Published: Feb 26, 2008

Specifications

Lubricants, Fluids, Sealers and Adhesives

Item	Specification
Manual transmission fluid	WSD-M2C200-C
Super DOT 4 brake fluid	ESD-M6C57-A
Sealant	WSS-M2G348-A10
Grease	ESD-M1C220-A

Capacities

Capacities	Litres
MT82 transmission - Initial fill	2.4
MT82 transmission - Service fill	2.2

Description	Nm	lb-ft
Gearshift yoke securing nut	12	9
Clutch slave cylinder bolts	11	8
Reversing lamp switch	20	15
Transmission extension housing bolts	25	18
Transfer case bolts	45	33
Transmission bolts	40	30
RH transmission mount nut*	30	22
RH transmission mount bolts+	63	46
LH transmission mount nut*	30	22
LH transmission mount bolts+	63	46
Starter motor bolts	35	26
Fuel line support bracket nut	9	7
Clutch slave cylinder hose from the mounting bracket nut	25	18
Transmission wiring harness bracket nut and bolt	47	35
Transfer case breather pipe	15	11
RH earth cables to the transfer case bolt	9	7
LH earth cable to the transfer case nut	45	33
Rear driveshaft to the transfer case nut	50	37
Tail pipe to the intermediate pipe nut	25	18

*If re-using nuts on vehicles built prior to VIN732932, tighten to 48 Nm. If replacing nuts, tighten to 30 Nm. +If re-using bolts on vehicles built prior to VIN732932, tighten to 85 Nm. If replacing bolts, tighten to 63 Nm.

Published: Feb 15, 2007

Transmission Draining and Filling (37.24.01)

1.

WARNING: Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

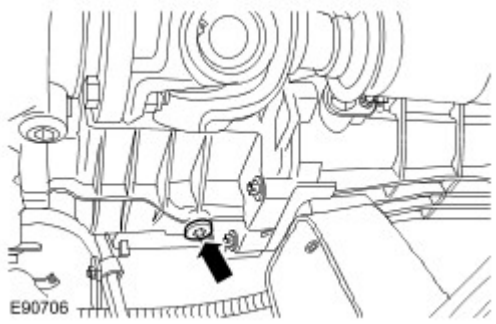
Raise and support the vehicle.

2. **NOTE:**
   The oil should be drained when the transmission is warm and the vehicle is standing on a level surface.

Position a container to collect the oil.

3. Clean the area surrounding the transmission drain plug.

4. Remove the transmission drain plug.
   - Allow the oil to drain.

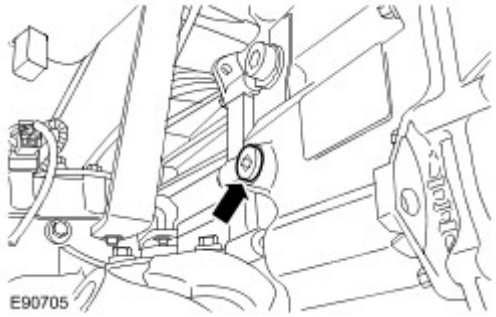


5. Clean transmission drain plug.

6. Install the transmission drain plug and clean any oil residue from the surrounding area.
   - Tighten to 50 Nm (37 lb.ft).

7. Clean the area surrounding the transmission filler plug.

8. Remove the transmission filler plug.



9. Fill the transmission with the correct grade of oil.
Specifications

10. Install the transmission filler plug and clean any oil residue from the surrounding area.
    - Tighten to 35 Nm (26 lb.ft).

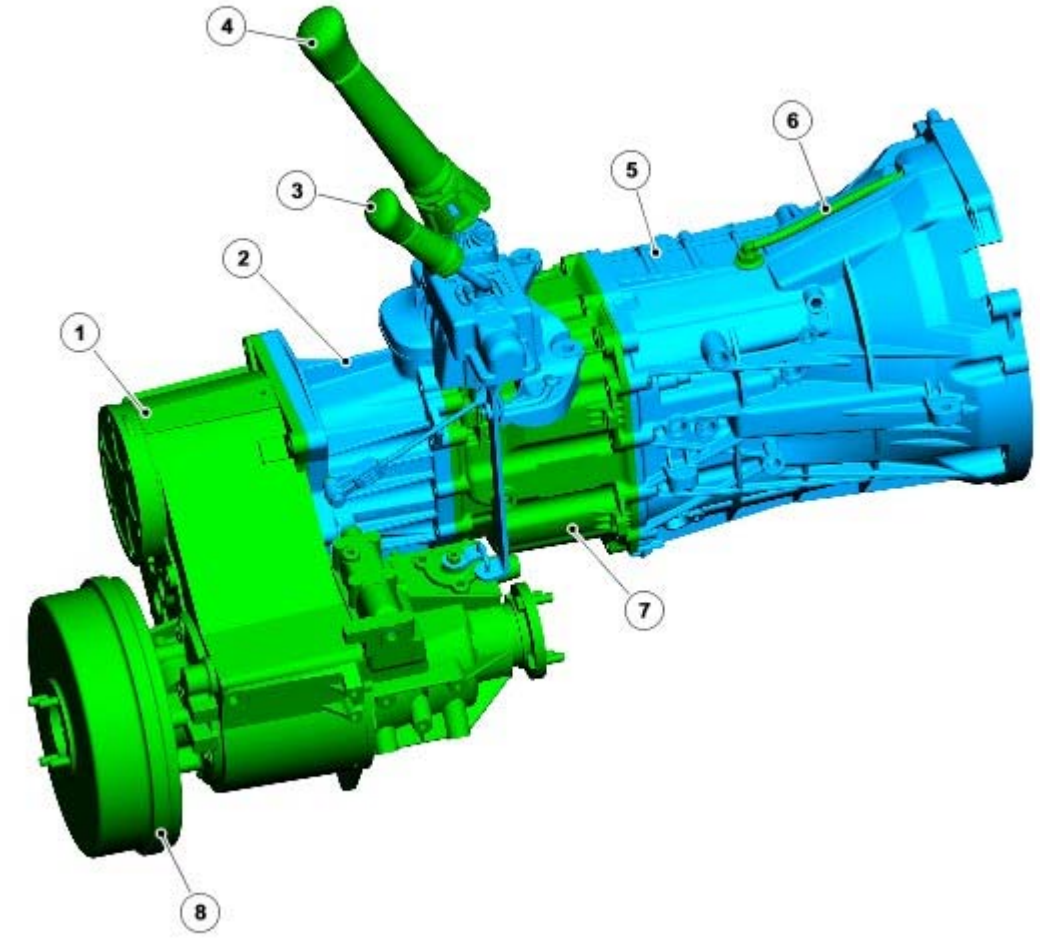
11. Remove the container.

12. Lower the vehicle.

Published: Jan 8, 2007

Manual Transmission - Vehicles With: 6-Speed Manual Transmission (MT82)

COMPONENT LOCATION



E87083

Item	Part Number	Description
1		Transfer box assembly
2		Transmission extension case
3		Transfer box selector lever
4		Gear selector lever
5		Transmission front casing
6		Breather pipe
7		Transmission housing
8		Transmission park brake

OVERVIEW

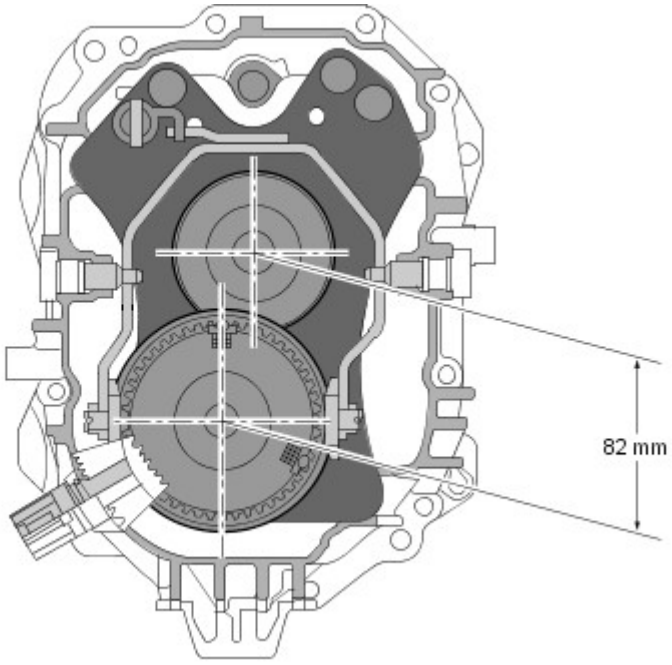
The MT82 manual transmission has 6 forward gears and a reverse. It is mounted longitudinally and has a maximum torque capacity of 360Nm. The aluminium die-cast transmission housing is bolted to the transfer box via an aluminium die-cast extension case.

The 6th gear ratio has been selected as an overdrive for economy and comfort at higher vehicle speeds. Optimum

gear steps ensure highly fuel-efficient utilisation of the engine torque. This 6-speed transmission provides a wide ratio spread supporting both economy and drivability (e.g. low speed maneuvering/trailer towing).

The name MT82 is derived from the distance between the 2 shafts in the transmission:

- **M** stands for manual
- **T** stands for transmission
- **82** is the distance between the 2 shafts in milimeters (mm)



E47709

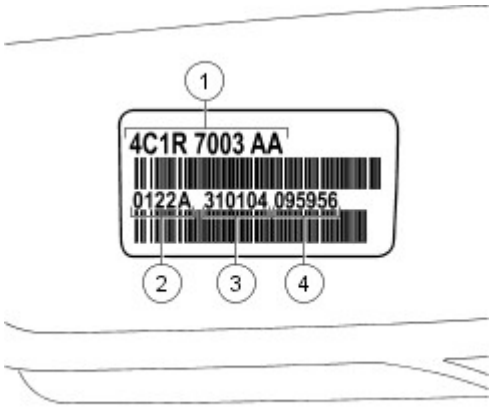
The transmission is a fill for life unit and no level check is required at service unless a leak is present.

Technical Data

Input Torque	Ratios	Dry Weight	Oil fill	Oil Specification						
1st	2nd	3rd	4th	5th	6th	Rev				
360Nm	5.441	2.840	1.721	1.223	1.00	0.742	4.935	50.8 kg	2.4L	WSD-M2C200-C

The input and output shafts are directly connected in 5th gear. This produces a gear ratio of 1:1.

Model Plate Label



E48449

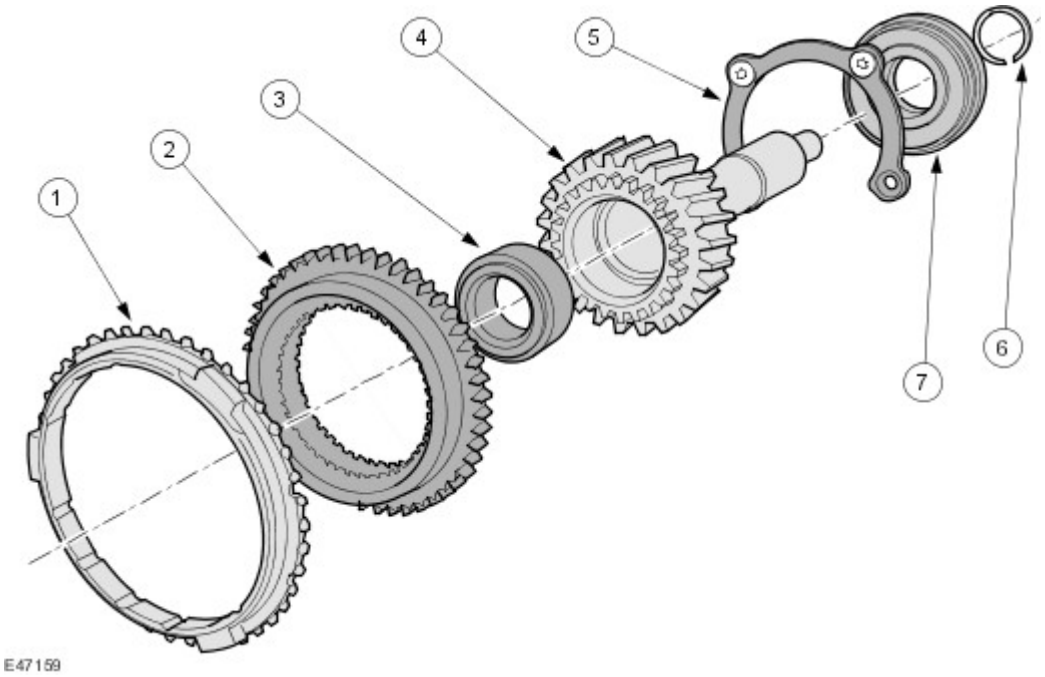
Item	Part Number	Description
1		Replacement part number

2		Place of manufacture (Halewood)
3		Vehicle build date
4		Build time

The model plate is located on the Right Hand (RH) side of the transmission, near the driveshaft drive flange.

It is only used to identify the transmission. All spare parts orders are still made using the Vehicle Identification number (VIN).

INPUT SHAFT



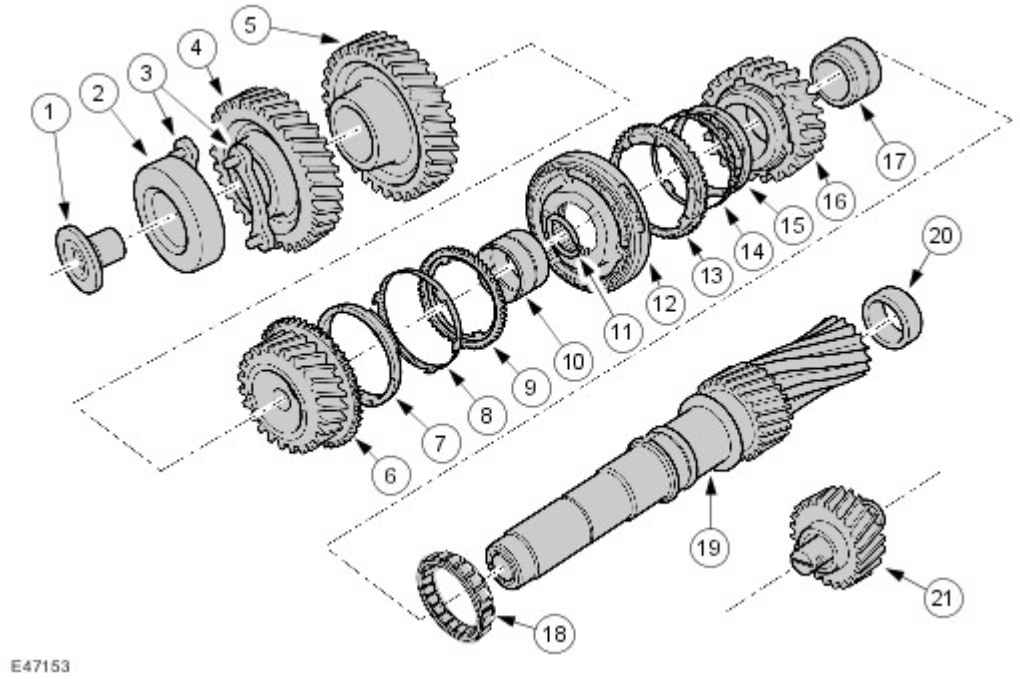
E47159

Item	Part Number	Description
1		5th gear synchroniser ring
2		Splined synchroniser, 5th gear
3		Output shaft pilot bearing
4		Input shaft
5		Bearing retaining plate
6		Ball bearing circlip
7		Input shaft ball bearing

The input shaft is rotationally mounted in the output shaft on the pilot bearing (3). In order to absorb the axial forces, the input shaft ball bearing (7) is additionally secured.

All the components on the input shaft can be serviced separately.

