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# Repairing Jatco's JF011E CVT

**B**y now, most of you have run into the Jatco Continuously Variable Transmission, or CVT. Getting the parts is becoming less of a problem, and bearings, solenoids, and stepper motors are now available.

The Jatco CVT comes in many different makes and models and it isn't going anywhere soon. So, if you haven't already started, now's the time to learn to rebuild this unit.

In this article we're going to go over a few of the issues with the Jatco CVT including the wear areas to look for to rebuild this transmission successfully.

## Engine Stalls on Engagement

A car comes into your shop. The customer says the engine stalls when you put the transmission in gear. A code scan reveals that it sometimes stores code P0744 in memory (TCC solenoid or valve function).

**To keep it simple, the lockup solenoids have multiple functions to control engagement feel and lockup operation.**

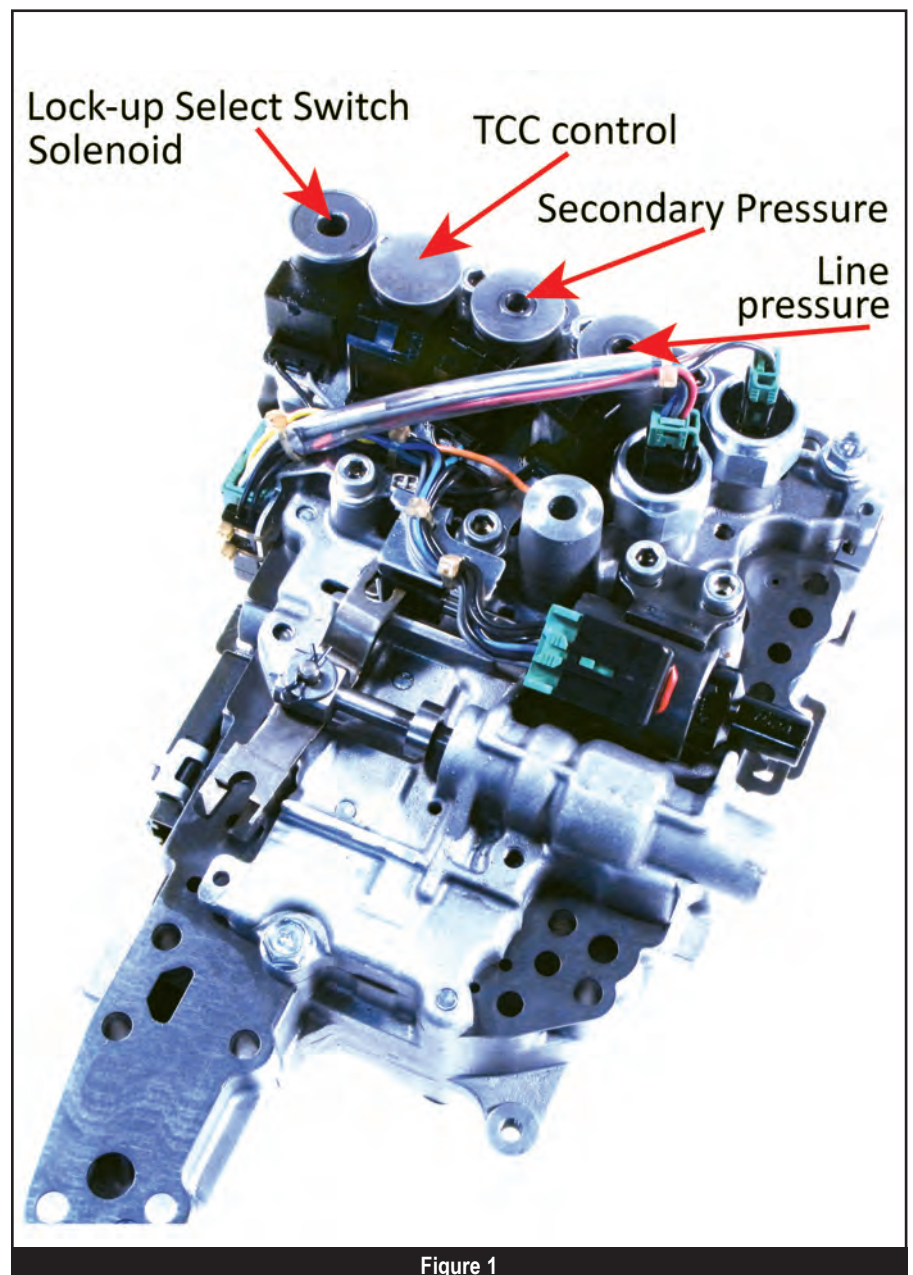


Figure 1

## **Automatic Transmission Parts**

### **Hard Parts**

- OE Manufacturer, Aftermarket New, Remanufactured, & Used
- Drums
- Shafts
- Pumps
- Planets
- Valve Bodies
- Complete Line of Miscellaneous parts

