



by Mike Brown

A Closer Look at the Toyota U250E

Toyota introduced the U250E 5-speed automatic transmission in the 2005 Camry with 2AZ-FE engines. It's a compact, lightweight and high-capacity 5-speed super electronically controlled transaxle that offers a higher overdrive ratio, a centrifugal fluid pressure canceling mechanism, and flex lockup control.

Looking at the chart (figure 1) you can see the gear ratio change: 1st, 2nd and 3rd are the same as the U241E used in the 2004 Camry; 4th and 5th are where the changes took place. Notice the differential gear ratio: The U250E has a lower differential gear ratio than the U241. That's what makes the U250E exceptional. Once in 5th gear, the overdrive ratio is 0.703 compared to the U241 4-speed's 1.020 ratio.

Centrifugal Fluid Pressure Canceling Mechanism

There are two reasons for the improvements to the conventional clutch:

1. Early units used a checkball to relieve pressure in the chamber behind the apply piston (chamber A), which would build up while the clutch was released due to centrifugal force. So before the clutch could be applied, the checkball would have to seat and the clutch apply chamber refill.
2. During shifting, in addition to the pressure controlled by the valve body, the rotation of the clutch drum would create even more pressure on the clutch through centrifugal force.

To address these conditions, a canceling fluid pressure chamber (chamber B) has been provided opposite chamber A (figure 2).

