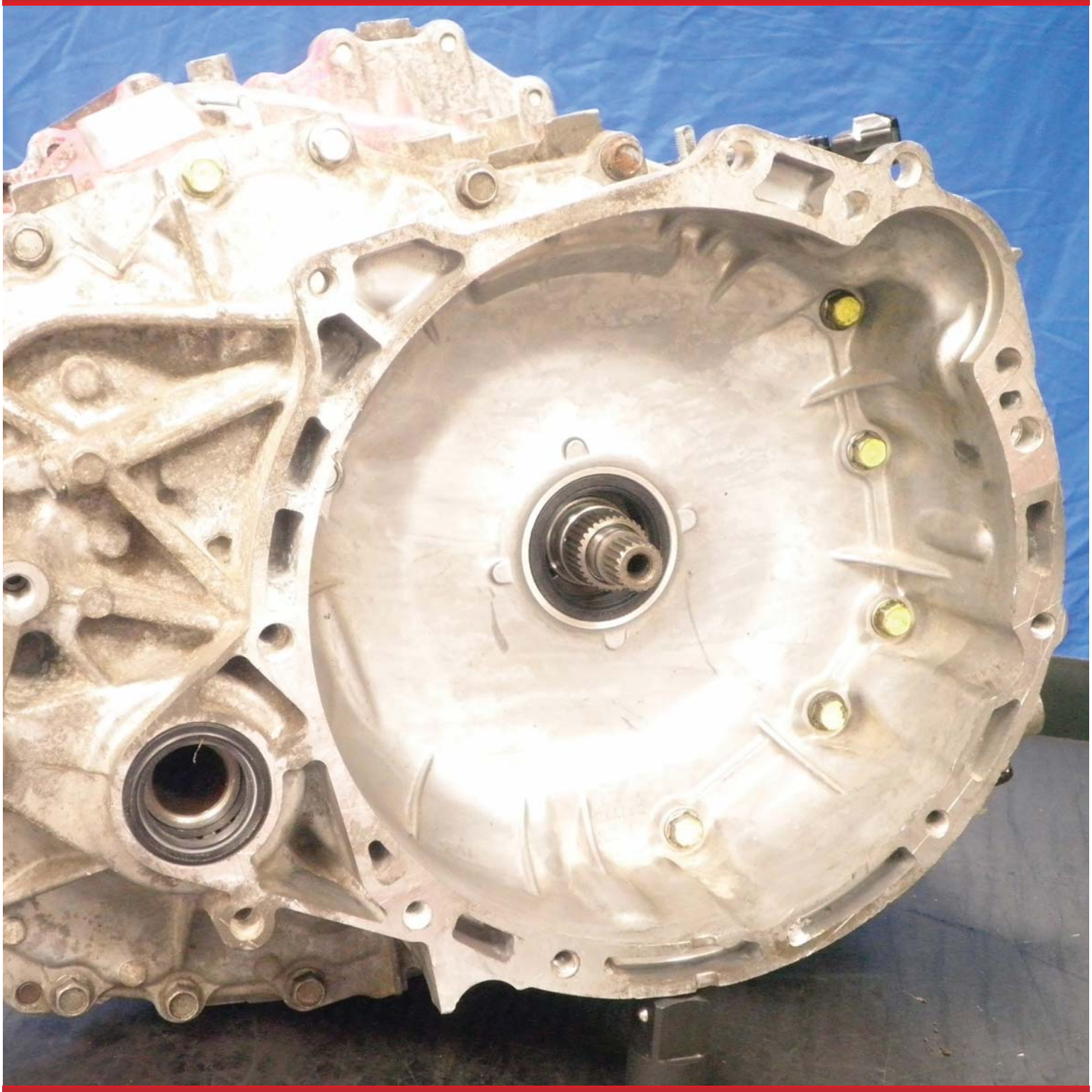
TRANSMISSIONS
AAMCO
TOTAL CAR CARE

JF010/11E CVT Manual



January 2015

Table of Contents

Every attempt has been made to ensure the accuracy of the information contained in this book. Due to variations in engine and transmission control systems from year to year, it is up to the technician using this book to verify the information is appropriate for the transmission he/she is working on.

Description of Operation

The JF011E (Chrysler) and the RE0F10A (Nissan) are very similar and will be covered in this manual. This CVT consists of a Torque Converter, Forward Clutch, Reverse clutch, Planetary Gear Set for Reverse, Drive Variator (pulley), Driven Variator (pulley) and Push Belt.

CVT stands for Continuously Variable Transmission, and is a type of transmission that can change through an infinite amount of gear ratios. The CVT is designed to keep the engine in its peak power range. Keeping the engine in this power range optimizes the fuel consumption and power output of the engine. Keeping the engine in its power band gives approximately 17% better fuel economy.

In the low range forward gear the primary (drive) pulley diameter where the belt rides is small or the distance between the pulley sleeves is wide. The secondary (driven) pulley diameter where the belt rides is large or the distance between the sleeves is narrow. As the vehicle accelerates the drive pulley diameter where the belt rides will become larger and driven pulley diameter where the belt rides will become smaller giving the CVT its infinite gear ratios in the given ratios 2.349-1 and .394-1. When the CVT is in reverse, the computer will lock the pulleys at a set ratio of 1.750-1, keeping the vehicle from accelerating too quickly.

The variable ratios are controlled by the ratio control system, which consists of a stepper motor, a ratio control valve, secondary valve and secondary pressure solenoid. The ratio control valve controls the filling and the exhausting of the drive pulley. The secondary valve controls the filling and exhausting of the driven pulley.

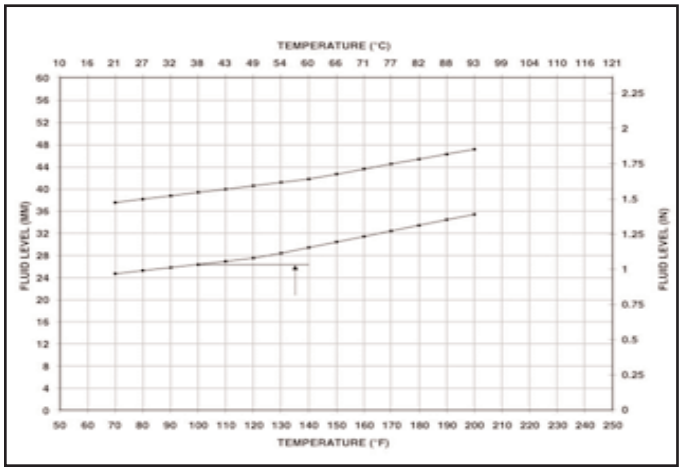
Fluid Type and Capacity

Chrysler - Mopar CVTF+4

Nissan - CVT Fluid NS-2

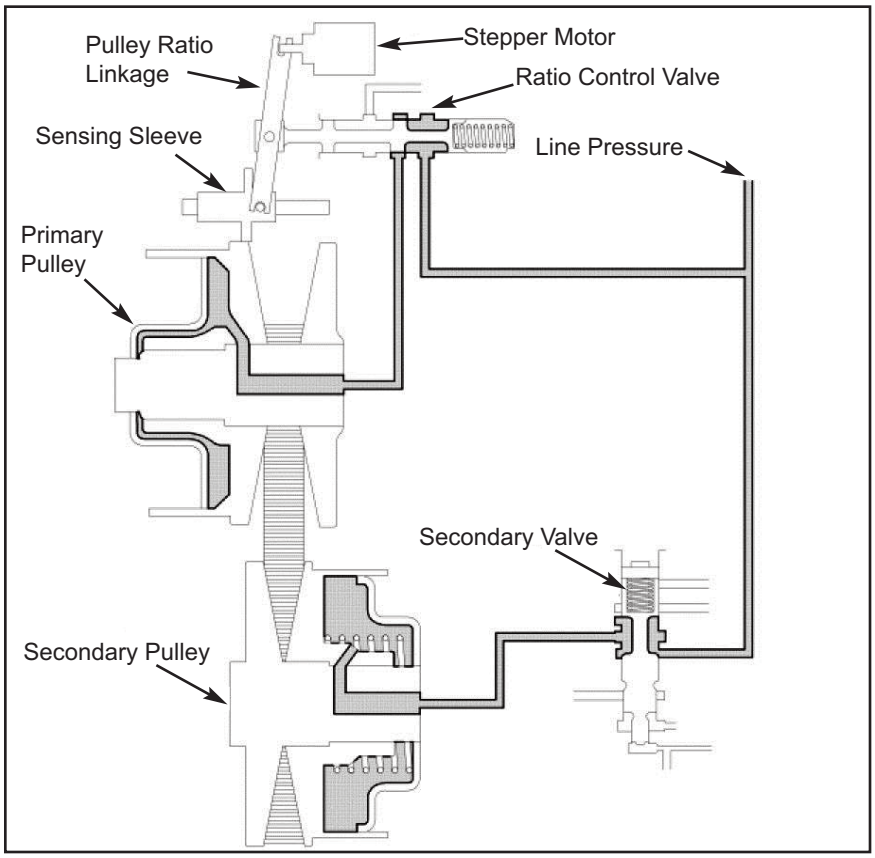
Fluid and Filter 14.8 pts. (7.0L)

Overhauled 17.1 pts. (8.1L)



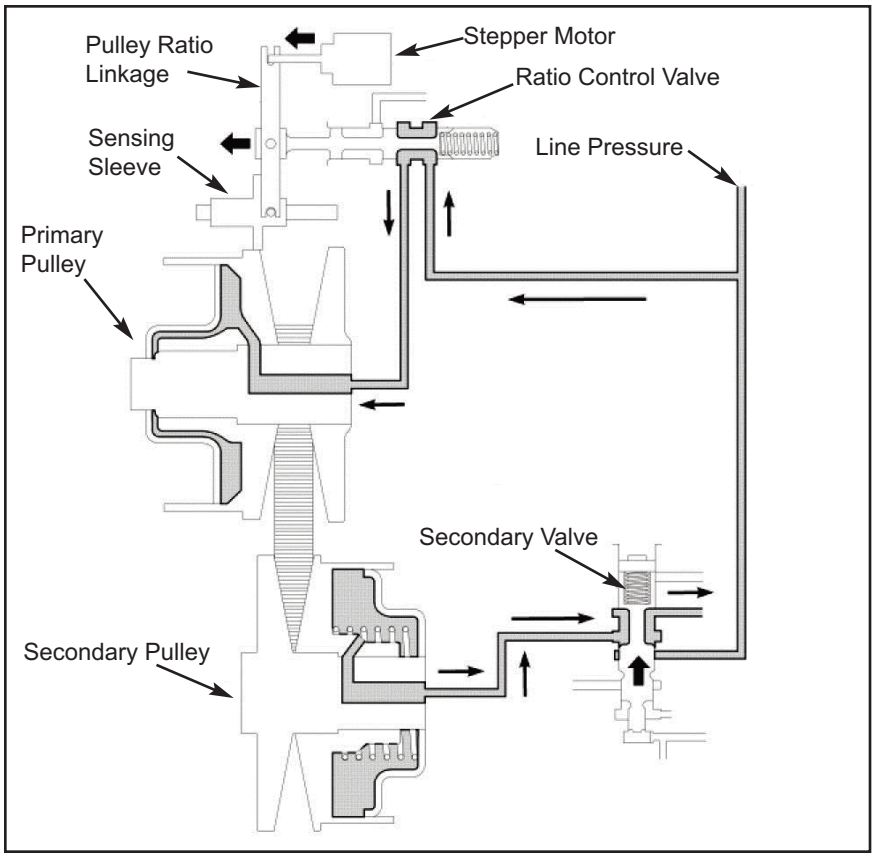
The transmission Oil Dipstick 9336A has indicator marks every 10 mm. Determine the height of the oil level on the dipstick and using the height, transmission temperature, and Transmission Fluid Graph, determine if the transmission oil level is correct.

Drive Low Range Phase 1



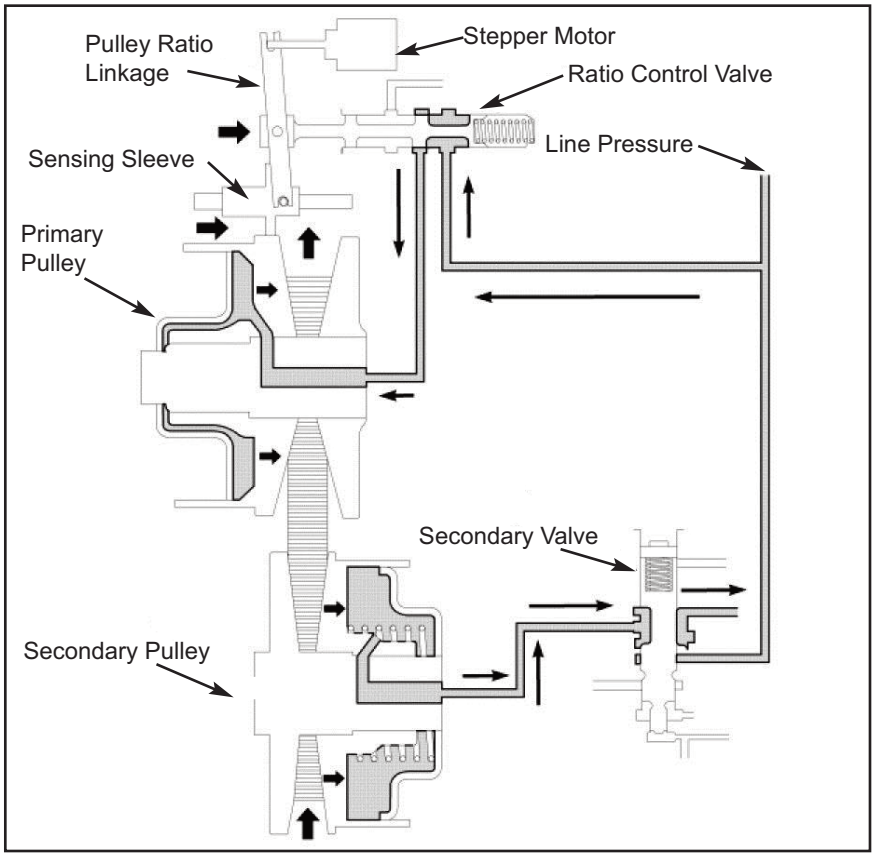
When the forward clutch is applied it will hold the forward clutch hub/sun gear. The sun gear is splined to the drive pulley, this gives the CVT its forward range. The secondary pressure solenoid does not apply pressure to the secondary control valve allowing line pressure to fill the secondary(driven) pulley applying clamping force to the push belt. The ratio control motor is fully retracted positioning the ratio control valve so there is no line pressure feeding the primary (drive) pulley. This produces low range. As you can see the ratio control valve is connected to the middle of the ratio control linkage. One end of the ratio control linkage is attached to the ratio control motor. The other end of the ratio linkage is attached to the sleeve height sensor.

Low to High Range Phase 2



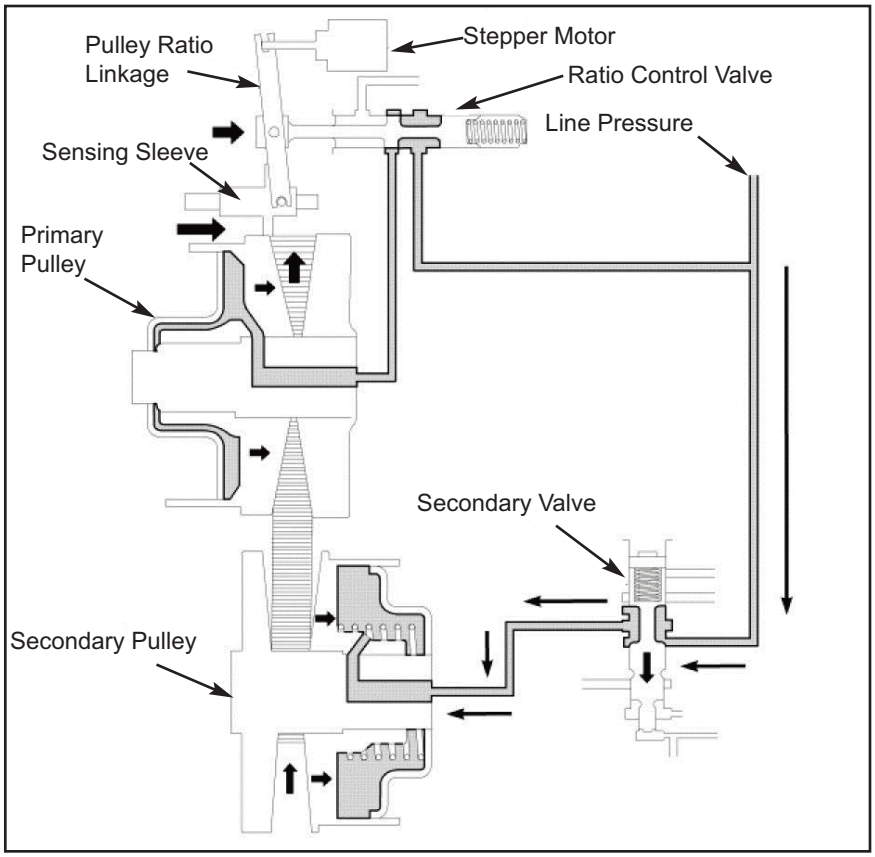
As the vehicle accelerates, the ratio control motor extends outward, allowing the ratio control valve to move to the left, applying line pressure to the primary(drive) pulley. The secondary solenoid applies pressure to the secondary valve, allowing the secondary(driven) pulley to drain, but, also to maintain clamping force on the push belt. Notice, the position of the ratio linkage. Both the ratio motor end and the sensing sleeve end are to the far right.

