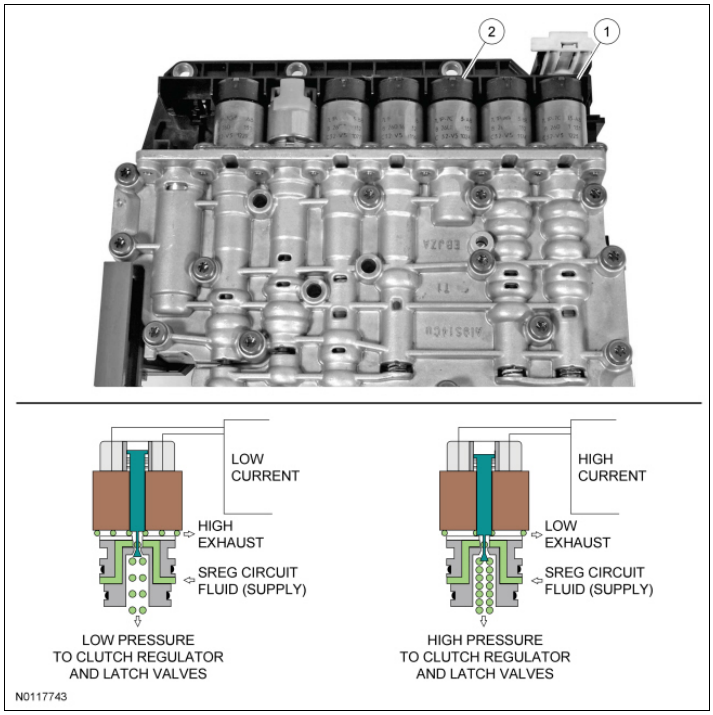
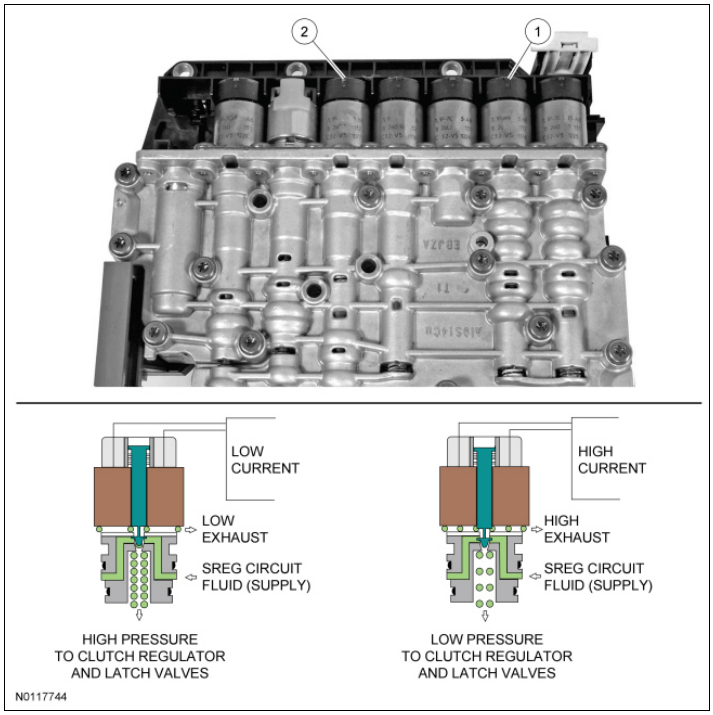



| Item | Description |
|---|---|
| 1 | Shift Solenoid A (SSA) Variable Force Solenoid (VFS) |
| 2 | Shift Solenoid C (SSC) VFS |

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



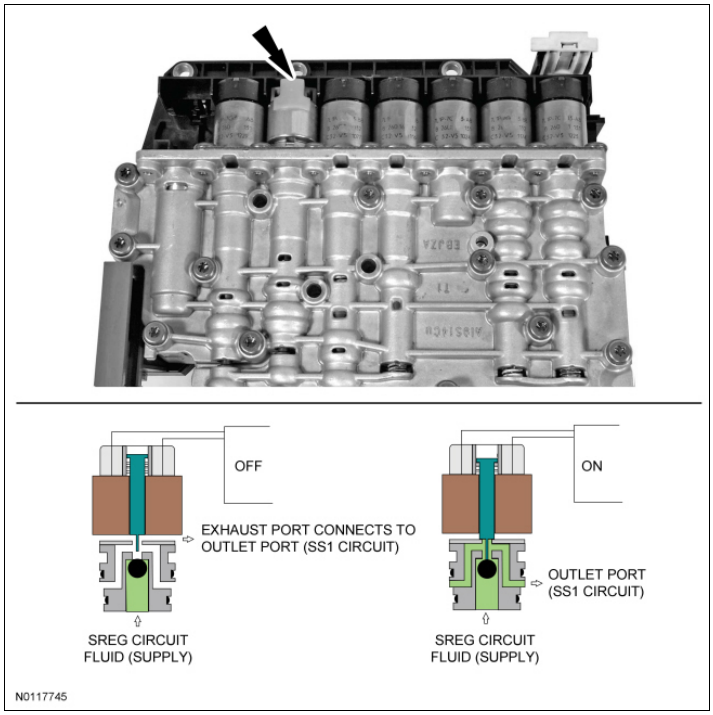

| Item | Description |
|---|---|
| 1 | Shift Solenoid B (SSB) Variable Force Solenoid (VFS) |
| 2 | Shift Solenoid D (SSD) VFS |