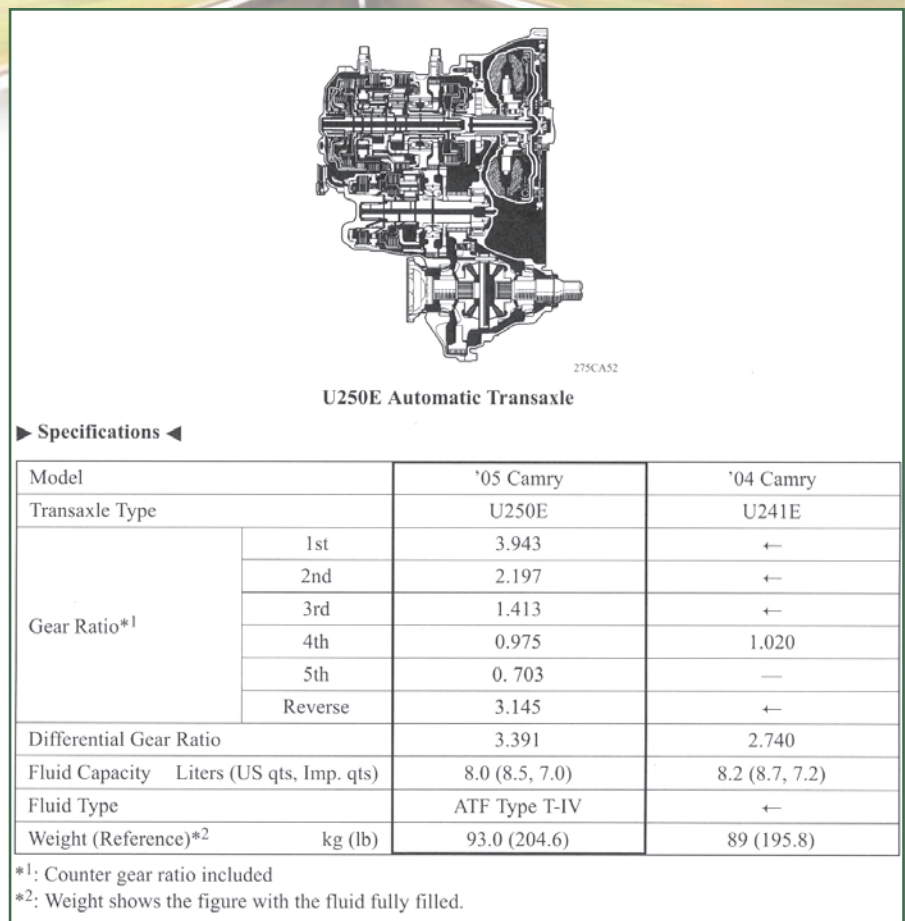


Figure 1

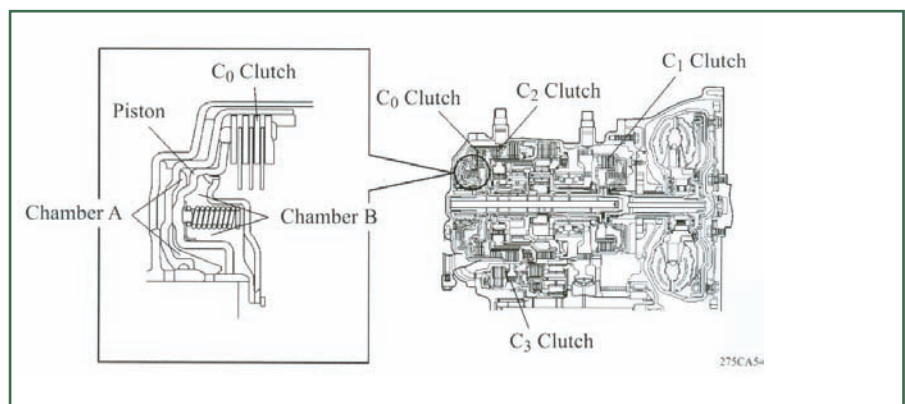


Figure 2

The flex lockup clutch control operates during deceleration in 4th and 5th gears in D range, and in 4th gear in 4 range.

By using the lubricating fluid from the shaft, the same amount of centrifugal force is applied to the opposite side of the piston, canceling the pressure created by centrifugal force that would apply the piston.

This addition eliminated the need to discharge the fluid through a checkball, resulting in a highly responsive and smooth shift.

Flex Lockup Control

Flex lockup control has been added to the conventional lockup timing control during deceleration. The flex lockup clutch control operates during deceleration in 4th and 5th gears in D range, and in 4th gear in 4 range.

The chart (figure 3) shows the flex lockup operating range. Figure 4 shows what the ECM and TCM are monitoring for flex lockup control.

Valve Body

The valve body assembly consists of the upper and lower valve bodies and 7 solenoids (figure 5).

Figure 6 lists the name of each solenoid used in the U250E transmission as well as the part name description provided in the electronic parts catalog.

The main thing you'll want to keep an eye on is the valve body. Toyota doesn't print checkball locations, so if one is missing or you drop one, this information will come in handy.

