General Information

Specifications

Item		Specification
Transmission type		A6LF2
Engine model		Gasoline 3.5
Torque converter type		3-element, 1-stage, 2-phase type
Torque converter size		Ø236 mm (9.2913 in.)
Oil pump system		Parachoid
Friction elements		Clutch: 2EA
		Brake: 3EA
		OWC : 1EA
Planetary gear		3EA
Gear ratio	1st	4.252
	2nd	2.654
	3rd	1.804
	4th	1.386
	5th	1.000
	6th	0.772
	Reverse	3.393
Final gear ratio		3.041
Fluid pressure balance piston		2EA
Accumulator		4EA
Solenoid valve		8EA (VFS:6EA, ON/OFF:2EA)
Shift lever position		4 Range (P,R,N,D)
Oil filter		1EA

VFS: Variable Force Solenoid

Tightening Torques

Item	N.m	Kgf.m	lb-ft
TCM installation nut mounting bolt	9.8 ~ 11.8	1.0 ~ 1.2	7.2 ~ 8.7
Shift cable bracket mounting bolt	17.7 ~ 24.5	1.8 ~ 2.5	13.0 ~ 18.1
Input shaft speed sensor mounting bolt	9.8 ~ 11.8	1.0 ~ 1.2	7.2 ~ 8.7
Output shaft speed sensor mounting bolt	9.8 ~ 11.8	1.0 ~ 1.2	7.2 ~ 8.7
Shift lever assembly mounting bolt	8.8 ~ 13.7	0.9 ~ 1.4	6.5 ~ 10.1
Inhibitor switch mounting bolt	9.8 ~ 11.8	1.0 ~ 1.2	7.2 ~ 8.7
Valve body cover mounting bolt	12.8 ~ 14.7	1.3 ~ 1.5	9.4 ~ 10.8
Eyebolt	34.3 ~ 44.1	3.5 ~ 4.5	25.3 ~ 32.6
Oil drain plug	34.3 ~ 44.1	3.5 ~ 4.5	25.3 ~ 32.6
Oil level plug	34.3 ~ 44.1	3.5 ~ 4.5	25.3 ~ 32.6
Torque converter mounting bolt	45.1 ~ 52.0	4.6 ~ 5.3	33.3 ~ 38.3
Automatic transaxle upper mounting bolt	63.7 ~ 83.4 32.4 ~ 49.0	6.5 ~ 8.5 3.3 ~ 5.0	47.0 ~ 61.5 23.9 ~ 36.2
Automatic transaxle lower mounting bolt	39.2 ~ 46.1 78.5 ~ 98.1	4.0 ~ 4.7 8.0 ~ 10.0	28.9 ~ 34.0 57.9 ~ 72.3
Automatic transaxle support bracket bolt	63.7 ~ 83.4	6.5 ~ 8.5	47.0 ~ 61.5

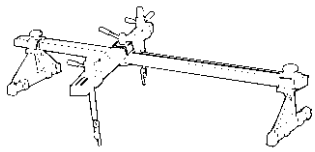
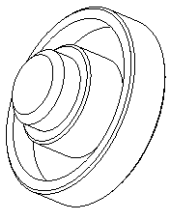
Lubricants

Item	Specified lubricant	Quantity
Transaxle fluid	SK ATF SP-IV, MICHANG ATF SP-IV, NOCA ATF S-P-IV, KIA Genuine ATF SP-IV	7.8L (2.06 U.S gal., 8.24 U.S.qt., 6.86 Imp.qt.)

Sealant

Item	Specified sealant
Rear cover Torque converter housing Valve body cover	LOCTITE FMD-546 or THREE-BOND TB1281B

Special Service Tools

Tools (Number and name)	Illustration	Use
09200-38001 Engine support fixture	 KKBF030A	Removal and installation of the transaxle.
09453-3L240 Oil seal installer	 S97AT9116D	Installation of transaxle case oil seal. [Using with handle (SST No.:09231-H1100)]
09231-H1100 Bar	 SLD766035D	Installation of transaxle case oil seal. [Using with oil seal installer (SST No.:09453-3 L240)]

Automatic Transaxle System

Service Adjustment Procedure

Oil level Check

NOTICE

A check of ATF level is not normally required during scheduled services. If an oil leak is found, perform the oil level check procedure after repairs are completed.

CAUTION

When checking the oil level, be careful not to enter dust, foreign matters, etc. from fill hole.

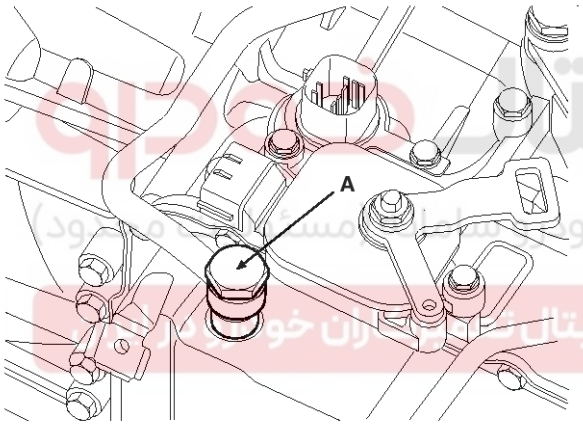
1. Remove the eyebolt (A).

Eyebolt tightening torque:
34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~ 32.6 lb-ft)

CAUTION

The gasket of the eyebolt use new one.

2. Add ATF SP-IV 700cc to the ATF injection hole.



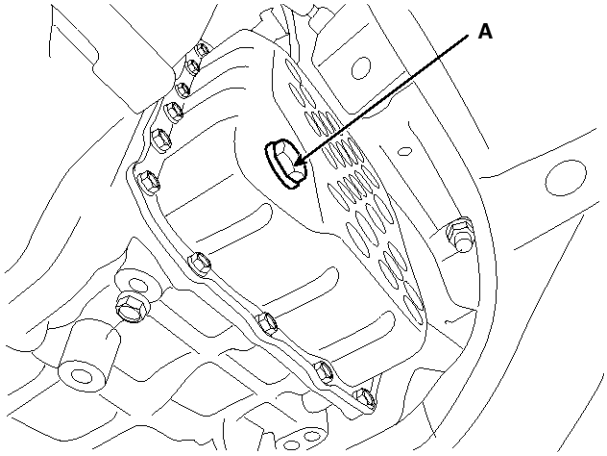
SLMAT0008D

3. Start the engine. (Don't step on brake and accelerator simultaneously.
4. Confirm that the temperature of the A/T oil temperature sensor is 50~60˚C(122~140˚F) with the GDS.
5. Shift the select lever slowly from "P" to "D", then "D" to "P" and repeat one more at idle.

CAUTION

Keep on each speed position more than 2 sec.

6. Lift the vehicle, then remove the oil level plug (A) from the valve body cover.



SVGAT0002D

CAUTION

At this time, the vehicle must be a horizontal state.

7. If the oil flows out of the overflow plug in thin steady stream, the oil level is correct.

   Then finish the procedure and tighten the oil plug.

NOTICE

Oil level check (excess or shortage) method

- *Excess: Oil flows out in thick stream.*
- *Shortage: No oil flows out of the overflow plug.*

CAUTION

If there is no damage at the automatic transaxle and the oil cooler, the oil cooler hose, transaxle case, valve body tightening state are normal, ATF must drop out after performing above 1 to 7 procedures. After performing above 1 to 7 procedures, if the oil doesn't drop out, inspect the automaticmatic transaxle system.

CAUTION

The gasket of the oil level plug use new one.

Oil level plug tightening torque:
34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~32.6 lb-ft)

8. Put down the vehicle with the lift and then tighten the eyebolt.

Replacement

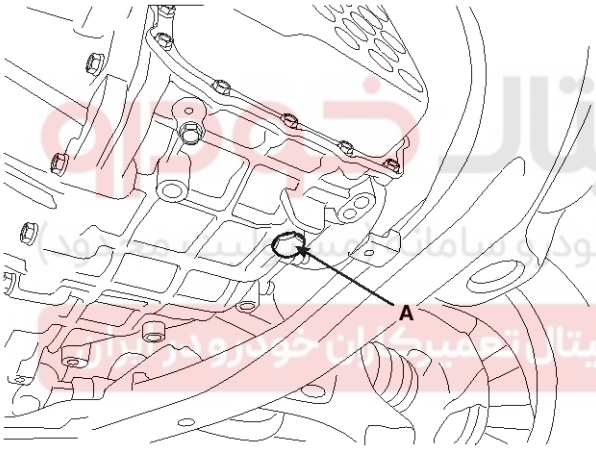
NOTICE

ATF of 6 speed automatic transaxle doesn't be replaced. But, if the vehicle is severe use or business use, replace ATF every 60,000 miles for severe usage.

Severe usage is defined as

- *Driving in rough road (Bumpy, Gravel, Snowy, Unpaved road, etc)*
- *Driving in mountain road, ascent/descent*
- *Repetition of short distance driving*
- *More than 50% operation in heavy city traffic during hot weather above 32˚C(89.6˚F) .*
- *Police, Taxi, Commercial type operation or trailer towing, etc*

1. Remove the drain plug (A) and reinstall the drain plug after draining ATF totally.



SYFAT0003D

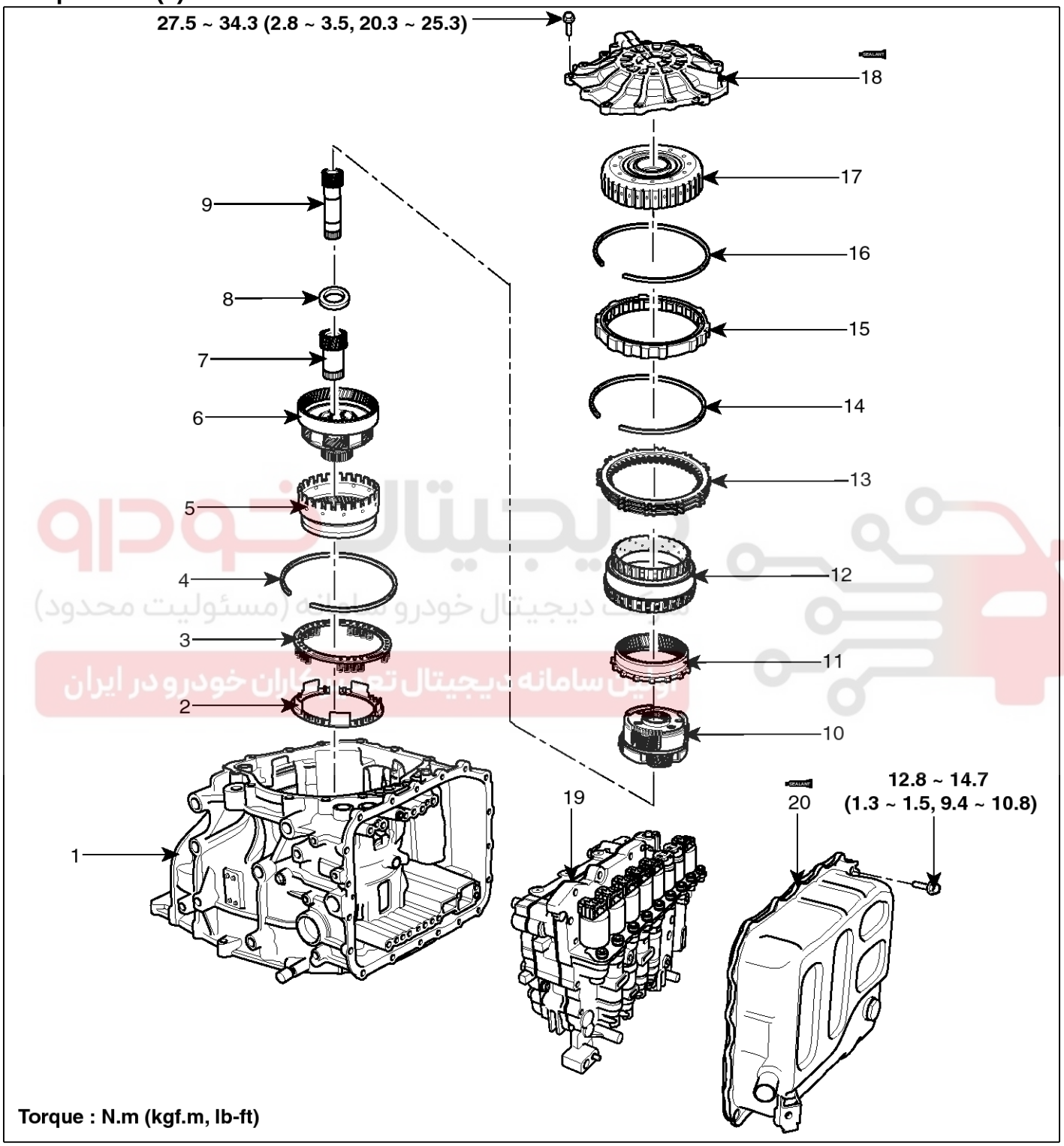
Drain plug tightening torque:
34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~32.6 lb-ft)

CAUTION
The gasket of the drain plug use new one.

2. Fill the oil about 5 liters.
3. Check the oil level. (Refer to Oil level check procedure.)

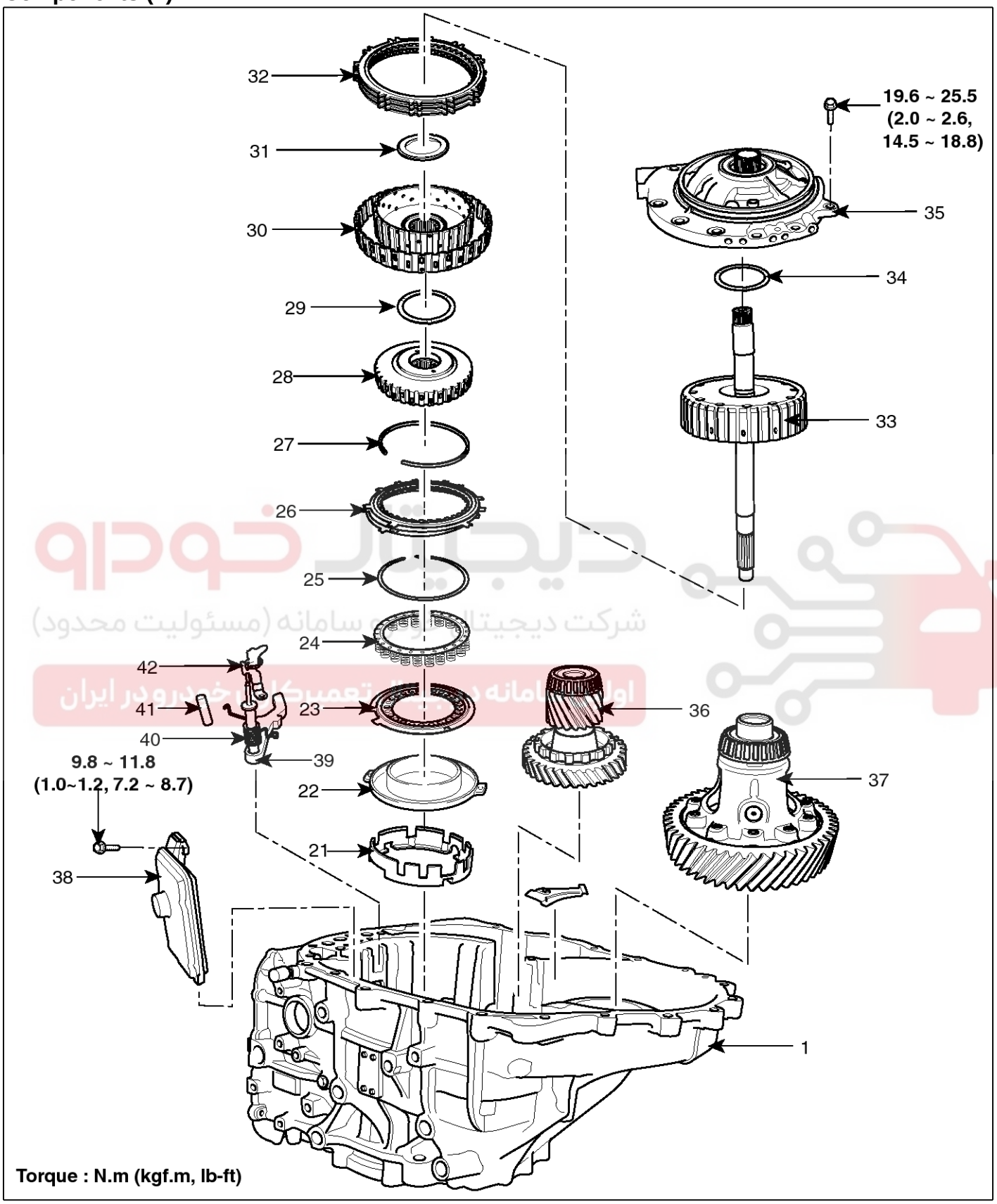
Automatic Transaxle

Components (1)



SCMAT0017L

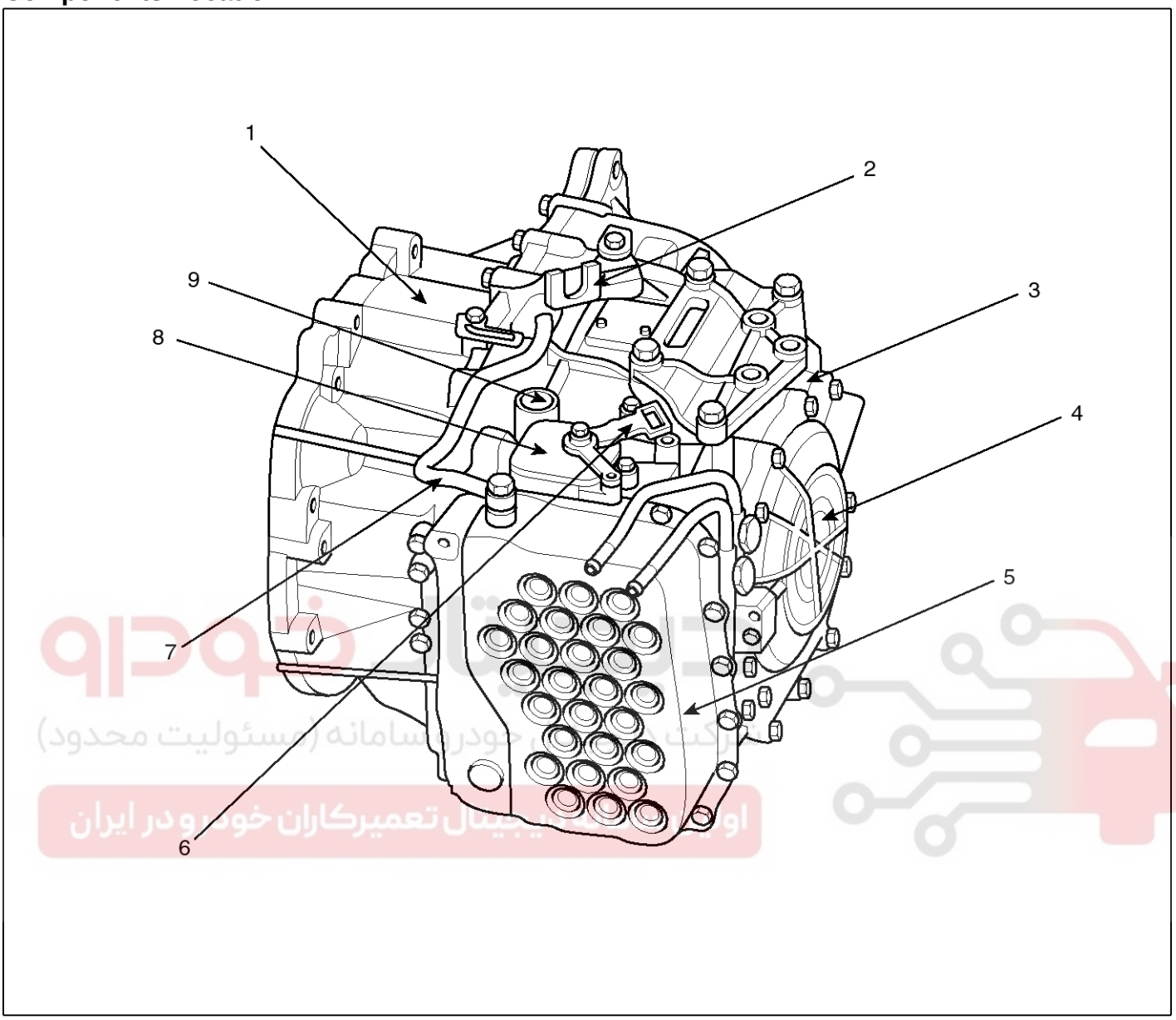
Components (2)



SXMAT0002L

1. Automatic transaxle case
2. Low & reverse brake piston
3. Low & reverse brake return spring
4. Snap ring
5. Front annulus gear assembly
6. Front planetary gear assembly
7. Front sun gear assembly
8. Bearing
9. Middle sun gear assembly
10. Middle & rear planetary gear assembly
11. Rear annulus gear assembly
12. One way clutch inner race assembly
13. Low & reverse brake disc set
14. Snap ring
15. One way clutch assembly
16. Snap ring
17. Overdrive clutch assembly
18. Rear cover assembly
19. Valve body assembly
20. Valve body cover
21. Under drive brake retainer
22. Under drive brake chamber
23. Under drive brake piston
24. Under drive brake spring
25. Snap ring
26. Under drive brake disc set
27. Snap ring
28. Under drive brake hub assembly
29. Thrust washer
30. 35R & 2/6 hub assembly
31. Thrust bearing
32. 2/6 brake disc set
33. 35R clutch assembly
34. Thrust washer
35. Oil pump assembly
36. Transfer driven gear assembly
37. Differential assembly
38. Oil filter assembly
39. Parking sprag
40. Parking sprag shaft & spring
41. Support shaft
42. Parking rod guide

Components Location

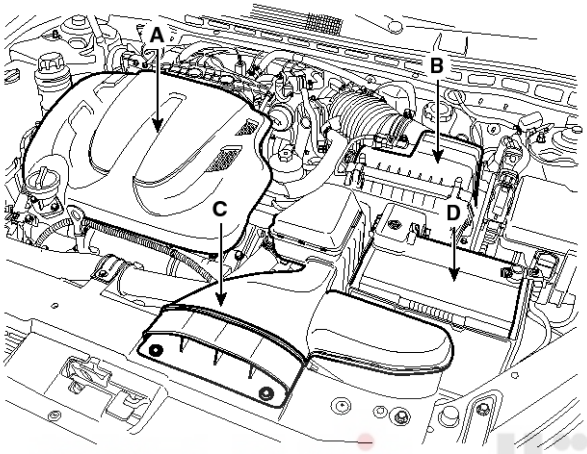


SYFAT0008D

1. Converter housing
2. Shift cable bracket
3. Automatic transaxle case
4. Rear cover
5. Valve body cover
6. Manual control lever
7. Air breather hose
8. Inhibitor switch
9. Solenoid valve connector

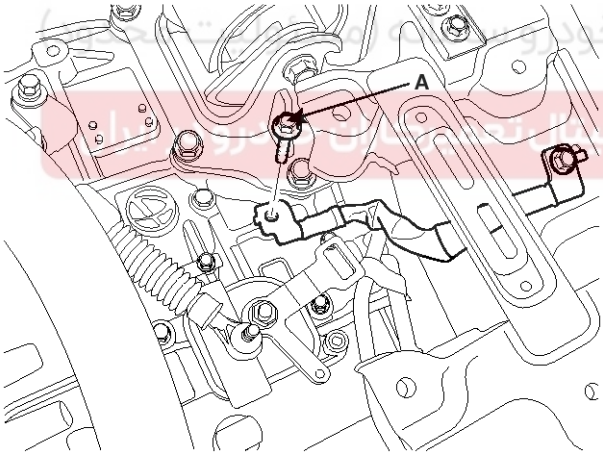
Removal

1. Remove the following items;
   - Engine cover (A) and the duct (C).(Refer to "Intake and Exhaust system" in EM group.)
   - Air cleaner assembly (B). (Refer to "Intake and Exhaust system" in EM group.)
   - Battery and battery tray (D).(Refer to "Charging system" in EE group.)



SVGAB0001D

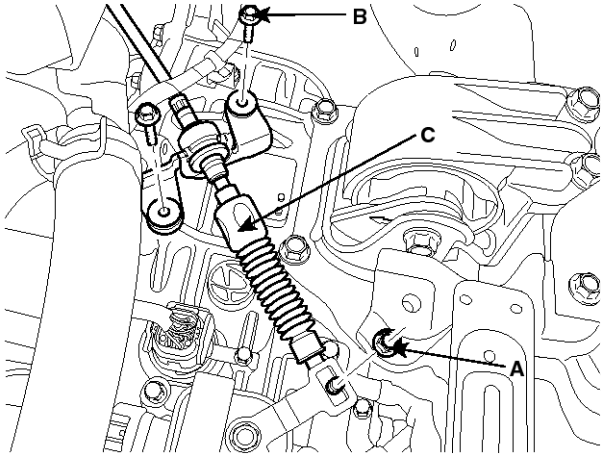
2. Remove the ground line after removing the bolt (A).



SXMAT9003D

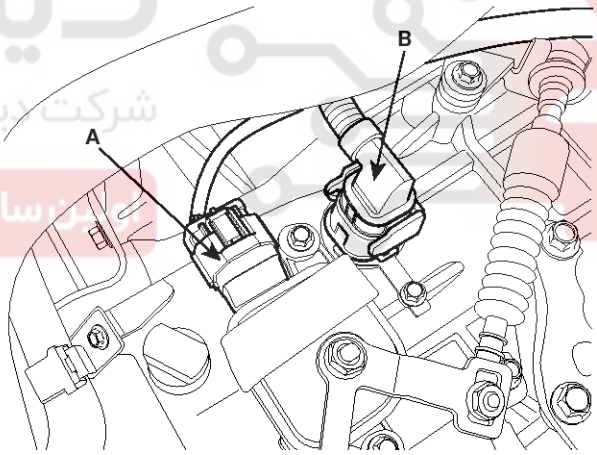
3. Remove the shift cable (C) after removing the nut (A) and the bolt (B).

Tightening torque:
(A) 8.8 ~ 13.7 N.m (0.9 ~ 1.4 kgf.m, 6.5 ~ 10.1 lb-ft)
(B) 17.7 ~ 24.5 N.m (1.8 ~ 2.5 kgf.m, 13.0 ~ 18.1 lb-ft)



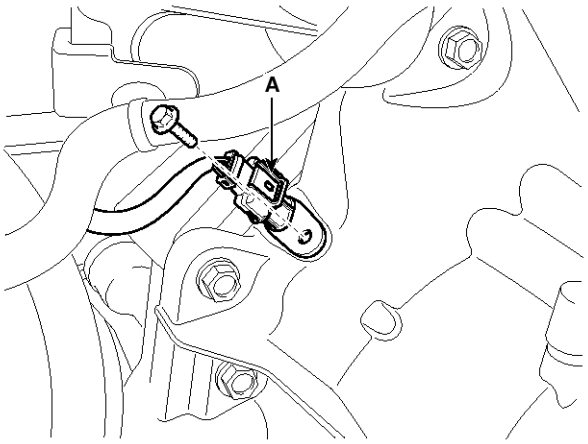
SXMAT9001D

4. Dissconnect the solenoid valve connector (B) and inhibitor switch connector (A).



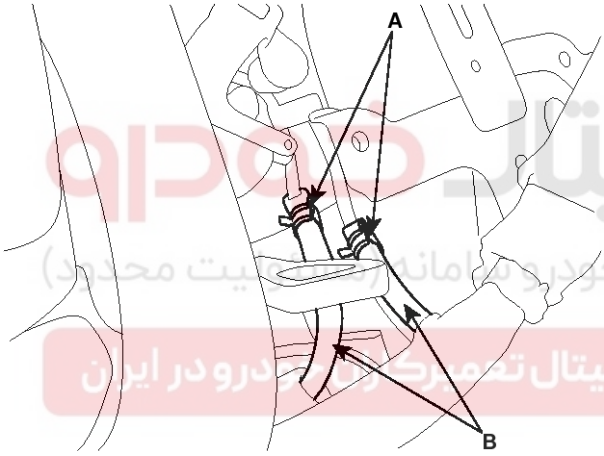
STGAT9004D

5. Remove the CKP sensor (A).



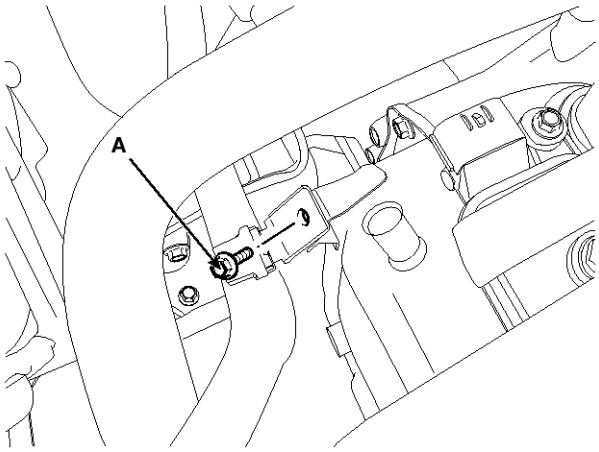
SGHAA9018D

6. Disconnect the hose (B) after removing the automatic transaxle fluid cooler hose clamp (A).



SCMAT6013D

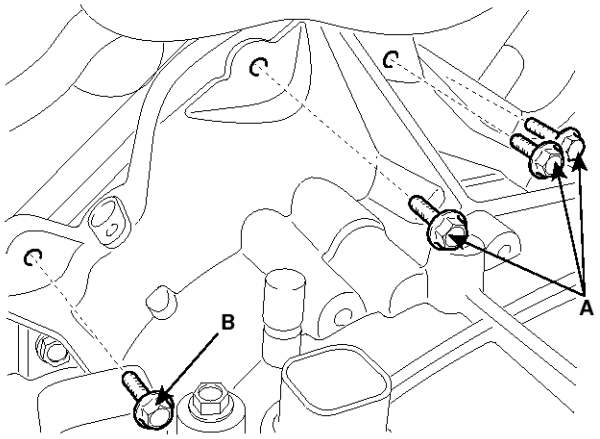
7. Remove the wiring bracket installation bolt (A).



SLMAA0022D

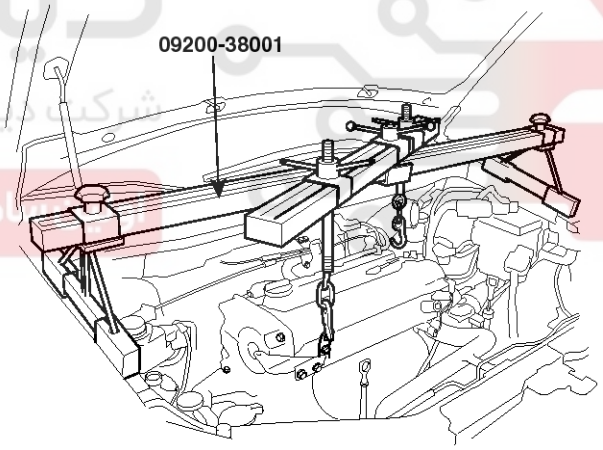
8. Remove the automatic transaxle upper mounting bolt (A, B).

Tightening torque:
(A) 63.7 ~ 83.4 N.m (6.5 ~ 8.5 kgf.m, 47.0 ~ 61.5 lb-ft)
(B) 32.4 ~ 49.0 N.m (3.3 ~ 5.0 kgf.m, 23.9 ~ 36.2 lb-ft)



STGAB9005D

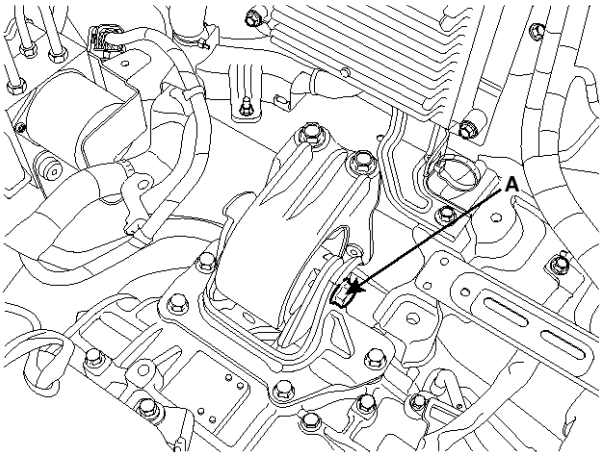
9. Using the SST(09200-38001), hold the engine and transaxle assembly safely.



SHDAA6002D

10. Remove the automatic transaxle mounting support bracket bolt (A).

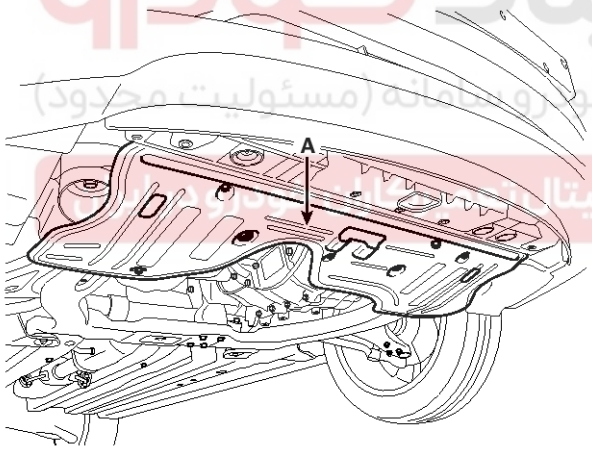
Tightening torque:
63.7 ~ 83.4 N.m (6.5 ~ 8.5 kgf.m, 47.0 ~ 61.5 lb-ft)



SCMAT0002L

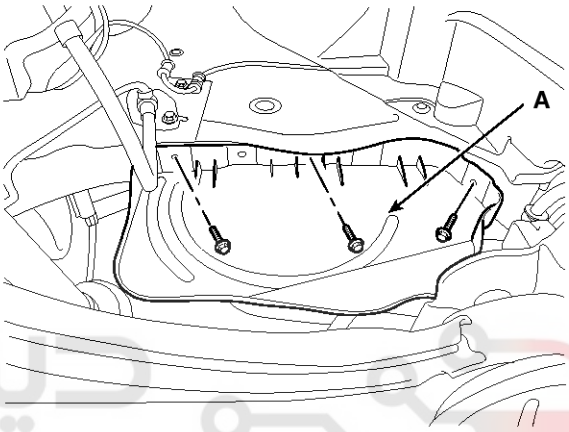
11. Remove the under cover (A).

Under cover installation bolt :
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



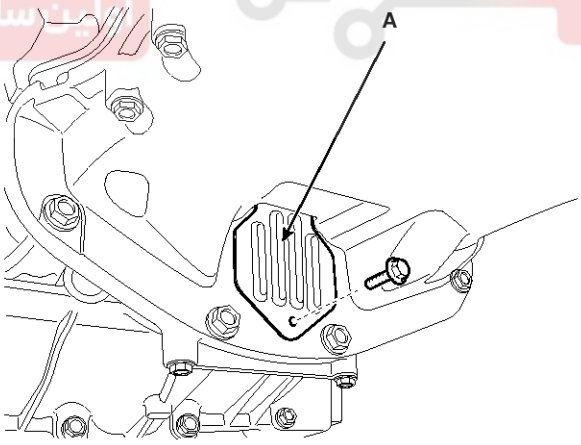
SYFAT0022D

12. Remove the following items;
    - Front wheels. (Refer to "Tires/Wheels" in SS group.)
    - Sub frame assembly. (Refer to "Front suspension system" in SS group.)
    - Drive shaft assembly from the automaticmatic transaxle system.(Refer to "Drive shaft assembly " in DS group.)
    - Front muffler assembly. (Refer to "Intake And Exhaust System" in EM group)
13. Remove the side cover (A).



SVGAA0102D

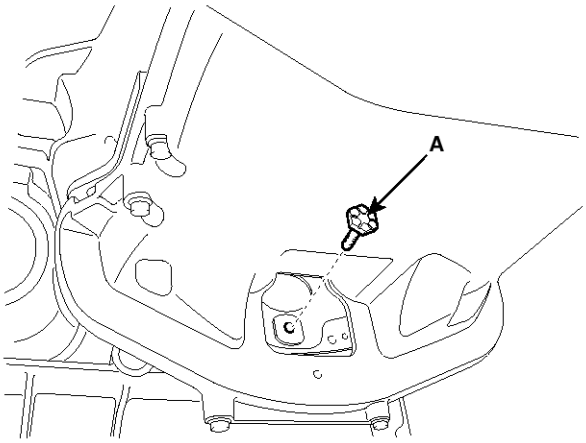
14. Remove the dust cover.(A)



SGHAA9033D

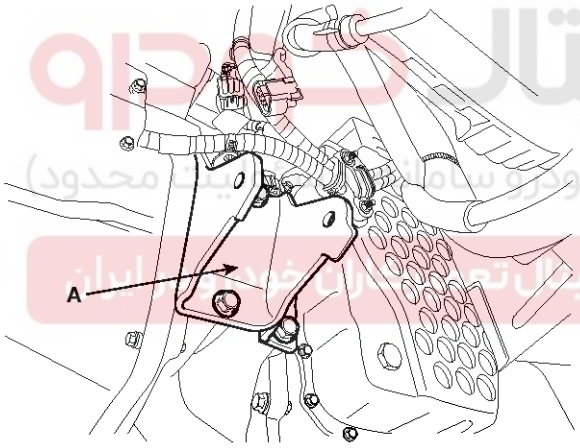
15. Remove the torque converter mounting bolt (A) (6ea) with rotating the crankshaft.

Tightening torque:
45.1 ~ 52.0 N.m (4.6 ~ 5.3 kgf.m, 33.3 ~ 38.3 lb-ft)



SGHAA9016D

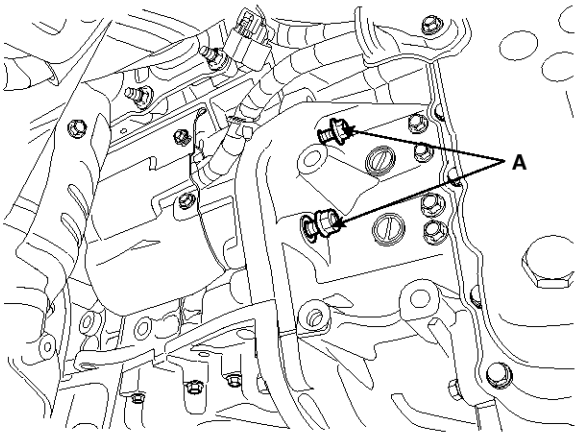
16. Remove the bracket (A).



SGHAA9008D

17. Remove the start motor mounting bolt (A).

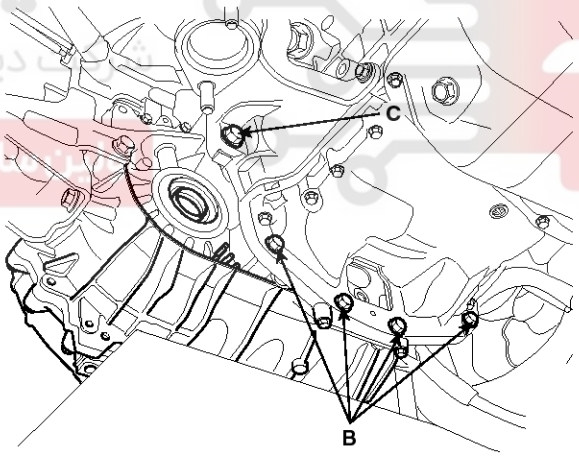
Tightening torque:
49.0 ~ 63.7N.m (5.0~6.5Kgf.m, 36.2 ~47.0 lb-ft)



SGHAA9009D

18. Remove the automatic transaxle with a jack after removing the mounting bolt (B-4ea, C-1ea).

Tightening torque:
(B) 39.2 ~ 46.1 N.m (4.0 ~ 4.7 kgf.m, 28.9~34.0lb-ft)
(C) 78.5 ~98.1N.m (8.0~10.0 kgf.m, 57.9 ~72.3 lb-ft)



SGHAA9007D

Installation

1. Installation is the reverse of removal.

CAUTION

After replacement or reinstallation procedure of the automaticmatic transaxle system, must perform procedures below.

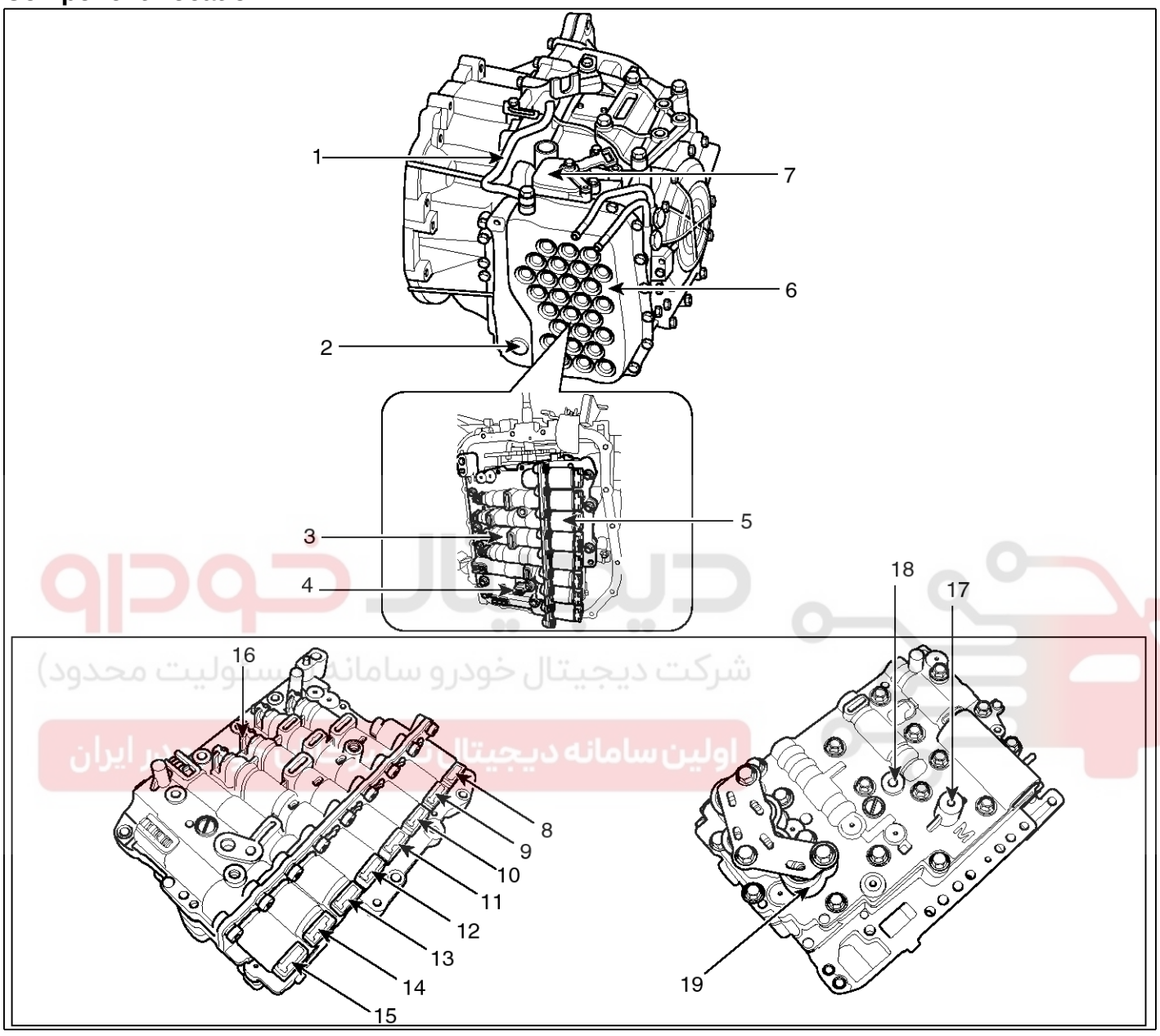
- **Power steering fluid replacement and air bleeding (Refer to "General information" in ST group.)**
- **Adding automatic transaxle fluid. (Refer to "automatic transaxle system" in this group.)**

NOTICE

- *When replacing the automatic transaxle, reset the automatic transaxle's values by using the GDS.*

Valve Body System

Component Location



SLMAT0003N

1. Air breather hose
2. Oil level plug
3. Valve body assembly
4. Oil temperature sensor
5. Solenoid valve
6. Valve body cover
7. Inhibitor switch
8. T/Con (VFS N/L)
9. 35R(VFS,N/H)
10. 2/6B (VFS,N/L)
11. UD(VFS,N/H)
12. OD(VFS,N/H)
13. SS-B(ON/OFF)
14. SS-A(ON/OFF)
15. LINE pressure(VFS,N/H)
16. PCV adjust screw
17. UD/B pressure
18. LR/B pressure(Low & Reverse Brake)
19. Accumulator

Valve Body

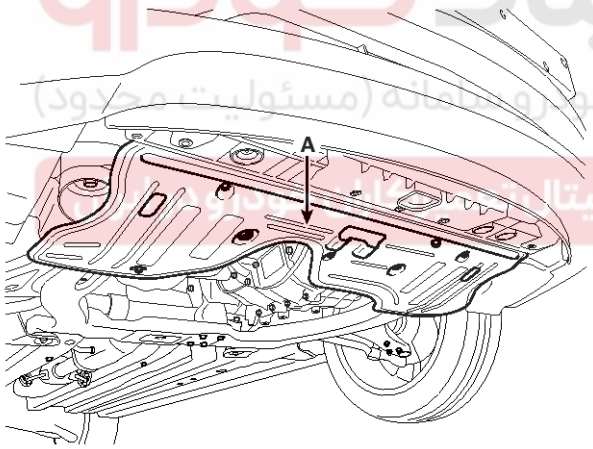
Specification

Piece	3pcs
Spool	20ea
Control	Full line pressure variable control Torque converter release control
Solenoid valve	VFS : 6ea ON/OFF: 2ea
Pressure adjusting	7ea Line pressure (1), Reducing press-ure (2), PCV (4)
Terminal type	Module

Removal

1. Remove the battery and the battery tray. (Refer to "Charging system" in EE group.)
2. Remove the under cover (A).

Under cover installation bolt :
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



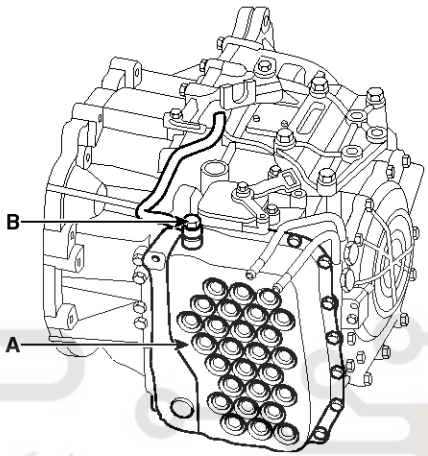
SYFAT0022D

3. Replace new gasket and the plug after drining the automatic transaxle fluid by removing the drain plug.
   (Refer to "Automatic transaxle system" in this group.)
4. Remove the valve body cover (A) and eyebolt (B).

Tightening torque:
(A) 12.8 ~ 14.7 N.m (1.3 ~ 1.5 kgf.m, 9.4 ~ 10.8 lb-ft)
(B) 34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~ 32.6 lb-ft)

CAUTION
The gasket of the eyebolt use new one.

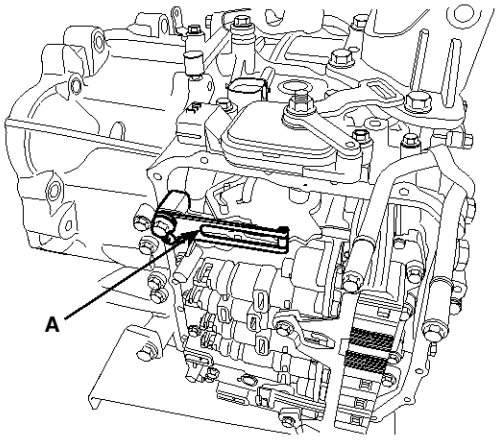
NOTICE
Remove installation bolts in the engin room first and then remove others under the vehicle.



SLMAT0004N

5. Remove the plate and the detend spring (A) after removing the bolt.

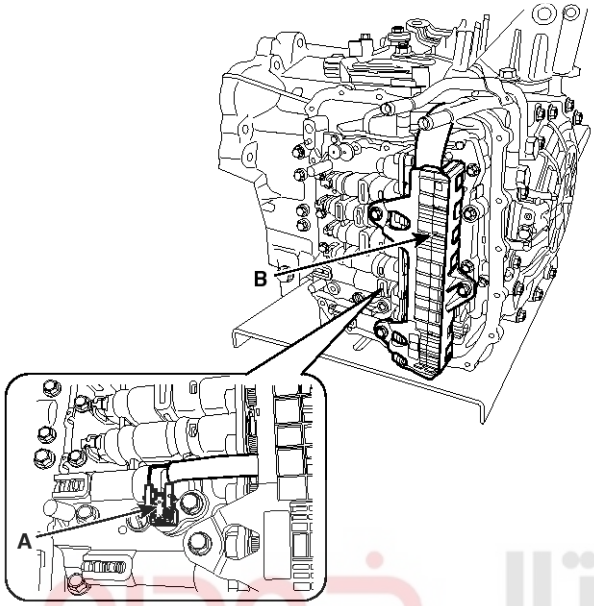
Tightening torque:
24.5 ~ 35.3 N.m (2.5 ~ 3.6 kgf.m, 18.1 ~ 26.0 lb-ft)



SLMAT0023D

6. Remove the bolt (3ea) after disconnecting the solenoid valve (B) connector and the oil temperature sensor connector (A).

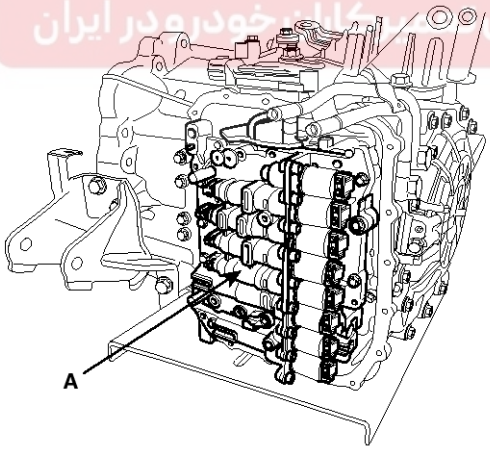
Tightening torque:
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



SLMAT0024D

7. Remove the valve body assembly (A).

Tightening torque:
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



SCMAT0008L

Installation

1. Installation is the reverse of removal.

⚠CAUTION
After replacement or reinstallation procedure of the valve body assembly, must perform procedures below.

- **Continue to apply liquid gasket at application points at the valve body cover with Ø2.5mm (0.0984in.) thickness.**

Liquid gasket Part name :
Threebond 1281B or LOCTITE FMD-546

- **Adding automatic transaxle fluid. (Refer to "automatic transaxle system" in this group.)**

Solenoid valve

Specification

Item	Function	Piece	Specification
VFS	26/B T/Con	2	Control pressure: 9.81~500.14kpa (0.1~5.1kgf/cm², 1.42~72.54 psi) Current value: 50~850mA Low Type, 5.1Ω
	Line pressure control	1	Control pressure: 500.14~9.81kpa (5.1~0.1kgf/cm², 72.54~1.42psi) Current value: 50~850mA High Type, 5.1Ω
	35R UD OD	3	Control pressure: 500.14~9.81kpa (5.1~0.1kgf/cm², 72.54~1.42psi) Current value: 50~850mA High Type, 5.1Ω
On/Off	SS-A SS-B	2	Control pressure: 490.33kpa (5.0kgf/cm², 71.12psi) 10~11Ω Low Type

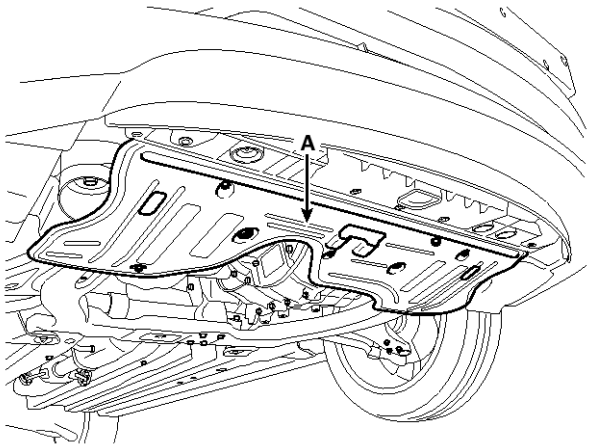
Solenoid Valve Operation Table

	SS-A	SS-B	UD-VFS	OD-VFS	35R-VFS	26-VFS
			N/H	N/H	N/H	N/L
N, P	●		●		●	
1	△			△	●	
2				●	●	●
3		●		●		
4					●	
5		●	●			
6			●		●	●
L	●				●	
R	●	●	●			

Removal

1. Remove the battery and the battery tray. (Refer to "Charging system" in EE group.)
2. Remove the under cover (A).

Under cover installation bolt :
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



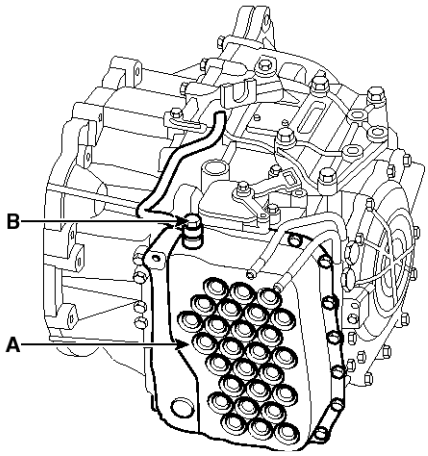
SYFAT0022D

3. Replace new gasket and the plug after drining the automatic transaxle fluid by removing the drain plug. (Refer to "Automatic transaxle system" in this group.)
4. Remove the valve body cover (A) and eyebolt (B).

Tightening torque:
(A) 12.8 ~ 14.7 N.m (1.3 ~ 1.5 kgf.m, 9.4 ~ 10.8 lb-ft)
(B) 34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~ 32.6 lb-ft)

CAUTION
The gasket of the eyebolt use new one.

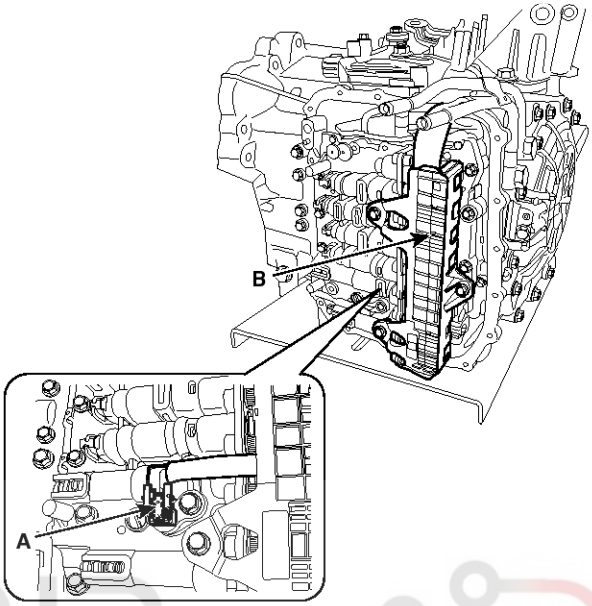
NOTICE
Remove installation bolts in the engin room first and then remove others under the vehicle.



SLMAT0004N

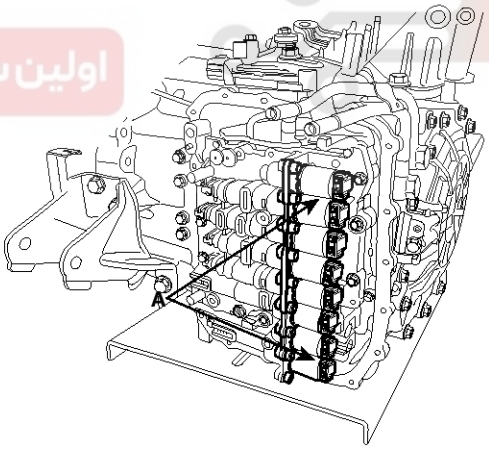
5. