

## 2000 Hyundai Sonata

2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul

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#### Mitsubishi F4A41 & F4A42 Overhaul

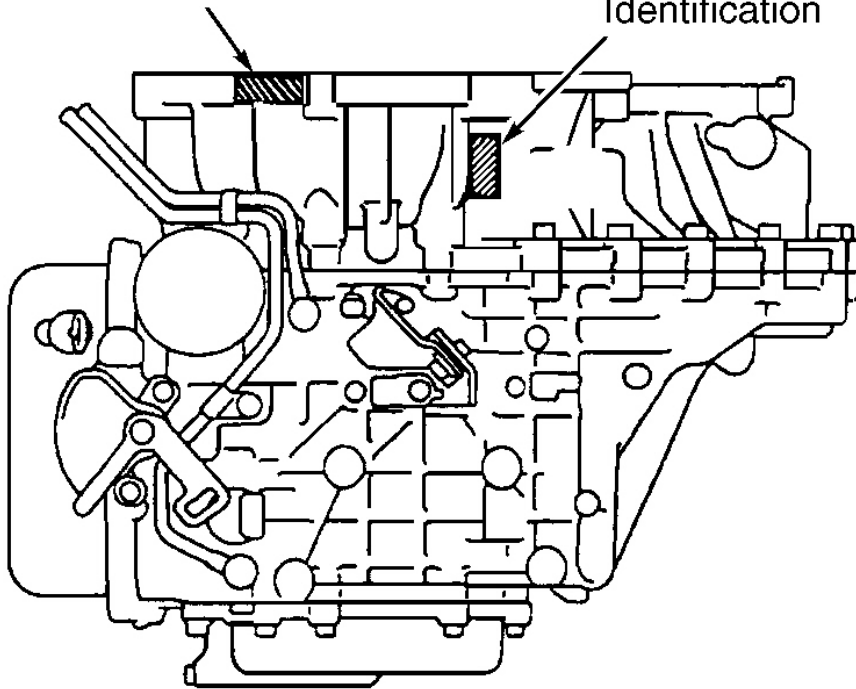
## APPLICATION

### AUTOMATIC TRANSAXLE APPLICATIONS

Application	Transaxle Model
Hyundai Sonata (2.4 & 2.5L)	F4A42
Mitsubishi	
Eclipse (2.4L)	F4A42
Galant (2.4L)	F4A42
Mirage	
1.5L	F4A41
1.8L	F4A41 & F4A42

## IDENTIFICATION

Transaxle model is identified by a metal tag attached to firewall. For parts replacement, identification information is stamped on converter housing of transaxle case. See **Fig. 1**.

Original Equipment  
Parts IdentificationReplacement Parts  
Identification

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**Fig. 1: Locating Transaxle Identification Tags**  
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

## GEAR RATIOS

### TRANSAXLE GEAR RATIOS

Gear Range/Application	Gear Ratio
1st	2.842:1
2nd	1.529:1
3rd	1.000:1
4th	0.712:1
Reverse	2.480:1
Final Drive	
Hyundai	3.770:1
Mitsubishi	4.042:1
Speedometer (Drive/Driven)	
Hyundai	(1)
Mitsubishi	

## 2000 Hyundai Sonata

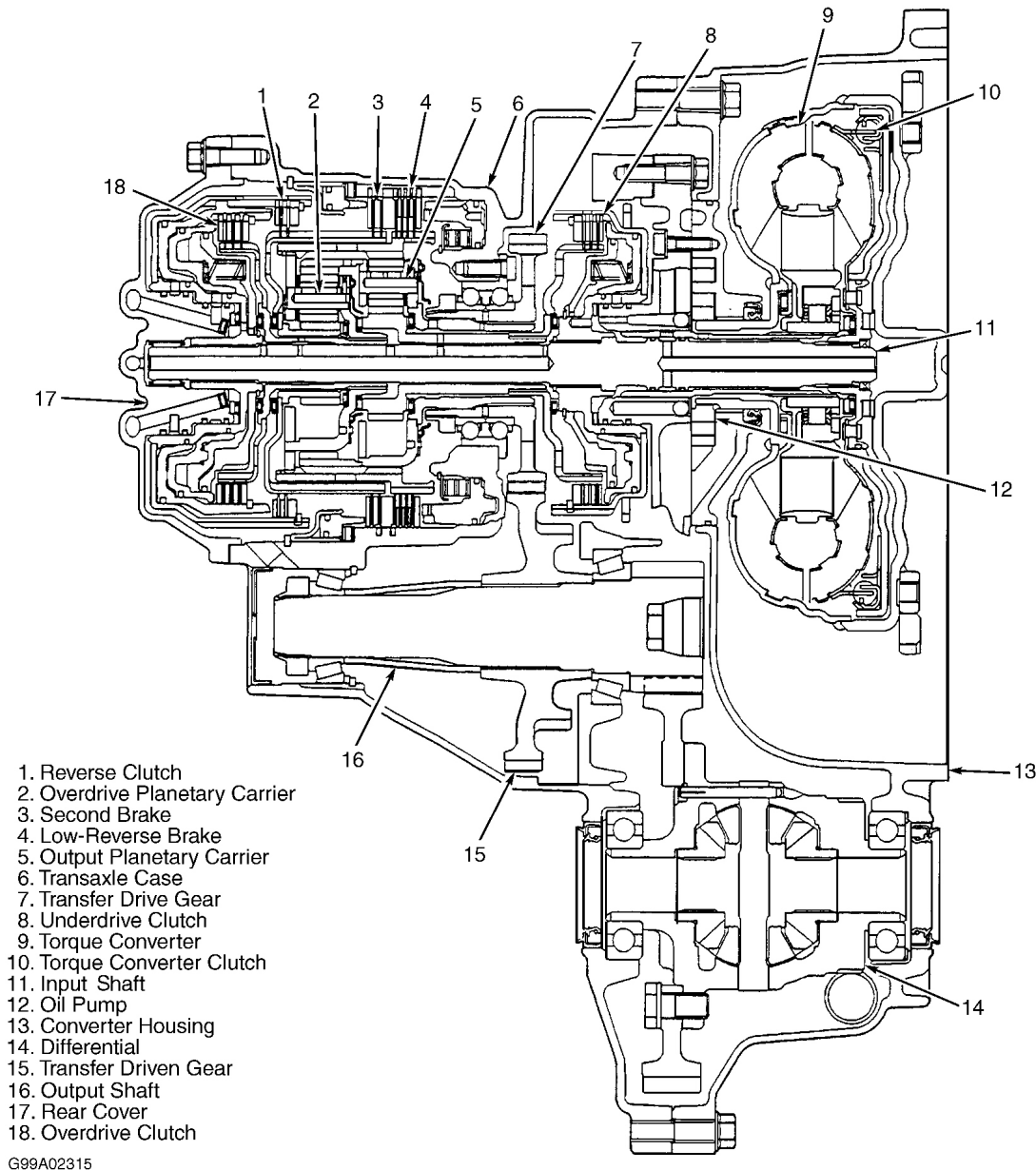
### 2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul

F4A41	31/36
F4A42	
Eclipse & Galant	29/36
Mirage	31/36
(1) Information is not available.	

## DESCRIPTION & OPERATION

Transaxle is an electronically controlled 4-speed automatic. Transaxle consists of 3 sets of multi-plate clutches, 2 sets of multi-plate brakes, a one-way clutch set, 2 sets of planetary gear sets, and a 3-element, 1-step, 2-phase torque converter with a built-in clutch. See **Fig. 2**.

The "INVECS-II" electronic control system incorporates feedback and learning controls to provide smooth shifting throughout all shift ranges. Gear shifting clutches use hydraulic balancing mechanisms to enable gear shifting at high engine speeds. The Transaxle Control Module (TCM) contains a self-diagnostic system, which stores Diagnostic Trouble Codes (DTC) if transaxle faults occur. DTCs can be retrieved to determine the transaxle problem area. For information on electronic transaxle components, see MITSUBISHI F4A41, F4A42 & F4A51 ELECTRONIC CONTROLS article.

**Fig. 2: Identifying Transaxle Components**

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

## LUBRICATION

### RECOMMENDED FLUID

Manufacturer specifies DIAMOND ATF SP-II, DIAMOND ATF SP-II M fluid, or equivalent. Fill transaxle with appropriate quantity. See **FLUID CAPACITIES**. For additional information, see appropriate AUTOMATIC TRANSMISSION SERVICING article in TRANSMISSION SERVICING.

## 2000 Hyundai Sonata

2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul

**NOTE:** Use Oil Filter Wrench (MB991610) to replace external spin-on oil filter. Coat **NEW** oil filter sealing "O" ring with ATF prior to installation on transaxle. Using oil filter wrench, tighten oil filter to 80 INCH lbs. (9 N.m).

### FLUID CAPACITIES

#### TRANSAXLE FLUID CAPACITIES

Application	Qts. (L)
All Models <sup>(1)</sup>	8.2 (7.8)

(1) All capacities listed are dry fill. During refill, add fluid to "C" mark on dipstick. Idle engine in Neutral, then add fluid to bring level to "H" mark with transaxle at normal operating temperature.

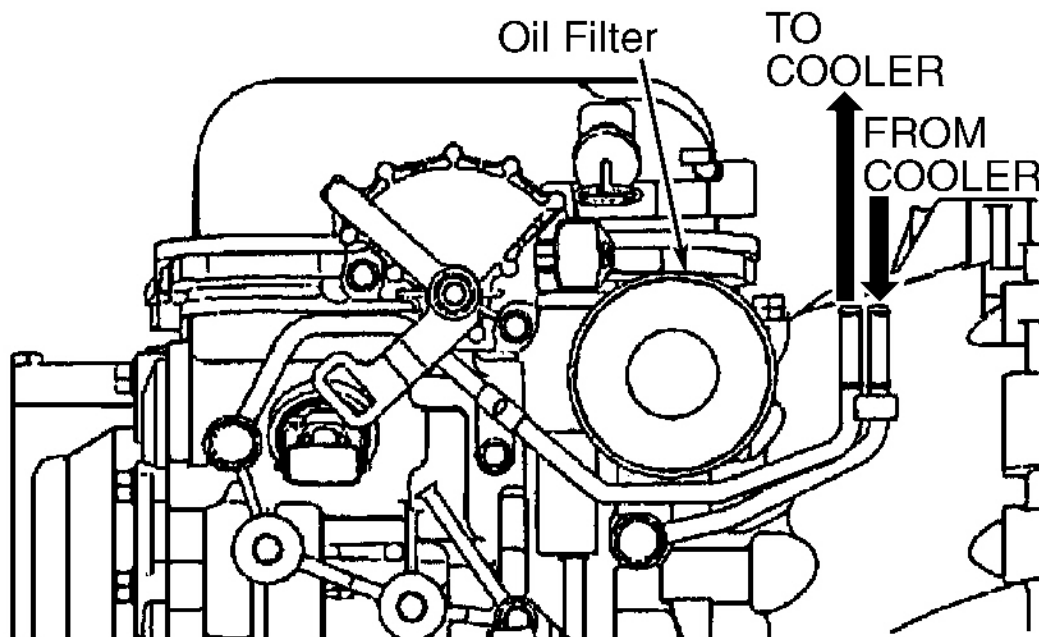
### ON-VEHICLE SERVICE

**NOTE:** For servicing of electronic control components not requiring transaxle removal, see MITSUBISHI F4A41, F4A42 & F4A51 ELECTRONIC CONTROLS article.

#### OIL COOLER FLOW CHECK

**CAUTION:** Flow check must be performed with fluid at correct level, and should not be less than one quart low due to fluid loss when disconnecting cooler lines. If fluid level is low, internal damage can occur. Ensure fluid level is at the correct level before performing test.

Disconnect cooler line (from cooler) at transaxle and place in drain pan. See **Fig. 3**. With transaxle in Neutral, start engine and run at curb idle while monitoring fluid flow from cooler line. If fluid flow is intermittent or takes more than 20 seconds to collect 1 quart (.95L) of fluid, replace transaxle oil cooler. If fluid flow is within acceptable limits, reconnect cooler line and refill transaxle with proper amount of fluid.



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**Fig. 3: Identifying Transaxle Oil Cooler Lines**

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

### OIL COOLER FLUSHING

**CAUTION:** Whenever a transaxle failure has contaminated the fluid, oil cooler must be flushed, and the oil cooler by-pass valve in transaxle must also be replaced. If vehicle is equipped with 2 oil coolers (one in radiator tank and one in front of radiator), flush oil coolers separately. Do not attempt to flush both oil coolers at one time.

There are 2 different methods for flushing oil coolers and lines. Manufacturer recommends using Flushing Tool (MB995062) with its supplied instructions. The other method is to use a hand suction gun and mineral spirits. Use only petroleum-based flushing solvents. Do not use solvents containing acids, water, gasoline or any other corrosive liquids.

### VALVE BODY SOLENOIDS

**NOTE:** Valve body solenoids may be checked and serviced on vehicle. For servicing procedures, see MITSUBISHI F4A41, F4A42 & F4A51 ELECTRONIC CONTROLS article.

## **TROUBLE SHOOTING**

### **PRELIMINARY INSPECTION**

Transaxle malfunctions may be caused by improper fluid or fluid level, poor engine performance, improper adjustments, or failure of hydraulic, mechanical or electronic components. Always begin by checking fluid level and fluid condition. Check related fuses and fusible links as well as harness connections. Perform road test to determine if problem has been corrected. See **ROAD TEST** under PERFORMANCE TESTS. If problem still exists, diagnose by symptom. See **SYMPTOM DIAGNOSIS**.

### **SYMPTOM DIAGNOSIS**

#### **Abnormal Vibration While Driving Vehicle**

If a vibration occurs while driving in high gear or when accelerating, the probable causes are, abnormal torque converter clutch oil pressure, a malfunction of the engine system, torque converter clutch solenoid, torque converter, valve body or the TCM.

#### **All Shift Points Early Or Late**

Probable causes are, a malfunctioning output shaft speed sensor, throttle position sensor, a solenoid valve or the TCM.

#### **Engine Stalls When Transaxle Is Shifted From Neutral To Drive Or Neutral To Reverse**

Probable causes are, a malfunction of the engine system, torque converter clutch solenoid, valve body, torque converter, or the TCM.

#### **Engine Will Not Crank**

Probable causes are, a malfunctioning park/neutral position switch system, transaxle control cable assembly, engine system, torque converter, or oil pump.

#### **Poor Acceleration**

Probable causes are, a malfunction of the engine system, a brake or clutch, or the TCM.

#### **Harsh Shifts Or Slipping Shifts**

Probable causes are, abnormal oil pressure, a malfunctioning solenoid valve, oil pump, valve body, a brake or clutch, or TCM.

#### **Harsh Shifts When Transaxle Is Shifted From Neutral To Drive & Neutral To Reverse, & Has A Long Time Lag**

Probable causes are, abnormal oil pressure, a malfunctioning oil pump, valve body, or TCM.

#### **Harsh Shift When Transaxle Is Shifted From Neutral To Reverse, & Has A Long Time Lag**

## 2000 Hyundai Sonata

### 2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul

Probable causes are, abnormal reverse clutch oil pressure or low-reverse brake oil pressure, a malfunctioning reverse clutch, low-reverse brake, valve body, or TCM, or a closed TP sensor.

#### Harsh Shift When Transaxle Is Shifted From Neutral To Drive, and Has A Long Time Lag

Probable causes are, abnormal underdrive clutch oil pressure, a malfunctioning underdrive clutch, valve body, or TCM, or a closed TP sensor.

#### Some Shift Points Early Or Late

Probable causes are, a malfunctioning valve body or TCM.

#### Vehicle Shifts Differently When A/C Is Engaged

When A/C is turned on, a dual pressure switch closes, introducing positive battery voltage to terminal No. 83 of the Powertrain Control Module (PCM) signaling the system to increase oil pressure and shift points to compensate for the additional engine load. If this action does not occur, the probable causes are, a faulty dual pressure switch or PCM. For diagnostic procedure, see MITSUBISHI F4A41, F4A42 & F4A51 ELECTRONIC CONTROLS article.

#### Vehicle Will Not Move Forward Or Backward In Any Selector position

Probable causes are, abnormal oil pressure, a malfunction in the powertrain, oil pump, valve body, or TCM.

#### Vehicle Will Not Move In Any Forward Gear

Probable causes are, abnormal oil pressure, a malfunctioning underdrive clutch, valve body, or TCM.

#### Vehicle Will Not Move In Reverse

Probable causes are, abnormal low-reverse brake or reverse clutch oil pressure, a malfunctioning reverse clutch, low-reverse brake, valve body, or TCM.

#### Vehicle Will Not Shift While Driving

If shifting does not occur while driving and no DTC's are present, the probable causes are, a malfunctioning park/neutral position switch or poor harness connection, or a malfunctioning TCM.

## CLUTCH APPLICATIONS

### CLUTCH APPLICATIONS

Gearshift Lever Position	Components In Use
"D" (Drive)	
1st Gear	Low-Reverse Brake & Underdrive Clutch
2nd Gear	2nd Brake & Underdrive Clutch
3rd Gear	Overdrive Clutch & Underdrive



## 2000 Hyundai Sonata

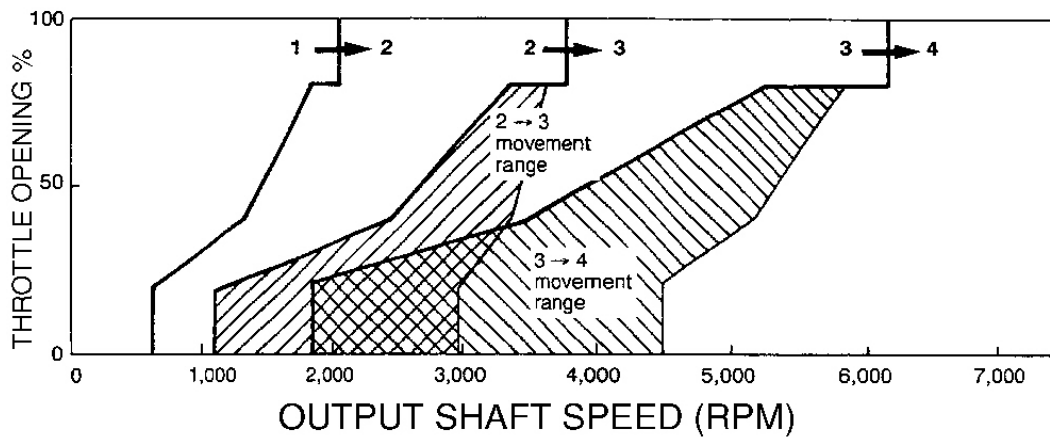
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	Clutch
4th Gear	2nd Brake & Overdrive Clutch
"3" (Third)	
1st Gear	Low-Reverse Brake & Underdrive Clutch
2nd Gear	2nd Brake & Underdrive Clutch
3rd Gear	Overdrive Clutch & Underdrive Clutch
"2" (Second)	
1st Gear	Low-Reverse Brake & Underdrive Clutch
2nd Gear	2nd Brake & Underdrive Clutch
"L" (Low)	Low-Reverse Brake & Underdrive Clutch
"R" (Reverse)	Low-Reverse Brake & Reverse Clutch
"N" Or "P" (Neutral Or Park)	Low-Reverse Brake

## PERFORMANCE TESTS

### ROAD TEST

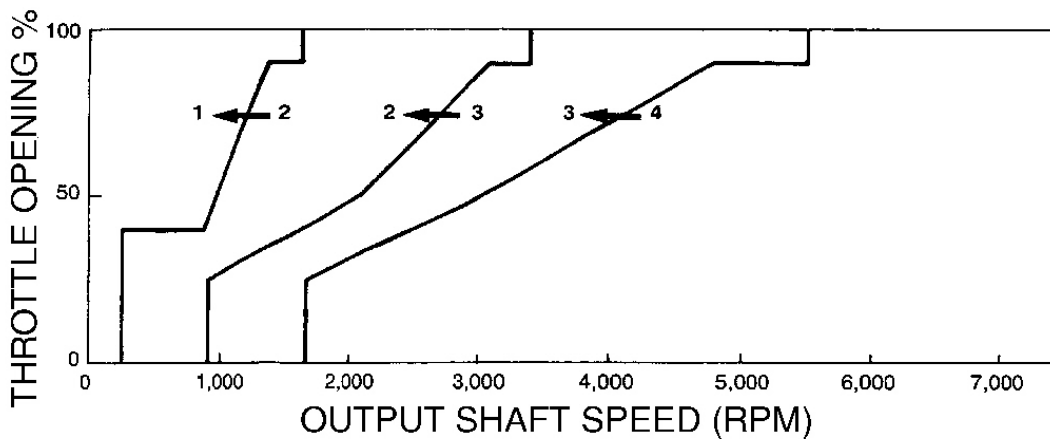
1. Ensure fluid level and condition are okay. Add fluid if necessary. Road test vehicle, and ensure shift points are at specified vehicle speeds. See **Fig. 4-Fig. 7** .
2. If shift points are not as specified, check for DTCs. See MITSUBISHI F4A41, F4A42 & F4A51 ELECTRONIC CONTROLS article. If slippage occurs, determine which components are applied in each gear. See **CLUTCH APPLICATIONS** under TROUBLE SHOOTING. Perform hydraulic pressure test to check transaxle internal components. See **HYDRAULIC PRESSURE TESTS**.



NOTE: Thick Line = Standard Shift Pattern

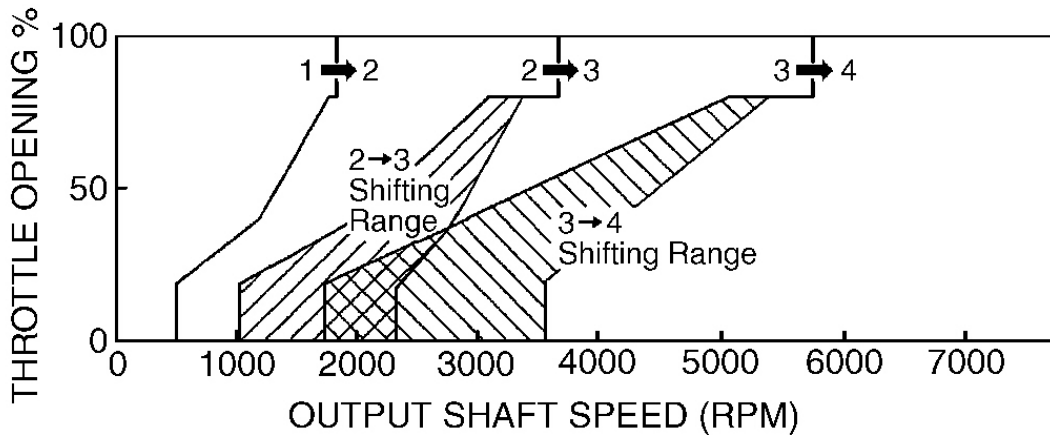
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**Fig. 4: Identifying Transaxle Upshift Points (F4A41)**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



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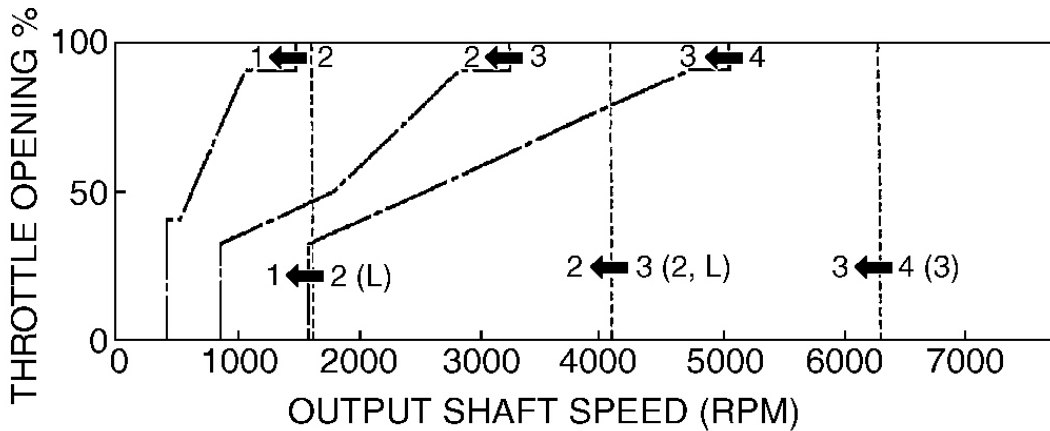
**Fig. 5: Identifying Transaxle Downshift Points (F4A41)**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



NOTE: Thick Line = Standard Shift Pattern

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**Fig. 6: Identifying Transaxle Upshift Points (F4A42)**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



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**Fig. 7: Identifying Transaxle Downshift Points (F4A42)**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

## TORQUE CONVERTER

**CAUTION:** Do not open throttle to wide open position for more than 8 seconds, or transaxle damage may occur. If performing more than one torque converter stall speed test, operate engine at 1000 RPM in Neutral for at

## 2000 Hyundai Sonata

2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul

**least 2 minutes to cool transaxle fluid before performing next stall speed test.**

**CAUTION:** Torque converter is a welded assembly and is not serviceable. If a malfunction occurs or torque converter becomes contaminated with foreign material, it **MUST** be replaced. Torque converter cannot be flushed or repaired.

### Stall Speed Test

1. Ensure transaxle fluid level and engine coolant level is correct. Apply parking brake and chock both rear wheels. Connect a tachometer to engine. Start and run engine until transaxle fluid temperature reaches 158-194°F (70-90°C) and engine coolant temperature reaches 176-212°F (80-100°C).
2. Place transaxle in Drive, and open throttle to wide open position, and read engine speed on tachometer. Ensure stall speed is as specified. See **STALL SPEED SPECIFICATIONS** table.
3. Repeat procedure with transaxle in Reverse. Once stall speed is obtained, place transaxle in Neutral, start and run engine for at least 2 minutes to allow transaxle to cool. Stop engine and place transaxle in Park. Ensure stall speed is as specified. If stall speed is as specified, test is complete. If stall speed is not as specified, use the following symptoms for trouble shooting results of stall speed tests.

### STALL SPEED SPECIFICATIONS

Application	Stall Speed RPM
Hyundai Sonata	2000-2900
Mitsubishi	
Eclipse & Galant	2100-2600
Mirage	1900-2400

#### Stall Speed Exceeds Specification In Both Drive & Reverse

Probable causes are low oil pressure, low-reverse brake slippage, or a malfunction of one-way clutch. If incorrect line pressure is suspected, adjust line pressure. See **LINE PRESSURE ADJUSTMENT**. If component failure is suspected, perform hydraulic pressure test. See **HYDRAULIC PRESSURE TESTS**.

#### Stall Speed Exceeds Specification In Drive Only

Probable cause is underdrive clutch slippage.