LAYSHAFT



E47153

Item	Part Number	Description
1		Retaining bolt
2		Ball bearing, layshaft
3		Retaining plate - bearing
4		Input pinion, layshaft
5		Gear - 6th gear
6		Gear wheel - 3rd gear
7		3rd gear synchroniser cone
8		Inner synchroniser ring
9		Outer synchroniser ring - 3rd gear
10		Needle bearing
11		Snap ring
12		3rd/4th gear synchroniser assembly
13		Outer synchroniser ring - 4th gear
14		Inner synchroniser ring
15		4th gear synchroniser cone
16		Gear wheel - 4th gear
17		Needle bearing
18		Centre bearing, layshaft
19		Layshaft
20		Roller bearing, layshaft
21		Reverse gear idler

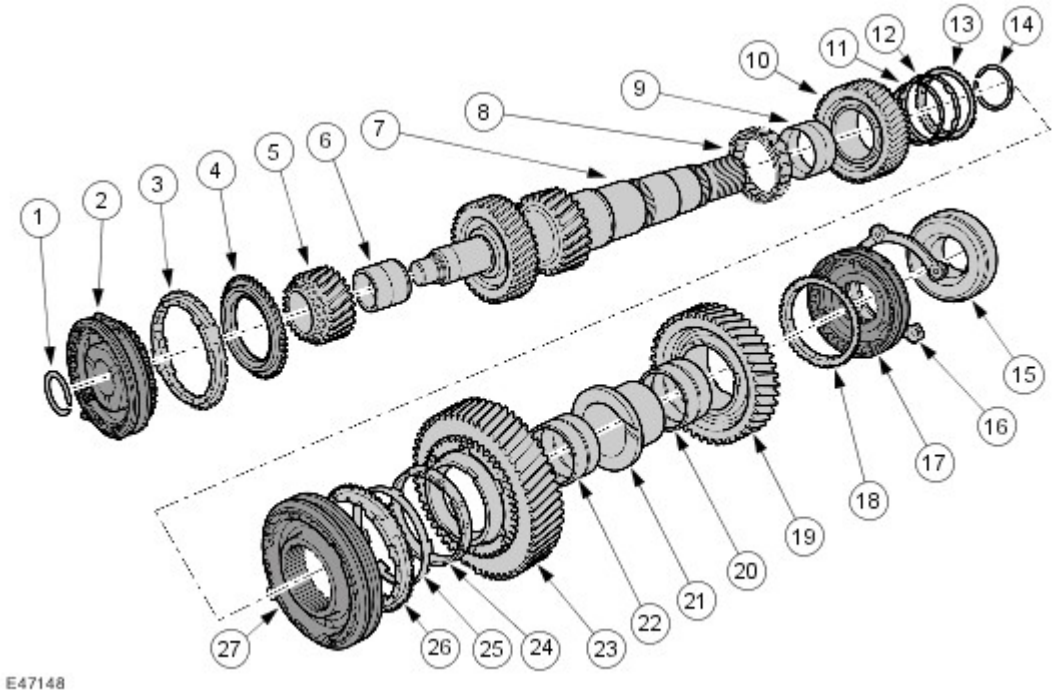
The layshaft transfers the torque from the input shaft onto the output shaft. Gear wheels and gears and the 3rd/4th gear synchroniser assembly are located on the shaft. First, 2nd and reverse gears are an integral part of the shaft.

The layshaft gearwheels and gears can be replaced individually. Because of improved manufacturing tolerances, it is no longer necessary to change the gears and gear wheels in pairs.

The layshaft is a solid shaft. In order to prevent the shaft from moving axially, it is additionally secured with a retaining bolt (1) and a bearing retaining plate (3).

The rotational direction of the output shaft is reversed by the use of the reverse gear idler (21).

OUTPUT SHAFT



Item	Part Number	Description
1		Snap ring
2		5th/6th gear synchroniser assembly
3		6th gear synchroniser ring
4		Splined synchroniser, 6th gear
5		Gear wheel - 6th gear
6		Needle bearing
7		Output shaft
8		Centre bearing - output shaft
9		Needle bearing
10		Gear wheel - 2nd gear
11		2nd gear synchroniser cone
12		Inner synchroniser ring
13		Outer synchroniser ring - 2nd gear
14		Snap ring
15		Ball bearing, output shaft
16		Retaining plate - bearing
17		Reverse gear synchroniser assembly
18		Reverse gear synchroniser ring
19		Gear wheel - reverse gear
20		Needle bearing
21		Inner race - needle bearing
22		Needle bearing
23		Gear wheel - 1st gear
24		1st gear synchroniser cone
25		Inner synchroniser ring - 1st gear
26		Outer synchroniser ring - 1st gear
27		1st/2nd gear synchroniser assembly

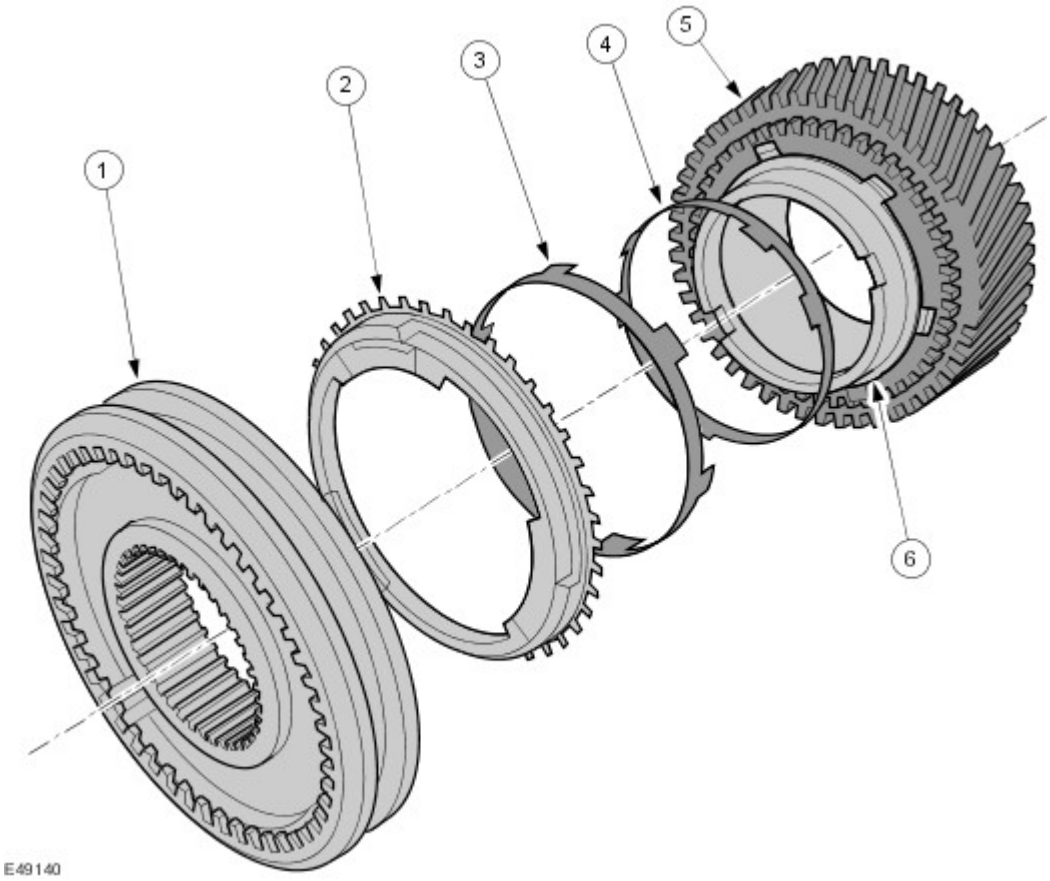
The output shaft transfers torque through the output flange, to an extension shaft connected to the transfer box. 1st,

2nd, 6th and reverse gear wheels are located on the output shaft. 3rd and 4th gears are an integral part of the output shaft.

In a similar way to the input shaft, there is a splined synchroniser (4) pushed on the 6th gear gear wheel. This makes it possible to transfer the torque in 6th gear.

The output shaft gearwheels and gears can be replaced individually.

TRIPLE SYNCHRONISER ASSEMBLY

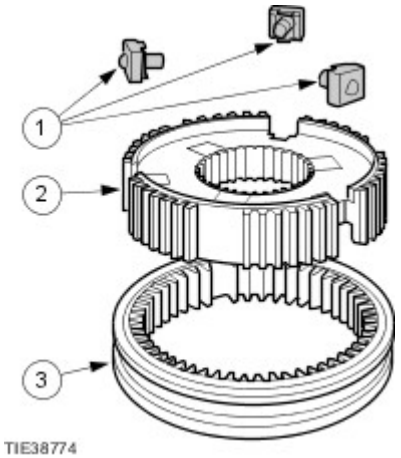


Item	Part Number	Description
1		1st/2nd gear synchroniser assembly
2		Outer synchroniser ring
3		Inner synchroniser ring
4		Synchroniser cone
5		Gear wheel
6		Conical surface

The Synchronisation assembly consists of 3 friction surfaces. The total friction surface of triple synchronisation is considerably increased by the additional conical surface (6). This leads to a reduction in the force needed to change into 1st or 2nd gear.

As the conical surface is part of the gear wheel, there is no need for an additional synchroniser ring.

SYNCHRONISER ASSEMBLY

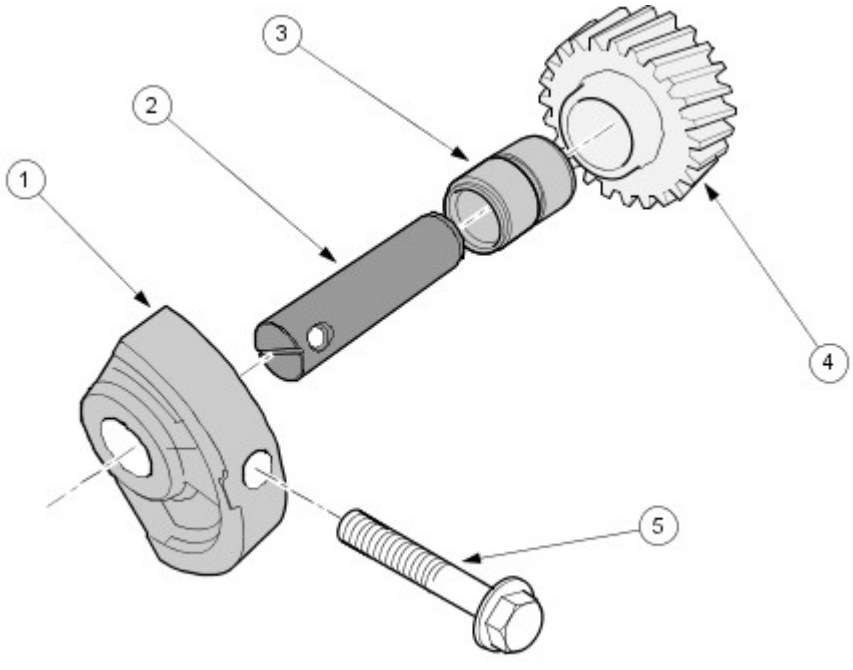


TIE38774

Item	Part Number	Description
1		Sliding block assembly
2		Synchroniser hub
3		Sliding collar

The pressure springs and detent balls of the sliding blocks are combined in one unit.

REVERSE GEAR IDLER



E47160

Item	Part Number	Description
1		Mounting
2		Reverse gear idler shaft
3		Needle bearing
4		Reverse gear idler
5		Retaining bolt - reverse gear mounting

The reverse gear idler allows the direction of rotation of the output shaft to be reversed. The reverse gear idler turns on a needle bearing, which runs on the reverse gear idler shaft. The shaft is retained by the mounting (1) and a locating bore in the transmission housing.

In order to absorb the radial forces, the reverse gear idler runs on an additional mounting.

If the reverse gear idler can be replaced as an individual unit.

Published: Apr 29, 2009

Selector Shaft Detents

Special Service Tools

Slide Hammer
100-012

Remover, Detent
308-657

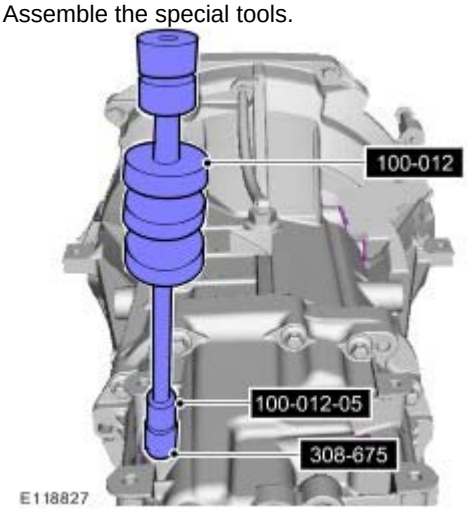
Adapter, Slide Hammer
100-012-05

Removal

1 . Remove the transmission.
For additional information, refer to Transmission (37.20.02.99)

2 . **CAUTION: Make sure area surrounding component is clean.**

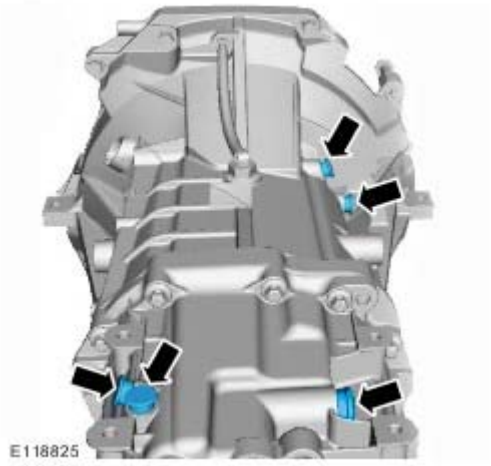
Assemble the special tools.



3 .

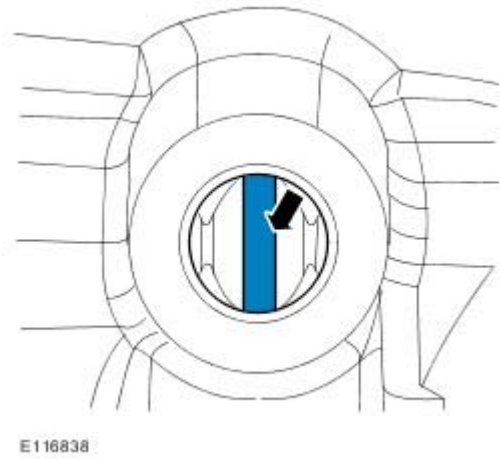
CAUTION: Make sure area surrounding component is clean.

Using the special tools, remove the selector rod detents.



Installation

1 . Make sure all gear selector rods are aligned as shown and the gear selector linkage is free to move.



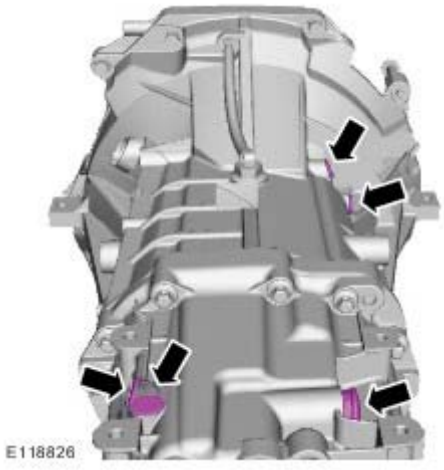
2 .

CAUTION: Make sure area surrounding component is clean.

NOTE:

New selector rod detents must be seated flush with transmission casing as necessary.

Using a suitable and , install the selector rod detents.



3 . Install the transmission.
For additional information, refer to Transmission (37.20.02.99)

Published: Apr 14, 2008

Transmission (37.20.02.99)

Special Service Tools

Powertrain Assembly Jack
HTJ1200-02

Remover, Slider
308-652

Slide Hammer
100-012

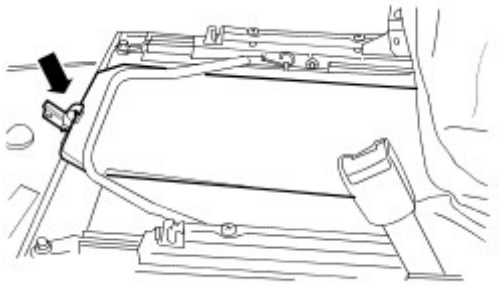
Adapter Slide Hammer
100-012-05

Removal

1 . Open the front door.

2 . Remove the front seat cushion assembly.
For additional information, refer to Front Seat Cushion (78.10.12/99)

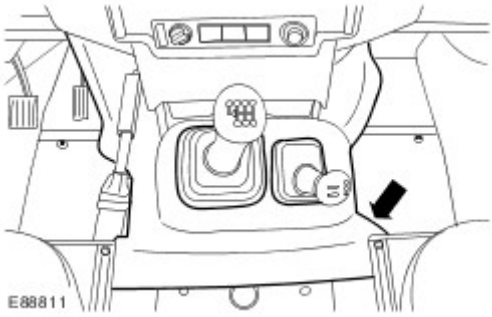
3 . Remove the battery cover.
- Release the clip.