Low to High Range Phase 3



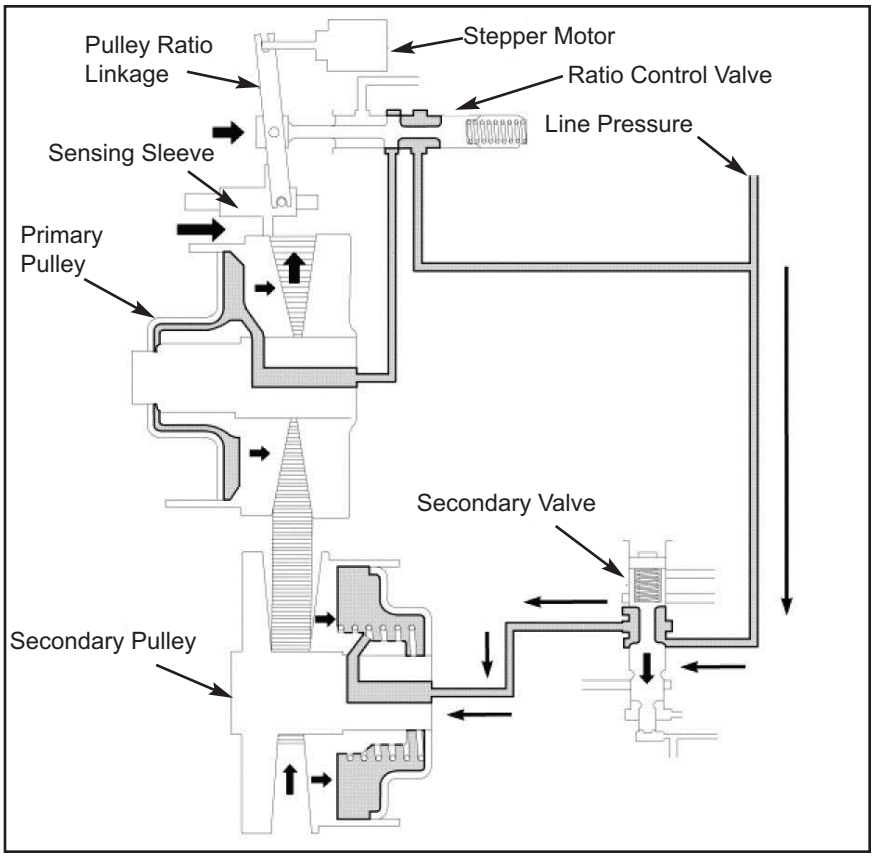
As the primary (drive) pulley fills, the sensing sleeve moves with the pulley. As the sensing sleeve moves, the ratio control valve will also move to the right, which will slowly stop the supply of line pressure and maintain clamping force to the primary (drive) pulley. At the same time, the secondary solenoid is releasing line pressure to the secondary valve, allowing the secondary (driven) pulley to drain, but maintains clamping force on the push belt.

Low to High Range Phase 4



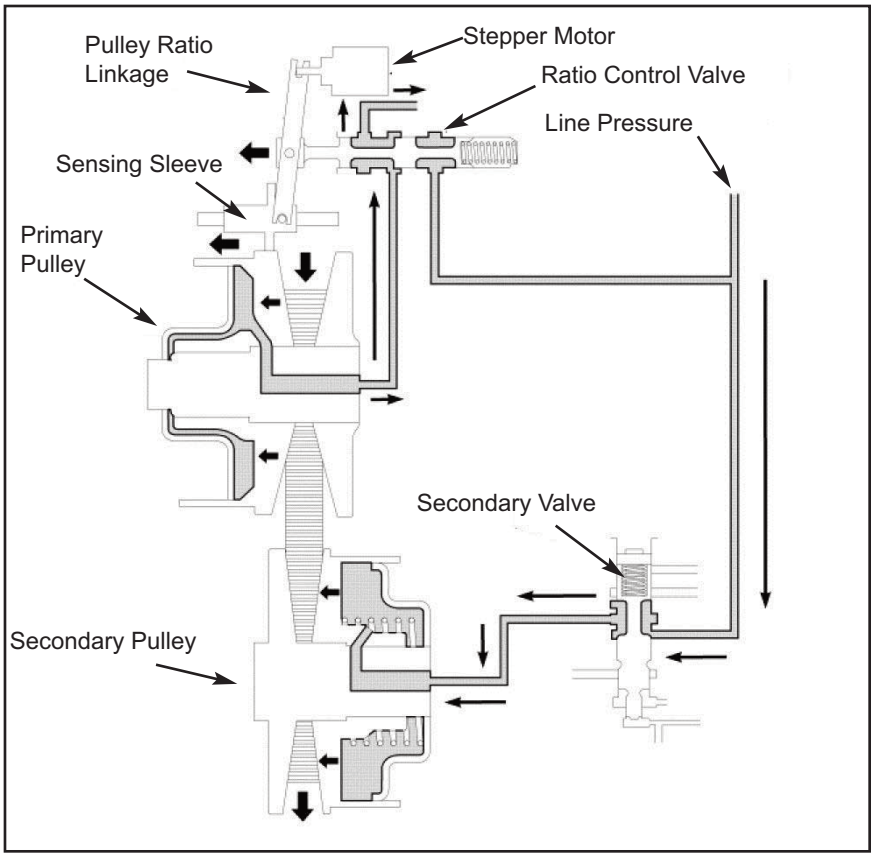
When the primary (drive) pulley moves to where the distance between the sleeves is narrow, the ratio control valve will stop the flow of line pressure to the primary (drive) pulley. The oil that remains in the primary (drive) pulley, will maintain clamping force on the push belt. The secondary solenoid has exhausted the oil to the secondary valve, allowing spring tension to move the secondary valve downwards, to apply line pressure, to the secondary (driven) pulley, to apply clamping force to the push belt. The transmission is in high gear.

High to Low Range Phase 1



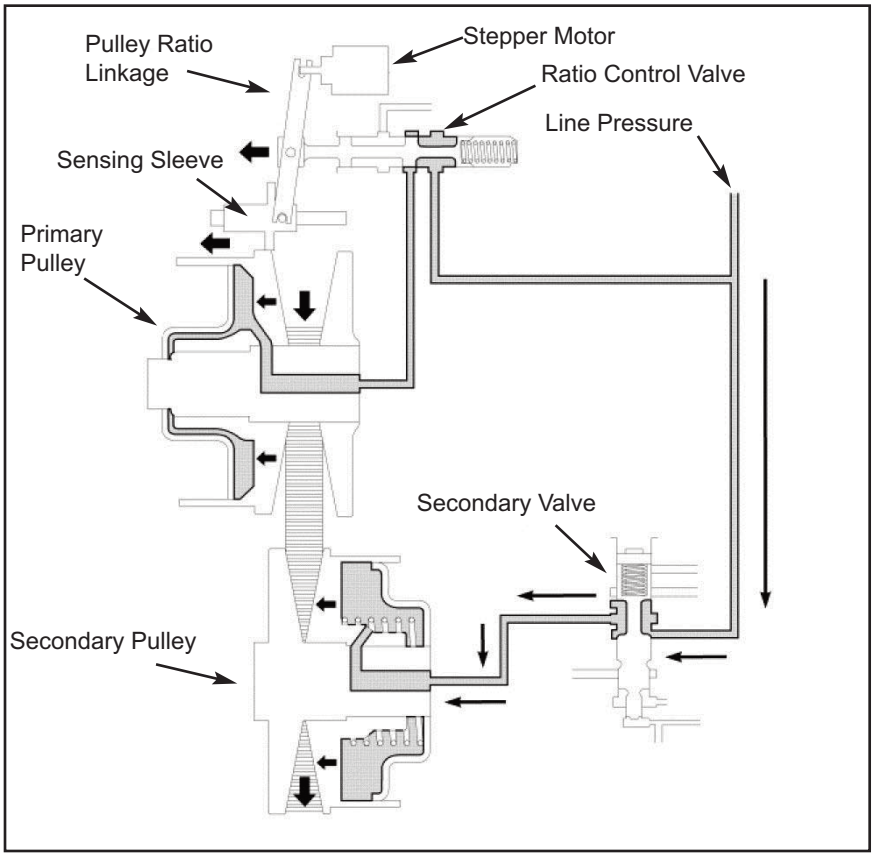
The stepper motor starts to retract moving the ratio control valve to the right allowing the primary (drive) pulley to drain. The secondary valve is still moved downwards applying line pressure to the secondary (driven) pulley.

High to Low Range Phase 2



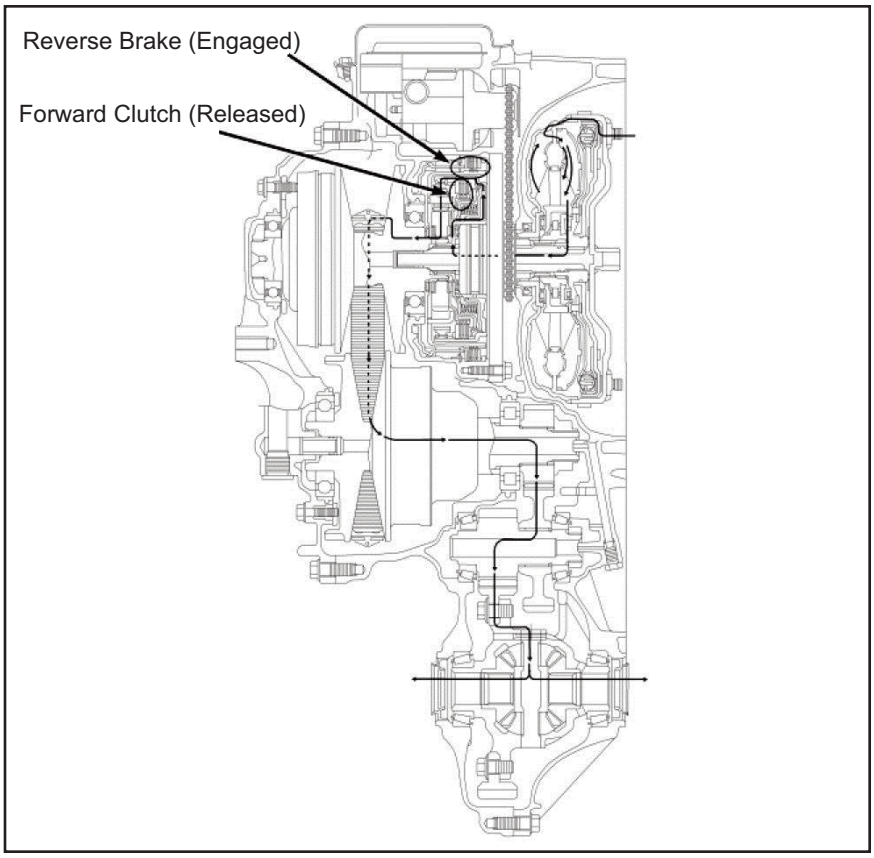
The secondary valve is being pushed down by spring pressure, allowing line pressure to fill the secondary. Pulling this causes the distance between the pulley sleeves to become narrower. As the distance becomes narrower in the secondary (driven) pulley it pulls the push belt down into the primary (drive) pulley. As the distance between the primary (drive) pulley sleeves becomes greater the sleeve sensor is also moving the ratio control valve to the left which closes off the exhausting oil maintain clamping force on the push belt.

High to Low Range Phase 3



When the secondary (driven) pulley is completely filled, the distance between the pulley sleeves is the narrowest and the push belt is pulled down into the primary (drive) pulley the distance between the primary (drive) pulley sleeves is the greatest. The sleeve sensor will cause the ratio valve to move to the right stopping the primary (drive) pulley from exhausting maintaining clamping force on the push belt. The transmission is in low gear.

Reverse



The reverse ring gear is lugged to the forward drum. The reverse clutch is lugged to the planetary carrier. When the reverse clutch is applied it will hold the planetary carrier. The forward drum is turning the ring gear, the ring gear is driving the pinion gears the pinion gears are turning the sun gear in reverse. The sun gear is splined to the primary (drive) pulley which is driving the transmission in reverse.

Pressure Test

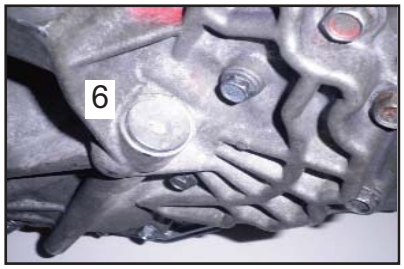
WARNING HIGH PRESSURE

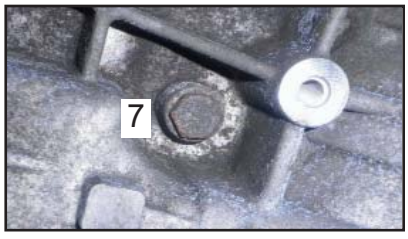
The pump can produce pressure that exceeds 1000 psi. To do a pressure test you will need a 2000 psi gauge and two pressure fitting adaptors.

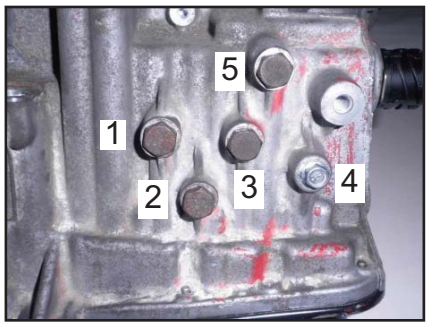
Miller Tool - 9873-3

Miller Tool - 9873-2

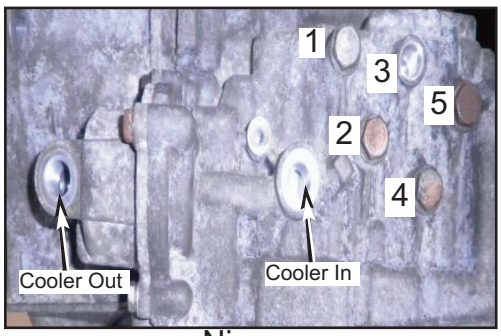
	Fluid Pressure (minimum-maximum)	Fluid Pressure (measurement reference value)		Remarks
	Reference Value MPa (PSI)	Measurement condition	Reference Valve MPa (PSI)	
(1) Line Pressure	0.5 - 6.0 (72-870)	Idling	0.5 - 1.5 (72-218)	
(2) Forward Clutch Pressure	0.1 - 1.5 (15-218)	Idling (D Position)	0.5 - 1.0 (72-145)	P, R, and N positions: 0 MPa (0 PSI)
(3) Primary Pressure	0.1 - 6.0 (15 - 870)	Idling	0.1 - 1.5 (15 - 218)	
(4) Torque Converter Apply Pressure	0.0 - 1.0 (0.0 - 145)	Lock-up ON	0.0 - 0.7 (0.0 - 102)	
(5) Torque Converter Release Pressure	0.0 - 1.0 (0.0 - 145)	Lock-Up OFF	0.0 - 0.7 (0.0 - 102)	
(6) Secondary Pressure	0.1-6.0 (15-870)	Idling	0.1 - 1.5 (15-218)	
(7) Reverse Brake Pressure	0.1-1.5 (15-218)	Idling (R Position)	0.5 - 1.0 (72 - 145)	Out of R position: 0 MPa (0 PSI)







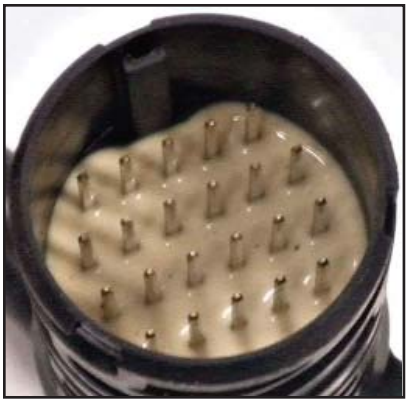
Chrysler



Nissan

Electrical Testing

Chrysler/Mitsubishi
1 2 3 4 5
6 7 8 9 10 11
12 13 14 15 16 17
18 19 20 21 22



Nissan
2 3 12 13 20
22 23 6 7 8 9
4 5 14 15 1 17
25 19 18 11 16

2 and Case Ground
3 and Case Ground
12 and Case Ground
13 and Case Ground

Chrysler
PCS 1 and 6
SPSC 2 and 6
LCS 3 and 6
LSS 4 and 6

Mitsubishi
1 and Case Ground
2 and Case Ground
3 and Case Ground
4 and Case Ground

DO NOT APPLY VOLTAGE TO STEPPER MOTOR

Terminal Chrysler	Terminal Nissan	Description	Resistance	Wire Color Chrysler	Wire Color Nissan
1	2	Pressure Control Solenoid PWM (PCS)	3-9 ohms	DG/LB	RD/YL
2	3	Secondary Pressure Control Solenoid PWM (SPCS)	3-9 ohms	YL/DB	WT/BK
3	12	Lockup Control Solenoid PWM (LCS)	3-9 ohms	YL/LB	GRN or BLU/WT
4	13	Lockup Select Solenoid (LSS)	10-15 ohms	YL/GY	BLU/BK or BLU/WT
5	20	5-Volt Supply	-	PK/LB	BLU/OR
6		Ground	-	BK	-
7	23	Secondary Pressure Signal	0.7-3.5 Volts	PK/LB	PPL/WT
8	8	Motor C	10-20 ohms	LB/YL	RD
9	6	Motor A	10-20 ohms	YL/OR	GRN/RD
10	7	Motor B	10-20 ohms	YL/WT	OR/BLU
11	9	Motor D	10-20 ohms	TN/YL	RD/GRN
16	1	ROM Chip Select	-	YL/LB	BLU/RD
17	17	Transmission Temperature	5k ohms at 75	RD/WT	PPL
18	19	Primary Pressure Signal	0.7-3.5 Volts	DG/YL	WT/RD
19		Sensor Ground	-	DG/VT	-
21	11	ROM	-	DG/BRN	GRN/WT
22	16	ROM	-	GY/YL	BRN/RD3

Torque Specifications

Description	Ft. Lbs.	N-M	In. Lbs.
Bell Housing to Case	33	45	398
Oil Pump to Case (inside) Oil Pump to Case (outside) Oil Pump Cover	14 20 19	19 28 26	168 247 230
Baffle Plate Oil Pump Drive Sprocket Upper and Lower	-	6	52
Bracket Oil Pump/Baffle	19	26	230
Valve Body to Case	-	8	70
Valve Body Half Bolts	-	-	70
Oil Filter to Valve Body	-	8	70
Detent Spring to Case	-	7	61
Nut Manual Valve to Valve Body	16	22	194
Oil Pan to Case	-	8	70
Drive Belt Assembly to Case	33	45	-
Oil Jet for Push Belt	-	8	70
Nut Drive Pulley (secondary)	185	-	-
Trans Range Sensor to Case	-	6	49
Nut Manual Lever to Manual Shaft	13	17	150
Speed Sensor Bolts (ISS/OSS)	-	6	52
Fluid Cooler to Case (Chrysler)	-	4	37
Cool Line Filter Cover to Case (Nissan)	-	4	37
Bell Housing to Engine Bolts	55	75	-
Rear Mount through Bolt	55	75	-
Rear Mount to Transaxle Bolts	55	75	-
Nut Driven Pulley (primary)	200		
Reduction Gear Nut	185		

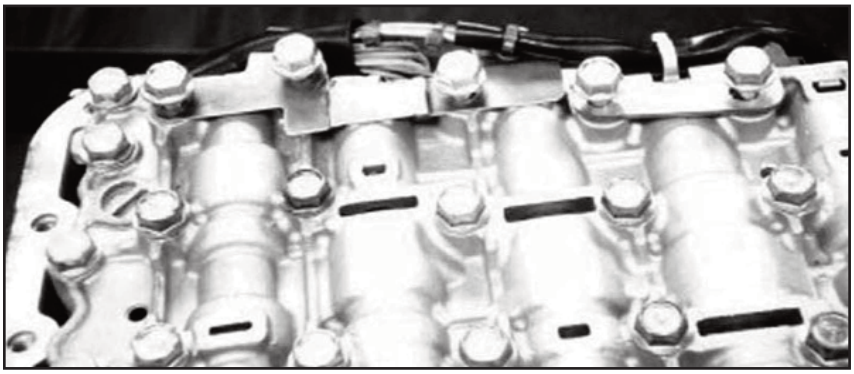
Transmission Disassembly

Remove clip holding in case center

Remove the oil pan

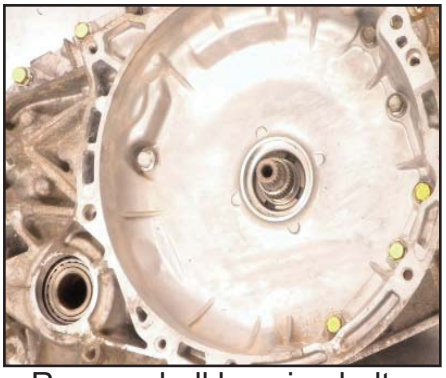
Remove the manual lever

Remove the filter



Remove the wire harness
ROM (Read Only Memory Module)

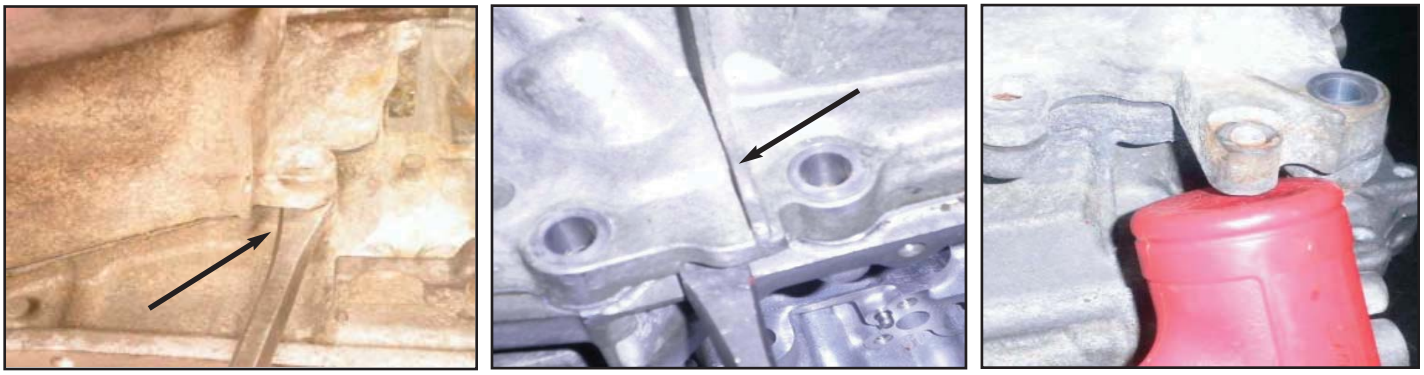
Remove marked bolts to remove valve body.



