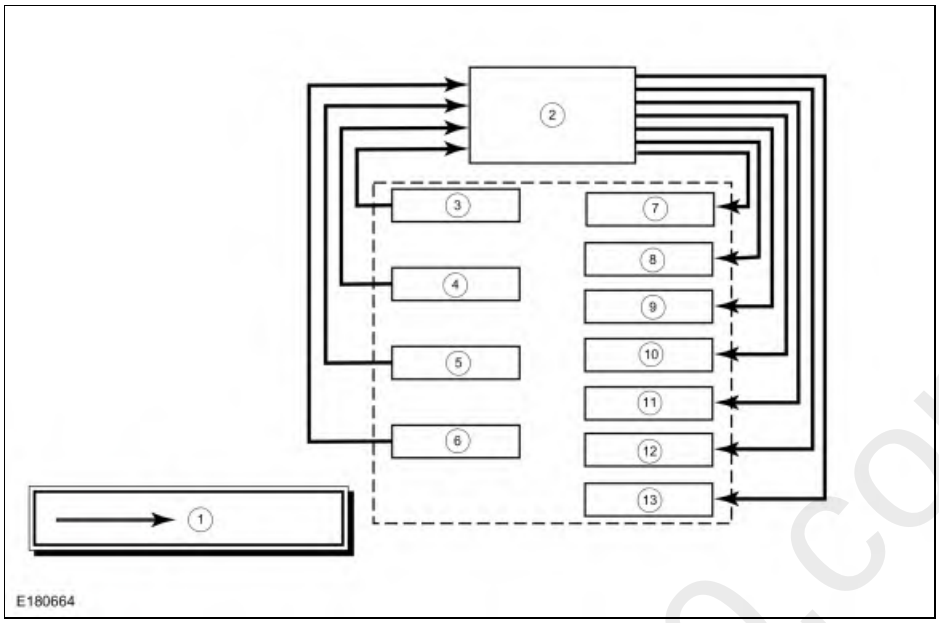
Transmission Description - System Operation and Component Description

System Diagram



Item	Description
1	Hardwire Connection
2	PCM
3	TFT
4	TR
5	TSS
6	OSS
7	LPC
8	SSA
9	SSB
10	SSC
11	SSD
12	SSE
13	TCC

Network Message Chart

Broadcast Message	Originating Module	Message Purpose
Engine Speed	PCM	Directly affects shift scheduling, TCC control, line pressure and transmission diagnostics. Indirectly affects shift pressure control.
Engine torque estimate	PCM	Directly affects shift pressure control, TCC control and transmission diagnostics. Indirectly affects shift scheduling and TCC scheduling.
APP	PCM	Directly affects shift scheduling, TCC scheduling and transmission diagnostics. Indirectly affects TCC control and shift control.

Commanded engine torque	PCM	Directly affects shift scheduling, TCC scheduling and transmission diagnostics. Indirectly affects shift control.
BPP	PCM	Directly affects shift scheduling and TCC scheduling

System Operation

The PCM and its input/output network controls the following operations:

Shift timing

Line pressure (shift feel)

The transmission control strategy is separate from the engine control strategy in the PCM, although some of the input signals are shared. When determining the best operating strategy for transmission operation, the PCM uses input information from engine and driver related sensors and switches.

In addition, the PCM receives input signals from transmission related sensors and switches. The PCM uses these signals when determining transmission operating strategy.

Using all of these input signals, the PCM can determine when the time and conditions are right for a shift or when to apply or release the TCC. It also determines the best line pressure to optimize shift engagement feel. To accomplish this, the PCM uses output solenoids to control transmission operation.

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Component Description

Component Description

Sensors and Switches

The PCM controls the electronic functions of this transmission. The PCM receives input signals from engine and transmission sensors and uses these inputs to control line pressure, shift time, TCC and shift solenoids.

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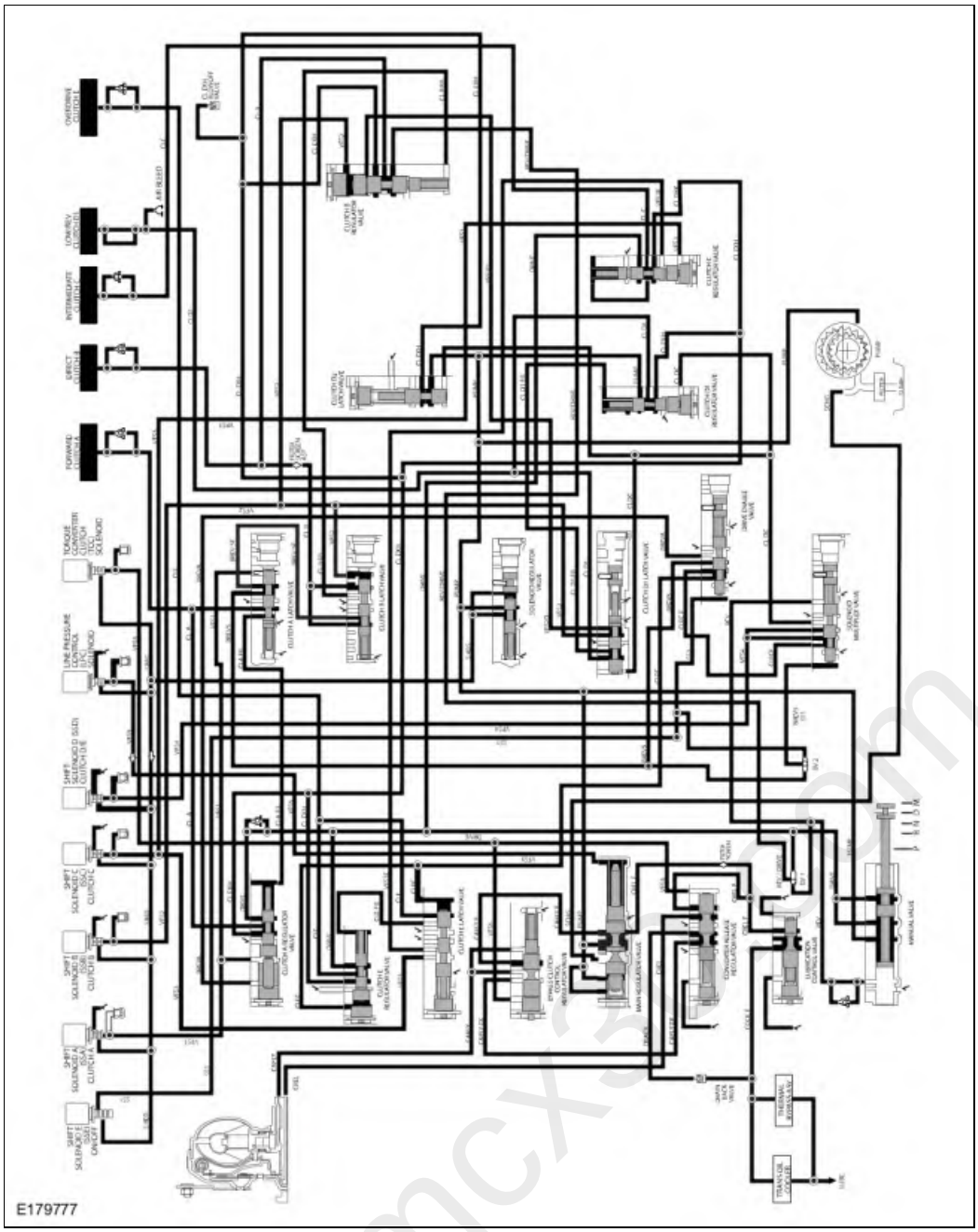
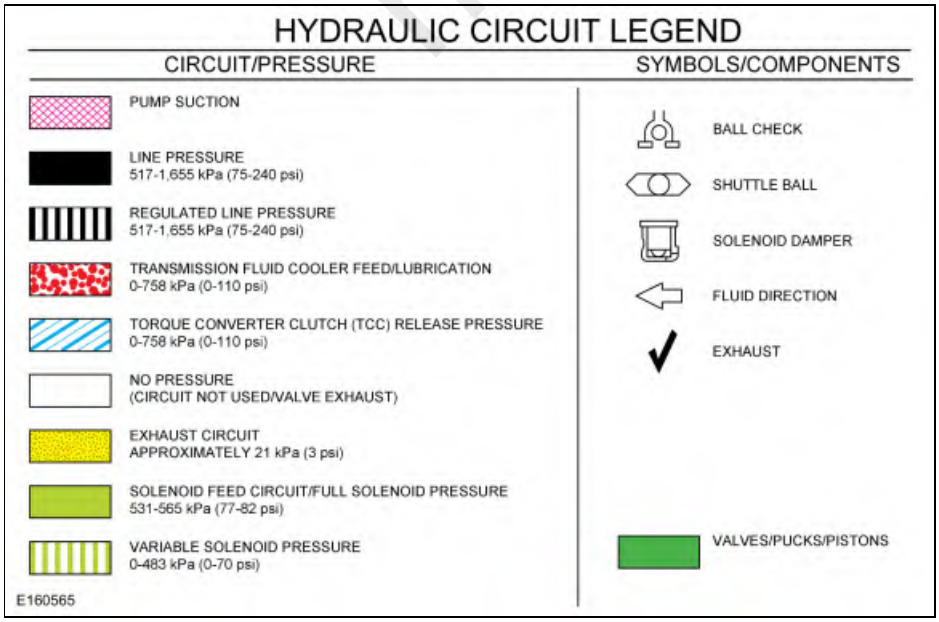
Item	Description
TFT Sensor	This sensor is located in the transmission main control molded leadframe. It is a temperature-sensitive device called a thermistor. The resistance value of the TFT sensor will vary with temperature change. The PCM monitors the voltage across the TFT sensor to determine the temperature of the transmission fluid. The PCM uses this initial signal to determine whether a cold start shift schedule is necessary. The cold start shift schedule allows delayed shifts when the transmission fluid is cold to help warm the transmission fluid. The PCM also inhibits TCC operation at low transmission fluid temperatures and adjusts line pressure for temperature.
TR Sensor	The TR sensor has a 6-pin electrical connector. The TR sensor is located on the inside of the transmission at the manual control lever. The TR sensor sends a signal to the PCM to start the vehicle in PARK and NEUTRAL. The TR sensor opens/closes a set of 4 switches that are monitored by the PCM to determine the position of the manual control lever.
TSS Sensor	The TSS sensor is a Hall-effect type sensor that provides a TSS signal to the PCM that changes in frequency as the rotating speed of the trigger wheel part of the forward clutch cylinder varies. The TSS information is compared to engine rpm to determine TSS performance. TSS is also compared to OSS to determine shift quality and clutch performance. The TSS sensor is an integral part of the main control molded leadframe.
OSS Sensor	The OSS sensor is a Hall-effect type sensor that provides a OSS signal to the PCM that changes in frequency as the rotating speed of the trigger wheel part of the output shaft ring gear varies. The OSS is used for shift scheduling. OSS is also compared to TSS to determine shift quality and clutch performance. The OSS sensor is an integral part of the main control molded leadframe.

Hydraulic System Diagram





Hydraulic Circuit Identification Chart

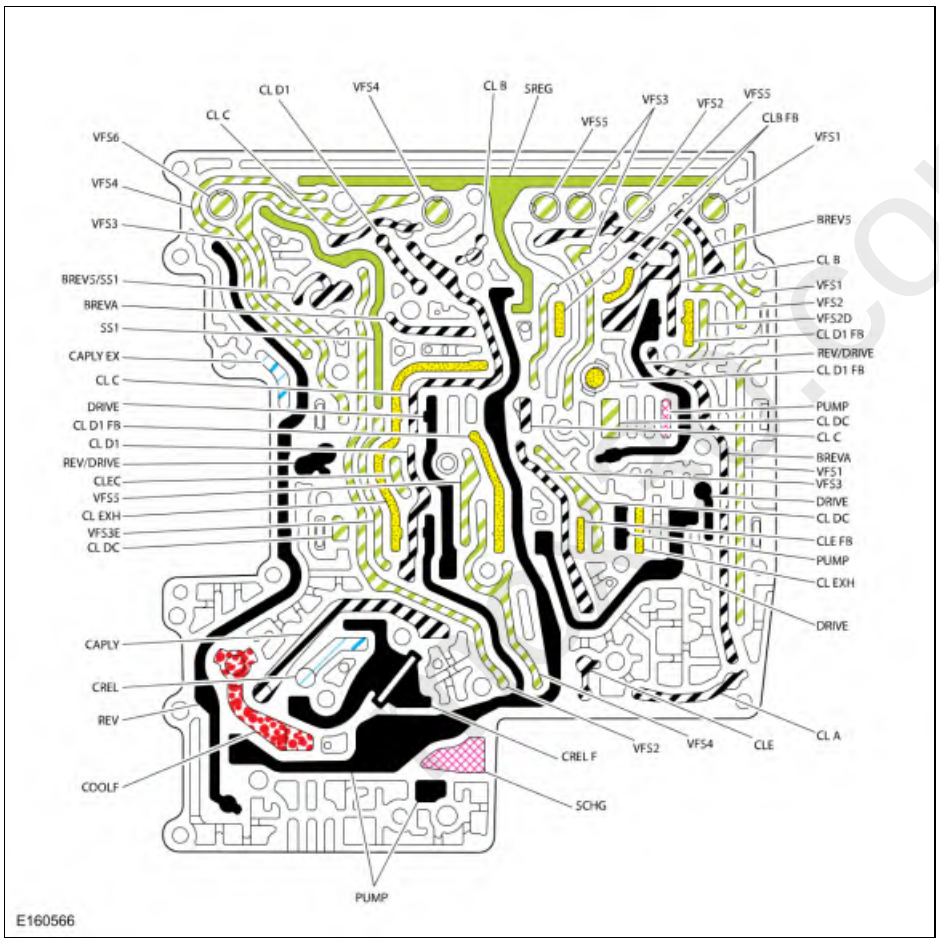
Circuit Name	Description
BREVA	BREV5 pressure from the drive enable valve to the clutch A regulator valve.
BREV5	BREV 5F pressure from the clutch A latch valve to the drive enable valve and the No. 2 shuttle ball.
BREV 5F	Regulated line pressure from the CL B circuit directed to the A clutch latch valve by the B clutch latch valve.
BREV5/SS1	BREV5 or SS1 pressure from the No. 2 shuttle ball to the solenoid multiplex valve.
CAPLY	Apply circuit to the torque converter, also the return circuit during TCC release.
CAPLY EX	TCC releases pressure from the bypass clutch control regulator valve to the converter release regulator valve.
CAPLY F	Line pressure from the PUMP circuit directed to the bypass clutch control regulator valve by the main regulator valve.
CL A	Regulated line pressure from the clutch A regulator valve to the clutch A latch valve and the forward (A) clutch to apply the clutch.
CLA FB	Regulated line pressure from the clutch A latch valve that feeds back to the clutch A regulator valve.
CL B	Regulated line pressure from the clutch B regulator valve to the clutch B latch valve and the direct (B) clutch to apply the clutch.
CLB FB	Regulated line pressure from the clutch B latch valve that feeds back to the clutch B regulator valve.
CL C	Regulated line pressure from the clutch C regulator valve to the intermediate (C) clutch to apply the clutch.
CL D1	Regulated line pressure from the clutch D1 regulator valve to the clutch D1 latch valve and the low/reverse (D) clutch to apply the clutch.
CL D1 FB	Regulated line pressure from the clutch D1 latch valve that feeds back to the clutch D1 regulator valve.
CL D2	Regulated line pressure from the clutch D2 regulator valve to the low/reverse (D) clutch to apply the clutch.
CL DC	Regulated solenoid output pressure from SSD directed by the solenoid multiplex valve to the D1 and D2 regulator and latch valves to apply the low/reverse (D) clutch.
CLE	Regulated line pressure from the clutch E regulator valve to the clutch E latch valve and the Overdrive (O/D) (E) clutch to apply the clutch.
CLEC	Regulated solenoid output pressure from the CLEC F circuit directed by the drive enable valve to the clutch E regulator and latch valves to apply the clutch.
CLEC F	Regulated solenoid output pressure from the VFS4 circuit directed to the drive enable valve by the solenoid multiplex valve to move the clutch E regulator and latch valves to apply the O/D (E) clutch.
CLE FB	Regulated line pressure from the clutch E latch valve that feeds back to the clutch E regulator valve.
CL EXH	Line pressure regulated to approximately 21 kPa (3 psi) by the D2 latch valve that supplies exhaust pressure to the A, B, C, D1 and E clutch when the clutches are released.
COOLF	Pressure from the lubrication control valve to the oil cooler or the thermal bypass valve that feeds the lubrication circuit.
CREL	Pressure supplied to the torque converter by the converter release regulator valve to release the TCC.
CREL F	Line pressure from the main regulator valve that supplies the converter release regulator valve and the lubrication control valve.
DBACK	CAPLY EX pressure directed to the drain back valve by the converter release regulator valve.
DRIVE	Line pressure directed by the manual valve to the A, C and E clutch regulator valves and the No. 1 shuttle ball.
LUBE	Transmission lubrication circuit supplied by the COOLF circuit after the fluid circulates the transmission fluid cooler or is returned by the cooler bypass valve.
PUMP	Line pressure supplied by the pump to the manual valve, solenoid pressure regulator valve, main regulator valve, clutch D1 regulator valve, clutch D2 regulator valve and clutch D2 latch valve.
REV	Line pressure from the manual valve to the No. 1 shuttle ball and the solenoid multiplex valve.
REV/DRIVE	REV or DRIVE pressure from the No. 1 shuttle ball to the clutch B regulator valve.
SCHG	Line pressure from the main regulator valve to the pump suction port.
SREG	Line pressure from the solenoid regulator valve that supplies pressure to the 7 solenoids, SSA , SSB, SSC, SSD, SSE, TCC solenoid and LPC solenoid.
SS1	Solenoid output pressure from SSE to the drive enable valve and to shuttle ball No. 2 to direct SSD output pressure to clutch E regulator and latch valves to apply the O/D (E) clutch.
VFS1	Solenoid output pressure from SSA to the A clutch regulator and latch valve to apply the forward (A) clutch.
VFS2	Solenoid output pressure from SSB to the B clutch regulator and latch valve to apply the direct (B) clutch and is also routed to the D1 latch valve.
VFS2D	SSB output pressure from the VFS2 circuit directed to the clutch B regulator valve by the D1 latch valve.