### **Torque Converters**

- Complete line of CVC Remanufactured Converters

### **Soft Parts**

- Master Kits
- Banner Kits (Less Steels)
- Overhaul Kits
- Paper/Rubber Kits
- Filters & Kits
- Frictions
- Steels
- Bushings
- Washers
- Bearings
- Gaskets
- Bands
- Flex Plates & Flywheels
- Coolers
- TeckPak Conversion Kits
- Superior Shift Correction Packages
- Transgo Reprogramming Kits
- Transgo Shift Kits

## **Standard Transmission Parts**

- Rebuild Kits
- Bearing Kits with Syncro Rings
- Gasket Sets
- Gears & Shafts

### **Rebuilt Transmissions**

- Standards

### **Clutch Parts**

- Sach's & Valeo Clutch Kits (New)
- Forks
- Pilot Bushings & Bearings
- Clutch Alignment Tools

### **Transfer Case Parts**

- Gasket & Seals Kits
- Overhaul Kits
- Chains

### **Shop Supplies & Tools**

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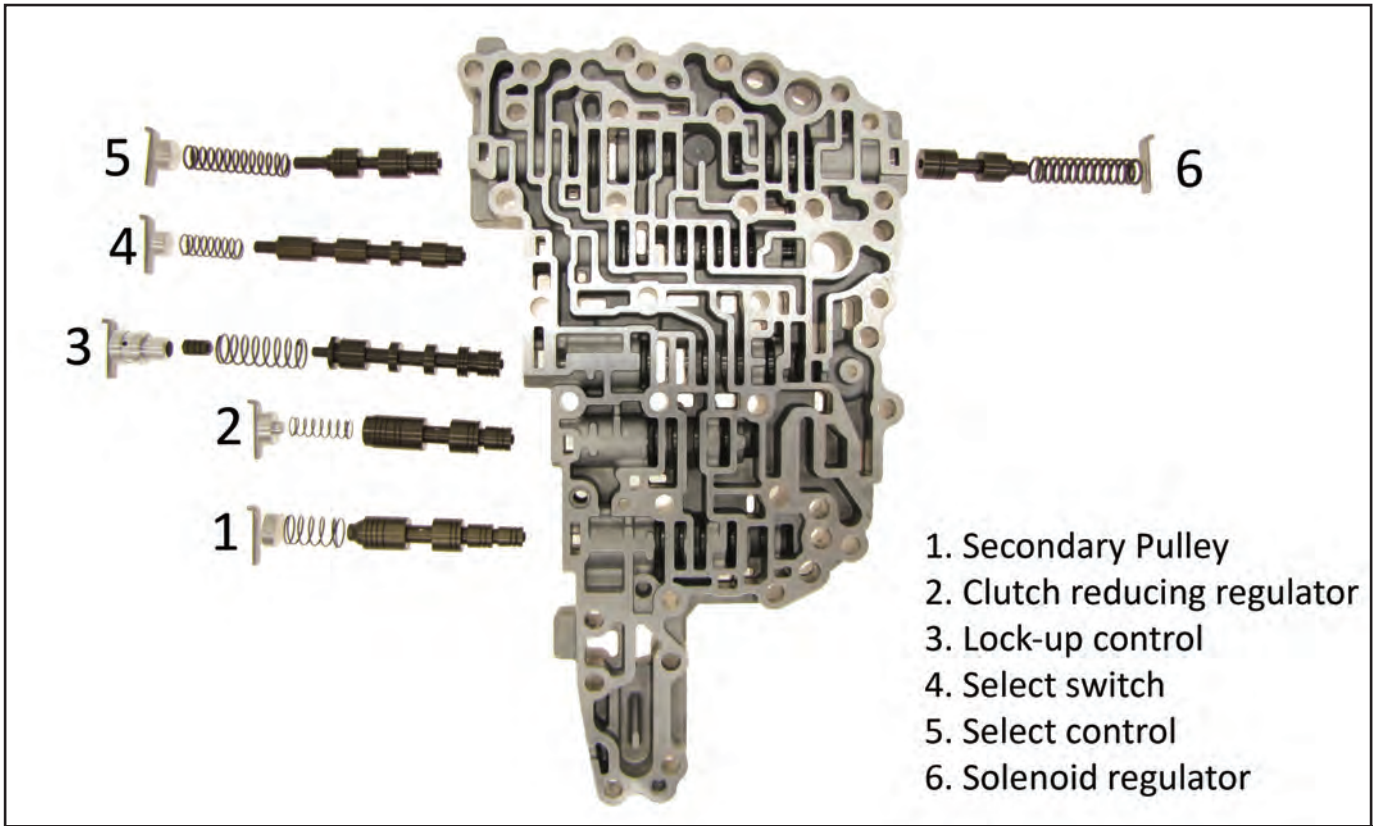


