

Manual Transmission/Transaxle and Clutch - General Information -

Lubricant

Item	Specification
Recommended lubricant	Castrol BOT 350 M3 - Land Rover (vehicles built from 2011 onwards)
	Castrol MTF97309 - Land Rover (vehicles built upto 2011)

Capacities

Item	Capacity (liters/pints/US quarts)
Initial dry fill	1.9/3.3/2.0

General Specification

Item	Specification
Transmission make/type	M66 EH50
Gears	6 speed manual
Synchromesh:	
Triple	1st and 2nd
Dual	3rd
Single	4th, 5th, 6th and reverse
Torque - Maximum	380 Nm (280 lb-ft)
Gear ratios:	
First	3.750:1
Second	1.905:1
Third	1.182:1
Fourth	0.838:1
Fifth	0.652:1
Sixth	0.540:1
Reverse	3.436:1

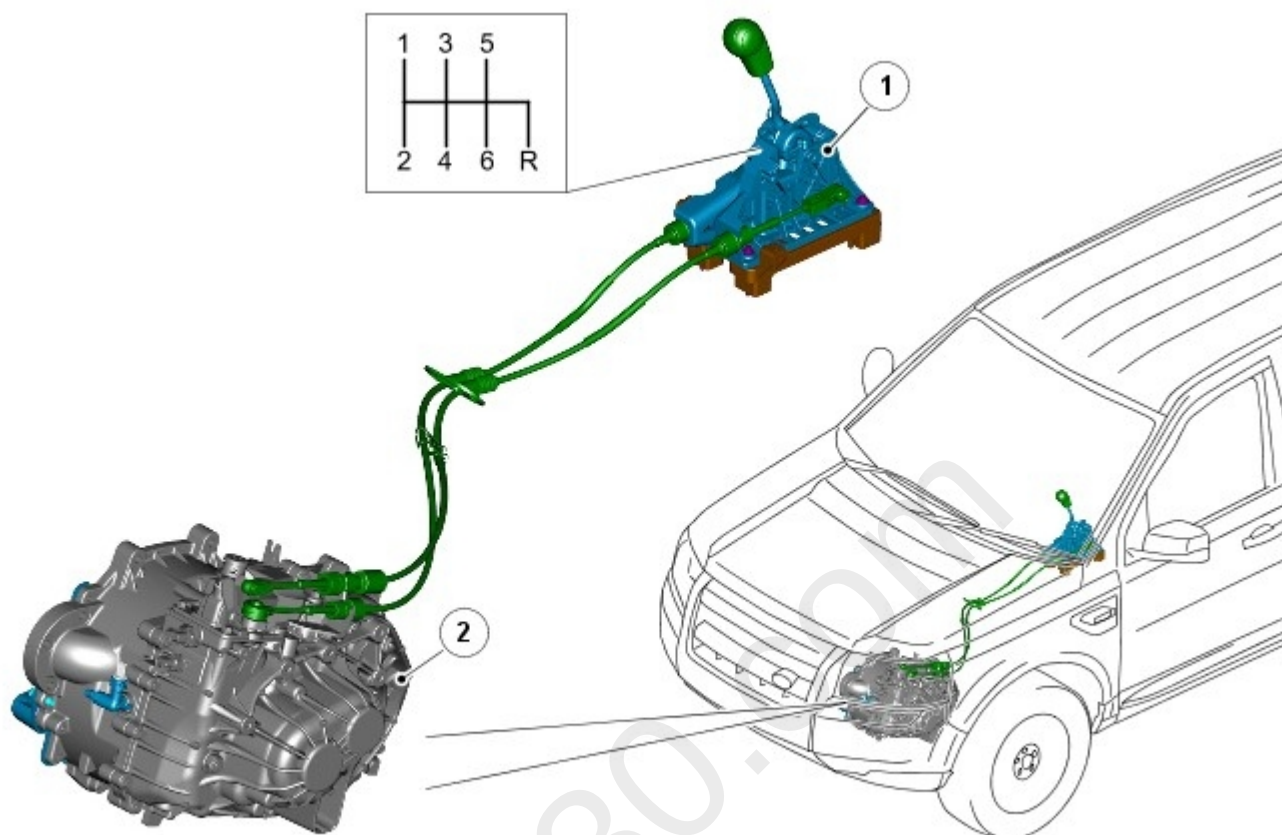
Torque Specifications

Description	Nm	lb-ft
Earth cable to transmission mounting bracket	25	18
Front flywheel closing panel	60	44
Front subframe		
Stage 1	140	103
Stage 2	240°	
Rear flywheel closing panel	24	18
Subframe cross-brace		
M16	140	103
M10	45	33
Transmission bolts	65	48
Transmission mounting bracket		
M8	24	18
M12	80	59
Transmission mounting to body mounting	175	129
Transmission fluid drain plug	30	22
Transmission fluid filler plug	35	26

Manual Transmission/Transaxle and Clutch - General Information - Manual Transmission and Clutch

Description and Operation

COMPONENT LOCATION



E77241

Item	Part Number	Description
1	-	Selector lever
2	-	Manual transmission

OVERVIEW

The M66EHA50 manual transmission is a 6 speed unit manufactured by Getrag-Ford in Cologne, Germany. The transmission is a highly compact 4 shaft design, incorporating the front final drive gear, and is adapted for All Wheel Drive (AWD) by providing a connection from the final drive carrier to the Power Transfer Unit. The transmission is capable of transferring high torque from the engine.

The transmission features two mechanical shift cables from the selector lever and an electronic reverse inhibitor.

The M66EH50 manual transmission has the following features:

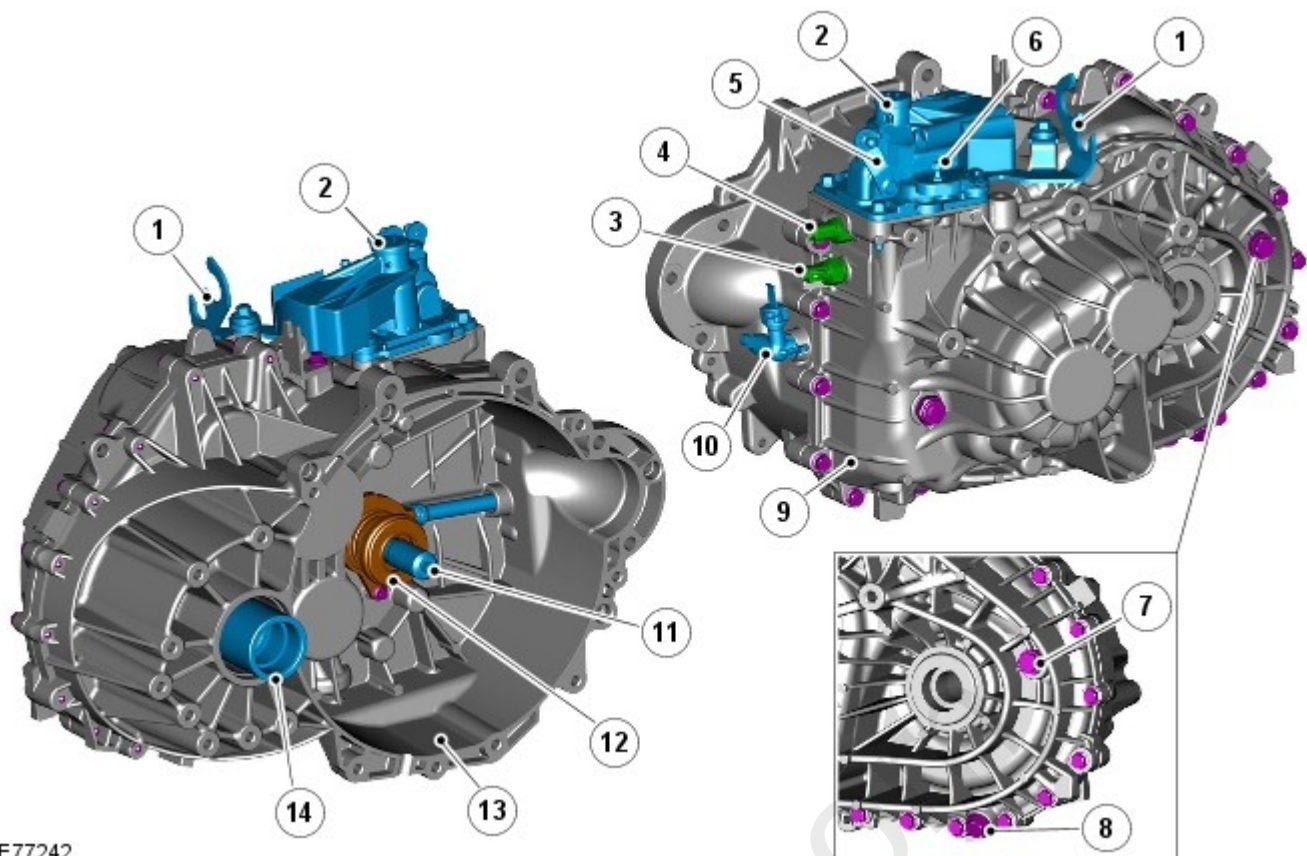
- 380 Nm torque capacity (with torque truncation in 1st and reverse gears)
- Dry weight 61 kg
- Transmission oil is fill for life - 1.9L fill to level plug Oil spec MTF97309
- Front differential integral with transmission
- 6 forward gears
- 4th to 6th gears and reverse gear have single cone synchronization
- 3rd gear is double cone synchronized
- 1st and 2nd gears have triple cone synchronization.

