

1999 Hyundai Sonata

1999-2008 AUTOMATIC TRANSMISSION Overhaul - F4A42 & F5A51 - Sonata, XG300, & XG350

1999-2008 AUTOMATIC TRANSMISSION

Overhaul - F4A42 & F5A51 - Sonata, XG300, & XG350

GENERAL INFORMATION

APPLICATION

APPLICATION CHART

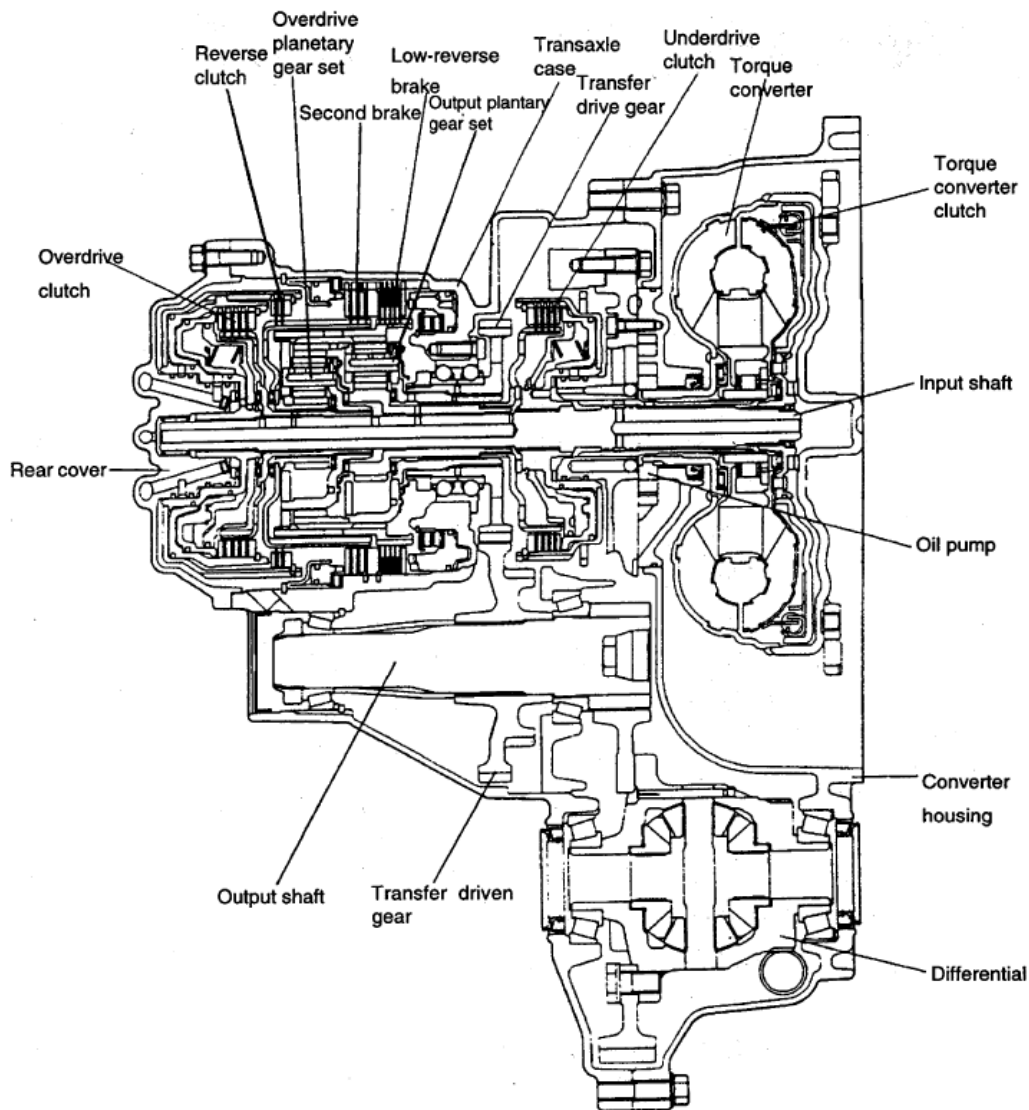
Year	Model ⁽¹⁾	Transmission
1999-2008	Sonata	F4A42
2001	XG300	F5A51
2002-2005	XG350	F5A51
(1) Canadian models included		

SECTION VIEW (F4A42)

COMPONENTS

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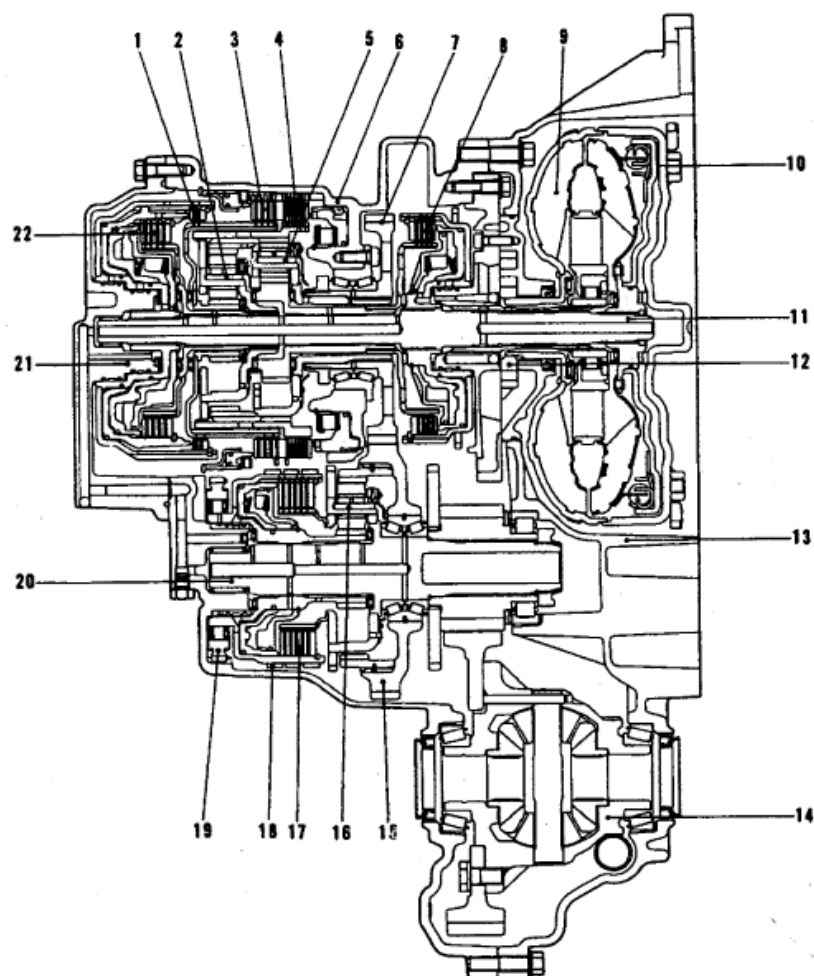
1999-2008 AUTOMATIC TRANSMISSION Overhaul - F4A42 & F5A51 - Sonata, XG300, & XG350



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Fig. 1: Section View Of Automatic Transmission (F4A42)
Courtesy of HYUNDAI MOTOR CO.

SECTION VIEW (F5A51)



- | | |
|----------------------------------|-------------------------------|
| 1. REVERSE CLUTCH | 12. OIL PUMP |
| 2. OVER DRIVE PLANETARY GEAR SET | 13. CONVERTER HOUSING |
| 3. SECOND BRAKE | 14. DIFFERENTIAL |
| 4. LOW & REVERSE BRAKE | 15. TRANSFER DRIVEN GEAR |
| 5. OUTPUT PLANETARY GEAR SET | 16. DIRECT PLANETARY GEAR SET |
| 6. TRANSMISSION CASE | 17. DIRECT CLUTCH |
| 7. TRANSFER DRIVE GEAR | 18. REDUCTION BRAKE |
| 8. UNDER DRIVE CLUTCH | 19. ONE WAY CLUTCH |
| 9. TORQUE CONVERTER | 20. OUTPUT SHAFT |
| 10. DAMPER CLUTCH | 21. REAR COVER |
| 11. INPUT SHAFT | 22. OVER DRIVE CLUTCH |

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Fig. 2: Section View Of Automatic Transmission (F5A51)
Courtesy of HYUNDAI MOTOR CO.

SERVICE SPECIFICATIONS

SERVICE SPECIFICATIONS

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Item	Standard value
Output shaft preload	0.01-0.09 mm
Brake reaction plate end play	0-0.16 mm
Low-reverse brake end play	1.35-1.81 mm (4 A/T), 1.65-2.11 mm (5 A/T)
Second brake end play	0.79-1.25 mm (4 A/T), 1.09-1.55 mm (5 A/T)
Underdrive sun gear end play	0.25-0.45 mm
Input shaft end play	0.70-1.45 mm
Differential case preload	0.045-0.105 mm
Underdrive clutch end play	1.65-1.85 mm
Reverse and overdrive clutch return spring end play	0-0.09 mm
Overdrive clutch end play	1.6-1.8 mm
Reverse clutch end play	1.5-1.7 mm
Backlash between differential side gear and pinion	0.025-0.150 mm
Clearance between snap ring and reaction plate of underdrive clutch	1.25-1.45 mm (4 A/T) 1.6-1.8 mm (5 A/T)
Clearance between snap ring and reaction plate of direct clutch	1.0-1.2 mm (5 A/T)

TIGHTENING TORQUE**TORQUE SPECIFICATIONS**

Item	N.m	kg.cm	lb.ft
Wiring harness bracket	20-26	200-260	14-18
Control cable bracket	20-26	200-260	14-18
Eye bolt	27-33	270-330	19-23
Oil cooler feed tube	10-12	100-120	7-8
Oil filter	11-13	110-130	8-9
Input shaft speed sensor	10-12	100-120	7-8
Output shaft speed sensor	10-12	100-120	7-8
Manual control lever	18-25	180-250	13-18
Transaxle range switch	10-12	100-120	7-8
Speedometer gear	4-6	40-60	3-4
Valve body cover	8-10	80-100	6-7
Valve body mounting bolt	10-12	100-120	-7-8
Fluid temperature sensor	10-12	100-120	7-8
Manual control shaft detent	5-7	50-70	4-5
Rear cover	20-26	200-260	14-18
Torque converter housing	42-54	420-540	29-38
Oil pump	20-26	200-260	14-18
Transfer drive gear	16-22	160-220	11-15
Output shaft lock nut	160-180	1600-1800	110-126
Output shaft bearing retainer	20-26	200-260	14-18

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Oil filler plug	29-34	290-340	20-24
Oil drain plug	29-34	290-340	20-24
Transfer drive gear lock nut	180-210	1800-2100	126-147
Differential drive gear	130-140	1300-1400	91-98
Valve body	10-12	100-120	7-8
Solenoid valve support	5-7	50-70	4-5
Plate	5-7	50-70	4-5
Pressure check plug	8-10	80-100	6-7
Front roll stopper bracket to subframe bolts	60-80	600-800	43-58
Front roll stopper insulator bolt and nut	50-65	500-650	36-47
Front roll stopper bracket to transaxle bolts	60-80	600-800	43-58
Rear roll stopper bracket to subframe bolts	50-65	500-650	36-47
Rear roll stopper insulator bolt and nut	50-65	500-650	36-47
Rear roll stopper bracket to transaxle bolts	60-80	600-800	43-58
Transaxle mounting sub bracket nut	60-80	600-800	43-58
Transaxle mounting bracket bolts	60-80	600-800	43-58
Transaxle mounting insulator bolt	90-110	900-1100	65-80
Reduction brake piston nut	16-22	160-220	11-15

LUBRICATIONS**LUBRICATION SPECIFICATIONS**

Item	Specified lubricant	Quantity
Transaxle fluid lit. (U.S. qts., Imp.qts.)	GENUINE DIAMOND ATF SP-II M	7.8 (8.2,6.9): F4A42 8.5 (8.9,7.5): F5A51

SEALANTS**SEALANT SPECIFICATIONS**

Item	Specified sealant
Rear cover	Hyundai genuine sealant TB1281B or equivalent
Torque converter housing	Hyundai genuine sealant TB1281B or equivalent
Valve body cover	Hyundai genuine sealant TB1281B or equivalent

SNAP RING AND SPACER FOR ADJUSTMENT

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IDENTIFICATION & THICKNESS SPECIFICATIONS

Part name	Thickness mm	Identification symbol
Thrust washer (For adjustment of input shaft end play)	1.8	18
	2.0	20
	2.2	22
	2.4	24
	2.6	26
	2.8	28
Snap ring (For adjustment of underdrive clutch and overdrive clutch end plays)	1.6	None
	1.7	blue
	1.8	Brown
	1.9	None
	2.0	Blue
	2.1	Brown
	2.2	None
	2.3	Blue
	2.4	Brown
	2.5	None
	2.6	Blue
	2.7	Brown
	2.8	None
	2.9	Blue
	3.0	Brown
Snap ring (For adjustment of low-reverse brake and second brake reaction plates end plays)	2.2	Blue
	2.3	Brown
	2.4	None
	2.5	Blue
Pressure plate (For adjustment of low-reverse brake and second brake end plays)	1.6	6
	1.8	1
	2.0	0
	2.2	2
	2.4	4
	2.6	6
	2.8	8
	3.0	D
Snap ring (For adjustment of reverse clutch end play)	1.9	None
	2.0	Blue
	2.1	Brown
	2.2	None
	2.3	Blue
	2.4	Brown
	2.5	None
	2.6	Blue

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	2.7	Brown
	2.8	None
Snap ring (For adjustment of reverse clutch and overdrive clutch spring retainers end plays)	1.48	Brown
	1.53	None
	1.58	Blue
	1.63	Brown
Thrust race (For adjustment of underdrive sun gear end play)	1.6	-
	1.7	-
	1.8	-
	1.9	-
	2.0	-
	2.1	-
	2.2	-
	2.3	-
	2.4	-
	2.5	-
	2.6	-
Spacer (For adjustment of output shaft preload)	1.88	88
	1.92	92
	1.96	96
	2.00	00
	2.04	04
	2.08	08
	2.12	12
	2.16	16
	2.20	20
	2.24	24
	2.28	28
	2.32	32
	2.36	36
	2.40	40
	2.44	44
	2.48	48
	2.52	52
	2.56	56
	2.60	60
	2.64	64
	2.68	68
	2.72	72
	2.76	76
Spacer (For adjustment of differential case preload)	0.71	71
	0.74	74
	0.77	77

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	0.80	80
	0.83	83
	0.86	86
	0.89	89
	0.92	92
	0.95	95
	0.98	98
	1.01	01
	1.04	04
	1.07	07
	1.10	J
	1.13	D
	1.16	K
	1.19	L
	1.22	G
	1.25	M
	1.28	N
	1.31	E
	1.34	O
	1.37	P
Spacer (For adjustment of backlash between differential side gear and pinion)	0.75 - 0.82	-
	0.83 - 0.92	-
	0.93 - 1.00	-
	1.01 - 1.08	-
	1.09 - 1.16	-
Snap ring (For adjustment of direct clutch endplay)	1.9	Brown
	2.0	None
	2.1	Blue
	2.2	Brown
	2.3	None
	2.4	Blue
	2.5	Brown
	2.6	None
	2.7	Blue
	2.8	Brown
	2.9	None
	3.0	Blue

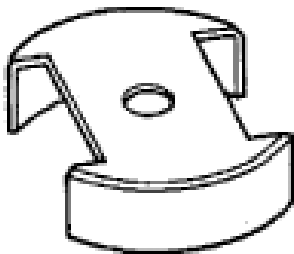
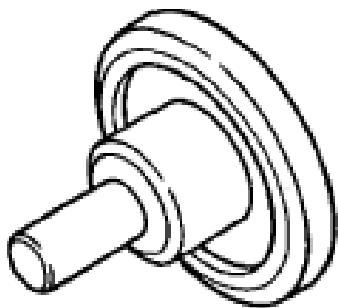
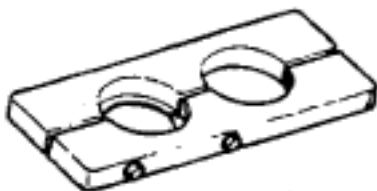
SPECIAL TOOLS

SPECIAL TOOLS

Tool (Number and Name)	Illustration	Use
09453-24000		Removal and installation of

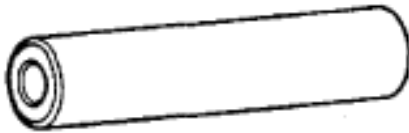
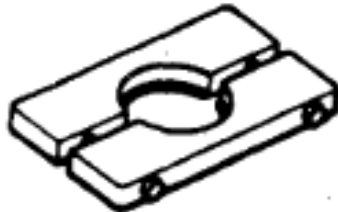
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Spring compressor	 45324000	underdrive clutch snap ring
09452-21401 Guide pin	 45221401	Installation of oil pump (use with 09452-21301)
09453-33100 Dial gauge extension	 45333100	Measurement of the low and reverse brake and the second brake end play
09431-39000 Oil seal installer	 43139000	Installation of differential oil seal
09432-33200 Removing plate	 43233200	Removal of transfer shaft bearing
09432-33800 Bearing installer		1. Removal of transfer driven gear taper bearing

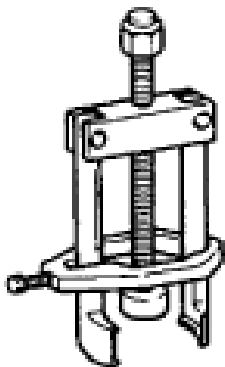
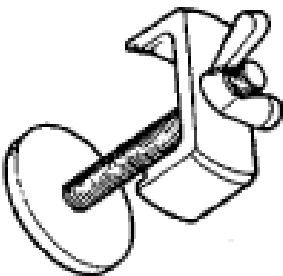
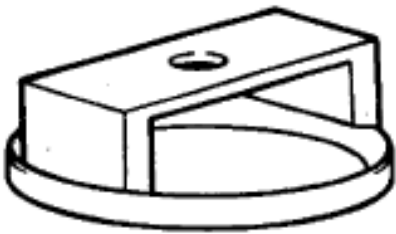
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	 43233800	(use with 09433-21000) 2. Installation or transfer shaft bearing
09433-21000 Removing plate	 43233800	1. Removal of transfer driven gear taper bearing (use with 09432-33800) 2. Removal of differential ball bearing
09500-11000 Bar	 50021000	Installation of differential bearing outer race (use with 09532-11500)
09455-33200 Bearing installer	 45521100	Installation of differential ball bearing and output shaft taper roller bearing
09453-21100 Spring compressor	 45321100	Removal and installation of the low-reverse brake snap ring (use with 09453-21000)
09455-21000 Bearing and gear puller		Removal of ball bearing and transfer drive gear

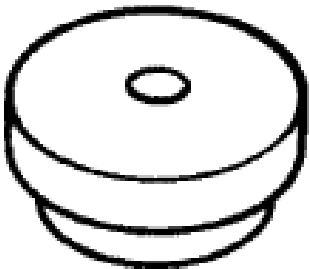
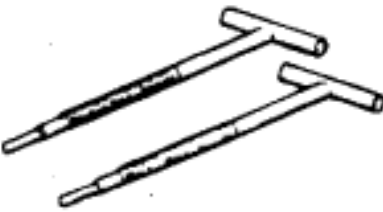
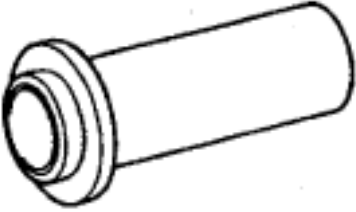
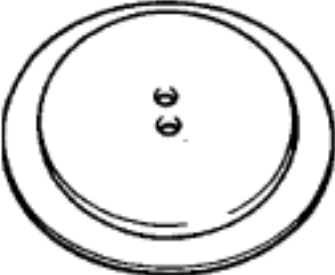
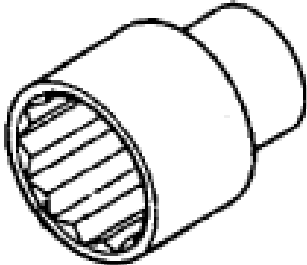
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	 45521000	
09455-21100 Bering installer	 45521100	1. Installation of ball bearing and transfer drive gear 2. installation of the transfer driven gear taper bearing
09532-11500 Bearing installer	 53211500	Installation of differential bearing outer race (use with 09500-11000)
09453-21000 Spring compressor	 45321000	• Removal and installation of low-reverse brake snap ring • Removal and installation of overdrive clutch snap ring (use with 09456-39000)
09456-39000 Spring compressor	 45639000	• Removal and installation of low-reverse brake and overdrive clutch snap ring
09432-21701 Bearing outer race installer		Installation of output shaft outer race

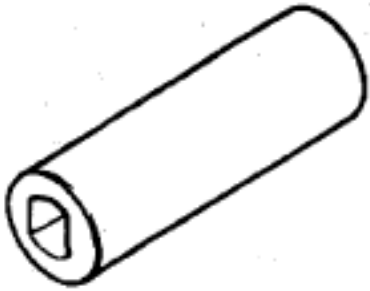
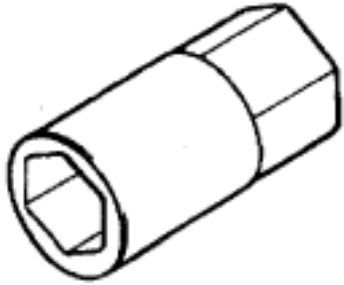
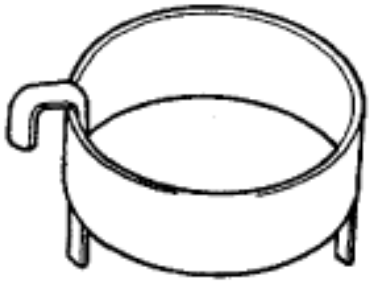
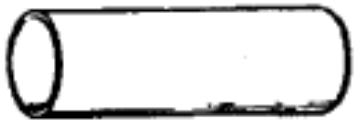
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	 43221701	
09452-33100 Oil pump remover	 45233100	Removal of the oil pump
09452-21200 Oil pump oil seal installer	 45221200	Installation of the oil pump oil seal
09456-39100 A/B Clearance dummy plate	 45639100	Measurement of low-reverse brake and second brake end plays (for F4A42)
09457-39000 Special socket (41)	 45739000	Removal and installation of output shaft lock nut

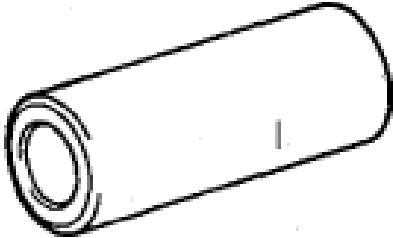
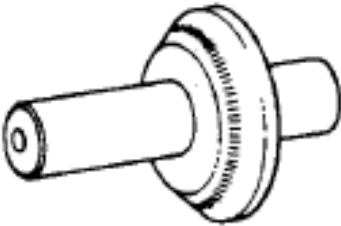
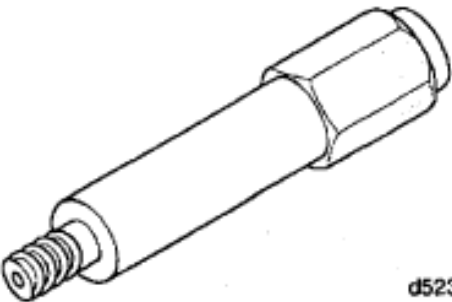
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09456-39000 Reduction socket	 45439000	Adjustment for reduction brake piston
09454-39100 Reduction socket wrench	 45439100	Adjustment for reduction brake piston
09454-39200 Reduction socket wrench	 45439200	Adjustment for reduction brake piston
09456-39200 Clearance dummy plate	 Y45-008B	Measurement of low-reverse brake and second brake end plays (for F5A51)
09455-39000 Spring compressor	 Y45-007G	Removal and installation of direct clutch snap ring
09452-21500 Oil pressure gauge		Measurement of the oil pressure (use with 09452-21001, 09452-21002)

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	 Y45-006E	
09452-21001 Oil pressure gauge adapter	 X45-007J	Measurement of the oil pressure (use with 09452-21500, 09452-21002)
09452-21002 Oil pressure gauge adapter	 Y45-005C	Measurement of the oil pressure, (use with 09452-21500 and 09452-21001)
09452-39000 Oil pressure gauge adapter	 d5239000	Measurement of the oil pressure, (use with 09452-21500 and 09452-21001) (For the direct and reduction clutch)

SERVICE ADJUSTMENT PROCEDURES

SERVICE ADJUSTMENT PROCEDURES

BRAKE REACTION PLATE END PLAY ADJUSTMENT

Replace the pressure plate of the low-reverse brake with the special tool, and then install the brake disc, brake plate and snap ring as shown in **Fig. 3**. Install the reaction plate and the used snap ring. Move the special tool up and down to measure the end play, and then replace the snap ring to adjust the end play to standard value. (Refer to "**SNAP RING AND SPACER FOR ADJUSTMENT**")

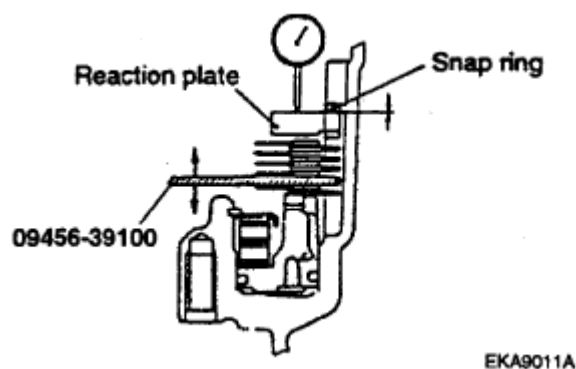


Fig. 3: Measuring/Adjusting Brake Reaction Plate End Play
Courtesy of HYUNDAI MOTOR CO.

Standard value: 0 - 0.16 mm

SECOND BRAKE END PLAY ADJUSTMENT

Replace the pressure plate of the second brake with the special tool, and then install the brake disc and brake plate as shown in **Fig. 4**. Install the return spring, second brake piston and snap ring. Move the special tool up and down to measure the end play.

Standard value : 0.79 - 1.25 mm (4 A/T)

1.09 - 1.55 mm (5 A/T)

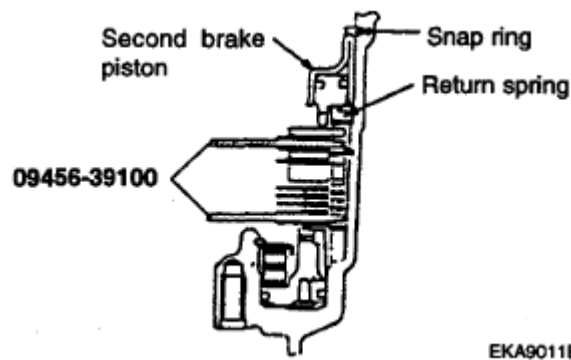


Fig. 4: Measuring/Adjusting Second Brake End Play
Courtesy of HYUNDAI MOTOR CO.

Reference

Select a pressure plate which thickness is within the following value. [A (moving amount) + thickness of the special tool - 1.25] to [A (moving amount) + thickness of the special tool - 0.79].

(Refer to "**SNAP RING AND SPACER FOR ADJUSTMENT**")

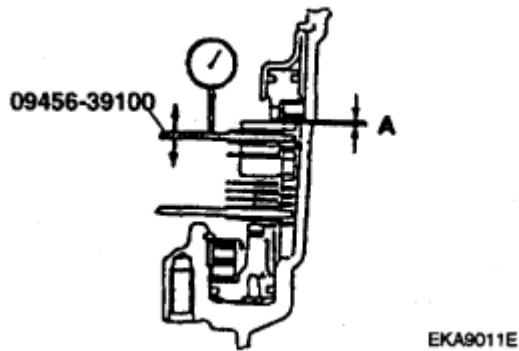


Fig. 5: Identifying Pressure Plate Thickness
Courtesy of HYUNDAI MOTOR CO.

LOW-REVERSE BRAKE END PLAY ADJUSTMENT

Reverse the transmission and install the dial gauge.

Move the special tool up and down to measure the end play.

Standard value : 1.35 - 1.81 mm (4 A/T)

1.65-2.11 mm (5A/T)

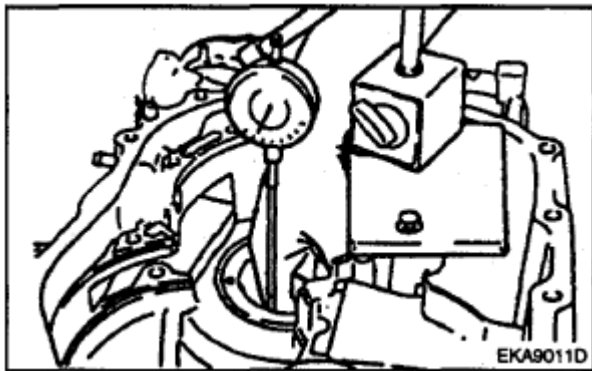


Fig. 6: Measuring/Adjusting Low-Reverse Brake End Play
Courtesy of HYUNDAI MOTOR CO.

Reference

Select a pressure plate which thickness is within the following value. [A (moving amount) + thickness of the special tool - 1.81] to [A (moving amount) + thickness of the special tool - 1.35].

