

## 1995 Kia Sephia GS

1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL & GF4A-EL Overhaul

### 1995-96 AUTOMATIC TRANSMISSIONS

#### FA4A-EL & GF4A-EL Overhaul

## APPLICATION & LABOR TIMES

### APPLICATION & LABOR TIMES

Vehicle Application	Labor Times <sup>(1)</sup> R & I	Labor Times <sup>(2)</sup> Overhaul	Trans. Model
Kia			
Sephia	4.7	8.6	FA4A-EL
Mazda			
Millenia			
2.5L	6.5	8.6	GF4A-EL
MX-3			
4-Cyl	4.5	8.6	FA4A-EL
V6	5.2	8.6	FA4A-EL
MX-6 & 626			
V6	6.4	8.6	GF4A-EL
Protege	5.2	8.6	FA4A-EL
(1) Removal and installation of transmission from vehicle chassis.			
(2) On bench overhaul for transmission and differential. DOES NOT include removal and installation.			

**CAUTION:** Disconnecting battery on models equipped with anti-theft radio require canceling of anti-theft operation. See appropriate TRANSMISSION SERVICING - A/T article in the TRANSMISSION SERVICING section.

### TRANSMISSION SERVICING - A/T - Kia

### TRANSMISSION SERVICING - A/T - Mazda

Refer to vehicle owner's manual to identify radio type.

## IDENTIFICATION

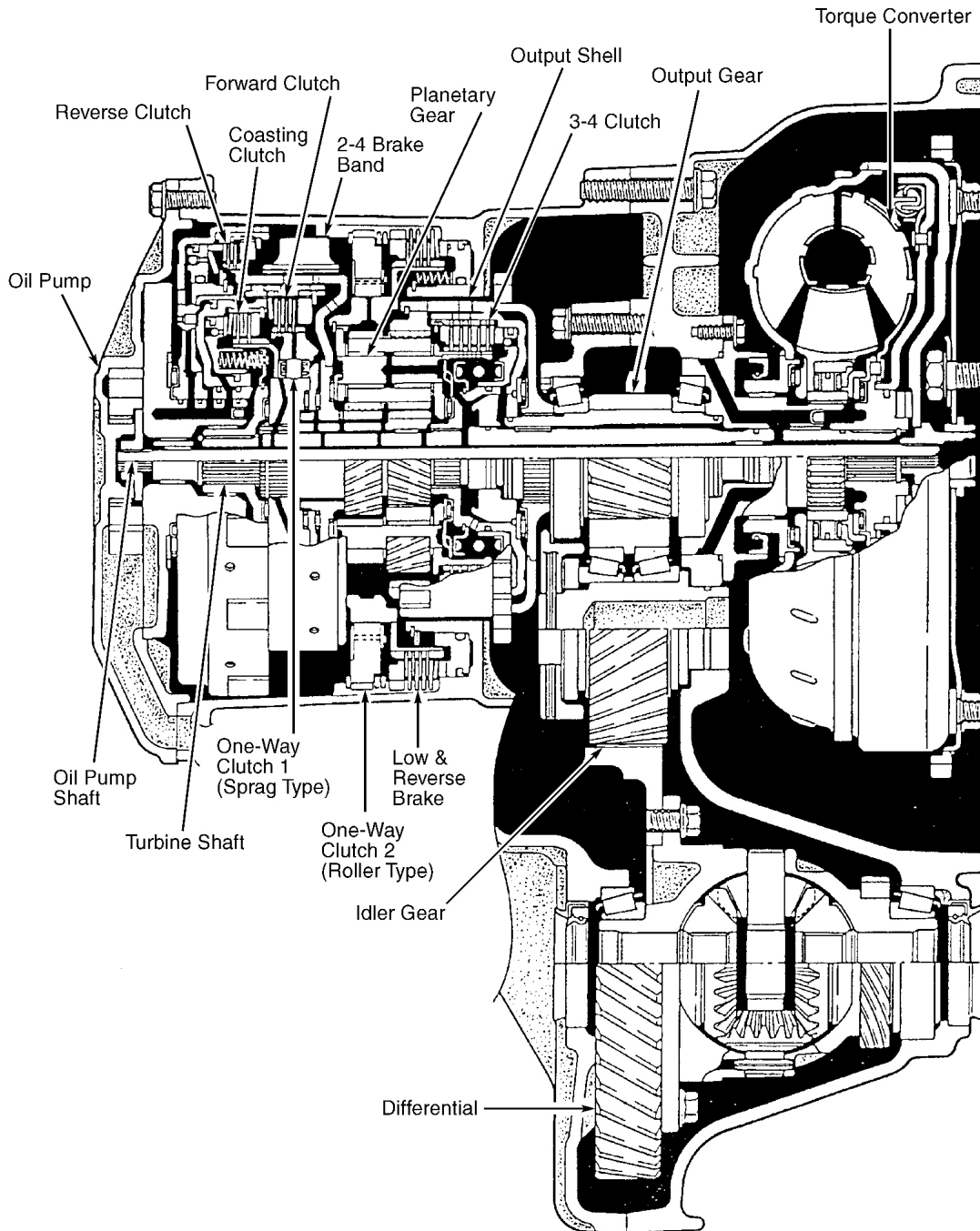
Vehicle Identification Number (VIN) is used for correct application of component parts and assemblies. Number is on a plate located at top left of instrument panel and on transaxle flange (exhaust side of engine).

## DESCRIPTION

The FA4A-EL and GF4A-EL are 4-speed electronically controlled automatic transaxles that incorporate 5 multi-disc hydraulic clutches, 2 one-way clutches (sprag and roller type) and a friction lined brake band that prevents rotation of sun gear drum. See **Fig. 1**.

ON/OFF and duty cycle solenoids control shift changes, line pressure and torque converter lock-up. Solenoids are attached to valve body. Solenoids are operated by either Transmission Control Module (TCM) or Powertrain Control Module (PCM).

TCM or PCM receives information from various input devices and uses this information to control solenoids for transaxle shifting, line pressure (GF4A-EL), shift feel (GF4A-EL) and torque converter clutch lock-up.



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**Fig. 1: Cut-Away View Of GF4A-EL (FA4A-EL Similar)**

Courtesy of MAZDA MOTORS CORP.

## **LUBRICATION & ADJUSTMENTS**

See appropriate TRANSMISSION SERVICING - A/T article in the TRANSMISSION SERVICING section.

### **TRANSMISSION SERVICING - A/T - Kia**

TRANSMISSION SERVICING - A/T - Mazda

## **ON-VEHICLE SERVICE**

See appropriate article in the TRANSMISSION SERVICING section.

## **TROUBLE SHOOTING**

### **PRELIMINARY CHECKS**

Automatic transaxle malfunction can be caused by either engine or transaxle problems. Isolate malfunction to engine or transaxle before proceeding with trouble shooting. Prior to trouble shooting check and adjust shift linkage, range switch and idle speed as needed. Ensure fluid level is correct. Check tires for correct inflation.

### **SYMPTOM DIAGNOSIS**

#### **Poor Acceleration**

Inspect range switch adjustment. Other possible causes: TCC solenoid valve, low line pressure, worn internal clutches, sticking pressure regulator, pressure modifier valve and or solenoid reducing valve, low engine power output and TCM or PCM malfunction.

#### **Surges While Cruising**

Possible causes: turbine shaft speed sensor, control valve, throttle position sensor, engine speed input to TCM or PCM.

#### **Lack Of Power**

Possible causes: worn torque converter clutch and/or burned reverse clutch.

#### **Poor Fuel Economy**

Possible causes: worn torque converter clutch solenoid valve and/or worn torque converter clutch control solenoid valve.

#### **Vehicle Does Not Move In "D", "2", "1" Or "R"**

Inspect ATF level, selector lever adjustment. Check line pressure. Other possible causes: internal component failure, stuck control valve, pressure control solenoid and/or shift solenoid "A", stuck parking mechanism and TCM or PCM.

**Vehicles Moves In "P" Or "N"**

Check selector lever adjustment. Other possible causes: worn forward clutch, coasting clutch and stuck control valve.

**Excessive Creep**

Possible causes: misadjusted engine idle speed, high line pressure at idle, throttle position sensor malfunction and TCM or PCM malfunction.

**Transaxle Will Not Shift**

Possible causes: low ATF level, shift solenoids "A", "B" and "C" malfunction, control valve, O/D OFF system malfunction, HOLD system malfunction, turbine shaft speed sensor malfunction, vehicle speed sensor malfunction, poor electrical ground, TCM or PCM malfunction.

**Abnormal Shift**

Possible causes: low ATF level, shift solenoids "A", "B" and "C" malfunction, valve body, turbine shaft speed sensor malfunction, throttle position sensor malfunction, range sensor malfunction, vehicle speed sensor malfunction, poor electrical ground, TCM or PCM malfunction.

**Frequent Shifting**

Possible causes: poor electrical ground, throttle position sensor malfunction or misadjustment, TCM or PCM malfunction, vehicle speed sensor malfunction and burnt 2-4 brake band.

**Shift Speeds Too High Or Too Low**

Possible causes: pressure control solenoid, throttle position sensor malfunction or misadjustment, transaxle fluid temperature sensor malfunction, turbine speed sensor malfunction, vehicle speed sensor malfunction and range switch malfunction.

**No Torque Converter Clutch**

Possible causes: ATF level (low), shift solenoids "A", "B", "C", TCC solenoid, 3-2 timing solenoid, pressure control solenoid, O/D OFF switch, HOLD switch, transaxle range switch, brake switch, valve body, transaxle fluid temperature sensor, engine speed input signal to TCM, turbine shaft speed sensor, vehicle speed sensor, TCM or PCM malfunction and torque converter.

**No Kickdown**

Possible causes: throttle position sensor, O/D OFF switch, HOLD switch, transaxle range switch, pressure control solenoid, valve body and TCM or PCM malfunction.

**Transaxle Shift Flare**

Possible causes: ATF level (low), selector lever adjustment, throttle position sensor, line pressure(low), internal component failure, pressure control solenoid, valve body, turbine shaft speed sensor, transaxle fluid temperature sensor and TCM or PCM malfunction.

**Excessive Gear Engagement Shock**

Possible causes: idle speed (high), throttle position sensor, line pressure (high), valve body, internal clutch slippage, pressure control solenoid, shift solenoids, transaxle fluid temperature sensor, N-D or N-R accumulator, transaxle range switch, turbine shaft speed sensor and TCM or PCM malfunction.

**Excessive Gear Shift Shock**

Possible causes: ATF level (high), throttle position sensor, line pressure (high), valve body, internal clutch slippage, pressure control solenoid, shift solenoids, 3-2 timing solenoid, pressure control solenoid, reduce torque signal No. 1 or No. 2, coolant temperature sensor, turbine shaft speed sensor, transaxle fluid temperature sensor, baro pressure sensor and TCM or PCM malfunction.

**No Engine Braking**

Possible causes: ATF level (low), internal clutch slippage, valve body, ISC solenoid valve, shift solenoids "B" and/or "C" and TCM or PCM malfunction.

**Transaxle Overheats**

Possible causes: ATF level (low), internal component failure, torque converter clutch piston, shift solenoids, 3-2 timing solenoid, pressure control solenoid, throttle position sensor, turbine shaft speed sensor, vehicle speed sensor, engine speed input signal, transaxle fluid temperature sensor, TCM or PCM malfunction and fluid cooling system.

**CLUTCH & BAND APPLICATIONS**

**NOTE:** Clutch and band application table for Kia Sephia 1.6L SOHC is not available from manufacturer at time of publication. Following tables are not model specific. Check vehicle to determine appropriate table.

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## 1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL & GF4A-EL Overhaul

Mode	Position/ Range	Gear Position	Engine braking effect	Forward clutch	Coasting clutch	3-4 clutch	Reverse clutch	2-4 brake		Low and reverse brake	One-way clutch 1	One-way clutch 2
								Applied	Released			
—	P	—	—									
	R	Reverse	Yes				○			○		
	N	—	Below approx. 4 km/h {2.5 mph}	—								
Non-HOLD	D	1GR	0 km/h {0 mph} and throttle valve opening 4/8 or more (when suddenly accelerating)	Yes	○	○					○	○
			Others	No	○						○	○
		2GR		No	○			○			○	
		3GR	Below approx. 33 km/h {20 mph} at operating temperature (B6 DOHC)	Yes	○	○	○		○		○	
			Below approx. 33 km/h {20 mph} at operating temperature (K8 DOHC)									
			Above approx. 34 km/h {21 mph} or cold engine (B6 DOHC)	Yes	○	○	○	⊗	○		○	
			Above approx. 35 km/h {22 mph} or cold engine (K8 DOHC)									
		4GR	Torque converter clutch non-operation	Yes	○		○	○			⊗	
			Torque Converter Clutch ON	Yes	○		○	○			⊗	
	S	1GR	0 km/h {0 mph} and throttle valve opening 4/8 or more (when suddenly accelerating)	Yes	○	○					○	○
			Others	No	○						○	○
		2GR		No	○			○			○	
		3GR	Below approx. 33 km/h {20 mph} at operating temperature (B6 DOHC)	Yes	○	○	○		○		○	
			Below approx. 33 km/h {20 mph} at operating temperature (K8 DOHC)									
			Above approx. 34 km/h {21 mph} or cold engine (B6 DOHC)	Yes	○	○	○	⊗	○		○	
			Above approx. 35 km/h {22 mph} or cold engine (K8 DOHC)									
		4GR		Yes	○		○	○			⊗	
	L	1GR	0 km/h {0 mph} and throttle valve opening 4/8 or more (when suddenly accelerating)	Yes	○	○				○	○	○
			Others	No	○					○	○	○
		2GR	Below approx. 104 km/h {64 mph} (B6 DOHC)	Yes	○	○		○			○	
			Below approx. 99 km/h {61 mph} (K8 DOHC)									
			Above approx. 110 km/h {68 mph} (B6 DOHC)	Yes	○	○		○			○	
			Above approx. 105 km/h {65 mph} (K8 DOHC)									

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**Fig. 2: Clutch & Band Application Table (HOLD Type Systems, 1 Of 2)**  
**Courtesy of MAZDA MOTORS CORP.**

# 1995 Kia Sephia GS

## 1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL & GF4A-EL Overhaul

Mode	Position/ Range	Gear Position		Engine braking effect	Forward clutch	Coasting clutch	3-4 clutch	Reverse clutch	2-4 brake		Low and reverse brake	One-way clutch 1	One-way clutch 2
									Applied	Released			
HOLD	D	1GR	0 km/h {0 mph} and throttle valve opening 4/8 or more (when suddenly accelerating)	Yes	○	○						○	○
			Others	No	○							○	○
		2GR	0 km/h {0 mph} and throttle valve opening 4/8 or more (when suddenly accelerating)	No	○	○			○			○	
			Others	No	○				○			○	
		3GR	Below approx. 33 km/h {20 mph} at operating temperature (B6 DOHC)	Yes	○	○	○			○		○	
			Below approx. 33 km/h {20 mph} at operating temperature (K8 DOHC)										
			Above approx. 34 km/h {21 mph} or cold engine (B6 DOHC)	Yes	○	○	○		⊗	○		○	
			Above approx. 35 km/h {22 mph} or cold engine (K8 DOHC)										
		4GR		Yes	○		○		○			⊗	
		2GR		Yes	○	○			○			○	
	S	3GR	Below approx. 33 km/h {20 mph} at operating temperature (B6 DOHC)	Yes	○	○	○			○		○	
			Below approx. 33 km/h {20 mph} at operating temperature (K8 DOHC)										
			Above approx. 34 km/h {21 mph} or cold engine (B6 DOHC)	Yes	○	○	○		⊗	○		○	
			Above approx. 35 km/h {22 mph} or cold engine (K8 DOHC)										
		4GR		Yes	○		○		○			⊗	
		1GR		Yes	○	○					○	○	○
	L	2GR	Below approx. 104 km/h {64 mph} (B6 DOHC)	Yes	○	○			○			○	
			Below approx. 99 km/h {61 mph} (K8 DOHC)										
			Above approx. 110 km/h {68 mph} (B6 DOHC)	Yes	○	○			○			○	
			Above approx. 105 km/h {65 mph} (K8 DOHC)										

⊗ : Fluid pressure to servo but band not applied due to pressure difference in servo.  
 ⊗ : Does not transmit power.

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**Fig. 3: Clutch & Band Application Table (HOLD Type Systems, 2 Of 2)**  
 Courtesy of MAZDA MOTORS CORP.

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1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL & GF4A-EL Overhaul

Position/ Range	Mode	Gear		Engine braking effect	Forward clutch	Coasting clutch	3-4 clutch	Reverse clutch	2-4 brake		Low and reverse brake	One-way clutch 1 (Sprag type)	One-way clutch 2 (Roller type)
									Applied	Released			
P	—	—		—									
R	—	Reverse	Below approx. 4 km/h {2.5 mph}	Yes				○			○		
			Above approx. 5 km/h {3 mph}	Yes				○			○		
		—	Above approx. 30 km/h {19 mph}	No				○					
N	—	—	Below approx. 4 km/h {2.5 mph}	—									
			Above approx. 5 km/h {3 mph}	—									
D	☆ O/D OFF SW OFF POWER/ NORMAL	First gear		No	○							○	○
		Second gear		No	○				○			○	
		Third gear		Yes	○	○	○		⊗	○		○	
		Fourth gear		Yes	○		○		○			⊗	
	☆ O/D OFF SW ON POWER/ NORMAL	Second gear	Below approx. 14 km/h {8.7 mph}	Yes	○	○			○			○	
			Above approx. 17 km/h {10.5 mph}	No	○				○			○	
		Third gear		Yes	○	○	○		⊗	○		○	
		*Fourth gear		Yes	○		○		○			⊗	
2	—	Second gear		Yes	○	○			○			○	
		*Third gear		Yes	○	○	○		⊗	○		○	
		*Fourth gear		Yes	○		○		○			⊗	
1	—	First gear		Yes	○	○					○	○	○
		*Second gear		Yes	○	○			○			○	

○ Operating.

⊗ Operating but not contributing to the power transmission.

⊙ POWER is not transmitted.

\* Engine overspeed protection.

☆ The powertrain control module automatically switches between POWER and NORMAL modes corresponding to the speed at which the accelerator pedal is depressed.

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**Fig. 4: Clutch & Band Application Table (O/D OFF Type Systems)**

Courtesy of MAZDA MOTORS CORP.

## TESTING

### PRELIMINARY CHECKS

Before testing transaxle, ensure fluid level is correct and shift linkage, range switch and idle speed are adjusted correctly.

### TIME LAG TEST

#### Preparation

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Check and adjust coolant, engine oil and ATF levels. Warm engine and transaxle to normal operating temperature. Block front and rear wheels on both sides. Set parking brake. Ensure engine idle speed and ignition timing is correct. See appropriate ADJUSTMENTS article in the ENGINE PERFORMANCE section.

### ADJUSTMENTS - 1995 Kia Sephia

### ADJUSTMENTS - 1996 Kia Sephia

### ADJUSTMENTS - 2.3L - 1995 Mazda Millenia

### ADJUSTMENTS - 2.5L - 1995 Mazda Millenia

### ADJUSTMENTS - 1995 Mazda MX-3

### ADJUSTMENTS - 2.0L - 1995 Mazda MX-6 & 626

### ADJUSTMENTS - 2.5L - 1995 Mazda MX-6 & 626

### ADJUSTMENTS - 1996 Mazda MX-6 & 626

### ADJUSTMENTS - 1.5L - 1995 Mazda Protege

### ADJUSTMENTS - 1.8L - 1995 Mazda Protege

### ADJUSTMENTS - 1996 Mazda Protege

This test measures time lag between selecting specific gear and actual transaxle shift. Test checks condition of the 1-2, N-R and N-D accumulators, forward and one-way clutches, 2-4 brake band and low-reverse brake.

### Testing

Start engine and shift from "N" to "D", "N" to "2" and "N" to "R". Measure time interval from moving shift lever to when shift shock is felt. See TIME LAG TEST SPECIFICATIONS table and TIME LAG TEST EVALUATION table.

### TIME LAG TEST SPECIFICATIONS

Application Range	Time Seconds
MX-3, Protege & Sephia	
"N"-"D"	0.5-0.6
"N"-"2"	0.5-0.7
"N"-"R"	0.6-0.7
Millenia, MX-6 & 626	
"N"-"D"	Less Than 0.9
"N"-"R"	Less Than 1.1

### TIME LAG TEST EVALUATION

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Application & Shift	Time	Possible Cause
"N"-"D"	More	Insufficient Line Pressure
"N"-"D"	More	Forward Clutch Slipping
"N"-"D"	More	One-Way Clutch No. 1 Slipping
"N"-"D"	More	One-Way Clutch No. 2 Slipping
"N"-"D"	Less	"N"-"D" Accumulator Not Operating Properly
"N"-"D"	Less	Excessive Line Pressure
"N"-"D" HOLD	More	Insufficient Line Pressure
"N"-"D" HOLD	More	Forward Clutch Slipping
"N"-"D" HOLD	More	2-4 Brake Band Slipping
"N"-"D" HOLD	More	One-Way Clutch No. 1 Slipping
"N"-"D" HOLD	Less	1-2 Accumulator Not Operating Properly
"N"-"D" HOLD	Less	Excessive Line Pressure
"N"-"R"	More	Insufficient Line Pressure
"N"-"R"	More	Low-Reverse Brake Slipping
"N"-"R"	More	Reverse Clutch Slipping
"N"-"R"	Less	"N"-"R" Accumulator Not Operating Properly
"N"-"R"	Less	Excessive Line Pressure

## ROAD TEST

1. Check for shift shock, positive shifts and shifting through all ranges. Ensure kickdown occurs within kickdown limits. See appropriate chart in **ROAD TEST SPECIFICATIONS** . Manually shift from "D" to "D2". Shift should take place immediately and engine braking should occur.
2. Manually shift from "D" to "2" to "L". Ensure appropriate downshift takes place with engine braking in 3rd and 2nd gear. With gear selector in "L", ensure transaxle does not upshift from "1". With gear selector in "2", ensure no upshift from "2" occurs.
3. On vehicles quipped with O/D OFF button, depress button while transaxle is in 4th gear. Transaxle should downshift to 3rd gear and upshift once button is released.
4. On vehicles equipped with HOLD switch, depress switch. HOLD function may be activated in "D", "S" or "L" gears. In "L" and "S" positions vehicle is held in these gears and no upshift or downshift takes place. In "D" position a 1-2 and 2-3 upshift is permitted when starting from a stop but after the 2-3 upshift the vehicle is locked in "D" until it comes to a complete stop. The 1-2 and 2-3 upshift pattern is changed to a "short shift" specification. Pushing HOLD button again deactivates system.
5. Ensure transaxle stays locked in "P". Compare actual shift speeds with appropriate **ROAD TEST SPECIFICATIONS** . See **Fig. 5** -9. If upshifts and downshifts are not as specified, see ROAD TEST EVALUATION table for possible cause.

## ROAD TEST EVALUATION

Condition	Possible Cause
No 1-2 Shift	Stuck 1-2 Shift Solenoid Valve "A"
No 1-2 Shift	Stuck 1-2 Shift Valve
No 2-3 Shift	Stuck 2-3 Shift Solenoid Valve "B"

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No 1-2 Shift	Stuck 2-3 Shift Valve
No 3-OD Shift	Stuck 3-4 Shift Solenoid Valve "C"
No 1-2 Shift	Stuck 3-4 Shift Valve
No Lock-Up	Stuck TCC Lock-Up Solenoid Valve
No 1-2 Shift	Stuck TCC Lock-Up Shift Valve
Incorrect Shift Point	Mis-Adjusted TPS
Incorrect Shift Point	Stuck Shift Valves
Excessive Shift Shock	Stuck Accumulators
Excessive Shift Shock	Stuck Or Missing One-Way Check Valve
Excessive Shift Shock	Worn Clutches, Brakes Or One-Way Clutch
No Engine Braking	Worn Clutches Or Brakes

## ROAD TEST SPECIFICATIONS

Range Mode	Throttle condition	Shift	Vehicle speed km/h {mph}	Turbine speed rpm
POWER	Wide open throttle	D <sub>1</sub> →D <sub>2</sub>	61—67 {38—41}	6100—6700
		D <sub>2</sub> →D <sub>3</sub>	106—113 {66—70}	5850—6200
		D <sub>3</sub> →D <sub>4</sub>	172—182 {107—112}	6150—6500
	Half throttle	D <sub>1</sub> →D <sub>2</sub>	42—51 {26—31}	4200—5100
		D <sub>2</sub> →D <sub>3</sub>	72—91 {45—56}	4000—5000
		D <sub>3</sub> →D <sub>4</sub>	119—145 {74—89}	4250—5150
	Closed throttle position	D <sub>4</sub> →D <sub>3</sub>	11—17 {7—10}	300—400
		D <sub>3</sub> →D <sub>1</sub>	29—35 {18—21}	1050—1250
	Kickdown (wide open throttle)	D <sub>4</sub> →D <sub>3</sub>	143—153 {89—94}	3600—3800
		D <sub>3</sub> →D <sub>2</sub>	91—99 {56—61}	3250—3500
NORMAL	Wide open throttle	D <sub>2</sub> →D <sub>1</sub>	37—43 {23—26}	2050—2350
		D <sub>1</sub> →D <sub>2</sub>	61—67 {38—41}	6100—6700
		D <sub>2</sub> →D <sub>3</sub>	106—113 {66—70}	5850—6200
		D <sub>3</sub> →D <sub>4</sub>	172—182 {107—112}	6150—6500
	Half throttle	TCC ON (D <sub>4</sub> )	147—157 {91—97}	3700—3900
		D <sub>1</sub> →D <sub>2</sub>	33—42 {20—26}	3300—4200
		D <sub>2</sub> →D <sub>3</sub>	59—76 {37—47}	3250—4150
		D <sub>3</sub> →D <sub>4</sub>	96—124 {60—76}	3450—4400
		TCC ON (D <sub>4</sub> )	127—150 {79—93}	3200—3750
	Closed throttle position	D <sub>4</sub> →D <sub>3</sub>	11—17 {7—10}	300—400
		D <sub>3</sub> →D <sub>1</sub>	29—35 {18—21}	1050—1250
	Kickdown (wide open throttle)	D <sub>4</sub> →D <sub>3</sub>	143—153 {89—94}	3600—3800
		D <sub>3</sub> →D <sub>2</sub>	91—99 {56—61}	3250—3500
		D <sub>2</sub> →D <sub>1</sub>	37—43 {23—26}	2050—2350
HOLD	—	D <sub>2</sub> →D <sub>3</sub>	15—25 {9—16}	850—1350
		TCC ON (D <sub>3</sub> )	105—115 {65—71}	3750—4100
		D <sub>4</sub> →D <sub>3</sub>	172—178 {100—104}	4300—4450
		D <sub>3</sub> →D <sub>2</sub>	7—13 {4—8}	250—450

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**Fig. 5: Shift Speed Table (1995-96 Millenia)**  
Courtesy of MAZDA MOTORS CORP.

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Mode	Range	Throttle condition (throttle position sensor voltage)	Shift	Vehicle speed km/h (mph)	
				4 Cyl. DOHC	V6 DOHC
Non-HOLD	D	Wide open throttle (3.1–4.4 V)	D <sub>1</sub> D <sub>2</sub>	58–64 {36–40}	59–65 {37–40}
			D <sub>2</sub> D <sub>3</sub>	102–110 {63–68}	101–109 {62.7–67.5}
			D <sub>3</sub> D <sub>4</sub>	166–176 {103–109}	167–177 {104–109}
		Half throttle (1.7–2.7 V)	D <sub>1</sub> D <sub>2</sub>	34–43 {22–26}	39–48 {25–29}
			D <sub>2</sub> D <sub>3</sub>	60–77 {37–48}	70–88 {44–54}
			D <sub>3</sub> D <sub>4</sub>	104–130 {64–81}	127–153 {78.8–94.8}
			TCC operation{D <sub>4</sub> }	99–124 {61–77}	127–153 {78.8–94.8}
		Closed throttle position (0.1–1.1 V)	D <sub>4</sub> D <sub>3</sub>	29–35 {18–22}	27–33 {17–20}
			D <sub>3</sub> D <sub>1</sub>	9–15 {5.6–9.3}	12–18 {7.5–11}
		Kickdown	D <sub>4</sub> D <sub>3</sub>	142–152 {88.1–94.2}	155–165 {96.1–102}
			D <sub>3</sub> D <sub>2</sub>	82–90 {51–55}	94–102 {59–63.2}
			D <sub>2</sub> D <sub>1</sub>	42–48 {27–29}	52–58 {33–35}
	S	Wide open throttle (3.1–4.4 V)	S <sub>1</sub> S <sub>2</sub>	58–64 {36–40}	59–65 {37–40}
			S <sub>2</sub> S <sub>3</sub>	102–110 {63–68}	101–109 {62.7–67.5}
		Half throttle (1.7–2.7 V)	S <sub>1</sub> S <sub>2</sub>	34–43 {22–26}	39–48 {25–29}
			S <sub>2</sub> S <sub>3</sub>	60–77 {37–48}	70–88 {44–54}
		Closed throttle position (0.1–1.1 V)	S <sub>4</sub> S <sub>3</sub>	166–172 {103–107}	167–173 {104–107}
			S <sub>3</sub> S <sub>1</sub>	9–15 {5.6–9.3}	12–18 {7.5–11}
		Kickdown	S <sub>3</sub> S <sub>2</sub>	82–90 {51–55}	94–102 {59–63.2}
			S <sub>2</sub> S <sub>1</sub>	42–48 {27–29}	52–58 {33–35}
	L	Wide open throttle (3.1–4.4 V)	L <sub>1</sub> L <sub>2</sub>	58–64 {36–40}	59–65 {37–40}
		Half throttle (1.7–2.7 V)	L <sub>1</sub> L <sub>2</sub>	34–43 {22–26}	39–48 {25–29}
		Closed throttle position (0.1–1.1 V)	L <sub>2</sub> L <sub>1</sub>	9–15 {6–9.3}	12–18 {7.5–11}
		Kickdown	L <sub>2</sub> L <sub>1</sub>	42–48 {27–29}	52–58 {33–35}
HOLD	D	—	D <sub>1</sub> D <sub>2</sub>	27–33 {17–20}	27–33 {17–20}
			D <sub>2</sub> D <sub>3</sub>	40–50 {25–31}	40–50 {25–31}
			D <sub>4</sub> D <sub>3</sub>	166–172 {103–107}	167–173 {104–107}
			D <sub>3</sub> D <sub>1</sub>	9–15 {6–9.3}	12–18 {7.5–11}
	S	—	S <sub>4</sub> S <sub>3</sub>	166–172 {103–107}	167–173 {104–107}
			S <sub>3</sub> S <sub>2</sub>	101–107 {62–66}	100–106 {62–65.7}
	L	—	L <sub>2</sub> L <sub>1</sub>	43–49 {27–30}	52–58 {33–35}

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**Fig. 6: Shift Speed Table (1995 MX3)**  
Courtesy of MAZDA MOTORS CORP.

