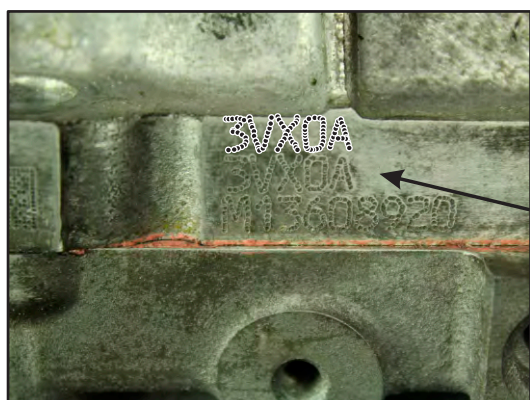


JATCO JF017E THE CVT 8 TRANSMISSION

The JATCO JF016/17E is continuously variable (CVT) transmission manufactured by the Japanese Automatic Transmission Company. Designed to be powered by 2.0L to 3.5L engines worldwide. Here in the United States there is a light version called the CVT-8LT for 4 cylinder applications (JF016E) and a heavier version called the CVT-8HT for V-6 applications (JF017E). Nissan refers to these transmissions as the RE0F10D (Transmission Code 3VX0A) and the RE0F10E (Transmission Code 3WX0A). Mitsubishi uses the F1CJC designations for FWD applications and the W1CJC for AWD applications.

A redesign of the pulleys and push belt produced a 7.0 ratio coverage. The previous design had a 6.0 ratio coverage. This ratio increase provides strong acceleration upon launch while lowering the engine rpm at high speeds for a quieter drive and improved fuel economy.

TRANSMISSION CODE LOCATION AND VEHICLE APPLICATION



Dot peening is used to place the transmission code into the case



VEHICLE APPLICATION CHART

VEHICLE	YEAR	ENGINE	COUNTRY	TRANSMISSION
<i>Nissan Altima*</i>	<i>2012-Up</i>	<i>2.5L (L4)</i>	<i>USA, CAN</i>	<i>JF016E (RE0F10D)</i>
<i>Nissan Altima</i>	<i>2012-Up</i>	<i>3.5L (V6)</i>	<i>USA, CAN</i>	<i>JF017E (RE0F10E)</i>
<i>Mitsubishi Outlander Sport (FWD)</i>	<i>2015-Up</i>	<i>2.0L, (L4)</i>	<i>USA, CAN</i>	<i>JF016E (F1CJC)</i>
<i>Mitsubishi Outlander (FWD)</i>	<i>2016-Up</i>	<i>2.4L, (L4)</i>	<i>USA, CAN</i>	<i>JF016E (F1CJC)</i>
<i>Mitsubishi Outlander (AWD)</i>	<i>2016-Up</i>	<i>2.4L (L4)</i>	<i>USA, CAN</i>	<i>JF016E (W1CJC)</i>
<i>Mitsubishi Lancer (FWD)</i>	<i>2016-Up</i>	<i>2.0L (L4)</i>	<i>USA, CAN</i>	<i>JF016E (F1CJC)</i>

* A Nissan Altima transmission is used to produce this technical portion of the seminar

Transmission provided by Ralph Abraham from Alonso's Transmissions in Miami Florida

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Figure 1

JATCO JF017E THE CVT 8 TRANSMISSION

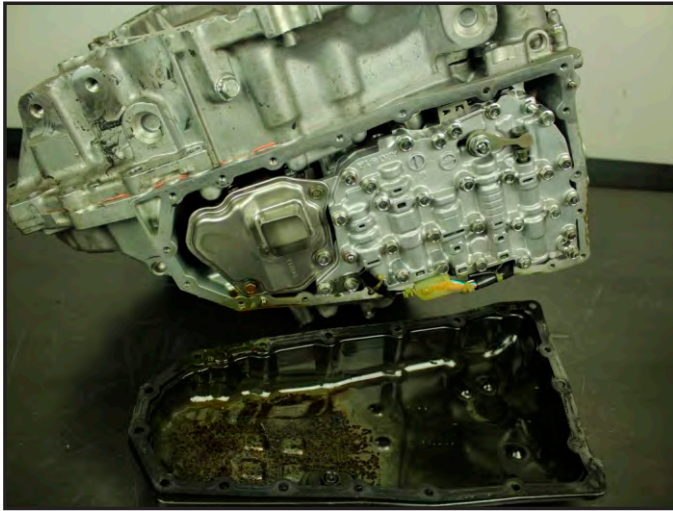


Figure 2

Although many changes were made to the CVT8 transmission when compared to the JF011E/CVT2 transmission, its construction and disassembly procedures is very similar. Beginning with the valve body (figure 2), the filter is removed (figure 3) followed by the filter bracket (figure 4), and then the valve body's perimeter attaching bolts identified in figure 5 followed by the valve body (figure 6).

The significant difference in the removal of the valve body between the two transmissions is the CVT8 does not use a stepper motor. As a result, there is no need to insert a rod through the valve body to retain a ratio control valve during removal. Nor is it needed for installation aligning the ratio control valve to the pulley follower pin as the follower is also not used.

