2010 TRANSMISSION

Overhaul-A5CF2 - Forte & Forte Koup

AUTOMATIC TRANSAXLE SYSTEM

GENERAL INFORMATION

Specifications

Service Standard

SERVICE STANDARD

Item	mm(in)
Input shaft end play (front)	0.7~1.25 (0.0276~0.0492)
Input shaft end play (rear)	0.25~0.45 (0.0098~0.0177)
Second brake pressure plate end play	1.05~1.35 (0.0413~0.0531)
Low&Reverse brake pressure plate end play	1.65~1.95 (0.0650~0.0768)
Reduction brake snap ring end play	1.05~1.35 (0.0413~0.0531)
Underdrive clutch snap ring end play	1.2~1.4 (0.0472~0.0551)
Overdrive clutch snap ring end play	0.9~1.1 (0.0354~0.0433)
Direct clutch snap ring end play	1.15~1.45 (0.0453~0.0571)
Reverse clutch snap ring end play	1.2~1.4 (0.0472~0.0551)

Tightening Torques

TIGHTENING TORQUES

Item	Nm	kgf.m	lb-ft
Control cable bracket	19~23	1.9~2.3	14~17
Eye bolt	28~34	2.8~3.4	19~24
Oil cooler feed tube	19~23	1.9~2.3	14~17
Oil filter	10~12	1.0~1.2	7~8
Input shaft speed sensor	10~12	1.0~1.2	7~8
Output shaft speed sensor	10~12	1.0~1.2	7~8
Manual control lever	17~21	1.7~2.1	13~15
Inhibitor switch	10~12	1.0~1.2	7~8
Valve body cover	10~12	1.0~1.2	7~8
Valve body mounting bolt	10~12	1.0~1.2	7~8
Manual control shaft detent	8~10	0.8~1.0	6~7
Manual valve lever	9~12	0.9~1.2	6.5~8
Parking rod guide	8~10	0.8~1.0	6~7
Rear cover	20~27	2.0~2.7	14~19
Torque converter housing	43~55	4.3~5.5	32~41

Oil pump	20~27	2.0~2.7	14~19
Transfer drive gear	8~12	0.8~1.2	6~8
Transfer drive gear lock nut	18~21	1.8~2.1	13~16
Oil drain plug	35~45	3.5~4.5	25~32
Differential drive gear	130~140	13.0~14.0	94~101
Pressure check plug	8~10	0.8~1.0	6~7

Snap Ring, Spacer, Thrust Washer And Pressure Plate

SNAP RING, SPACER, THRUST WASHER AND PRESSURE PLATE

Part name	Part number	Thickness mm(in)
Thrust washer (For adjustment of input shaft end play-front)	45456-23160	1.6 (0.063)
	45544-39180	1.8 (0.071)
	45544-39200	2.0 (0.079)
	45544-39220	2.2 (0.087)
	45544-39240	2.4 (0.094)
	45544-39260	2.6 (0.102)
	45544-39280	2.8 (0.110)
Thrust race (For adjustment of input shaft end play-rear)	45853-23013	1.3 (0.051)
	45853-23014	1.4 (0.055)
	45853-23015	1.5 (0.059)
	45853-23016	1.6 (0.063)
	45853-23017	1.7 (0.067)
	45853-23018	1.8 (0.071)
	45853-23019	1.9 (0.075)
	45853-23020	2.0 (0.079)
	45853-23021	2.1 (0.083)
Pressure plate (For adjustment of Low&reverse brake end play)	45635-23160	1.6 (0.063)
	45635-23180	1.8 (0.071)
	45635-23200	2.0 (0.079)
	45635-23220	2.2 (0.087)
	45635-23240	2.4 (0.094)
	45635-23260	2.6 (0.102)
	45635-23280	2.8 (0.110)
	45635-23300	3.0 (0.118)
Pressure plate (For adjustment of 2ND brake end play)	45668-23140	1.4 (0.055)
	45668-23160	1.6 (0.063)
	45668-23180	1.8 (0.071)
	45668-23200	2.0 (0.079)
	45668-23220	2.2 (0.087)
	45668-23240	2.4 (0.094)
	45668-23260	2.6 (0.102)

	45668-23280	2.8 (0.110)
Snap ring (For adjustment of Reduction brake snap ring end play)	45689-23816	1.6 (0.063)
	45689-23818	1.8 (0.071)
	45689-23820	2.0 (0.079)
	45689-23822	2.2 (0.087)
	45689-23824	2.4 (0.094)
	45689-23826	2.6 (0.102)
	45689-23828	2.8 (0.110)
Snap ring (For adjustment of Overdrive clutch snap ring end play)	45427-39161	1.6 (0.0630)
	45427-39171	1.7 (0.0669)
	45427-39181	1.8 (0.0709)
	45427-39191	1.9 (0.0748)
	45427-39201	2.0 (0.0787)
	45427-39211	2.1 (0.0827)
	45427-39221	2.2 (0.0866)
	45427-39231	2.3 (0.0906)
	45427-39241	2.4 (0.0945)
	45427-39251	2.5 (0.0984)
	45427-39261	2.6 (1.1024)
	45427-39271	2.7 (0.0063)
	45427-39281	2.8 (0.1102)
	45427-39291	2.9 (0.1142)
	45427-39301	3.0 (0.1181)
	45427-39311	3.1 (0.1220)
Snap ring (For adjustment of Reverse clutch snap ring end play)	45432-39161	1.6 (0.0630)
	45432-39171	1.7 (0.0669)
	45432-39181	1.8 (0.0709)
	45432-39191	1.9 (0.0748)
	45432-39201	2.0 (0.0787)
	45432-39211	2.1 (0.0827)
	45432-39221	2.2 (0.0866)
	45432-39231	2.3 (0.0906)
	45432-39241	2.4 (0.0945)
	45432-39251	2.5 (0.0984)
	45432-39261	2.6 (0.1024)
	45432-39271	2.7 (0.1063)
	45432-39281	2.8 (0.1102)
	45432-23160	1.6 (0.0630)
	45432-23170	1.7 (0.0669)
	45432-23180	1.8 (0.0709)
	45432-23190	1.9 (0.0748)

Snap ring (For adjustment of Underdrive clutch snap ring end play)	45432-23200	2.0 (0.0787)
	45432-23210	2.1 (0.0827)
	45432-23220	2.2 (0.0866)
	45432-23230	2.3 (0.0906)
	45432-23240	2.4 (0.0945)
	45432-23250	2.5 (0.0984)
	45432-23260	2.6 (1.1024)
	45432-23270	2.7 (0.0063)
	45432-23280	2.8 (0.1102)
	45432-23290	2.9 (0.1142)
	45432-23300	3.0 (0.1181)

Lubricant

LUBRICANT SPECIFICATIONS

Items	Specified lubricant	Quantity
Transaxle fluid liter(US qt, limp. qt)	GENUINE DIAMOND ATF SP-III or S ATF SP-III	7.6 (8.0, 6.7)

Sealants

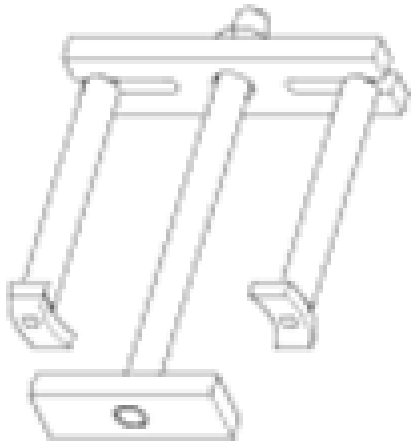
SEALANTS SPECIFICATIONS

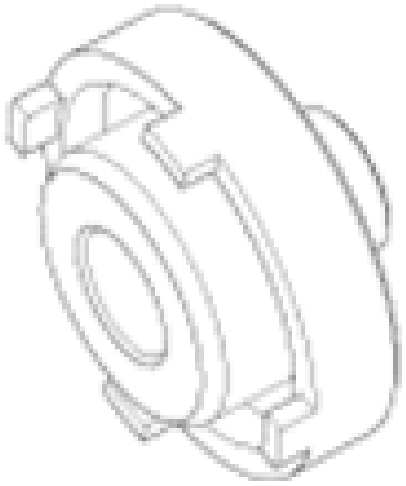
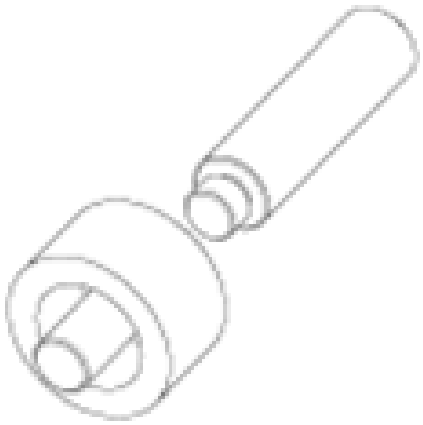
Items	Specified sealant
Rear cover Torque converter housing Oil pan	LOCTITE FMD-546

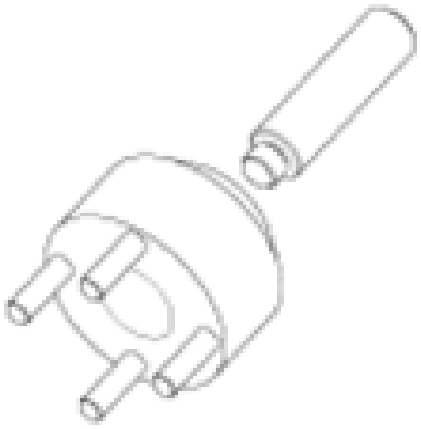
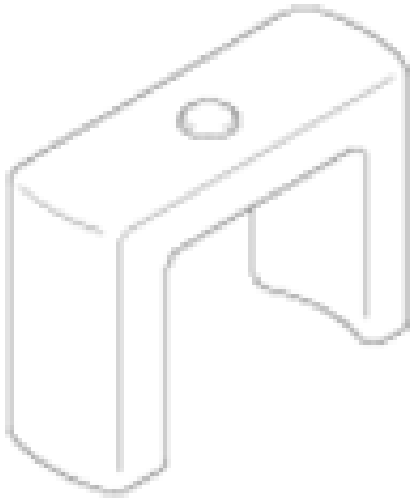
Special Service Tools

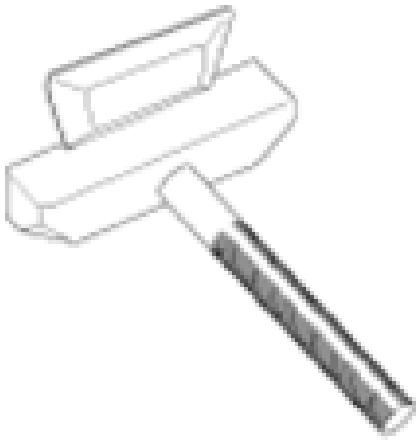
SPECIAL SERVICE TOOLS

Tool (Number and name)	Illustration	Use
09453-1M100 Snap ring remover/installer		Removal and installation of the snap ring of Reduction brake return spring retainer

09453-1M200 Snap ring remover/installer		Removal and installation of snap rings of spring retainer of Low&Rev. brake and Underdrive clutch
09453-1M300 Outer race installer		Installation of outer races of Transaxle case and Converter housing
09453-1M400 Oil seal installer		Installation of oil seals of Transaxle case and Converter housing
09453-1M500		Installation of bearings of Differential

Bearing installer		
09453-1M600 Locking nut remover/installer		Removal and installation of the locking nut of Transfer drive gear
09453-1M700 Oil seal installer		Installation of the oil seal of Oil pump assembly
09453-1M800 Bearing remover		Removal of double angular ball bearing of Transfer drive gear

		
09453-1M900 Gear remover		Removal of the output gear (with parking gear and taper roller bearing) of Transfer driven gear
09453-4C300 Snap ring remover/installer		Removal and installation of the snap ring of Direct clutch spring retainer

09215-3C000 Oil fan remover		Removal of Oil pan

AUTOMATIC TRANSAXLE

Components and Components Location

Components (1)

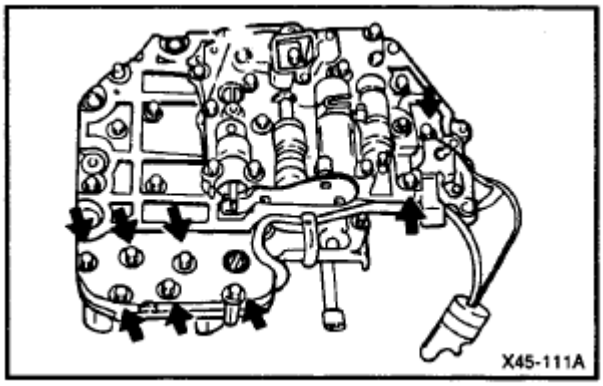


Fig. 1: Exploded View Of Automatic Transaxle (1 Of 2)
Courtesy of KIA MOTORS AMERICA, INC.

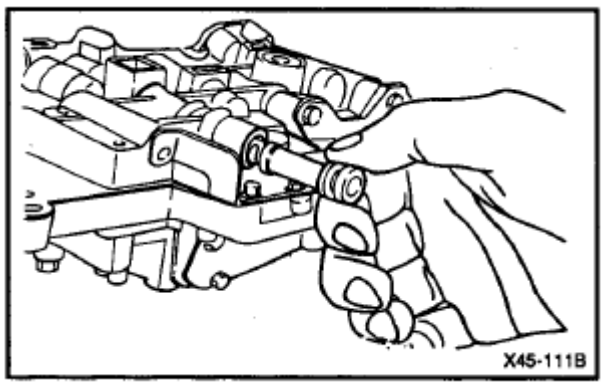


Fig. 2: Exploded View Of Automatic Transaxle (2 Of 2)
Courtesy of KIA MOTORS AMERICA, INC.

Repair procedures

Disassembly

1. Remove the oil feed tube assembly by removing the bolts (A) with washers and the bracket bolt (B).

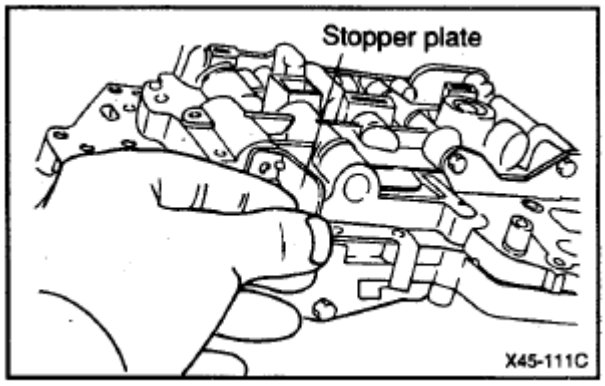


Fig. 3: Locating Oil Feed Tube Assembly, Bolts, Washers And Bracket Bolt
Courtesy of KIA MOTORS AMERICA, INC.

2. Remove the bracket bolt and pull out the oil filler tube.

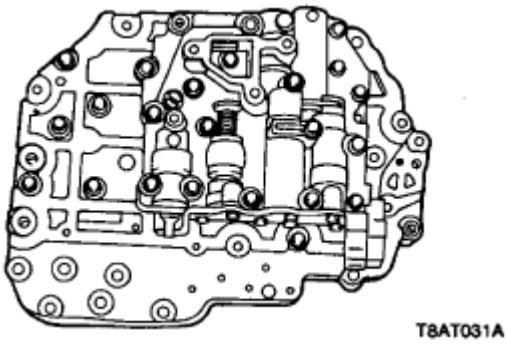


Fig. 4: Identifying Bracket Bolt And Oil Filler Tube
Courtesy of KIA MOTORS AMERICA, INC.

3. Remove the manual control lever by removing the nut.

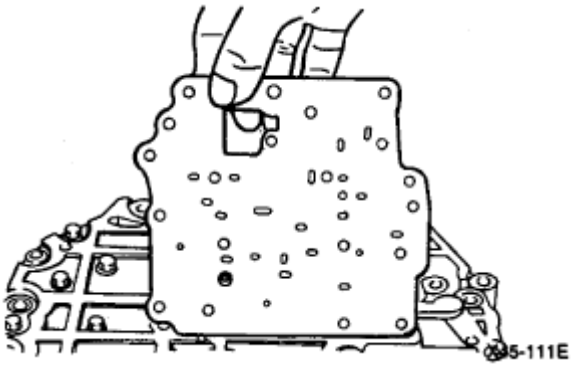


Fig. 5: Identifying Manual Control Lever And Nut
Courtesy of KIA MOTORS AMERICA, INC.

4. Remove the inhibiter switch assembly by removing the bolts (2ea).

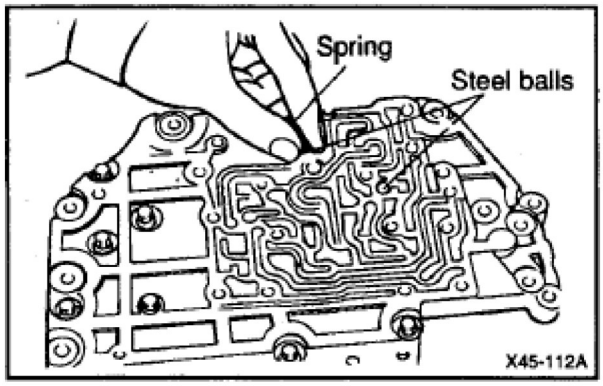


Fig. 6: Identifying Inhibiter Switch Assembly And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

5. Remove the input speed senor by removing the bolt.

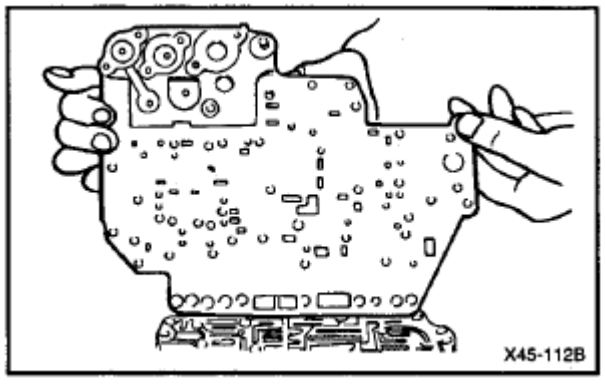


Fig. 7: Identifying Input Speed Senor And Bolt
Courtesy of KIA MOTORS AMERICA, INC.

6. Remove the output speed senor by removing the bolt.

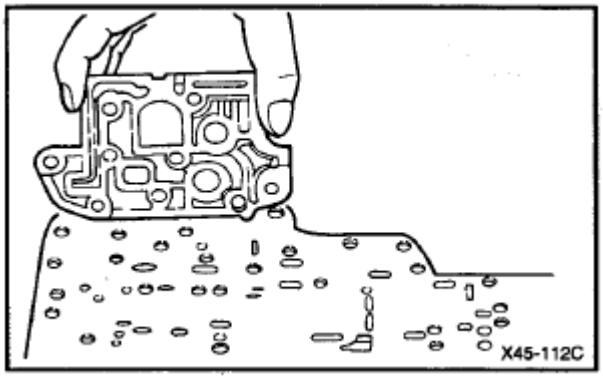


Fig. 8: Identifying Output Speed Senor And Bolt
Courtesy of KIA MOTORS AMERICA, INC.

7. Remove the oil pan by removing the bolts (19ea) and using the oil pan remover.

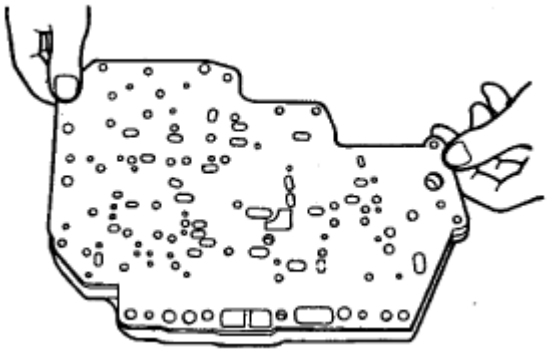


Fig. 9: Identifying Oil Pan And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

8. Remove the manual lever by removing the nut.

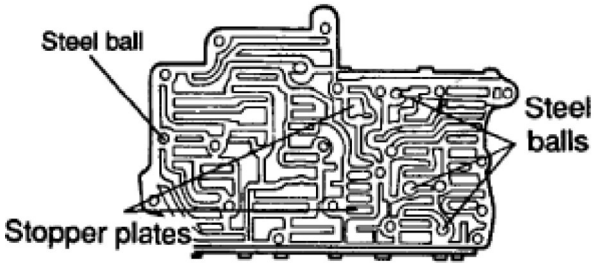


Fig. 10: Identifying Manual Lever And Nut
Courtesy of KIA MOTORS AMERICA, INC.

9. Disconnect the main harness connector.

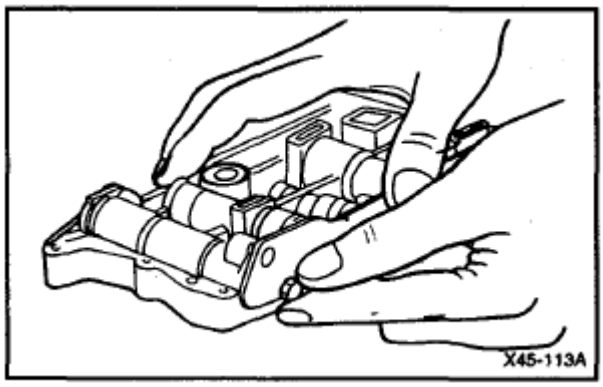


Fig. 11: Identifying Main Harness Connector
Courtesy of KIA MOTORS AMERICA, INC.

10. Remove the oil filter by removing the bolts (3ea).

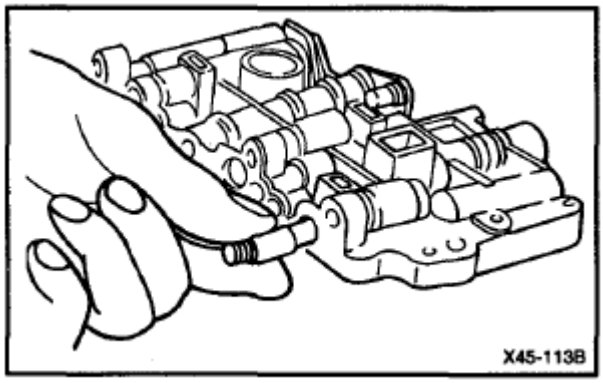


Fig. 12: Identifying Oil Filter And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

11. Remove the valve body by removing the bolts (20ea).

NOTE: 6x30mm (A): 16EA, 6x35mm (B): 1EA, 6x40mm (C): 1EA, 6X55mm (D):1EA, 6x60mm (E): 1EA

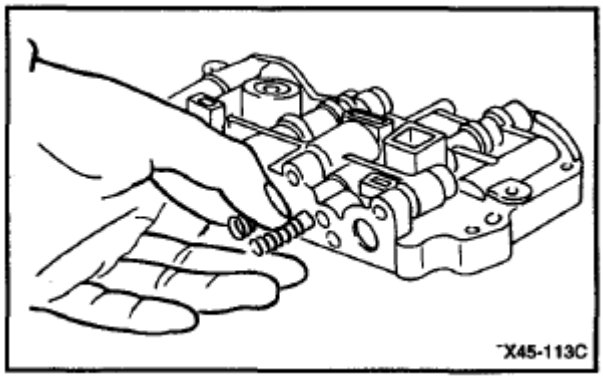


Fig. 13: Identifying Valve Body And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

12. After removing the clip (B), remove the control valve connector (A).

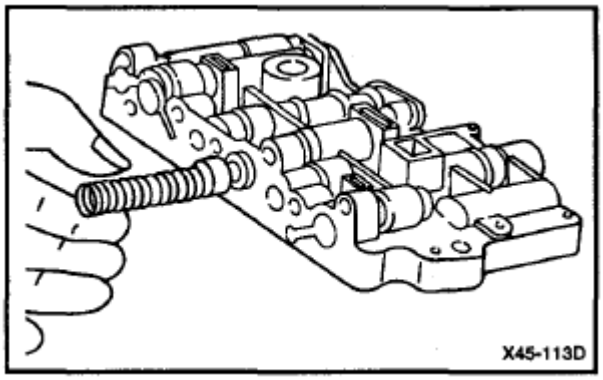


Fig. 14: Locating Clip And Control Valve Connector
Courtesy of KIA MOTORS AMERICA, INC.

13. Remove each accumulator piston and the spring.

Accumulator spring identification

ACCUMULATOR SPRING IDENTIFICATION

NO.	Use	I.D. Color	Spring number
A	Rev clutch	Pink	2
B	2nd brake	Pink/Pink	1
C	OD clutch	Pink	2
D	UD clutch	Green/Green	1

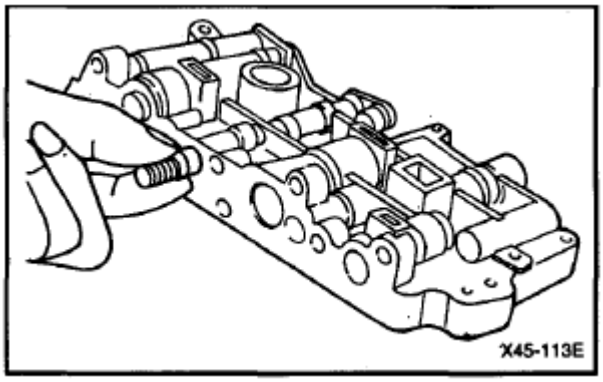


Fig. 15: Locating Accumulator Piston And Spring
Courtesy of KIA MOTORS AMERICA, INC.

14. After removing the bolts (18ea), remove the torque converter housing from the transmission case.

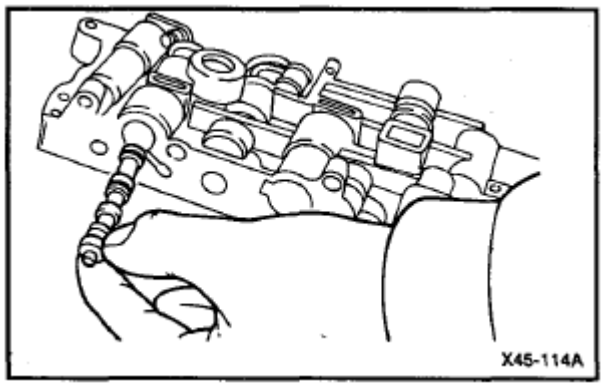


Fig. 16: Identifying Bolts, Torque Converter Housing And Transmission Case (1 Of 3)
Courtesy of KIA MOTORS AMERICA, INC.

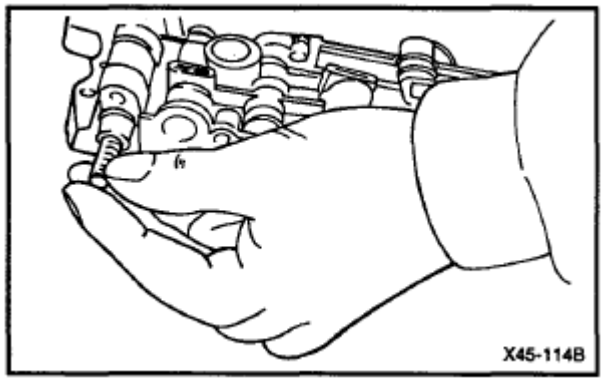


Fig. 17: Identifying Bolts, Torque Converter Housing And Transmission Case (2 Of 3)
Courtesy of KIA MOTORS AMERICA, INC.

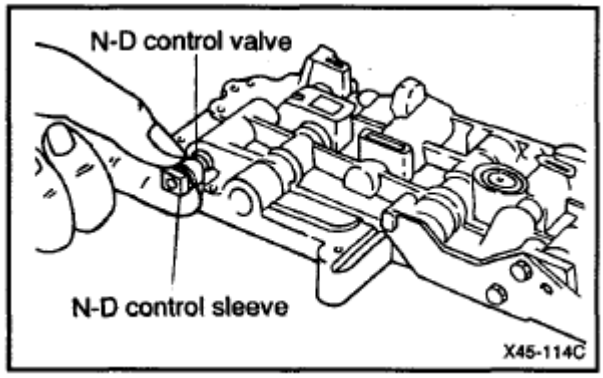


Fig. 18: Identifying Bolts, Torque Converter Housing And Transmission Case (3 Of 3)
Courtesy of KIA MOTORS AMERICA, INC.

15. Remove the oil separater by removing the bolts (3ea).

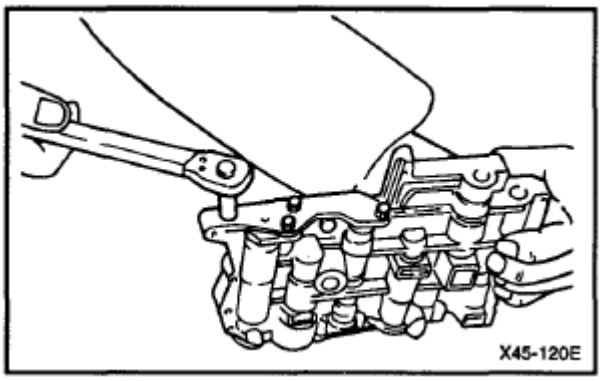


Fig. 19: Identifying Oil Separater And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

16. Remove the outer race for diffrential bearing from the torque converter housing.

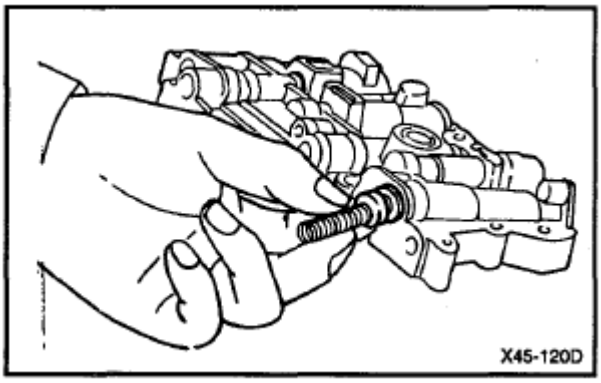


Fig. 20: Identifying Outer Race Of Diffrential Bearing From Torque Converter Housing
Courtesy of KIA MOTORS AMERICA, INC.

17. Remove the oil seal from the torque converter housing.

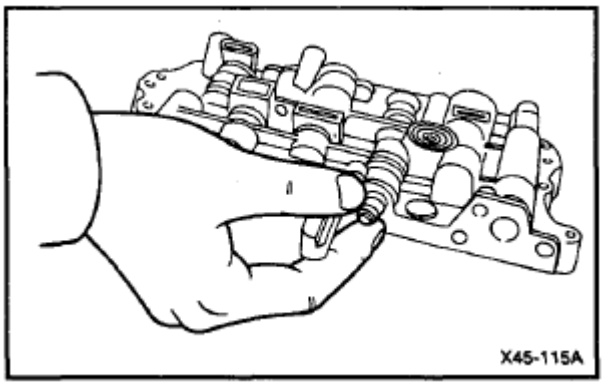


Fig. 21: Identifying Oil Seal On Torque Converter Housing
Courtesy of KIA MOTORS AMERICA, INC.

18. Remove the differential assembly.

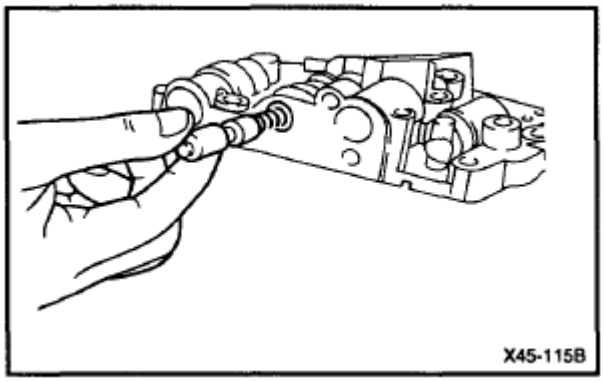


Fig. 22: Identifying Differential Assembly
Courtesy of KIA MOTORS AMERICA, INC.

19. Remove the oil pump assembly by removing the bolts (7ea).

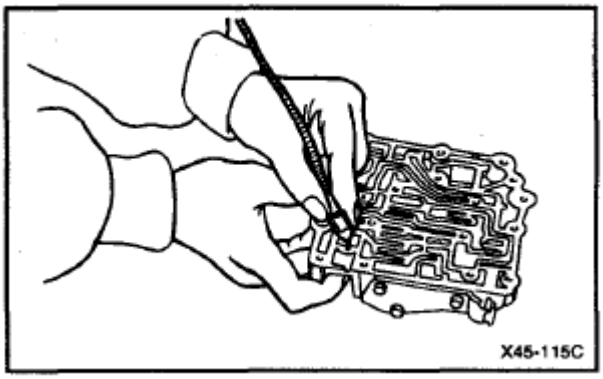


Fig. 23: Identifying Oil Pump Assembly And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

20. Remove the thrust washer.

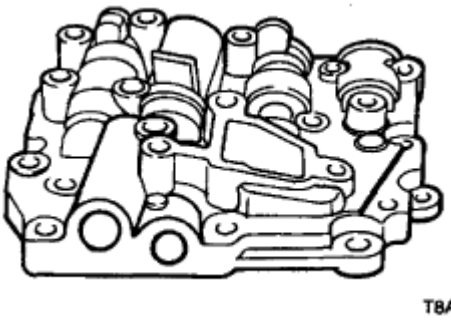


Fig. 24: Identifying Thrust Washer
Courtesy of KIA MOTORS AMERICA, INC.

21. Remove the underdrive clutch assembly.

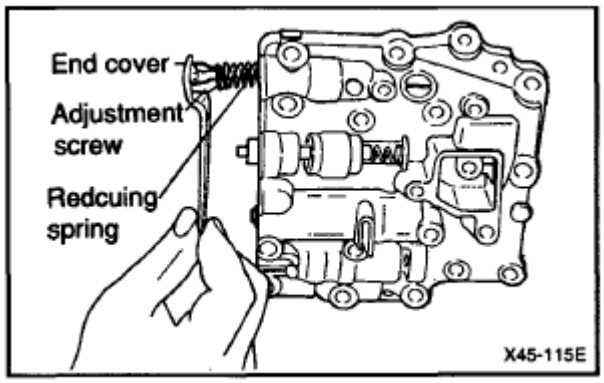


Fig. 25: Identifying Underdrive Clutch Assembly
Courtesy of KIA MOTORS AMERICA, INC.

22. Remove the thrust bearing.

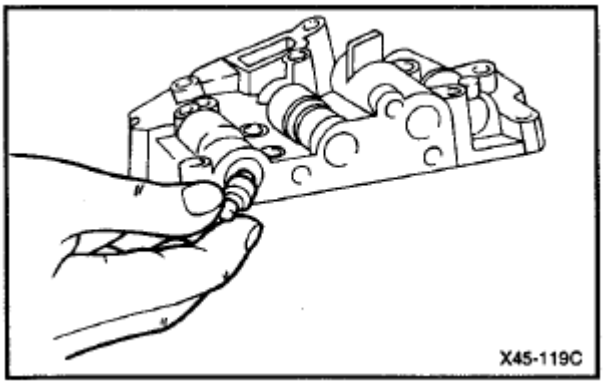


Fig. 26: Identifying Thrust Bearing
Courtesy of KIA MOTORS AMERICA, INC.

23. Remove the underdrive clutch hub.

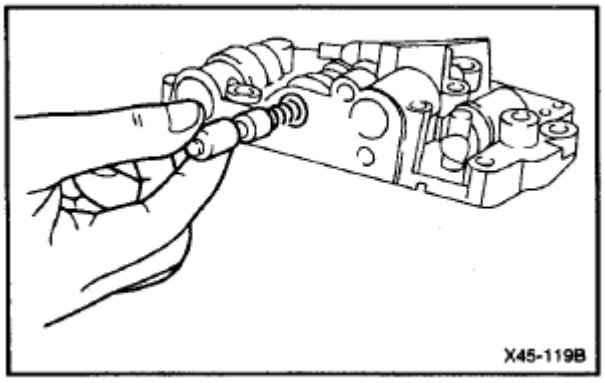


Fig. 27: Identifying Underdrive Clutch Hub
Courtesy of KIA MOTORS AMERICA, INC.

24. Remove the parking rod guide by removing the bolts (2ea).

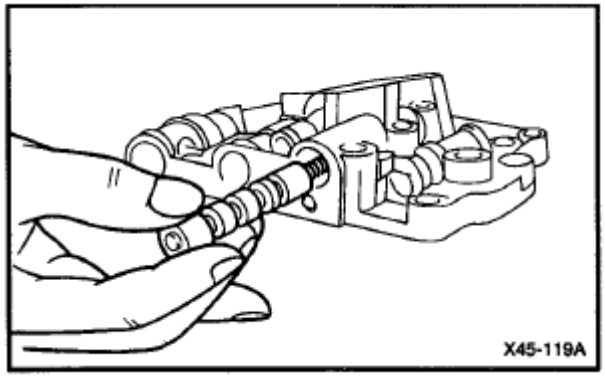


Fig. 28: Identifying Parking Rod Guide And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

25. Remove the detent spring by removing the bolt.

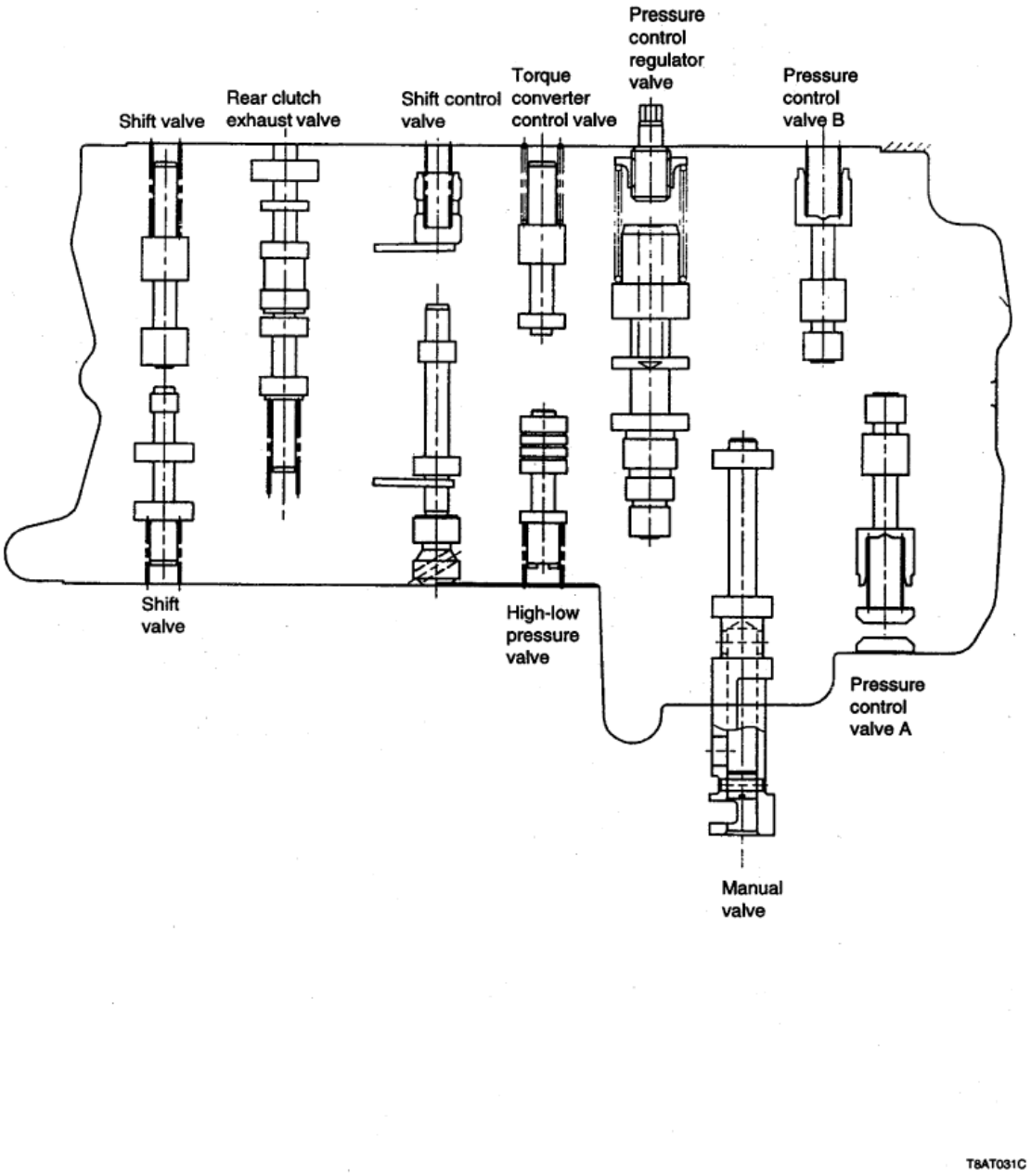


Fig. 29: Identifying Detent Spring And Bolt
Courtesy of KIA MOTORS AMERICA, INC.