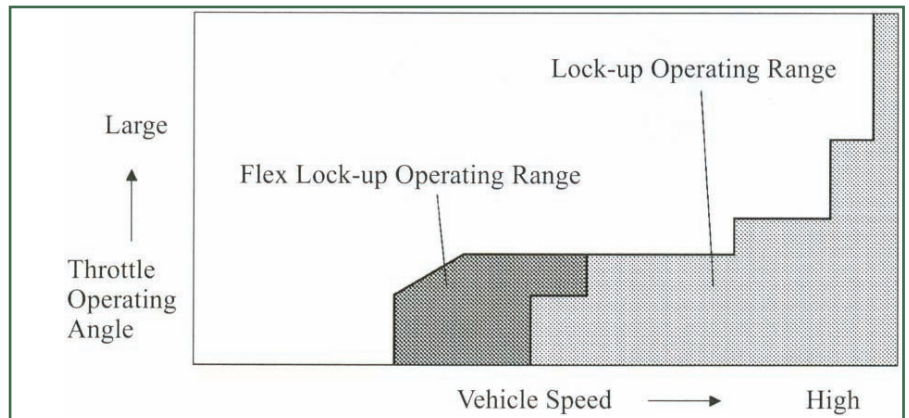


Figure 3

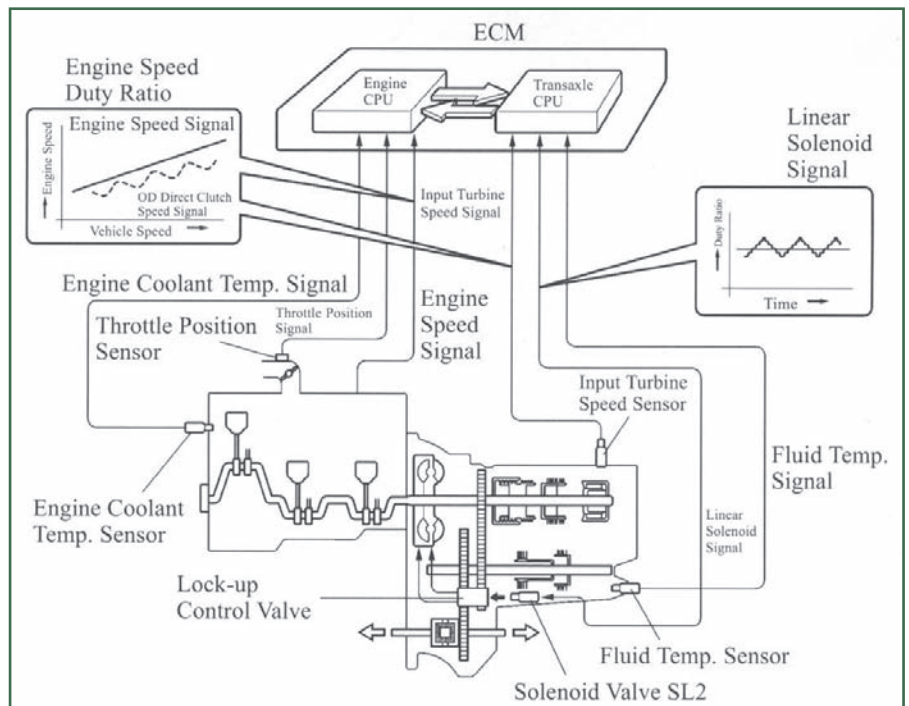


Figure 4

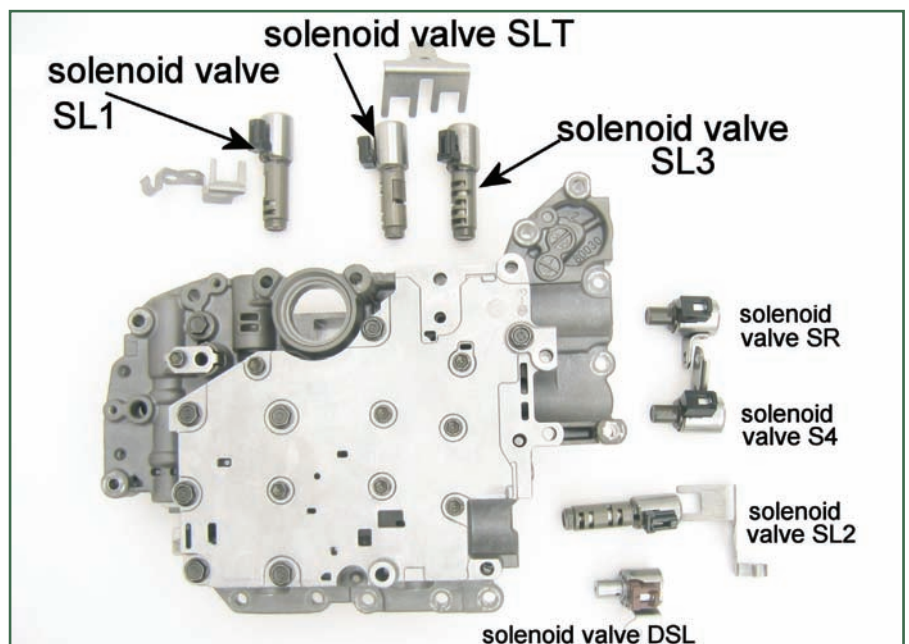
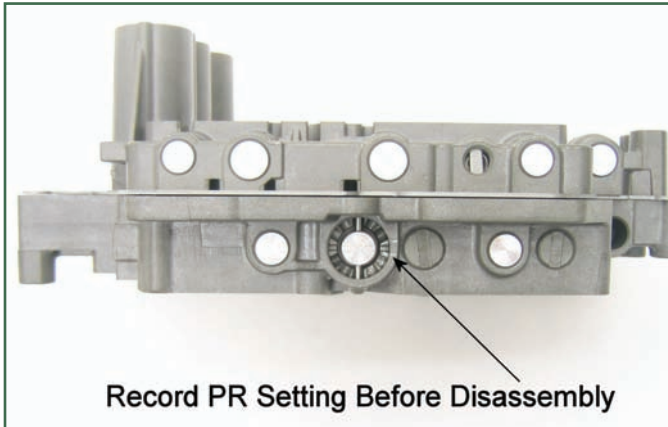