4 . Disconnect the battery ground cable.
For additional information, refer to Battery Disconnect and Connect

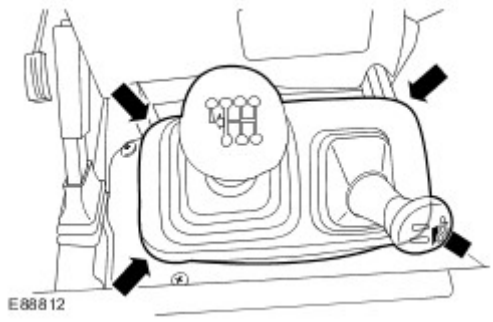
5 . Remove centre floor console.
For additional information, refer to Floor Console (76.25.01)

6 . Remove the transmission cover panel carpet.



7 . Release the gear selector lever gaiter.

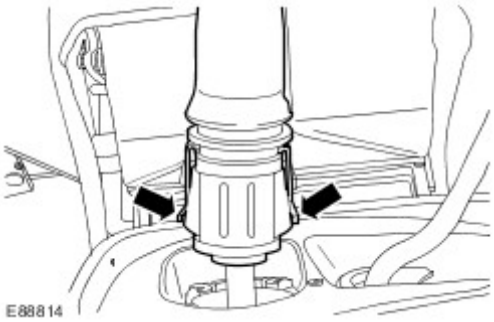
- Release the gear selector lever gaitor from the transmission tunnel.
- Release the gear selector lever gaiter from the high-low selector lever.



8 .

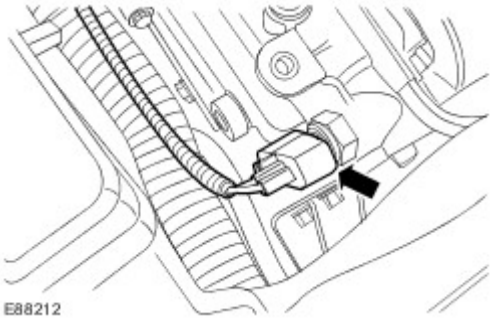
WARNING: The gearshift lever knob will be released suddenly, keep face clear during removal. Failure to follow this instruction may result in personal injury.

Remove the upper gear change lever.



9 . Remove the gear selector lever gaiter.

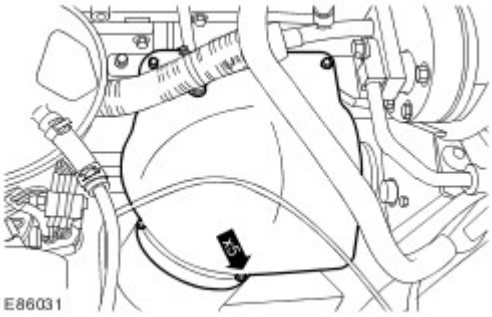
10 . Disconnect the reversing lamp switch electrical connector.



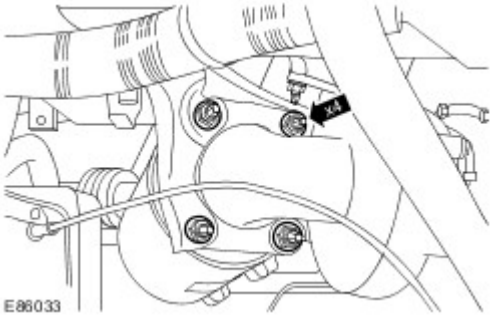
11 . Open bonnet for access.

12 . Remove the turbocharger heat shield.

- Remove the 5 bolts.



13 . Remove the 4 catalytic converter securing studs.

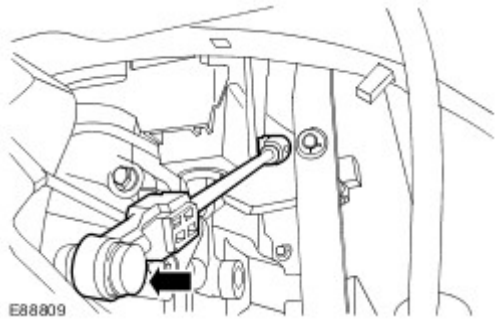


14 .

WARNING: Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

15 . Release the high-low selector rod ball joint from the transfer gearbox.



16 . Lower the vehicle.

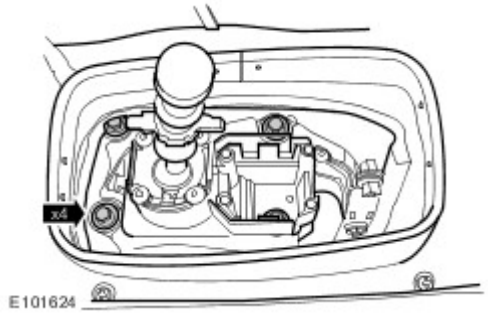
17 . Open the front door.

18 . Remove the foam pad from around the selector levers.

19 . Remove the 4 high-low selector lever securing bolts.

20 . Remove the high-low selector lever.

21 . Remove the 4 gear selector housing securing bolts.

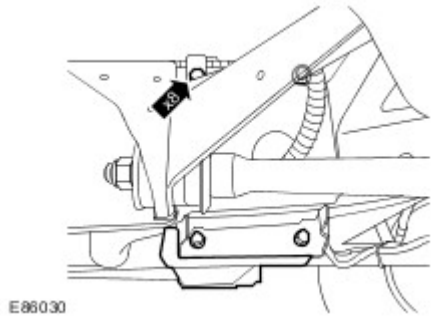


22 . **NOTE:**

Left-hand side shown, right-hand side similar.

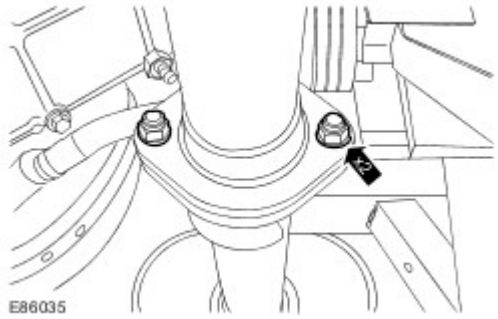
Remove the chassis cross member.

Remove the 8 bolts.

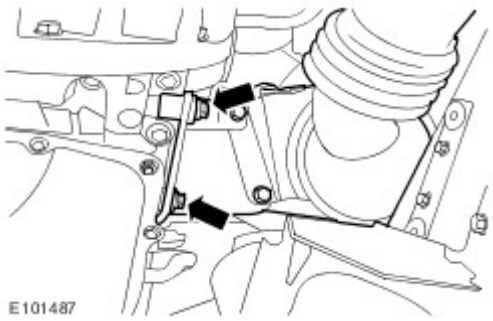


23 . Remove the front driveshaft.
For additional information, refer to Front Driveshaft (47.15.02)

24 . Remove the 2 catalytic converter to intermediate pipe securing nuts.

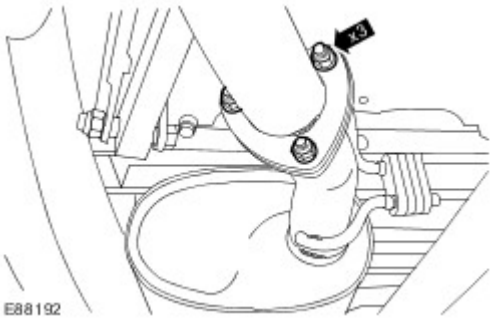


25 . Remove the 2 catalytic converter mounting bracket securing bolts.

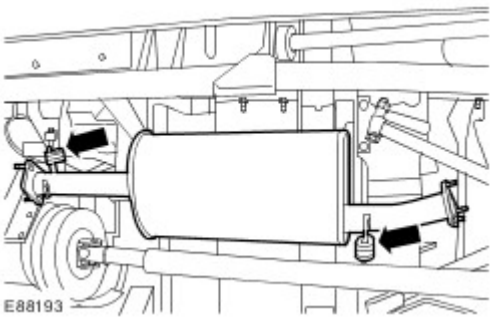


26 . Remove the catalytic converter.

27 . Remove the tailpipe and muffler, to intermediate pipe securing nuts.



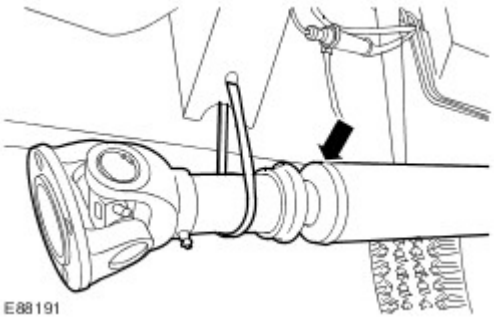
28 . Remove the intermediate pipe and muffler.



29 . Displace and reposition the rear driveshaft.

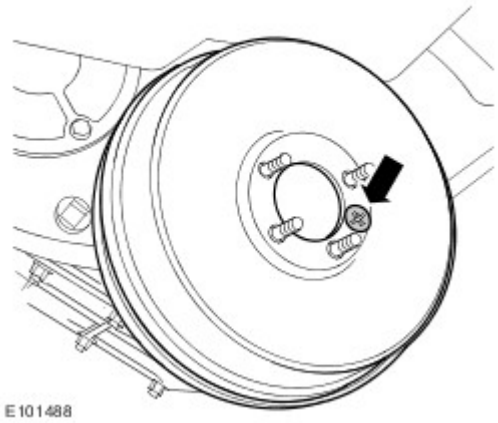
- Mark the position of the driveshaft in relation to the drive pinion flange.
- Remove the rear driveshaft to transfer gearbox securing nuts.

30 . Using a suitable tie strap, secure the rear driveshaft to the chassis.

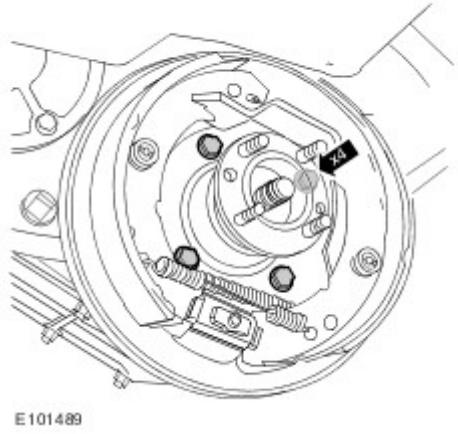


31 . Remove the parking brake drum.

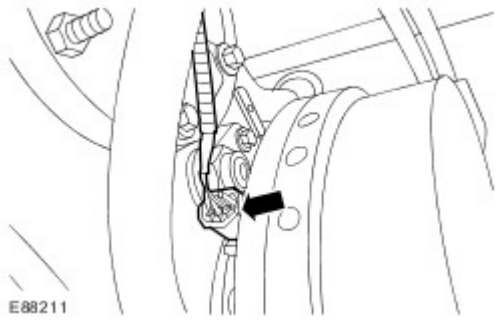
- Remove the securing screw.



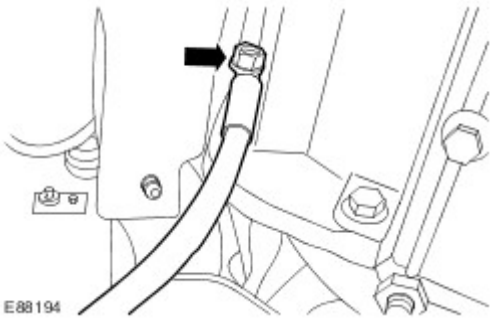
32 . Remove the parking brake assembly and tie aside.



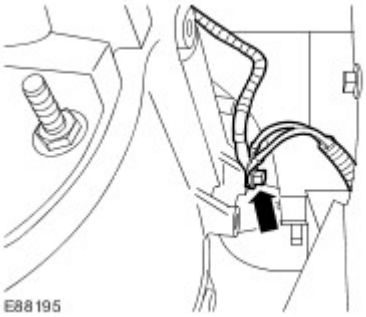
33 . Disconnect the electronic speedometer drive electrical connector from the transfer gearbox.



34 . Remove the nut and disconnect the LH earth cable from the transfer gearbox.

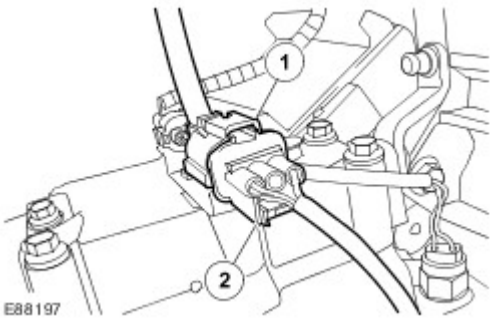


35 . Remove the bolt securing the RH earth cables from the transfer gearbox.



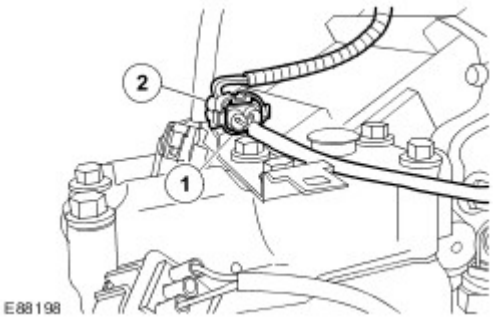
36 . Displace and reposition the high-low detection switch electrical connector away from the transfer gearbox.

- Disconnect the high-low detection switch electrical connector.



37 . Disconnect the differential lock detection switch electrical connector.

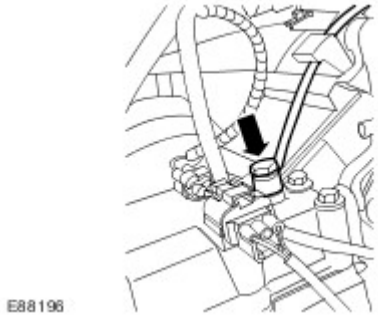
- Release the electrical connector from the bracket.



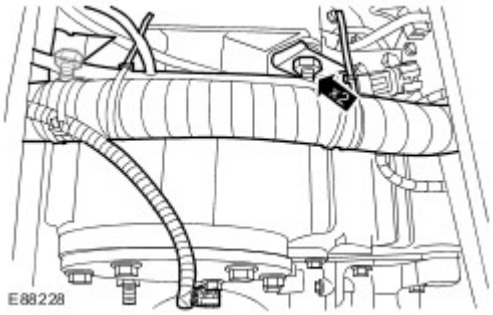
38 . Release the breather pipe from transfer gearbox.

- Remove the securing bolt.

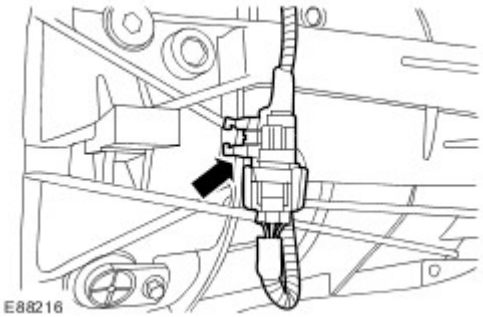
- Remove and discard the 2 sealing washers.



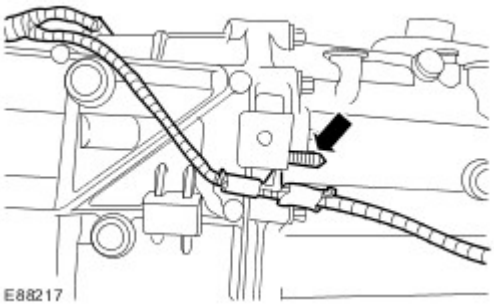
39 . Remove the transmission harness retaining bracket securing nut and bolt and reposition the harness.



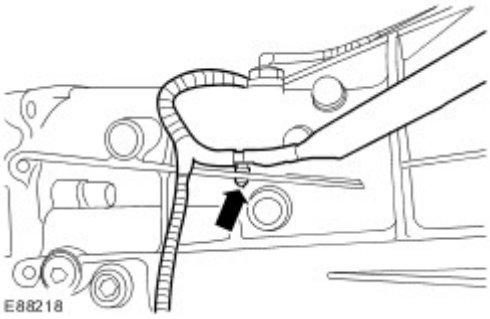
40 . Release the transmission wiring harness connector and bracket from the RH side of the transmission.



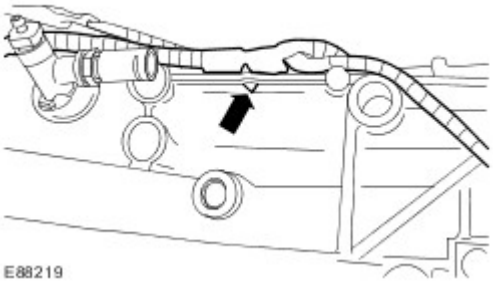
41 . Release the transmission wiring harness securing clip from the LH side of the transmission.