26. Remove the reamer bolt.

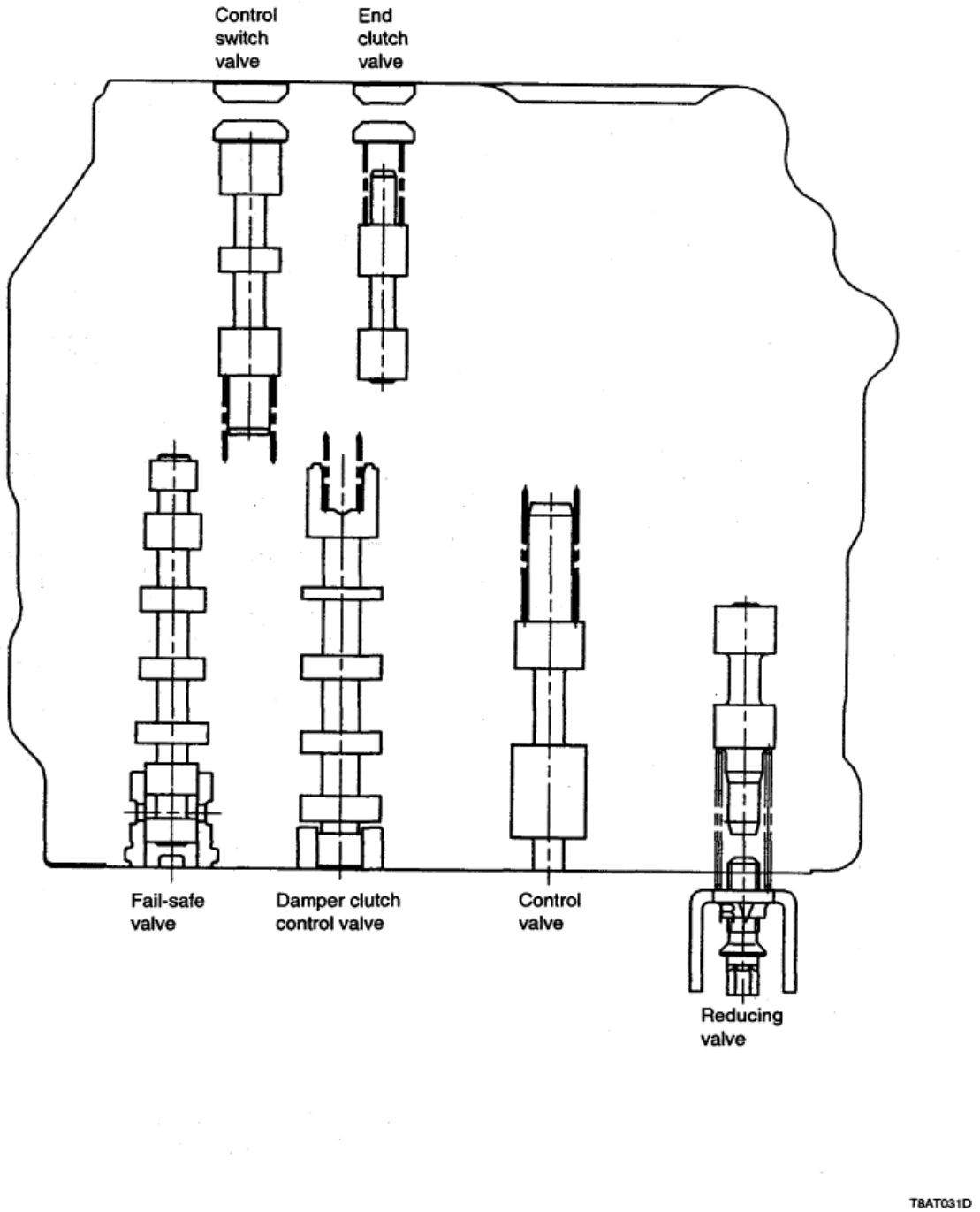


Fig. 30: Identifying Reamer Bolt
Courtesy of KIA MOTORS AMERICA, INC.

27. Remove the parking sprag rod assembly.

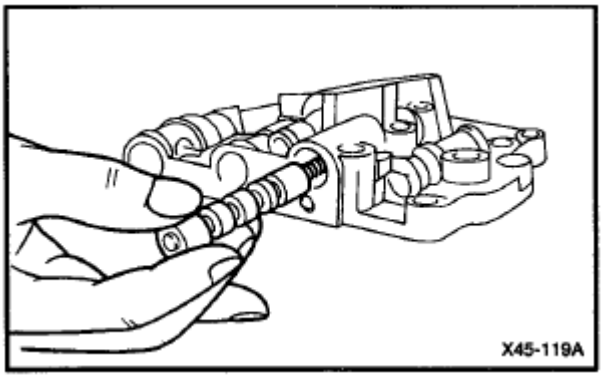


Fig. 31: Removing Parking Sprag Rod Assembly
Courtesy of KIA MOTORS AMERICA, INC.

28. Remove the manual shaft mounting groove bolt.

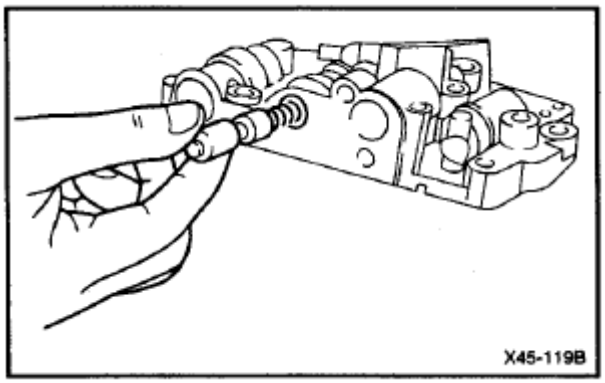


Fig. 32: Identifying Manual Shaft Mounting Groove Bolt
Courtesy of KIA MOTORS AMERICA, INC.

29. Remove the manual control shaft (A) (including the two O-rings), the detent lever (B).

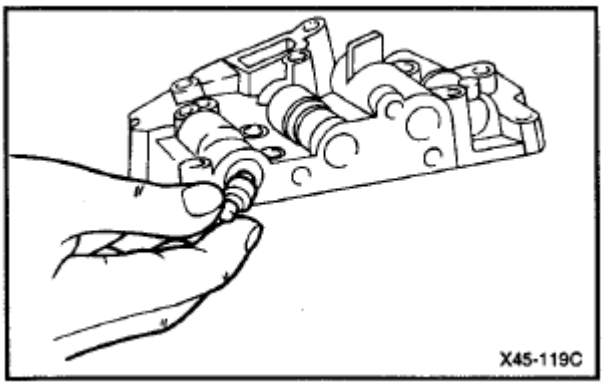


Fig. 33: Locating Manual Control Shaft And Detent Lever
Courtesy of KIA MOTORS AMERICA, INC.

30. Remove the parking sprag (A), shaft (B) and sprag spring (C).

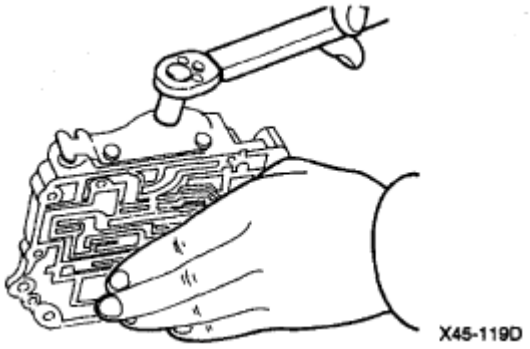


Fig. 34: Locating Parking Sprag, Shaft And Sprag Spring
Courtesy of KIA MOTORS AMERICA, INC.

31. Remove the transfer driven gear & Direct Planetang Carrier Assembly.

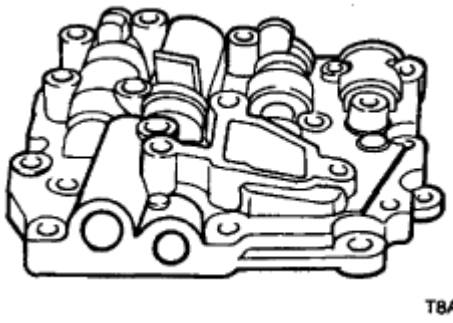


Fig. 35: Identifying Transfer Driven Gear & Direct Planetang Carrier Assembly
Courtesy of KIA MOTORS AMERICA, INC.

32. Remove the direct clutch retairer assembly and the thrust bearing.

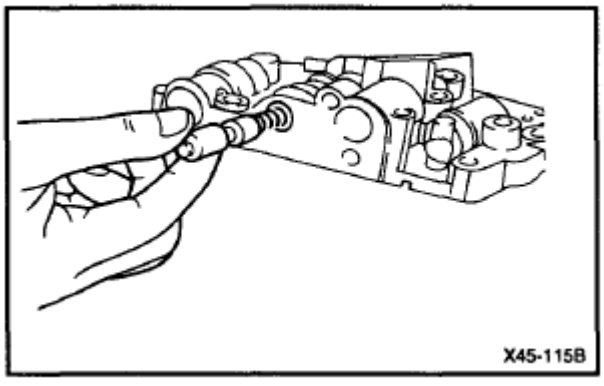


Fig. 36: Identifying Direct Clutch Retairer Assembly And Thrust Bearing
Courtesy of KIA MOTORS AMERICA, INC.

33. Remove the thrust race.

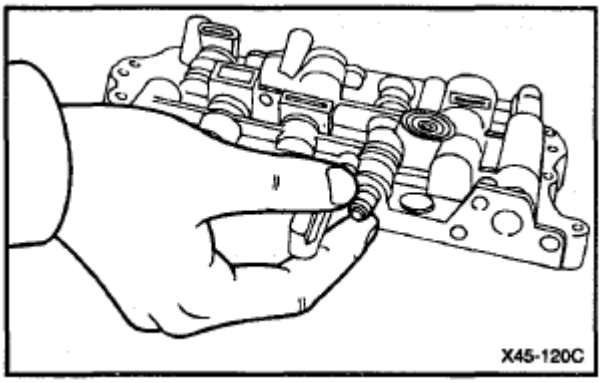


Fig. 37: Identifying Thrust Race
Courtesy of KIA MOTORS AMERICA, INC.

34. Remove the snap ring.

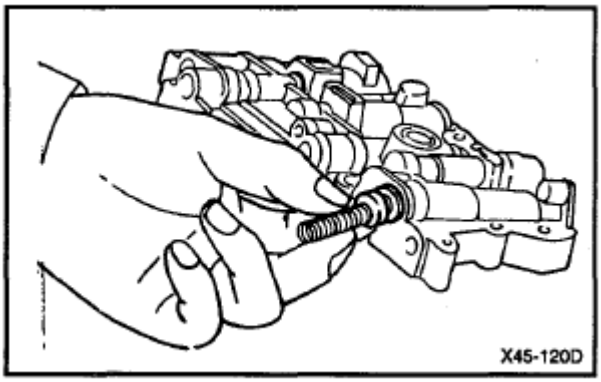


Fig. 38: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

35. Remove the one way clutch assembly.

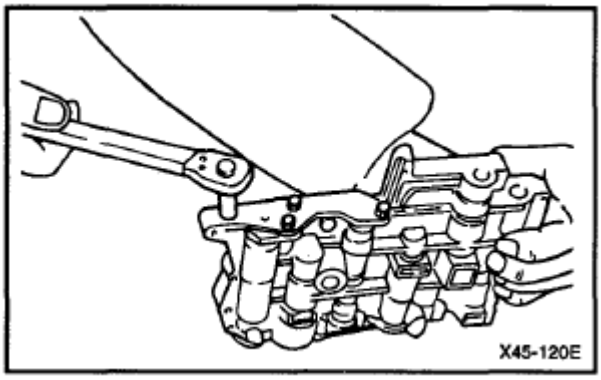


Fig. 39: Identifying One Way Clutch Assembly

Courtesy of KIA MOTORS AMERICA, INC.

36. Remove the snap rings (2ea).

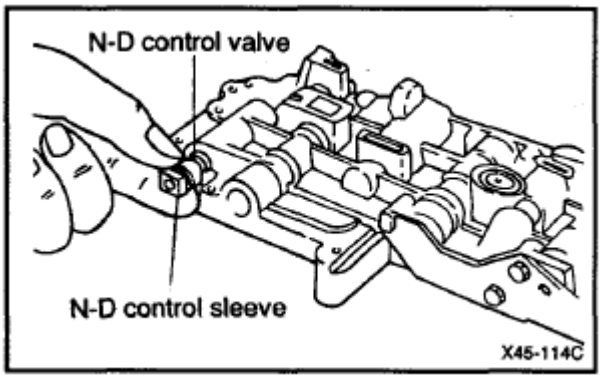


Fig. 40: Identifying Snap Rings
Courtesy of KIA MOTORS AMERICA, INC.

37. Remove the brake disk set.

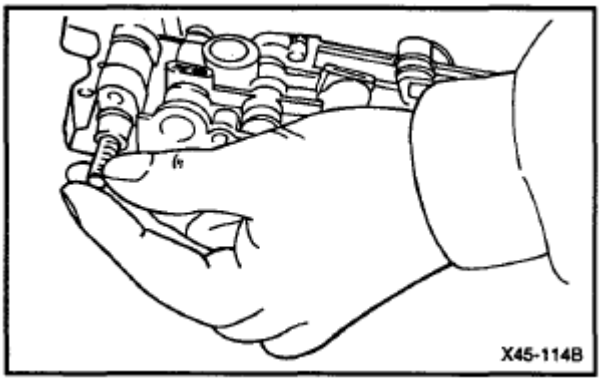


Fig. 41: Identifying Brake Disk Set
Courtesy of KIA MOTORS AMERICA, INC.

38. Remove the snap ring by using the SST (09453-1M100).

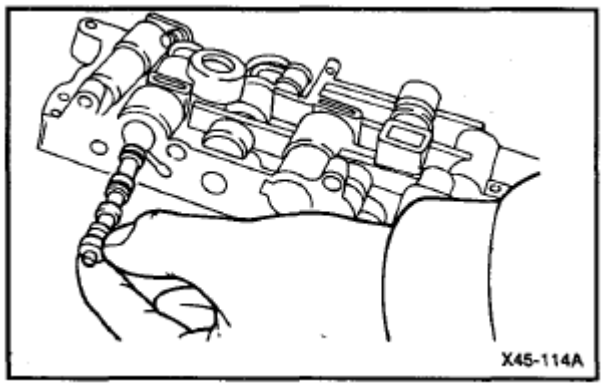


Fig. 42: Removing Snap Ring By Using SST (09453-1M100)
Courtesy of KIA MOTORS AMERICA, INC.

39. Remove the seal rings (2ea) from the sleeve.

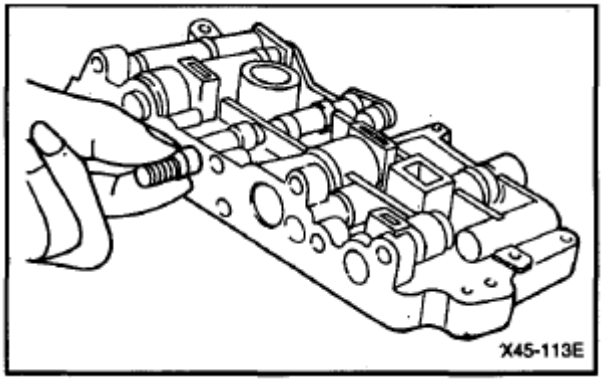


Fig. 43: Identifying Seal Rings
Courtesy of KIA MOTORS AMERICA, INC.

40. Remove the reduction brake spring retainer.

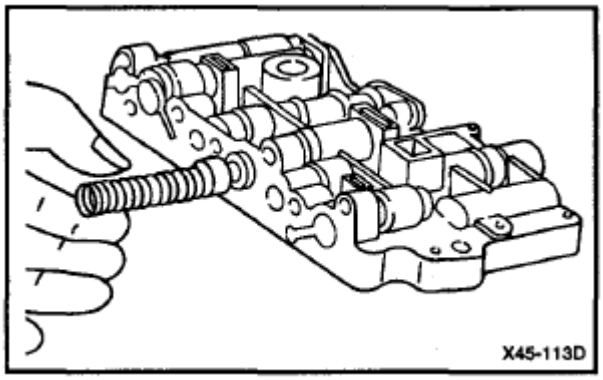


Fig. 44: Identifying Reduction Brake Spring Retainer
Courtesy of KIA MOTORS AMERICA, INC.

41. Remove the reduction brake return spring.

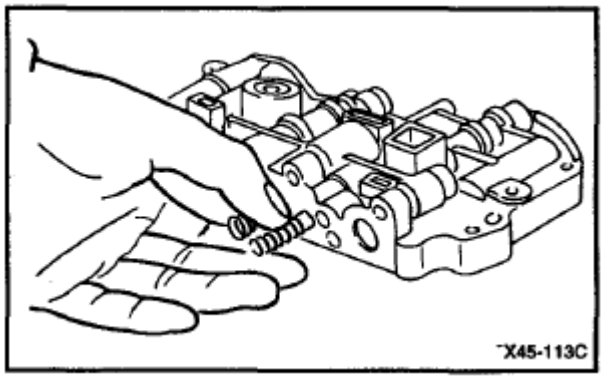


Fig. 45: Identifying Reduction Brake Return Spring
Courtesy of KIA MOTORS AMERICA, INC.

42. Remove the reduction brake piston.

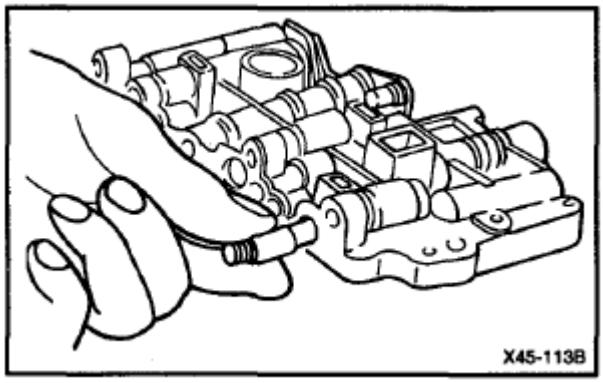


Fig. 46: Identifying Reduction Brake Piston
Courtesy of KIA MOTORS AMERICA, INC.

43. Remove the retainer ring.

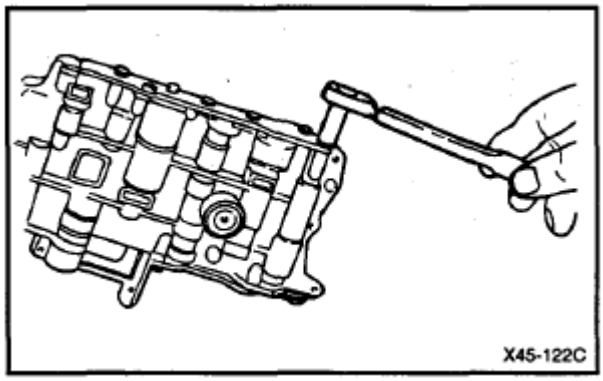


Fig. 47: Identifying Retainer Ring

Courtesy of KIA MOTORS AMERICA, INC.

44. Remove the accumulator cover, spring, and piston.

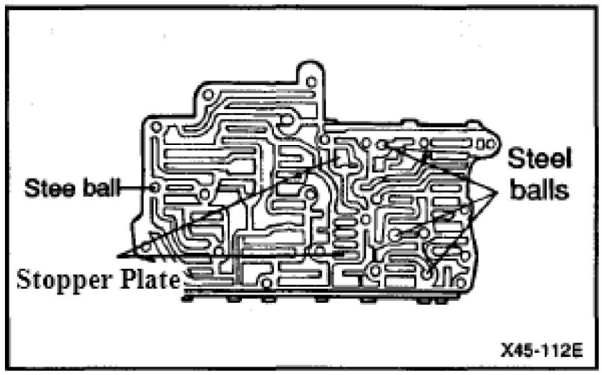


Fig. 48: Identifying Accumulator Cover, Spring, And Piston
Courtesy of KIA MOTORS AMERICA, INC.

45. Remove the O-ring.

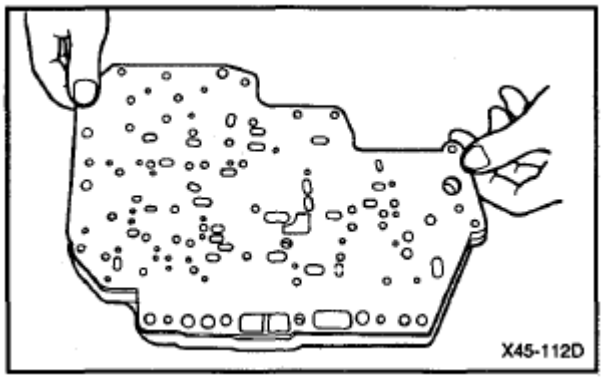


Fig. 49: Identifying O-Ring
Courtesy of KIA MOTORS AMERICA, INC.

46. Remove the rear cover assembly by removing the bolts (11ea).

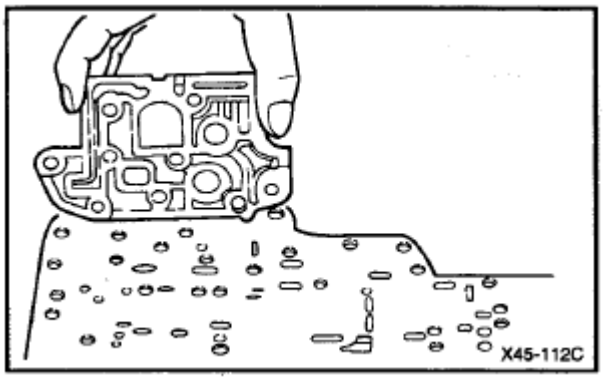


Fig. 50: Identifying Rear Cover Assembly And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

47. Remove the thrust race from the rear cover assembly.

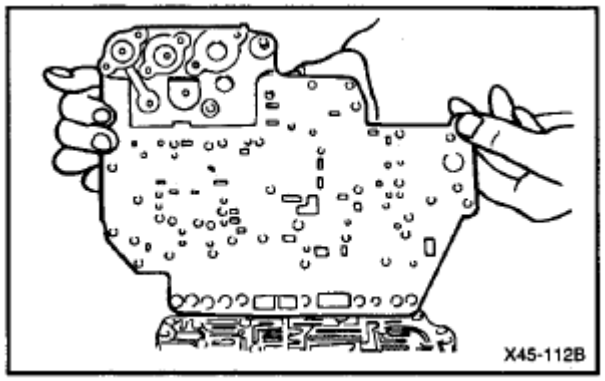


Fig. 51: Identifying Thrust Race And Rear Cover Assembly
Courtesy of KIA MOTORS AMERICA, INC.

48. Remove the D-rings (4ea) from the rear cover assembly.

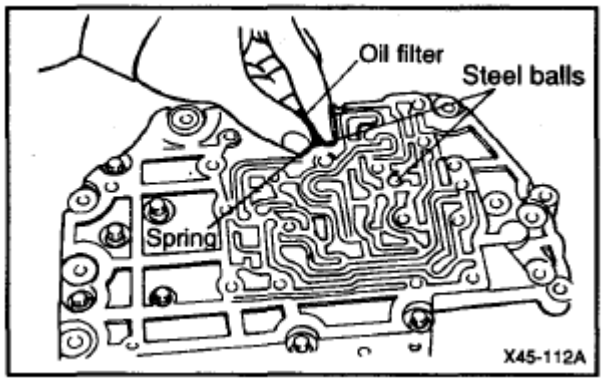


Fig. 52: Identifying D-Rings And Rear Cover Assembly
Courtesy of KIA MOTORS AMERICA, INC.

49. Remove the accumulator piston and spring.

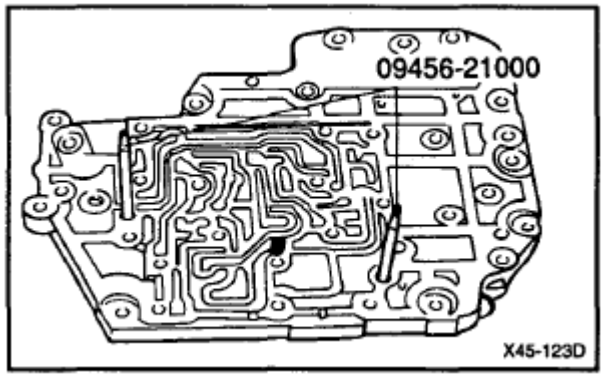


Fig. 53: Identifying Accumulator Piston And Spring
Courtesy of KIA MOTORS AMERICA, INC.

50. Remove the O-rings (7ea, 1ea)

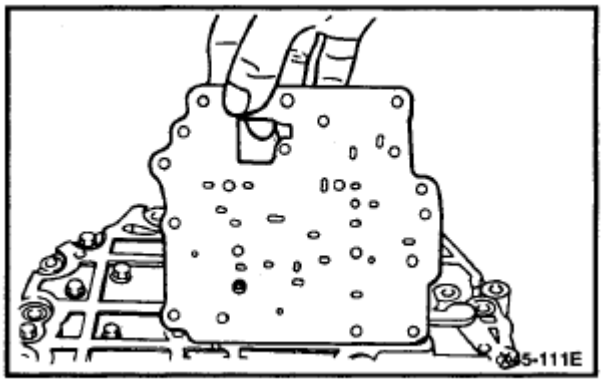


Fig. 54: Identifying O-Rings
Courtesy of KIA MOTORS AMERICA, INC.

51. Remove the thrust bearing.

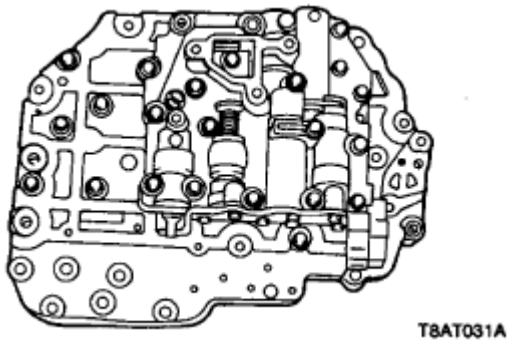


Fig. 55: Identifying Thrust Bearing
Courtesy of KIA MOTORS AMERICA, INC.

52. Remove the reverse & overdrive clutch assembly.

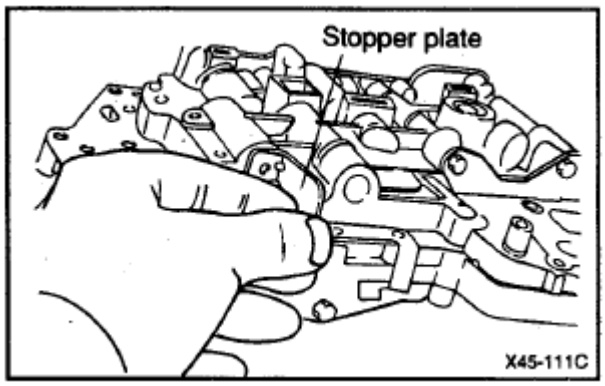


Fig. 56: Identifying Reverse & Overdrive Clutch Assembly
Courtesy of KIA MOTORS AMERICA, INC.

53. Remove the overdrive clutch hub and the thrust bearings (2ea).

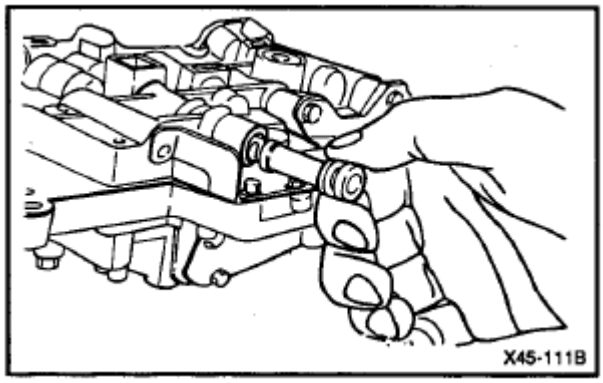


Fig. 57: Identifying Overdrive Clutch Hub And Thrust Bearings
Courtesy of KIA MOTORS AMERICA, INC.

54. Remove the reverse sun gear assembly.

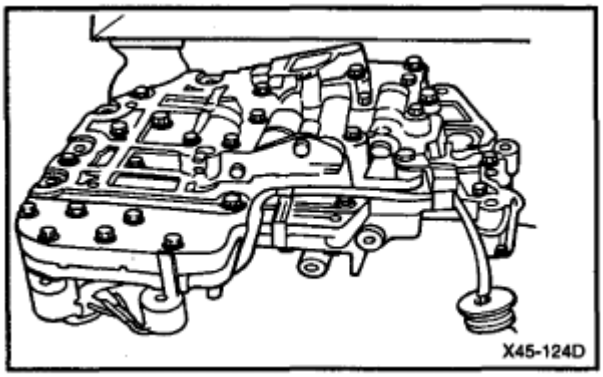


Fig. 58: Identifying Reverse Sun Gear Assembly

Courtesy of KIA MOTORS AMERICA, INC.

55. Remove the snap ring.

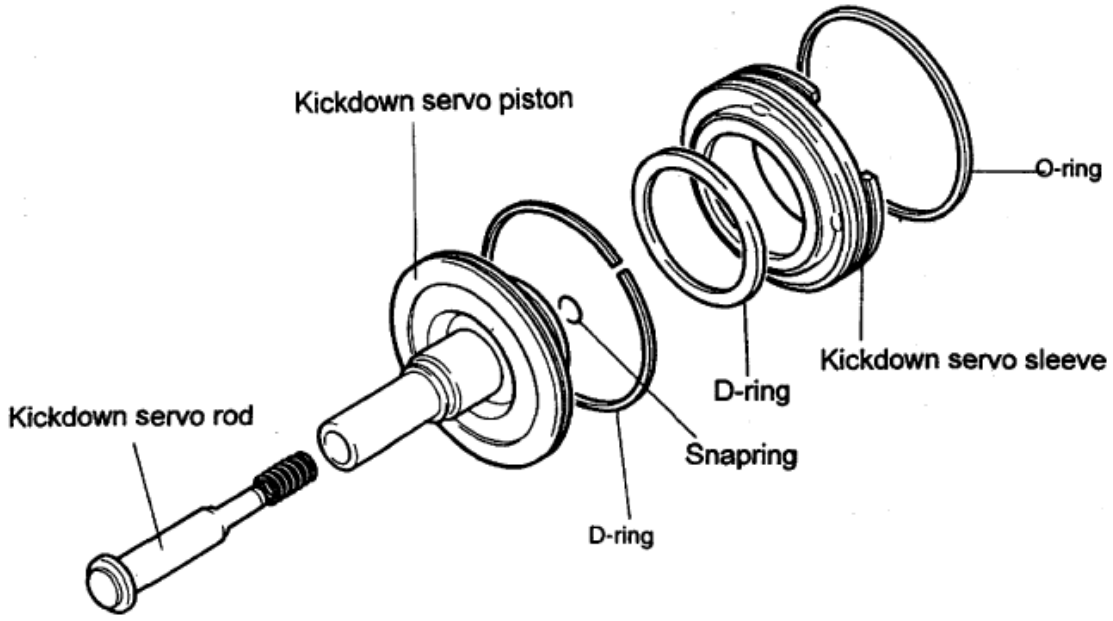


Fig. 59: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

56. Remove the second brake retainer and piston assembly.

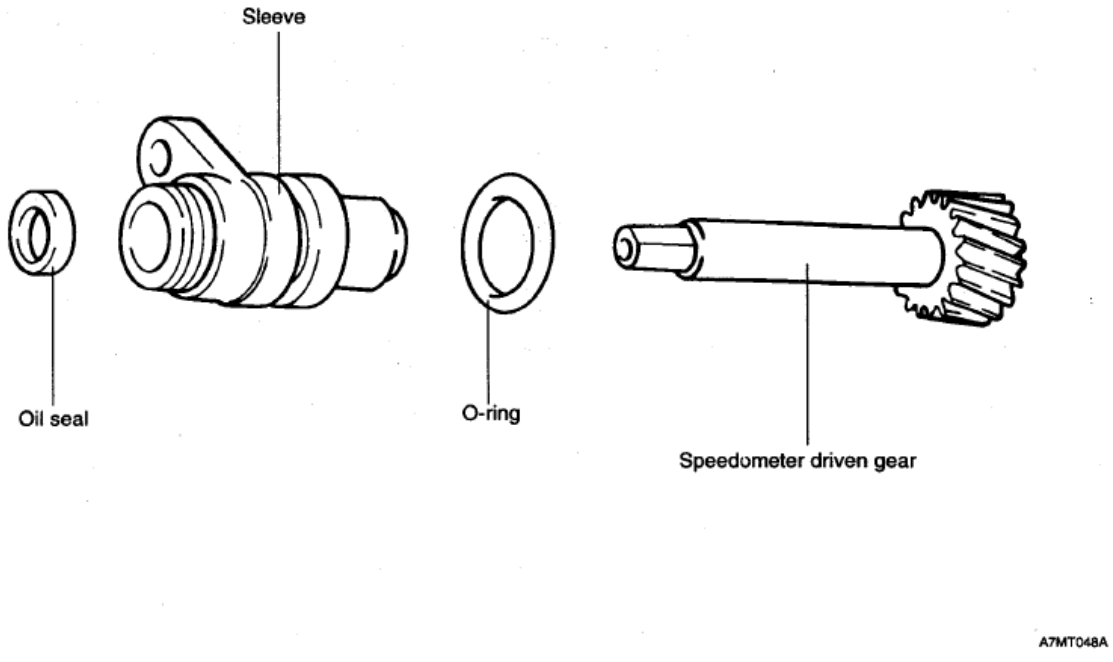


Fig. 60: Identifying Second Brake Retainer And Piston Assembly
Courtesy of KIA MOTORS AMERICA, INC.

57. Remove second brake return spring.

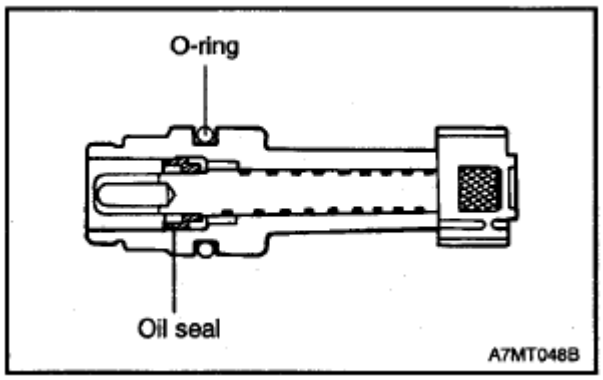


Fig. 61: Identifying Second Brake Return Spring
Courtesy of KIA MOTORS AMERICA, INC.

58. Remove the pressure plate, brake disk set, snap ring and reaction plate.

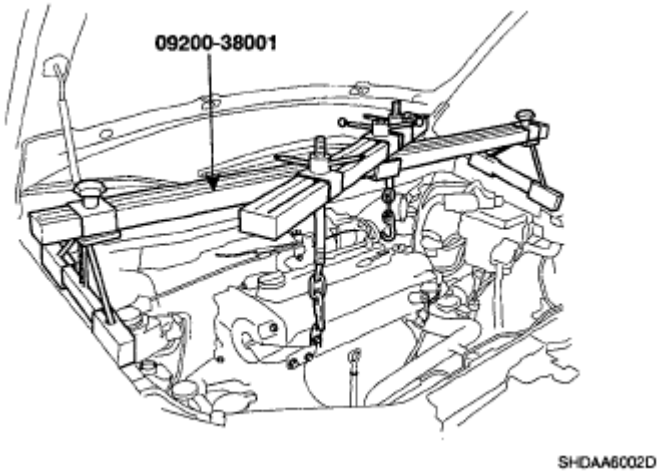


Fig. 62: Identifying Pressure Plate, Brake Disk Set, Snap Ring And Reaction Plate
Courtesy of KIA MOTORS AMERICA, INC.

59. Remove the overdrive & output planetary gear assembly.

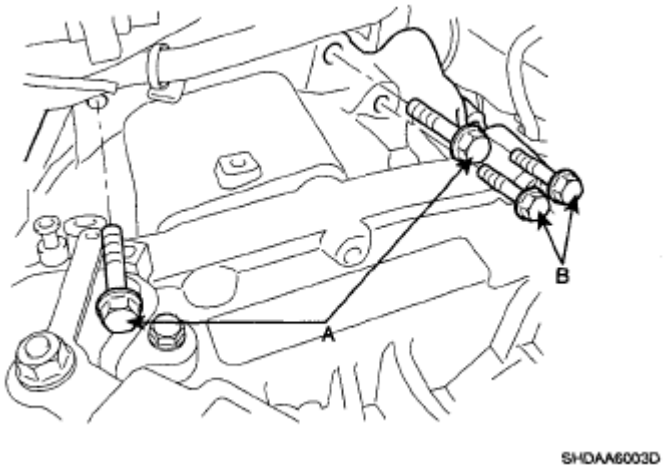


Fig. 63: Identifying Overdrive & Output Planetary Gear Assembly
Courtesy of KIA MOTORS AMERICA, INC.

60. Remove the snap ring.

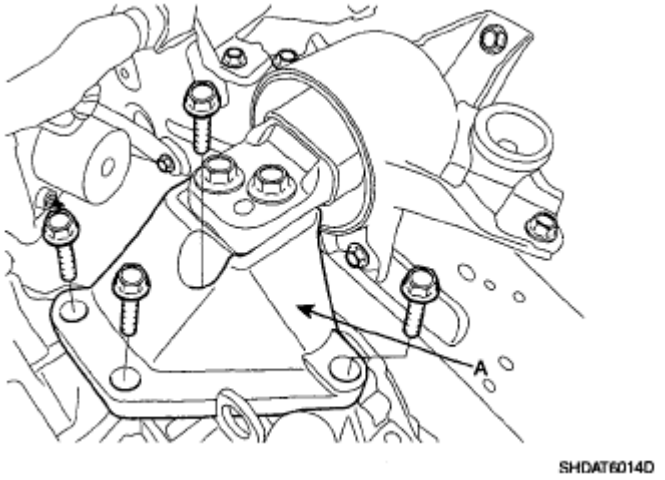


Fig. 64: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

61. Remove the brake disk set and pressure plate.

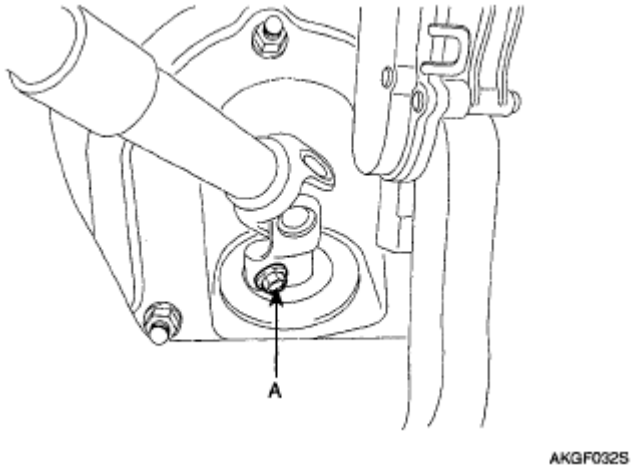


Fig. 65: Identifying Brake Disk Set And Pressure Plate
Courtesy of KIA MOTORS AMERICA, INC.