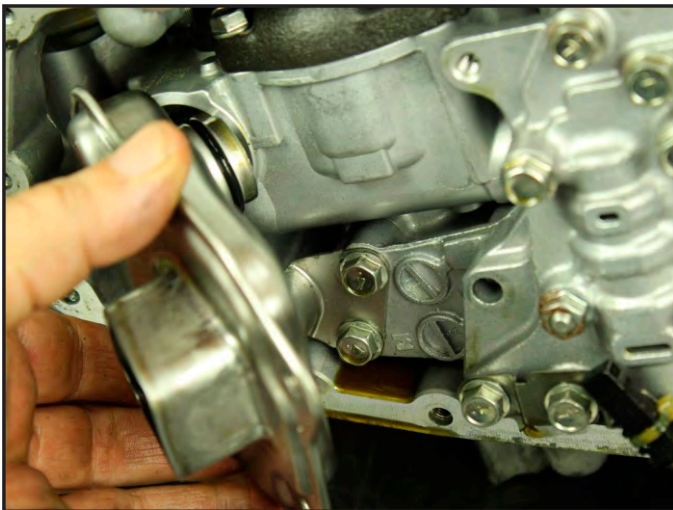


Figure 3

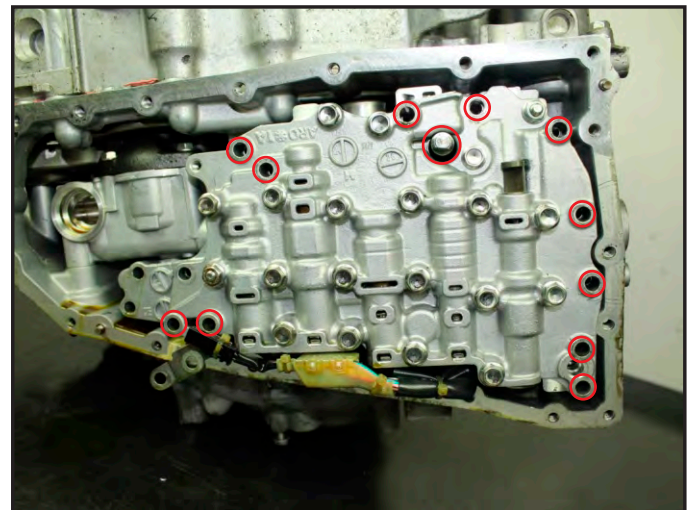


Figure 5

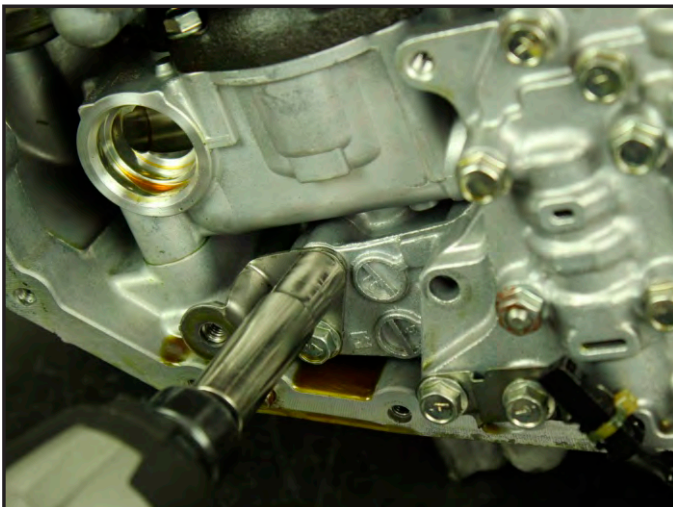


Figure 4

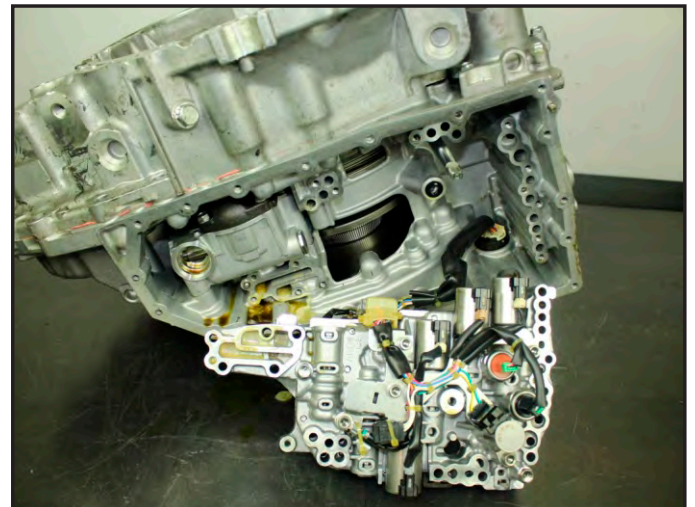


Figure 6

JATCO JF017E THE CVT 8 TRANSMISSION

Like the CVT2 transmission, once the converter housing is separated from the main case, the differential housing, reduction gear, the pump drive gear/chain assembly and stator support cover all come into view (figure 7).

Behind the stator support cover is the forward clutch drum and internal ring gear assembly which lugs into the forward clutch drum like the CVT2 (figure 8).

Then comes the forward clutch hub and sun gear assembly (figure 9), followed by the reverse brake hub and carrier assembly (figure 10), and finally the reverse brake assembly (figure 11).

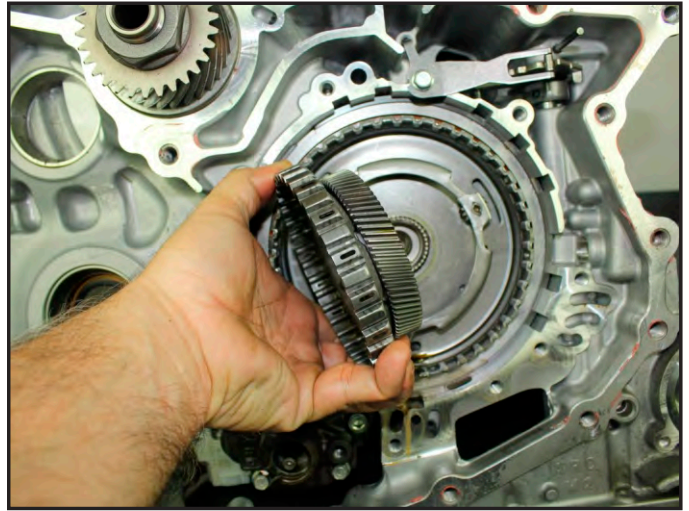


Figure 9

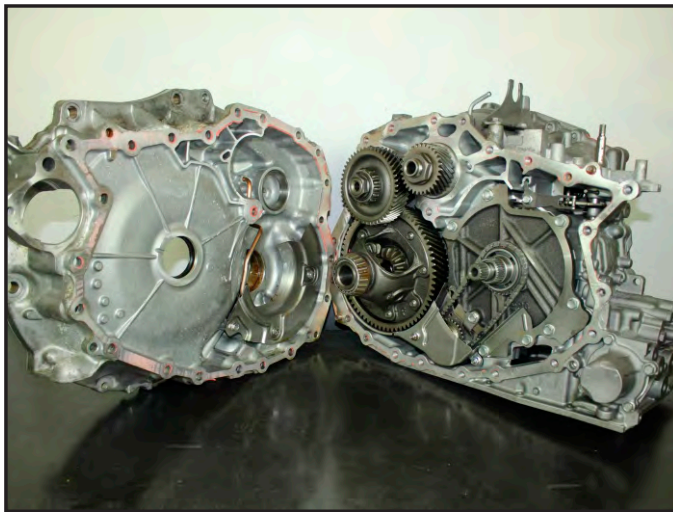


Figure 7

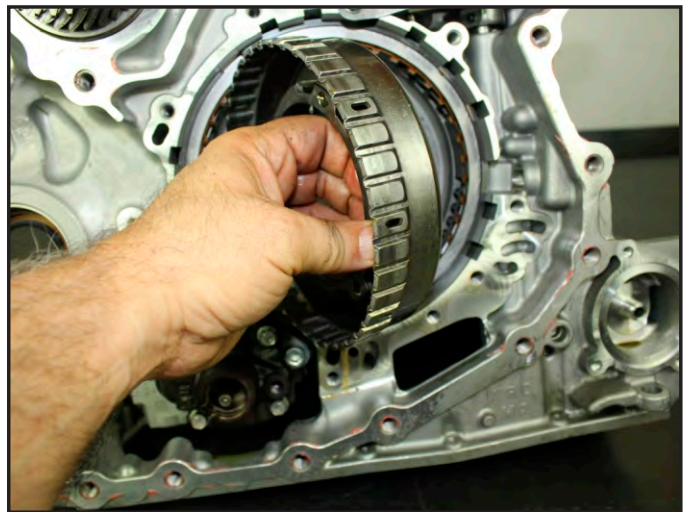


Figure 10

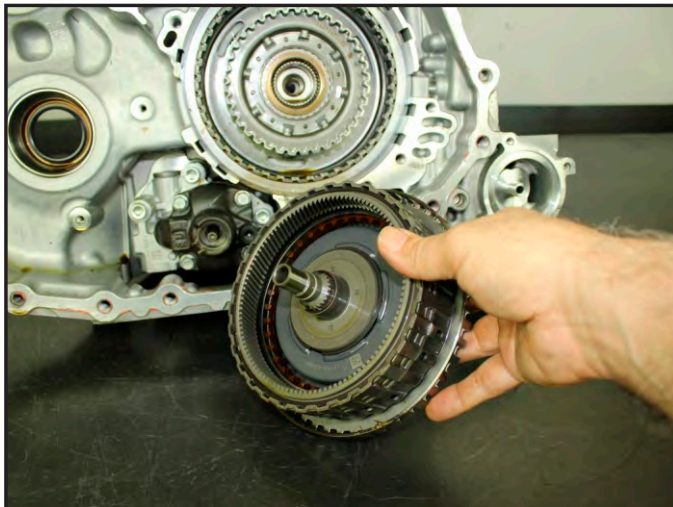


Figure 8



Figure 11

JATCO JF017E THE CVT 8 TRANSMISSION



Figure 12

Disassembly of the pulleys are also quite similar (figure 12). A special tool is required to open the secondary pulley like the one seen in figure 13 available through TransGo (figure 13). Their JF011E-PTK kit provides clamps and threaded rods to be used in conjunction with the shop's bearing puller.

As with the CVT2 transmission, before opening the pulley to remove the belt, use wires ties around the belt to prevent the elements from falling out of the bands (figure 14). Also take note of the direction of rotation by the arrow printed on the belt for proper reassembly (figure 15). Once the tension has been released from the push belt, the pulleys can be unbolted and removed from the side cover (figures 16 and 17).