# 1995 Kia Sephia GS

1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL & GF4A-EL Overhaul

Range/Mode			Throttle condition (throttle position sensor voltage)	Shift	Vehicle speed km/h {mph}	Turbine speed (rpm)
D	O/D OFF switch OFF	POWER	Wide open throttle (3.0—4.4 V)	D <sub>1</sub> →D <sub>2</sub>	57—63 {36—39}	6,050—6,600
				D <sub>2</sub> →D <sub>3</sub>	99—107 {62—66}	5,750—6,200
				D <sub>3</sub> →D <sub>4</sub>	162—172 {101—106}	6,100—6,500
			Half throttle	D <sub>1</sub> →D <sub>2</sub>	39—49 {25—30}	4,150—5,150
				D <sub>2</sub> →D <sub>3</sub>	69—87 {43—53}	4,050—5,000
				D <sub>3</sub> →D <sub>4</sub>	114—138 {71—85}	4,300—5,150
		NORMAL	Closed throttle position (0.1—1.1 V)	D <sub>4</sub> →D <sub>1</sub>	11—17 {7—10}	300—400
				D <sub>4</sub> →D <sub>3</sub>	135—145 {84—89}	3,600—3,800
				D <sub>3</sub> →D <sub>2</sub>	86—94 {54—58}	3,250—3,500
			Kickdown	D <sub>2</sub> →D <sub>1</sub>	37—43 {23—26}	2,150—2,450
				D <sub>1</sub> →D <sub>2</sub>	57—63 {36—39}	6,050—6,600
				D <sub>2</sub> →D <sub>3</sub>	99—107 {62—66}	5,750—6,200
	O/D OFF switch ON	POWER	Wide open throttle (3.0—4.4 V)	D <sub>3</sub> →D <sub>4</sub>	162—172 {101—106}	6,100—6,500
				TCC ON (D <sub>4</sub> )	162—172 {101—106}	6,100—6,500
				D <sub>1</sub> →D <sub>2</sub>	32—40 {20—24}	3,400—4,200
			Half throttle	D <sub>2</sub> →D <sub>3</sub>	53—69 {33—42}	3,100—4,000
				D <sub>3</sub> →D <sub>4</sub>	92—119 {58—73}	3,500—4,450
				TCC ON (D <sub>4</sub> )	124—148 {77—91}	3,300—3,900
		NORMAL	Closed throttle position (0.1—1.1 V)	D <sub>4</sub> →D <sub>1</sub>	11—17 {7—10}	300—400
				D <sub>4</sub> →D <sub>3</sub>	135—145 {84—89}	3,600—3,800
				D <sub>3</sub> →D <sub>2</sub>	86—94 {54—58}	3,250—3,500
			Kickdown	D <sub>2</sub> →D <sub>1</sub>	37—43 {23—26}	2,150—2,450
				D <sub>1</sub> →D <sub>2</sub>	57—63 {36—39}	6,050—6,600
				D <sub>2</sub> →D <sub>3</sub>	99—107 {62—66}	5,750—6,200
	O/D OFF switch ON	POWER	Wide open throttle (3.0—4.4 V)	D <sub>2</sub> →D <sub>3</sub>	99—107 {62—66}	5,750—6,200
				D <sub>1</sub> →D <sub>2</sub>	39—49 {25—30}	4,150—5,150
				D <sub>2</sub> →D <sub>3</sub>	69—87 {43—53}	4,050—5,000
			Closed throttle position (0.1—1.1 V)	D <sub>3</sub> →D <sub>1</sub>	11—17 {7—10}	450—600
				D <sub>3</sub> →D <sub>2</sub>	86—94 {54—58}	3,250—3,500
				D <sub>2</sub> →D <sub>1</sub>	37—43 {23—26}	2,150—2,450
		NORMAL	Wide open throttle (3.0—4.4 V)	D <sub>1</sub> →D <sub>2</sub>	57—63 {36—39}	6,050—6,600
				D <sub>2</sub> →D <sub>3</sub>	99—107 {62—66}	5,750—6,200
				D <sub>1</sub> →D <sub>2</sub>	32—41 {20—25}	3,400—4,300
			Half throttle	D <sub>2</sub> →D <sub>3</sub>	53—69 {33—42}	3,100—4,000
				D <sub>3</sub> →D <sub>1</sub>	11—17 {7—10}	450—600
				D <sub>3</sub> →D <sub>2</sub>	86—94 {54—58}	3,250—3,500
			Kickdown	D <sub>2</sub> →D <sub>1</sub>	37—43 {23—26}	2,150—2,450

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**Fig. 7: Shift Speed Table (1995-96 MX6 & 626)**  
**Courtesy of MAZDA MOTORS CORP.**

# 1995 Kia Sephia GS

## 1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL & GF4A-EL Overhaul

Range/Mode		Throttle condition	Shift	Vehicle speed (km/h { mph })		Turbine speed (rpm)	
				1.5L	1.8L	1.6L	1.8L
D	Except O/D OFF mode	Wide open throttle	1GR→2GR	52—58 { 32—36 }	53—59 { 33—36 }	5,600—6,200	5,300—5,850
			2GR→3GR	94—102 { 58—63 }	98—106 { 61—65 }	5,600—6,000	5,400—5,800
			3GR→4GR	149—159 { 92—99 }	162—172 { 101—106 }	5,750—6,100	5,800—6,100
		Half throttle	1GR→2GR	33—43 { 20—27 }	33—42 { 21—26 }	3,600—4,600	3,300—4,150
			2GR→3GR	64—84 { 40—52 }	66—85 { 41—52 }	3,800—4,950	3,650—4,650
			3GR→4GR	127—152 { 79—94 }	112—142 { 70—88 }	4,900—5,800	4,000—5,050
			TCC ON (4GR)	127—152 { 79—94 }	92—120 { 57—74 }	4,900—5,800	2,300—2,950
		Closed throttle position	4GR→3GR	27—33 { 17—20 }	33—39 { 21—24 }	750—850	850—950
			3GR→1GR	11—17 { 7—11 }	12—18 { 8—11 }	450—650	450—600
		Kickdown (wide open throttle)	4GR→3GR	143—153 { 87—95 }	151—161 { 94—99 }	3,850—4,100	3,800—4,000
			3GR→2GR	84—94 { 52—57 }	91—99 { 56—61 }	3,250—3,600	3,250—3,500
			2GR→1GR	42—48 { 27—29 }	44—50 { 27—31 }	2,500—2,800	2,450—2,700
	O/D OFF mode	Wide open throttle	1GR→2GR	52—58 { 32—36 }	53—59 { 33—36 }	5,600—6,200	5,300—5,850
			2GR→3GR	94—102 { 58—63 }	98—106 { 61—65 }	5,600—6,000	5,400—5,800
		Half throttle	1GR→2GR	33—42 { 20—27 }	32—41 { 20—25 }	3,600—4,600	3,200—4,050
			2GR→3GR	64—84 { 40—52 }	66—85 { 41—52 }	3,800—4,950	3,650—4,650
		Closed throttle position	4GR→3GR	149—155 { 92—96 }	162—168 { 100—104 }	4,050—4,150	4,050—4,150
			3GR→1GR	11—17 { 7—11 }	12—18 { 8—11 }	450—650	450—600
		Kickdown (wide open throttle)	3GR→2GR	84—92 { 52—57 }	91—99 { 57—61 }	3,250—3,600	3,250—3,500
			2GR→1GR	42—48 { 27—29 }	44—50 { 27—31 }	2,500—2,800	2,450—2,700

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**Fig. 8: Shift Speed Table (1995-96 Protege)**  
**Courtesy of MAZDA MOTORS CORP.**

## 1995 Kia Sephia GS

1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL & GF4A-EL Overhaul

Range		Throttle Condition	Shift	Vehicle Speed mph (km/h)
O/D Switch OFF	D	Wide open throttle	1GR→2GR	36 - 39 (57 - 63)
			2GR→3GR	61 - 65 (98 - 106)
			3GR→4GR	101 - 106 (165 - 172)
		Half throttle	1GR→2GR	21 - 26 (33 - 43)
			2GR→3GR	42 - 53 (67 - 86)
			3GR→4GR	70 - 88 (113 - 142)
			TCC ON (4GR)	58 - 74 (93 - 120)
		Closed throttle position	4GR→3GR	21 - 24 (33 - 39)
			3GR→1GR	8 - 11 (12 - 18)
		Kickdown (wide open throttle)	4GR→3GR	94 - 99 (151 - 161)
			3GR→2GR	57 - 61 (91 - 99)
			2GR→1GR	28 - 31 (44 - 50)
O/D Switch ON	D	Wide open throttle	1GR→2GR	36 - 39 (57 - 63)
			2GR→3GR	61 - 65 (98 - 106)
		Half throttle	1GR→2GR	21 - 26 (33 - 43)
			2GR→3GR	42 - 53 (67 - 86)
		Closed throttle position	4GR→3GR	100 - 104 (162 - 168)
			3GR→1GR	8 - 11 (12 - 18)
		Kickdown (wide open throttle)	3GR→2GR	57 - 61 (91 - 99)
			2GR→1GR	28 - 31 (44 - 50)

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**Fig. 9: Shift Speed Table (1995-96 Sephia)**  
Courtesy of MAZDA MOTORS CORP.

### STALL SPEED TEST

#### Preparation

Check and adjust coolant, engine oil and ATF levels. Warm engine and transaxle to operating temperature. Block front and rear wheels on both sides. Set parking brake. Connect tachometer to engine. Ensure engine idle speed and ignition timing is correct. See appropriate ADJUSTMENTS article in the ENGINE PERFORMANCE section.

**ADJUSTMENTS** - 1995 Kia Sephia

**ADJUSTMENTS** - 1996 Kia Sephia

ADJUSTMENTS - 2.3L - 1995 Mazda Millenia

ADJUSTMENTS - 2.5L - 1995 Mazda Millenia

ADJUSTMENTS - 1995 Mazda MX-3

ADJUSTMENTS - 2.0L - 1995 Mazda MX-6 & 626

ADJUSTMENTS - 2.5L - 1995 Mazda MX-6 & 626

## 1995 Kia Sephia GS

1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL & GF4A-EL Overhaul

ADJUSTMENTS - 1996 Mazda MX-6 & 626

ADJUSTMENTS - 1.5L - 1995 Mazda Protege

ADJUSTMENTS - 1.8L - 1995 Mazda Protege

ADJUSTMENTS - 1996 Mazda Protege

**CAUTION: Stall test generates high ATF temperatures. DO NOT hold throttle open at stall speed for more than 5 seconds. Allow engine to idle for at least one minute to cool fluid between each test.**

### Testing

Firmly depress brake pedal with engine running. Select "R" range and depress accelerator pedal to floor. When engine speed no longer increases, read RPM on tachometer and release accelerator pedal. Perform stall test in "R" , "D", "S" and "L". Compare RPM with STALL SPEED table.

**NOTE: Stall speed specifications are approximate.**

### STALL SPEED

Application	RPM
MX-3	
4-Cylinder	2100-2400
V6	2450-2750
Millenia	2270-2500
MX-6 & 626	2270-2500
Protege 1993-94	
1.5L (ZJ)	1950-2250
1.8L (BP)	2200-2500
Sephia	
1.6L (B6)	2200-2500
1.8L (BP)	2300-2600

### STALL SPEED EVALUATION

#### High In "L", "S", "D" & "R"

Worn oil pump. Oil leakage from oil pump, control valve and/or transmission case. Stuck pressure regulator valve. Solenoid valve malfunction. Pressure modulator valve sticking.

#### High In "D", "S" & "L"

Forward clutch and/or one-way clutch No. 1 slipping.

**High In "D"**

One-way clutch No. 2 slipping.

**High In "S" HOLD & "L" HOLD**

Coasting clutch slipping.

**High In "D" HOLD & "S" HOLD**

2-4 brake band slipping.

**High In "R", "L" & "L" HOLD**

Low-reverse brake slipping.

**High In "R"**

Low-reverse brake slipping. Reverse clutch slipping. Perform road test to determine whether problem is low-reverse brake or reverse clutch. If engine braking is okay in "L", problem is reverse clutch. If no engine braking is present in "L", problem is low-reverse brake.

**Below Specifications**

Engine out of tune. One-way clutch slipping within torque converter.

**LINE PRESSURE TEST**

Inspection of line pressure checks the condition of hydraulic components and ensures that no internal oil leaks exist.

**Preparation**

Follow stall speed test preparation. Connect line pressure gauge to line pressure test port. See **Fig. 10** or **Fig. 11**. Place line pressure gauge where it can be read from driver seat. Ensure engine idle speed and ignition timing is correct. See appropriate ADJUSTMENTS article in the ENGINE PERFORMANCE section.

**ADJUSTMENTS** - 1995 Kia Sephia**ADJUSTMENTS** - 1996 Kia Sephia**ADJUSTMENTS** - 2.3L - 1995 Mazda Millenia**ADJUSTMENTS** - 2.5L - 1995 Mazda Millenia**ADJUSTMENTS** - 1995 Mazda MX-3**ADJUSTMENTS** - 2.0L - 1995 Mazda MX-6 & 626

ADJUSTMENTS - 2.5L - 1995 Mazda MX-6 & 626

ADJUSTMENTS - 1996 Mazda MX-6 & 626

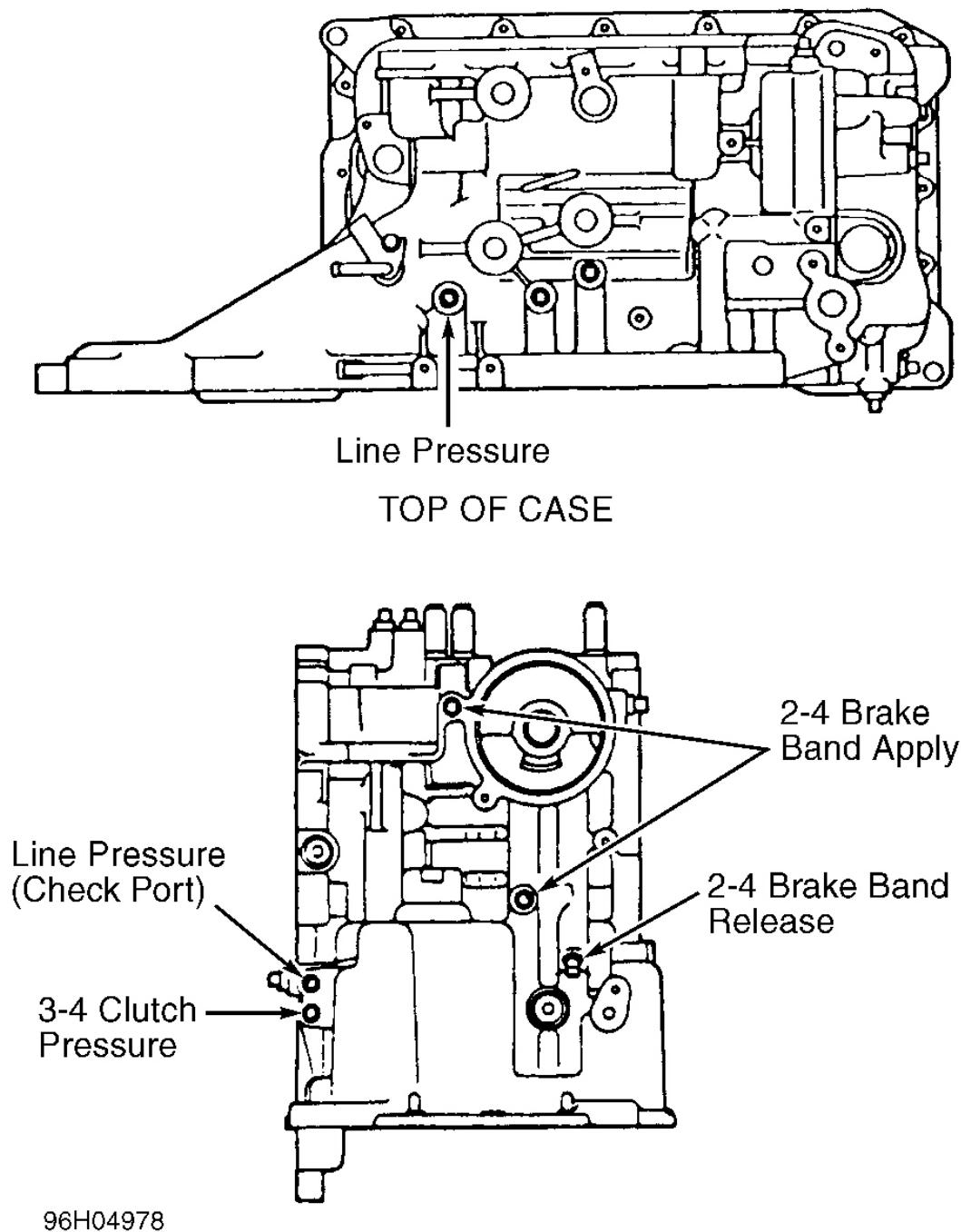
ADJUSTMENTS - 1.5L - 1995 Mazda Protege

ADJUSTMENTS - 1.8L - 1995 Mazda Protege

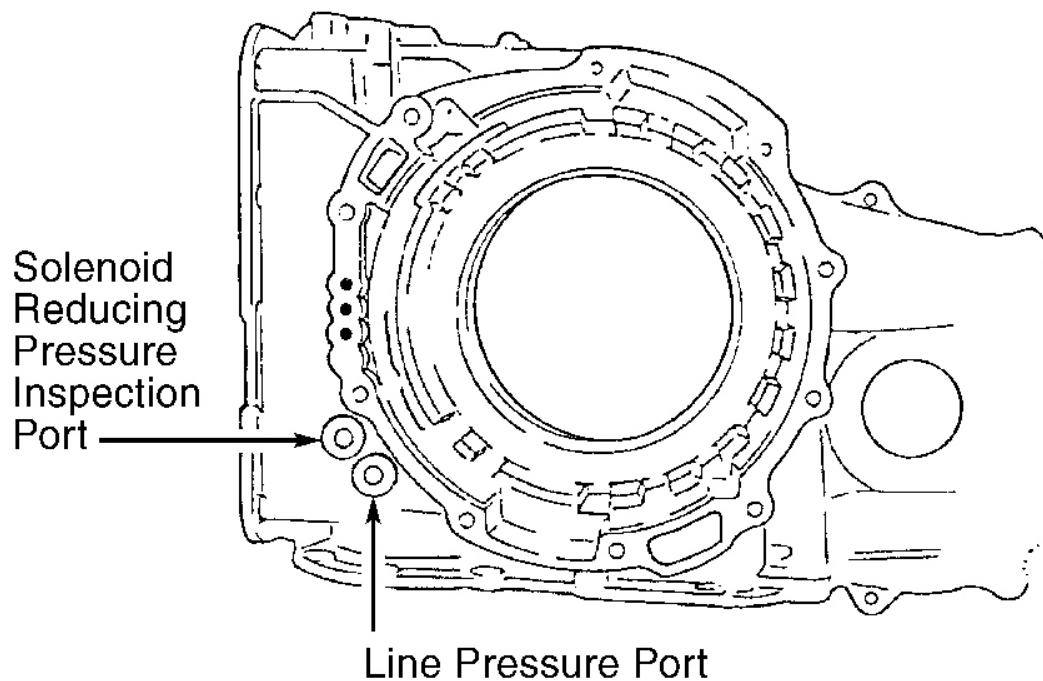
ADJUSTMENTS - 1996 Mazda Protege

### **Testing**

Start engine, depress brake pedal firmly, shift selector to "D" and read line pressure at idle. Depress accelerator fully and read line pressure as soon as RPM becomes constant, then release accelerator pedal. Shift selector to "N" and idle engine for at least one minute, to cool fluid. Read line pressure at idle and stall speeds for each range in the same manner. Compare with LINE PRESSURE TEST SPECIFICATIONS table and **LINE PRESSURE TEST EVALUATION** .



**Fig. 10: Locating Line Pressure Test Port (FA4A-EL)**  
Courtesy of MAZDA MOTORS CORP.



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**Fig. 11: Locating Line Pressure Test Port (GF4A-EL)**

Courtesy of MAZDA MOTORS CORP.

**NOTE:** Line pressure specifications are approximate.**LINE PRESSURE TEST SPECIFICATIONS**

Application & Range	Idle Pressure psi (kPa)	Stall Pressure psi (kPa)
<b>MX-3</b>		
"D", "S" & "L"	62-79 (430-550)	133-151 (920-1040)
"R"	106-126 (730-870)	218-247 (1500-1700)
<b>Millenia</b>		
"D", "S" & "L"	60-79 (420-550)	160-170 (1100-1170)
"R"	106-146 (730-1010)	277-293 (1910-2020)
<b>MX-6 &amp; 626</b>		
"D", "S" & "L"	61-77 (420-530)	160-170 (1100-1170)
"R"	106-146 (730-1010)	277-294 (1910-2030)
<b>Protege</b>		
"D", "S" & "L"	62-79 (430-550)	133-151 (920-1040)
"R"	106-126 (730-870)	218-247 (1500-1700)
<b>Sephia</b>		

## 1995 Kia Sephia GS

1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL & GF4A-EL Overhaul

"D", "S" & "L"	62-79 (430-550)	133-151 (920-1040)
"R"	106-126 (730-870)	218-248 (1500-1710)

### LINE PRESSURE TEST EVALUATION

#### Low In "D", "S", "L" & "R"

Worn oil pump. Fluid leaking from oil pump, control valve body or transaxle case. Pressure regulator valve stuck.

#### Low In "D" & "S"

Fluid leaking from hydraulic circuit of forward clutch.

#### Low In "R"

Fluid leaking from hydraulic circuit of low and reverse brake.

#### High In "D", "S", "L" & "R"

Throttle valve stuck. Throttle modulator valve stuck. Pressure regulator valve stuck.

### REMOVAL & INSTALLATION

For transmission removal and installation, see appropriate TRANSMISSION REMOVAL & INSTALLATION - A/T article in the TRANSMISSION SERVICING section.

#### TRANSMISSION REMOVAL & INSTALLATION - A/T - Kia

TRANSMISSION REMOVAL & INSTALLATION - A/T - Mazda

### TORQUE CONVERTER

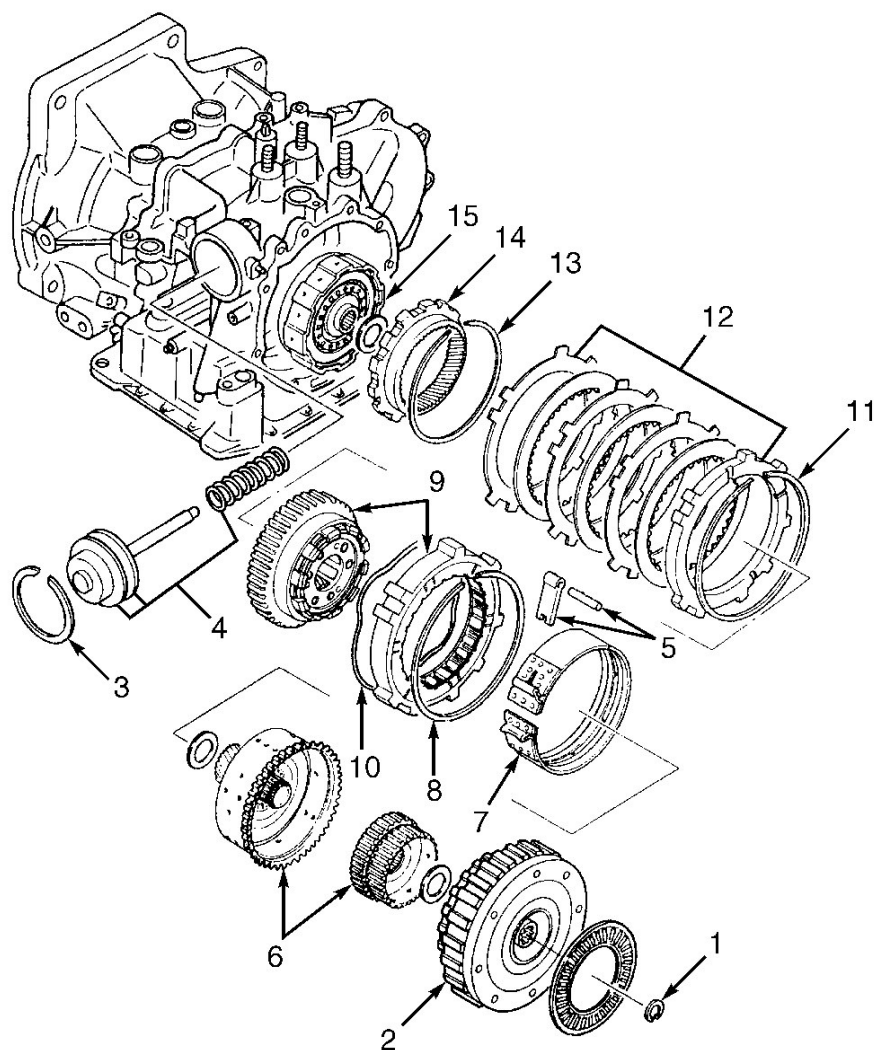
1. Torque converter is a sealed unit and cannot be disassembled for service. Inspect for damage and cracks. Replace torque converter if defective. Remove any rust from pilot hub and boss of converter. Replace torque converter if converter boss bushing inner diameter exceeds specification. Maximum bushing diameter on FA4A-EL converter is 2.090" (53.08 mm). Maximum bushing diameter on GF4A-EL converter is 2.0884" (53.045 mm).
2. Flush torque converter. After converter is removed from cleaner, thoroughly drain solvent through hub. Add about .53 qt. (.5L) clean ATF to converter. Agitate fluid by hand. Drain ATF from converter.

### TRANSAXLE DISASSEMBLY

1. Mount transaxle on stand. Remove torque converter. Remove oil pump drive shaft. Remove dipstick tube. Remove range switch, turbine shaft speed sensor. Remove oil pipe, spring and ball next to range switch.
2. Remove oil pan and gasket. Remove oil strainer and "O" ring. On GF4A-EL models, remove valve body

cover and gasket. On all models, remove valve body with electrical harness. On FA4A-EL models, remove throttle cable. Remove manual shaft, manual plate, parking assist lever and actuator support. Remove oil pipe at oil pump. On all models, remove oil pump and gasket.

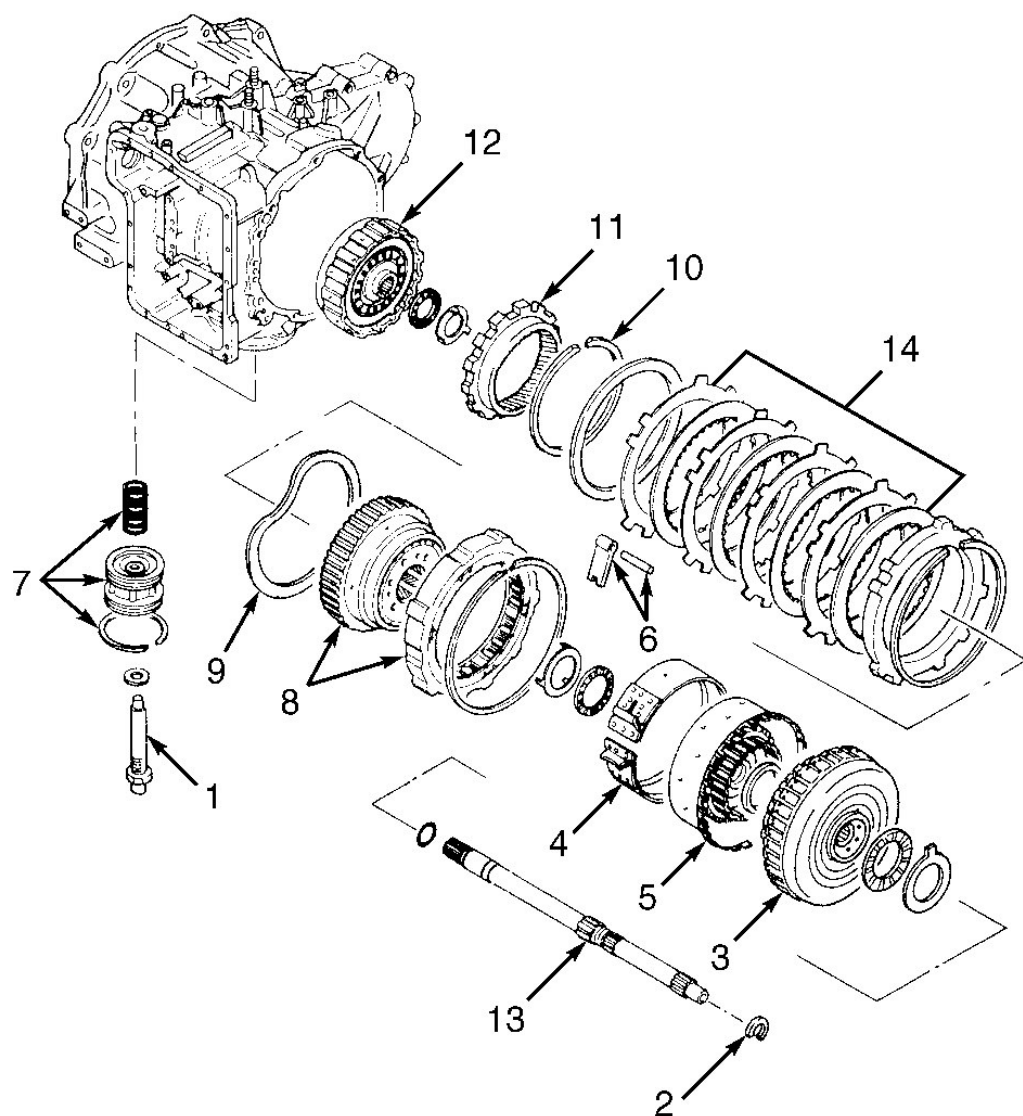
3. Remove clutch assembly turbine shaft snap ring and remove clutch assembly. On FA4A-EL models, compress servo and remove retaining ring, servo and spring. Pull anchor shaft while holding strut and remove strut.
4. On all models, remove small sun gear and one-way clutch No. 1 assembly. See **Fig. 12** or **Fig. 13** . Secure 2-4 band with wire to prevent stretching and remove 2-4 band. On GF4A-EL models, pull anchor shaft while holding strut and remove strut. Pull piston stem from 2-4 brake band servo. Remove snap ring, band servo and spring.
5. On all models, remove one-way clutch retaining snap ring, one-way clutch No. 2 and carrier hub assembly. Remove low and reverse brake snap ring, retaining plate, drive and driven plates.