Figure 5

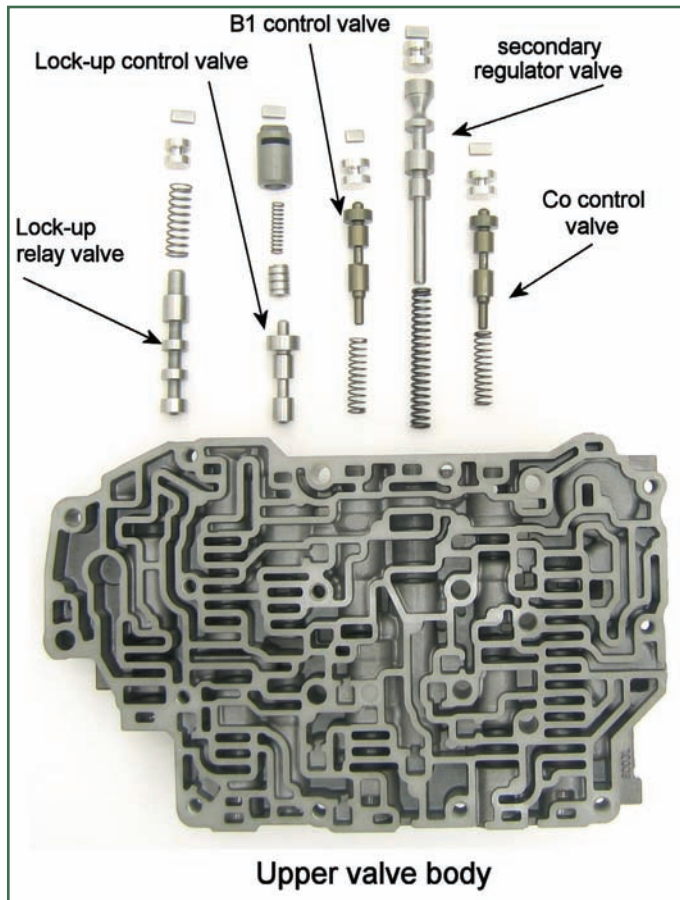
| REPAIR MANUAL SOLENOID NAME | PART CATALOG DESCRIPTION |
|-----------------------------|---|
| SL1 | Solenoid Assembly, Clutch Control No. 1 |
| SL2 | Solenoid Assembly, Clutch Control No. 2 |
| SL3 | Solenoid Assembly, Clutch Control No. 2 |
| S4 | Solenoid Assembly, Transmission 3-Way No. 2 (No. 1) |
| SR | Solenoid Assembly, Transmission 3-Way No. 2 (No. 2) |
| SLT | Solenoid Assembly, Line Pressure Control |
| DSL | Solenoid Assembly, Transmission 3-Way |

Figure 6



Record PR Setting Before Disassembly

Figure 7



Upper valve body

Figure 8

CAUTION: Before disassembling the valve body, record or mark the pressure regulator setting (figure 7). There are no factory settings for this valve; it's model-dependent, and will vary from vehicle to vehicle.