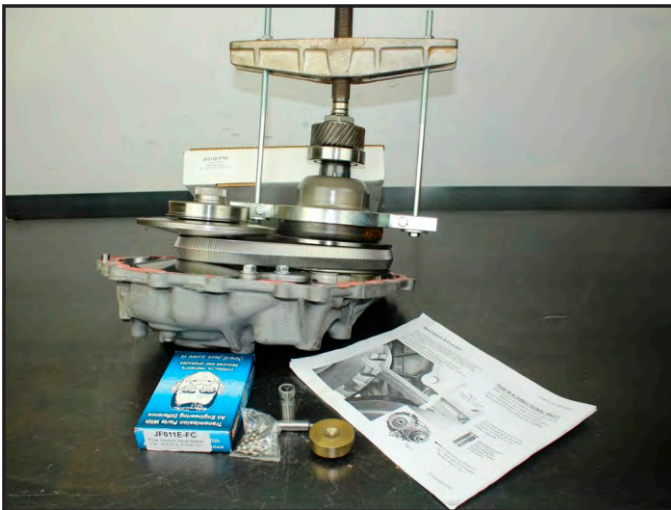


Figure 13



Figure 15

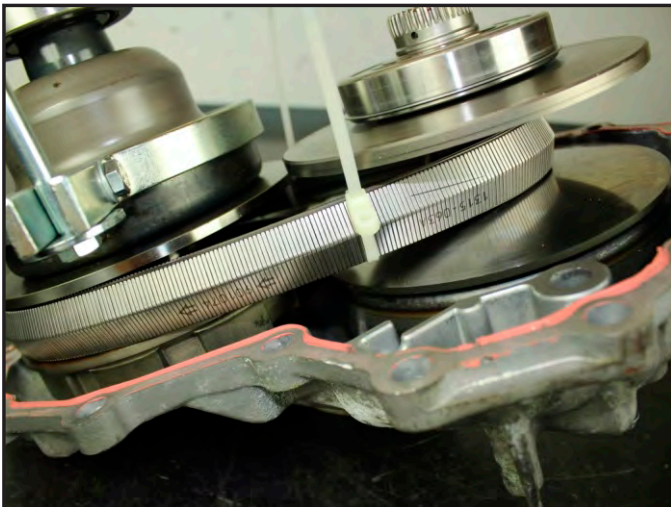


Figure 14

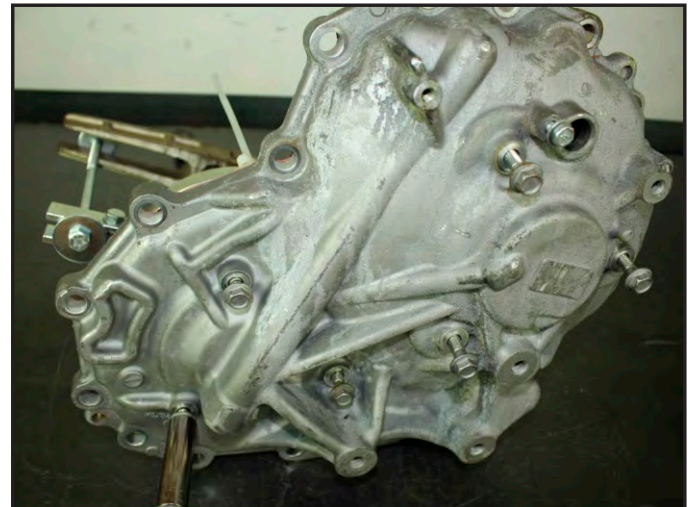


Figure 16

JATCO JF017E THE CVT 8 TRANSMISSION

Once the primary and secondary pulleys have been removed from the side cover the retaining nuts of both pulleys can be removed. The secondary pulley uses a left hand thread while the primary pulley uses right hand threading.

The secondary pulley contains a high tension spring requiring care when disassembling the unit. After the drive gear and bearing has been removed (figure 18), screw the nut back onto the shaft (figure 19). Bring the assembly to a press to push the shaft through the moveable pulley sheave (figure 20). The nut will prevent the shaft from falling through the pulley sheave (figure 21). Have a catch basin underneath as up the three rollers or pins may fall from the assembly.

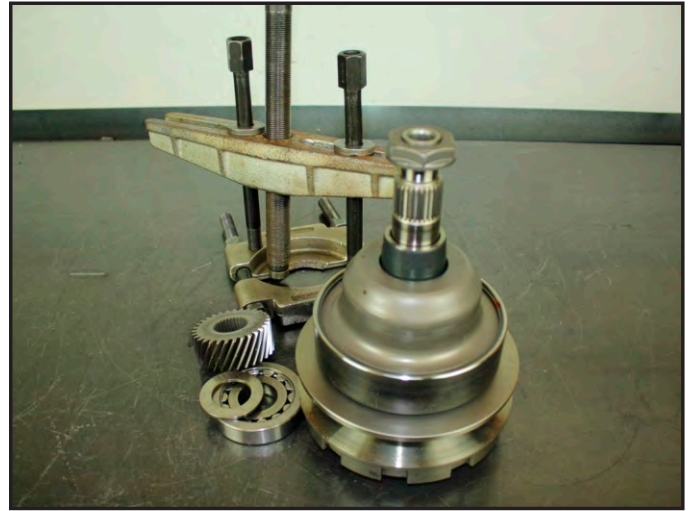


Figure 19



Figure 17



Figure 20



Figure 18



Figure 21

JATCO JF017E THE CVT 8 TRANSMISSION



Figure 22

After removing the shaft from the moveable pulley sheave, compress the high tension spring using a suitable tool and remove the piston cover snap ring (figure 22).

Carefully release the tension of the spring. Often times the piston will stick in the drum requiring a slight tapping of a hammer to pop it free. It will pop with great force so be careful (figure 23). All the parts for the secondary pulley can now be cleaned and inspected (figure 24). The CVT8 uses rollers rather than steel balls for the pulley to move across without spinning (figure 25). This is an area to inspect for wear. A plastic lap joint type seal is used on the piston which is to be replaced if all parts check good (figure 26).



Figure 23

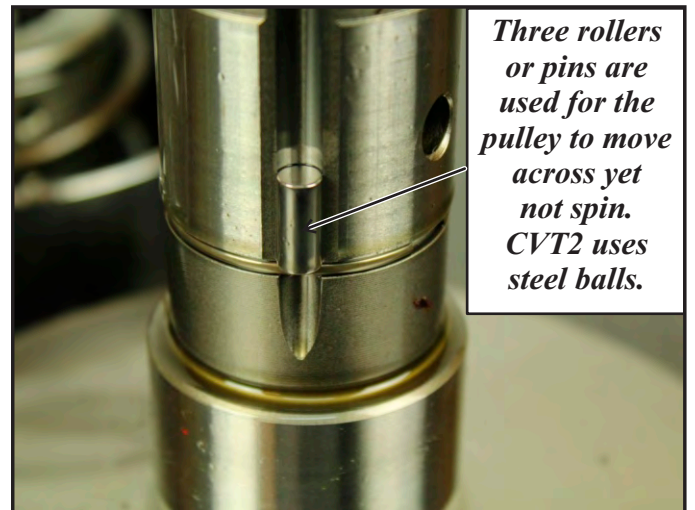


Figure 25

Three rollers or pins are used for the pulley to move across yet not spin. CVT2 uses steel balls.



Figure 24



Figure 26

JATCO JF017E THE CVT 8 TRANSMISSION

The primary pulley disassembles in a similar way as the secondary pulley but without having a high tension spring to be cautious of. With the nut already removed the bearing can be pulled off (figure 27). Afterwards the shaft can be pressed out of the moveable pulley half. Once separated all pieces can be washed and inspected (figure 28).

The sensor wheel for the Primary Speed Sensor is fairly sturdy but caution is still recommended preventing it from being bent or distorted in any way (figure 29).

There are two rollers/pins on the primary pulley shaft secured by roller guide which the secondary pulley does not use (figures 30 and 31).

