BORG WARNER
TRANSFER GEARBOX

Overhaul Manual

Borg Warner
Verdeelbak revisieboek

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Boîte de transfert
Manuel de révision

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BORG WARNER 44-62 TRANSFER BOX

OVERHAUL MANUAL

This transfer box is used on the following models:

New Range Rover

Published by Rover Technical Communication

Publication Part No. LRL 0090ENG

INTRODUCTION

How to use this Manual

To assist in the use of this Manual the section title is given at the top and the relevant sub-section is given at the bottom of each page.

This Manual contains procedures for overhaul of the Borg Warner transfer gearbox on the bench. For all other information regarding General Information, Adjustments, removal of transmission unit and ancillary equipment, consult the relevant section of the New Range Rover Workshop Manual.

This Manual is divided into 3 sections, Description and Operation, Overhaul and Torque & Tools. To assist filing of revised information each sub-section is numbered from page 1.

Items numbered in the illustrations are referred to in the text. Overhaul operations include reference to Service Tool numbers and the associated illustration depicts the tool. Where usage is not obvious the tool is shown in use. Operations also include reference to wear limits, relevant data, torque figures, and specialist information and useful assembly details.

WARNINGS, CAUTIONS and **NOTES** have the following meanings:

WARNING: Procedures which must be followed precisely to avoid the possibility of injury.

CAUTION: Calls attention to procedures which must be followed to avoid damage to components.

NOTE: Gives helpful information.

References

Operations covered in this Manual do not include reference to testing the vehicle after repair. It is essential that work is inspected and tested after completion and if necessary a road test of the vehicle is carried out particularly where safety related items are concerned.

Dimensions

The dimensions quoted are to design engineering specification with Service limits where applicable.

REPAIRS AND REPLACEMENTS

When replacement parts are required it is essential that only Land Rover recommended parts are used.

Attention is particularly drawn to the following points concerning repairs and the fitting of replacement parts and accessories.

Safety features and corrosion prevention treatments embodied in the vehicle may be impaired if other than Land Rover recommended parts are fitted. In certain territories, legislation prohibits the fitting of parts not to the manufacturer's specification.

Torque wrench setting figures given in this Manual must be used. Locking devices, where specified, must be fitted. If the efficiency of a locking device is impaired during removal it must be renewed.

The Terms of the vehicle Warranty may be invalidated by the fitting of other than Land Rover recommended parts. All Land Rover recommended parts have the full backing of the vehicle Warranty.

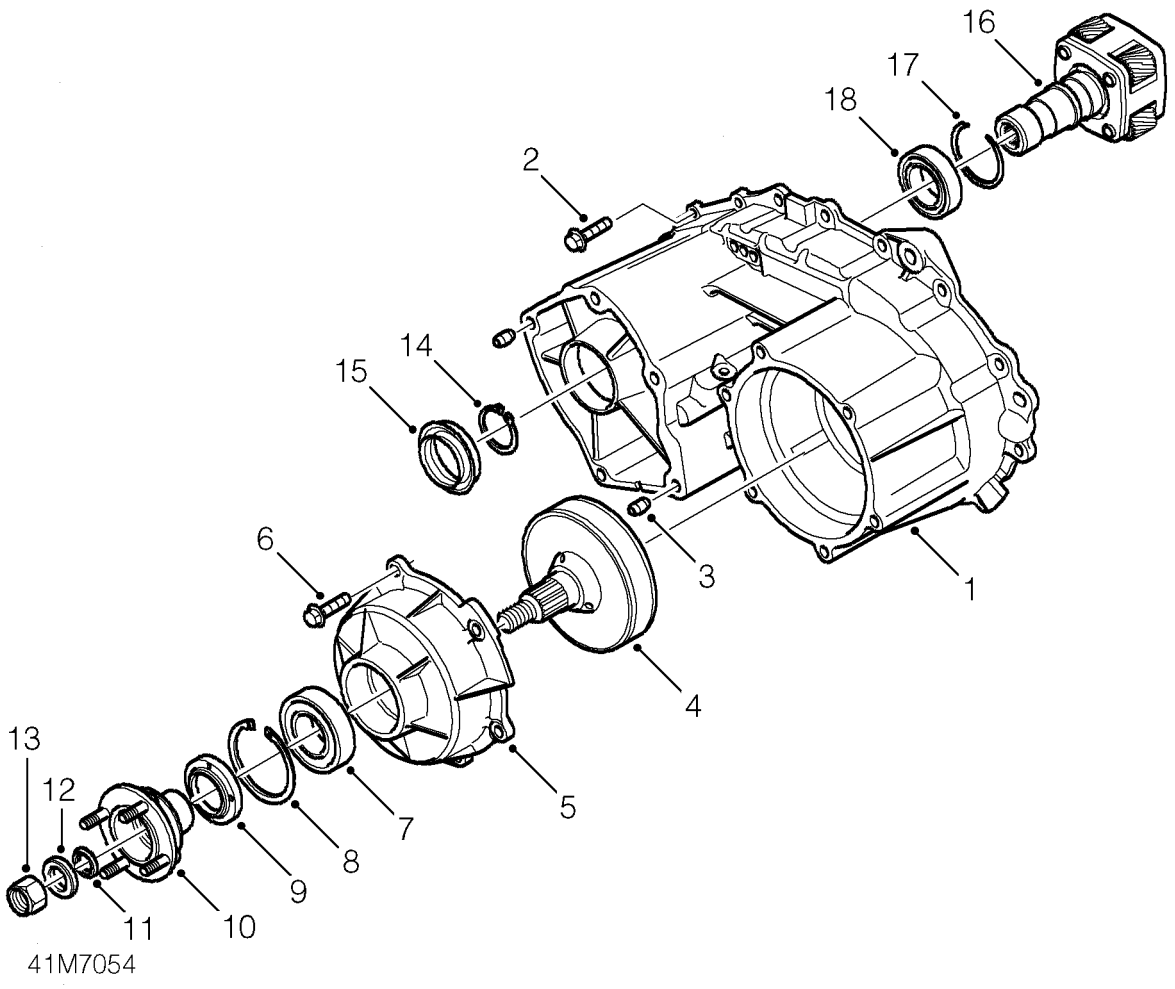
Land Rover Dealers are obliged to supply only Land Rover recommended parts.

SPECIFICATION

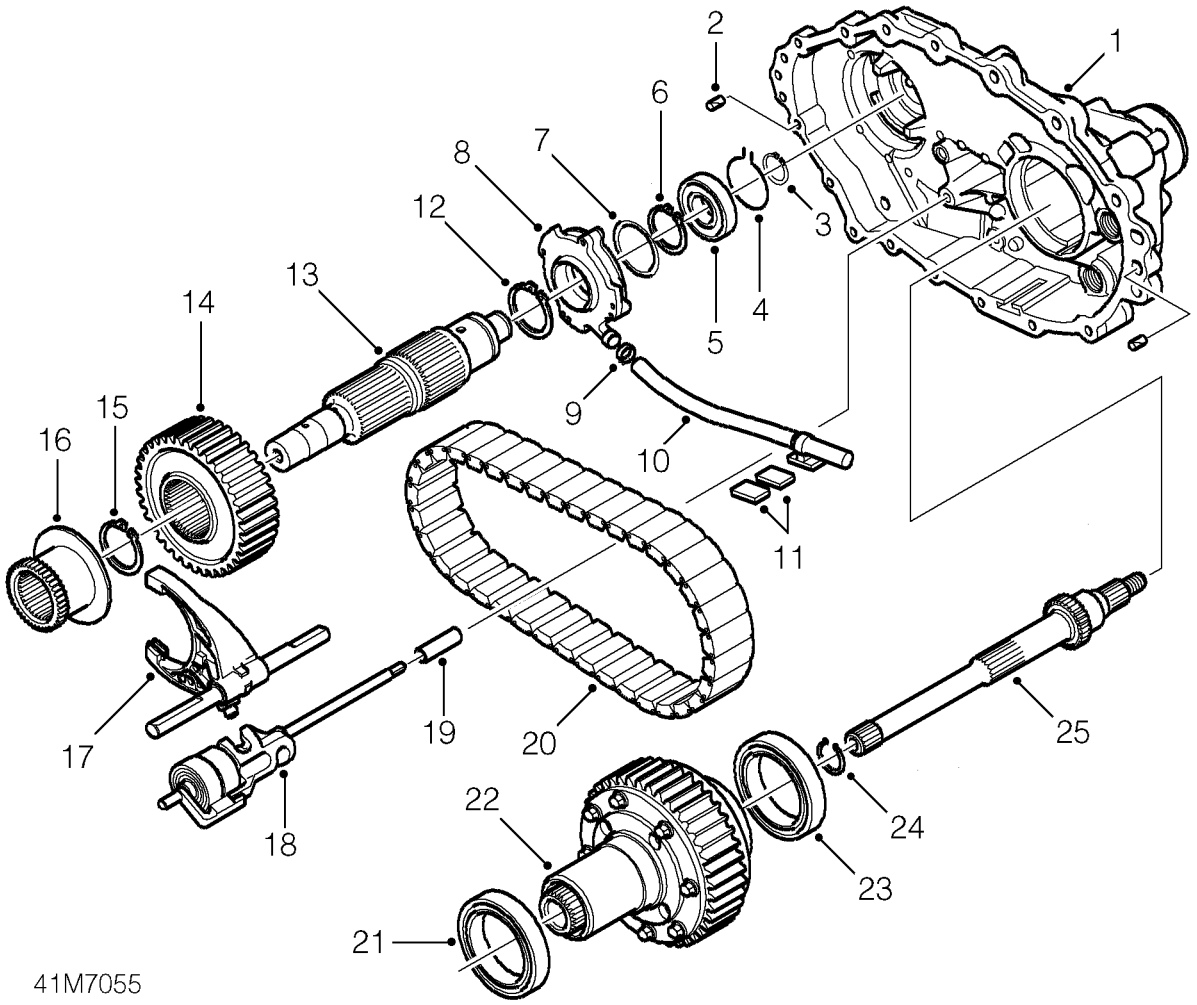
Land Rover are constantly seeking to improve the specification, design and production of their vehicles and alterations take place accordingly. While every effort has been made to ensure the accuracy of this Manual, it should not be regarded as an infallible guide to current specifications of any particular component or vehicle.