Circuit Name	Description
VFS3	Solenoid output pressure from SSC to the C clutch regulator valve to apply the intermediate (C) clutch and is also routed to the clutch E latch valve.
VFS3E	SSC output pressure from the VFS3 circuit directed to the clutch C regulator valve by the clutch E latch valve.
VFS4	Solenoid output pressure from SSD to the solenoid multiplex valve to apply either the D or E clutch.
VFS5	Solenoid output pressure from the LPC solenoid to the main regulator valve to control line pressure.
VFS6	Solenoid output pressure from the TCC solenoid to the bypass clutch control regulator valve and the converter release regulator valve to control the TCC.

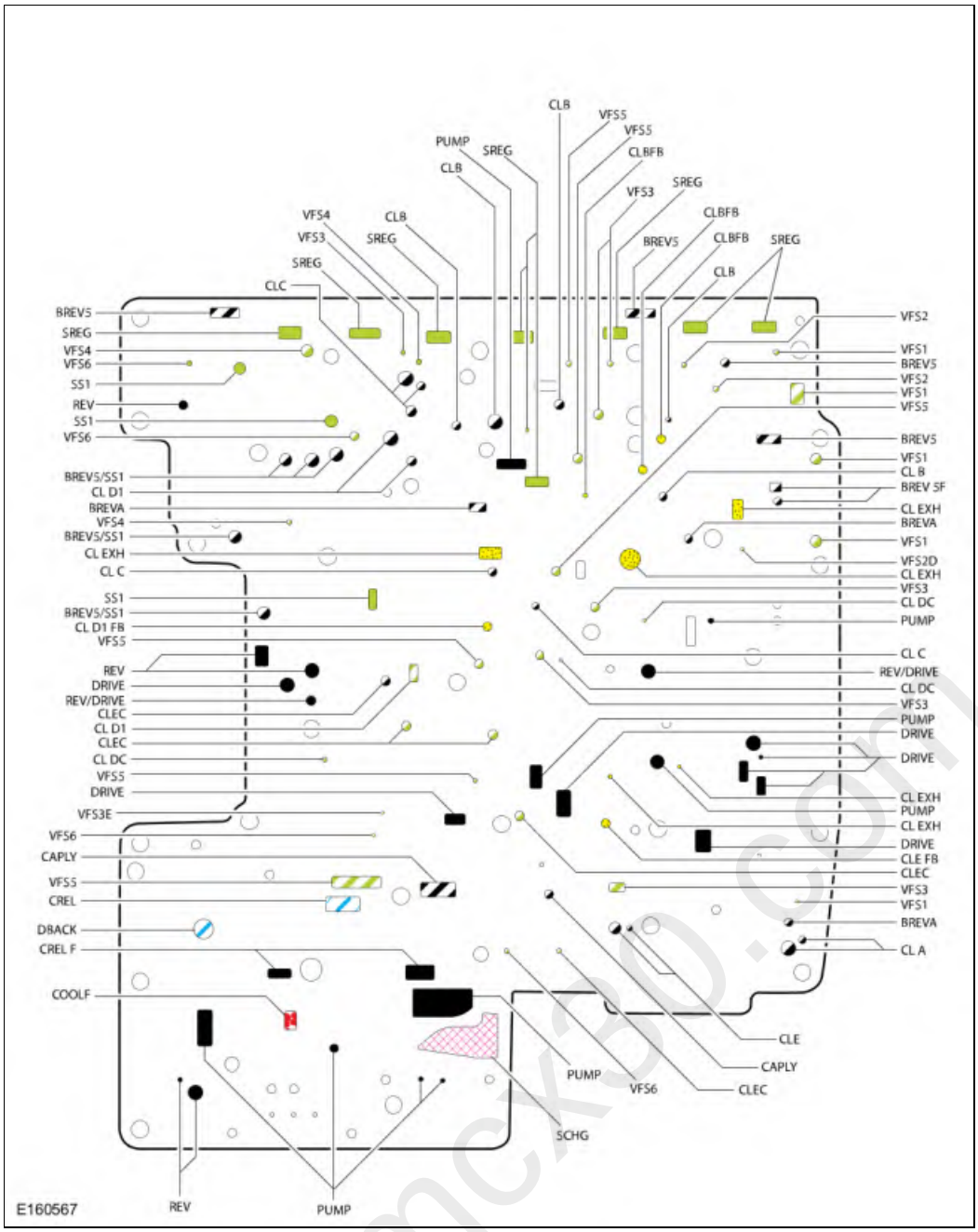
Valve Body Maps for Solenoid and Line Pressure

Solenoid Body Hydraulic Passages

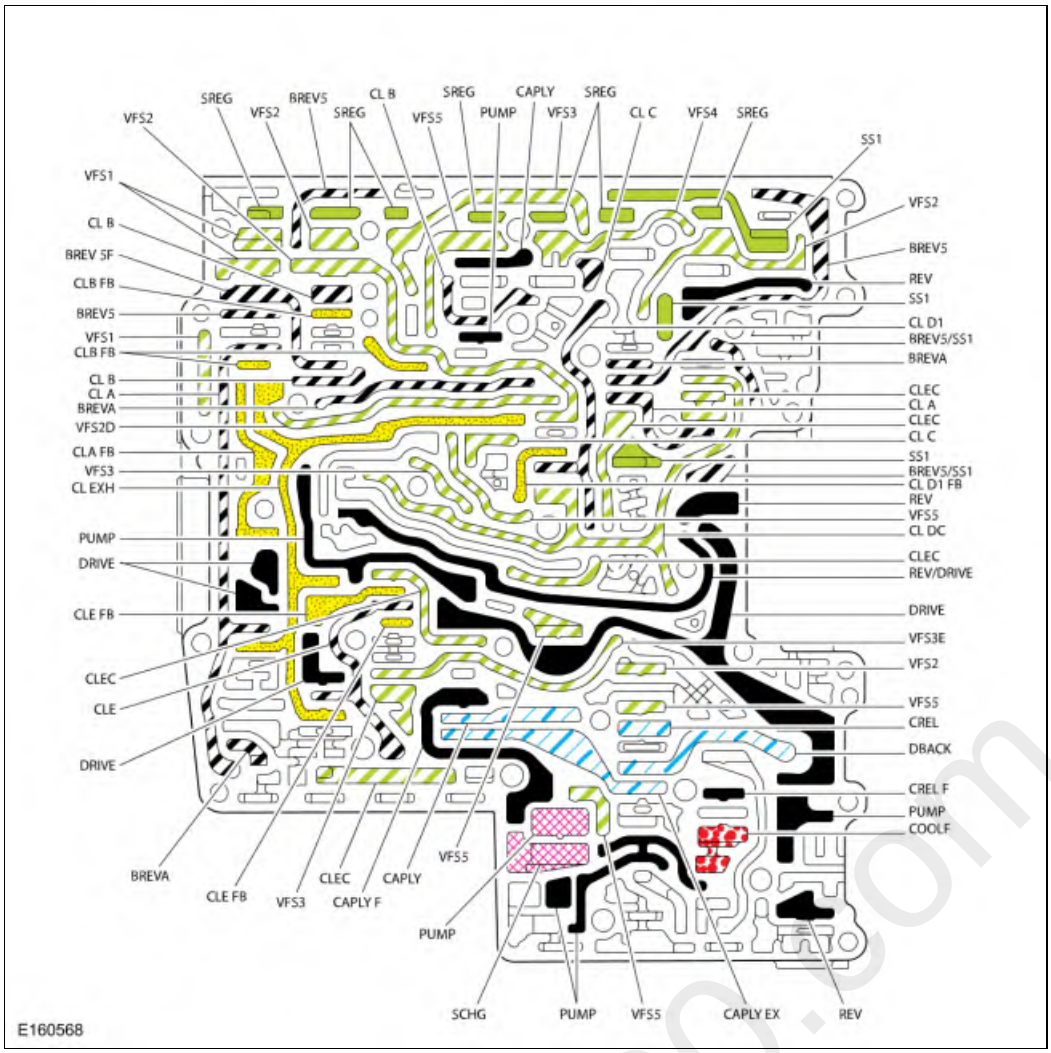
Upper Valve Body Passages



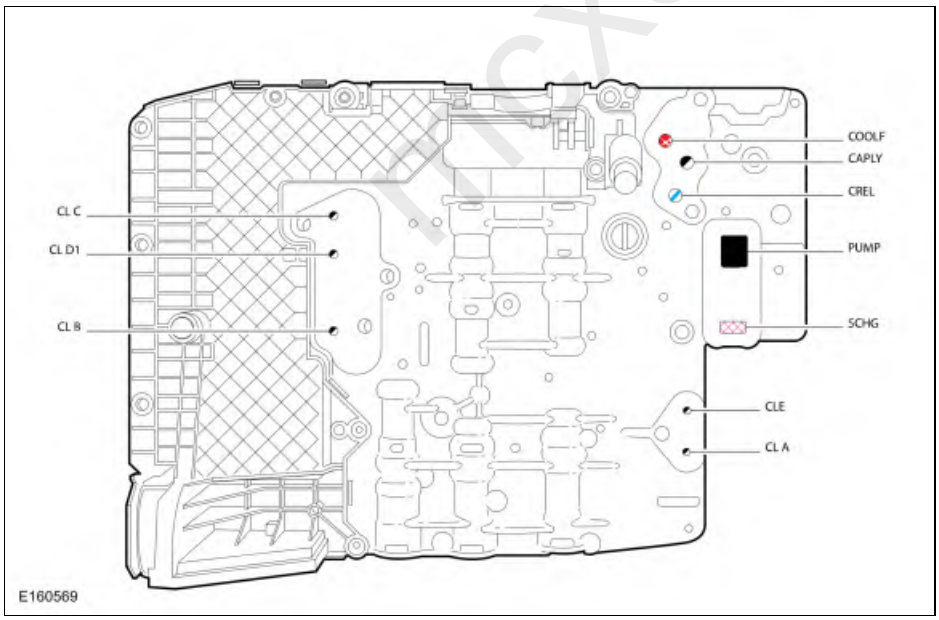
Seperator Plate Passages (Lower Valve Body Side)



Lower Valve Body Passages



Valve Body - To - Transmission Case Hydraulic Passages



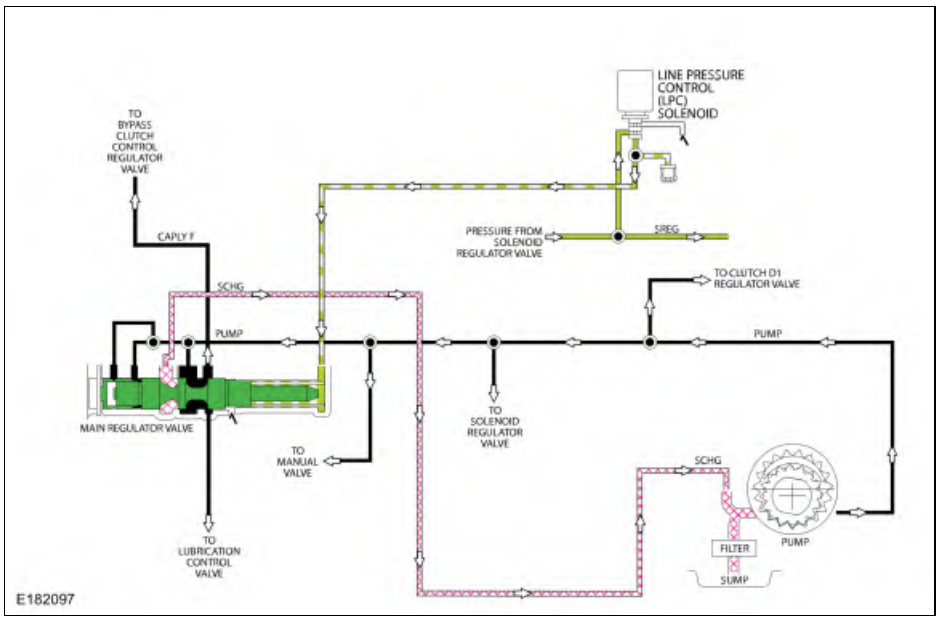
Line Pressure Hydraulic Circuits

The PCM controls line pressure with the LPC solenoid. Varying pressure from the LPC solenoid effects shift feel while allowing sufficient pressure for clutch application.

When the engine is running, the pump supplies pressure to the main regulator valve through the PUMP circuit. The position of the main regulator valve controls line pressure (in the PUMP circuit). Pressure from the LPC solenoid through the VFS5 circuit controls the position of the main regulator valve.

The main regulator valve varies pressure in the SCHG circuit. The higher the pressure in the SCHG circuit, the lower the line pressure (PUMP circuit) is. As SCHG pressure decreases, line pressure (PUMP circuit) increases.

Line Pressure Hydraulic Circuits



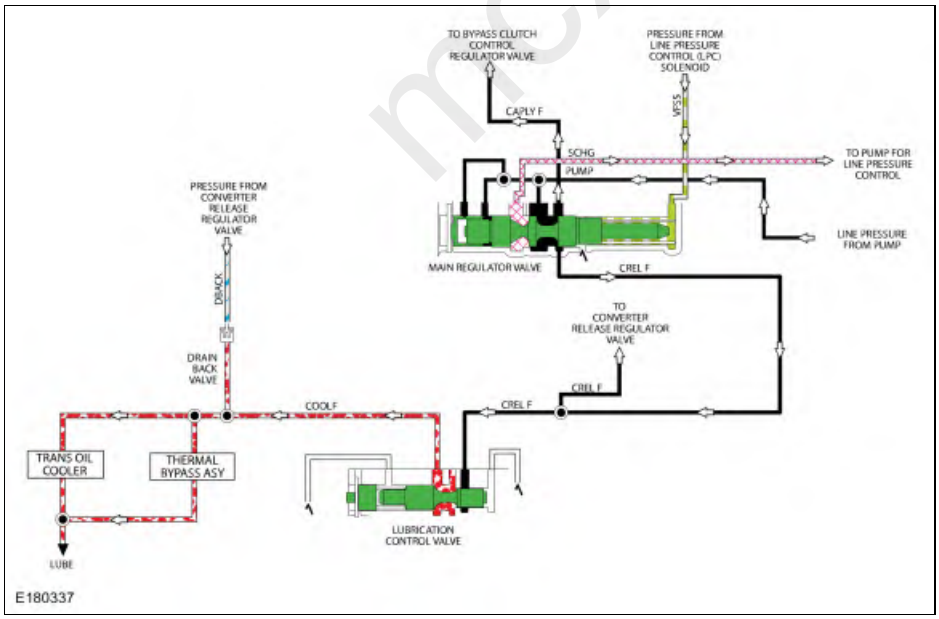
Lubrication Hydraulic Circuits

The main regulator valve supplies pressure to the lubrication control valve through the CREL F circuit. When the TCC is applied, the lubrication control valve supplies the transmission lubrication through the COOLF circuit to the LUBE circuit.

When the TCC is released, return fluid from the torque converter is supplied to the LUBE circuit through the CAPLY, CAPLY EX and DBACK circuits.

Pressure in the LUBE circuit either circulates through the thermal bypass valve when TFT is below operating temperature or through the transmission fluid cooler when the transmission fluid is at or above operating temperature. Return fluid from the thermal bypass valve or the transmission fluid cooler enters the input shaft through the pump assembly and flows through passages in the input shaft, intermediate shaft and output shaft to provide lubrication for the transmission.

Lubrication Hydraulic Circuits



Transmission Electronic Control System

The PCM control the electronic functions of this transmission. A plastic molded leadframe is bolted to the main control assembly. The leadframe contains the TSS, OSS, TFT and TR sensors.

The PCM receives input signals from engine and transmission sensors and uses these inputs to control line pressure, shift time, TCC, and shift solenoids. The PCM also provides power and ground for the reverse lamp relay coil and provides a PARK/NEUTRAL start enable signal.

The following is a list of direct engine and driver inputs to the PCM along with module information from the vehicle CAN:

- Engine speed
- Engine torque
- ECT
- Engine Oil Temperature (EOT)
- TP
- APP
- BPP
- ABS wheel speed
- Traction Control (ATC) status

The PCM also:

- Monitors inputs and outputs for the presence of faults.
- Stores DTCs related to detected faults.
- Provides outputs on the CAN for TR, OSS, TSS, TFT, current gear and A/C inhibit.
- Provides OBD information using the CAN to illuminate the MIL or TCIL.
- Provides diagnostic information to a scan tool through the DLC.

If the PCM detects a system or component fault, it substitutes a default value or signal using Failure Mode and Effect Management strategies.

The PCM also uses Failure Mode and Effect Management strategies to compensate for electrical or mechanical shift solenoid and apply component faults that result in alternate shift patterns.

If the transmission loses complete electronic control, it operates in a fail-safe mode with:

- Maximum line pressure in all transmission ranges
- Functional PARK, REVERSE and NEUTRAL positions
- Operation in 3rd or 5th gear (depending on the failure conditions) when the selector lever is in the DRIVE, 3, 2 or 1 position
- TCC is released in all transmission ranges and gears

Torque Converter Clutch (TCC) Proportional (VFS)

The TCC solenoid is a VFS that varies hydraulic pressure by actuating a hydraulic valve. The PCM applies variable current to the TCC solenoid which varies pressure in the VFS6 hydraulic circuit to the Converter Release Regulator Valve and the Bypass Clutch Control Regulator Valve. The TCC solenoid uses proportional operation. As the current from the PCM decreases, the pressure from the solenoid decreases. As the current from the PCM increases, the pressure from the solenoid increases. The TCC solenoid is supplied hydraulic pressure from the SREG circuit. With zero current, the TCC solenoid fully closes the hydraulic valve which applies the minimum amount of hydraulic pressure to the Converter Release Regulator Valve and the Bypass Clutch Control Regulator Valve through the VFS6 hydraulic circuit and releases the TCC. With maximum current to the solenoid, the hydraulic valve fully opens the outlet port for maximum pressure to the VFS6 hydraulic circuit to apply the TCC.