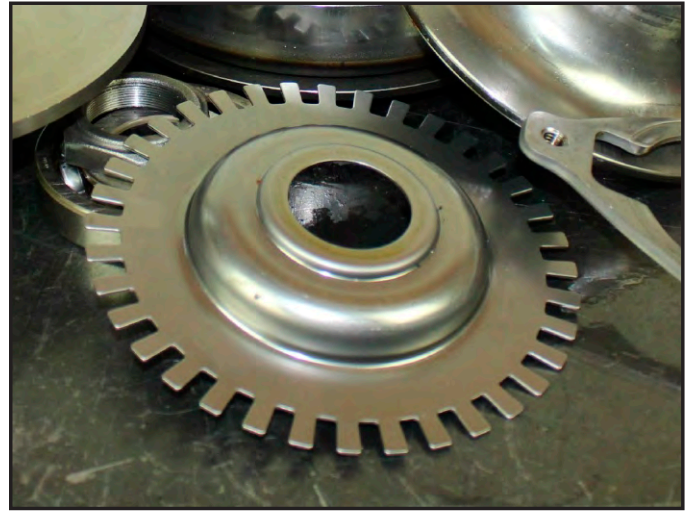


Figure 29

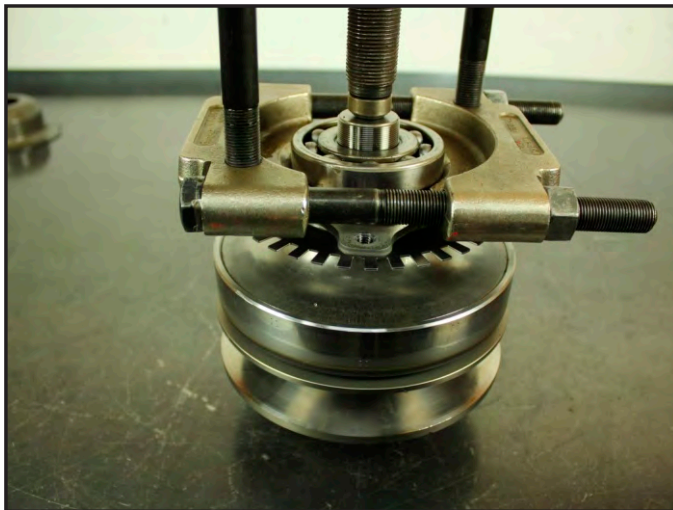


Figure 27



Figure 30



Figure 28



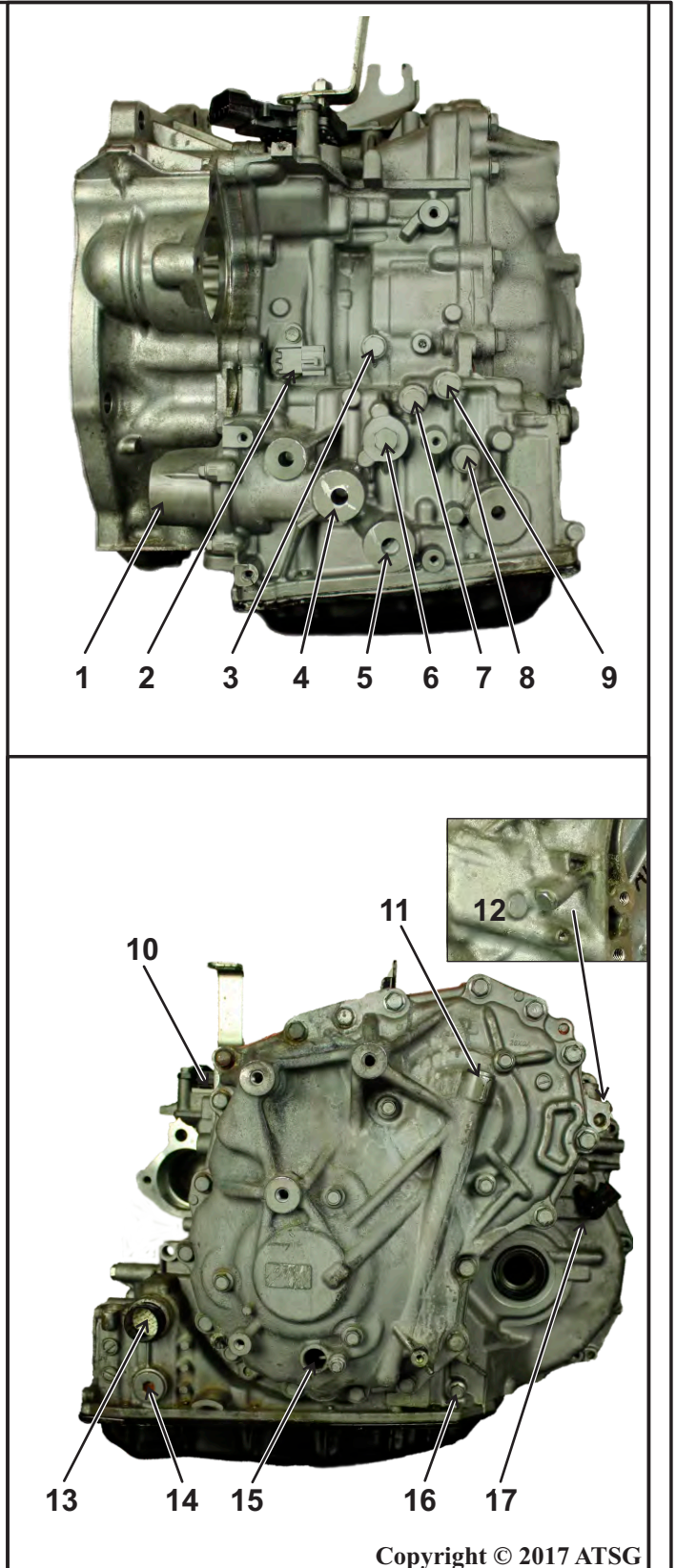
Figure 31

JATCO JF017E THE CVT 8 TRANSMISSION

1. External filter*
2. Input Speed Sensor (P1715)**
3. Reverse Clutch Pressure Tap
4. Cooler (H/E) Return Port
5. To Cooler (H/E) Port
6. Line Pressure Tap
7. Forward Clutch Pressure Tap
8. TCC Release Pressure Tap
9. Primary Pulley Pressure Tap
10. Transmission Range Sensor
11. Secondary Pulley Pressure Tap
12. Lube Pressure Tap
13. F209 Connector (Nissan)
14. Partial Drain Plug
15. Primary (Pulley) Speed Sensor (Input Speed Sensor A - (P0715, P0717)**
16. Internal Pump Retaining Bolt
17. Output Speed Sensor (Input Speed Sensor B - P2765)**

* - The external filter receives fluid returning to the transmission from the cooler (heat exchanger - H/E) which becomes lubrication for the push belt.

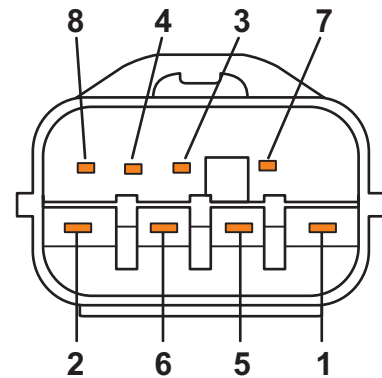
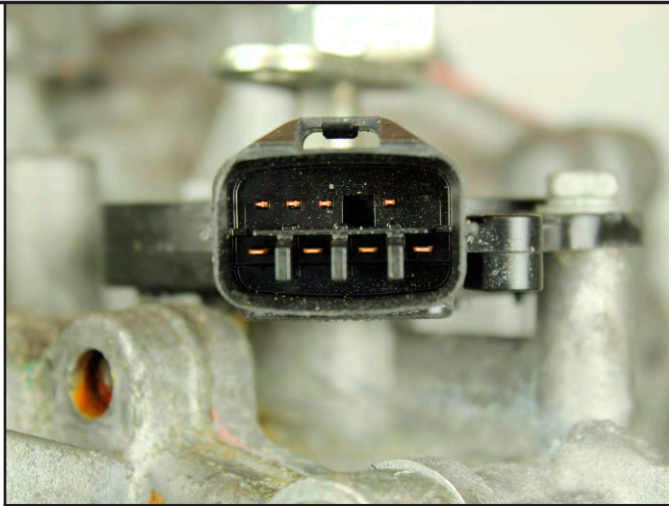
** - All speed sensors are 3 wire Hall Effect type. Each are supplied with system voltage and ground with each of their individual signal wires sending an approximate 12 volt digital pulse signal to the TCM.