This Manual does not constitute an offer for sale of any particular component or vehicle. Land Rover Dealers are not agents of Land Rover and have no authority to bind the manufacturer by any expressed or implied undertaking or representation.

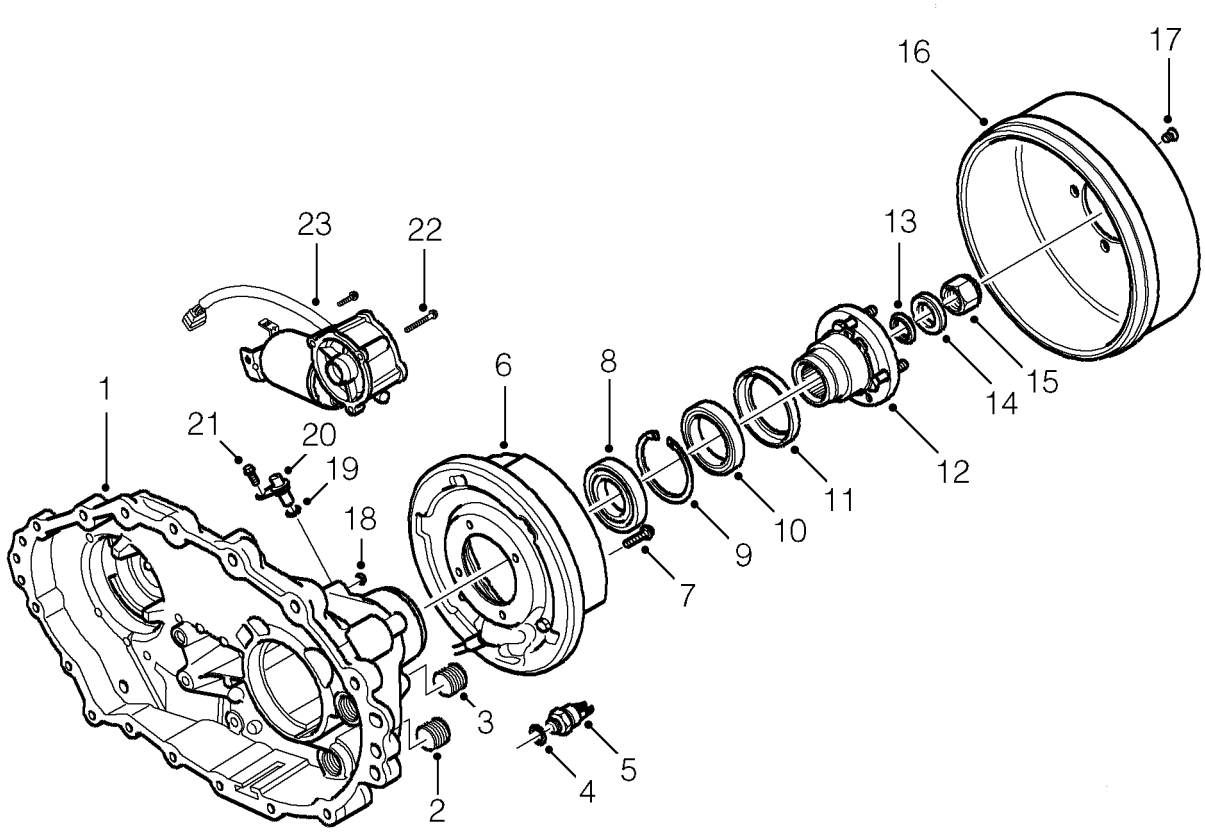
GEARBOX COMPONENTS



1. Front casing - transfer box
2. Bolt - front casing to rear casing
3. Dowel - transfer box to gearbox
4. Viscous coupling
5. Housing - viscous coupling
6. Bolt - viscous coupling housing to front casing
7. Bearing - front output shaft
8. Circlip - bearing retention
9. Oil seal - front output shaft
10. Drive flange - front output shaft
11. Sealing washer
12. Plain washer
13. Nut - drive flange
14. Circlip - epicyclic gear to bearing
15. Oil seal - input shaft
16. Epicyclic gear set
17. Circlip - bearing retention
18. Bearing - input shaft



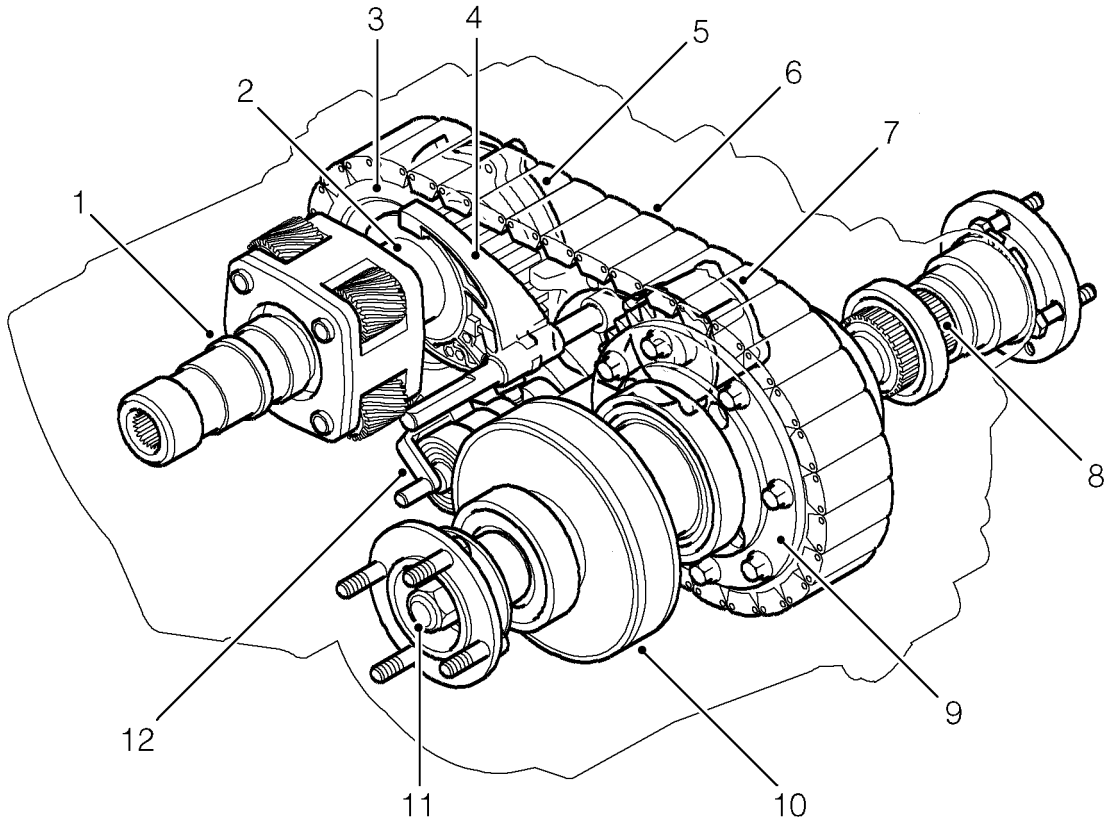
1. Rear casing - transfer box
2. Dowel - front casing to rear casing
3. Circlip - bearing retention
4. Snap ring - bearing to rear casing
5. Bearing - intermediate shaft
6. Circlip - oil pump retention
7. Shim
8. Oil pump
9. Clip - hose to pump
10. Hose and strainer
11. Magnet
12. Circlip - gear retention
13. Intermediate shaft
14. Gear
15. Circlip - gear retention
16. Reduction hub
17. Selector fork assembly
18. Interlock spool
19. Tube spacer
20. Morse chain
21. Bearing - differential
22. Differential assembly
23. Bearing - differential
24. Circlip - gear retention
25. Rear output shaft



41M7056

1. Rear casing - transfer box
2. Plug - oil drain
3. Plug - oil fill
4. Sealing washer - temperature sensor
5. Temperature sensor
6. Parking brake assembly
7. Bolt - parking brake to rear casing
8. Bearing - rear output shaft
9. Circlip - bearing retention
10. Oil seal - rear output shaft
11. Dust shroud
12. Drive flange - rear output shaft
13. Sealing washer
14. Plain washer
15. Nut - drive flange
16. Drum - parking brake
17. Screw - drum to flange
18. Oil seal - interlock spool shaft
19. 'O' ring seal - speed sensor
20. Speed sensor
21. Bolt - speed sensor
22. Bolt - ratio control motor to rear casing
23. Ratio control motor