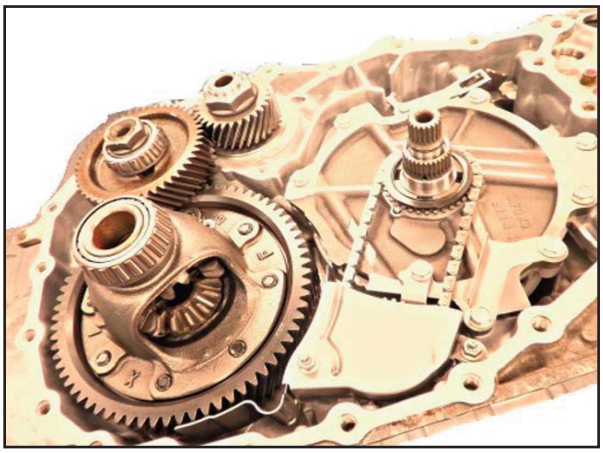
Remove bell housing bolts.

NOTE LOCATION OF THE 5 LONG BOLTS

Transmission Disassembly



Separate bell housing from main case



Remove the reduction gear and differential

Remove o-ring, selective washer and upper baffle

Remove pump driven gear chain and drive gear

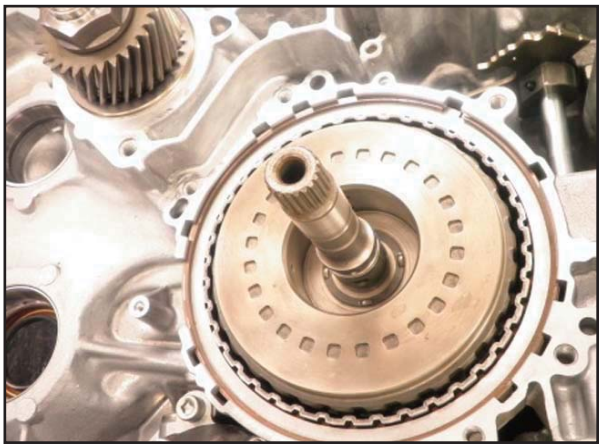
Remove the pump bracket to lower baffle and lower baffle.

Transmission Disassembly

Remove the pump. There is one external bolt.

Remove stator support.

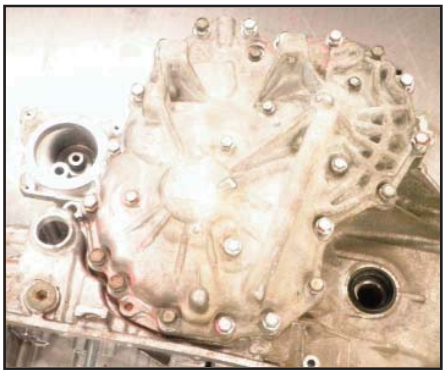
Remove detent spring



Remove forward drum

Remove planetary assembly

Remove reverse clutch, reverse clutch retainer and piston



Remove case rear cover bolt

Subassemblies

Pulleys and Drive Belt Assembly

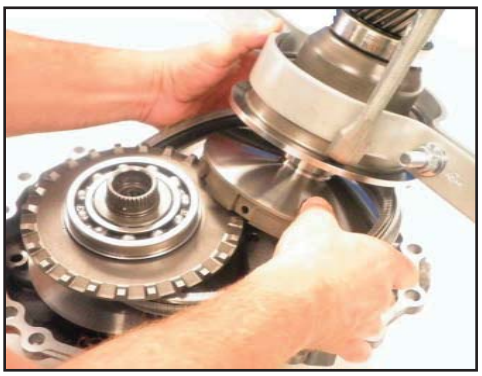
Note the direction of the belt

Always wire tie belt, if not, belt could come apart

Tool used is an11 inch two jaw puller with 5 inch duct flange. Purchased at a plumbing supply warehouse.

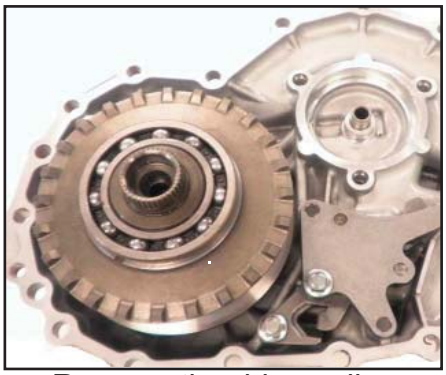
Compress the Driven Pulley

Chrysler tool 9874



Remove driven pulley

Remove the driven pulley shim

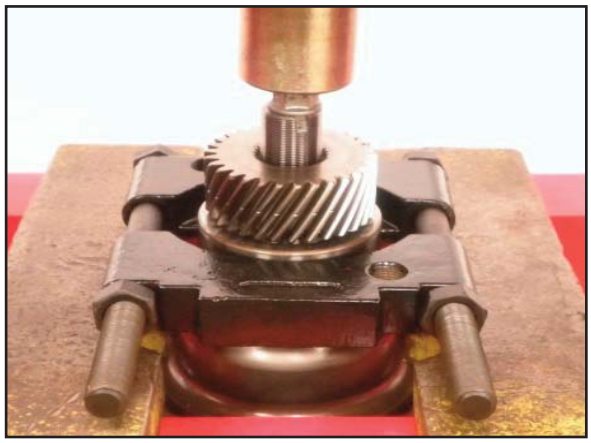


Remove the drive pulley

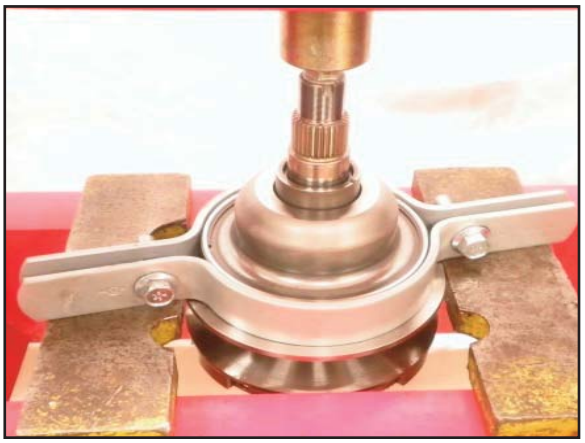
Subassemblies

Pulleys and Drive Belt Assembly

Secondary Pulley



Using a bearing splitter under the bearing, on the driven pulley, press bearing and gear off pulley assembly



Using the same clamp, press the pulley halves apart. Place a bucket under the pulley assembly. There are 12 6mm balls on the inside of the pulley assembly that need to be saved.

Subassemblies

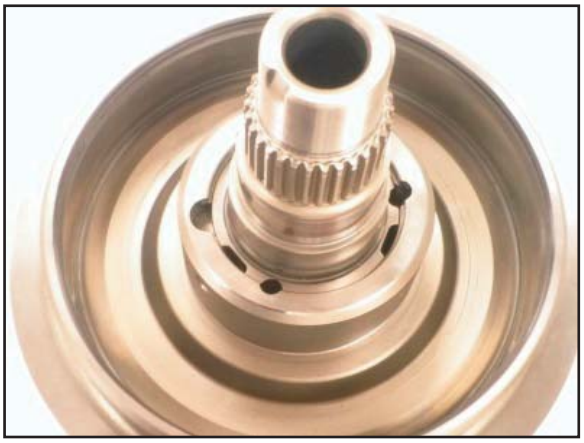
Pulleys and Drive Belt Assembly

Secondary Pulley - Continued

Compress balance piston

Remove piston retainer snap ring

Inspect both the shaft groove, pulley groove and the twelve 6mm balls for any wear. If any wear is found, the pulley shaft and balls will need to be replaced.



Carefully install the upper secondary pulley half onto the lower pulley half/shaft. This is a very tight fit. Do not force these halves together. They should slide up and down freely.

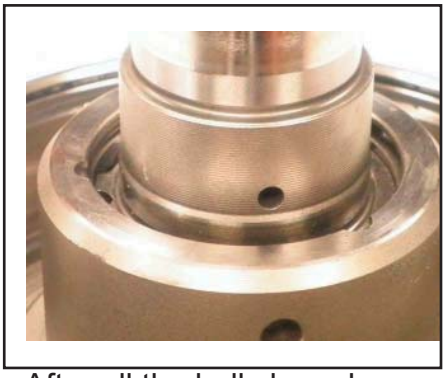
Subassemblies

Pulleys and Drive Belt Assembly

Secondary Pulley - Continued

Insert the twelve 6mm balls into the slots, 4 balls per slot.

Insert one ball in each slot, lightly tap each ball with a punch until, the ball is seated into the bottom of each slot.



After all the balls have been seated, slide the upper pulley half up so the snap ring groove is just completely accessible.

Install the snap ring that retains the balls.

Install the piston return spring

NOTE **THERE IS A HUMP IN THE SNAP RING THAT NEEDS TO LINE UP WITH THE NOTCH IN THE UPPER PULLEY.**

Subassemblies

Pulleys and Drive Belt Assembly

Secondary Pulley - Continued

Install piston seal, make sure the ends overlap correctly

Install secondary piston then install secondary balance piston

Press secondary piston down just enough to install the piston retaining snap ring. You may need to tap the balance piston down to get the snap ring in. Once the snap ring is installed, continue pressing the piston until it is completely seated.

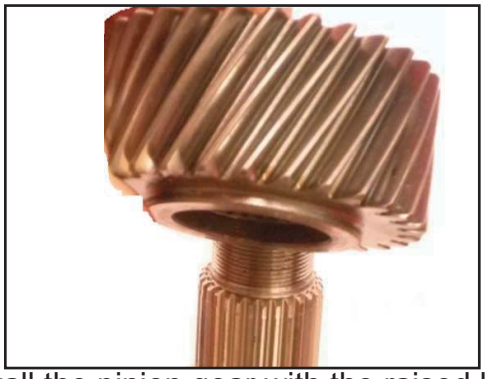
Install the bearing on the secondary shaft with the lip facing down or towards the pulley.

Press the bearing onto the secondary shaft

Subassemblies

Pulleys and Drive Belt Assembly

Secondary Pulley - Continued

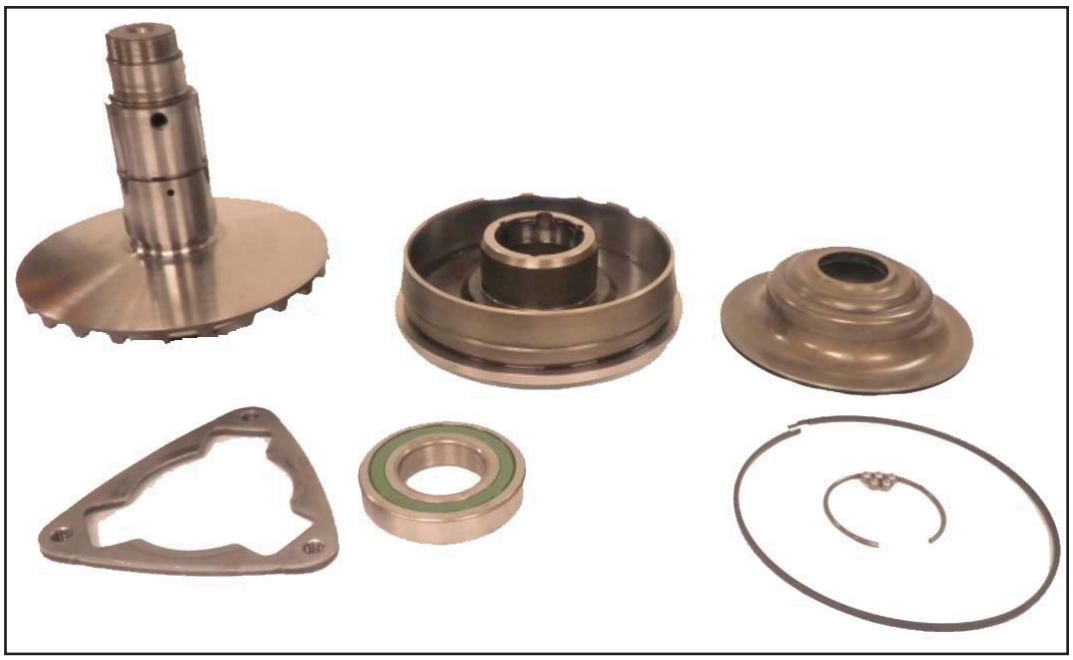

Install washer onto bearing. Install the pinion gear with the raised lip facing down or towards the pulley. Press the pinion gear onto secondary shaft.

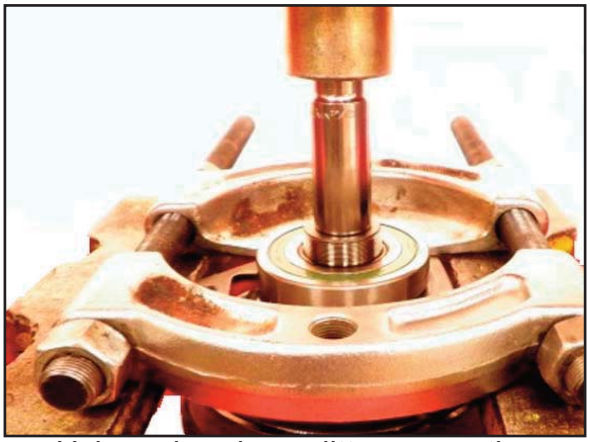
Install the retaining nut. Torque to 185 Ft. Lbs. than stake nut.

Subassemblies

Pulleys and Drive Belt Assembly

Primary Pulley





Using a bearing splitter, press the bearing off the primary shaft.

Press the pulley halves apart. Place a container under the press, there are six 6mm balls that will be saved.

Subassemblies

Pulleys and Drive Belt Assembly

Primary Pulley


Inspect the groove in the shaft and the pulley for wear, also inspect the six 6mm balls for wear.


Install one 6mm ball in each of the three grooves, using a punch, lightly tap each ball down until it is fully seated. Each slot takes 2 balls.

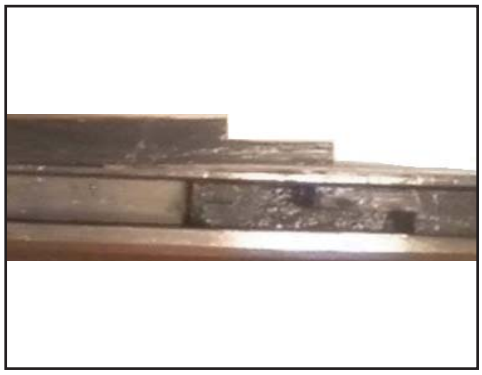


Lift the upper pulley half just enough so that the entire slot for the snap ring is exposed. Install the snap ring that retains the balls, with the hump in the snap ring, into the notch in the pulley

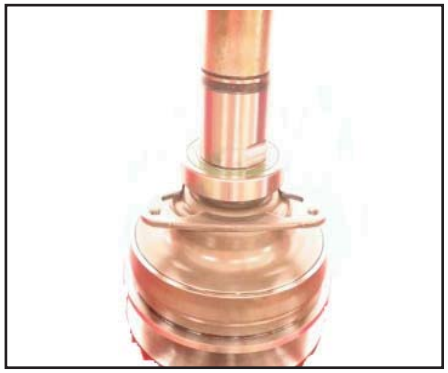
Subassemblies

Pulleys and Drive Belt Assembly

Primary Pulley - Continued



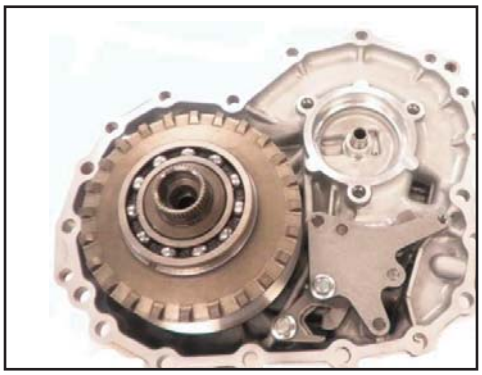
Install a new primary piston seal aligning the ends correctly. As you can see, the two ends overlap each other. Install piston into the upper pulley half, then press the piston onto the secondary shaft. Once the piston is fully seated, lift up on the upper pulley half, make sure it moves freely up and down.