Valve Body Disassembly

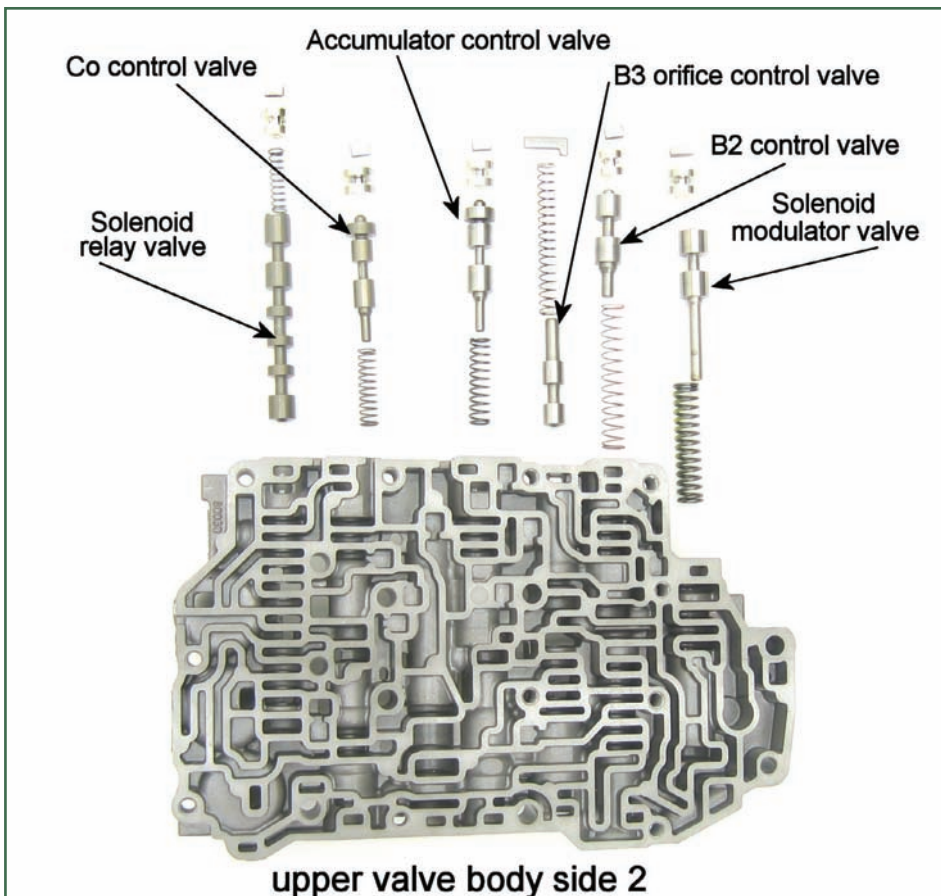
As with any valve body, there are a few common practices you should keep in mind:

1. Always inspect the valves and springs thoroughly during disassembly.
2. Check the valves for scoring and make sure the valve bore is clean.
3. Pay close attention to the valve layout and make sure you put the valves back together the way they came out.

Upper Valve Body Side 1
(see figure 8)

Upper Valve Body Side 2
(see figure 9)

Lower Valve Body
(see figure 10)



upper valve body side 2

Figure 9

One very important thing to remember is that the U250E requires ATF WS

Checkball Locations

There are 3 large steel checkballs in the upper valve body (figure 11), and 11 small checkballs in the main valve body (figure 12).