Figure 2

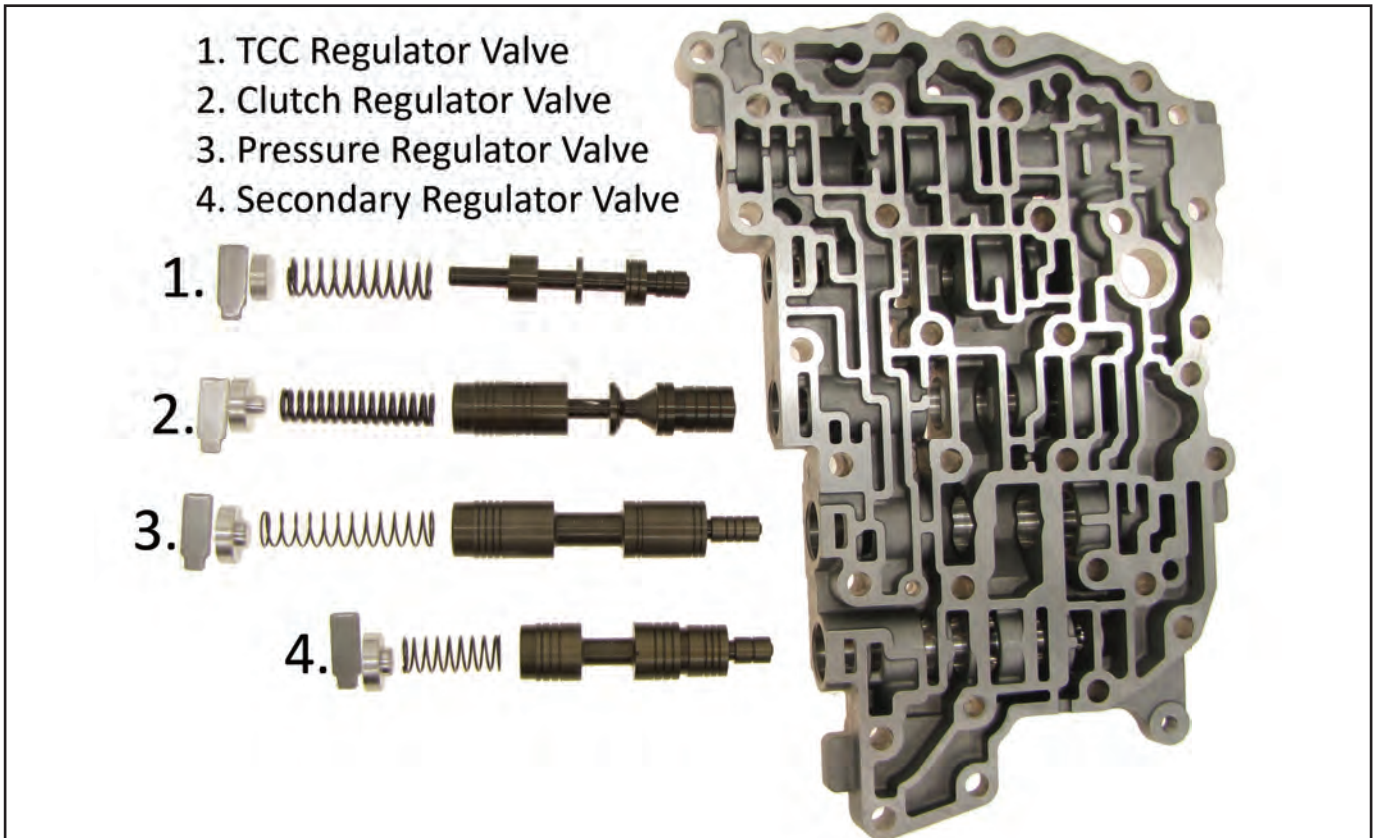


Figure 3

Nissan has a TSB for this code that suggests replacing the valve body. But that isn't always what's needed to fix this problem.