Install the bearing retainer with the groove facing up. Then press the bearing onto the primary shaft until it is fully seated.

Subassemblies

Rear Cover Reassembly



Install primary pulley into the end cover with new o-ring on the bolts. Torque to 33 Ft. Lbs. (45Nm)

Install thrust washer for secondary pulley

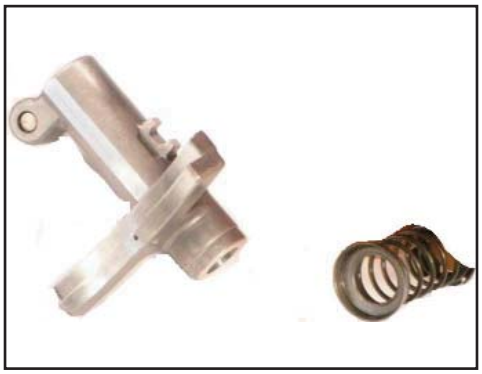
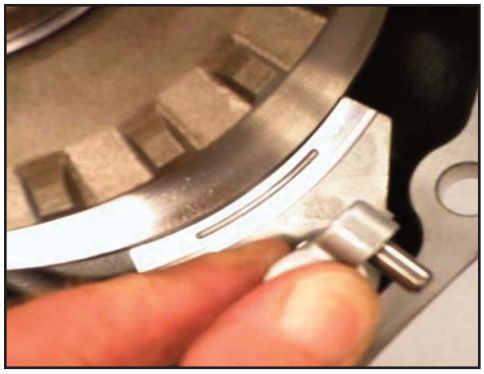
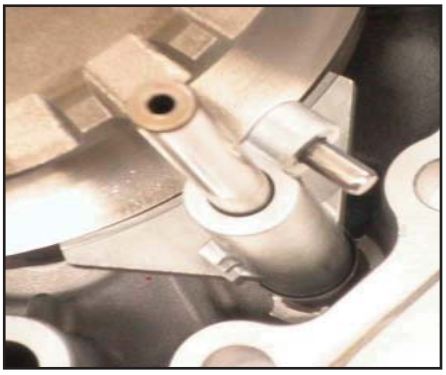
Install drive belt with arrow pointing to the left.



Compress secondary pulley, using new o-ring on the bolts. Torque Bolts to 33 Ft. Lbs. (45N).

Subassemblies

Rear Cover Reassembly - Continued

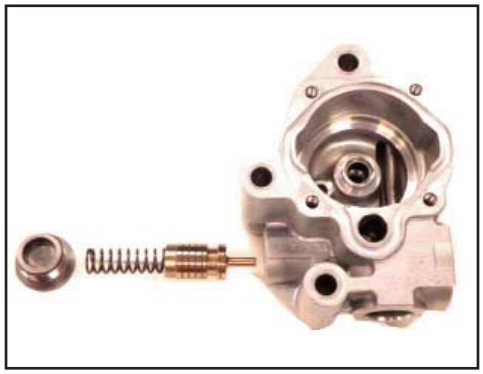




Install the spring, onto the ratio control lever, with cupped washer facing the lever. Install the lever into the case, with the lip, on the lever top half, of the primary pulley. Install the rod that the ratio control lever rides on.

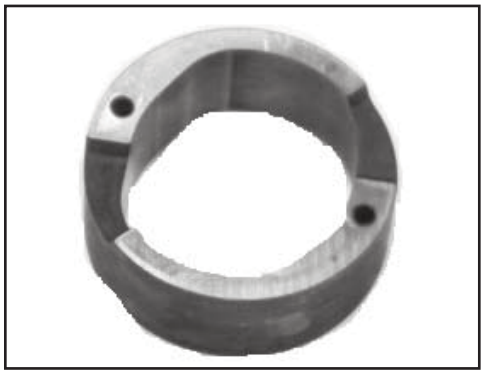
Pump

Subassemblies

Pump - Continued

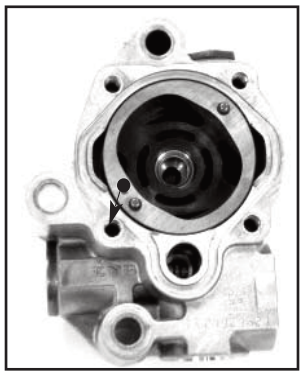


The flow control valve is a high wear part
Sonnax valve 33510N-01

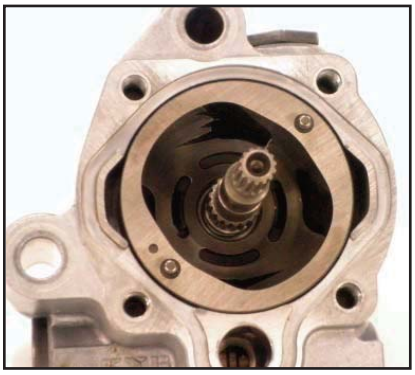


Notches are installed facing down

Notches facing down

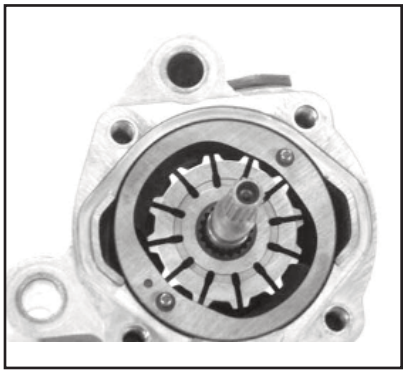


Install the sleeve assembly with dot facing this bolt hole

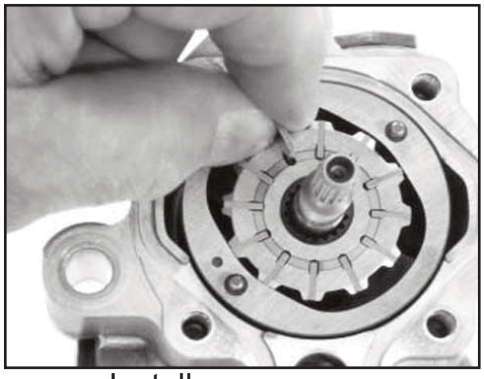


Install pump shaft

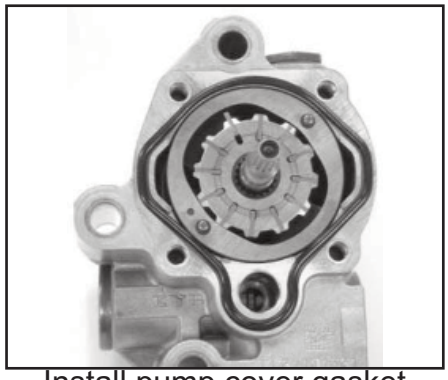
Dots on rotor face down



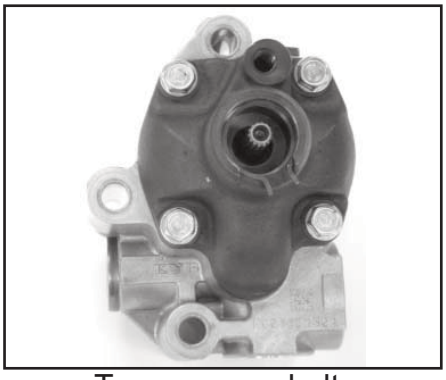
Install rotor dots down



Install pump vanes



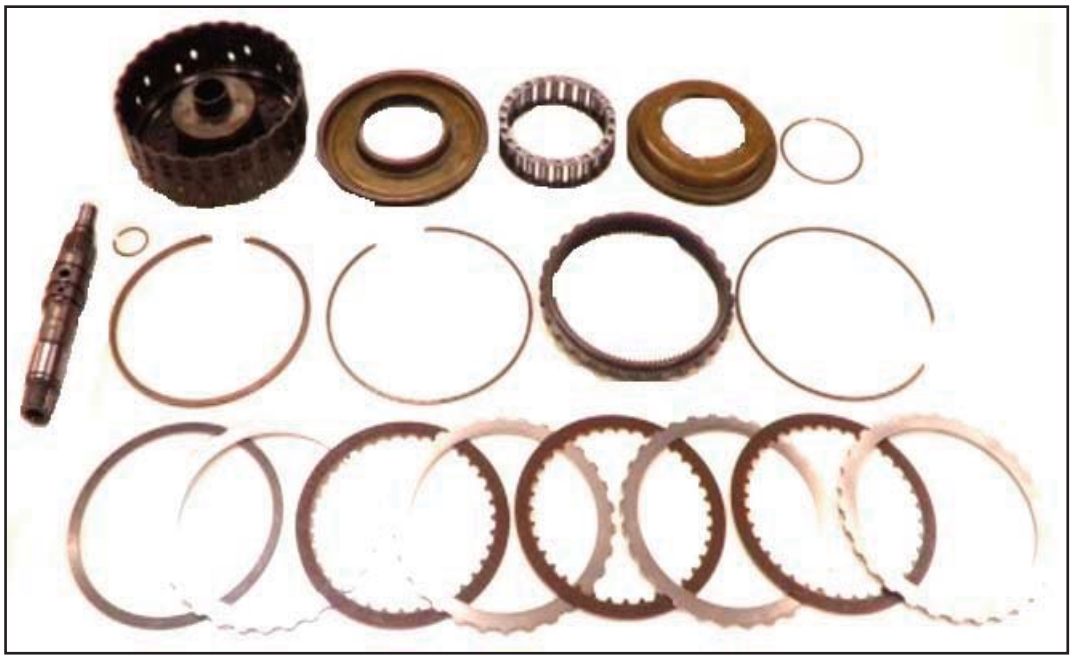
Install pump cover gasket



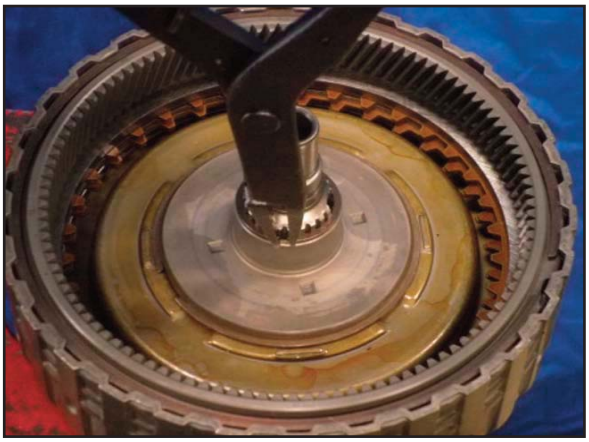
Torque cover bolts
19 Ft. Lbs. (26Nm)

Subassemblies

Forward Clutch



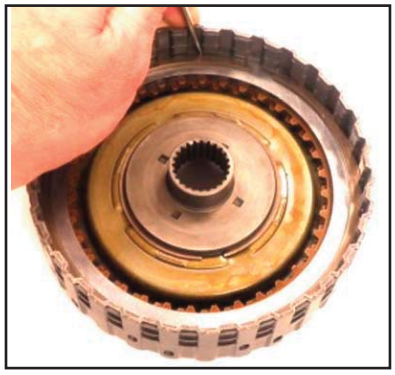
Forward Clutch Disassembly



Subassemblies

Remove Input Shaft

Remove the snap ring and planetary ring gear

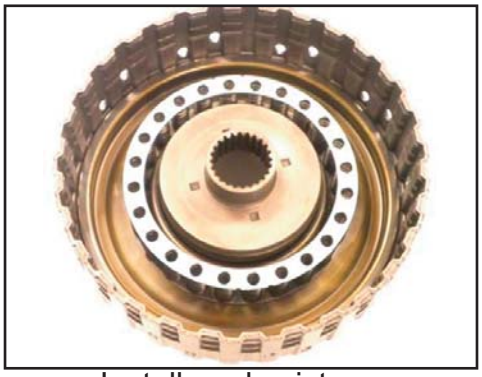


Remove the snap ring, pressure plate clutches and steels

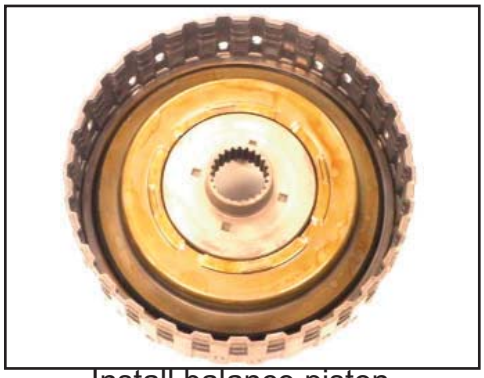
Compress the retainer and remove snap ring

Remove forward clutch balance piston

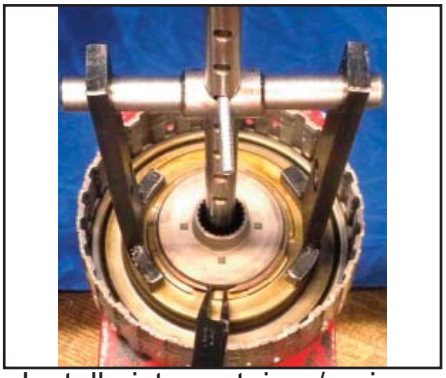
Forward Clutch Reassembly



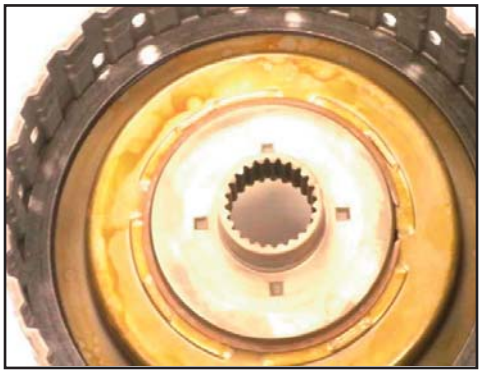
Install apply pistons and return springs



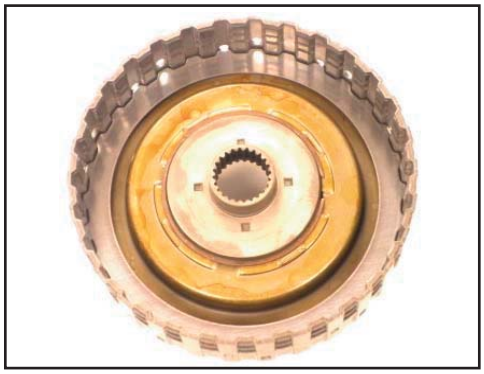
Install balance piston



Install piston retainer/springs and snap rings



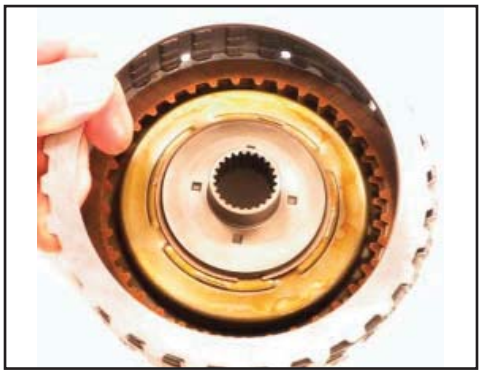
Install cushion plate dish down



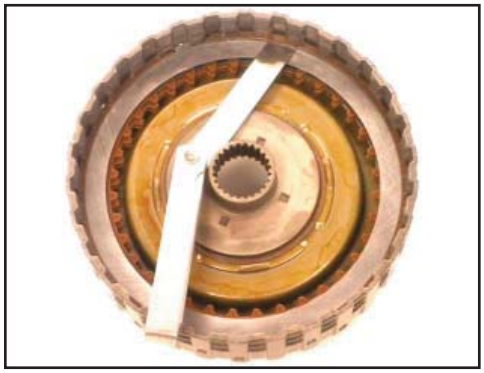
Start with steel plate, then friction plate, alternating ending with a friction plate

Subassemblies

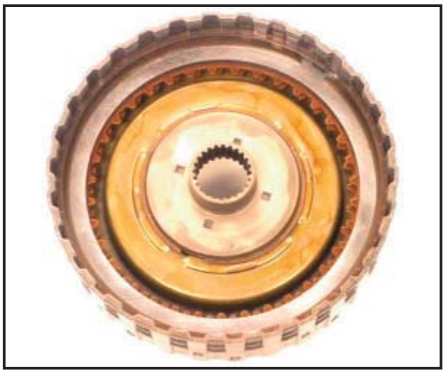
Forward Clutch Reassembly - Continued



Install forward clutch pressure plate



Check clutch pack clearance .047-.059 (1.2-1.5 Nm)



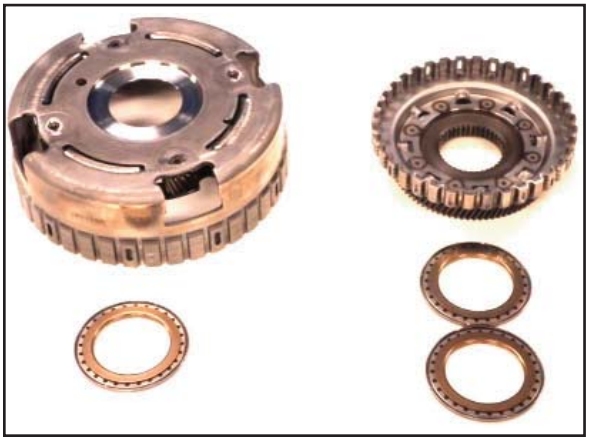
Install ring gear and lower snap ring

Install ring gear and upper snap ring

Replace input shaft sealing rings

Install input shaft and snap ring

Planetary



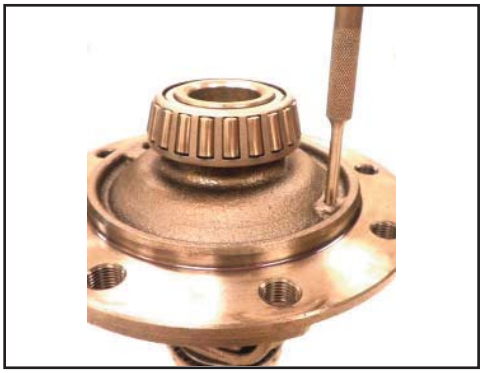
Inspect teeth, pinions for excessive play and pinion washers for wear.