(Refer to "**SNAP RING AND SPACER FOR ADJUSTMENT**")

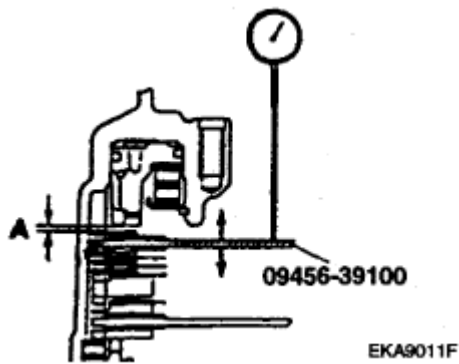
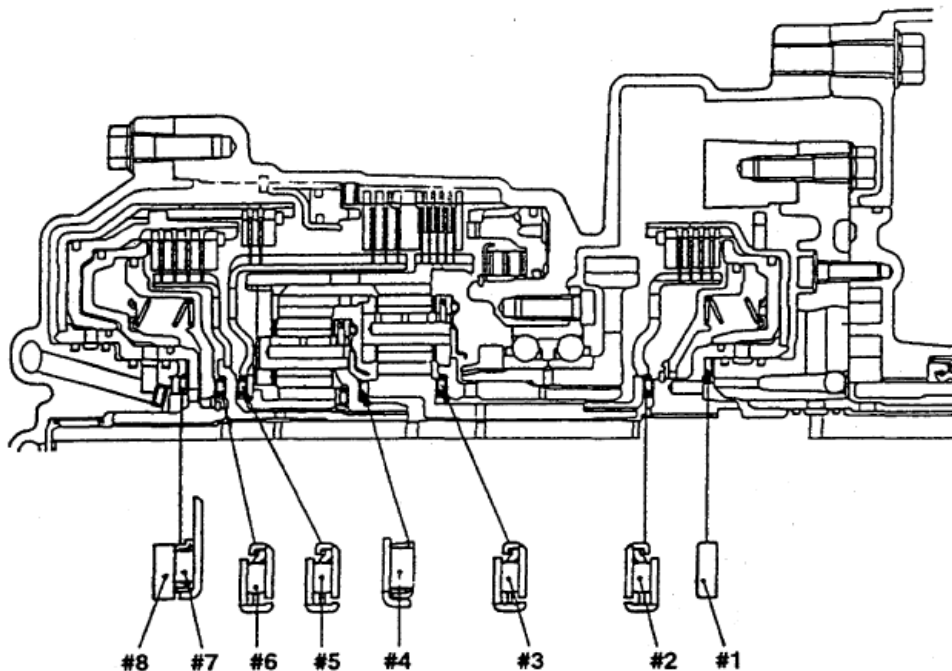


Fig. 7: Identifying Pressure Plate Thickness
Courtesy of HYUNDAI MOTOR CO.

<F4A42 Model>



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Fig. 8: Identifying Thrust Bearing, Thrust Races, & Thrust Washers (F4A42 Model)
Courtesy of HYUNDAI MOTOR CO.

IDENTIFICATION OF THRUST BEARING, THRUST RACES, AND THRUST WASHERS

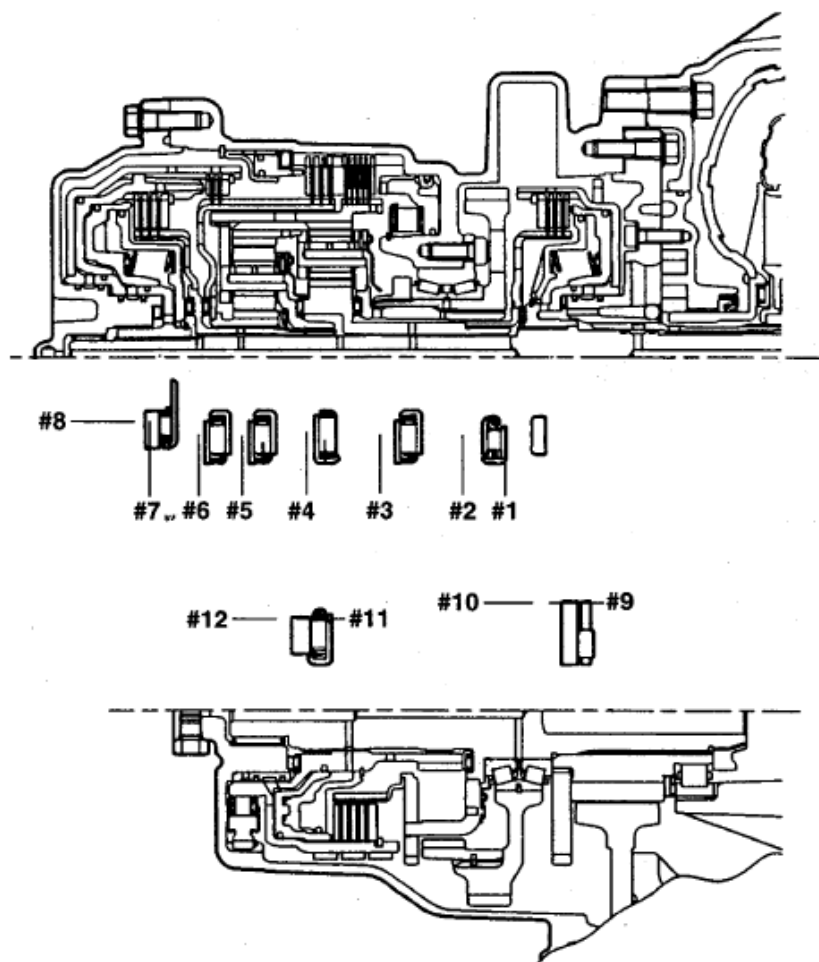
THRUST BEARING/RACE/WASHER THICKNESS & INNER/OUTER DIAMETER SPECIFICATIONS (F4A42 MODEL)

Outer Diameter (mm)	Inner Diameter (mm)	Thickness (mm)	Symbol
59	47	1.8	#1

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59	47	2.0	#1
59	47	2.2	#1
59	47	2.4	#1
59	47	2.6	#1
59	47	2.8	#1
49	36	3.6	#2
49	36	3.6	#3
45.3	31	3.3	#4
49	36	3.6	#5
49	36	3.6	#6
59	37	2.8	#7
48.9	37	1.6	#8
48.9	37	1.7	#8
48.9	37	1.8	#8
48.9	37	1.9	#8
48.9	37	2.0	#8
48.9	37	2.1	#8
48.9	37	2.2	#8
48.9	37	2.3	#8
48.9	37	2.4	#8
48.9	37	2.5	#8
48.9	37	2.6	#8
-	-	-	-



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Fig. 9: Identifying Thrust Bearing, Thrust Races, & Thrust Washers (F5A51 Model)
 Courtesy of HYUNDAI MOTOR CO.

IDENTIFICATION OF THRUST BEARING, THRUST RACES, AND THRUST WASHERS

THRUST BEARING/RACE/WASHER THICKNESS & INNER/OUTER DIAMETER SPECIFICATIONS (F5A51 MODEL)

Outer Diameter (mm)	Inner Diameter (mm)	Thickness (mm)	Symbol
59	47	1.8	#1
		2.0	
		2.2	
		2.4	
		2.6	
		2.8	
49	36	3.6	#2
57	38.5	4.12	#3
54.4	38.5	3.3	#4
57	38.5	4.12	#5

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1999-2008 AUTOMATIC TRANSMISSION Overhaul - F4A42 & F5A51 - Sonata, XG300, & XG350

57	38.5	4.12	#6
59	37	2.8	#7
48.9	37	1.6	#8
		1.7	
48.9	37	1.8	#8
		1.9	
		2.0	
		2.1	
		2.2	
		2.3	
		2.4	
		2.5	
		2.6	
78.5	60	2.5	#9
80	60	2.5	#10
58	40.7	4.2	#11
54.7	43	3.0	#12

UNDERDRIVE SUN GEAR END PLAY ADJUSTMENT

Install the used thrust race #8, and then the rear cover. Measure end play of the underdrive sun gear. Move the underdrive sun gear up and down to measure the end play. Replace thrust race #8 to adjust the play to the standard value.

Standard value : 0.25 - 0.45 mm

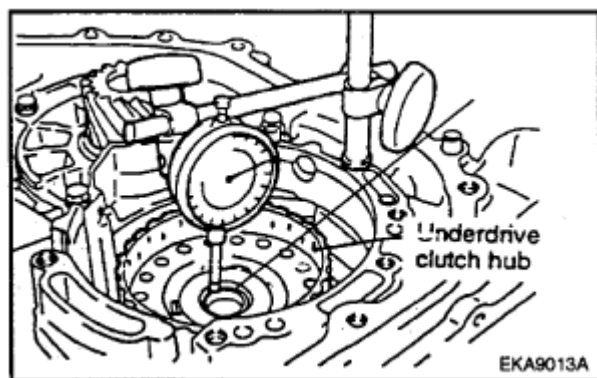


Fig. 10: Measuring End Play Of Underdrive Sun Gear
Courtesy of HYUNDAI MOTOR CO.

NOTE: Installing the underdrive clutch hub makes it easy to measure the end play of the underdrive sun gear.

DIFFERENTIAL CASE PRELOAD ADJUSTMENT

Place a solder (approx. 10 mm in length, 3 mm in diameter) on the torque converter housing as shown in **Fig. 11**.

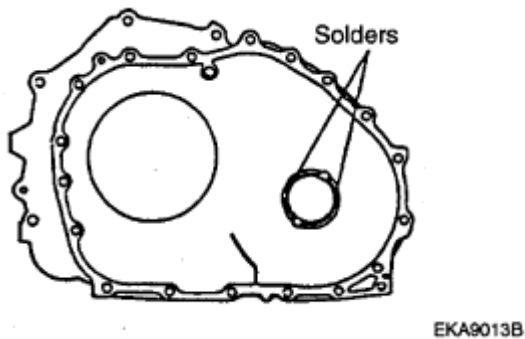


Fig. 11: Identifying Solder Location On Torque Converter Housing
Courtesy of HYUNDAI MOTOR CO.

Install the torque converter housing to the transmission case without applying sealant. Tighten its mounting bolts to the specified torque. Loosen the bolts, and remove the solder.

Use a micrometer to measure the thickness (T) of the pressed solder. Select a spare which thickness is within the following value.

Standard value : (T+0.045 mm) to (T+0.105 mm)

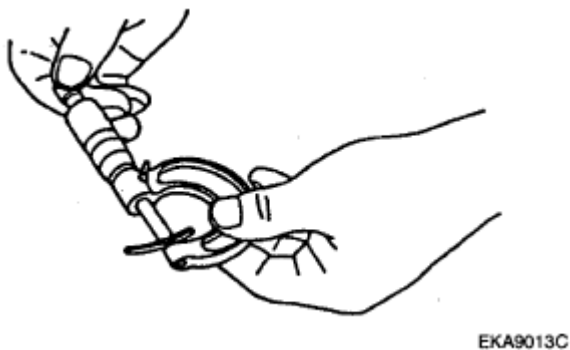


Fig. 12: Measuring Thickness Of Pressed Solder
Courtesy of HYUNDAI MOTOR CO.

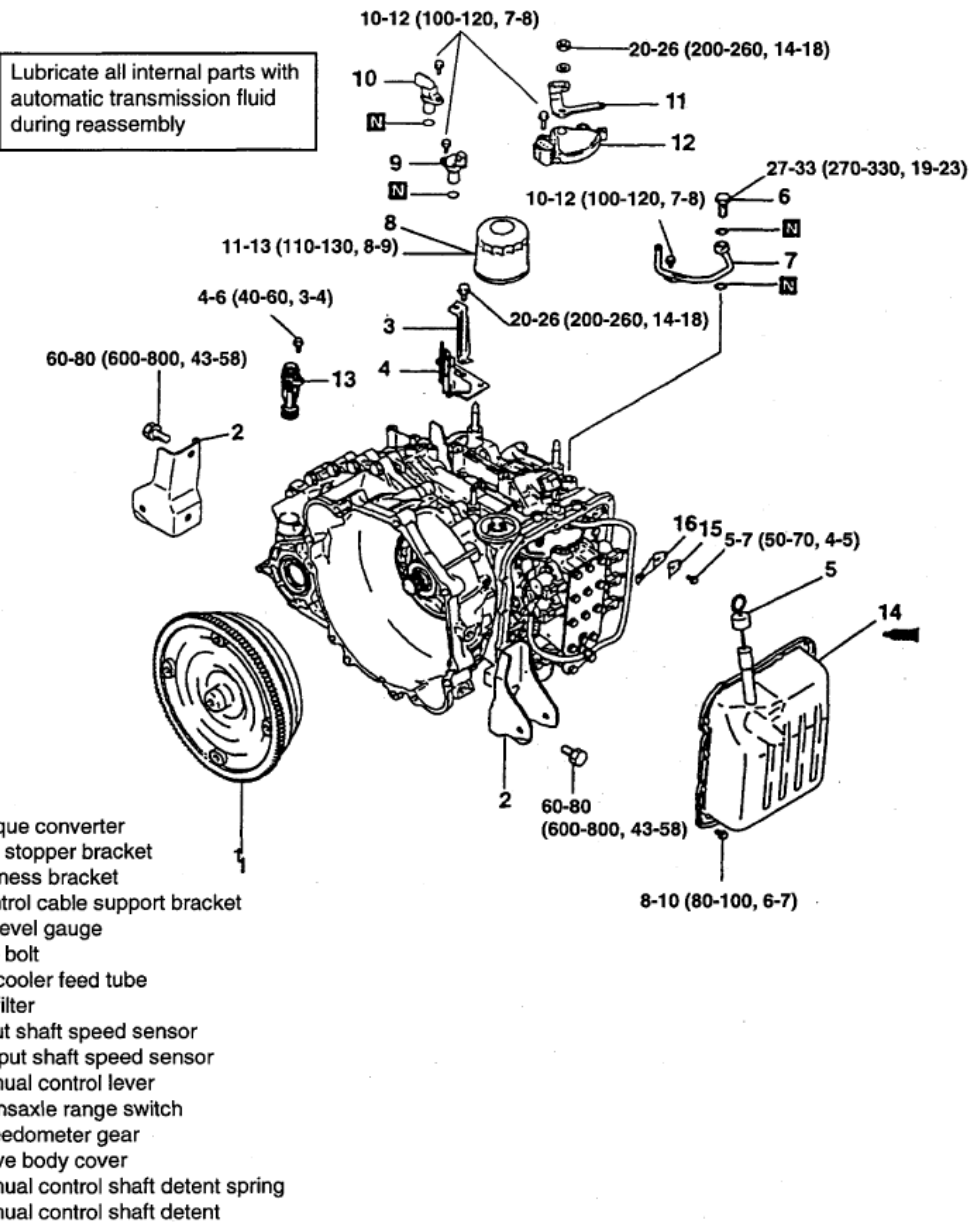
AUTOMATIC TRANSAXLE

AUTOMATIC TRANSAXLE

COMPONENTS

1999 Hyundai Sonata

1999-2008 AUTOMATIC TRANSMISSION Overhaul - F4A42 & F5A51 - Sonata, XG300, & XG350



TORQUE : Nm (kg-cm, lb-ft)

EKA9014A

Fig. 13: Identifying Automatic Transaxle Components With Torque Specifications
Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

- CAUTION:**
1. Because the automatic transaxle is manufactured from high-precision parts, sufficient care must be taken not to scratch or damage these parts during disassembly and reassembly.
 2. The working area should be covered with a rubber mat to keep it clean at all times.

3. Do not wear any cloth gloves and do not use any rags during disassembly. Use nylon cloth or paper towels if you need to use something.
4. Parts which have been disassembled should all be cleaned. Metal parts can be cleaned with normal detergent but they should be dried completely using compressed air.
5. Clutch discs, plastic thrust plates and rubber parts should be cleaned with automatic transmission fluid (ATF) so that they do not become dirty.
6. If the transmission body has been damaged, disassemble and clean the cooler system also.

1. Remove the torque converter.
2. Measure the input shaft end play.
3. Remove the left and right roll stopper brackets.
4. Remove the wiring harness bracket.
5. Remove the control cable support bracket.

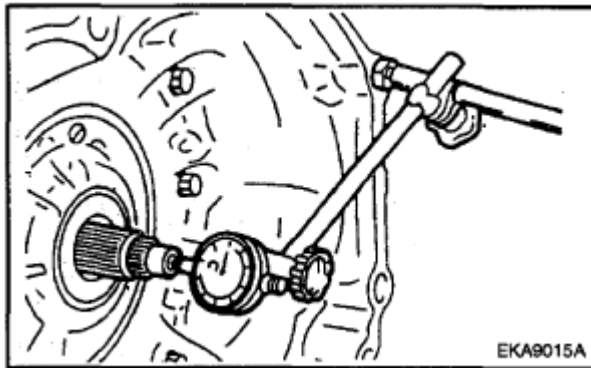


Fig. 14: Measuring Input Shaft End Play
Courtesy of HYUNDAI MOTOR CO.

6. Remove the dipstick.
7. Remove the oil cooler feed tube, gasket, and eye bolt.
8. Remove the oil filter and gasket.
9. Remove the input shaft speed sensor and the output shaft speed sensor.

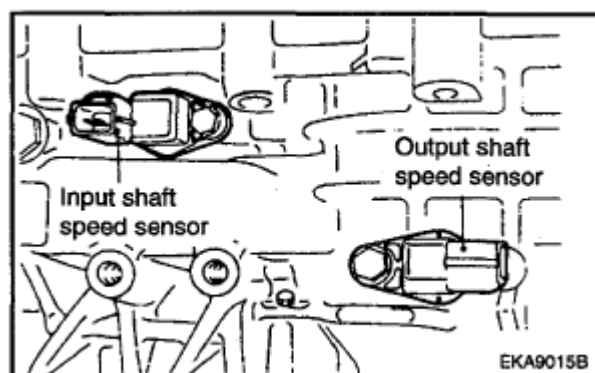


Fig. 15: Identifying Input & Output Shaft Speed Sensors
Courtesy of HYUNDAI MOTOR CO.

10. Remove the manual control lever, then remove the transaxle range switch.

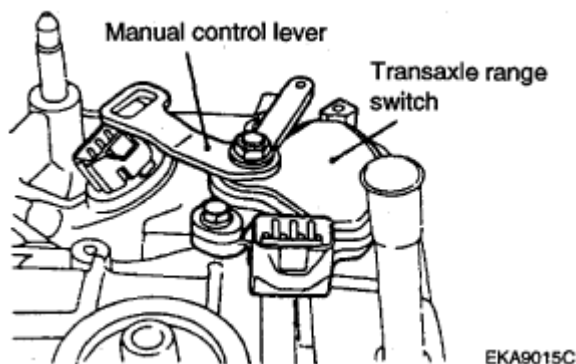


Fig. 16: Identifying Manual Control Lever & Transaxle Range Switch
Courtesy of HYUNDAI MOTOR CO.

11. Remove the speedometer gear.

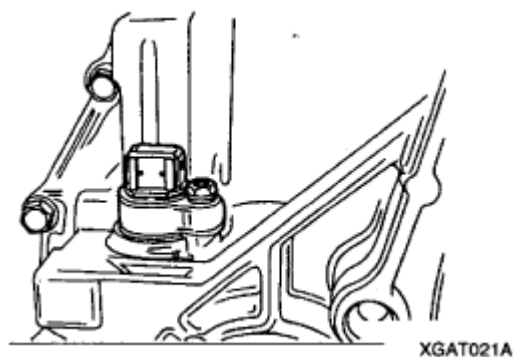
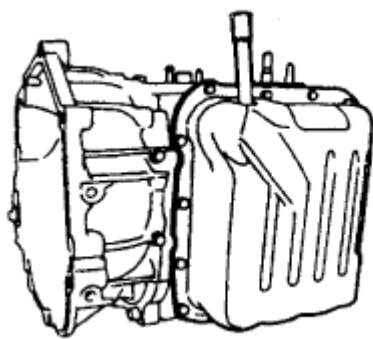


Fig. 17: Identifying Speedometer Gear
Courtesy of HYUNDAI MOTOR CO.

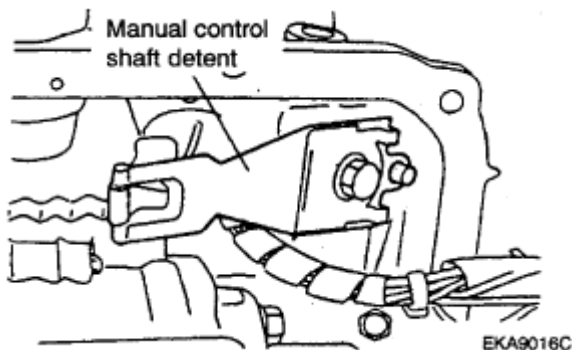
12. Remove the valve body cover.



EKA9016B

Fig. 18: Identifying Valve Body Cover
Courtesy of HYUNDAI MOTOR CO.

13. Remove the manual control shaft detent.

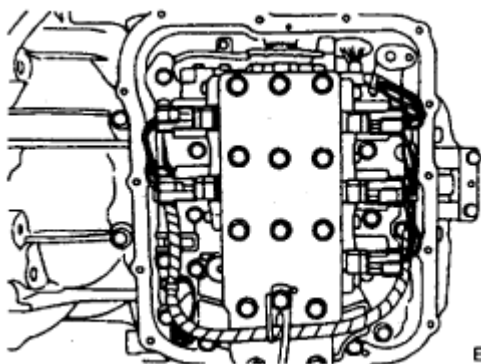


EKA9016C

Fig. 19: Identifying Manual Control Shaft Detent
Courtesy of HYUNDAI MOTOR CO.

14. Disconnect the harness connectors of the valve body.

CAUTION: To prevent the transaxle component from damaging make sure that the manual control lever and the park/neutral switch have been removed before attempting to remove the valve body.



EKA9016D

Fig. 20: Identifying Harness Connectors

Courtesy of HYUNDAI MOTOR CO.

NOTE: The valve body mounting bolts have different lengths. Note the locations of the each bolt to aid in assembly.

15. Remove the valve body mounting bolts. Do not remove the bolts shown in **Fig. 21** at this time.
16. Remove the fluid temperature sensor.

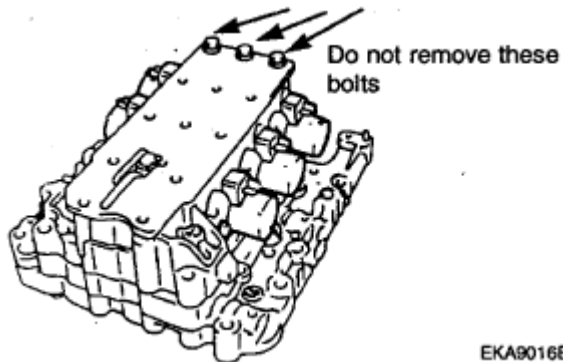


Fig. 21: Identifying Valve Body Mounting Bolts
Courtesy of HYUNDAI MOTOR CO.

17. Remove the valve body, gasket, and the 2 steel balls.

NOTE: Make sure not to lose the 2 steel balls.

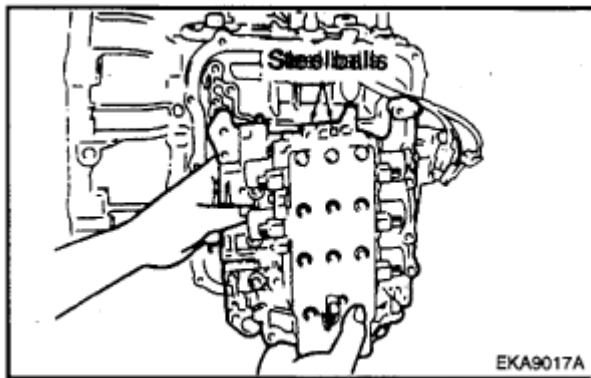


Fig. 22: Removing/Installing Valve Body, Gasket, & Steel Balls
Courtesy of HYUNDAI MOTOR CO.

18. Remove the solenoid valve wiring harness snap ring.
19. Remove the solenoid valve harness.

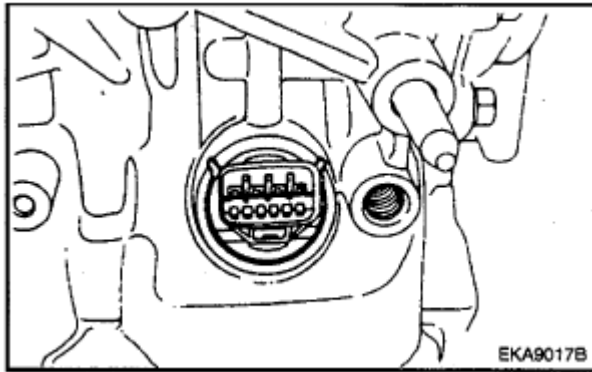


Fig. 23: Identifying Solenoid Valve Harness
Courtesy of HYUNDAI MOTOR CO.

20. Remove the strainer.
21. Remove the second brake retainer oil seal.

CAUTION: The second brake retainer oil seal must be removed before removing the transaxle powertrain components from the case or damage to the seal will occur.

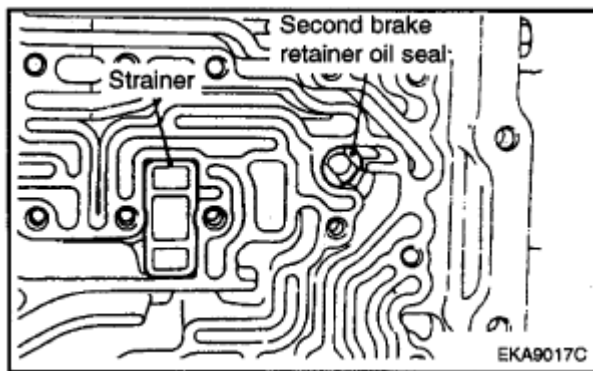


Fig. 24: Identifying Second Brake Retainer Oil Seal & Strainer
Courtesy of HYUNDAI MOTOR CO.

22. Remove the 4 accumulator pistons, the 4 large springs, and the 3 small springs.

ACCUMULATOR FUNCTION CHART

Number	Functional Name
1	Low-Reverse Brake
2	Underdrive Clutch
3	Second Brake
4	Overdrive Clutch

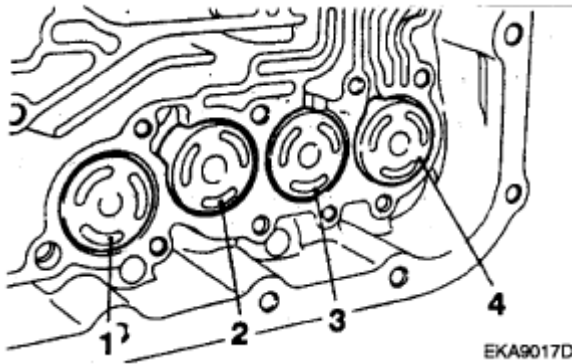


Fig. 25: Locating Accumulator Pistons, Large Springs, & Small Springs
Courtesy of HYUNDAI MOTOR CO.

23. Remove the manual control lever shaft pin (roller).
24. Remove the manual control lever shaft and the parking pawl rod.

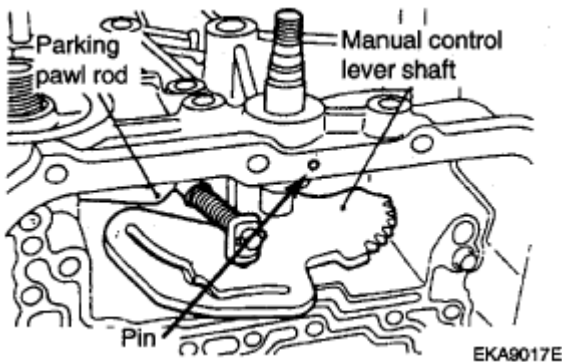


Fig. 26: Identifying Manual Control Lever Shaft & Parking Pawl Rod
Courtesy of HYUNDAI MOTOR CO.

25. After removing the snap ring, remove the reduction brake accumulator cover and the spring piston (F5A51 Model).

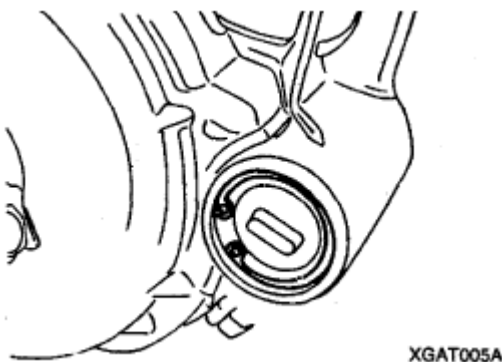


Fig. 27: Identifying Reduction Brake Accumulator Cover
Courtesy of HYUNDAI MOTOR CO.

26. Remove the torque converter housing and mounting bolts. Tap the housing off with a non-metallic hammer.

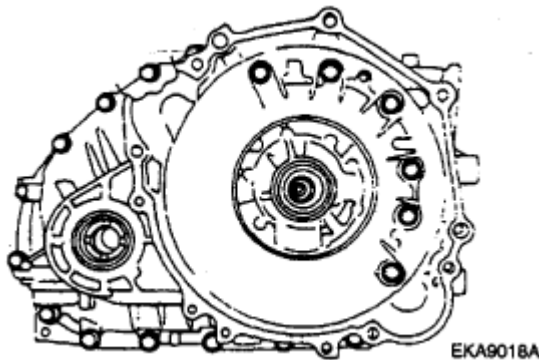


Fig. 28: Identifying Torque Converter Housing & Mounting Bolts
Courtesy of HYUNDAI MOTOR CO.

27. Remove the 2 O-rings from the case.

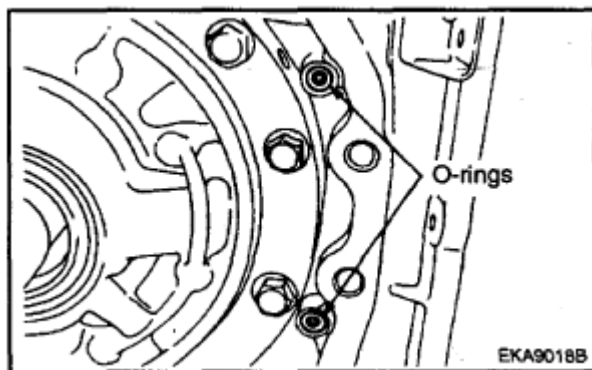


Fig. 29: Identifying O-Rings
Courtesy of HYUNDAI MOTOR CO.

28. Remove the differential.

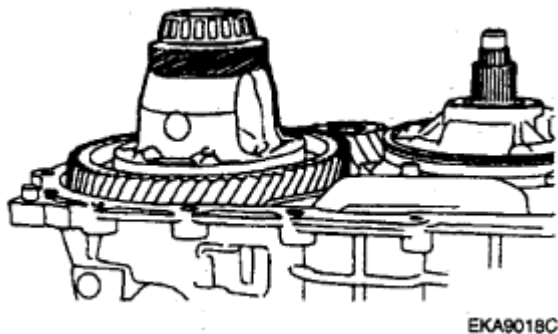


Fig. 30: Identifying Differential

Courtesy of HYUNDAI MOTOR CO.

