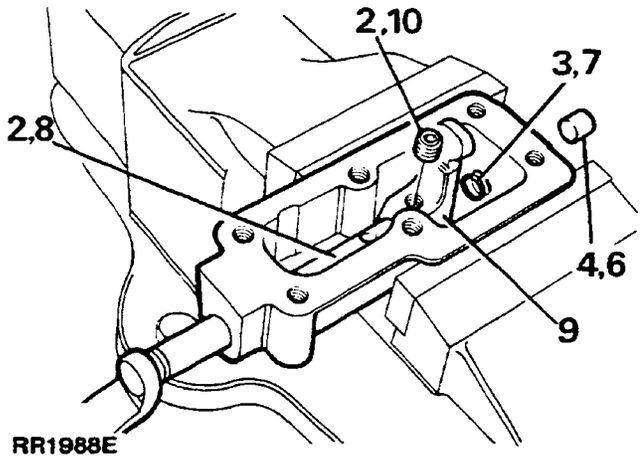
9. Fit the differential lock finger housing into its seating on the front output housing, ensuring that the selector finger is located in the flat of the selector shaft.
10. Apply Loctite 290 to the bolt threads and retain the lock finger housing with the three bolts and washers to the specified torque.



RR1986E

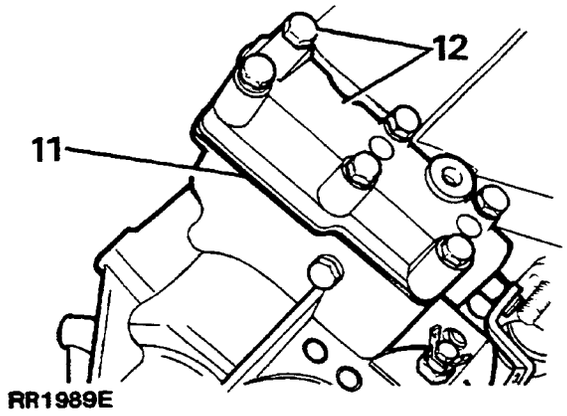
High/low cross - shaft housing overhaul

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.
9. Fit selector finger ensuring that it aligns with the recess in the cross - shaft.
10. Apply Loctite 290 to the grub screw and secure the selector finger to the cross - shaft and fully tighten to the specified torque.



RR1988E

11. Grease and fit the high/low selector housing gasket on the front output housing.
12. 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.

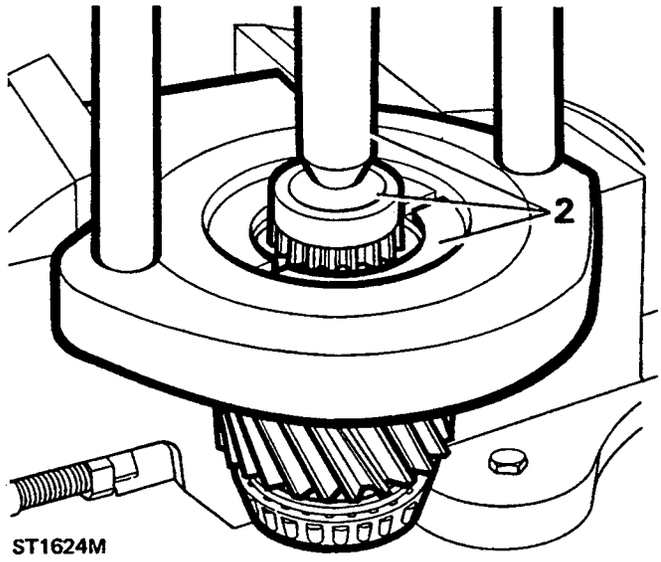


RR1989E

Input gear overhaul - dismantle and overhaul

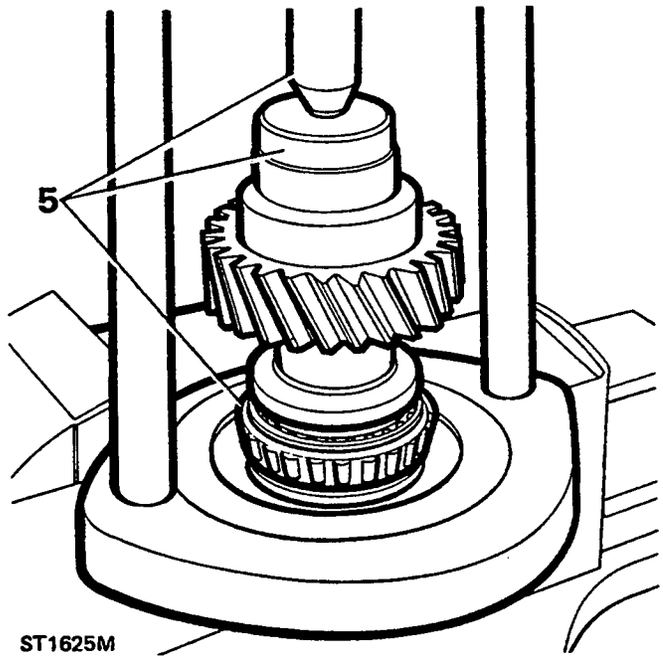
1. Clean the input gear assembly and examine for wear or damage. Remove the bearings only if they are to be renewed.