Here are the conditions necessary to set code P0744:

- Torque converter can't lock up

even though there doesn't appear to be any electrical problems in the circuit.

- Transmission Control Module

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## Honda/Acura Advantages



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## General Motors Advantages



fixes shredding problem from the OE design

loose valvebody gaskets that fit all 19 4L60E separator plates



additional screen filters



additional 3-2 spring

## Chrysler Advantages

TTK includes everything you need to get the job done right!

parts for rebuilding solenoid blocks



seals for the oil cooler



patented retainer reinforcement plate



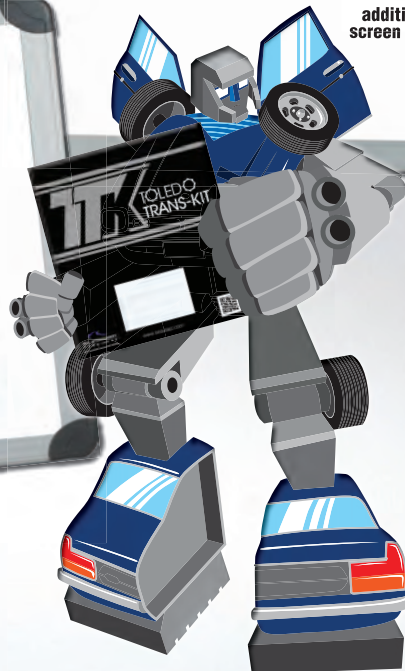
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**Before performing any further diagnosis, always verify the complaint and check fluid level and condition.**

(TCM) detects irregular values with slip rotation speeds.

- There's a big difference between engine speed and primary speed when TCM lockup signal is on.

The code definition states that P0744 can be caused by an open or shorted wire to the lockup select solenoid valve or a mechanical failure, such as the control valve sticking or improper solenoid operation. But problems aren't limited exclusively to these areas.

Before performing any further diagnosis, always verify the complaint and check fluid level and condition. And check scan data to make sure the range switch and speed sensor are operating correctly.

A major trap when diagnosing this condition is that the scan data can be wrong. Some scan tools have shown fluid temperatures around 100°F (about 55°C) higher than it actually is. Always try a different scan tool to confirm your readings.

A second trap is when you put the transmission in gear: The TCC control solenoid and lockup select solenoid will change states on engagement. This is normal and isn't causing the engine to stall.

The TCC control solenoid controls the lockup control valves and also regulates forward and reverse engagements.