OPERATION



41M7057

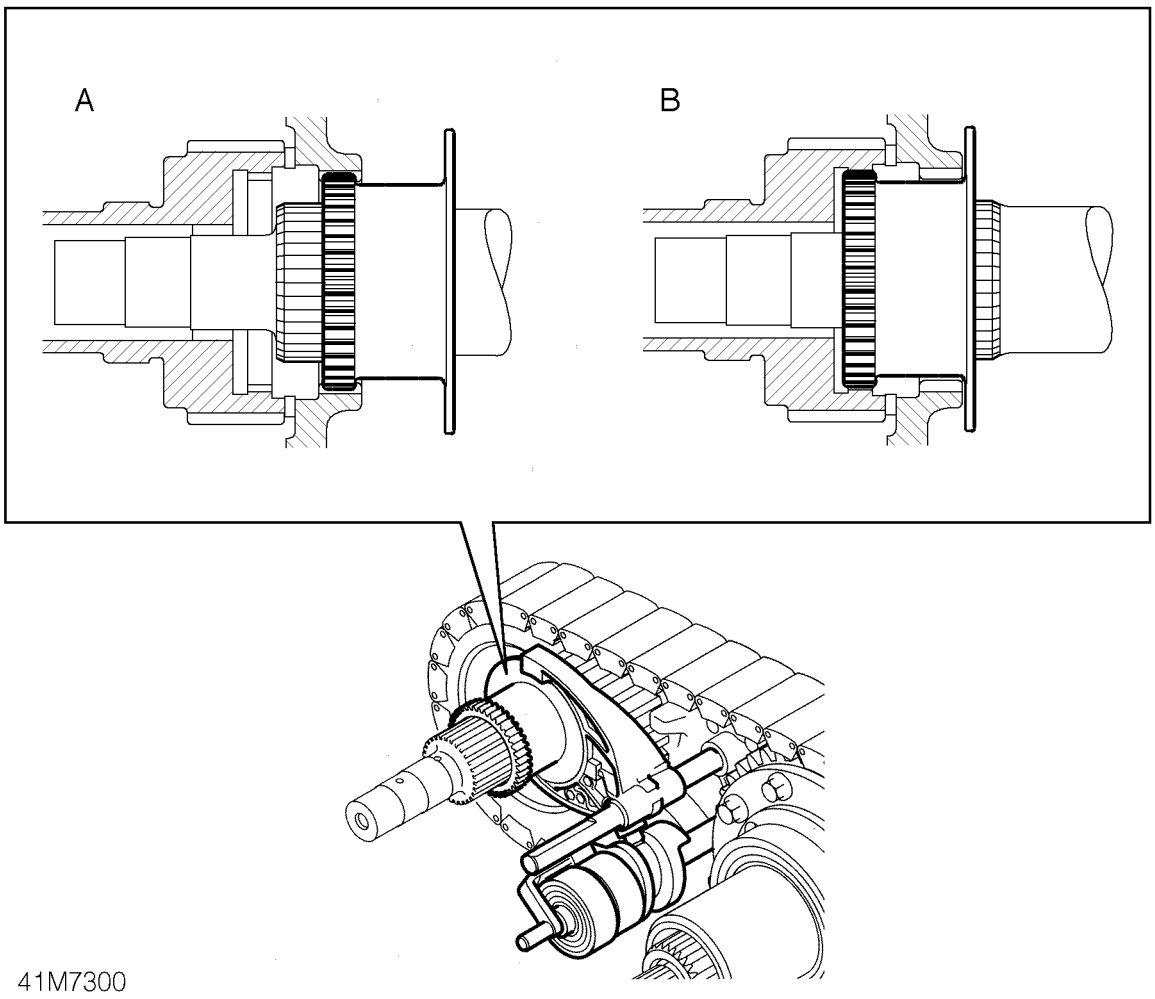
1. Epicyclic gear set
2. Reduction hub
3. Drive gear
4. Selector fork
5. Oil pump
6. Morse chain
7. Raito control motor
8. Rear output shaft
9. Differential unit
10. Viscous coupling unit
11. Front output shaft
12. Selector spool

Introduction

The Borg Warner transfer box splits the drive from the main gearbox to the front and rear axles through the propeller shafts. Two speed ratios and a neutral position are provided by means of a single, epicyclic gear set. The two speed ratios, High and Low range, and neutral position are selected electronically by the ratio control motor.

A Morse chain transmits the drive through a gear from the intermediate shaft to the differential unit. The differential unit allows the front and rear output shafts to rotate at different speeds. A viscous coupling unit (VCU) limits the amount of slippage allowed between the front and rear output shafts and renders a conventional differential lock unnecessary.

High and Low Range



High and Low range are selected by the driver from a dashboard mounted switch on manual vehicles and via the selector lever on automatic vehicles. Transfer neutral is selected by inserting a 5 Amp fuse in position 11 of the driver's seat fuse box. Refer to Owner's Handbook.

Drive from the main gearbox is permanently engaged to the sun gear of the epicyclic gear set. When in High range (position B) the sun gear transmits drive directly to the reduction hub. The reduction hub and intermediate shaft rotate at the same speed as the main gearbox output shaft. When in Low range (position A) the reduction hub is driven through the planet carrier. The reduction hub and intermediate shaft rotate at a lower speed than the gearbox output shaft. When in transfer neutral, the reduction hub is positioned between the sun gear and planet carrier.

Changing between ratios is achieved by the reduction hub sliding along a splined section of the intermediate shaft to engage with the required gear. The ratio change mechanism comprises the ratio control motor, reduction hub, interlock spool and selector fork.

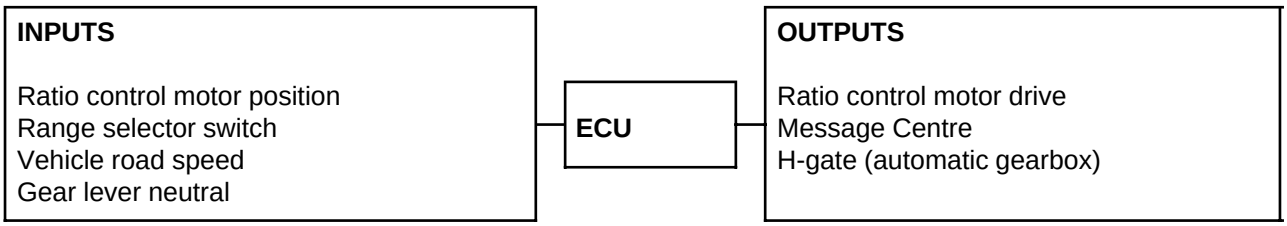
The interlock spool consists of a shaft which locates in the front casing and protrudes through the rear casing to engage with the ratio control motor. The shaft carries an aluminium casting with a helical cam track and two springs, which are anchored at one end to the shaft and at the other to the cam track casting.

The selector fork is mounted on a second shaft located within the front and rear casings but is able to slide in the casing mountings. A cam follower on the selector fork engages with the cam track of the interlock spool. When the ratio control motor rotates the interlock spool, the cam follower of the selector fork follows the cam track of the interlock spool. This converts rotational movement of the interlock spool into linear movement of the selector fork.

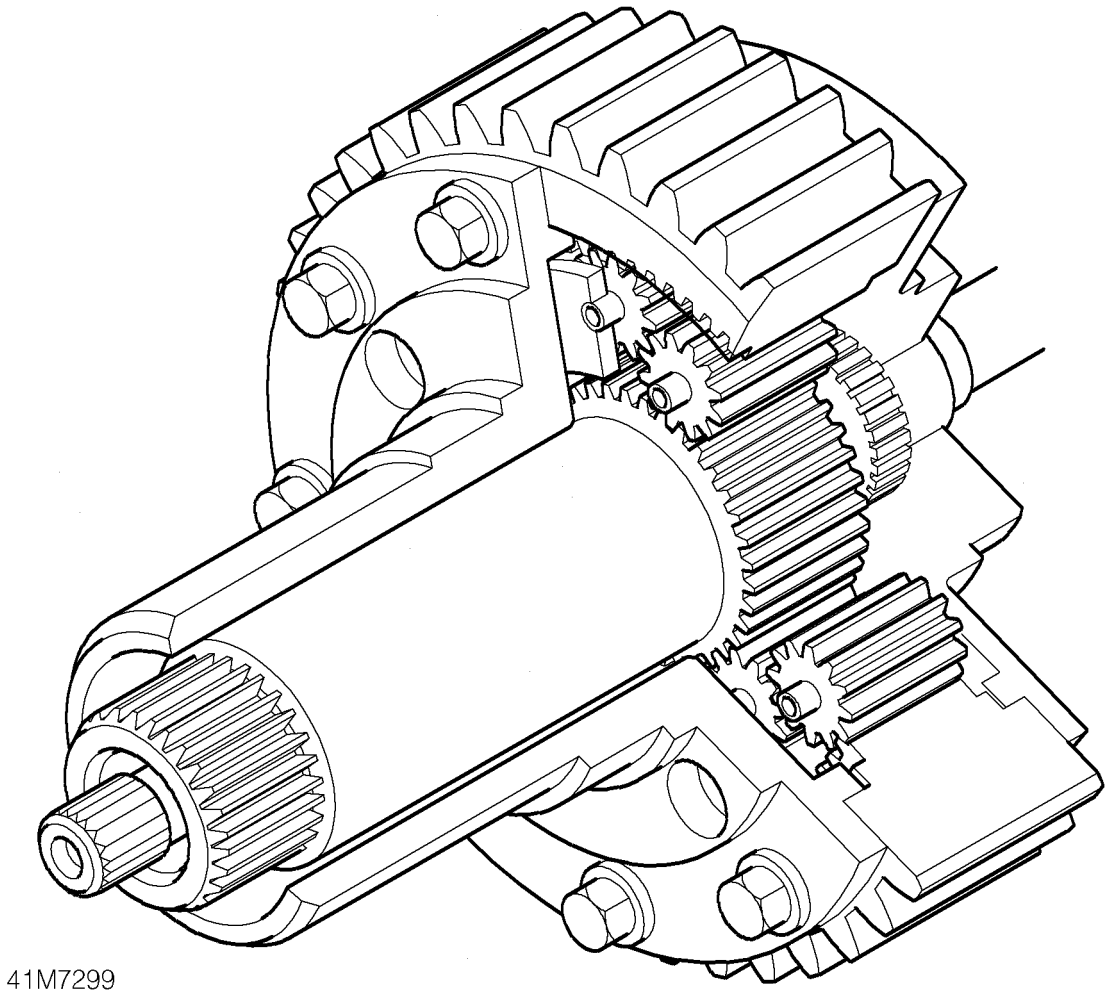
The selector fork is engaged to the reduction hub. Linear movement of the selector fork is transmitted to the reduction hub, moving it between High, Low and neutral positions. In the event of the reduction hub gear failing to mesh with the epicyclic gear set, wind-up of the interlock is prevented by the interlock spool springs. The springs apply a constant torque to the cam track casting until the reduction hub engages with the epicyclic gear.

Ratio control motor

The ratio control motor drives the selector mechanism and is controlled by the transfer box electronic control unit (ECU). The ECU monitors a number of variables including the position of the ratio control motor, the speed of the vehicle, and the drive ratio selected by the driver. When a ratio change is requested, the transfer box ECU checks that conditions are favourable for the change, for example that the vehicle speed is sufficiently low to permit engagement. The ECU then drives the ratio control motor to the required position. When the conditions for a ratio change are unfavourable, the transfer box ECU communicates instructions to the driver through the Message Centre and will not attempt to change ratios until the correct conditions are met.