The clutch system used is a conventional single driven plate and a diaphragm spring clutch cover assembly. The clutch is hydraulically operated by operation of the clutch pedal which disengages the drive from the engine crankshaft to the transmission.

TRANSMISSION

For shift cable and selector lever description refer to External Controls.

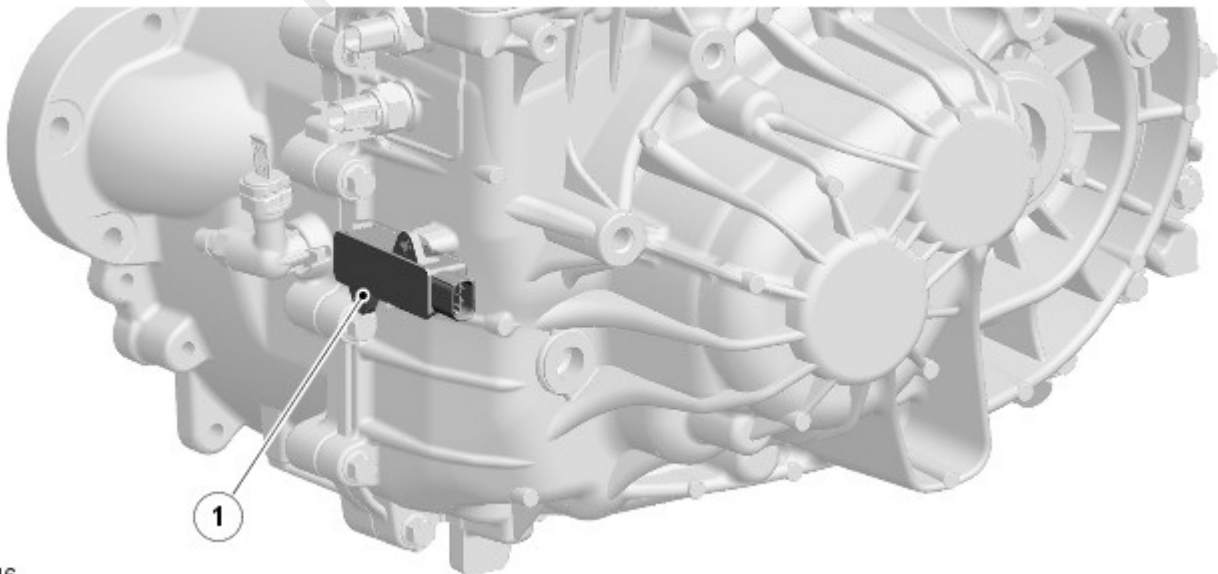
For additional information, refer to: [External Controls](#) (308-06 Manual Transmission/Transaxle External Controls, Description and Operation).



E77242

Item	Part Number	Description
1	-	Cable retaining bracket
2	-	Longitudinal lever
3	-	1st gear detection switch
4	-	Reverse switch
5	-	Lateral lever
6	-	Shift cable ball end
7	-	Transmission oil level/filler plug
8	-	Transmission drain plug
9	-	Transmission casing
10	-	Hydraulic clutch bleed adaptor
11	-	Input shaft
12	-	Clutch slave cylinder
13	-	Clutch housing
14	-	Differential output (Right Hand (RH) side)

Neutral Gear Sensor - Stop/Start Vehicles - From 2010 MY



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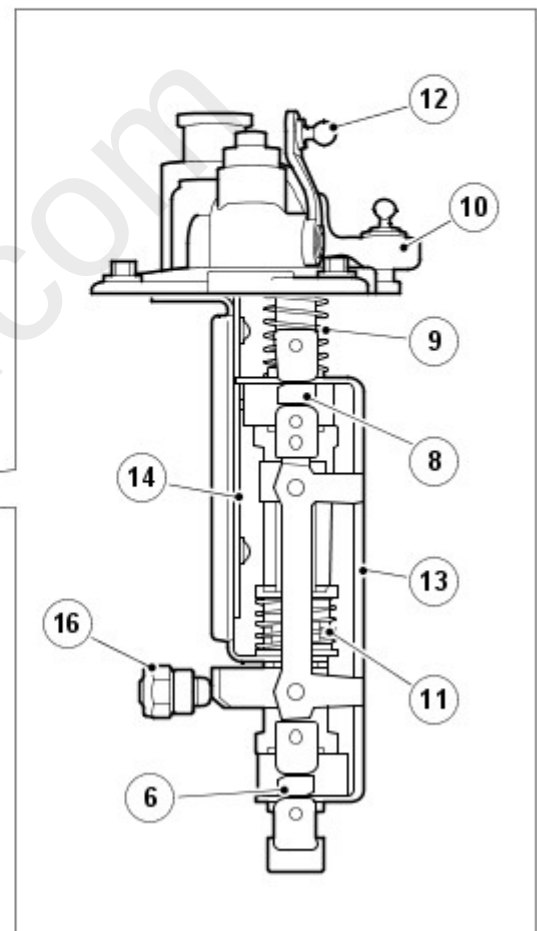
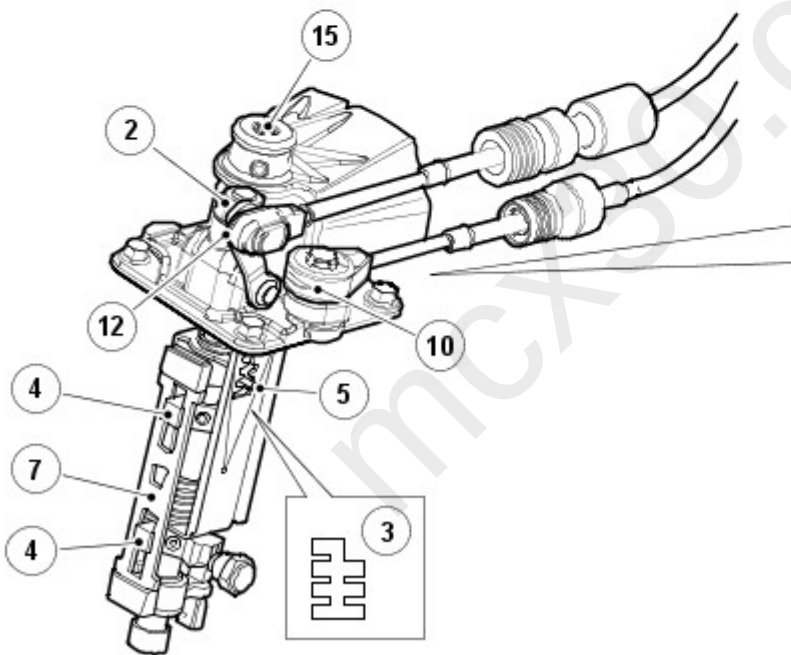
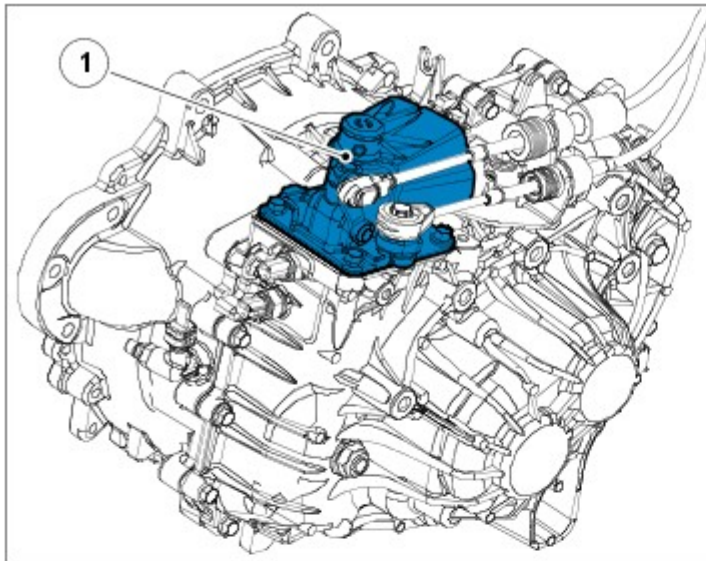
Item	Part Number	Description
1	-	Neutral gear sensor

Neutral Gear Sensor

A PLCD (Permanent Magnet Linear Contactless Displacement) sensor is introduced on Stop/Start vehicles and located on the exterior of the transmission casing and hardwired to the ECM. The sensor's function is to detect that neutral gear has been selected within a calibrated window.