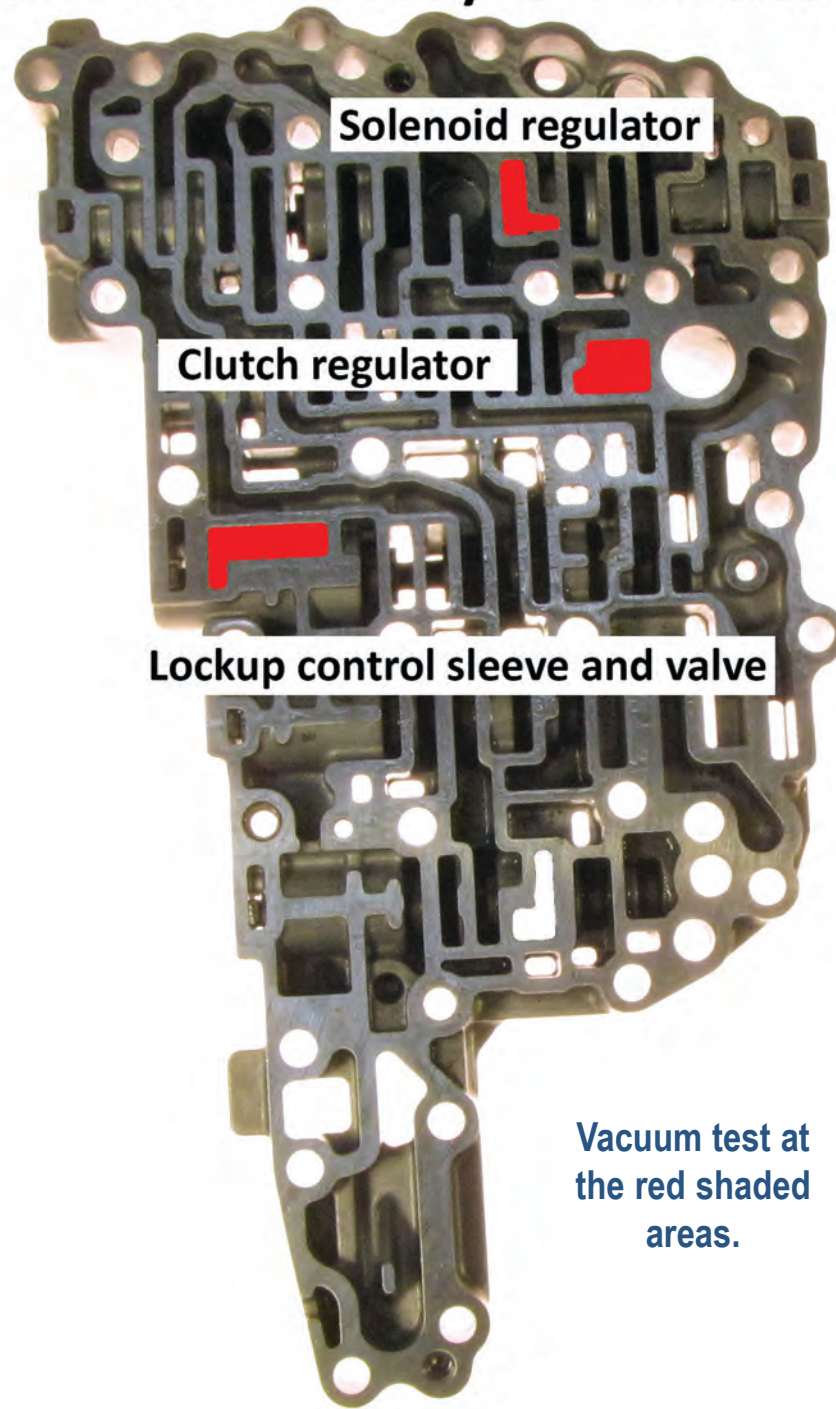
The lockup select switch solenoid controls the select switch valve, which diverts fluid between the lockup and select control valves. To keep it simple, the lockup solenoids have multiple functions to control engagement feel and lockup operation.

Here's where you need to look for a problem:

Solenoids (figure 1)

- Lockup select switch solenoid

## Middle valve body vacuum test.



**Vacuum test at the red shaded areas.**

Figure 4

- TCC control solenoid Valves (figure 2, pg. 14)
- Lockup control valve and sleeve
- Select switch valve
- TCC regulator valve

### Checking the Solenoids

The lockup select switch solenoid should have 15 to 30 ohms resistance

and should operate around half an amp to one amp. This is a normally-closed, on/off style solenoid.

The TCC control solenoid should have 3 to 9 ohms resistance and should operate around one amp. This is a normally-closed, pulse width modulated solenoid.



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## Lower valve body vacuum test.