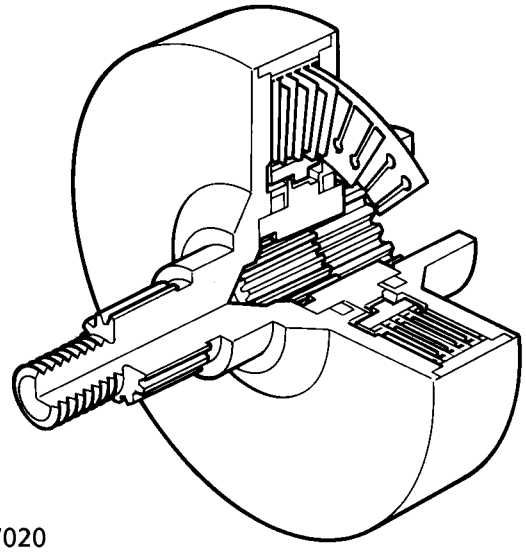
Differential unit



The differential unit is driven from the intermediate shaft through a Morse chain. The outer casing of the differential unit is the differential input, while the sun gear provides the front output and the planet carrier the rear output.

The planet carrier contains three sets of gears, which mesh in pairs to maintain the correct directional relationship between front and rear differential outputs. The rear output shaft passes through the differential unit, engaging with the planet carrier and protruding through the sun gear shaft to locate to the VCU inner spline. The sun gear shaft locates to the VCU outer spline.

Viscous coupling (VCU)



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The VCU comprises a short cylinder which contains an inner shaft with slotted discs attached to its outer surface, and a similar set of discs attached to the inner surface of the cylinder. Both sets of discs are arranged so that they interleave alternately and in close proximity to each other. The VCU is sealed, and filled with a type of silicone jelly which has the property of increasing its viscosity with rises in temperature and shear forces.

Variations in speed between the front and rear output shafts are transmitted through the VCU, with the speed differential occurring between the inner shaft and the cylinder. In normal road conditions where the speed variation between front and rear shafts is low, the difference in rotational speed between the VCU discs is also low. As a result, the shear forces acting on the silicon jelly are marginal and offer little resistance to the different rotational speeds of the output shafts.

In cases where large rotational speed differences occur between the front and rear output shafts, such as in rough terrain conditions, the speed variation between the discs is high with a subsequent increase in the shear forces acting on the viscous jelly. The resulting increase in viscosity generates sufficient shear resistance to force both sets of discs to rotate at similar speeds, reducing axle slippage and loss of traction.

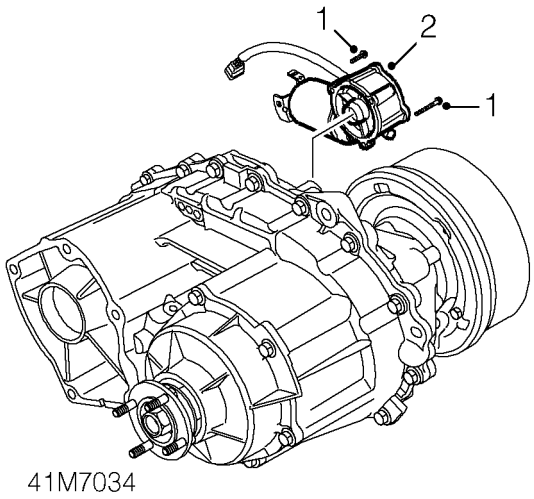
Lubrication

Internal lubrication of the transfer gearbox is provided by a low pressure, plunger-type oil pump mounted on the rear of the intermediate shaft. Oil pick-up is through a strainer in the transfer box sump. From the pump, oil is supplied through the intermediate shaft to the epicyclic gear set. The differential and Morse chain are partially immersed in oil and lubricated as the components rotate. The VCU is a fully sealed unit and does not require separate lubrication.

RATIO CONTROL MOTOR

Service repair no - 41.30.03/01

Remove



41M7034

1. Remove 4 bolts securing motor to transfer box.
2. Remove motor.

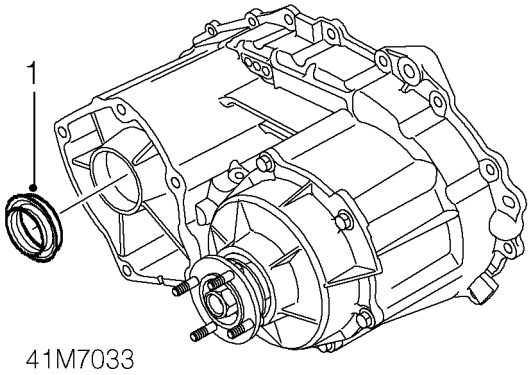
Refit

1. Fit motor and engage to drive spindle.
2. Tighten bolts to 10 Nm. (7 lbf.ft).

INPUT SHAFT OIL SEAL

Service repair no - 41.20.50/01

Remove



41M7033

1. Using a flat bladed screwdriver free of rough edges, ease input shaft oil seal from transfer box front casing.

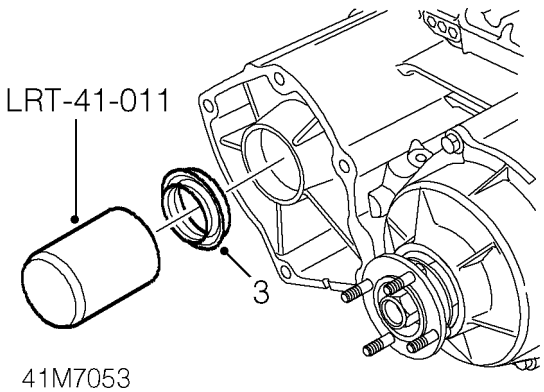
CAUTION: Do not mark sealing surface of front casing.

Refit

1. Clean sealing surface of front casing and running surface of input shaft. Ensure all traces of rubber are removed.

CAUTION: Do not use a metal scraper as this may damage sealing surfaces.

2. Lubricate oil seal sealing face with clean gearbox oil.



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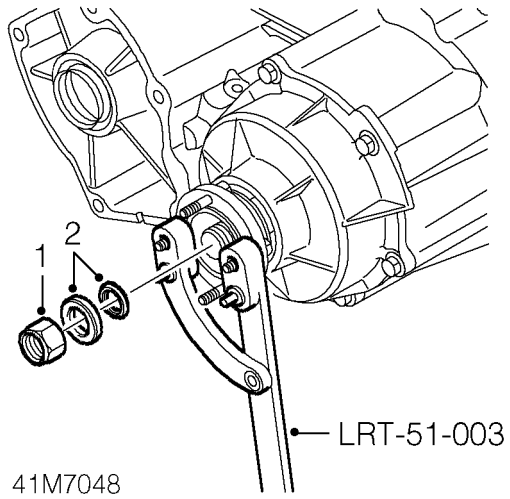
3. Position oil seal to transfer box front casing and fit oil seal using LRT-41-011.

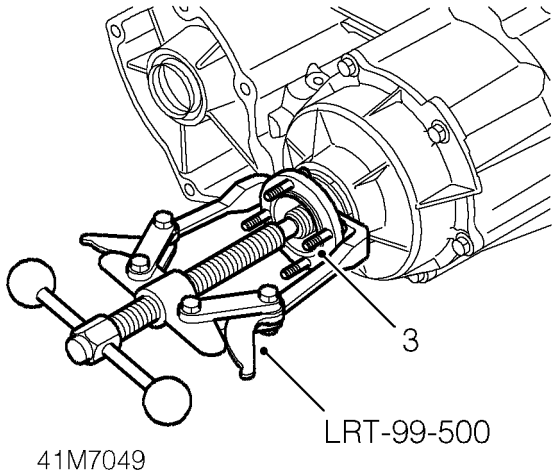
FRONT OUTPUT SHAFT DRIVE FLANGE

Service repair no - 41.20.15/01

Remove



1. Using LRT-51-003 to restrain front output shaft drive flange, remove and discard nut securing drive flange to front output shaft.
2. Collect washer and seal.



3. Using LRT-99-500 if necessary, remove drive flange from front output shaft.

Refit

1. Clean running surface of drive flange. Ensure all traces of rubber are removed.

CAUTION: Do not use a metal scraper as this may damage sealing surface.

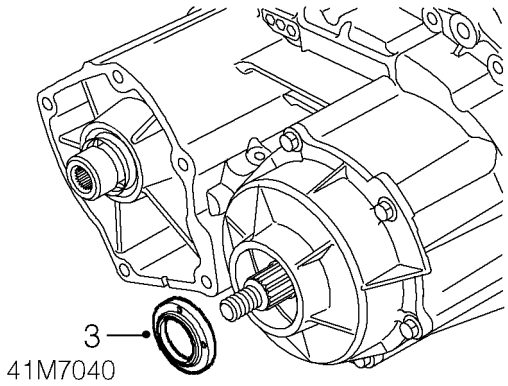
2. Fit drive flange to front output shaft.
3. Fit seal, washer and new nut to front output shaft.
4. Using LRT-51-003 to restrain drive flange, tighten nut to 220 Nm. (162 lbf.ft)

FRONT OUTPUT SHAFT OIL SEAL

Service repair no - 41.20.51/01

Remove

1. Remove front output shaft drive flange. ***See this section.***



2. Using a flat bladed screwdriver free of rough edges, ease front output shaft oil seal from front casing.

CAUTION: Do not mark sealing surface of front casing.

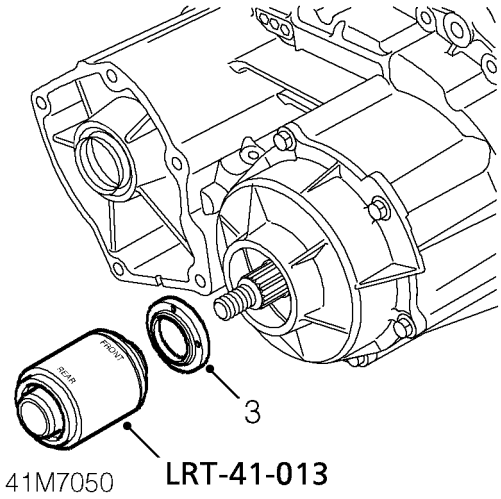
3. Remove oil seal.

Refit

1. Clean sealing area of front casing and running surface of front drive flange. Ensure all traces of rubber are removed.

CAUTION: Do not use a metal scraper as this may damage sealing surfaces.

