

6.  CAUTION: Evenly and progressively, remove the VVT units from each side.

 NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

Installation

1.  CAUTION: Make sure that the mating faces are clean and free of foreign material.

 NOTE: Lubricate the O-ring seal with clean engine oil.

To install, reverse the removal procedure.

2.  NOTE: For NAS vehicles only.

If required, carry out a short drive cycle.

Refer to: [Powertrain Control Module \(PCM\) Short Drive Cycle Self-Test](#) (303-14D Electronic Engine Controls - V8 S/C 5.0L Petrol, General Procedures).

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol -



CAUTION: CAUTION: Use only Shell M1375.4 Automatic transmission fluid. Use of any other fluids may result in a transmission malfunction or failure.

Description	Intervals
Normal maintenance	Filled for life.
Severe duty maintenance	Change the fluid at 48,000 km (30,000 miles) intervals.



NOTE: Lubricants, Fluids, Sealers and Adhesives

Description	Specification
Transmission fluid	Shell M1375.4
Sealant	WSS-M4G323-A6
Metal surface cleaner	WSW-M5B392-A
High temperature grease	Molecote FB180



NOTE: General Specifications

Vehicle	Engine	Approximate Liters	Refill capacity approximate dry capacity, includes cooler and tubes. Check the level at normal operating temperature. DO NOT OVERFILL. If it is necessary to add or change fluid, use only fluid which has been certified by the supplier as meeting the Jaguar Cars Ltd specification shown. U.S. Quarts
XJ	All vehicles	10.0	10.57



NOTE: Torque Specifications

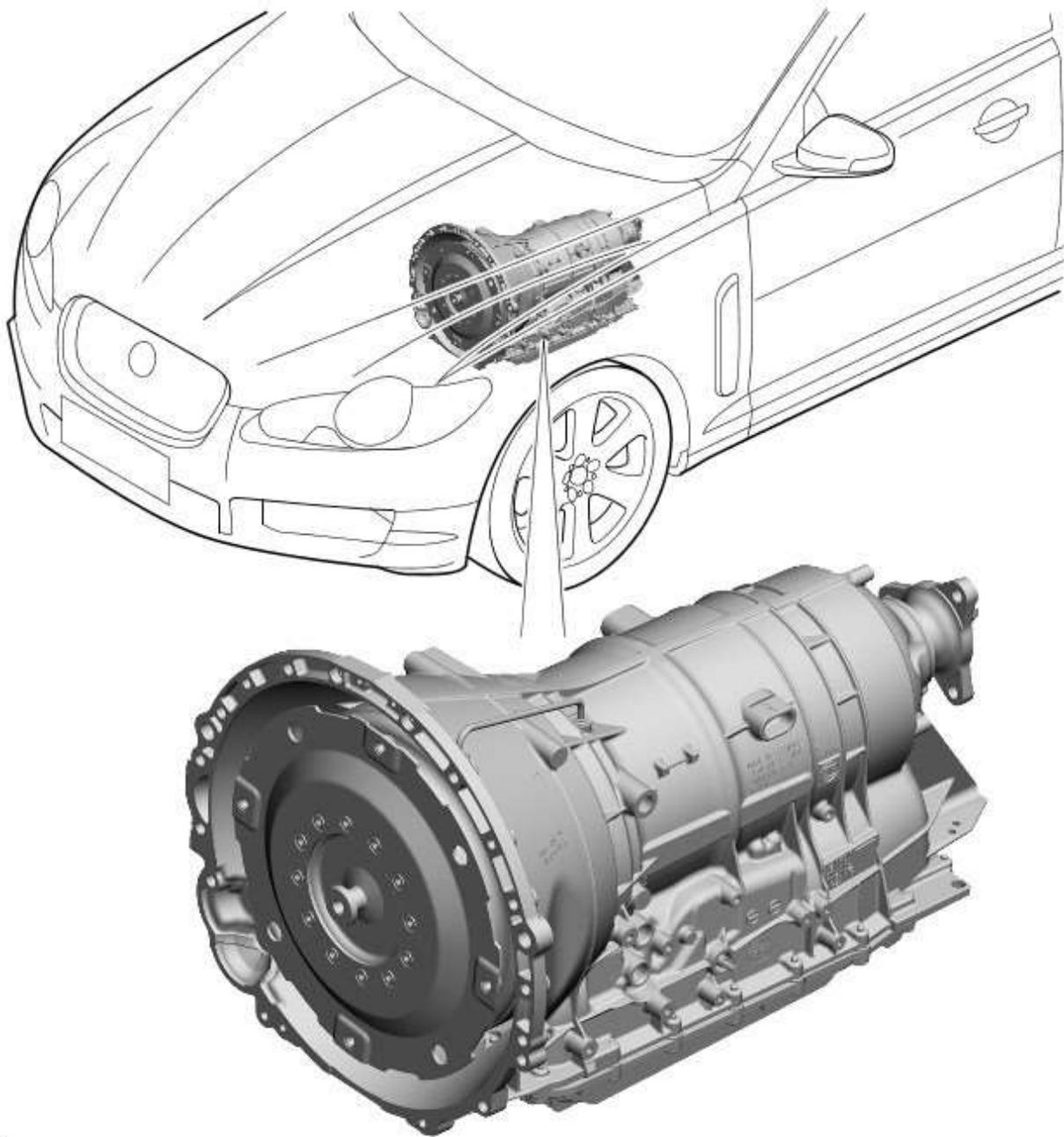
Description	Nm	lb-ft	lb-in
Transmission retaining bolts	48	35	-
Transmission mount retaining bolts	51	38	-
Transmission fluid fill plug	A	A	A
Transmission control module (TCM) and main control valve body retaining bolts	8	-	53
Output shaft flange retaining nut	60	44	-
Torque converter retaining bolts	62	46	-
Transmission fluid cooler tube retaining bolt	22	16	-
Transmission fluid drain plug	8	-	53
Transmission fluid pan, gasket and filter retaining bolts	8	-	53

A = refer to the procedure for correct torque sequence

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Description - Component Location

Description and Operation

COMPONENT LOCATION



E117880

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Description - Overview

Description and Operation

OVERVIEW

The ZF 6HP28 transmission is an electronically controlled, hydraulically operated, six speed automatic unit. The hydraulic and electronic control elements of the transmission, including the [TCM \(transmission control module\)](#), are incorporated in a single unit located inside the transmission and is known as 'Mechatronic'.

5.1L [SC \(supercharger\)](#) and 3.0L diesel models use an updated derivative of the ZF 6HP28 transmission used in the 5.0L naturally aspirated models.

The ZF 6HP28 transmission has the following features:

- Designed to be maintenance free
- Transmission fluid is 'fill for life'
- The torque converter features a controlled slip feature with electronically regulated control of lock-up, creating a smooth transition to the fully locked condition
- Shift programs controlled by the [TCM](#)
- Electronic park lock, controlled by the [TCM](#), with a mechanical emergency release
- ASIS (adaptive shift strategy), to provide continuous adaptation of shift changes to suit the driving style of the driver, which can vary from sporting to economical.
- Connected to the [ECM \(engine control module\)](#) via the high speed [CAN \(controller area network\)](#) bus for communications
- Default mode if major faults occur
- Diagnostics available from the [TCM](#) via the high speed [CAN](#) bus.

The transmission selections are made using the rotary JaguarDrive selector in the floor console and two paddle switches on the steering wheel. For additional information, refer to 307-05B Automatic Transmission/Transaxle External Controls - 5.0L/3.0L Diesel).

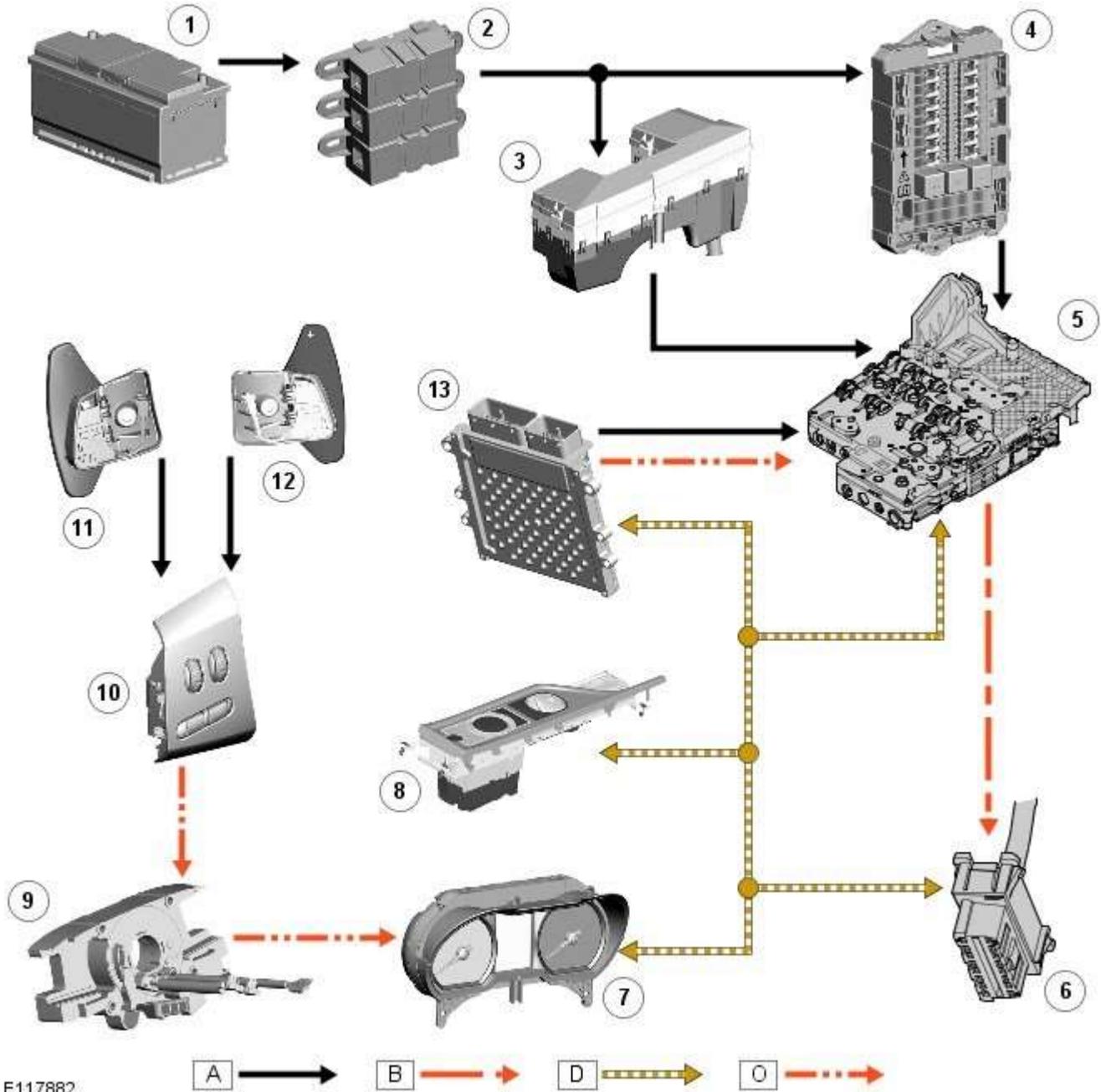
Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Description - System Operation and Component Description

Description and Operation

Control Diagram



NOTE: A = Hardwired; B = K bus; D = High speed CAN (controller area network) bus; O = LIN (local interconnect network) bus



E117882

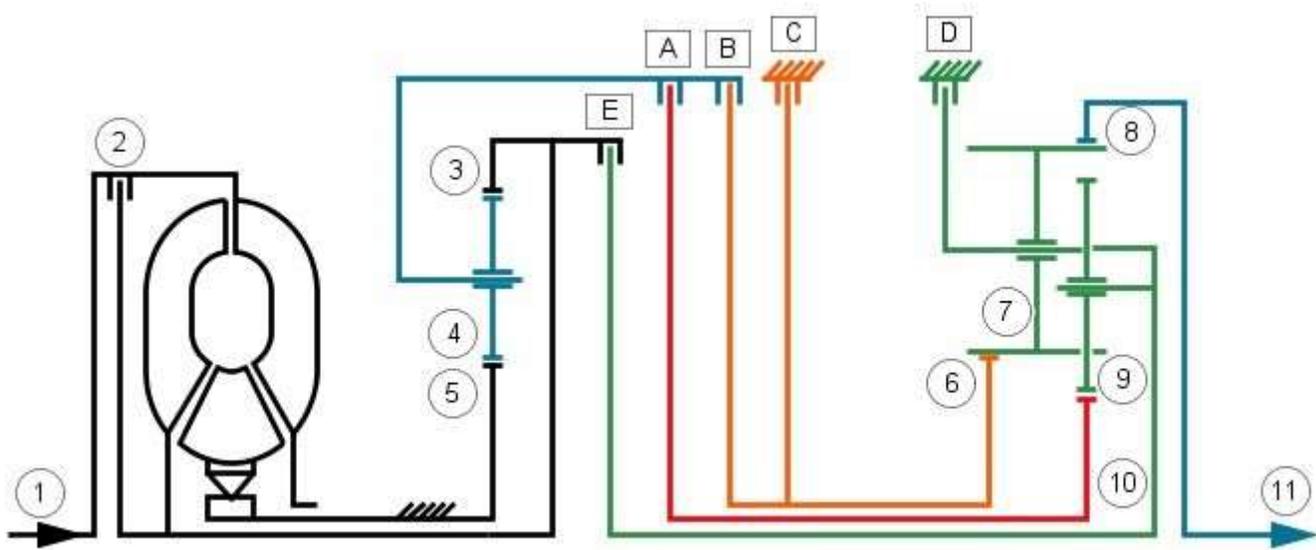
Item	Description
1	Battery
2	BJB (battery junction box) (250 A megafuse)
3	EJB (engine junction box)
4	CJB (central junction box)

5	TCM (transmission control module)
6	Diagnostic socket
7	Instrument cluster
8	JaguarDrive selector
9	Clockspring
10	Steering wheel audio switches
11	Downshift paddle switch
12	Upshift paddle switch
13	ECM (engine control module)

System Operation

POWER FLOWS

Operation of the transmission is controlled by the [TCM \(transmission control module\)](#), which electrically activates various solenoids to control the transmission gear selection. The sequence of solenoid activation is based on programmed information in the [TCM](#) memory and physical transmission operating conditions such as vehicle speed, throttle position, engine load and JaguarDrive selector position.



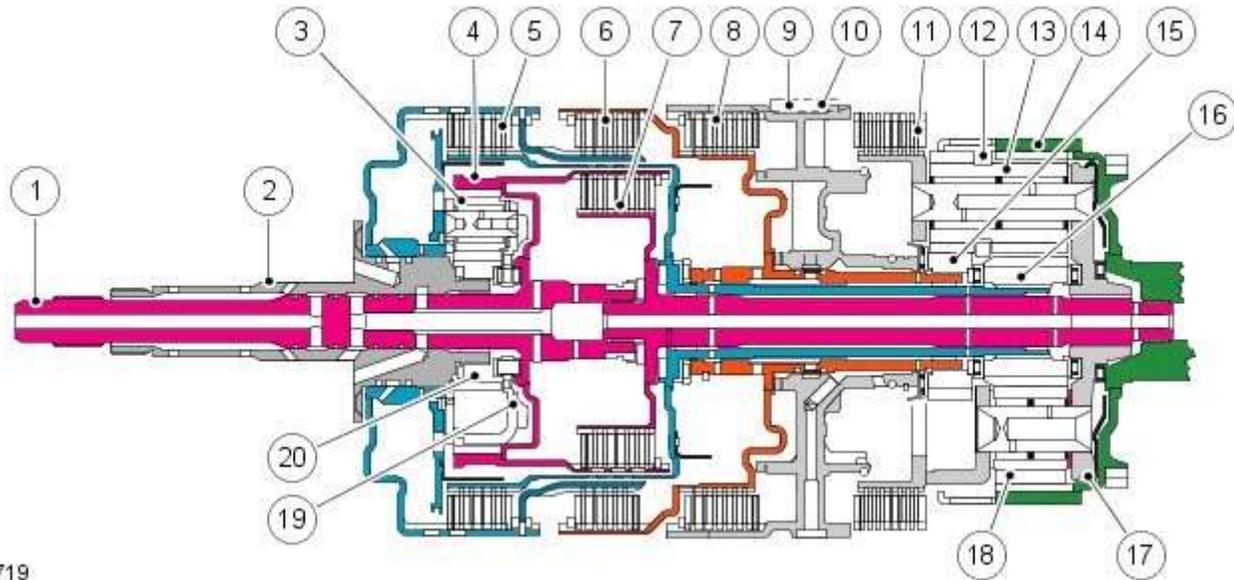
E42718

Item	Description
1	Torque input from engine
2	Torque converter lock-up clutch
3	Single web planetary gear carrier
4	Single web planetary gears
5	Single web sunwheel 1
6	Double web sunwheel 2
7	Double web planetary gears - long
8	Double web planetary gear carrier
9	Double web planetary gears - short
10	Double web sunwheel 3
11	Torque output from transmission
A	Multiplate clutch
B	Multiplate clutch
C	Multiplate brake
D	Multiplate brake
E	Multiplate clutch

Engine torque is transferred, via operation of single or combinations of clutches to the 2 planetary gear trains. Both gear trains are controlled by reactionary inputs from brake clutches to produce the 6 forward gears and 1 reverse gear. The ratios are as follows:

Gear	1st	2nd	3rd	4th	5th	6th	Reverse
Ration	4.171	2.340	1.521	1.143	0.867	0.691	3.403

Shift Elements



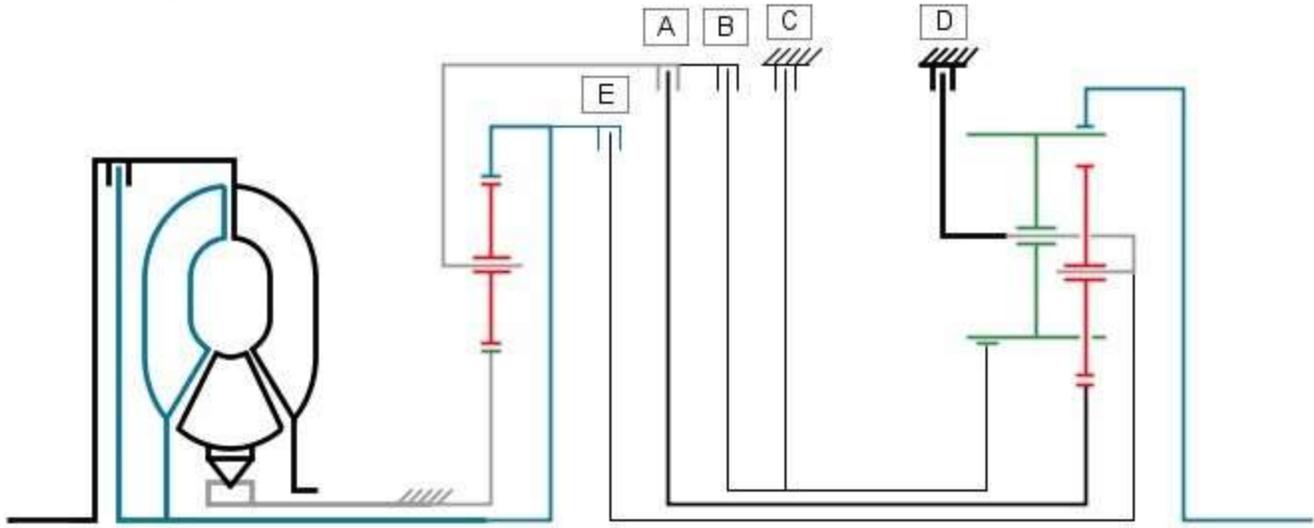
E42719

Item	Description
1	Turbine shaft
2	Stator shaft
3	Single web planetary gear train
4	Ring gear 1
5	Clutch A
6	Clutch B
7	Clutch E
8	Brake clutch C
9	Fixed connection to transmission housing
10	Shaft key
11	Brake clutch D
12	Double web planetary gear train
13	Planetary gears - long
14	Ring gear 2
15	Sunwheel 2
16	Sunwheel 3
17	Double web planetary gear carrier
18	Planetary gears - short
19	Single web planetary gear carrier
20	Sunwheel 1

The shift elements are three rotating multiplate clutches (A, B and E) and two fixed multiplate brakes (C and D). All shifts from 1st to 6th gears are power-on overlapping shifts. Overlapping shifts can be described as one of the clutches continuing to transmit drive at a lower main pressure until the next required clutch is able to accept the input torque.

The shift elements, clutches and brakes are actuated hydraulically. Fluid pressure is applied to the required clutch and/or brake, pressing the plates together and allowing drive to be transmitted through the plates. The purpose of the shift elements is to perform power-on shifts with no interruption to traction and smooth transition between gear ratios.

Power Flow 1st Gear



E42720

The JaguarDrive selector and the selector valve spool are in the 'D' position. Engine torque is transmitted from the torque converter turbine shaft to the ring gear 1 of the single web planetary gear train and the outer plate carrier of clutch 'E'.

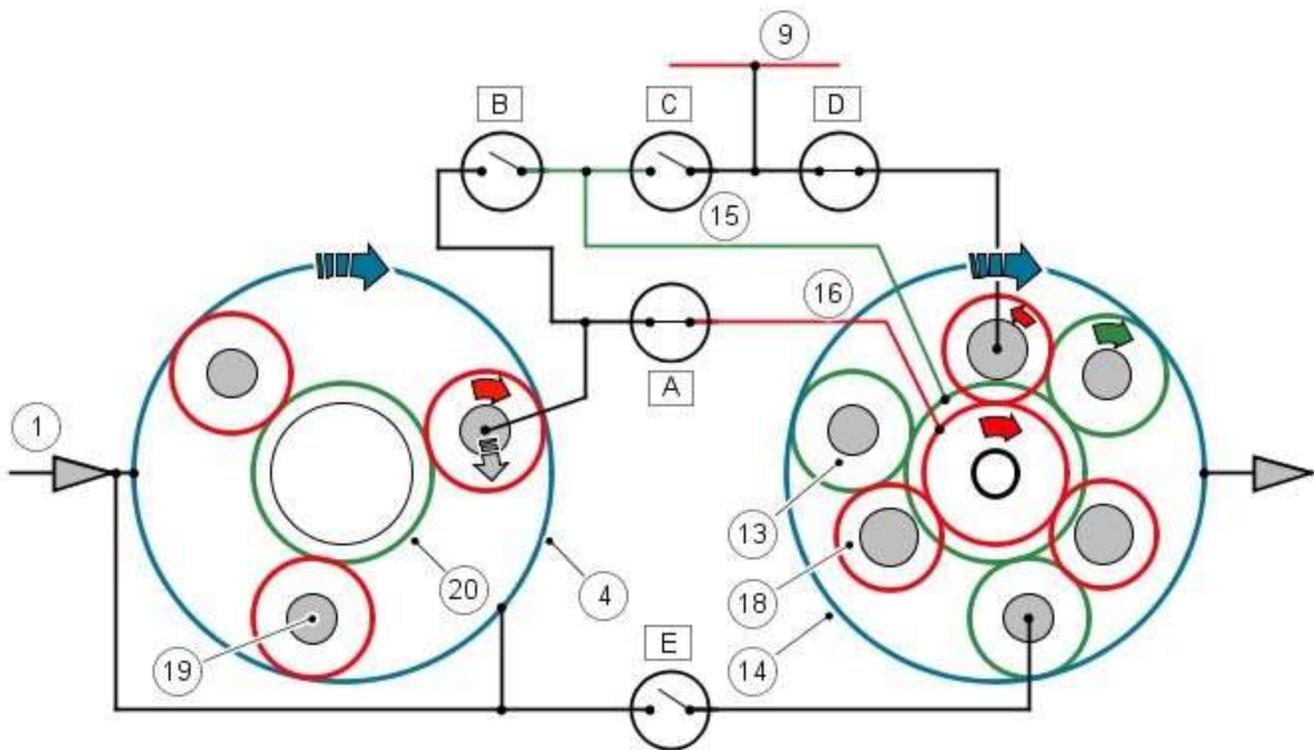
Ring gear 1 drives the planetary gears which rotate around sunwheel 1. This drives the planetary gear carrier 1 and also the outer plate carrier of clutch 'A' and the inner plate carrier of clutch 'B'.

When clutch 'A' is engaged, sunwheel 3 in the double web planetary gear train is driven and meshes with the short planetary gears.

The double web planetary gear train is locked against the transmission housing by brake 'D'. This allows ring gear 2 (output shaft) to be driven in the same direction as the engine via the long planetary gears.

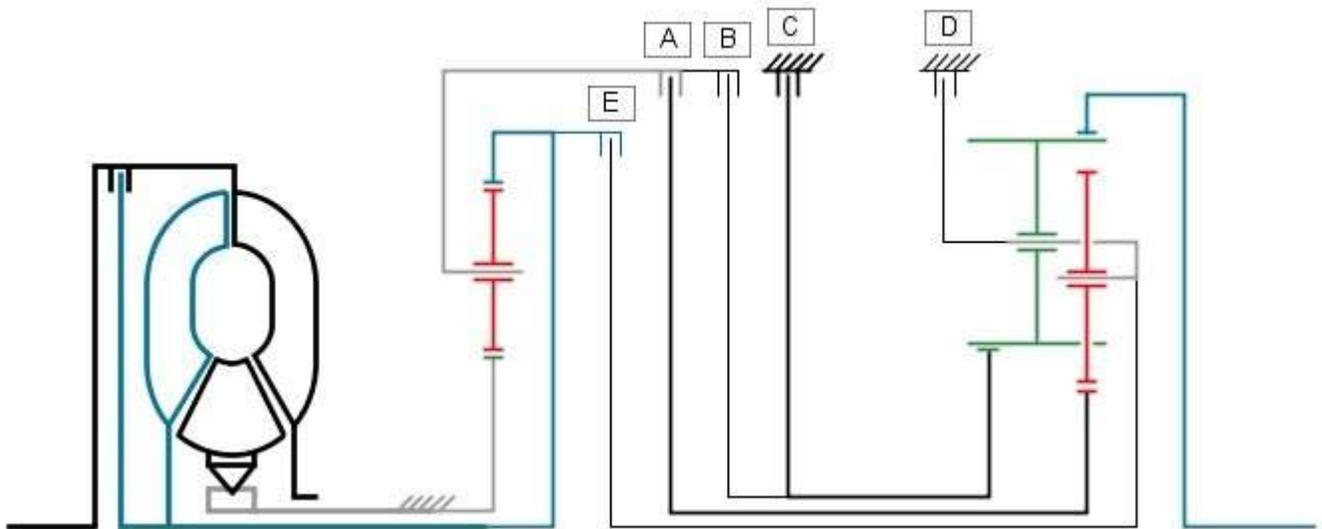


NOTE: Refer to 'Shift Elements' illustration for key



E42721

Power Flow 2nd Gear



E42722

The JaguarDrive selector and the selector spool valve are in the 'D' position. Engine torque is transmitted from the torque converter turbine shaft to the ring gear 1 of the single web planetary gear train and the outer plate carrier of clutch 'E'.

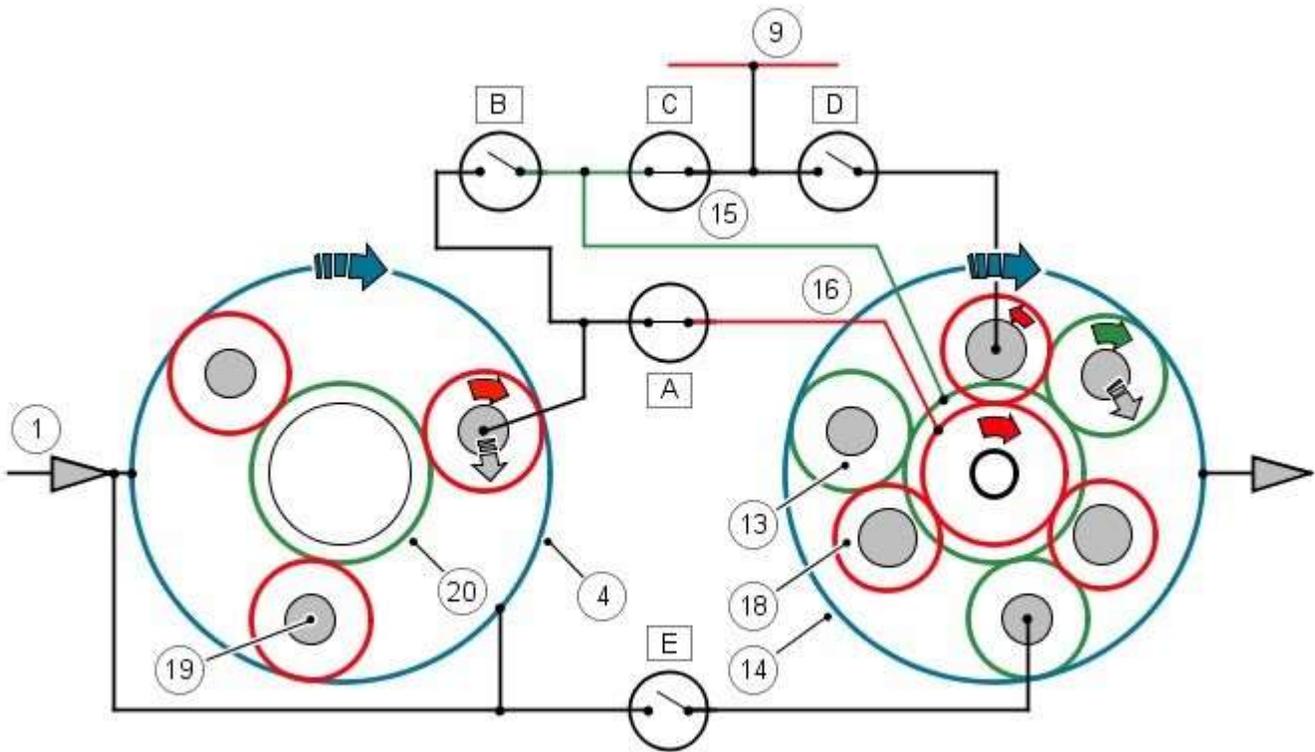
Ring gear 1 drives the planetary gears which rotate around sunwheel 1. This drives the planetary gear carrier 1 and also the outer plate carrier of clutch 'A' and the inner plate carrier of clutch 'B'.

When clutch 'A' is engaged, sunwheel 3 in the double web planetary gear train is driven and meshes with the short planetary gears.

Sunwheel 2 is locked to the transmission housing by brake clutch 'C'. The long planetary gears, which are also meshed with the short planetary gears, roll around the fixed sunwheel 2 and transmit drive to the double web planetary gear train carrier and ring gear 2 in the direction of engine rotation.

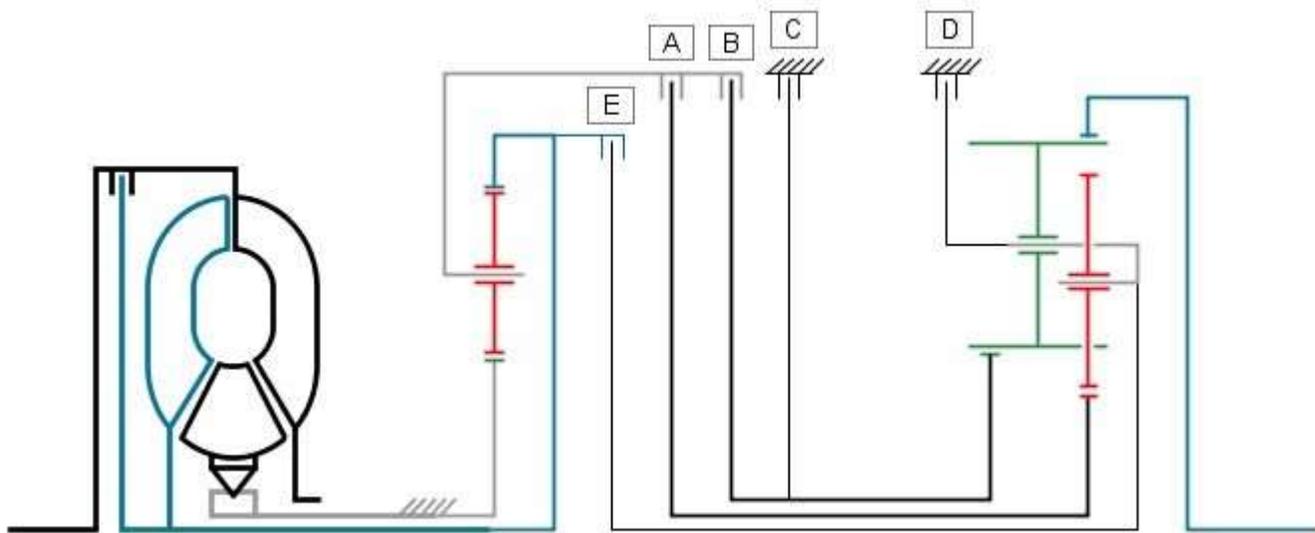


NOTE: Refer to 'Shift Elements' illustration for key



E42723

Power Flow 3rd Gear



E 42724

The JaguarDrive selector and the selector spool valve are in the 'D' position. Engine torque is transmitted from the torque converter turbine shaft to the ring gear 1 of the single web planetary gear train and the outer plate carrier of clutch 'E'.

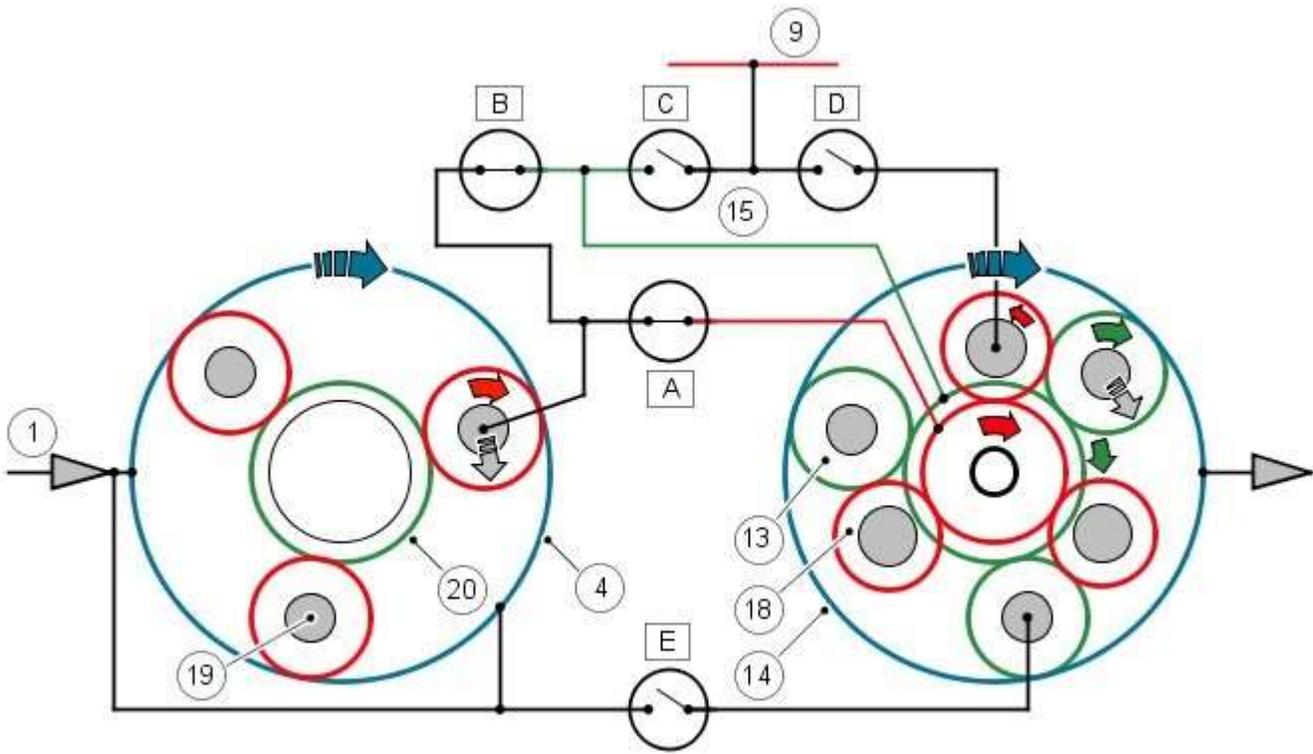
Ring gear 1 drives the planetary gears which rotate around sunwheel 1. This drives the planetary gear carrier 1 and also the outer plate carrier of clutch 'A' and the inner plate carrier of clutch 'B'.

When clutch 'A' is engaged, sunwheel 3 in the double web planetary gear train is driven and meshes with the short planetary gears.

Sunwheel 2 is driven via clutch 'B' which is engaged. The long planetary gears, which are also meshed with the short planetary gears, cannot roll around the fixed sunwheel 2 and therefore transmit drive to the locked double web planetary gear train carrier in the direction of engine rotation.

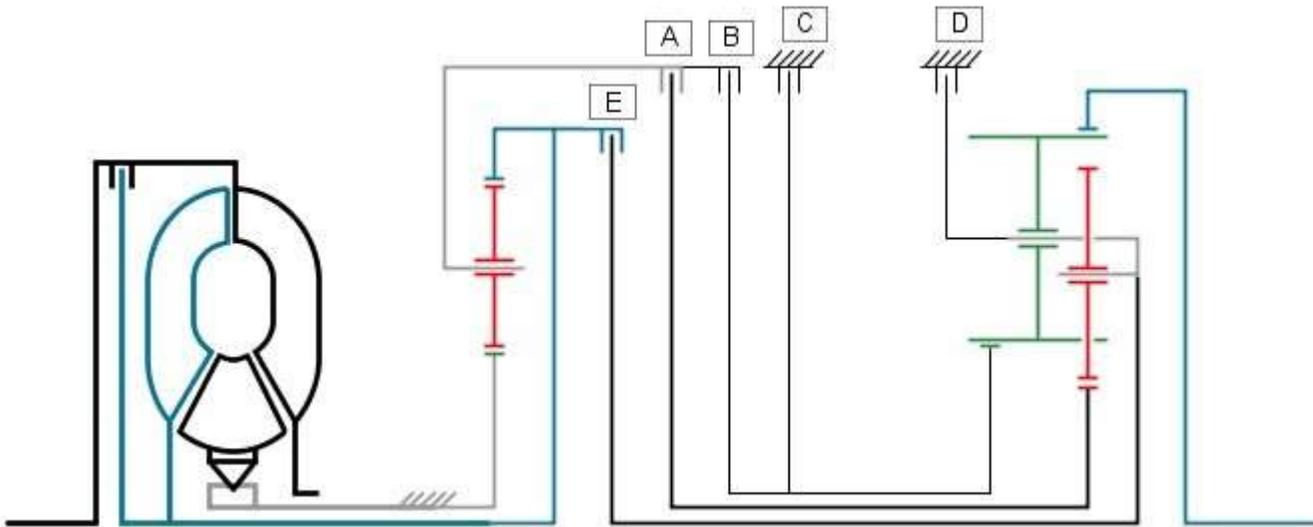


NOTE: Refer to 'Shift Elements' illustration for key



E42725

Power Flow 4th Gear



E42726

The JaguarDrive selector and the selector spool valve are in the 'D' position. Engine torque is transmitted from the torque converter turbine shaft to ring gear 1 of the single web planetary gear train and the outer plate carrier of clutch 'E'.

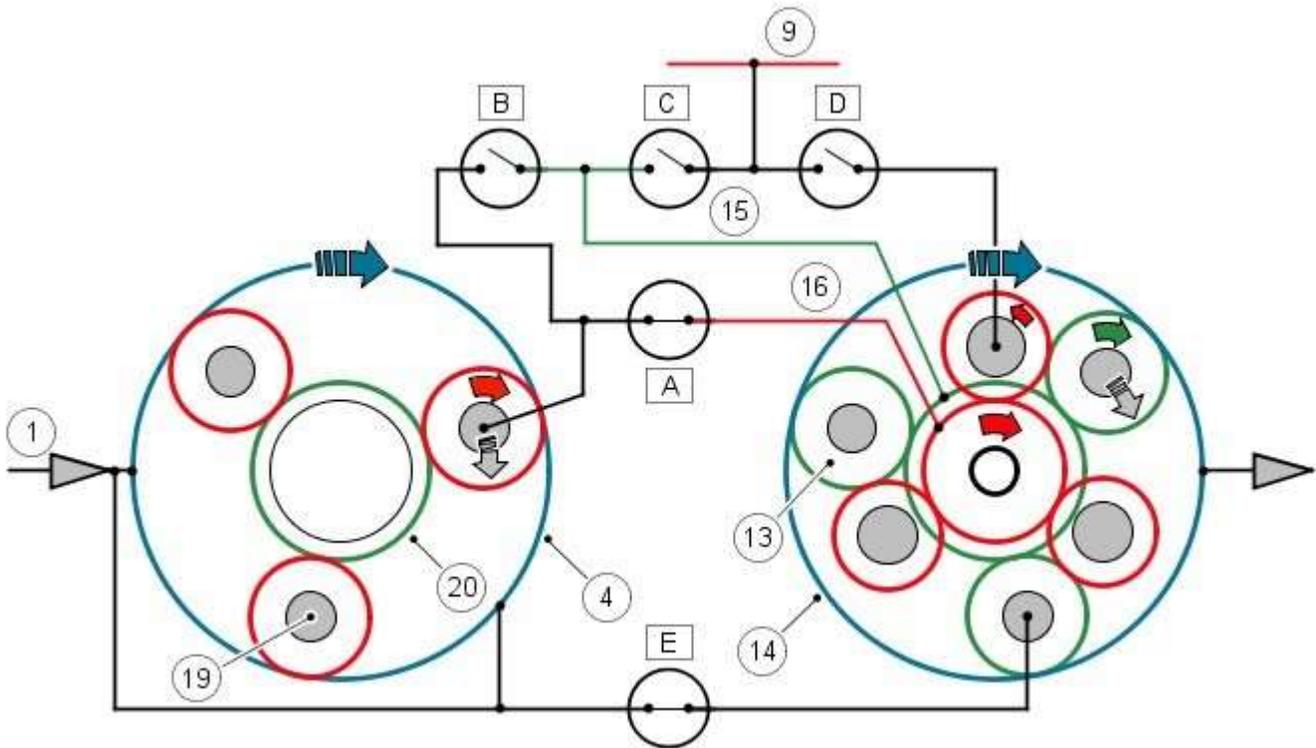
Ring gear 1 drives the planetary gears which rotate around sunwheel 1. This drives the planetary gear carrier 1 and also the outer plate carrier of clutch 'A' and the inner plate carrier of clutch 'B'.

When clutch 'A' is engaged, sunwheel 3 in the double web planetary gear train is driven and meshes with the short planetary gears.