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Figure 32

JATCO JF017E THE CVT 8 TRANSMISSION



TRS (F85) Connector View

	P	R	N	D	DS
Ignition Power ————— 1	○		○		
Start Signal Power ————— 2	○		○		
Ignition Power ————— 3	○	○	○	○	○
Park Signal to TCM Terminal 7 ————— 4	○				
Reverse Signal to TCM Terminal 6 ————— 5		○			
Neutral Signal to TCM Terminal 5 ————— 6			○		
Drive Signal to TCM Terminal 4 ————— 7				○	
DS* Signal to TCM Terminal 2 ————— 8					○

**TRS Continuity Bench
Test Check Chart**

**DS is a Drive Sport mode which also allows for manual shift control (if so equipped) using steering wheel paddles. There are seven gears available in the manual shift mode.*

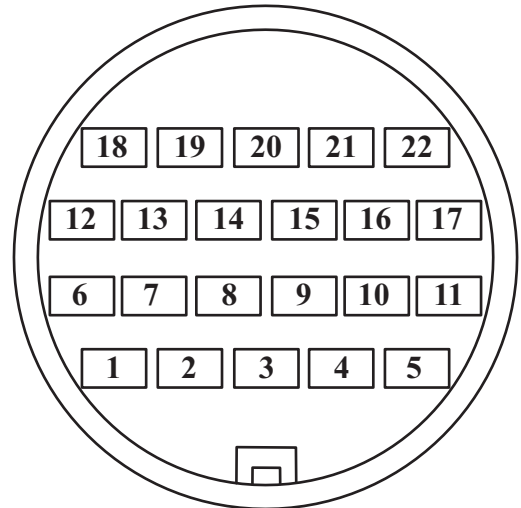
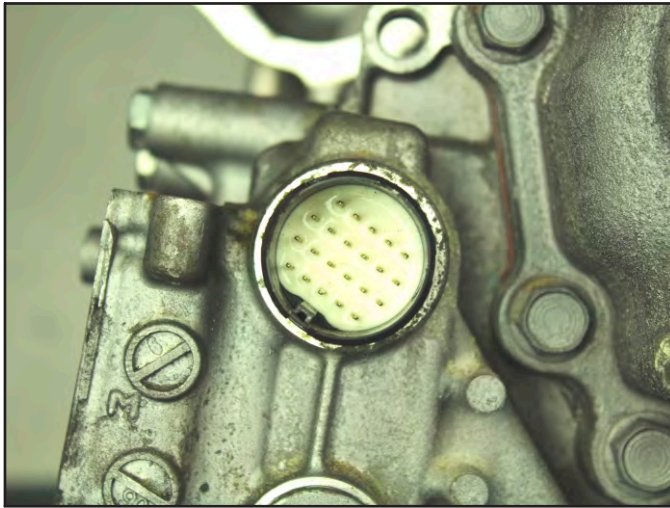
The Transmission Range Sensor continuity check chart can also be used to quickly identify in-vehicle electrical checks. Terminals 1 and 2 of the sensor is used to start the vehicle in Park and Neutral and should not allow start-up in any other range. If voltage is seen on these two terminals in any other range the sensor is bad and will need to be replaced. If the vehicle does not crank, verify good battery voltage first. If good, check terminal 1 at the sensor for power during crank. If ignition power is seen on terminal 1 during crank repeat the same check on terminal 2. If voltage is seen there as well, the problem is beyond the sensor.

Terminal 3 is a power supply to the sensor during crank and run positions of the ignition switch. This power is then routed through the switch to the TCM from different terminals depending on which gear range has been selected. Code P0706 should set if power is lost at terminal 3. Without power at terminal 3 the TCM will not know which gear range has been selected. If there is an intermittent loss of power on terminal 3 while driving, this will cause erratic transmission behavior. If the sensor fails providing output voltage on more than one terminal, P0705 will set and the TCM should initiate failsafe which may prevent engagements into gear by not operating the Select Solenoid.

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Figure 33

JATCO JF017E THE CVT 8 TRANSMISSION



F209 Connector

COMPONENT BENCH TEST TABLE

COMPONENT	+ TERMINAL	- TERMINAL	RESISTANCE
Line Pressure Solenoid Valve	1	Case	6.5 Ω
Primary Pressure Solenoid Valve	2	Case	6.5 Ω
Secondary Pressure Solenoid Valve	3	Case	6.5 Ω
Select Solenoid Valve	4	Case	6.5 Ω
TCC Solenoid Valve	5	Case	6.5 Ω
TFT Sensor	12	18	6.5k Ω @ 20°C (68°F)
			2.2k Ω @ 50°C (122°F)
			0.9k Ω @ 80°C (176°F)

The two pulley pressure sensors (transducers) are supplied with 5 volts from the TCM through terminal 22. They each share the same ground with the TFT to the TCM through terminal 18. Terminal 10 is the Primary Pressure Sensor signal to the TCM while terminal 14 is the Secondary Pressure Sensor signal to the TCM. At idle in neutral approximately 0.90 - 0.92 volts can be observed on the Primary Sensor signal wire while approximately 1.67 - 1.69 volts will be seen of the Secondary Pressure Sensor signal wire.

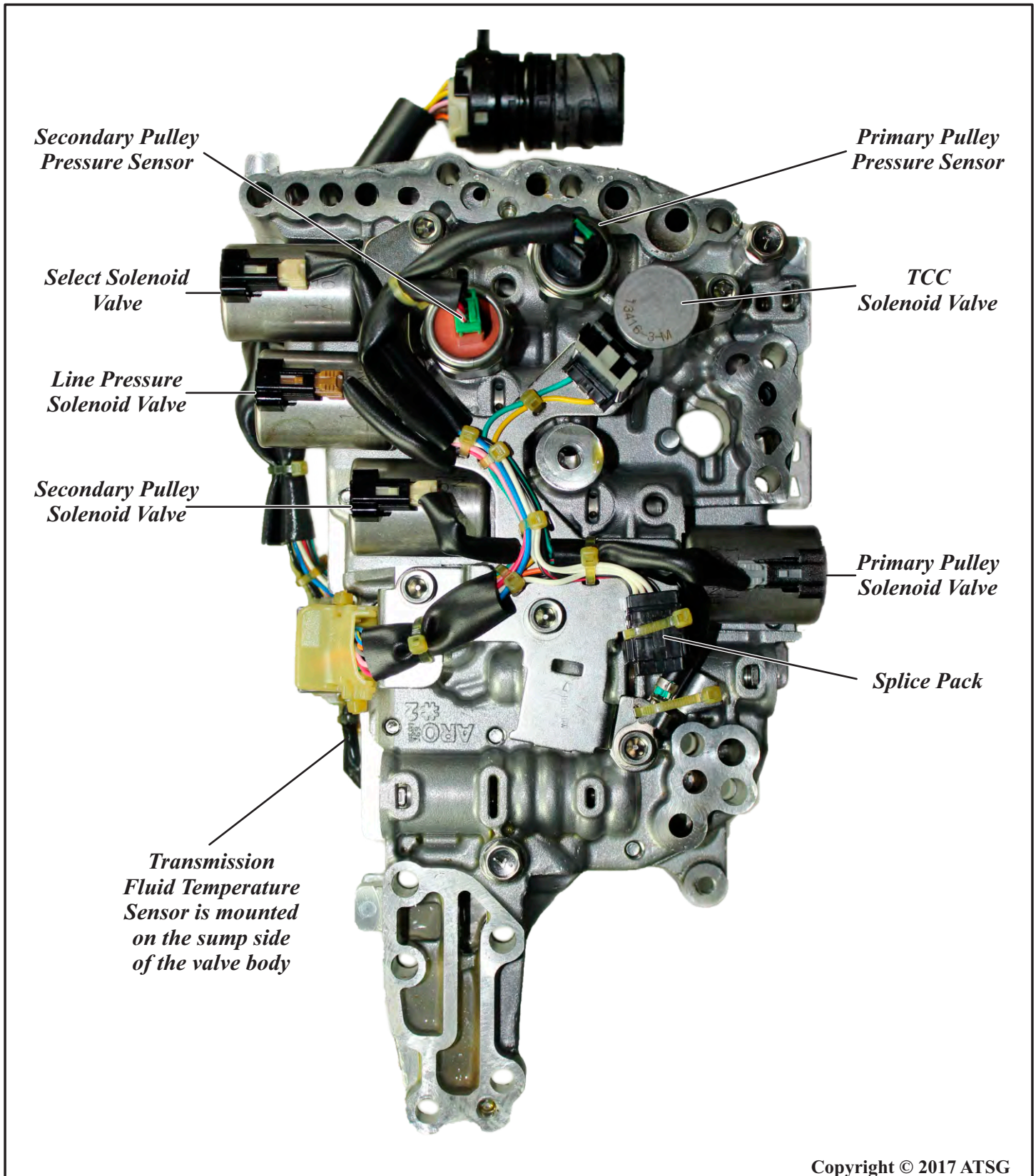
All solenoids for the exception of the TCC Solenoid are Normally High Solenoids. When they are off (approx. 0.1 amp), they apply pressure to their respective circuits. When they are in full duty cycle (approx. 1 amp), they close pressure to their respective circuits.