2. Lubricate sealing faces of new seal with clean gearbox oil.



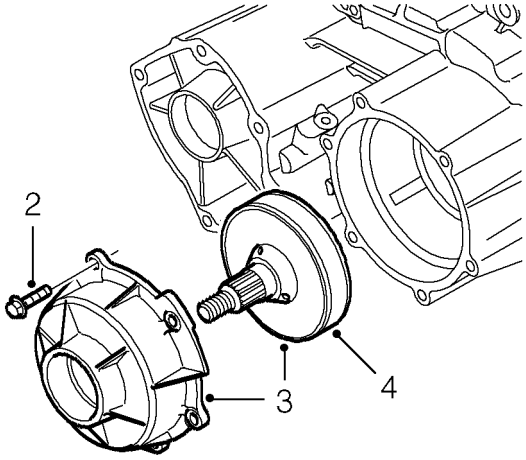
3. Using LRT-41-013 fit front output shaft oil seal to front casing. Ensure that seal is square to casing bore.
4. Fit front output shaft drive flange. ***See this section.***

VISCOUS COUPLING UNIT (VCU)

Service repair no - 41.20.66/01

Remove

1. Remove front output shaft drive flange. ***See this section.***



41M7039

2. Remove 6 bolts securing VCU housing to transfer box.
3. With care, break front face RTV seal and remove VCU assembly.
   Do not carry out further dismantling if component is removed for access only.
4. Press out viscous coupling from housing.

CAUTION: Protect output shaft thread and do not use excessive force when pressing out viscous coupling.

Refit

1. Clean mating surfaces of viscous coupling housing and transfer box.

CAUTION: Do not use a metal scraper as this may damage sealing surfaces.

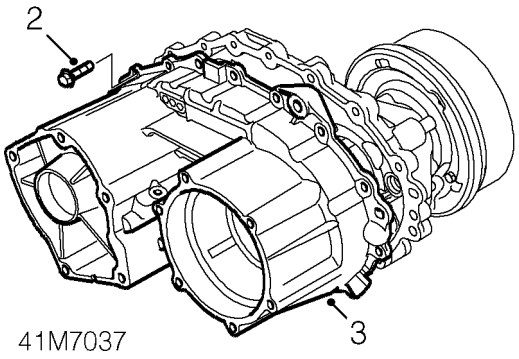
2. Clean bearing and VCU mating faces.
3. Press VCU into bearing.
4. Apply a continuous 2mm bead of sealant to VCU housing mating face. Path to be around inside of bolt holes.
5. Fit VCU assembly to transfer box ensuring correct alignment of bolt holes before disturbing RTV bead.
6. Fit bolts and progressively tighten to 35 Nm. (26 lbf.ft)
7. Fit front output shaft drive flange. ***See this section.***

EPICYCLIC GEAR SET

Service repair no - 41.20.68/01

Remove

1. Remove viscous coupling assembly. ***See this section.***



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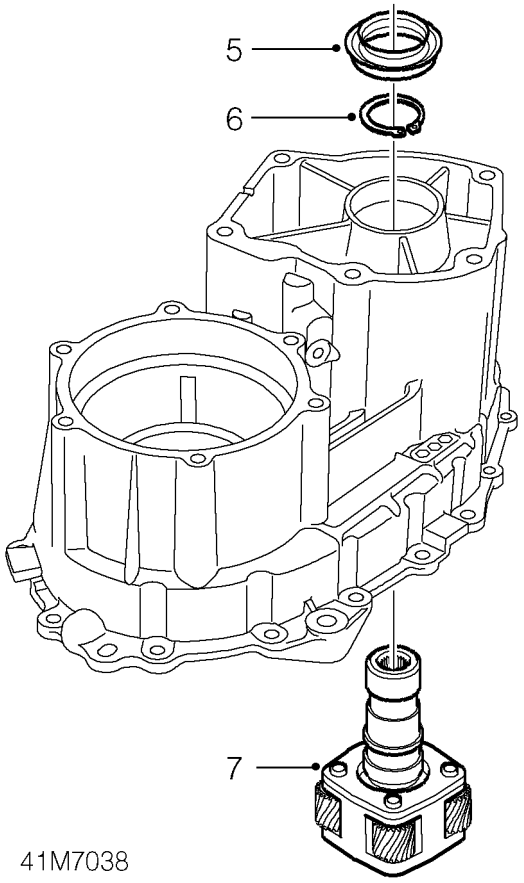
2. Remove 17 bolts securing halves of transfer box casing.
3. Carefully break RTV seal and remove front transfer gearbox casing from rear casing.
4. Position front casing, input shaft upwards. Position block of wood under epicyclic gear set.



5. Using a flat bladed screwdriver free of rough edges, ease input shaft oil seal from front casing.

CAUTION: Do not mark sealing surface of front casing.

6. Release circlip retaining epicyclic gear to front casing. Epicyclic gear set will fall onto block of wood.
7. Remove epicyclic gear set.

Refit

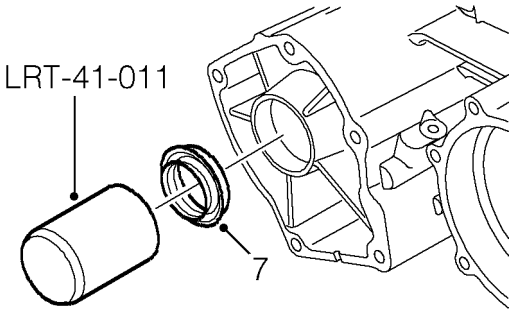
1. Clean RTV sealant from front and rear casing mating surfaces.

CAUTION: Do not use a metal scraper as this may damage sealing surfaces.

2. Clean bearing and input shaft mating faces.
3. Clean sealing area of front casing and running surface of input shaft. Ensure all traces of rubber are removed from sealing surfaces.

CAUTION: Do not use a metal scraper as this may damage sealing surfaces.

4. Fit epicyclic gear set to front casing.
5. Fit circlip retaining epicyclic gear set to front casing.
6. Lubricate sealing faces of seal with clean gearbox oil.



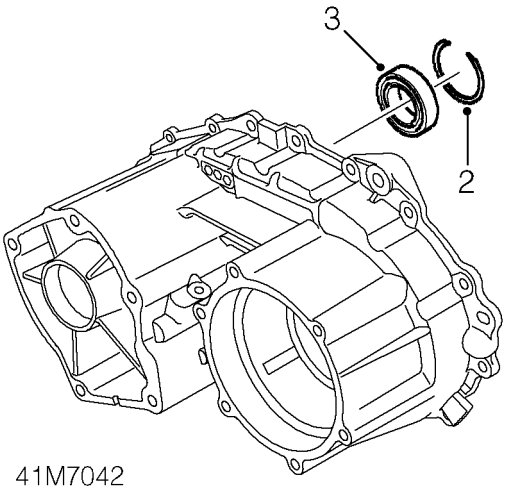
7. Using LRT-41-011 drift input shaft seal into front casing.
8. If removed, fit 2 dowels to front casing.
9. Apply a continuous 2 mm bead of RTV sealant to rear casing mating face. Path to be around inside of bolt holes.
10. Fit front casing to rear casing, ensure bolt holes are aligned before disturbing RTV sealant.
11. Fit bolts securing front casing to rear casing and progressively tighten to 35 Nm. (26 lbf.ft)
12. Check freedom of rotation of input shaft and that rear output shaft rotates.
13. Fit viscous coupling assembly. ***See this section.***

INPUT SHAFT BEARING

Service repair no - 41.20.65/01

Remove

1. Remove epicyclic gear set. ***See this section.***



2. Remove snap ring retaining input shaft bearing to front casing.
3. Press out input shaft bearing.

Refit

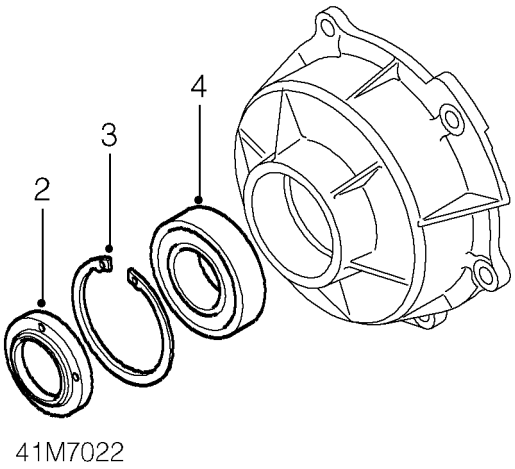
1. Clean bearing and front casing mating faces, ensure casing is free from burrs.
2. Press bearing into front casing.
3. Fit snap ring retaining bearing to front casing.
4. Fit epicyclic gear set. ***See this section.***

FRONT OUTPUT SHAFT BEARING

Service repair no - 41.20.08/01

Remove

1. Remove viscous coupling unit (VCU). ***See this section.***



2. Using a flat bladed screwdriver free of rough edges, ease oil seal from VCU housing.

CAUTION: Do not mark sealing surfaces of VCU housing.

3. Remove circlip retaining output shaft bearing to casing.
4. Press out bearing from VCU casing.

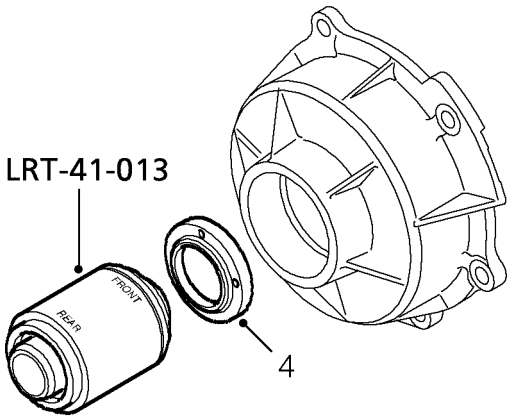
Refit

1. Clean bearing and VCU casing mating faces.

CAUTION: Do not use a metal scraper as this may damage sealing surfaces.

2. Press bearing into VCU housing and fit retaining circlip.
3. Clean sealing area of VCU housing and running surface of front output shaft drive flange. Ensure all traces of rubber are removed.

CAUTION: Do not use a metal scraper as this may damage sealing surfaces.