62. Remove the wave spring.

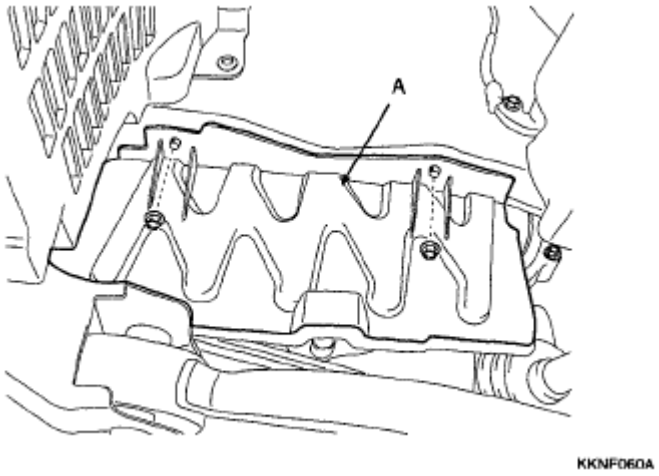


Fig. 66: Identifying Wave Spring
Courtesy of KIA MOTORS AMERICA, INC.

63. Remove the snap ring.

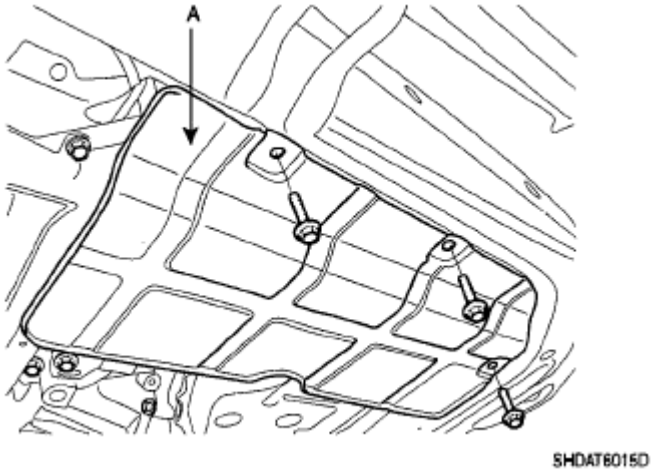


Fig. 67: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

64. Remove the one way clutch inner race.

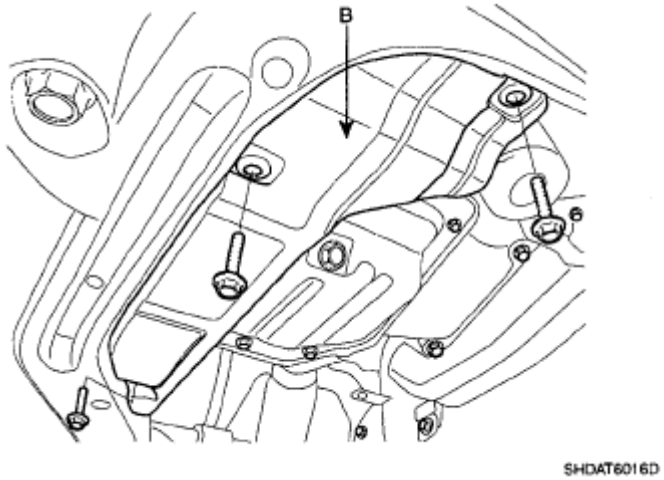


Fig. 68: Identifying One Way Clutch Inner Race
Courtesy of KIA MOTORS AMERICA, INC.

65. Remove the snap ring by using the SST (09453-1M200).

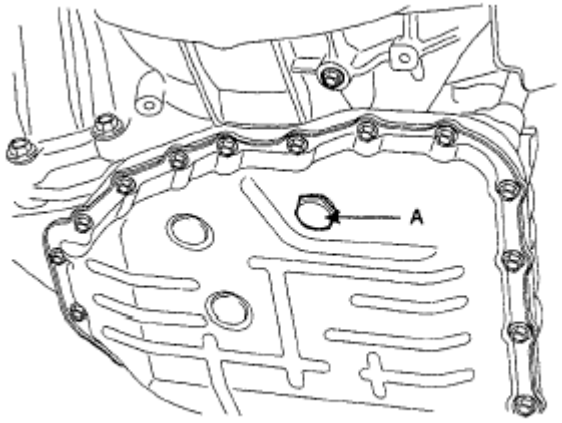


Fig. 69: Removing Snap Ring By Using SST (09453-1M200)
Courtesy of KIA MOTORS AMERICA, INC.

66. Remove the brake spring retainer.

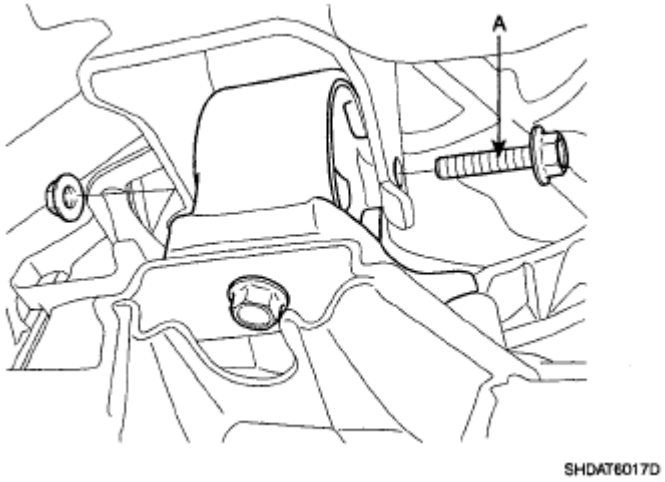


Fig. 70: Identifying Brake Spring Retainer
Courtesy of KIA MOTORS AMERICA, INC.

67. Remove low & reverse brake return spring.

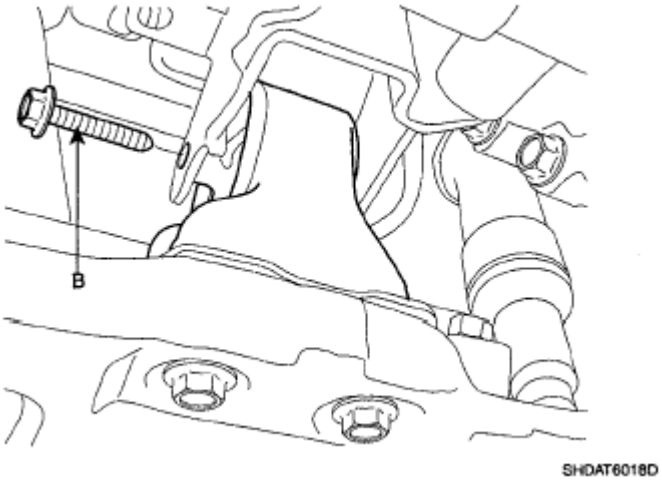


Fig. 71: Identifying Low & Reverse Brake Return Spring
Courtesy of KIA MOTORS AMERICA, INC.

68. Remove low & reverse brake piston.

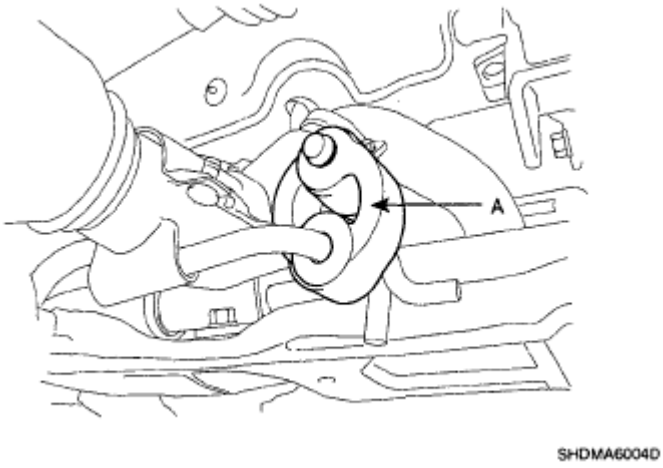


Fig. 72: Identifying Low & Reverse Brake Piston
Courtesy of KIA MOTORS AMERICA, INC.

69. Remove the transfer drive gear assembly by removing the bolts (4ea+4ea).

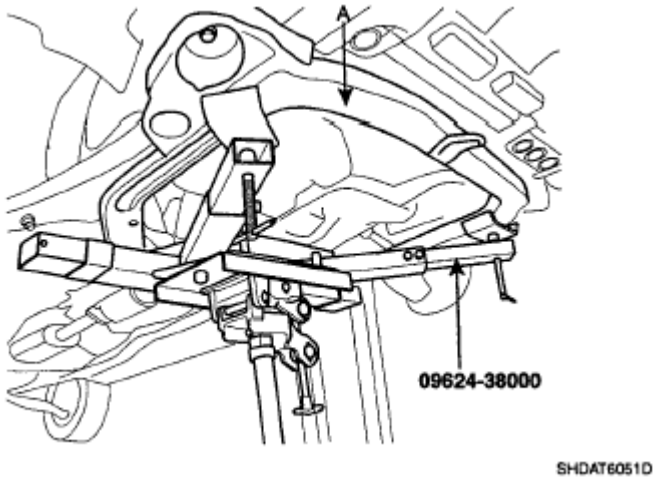


Fig. 73: Identifying Transfer Drive Gear Assembly And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

70. Remove the oil guide plate by removing the bolt.

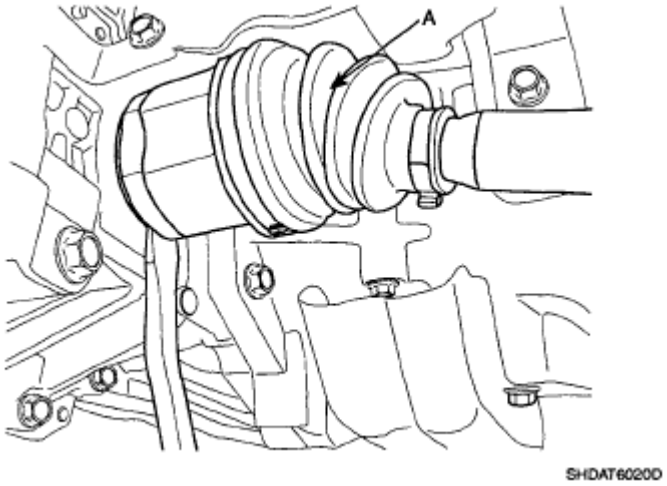


Fig. 74: Identifying Oil Guide Plate And Bolt
Courtesy of KIA MOTORS AMERICA, INC.

71. Remove the outer race for differential bearing from the transmission case.

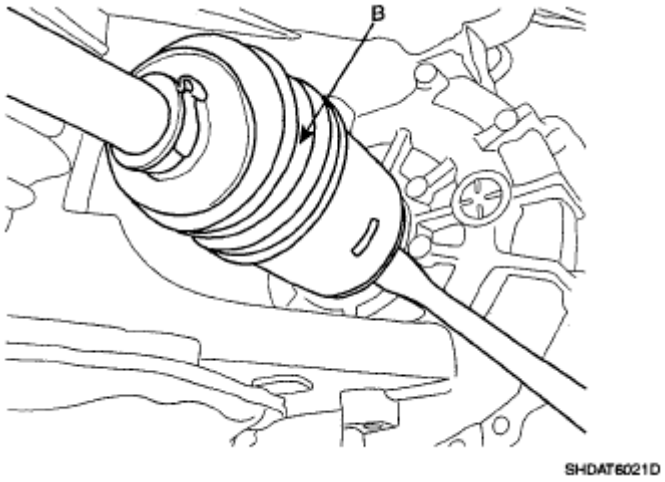


Fig. 75: Identifying Outer Race Of Differential Bearing
Courtesy of KIA MOTORS AMERICA, INC.

72. Remove the oil seal from the transmission case.

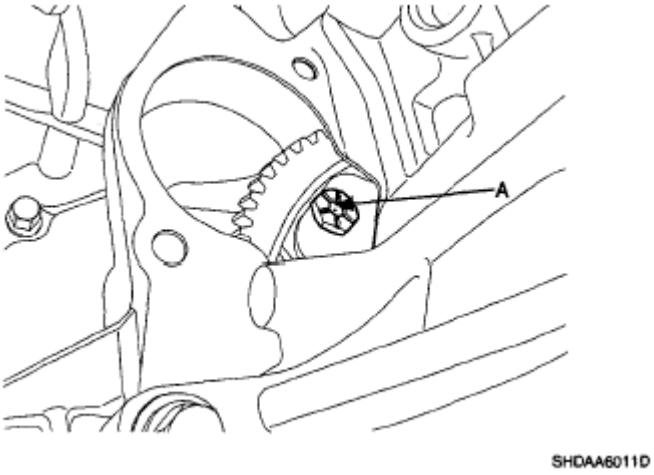


Fig. 76: Identifying Oil Seal On Transmission Case
Courtesy of KIA MOTORS AMERICA, INC.

Reassembly

CAUTION:

- **Keep the workbench and parts always clean and dirt free.**
- **Do not use cotton gloves. Use paper towel and nylon rag. Do not use nappy fabric.**
- **Do not use grease at any place otherwise specified. Use white vaseline or blue mineral oil if necessary.**
- **Insert each snap ring firmly into the seat. Do not use deformed rings.**
- **Do not allow dirt to remain on the surface to apply liquid gasket during reassembly.**

- **Oil gasket, valve body mounting bolts (6X25) and oil seals shall not be used again, and use the new ones in assembly.**
- **New clutch and brake discs shall be dipped in ATF for 2 hours or more before use.**
- **In reassembly, replace ATF and cleanse its filter thoroughly. Replace the damaged filter element with a new one.**
- **Apply required minimum quantity of white vaseline, blue mineral oil, or ATF on each of the bearing part, the thrust face moving part, the oil pump moving part, the seal ring, and the O-ring.**
- **Do not replace the ATF in the fluid cooler.**
- **Be careful not to allow dirt to come through the transaxle openings before transaxle mounting onto the vehicle. (including electronic part connector).**

1. Install the oil seal to the transmission case by using the SST (09453-1M400).

**NOTE: Check if the oil seal is red.
lubricate with A/T oil.**

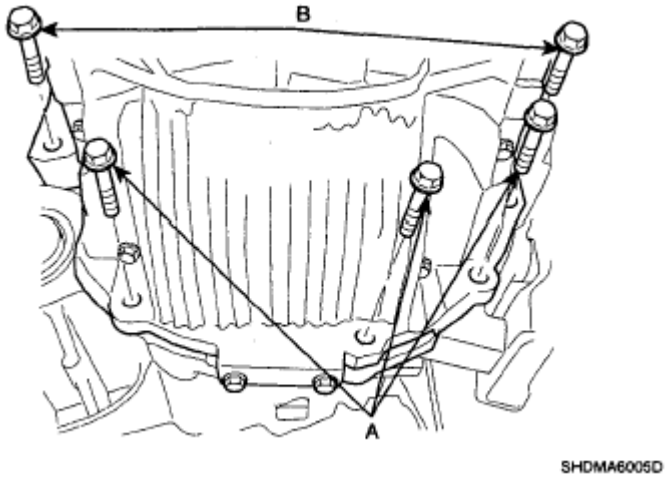


Fig. 77: Identifying Oil Seal In Transmission Case
Courtesy of KIA MOTORS AMERICA, INC.

2. Install the outer race for differential bearing to the transmission case by using the SST (09453-1M300).

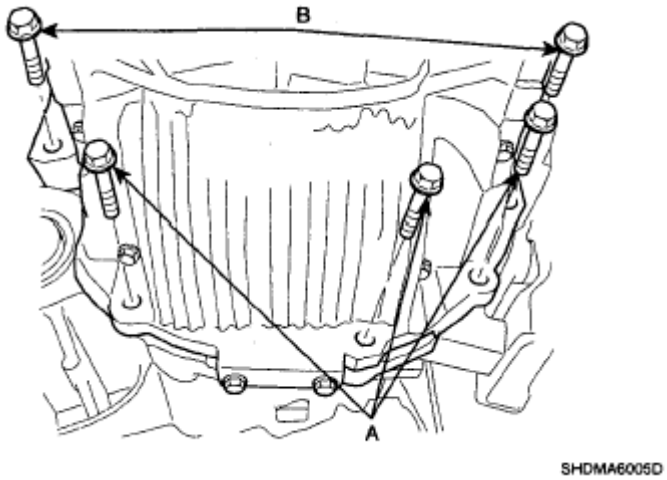


Fig. 78: Identifying Outer Race Of Differential Bearing
Courtesy of KIA MOTORS AMERICA, INC.

3. Install the oil guide plate by installing the bolt.

   Tightening torque :

   10~12 Nm (1.0~1.2 kgf.m, 7.2~8.7 lb-ft)

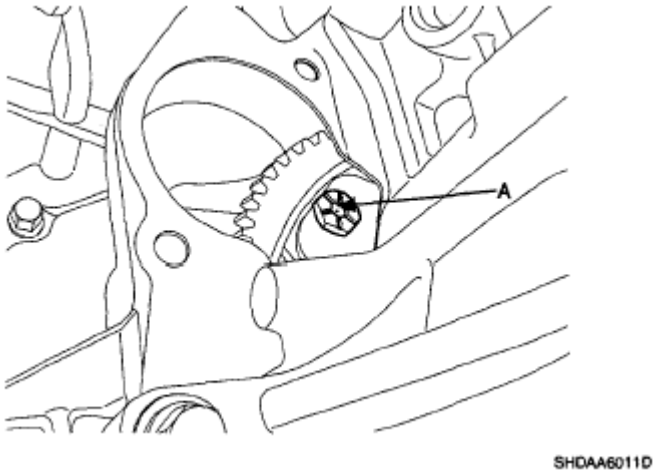


Fig. 79: Identifying Oil Guide Plate And Bolt
Courtesy of KIA MOTORS AMERICA, INC.

4. Install the transfer drive gear assembly by installing the bolts (4ea+4ea).

   Tightening torque :

   8~12 Nm (0.8~1.2 kgf.m, 5.8~8.7 lb-ft)

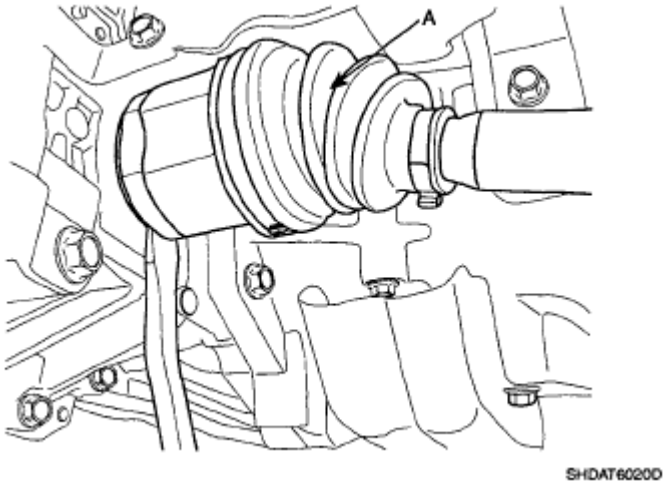


Fig. 80: Identifying Transfer Drive Gear Assembly And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

5. Install low & reverse brake piston.

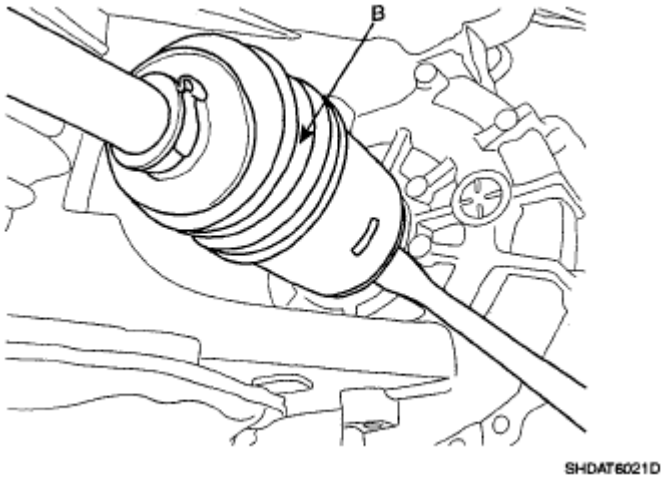


Fig. 81: Identifying Low & Reverse Brake Piston
Courtesy of KIA MOTORS AMERICA, INC.

6. Install low & reverse brake return spring.

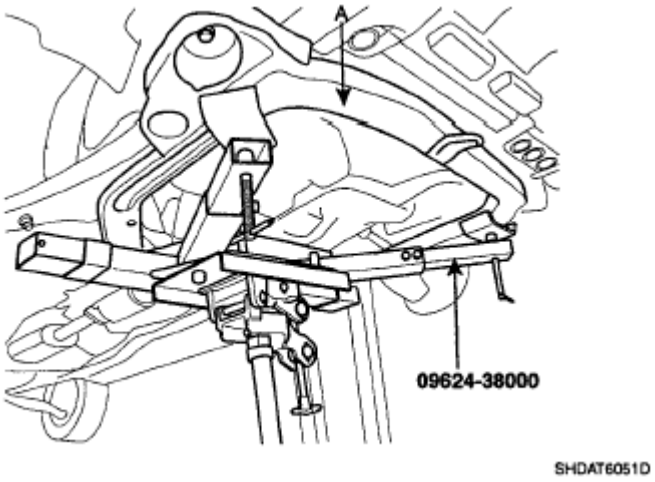


Fig. 82: Identifying Low & Reverse Brake Return Spring
Courtesy of KIA MOTORS AMERICA, INC.

7. Install the brake spring retainer.

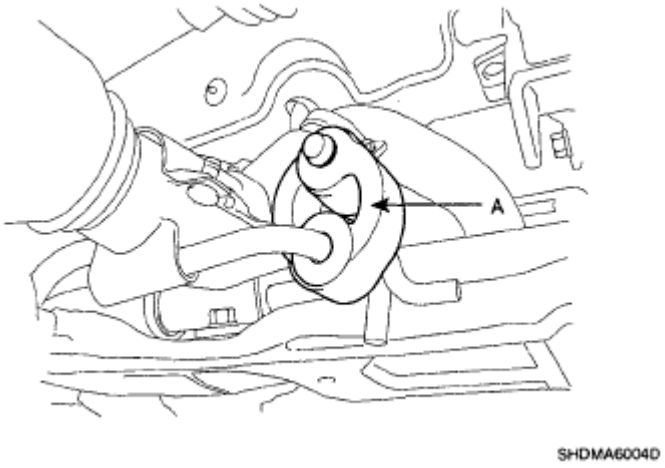


Fig. 83: Identifying Brake Spring Retainer
Courtesy of KIA MOTORS AMERICA, INC.

8. Install the snap ring by using the SST (09453-1M200).

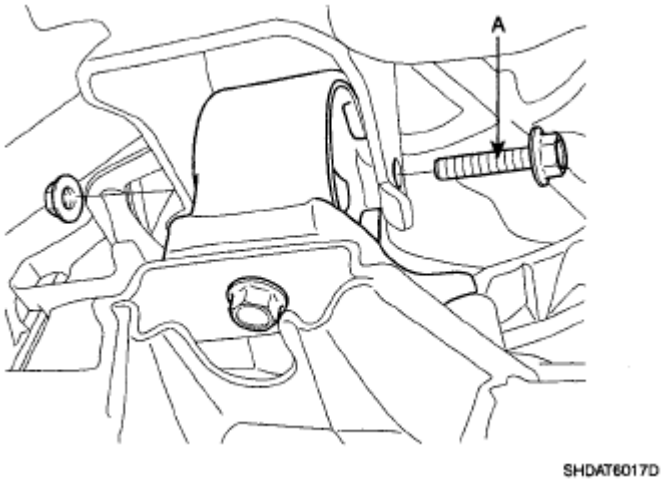


Fig. 84: Installing Snap Ring By Using SST (09453-1M200)
Courtesy of KIA MOTORS AMERICA, INC.

9. Install the one way clutch inner race.

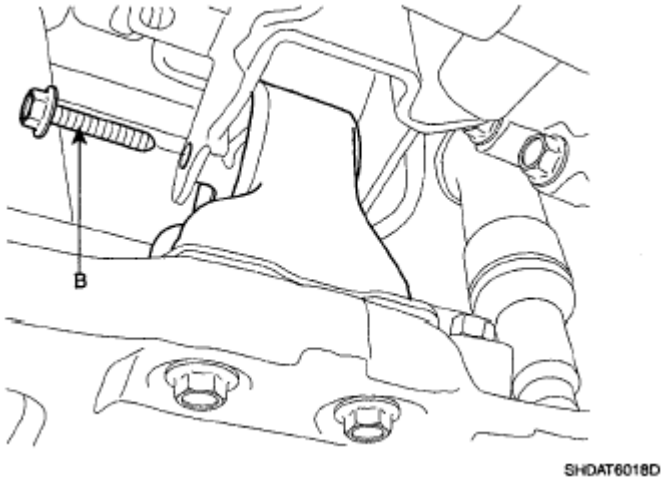


Fig. 85: Identifying One Way Clutch Inner Race
Courtesy of KIA MOTORS AMERICA, INC.

10. Install the snap ring.

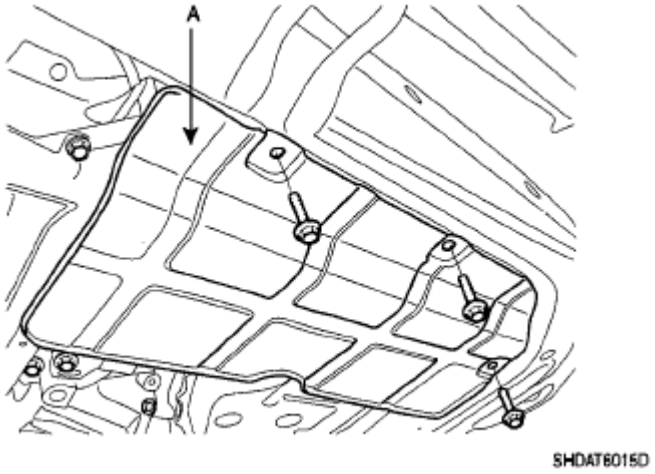


Fig. 86: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

11. Install the wave spring.

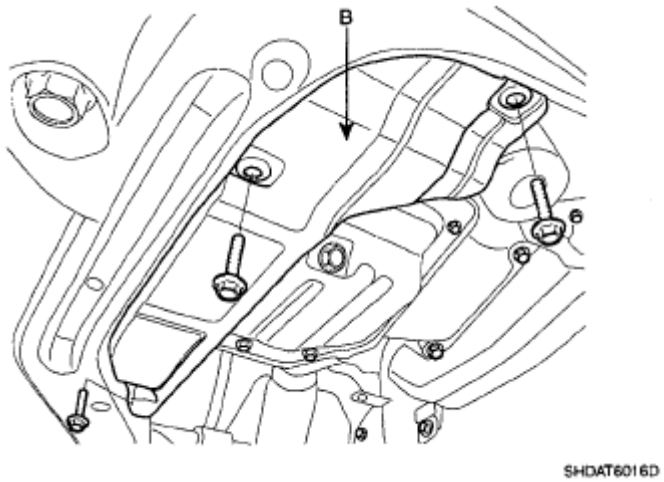


Fig. 87: Identifying Wave Spring
Courtesy of KIA MOTORS AMERICA, INC.

12. Install the pressure plate, brake disk set.

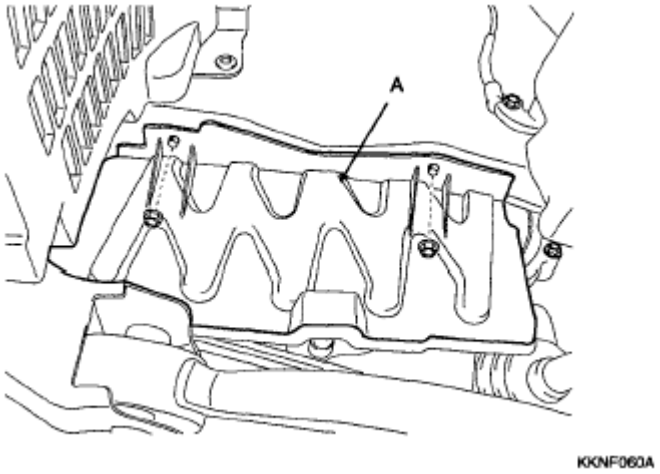


Fig. 88: Identifying Pressure Plate, Brake Disk Set
Courtesy of KIA MOTORS AMERICA, INC.

13. Install the snap ring.

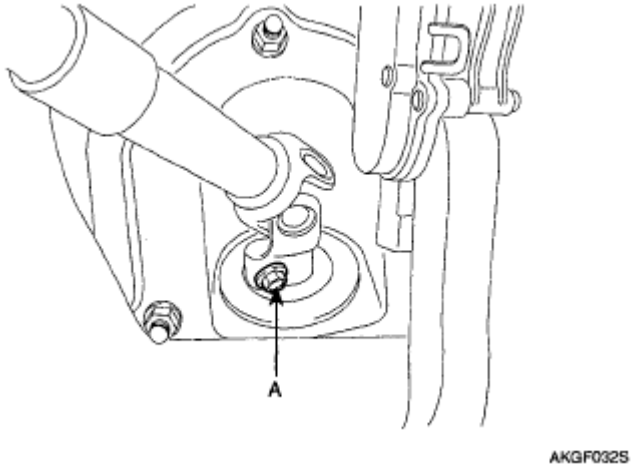


Fig. 89: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

End play : 1.65 ~ 1.95 mm

Thickness of pressure plate = (distance between surface of L/R brake piston and end of snap ring) - (distance between end of pressure plate and end of snap ring) under the load of 50N (5kgf)

PRESSURE PLATE THICKNESS

Part number	Thickness mm(in)
45635-23160	1.6 (0.063)
45635-23180	1.8 (0.071)
45635-23200	2.0 (0.079)
45635-23220	2.2 (0.087)

45635-23240	2.4 (0.094)
45635-23260	2.6 (0.102)
45635-23280	2.8 (0.110)
45635-23300	3.0 (0.118)

14. Install the orerdrive & output planetary gear assembly.

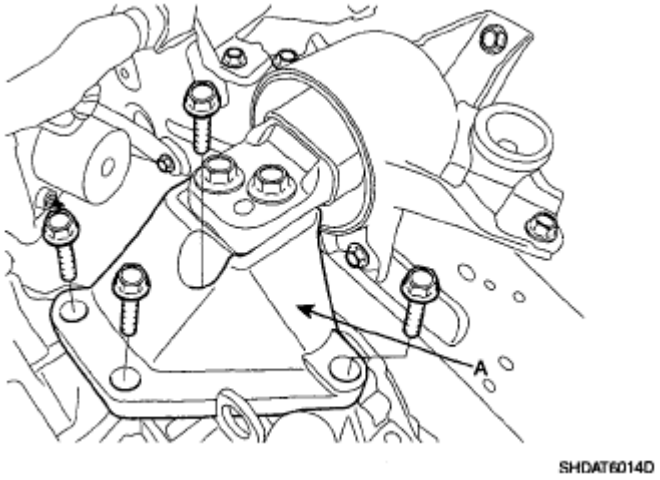


Fig. 90: Identifying Orerdrive & Output Planetary Gear Assembly
Courtesy of KIA MOTORS AMERICA, INC.

15. Install the reaction plate, snap ring and brake disc set.

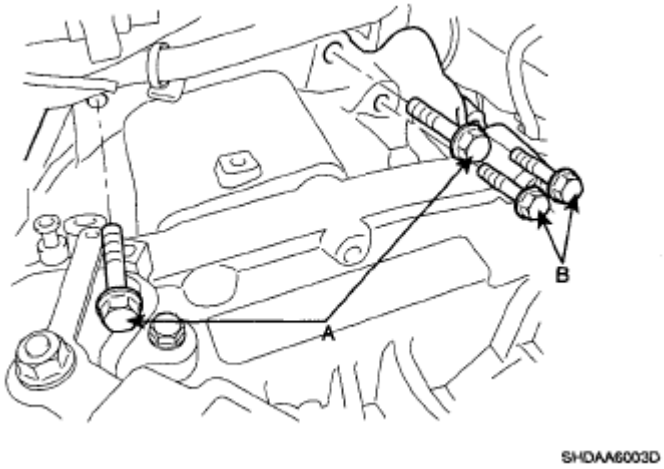


Fig. 91: Identifying Reaction Plate, Snap Ring And Brake Disc Set
Courtesy of KIA MOTORS AMERICA, INC.

End play : 1.05 ~ 1.35 mm

Thickness of pressure plate = (distance between end of snap rings of L/R brake and snap ring of 2nd

brake) - (distance between floor of 2nd brake piston and end of snap ring of 2nd brake) - (distance between end of snap ring of L/R brake and floor of pressure plate of 2nd brake) under the load of 50N (5kgf)

PRESSURE PLATE THICKNESS

Part number	Thickness mm(in)
45668-23140	1.4 (0.055)
45668-23160	1.6 (0.063)
45668-23180	1.8 (0.071)
45668-23200	2.0 (0.079)
45668-23220	2.2 (0.087)
45668-23240	2.4 (0.094)
45668-23260	2.6 (0.102)
45668-23280	2.8 (0.110)

16. Install second brake return spring.

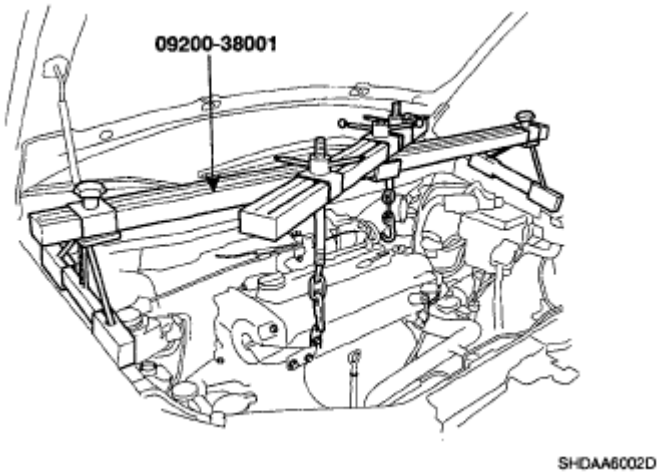


Fig. 92: Identifying Second Brake Return Spring
Courtesy of KIA MOTORS AMERICA, INC.

17. Install the second brake retainer and piston assembly.

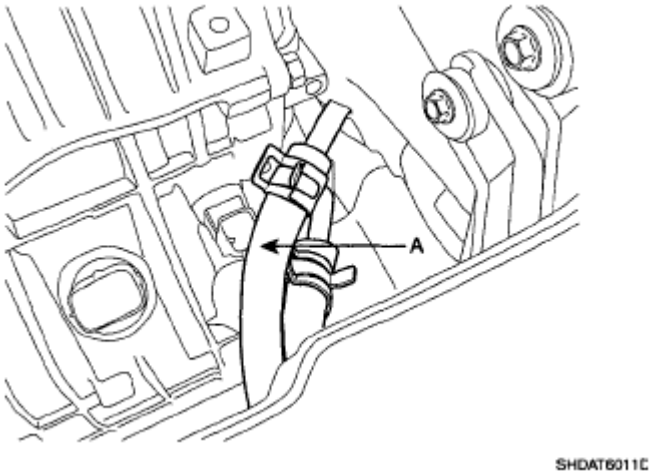


Fig. 93: Identifying Second Brake Retainer And Piston Assembly
Courtesy of KIA MOTORS AMERICA, INC.

18. Install the snap ring.

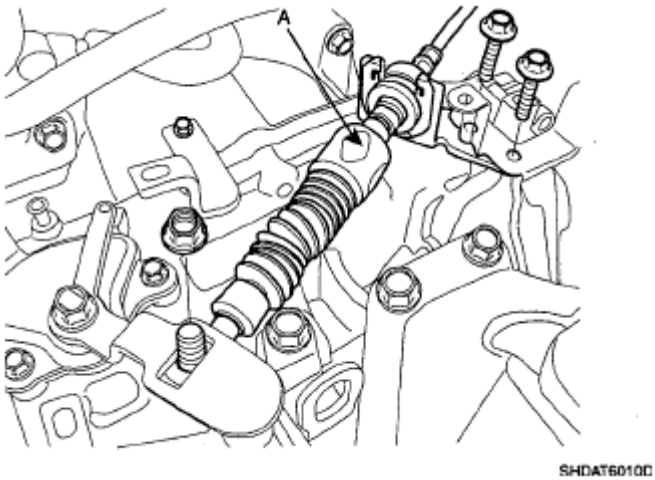


Fig. 94: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

19. Install the reverse sun gear assembly.

NOTE: Check if the low & reverse annulus gear rotates counter clockwise.

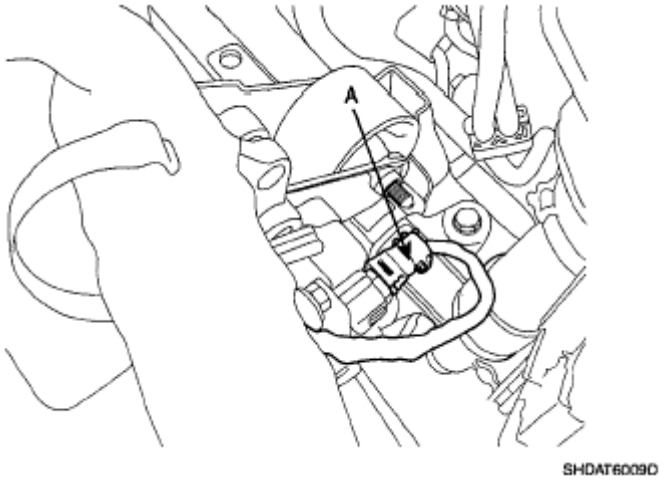


Fig. 95: Identifying Reverse Sun Gear Assembly
Courtesy of KIA MOTORS AMERICA, INC.

20. Install the overdrive clutch hub and the thrust bearings (2ea).

NOTE: Be sure to place the thrust bearings in right direction as shown in the illustration.

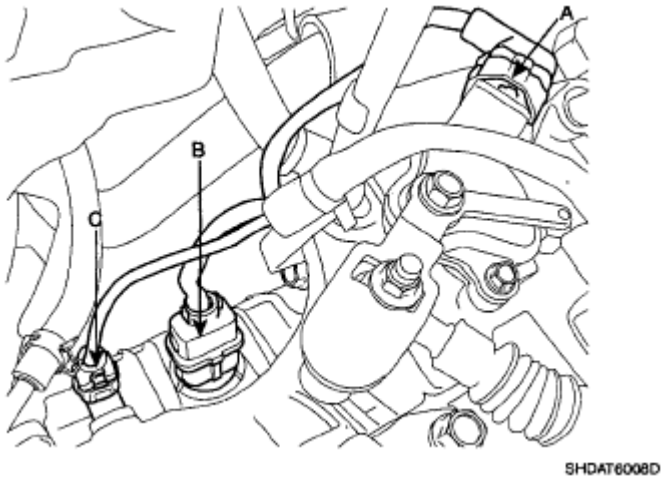


Fig. 96: Identifying Overdrive Clutch Hub And Thrust Bearings
Courtesy of KIA MOTORS AMERICA, INC.

21. Install the reverse & overdrive clutch assembly.

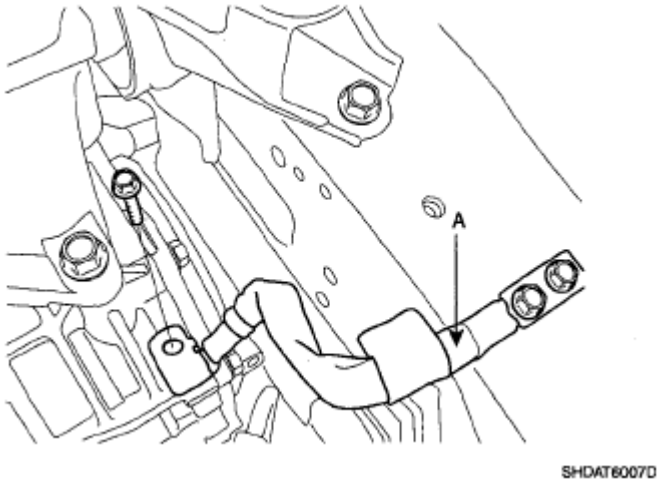


Fig. 97: Identifying Reverse & Overdrive Clutch Assembly
Courtesy of KIA MOTORS AMERICA, INC.