29. Remove the main oil filter.

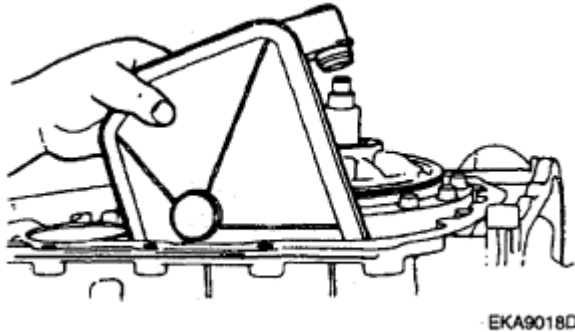


Fig. 31: Removing/Installing Main Oil Filter
Courtesy of HYUNDAI MOTOR CO.

30. Remove oil pump mounting bolts.

CAUTION: The oil pump is not serviceable, it must be replaced as a pump assembly. Do not disassemble the pump as improper alignment during assembly will cause pump failure and could cause damage to the transaxle.

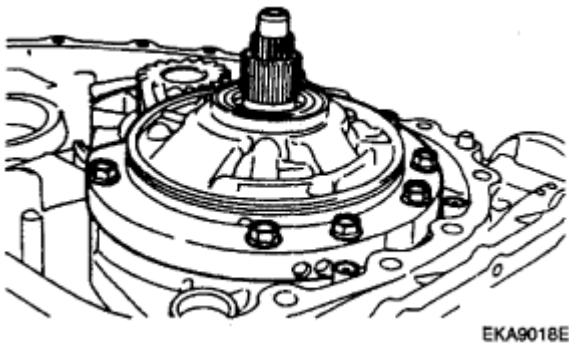


Fig. 32: Identifying Oil Pump Mounting Bolts
Courtesy of HYUNDAI MOTOR CO.

31. Install the special tool (09452-33100), as shown in **Fig. 33**.
32. Remove the oil pump by turning special tool screws clockwise.
33. Remove the oil pump gasket.

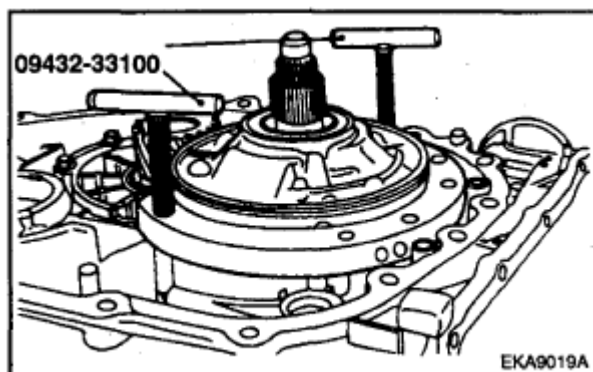


Fig. 33: Removing Oil Pump With Special Tool
Courtesy of HYUNDAI MOTOR CO.

34. Remove the oil pump and the pipe (F5A51 Model).

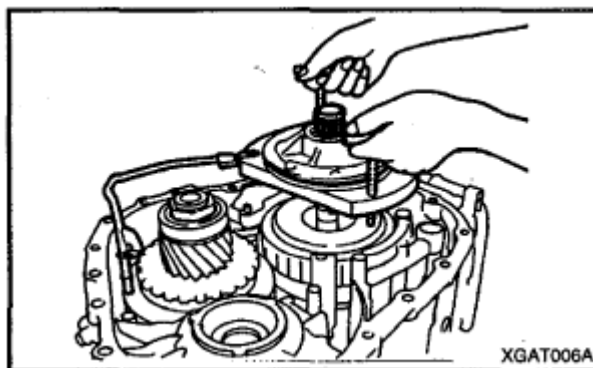


Fig. 34: Removing/Installing Oil Pump & Pipe
Courtesy of HYUNDAI MOTOR CO.

35. Remove thrust washer #1.

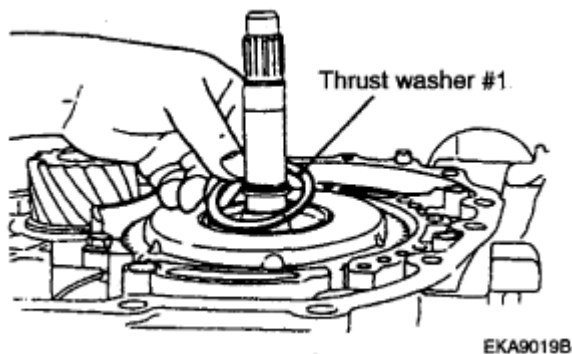


Fig. 35: Removing/Installing Thrust Washer
Courtesy of HYUNDAI MOTOR CO.

36. Grasp the input shaft, then pull out the underdrive clutch and input shaft as an assembly.

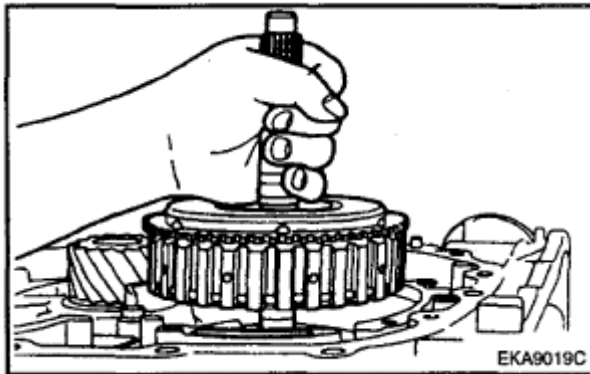


Fig. 36: Pulling Underdrive Clutch
Courtesy of HYUNDAI MOTOR CO.

37. Remove thrust bearing #2.

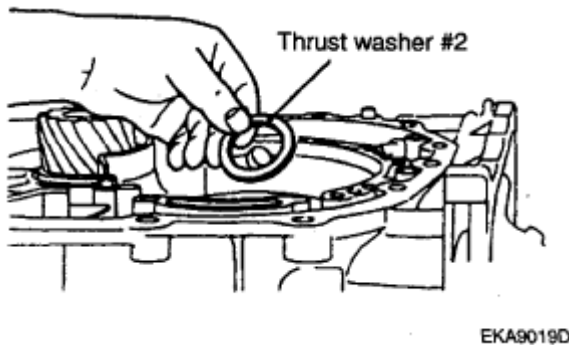


Fig. 37: Removing/Installing Thrust Bearing #2
Courtesy of HYUNDAI MOTOR CO.

38. Remove the underdrive clutch hub.

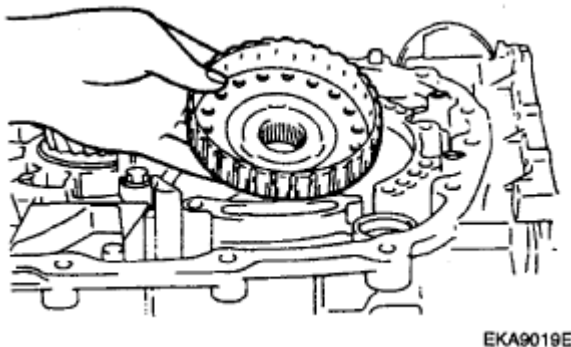


Fig. 38: Removing/Installing Underdrive Clutch Hub
Courtesy of HYUNDAI MOTOR CO.

39. Remove the direct planetary gear assembly (F5A51 Model).

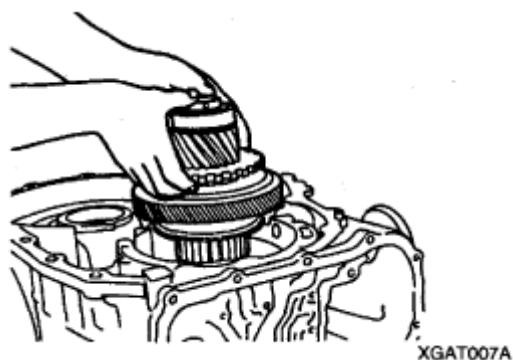


Fig. 39: Removing/Installing Direct Planetary Gear Assembly
Courtesy of HYUNDAI MOTOR CO.

40. Remove the direct clutch (F5A51 Model).

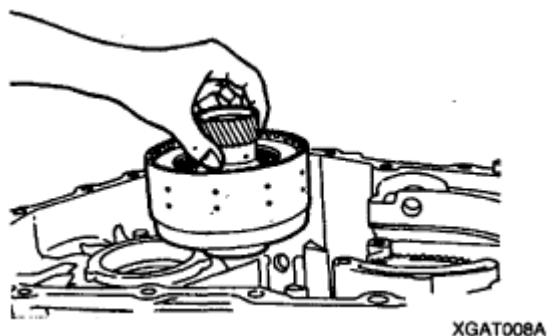


Fig. 40: Removing/Installing Direct Clutch
Courtesy of HYUNDAI MOTOR CO.

41. Remove the reduction brake band (F5A51 Model).

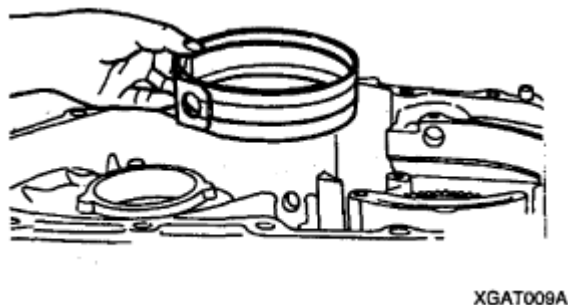
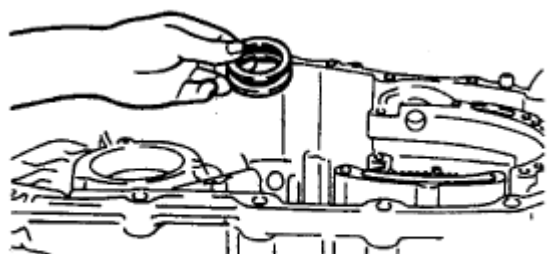


Fig. 41: Removing/Installing Reduction Brake Band
Courtesy of HYUNDAI MOTOR CO.

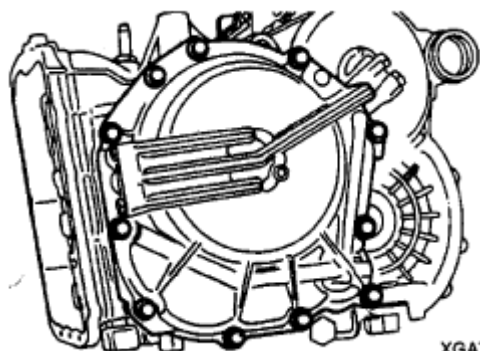
42. Remove the thrust bearing #11 and the thrust race #12 (F5A51 Model).



XGAT010A

Fig. 42: Removing/Installing Thrust Bearing & Race
Courtesy of HYUNDAI MOTOR CO.

43. Remove the rear cover (F5A51 Model).
44. Remove the thrust race #8 (F5A51 Model).
45. Remove the seal ring (F5A51 Model).
46. Remove the input shaft rear bearing (F5A51 Model).



XGAT011A

Fig. 43: Identifying Rear Cover Bolts
Courtesy of HYUNDAI MOTOR CO.

47. Remove the rear cover and mounting bolts.
48. Remove the thrust race #8.
49. Remove the 4 seal rings.

NOTE: Do not remove the input shaft rear bearing unless directed to do so by the instructor.
Once this bearing has been removed, it **MUST** be replaced.

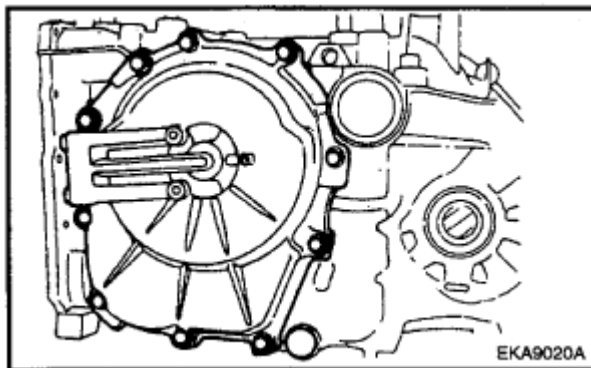


Fig. 44: Identifying Rear Cover & Mounting Bolts
Courtesy of HYUNDAI MOTOR CO.

50. Remove the 3 O-rings.

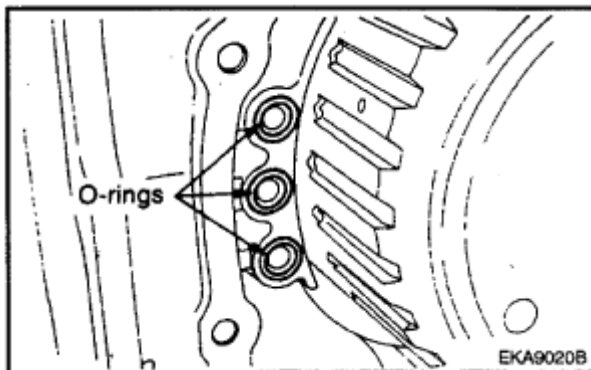


Fig. 45: Identifying O-Rings
Courtesy of HYUNDAI MOTOR CO.

51. Remove thrust bearing #7.
52. Remove the reverse and overdrive clutch.

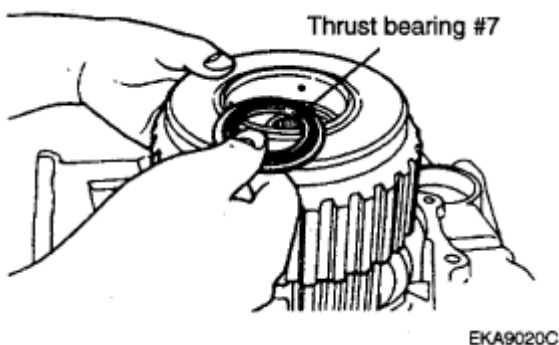


Fig. 46: Removing/Installing Thrust Bearing #7
Courtesy of HYUNDAI MOTOR CO.

- 53. Remove thrust bearing #6.
- 54. Remove the overdrive clutch hub.

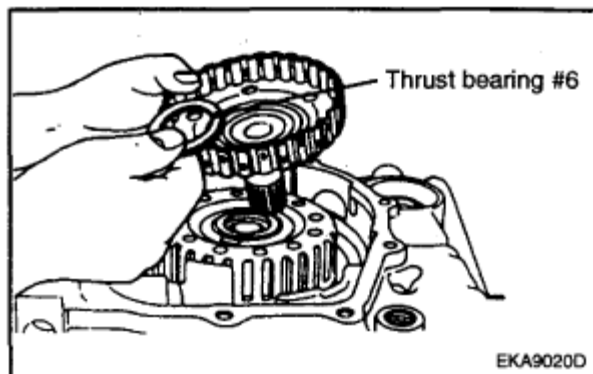


Fig. 47: Removing/Installing Thrust Bearing #6
Courtesy of HYUNDAI MOTOR CO.

- 55. Remove thrust bearing #5.

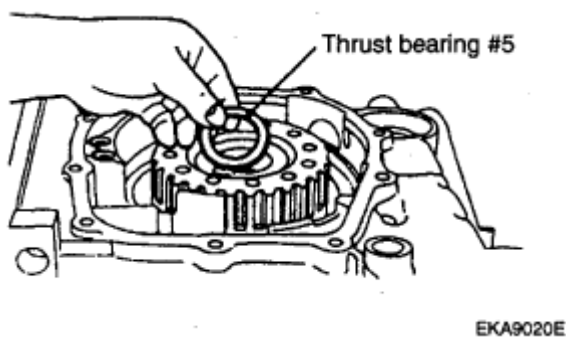


Fig. 48: Removing/Installing Thrust Bearing #5
Courtesy of HYUNDAI MOTOR CO.

- 56. Remove the planetary reverse sun gear.

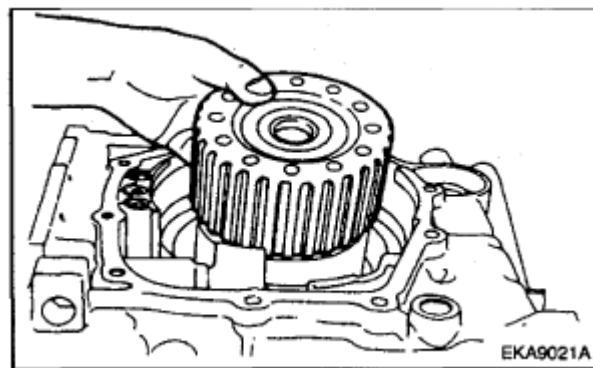


Fig. 49: Removing/Installing Planetary Reverse Sun Gear

Courtesy of HYUNDAI MOTOR CO.

57. Remove the second brake piston snap ring.

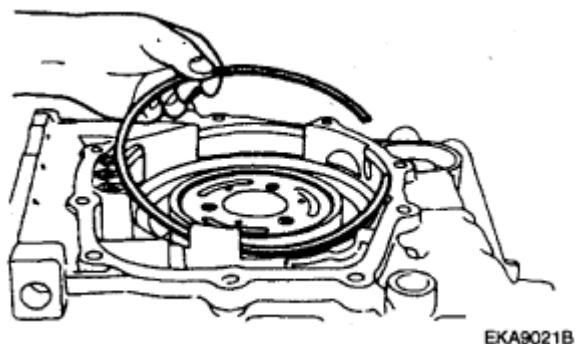


Fig. 50: Removing/Installing Second Brake Piston Snap Ring
Courtesy of HYUNDAI MOTOR CO.

58. Remove the second brake piston and return spring.

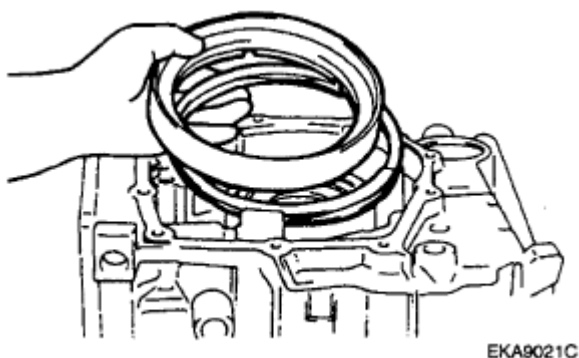


Fig. 51: Removing/Installing Second Brake Piston & Return Spring
Courtesy of HYUNDAI MOTOR CO.

59. Remove the second brake pressure plate.

BRAKE DISC & PLATE REFERENCE CHART

Model	Brake disc	Brake plate
F4A42	3EA	2EA
F5A51	4EA	3EA

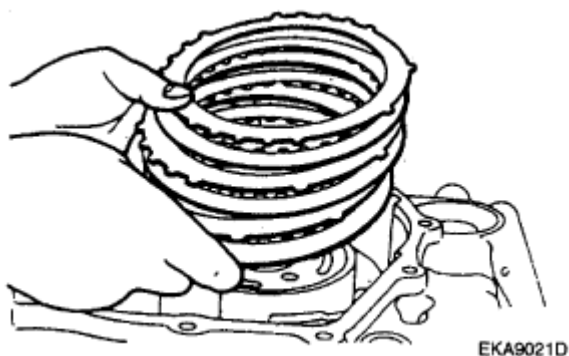


Fig. 52: Removing/Installing Second Brake Pressure Plate
Courtesy of HYUNDAI MOTOR CO.

60. Remove the overdrive planetary carrier.

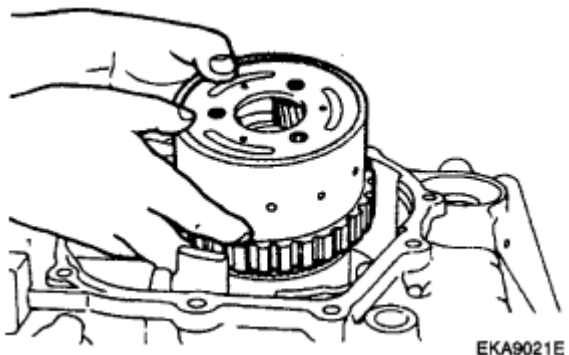


Fig. 53: Removing/Installing Overdrive Planetary Carrier
Courtesy of HYUNDAI MOTOR CO.

61. Remove thrust bearing #4.
62. Remove the output planetary carrier.

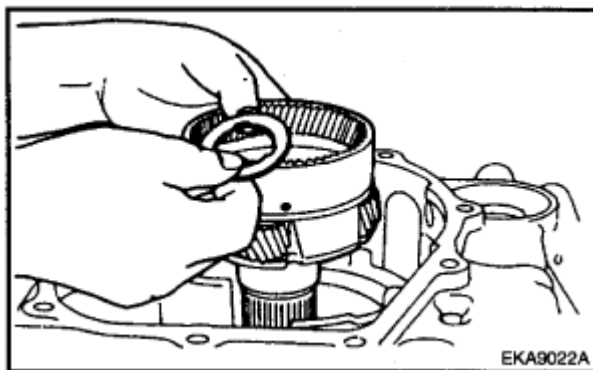


Fig. 54: Removing/Installing Output Planetary Carrier
Courtesy of HYUNDAI MOTOR CO.

- 63. Remove the underdrive sun gear.
- 64. Remove thrust bearing #3.

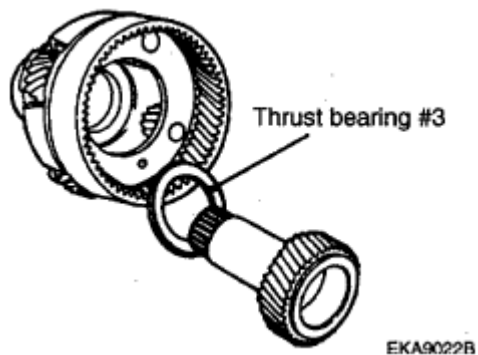


Fig. 55: Removing/Installing Thrust Bearing #3
Courtesy of HYUNDAI MOTOR CO.

- 65. Remove the low/reverse reaction plate snap ring.

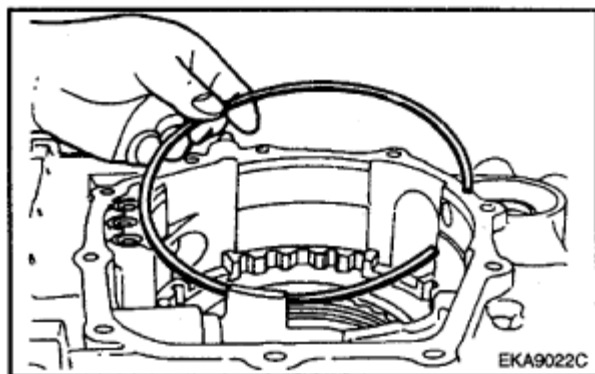


Fig. 56: Removing/Installing Low/Reverse Reaction Plate Snap Ring
Courtesy of HYUNDAI MOTOR CO.

- 66. Remove the low/reverse reaction plate and brake disc.

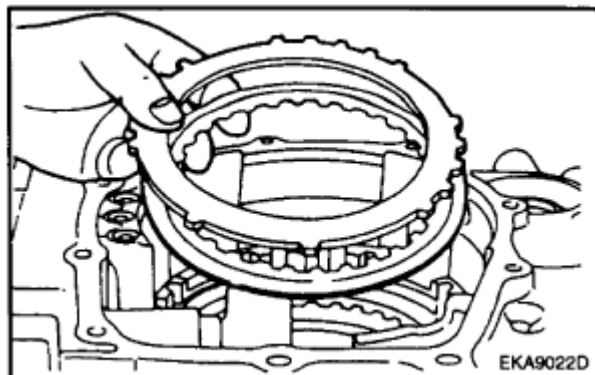


Fig. 57: Removing/Installing Low/Reverse Reaction Plate & Brake Disc
Courtesy of HYUNDAI MOTOR CO.

67. Remove the low/reverse brake snap ring.

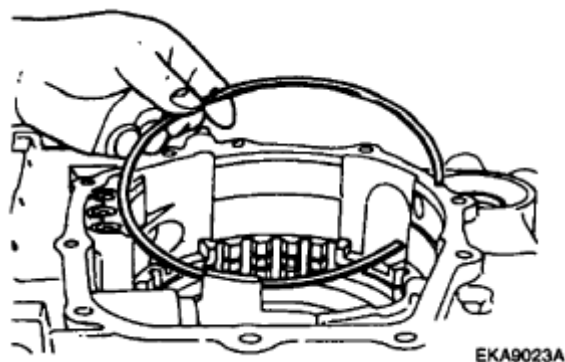


Fig. 58: Removing/Installing Low/Reverse Brake Snap Ring
Courtesy of HYUNDAI MOTOR CO.

68. Remove the low/reverse brake discs, brake plates, and brake pressure plate.

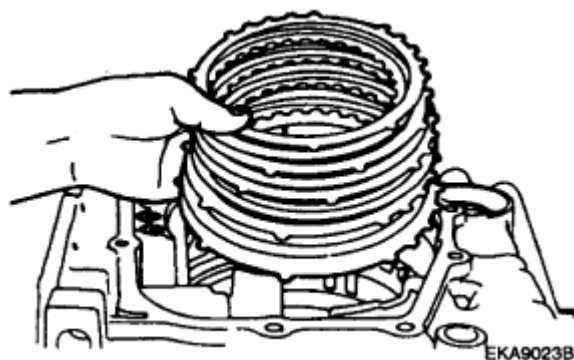


Fig. 59: Removing/Installing Low/Reverse Brake Discs, Brake Plates, & Brake Pressure Plate
Courtesy of HYUNDAI MOTOR CO.

69. Remove the wave spring.

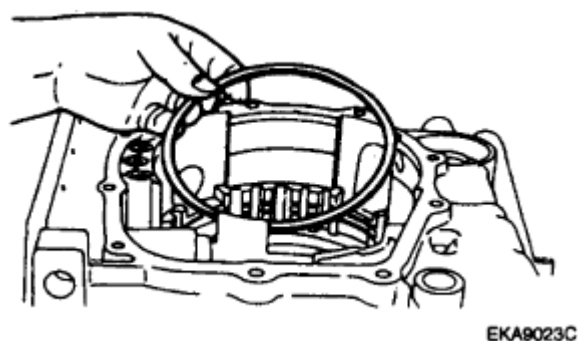


Fig. 60: Removing/Installing Wave Spring
Courtesy of HYUNDAI MOTOR CO.

70. Remove the parking pawl shaft.
71. Remove the spacer.
72. Remove the parking pawl spring. Note the orientation of the spring to aid in reassembly.

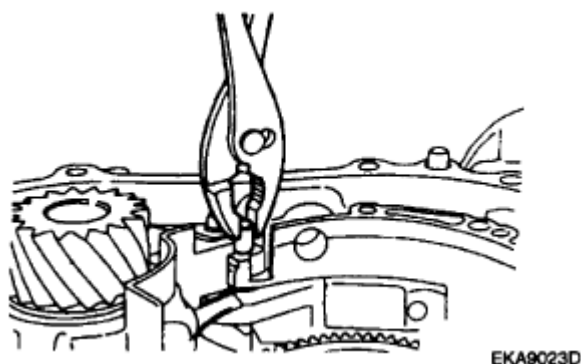


Fig. 61: Removing/Installing Parking Pawl Spring
Courtesy of HYUNDAI MOTOR CO.

73. Remove the 2 parking roller support shafts.
74. Remove the parking pawl case.
75. Remove the parking roller support.

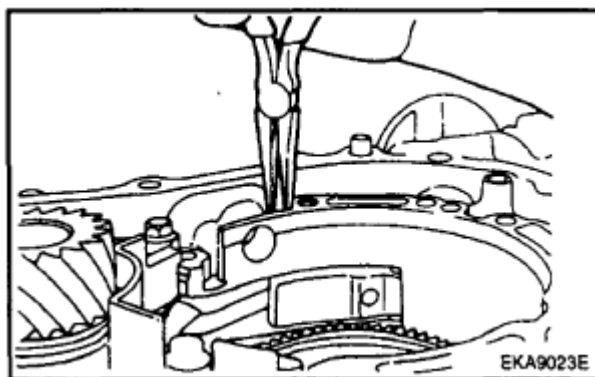


Fig. 62: Removing/Installing Parking Pawl Spring
Courtesy of HYUNDAI MOTOR CO.

76. Remove the snap ring.
77. Remove the spring retainer.
78. Remove the return spring.
79. Remove the low/reverse brake piston. Use compressed air directed into the valve body passage.

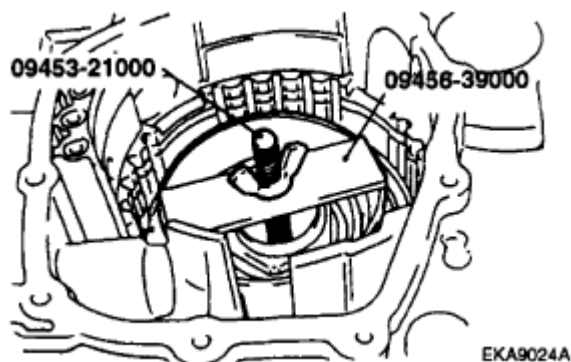


Fig. 63: Removing/Installing Low/Reverse Brake Piston
Courtesy of HYUNDAI MOTOR CO.

80. Remove the 4 transfer gear mounting bolts.

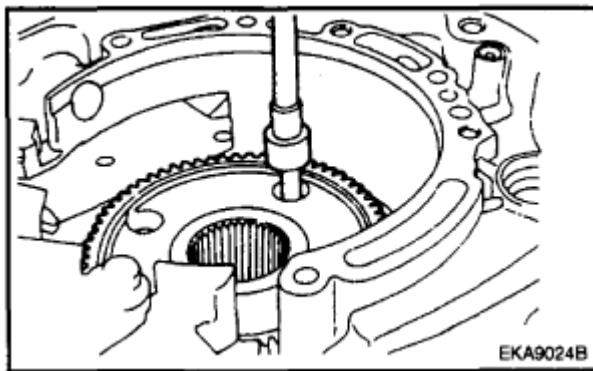


Fig. 64: Identifying Transfer Gear Mounting Bolts
Courtesy of HYUNDAI MOTOR CO.

81. Remove the transfer drive gear.

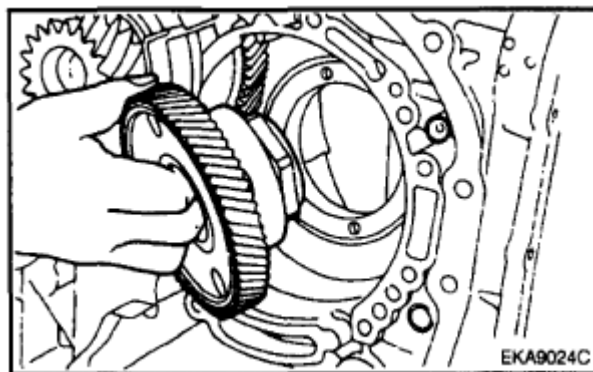


Fig. 65: Removing/Installing Transfer Drive Gear
Courtesy of HYUNDAI MOTOR CO.