42 . Release the transmission wiring harness securing clip from the RH side of the transmission.



43 . Release the transmission wiring harness securing clip from the top of the transmission.



44 . Remove the clutch slave cylinder fluid hose mounting bracket securing nut and bolt.

- Install a suitable pipe clamp to the clutch slave cylinder fluid hose.

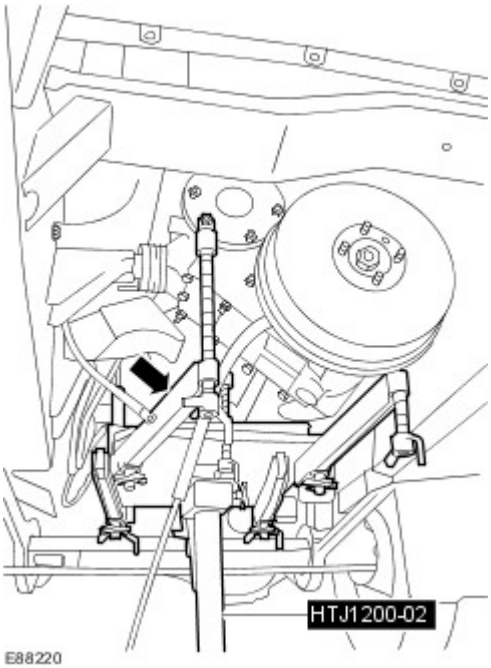
45 .

CAUTION: Make sure that all openings are sealed. Use new blanking caps.

Disconnect the clutch slave cylinder fluid hose from the clutch slave cylinder.

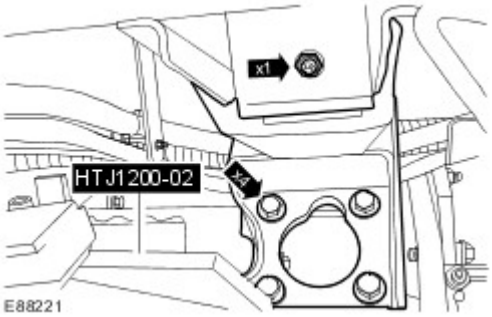
- Remove the clutch slave cylinder line clip.
- Remove and discard the O-ring seal.

46 . Install the special tool HTJ1200-02 to the transmission and transfer gearbox.



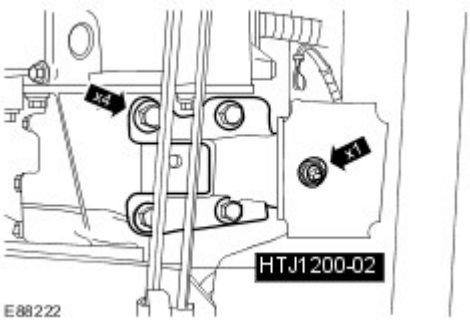
47 . Remove the LH transmission mount and mounting bracket.

- Remove the LH transmission mount and mounting bracket securing nuts and bolts.

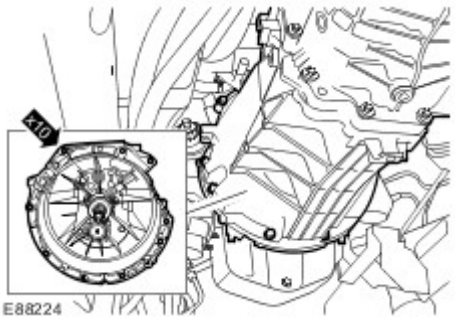


48 . Remove the RH transfer gearbox mounting bracket.

- Remove the RH transfer gearbox mount and mounting bracket securing nuts and bolts.

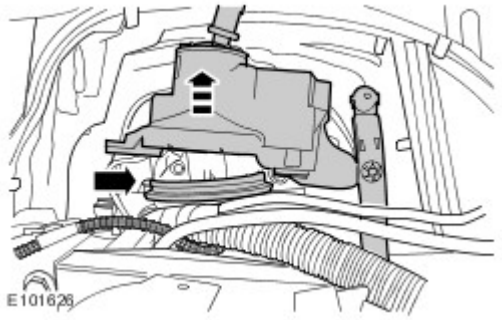


49 . Remove the bell housing bolts.



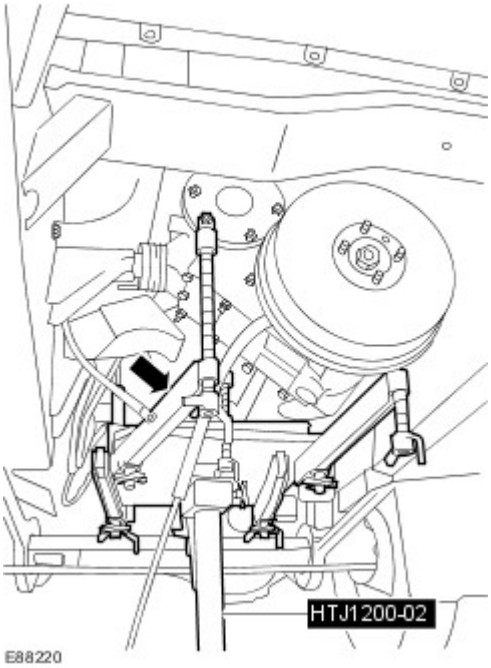
50 . Remove the gear selector housing.

- Reposition the transmission to allow access to the gear selector housing.
- Remove from below the vehicle.
- Remove the rubber seal.



51 . **CAUTION: Disengage the transmission from the clutch by 30mm before lowering HTJ1200-02 to protect clutch from damage.**

Remove the transmission and transfer gearbox from the vehicle.



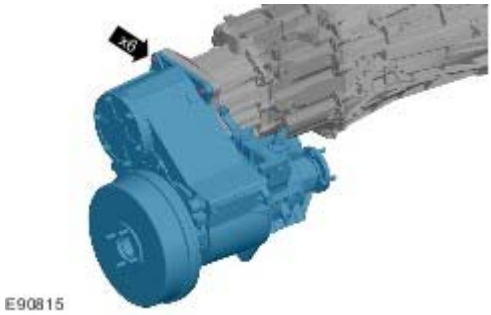
52 . **NOTE:**

Do not disassemble further if the component is removed for access only.

Remove the transmission from the special tool.

53 . With assistance, remove the transfer case.

- Remove the 4 bolts.
- Remove the 2 nuts.



E90815

54 . Remove the transmission extension housing.

- Remove the 10 bolts.

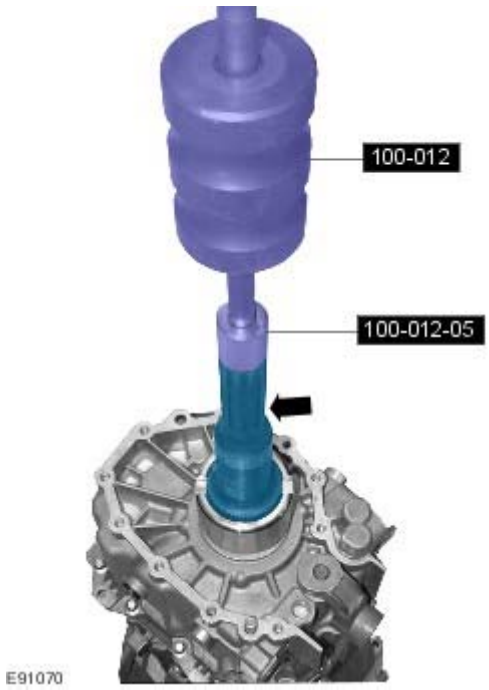
E91067

55 . Remove the transmission extension shaft cover.

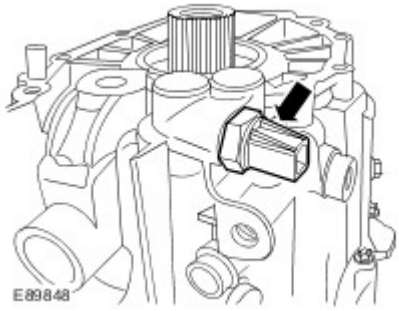
- Remove the tie strap.
- Remove the cover.

56 . Remove the seal.

57 . Using the special tools, remove the transmission extension shaft.

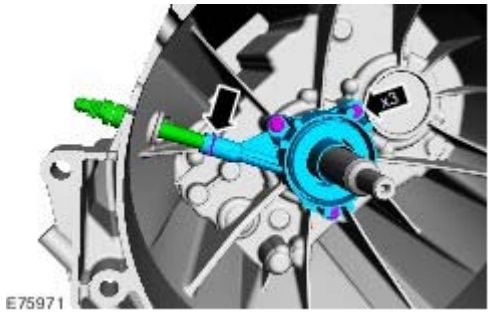


58 . Remove the reversing lamp switch.

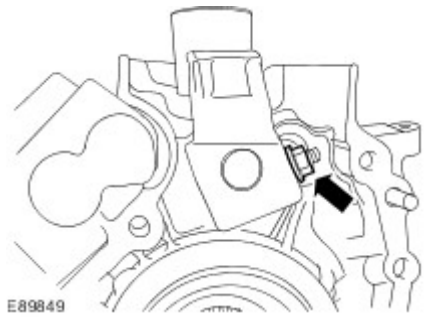


59 . Remove the clutch slave cylinder.

- Remove the connecting pipe securing clip.
- Remove the connecting pipe.
- Remove the 3 bolts.

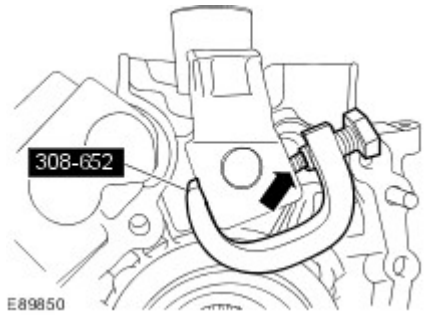


60 . Remove the gearshift yoke securing nut.



61 . Using the special tool, remove the gearshift yoke.

Remove the pin.



Published: Apr 14, 2008

Transmission (37.20.02.99)

Special Service Tools

Powertrain Assembly Jack
HTJ1200-02

Gear Selector Setting Tool
308-561

Installation

NOTE:

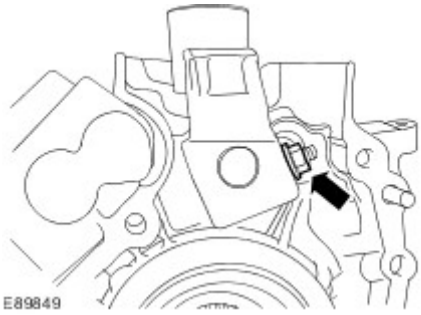
If a new transmission is being fitted then the gearshift lever retaining bolts must be pre installed to the transmission to cut the threads. Failure to follow this instruction will increase the difficulty of fitting the gearshift lever to the transmission.

1 . **NOTE:**

Make sure the pin is fitted from Left to Right when viewed from the rear of the transmission.

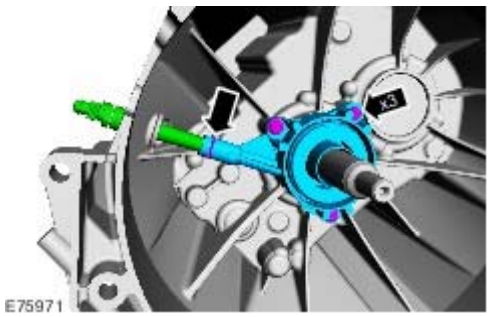
Install the gearshift yoke.

- Install the pin.
- Tighten the nut to 12 Nm (9 lb.ft).



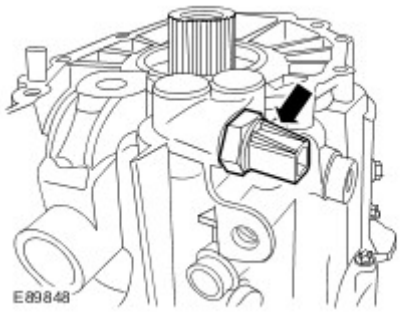
2 . Install the clutch slave cylinder.

- Tighten the bolts to 11 Nm (8 lb.ft).
- Install the connecting pipe.
- Install the connecting pipe securing clip.



3 . Install the reversing lamp switch.

Tighten to 20 Nm (15 lb.ft).



4 . Install the seal.

5 . **NOTE:**

Apply anti seize grease to the splines.

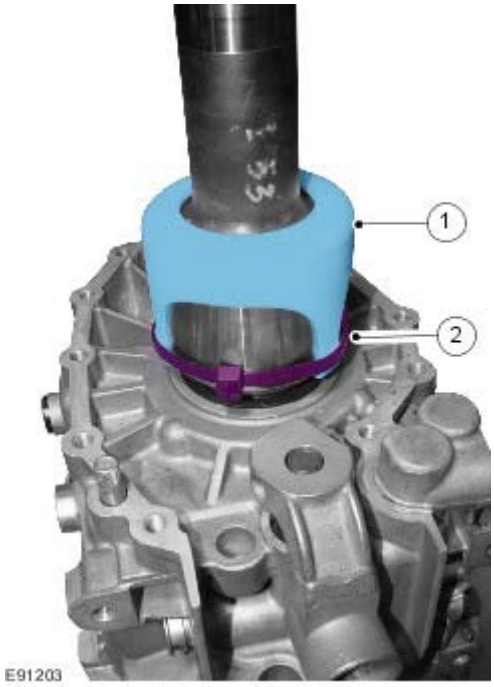
NOTE:

Make sure that the tie strap joint is between the fingers of the extension shaft seal cover and that it has been cut flush.

Install the transmission extension shaft.

Install the cover.

- Install the tie strap.



6 . Install the transmission extension housing.

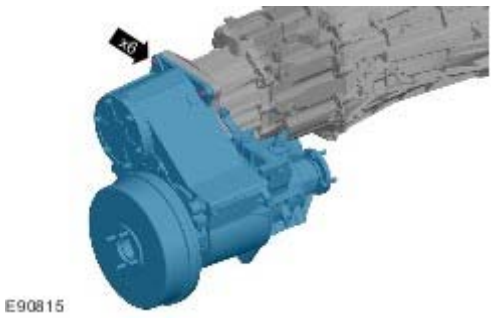
- Tighten the bolts to 25 Nm (18 lb.ft).

7 . **NOTE:**

Apply sealant STC 50552 to the bolt threads.

With assistance, install the transfer case.

- Tighten the bolts to 45 Nm (33 lb.ft).
- Tighten the nuts to 45 Nm (33 lb.ft).



8 . **NOTE:**

This step must be carried out if a new transmission is being fitted.

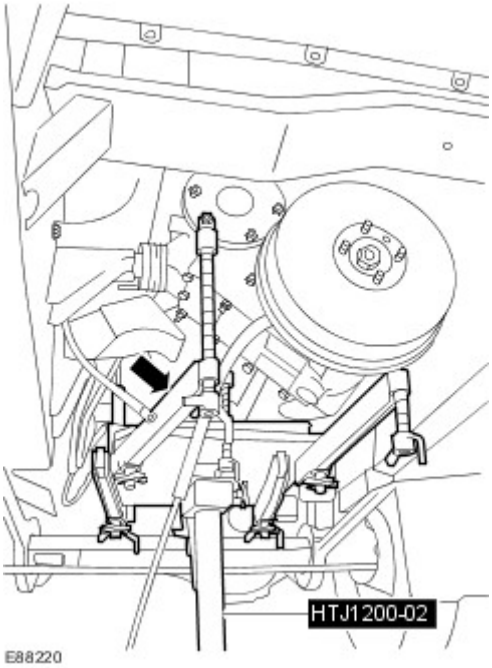
Install the gear selector housing securing bolts to cut a new thread.

- Remove the bolts.

9 .

CAUTION: Care must be taken when locating the transmission to the clutch.

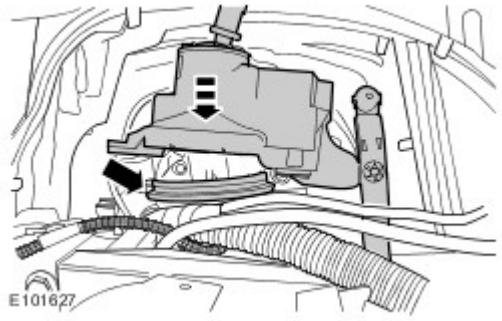
Install the transmission and transfer gearbox.



