



Automatic Transaxle System

General Information

Tightening torque

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
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
Vehicle speed sensor	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
Oil 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	31-36	320-370	23-27
Output shaft lock nut	160-180	1600-1800	110-126
Output shaft bearing retainer	20-26	200-260	14-18
Oil filler tube	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 cross member 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 cross member 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

WARNING

ALWAYS FOLLOW TORQUE TIGHTENING LEVELS. FAILURE TO FOLLOW SUCH LEVELS CAN RESULT IN PARTS BREAKING IF OVER-TIGHTENED OR LOOSENING IF UNDER-TIGHTENED. IN EITHER CASE, SERIOUS PERSONAL INJURY OR DEATH COULD RESULT TO THE VEHICLE OCCUPANTS.





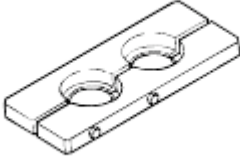
Lubricant

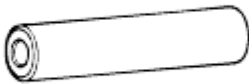
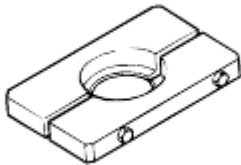



Items	Specified lubricant	Quantity
Transaxle fluid lit.	GENUINE DIAMOND ATF SP-III	8.5lit (8.9US qt, 7.4 Imp qt)





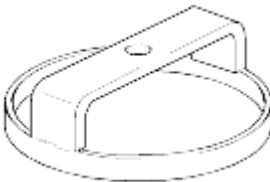
Sealants

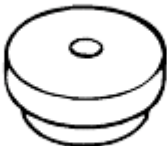

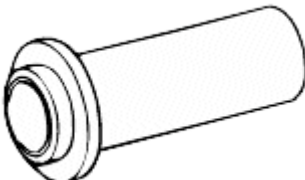
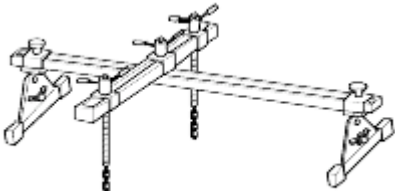
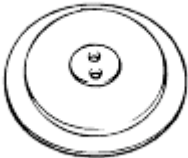
Items	Specified sealant
Rear cover Torque converter housing Valve body cover	HMC's approved sealant TB 1281B or LOCTITE FMD546

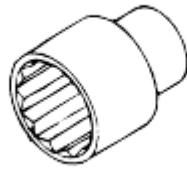
Special service tools

Tool (Number and Name)	Illustration	Use
09453-24000 Snap ring compressor		Removal and installation of the underdrive clutch snap ring.
09452-21401 Guide pin		Installation of the oil pump and transfer drive gear. (use with 09452-21301)
09453-33100 Dial gauge extension		Measurement of the low and reverse and second brake end play.
09431-39000 Oil seal installer		Installation of the drive shaft oil seal.
09432-33200 Remover plate		Removal of the transfer shaft bearing.

09432-33800 Bearing installer		<ol style="list-style-type: none"> 1. Removal of the transfer drive gear taper bearing. (use with 09433-21000) 2. Installation of the transfer shaft bearing.
09433-21000 Remover plate		<ol style="list-style-type: none"> 1. Removal of the transfer drive gear taper bearing. (use with 09432-33800) 2. Removal of the differential ball bearing.
09500-11000 Bar		Installation of the differential outlace bearing. (use with 09532-11500)
09455-33200 Bearing installer		Installation of the differential ball bearing and output shaft taper roller bearing.
09453-21100 Snap ring compressor		Removal and installation of the low and reverse brake snap ring. (use with 09453-2100)
09455-21000 Bearing and gear puller		Removal of the transfer drive gear and bearing.

		
09455-21100 Bearing installer		<ol style="list-style-type: none"> 1. Installation of the transfer drive gear and bearing. 2. Installation of the transfer drive gear taper bearing.
09532-11500 Bearing installer		Installation of the differential outcase bearing. (use with 09500-11000)
09453-21000 Snap ring compressor		<ol style="list-style-type: none"> 1. Removal and installation fo the low & reverse brake snap ring. 2. Removal and installation fo the overdrive clutch snap ring. (use with 09456-39000)
09456-39000 Spring compressor		Removal and installation of the low and reverse brake and overdrive clutch snap ring.
09432-21701 Bearing outlace installer		Installation of the output shaft outlace.

		
09452-33100 Oil pump remover		Removal of the oil pump.
09452-21200 Oil pump oil seal installer		Installation of the oil pump oil seal.
09200-38001 Engine support		Removal and installation of the transaxle.
09456-39100A/B Clearance dummy plate		Measurement of the low and reverse and second brake end play.
09457-39000 Socket wrench (41)		Removal and installation of the output lock nut.



Specifications

Items		Model	F5A51-3
Torque converter type			3 elements, 1 stage, 2 phase
Transaxle type			5-speed forward, 1-speed reverse
Engine type			Σ 3.5 DOHC
Gear ratio	First		3.789
	Second		2.057
	Third		1.421
	Fourth		1.000
	Fifth		0.731
	Reverse		3.865
Final gear ratio			3.333

Service specifications

		in(mm)
Item	Model	F5A51-3
Underdrive clutch end play		0.063 ~ 0.071(1.6~1.8)
Overdrive clutch end play		0.063 ~ 0.071(1.6~1.8)
Reverse clutch end play		0.059~ 0.067(1.5~1.7)
Second brake end play		0.043 ~ 0.061(1.09~1.55)
Low and reverse brake end play		0.065 ~ 0.083(1.65~2.11)
Direct clutch end play		0.024 ~ 0.031(0.6~0.8)
Underdrive sun gear end play		0.0098 ^L ~ 0.0177 ^L (0.25 ^L ~0.45 ^L)
Input shaft end play		0.027 ^L ~ 0.057 ^L (0.70 ^L ~1.45 ^L)
Differential case end play		0.0177 ^T ~ 0.0041 ^T (0.45 ^T ~0.105 ^T)
Differential side gear and pinion gear end play		0.00098 ^L ~ 0.0059 ^L (0.025 ^L ~0.150 ^L)
Brake reaction plate end play		0 ~ 0.0063 ^L (0~0.16 ^L)

Snap ring, spacer, thrust washer and pressure plate

Part name	Models	Thickness in(mm)	Identification symbol
Thrust washer (For adjustment of input shaft end play)	F5A51- 3	0.071(1.8)	18
		0.079(2.0)	20
		0.087(2.2)	22
		0.094(2.4)	24
		0.102(2.6)	26
		0.110(2.8)	28
Snap ring (For adjustment of underdrive clutch and overdrive clutch end play)	F5A51- 3	0.079(2.0)	colorless
		0.083(2.1)	blue
		0.087(2.2)	brown
		0.091(2.3)	colorless
		0.094(2.4)	blue
		0.098(2.5)	brown
		0.102(2.6)	colorless

		0.106(2.7)	blue
		0.110(2.8)	brown
		0.114(2.9)	colorless
		0.118(3.0)	blue
		0.075(1.9)	brown
		0.071(1.8)	blue
		0.067(1.7)	colorless
		0.063(1.6)	brown
Snap ring (For adjustment of low and reverse brake and second brake reaction plate end play)	F5A51-3	0.085(2.2)	colorless
		0.091(2.3)	blue
		0.094(2.4)	brown
		0.098(2.5)	colorless
Pressure plate (For adjustment of low and reverse brake and second brake reaction plate end play)	F5A51-3	0.071(1.8)	E
		0.079(2.0)	D
		0.087(2.2)	C
		0.094(2.4)	B
		0.102(2.6)	A
		0.110(2.8)	O
		0.118(3.0)	I
		0.063(1.6)	F
Snap ring (For adjustment of reverse clutch end play)	F5A51-3	0.079(2.0)	blue
		0.083(2.1)	brown
		0.087(2.2)	colorless
		0.091(2.3)	blue
		0.094(2.4)	brown
		0.098(2.5)	colorless
		0.102(2.6)	blue
		0.106(2.7)	brown
		0.110(2.8)	colorless
		0.075(1.9)	colorless
		0.071(1.8)	brown
		0.067(1.7)	blue
		0.063(1.6)	colorless
Snap ring (For adjustment of reverse brown and overdrive clutch spring retainer colorless end play)	F5A51-3	0.0583(1.48)	brown
		0.0602(1.53)	colorless
		0.0622(1.58)	blue
		0.0642(1.63)	brown
Thrust washer (For adjustment of underdrive sun gear end play) Snap ring (For adjustment of direct clutch end play) Spacer (For adjustment of output shaft preload)	F5A51-3	0.036(1.6)	-
		0.067(1.7)	-
		0.071(1.8)	-
		0.075(1.9)	-
		0.079(2.0)	-
		0.083(2.1)	-
		0.087(2.2)	-

		0.091(2.3)	-
		0.094(2.4)	-
		0.098(2.5)	-
		0.102(2.6)	-
		0.075(1.9)	brown
		0.079(2.0)	colorless
		0.083(2.1)	blue
		0.087(2.2)	brown
		0.091(2.3)	colorless
		0.094(2.4)	blue
		0.098(2.5)	brown
		0.102(2.6)	colorless
		0.106(2.7)	blue
		0.110(2.8)	brown
		0.114(2.9)	colorless
		0.118(3.0)	blue
		0.074(1.88)	88
		0.076(1.92)	92
		0.077(1.96)	96
		0.079(2.00)	00
		0.080(2.04)	04
		0.082(2.08)	08
		0.083(2.12)	12
		0.085(2.16)	16
		0.087(2.20)	20
		0.088(2.24)	24
		0.089(2.28)	28
		0.091(2.32)	32
		0.093(2.36)	36
		0.094(2.40)	40
		0.096(2.44)	44
		0.097(2.48)	48
		0.099(2.52)	52
		0.101(2.56)	56
		0.102(2.60)	60
		0.104(2.64)	64
		0.106(2.68)	68
		0.107(2.72)	72
		0.109(2.76)	76
Spacer (For adjustment of differential gear backlash) Spacer (For adjustment of differential case preload)	F5A51-3	0.024(0.6)	-
		0.027(0.7)	-
		0.031(0.8)	-
		0.035(0.9)	-
		0.039(1.0)	-

		0.043(1.1)	-
		0.047(1.2)	-
		0.051(1.3)	-
		0.055(1.4)	-
		0.033(0.83)	83
		0.034(0.86)	86
		0.035(0.89)	89
		0.036(0.92)	92
		0.037(0.95)	95
		0.038(0.98)	98
		0.040(1.01)	01
		0.041(1.04)	04
		0.042(1.07)	07
		0.043(1.10)	10
		0.044(1.13)	13
		0.046(1.16)	16
		0.047(1.19)	19
		0.048(1.22)	22
		0.049(1.25)	25
		0.050(1.28)	28
		0.052(1.31)	31
		0.053(1.34)	34
		0.054(1.37)	37

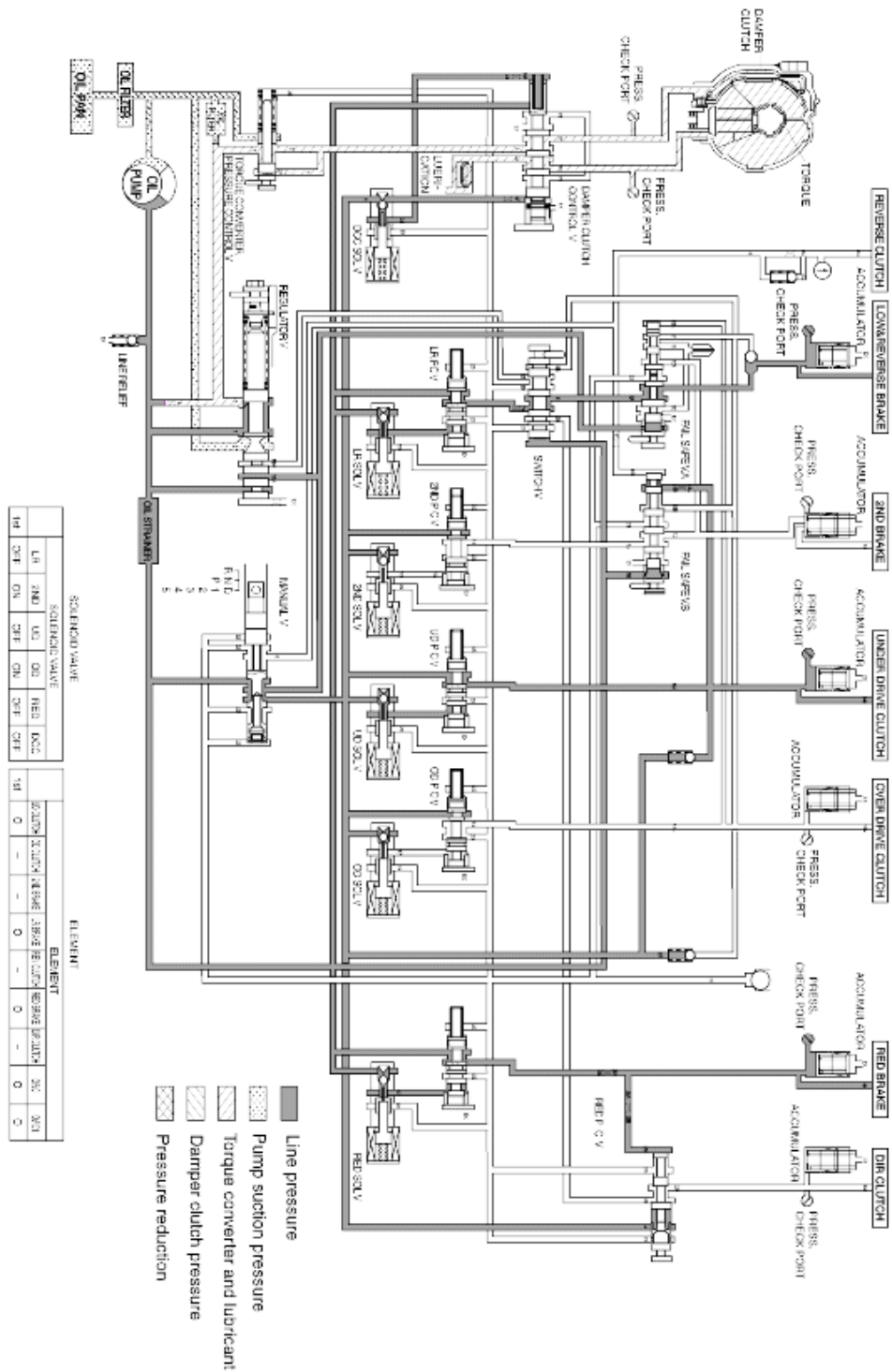


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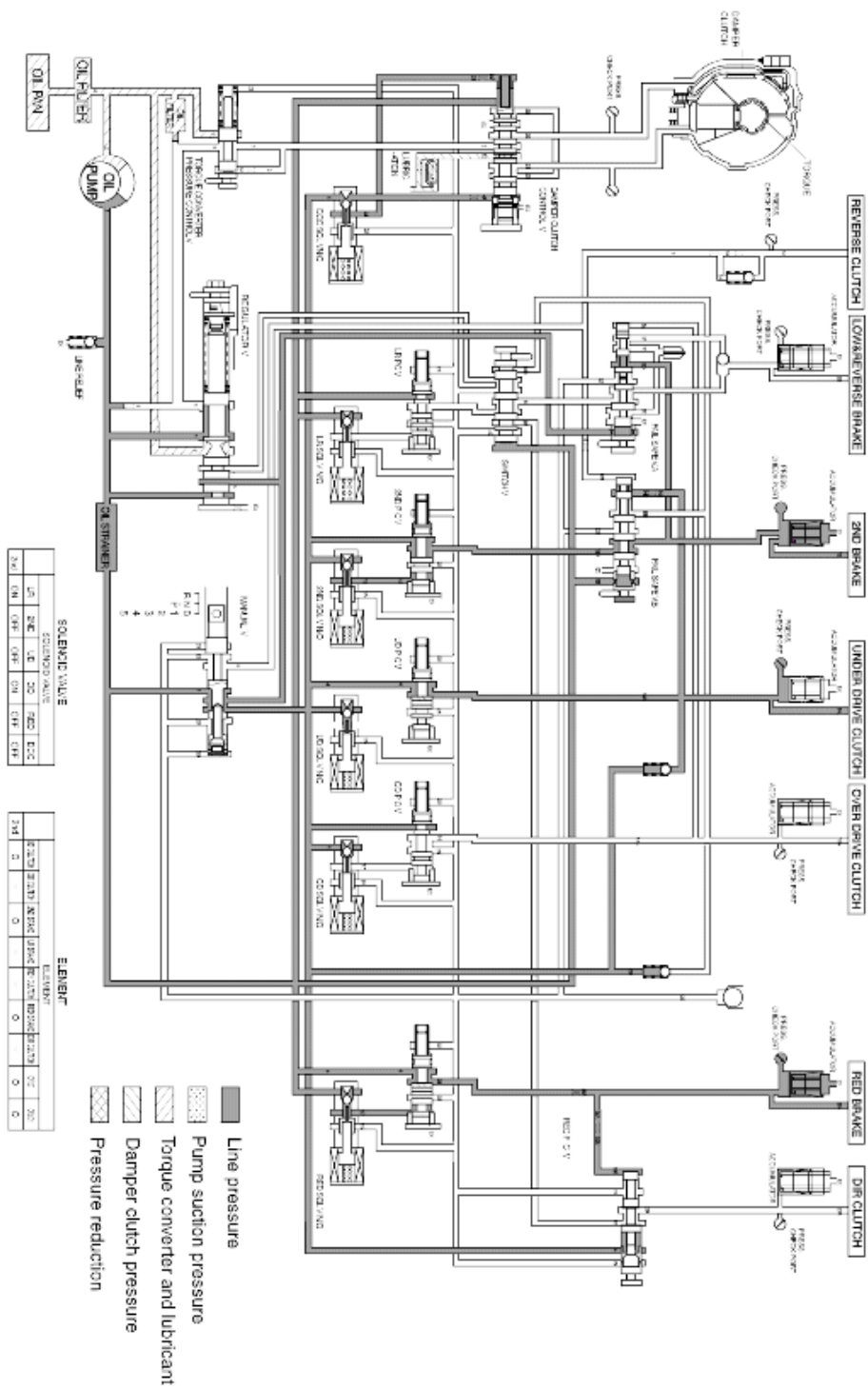
Automatic Transaxle System

Hydraulic pressure circuit

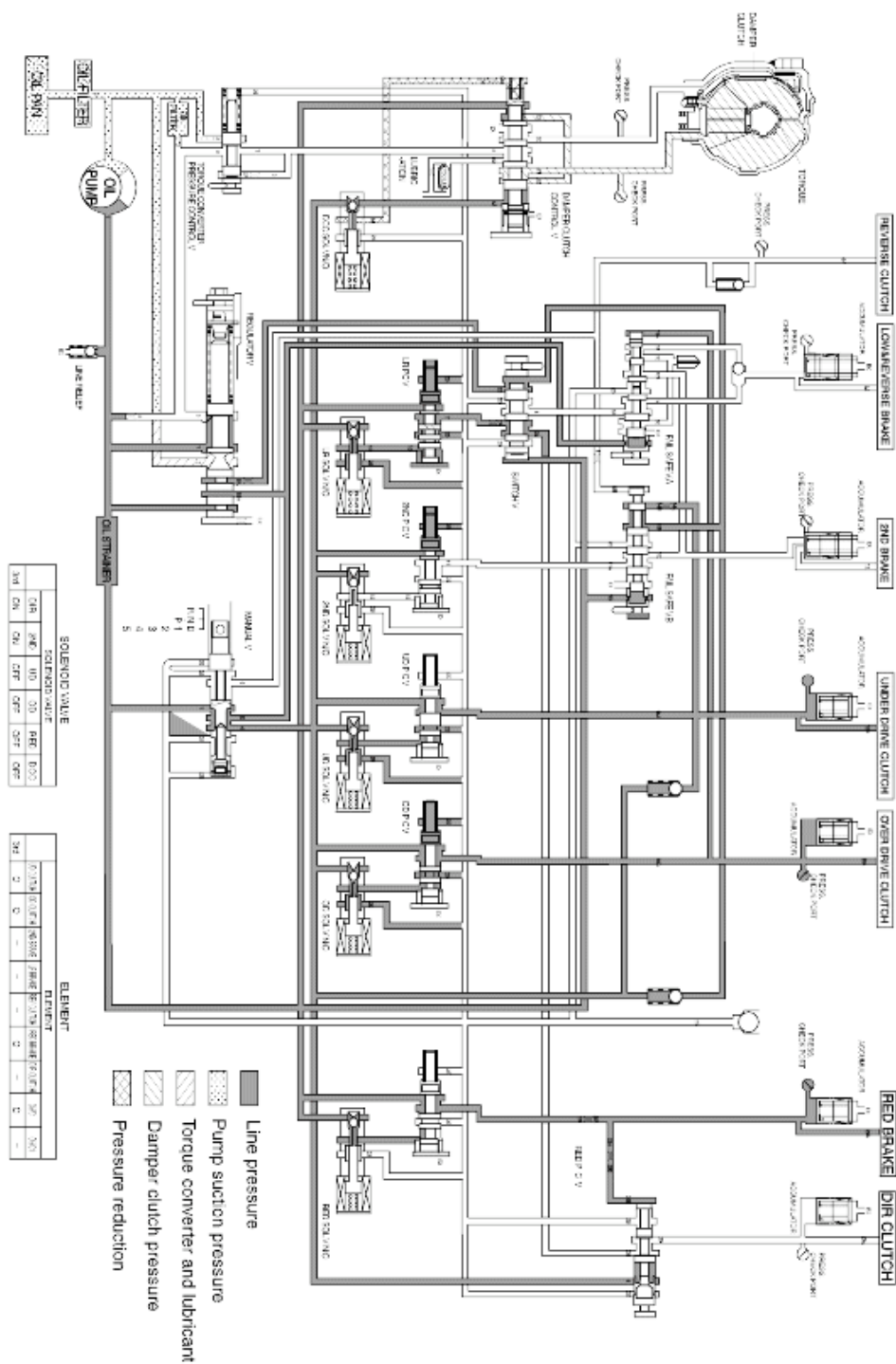
First speed



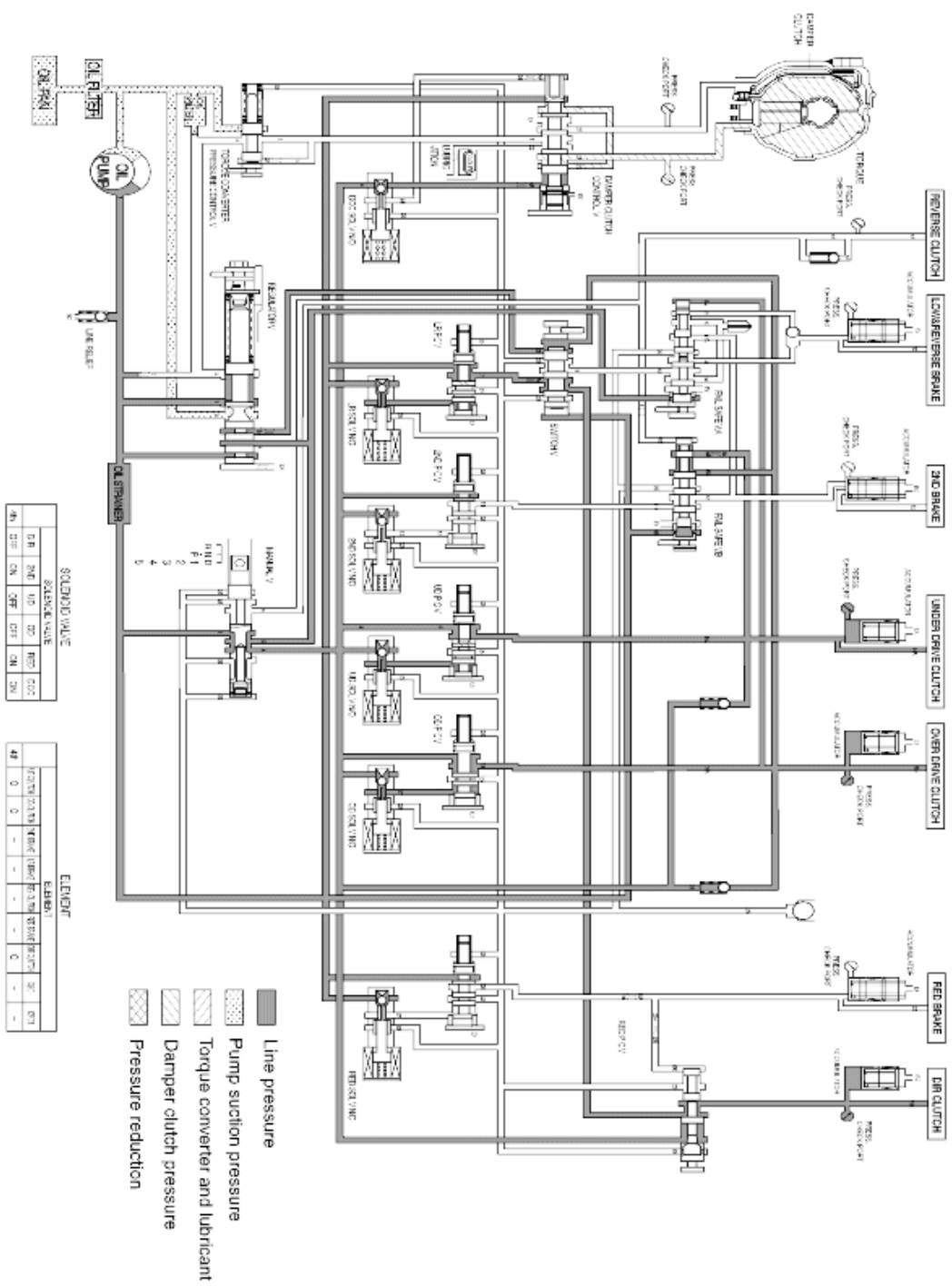
Second speed



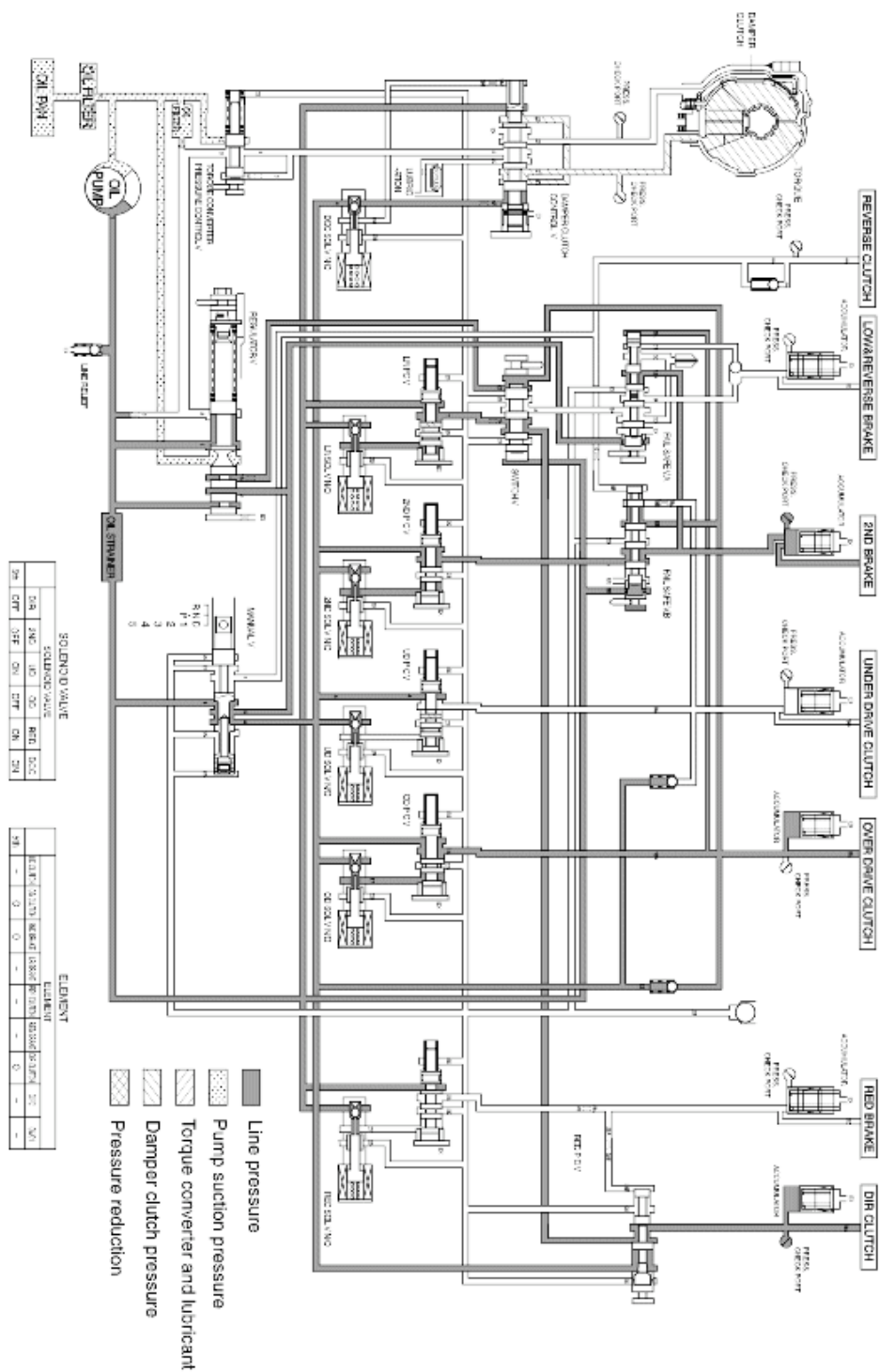
Third speed



Fourth speed



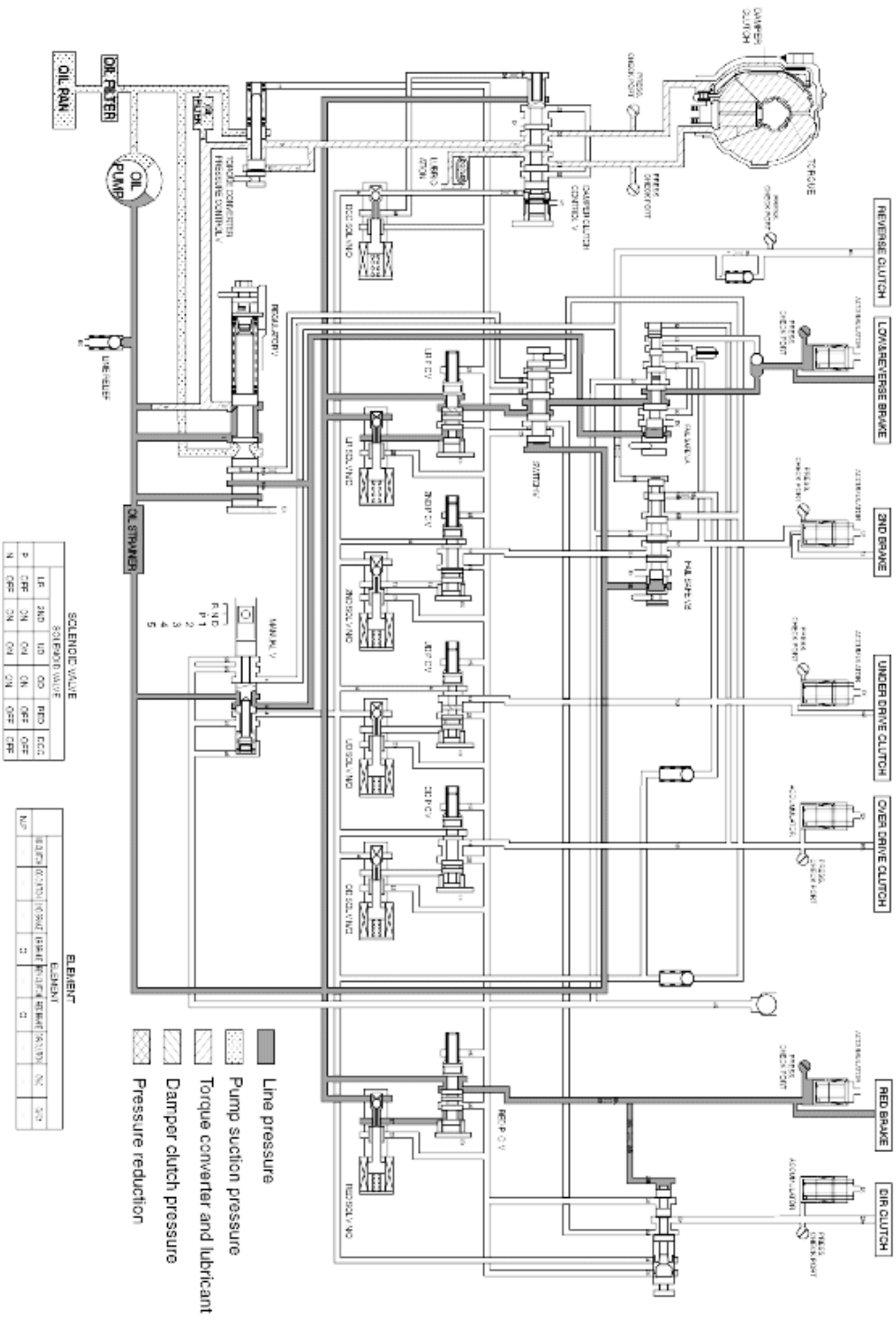
Fifth speed

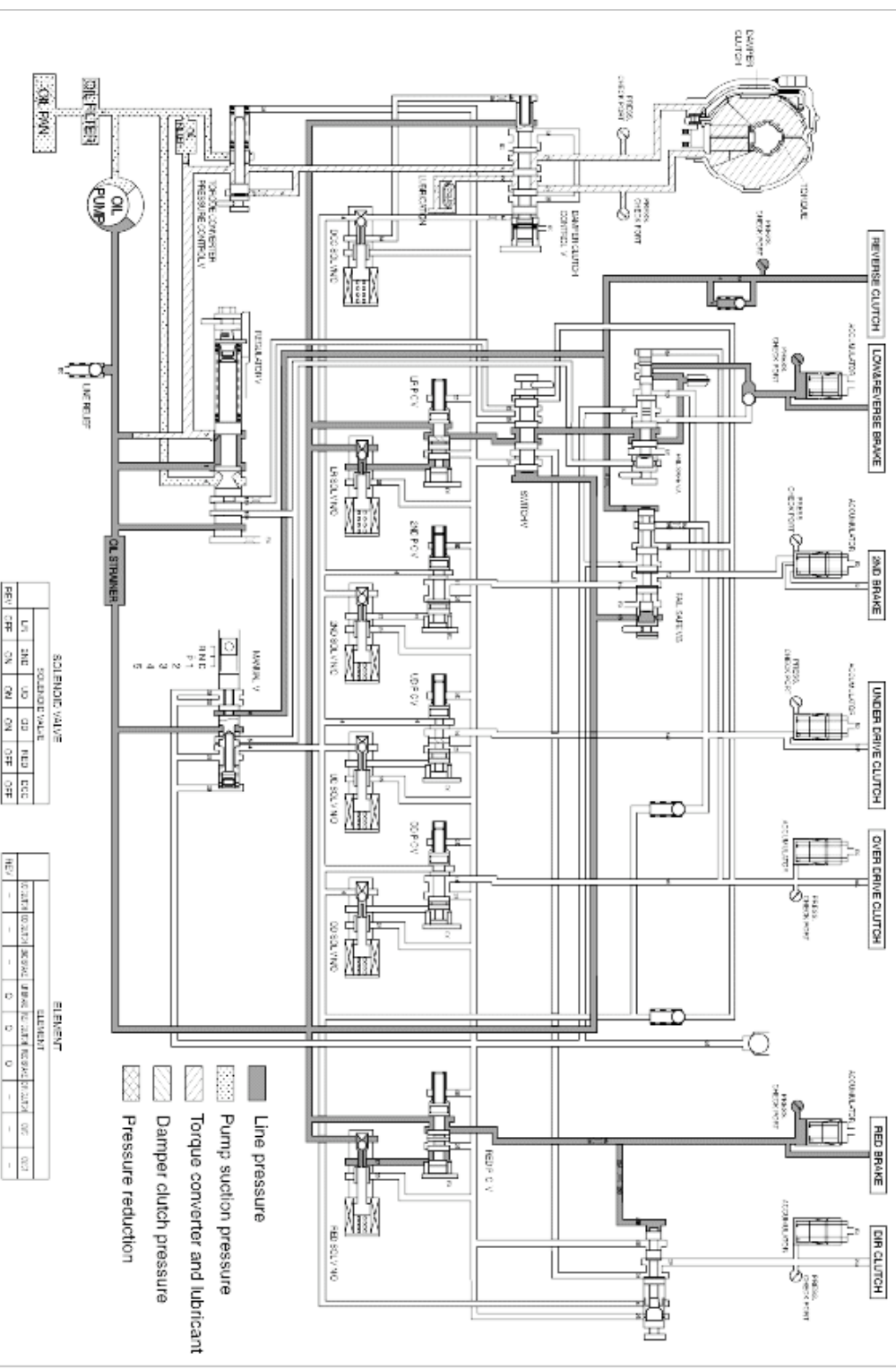


SOLENOID VALVE					
	DS	LV	2D	OD	RT
ON	OFF	ON	OFF	ON	ON

ELEMENT					
	DS	LV	2D	OD	RT
ON	OFF	ON	OFF	ON	ON

Neutral and parking





SCHEMATIC VALVE

LINE	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	11TH	12TH	13TH	14TH	15TH	16TH	17TH	18TH	19TH	20TH	21TH	22TH	23TH	24TH	25TH	26TH	27TH	28TH	29TH	30TH	31TH	32TH	33TH	34TH	35TH	36TH	37TH	38TH	39TH	40TH	41TH	42TH	43TH	44TH	45TH	46TH	47TH	48TH	49TH	50TH	51TH	52TH	53TH	54TH	55TH	56TH	57TH	58TH	59TH	60TH	61TH	62TH	63TH	64TH	65TH	66TH	67TH	68TH	69TH	70TH	71TH	72TH	73TH	74TH	75TH	76TH	77TH	78TH	79TH	80TH	81TH	82TH	83TH	84TH	85TH	86TH	87TH	88TH	89TH	90TH	91TH	92TH	93TH	94TH	95TH	96TH	97TH	98TH	99TH	100TH
LINE	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	11TH	12TH	13TH	14TH	15TH	16TH	17TH	18TH	19TH	20TH	21TH	22TH	23TH	24TH	25TH	26TH	27TH	28TH	29TH	30TH	31TH	32TH	33TH	34TH	35TH	36TH	37TH	38TH	39TH	40TH	41TH	42TH	43TH	44TH	45TH	46TH	47TH	48TH	49TH	50TH	51TH	52TH	53TH	54TH	55TH	56TH	57TH	58TH	59TH	60TH	61TH	62TH	63TH	64TH	65TH	66TH	67TH	68TH	69TH	70TH	71TH	72TH	73TH	74TH	75TH	76TH	77TH	78TH	79TH	80TH	81TH	82TH	83TH	84TH	85TH	86TH	87TH	88TH	89TH	90TH	91TH	92TH	93TH	94TH	95TH	96TH	97TH	98TH	99TH	100TH