The double web planetary gear carrier is driven via clutch 'E' which is engaged. The long planetary gears, which are also

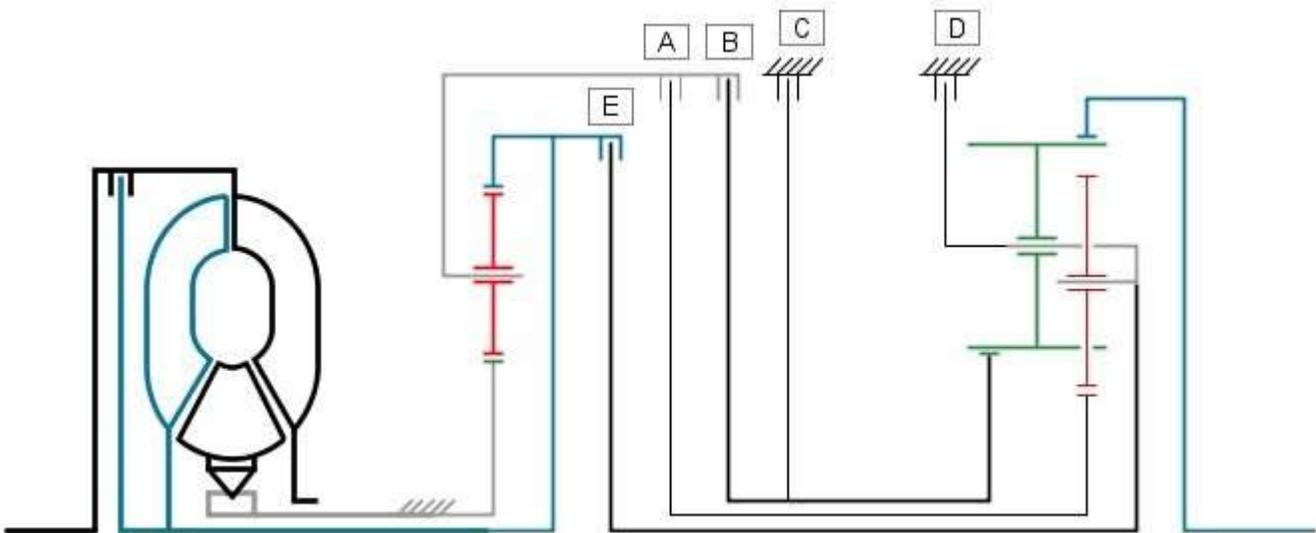
meshed with the short planetary gears and the double web planetary gear carrier, drive ring gear 2 in the direction of engine rotation.

 NOTE: Refer to 'Shift Elements' illustration for key



E42727

Power Flow 5th Gear



E42728

The JaguarDrive selector and the selector spool valve are in the 'D' position. Engine torque is transmitted from the torque converter turbine shaft to ring gear 1 of the single web planetary gear train and the outer plate carrier of clutch 'E'.

Ring gear 1 drives the planetary gears which rotate around sunwheel 1. This drives the planetary gear carrier 1 and also the outer plate carrier of clutch 'A' and the inner plate carrier of clutch 'B'.

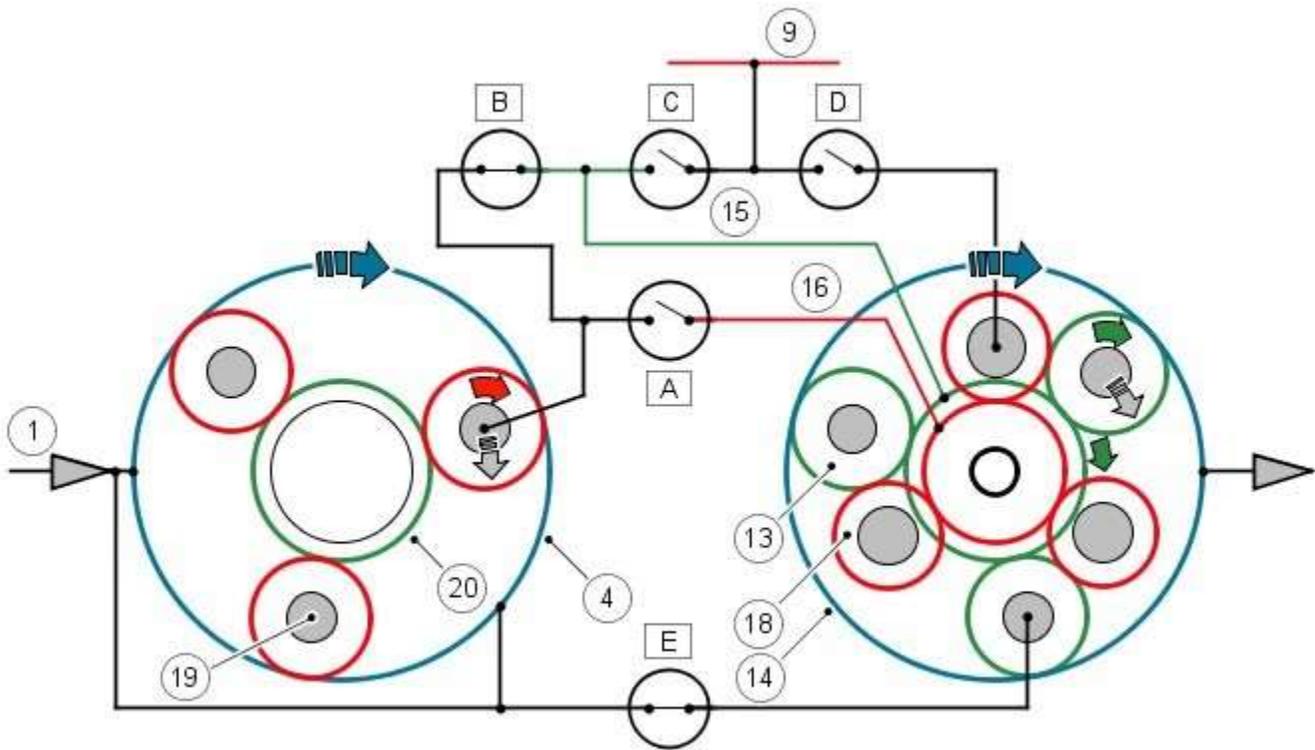
When clutch 'A' is engaged, sunwheel 3 in the double web planetary gear train is driven and meshes with the short planetary

gears.

The long planetary gears, which are also meshed with the short planetary gears and the double web planetary gear carrier, drive ring gear 2 in the direction of engine rotation.

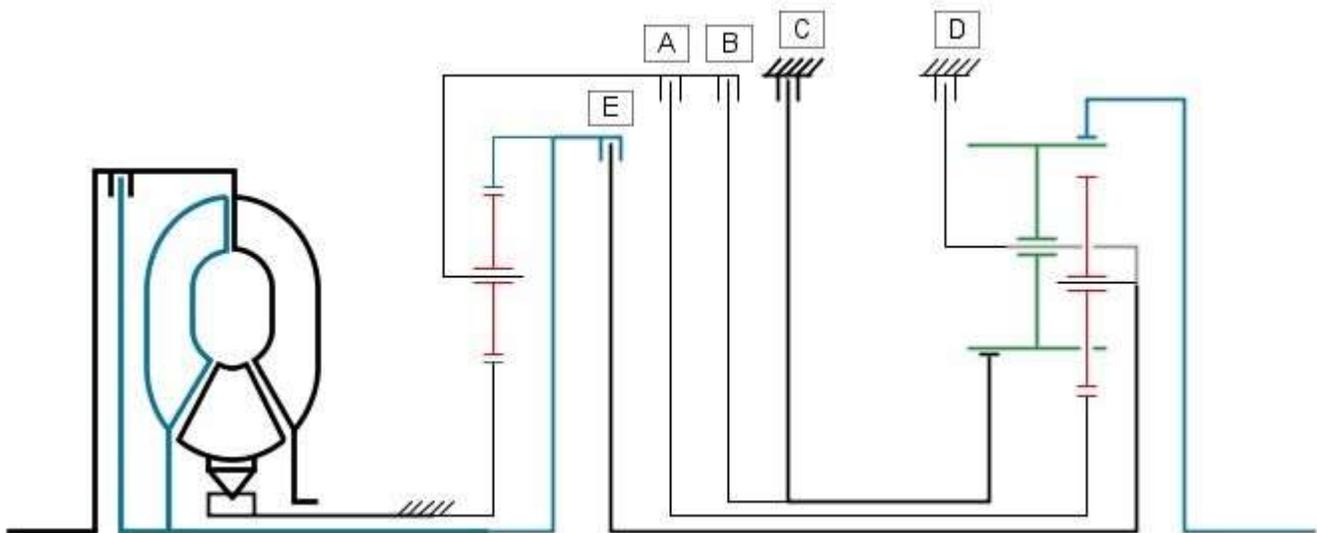


NOTE: Refer to 'Shift Elements' illustration for key



E42729

Power Flow 6th Gear



E42730

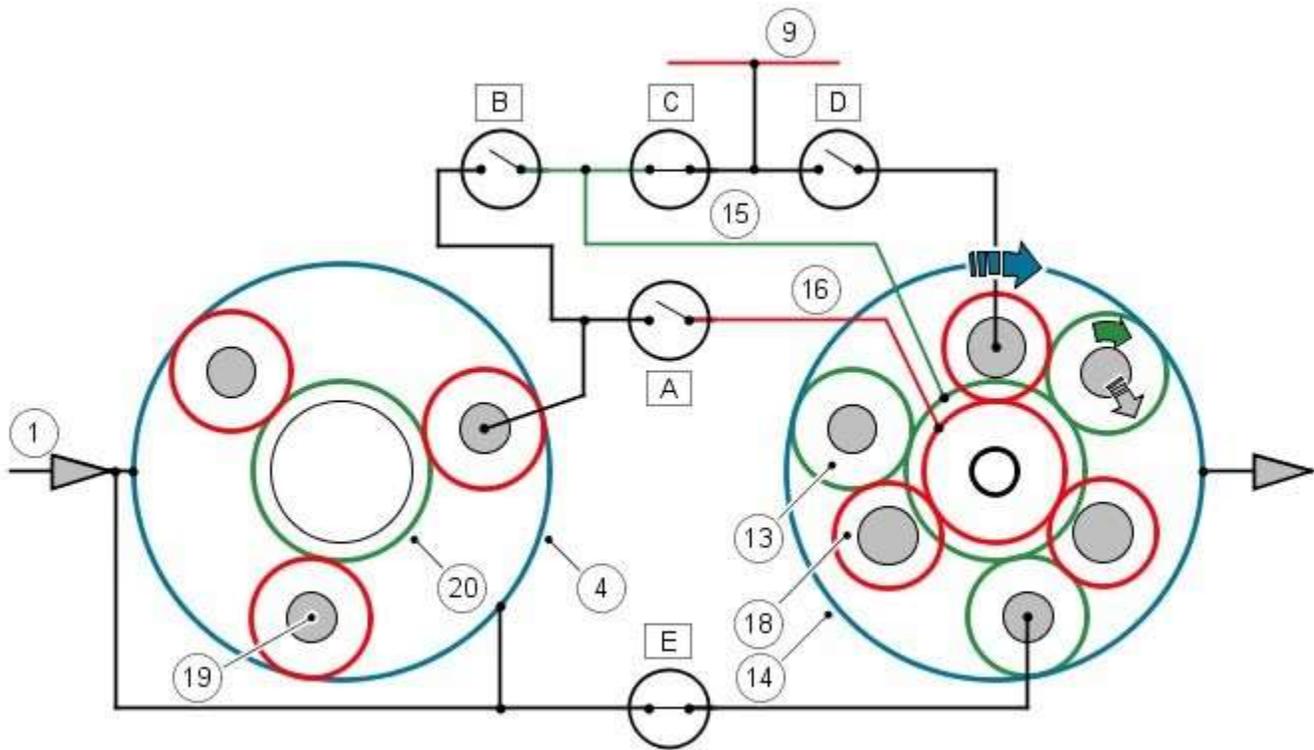
The JaguarDrive selector and the selector spool valve are in the 'D' position. Engine torque is transmitted from the torque converter turbine shaft to ring gear 1 of the single web planetary gear train and the outer plate carrier of clutch 'E'.

Clutches 'A' and 'B' are released, removing the effect of the single web planetary gear train.

Clutch brake 'C' is applied which locks sunwheel 2 to the transmission housing.

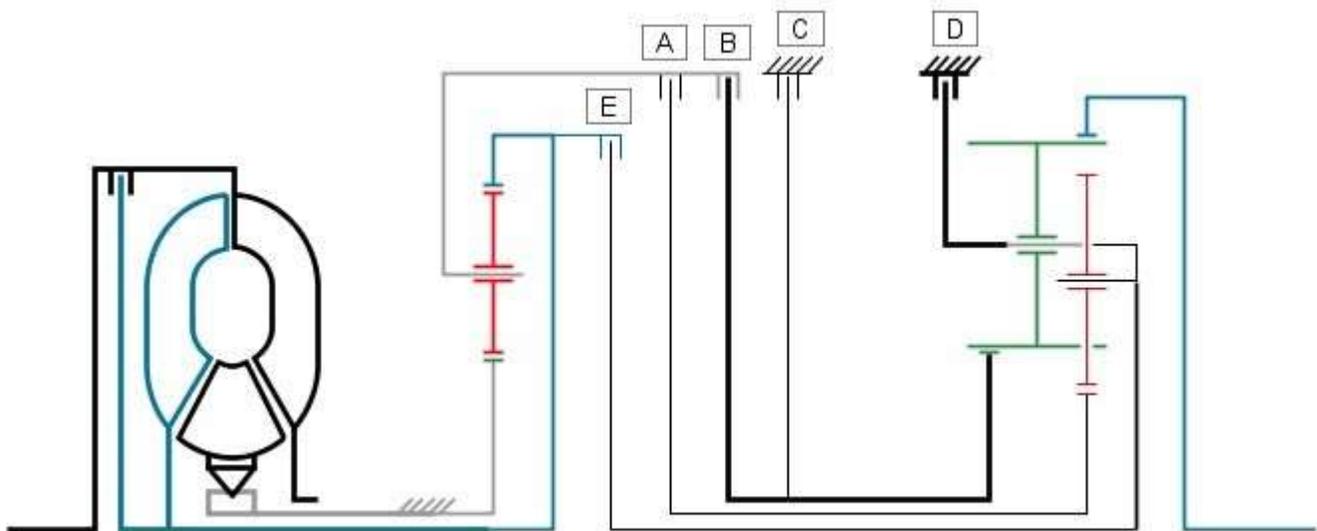
Clutch 'E' is engaged and drives the double web planetary gear carrier. This causes the long planetary gears to rotate around the fixed sunwheel 2 and transmit drive to ring gear 2 which is driven in the direction of engine rotation.

 NOTE: Refer to 'Shift Elements' illustration for key



E42731

Power Flow Reverse Gear



E42732

The JaguarDrive selector and the selector spool valve are in the 'R' position. Engine torque is transmitted from the torque converter turbine shaft to ring gear 1 of the single web planetary gear train and the outer plate carrier of clutch 'A'.

Ring gear 1 drives the planetary gears of the single web planetary gear train which rotate around the fixed sunwheel 1. This transmits the drive to the single web planetary gear carrier, the outer plate carrier of clutch 'A' and the inner plate carrier of

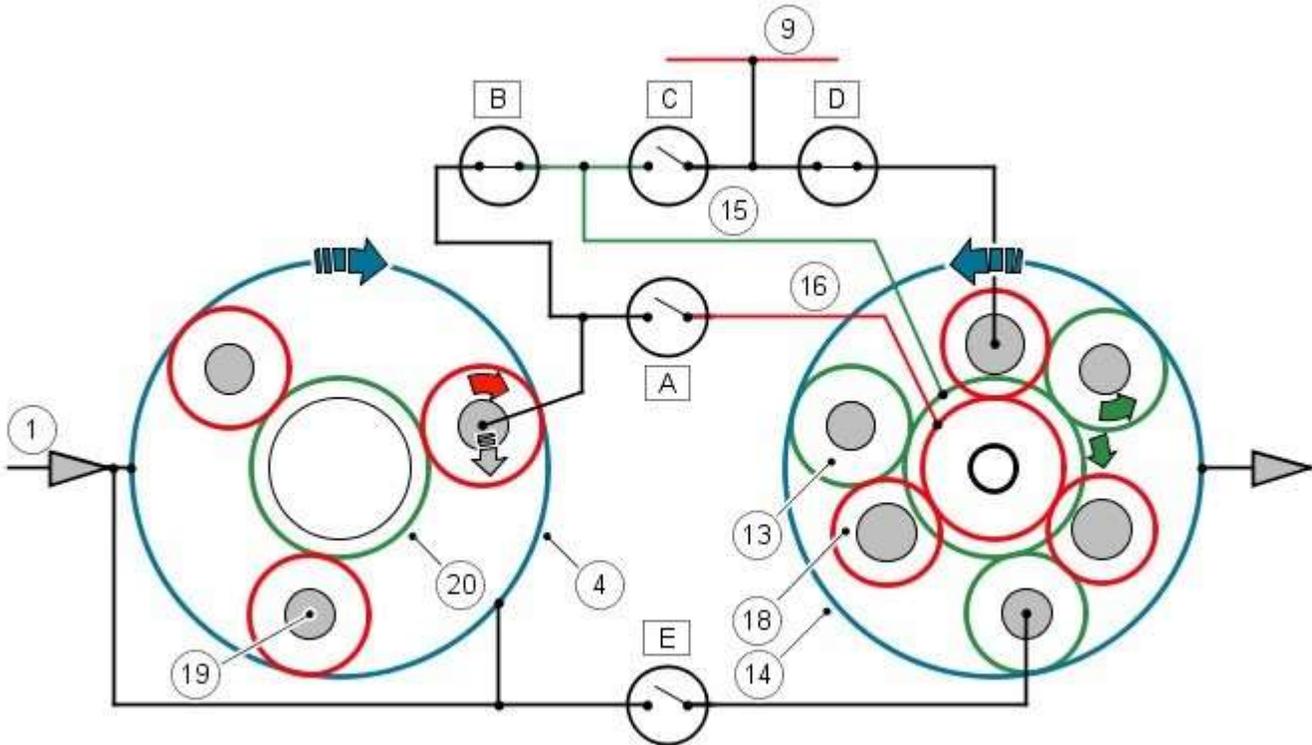
clutch 'B'.

With clutch 'B' applied, sunwheel 2 in the double web planetary gear train is driven and meshes with the long planetary gears.

The double web planetary gear carrier is locked to the transmission housing by brake clutch 'D'. This allows ring gear 2 to be driven in the opposite direction to engine rotation by the long planetary gears.



NOTE: Refer to 'Shift Elements' illustration for key



E42733

INSTRUMENT CLUSTER



E118106

Item	Description
1	Transmission selected gear status
2	MIL (malfunction indicator lamp)
3	Message center

The instrument cluster is connected to the [TCM](#) via the high speed [CAN](#) bus. Transmission status is transmitted by the [TCM](#) and displayed to the driver in one of two displays in the instrument cluster. For additional information, refer to 413-01 Instrument Cluster.

Malfunction Indicator Lamp

The [MIL \(malfunction indicator lamp\)](#) is located in the tachometer in the instrument cluster. Transmission related faults which may affect the vehicle emissions output will illuminate the [MIL](#).

The [MIL](#) is illuminated by the [ECM \(engine control module\)](#) on receipt of a relevant fault message from the [TCM](#) on the high speed [CAN](#). The nature of the fault can be diagnosed using a Jaguar approved diagnostic system which reads the fault codes stored in the [TCM](#) memory.

Transmission Status Display

The transmission status display is located in a [LCD \(liquid crystal display\)](#) at the top of the instrument cluster, between the speedometer and the tachometer. The [LCD](#) shows the JaguarDrive selector position or the selected gear when in manual 'Jaguar Sequential Shift' mode.

The following table shows the displays and their descriptions.

Symbol	Description
P	Park selected
R	Reverse selected
N	Neutral selected
D	Drive selected
S	Sport mode selected
1	1st gear selected (manual Jaguar sequential shift mode)
2	2nd gear selected (manual Jaguar sequential shift mode)
3	3rd gear selected (manual Jaguar sequential shift mode)
4	4th gear selected (manual Jaguar sequential shift mode)
5	5th gear selected (manual Jaguar sequential shift mode)
6	6th gear selected (manual Jaguar sequential shift mode)

The message center is located in the lower center of the instrument cluster. The message center is a [LCD](#) to relay vehicle status and operating information to the driver and can display messages relating to a number of the vehicle systems. If a transmission fault occurs, the message center will display the message 'GEARBOX FAULT'.

TRANSMISSION CONTROL MODULE

The [TCM](#) outputs signals to control the shift control solenoid valve and the EPRS (electronic pressure regulating solenoid) to control the hydraulic operation of the transmission.

The [TCM](#) processes signals from the transmission speed and temperature sensors, the [ECM](#) and other vehicle systems. From the received signal inputs and pre-programmed data, the module calculates the correct gear, torque converter clutch setting and optimum pressure settings for gear shift and lock-up clutch control.

The [ECM](#) supplies the engine management data over the high speed [CAN](#) bus. The [TCM](#) requires engine data to efficiently control the transmission operation, for example; flywheel torque, engine speed, accelerator pedal angle, engine temperature. The steering angle sensor and the [ABS \(anti-lock brake system\)](#) module also supply data to the [TCM](#) on the high speed [CAN](#) bus. The [TCM](#) uses data from these systems to suspend gear changes when the vehicle is cornering and/or the [ABS](#) module is controlling braking or traction control.

Using the signal inputs and the memorized data, the [TCM](#) control program computes the correct gear and torque converter lock-up clutch setting and the optimum pressure settings for gear shift and lock-up clutch control. Special output-side modules (power output stages, current regulator circuits), allow the [TCM](#) to control the solenoid valves and pressure regulators and consequently precisely control the hydraulics of the automatic transmission. In addition, the amount and duration of engine interventions are supplied to the engine management by way of the [CAN](#) bus.

The transmission has a fully electronic JaguarDrive selector with no Bowden cable connection to the transmission. The transmission selections are made using a rotary JaguarDrive selector which rises from the floor console once the engine is running. Rotation of the JaguarDrive selector to any of the five positions is sensed by the [TCM](#) via the high speed [CAN](#) bus. The [TCM](#) then reacts according to the selected position. The 'S' (sport) position selection allows the [TCM](#) to operate the transmission using the semi-automatic 'Jaguar Sequential Shift'.

Gear selections are sensed by the [TCM](#) when the driver operates the steering wheel paddle switches. Once the JaguarDrive selector position is confirmed, the [TCM](#) outputs appropriate information on the high speed [CAN](#) bus.

If the JaguarDrive selector is in 'D', 'Jaguar Sequential Shift' is temporary and will cancel after a time period or can be cancelled by pressing and holding the + paddle for approximately 2 seconds.

If the JaguarDrive selector is in 'S', 'Jaguar Sequential Shift' is permanent and can only be cancelled by pressing and holding the + paddle for approximately 2 seconds or by moving the JaguarDrive selector to the 'D' position.

The [TCM](#) can be reprogrammed using a Jaguar approved diagnostic system using a flash code. The [TCM](#) processor has a 440 kb internal flash memory. Of this capacity, approximately 370 kb are used by the basic transmission program. The remainder, approximately 70 kb is used to store vehicle-specific application data.

Engine Stall

If the vehicle stalls it will coast down in gear, with the transmission providing drive to the engine. A restart can be attempted at this point and the engine may start and the driver can continue.

If the coast down speed reduces such that the speed of the engine is less than 600 rev/min, the transmission will go to neutral, D illumination will flash in the instrument cluster. The driver needs to select neutral or park and then press the brake pedal to restart the engine.

If the start/stop button is pressed when driving, the message ENGINE STOP BUTTON PRESSED is displayed in the message center but there will be no change to the ignition state. If the driver requires to switch off the engine, the start/stop button must be pressed for a second time. The engine will be stopped and will be back driven by the transmission as the vehicle coasts down. When the engine speed is less than 600 rev/min the transmission engages neutral (flashing D illumination in the instrument cluster). When vehicle speed is less than 2 km/h (1.2 mph) Park is engaged. The JaguarDrive selector automatically rotates back to its lowered P position and the vehicle ignition is switched off.

The park engagement is prevented in a stall case as the ignition power is on and D was the last selected gear. The park engagement speed at ignition off is from the least value of the wheel speeds ([CAN](#) signal) and transmission output speed (internal signal).

Component Description

TRANSMISSION

The transmission comprises the main casing which houses all of the transmission components. The main casing also incorporates an integral bell housing.

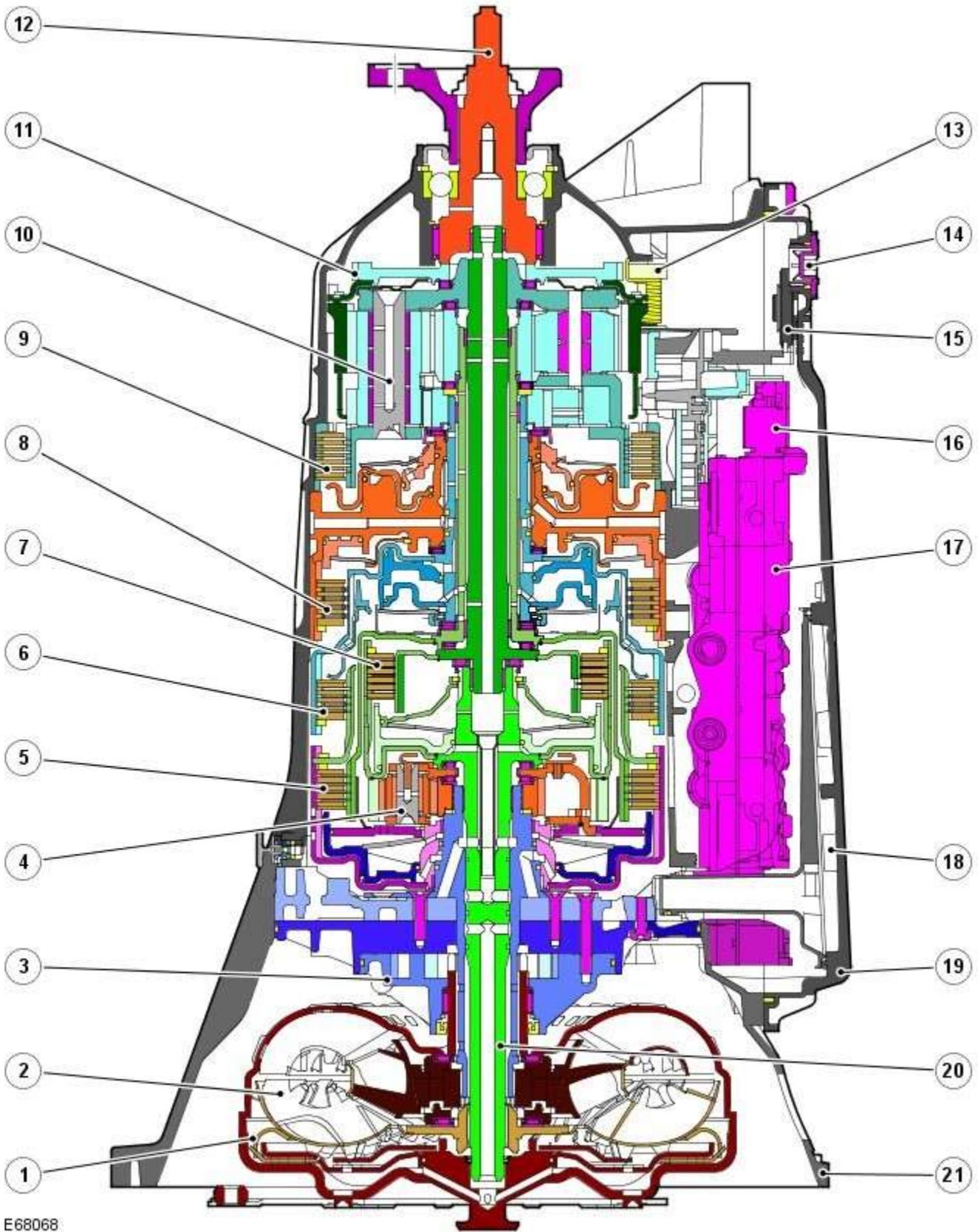
A fluid pan is attached to the lower face of the main casing and is secured with bolts. The fluid pan is sealed to the main casing with a gasket. Removal of the fluid pan allows access to the Mechatronic valve block. The fluid pan has a magnet located around the drain plug which collects any metallic particles present in the transmission fluid.

A fluid filter is located inside the fluid pan. If the transmission fluid becomes contaminated or after any service work, the fluid pan with integral filter must be replaced.

The integral bell housing provides protection for the torque converter assembly and also provides the attachment for the gearbox to the engine cylinder block. The torque converter is a non-serviceable assembly which also contains the lock-up clutch mechanism. The torque converter drives a crescent type pump via drive tangs. The fluid pump is located in the main casing, behind the torque converter.

The main casing contains the following major components:

- Input shaft
- Output shaft
- Mechatronic valve block which contains the solenoids, speed sensors and the [TCM](#)
- Three rotating multiplate drive clutches
- Two fixed multiplate brake clutches
- A single planetary gear train and a double planetary gear train.

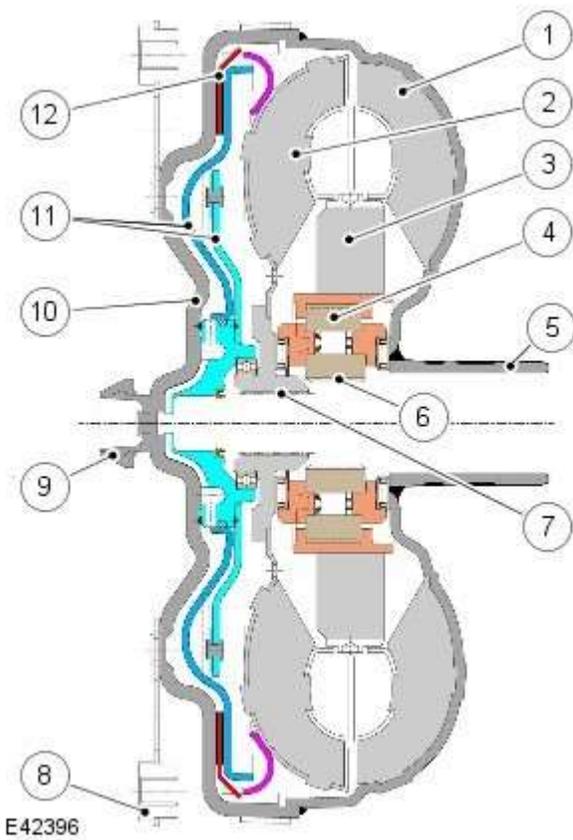


E68068

Item	Description
1	Torque converter lock-up clutch
2	Torque converter
3	Fluid pump
4	Single planetary gearset

5	Clutch A
6	Clutch B
7	Clutch E
8	Brake C
9	Brake D
10	Double planetary gearset
11	Park lock gear
12	Output shaft
13	Park lock pawl
14	Drain plug
15	Magnet
16	Pressure regulator
17	Mechatronic valve block
18	Fluid filter
19	Fluid pan
20	Input shaft
21	Bell housing

TORQUE CONVERTER



Item	Description
1	Impeller
2	Turbine
3	Stator
4	Freewheel clutch
5	Torque converter hub
6	Stator shaft
7	Turbine shaft

8	Drive plate
9	Journal - Drive plate/crankshaft location
10	Torque converter cover
11	Lock-up clutch piston
12	Lock-up clutch plate

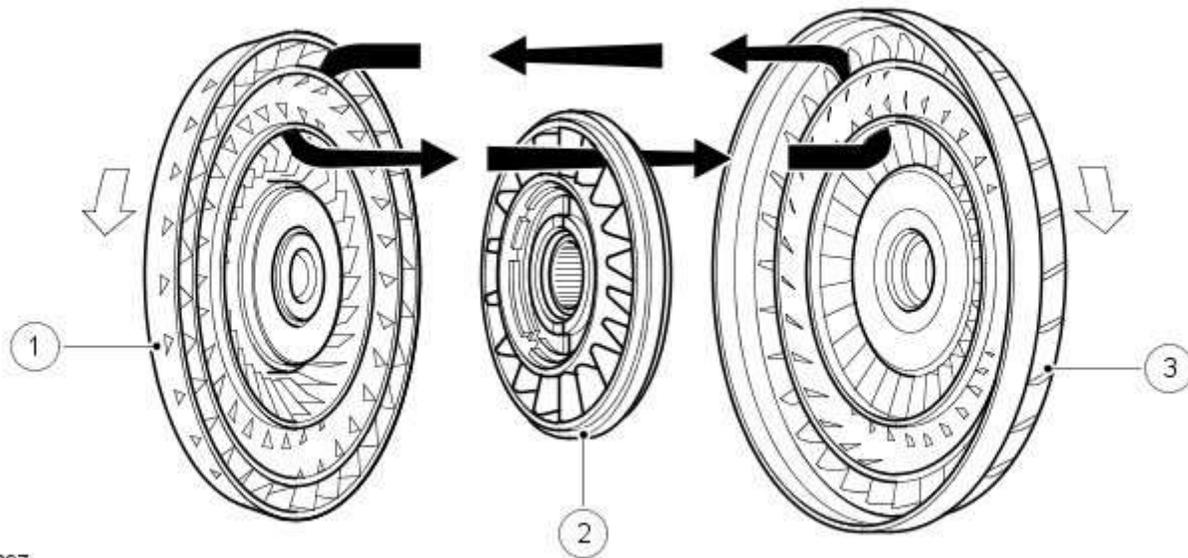
The torque converter is the coupling element between the engine and the transmission and is located in the bell housing, on the engine side of the transmission. The driven power from the engine crankshaft is transmitted hydraulically and mechanically through the torque converter to the transmission. The torque converter is connected to the engine by a drive plate attached to the rear of the crankshaft.

The torque converter comprises an impeller, a stator and a turbine. The torque converter is a sealed unit with all components located between the converter housing cover and the impeller. The two components are welded together to form a sealed, fluid filled housing. With the impeller welded to the converter housing cover, the impeller is therefore driven at engine crankshaft speed.

The converter housing cover has four threaded bosses, which provide for attachment of the engine drive plate. The threaded bosses also provide for location of special tools which are required to remove the torque converter from the bell housing.

Impeller

Fluid Flow



E42397

Item	Description
1	Turbine
2	Stator
3	Impeller

When the engine is running the rotating impeller acts as a centrifugal pump, picking up fluid at its center and discharging it at high velocity through the blades on its outer rim. The design and shape of the blades and the curve of the impeller body cause the fluid to rotate in a clockwise direction as it leaves the impeller. This rotation improves the efficiency of the fluid as it contacts the outer row of blades on the turbine.

The centrifugal force of the fluid leaving the blades of the impeller is passed to the curved inner surface of the turbine via the tip of the blades. The velocity and clockwise rotation of the fluid causes the turbine to rotate.

Turbine

The turbine is similar in design to the impeller with a continuous row of blades. Fluid from the impeller enters the turbine through the tip of the blades and is directed around the curved body of the turbine to the root of the blades. The curved surface redirects the fluid back in the opposite direction to which it entered the turbine, effectively increasing the turning force applied to the turbine from the impeller. This principle is known as torque multiplication.

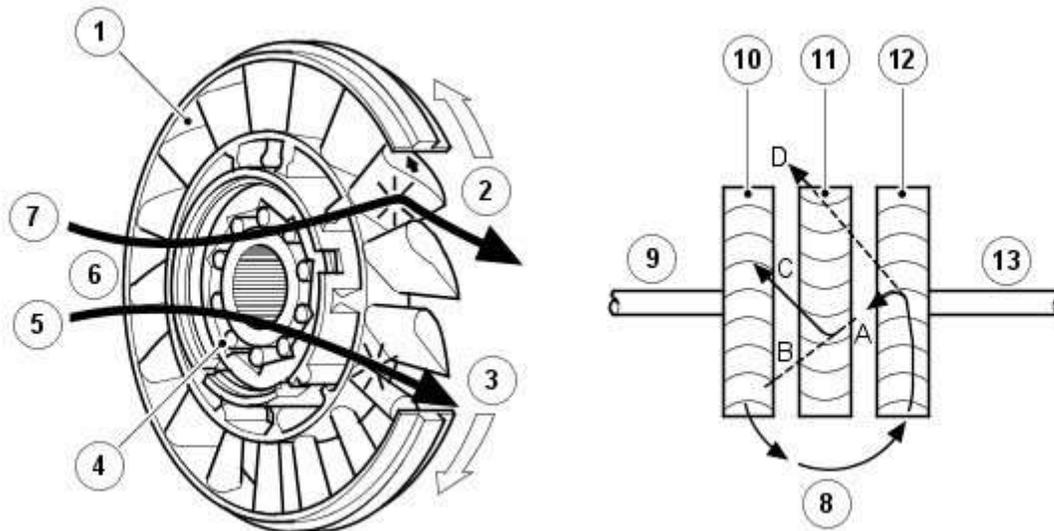
When engine speed increases, turbine speed also increases. The fluid leaving the inner row of the turbine blades is rotated in a counter-clockwise direction due to the curve of the turbine and the shape of the blades. The fluid is now flowing in the opposite direction to the engine rotation and therefore the impeller. If the fluid was allowed to hit the impeller in this condition, it would have the effect of applying a brake to the impeller, eliminating the torque multiplication effect. To prevent this, the stator is located between the impeller and the turbine.

Stator

The stator is located on the splined transmission input shaft via a freewheel clutch. The stator comprises a number of blades which are aligned in an opposite direction to those of the impeller and turbine. The main function of the stator is to redirect the returning fluid from the turbine, changing its direction to that of the impeller.

The redirected fluid from the stator is directed at the inner row of blades of the impeller, assisting the engine in turning the impeller. This sequence increases the force of the fluid emitted from the impeller and thereby increases the torque multiplication effect of the torque converter.

Stator Functions



E 42398

Item	Description
1	Blades
2	Stator held – fluid flow redirected
3	Stator rotates freely
4	Roller
5	Converter at coupling speed
6	Fluid flow from turbine
7	Converter multiplying
8	Fluid flow from impeller
9	Drive from engine
10	Impeller
11	Stator
12	Turbine
13	Output to transmission

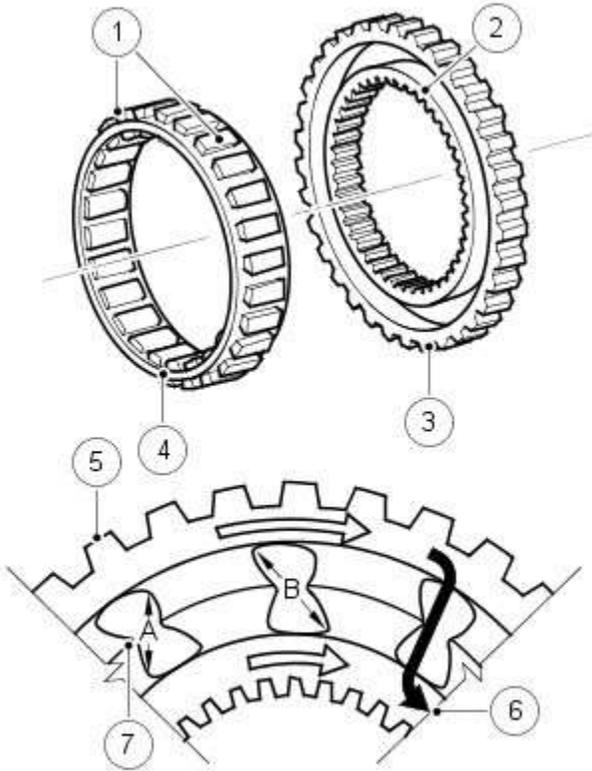
Fluid emitted from the impeller acts on the turbine. If the turbine is rotating at a slower speed than the fluid from the impeller, the fluid will be deflected by the turbine blades in the path 'A'. The fluid is directed at and deflected by the stator blades from path 'B' to path 'C'. This ensures that the fluid is directed back to the pump in the optimum direction. In this condition the sprag clutch is engaged and the force of the fluid on the stator blades assists the engine in rotating the impeller.

As the rotational speed of the engine and therefore the turbine increases, the direction of the fluid leaving the turbine changes to path 'D'. The fluid is now directed from the turbine to the opposite side of the stator blades, rotating the stator in the opposite direction. To prevent the stator from resisting the smooth flow of the fluid from the turbine, the sprag clutch releases, allowing the stator to rotate freely on its shaft.

When the stator becomes inactive, the torque converter no longer multiplies the engine torque. When the torque converter reaches this operational condition it ceases to multiply the engine torque and acts solely as a fluid coupling, with the impeller and the turbine rotating at approximately the same speed.

The stator uses a sprag type, one way, freewheel clutch. When the stator is rotated in a clockwise direction the sprags twist and are wedged between the inner and outer races. In this condition the sprags transfer the rotation of the outer race to the inner race which rotates at the same speed.

One Way Free Wheel Clutch – Typical



E 42712

Item	Description
1	Sprags
2	Inner race
3	Outer race
4	Sprag and cage assembly
5	Sprag outer race
6	Sprag inner race
7	Retaining ring

The free wheel clutch can perform three functions; hold the stator stationary, drive the stator and free wheel allowing the stator to rotate without a drive output. The free wheel clutch used in the ZF 6HP28 transmission is of the sprag type and comprises an inner and outer race and a sprag and cage assembly. The inner and outer races are pressed into their related components with which they rotate. The sprag and cage assembly is located between the inner and outer races.

The sprags are located in a cage which is a spring which holds the sprags in the 'wedge' direction and maintains them in contact with the inner and outer races.

Referring to the illustration, the sprags are designed so that the dimension '**B**' is larger than the distance between the inner and outer race bearing surfaces. When the outer race rotates in a clockwise direction, the sprags twist and the edges across the dimension '**B**' wedge between the races, providing a positive drive through each sprag to the inner race. The dimension '**A**' is smaller than the distance between the inner and outer race bearing surfaces. When the outer race rotates in an anti-clockwise direction, the dimension '**A**' is too small to allow the sprags to wedge between the races, allowing the outer race to rotate freely.

On the illustration shown, when the outer race is rotated in a clockwise direction, the sprags twist and are 'wedged' between the inner and outer races. The sprags then transfer the rotation of the outer race to the inner race, which rotates at the same speed.

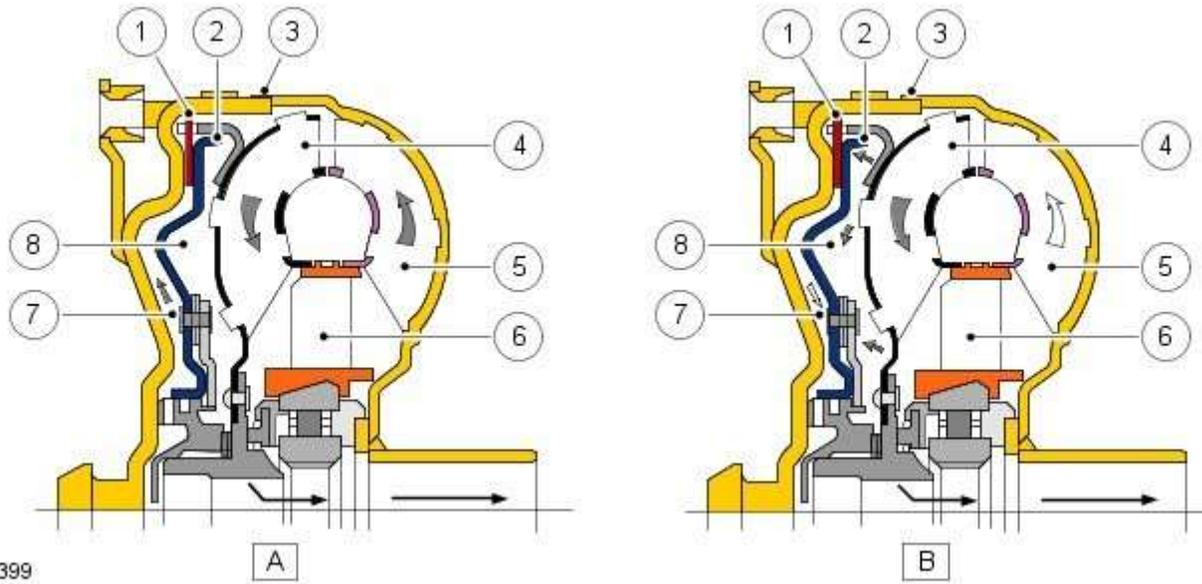
Lock-Up Clutch Mechanism

The [TCC \(torque converter clutch\)](#) is hydraulically controlled by an EPRS, which is controlled by the [TCM](#). This allows the torque converter to have three states of operation as follows:

- Fully engaged
- Controlled slip variable engagement
- Fully disengaged.