10 . **NOTE:**

Make sure the rubber gasket is fitted to the gearshift lever housing before installation.

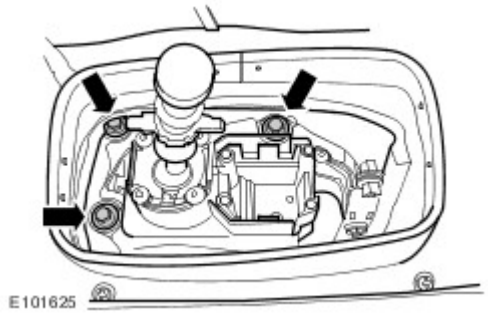
Install the gear selector housing.



11 . **NOTE:**

From below the vehicle.

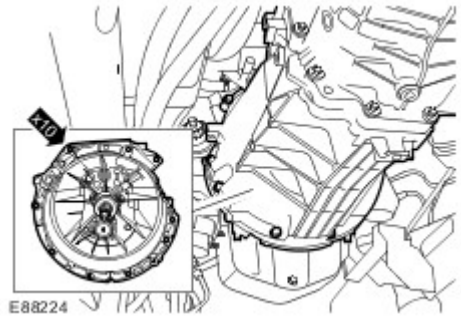
Install the 3 accessible gear selector housing securing bolts by hand only.



12 . Position the transmission to the engine.

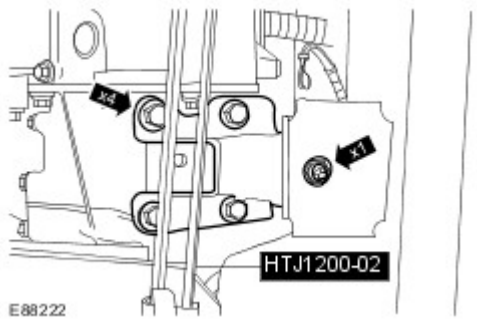
13 . Install the bell housing bolts.

- Tighten to 40 Nm



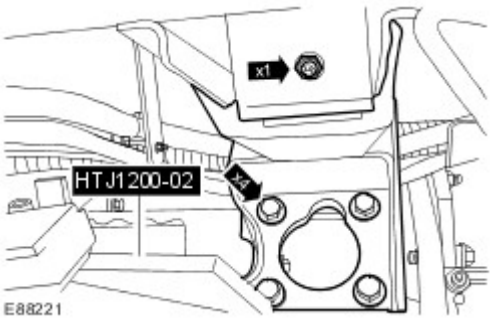
14 . Install the RH transfer gearbox mounting bracket.

- Tighten the nut to 48 Nm
- Tighten the bolts to 85 Nm

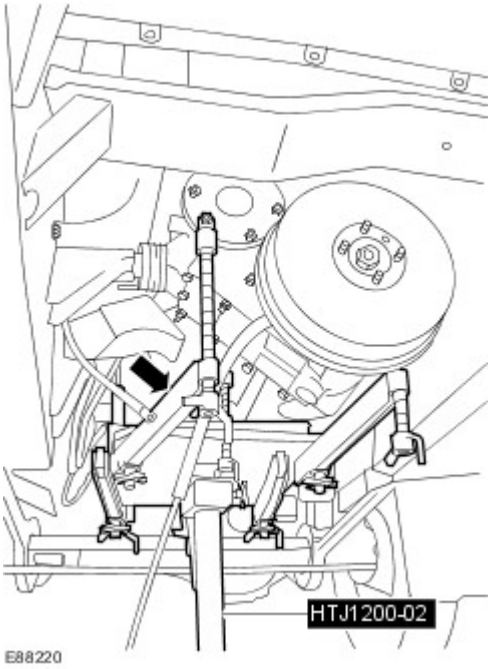


15 . Install the LH transmission mount and mounting bracket.

- Tighten the nut to 48 Nm
- Tighten the bolts to 85 Nm



16 . Remove the special tool HTJ1200-02 from the transmission and transfer gearbox.



17 . Connect the clutch slave cylinder fluid hose to the clutch slave cylinder.

- Remove the blanking plugs from the orifices.
- Install a new clutch slave cylinder fluid hose O-ring seal.
- Install the clutch slave cylinder line clip.

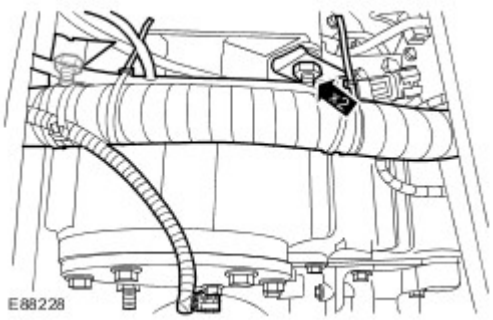
18 . Install and fully tighten the clutch slave cylinder fluid hose mounting bracket securing nut and bolt.

- Remove the pipe clamp from the clutch slave cylinder fluid hose.
- Tighten the bolt to 25 Nm

19 . Secure the wiring harness to the transmission.

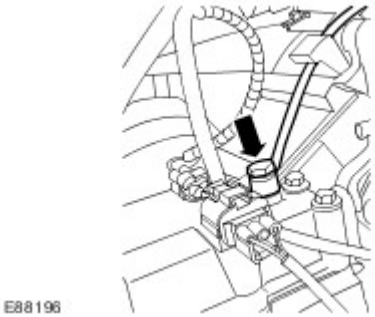
20 . Reposition the transmission harness and install the transmission harness retaining bracket securing nut and bolt.

- Tighten to 47 Nm



21 . Install the transfer gearbox breather pipe.

- Install new sealing washers onto the transfer gearbox breather pipe securing bolt.
- Install the securing bolt.
- Tighten to 15 Nm.



22 . Connect the differential lock detection switch electrical connector.

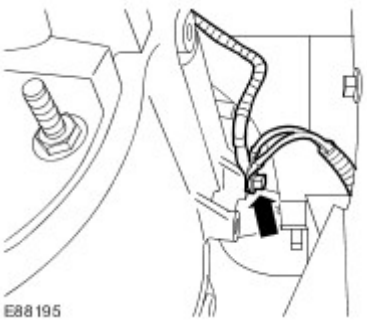
- Secure the electrical connector to the bracket.

23 . Reposition and secure the high-low detection switch electrical connector onto the transfer gearbox.

- Secure the electrical connector to the bracket.

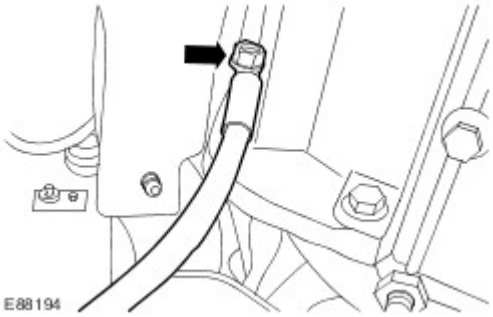
24 . Install the RH transfer gearbox earth cables securing bolt.

- Tighten to 12 Nm



25 . Install the LH transfer gearbox earth cable securing nut.

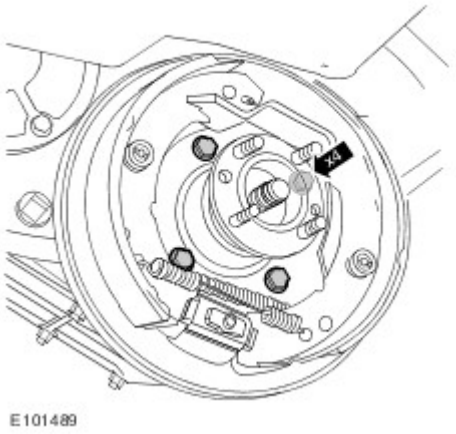
- Tighten to 45 Nm



26 . Connect the electronic speedometer electrical connector to the transfer gearbox.

27 . Install the parking brake assembly.

- Install the 4 securing bolts.
- Tighten to 73 Nm.



28 . Install the parking brake drum.

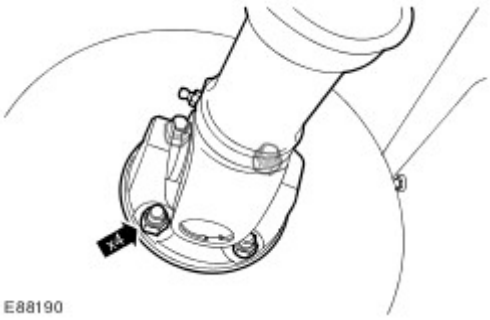
- Install the securing screw.

29 . **NOTE:**

Align to the position noted on removal.

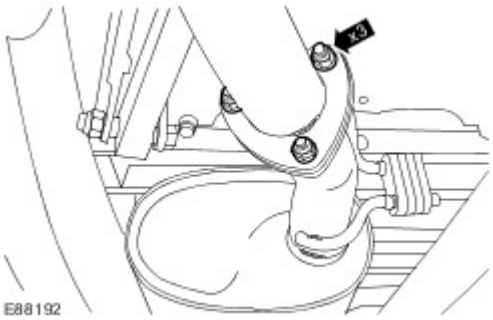
Reposition and secure the rear driveshaft to the transfer gearbox.

- Release the driveshaft from the chassis.
- Install the rear driveshaft to transfer gearbox securing bolts.
- Tighten to 47 Nm



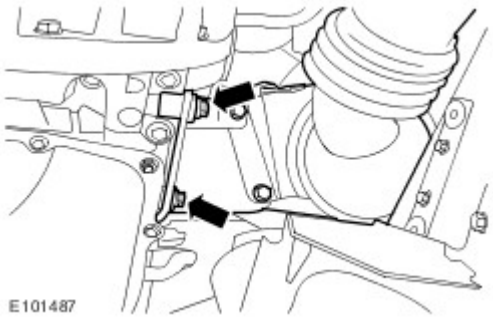
30 . Install and secure the intermediate pipe and muffler.

- Install a new gasket.
- Install the tailpipe and muffler, to intermediate pipe securing nuts.
- Tighten to 25 Nm



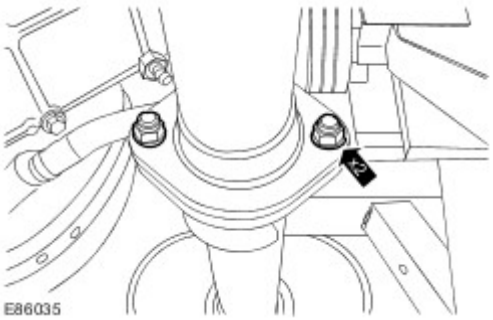
31 . Install the catalytic converter.

- Clean the catalytic converter mating faces.
- Loosely install the 2 catalytic converter mounting bracket securing bolts.



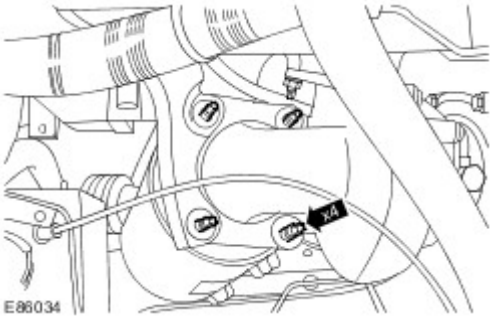
32 . Secure the catalytic converter.

- Loosely install the catalytic converter to intermediate pipe securing nuts.



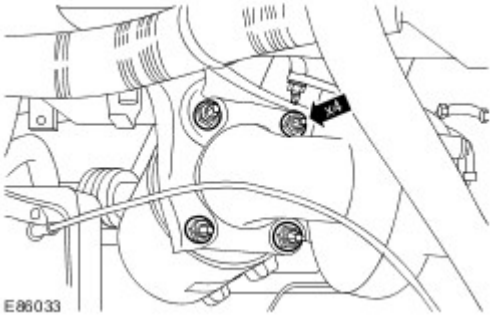
33 . Lower the vehicle.

34 . Install 4 new catalytic converter securing studs.



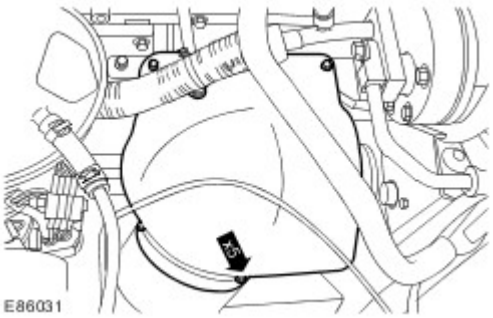
35 . Install 4 new securing nuts.

Tighten to 45 Nm



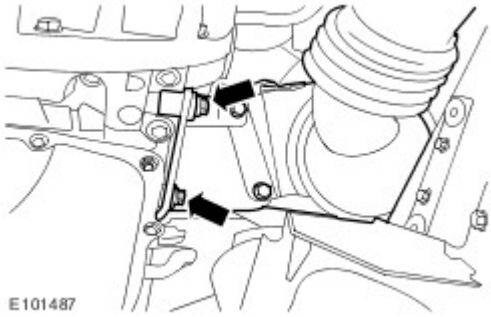
36 . Install the turbocharger heat shield.

Tighten to 10 Nm.

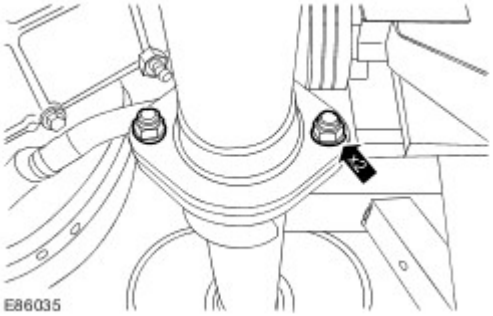


37 . Close the bonnet.

38 . Tighten to 30 Nm (22 lb.ft).



39 . Tighten to 30 Nm (22 lb.ft).



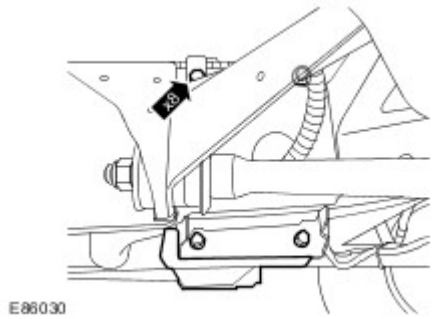
40 . Install the front driveshaft.
For additional information, refer to Front Driveshaft (47.15.02)

41 . **NOTE:**

Left-hand side shown, right-hand side similar.

Install the chassis cross member.

Tighten to 85 Nm



42 . Open the front door.

43 . Connect the reverse light switch electrical connector.

44 . **NOTE:**

Make sure that the transmission is in third gear.

NOTE:

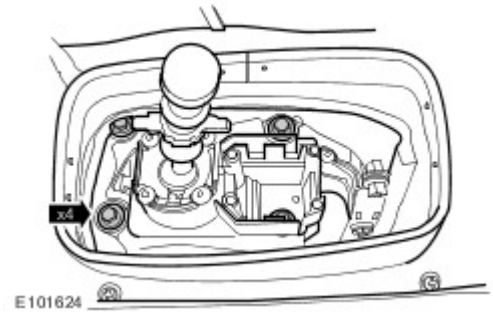
Make sure the gearshift selector lever ball joint bush and the selector yoke are centralised before installing the special tool.

Install the gearshift lever.

- Install the special tool 308-561 onto the gear selector lever.

45 . Tighten the 4 gear selector housing securing bolts.

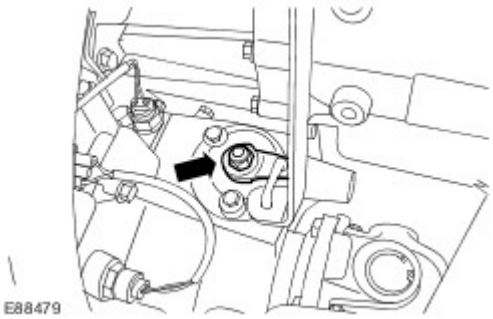
- Tighten to 25 Nm



46 . Remove the special tool 308-561 from the gear selector lever.

47 . Install a new differential lock pivot nut.

- Tighten to 25 Nm



48 . Install the high-low selector lever onto the gearbox.

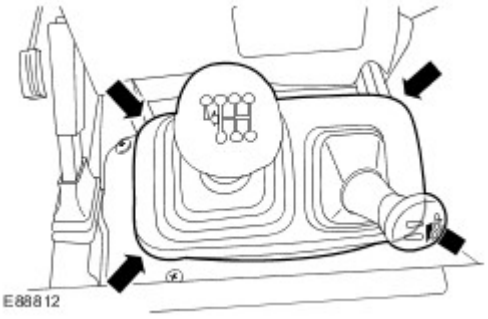
- Tighten to 7 Nm

49 . Install the foam pad.