#### Stall Speed Exceeds Specification In Reverse Only

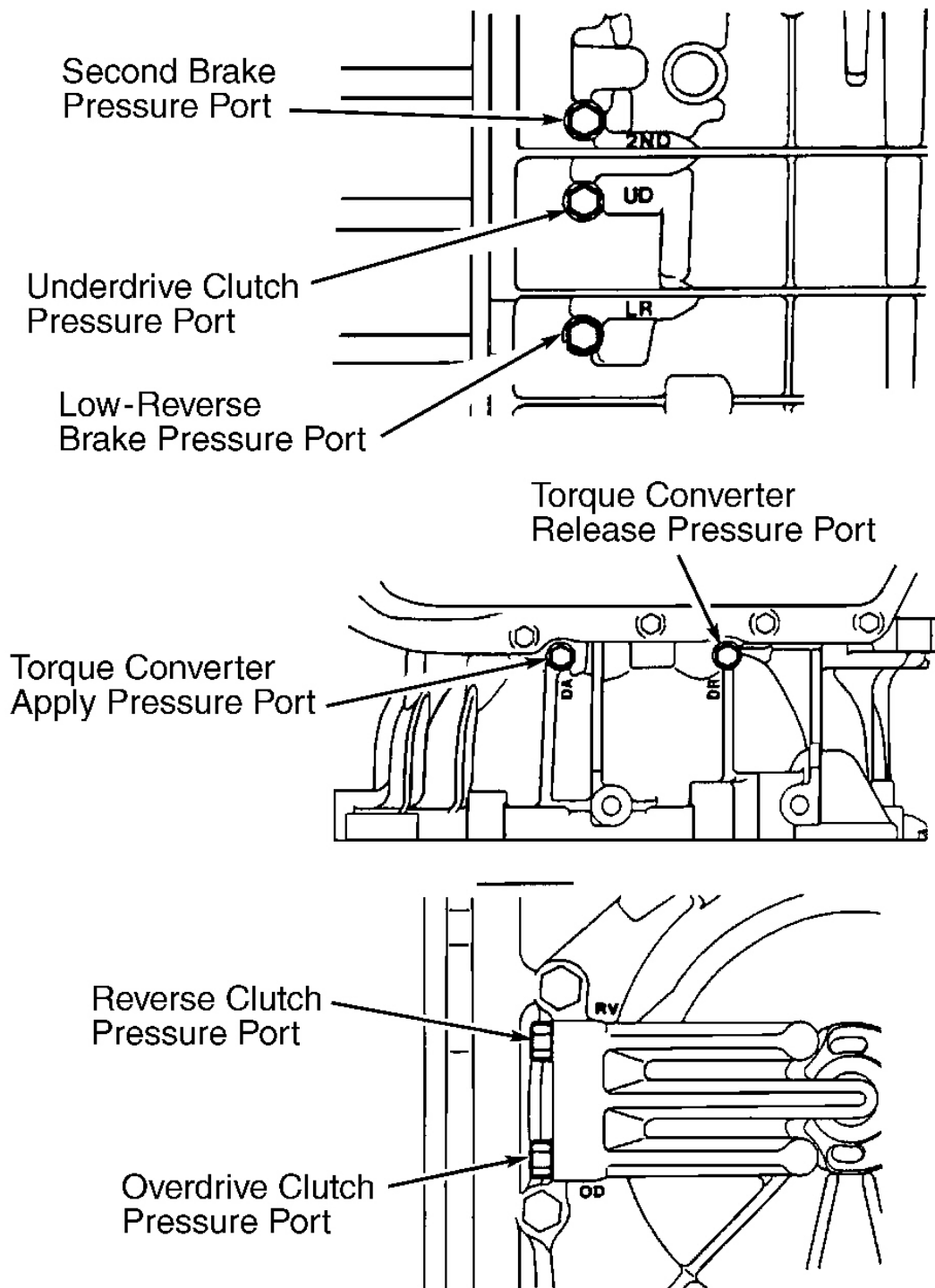
Probable cause is reverse clutch slippage.

#### Stall Speed Is Less Than Specification In Both Drive & Reverse

Probable causes are, insufficient engine output, or a malfunctioning torque converter.

### HYDRAULIC PRESSURE TESTS

1. Ensure engine coolant and transaxle fluid levels are correct. Start and run engine until transaxle fluid and engine coolant are at normal operating temperatures. Connect a tachometer to engine, and position it so driver can view it. Raise and support vehicle so drive wheels rotate freely.
2. Note locations of hydraulic pressure ports on transaxle case. See **Fig. 8**. Remove appropriate pressure port plug, and install appropriate adapter and oil pressure gauge to each pressure port.
3. Measure hydraulic pressure at each pressure port, except the torque converter port, with engine speed at 2500 RPM in each gear position. If torque converter pressure is measured, engine speed should not exceed 1500 RPM. For pressure port specifications, refer to appropriate illustration. See **Fig. 9** or **Fig. 10** . If pressure is within specification, go to next step. If pressure is not within specification, identify probable cause and repair as necessary. See **HYDRAULIC PRESSURE DIAGNOSIS** table.
4. Remove pressure gauge and adapters and install pressure port plugs.



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**Fig. 8: Identifying Transaxle Hydraulic Pressure Ports**

## 2000 Hyundai Sonata

### 2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul

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Measurement condition			Standard hydraulic pressure psi					
Selector lever position	Shift position	Engine speed (r/min)	Underdrive clutch pressure [UD]	Reverse clutch pressure [RV]	Overdrive clutch pressure [OD]	Low and reverse brake pressure [LR]	Second brake pressure [2ND]	Torque converter pressure [DR]
P	-	2,500	-	-	-	46 - 57	-	37 - 57
R	Reverse	2,500	-	185 - 256	-	185 - 256	-	73 - 101
N	-	2,500	-	-	-	46 - 57	-	37 - 57
D	1st gear	2,500	147 - 152	-	-	147 - 152	-	73 - 101
	2nd gear	2,500	147 - 152	-	-	-	147 - 152	73 - 101
	3rd gear	2,500	85 - 100	-	85 - 100	-	-	65 - 94
	4th gear	2,500	-	-	85 - 100	-	85 - 100	65 - 94

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**Fig. 9: Standard Transaxle Hydraulic Pressures (F4A41)**

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## 2000 Hyundai Sonata

### 2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul

MEASUREMENT CONDITION			STANDARD HYDRAULIC PRESSURE psi					
SELECTOR LEVER POSITION	SHIFT POSITION	ENGINE SPEED (r/min)	UNDER-DRIVE CLUTCH PRESSURE [UD]	REVERSE CLUTCH PRESSURE [RV]	OVERDRIVE CLUTCH PRESSURE [OD]	LOW-REVERSE BRAKE PRESSURE [LR]	SECOND BRAKE PRESSURE [2ND]	TORQUE CONVERTER PRESSURE [DR]
P	-	2,500	-	-	-	32 - 52	-	37 - 57
R	Reverse	2,500	-	185 - 256	-	185 - 256	-	73 - 101
N	-	2,500	-	-	-	32 - 52	-	37 - 57
L <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	1st gear	2,500	147 - 152	-	-	147 - 152	-	73 - 101
2 <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	2nd gear	2,500	147 - 152	-	-	-	147 - 152	73 - 101
3 <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	3rd gear	2,500	113 - 128	-	113 - 128	-	-	-
D <Vehicles without sport mode> or Sport mode <Vehicles with sport mode>	4th gear	2,500	-	-	113 - 128	-	113 - 128	-

NOTE: If the torque converter pressure is measured, the engine speed should be 1,000 r/min or less.

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**Fig. 10: Standard Transaxle Hydraulic Pressures (F4A42)**  
**Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.**

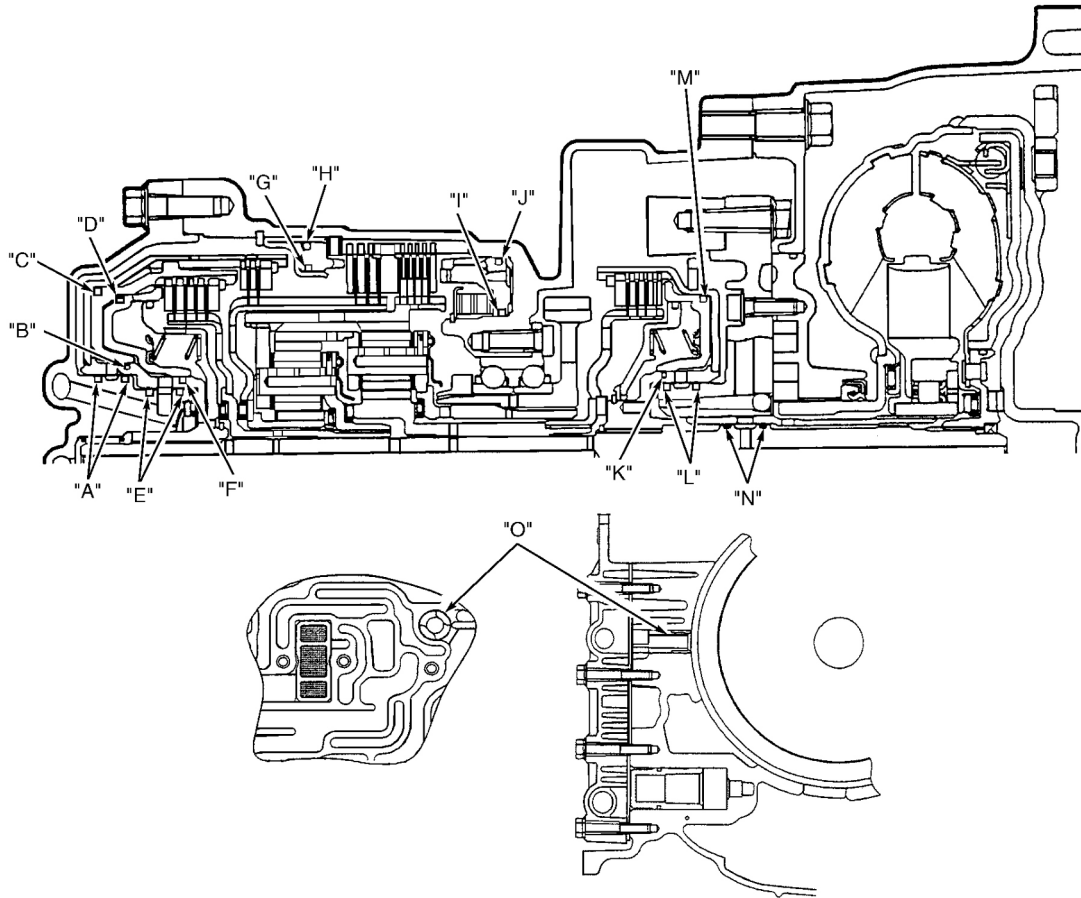
### HYDRAULIC PRESSURE DIAGNOSIS

Symptom	Probable Cause
All Pressures High	Incorrect Transaxle Control Cable Adjustment, Malfunction Of Regulator Valve
All Pressures Low	Incorrect Transaxle Control Cable Adjustment, Oil Pump Malfunction, Clogged External or Internal Oil Filter, Clogged Oil Cooler, Regulator Valve Malfunction, Relief Valve Malfunction, Incorrect Valve Body Installation
Abnormal Pressure In Reverse Only	Regulator Valve Malfunction, Clogged Orifice, Incorrect Valve Body Installation



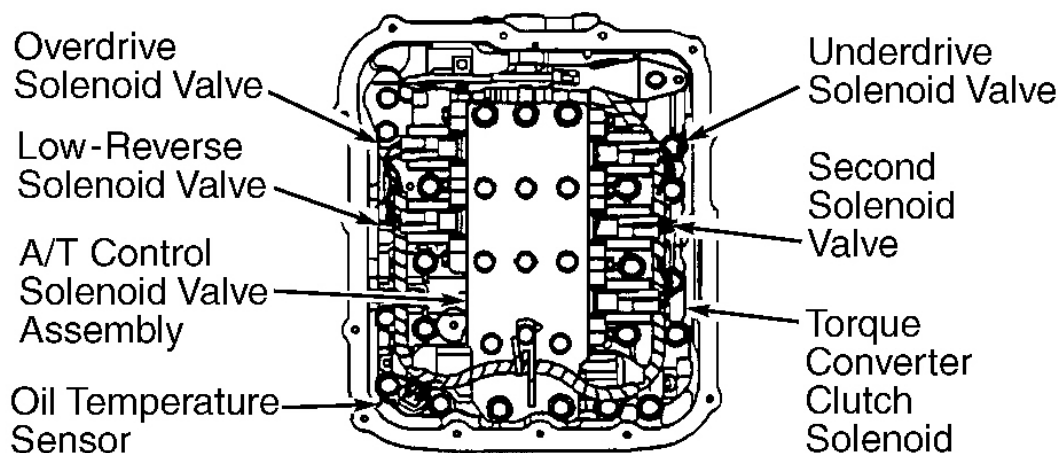
**2000 Hyundai Sonata****2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul**

Abnormal Pressure In 3rd Or 4th Only	Overdrive Solenoid Valve Malfunction, Overdrive Pressure Control Valve Malfunction, Regulator Valve Malfunction, Switch Valve Malfunction, Clogged Orifice, Incorrect Valve Body Installation
Abnormal Underdrive Pressure Only	(1) Malfunction Of Oil Seal "K", "L" Or "M", (2) Underdrive Solenoid Valve Malfunction, Underdrive Pressure Control Valve Malfunction, Check Ball Malfunction, Clogged Orifice, Incorrect Valve Body Installation
Abnormal Reverse Clutch Pressure Only	(1) Malfunction Of Oil Seal "A", "B" Or "C", Clogged Orifice, Incorrect Valve Body Installation
Abnormal Overdrive Pressure Only	(1) Malfunction Of Oil Seal "D", "E" Or "F", (2) Overdrive Solenoid Valve Malfunction, Overdrive Pressure Control Valve Malfunction, Check Ball Malfunction, Clogged Orifice, Incorrect Valve Body Installation
Abnormal Low-Reverse Pressure Only	(1) Malfunction Of Oil Seal "I" Or "J", (2) Low-Reverse Solenoid Valve Malfunction, Low-Reverse Pressure Control Valve Malfunction, Switch Valve Malfunction, Fail Safe Valve "A" Malfunction, Check Ball Malfunction, Clogged Orifice, Incorrect Valve Body Installation
Abnormal 2nd Brake Pressure Only	(1) Malfunction Of Oil Seal "G", "H" Or "O", (2) Second Solenoid Valve Malfunction, Second Pressure Control Valve Malfunction, Fail-Safe Valve "B" Malfunction, Clogged Orifice, Incorrect Valve Body Installation
Abnormal Torque Converter Pressure Only	Clogged Oil Cooler, (1) Malfunction Of Oil Seal "N", (2) Torque Converter Clutch Solenoid Malfunction , Torque Converter Clutch Control Valve Malfunction, Torque Converter Pressure Control Valve Malfunction, Clogged Orifice, Incorrect Valve Body Installation
Pressure Applied To Element Which Should Not Receive Pressure	Incorrect Transaxle Control Cable Adjustment, Manual Valve Malfunction, Check Ball Malfunction, Incorrect Valve Body Installation
(1) Refer to illustration for seal locations. See <b>Fig. 11</b> .	
(2) Refer to illustration for valve body component locations. See <b>Fig. 12</b> .	



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**Fig. 11: Identifying Oil Seal Locations**  
**Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.**



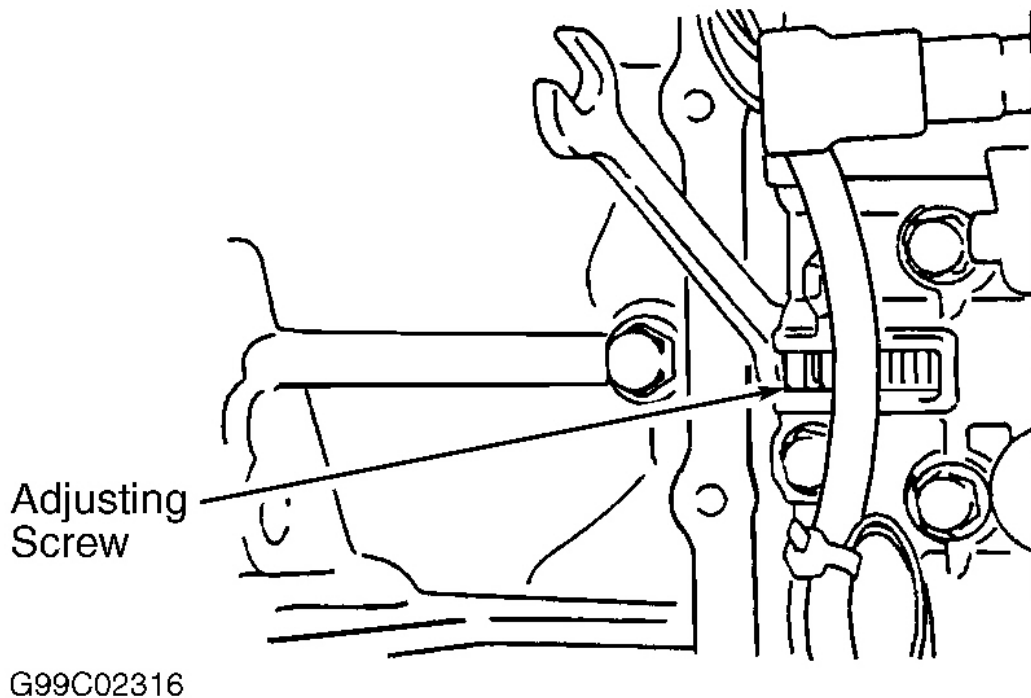
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**Fig. 12: Identifying Valve Body Bolts & Solenoid Valves**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

#### LINE PRESSURE ADJUSTMENT

**NOTE:** Valve body cover must be removed for oil pressure adjustment. Check oil pressure before attempting pressure adjustment. See HYDRAULIC PRESSURE TESTS.

1. Raise and support vehicle. Drain transaxle fluid. Remove valve body cover. Note location of pressure adjusting screw. See Fig. 13. Rotate pressure adjusting screw clockwise to decrease pressure, and counterclockwise to increase pressure.
2. Rotating pressure adjusting screw one revolution will change oil pressure about 5.1 psi (35 kPa). The standard value for oil pressure should be 147-152 psi (1010-1050 kPa). After adjusting oil pressure, apply a continuous bead of silicone sealant to mating surface of valve body cover and install to transaxle. Install retaining bolts and tighten to specification. See TORQUE SPECIFICATIONS. Refill transaxle and recheck oil pressure. Repeat procedure until pressure is at proper specification.



**Fig. 13: Locating Line Pressure Adjusting Screw**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

## COMPONENT TESTS

### TORQUE CONVERTER

**CAUTION:** Torque converter is a welded assembly and is not serviceable. If a malfunction occurs or torque converter becomes contaminated with foreign material, it must be replaced. Torque converter cannot be flushed or repaired.

**NOTE:** For torque converter stall speed test, see TORQUE CONVERTER under PERFORMANCE TESTS.

## REMOVAL & INSTALLATION

### AXLE SHAFTS

**NOTE:** See appropriate article in DRIVE AXLES.

## PARK/NEUTRAL POSITION SWITCH

**NOTE:** For park/neutral position switch removal and installation, see MITSUBISHI F4A41, F4A42 & F4A51 ELECTRONIC CONTROLS article.

## TRANSAXLE ASSEMBLY

**NOTE:** See appropriate AUTOMATIC TRANSMISSION REMOVAL article in TRANSMISSION SERVICING.

## VALVE BODY

**CAUTION:** Manual control lever and park/neutral position switch must be removed prior to removing valve body to reduce risk of damage to park/neutral position switch.

**CAUTION:** When removing valve body, be careful not to drop the 2 steel check balls located at top of valve body.

### Removal

1. Remove drain plug and drain transaxle fluid. Remove manual control lever. Remove park/neutral position switch. Remove speedometer gear.
2. Remove valve body cover. Remove manual control shaft detent. Disconnect valve body solenoid harness connectors. See **Fig. 12**. Remove valve body bolts and note bolt length and location for reassembly purposes. Remove oil temperature sensor. See **Fig. 17**. Remove valve body, valve body gasket and 2 steel check balls.

### Installation

1. Using a NEW gasket, install valve body and 2 steel check balls into transaxle. Install oil temperature sensor. See **Fig. 17**. Install valve body bolts in their correct location and tighten to specification. See **TORQUE SPECIFICATIONS**. Connect all valve body harness connectors.
2. Install manual control shaft detent. See **Fig. 16**. Apply a continuous bead of silicone sealant to mating surface of valve body cover. Install valve body cover and retaining bolts. Tighten valve body cover bolts to specification. See **TORQUE SPECIFICATIONS**. Refill transaxle with appropriate fluid to proper level. See **LUBRICATION**.

## TRANSAXLE DISASSEMBLY

### VALVE BODY & INTERNAL COMPONENTS

**NOTE:** During removal, note locations of all thrust bearings, thrust races and thrust washers for reassembly reference. See **Fig. 14**.

**CAUTION: Manual control lever lock nut must be removed before removing valve body. If valve body is removed before removing control lever lock nut, park/neutral position switch will be damaged.**

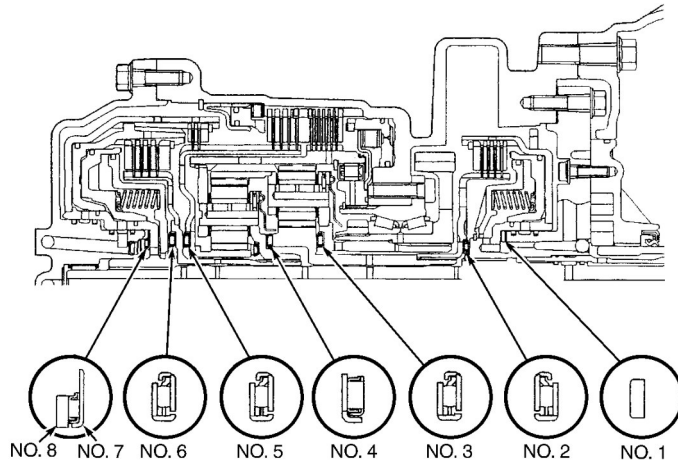
1. Remove torque converter. Using a dial indicator, measure and note input shaft end play for reassembly purposes. See **Fig. 15**. Remove all external brackets from transaxle case. See **Fig. 16**. Remove oil level dipstick. Remove 2 eye (banjo) bolts from oil cooler line banjo fittings, and remove oil cooler feed tube assembly and gaskets. Remove external oil filter and gasket. Remove input and output shaft speed sensors. Remove manual control lever. Remove park/neutral position switch. Remove speedometer gear.
2. Remove valve body cover. Remove manual control shaft detent. Disconnect all valve body harness connectors. See **Fig. 12**. Remove 28 valve body retaining bolts. Note bolt length and location for reassembly reference. Remove oil temperature sensor. See **Fig. 17**. Remove valve body, valve body gasket and 2 steel check balls. Remove snap ring and solenoid valve harness. Remove strainer and second brake retainer oil seal. See **Fig. 18**. Remove accumulator pistons and springs. See **Fig. 17**.
3. Using a magnet, remove steel pin retaining manual control lever shaft. Remove manual control lever shaft and parking pawl rod. Remove 18 torque converter housing retaining bolts and remove torque converter housing. See **Fig. 19**. Remove and discard 2 torque converter housing-to-transaxle case "O" rings. See **Fig. 20**.
4. On F4A41 models, remove differential and spacer. On F4A42 models, remove differential. Using a hammer and punch, remove differential bearing outer race and spacer from transaxle case. On all models, remove internal oil (screen) filter. Remove 6 oil pump retaining bolts. Using Oil Pump Removers (MD998333), remove oil pump. See **Fig. 21**. Remove and discard oil pump gasket. Remove No. 1 thrust washer from underdrive clutch and input shaft. See **Fig. 19**.
5. Pull input shaft and underdrive clutch from transaxle case. Remove No. 2 thrust bearing between underdrive clutch and hub. Remove underdrive clutch hub. Remove rear cover from transaxle case. See **Fig. 22**. Remove and discard 4 sealing rings from rear cover. Remove No. 8 thrust race. Remove input shaft rear bearing. Remove 3 "O" rings in transaxle case, near reverse and overdrive clutch. Remove reverse and overdrive clutch and No. 7 thrust bearing. Remove overdrive clutch hub and No. 6 thrust bearing. Remove No. 5 thrust bearing.
6. Remove planetary reverse sun gear. Remove snap ring and remove second brake piston and return spring. Remove pressure plate, brake discs (F4A41 transaxle has 2; F4A42 transaxle has 3) and brake plate(s) (F4A41 transaxle has 1; F4A42 transaxle has 2). Remove overdrive planetary carrier assembly.
7. Remove output planetary carrier and No. 4 thrust bearing. Remove underdrive sun gear and No. 3 thrust bearing from output planetary carrier. Remove snap ring. Remove stepped reaction plate and brake disc. Remove snap ring. Remove brake plates (F4A41 transaxle has 3; F4A42 transaxle has 4), brake discs (F4A41 transaxle has 3; F4A42 transaxle has 4) and pressure plate. Remove wave spring.
8. Remove parking pawl shaft, spacer and spring. Remove 2 parking roller support shafts, parking pawl case and parking roller support.
9. Using Spring Compressor (MD998903) and Spring Compressor Retainer (MD998924), compress one-way clutch inner race and remove snap ring. See **Fig. 23**. Remove Spring Compressor tools. Remove one-way clutch inner race, "O" ring, spring retainer, return spring and low-reverse brake piston. Remove transfer drive gear mounting bolts. Remove transfer drive gear.
10. Using a small pry bar or screw driver, remove output shaft cap from transaxle case. See **Fig. 24**. Bend locking tabs of output shaft lock nut down. Using Special Sockets (MB991625 and MB990607), remove reverse threaded output shaft lock nut. See **Fig. 25**. Remove output shaft bearing retainer bolts. Using a

hammer and brass bar, tap on rear of output shaft to remove output shaft, tapered roller bearing and collar. Remove spacer and outer race. Remove snap ring.

11. On F4A41 models, remove differential bearing spacer from torque converter case. On F4A42 models, remove differential bearing outer race and spacer from converter case. Remove differential bearing outer race from transaxle case.

# 2000 Hyundai Sonata

## 2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul



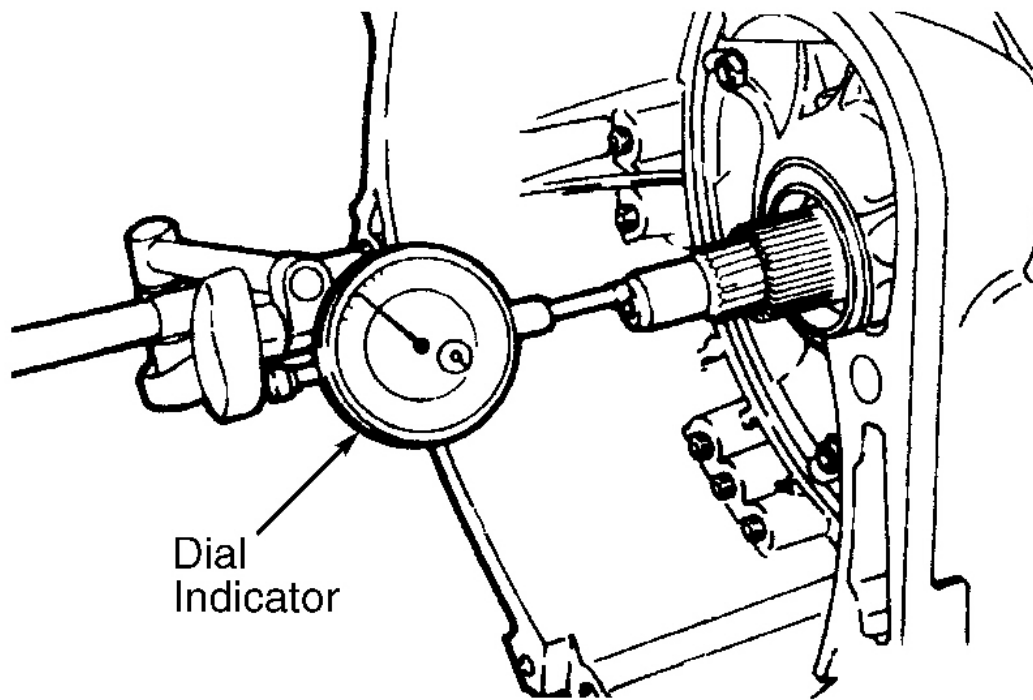
IDENTIFICATION OF THRUST BEARING, THRUST RACES, AND THRUST WASHERS - mm (In.)