Subassemblies

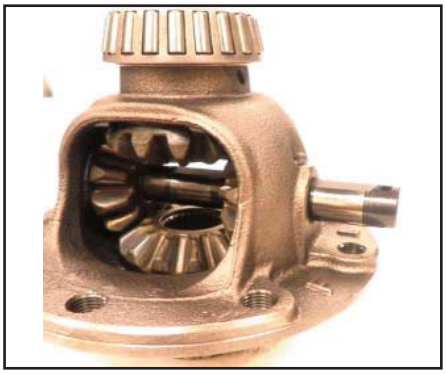
Differential and Reduction Gear

NOTE **ITS GOOD PRACTICE TO MARK THE SIDE AND SPIDER GEARS AND KEEP THEM IN THEIR RESPECTIVE PLACES UPON REASSEMBLY.**

Remove ring gear



Remove differential roll pin



Remove the shaft that holds in the spider gears

Rotate the spider gears 90° then remove the gears and the washers

Remove both side gears and washers

Subassemblies

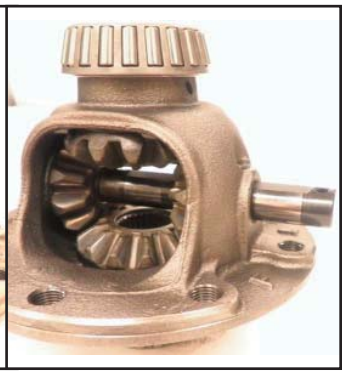
Differential and Reduction Gear - Continued

Inspect the spider gears, spider gear washers, side gears and washers for any pitting, galling or wear. Also inspect the differential carrier and gear pockets for wear. Inspect the spider gear shaft and spider gears for wear. Replace any worn parts.

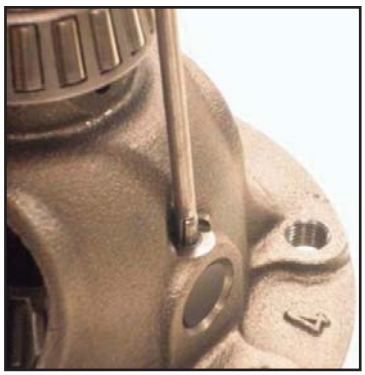
Install both side gears and washers.

Install the spider gears and washers

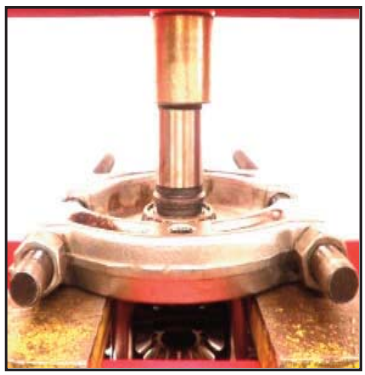
Rotate spider gears 90° make sure the washer lines up with the hole in differential carrier.

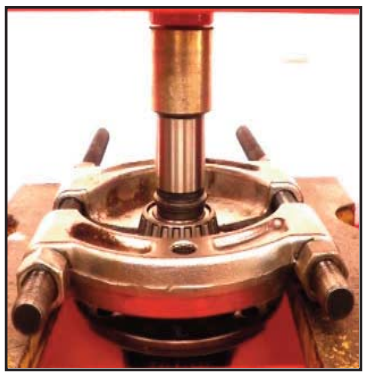


Install spider gear shaft



Install roll pin



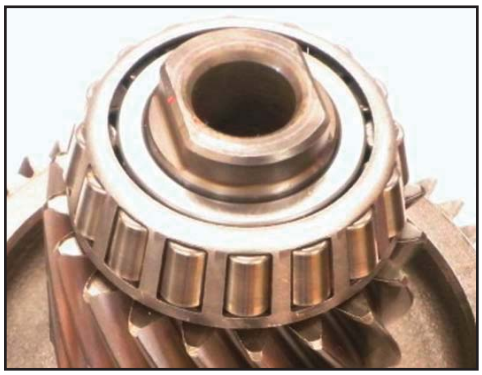


Remove both differential side bearings.

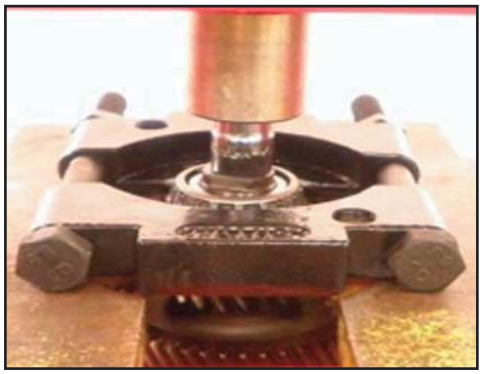
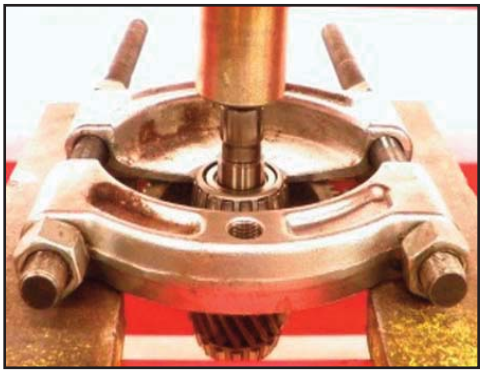
Subassemblies

Differential and Reduction Gear - Continued

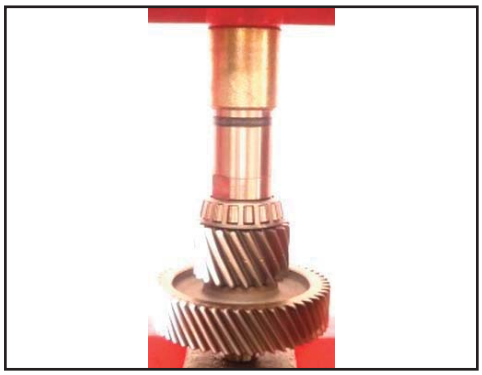
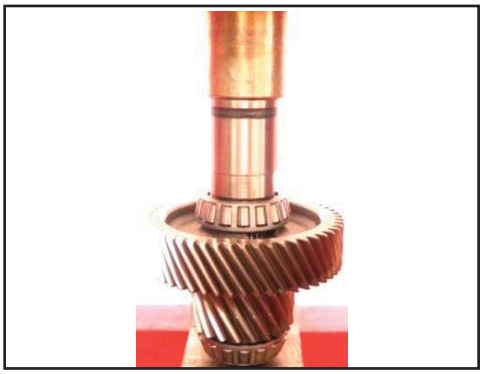
Reduction Gear



There are flats on the reduction gear shaft. Then mount the transfer gear into a vise against these flats. Use an impact and socket to remove the retaining nut.

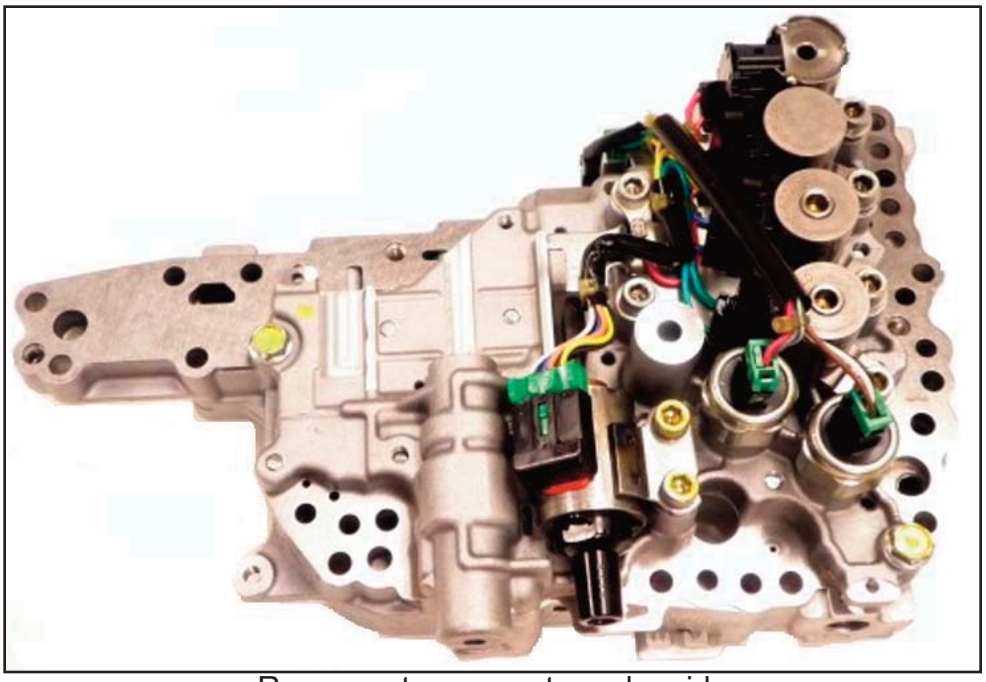



Using a bearing splitter,
remove both bearings from the reduction gear.

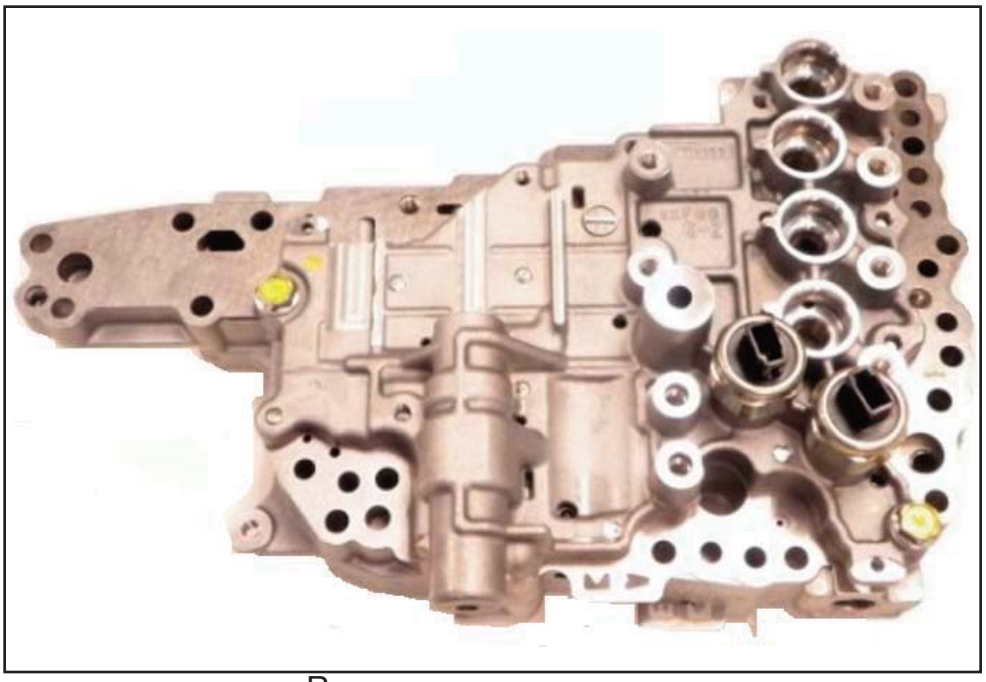




Press both bearings onto the reduction gear. Torque to 185 Ft. Lbs. (250Nm)