ELEMENT

LINE	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	11TH	12TH	13TH	14TH	15TH	16TH	17TH	18TH	19TH	20TH	21TH	22TH	23TH	24TH	25TH	26TH	27TH	28TH	29TH	30TH	31TH	32TH	33TH	34TH	35TH	36TH	37TH	38TH	39TH	40TH	41TH	42TH	43TH	44TH	45TH	46TH	47TH	48TH	49TH	50TH	51TH	52TH	53TH	54TH	55TH	56TH	57TH	58TH	59TH	60TH	61TH	62TH	63TH	64TH	65TH	66TH	67TH	68TH	69TH	70TH	71TH	72TH	73TH	74TH	75TH	76TH	77TH	78TH	79TH	80TH	81TH	82TH	83TH	84TH	85TH	86TH	87TH	88TH	89TH	90TH	91TH	92TH	93TH	94TH	95TH	96TH	97TH	98TH	99TH	100TH
LINE	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	11TH	12TH	13TH	14TH	15TH	16TH	17TH	18TH	19TH	20TH	21TH	22TH	23TH	24TH	25TH	26TH	27TH	28TH	29TH	30TH	31TH	32TH	33TH	34TH	35TH	36TH	37TH	38TH	39TH	40TH	41TH	42TH	43TH	44TH	45TH	46TH	47TH	48TH	49TH	50TH	51TH	52TH	53TH	54TH	55TH	56TH	57TH	58TH	59TH	60TH	61TH	62TH	63TH	64TH	65TH	66TH	67TH	68TH	69TH	70TH	71TH	72TH	73TH	74TH	75TH	76TH	77TH	78TH	79TH	80TH	81TH	82TH	83TH	84TH	85TH	86TH	87TH	88TH	89TH	90TH	91TH	92TH	93TH	94TH	95TH	96TH	97TH	98TH	99TH	100TH

- Line pressure
- Pump suction pressure
- Torque converter and lubricant
- Damper clutch pressure
- Pressure reduction

Sensor and actuator functions

Item	Functions
Input speed sensor	Detect the turbine rpm at the UD retainer part
Output speed sensor	Detect at the direct planetary carrier part
Crank angle sensor	Detect the engine rpm at the crankshaft part
TPS	Detect the pedal press level through the potentiometer
Fluid temperature sensor	Detect the ATF temperature through the thermistor
Transaxle range switch	Detect the shift lever position by the contact switch
Stop lamp switch	Detect the brake operation by the contact switch at the brake pedal part
Vehicle speed sensor	Detect the vehicle speed at the speedometer gear part
Air conditioner load switch	Detect the compressor operation through the hydraulic pressure switch
A/T control relay	Power supply to the solenoid valve
DCC solenoid valve	Control the fluid pressure to the pressure control valve for shift control
LR (DIR) solenoid valve	Control the fluid pressure to the pressure control valve for shift control
2ND solenoid valve	Control the fluid pressure to the pressure control valve for shift control
UD solenoid valve	Control the fluid pressure to the pressure control valve for shift control
OD solenoid valve	Control the fluid pressure to the pressure control valve for shift control
RED solenoid valve	Control the fluid pressure to the pressure control valve for shift control
Engine ECM	Receive the control signals via communication with A/T ECM

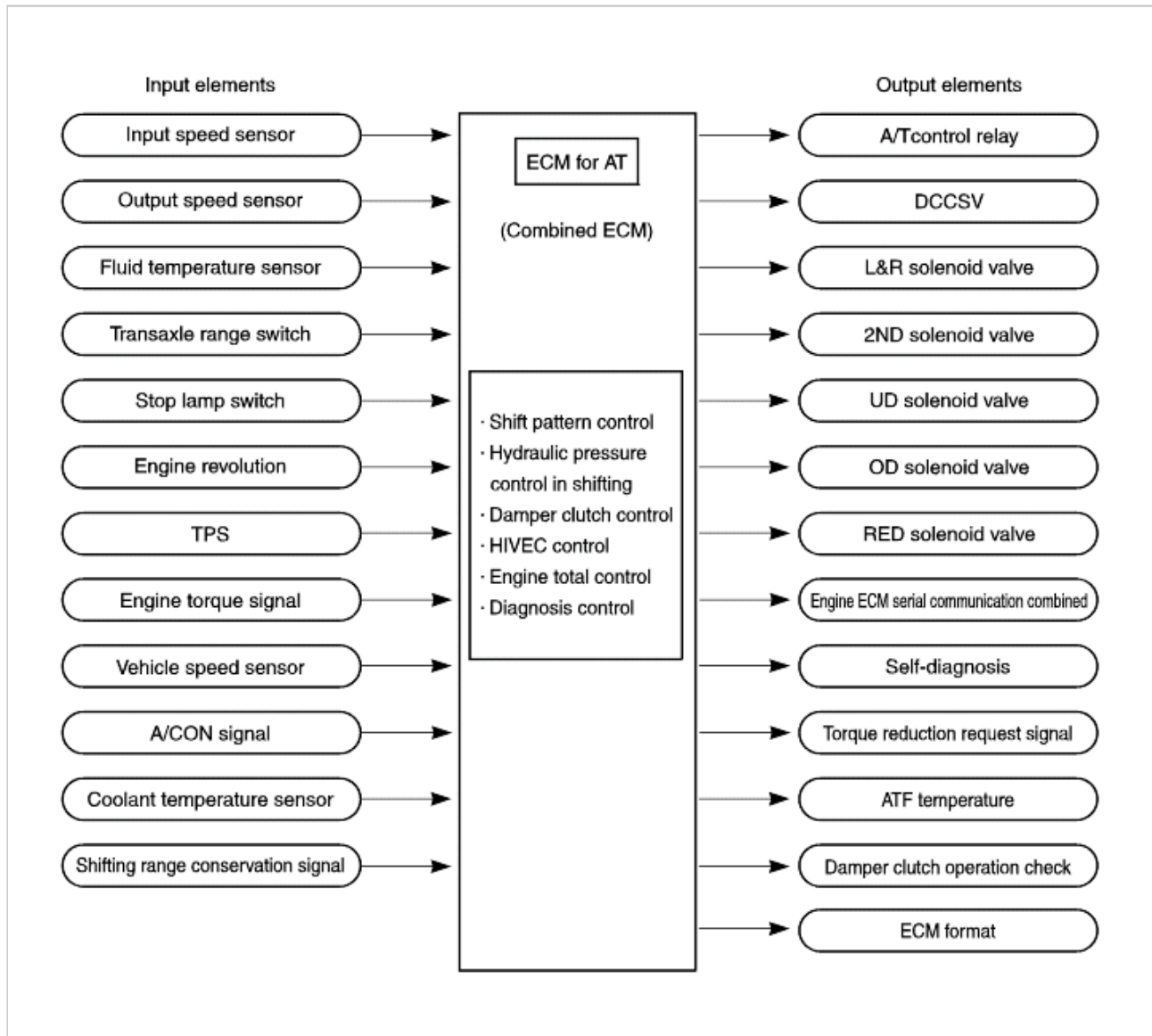
Electronic control system

Summary

HMC has integrated nervous network and artificial intelligence onto HIVEC (Hyundai Intelligent Vehicle Electronic Control) Control System.

HIVEC System will provide optimum shift control in accordance with driver's habit and driving condition. Each clutch or brake has its own solenoid valve to implement clutch-to-clutch control, and then most comfortable shifting and durability are ensured.

Input/output chart



Clutch and brake operating elements of each shifting range

Range		UD clutch	OD clutch	2ND brake	LR brake	REV clutch	RED brake	DIR clutch	OWC	OWC1
P		-	-	-	o	-	o	-	-	-
R		-	-	-	o	o	o	-	-	-
N		-	-	-	o	-	o	-	-	-
D	First speed	o	-	-	(o)	-	o	-	o	o
	Second speed	o	-	o	-	-	o	-	o	-

	Third speed	o	o	-	-	-	o	-	o	-
	Fourth speed	o	o	-	-	-	-	o	-	-
	Fifth speed	-	o	o	-	-	-	o	-	-

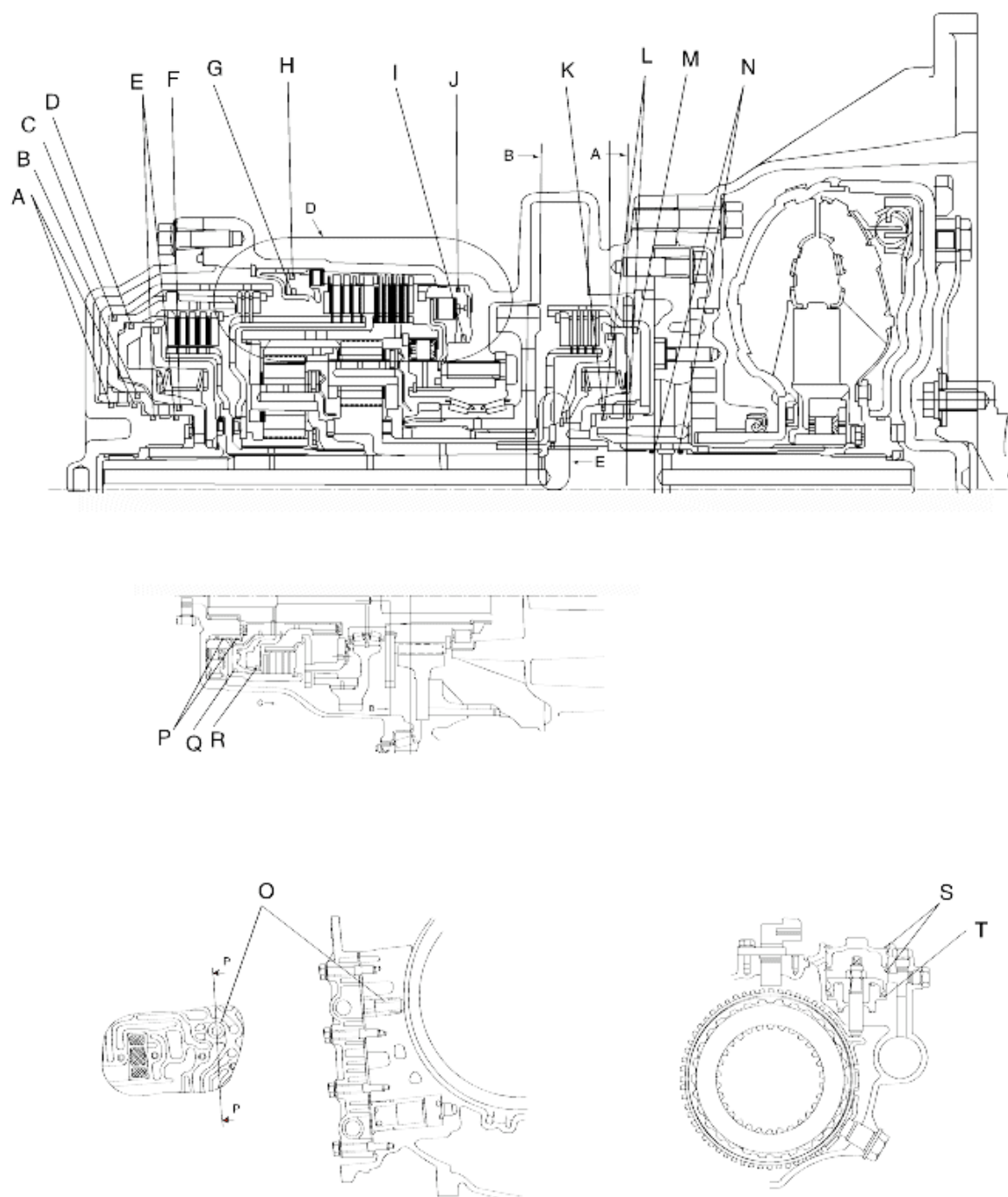
Clutch and brake function

Operating elements	Symbol	Function
Underdrive clutch	UD	Connect between input shaft and underdrive sun gear
Reverse clutch	REV	Connect between input shaft and reverse sun gear
Overdrive clutch	OD	Connect between input shaft and overdrive carrier
Director clutch	DIR	Connect between director sun gear and director carrier
Low and reverse brake	LR	Hold annulus gear and overdrive carrier
Second brake	2ND	Hold reverse sun gear
Reduction brake	RED	Hold director sun gear
One way clutch	OWC	Restrict director sun gear turning direction
One way clutch 1	OWC1	Restrict low and reverse ring gear turning direction

Solenoid valve operating elements of each shift range

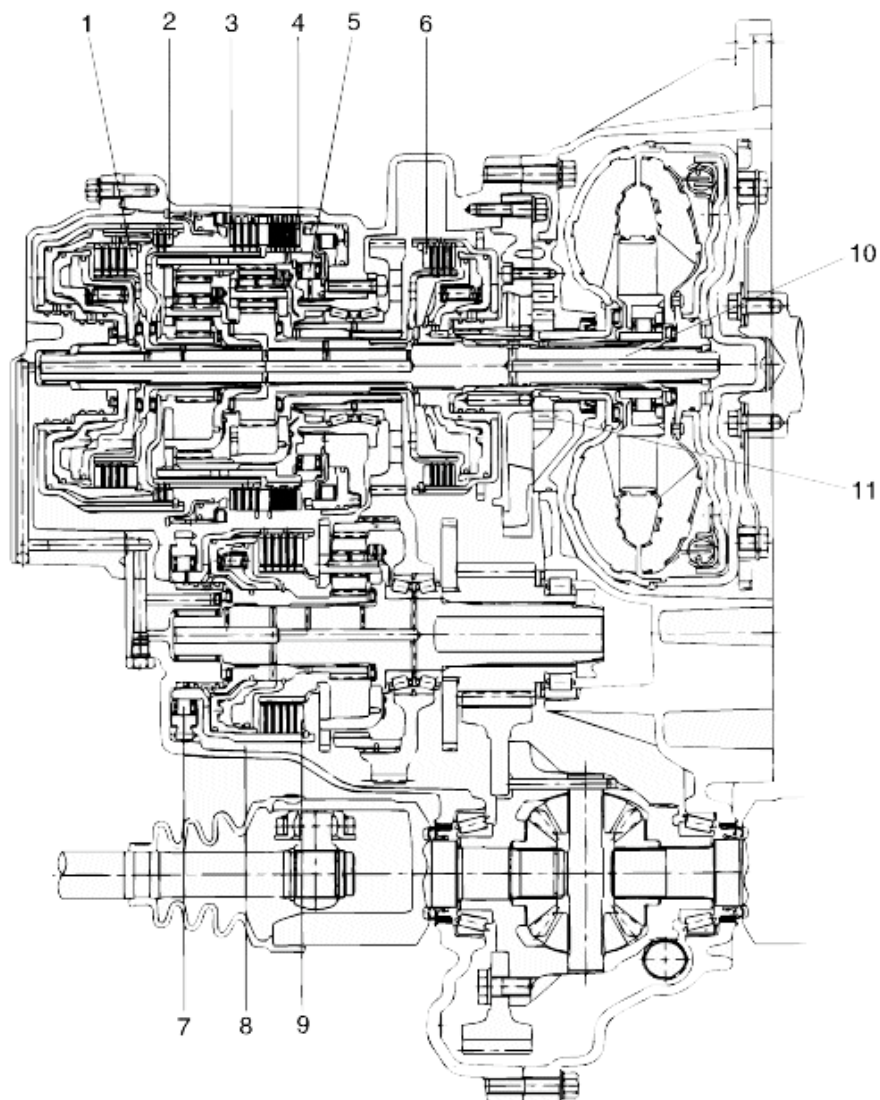
Item	Solenoid valve					
Shift range	LR (DIR)	2ND	UD	OD	RED	DCC(reference)
First speed	OFF (LR)	ON	OFF	ON	OFF	OFF
Second speed	ON (LR)	OFF	OFF	ON	OFF	OFF
Third speed	ON (DIR)	ON	OFF	OFF	OFF	OFF
Fourth speed	OFF (DIR)	ON	OFF	OFF	ON	ON
Fifth speed	OFF (DIR)	OFF	ON	OFF	ON	ON
Reverse	OFF (LR)	ON	ON	ON	OFF	OFF
Neutral, parking	OFF (LR)	ON	ON	ON	OFF	OFF

Oil seal locations



SERVICE ADJUSTMENT PROCEDURES

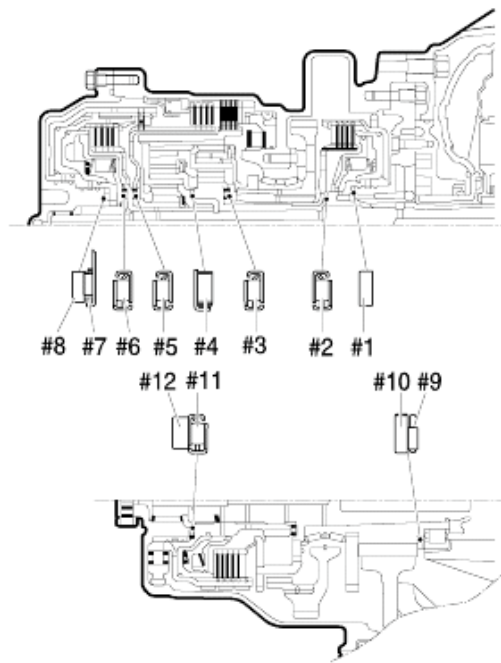
Sectional view



- 1. Overdrive clutch
- 2. Reverse clutch
- 3. Second clutch
- 4. Low and reverse clutch
- 5. One way clutch 1
- 6. Underdrive clutch

- 7. One way clutch 2
- 8. Reduction clutch
- 9. Director clutch
- 10. Input shaft
- 11. Oil pump

Component



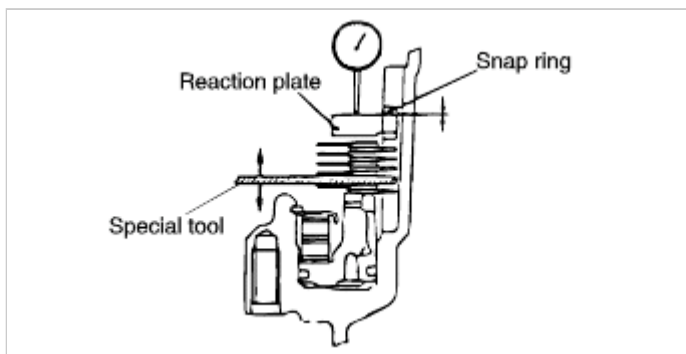
End play adjustment procedure

Adjusting the brake reaction plate end play.

Replace/LR brake plate using the special tool, and install the brake disc, the brake plate, and the snap ring as illustrated on the figure. Install the reaction plate and the snap ring. Move the special tool and measure the end play. Adjust the end play into standard range using a new snap ring.

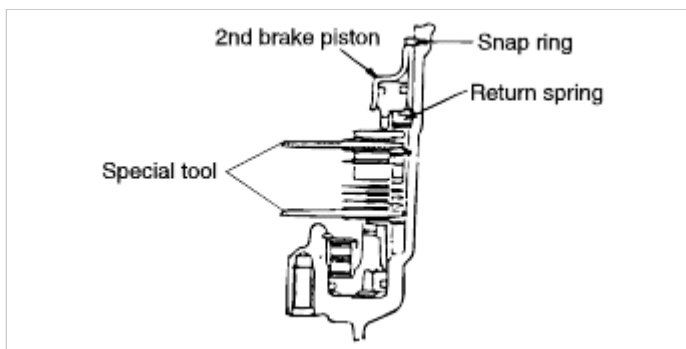
Standard end play

F5A52-3 : 0~0.0063in(0~0.16mm)



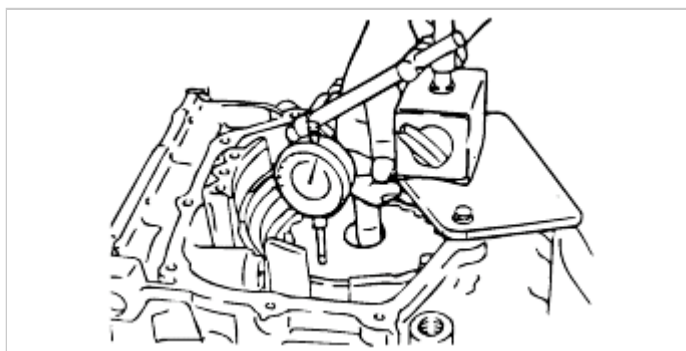
Adjusting 2nd brake end play

Replace the second brake pressure plate using the special tool and install the brake disc and the brake plate as illustrated on the figure. Install the return spring, the second brake piston and the snap ring.



Standard end play

F5A51-3 : 0.039~0.061in(1.09~1.55mm)



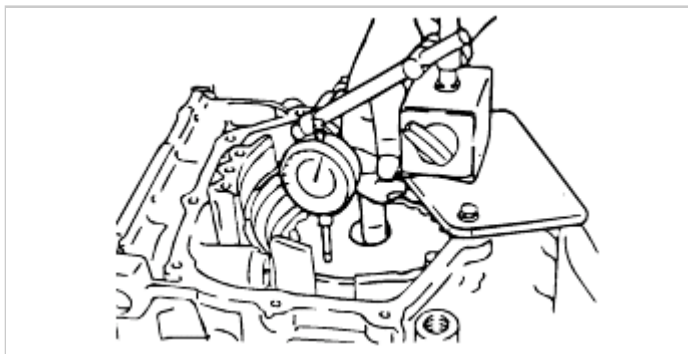
Adjusting LR brake end play

Rotate transaxle.

Adjust the end play of the pivot.

Standard end play

F5A51-3 : 0.065~0.083 in (1.65~2.11 mm)

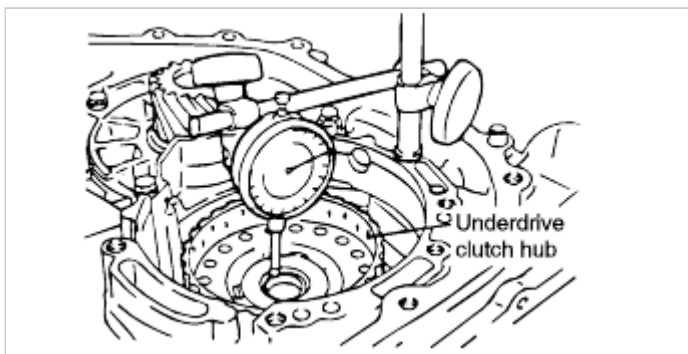


Adjusting underdrive sun gear end play

Assemble the used thrust race (No.8) and the rear cover. Measure the underdrive sun gear. Adjust the end play to standard value using a new thrust race (No.8).

Standard value

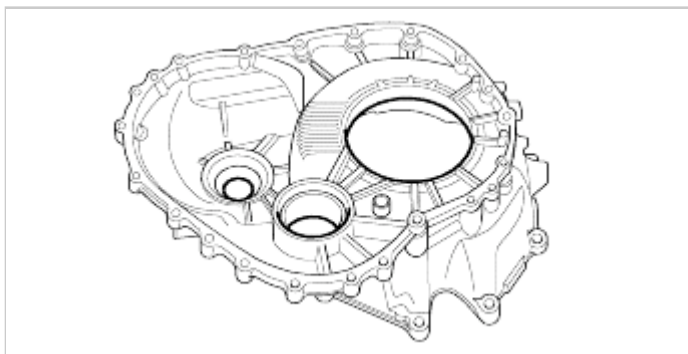
F5A52-3 : 0.0098L~0.0177L (0.25L~0.45L mm)



Assemble underdrive clutch hub, then it will be easy to measure underdrive sun gear.

Adjusting differential case preload

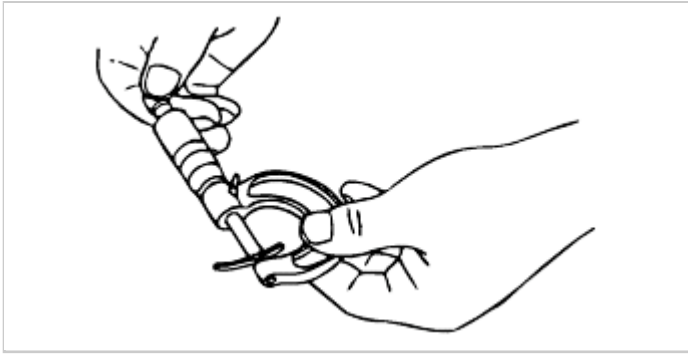
Place 3 solders (length 10mm approx. dia 3mm) on the torque converter housing as illustrated on the figure.



Assemble the torque converter housing on the transaxle case without applying sealant. Tighten the connecting bolts with tightening torque. Release the bolts and remove the solders. Measure solder's compressed thickness (T) using a micrometer. Use one within standard value.

Standard value

F5A52-3 : 0.0177T~0.0041T (0.45T~0.105T mm)



Thrust bearing and thrust race identification

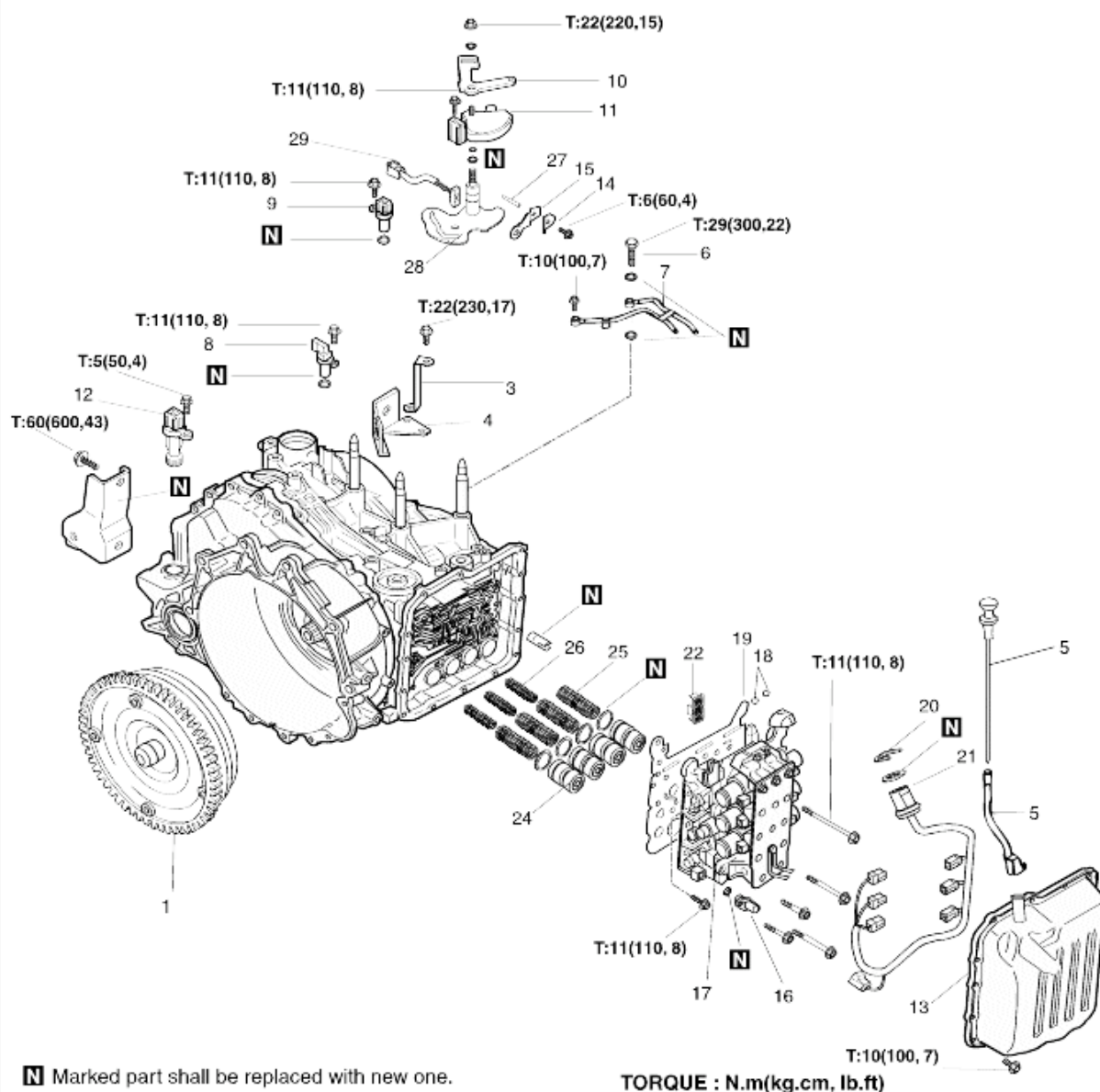
OD	ID	Thickness (in (mm))	Symbol		OD	ID	Thickness (in (mm))	Symbol
59	47	0.071(1.8) 0.079(2.0) 0.087(2.2) 0.094(2.4) 0.102(2.6) 0.110(2.8)	#1		48.9	37	0.071(1.8) 0.075(1.9) 0.079(2.0) 0.083(2.1) 0.087(2.2) 0.091(2.3)	#8
49	36	0.142(3.6)	#2				0.094(2.4)	
57	38.5	0.162(4.12)	#3				0.098(2.5)	
54.4	38.5	0.130(3.3)	#4				0.102(2.6)	
57	38.5	0.162(4.12)	#5		78.5	60	0.098(2.5)	#9
57	38.5	0.162(4.12)	#6		80	60	0.098(2.5)	#10
59	37	0.110(2.8)	#7		58	40.7	0.162(4.2)	#11
48.5	37	0.063(1.6) 0.067(1.7)	#8		54.7	43	0.118(3.0)	#12



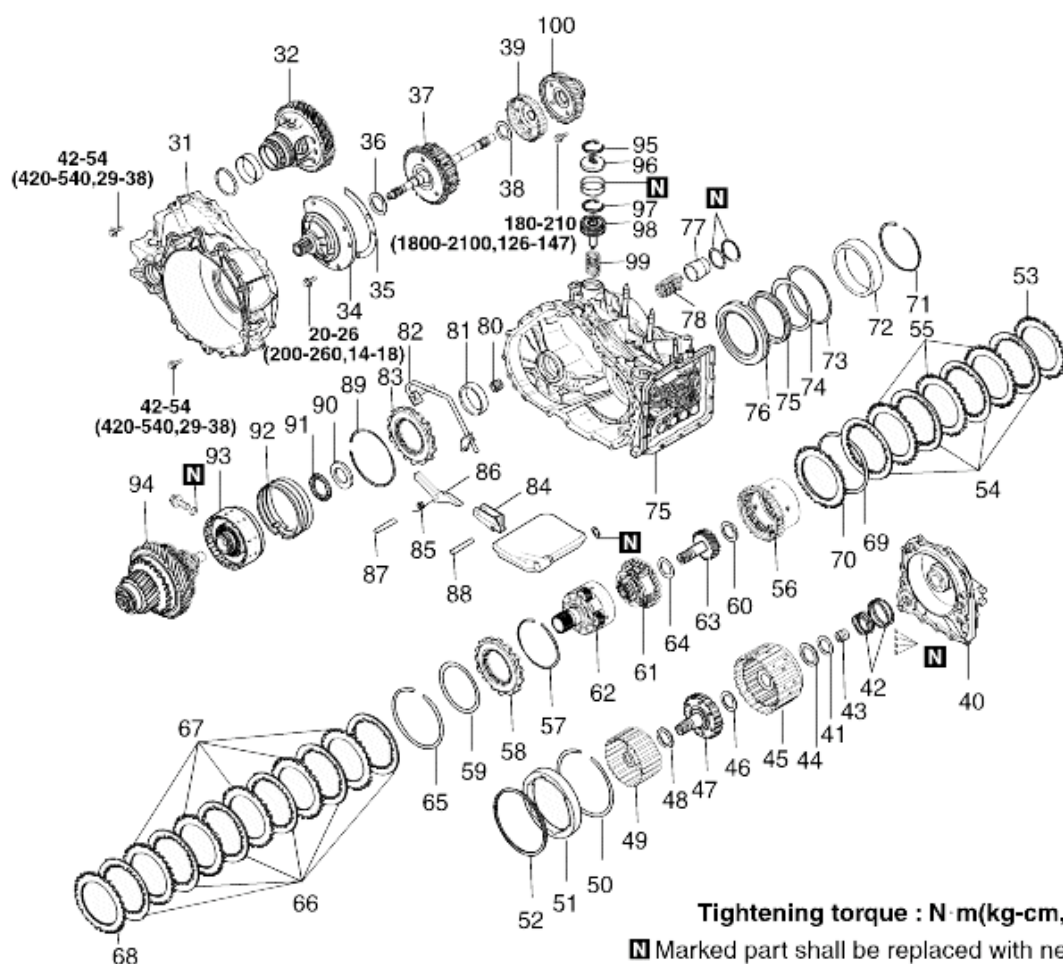
Automatic Transaxle System

Automatic Transaxle System - Automatic Transaxle

Components



- | | | |
|------------------------------------|--|---------------------------------------|
| 1. Torque converter | 11. Transaxle range switch | 21. Solenoid valve harness |
| 3. Harness bracket | 12. Vehicle speed sensor | 22. Strainer |
| 4. Shift cable bracket | 13. Valve body cover | 24. Accumulator piston |
| 5. Fluid level gauge & filler tube | 14. Manual control shaft detent spring | 25. Accumulator spring |
| 6. Eyebolt | 15. Detent spring | 26. Accumulator spring |
| 7. Fluid cooler feed tube | 16. Fluid temperature sensor | 27. Manual control lever shaft roller |
| 8. Output shaft speed sensor | 17. Valve body | 28. Manual control lever shaft |
| 9. Input shaft speed sensor | 18. Steel ball | 29. Parking roller rod |
| 10. Manual control lever | 19. Gasket | |
| | 20. Snap ring | |