SYMBOL	OD	ID	THICKNESS	PART NO.	APPLICATION
No. 1	59 (2.32)	47 (1.85)	1.8 (0.071)	MD754509	
	59 (2.32)	47 (1.85)	2.0 (0.079)	MD754508	
	59 (2.32)	47 (1.85)	2.2 (0.087)	MD754507	
	59 (2.32)	47 (1.85)	2.4 (0.094)	MD753793	
	59 (2.32)	47 (1.85)	2.6 (0.102)	MD753794	
	59 (2.32)	47 (1.85)	2.8 (0.110)	MD753795	
No. 2	49 (1.93)	36 (1.42)	3.6 (0.142)	MD756846	
No. 3	49 (1.93)	36 (1.42)	3.6 (0.142)	MD756846	
No. 4	45.3 (1.783)	31 (1.22)	3.3 (0.130)	MD757647	F4A42
	55.4 (2.181)	38.5 (1.516)	3.3 (0.130)	MD761683	F4A51
No. 5	49 (1.93)	36 (1.42)	3.6 (0.142)	MD756846	F4A42
	57 (2.244)	38.5 (1.516)	4.1 (0.161)	MD758556	F4A51
No. 6	49 (1.93)	36 (1.42)	3.6 (0.142)	MD756846	F4A42
	57 (2.244)	38.5 (1.516)	4.1 (0.161)	MD758556	F4A51
No. 7	59 (2.32)	37 (1.46)	2.8 (0.110)	MD754595	
No. 8	48.9 (1.925)	37 (1.46)	1.6 (0.063)	MD707267	
	48.9 (1.925)	37 (1.46)	1.7 (0.067)	MD759681	
	48.9 (1.925)	37 (1.46)	1.8 (0.071)	MD723064	
	48.9 (1.925)	37 (1.46)	1.9 (0.075)	MD754794	
	48.9 (1.925)	37 (1.46)	2.0 (0.079)	MD707268	
	48.9 (1.925)	37 (1.46)	2.1 (0.083)	MD754795	
	48.9 (1.925)	37 (1.46)	2.2 (0.087)	MD723065	
	48.9 (1.925)	37 (1.46)	2.3 (0.091)	MD754796	
	48.9 (1.925)	37 (1.46)	2.4 (0.094)	MD724358	
	48.9 (1.925)	37 (1.46)	2.5 (0.098)	MD754797	
	48.9 (1.925)	37 (1.46)	2.6 (0.102)	MD754798	

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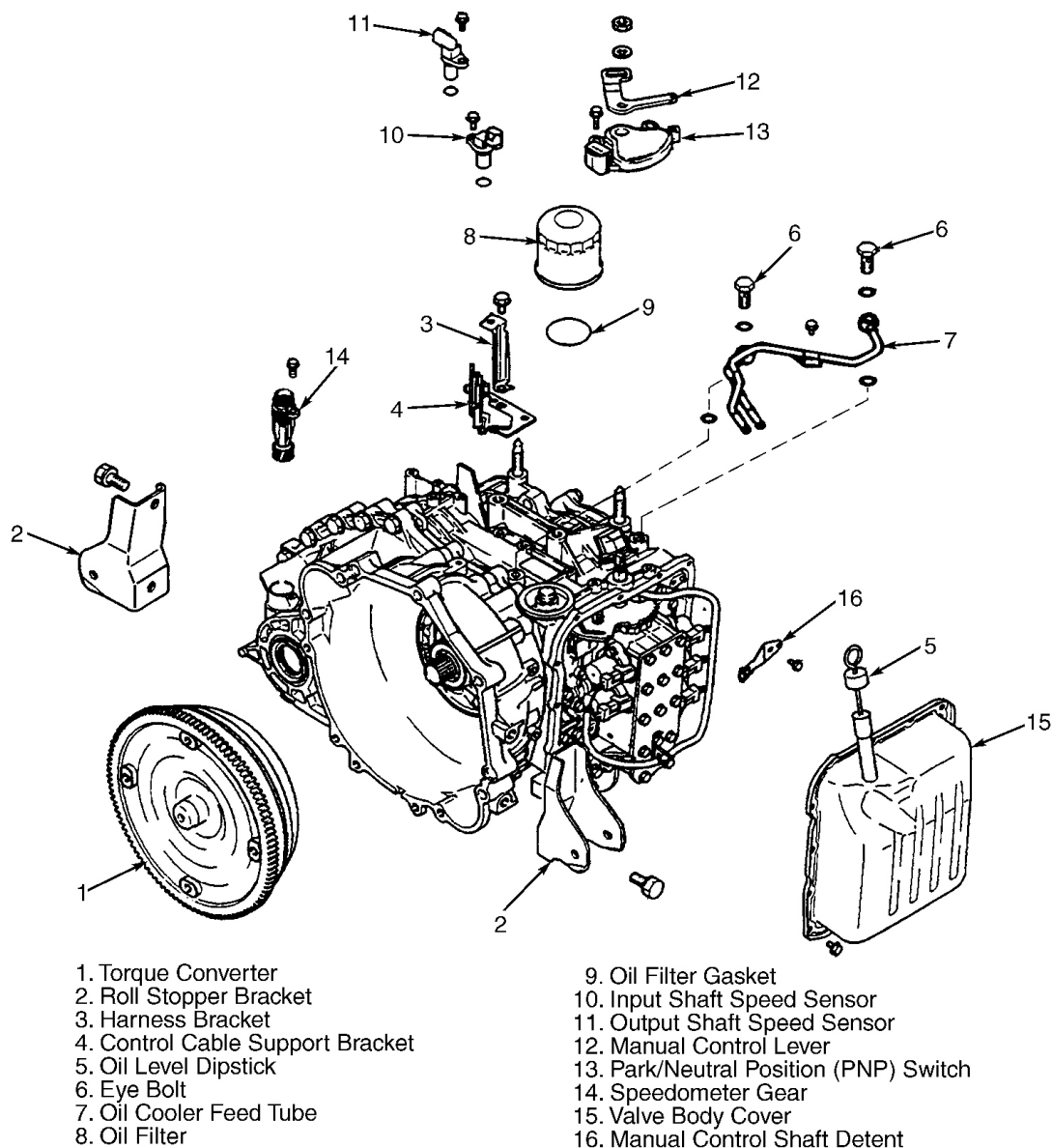
**Fig. 14: Identifying Thrust Bearings, Races & Washers**  
**Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.**





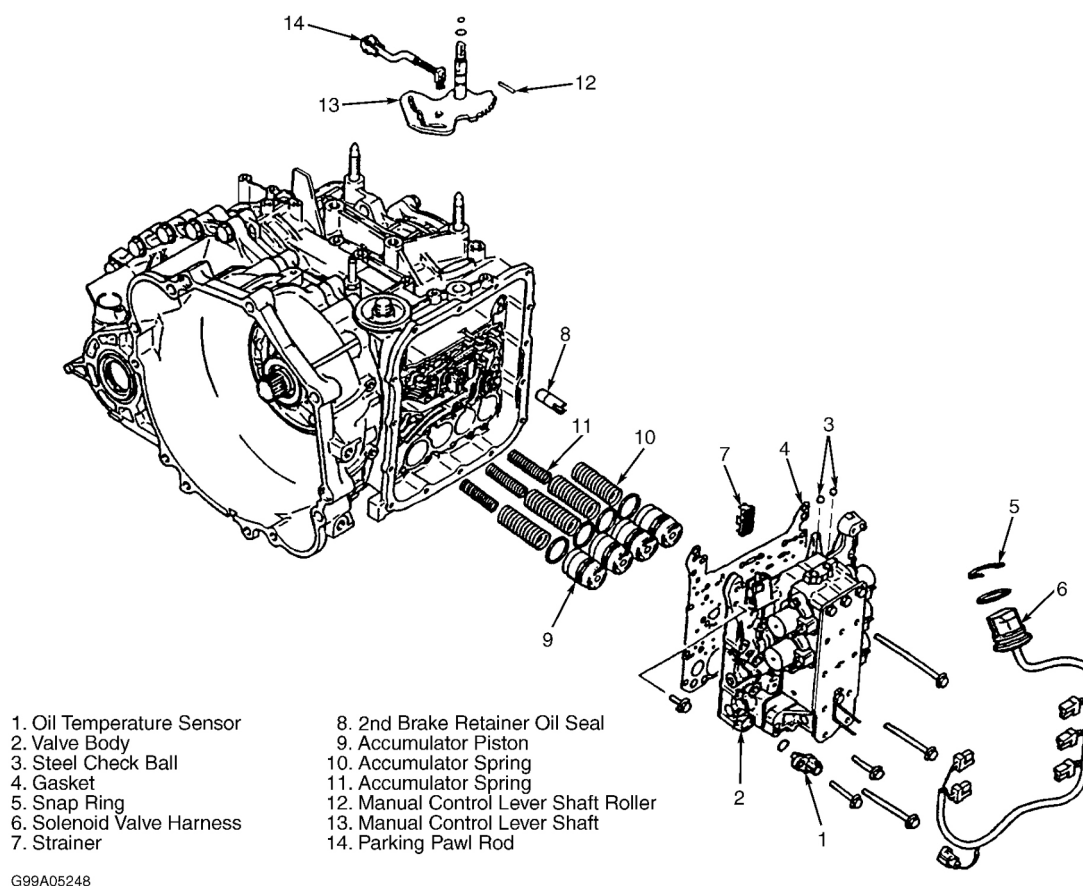
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**Fig. 15: Measuring Input Shaft End Play**  
Courtesy of CHRYSLER LLC

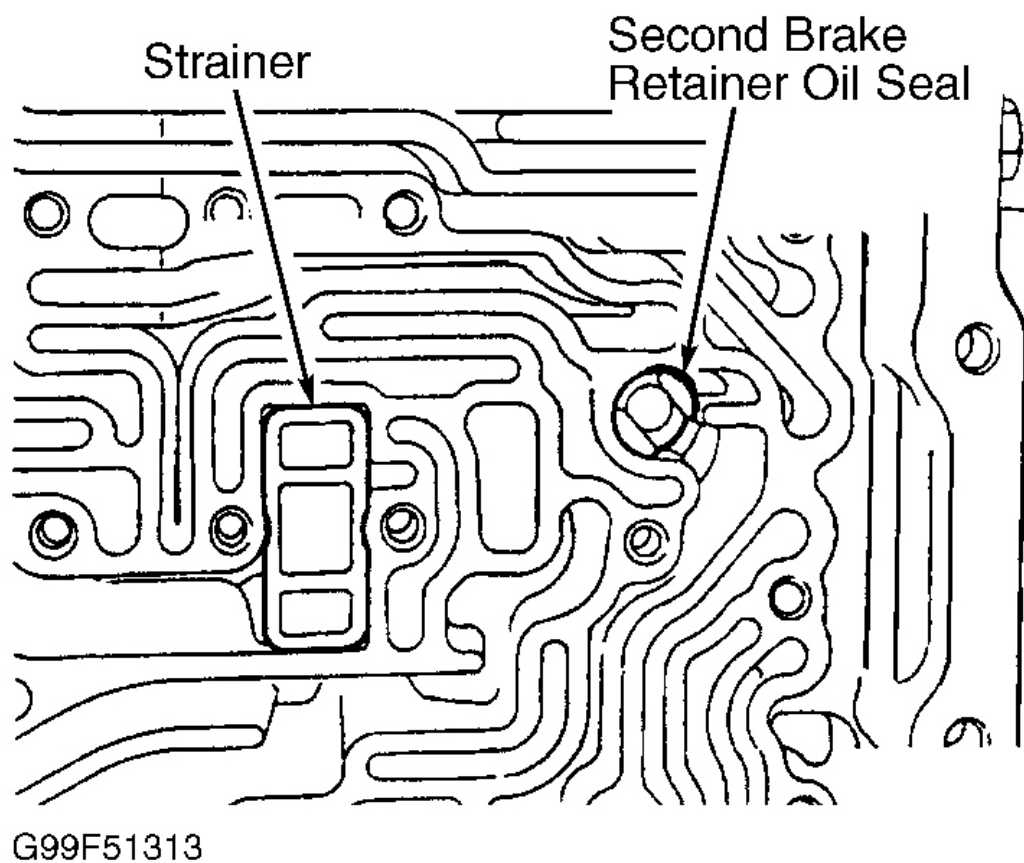


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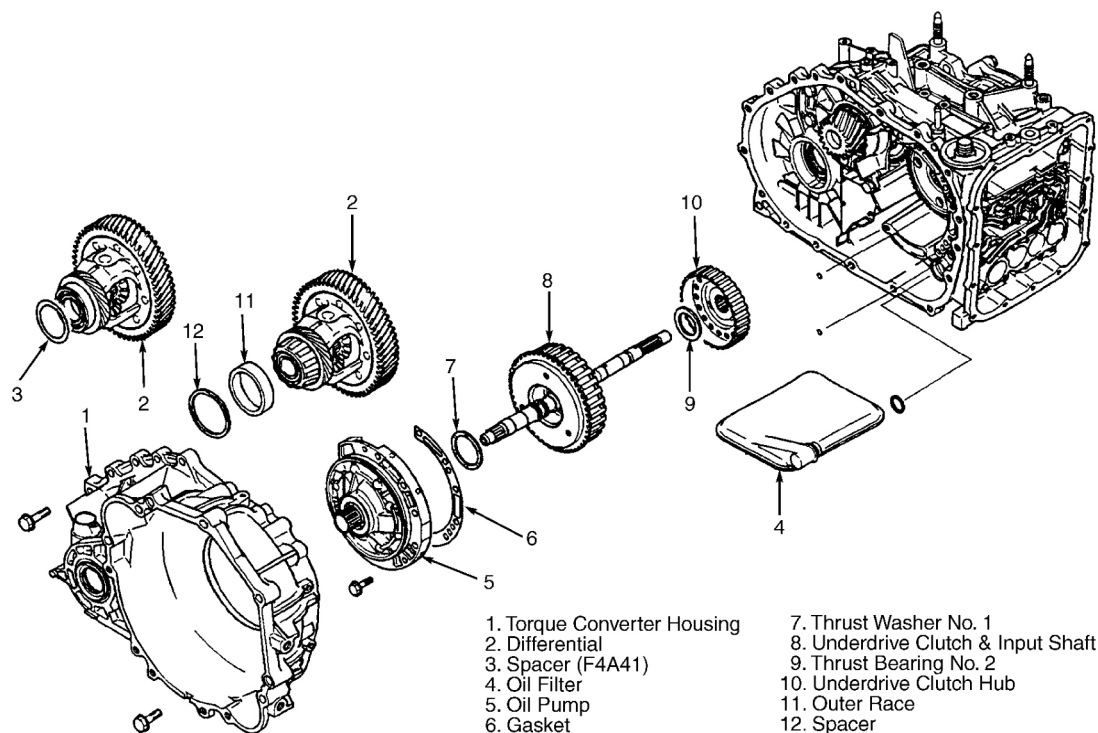
**Fig. 16: Exploded View Of Transaxle External Components**  
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



**Fig. 17: Exploded View Of Valve Body Components**  
**Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.**

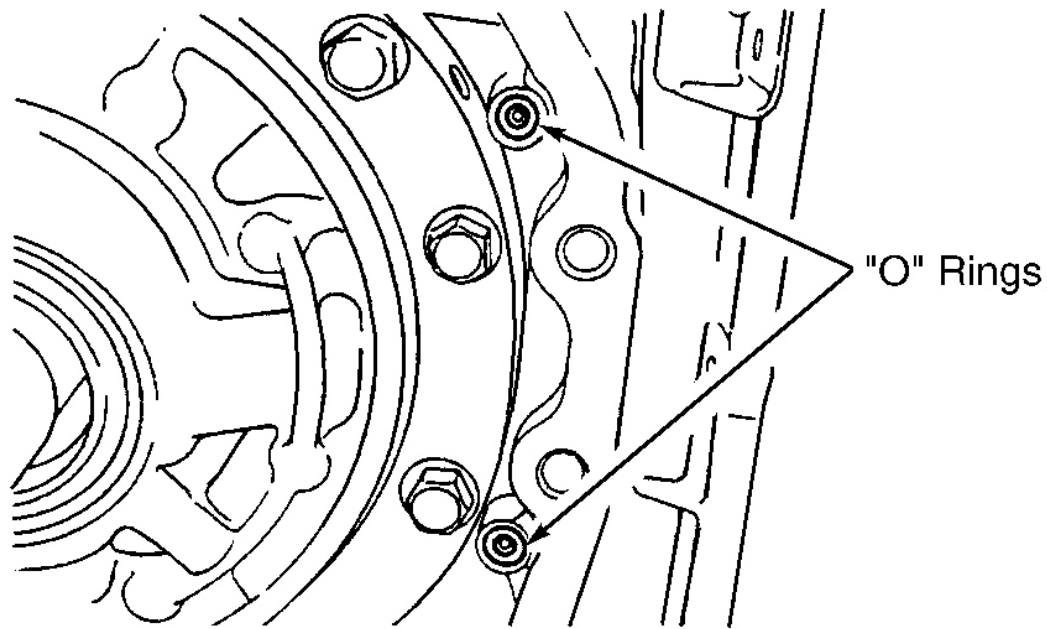


**Fig. 18: Exploded View Of Second Brake Retainer Oil Seal & Strainer**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



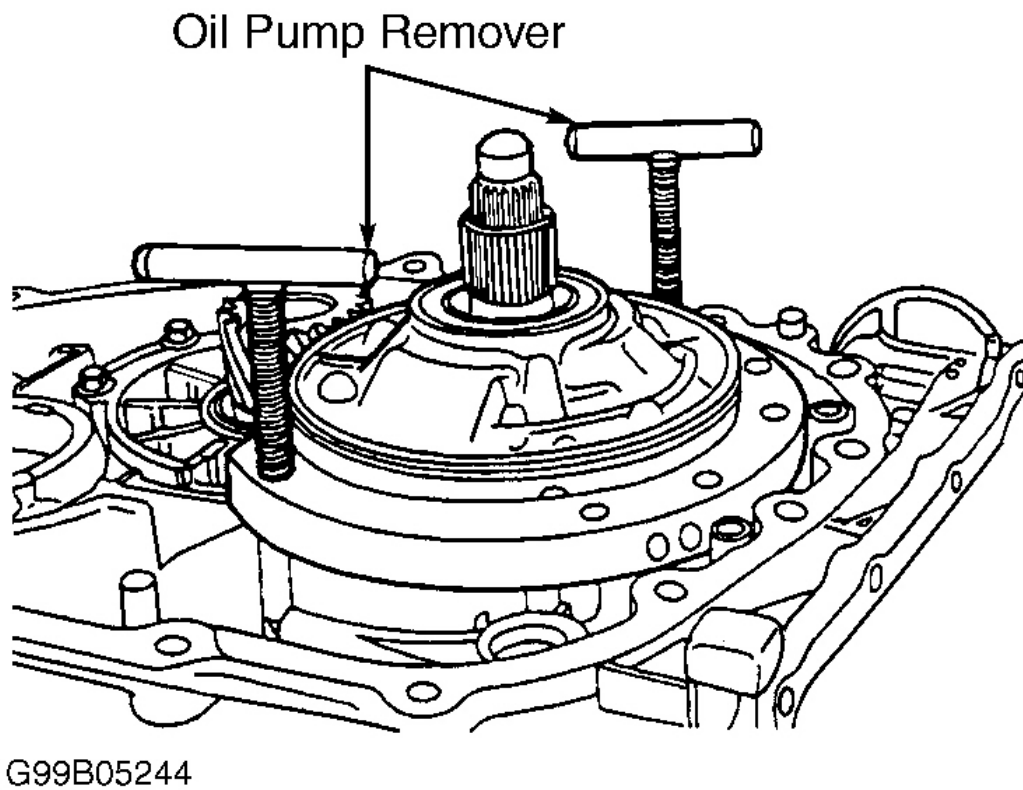
G99C05249

**Fig. 19: Exploded View Of Differential Components**  
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



G99J51283

**Fig. 20: Identifying Torque Converter Housing-To-Transaxle Case "O" Rings**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



**Fig. 21: Removing Oil Pump**

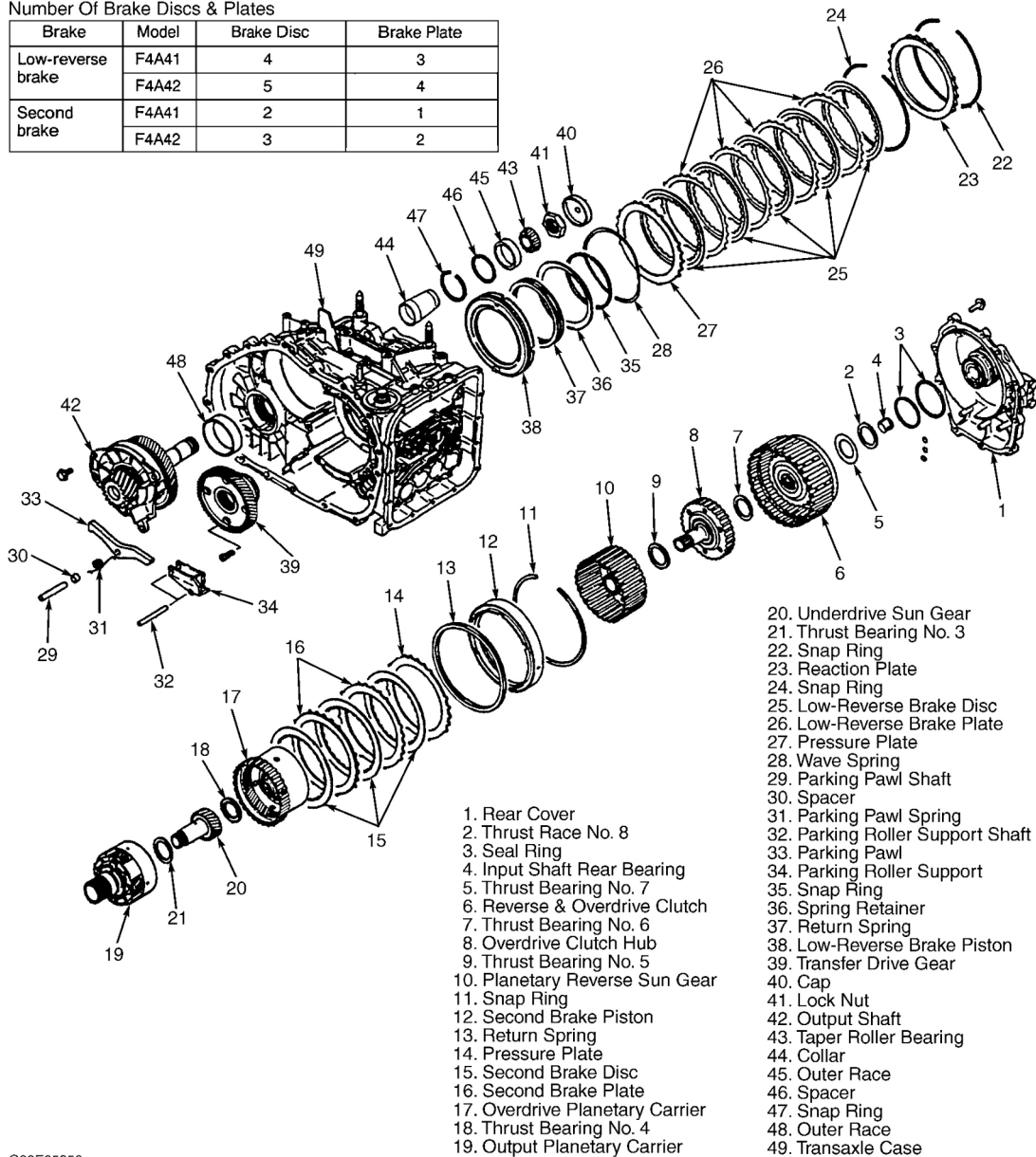
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

## 2000 Hyundai Sonata

### 2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul

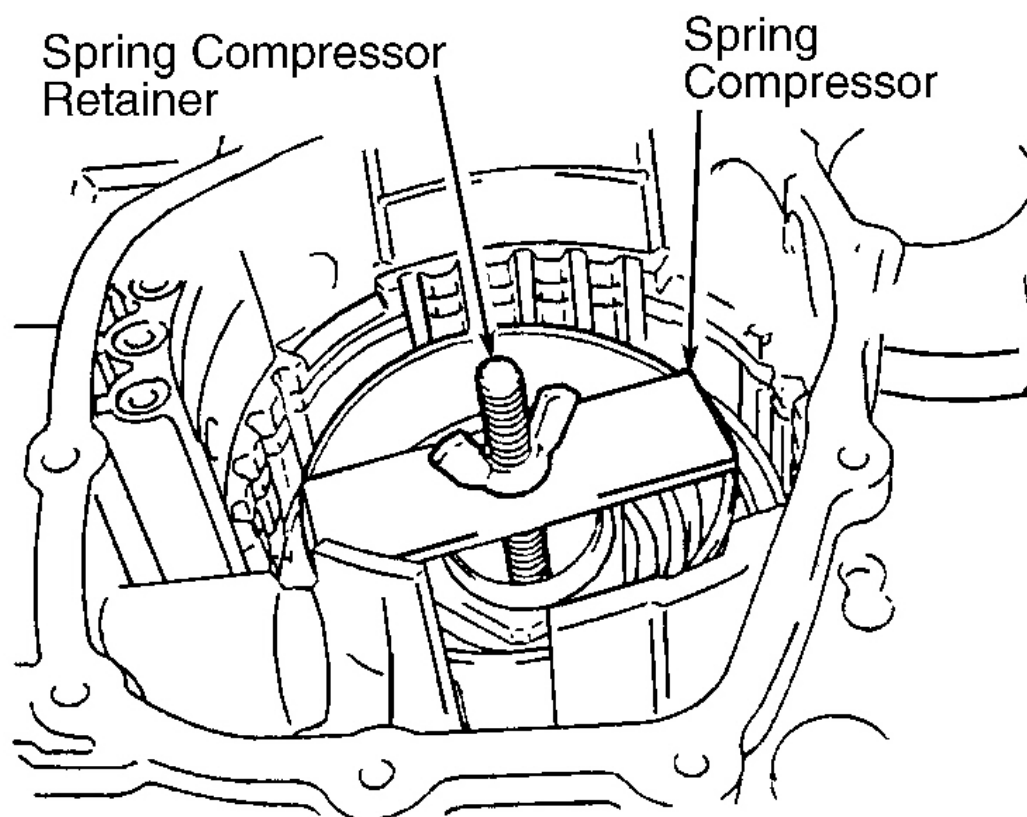
Number Of Brake Discs & Plates

Brake	Model	Brake Disc	Brake Plate
Low-reverse brake	F4A41	4	3
	F4A42	5	4
Second brake	F4A41	2	1
	F4A42	3	2



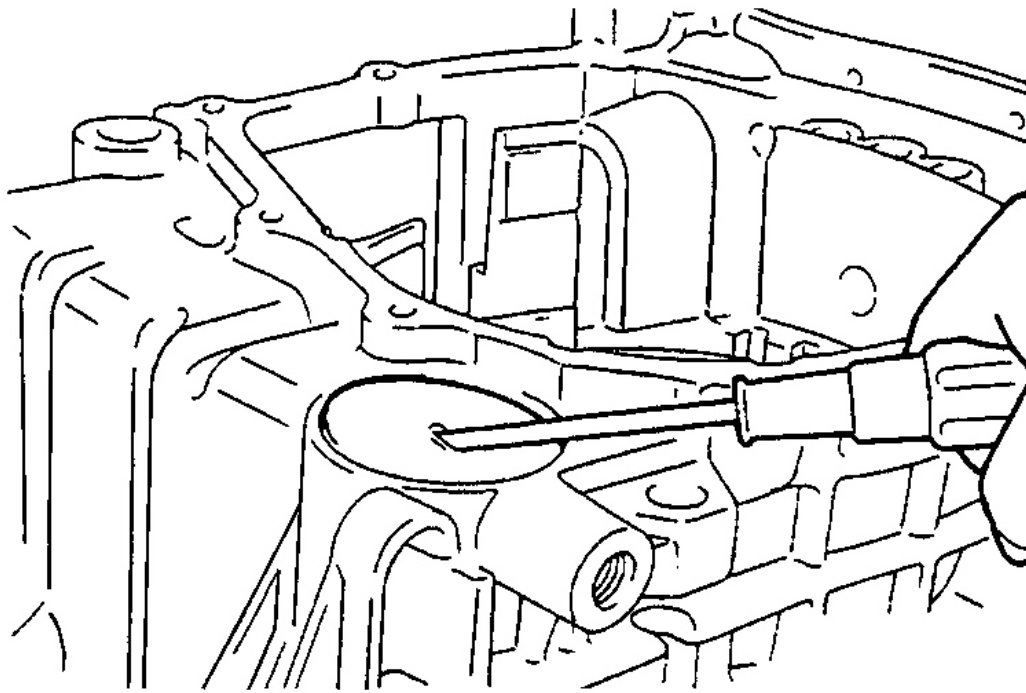
**Fig. 22: Exploded View Of Transaxle Internal Components**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.