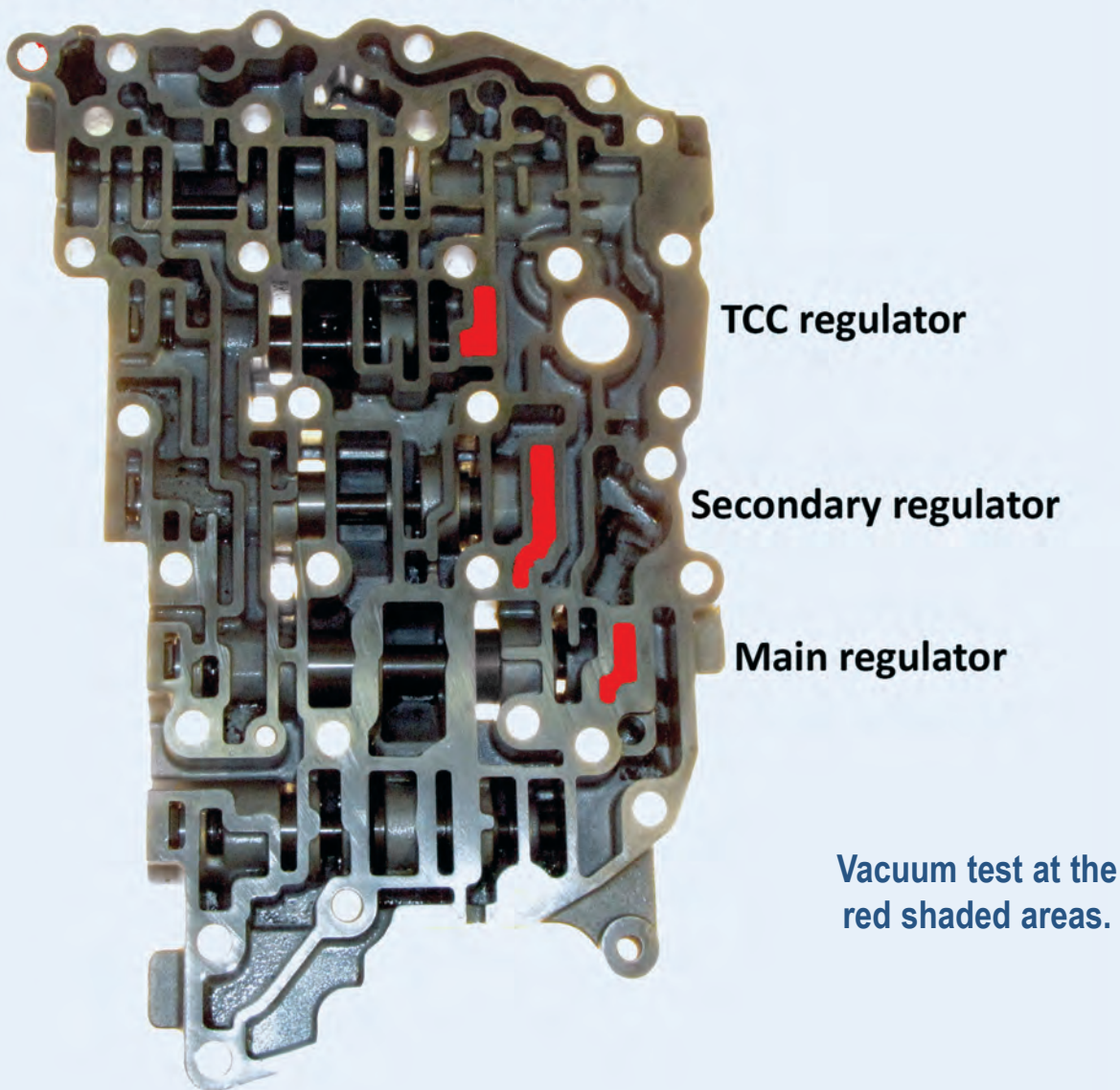


Figure 5

### Checking the Valve Body

Check the lockup control valve and sleeve (figure 2, pg. 14). This is where most problems occur. The sleeve tends to wear and the valve sticks in the sleeve. There are aftermarket solutions available to replace this valve and sleeve.

The TCC regulator valve is also a high wear bore (figure 3, pg. 14). If this valve is worn, it causes torque converter clutch to lock up too quickly and may also cause the converter clutch to slip or not lock up.

Check the select switch valve for nicks, burrs, or worn areas. See if the valve strokes all the way in and out of

the bore freely.

Assuming the converter and oil circuits are working properly, checking these valves and solenoids will usually reveal the source of the engine stalling on engagement.

### Regulation Issues

The pump in this transmission can produce up to 1000 PSI. The job of the pressure regulator valves is to lower pressure to a usable range for each circuit. This is where this transmission operates a little differently than most other transmissions.

The line pressure regulator valve provides supply pressure to the ratio control valve, secondary valve, and

downstream for clutch regulation. Circuit pressures for the primary and secondary pulleys range from 72 to 870 PSI.

The clutch pressure regulator valve provides the supply pressure necessary for the forward and reverse clutches, and downstream for TCC regulation. The circuit pressures for the forward and reverse clutches range from 15 to 218 PSI.