- 31. Converter housing
- 32. Differential
- 34. Oil pump
- 35. Gasket
- 36. Thrust washer #1
- 37. Underdrive clutch and input shaft
- 38. Thrust bearing #2
- 39. Underdrive clutch hub
- 40. Rear cover
- 41. Thrust race #8
- 42. Sealing
- 43. Input shaft rear bearing
- 44. Thrust bearing #7
- 45. Reverse and overdrive clutch
- 46. Thrust bearing #6
- 47. Overdrive clutch hub
- 48. Thrust bearing #5
- 49. Planetary carrier reverse sun gear
- 50. Snap ring
- 51. Second brake piston
- 52. Return spring
- 53. Pressure plate
- 54. Second brake disc

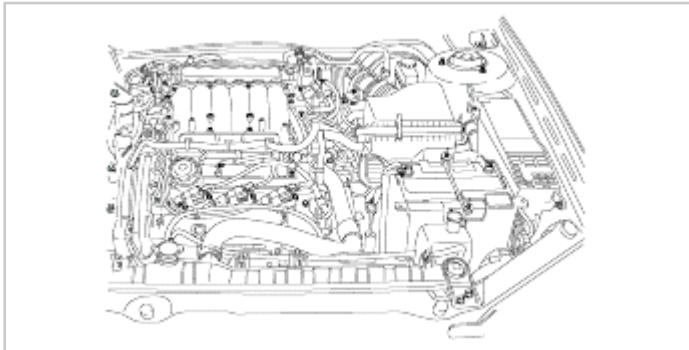
- 55. Second brake plate
- 56. Low & reverse annulus gear
- 57. Snap ring
- 58. One way clutch 1
- 59. Stopper plate
- 60. Thrust bearing #4
- 61. Overdrive planetary carrier
- 62. Output planetary carrier
- 63. Underdrive sun gear
- 64. Thrust bearing #3
- 65. Snap ring
- 66. LR brake disc
- 67. LR brake plate
- 68. Pressure plate
- 69. Snap ring
- 70. Reaction plate
- 71. Snap ring
- 72. Inner race
- 73. Wave spring
- 74. Spring retainer
- 75. Return spring
- 76. LR brake piston
- 77. Accumulator piston

- 78. Spring
- 80. Needle bearing
- 81. Outer race
- 82. Pipe
- 83. One way clutch 2
- 84. Parking roller support
- 85. Hole spring
- 86. Parking ball spring
- 87. Parking pole shaft
- 88. Parking roller support shaft
- 89. Snap ring
- 90. Thrust race
- 91. Thrust bearing
- 92. Reduction brake band
- 93. Direct clutch
- 94. Direct planetary carrier
- 95. Snap ring
- 96. Reduction brake piston cover
- 97. Snap ring
- 98. Reduction brake piston
- 99. Reduction brake spring
- 100. Transfer drive gear set

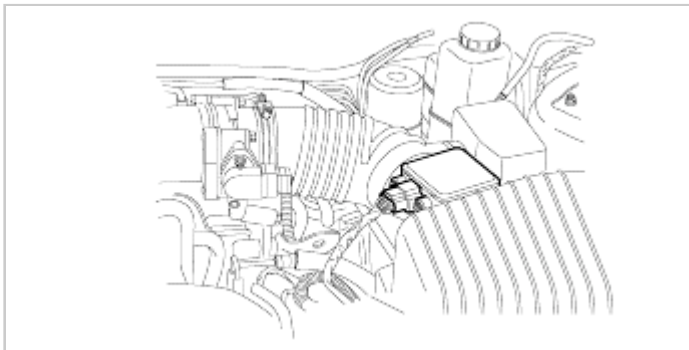
Automatic transaxle system

Removing transaxle

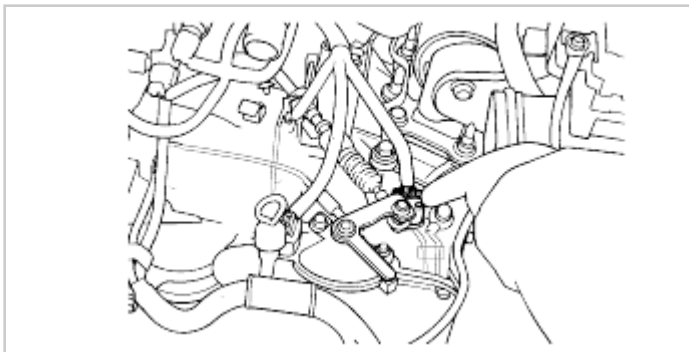
1. Remove the battery and the tray assembly.



2. Remove the engine wiring and the transaxle wiring.



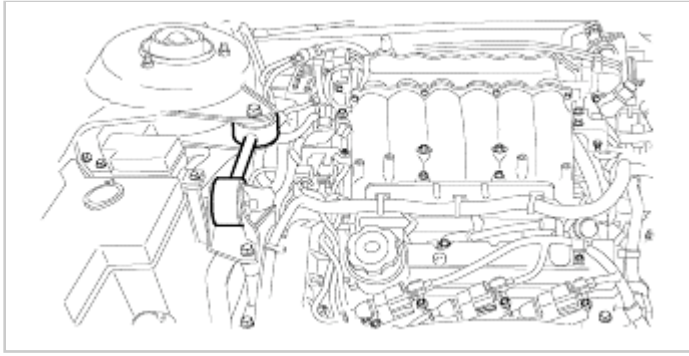
3. Remove the air cleaner (air duct, hose) assembly.
4. Disconnect the shift cable from the transaxle.



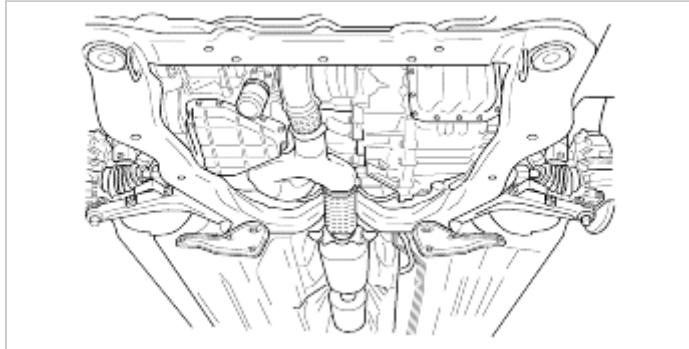
5. Disconnect the cooler hose from the transaxle.
6. Remove the radiator and the hose (drain coolant).
7. Disconnect the heater hose.
8. Disconnect the power steering column and the gear box universal joint.
9. Remove the power steering oil pressure and return the tube from the gear box.

NOTE

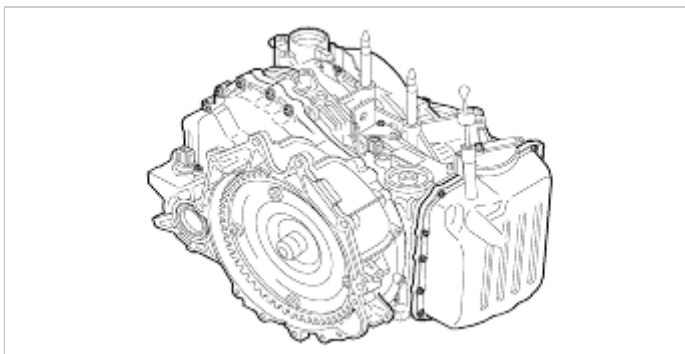
Collect dropping oil with a container when disconnecting tube.



10. Remove the engine upper roll stopper and the bracket.
11. Lift vehicle and remove wheels.



12. Remove the oxygen sensor connector and the front muffler.
13. Drain the transaxle fluid.
14. Remove the tie rod, lower arm ball joint, and the drive shaft.
15. Remove the steering tube mounting bolt attached to the cross member (subframe).
16. Install the cross member removal jack.
17. Remove the cross member mounting bolt, and remove the cross member assembly with the steering gear box and the stabilizer attached.
18. Remove the start motor assembly.
19. Remove the transaxle housing cover.
20. Install the transaxle removal jack.
21. Remove the drive plate and the torque converter connecting bolt, turning the crankcase shaft.
22. Remove the transaxle support bolt.
23. Remove the transaxle.



Installation

1. Installation is reverse order of removal.

2. Add coolant, power-steering oil, and transaxle fluid correctly after installation.
3. Ensure good mounting and no interference in wiring.
4. Fill air conditioner refrigerant.

Disassembly

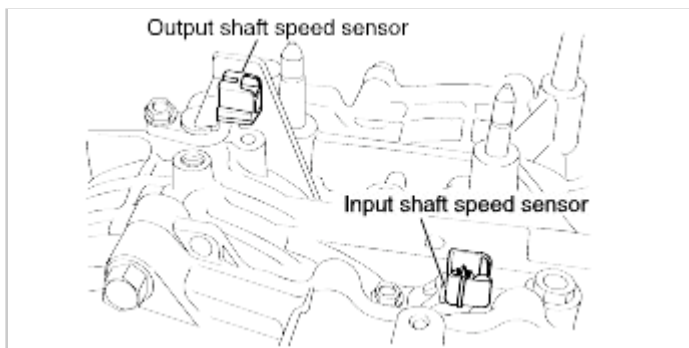
CAUTION

1. Automatic transaxle consists of precision parts. Be careful not to damage them in disassembly and assembly.
2. Keep clean workbench, and rubber and mat thereon.
3. Do not use cotton or muslin fiber. Use nylon fabric or paper towel.
4. Clean the disassembled components. Clean the metal parts with cleaning agent or dry them with a blower.
5. Clean the clutch disc, thrust plate made of resin, and rubber parts with ATF and keep them dust free.
6. If transaxle body is damaged, disassemble and clean the cooler line.

1. Remove the torque converter.
2. Measure the input shaft end play using a dial gauge.



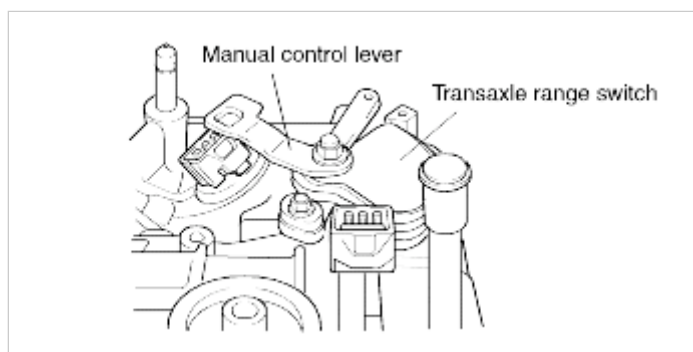
3. Remove each bracket.
4. Remove the wiring harness bracket.
5. Remove the shift control cable bracket.
6. Remove the fluid level gauge.
7. Remove the eyebolt, gasket, and the fluid cooler feed tube.
8. Remove the fluid filter.
9. Remove input speed sensor and the output speed sensor.



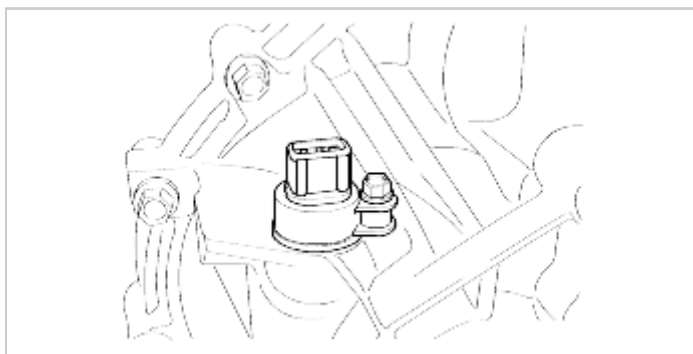
10. Remove the manual control lever and transaxle range switch.

CAUTION

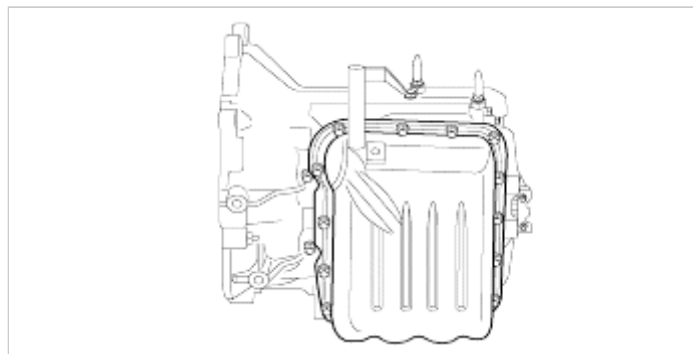
Remove transaxle range switch with valve body installed without fail.



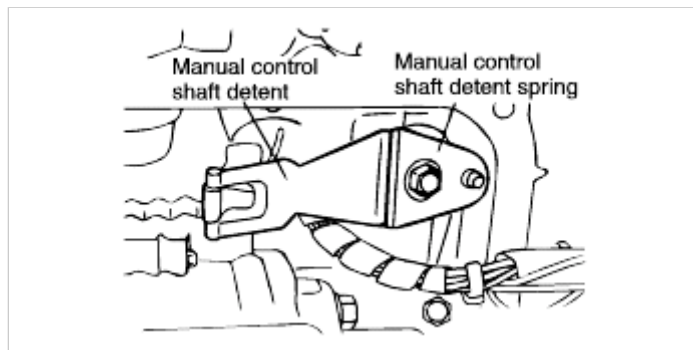
11. Remove the speedometer gear.



12. Remove the valve body cover.

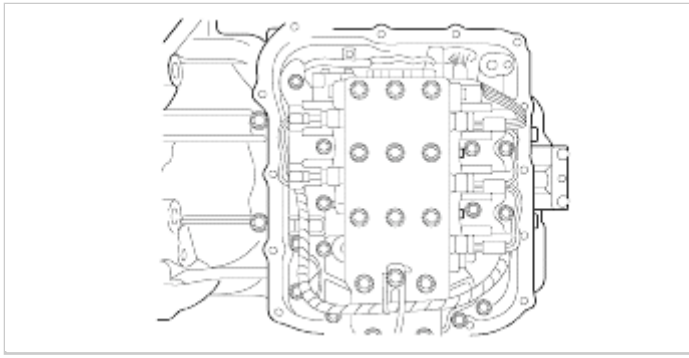


13. Remove the manual control shaft detent spring and the detent.

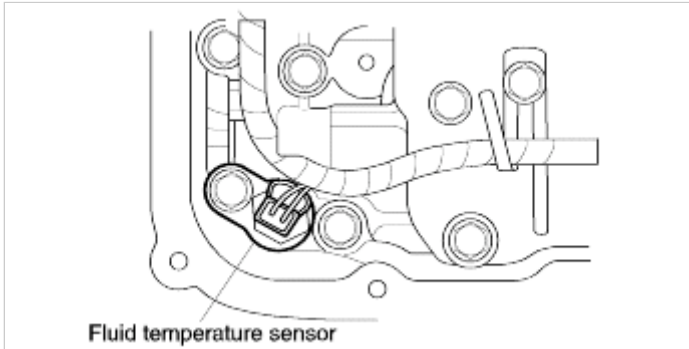


14. Disconnect the harness connector from the valve body.

15. Remove the valve body mounting bolts (28), except those bolts marked on illustration with arrow.



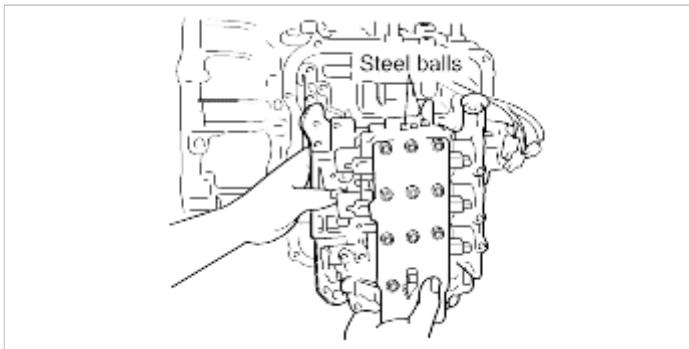
16. Remove the fluid temperature sensor.



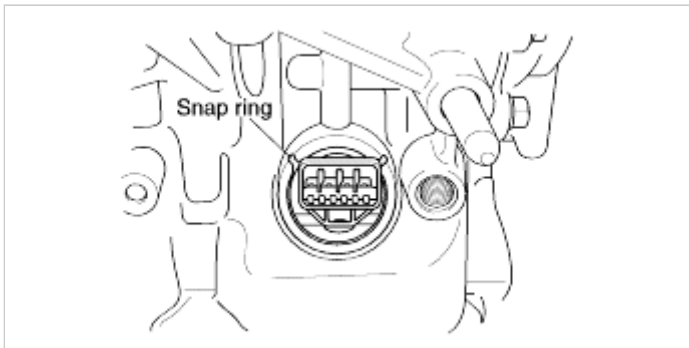
17. Remove the valve body, the gasket and the steel balls (two).

CAUTION

Be careful not to lose the steel balls.



18. Remove the solenoid valve harness snap ring.



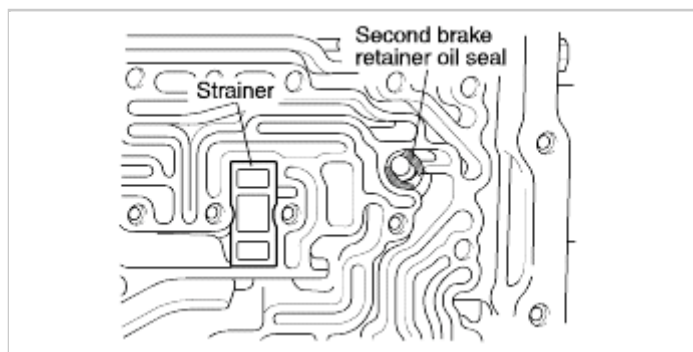
19. Remove the solenoid valve harness.

20. Remove the strainer.

21. Remove the second brake retainer oil seal.

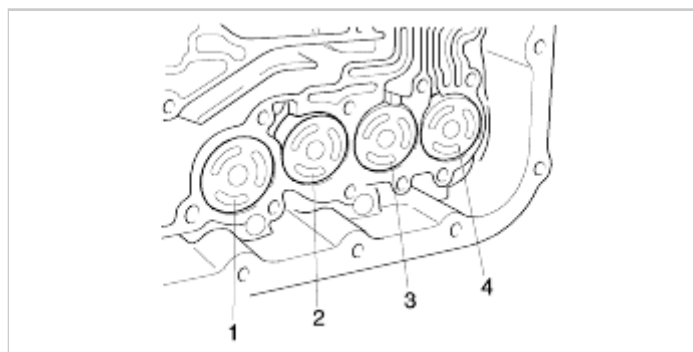
CAUTION

If the second brake retainer oil seal is not removed, it may be damaged when removing and installing the second brake piston.

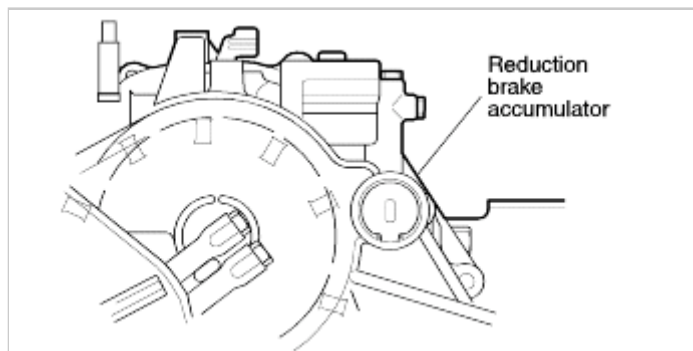


22. Remove each accumulator piston and spring.

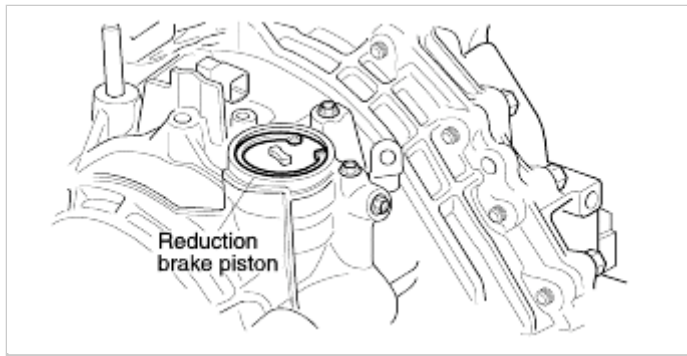
No.	Use
1	LR brake
2	UD clutch
3	Second brake
4	OD clutch



23. Remove the snap ring and then the reduction brake accumulator and the spring.



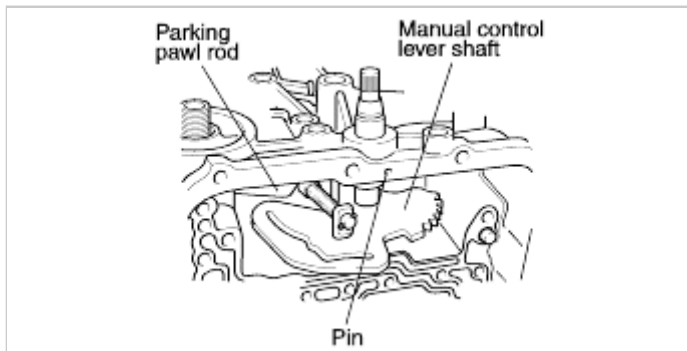
24. Remove the snap ring and the reduction brake piston.



25. Remove the inner snap ring, and then the brake piston and the spring.

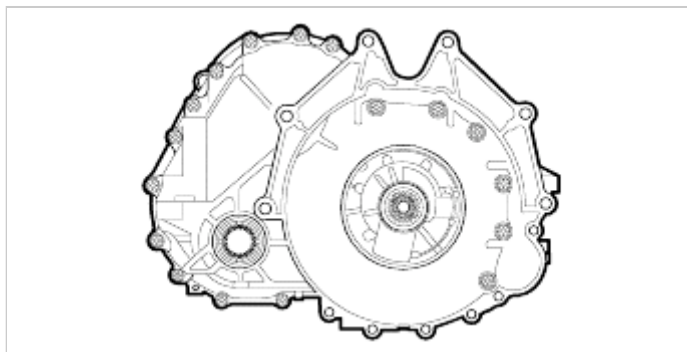
26. Remove the manual control shaft pin.

27. Remove the manual control shaft.

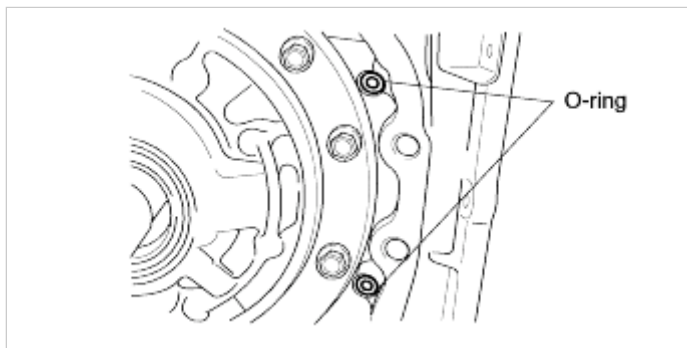


28. Remove the parking roller rod assembly.

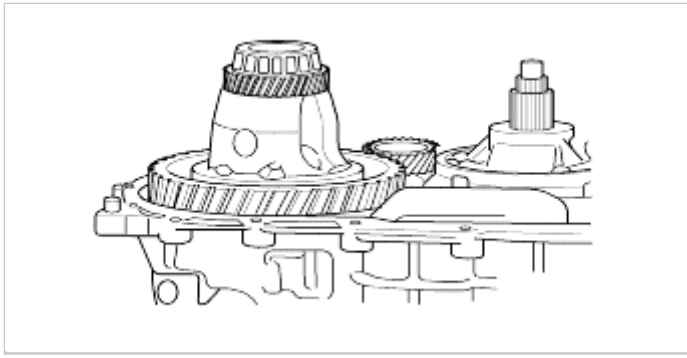
29. Remove the converter housing mounting bolts (twenty) and the converter housing.



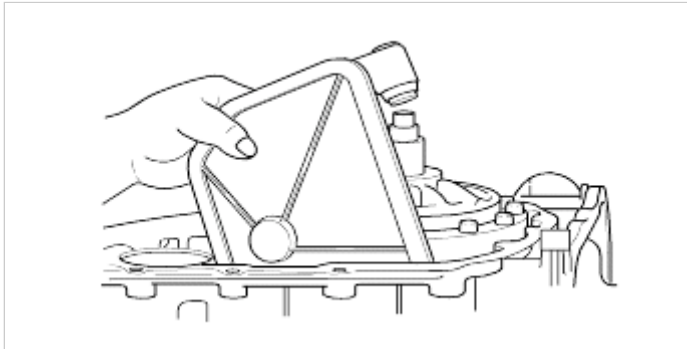
30. Remove the O-ring (two).



31. Remove the differential.



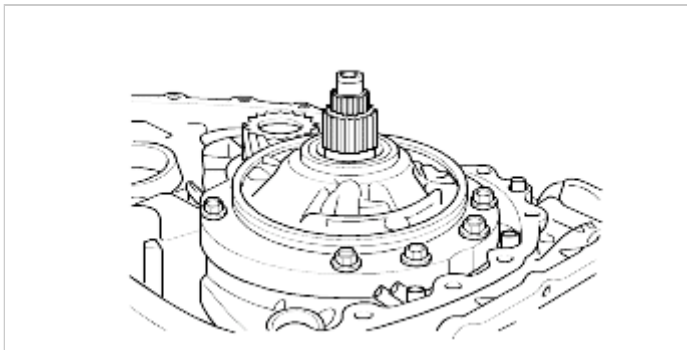
32. Remove the main oil filter.



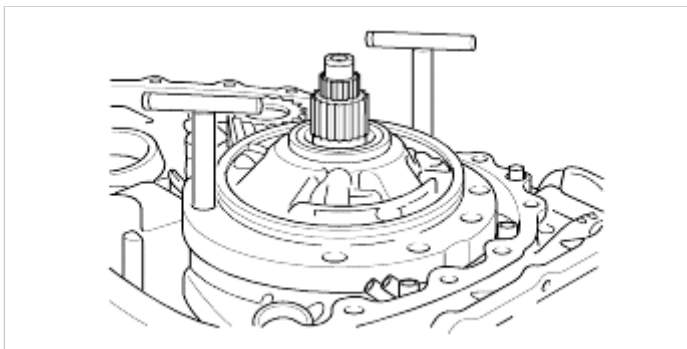
33. Release the fluid pump mounting bolts(six).

CAUTION

Do not disassemble the fluid pump. Misalignment during assembly may damage the pump and the transaxle.



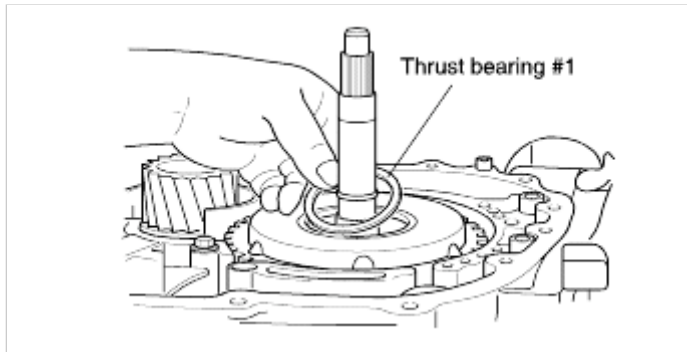
34. Install the special tool (09452-33100).



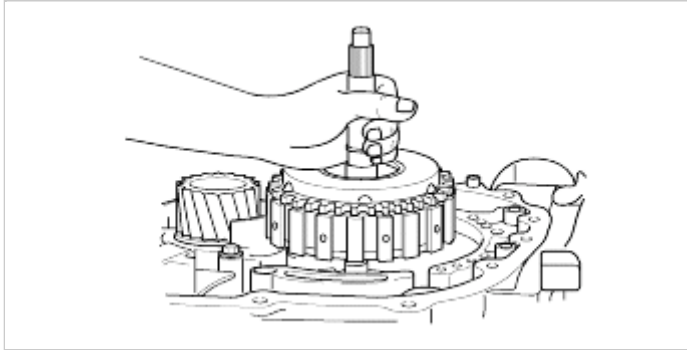
35. Remove the fluid pump using the special tool.

36. Remove the fluid pump gasket.

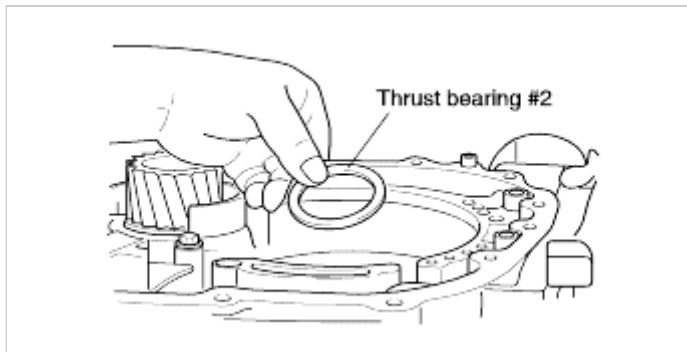
37. Remove the thrust washer #1.



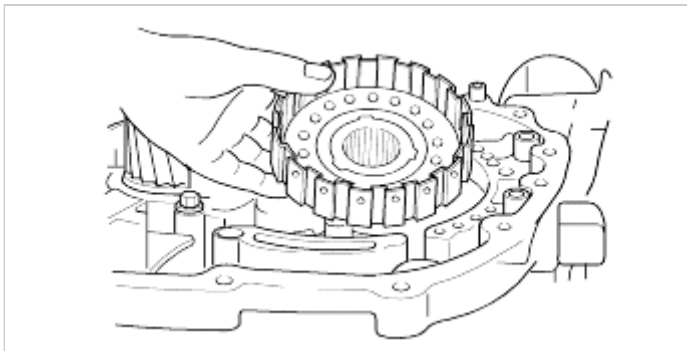
38. Hold the input shaft with one hand and remove the drive clutch.



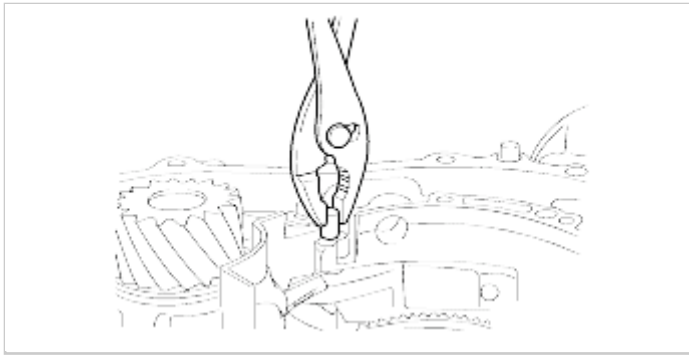
39. Remove the thrust bearing #2.



40. Remove the underdrive clutch hub.

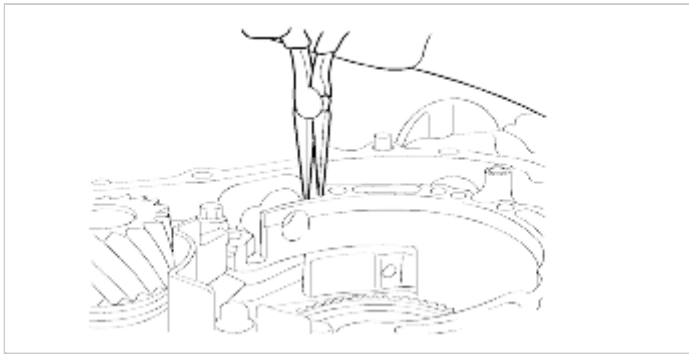


41. Remove the parking sprag shaft.



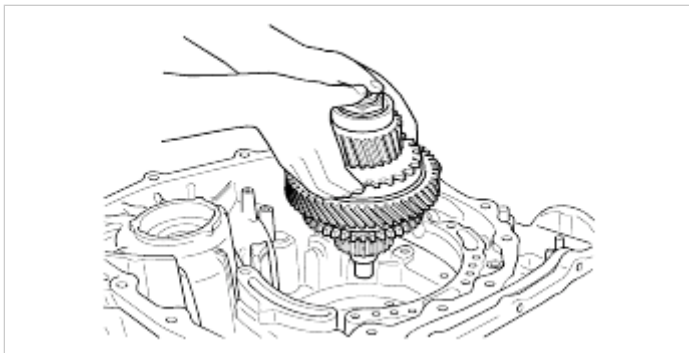
42. Remove the parking sprag shaft spacer and spring.

43. Remove the parking roller support shafts(two).

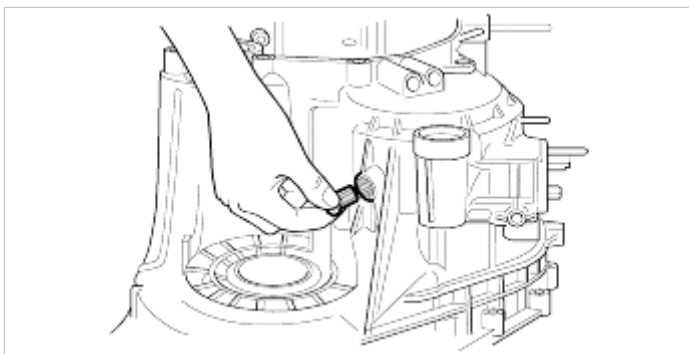


44. Remove the parking roller support.

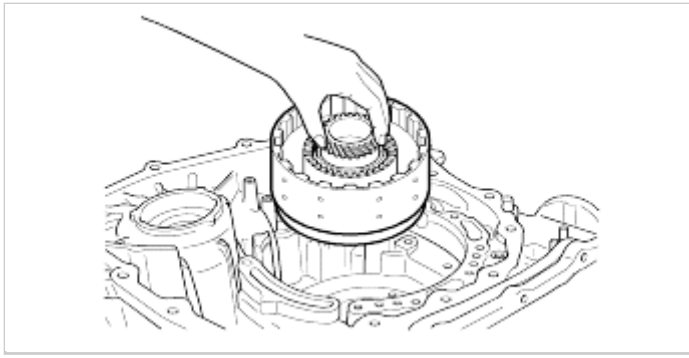
45. Remove the director planetary carrier assembly.