82. Remove the plastic cap, if present.

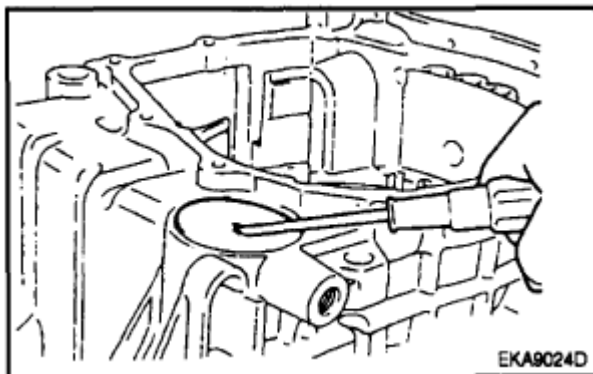


Fig. 66: Identifying Plastic Cap
Courtesy of HYUNDAI MOTOR CO.

83. Straighten the locking tab of the output shaft lock nut, if bent.

NOTE: The output shaft lock nut is left-hand thread.

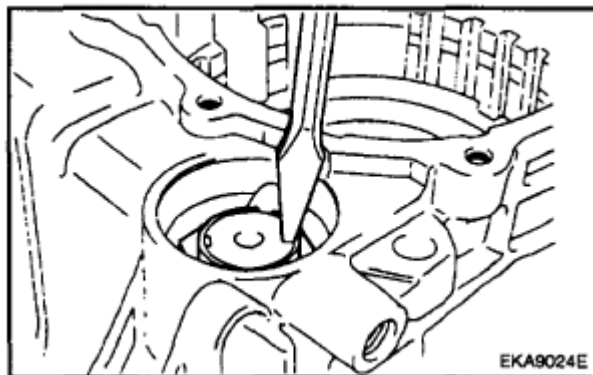


Fig. 67: Straightening Locking Tab Of Output Shaft Lock Nut (If Bent)
Courtesy of HYUNDAI MOTOR CO.

84. Remove the output shaft lock nut.

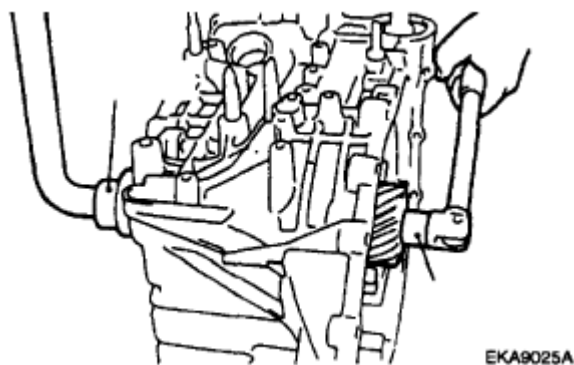


Fig. 68: Removing/Installing Output Shaft Lock Nut
Courtesy of HYUNDAI MOTOR CO.

85. Remove the output shaft bearing retainer mounting bolts.

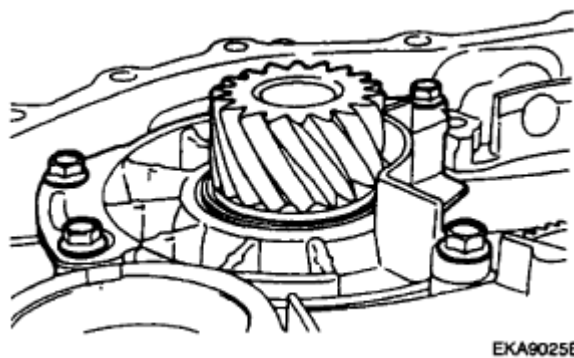


Fig. 69: Identifying Output Shaft Bearing Retainer Mounting Bolts
Courtesy of HYUNDAI MOTOR CO.

86. Tap out the output shaft, tapered roller bearing, and the collar from the back side.
87. Tap out the bearing outer race and spacer using a suitable driver.

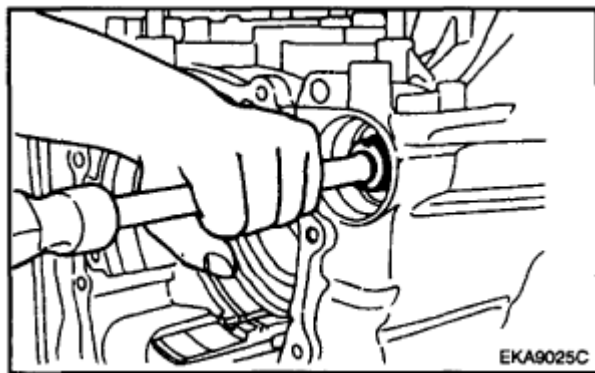


Fig. 70: Tapping Out Bearing Outer Race & Spacer Using Suitable Driver
Courtesy of HYUNDAI MOTOR CO.

88. Remove the snap ring.
89. Remove the differential bearing outer race and spacer from the torque converter housing.
90. Remove the differential bearing outer race from the transaxle case.

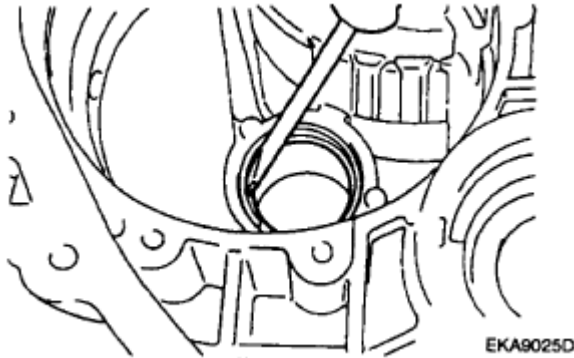


Fig. 71: Removing/Installing Differential Bearing Outer Race
Courtesy of HYUNDAI MOTOR CO.

91. Remove the one-way clutch (F5A51 Model).
92. Remove the seal ring (F5A51 Model).
93. Remove the needle bearing (F5A51 Model).

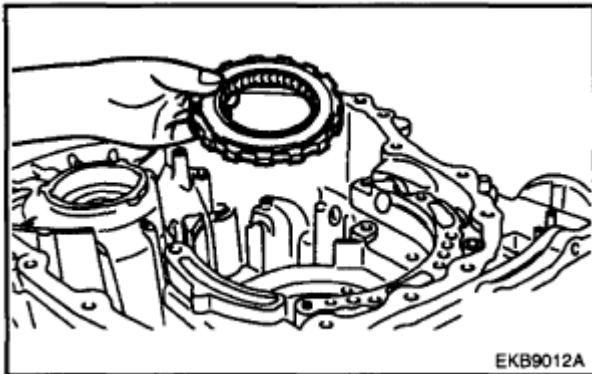


Fig. 72: Identifying One-way Clutch
Courtesy of HYUNDAI MOTOR CO.

REASSEMBLY

CAUTION:

- Never reuse the gasket, O-ring, oil seal, etc. Always replace with a new one when reassembling.
- Never use grease other than blue petrolatum jelly and white Vaseline.
- Apply ATF to friction components, rotating parts, and sliding parts before installation. Immerse a new clutch disc or brake disc in ATF for at least two hours before assembling them.

- **Never apply sealant or adhesive to gaskets.**
- **When replacing a bushing, replace the assembly which it belongs to.**
- **Never use any cloth gloves or any rags during reassembly. Use nylon cloth or paper towels if you need to use something.**

1. Tap the differential bearing outer race into the transaxle case using special tools (09500-11000 and 09532-11500).

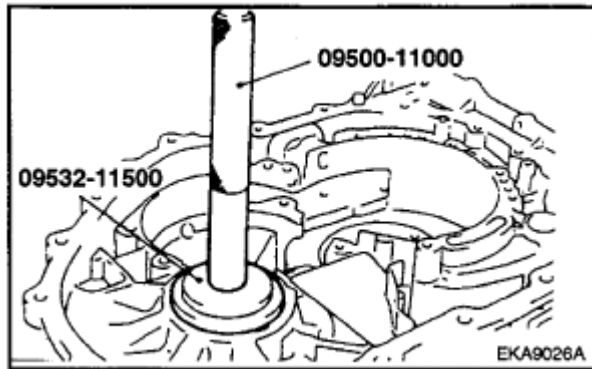


Fig. 73: Tapping Differential Bearing Outer Race Into Transaxle Case
Courtesy of HYUNDAI MOTOR CO.

2. Tap the output shaft bearing outer race into the transaxle case using special tool (09500-11000).
3. Install the spacer and the snap ring.

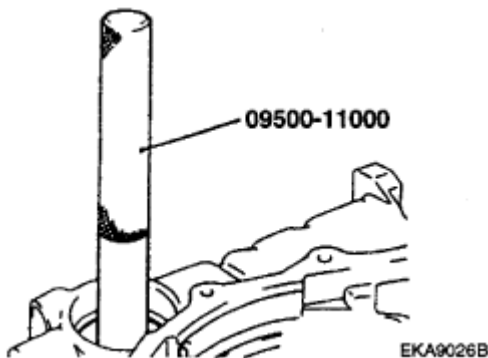


Fig. 74: Tapping Output Shaft Bearing Outer Race Into Transaxle Case
Courtesy of HYUNDAI MOTOR CO.

4. Install the low-reverse brake piston, return spring, and spring retainer.
5. Install the snap ring using special tools (09453-21000). To be sure that you have the correct snap ring, measure the thickness and compare it to the **IDENTIFICATION & THICKNESS SPECIFICATIONS** chart.

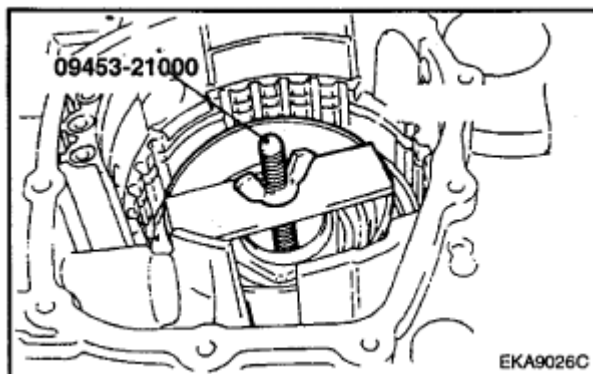


Fig. 75: Removing/Installing Snap Ring
Courtesy of HYUNDAI MOTOR CO.

6. Install the wave spring.

NOTE: In steps 7 through 9, you will determine the actual clearance between the low-reverse brake discs and plates when the clutch is released.

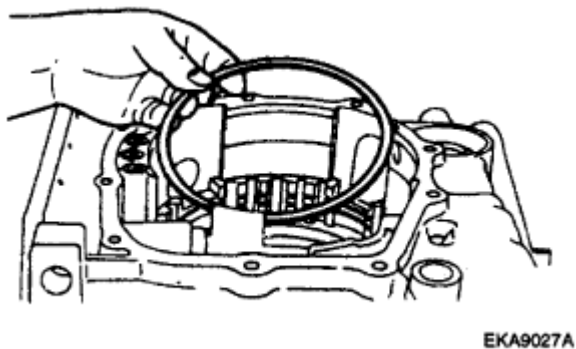


Fig. 76: Removing/Installing Wave Spring
Courtesy of HYUNDAI MOTOR CO.

7. Replace the pressure plate of the low-reverse brake with special tool, then install the brake discs, brake plates and the snap ring.

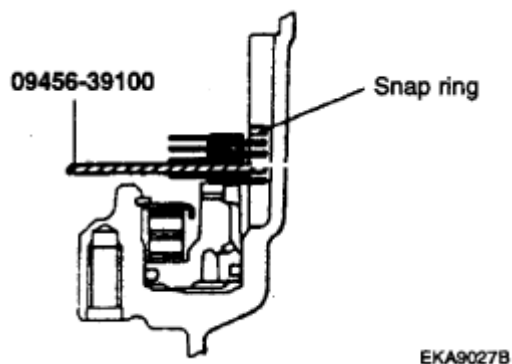


Fig. 77: Identifying Snap Ring & Special Tool
Courtesy of HYUNDAI MOTOR CO.

8. Install the low and reverse reaction plate and the old snap ring.
9. With a dial indicator installed, move the special tool up and down to measure the end play.

Standard Value:

0-0.16 mm (0-0.0063 in.)

If the end play is incorrect, measure the old snap ring, then select the proper snap ring from the chart shown in **IDENTIFICATION & THICKNESS SPECIFICATIONS** and recheck the clearance.

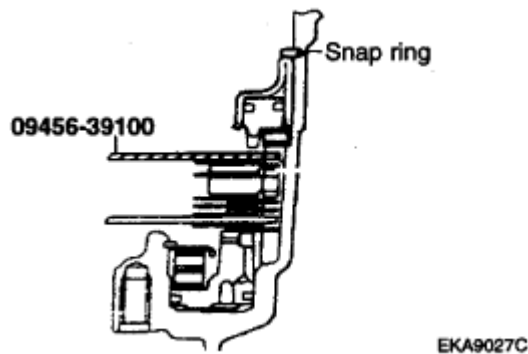


Fig. 78: Identifying Snap Ring & Special Tool
Courtesy of HYUNDAI MOTOR CO.

10. Remove the special tool.

NOTE: In steps 11 through 16, you will determine the actual clearance between the second brake discs and plates when the clutch is released.

11. Install the 3 second brake discs and 2 plates.
12. Install the second brake return spring, second brake piston, and snap ring.

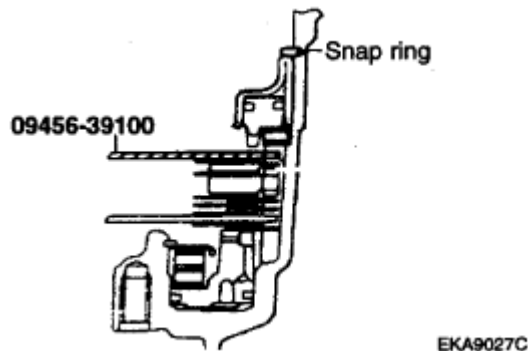


Fig. 79: Identifying Snap Ring & Special Tool

Courtesy of HYUNDAI MOTOR CO.

13. Install a dial indicator as shown in **Fig. 80**.
14. Move up and down, while observing the end play.
15. To determine the proper thickness of the second brake pressure plate, use this formula and record your answer. (Dial indicator reading + S.S.T. thickness - 1.25 mm) to (Dial indicator reading + S.S.T. thickness - 0.79 mm) = _____

Standard value

0.79-1.25 mm (0.0311-0.0492 in.); F4A42 Model

1.09-1.55 mm (0.0429-0.0610 in.); F5A51 Model

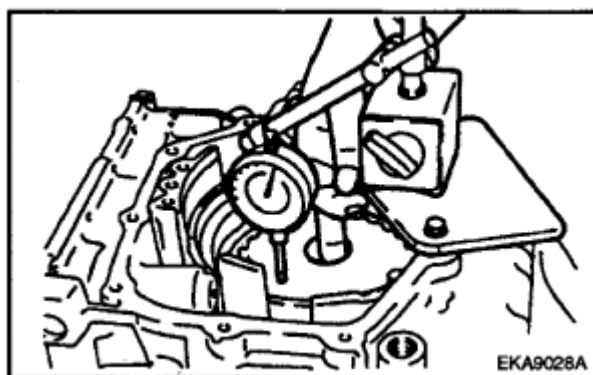


Fig. 80: Determining Proper Thickness Of Second Brake Pressure Plate
Courtesy of HYUNDAI MOTOR CO.

16. If the standard value is incorrect, select a pressure plate of the proper thickness from the **IDENTIFICATION & THICKNESS SPECIFICATIONS** chart and recheck the clearance.

NOTE: In steps 18 through 21, you will determine the actual clearance between the low-reverse brake discs and plates when the clutch is released.

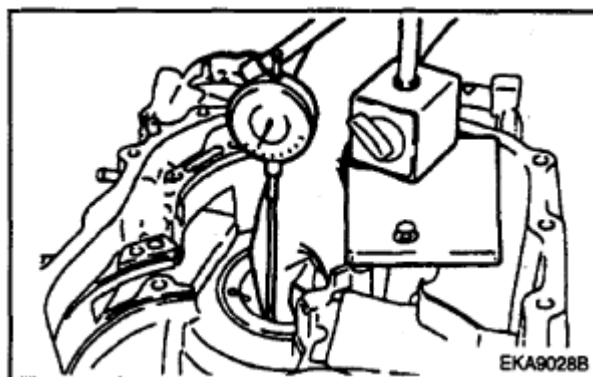


Fig. 81: Checking Clearance Of Pressure Plate
Courtesy of HYUNDAI MOTOR CO.

17. Install the special tool in place of the low/reverse brake pressure plate.
18. Install the 5 brake discs, 4 brake plates and snap ring.
19. Turn the transaxle upside down, install a dial indicator, as shown in **Fig. 82**.
20. Move the special tool up and down while observing the end play.
21. To determine the proper thickness of the low/reverse brake pressure plate, use this formula and record your answer; (Dial indicator reading + S.S.T thickness -1.81 mm) to (Dial indicator reading + S.S.T. thickness -1.35 mm) = _____

Standard Value

1.35-1.81 mm (0.0531-0.0713 in.); F4A42

1.62-2.11 mm (0.0637-0.0831 in.); F5A51

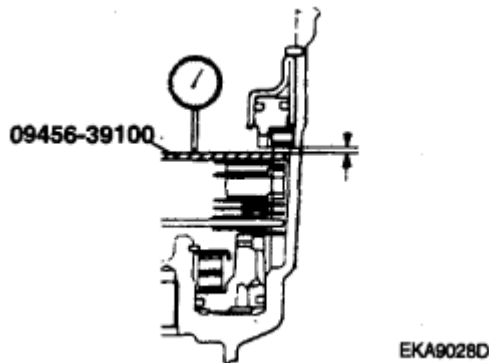


Fig. 82: Determining Proper Thickness Of Low/Reverse Brake Pressure Plate
Courtesy of HYUNDAI MOTOR CO.

22. If the standard value is incorrect, select a pressure plate of the proper thickness from **IDENTIFICATION & THICKNESS SPECIFICATIONS** chart and recheck the clearance.
23. Remove the special tool.
24. Install the needle bearing (F5A51 Model).
25. Install the seal rings (2EA) (F5A51 Model).

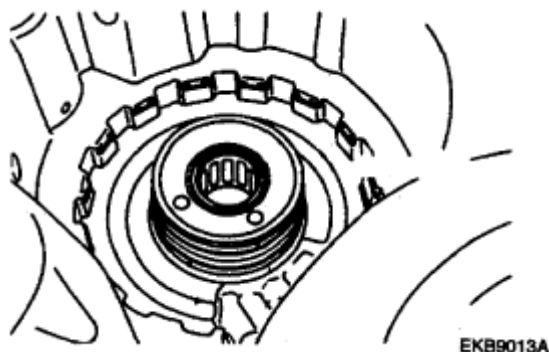


Fig. 83: Identifying Needle Bearing
Courtesy of HYUNDAI MOTOR CO.

26. Install the one-way clutch (F5A51 Model).

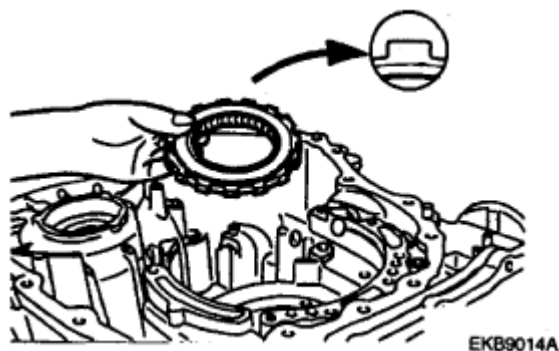


Fig. 84: Identifying One-way Clutch
Courtesy of HYUNDAI MOTOR CO.

27. Install the output shaft.
28. Install the output bearing retainer mounting bolts. Tighten the bolts to 23 Nm (17 lbs.ft) of torque.

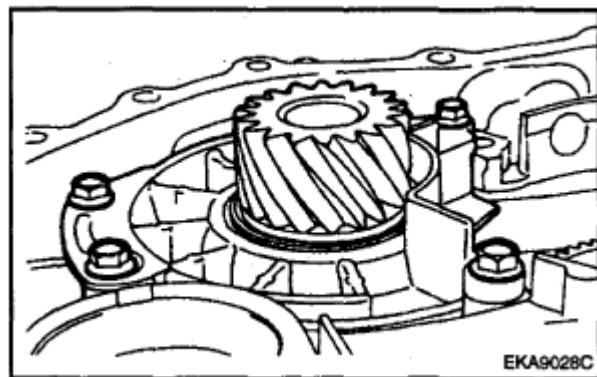


Fig. 85: Identifying Output Bearing Retainer Mounting Bolts
Courtesy of HYUNDAI MOTOR CO.

29. Install the output shaft collar and tapered roller bearing using special tool (09455-33200).

NOTE: The output shaft lock nut is left-hand thread.

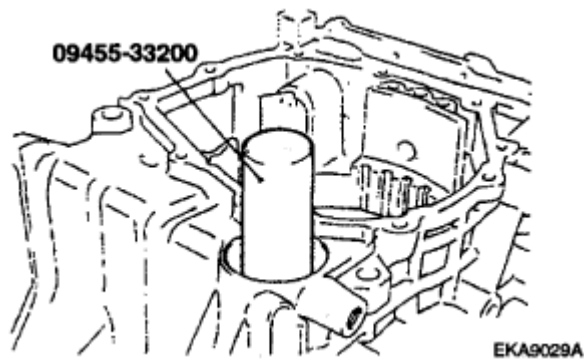


Fig. 86: Installing Output Shaft Collar & Tapered Roller Bearing
Courtesy of HYUNDAI MOTOR CO.

30. Apply ATF and install the old lock nut and tighten to 167 Nm (123 lbs.ft). Loosen the nut 1 full turn, then re-tighten to specifications. Do not stake the lock nut unless instructed to do so by the instructor.

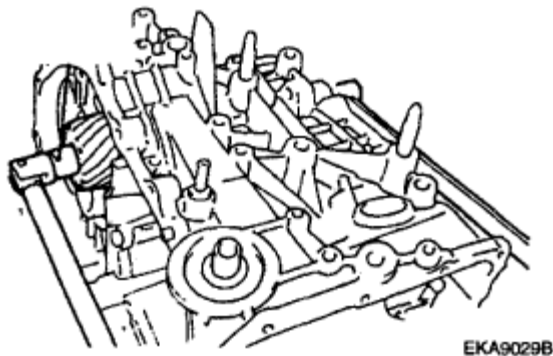


Fig. 87: Installing Old Lock Nut
Courtesy of HYUNDAI MOTOR CO.

31. Install a dial indicator as shown in **Fig. 88**.
32. Move the output shaft in and out to measure the end lay.

Standard value

0.01-0.09 mm (0.0004-0.0035 in.)

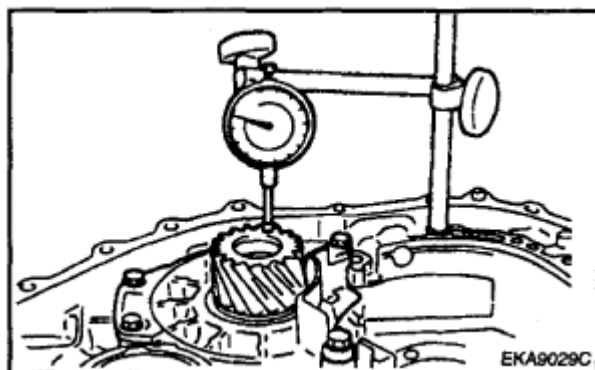


Fig. 88: Measuring Output Shaft End Play
Courtesy of HYUNDAI MOTOR CO.

33. If the standard value is incorrect, use this formula to select the correct spacer from the **IDENTIFICATION & THICKNESS SPECIFICATIONS** chart. $[\text{Measured amount}] + [\text{thickness of the old spacer}] + [0.01 \text{ mm (0.0004 in.)}]$ to $[\text{measured amount}] + [\text{thickness of old spacer} + 0.09 \text{ mm (0.0035 in.)}] =$
34. Install the output shaft protective cap.

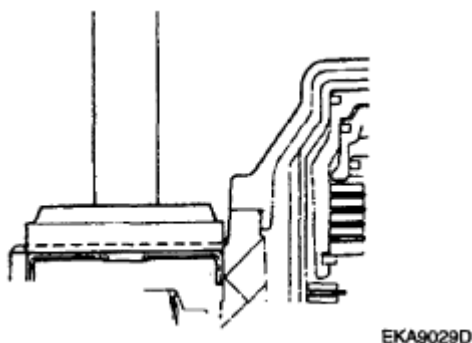


Fig. 89: Identifying Output Shaft Protective Cap
Courtesy of HYUNDAI MOTOR CO.

35. Install the transfer drive gear using special tool (09500-11000).

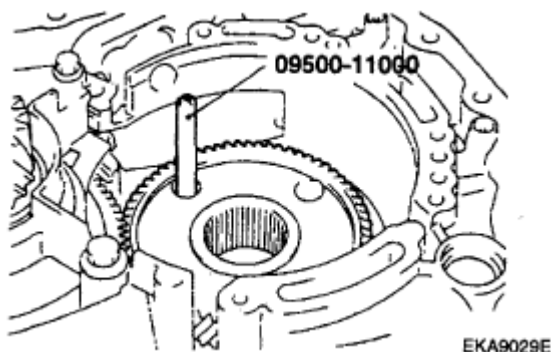


Fig. 90: Installing Transfer Drive Gear

Courtesy of HYUNDAI MOTOR CO.

36. Install the 4 transfer gear mounting bolts. Tighten the bolts to 19 Nm (14 lbs.ft).

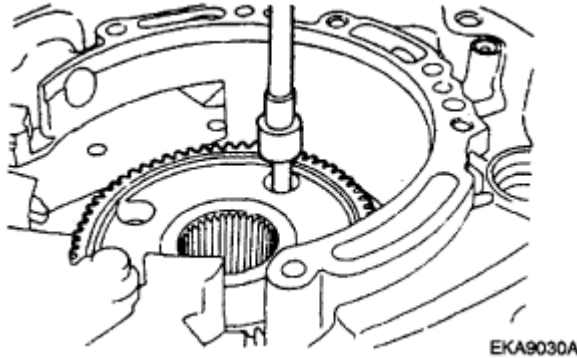


Fig. 91: Identifying Transfer Gear Mounting Bolts
Courtesy of HYUNDAI MOTOR CO.

37. Install the parking pawl, spacer and spring, then install the parking pawl shaft.

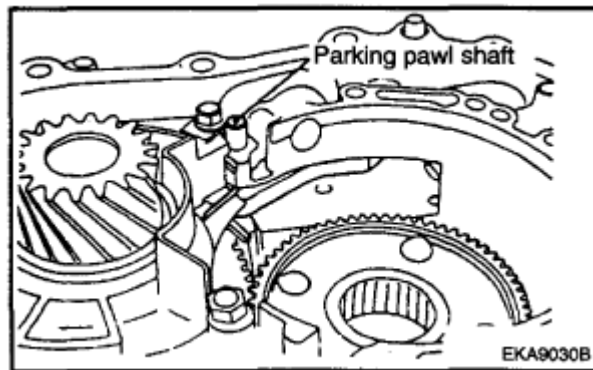


Fig. 92: Identifying Parking Pawl Shaft
Courtesy of HYUNDAI MOTOR CO.

38. Install the parking roller support, then the two parking roller support shafts.

CAUTION: Be sure to install the thrust bearing in the proper direction.

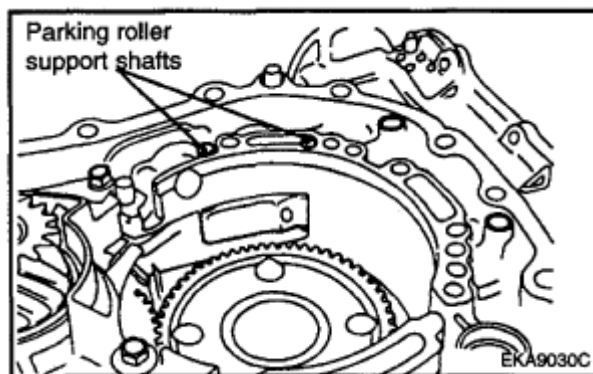


Fig. 93: Identifying Parking Roller Support Shafts
Courtesy of HYUNDAI MOTOR CO.

39. Install the underdrive sun gear and thrust bearing #3 to the output planetary carrier.

CAUTION: Be sure to install the thrust bearing in the proper direction.

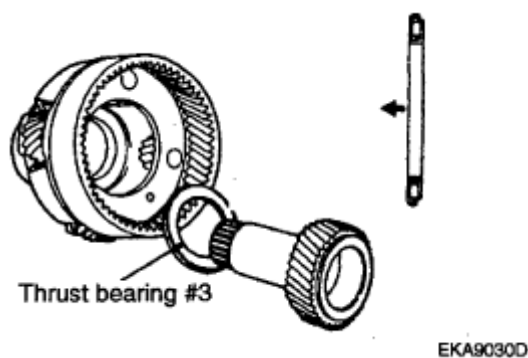


Fig. 94: Installing Thrust Bearing #3
Courtesy of HYUNDAI MOTOR CO.

40. Install the output planetary carrier and thrust bearing #4.

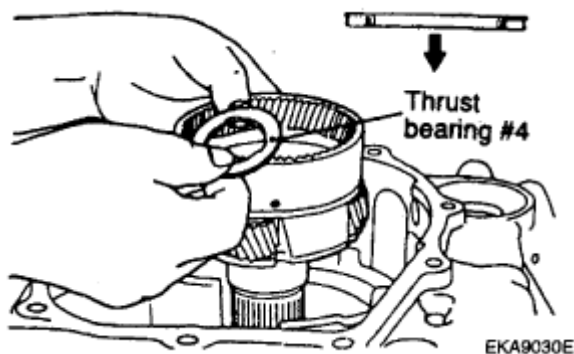


Fig. 95: Installing Thrust Bearing #4

Courtesy of HYUNDAI MOTOR CO.