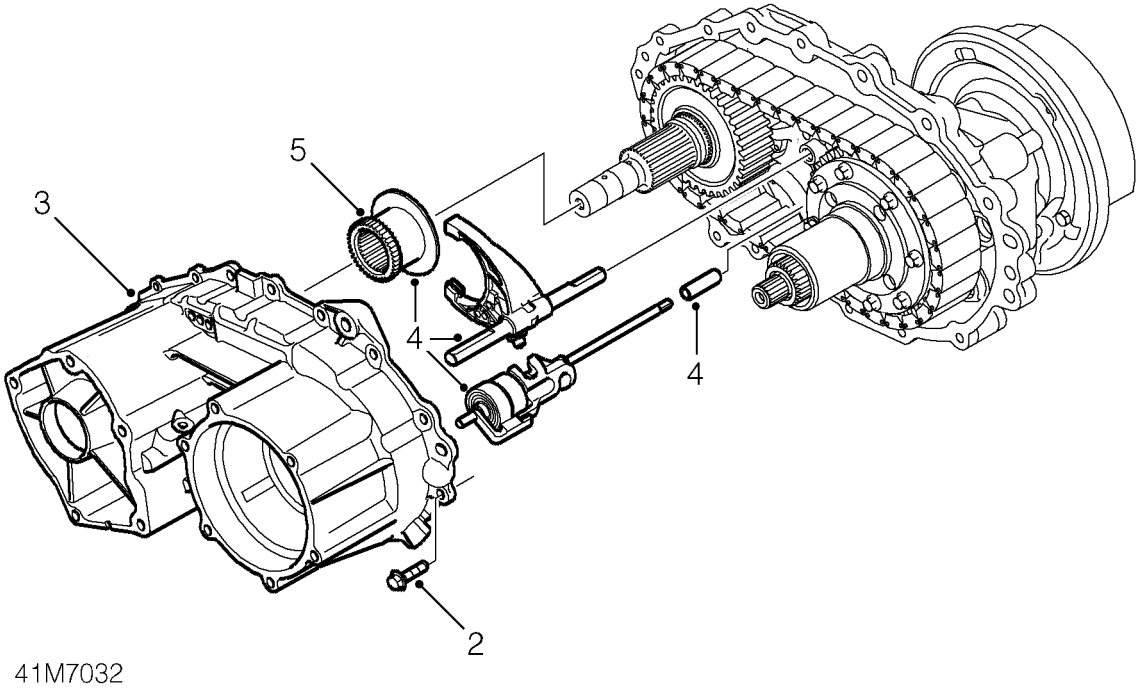
41M7051

4. Using tool LRT-41-013 , drift oil seal into VCU housing. Ensure the seal is square to housing bore.
5. Fit VCU to housing. ***See this section.***

SELECTOR FORK ASSEMBLY

Service repair no - 41.20.40/01

Remove



1. Remove viscous coupling assembly. ***See this section.***
2. Remove 17 bolts securing halves of transfer box casing.
3. Carefully break RTV seal and remove front transfer box casing from rear casing.
4. Remove selector fork assembly, interlock spool shaft and reduction hub from rear casing. Collect tube spacer.
5. Remove reduction hub from selector fork assembly.

Refit

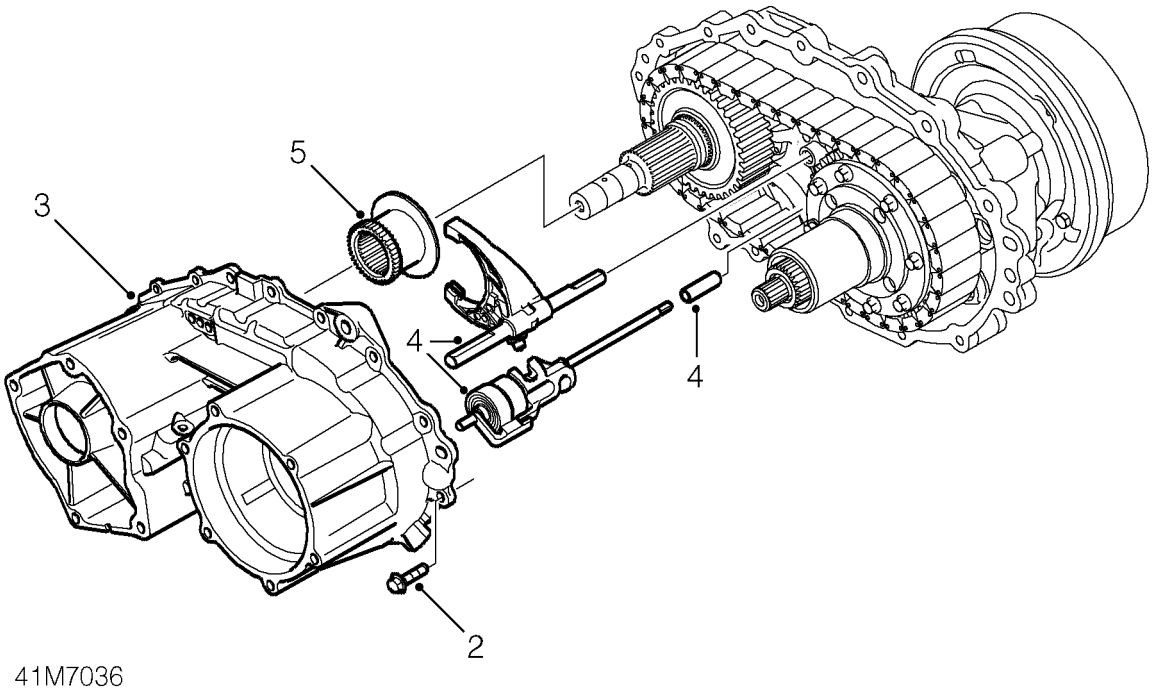
1. Clean RTV sealant from front and rear casing mating surfaces.

CAUTION: Do not use a metal scraper as this may damage sealing surfaces.

2. Fit reduction hub to selector fork assembly with hub splines towards the shorter end of shift rail.
3. Fit tube spacer to interlock spool shaft.
4. Engage selector fork cam follower to interlock spool cam track.
5. Fit reduction hub to intermediate shaft and engage interlock spool shaft and shift rail to holes in rear casing.
6. Rotate interlock spool shaft to position reduction hub and selector fork to low ratio position, nearest rear casing half. Ensure tube spacer is in position and selector fork cam follower is correctly engaged in interlock spool.
7. If removed, fit 2 dowels into front casing.
8. Apply a continuous 2 mm bead of RTV sealant to rear casing mating face. Path to be around inside of bolt holes.
9. Fit front casing to rear casing, ensure bolt holes and dowels are aligned before disturbing RTV sealant.
10. Fit bolts securing front casing to rear casing and progressively tighten to 35 Nm. (26 lbf.ft)
11. Check freedom of rotation of input shaft and that rear output shaft rotates.
12. Fit viscous coupling assembly. ***See this section.***

REDUCTION HUB

Service repair no - 41.20.70/01



Remove

1. Remove viscous coupling assembly. ***See this section.***
2. Remove 17 bolts securing halves of transfer gearbox casing.
3. Carefully break RTV seal and remove front transfer box casing from rear casing.
4. Remove selector fork assembly, interlock spool shaft and reduction hub from rear casing. Collect tube spacer.
5. Remove reduction hub from selector fork.

Refit

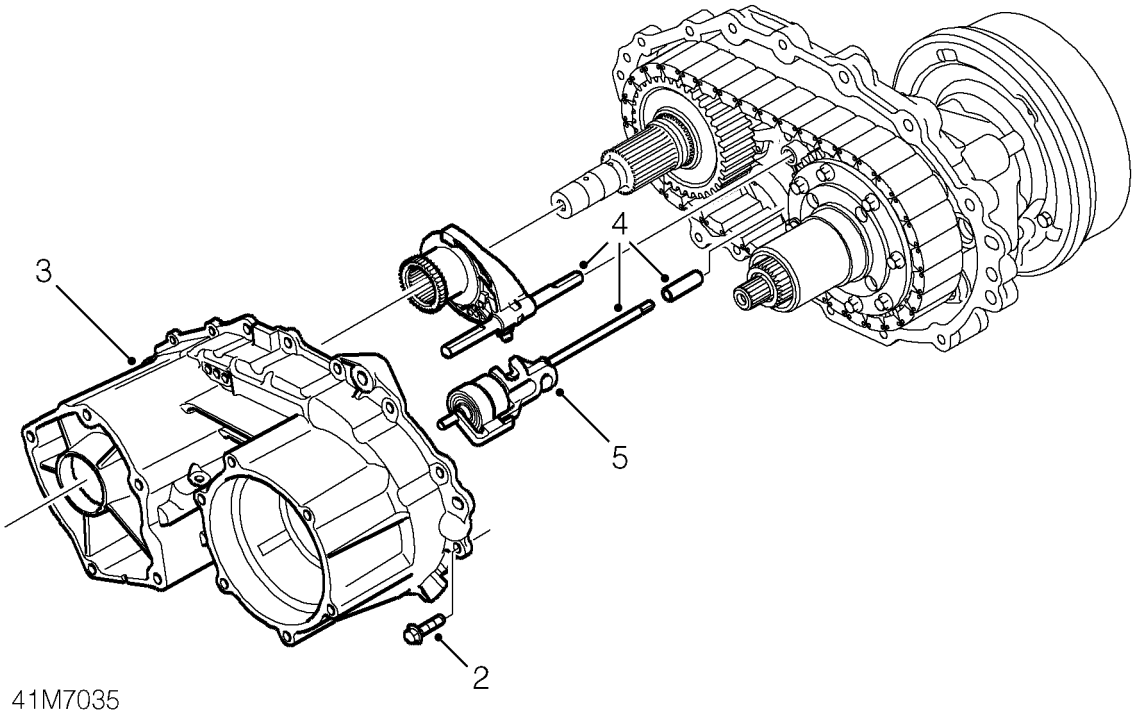
1. Clean RTV sealant from front and rear casing mating surfaces.

CAUTION: Do not use a metal scraper as this may damage sealing surfaces.