22. Install the thrust bearing.

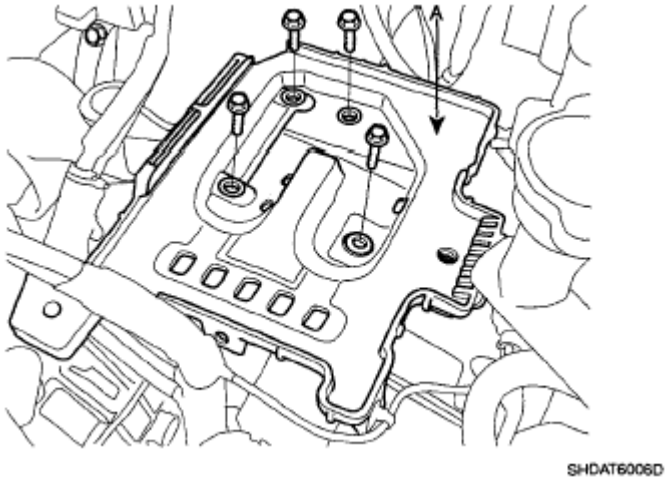


Fig. 98: Identifying Thrust Bearing
Courtesy of KIA MOTORS AMERICA, INC.

23. Install the O-rings (7ea,1ea).

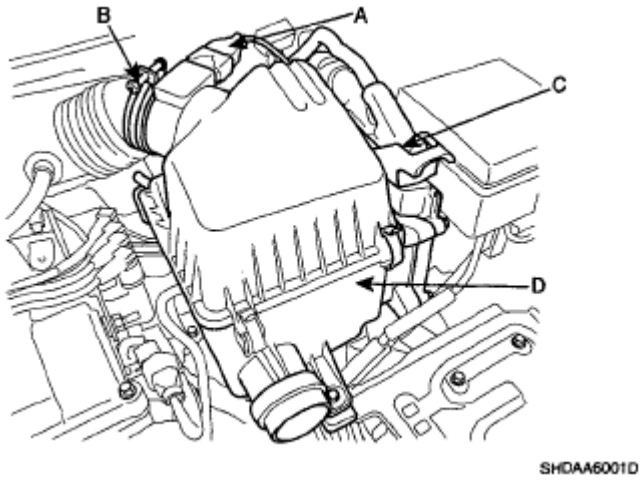


Fig. 99: Identifying O-Rings
Courtesy of KIA MOTORS AMERICA, INC.

24. Install the accumulator piston and spring.

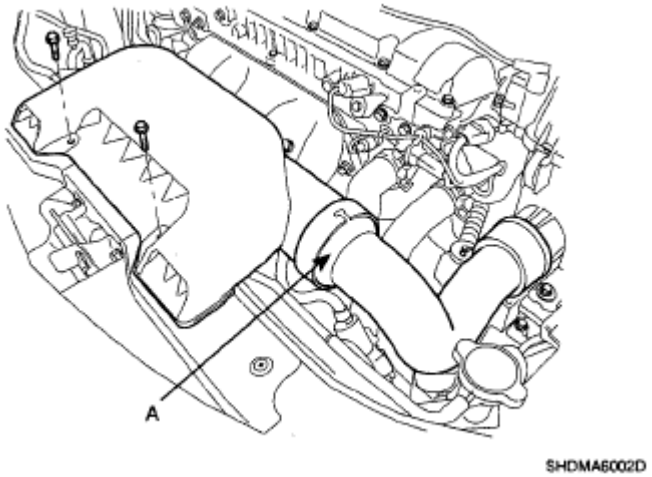


Fig. 100: Identifying Accumulator Piston And Spring
Courtesy of KIA MOTORS AMERICA, INC.

25. Install the D-rings (4ea) to the rear cover assembly.

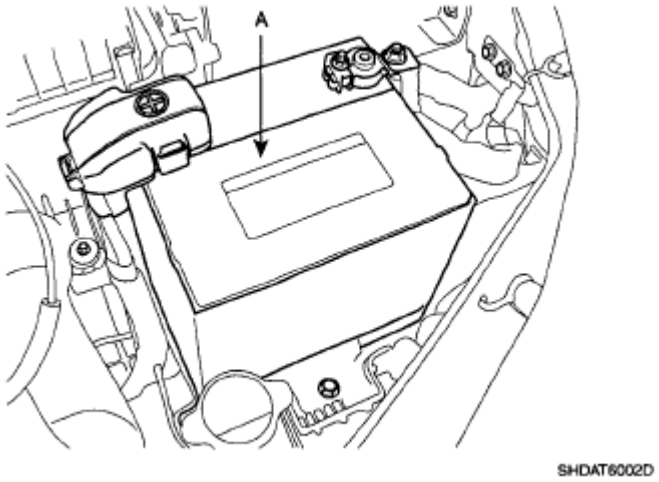


Fig. 101: Identifying D-Rings And Rear Cover Assembly
Courtesy of KIA MOTORS AMERICA, INC.

26. Install the thrust race to the rear cover assembly.

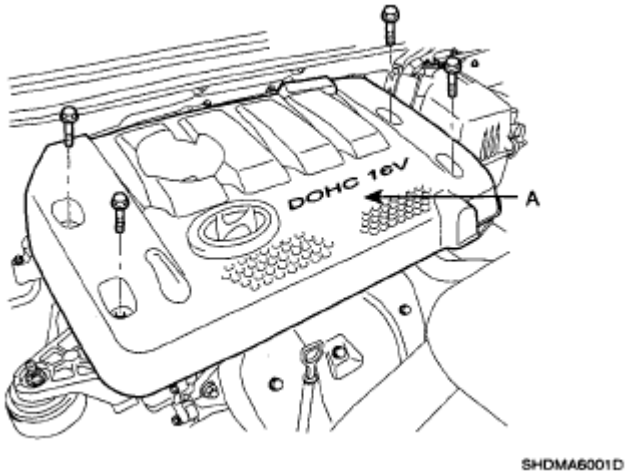


Fig. 102: Identifying Thrust Race And Rear Cover Assembly
Courtesy of KIA MOTORS AMERICA, INC.

End play : 0.25L ~ 0.45L mm

Thickness of thrust race = (distance between surface of rear cover contacting the thrust race and surface of transmission case contacting rear cover) - (distance between end of thrust race and surface of rear cover contacting transmission case) while pressing each component forward.

THRUST RACE THICKNESS

Part number	Thickness mm(in)
45853-23013	1.3 (0.051)
45853-23014	1.4 (0.055)

45853-23015	1.5 (0.059)
45853-23016	1.6 (0.063)
45853-23017	1.7 (0.067)
45853-23018	1.8 (0.071)
45853-23019	1.9 (0.075)
45853-23020	2.0 (0.079)
45853-23021	2.1 (0.083)

27. Apply liquid gasket with 1.6mm thickness on the rear cover surface.

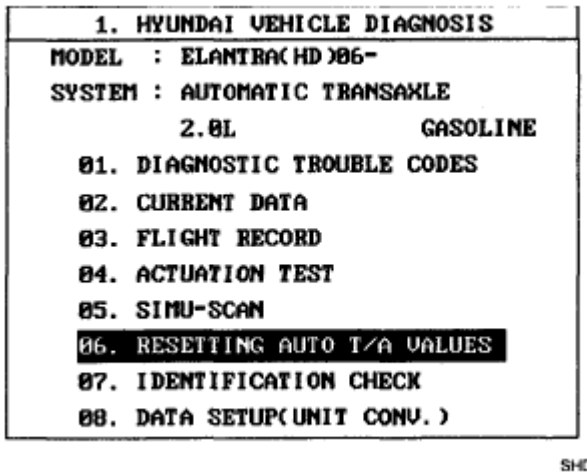


Fig. 103: Applying Liquid Gasket With 1.6mm Thickness On Rear Cover Surface
Courtesy of KIA MOTORS AMERICA, INC.

28. Install the rear cover assembly by installing the bolts (11ea).

Tightening torque :

20~27 Nm (2.0~2.7 kgf.m, 14.5~19.5 lb-ft)

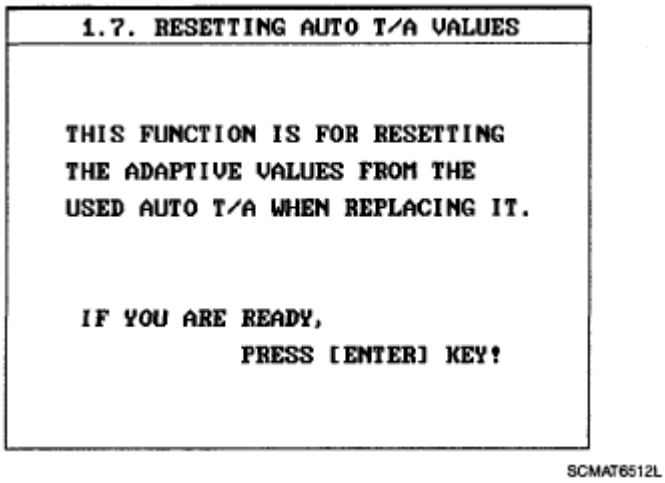


Fig. 104: Identifying Rear Cover Assembly And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

29. Install the O-ring.

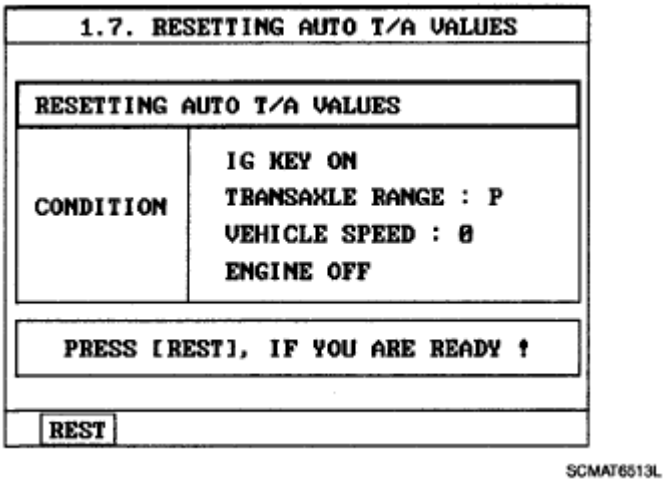


Fig. 105: Identifying O-Ring
Courtesy of KIA MOTORS AMERICA, INC.

30. Install the accumulator piston, spring, and cover.

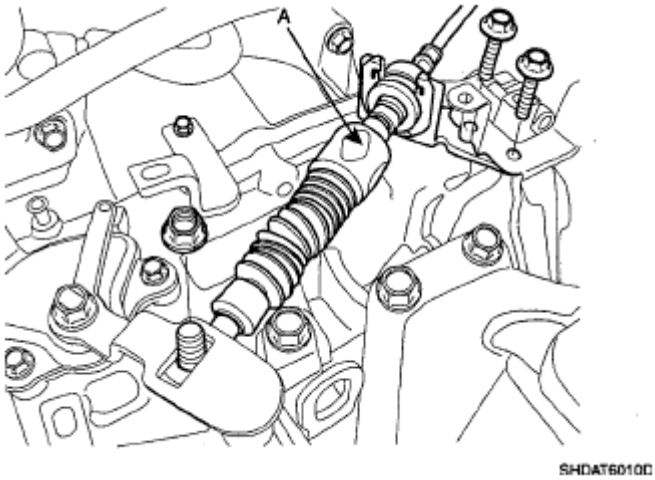


Fig. 106: Identifying Accumulator Piston, Spring, And Cover
Courtesy of KIA MOTORS AMERICA, INC.

31. Install the retainer ring.

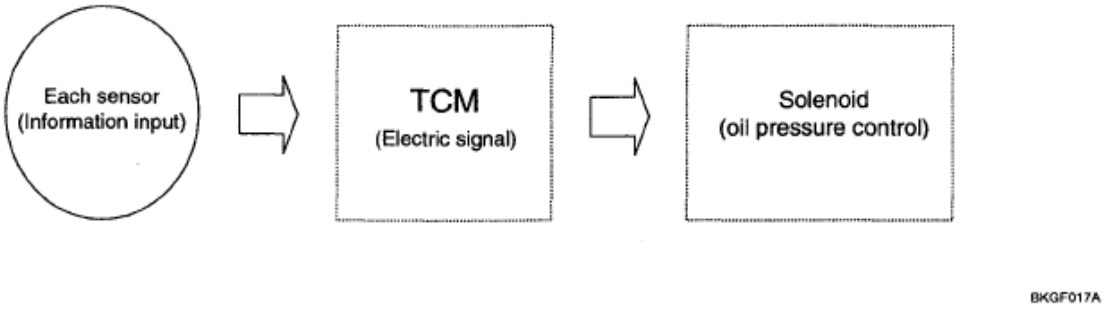


Fig. 107: Identifying Retainer Ring
Courtesy of KIA MOTORS AMERICA, INC.

32. Install the reduction brake piston.

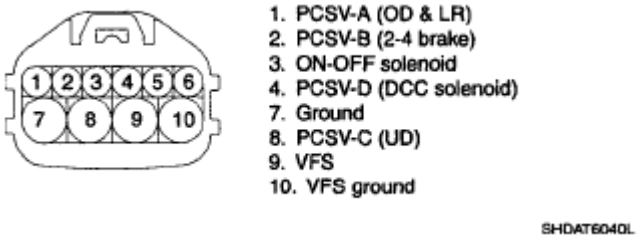
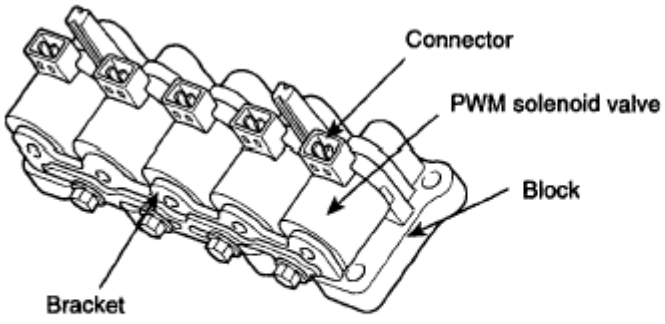


Fig. 108: Identifying Reduction Brake Piston
Courtesy of KIA MOTORS AMERICA, INC.

33. Install the reduction brake spring.

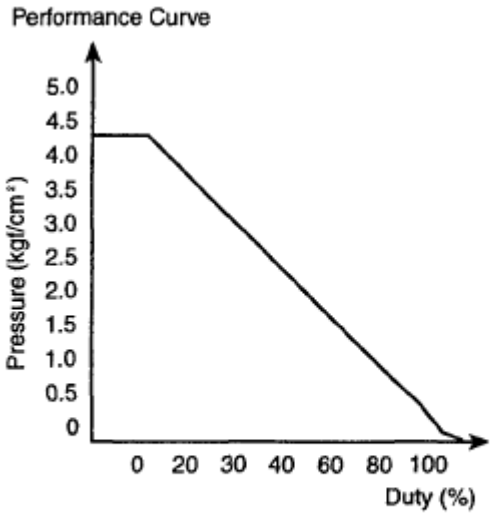


<PWM block assembly>

BKGF017C

Fig. 109: Identifying Reduction Brake Spring
Courtesy of KIA MOTORS AMERICA, INC.

34. Install the reduction brake spring retainer.



<PWM Solenoid valve performance curve>

BKGF017D

Fig. 110: Identifying Reduction Brake Spring Retainer
Courtesy of KIA MOTORS AMERICA, INC.

35. Install the seal rings (2ea) to the sleeve.

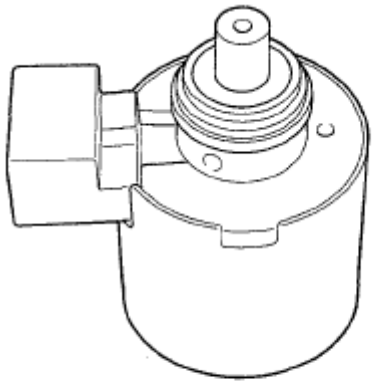


Fig. 111: Identifying Seal Rings
Courtesy of KIA MOTORS AMERICA, INC.

36. Install the snap ring by using the SST (09453-1M100).

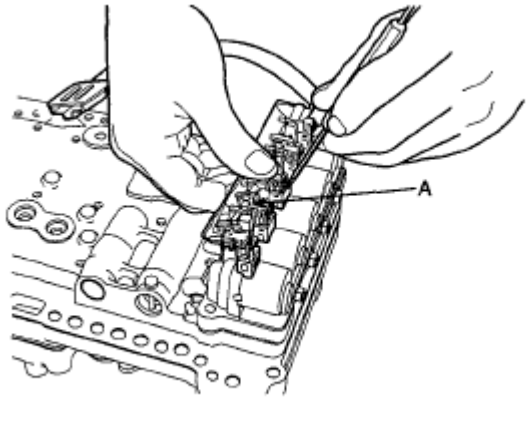


Fig. 112: Installing Snap Ring By Using SST (09453-1M100)
Courtesy of KIA MOTORS AMERICA, INC.

37. Install the brake disk set.

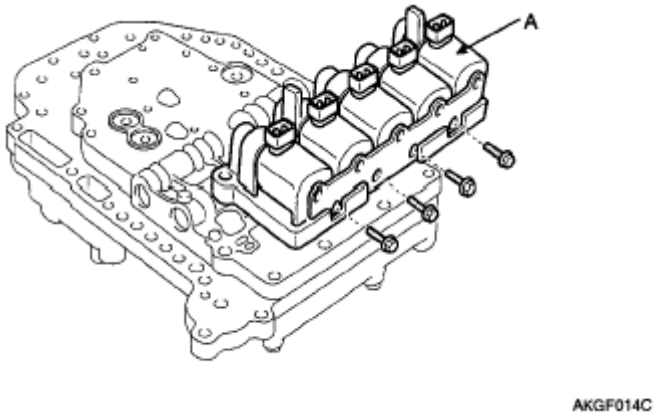


Fig. 113: Identifying Brake Disk Set
Courtesy of KIA MOTORS AMERICA, INC.

38. Install the snap rings (A, B).

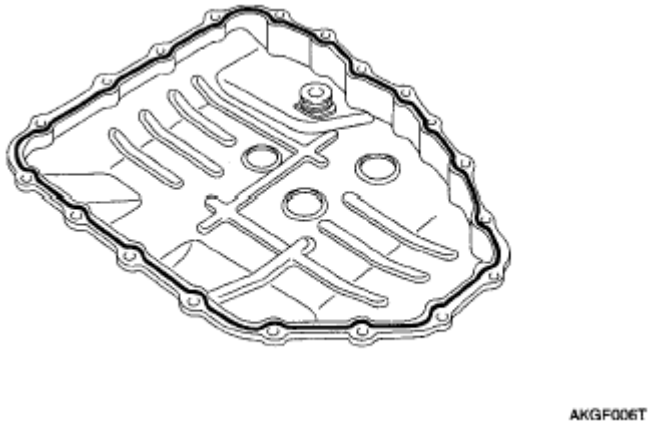


Fig. 114: Identifying Snap Rings
Courtesy of KIA MOTORS AMERICA, INC.

End play : 1.05 ~ 1.35 mm

Thickness of snap ring (A) = (distance between surface of Reduction brake piston and end of snap ring (B)) - (thickness of brake disk set) - (thickness of snap ring (B)) under the load of 50N (5kgf).

SNAP RING THICKNESS

Part number	Thickness mm(in)
45689-23816	1.6 (0.063)
45689-23818	1.8 (0.071)
45689-23820	2.0 (0.079)
45689-23822	2.2 (0.087)
45689-23824	2.4 (0.094)
45689-23826	2.6 (0.102)

45689-23828	2.8 (0.110)

39. Install the one way clutch assembly.

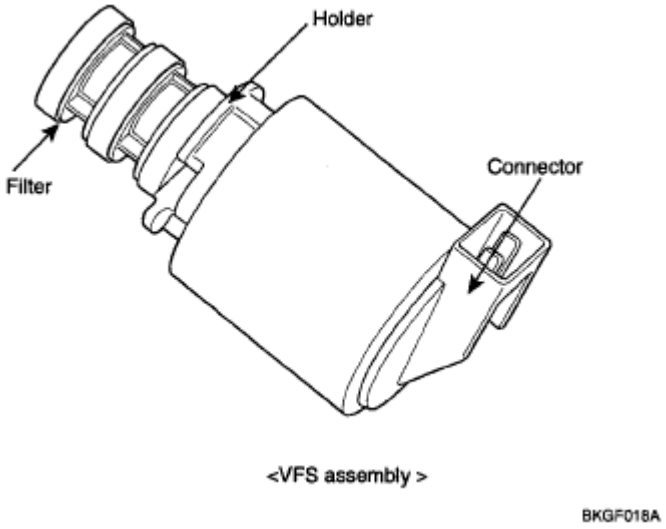


Fig. 115: Identifying One Way Clutch Assembly
Courtesy of KIA MOTORS AMERICA, INC.

40. Install the snap ring.

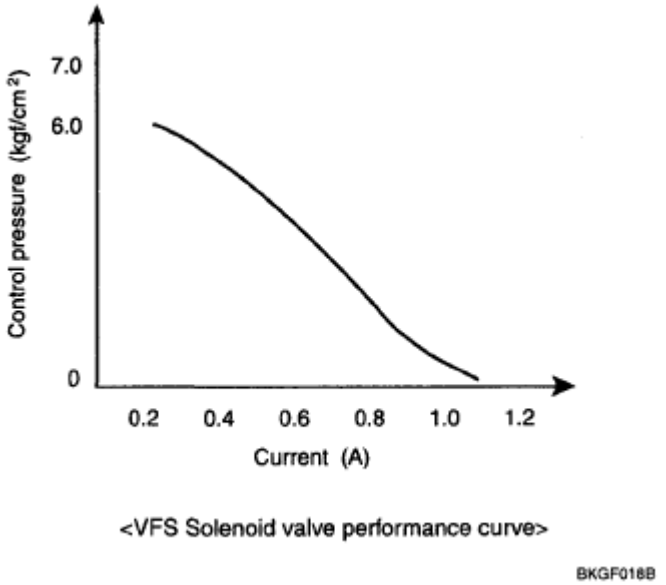


Fig. 116: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

41. Install the thrust race.

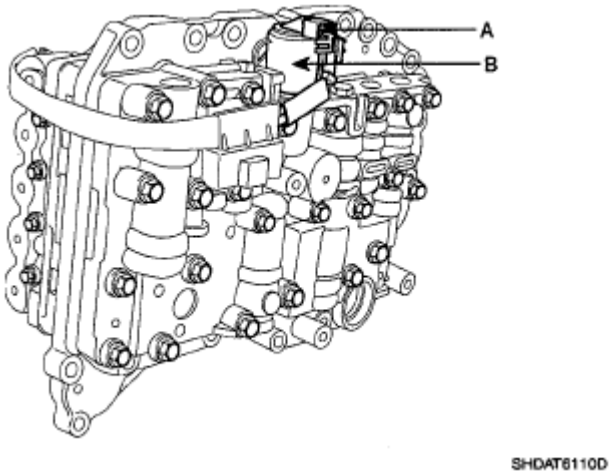


Fig. 117: Identifying Thrust Race
Courtesy of KIA MOTORS AMERICA, INC.

42. Install the thrust bearing and the direct clutch retainer assembly.

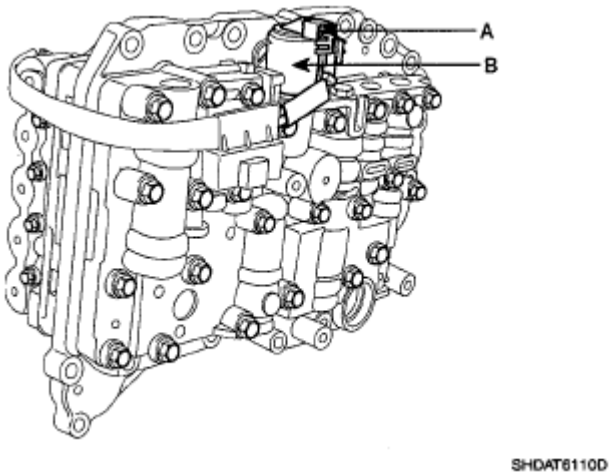
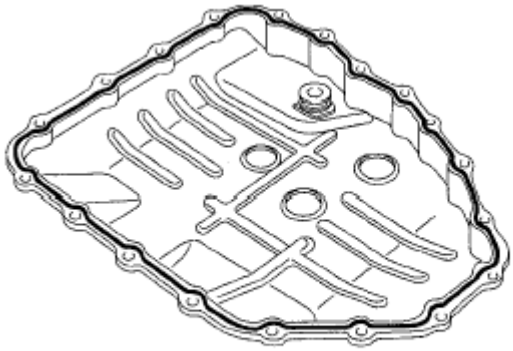


Fig. 118: Identifying Thrust Bearing And Direct Clutch Retainer Assembly
Courtesy of KIA MOTORS AMERICA, INC.

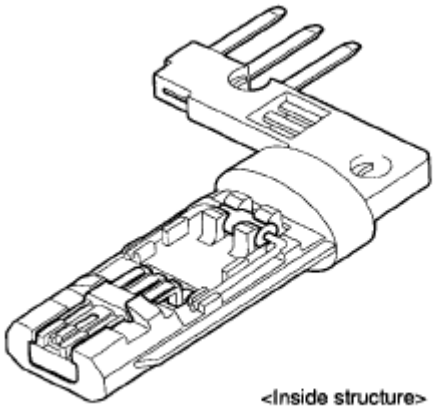
43. Install the transfer driver gear & direct planetary carrier assembly.



AKGF006T

Fig. 119: Identifying Transfer Driver Gear & Direct Planetary Carrier Assembly
Courtesy of KIA MOTORS AMERICA, INC.

44. Install the parking sprag (A), shaft (B) and sprag spring (C).



BKGF012B

Fig. 120: Identifying Parking Sprag, Shaft And Sprag Spring
Courtesy of KIA MOTORS AMERICA, INC.

45. Install the manual control shaft (A) (including the two O-rings), the detent lever (B).

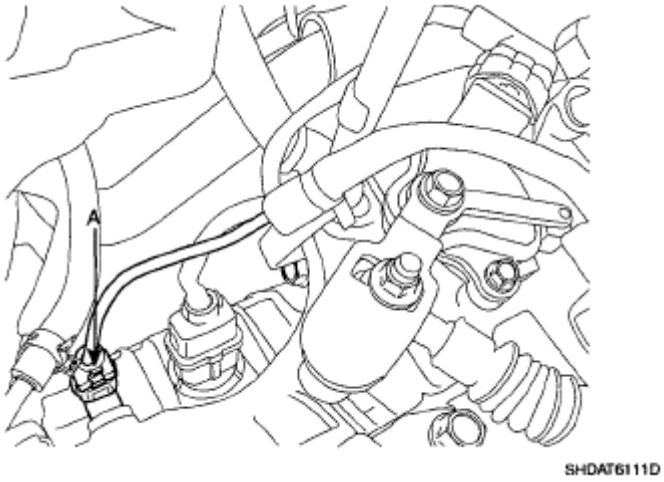


Fig. 121: Locating Manual Control Shaft And Detent Lever
Courtesy of KIA MOTORS AMERICA, INC.

46. Install the manual shaft mounting groove bolt.

    Tightening torque :

    8~10 Nm (0.8~1.0 kgf.m, 5.8~7.2 lb-ft)

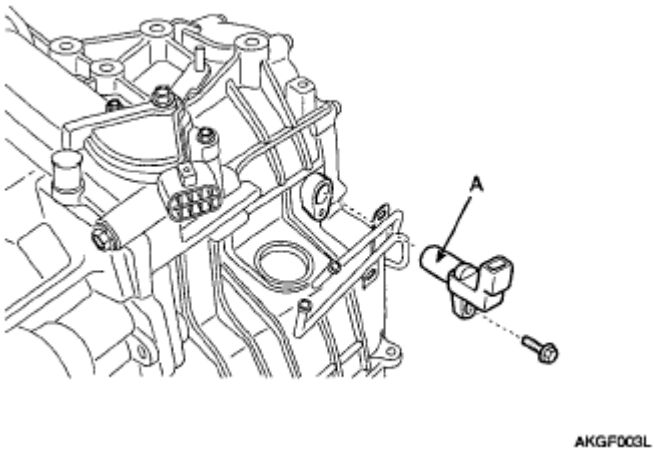


Fig. 122: Identifying Manual Shaft Mounting Groove Bolt
Courtesy of KIA MOTORS AMERICA, INC.

47. Install the parking sprag rod assembly.

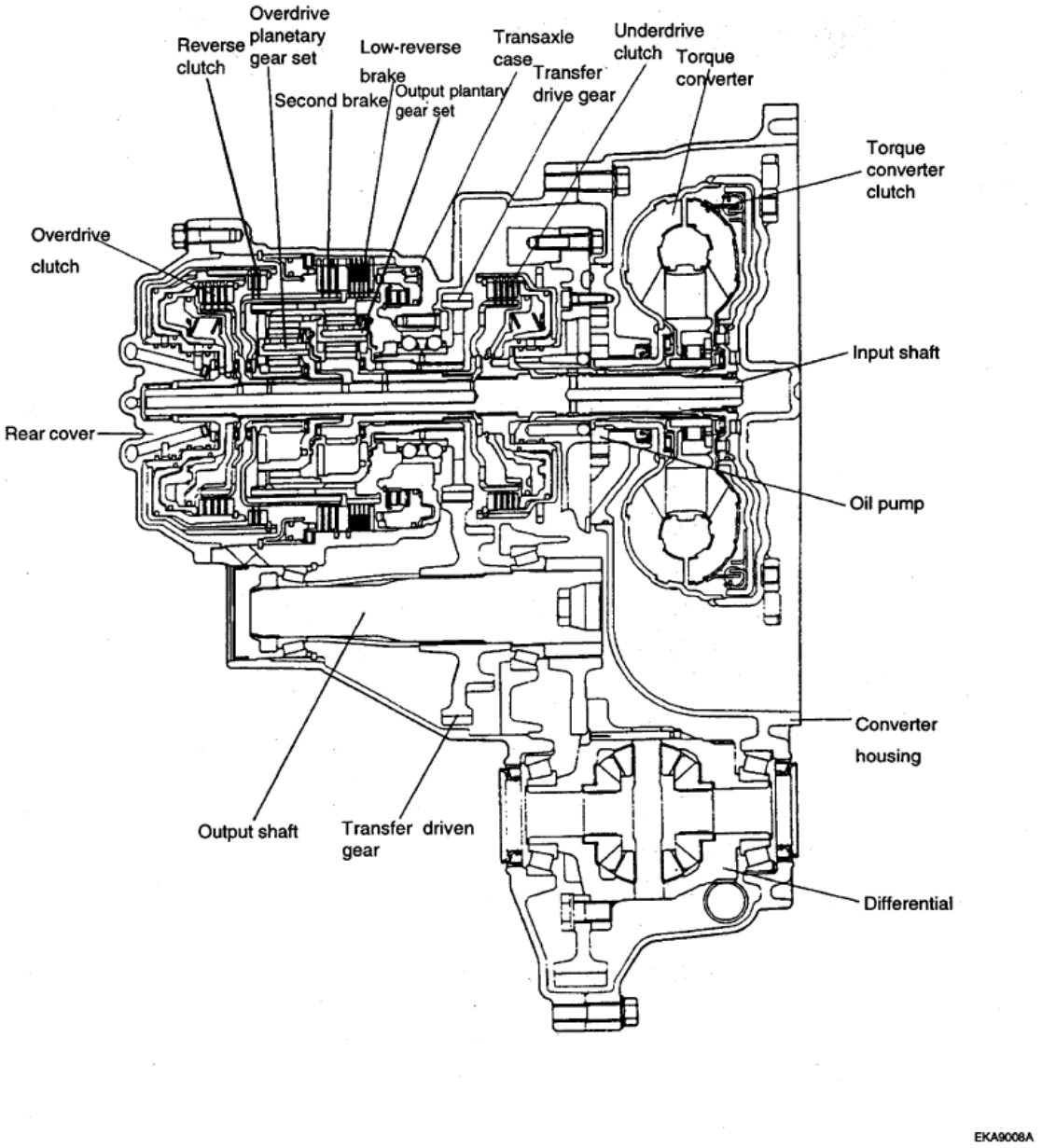
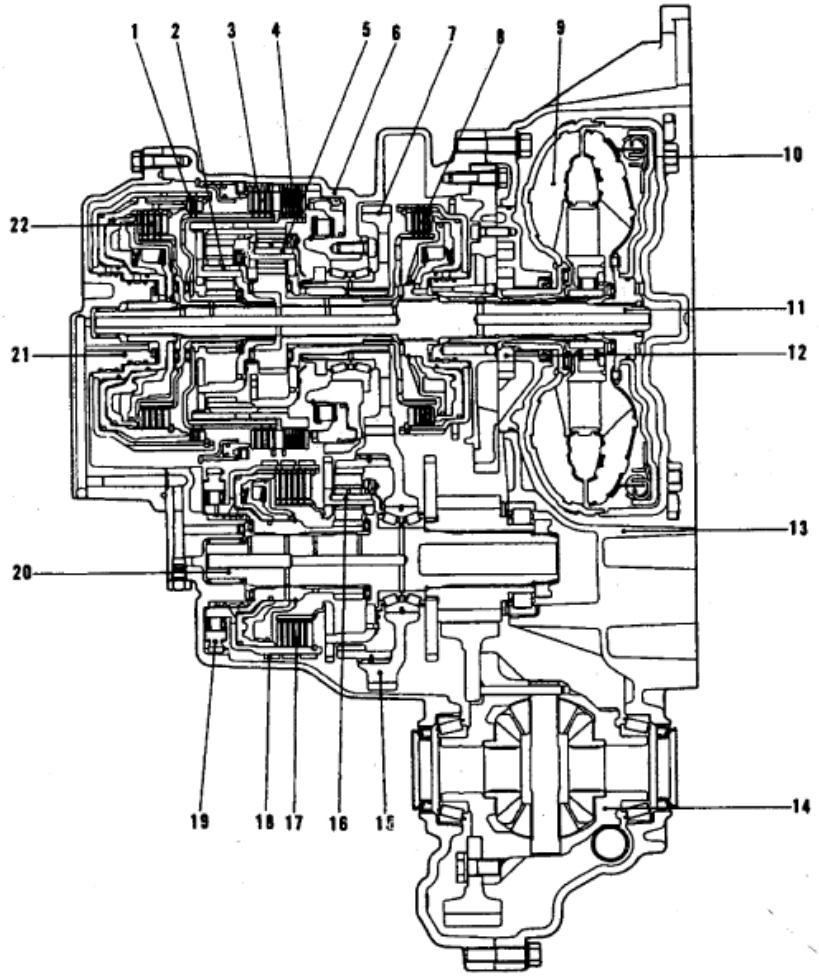


Fig. 123: Installing Parking Sprag Rod Assembly
Courtesy of KIA MOTORS AMERICA, INC.

48. Install the reamer bolt.

Tightening torque :

8~10 Nm (0.8~1.0 kgf.m, 5.8~7.2 lb-ft)



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

Fig. 124: Identifying Reamer Bolt
Courtesy of KIA MOTORS AMERICA, INC.

49. Install the detent spring by installing the bolt.

Tightening torque :

8~10 Nm (0.8~1.0 kgf.m, 5.8~7.2 lb-ft)

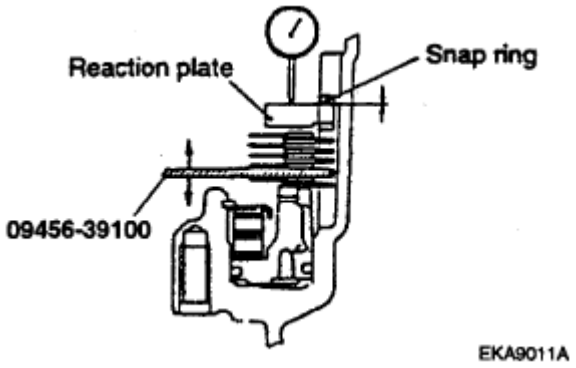


Fig. 125: Identifying Detent Spring And Bolt
Courtesy of KIA MOTORS AMERICA, INC.

50. Install the parking rod guide by installing the bolts (2ea).

Tightening torque :

8~10 Nm (0.8~1.0 kgf.m, 5.8~7.2 lb-ft)

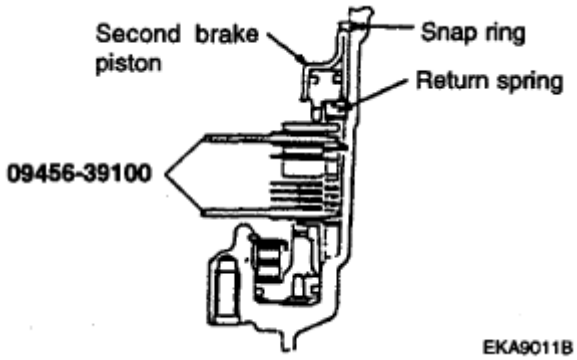


Fig. 126: Identifying Parking Rod Guide And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

51. Install the underdrive clutch hub.

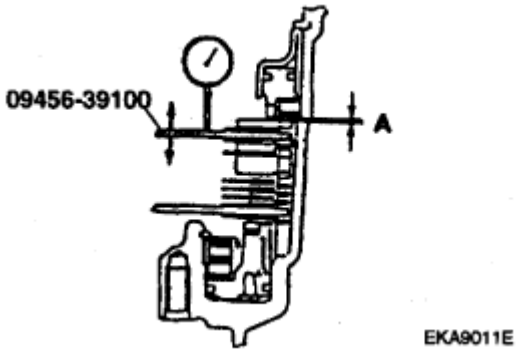


Fig. 127: Identifying Underdrive Clutch Hub
Courtesy of KIA MOTORS AMERICA, INC.

52. Install the thrust bearing.

NOTE: Be sure to place the thrust bearings in right direction as shown in the illustration.

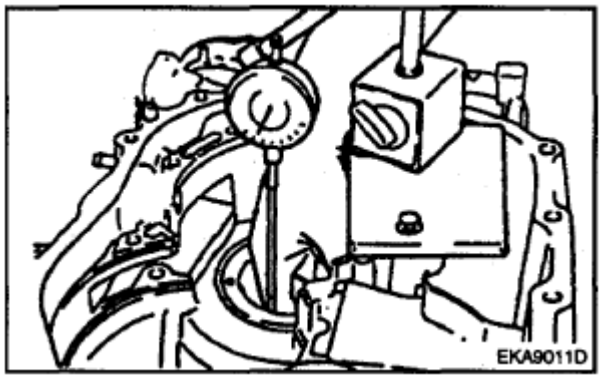


Fig. 128: Identifying Thrust Bearing
Courtesy of KIA MOTORS AMERICA, INC.

53. Install the underdrive clutch assembly.

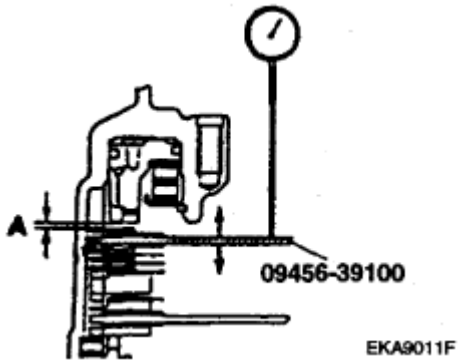


Fig. 129: Identifying Underdrive Clutch Assembly

Courtesy of KIA MOTORS AMERICA, INC.