41. Install the overdrive planetary carrier.

NOTE: Rotating the output shaft will help align the clutch teeth and help the carrier seat.

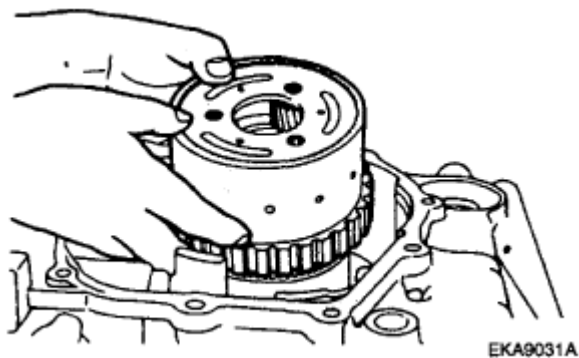


Fig. 96: Removing/Installing Overdrive Planetary Carrier
Courtesy of HYUNDAI MOTOR CO.

42. Install the reverse planetary sun gear.

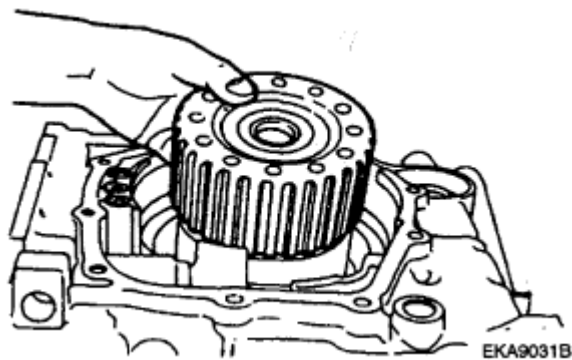


Fig. 97: Removing/Installing Reverse Planetary Sun Gear
Courtesy of HYUNDAI MOTOR CO.

43. Install the wave spring.

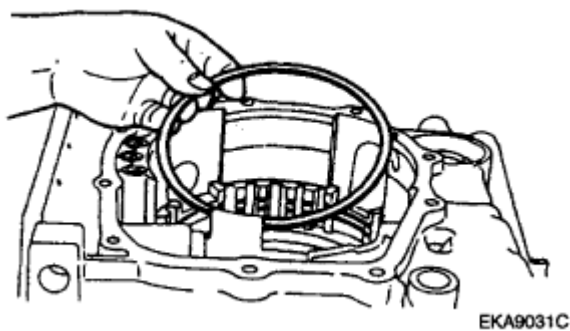


Fig. 98: Removing/Installing Wave Spring
Courtesy of HYUNDAI MOTOR CO.

44. Install the pressure plate, 6 brake discs, and 5 brake plates.

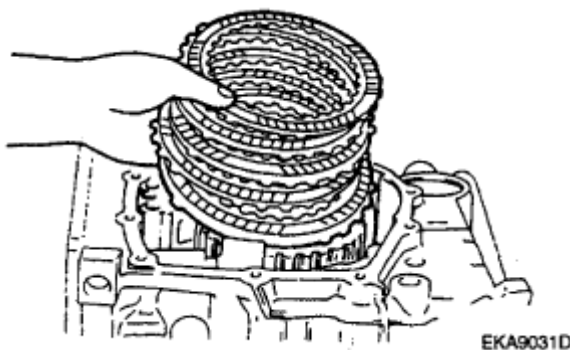


Fig. 99: Removing/Installing Pressure Plate, Brake Discs, & Brake Plates
Courtesy of HYUNDAI MOTOR CO.

45. Install the snap ring.

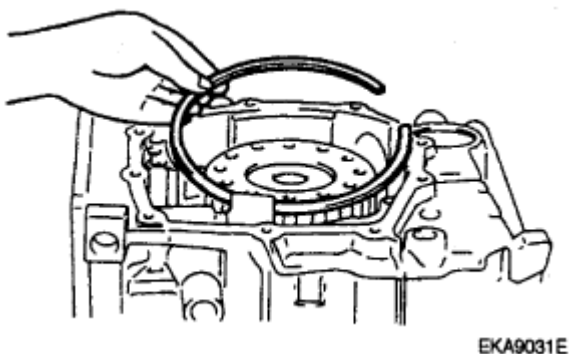


Fig. 100: Removing/Installing Snap Ring
Courtesy of HYUNDAI MOTOR CO.

46. Install the reaction plate.

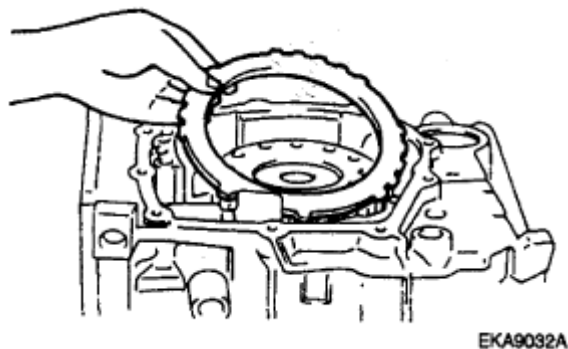


Fig. 101: Removing/Installing Reaction Plate
Courtesy of HYUNDAI MOTOR CO.

47. Install the snap ring.

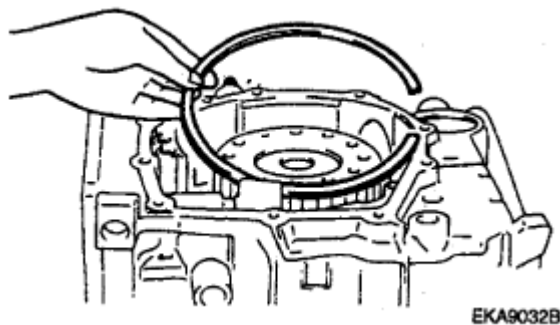


Fig. 102: Removing/Installing Snap Ring
Courtesy of HYUNDAI MOTOR CO.

48. Install the pressure plate, brake discs, and brake plates.

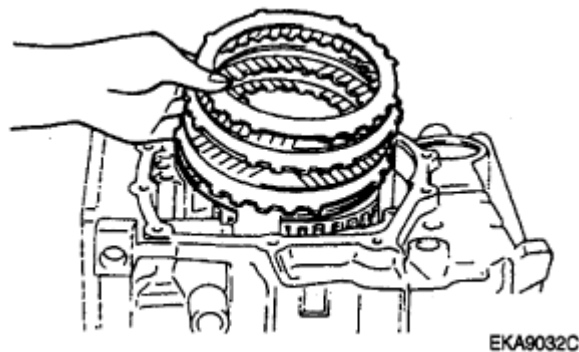


Fig. 103: Removing/Installing Pressure Plate, Brake Discs, & Brake Plates
Courtesy of HYUNDAI MOTOR CO.

49. Install the return spring and second brake piston.

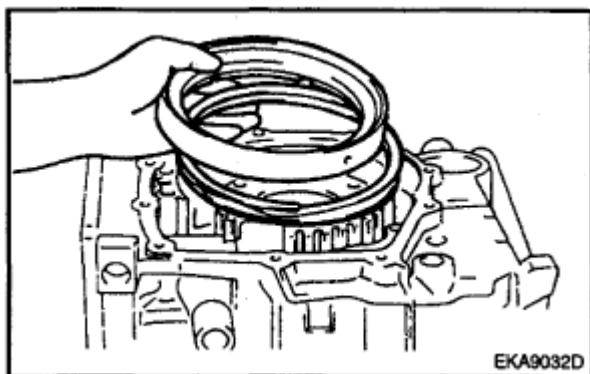


Fig. 104: Removing/Installing Return Spring & Second Brake Piston
Courtesy of HYUNDAI MOTOR CO.

50. Install the snap ring.

CAUTION: Be sure to install the thrust bearing in the proper direction.

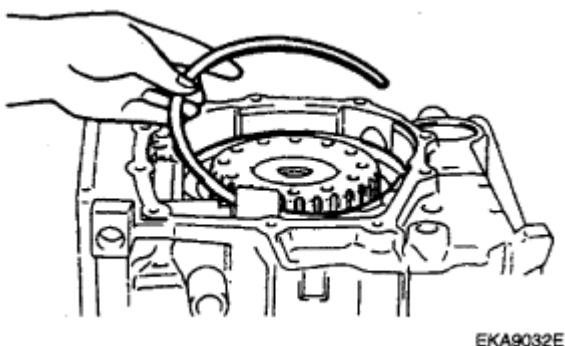


Fig. 105: Removing/Installing Snap Ring
Courtesy of HYUNDAI MOTOR CO.

51. Install thrust bearing #5.

CAUTION: Be sure to install the thrust bearing in the proper direction.

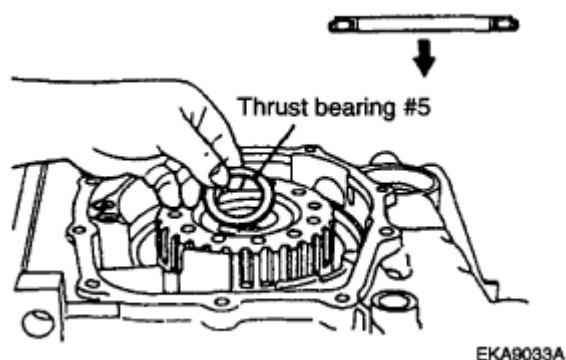


Fig. 106: Installing Thrust Bearing #5
Courtesy of HYUNDAI MOTOR CO.

52. Install the overdrive clutch hub and thrust bearing #6 to the reverse and overdrive clutch.

CAUTION: Be sure to install the thrust bearing in the proper direction.

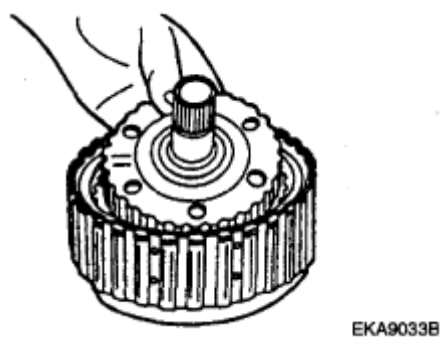


Fig. 107: Removing/Installing Overdrive Clutch Hub
Courtesy of HYUNDAI MOTOR CO.

53. Install the reverse and overdrive clutch and thrust bearing #7.

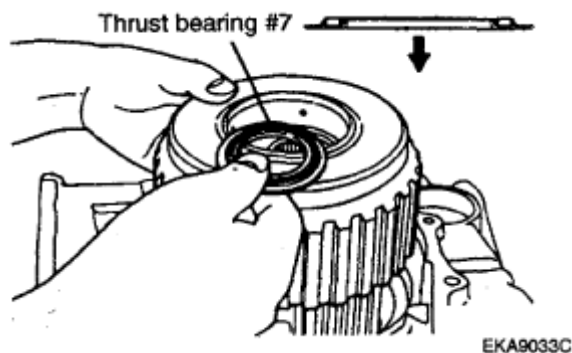


Fig. 108: Installing Thrust Bearing #7
Courtesy of HYUNDAI MOTOR CO.

54. Install the direct clutch, the accumulator spring, the piston, and the o-ring (F5A51 Model).



Fig. 109: Installing Direct Clutch, Accumulator Spring, Piston, & O-Ring
Courtesy of HYUNDAI MOTOR CO.

55. Install the o-rings (6EA) (F5A51 Model).

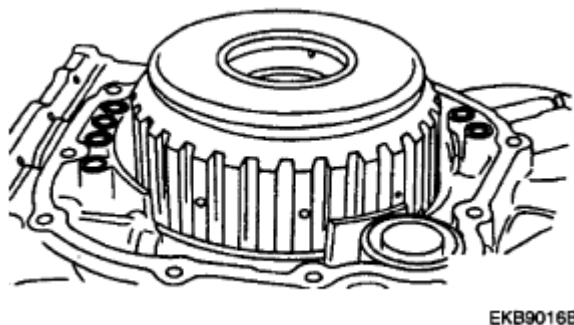


Fig. 110: Installing O-Rings (F5A51 Model)
Courtesy of HYUNDAI MOTOR CO.

56. Install the three O-rings.

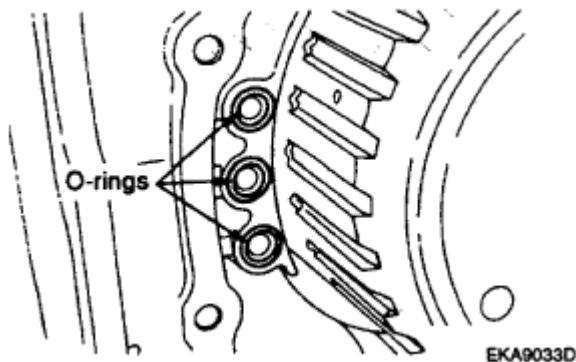


Fig. 111: Identifying O-Rings
Courtesy of HYUNDAI MOTOR CO.

57. Install the 3 seal rings into the rear cover.

NOTE: The cover should be clean and dry for step 56. It is only being installed to measure the underdrive sun gear end play.

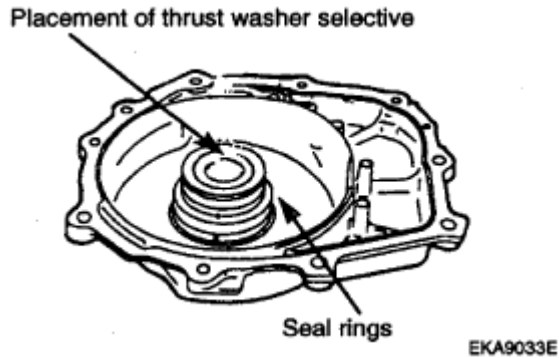


Fig. 112: Identifying Seal Rings
Courtesy of HYUNDAI MOTOR CO.

58. Install the used thrust race #8 and the rear cover.
59. Using a dial indicator, measure the end play of the underdrive sun gear.

Standard Value : 0.25-0.45 mm (0.0098-0.0177 in.)

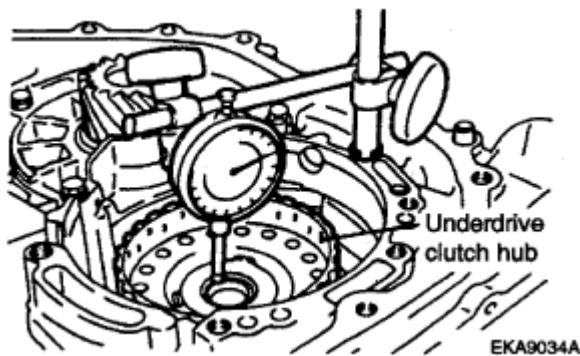


Fig. 113: Measuring End Play Of Underdrive Sun Gear
Courtesy of HYUNDAI MOTOR CO.

60. If the end play exceeds the standard value, measure the used race with a micrometer and select the proper size from the **IDENTIFICATION & THICKNESS SPECIFICATIONS** chart.
61. Reinstall the rear cover and mounting bolts.

Tighten the mounting bolts to 23 Nm (17 lbs. ft).

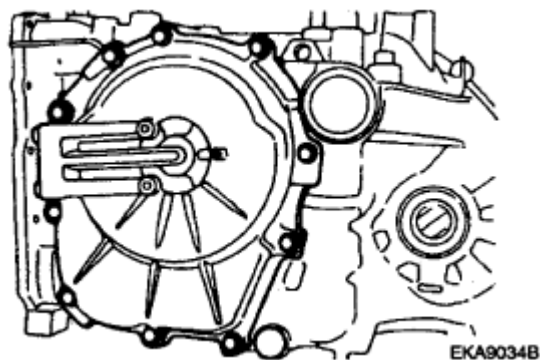


Fig. 114: Identifying Rear Cover Mounting Bolts
Courtesy of HYUNDAI MOTOR CO.

62. Install the thrust race #12 and the thrust bearing #11 (F5A51 Model).

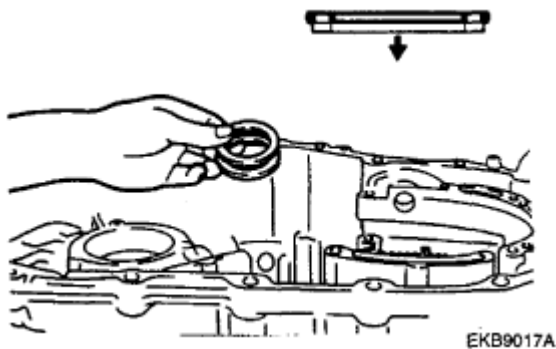


Fig. 115: Removing/Installing Thrust Race & Thrust Bearing
Courtesy of HYUNDAI MOTOR CO.

63. Install the reduction brake band and the direct clutch at the same time (F5A51 Model).

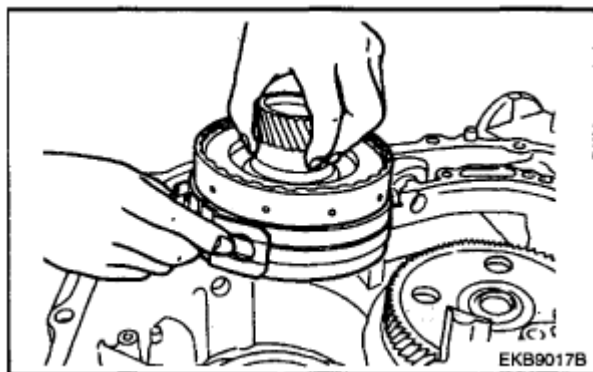


Fig. 116: Identifying Reduction Brake Band
Courtesy of HYUNDAI MOTOR CO.

64. Check the direct clutch to rotate as shown in **Fig. 117** (F5A51 Model).

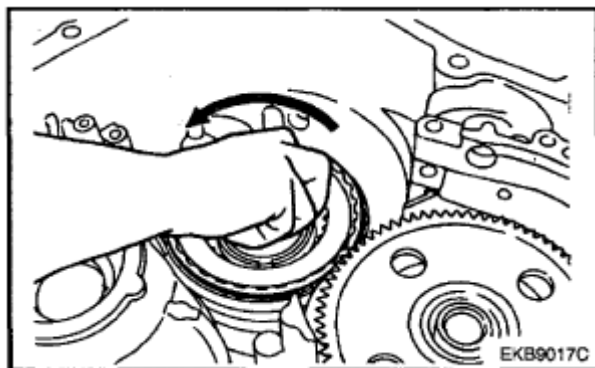


Fig. 117: Checking Direct Clutch Rotation
Courtesy of HYUNDAI MOTOR CO.

65. Install the planetary gear assembly (F5A51 Model).

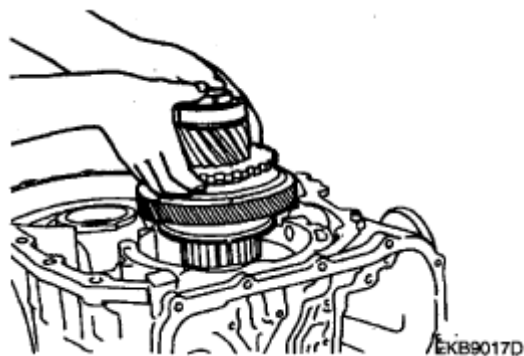


Fig. 118: Removing/Installing Planetary Gear Assembly
Courtesy of HYUNDAI MOTOR CO.

66. Install the spring, the reduction brake piston, and the snap ring (F5A51 Model).

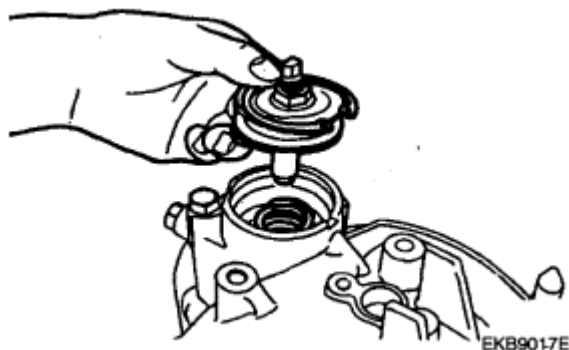


Fig. 119: Removing/Installing Reduction Brake Piston & Snap Ring
Courtesy of HYUNDAI MOTOR CO.

67. Adjust the reduction brake piston as follows (F5A51 Model).

1. Remove the nut of reduction brake piston.
2. Install the special tool not to rotate the reduction brake piston.

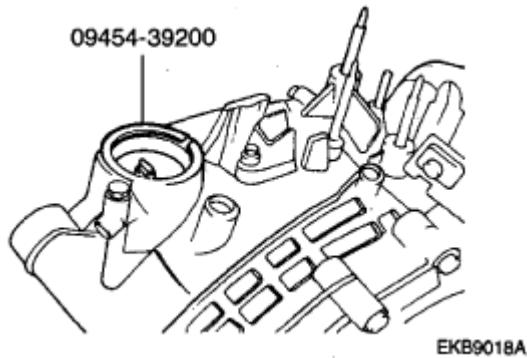


Fig. 120: Installing Special Tool
Courtesy of HYUNDAI MOTOR CO.

3. Loosen and tighten the adjustment screw two times by torque of 10 Nm.

Tighten the screw by torque of 5 Nm.

And loosen the special tool (Socket) 5-1/2 to 5-3/4 turns.

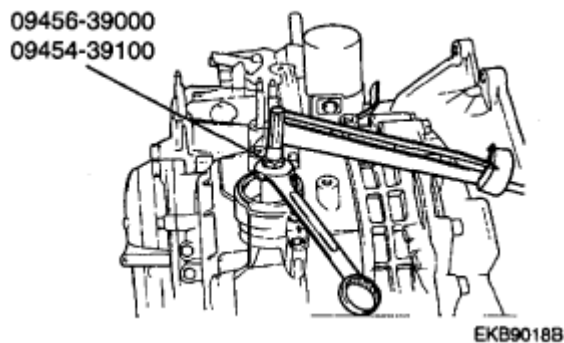


Fig. 121: Tightening Adjustment Screw
Courtesy of HYUNDAI MOTOR CO.

4. Tighten the nut by torque of 19 Nm.

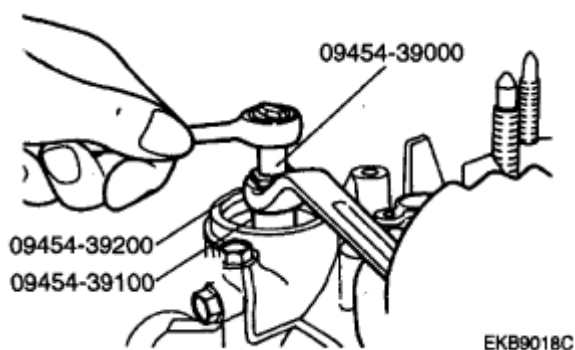


Fig. 122: Tightening Nut
Courtesy of HYUNDAI MOTOR CO.

68. Install the reduction brake piston cover and the snap ring (F5A51 Model).

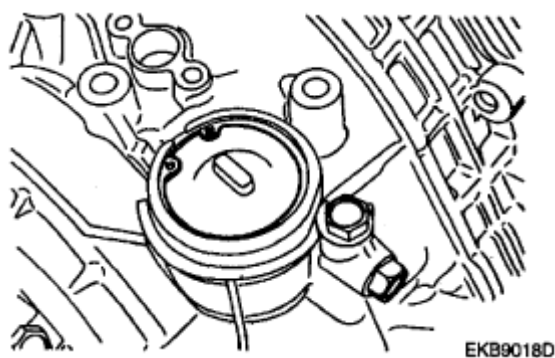


Fig. 123: Identifying Reduction Brake Piston Cover & Snap Ring
Courtesy of HYUNDAI MOTOR CO.

69. Install the parking pawl, the spring, and the parking pawl shaft (F5A51 Model).

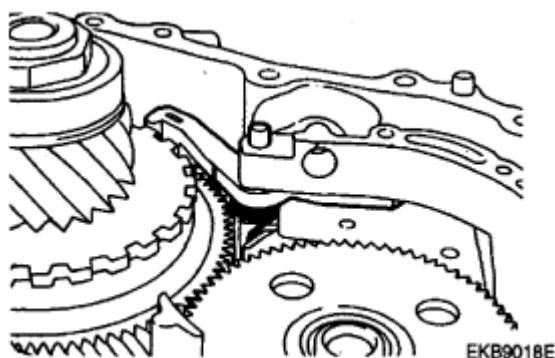


Fig. 124: Identifying Parking Pawl, Spring, & Parking Pawl Shaft
Courtesy of HYUNDAI MOTOR CO.

70. Install the underdrive clutch hub.

CAUTION: Be sure to install the thrust bearing in the proper direction.

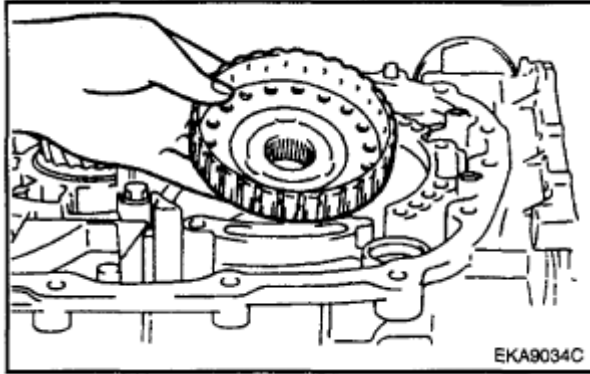


Fig. 125: Removing/Installing Underdrive Clutch Hub
Courtesy of HYUNDAI MOTOR CO.

71. Install thrust bearing #2.

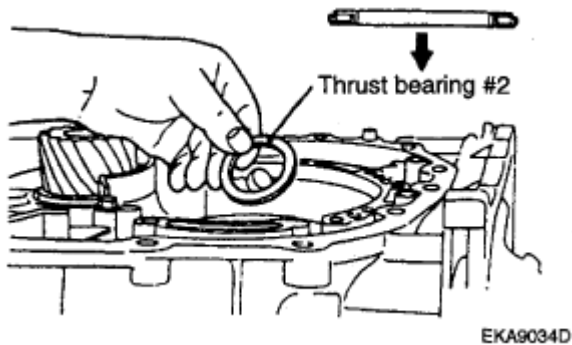


Fig. 126: Installing Thrust Bearing #2
Courtesy of HYUNDAI MOTOR CO.

72. Grasp the input shaft and lower the underdrive clutch into position.

NOTE: Looking into the hole where the input speed sensor mounts to the case will help you ensure that the underdrive clutch is fully seated.

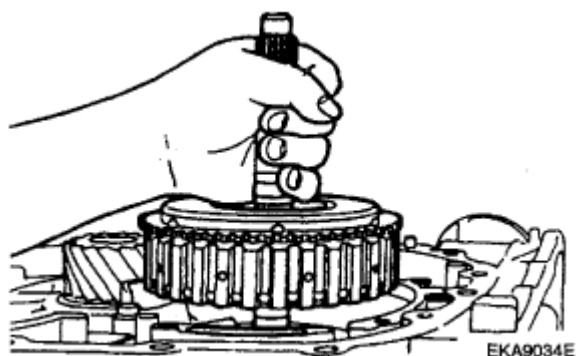


Fig. 127: Lowering Underdrive Clutch Into Position
Courtesy of HYUNDAI MOTOR CO.

73. Install the used thrust washer #1.

CAUTION: Be sure to use a new oil pump gasket.

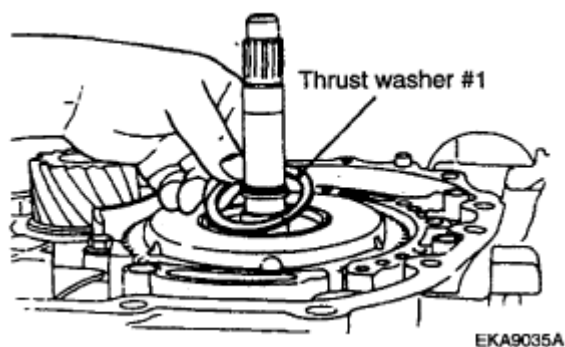


Fig. 128: Removing/Installing Thrust Washer #1
Courtesy of HYUNDAI MOTOR CO.

74. Install the oil pump, a new gasket, and the oil pump mounting bolts (In case F5A51 Model, with the pipe).

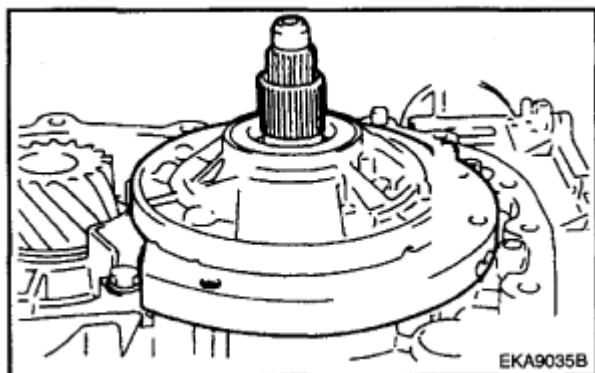


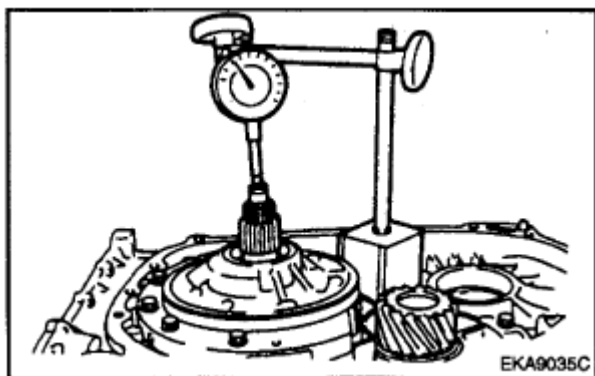
Fig. 129: Identifying Oil Pump

Courtesy of HYUNDAI MOTOR CO.

75. Using a dial indicator, measure the end play of the input shaft.

Standard Value : 0.70-1.20 mm (0.0276-0.0472 in.)

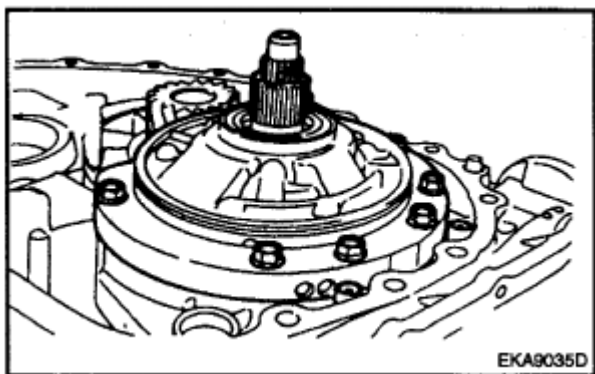
76. If the end play exceeds the standard value, measure the used race with a micrometer and select the proper size from the **IDENTIFICATION & THICKNESS SPECIFICATIONS** chart.