- |  |  |
|--|--|
| 1. Snap Ring                                   | 9. One-Way Clutch No. 2 & Carrier Hub Assembly |
| 2. Coasting, Forward & Reverse Clutch Assembly | 10. Friction Plate                             |
| 3. Snap Ring                                   | 11. Snap Ring                                  |
| 4. 2-4 Brake Servo                             | 12. Low-Reverse Drive & Driven Plates          |
| 5. Anchor Strut & Shaft                        | 13. Snap Ring                                  |
| 6. Small Sun Gear & One-Way Clutch No. 1       | 14. Internal Gear                              |
| 7. 2-4 Brake Band                              | 15. 3-4 Clutch                                 |
| 8. Snap Ring                                   |  |

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**Fig. 12: Exploded View Of Internal Clutch Assemblies (FA4A-EL)**  
**Courtesy of MAZDA MOTORS CORP.**



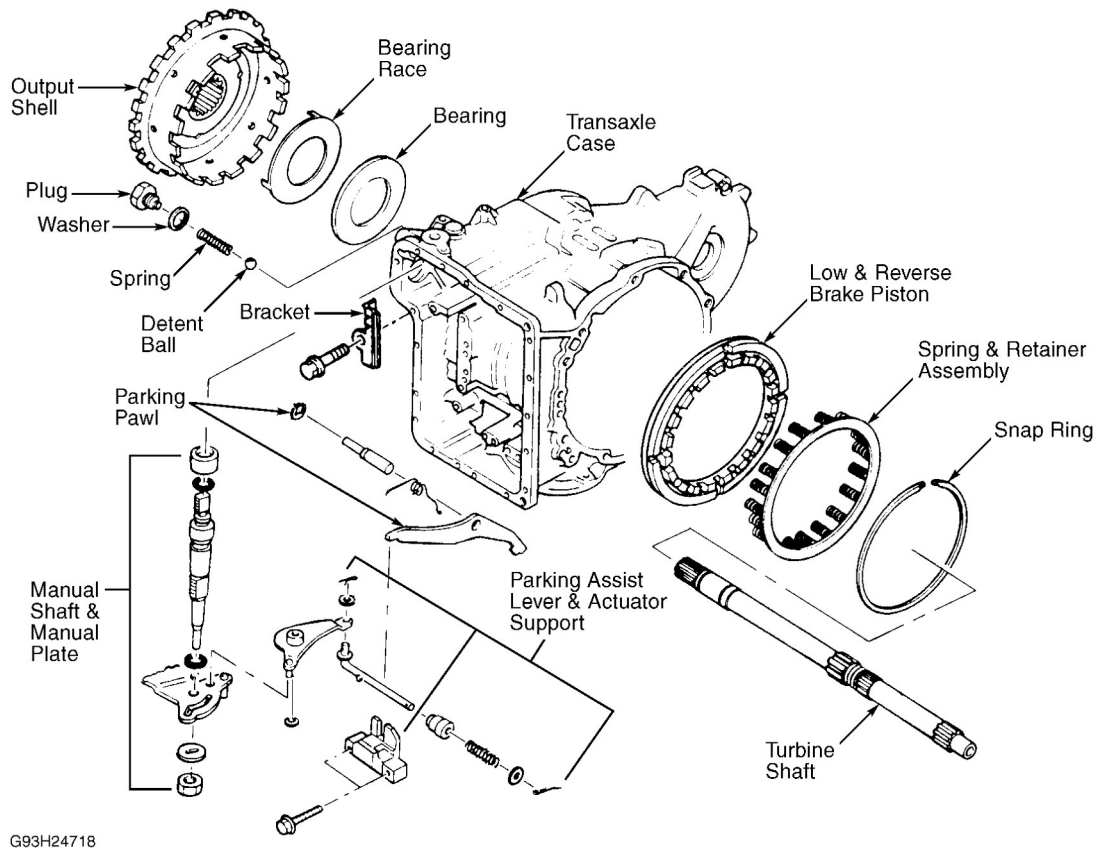
- |  |   |
|--|---|
| 1. Piston Stem                           | 8. Low-Reverse Hub Inner Race, Planetary Carrier Hub & One-Way Clutch No. 2 |
| 2. Snap Ring (Turbine Shaft)             | 9. Friction Plate   |
| 3. Forward, Coasting & Reverse Clutch    | 10. Snap Ring   |
| 4. 2-4 Brake Band                        | 11. Internal Gear   |
| 5. Small Sun Gear & One-Way Clutch No. 1 | 12. 3-4 Clutch  |
| 6. Anchor Strut & Pin                    | 13. Turbine Shaft   |
| 7. Servo                                 | 14. Low-Reverse Clutch  |

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**Fig. 13: Exploded View Of Internal Clutch Assemblies (GF4A-EL)**

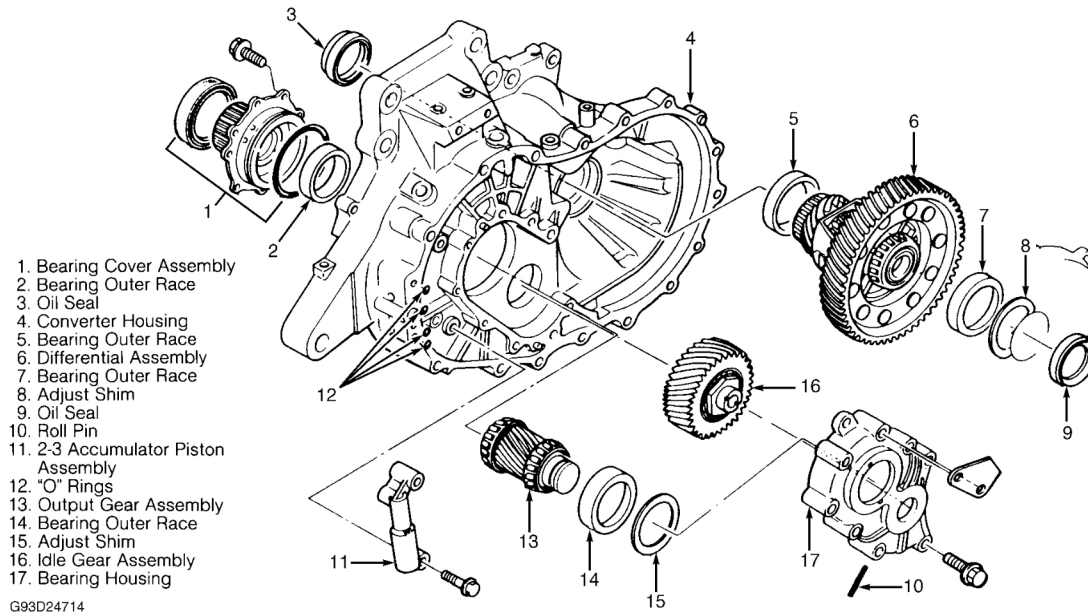
Courtesy of MAZDA MOTORS CORP.

6. Remove internal gear snap ring and remove internal gear from output shell. Remove "O" ring located on converter housing side of turbine shaft. Pull out turbine shaft with 3-4 clutch assembly.
7. Remove bolts from converter housing to transaxle. Tap lightly with a plastic hammer to remove transaxle case. Remove parking pawl assembly. Remove output shell and output gear. On GF4A-EL models, remove manual shaft, manual plate, parking assist lever and actuator support. See **Fig. 14** . On all models, remove differential assembly. See **Fig. 15** .



**Fig. 14: Low & Reverse Brake Piston & Related Components (GF4A-EL Shown; FA4A-EL Similar)**

Courtesy of MAZDA MOTORS CORP.



**Fig. 15: Exploded View Of Idler & Differential Assembly (GF4A-EL Shown; FA4A-EL Similar)**  
 Courtesy of MAZDA MOTORS CORP.

8. On GF4A-EL models, remove 2-3 accumulator, orifice check valve spring and check valve. On all models, remove bolt in idler gear and output gear bearing housing to access roll pin in idler gear. Drive roll pin out with pin punch. See **Fig. 15** . Remove other bolts in idler gear and output gear housing.
9. Tap housing with plastic hammer lightly to remove. Tap out idler gear shaft from converter housing and remove idler gear with output gear. Remove bearing cover assembly. Remove converter housing from holding fixture. Press bearing race out of torque converter housing using step plate.

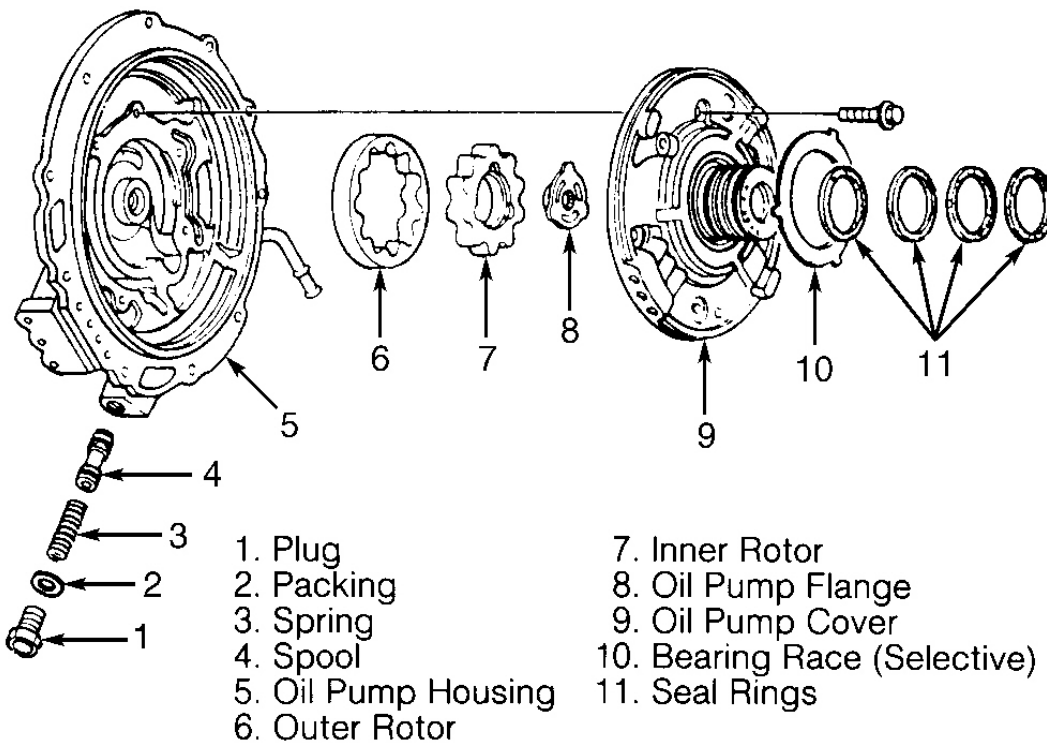
## COMPONENT DISASSEMBLY & REASSEMBLY

### OIL PUMP

**NOTE:** Do not place reference marks on oil pump rotors with a punch.

#### Disassembly

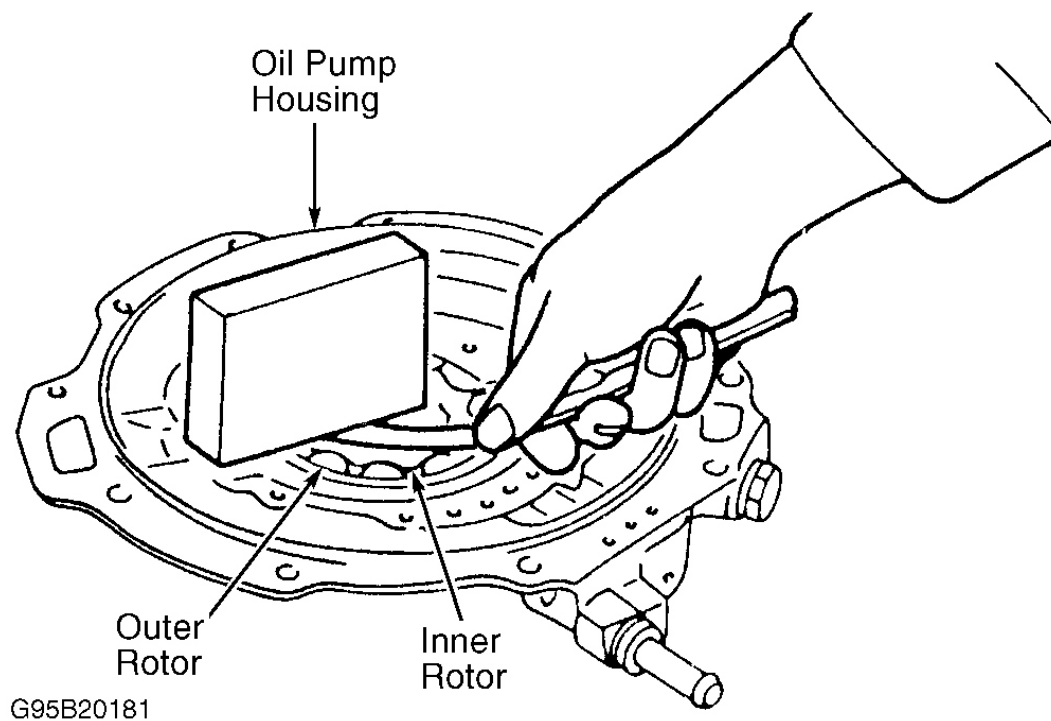
1. Remove oil pump cover mounting bolts in crisscross pattern. Mark inner and outer rotors for reassembly reference. Remove flange, inner and outer rotors. See **Fig. 16** .
2. Remove plug, spring and spool. Remove selective bearing race, "O" rings and seal rings from cover.



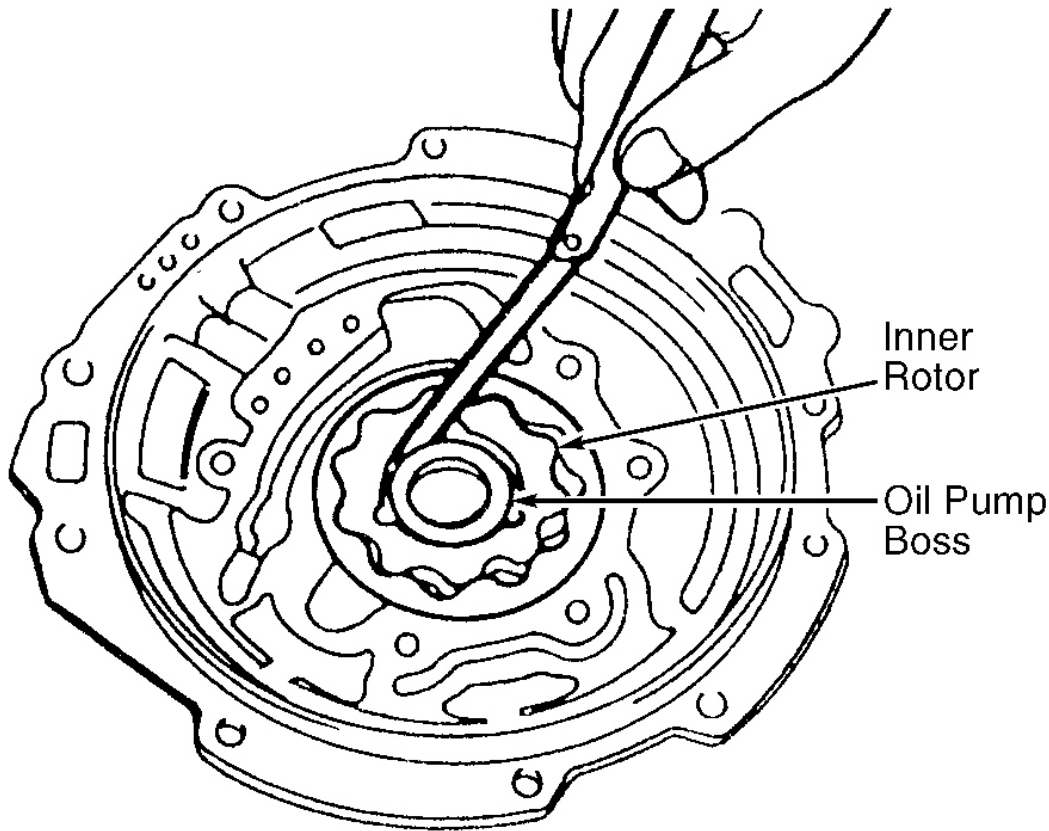
**Fig. 16: Exploded View Of FA4A-EL Oil Pump (GF4A-EL Is Similar)**  
Courtesy of MAZDA MOTORS CORP.

### Inspection

1. Check oil pump for broken or worn seal ring or weak springs. Check for damaged or worn sliding surfaces. Replace as required.
2. Measure clearances of all wear surfaces. See **OIL PUMP SPECIFICATIONS** table. If clearances are not within specifications, replace oil pump.
3. At several points around surface, measure end clearance between oil pump housing and rotors. See **Fig. 17**. Measure clearance between oil pump boss and inner rotor. See **Fig. 8**.
4. Ensure spool valve spring free length is 2.09" (53.0 mm). Ensure pressure regulator valve minimum diameter is .550" (14.00 mm).



**Fig. 17: Measuring Rotor End Clearance**  
Courtesy of MAZDA MOTORS CORP.



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**Fig. 18: Measuring Rotor Side Clearance**  
 Courtesy of MAZDA MOTORS CORP.

**NOTE:** Ensure all components are coated with ATF during assembly

#### Reassembly

1. Install spool and spring into oil pump body. Ensure valve moves freely. Install plug with new packing and tighten.
2. Align rotor reference marks and install rotors in oil pump housing. Install oil pump flange. Install oil pump cover on oil pump flange and tighten in sequence to specification.
3. Install oil pump shaft and check for smooth operation. Install new seal rings. Apply petroleum jelly to selective bearing race and install on oil pump cover.

#### OIL PUMP SPECIFICATIONS

Application	In. (mm)
Rotor End Clearance	.0008-.0016 (.020-.040)

## 1995 Kia Sephia GS

1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL & GF4A-EL Overhaul

Rotor Side Clearance	.0016-.005 (.040-.125)
Seal Ring Inner Diameter	
FA4A-EL	1.553 (39.45)
GF4A-EL	2.026 (51.45)

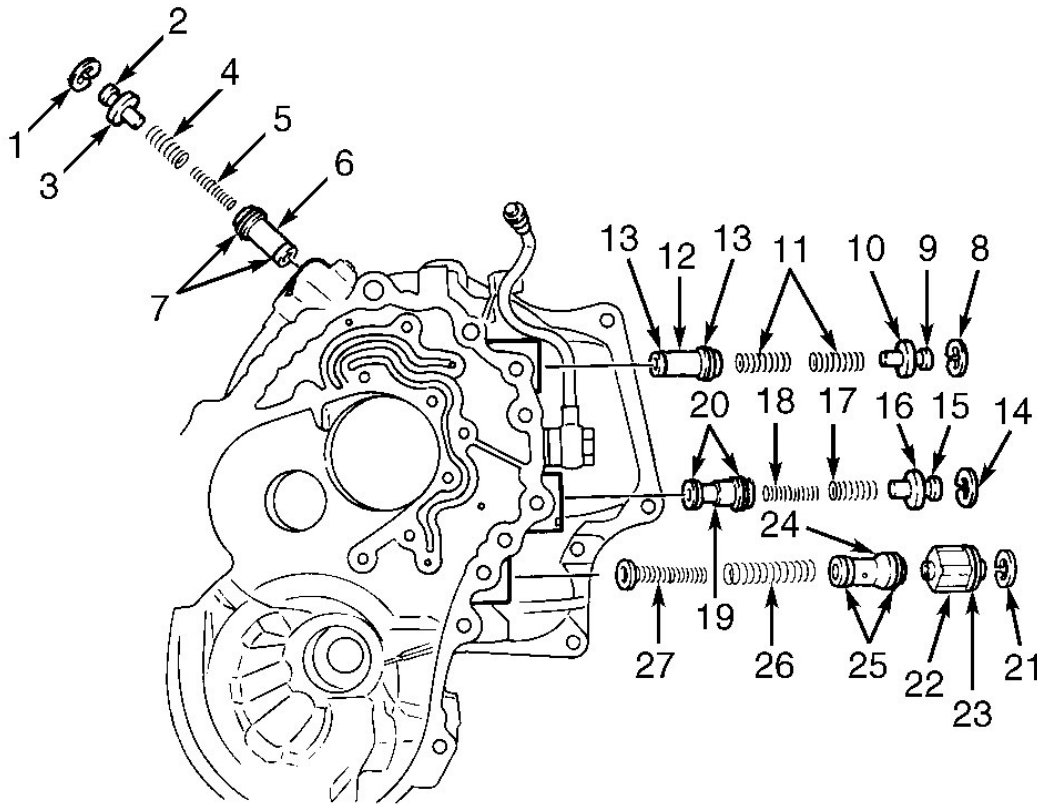
### ACCUMULATORS

#### Disassembly (FA4A-EL)

1. Remove snap rings and stopper plugs. See **Fig. 19** . Remove accumulator pistons by applying air pressure to oil passages. See **Fig. 20** .
2. Measure spring free length. See **FA4A-EL ACCUMULATOR SPRING SPECIFICATIONS** table. If not within specifications, replace spring.

#### Reassembly

To reassemble, reverse disassembly procedure. Note location of piston and springs. See **FA4A-EL ACCUMULATOR & SIZE** chart. See **Fig. 19** .



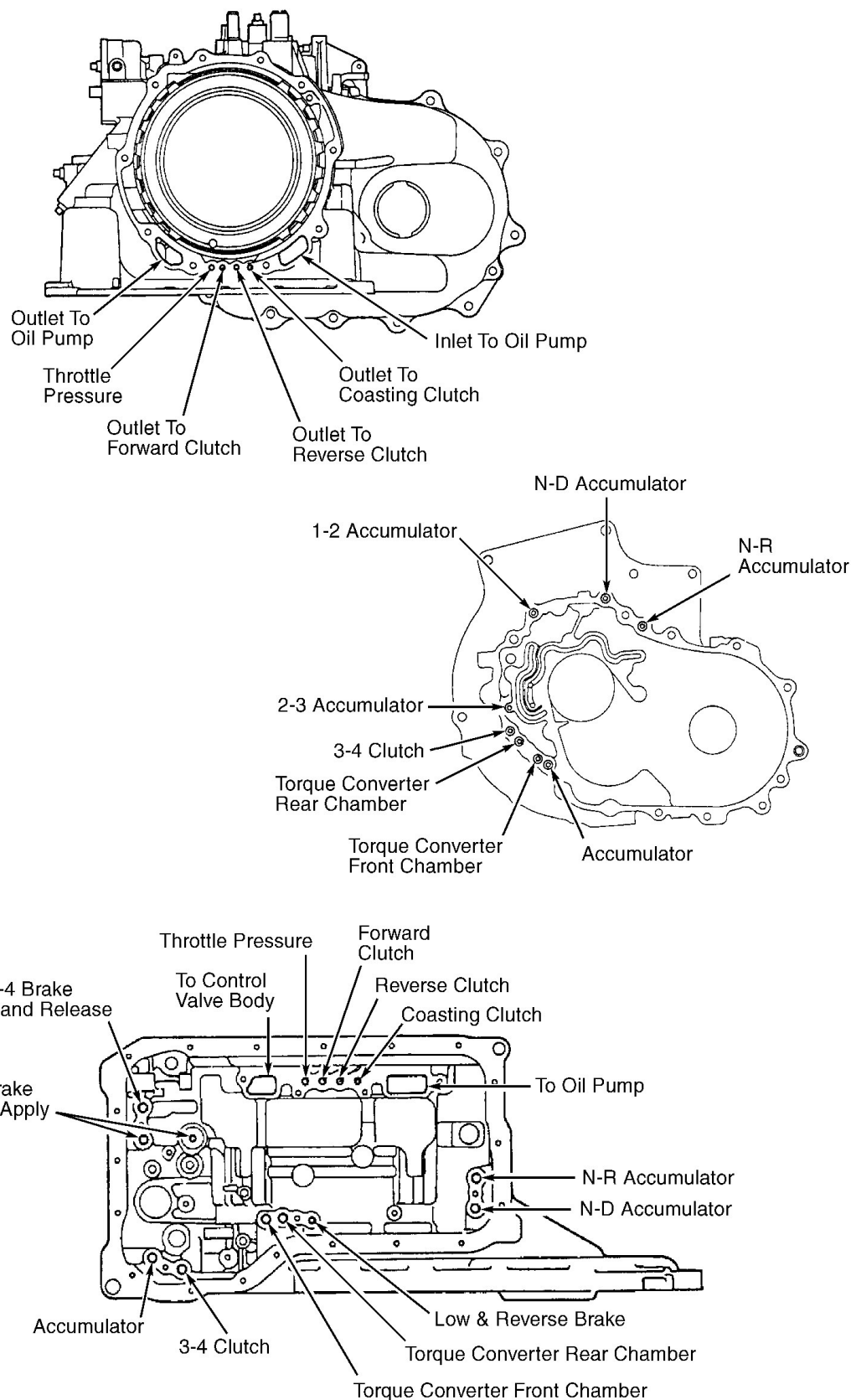
- |                                |                                |
|--------------------------------|--------------------------------|
| 1. Snap Ring                   | 15. Stopper Plug               |
| 2. Stopper Plug                | 16. "O" Rings                  |
| 3. "O" Ring                    | 17. N-D Accumulator Spring (L) |
| 4. 2-3 Accumulator Spring (L)  | 18. N-D Accumulator Spring (S) |
| 5. 2-3 Accumulator Spring (S)  | 19. N-D Accumulator Piston     |
| 6. 2-3 Accumulator Piston      | 20. Seal Rings                 |
| 7. Seal Rings                  | 21. Snap Ring                  |
| 8. Snap Ring                   | 22. Stopper Plug               |
| 9. Stopper Plug                | 23. "O" Rings                  |
| 10. "O" Ring                   | 24. N-R Accumulator Piston     |
| 11. 1-2 Accumulator Spring (L) | 25. Seal Rings                 |
| 12. 1-2 Accumulator Piston     | 26. N-R Accumulator Spring (L) |
| 13. "D" Rings                  | 27. N-R Accumulator Spring (S) |
| 14. Snap Ring                  |                                |

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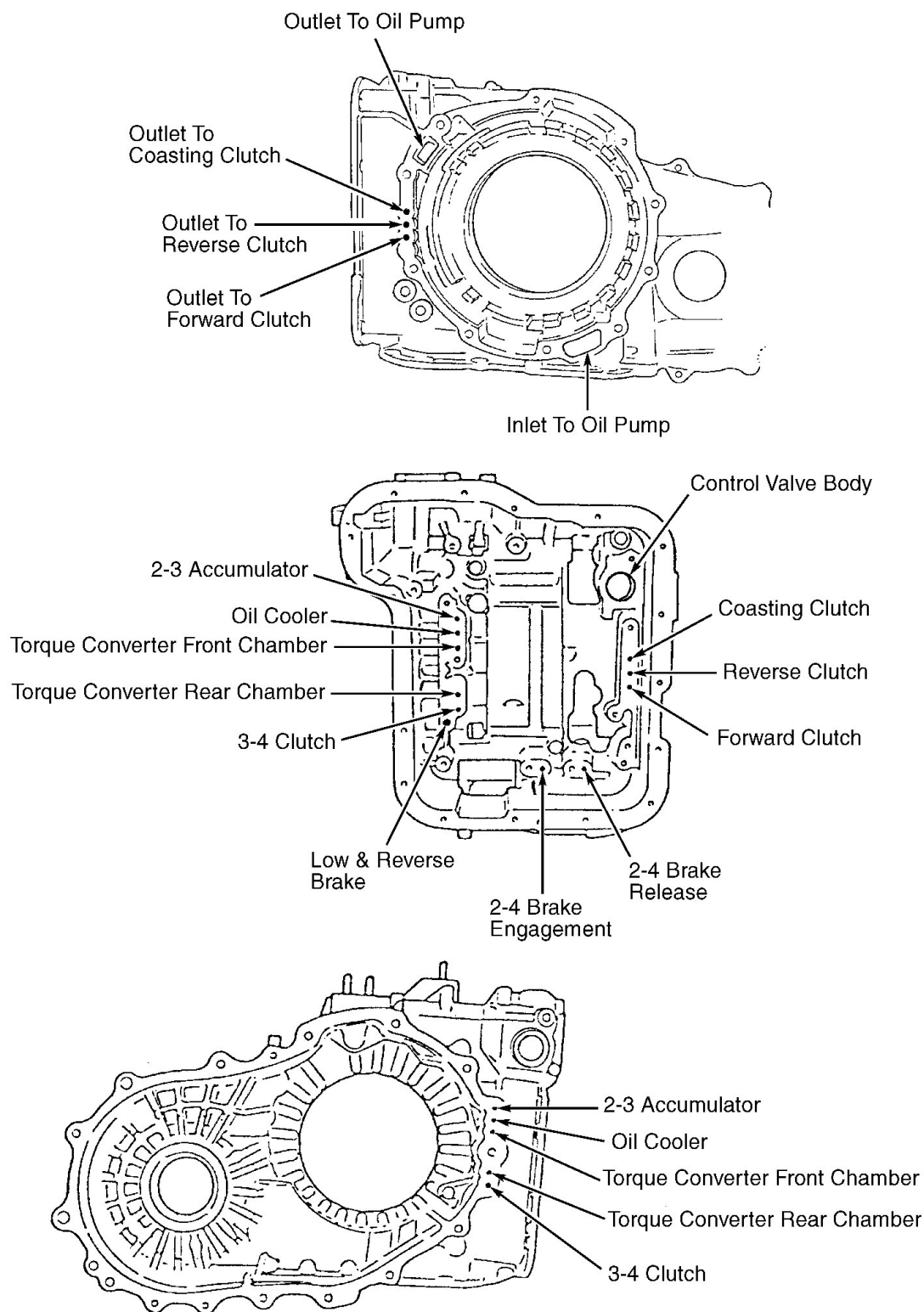
**Fig. 19: Exploded View Of FA4A-EL Accumulators**  
 Courtesy of MAZDA MOTORS CORP.

## 1995 Kia Sephia GS

### 1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL & GF4A-EL Overhaul



**Fig. 20: Identifying Fluid Passage Locations (FA4A-EL)**  
**Courtesy of MAZDA MOTORS CORP.**



G96D04981

**Fig. 21: Identifying Fluid Passage Locations (GF4A-EL)**

**1995 Kia Sephia GS**

1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL &amp; GF4A-EL Overhaul

Courtesy of MAZDA MOTORS CORP.

**FA4A-EL ACCUMULATOR SPRING SPECIFICATIONS**

Application	Spring Color	In. (mm)
<b>N-D</b>		
Small Spring	None	3.98 (101.2)
Large Spring	Red	3.71 (94.2)
<b>N-R</b>		
Small Spring	None	3.67 (93.2)
Large Spring	Orange	4.19 (106.5)
<b>1-2</b>		
Small Spring		
1.5L & 1.6L	Purple	3.34 (84.7)
1.8L & 2.5L V6	Red	3.22 (81.7)
Large Spring		
1.5L & 1.6L	Purple	3.34 (84.7)
1.8L & 2.5L V6	Yellow	3.23 (82.1)
<b>2-3</b>		
Small Spring		
1.5L & 1.6L	Pink	2.70 (67.8)
1.8L & 2.5L V6	Gray	2.35 (59.7)
Large Spring		
1.5L & 1.6L	Maroon	2.74 (69.5)
1.8L & 2.5L V6	Gray	2.83 (71.8)

**FA4A-EL ACCUMULATOR & SIZE**

Seal Ring & Piston Application	Large In. (mm)	Small In. (mm)
2-3 Accumulator <sup>(1)</sup>	1.176 (29.87)	.863 (21.91)
1-2 Accumulator <sup>(1)</sup>	.961 (24.40)	.657 (16.70)
N-D Accumulator <sup>(1)</sup>	1.176 (29.87)	.863 (21.91)
N-R Accumulator <sup>(1)</sup>	1.176 (29.87)	.866 (22.00)
(1) For location on transaxle case, See <b>Fig. 19</b> .		

**Disassembly (2-3 Accumulator - GF4A-EL)**

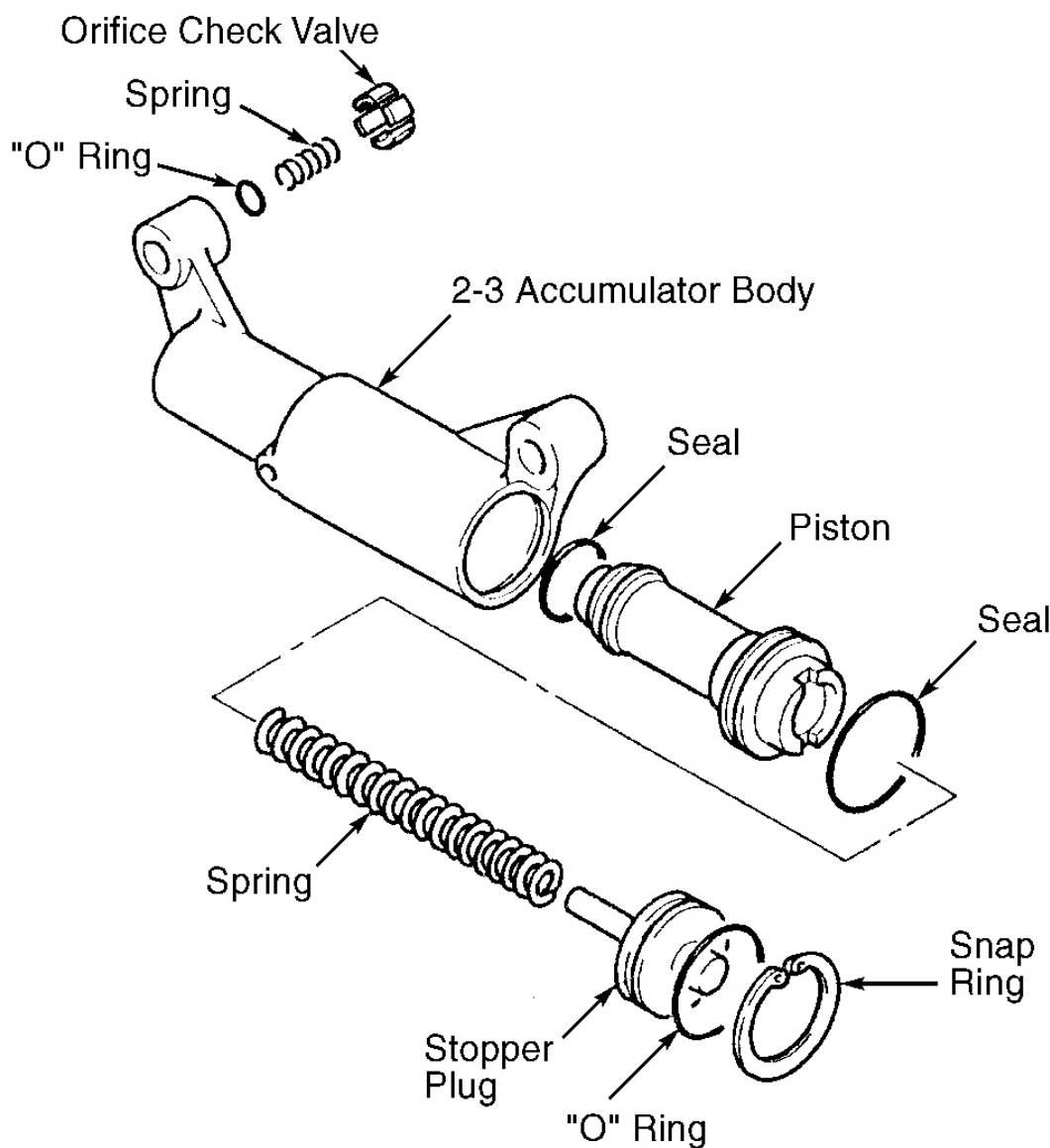
Remove snap ring and stopper plug. See **Fig. 22** . Remove accumulator spring and piston. Remove orifice check valve and spring.