54. Install the thrust washer.

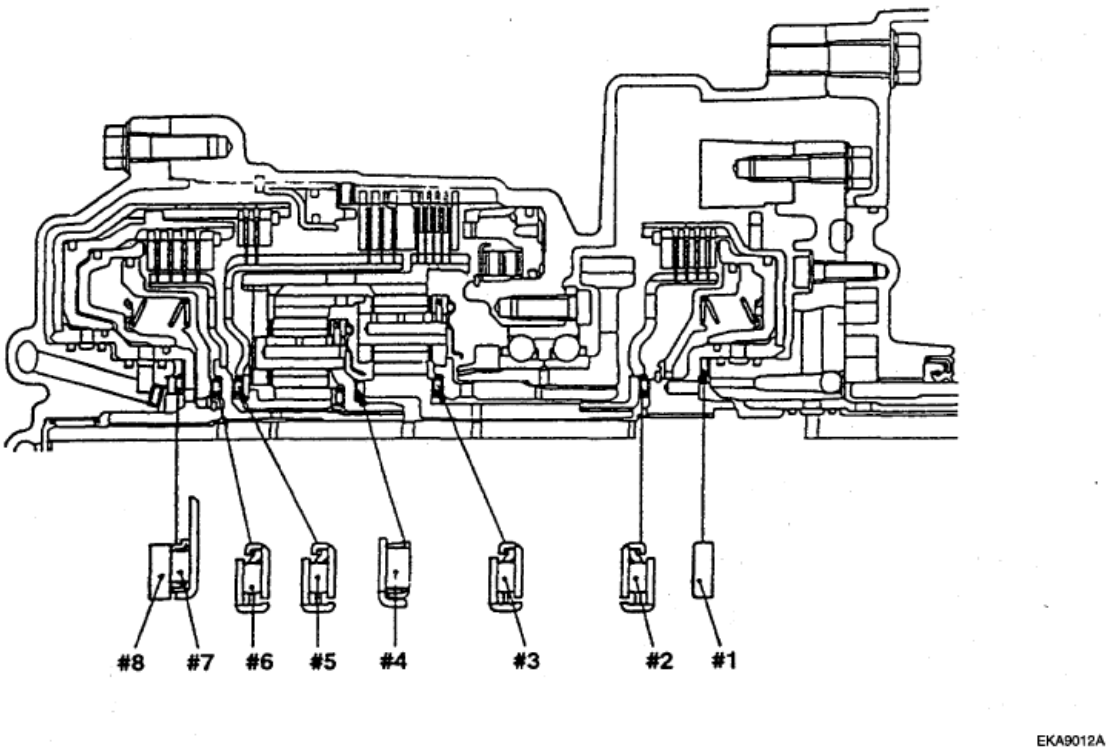


Fig. 130: Identifying Thrust Washer
Courtesy of KIA MOTORS AMERICA, INC.

End play : 0.7L ~ 1.25L mm

Thickness of thrust washer = (distance between surface of OD clutch contacting the thrust washer and surface of transmission case contacting oil pump) - (distance between center end of oil pump and surface of oil pump contacting transmission case) while pressing each component forward.

THRUST WASHER THICKNESS

Part number	Thickness mm(in)
45456-23160	1.6 (0.063)
45544-23180	1.8 (0.071)
45544-23200	2.0 (0.079)
45544-23220	2.2 (0.087)
45544-23240	2.4 (0.094)
45544-23260	2.6 (0.102)
45544-23280	2.8 (0.110)

55. Install the oil pump assembly by installing the bolts (7ea).

Tightening torque :

20~27 Nm (2.0~2.7 kgf.m, 14.5~19.5 lb-ft)

NOTE: Be sure that the two oil seals and O-ring are on the oil pump assembly.

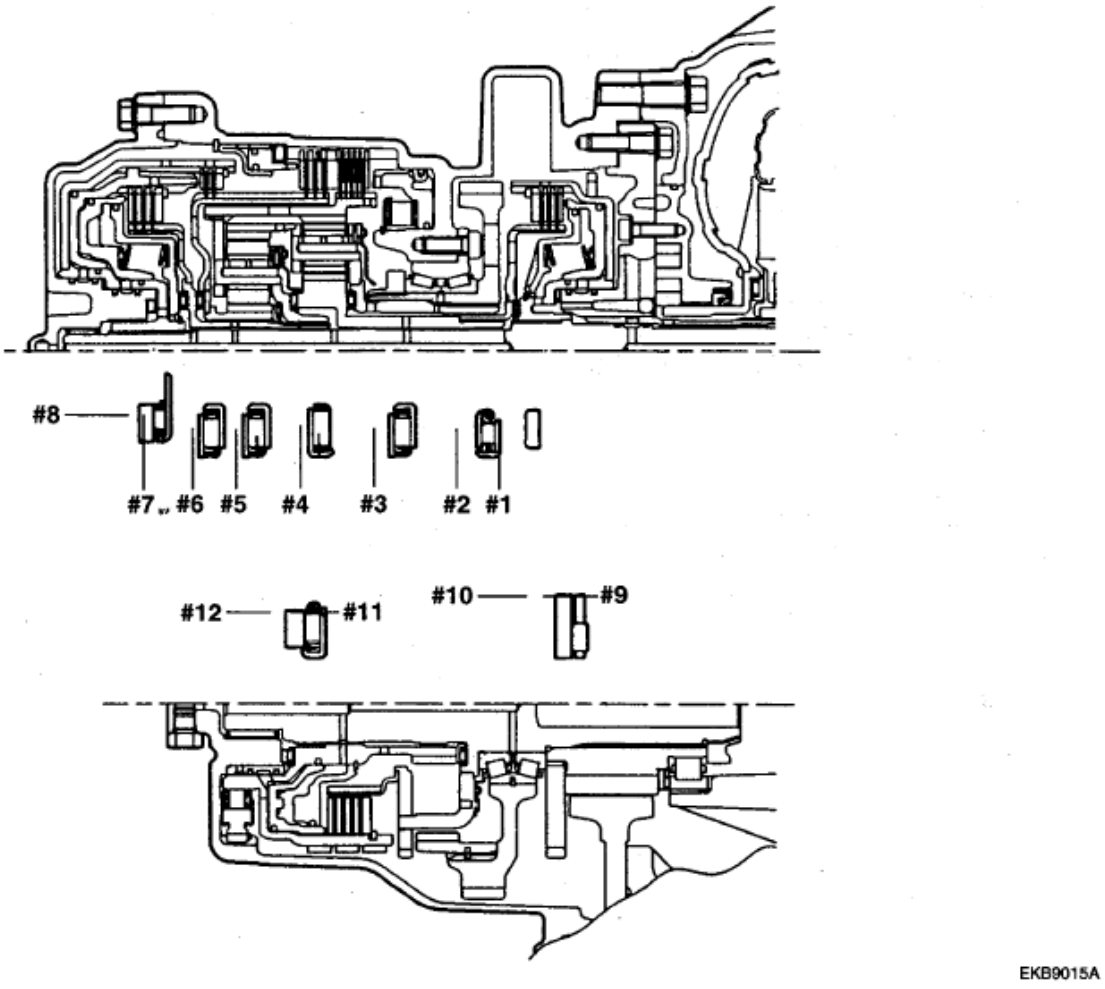


Fig. 131: Identifying Oil Pump Assembly And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

56. Install the differential assembly.

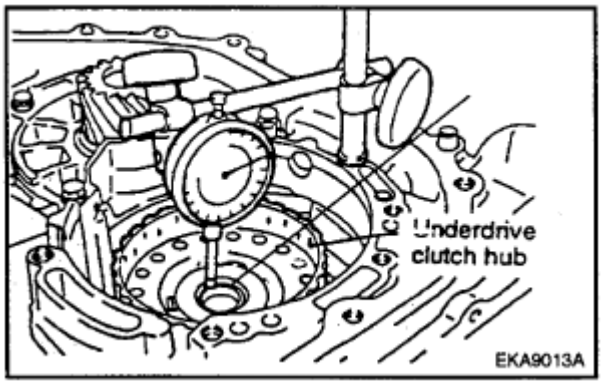


Fig. 132: Identifying Differential Assembly
Courtesy of KIA MOTORS AMERICA, INC.

57. Install the oil seal to the torque converter housing by using the SST (09453-1M400).

NOTE: Check if the oil seal is blue. lubricate with A/T oil.

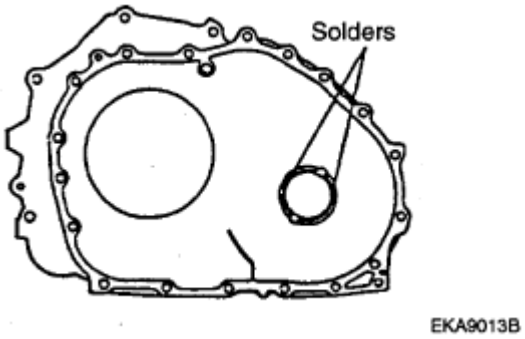


Fig. 133: Identifying Oil Seal On Torque Converter Housing By Using SST (09453-1M400)
Courtesy of KIA MOTORS AMERICA, INC.

58. Install the outer race for diffrential bearing to the torque converter housing by using the SST (09453-1M300).

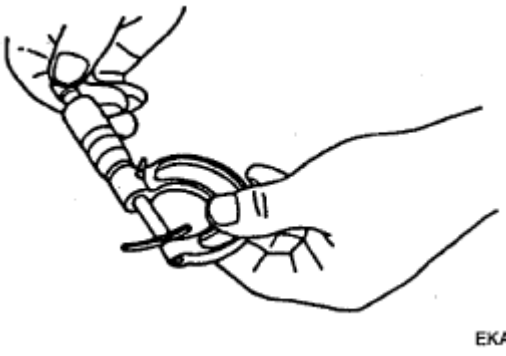


Fig. 134: Identifying Outer Race Of Diffrential Bearing

Courtesy of KIA MOTORS AMERICA, INC.

59. Install the oil separater by installing the bolts (3ea).

Tightening torque :

9~12 Nm (0.9~1.2 kgf.m, 6.5~8.7 lb-ft)

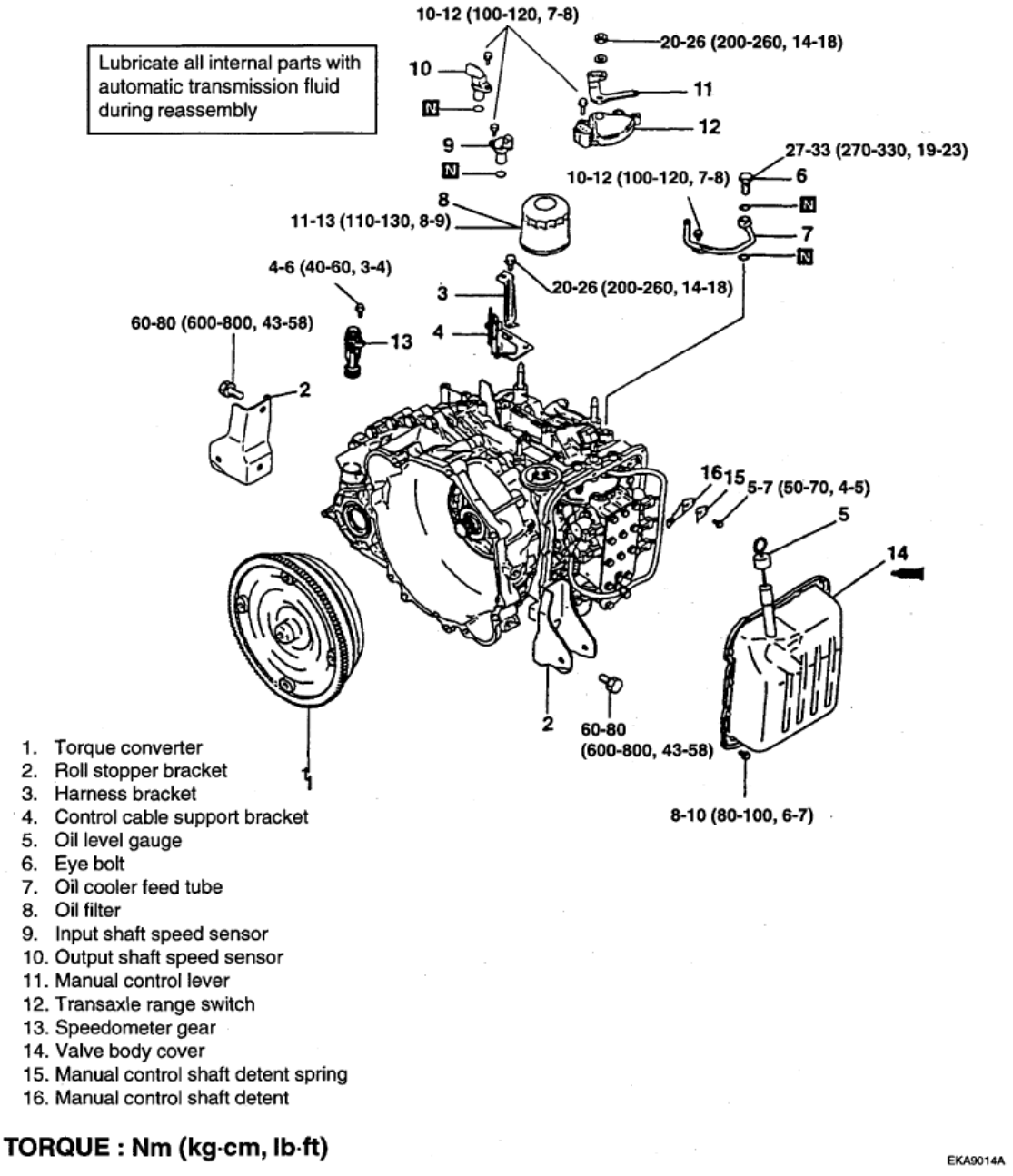


Fig. 135: Identifying Oil Separater And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

60. Apply liquid gasket with 1.6mm thickness on surface of the torque converter housing.

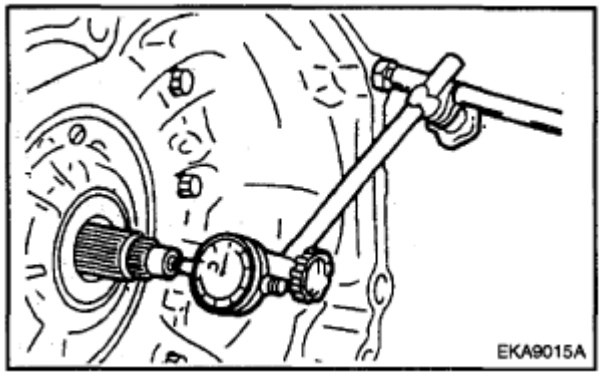


Fig. 136: Applying Liquid Gasket With 1.6mm Thickness On Surface Of Torque Converter Housing
Courtesy of KIA MOTORS AMERICA, INC.

61. After installing the bolts (18ea), Install the torque converter housing to the transmission case.

Tightening torque :

43~55 Nm (4.3~5.5 kgf.m, 31.1~39.8 lb-ft)

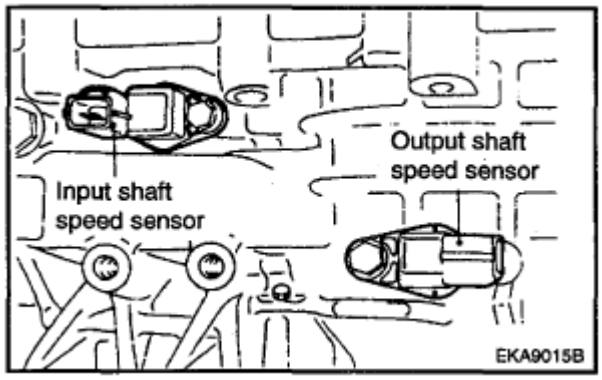


Fig. 137: Identifying Torque Converter Housing To Transmission Case Bolts (1 Of 3)
Courtesy of KIA MOTORS AMERICA, INC.

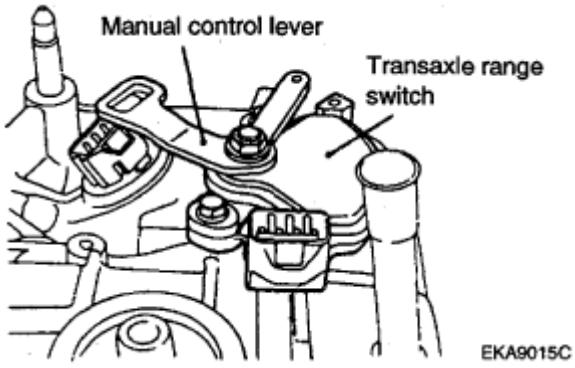


Fig. 138: Identifying Torque Converter Housing To Transmission Case Bolts (2 Of 3)
Courtesy of KIA MOTORS AMERICA, INC.

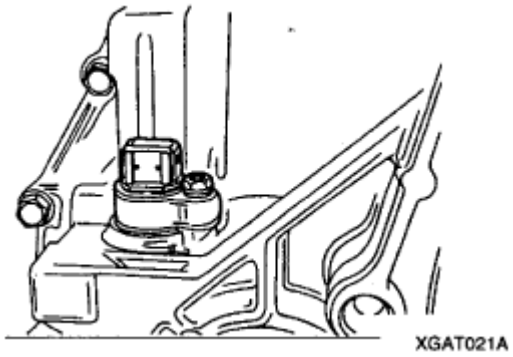


Fig. 139: Identifying Torque Converter Housing To Transmission Case Bolts (3 Of 3)
Courtesy of KIA MOTORS AMERICA, INC.

62. Install each spring and accumulator piston.

Accumulator spring identification

ACCUMULATOR SPRING IDENTIFICATION

NO.	Use	I.D. Color	Spring number
A	Rev clutch	Pink	2
B	2nd brake	Pink/Pink	1
C	O/D clutch	Pink	2
D	U/D clutch	Green/Green	1

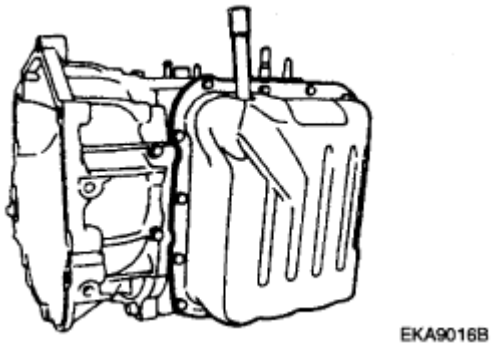


Fig. 140: Locating Spring And Accumulator Piston
Courtesy of KIA MOTORS AMERICA, INC.

63. After installing the clip (B), Install the control valve connector (A).

Fig. 141: Locating Clip And Control Valve Connector
Courtesy of KIA MOTORS AMERICA, INC.

64. Install the valve body by installing the bolts (20ea).

Tightening torque :

10~12 Nm (1.0~1.2 kgf.m, 7.2~8.7 lb-ft)

NOTE: 6x30mm (A): 16EA, 6x35mm (B): 1EA, 6x40mm (C): 1EA, 6X55mm (D):1EA, 6x60mm (E): 1EA

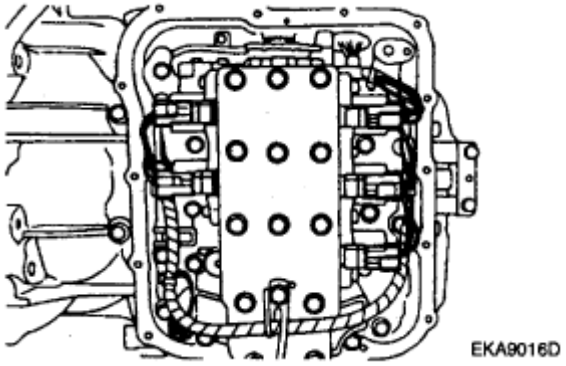


Fig. 142: Identifying Valve Body And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

65. Install the oil filter by installing the bolts (3ea).

Tightening torque :

10~12 Nm (1.0~1.2 kgf.m, 7.2~8.7 lb-ft)

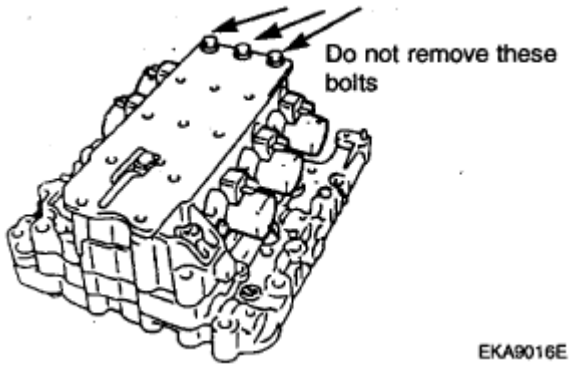


Fig. 143: Identifying Oil Filter And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

66. diskonnect the main harness connector.

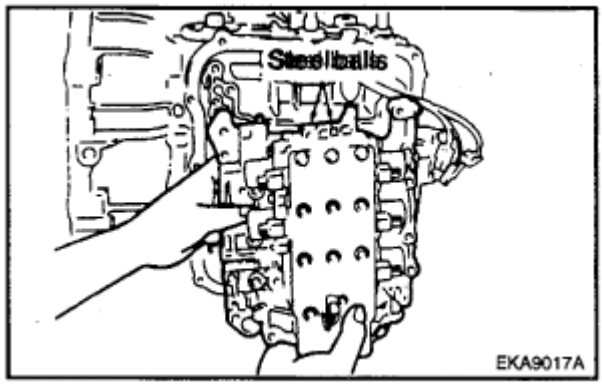


Fig. 144: Identifying Main Harness Connector
Courtesy of KIA MOTORS AMERICA, INC.

67. Install the manual lever by installing the nut.

Tightening torque :

9~12 Nm (0.9~1.2 kgf.m, 6.5~8.7 lb-ft)

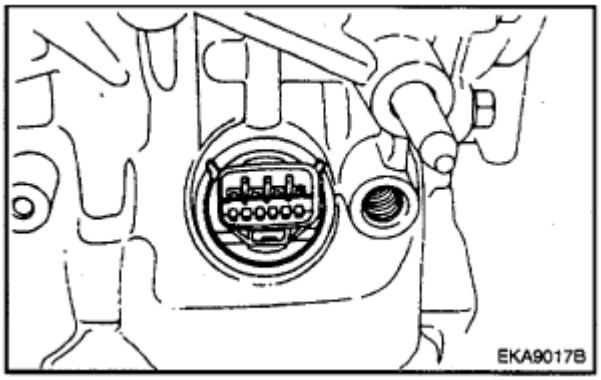


Fig. 145: Identifying Manual Lever And Nut
Courtesy of KIA MOTORS AMERICA, INC.

68. Apply liquid gasket with 2.5mm thickness on surface of the oil pan.

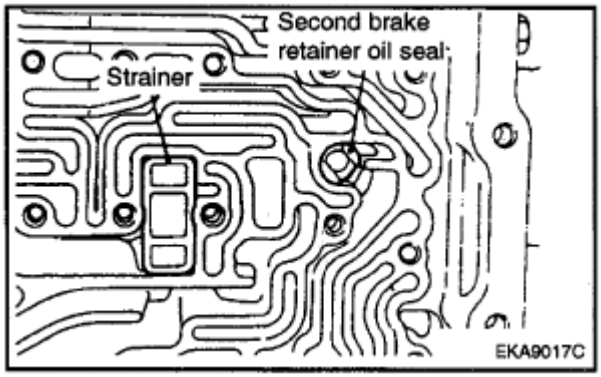


Fig. 146: Applying Liquid Gasket With 2.5mm Thickness On Surface Of Oil Pan
Courtesy of KIA MOTORS AMERICA, INC.

69. Install the oil pan by installing the bolts (19ea).

Tightening torque :

10~12 Nm (1.0~1.2 kgf.m, 7.2~8.7 lb-ft)

NOTE: Check if there are the three magnets on the oil pan.

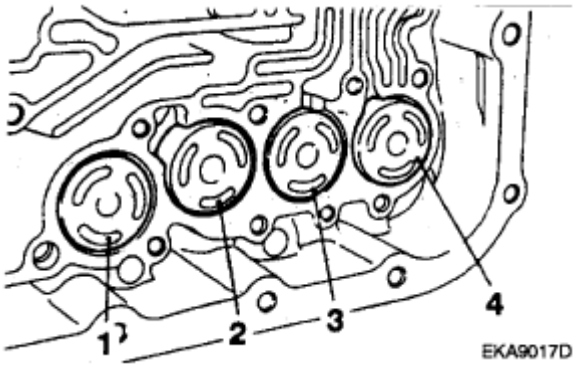


Fig. 147: Identifying Oil Pan And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

70. Install the output speed senor by installing the bolt.

    Tightening torque :

    6~8 Nm (0.6~0.8 kgf.m, 4.3~5.8 lb-ft)

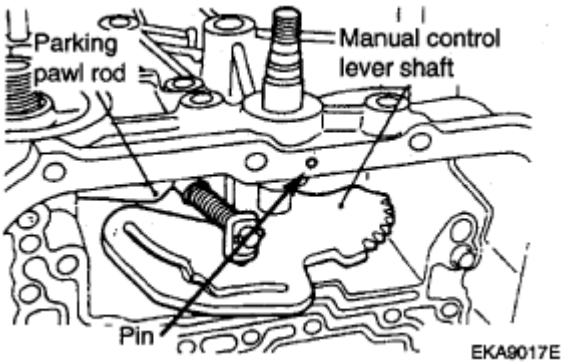


Fig. 148: Identifying Output Speed Senor And Bolt
Courtesy of KIA MOTORS AMERICA, INC.

71. Install the input speed senor by installing the bolt.

    Tightening torque :

    6~8 Nm (0.6~0.8 kgf.m, 4.3~5.8 lb-ft)

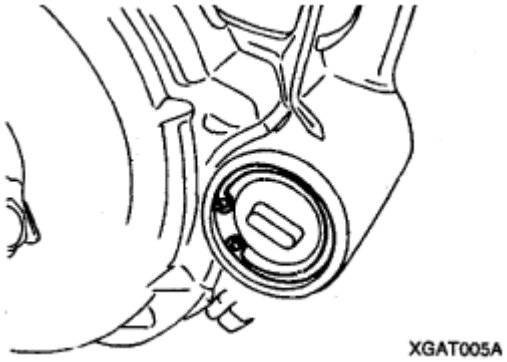


Fig. 149: Identifying Input Speed Senor And Bolt
Courtesy of KIA MOTORS AMERICA, INC.

72. Install the inhibiter switch assembly by installing the bolts (2ea).

    Tightening torque :

    10~12 Nm (1.0~1.2 kgf.m, 7.2~8.7 lb-ft)

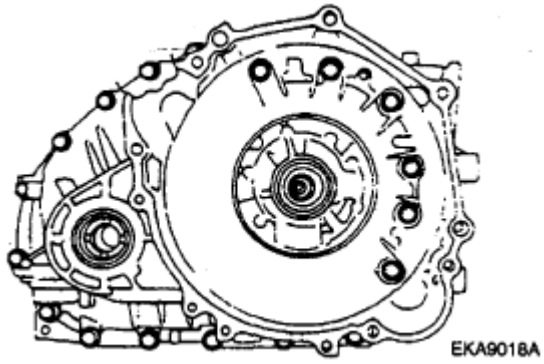


Fig. 150: Identifying Inhibiter Switch Assembly And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

73. Install the manual control lever by installing the nut with a new washer.

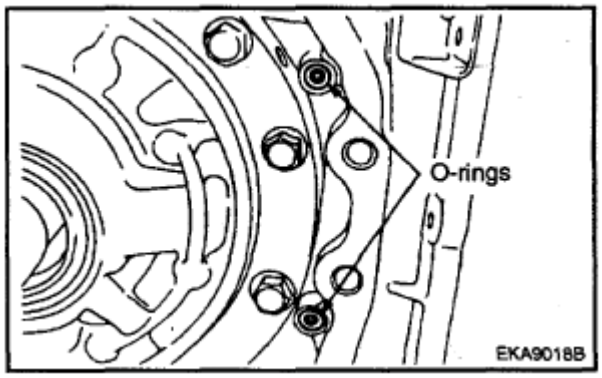


Fig. 151: Identifying Manual Control Lever, Nut And Washer
Courtesy of KIA MOTORS AMERICA, INC.

74. After inserting the oil gauge guide, install the bracket bolt.

Tightening torque :

19~23 Nm (1.9~2.3 kgf.m, 13.7~16.6 lb-ft)

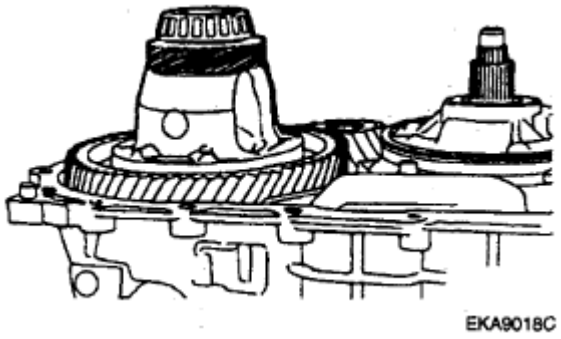


Fig. 152: Identifying Inserting Oil Gauge Guide And Bracket Bolt
Courtesy of KIA MOTORS AMERICA, INC.

75. Install the oil cooler tube assembly by installing the bolts (A) with washers and the bracket bolt (B).

Tightening torque:

[A] 28~34 Nm (2.8~3.4 kgf.m)

[B] 19~23 Nm (1.9~2.3 kgf.m, 13.7~16.6 lb-ft)

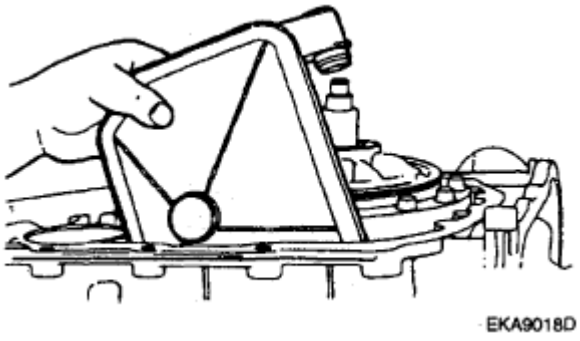


Fig. 153: Locating Oil Cooler Tube Assembly, Bolts, Washers And Bracket Bolt
Courtesy of KIA MOTORS AMERICA, INC.

VALVE BODY SYSTEM

VALVE BODY

Components and Components Location

Components (1)

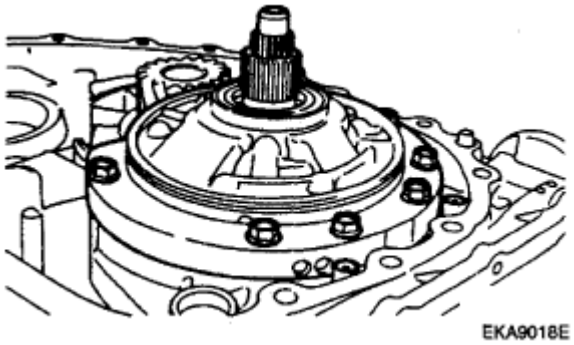


Fig. 154: Exploded View Of Valve Body Components (1 Of 2)
Courtesy of KIA MOTORS AMERICA, INC.

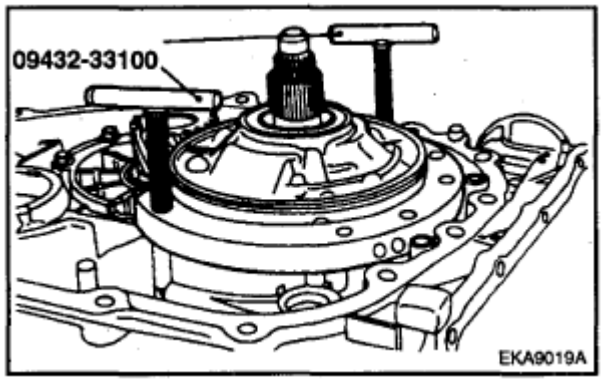


Fig. 155: Exploded View Of Valve Body Components (2 Of 2)
Courtesy of KIA MOTORS AMERICA, INC.

Repair procedures

Disassembly

1. Disconnect the wire from the VF solenoid valve.

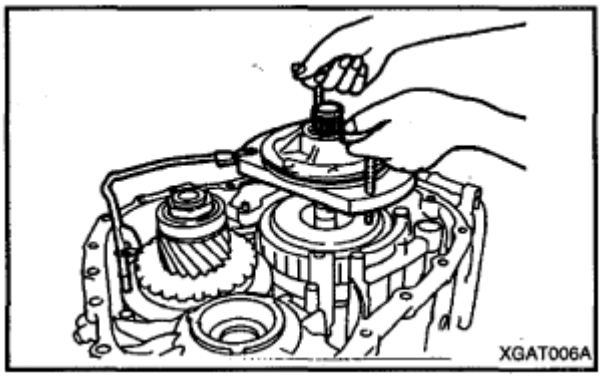


Fig. 156: Disconnecting Wire From VF Solenoid Valve
Courtesy of KIA MOTORS AMERICA, INC.

2. Pull out the connector from the bracket.

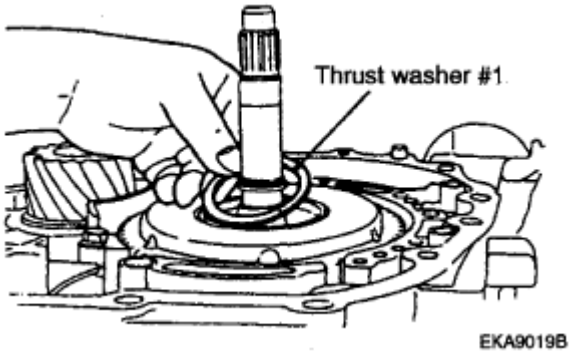


Fig. 157: Pulling Out Connector From Bracket
Courtesy of KIA MOTORS AMERICA, INC.

3. Disconnect the wire from the PWM solenoid valve.

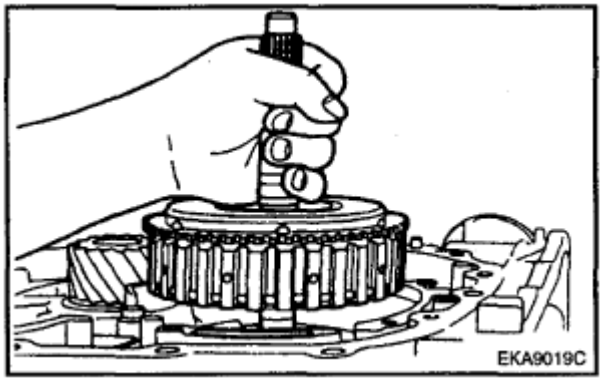


Fig. 158: Disconnecting Wire From PWM Solenoid Valve
Courtesy of KIA MOTORS AMERICA, INC.

4. Disconnect the wire from the PWM solenoid valve assembly.

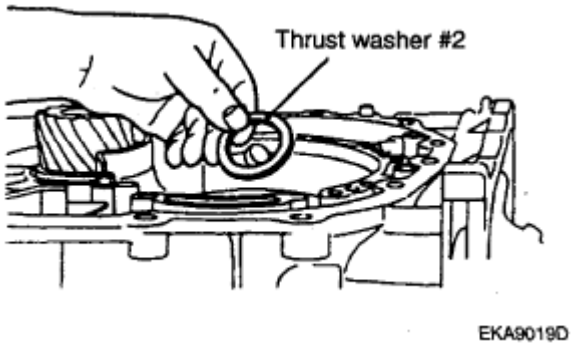


Fig. 159: Disconnecting Wire From PWM Solenoid Valve Assembly
Courtesy of KIA MOTORS AMERICA, INC.

5. Remove the bolts (7ea) related to the PWM solenoid valve assembly.

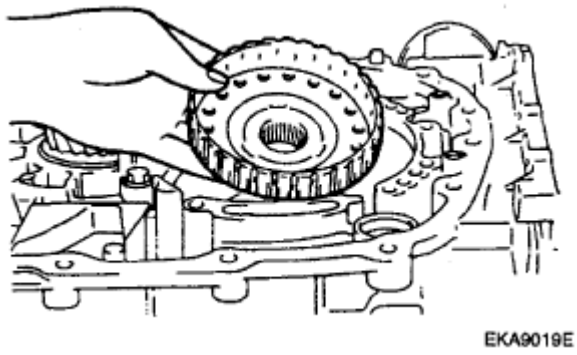


Fig. 160: Identifying Bolts And PWM Solenoid Valve Assembly
Courtesy of KIA MOTORS AMERICA, INC.

6. Remove the PWM solenoid valve assembly and separating plate from the valve body.

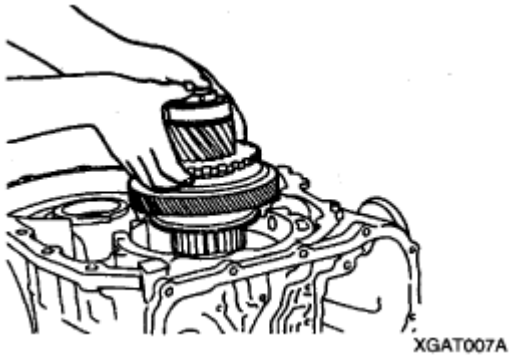


Fig. 161: Identifying PWM Solenoid Valve Assembly, Separating Plate And Valve Body
Courtesy of KIA MOTORS AMERICA, INC.

7. Remove the bolts (17ea).

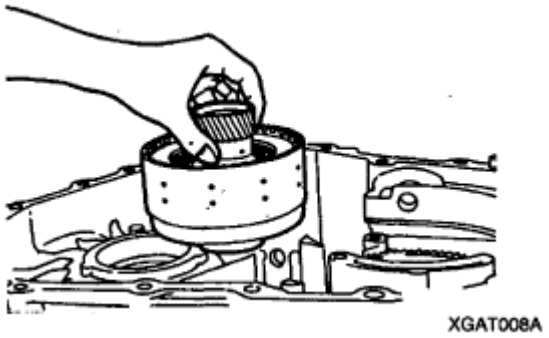


Fig. 162: Identifying Bolts
Courtesy of KIA MOTORS AMERICA, INC.

8. Remove the bracket and the VF solenoid valve from the upper valve body.

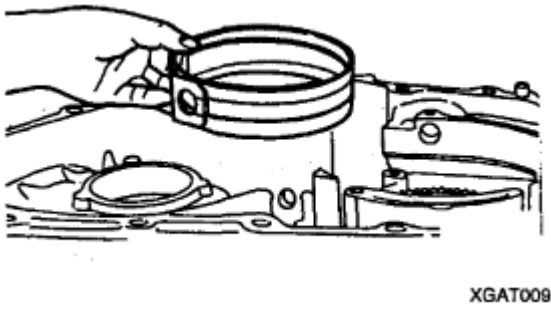


Fig. 163: Identifying Bracket, VF Solenoid Valve And Upper Valve Body
Courtesy of KIA MOTORS AMERICA, INC.

9. Remove the upper valve body and separating plate from the intermediate plate.
10. Remove the oil strainer, steel ball, and coil spring from the intermediate plate.

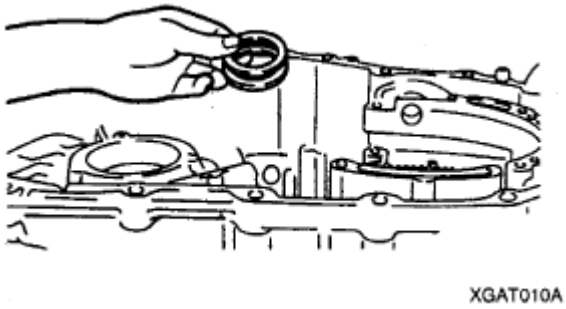


Fig. 164: Identifying Oil Strainer, Steel Ball, Coil Spring And Intermediate Plate
Courtesy of KIA MOTORS AMERICA, INC.

11. Remove the intermediate plate from the lower valve body.
12. Remove the lower separating plate from the lower valve body.

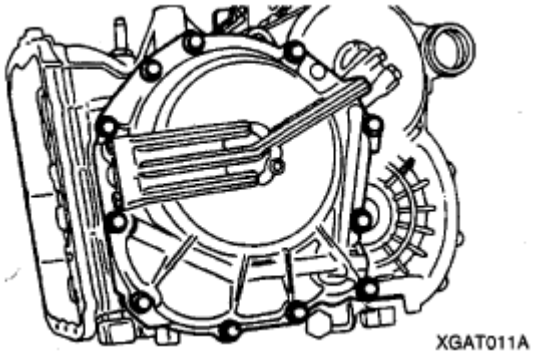


Fig. 165: Identifying Lower Separating Plate And Lower Valve Body
Courtesy of KIA MOTORS AMERICA, INC.

13. Remove the steel balls and coil springs from the lower valve body.

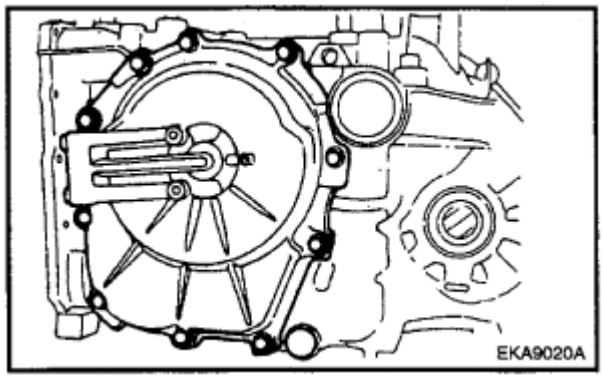


Fig. 166: Identifying Steel Balls, Coil Springs And Lower Valve Body
Courtesy of KIA MOTORS AMERICA, INC.