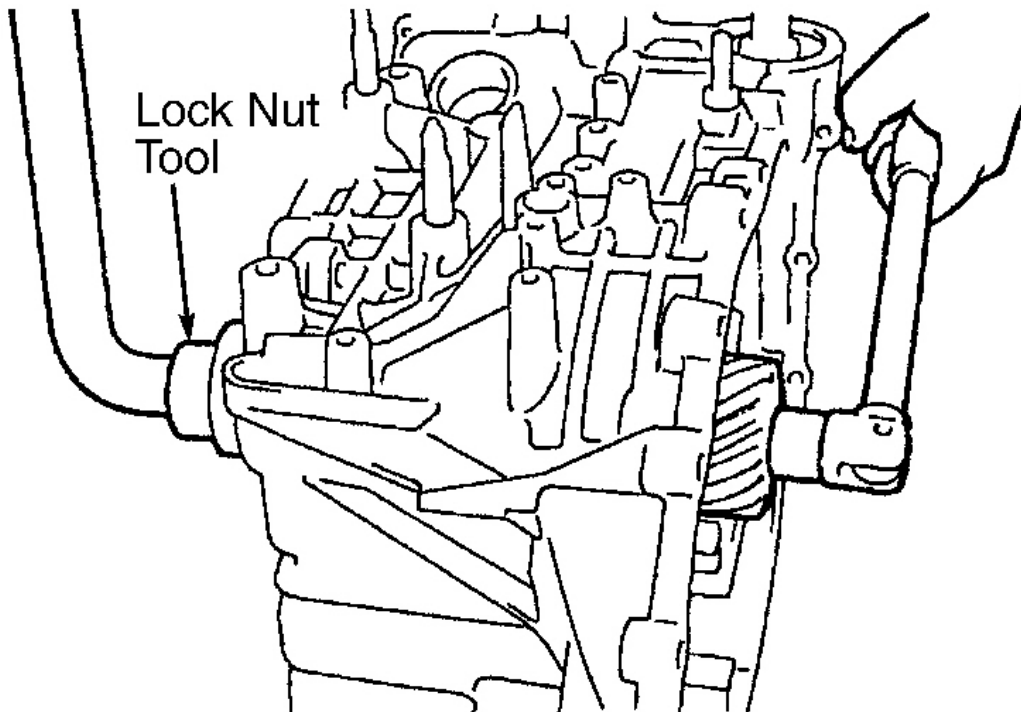
G99E05245

**Fig. 23: Removing Snap Ring Using Spring Compressor & Spring Compressor Retainer**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



G99G05246

**Fig. 24: Removing Output Shaft Cap**  
**Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.**



G00021017

**Fig. 25: Installing & Removing Output Shaft Lock Nut**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

## COMPONENT DISASSEMBLY & REASSEMBLY

**NOTE:** Manufacturer specifies DIAMOND ATF SP-II for use in these transaxles. This fluid should also be used during assembly. See appropriate AUTOMATIC TRANSMISSION SERVICING article in TRANSMISSION SERVICING for additional information and draining and refilling procedures.

### OIL PUMP

**NOTE:** Manufacturer specifies replacement of oil pump if it is faulty. No inspection or repair information is available.

#### Disassembly

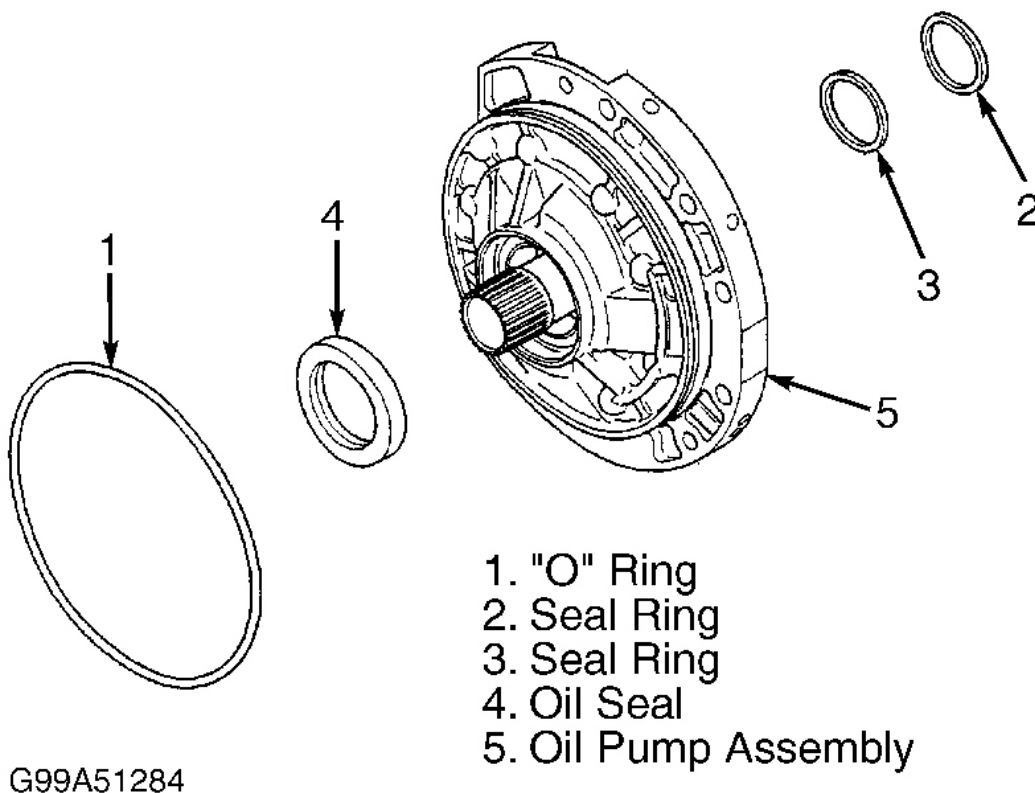
Remove "O" ring from outer groove of oil pump housing. See **Fig. 26**. Remove 2 sealing rings. Remove oil seal from front of oil pump housing.

### Cleaning & Inspection

Clean and inspect components for damage. Inspect all machined surfaces for pitting or damage.

### Reassembly

Using a hammer and Seal Installer (MD998334), install NEW oil seal into front of oil pump housing. Install 2 NEW seal rings. Install NEW "O" ring coated with ATF or petroleum jelly into outer groove of oil pump housing. Coat seal lip and sealing rings with ATF or petroleum jelly.



**Fig. 26: Exploded View Of Oil Pump & Components**

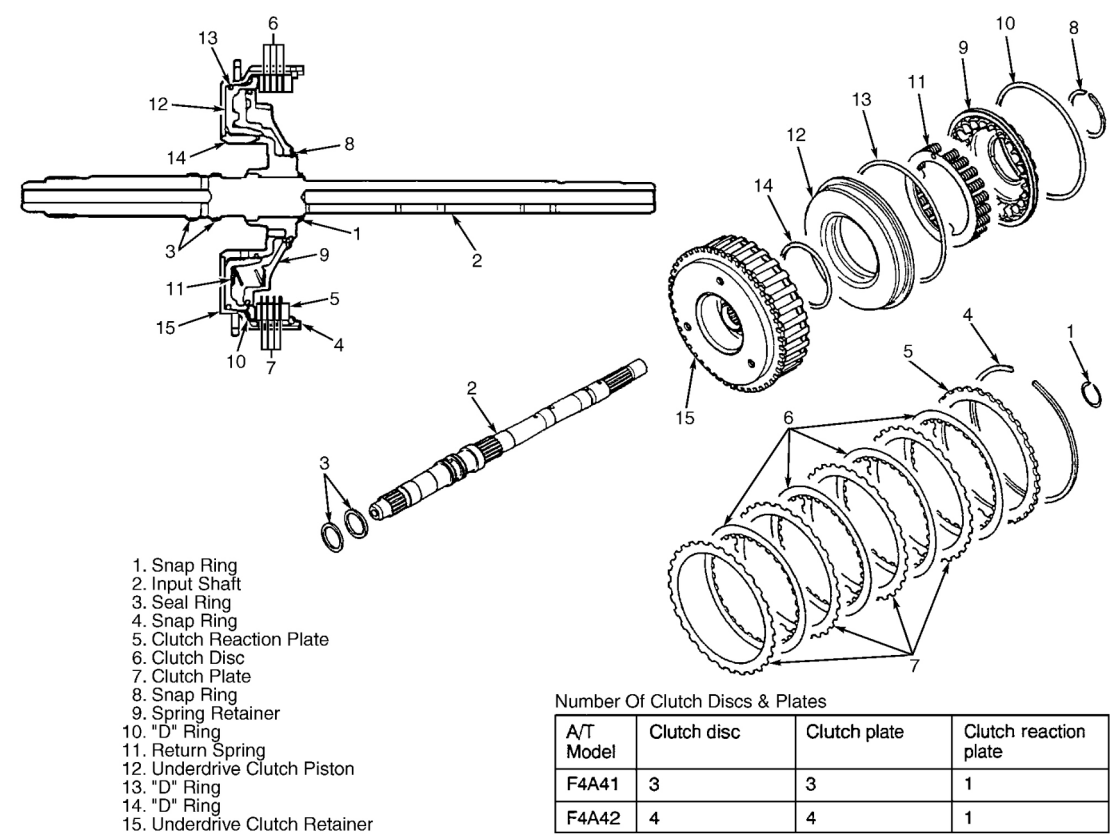
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

### UNDERDRIVE CLUTCH & INPUT SHAFT

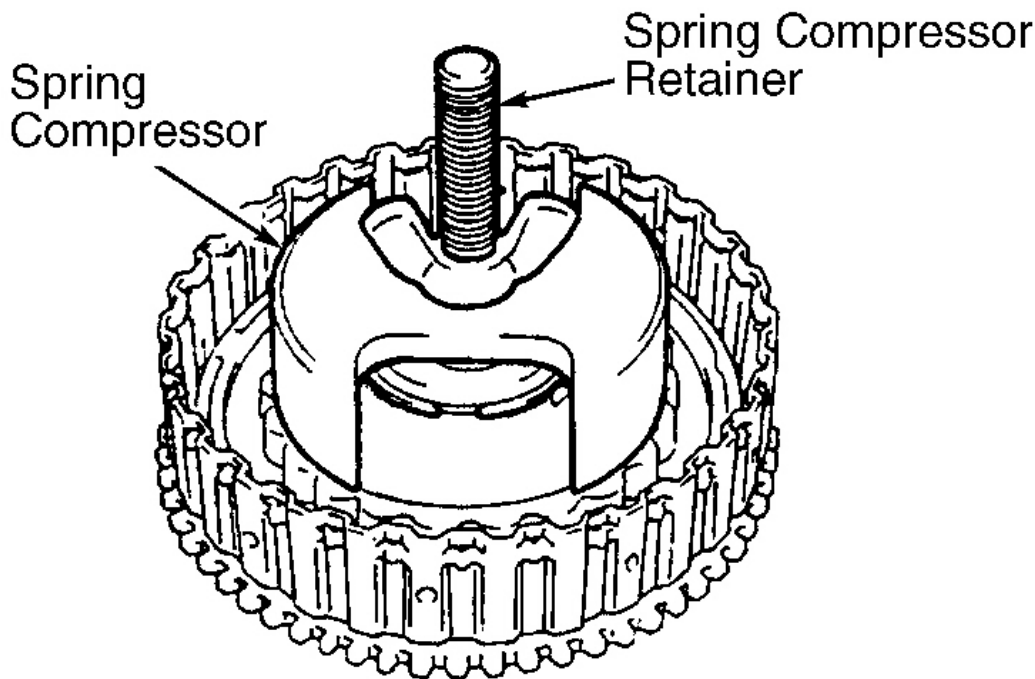
#### Disassembly

Remove snap ring and remove input shaft and 2 sealing rings from underdrive clutch. Remove snap ring and remove clutch reaction plate, clutch discs and clutch plates. See **Fig. 27**. Using Spring Compressor (MD998907) and Spring Compressor Retainer (MD998924), compress spring retainer and remove underdrive

clutch snap ring. See **Fig. 28**. Remove "D" ring, spring retainer and return spring. Remove "D" ring and underdrive clutch piston. Remove "D" ring from underdrive clutch retainer.



**Fig. 27: Exploded View Of Underdrive Clutch & Input Shaft**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



G99D51287

**Fig. 28: Removing & Installing Underdrive Clutch Snap Ring**  
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

#### Reassembly

**NOTE:** Apply ATF to all moving parts before installation. Immerse clutch discs in ATF for at least 2 hours before installation. Apply ATF or petroleum jelly to all "D" rings before installation.

1. Install "D" ring into underdrive clutch retainer. Install underdrive clutch piston and "D" ring. Install return spring, spring retainer and "D" ring.
2. Using Spring Compressor (MD998907) and Spring Compressor Retainer (MD998924), install underdrive clutch snap ring. See **Fig. 28**. Align teeth of clutch plates and clutch discs and install into underdrive clutch retainer. Install clutch reaction plate as shown. See **Fig. 29**. Install snap ring.

**NOTE:** F4A41 transaxle uses 3 clutch discs and 3 clutch plates; F4A42 transaxle uses 4 clutch discs and 4 clutch plates.

3. Using Spring Compressor (MB991628) and Spring Compressor Retainer (MD998924), apply even pressure on reaction plate. See **Fig. 30**. Measure clearance between snap ring and reaction plate. On F4A41 transaxle, clearance should be .0472-.0551" (1.20-1.40 mm). On F4A42 transaxle, clearance

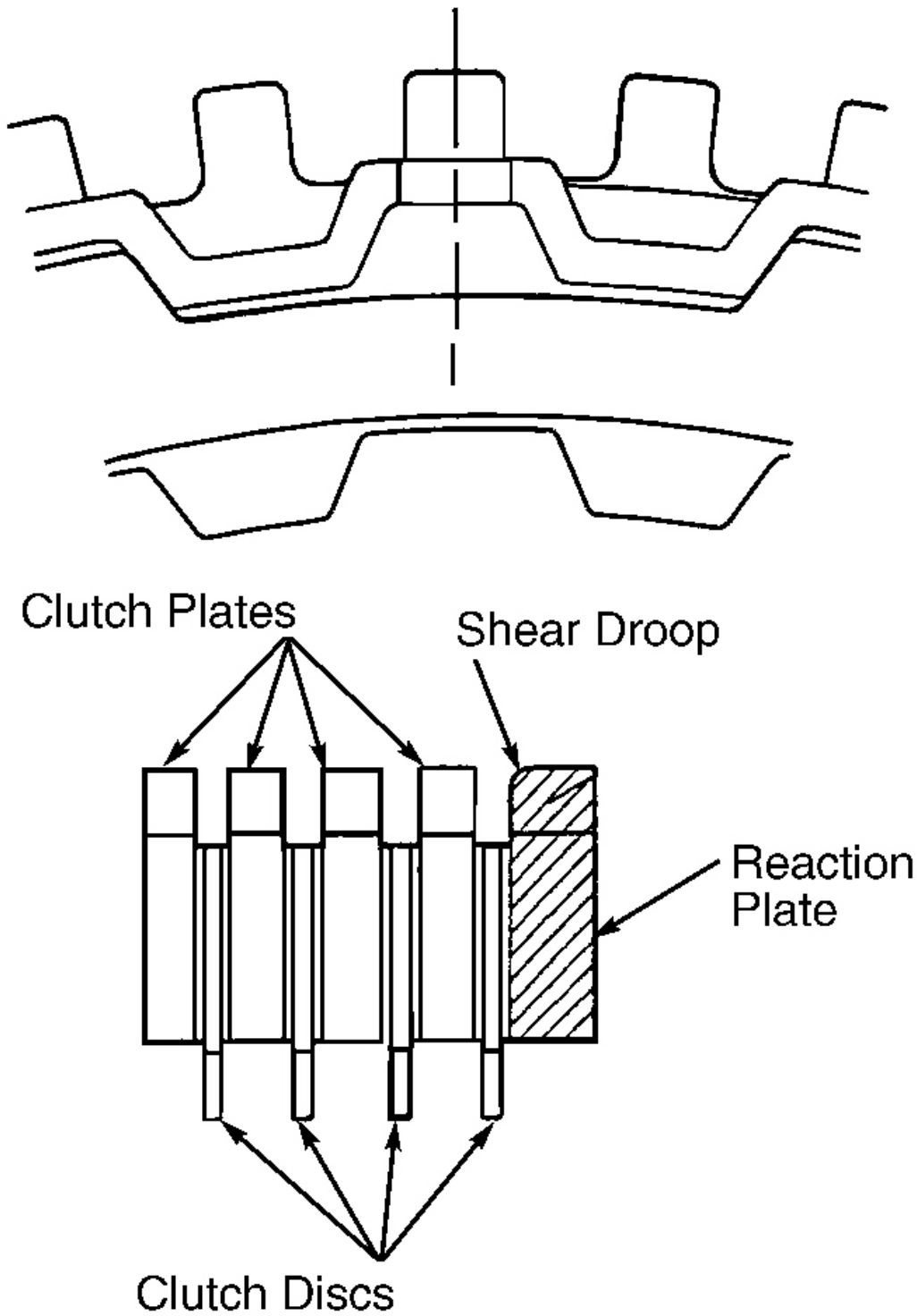
## 2000 Hyundai Sonata

### 2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul

should be .0630-.0709" (1.65-1.85 mm). If clearance is not as specified, replace snap ring to adjust. See **OVERDRIVE & UNDERDRIVE CLUTCH END PLAY SNAP RING SPECIFICATIONS** table. Install input shaft, 2 NEW seal rings and selected snap ring.

#### OVERDRIVE & UNDERDRIVE CLUTCH END PLAY SNAP RING SPECIFICATIONS

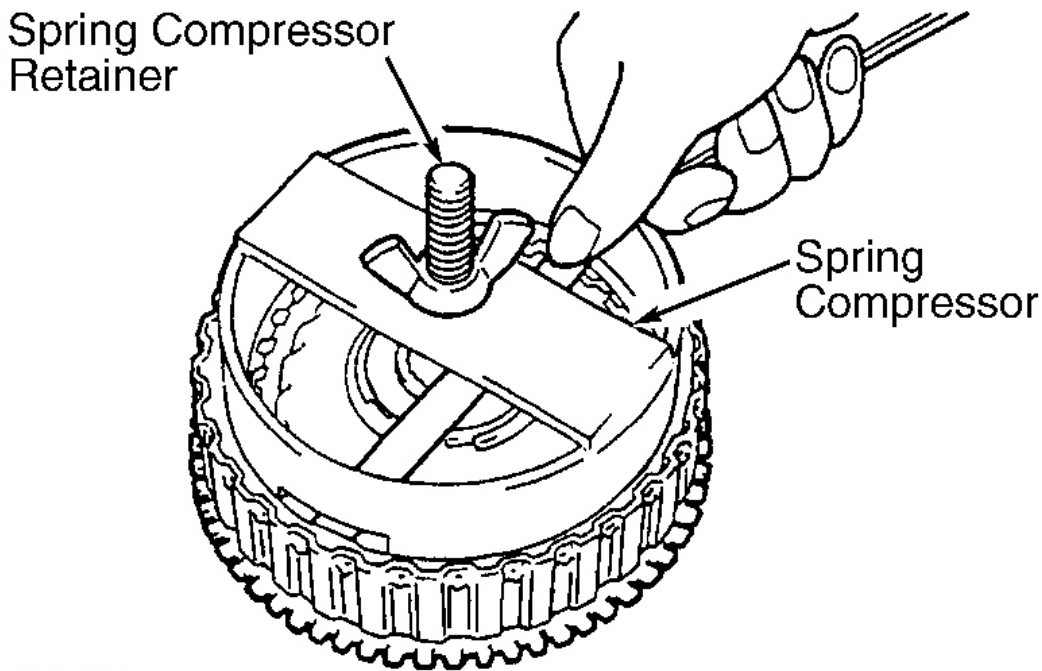
Thickness - In. (mm)	Identification Color	Part Number
.063 (1.6)	None	MD759666
.067 (1.7)	Blue	MD759667
.071 (1.8)	Brown	MD759668
.075 (1.9)	None	MD752124
.079 (2.0)	Blue	MD752125
.083 (2.1)	Brown	MD752126
.087 (2.2)	None	MD752127
.091 (2.3)	Blue	MD752128
.094 (2.4)	Brown	MD752129
.098 (2.5)	None	MD752130
.102 (2.6)	Blue	MD752131
.106 (2.7)	Brown	MD752132
.110 (2.8)	None	MD752133
.114 (2.9)	Blue	MD752134
.118 (3.0)	Brown	MD754680



G99E51288



**Fig. 29: Positioning Underdrive & Overdrive Clutch Discs & Plates**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



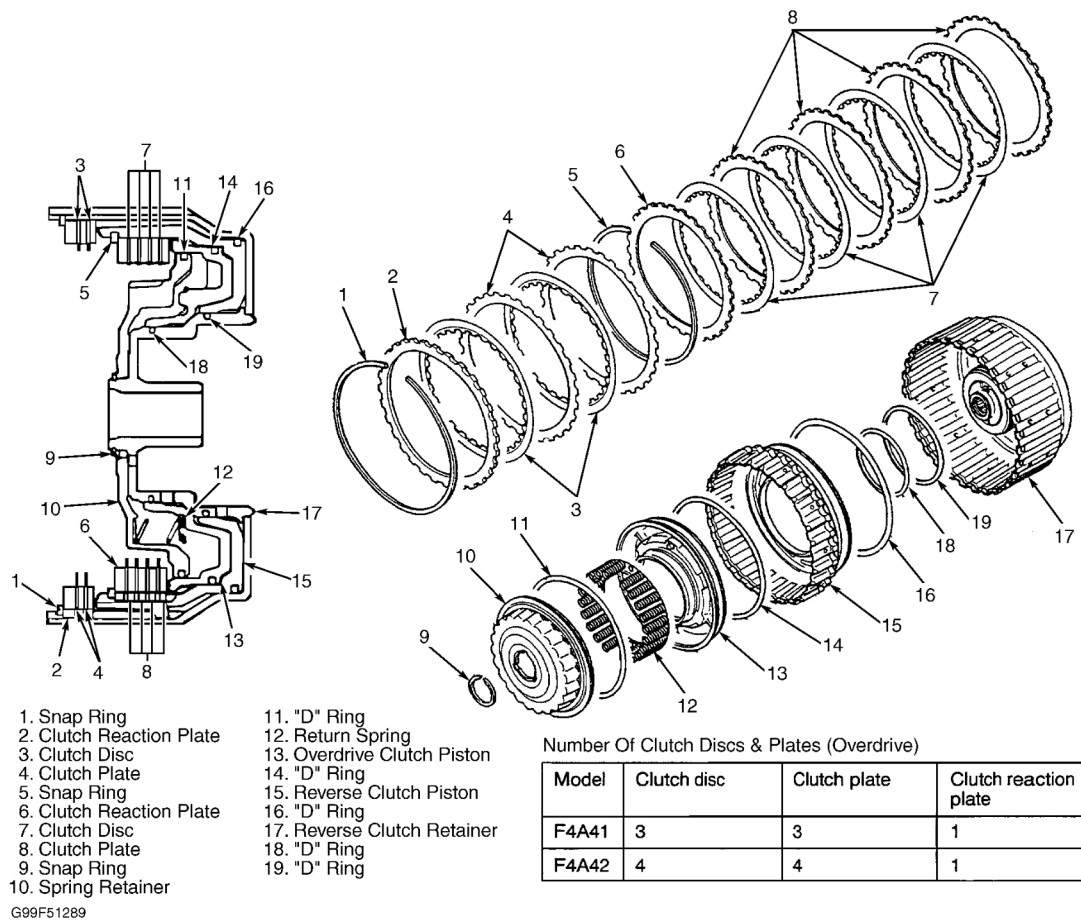
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**Fig. 30: Measuring Underdrive Clutch Reaction Plate End Play**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

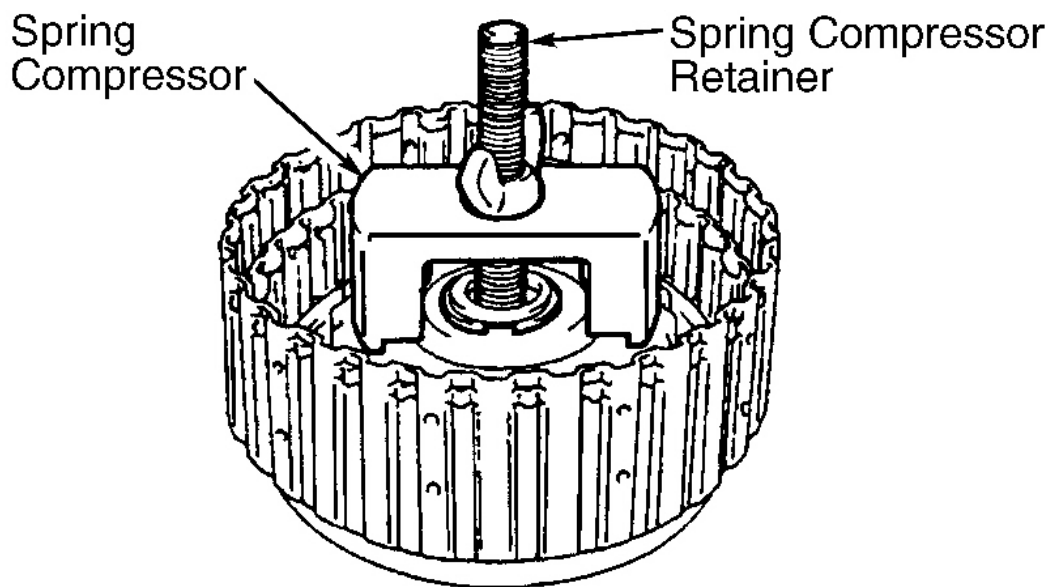
## REVERSE & OVERDRIVE CLUTCH

### Disassembly

1. Remove snap ring, reaction plate, clutch discs and clutch plates. See **Fig. 31**. Remove second snap ring, reaction plate, clutch discs and clutch plates. Using Spring Compressor (MB999590) and Spring Compressor Retainer (MD998924), remove overdrive clutch spring retainer snap ring. See **Fig. 32**. Remove spring retainer.
2. Remove "D" ring, return spring and overdrive clutch piston. Remove "D" ring and reverse clutch piston. Remove remaining 3 "D" rings from reverse clutch retainer.



**Fig. 31: Exploded View Of Reverse & Overdrive Clutch**  
**Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.**



G99I51290

**Fig. 32: Removing Overdrive Clutch Spring Retainer Snap Ring**  
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

#### Reassembly

**NOTE:** Apply ATF to all moving parts before installation. Immerse clutch discs in ATF for at least 2 hours before installation. Apply ATF or petroleum jelly to all "D" rings before installation.

1. Install 3 "D" rings into reverse clutch retainer. Align outer circumference holes in piston and retainer and install reverse clutch piston into reverse clutch retainer. See **Fig. 33**. Install "D" ring and overdrive clutch piston. Install return spring, "D" ring and spring retainer.
2. Using spring compressor and spring compressor retainer, install snap ring. See **Fig. 32**. Using spring compressor tools, apply about 11 lbs. of pressure evenly to spring retainer. Using a feeler gauge, measure clearance between snap ring and spring retainer. Clearance should be 0-.0035" (0-.09 mm). If clearance is not as specified, replace snap ring to bring clearance within specification. See **REVERSE & OVERDRIVE CLUTCH SPRING RETAINER SNAP RING SPECIFICATIONS** table.
3. Install clutch plates and clutch discs into reverse clutch retainer, ensuring discs and plates are positioned correctly. Install reaction plate into reverse clutch retainer as shown. See **Fig. 29**. Install snap ring. Using spring compressor and spring compressor retainer, apply even pressure on reaction plate. Using a feeler gauge, measure clearance between snap ring and reaction plate. See **Fig. 30**. On F4A41, clearance should be .0472-.0551" (1.20-1.40 mm). On F4A42, clearance should be .0630-.0709" (1.60-1.80 mm). If clearance is not as specified, replace snap ring to bring clearance within specification. See **REVERSE CLUTCH END PLAY SNAP RING SPECIFICATIONS** table.