50 . Install the upper gear change lever.

51 . Install the gear selector lever gaiter.

- Secure the gear selector lever gaitor to the transmission tunnel.
- Secure the gear selector lever gaitor to the high-low selector lever.



52 . Install the transmission cover panel carpet.

53 . Install the floor console assembly.
For additional information, refer to Floor Console (76.25.01)

54 . Connect the battery ground cable.
For additional information, refer to Battery Disconnect and Connect

55 . Install the battery cover.

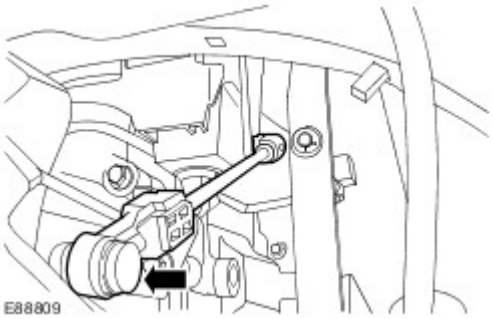
56 . Install the front seat cushion assembly.
For additional information, refer to Front Seat Cushion (78.10.12/99)

57 . Raise the vehicle on the lift.

58 . **NOTE:**

Make sure the rod is fully engaged on the ball joint and not on the foam washer.

Install the high-low selector rod ball joint onto the transfer gearbox.



59 . Bleed the clutch hydraulic system.
For additional information, refer to Clutch System Bleeding

60 . Lower the vehicle.

Published: Jan 31, 2007

Gearshift Control Shaft Seal (37.23.10)

Removal

1 . Disconnect the battery ground cable.
For additional information, refer to Battery Disconnect and Connect

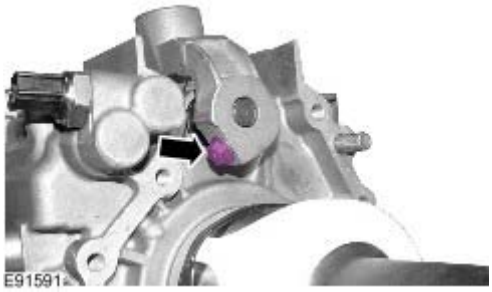
2 .
WARNING: Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

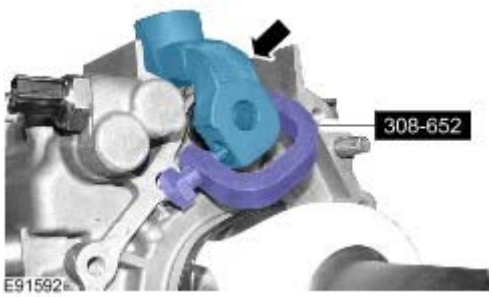
3 . Remove the transfer case.
For additional information, refer to Transfer Case (41.20.25.99)

4 . Remove the transmission extension housing.
- Remove the 10 bolts.

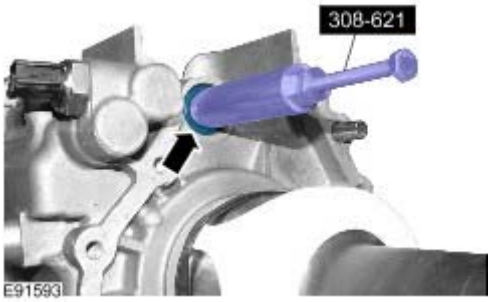
5 . Remove the gearshift yoke nut.



6 . Using the special tool, remove the gearshift yoke.
- Remove the pin.

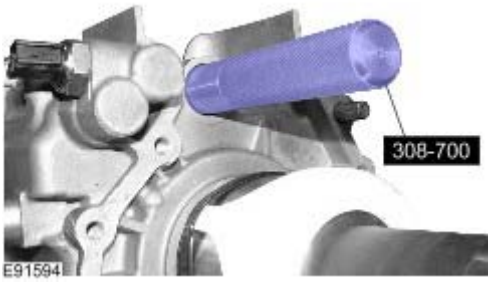


7 . Using the special tool, remove the gearshift control shaft seal.



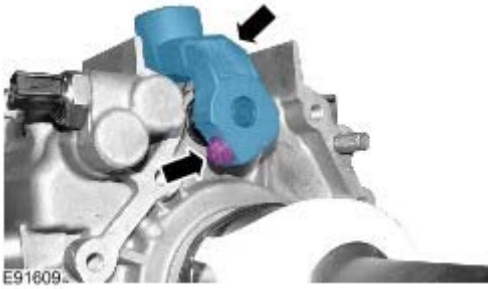
Installation

1 . Using the special tool, install the gearshift control shaft seal.



2 . Install the gearshift selector yoke.

Tighten to 12 Nm (9 lb.ft).



3 . Install the transmission extension housing.

Tighten to 25 Nm (18 lb.ft).

4 . Install the transfer case.
For additional information, refer to Transfer Case (41.20.25)

5 . Connect the battery ground cable.
For additional information, refer to Battery Connect

Published: Jan 30, 2007

Input Shaft Seal (37.23.06)

Special Service Tools

Slide Hammer
100-012

Remover, Seals
308-615

Installer Input Shaft Seal
308-605

Removal

1 . Disconnect the battery ground cable.
For additional information, refer to Battery Disconnect and Connect

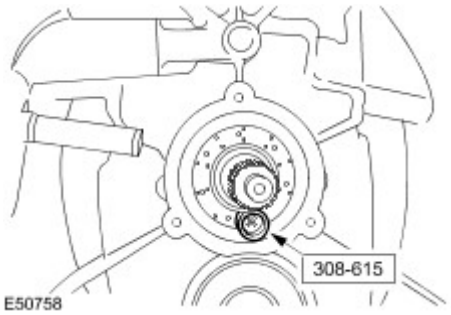
2 . **WARNING: Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.**

Raise and support the vehicle.

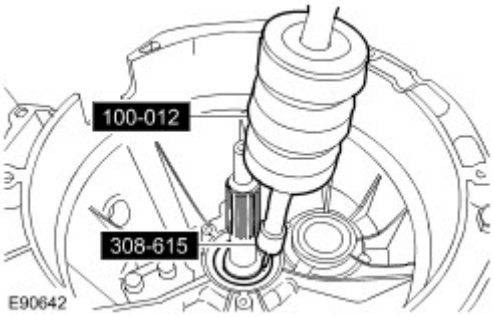
3 . Drain the transmission.
For additional information, refer to Transmission Draining and Filling (37.24.01)

4 . Remove the clutch slave cylinder.
For additional information, refer to Clutch Slave Cylinder (33.35.01)

5 . Install the special tool into the seal.

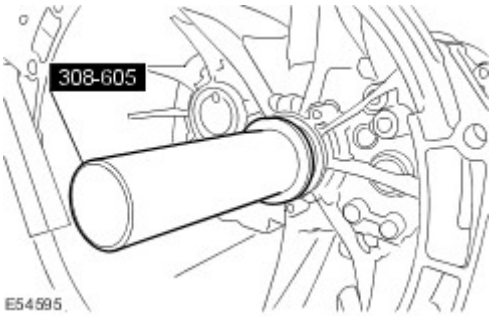


6 . Using the special tools, remove and discard the input shaft seal.



Installation

1 . Using the special tool, install the new input shaft seal.



2 . Install the clutch slave cylinder.
For additional information, refer to Clutch Slave Cylinder (33.35.01)

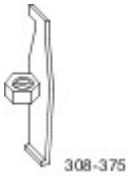
3 . Fill the transmission.
For additional information, refer to Transmission Draining and Filling (37.24.01)

Published: Feb 1, 2007

Output Shaft Seal (37.23.01)

Special Service Tools

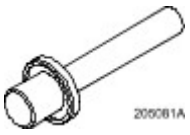
Slide Hammer
100-012



Seal Remover Input and Output
308-375

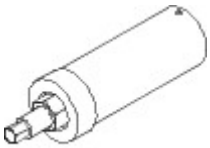
Slide Hammer Adaptor
100-012-01

Holding Tool, Output Flange
308-701



Installer
205-081A

Long Legged Puller
308-516



E49064

Installer, Output Drive Flange Seal
308-604

E91077

Adapter Slide Hammer
100-012-05

Removal

1 . Disconnect the battery ground cable.
For additional information, refer to Battery Disconnect and Connect

2 . Remove the gearshift lever.
For additional information, refer to Gearshift Lever (37.16.04)

3 . **WARNING: Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.**

Raise and support the vehicle.

4 . Drain the transmission.
For additional information, refer to Transmission Draining and Filling (37.24.01)

5 . Remove the transfer case.
For additional information, refer to Transfer Case (41.20.25.99)

6 . Remove the transmission extension shaft cover.

- Remove and discard the tie strap.

E91522

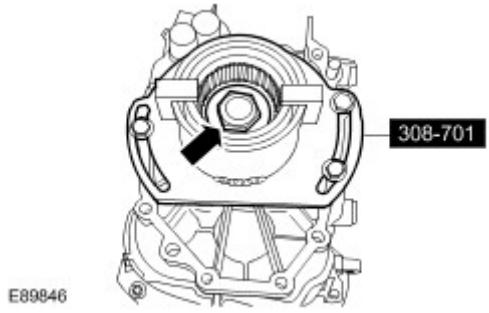
7 . Using a suitable tool, remove the transmission extension shaft.

- Remove the seal.

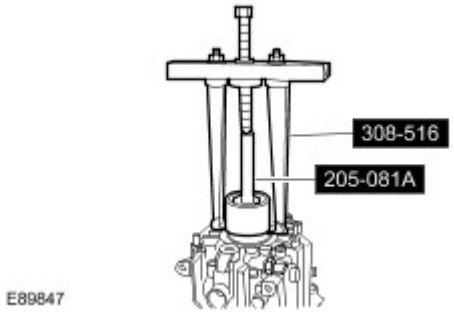
8 . Remove the transmission extension housing.

- Remove the 10 bolts.

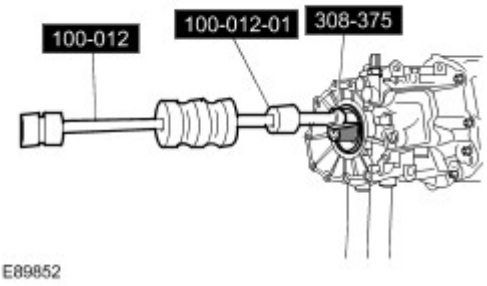
9 . Using the special tool, remove the output flange securing bolt.



10 . Using the special tools, remove the output flange.

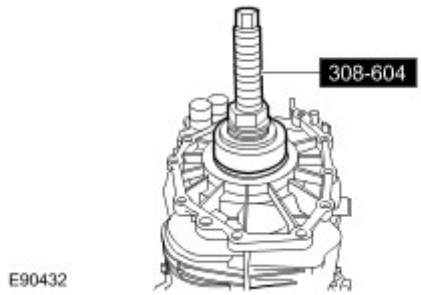


11 . Using the special tools, remove and discard the output shaft seal.



Installation

1 . Using the special tool, install the output shaft seal.



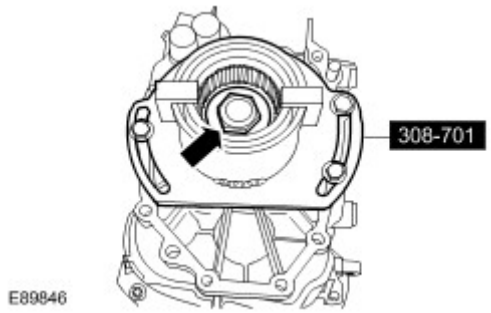
2 . **WARNING: Care should be taken when using the hot air blower. Failure to follow this instruction may result in personal injury.**

NOTE:

Heat the output flange to approx. 100 °C using a hot air blower.

Using the special tool, install the transmission output flange.

- Tighten the bolt to 210 Nm (155 lb.ft).
- Loosen the bolt.
- Apply thread locking compound.
- Tighten the bolt to 180 Nm (133 lb.ft).



3 . Install the transmission extension shaft.

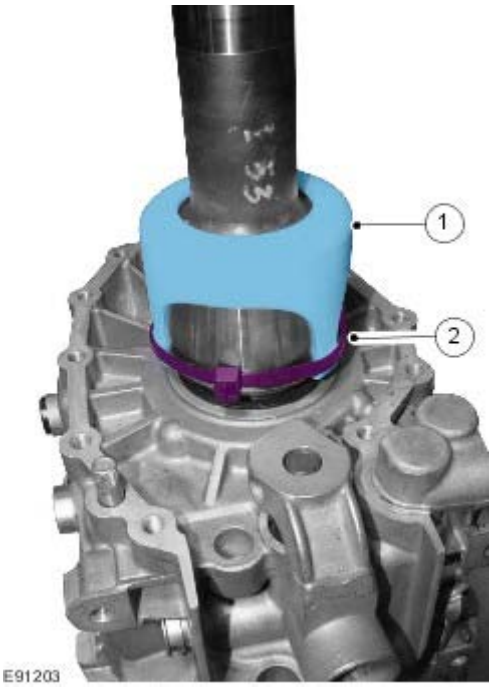
- Install the seal.

4 . **NOTE:**

Make sure that the tie strap joint is between the fingers of the extension shaft seal cover and that it has been cut flush.

Install the transmission extension shaft cover.

1) Install the cover.
2) Install the tie strap.



5 . Install the transmission extension housing.

Tighten the bolts to 25 Nm (18 lb.ft).

6 . Install the transfer case.
For additional information, refer to Transfer Case (41.20.25)

7 . Fill the transmission.
For additional information, refer to Transmission Draining and Filling (37.24.01)

8 . Install the gearshift lever.
For additional information, refer to Gearshift Lever (37.16.04)

9 . Connect the battery ground cable.
For additional information, refer to Battery Connect

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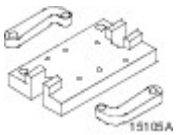
Transmission

Special Service Tools



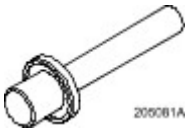
Mounting Bracket, Engine/Differential
205-329

Slide Hammer
100-012

Remover Seals
308-615

Rear Seal Remover/Replacer.
303-538

Puller
308-516

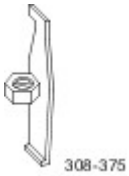


Installer
205-081A

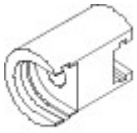
Remover Slider
308-652

Remover Selector Shaft Seal
308-621

Adaptor Slide Hammer
100-012-01

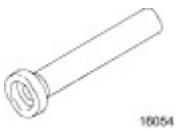


Seal Remover Input & Output
308-375

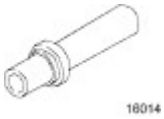


Remover, Detent
308-657

Adapter for 205-071 (Thrust Pad)
205-071-01



Installer, Mainshaft Double Lip Seal
308-150



Installer, Transmission Extension Housing Bushing/Seal
308-044

Remover, Bearing/Gear
205-310

Installer, Differential Bearing
205-082

Remover, Countershaft Bearing Outer Race
100-012-06

Adapter, Slide Hammer
100-012-05

Locking Tool, Output Flange
308-701

Disassembly

NOTE:

Make sure the positions of the transmission component are marked before removal.

1 . Disconnect the battery ground cable.
For additional information, refer to Battery Disconnect and Connect

2 .

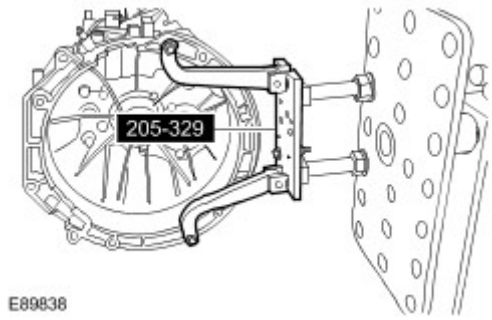
WARNING: Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

3 . Drain the transmission oil.
For additional information, refer to Transmission Draining and Filling (37.24.01)

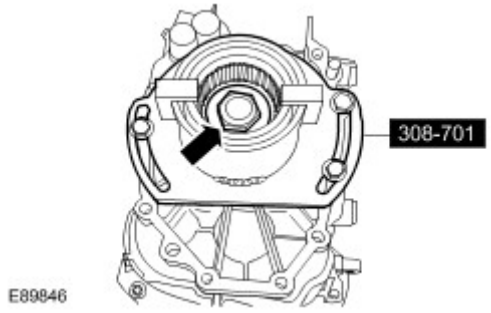
4 . Remove the transmission.
For additional information, refer to Transmission (37.20.02.99)

5 . Using the special tools, secure the transmission.