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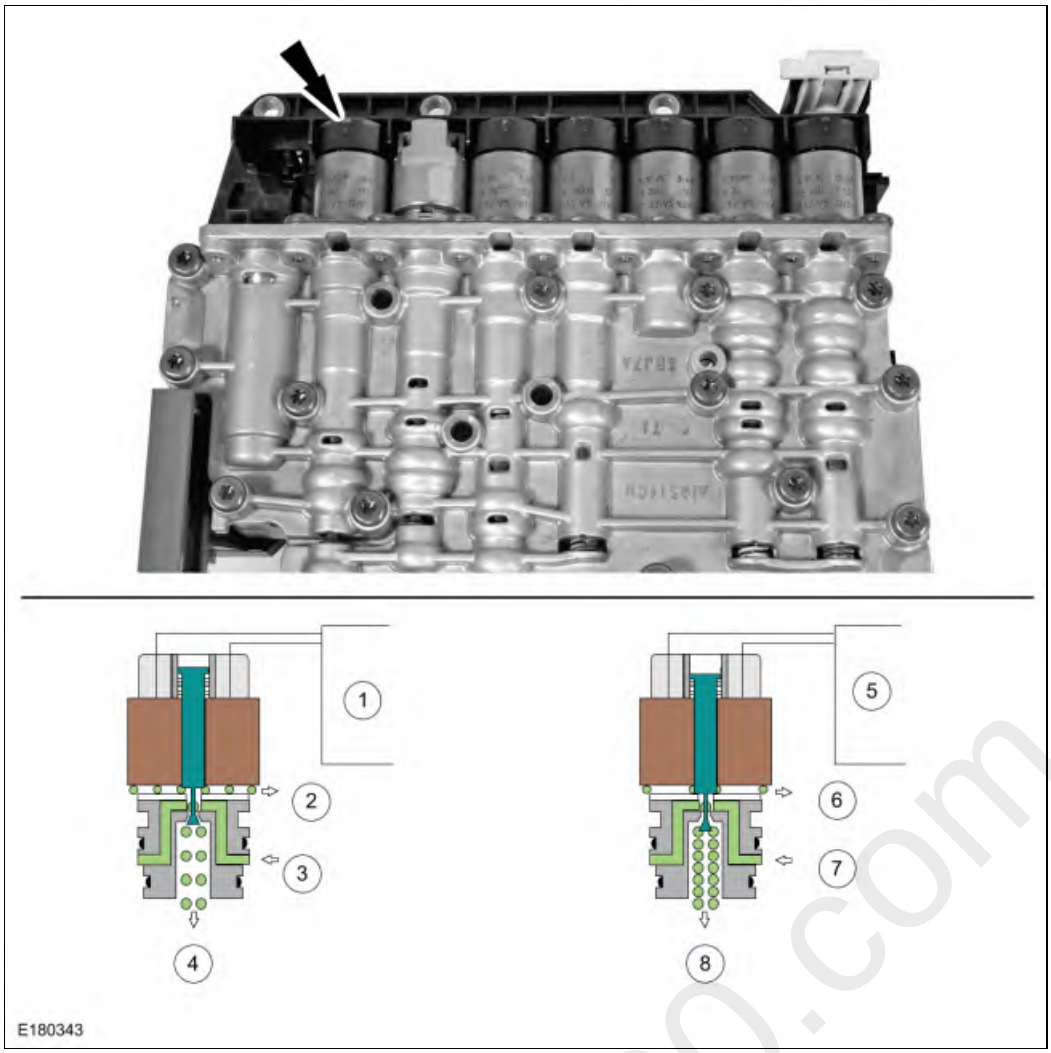

Item	Description
1	Low Current
2	Low Exhaust
3	SREG Circuit Fluid (Supply)
4	Low Pressure To VFS5 Hydraulic Circuit
5	High Current
6	High Exhaust
7	SREG Circuit Fluid (Supply)
8	High Pressure To VFS5 Hydraulic Circuit

Shift Solenoid A (SSA), Shift Solenoid B (SSB), Shift Solenoid C (SSC) and Shift Solenoid D (SSD)

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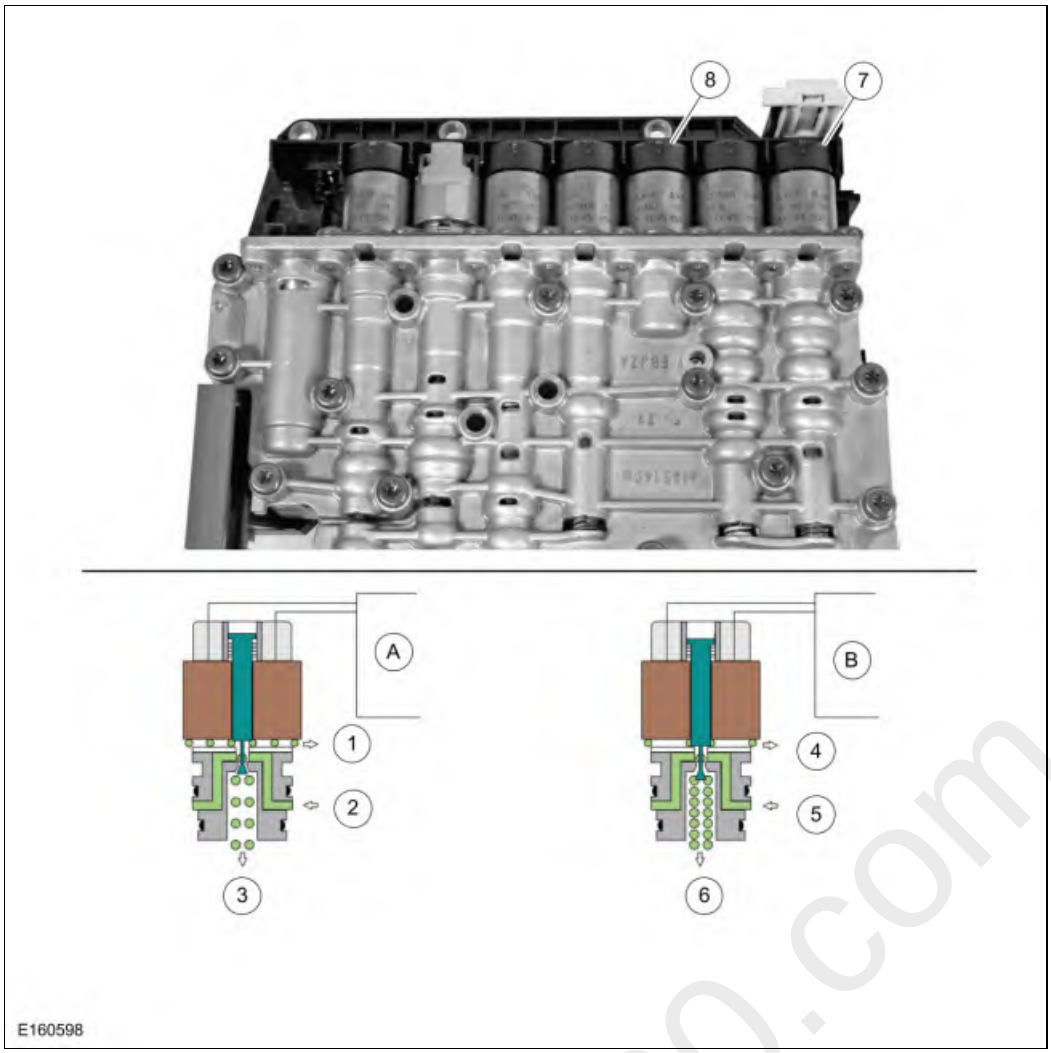

Item	Description
A	Low Current
B	High Current
1	High Exhaust
2	SREG Circuit Fluid (Supply)
3	Low Pressure To Clutch Regulator And Latch Valves
4	Low Exhaust
5	SREG Circuit Fluid (Supply)
6	High Pressure To Clutch Regulator And Latch Valves
7	SSA Variable Force Solenoid (VFS)
8	SSC VFS

SSB and SSD use inverse proportional operation. As the current from the PCM decreases, the pressure from the solenoid increases. As the current from the PCM increases, the pressure from the solenoid decreases. SSB and SSD are supplied hydraulic pressure from the SREG circuit.

With zero current, SSB and SSD fully open the hydraulic valves which applies maximum hydraulic pressure to the regulator and latch valves to apply the clutch that it controls. With maximum current to the solenoids, the hydraulic valve fully closes to apply zero amount of hydraulic pressure to the regulator and latch valves of the clutch that it controls and releases the clutch.

Shift solenoids A through D are VFS that vary hydraulic pressure by actuating a hydraulic valve.

The PCM applies variable current to the shift solenoids which varies pressure in the hydraulic circuit to the regulator and latch valves of the clutch that it controls.

SSA and SSC use proportional operation. As the current from the PCM decreases, the pressure from the solenoid decreases. As the current from the PCM increases, the pressure from the solenoid increases. SSA and SSC are supplied hydraulic pressure from the SREG circuit.

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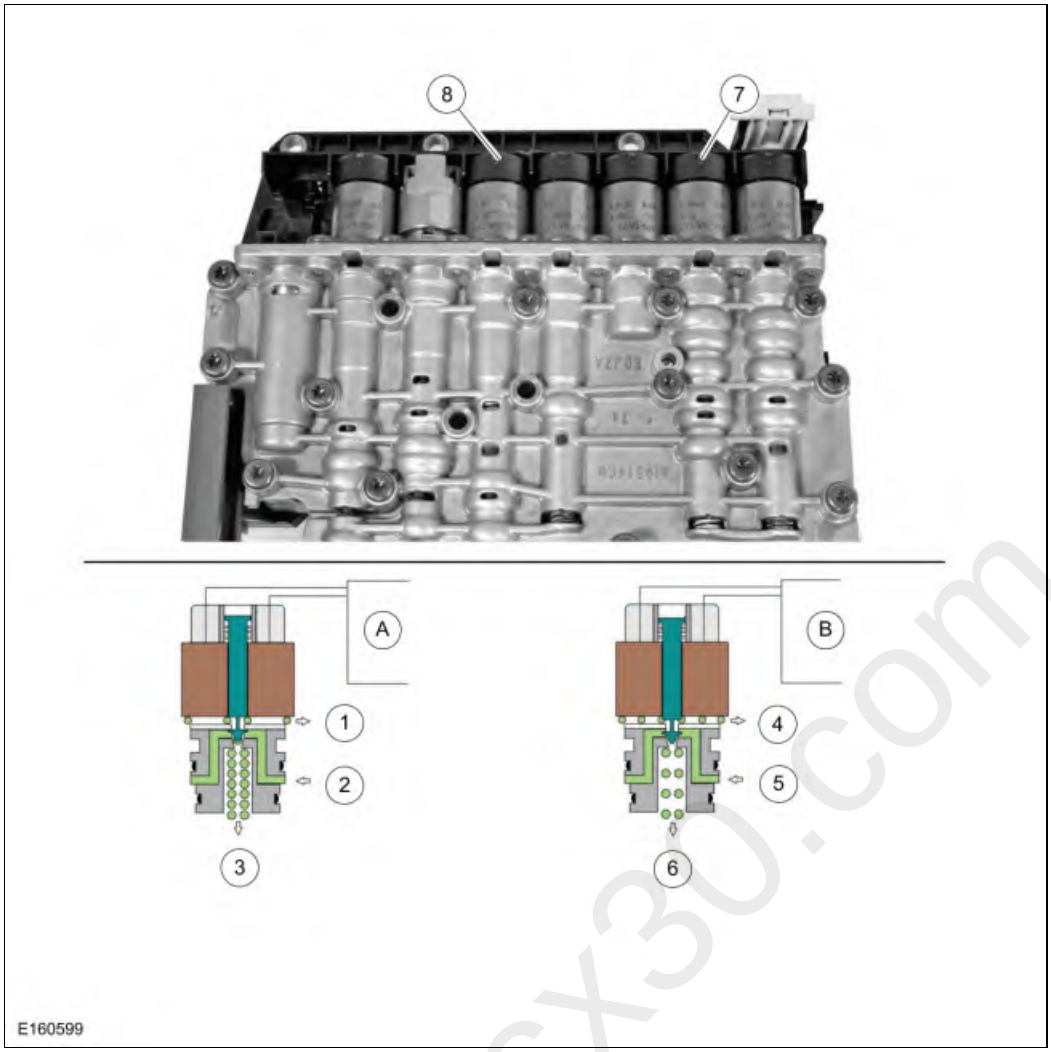
With zero current, SSA and SSC fully close the hydraulic valves which applies zero amount of hydraulic pressure to the regulator and latch valves of the clutch that it controls and releases the clutch. With maximum current to the solenoids, the hydraulic valves fully open for maximum pressure to the regulator and latch valves to apply the clutch.

Shift Solenoid B (SSB) and Shift Solenoid D (SSD) Inverse Proportional Variable VFS



Item	Description
A	Low Current
B	High Current
1	Low Exhaust
2	SREG Circuit Fluid (Supply)
3	High Pressure To Clutch Regulator And Latch Valves
4	High Exhaust
5	SREG Circuit Fluid (Supply)
6	Low Pressure To Clutch Regulator And Latch Valves
7	SSB Variable Force Solenoid (VFS)
8	SSD VFS

Shift Solenoid E (SSE) ON/OFF Solenoid

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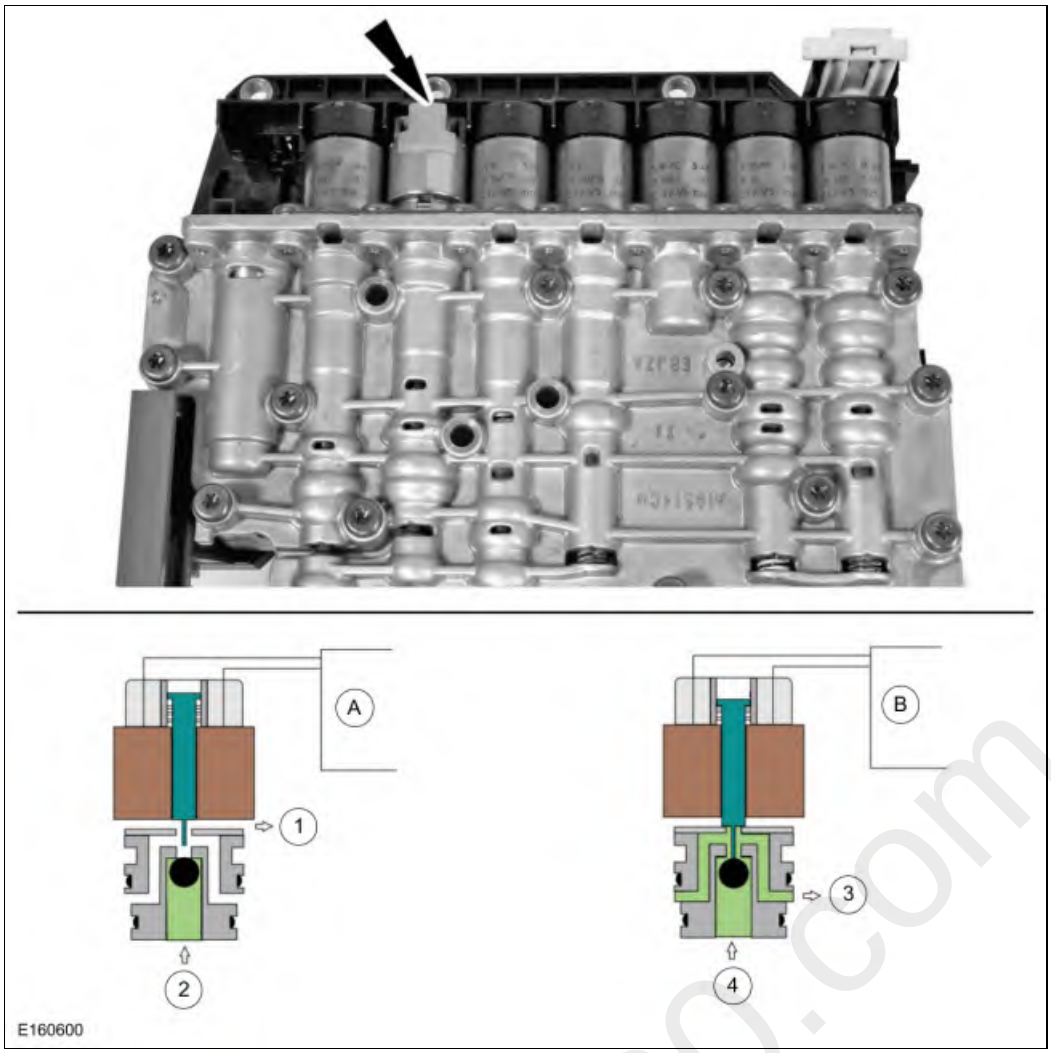

Item	Description
A	Off
B	On
1	Exhaust Port Connects To Outlet Port (SS1 Circuit)
2	SREG Circuit Fluid (Supply)
3	Outlet Port (SS1 Circuit)
4	SREG Circuit Fluid (Supply)

Turbine Shaft Speed (TSS) Sensor

The TSS is a Hall-effect type sensor that provides a signal to the PCM that changes in frequency as the rotating speed of the forward (1,2,3,4) clutch cylinder varies.

The PCM compares the TSS sensor signal with the engine speed information to determine the amount of slip occurring in the torque converter.

The PCM also compares the TSS sensor signal with the OSS sensor signal to determine the gear ratio provided by the rear planetary gearset.

The PCM uses the TSS sensor signal as an input for its strategies for shifts and TCC operation. The PCM also uses the TSS sensor signal for transmission fault detection and diagnostics.

Output Shaft Speed (OSS) Sensor

The OSS sensor is a Hall-effect type sensor that provides a signal to the PCM that changes in frequency as the rotating speed of the output shaft ring gear varies.

The PCM also compares the OSS sensor signal with the TSS sensor signal to determine the gear ratio provided by the rear planetary gearset.

The PCM uses the OSS sensor signal as an input for its strategies for shifts and TCC operation. The PCM also uses the OSS sensor signal for transmission fault detection and diagnostics.

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Transmission Fluid Temperature (TFT) Sensor

The TFT sensor is a temperature dependent resistor that is in contact with transmission fluid in the transmission sump area.

The PCM monitors the voltage across the TFT sensor, which changes as transmission fluid temperature varies.

The PCM uses the TFT sensor signal as an input for its strategy for shifting and TCC operation. The PCM also uses the TFT sensor signal for transmission fault detection and diagnostics.

Transmission Range (TR) Sensor

The TR sensor has a set of Hall-effect sensors that have a pattern of ON/OFF states which are dependent on the PARK, REVERSE, NEUTRAL, DRIVE, 3,

2 or 1 position of the manual valve.

The TR sensor also provides signals for the starting system and the reverse lights.

The PCM uses the TR sensor signal as an input for its strategy for shifting and TCC operation. The PCM also uses the TR sensor signal for transmission fault detection and diagnostics.

Transmission Operation Overview

Transmission operation is controlled by the PCM.

Torque Converter

This transmission uses a torque converter with the following elements:

- Impeller
- Turbine
- Reactor
- TCC

For diagnostic information,
Refer to: Torque Converter Clutch (TCC) (307-01A Automatic Transmission, Transfer Case and Power Transfer Unit - 6-Speed Automatic Transmission â€“ 6R100, Diagnosis and Testing).

Planetary Gearsets

Operation of this transmission involves the use of 2 planetary gearsets that have the following components:

- Front (single planetary gearset)
  - One sun gear
  - One planetary carrier with 4 gears
  - One ring gear

- Rear (ravigneaux planetary gearset)
  - Two sun gears of different sizes
  - Three short planetary gear pinions meshing with the sun gears
  - Three long planetary gear pinions meshing with the sun gears
  - One planetary carrier
  - One ring gear

Hydraulic System

The hydraulic operation of this transmission includes the following components:

- Main control assembly
- Pump assembly with filter
- Torque converter
- Apply components (clutches)

Transmission Operation Overview

The PCM controls the operation of this transmission with the following solenoids:

- LPC solenoid
- SSA
- SSB

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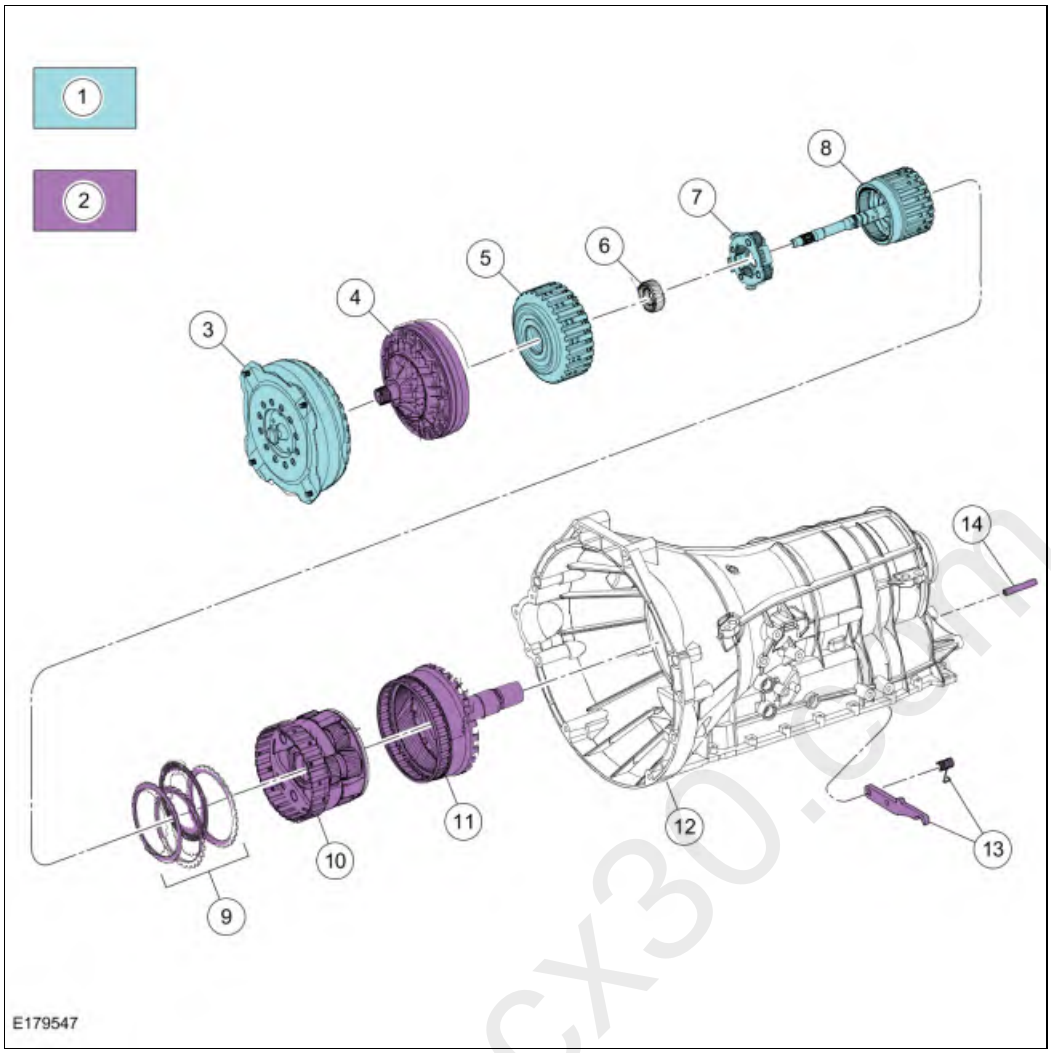
- SSC
- SSD
- SSE
- TCC solenoid

Park Position



Item	Description
1	Driven Components
2	Held Components
3	Torque Converter
4	Pump Assembly
5	Forward Clutch Cylinder and Hub Assembly
6	Front Planetary Sun Gear (No. 1)
7	Front Planetary Carrier Assembly
8	Front Planetary Ring Gear Assembly (input shaft)
9	Low Reverse Clutch D Assembly
10	Rear Planetary Carrier
11	Rear Planetary Ring Gear and Output Shaft Assembly
12	Transmission Case
13	Park Pawl and Spring
14	Park Pawl Pin

Mechanical Operation

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Apply components:

- Park pawl engaged holding the park gear (output shaft) stationary
- Low/reverse clutch (D) applied

Planetary Gearset Operation

Front planetary gearset driving components:

- Ring gear (input shaft)

Front planetary gearset driven components:

- Planetary carrier

Front planetary gearset held components:

- Sun gear (splined to pump assembly)

Rear planetary gearset driving components:

- None

Rear planetary gearset driven components:

- None

Rear planetary gearset held components:

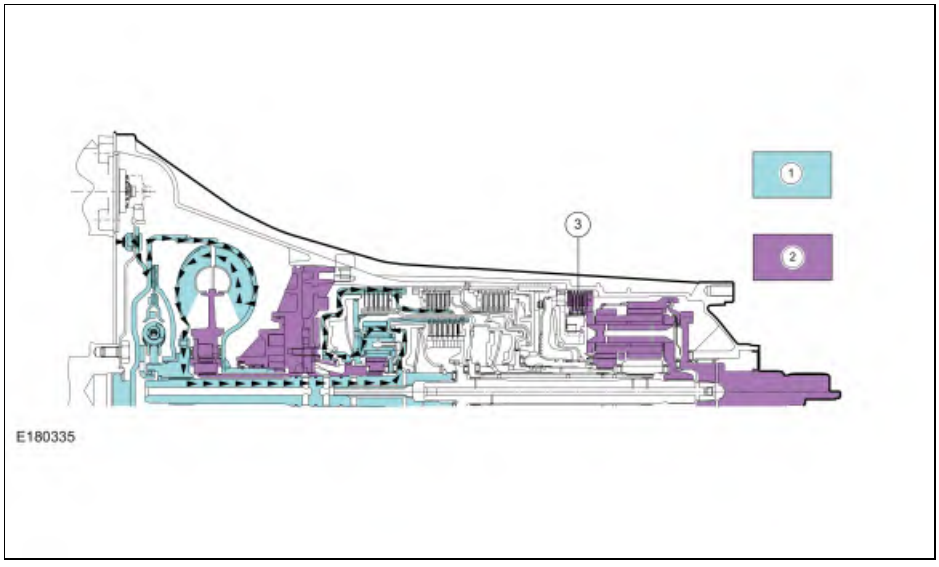
- Planetary carrier
- Ring gear (output shaft)

Park Position Clutch Application Chart

Gear	Forward A (1,2,3,4)	Direct B (3,5,R)	Intermediate C (2,6)	Low/ Reverse D (1,R)	Overdrive E (4,5,6)	Low-OWC
Park	-	-	-	H*	-	-
Planetary Components	Front planetary carrier-to-No. 3 sun gear	Front carrier-to-No. 2 sun gear	No. 2 sun gear	Rear planetary carrier	Input shaft-to-rear planetary carrier	Rear planetary carrier

* H = Hold Clutch

Park Position Power Flow



Item	Description

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1	Driven Components
2	Held Components
3	Low Reverse Clutch (D)

Hydraulic Operation

Line pressure hydraulic circuits:

- The position of the main regulator valve controls line pressure. The position of the main regulator valve is dependent on the pressure applied to it by the LPC solenoid through the VFS5 circuit.
- The main regulator valve varies pressure in the PUMP circuit by controlling hydraulic flow from the SCHG circuit into the pump suction circuit.
- Line pressure is supplied to the:
  - manual valve.
  - lubrication control valve.
  - converter release regulator valve.
  - bypass clutch control regulator valve.
  - solenoid pressure regulator valve.
  - D1 latch and regulator valves.

Torque converter circuits:

- When the TCC is released, the converter release regulator valve applies pressure to the torque converter through the CREL circuit to release the TCC.
- CREL pressure exits the torque converter through the CAPLY circuit to the bypass clutch control regulator valve.
- The bypass clutch control regulator valve directs the pressure from the CAPLY circuit back to the converter release regulator valve through the CAPLY EX circuit.
- The converter release regulator valve directs the pressure from the CAPLY EX circuit to the drain back valve through the DBACK circuit.

Cooler and lubrication hydraulic circuits:

- The lubrication control valve directs line pressure to the transmission fluid cooler or the thermal bypass valve through the COOLF circuit.
- When the transmission fluid exits the transmission fluid cooler or thermal bypass valve, it provides lubrication to the transmission through the LUBE circuit.

Solenoid hydraulic circuits:

- The solenoid pressure regulator valve supplies regulated line pressure to the shift, LPC and TCC solenoids through the SREG hydraulic circuit.
- The LPC solenoid applies varying pressure to the main regulator valve through the VFS5 hydraulic circuit. The LPC solenoid regulates line pressure by controlling the position of the main regulator valve.
- SSD supplies pressure to the solenoid multiplex valve through the VFS4 circuit.
- The position of the solenoid multiplex valve allows pressure from the VFS4 circuit to be directed to the D1 and D2 latch and regulator valves through the CL DC circuit to position the valves for low/reverse clutch (D) application.

Clutch hydraulic circuits:

- Line pressure is supplied by the pump to the D1 latch and regulator valves.
- Regulated line pressure from the D1 regulator valve is supplied to the low/reverse clutch (D) to apply the clutch.

Electrical Operation

Solenoid operation:

Selector Lever Position	PCM Commanded Gear	SSA NL (1,2,3,4)	SSB NH (3,5,R)	SSC NL (CB 2,6)	NH (CB L/R 4,5,6)	SSE NC	TCC NL
P	P	Off	On	Off	On	On	Off

CB = Clutch brake, NC = Normally closed, NH = Normally high, NL = Normally low

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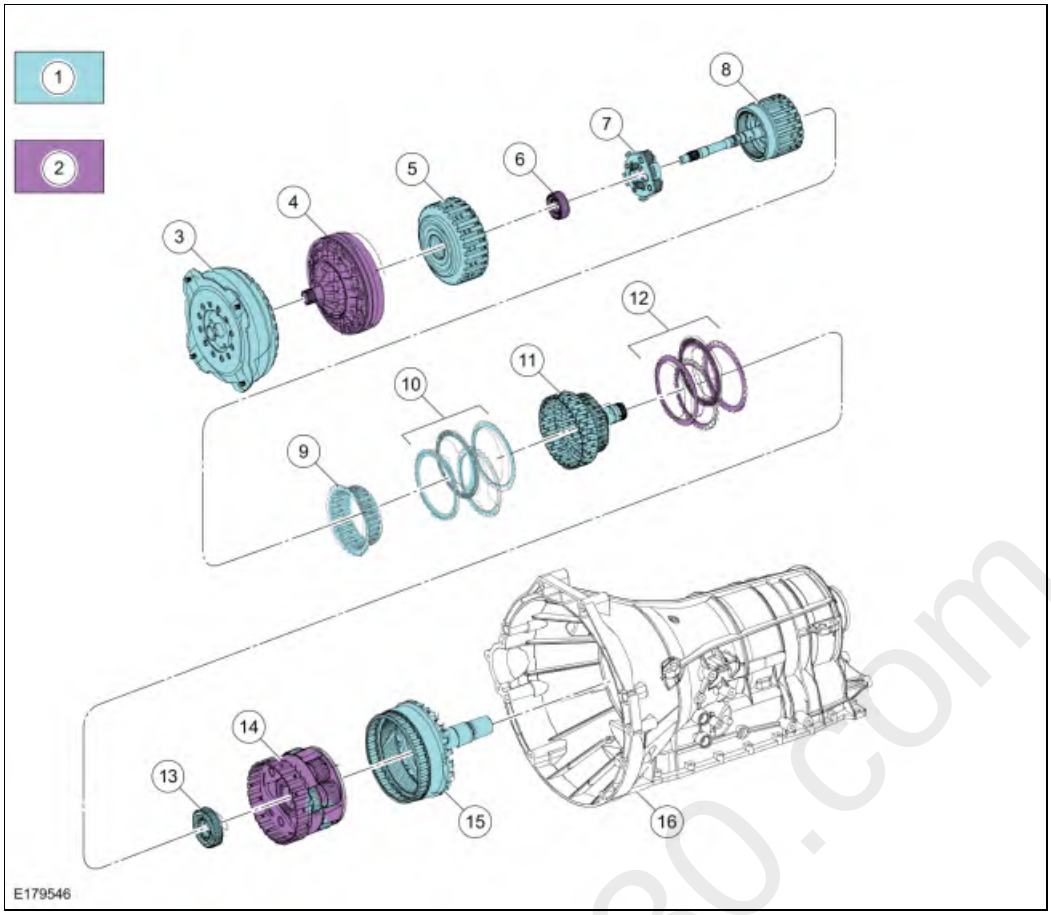
For solenoid information,
Refer to: Main Control Valve Body (307-01A Automatic Transmission, Transfer Case and Power Transfer Unit - 6-Speed Automatic Transmission â€“ 6R100, Description and Operation).

Reverse Position



Item	Description
1	Driven Components
2	Held Components
3	Torque Converter
4	Pump Assembly
5	Forward Clutch Cylinder and Hub Assembly
6	Front Planetary Sun Gear (No. 1)
7	Front Planetary Carrier Assembly
8	Front Planetary Ring Gear Assembly (Input Shaft)
9	Direct Clutch Hub
10	Direct Clutch (B) Assembly
11	Direct Clutch cylinder
12	Low/Reverse Clutch (D)
13	Front Planetary Sun Gear (No. 2)
14	Rear Planetary Carrier
15	Rear Planetary Ring Gear and Output Shaft Assembly
16	Transmission Case

Mechanical Operation

Apply components:

- Low/reverse clutch (D) applied

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- Direct clutch (B) applied

Planetary Gearset Operation

Planetary Gearset Operation

Front planetary gearset driving components

- Ring gear (input shaft)

Front planetary gearset driven components:

- Planetary carrier

Front planetary gearset held components:

- Sun gear (splined to pump assembly)

Rear planetary gearset driven components:

- None

Rear planetary gearset driven components:

- Ring gear (output shaft)

Rear planetary gearset held components:

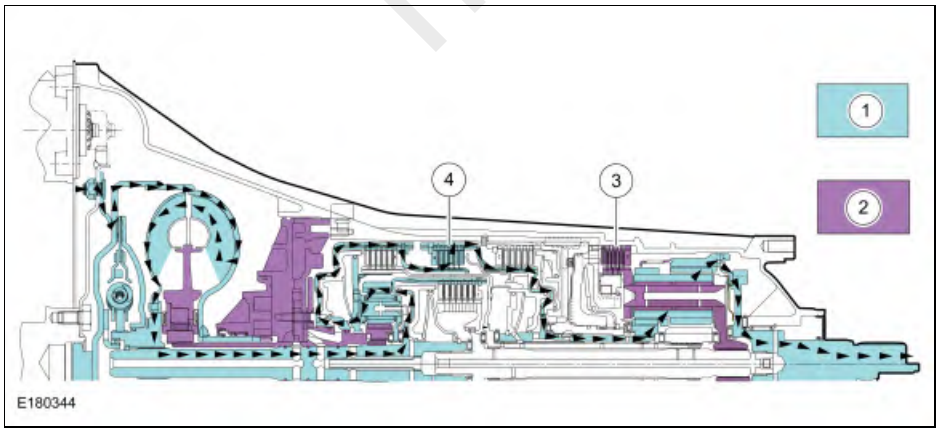
- Planetary carrier

Reverse Position Clutch Application Chart

Gear	Forward A (1,2,3,4)	Direct B (3,5,R)	Intermediate C (2,6)	Low/ Reverse D (1,R)	Overdrive E (4,5,6)	Low-OWC
Reverse	-	D	-	H*	-	-
Planetary Components	Front planetary carrier-to-No. 3 sun gear	Front carrier-to-No. 2 sun gear	No. 2 sun gear	Rear planetary carrier	Input shaft-to-rear planetary carrier	Rear planetary carrier

* H = Hold Clutch

Reverse Position Power Flow



Item	Description
1	Driven Components
2	Held Components
3	Low Reverse Clutch (D)
4	Direct Clutch (B)

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Hydraulic Operation

Line pressure hydraulic circuits:

- The position of the main regulator valve controls line pressure. The position of the main regulator valve is dependent on the pressure applied to it by the LPC solenoid through the VFS5 circuit.
- The main regulator valve varies pressure in the PUMP circuit by controlling hydraulic flow from the SCHG circuit into the pump suction circuit.
- Line pressure is supplied to the:
  - manual valve.
  - lubrication control valve.
  - converter release regulator valve.
  - bypass clutch control regulator valve.
  - solenoid pressure regulator valve.
  - D1 latch and regulator valves.
- In reverse, the manual valve directs line pressure to the No. 1 shuttle valve and the solenoid multiplex valve through the REV circuit.
- The No. 1 shuttle ball directs line pressure to the clutch B regulator valve.