2. Secure hand press MS47 in the vice and using collars 18G47 - 7 and button 18G47 - BB/3, remove rear taper roller bearing from input gear assembly.
3. Invert input gear assembly in hand press and remove front taper roller bearing.
4. Clean input gear.

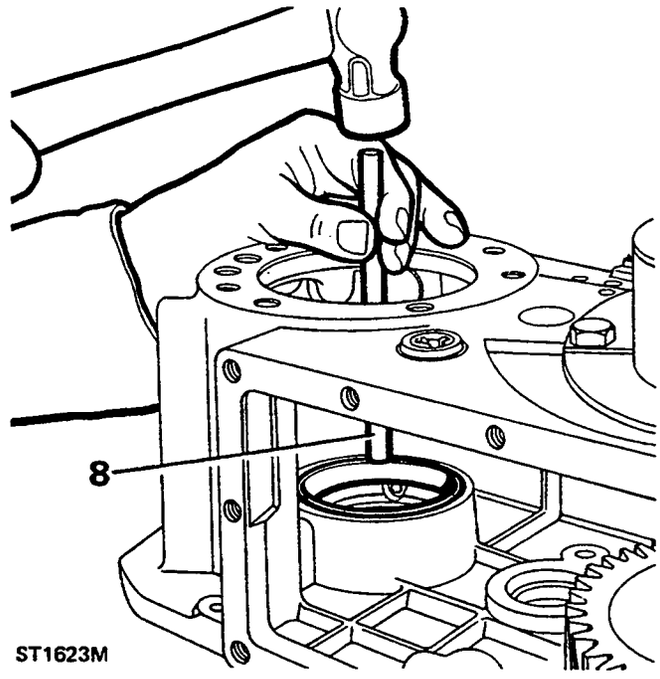


Re-assembling input gear assembly

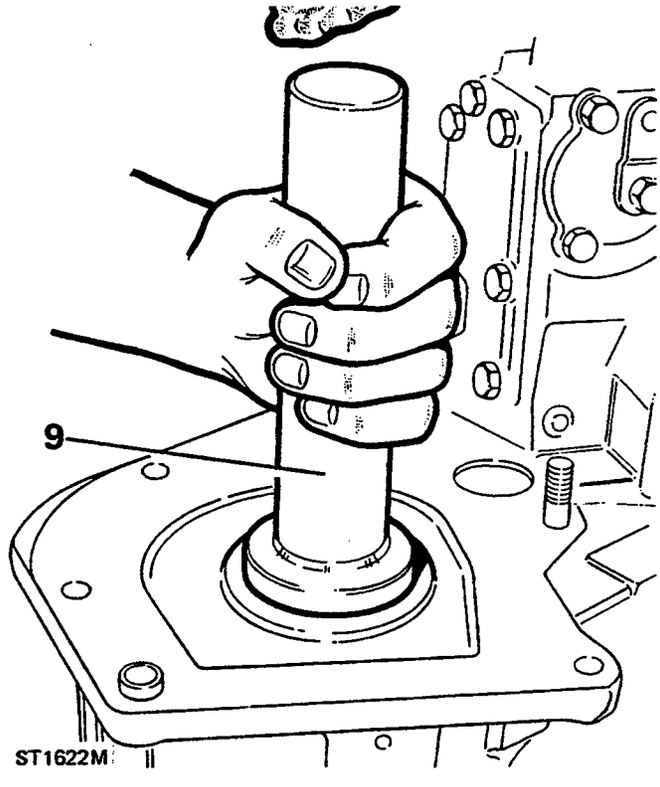
5. Position rear taper roller bearing on input gear and using hand press MS47 and collars 18G47 - 7 press the shaft onto bearing.
6. Invert input gear and fit the front taper roller bearing using the press and collars.



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



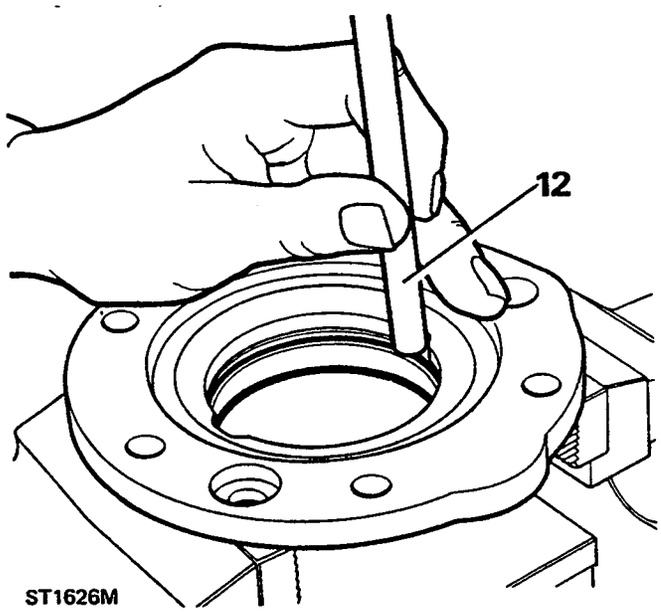
9. Reposition transfer box casing so the front face is uppermost and fit oil seal (lip side inwards) using replacer tool 18G1422.