2. Fit reduction hub to selector fork with hub splines towards the shorter end of shift rail.
3. Fit tube spacer to interlock spool shaft.
4. Engage selector fork cam follower to interlock spool cam track.
5. Fit reduction hub to intermediate shaft and engage interlock spool shaft and shift rail to holes in rear casing.
6. Rotate interlock spool shaft to position reduction hub and selector fork to low ratio position, nearest rear casing half. Ensure tube spacer is in position and selector fork cam follower is correctly engaged to interlock spool.
7. If removed, fit 2 dowels to front casing.
8. Apply a continuous 2 mm bead of RTV sealant to rear casing mating face. Path to be around inside of bolt holes.
9. Fit front casing to rear casing, ensure bolt holes and dowels are aligned before disturbing RTV sealant.
10. Fit bolts securing front casing to rear casing and progressively tighten to 35 Nm. (26 lbf.ft)
11. Check freedom of rotation of input shaft and that rear output shaft rotates.
12. Fit viscous coupling assembly. ***See this section.***

INTERLOCK SPOOL

Service repair no - 41.20.74/01



Remove

1. Remove viscous coupling assembly. ***See this section.***
2. Remove 17 bolts securing halves of transfer box casing.
3. Carefully break RTV seal and remove front transfer box casing from rear casing.
4. Remove selector fork assembly, interlock spool shaft and reduction hub from rear casing. Collect tube spacer.
5. Collect interlock spool.

Refit

1. Clean RTV sealant from front and rear casing mating surfaces.

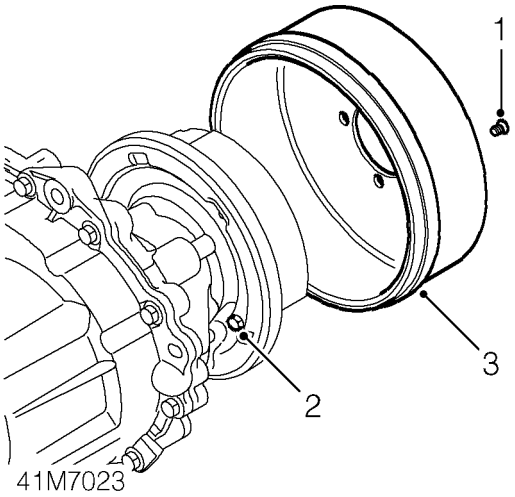
CAUTION: Do not use a metal scraper as this may damage sealing surfaces.

2. Fit tube spacer to interlock spool shaft.
3. Engage selector fork cam follower to interlock spool cam track.
4. Fit reduction hub to intermediate shaft and engage interlock spool shaft and shift rail to holes in rear casing.
5. Rotate interlock spool shaft to position reduction hub and selector fork to low ratio position, nearest rear casing half. Ensure tube spacer is in position and selector fork cam follower is correctly engaged in interlock spool.
6. If removed, fit 2 dowels into front casing.
7. Apply a continuous 2 mm bead of RTV sealant to rear casing mating face. Path to be around inside of bolt holes.
8. Fit front casing to rear casing, ensure bolt holes and dowels are aligned before disturbing RTV sealant.
9. Fit bolts securing front casing to rear casing and progressively tighten to 35 Nm. (26 lbf.ft)
10. Check freedom of rotation of input shaft and that rear output shaft rotates.
11. Fit viscous coupling assembly. ***See this section.***

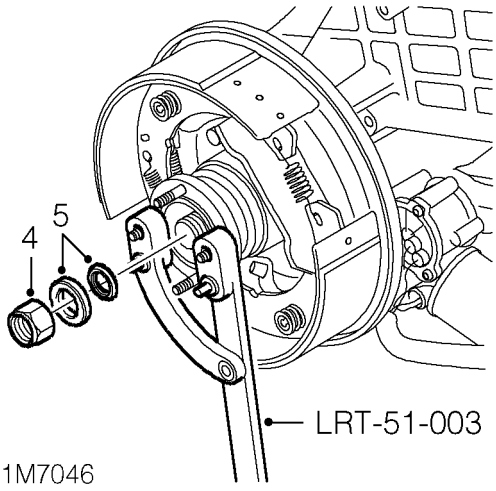
REAR OUTPUT SHAFT DRIVE FLANGE

Service repair no - 41.20.14/01

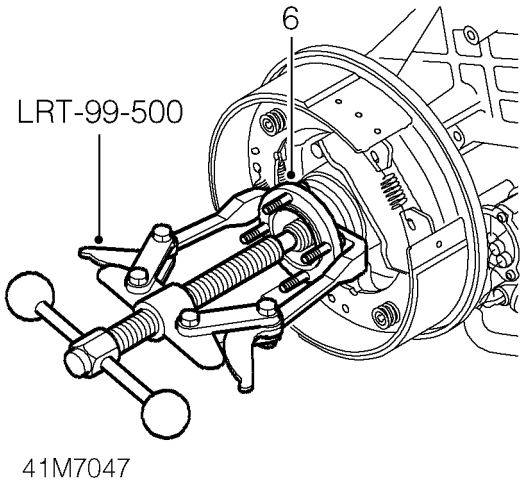
Remove



1. Remove screw securing brake drum to flange.
2. Loosen park brake drum adjusting screw.
3. Remove brake drum.



4. Using LRT-51-003 to restrain drive flange, remove nut securing drive flange to rear output shaft.
5. Collect washer and seal.



6. Using LRT-99-500 if necessary, remove flange from output shaft.

Refit

1. Clean running surface of drive flange. Ensure all traces of rubber are removed.

CAUTION: Do not use a metal scraper as this may damage sealing surface.

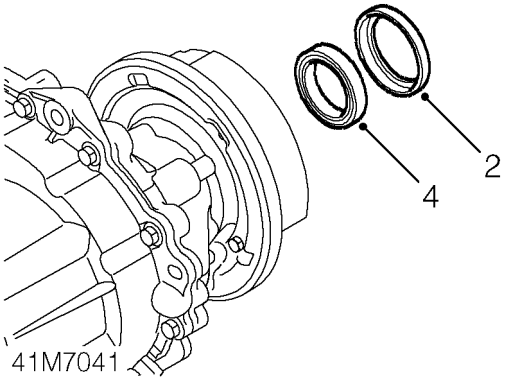
2. Fit drive flange to rear output shaft.
3. Fit seal, washer and new nut to rear output shaft.
4. Using LRT-51-003 to restrain drive flange, tighten nut to 220 Nm. (162 lbf.ft)
5. Fit brake drum to drive flange and secure with screw.
6. Adjust park brake drum screw. ***See New Range Rover Workshop Manual.***

REAR OUTPUT SHAFT OIL SEAL

Service repair no - 41.20.54/01

Remove

1. Remove rear output shaft drive flange. ***See this section.***



2. Remove dust shroud from transfer box rear casing.
3. Using a flat bladed screwdriver free of rough edges, ease oil seal from rear casing.

CAUTION: Do not mark sealing surface on rear casing.

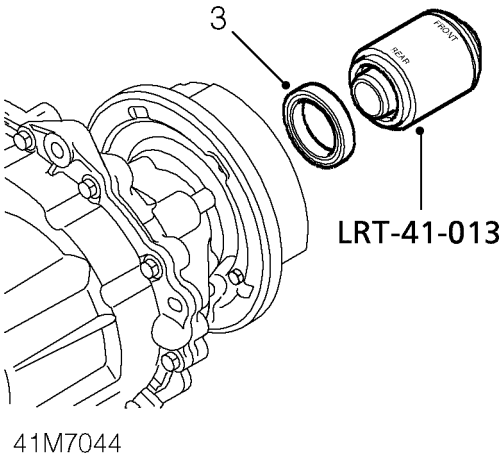
4. Remove rear output shaft oil seal.

Refit

1. Clean sealing area of rear casing and running surface of drive flange. Ensure all traces of rubber are removed.

CAUTION: Do not use a metal scraper as this may damage sealing surfaces.

2. Lubricate sealing surfaces of seal with clean gearbox oil.



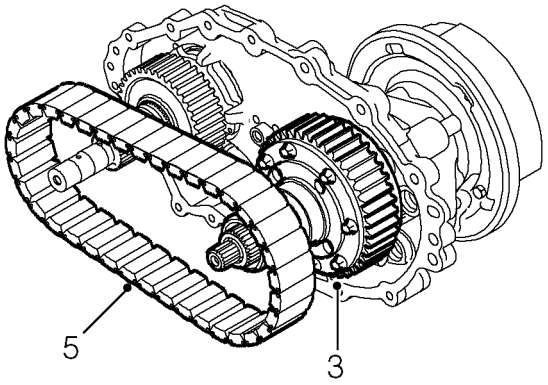
3. Using LRT-41-013 fit oil seal to transfer box rear casing.
4. Fit dust shroud to transfer box rear casing.
5. Fit rear output shaft drive flange. ***See this section.***

DRIVE CHAIN

Service repair no - 41.20.67/01

Remove

1. Remove rear output shaft drive flange. ***See this section.***
2. Remove interlock spool. ***See this section.***



41M7031

3. Release differential assembly from rear casing until differential rear bearing is clear of casing.

NOTE: Ensure rear output drive shaft moves with differential.

4. Tilt differential assembly towards drive sprocket, take care not to bruise casing.
5. Remove drive chain from gears.
6. Position differential assembly to rest in rear casing.