14. Remove the PWM solenoid valve by removing a hexagon bolt.

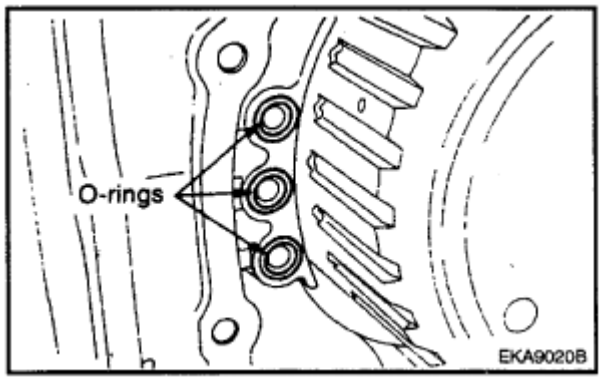


Fig. 167: Identifying PWM Solenoid Valve And Hexagon Bolt
Courtesy of KIA MOTORS AMERICA, INC.

15. Remove each Roller, DCC Sleeve, DCC Valve, Valve, and coil spring.

NOTE: There are the damper clutch control valve and PCV-A from the top.

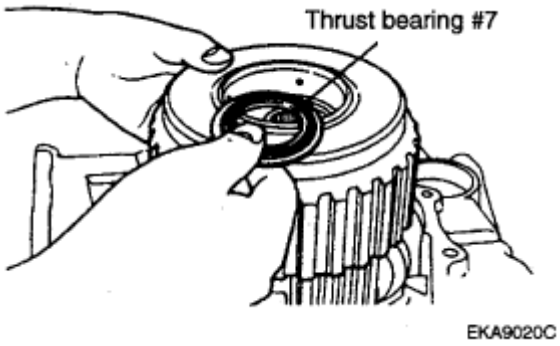


Fig. 168: Identifying Roller, DCC Sleeve, DCC Valve, Valve, And Coil Spring
Courtesy of KIA MOTORS AMERICA, INC.

16. Remove each stopper pin, stopper plug, control valve, and coil spring.

NOTE: There are the PCV-C, PCV-B, PCV-E, and fail safe valve-C from the top.

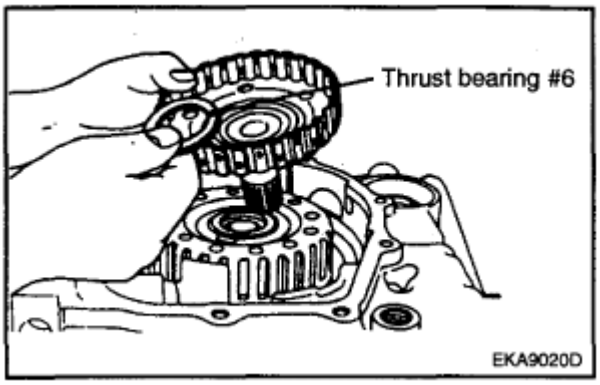


Fig. 169: Identifying Stopper Pin, Stopper Plug, Control Valve, And Coil Spring
Courtesy of KIA MOTORS AMERICA, INC.

17. Remove the upper separating plate from the upper valve body.

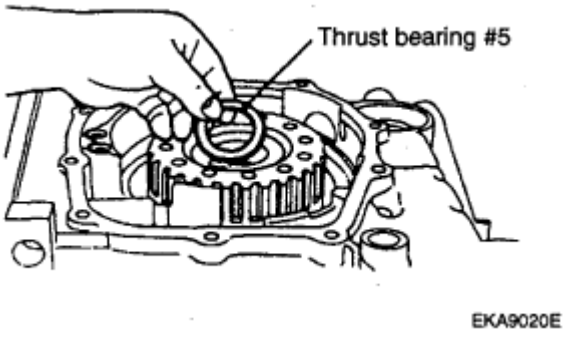


Fig. 170: Identifying Upper Separating Plate And Upper Valve Body
Courtesy of KIA MOTORS AMERICA, INC.

18. Remove the damping valve and coil spring.

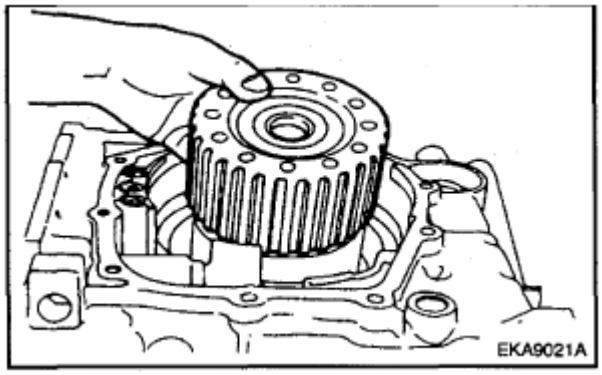


Fig. 171: Identifying Damping Valve And Coil Spring
Courtesy of KIA MOTORS AMERICA, INC.

19. Remove each stopper pin, stopper plug, control valve, and coil spring.

NOTE: There are the manual valve, PCV-D, DIR&LR switch valve, and T/C control valve from the top.

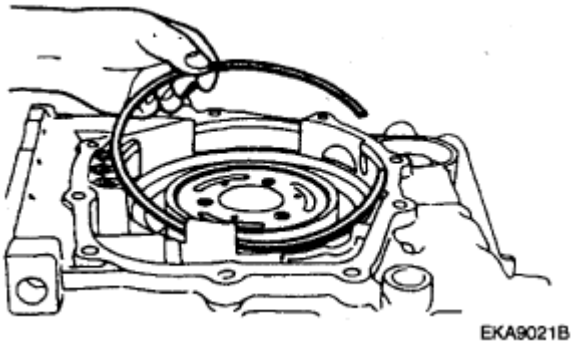


Fig. 172: Identifying Stopper Pin, Stopper Plug, Control Valve, And Coil Spring
Courtesy of KIA MOTORS AMERICA, INC.

20. Remove each stopper pin, stopper plug, control valve, and coil spring.

NOTE: There are the N-R control valve, reducing valve, regulator valve, fail safe valve-B, and fail safe valve-A from the top.

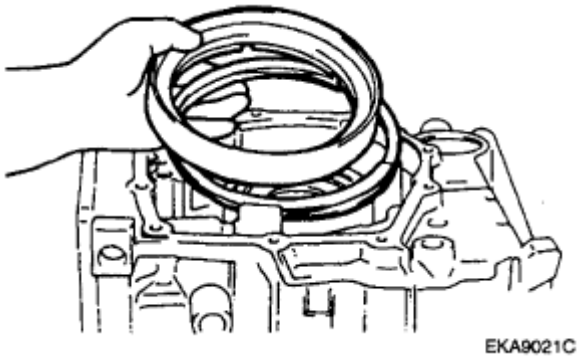


Fig. 173: Identifying Stopper Pin, Stopper Plug, Control Valve, And Coil Spring
Courtesy of KIA MOTORS AMERICA, INC.

21. Remove the bracket from the solenoid valve assembly by removing the bolts (4ea).

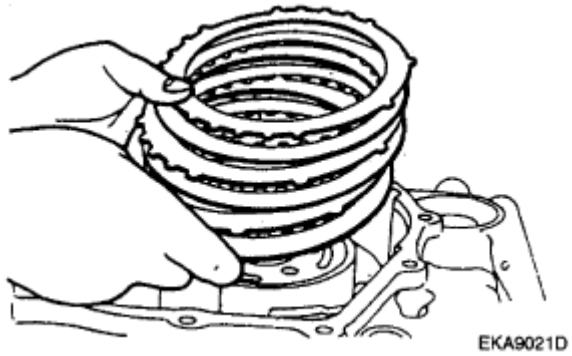


Fig. 174: Identifying Bracket, Solenoid Valve Assembly And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

22. Remove the solenoid valves from the block.

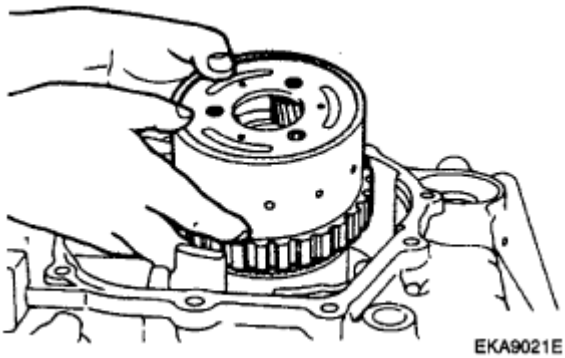


Fig. 175: Identifying Solenoid Valves And Block
Courtesy of KIA MOTORS AMERICA, INC.

Reassembly

1. Install the solenoid valves to the block.

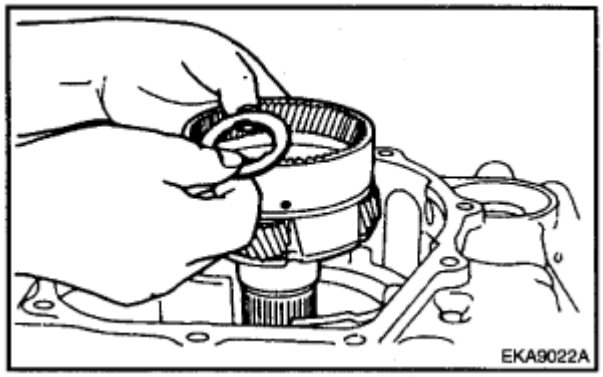


Fig. 176: Identifying Solenoid Valves And Block
Courtesy of KIA MOTORS AMERICA, INC.

2. Install the bracket to the solenoid valve assembly by tightening the bolts (4ea).

   Tightening torque :

   10~12 Nm (1.0~1.2 kgf.m, 7.2~8.7 lb-ft)

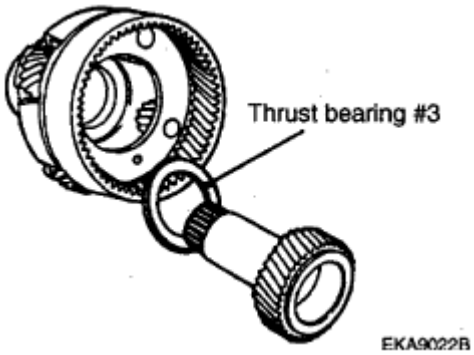


Fig. 177: Identifying Bracket, Solenoid Valve Assembly And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

3. Install each stopper pin, stopper plug, control valve, and coil spring.

   NOTE: There are the N-R control valve, reducing valve, regulator valve, fail safe valve-B, and fail safe valve-A to the top.

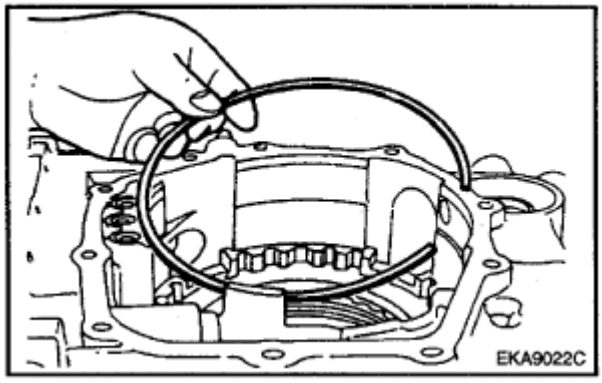


Fig. 178: Identifying Stopper Pin, Stopper Plug, Control Valve, And Coil Spring
Courtesy of KIA MOTORS AMERICA, INC.

4. Install each stopper pin, stopper plug, control valve, and coil spring.

NOTE: There are the manual valve, PCV-D, DIR&LR switch valve, and T/C control valve to the top.

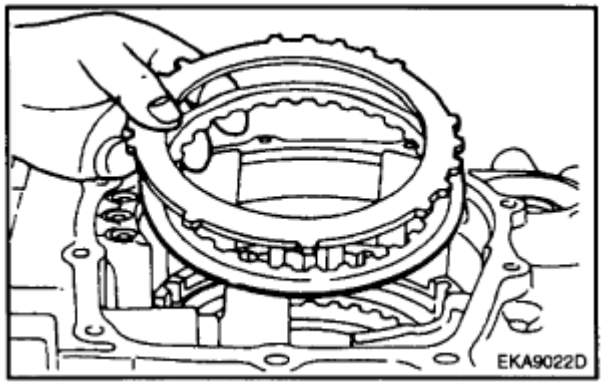


Fig. 179: Identifying Stopper Pin, Stopper Plug, Control Valve, And Coil Spring
Courtesy of KIA MOTORS AMERICA, INC.

5. Install the damping valve and coil spring.

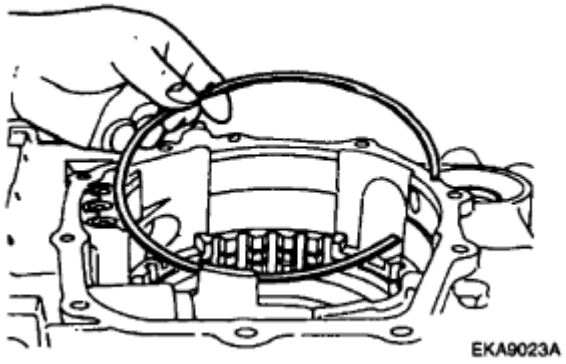


Fig. 180: Identifying Damping Valve And Coil Spring
Courtesy of KIA MOTORS AMERICA, INC.

6. Install the upper separating plate to the upper valve body.

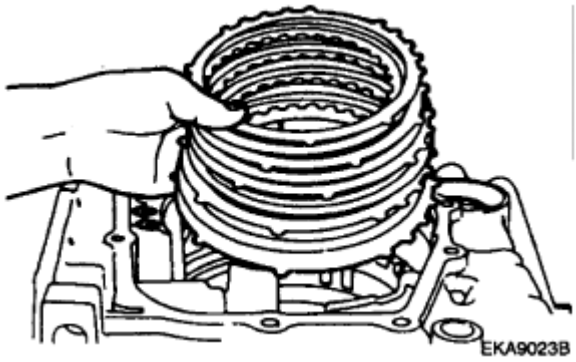


Fig. 181: Identifying Upper Separating Plate And Upper Valve Body
Courtesy of KIA MOTORS AMERICA, INC.

7. Install each stopper pin, stopper plug, control valve, and coil spring.

NOTE: There are the PCV-C, PCV-B, PCV-E, and fail safe valve-C to the top.

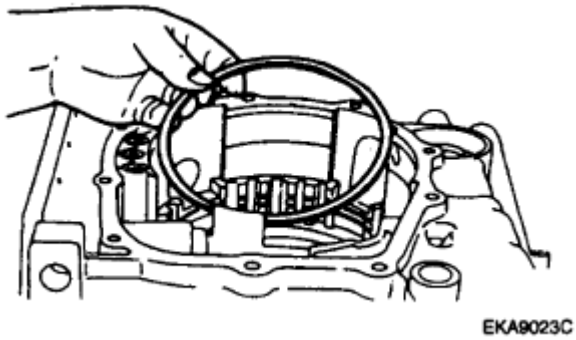


Fig. 182: Identifying Stopper Pin, Stopper Plug, Control Valve, And Coil Spring
Courtesy of KIA MOTORS AMERICA, INC.

8. Install each stopper pin, stopper plug, control valve, and coil spring.

NOTE: There are the damper clutch control valve and PCV-A to the top.

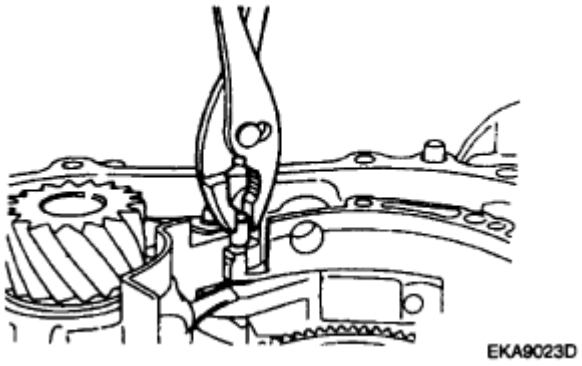


Fig. 183: Identifying Stopper Pin, Stopper Plug, Control Valve, And Coil Spring
Courtesy of KIA MOTORS AMERICA, INC.

9. Install the PWM solenoid valve by tightening a hexagon bolt.

   Tightening torque :

   10~12 Nm (1.0~1.2 kgf.m, 7.2~8.7 lb-ft)

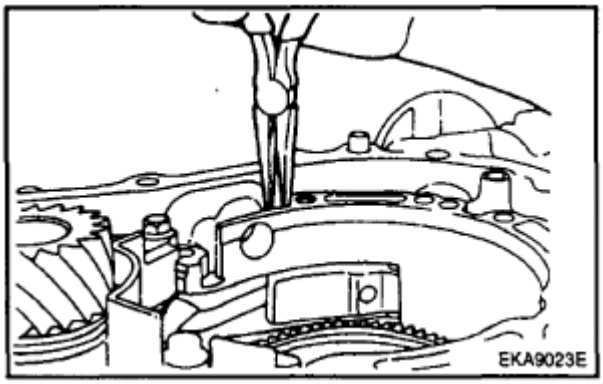


Fig. 184: Identifying PWM Solenoid Valve And Hexagon Bolt
Courtesy of KIA MOTORS AMERICA, INC.

10. Install the steel balls and coil springs to the lower valve body.

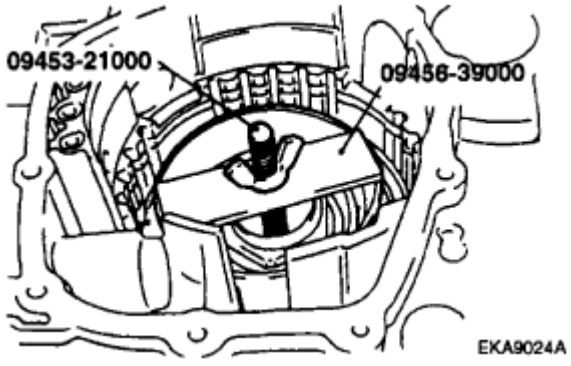


Fig. 185: Identifying Steel Balls, Coil Springs And Lower Valve Body
Courtesy of KIA MOTORS AMERICA, INC.

11. Install the lower separating plate to the lower valve body.

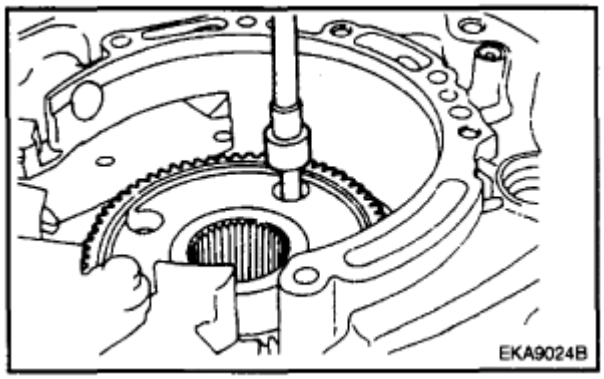


Fig. 186: Identifying Lower Separating Plate And Lower Valve Body
Courtesy of KIA MOTORS AMERICA, INC.

12. Install the intermediate plate to the lower valve body.
13. Install the oil strainer, steel ball, and coil spring to the intermediate plate.

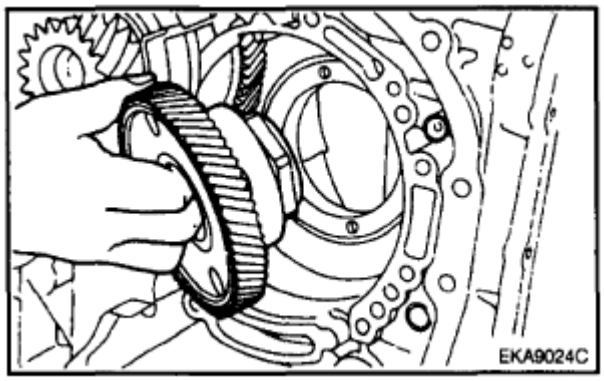


Fig. 187: Identifying Oil Strainer, Steel Ball, Coil Spring And Intermediate Plate
Courtesy of KIA MOTORS AMERICA, INC.

14. Install the upper valve body and separating plate to the intermediate plate.
15. Install the bracket and the VF solenoid valve to the upper valve body.

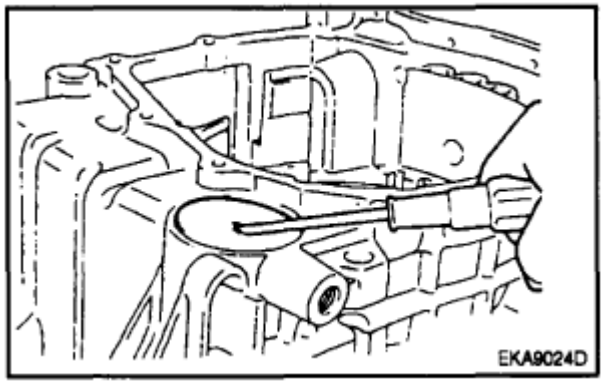


Fig. 188: Identifying Bracket, VF Solenoid Valve And Upper Valve Body
Courtesy of KIA MOTORS AMERICA, INC.

16. Install the bolts (17ea).

    Tightening torque :

    10~12 Nm (1.0~1.2 kgf.m, 7.2~8.7 lb-ft)

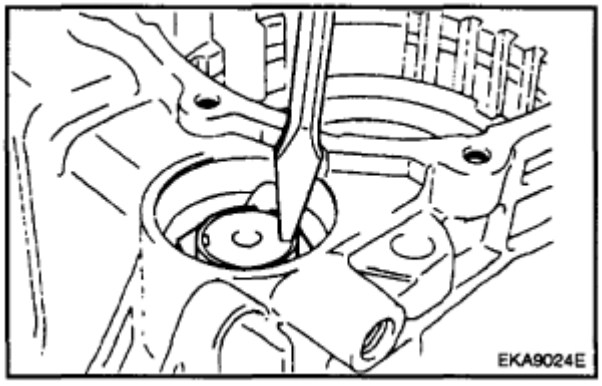


Fig. 189: Identifying Bolts
Courtesy of KIA MOTORS AMERICA, INC.

17. Install the PWM solenoid valve assembly and separating plate to the valve body.

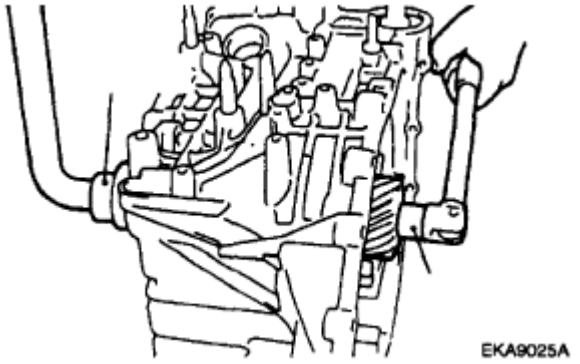


Fig. 190: Identifying PWM Solenoid Valve Assembly, Separating Plate And Valve Body
Courtesy of KIA MOTORS AMERICA, INC.

18. Install the bolts (7ea) related to the PWM solenoid valve assembly.

    Tightening torque :

    10~12 Nm (1.0~1.2 kgf.m, 7.2~8.7 lb-ft)

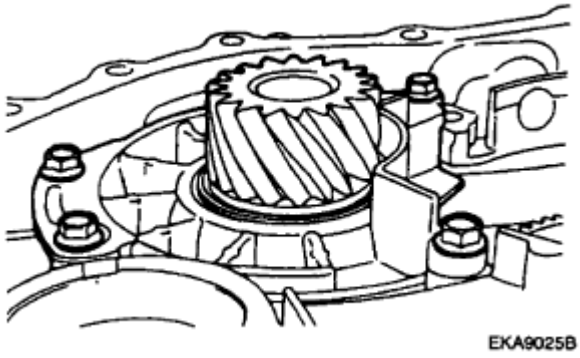


Fig. 191: Identifying Bolts And PWM Solenoid Valve Assembly
Courtesy of KIA MOTORS AMERICA, INC.

19. Connect the wire to the PWM solenoid valve assembly.

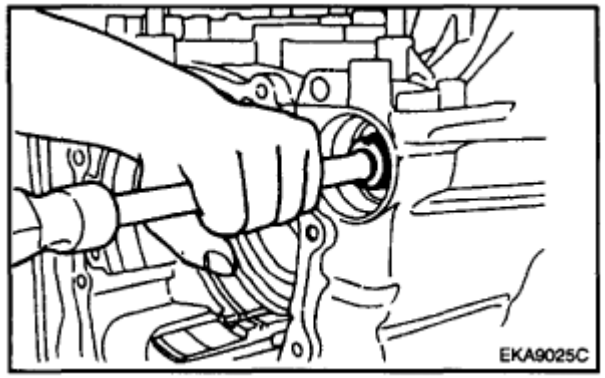


Fig. 192: Connecting Wire To PWM Solenoid Valve Assembly
Courtesy of KIA MOTORS AMERICA, INC.

20. Connect the wire to the PWM solenoid valve.

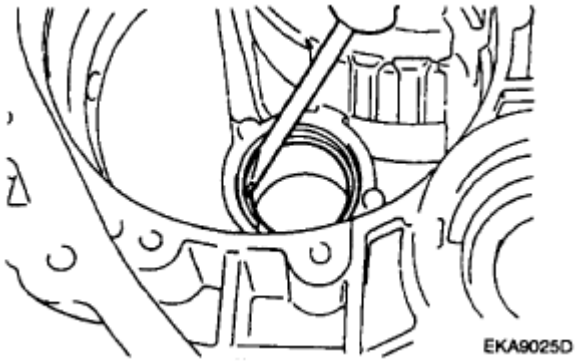


Fig. 193: Connecting Wire To PWM Solenoid Valve
Courtesy of KIA MOTORS AMERICA, INC.

21. Insert the connector to the bracket.

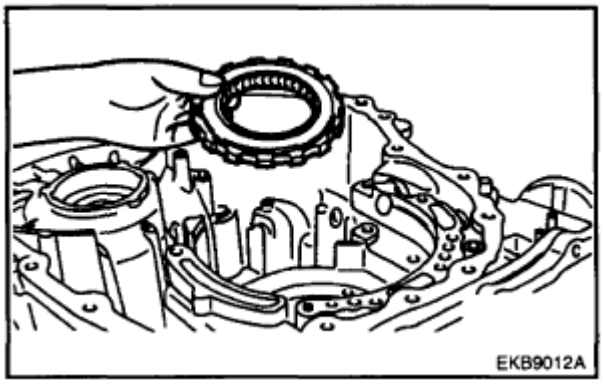


Fig. 194: Inserting Connector To Bracket
Courtesy of KIA MOTORS AMERICA, INC.

22. Connect the wire to the VF solenoid valve.

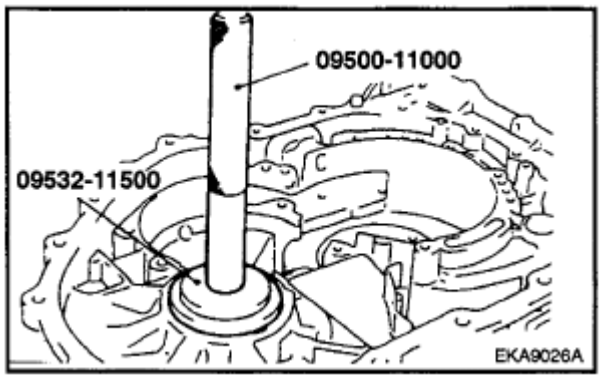


Fig. 195: Connecting Wire To VF Solenoid Valve
Courtesy of KIA MOTORS AMERICA, INC.

CLUTCH & BRAKE

UNDERDRIVE CLUTCH

Components and Components Location

Components

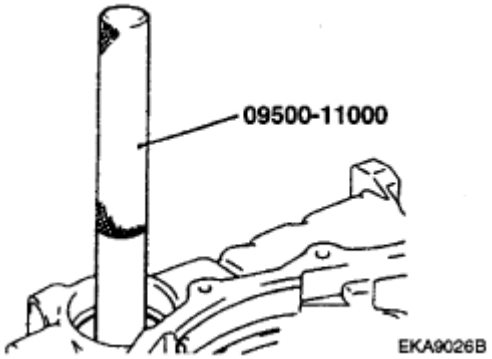


Fig. 196: Identifying Underdrive Clutch Components
Courtesy of KIA MOTORS AMERICA, INC.

Repair procedures

Disassembly

1. Take out the input shaft snap ring.

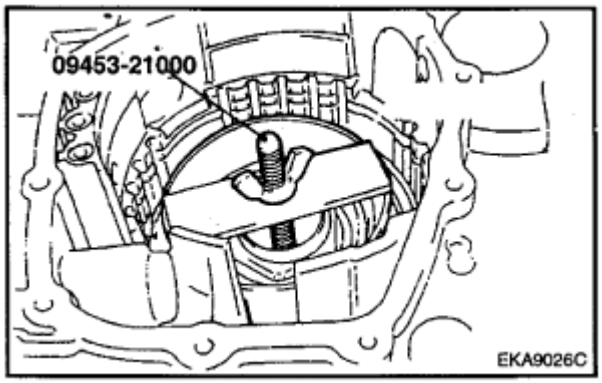


Fig. 197: Removing Input Shaft Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

2. After removing the input shaft, take two seal rings.

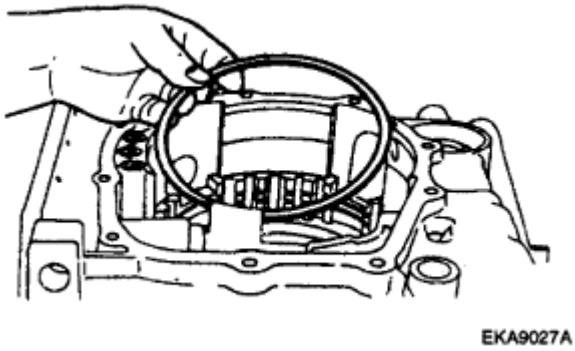


Fig. 198: Identifying Input Shaft And Seal Rings
Courtesy of KIA MOTORS AMERICA, INC.

3. Remove the snap ring.

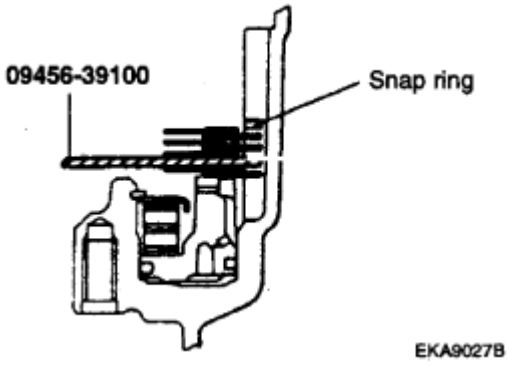


Fig. 199: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

4. Remove the underdrive clutch disc set.

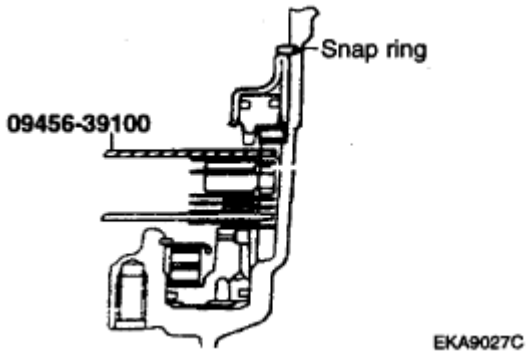


Fig. 200: Identifying Underdrive Clutch Disc Set
Courtesy of KIA MOTORS AMERICA, INC.

5. After pushing the underdrive clutch spring retainer by using the SST (09453-1M200), take the snap ring.

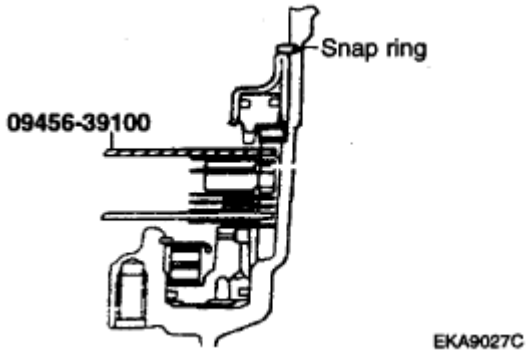


Fig. 201: Removing Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

6. Remove the underdrive clutch spring retainer with the D-ring.

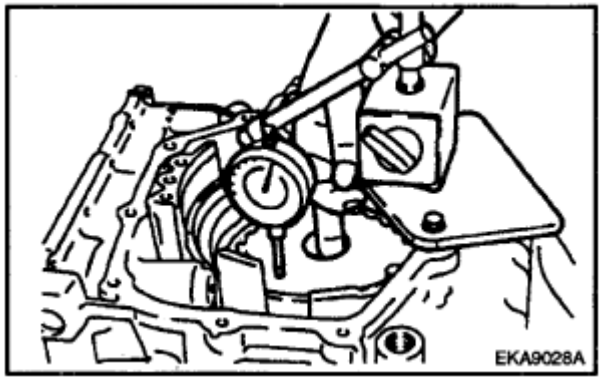


Fig. 202: Identifying Underdrive Clutch Spring Retainer And D-Ring
Courtesy of KIA MOTORS AMERICA, INC.

7. Remove the underdrive clutch return spring.

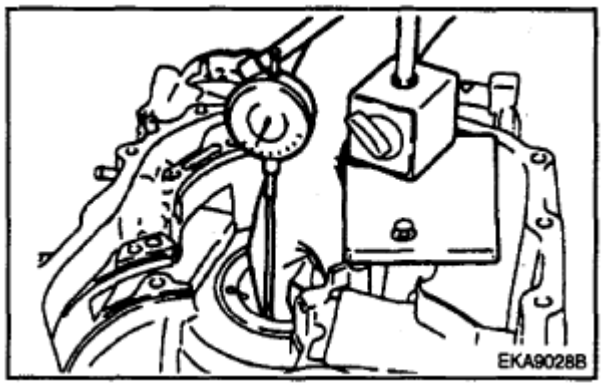


Fig. 203: Identifying Underdrive Clutch Return Spring
Courtesy of KIA MOTORS AMERICA, INC.

8. Remove the underdrive clutch piston by using compressed air.

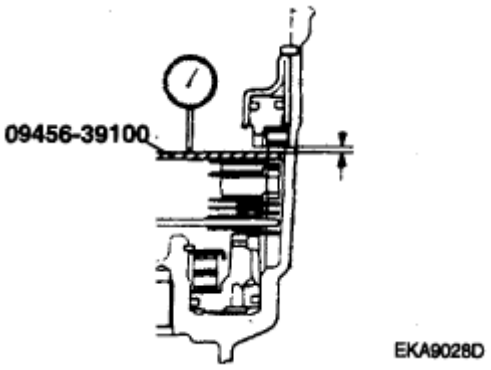


Fig. 204: Removing Underdrive Clutch Piston By Using Compressed Air
Courtesy of KIA MOTORS AMERICA, INC.

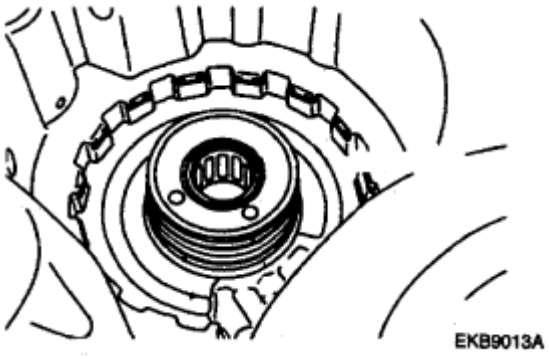


Fig. 205: Identifying Underdrive Clutch Piston
Courtesy of KIA MOTORS AMERICA, INC.

9. Remove the D-ring.

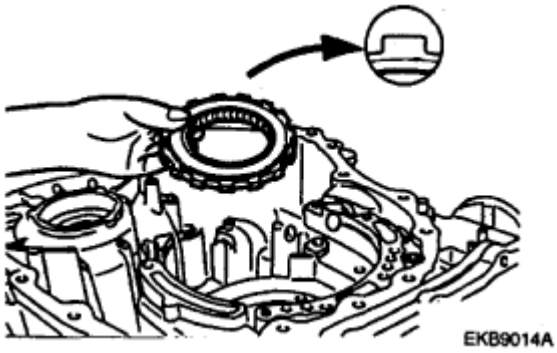


Fig. 206: Identifying D-Ring
Courtesy of KIA MOTORS AMERICA, INC.

Reassembly

1. Install the D-ring.

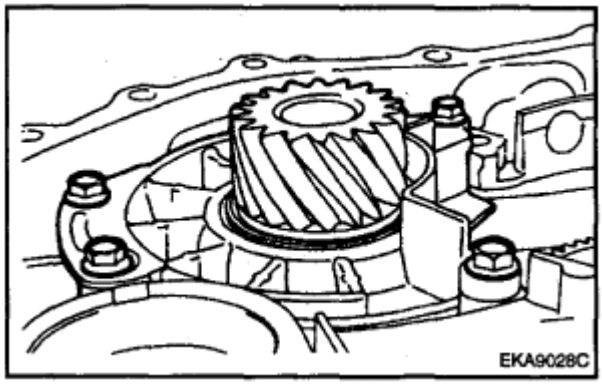


Fig. 207: Identifying D-Ring
Courtesy of KIA MOTORS AMERICA, INC.

2. Install the underdrive clutch piston.

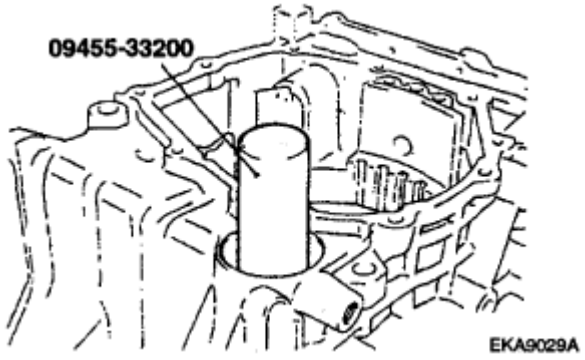


Fig. 208: Identifying Underdrive Clutch Piston
Courtesy of KIA MOTORS AMERICA, INC.

3. Install the clutch return spring.

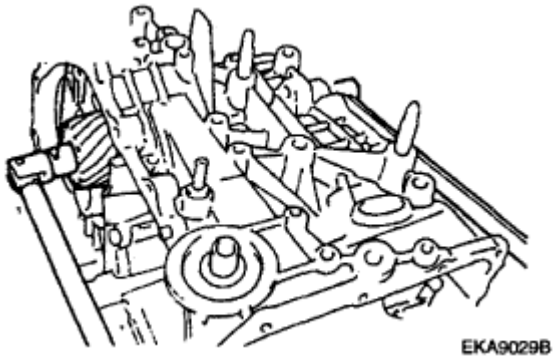


Fig. 209: Identifying Clutch Return Spring
Courtesy of KIA MOTORS AMERICA, INC.

4. Install the clutch spring retainer with the D-ring.

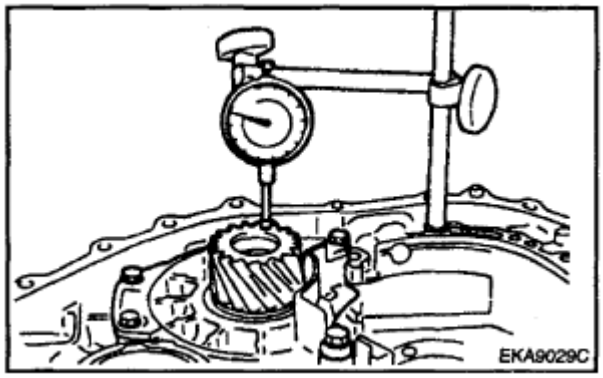


Fig. 210: Identifying Clutch Spring Retainer With D-Ring
Courtesy of KIA MOTORS AMERICA, INC.