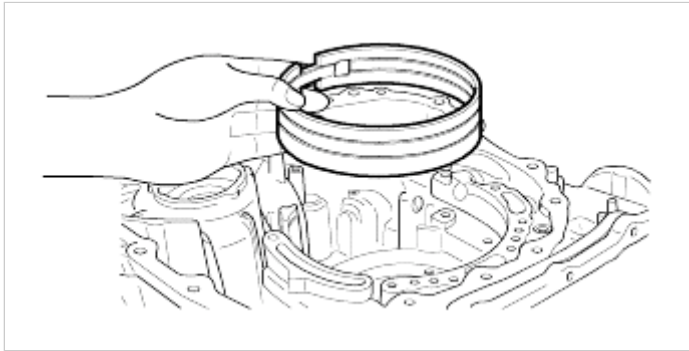
46. Remove the anchor plug and O-ring.



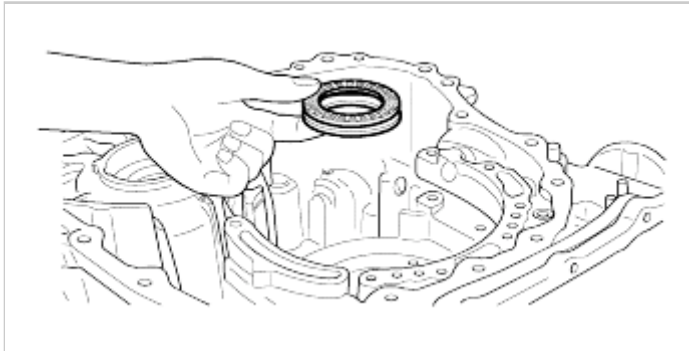
47. Remove the direct clutch assembly.



48. Remove the reduction brake band.

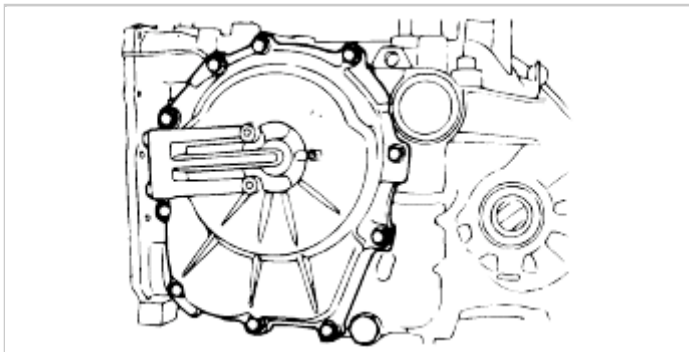


49. Remove the thrust bearing #11.

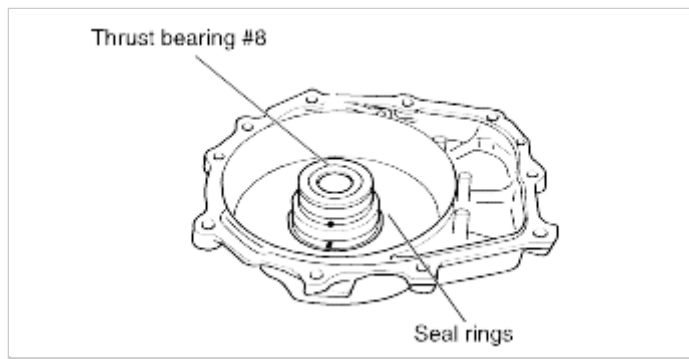


50. Remove the thrust bearing #12.

51. Remove the rear cover.



52. Remove the thrust bearing #8.



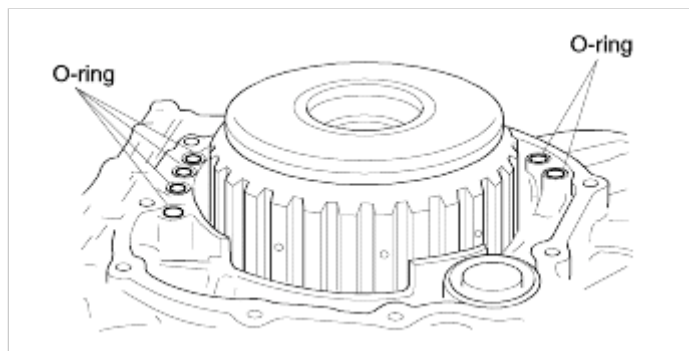
53. Remove the seal rings(four).

54. Remove the input shaft rear bearing.

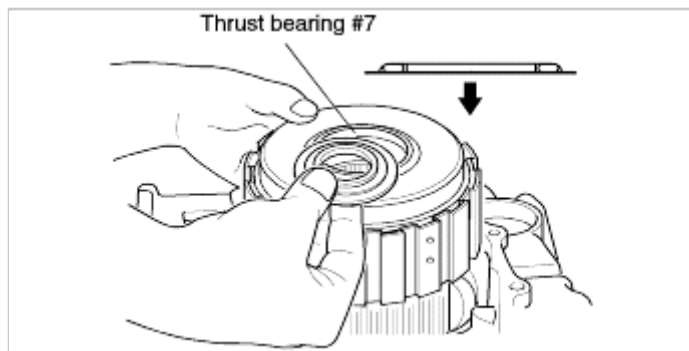
CAUTION

The rear cover may be damaged in replacing the rear bearing, therefore do not replace it if not faulty after checking.

55. Remove O-rings(six).

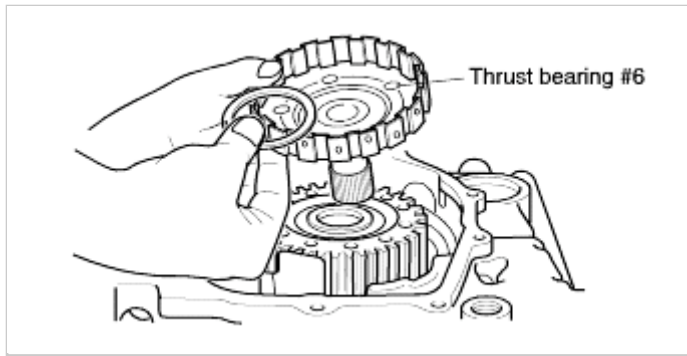


56. Remove the thrust bearing #7.



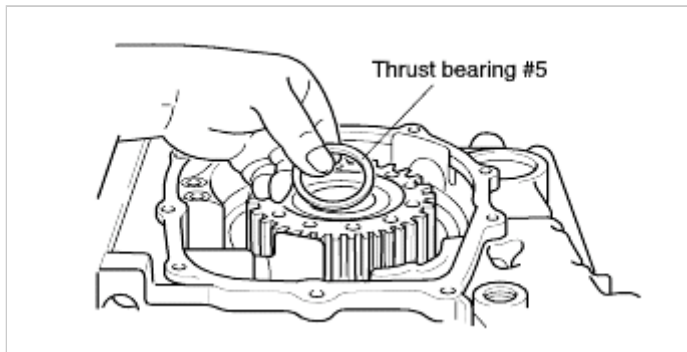
57. Remove the reverse and overdrive clutch.

58. Remove the thrust bearing #6.

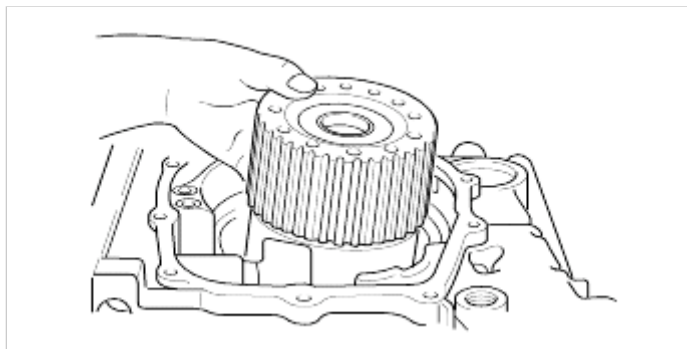


59. Remove the overdrive clutch hub.

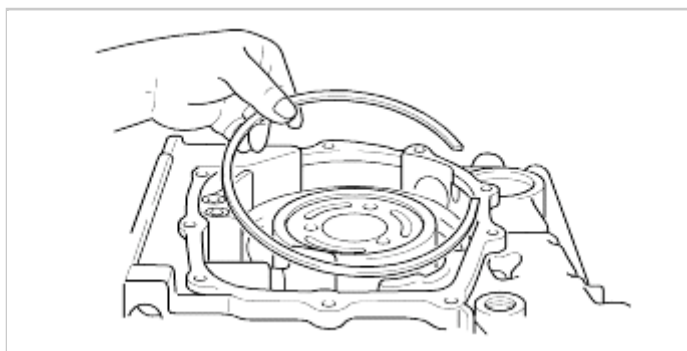
60. Remove the thrust bearing #5.



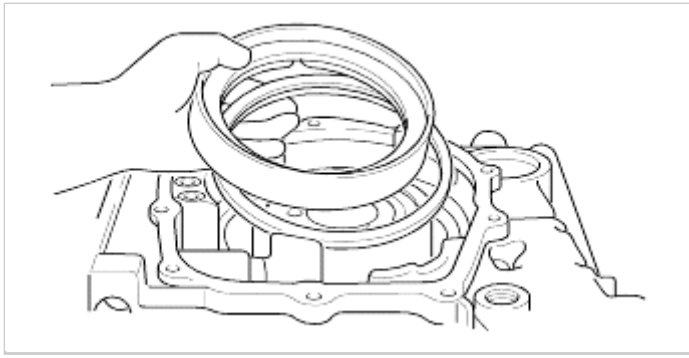
61. Remove the planetary gear reverse sun gear.



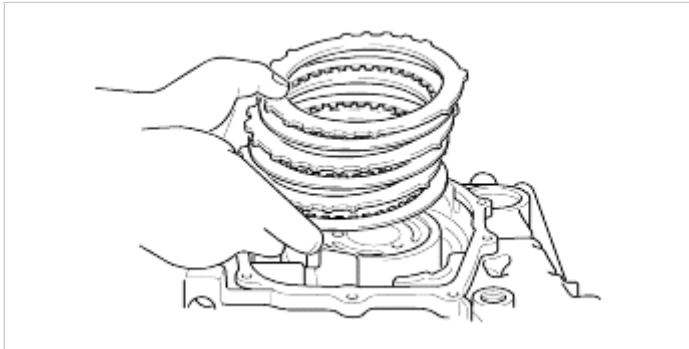
62. Remove the second brake piston snap ring.



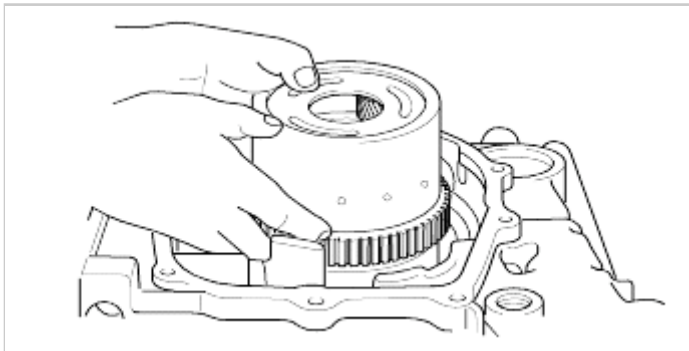
63. Remove the second brake piston and return spring.



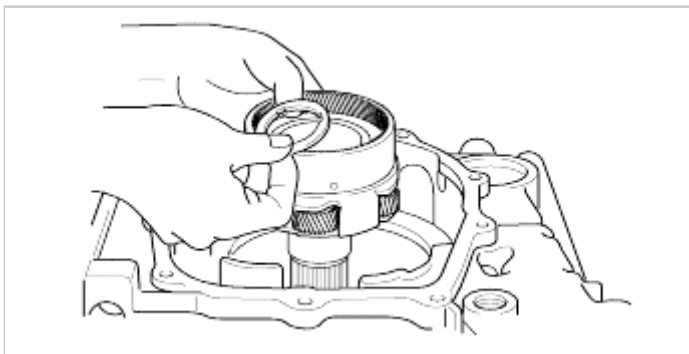
64. Remove the pressure plate, brake disc and brake plate.



65. Remove the overdrive planetary carrier.



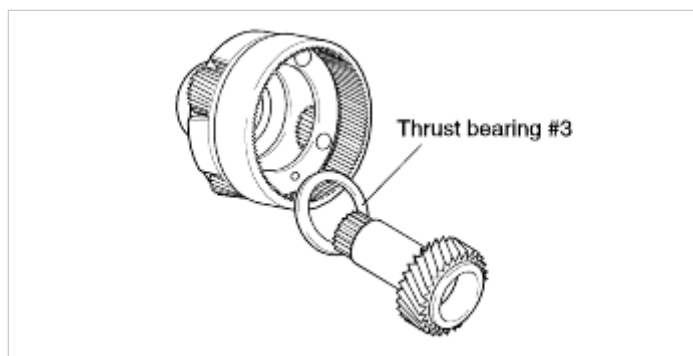
66. Remove the output planetary carrier thrust bearing #4.



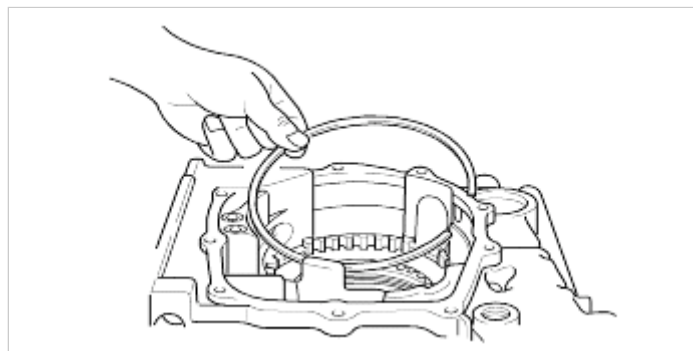
67. Remove the output planetary carrier.

68. Remove the underdrive sun gear.

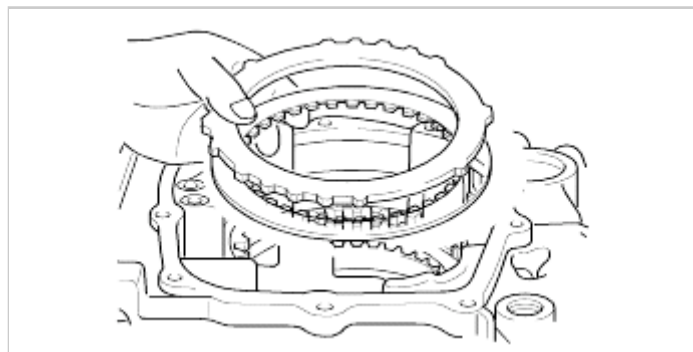
69. Remove the thrust bearing #3.



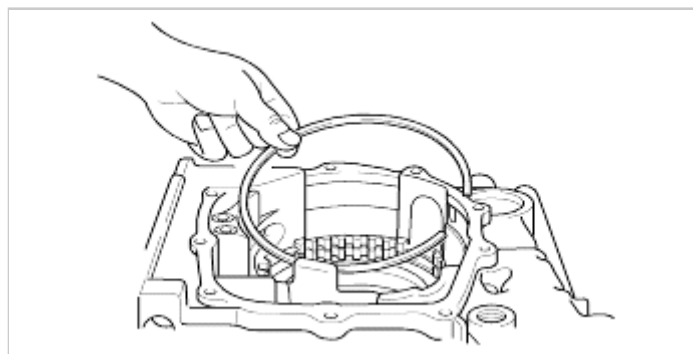
70. Remove the LR reaction plate snap ring.



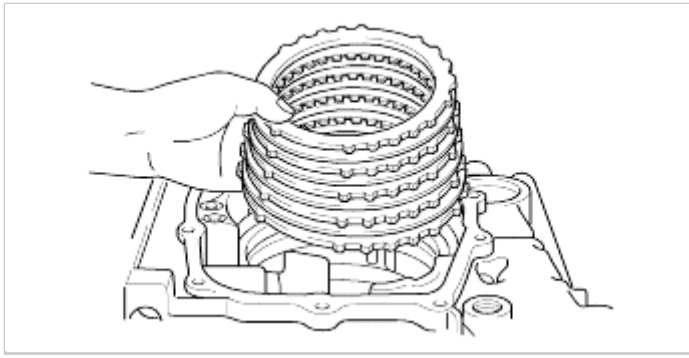
71. Remove the reaction plate and brake disc.



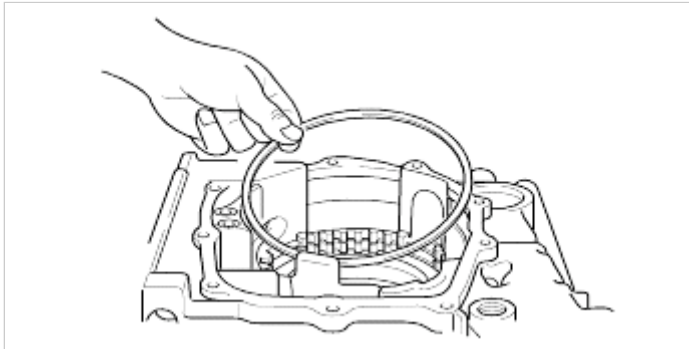
72. Remove the LR brake snap ring.



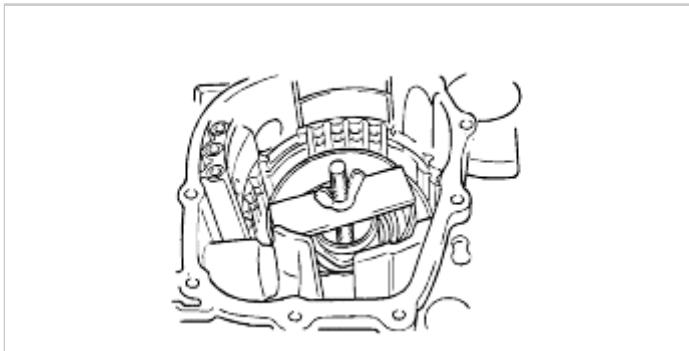
73. Remove the brake plate, the brake disc, and the pressure plate.



74. Remove the wave spring.



75. Remove the snap ring using special tool.



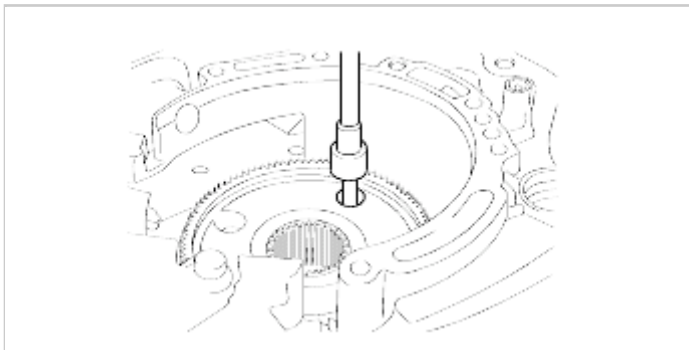
76. Remove the one way clutch inner race.

77. Remove the spring retainer, return spring and LR brake piston.

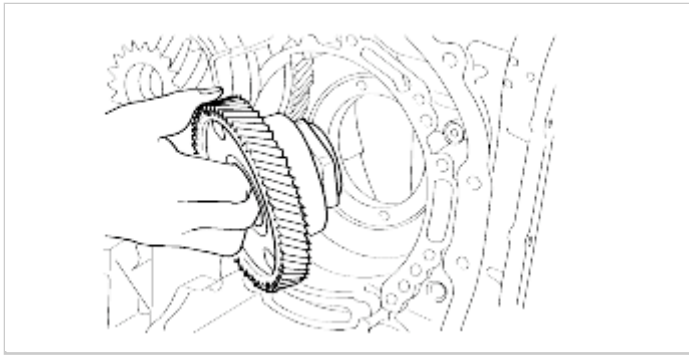
78. Release the transfer drive gear mounting bolts (eight).

NOTE

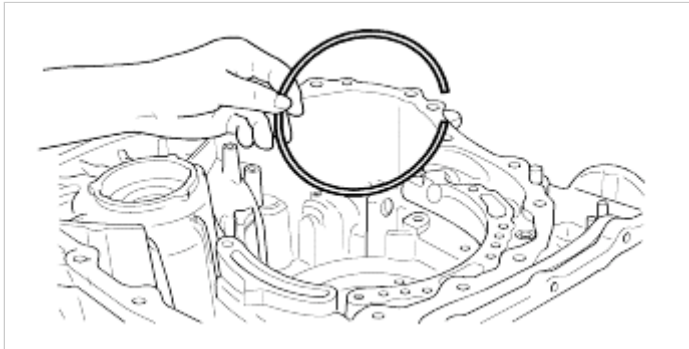
Remove the revolving drive gear by turning it.



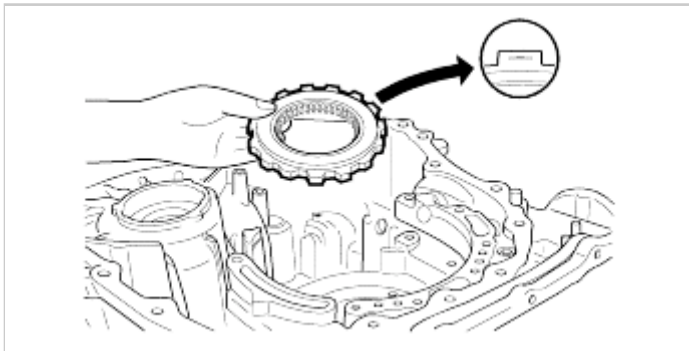
79. Remove the transfer drive gear.



80. Remove the one way clutch holding snap ring.



81. Remove the one way clutch assembly.



82. Remove the seal rings (two).

83. Remove the needle bearing.

CAUTION

Transaxle case may be damaged in replacing the output shaft rear bearing, therefore do not replace it if not faulty after checking.

84. Remove the differential bearing output race and spacer out of converter housing.



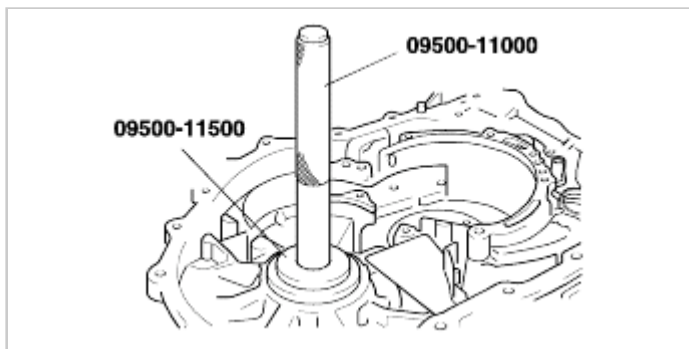
85. Remove the differential bearing output race out of the transaxle case.

Reassembly

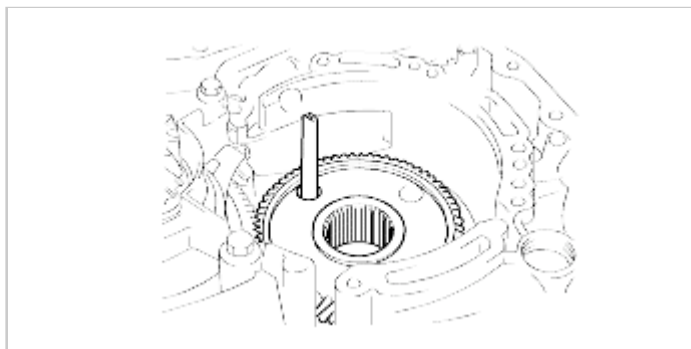
CAUTION

1. Keep the workbench and parts always clean and dirt free.
2. Do not use cotton gloves.
Use paper towel and nylon rag. Do not use nappy fabric.
Kimberly's Kimtowel J130, Kim WIPE L-100 or equivalent.
3. Do not use grease at any place otherwise specified.
Use white vaseline or blue mineral oil if necessary.
4. Insert each snap ring firmly into the seat. Do not use deformed rings.
5. Do not allow dirt remain on the surface to apply liquid gasket during reassembly.
6. Gasket, O-ring, and oil shall not be used again, and use new ones in assembly.
7. A new clutch disc and a new brake disc shall be dipped in ATF for 2 hours or more before use.
8. Replace the ATF and clean the filter thoroughly in reassembly. Replace the damaged filter element with a new one.
9. Apply required minimum quantity of white vaseline, blue mineral oil, or ATF on each of the bearing part, the thrust face moving part, the fluid pump moving part, the seal ring, and the O-ring.
10. Do not replace the ATF in the fluid cooler.
11. Be careful not to allow dirt come through the transaxle openings before mounting onto the vehicle.
(including electronic part connector)

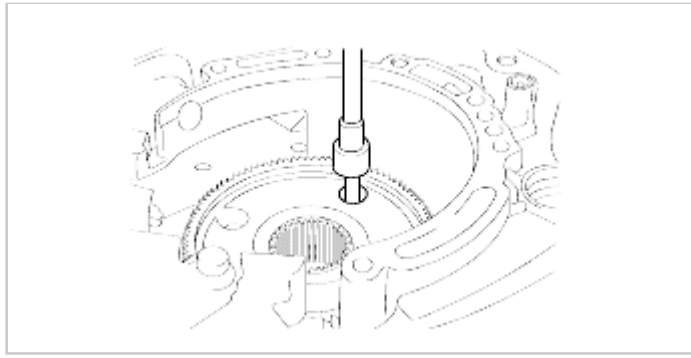
1. Install the differential bearing output race on the transaxle case using the special tool.



2. Apply ATF on the transaxle case and install 2 guide pins.
3. Install the transfer drive gear.



4. Connect the transfer drive gear mounting bolts (eight) using tightening torque.



Tightening torque

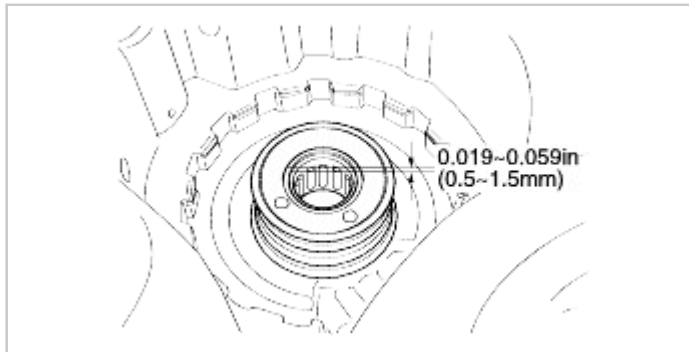
F5A51-3 :

31.4~36.3 N·m (320~370 kg·cm, 23~27 lb·ft)

NOTE

Turn the transfer drive gear one revolution and ensure no interference with bolts.

5. Install the output shaft rear bearing.

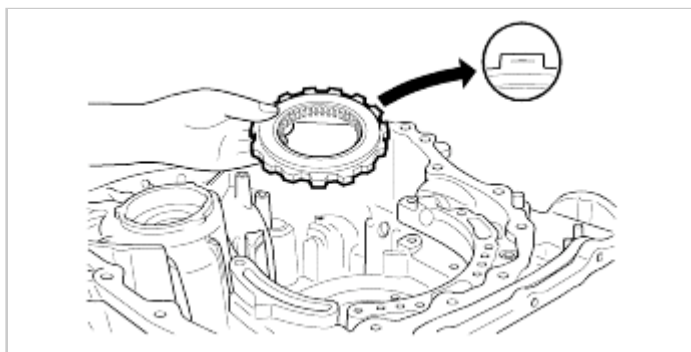


6. Install the 4 seal rings.

7. Install the one way clutch.

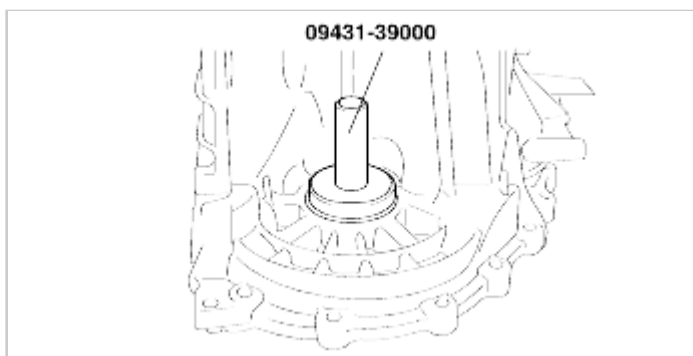
NOTE

Be cautious to the direction of the one way clutch. Line marked side shall be located forward. (see figure)

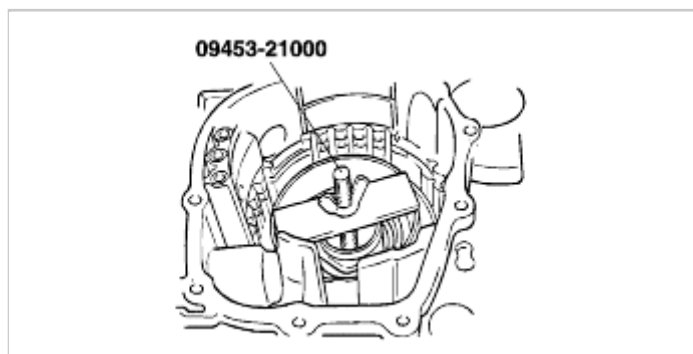


8. Install the one way clutch holding snap ring.

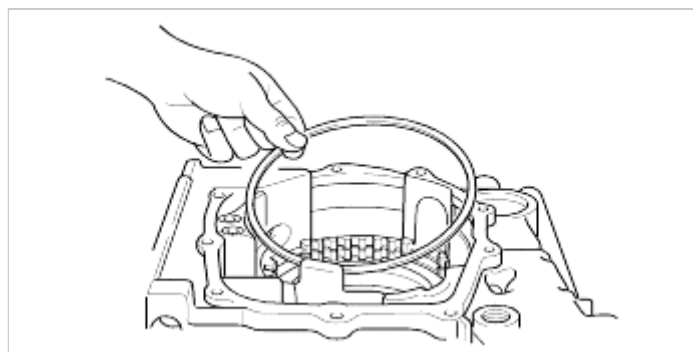
9. Install the driveshaft oil seal on the transaxle case.



10. Install the LR brake piston and the return spring.
11. Install the spring retainer.
12. Install the one way clutch inner race.
13. Install the snap ring using the special tool.

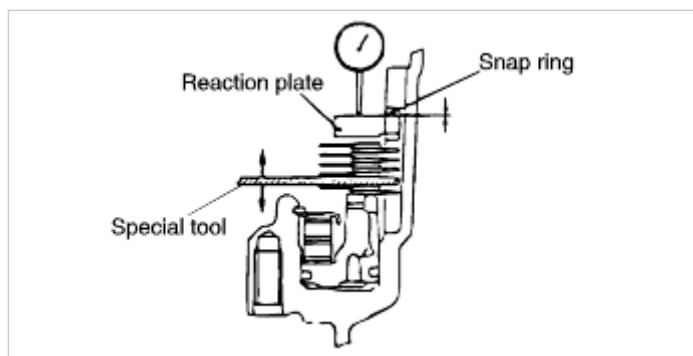


14. Install the wave spring.



15. Install the LR brake pressure plate on the special tool, and install the brake disc, the brake plate and the snap ring as illustrated on the figure.

Brake disc	Brake plate
6	5



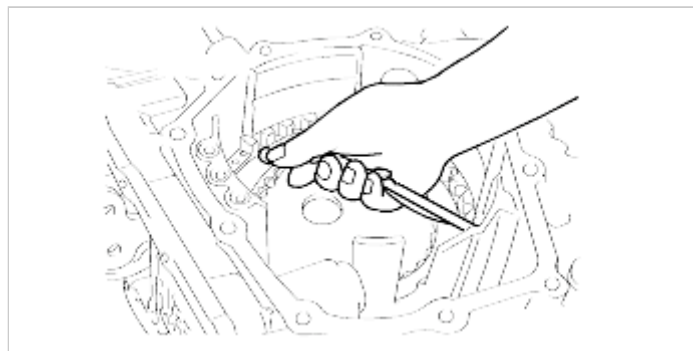
16. Install the reaction plate and the used snap ring.

17. Move special tool and check the end play, and install appropriate snap rings (8 sizes).

Standard value : 0~0.0063in(0~0.16mm)

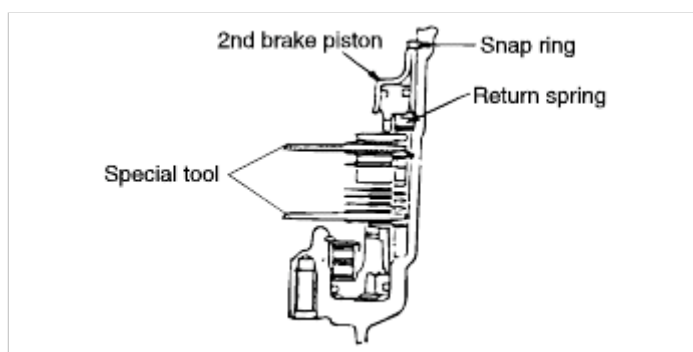
NOTE

Upon releasing the clutch, determine the actual gap between the LR brake disc and the plate.



18. Install the brake disc, the brake plate, and second brake pressure plate using special tool as illustrated on figure.