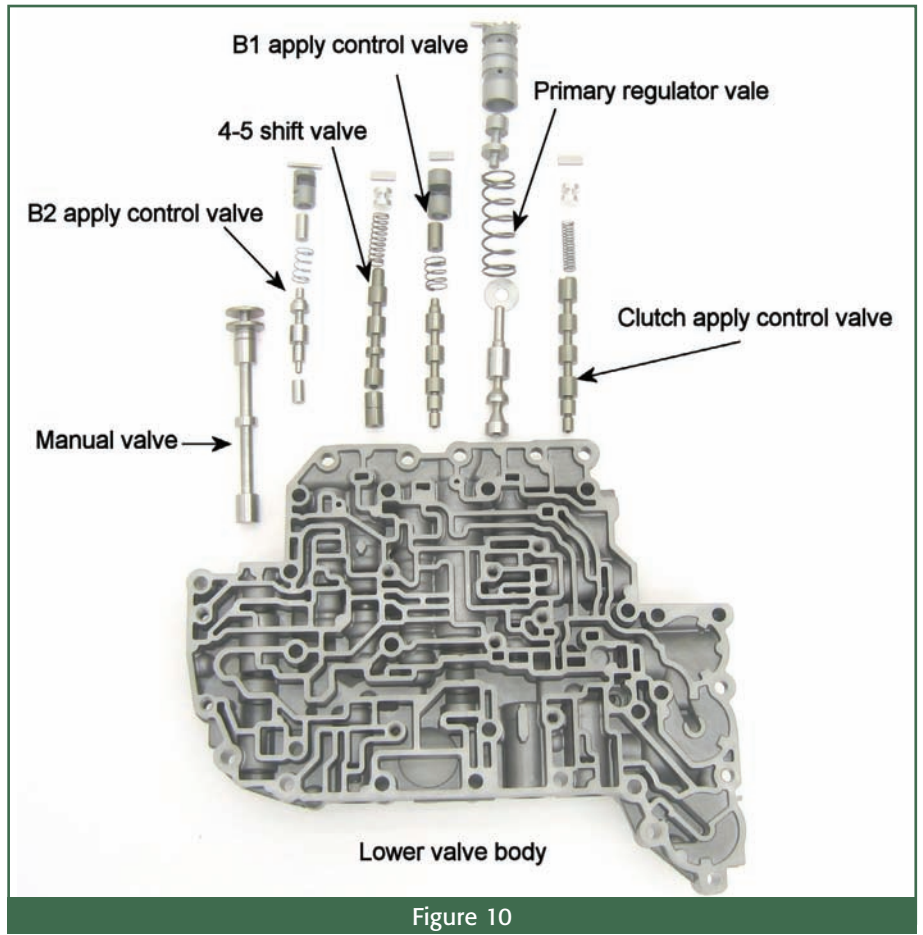


Figure 10

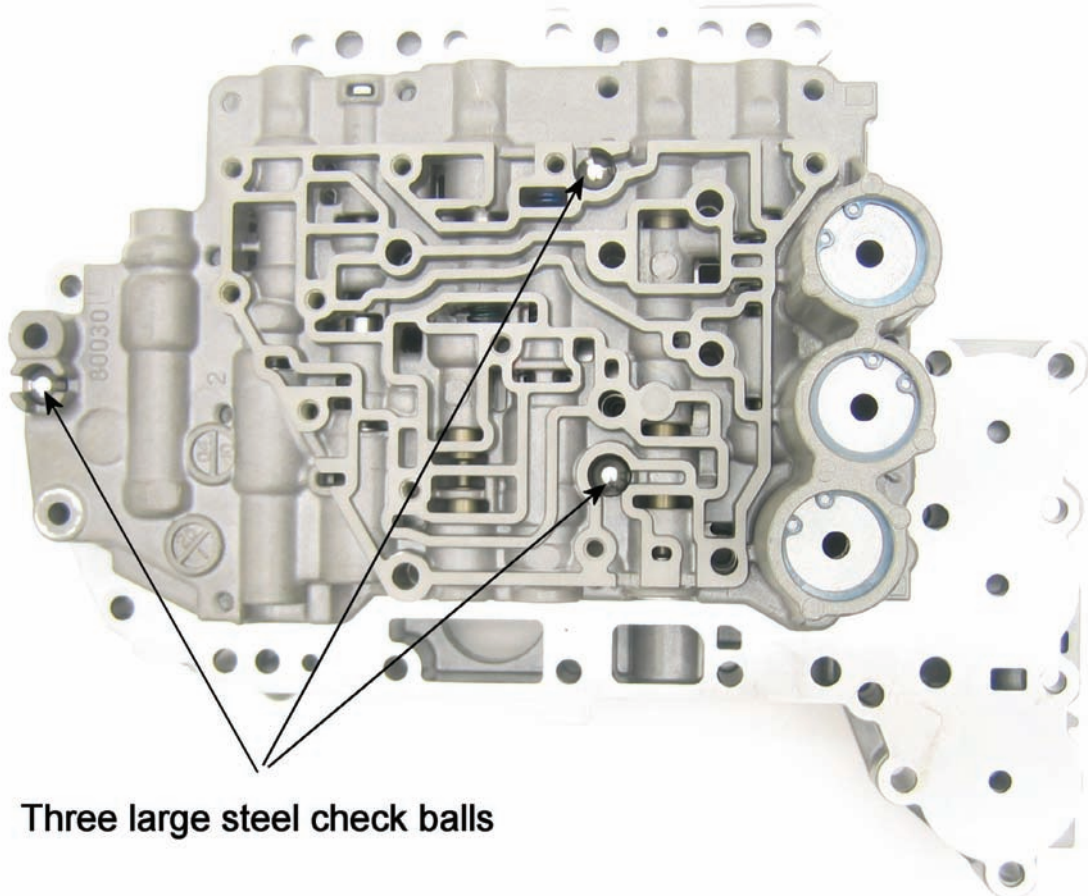


Figure 11

All of these checkballs are composite. During the rebuild, make sure that the checkballs seat on the valve body separator plate and aren't damaged or decomposed.