**Inspection**

Check spring free lengths and replace if not within specification. Ensure accumulator spring is 3.06" (77.7 mm) in length. Ensure orifice check valve spring is .512" (13.00 mm) in length.

**Reassembly**

Install "O" rings on accumulator using ATF. Install accumulator piston and spring. Install stopper plug and "O" ring. Install snap ring while applying pressure to stopper plug. For remainder of installation procedures, reverse disassembly procedures. Ensure snap ring is seated properly.



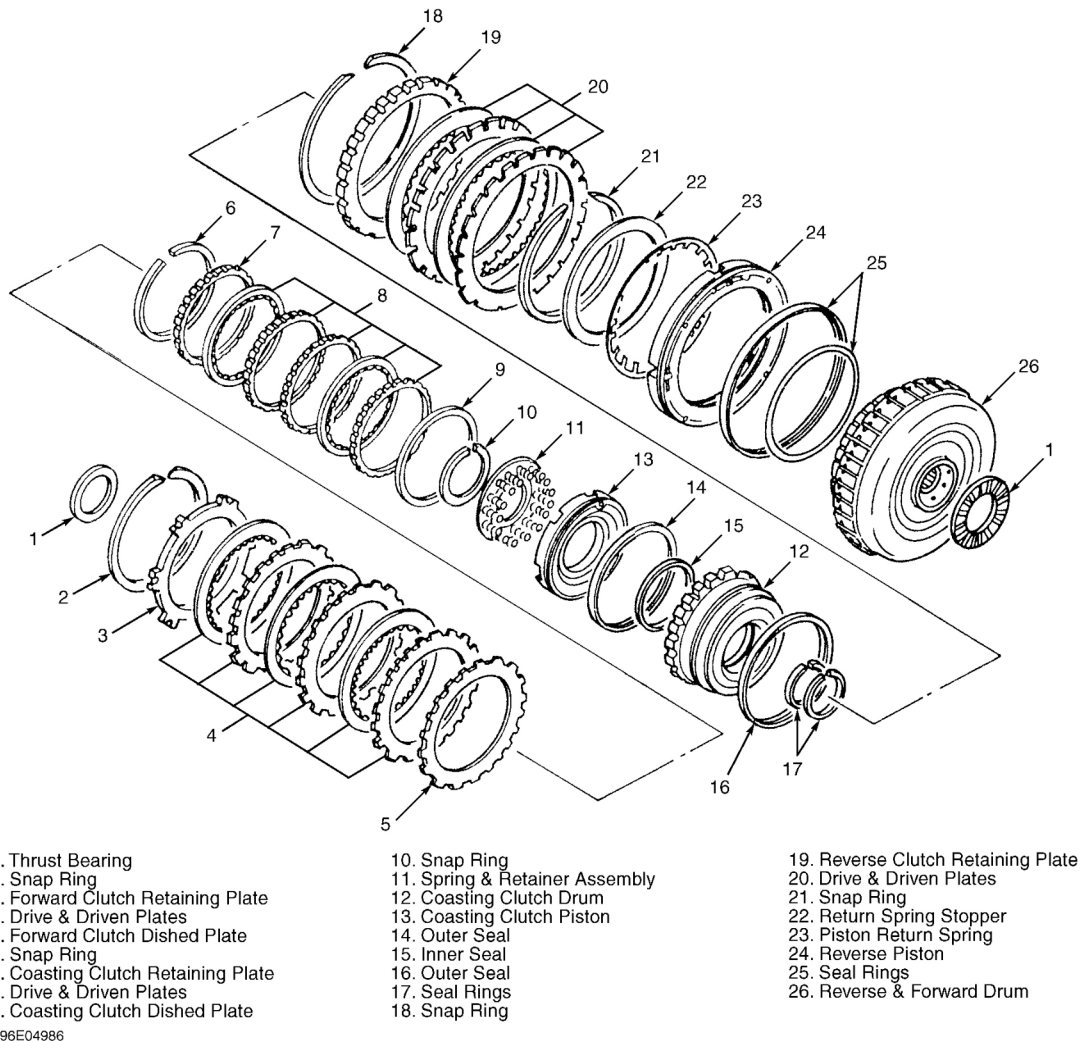
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**Fig. 22: Exploded View Of GF4A-EL 2-3 Accumulator**  
Courtesy of MAZDA MOTORS CORP.

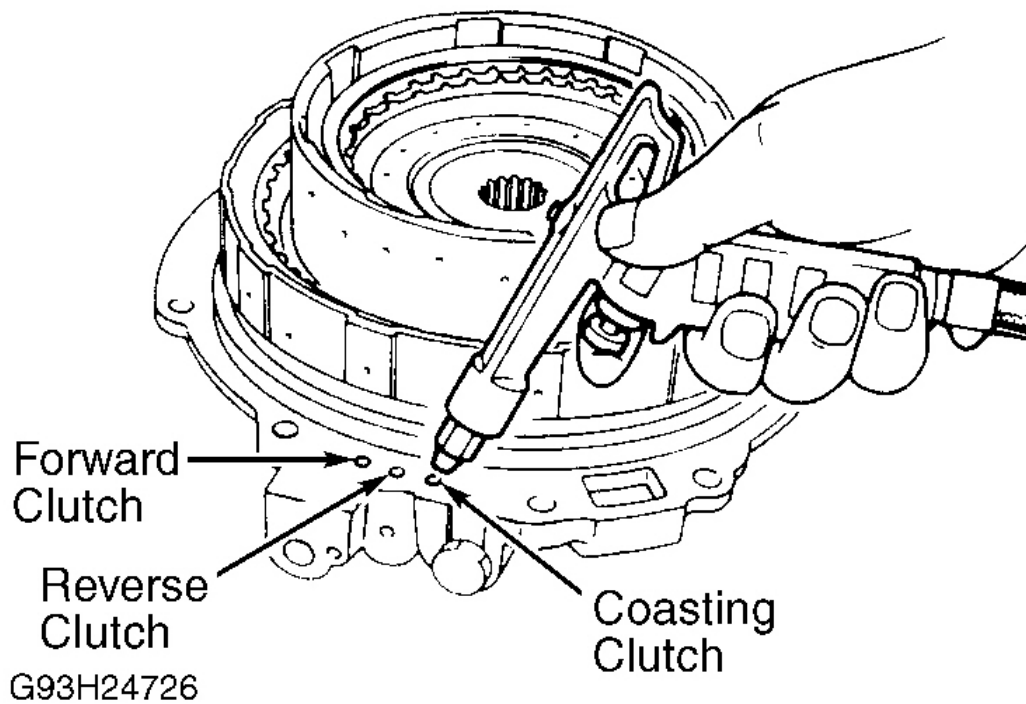
**FORWARD, COASTING & REVERSE CLUTCHES**

## Disassembly

1. Remove snap ring, retainer plate, drive and driven plates and dished plate from forward clutch, coasting clutch and reverse clutch. See **Fig. 23**.
2. Compress coasting clutch spring and remove snap ring. Remove spring and retainer assembly. Remove coasting clutch drum from reverse and forward drum. Using air pressure, remove coasting clutch piston from coasting clutch drum. See **Fig. 24**.
3. Remove reverse clutch snap ring from reverse and forward drum. Place reverse and forward drum on oil pump. Use air pressure to remove reverse piston.
4. Check and repair or replace any faulty parts. Inspect piston check ball for leakage and sticking. Check for worn snap ring.

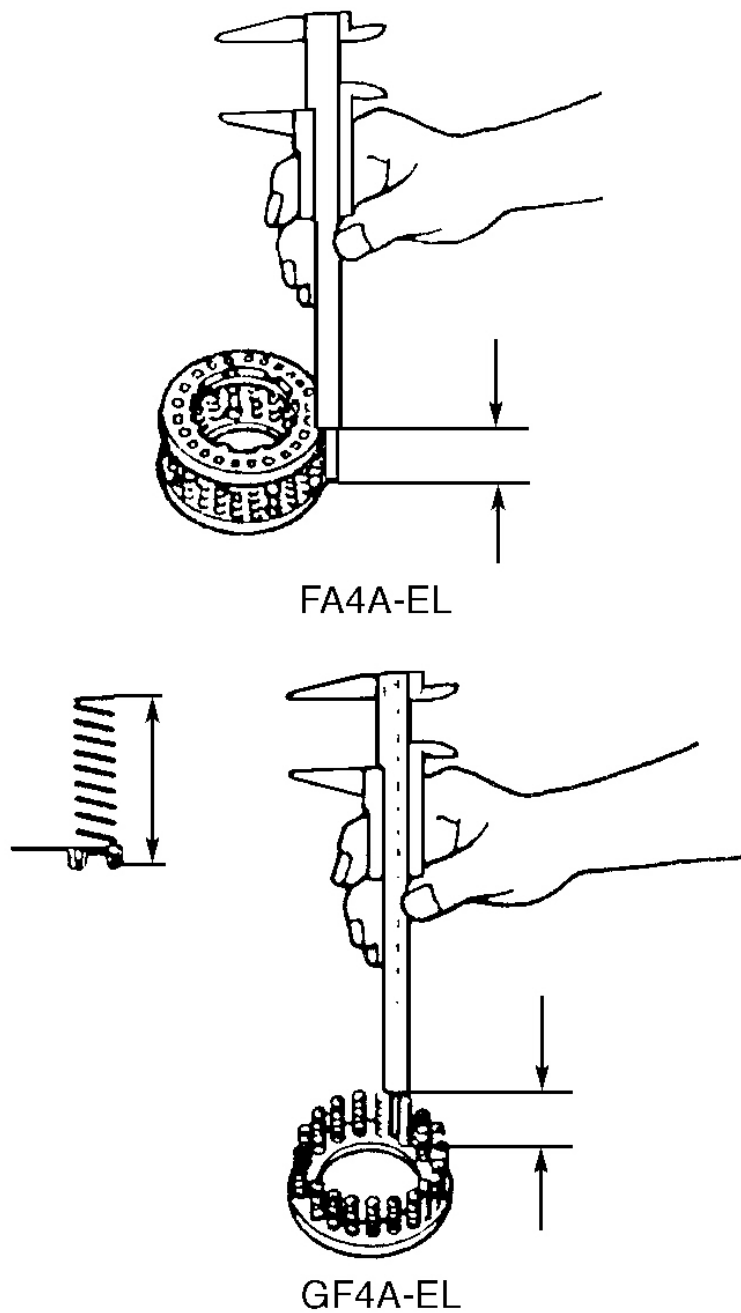


**Fig. 23: Exploded View Of Forward, Coasting & Reverse Clutch Assemblies**  
Courtesy of MAZDA MOTORS CORP.



**Fig. 24: Removing Clutch Pistons & Air Checking Clutches**  
Courtesy of MAZDA MOTORS CORP.

5. Check for broken or weak return springs. Check spring and retainer assembly for separation or deformation. Replace drive plates (friction discs) if thickness is less than .055" (1.40 mm). Measure spring and retainer free height. See **Fig. 25**. On FA4A-EL models, height should be .805" (20.45 mm). On GF4A-EL models, height should be 1.242" (31.54 mm).

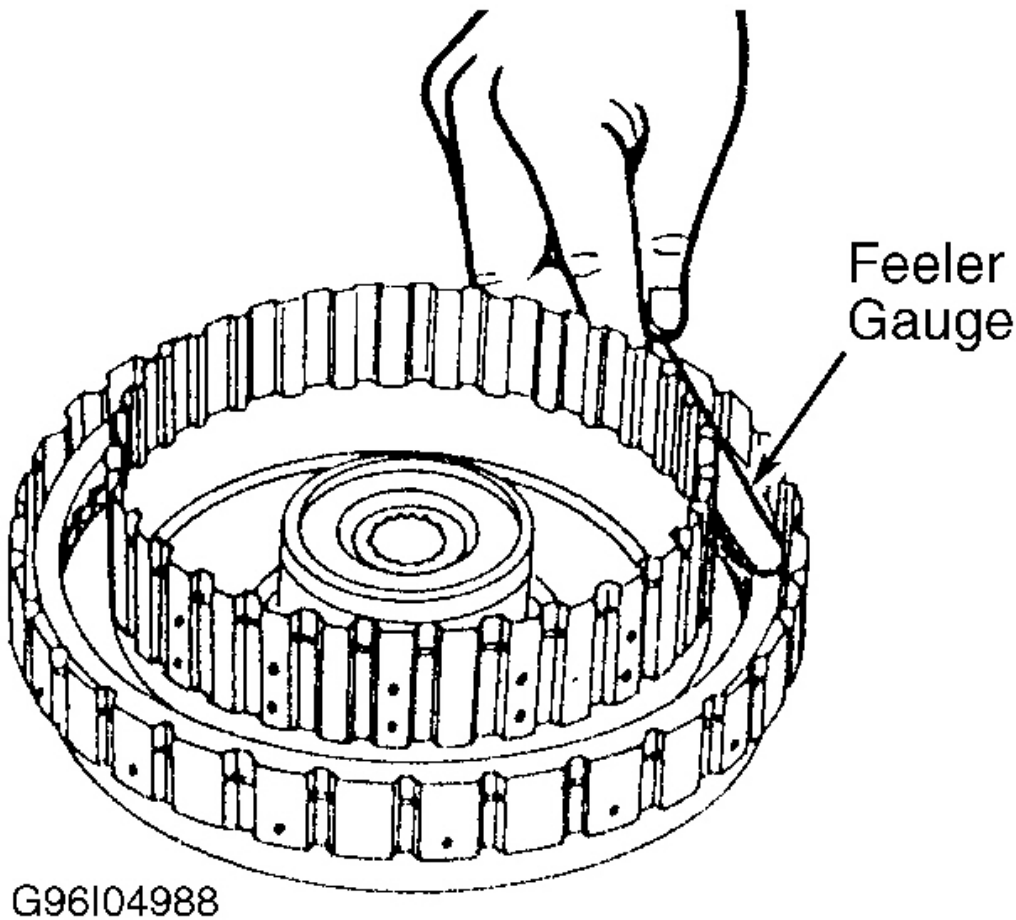


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**Fig. 25: Measuring Clutch Spring & Retainer Height**  
Courtesy of MAZDA MOTORS CORP.

Reassembly

1. Apply ATF to all parts. Soak drive plates for at least 15 minutes. Install inner and outer seals on reverse piston. Install reverse piston into reverse clutch drum. Install piston return spring with tabs facing away from piston. Install return spring stop with step upward. Compress spring and retainer. Install snap ring.
2. Install reverse clutch dished plate with the dished side facing piston. Install drive and driven plates, retaining plate (step facing down) and snap rings. Measure clearance of reverse clutch between retaining plate and snap ring. See **Fig. 26**.

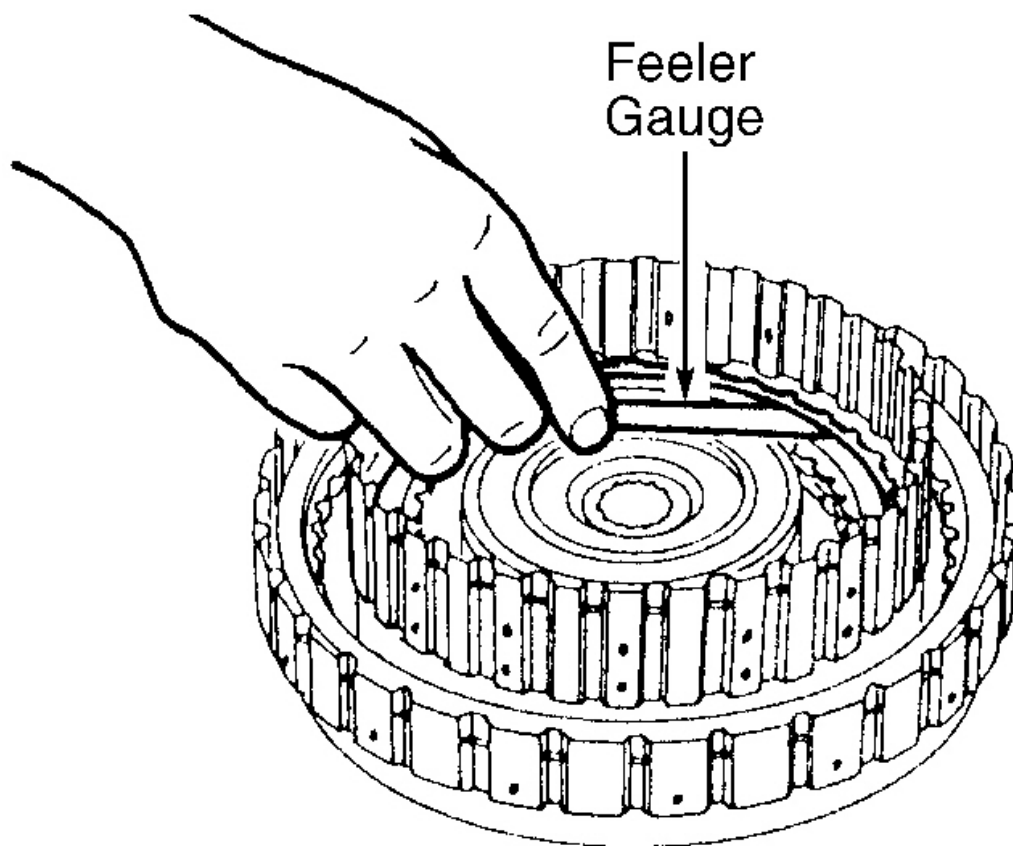


**Fig. 26: Measuring Reverse Clutch Clearance**  
Courtesy of MAZDA MOTORS CORP.

3. On FA4A-EL models, clearance should be .083-.094" (2.10-2.40 mm). Adjust clearance by installing selective snap ring. Snap rings range in thickness from .079" (2.0 mm) to .118" (3.00 mm) in .008" (.20 mm) increments.
4. On GF4A-EL models, clearance should be .059-.071" (1.50-1.80 mm). Adjust clearance by installing

selective snap ring. Snap rings range in thickness from .079" (2.00) to .110" (2.80 mm) in .008" (.20 mm) increments.

5. Install inner and outer seals on coasting drum. Install drum into forward and reverse drum. Install seal rings onto coasting clutch piston. Install coasting clutch piston into coasting clutch drum. Install spring and retainer. Compress spring and retainer, and install snap ring.
6. Install dished plate with dished side facing upward. Install drive (friction) and driven plates, retaining plate and snap ring. See **Fig. 23** . Ensure coasting clutch snap ring opening is opposite of piston snap ring. Measure coasting clutch clearance. See **Fig. 27** . Clearance should be .039-.047" (1.00-1.20 mm).

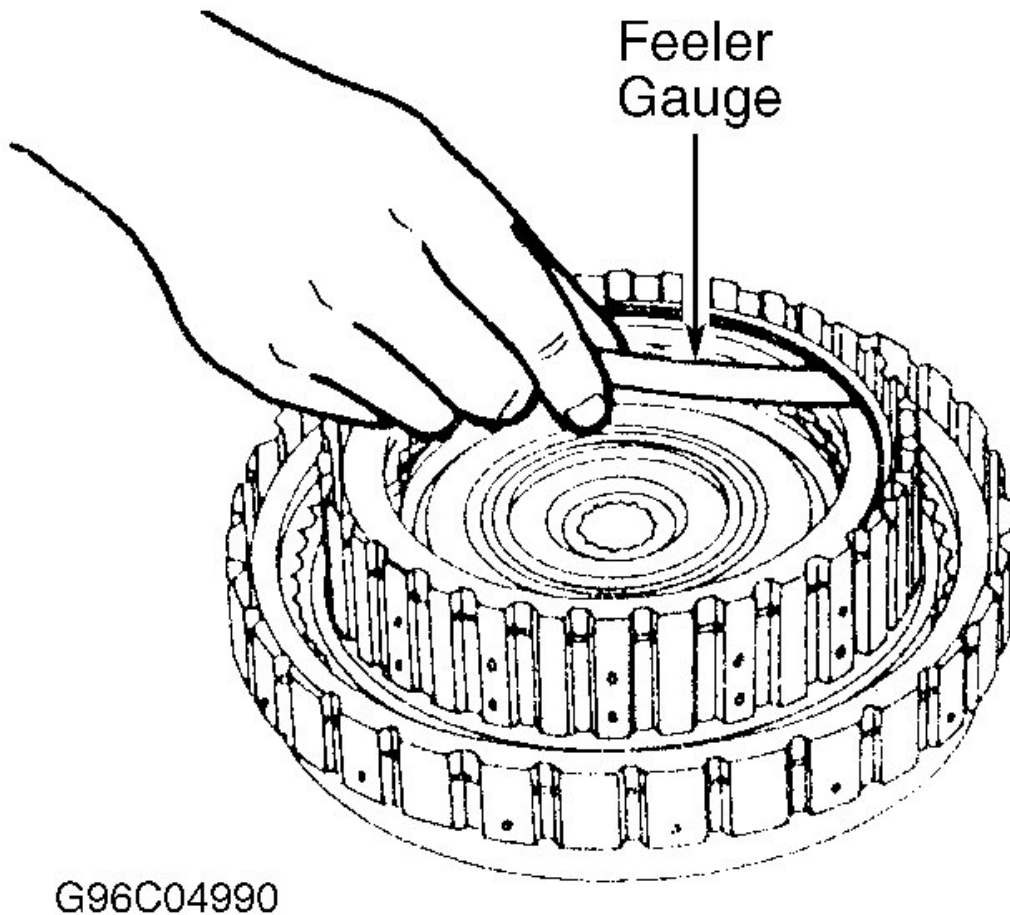


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**Fig. 27: Measuring Coasting Clutch Clearance**  
Courtesy of MAZDA MOTORS CORP.

7. Adjust clearance by installing selective snap ring. On FA4A-EL models, selective snap rings range in thickness from .063" (1.60 mm) to .104" (2.65 mm) in .006" (.15 mm) increments. On GF4A-EL models, selective snap rings range in thickness from .059" (1.50 mm) to .089" (2.25 mm) in increments of .006" (.15 mm).

8. Install forward clutch dished plate with dished side facing downward. Install drive (friction) and driven plates, retainer plate and snap ring. Check forward clutch clearance between retainer plate and snap ring. See **Fig. 28** . Clearance should be .039-.047" (1.00-1.20 mm).



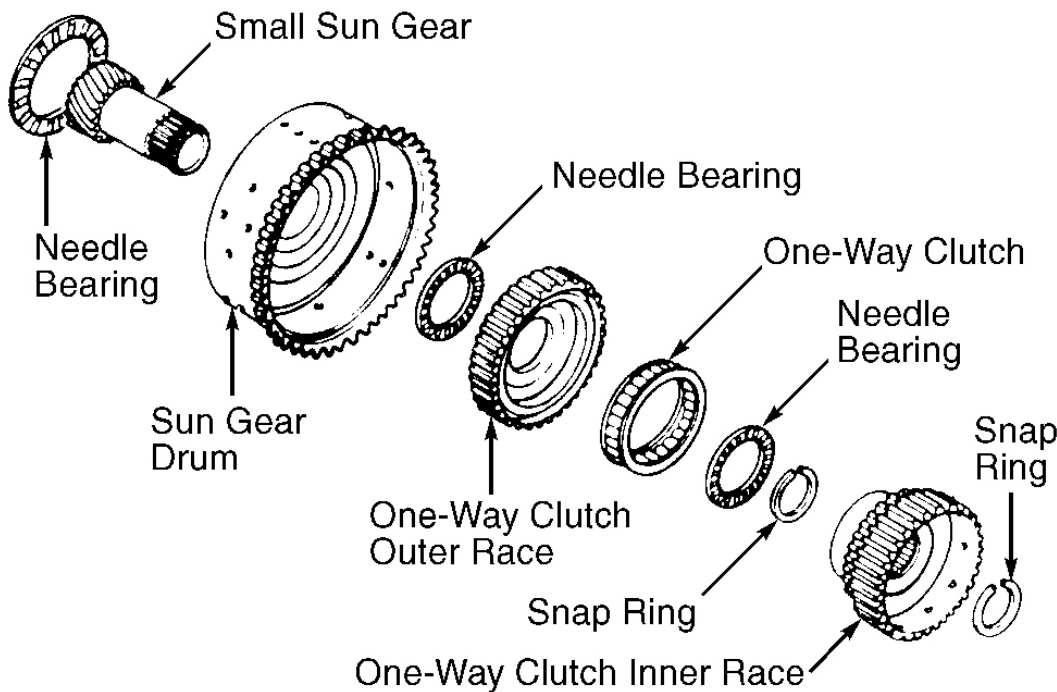
**Fig. 28: Measuring Forward Clutch Clearance**  
Courtesy of MAZDA MOTORS CORP.

9. Adjust clearance by installing selective snap ring. On FA4A-EL models, selective snap rings range in thickness from .063" (1.60 mm) to .104" (2.65 mm) in .006" (.15 mm) increments. On GF4A-EL models, selective snap rings range in thickness from .059" (1.50 mm) to .089" (2.25 mm) in increments of .006" (.15 mm).
10. Check operation of clutches by setting clutch assembly onto oil pump. Apply 57 psi (4 kg/cm<sup>2</sup>) air pressure to appropriate oil passage. See **Fig. 24** .

#### SMALL SUN GEAR & ONE-WAY CLUTCH NO. 1

**Disassembly**

1. Remove snap ring, one-way clutch inner race, snap ring, needle bearing, one-way clutch, one-way clutch outer race, needle bearing and small sun gear. See **Fig. 29** .
2. Measure bushing inside diameters. Maximum inside diameter of sun gear drum is 1.198" (30.42 mm) on FA4A-EL, or 1.316" (33.43 mm) on GF4A-EL. Maximum inside diameter of sun gear is .828" (21.20 mm) on FA4A-EL, or .945" (24.00 mm) on GF4A-EL. Check sun gear drum and small sun gear, inner and outer race, clutch hub, gear and needle bearings for damage or wear.



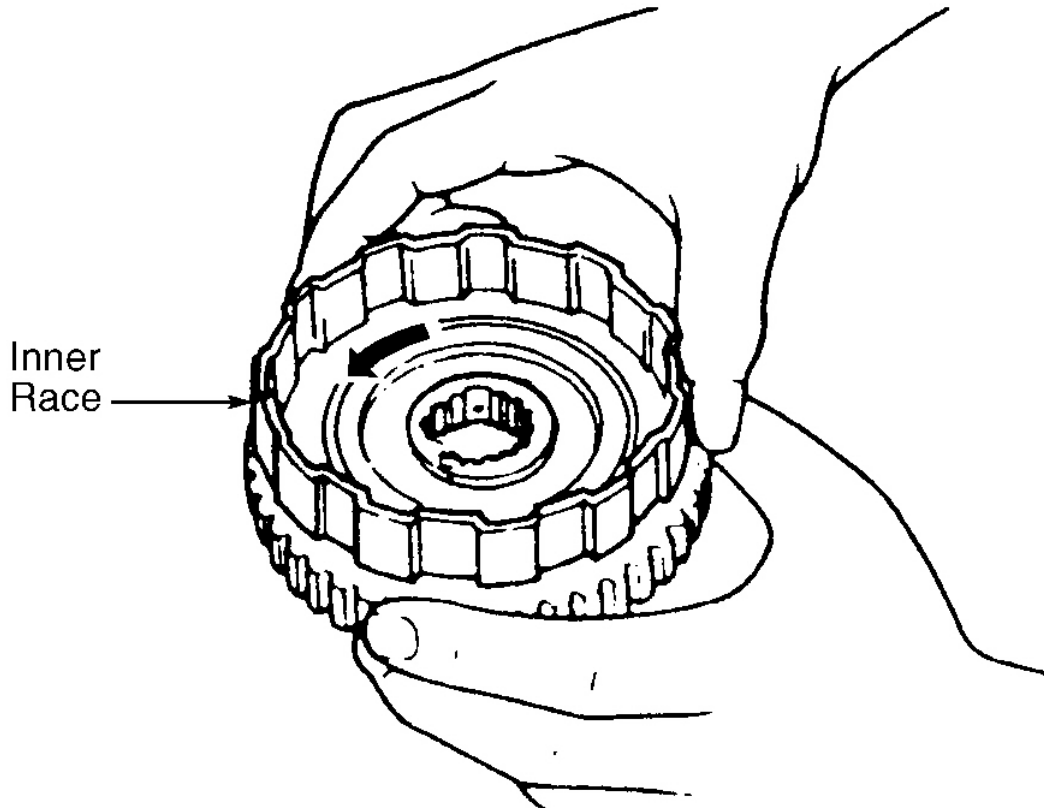
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**Fig. 29: Exploded View Of Small Sun Gear & One-Way Clutch No. 1**  
**Courtesy of MAZDA MOTORS CORP.**

**Reassembly**

1. Apply petroleum jelly to needle bearing and install into one-way clutch inner race. Install one-way clutch into outer race. Ensure spring cage faces toward outer race.
2. Install one-way clutch inner race into one-way clutch by turning inner race counterclockwise. Ensure inner race turns counterclockwise only. See **Fig. 30** .
3. Install small sun gear into drum and install snap ring. Install one-way clutch races to sun gear drum. Ensure one-way clutch inner race and small gear clutch hub splines are aligned. Install snap ring.
4. Hold one-way clutch outer race with one-way clutch inner race facing upward. Inner race should turn smoothly in a counterclockwise direction and lock in clockwise direction. See **Fig. 30** . Apply petroleum

jelly to needle bearing and install into sun gear drum.