Valve Body

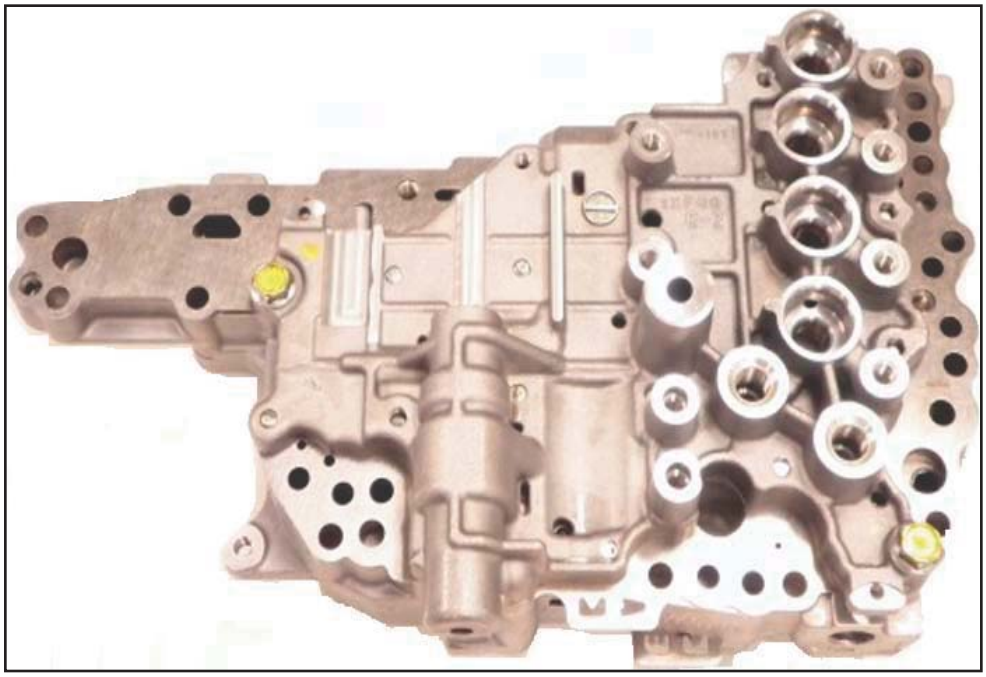


Remove stepper motor solenoids

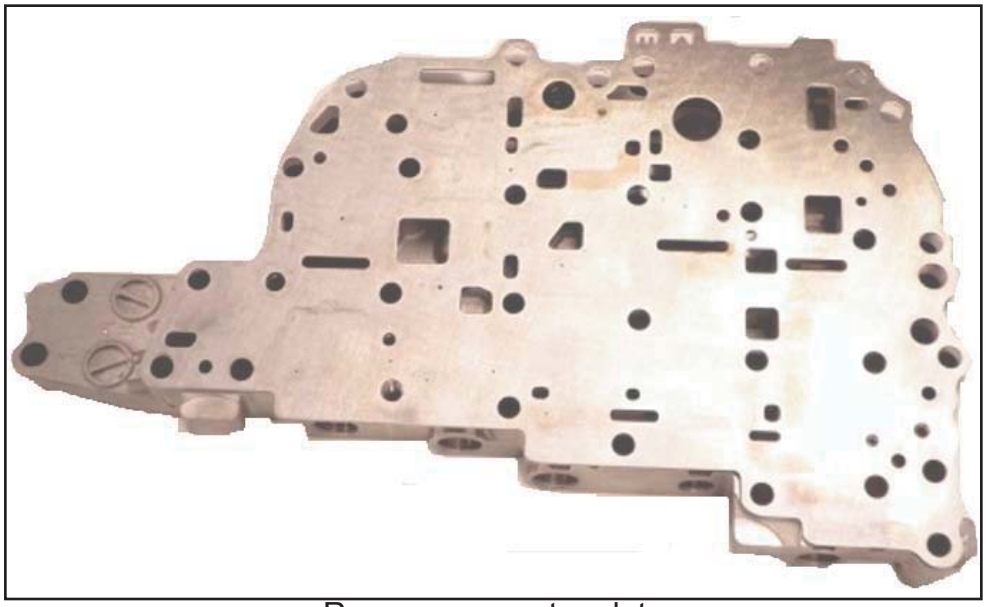


Remove pressure sensors

Valve Body - Continued

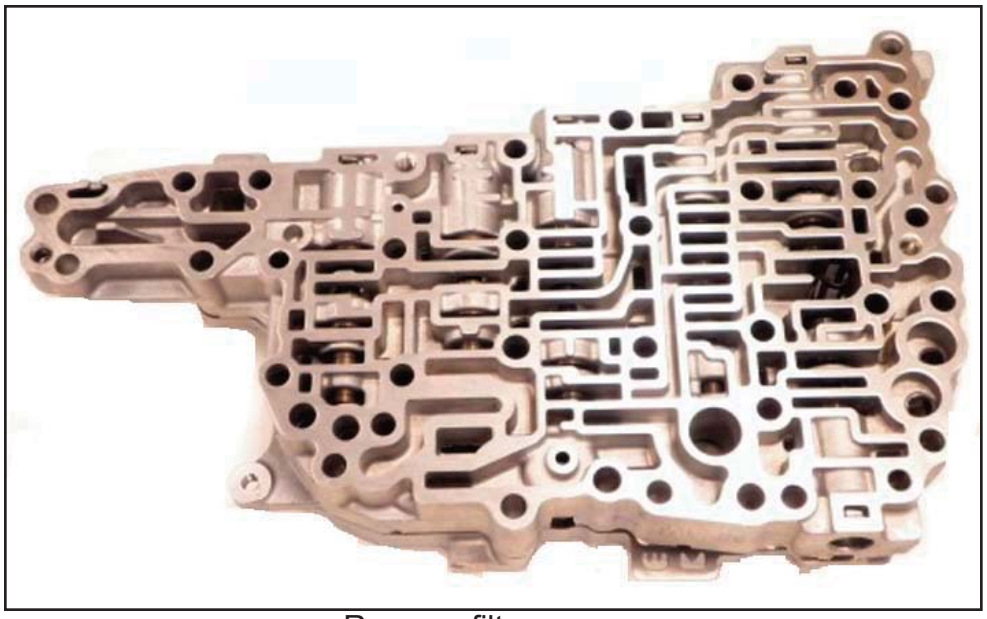


Remove the two bolts holding valve body together, separate valve body halves

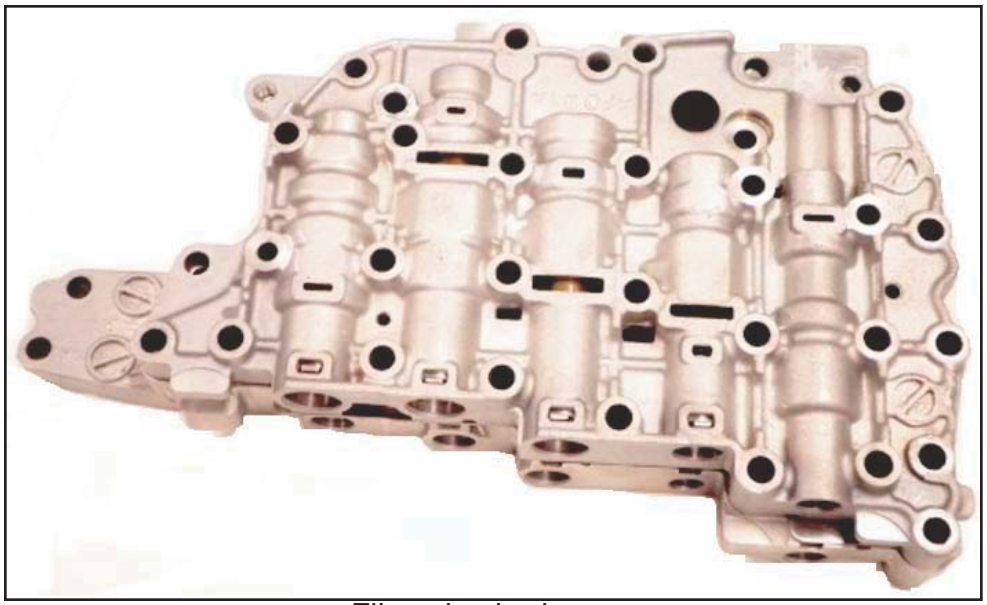


Remove separator plate

Valve Body - Continued

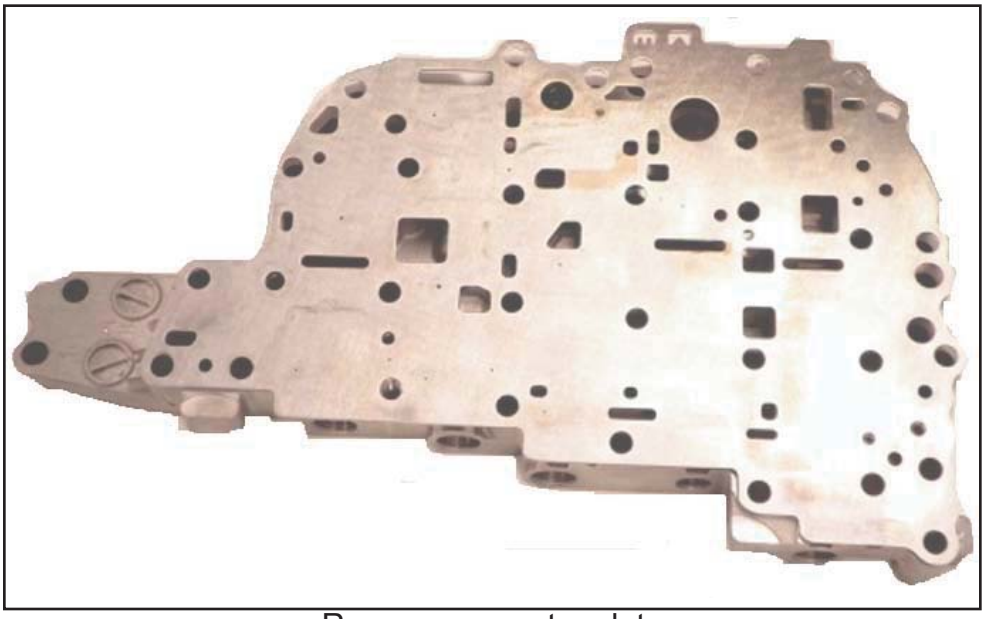


Remove filter screen

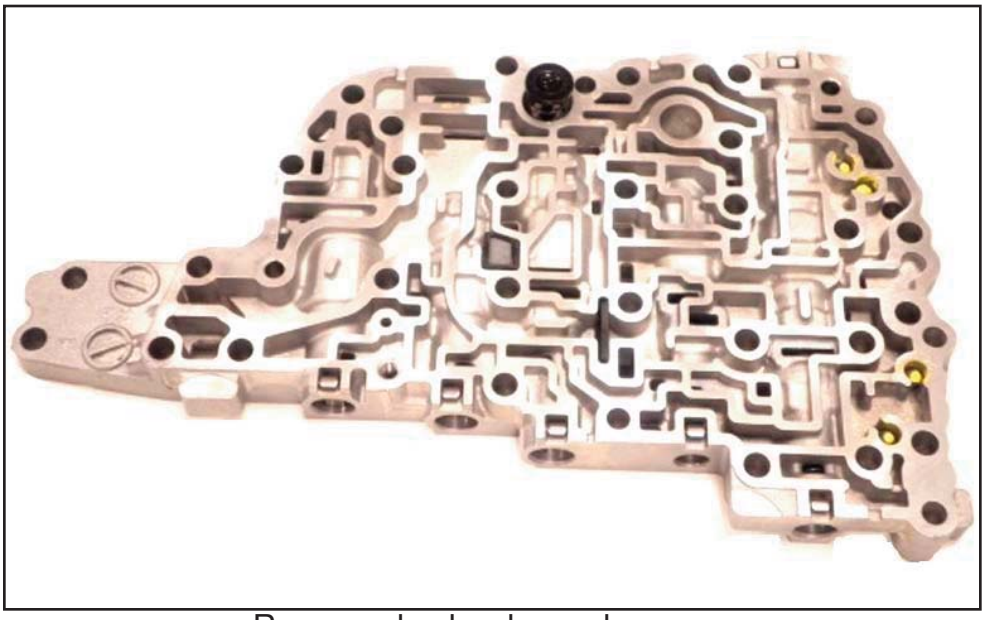


Flip valve body over

Valve Body - Continued

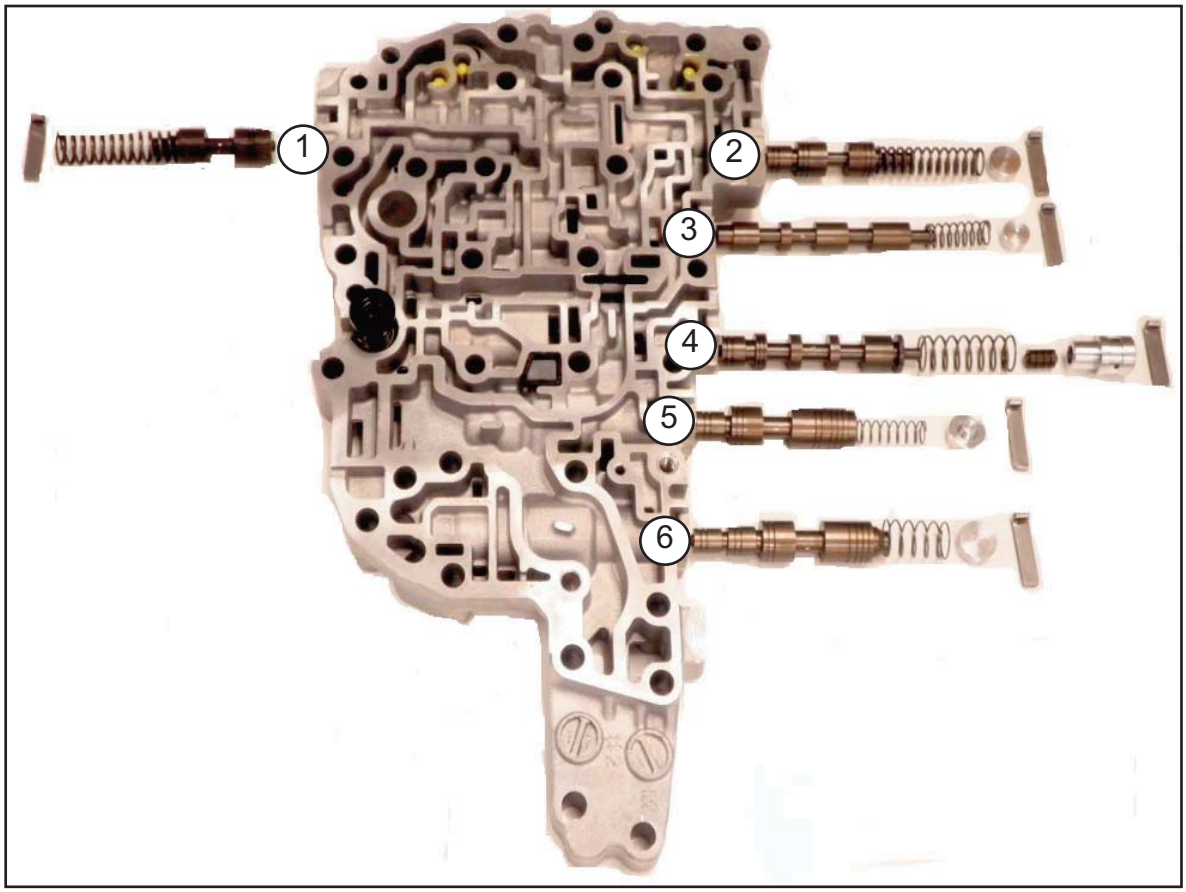


Remove separator plate



Remove check valve and screens

Valve Body - Continued

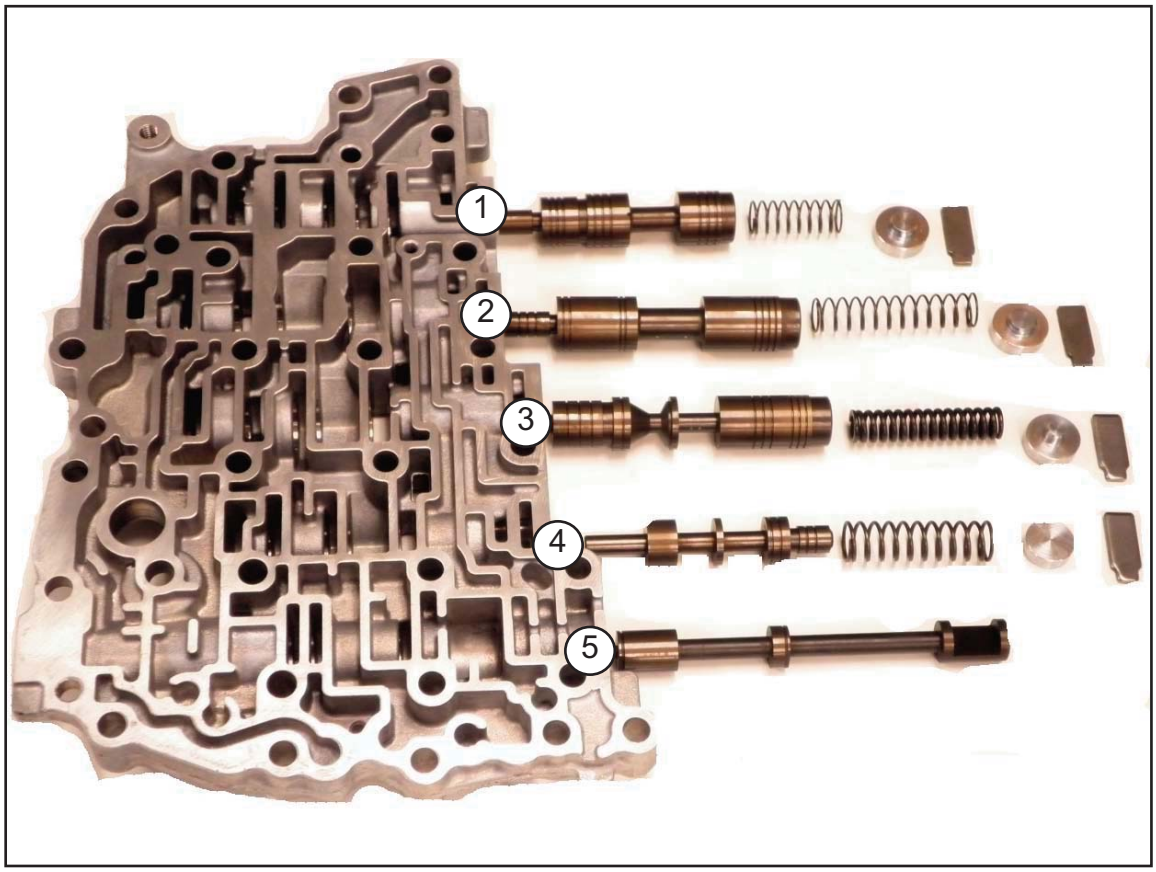


Item Number	Valve	Spring Height	Wire Diameter	Spring Diameter
1	Solenoid Regulator Valve	1.716 in.	.053 in.	.424 in.
2	Select Control Valve	1.565 in.	.042 in.	.387 in.
3	Select Switch Valve	.896 in.	.030 in.	.336 in.
4	Lock Up Control Valve	1.278 in.	.039 in.	.479 in.
5	Clutch Reducing Regulator Valve Bore Plug Elevated Spring Seat Towards Valve	.915 in.	.024 in.	.304 in.
6	Secondary Pulley Control Valve	.823 in.	.029 in.	.464 in.

Valves that Wear

Solenoid Regulator Valve
Lockup Plunger and Sleeve

Valve Body - Continued

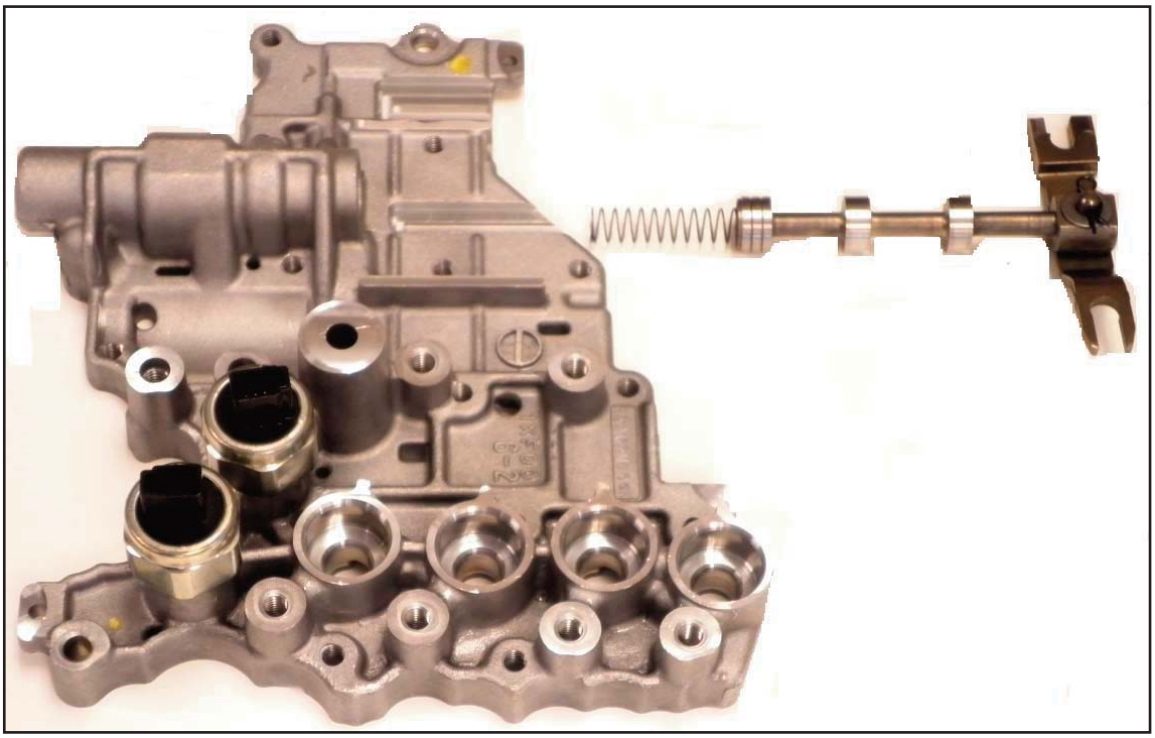


Item Number	Valve	Spring Height	Wire Diameter	Spring Diameter
1	Solenoid Pulley Regulator Valve	1.108in.	.031 in.	.423 in.
2	Pressure Regulator Valve 1	1.935 in.	.033 in.	.424 in.
3	Pressure Regulator Valve 2	1.733 in.	.067 in.	.394 in.
4	TCC Regulator Valve	1.621 in.	.046 in.	.473 in.
5	Manual Valve	N/A	N/A	N/A

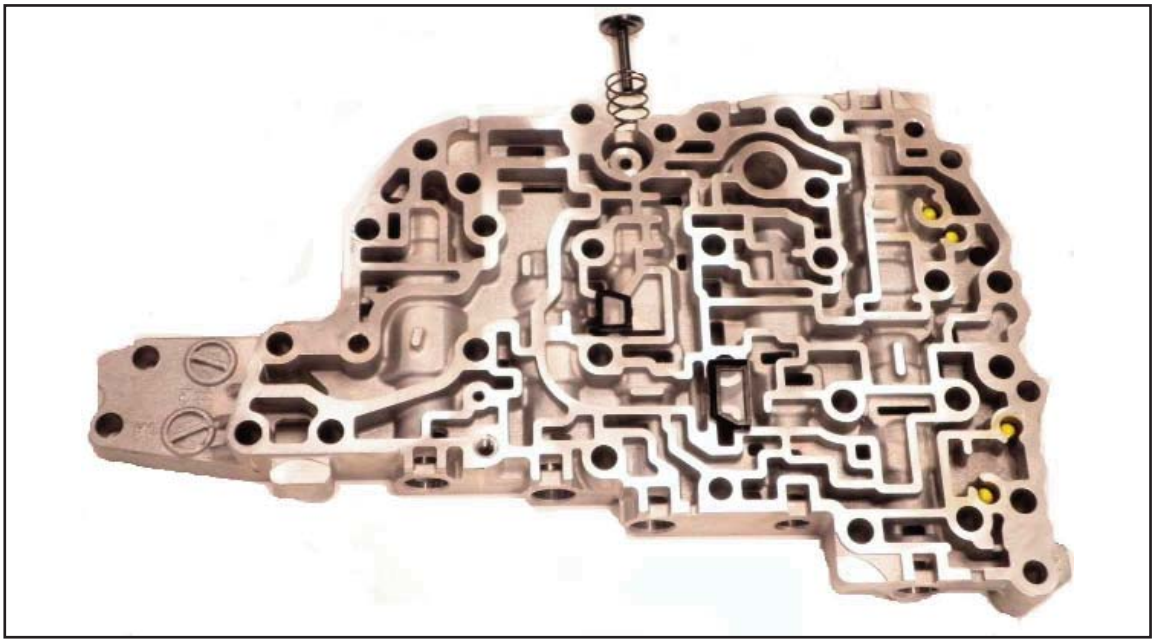
Valves that Wear

Secondary Pulley Regulator Valve
Pressure Regulator Valve 1
Pressure Regulator Valve 2
TCC Regulator Valve