Model	Brake disc	Brake plate
F5A51-3	4	4

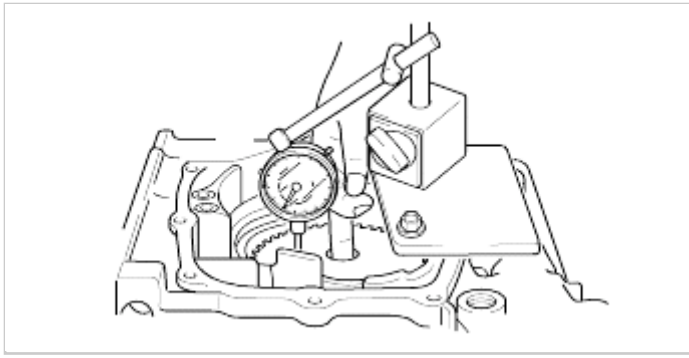


19. Install the return spring, the second brake piston, and the snap ring.

20. Move the special tool and check the end play.

Standard value

F5A51-3 : 0.043~0.061in(1.09 ~ 1.55 mm)

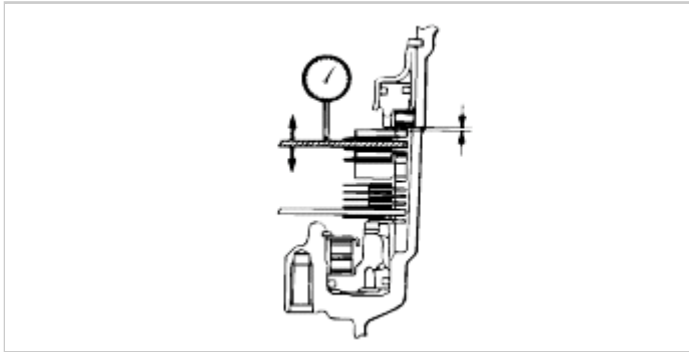


NOTE

Using the below formula and the special tool installed at procedure 10, choose a pressure plate :
F5A51-3

$[A \text{ (travel)} + \text{special tool thickness } 0.079\text{in}(2.0\text{mm}) - 0.061\text{in}(1.55\text{mm})]$

$\sim [A \text{ (travel)} + \text{special tool thickness } 0.079\text{in}(2.0\text{mm}) - 0.043\text{in}(1.09\text{mm})]$

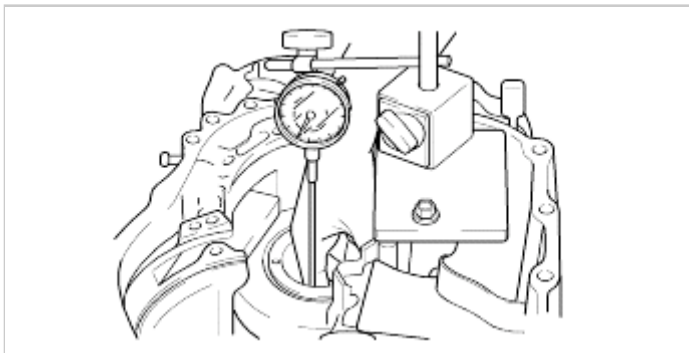


21. Turn the transaxle upside down.

22. Connect the special tool (09453-33100) with dial gauge, and move the special tool to check the end play.

Standard value :

F5A51-3 : 0.065~0.083in(1.65 ~ 2.11 mm)



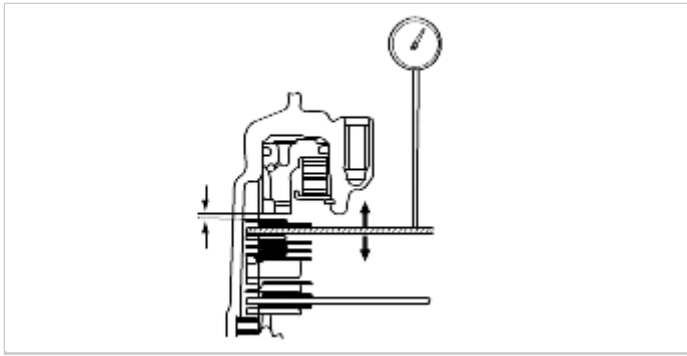
NOTE

Using the below formula and the special tool installed at procedure 7, choose a pressure plate :

F5A51-3

$[A \text{ (travel)} + \text{special tool thickness } 0.079\text{in}(2.0\text{mm}) - 0.083\text{in}(2.11\text{mm})]$

$\sim [A \text{ (travel)} + \text{special tool thickness } 0.079\text{in}(2.0\text{mm}) - 0.065\text{in}(1.65\text{mm})]$

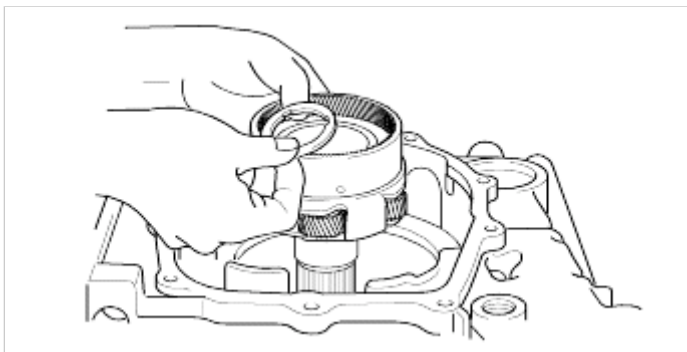


23. Remove parts installed in procedures 14~22.

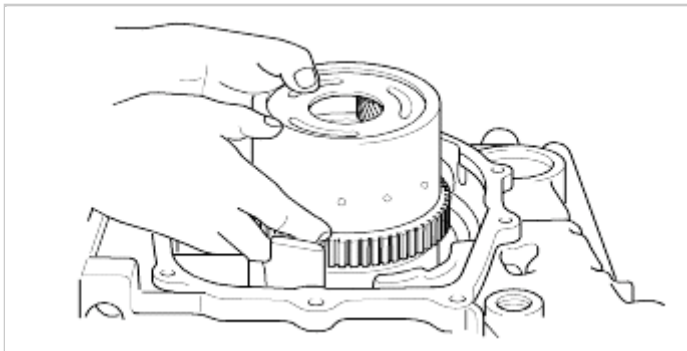
24. Install the output planetary carrier and the thrust bearing #4.

NOTE

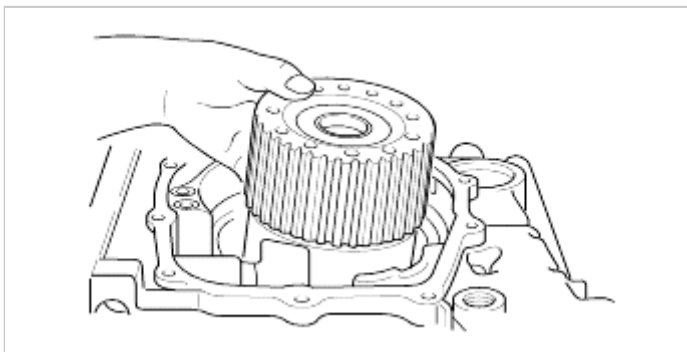
Be careful not to reverse the direction of the thrust bearing.



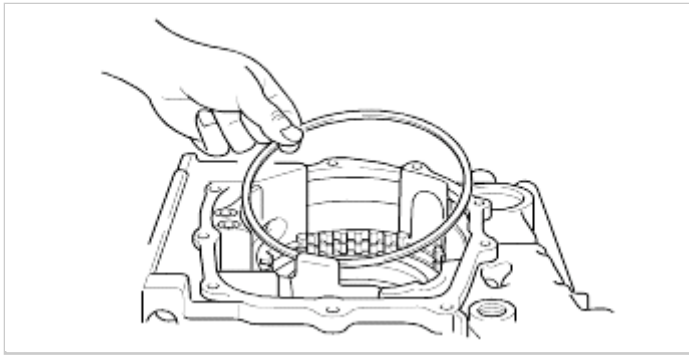
25. Install the overdrive planetary carrier.



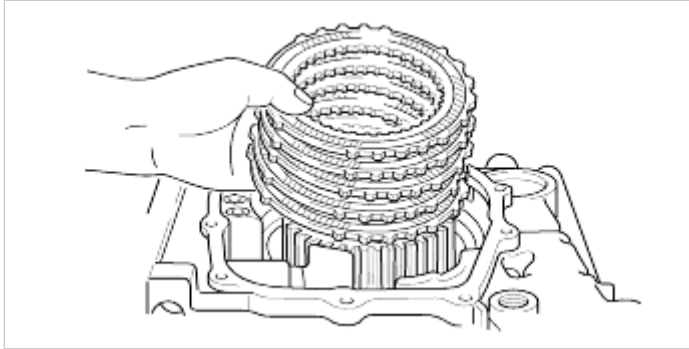
26. Install the planetary gear reverse sun gear.



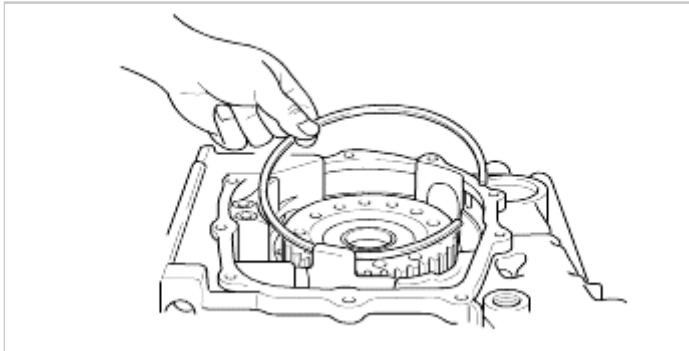
27. Install the wave spring.



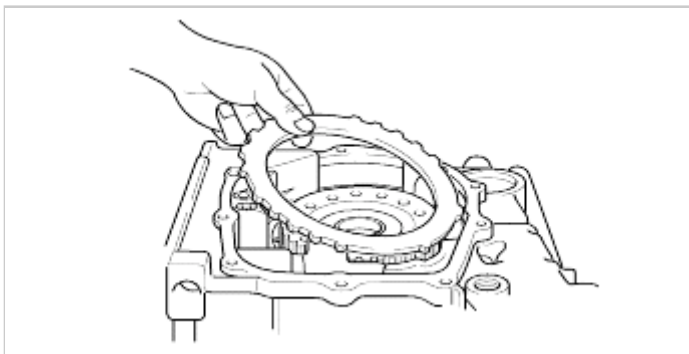
28. Install the pressure plate, the brake disc, and the brake plate.



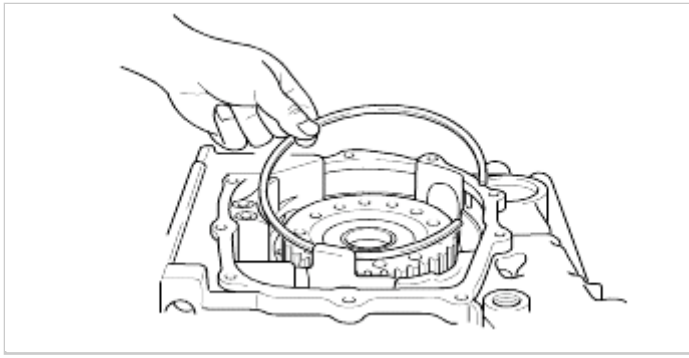
29. Install the snap ring.



30. Install the reaction plate.



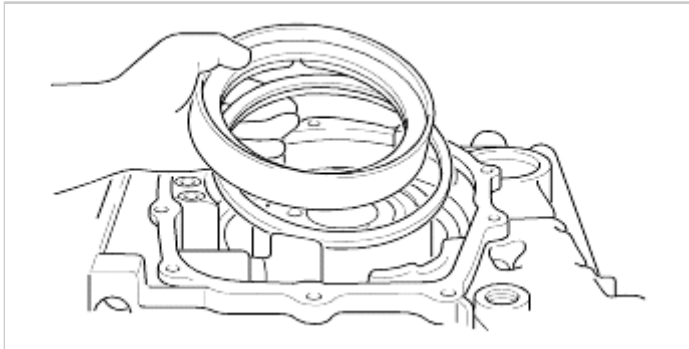
31. Install the snap ring.



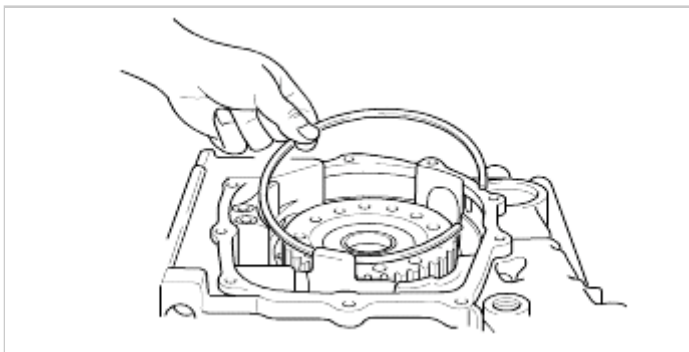
32. Install the brake disc, the brake plate, and the pressure plate.



33. Install the return spring and the second brake piston.



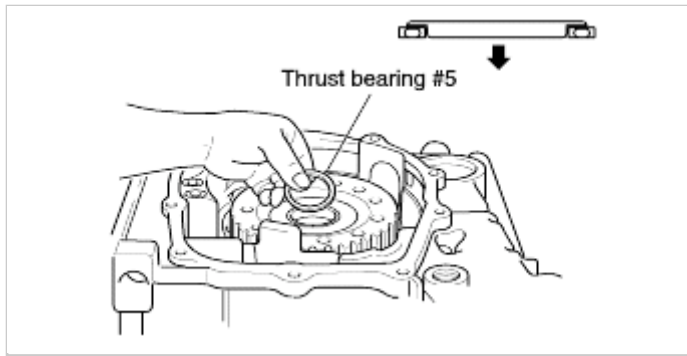
34. Install the snap ring.



35. Install the thrust bearing #5.

CAUTION

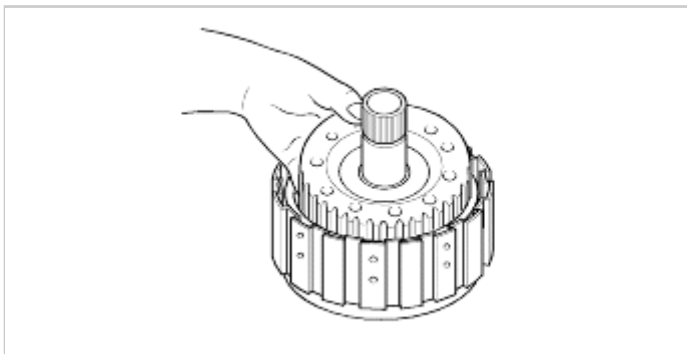
Be careful not to reverse the direction of the thrust bearing.



36. Assemble the overdrive clutch hub and the thrust bearing #6 into the reverse & overdrive clutch.

CAUTION

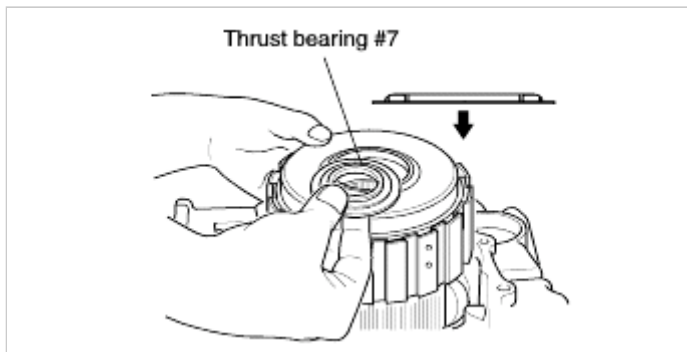
Be careful not to reverse the direction of the thrust bearing.



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

CAUTION

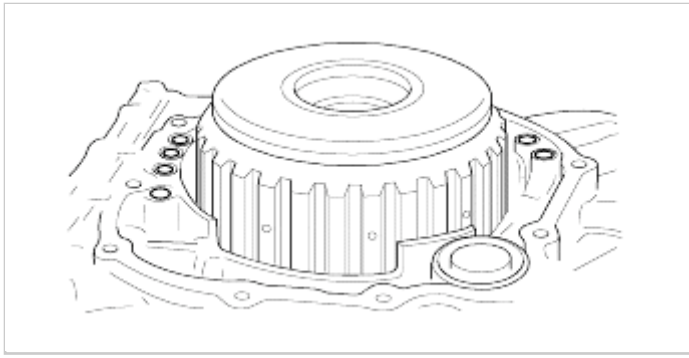
Be careful not to reverse the direction of the thrust bearing.



38. Install the overdrive clutch assembly.

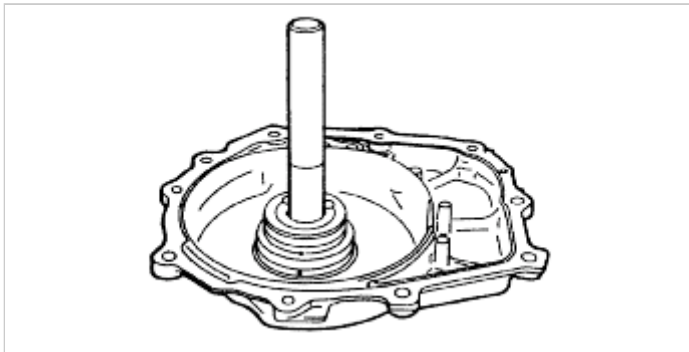
NOTE

Upon correct assembly the clutch retainer hole will match with the case surface.



39. Install O-rings(six).

40. Install the input shaft bearing



41. Install the seal rings(four).

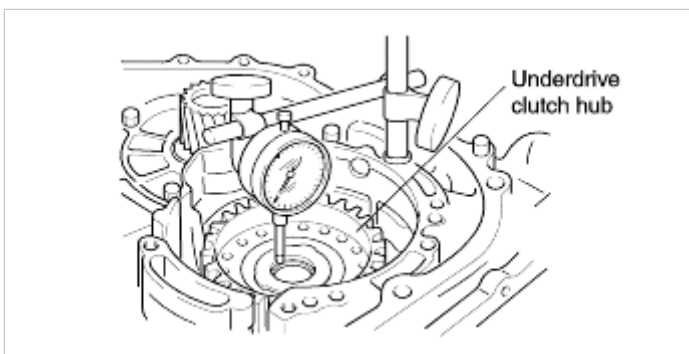
42. Insert the used thrust bearing #8 and install the rear cover.

NOTE

Rear cover will be installed in order to check the underdrive sun gear gap.

43. Measure the underdrive sun gear end play. Choose the installed thrust race in the order of standard value, and install it.

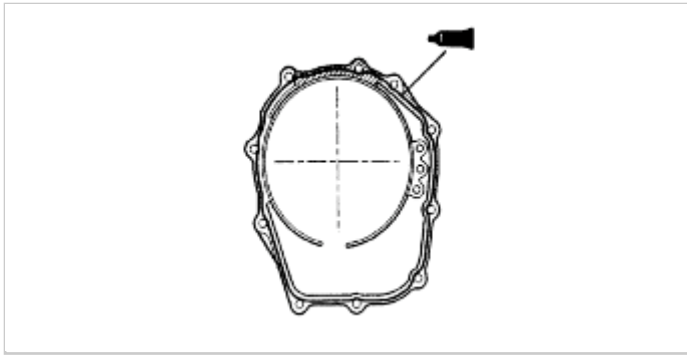
Standard value : 0.0098~0.0177in(0.25~0.45mm)



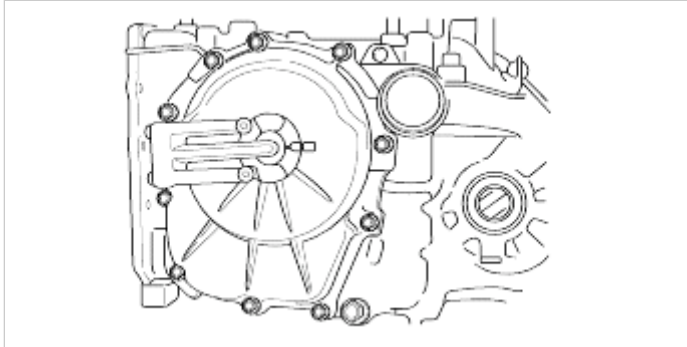
44. Continue to apply liquid gasket at application points at the rear cover with Ø1.6mm thickness.

Liquid gasket

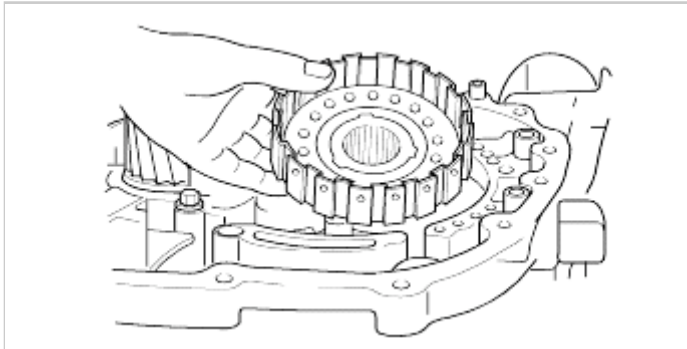
Part name:Threebond 1281B or LOCTITE FMD546



45. Install the rear cover and tighten it with tightening torque.

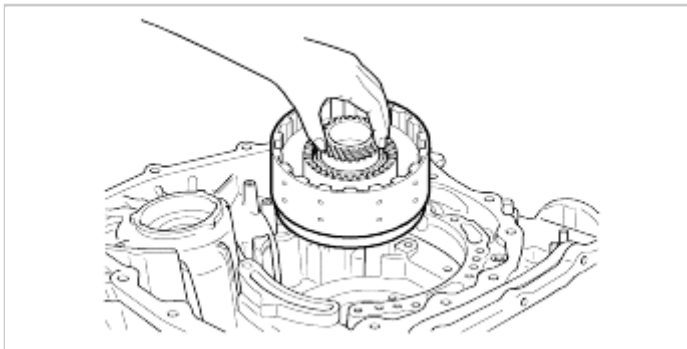


46. Install the underdrive clutch hub.



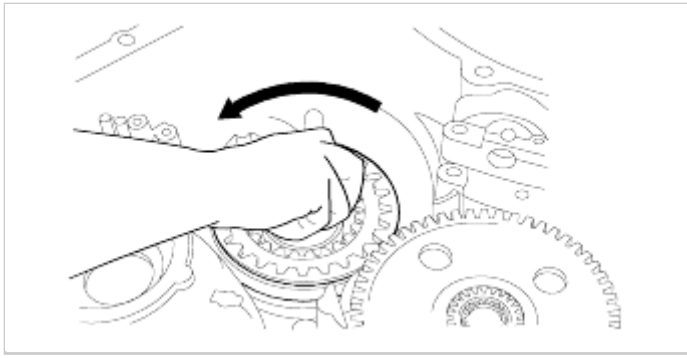
47. Install the director clutch assembly.

48. Install the reduction brake band.

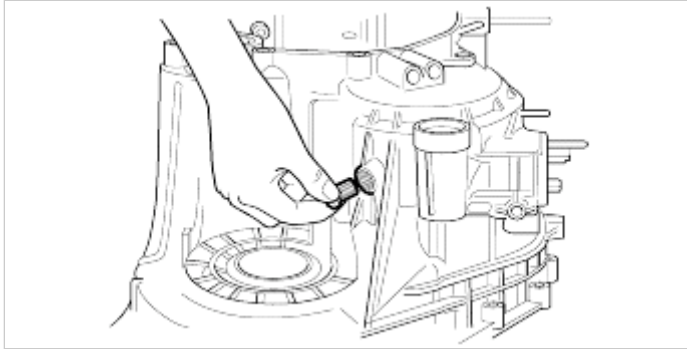


NOTE

Turn the direct clutch counterclockwise to install.



49. Insert the anchor plug with hand matching into the reduction brake band hole.



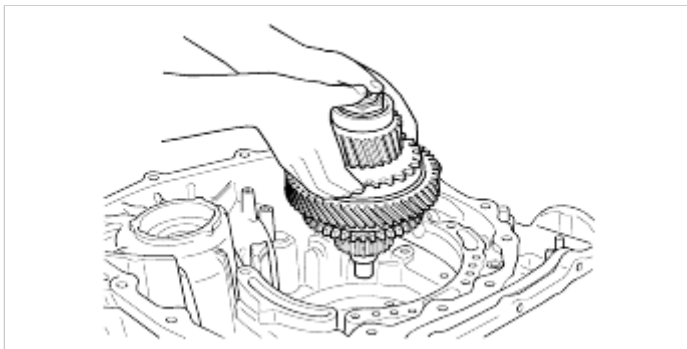
50. Install the director planetary carrier assembly.

NOTE

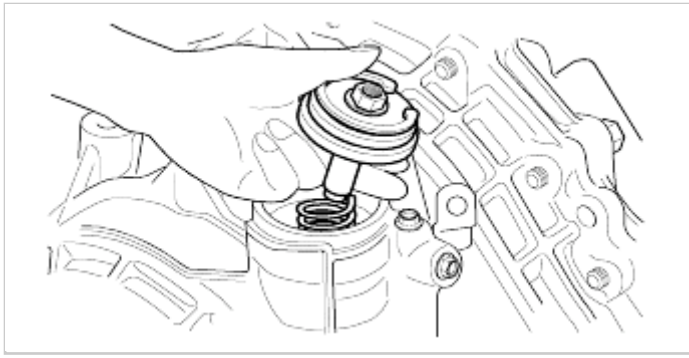
Look into the hole where output speed sensor will be installed, in order to check if direct planetary carrier assembly is seated correctly.

CAUTION

On moving the transaxle case, be careful that the director assembly do not slide out.

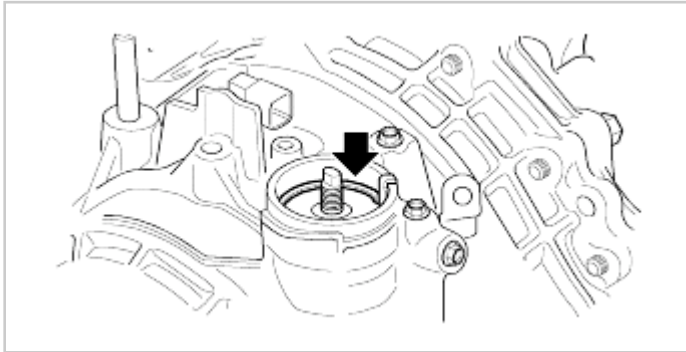


51. Install the spring and reduction brake piston assembly.

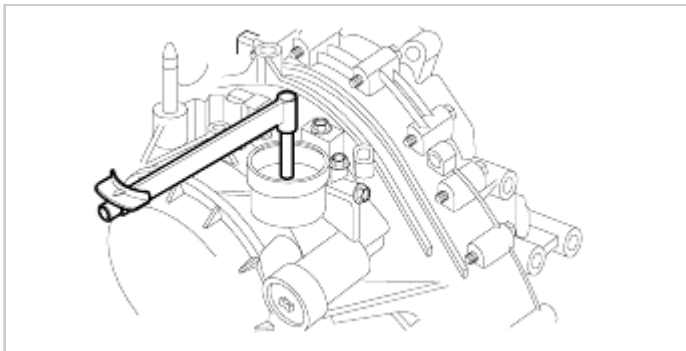


52. Adjust the reduction brake band in the following procedure:

- (1) Install the reduction brake piston snap ring.



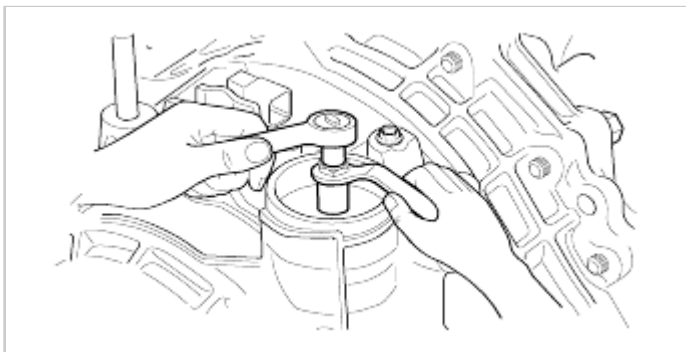
- (2) Hold the reduction brake piston not to turn and tighten and release the adjustor rod 2 times with tightening torque (100kg·cm).
- (3) Tighten with 50kg·cm torque again and release 5.5~5.75 times.



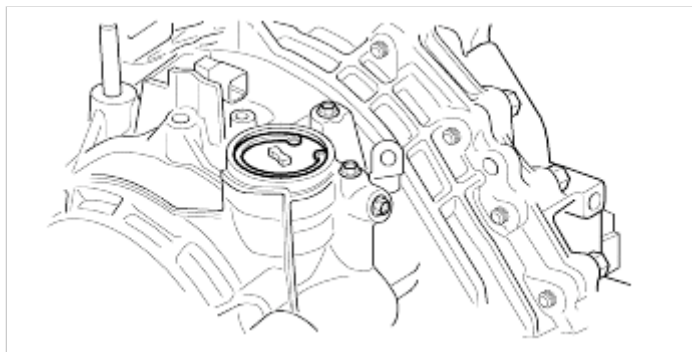
- (4) Tighten the reduction brake piston rod holding nut with tightening torque.

Tightening torque :

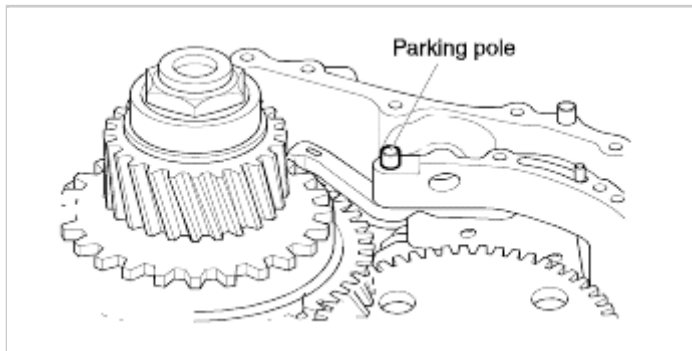
14.7~21.6N·m(150~220kg·cm, 10.8~15.9 lb·ft)



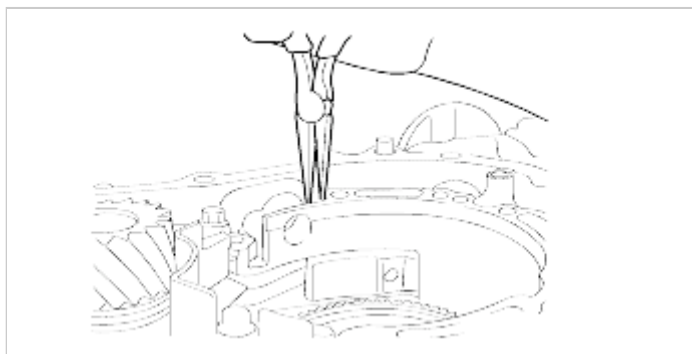
53. Install the outer reduction brake piston and the snap ring.



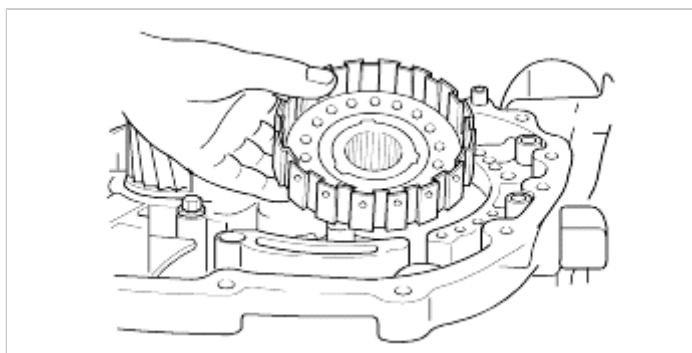
54. Install the parking pole, the spacer and the spring and then the parking pole shaft.



55. Install the parking roller support and the roller shafts(two).



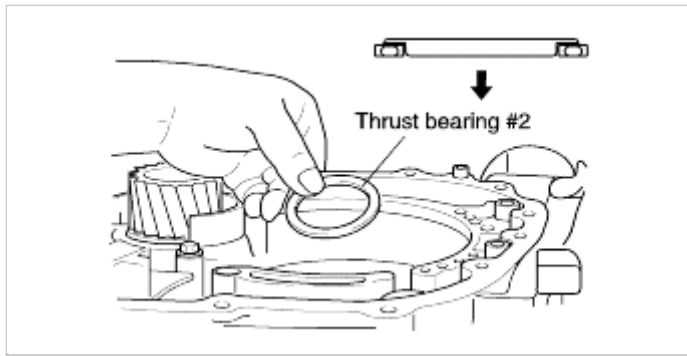
56. Install the underdrive clutch hub.



57. Install the thrust bearing #2.

CAUTION

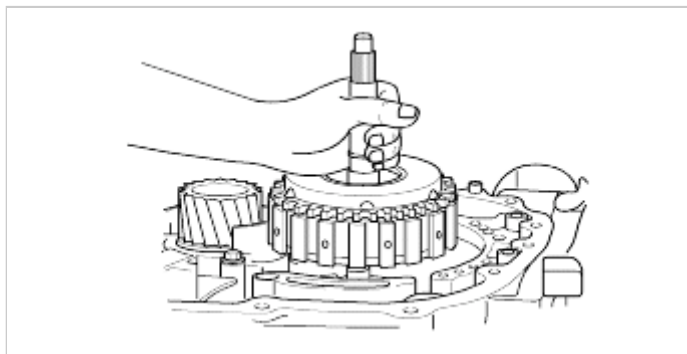
Be careful not to reverse the direction of the thrust bearing.



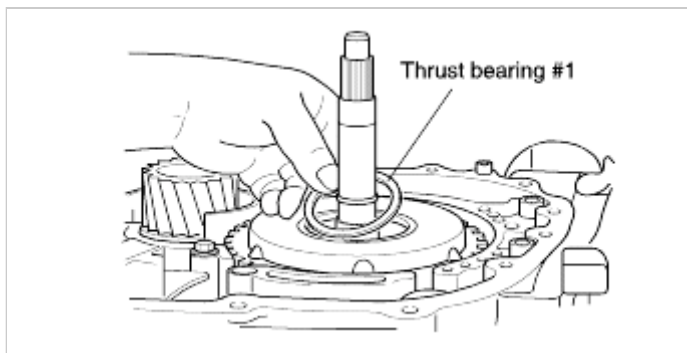
58. Hold the input shaft and install the underdrive clutch.

NOTE

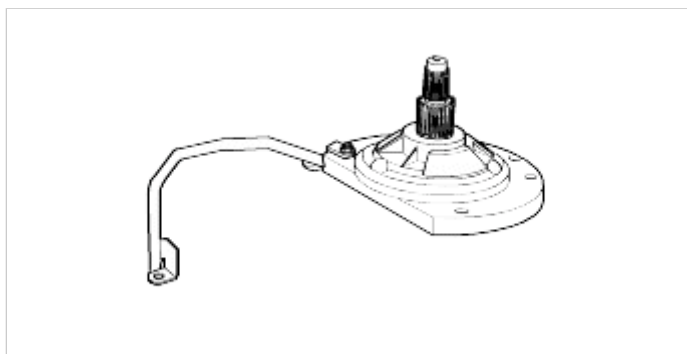
Look into the hole where the output speed sensor will be installed, in order to check if direct planetary carrier assembly is seated correctly.



59. Install the used thrust washer #1.



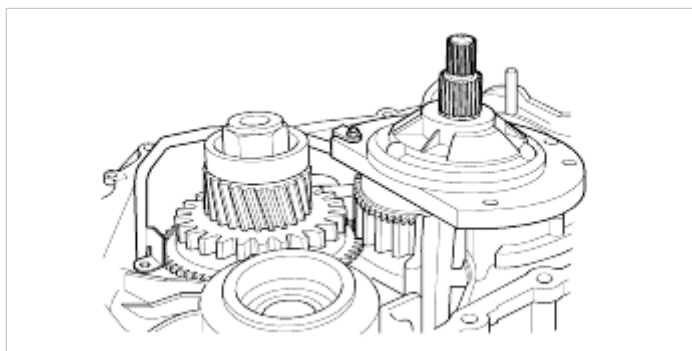
60. Connect the pipe to the fluid pump.



61. Install the new fluid pump gasket and the oil pump assembly.

CAUTION

Do not reuse used gasket.

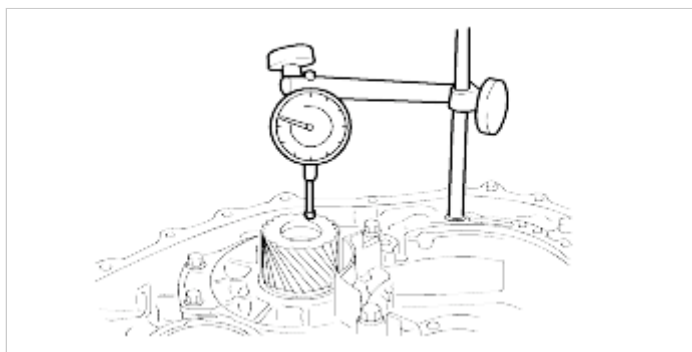


62. Tighten the fluid pump mounting bolt with tightening torque.

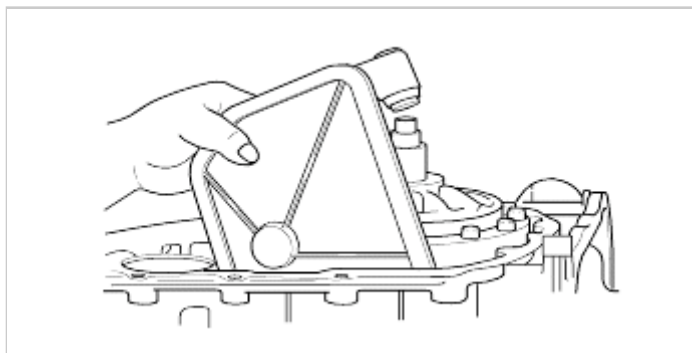
63. Check the input shaft end play and install the appropriate thrust washer in procedure 59.