Figure 13 shows the check valve location — spring first then valve.

Figure 14 accumulator piston and spring identification and locations.

One very important thing to remember is that the U250E requires ATF WS:

- ATF WS is used to reduce the resistance of the ATF and improve the fuel economy by reducing its viscosity at normal operating temperatures. At higher fluid temperatures, the viscosity is the same as that of ATF Type T-IV, which ensures the durability of this unit.

- ATF WS and other types of ATF (ATF Type T-IV, D-II) aren't interchangeable. See the reduced viscosity in the chart (figure 15).

So with ATF WS you get improved fuel economy and durability and that's not only smart... it's *street smart!*

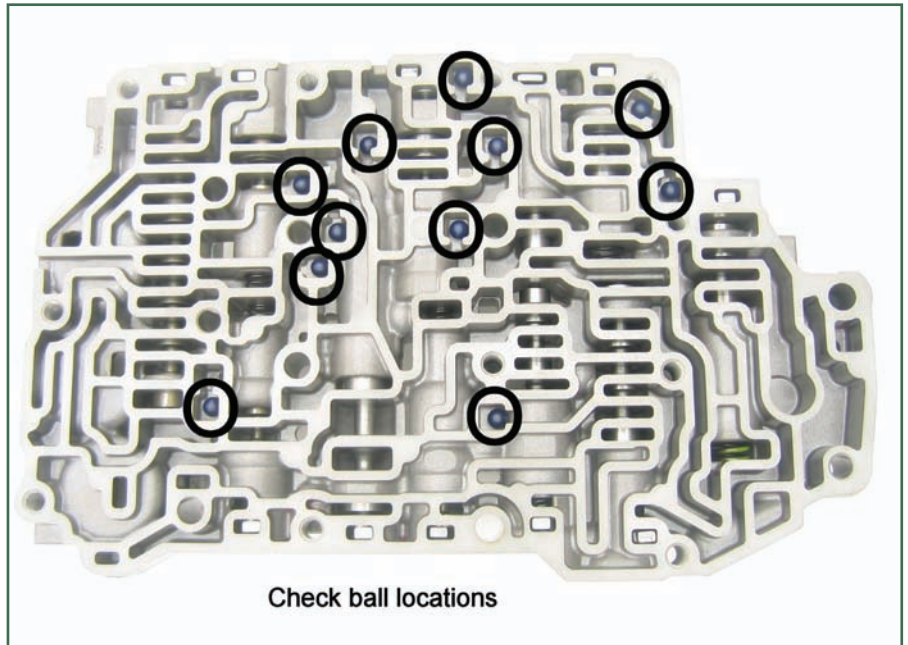


Figure 12

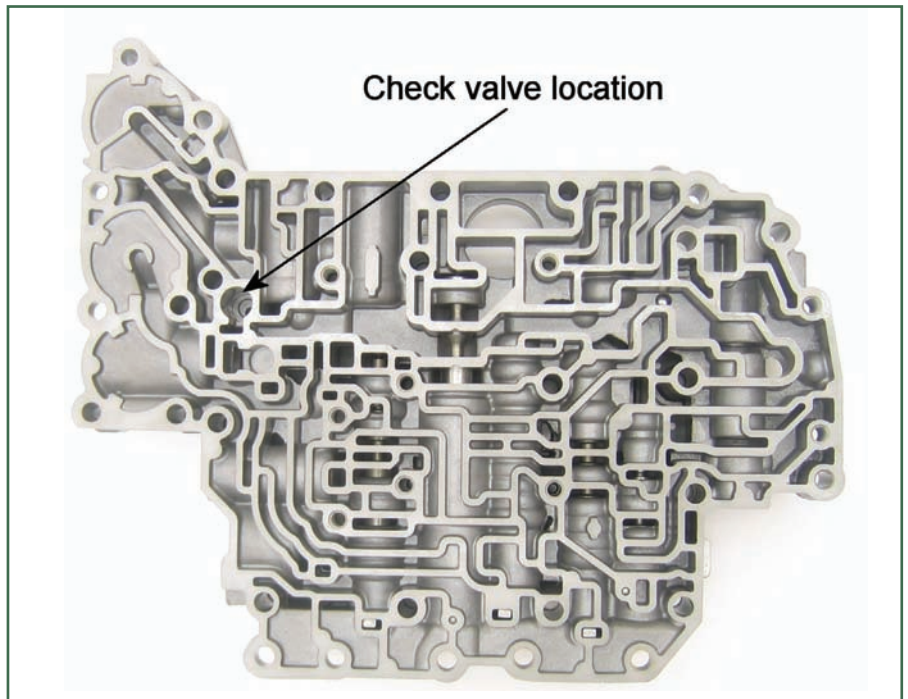


Figure 13