Approx. TFT sensor voltages: 2VDC @ 20°C (68°F), 1.5VDC @ 50°C (122°F), 0.9VDC @ 80°C (176°F)

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Figure 34

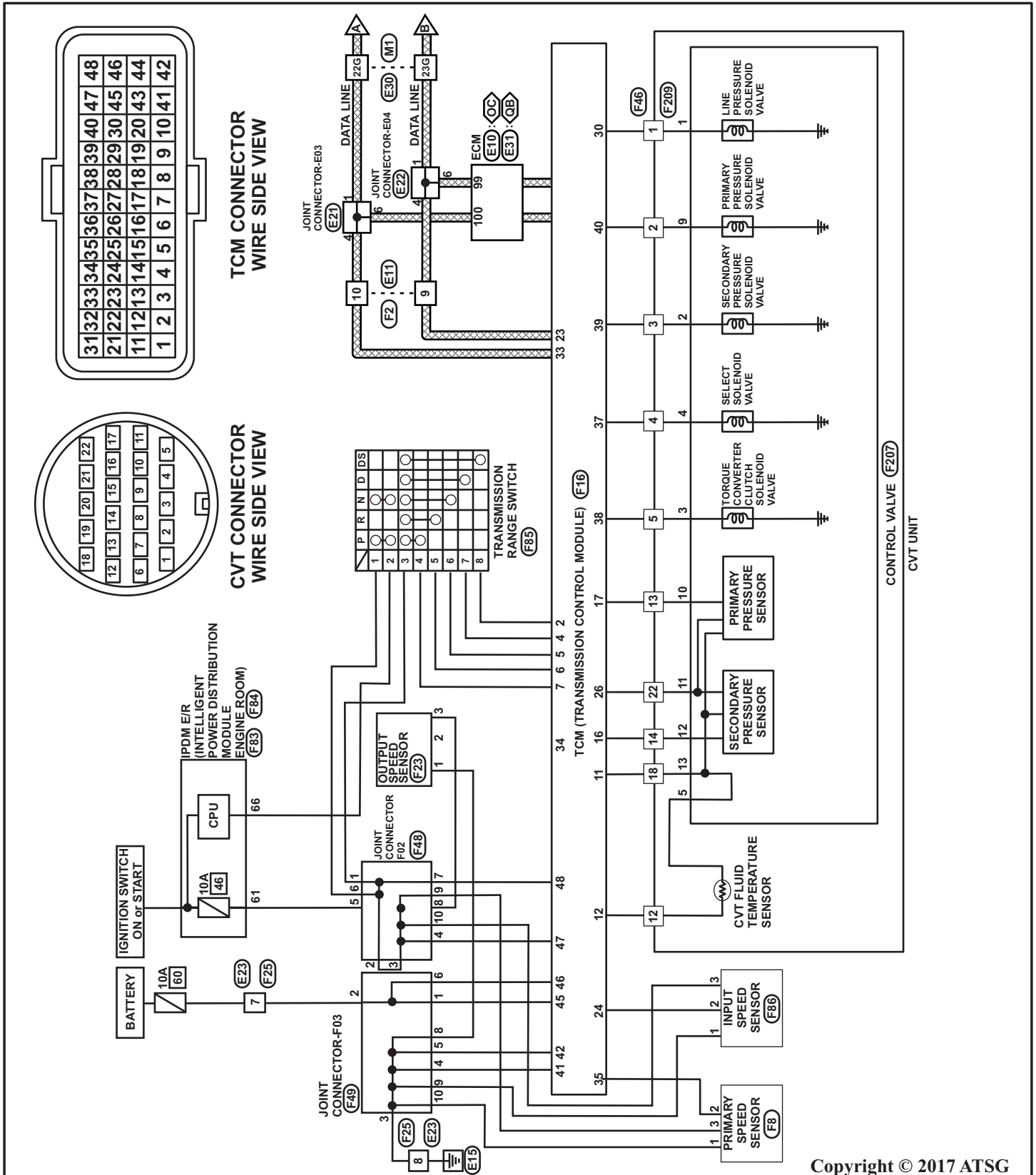
JATCO JF017E THE CVT 8 TRANSMISSION



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Figure 35

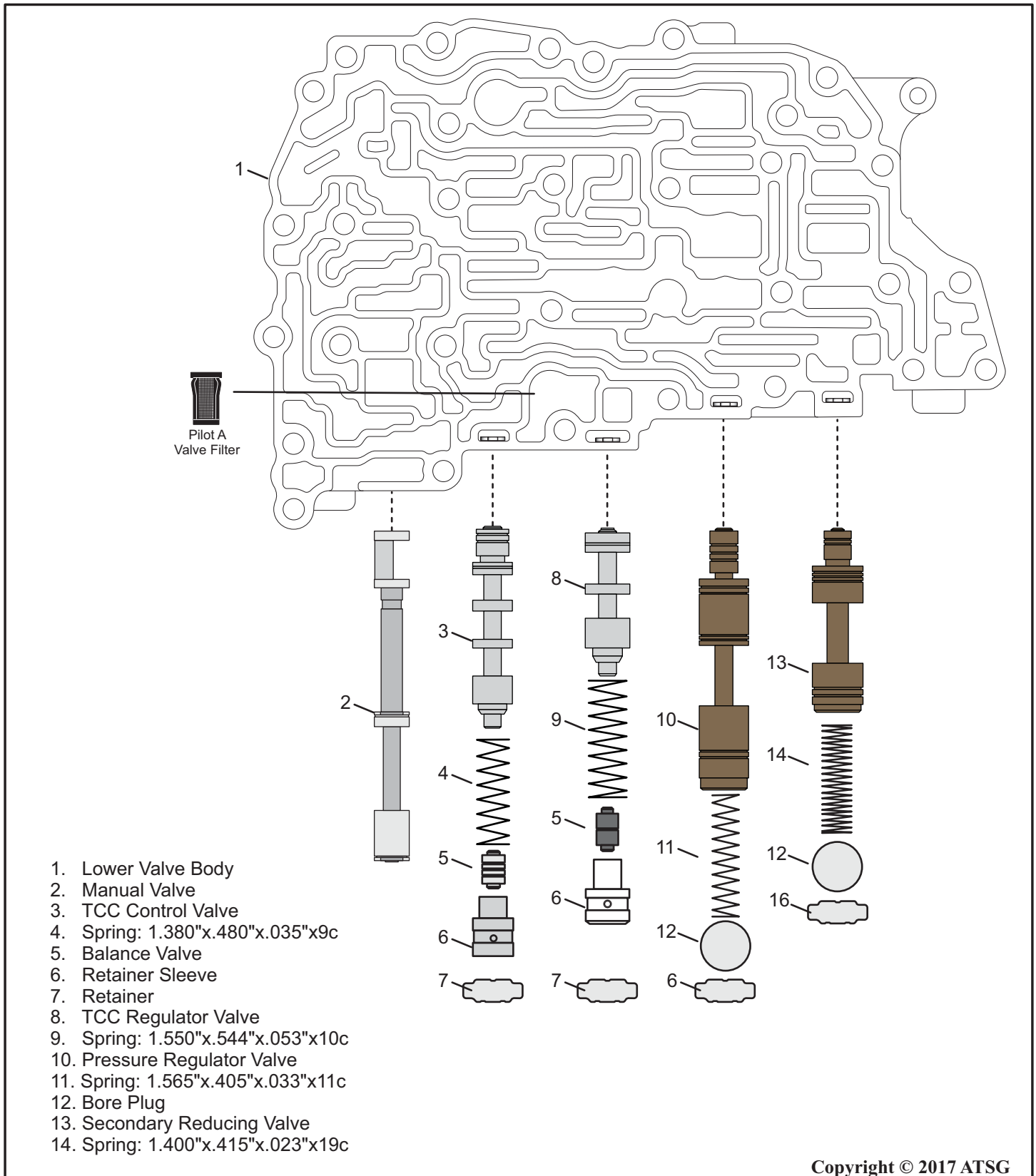
JATCO JF017E THE CVT 8 TRANSMISSION



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Figure 36

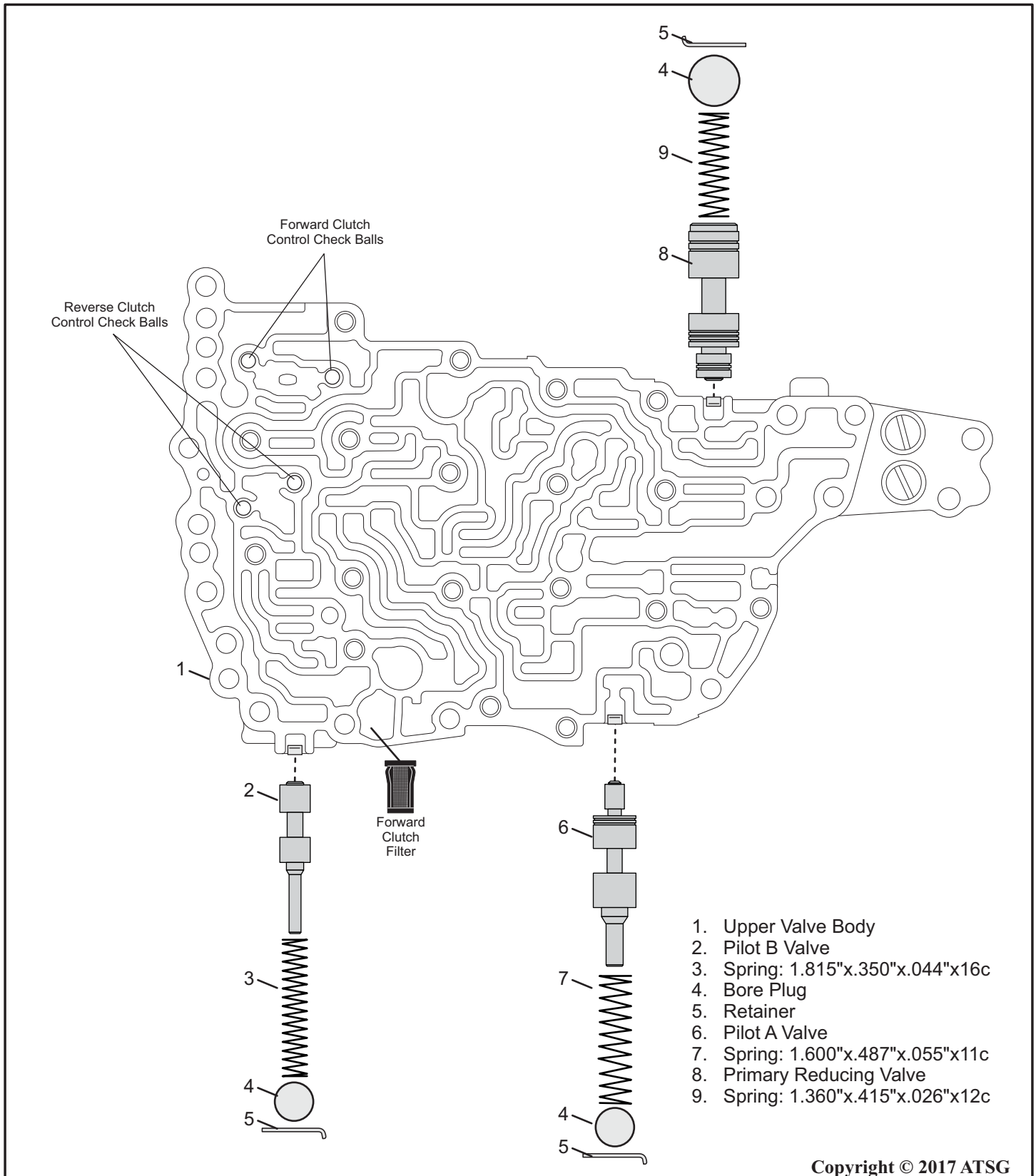
JATCO JF017E THE CVT 8 TRANSMISSION



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Figure 37

JATCO JF017E THE CVT 8 TRANSMISSION



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Figure 38

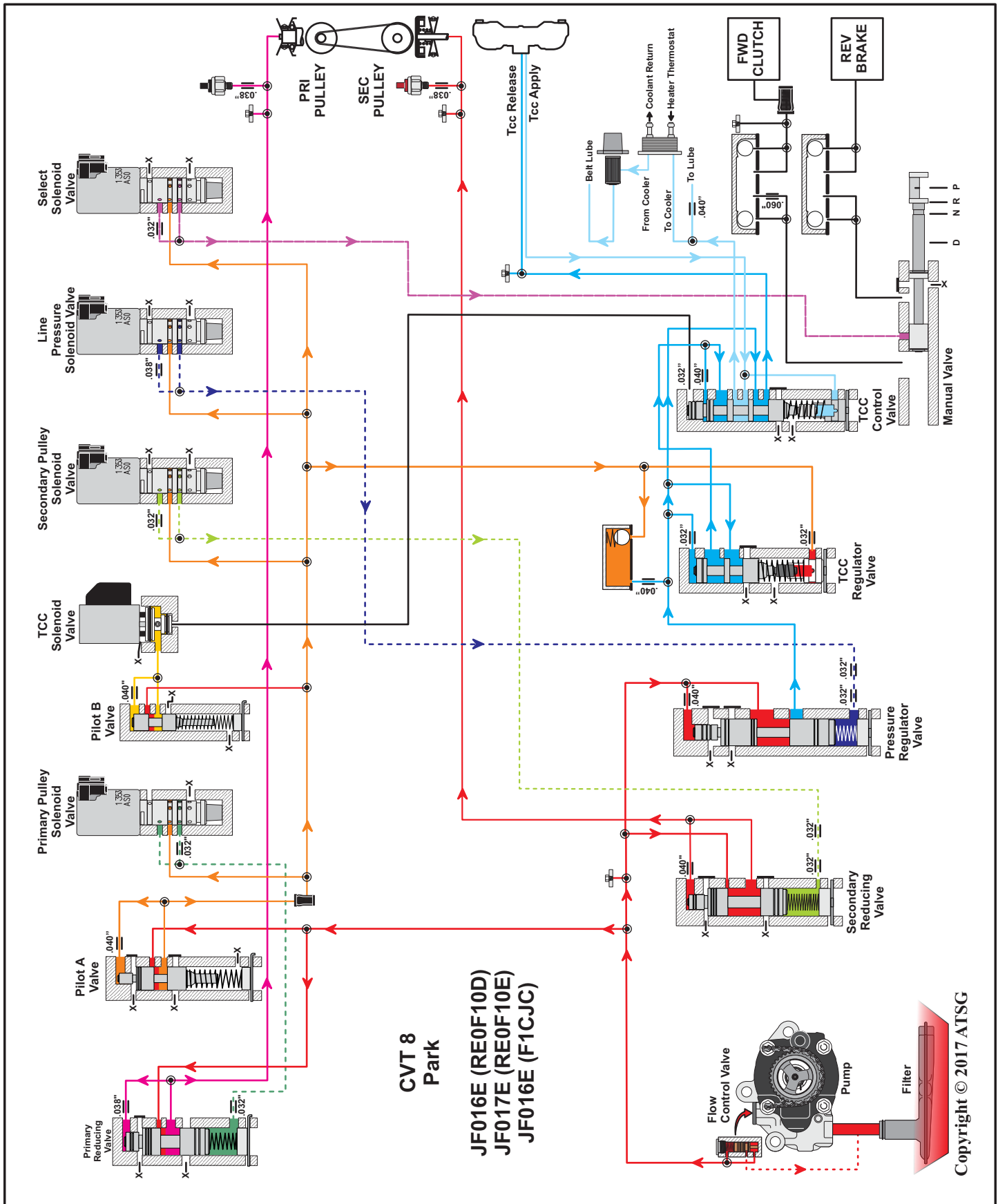
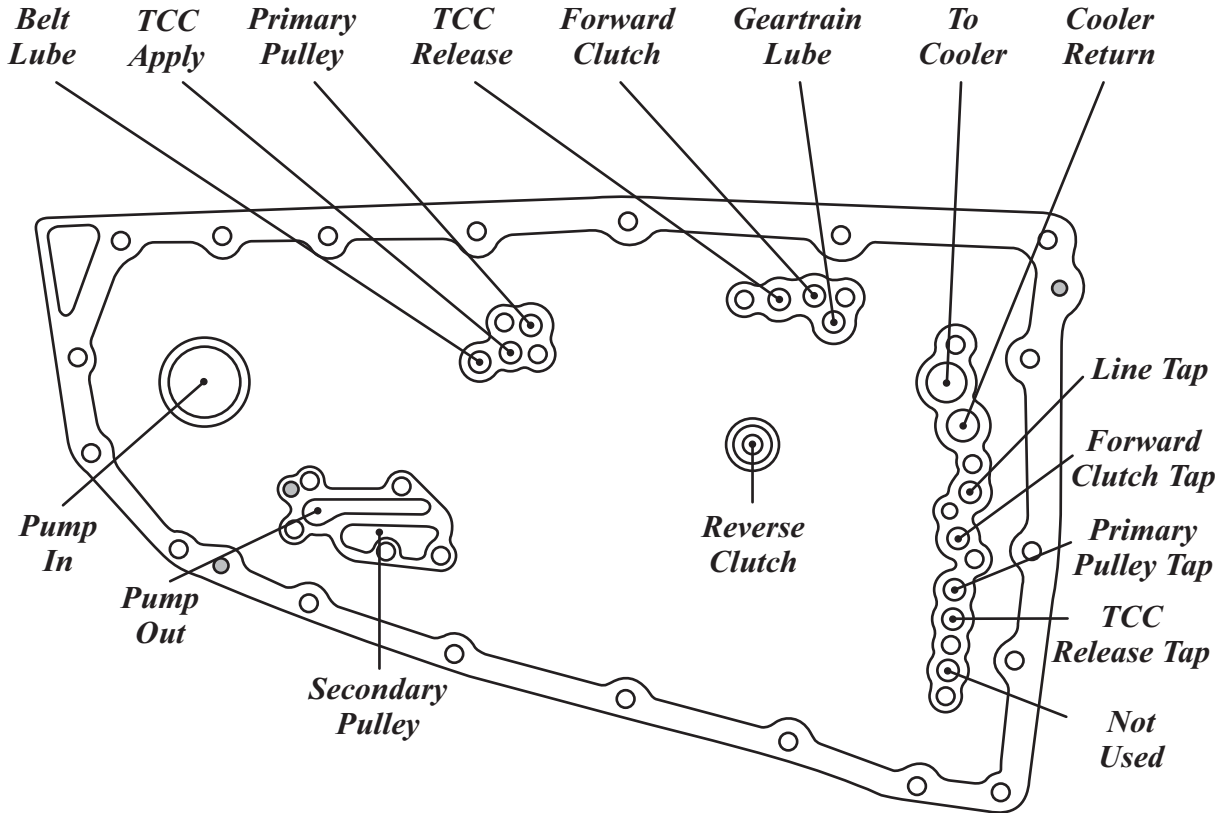