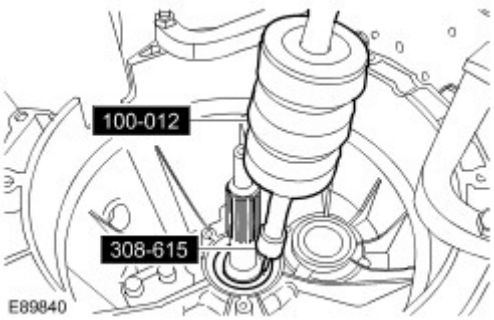


6 . Using the special tool, lock the output shaft flange.

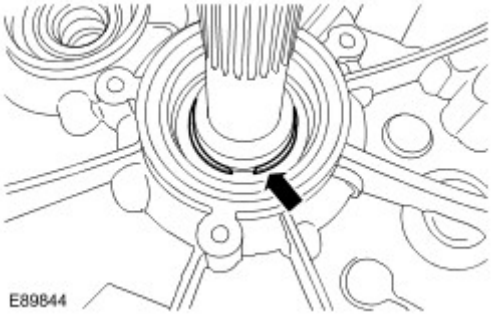
- Remove the bolt.



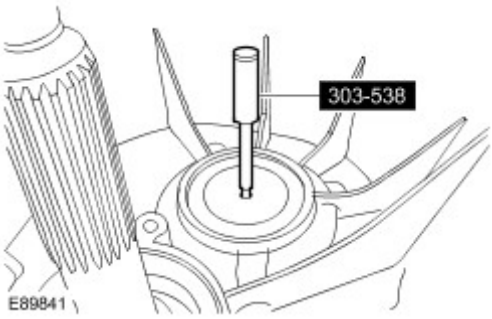
7 . Using the special tools, remove and discard the input shaft seal.



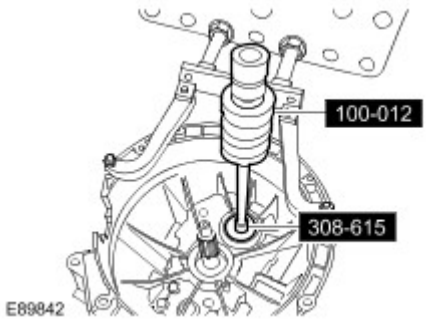
8 . Remove and discard the input shaft snap ring.



9 . Using the special tool, make a hole in the countershaft seal.



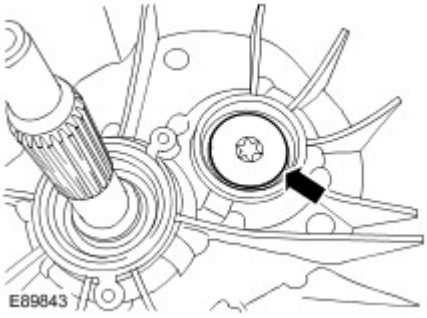
10 . Using the special tools, remove and discard the countershaft seal.



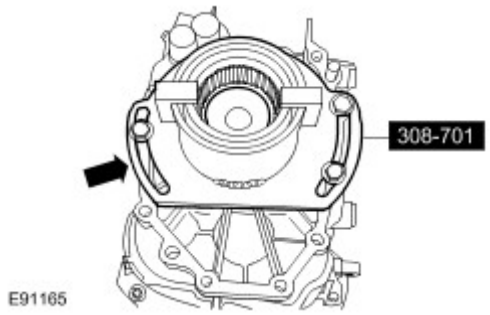
11 . **NOTE:**

Make sure that a gear is selected.

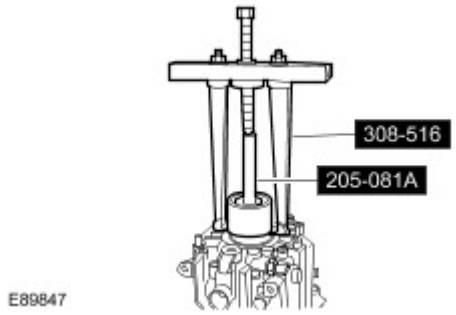
Remove the countershaft bolt.



12 . Remove the special tool.

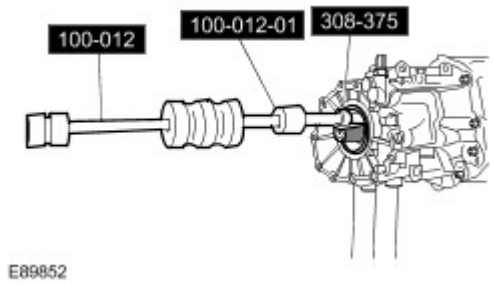


13 . Using the special tools, remove the output shaft flange.

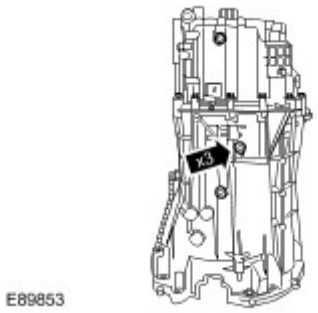


14 . Using the special tool, remove the selector shaft seal.

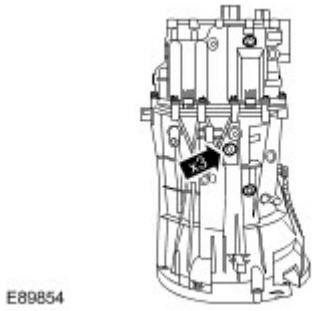
15 . Using the special tools, remove the output shaft seal.



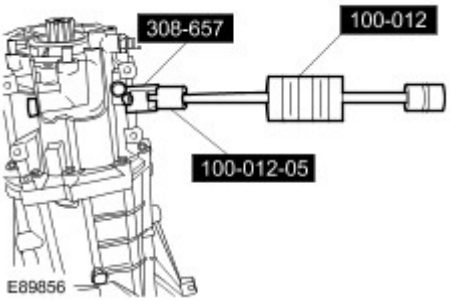
16 . Remove the 3 LH selector fork bolts.



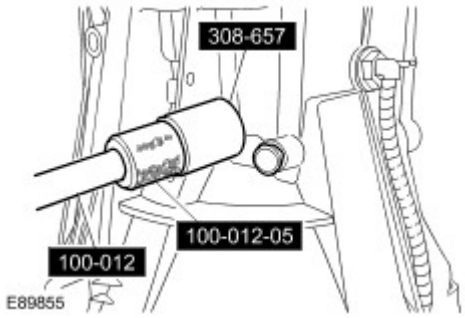
17 . Remove the 3 RH selector fork bolts.



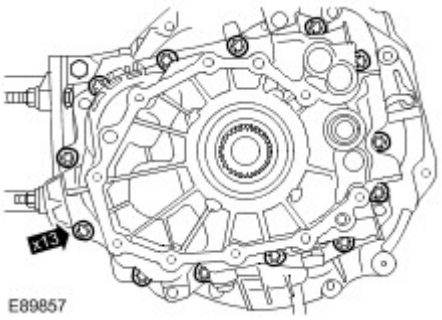
18 . Using the special tools, remove the 3 selector shaft detents.



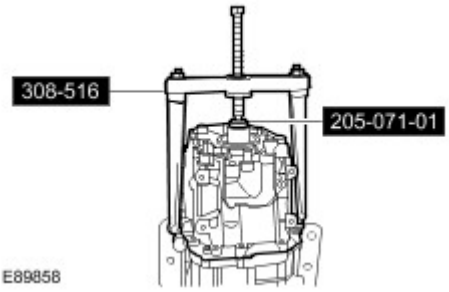
19 . Remove the 2 selector shaft detents.



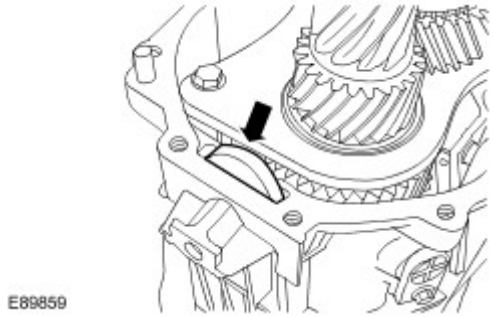
20 . Remove the 13 bolts.



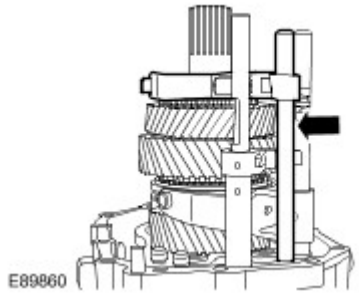
21 . Using the special tools, remove the transmission housing.



22 . Remove the magnet.

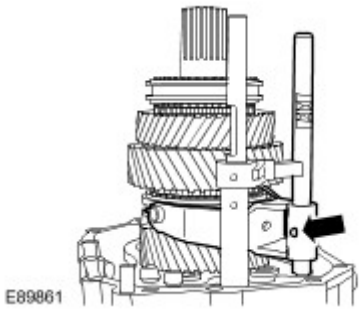


23 . Remove the reverse gear selector.

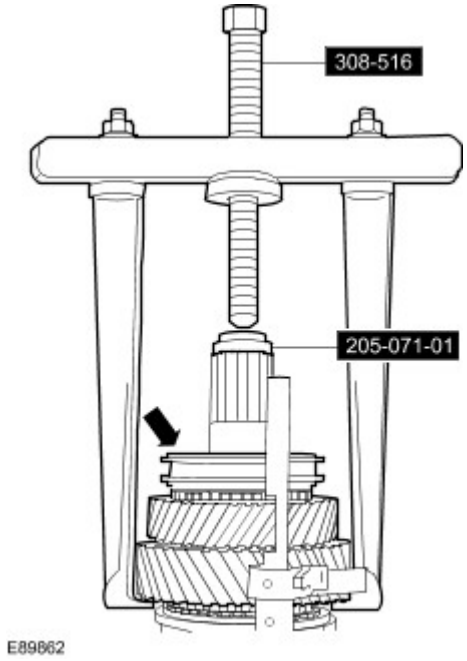


24 . Remove the 1st/2nd gear selector.

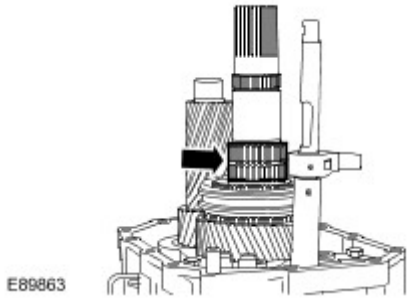
- Remove and discard the pin.



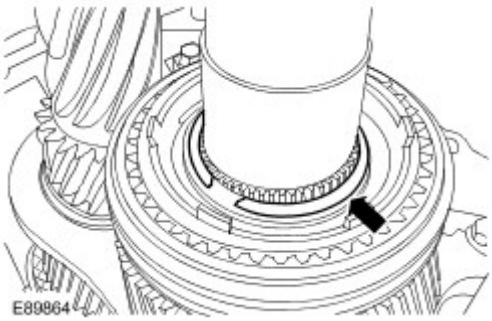
25 . Using the special tools, remove the 1st and reverse gear assemblies from the output shaft.



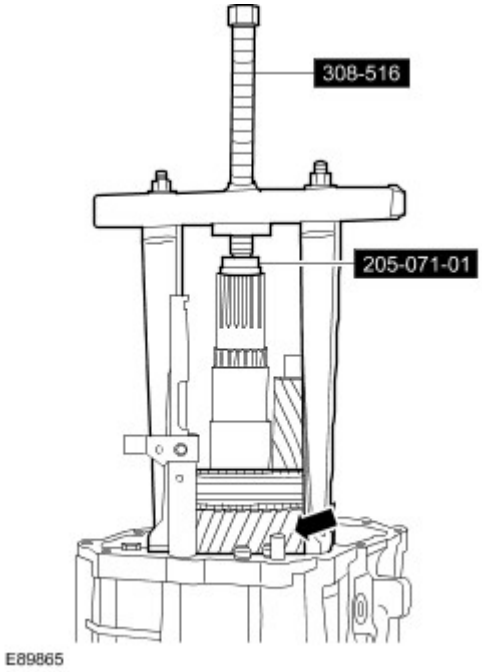
26 . Remove the 1st gear bearing.



27 . Remove the 1st/2nd gear synchronizer snap ring.

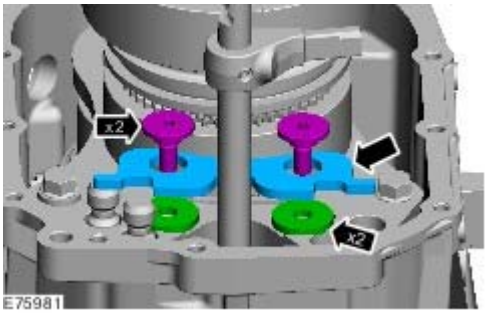


28 . Using the special tools, remove the 2nd gear and 1st/2nd gear synchronizer assemblies from the output shaft.



29 . Remove the selector shaft locking plate.

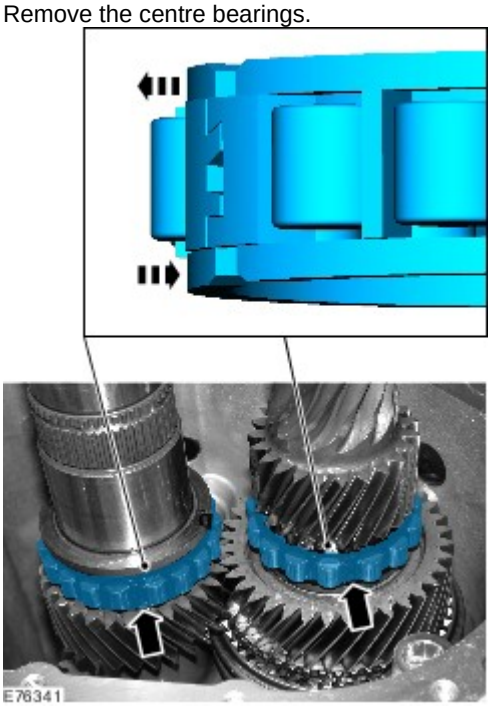
- Remove the 2 bolts.
- Remove the 2 spacers.



30 . Remove the centre bearing mounting plate.

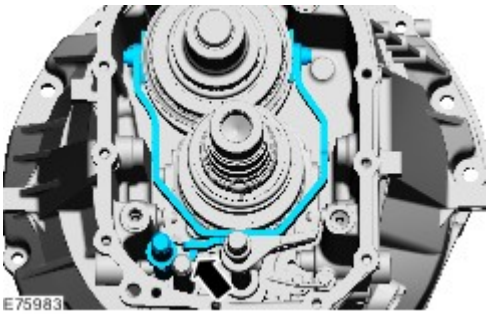
- Remove the 3 bolts.

31 . Remove the centre bearings.



32 . Remove the 3rd/4th gear selector from the transmission housing.

- Release the selector fork from the selector shaft.

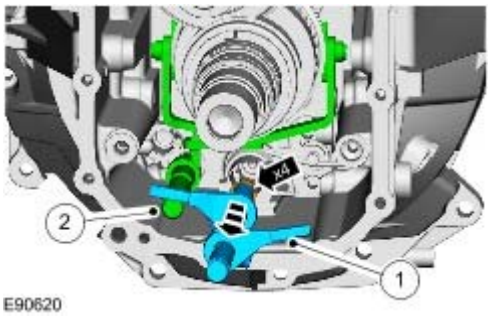


33 . **NOTE:**

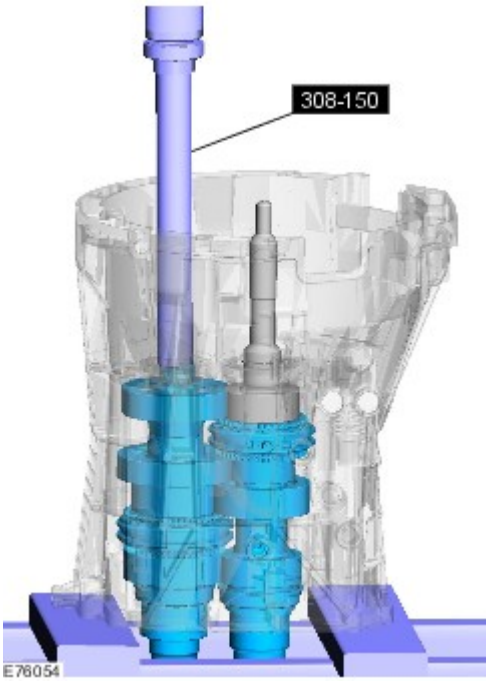
Take care not to lose the 4 main selector shaft bearings.