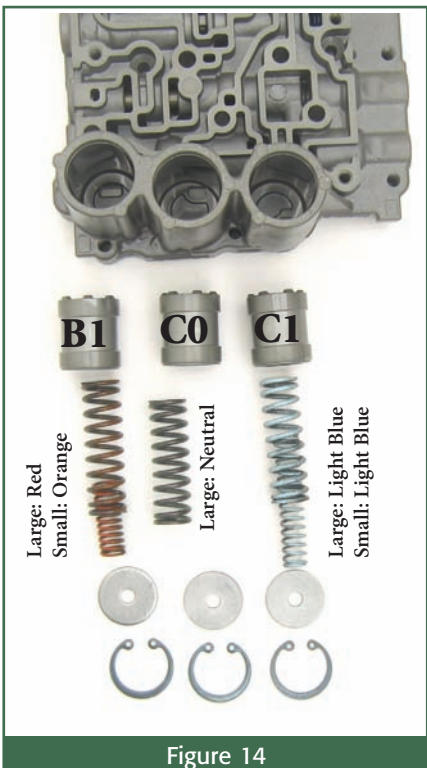


Figure 14

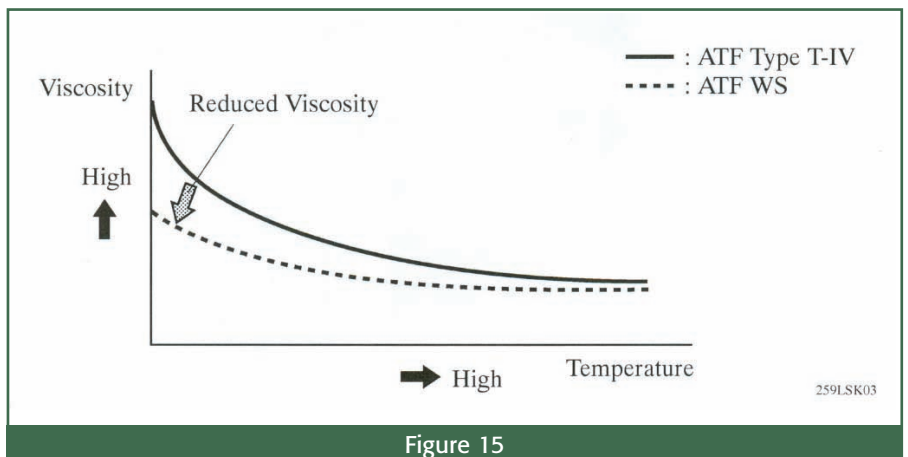


Figure 15

259LSK03

1978 was a good year.



Gas was
70 cents a
gallon



A movie ticket cost **\$2**

Mork & Mindy
was a **TV** favorite



TransTec® kits were introduced

Mork and Mindy are long gone, along with \$2.00 movie tickets and gas at 70 cents a gallon. But TransTec® transmission kits have grown to become the leading brand requested by transmission professionals. In fact, more TransTec® kits are installed than all other kits combined.

We'd like to thank our customers, representatives, suppliers and associates for their faithfulness and support throughout the past 30 years.

These years have been very good to us. We can't wait to see what the future holds.

TRANStec®
CELEBRATING **30** YEARS



We make it Easy.