Figure 39

JATCO JF017E THE CVT 8 TRANSMISSION

CASE PASSAGE IDENTIFICATION



FLUID SPECIFICATIONS



ATF Type: NISSAN CVT fluid NS-3

Capacity: 8 5/8 qt (8.2L)

Fluid level is checked between 35°C (95°F) to 45°C (113°F)

Special tool # KV311039S0 will allow fluid fill at the check level plug.

Pipe Plug

Fluid Fill Pipe

Check Level Plug



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Figure 40

<i>DIAGNOSTIC TROUBLE CODES</i>	
DTC	DESCRIPTION
<i>P062F</i>	<i>EEPROM - Flash ROM inside the TCM - Calculated values do not match</i>
<i>P0705</i>	<i>Transmission Range Sensor A - Volts to high or double signal (performance fault)</i>
<i>P0706</i>	<i>Transmission Range Sensor A - Loss of signal: loss of power supply or loss of signal</i>
<i>P0711</i>	<i>Fluid Temperature Sensor A - Performance fault</i>
<i>P0712</i>	<i>Fluid Temperature Sensor A - Electrical fault: circuit low</i>
<i>P0713</i>	<i>Fluid Temperature Sensor A - Electrical fault: circuit high</i>
<i>P0715</i>	<i>Input Speed Sensor A - Performance or Electrical fault</i>
<i>P0717</i>	<i>Input Speed Sensor A - Electrical fault: loss of signal - circuit open or shorted</i>
<i>P0740</i>	<i>Torque Converter Clutch Circuit Open</i>
<i>P0743</i>	<i>Torque Converter Clutch Circuit Shorted</i>
<i>P0744</i>	<i>Torque Converter Clutch Circuit Intermittent</i>
<i>P0746</i>	<i>Pressure Control Solenoid A (Line Pressure) - Performance stuck off</i>
<i>P0776</i>	<i>Pressure Control Solenoid B (Secondary Pulley) - Performance stuck off</i>
<i>P0778</i>	<i>Pressure Control Solenoid B (Secondary Pulley) - Electrical fault: short to ground</i>
<i>P0779</i>	<i>Pressure Control Solenoid B (Secondary Pulley) - Intermittent</i>
<i>P0841</i>	<i>Fluid Pressure Sensor A - Circuit Range/Performance fault</i>
<i>P0847</i>	<i>Fluid Pressure Sensor B (Secondary Pulley) - Circuit Low: open or short to ground</i>
<i>P0848</i>	<i>Fluid Pressure Sensor B (Secondary Pulley) - Circuit High: short to power</i>
<i>P084C</i>	<i>Fluid Pressure Sensor H (Primary Pulley) - Circuit Low: open or short to ground</i>
<i>P084D</i>	<i>Fluid Pressure Sensor H (Primary Pulley) - Circuit High: short to power</i>
<i>P0863</i>	<i>TCM Communication CAN BUS Error Detected</i>
<i>P0890</i>	<i>TCM Power Supply Low - open or short to ground</i>
<i>P0962</i>	<i>Pressure Control Solenoid A - Circuit Low: open or short to ground</i>
<i>P0963</i>	<i>Pressure Control Solenoid A - Circuit High: short to power</i>
<i>P0965</i>	<i>Pressure Control Solenoid B - Circuit Range/Performance fault</i>
<i>P0966</i>	<i>Pressure Control Solenoid B - Circuit Low: open or short to ground</i>
<i>P0967</i>	<i>Pressure Control Solenoid B - Circuit High: short to power</i>
<i>P2765</i>	<i>Input Speed Sensor B - Circuit Low: open or short to ground</i>
<i>P2813</i>	<i>Select Solenoid Performance Fault</i>
<i>P2814</i>	<i>Select Solenoid Circuit Shorted to Ground</i>
<i>P2815</i>	<i>Select Solenoid Circuit Open or Shorted to Power</i>

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Figure 41



Technical Service Information

DIAGNOSTIC TROUBLE CODES	
DTC	DESCRIPTION
<i>U0073</i>	<i>TCM Communication Bus A Off - BUS Line Fault</i>
<i>U0100</i>	<i>Loss Communication (ECM A) - TCM unable to receive ECM Data</i>
<i>U0140</i>	<i>Loss Communication (BCM) - TCM unable to receive BCM Data</i>
<i>U0141</i>	<i>Loss Communication (BCM A) - IPDM E/R or BUS Line Fault</i>
<i>U0155</i>	<i>Loss Communication (IPC) - Lost communication with the Instrument Panel Cluster Module</i>
<i>U0300</i>	<i>CAN Comm. Data - Internal Control Module Software Incompatibility</i>
<i>U1000</i>	<i>CAN Comm. Circuit - BUS Line Fault</i>
<i>U1117</i>	<i>Loss Communication (ABS) - TCM unable to receive ABS Data</i>
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Figure 42