Torque converter circuits:

- When the TCC is released, the converter release regulator valve applies pressure to the torque converter through the CREL circuit to release the TCC.
- CREL pressure exits the torque converter through the CAPLY circuit to the bypass clutch control regulator valve.
- The bypass clutch control regulator valve directs the pressure from the CAPLY circuit back to the converter release regulator valve through the CAPLY EX circuit.
- The converter release regulator valve directs the pressure from the CAPLY EX circuit to the drain back valve through the DBACK circuit.

Cooler and lubrication hydraulic circuits:

- The lubrication control valve directs line pressure to the transmission fluid cooler or the thermal bypass valve through the COOLF circuit.
- When the transmission fluid exits the transmission fluid cooler or thermal bypass valve, it provides lubrication to the transmission through the LUBE circuit.

Solenoid hydraulic circuits:

- The solenoid pressure regulator valve supplies regulated line pressure to the shift, LPC and TCC solenoids through the SREG hydraulic circuit.
- The LPC solenoid applies varying pressure to the main regulator valve through the VFS5 hydraulic circuit. The LPC solenoid regulates line pressure by controlling the position of the main regulator valve.
- SSD supplies pressure to the solenoid multiplex valve through the VFS4 circuit.
- SSB supplies pressure to the clutch B regulator and latch valves to position the valves for direct clutch (B) application.

Clutch hydraulic circuits:

- Line pressure is supplied by the pump to the D1 latch and regulator valves.
- Regulated line pressure from the D1 regulator valve is supplied to the low/reverse clutch (D) to apply the clutch.
- Line pressure is supplied by the manual valve to the clutch B latch and regulator valves.
- Regulated line pressure from the clutch B regulator valve is supplied to the direct clutch (B) to apply the clutch.

Reverse Position Solenoid Operation Chart

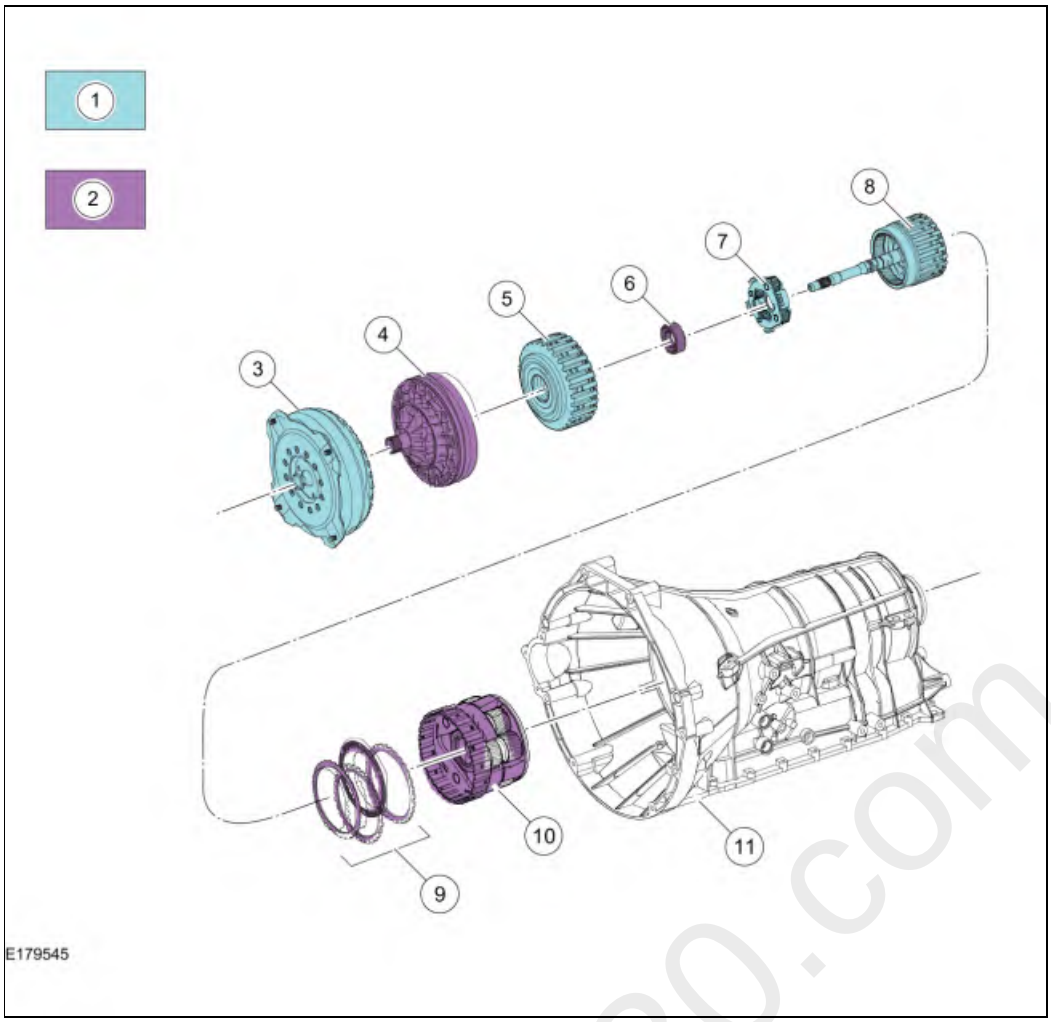
Solenoid operation:

Selector Lever Position	PCM Commanded Gear	NL (1,2,3,4)	SSB NH (3,5,R)	SSC NL (CB 2,6)	SSD NH (CB L/R 4,5,6)	SSE NC	TCC NL
R	R	Off	Off	Off	Off	On	Off

CB = Clutch brake, NC = Normally closed, NH = Normally high, NL = Normally low

For solenoid information,
Refer to: Main Control Valve Body (307-01A Automatic Transmission, Transfer Case and Power Transfer Unit - 6-Speed Automatic Transmission â€“ 6R100, Description and Operation).

Neutral Position



Item	Description
1	Driven Components
2	Held Components
3	Torque Converter
4	Pump Assembly
5	Forward Clutch Cylinder and Hub Assembly
6	Front Planetary Sun Gear (No. 1)
7	Front Planetary Carrier Assembly
8	Front Planetary Ring Gear Assembly (Input Shaft)
9	Low Reverse Clutch (D) Assembly
10	Rear Planetary Carrier
11	Transmission Case

Mechanical Operation

Apply components:

- Low/reverse clutch (D) applied

Planetary Gearset Operation

Planetary Gearset Operation

Front planetary gearset driving components

- Ring gear (input shaft)

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Front planetary gearset driven components:

- Planetary carrier

Front planetary gearset held components:

- Sun gear (splined to pump assembly)

Rear planetary gearset driving components:

- None

Rear planetary gearset driven components:

- None

Rear planetary gearset held components:

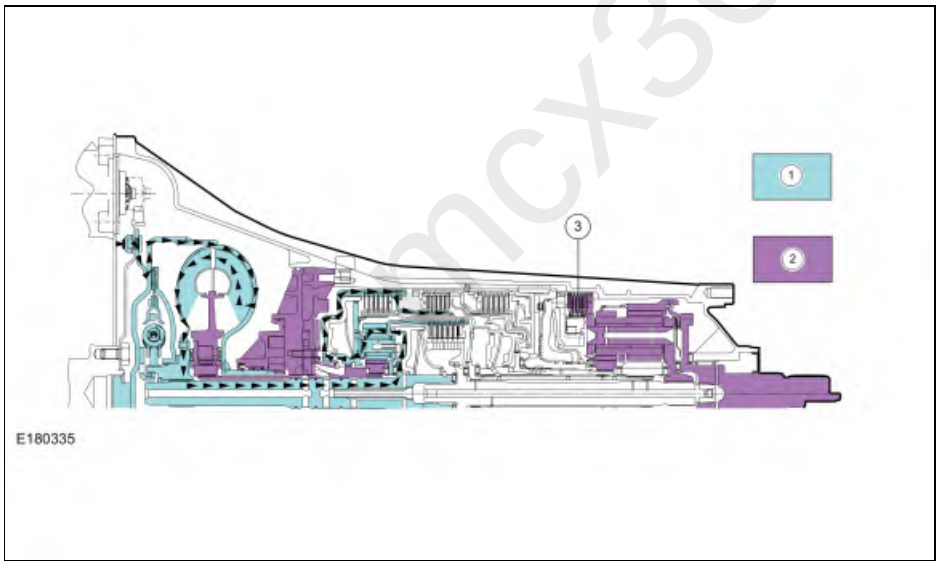
- Planetary carrier

Neutral Position Clutch Application Chart

Gear	Forward A (1,2,3,4)	Direct B (3,5,R)	Intermediate C (2,6)	Low/ Reverse D (1,R)	Overdrive E (4,5,6)	Low-OWC
Reverse	-	-	-	H*	-	-
Planetary Components	Front planetary carrier-to-No. 3 sun gear	Front carrier-to-No. 2 sun gear	No. 2 sun gear	Rear planetary carrier	Input shaft-to-rear planetary carrier	Rear planetary carrier

* H = Hold Clutch

Neutral Position Power Flow



Item	Description
1	Driven Components
2	Held Components
3	Low Reverse Clutch (D)

Hydraulic Operation

Line pressure hydraulic circuits:

- The position of the main regulator valve controls line pressure. The position of the main regulator valve is dependent on the pressure applied to it by the LPC solenoid through the VFS5 circuit.

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- The main regulator valve varies pressure in the PUMP circuit by controlling hydraulic flow from the SCHG circuit into the pump suction circuit.
- Line pressure is supplied to the:
  - manual valve.
  - lubrication control valve.
  - converter release regulator valve.
  - bypass clutch control regulator valve.
  - solenoid pressure regulator valve.
  - D1 latch and regulator valves.
- In reverse, the manual valve directs line pressure to the No. 1 shuttle valve and the solenoid multiplex valve through the REV circuit.
- The No. 1 shuttle ball directs line pressure to the clutch B regulator valve.

Torque converter circuits:

- When the TCC is released, the converter release regulator valve applies pressure to the torque converter through the CREL circuit to release the TCC.
- CREL pressure exits the torque converter through the CAPLY circuit to the bypass clutch control regulator valve.
- The bypass clutch control regulator valve directs the pressure from the CAPLY circuit back to the converter release regulator valve through the CAPLY EX circuit.
- The converter release regulator valve directs the pressure from the CAPLY EX circuit to the drain back valve through the DBACK circuit.

Cooler and lubrication hydraulic circuits:

- The lubrication control valve directs line pressure to the transmission fluid cooler or the thermal bypass valve through the COOLF circuit.
- When the transmission fluid exits the transmission fluid cooler or thermal bypass valve, it provides lubrication to the transmission through the LUBE circuit.

Solenoid hydraulic circuits:

- The solenoid pressure regulator valve supplies regulated line pressure to the shift, LPC and TCC solenoids through the SREG hydraulic circuit.
- The LPC solenoid applies varying pressure to the main regulator valve through the VFS5 hydraulic circuit. The LPC solenoid regulates line pressure by controlling the position of the main regulator valve.
- SSD supplies pressure to the solenoid multiplex valve through the VFS4 circuit.
- SSB supplies pressure to the clutch B regulator and latch valves to position the valves for direct clutch (B) application.

Clutch hydraulic circuits:

- Line pressure is supplied by the pump to the D1 latch and regulator valves.
- Regulated line pressure from the D1 regulator valve is supplied to the low/reverse clutch (D) to apply the clutch.
- Line pressure is supplied by the manual valve to the clutch B latch and regulator valves.
- Regulated line pressure from the clutch B regulator valve is supplied to the direct clutch (B) to apply the clutch.

Neutral Position Solenoid Operation Chart

Solenoid operation:

Selector Lever Position	PCM Commanded Gear	SSA NL (1,2,3,4)	SSB NH (3,5,R)	SSC NL (CB 2,6)	SSD NH (CB L/R 4,5,6)	SSE NC	TCC NL
R	R	Off	Off	Off	Off	On	Off

CB = Clutch brake, NC = Normally closed, NH = Normally high, NL = Normally low

For solenoid information,
Refer to: Main Control Valve Body (307-01A Automatic Transmission, Transfer Case and Power Transfer Unit - 6-Speed Automatic Transmission â€“ 6R100, Description and Operation).

1st Gear

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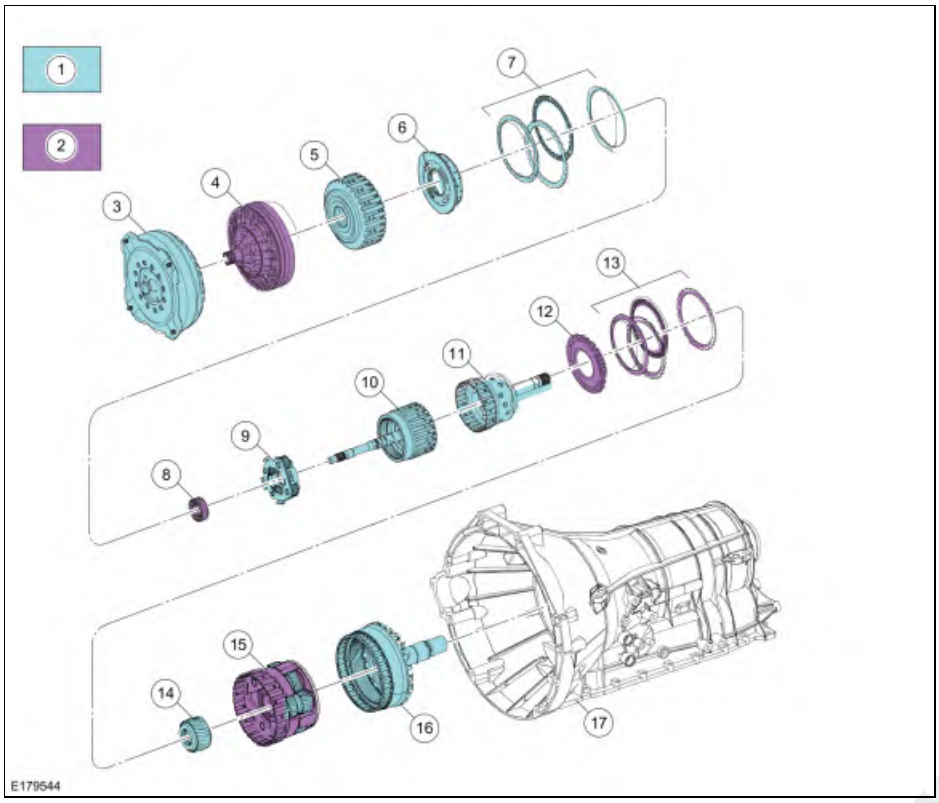

Item	Description
1	Driven Components
2	Held Components
3	Torque Converter
4	Pump Assembly
5	Forward Clutch Cylinder and Hub Assembly
6	Forward Clutch Balance Piston Assembly
7	Forward Clutch (A) Assembly
8	Front Planetary Sun Gear (No. 1)
9	Front Planetary Carrier Assembly
10	Front Planetary Ring Gear Assembly (Input Shaft)
11	No. 3 Sun Gear Hub and Shaft Assembly
12	Low One-Way Clutch
13	Low reverse Clutch (D) Assembly
14	Rear Planetary Sun Gear (No. 3)
15	Rear Planetary Carrier
16	Rear Planetary Ring Gear and Output Shaft Assembly
17	Transmission Case

Mechanical Operation

Apply components:

- Low/reverse clutch (D) applied

Planetary Gearset Operation

Planetary Gearset Operation

Front planetary gearset driving components

- Ring gear (input shaft)

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Front planetary gearset driven components:

- Planetary carrier

Front planetary gearset held components:

- Sun gear (splined to pump assembly)

Rear planetary gearset driving components:

- None

Rear planetary gearset driven components:

- None

Rear planetary gearset held components:

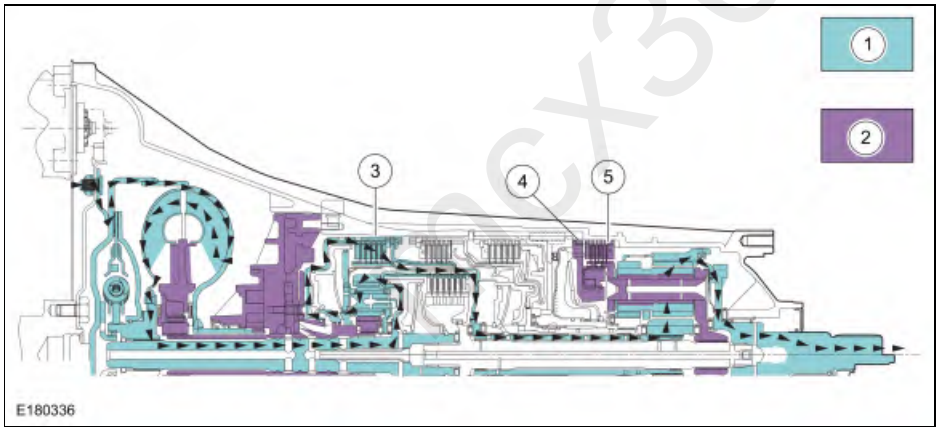
- Planetary carrier

1st Gear Clutch Application Chart

Gear	Forward A (1,2,3,4)	Direct B (3,5,R)	Intermediate C (2,6)	Low/ Reverse D (1,R)	Overdrive E (4,5,6)	Low-OWC
Reverse	-	-	-	*H	-	-
Planetary Components	Front planetary carrier-to-No. 3 sun gear	Front carrier-to-No. 2 sun gear	No. 2 sun gear	Rear planetary carrier	Input shaft-to-rear planetary carrier	Rear planetary carrier

* H = Hold Clutch

1st Gear Power Flow



Item	Description
1	Driven Components
2	Held Components
3	Forward Clutch (A)
4	Low One-Way Clutch
5	Low Reverse Clutch (D) (Applied Below 5 kph [3 mph] Only)

Hydraulic Operation

Line pressure hydraulic circuits:

- The position of the main regulator valve controls line pressure. The position of the main regulator valve is dependent on the pressure applied to it by the LPC solenoid through the VFS5 circuit.
- The main regulator valve varies pressure in the PUMP circuit by controlling hydraulic flow from the SCHG circuit into the pump suction

circuit.
- Line pressure is supplied to the:
  - manual valve.
  - lubrication control valve.
  - converter release regulator valve.
  - bypass clutch control regulator valve.
  - solenoid pressure regulator valve.
  - D1 latch and regulator valves.
- In reverse, the manual valve directs line pressure to the No. 1 shuttle valve and the solenoid multiplex valve through the REV circuit.
- The No. 1 shuttle ball directs line pressure to the clutch B regulator valve.