**Shift Solenoid E (SSE)**

SSE is an ON/OFF solenoid. When SSE is in the OFF position, SSD controls the regulator and latch valves to apply the low/reverse clutch. When SSE is in the ON position, SSD controls the regulator and latch valves to apply the overdrive (456) clutch. Refer to Hydraulic Circuits in this section.

SSE is supplied hydraulic pressure from the SREG circuit. When SSE is OFF, the solenoid supply is blocked and the outlet port (SS1 circuit) is connected to the exhaust port. When SSE is ON, the exhaust port is blocked and the solenoid supply is connected to the outlet port (SS1 circuit).

**Shift Solenoid E (SSE) ON/OFF Solenoid**




**Turbine Shaft Speed (TSS) Sensor**

The TSS sensor 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.

Refer to the component illustration at the beginning of this procedure for the location of the TSS sensor.

**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.

Refer to the component illustration at the beginning of this procedure for the location of the OSS sensor.

**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.

Refer to the component illustration at the beginning of this procedure for the location of the TFT sensor.

**Transmission Range (TR) Sensor**

The TR sensor has a set of Hall-effect sensors that have a pattern of ON/OFF states which are dependant 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.

Refer to the component illustration at the beginning of this procedure for the location of the TR sensor.

---

## Transmission Operation

### 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
- Torque Converter Clutch (TCC)

For component information, refer to Torque Converter in this section.

### 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

### Apply Clutches

This transmission uses the following clutches to operate the 2 planetary gearsets:

- Forward clutch (A)
- Direct clutch (B)
- Intermediate clutch (C)
- Low/reverse clutch (D)
- Overdrive clutch (E)
- Low One-Way Clutch (OWC)

For information about planetary gearsets or the apply clutches, refer to Mechanical Components and Functions in this section.

### Hydraulic System

The hydraulic operation of this transmission includes the following components:

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

For component information, refer to Hydraulic System in this section.

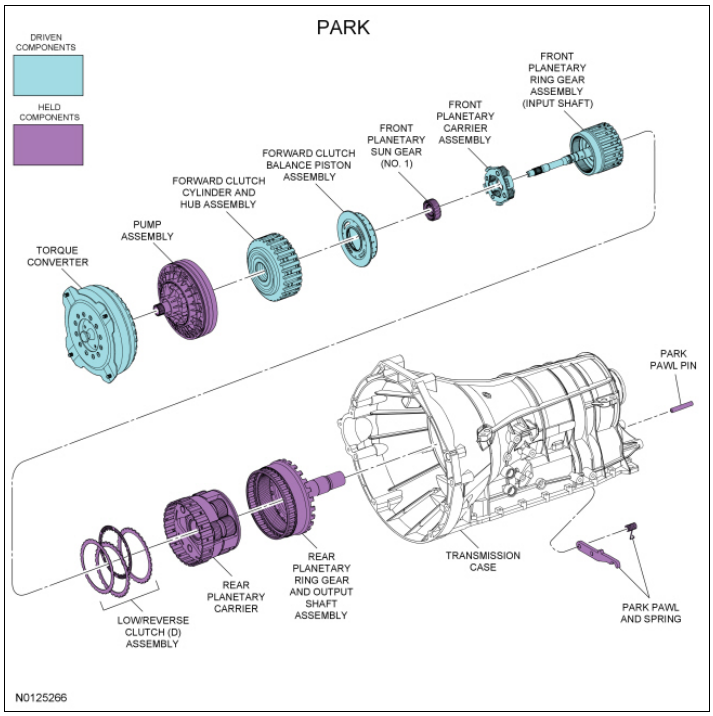
**Electronic Operation**

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

- Line Pressure Control (LPC) solenoid
- Shift Solenoid A (SSA)
- Shift Solenoid B (SSB)
- Shift Solenoid C (SSC)
- Shift Solenoid D (SSD)
- Shift Solenoid E (SSE)
- TCC solenoid

For solenoid information, refer to Transmission Electronic Control System in this section.

**Park Position**




**Mechanical Operation**

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) | Inter-mediate 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

For component information, refer to Mechanical Components and Functions in this section.

#### Park Position Power Flow