Standard range

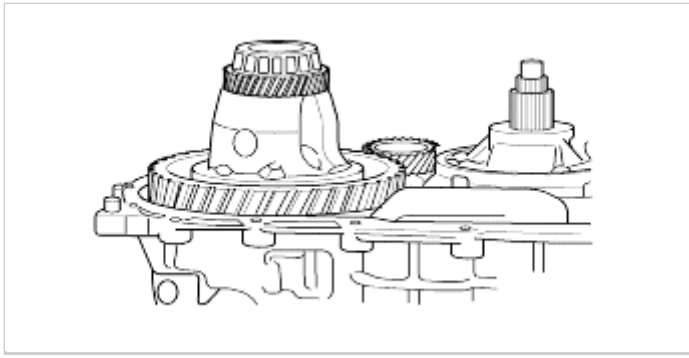
F5A51-3 : 0.027~0.057in(0.70~1.45mm)



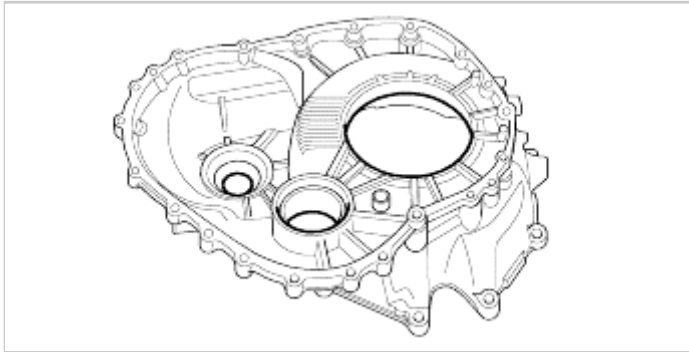
64. Install the main fluid filter.



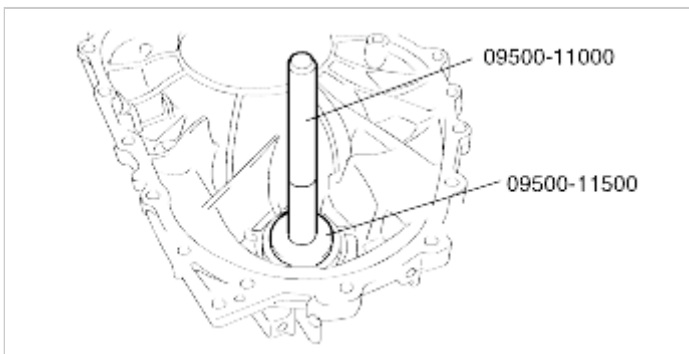
65. Install the differential assembly.



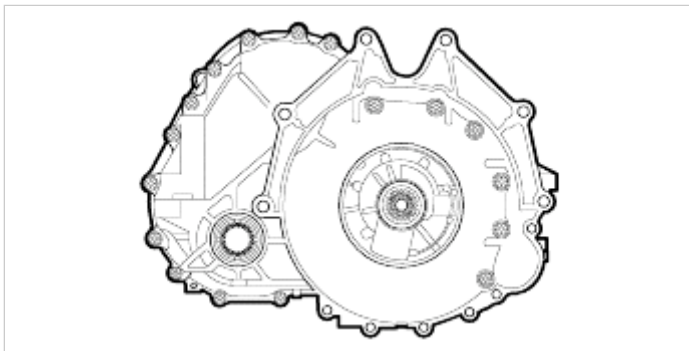
66. Install 3 solders (length approx 0.39in(10mm), thickness 0.12in(3mm)) on the torque converter housing at positions illustrated on the figure.



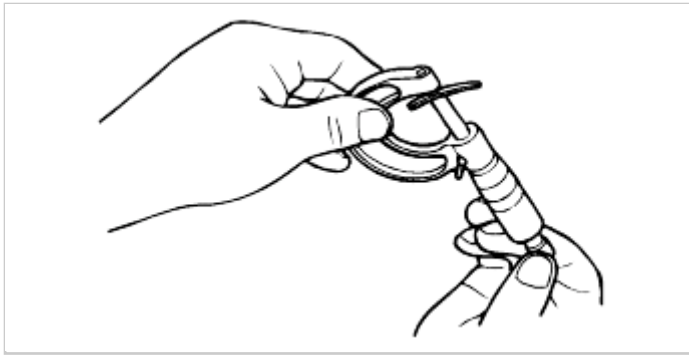
67. Hit output race into the housing using the special tool.



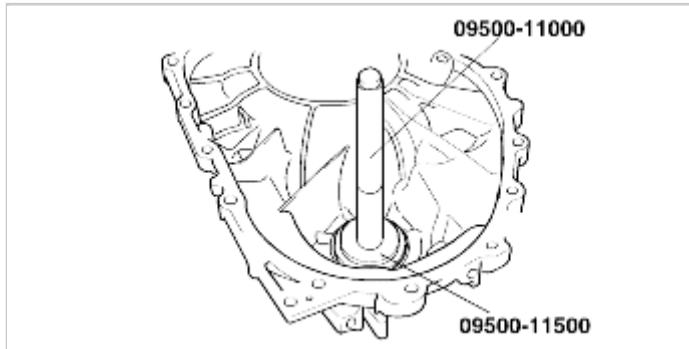
68. Install the torque converter housing onto the transaxle case without applying sealing material and tighten with tightening torque.



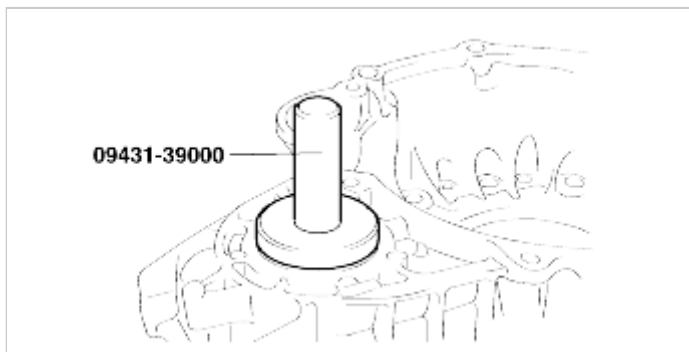
69. Release the bolts and remove the solders.
70. Measure the solder thickness with a micrometer and choose a spacer using the below formula:
 $(T+0.0022\text{in}(0.056\text{mm})\sim(T+0.0041\text{in}(0.105\text{mm}))$



71. Install the spacer chosen at procedure 70 on the converter housing. Tap the output race into it using the special tool.

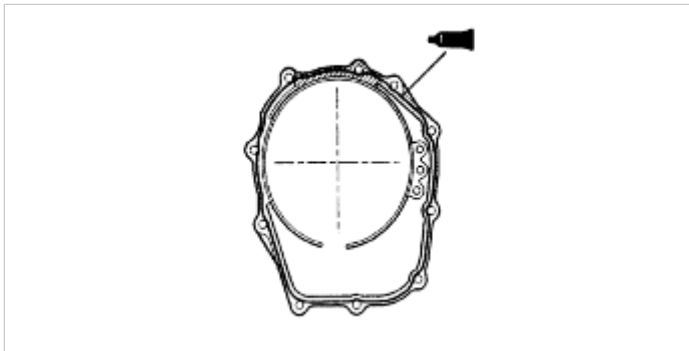


72. Install the driveshaft oil seal on the torque converter housing case.

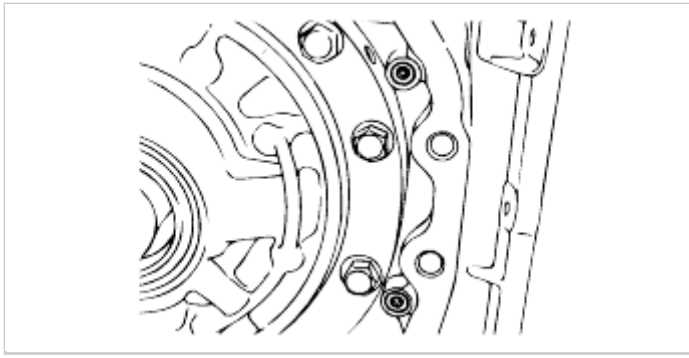


73. Continually apply liquid gasket at the torque converter housing at $\varnothing 1.6\text{mm}$ thickness as the figure.

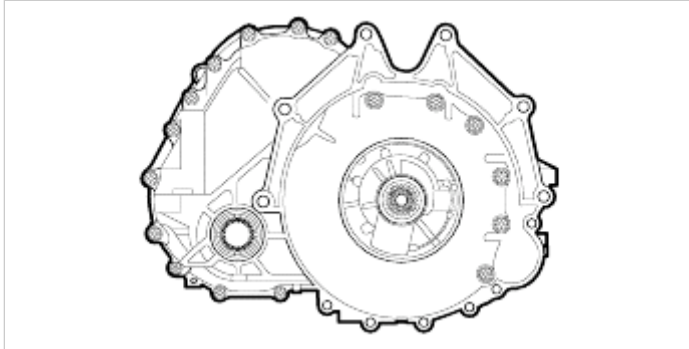
Standard sealant :
Threebond 1281B or LOTITE FMD546



74. Install new O-rings(two).

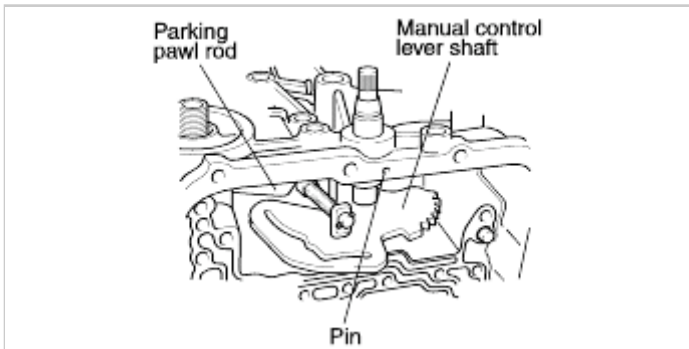


75. Connect the torque converter housing and tighten the connecting bolts (twenty) with tightening torque.

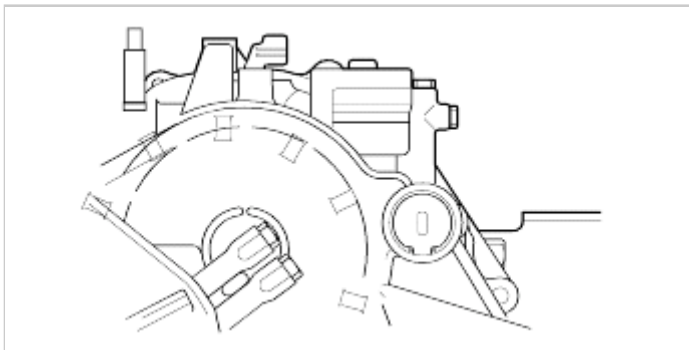


76. Install the manual control shaft and the parking pole rod.

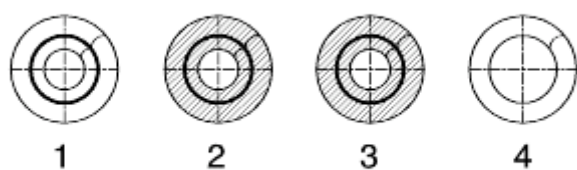
77. Install the manual control shaft roller.



78. Install the reduction brake accumulator spring and the piston and then the snap ring.



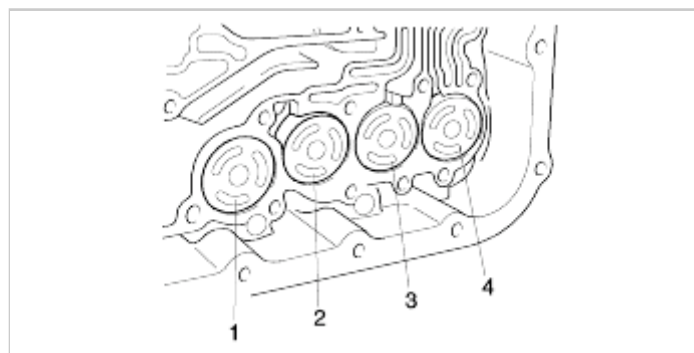
79. Install each accumulator piston, a new seal ring, and the piston.



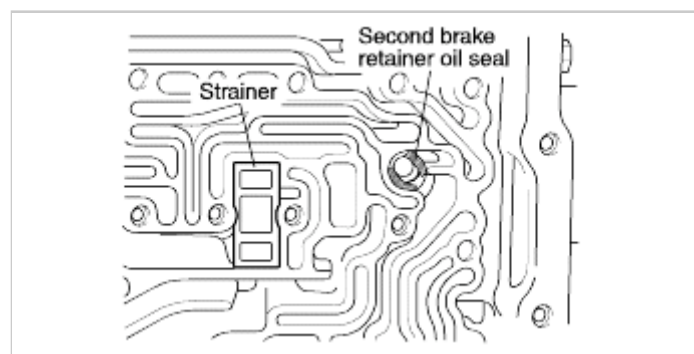
NOTE

Accumulator spring identification

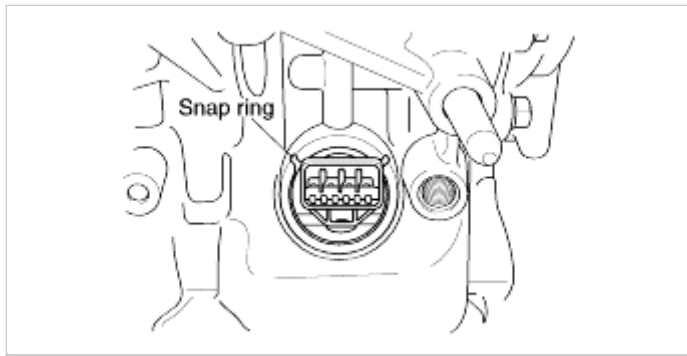
No.	Use	I.D.Color
1	LR brake	Colorless
2	UD clutch	Yellow
3	2ND brake	White
4	OD clutch	Colorless



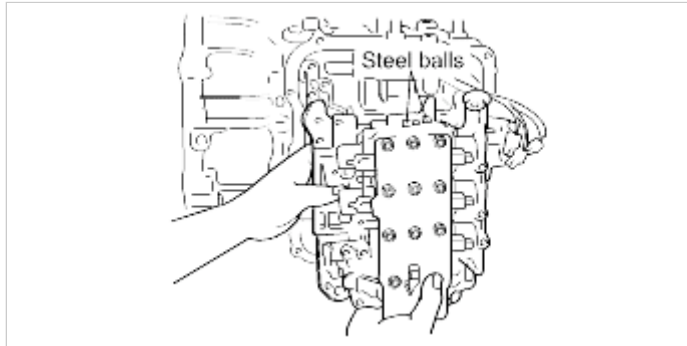
80. Install the strainer and the second brake retainer oil seal.



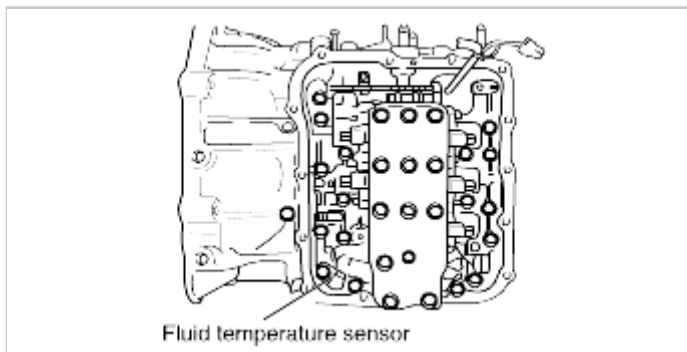
81. Install the solenoid valve harness and install the snap ring around the connector tightly.



82. Install the valve body, the gasket and the steel balls(two).



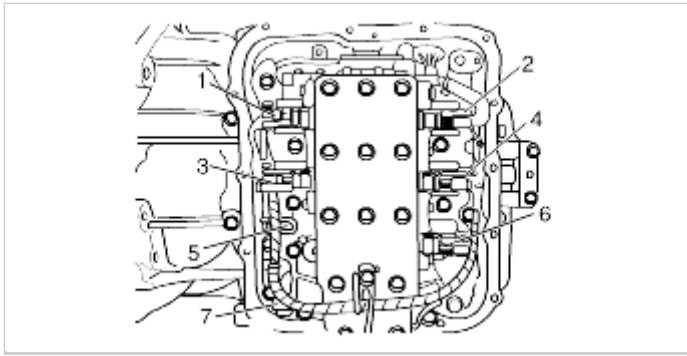
83. Install the fluid temperature sensor.



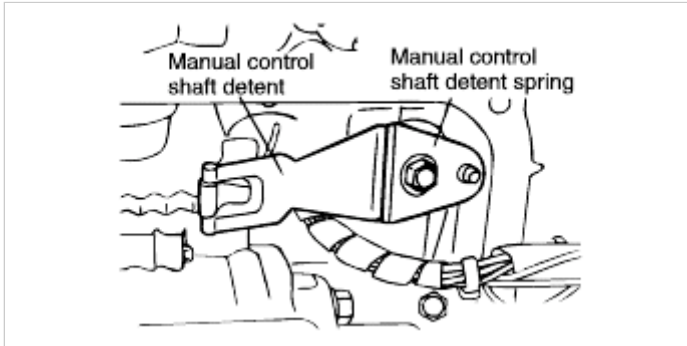
84. Install the valve body mounting bolts(twenty eight).

85. Connect the connector valve body.

No.	Connecting point	Wire color	Connector housing color
1	OD solenoid valve	Red	Black
2	UD solenoid valve	White, red, red	Black
3	LR solenoid valve	Brown, yellow	Milky white
4	2nd solenoid valve	Green, red, red	Milky white
5	RED solenoid valve	Brown, yellow, yellow	Black
6	DCC solenoid valve	Blue, yellow, yellow	Black
7	Temperature sensor	Black, red	Black

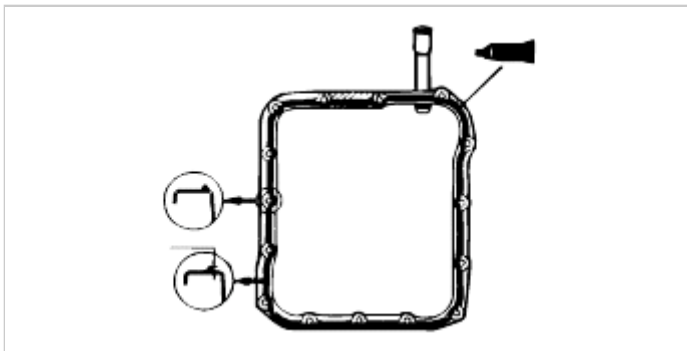


86. Install the manual control shaft detent spring and the detent.

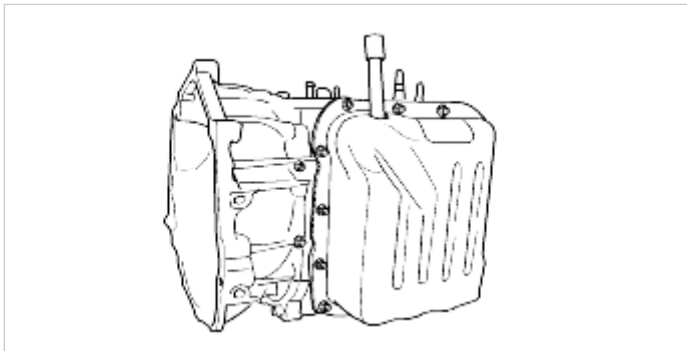


87. Continually apply liquid gasket at the valve body at $\varnothing 0.098\text{in}(2.5\text{mm})$ thickness as the figure.

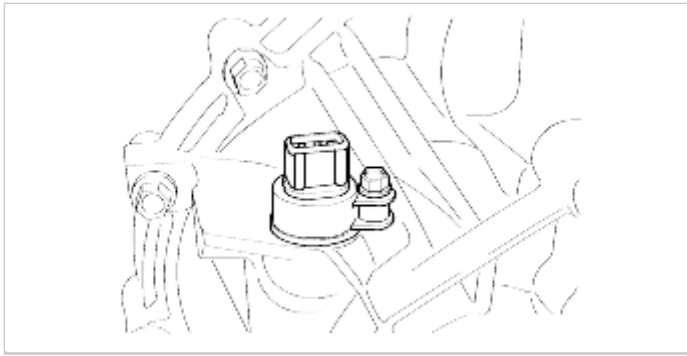
Liquid gasket
 Standard sealant
 Threebond 1281B or LOCTITE FMD546



88. Install the valve body cover and tighten the mounting bolts with tightening torque.



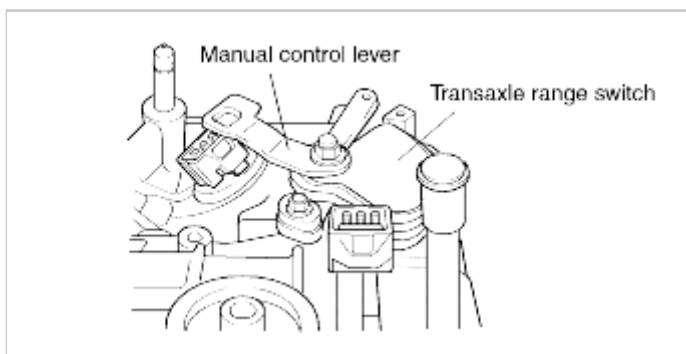
89. Install the speedometer gear.



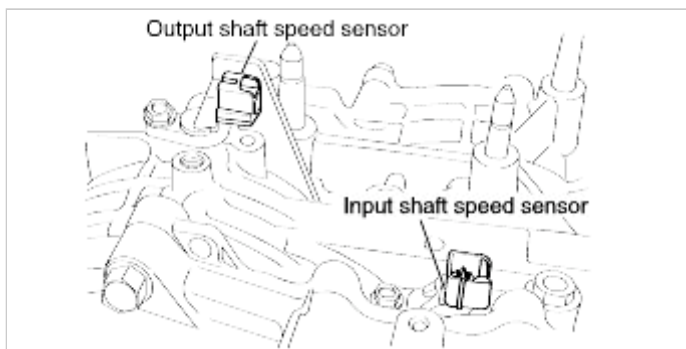
90. Install the transaxle range switch and the manual control lever.

CAUTION

The transaxle range switch shall be installed with the valve body installed as it was.



91. Install the input speed sensor and output speed sensor.



92. Install the evebolt, a new gasket, and the oil cooler feed tube.

93. Install the fluid level gauge.

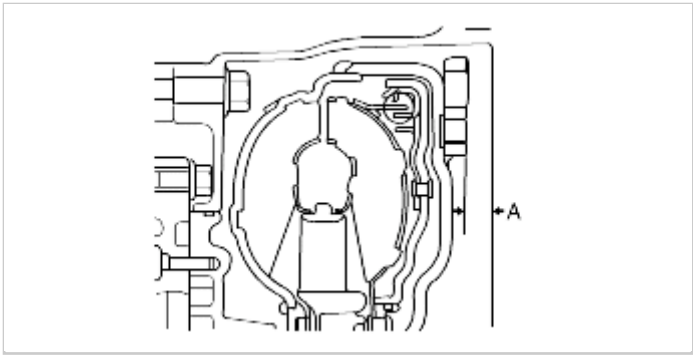
94. Install each bracket.

95. Install the torque converter and tighten it into tolerance.

Tolerance: approx. 0.37in(9.4mm)

CAUTION

Apply ATF to avoid damage on the torque converter shaft and the oil pump seal lip.



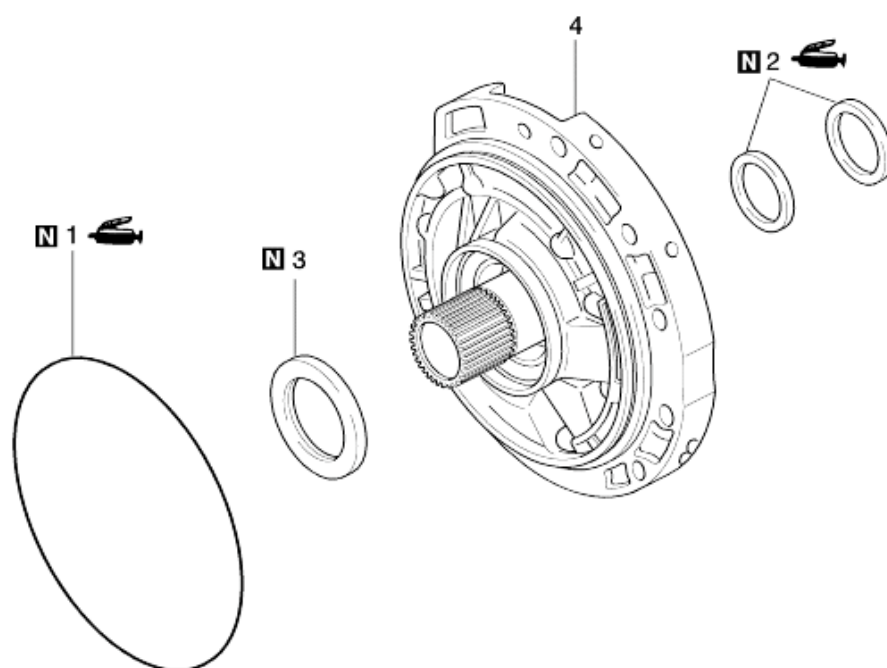


Automatic Transaxle System

Hydraulic System - Oil Pump

Components

N Marked part shall be replaced with new part.



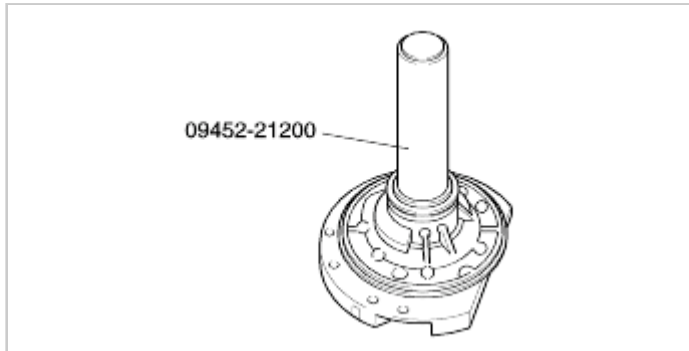
Disassembly steps

1. O-ring
2. Seal ring

3. Oil seal
4. Oil pump assembly

Assembly

1. Install the oil seal.



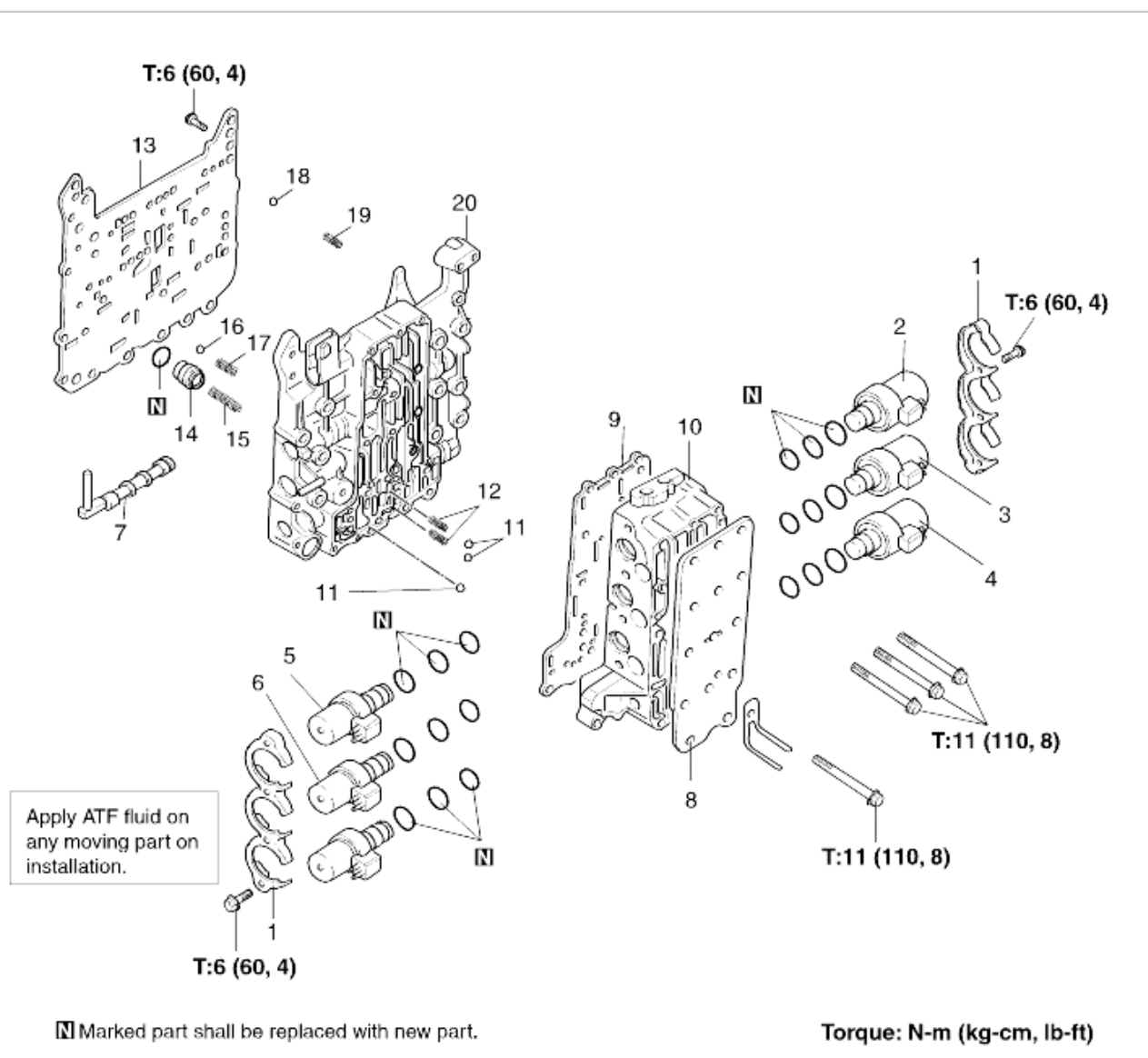
2. Install the O-ring
Install the new O-ring around fluid pump and apply ATF, blue mineral oil, or white vaseline around the O-ring.



Automatic Transaxle System

Valve Body System

Components A

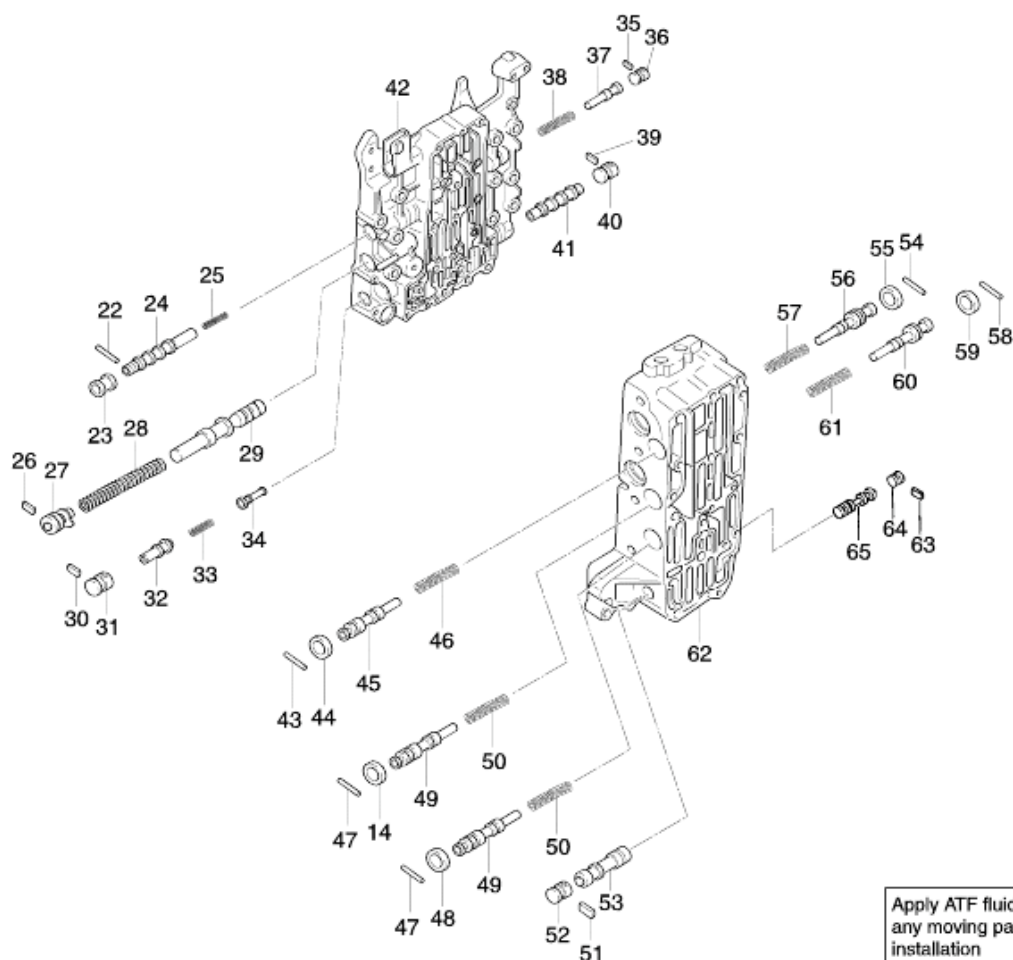


Disassembly steps

1. Solenoid valve support
2. UD clutch solenoid valve
3. 2nd brke 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

Components B



Torque: N-m (kg-cm, lb-ft)

Disassembly procedure

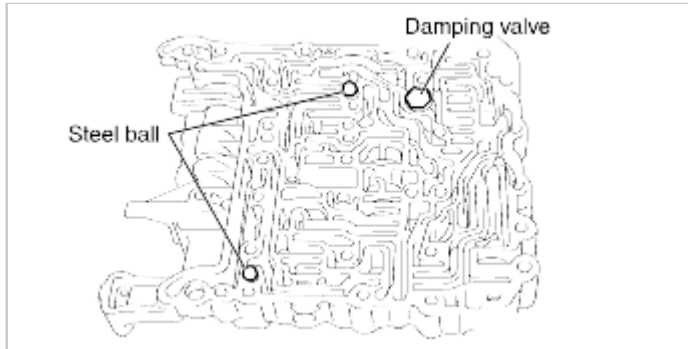
- | | | |
|--|---|--|
| 22. Roller | 40. Failsafe B sleeve | 53. Switch valve |
| 23. Damper clutch control valve sleeve | 41. Failsafe B | 54. Roller |
| 24. Damper clutch control valve | 42. Inside valve body | 55. Underdrive pressure control valve sleeve |
| 25. Damper clutch control valve spring | 43. Roller | 56. Underdrive pressure control valve |
| 26. Plate | 44. Overdrive pressure control valve sleeve | 57. Underdrive pressure control valve spring |
| 27. Screw | 45. Overdrive pressure control valve | 58. Roller |
| 28. Regulator valve spring | 46. Overdrive pressure control valve spring | 59. Second pressure control valve sleeve |
| 29. Regulator valve | 47. Roller | 60. Second pressure control valve |
| 30. Plate | 48. Low and reverse pressure control valve sleeve | 61. Second pressure control valve spring |
| 31. Failsafe valve A sleeve | 49. Low and reverse pressure control valve | 62. Outside valve body |
| 32. Failsafe valve A2 | 50. Low and reverse pressure control valve spring | 63. Plate |
| 33. Failsafe A spring | 51. Plate | 64. Failsafe valve C sleeve |
| 34. Failsafe valve A1 | 52. Plug | 65. Failsafe valve C |
| 35. Plate | | |
| 36. Plug | | |
| 37. Torque converter valve | | |
| 38. Torque converter valve spring | | |
| 39. Plate | | |

Disassembly

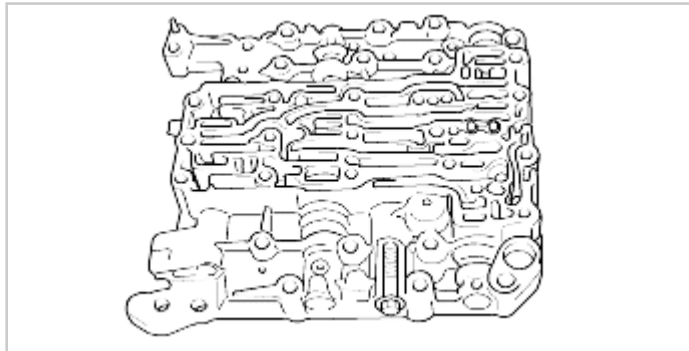
1. Remove each solenoid valve.
Mark each installation point with white paint or so.