## 2000 Hyundai Sonata

### 2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul

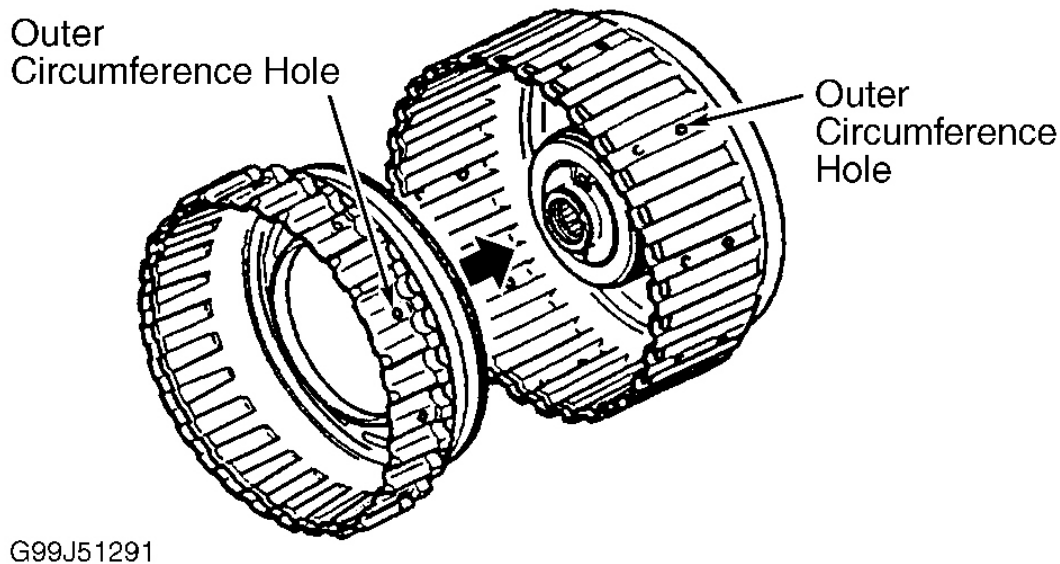
4. Align space between teeth of clutch plates, clutch discs and reaction plate with outer circumference hole of reverse clutch retainer. Install clutch plates, clutch discs and reaction plate into reverse clutch retainer, ensuring discs and plates are positioned correctly. See **Fig. 29**.
5. Install snap ring. Using spring compressor tools, apply about 11 lbs. of pressure evenly on reaction plate. Using a feeler gauge, measure clearance between snap ring and reaction plate. Clearance should be .0591-.0669" (1.50-1.70 mm). If clearance is not as specified, replace snap ring to bring clearance within specification. See **REVERSE CLUTCH END PLAY SNAP RING SPECIFICATIONS** table.

#### REVERSE & OVERDRIVE CLUTCH SPRING RETAINER SNAP RING SPECIFICATIONS

Thickness - In. (mm)	Identification Color	Part Number
.0583 (1.48)	Brown	MD755600
.0602 (1.53)	None	MD755601
.0622 (1.58)	Blue	MD755602
.0642 (1.63)	Brown	MD755603

#### REVERSE CLUTCH END PLAY SNAP RING SPECIFICATIONS

Thickness - In. (mm)	Identification Color	Part Number
.063 (1.6)	None	MD761085
.067 (1.7)	Blue	MD761086
.071 (1.8)	Brown	MD761087
.075 (1.9)	None	MD752137
.079 (2.0)	Blue	MD752138
.083 (2.1)	Brown	MD752139
.087 (2.2)	None	MD752140
.091 (2.3)	Blue	MD752141
.094 (2.4)	Brown	MD752142
.098 (2.5)	None	MD752143
.102 (2.6)	Blue	MD752144
.106 (2.7)	Brown	MD752145
.110 (2.8)	None	MD752146

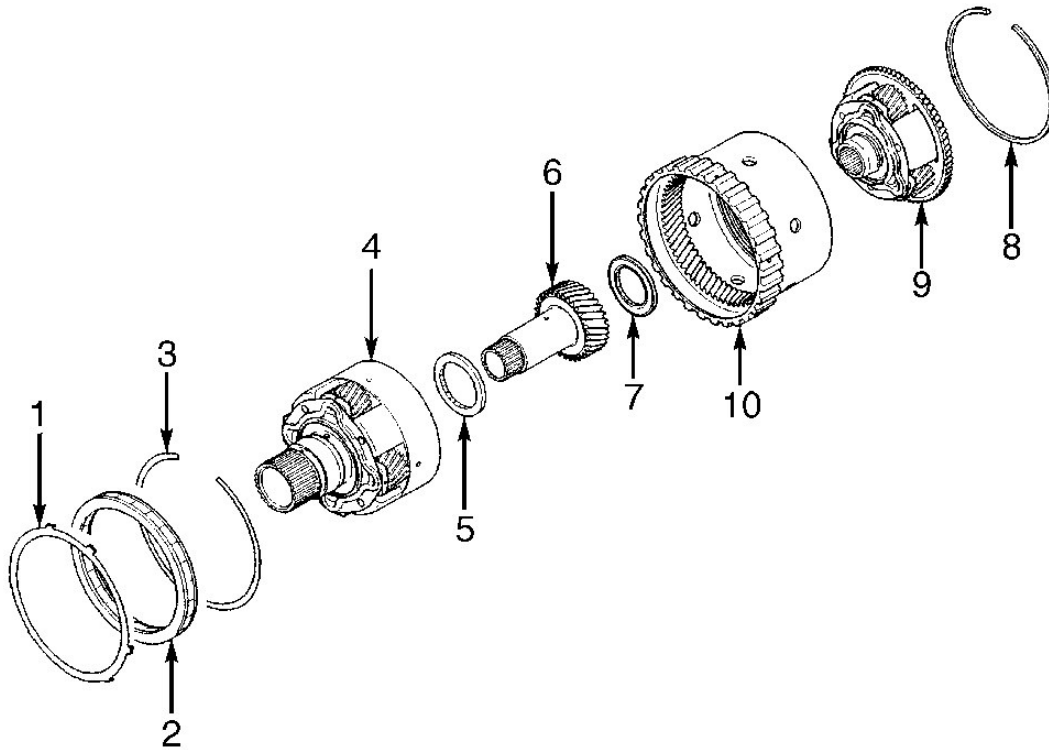


**Fig. 33: Aligning Reverse Clutch Piston & Retainer Outer Circumference Holes**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

## OVERDRIVE PLANETARY CARRIER

### Disassembly

Remove stopper plate and one-way clutch. Remove snap ring. Remove output planetary carrier. See **Fig. 34**. Remove underdrive sun gear and thrust bearings Nos. 3 and 4. Remove snap ring and remove overdrive planetary carrier from overdrive annulus gear.



1. Stopper Plate
2. One-Way Clutch
3. Snap Ring
4. Output Planetary Carrier
5. Thrust Bearing No. 3

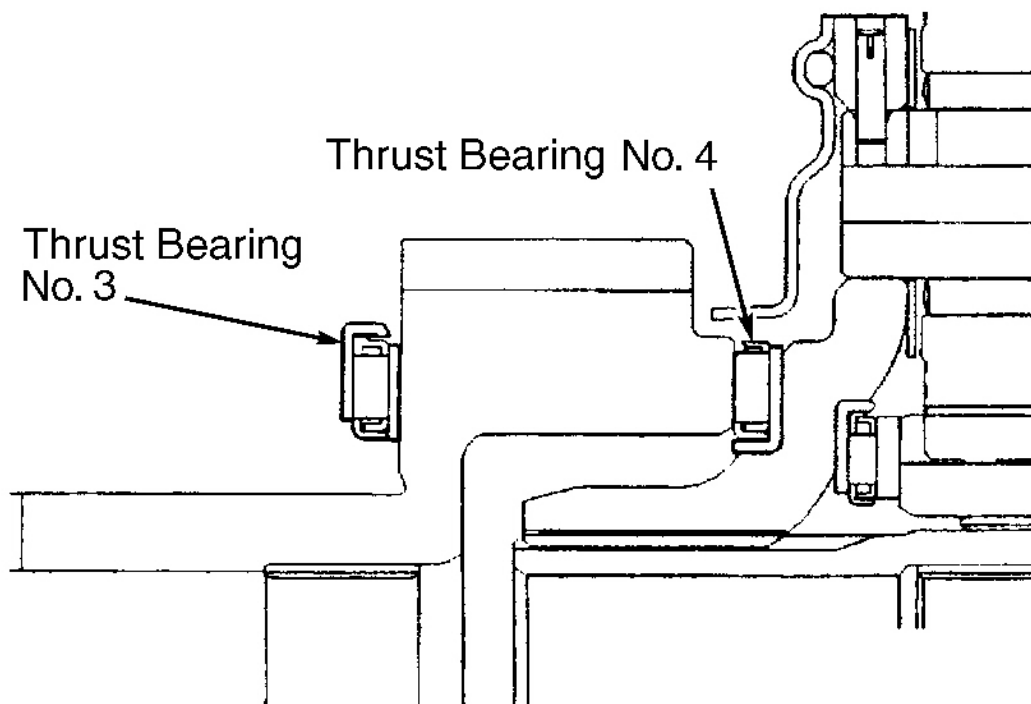
6. Underdrive Sun Gear
7. Thrust Bearing No. 4
8. Snap Ring
9. Overdrive Planetary Carrier
10. Overdrive Annulus Gear

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**Fig. 34: Exploded View Of Overdrive Planetary Carrier Assembly**  
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

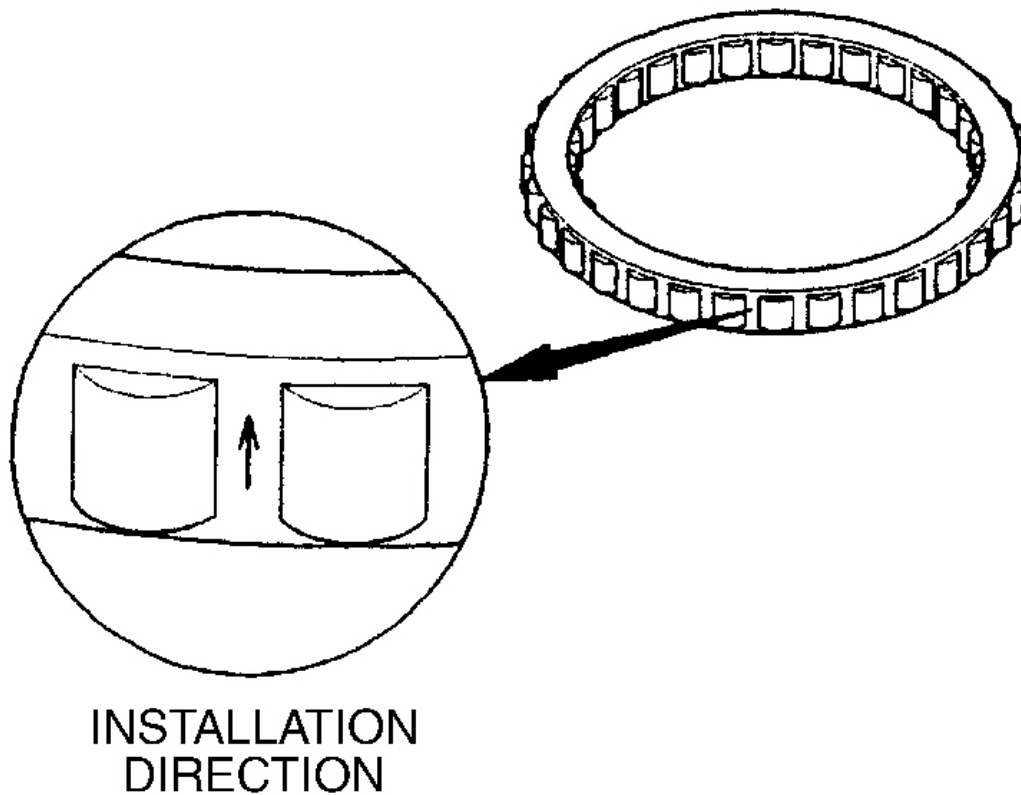
#### Reassembly

Lubricate all internal parts with ATF during reassembly. To assemble, reverse removal procedure. Ensure thrust bearings are installed as shown. See **Fig. 35**. Install one-way clutch so arrow points to output planetary carrier. See **Fig. 36**.



G00050279

**Fig. 35: Installing Thrust Bearings No. 3 & 4**  
**Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.**



G00050280

**Fig. 36: Installing Overdrive Planetary One-Way Clutch**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

## LOW-REVERSE BRAKE

### Disassembly & Reassembly

Remove "D" rings and low-reverse brake piston. To assemble, reverse removal procedure. Apply ATF or petroleum jelly to all "D" rings and low-reverse brake piston before installation.

## SECOND BRAKE

### Disassembly & Reassembly

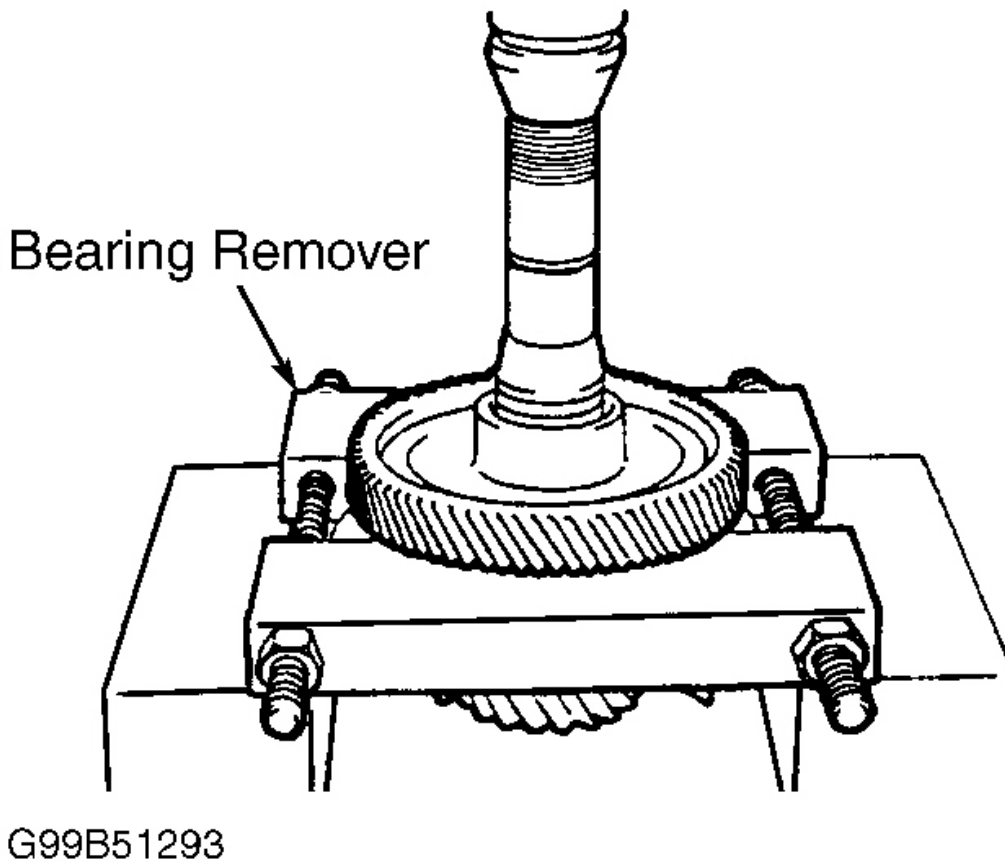
Separate second brake retainer, "D" ring, second brake piston and remaining "D" ring. To assemble, reverse removal procedure. Apply ATF or petroleum jelly to "D" rings and second brake retainer before installation.

## OUTPUT SHAFT

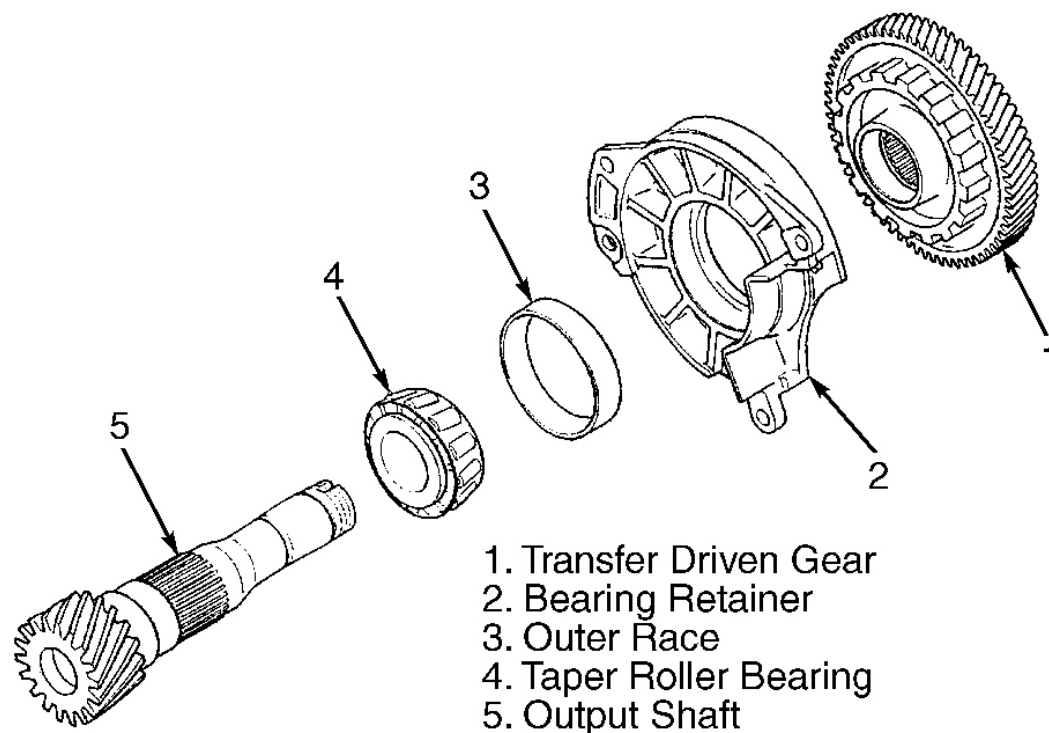


**Disassembly**

Using a press and Bearing Remover (MD998917), remove output shaft from transfer driven gear. See **Fig. 37** and **Fig. 38**. Using a hammer and punch, remove bearing race from bearing retainer. Using a press and Bearing Remover (MD998801), remove tapered roller bearing from output shaft.



**Fig. 37: Removing Transfer Driven Gear From Output Shaft**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



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**Fig. 38: Exploded View Of Output Shaft**

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

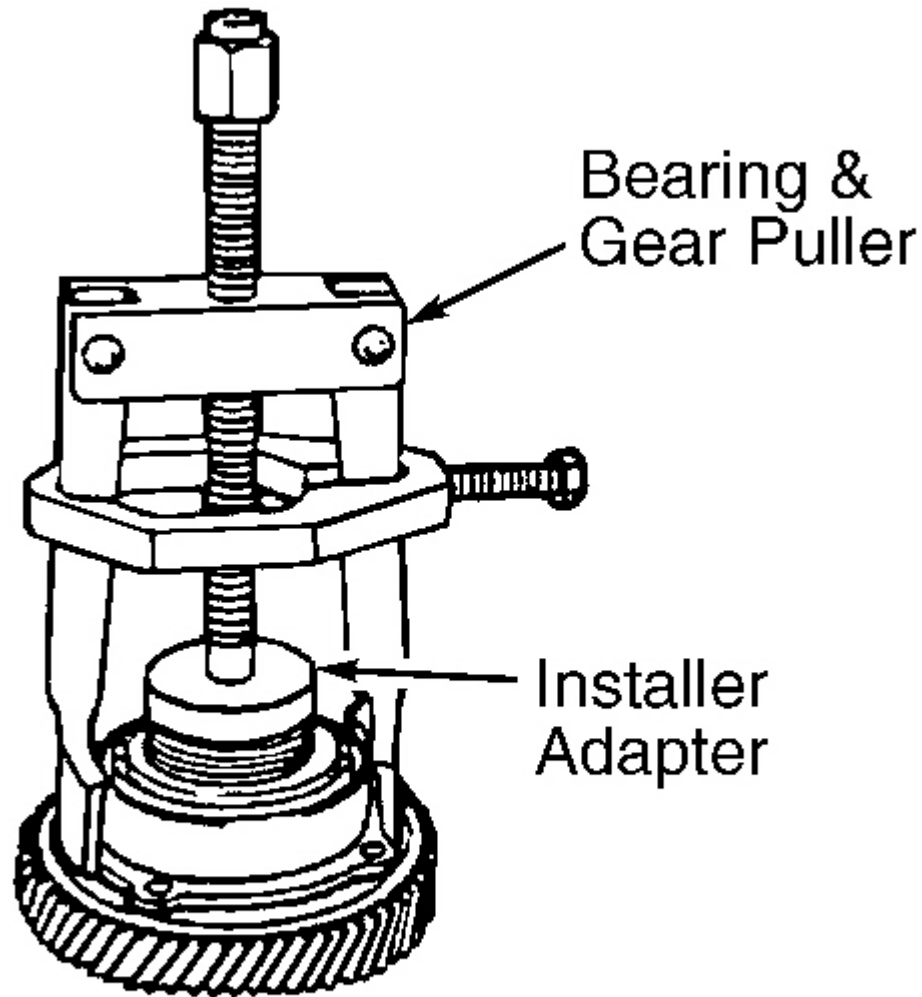
**Reassembly**

**NOTE:** Apply ATF to all moving parts during reassembly.

Using a press and Installer Cap (MD998812), Installer (MD998814) and Installer Adapter (MD998823), install NEW tapered roller bearing onto output shaft. Using a hammer, Handle (MB990938) and Installer Adapter (MB990936), install NEW bearing race into bearing retainer. Place bearing retainer on output shaft. Using a press, Installer Cap (MD998812), Installer (MD998813) and Installer Adapter (MD998823), install transfer driven gear onto output shaft.

**TRANSFER DRIVE GEAR****Disassembly**

Using a hammer and punch, straighten locking tabs of transfer drive gear lock nut. Using Lock Nut Socket (MB991626), remove lock nut from transfer drive gear. Using Bearing and Gear Puller (MD998348) and Installer Adapter (MB990928), remove bearing from transfer drive gear. See **Fig. 39**.



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**Fig. 39: Removing Transfer Drive Gear Bearing**

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

**Reassembly****NOTE:** Apply ATF to all moving parts during reassembly.

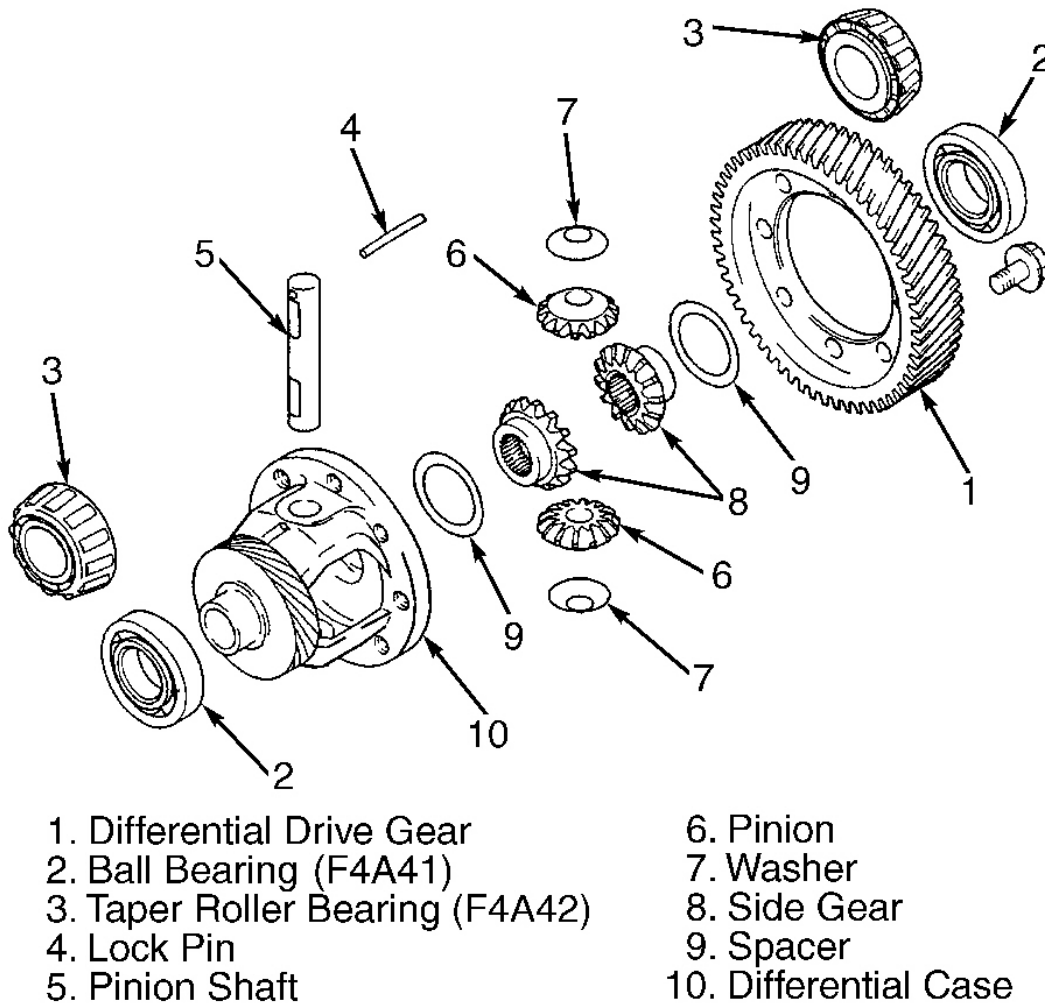
Using a press, Installer Cap (MD998812) and Installer Adapter (MD998829), install NEW bearing to transfer drive gear. Apply ATF to NEW transfer drive gear lock nut. Using Lock Nut Socket (MB991626), tighten

transfer drive gear lock nut to 141 ft. lbs. (191 N.m). Loosen transfer drive gear lock nut one turn and re-tighten transfer drive gear lock nut to 141 ft. lbs. (191 N.m). Using a hammer and punch, bend locking tabs of transfer drive gear lock nut in 2 places.

## DIFFERENTIAL

### Disassembly

Remove differential drive gear mounting bolts. Remove differential drive gear from differential case. See **Fig. 40**. Using a press and Bearing Remover (MD998801), remove differential case side bearings (ball bearings are used on F4A41 transaxle and roller bearings are used on F4A42 transaxle). Remove pinion shaft lock pin. Remove pinion shaft. Remove pinion gears and thrust washers. Remove side gears and spacers.



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**Fig. 40: Exploded View Of Differential Assembly**

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

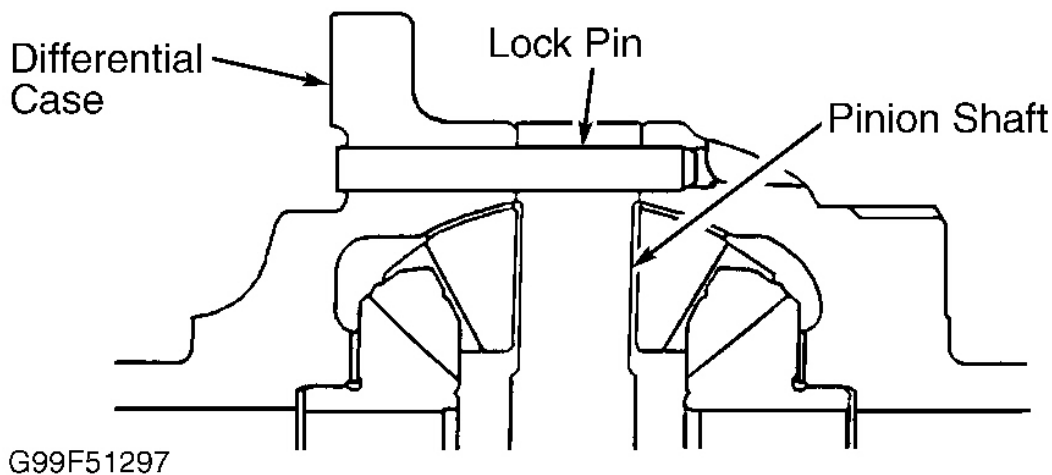
### Reassembly

**NOTE:** Apply ATF to all moving parts during reassembly.

1. Install spacers on side gears. If replacing side gears, use .0366-.0395" (.930-1.00 mm) medium thickness spacers. If using original side gears, use original spacers. Install side gears and spacers into differential case. Position thrust washers on back of pinion gears and mesh pinion gears with side gears in differential case. Insert pinion shaft in differential case and through pinion gears.