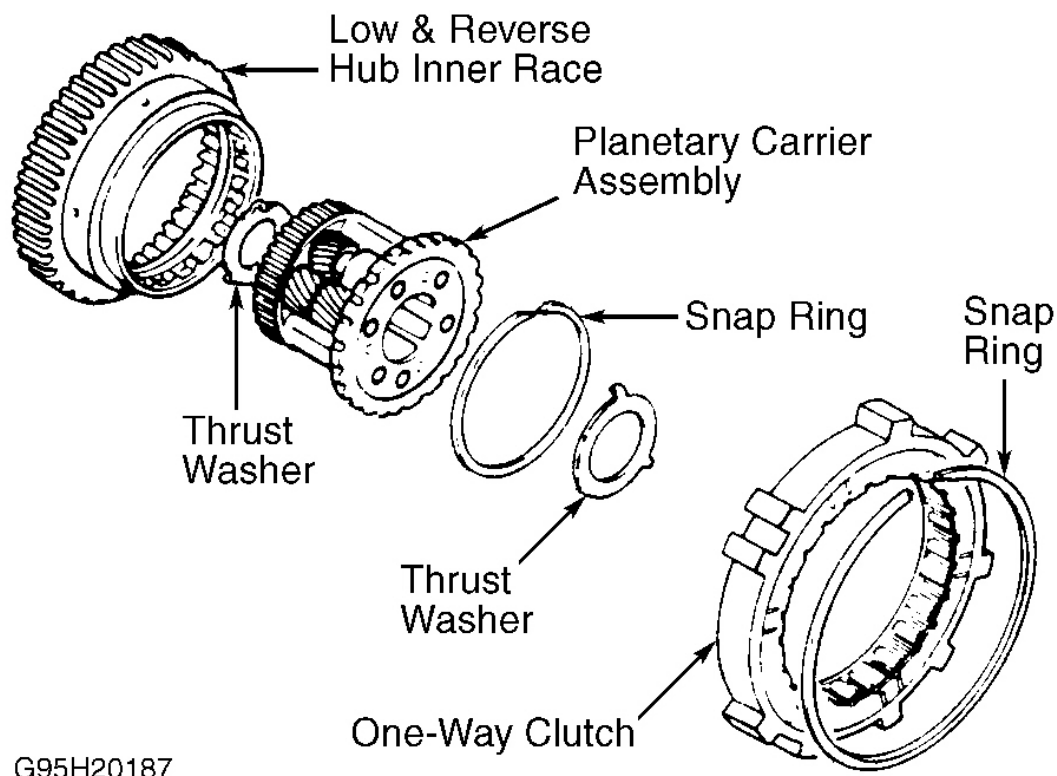
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**Fig. 30: Checking One-Way Clutch No. 1 Operation**  
Courtesy of MAZDA MOTORS CORP.

## ONE-WAY CLUTCH NO. 2 & PLANETARY CARRIER

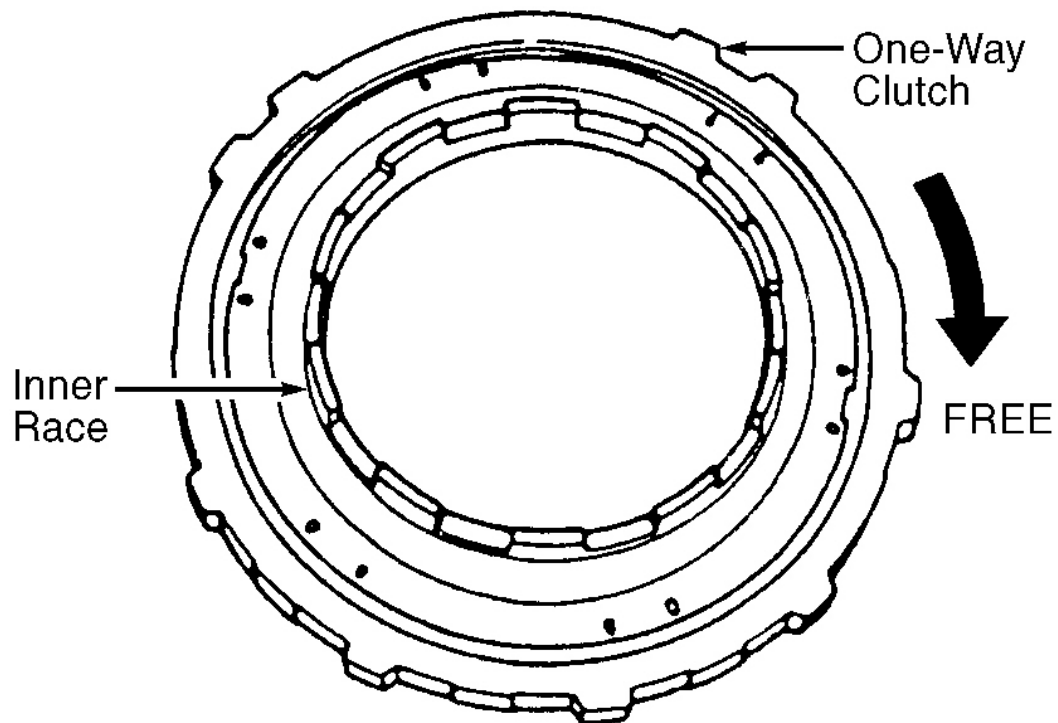
### Disassembly

1. Remove one-way clutch, thrust washers and snap ring. See **Fig. 31** . Remove planetary carrier assembly from inner race. Place one-way clutch on inner race. Holding inner race, ensure one-way clutch rotates smoothly in clockwise direction. See **Fig. 32** .
2. Inspect for damaged or worn parts. Ensure clearance between planetary pinion gear and washer is .008-.028" (.20-.70 mm). See **Fig. 33** .



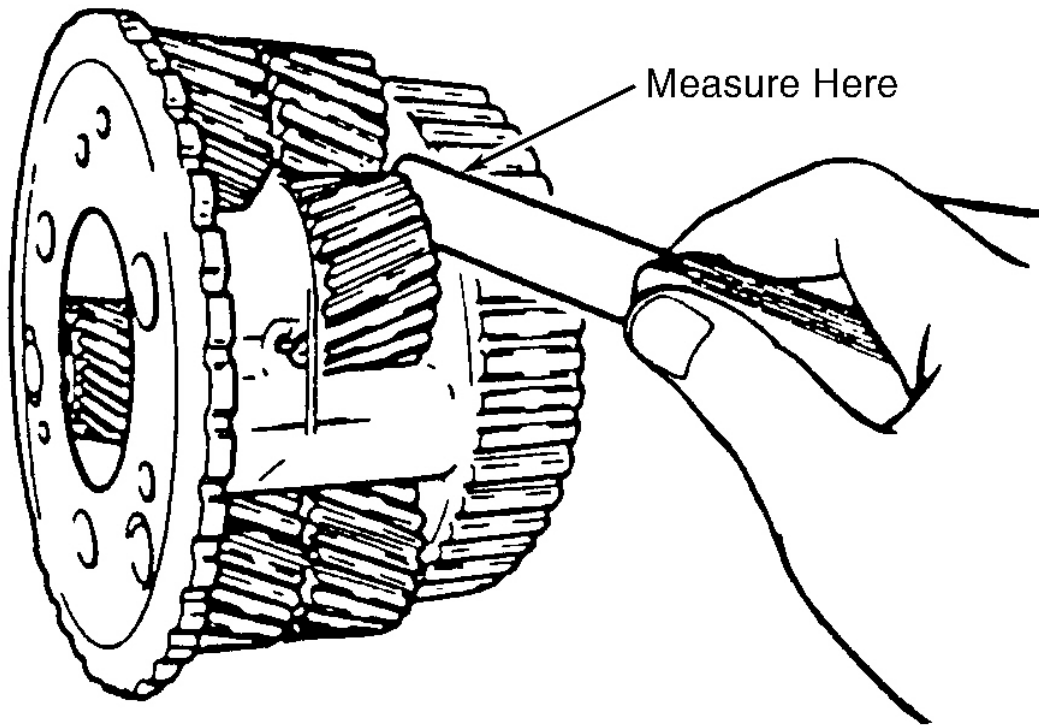
**Fig. 31: Exploded View Of One-Way Clutch No. 2 & Planetary Carrier (GF4A-EL Shown, FA4A-EL Similar)**

Courtesy of MAZDA MOTORS CORP.



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**Fig. 32: Checking One-Way Clutch No. 2 Operation**  
**Courtesy of MAZDA MOTORS CORP.**



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**Fig. 33: Measuring Pinion Gear To Thrust Washer Clearance**  
 Courtesy of MAZDA MOTORS CORP.

#### Reassembly

1. Assemble planetary gear to inner race. Install snap ring. Apply petroleum jelly to thrust washer and install on clutch and planetary carrier assembly.
2. Outer diameter of thrust washer for FA4A-EL is 3.307" (84.0 mm). Outer diameter of thrust washer for sun gear side of GF4A-EL planetary is 2.835" (72.00 mm). Outer diameter of thrust washer for 3-4 clutch side is 2.209" (56.10 mm). Install one-way clutch. While holding inner race, ensure one-way clutch No. 2 rotates clockwise and locks counterclockwise. See **Fig. 32**.

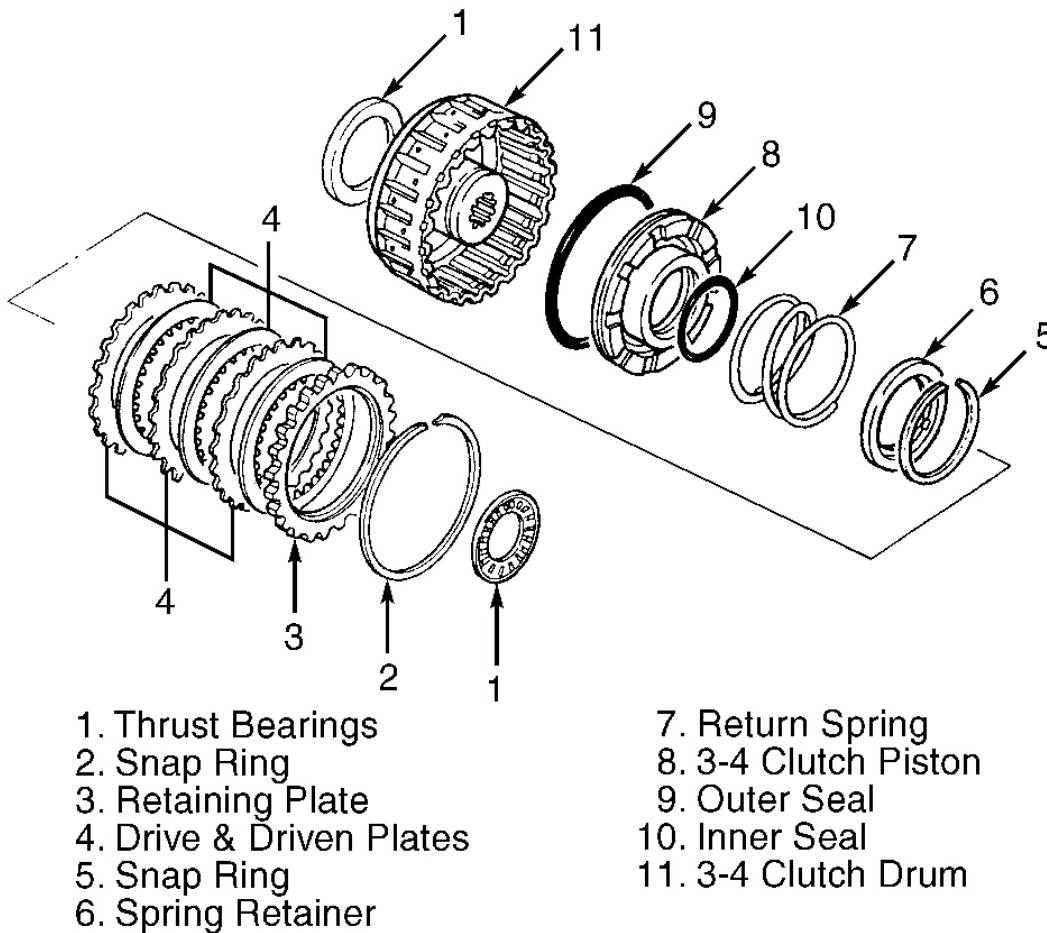
#### 3-4 CLUTCH

##### Disassembly

1. Remove needle bearings and snap ring. Remove retaining plate and clutch pack. See **Fig. 34**. Compress return spring and retainer. Remove snap ring.
2. Remove spring and retainer assembly. Remove piston, and inner and outer seals from piston.

##### Inspection

Check drive and driven plates for damage or wear. Minimum thickness of drive (friction) plates is .055" (1.40 mm). Check return spring free length. Free length of springs should be 1.594" (40.50 mm) for FA4A-EL. For GF4A-EL, free length should be 1.524" (38.70 mm).



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**Fig. 34: Exploded View Of 3-4 Clutch**  
Courtesy of MAZDA MOTORS CORP.

#### Reassembly

1. Install seal rings. Coat 3-4 clutch piston with ATF and install into 3-4 clutch drum. Install and compress spring and retainer assembly. Install snap ring.
2. Install 3-4 clutch drive and driven plates. Install retaining plate and snap ring. Measure clearance between retaining plate and snap ring. On FA4A-EL models, clearance should be .051-.063" (1.30-1.60 mm). Adjust clearance by installing selective snap ring. Snap rings range in thickness from .055" (1.40 mm) to .094" (2.40 mm) in .008" (.20 mm) increments.
3. On GF4A-EL models, clearance should be .051-.059" (1.30-1.50 mm). Adjust clearance by installing

selective retaining plate. Retaining plates range in thickness from .150" (3.80 mm) to .189" (4.80 mm) in .008" (.20 mm) increments.

4. Check clutch operation. Ensure clutch piston seal does not leak. Apply petroleum jelly to needle bearings and install on 3-4 clutch. Bearing outer diameter is 2.21" (56.1 mm) for carrier side and 2.84" (72.1 mm) for output shell side.

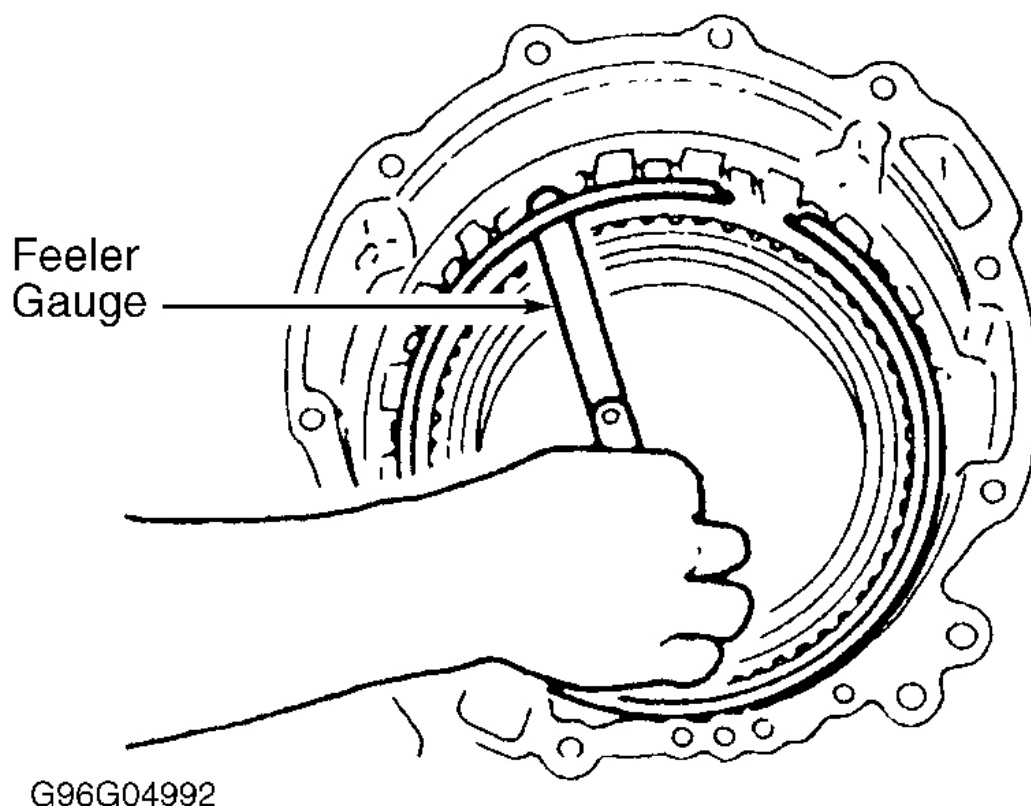
## **LOW & REVERSE BRAKE**

### **Disassembly & Inspection**

1. Use air pressure to remove low and reverse brake. See **Fig. 20** or **Fig. 21**. Check for worn drive (friction) and driven plates. See **Fig. 12** or **Fig. 13**. Drive plate minimum thickness is .055" (1.40 mm). Check snap ring for wear and cracks. Check for deformed or detached spring and retainer assembly. Check for broken or weak springs.
2. Check for spring free length of .563" (14.30 mm) for FA4A-EL, and .711" (18.07 mm) for GF4A-EL. Check piston for damage or wear and seal contact area in transaxle case for damage.

### **Reassembly**

1. Install low and reverse brake piston. Install spring and retainer assembly. Compress spring and retainer assembly enough to install snap ring. Install clutches in order: driven, drive, driven, drive, driven, drive, driven and drive. Install retaining plate and snap ring.
2. Measure clearance between retaining plate and snap ring. See **Fig. 35**. Adjust clearance by selective snap rings or retainer plates. On FA4A-EL models, clearance should be .083-.094" (2.10-2.40 mm). Adjust clearance by installing selective snap ring. Snap rings range in thickness from .079" (2.0 mm) to .118" (3.0 mm) in .008" (.20 mm) increments.
3. On GF4A-EL models, clearance should be .059-.071" (1.50-1.80 mm). Adjust clearance by installing selective retaining plate. Retaining plates range in thickness from .276" (7.0 mm) to .291" (7.4 mm) in .008" (.20 mm) increments.



**Fig. 35: Measuring Low & Reverse Clutch Clearance**  
Courtesy of MAZDA MOTORS CORP.

## 2-4 BRAKE BAND SERVO

### Disassembly (FA4A-EL)

Separate servo retainer from servo piston. See **Fig. 12** . Remove "O" rings, "D" rings, spring clip and piston stem.

### Inspection

Check for damaged or worn piston and spring. Spring free length should be 1.703" (43.25 mm).

### Reassembly

Install new "O" ring and "D" rings. Assemble servo piston to servo retainer. Install 2-4 brake band servo.

**NOTE:**      **Alternative method of adjustment for 2-4 servo is available. See appropriate TRANSMISSION SERVICING - A/T article in the TRANSMISSION SERVICING**

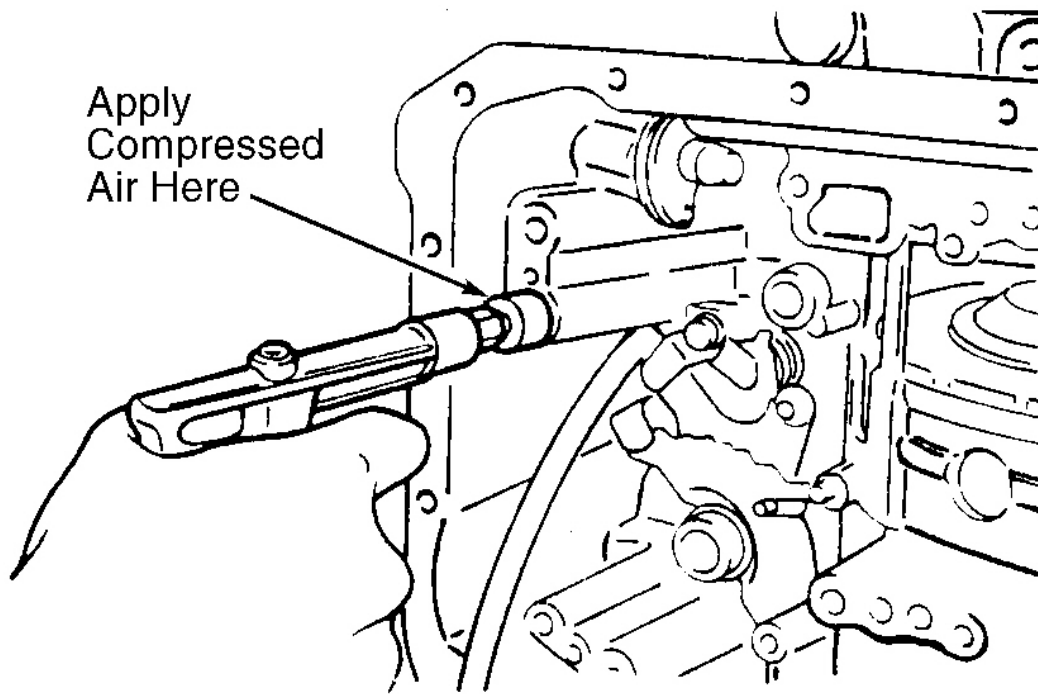
section.

### **TRANSMISSION SERVICING - A/T - Kia**

#### **TRANSMISSION SERVICING - A/T - Mazda**

##### **Adjustment (Without Transaxle Internal Components Installed)**

Measure by marking piston stem at transmission case. Apply air pressure of 57 psi (393 kPa) or less to oil passage. See **Fig. 36** . Make second mark on piston stem. Distance of stroke should be .039-.067" (1.00-1.70 mm). If not correct, install different piston stem. Selective piston stems are available in lengths from 3.74" (95.0 mm) to 3.90" (99.0 mm) in .020" (.50 mm) increments.



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**Fig. 36: Checking 2-4 Brake Band Servo**  
Courtesy of MAZDA MOTORS CORP.

##### **Disassembly (GF4A-EL)**

Separate servo retainer from servo piston. See **Fig. 13** . Remove "O" rings, "D" rings, spring and piston stem.

##### **Inspection**

Check for damaged or worn piston and spring. Spring free length should be 1.703" (43.25 mm).

**Reassembly**

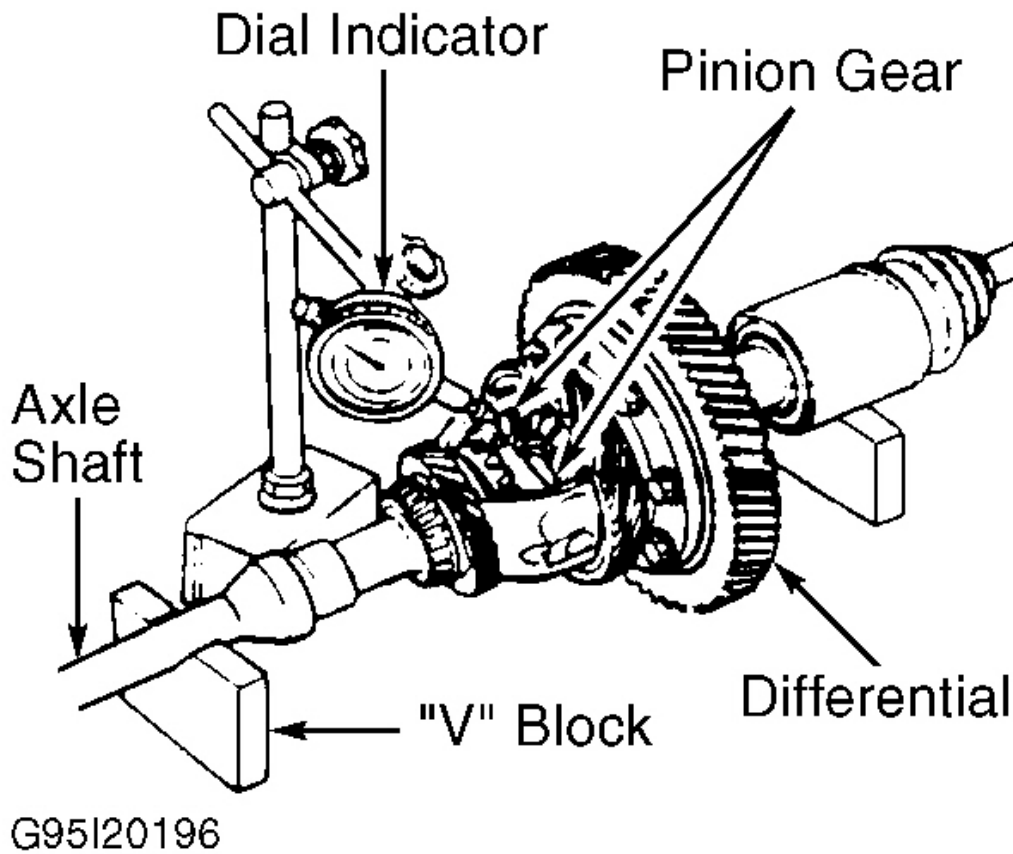
Install new "O" ring and "D" rings. Assemble servo piston to servo retainer. Install 2-4 brake band servo.

**2-4 BRAKE BAND**

After 2-4 brake band servo is removed, remove 2-4 brake band. If damaged or worn, replace 2-4 band.

**DIFFERENTIAL ASSEMBLY****Pre-Disassembly Backlash Inspection**

Install left and right axle shafts into differential. Support axle shafts on V-blocks. See **Fig. 37** . Measure backlash of both pinion gears. Backlash should be .002-.006" (.05-.15 mm). Maximum service limit is .020" (.50 mm). Rebuild or replace differential assembly if backlash is not as specified.



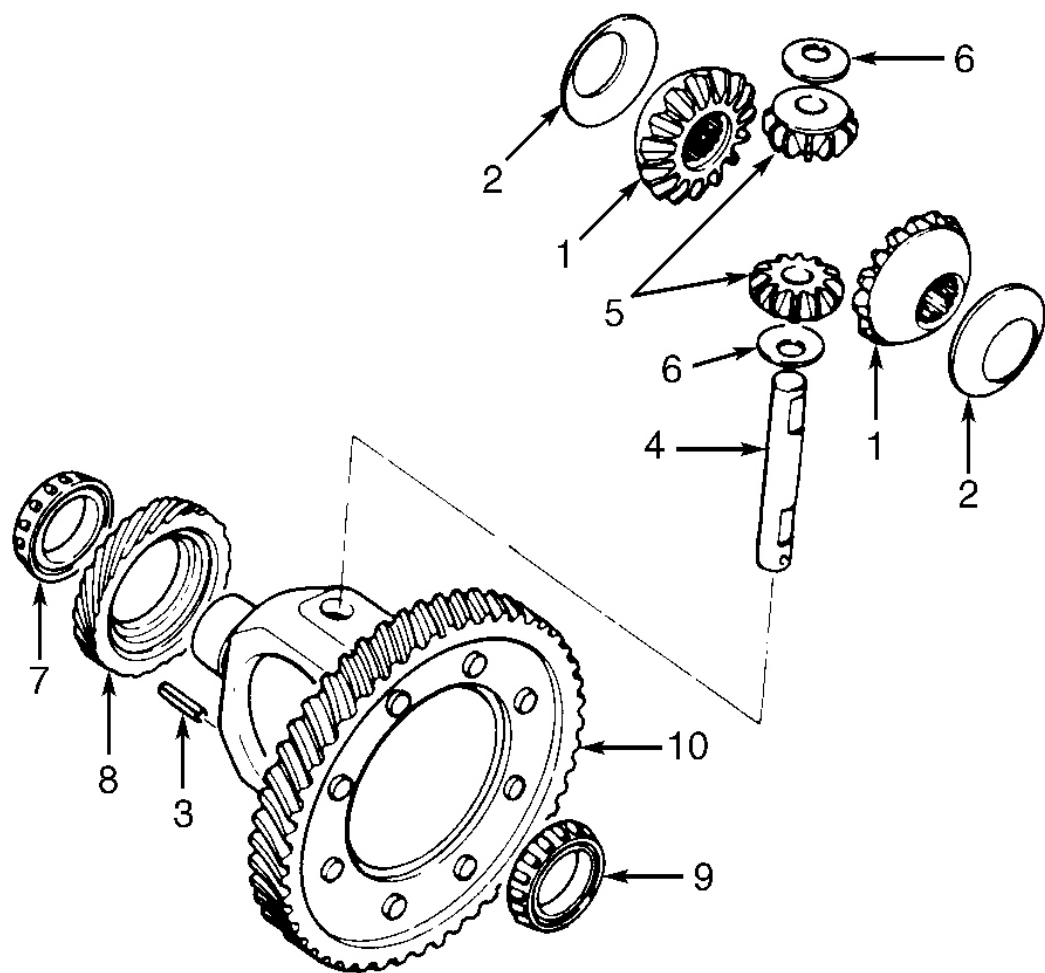
**Fig. 37: Checking Pinion Gear Backlash**  
Courtesy of MAZDA MOTORS CORP.

#### Disassembly

1. Remove roll pin and pinion shaft. See **Fig. 38** . Remove pinion gears and rotate thrust washers out of differential housing.
2. Remove side gears and thrust washers. Using appropriate bearing puller, remove side bearings. DO NOT remove speedometer drive gear unless damaged.

#### Reassembly

Install speedometer drive gear (if removed) and bearings. Install thrust washers, pinion gears and side gears. Install pinion shaft. Install and crimp roll pin.



- 1. Side Gear
- 2. Side Gear Thrust Washer
- 3. Roll Pin
- 4. Pinion Shaft
- 5. Pinion Gear

- 6. Pinion Gear Thrust Washer
- 7. Side Bearing Inner Race
- 8. Speedometer Drive Gear
- 9. Side Bearing Inner Race
- 10. Ring Gear

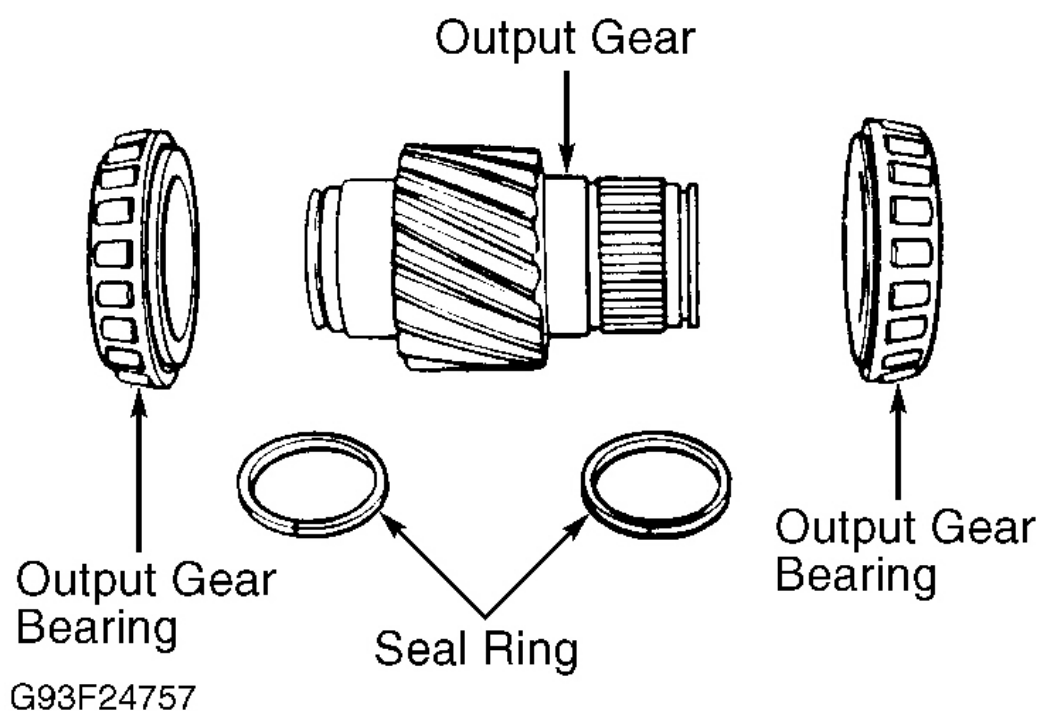
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**Fig. 38: Exploded View Of Differential**  
 Courtesy of MAZDA MOTORS CORP.

## OUTPUT GEAR

### Disassembly & Reassembly

Remove seal rings. Using bearing puller, remove bearings. To reassemble, reverse disassembly procedure. See **Fig. 39**.