**Fig. 130: Measuring End Play Of Input Shaft**

Courtesy of HYUNDAI MOTOR CO.

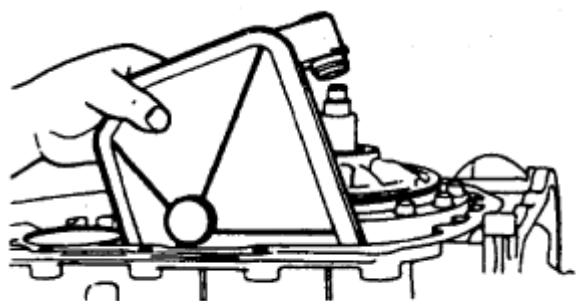
77. Reinstall the oil pump and mounting bolts.

Tighten the mounting bolts to 23 Nm (17 lbs. ft).

**Fig. 131: Identifying Oil Pump Mounting Bolts**

Courtesy of HYUNDAI MOTOR CO.

78. Install the oil filter.



EKA9036A

Fig. 132: Removing/Installing Oil Filter
Courtesy of HYUNDAI MOTOR CO.

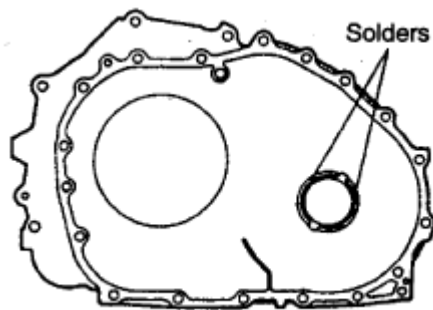
79. Install the differential.



EKA9036B

Fig. 133: Identifying Differential
Courtesy of HYUNDAI MOTOR CO.

80. Place two strips of solder, approximately 10 mm (0.39 in) long and 3 mm (0.12 in) thick, on the torque converter housing.



EKA9036C

Fig. 134: Identifying Solder Location On Torque Converter Housing
Courtesy of HYUNDAI MOTOR CO.

81. Install the torque converter housing and mounting bolts. Tighten the bolts to 47 Nm (35 lbs. ft) of torque.
82. Remove the torque converter housing, the bolts and the solder.

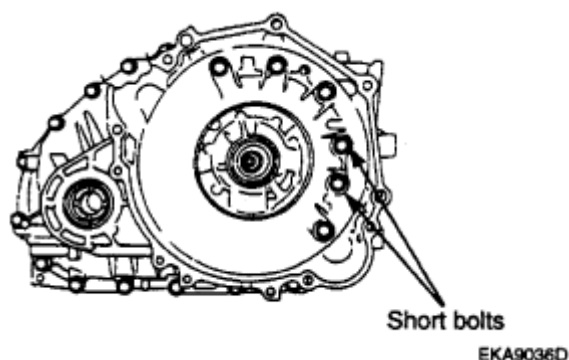


Fig. 135: Identifying Torque Converter Housing & Mounting Bolts
Courtesy of HYUNDAI MOTOR CO.

83. Using a micrometer, measure the thickness of the pressed solder.
84. Select a spacer that will give the following clearance.

Standard Value:

0.045 mm (0.0018 in.)-0.105 mm (0.0041 in.)

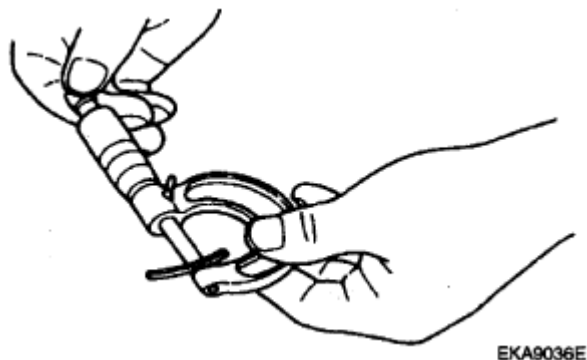


Fig. 136: Measuring Thickness Of Pressed Solder
Courtesy of HYUNDAI MOTOR CO.

85. Install the differential spacer selected in the previous step in the torque converter housing.
86. Use special tools 09532-11500 and 09500-11000 to press in the differential bearing outer race.

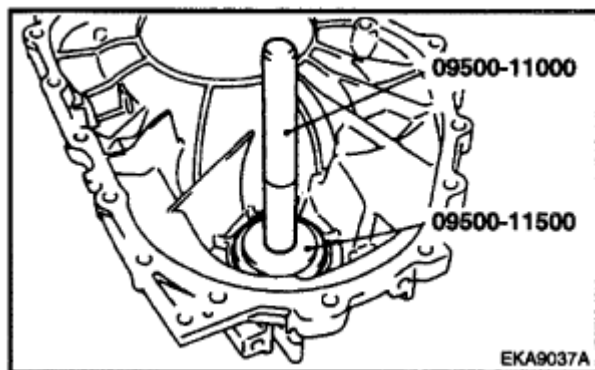


Fig. 137: Pressing Differential Bearing Outer Race
Courtesy of HYUNDAI MOTOR CO.

87. Install the two O-rings.

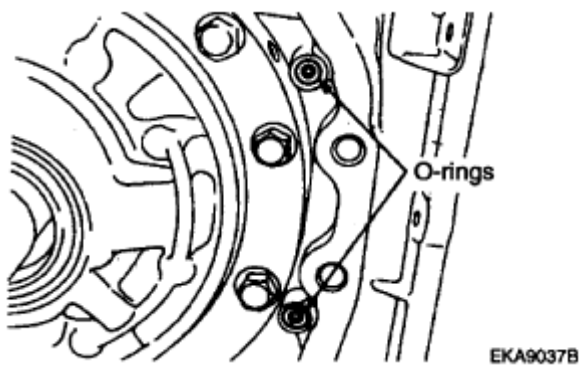


Fig. 138: Identifying O-Rings
Courtesy of HYUNDAI MOTOR CO.

88. Install the torque converter housing and mounting bolts. Tighten the bolts to 47 Nm (35 lbs. ft) of torque.

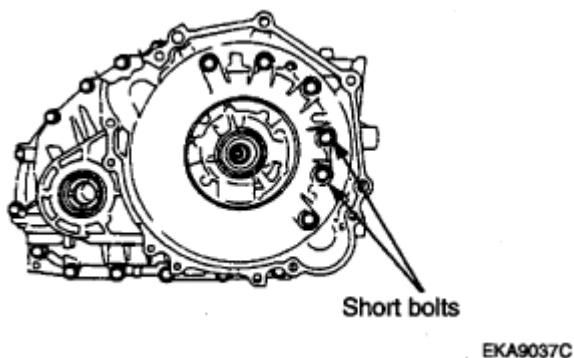


Fig. 139: Identifying Torque Converter Housing & Mounting Bolts
Courtesy of HYUNDAI MOTOR CO.

89. Install the manual control lever shaft and parking pawl.

90. Install the manual control shaft roller.

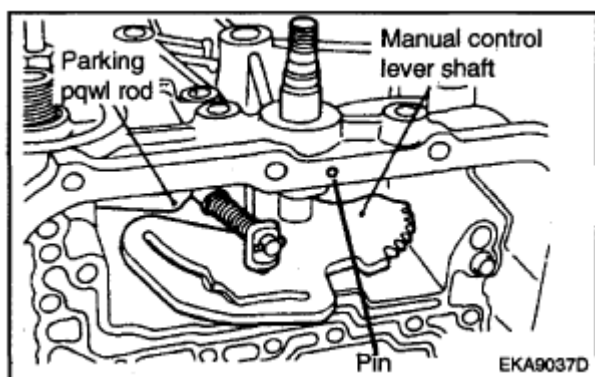


Fig. 140: Identifying Manual Control Lever Shaft & Parking Pawl
Courtesy of HYUNDAI MOTOR CO.

91. Install the reduction brake accumulator piston and the cover (F5A51 Model).

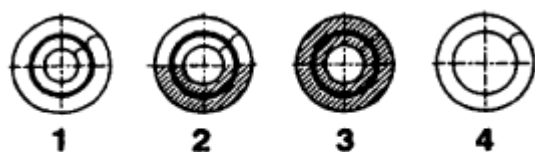


Fig. 141: Identifying Reduction Brake Accumulator Piston Cover
Courtesy of HYUNDAI MOTOR CO.

92. Install the three small springs and three larger springs into the accumulator pistons. The accumulator springs are identified in **Fig. 142** and in **ACCUMULATOR FUNCTION CHART**.

ACCUMULATOR FUNCTION CHART

Number	Function Name
1	Low-Reverse Brake
2	Underdrive Clutch
3	Second Brake
4	Overdrive Clutch



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Fig. 142: Identifying Accumulators
Courtesy of HYUNDAI MOTOR CO.

93. Install the accumulators with the springs according to **Fig. 143** and **ACCUMULATOR IDENTIFICATION CHART**. The accumulators should be flush with the transaxle case.

ACCUMULATOR IDENTIFICATION CHART

Number	Function Name	Color
1	Low-Reverse Brake	None
2	Underdrive Clutch	Yellow
3	Second Brake	Blue
4	Overdrive Clutch	None

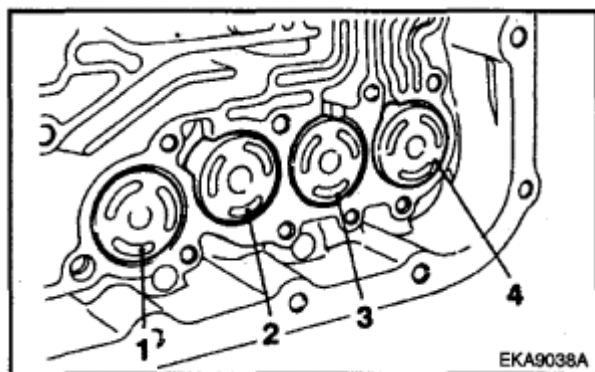


Fig. 143: Installing Accumulators
Courtesy of HYUNDAI MOTOR CO.

94. Install the strainer and the second brake retainer oil seal.

NOTE: Note the oil seal orientation in **Fig. 144**.

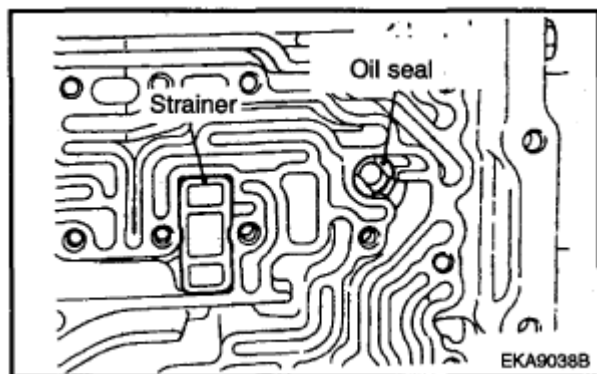


Fig. 144: Identifying Strainer & Second Brake Retainer Oil Seal
Courtesy of HYUNDAI MOTOR CO.

95. Install the solenoid wiring harness, then install the snap ring in its groove.

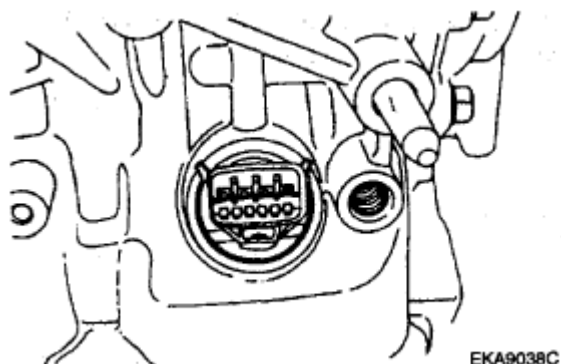


Fig. 145: Identifying Solenoid Wiring Harness
Courtesy of HYUNDAI MOTOR CO.

96. Install the valve body, gasket, and two steel balls.

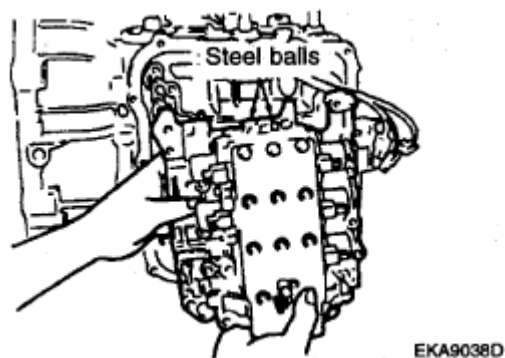


Fig. 146: Locating Steel Balls
Courtesy of HYUNDAI MOTOR CO.

97. Install the fluid temperature sensor. Tighten the mounting bolt to 11 Nm.

98. Install 28 valve body mounting bolts. Tighten all valve body mounting bolts to 11 Nm.

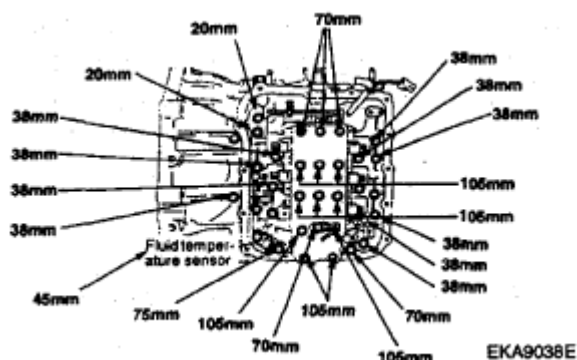


Fig. 147: Identifying Valve Body Mounting Bolts
Courtesy of HYUNDAI MOTOR CO.

99. Connect the solenoid wiring and temperature sensor connectors according to **Fig. 148** and **SOLENOID & TEMPERATURE SENSOR WIRING/CONNECTOR REFERENCE CHART**.

SOLENOID & TEMPERATURE SENSOR WIRING/CONNECTOR REFERENCE CHART

No.	Part to be connected	Wire color	Connector
1	Underdrive solenoid valve	White, Red, Red	housing color Black
2	Overdrive solenoid valve	Orange, Red	Black
3	Low-Reverse solenoid valve	Brown, Yellow	Milky White
4	Second solenoid valve	Green, Red, Red	Milky White
5	Torque converter clutch control solenoid valve	Blue, Yellow, Yellow	Black
6	Fluid temp, sensor	Black, Red	Black
7	Reduction solenoid valve	Orange, Yellow	Black

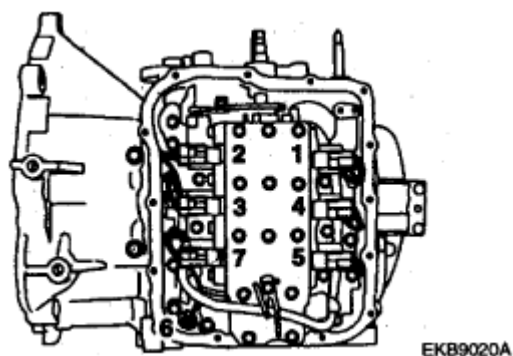


Fig. 148: Identifying Temperature Sensor & Solenoid Connectors
Courtesy of HYUNDAI MOTOR CO.

100. Install the manual control shaft detent. Tighten the nut to 6 Nm (4.4 lb. ft) of torque.

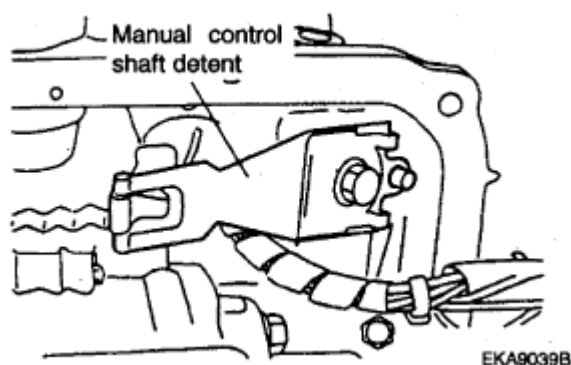


Fig. 149: Identifying Manual Control Shaft Detent
Courtesy of HYUNDAI MOTOR CO.

101. Install the valve body cover and mounting bolts. Tighten the mounting bolts to 9 Nm of torque.

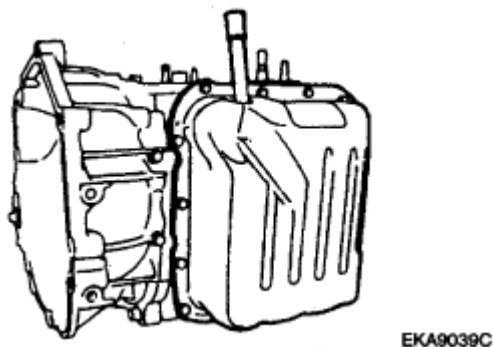


Fig. 150: Identifying Valve Body Cover
Courtesy of HYUNDAI MOTOR CO.

102. Install the speedometer gear and mounting bolt. Tighten the mounting bolt to 5 Nm of torque.

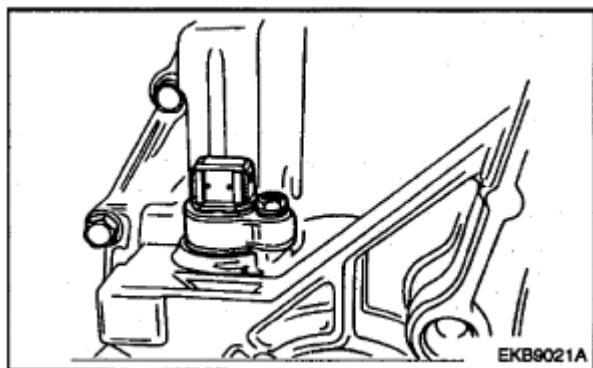


Fig. 151: Identifying Speedometer Gear & Mounting Bolt
Courtesy of HYUNDAI MOTOR CO.

103. Install the park/neutral position switch.

Tighten the mounting bolt to 11 Nm (8 lbs. ft) of torque.

104. Install the manual control lever. Tighten the mounting nut to 22 Nm (26 lbs. ft) of torque.

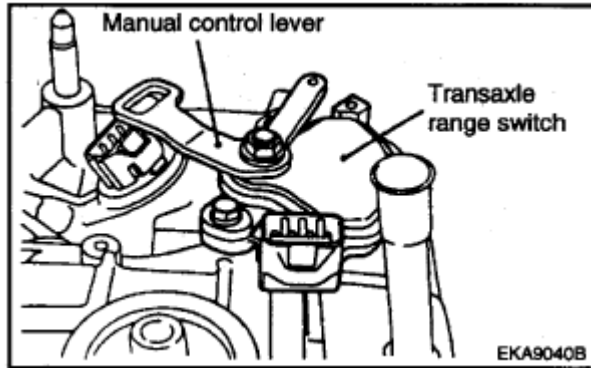


Fig. 152: Identifying Manual Control Lever & Transaxle Range Switch
Courtesy of HYUNDAI MOTOR CO.

105. Install the input and output shaft speed sensors. Tighten the mounting bolts to 11 Nm of torque.

CAUTION: Make sure that you are installing the correct oil filter. While the engine oil filter and the transaxle oil filter look similar, their filtering action is different. Installing the wrong oil filter could cause damage to the transaxle. Transaxle oil filters are identified as A/T ONLY.

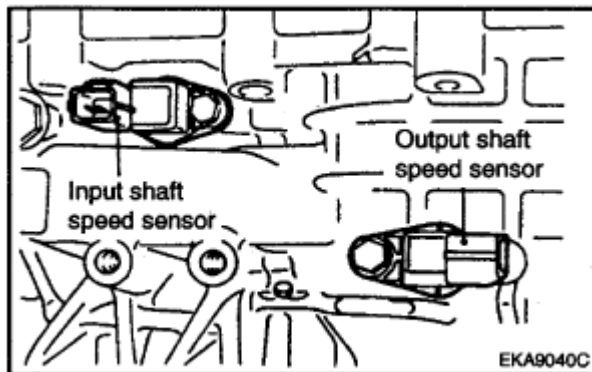


Fig. 153: Identifying Input & Output Shaft Speed Sensors
Courtesy of HYUNDAI MOTOR CO.

106. Apply a small amount of ATF to the oil filter and install. Tighten the filter to 12 Nm.

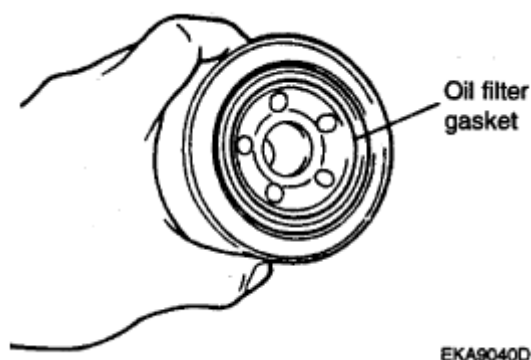


Fig. 154: Identifying Oil Filter Gasket
Courtesy of HYUNDAI MOTOR CO.

107. Install the cooler feed tube with a new gasket and the eye bolt. Tighten the eye bolt to 30 Nm (22 lbs. ft) of torque.

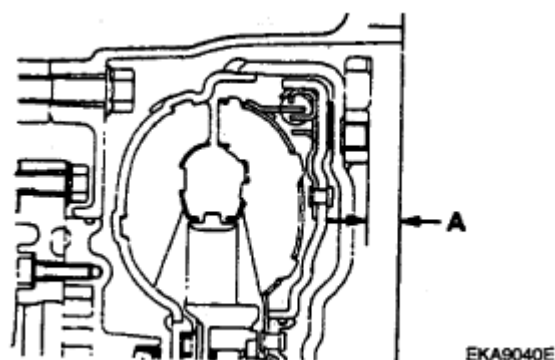


Fig. 155: Identifying Cooler Feed Tube
Courtesy of HYUNDAI MOTOR CO.

108. Install the dipstick.
109. Install the control cable bracket. Tighten the mounting bolt to 23 Nm (17 lbs.ft).
110. Install the wiring harness bracket. Tighten the mounting bolt to 23 Nm (17 lbs.ft).
111. Install the two roll stopper brackets. Tighten the mounting bolts to 69 Nm (51 lbs. ft).
112. Install the torque converter and secure it so that dimension A. Meets the reference value.

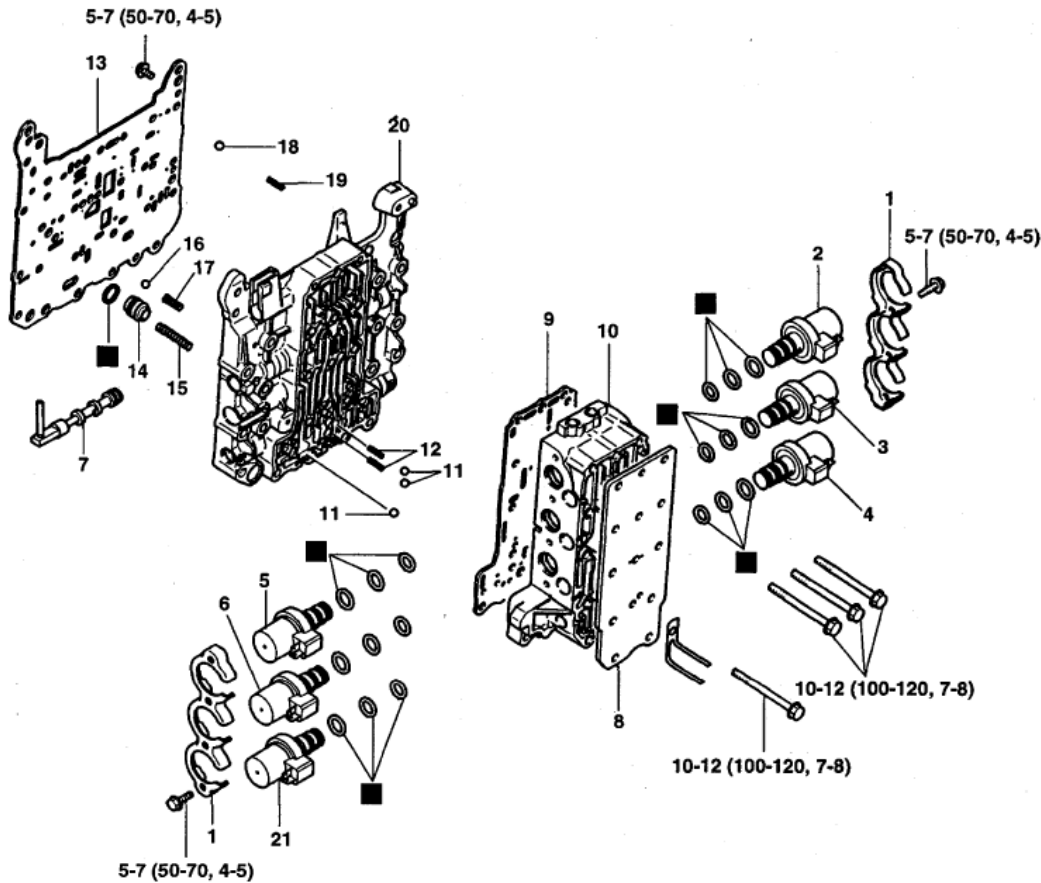
Reference value : approx. 12.2 mm (0.480 in.)

CAUTION: Apply ATF to the oil pump drive hub before installing the torque converter. Be careful not to damage the oil pump seal.

VALVE BODY

VALVE BODY

COMPONENTS



<Disassembly steps>

1. Solenoid valve support
2. UD clutch solenoid valve
3. 2nd brake solenoid valve
4. Damper clutch control solenoid valve
5. OD clutch solenoid valve
6. L & R brake solenoid valve
7. Manual valve
8. Cover
9. Plate
10. Outside valve body assembly

11. Still ball (Orifice check ball)
12. Spring
13. Plate
14. Damping valve
15. Damping valve spring
16. Steel ball (line relief)
17. Spring
18. Steel ball (orifice check ball)
19. Spring
20. Inside valve body assembly
21. Reduction solenoid valve (F5A51 Model)

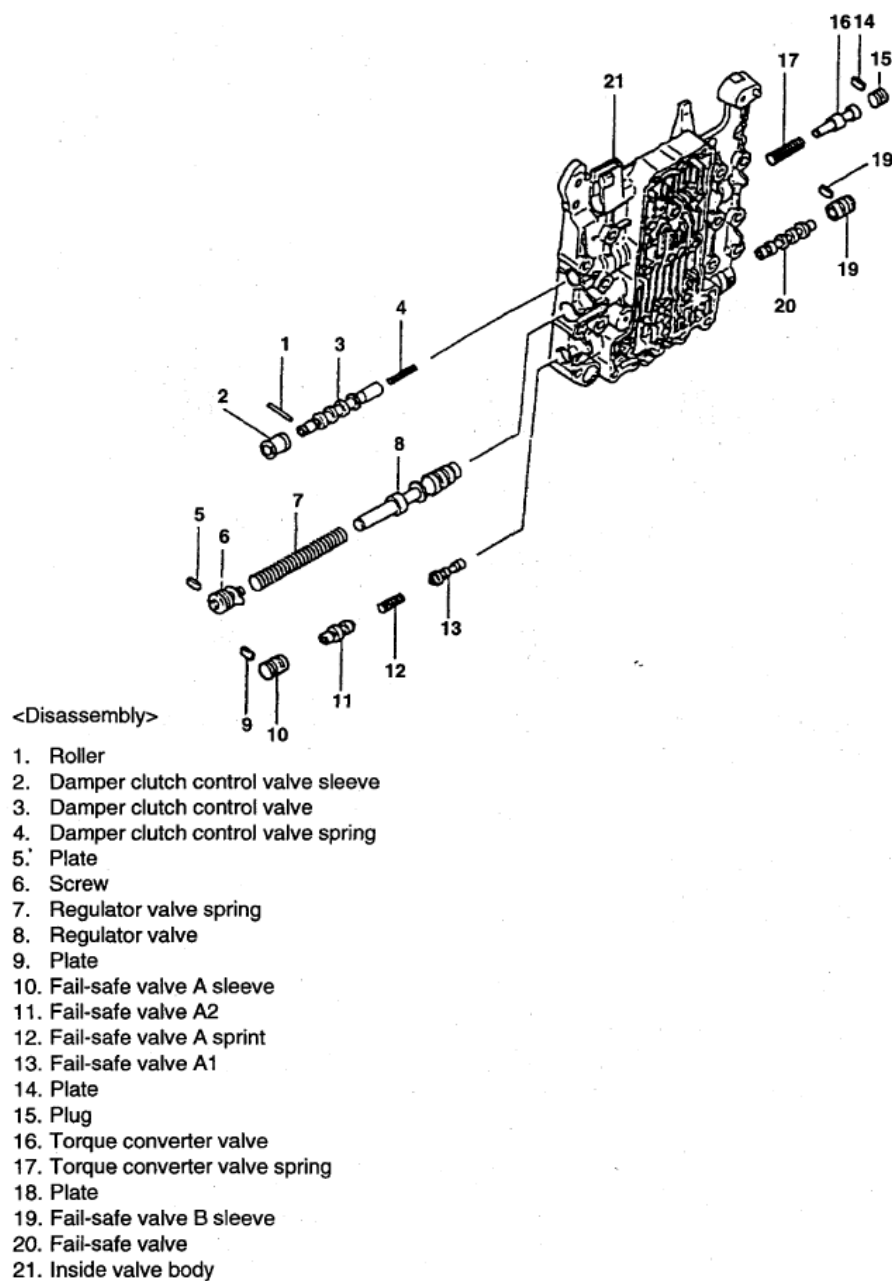
TORQUE : Nm (kg-cm, lb-ft)

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Fig. 156: Identifying Valve Body Components With Torque Specifications
Courtesy of HYUNDAI MOTOR CO.

INSIDE VALVE BODY

COMPONENTS

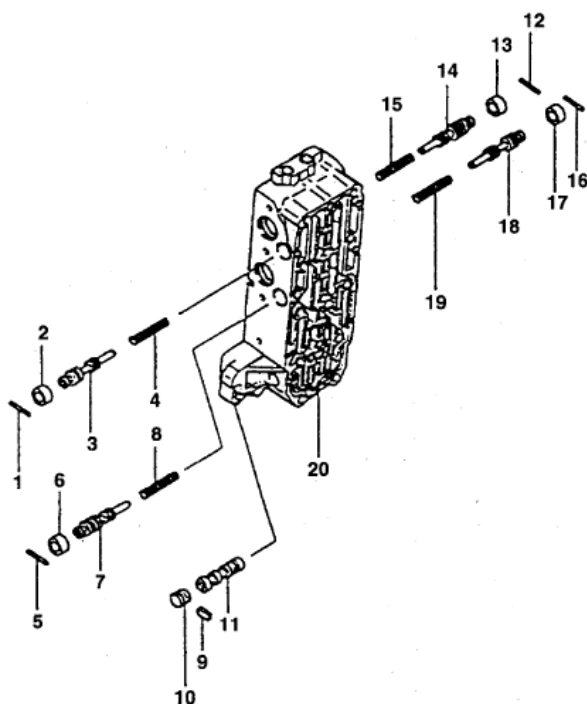


EKA9041A

Fig. 157: Identifying Inside Valve Body Components
Courtesy of HYUNDAI MOTOR CO.

OUTSIDE VALVE BODY (F4A42 MODEL)

COMPONENTS



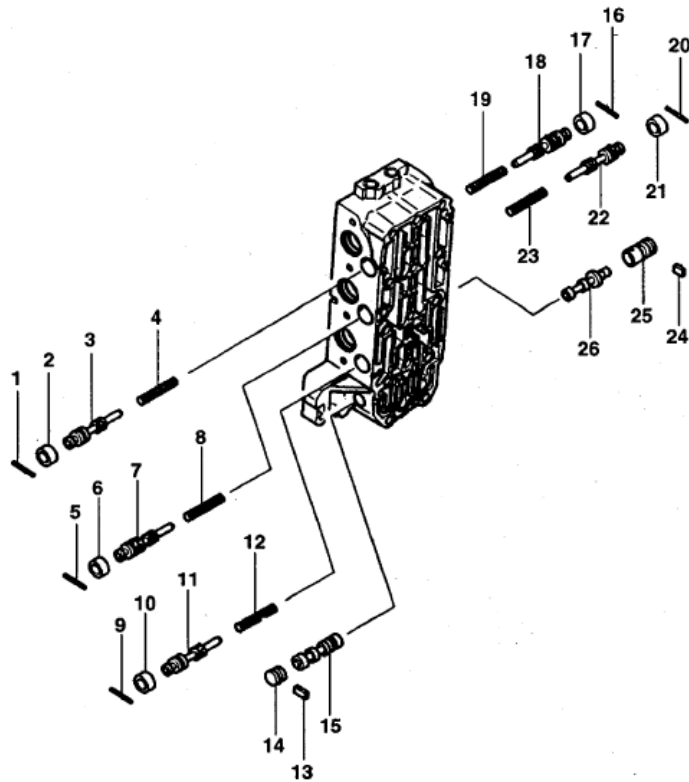
<Disassembly>

1. Roller
2. Overdrive pressure control valve sleeve
3. Overdrive pressure control valve
4. Overdrive pressure control valve spring
5. Roller
6. Low-reverse pressure control valve sleeve
7. Low-reverse pressure control valve
8. Low-reverse pressure control valve spring
9. Plate
10. Plug
11. Switching valve
12. Roller
13. Underdrive pressure control valve sleeve
14. Underdrive pressure control valve
15. Underdrive pressure control valve spring
16. Roller
17. Second pressure control valve sleeve
18. Second pressure control valve
19. Second pressure control valve spring
20. Outside valve body

EKA9042A

Fig. 158: Identifying Outside Valve Body Components (F4A42 Model)
 Courtesy of HYUNDAI MOTOR CO.

OUTSIDE VALVE BODY (F5A51 MODEL)



<Disassembly steps>

- | | |
|--|--|
| 1. Roller | 14. Plug |
| 2. Overdrive pressure control valve sleeve | 15. Switching valve |
| 3. Overdrive pressure control valve | 16. Roller |
| 4. Overdrive pressure control valve spring | 17. Underdrive pressure control valve sleeve |
| 5. Roller | 18. Underdrive pressure control valve |
| 6. Low-reverse pressure control valve sleeve | 19. Underdrive pressure control valve spring |
| 7. Low-reverse pressure control valve | 20. Roller |
| 8. Low-reverse pressure control valve spring | 21. Second pressure control valve sleeve |
| 9. Roller | 22. Second pressure control valve |
| 10. Reduction pressure control valve sleeve | 23. Second pressure control valve spring |
| 11. Reduction pressure control valve | 24. Plate |
| 12. Reduction pressure control valve spring | 25. Fail safe valve "C" sleeve |
| 13. Plate | 26. Fail safe valve "C" |

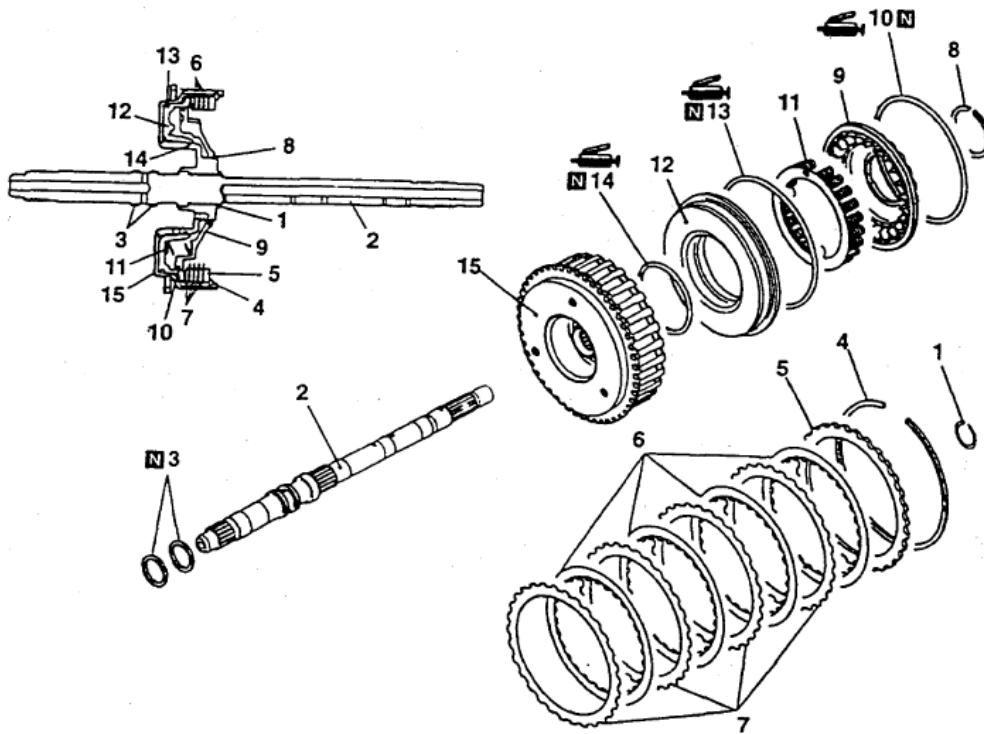
EKB9022A

Fig. 159: Identifying Outside Valve Body Components (F5A51 Model)

Courtesy of HYUNDAI MOTOR CO.

UNDERDRIVE CLUTCH AND INPUT SHAFT

UNDERDRIVE CLUTCH AND INPUT SHAFT



Disassembly steps

1. Snap ring
2. Input shaft
3. Seal ring
4. Snap ring
5. Clutch reaction plate
6. Clutch disc
7. Clutch plate
8. Snap ring
9. Spring retainer
10. D-ring
11. Return spring
12. Underdrive clutch piston
13. D-ring
14. D-ring
15. Underdrive clutch retainer

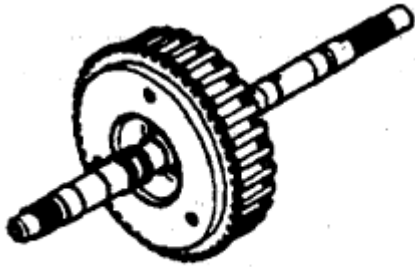
EKA9043A

Fig. 160: Identifying Underdrive Clutch & Input Shaft Components
Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

1. Remove the input shaft snap ring.
2. Remove the input shaft.
3. Remove the 2 seal rings.
4. Remove the clutch reaction plate snap ring.
5. Remove the clutch reaction plate.

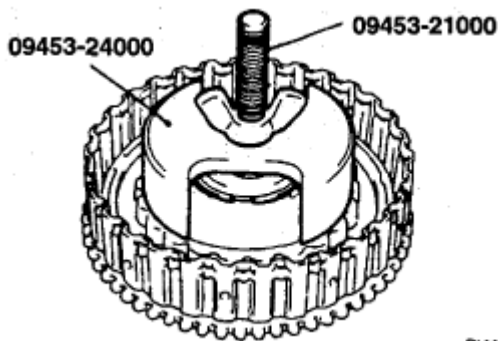
6. Remove the 4 clutch discs and 4 clutch plates.



EKA9044A

Fig. 161: Identifying Input Shaft
Courtesy of HYUNDAI MOTOR CO.

7. Compress the clutch return springs using special tools, 09453-24000 and 09453-21000 then remove the clutch spring retainer snap ring.
8. Remove the clutch spring retainer.
9. Remove the D-ring seal.
10. Remove the clutch return spring.
11. Remove the underdrive clutch piston using compressed air.
12. Remove the 2 D-ring seals.



EKA9044B

Fig. 162: Compressing Clutch Return Springs
Courtesy of HYUNDAI MOTOR CO.

REASSEMBLY

1. Install the 2 D-ring seals.
2. Install the underdrive clutch piston.
3. Install the clutch return spring.
4. Install the D-ring seal.
5. Install the clutch spring retainer.

6. Compress the clutch return springs using special tools, 09453-21100 and 09453-21000, then install the clutch spring retainer snap ring.

CAUTION: Dip each clutch disc in ATF before assembling.

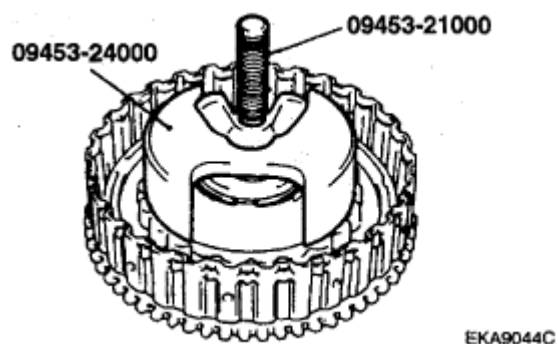


Fig. 163: Compressing Clutch Return Springs
Courtesy of HYUNDAI MOTOR CO.

7. Align the spaces between the teeth (A) on the clutch plates, clutch discs, and reaction plate to the outer circumference hole (B) in the underdrive clutch retainer.
8. Install the 4 clutch discs and the 4 clutch plates.
9. Install the clutch reaction plate with the shear droop toward the clutch disc.
10. Install the clutch reaction plate snap ring.

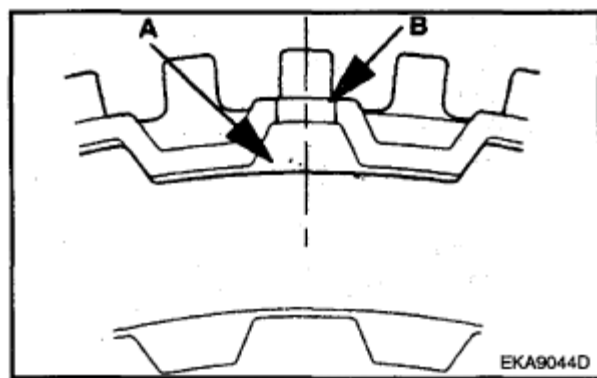


Fig. 164: Aligning Spaces Between Teeth To Outer Circumference Hole
Courtesy of HYUNDAI MOTOR CO.

11. Install special tool 09453-21000 as shown in **Fig. 165**, then check the clearance between the snap ring and the reaction plate using a feeler gauge.

Standard value : 1.25-1.45 mm (F4A42 Model) 1.6-1.8 mm (F5A51 Model)

12. If the clearance is correct, measure the old snap ring, then select the correct size from the

IDENTIFICATION & THICKNESS SPECIFICATIONS chart.

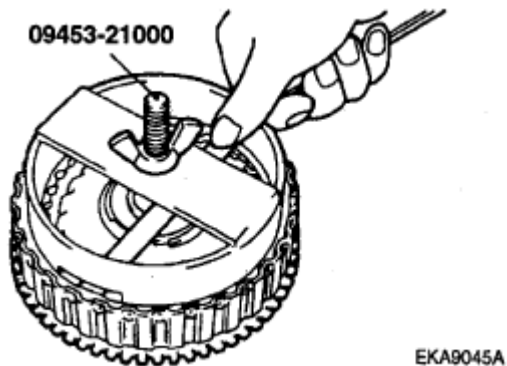


Fig. 165: Checking Clearance Between Snap Ring & Reaction Plate
Courtesy of HYUNDAI MOTOR CO.

13. Install the seal rings.
14. Install the input shaft.
15. Install the input shaft snap ring.

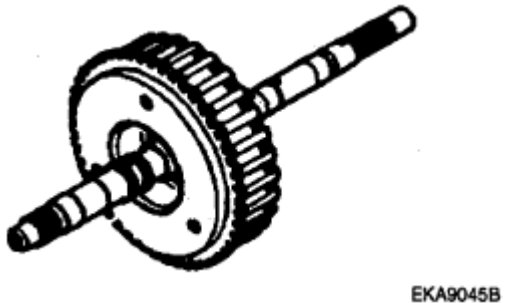
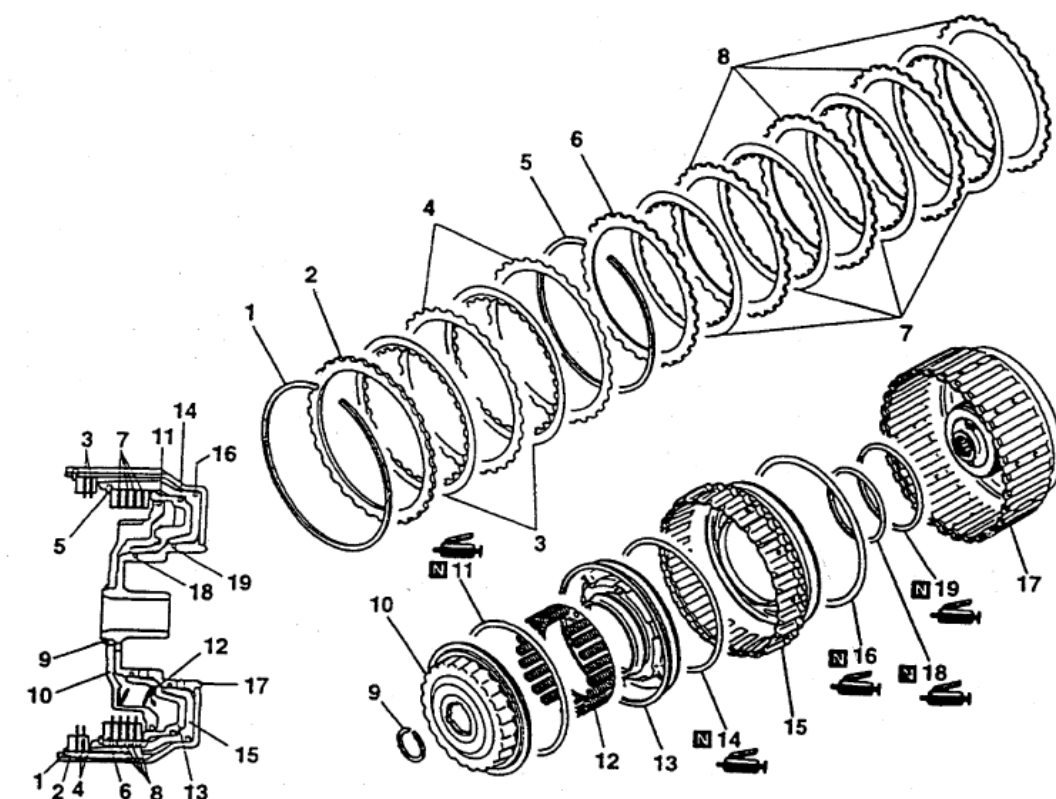


Fig. 166: Identifying Input Shaft
Courtesy of HYUNDAI MOTOR CO.

REVERSE AND OVERDRIVE CLUTCH

REVERSE AND OVERDRIVE CLUTCH

COMPONENTS



Disassembly steps

- | | |
|--------------------------|-----------------------------|
| 1. Snap ring | 10. Spring retainer |
| 2. Clutch reaction plate | 11. D-ring |
| 3. Clutch disc | 12. Return spring |
| 4. Clutch plate | 13. Overdrive clutch piston |
| 5. Snap ring | 14. D-ring |
| 6. Clutch reaction plate | 15. Reverse clutch piston |
| 7. Clutch disc | 16. D-ring |
| 8. Clutch plate | 17. Reverse clutch retainer |
| 9. Snap ring | 18. D-ring |
| | 19. D-ring |

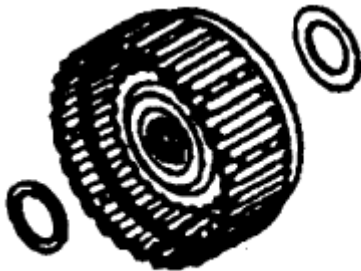
EKA9046A

Fig. 167: Identifying Reverse & Overdrive Clutch Components
 Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

1. Remove the overdrive clutch reaction plate snap ring.
2. Remove the overdrive clutch reaction plate.
3. Remove the 2 overdrive clutch discs and 2 plates.
4. Remove the reverse clutch reaction plate snap ring.
5. Remove the reverse clutch reaction plate.

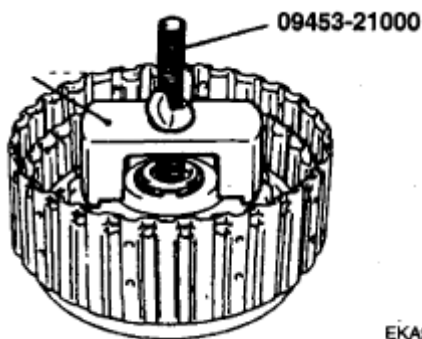
6. Remove the 4 reverse clutch discs and 4 plates.
7. Compress the clutch return springs using special tools, 09453-21000 then remove the clutch spring retainer snap ring.



EKA9047A

Fig. 168: Identifying Overdrive Clutch Discs & Plates
Courtesy of HYUNDAI MOTOR CO.

8. Remove the clutch spring retainer.
9. Remove the D-ring seal.
10. Remove the clutch return spring.
11. Remove the overdrive clutch piston using compressed air.
12. Remove the D-ring seal.
13. Remove the Reverse clutch piston.
14. Remove the 3 D-ring seals.



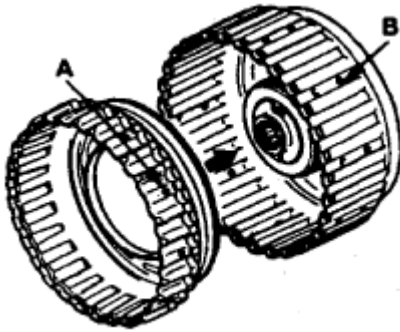
EKA9047B

Fig. 169: Compressing Clutch Return Springs
Courtesy of HYUNDAI MOTOR CO.

REASSEMBLY

1. Install the 3 D-ring seals.
2. Align the outer circumference holes (A and B) on the reverse piston and the reverse piston retainer before assembly.
3. Install the Reverse clutch piston.

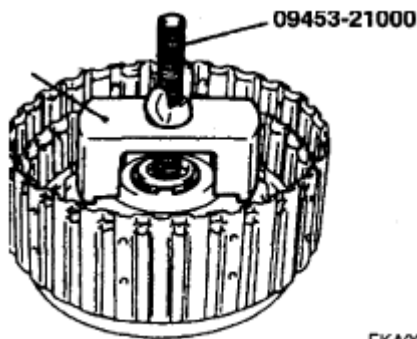
4. Install the D-ring seal.



EKA9047C

Fig. 170: Aligning Outer Circumference Holes On Reverse Piston & Reverse Piston Retainer
Courtesy of HYUNDAI MOTOR CO.

5. Install the overdrive clutch piston.
6. Install the clutch return spring.
7. Install the D-ring seal.
8. Install the clutch spring retainer.



EKA9047D

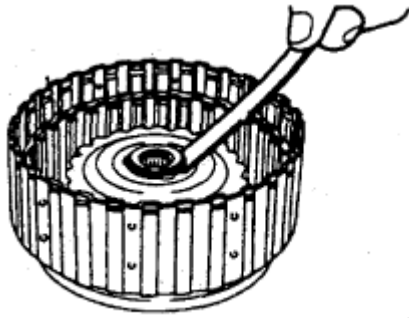
Fig. 171: Compressing Clutch Return Springs
Courtesy of HYUNDAI MOTOR CO.

9. Compress the clutch return springs using special tools, 09453-21000 then install the clutch spring retainer snap ring.
10. Check the clearance between the snap ring and the return spring retainer.

Standard value : 0-0.09 mm (0-0.0035 in.)

11. If the clearance is incorrect, measure the old snap ring, then select the correct size from the **IDENTIFICATION & THICKNESS SPECIFICATIONS** chart.

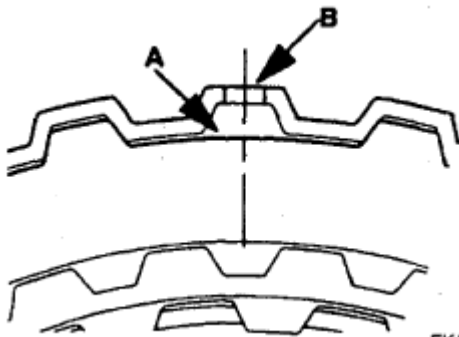
CAUTION: Dip each clutch disc in ATF before assembling.



EKA9048A

Fig. 172: Checking Clearance Between Snap Ring & Return Spring Retainer
Courtesy of HYUNDAI MOTOR CO.

12. Align the spaces between the teeth (A) on the clutch plates, clutch discs, and reaction plate to the outer circumference hole (B) in the reverse clutch retainer.
13. Install the 4 reverse clutch discs and 4 plates.
14. Install the reverse clutch reaction plate.
15. Install the reverse clutch reaction plate snap ring.



EKA9048B

Fig. 173: Aligning Spaces Between Teeth To Outer Circumference Hole
Courtesy of HYUNDAI MOTOR CO.

16. Install special tool 09453-21000 as shown in **Fig. 174**, then check the clearance between the snap ring and the reaction plate using a feeler gauge.

Standard value:

1.6-1.8 mm (0.0630-0.0709 - inch)

17. If the clearance is incorrect, measure the old snap ring, then select the correct size from the **IDENTIFICATION & THICKNESS SPECIFICATIONS** chart.

CAUTION: Dip each clutch disc in ATF before assembling.

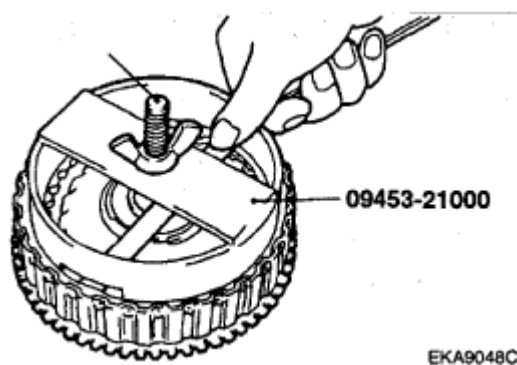


Fig. 174: Checking Clearance Between Snap Ring & Reaction Plate
Courtesy of HYUNDAI MOTOR CO.

18. Align the spaces between the teeth (A) on the clutch plates, clutch discs, and reaction plate to the outer circumference hole (B) in the overdrive clutch retainer.
19. Install the 2 overdrive clutch discs and 2 plates.
20. Install the overdrive clutch reaction plate.
21. Install the overdrive clutch reaction plate snap ring.

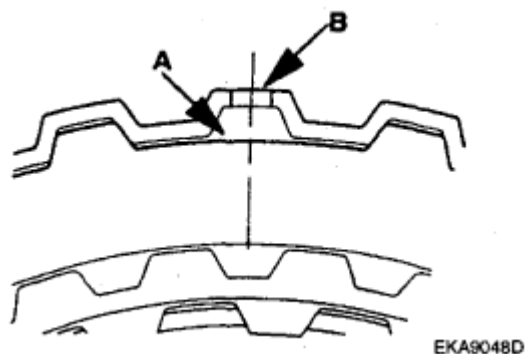


Fig. 175: Aligning Spaces Between Teeth To Outer Circumference Hole
Courtesy of HYUNDAI MOTOR CO.

22. Check the clearance between the snap ring and the clutch reaction plate.

Standard value: 1.6-1.8 mm

23. If the clearance is incorrect, measure the old snap ring, then select the correct size from the **IDENTIFICATION & THICKNESS SPECIFICATIONS** chart.

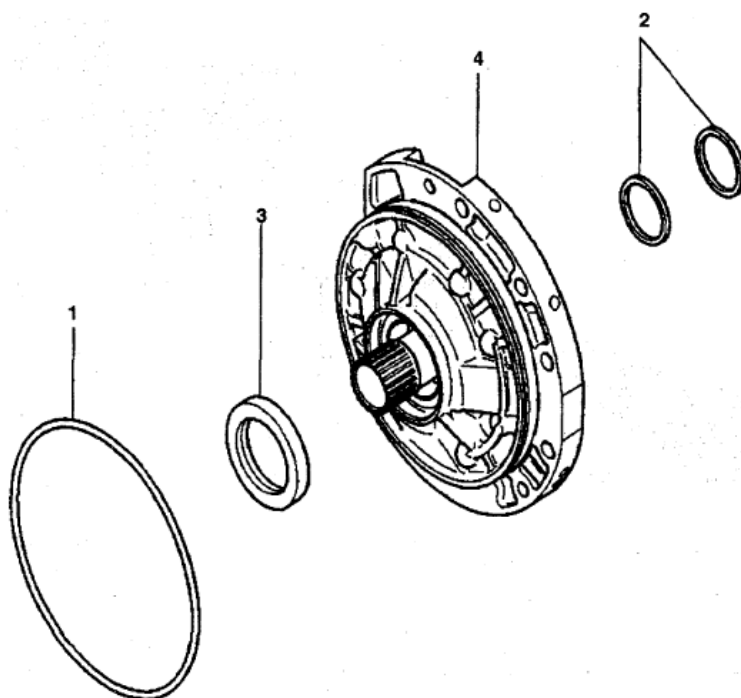


EKA9048E

Fig. 176: Checking Clearance Between Snap Ring & Clutch Reaction Plate
Courtesy of HYUNDAI MOTOR CO.

OIL PUMP ASSEMBLY

COMPONENTS



<Disassembly steps>

- 1.O-ring
- 2.Seal ring
- 3.Oil seal
- 4.Oil pump ass'y

EKA9055A

Fig. 177: Identifying Oil Pump Assembly Components
Courtesy of HYUNDAI MOTOR CO.

REASSEMBLY**Oil seal replacement**

1. Using the special tool (09452-21200), install the oil seal to the pump housing.
2. Apply a thin coat of automatic transaxle fluid to the lip of the oil seal before installation.

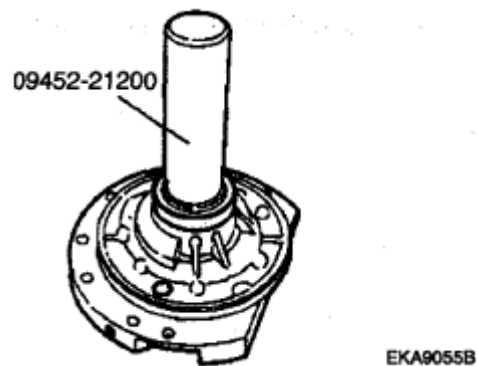
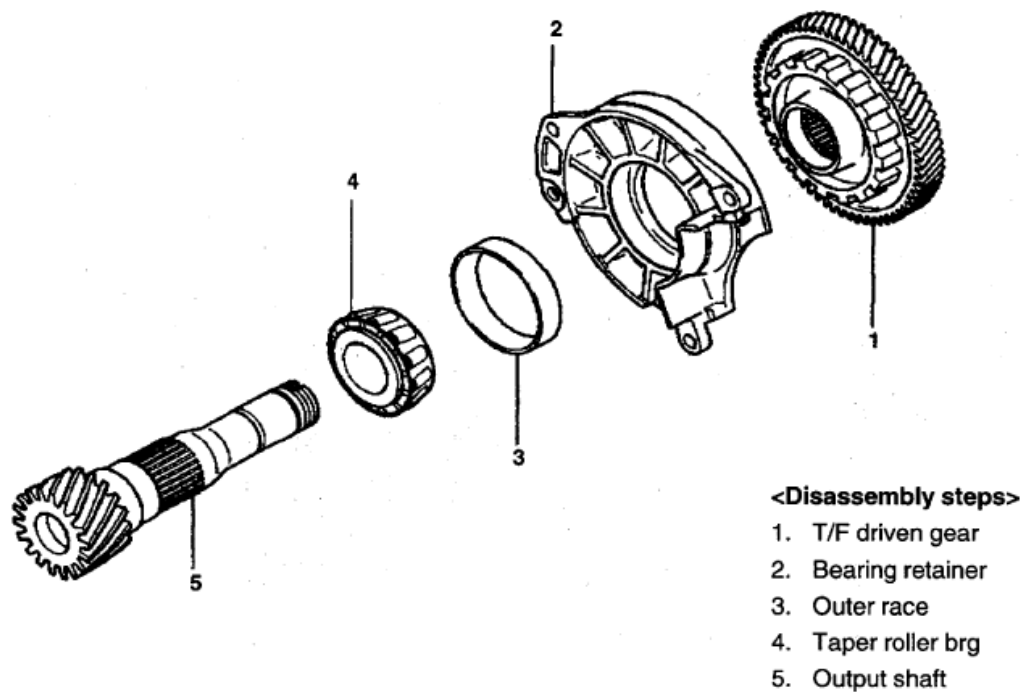


Fig. 178: Removing/Installing Pump Housing Oil Seal
Courtesy of HYUNDAI MOTOR CO.