Torque converter circuits:

- When the TCC is released, the converter release regulator valve applies pressure to the torque converter through the CREL circuit to release the TCC.
- CREL pressure exits the torque converter through the CAPLY circuit to the bypass clutch control regulator valve.
- The bypass clutch control regulator valve directs the pressure from the CAPLY circuit back to the converter release regulator valve through the CAPLY EX circuit.
- The converter release regulator valve directs the pressure from the CAPLY EX circuit to the drain back valve through the DBACK circuit.

Cooler and lubrication hydraulic circuits:

- The lubrication control valve directs line pressure to the transmission fluid cooler or the thermal bypass valve through the COOLF circuit.
- When the transmission fluid exits the transmission fluid cooler or thermal bypass valve, it provides lubrication to the transmission through the LUBE circuit.

Solenoid hydraulic circuits:

- The solenoid pressure regulator valve supplies regulated line pressure to the shift, LPC and TCC solenoids through the SREG hydraulic circuit.
- The LPC solenoid applies varying pressure to the main regulator valve through the VFS5 hydraulic circuit. The LPC solenoid regulates line pressure by controlling the position of the main regulator valve.
- SSD supplies pressure to the solenoid multiplex valve through the VFS4 circuit.
- SSB supplies pressure to the clutch B regulator and latch valves to position the valves for direct clutch (B) application.

Clutch hydraulic circuits:

- Line pressure is supplied by the pump to the D1 latch and regulator valves.
- Regulated line pressure from the D1 regulator valve is supplied to the low/reverse clutch (D) to apply the clutch.
- Line pressure is supplied by the manual valve to the clutch B latch and regulator valves.
- Regulated line pressure from the clutch B regulator valve is supplied to the direct clutch (B) to apply the clutch.

1st Gear Solenoid Operation Chart

Solenoid operation:

Selector Lever Position	PCM Commanded Gear	SSA NL (1,2,3,4)	SSB NH (3,5,R)	SSC NL (CB 2,6)	SSD NH (CB L/R 4,5,6)	SSE NC	TCC NL
D	1	On	On	Off	Off*	On	Off
1	1	On	On	Off	Off	On	Off

CB = Clutch brake, NC = Normally closed, NH = Normally high, NL = Normally low * Solenoid is ON when vehicle speed is above 4 kph (3mph).

2nd Gear

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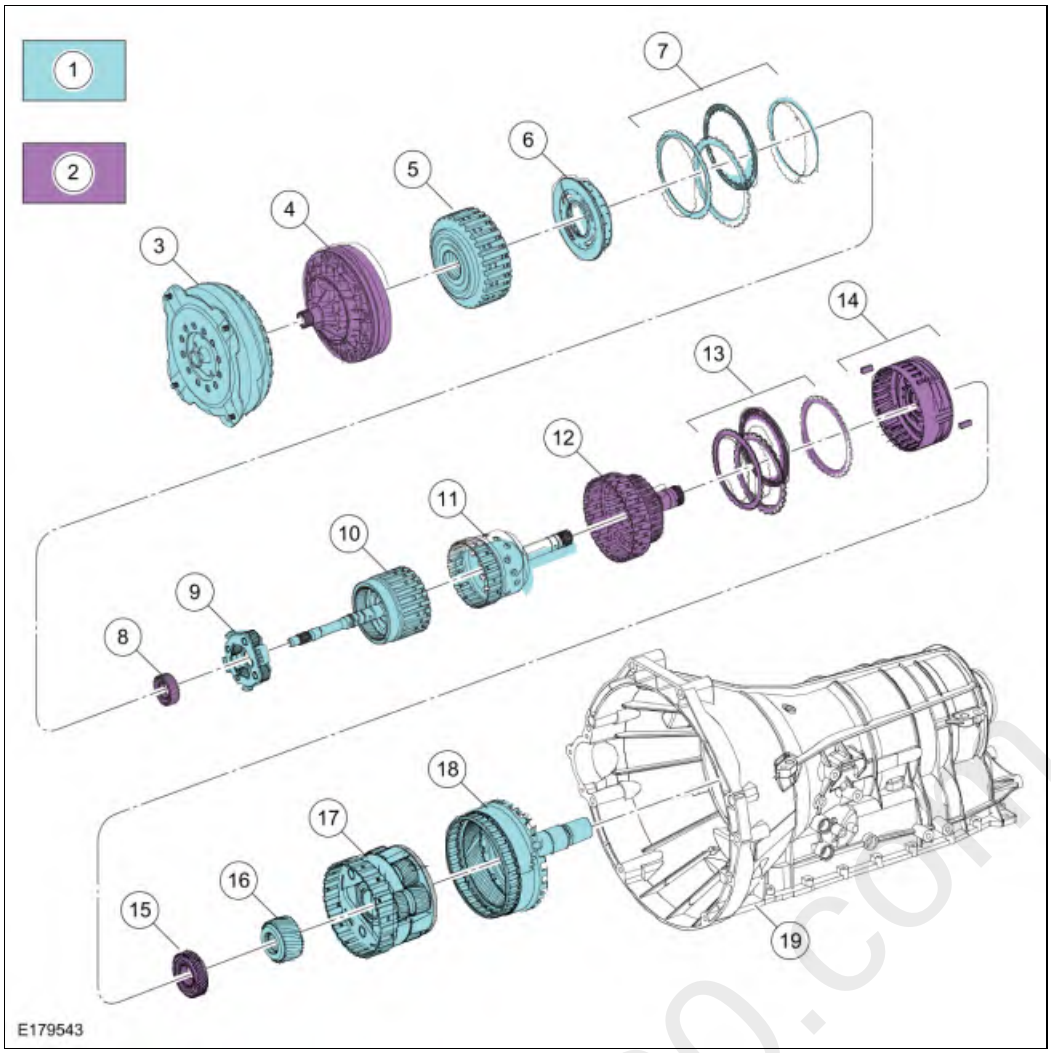

Item	Description
1	Driven Components
2	Held Components
3	Torque Converter
4	Pump Assembly
5	Forward Clutch Cylinder and Hub Assembly
6	Forward Clutch Balance Piston Assembly
7	Forward Clutch (A) Assembly
8	Front Planetary Sun Gear (No. 1)
9	Front Planetary Carrier Assembly
10	Front Planetary Ring Gear Assembly (Input Shaft)
11	No. 3 Sun Gear Hub and Shaft Assembly
12	Direct Clutch Cylinder
13	Intermediate Clutch (C)
12	Low One-Way Clutch
14	Center Support
15	Rear Planetary Sun Gear (No. 2)
16	Rear Planetary Sun Gear (No. 3)
17	Rear Planetary Carrier
18	Rear Planetary Ring Gear and Output Shaft Assembly
19	Transmission Case

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Mechanical Operation

Apply components:

- Forward clutch (A) applied
- Intermediate clutch (C) applied

Planetary Gearset Operation

Front planetary gearset driving components:

- Ring gear (input shaft)

Front planetary gearset driven components:

- Planetary carrier

Front planetary gearset held components:

- Sun gear (splined to pump assembly)

Rear planetary gearset driving components:

- No. 3 sun gear

Rear planetary gearset driven components:

- Planetary carrier
- Ring gear (output shaft)

Rear planetary gearset held components:

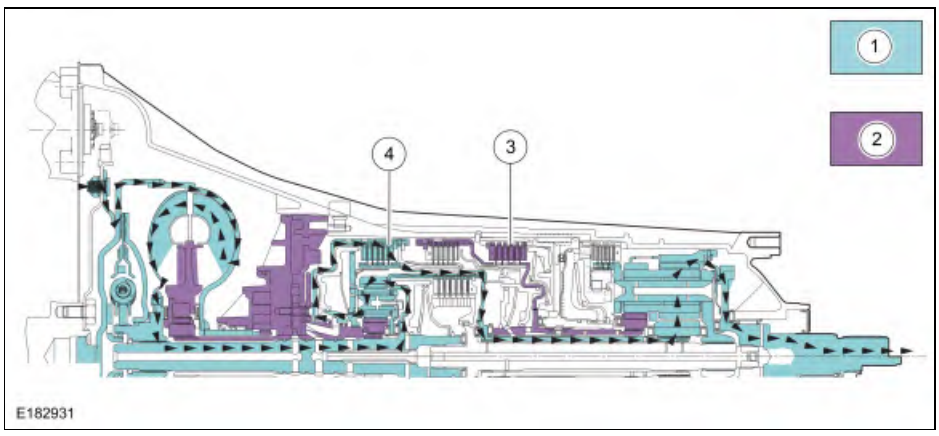
- No. 2 sun gear

2nd Gear Clutch Application Chart

Gear	Forward A (1,2,3,4)	Direct B (3,5,R)	Intermediate C (2,6)	Low/ Reverse D (1,R)	Overdrive E (4,5,6)	Low-OWC
2nd Gear D and Manual 2	D	-	H	-	-	O/R
Planetary Components	Front planetary carrier-to-No. 3 sun gear	Front carrier-to-No. 2 sun gear	No. 2 sun gear	Rear planetary carrier	Input shaft-to-rear planetary carrier	Rear planetary carrier

D = Drive Clutch * H = Hold Clutch O/R = Overrunning

2nd Gear Power Flow



Item	Description
1	Driven Components

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2	Held Components
3	Intermediate Clutch (C)
4	Forward Clutch (A)

Hydraulic Operation

Line Pressure Hydraulic Circuits:

- The position of the main regulator valve controls line pressure. The position of the main regulator valve is dependent on the pressure applied to it by the LPC solenoid through the VFS5 circuit.
- The main regulator valve varies pressure in the PUMP circuit by controlling hydraulic flow from the SCHG circuit into the pump suction circuit.
- Line pressure is supplied to the:
  - Manual valve.
  - Lubrication control valve.
  - Converter release regulator valve.
  - Bypass clutch control regulator valve.
  - Solenoid pressure regulator valve.
  - D1 latch and regulator valves.
- In drive, the manual valve directs line pressure to the No. 1 shuttle valve and clutch A, C and E regulator valves.
- The No. 1 shuttle ball directs line pressure to the clutch B regulator valve.

Torque converter circuits:

- When the TCC is released, the converter release regulator valve applies pressure to the torque converter through the CREL circuit to release the TCC.
- CREL pressure exits the torque converter through the CAPLY circuit to the bypass clutch control regulator valve.
- The bypass clutch control regulator valve directs the pressure from the CAPLY circuit back to the converter release regulator valve through the CAPLY EX circuit.
- The converter release regulator valve directs the pressure from the CAPLY EX circuit to the drain back valve through the DBACK circuit.

Cooler and lubrication hydraulic circuits:

- The lubrication control valve directs line pressure to the transmission fluid cooler or the thermal bypass valve through the COOLF circuit.
- When the transmission fluid exits the transmission fluid cooler or thermal bypass valve, it provides lubrication to the transmission through the LUBE circuit.

Solenoid hydraulic circuits:

- The solenoid pressure regulator valve supplies regulated line pressure to the shift, LPC and TCC solenoid through the SREG hydraulic circuit.
- The LPC solenoid applies varying pressure to the main regulator valve through the VFS5 hydraulic circuit. The LPC solenoid regulates line pressure by controlling the position of the main regulator valve.
- SSA supplies pressure to the clutch A regulator and latch valves to position the valves for forward clutch (A) application.
- SSC supplies pressure to the clutch C regulator valve to position the valve for intermediate clutch (C) application.

Clutch hydraulic circuits:

- Regulated line pressure from the clutch A regulator valve is supplied to the forward clutch (A) to apply the clutch.
- Regulated line pressure from the clutch C regulator valve is supplied to the intermediate clutch (C) to apply the clutch.

Electrical Operation

2nd Gear Solenoid Operation Chart

Selector Lever Position	PCM Commanded Gear	Shift Solenoid					TCC NL
		SSA NL (1,2,3,4)	SSB NH (3,5,R)	SSC NL (CB 2,6)	SSD NH (CB L/R 4,5,6)	SSE NC	
D and 2	2	ON	ON	ON	ON	OFF	OFF

CB = Clutch brake

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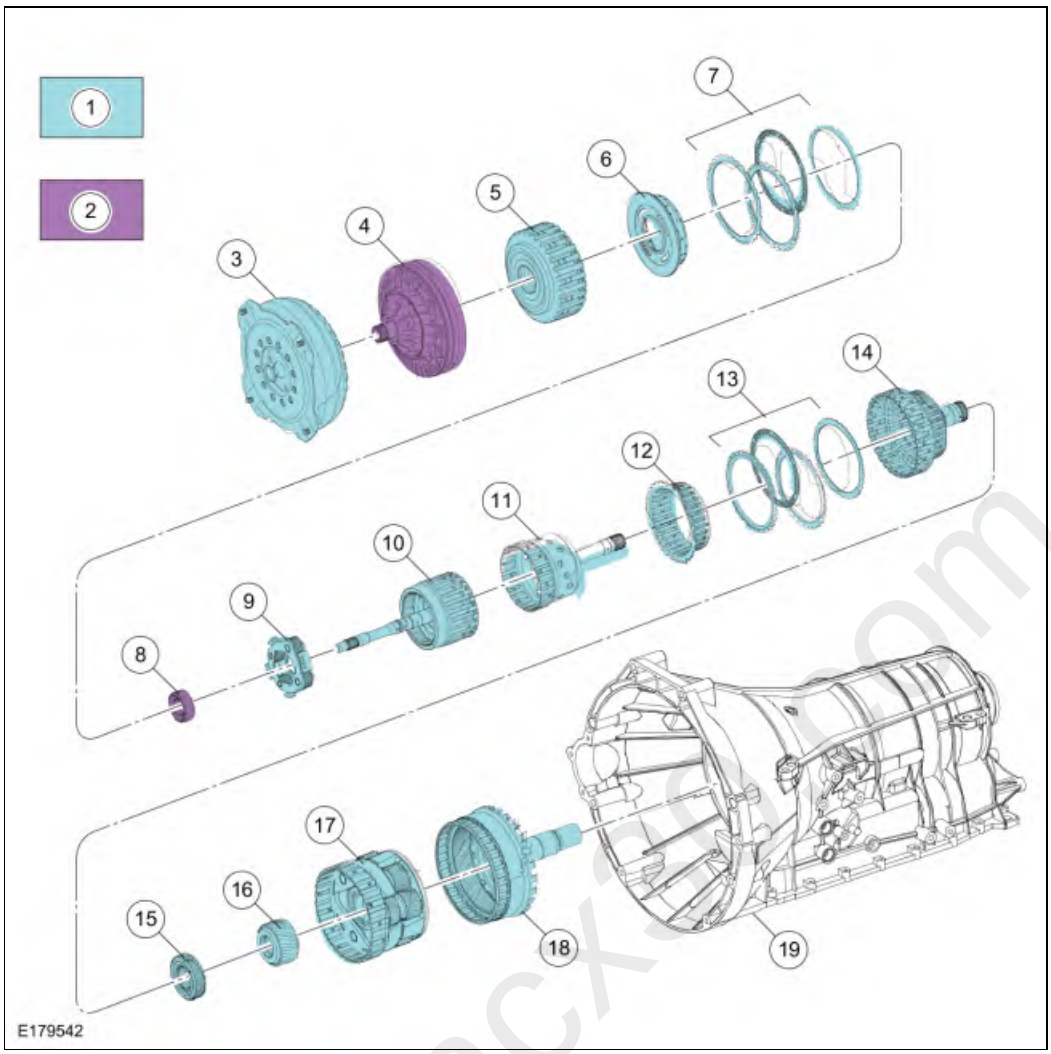
NC = Normally closed

NH = Normally high

NL = Normally low

3rd Gear



Item	Description
1	Driven Components
2	Held Components
3	Torque Converter
4	Pump Assembly
5	Forward Clutch Cylinder and Hub Assembly
6	Forward Clutch Balance Piston Assembly
7	Forward Clutch (A) Assembly
8	Front Planetary Sun Gear (No. 1)
9	Front Planetary Carrier Assembly
10	Front Planetary Ring Gear Assembly (Input Shaft)
11	No. 3 Sun Gear Hub and Shaft Assembly
12	Direct Clutch Cylinder
13	Intermediate Clutch (C)
12	Low One-Way Clutch
14	Center Support
15	Rear Planetary Sun Gear (No. 2)

16	Rear Planetary Sun Gear (No. 3)
17	Rear Planetary Carrier
18	Rear Planetary Ring Gear and Output Shaft Assembly
19	Transmission Case

Mechanical Operation

Apply components:

- Forward clutch (A) applied
- Direct clutch (B) applied

Planetary Gearset Operation

Front planetary gearset driving components:

- Ring gear (input shaft)

Front planetary gearset driven components:

- Planetary carrier

Front planetary gearset held components:

- Sun gear (splined to pump assembly)

Rear planetary gearset driving components:

- No. 3 sun gear
- No. 2 sun gear

Rear planetary gearset driven components:

- Planetary carrier
- Ring gear (output shaft)

Rear planetary gearset held components:

- None

3rd Gear Clutch Application Chart

Gear	Forward A (1,2,3,4)	Direct B (3,5,R)	Intermediate C (2,6)	Low/ Reverse D (1,R)	Overdrive E (4,5,6)	Low-OWC
3rd Gear D and Manual 3	D	D				O/R
Planetary Components	Front planetary carrier-to-No. 3 sun gear	Front carrier-to-No. 2 sun gear	No. 2 sun gear	Rear planetary carrier	Input shaft-to-rear planetary carrier	Rear planetary carrier

CB = Clutch brake

NC = Normally closed

NH = Normally high

NL = Normally low

3rd Gear Power Flow

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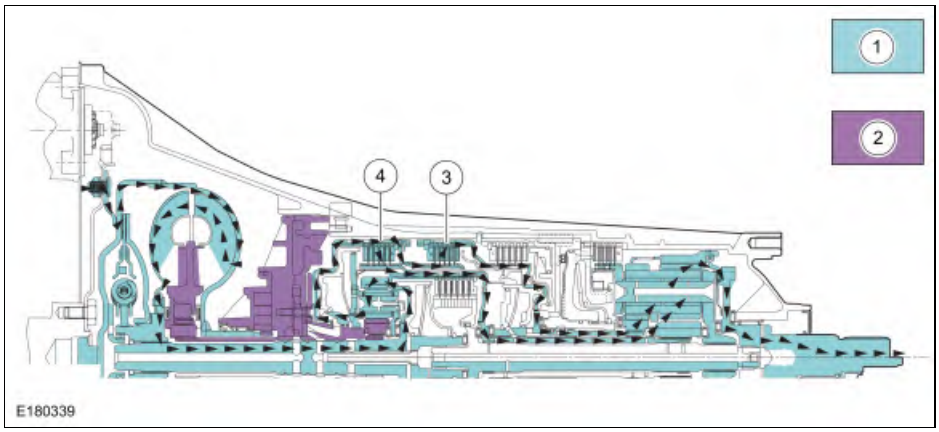

Item	Description
1	Driven Components
2	Held Components
3	Direct Clutch (B)
4	Forward Clutch (A)

Hydraulic Operation

Line pressure hydraulic circuits:

- The position of the main regulator valve controls line pressure. The position of the main regulator valve is dependent on the pressure applied to it by the LPC solenoid through the VFS5 circuit.
- The main regulator valve varies pressure in the PUMP circuit by controlling hydraulic flow from the SCHG circuit into the pump suction circuit.

- Line pressure is supplied to the:
  - Manual valve.
  - Lubrication control valve.
  - Converter release regulator valve.
  - Bypass clutch control regulator valve.
  - Solenoid pressure regulator valve.
  - D1 latch and regulator valves.
- In drive, the manual valve directs line pressure to the No. 1 shuttle valve and clutch A, C and E regulator valves.
- The No. 1 shuttle ball directs line pressure to the clutch B regulator valve.

Torque converter circuits:

- When the TCC is released, the converter release regulator valve applies pressure to the torque converter through the CREL circuit to release the TCC.
  - CREL pressure exits the torque converter through the CAPLY circuit to the bypass clutch control regulator valve.
- The bypass clutch control regulator valve directs the pressure from the CAPLY circuit back to the converter release regulator valve through the CAPLY EX circuit.
- The converter release regulator valve directs the pressure from the CAPLY EX circuit to the drain back valve through the DBACK circuit.

Cooler and lubrication hydraulic circuits:

- The lubrication control valve directs line pressure to the transmission fluid cooler or the thermal bypass valve through the COOLF circuit.
- When the transmission fluid exits the transmission fluid cooler or thermal bypass valve, it provides lubrication to the transmission through the LUBE circuit.

Solenoid hydraulic circuits:

- The solenoid pressure regulator valve supplies regulated line pressure to the shift, LPC and TCC solenoid through the SREG hydraulic circuit.
- The LPC solenoid applies varying pressure to the main regulator valve through the VFS5 hydraulic circuit. The LPC solenoid regulates line pressure by controlling the position of the main regulator valve.
- SSA supplies pressure to the clutch A regulator and latch valves to position the valves for forward clutch (A) application.
- SSB supplies pressure to the clutch B regulator valve to position the valve for direct clutch (B) application.

Clutch hydraulic circuits:

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- Regulated line pressure from the clutch A regulator valve is supplied to the forward clutch (A) to apply the clutch.
- Regulated line pressure from the clutch B regulator valve is supplied to the direct clutch (B) to apply the clutch.

Electrical Operation

3rd Gear Solenoid Operation Chart

Selector Lever Position	PCM Commanded Gear	Shift Solenoid					TCC NL
		SSA NL (1,2,3,4)	SSB NH (3,5,R)	SSC NL (CB 2,6)	SSD NH (CB L/R 4,5,6)	SSE NC	
D and 3	3	On	Off	Off	On	Off	Off

CB = Clutch brake

NC = Normally closed

NH = Normally high

NL = Normally low

4th Gear

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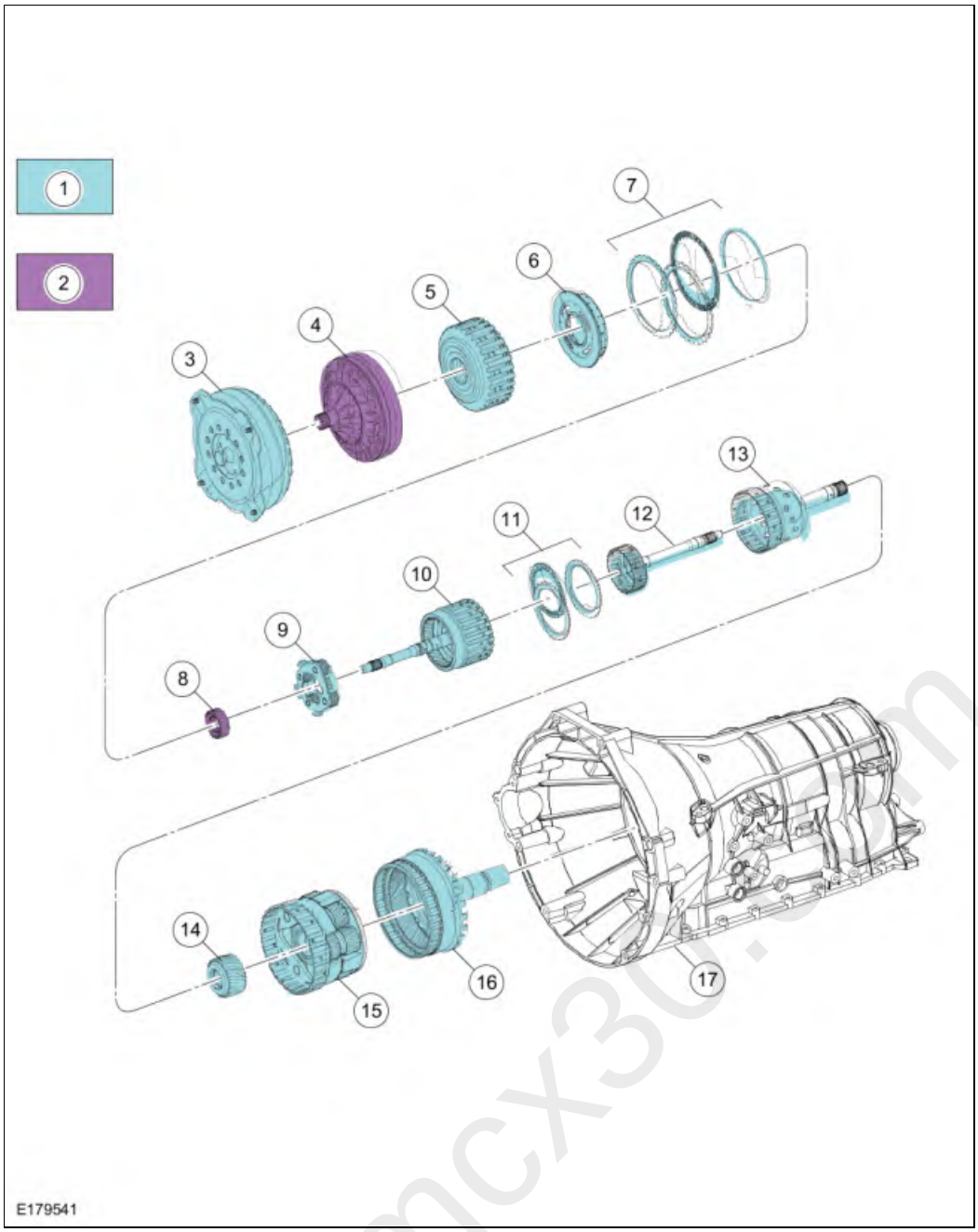

Item	Description
1	Driven Components
2	Held Components
3	Torque Converter
4	Pump Assembly
5	Forward Clutch Cylinder and Hub Assembly
6	Forward Clutch Balance Piston
7	Forward Clutch Assembly (A)
8	Front Planetary Sun Gear (No. 1)
9	Front Planetary Carrier Assembly
10	Front Planetary Ring Gear Assembly (Input Shaft)
11	Overdrive Clutch (E) Assembly
12	Overdrive Clutch Shaft
13	No. 3 Sun Gear Hub and Shaft Assembly
14	Rear Planetary Sun Gear (No. 3)
15	Rear Planetary Carrier

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16	Rear Planetary Ring Gear and Output Shaft Assembly
17	Transmission Case

Mechanical Operation

Apply components:

- Forward clutch (A) applied
- Overdrive clutch (E) applied

Planetary Gearset Operation

Front planetary gearset driving components:

- Ring gear (input shaft)

Front planetary gearset driven components:

- Planetary carrier

Front planetary gearset held components:

- Sun gear (splined to pump assembly

Rear planetary gearset driving components:

- No. 3 sun gear
- Planetary carrier

Rear planetary gearset driven components:

- Ring gear (output shaft)

Rear planetary gearset held components:

- None

4th Gear Clutch Application Chart

Gear	Forward A (1,2,3,4)	Direct B (3,5,R)	Inter-mediate C (2,6)	Low/ Reverse D (1,R)	Overdrive E (4,5,6)	Low- OWC
4th Gear D						
Planetary Components	Front planetary carrier-to-No. 3 sun gear	Front carrier-to-No. 2 sun gear	No. 2 sun gear	Rear planetary carrier	Input shaft-to-rear planetary carrier	Rear planetary carrier

- D = Drive Clutch
- O/R = Overrunning

4th Gear Power Flow

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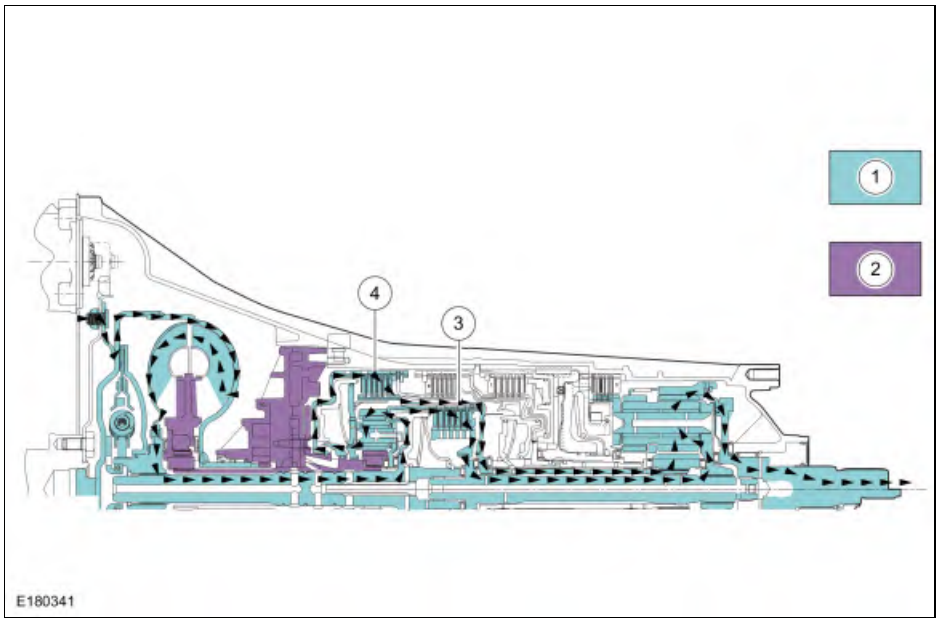

Item	Description
1	Driven Components
2	Held Components
3	Overdrive Clutch (E)
4	Forward Clutch (A)

Hydraulic Operation

Line pressure hydraulic circuits:

- The position of the main regulator valve controls line pressure. The position of the main regulator valve is dependent on the pressure applied to it by the LPC solenoid through the VFS5 circuit.
- The main regulator valve varies pressure in the PUMP circuit by controlling hydraulic flow from the SCHG circuit into the pump suction circuit.

- Line pressure is supplied to the:
  - Manual valve.
  - Lubrication control valve
  - Converter release regulator valve.
  - Bypass clutch control regulator valve.
  - Solenoid pressure regulator valve.
  - D1 latch and regulator valves.

- In drive, the manual valve directs line pressure to the No. 1 shuttle valve and clutch A, C and E regulator valves.
- The No. 1 shuttle ball directs line pressure to the clutch B regulator valve.

Torque converter circuits:

- When the TCC is released, the converter release regulator valve applies pressure to the torque converter through the CREL circuit to release the TCC.
- CREL pressure exits the torque converter through the CAPLY circuit to the bypass clutch control regulator valve.
- The bypass clutch control regulator valve directs the pressure from the CAPLY circuit back to the converter release regulator valve through the CAPLY EX circuit.
- The converter release regulator valve directs the pressure from the CAPLY EX circuit to the drain back valve through the DBACK circuit.

Cooler and lubrication hydraulic circuits:

- The lubrication control valve directs line pressure to the transmission fluid cooler or the thermal bypass valve through the COOLF circuit.
- When the transmission fluid exits the transmission fluid cooler or thermal bypass valve, it provides lubrication to the transmission through the LUBE circuit.

Solenoid hydraulic circuits:

- The solenoid pressure regulator valve supplies regulated line pressure to the shift, LPC and TCC solenoid through the SREG hydraulic

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circuit.

- The LPC applies varying pressure to the main regulator valve through the VFS5 hydraulic circuit. The LPC solenoid regulates line pressure by controlling the position of the main regulator valve.
- SSA supplies pressure to the clutch A regulator and latch valves to position the valves for forward clutch (A) application.
- SSD supplies pressure to the solenoid multiplex valve through the VFS4 circuit.
- SSE supplies pressure to the solenoid multiplex valve and the drive enable valve through the SS1 circuit to move the valves.
- The position of the solenoid multiplex valve and the drive enable valve allows pressure from the VFS4 circuit to be directed to the clutch E latch and regulator valves through the CLEC circuit to position the valves for overdrive clutch (E) application.

Clutch hydraulic circuits:

- Regulated line pressure from the clutch A regulator valve is supplied to the forward clutch (A) to apply the clutch.
- Regulated line pressure from the clutch E regulator valve is supplied to the overdrive clutch (E) to apply the clutch.