The [TCC](#) is controlled by two hydraulic spool valves located in the valve block. These valves are actuated by pilot pressure supplied via a solenoid valve which is also located in the valve block. The solenoid valve is operated by [PWM \(pulse width](#)

modulation) signals from the [TCM](#) to give full, partial or no lock-up of the torque converter.



Item	Description
A	Unlocked condition
B	Locked condition
1	Clutch plate
2	Clutch piston
3	Torque converter body
4	Turbine
5	Impeller
6	Stator
7	Piston chamber
8	Turbine chamber

The lock-up clutch is a hydro-mechanical device which eliminates torque converter slip, improving fuel consumption. The engagement and disengagement is controlled by the [TCM](#) to allow a certain amount of controlled 'slip'. This allows a small difference in the rotational speeds of the impeller and the turbine which results in improved shift quality. The lock-up clutch comprises a piston and a clutch friction plate.

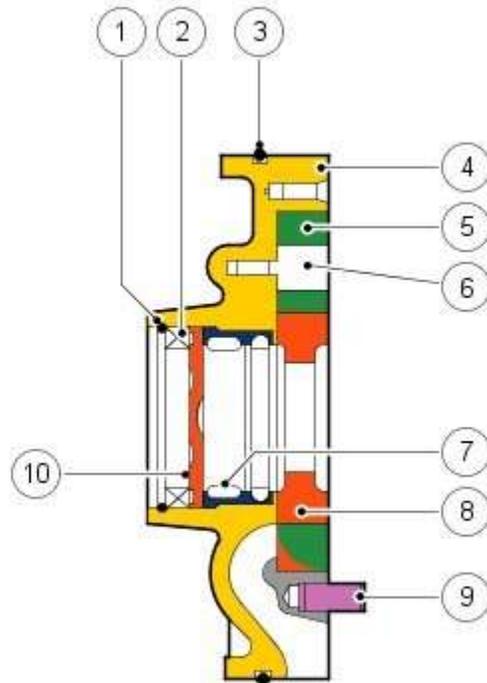
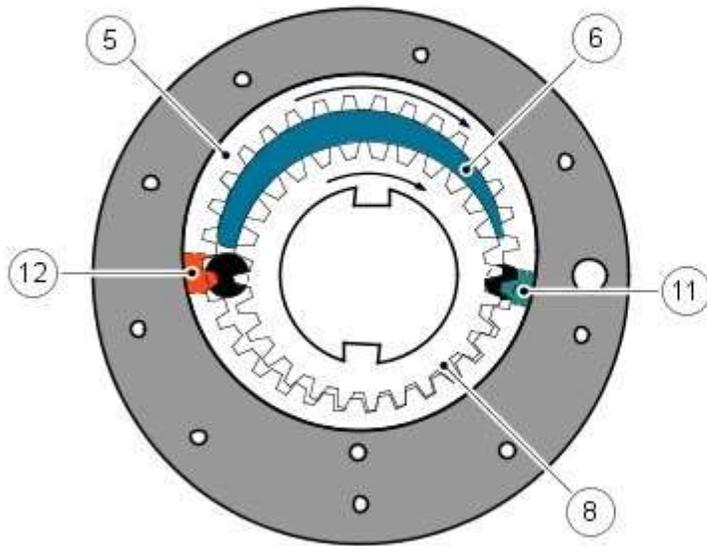
In the unlocked condition, the oil pressure supplied to the piston chamber and the turbine chamber is equal. Pressurized fluid flows through a drilling in the turbine shaft and through the piston chamber to the turbine chamber. In this condition the clutch plate is held away from the torque converter body and torque converter slip is permitted.

In the locked condition, the [TCC](#) spool valves are actuated by the EPRS. The fluid flow in the unlocked condition is reversed and the piston chamber is vented. Pressurized fluid is directed into the turbine chamber and is applied to the clutch piston. The piston moves with the pressure and pushes the clutch plate against the torque converter body. As the pressure increases, the friction between the clutch plate and the body increases, finally resulting in full lock-up of the clutch plate with the body. In this condition there is direct mechanical drive from the engine crankshaft to the transmission planetary gear train.

FLUID PUMP

The fluid pump is an integral part of the transmission. The fluid pump is used to supply hydraulic pressure for the operation of the control valves and clutches, to pass the fluid through the transmission cooler and to lubricate the gears and shafts.

The ZF 6HP28 fluid pump is a crescent type pump and is located between the intermediate plate and the torque converter. The pump has a delivery rate of 16 cm³ per revolution.



E42400

Item	Description
1	Securing ring
2	Shaft oil seal
3	O-ring seal
4	Pump housing
5	Ring gear
6	Crescent spacer
7	Roller bearing
8	Impeller
9	Centering pin
10	Spring washer
11	Outlet port (high pressure)
12	Inlet port (low pressure)

The pump comprises a housing, a crescent spacer, an impeller and a ring gear. The housing has inlet and outlet ports to direct flow and is located in the intermediate plate by a centering pin. The pump action is achieved by the impeller, ring gear and crescent spacer.

The crescent spacer is fixed in its position by a pin and is located between the ring gear and the impeller. The impeller is driven by drive from the torque converter hub which is located on a needle roller bearing in the pump housing. The impeller teeth mesh with those of the ring gear. When the impeller is rotated, the motion is transferred to the ring gear which rotates in the same direction.

The rotational motion of the ring gear and the impeller collects fluid from the intake port in the spaces between the teeth. When the teeth reach the crescent spacer, the oil is trapped in the spaces between the teeth and is carried with the rotation of the gears. The spacer tapers near the outlet port. This reduces the space between the gear teeth causing a build up of fluid pressure as the oil reaches the outlet port. When the teeth pass the end of the spacer the pressurized fluid is released into the outlet port.

The fluid emerging from the outlet port is passed through the fluid pressure control valve. At high operating speeds the pressure control valve maintains the output pressure to the gearbox at a predetermined maximum level. Excess fluid is relieved from the pressure control valve and is directed, via the main pressure valve in the valve block, back to the pump inlet port. This provides a pressurized feed to the pump inlet which prevents cavitation and reduces pump noise.

MECHATRONIC VALVE BLOCK

The Mechatronic valve block is located in the bottom of the transmission and is covered by the fluid pan. The valve block houses the [TCM](#), electrical actuators, speed sensors and control valves which provide all electro-hydraulic control for all transmission functions. The Mechatronic valve block comprises the following components:

- [TCM](#)
- Pressure regulator solenoids
- Shift control solenoid
- Damper
- Hydraulic spool valves
- Selector valve
- Temperature sensor
- Turbine speed sensor
- Output shaft speed sensor.

Sensors

Speed Sensors

The turbine speed sensor and the output shaft speed sensor are Hall effect type sensors located in the Mechatronic valve block and are not serviceable items. The [TCM](#) monitors the signals from each sensor to determine the input (turbine) speed and the output shaft speed.

The turbine speed is monitored by the [TCM](#) to calculate the slip of the torque converter clutch and internal clutch slip. This signal allows the [TCM](#) to accurately control the slip timing during shifts and adjust clutch application or release pressure for overlap shift control.

The output shaft speed is monitored by the [TCM](#) and compared to engine speed signals received on the [CAN](#) bus from the [ECM](#). Using a comparison of the two signals the [TCM](#) calculates the transmission slip ratio for plausibility and maintains adaptive pressure control.

Temperature Sensor

The temperature sensor is also located in the Mechatronic valve block. The [TCM](#) uses the temperature sensor signals to determine the temperature of the transmission fluid. These signals are used by the [TCM](#) to control the transmission operation to promote faster warm-up in cold conditions or to assist with fluid cooling by controlling the transmission operation when high fluid temperatures are experienced. If the sensor fails, the [TCM](#) will use a default value and a fault code will be stored in the [TCM](#).

Damper

There is one damper located in the valve housing. The damper is used to regulate and dampen the regulated pressure supplied via EPRS. The damper is load dependent through modulation of the damper against return spring pressure.

The damper comprises a piston, a housing bore and a spring. The piston is subject to the pressure applied by the spring. The bore has a connecting port to the function to which it applies. Fluid pressure applied to the applicable component (i.e. a clutch) is also subjected to the full area of the piston, which moves against the opposing force applied by the spring. The movement of the piston creates an action similar to a shock absorber, momentarily delaying the build up of pressure in the circuit. This results in a more gradual application of clutches improving shift quality.

Spool Valves

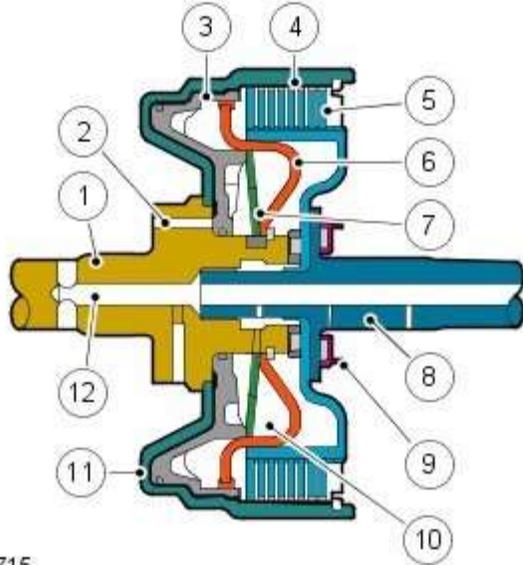
The valve block spool valves control various functions of the transmission. The spool valves are of conventional design and are operated by fluid pressure.

Each spool valve is located in its spool bore and held in a default (unpressurized) position by a spring. The spool bore has a number of ports which allow fluid to flow to other valves and clutches to enable transmission operation. Each spool has a piston which is waisted to allow fluid to be diverted into the applicable ports when the valve is operated.

When fluid pressure moves a spool, one or more ports in the spool bore are covered or uncovered. Fluid is prevented from flowing or is allowed to flow around the applicable waisted area of the spool and into another uncovered port. The fluid is either passed through galleries to actuate another spool, operate a clutch or is returned to the fluid pan.

DRIVE CLUTCHES

Multiplate Drive or Brake Clutch – Typical



E42715

Item	Description
1	Input shaft
2	Main pressure supply port
3	Piston
4	Cylinder – external plate carrier
5	Clutch plate assembly
6	Baffle plate
7	Diaphragm spring
8	Output shaft
9	Bearing
10	Dynamic pressure equalization chamber
11	Piston chamber
12	Lubrication channel

There are three drive clutches and two brake clutches used in the ZF 6HP28 transmission. Each clutch comprises one or more friction plates dependent on the output controlled. A typical clutch consists of a number of steel outer plates and inner plates with friction material bonded to each face.

On 5.0L [SC \(supercharger\)](#) and 3.0L diesel models, the updated transmission includes additional clutch plates to enable the transmission to manage the additional power output from these engines.

The clutch plates are held apart mechanically by a diaphragm spring and hydraulically by dynamic pressure. The pressure is derived from a lubrication channel which supplies fluid to the bearings etc. The fluid is passed via a drilling in the output shaft into the chamber between the baffle plate and the piston. To prevent inadvertent clutch application due to pressure build up produced by centrifugal force, the fluid in the dynamic pressure equalization chamber overcomes any pressure in the piston chamber and holds the piston off the clutch plate assembly.

When clutch application is required, main pressure from the fluid pump is applied to the piston chamber from the supply port. This main pressure overcomes the low pressure fluid present in the dynamic pressure equalization chamber. The piston moves, against the pressure applied by the diaphragm spring, and compresses the clutch plate assembly. When the main pressure falls, the diaphragm spring pushes the piston away from the clutch plate assembly, disengaging the clutch.

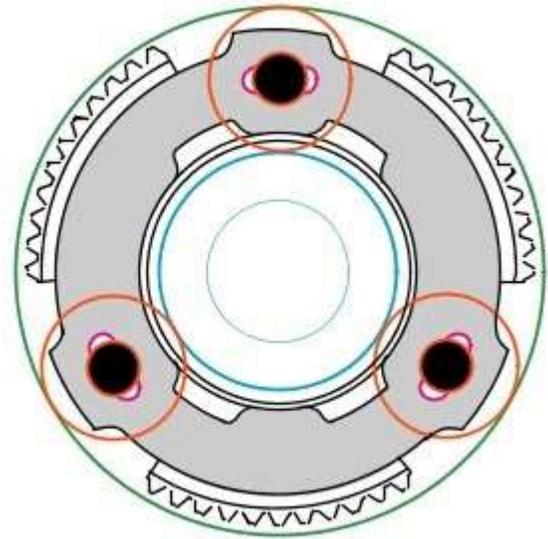
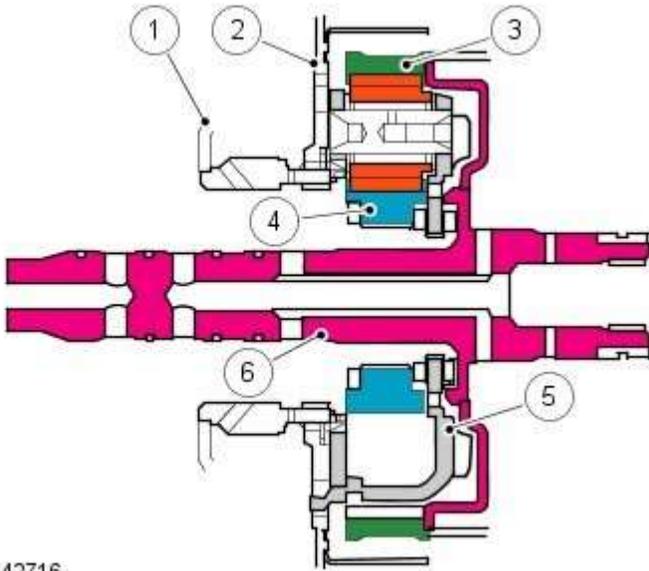
PLANETARY GEAR TRAINS

The planetary gear trains used on the ZF 6HP28 transmission comprise a single web planetary gear train and a double web planetary gear train. These gear trains are known as Lepelletier type gear trains and together produce the six forward gears and the one reverse gear.

Single Web Planetary Gear Train

The single web planetary gear train comprises:

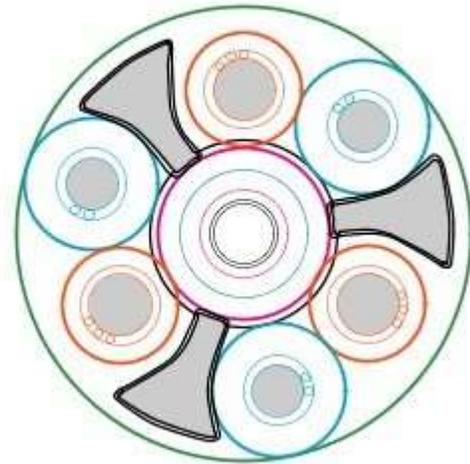
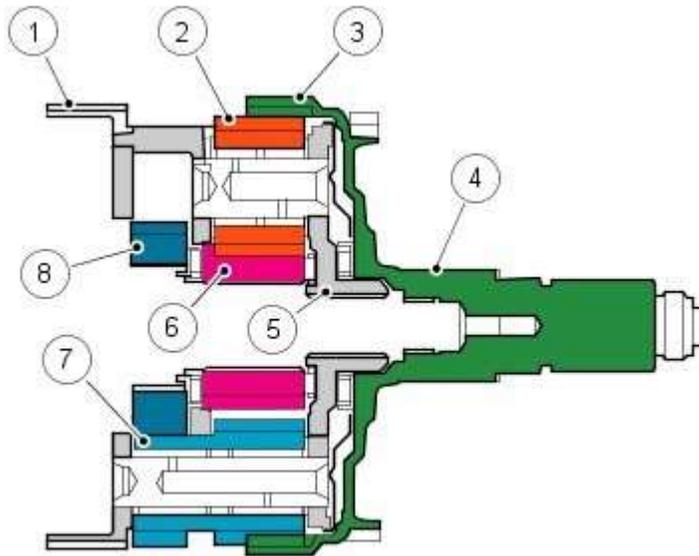
- Sunwheel
- Three (naturally aspirated versions) or four (5.0L [SC](#) and 3.0L diesel versions) planetary gears
- Planetary gear carrier (spider)
- Ring gear or annulus.



E42716

Item	Description
1	Cylinder
2	Baffle plate
3	Ring gear
4	Sun gear
5	Planetary gear spider
6	Torque converter input shaft

Torque Converter Input Shaft



E42717

Item	Description
1	Planetary gear spider
2	Planetary gears (short)
3	Ring gear
4	Output shaft
5	Planetary gear carrier
6	Sunwheel
7	Double planetary gears (long)
8	Sunwheel

The double planetary gear train comprises:

- Two sunwheels
- Three short planetary gears
- Three long planetary gears
- Planetary gear carrier
- Ring gear or annulus

ELECTRONIC PARK LOCK

The park lock is electronically actuated by solenoid valve located in the valve block. The park lock is engaged by a mechanical spring system comprising a parking disc and a lock cylinder controlled by a solenoid valve.

The park lock is engaged when the [TCM](#) receives a park request from the JaguarDrive selector. When the park lock is released, a solenoid valve in the valve housing directs hydraulic pressure to the lock cylinder, which moves the piston within the cylinder and releases the park lock pawl at the rear of the transmission by means of a connecting rod. The solenoid on the lock cylinder is energized and locks the cylinder piston in the unlocked position. Additional locking of the piston is achieved with ball catches within the lock cylinder.

When park is selected, the solenoid on the lock cylinder is de-energized, the ball catches are released and the piston is free to move in the lock cylinder. The solenoid in the valve housing is also de-energized. The spring loaded parking disc pulls the cylinder piston in the park direction which allows the park disc to move on its mounting. This movement is transferred via the connecting rod to parking pawl, which is engaged in the park lock gear.

If an electrical failure occurs, the park lock can be manually released by means of an emergency park release lever located in the floor console. The lever is connected to the parking disc by a cable and allows the park lock to be released manually. For additional information, refer to 307-05B Automatic Transmission/Transaxle External Controls.

TRANSMISSION CONTROL MODULE

The [TCM](#) is an integral part of the Mechatronic valve block which is located at the bottom of the transmission, within the fluid pan. The [TCM](#) is the main controlling component of the transmission.

The [TCM](#) processes signals from the transmission speed and temperature sensors, [ECM](#) and other vehicle systems. From the received signal inputs and pre-programmed data, the module calculates the correct gear, torque converter clutch setting and optimum pressure settings for gear shift and lock-up clutch control.

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Diagnostics

Diagnosis and Testing

Principle of Operation

For a detailed description of the automatic transmission/transaxle, refer to the relevant Description and Operation section in the workshop manual. REFER to: (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol)

[Transmission Description](#) (Description and Operation),
[Transmission Description](#) (Description and Operation),
[Transmission Description](#) (Description and Operation).

Fluid Level and Condition Check



CAUTION: The vehicle should not be driven if the fluid level is low as internal failure can result.



NOTE: The transmission fluid temperature must not be allowed to exceed 50°C (122°F) whilst checking level. Should the temperature rise above this figure, abort the check and allow the transmission fluid to cool to below 30°C (86°F).

This vehicle is not equipped with a fluid level indicator. An incorrect level may affect the transmission operation and could result in transmission damage. To correctly check and add fluid to the transmission.

REFER to: [Transmission Fluid Level Check](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, General Procedures).

High Fluid Level

A fluid level that is too high may cause the fluid to become aerated due to the churning action of the rotating internal parts. This will cause erratic control pressure, foaming, loss of fluid from the vent tube and possible transmission damage. If an overfill condition is identified, with the engine at idle ensure the fluid temperature is within the specified range and allow the excess fluid to drain until a small thread of fluid runs from the filler/level plug hole.

Low Fluid Level

A low fluid level could result in poor transmission engagement, slipping, or damage. This could also indicate a leak in one of the transmission seals or gaskets.

REFER to: [Transmission Fluid Level Check](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, General Procedures).

Adding Fluid



CAUTION: The use of any other type of transmission fluid other than that specified can result in transmission damage.

If fluid needs to be added, add fluid in 0.50 liter increments through the fill hole Opening. Do not overfill the fluid. For fluid type, refer to the General Specification chart in this section.

REFER to: [Specifications](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, Specifications).

Fluid Condition Check

1. Check the fluid level.
REFER to: [Transmission Fluid Level Check](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, General Procedures).
2. Observe the color and the odor of the fluid. The color under normal circumstances should be Honey.
3. Allow the fluid to drip onto a facial tissue and examine the stain.
4. If evidence of solid material is found, the transmission fluid pan should be removed for further inspection.

NOTE: In the event of a transmission unit replacement for internal failure, the oil cooler and pipes must also be replaced.

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of damage and system integrity.

Visual Inspection

Mechanical	Electrical	Hydraulic
<ul style="list-style-type: none"> Damaged/stuck shift mechanism Damaged automatic transmission casing 	<ul style="list-style-type: none"> Blown fuse(s) Damaged, loose or corroded connectors Wiring harness 	<ul style="list-style-type: none"> Fluid level too high/low Poor condition of fluid Fluid leak

- If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
- If the cause is not visually evident check for diagnostic trouble codes (DTCs) and refer to the DTC Index.

DTC Index



CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00.

NOTES:



If the control module/transmission is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/transmission.



Generic scan tools may not read the codes listed, or may read only five digit codes. Match the five digits from the scan tool to the first five digits of the seven digit code listed to identify the fault (the last two digits give additional information read by the manufacturer approved diagnostic system).



When performing electrical voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.



Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.



Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.



If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

DTC	Description	Possible Cause	Action
P0121-86	Throttle/Pedal Position Sensor A Circuit Range/Performance - signal invalid	<ul style="list-style-type: none"> Throttle/Pedal Position Sensor Fault (Data received over CAN Bus) 	Check Engine Control Module for stored DTCs
P0219-86	Engine Overspeed Condition - signal invalid	<ul style="list-style-type: none"> Engine speed too low or too high (Data received over CAN Bus) 	Check Engine Control Module for stored DTCs
P0500-81	Vehicle Speed Sensor A - invalid serial data received	<ul style="list-style-type: none"> Vehicle Speed Sensor fault (Data received over CAN Bus) 	Check DSC module for stored DTCs
P0501-81	Vehicle Speed Sensor A Range/Performance invalid serial data received	<ul style="list-style-type: none"> Vehicle Speed receive over CAN Bus does not match Transmission Output-Shaft speed 	Check Anti-lock braking system module for stored DTCs. Check correct Differential is installed to the vehicle
P0561-1C	System Voltage Unstable - Circuit voltage out of range	<ul style="list-style-type: none"> Power supply voltage out of range when engine running 	Check Engine control module for stored DTCs. Check Charging System and Battery condition
P0562-21	System Voltage Low - signal amplitude < minimum	<ul style="list-style-type: none"> Circuit low voltage. Battery supply voltage to Transmission Control Module (Transmission 	Refer to Circuit diagrams and check Power and Ground Circuit for fault. Check Engine control module for stored DTCs. Check Charging System and Battery condition

DTC	Description	Possible Cause	Action
		control module)	
P0563-22	System Voltage High - signal amplitude > maximum	<ul style="list-style-type: none"> High Battery charge, alternator fault 	Check Engine control module for stored DTCs. Check Charging System and Battery condition
P0601-41	Internal Control Module Memory Check Sum Error - general checksum failure	<ul style="list-style-type: none"> Software error Transmission control module failure 	Re-configure the Transmission control module using the manufacturer approved diagnostic system, clear DTC and re-test. If DTC remains, Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0604-00	Internal Control Module Random Access Memory (RAM) Error - no sub type information	<ul style="list-style-type: none"> Shift-by-Wire fault 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0605-41	Internal Control Module Read Only Memory (ROM) Error - general checksum failure	<ul style="list-style-type: none"> General checksum failure 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0606-04	Transmission control module Processor - System Internal Failures	<ul style="list-style-type: none"> Micro controller component faults 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0606-26	Transmission control module Processor - signal rate of change below threshold	<ul style="list-style-type: none"> Micro controller component faults 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0606-49	Transmission control module Processor-internal electronic failure	<ul style="list-style-type: none"> Micro controller component faults 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0613-04	Transmission control module Processor - System Internal Failures	<ul style="list-style-type: none"> Micro controller component faults 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0613-06	Transmission control module Processor - Algorithm Based Failures	<ul style="list-style-type: none"> Micro controller component faults 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0613-11	Transmission control module Processor - Circuit Short to Ground	<ul style="list-style-type: none"> Watchdog fault 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0613-12	Transmission control module Processor - Circuit Short to Battery	<ul style="list-style-type: none"> Watchdog fault 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0613-13	Transmission control module Processor - Circuit Open	<ul style="list-style-type: none"> Watchdog fault 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0613-14	Transmission control module Processor - Circuit Short to Ground or Open	<ul style="list-style-type: none"> Watchdog fault 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0613-21	Transmission control module Processor - signal amplitude < minimum	<ul style="list-style-type: none"> Watchdog fault 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0613-22	Transmission control module Processor - signal amplitude > maximum	<ul style="list-style-type: none"> Watchdog fault 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0613-47	Transmission control module Processor - watchdog / safety Micro controller failure	<ul style="list-style-type: none"> Watchdog fault 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0613-49	Transmission control module Processor - internal electronic failure	<ul style="list-style-type: none"> Micro controller component faults 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0613-68	Transmission control module Processor-Event Information	<ul style="list-style-type: none"> Watchdog fault 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index

DTC	Description	Possible Cause	Action
P061B-02	Internal Control Module Torque Calculation Performance - general signal failure	<ul style="list-style-type: none"> Transmission control module - positive torque signal not valid 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P061B-26	Internal Control Module Torque Calculation Performance - signal rate of change below threshold	<ul style="list-style-type: none"> Transmission control module positive torque signal not valid 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P062F-04	Internal Control Module EEPROM Error - System Internal Failures	<ul style="list-style-type: none"> EEPROM communication error 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0642-21	Sensor Reference Voltage A Circuit Low - signal amplitude < minimum	<ul style="list-style-type: none"> Sensor supply voltage fault low 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0643-22	Sensor Reference Voltage A Circuit High - signal amplitude > maximum	<ul style="list-style-type: none"> Sensor supply voltage fault high 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0657-13	Actuator Supply Voltage A Circuit / Open - Circuit Open	<ul style="list-style-type: none"> Actuator supply (pressure control valves etc) Open Circuit 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0657-1C	Actuator Supply Voltage A Circuit / Open - Circuit voltage out of range	<ul style="list-style-type: none"> Actuator supply (pressure control valves etc) voltage plausibility fault 	Refer to electrical Circuit diagrams and check Transmission control module connector for signs of water ingress or damage, check pin 7 for Short to Power or Ground (should NOT be connected and harness terminal should have a bung fitted). If no fault identified, suspect the Transmission control module. Check and install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0658-11	Actuator Supply Voltage A Circuit Low - Circuit Short to Ground	<ul style="list-style-type: none"> Actuator supply (pressure control valves etc) voltage Short to Ground 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0659-12	Actuator Supply Voltage A Circuit High - Circuit Short to Battery	<ul style="list-style-type: none"> Actuator supply (pressure control valves etc) voltage Short to Power 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0667-01	PCM / Engine control module / Transmission control module Internal Temperature Sensor A Range/Performance - General Electrical Failure	<ul style="list-style-type: none"> General electrical failure 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0667-04	PCM / Engine control module / Transmission control module Internal Temperature Sensor A Range/Performance - System Internal Failures	<ul style="list-style-type: none"> Internal Electronic Failure 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0667-49	PCM / Engine control module / Transmission control module Internal Temperature Sensor A Range/Performance - Internal electronic failure	<ul style="list-style-type: none"> Internal electronic failure 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0700-02	Transmission Control System (MIL Request) - General signal failure	<ul style="list-style-type: none"> General Signal failure 	Clear DTC, Road test and re-test, Read DTCs and Investigate as required
P0700-22	Transmission Control System (MIL Request) - signal amplitude > maximum	<ul style="list-style-type: none"> Double fault from monitoring of internal power supply and pressure regulator/solenoid control software 	If any of the following DTCs are also present; P074013, P096712, P273912, P273012, P272112, P096312, P276312, P097112, suspect the Transmission control module, check and install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0700-75	Transmission Control System (MIL Request) - Emergency Position Not Reachable	<ul style="list-style-type: none"> Emergency Position Not Reachable 	Clear DTC, Road test and re-test, Read DTCs and investigate as required

DTC	Description	Possible Cause	Action
P0710-13	Transmission Fluid Temperature Sensor A Circuit - Circuit Open	<ul style="list-style-type: none"> Transmission fluid temperature sensor Circuit Open Circuit 	Clear DTC and test. If code re-detects suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0711-01	Transmission Fluid Temperature Sensor A Circuit Range/Performance - General Electrical Failure	<ul style="list-style-type: none"> General electrical failure 	Clear DTC and test. If code re-detects suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0711-22	Transmission Fluid Temperature Sensor A Circuit Range/Performance - signal amplitude > maximum	<ul style="list-style-type: none"> Signal amplitude > maximum. Excessive jump in temperature 	Clear DTC. Carry out cold start road test, continue driving vehicle until normal operating temperature is achieved. Reads DTCs, if DTC returns, suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0712-11	Transmission Fluid Temperature Sensor A Circuit Low - Circuit Short to Ground	<ul style="list-style-type: none"> Transmission fluid temperature sensor Circuit Short to Ground 	Clear DTC and test. If code re-detects suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0713-01	Transmission Fluid Temperature Sensor A Circuit High-General Electrical Failure	<ul style="list-style-type: none"> General electrical failure 	Clear DTC and test. If code re-detects suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0713-12	Transmission Fluid Temperature Sensor A Circuit High - Circuit Short to Battery	<ul style="list-style-type: none"> Transmission fluid temperature sensor Circuit Short to Power 	Clear DTC and test. If code re-detects suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0716-14	Turbine/Input Shaft Speed Sensor A Circuit Range/Performance - Circuit Short to Ground or Open	<ul style="list-style-type: none"> Turbine/Input Shaft Speed Sensor Circuit Short to Ground or Open Circuit 	Clear DTC and test. If code re-detects suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0716-21	Turbine/Input Shaft Speed Sensor A Circuit Range/Performance - signal amplitude < minimum	<ul style="list-style-type: none"> Turbine/Input Shaft Speed Sensor signal too small 	Clear DTC and road test, if DTC returns suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0716-22	Turbine/Input Shaft Speed Sensor A Circuit Range/Performance - signal amplitude > maximum	<ul style="list-style-type: none"> Turbine/Input Shaft Speed Sensor signal above maximum 	Clear DTC and road test, if DTC returns suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0717-12	Turbine/Input Shaft Speed Sensor A Circuit No Signal - Circuit Short to Battery	<ul style="list-style-type: none"> Turbine/input shaft speed sensor A Circuit Short to Power 	Clear DTC and test. If code re-detects suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0720-12	Output Shaft Speed Sensor Circuit - Circuit Short to Battery	<ul style="list-style-type: none"> Transmission output shaft speed sensor Circuit Short to Power 	Clear DTC and test. If code re-detects suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0720-14	Output Shaft Speed Sensor Circuit - Circuit Short to Ground or Open	<ul style="list-style-type: none"> Transmission output shaft speed sensor Circuit Short to Ground or Open Circuit 	Clear DTC and test. If code re-detects suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0721-22	Output Shaft Speed Sensor Circuit Range/Performance - signal amplitude > maximum	<ul style="list-style-type: none"> Transmission output shaft speed sensor signal above maximum 	Clear DTC and road test, if DTC returns suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0721-27	Output Shaft Speed Sensor Circuit Range/Performance - signal rate of change above threshold	<ul style="list-style-type: none"> Output shaft speed negative gradient too high 	Clear DTC and road test, if DTC returns suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index

DTC	Description	Possible Cause	Action
P0721-64	Output Shaft Speed Sensor Circuit Range/Performance - signal plausibility failure	<ul style="list-style-type: none"> Signal plausibility failure 	Clear DTC and test. If code re-detects suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0731-07	Incorrect Gear Ratio-Mechanical Failures	<ul style="list-style-type: none"> Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0732-07	Incorrect Gear Ratio-Mechanical Failures	<ul style="list-style-type: none"> Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0733-07	Incorrect Gear Ratio-Mechanical Failures	<ul style="list-style-type: none"> Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0734-07	Incorrect Gear Ratio-Mechanical Failures	<ul style="list-style-type: none"> Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0735-07	Incorrect Gear Ratio-Mechanical Failures	<ul style="list-style-type: none"> Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0736-07	Incorrect Gear Ratio-Mechanical Failures	<ul style="list-style-type: none"> Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0740-13	Torque Converter Clutch Solenoid Circuit / Open - Circuit Open	<ul style="list-style-type: none"> Pressure control solenoid 2 Circuit Open Circuit 	Clear DTC and test. If code re-detects suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0741-07	Torque Converter Clutch Solenoid Circuit Performance/Stuck Off - Mechanical Failures	<ul style="list-style-type: none"> Too high slip at torque converter clutch. Mechanical Failures 	Suspect torque converter lockup clutch. Install a new torque converter, refer to the new module/component installation note at the top of the DTC Index. If transmission fluid is in very poor condition and dirty, install a new transmission, refer to the new module/component installation note at the top of the DTC Index
P0745-04	Pressure Control Solenoid A - System Internal Failures	<ul style="list-style-type: none"> System Internal Failures 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0745-48	Pressure Control Solenoid A - Supervision Software Failure	<ul style="list-style-type: none"> Supervision Software Failure 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0758-12	Shift Solenoid B Electrical - Circuit Short to Battery	<ul style="list-style-type: none"> Circuit Short to Power 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0758-13	Shift Solenoid B Electrical - Circuit Open	<ul style="list-style-type: none"> Solenoid valve 1 or Pressure control Solenoid G Circuit Open Circuit 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0771-71	Shift Solenoid E Performance/Stuck Off - actuator stuck	<ul style="list-style-type: none"> Actuator stuck 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0775-04	Pressure Control Solenoid B - System Internal Failures	<ul style="list-style-type: none"> System Internal Failures 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0775-48	Pressure Control Solenoid B - Supervision Software Failure	<ul style="list-style-type: none"> Supervision Software Failure 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index

DTC	Description	Possible Cause	Action
P0781-07	1-2 Shift - Mechanical Failures	<ul style="list-style-type: none"> • Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (Gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0781-77	2-1 Shift - commanded position not reachable	<ul style="list-style-type: none"> • Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (Gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0782-07	2-3 Shift - commanded position not reachable	<ul style="list-style-type: none"> • Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (Gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0782-77	3-2 Shift - commanded position not reachable	<ul style="list-style-type: none"> • Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (Gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0783-07	3-4 Shift - Mechanical Failures	<ul style="list-style-type: none"> • Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (Gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0783-77	3-4 Shift - commanded position not reachable	<ul style="list-style-type: none"> • Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (Gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0784-07	4-5 Shift - Mechanical Failures	<ul style="list-style-type: none"> • Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (Gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0784-77	4-5 Shift - commanded position not reachable	<ul style="list-style-type: none"> • Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (Gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0798-1A	Pressure Control Solenoid C Electrical - Circuit Resistance Below Threshold	<ul style="list-style-type: none"> • Pressure control solenoid C Circuit resistance below threshold 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0798-1E	Pressure Control Solenoid C Electrical - Circuit Short to Ground	<ul style="list-style-type: none"> • Pressure control solenoid C electrical circuit short to ground 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0798-21	Pressure Control Solenoid C Electrical - signal amplitude < minimum	<ul style="list-style-type: none"> • Pressure Control Solenoid C Electrical signal amplitude < minimum 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0814-62	Transmission Range Display Circuit - signal compare failure	<ul style="list-style-type: none"> • Transmission Range Display Circuit signal compare failure 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0826-08	Up and Down Switch circuit - Bus Signal Message Failures	<ul style="list-style-type: none"> • Invalid CAN signal from BCM/Instrument cluster • Stuck switch • CAN bus circuit fault 	Check Central junction box and Instrument cluster for stored DTCs. Check gear change switches for correct operation. Refer to circuit diagrams and check CAN bus for a circuit fault
P0826-81	Up and Down Switch Circuit - invalid serial data received	<ul style="list-style-type: none"> • Invalid Can signal from BCM / Instrument cluster • Stuck switch • CAN Bus Circuit fault 	Check Central junction box and Instrument cluster for stored DTCs. Check Gear Change Switches for correct operation. Refer to Circuit diagrams and check CAN Bus for Circuit fault
P0826-88	Up and Down Switch Circuit - Bus off	<ul style="list-style-type: none"> • SWM to BCM / Instrument cluster LIN Bus failure 	Check Central junction box and Steering Wheel Ice Switches for stored DTCs. Refer to Circuit diagrams and check LIN Bus for Circuit fault

DTC	Description	Possible Cause	Action
P0829-07	5-6 Shift - Mechanical Failures	<ul style="list-style-type: none"> • Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P0829-77	6-5 Shift - Commanded Position Not Reachable	<ul style="list-style-type: none"> • Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P084F-01	Park / Neutral Switch Input Circuit - General Electrical Failure	<ul style="list-style-type: none"> • Wrong voltage level detected on Park/No Park signal 	Check for correct output at Transmission control module park signal pin (check in all positions) 12 volts in Park, 0 volts in all other positions. If fault identified, suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index. If no fault identified, check Park signal circuit to Transmission Shift Module for short, open circuit.
P0850-01	Park / Neutral Switch Input Circuit - General Electrical Failure	<ul style="list-style-type: none"> • General electrical failure 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0850-02	Park / Neutral Switch Input Circuit - General signal failure	<ul style="list-style-type: none"> • General signal failure 	Check park lock mechanism. If park lock operation is correct, suspect the transmission control module. Check and install a new transmission control module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component
P0850-29	Park / Neutral Switch Input Circuit - signal invalid	<ul style="list-style-type: none"> • Signal invalid 	Check park lock mechanism. If park lock operation is correct, suspect the transmission control module. Check and install a new transmission control module as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component
P850-1C	Park / Neutral Switch Input Circuit - circuit voltage out of range	<ul style="list-style-type: none"> • Circuit voltage out of range 	Check park lock mechanism, if park lock operation correct suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0919-93	Gear Shift Position Control Error - no operation	<ul style="list-style-type: none"> • No shifting despite driver request 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0919-94	Gear Shift Position Control Error - unexpected operation	<ul style="list-style-type: none"> • Shifting without driver request 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0938-29	Hydraulic Oil Temperature Sensor Range/Performance - signal invalid	<ul style="list-style-type: none"> • Transmission fluid temperature compared with module temperature fault 	Clear DTC. Carry out cold start road test, continue driving vehicle until normal operating temperature is achieved. Read DTCs, if DTC returns, suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0963-12	Pressure Control Solenoid A Control Circuit High - Circuit Short to Battery	<ul style="list-style-type: none"> • Pressure control solenoid 1 Circuit Short to Power 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0964-13	Pressure Control Solenoid B Control Circuit / Open - Circuit Open	<ul style="list-style-type: none"> • Pressure Control Solenoid B Control Circuit Open 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0964-14	Pressure Control Solenoid B Control Circuit / Open - Circuit Short to Ground or Open	<ul style="list-style-type: none"> • Pressure Control Solenoid B Control Circuit Short to Ground or Open 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0966-11	Pressure Control Solenoid B Control Circuit Low - Circuit Short to Ground	<ul style="list-style-type: none"> • Pressure control solenoid 2 Circuit Short to Ground 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index

DTC	Description	Possible Cause	Action
P0967-12	Pressure Control Solenoid B Control Circuit High - Circuit Short to Battery	<ul style="list-style-type: none"> Pressure control solenoid 2 Circuit Short to Power 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0968-14	Pressure Control Solenoid C Control Circuit / Open - Circuit Short to Ground or Open	<ul style="list-style-type: none"> Pressure control solenoid 3 Circuit Short to Ground or Open Circuit 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0970-11	Pressure Control Solenoid C Control Circuit Low - Circuit Short to Ground	<ul style="list-style-type: none"> Pressure control solenoid 3 Circuit Short to Ground 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0971-12	Pressure Control Solenoid C Control Circuit High - Circuit Short to Battery	<ul style="list-style-type: none"> Pressure control solenoid 3 Circuit Short to Power 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0972-22	Shift Solenoid A Control Circuit Range/Performance - signal amplitude > maximum	<ul style="list-style-type: none"> Pressure control solenoid 1 current too large 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0973-11	Shift Solenoid A Control Circuit Low - Circuit Short to Ground	<ul style="list-style-type: none"> Shift solenoid A control Circuit Short to Ground 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0973-14	Shift Solenoid A Control Circuit Low - Circuit Short to Ground or Open	<ul style="list-style-type: none"> Pressure control solenoid 1 Circuit Short to Ground or Open Circuit 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0973-1A	Shift Solenoid A Control Circuit Low - Circuit Resistance Below Threshold	<ul style="list-style-type: none"> Shift Solenoid A control circuit resistance below threshold 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0973-1E	Shift Solenoid A Control Circuit Low - Circuit Resistance Out Of Range	<ul style="list-style-type: none"> Shift Solenoid A control circuit resistance out of range 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0976-11	Shift Solenoid B Control Circuit Low - Circuit Short to Ground	<ul style="list-style-type: none"> Solenoid valve 2 Circuit Short to Ground 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P0976-14	Shift Solenoid B Control Circuit Low - Circuit Short to Ground or Open	<ul style="list-style-type: none"> Solenoid valve 2 Circuit Short to Ground or Open Circuit 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P1674-04	Control Module Software Corrupted - System Internal Failures	<ul style="list-style-type: none"> System internal failures 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P1674-48	Control Module Software Corrupted - Supervision Software Failure	<ul style="list-style-type: none"> Supervision software failure 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P1707-07	Transfer Case Neutral or Park/Neutral Indication Circuit - commanded position not reachable	<ul style="list-style-type: none"> Transfer case neutral or park/neutral indication circuit - mechanical failures 	Clear the DTC. Test drive the Vehicle, engaging and disengaging the parking lock several times. If the DTC recurs, check parking lock components and replace as required. If no faulty park lock component is found Clear DTC and the DTC returns suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P1707-72	Transfer Case Neutral or Park/Neutral Indication Circuit - Actuator Stuck Open	<ul style="list-style-type: none"> Transfer case neutral or park/neutral indication circuit - Actuator stuck open 	Clear the DTC. Test drive the Vehicle, engaging and disengaging the parking lock several times. If the DTC recurs, check parking lock components and replace as required. If no faulty park lock component is found Clear DTC and the DTC returns suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index