The TCC regulator valve provides supply pressure necessary for the TCC and lube/cooler circuits. Circuit pressures range from 0.0 to 145 PSI.

The solenoid regulator valve's job is to provide supply pressure to the solenoids to operate the transmission.





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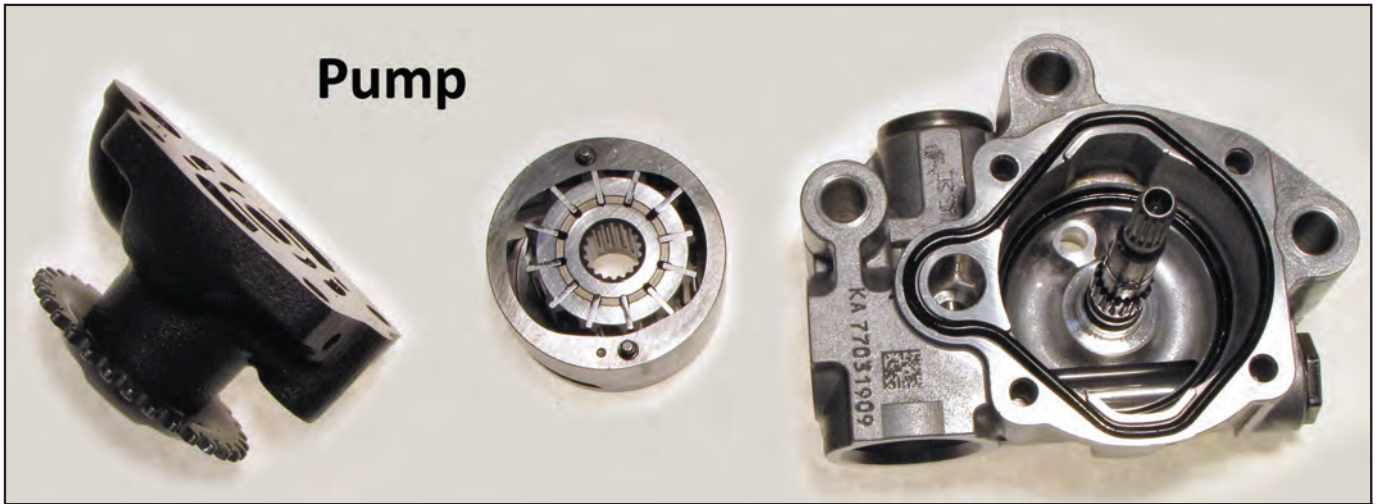


Figure 6

The Jatco JF011E uses a high-pressure, dual-working, vane-style pump. See figure 6.

In the middle valve body, you can vacuum test the solenoid regulator, clutch regulator, and the lockup control sleeve for wear (figure 4, pg. 16).

In the lower valve body, you can vacuum test the TCC regulator, secondary regulator, and the main regulator valve for wear (figure 5, pg. 18).

Remember, when vacuum testing, keep a log of your test results so you become familiar with what's normal versus what's not. There are aftermarket repair kits for most of these valve bores.

### The Pump

The Jatco JF011E uses a high-pressure, dual-working, vane-style pump (figure 6). The filter is connected directly into the suction side of the pump.

As the chain drives the pump, it draws fluid in on each side of the rotor. The high pressure fluid runs out the other side of the pump through two ports into a combined chamber. From there, oil pressure is routed to the flow control and pressure regulator valves.

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**A good visual inspection of the valve and its bore will usually reveal any signs of wear.**

To change ratio, the stepper motor moves the ratio control valve. The ratio control valve controls oil flow to each pulley. Large volumes of oil are needed to change the ratio; the greater the ratio change the more oil needed to move the pulley.

Why is this important? Keeping this transmission running properly is all about volume and pressure. The job of the flow control valve is to control oil volume when needed.

When the pulleys change position, the pressure and volume of oil increases; if the flow control valve isn't working correctly, the pressure and volume will be low.

The flow control valve has pump pressure on one end. When there's enough force on the valve, it opens, exhausting oil to the suction side. When the ratio changes and volume is need, the valve closes and directs more oil to the pulleys.

You can vacuum test the flow valve and bore by applying a test plate to the filter inlet port and plugging off the other port (figure 7). A good visual inspection of the valve and its bore will usually reveal any signs of wear.