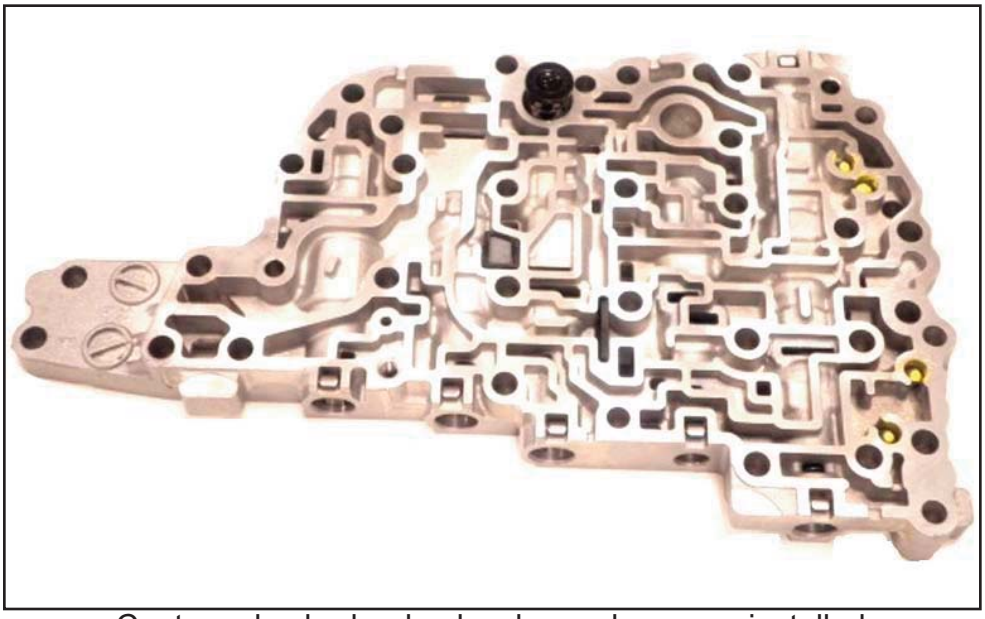
Valve Body - Continued



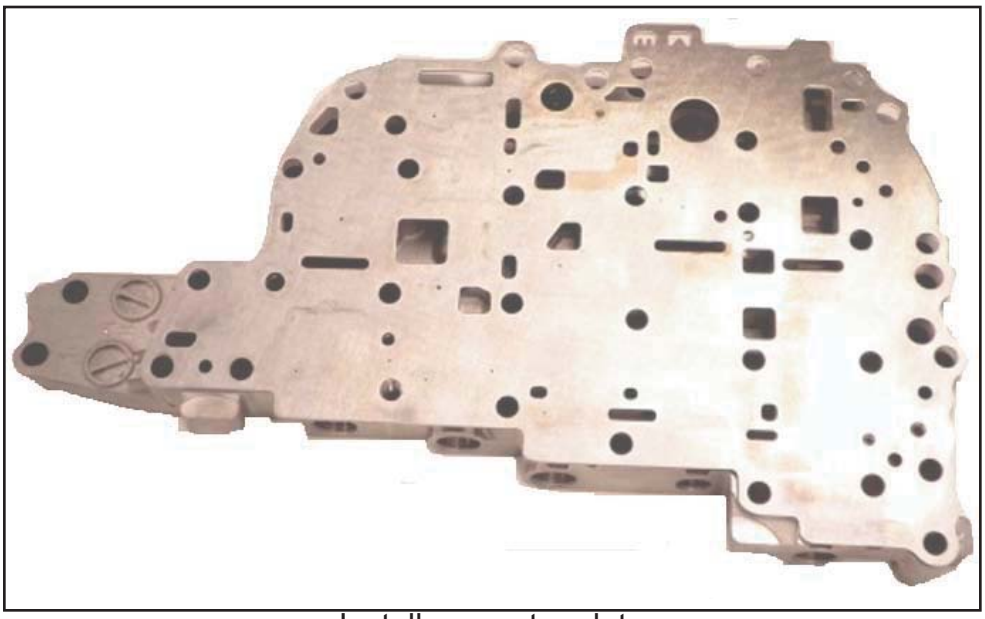
Valve	Spring Height	Wire Diameter	Spring Diameter
Ratio Control Valve	1.582 in.	.020 in.	.350 in.



Valve Body Reassembly

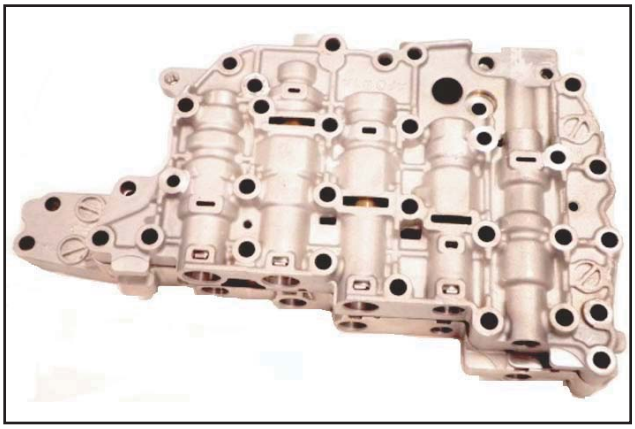


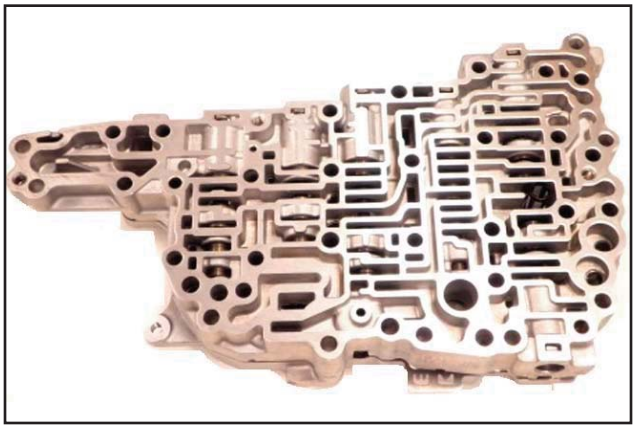
Center valve body, check valve and screens installed



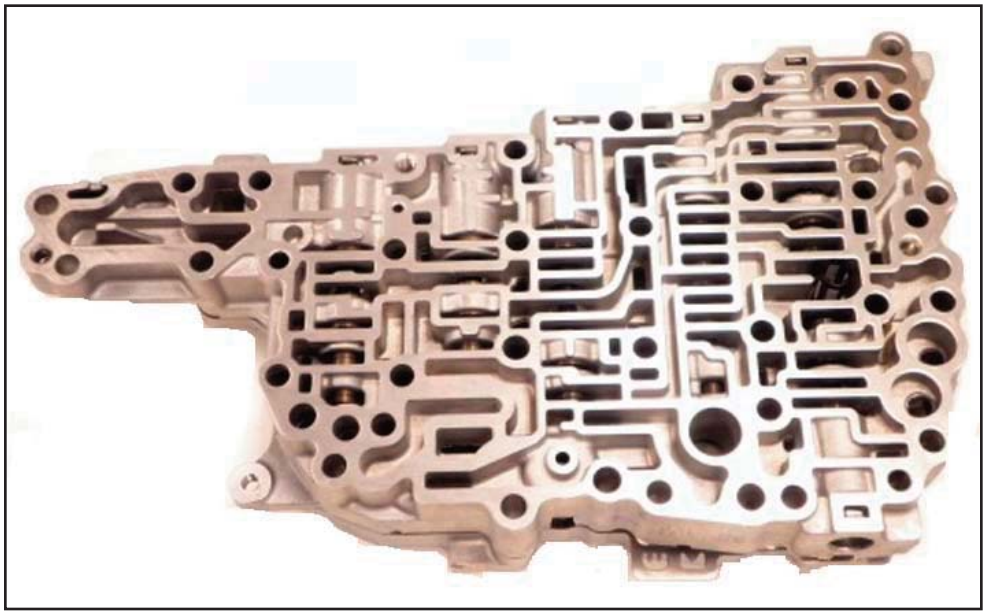
Install separator plate

Valve Body Reassembly - Continued



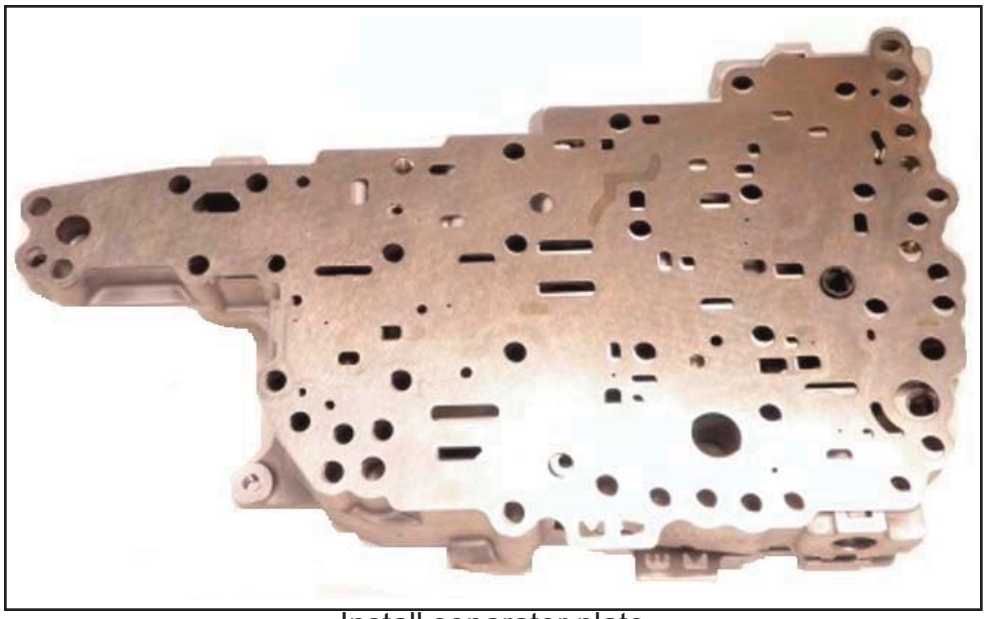


Tightly hold valve bodies together, flipping valve bodies over

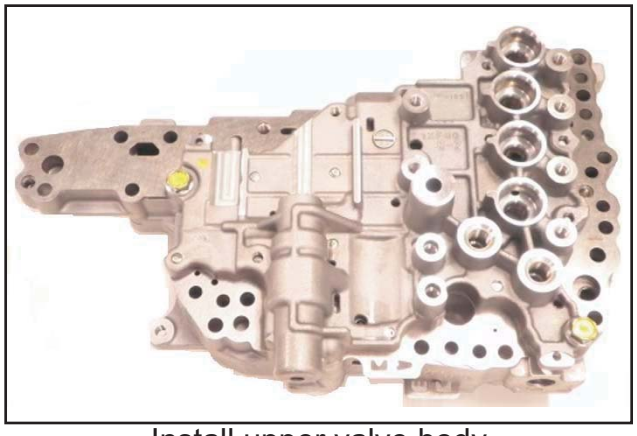


Install filter screen

Valve Body Reassembly - Continued



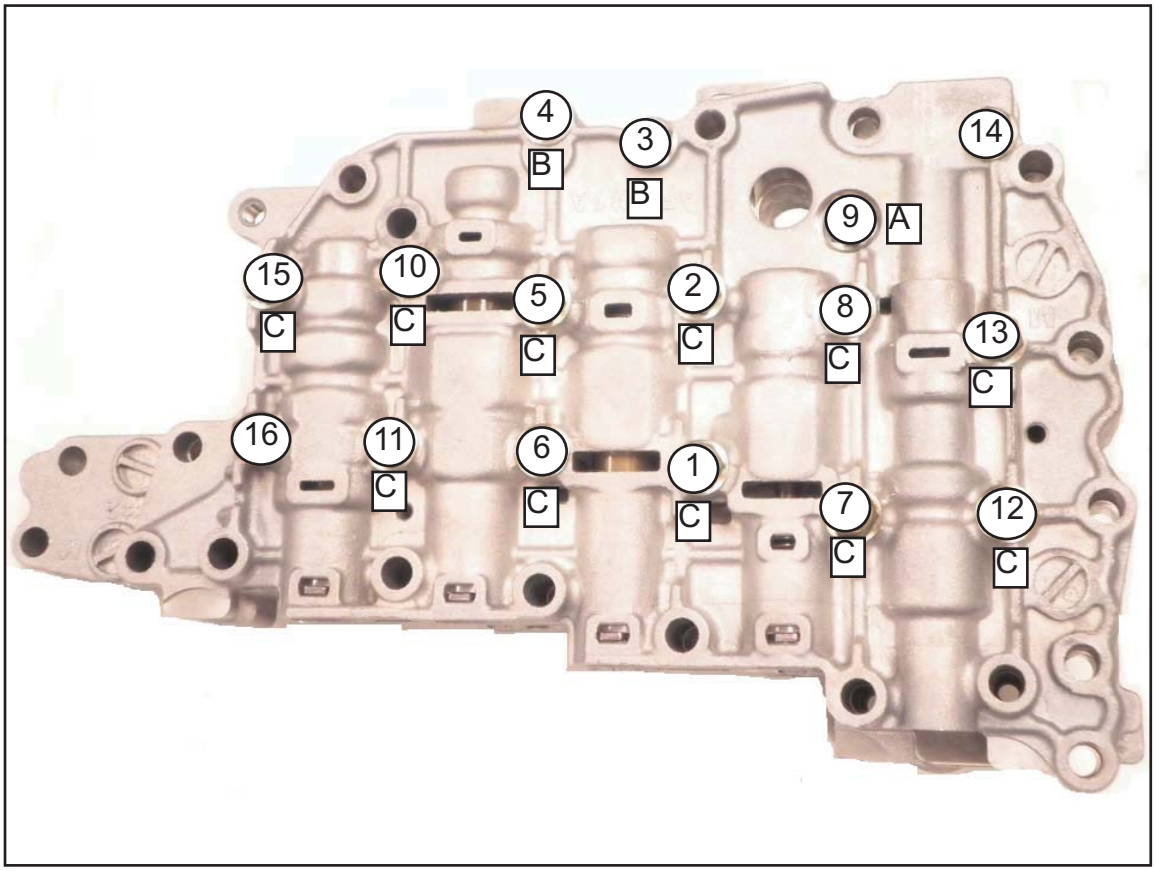
Install separator plate



Install upper valve body
Torque through bolts to 70 In. Lbs.

Replace both pressure switches and o-rings

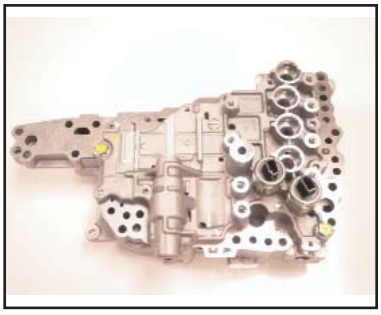
Valve Body - Continued



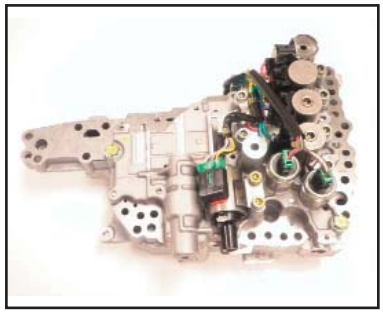
Valve Body - Bolt Lengths

A) 1.94
B) 2.228
C) 2.538

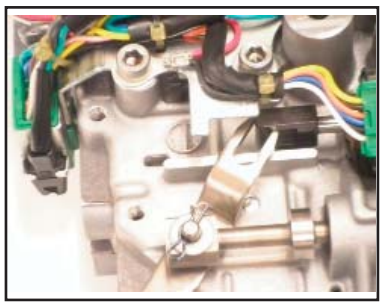
Torque valve body half bolts to 70-108 in. lbs. in sequence.



Pressure switch torque 70 In. Lbs.



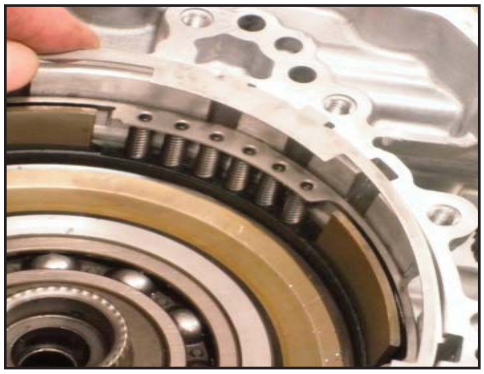
Torque stepper motor and solenoid bolts to 70 In. Lbs.



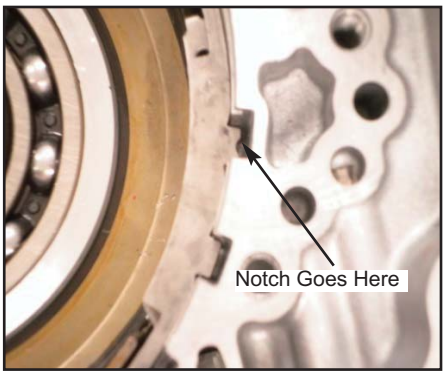
Install ratio control valve. Install lever into ratio control motor.

Reverse Clutch

Install reverse clutch piston

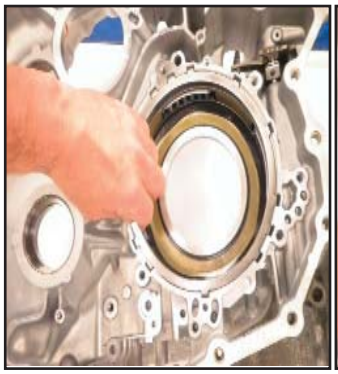


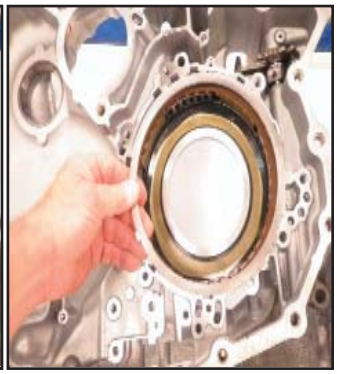
Install reverse clutch, return springs and retainer plate



Compress retainer install snap ring

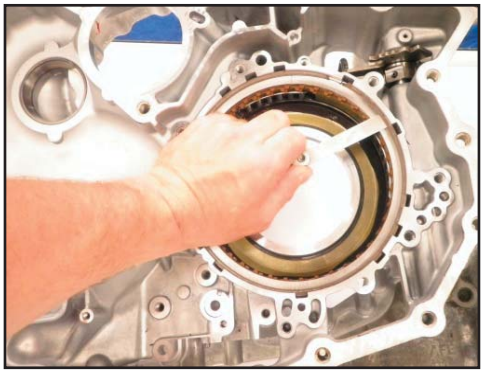
Install cushion plate, dish up



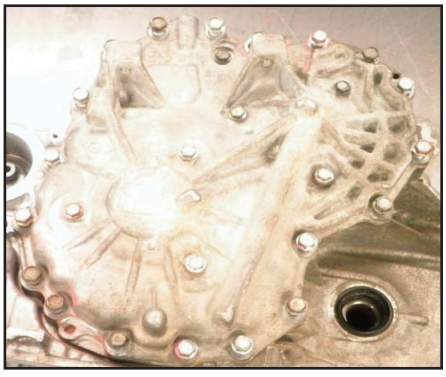


Install steel plate then friction plate, alternating ending with friction plate.