5. After pushing the underdrive clutch spring retainer by using the SST (09453-1M200), fix the snap ring.

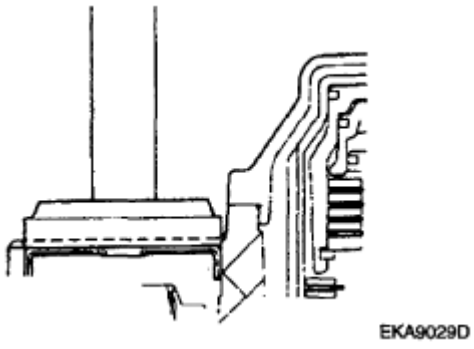


Fig. 211: Installing Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

6. Align the teeth (A) of the clutch plate, clutch disc and clutch reaction plate with the hole (B) of the underdrive clutch as shown below.

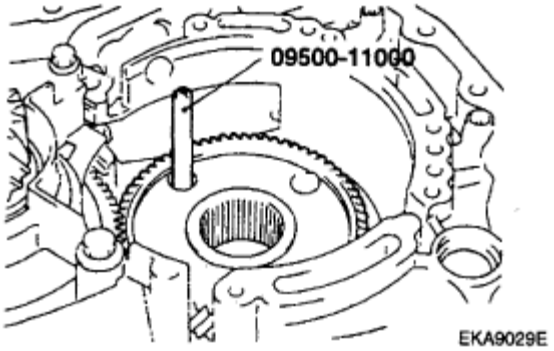


Fig. 212: Aligning Teeth Of Clutch Plate, Clutch Disc And Clutch Reaction Plate With Hole Of Underdrive Clutch
Courtesy of KIA MOTORS AMERICA, INC.

A. Dip the clutch discs (A) in ATF sufficiently before assembly.
B. Insert the clutch reaction plate (B) to the direction such as the picture below.

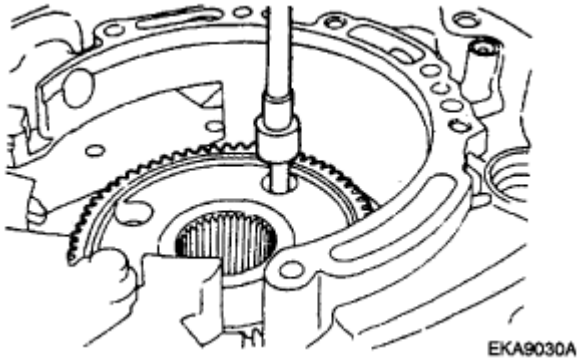


Fig. 213: Locating Clutch Discs And Clutch Reaction Plate
Courtesy of KIA MOTORS AMERICA, INC.

7. Install the snap ring.

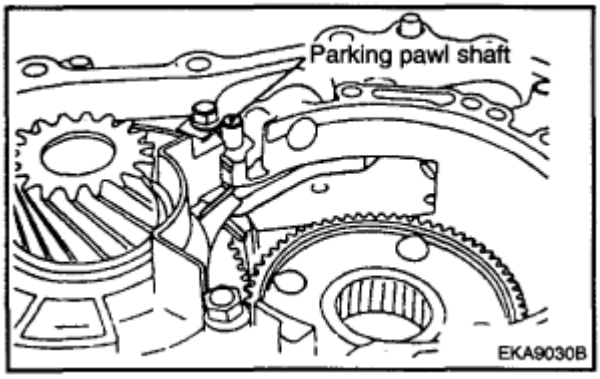


Fig. 214: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

8. Check the end play between the snap ring and the reaction plate with 1200±50N (120±5kgf, 337.2±11.2lbf) weight and 250±25kPa (2.5±0.25kgf/cm^2 , 35.56±3.56psi) air pressure applied.

   End Play: 1.2 ~ 1.4mm (0.0787~0.0866 in)

9. If the end play deviates from the standard value above, choose a proper snap ring from the table below.

SNAP RING THICKNESS

Part Number	Thickness mm(in)
45432-23160	1.6 (0.0630)
45432-23170	1.7 (0.0669)
45432-23180	1.8 (0.0709)
45432-23190	1.9 (0.0748)
45432-23200	2.0 (0.0787)
45432-23210	2.1 (0.0827)
45432-23220	2.2 (0.0866)
45432-23230	2.3 (0.0906)
45432-23240	2.4 (0.0945)
45432-23250	2.5 (0.0984)
45432-23260	2.6 (1.1024)
45432-23270	2.7 (0.0063)
45432-23280	2.8 (0.1102)
45432-23290	2.9 (0.1142)
45432-23300	3.0 (0.1181)

10. Install the two seal rings.

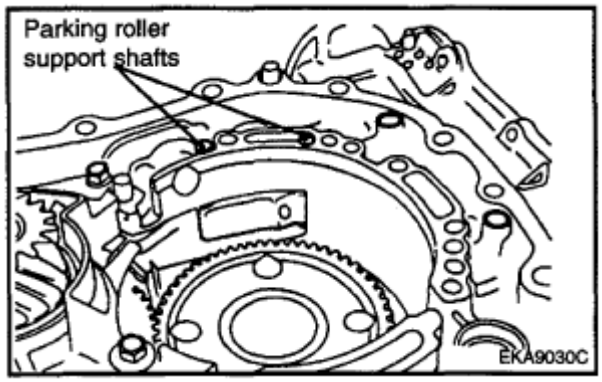


Fig. 215: Identifying Seal Rings
Courtesy of KIA MOTORS AMERICA, INC.

11. Make the input shaft pass through the underdrive clutch assembly and fix it with a snap ring.

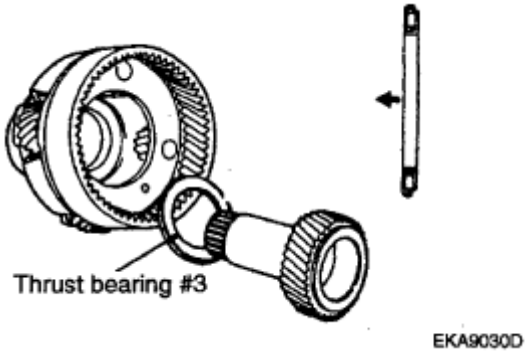


Fig. 216: Installing Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

DIRECT CLUTCH

Components and Components Location

Components

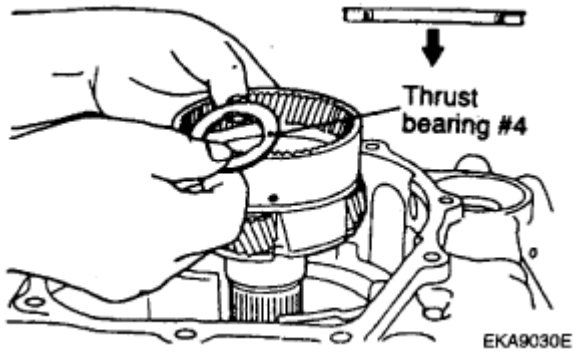


Fig. 217: Identifying Direct Clutch Components

Courtesy of KIA MOTORS AMERICA, INC.

Repair procedures

Disassembly

1. Remove the snap ring.

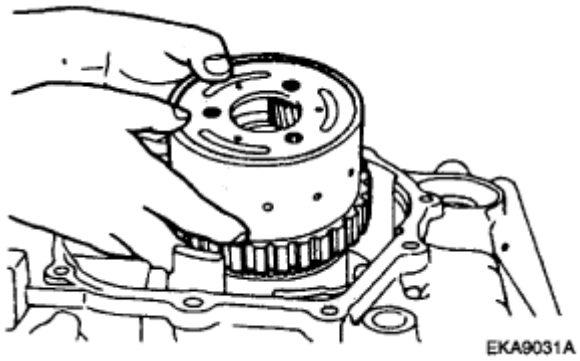


Fig. 218: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

2. Remove the direct clutch reaction plate.
3. Remove the direct clutch discs (A-5EA), plates (B-5EA).

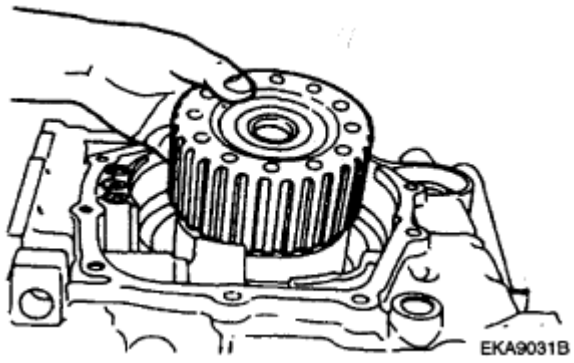


Fig. 219: Identifying Direct Clutch Discs And Plates
Courtesy of KIA MOTORS AMERICA, INC.

4. Using the SST (09453-4C300) and a press machine, remove the snap ring.

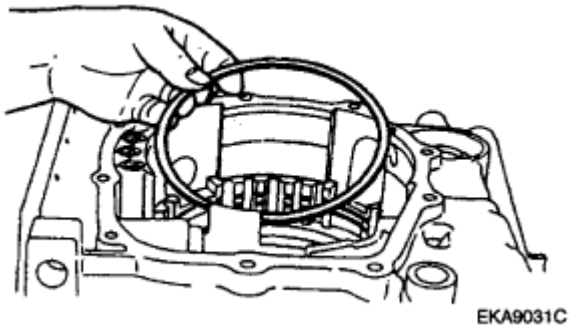


Fig. 220: Removing Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

5. After removing the direct clutch spring retainer.

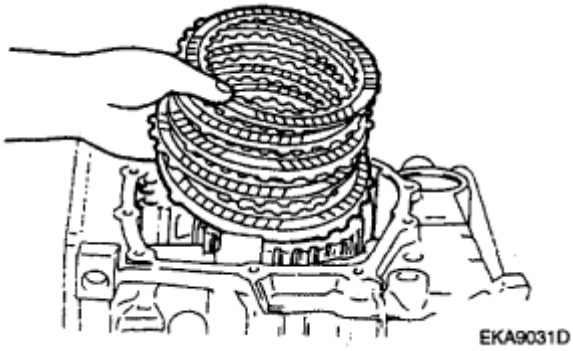


Fig. 221: Identifying Direct Clutch Spring Retainer
Courtesy of KIA MOTORS AMERICA, INC.

6. Remove the direct clutch return spring.

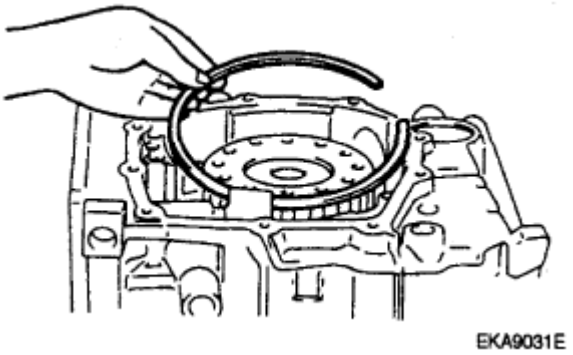


Fig. 222: Identifying Direct Clutch Return Spring
Courtesy of KIA MOTORS AMERICA, INC.

7. Inflict air pressure as follows and remove the direct clutch piston and the D-ring (1ea).

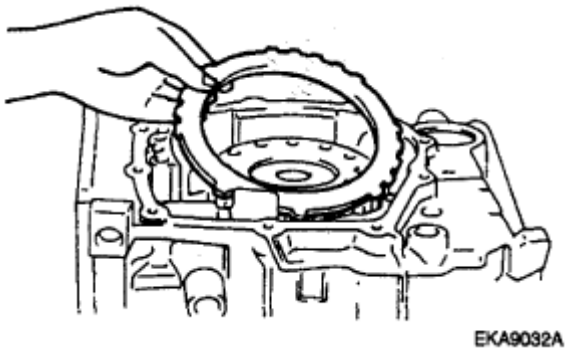


Fig. 223: Identifying Direct Clutch Piston
Courtesy of KIA MOTORS AMERICA, INC.

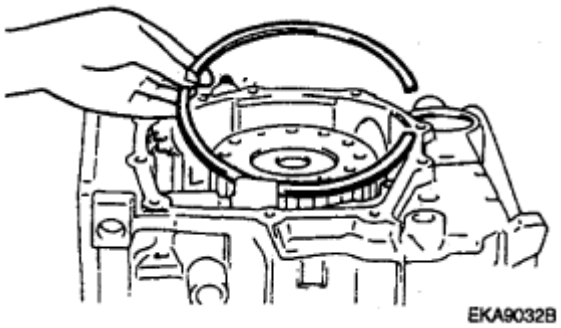


Fig. 224: Identifying D-Ring
Courtesy of KIA MOTORS AMERICA, INC.

Reassembly

1. Inserting the D- ring to the direct clutch retainer, install the piston inside the retainer.

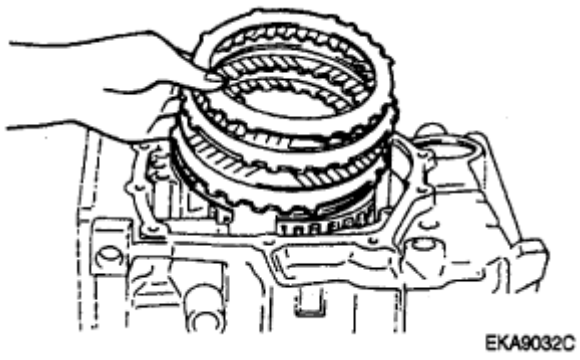


Fig. 225: Identifying D-Ring
Courtesy of KIA MOTORS AMERICA, INC.

2. Install the return spring and the spring retainer.

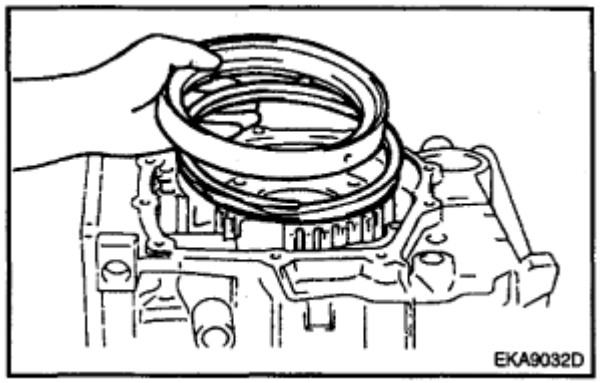


Fig. 226: Identifying Return Spring And Spring Retainer
Courtesy of KIA MOTORS AMERICA, INC.

3. Using the SST (09453-4C300) and a press machine, fix the snap ring.

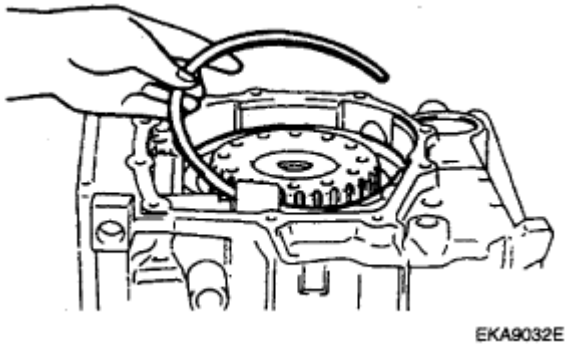


Fig. 227: Installing Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

4. Assemble the clutch plate, clutch disk and clutch reaction plate.
5. Install the snap ring.

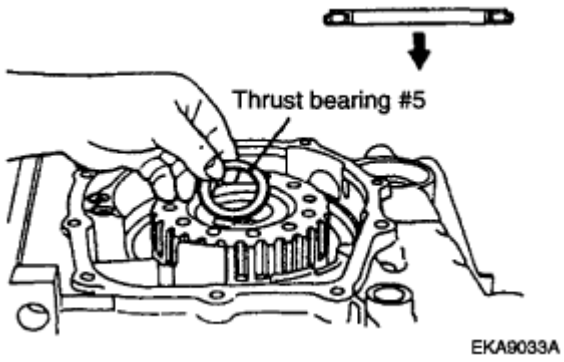


Fig. 228: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

6. Check the end play between the snap ring and the reaction plate with 50±5N (5±0.5kgf, 337.2±11.2lbf) weight and 250±25kPa (2.5±0.25kgf/cm^2 , 35.56±3.56psi) air pressure applied.

   End Play: 1.15 ~ 1.45mm (0.0453~0.0571 in)

7. If the end play deviates from the standard value above, choose a proper snap ring from the table below.

SNAP RING THICKNESS

Part Number	Thickness mm(in)
45556-23814	1.4 (0.055)
45556-23816	1.6 (0.063)
45556-23818	1.8 (0.071)
45556-23820	2.0 (0.079)
45556-23822	2.2 (0.087)
45556-23824	2.4 (0.094)
45556-23826	2.6 (0.102)

REVERSE AND OVERDRIVE CLUTCH

Components and Components Location

Components

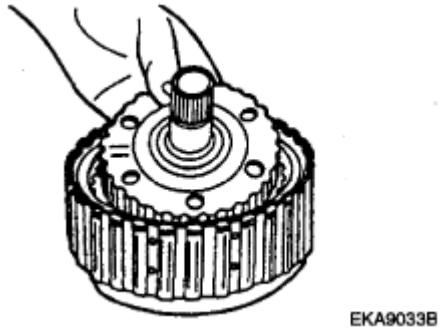


Fig. 229: Identifying Reverse And Overdrive Clutch Components
Courtesy of KIA MOTORS AMERICA, INC.

Repair procedures

Disassembly

1. Remove the snap ring.

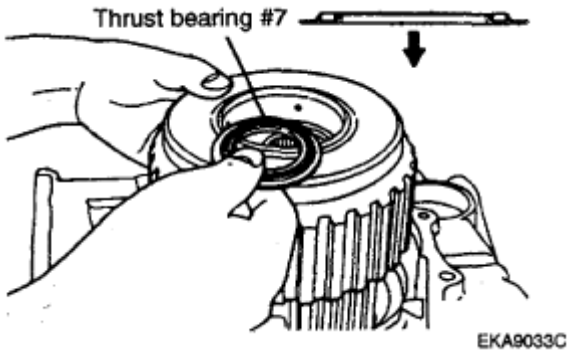


Fig. 230: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

2. Remove the reverse clutch reaction plate and clutch disc set.

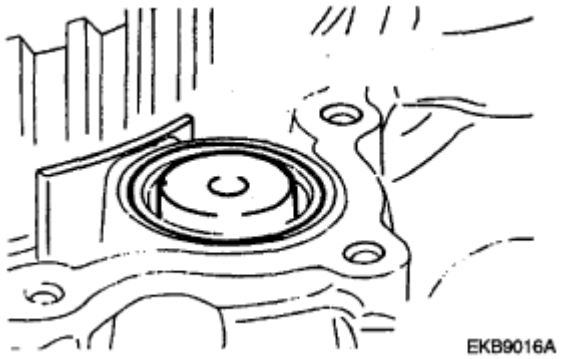


Fig. 231: Identifying Reverse Clutch Reaction Plate And Clutch Disc Set
Courtesy of KIA MOTORS AMERICA, INC.

3. Remove the snap ring.

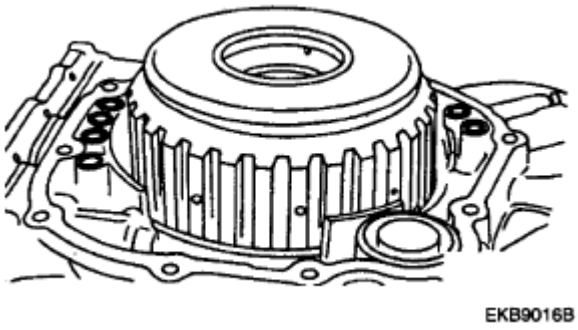


Fig. 232: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

4. Remove the overdrive clutch reaction plate and clutch disc set.

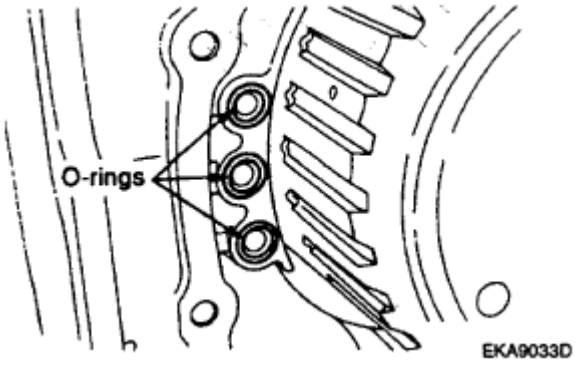


Fig. 233: Identifying Overdrive Clutch Reaction Plate And Clutch Disc Set
Courtesy of KIA MOTORS AMERICA, INC.

5. Using the SST (09453-4C400), remove the clutch spring retainer snap ring.

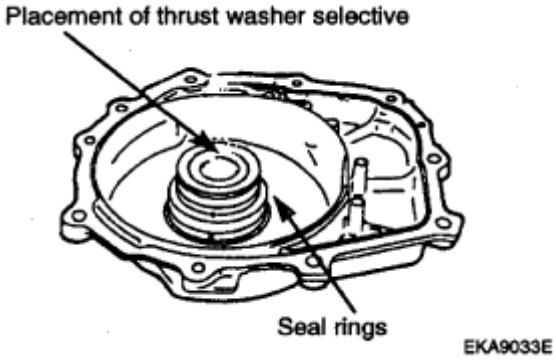


Fig. 234: Removing Clutch Spring Retainer Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

6. Remove the overdrive clutch spring retainer.

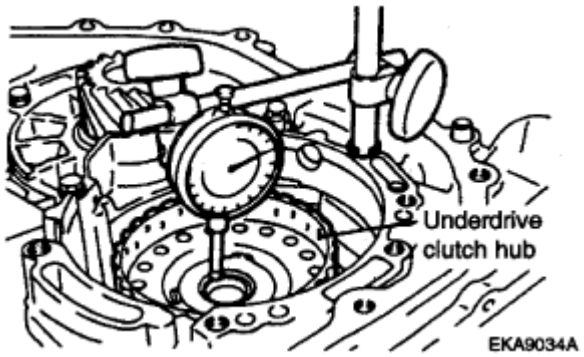


Fig. 235: Identifying Overdrive Clutch Spring Retainer
Courtesy of KIA MOTORS AMERICA, INC.

7. Remove the clutch return spring.

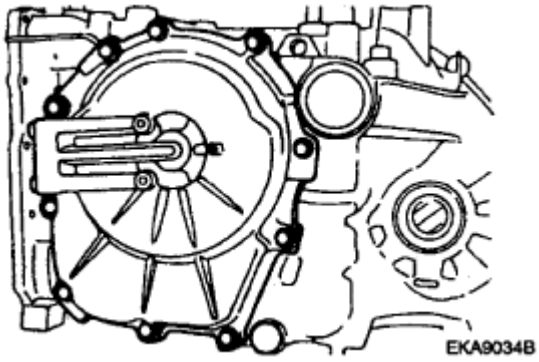


Fig. 236: Identifying Clutch Return Spring
Courtesy of KIA MOTORS AMERICA, INC.

8. Remove the reverse and overdrive clutch piston using compressed air.

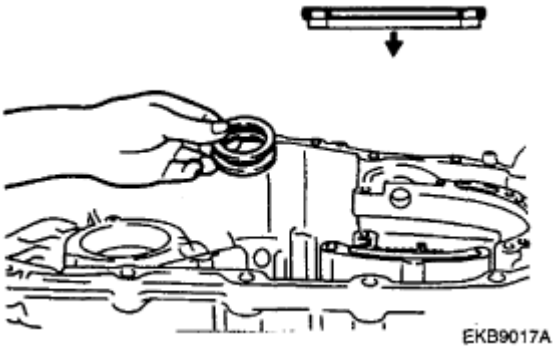


Fig. 237: Identifying Reverse And Overdrive Clutch Piston
Courtesy of KIA MOTORS AMERICA, INC.

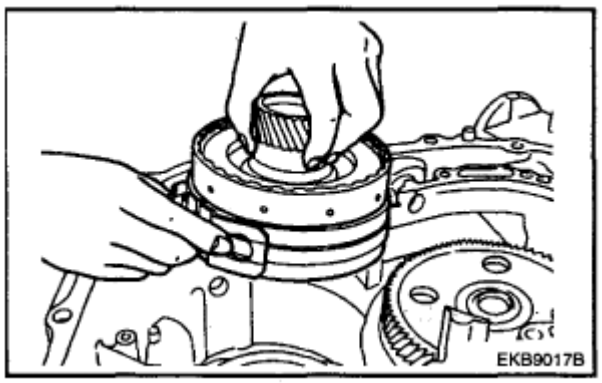


Fig. 238: Identifying Overdrive Clutch Piston
Courtesy of KIA MOTORS AMERICA, INC.

9. Separate the reverse clutch piston from the overdrive clutch piston.

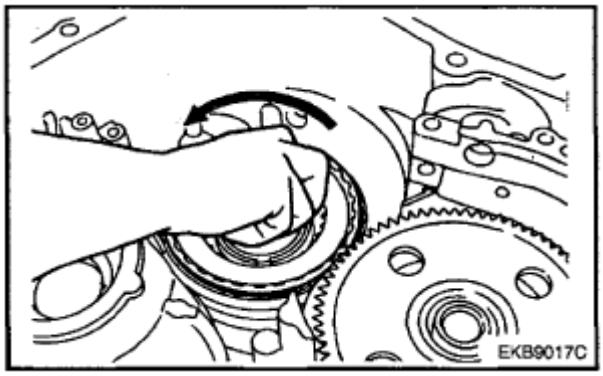


Fig. 239: Identifying Reverse Clutch Piston And Overdrive Clutch Piston
Courtesy of KIA MOTORS AMERICA, INC.

10. Remove the D-rings (2ea) from the reverse clutch retainer.

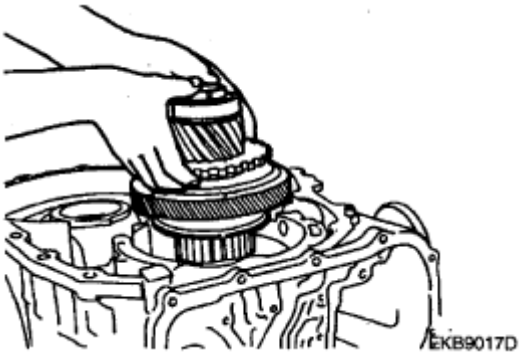


Fig. 240: Identifying D-Rings And Reverse Clutch Retainer
Courtesy of KIA MOTORS AMERICA, INC.

Reassembly

1. Attach D- ring to reverse clutch retainer.
2. Install the reverse clutch piston to the reverse clutch retainer.

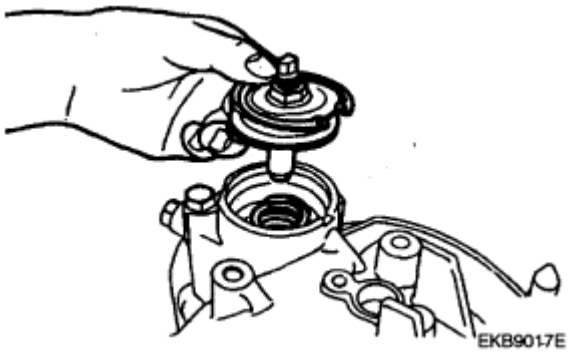


Fig. 241: Identifying Reverse Clutch Piston And Reverse Clutch Retainer
Courtesy of KIA MOTORS AMERICA, INC.

3. Install the overdrive clutch piston to the reverse clutch piston.
4. Install the clutch return spring.

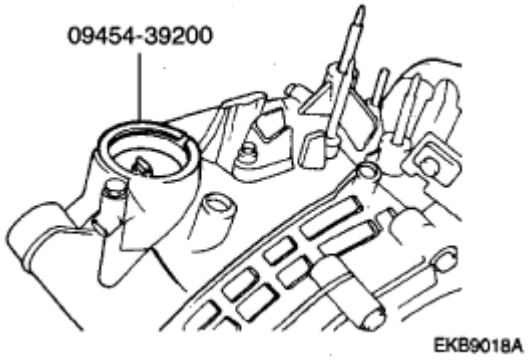


Fig. 242: Identifying Clutch Return Spring
Courtesy of KIA MOTORS AMERICA, INC.

5. Install the overdrive clutch spring retainer.

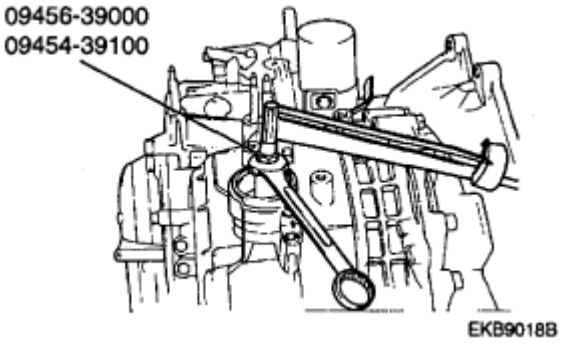


Fig. 243: Identifying Overdrive Clutch Spring Retainer
Courtesy of KIA MOTORS AMERICA, INC.

6. Using the SST (09453-4C400), install the clutch spring retainer snap ring.

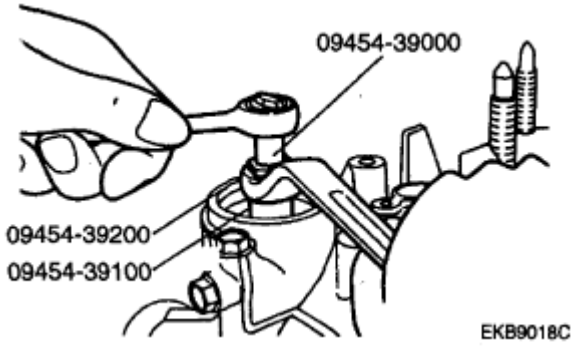


Fig. 244: Installing Clutch Spring Retainer Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

7. Install the overdrive clutch reaction plate and clutch disc set.

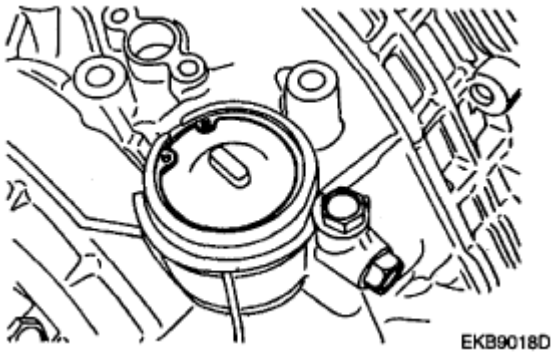


Fig. 245: Identifying Overdrive Clutch Reaction Plate And Clutch Disc Set
Courtesy of KIA MOTORS AMERICA, INC.

8. Install the snap ring.

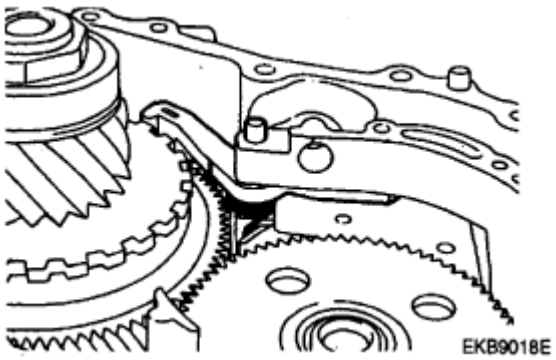


Fig. 246: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

9. Check the end play between the snap ring and the reaction plate with 50N (5kgf, 337.2lbf) weight and 200kPa (2kgf/cm^2 , 28.45psi) air pressure applied.

   End Play: 0.9 ~ 1.1mm (0.0354~0.0433 in)

10. If the end play deviates from the standard value above, choose a proper snap ring from the table below.

SNAP RING THICKNESS

Part Number	Thickness mm(in)
45427-39161	1.6 (0.0630)
45427-39171	1.7 (0.0669)
45427-39181	1.8 (0.0709)
45427-39191	1.9 (0.0748)
45427-39201	2.0 (0.0787)

45427-39211	2.1 (0.0827)
45427-39221	2.2 (0.0866)
45427-39231	2.3 (0.0906)
45427-39241	2.4 (0.0945)
45427-39251	2.5 (0.0984)
45427-39261	2.6 (1.1024)
45427-39271	2.7 (0.0063)
45427-39281	2.8 (0.1102)
45427-39291	2.9 (0.1142)
45427-39301	3.0 (0.1181)
45427-39311	3.1 (0.1220)

11. Install the reverse clutch reaction plate and clutch disc set.

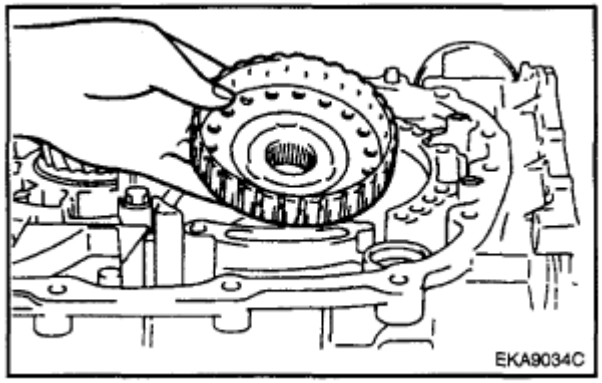


Fig. 247: Identifying Reverse Clutch Reaction Plate And Clutch Disc Set
Courtesy of KIA MOTORS AMERICA, INC.

12. Install the snap ring.

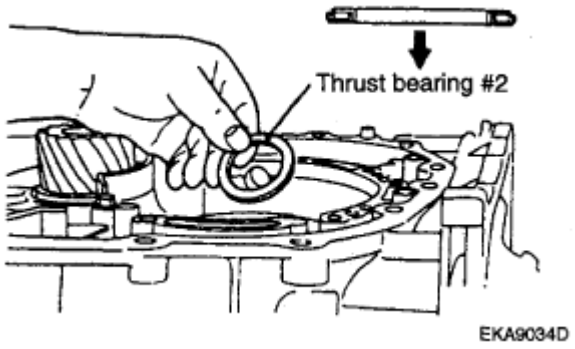


Fig. 248: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

13. Check the end play between the snap ring and the reaction plate with 1200±50N (120±5kgf,

337.2±11.2lbf) weight and 350±25kPa (3.5±0.25kgf/cm^2 , 49.78±3.56psi) air pressure applied.

End Play: 1.2 ~ 1.4mm (0.0453~0.0571 in)

14. If the end play deviates from the standard value above, choose a proper snap ring from the table below.

SNAP RING THICKNESS

Part Number	Thickness mm(in)
45432-39161	1.6 (0.0630)
45432-39171	1.7 (0.0669)
45432-39181	1.8 (0.0709)
45432-39191	1.9 (0.0748)
45432-39201	2.0 (0.0787)
45432-39211	2.1 (0.0827)
45432-39221	2.2 (0.0866)
45432-39231	2.3 (0.0906)
45432-39241	2.4 (0.0945)
45432-39251	2.5 (0.0984)
45432-39261	2.6 (0.1024)
45432-39271	2.7 (0.1063)
45432-39281	2.8 (0.1102)

GEAR SYSTEM

PLANETARY GEAR

Components and Components Location

Components

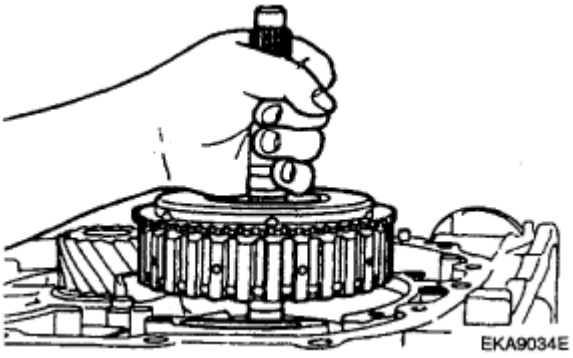


Fig. 249: Identifying Planetary Gear Components
Courtesy of KIA MOTORS AMERICA, INC.

Repair procedures

Disassembly

1. Take out the snap ring from the back side of the low&reverse annulus gear.

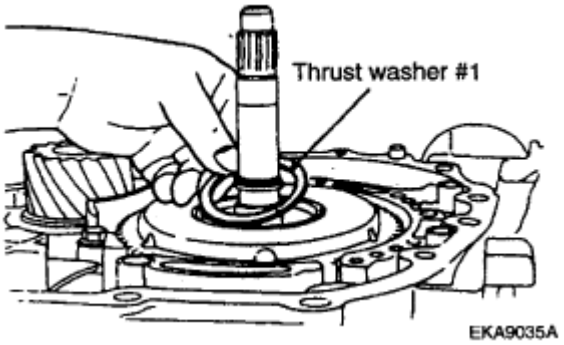


Fig. 250: Identifying Snap Ring And Low&Reverse Annulus Gear
Courtesy of KIA MOTORS AMERICA, INC.

2. Remove the overdrive planetary carrier assembly.

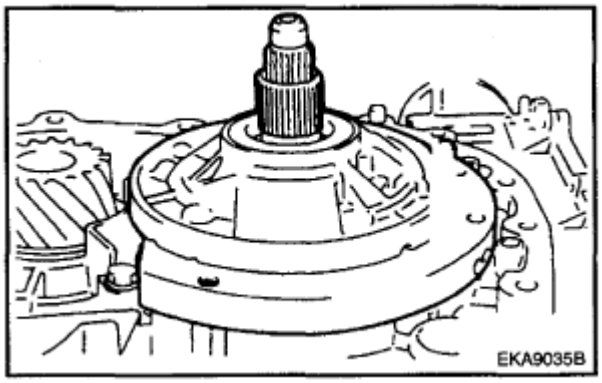


Fig. 251: Identifying Overdrive Planetary Carrier Assembly
Courtesy of KIA MOTORS AMERICA, INC.

3. Remove the thrust race.

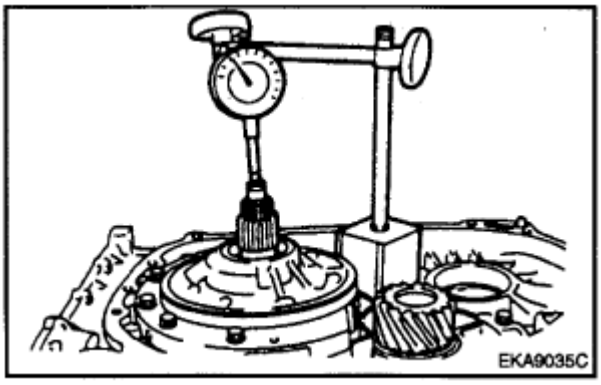


Fig. 252: Identifying Thrust Race
Courtesy of KIA MOTORS AMERICA, INC.

4. Remove the underdrive sun gear.

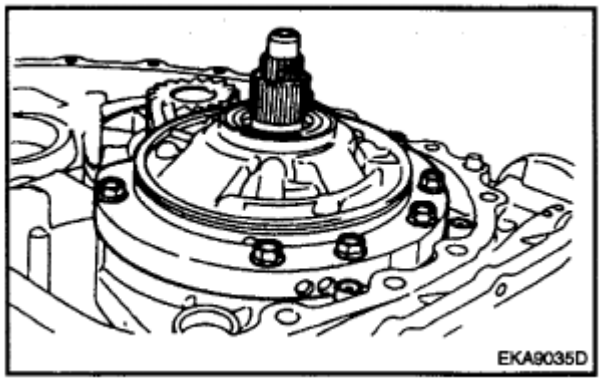


Fig. 253: Identifying Underdrive Sun Gear
Courtesy of KIA MOTORS AMERICA, INC.

5. Remove the thrust bearing.

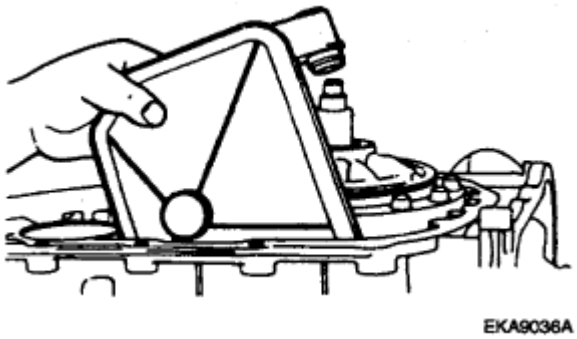


Fig. 254: Identifying Thrust Bearing
Courtesy of KIA MOTORS AMERICA, INC.

6. Remove the output planetary carrier assembly.

Fig. 255: Identifying Output Planetary Carrier Assembly

Courtesy of KIA MOTORS AMERICA, INC.

7. Remove the stopper plate.

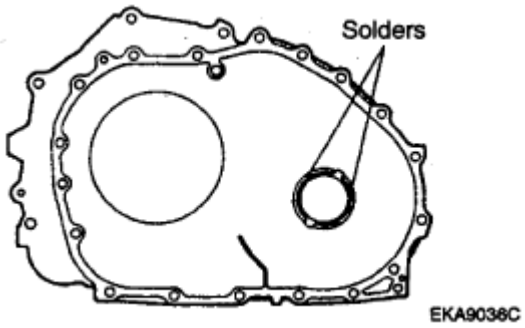


Fig. 256: Identifying Stopper Plate
Courtesy of KIA MOTORS AMERICA, INC.

8. Remove the one way clutch.

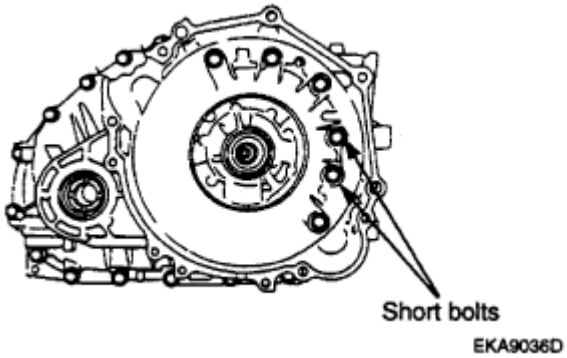


Fig. 257: Identifying One Way Clutch
Courtesy of KIA MOTORS AMERICA, INC.

Reassembly

1. Apply ATF on the inner/outer surface of the one way clutch end bearing and assemble the bearing with the arrow mark on the inner race facing to rear.

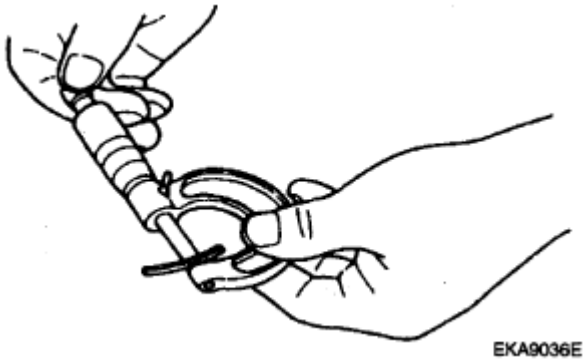


Fig. 258: Identifying One Way Clutch End Bearing
Courtesy of KIA MOTORS AMERICA, INC.

2. Install the stopper plate.

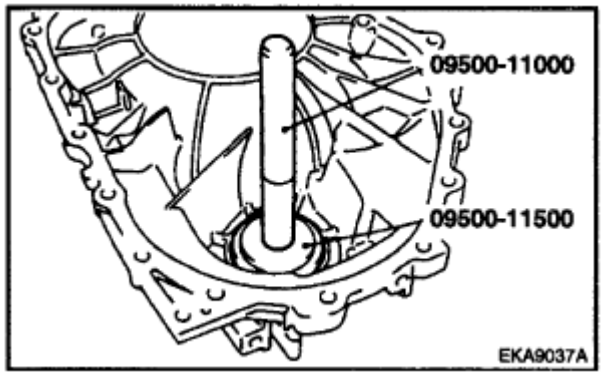


Fig. 259: Identifying Stopper Plate
Courtesy of KIA MOTORS AMERICA, INC.

3. Install in the planetary gear the output planetary carrier assembly.

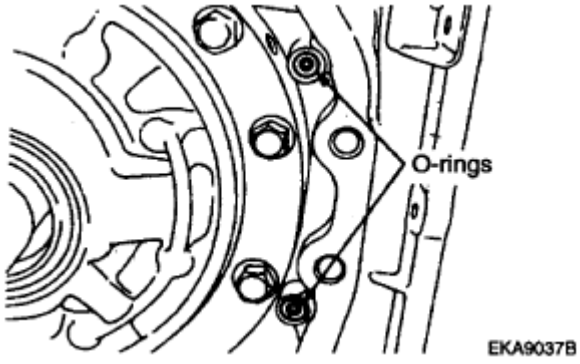


Fig. 260: Identifying Planetary Gear Output Planetary Carrier Assembly
Courtesy of KIA MOTORS AMERICA, INC.

4. Install the thrust bearing.

CAUTION: Pay attention to the direction of the thrust bearing when installing it.

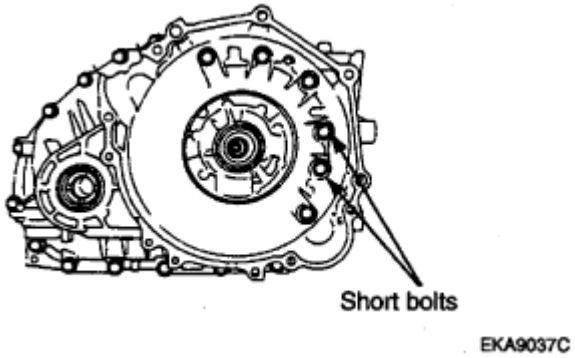


Fig. 261: Identifying Thrust Bearing
Courtesy of KIA MOTORS AMERICA, INC.

5. Install the underdrive sun gear.

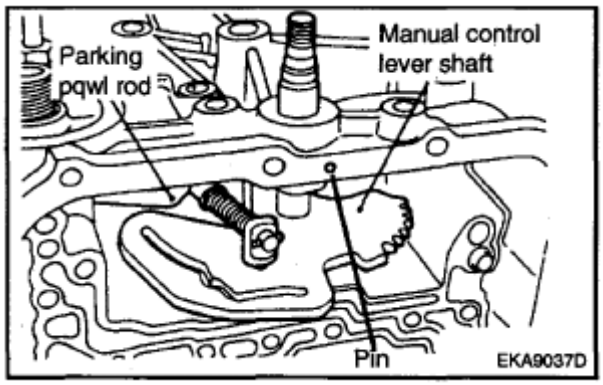


Fig. 262: Identifying Underdrive Sun Gear
Courtesy of KIA MOTORS AMERICA, INC.

6. Insert the thrust race & thrust bearing.

CAUTION: Pay attention to the direction of the thrust bearing when installing it.

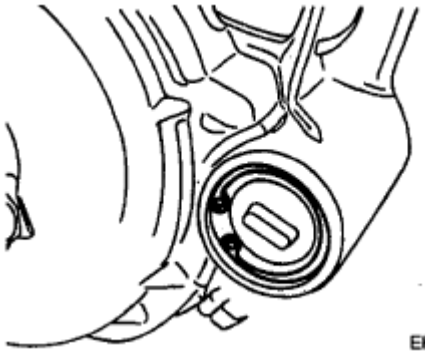


Fig. 263: Identifying Thrust Race & Thrust Bearing
Courtesy of KIA MOTORS AMERICA, INC.

7. Install the overdrive planetary carrier assembly.

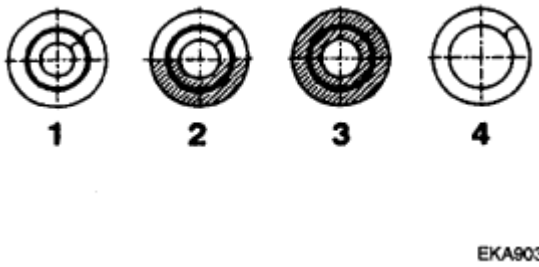


Fig. 264: Identifying Overdrive Planetary Carrier Assembly
Courtesy of KIA MOTORS AMERICA, INC.

8. Insert the snap ring.

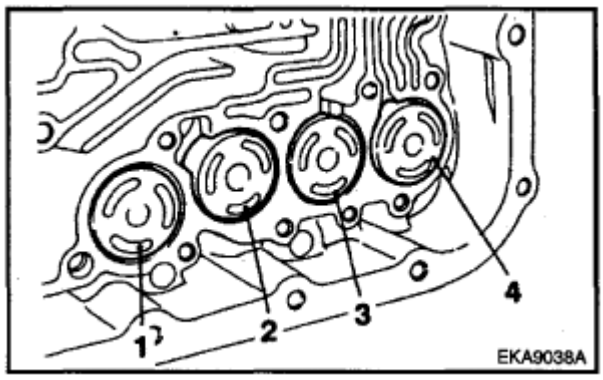


Fig. 265: Identifying Snap Ring
Courtesy of KIA MOTORS AMERICA, INC.

TRANSFER DRIVE GEAR

Components and Components Location

Components

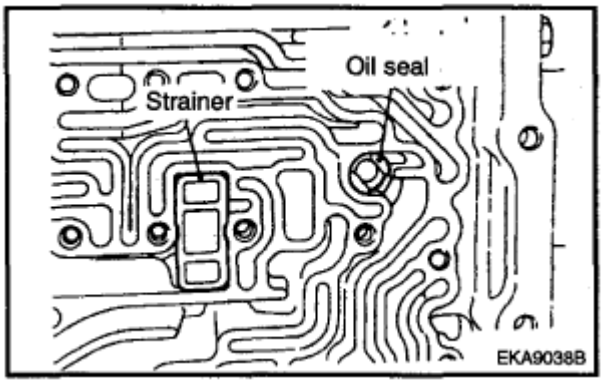


Fig. 266: Identifying Transfer Drive Gear Components
Courtesy of KIA MOTORS AMERICA, INC.

Repair procedures

Disassembly

1. Remove the lock nut from the transfer drive gear assembly by using the SST (09453-1M600).

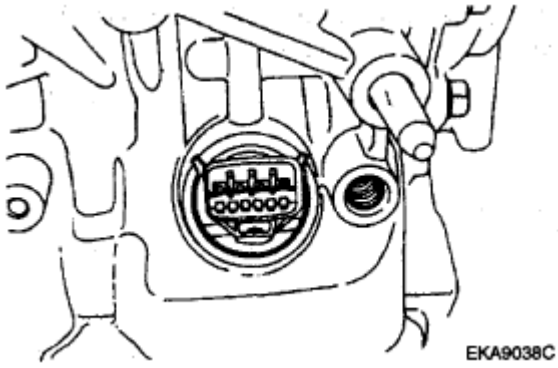


Fig. 267: Identifying Lock Nut And Transfer Drive Gear Assembly
Courtesy of KIA MOTORS AMERICA, INC.

2. Remove the double taper roller ball bearing from the transfer drive gear by using the SST (09453-1M800).

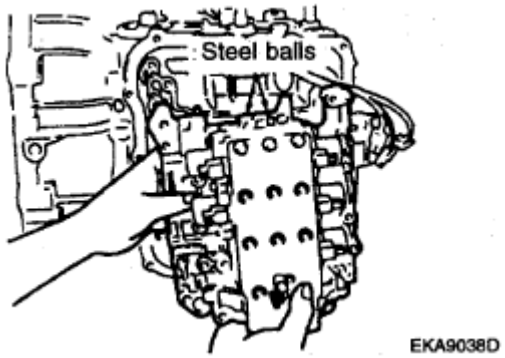


Fig. 268: Removing Double Taper Roller Ball Bearing From Transfer Drive Gear By Using SST (09453-1M800)
Courtesy of KIA MOTORS AMERICA, INC.

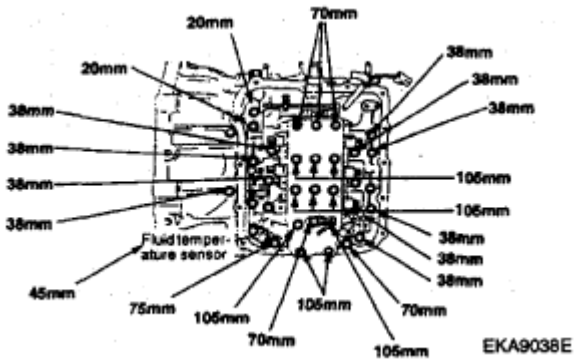


Fig. 269: Identifying Double Taper Roller Ball Bearing And Transfer Drive Gear
Courtesy of KIA MOTORS AMERICA, INC.

Reassembly

1. Install the double taper roller bearing to the transfer drive gear by using the press.

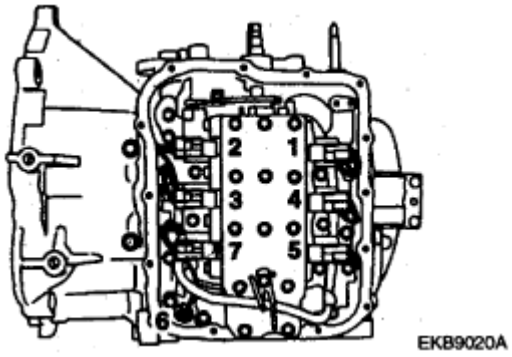


Fig. 270: Identifying Double Taper Roller Bearing And Transfer Drive Gear
Courtesy of KIA MOTORS AMERICA, INC.

2. Install the lock nut to the transfer drive gear assembly by using the SST (09453-1M600).

Tightening torque :

180~210 Nm (18~21 kgf.m, 130~152 lb-ft)

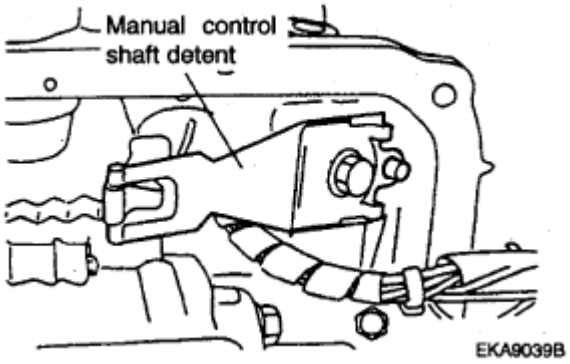


Fig. 271: Identifying Lock Nut And Transfer Drive Gear Assembly
Courtesy of KIA MOTORS AMERICA, INC.

DIRECT PLANETARY CARRIER

Components and Components Location

Components

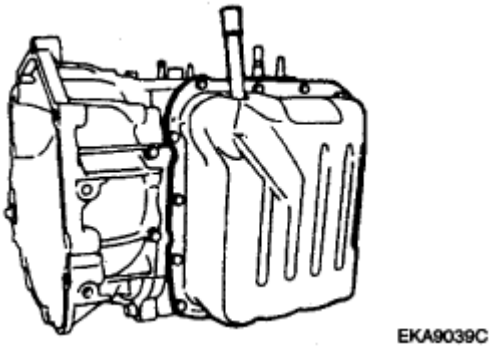


Fig. 272: Identifying Direct Planetary Carrier Components
Courtesy of KIA MOTORS AMERICA, INC.

Repair procedures

Disassembly

1. Remove the lock nut.

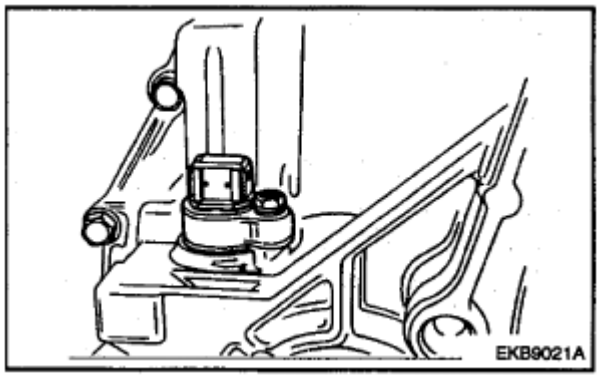


Fig. 273: Identifying Lock Nut
Courtesy of KIA MOTORS AMERICA, INC.

2. Remove the roller bearing.

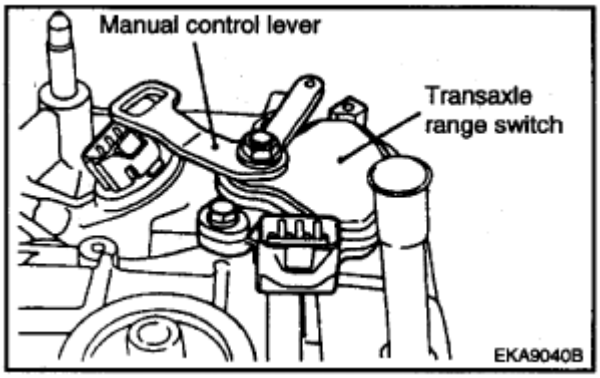


Fig. 274: Identifying Roller Bearing
Courtesy of KIA MOTORS AMERICA, INC.

3. Remove the thrust bearing.

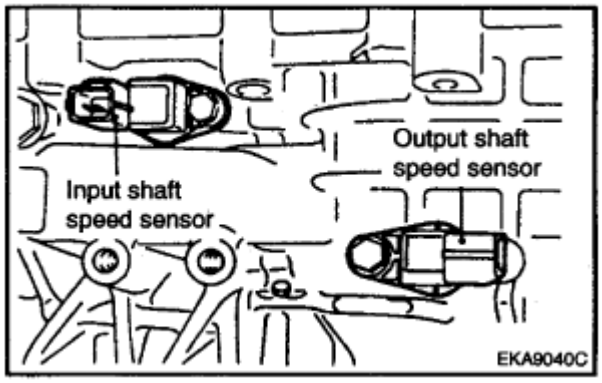


Fig. 275: Identifying Thrust Bearing
Courtesy of KIA MOTORS AMERICA, INC.

4. Disassemble the output gear, parking gear, double taper roller bearing, transfer driven gear from the direct planetary gear assembly at once by using the SST (09453-1M900) with press.

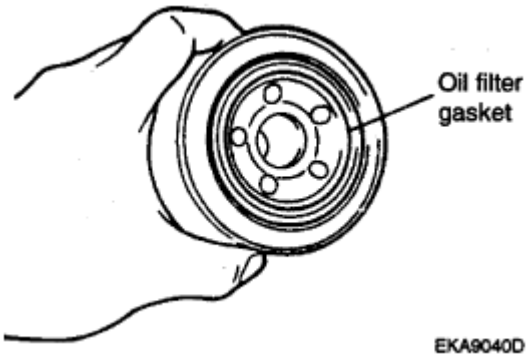


Fig. 276: Disassemblying Output Gear, Parking Gear, Double Taper Roller Bearing, Transfer Driven Gear From Direct Planetary Gear Assembly
Courtesy of KIA MOTORS AMERICA, INC.

Reassembly

1. Reassemble the output gear, parking gear, double taper roller bearing, transfer driven gear to the direct planetary gear assembly at once by using the press.

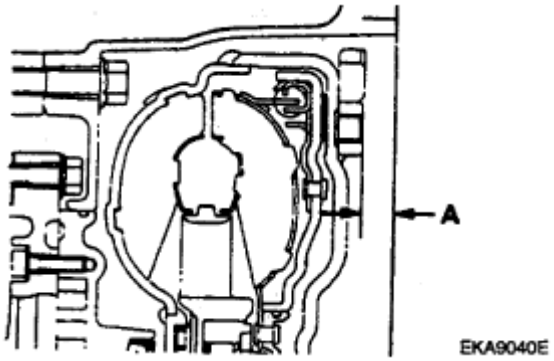
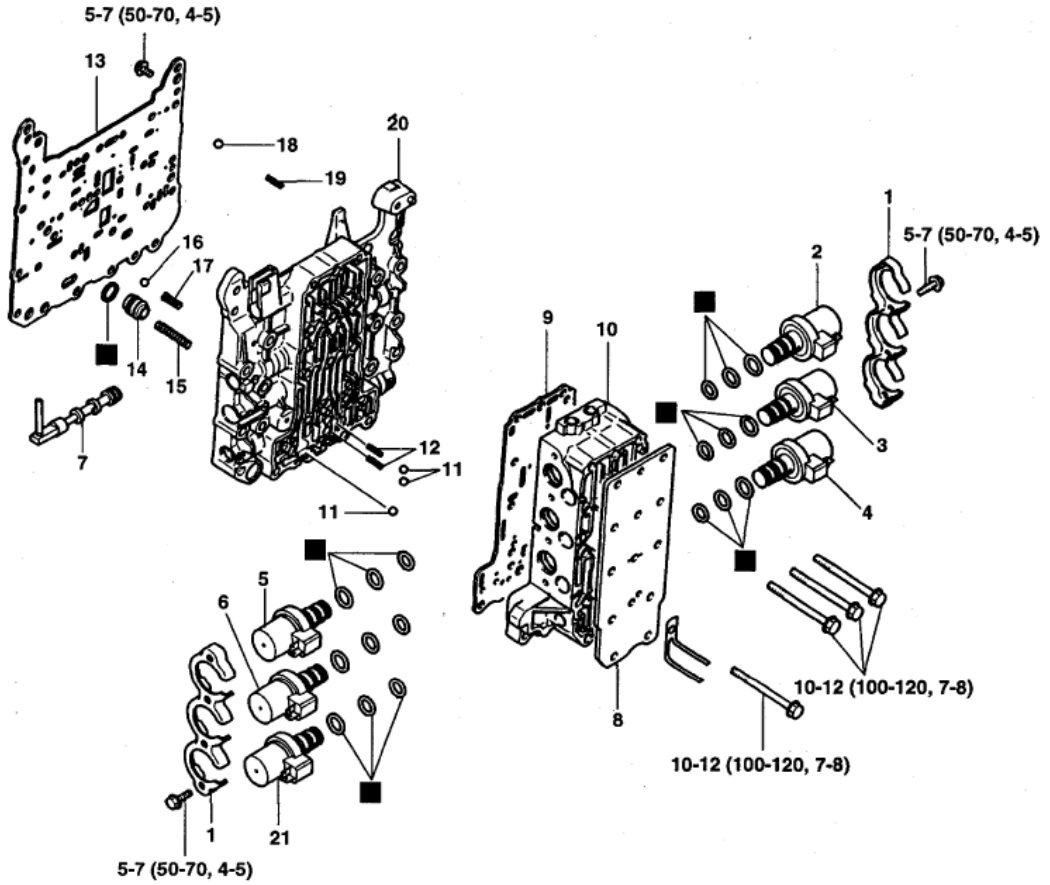


Fig. 277: Reassemblying Output Gear, Parking Gear, Double Taper Roller Bearing, Transfer Driven Gear To Direct Planetary Gear Assembly
Courtesy of KIA MOTORS AMERICA, INC.

2. Install the thrust bearing.



<Disassembly steps>

1. Solenoid valve support
2. UD clutch solenoid valve
3. 2nd brake solenoid valve
4. Damper clutch control solenoid valve
5. OD clutch solenoid valve
6. L & R brake solenoid valve
7. Manual valve
8. Cover
9. Plate
10. Outside valve body assembly
11. Still ball (Orifice check ball)
12. Spring
13. Plate
14. Damping valve
15. Damping valve spring
16. Steel ball (line relief)
17. Spring
18. Steel ball (orifice check ball)
19. Spring
20. Inside valve body assembly
21. Reduction solenoid valve (F5A51 Model)

TORQUE : Nm (kg·cm, lb·ft)

EKA9041B

Fig. 278: Identifying Thrust Bearing
Courtesy of KIA MOTORS AMERICA, INC.

3. Install the roller bearing.

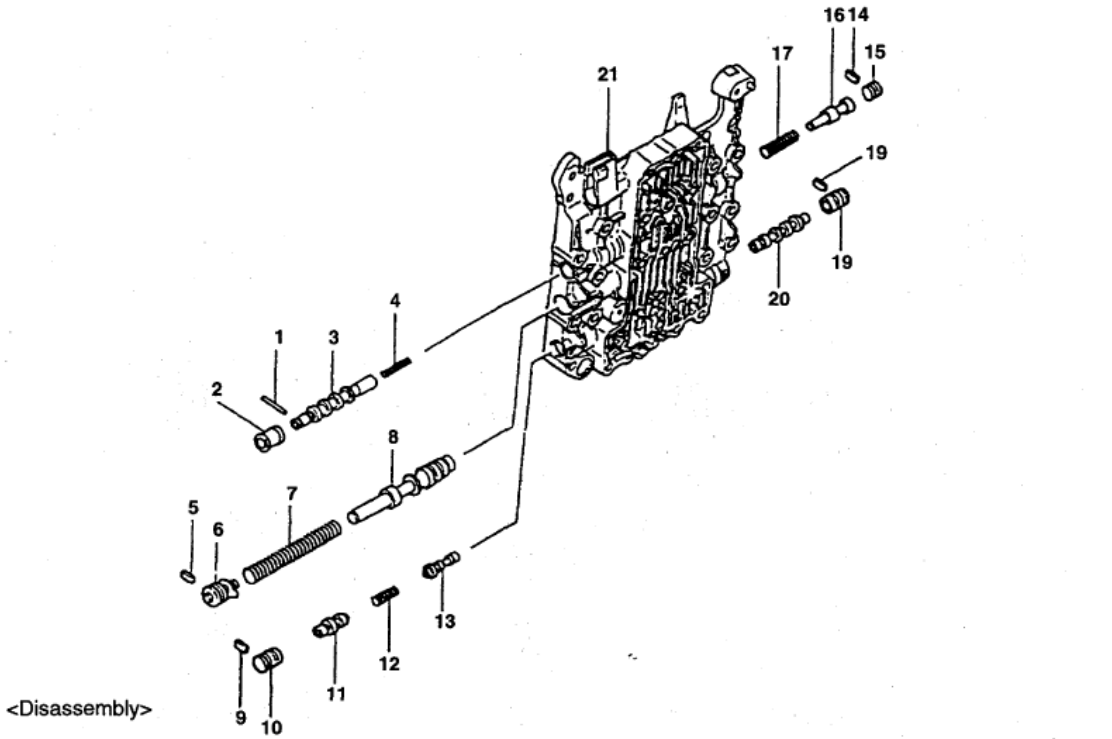
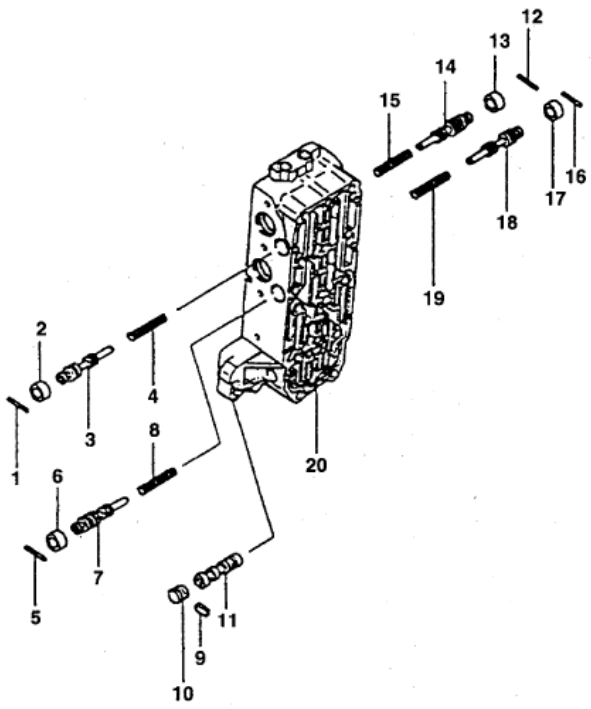


Fig. 279: Identifying Roller Bearing
Courtesy of KIA MOTORS AMERICA, INC.

4. Install the lock nut.

Tightening torque :

16~18Nm (1.6~1.8kgf.m, 11.6~13.0lb-ft)



<Disassembly>

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

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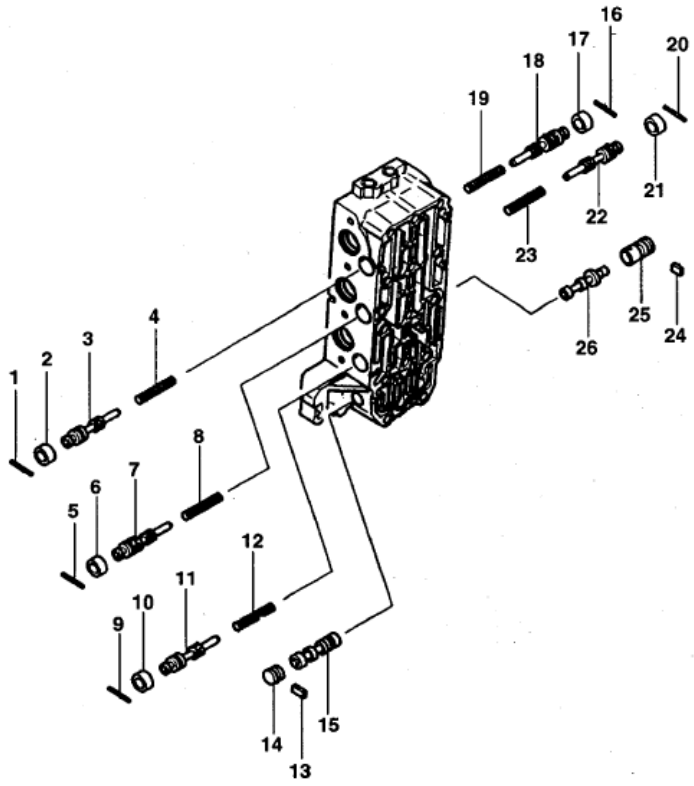
Fig. 280: Identifying Lock Nut
Courtesy of KIA MOTORS AMERICA, INC.

DIFFERENTIAL

Components and Components Location

Components



<Disassembly steps>

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

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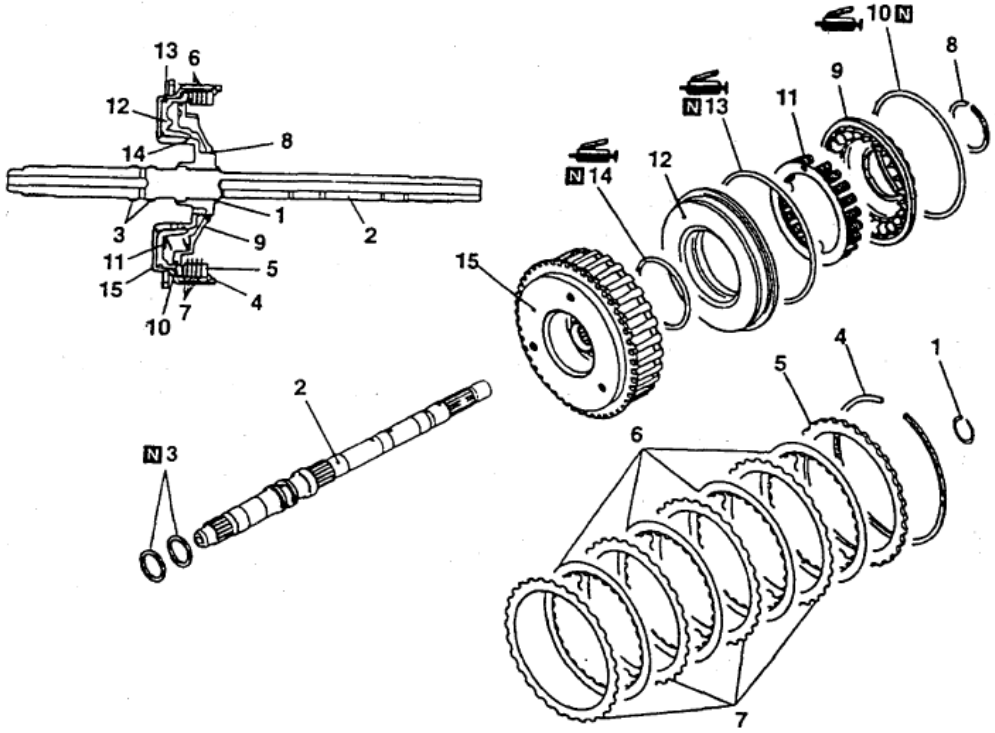
Fig. 281: Identifying Differential Components
Courtesy of KIA MOTORS AMERICA, INC.

Repair procedures

Disassembly

1. Remove the bolts (10ea).



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

Fig. 282: Identifying Bolts
Courtesy of KIA MOTORS AMERICA, INC.

2. Remove the differential drive gear from the differential assembly.

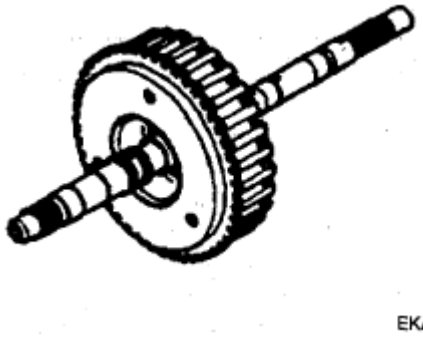


Fig. 283: Identifying Differential Drive Gear And Differential Assembly
Courtesy of KIA MOTORS AMERICA, INC.

3. Remove the lock pin.

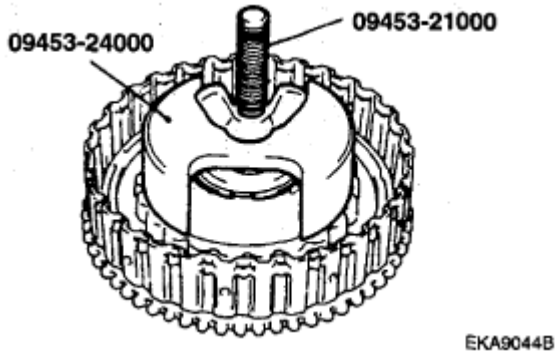


Fig. 284: Removing Lock Pin
Courtesy of KIA MOTORS AMERICA, INC.

4. Remove the pinion shaft.

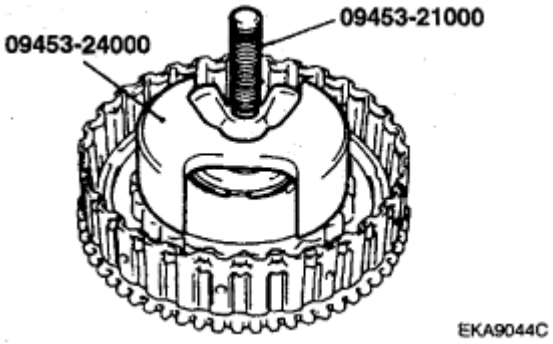


Fig. 285: Removing Pinion Shaft
Courtesy of KIA MOTORS AMERICA, INC.

5. Remove the differential gear set and spacer set.

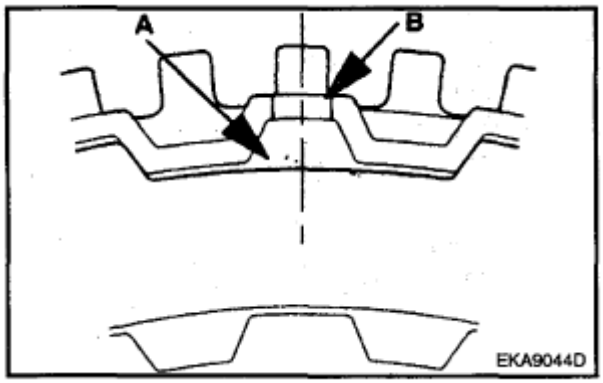


Fig. 286: Removing Differential Gear Set And Spacer Set
Courtesy of KIA MOTORS AMERICA, INC.

6. Remove the taper roller bearings from the differential case.

Reassembly

1. Install the taper roller bearings to the differential case by using the SST (09453-1M500).
2. Install the differential gear set and spacer set.

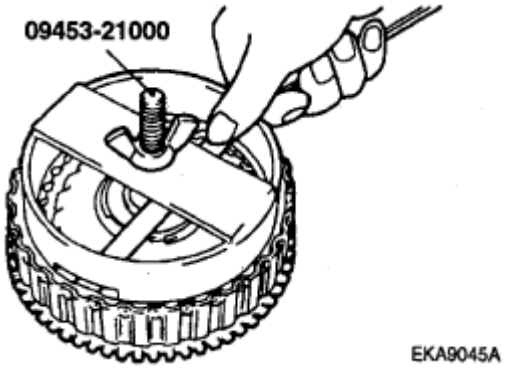


Fig. 287: Installing Differential Gear Set And Spacer Set
Courtesy of KIA MOTORS AMERICA, INC.

3. Install the pinion shaft.

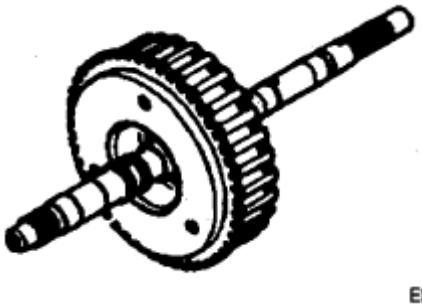


Fig. 288: Installing Pinion Shaft
Courtesy of KIA MOTORS AMERICA, INC.

4. Install the lock pin.

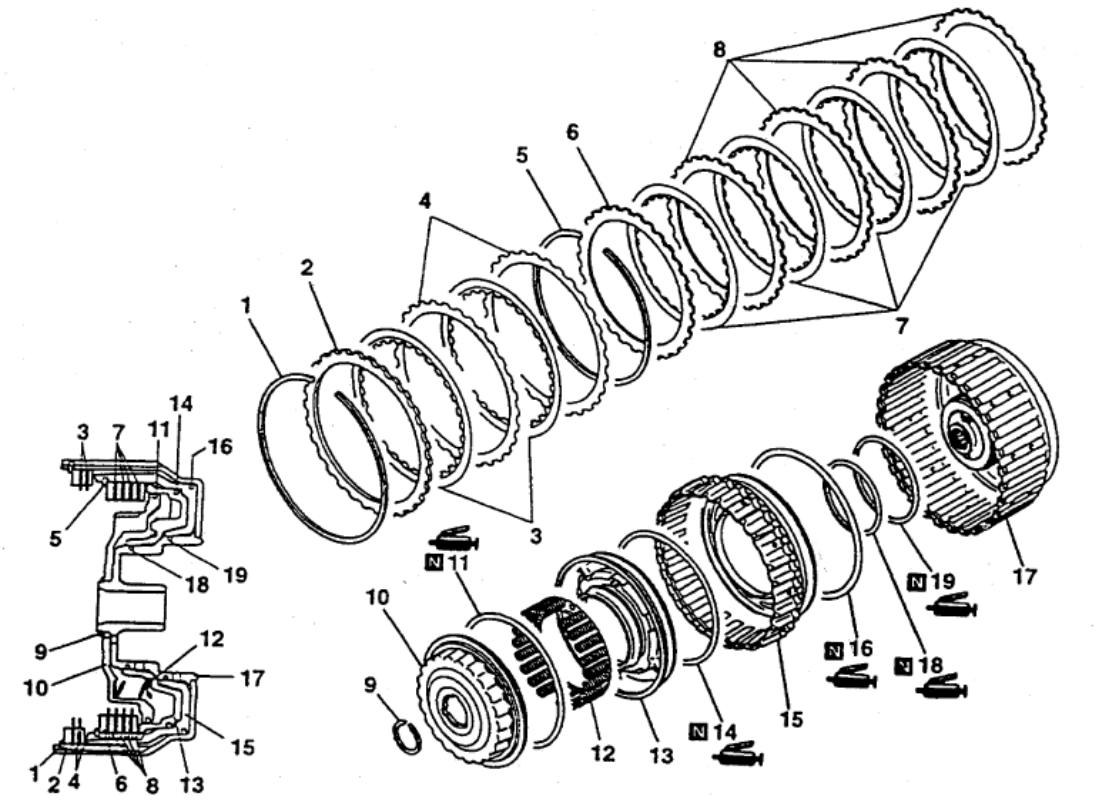


Fig. 289: Installing Lock Pin
Courtesy of KIA MOTORS AMERICA, INC.

5. Install the differential drive gear to the differential case.

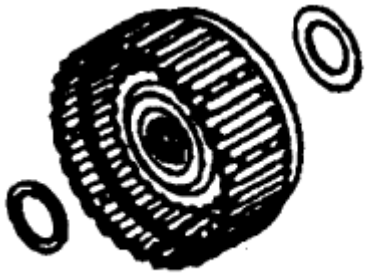


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Fig. 290: Identifying Differential Drive Gear And Differential Case
Courtesy of KIA MOTORS AMERICA, INC.

6. Install the bolts (10ea).

Tightening torque :

130~140 Nm (13~14 kgf.m, 94~101 lb-ft)

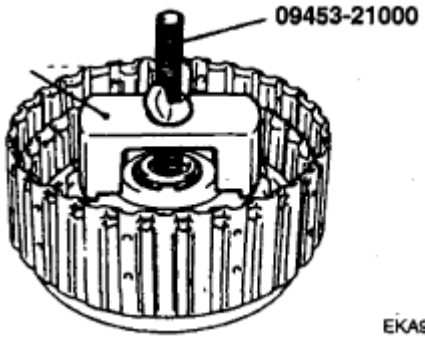

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Fig. 291: Identifying Differential Drive Gear And Bolts
Courtesy of KIA MOTORS AMERICA, INC.