DTC	Description	Possible Cause	Action
P1707-77	Transfer Case Neutral or Park/Neutral Indication Circuit - commanded position not reachable	<ul style="list-style-type: none"> Commanded position not reachable 	Clear the DTC. Test drive the Vehicle, engaging and disengaging the parking lock several times. If the DTC recurs, check parking lock components and replace as required. If no faulty park lock component is found Clear DTC and the DTC returns suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2700-07	Transmission Friction Element A Apply Time Range/Performance - Mechanical Failures	<ul style="list-style-type: none"> Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (Gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P2701-07	Transmission Friction Element B Apply Time Range/Performance - Mechanical Failures	<ul style="list-style-type: none"> Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (Gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P2702-07	Transmission Friction Element C Apply Time Range/Performance - Mechanical Failures	<ul style="list-style-type: none"> Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (Gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P2703-07	Transmission Friction Element D Apply Time Range/Performance - Mechanical Failures	<ul style="list-style-type: none"> Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (Gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P2704-07	Transmission Friction Element E Apply Time Range/Performance - Mechanical Failures	<ul style="list-style-type: none"> Gear Ratio Monitoring. Mechanical Failures 	Check and correct oil level. Clear DTC. If code re-detects suspect Transmission (Gearbox) internal fault. Install a new Transmission as required, refer to the new module/component installation note at the top of the DTC Index
P2713-04	Pressure Control Solenoid D - System Internal Failures	<ul style="list-style-type: none"> System internal failures 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2713-48	Pressure Control Solenoid D - Supervision Software Failure	<ul style="list-style-type: none"> Supervision software failure 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2716-22	Pressure Control Solenoid D Electrical - signal amplitude > maximum	<ul style="list-style-type: none"> Pressure Control Solenoid D Electrical signal amplitude > maximum 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2716-1A	Pressure Control Solenoid D Electrical - Circuit Resistance Below Threshold	<ul style="list-style-type: none"> Pressure control solenoid D circuit resistance below threshold 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2716-1E	Pressure Control Solenoid D Electrical - Circuit Resistance Out Of Range	<ul style="list-style-type: none"> Pressure control solenoid D circuit resistance out of range 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2718-14	Pressure Control Solenoid D Control Circuit / Open - Circuit Short to Ground or Open	<ul style="list-style-type: none"> Pressure control solenoid D Circuit Short to Ground or Open Circuit 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2720-11	Pressure Control Solenoid D Control Circuit Low - Circuit Short to Ground	<ul style="list-style-type: none"> Pressure control solenoid D Circuit Short to Ground 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2721-12	Pressure Control Solenoid D Control Circuit High - Circuit Short to Battery	<ul style="list-style-type: none"> Pressure control solenoid D Circuit Short to Power 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2722-04	Pressure Control Solenoid E - System Internal Failures	<ul style="list-style-type: none"> Pressure Control Solenoid E system internal failures 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index

DTC	Description	Possible Cause	Action
P2722-48	Pressure Control Solenoid E - Supervision Software Failure	<ul style="list-style-type: none"> Pressure Control Solenoid E supervision control software failure 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2725-22	Pressure Control Solenoid E Electrical - signal amplitude > maximum	<ul style="list-style-type: none"> Pressure Control Solenoid E Electrical signal amplitude > maximum 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2725-1A	Pressure Control Solenoid E Electrical - Circuit Resistance Below Threshold	<ul style="list-style-type: none"> Pressure control solenoid E electrical resistance below threshold 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2725-1E	Pressure Control Solenoid E Electrical - Circuit Resistance Out Of Range	<ul style="list-style-type: none"> Pressure control solenoid E circuit resistance out of range 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2727-14	Pressure Control Solenoid E Control Circuit / Open - Circuit Short to Ground or Open	<ul style="list-style-type: none"> Pressure Control Solenoid E Control Circuit Short to Ground or Open Circuit 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2729-11	Pressure Control Solenoid E Control Circuit Low - Circuit Short to Ground	<ul style="list-style-type: none"> Pressure control solenoid E Circuit Short to Ground 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2730-12	Pressure Control Solenoid E Control Circuit High-Circuit Short to Battery	<ul style="list-style-type: none"> Pressure control solenoid E Circuit Short to Power 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2731-04	Pressure Control Solenoid F-System Internal Failures	<ul style="list-style-type: none"> Pressure Control Solenoid F no sub type information 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2731-48	Pressure Control Solenoid F - Supervision Software Failure	<ul style="list-style-type: none"> Pressure Control Solenoid F supervision software failure 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2734-22	Pressure Control Solenoid F Electrical-signal amplitude > maximum	<ul style="list-style-type: none"> Pressure Control Solenoid F Electrical signal amplitude > maximum 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2734-1A	Pressure Control Solenoid F Electrical-Circuit Resistance Below Threshold	<ul style="list-style-type: none"> Pressure control solenoid F electrical circuit resistance below threshold 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2734-1E	Pressure Control Solenoid F Electrical-Circuit Resistance Out Of Range	<ul style="list-style-type: none"> Pressure control solenoid F electrical circuit resistance out of range 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2736-14	Pressure Control Solenoid F Control Circuit / Open - Circuit Short to Ground or Open	<ul style="list-style-type: none"> Pressure Control Solenoid F Control Circuit Short to Ground or Open 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2738-11	Pressure Control Solenoid F Control Circuit Low - Circuit Short to Ground	<ul style="list-style-type: none"> Pressure Control Solenoid F Control Circuit Short to Ground 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2739-12	Pressure Control Solenoid F Control Circuit High - Circuit Short to Battery	<ul style="list-style-type: none"> Pressure Control Solenoid F Control Circuit Short to Power 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2763-12	Torque Converter Clutch Pressure Control Solenoid Control Circuit High - Circuit Short to Battery	<ul style="list-style-type: none"> Pressure control solenoid F Circuit Short to Power 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index

DTC	Description	Possible Cause	Action
P2764-11	Torque Converter Clutch Pressure Control Solenoid Control Circuit Low - Circuit Short to Ground	<ul style="list-style-type: none"> Torque converter clutch pressure control solenoid control Circuit Short to Ground 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2764-1A	Torque Converter Clutch Pressure Control Solenoid Control Circuit Low-Circuit Resistance Below Threshold	<ul style="list-style-type: none"> Torque converter clutch pressure control solenoid control circuit resistance below threshold 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2764-1E	Torque Converter Clutch Pressure Control Solenoid Control Circuit Low-Circuit Resistance Out Of Range	<ul style="list-style-type: none"> Torque converter clutch pressure control solenoid control circuit resistance out of range 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2807-11	Pressure Control Solenoid G - Circuit Short to Ground	<ul style="list-style-type: none"> Park solenoid Circuit Short to Ground 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2807-12	Pressure Control Solenoid G - Circuit Short to Battery	<ul style="list-style-type: none"> Park solenoid Circuit Short to Power 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2807-13	Pressure Control Solenoid G - Circuit Open	<ul style="list-style-type: none"> Park solenoid Circuit Open Circuit 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
P2807-14	Pressure Control Solenoid G - Circuit Short to Ground or Open	<ul style="list-style-type: none"> Park solenoid Circuit Short to Ground or Open Circuit 	Carry out any diagnostic pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
B1087-82	LIN Bus "A" - alive / sequence counter incorrect / not updated	<ul style="list-style-type: none"> Alive counter fault 	Check Transmission Shift Module for stored DTCs. Refer to the electrical Circuit diagrams and check Transmission control module to Transmission Shift Module for Short to Ground or Open Circuit (LIN Bus)
B1087-83	LIN Bus "A" - value of signal protection calculation incorrect	<ul style="list-style-type: none"> Checksum error 	Check Transmission Shift Module for stored DTCs Refer to the electrical Circuit diagrams and check Transmission control module to Transmission Shift Module for Short to Ground or Open Circuit (LIN Bus)
B1087-87	LIN Bus "A" - missing message	<ul style="list-style-type: none"> GSM is NOT visible to the Transmission control module on the LIN Bus 	Check Transmission Shift Module for stored DTCs Refer to the electrical Circuit diagrams and check Transmission control module to Transmission Shift Module for Short or Open Circuit (LIN Bus)
B1087-88	LIN Bus "A" - Bus off	<ul style="list-style-type: none"> LIN Bus Circuit fault. Check hardware of LIN connection between transmission and GSM 	Refer to the electrical Circuit diagrams and check Transmission control module to Transmission shift module for Short, Open Circuit (LIN Bus). Check Transmission Shift Module for related DTCs
U0001-88	High Speed CAN Communication Bus - Bus off	<ul style="list-style-type: none"> CAN Bus off 	Refer to the electrical Circuit diagrams and check CAN Bus for Circuit fault
U0100-82	Lost Communication With Engine control module/PCM "A" - alive / sequence counter incorrect / not updated	<ul style="list-style-type: none"> Alive counter fault 	Check Engine control module for stored DTCs
U0100-83	Lost Communication With Engine control module/PCM "A" - value of signal protection calculation incorrect	<ul style="list-style-type: none"> Checksum fault 	Check Engine control module for stored DTCs
U0100-87	Lost Communication With Engine control module/PCM "A" - missing message	<ul style="list-style-type: none"> CAN Timeout 	 NOTE: Do NOT install a new Engine control module if an Engine control module Timeout DTC is only logged in the Transmission control module, the failure is NOT with the Engine control module Check Engine control module for stored DTCs. Check CAN Bus Circuit for fault

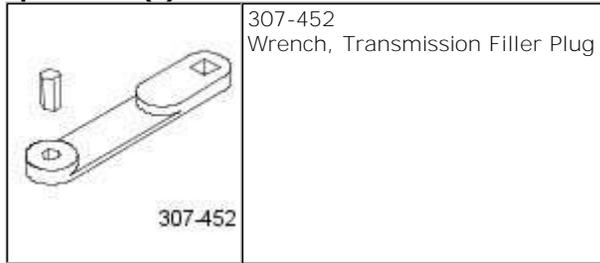
DTC	Description	Possible Cause	Action
U0103-82	Lost Communication With Gear Shift Control Module A - alive / sequence counter incorrect / not updated	<ul style="list-style-type: none"> • Alive counter fault 	Check Transmission shift module for stored DTCs. Check CAN Bus Circuit for fault
U0103-83	Lost Communication With Gear Shift Control Module A - value of signal protection calculation incorrect	<ul style="list-style-type: none"> • Checksum fault 	Check Transmission shift module for stored DTCs. Check CAN Bus Circuit for fault
U0103-87	Lost Communication With Gear Shift Control Module A - missing message	<ul style="list-style-type: none"> • CAN Timeout 	Check Transmission shift module for stored DTCs. Check CAN Bus Circuit for fault
U0122-82	Lost Communication With Vehicle Dynamics Control Module - alive / sequence counter incorrect / not updated	<ul style="list-style-type: none"> • Alive counter fault 	Check Anti-lock braking system for stored DTCs. Check CAN Bus Circuit for fault
U0122-83	Lost Communication With Vehicle Dynamics Control Module - value of signal protection calculation incorrect	<ul style="list-style-type: none"> • Checksum fault 	Check Anti-lock braking system for stored DTCs. Check CAN Bus Circuit for fault
U0122-87	Lost Communication With Vehicle Dynamics Control Module - missing message	<ul style="list-style-type: none"> • CAN Timeout 	Check Anti-lock braking system for stored DTCs. Check CAN Bus Circuit for fault
U0126-00	Lost Communication With Steering Angle Sensor Module - no sub type information	<ul style="list-style-type: none"> • Lost Communication With Steering Angle Sensor Module 	Check Steering angle sensor for stored DTCs. Check CAN Bus Circuit for fault
U0128-87	Lost Communication With Park Brake Control Module - missing message	<ul style="list-style-type: none"> • CAN timeout electronic parking brake module 	Check Electronic Parking Brake Module for stored DTCs. Check CAN Bus Circuit for fault
U0140-82	Lost Communication With Body Control Module - alive / sequence counter incorrect / not updated	<ul style="list-style-type: none"> • Alive counter fault 	Check Central junction box for stored DTCs. Check CAN Bus Circuit for fault
U0140-83	Lost Communication With Body Control Module - value of signal protection calculation incorrect	<ul style="list-style-type: none"> • Checksum fault 	Check Central junction box for stored DTCs. Check CAN Bus Circuit for fault
U0140-87	Lost Communication With Body Control Module - missing message	<ul style="list-style-type: none"> • CAN Timeout 	Check Central junction box for stored DTCs. Check CAN Bus Circuit for fault
U0155-87	Lost Communication With Instrument Panel Cluster (Instrument cluster) Control Module - missing message	<ul style="list-style-type: none"> • CAN timeout instrument cluster 	Check Instrument cluster for stored DTCs. Check CAN Bus Circuit for fault
U0300-68	Control Module - event information	<ul style="list-style-type: none"> • Transmission software does not match vehicle network 	Check Central junction box software level, Check Transmission control module Software level, Update software as required using the manufacturer approved process
U0401-08	Invalid Data Received From Engine control module/PCM A - Bus Signal Message Failures	<ul style="list-style-type: none"> • Inaccurate engine speed, torque information 	Check Engine control module for stored DTCs, Check CAN Bus circuit for faults
U0401-68	Invalid Data Received from Engine control module/PCM A - event information	<ul style="list-style-type: none"> • Inaccurate engine speed, torque information 	Check Engine control module for stored DTCs. Check CAN Bus Circuit for fault
U0401-86	Invalid Data Received from Engine control module/PCM A - Signal Invalid	<ul style="list-style-type: none"> • Inaccurate engine speed, torque information 	Check Engine control module for stored DTCs. Check CAN Bus Circuit for fault
U0404-68	Invalid Data Received from Gear Shift Control Module A - event information	<ul style="list-style-type: none"> • Incorrect CAN data received from Transmission shift module 	Check Transmission Shift Module for stored DTCs. Refer to Circuit diagrams and check CAN and LIN Bus for Circuit fault
U0404-81	Invalid Data Received from Gear Shift Control Module A - Invalid Serial Data Received	<ul style="list-style-type: none"> • Incorrect LIN data received from Transmission shift module 	Check Transmission Shift Module for stored DTCs. Refer to Circuit diagrams and check CAN and LIN Bus for Circuit fault

DTC	Description	Possible Cause	Action
U0416-68	Invalid Data Received From Vehicle Dynamics Control Module - event information	<ul style="list-style-type: none"> Event information brake information 	Check Engine control module for stored DTCs. Check CAN Bus Circuit for fault
U0422-68	Invalid Data Received From Body Control Module - event information	<ul style="list-style-type: none"> Event information invalid Power mode information 	Check Central junction box for stored DTCs. Check CAN Bus Circuit for fault
U101B-87	Lost Communication With GSM - Multiple Bus-missing message	<ul style="list-style-type: none"> Missing message lost communication with Transmission Shift Module (multiple Bus) 	Check Transmission Shift Module for stored DTCs. Refer to Circuit diagrams and check CAN and LIN Bus for Circuit fault
U3000-49	Control Module - internal electronic failure	<ul style="list-style-type: none"> Internal electronic failure 	Suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
U3000-4B	Control Module - Circuit resistance above threshold	<ul style="list-style-type: none"> Internal electronic failure 	Check and correct oil level. Check hydraulic flow through oil cooler and pipe circuit for restriction or blockage. If no restrictions found, suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index
U3000-81	Control Module - invalid serial data received	<ul style="list-style-type: none"> Vehicle or Engine type signal incorrect from BCM or incorrect Transmission control module software installed 	Reflash the Transmission control module using the manufacturer approved process
U3001-94	Control Module Improper Shutdown - unexpected operation	<ul style="list-style-type: none"> Control Module Improper Shutdown (voltage related) 	Check Engine control module For Power (generator) faults. Check Power and Ground Circuit and Battery for fault. Clear DTCs. Road Test. If DTC reoccurs suspect the Transmission control module. Install a new Transmission control module as required, refer to the new module/component installation note at the top of the DTC Index

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Fluid Level Check

General Procedures

Special Tool(s)



Activation

WARNINGS:



Observe due care when draining, as the fluid can be very hot.



Observe due care when working near a hot exhaust system.

1.
 - The following steps must be observed before starting the transmission fluid level check.
 - The vehicle must be on a horizontal ramp.
 - The parking brake must be applied.
 - The engine must be running for 2 minutes with the transmission control switch (TCS) in the "P" position.



2. **CAUTION:** Make sure that the transmission fluid temperature is below 30 degrees before starting the fluid level check.

Connect Jaguar approved diagnostic equipment to the vehicle.

3.
 - Apply, and hold, the footbrake.
 - Move the selector lever from 'P' through all the gear positions, pausing in each gear position for 2-3 seconds and return to the 'P' position.

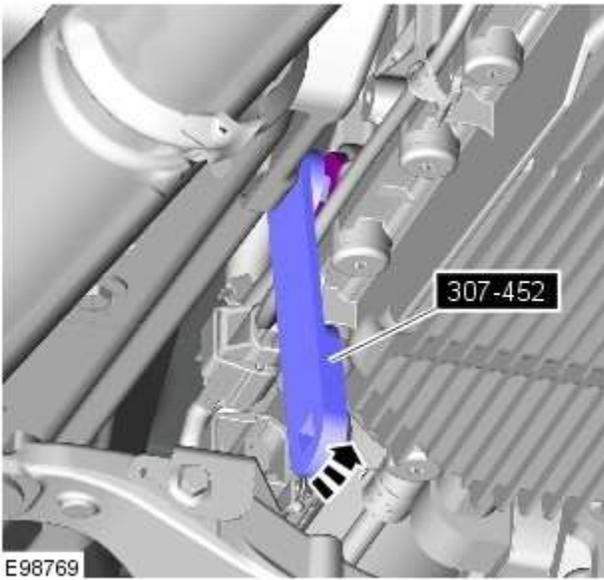


4. **WARNING:** Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

5. Refer to: [Air Deflector](#) (501-02 Front End Body Panels, Removal and Installation).

6. Place a suitable container under the transmission fluid fill plug.

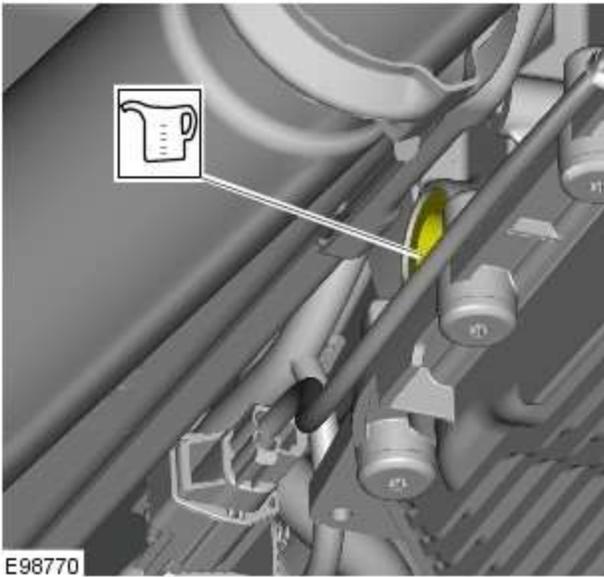


7. CAUTIONS:

 The transmission fluid level must only be checked when the temperature of the fluid is between 30 degrees and 50 degrees. The fluid level obtained will be incorrect if the reading is outside this temperature range.

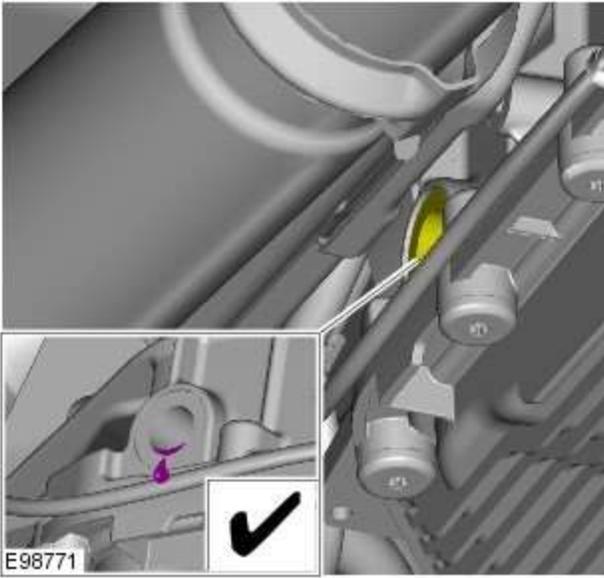
 Discard the seal.

Special Tool(s): [307-452](#)



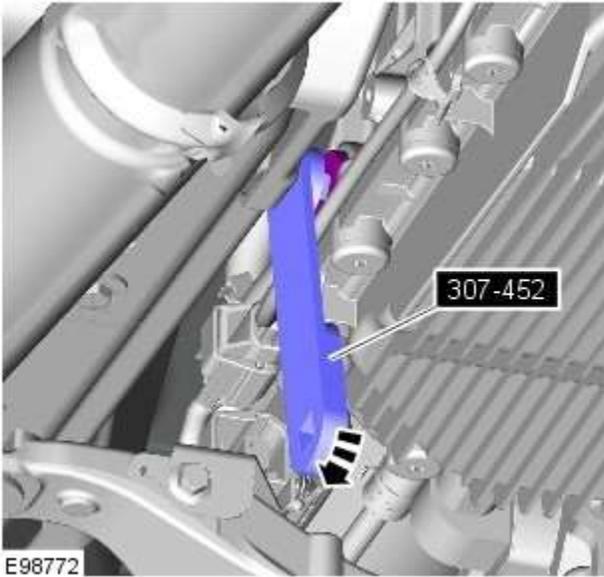
8.  NOTE: Use transmission fluid meeting Jaguar specification.

If the transmission fluid does not come out of the transmission fluid fill plug hole the transmission fluid level is insufficient. If this is the case add the transmission fluid in 0.5 liter units into the transmission fluid fill plug hole until fluid comes out.



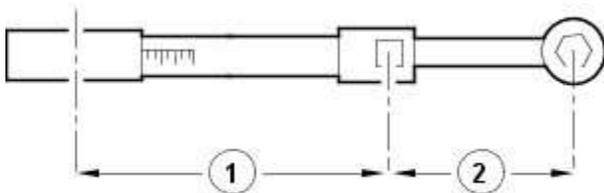
9.  NOTE: Make sure the transmission fluid temperature does not exceed 50 °C (122 °F). If the transmission fluid temperature does exceed 50 °C (122 °F) stop the transmission fluid level check and allow the transmission fluid to cool until the temperature is below 30 °C (86 °F).

Allow the transmission fluid to drain from the transmission fluid filler plug hole until the flow almost stops.



10.  NOTE: Install a new sealing washer.

Using the special tool, install the new transmission fluid fill plug.



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11.  CAUTION: Make sure the transmission fluid fill plug is tightened to the correct specification. Failure to follow this instruction may result in damage to the vehicle.

- To make sure the transmission fill plug is torqued to the correct specification. Using the special tool and torque wrench the following calculation steps must be followed.
- Step 1. Multiply 35 Nm by the effective length of the torque wrench (1).
- Step 2. Add the effective length of the special tool (2) to the effective length of the torque wrench (1).
- Step 3. Divide the total of step 1 by the total of step 2.
- Step 4. Set the torque wrench to the figure arrived at in step 3.
- Tighten the transmission fluid fill plug to the torque given by the calculation.

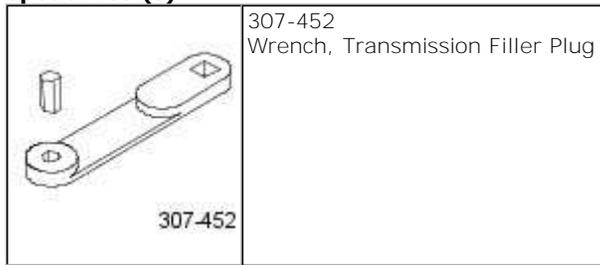
12. Remove the special tool.

13. Remove the container.
14. Refer to: [Air Deflector](#) (501-02 Front End Body Panels, Removal and Installation).
15. Lower the vehicle.
16. Disconnect the Jaguar approved diagnostic equipment from the vehicle.

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Fluid Drain and Refill

General Procedures

Special Tool(s)



WARNINGS:



Observe due care when draining, as the fluid can be very hot.



Observe due care when working near a hot exhaust system.

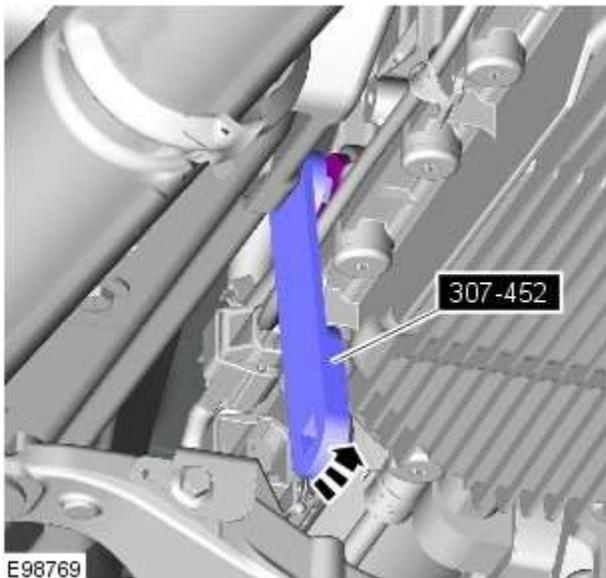


1. **WARNING:** Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

2. Refer to: [Air Deflector](#) (501-02 Front End Body Panels, Removal and Installation).

3. Place a container under the transmission.



4. **CAUTION:** Discard the seal.

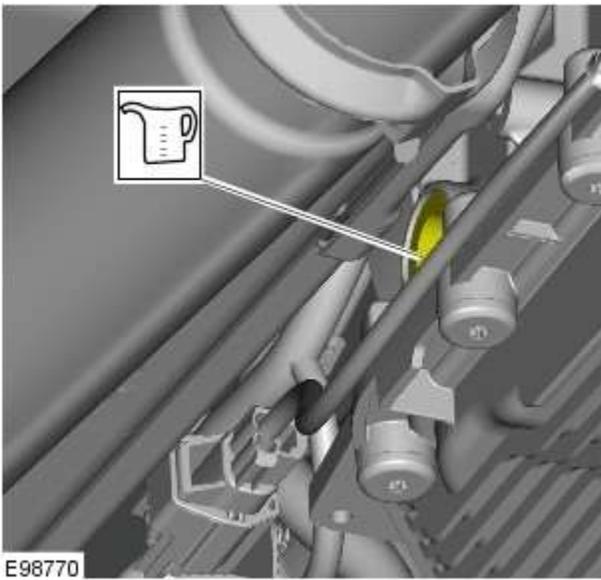
Special Tool(s): [307-452](#)



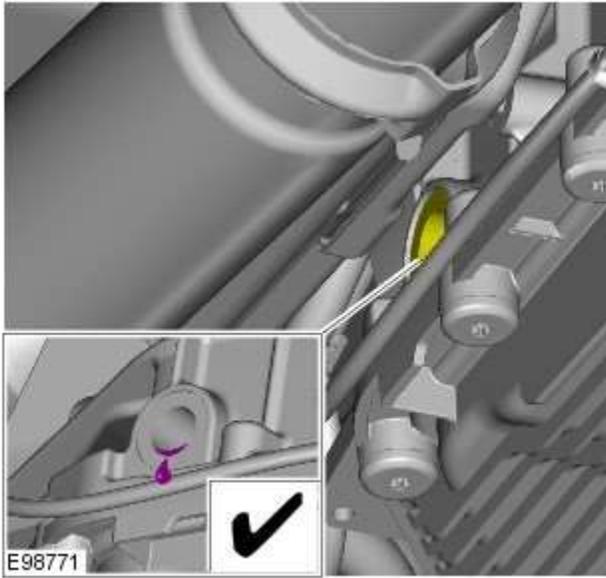
5.  CAUTION: Discard the component.
- Allow the fluid to drain.



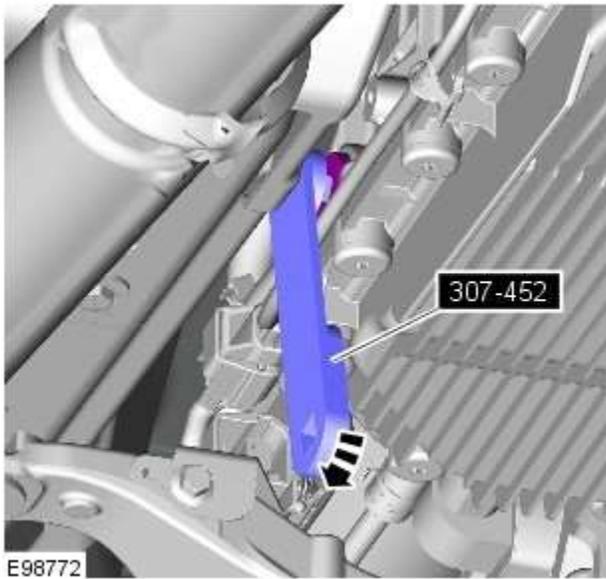
6.  CAUTION: Make sure that a new component is installed.
- Torque: 8 Nm*



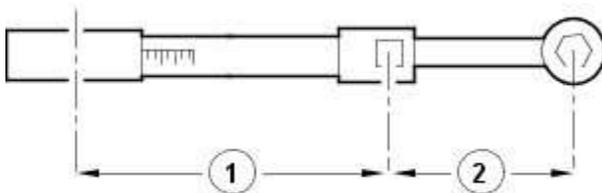
7.  NOTE: Use transmission fluid meeting Jaguar specification.
- Refill the transmission with fluid.



8. Allow the transmission fluid to drain from the transmission fluid filler plug hole until the flow almost stops.



9.  **NOTE:** Install a new sealing washer.
 - Loosely install the transmission fluid fill plug.



10.  **CAUTION:** Make sure the transmission fluid fill plug is tightened to the correct specification. Failure to follow this instruction may result in damage to the vehicle.
 - To make sure the transmission fill plug is torqued to the correct specification. Using the special tool and torque wrench the following calculation steps must be followed.
 - Step 1. Multiply 35 Nm by the effective length of the torque wrench (1).
 - Step 2. Add the effective length of the special tool (2) to the effective length of the torque wrench (1).
 - Step 3. Divide the total of step 1 by the total of step 2.
 - Step 4. Set the torque wrench to the figure arrived at in step 3.
 - Tighten the transmission fluid fill plug to the torque given by the calculation.

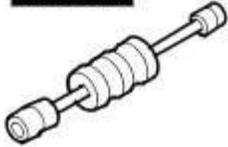
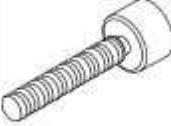
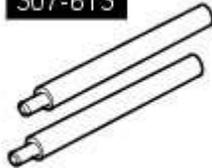
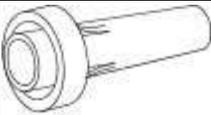
11. Carry out a transmission fluid level check.

Refer to: [Transmission Fluid Level Check](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, General Procedures).

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Input Shaft Seal

Removal and Installation

Special Tool(s)

 <p>100-012</p> <p>E54135</p>	<p>100-012 Slide Hammer</p>
 <p>100-012-01</p>	<p>100-012-01 Slide Hammer Adapter</p>
 <p>307-613</p> <p>E84067</p>	<p>307-613 Holding Pins, Torque Converter</p>
 <p>308246</p>	<p>308-246 Installer, Front Seal</p>
 <p>308-375</p>	<p>308-375 Remover, Input and Output Seal</p>

Removal

NOTE: Removal steps in this procedure may contain installation details.

1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).



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

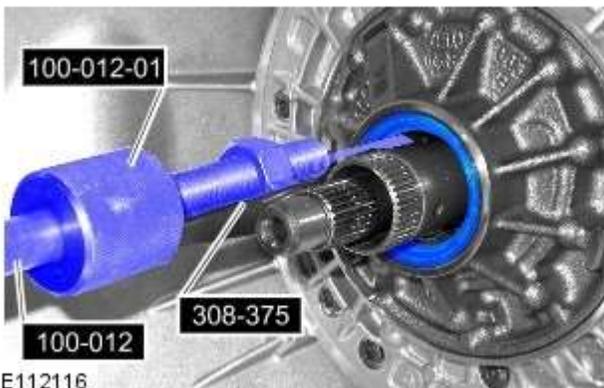
Raise and support the vehicle.

3. Refer to: [Transmission - TDV6 3.0L Diesel](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal).

4. *Special Tool(s)*: [307-613](#)



E112115



E112116

5. CAUTIONS:



Take extra care not to damage the edges of the component.



Discard the seal.

Special Tool(s): [100-012](#), [100-012-01](#), [308-375](#)

Installation

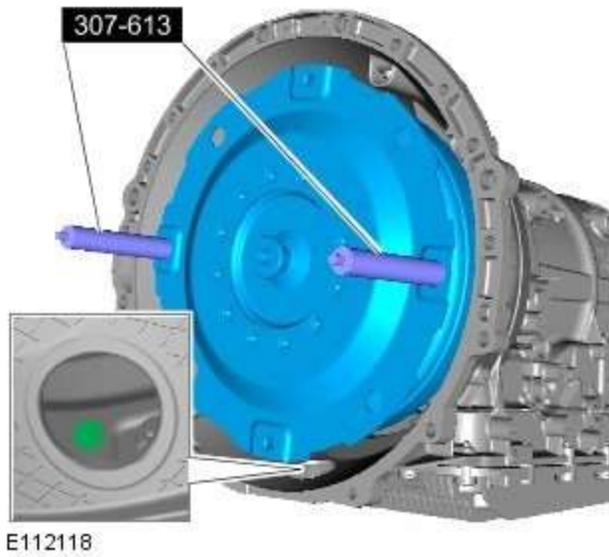


E112117



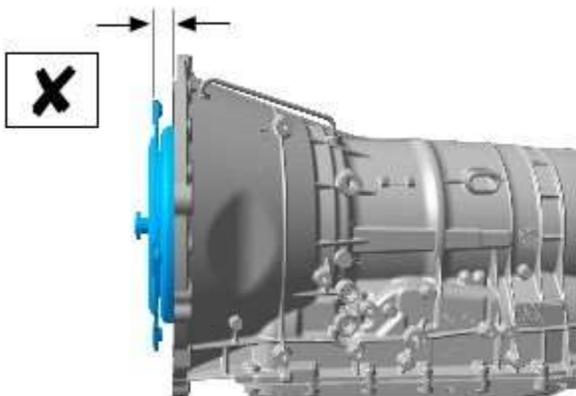
1. CAUTION: Install a new seal.

Special Tool(s): [308-246](#)

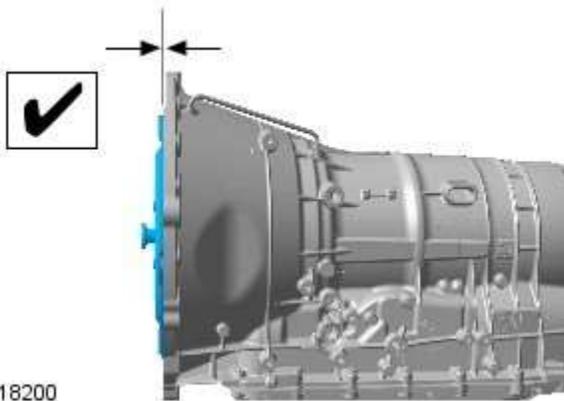


- NOTE: Make sure that the alignment mark is visible through the inspection hole as illustrated.

Special Tool(s): [307-613](#)



-  CAUTION: Make sure the torque converter is fully located into the oil pump drive.

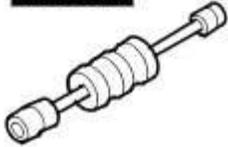
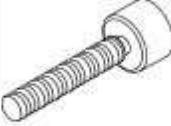
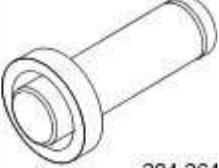
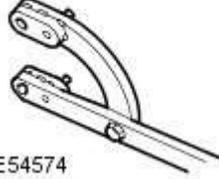


- Refer to: [Transmission - TDV6 3.0L Diesel](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, Installation).
- Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Extension Housing Seal

Removal and Installation

Special Tool(s)

 <p>100-012</p> <p>E54135</p>	<p>100-012 Slide Hammer</p>
 <p>100-012-01</p>	<p>100-012-01 Slide Hammer Adapter</p>
 <p>204-264</p>	<p>204-264 Pinion Seal Replacer</p>
 <p>205-053</p> <p>E54574</p>	<p>205-053 Retainer, Drive Flange</p>
 <p>303-D121</p> <p>E64849</p>	<p>303-D121 Puller, General Purpose</p>
 <p>308-375</p>	<p>308-375 Remover, Input and Output Seal</p>

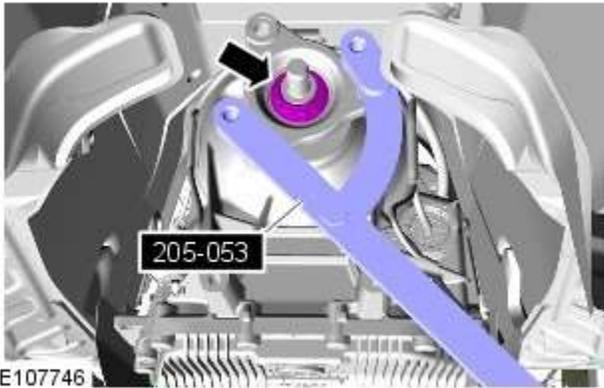
Removal

1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and

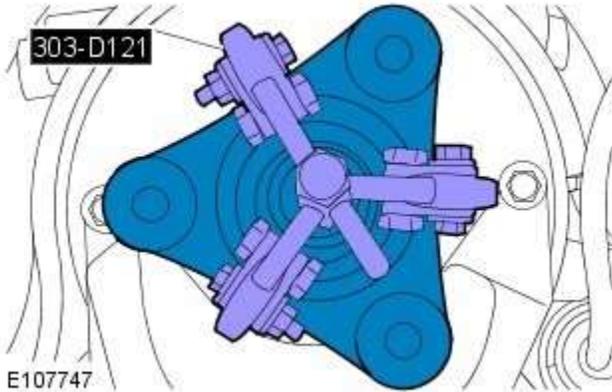
Cables, General Procedures).



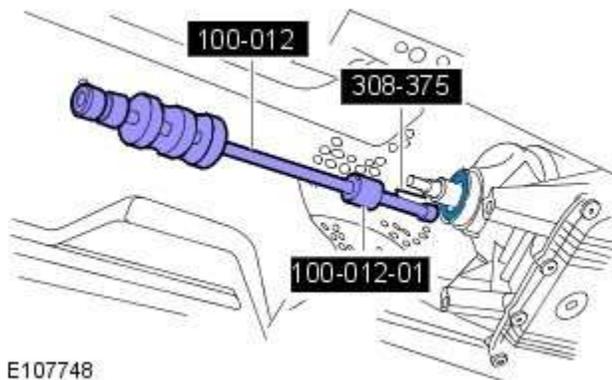
2. **WARNING:** Make sure to support the vehicle with axle stands.
Raise and support the vehicle.
3. Refer to: [Driveshaft - TDV6 3.0L Diesel](#) (205-01 Driveshaft, Removal and Installation).
4. Refer to: [Transmission Support Insulator - TDV6 3.0L Diesel](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).



5.  **CAUTION:** Discard the nut.
Special Tool(s): [205-053](#)

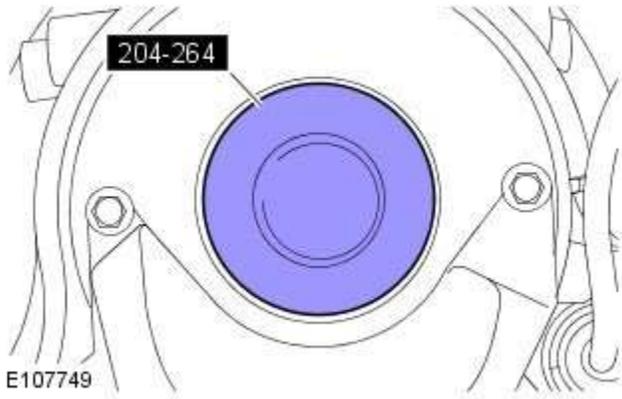


6. *Special Tool(s):* [303-D121](#)



7.  **CAUTION:** Discard the seal.
Special Tool(s): [100-012](#), [100-012-01](#), [308-375](#)

Installation

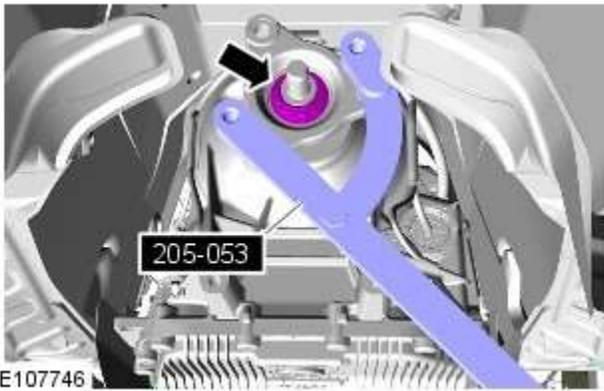


1. CAUTIONS:

 Make sure that the mating faces are clean and free of foreign material.

 Install a new seal.

Special Tool(s): [204-264](#)



2.  **WARNING:** Make sure that a new nut is installed.

Torque: 60 Nm

3. Refer to: [Transmission Support Insulator - TDV6 3.0L Diesel](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).
4. Refer to: [Driveshaft - TDV6 3.0L Diesel](#) (205-01 Driveshaft, Removal and Installation).
5. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Control Module (TCM) and Main Control Valve Body

Removal and Installation

Removal



NOTE: The transmission control module (TCM) is part of the main control valve body and cannot be serviced separately.

1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

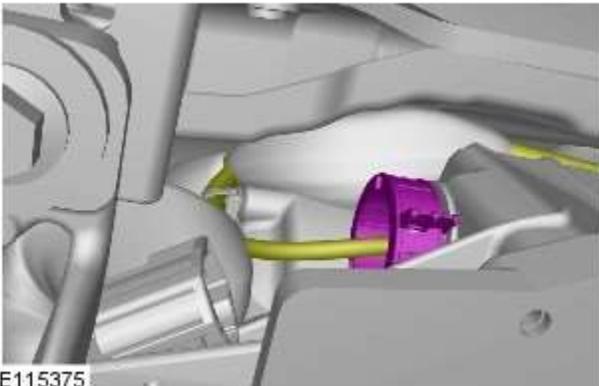


2. **WARNING:** Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

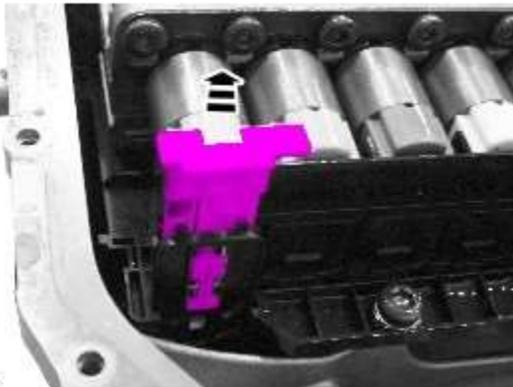
3. Refer to: [Transmission Fluid Pan, Gasket and Filter](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).