Install the reverse pressure



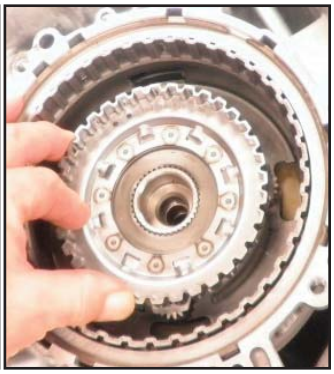
.047-.059 in. (1.2-1.5mm), 30 Ft. Lbs. (45Nm)



Using loctite 509 sealer, install end cover onto the main case. Torque bolts to 33 Ft. (45Mn)

Reassembly


Install torrington bearing and planet carrier

Install torrington bearing and sun gear into planet carrier

Install torrington bearing

Install forward drum, drum is fully seated top of drum even with carrier


Install stator support and thrust washer

Install TCC o-ring

Install new pump seal, install the pump, Torque the inside bolts to 14 Ft. Lbs (19Nm) and outside bolt with o-ring to 20 Ft. Lbs (28Nm)


Outside pump bolt

Reverse Clutch - Continued

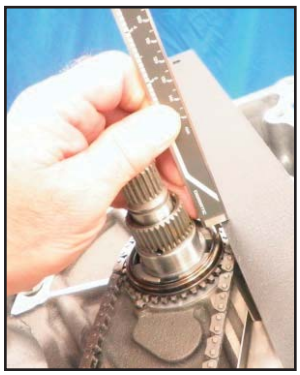
Install lower oil baffle and pump bracket. Torque baffle bolts 52 In. Lbs. Pump bracket and stator support bolts to 19 Ft. Lbs.

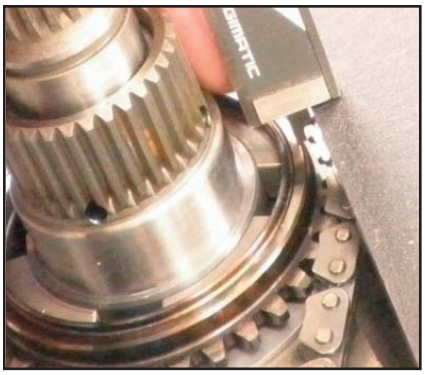
Install pump chain and gears

Install upper baffle. Torque to 52 In. Lbs.

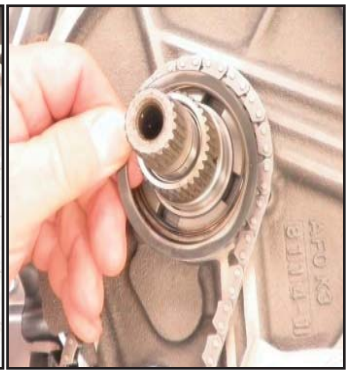
Install pin for manual valve shaft and detent spring. Torque bolt to 61 In. Lbs.

Measuring Pump Gear Clearance

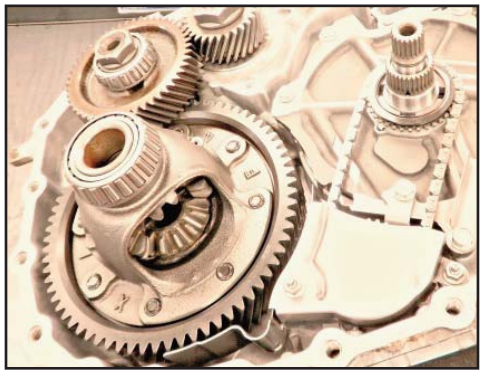




Measurement A from straight edge to the Measurement B step on gear. To calculate the correct shim. A + B - .0065In. (.16mm)



Install the selective shim



Install differential and transfer gears

Install axle seal and front seal

Using loctite 509 sealer, install the bell housing bolts marked in yellow. Torque to 33 Ft. Lbs. (45Nm). Bolts marked in yellow 1.67 in(42.8mm)

Reassembly

Chrysler

Install cooler filter

Install cooler with new o-ring.Torque bolts to 37 In. Lbs. (4Nm)

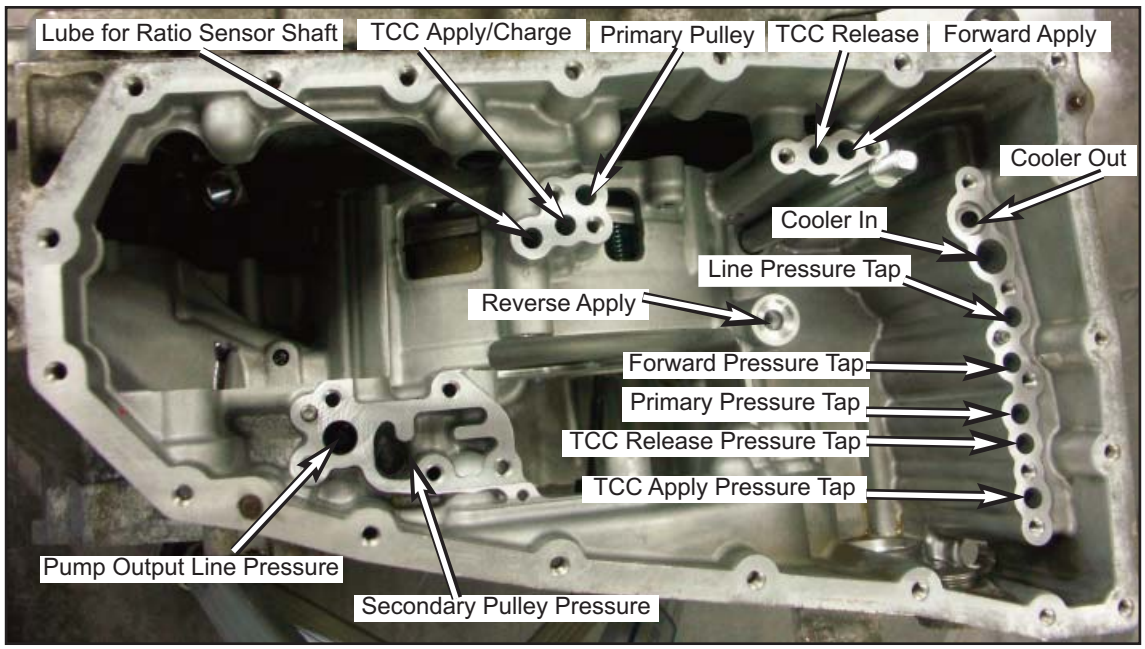
Nissan

Install cooler filter

Install cover with new o-ring. Torque bolts to 37 In. Lbs. (4Nm)

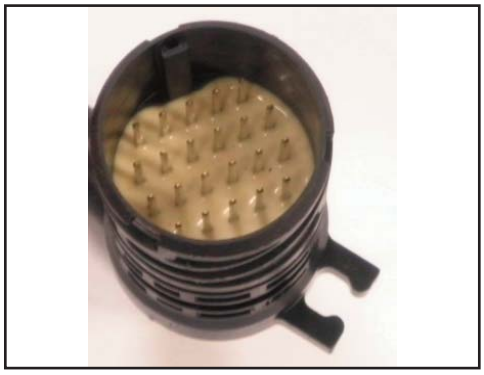
Because of the design of these coolers they are very difficult to flush. If there is any kind of contamination in the unit, the cooler should be replaced.

Airtest



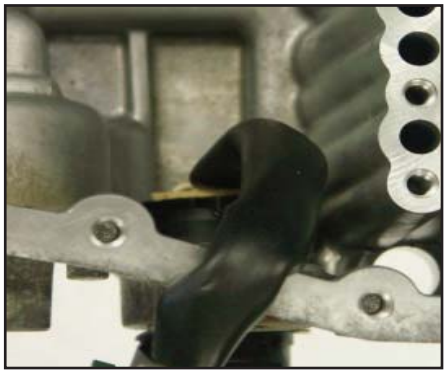
Reassembly - Continued

Install case connector into case

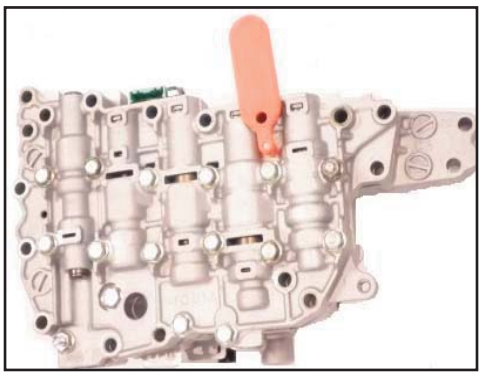


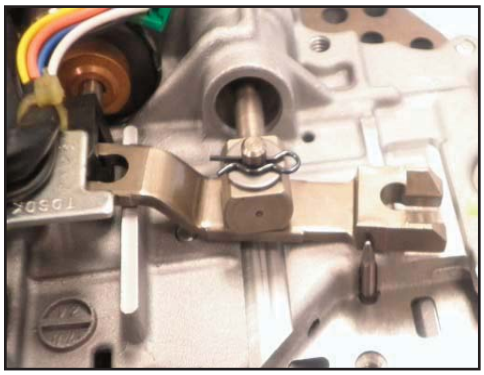
Tang on case connector faces down towards recessed in case

Install case connector clip



Lay harness across case





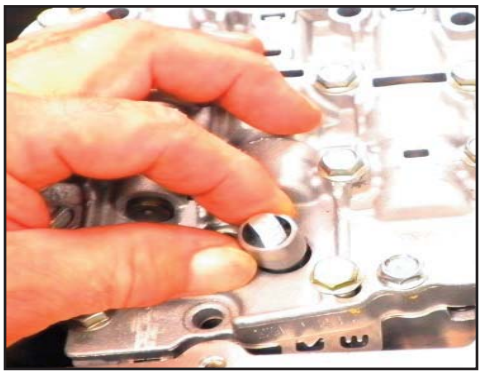
Install pin to hold ratio control lever as shown in these pictures. The end of the lever goes into the ratio control motor. The pin holds the lever in the correct position so it will line up with the ratio control sensor. The last picture is just showing the correct positioning of the lever to the sensor, you really cannot see this with the transmission assembled. The picture is just showing what the pin is used for.

Reassembly - Continued

Install valve body and filter bracket

Install wiring harness bracket

Torque all valve body bolts to 70 In. Lbs. (8 Nm)



Install spacer for manual valve shaft

Install manual lever onto manual shaft. Tighten nut to 194 In. Lbs. (22Nm)

Install filter with new o-ring. Tighten bolts to 70 In. Lbs. (8Nm)

Install oil pan and gasket. Tighten bolts to 70 In. Lbs. (8Nm)

Codes

Codes	Description
P0700	MIL Request
P0703	Brake Switch 2 Performance
P0707	Transmission Range Sensor Circuit Low
P0708	Transmission Range Sensor Circuit High
P0711	Transmission Temperature Sensor Performance
P0712	Transmission Temperature Sensor Low
P0713	Transmission Temperature Sensor High
P0716	Input Speed Sensor 1 Circuit Performance
P0717	Input Speed Sensor 1 Circuit No Signal
P0721	Output Speed Sensor Circuit Performance
P0722	Output Speed Sensor Circuit No Signal
P0730	Incorrect Gear Ratio
P0741	Torque Converter Clutch Circuit Performance
P0746	Line Pressure Solenoid Performance
P0776	Secondary Pressure Solenoid Stuck Off (High Pressure)
P0777	Secondary Pressure Solenoid Stuck On (Low Pressure)
P0826	Up/Down Shift Switch Circuit
P0842	Primary Oil Pressure Sensor Circuit Low
P0843	Primary Oil Pressure Sensor Circuit High
P0847	Secondary Oil Pressure Sensor Circuit Low
P0848	Secondary Oil Pressure Sensor Circuit High
P0850	Park/Neutral Switch Performance
P0962	Pressure Control Solenoid A Control Circuit Low
P0963	Pressure Control Solenoid A Control Circuit High
P0966	Pressure Control Solenoid B Control Circuit Low
P0967	Pressure Control Solenoid B Control Circuit High
P1702	Primary Oil Pressure Sensor/Secondary Oil Pressure Sensor Correlation
P1723	Lock Up/Select Control Circuit
P1729	Transmission Ratio Control Circuit

CVT Reference Guide

Manufacturer	Years	Sales TD(1)	Unit ID	Type	Uses Converter	Fluid(2)	Quantity	Transmission Fluid Change Service Interval (3)
Audi A4/A6/Cabrio	2004-Up	200,000	01J	ZF	No	G052 180A25	5Qts	115,000 miles
Dodge Caliber	2007-Up	1 mil/year	JF011e	Jatco	Yes	CVTF+4	7.5Qts	64,000 miles
Ford/Mercury 500, Freestyle, Montego	2005-07	150,000	CFT30	ZF	Yes	Ford CVT	5Qts	30,000 severe use
Honda Civic/ Insight	1996-Up	500,000	Varies	Aisin	No/Start Clutch	Honda CVT	3-3.5Qts	30,000 miles (2)
Jeep Com-pass/Patriot	2007-Up	1 mil/year	JF011F	Jatco	Yes	CVTF+4	7.5Qts	64,000 miles
Mini	2003-2006	50,000	CFT25/27	ZF	No	Esso EXL799	3-3.5Qts.	30,000 miles(2)
Nissan Altima	2007-Up	1 mil/year	RE0F09A/B	Jatco	Yes	CVTNS2	10.5-11Qts.	60,000 miles
Cube	2003-Up	1 mil/year	RE0F08A	Jatco	Yes	CVT NS2	7.9Qts.	60,000 miles
Maxima	2007-Up	1 mil/year	RE0F09B	Jatco	Yes	CVT NS2	10.5-11Qts.	60,000 miles
Murano	2003-Up	1 mil/year	RE0F09B	Jatco	Yes	CVT NS2	10.5-11Qts.	60,000 miles
Rogue	2008-Up	1 mil/year	RE0F09A	Jatco	Yes	CVT NS2	10.5Qts.	60,000 miles
Sentra	2007-Up	1 mil/year	RE0F10A	Jatco	Yes	CVT NS2	8.8Qts.	60,000 miles
Versa	2007-Up	1 mil/year	RE0F08A	Jatco	Yes	CVT NS2	7.9Qts.	60,000 miles
Saturn Ion/Vue	2002-06	250,000	VT20/25-E	Jatco	Yes	DEX CVT	8.5-8.7Qts.	50,000 miles

(1) - Combined 1 million/year (Dodge/Jeep/Nissan)
(2) - OE Fluid Recommended
(3) - Honda uses Maintenance Minder monitors variables to determine when the right time to change Oil. Mini models use Condition Based Servicing (CBS) which replaces the older inspection style service regime. CBS uses sensors to determine right time for Oil Change.

CVT Reference Guide Continued

Manufacturer	Years	Common Issues (4)	Stepper Motor Sources	Special Tools (5)
Audi A4/A6/Cabrio	2004-Up	Shudder, Pump, Noises, TCM	Do Not Use Stepper Motor	Yes
Dodge Caliber	2007-Up	Noise/Stepper Motor	Transtar Sourcing	Yes
Ford/Mercury 500, Freestyle, Montego	2005-07	Noises, Shudder, Belt, Bearing	Do Not Use Stepper Motor	Yes
Honda Civic/ Insight	1996-Up	Shudder, Bearings, Belt	Do Not Use Stepper Motor	Yes
Jeep Compass/Patriot	2007-Up	Shudder, Belt, Stepper Motor		Yes
Mini	2003-2006	Shudder,Noise,Belt,Stepper	Valve Body Pro	Yes
Nissan Altima	2007-Up	Shudder,Stepper Motor		Yes
Cube	2003-Up	Shudder,Stepper Motor		Yes
Maxima	2007-Up	Shudder, Stepper Motor		Yes
Murano	2003-Up	Shudder, Stepper Motor		Yes
Rogue	2008-Up	Shudder,Stepper Motor		Yes
Sentra	2007-Up	Shudder,Stepper Motor		Yes
Versa	2007-Up	Shudder,Stepper Motor	GFX/Valve Body Pro	Yes
Saturn Ion/Vue	2002-06	Shudder,Stepper Motor,Noises,Valve Body,Belt	(NEW Valve Body which includes Stepper Motor) Valve Body Pro	Yes

(4) - Common Issues - Symptoms/Diagnosis

If the unit does not move in either direction, something catastrophic is typically wrong.
If the unit moves only in one direction, look for clutch or hydraulic issue, which can affect its movement in that direction.
Reverse operation is fixed at one ratio.
Noises which are present in Park/Neutral, but go away in gear, are usually related to the input shaft/support.
Some Honda CVT'S will have noise in reverse - This is normal.
A Shudder on takeoff usually related to internal leaks, low pressure, damaged clutches, electrical, driveability or strategy.
Electrical issues including the TCM, will usually set a specific code.

(5) - Special Tools

Needed to remove belts and pulleys or improvise.

CVT Reference Guide Continued

Manufacturer	Years	OE Vehicle Warranty	Dealer Unit Warranty	Soft Part Available (6)	Hard Parts Available (7)	Belts Available New
Audi A4/A6/Cabrio	2004-Up	10yr/100,000 up to 2006	12mo/12,000	Transtar New	Various Used	Yes
Dodge Caliber	2007-Up	2007 3yr/35,000 miles, 2008 up 5yr/100,000 miles	3yr/100,000	Transtar, Natpro GFX	New Limited	TBA
Ford/Mercury 500, Freestyle, Montego	2005-07	5 yr/60,000 miles	3yr/unlimited miles	Transtar, Natpro GFX	Limited New	No
Honda Civic/ Insight	1996-Up	5yr/60,000 miles	3yr/30,000	Transtar, Natpro GFX	OEM	Yes
Jeep Compass/Patriot	2007-Up	5yr/100,000 miles	3yr/100,000	Transtar, Natpro GFX	Limited New	No
Mini	2003-2006	Extended in some cases	2yr/Unlimited	Transtar, Natpro GFX	Limited New	Yes
Nissan Altima	2007-Up	Factory 10yr/120,000 Warranty	12mo/12,000	Transtar, Natpro GFX	Limited New	Yes
Cube	2003-Up	Factory 10yr/120,000 Warranty	12mo/12,000	Transtar, Natpro GFX	Limited New	Yes
Maxima	2007-Up	Factory 10yr/120,000 Warranty	12mo/12,000	Transtar, Natpro GFX	Limited New	Yes
Murano	2003-Up	Factory 10yr/120,000 Warranty	12mo/12,000	Transtar, Natpro GFX	Limited New	Yes
Rogue	2008-Up	Factory 10yr/120,000 Warranty	12mo/12,000	Transtar, Natpro GFX	Limited New	Yes
Sentra	2007-Up	Factory 10yr/120,000 Warranty	12mo/12,000	Transtar, Natpro GFX	Limited New	Yes
Versa	2007-Up	Factory 10yr/120,000 Warranty	12mo/12,000	Transtar, Natpro GFX	Limited New	Yes
Saturn Ion/Vue	2002-06	Not Applicable	12mo/12,000	Transtar,Natpro GFX	New & Used Limited	Yes

(6) - Soft Parts are available through Transtar/NatPro/GFX such as frictions,seal kits. They also carry the most common failure parts.

(7) - Hard Parts such as variators, pumps, planets, drums, hubs and sheaves are typically not stocked and will probably be sourced as used parts. Valve Bodies are typically not remanufactured.

SERVICE Repair - After the Overhaul or replacement, all CVT's require adaptation. MINI CVT requires the BMW scanner to perform this step.