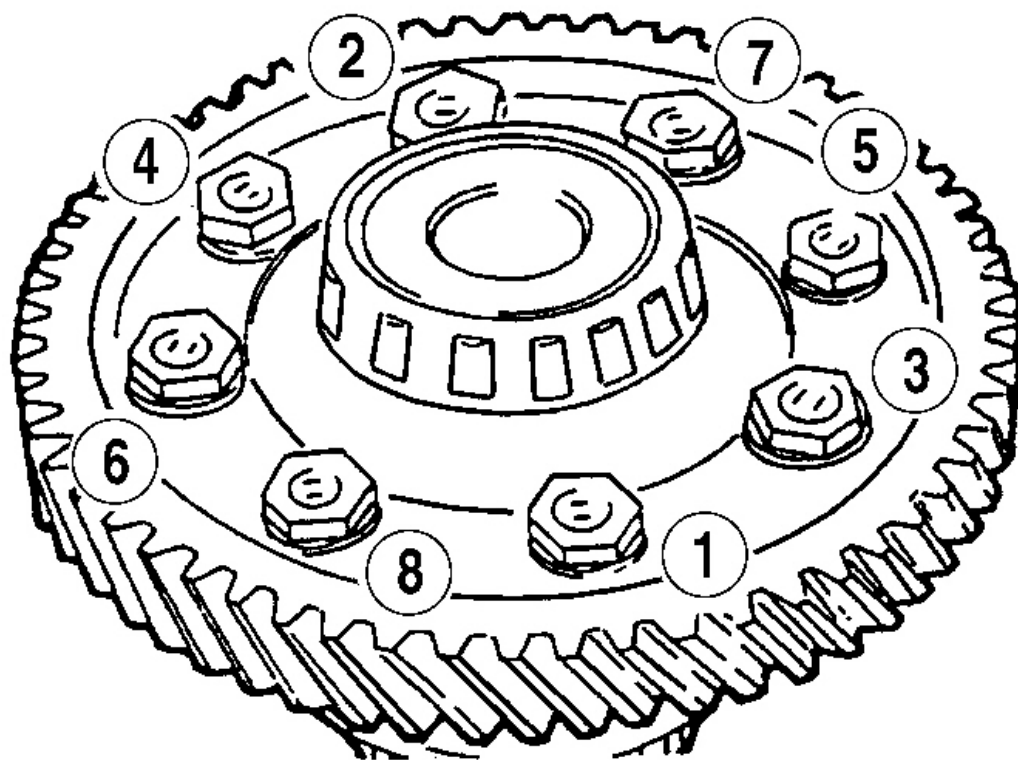
**NOTE:** When measuring backlash, ensure both sides are equal.

2. Measure backlash between side gears and pinions. Backlash should be .001-.006" (.03-.15 mm). If backlash is not within specification, select and install appropriate spacers and re-measure backlash. If backlash is within specification, go to next step.
3. Insert lock pin into pinion shaft, chamfered side first. See **Fig. 41**. On F4A41 models, using a press, Installer Cap (MD998812) and Installer Adapter (MD998819), install differential case ball bearings. On F4A42 models, using Installer Cap (MD998812) and Installer Adapter (MD998820), install differential case tapered roller bearings. Apply ATF to differential drive gear bolt threads. Mount differential drive gear to differential case. Tighten differential drive gear bolts in sequence, to 98 ft. lbs. (133 N.m). See **Fig. 42**.



**Fig. 41: Installing Lock Pin Into Pinion Shaft**

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



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**Fig. 42: Differential Drive Gear Tightening Sequence**  
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

## VALVE BODY

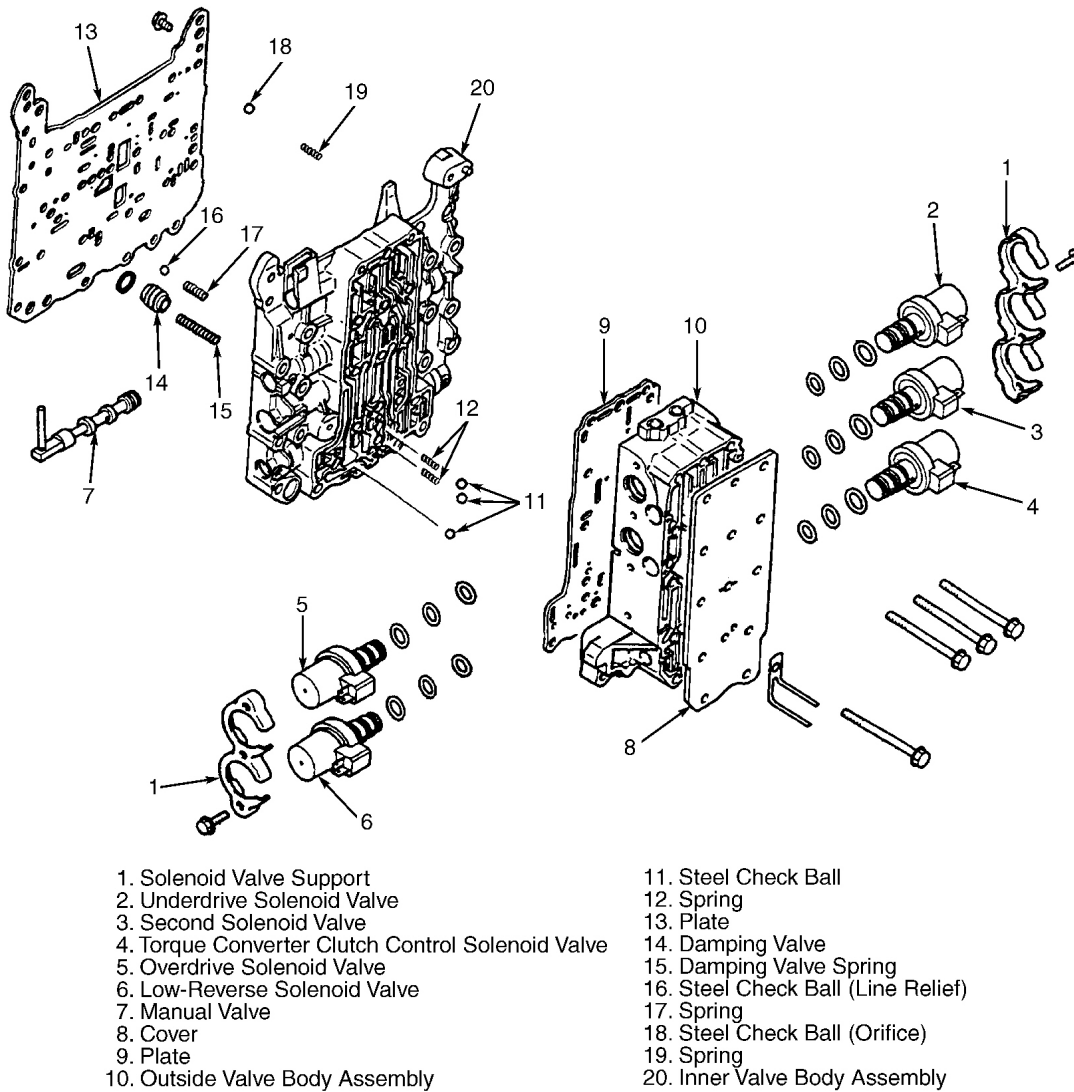
### Disassembly

**NOTE:** Mark and/or note valve body component locations during disassembly to ensure correct installation on assembly.

1. Remove solenoid valve supports. See **Fig. 43**. Mark and remove all solenoid valves from valve body. Remove manual valve from valve body. Remove cover and plate from outside valve body assembly. Remove steel check balls and springs. Remove plate from inner valve body. Remove damping valve and spring. Remove steel check ball (line relief) and spring. Remove steel check balls and springs.
2. Remove roller and torque converter clutch control valve sleeve from inner valve body. See **Fig. 44**. Remove torque converter clutch control valve and spring. Remove plate and screw. Remove regulator valve spring and regulator valve. Remove plate and fail-safe valve "A" sleeve. Remove fail-safe valve A2. Remove fail-safe valve "A" spring. Remove fail-safe valve A1. Remove plate and plug. Remove

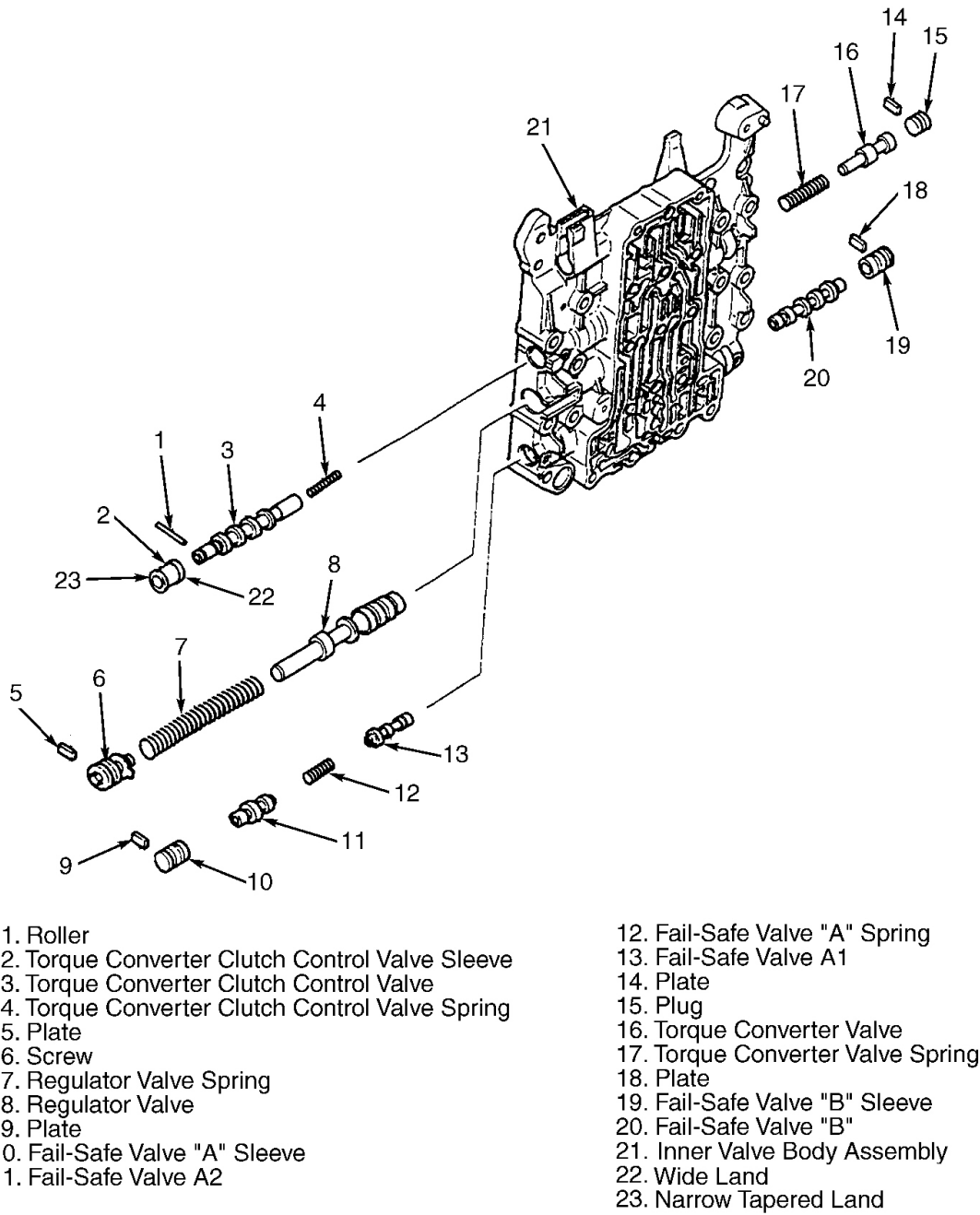
torque converter valve and spring. Remove plate and fail-safe valve "B" sleeve.

3. Remove roller and overdrive pressure control valve sleeve. See **Fig. 45**. Remove overdrive pressure control valve and spring. Remove roller and low-reverse pressure control valve sleeve. Remove low-reverse pressure control valve and spring. Remove plate, plug and switching valve. Remove roller and underdrive pressure control valve sleeve. Remove underdrive pressure control valve and spring. Remove roller and second pressure control valve sleeve. Remove second pressure control valve and spring.



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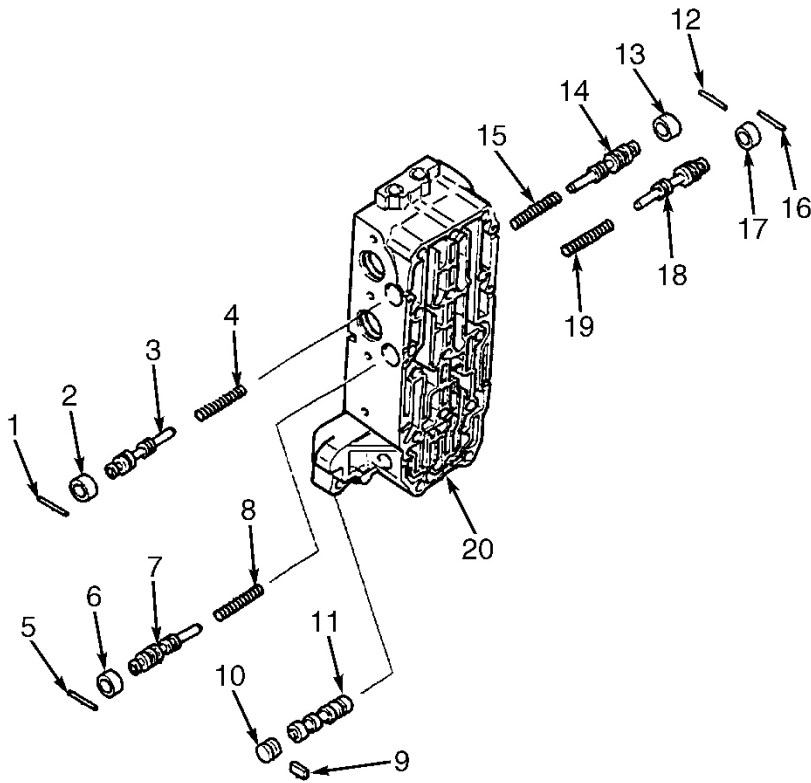
**Fig. 43: Exploded View Of Inner & Outer Valve Body**  
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



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**Fig. 44: Exploded View Of Inner Valve Body**  
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.





1. Roller
2. Overdrive Pressure Control Valve Sleeve
3. Overdrive Pressure Control Valve
4. Overdrive Pressure Control Valve Spring
5. Roller
6. Low-Reverse Pressure Control Valve Sleeve
7. Low-Reverse Pressure Control Valve
8. Low-Reverse Pressure Control Valve Spring
9. Plate
10. Plug
11. Switching Valve
12. Roller
13. Underdrive Pressure Control Valve Sleeve
14. Underdrive Pressure Control Valve
15. Underdrive Pressure Control Valve Spring
16. Roller
17. Second Pressure Control Valve Sleeve
18. Second Pressure Control Valve
19. Second Pressure Control Valve Spring
20. Outer Valve Body Assembly

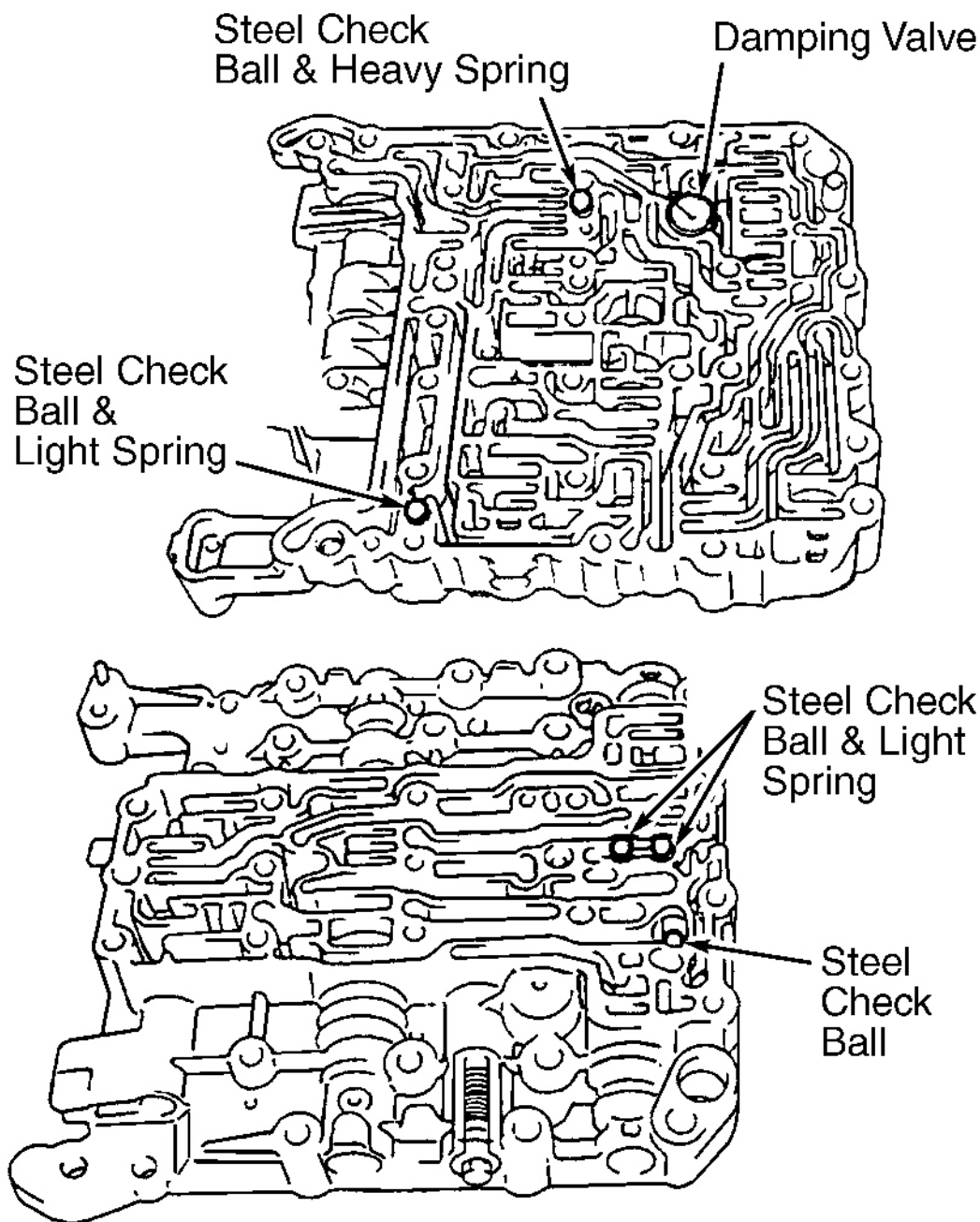
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**Fig. 45: Exploded View Of Outer Valve Body**  
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

**Reassembly**

**NOTE:**        **Apply ATF to all moving parts during assembly.**

To assemble, reverse disassembly procedure. Ensure check balls and springs are installed in correct locations. See **Fig. 46**. For valve body spring identification, see **VALVE BODY SPRING IDENTIFICATION** table. Ensure solenoid valves are installed in correct locations. See **Fig. 43**.



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**Fig. 46: Locating Valve Body Steel Check Balls & Springs**  
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

#### VALVE BODY SPRING IDENTIFICATION

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2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul

Spring	OD - In. (mm)	Free Length - In. (mm)	Number Of Coils
Regulator Valve	.618 (15.7)	3.413 (86.70)	24
Underdrive Pressure Control Valve	.299 (7.60)	1.484 (37.70)	25
Overdrive Pressure Control Valve	.299 (7.60)	1.484 (37.70)	25
Low-Reverse Pressure Control Valve	.299 (7.60)	1.484 (37.70)	25
Second Pressure Control Valve	.299 (7.60)	1.484 (37.70)	25
Torque Converter	.441 (11.2)	1.354 (34.40)	12.5
Torque Converter Clutch Control Valve	.232 (5.90)	1.106 (28.10)	19
Fail-Safe Valve A	.350 (8.90)	.862 (21.9)	9.5
Damping Valve	.303 (7.70)	1.409 (35.80)	17
Line Relief Valve	.276 (7.00)	.681 (17.3)	10
Orifice Check Ball	.177 (4.50)	.677 (17.2)	15

### SPEEDOMETER GEAR

#### Disassembly & Reassembly

**NOTE:** Apply ATF to all internal parts during reassembly.

Remove "E" clip, speedometer gear and "O" ring as necessary. To reassemble, reverse disassembly procedure.

### DRIVE SHAFT OIL SEAL

**NOTE:** Apply ATF to all internal parts during reassembly.

#### Disassembly & Reassembly

Using a hammer and punch, remove drive shaft oil seal(s) from torque converter housing and transaxle case. Using a hammer and Oil Seal Installer (MD998800), install NEW drive shaft oil seal(s). Coat seal lips with ATF.

## TRANSAXLE REASSEMBLY

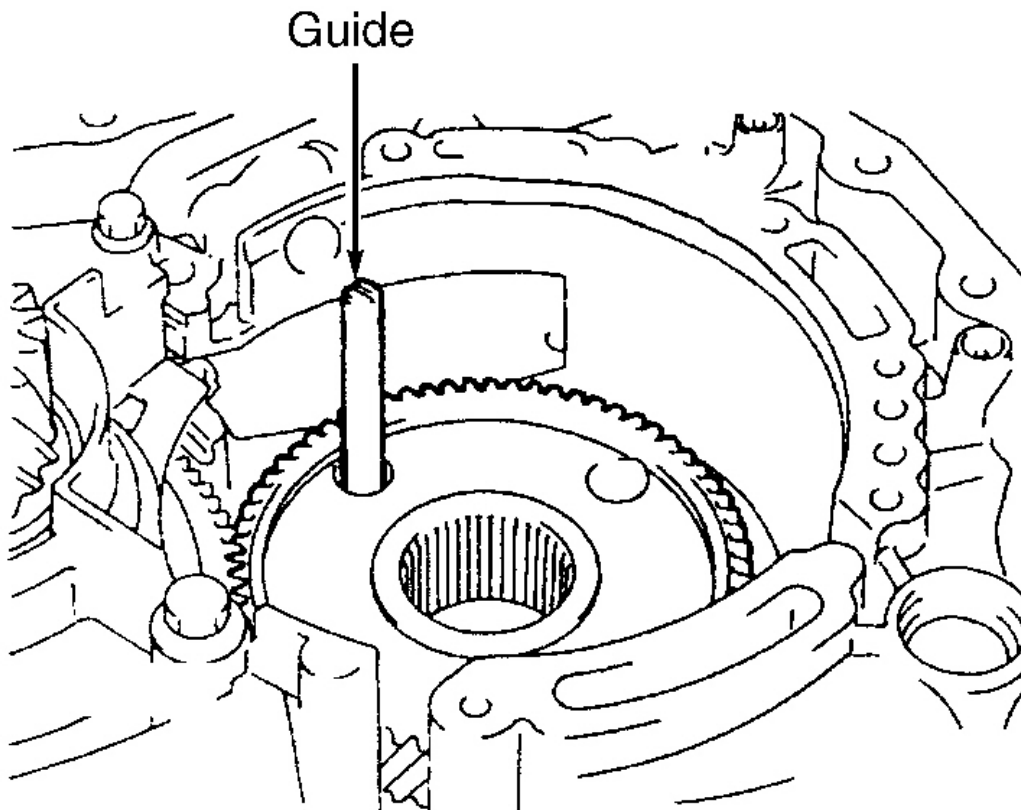
### VALVE BODY & INTERNAL COMPONENTS

**NOTE:** Apply ATF to all internal parts during reassembly.

**NOTE:** Never reuse gaskets, "O" rings or seals. Use petroleum jelly (Vaseline) to hold thrust bearings, thrust races and thrust washers in position, DO NOT use

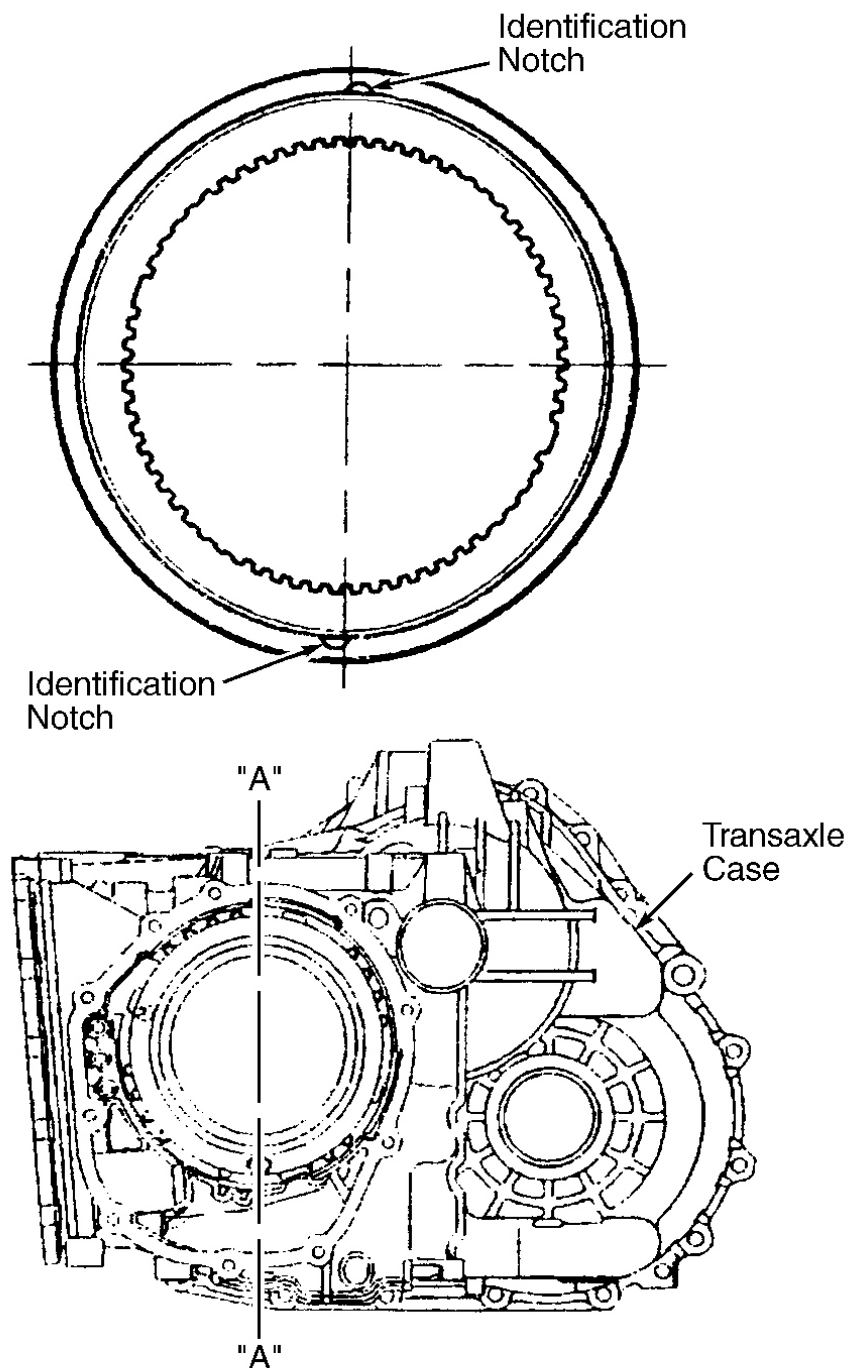
**grease. Soak brake and clutch discs in ATF for at least 2 hours before assembly. Ensure thrust bearings, thrust races and thrust washers are installed in their correct locations and in the proper direction. See Fig. 14.**

1. On F4A42 models, using a hammer, Installer Adapter (MB990935) and Installer Handle (MB990938), install differential bearing outer race into transaxle case. On all models, install Guide (MD998412) in the installation screw hole in transaxle case. See **Fig. 47**. Using Guide tool, install transfer drive gear and bearing in transaxle case. Install transfer drive gear retaining bolts and tighten to 25 ft. lbs. (34 N.m). Install low-reverse brake piston, return spring and spring retainer in transaxle case. Install a NEW "O" ring into groove of one-way clutch inner race. Install one-way clutch inner race to transfer drive gear bearing so the notches align with the "A" line shown in illustration. See **Fig. 48**. Position inner race snap ring on inner race. Using Spring Compressor (MB991628) and Spring Compressor Retainer (MD998924), install snap ring. See **Fig. 23**.