OUTPUT SHAFT**OUTPUT SHAFT****COMPONENTS**



EKA9056A

Fig. 179: Identifying Output Shaft Components
Courtesy of HYUNDAI MOTOR CO.

REASSEMBLY

1. Remove the transfer driven gear by press.

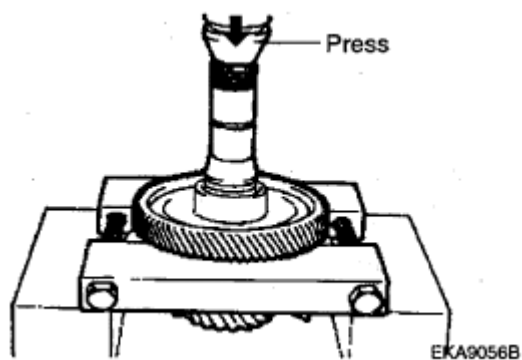


Fig. 180: Removing Transfer Driven Gear By Press
Courtesy of HYUNDAI MOTOR CO.

2. Remove the taper roller bearing.

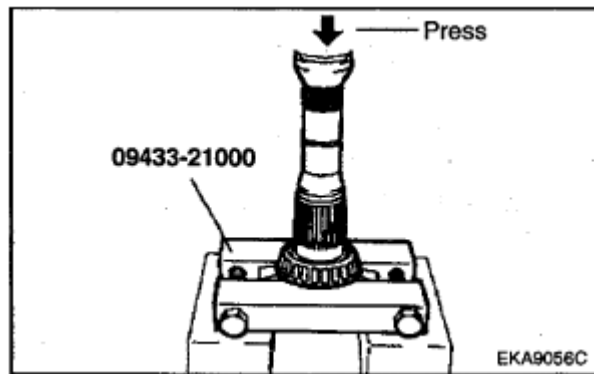
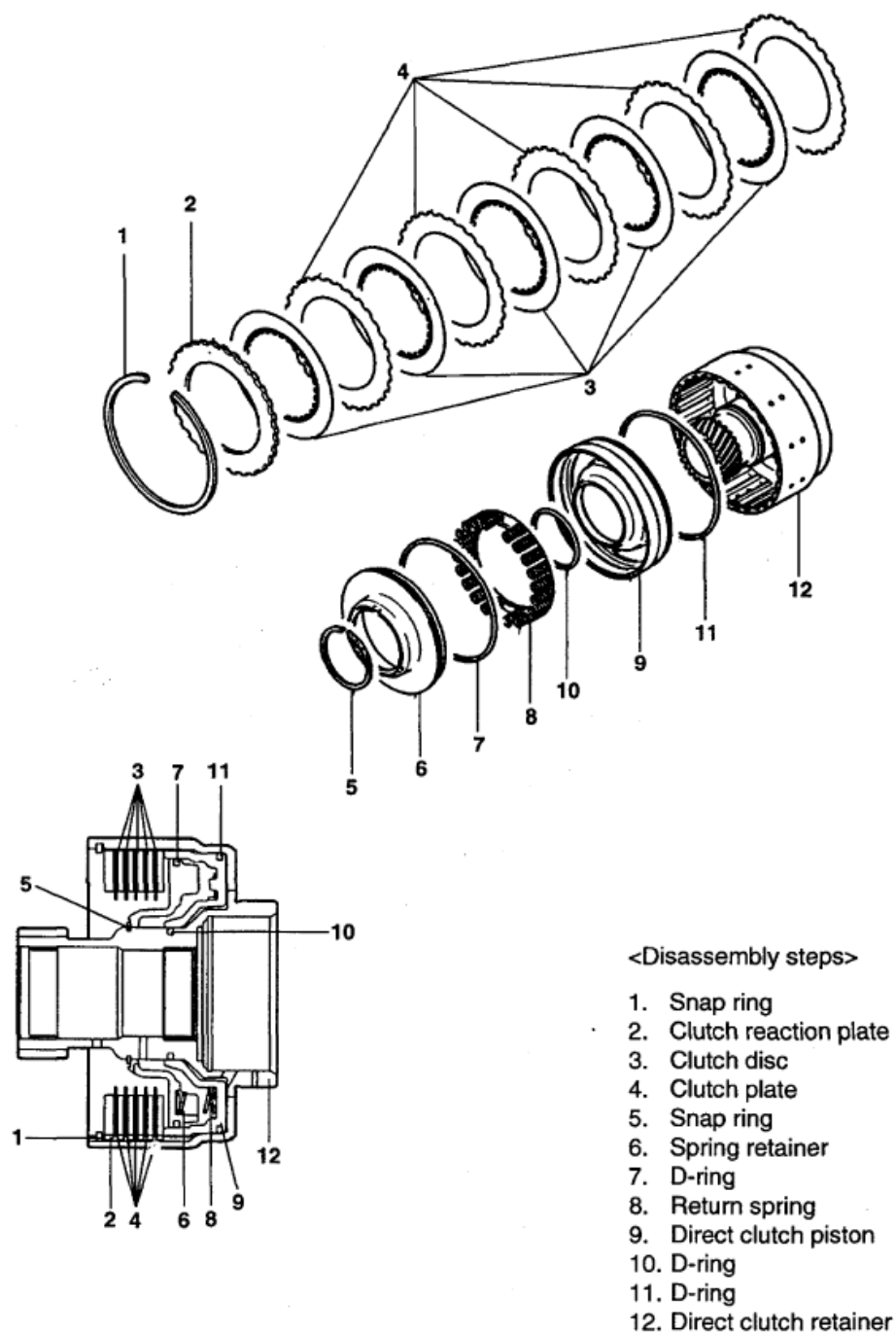


Fig. 181: Removing Taper Roller Bearing
Courtesy of HYUNDAI MOTOR CO.

DIRECT CLUTCH

DIRECT CLUTCH (F5A51 MODEL)

COMPONENTS

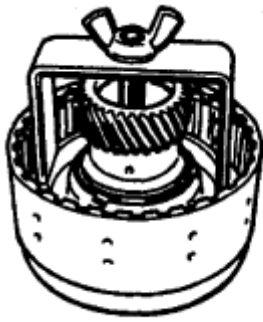


EKB9023A

Fig. 182: Identifying Direct Clutch Components (F5A51 Model)
Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

1. Disassemble the snap-ring with special tool.

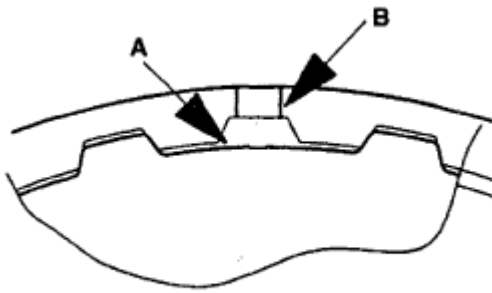


EKB9024A

Fig. 183: Disassembling Snap-Ring With Special Tool
Courtesy of HYUNDAI MOTOR CO.

REASSEMBLY

1. Align the spaces between the teeth (A) on the clutch plates, clutch discs, and clutch reaction plate to the outer circumference hole (B) in the direct clutch retainer.
2. Install the clutch reaction plate.



EKB9024B

Fig. 184: Aligning Spaces Between Teeth On Clutch Plates To Outer Circumference Hole
Courtesy of HYUNDAI MOTOR CO.

3. Check that the clearance between the snap ring and the clutch reaction plate is within the standard value. When measuring the clearance, press the clutch reaction plate by the force of 5kg evenly. If not within the standard value, select a snap ring to adjust.

Standard value : 1.0 -1.2 mm

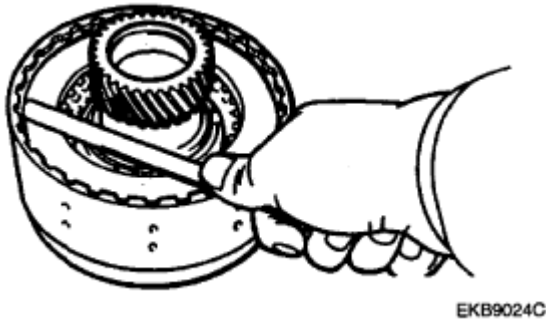
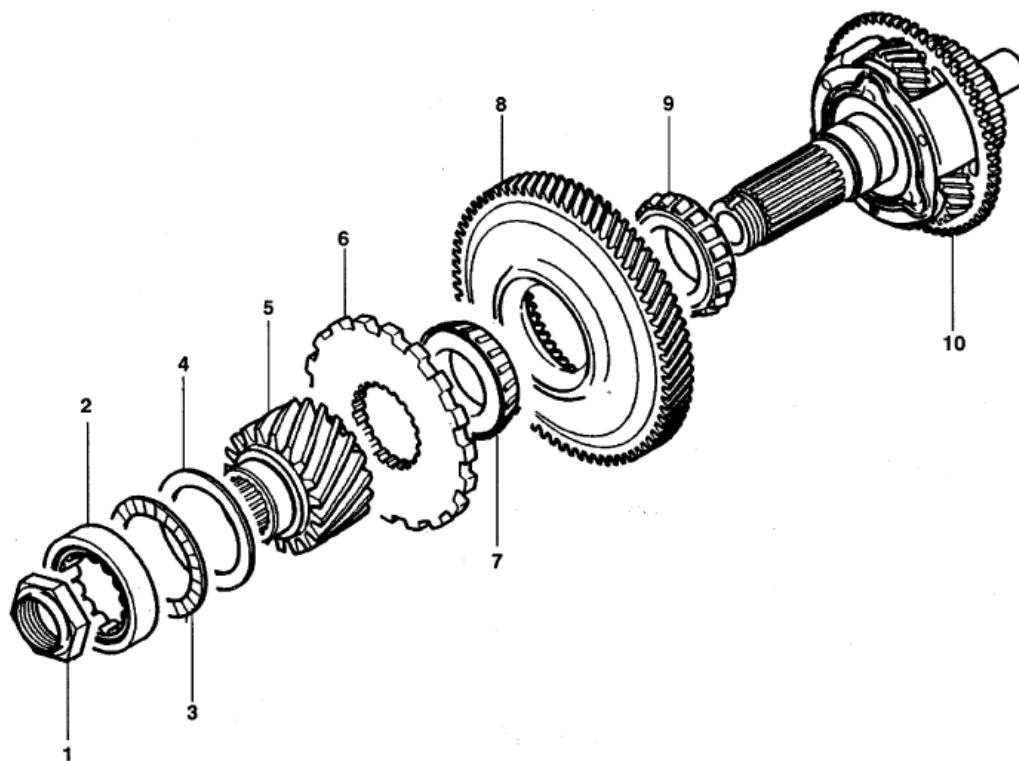


Fig. 185: Checking Clearance Between Snap Ring & Clutch Reaction Plate
Courtesy of HYUNDAI MOTOR CO.

DIRECT PLANETARY CARRIER

DIRECT PLANETARY CARRIER (F5A51 MODEL)

COMPONENTS



<Disassembly steps>

1. Lock nut
2. Roller bearing
3. Thrust bearing #9
4. Thrust race #10
5. Output gear
6. Parking gear
7. Taper roller bearing
8. Transfer driven gear
9. Taper roller bearing
10. Direct planetary carrier

EKB9025A

Fig. 186: Identifying Direct Planetary Carrier Components (F5A51 Model)
Courtesy of HYUNDAI MOTOR CO.

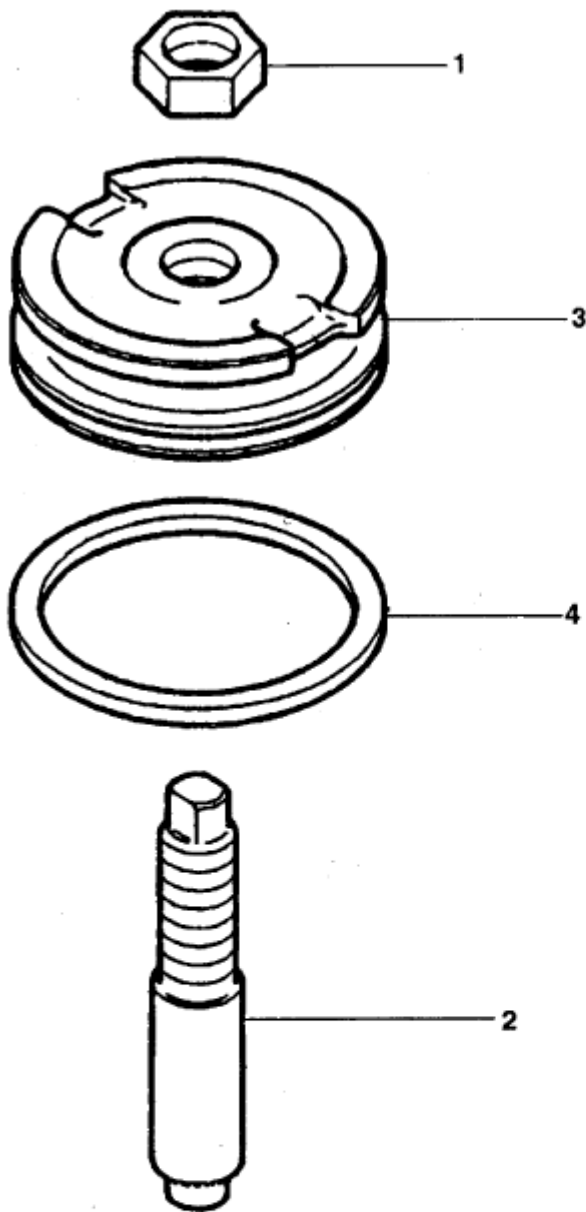
REDUCTION BRAKE PISTON

REDUCTION BRAKE PISTON (F5A51 MODEL)

COMPONENTS

1999 Hyundai Sonata

1999-2008 AUTOMATIC TRANSMISSION Overhaul - F4A42 & F5A51 - Sonata, XG300, & XG350



<Disassembly steps>

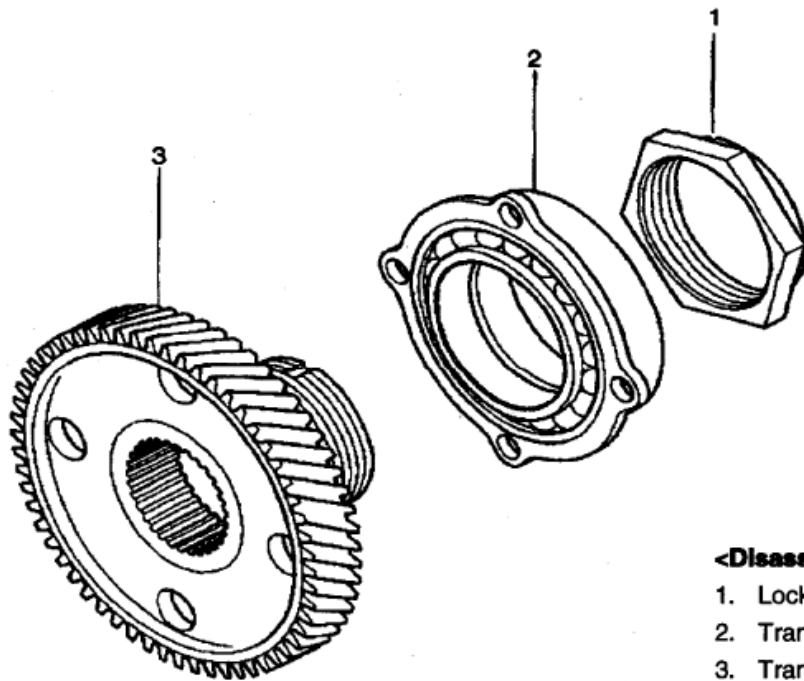
1. Nut
2. Adjust rod
3. Reduction brake piston
4. Seal-ring

Fig. 187: Identifying Reduction Brake Piston Components (F5A51 Model)

Courtesy of HYUNDAI MOTOR CO.

TRANSFER DRIVE GEAR

COMPONENTS



<Disassembly steps>

1. Lock nut
2. Transfer drive gear bearing
3. Transfer drive gear

EKA9057A

Fig. 188: Identifying Transfer Drive Gear Components

Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

1. Loosen the lock nut caulking.



EKA9057B

Fig. 189: Loosening Lock Nut Caulking

Courtesy of HYUNDAI MOTOR CO.

2. Remove the lock by using socket.

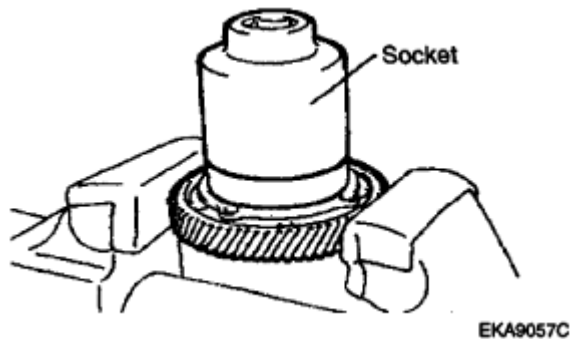


Fig. 190: Removing/Installing Lock Nut
Courtesy of HYUNDAI MOTOR CO.

REASSEMBLY

1. Apply ATF to the new lock nut and tighten to the specified torque. And loosen 1 turn and tighten to the specified torque again

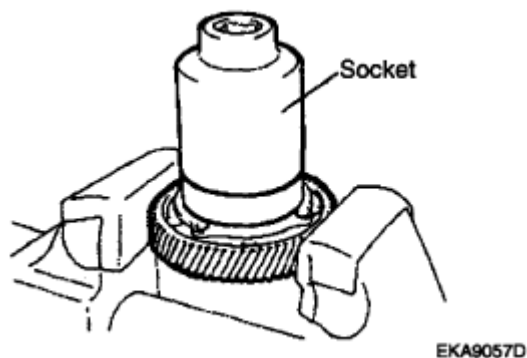


Fig. 191: Tightening Transfer Drive Gear Lock Nut
Courtesy of HYUNDAI MOTOR CO.

2. Caulk the lock nut by using punch.



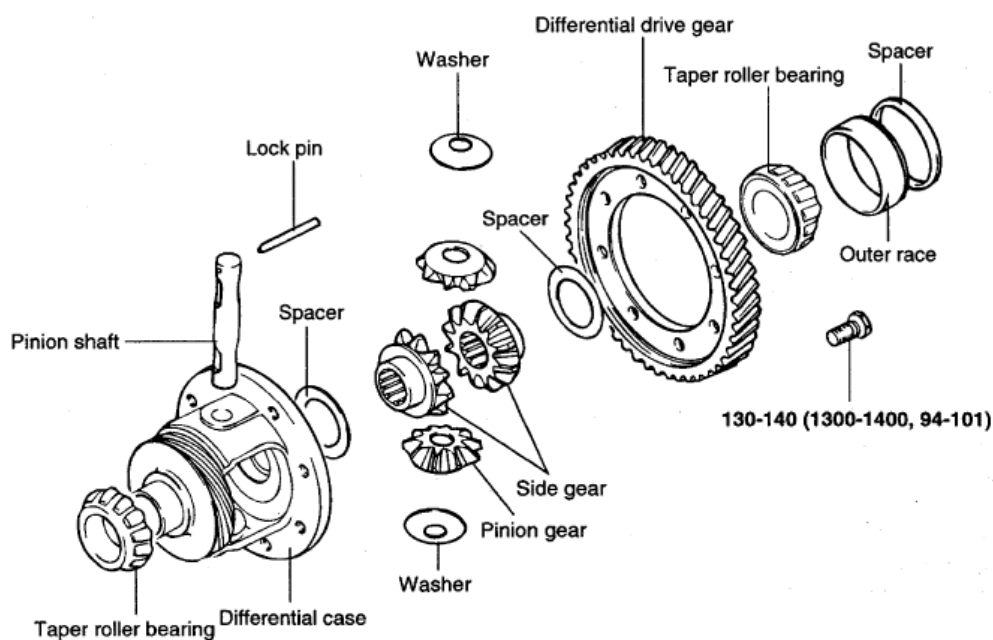
EKA9057E

Fig. 192: Caulking Lock Nut
Courtesy of HYUNDAI MOTOR CO.

DIFFERENTIAL

DIFFERENTIAL

COMPONENTS



V5MT023B

Fig. 193: Identifying Differential Components With Torque Specifications
Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

1. Clamp the differential case in a vise.
2. Remove the differential drive retaining bolts and remove the differential drive gear from the case.

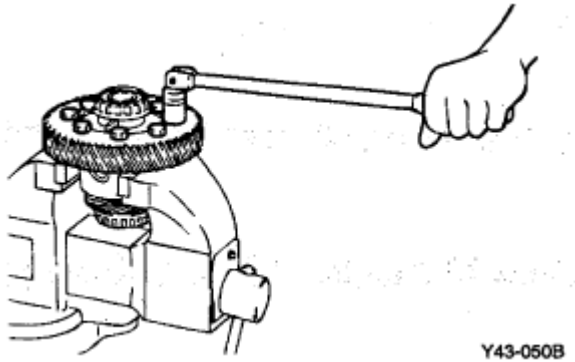


Fig. 194: Removing/Installing Differential Drive Retaining Bolts
Courtesy of HYUNDAI MOTOR CO.

3. Remove the taper bearing using the special tool (09433-21000).

CAUTION: Do not reuse the bearing removed from the shaft.

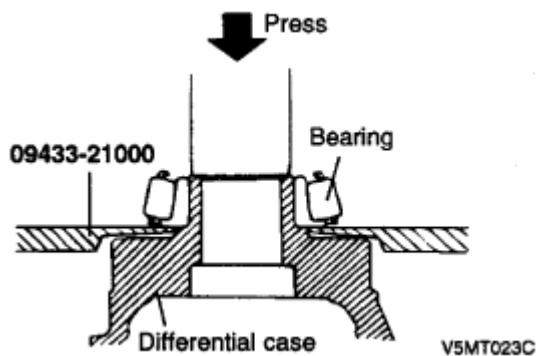


Fig. 195: Removing/Installing Taper Bearing
Courtesy of HYUNDAI MOTOR CO.

4. Drive out the lock pin from the hole A using a punch.
5. Drive out the pinion shaft.
6. Remove the pinion gears, washers, side gear and spacers.

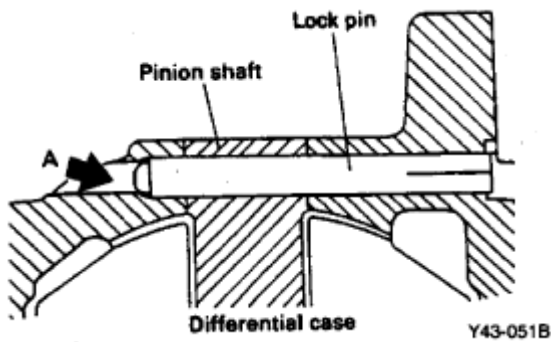


Fig. 196: Identifying Lock Pin, Pinion Shaft, & Differential Case
Courtesy of HYUNDAI MOTOR CO.

REASSEMBLY

1. Install the spacer on the back of the side gear and then install the gear in the differential case.

- CAUTION:**
1. When installing a new side gear, use a spacer of medium thickness [0.83-0.92 mm (0.33-0.036 in.); F4A42, 0.93-1.00 mm (0.37-0.39); F5A51]
 2. Do not reuse the lock pin.
 3. The lock pin head must be sunk below the flange surface of the differential case.



Fig. 197: Removing/Installing Gear In Differential Case
Courtesy of HYUNDAI MOTOR CO.

2. Set the washer on the back of each pinion and insert the two pinions to specified position while engaging them with the side gears by turning them.
3. Insert the pinion shaft.

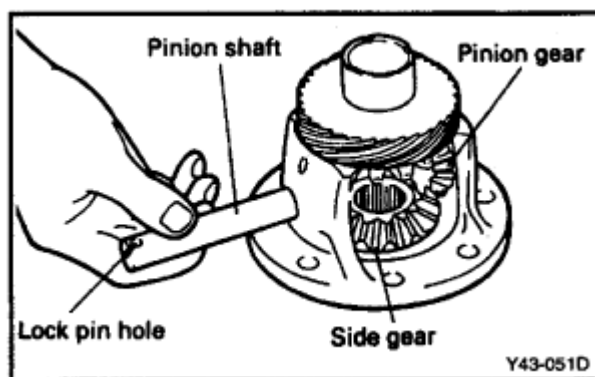


Fig. 198: Inserting Pinion Shaft

Courtesy of HYUNDAI MOTOR CO.

4. Measure the backlash between the side gears and pinions.

Standard value:

0.025-0.150 mm (0.001-0.006 in.)

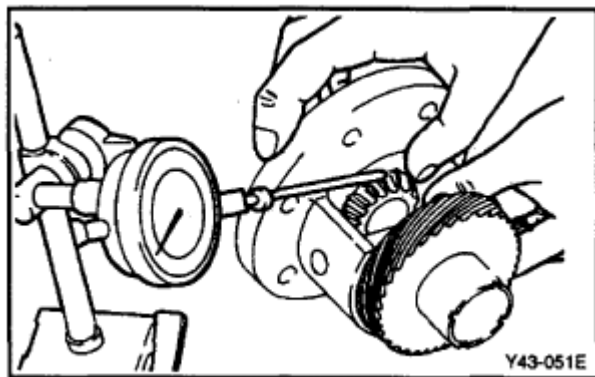


Fig. 199: Measuring Backlash Between Side Gears & Pinions

Courtesy of HYUNDAI MOTOR CO.

5. If the backlash is out of specification, disassemble and install the correct spacer, reassemble and re-measure.

CAUTION: Adjust the backlash of both side gears to the same specification.

6. Align the pinion shaft lock pin hole with the case lock pin hole and insert the lock pin.

CAUTION:

1. Do not reuse the lock pin.
2. The lock pin head must not protrude more than 3 mm (0.0118 in.)

in.) gear in the differential case.

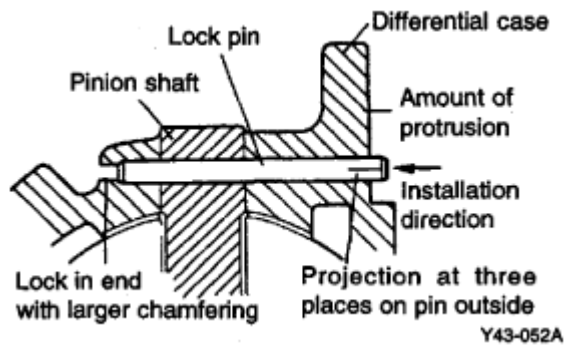


Fig. 200: Aligning Pinion Shaft Lock Pin Hole With Case Lock Pin Hole
Courtesy of HYUNDAI MOTOR CO.

7. Install the tapered roller bearing on both sides of the differential case using the special tool (09455-21100).

CAUTION: When press-fitting the bearing, press on the inner race only.

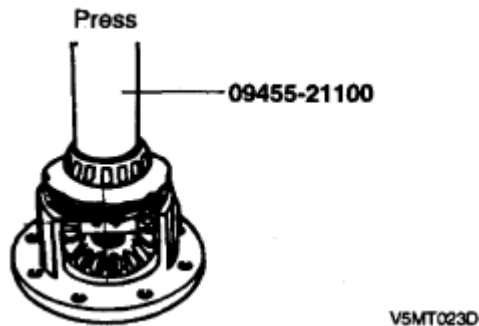


Fig. 201: Removing/Installing Tapered Roller Bearing
Courtesy of HYUNDAI MOTOR CO.

8. Apply specified sealant to the entire threads of the bolts. Tighten to specifications using the sequence shown in **Fig. 202**. Specified sealant: BM stud locking No.2471

CAUTION: If a bolt is reused, remove the old sealant from the threads.

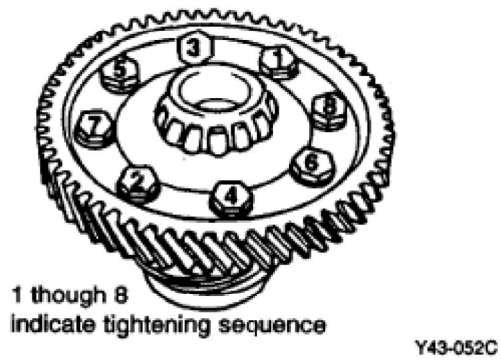
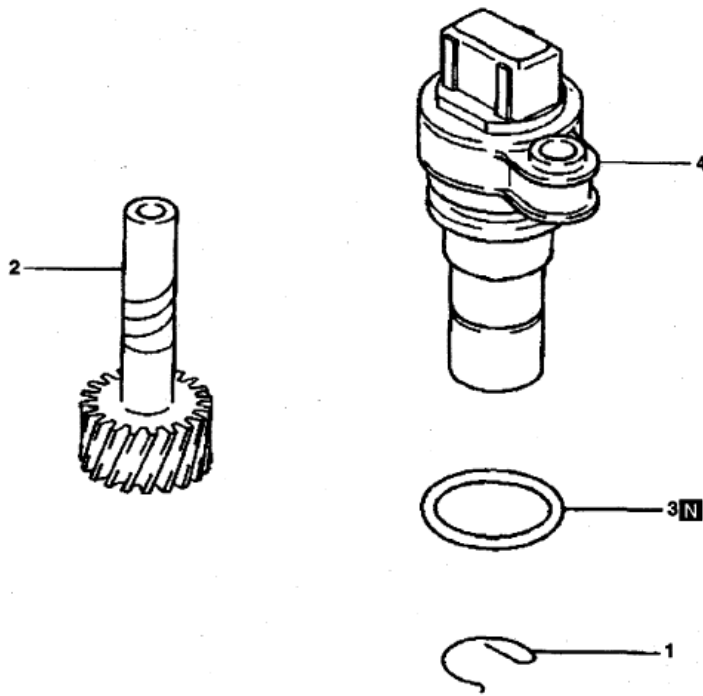


Fig. 202: Identifying Tightening Sequence Of Differential Case Bolts
Courtesy of HYUNDAI MOTOR CO.

SPEEDOMETER DRIVEN GEAR

SPEEDOMETER DRIVEN GEAR

COMPONENTS



<Disassembly steps>

1. E-clip
2. Speedometer driven gear
3. O-ring
4. Sleeve

EKA9058A

Fig. 203: Identifying Speedometer Driven Gear Components
 Courtesy of HYUNDAI MOTOR CO.

1. Apply gear oil sparingly to the speedometer driven shaft and insert the shaft.