For additional information, refer to: [Starting System](#) (303-06C Starting System - TD4 2.2L Diesel, Vehicles Built From: 01-03-2009, Description and Operation).

Shift Control Mechanism



E77243

Item	Part Number	Description
1	-	Shift control mechanism
2	-	Ball limiter 5th - 6th gear control
3	-	Gearshift gate
4	-	Flange
5	-	Gear shift gate pin
6	-	Lower gear selector
7	-	Gear selector rod
8	-	Upper gear selector
9	-	Spring
10	-	Longitudinal lever
11	-	Spring
12	-	Lateral lever
13	-	Catch plate
14	-	Carrier plate
15	-	Bleed cap
16	-	

16	-	Ball limiter for gear selector
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The transmission is operated by two shift cables which are attached to the selector lever. Movement of the selector lever is passed via the cables to two lever mechanisms on the top of the transmission. The levers operate a shift control mechanism within the transmission to select the requested gear ratio.

The shift control mechanism is located at the front of the transmission and transfers the shift cable movement into gear selections.

The shift control mechanism is a one-piece assembly which is retained in the transmission housing with 4 bolts. The shift control mechanism moves the upper and lower gear selector forks via the lateral and longitudinal levers on the top of the shift control mechanism. There are 2 upper selector forks and 2 lower selector forks as follows:

- The 2 upper gear selector forks are used to engage reverse, 1st or 2nd gears
- The 2 lower gear selector forks are used to engage 3rd, 4th, 5th and 6th gears.

The 4 selector forks transfer movement from the shift control mechanism to the relevant shift coupling sleeve. The shift forks are mounted in bearings in the transmission case.

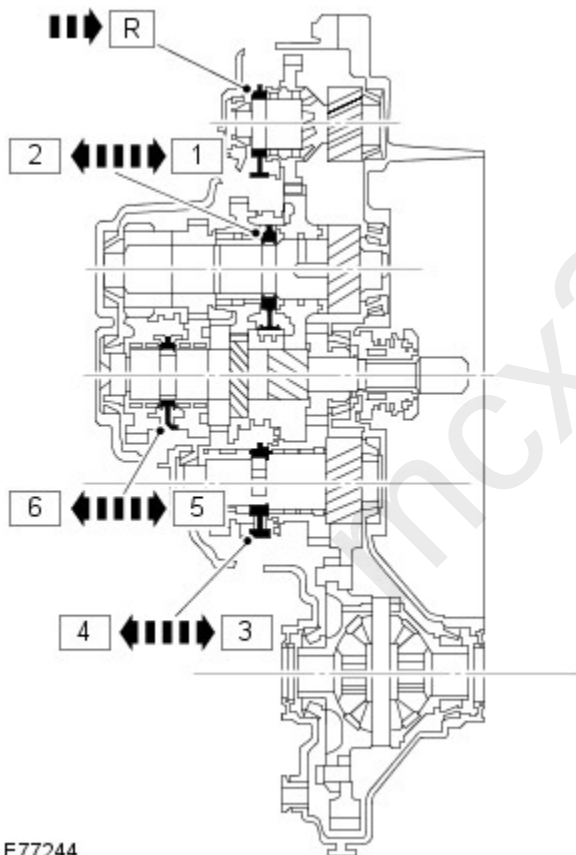
Two carrier plates transfer torque from the longitudinal lever to the sliding gear selectors. The carriers are located and run in a groove in the gear selector plate.

The carrier plates can move vertically between 4 positions. The different gears are selected from one of the 4 positions as follows:

- Uppermost position - gear selector selects reverse gear
- Second uppermost position - gear selector selects 1st and 2nd gears
- Second lowest position - gear selector selects 5th and 6th gears
- Lowest position - gear selector selects 3rd and 4th gears.

The shift control mechanism has two springs that return the selector lever to the neutral position.

Transmission Shift Selector Shafts



E77244

The above illustration shows the coupling sleeves for each gear cluster. Movement of these sleeves as selected by the shift control mechanism, connect the required gear trains together to produce the required output ratio.

The coupling sleeve is part of the synchronizing hub assembly which also consists of a flange and the hub. Each synchronizing hub is joined to its shaft by splines and rotates with it. Idler wheels are fitted on both sides of each synchronizing hub. The idler wheels rotate freely on the shaft (with the exception of reverse gear). Each idler wheel is constantly engaged in its pinion. The synchronizing set is positioned between the synchronizing hub and the idler wheel.

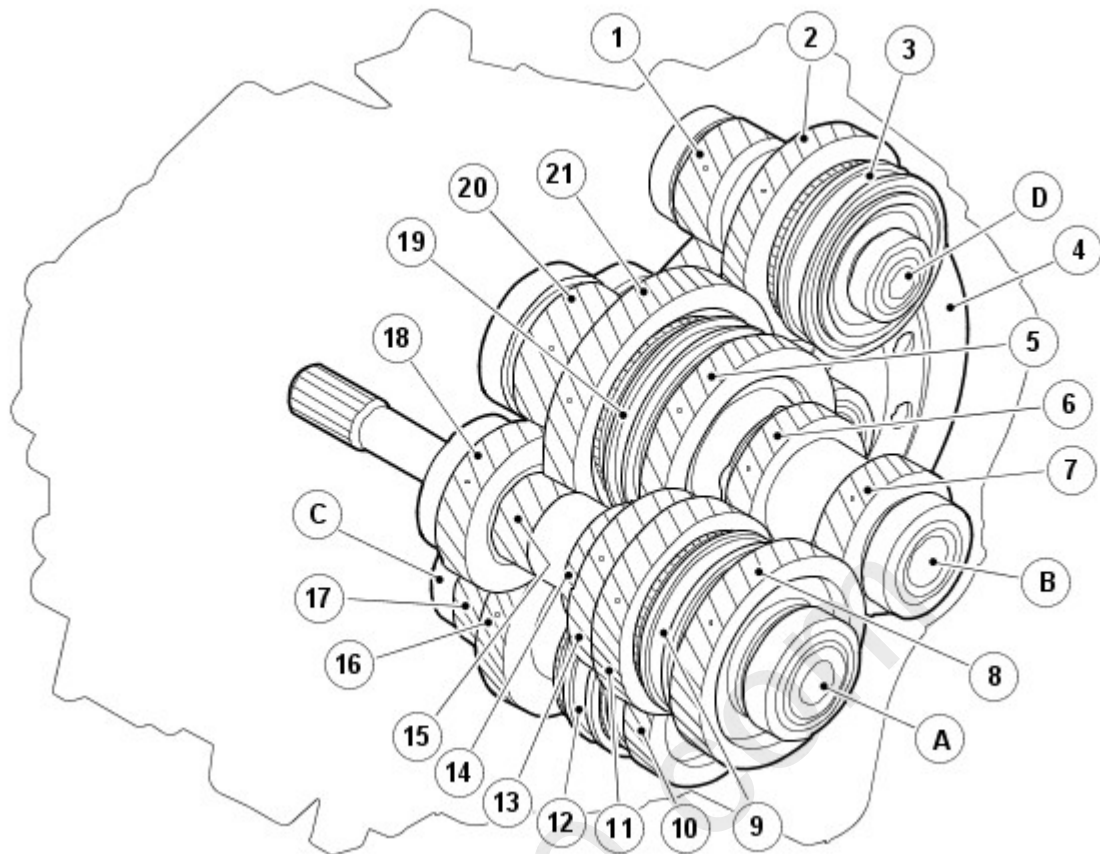
The synchronizing units are positioned on the shafts in the transmission as follows:

- The synchronizing unit for 1st - 2nd gear is on the intermediate shaft 1st - 2nd, 5th - 6th
- The synchronizing unit for 3rd - 4th gear is on the intermediate shaft 3rd - 4th
- The synchronizing unit for 5th-6th gear is on the input shaft
- The synchronizing unit for reverse gear is on the reverse shaft.

The synchronizing rings expand when heated by the same amount as the components they are in contact with. As a result

no safety margin is required to counter expansion. The idler wheels for single and double synchronization have no cones. An inner ring on the synchronizer unit performs this function instead.

Transmission Gear Cluster



E77245

Item	Part Number	Description
A	-	Input shaft
B	-	Intermediate shaft 1st to 2nd, 5th to 6th
C	-	Intermediate shaft 3rd to 4th
D	-	Reverse shaft
1	-	Reverse final gear
2	-	Reverse idler gear
3	-	Reverse gear coupling sleeve
4	-	Final gear - Differential
5	-	2nd gear - idle gear
6	-	5th gear
7	-	6th gear
8	-	6th gear - idle gear
9	-	5th to 6th gear coupling sleeve
10	-	4th gear - idle gear
11	-	5th gear - idle gear
12	-	3rd to 4th gear coupling sleeve
13	-	4th gear
14	-	2nd gear path
15	-	1st gear path
16	-	3rd gear - idle gear
17	-	3rd to 4th final gear pinion
18	-	3rd gear
19	-	1st to 2nd gear coupling sleeve
20	-	1st to 2nd and 5th to 6th final gear pinion
21	-	1st gear - idle gear

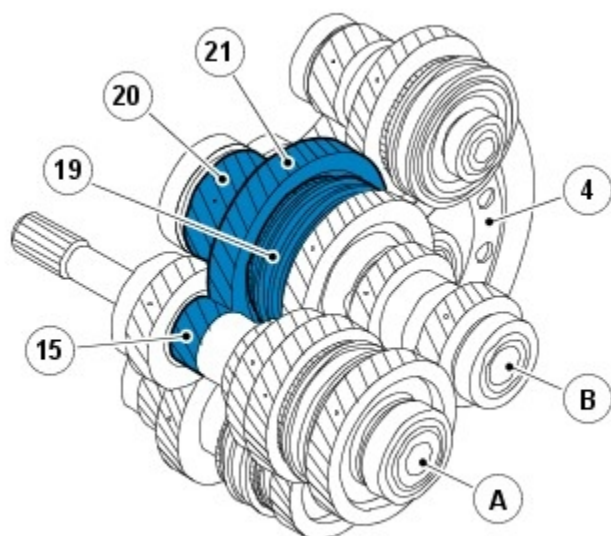
The gear wheels are located on four shafts, as follows:

- Input shaft
- Intermediate shaft 1-2, 5-6
- Intermediate shaft 3-4
- Reverse shaft.

In order to keep the shafts short, the clutch gears are welded directly to the idler wheel and needle bearings with inner rings are used instead of snap rings. The inner rings sit on the shaft inside the idler gears and extend lengthwise outside each idler gear. When the components on the shafts are pulled together the inner rings counterhold, so that the idler wheels have the clearance that they require to rotate. The components of the input shafts are pulled together with a bolt located in the end of the shaft. Components of intermediate shaft 3rd -4th are held together with a press joint and a bolt located in the end of the shaft. The components of intermediate shaft 1st -2nd, 5th -6th are held together with the press

joint of the 5th and 6th gear pinion.

1st Gear Power Flow



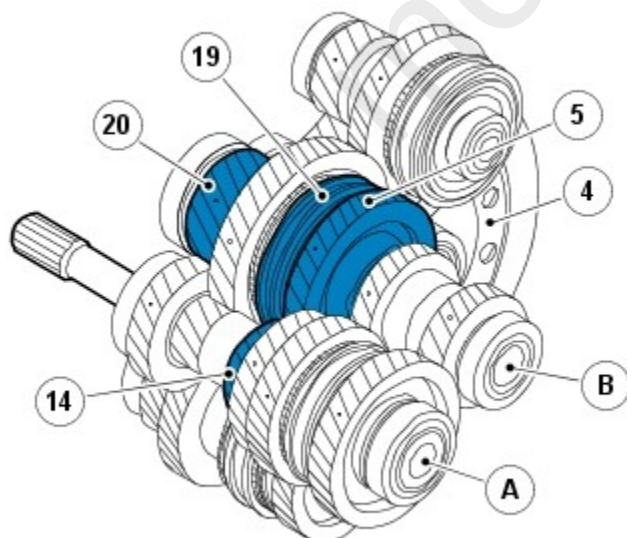
E77246

Item	Part Number	Description
A	-	Input shaft
B	-	Intermediate shaft 1st - 2nd and 5th - 6th
4	-	Ring gear
15	-	1st gear
19	-	1st - 2nd gear coupling sleeve
20	-	Final drive 1st - 2nd and 5th - 6th
21	-	1st gear idler gear

When 1st gear is selected, the coupling sleeve for 1st - 2nd gear is moved by a gear selector fork along the synchronizing hub towards the 1st gear idler gear. The coupling sleeve and the synchronizing hub lock the 1st gear idler gear at the intermediate shaft 1st - 2nd and 5th - 6th.

Engine torque is transferred to the input shaft via the clutch. The 1st gear rack on the input shaft transfers the power to the 1st gear idler gear. From there the power is transferred to the intermediate shaft 1st - 2nd and 5th - 6th and to the final drive, which in turn transfers power to the ring gear. The ring gear is connected to the drive shafts through the differential.

2nd Gear Power Flow



E77247

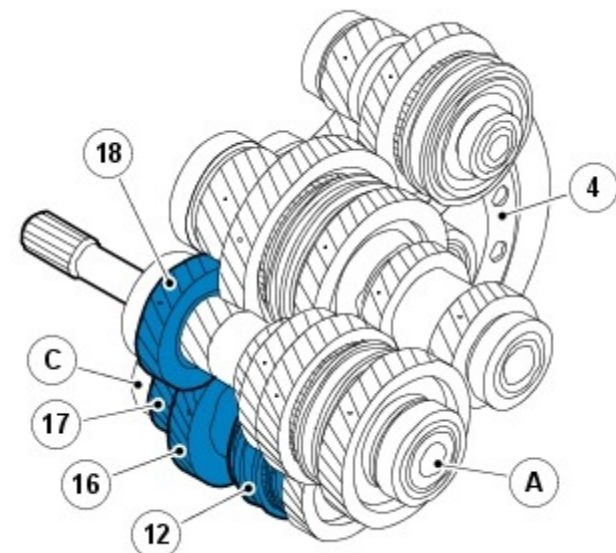
Item	Part Number	Description
A	-	Input shaft
B	-	Intermediate shaft 1st - 2nd and 5th - 6th
4	-	Ring gear
5	-	2nd gear idler gear
14	-	2nd gear
19	-	1st - 2nd gear coupling sleeve

20	-	Final drive 1st - 2nd and 5th - 6th
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When 2nd gear is selected, the coupling sleeve for 1st - 2nd gear is moved by a gear selector fork along the synchronizing hub towards the 2nd gear idler gear. The coupling sleeve and the synchronizing hub lock the 2nd gear idler gear at the intermediate shaft 1st - 2nd and 5th - 6th.

Engine torque is transferred to the input shaft via the clutch. The 2nd gear rack on the input shaft transfers the power to the 2nd gear idler gear. From there the power is transferred to the intermediate shaft 1st - 2nd and 5th - 6th and to the final drive, which in turn transfers power to the ring gear. The ring gear is connected to the drive shafts through the differential.

3rd Gear Power Flow

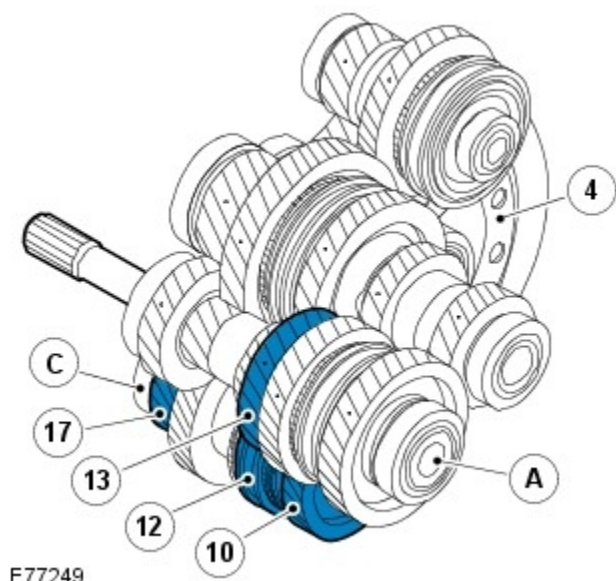


Item	Part Number	Description
A	-	Input shaft
C	-	Intermediate shaft 3rd - 4th
4	-	Ring gear
12	-	3rd - 4th gear coupling sleeve
16	-	3rd gear idler gear
17	-	Final drive 3rd - 4th
18	-	3rd gear

When 3rd gear is selected, the coupling sleeve for 3rd - 4th gear is moved by a gear selector fork along the synchronizing hub towards the 3rd gear idler gear. The coupling sleeve and the synchronizing hub lock the 3rd gear idler gear at the intermediate shaft 3rd - 4th.