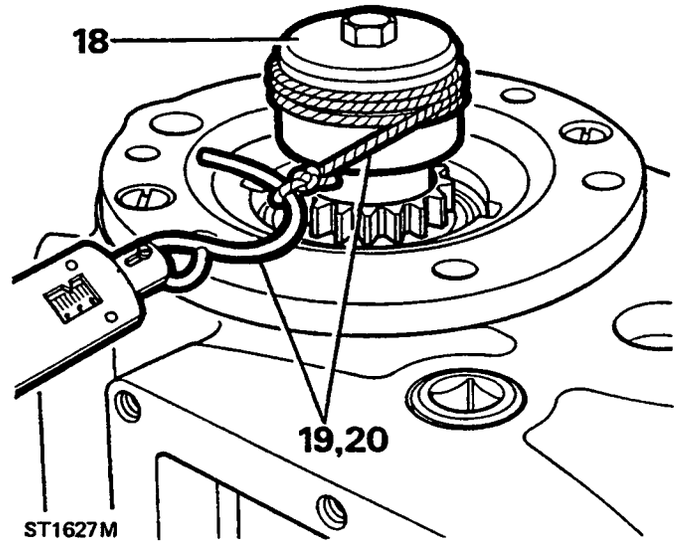
10. Lubricate both bearings with clean oil.
11. Fit the input gear assembly into the transfer box casing with the dog teeth uppermost.

Checking input gear bearing pre - load

12. Secure bearing support plate in the vice. Drift 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.



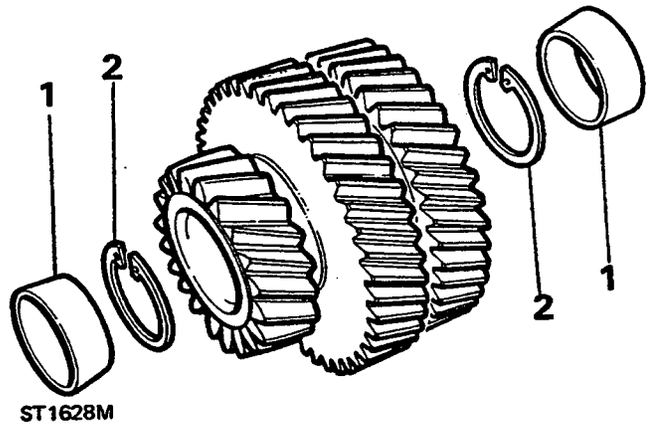
19. Tie a length of string to the split pin and fit it to the service tool as shown.
20. Attach a spring balance to the string and carefully tension the spring until a load to turn the input gear is obtained. A pull of 2,26 kg to 9 kg (5 lb to 20 lb) is required.

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 2.25 Nm (5 to 20 in lb).

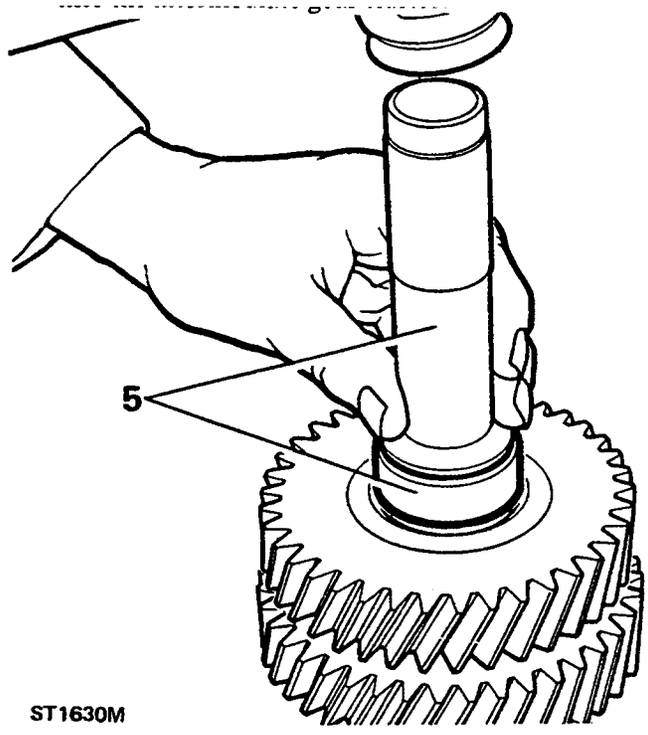
21. If the reading obtained is outside the above limits, the original shim must be changed.
22. Remove the spring balance, string and service tool.
23. Remove the six bolts and the bearing support plate.
24. Drift out the input gear bearing track from the support plate and discard original shim.
25. Select the correct size shim to obtain a load to turn of 2,26 kg to 9 kg (5 lb to 20 lb) or torque to turn 0.56 to 2.25 Nm (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 **(do not tighten).**
28. Repeat the rolling resistance check as previously described, and note the value obtained.

Intermediate gear assembly overhaul

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

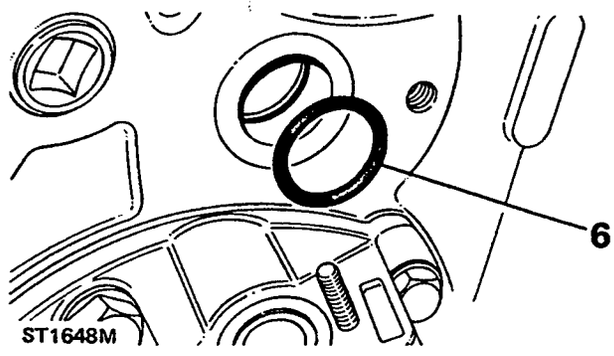


3. Clean all intermediate gear components and lock plate. Check for damage or wear and replace as necessary.
4. Fit new circlips into the intermediate gear cluster.
5. Using tools LST550 - 4 and MS550 fit bearing tracks into the intermediate gear cluster.



ST1630M

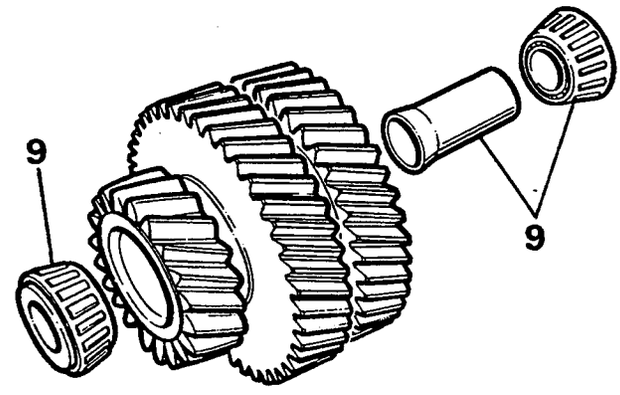
6. Fit the 'O' rings to the intermediate shaft and into the intermediate shaft bore at the front of the transfer box casing.



ST1648M

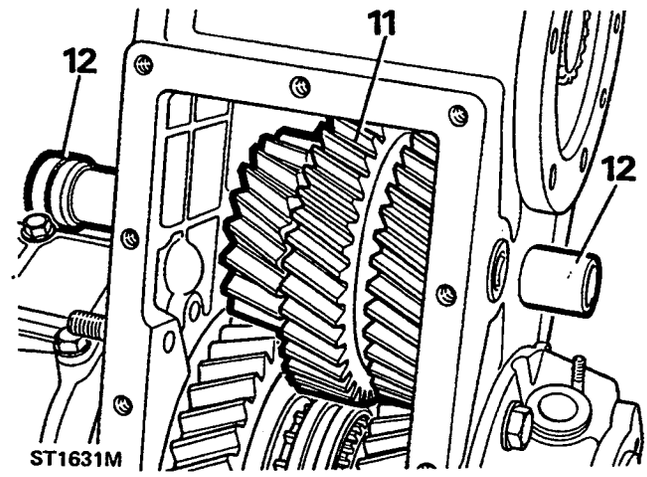
Intermediate gear reassembly

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 bearing and intermediate gear shaft.
9. Insert new bearing spacer to gear assembly, followed by the taper roller bearings.



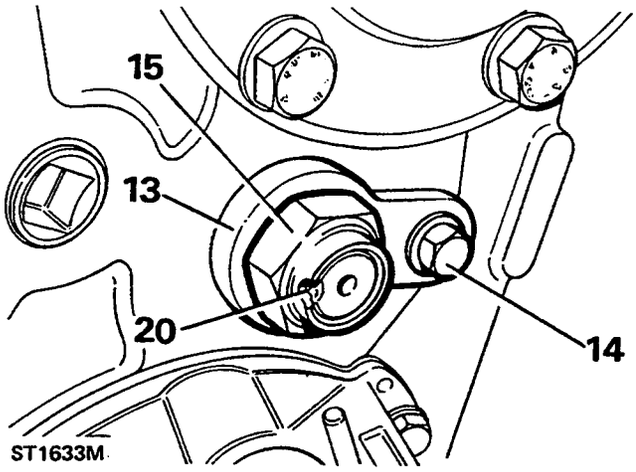
ST1649M

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 high range and low range gears.)



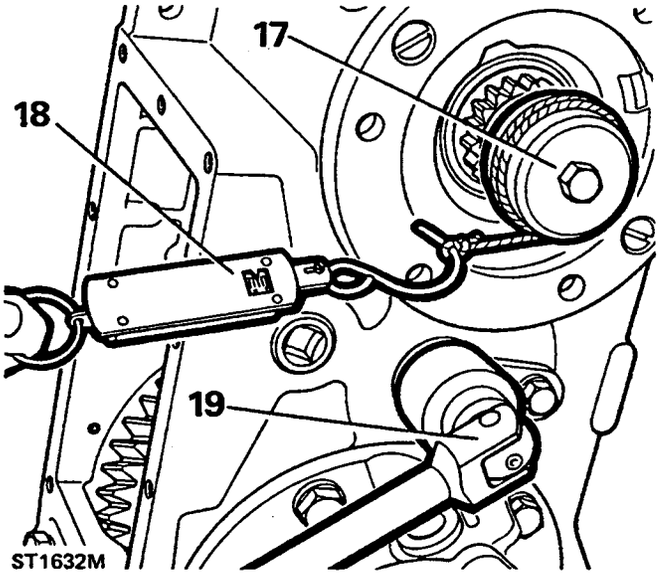
ST1631M

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.



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 split 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) ± 1,63 kg (± 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.

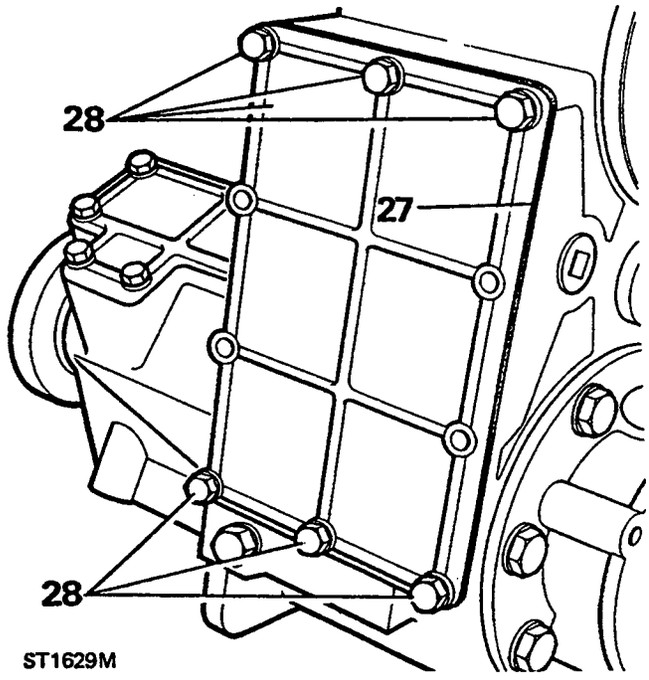
CAUTION: A round nose tool must be used for this operation to avoid splitting the collar of the nut.

Power take - off cover - reassemble

21. Clean power take - off cover and gasket face.
22. Fit the two countersunk screws and tighten.
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.

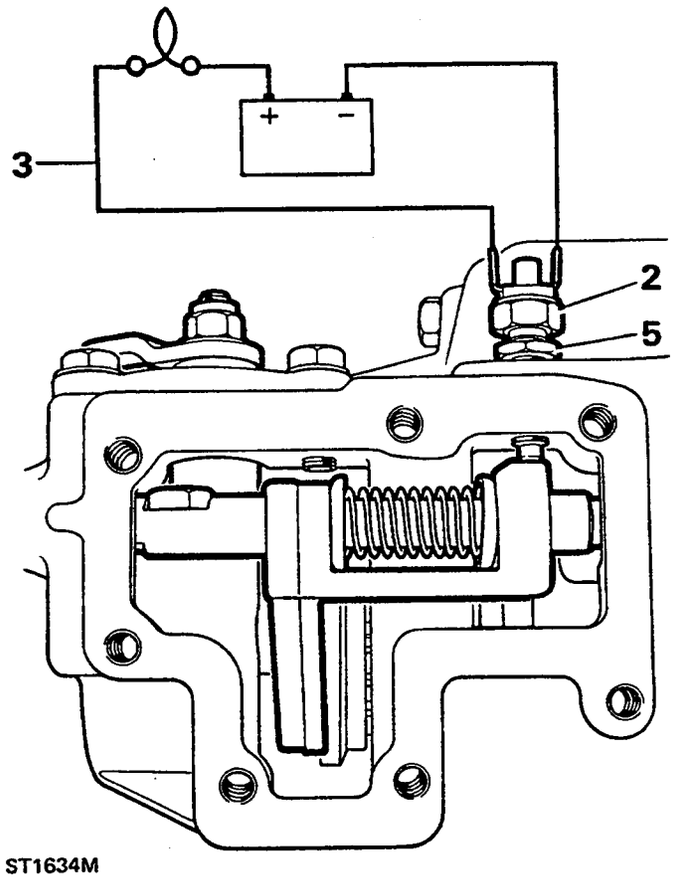
Bottom cover - reassemble

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.



Differential lock switch adjustment

1. Select differential locked position by moving the lock taper 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.



ST1634M

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 threads, fit side cover and secure with seven bolts and washers.

Transmission brake drum - re-assemble.

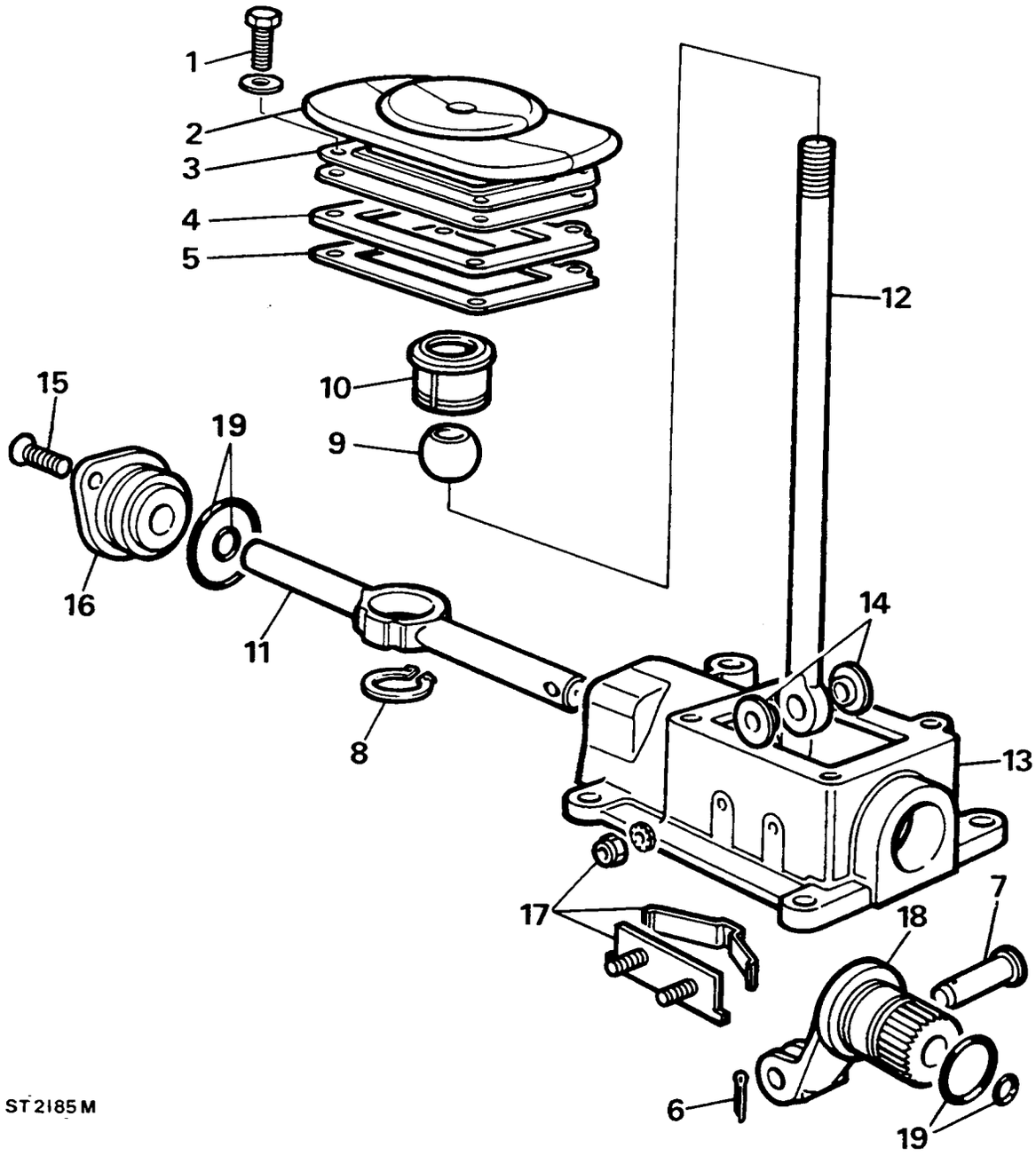
1. Clean brake backplate and oil catcher and apply sealant to the catcher joint face.
2. Locate brake backplate on the rear output housing with the brake operating lever on the right side of the transfer box casing.
3. Secure the backplate (including the oil catcher) with the four special bolts and tighten using a hexagonal socket to the specified torque.
4. Clean and fit brake drum and secure with two countersunk screws.

Transfer gear housing

1. Remove the four screws and remove the gaiter assembly.
2. Disconnect the gear lever from the selector fork.
3. Retrieve the non-metallic bushes.
4. Remove the circlip to release the ball and nylon seat and withdraw gear lever.
5. Remove screws from end cover to withdraw cover and cross shaft.
6. Remove selector fork.
7. Remove detent spring and plate.
8. Clean and examine all parts as necessary.

NOTE: Assemble the housing using multi-purpose grease on all moving parts.

9. Fit internal and external 'O' rings to fork assembly.
10. Fit detent spring.
11. Fit 'O' rings to end cover and fit to short end of shaft.
12. Insert shaft into fork and secure end cover with screws.
13. Fit nylon seat, groove downwards, to gear lever.
14. Fit gear lever and seat to cross shaft and secure with circlip.
15. Fit bushes to gear lever and secure with clevis pin and split pin.
16. Fit gaiter assembly and secure with the four screws.



TRANSFER GEAR SELECTOR COMPONENTS

1. Gaiter retaining screw - 4 off
2. Gaiter
3. Gaiter support plate
4. Gate plate
5. Gasket
6. Split pin
7. Clevis pin
8. Circlip, retaining nylon seat
9. Gear lever ball
10. Nylon seat
11. Cross shaft
12. Gear lever
13. Gear change housing
14. Non-metalic bushes
15. Countersunk screws
16. End cover
17. Detent spring and plate
18. Selector fork
19. 'O' ring seals

LT230T TRANSFER GEARBOX FROM ZF AUTOMATIC GEARBOX

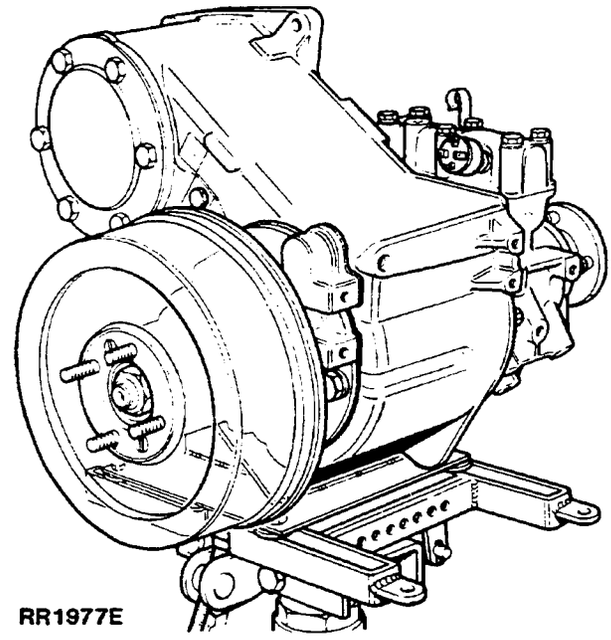
Service Tools:

18G 1425 Guide studs 3
Adaptor plate

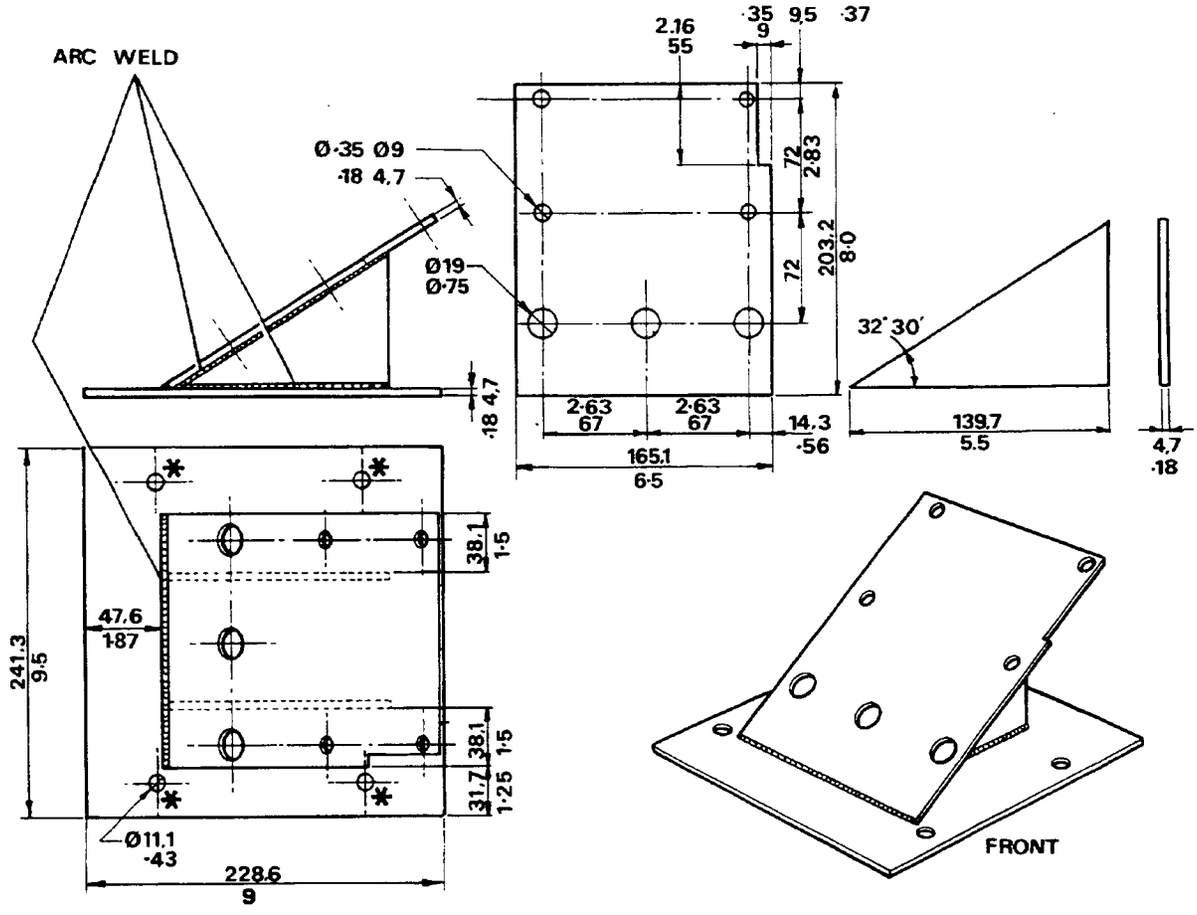
Adaptor plate for removing transfer gearbox

The transfer gearbox is removed from underneath the vehicle. Using a transmission hoist with an adaptor plate for securing the transfer gearbox 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.



RR1977E



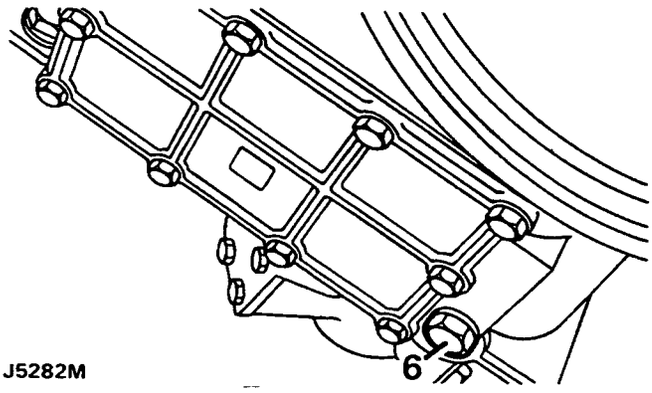
MATERIAL: STEEL PLATE

✱= TO BE DRILLED TO FIT TRANSMISSION JACK BEING USED

RR2195E

Remove

1. Site vehicle on a four post ramp.
2. Disconnect battery negative lead.
3. Remove fan cowl from radiator.
4. Remove transfer gear lever knob and gaiter.
5. Raise vehicle on ramp.
6. Drain oil and refit plug.



J5282M

7. Detach heat shield at front exhaust pipe to manifold.
8. Disconnect electrics to Lambda sensors.
9. Remove catalytic converter assembly.
10. Remove chassis crossmember from under gearbox.
11. Remove heat shield from speedometer cable at transfer gearbox.
12. Remove clamp and disconnect speedometer cable from transfer gearbox. Tie cable to one side.
13. Mark for reassembly then disconnect propeller shaft to output flange, tie to one side.
14. Repeat on front propeller shaft to output flange.
15. Remove bolts retaining silencer front and rear securing brackets and tie silencer to one side.
16. Place four 30mm long spacers between top of hoist and adaptor plate, at securing points, and secure adaptor plate to hoist.
17. Remove four central bolts from transfer gearbox bottom cover, move hoist into position and secure adaptor plate to transfer gearbox.
18. Adjust hoist to take weight of transfer gearbox.
19. Remove tie bar, transfer gearbox to main gearbox.
20. Remove nuts and bolts securing right transfer gearbox mounting bracket to chassis.
21. Repeat for left mounting bracket. Removal of these fixings will also free speedometer transducer bracket
22. Remove right side mounting bracket to flexible mounting rubber.
23. Lower hoist until rear brake drum clears passenger footwell. Check engine does not crush any components while lowering.
24. Remove split pin and withdraw hand brake clevis pin.
25. Loosen hand brake cable adjuster nut and release cable from bracket.
26. Release hand brake cable from clip on high/low selector housing.
27. Disconnect leads from transfer gearbox temperature sensor and differential lock warning light switch.
28. Remove banjo bolt from breather pipe, retrieve sealing washers and lay pipe aside.
29. Remove split pin and washers securing differential lock lever to connecting rod and disconnect rod from lever.
30. Select low range transfer gearbox position.
31. Remove high/low rod lower lock nut and remove rod from yoke.
32. Position hoist jack channel under bell housing.
33. Using wooden block support the main gearbox and bell housing.
34. Remove upper and lower bolts securing transfer gearbox to main gearbox.
35. Fit guide studs 18G 1425 to main gearbox and move transfer gearbox rearwards to detach.

Refit

36. Select P in main gearbox, with low range and differential lock selected in transfer gearbox.
37. Secure transfer gearbox to adaptor plate on lifting hoist.
38. Ensure joint faces of transfer and main gearboxes are clean and guide studs 18G 1425 are fitted.
39. Raise hoist until transfer gearbox can be located over guide studs to main gearbox. At the same time locate high/low lower link to yoke.
40. Remove guide studs and secure transfer gearbox to main gearbox. Tighten nuts and bolts to correct torque see Section 06.
41. Complete refitting by reversing removal procedure, noting the following important points.
42. After removal of adaptor plate from transfer gearbox, clean threads of four bottom cover bolts, coat threads with Loctite 290 and fit together with spring washers, tighten to correct torque.
43. Refill transfer gearbox with correct grade oil to oil level plug hole, Section 09.
44. Check main gearbox oil level, top up as necessary using correct grade oil, Section 09.
45. Check operation of parking brake and adjust as necessary, Section 10.