Remove the selectors.

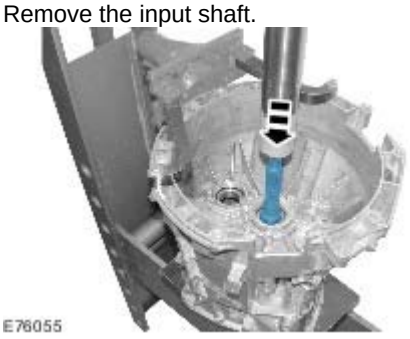
- Remove the main selector.
- Remove the 5th/6th selector.



34 . With an assistant, remove the shaft assemblies.

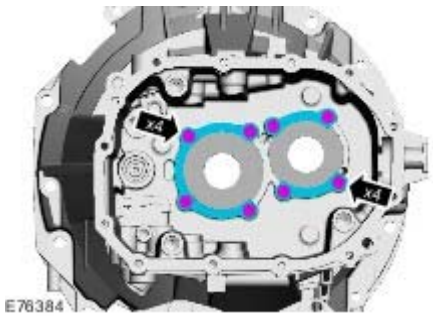


35 . Remove the input shaft.

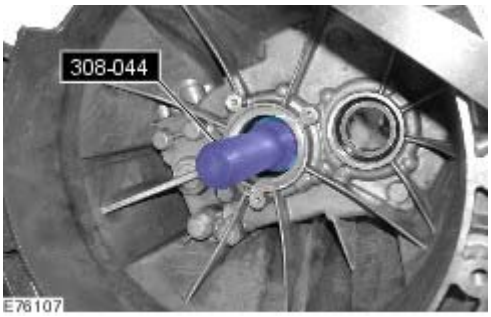


36 . Remove the 2 bearing retaining plates.

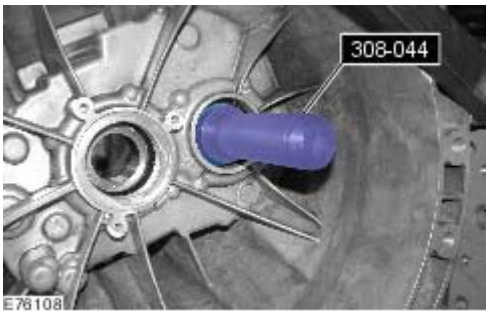
- Remove the 8 bolts.



37 . Using the special tool, remove the input shaft bearing.



38 . Using the special tool, remove the countershaft bearing.

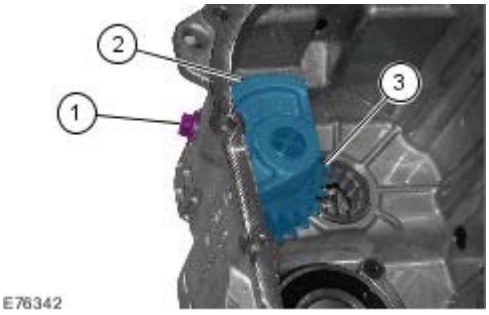


39 . **NOTE:**

Note the positions of the components on removal.

Remove the components in the sequence shown.

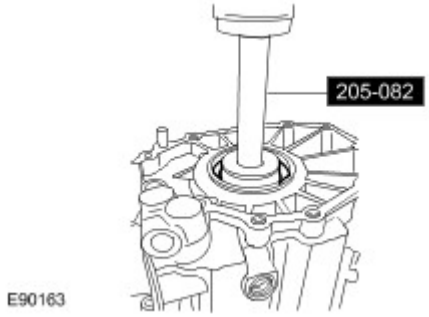
- Reverse gear idler mounting bolt.
- Reverse gear idler mounting.
- Reverse gear idler.
- Countershaft roller bearing.



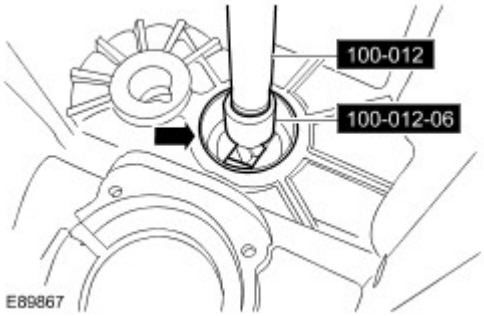
40 . Remove the output shaft bearing retaining plate.

- Remove the 4 bolts.

41 . Using the special tool, remove the output shaft bearing.

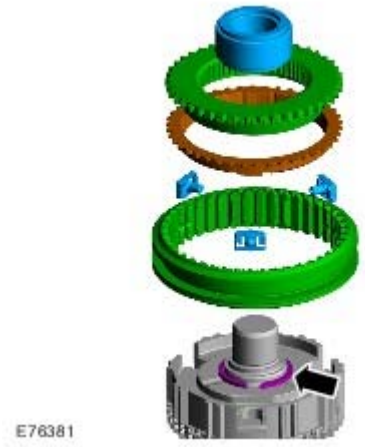


42 . Using the special tools, remove the countershaft bearing outer race.

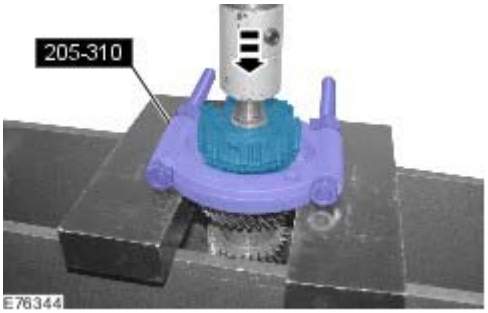


43 . Remove the output shaft pilot bearing and the 5th gear synchronizer assembly from the output shaft.

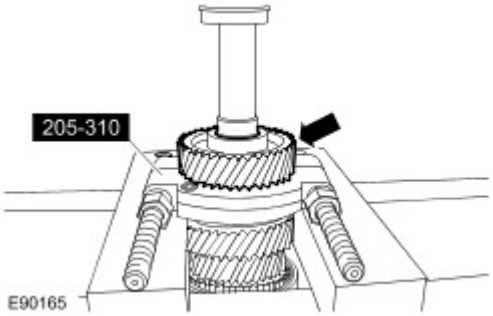
- Remove and discard the snap ring.



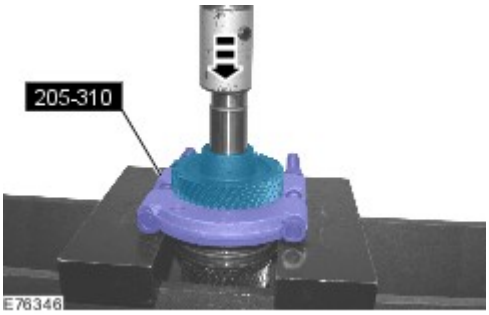
44 . Using the special tool, remove the 6th gear synchronizer/hub assembly from the output shaft.



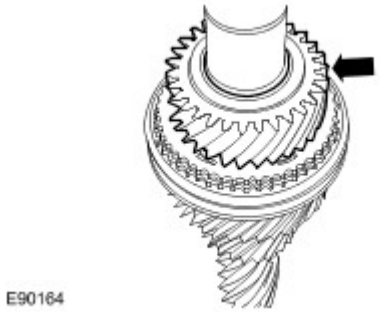
45 . Using the special tool, remove the 5th gear from the countershaft.



46 . Using the special tool, remove the 6th gear from the countershaft.

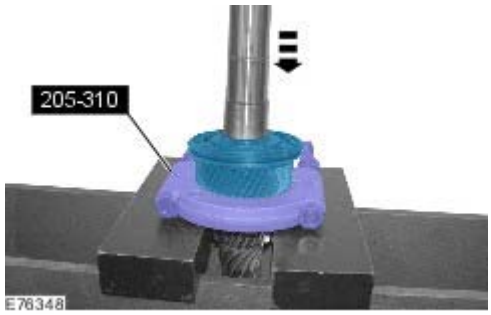


47 . Remove the 3rd gear from the countershaft.



48 . Remove the 3rd/4th gear synchronizer snap ring from the countershaft.

49 . Using the special tool, remove the 4th gear and synchronizer assembly from the countershaft.



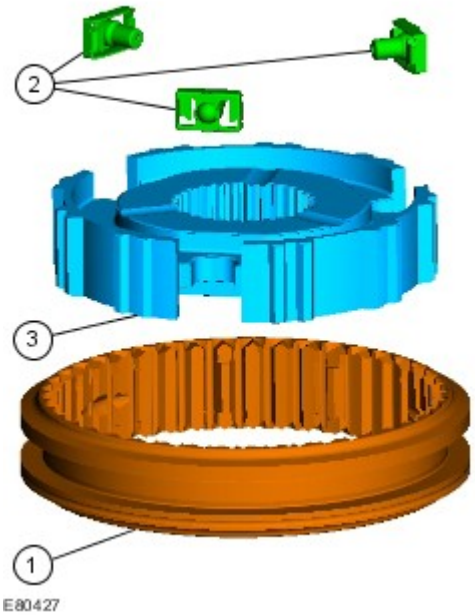
Published: Jan 29, 2007

Synchronizers

Disassembly

1 . **NOTE:**
Make a note of/mark the installed positions of the components before removal.

- Sliding collar.
- Sliding block assemblies.
- Synchronizer hub.



Assembly

1 . **NOTE:**
Make sure that the components are installed in their original positions.

To install, reverse the removal procedure.

Published: Jan 26, 2007

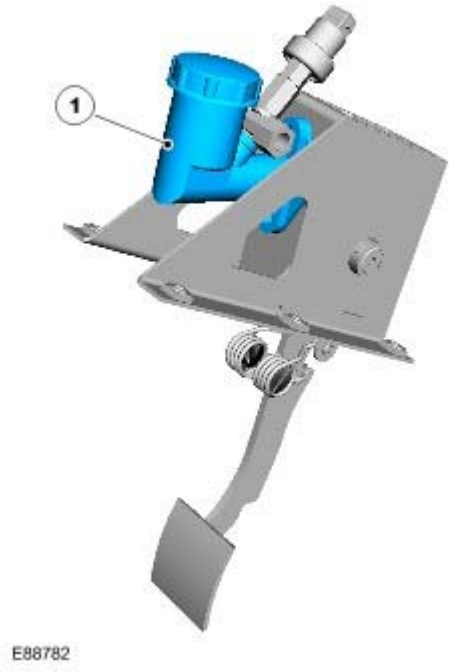
OVERVIEW

The clutch system is based on the established principle of a single driven plate and diaphragm spring clutch cover assembly hydraulically actuated from the clutch pedal. Depressing the clutch pedal transfers hydraulic fluid through the master cylinder, pipe work, and concentric slave cylinder ultimately actuating the clutch fingers to release the clutch and thus disengage drive from the crankshaft. When your foot is off the pedal, the spring pushes the pressure plate against the clutch disc, which in turn presses against the flywheel; this locks the engine to the transmission input shaft, causing them to rotate at the same speed.

The clutch system is of conventional design comprising the following major components:

- Clutch master cylinder and pressure pipes
- Concentric slave cylinder outlet assembly and peak torque limiter
- Vibration damper (Left hand drive vehicles only)
- Concentric slave cylinder
- Clutch cover assembly
- Clutch driven plate
- Flywheel

CLUTCH MASTER CYLINDER



Item	Part Number	Description
1		Clutch master cylinder

The clutch master cylinder is attached directly to the pedal box assembly, located in the driver's footwell.

The cylinder contains a piston assembly, with a push rod connected to the clutch pedal and spring. When the clutch pedal is depressed, it pushes on the piston, via a linkage. Pressure builds in the cylinder and lines as the clutch pedal is depressed further.

The cylinder has 2 hydraulic connections:

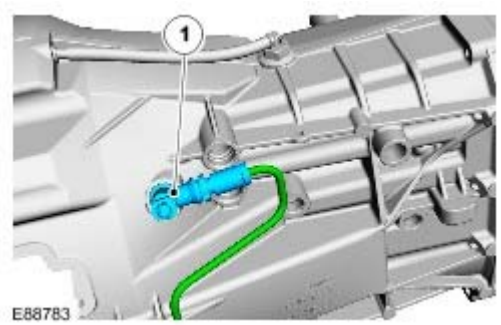
- A low pressure feed pipe (providing fluid supply from the brake fluid reservoir)
- A high pressure pipe

The pedal travel is constrained by an 'up-stop' contained within the master cylinder and a 'down-stop' contained within the pedal box.

CONCENTRIC SLAVE CYLINDER OUTLET ASSEMBLY

NOTE:

Right hand drive vehicle shown.



Item	Part Number	Description
1		Slave cylinder outlet assembly and peak torque limiter

The concentric slave cylinder outlet assembly connects the external pipes with the release system contained within the clutch housing. A securing bracket locates the assembly in the correct orientation and a seal is provided between the assembly and the clutch housing.

Contained within the slave cylinder outlet assembly is a peak torque limiter. This component is designed to restrict the hydraulic fluid flow during the clutch pedal up-stroke. Under normal pedal actuation this restriction can not be detected, but in the event of an unintentional pedal release (e.g. wet shoe slipping off the clutch pedal) the peak torque limiter limits the fluid return rate and protects the transmission and driveline form excessive shock loads, which might cause damage.

On left hand drive vehicles, the hydraulic pipework contains an anti-vibration damper plugged into the peak torque limiter. This is used to reduce pedal roar/vibrations during clutch operation.

CONCENTRIC SLAVE CYLINDER

The concentric slave cylinder assembly contains the release bearing and the hydraulic slave cylinder. The assembly is attached to the front end of the transmission via 3 bolts. These bolts are asymmetrically positioned to ensure correct angular location of the slave cylinder, which is also spigot-mounted for positional fit. In its free condition the slave cylinder is fully extended, but it positions itself automatically as the clutch housing is fitted to the engine. The assembly requires no setting or adjustment.

CLUTCH COVER ASSEMBLY

The clutch cover assembly comprises a pressure plate, cover and diaphragm and is mounted on and rotates with the flywheel.

The pressure plate is machined to provide a smooth surface for the drive plate to engage on. Lugs on the outer diameter of the pressure plate connect it via leaf springs to the cover. The leaf springs have leaves, which assist in pulling the pressure plate away from the drive plate when the clutch pedal is depressed.

The cover houses all pressure plate components. Shouldered rivets support the diaphragm inside the cover. The rivets heads are chamfered to allow the diaphragm to pivot when pressure is applied to it by the release bearing. Holes in the cover locate on dowels on the flywheel and further holes provide for the attachment of the cover to the flywheel. Larger holes in the cover provide ventilation for the drive plate and pressure plate and flywheel contact surfaces.

The diaphragm comprises a cast ring with fingers. The diaphragm is attached to the cover with shouldered rivets. The inner head of each rivet is chamfered to allow the diaphragm to pivot when the clutch is depressed or released. When pressure is applied to the fingers of the diaphragm by the release bearing, the diaphragm pivots on the rivets and moves away from the pressure plate, releasing the force applied to the pressure plate and allowing the drive plate to slip between the pressure plate and the flywheel.

CLUTCH DRIVEN PLATE

The clutch driven plate is sandwiched between the flywheel and the pressure plate of the clutch cover assembly. The clutch driven plate has a splined hub, which engages with the splines on the primary shaft from the transmission. The splined hub is located in an inner plate, which contains 3 compression pre-damper springs. The inner plate is retained by the springs, which can compress in both directions to cushion engine vibration at idle speed. The inner plate is located on 4 larger compression springs, which are located in a central plate. The hub is sandwiched between the central plate and the friction damper. The friction damper comprises friction washers located between the hub and the central plate. The friction washers reduce transmission noises and vibrations due to engine cyclic excitation.

FLYWHEEL

The single mass flywheel is bolted to the flange of the engine crankshaft. A dowel ensures that the flywheel is correctly located. A ring gear is located on the outside diameter of the flywheel and is seated against a flange. The ring gear is an interference fit on the flywheel and is a serviceable item, which can be replaced if damaged or worn.

The operating face of the flywheel is machined to provide a smooth surface for the clutch driven plate to engage on.