When working on the Jatco CVT, always remember that there are a few traps in the temperature sensor reading on some scan tools, and the TCC control and lockup select solenoids change states on engagement.

Pay attention to the wear in regulation valve bores and the pump flow control valve.

This transmission is different than most others, but with a little understanding of common wear areas and how it's controlled, you can rebuild it with confidence.

Special thanks to Perfection Plus Transmission Parts, in Portland, Oregon, for the use of this core to help make this article possible.

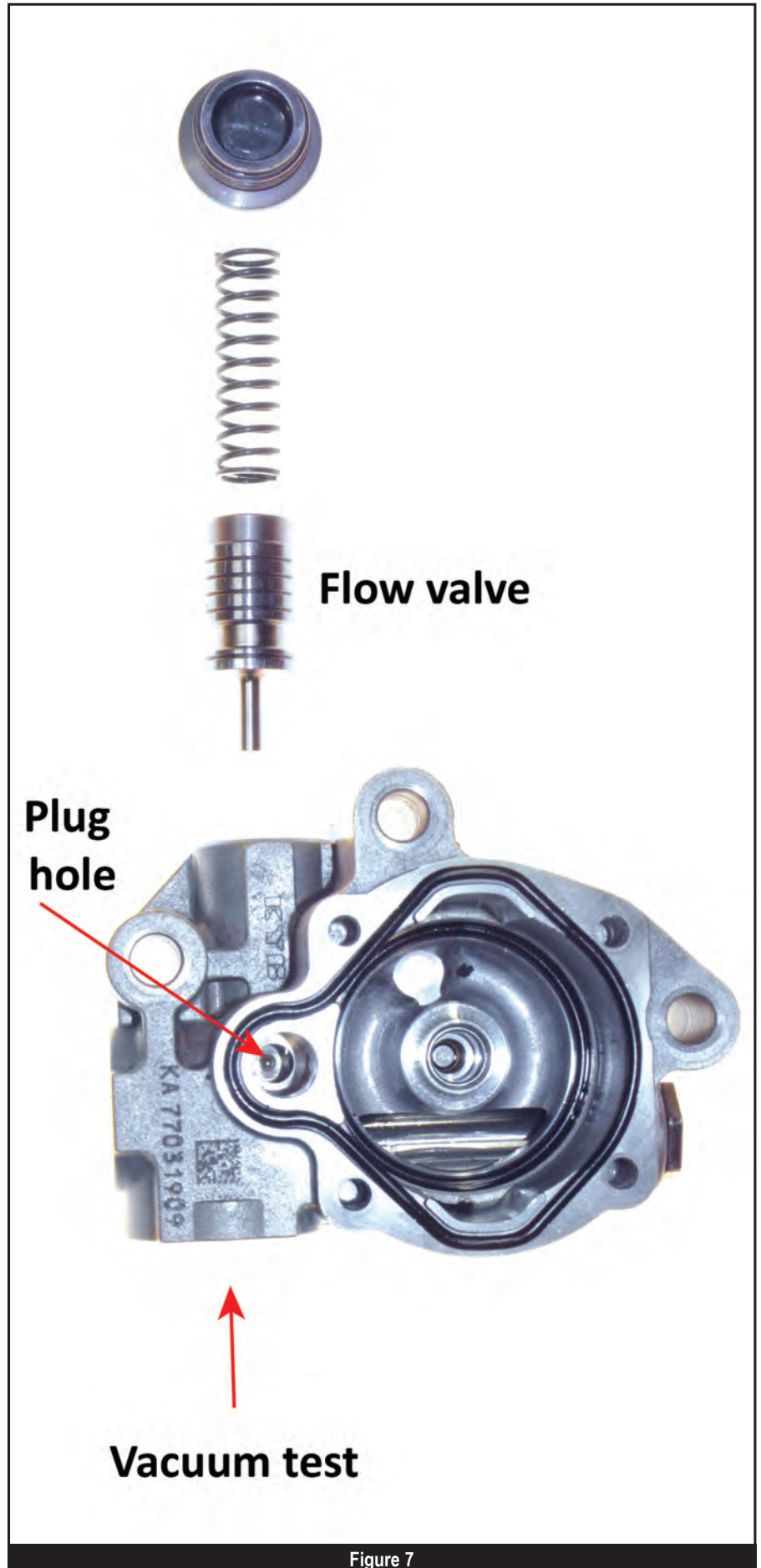


Figure 7