4.

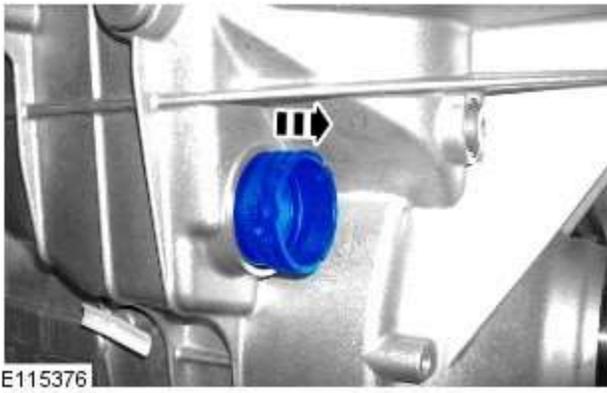


E115375

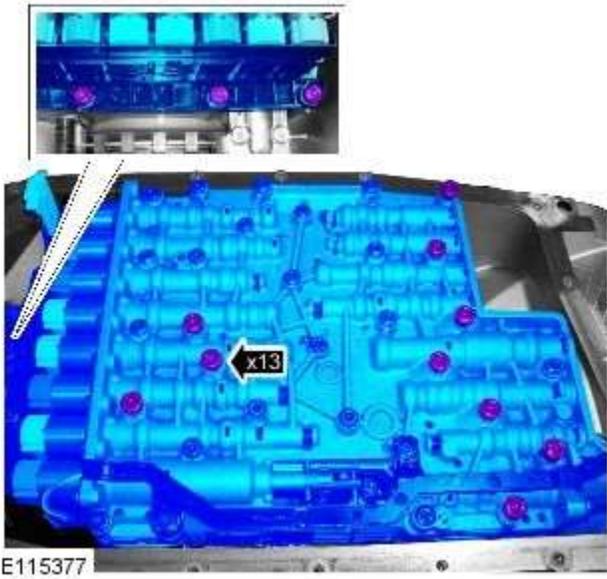
5.



E115374

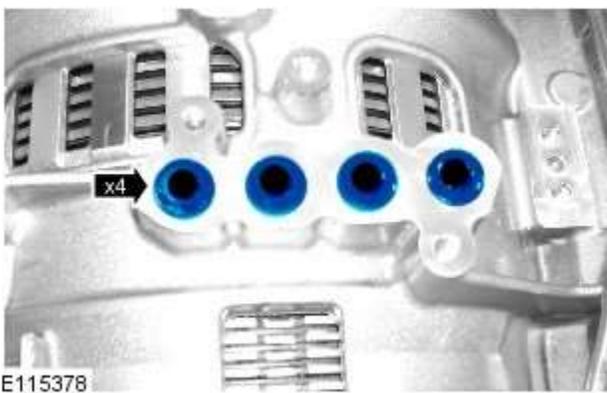


6.  CAUTION: Discard the component.



7.  CAUTION: Be prepared to collect escaping fluids.

 NOTE: Note the position of the manual park brake release.



8.

9.



Installation

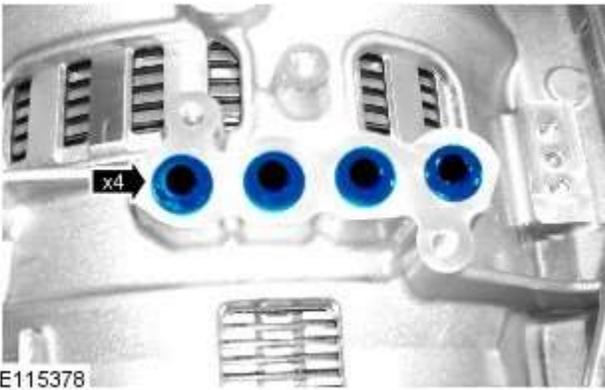


1. CAUTIONS:

 Make sure that when fully fitted, all seals protrude by the same amount.

 Install the new seals.

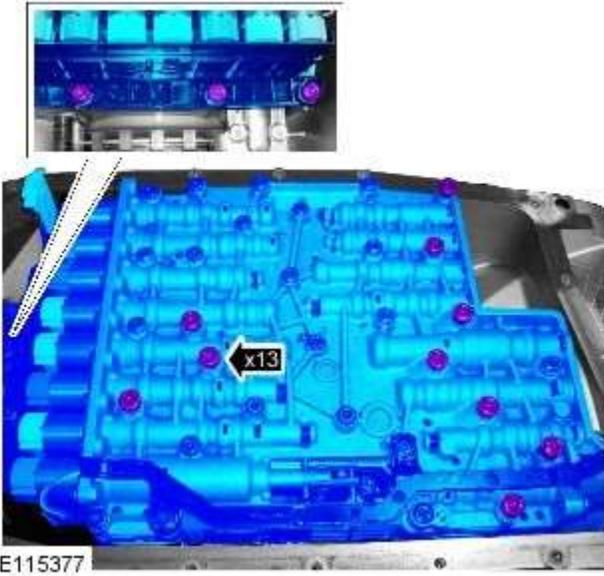
- Install a new seal block.



2. CAUTIONS:

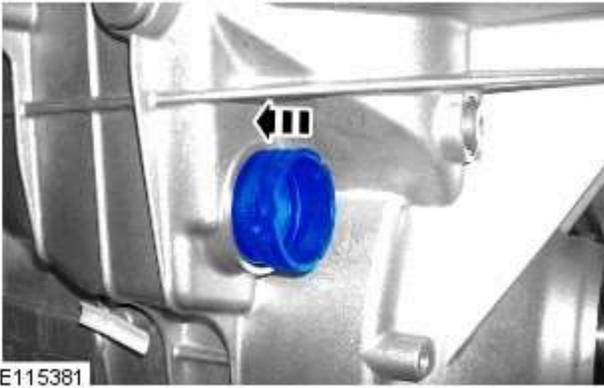
 Install the new seals.

 Make sure that when fully fitted, all seals protrude by the same amount.

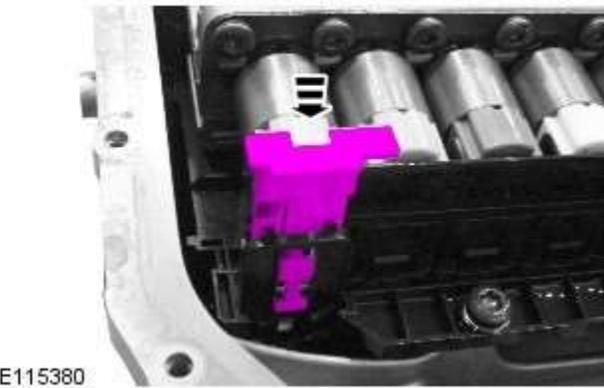


3. CAUTION: Make sure the manual park release is correctly engaged.

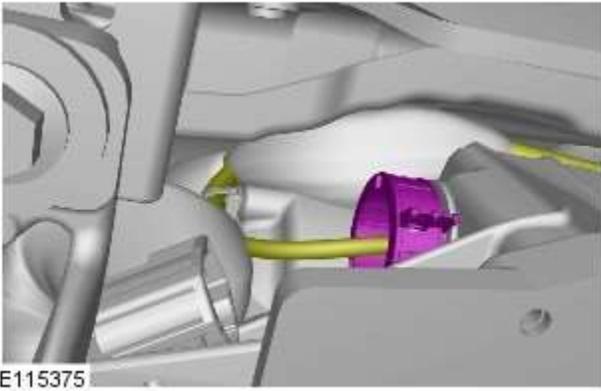
Torque: 8 Nm



4. CAUTION: Make sure that a new component is installed.



- 5.



6.

7. Refer to: [Transmission Fluid Pan, Gasket and Filter](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).
8. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
9. If a new component has been installed, configure using Jaguar approved diagnostic equipment.

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Fluid Pan, Gasket and Filter

Removal and Installation

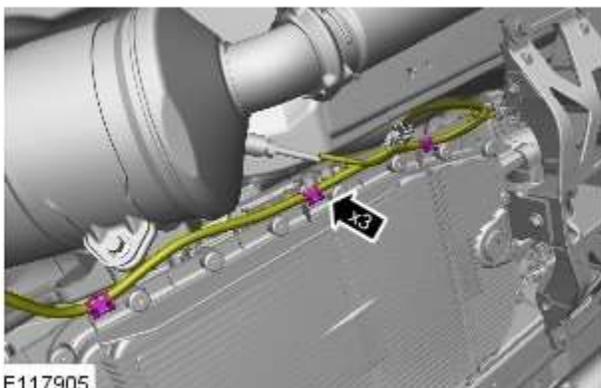
Removal



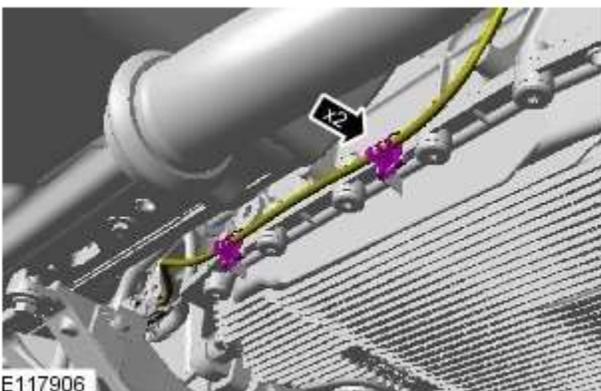
NOTE: Removal steps in this procedure may contain installation details.

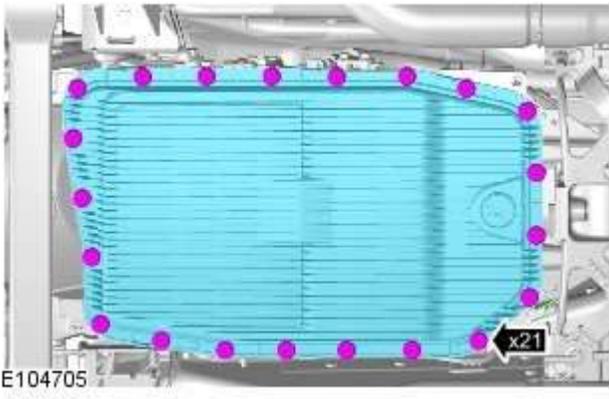
1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
2. Raise and support the vehicle.
3. Refer to: [Air Deflector](#) (501-02 Front End Body Panels, Removal and Installation).
4. Refer to: [Transmission Fluid Drain and Refill](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, General Procedures).

5.



6.  NOTE: Some variation in the illustrations may occur, but the essential information is always correct.





7. CAUTIONS:



Make sure that the area around the component is clean and free of foreign material.



Be prepared to collect escaping fluids.

Torque: 8 Nm

Installation

1. To install, reverse the removal procedure.

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Support Insulator V8 5.0L Petrol/V8 S/C 5.0L Petrol

Removal and Installation

Removal

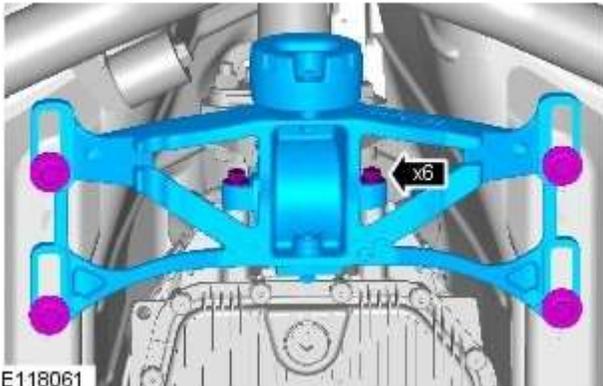


NOTE: Removal steps in this procedure may contain installation details.



1. **WARNING:** Make sure to support the vehicle with axle stands.
Raise and support the vehicle.

2. Refer to: [Air Deflector](#) (501-02 Front End Body Panels, Removal and Installation).

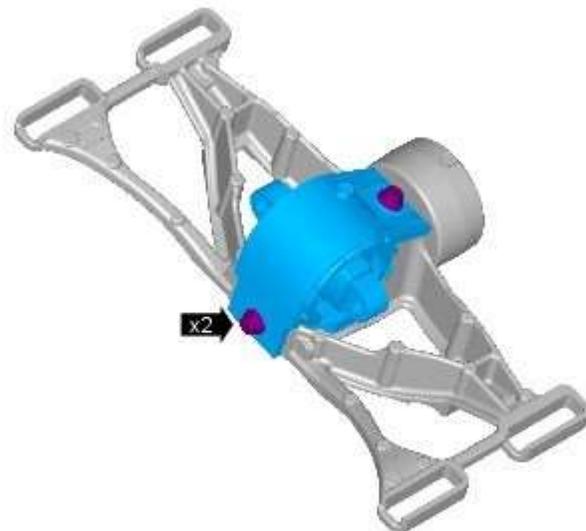


E118061



3. **CAUTION:** During this procedure the transmission crossmember is removed, make sure the transmission is correctly supported to avoid damaging associated components.

Torque: 48 Nm



E118062



4. **NOTE:** Do not disassemble further if the component is removed for access only.

Torque: 55 Nm

Installation

1. To install, reverse the removal procedure.

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission, Transmission Fluid Cooler and Transmission Fluid Cooler Tubes V8 5.0L Petrol/V8 S/C 5.0L Petrol

Removal and Installation

Removal



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



NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).



2. **WARNING:** Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

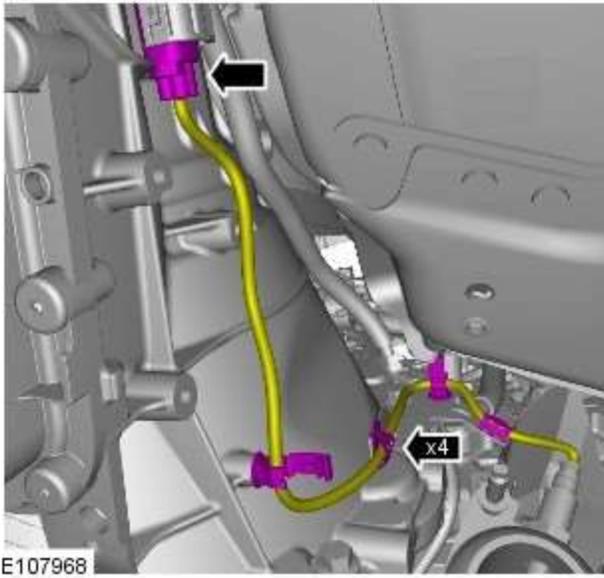
3. Refer to: [Catalytic Converter RH](#) (309-00C Exhaust System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).

4. Refer to: [Catalytic Converter LH](#) (309-00C Exhaust System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).

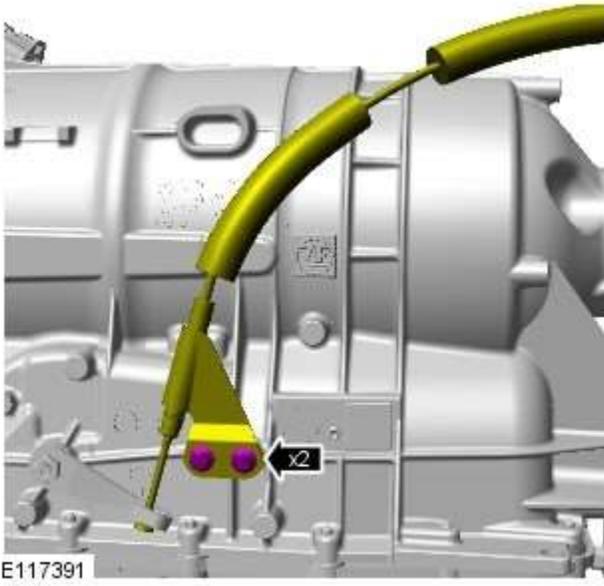
5.



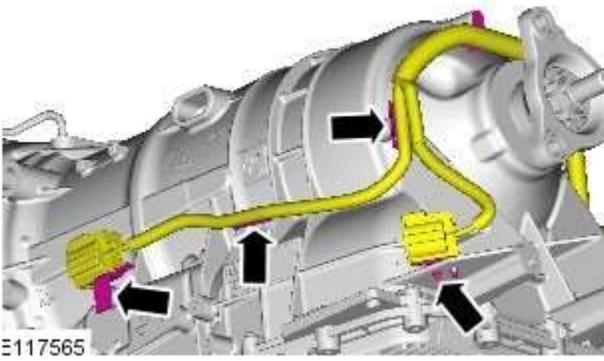
6.

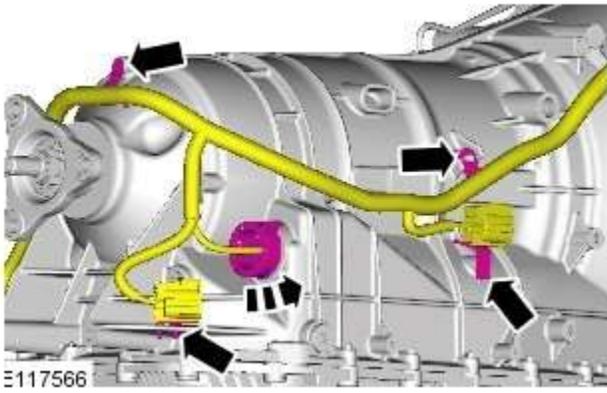


7.

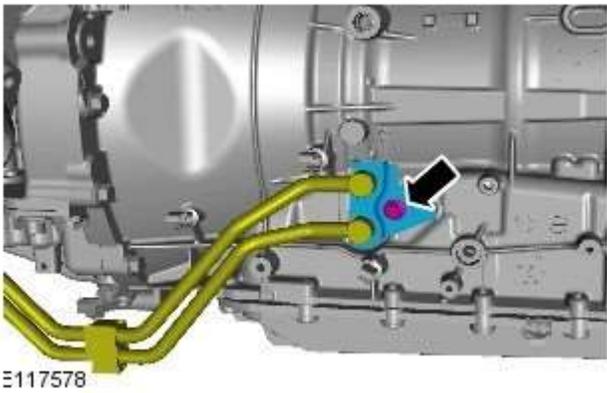


8.





9.



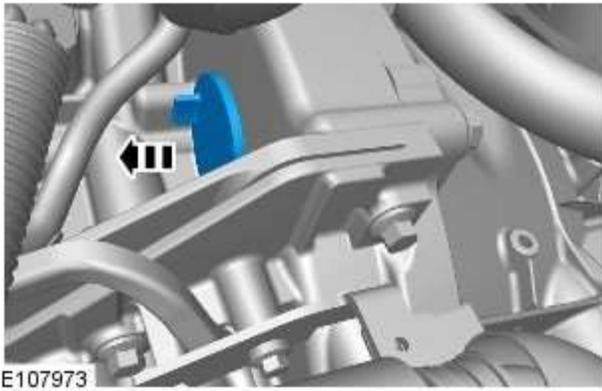
10.  CAUTION: Be prepared to collect escaping fluids.

 NOTE: Remove and discard the O-ring seals.

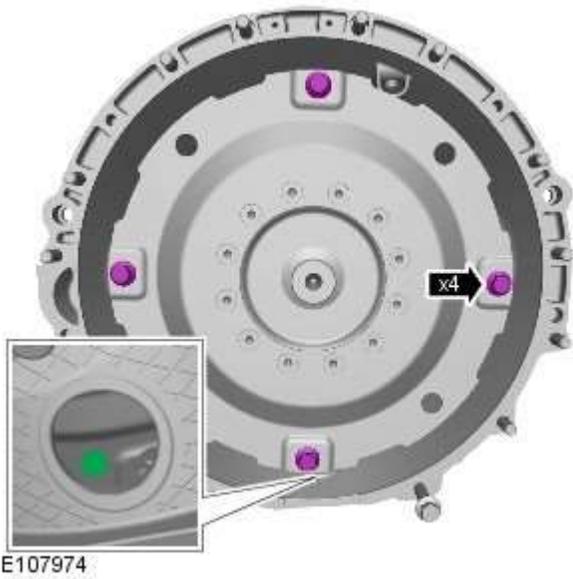
Install blanking caps to the exposed ports.



11.

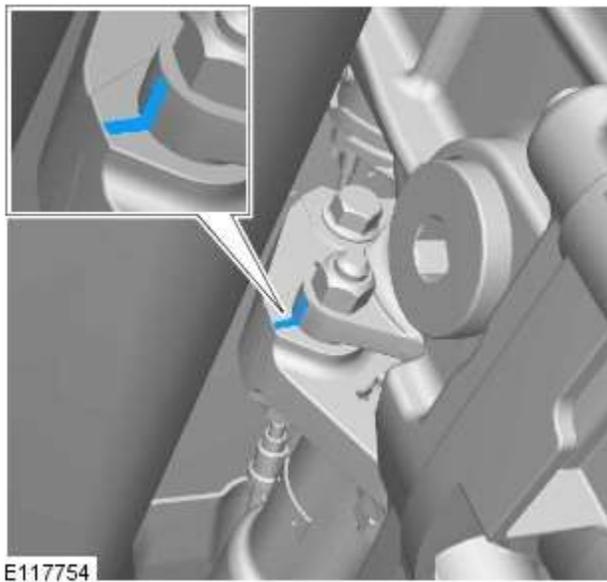


12.

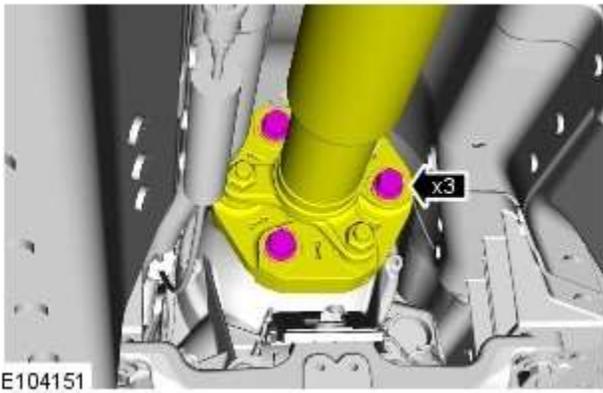


13.

- Make sure that the alignment mark is visible through the inspection hole on removal of the last torque converter bolt.



14.  NOTE: Mark the position of the driveshaft on the transmission flange.

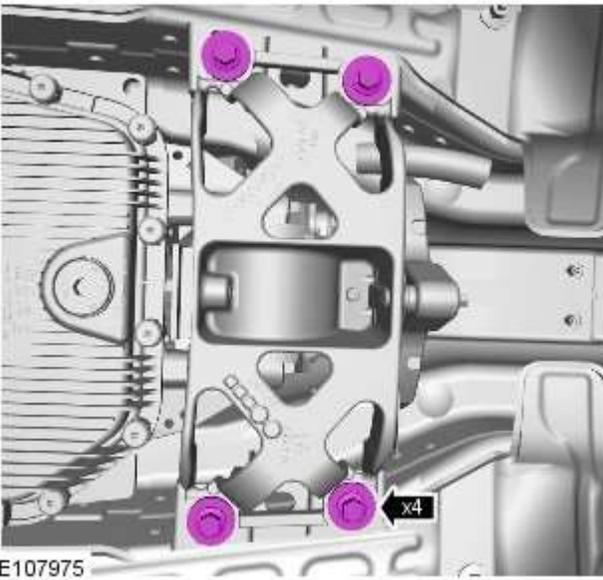


15.

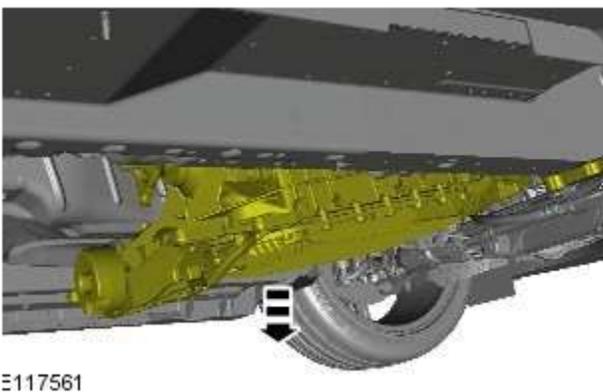
- Using a suitable tie strap, secure the driveshaft.

16.  **WARNING:** Make sure that the transmission is secured with suitable retaining straps.

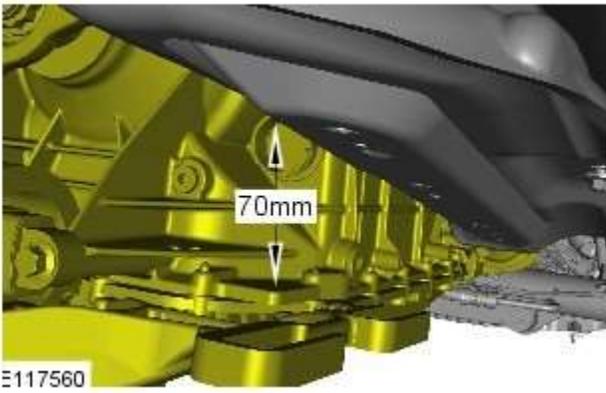
Using a suitable stand, support the transmission.



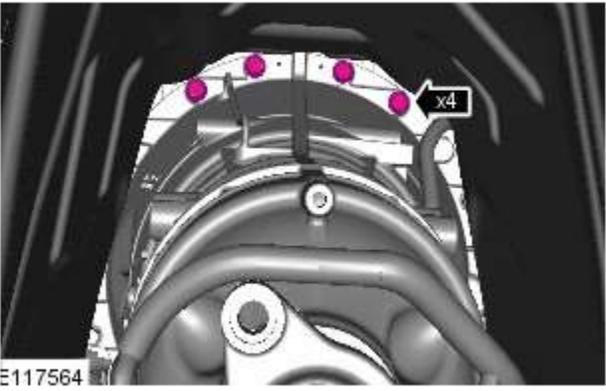
17.



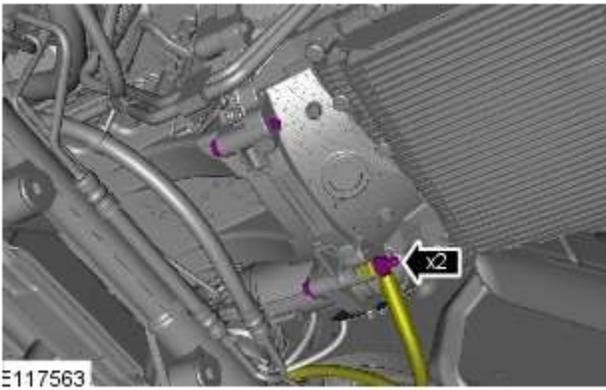
18.  **NOTE:** The transmission is lowered for access.
Lower the rear of the transmission for access.



19.  NOTE: The transmission is lowered for access.

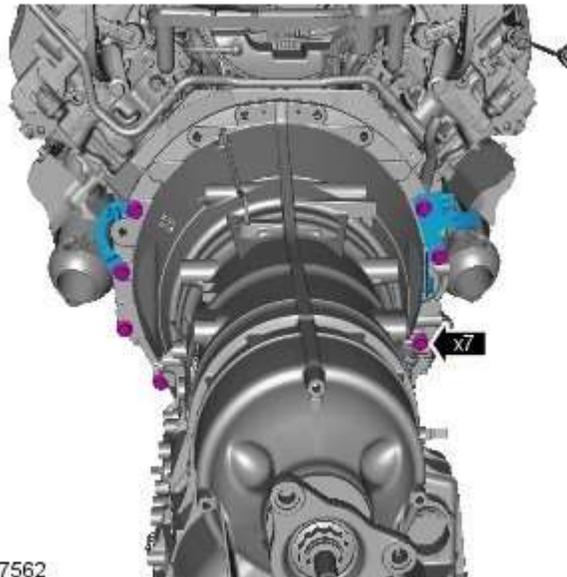


20.



21.

22.

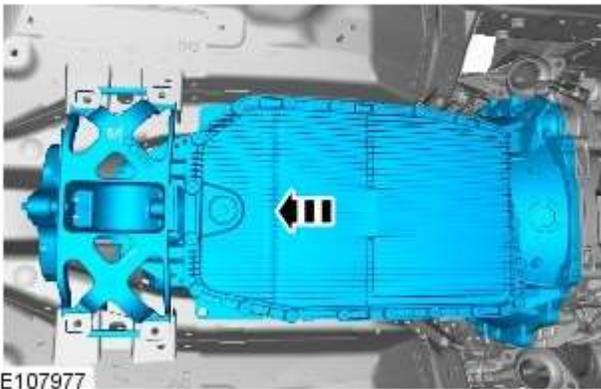


E117562

23.  CAUTION: Make sure that the torque converter remains in the transmission.

 NOTE: This step requires the aid of another technician.

- Install the torque converter retainer.

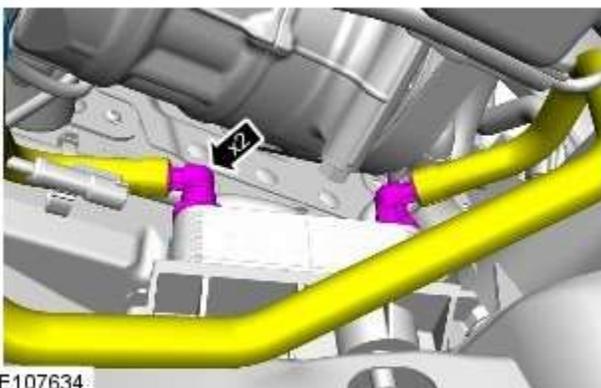


E107977

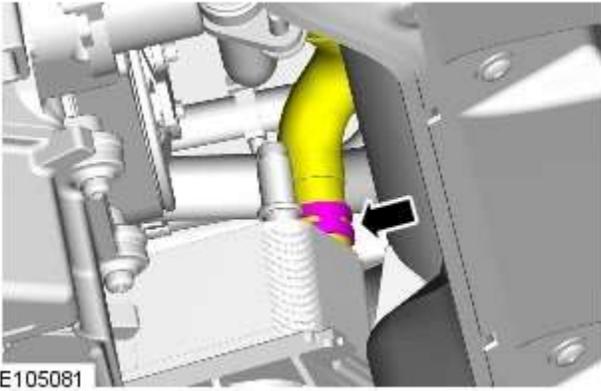
24. CAUTIONS:

 Be prepared to collect escaping fluids.

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

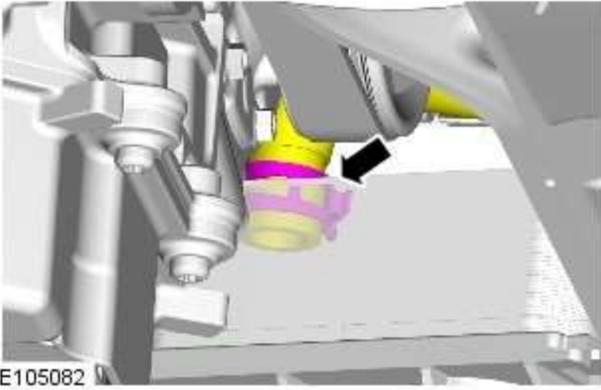


E107634

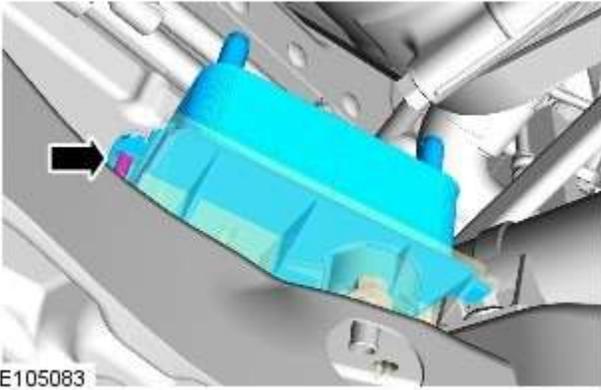


25.

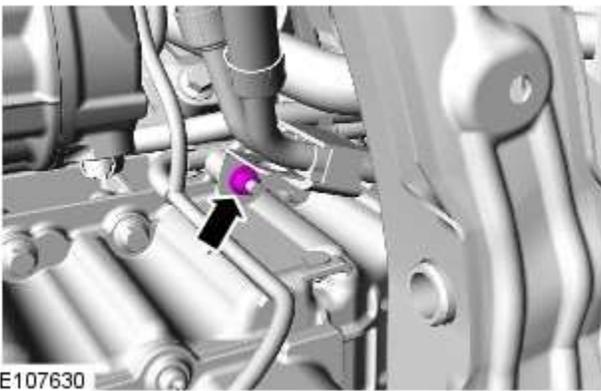
- Clamp the hoses to minimize coolant loss.



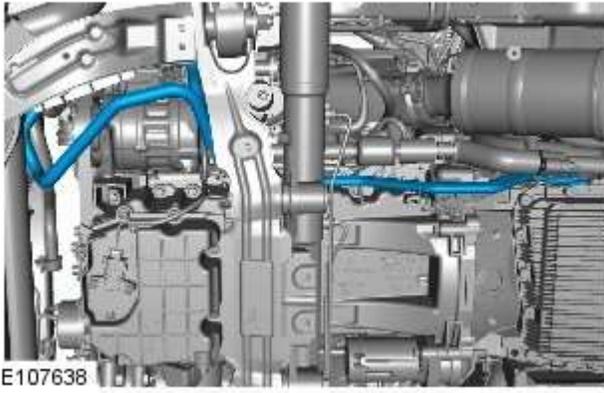
26.



27.

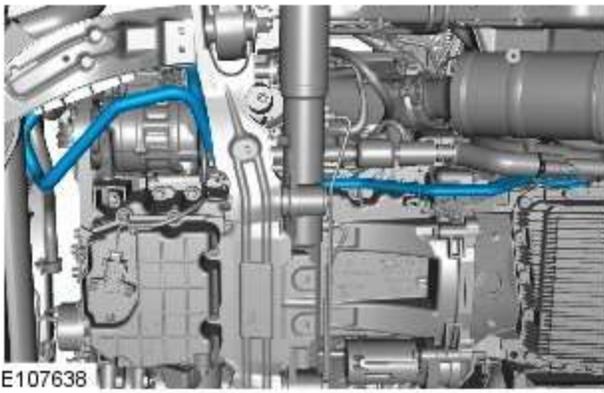


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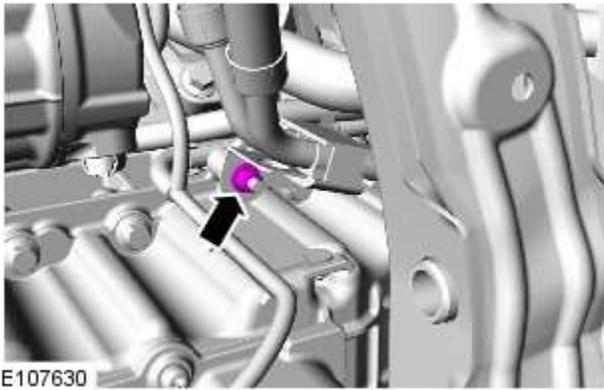


29.  NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

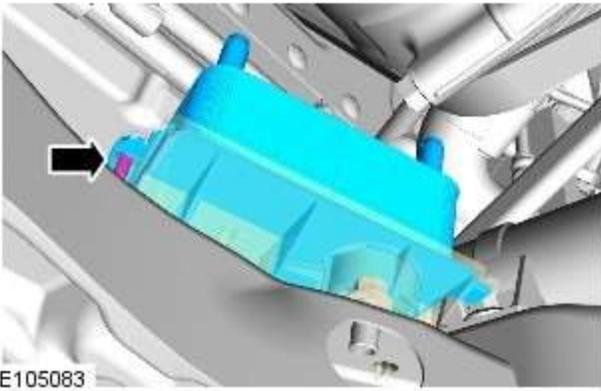
Installation



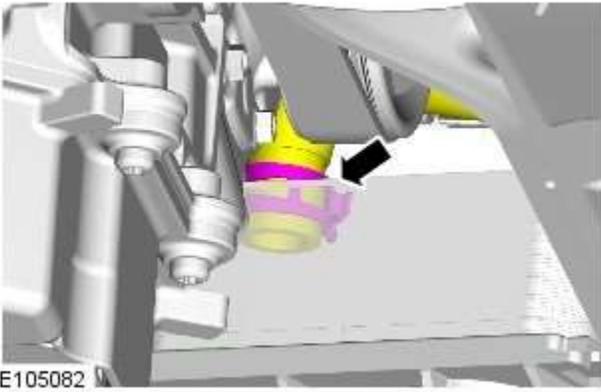
1. NOTE: Some variation in the illustrations may occur, but the essential information is always correct.



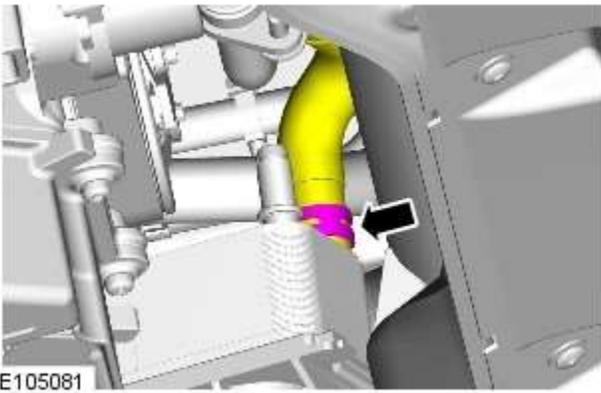
2. *Torque:* 11 Nm



3. *Torque:* 5 Nm

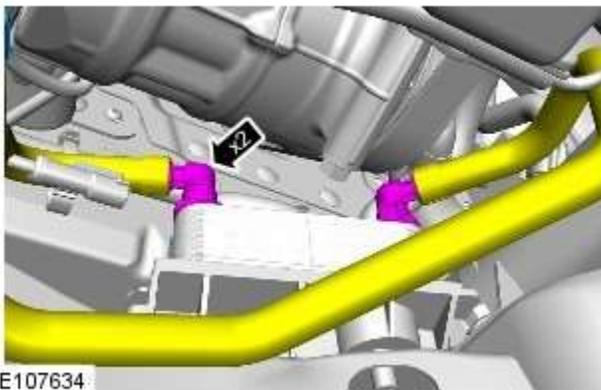


4.



5.

- Clamp the hoses to minimize coolant loss.



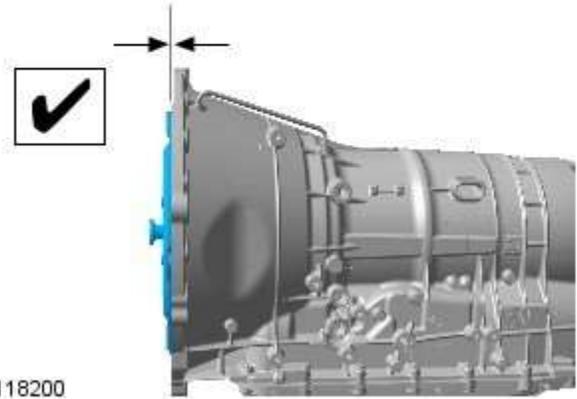
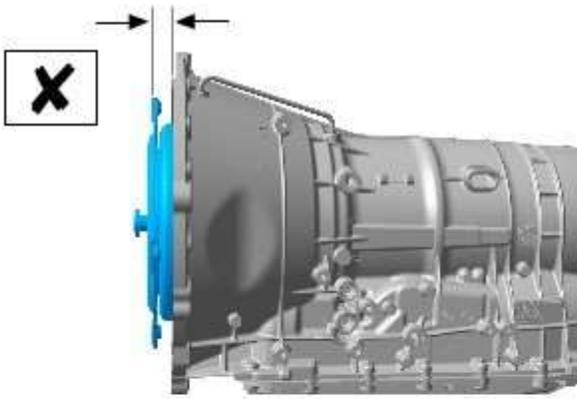
6. CAUTIONS:



Be prepared to collect escaping fluids.



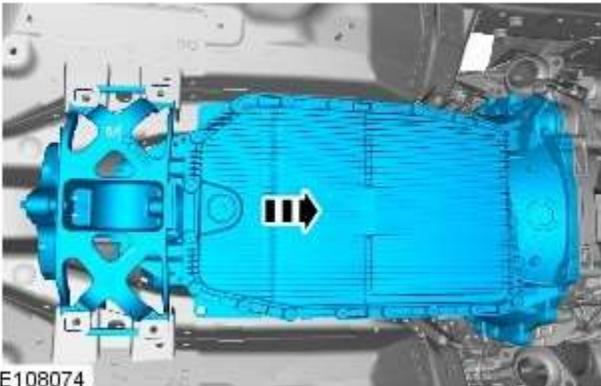
Make sure that all openings are sealed. Use new blanking caps.



E118200



7. CAUTION: Make sure the torque converter is fully located into the oil pump drive.



E108074

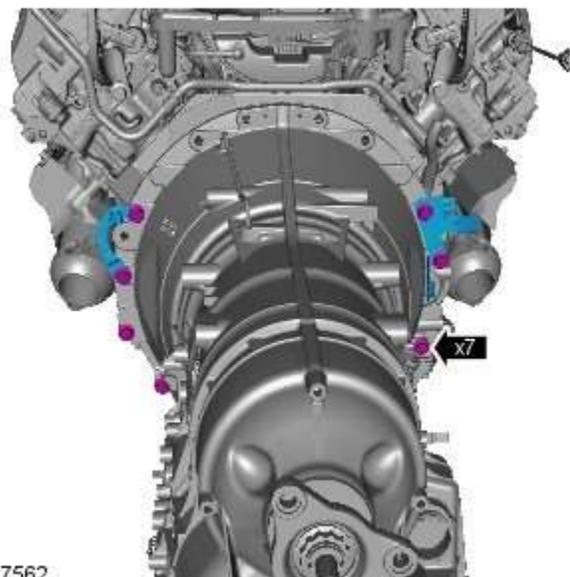


8. CAUTION: Make sure that the torque converter remains in the transmission.



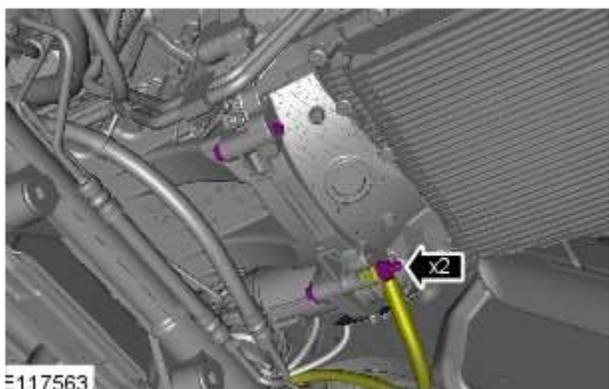
NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

Raise the powertrain assembly jack and transmission assembly.