Engine torque is transferred to the input shaft via the clutch. The 3rd gear rack on the input shaft transfers the power to the 3rd gear idler gear. From there the power is transferred to the intermediate shaft 3rd - 4th and to the final drive, which in turn transfers power to the ring gear. The ring gear is connected to the drive shafts through the differential.

4th Gear Power Flow



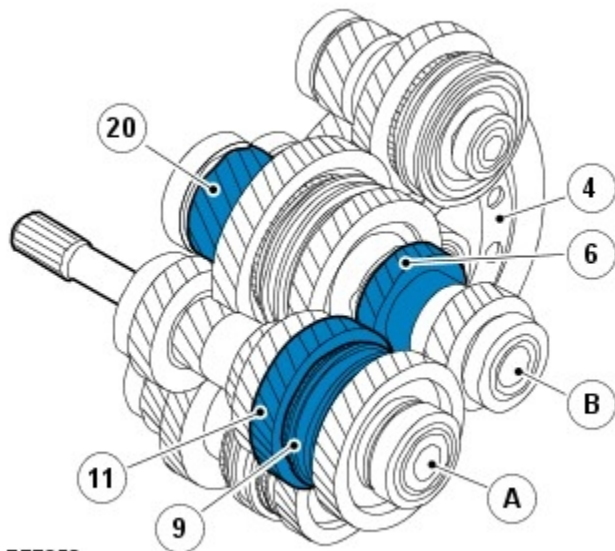
Item	Part Number	Description
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A	-	Input shaft
C	-	Intermediate shaft 3rd - 4th
4	-	Ring gear
10	-	4th gear idler gear
12	-	3rd - 4th gear coupling sleeve
13	-	4th gear
17	-	Final drive 3rd - 4th

When 4th gear is selected, the coupling sleeve for 3rd - 4th gear is moved by a gear selector fork along the synchronizing hub towards the 4th gear idler gear. The coupling sleeve and the synchronizing hub lock the 4th gear idler gear at the intermediate shaft 3rd - 4th.

Engine torque is transferred to the input shaft via the clutch. The 4th gear rack on the input shaft transfers the power to the 4th gear idler gear. From there the power is transferred to the intermediate shaft 3rd - 4th and to the final drive, which in turn transfers power to the ring gear. The ring gear is connected to the drive shafts through the differential.

5th Gear Power Flow

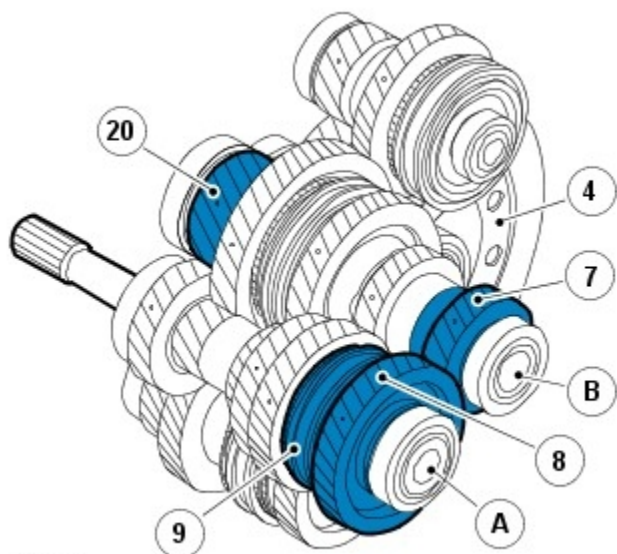


Item	Part Number	Description
A	-	Input shaft
B	-	Intermediate shaft 1st - 2nd and 5th - 6th
4	-	Ring gear
6	-	5th gear
9	-	5th - 6th gear coupling sleeve
11	-	5th gear idler gear
20	-	Final drive 1st - 2nd and 5th - 6th

When 5th gear is selected, the coupling sleeve for 5th - 6th gear is moved by a gear selector fork along the synchronizing hub towards the 5th gear idler gear. The coupling sleeve and the synchronizing hub lock the 5th gear idler gear at the input shaft.

Engine torque is transferred to the input shaft via the clutch. The 5th - 6th coupling sleeve and 5th gear idler gear located on the input shaft, transfer the power to the 5th gear. From there the power is transferred to the intermediate shaft 1st - 2nd and 5th - 6th and to the final drive, which in turn transfers power to the ring gear. The ring gear is connected to the drive shafts through the differential.

6th Gear Power Flow



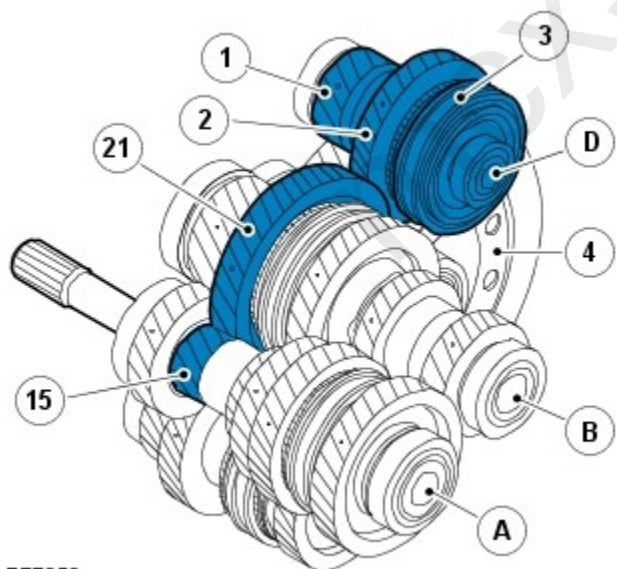
E77251

Item	Part Number	Description
A	-	Input shaft
B	-	Intermediate shaft 1st - 2nd and 5th - 6th
4	-	Ring gear
7	-	6th gear
8	-	6th gear idler gear
9	-	5th - 6th gear coupling sleeve
20	-	Final drive 1st - 2nd and 5th - 6th

When 6th gear is selected, the coupling sleeve for 5th - 6th gear is moved by a gear selector fork along the synchronizing hub towards the 6th gear idler gear. The coupling sleeve and the synchronizing hub lock the 6th gear idler gear at the input shaft.

Engine torque is transferred to the input shaft via the clutch. The 5th - 6th coupling sleeve and 6th gear idler gear located on the input shaft, transfer the power to the 6th gear. From there the power is transferred to the intermediate shaft 1st - 2nd and 5th - 6th and to the final drive, which in turn transfers power to the ring gear. The ring gear is connected to the drive shafts through the differential.

Reverse Gear Power Flow



E77252

Item	Part Number	Description
A	-	Input shaft
B	-	Intermediate shaft 1st - 2nd and 5th - 6th
D	-	Reverse shaft
1	-	Final drive for reverse gear
2	-	Reverse gear idler gear
3	-	Reverse gear coupling sleeve
4	-	Ring gear
15	-	1st gear
21	-	1st gear idler gear

When reverse gear is selected, the coupling sleeve for reverse gear is moved by a gear selector fork along the

synchronizing hub towards the reverse gear idler gear.

The coupling sleeve and synchronizing hub lock the reverse gear idler gear at the reverse shaft.

The torque of the engine is transferred via the clutch to the input shaft. The 1st gear on the input shaft transfers power to the 1st gear idler gear. The power is then transferred to the reverse gear idler gear and then to the reverse gear coupling sleeve. From there power is transferred to the intermediate shaft 1st - 2nd and 5th - 6th and to the final drive which in turn transfers power to the ring gear. The ring gear is connected to the drive shafts through the differential.

Differential

The differential distributes drive from the transmission equally between the LH and RH front half shafts and also provides drive torque to the rear differential via the power transfer unit.

The differential is located at the rear of the transmission housing. Both sides of the differential are connected to the LH and RH drive shafts, supplying torque to the front wheels. The differential is also connected to the Power Transfer Unit via a splined shaft to the RH side of the transmission, supplying torque to the rear driveline.