Reassembly

1. Install the spring/steel ball/damping valve/damping valve spring.

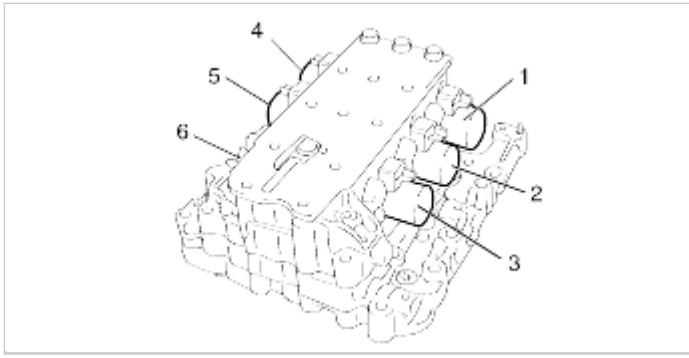


2. Install the spring/steel ball.



3. Install each solenoid valve.
(1) Apply ATF or white vaseline on the O-ring and assemble it caring not to damage it.
(2) Remove the marking made in disassembly and install them.

No.	Name
1	Underdrive solenoid valve
2	Second solenoid valve
3	Damper clutch control solenoid valve
4	Overdrive solenoid valve
5	Low and reverse solenoid valve
6	Reduction solenoid valve (5 A/T)





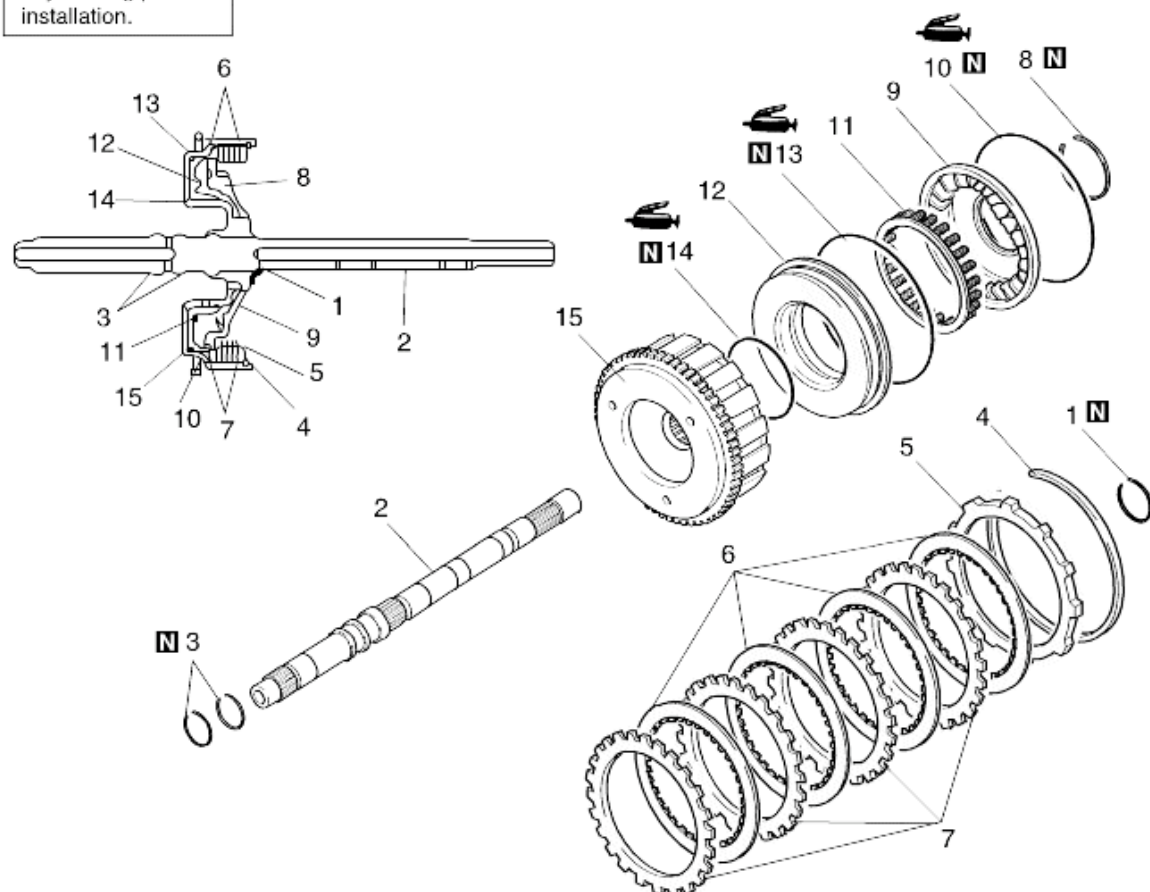
Automatic Transaxle System

Clutch & Brake - Underdrive Clutch

Components



Apply ATF fluid on any moving part on installation.



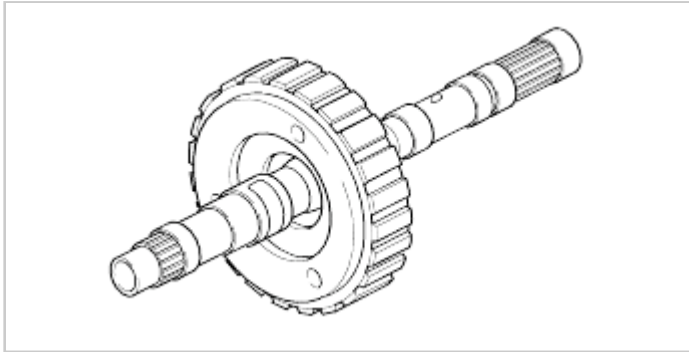
N Marked part shall be replaced with new part.

Disassembly procedure

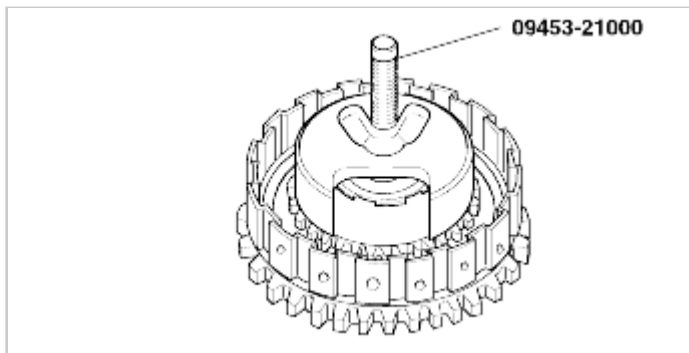
- | | |
|--------------------------|--------------------------------------|
| 1. Snap ring | 9. Underdrive clutch spring retainer |
| 2. Input shaft | 10. O-ring |
| 3. Seal ring | 11. Return spring |
| 4. Snap ring | 12. Underdrive clutch piston |
| 5. Clutch reaction plate | 13. O-ring |
| 6. Clutch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

Disassembly

1. Remove the input shaft snap ring.



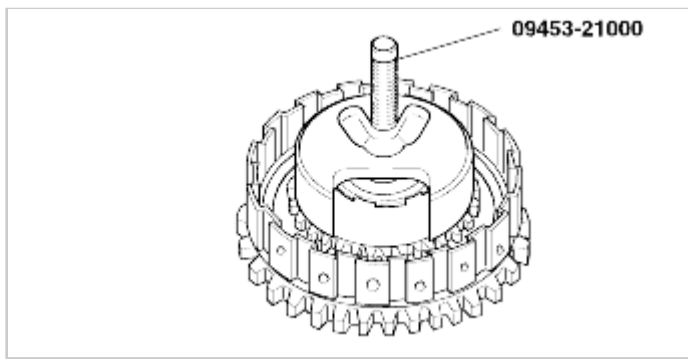
2. Disconnect the input shaft.
3. Remove seal rings(two).
4. Remove the clutch reaction plate snap ring.
5. Disconnect the clutch reaction plate.
6. Disassemble the clutch disce (four) and plates (four).
7. Remove the under clutch piston snap ring using the special tool.



8. Remove the clutch spring retainer.
9. Remove the O-ring.
10. Remove the clutch return spring.
11. Remove the under clutch piston using compressed air.
12. Remove the O-rings(two).

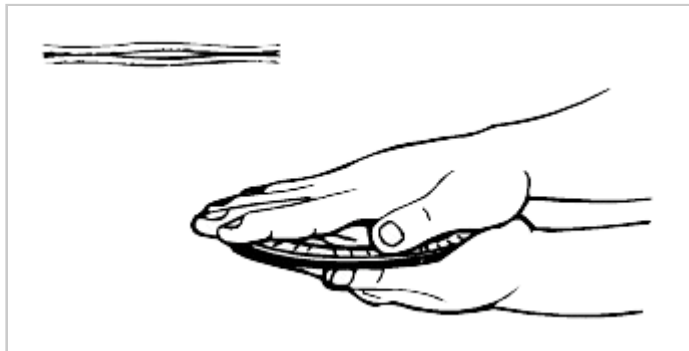
Reassembly

1. Install the O-ring(two).
2. Install the underdrive clutch piston.
3. Install the clutch return spring.
4. Install the O-ring.
5. Install the clutch spring retainer.
6. Install the clutch spring retainer snap ring using the special tool.



NOTE

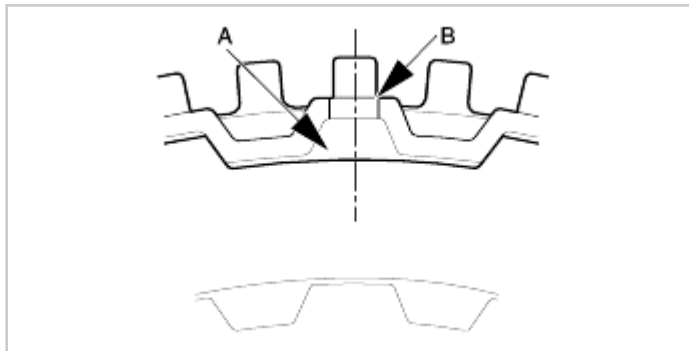
Hold the 2 clutch discs together, and slide them a little, If there is a gap, they are wave discs.



7. Align the teeth of the clutch plate, the clutch disc and the clutch reaction plate (fig.A), and hold the underdrive clutch(fig.B).

CAUTION

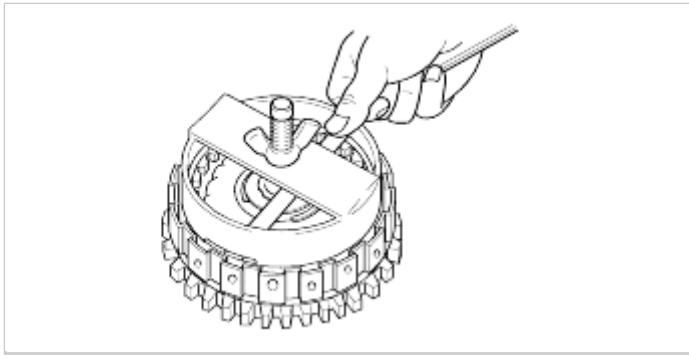
Dip the clutch disc in ATF sufficiently before assembly.



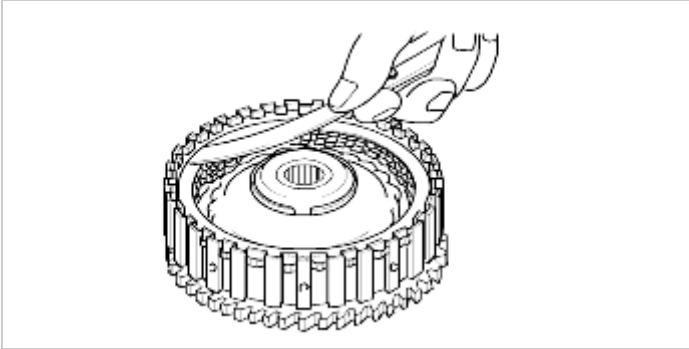
8. Install the clutch reaction plate in the direction on figure.
9. Install the snap ring.
10. Check the gap between the snap ring and the reaction plate.

Standard value

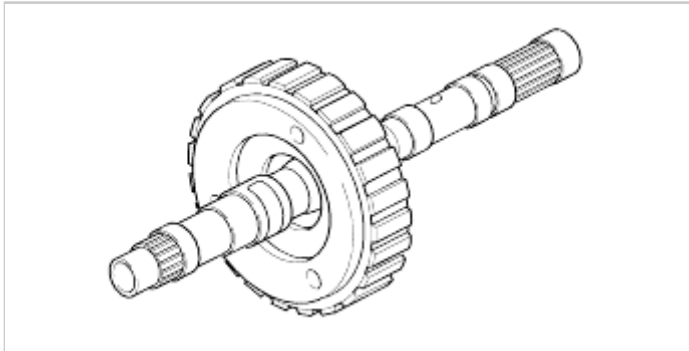
F5A51-3 : 0.063~0.071in(1.6~1.8mm)



11. If the gap deviates from standard value, choose a proper snap ring(15 sizes).



12. Install the underdrive clutch assembly on the input shaft.



13. Install the snap ring on the input shaft.

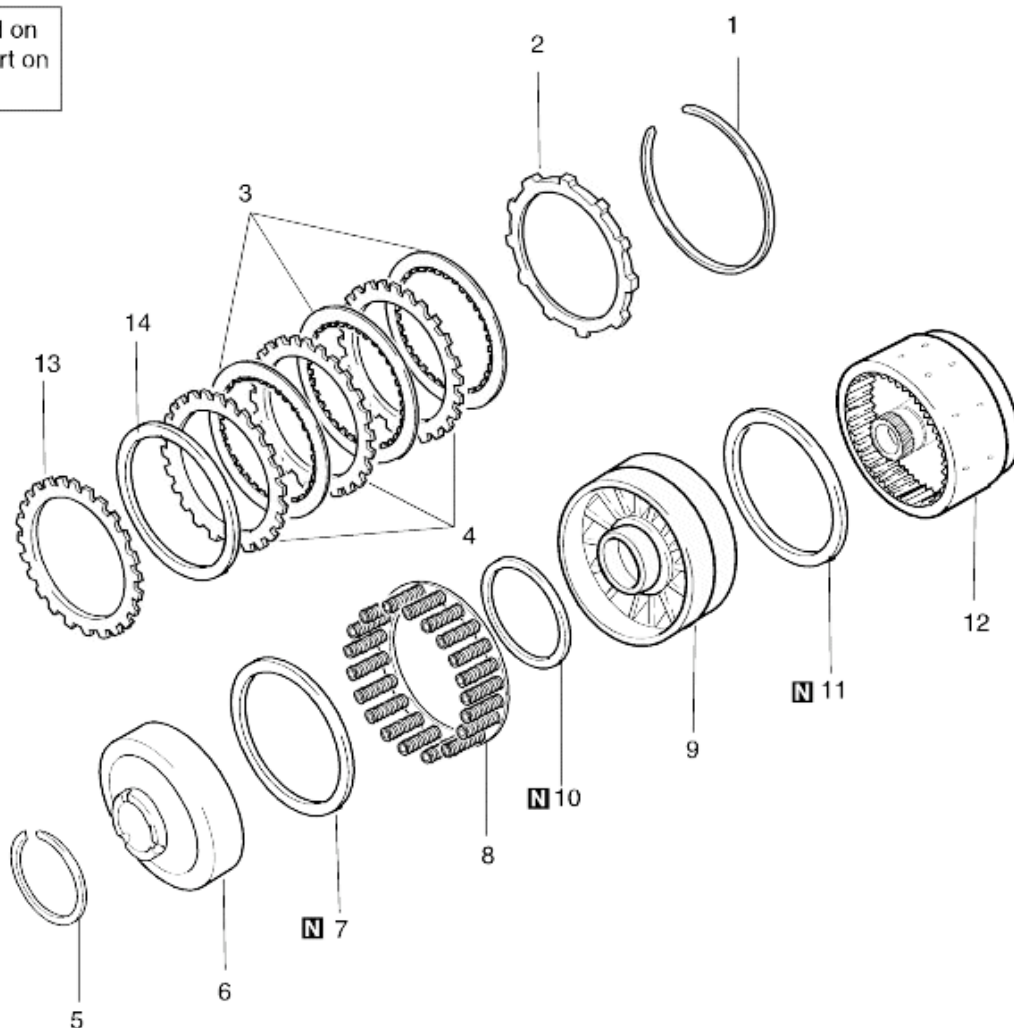


Automatic Transaxle System

Clutch & Brake - Direct Clutch

Components

Apply ATF fluid on any moving part on installation.



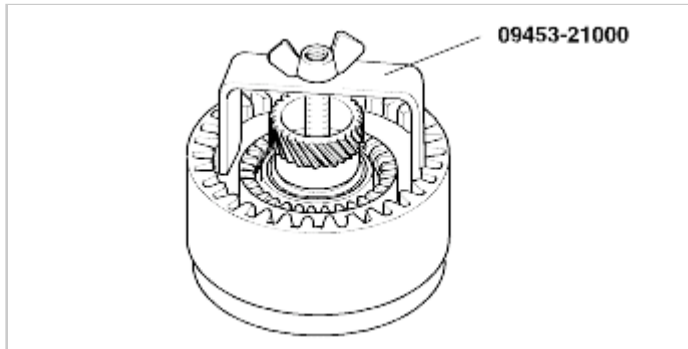
N Marked part shall be replaced with new part.

Disassembly procedure

- | | |
|--------------------------|----------------------------|
| 1. Snap ring | 8. Return spring |
| 2. Clutch reaction plate | 9. Direct clutch piston |
| 3. Clutch disc | 10. O-ring |
| 4. Clutch plate | 11. O-ring |
| 5. Snap ring | 12. Direct clutch retainer |
| 6. Spring retainer | 13. Intermediate plate |
| 7. O-ring | 14. Cushion plate |

Disassembly

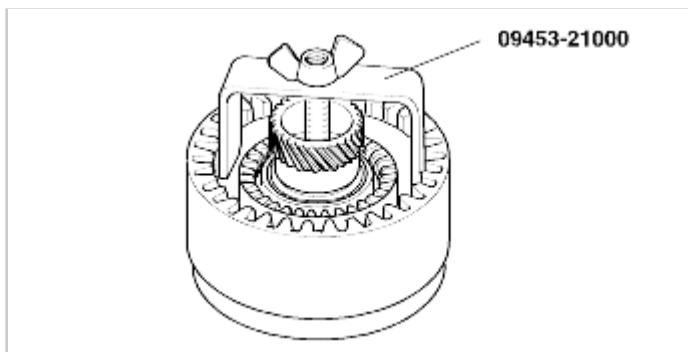
1. Remove the direct clutch snap ring.
2. Remove the clutch reaction plate.
3. Remove the clutch discs (five) and plates (five).
4. Remove the snap ring using special tool.



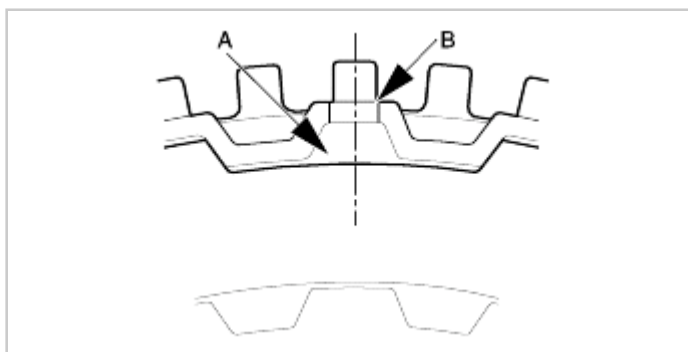
5. Remove the direct spring retainer.
6. Remove the return spring.
7. Remove the direct clutch piston and O-ring.

Reassembly

1. Install the O-rings on direct clutch retainer and piston.
2. Install the clutch piston.
3. Install the O-ring on spring retainer and install return spring and retainer.
4. Install the snap ring using the special tool.



5. Aligning the teeth of the clutch plate, the clutch disc, and the clutch reaction plate (fig.A) and the direct clutch retainer hole (fig.B), assemble them.

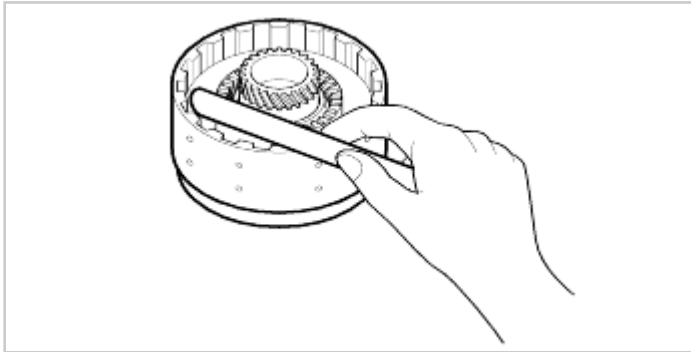


6. Install the direct clutch reaction plate as illustrated on the figure.

7. Applying force of 5kg on the direct clutch reaction plate, measure the gap with the snap ring using a gauge. If the measurement deviates from standard value, use an appropriate snapring (12 sizes).
-

Standard value

F5A51-3 : 0.024~0.031in(0.6~0.8mm)





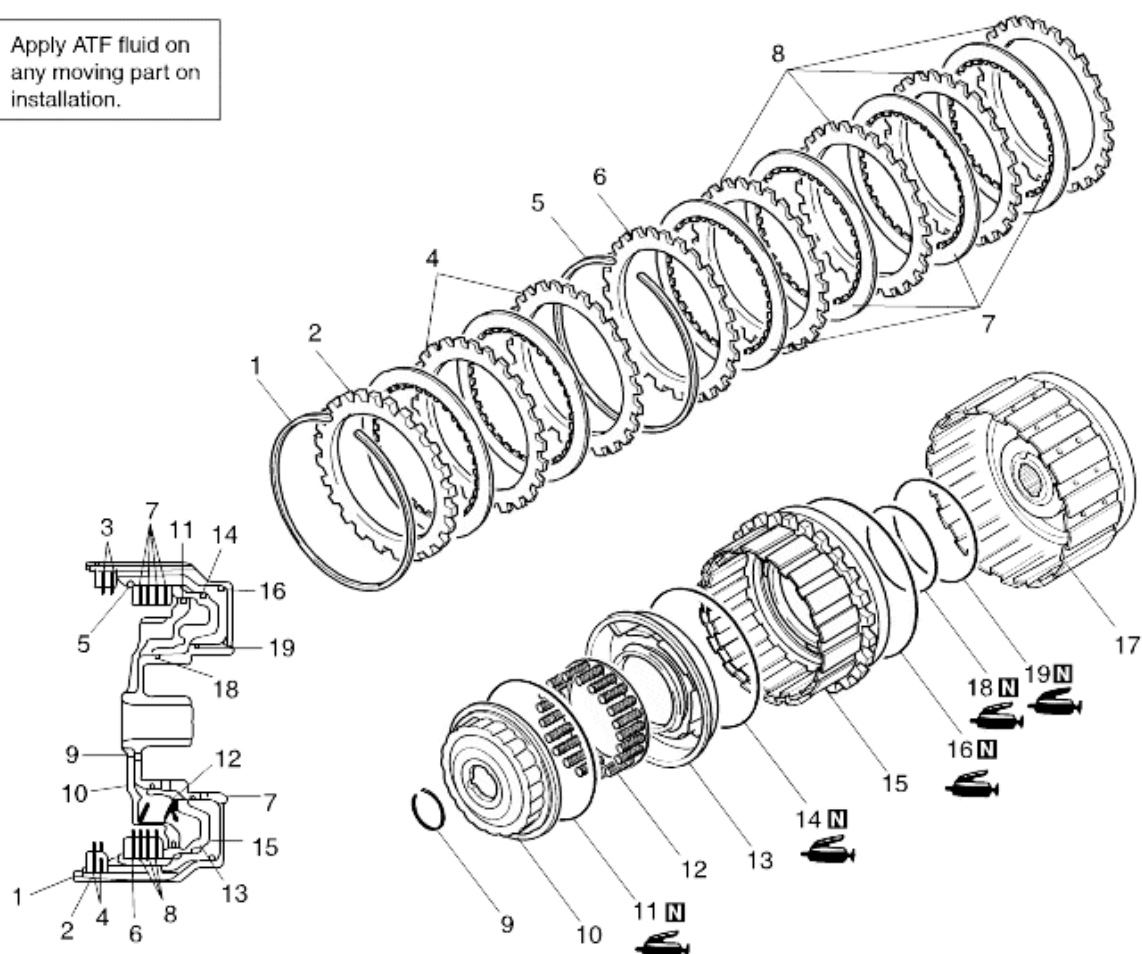
Automatic Transaxle System

Clutch & Brake - Reverse and Overdrive Clutch

Components



Apply ATF fluid on any moving part on installation.



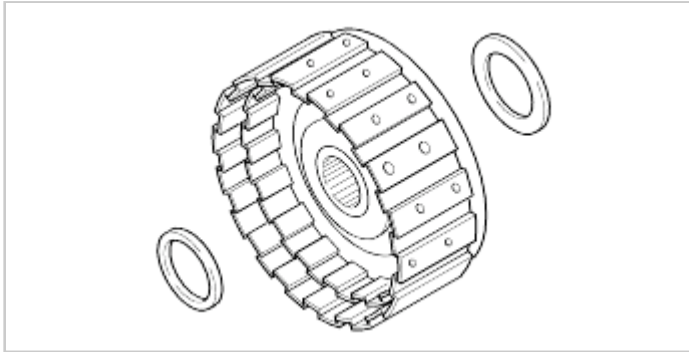
Marked part shall be replaced with new part.

Disassembly steps

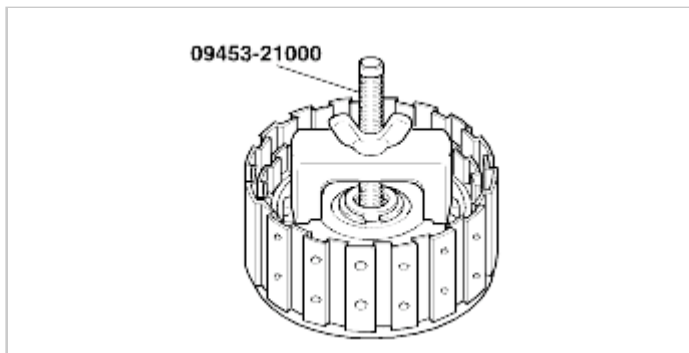
- | | |
|--------------------------|-----------------------------|
| 1. Snap ring | 11. O-ring |
| 2. Clutch reaction plate | 12. Return spring |
| 3. Clutch disc | 13. Overdrive clutch piston |
| 4. Clutch plate | 14. O-ring |
| 5. Snap ring | 15. Reverse clutch piston |
| 6. Clutch reaction plate |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

Disassembly

1. Remove the overdrive clutch reaction plate snap ring.



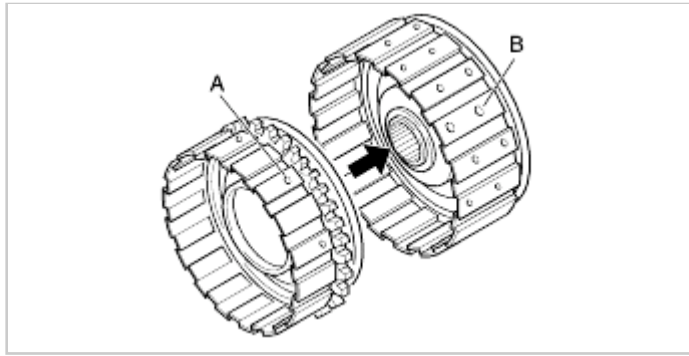
2. Remove the overdrive reaction plate.
3. Remove the overdrive clutch discs(four) and the plates(four).
4. Remove the reverse clutch reaction plate snap ring.
5. Remove the reverse clutch reaction plate.
6. Remove the reverse clutch discs(two) and the plates(two).
7. Remove the clutch spring retainer snap ring using special tool.



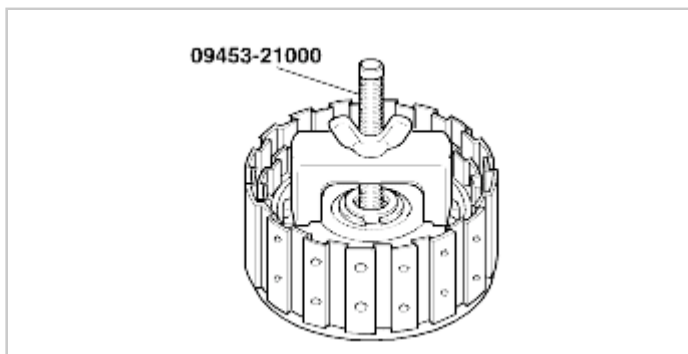
8. Disconnect the clutch spring retainer.
9. Remove the O-ring.
10. Remove the clutch return spring.
11. Remove the overdrive clutch piston using compressed air.
12. Remove the O-ring.
13. Remove the reverse clutch piston.
14. Remove the O-rings(three).

Reassembly

1. Install the O-rings(three).
2. Connect the reverse retainer and reverse piston aligning holes A & B.

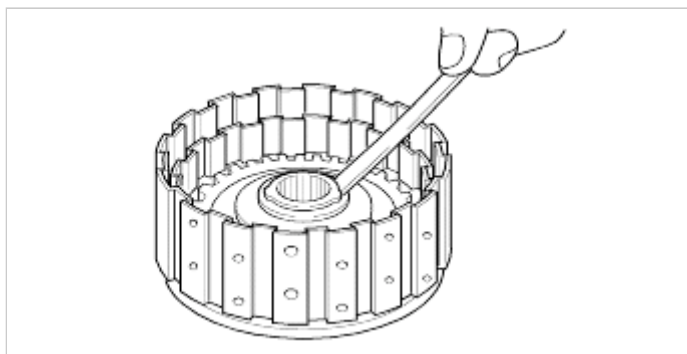


3. Install the reverse clutch piston.
4. Install the O-ring.
5. Install the overdrive clutch piston.
6. Install the clutch return spring.
7. Install the O-ring.
8. Install the clutch spring retainer.
9. Install the overdrive clutch spring retainer snap ring using the special tool.



10. Measure the gap with the snap rings by using special tool. If the gap deviates from standard value, use an appropriate snap ring(4 sizes).

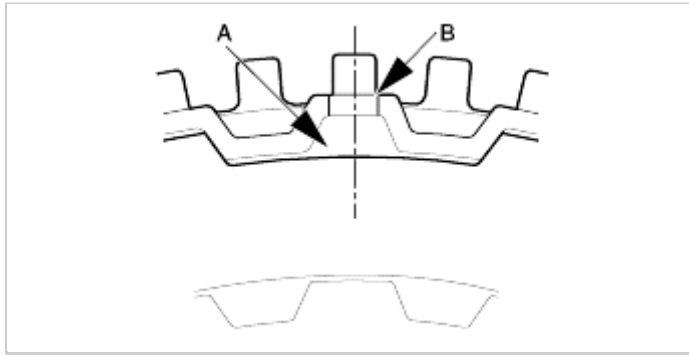
End play : 0~0.035L in(0T~0.09L mm)



CAUTION

Dip the clutch disc in ATF sufficiently before assembly.

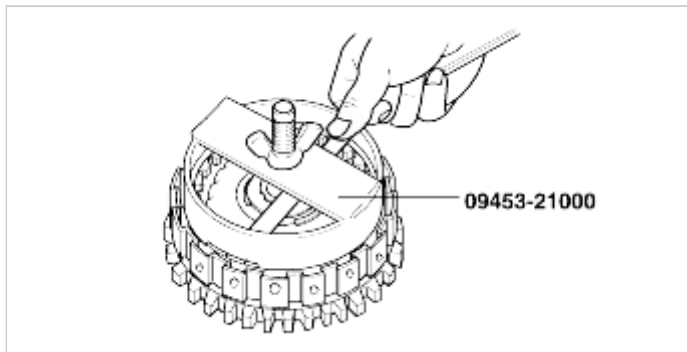
11. Aligning the teeth of the clutch plate, the clutch disc, and the clutch reaction plate (fig.A) and the reverse clutch retainer hole (fig.B), assemble them.



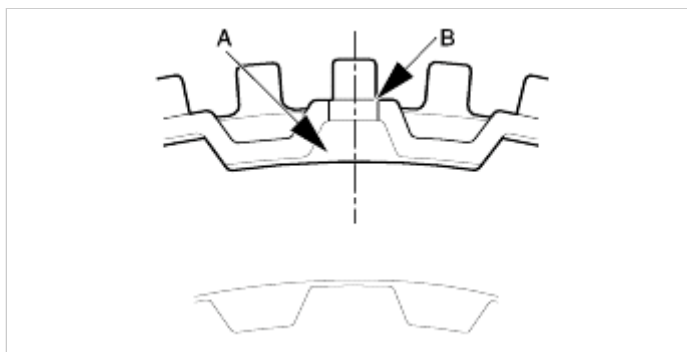
12. Install the reverse clutch discs (two) and plates (two).
13. Install the reverse clutch reaction plate.
14. Install the snap ring.
15. Measure the gap between the reverse clutch reaction plate and the snap ring by using special tool. If the gap deviates from standard value, use an appropriate snap ring (4 sizes).

Standard value

F5A51-3 : 0.059~0.067in(1.5~1.7mm)



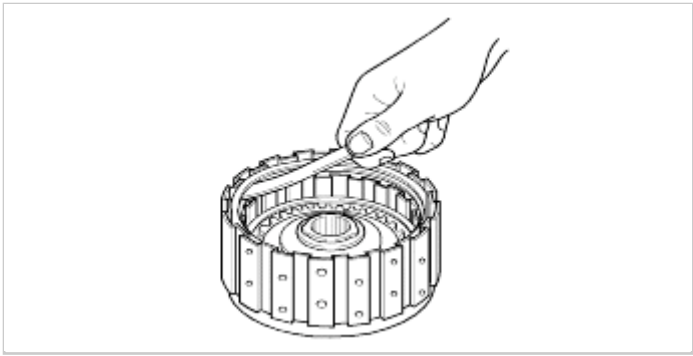
16. Aligning the teeth of the clutch plate, the clutch disc, and the clutch reaction plate (fig.A) and the overdrive clutch retainer hole (fig.B), assemble them.