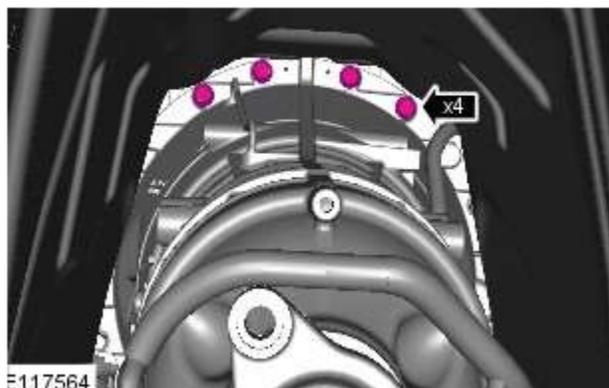
E117562

9.  NOTE: Transmission shown removed for clarity.
Torque: 48 Nm



E117563

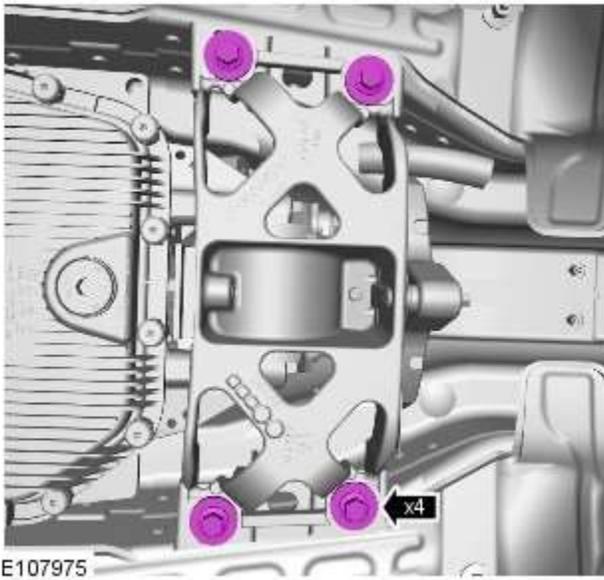
10. Torque: 48 Nm



E117564

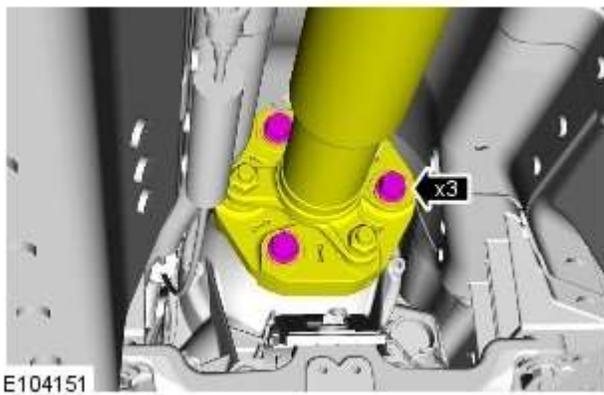
11. Torque: 48 Nm

12. *Torque:* 45 Nm



13. Remove the support.

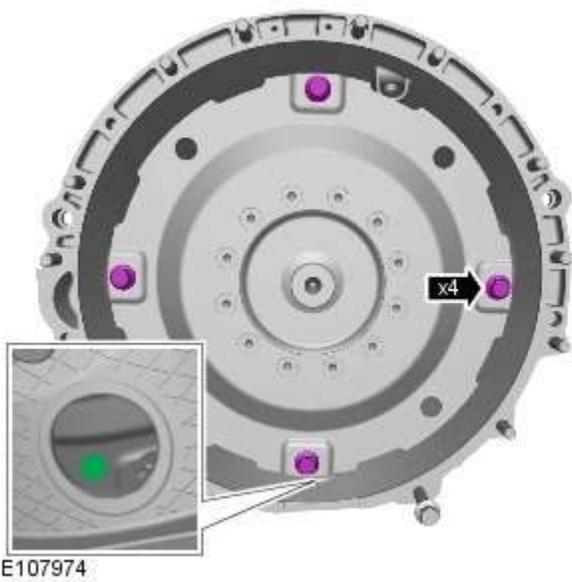
14. *Torque:* 110 Nm



15.  CAUTION: Only rotate the crankshaft clockwise.

 NOTE: Make sure that the alignment mark is visible through the inspection hole as illustrated.

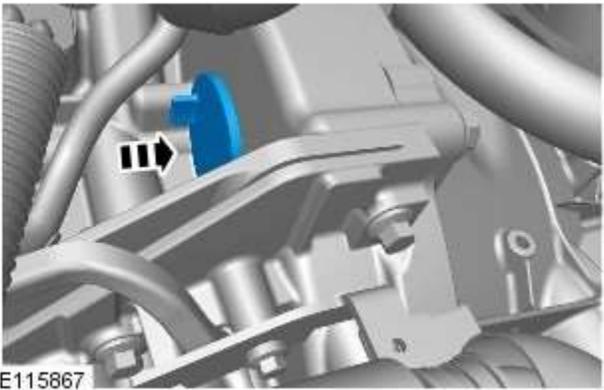
Torque: 63 Nm





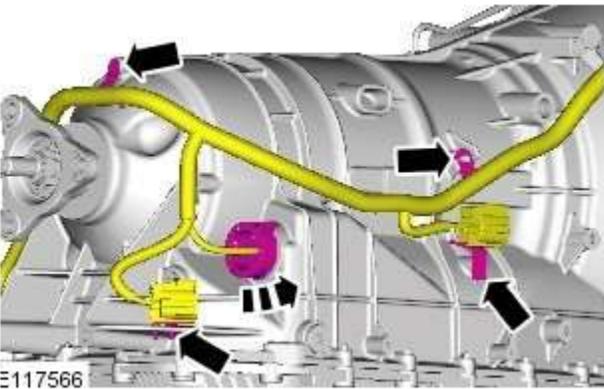
E107972

16.



E115867

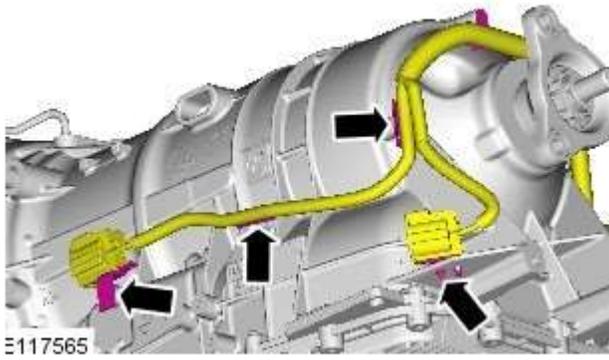
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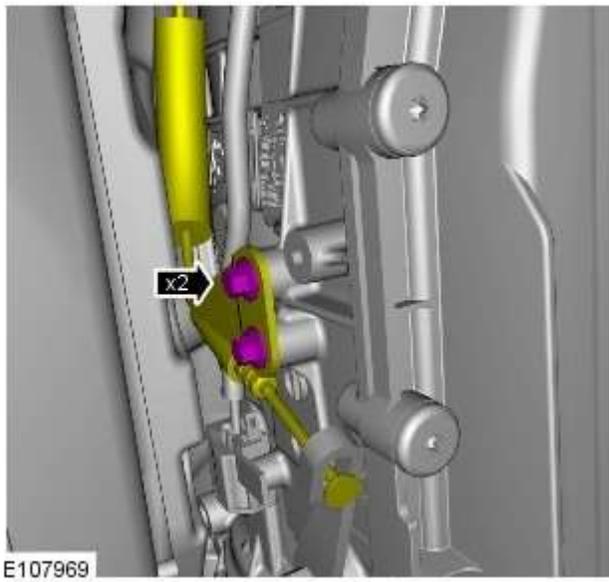
E117566

18.

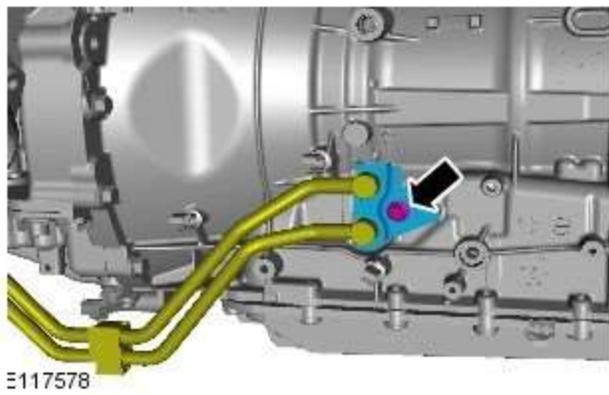
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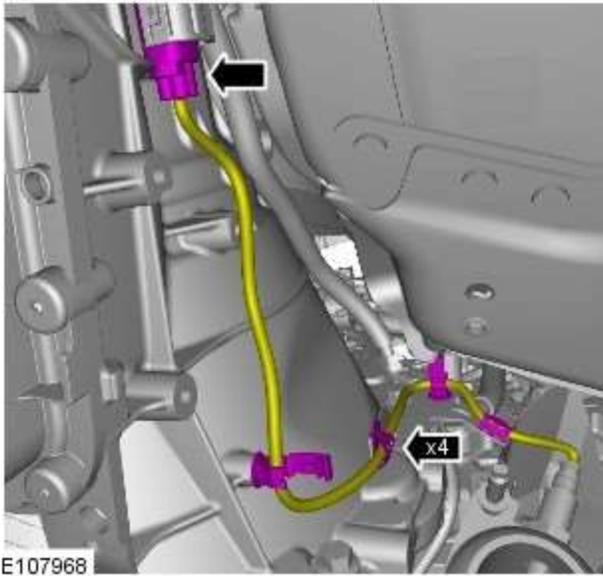
20. *Torque:* 10 Nm



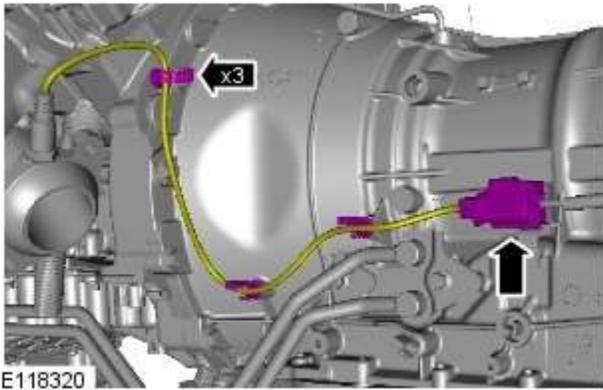
21.  CAUTION: Install new o-ring seals
Torque: 10 Nm



22.



23.



24. Refer to: [Catalytic Converter LH](#) (309-00C Exhaust System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).
25. Refer to: [Catalytic Converter RH](#) (309-00C Exhaust System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).
26. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
27. Check and top up the cooling system as required.
28. Set the heater controls to HOT.
29.  **CAUTION:** Observe the engine temperature warning light. If the warning light is displayed, switch off immediately and allow to cool. Failure to follow this instruction may cause damage to the vehicle.
Start the engine and allow to idle until hot air is emitted at the face registers.

30.  CAUTION: Observe the engine temperature warning light. If the warning light is displayed, switch off immediately and allow to cool. Failure to follow this instruction may cause damage to the vehicle.

Raise the engine speed to 2000 RPM and maintain at 2000 RPM until the engine cooling fan operates.

31.  CAUTION: Switch off the engine and allow the coolant temperature to go cold.

Switch the engine off and allow to cool.

32. Visually check the engine and cooling system for signs of coolant leakage.

33. WARNINGS:



When releasing the cooling system pressure, cover the coolant expansion tank cap with a thick cloth.



Since injury such as scalding could be caused by escaping steam or coolant, make sure the vehicle cooling system is cool prior to carrying out this procedure.

CAUTIONS:



Make sure the coolant level remains above the "COLD FILL RANGE" lower level mark.



Anti-freeze concentration must be maintained at 50%.



NOTE: When the cooling system is warm, the coolant will be approximately 10mm above the upper level mark on the expansion tank with the cap removed.

Check and top-up the coolant if required.

34. Refer to: [Transmission Fluid Level Check](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, General Procedures).

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission and Transmission Fluid Cooler V8 5.0L Petrol/V8 S/C 5.0L Petrol

Removal and Installation

Removal



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



NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).



2. WARNING: Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

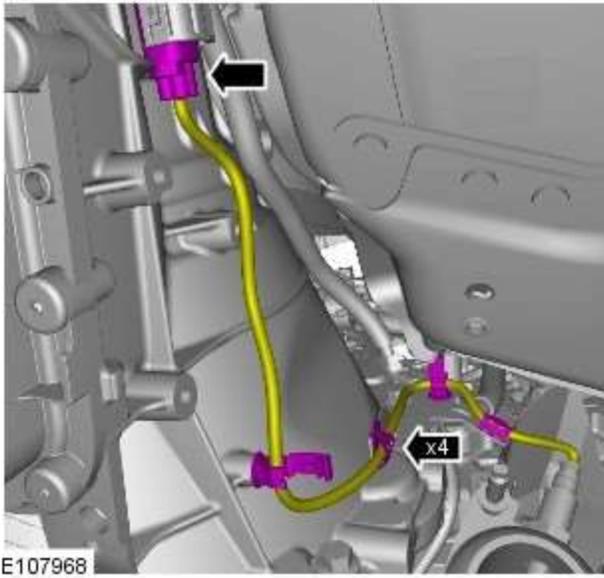
3. Refer to: [Catalytic Converter RH](#) (309-00C Exhaust System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).

4. Refer to: [Catalytic Converter LH](#) (309-00C Exhaust System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).

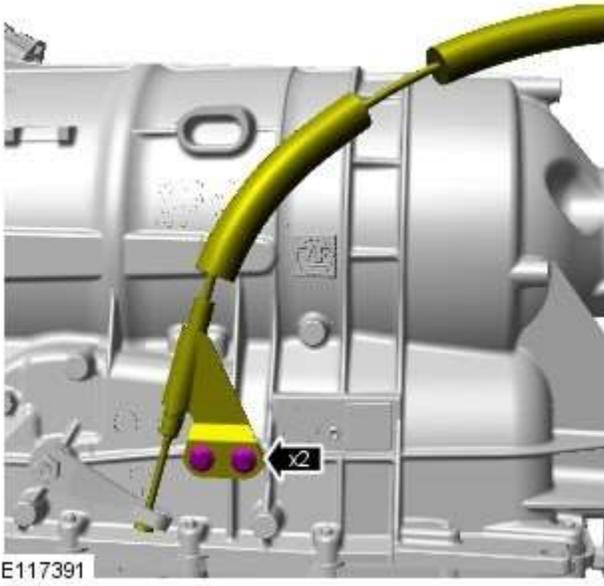
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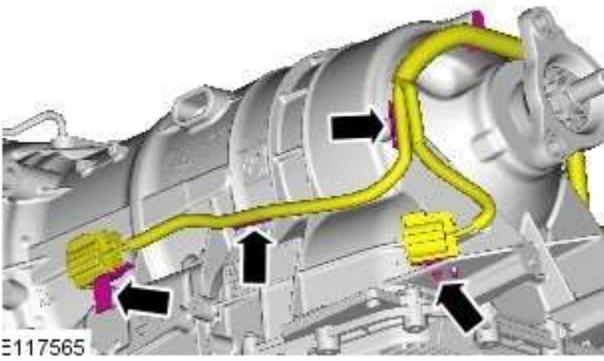
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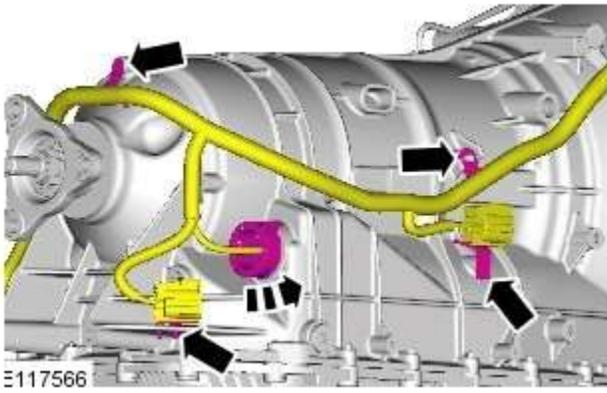


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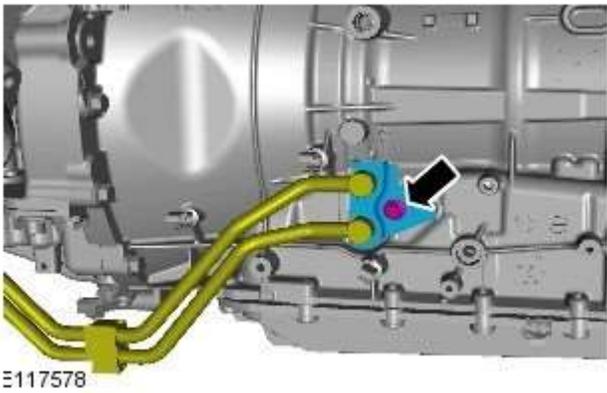


8.





9.



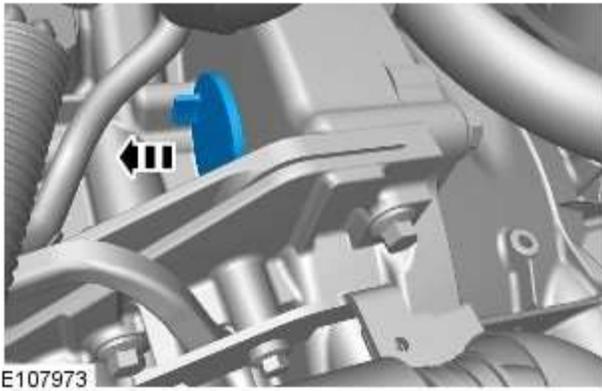
10.  CAUTION: Be prepared to collect escaping fluids.

 NOTE: Remove and discard the O-ring seals.

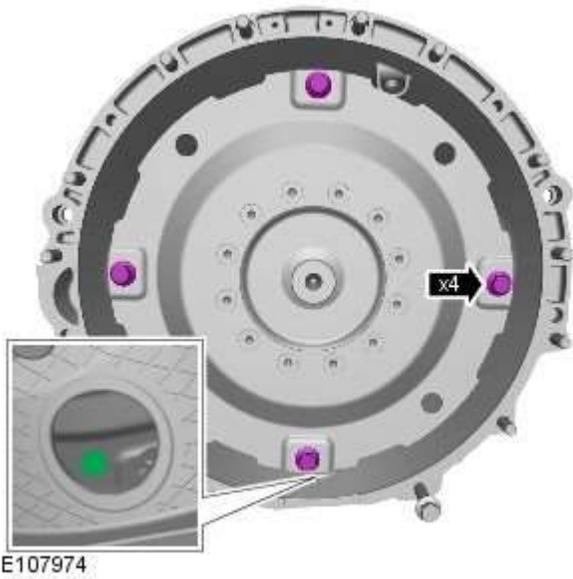
Install blanking caps to the exposed ports.



11.

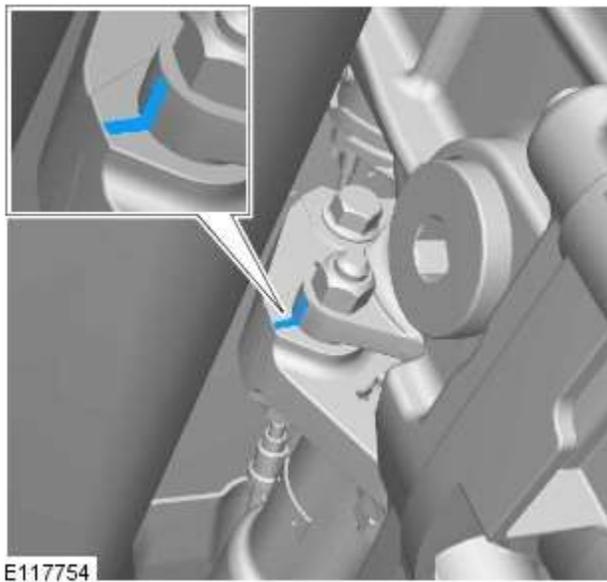


12.

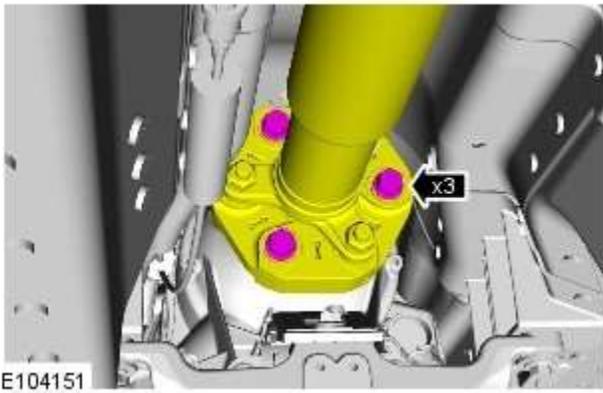


13.

- Make sure that the alignment mark is visible through the inspection hole on removal of the last torque converter bolt.

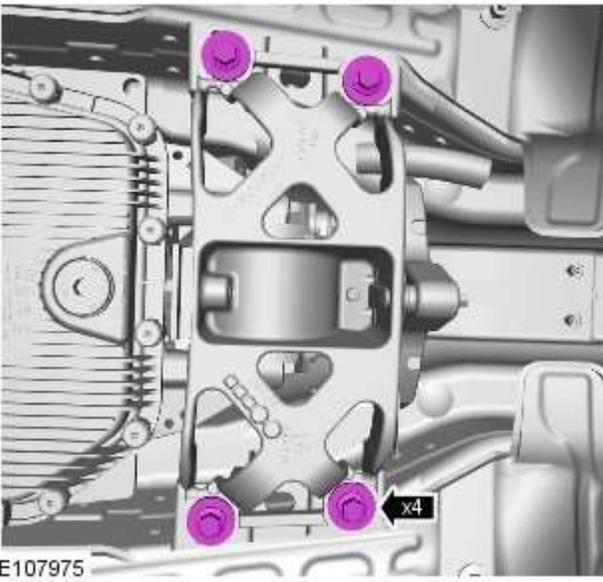


14.  NOTE: Mark the position of the driveshaft on the transmission flange.

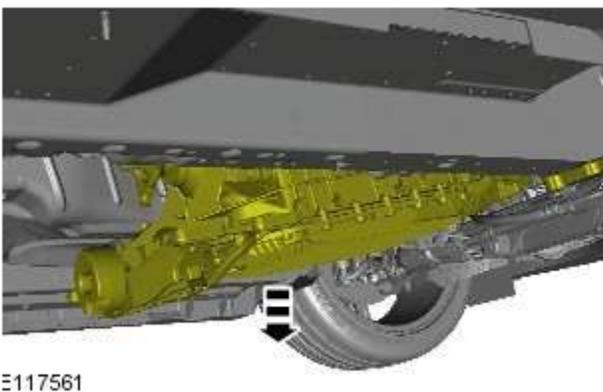


- 15.
- Using a suitable tie strap, secure the driveshaft.

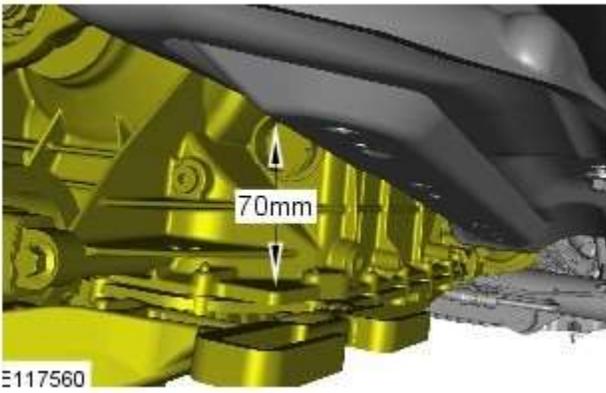
16.  **WARNING:** Make sure that the transmission is secured with suitable retaining straps.
Using a suitable stand, support the transmission.



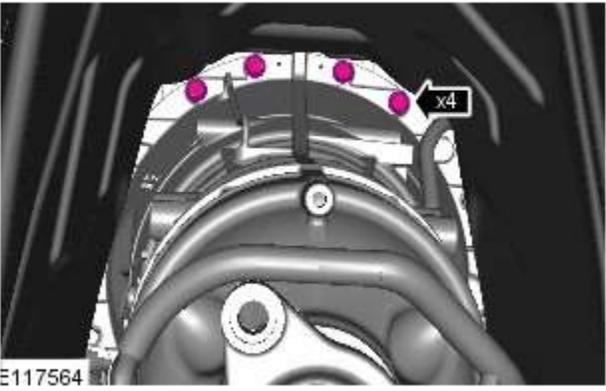
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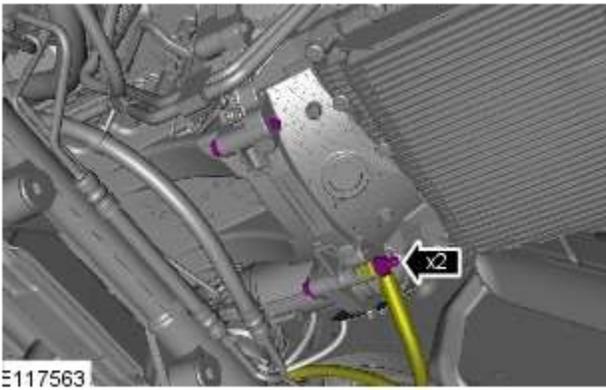
18.  **NOTE:** The transmission is lowered for access.
Lower the rear of the transmission for access.



19.  NOTE: The transmission is lowered for access.

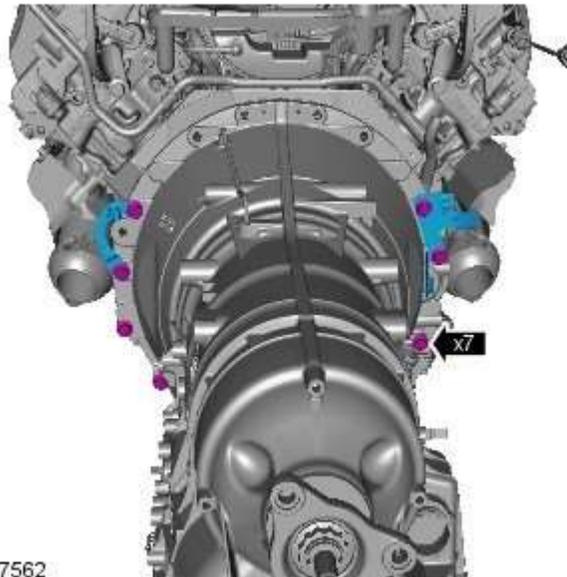


20.



21.

22.

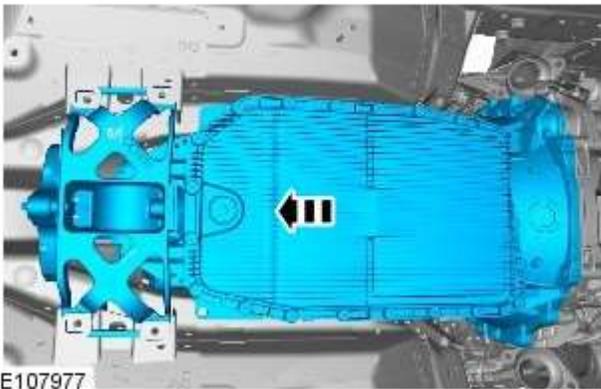


E117562

23.  CAUTION: Make sure that the torque converter remains in the transmission.

 NOTE: This step requires the aid of another technician.

- Install the torque converter retainer.

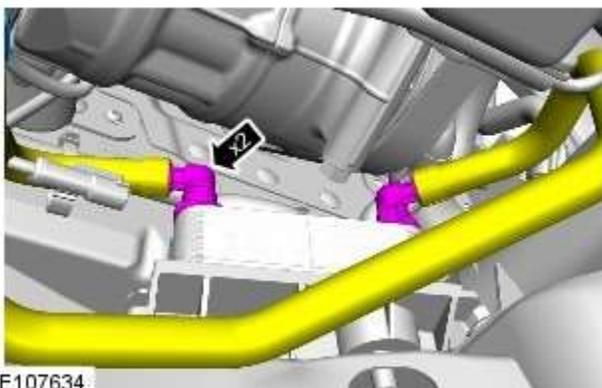


E107977

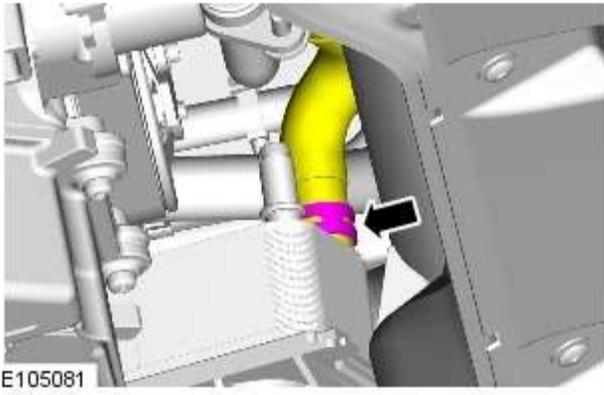
24. CAUTIONS:

 Be prepared to collect escaping fluids.

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

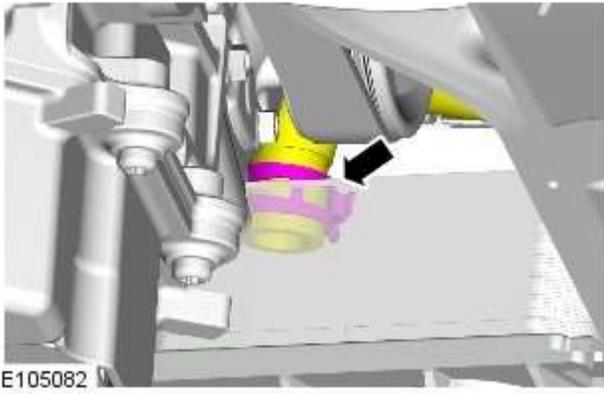


E107634

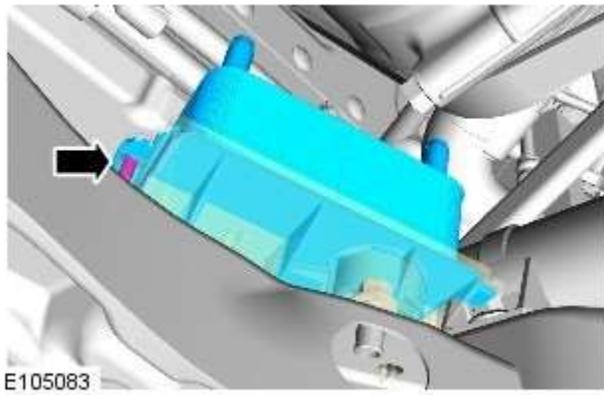


25.

- Clamp the hoses to minimize coolant loss.

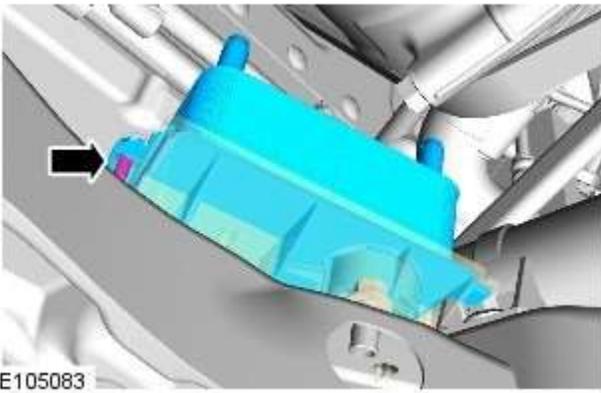


26.

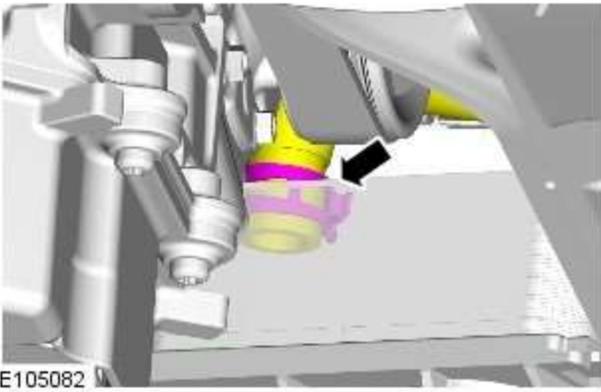


27.

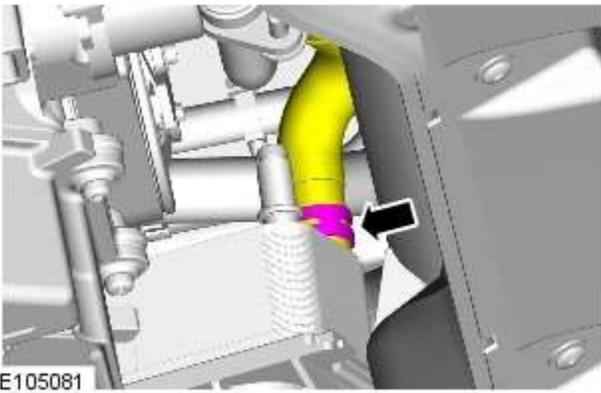
Installation



1. *Torque:* 5 Nm

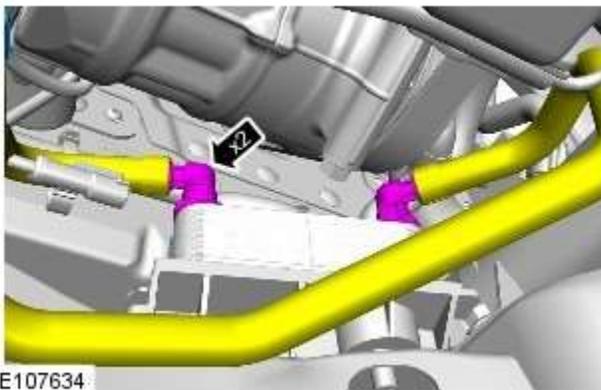


2.



3.

- Clamp the hoses to minimize coolant loss.



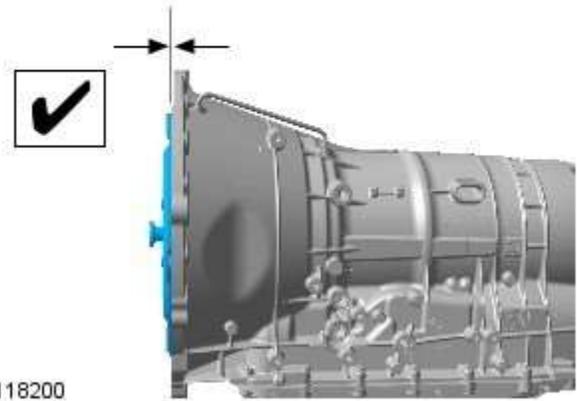
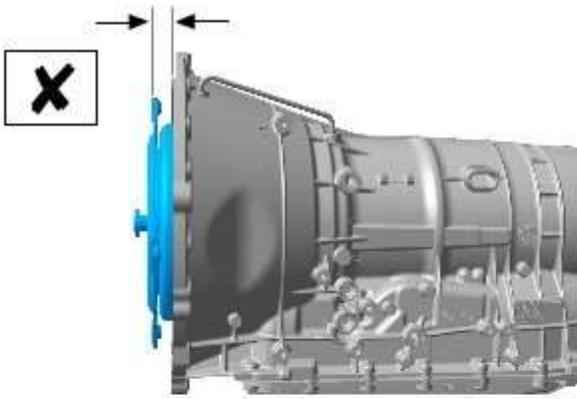
4. CAUTIONS:



Be prepared to collect escaping fluids.



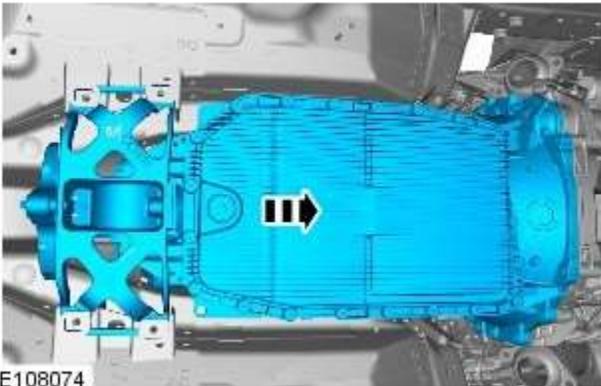
Make sure that all openings are sealed. Use new blanking caps.



E118200



5. CAUTION: Make sure the torque converter is fully located into the oil pump drive.



E108074

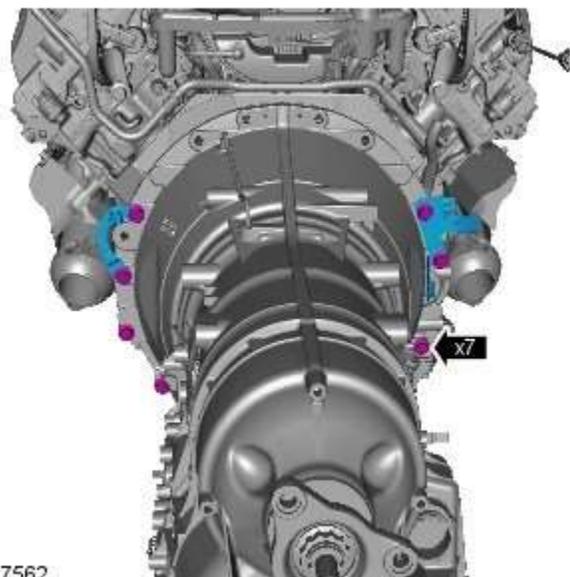


6. CAUTION: Make sure that the torque converter remains in the transmission.



NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

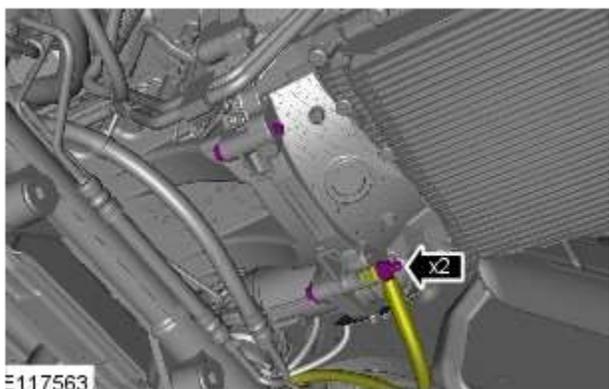
Raise the powertrain assembly jack and transmission assembly.



E117562

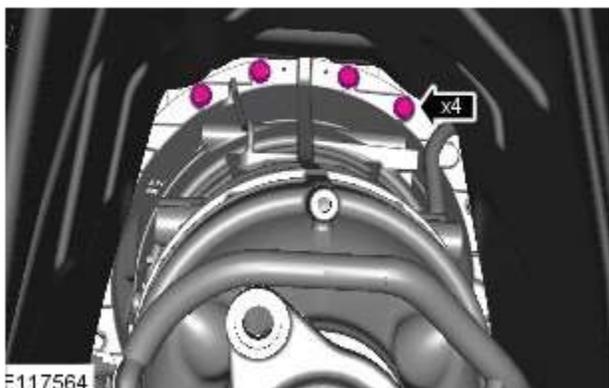
7.  NOTE: Transmission shown removed for clarity.

Torque: 48 Nm



E117563

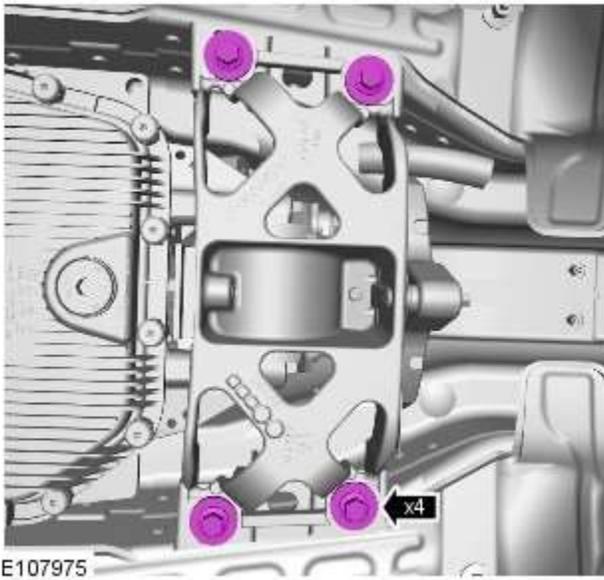
8. Torque: 48 Nm



E117564

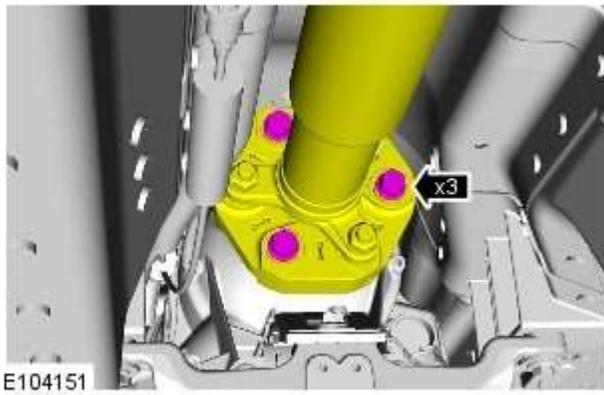
9. Torque: 48 Nm

10. *Torque:* 45 Nm



11. Remove the support.

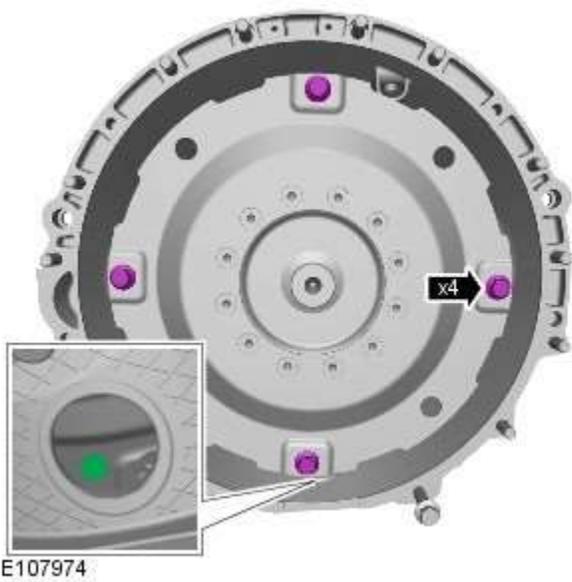
12. *Torque:* 110 Nm



13.  CAUTION: Only rotate the crankshaft clockwise.

 NOTE: Make sure that the alignment mark is visible through the inspection hole as illustrated.

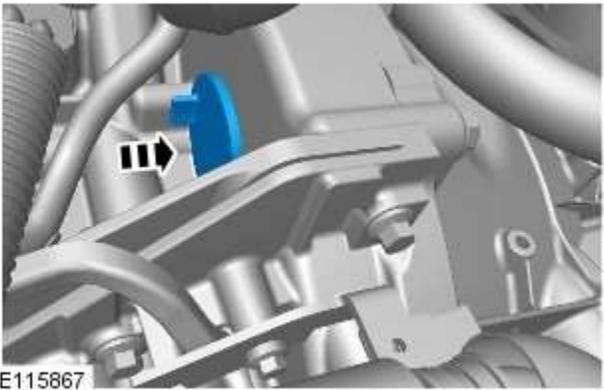
Torque: 63 Nm





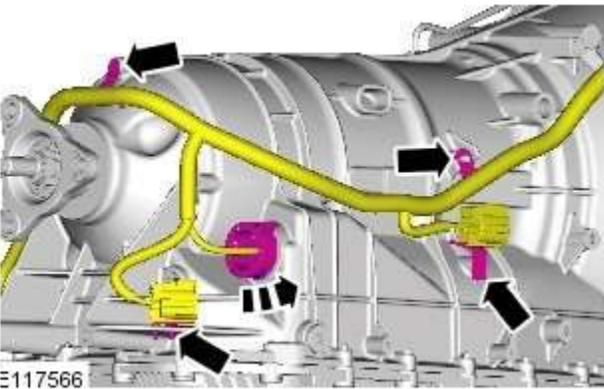
E107972

14.