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**Fig. 47: Installing Transfer Drive Gear Guide**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



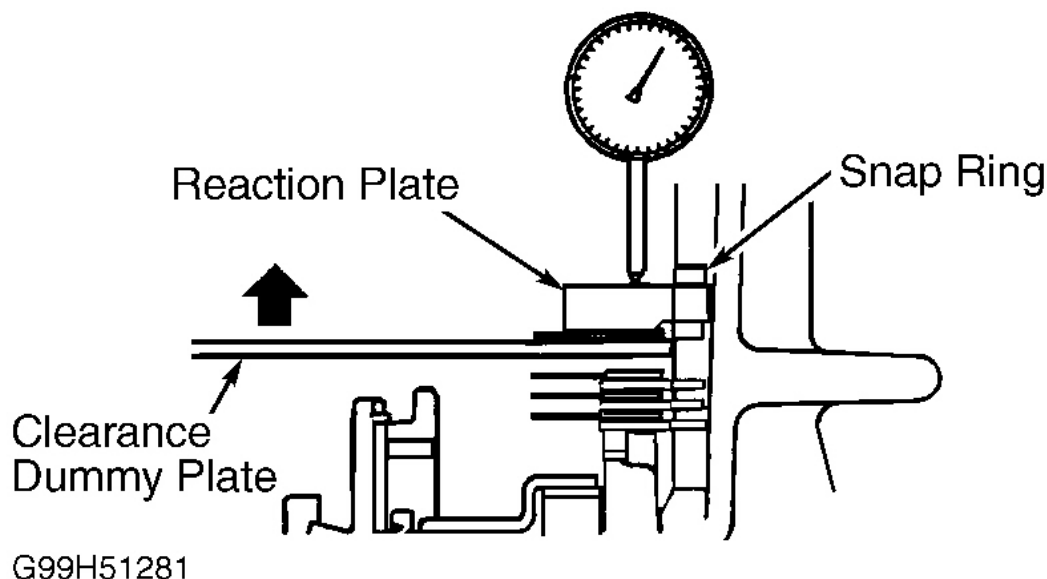
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**Fig. 48: Installing One-Way Clutch**

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

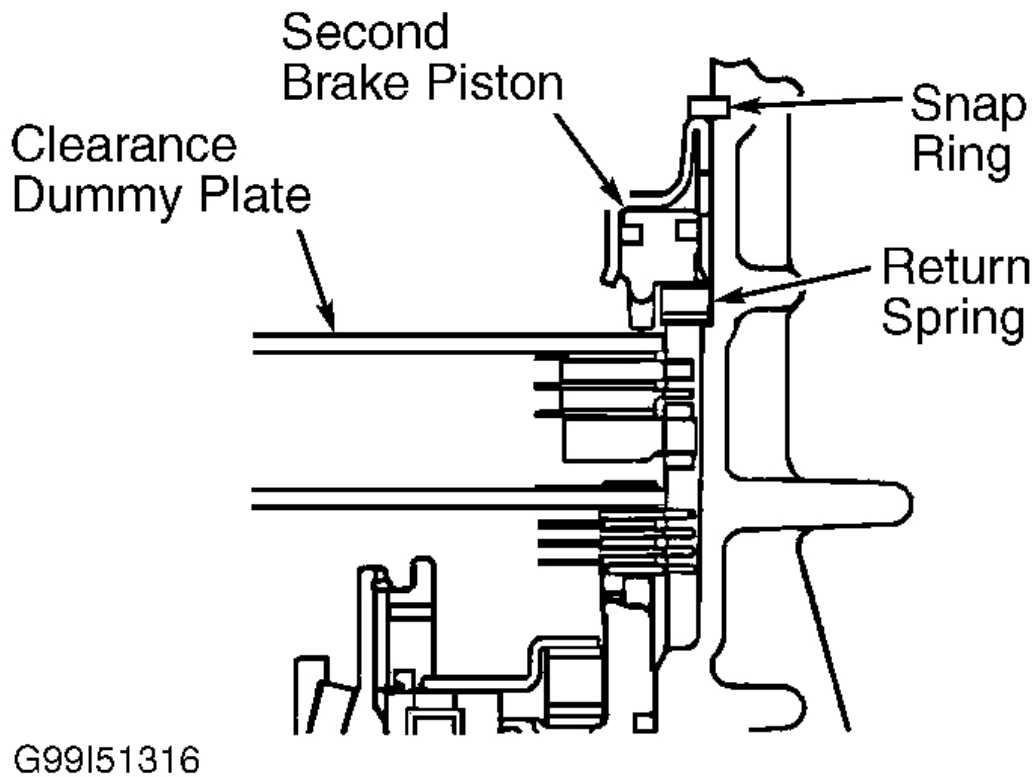
2. Install wave spring on low-reverse brake piston. Install low-reverse brake discs (F4A41 transaxle has 4; F4A42 transaxle has 5), brake plates (F4A41 transaxle has 3; F4A42 transaxle has 4) and snap ring. See

**Fig. 22.** DO NOT install pressure plate at this time. Install Clearance Dummy Plate (MB991631) as shown. See **Fig. 49**. Install reaction plate and original snap ring, and position a dial indicator as shown. Lift up Clearance Dummy Plate and measure end play using a dial indicator. End play should be 0-.006" (0-.16 mm). If end play is as specified, go to next step. If end play is not as specified, select and replace snap ring to adjust clearance. See **LOW-REVERSE BRAKE & SECOND BRAKE REACTION PLATE SNAP RING SPECIFICATIONS** table.



**Fig. 49: Measuring Low-Reverse Brake End Play (F4A42 Shown; F4A41 Is Similar)**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

3. Install second brake discs (F4A41 transaxle has 2; F4A42 transaxle has 3), and brake plates (F4A41 transaxle has 1; F4A42 transaxle has 2). DO NOT install pressure plate at this time. Install Clearance Dummy Plate (MB991631) on top of brake disc in place of pressure plate as shown. See **Fig. 50**. Install return spring, second brake piston and snap ring. Lift Clearance Dummy Plate and measure movement with dial indicator. On F4A41, clearance should be .019-.037 (.49-.95 mm) and F4A42, clearance should be .031-.049" (.79-1.25 mm). If clearance is not within specification, select and install correct thickness pressure plate that corresponds to measured amount of movement. See **SECOND BRAKE PRESSURE PLATE THICKNESS (F4A41)** or **SECOND BRAKE PRESSURE PLATE THICKNESS (F4A42)** table.

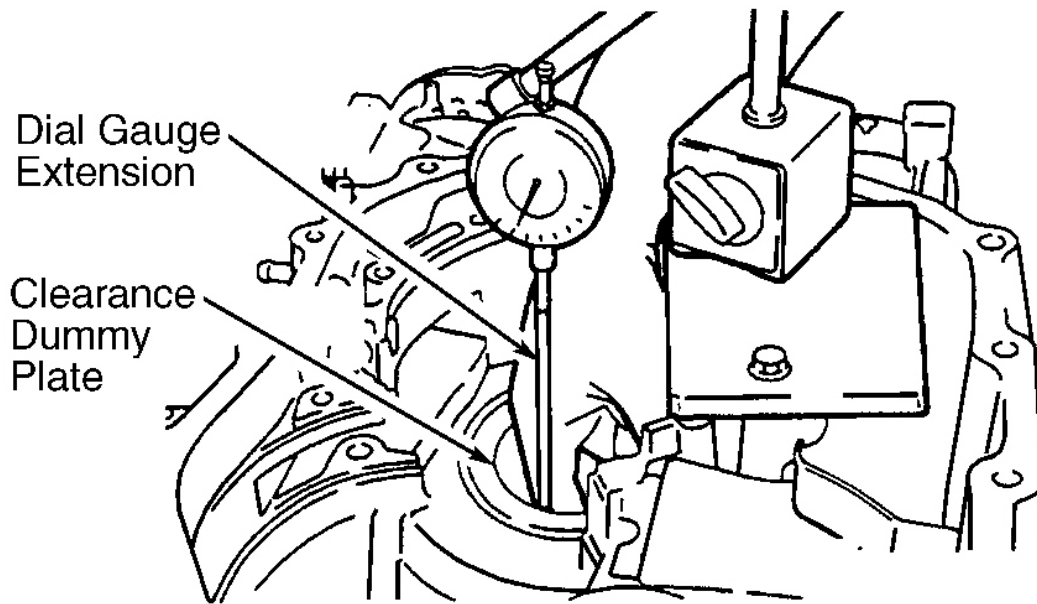


**Fig. 50: Installing Second Brake Discs & Plates For Second Brake End Play Adjustment (F4A42 Shown; F4A41 Is Similar)**

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

4. Turn transaxle so mounting flange of torque converter housing is facing upward. Install Extension (MD998913) on dial indicator. Lift Clearance Dummy Plate and measure movement. See **Fig. 51**. End play on F4A41 transaxle should be .041-.059" (1.05-1.51 mm) and on F4A42 transaxle .053-.071" (1.35-1.81 mm). If clearance is not within specification, select and install appropriate size pressure plate whose thickness corresponds to measured amount of clearance. See **LOW-REVERSE BRAKE PRESSURE PLATE THICKNESS (F4A41)** or **LOW-REVERSE BRAKE PRESSURE PLATE THICKNESS (F4A42)** table.





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**Fig. 51: Measuring Low-Reverse Clutch End Play**  
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

#### LOW-REVERSE BRAKE & SECOND BRAKE REACTION PLATE SNAP RING SPECIFICATIONS

Thickness - In. (mm)	Identification Color	Part Number
.087 (2.2)	Blue	MD754786
.091 (2.3)	Brown	MD754787
.094 (2.4)	None	MD758240
.098 (2.5)	Blue	MD758241

#### SECOND BRAKE PRESSURE PLATE THICKNESS (F4A41)

Movement Amount - In. (mm)	Plate Thickness - In. (mm)	ID Symbol	Part Number
.012-.020 (.30-.50)	.063 (1.60)	L	MD759567
.020-.028 (.50-.70)	.071 (1.80)	1	MD759414
.028-.035 (.70-.90)	.079 (2.00)	0	MD759415
.035-.043 (.90-1.10)	.087 (2.20)	2	MD759416

**2000 Hyundai Sonata**

2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 &amp; F4A42 Overhaul

1.10)			
.043-.051 (1.10-1.30)	.094 (2.40)	4	MD759417
.051-.059 (1.3-1.5)	.102 (2.60)	6	MD759418

**SECOND BRAKE PRESSURE PLATE THICKNESS (F4A42)**

<b>Movement Amount - In. (mm)</b>	<b>Plate Thickness - In. (mm)</b>	<b>ID Symbol</b>	<b>Part Number</b>
.024-.031 (0.6-0.8)	.063 (1.6)	L	MD759567
.031-.039 (0.8-1.0)	.071 (1.8)	1	MD759414
.039-.047 (1.0-1.2)	.079 (2.0)	0	MD759415
.047-.055 (1.2-1.4)	.087 (2.2)	2	MD759416
.055-.062 (1.4-1.6)	.094 (2.4)	4	MD759417
.062-.071 (1.6-1.8)	.102 (2.6)	6	MD759418

**LOW-REVERSE BRAKE PRESSURE PLATE THICKNESS (F4A41)**

<b>Movement Amount - In. (mm)</b>	<b>Plate Thickness - In. (mm)</b>	<b>ID Symbol</b>	<b>Part Number</b>
.028-.035 (.70-.90)	.063 (1.60)	L	MD759567
.035-.043 (.90-1.10)	.071 (1.80)	1	MD759414
.043-.051 (1.10-1.30)	.079 (2.00)	0	MD759415
.051-.059 (1.30-1.50)	.087 (2.20)	2	MD759416
.059-.067 (1.50-1.70)	.094 (2.40)	4	MD759417
.067-.075 (1.70-1.90)	.102 (2.60)	6	MD759418
.075-.083 (1.90-2.10)	.110 (2.80)	8	MD759419
.083-.091 (2.10-2.30)	.118 (3.00)	D	MD759420

**LOW-REVERSE BRAKE PRESSURE PLATE THICKNESS (F4A42)**

<b>Movement Amount - In. (mm)</b>	<b>Plate Thickness - In. (mm)</b>	<b>ID Symbol</b>	<b>Part Number</b>
.039-.047 (1.00-1.20)	.063 (1.60)	L	MD759567
.047-.055 (1.20-1.40)	.071 (1.80)	1	MD759414
.055-.063 (1.40-1.60)	.079 (2.00)	0	MD759415
.063-.071 (1.60-1.80)	.087 (2.20)	2	MD759416
.071-.079 (1.80-2.00)	.094 (2.40)	4	MD759417
.079-.087 (2.00-2.20)	.102 (2.60)	6	MD759418
.087-.094 (2.20-2.40)	.110 (2.80)	8	MD759419
.094-.102 (2.40-2.60)	.118 (3.00)	D	MD759420

- Remove special tools and previous components installed to measure second brake preload clearance. Remove and separate pressure plate and selected snap installed in step 2. Install snap ring into groove of transaxle case output shaft bore. Install thinnest output shaft preload Adjustment Spacer (MD756579). This spacer may be replaced with one of a different thickness after checking output shaft end play. Using a hammer, Handle (MB990938), and Installer Adapter (MB990930), install output shaft bearing outer race in transaxle case.

**CAUTION: DO NOT reuse output shaft bearing retainer bolts, as they have a coating of pre-applied sealant.**

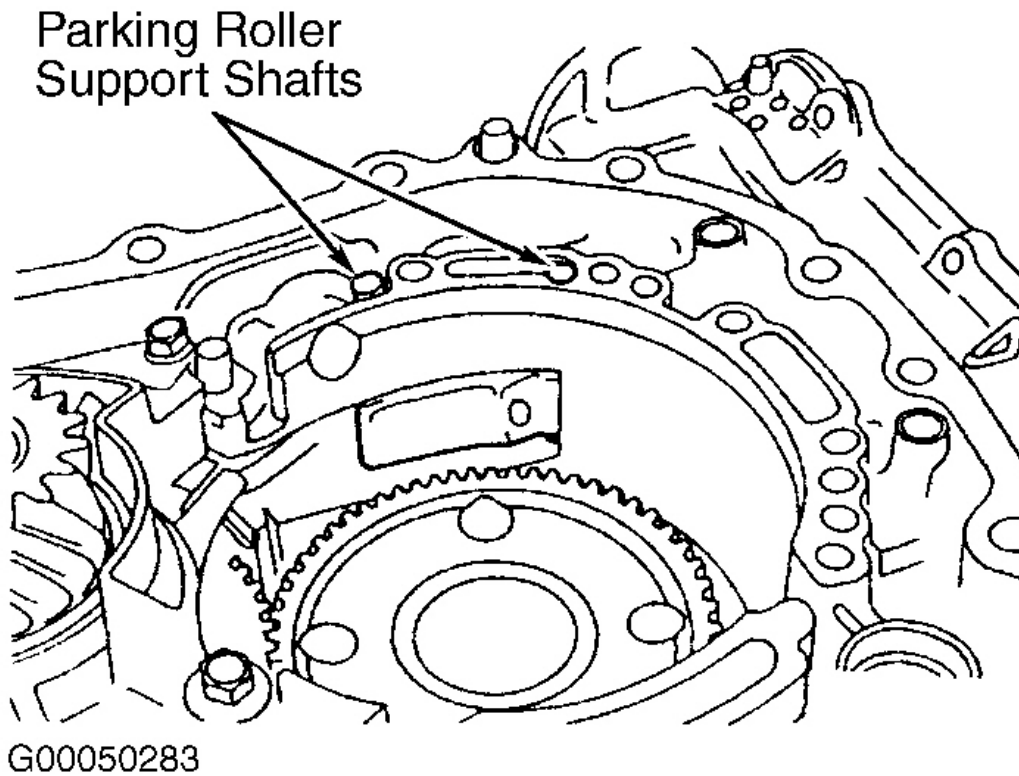
- Using original bolts temporarily, install output shaft bearing retainer and tighten mounting bolts to specification. See **TORQUE SPECIFICATIONS**. Install output shaft into transaxle case. Using Bearing Installer (MD998350), install collar and tapered roller bearing on output shaft. Temporarily install original reverse threaded output shaft lock nut. Using Special Sockets (MB991625 and MB990607), tighten output shaft lock nut to specification. See **Fig. 25**. Loosen output shaft lock nut one turn, and then re-tighten to specification.
- Using a dial indicator, measure and note output shaft end play. Output shaft end play should be .0004-.0035" (.01-.09 mm). If end play is not within specification, remove previously installed components including the thinnest output shaft preload adjustment spacer previously installed.
- To determine thickness of proper adjustment spacer needed, use the following formula: Add measured output shaft end play to .074" (.01 mm), record measurement, then add .0004" (.01 mm). Record measurement as "A". Add measured output shaft end play to .074" (.01 mm), record measurement, then add .0035" (.09 mm). Record measurement as "B". Select output shaft preload spacer that is closest to measured range between "A" and "B". See **OUTPUT SHAFT PRELOAD SPACER**

**SPECIFICATIONS** table. Install proper size adjustment spacer and repeat procedure to ensure end play is within specification.

#### OUTPUT SHAFT PRELOAD SPACER SPECIFICATIONS

Thickness - In. (mm)	Identification Number	Part Number
.0740 (1.88)	88	MD756579
.0756 (1.92)	92	MD756580
.0772 (1.96)	96	MD756581
.0787 (2.00)	00	MD756582
.0803 (2.04)	04	MD756583
.0819 (2.08)	08	MD756584
.0835 (2.12)	12	MD756585
.0850 (2.16)	16	MD756586
.0866 (2.20)	20	MD756587
.0882 (2.24)	24	MD756588
.0898 (2.28)	28	MD756589
.0913 (2.32)	32	MD756590
.0929 (2.36)	36	MD756591
.0945 (2.40)	40	MD756592
.0961 (2.44)	44	MD756593
.0976 (2.48)	48	MD756594
.0992 (2.52)	52	MD756595
.1008 (2.56)	56	MD756596
.1024 (2.60)	60	MD756597
.1039 (2.64)	64	MD756598
.1055 (2.68)	68	MD756599
.1071 (2.72)	72	MD760685
.1087 (2.76)	76	MD760686

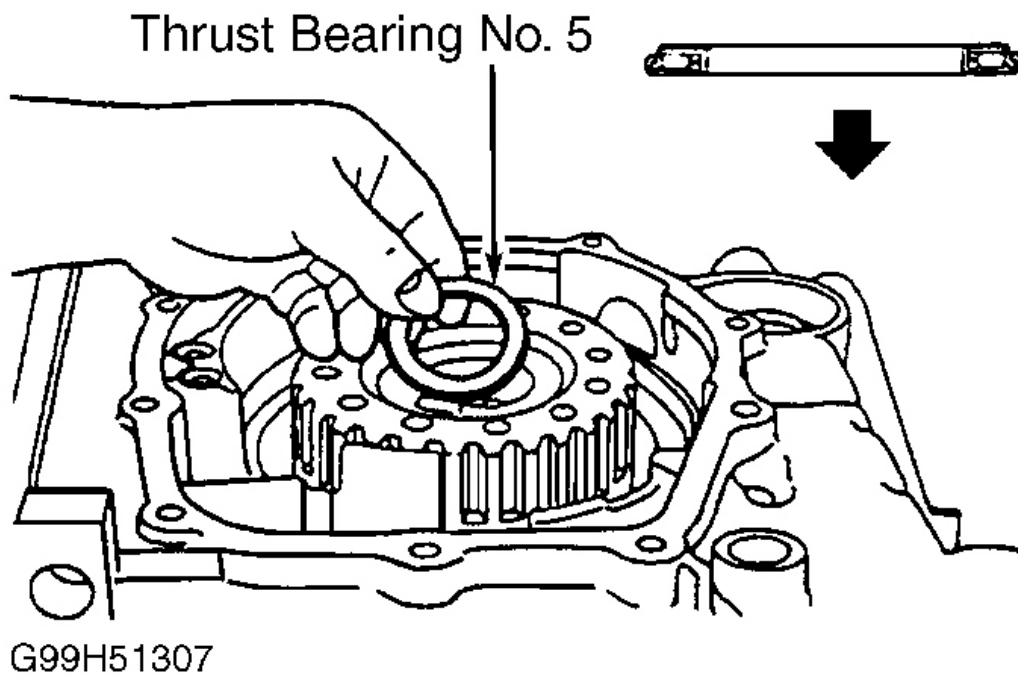
9. Reinstall collar and tapered roller bearing. Reinstall output shaft bearing retainer with NEW mounting bolts. Tighten output shaft bearing retainer mounting bolts to specification. See **TORQUE SPECIFICATIONS**. Apply ATF to threads of a NEW reverse threaded output shaft lock nut and tighten to specification. Turn output shaft lock nut back one turn and then retighten to specification. Using a hammer and punch, stake lock nut in 2 places. Using a hammer, Installer Adapter (MB990931) and Handle (MB990938), install output shaft cap into transaxle case until cap is recessed in case .098-.118" (2.5-3.0 mm).
10. Position parking pawl, spacer and spring in place and install parking pawl shaft. Install parking roller support, and the 2 parking roller support shafts. See **Fig. 52**. Install planetary carrier assembly in transfer case. Install planetary reverse sun gear.



**Fig. 52: Installing Parking Roller Support Shafts**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

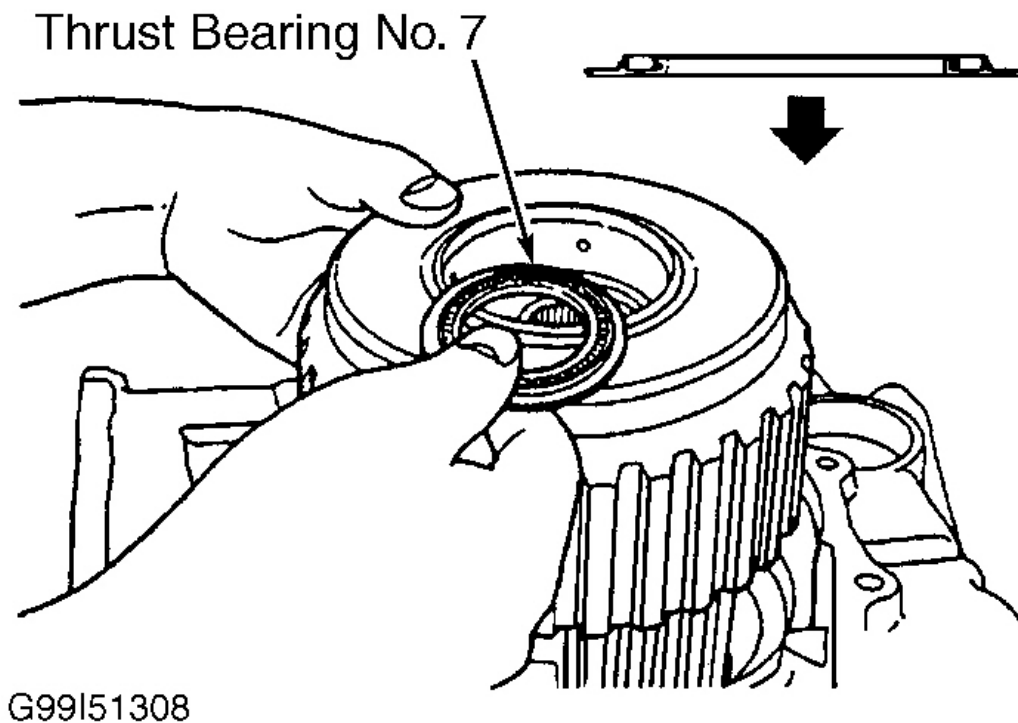
11. Install wave spring on low-reverse brake piston. Install pressure plate. Install brake discs and brake plates (F4A41 models use 4 brake discs and 3 brake plates, and F4A42 models use 5 brake discs and 4 brake plates). Install snap ring. Install reaction plate. Install snap ring selected in step 2. Install brake discs and brake plates (F4A41 models use 2 brake discs and one brake plate, and F4A42 models use 3 brake discs, and 2 brake plates). Install return spring and second brake piston. Install snap ring over second brake piston.