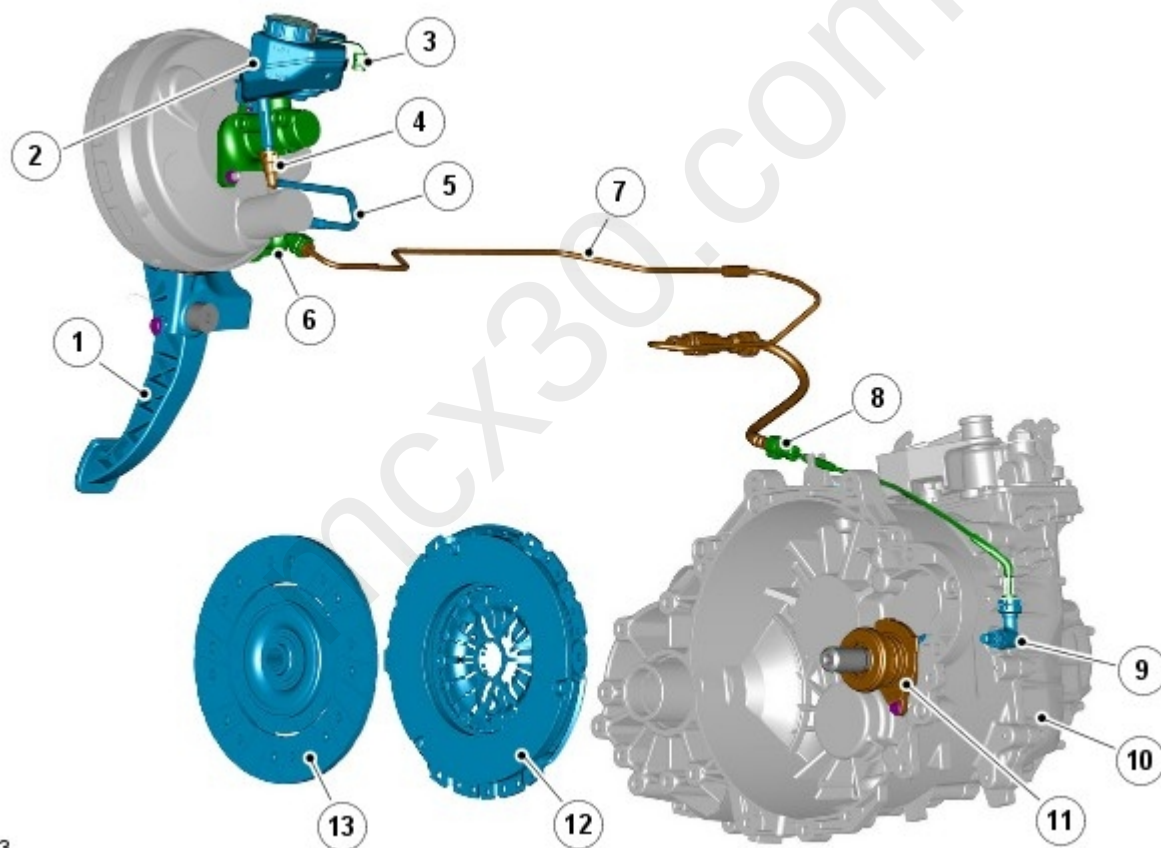
Reverse Switch

The reverse switch is located in the front of the transmission casing, above the 1st gear detection switch. The switch is used by the Anti-lock Brake System (ABS) module for Hill Descent Control (HDC) and also for reversing lamp operation.

1st Gear Position Switch

The 1st gear switch is located on the front of the transmission casing, below the reverse switch. The switch is used by the ABS module for HDC.

CLUTCH



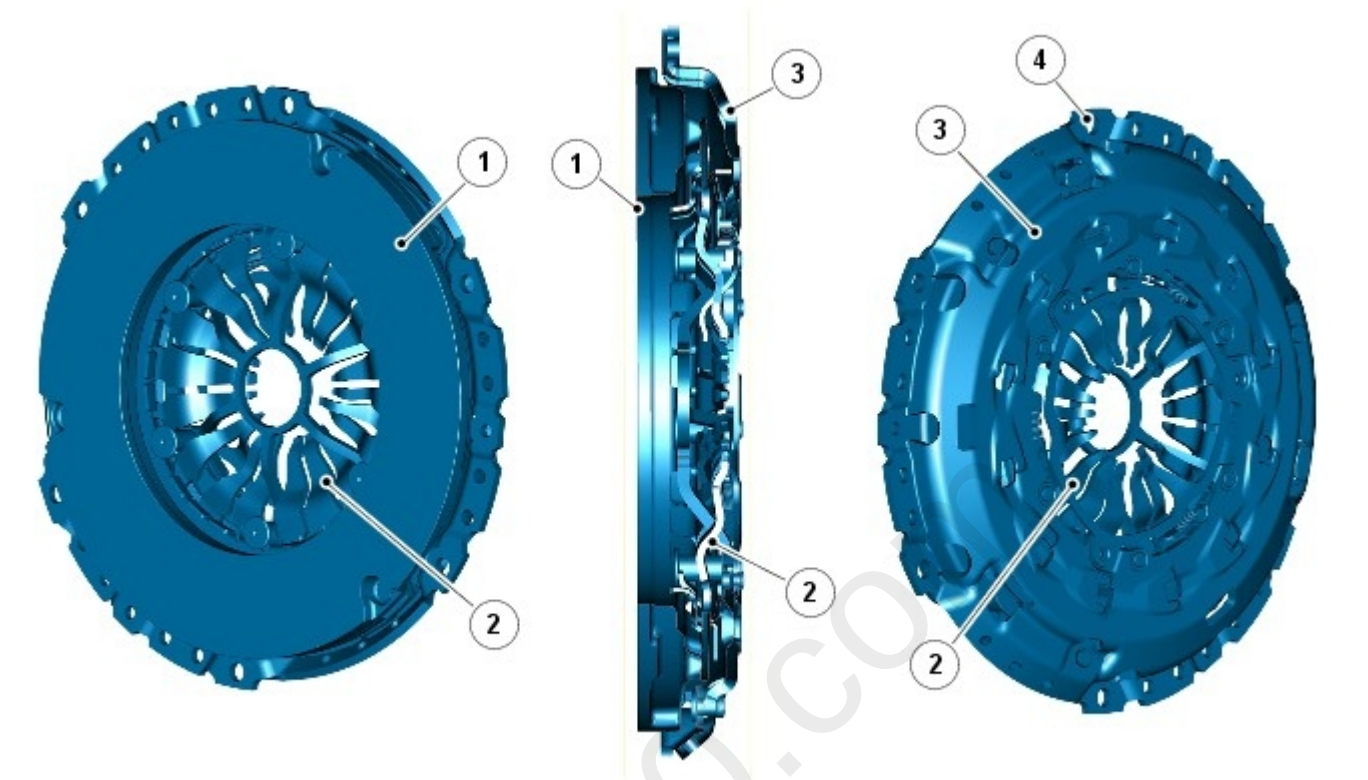
Item	Part Number	Description
1	-	Clutch pedal
2	-	Brake/clutch reservoir
3	-	Fluid level sensor
4	-	Connector
5	-	Low pressure hose
6	-	Master cylinder
7	-	High pressure clutch line
8	-	Connector
9	-	Clutch bleed adaptor
10	-	Transmission
11	-	Slave cylinder and release bearing
12	-	Clutch cover assembly
13	-	Driven (friction) plate

The clutch is a conventional single driven plate and diaphragm spring clutch cover assembly which is hydraulically actuated

from the clutch pedal.

The main components of the clutch are the clutch cover assembly (pressure plate), the engine flywheel and the driven plate (friction plate). Together with flywheel and driven plate, the clutch cover forms a friction system and is mounted to the flywheel by bolts in the housing.

Clutch Cover



E77325

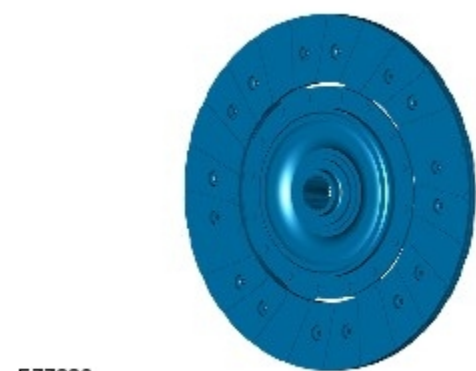
Item	Part Number	Description
1	-	Contact plate
2	-	Diaphragm spring
3	-	Cover
4	-	Mounting holes

The clutch cover ensures that the engine torque is transferred via the driven plate to the transmission intake shaft. The contact force required for transferring engine torque is provided by a slotted diaphragm spring. The diaphragm spring allows the driver to apply less pressure on the clutch pedal due to low engaging force. A contact plate provides the friction surface for the driven plate to engage on.

The diaphragm spring is of the compressed type which is actuated by the slave cylinder. When the slave cylinder is operated, the force from the diaphragm spring is transferred through the clutch cover housing into the flywheel it is bolted to, releasing the pressure on the driven plate and disengaging the drive to the transmission.

The clutch cover contact plate is attached to the clutch housing by plate springs. Cams on the contact plate project through the openings in the housing and the outer diaphragm springs are supported on the cams. The contact plate is attached to the housing by bolts and wire rings. When the slave cylinder is operated, the pressure on the diaphragm springs is released and the contact plate can pivot on the cams, releasing the pressure on the driven plate.

Driven Plate



E77326

The driven plate is the central connection element in the clutch. In combination with the clutch cover assembly, it separates and links engine and powertrain by connecting the engine crankshaft to the transmission input shaft.

The driven plate is a rigid type friction plate. The flywheel is of the dual mass type and absorbs torque fluctuations generated by the combustion processes to reduce noise and wear in the transmission.

Dual Mass Flywheel

The dual mass flywheel comprises two main components; the primary side which is attached to the engine crankshaft and the secondary side to which the clutch cover assembly is attached.

The primary side has the starter ring gear attached to its outer circumference. The ring gear is used by the starter motor to rotate the engine during engine crank at start up. The primary side is secured to the crankshaft with eight bolts. A dowel in the crankshaft flange ensures that the flywheel is correctly located.

The secondary side has the smooth friction surface on which the driven plate friction material engages. Dowels and fixing holes allow for the correct alignment and attachment of the clutch cover assembly.

The primary and secondary sides are connected with long coil springs. The two sides can rotate against each other, limited by the coil springs, which absorb torque loading on clutch engagement and torsional vibrations from the engine.

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Manual Transmission/Transaxle and Clutch - General Information - Manual Transaxle and Clutch

Diagnosis and Testing

Principles of Operation

For a detailed description of the manual transmission/transaxle and clutch, refer to the relevant Description and Operation section in the workshop manual. REFER to:

[Manual Transmission and Clutch](#) (308-00 Manual Transmission/Transaxle and Clutch - General Information, Description and Operation),
[Clutch Controls](#) (308-02 Clutch Controls, Description and Operation),
[External Controls](#) (308-06 Manual Transmission/Transaxle External Controls, Description and Operation),
[Four-Wheel Drive Systems](#) (308-07A Four-Wheel Drive Systems, Description and Operation),
[Transfer Case](#) (308-07B Transfer Case, Description and Operation).

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection

Mechanical	Electrical
• Transmission fluid leaks • Clutch fluid leaks • Missing fixings • Switches • Shift mechanisms	• Wiring harnesses • Switches

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Symptom Chart.

Symptom Chart

• **NOTE:** Check transmission fluid level prior to carrying out any further diagnosis.
 REFER to: [Transmission Fluid Level Check](#) (308-03 Manual Transmission/Transaxle, General Procedures).

Symptom	Possible Cause	Action
Significant effort required when downshifting or synchronizer crashing	• Gear shift mechanism • Gear synchronization is inadequate	Check integrity of gear shift mechanism and for correct installation. If gear synchronization is inadequate, install a new transmission. Refer to the new module/component installation note at the top of the DTC Index
Gear jumps out of engagement while driving	• Worn or broken synchronizer components • Manufacturing error (incorrect gear wheel toothing or synchronizer ring)	Install a new transmission, refer to the new module/component installation note at the top of the DTC Index
Gearshift linkage does not operate freely (stiff or partially seized)	• Excessive friction in lever bearing • Gearshift selector cables assembly damaged or worn • Gear shift mechanism • Possible fault in transmission	Check and install a new lever bearing as necessary. Check integrity of gearshift cables and mechanism, and for correct installation. If internal components are suspect, install a new transmission, refer to the new module/component installation note at the top of the DTC Index
Brief scratching noise during gear shifting	• Inadequate gear synchronization	Install a new transmission, refer to the new module/component installation note at the top of the DTC Index
Leak from transmission housing	• Leak from breather • Leak from fill/drain plugs • Sealing lip of the input/output shaft oil seals damaged • Leak from the selector shaft oil seal • Leak from crankshaft rear seal • Leak from clutch hydraulics	Check and rectify fluid leaks from breather, fill/drain plugs, seals and clutch hydraulics
Clicking noises in reverse gear	• Gear wheels chipped	Install a new transmission, refer to the new module/component installation note at the top of the DTC Index

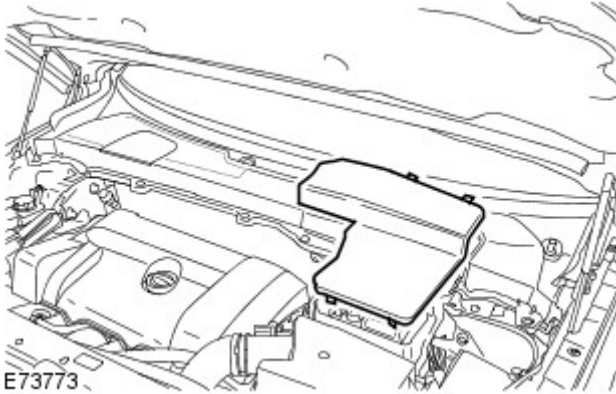
Symptom	Possible Cause	Action
Gear wheels banging when shifting	● Low transmission fluid level ● Clutch not clearing ● Selector forks or synchronizer rings	Check and top-up transmission fluid. Check for correct operation of clutch. If selector fork or synchronizer rings suspect, install a new transmission, refer to the new module/component installation note at the top of the DTC Index
Noises in the forward gears	● Low transmission fluid level ● The engine/transmission assembly is in contact with the chassis/body ● Engine/transmission flange bolts ● Input and output shaft bearings	Check top-up transmission fluid. Ensure engine/transmission assembly is not in contact with the chassis/body. Tighten engine/transmission flange bolts to correct torque. REFER to: Specifications (308-00 Manual Transmission/Transaxle and Clutch - General Information, Specifications). If input or output bearings are suspect, install a new transmission, refer to the new module/component installation note at the top of the DTC Index
Gears jump out of engagement	● Engine/transmission support insulator ● Gearshift linkage malfunction ● Internal components	Repair and install new engine/transmission support insulator as necessary. Check gearshift mechanism is installed and adjusted correctly. If internal components are suspect, install a new transmission, refer to the new module/component installation note at the top of the DTC Index
One of the gears (particularly reverse) cannot be selected	● Gearshift linkage malfunction ● Transmission internal selection problem	Check gearshift mechanism is installed and adjusted correctly. If internal components are suspect, install a new transmission, refer to the new module/component installation note at the top of the DTC Index
Unable to select first and second gears (third, sixth and reverse ok)	● Broken selector pin in gate guide (internal to transmission shift mechanism)	Install new transmission internal shift mechanism (do not install new transmission for this fault)
Gearshift linkage has excessive play	● Gearshift lever bearing worn ● Gearshift selector cables assembly damaged or worn	Check and install new gearshift lever bearing and cables as necessary
Clutch slipping	● Clutch pedal free play ● Sticking clutch pedal ● Clutch pressure plate and diaphragm springs ● Clutch drive plate friction material worn/contaminated ● Flywheel ● Slave cylinder sticking ● Excessive temperature	Check clutch pedal has sufficient free play and is not sticking. Check and install new clutch pressure and drive plates as necessary. Check integrity of flywheel. Check and install new slave cylinder as required
Clutch chatter or shudder	● Engine mounts ● Oil contamination on drive plate ● Diaphragm springs ● Clutch pressure plate ● Flywheel	Check integrity of engine mountings. Check integrity and for contamination of clutch components. Check condition of flywheel. Rectify and install new components as necessary
Clutch drag (difficulty shifting)	● Insufficient brake fluid ● Air in clutch hydraulic system ● Clutch pedal free play ● Insufficient clutch pedal travel ● Diaphragm springs ● Drive plate friction material contamination ● Clutch disc splines	Check/top-up brake hydraulic fluid level and check clutch hydraulic system for leaks. Check clutch free play and travel. Check integrity of clutch, ensure drive plate moves freely on the input shaft splines
Clutch pedal pulsation	● Clutch and brake pedal pivot shaft not correctly lubricated ● Damaged springs in pressure plate ● Release bearing noisy or worn ● Flywheel	Check for free movement of clutch pedal at pivot. Check integrity of clutch pressure plate, release bearing and flywheel

Manual Transmission/Transaxle and Clutch - General Information - Clutch System Bleeding

General Procedures

1. Check that all the clutch line connections are tight and that there are no signs of leaks.

2.