Refit

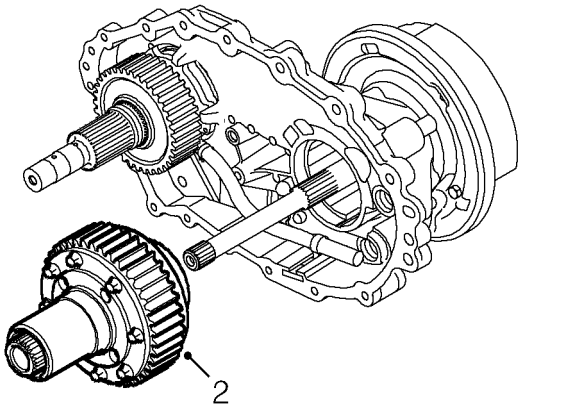
1. Position differential assembly towards drive gear and fit drive chain to both gears.
2. Engage chain to gears and align differential rear bearing to rear casing.
3. Engage differential rear bearing to rear casing and output shaft to output shaft bearing.
4. Fit interlock spool. ***See this section.***
5. Fit rear output shaft drive flange. ***See this section.***

DIFFERENTIAL UNIT

Service repair no - 41.20.13/01

Remove

1. Remove drive chain. ***See this section.***



41M7027

2. Remove differential unit from rear output shaft.

Refit

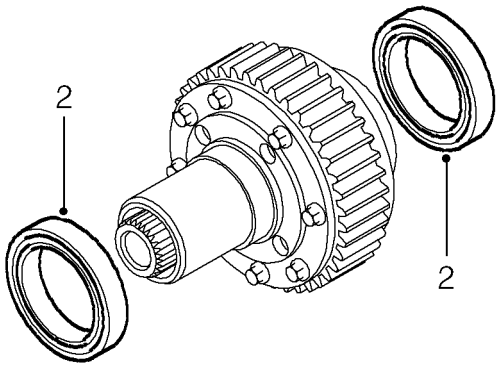
1. Fit differential unit to rear output shaft.
2. Fit drive chain. ***See this section.***

DIFFERENTIAL BEARINGS

Service repair no - 41.20.17/01

Remove

1. Remove differential unit from transfer box. ***See this section.***



41M7021

2. Using a suitable puller, remove 2 bearings from differential unit.

Refit

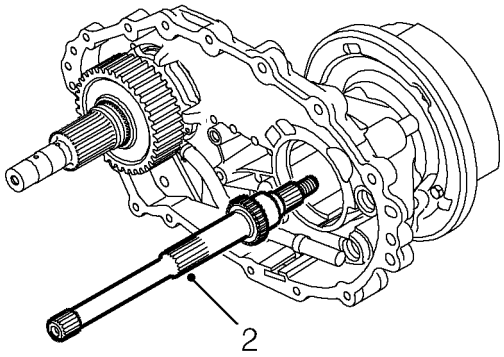
1. Ensure bearing and differential mating faces are clean.
2. Press bearings onto differential unit.
3. Fit differential unit to transfer box. ***See this section.***

REAR OUTPUT SHAFT

Service repair no - 41.20.18/01

Remove

1. Remove differential unit. ***See this section.***



41M7024

2. Remove rear output shaft from rear casing.

Refit

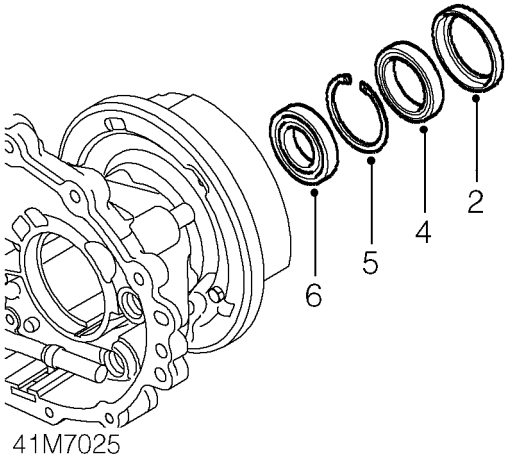
1. Fit rear output shaft to rear casing.
2. Fit differential unit. ***See this section.***

REAR OUTPUT SHAFT BEARING

Service repair no - 41.20.19/01

Remove

1. Remove rear output shaft. ***See this section.***



41M7025

2. Remove dust shroud from transfer box rear casing.
3. Using a flat bladed screwdriver free of rough edges, ease oil seal from rear casing.

CAUTION: Do not mark sealing surface on rear casing.

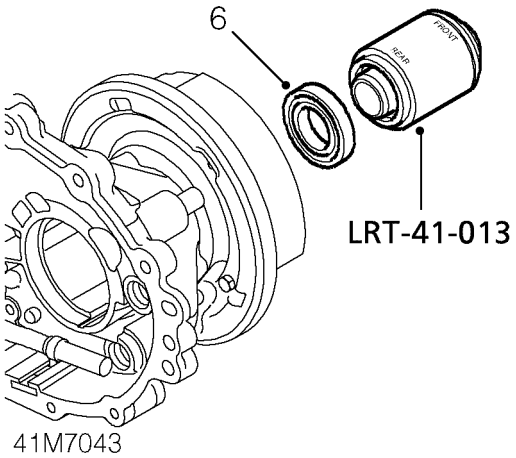
4. Remove rear output shaft oil seal.
5. Remove circlip retaining rear output shaft bearing to rear casing.
6. Press out rear output shaft bearing from rear casing.

Refit

1. Clean bearing and rear casing mating surfaces.
2. Press bearing into rear casing.
3. Fit circlip retaining bearing in rear casing.
4. Clean sealing area of rear casing and running surface of drive flange. Ensure all traces of rubber are removed.

CAUTION: Do not use a metal scraper as this may damage sealing surfaces.

5. Lubricate sealing surfaces of seal with clean gearbox oil.



41M7043

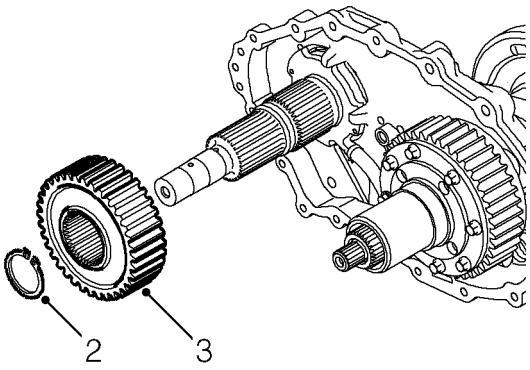
6. Using LRT-41-013, fit oil seal to transfer gearbox rear casing.
7. Fit dust shroud to transfer box rear casing.
8. Fit rear output shaft. ***See this section.***

INTERMEDIATE SHAFT DRIVE GEAR

Service repair no - 41.20.22/01

Remove

1. Remove drive chain. ***See this section.***



41M7029

2. Remove circlip securing drive gear to intermediate shaft.
3. Remove drive gear from intermediate shaft.

Refit

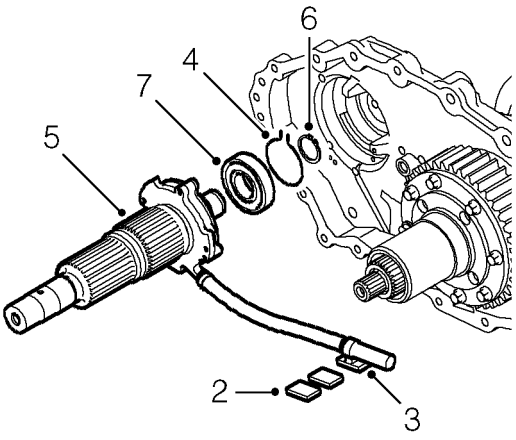
1. Ensure drive gear and intermediate shaft are clean and free from burrs.
2. Fit drive gear to intermediate shaft.
3. Fit circlip retaining drive gear to intermediate shaft.
4. Fit drive chain. ***See this section.***

INTERMEDIATE SHAFT REAR BEARING

Service repair no - 41.20.21/01

Remove

1. Remove intermediate shaft drive gear. ***See this section.***



41M7028

2. Remove 2 magnets from rear casing.
3. Release oil strainer clip from rear casing.
4. Expand snap ring retaining intermediate shaft rear bearing to rear casing.
5. Remove intermediate shaft, oil pump and strainer assembly from rear casing.
6. Remove circlip retaining intermediate shaft bearing to intermediate shaft.
7. Using a suitable puller, remove bearing from rear of intermediate shaft.

Refit

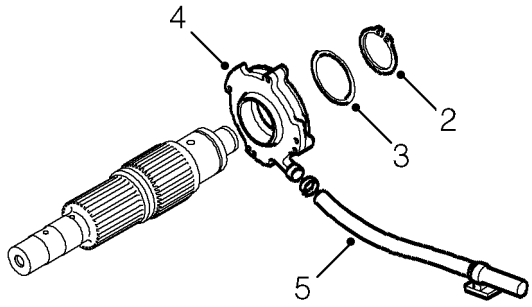
1. Ensure bearing and intermediate shaft mating surfaces are clean and free of burrs.
2. Press bearing onto intermediate shaft.
3. Fit circlip retaining bearing to intermediate shaft.
4. Expand snap ring in rear housing and fit intermediate shaft assembly to rear casing.
5. Ensure snap ring is correctly located to rear bearing.
6. Fit filter hose clip to rear casing.
7. Fit magnets to rear casing.
8. Fit intermediate shaft drive gear. ***See this section.***

OIL PUMP

Service repair no - 41.20.30/01

Remove

1. Remove intermediate shaft rear bearing. ***See this section.***



41M7030

2. Remove circlip retaining oil pump to intermediate shaft.
3. Remove washer from intermediate shaft.
4. Remove oil pump and hose assembly from intermediate shaft.
5. Release clip and remove hose from oil pump.

Refit

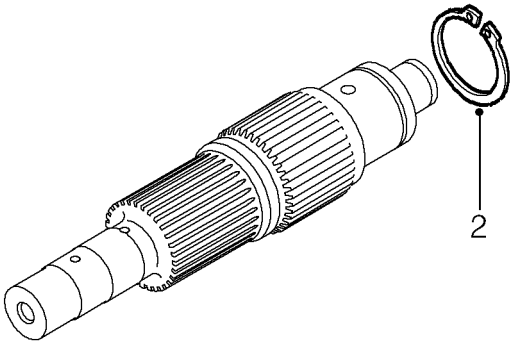
1. Fit hose to oil pump and secure with clip.
2. Fit oil pump to intermediate shaft.
3. Fit washer and circlip securing pump to intermediate shaft.
4. Fit intermediate shaft rear bearing. ***See this section.***

INTERMEDIATE SHAFT

Service repair no - 41.20.20/01

Remove

1. Remove oil pump. ***See this section.***



41M7026

2. Remove circlip from intermediate shaft.

Refit

1. Fit circlip to intermediate shaft.
2. Fit oil pump. ***See this section.***

TORQUE SETTINGS

Output shaft drive flange nut	220 Nm. (162 lbf.ft)
Front gearcase to rear gearcase bolts	35 Nm. (26 lbf.ft)
VCU housing to gearcase bolts	35 Nm. (26 lbf.ft)
Speed sensor	30 Nm. (22 lbf.ft)
Drain/Refill plugs	25 Nm. (18 lbf.ft)
Temperature sensor	15 Nm. (11 lbf.ft)
Ratio control motor to gearcase bolts	10 Nm. (7 lbf.ft)
Breather hose	10 Nm. (7 lbf.ft)

TOOL NUMBERS

LRT 41 011	Input shaft oil seal replacer
LRT 41 013	Output shaft oil seal replacer
LRT 51 003	Drive flange restraining tool
LRT 99 500	Drive flange puller