E115867

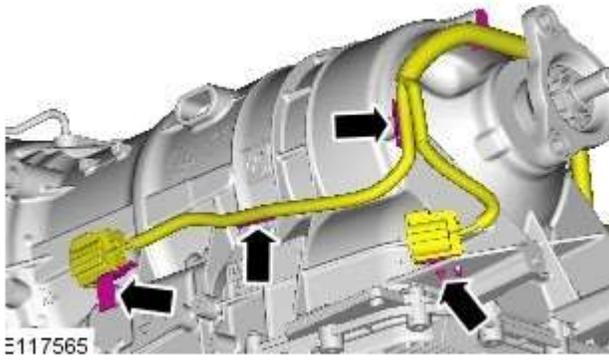
15.



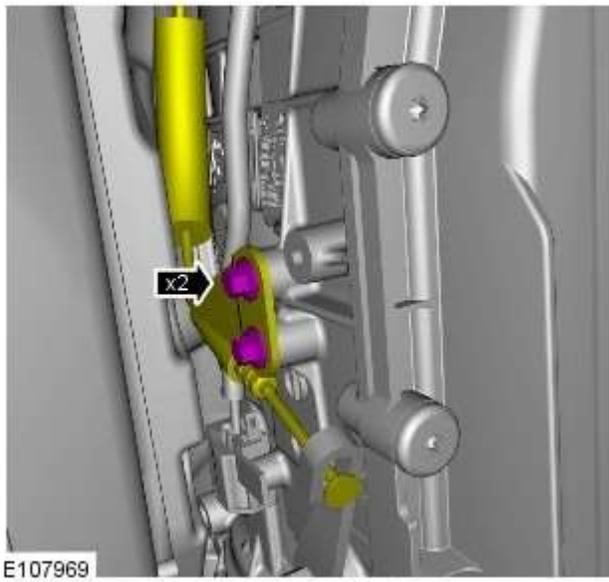
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16.

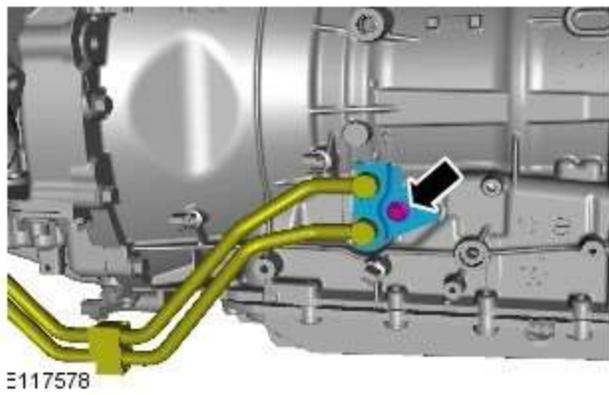
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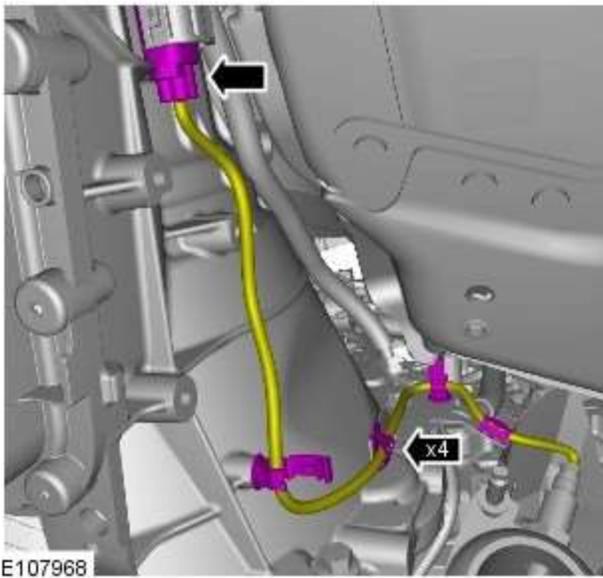
18. *Torque:* 10 Nm



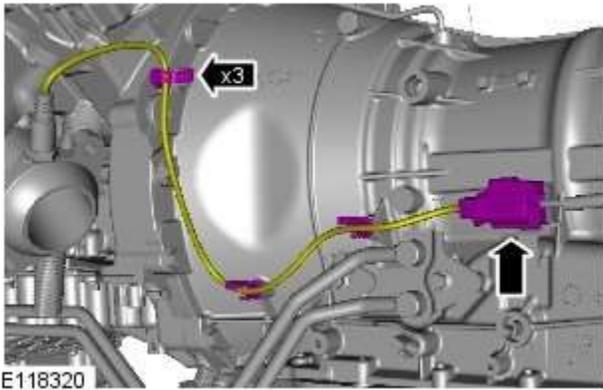
19.  CAUTION: Install new o-ring seals
Torque: 10 Nm



20.



21.



22. Refer to: [Catalytic Converter LH](#) (309-00C Exhaust System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).
23. Refer to: [Catalytic Converter RH](#) (309-00C Exhaust System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).
24. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
25. Check and top up the cooling system as required.
26. Set the heater controls to HOT.
27.  **CAUTION:** Observe the engine temperature warning light. If the warning light is displayed, switch off immediately and allow to cool. Failure to follow this instruction may cause damage to the vehicle.
Start the engine and allow to idle until hot air is emitted at the face registers.

28.  CAUTION: Observe the engine temperature warning light. If the warning light is displayed, switch off immediately and allow to cool. Failure to follow this instruction may cause damage to the vehicle.

Raise the engine speed to 2000 RPM and maintain at 2000 RPM until the engine cooling fan operates.

29.  CAUTION: Switch off the engine and allow the coolant temperature to go cold.

Switch the engine off and allow to cool.

30. Visually check the engine and cooling system for signs of coolant leakage.

31. WARNINGS:



When releasing the cooling system pressure, cover the coolant expansion tank cap with a thick cloth.



Since injury such as scalding could be caused by escaping steam or coolant, make sure the vehicle cooling system is cool prior to carrying out this procedure.

CAUTIONS:



Make sure the coolant level remains above the "COLD FILL RANGE" lower level mark.



Anti-freeze concentration must be maintained at 50%.



NOTE: When the cooling system is warm, the coolant will be approximately 10mm above the upper level mark on the expansion tank with the cap removed.

Check and top-up the coolant if required.

32. Refer to: [Transmission Fluid Level Check](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, General Procedures).

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission V8 5.0L Petrol/V8 S/C 5.0L Petrol

Removal

1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).



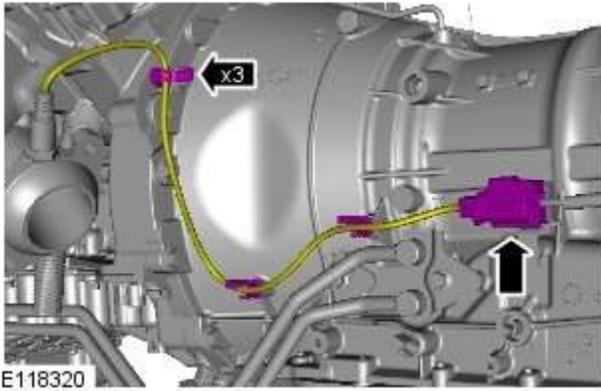
2. **WARNING:** Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

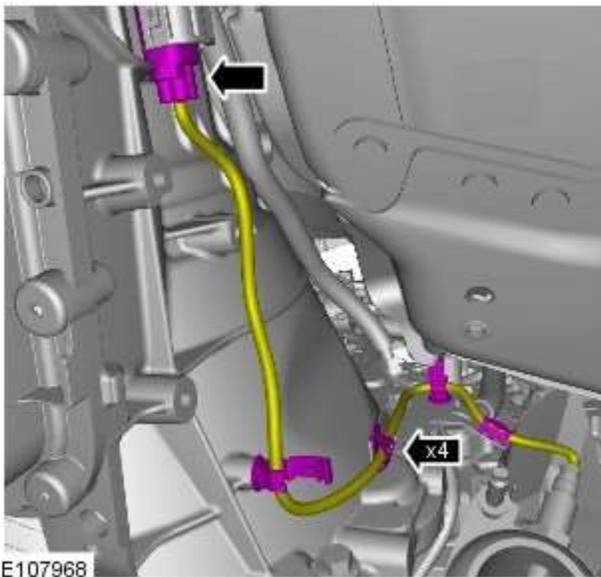
3. Refer to: [Catalytic Converter RH](#) (309-00C Exhaust System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).

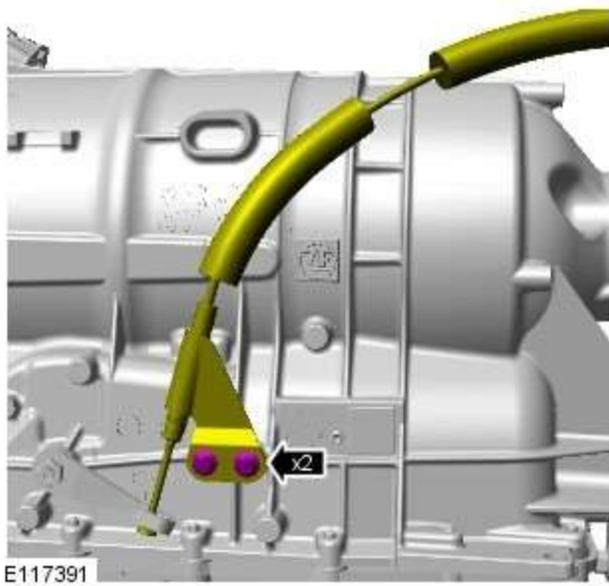
4. Refer to: [Catalytic Converter LH](#) (309-00C Exhaust System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).

5.

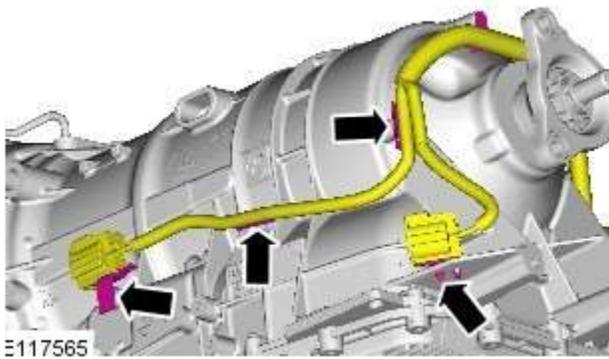


6.

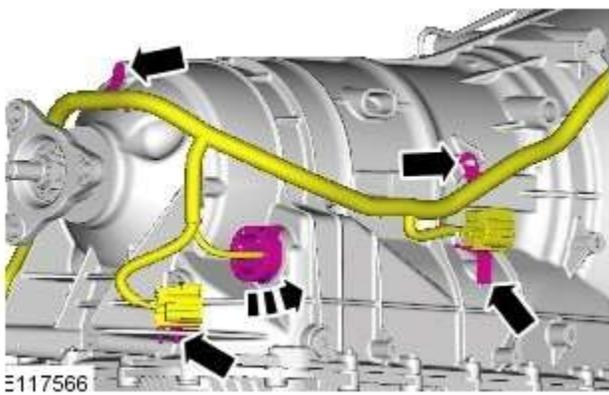




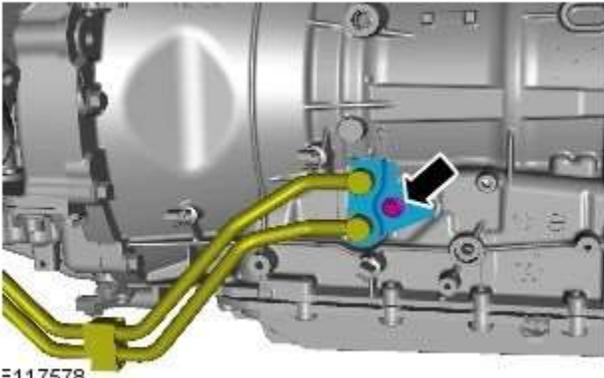
7.



8.



9.



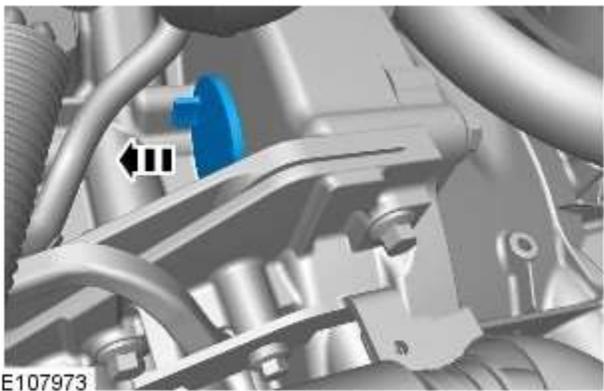
E117578

10.  CAUTION: Be prepared to collect escaping fluids.



E107972

11.

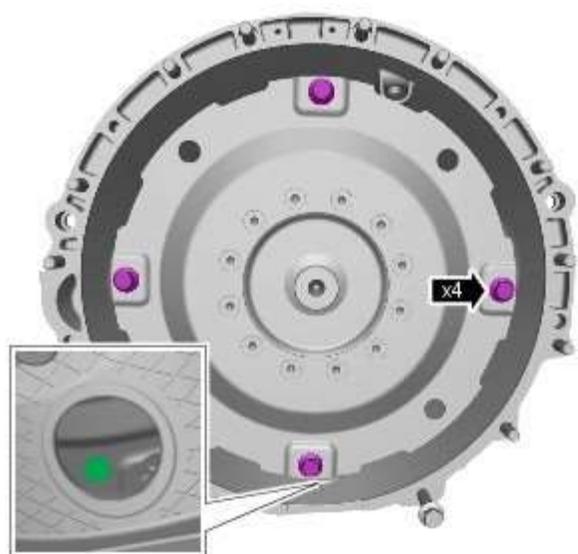


E107973

12.

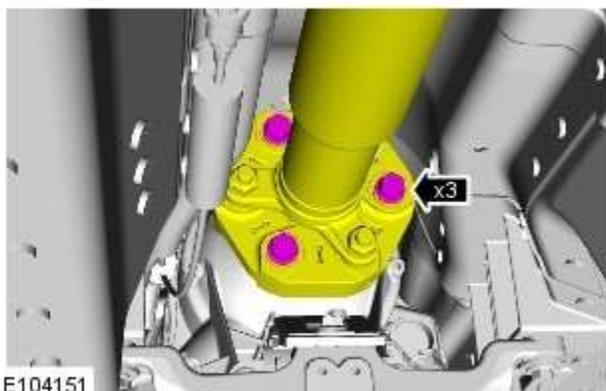
13.

- Make sure that the alignment mark is visible through the inspection hole on removal of the last torque converter bolt.



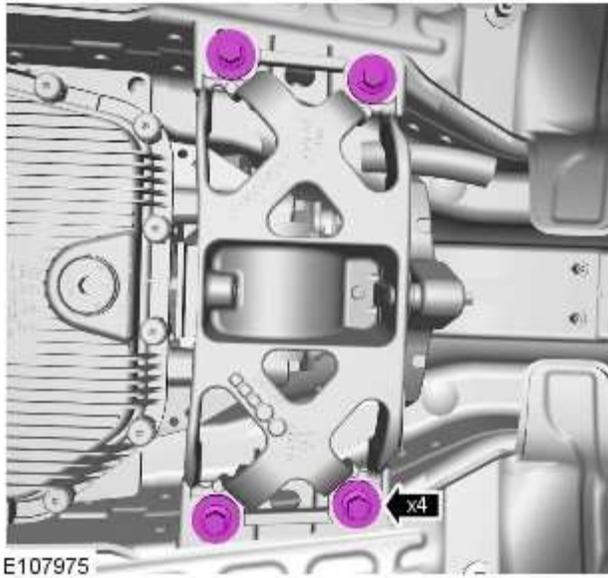
E107974

14.

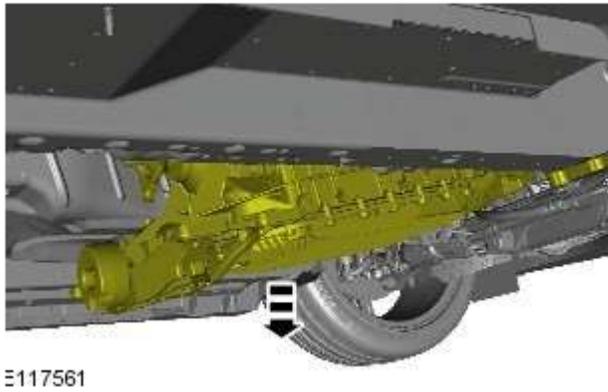


E104151

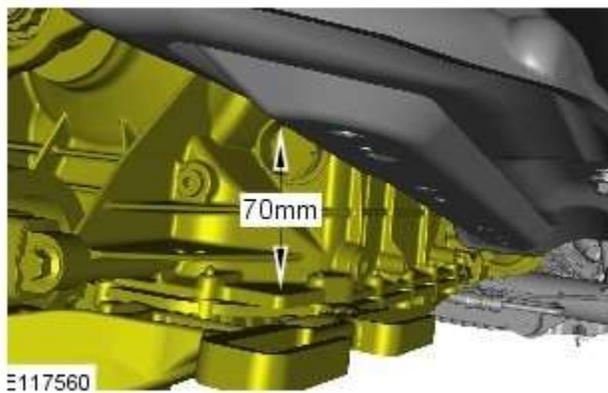
15.  **WARNING:** Make sure that the transmission is secured with suitable retaining straps.
Using a suitable stand, support the transmission.



16.

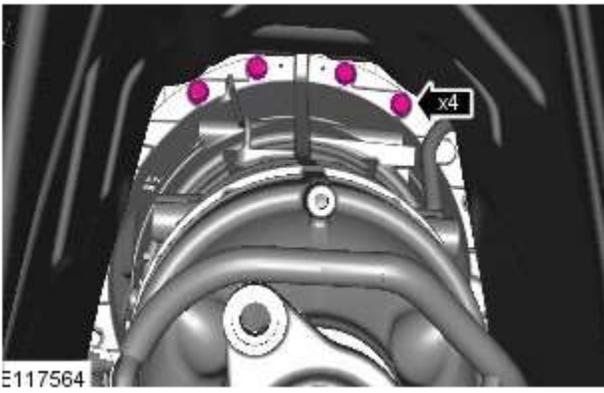


17.  NOTE: The transmission is lowered for access.
Lower the rear of the transmission for access.

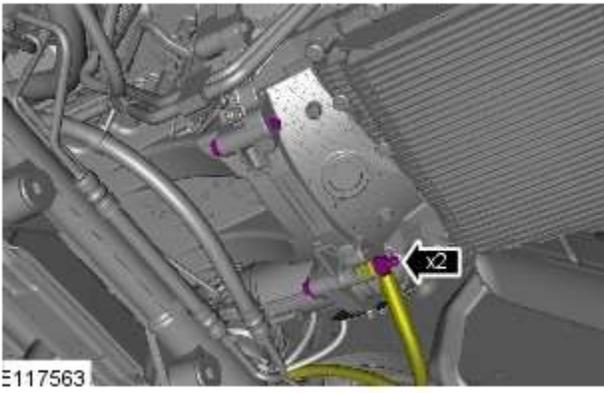


18.  NOTE: The transmission is lowered for access.

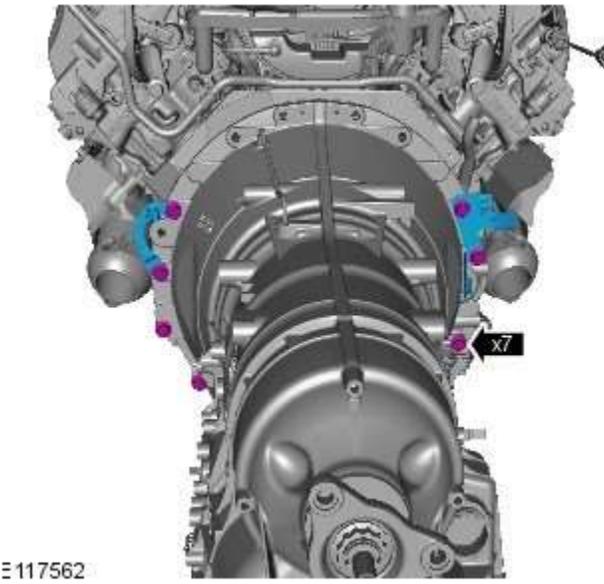
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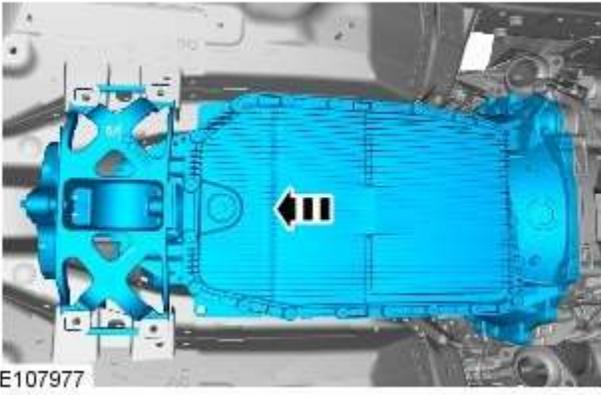


20.



21.





22.  CAUTION: Make sure that the torque converter remains in the transmission.

 NOTE: This step requires the aid of another technician.

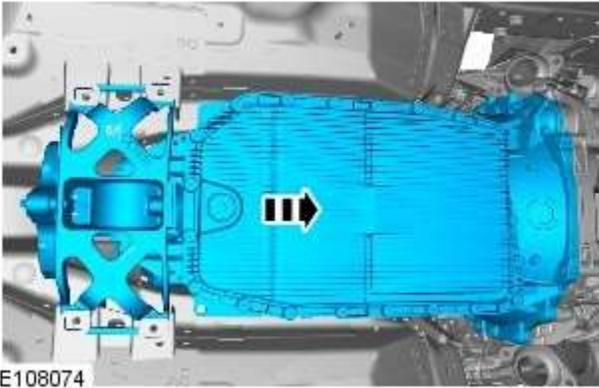
- Install the torque converter retainer.

Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission V8 5.0L Petrol/V8 S/C 5.0L Petrol

Installation



NOTE: Some variation in the illustrations may occur, but the essential information is always correct.



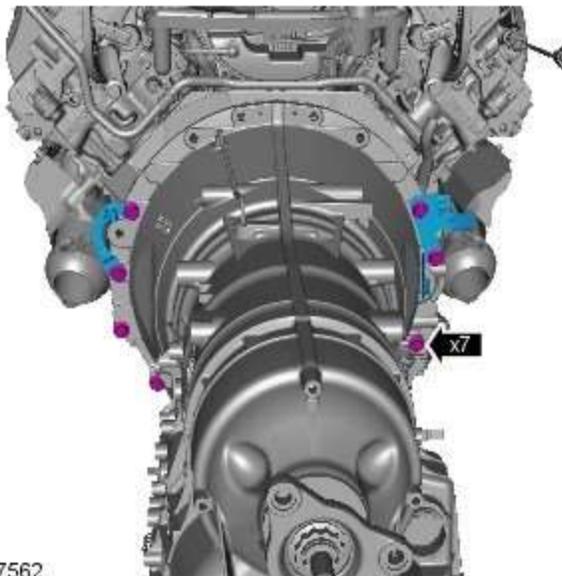
E108074

1.  CAUTION: Make sure that the torque converter remains in the transmission.



NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

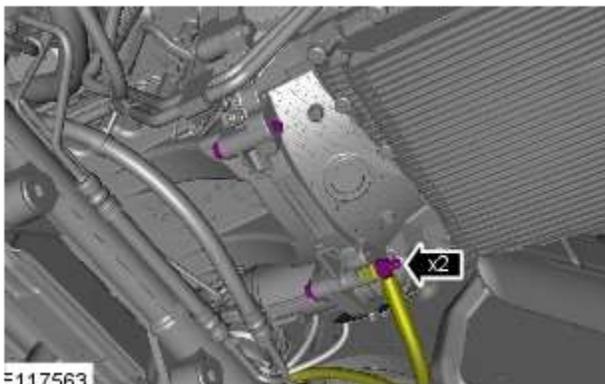
Raise the powertrain assembly jack and transmission assembly.



E117562

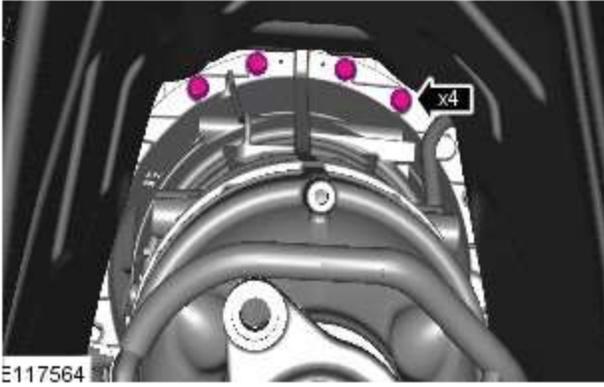
2.  NOTE: Transmission shown removed for clarity.

Torque: 48 Nm

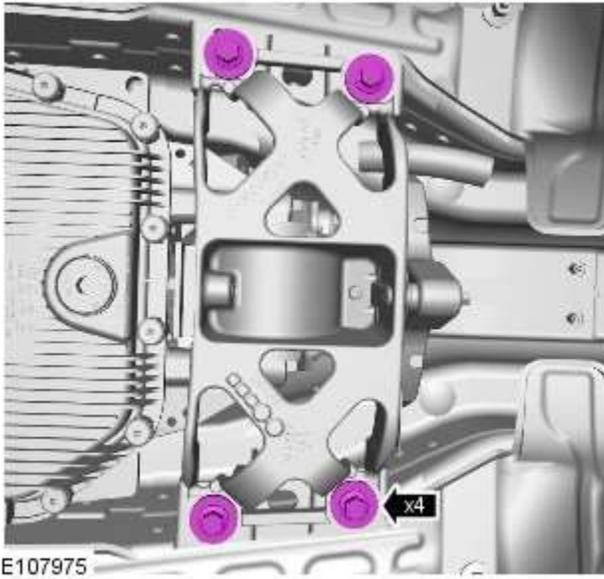


E117563

3. *Torque: 48 Nm*

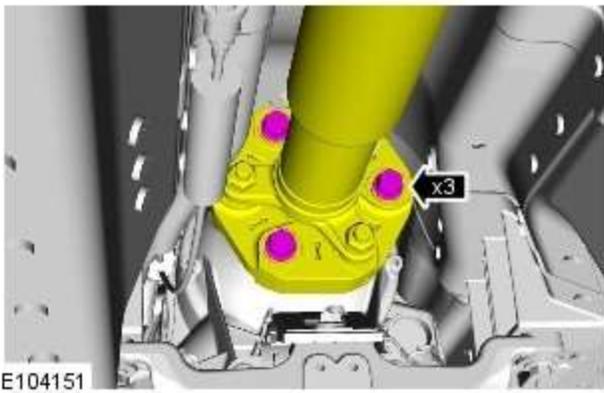


4. *Torque:* 48 Nm

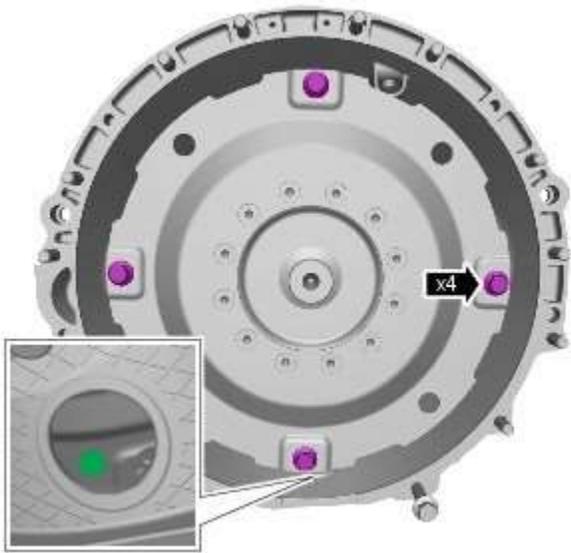


5. *Torque:* 45 Nm

6. Remove the support.



7. *Torque:* 110 Nm



E107974

8.  CAUTION: Only rotate the crankshaft clockwise.

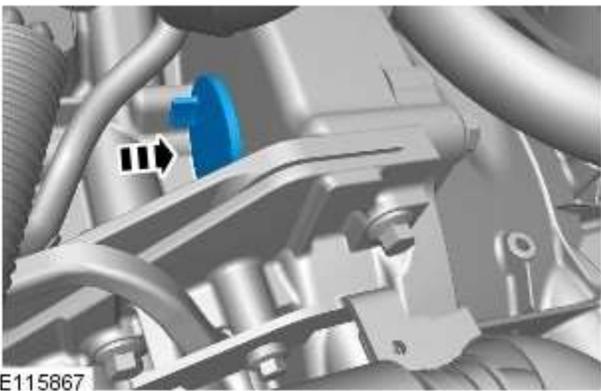
 NOTE: Make sure that the alignment mark is visible through the inspection hole as illustrated.

Torque: 63 Nm



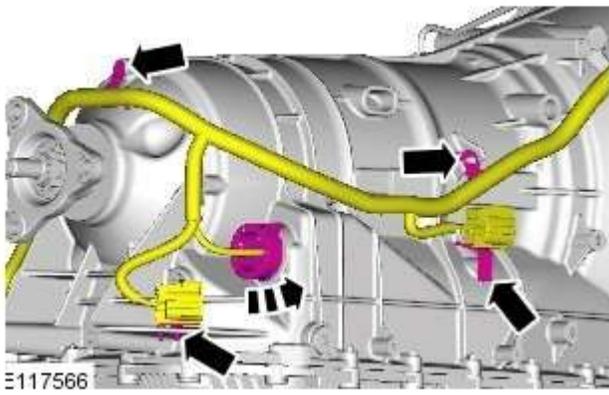
E107972

9.

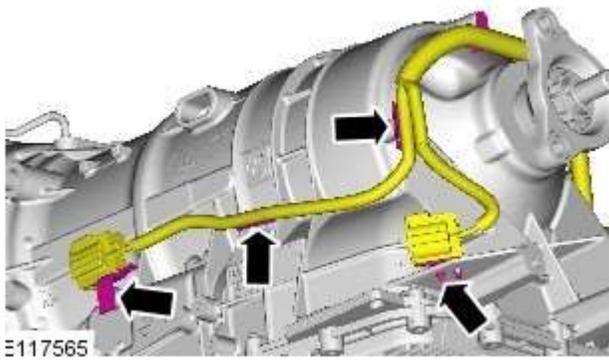


E115867

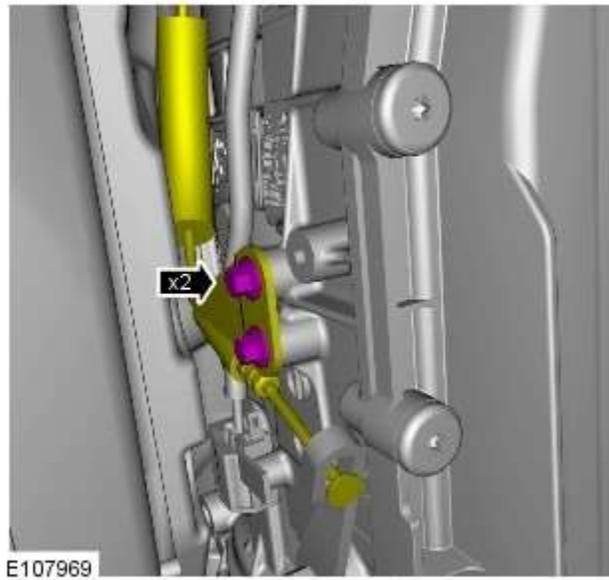
10.



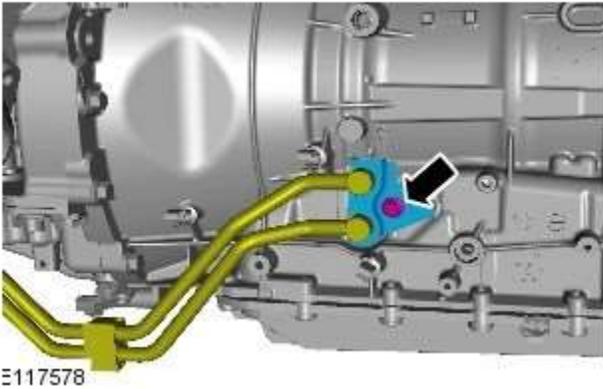
11.



12.



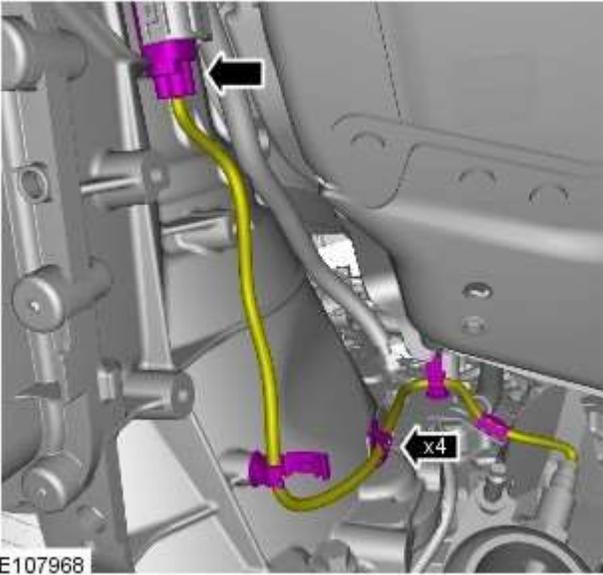
13. *Torque:* 10 Nm



E117578

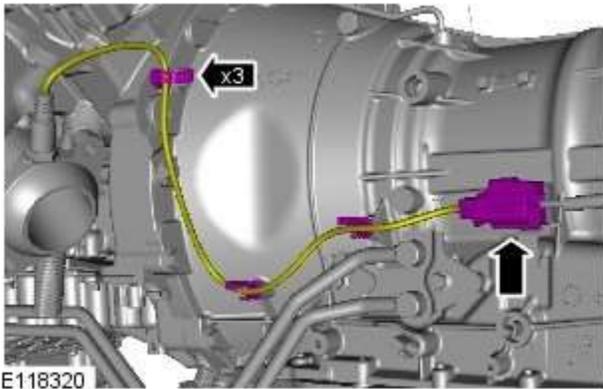
14.  CAUTION: Install new o-ring seals

Torque: 10 Nm



E107968

15.



E118320

16.

17. Refer to: [Catalytic Converter LH](#) (309-00C Exhaust System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).

18. Refer to: [Catalytic Converter RH](#) (309-00C Exhaust System - V8 5.0L Petrol/V8 S/C 5.0L Petrol, Removal and Installation).

19. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).

20.  NOTE: For NAS vehicles only.

If required, carry out a long drive cycle.

Refer to: [Powertrain Control Module \(PCM\) Long Drive Cycle Self-Test](#)
(303-14D Electronic Engine Controls - V8 S/C 5.0L Petrol, General Procedures).

Transmission/Transaxle Cooling - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol -

Item	Specification
Transmission fluid	ATF Shell M 1375.4

Vehicles with 3.0L diesel engine

Description	Nm	lb-ft
Transmission fluid cooler tube to transmission housing bolt	23	17
Transmission fluid cooler tube bracket to engine oil pan retaining bolt	23	17

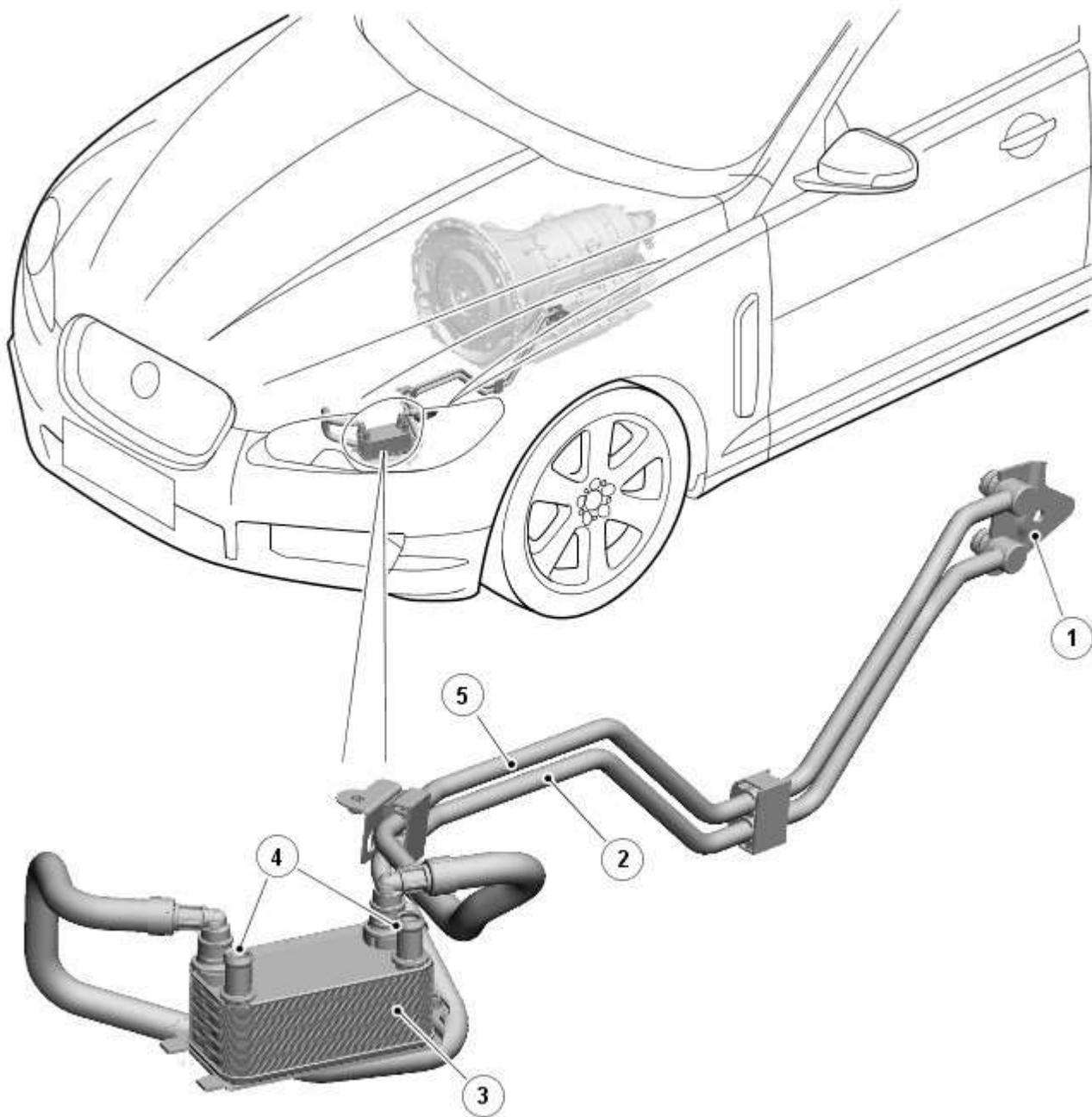
Vehicles with 5.0L engine

Description	Nm	lb-ft
Transmission fluid cooler tube to transmission housing bolt	23	17
Transmission fluid cooler tube bracket to engine oil pan retaining bolt	11	8

Transmission/Transaxle Cooling - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Cooling - Component Location

Description and Operation

COMPONENT LOCATION



E118008

Item	Description
1	Latch-plate
2	Feed hose and pipe (from transmission)
3	Transmission fluid cooler
4	Engine coolant hose connections
5	Return hose and pipe (to transmission)

Transmission/Transaxle Cooling - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Cooling - Overview

Description and Operation

OVERVIEW

Transmission cooling is provided by a transmission fluid cooler, which transfers heat from the transmission to the engine cooling system. The transmission fluid cooler is attached to a mounting bracket on the front subframe, in the front left corner of the engine compartment.

Two hose and pipe assemblies connect the transmission fluid cooler to the automatic transmission. Two engine coolant hose connections are incorporated into the top of the transmission fluid cooler for the supply and return of coolant from the engine cooling system. For additional information, refer to 303-03D Engine Cooling.

Transmission/Transaxle Cooling - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Cooling - System Operation and Component Description

Description and Operation

System Operation

Fluid from the pump in the automatic transmission flows through the feed hose and pipe to the transmission fluid cooler. The fluid then flows through the transmission fluid cooler, and the return hose and pipe, to the sump of the automatic transmission.

Transmission/Transaxle Cooling - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Cooling

Diagnosis and Testing

Principle of Operation

For a detailed description of the automatic transmission cooling system, refer to the relevant Description and Operation sections in the workshop manual. REFER to: (307-02B Transmission/Transaxle Cooling - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol)

[Transmission Cooling](#) (Description and Operation),
[Transmission Cooling](#) (Description and Operation),
[Transmission Cooling](#) (Description and Operation).

Inspection and Verification

1. Verify the customer concern by operating the system.
2. Visually inspect for obvious signs of damage and system integrity.

Visual Inspection

Mechanical
<ul style="list-style-type: none"> • Feed and return tubes • Connections to the automatic transmission and the automatic transmission fluid cooler • Automatic transmission fluid level

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. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

Symptom Chart

Condition	Possible Causes	Action
Over heating of the automatic transmission	Obstruction in the automatic transmission fluid cooler	Flush out the automatic transmission fluid cooler with new automatic transmission fluid. If the flushing is unsuccessful, install a new transmission fluid cooler.
Over heating of the automatic transmission	Obstruction in the automatic transmission fluid tubes	Flush out the automatic transmission fluid cooler tubes with new automatic transmission fluid. If the flushing is unsuccessful install new automatic transmission fluid cooler tubes.
Loss of automatic transmission fluid	Connections to the automatic transmission and the automatic transmission fluid cooler	Check the integrity of the tubes, connections and seals. Check the torque of the tube fixings.
Loss of automatic transmission fluid	Leak at oil cooler	Check the integrity of tubes, connections and seals. Check the torque of the tube fixings.

Transmission/Transaxle Cooling - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Fluid Cooler V8 5.0L Petrol/V8 S/C 5.0L Petrol

Removal and Installation

Removal



NOTE: Removal steps in this procedure may contain installation details.



1. **WARNING:** Make sure to support the vehicle with axle stands.
Raise and support the vehicle.
2. Refer to: [Transmission Fluid Drain and Refill](#) (307-01B Automatic Transmission/Transaxle - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol, General Procedures).
3. Refer to: [Cooling System Draining and Vacuum Filling](#) (303-03C Engine Cooling - V8 5.0L Petrol/V8 S/C 5.0L Petrol, General Procedures).