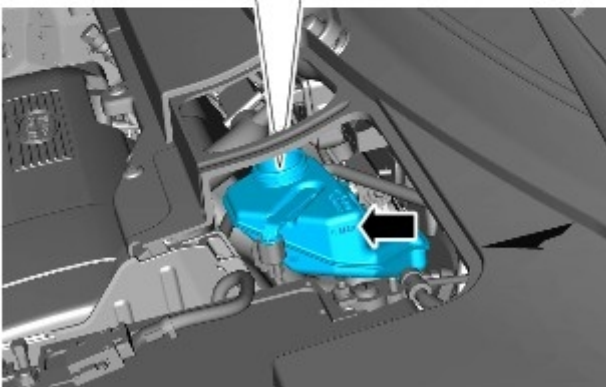
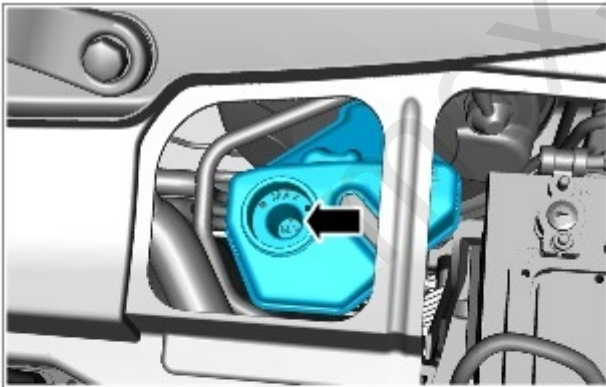


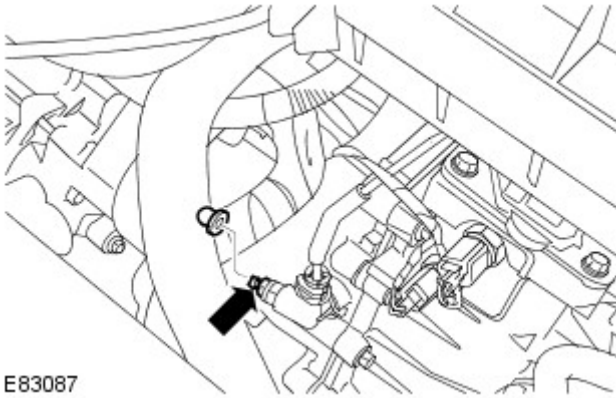
3.  **WARNING:** Do not allow dirt or foreign liquids to enter the reservoir. Use only new brake fluid of the correct specification from airtight containers. Do not mix brands of brake fluid as they may not be compatible.

 **CAUTION:** Brake fluid will damage paint finished surfaces. If spilled, immediately remove the fluid and clean the area with water.

Remove the brake fluid reservoir cap.

4. Fill the brake fluid reservoir to the MAX mark.





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5. Attach the clear bleed tube to the clutch bleed screw and immerse the free end of the bleed tube in a bleed jar containing a small quantity of approved brake fluid.

6. Loosen the bleed screw by two complete turns.

7. **7. ⚠ CAUTION:** The brake fluid reservoir must remain full with new, clean brake fluid at all times during bleeding.

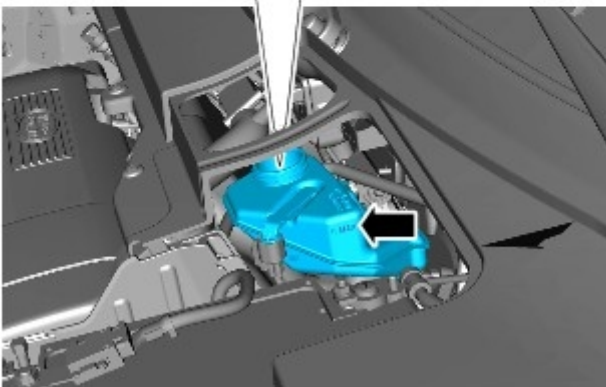
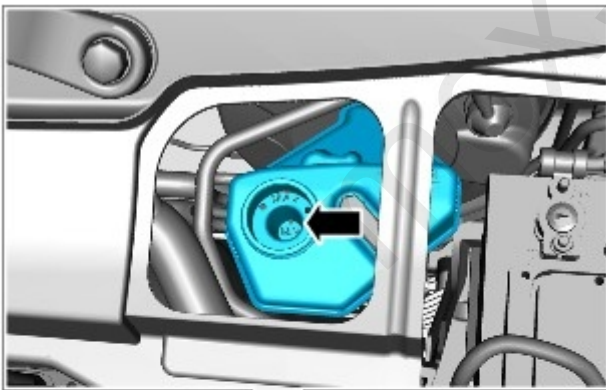
Depress the clutch pedal steadily through its full stroke. With the pedal held down, close the bleed screw. When the bleed screw is fully closed, allow the clutch pedal to return to the rest position. Repeat the procedure until a flow of clean, air-free fluid is being pumped into the bleed jar.

8. **8. ⚠ CAUTION:** Make sure the bleed screw cap is installed after bleeding. This will prevent corrosion to the bleed screw.

With the clutch pedal fully depressed, tighten the bleed screw.

Torque: 10 Nm

9. Fill the brake fluid reservoir to the MAX mark.



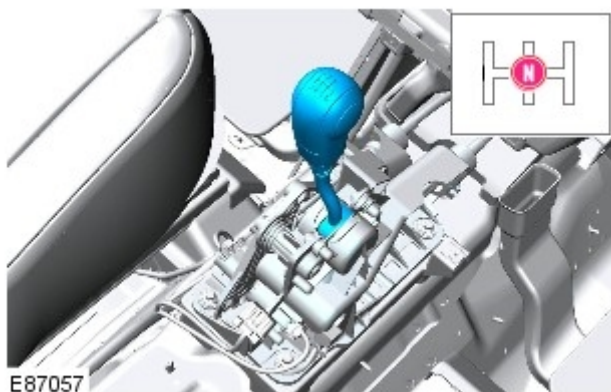
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Manual Transmission/Transaxle and Clutch - General Information - Gearshift Cable Adjustment

General Procedures

1. Check the gearshift operation.

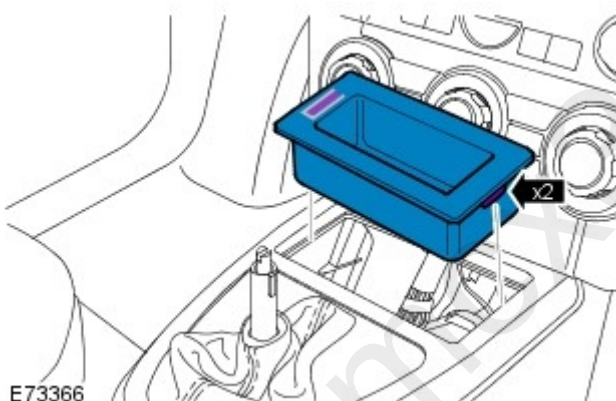
2. Position the gearshift lever in NEUTRAL.



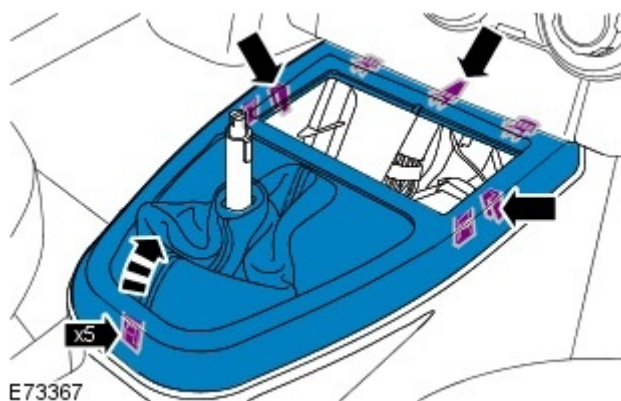
3. Remove the gear selector knob.

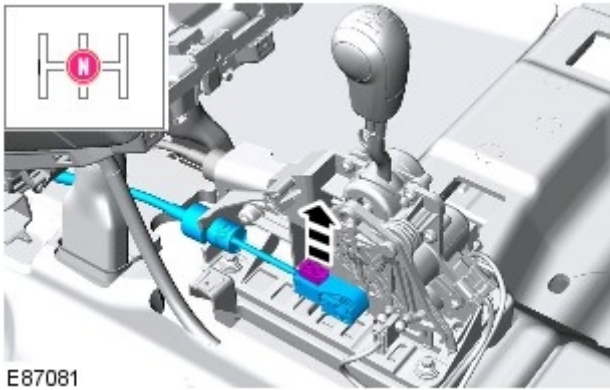
Refer to: [Gearshift Lever Knob](#) (308-06 Manual Transmission/Transaxle External Controls, Removal and Installation).

4.



5.





6.

- Release the LH cable securing clip.
- Allow the gearshift lever to come to rest in the neutral position.
- Secure the cable selector clip, without disturbing the gearshift selector lever position.

7. Secure the gear selector cover.

8. Install the stowage compartment tray.

9. Install the gear selector knob.

Refer to: [Gearshift Lever Knob](#) (308-06 Manual Transmission/Transaxle External Controls, Removal and Installation).