**Fig. 39: Exploded View Of Output Gear Assembly**  
Courtesy of MAZDA MOTORS CORP.

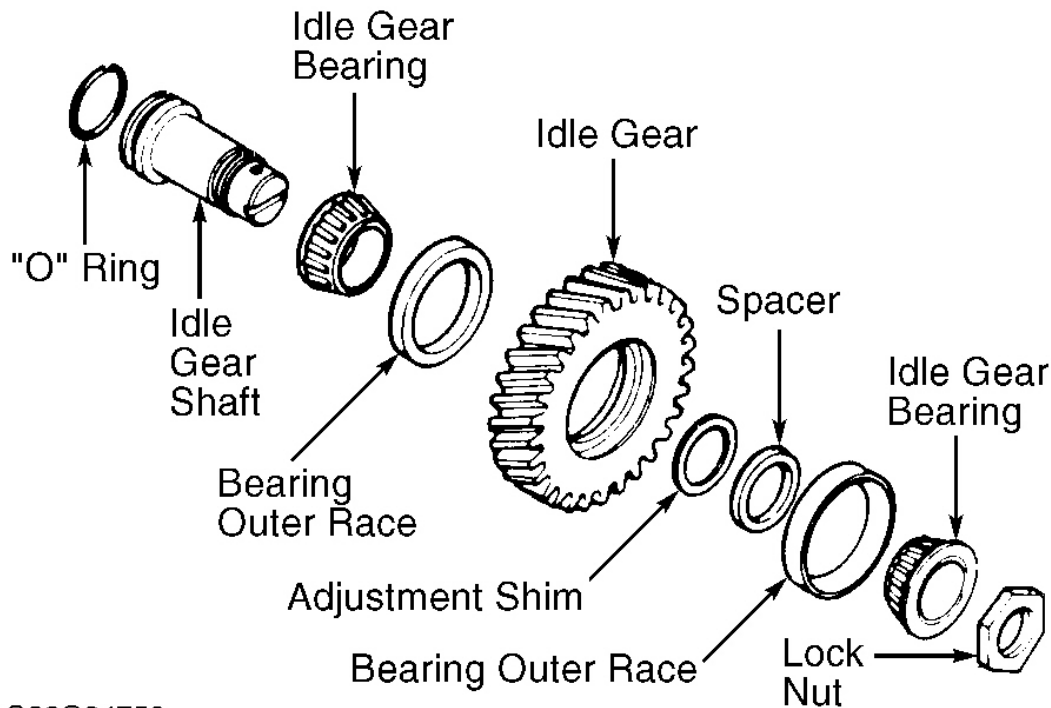
## IDLER GEAR ASSEMBLY

### Disassembly

Using Holding Device (49G019013), mount idler gear shaft in vise. Remove lock nut from idler shaft. Remove both outer bearing races from idler gear. See **Fig. 40**.

### Cleaning & Inspection

Inspect idler gear and bearings for damage or wear. Replace as needed.

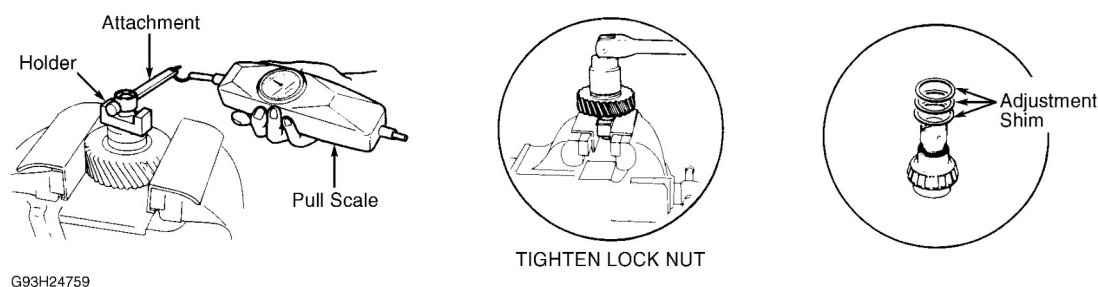


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**Fig. 40: Exploded View Of Idler Gear Assembly**  
 Courtesy of MAZDA MOTORS CORP.

#### Reassembly

1. Press both outer bearing races into idler gear. Assemble idler gear assembly. See **Fig. 40** . Using holding device, mount idler gear shaft in vise. Tighten lock nut to lower limit of torque specifications. See **TORQUE SPECIFICATIONS** .
2. Secure idle gear assembly in vise and measure bearing preload. See **Fig. 41** . Preload can be measured using a INCH Lb. torque wrench or pull scale. Using torque wrench, preload should be .22-6.2 INCH Lbs. (.03-.70 N.m). Using pull scale, preload should be .066-1.98 Lbs. (.03-.90 kg).
3. If specified preload cannot be obtained within specified torque, adjust preload by selecting different adjusting shims. On FA4A-EL models, adjusting shims range in thickness from .150" (3.80 mm) to .187" (4.75 mm) in increments of .008" (.20 mm). On GF4A-EL models, adjusting shims range in thickness from .179" (4.54 mm) to .205" (5.21 mm) in increments of .008" (.20 mm).

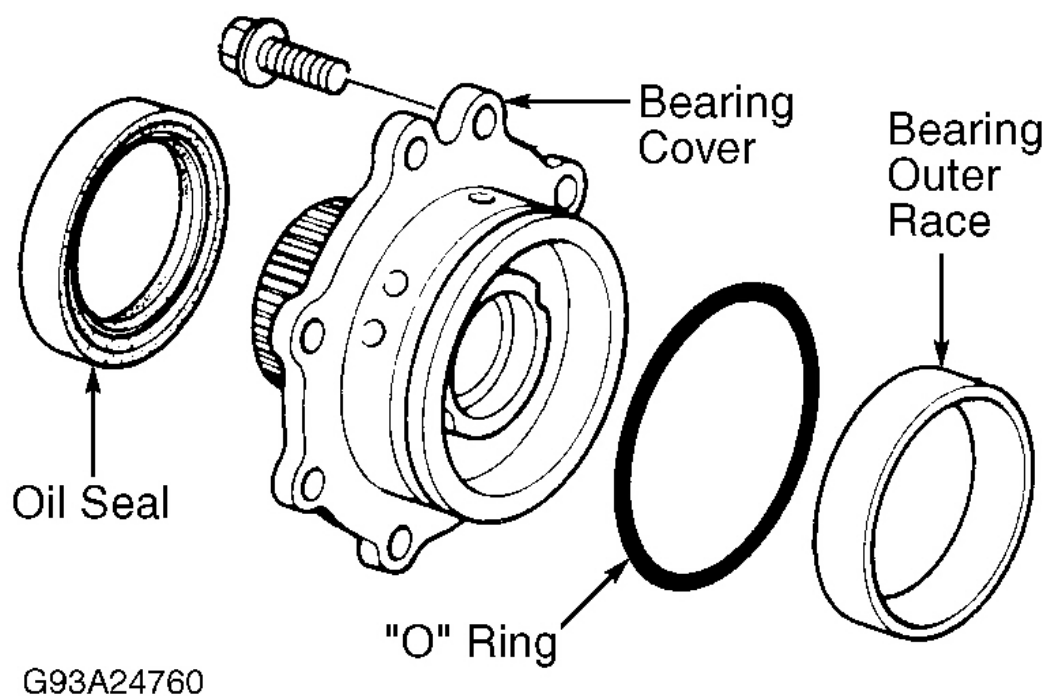


**Fig. 41: Measuring Idler Gear Preload**  
Courtesy of MAZDA MOTORS CORP.

## BEARING COVER ASSEMBLY

### Disassembly, Inspection & Reassembly

Using a pin punch, remove bearing outer race. Inspect bearing cover, outer race and oil seal for damage or wear. See **Fig. 42** . To reassemble, reverse disassembly procedure.



**Fig. 42: Bearing Cover Assembly**  
Courtesy of MAZDA MOTORS CORP.

## VALVE BODY ASSEMBLY

**CAUTION:** All valve body components must be installed in original location. Lay all components in sequence during removal for reassembly reference.

### Disassembly (FA4A-EL)

1. Remove solenoid valves, "O" rings, oil strainers and oil pipe assembly. Remove upper valve body, gasket "B", upper separator plate oil filter and gasket "A".
2. Remove throttle relief ball and spring from upper valve body. Remove main valve body, gasket "D", main separator plate and gasket "C". Remove rubber balls from main valve body.
3. Remove pre-main valve body. Remove oil strainer from pre-main valve body. Remove oil filter, gasket "E", lower separator plate and gasket "F". Remove oil strainer from lower valve body.
4. Disassemble pre-main body, main body and rear body valve assemblies. See **Fig. 43** , **Fig. 45** and **Fig. 49** -51.

### Disassembly (GF4A-EL)

1. Remove sensors, solenoid valves and "O" rings. Remove front valve body, pre-main separator plate and pre-main separator plate gaskets. Remove front/pre-main gaskets, pre-main separator plate and pre-main separator plate gaskets. See **Fig. 44** and **Fig. 46**
2. Locate and remove rubber balls from front and pre-main valve body. Remove pre-main valve body, main separator plate and main separator plate gaskets.
3. Remove pre-main/main gaskets and main separator plate from pre-main valve body. Remove jet orifices and nuts from main separator plate. Locate and remove rubber balls and oil strainer from pre-main valve body.
4. Locate and remove rubber balls and oil strainer from main valve body. Turn assembly over and remove oil pipe, baffle and shift solenoids. Remove rear separator plate and rear separator plate gaskets from main valve body.
5. Remove main/rear gaskets and separator plate from rear valve body. Locate and remove rubber balls and oil strainer from rear valve body. Locate and remove rubber balls and oil strainer from main valve body.
6. Disassemble pre-main body, main body and rear body valve assemblies. See **Fig. 47** , **Fig. 48** and **Fig. 52** .

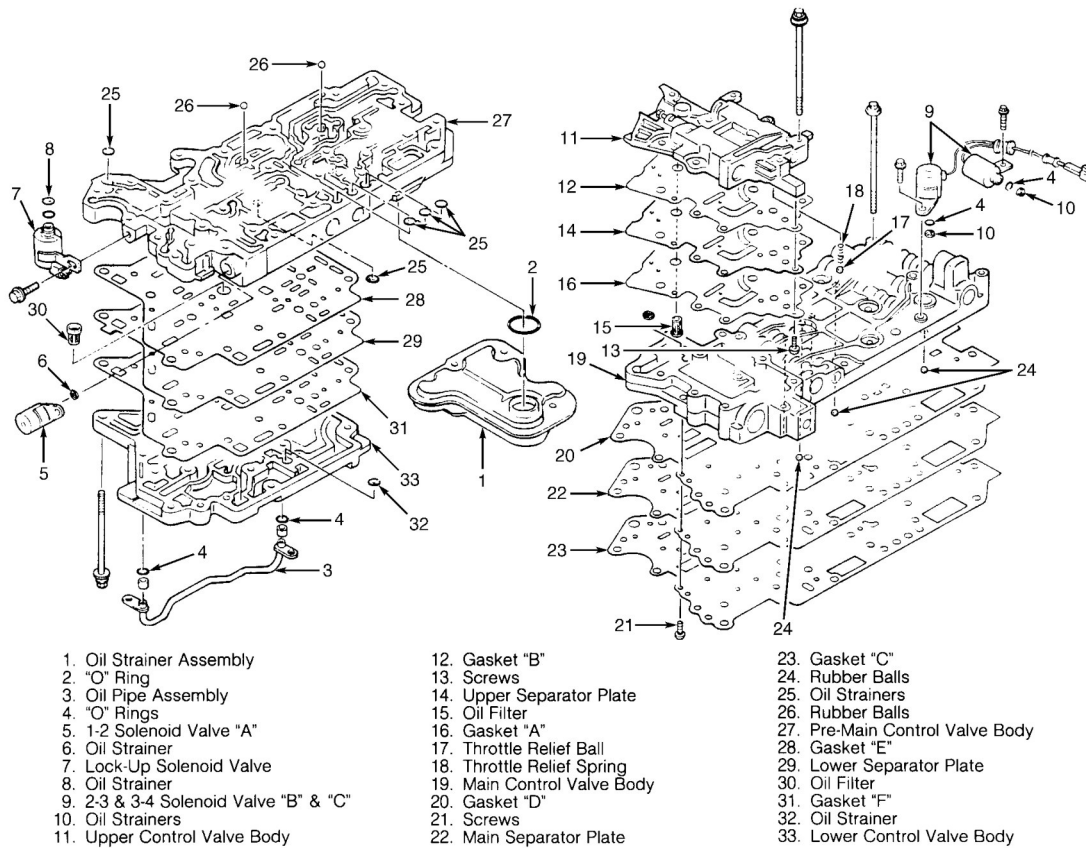
### Cleaning & Inspection

Inspect valve bodies for worn valves, damaged oil passages and cracks. Check operation of each valve in valve bore and valve spring free length. See appropriate VALVE BODY SPRING SPECIFICATIONS table.

### Reassembly (FA4A-EL & GF4A-EL)

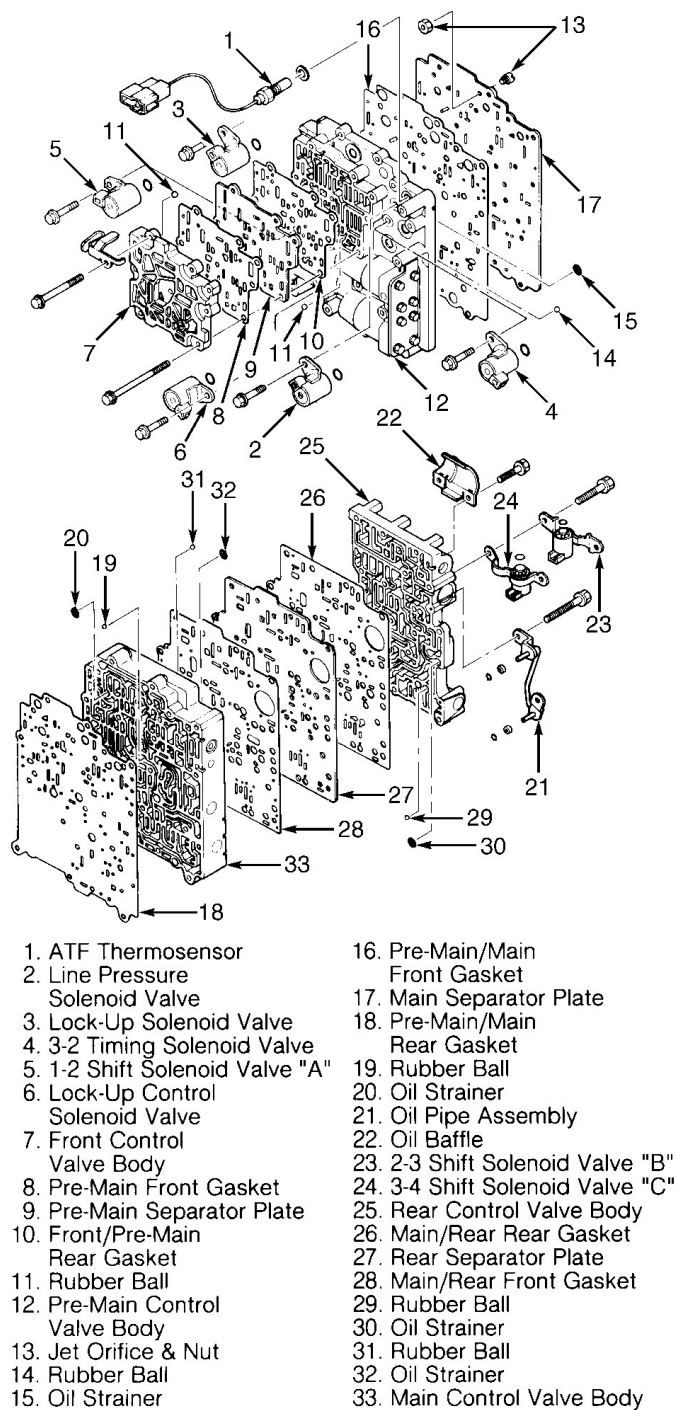
1. Reassemble valve bodies. Install check balls, oil strainers and jet orifices in correct location. See **Fig. 43** -46.
2. During assembly of valve body, ensure bolts are installed in correct location. See **Fig. 55** or **Fig. 56** . Ensure valve body gaskets are installed in correct location. See **Fig. 42** -43. Tighten all bolts to

specification. See **TORQUE SPECIFICATIONS**.



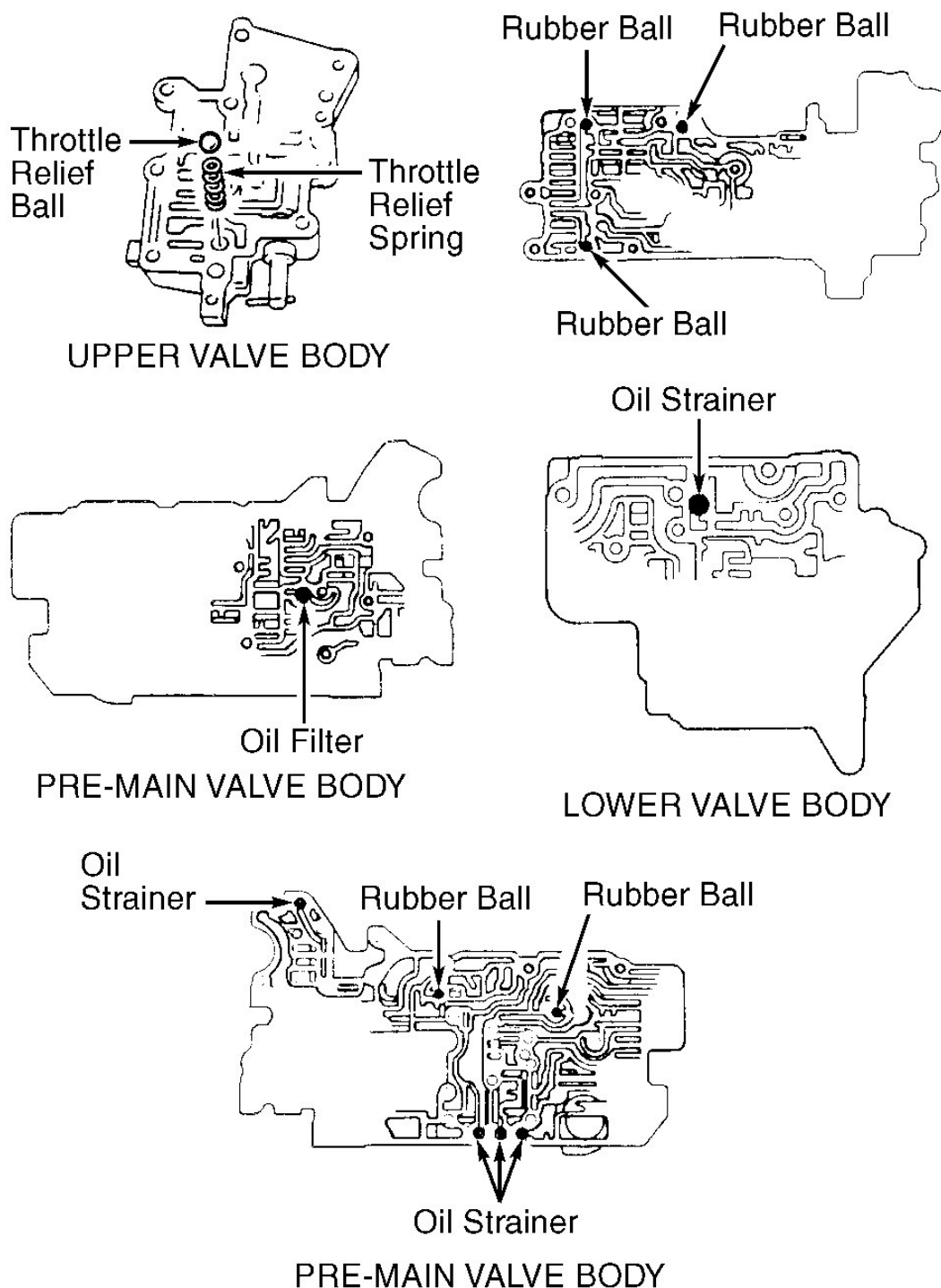
96104969

**Fig. 43: Exploded View Of Valve Body Assembly (FA4A-EL)**  
**Courtesy of MAZDA MOTORS CORP.**



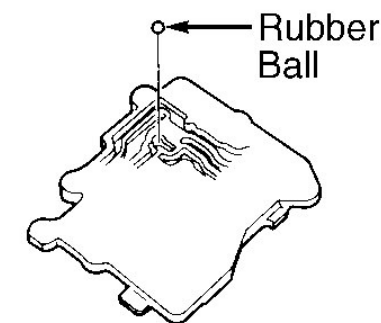
G96G29997

**Fig. 44: Exploded View Of Valve Body Assembly (GF4A-EL)**  
**Courtesy of MAZDA MOTORS CORP.**

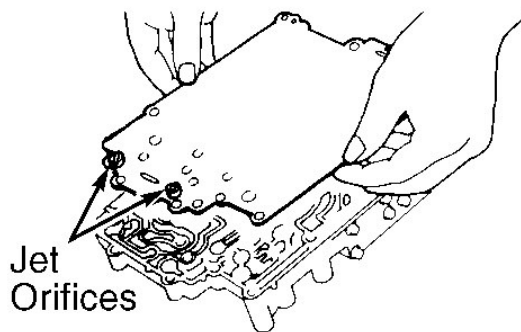


96I04993

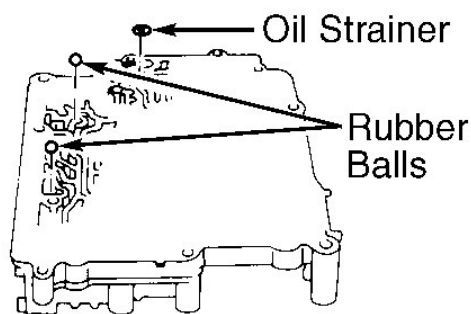
**Fig. 45: Locating Valve Body Components (FA4A-EL)**  
 Courtesy of MAZDA MOTORS CORP.



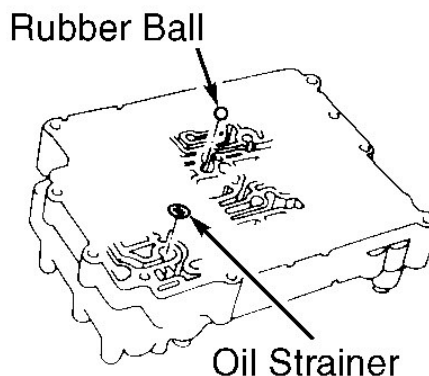
FRONT CONTROL VALVE BODY



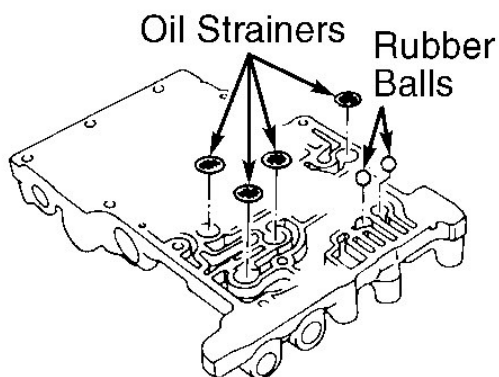
MAIN SEPARATOR PLATE



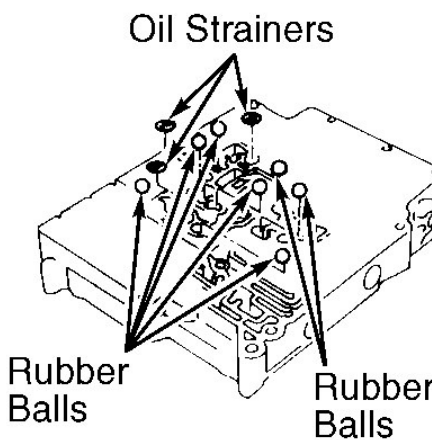
PRE-MAIN CONTROL VALVE BODY



MAIN CONTROL VALVE BODY REAR SIDE



REAR CONTROL VALVE BODY

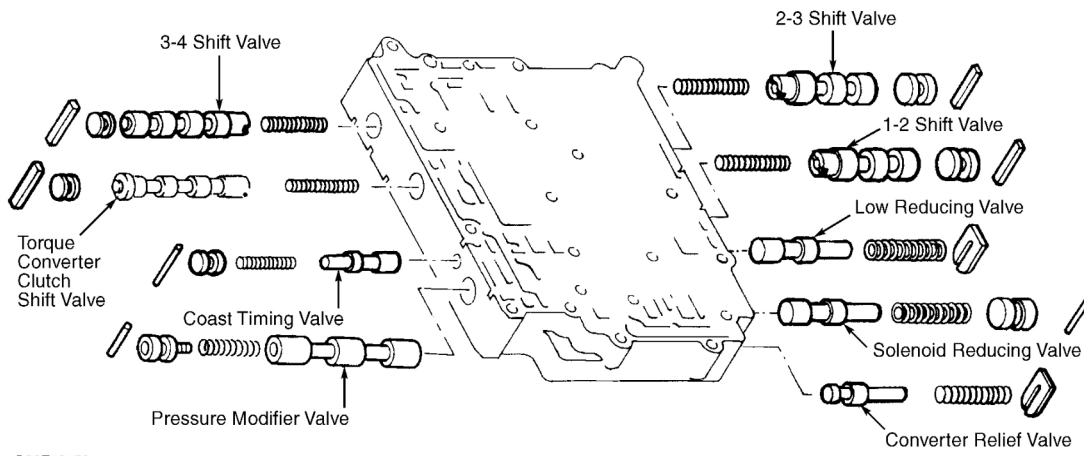


MAIN CONTROL VALVE BODY PRE-MAIN SIDE

G95C20190

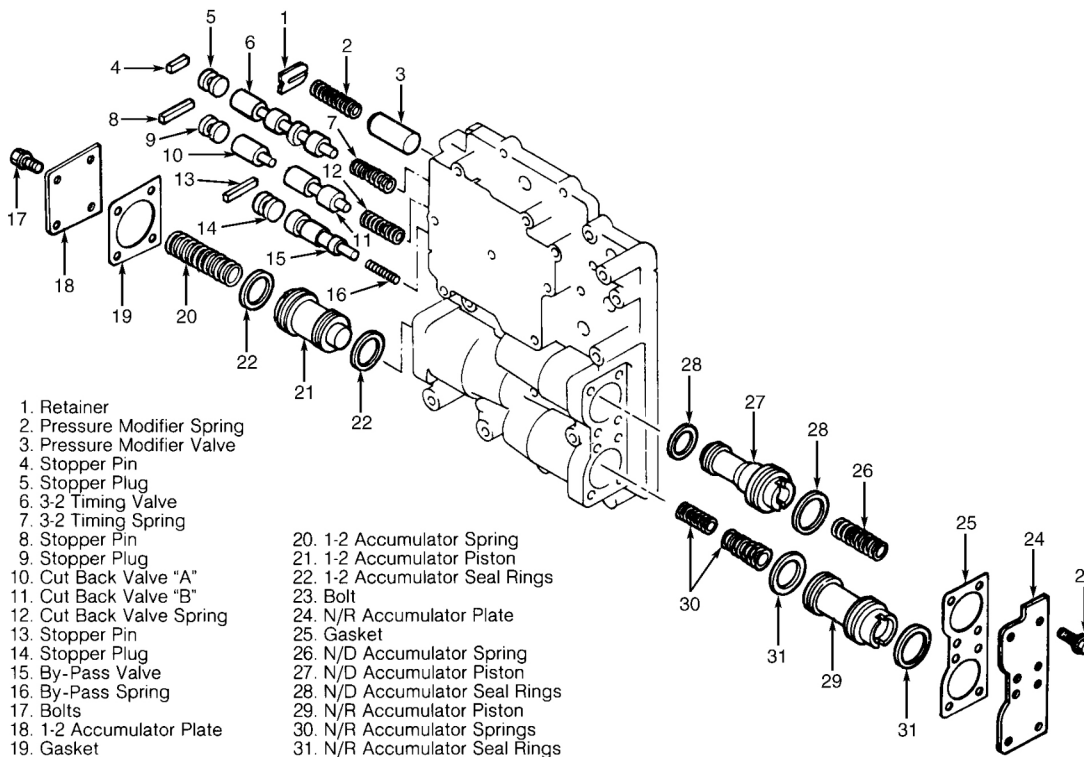
**Fig. 46: Locating Valve Components (GF4A-EL)**

Courtesy of MAZDA MOTORS CORP.



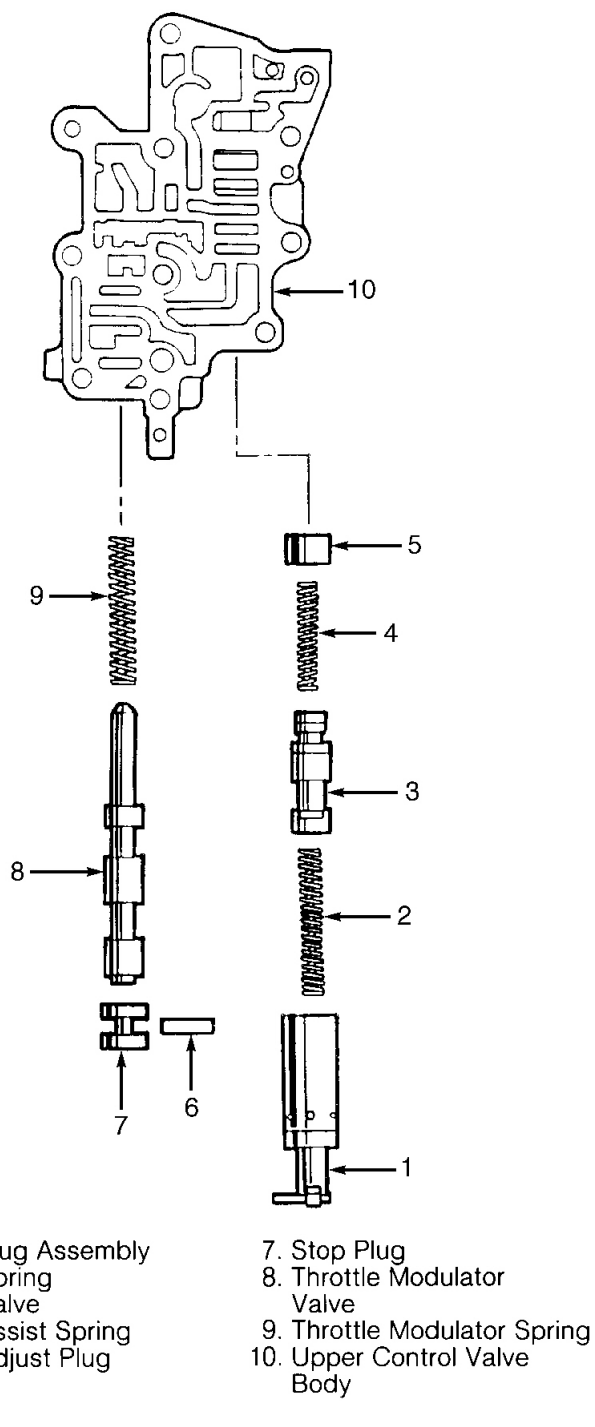
G96E19152

**Fig. 47: Exploded View Of Main Valve Body (GF4A-EL)**  
Courtesy of MAZDA MOTORS CORP.

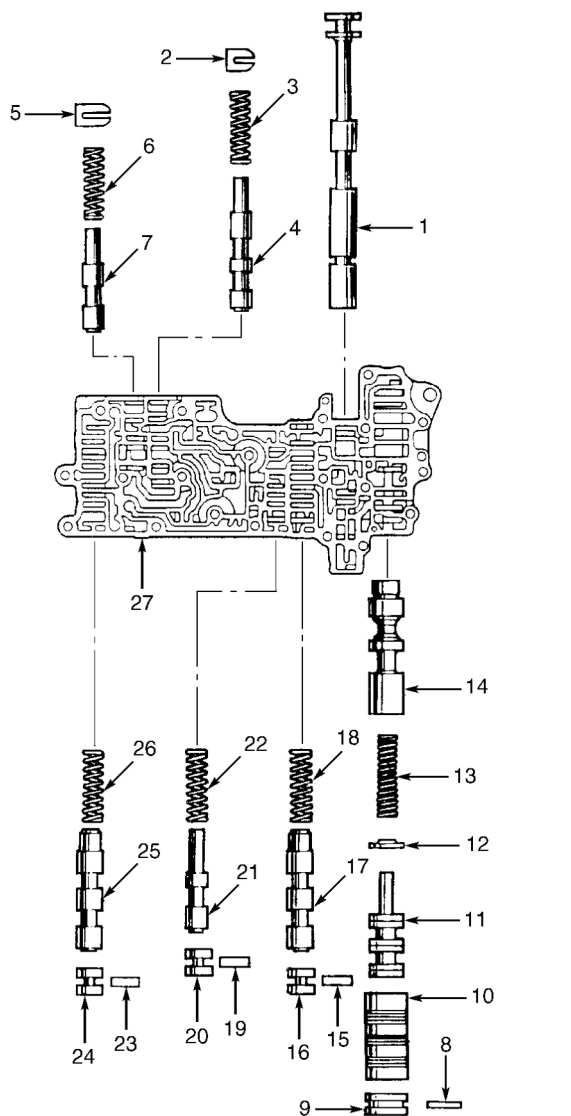


G95E20192

**Fig. 48: Exploded View Of Pre-Main Valve Body (GF4A-EL)**  
Courtesy of MAZDA MOTORS CORP.



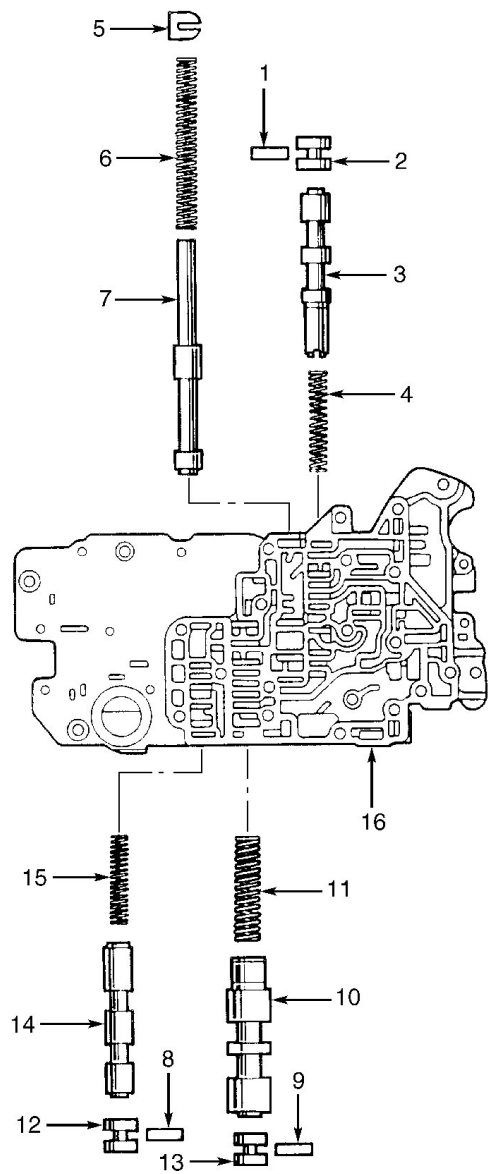
**Fig. 49: Exploded View Of Rear Valve Body (FA4A-EL)**  
 Courtesy of MAZDA MOTORS CORP.