Electrical Operation

Solenoid operation:

4th Gear Solenoid Operation Chart

Selector Lever Position	PCM Commanded Gear						TCC NL
		SSA NL (1,2,3,4)	SSB NH (3,5,R)	SSC NL (CB 2,6)	SSD NH (CB L/R 4,5,6)	SSE NC	
D	4	On	On	Off	Off	Off	On/Off

CB = Clutch brake

NC = Normally closed

NH = Normally high

NL = Normally low

5th Gear

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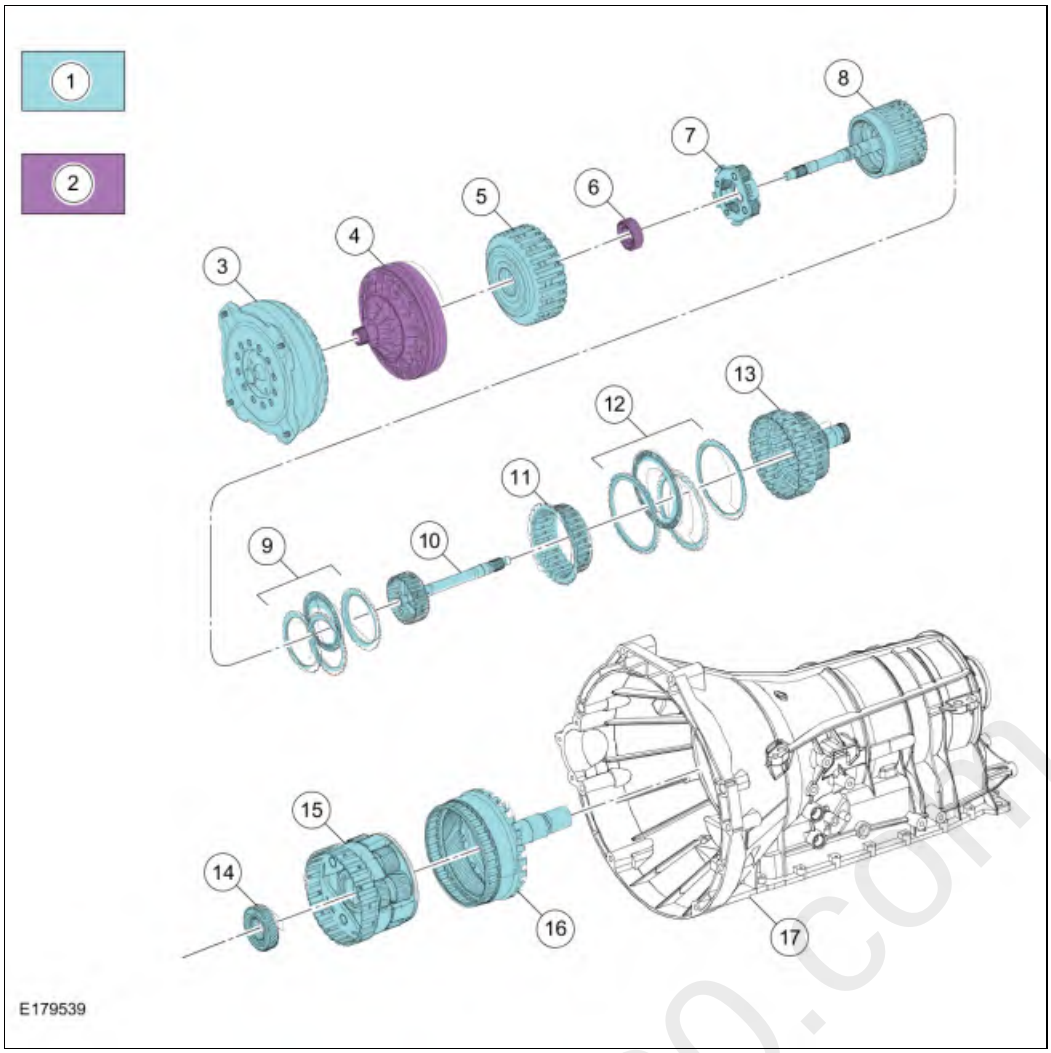

Item	Description
1	Driven Components
2	Held Components
3	Torque Converter
4	Pump Assembly
5	Forward Clutch Cylinder and Hub Assembly
6	Front Planetary Sun Gear (No. 1)
7	Front Planetary Carrier Assembly
8	Front Planetary Ring Gear Assembly (Input Shaft)
9	Overdrive Clutch (E) Assembly
10	Overdrive Clutch Shaft
11	Direct Clutch Hub
12	Direct Clutch (B) Assembly
13	Direct Clutch Cylinder
14	Rear Planetary Sun Gear (No. 2)
15	Rear Planetary Carrier
16	Rear Planetary Ring Gear and Output Shaft Assembly
17	Transmission Case

Mechanical Operation

Apply components:

- Overdrive clutch (E) applied

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- Direct clutch (B) applied

Planetary Gearset Operation

Front planetary gearset driving components:

- Ring gear (input shaft)

Front planetary gearset driven components:

- Planetary carrier

Front planetary gearset held components:

- Sun gear (splined to pump assembly)

Rear planetary gearset driving components:

- No. 2 sun gear
- Planetary carrier

Rear planetary gearset driven components:

- Ring gear (output shaft)

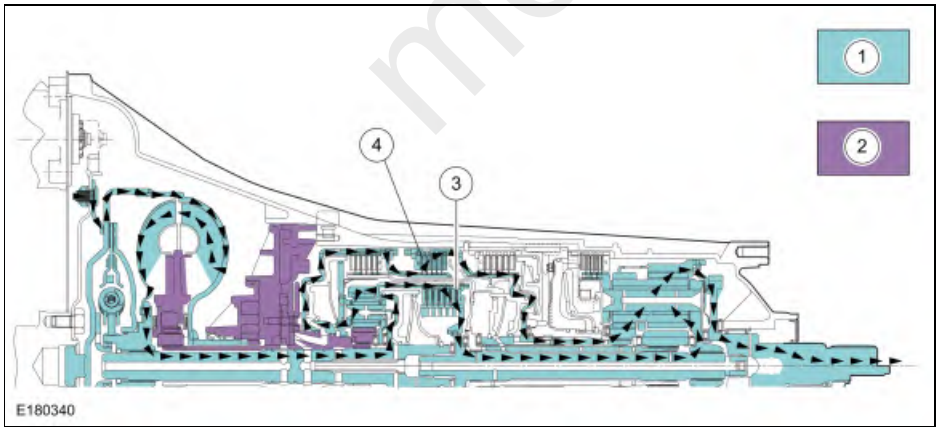
Rear planetary gearset held components:

- None

5th Gear Clutch Application Chart

Gear	Forward A (1,2,3,4)	Direct B (3,5,R)	Intermediate C (2,6)	Low/ Reverse D (1,R)	Overdrive E (4,5,6)	Low-OWC
5th Gear D	-	D	-	-	D	O/R
Planetary Components	Front planetary carrier-to-No. 3 sun gear	Front carrier-to-No. 2 sun gear	No. 2 sun gear	Rear planetary carrier	Input shaft-to-rear planetary carrier	Rear planetary carrier

5th Gear Power Flow



Item	Description
1	Driven Components
2	Held Components
3	Overdrive Clutch (E)
4	Direct Clutch (B)

Hydraulic Operation

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Line pressure hydraulic circuits:

The position of the main regulator valve controls line pressure. The position of the main regulator valve is dependent on the pressure applied to it by the LPC solenoid through the VFS5 circuit.

The main regulator valve varies pressure in the PUMP circuit by controlling hydraulic flow from the SCHG circuit into the pump suction circuit.

- Line pressure is supplied to the:
  - Manual valve.
  - Lubrication control valve.
  - Converter release regulator valve.
  - Bypass clutch control regulator valve.
  - Solenoid pressure regulator valve.
  - D1 latch and regulator valves.

- In drive, the manual valve directs line pressure to the No. 1 shuttle valve and clutch A, C and E regulator valves.
- The No. 1 shuttle ball directs line pressure to the clutch B regulator valve.

Torque converter circuits:

- When the TCC is released, the converter release regulator valve applies pressure to the torque converter through the CREL circuit to release the TCC.
- CREL pressure exits the torque converter through the CAPLY circuit to the bypass clutch control regulator valve.
- The bypass clutch control regulator valve directs the pressure from the CAPLY circuit back to the converter release regulator valve through the CAPLY EX circuit.
- The converter release regulator valve directs the pressure from the CAPLY EX circuit to the drain back valve through the DBACK circuit.

Cooler and lubrication hydraulic circuits:

- The lubrication control valve directs line pressure to the transmission fluid cooler or the thermal bypass valve through the COOLF circuit.
- When the transmission fluid exits the transmission fluid cooler or thermal bypass valve, it provides lubrication to the transmission through the LUBE circuit.

Solenoid hydraulic circuits:

- The solenoid pressure regulator valve supplies regulated line pressure to the shift, LPC and TCCsolenoid through the SREG hydraulic circuit.

- The PCA applies varying pressure to the main regulator valve through the VFS5 hydraulic circuit. LPC solenoid regulates line pressure by controlling
- The position of the main regulator valve.
- SSB supplies pressure to the clutch B regulator valve to position the valve for direct clutch (B) application.
- SSD supplies pressure to the solenoid multiplex valve through the VFS4 circuit.
- SSE supplies pressure to the solenoid multiplex valve and the drive enable valve through the SS1 circuit to move the valves.
- The position of the solenoid multiplex valve and the drive enable valve allows pressure from the VFS4 circuit to be directed to the clutch E latch and regulator valves through the CLEC circuit to position the valves for overdrive clutch (E) application.

Clutch hydraulic circuits:

- Regulated line pressure from the clutch B regulator valve is supplied to the direct clutch (B) to apply the clutch.
- Regulated line pressure from the clutch E regulator valve is supplied to the overdrive clutch (E) to apply the clutch.

Electrical Operation

Solenoid operation:

5th Gear Solenoid Operation Chart

Selector Lever Position	PCM Commanded Gear	Shift Solenoid					TCC NL
		SSA NL (1,2,3,4)	SSB NH (3,5,R)	SSC NL (CB 2,6)	SSD NH (CB L/R 4,5,6)	SSE NC	
D	5	OFF	Off	Off	OFF	Off	ON/Off

CB = Clutch brake

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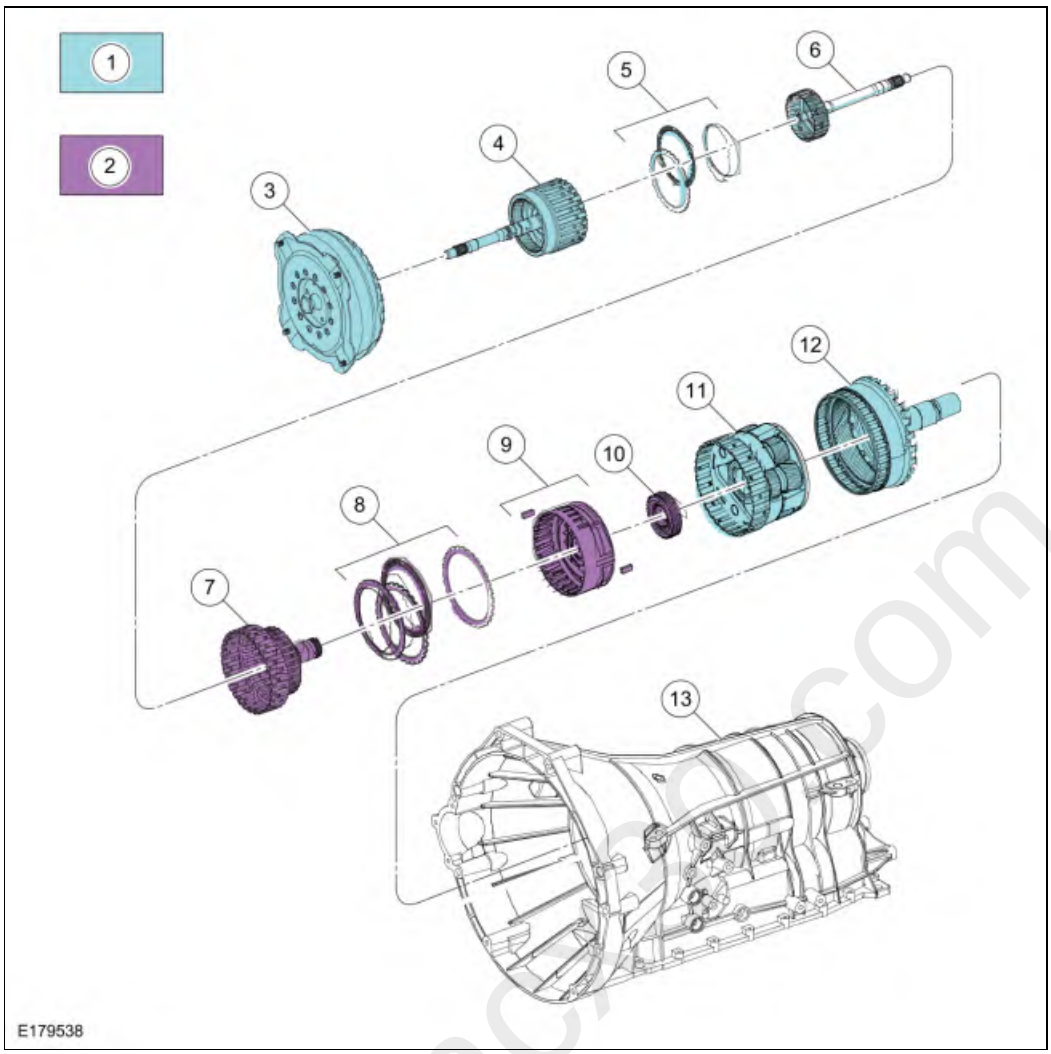
NC = Normally closed

NH = Normally high

NL = Normally low

6th Gear Torque Converter Clutch (TCC) Applied



Item	Description
1	Driven Components
2	Held Components
3	Torque Converter
4	Front Planetary Ring Gear Assembly (Input Shaft)
5	Overdrive Clutch (E) Assembly
6	Overdrive Clutch Shaft
7	Direct Clutch Cylinder
8	Intermediate Clutch (C) Assembly
9	Center Support
10	Rear Planetary Sun Gear (No. 2)
11	Rear Planetary Carrier
12	Rear Planetary Ring Gear and Output Shaft Assembly
13	Transmission Case

Mechanical Operation

Apply components:

- Overdrive clutch (E) applied
- Intermediate clutch (C) applied

Planetary Gearset Operation

Front planetary gearset driving components:

- Ring gear (input shaft)

Front planetary gearset driven components:

- Planetary carrier (does not contribute to power flow)

Front planetary gearset held components:

- Sun gear (splined to pump assembly)

Rear planetary gearset driving components:

- Planetary carrier

Rear planetary gearset driven components:

- Ring gear (output shaft)

Rear planetary gearset held components:

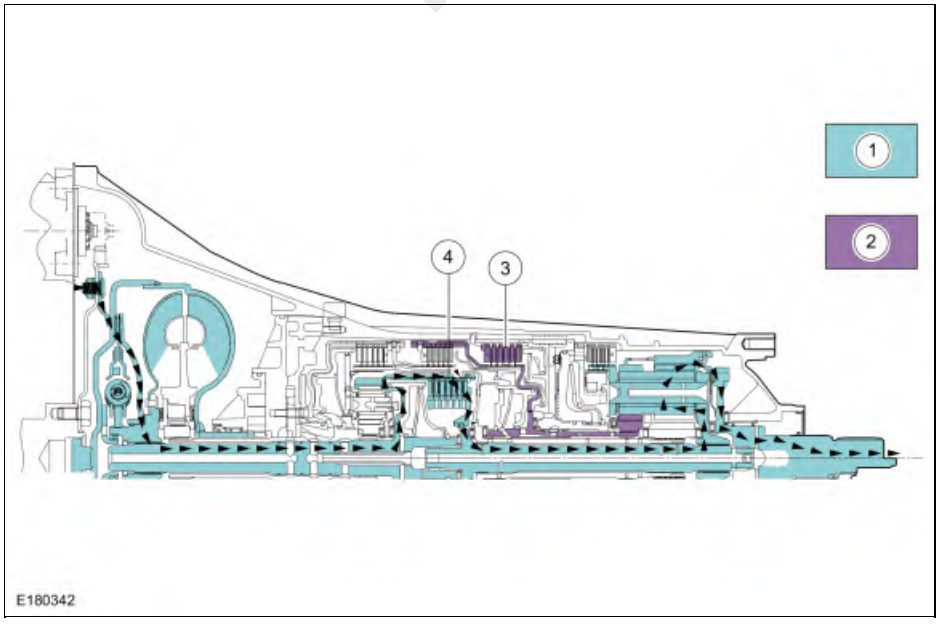
- No. 2 sun gear

6th Gear Torque Converter Clutch (TCC) Applied Clutch Application Chart

Gear	Forward A (1,2,3,4)	Direct B (3,5,R)	Intermediate C (2,6)	Low/ Reverse D (1,R)	Overdrive E (4,5,6)	Low-OWC
6th Gear D			H		D	O/R
Planetary Components	Front planetary carrier-to-No. 3 sun gear	Front carrier-to-No. 2 sun gear	No. 2 sun gear	Rear planetary carrier	Input shaft-to-rear planetary carrier	Rear planetary carrier

- D = Drive Clutch
- H = Hold Clutch
- O/R = Overrunning

6th Gear Power Flow



Item	Description

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1	Driven Components
2	Held Components
3	Intermediate Clutch (C)
4	Overdrive Clutch (E)

Hydraulic Operation

Line pressure hydraulic circuits:

- The position of the main regulator valve controls line pressure. The position of the main regulator valve is dependent on the pressure applied to it by the LPC solenoid through the VFS5 circuit.
- The main regulator valve varies pressure in the PUMP circuit by controlling hydraulic flow from the SCHG circuit into the pump suction circuit.
- Line pressure is supplied to the:
  - Manual valve.
  - Lubrication control valve.
  - Converter release regulator valve.
  - Bypass clutch control regulator valve.
  - Solenoid pressure regulator valve.
  - D1 latch and regulator valves.
- In drive, the manual valve directs line pressure to the No. 1 shuttle valve and clutch A, C and E regulator valves
- The No. 1 shuttle ball directs line pressure to the clutch B regulator valve.

Torque converter circuits:

- When the TCC is applied, the bypass clutch control regulator valve applies pressure to the torque converter through the CAPLY circuit to apply the TCC.
- CAPLY pressure exits the torque converter through the CREL circuit to the converter release regulator valve.

Cooler and lubrication hydraulic circuits:

- The lubrication control valve directs line pressure to the transmission fluid cooler or the thermal bypass valve through the COOLF circuit.
- When the transmission fluid exits the transmission fluid cooler or thermal bypass valve, it provides lubrication to the transmission through the LUBE circuit.

Solenoid hydraulic circuits:

- The solenoid pressure regulator valve supplies regulated line pressure to the shift, LPC and TCC solenoids through the SREG hydraulic circuit.
- The LPC solenoid applies varying pressure to the main regulator valve through the VFS5 hydraulic circuit. The LPC solenoid regulates line pressure by controlling the position of the main regulator valve.
- The TCCsolenoid supplies pressure to the converter release regulator valve and the bypass clutch control regulator valve to move the position of the valves for TCC application.
- SSC supplies pressure to the clutch C regulator valve to position the valve for intermediate clutch (C) application.
- SSD supplies pressure to the solenoid multiplex valve through the VFS4 circuit.
- SSE supplies pressure to the solenoid multiplex valve and the drive enable valve through the SS1 circuit to move the valves.
- The position of the solenoid multiplex valve and the drive enable valve allows pressure from the VFS4 circuit to be directed to the clutch E latch and regulator valves through the CLEC circuit to position the valves for overdrive clutch (E) application.

Clutch hydraulic circuits:

- Regulated line pressure from the clutch C regulator valve is supplied to the intermediate clutch (C) to apply the clutch.
- Regulated line pressure from the clutch E regulator valve is supplied to the overdrive clutch (E) to apply the clutch.

6th Gear Torque Converter Clutch (TCC) Applied Solenoid Operation Chart

Selector Lever Position	PCM Commanded Gear	Shift Solenoid					TCC NL
		SSA NL (1,2,3,4)	SSB NH (3,5,R)	SSC NL (CB 2,6)	SSD NH (CB L/R 4,5,6)	SSE NC	
6	Off	On	On	Off	Off	Off	On/Off

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CB = Clutch brake

NC = Normally closed

NH = Normally high

NL = Normally low

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