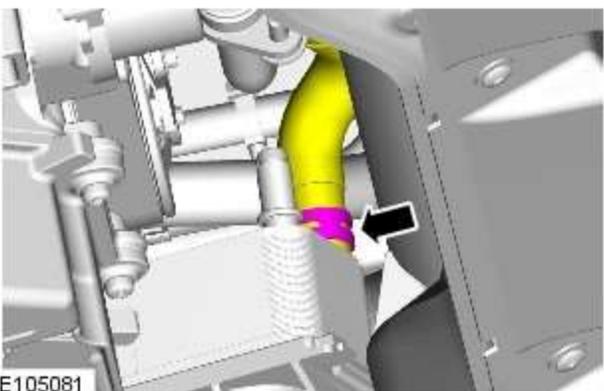
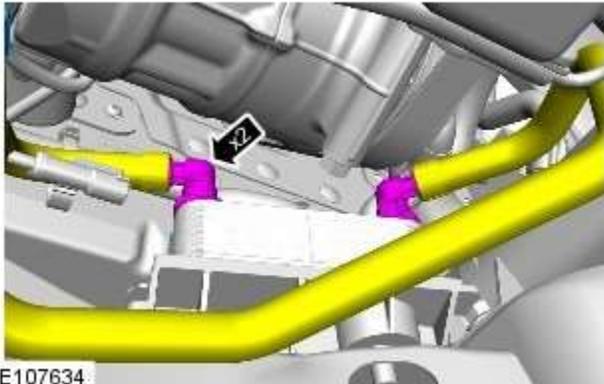
4. CAUTIONS:



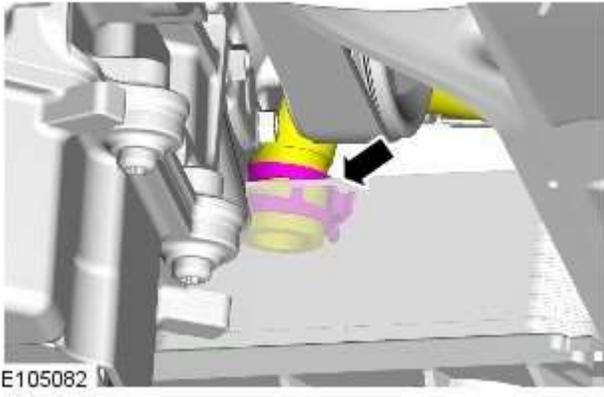
Be prepared to collect escaping fluids.



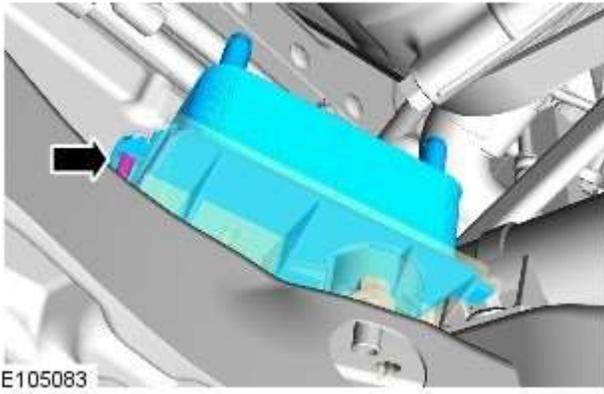
Make sure that all openings are sealed. Use new blanking caps.



5.



6.



7. *Torque:* 5 Nm

Installation

1. To install, reverse the removal procedure.

Transmission/Transaxle Cooling - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - Transmission Fluid Cooler Tubes V8 5.0L Petrol/V8 S/C 5.0L Petrol

Removal and Installation

Removal



NOTE: Removal steps in this procedure may contain installation details.



1. **WARNING:** Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

2. Refer to: [Transmission Fluid Drain and Refill](#) (307-01A Automatic Transmission/Transaxle - V6 3.0L Petrol, General Procedures).

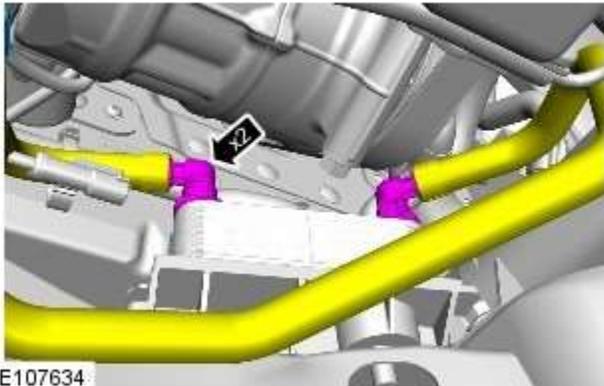
3. **CAUTIONS:**



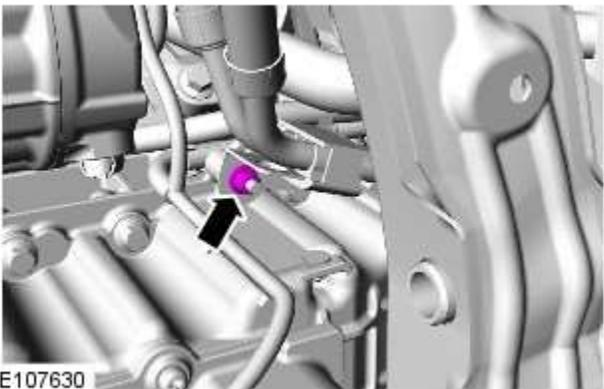
Be prepared to collect escaping fluids.



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

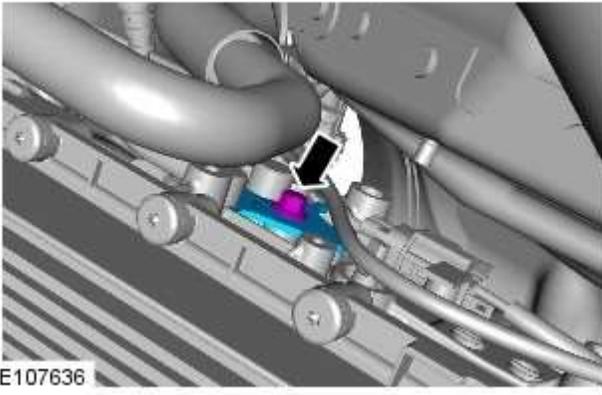


E107634

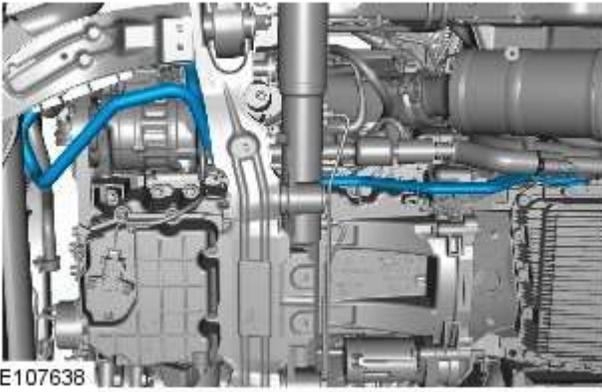


E107630

4. **Torque:** 11 Nm



5. *Torque:* 23 Nm



6.  NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

Installation

1. To install, reverse the removal procedure.

Automatic Transmission/Transaxle External Controls - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol -

Torque Specifications

Description	Nm	lb-ft	lb-in
Uppshift paddle switch to steering wheel retaining bolt	3	-	27
Downshift paddle switch to steering wheel retaining bolt	3	-	27
Transmission control switch (TCS) to floor console bracket retaining bolts	4	-	35
Emergency park position release lever cable bracket to transmission housing retaining bolts	11	8	-

Automatic Transmission/Transaxle External Controls - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - External Controls - Component Location

Description and Operation

COMPONENT LOCATION



E118501

Item	Description
1	Upshift (+) paddle switch
2	Downshift (-) paddle switch
3	JaguarDrive selector
4	Emergency park release

Automatic Transmission/Transaxle External Controls - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - External Controls - Overview

Description and Operation

OVERVIEW

The external controls for the transmission consist of a JaguarDrive selector, two paddle switches and an emergency park release.

The JaguarDrive selector transmits driver transmission selections to the [TCM \(transmission control module\)](#). The paddle switches allow the driver to initiate gear shifts when the transmission is in the sequential shift manual mode. The emergency park release ensures the transmission is kept in neutral during vehicle recovery operations.

Four additional switches adjacent to the JaguarDrive selector control the JaguarDrive control functions. For additional information, refer to 204-06 Ride and Handling Optimization Description and Operation.

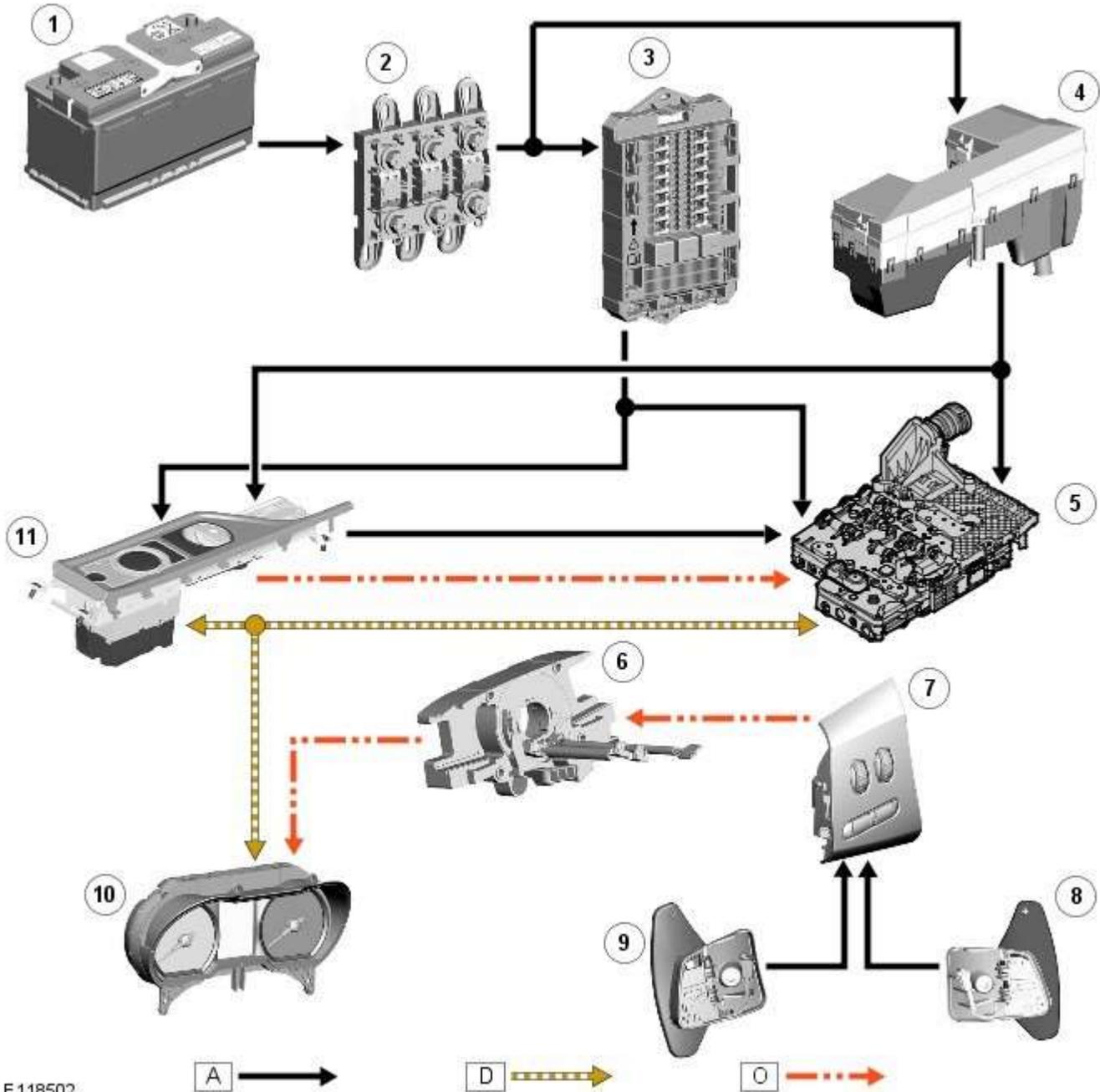
Automatic Transmission/Transaxle External Controls - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - External Controls - System Operation and Component Description

Description and Operation

Control Diagram



NOTE: A = Hardwired; D = High speed CAN (controller area network) bus; O = LIN (local interconnect network) bus



E 118502

A →

D →

O →

Item	Description
1	Battery
2	BJB (battery junction box) (250 A megafuse)
3	CJB (central junction box)
4	EJB (engine junction box)
5	TCM (transmission control module)

6	Clockspring
7	Steering wheel audio switches
8	Upshift paddle switch
9	Downshift paddle switch
10	Instrument cluster
11	JaguarDrive selector

System Operation

JAGUARDRIVE SELECTOR

Rotation of the JaguarDrive selector to any of the five positions is sensed by the [TCM \(transmission control module\)](#) via the high speed [CAN](#) bus. A [LIN](#) bus connection is also provided, but is only used in the event of a [CAN](#) bus failure as a back-up. The [TCM](#) then reacts according to the selected position. The JaguarDrive selector is a magnetic system using Hall effect sensors to determine the position of the selector.

The S (sport) position selection allows the [TCM](#) to operate the transmission using the semi-automatic Jaguar sequential shift. Gear selections are sensed by the [TCM](#) when the driver operates the steering wheel paddle switches. Once the JaguarDrive selector position is confirmed, the [TCM](#) outputs appropriate information on the high speed [CAN](#) bus which is received by the instrument cluster to display the gear selection information in the message center. Refer to: [Information and Message Center](#) (413-08 Information and Message Center, Description and Operation).

The paddles can also be used on a temporary basis when the JaguarDrive selector is in the D (drive) position to override the automatic gear selection if required.

PARK INTERLOCK AND NEUTRAL LOCK

Neutral lock is a requirement for the JaguarDrive selector. The selector is always locked at ignition on when the engine is not running, except after an engine stall when the selector is not in P (park) or N (neutral).

If, when driving with the JaguarDrive selector in S, D or R (reverse) at a speed of more than 5 km/h (3 mph), the driver selects P or N:

- Without the brake pedal pressed, the JaguarDrive selector will be immediately locked once the vehicle speed falls to below 5 km/h (3 mph).
- With the brake pedal pressed, the JaguarDrive selector will remain locked for as long as the brake pedal remains pressed, regardless of vehicle speed.

The transmission will only engage park once the vehicle speed is less than 2 km/h (1 mph).

If the driver selects N and releases the brake pedal with a vehicle speed of less than 5 km/h (3 mph), the JaguarDrive selector will be locked 2 seconds after N is selected. The selector will remain locked until the driver presses the brake pedal again.

To ensure that a driver request to change from a non-driving range (N for example) to a driving range (D for example), the park interlock and neutral lock features are used in conjunction with the intermediate position.

If the transmission receives a range change request without the brake pedal pressed, the [TCM](#) initiates a soft lock function. The transmission will remain in park or neutral, depending on the starting position.

If a transmission position letter is flashing in the message center and the vehicle has no drive, the driver must:

- Press the brake pedal.
- Reselect N or P on the JaguarDrive selector.
- Select the required driving range, ensuring that the brake pedal is pressed.

Rocking Function

The rocking function compliments the neutral lock function. For all changes from a non-driving range to a driving range, it is necessary to press the brake pedal (to release either the park interlock or neutral lock).

In situations where the driver will require to change the gear selection from R to D, or from D to R, without brake pedal input (car park maneuvering, 3 point turns or 'rocking' the vehicle from a slippery surface for example), the rocking function gives a 2 second lock delay when N is selected on the JaguarDrive selector and the brake pedal is not pressed.

Intermediate Position

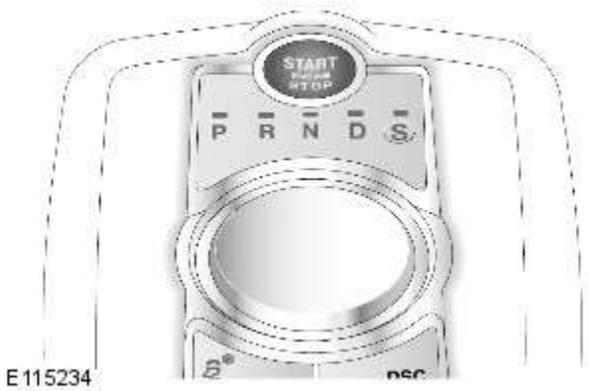
If the JaguarDrive selector is rotated slowly from P to S and back to position P with the brake pedal pressed, the R or D position display letter in the message center will flash and the transmission will remain in park or neutral depending on the previous starting position of the selector.

If the brake pedal is released when R or D is flashing in the message center and the JaguarDrive selector is rotated to the R or D position, the required range will not be selected and the transmission will remain in park or neutral, depending on the previous starting position. This feature is known as soft lock.

If the driving range letter in the message center is flashing and the vehicle has no drive, the driver should depress the brake pedal to reselect N or P, and then select the required driving range while the brake pedal remains pressed.

Component Description

JAGUARDRIVE SELECTOR



The Jaguardrive selector is a rotary selector installed in the top of the JaguarDrive selector module. The JaguarDrive selector module is located in the floor console and controls the vehicle optimization functions on the vehicle. For additional information, refer to: Ride and Handling Optimization (204-06 Ride and Handling Optimization, Description and Operation).

The [TCM](#) allows the transmission to be operated as a conventional automatic unit by selecting P, R, N, D on the JaguarDrive selector.

Rotation of the JaguarDrive selector allows the selection of P, R, N and D. By depressing the JaguarDrive selector and rotating clockwise from the D position, S mode can be selected. The JaguarDrive selector is fully electronic rotary transmission selector with no mechanical connection to the transmission.

The JaguarDrive selector rises from the JaguarDrive selector module once the engine is running. When the engine is stopped with the JaguarDrive selector in any position other than N, it retracts into the JaguarDrive selector module again. If the selector is in position N when the engine is stopped, it remains in the raised position for up to 10 minutes, for use in a drive through car wash for example. After 10 minutes the selector automatically retracts into the JaguarDrive selector module. The selector also retracts if P is selected within the 10 minute period.

If the JaguarDrive selector does not rise from the console when the engine is started, but electrical power is supplied to the selector, the retracted selector can still be rotated to make selections. If electrical power to the JaguarDrive selector is lost, the selector will not rise from the console when the engine is started and the retracted selector will not rotate.

The JaguarDrive selector contains an internal interlock solenoid to prevent the selector from being rotated when the engine is not running.

The engine can be stopped with the JaguarDrive selector in any position. Once the engine is stopped the selector will automatically reset to the P position and the transmission park lock will be engaged, except if the selector is moved to the N position when the engine is stopped.

PADDLE SWITCHES



E115235

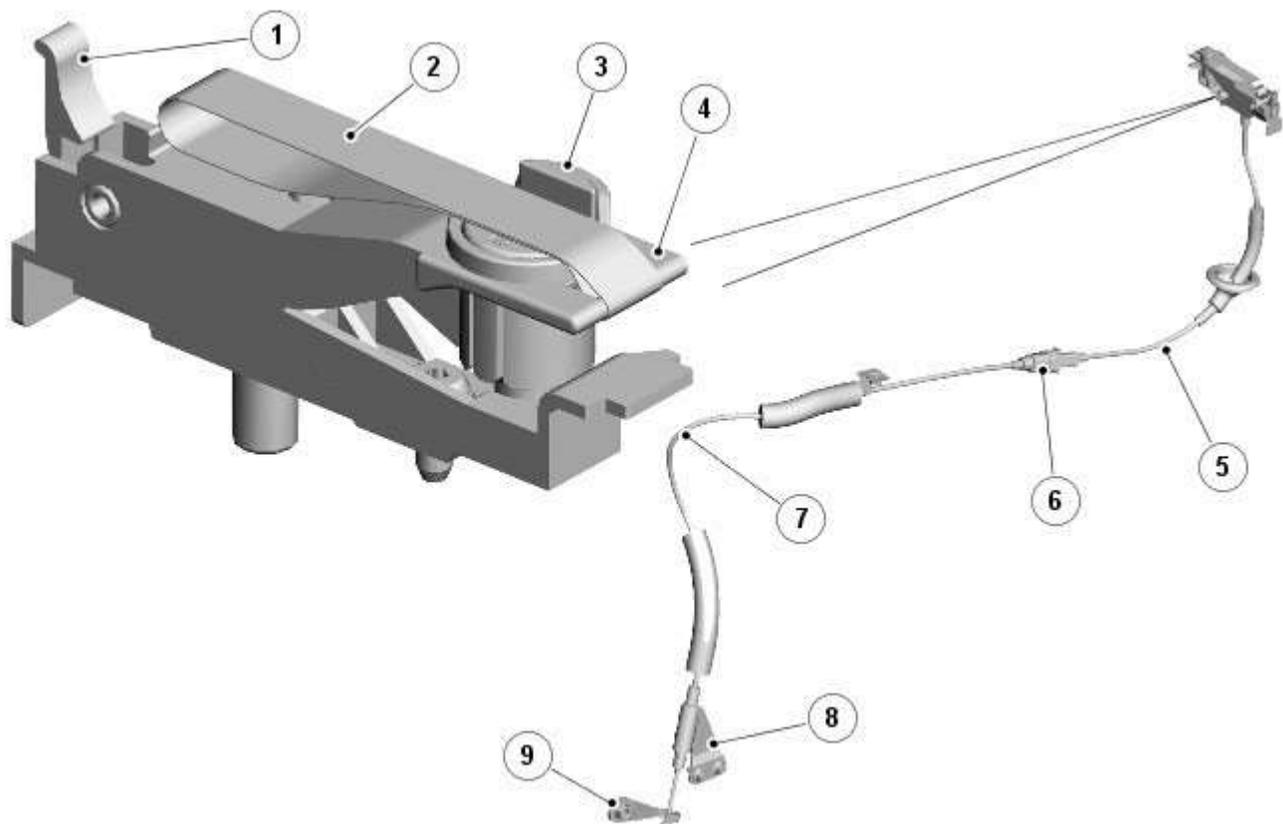
Two gear change 'paddle' switches are fitted at the rear of the steering wheel and allow the driver to operate the transmission as a semi-automatic manual gearbox using the Jaguar sequential shift feature.

Each paddle switch has three connections; ground, illumination [PWM \(pulse width modulation\)](#) supply and ground switch signal. The paddle switches are hardwired to the steering wheel audio switches. Operation of the paddle switch completes a ground path to the audio switch assembly. The audio switch assembly converts the completed ground signal into a [LIN](#) bus signal which is passed via the clockspring to the instrument cluster. The instrument cluster converts the signal into a high speed [CAN](#) bus signal to the [TCM](#).

Pulling the [LH \(left-hand\)](#) downshift - paddle provides down changes and pulling the [RH \(right-hand\)](#) upshift (+) paddle provides up changes. The first operation of either paddle, after sport mode is selected, puts the transmission into permanent manual Jaguar sequential shift mode. Rotation of the JaguarDrive selector back to the D position, returns the transmission to conventional automatic operation.

Temporary operation of manual Jaguar sequential shift mode can also be operated with the JaguarDrive selector in the D position. Operation of either the upshift or downshift paddles activates the manual mode operation. If the JaguarDrive selector is in D, Jaguar sequential shift will cancel after a time period or can be cancelled by pressing and holding the + paddle for approximately 2 seconds.

EMERGENCY PARK RELEASE



E118503

Item	Description
1	Latch
2	Strap
3	Locking cylinder
4	Operating lever
5	Upper cable
6	Cable joint
7	Lower cable
8	Cable bracket
9	Park interlock lever

If a vehicle requires recovery/transportation, the emergency park release mechanism is used to manually disengage the park lock and engage the transmission in neutral.

The emergency park release mechanism consists of an operating lever that is connected to a park interlock lever on the transmission by an upper and lower cable assembly.

The operating lever is installed in the floor console, under the trim panel between the drinks holder and the cubby box. The park interlock lever is attached to the transmission selector shaft.

One end of the operating lever is attached to a base by a hinge pin. A locking cylinder is installed in the other end of the operating lever, to secure the operating lever to the base. The operating lever is raised by pulling on a strap.

When operated, the emergency park release mechanism turns the transmission selector shaft.

To disengage the park lock:

- Open the cubby box lid and the drinks holder lid.
- Remove the trim panel from between the drinks holder and the cubby box.
- Rotate the locking mechanism of the emergency park release lever 90 degrees counterclockwise.
- Apply the footbrake, pull the operating lever upwards and ensure it locks in the vertical position.

Raising the operating lever causes the emergency park release cable to rotate the park interlock lever on the transmission, which disengages the parking pawl and engages neutral. This allows the vehicle to freewheel.

To re-engage the park lock:

- Hold the strap on the operating lever, release the latch and lower the operating lever to the horizontal position.
- Lock the operating lever by turning the locking mechanism 90 degrees clockwise.
- Install the trim panel.
- Close the cubby box lid and the drinks holder.

Automatic Transmission/Transaxle External Controls - TDV6 3.0L Diesel /V8 5.0L Petrol/V8 S/C 5.0L Petrol - External Controls

Diagnosis and Testing

Principles of Operation

For a detailed description of the transmission external controls, refer to the relevant Description and Operation sections in the workshop manual. REFER to: (307-05)

External Controls (Description and Operation),
External Controls (Description and Operation),
External Controls (Description and Operation).

Inspection and Verification



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

1. Verify the customer concern.
2. Visually inspect for obvious signs of damage and system integrity.

Visual Inspection

Mechanical	Electrical
<ul style="list-style-type: none"> • Check for stuck/jammed switches and buttons • Visibly damaged or worn components • Loose or missing fasteners 	<ul style="list-style-type: none"> • Fuse(s) • Loose or corroded electrical connector(s) • Transmission control module • Transmission control switch

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. If the cause is not visually evident, check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

DTC Index

For a list of DTCs that could be logged on this vehicle, please refer to Section 100-00.

REFER to: Diagnostic Trouble Code (DTC) Index - DTC: Transmission Control Module (TCM) (100-00, Description and Operation)
/

Diagnostic Trouble Code (DTC) Index - DTC: Transmission Control Switch (TCS) (100-00, Description and Operation).

Automatic Transmission/Transaxle External Controls - V6 3.0L Petrol - Transmission Control Switch (TCS)

Removal and Installation

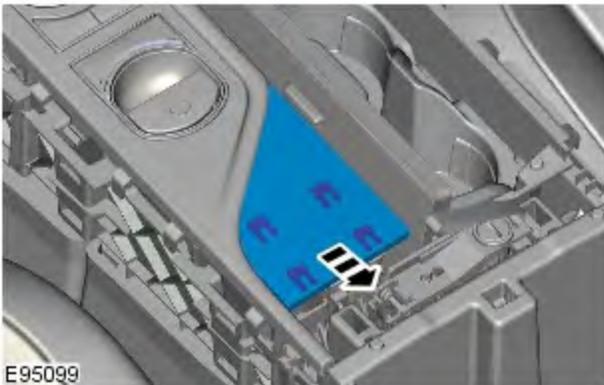
Removal



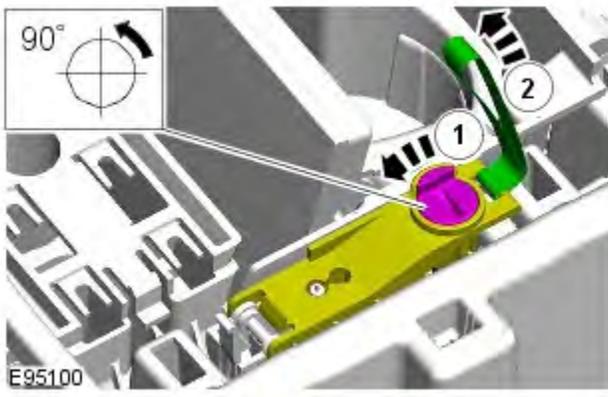
NOTE: Removal steps in this procedure may contain installation details.

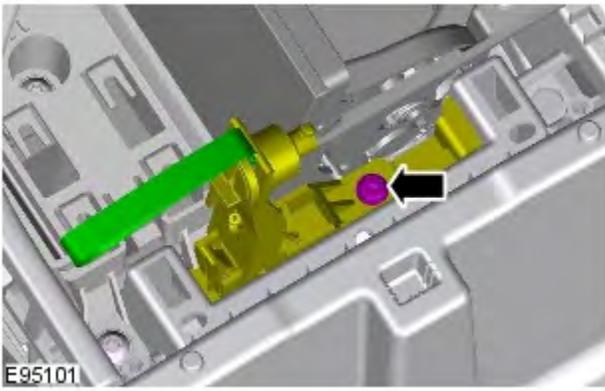
1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
2. Refer to: [Audio and Climate Control Assembly](#) (415-01A Information and Entertainment System, Removal and Installation).

3.

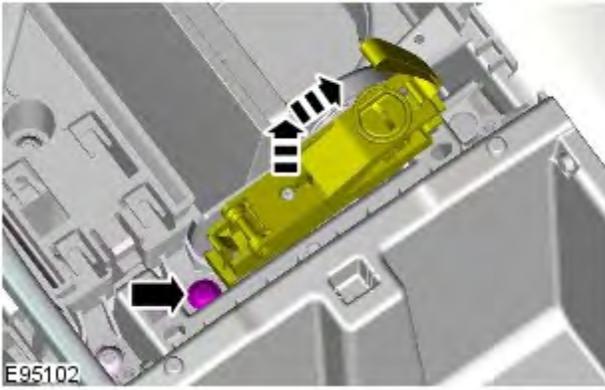


4.

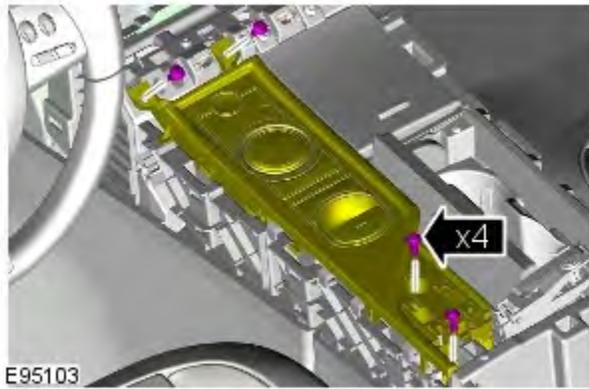




5. Torque: 4 Nm

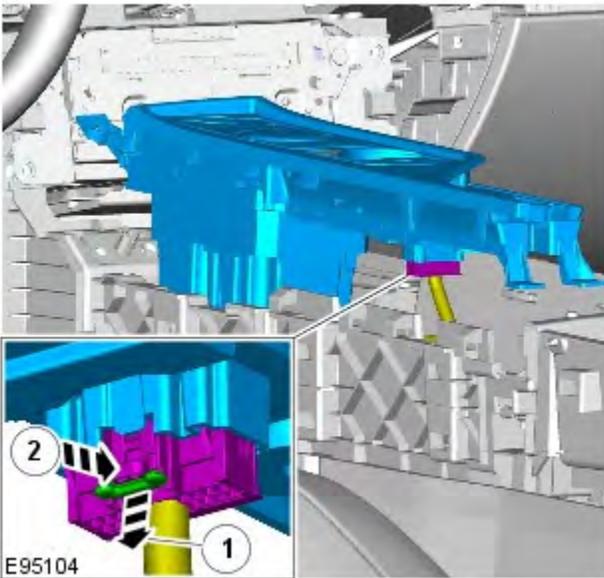


6. Torque: 4 Nm



7. Torque: 4 Nm

8.



Installation

1.  CAUTION: Make sure that all diagnostic trouble codes (DTCs) have been removed after the road test.

To install, reverse the removal procedure.

Automatic Transmission/Transaxle External Controls - V6 3.0L Petrol - Transmission Control Switch (TCS) Knob

Removal and Installation

Removal



NOTE: Removal steps in this procedure may contain installation details.



1.
 - Start the engine and make sure that 'P' is selected.



2. Torque: 2 Nm

Installation

1. To install, reverse the removal procedure.

Automatic Transmission/Transaxle External Controls - V6 3.0L Petrol - Emergency Park Position Release Lever

Removal and Installation

Removal

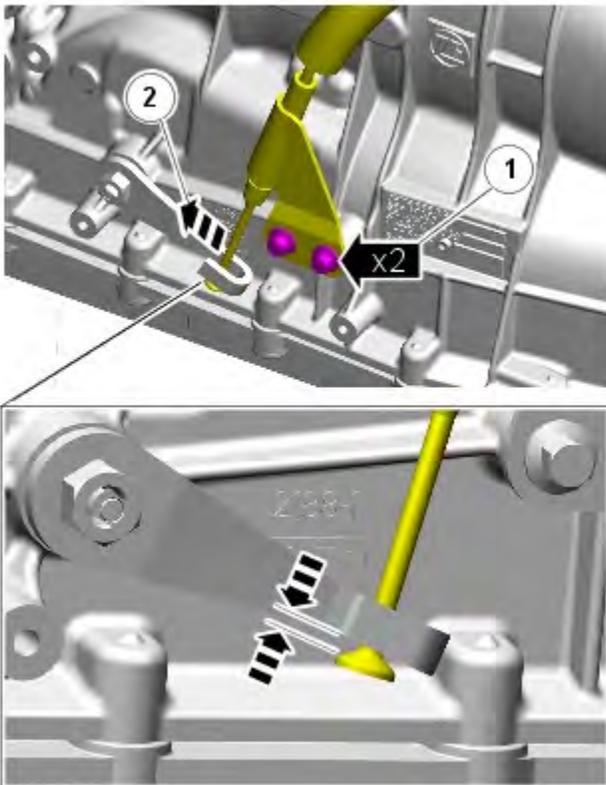


NOTE: Removal steps in this procedure may contain installation details.

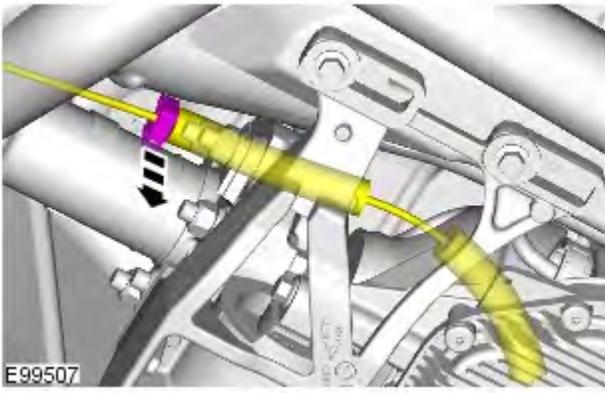
1. Refer to: [Battery Disconnect and Connect](#) (414-01 Battery, Mounting and Cables, General Procedures).
2. Refer to: [Air Deflector](#) (501-02, Removal and Installation).
3. Refer to: [Engine Rear Undershield](#) (501-02 Front End Body Panels, Removal and Installation).
4. Refer to: [Floor Console Side Trim Panel](#) (501-12 Instrument Panel and Console, Removal and Installation).

5.  **WARNING:** Make sure to support the vehicle with axle stands.

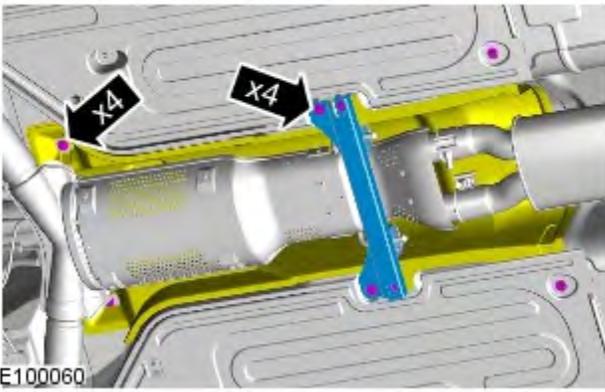
Torque: 11 Nm



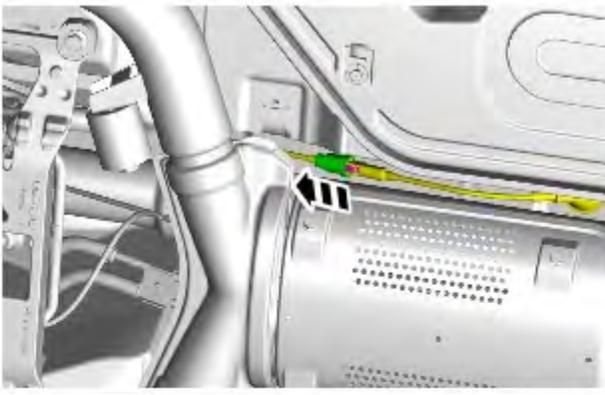
E100350



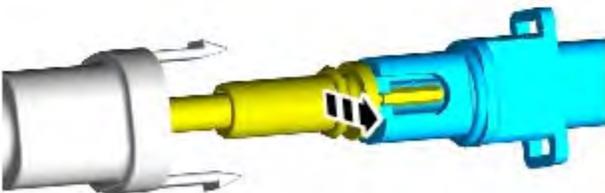
6.



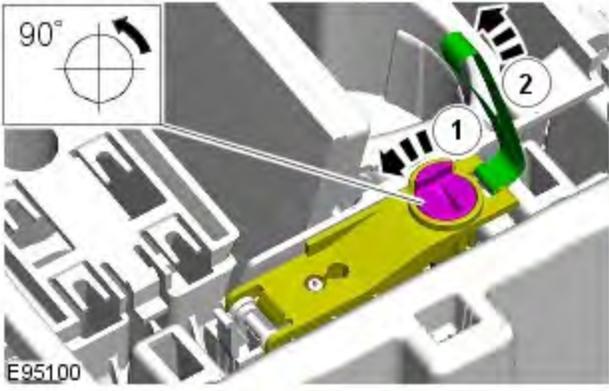
7. Torque: 7 Nm



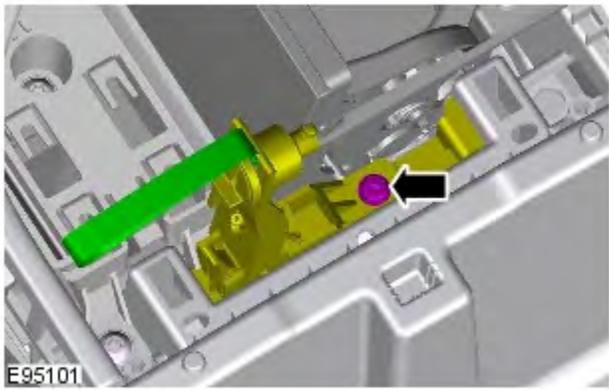
8.



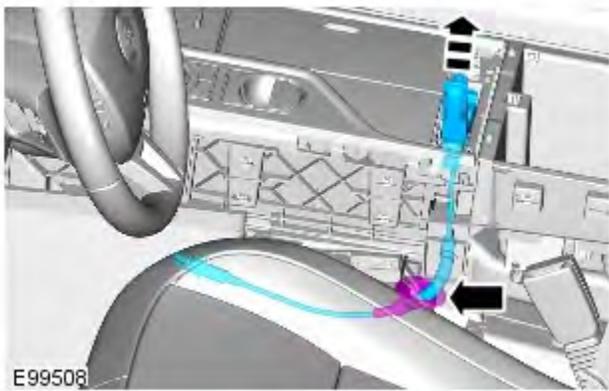
E100061



9.

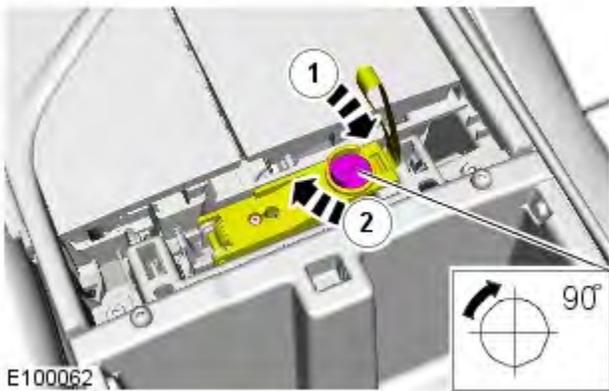


10. Torque: 3 Nm



11.

Installation



1. To install, reverse the removal procedure.

Automatic Transmission/Transaxle External Controls - V6 3.0L Petrol - Upshift Paddle Switch

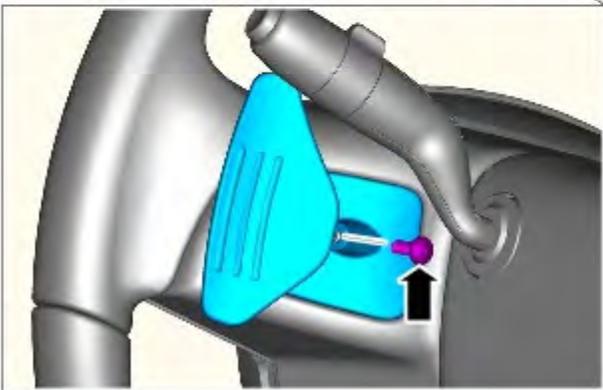
Removal and Installation

Removal



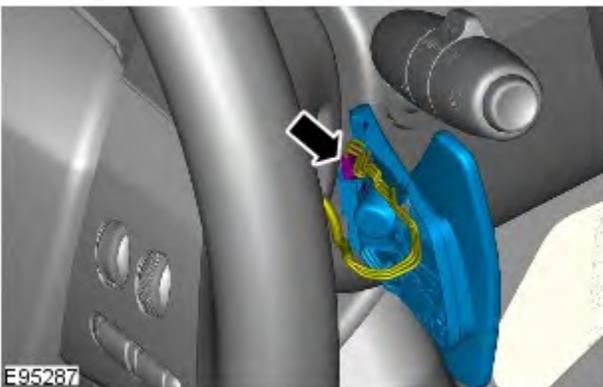
NOTE: Removal steps in this procedure may contain installation details.

1. Torque: 3 Nm



E95286

- 2.



E95287

Installation



1. NOTE: Make sure the wiring harness is routed correctly. To install, reverse the removal procedure.

Automatic Transmission/Transaxle External Controls - V6 3.0L Petrol - Downshift Paddle Switch

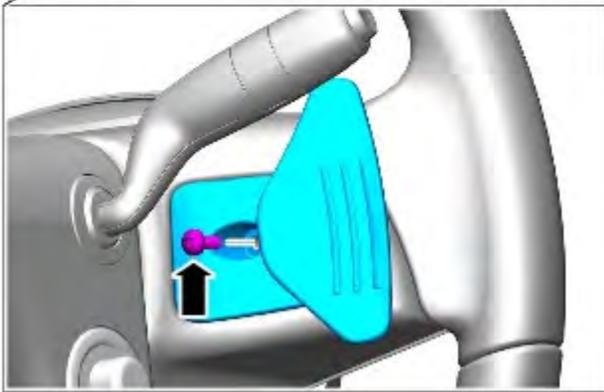
Removal and Installation

Removal



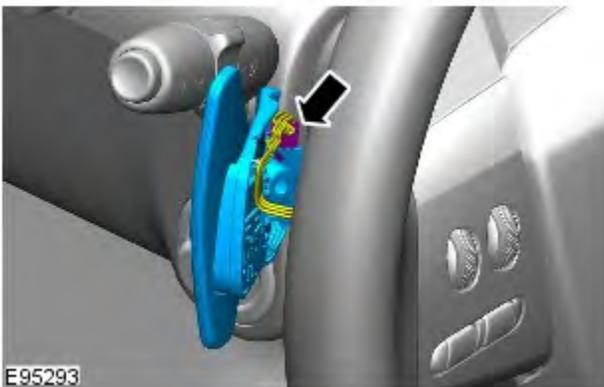
NOTE: Removal steps in this procedure may contain installation details.

1. Torque: 3 Nm



E95292

- 2.



E95293

Installation



1. NOTE: Make sure the wiring harness is routed correctly.
To install, reverse the removal procedure.