17. Install the overdrive clutch discs (four) and plates (four).
18. Install the overdrive clutch reaction plate.
19. Install the snap ring.
20. Measure the gap between the overdrive reaction plate and the snap ring. If the gap deviates from standard value, use an appropriate snap ring (15 sizes).

Standard value

F5A51-3 : 0.063~0.071in(1.6~1.8mm)

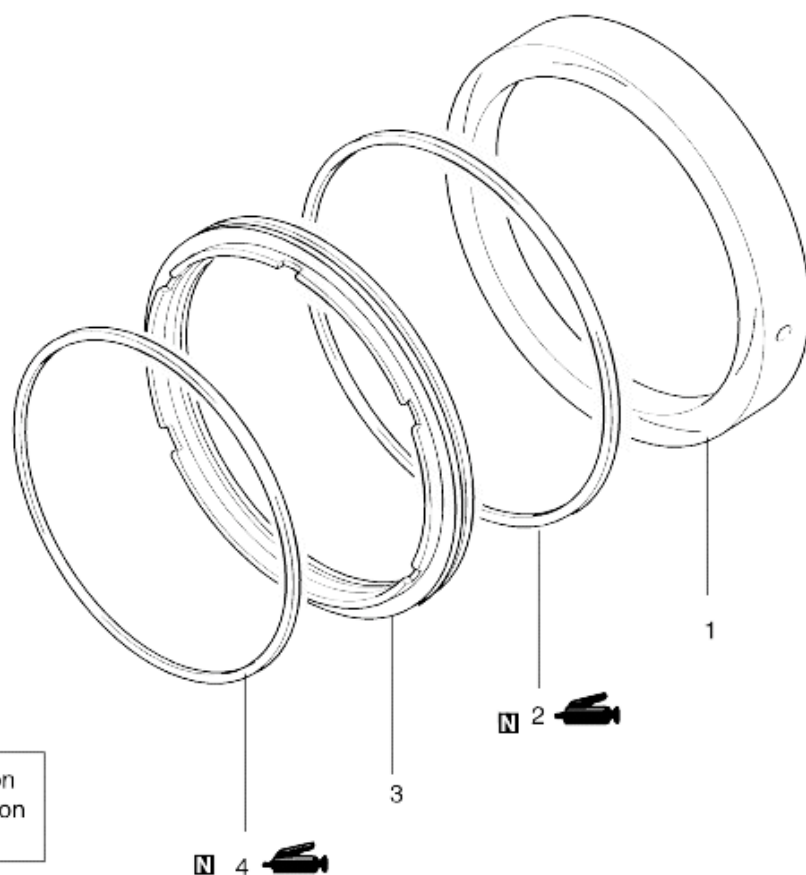




Automatic Transaxle System

Clutch & Brake - Second Brake

Components



Disassembly procedure

1. Second brake retainer
2. O-ring

3. Second brake piston
4. O-ring

Assembly

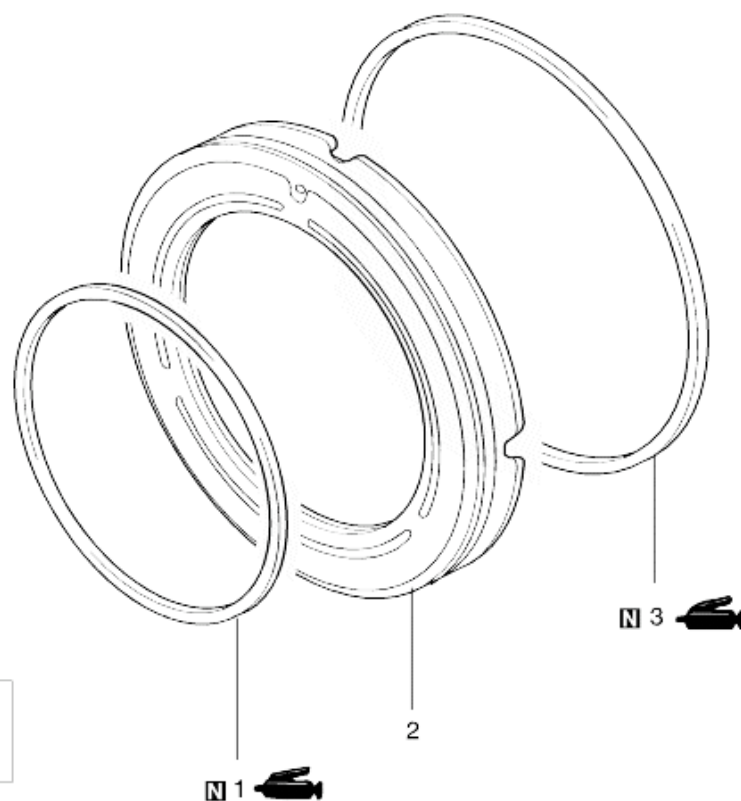
1. Install the O-ring.
Apply ATF or white vaseline on the seal ring and install it caring not to damage it.



Automatic Transaxle System

Clutch & Brake - Low and Reverse Brake

Components



N Marked part shall be replaced with new part.

Disassembly procedure

1. O-ring
3. O-ring

2. Low and reverse brake piston

Assembly

1. Install the seal ring.
Apply ATF or white vaseline on the seal ring and install it caring not to damage it.

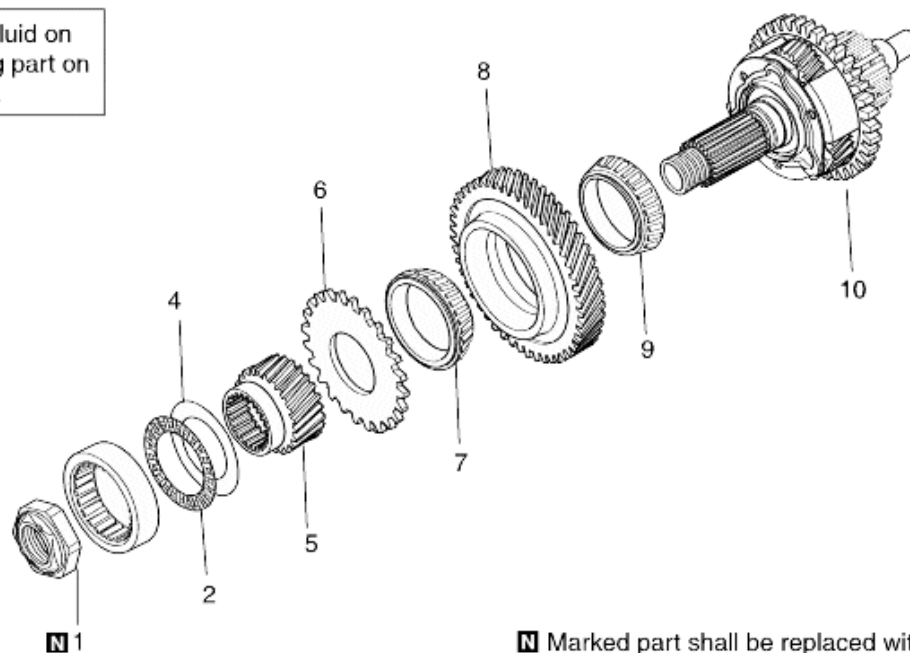


Automatic Transaxle System

Gear System - Planetary Gear

Components

Apply ATF fluid on any moving part on installation.

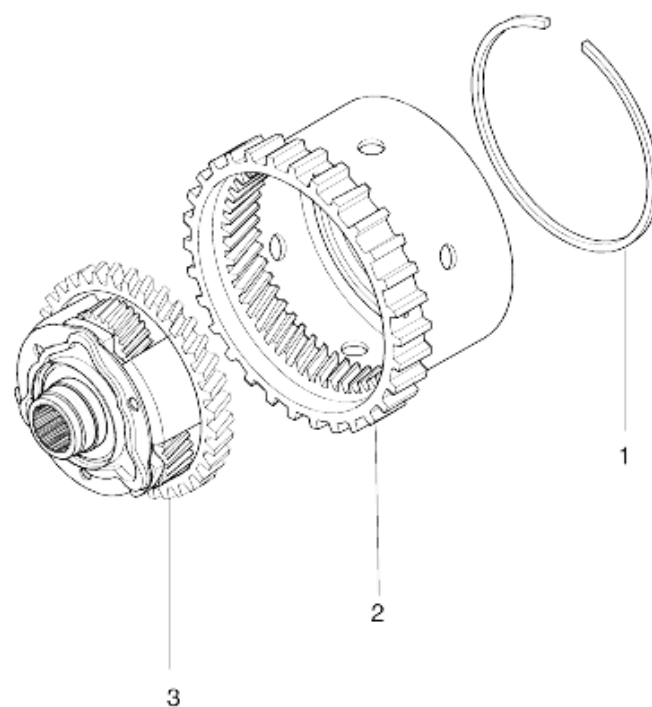


N Marked part shall be replaced with new part.

Disassembly procedure

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

Components



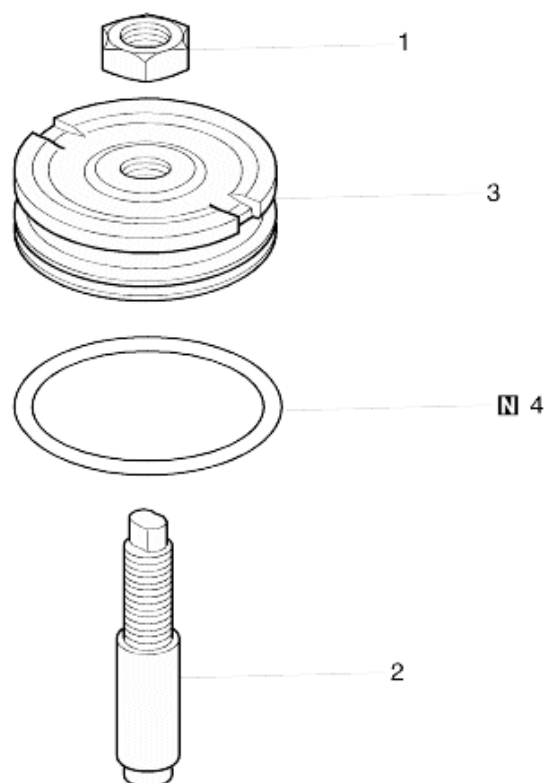
Apply ATF fluid on
any moving part on
installation.

Disassembly procedure

1. Snap ring
2. Overdrive planetary carrier

3. Overdrive annulus gear

Components



Apply ATF fluid on any moving part on installation.

▣ Marked part shall be replaced with new part.

Disassembly procedure

1. Nut

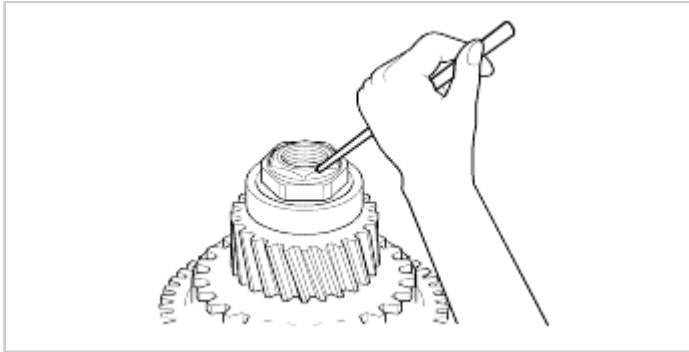
2. Adjust rod

3. Reduction brake piston

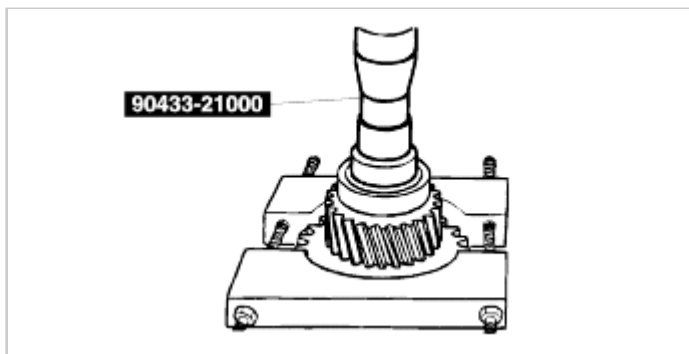
4. Seal ring

Disassembly

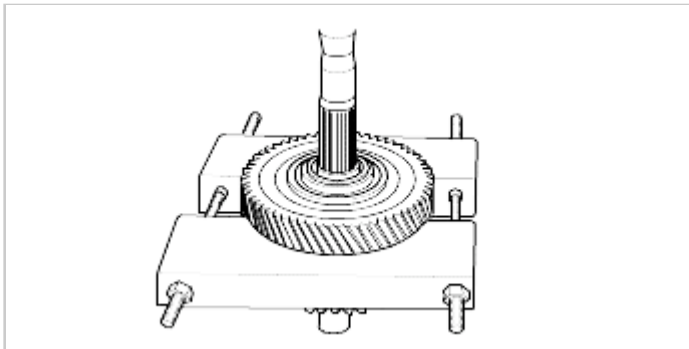
1. Cock the lock nut only enough to trum.



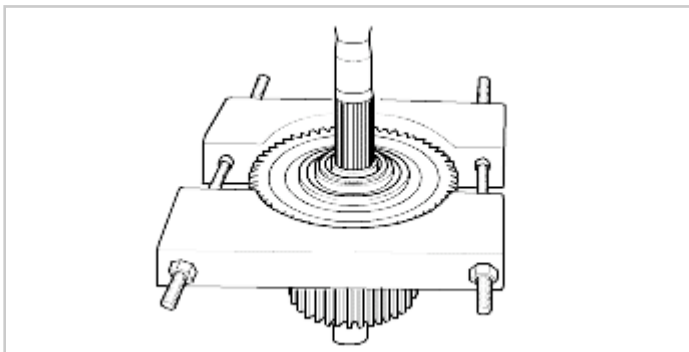
2. Remove the lock nut.
3. Remove the output gear and the parking brake gear using the special tool.



4. Remove the taper roller bearing and the transfer driven gear.

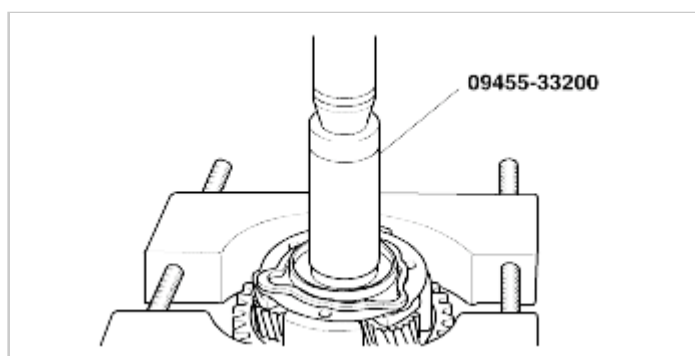


5. Remove the inner taper roller bearing.

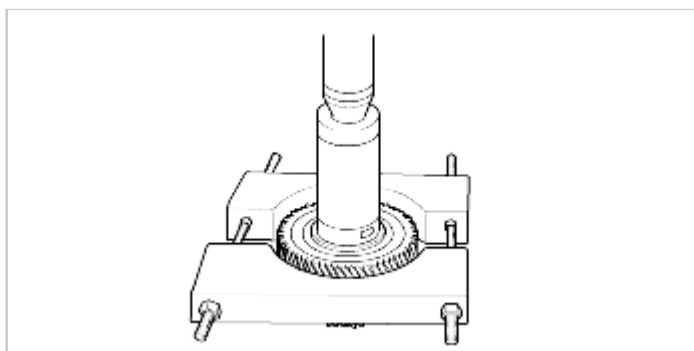


Reassembly

1. Install the inner taper roller bearing using the special tool.

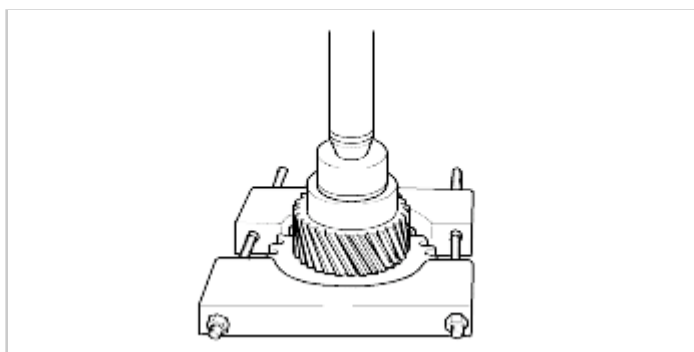


2. Install the transfer driven gear and the taper roller bearing

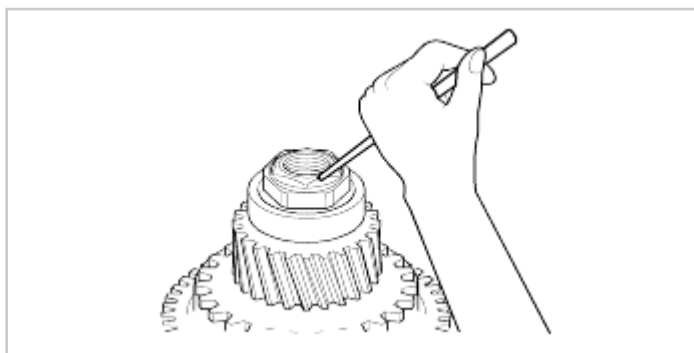


3. Install the parking brake gear and the output gear.

4. Install the roller bearing and tighten the lock nut with tightening torque.



5. Cock the lock nut (two points) not to move.

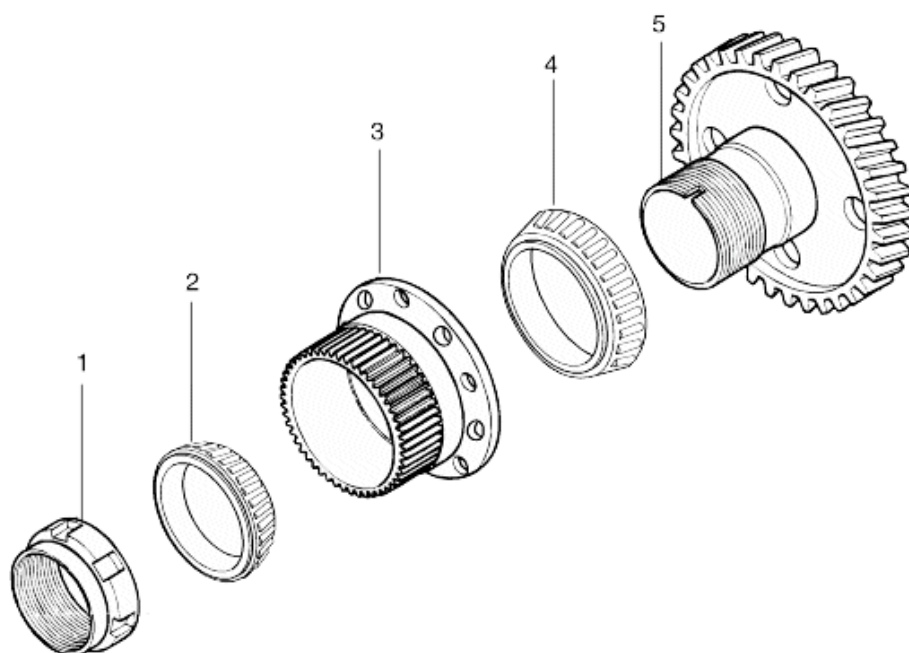




Automatic Transaxle System

Gear System - Transfer Drive Gear

Components

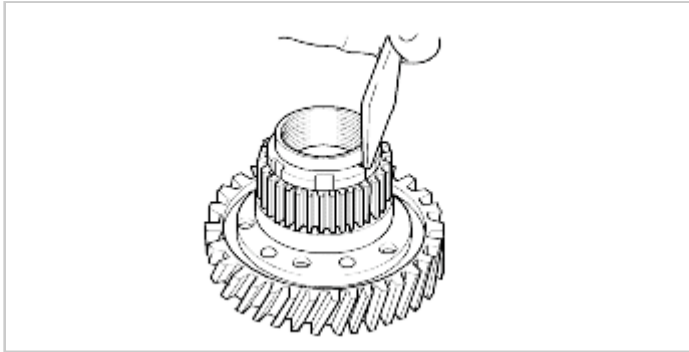


Disassembly procedure

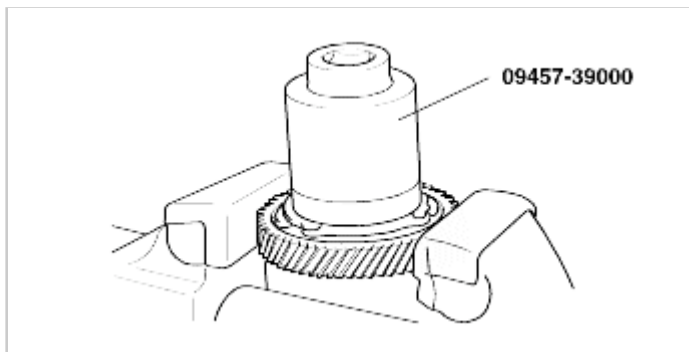
1. Lock nut
2. Roller bearing
3. Transfer drive gear bearing
4. Taper roller
5. Transfer drive gear

Disassembly

1. Cock the lock nut only enough to turn.

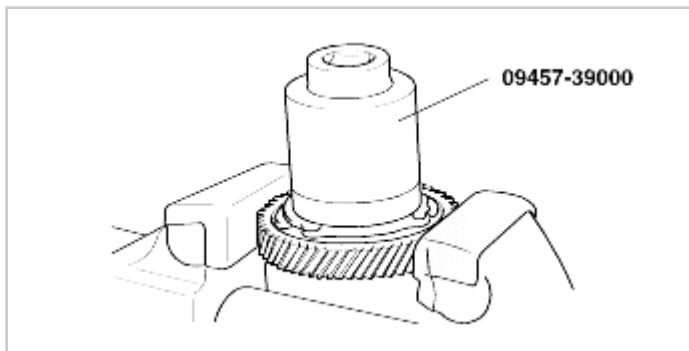


2. Remove the output gear and the parking brake gear using the special tool.

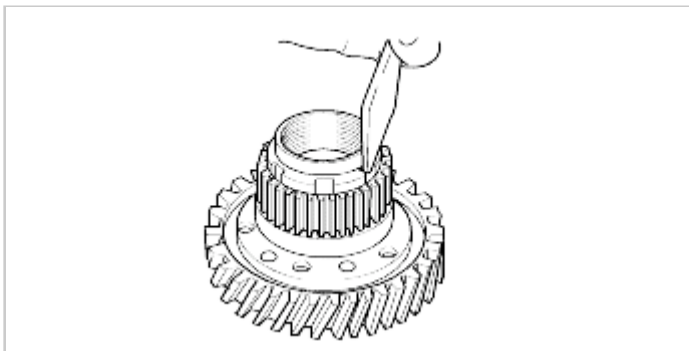


Reassembly

1. Assemble the transfer drive gear bearing.



2. Apply ATF on a new lock nut and tighten it with tightening torque.
Release it one revolution and retighten it with tightening torque.
3. Tighten the lock nut with punch (2 points).

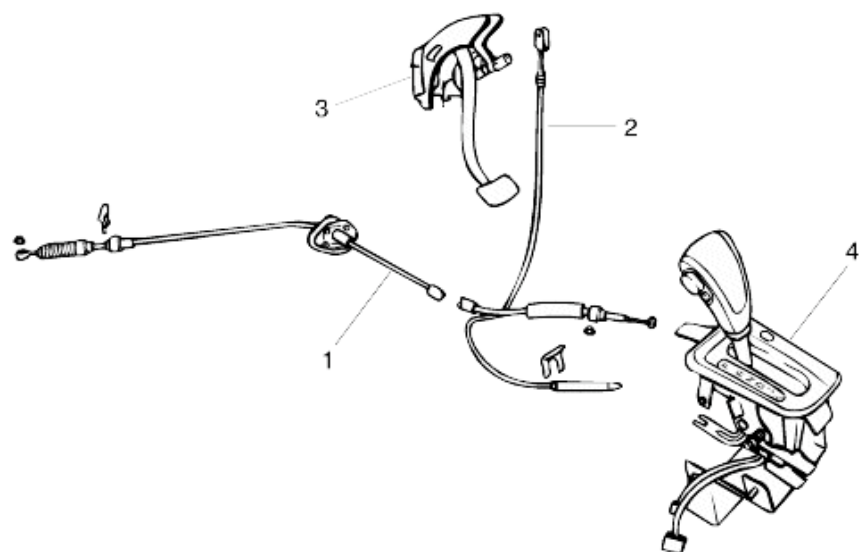




Automatic Transaxle System

Automatic Transaxle Control System - Shift Lever

Automatic transaxle shift control

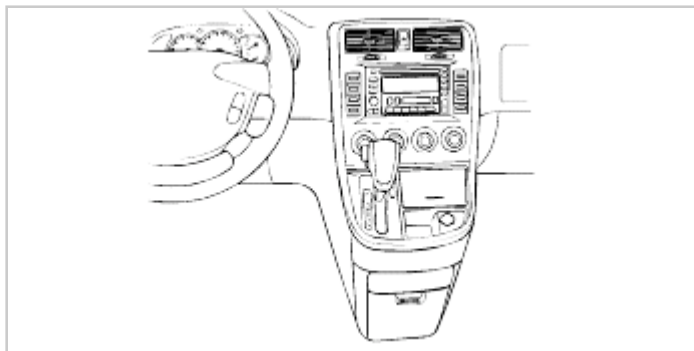


- 1. Shift control cable
- 2. Inter lock cable

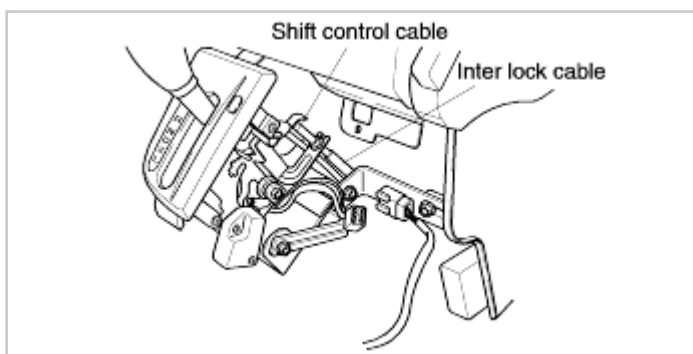
- 3. Brake pedal assembly
- 4. Shift control assembly

Removal

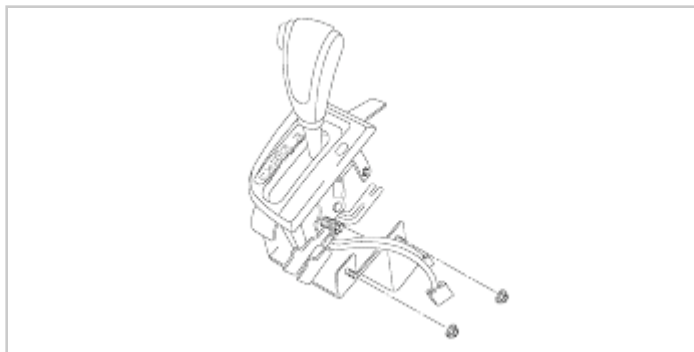
1. Remove the audio cover plate.
2. Remove the center console.



3. Remove the shift control cable.
4. Remove the inter lock cable.
5. Disconnect the harness connector.



6. Remove the selector lever assembly.

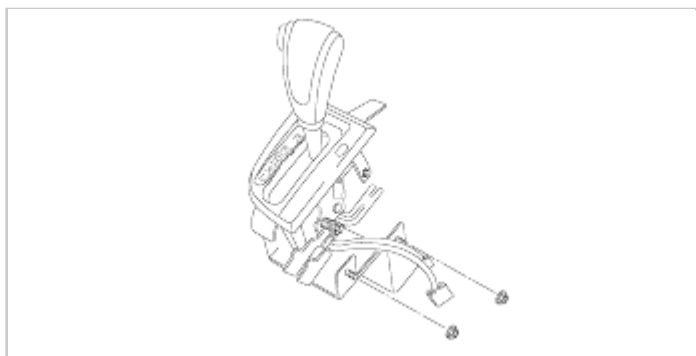


Installation

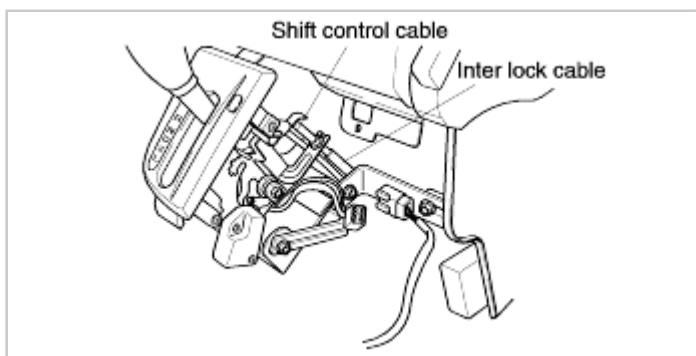
1. Install the selector lever assembly with tightening torque.

Tightening torque :

8.8~13.7 N·m (90~140 kg·cm, 65~10.1 lb·ft)

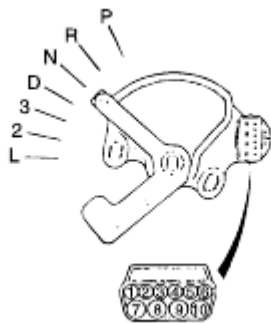


2. Install the inter lock cable.
3. Install the shift control cable.
4. Connect the harness connector.
5. After installing the inter lock cable, move the selector lever to "P" and press the brake pedal to check the inter lock cable operation.



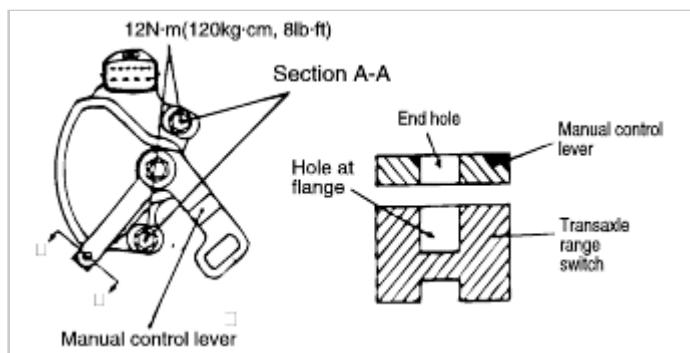
Checking continuity of the transaxle range switch

Items	Terminal No.									
	1	2	3	4	5	6	7	8	9	10
P			○					○	○	○
R							○	○		
N				○				○	○	○
D	○							○		
3					○			○		
L		○						○		



Control cable adjustment

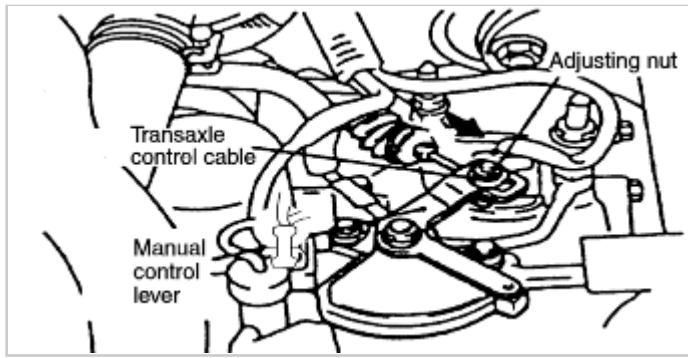
1. Move the shift lever to position "N".
2. Release the adjusting nut at the connection between the transaxle control cable and the manual control lever and separate them.



3. Move the manual control lever to position "N".
4. Insert $\pm 0.197\text{in}(\pm 5\text{mm})$ pin into holes $\pm 0.197\text{in}(\pm 5\text{mm})$ transaxle range switch and the manual control lever. Adjust the transaxle range switch and manual control lever at position "N" correctly.

CAUTION

If you do not insert $\pm 0.197\text{in}(\pm 5\text{mm})$ pin, position "N" may move when tightening the adjusting nut.



Control cable checking

1. Press the brake pedal and engage the parking brake completely.
2. Move the shift lever at position "R".
3. Turn the engine start switch to position "ST".
4. Move the shift lever to position "P".
If starter motor operates when it clicks, control cable is adjusted correctly.
5. With the same manner, move the shift lever to position "N". If the starter motor operates, it is correct.
6. If the starter motor operates at positions "P" and "N" as described above and does not operate at any other position, then the control cable is adjusted properly.

O/D switch

Operation inspection

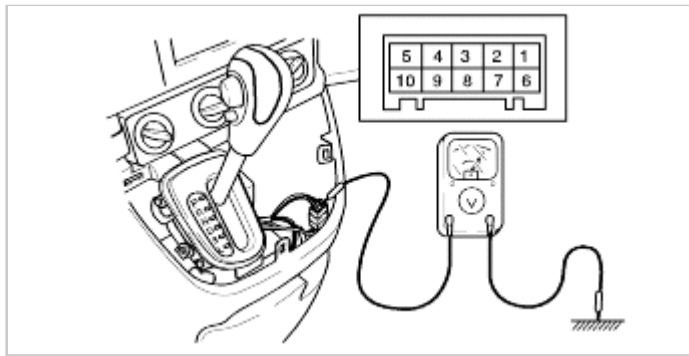
1. Turn ignition switch ON.
2. Verify that the O/D indicator light is not illuminated.
Depress O/D switch and verify that the O/D indicator light illuminates.
3. If O/D indicator light does not operate, continue with inspection of voltage test.

Voltage inspection

1. Remove center panel(Refer to section BD, body).
2. Turn ignition switch ON.
3. Measure voltage at O/D switch connector.

Position	Connector terminal	
	6	7
Normal (V)	O	B+
Depressed (V)	O	O

B+ : Battery positive voltage



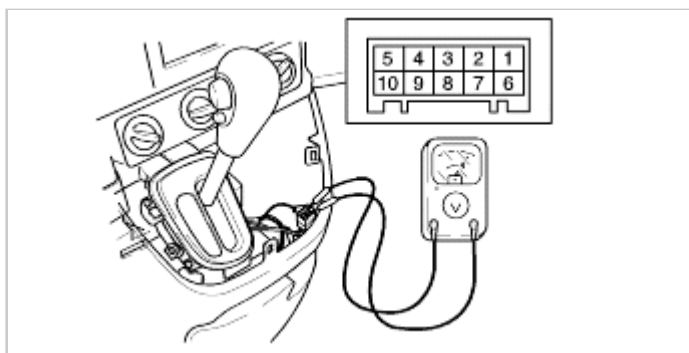
4. If not as specified, check for continuity at O/D switch.
5. Install center panel(Refer to section BD, body).

Continuity inspection

1. Disconnect negative battery cable.
2. Disconnect O/D switch connector.
3. Check a continuity on 6 terminal and 7 terminal.

Position	Connector terminal	
	6	7
Normal (V)		
Depressed (V)	O	O

O—O: Indicates continuity



4. Replace selector lever knob if not as specified.
5. Check wiring harness for continuity if switch is operating correctly(from O/D switch to ECM, and from O/D switch to ground).