**NOTE:** Ensure thrust bearings are installed in the proper location and direction.  
See Fig. 14.



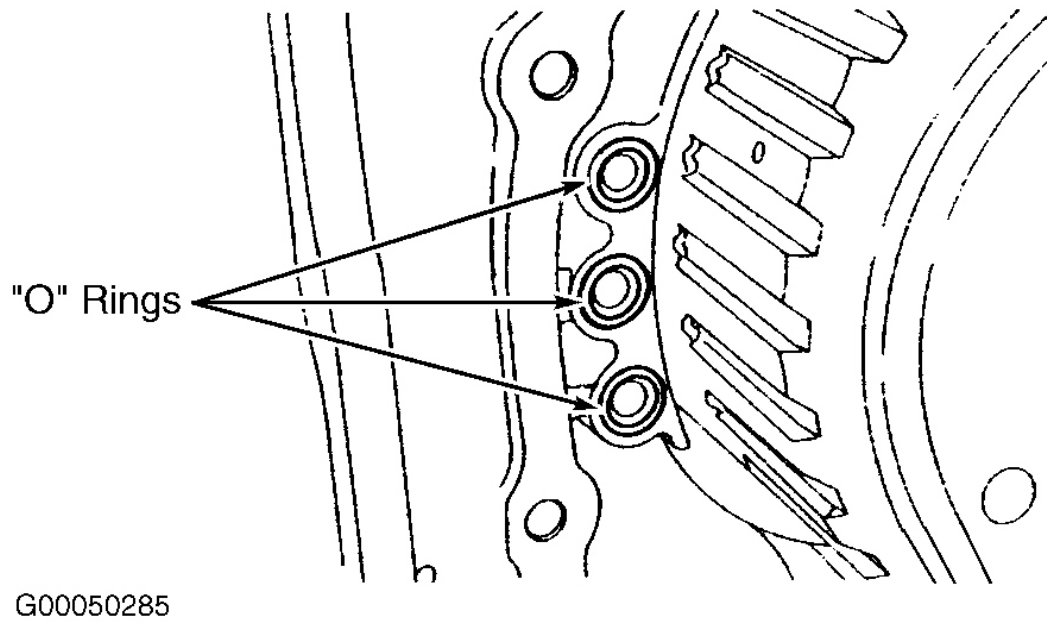
**Fig. 53: Installing Thrust Bearing No. 5**

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

**Fig. 54: Installing Thrust Bearing No. 7**

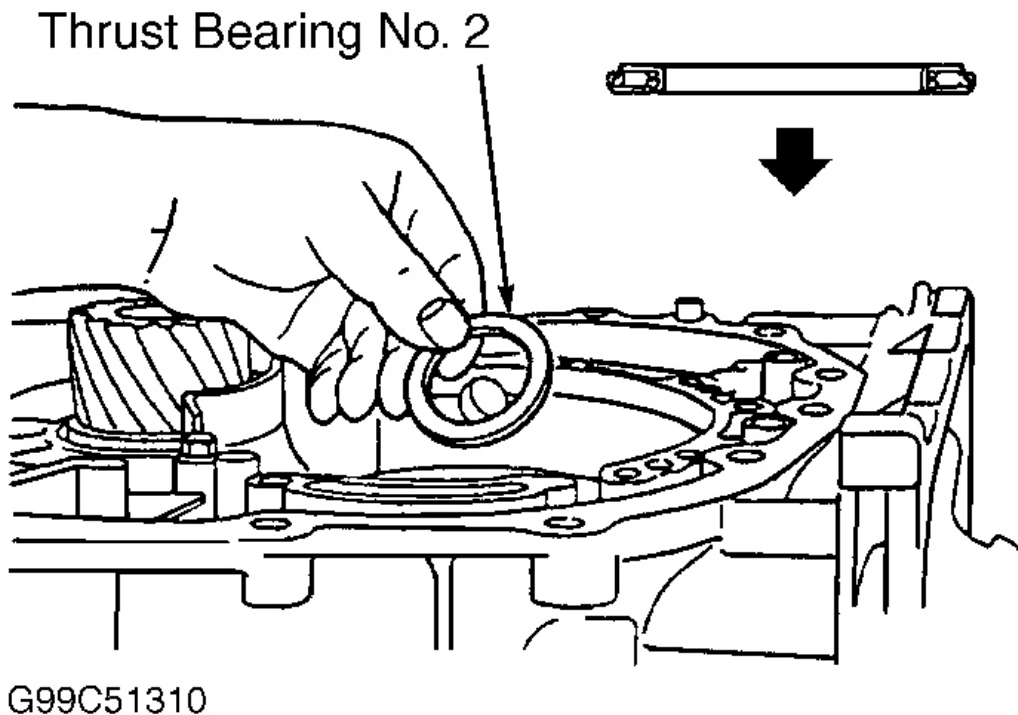
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

12. Install thrust bearing No. 5 onto planetary reverse sun gear. See **Fig. 53**. Install overdrive clutch hub in planetary reverse sun gear. Install thrust bearing No. 6 on overdrive clutch hub. Install reverse and overdrive clutch to overdrive clutch hub and planetary reverse sun gear. Install thrust bearing No. 7. See **Fig. 54**.
13. Using a hammer and appropriate installer adapter, install input shaft rear bearing in rear cover. Install 4 NEW sealing rings in rear cover grooves. Install the thinnest thrust race No. 8, .063" (1.6 mm) thick, (MD707267) on thrust bearing No. 7. Install rear cover to transfer case and tighten retaining bolts to 17 ft. lbs. (23 N.m).
14. Turn transaxle case so mounting flange of torque converter housing is facing upward. Install underdrive clutch hub on underdrive sun gear. Using a dial indicator, measure and record underdrive sun gear end play. End play should be .0098-.0177" (0.25-0.45 mm). Remove all components installed in this step. Select a thrust race No. 8 that equals the recorded end play measurement. Install selected thrust race No. 8 on thrust bearing No. 7.
15. Install 3 NEW "O" rings in transaxle case mating surface grooves. See **Fig. 55**. Apply a continuous bead of silicone sealant to mating surface of rear cover and install onto transaxle case. Install retaining bolts and tighten to 17 ft. lbs. (23 N.m).
16. Install underdrive clutch hub to underdrive sun gear. Install thrust bearing No. 2 on underdrive clutch hub. See **Fig. 56**. Install underdrive clutch and input shaft on underdrive clutch hub.



**Fig. 55: Identifying Transaxle Case To Rear Cover "O" Rings**  
**Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.**



**Fig. 56: Installing Thrust Bearing No. 2**

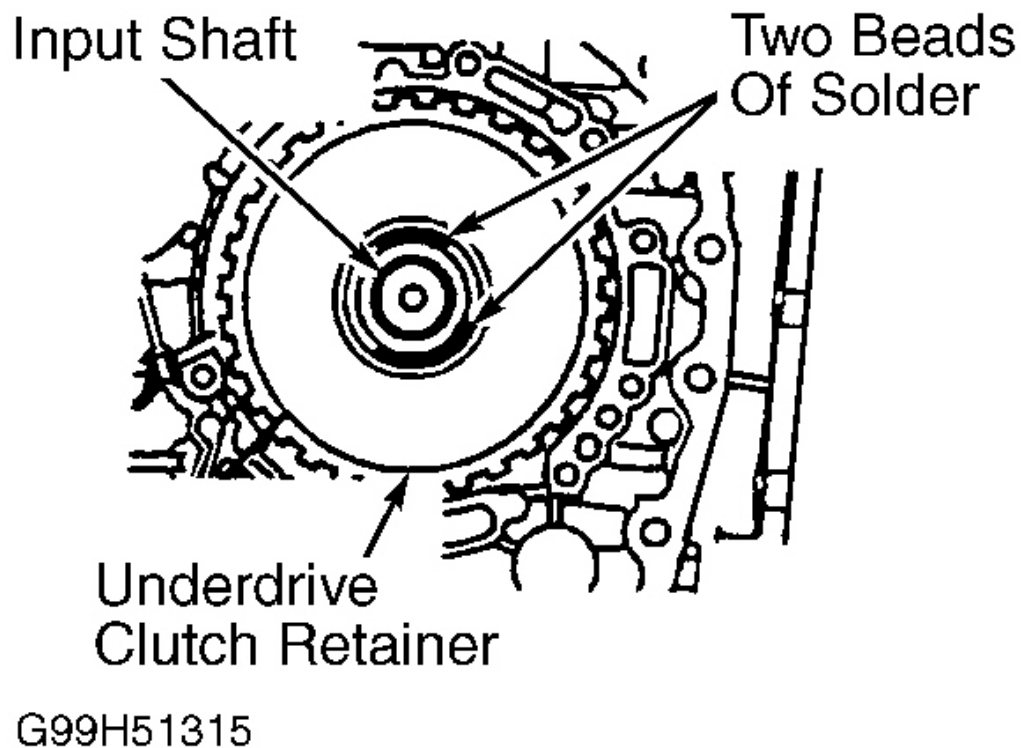
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

17. Place 2 pieces of solder about .393" (10 mm) in length and .14" (3.5 mm) in diameter on underdrive clutch retainer. See **Fig. 57**. Using Guide (MB998412), install oil pump. See **Fig. 58**. Tighten oil pump mounting bolts to 17 ft. lbs. (23 N.m). Using Oil Pump Removers (MD998333) remove oil pump. Remove crushed solder pieces. Using an outside micrometer, measure and record thickness of solder pieces. Select appropriate thrust washer No. 1 whose thickness corresponds to the measured value. See **THRUST WASHER NO. 1 SPECIFICATIONS** table. Install selected thrust washer No. 1 on underdrive clutch retainer.

**THRUST WASHER NO. 1 SPECIFICATIONS**

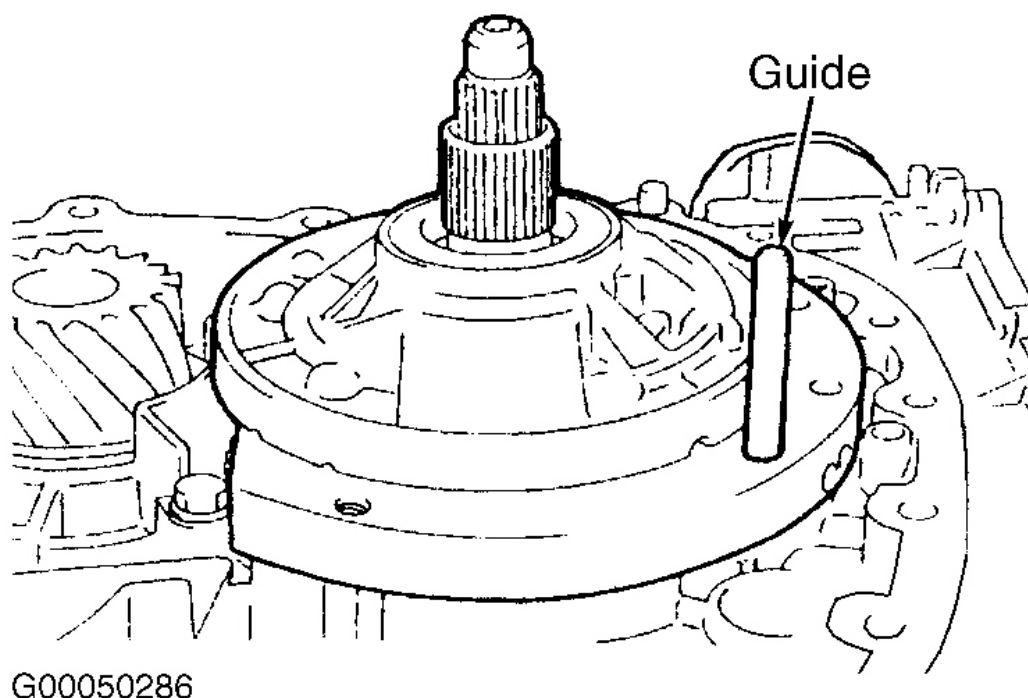
Measured Value - In. (mm)	Thickness - In. (mm)	ID Number	Part Number
.089-.096 (2.25-2.45)	.071 (1.8)	18	MD754509
.096-.104 (2.45-2.65)	.079 (2.0)	20	MD754508
.104-.112 (2.65-2.85)	.087 (2.2)	22	MD754507

.112-.120 (2.85-3.05)	.094 (2.4)	24	MD753793
.120-.128 (3.05-3.25)	.102 (2.6)	26	MD753794
.128-.136 (3.25-3.45)	.110 (2.8)	28	MD753795



**Fig. 57: Determining Input Shaft Clearance**

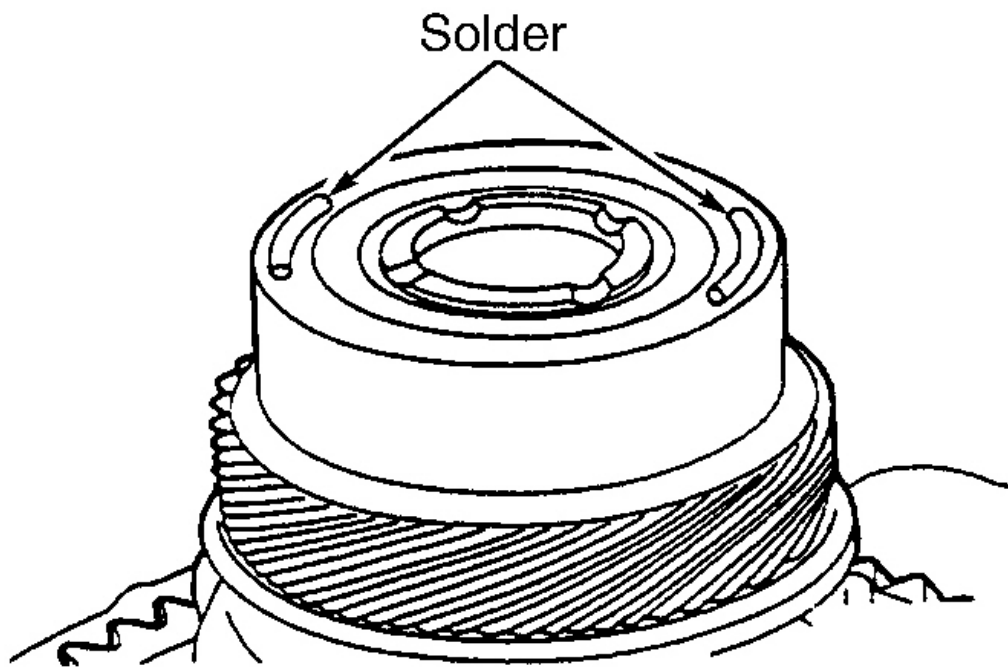
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

**Fig. 58: Installing Oil Pump**

Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

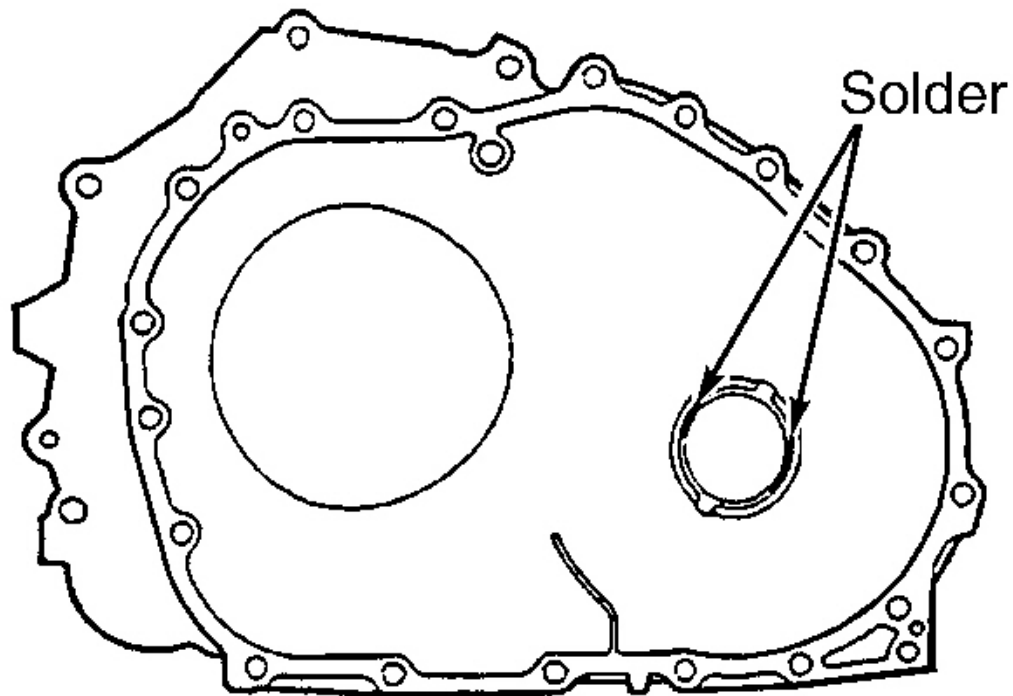
18. Install NEW oil pump gasket on transaxle. Using Guide (MB998412), install oil pump and tighten retaining bolts to specification. See **TORQUE SPECIFICATIONS**. Using a dial indicator, ensure input shaft end play is .0276-.0571" (0.70-1.45 mm). Install oil filter. On F4A42 models, install differential outer bearing race in transaxle case using a hammer, Installer Adapter (MB990935) and Handle (MB990938). On all models, install differential.
19. On F4A41 models, place 2 pieces of solder about .39" (10 mm) in length and .12" (3 mm) in diameter on end of differential. See **Fig. 59**. On F4A42 models, place 2 beads of solder about .39" (10 mm) in length and .12" (3 mm) in diameter on torque converter housing. See **Fig. 60**. Using Handle (MB990938) and Installer Adapter (MB990936), install differential outer bearing race into torque converter housing.
20. On all models, install torque converter housing to transaxle case (without sealant). Tighten torque converter housing bolts to specification. Loosen bolts, remove torque converter housing and remove solder pieces.
21. Using an outside micrometer, measure and record thickness of crushed solder pieces. On F4A42 models, add thickness of solder to .0018" (.045 mm). Record measurement. Add thickness of solder to .0041" (.105 mm). Record measurement. Select a spacer that is closest to measured range. See **DIFFERENTIAL CASE PRELOAD SPACER SPECIFICATIONS (F4A42)** table.
22. On F4A41 models, subtract thickness of solder from .0018" (.045 mm). Record measurement. Subtract thickness of solder from .0065" (.165 mm). Record measurement. Select a spacer that is closest to measured range. See **DIFFERENTIAL CASE PRELOAD SPACER SPECIFICATIONS (F4A41)**

table.



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**Fig. 59: Determining Differential End Clearance (F4A41)**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.



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**Fig. 60: Determining Differential End Clearance (F4A42)**  
 Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.

**DIFFERENTIAL CASE PRELOAD SPACER SPECIFICATIONS (F4A42)**

Thickness - In. (mm)	ID Symbol	Part Number
.0280 (.71)	71	MD754475
.0291 (.74)	74	MD727660
.0303 (.77)	77	MD754476
.0315 (.80)	80	MD727661
.0327 (.83)	83	MD720937
.0339 (.86)	86	MD720938
.0350 (.89)	89	MD720939
.0362 (.92)	92	MD720940
.0374 (.95)	95	MD720941
.0386 (.98)	98	MD720942
.0398 (1.01)	01	MD720943

## 2000 Hyundai Sonata

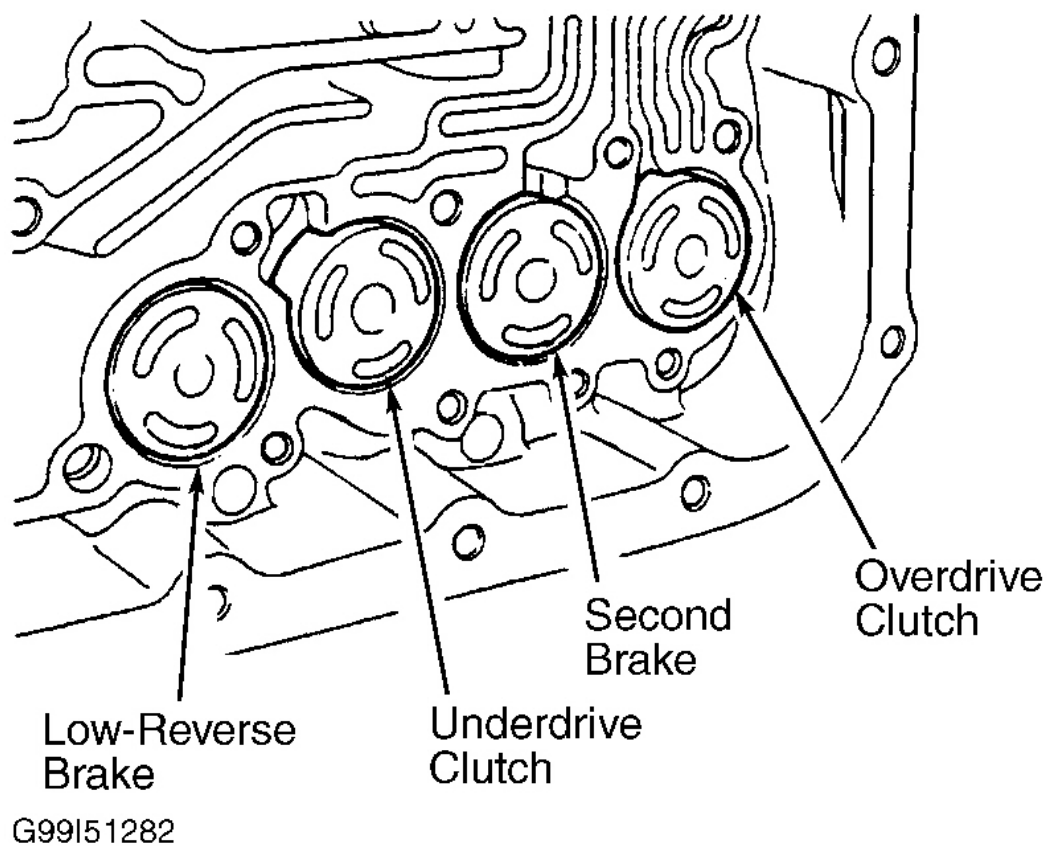
### 2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 & F4A42 Overhaul

.0409 (1.04)	04	MD720944
.0421 (1.07)	07	MD720945
.0433 (1.10)	J	MD710454
.0445 (1.13)	D	MD700270
.0457 (1.16)	K	MD710455
.0469 (1.19)	L	MD710456
.0480 (1.22)	G	MD700271
.0492 (1.25)	M	MD710457
.0504 (1.28)	N	MD710458
.0516 (1.31)	E	MD706574
.0528 (1.34)	O	MD710459
.0539 (1.37)	P	MD710460

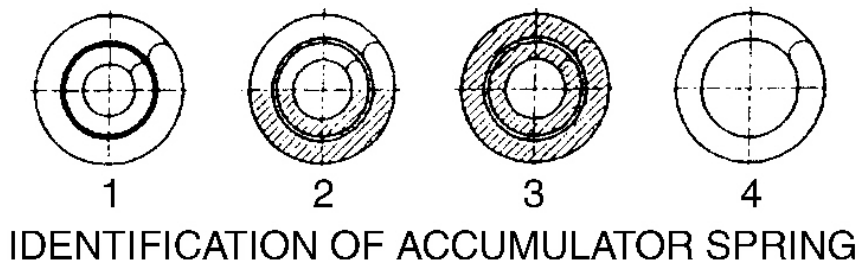
### DIFFERENTIAL CASE PRELOAD SPACER SPECIFICATIONS (F4A41)

Thickness - In. (mm)	ID Symbol	Part Number
.054 (1.28)	N	MD710458
.0539 (1.37)	P	MD710460
.0575 (1.46)	R	MD710462
.0610 (1.55)	T	MD710464
.0646 (1.64)	V	MD710466
.0681 (1.73)	X	MD710468
.0717 (1.82)	Z	MD710470

23. Install selected spacer in torque converter housing. On F4A42 models, install outer bearing race in torque converter housing using Installer Handle (MB990938), Installer Adapter (MB990935), and a press.
24. On all models, apply a continuous bead of silicone sealant to mating surface of torque converter housing. Install 2 NEW "O" rings in transaxle housing. See **Fig. 20**. Install torque converter housing. Tighten torque converter housing retaining bolts to specification. Install manual control lever shaft and parking pawl rod. See **Fig. 17**. Install manual control lever shaft roller pin. Identify correct location of accumulator pistons. See **Fig. 61**. Install accumulator pistons, NEW seal rings and springs. Ensure correct accumulator piston springs are placed in the correct location. See **Fig. 62**.
25. Install strainer and second brake retainer oil seal. See **Fig. 18**. Install solenoid valve harness and secure with snap ring. Using a NEW gasket, install valve body and 2 steel check balls into transaxle case. Install oil temperature sensor. See **Fig. 12**. Install 28 valve body bolts in their correct locations and tighten to specification. Connect all valve body electrical connectors. See **Fig. 63**.



**Fig. 61: Identifying Location Of Accumulator Pistons**  
**Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.**

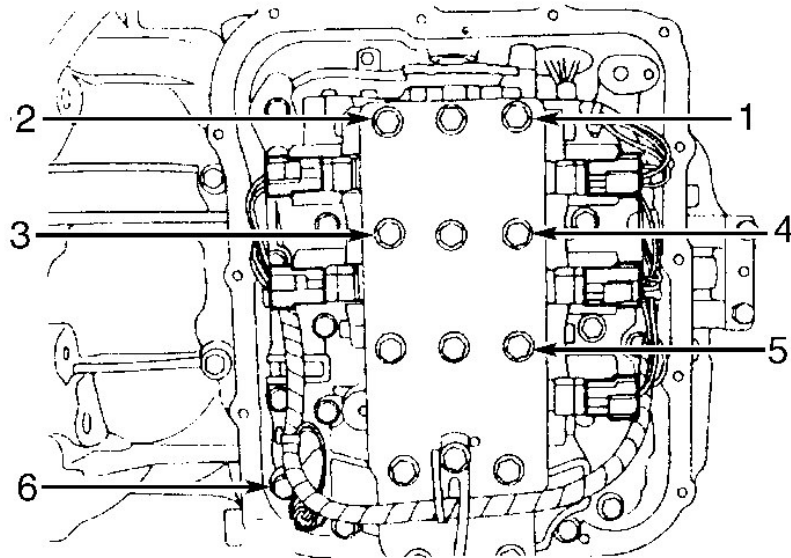


No.	Name	Identification "Blue-ing"
1	For Low-Reverse Brake	None
2	For Underdrive Clutch	Half
3	For Second Brake	Whole Surface
4	For Overdrive Clutch	None

Note: The shadows are the areas of identification "blue-ing."  
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**Fig. 62: Identifying Accumulator Piston Springs**  
Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.





No.	Parts to be connected	Cable color	Connector housing color
1	Underdrive solenoid valve	White, red, red	Black
2	Overdrive solenoid valve	Orange, red	Black
3	Low-reverse solenoid valve	Brown, yellow	Milky white
4	Second solenoid valve	Green, red, red	Milky white
5	Damper clutch control solenoid valve	Blue, yellow, yellow	Black
6	Fluid temperature sensor	Black, red	Black

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**Fig. 63: Identifying Valve Body Electrical Connectors**

**Courtesy of MITSUBISHI MOTOR SALES OF AMERICA.**

26. Install manual control shaft detent. See **Fig. 16**. Apply a continuous bead of silicone sealant to mating surface of valve body cover. Install valve body cover and tighten retaining bolts to specification. Install speedometer gear. Install park/neutral position switch and manual control lever. Install input shaft and output shaft speed sensors. Coat oil filter gasket with ATF and install to transaxle case to specified torque. See **TORQUE SPECIFICATIONS**.
27. Using NEW gaskets, install oil cooler feed tube assembly. Install oil dipstick. Install all brackets. Apply ATF to torque converter oil pump drive hub and install torque converter. Ensure converter is fully seated into oil pump. When torque converter is fully seated, torque converter will be recessed about .480" (12.2 mm) from transaxle-to-engine mounting flange.

**TORQUE SPECIFICATIONS****TORQUE SPECIFICATIONS**

<b>Application</b>	<b>Ft. Lbs. (N.m)</b>
Control Cable Bracket Bolt	17 (23)
Differential Drive Gear Bolt	98 (133)
Eye (Banjo) Bolt	22 (30)
Flywheel/Drive Plate Bolt	
1.5L & 2.4L	94-101 (127-137)
1.8L	69-76 (93-103)
Manual Control Lever Nut	16 (22)
Oil Pump Bolt	17 (23)
Output Shaft Bearing Retainer Bolt	17 (23)
Output Shaft Lock Nut	123 (167)
Park/Neutral Position Switch Wiring Harness Bracket Bolt	17 (23)
Rear Cover Bolt	17 (23)
Roll Stopper Bracket Bolt	51 (69)
Torque Converter Housing Bolt	35 (47)
Transfer Drive Gear	14 (19)
Transfer Drive Gear Lock Nut	141 (191)
	<b>INCH Lbs. (N.m)</b>
Input Shaft Speed Sensor	97 (11)
Manual Control Shaft Detent	53 (6)
Oil Cooler Feed Tube	97 (11)
Oil Filter	106 (12)
Oil Temperature Sensor	97 (11)
Output Shaft Speed Sensor	97 (11)
Park/Neutral Position Switch	97 (11)
Speedometer Gear	44 (5)
Valve Body Cover	97 (11)
Valve Body Mounting Bolt	97 (11)

**2000 Hyundai Sonata**

2000 AUTOMATIC TRANSMISSIONS Mitsubishi F4A41 &amp; F4A42 Overhaul

Valve Body Solenoid Valve Support Bracket Bolt

53 (6)

**TRANSAXLE SPECIFICATIONS****TRANSAXLE SPECIFICATIONS**

<b>Application</b>	<b>In. (mm)</b>
Backlash Between Differential Side Gear & Pinion	.001-.006 (.03-.15)
Brake Reaction Plate End Play	0-.006 (0-.15)
Differential Case End Play (F4A41)	.002-.007 (.05-.17)
Differential Case Preload (F4A42)	.002-.004 (.05-.11)
Input Shaft End Play	.028-.057 (.70-1.45)
Low-Reverse Brake End Play	
F4A41	.041-.059 (1.05-1.51)
F4A42	.053-.071 (1.35-1.80)
Output Shaft Preload	.0004-.0035 (.01-.09)
Overdrive Clutch End Play	
F4A41	.047-.055 (1.19-1.40)
F4A42	.063-.071 (1.60-1.80)
Reverse Clutch End Play	.059-.067 (1.50-1.70)
Reverse & Overdrive Clutch Return Spring End Play	0-.0035 (0-.09)
Second Brake End Play	
F4A41	.019-.037 (.49-.95)
F4A42	.031-.049 (.79-1.25)
Underdrive Clutch End Play	
F4A41	.047-.055" (1.19-1.40)
F4A42	.063-.071" (1.60-1.80)
Underdrive Sun Gear End Play	.010-.018 (.25-.45)