- |                                    |                         |
|------------------------------------|-------------------------|
| 1. Manual Valve                    | 15. Stop Pin            |
| 2. Spring Retainer                 | 16. Stop Plug           |
| 3. 2-3 Timing Spring               | 17. 1-2 Shift Valve     |
| 4. 2-3 Timing Valve                | 18. 1-2 Shift Spring    |
| 5. Spring Retainer                 | 19. Stop Pin            |
| 6. 3-2 Timing Spring               | 20. Stop Plug           |
| 7. 3-2 Timing Valve                | 21. Low Reducing Valve  |
| 8. Roll Pin                        | 22. Low Reducing Spring |
| 9. Stop Plug                       | 23. Stop Pin            |
| 10. Pressure Regulator Plug        | 24. Stop Plug           |
| 11. Regulator Plug Sleeve          | 25. 3-4 Shift Valve     |
| 12. Pressure Regulator Spring Seat | 26. 3-4 Shift Spring    |
| 13. Pressure Regulator Spring      | 27. Pre-Main Control    |
| 14. Pressure Regulator Valve       | Valve Body              |

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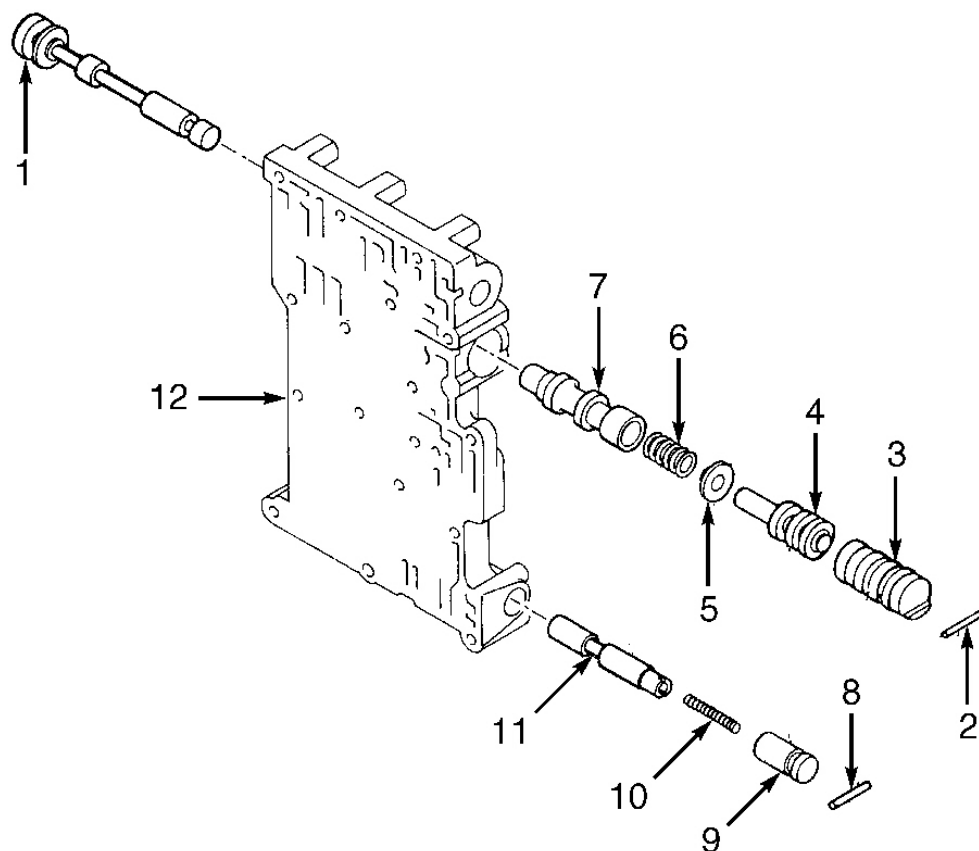
**Fig. 50: Exploded View Of Pre-Main Valve Body (FA4A-EL - 1 Of 2)**  
**Courtesy of MAZDA MOTORS CORP.**



- |                            |                             |
|----------------------------|-----------------------------|
| 1. Stop Pin                | 9. Stop Plug                |
| 2. Stop Plug               | 10. 2-3 Shift Valve         |
| 3. Lock-Up Control Valve   | 11. 2-3 Shift Spring        |
| 4. Lock-Up Control Spring  | 12. Stop Pin                |
| 5. Spring Retainer         | 13. Stop Plug               |
| 6. Converter Relief Spring | 14. By-Pass Valve           |
| 7. Converter Relief Valve  | 15. By-Pass Spring          |
| 8. Stop Pin                | 16. Main Control Valve Body |

93J24769

**Fig. 51: Exploded View Of Pre-Main Valve Body (FA4A-EL - 2 Of 2)**  
**Courtesy of MAZDA MOTORS CORP.**

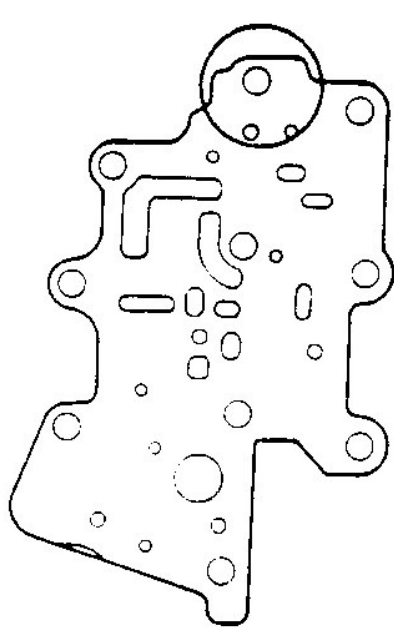


- |                                   |                             |
|-----------------------------------|-----------------------------|
| 1. Manual Valve                   | 7. Pressure Regulator Valve |
| 2. Stop Pin                       | 8. Stop Pin                 |
| 3. Pressure Regulator Plug Sleeve | 9. 2-3 Timing Plug          |
| 4. Pressure Regulator Plug        | 10. 2-3 Timing Spring       |
| 5. Pressure Regulator Spring Seat | 11. 2-3 Timing Valve        |
| 6. Pressure Regulator Spring      | 12. Rear Control Valve Body |

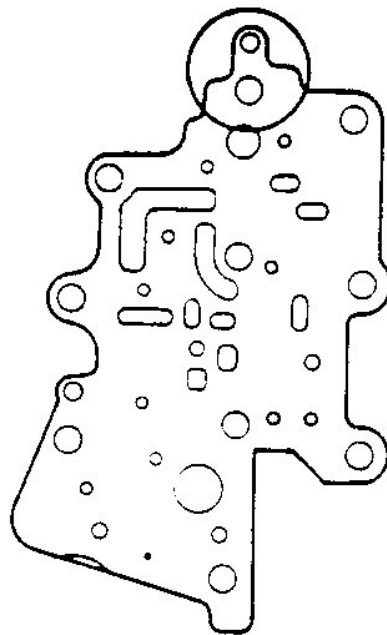
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**Fig. 52: Exploded View Of Rear Valve Body (GF4A-EL)**

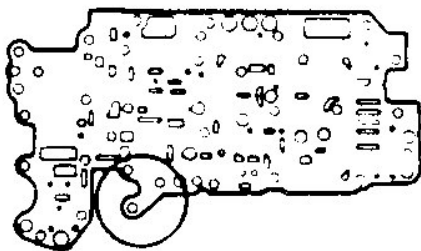
Courtesy of MAZDA MOTORS CORP.



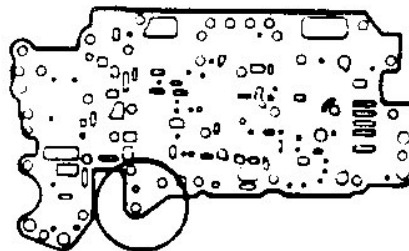
GASKET "B"



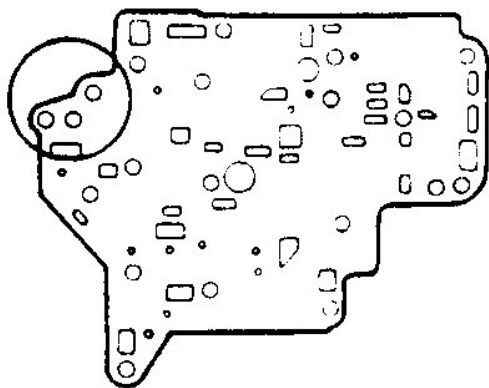
GASKET "A"



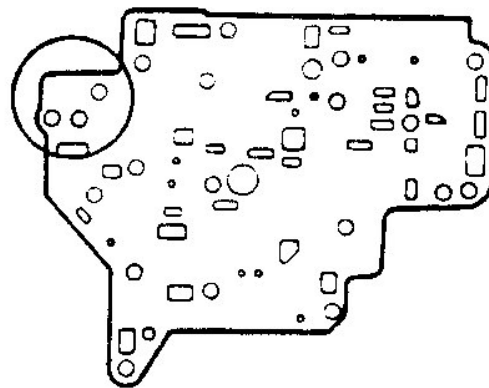
GASKET "D"



GASKET "C"



GASKET "F"

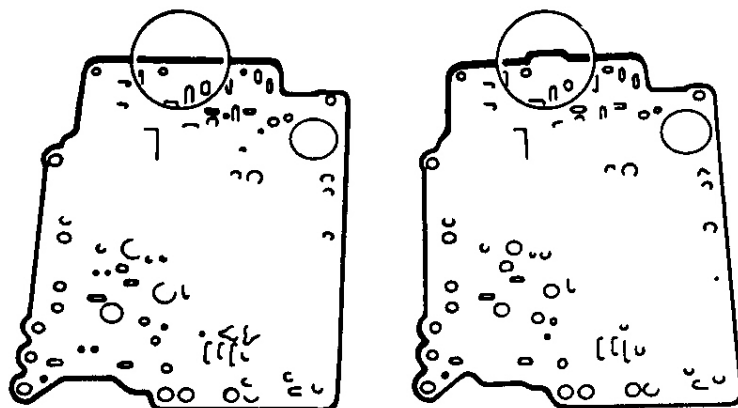
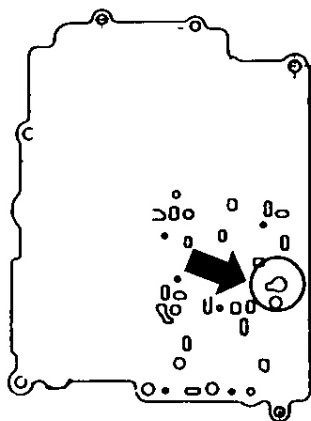
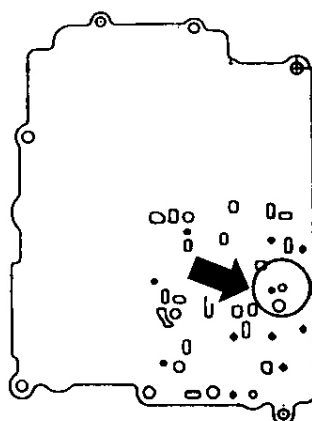
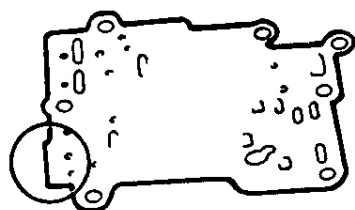
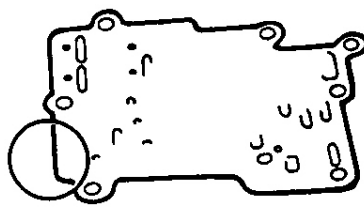


GASKET "E"

G93D24771

**Fig. 53: Identifying Valve Body Gaskets (FA4A-EL)**

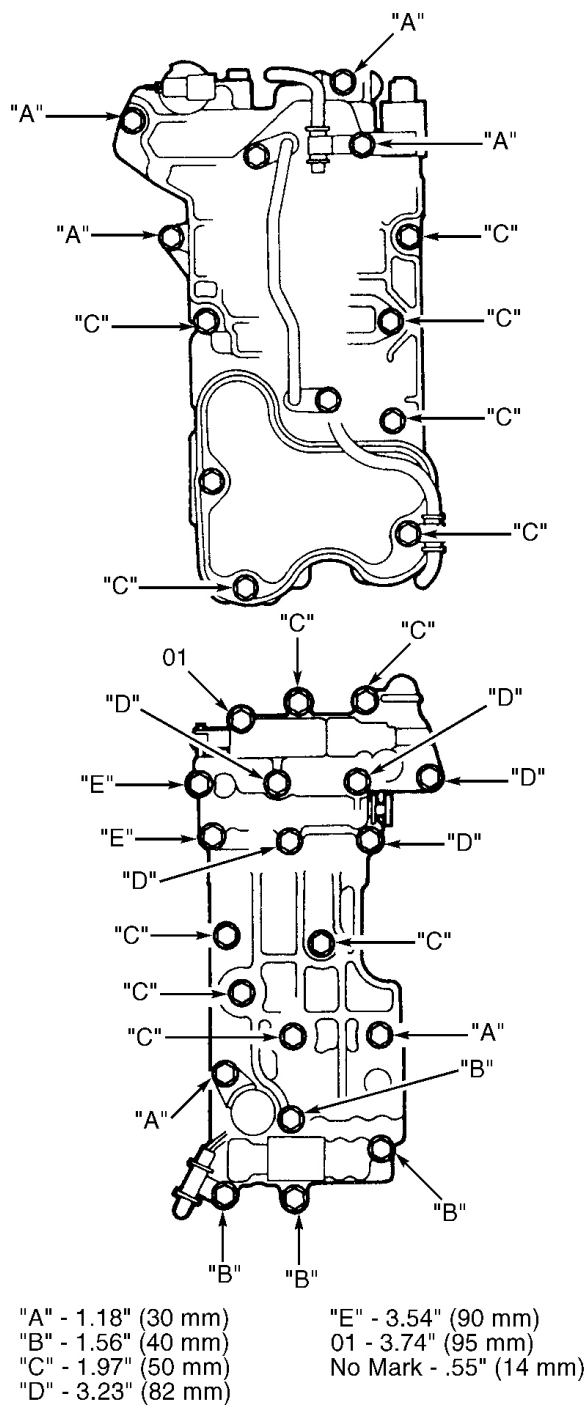
Courtesy of MAZDA MOTORS CORP.

MAIN/REAR  
FRONT GASKETMAIN/REAR  
REAR GASKETPRE-MAIN/MAIN  
FRONT GASKETPRE-MAIN/MAIN  
REAR GASKETFRONT/PRE-MAIN  
FRONT GASKETFRONT/PRE-MAIN  
REAR GASKET

G95G20194

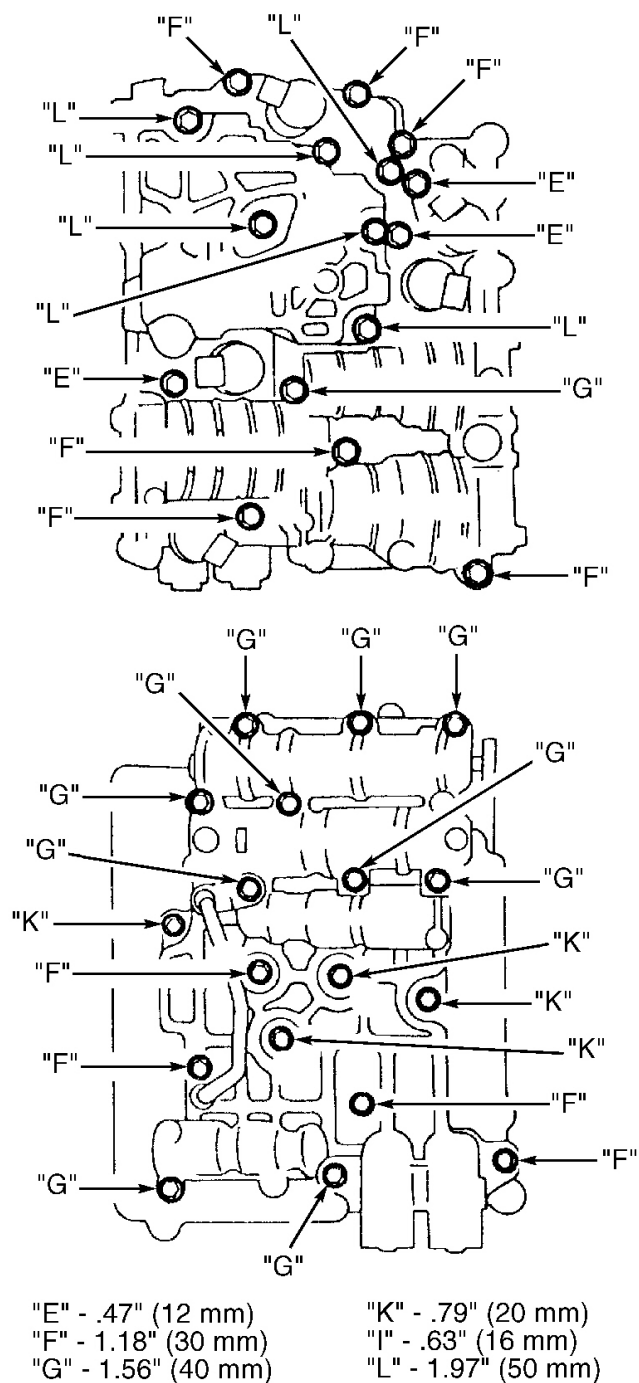
**Fig. 54: Identifying Valve Body Gaskets (GF4A-EL)**

Courtesy of MAZDA MOTORS CORP.



96A04994

**Fig. 55: Identifying Valve Body Bolt Location (FA4A-EL)**  
 Courtesy of MAZDA MOTORS CORP.



G96D04995

**Fig. 56: Identifying Valve Body Bolt Location (GF4A-EL)**  
 Courtesy of MAZDA MOTORS CORP.

#### FA4A-EL VALVE BODY SPRING SPECIFICATIONS

Application	Spring Color	In. (mm)
-------------	--------------	----------

**1995 Kia Sephia GS**

1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL &amp; GF4A-EL Overhaul

By-Pass Spring	Blue	1.20 (30.5)
Converter Relief Spring	Blue	2.69 (68.4)
Lock-Up Spring	Purple	1.19 (30.1)
Low Reducing Spring	Orange	1.36 (34.5)
Pressure Regulator Spring	Red	1.35 (34.2)
Throttle Assist Spring	Red	1.06 (26.88)
Throttle Modulator Spring	Gray	1.71 (43.4)
Throttle Relief Spring	N/A	.850 (21.6)
Throttle Spring	Light Green	1.82 (46.2)
1-2 Shift Spring	Yellow	1.63 (41.3)
2-3 Shift Spring	Yellow	1.63 (41.3)
3-4 Shift Spring	Yellow	1.63 (41.3)
3-2 Timing Spring	Blue	1.18 (30.0)

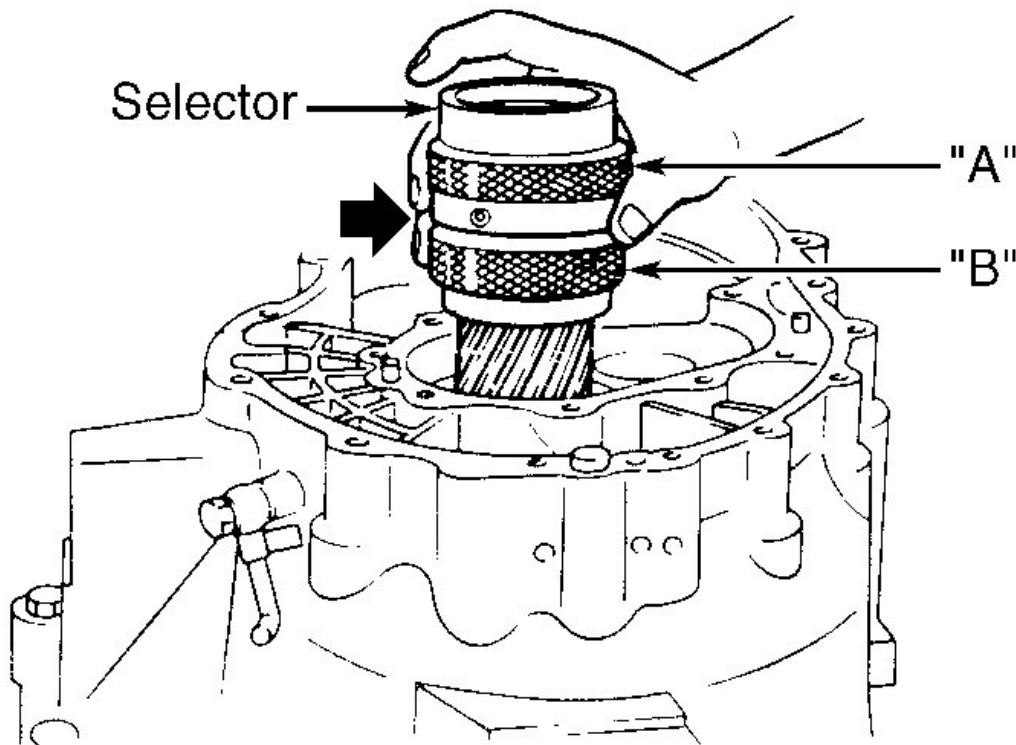
**GF4A-EL BODY SPRING SPECIFICATIONS**

<b>Application</b>	<b>Spring Color</b>	<b>In. (mm)</b>
By-Pass Spring	Green	1.16 (29.5)
Coast Timing Spring	Blue	1.10 (28.0)
Converter Relief Spring	None	1.27 (32.3)
Lock-Up Spring	White	1.30 (33.1)
Lock-Up Shift Spring	White	1.57 (40.0)
Low Reducing Spring	Yellow	1.51 (38.3)
N-D Accumulator	White	2.08 (52.9)
N-R Accumulator		
Small Spring	None	2.37 (60.1)
Large Spring	None	2.20 (56.0)
Pressure Modifier Spring	Light Green	1.50 (38.2)
Pressure Regulator Spring	None	1.34 (33.9)
Solenoid Reducing Spring	Red	1.56 (39.7)
1-2 Accumulator		
Small Spring	Gray	3.21 (81.6)
Large Spring	Green	3.21 (81.6)
1-2 Shift Spring	Purple	1.44 (36.6)
2-3 Shift Spring	Purple	1.44 (36.6)
2-3 Timing Spring	White	0.88 (22.3)
3-4 Shift Spring	Purple	1.44 (36.6)
3-2 Timing Spring	Light Blue	1.39 (35.4)

**TRANSAXLE REASSEMBLY****ADJUSTMENTS**

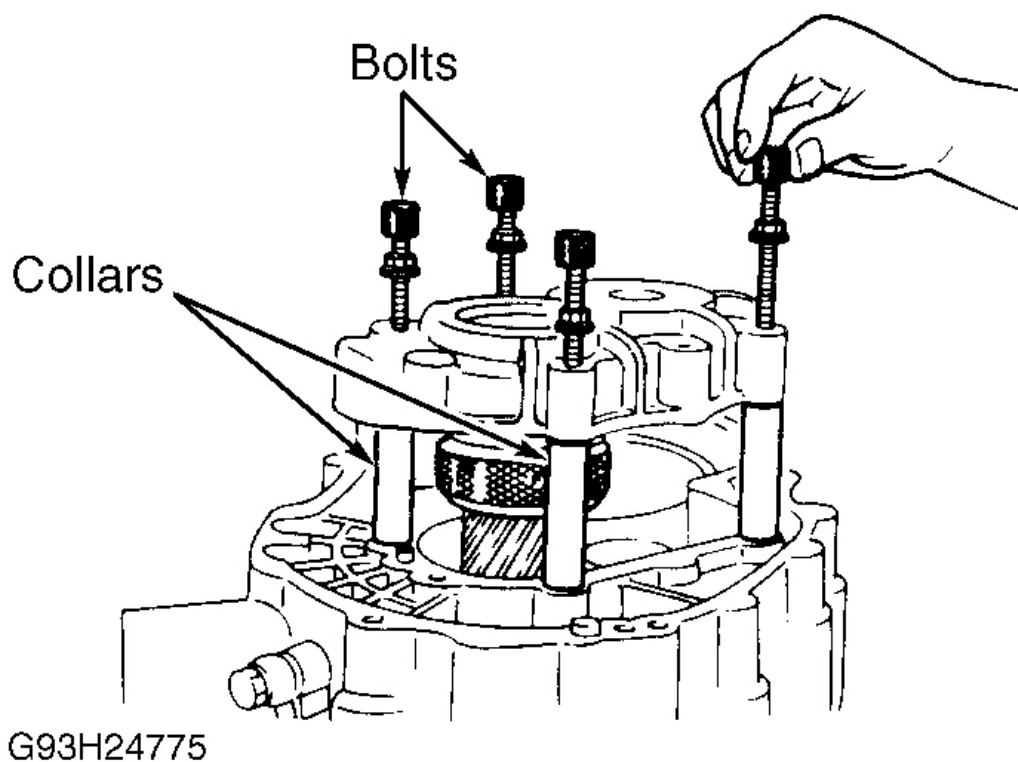
**Output Gear Bearing Preload**

1. Install bearing cover into converter housing. Before installing bearing housing, adjust output gear bearing preload.
2. Remove bearing outer race and adjustment shims from bearing housing. Reinstall bearing race into bearing housing. Mount output gear assembly on converter housing. Mount selector gauge (49 B019 0A0B-Selector Tool Set) on output gear assembly. Eliminate gap of selector gauge by turning collars "A" or "B" of selector gauge. See **Fig. 57**.
3. Mount bearing housing on selector gauge. Mount 4 collars between converter housing and bearing housing. Tighten bolts to 14-19 ft. lbs. (19-25 N.m). See **Fig. 58**.

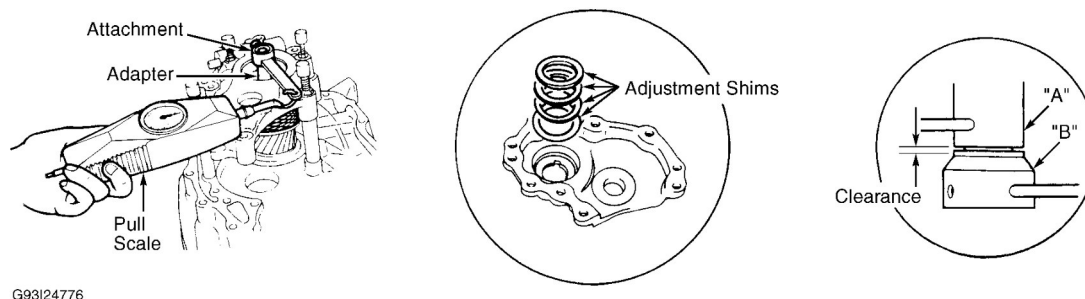


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**Fig. 57: Installing Selector Gauge On Output Gear Assembly**  
Courtesy of MAZDA MOTORS CORP.



**Fig. 58: Mounting Bearing Housing On Selector Gauge**  
 Courtesy of MAZDA MOTORS CORP.



**Fig. 59: Measuring Output Gear Bearing Preload**  
 Courtesy of MAZDA MOTORS CORP.

4. Turn selector in a direction which widens the gap between "A" and "B" of selector gauge until it will no longer turn. This will seat bearing race. Turn selector in opposite direction (reducing gap) until gap is eliminated.
5. Mount preload adapter to output gear. See **Fig. 59** . Measure preload with torque wrench or pull scale.

Widen gap on selector gauge to obtain specified reading. See **OUTPUT GEAR BEARING PRELOAD SPECIFICATION** table.

6. Measure clearance between "A" and "B" of selector gauge when specified preload is obtained. Measure clearance around entire circumference and select shim(s) equal to maximum clearance measured. See **OUTPUT GEAR SHIMS** chart. Maximum number of shims allowed is 7 for FA4A-EL and one for GF4A-EL.
7. Remove bearing housing and selector gauge. Install required shim(s), press bearing race into bearing housing and install bearing housing. Tighten bearing housing to specified torque. See **TORQUE SPECIFICATIONS**. After installing bearing cover, check output gear bearing preload. See **OUTPUT GEAR BEARING PRELOAD SPECIFICATION** table.

#### OUTPUT GEAR BEARING PRELOAD SPECIFICATION

Measuring Tool	Specification
FA4A-EL	
Torque Wrench	8-15 INCH lbs. (.9-1.7 N.m)
Pull Scale	2.0-3.9 lbs. (9-17 N)
GF4A-EL	
Torque Wrench	10-17 INCH lbs. (1.1-1.9 N.m)
Pull Scale	2.5-4.4 lbs. (11-19 N)

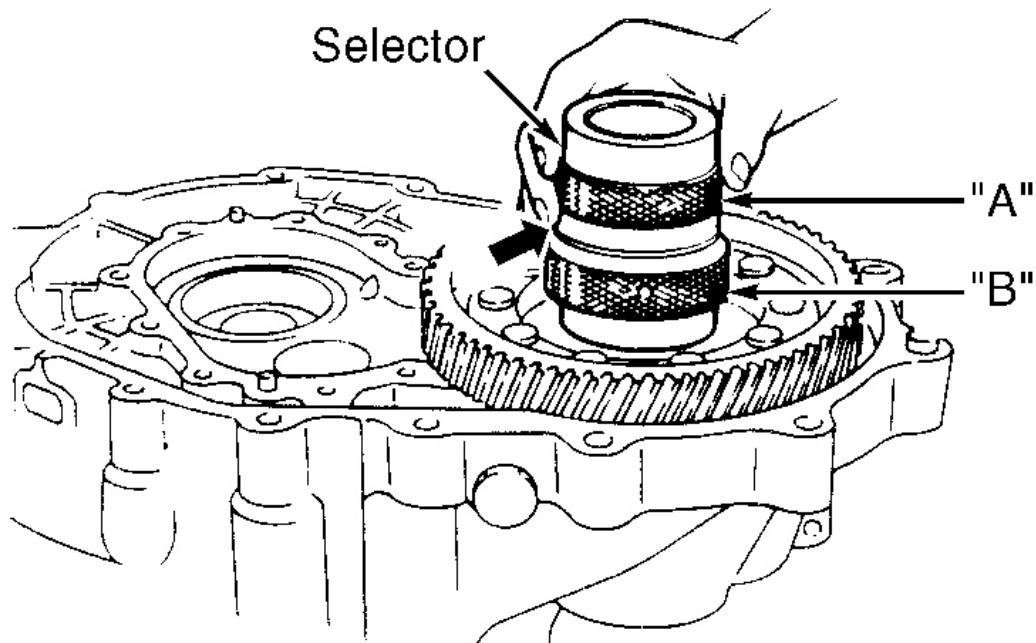
#### OUTPUT GEAR SHIMS

Application	(1) Shims Available
FA4A-EL	.020-.057" (.50-1.45 mm)
GF4A-EL	.014-.055" (.35-1.38 mm)
(1) In increments of .001" (.02 mm).	

#### Differential Assembly

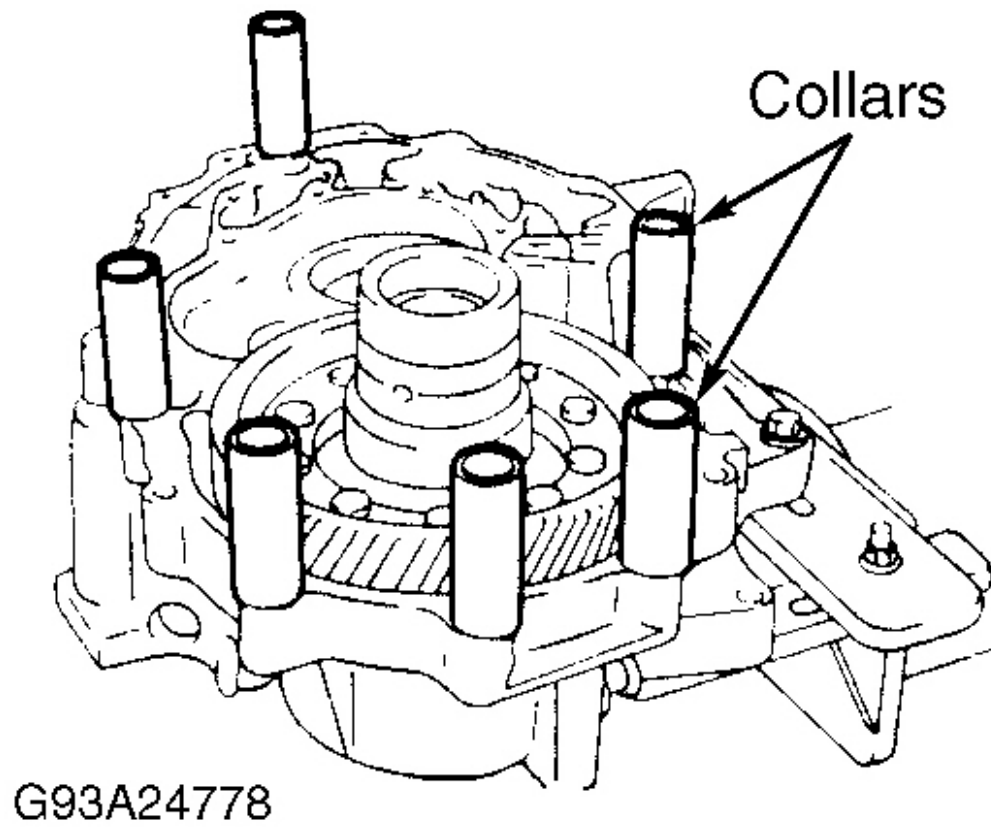
1. Remove bearing outer race and adjustment shims from transaxle case. Mount differential assembly in converter housing. Install bearing outer race into Selector Gauge (49 B019 0A0B-Selector Tool Set). Mount selector gauge on differential assembly. See **Fig. 60** . Eliminate gap by turning collars "A" and "B" of selector gauge.
2. Mount 6 spacing collars on differential assembly. See **Fig. 61** . Mount transaxle case onto selector gauge. Tighten Bolts to 27- 38 ft. lbs. (37-52 N.m).
3. Turn assembly over. Install 2 remaining bolts and tighten to 27-38 ft. lbs. (37-52 N.m). See **Fig. 62** . Using bars on collars "A" and "B" of selector, turn selector in a direction which widens the gap between "A" and "B" of selector. Turn selector (to widen gap) until it will no longer turn. This will seat bearing race. Turn selector in opposite direction (reducing gap) until preload is eliminated.
4. Mount preload adapter into differential until in contacts pinion shaft. Measure preload with torque wrench or pull scale. See **Fig. 63** . Widen gap on selector gauge to obtain specified reading. See **DIFFERENTIAL BEARING PRELOAD SPECIFICATION** table.
5. Measure clearance between "A" and "B" of selector gauge when specified preload is obtained. Measure clearance around entire circumference and select shims equal to maximum clearance measured. Add .012" (.30 mm) to measured clearance. Maximum of 3 shims may be used. For available shims, see

**DIFFERENTIAL BEARING SHIM** chart.

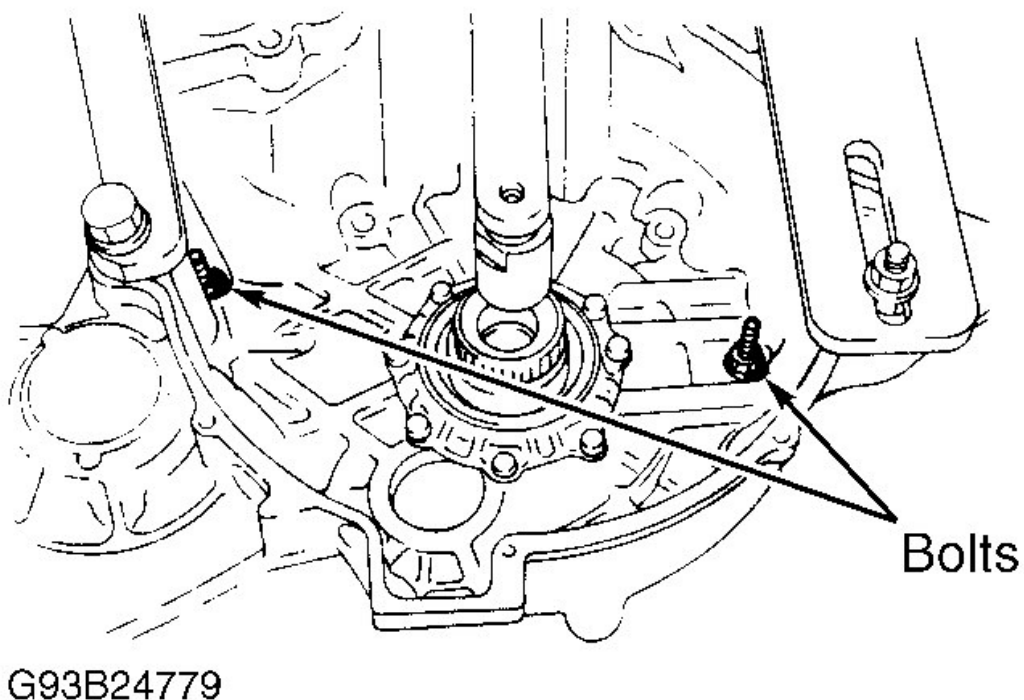


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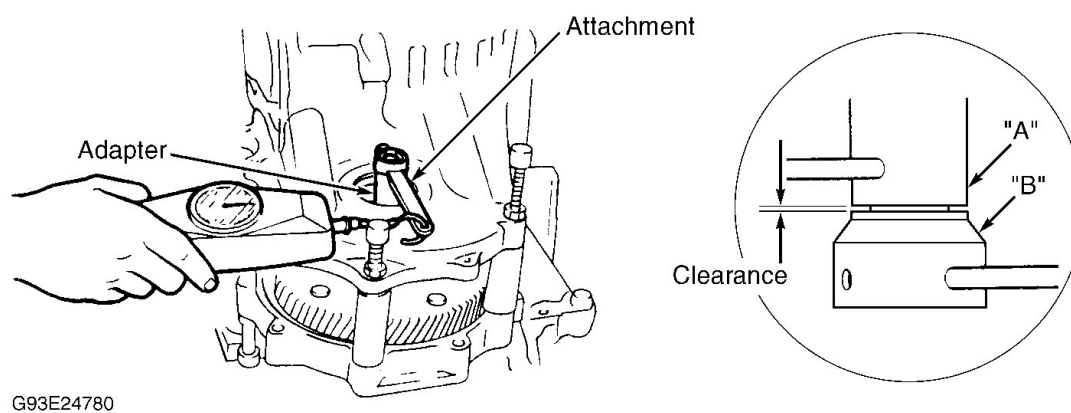
**Fig. 60: Installing Selector Gauge On Differential**  
Courtesy of MAZDA MOTORS CORP.



**Fig. 61: Positioning Collars On Differential**  
Courtesy of MAZDA MOTORS CORP.



**Fig. 62: Installing Collar Bolts**  
Courtesy of MAZDA MOTORS CORP.



**Fig. 63: Measuring Differential Side Bearing Preload**  
Courtesy of MAZDA MOTORS CORP.

6. Remove transaxle case and selector. Install the required amount of shims and press bearing race into

bearing housing. Install bearing housing. Check differential bearing preload. Using torque wrench, preload should be 26-35 INCH lbs. (2.9-3.9 N.m). Using pull scale, preload should be 6.6-8.8 lbs. (29-39 N). If preload is not within specification, repeat measuring and adjusting procedure (as necessary).

7. Remove transaxle case and bearing housing. Install output gear with idler gear. Tap idler gear in position with a plastic hammer. Install bearing housing. Align groove on idler shaft with matching mark on bearing housing and install roll pin. Install differential assembly. On GF4A-EL models, install 2-3 accumulator piston assembly.

#### DIFFERENTIAL BEARING PRELOAD SPECIFICATION

Measuring Tool	Specification
Torque Wrench	4.4 INCH lbs. (.5 N.m)
Pull Scale	1.1 lbs. (5.0 N)

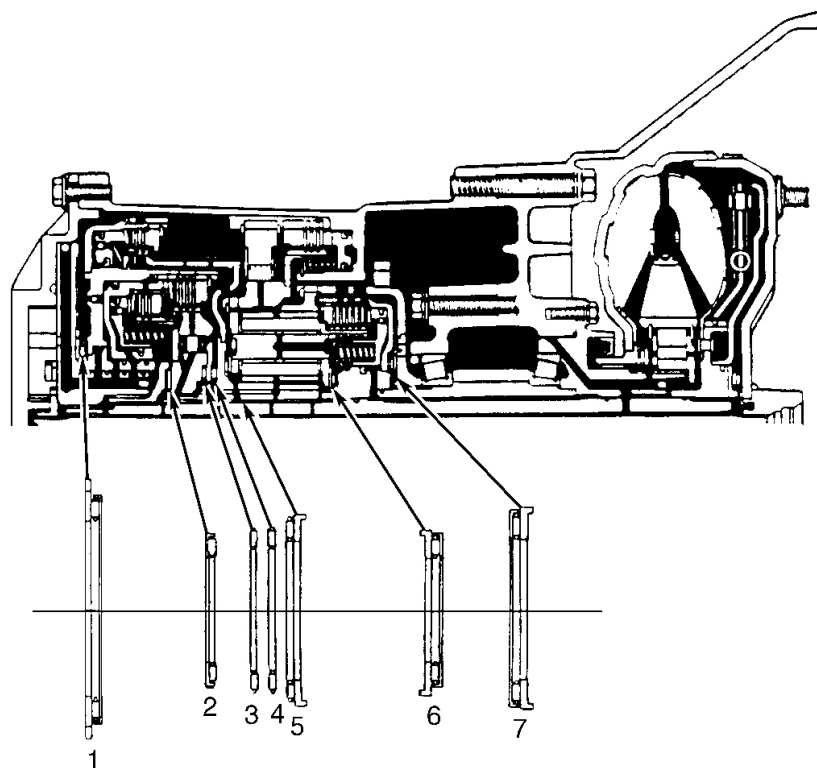
#### DIFFERENTIAL BEARING SHIM

Application	Thickness of Shim
FA4A-EL	(1) .020-.057" (.50-1.45 mm)
GF4A-EL	(2) .004-.047" (.10-1.20 mm)
(1) In increments of .001" (.02 mm).	
(2) In increments of .002" (.05 mm).	

#### FINAL ASSEMBLY

**NOTE:** Ensure all bearing preloads are set and appropriate shims are installed. See ADJUSTMENTS .

**NOTE:** For location of thrust bearings and races, see Fig. 64 .

**BEARING & RACE DIAMETER**

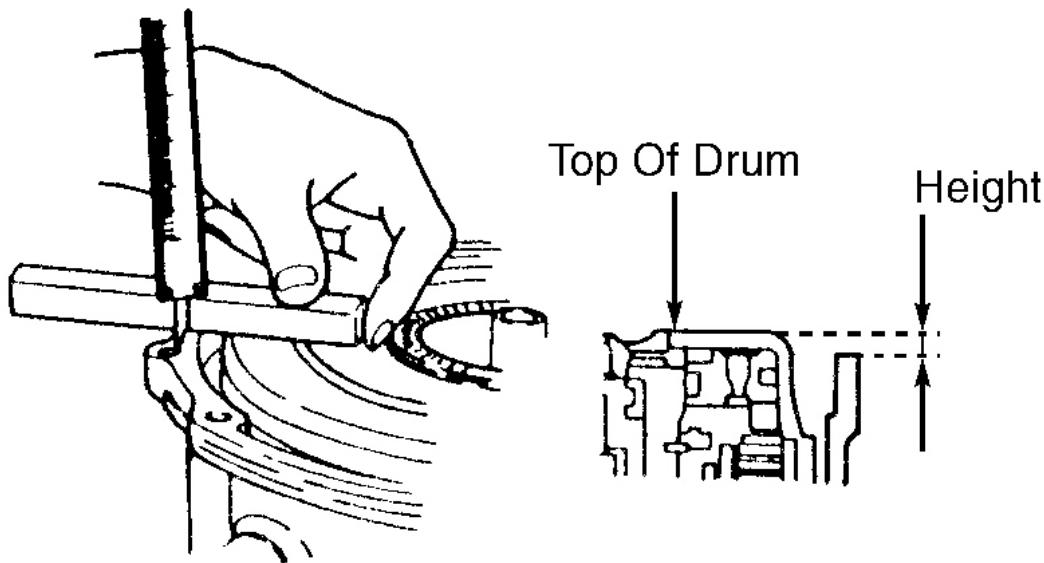
Application	In. (mm)
<b>FA4A-EL</b>	
No. 1 Bearing .....	3.390 (86.10)
No. 2 & 6 Bearing .....	2.210 (56.10)
No. 3 Bearing .....	2.280 (58.00)
No. 4 & 5 .....	3.390 (86.10)
No. 1 Race .....	3.460 (88.00)
No. 5 Race .....	3.310 (84.00)
No. 7 Bearing .....	2.840 (72.10)
<b>GF4A-EL</b>	
No. 1 Bearing .....	3.390 (86.00)
No. 1 Race .....	3.460 (88.00)
No. 2 Bearing .....	2.210 (56.10)
No. 3 & 4 Bearing .....	2.450 (62.15)
No. 5 Bearing .....	2.830 (72.00)
No. 5 Race .....	2.830 (72.00)
No. 6 Bearing .....	2.200 (56.00)
No. 6 Race .....	2.246 (57.00)
No. 7 Bearing .....	2.800 (71.00)
No. 7 Race .....	2.830 (72.00)

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**Fig. 64: Locating Thrust Bearings & Races**  
 Courtesy of MAZDA MOTORS CORP.

1. Install parking pawl. Assemble parking assist lever and actuator support, manual shaft and manual plate. See **Fig. 14** . Install detent ball, spring washer and plug. Manually check that parking pawl operates.

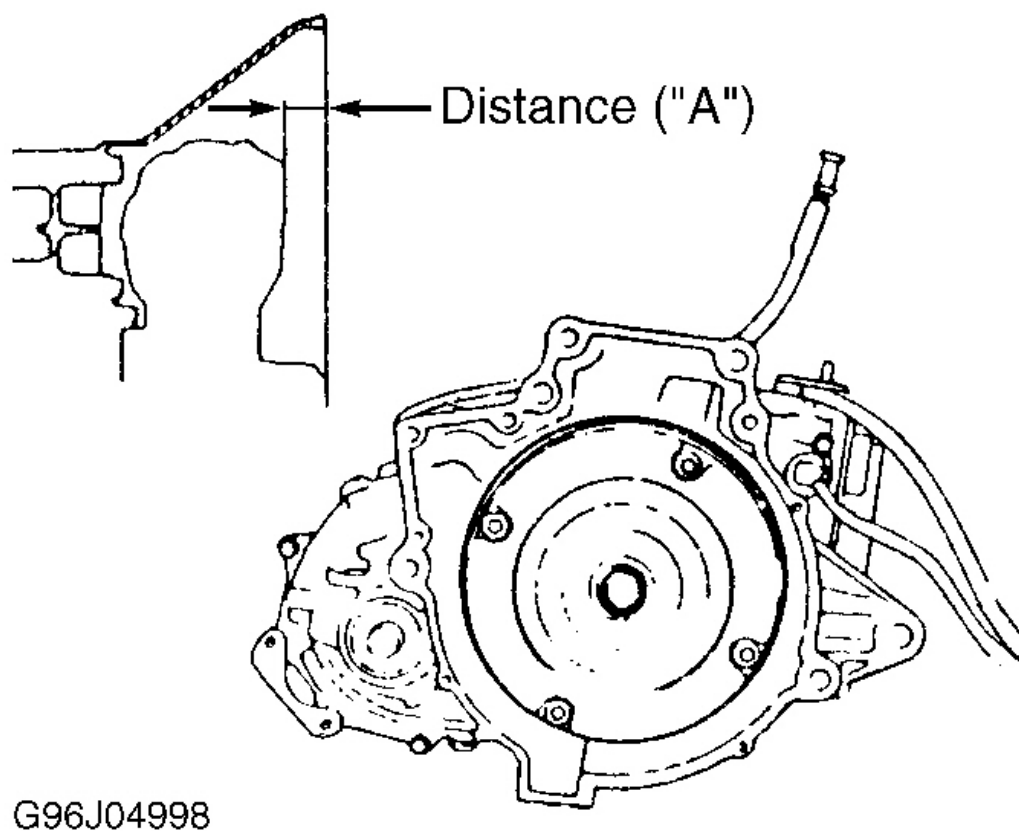
2. Install output shell to output gear. Ensure thrust bearing is installed on output shell. Apply a thin coat of sealant to contact surfaces of converter housing and transmission case. Install oil passage "O" rings in converter housing. Install transaxle case to converter housing. Install bolts and tighten to specifications. See **TORQUE SPECIFICATIONS**.
3. Install holding support to hold turbine shaft. Place turbine shaft through 3-4 clutch assembly. Install thrust bearings on both sides of 3-4 clutch assembly and install 3-4 clutch assembly with turbine shaft into transaxle case. Install internal gear to 3-4 clutch drum and install snap ring. See **Fig. 12** or **Fig. 13**.
4. Install bearing race in carrier hub and hold turbine shaft to prevent it from turning while installing carrier hub assembly with a rotating motion into 3-4 clutch drum.
5. Install low-reverse brake drive and driven plates, retaining plate and snap ring. Check clearance with a feeler gauge between retaining plate and snap ring. See **LOW & REVERSE BRAKE** under COMPONENT DISASSEMBLY & REASSEMBLY. Check low-reverse brake operation by applying air pressure to low-reverse oil passage. See **Fig. 20** or **Fig. 21**.
6. Hold one-way clutch horizontally while installing. Rotate carrier hub assembly counterclockwise and install snap ring. Install servo spring, servo assembly and snap ring. On GF4A-EL, install piston stem and hand tighten nut. On all models, install anchor strut with groove upward. Install 2-4 brake band in transaxle case, interlocking brake band into anchor strut.
7. Install bearing race on carrier hub and thrust bearing on small sun gear and one-way clutch. Install small sun gear and one-way clutch with rotating motion.
8. Install forward, coasting and reverse clutch assembly. Ensure thrust bearings are on both sides of clutch assembly. Measure the height of reverse, coasting and forward drum above transaxle case. See **Fig. 65**. On FA4A-EL, height should be .035" (.90 mm) or .028-.075" (.7-1.9 mm) on GF4A-EL. Install snap ring on turbine shaft bottom groove.



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**Fig. 65: Checking Reverse, Coasting & Forward Drum Installation**  
 Courtesy of MAZDA MOTORS CORP.

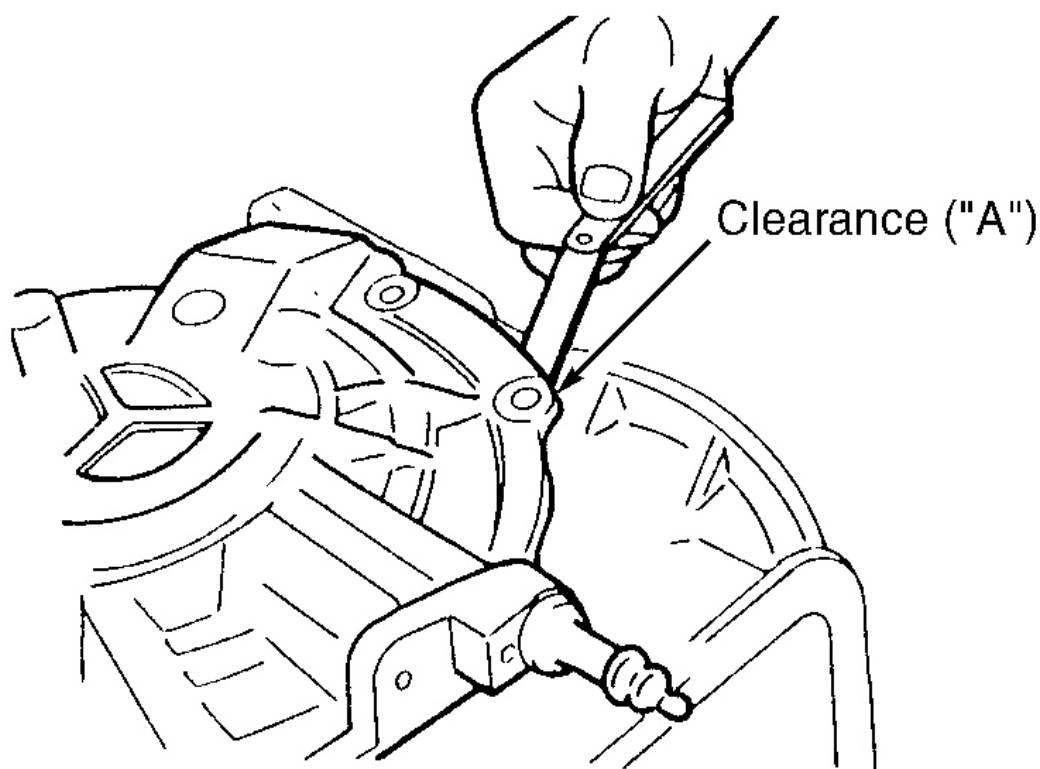
9. Remove bearing race and gasket from oil pump (if installed). Select a .087" (2.20 mm) bearing race and place on oil pump. Install oil pump on transaxle case. Measure with a feeler gauge between oil pump and transaxle case. See **Fig. 67** . Use clearance measured to select bearing race. See OIL PUMP BEARING RACE SELECTION table.
10. Remove oil pump. Install selected bearing race and new gasket onto oil pump. Install oil pump onto reverse, coasting and forward drum. Install oil pipe. Tighten oil pump bolts to 14-19 ft. lbs. (19-26 N.m) in crisscross pattern. On GF4A-EL, install oil pipe. Tighten 2-4 brake band servo stem adjusting nut to 105-130 INCH lbs. (11.8-14.7 N.m), then loosen piston 1.5 turns. Tighten lock nut to 19-28 ft. lbs. (25-39 N.m).
11. On FA4A-EL, install throttle cable with new bracket "O" ring. On all models, install valve body solenoid connector to transaxle case. Ensure manual valve is aligned with pin and install valve body assembly into transaxle case. Tighten valve body bolts to 70-95 INCH lbs. (7.9-10.7 N.m).
12. Install oil filter and "O" ring to transaxle case. Install oil pan and new gasket. Tighten oil pan bolts to 74-95 INCH lbs. (8.4-10.7 N.m). Install remainder of electrical switches and sensors. Install valve body cover with a new gasket. Tighten cover bolts to 74-95 INCH lbs. (8.4-10.7 N.m).
13. Install dipstick tube with new "O" ring. Install oil pump shaft. Fill torque converter with ATF. Install new "O" ring on stator shaft and install torque converter. Measure distance from converter housing to torque converter. See **Fig. 66** . On FA4A-EL transaxle, distance should be .54" (13.6 mm) and .61" (15.4 mm) on GF4A-EL transaxle.



**Fig. 66: Measuring Torque Converter Installed Depth**  
 Courtesy of MAZDA MOTORS CORP.

#### OIL PUMP BEARING RACE SELECTION

Clearance Measured ("A") In. (mm)	Bearing Race Selection In. (mm)
.036-.043 (.91-1.10)	.047 (1.20)
.028-.035 (.71-.90)	.055 (1.40)
.020-.027 (.51-.70)	.063 (1.60)
.012-.020 (.31-.51)	.071 (1.80)
.004-.012 (.11-.30)	.079 (2.00)
.000-.004 (.00-.10)	.087 (2.20)



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**Fig. 67: Determining Total End Play**  
 Courtesy of MAZDA MOTORS CORP.

## TORQUE SPECIFICATIONS

### TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Bearing Cover Bolts	
FA4A-EL	14-18 (19-25)
GF4A-EL	21-25 (28-34)
Converter Housing-To-Transaxle Case	27-38 (37-51)
Drive Plate Bolts	27-40 (37-54)
Idler Gear Nut	94-130 (128-177)
Manual Shaft (Large Nut)	31-40 (42-54)
Oil Pump-To-Transaxle Case Bolts	14-19 (19-26)
Oil Pump Spool Valve Plug	24-34 (32-47)
Output Gear Bearing Housing Bolt	21-25 (28-34)

**1995 Kia Sephia GS**

1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL &amp; GF4A-EL Overhaul

2-4 Brake Band Lock Nut	18-29 (25-39)
	<b>INCH Lbs. (N.m)</b>
Detent Ball Plug	105-156 (12-18)
Dipstick Tube Bolt	61-86 (7-10)
Lever Holder Bolt	70-95 (8-11)
Manual Shaft (Small Nut)	70-95 (8-11)
N-R Accumulator Plate Bolts	58-69 (6-8)
Oil Filter Bolts	70-95 (8-11)
Oil Filter Pan Bolts	70-95 (8-11)
Oil Pump Cover-To-Pump Body Bolts	70-95 (8-11)
Solenoid Valves-To-Control Valve Body	58-69 (6-8)
Stopper Bolt	53-80 (6-9)
Transaxle Fluid Temperature Switch	70-95 (8-11)
Valve Body Bolts	53-69 (6-8)
Valve Body Pan Bolts	70-95 (8-11)
Valve Body-To-Case Bolts	97-130 (11-15)
1-2 Accumulator Plate Bolts	58-69 (6-8)
2-3 Accumulator Bolts	70-95 (8-11)
2-4 Brake Band Adjustment Bolt (GF4A-EL)	105-130 (12-15)

**TRANSAXLE SPECIFICATIONS****TRANSAXLE SPECIFICATIONS (FA4A-EL)**

<b>Application</b>	<b>In. (mm)</b>
Bushing Inside Diameter (Maximum) Torque Converter	2.090 (53.08)
Brake Snap Ring-To-Retaining Plate Clearance, Low & Reverse Brake	.083-.094 (2.10-2.40)
Clutch Snap Ring-To-Retaining Plate Clearance	
Coasting Clutch	.039-.047 (1.00-1.20)
Forward Clutch	.039-.047 (1.00-1.20)
Reverse Clutch	.083-.094 (2.10-2.40)
3-4 Clutch	.051-.063 (1.30-1.60)
Clutch Drive Plate Minimum Thickness All Clutches	.055 (1.40)
Planetary Pinion Gear Clearance	.008-.028 (.20-.70)
Oil Pump	
Rotor End Clearance	.0008-.0016 (.020-.040)
Rotor Side Clearance	.0016-.005 (.040-.125)
Seal Ring Inner Diameter	1.553 (39.45)
<b>Bearing Preload</b>	
Differential	
Torque Wrench	26-35 INCH Lbs. (2.9-3.9 N.m)

**1995 Kia Sephia GS**

1995-96 AUTOMATIC TRANSMISSIONS FA4A-EL &amp; GF4A-EL Overhaul

Pull Scale	6.6-8.8 Lbs. (29-39 N)
Output Gear	
Torque Wrench	8-15 INCH Lbs. (.9-1.7 N.m)
Pull Scale	2.0-3.9 Lbs. (9-17 N)

**TRANSAXLE SPECIFICATIONS (GF4A-EL)**

<b>Application</b>	<b>In. (mm)</b>
Bushing Inside Diameter (Maximum) Torque Converter	2.0884 (53.045)
Brake Snap Ring-To-Retaining Plate Clearance, Low & Reverse Brake	.059-.071 (1.50-1.80)
Clutch Snap Ring-To-Retaining Plate Clearance	
Coasting Clutch	.039-.047 (1.00-1.20)
Forward Clutch	.039-.047 (1.00-1.20)
Reverse Clutch	.059-.071 (1.50-1.80)
3-4 Clutch	.051-.059 (1.30-1.50)
Clutch Drive Plate Minimum Thickness All Clutches	.055 (1.40)
Planetary Pinion Gear Clearance	.008-.028 (.20-.70)
Oil Pump	
Rotor End Clearance	.0008-.0016 (.020-.040)
Rotor Side Clearance	.0016-.005 (.040-.125)
Seal Ring Inner Diameter	2.026 (51.45)
<b>Bearing Preload</b>	
Differential	
Torque Wrench	26-35 INCH Lbs. (2.9-3.9 N.m)
Pull Scale	6.6-8.8 Lbs. (29-39 N)
Output Gear	
Torque Wrench	10-17 INCH Lbs. (1.1-1.9 N.m)
Pull Scale	2.5-4.4 Lbs. (11-19 N)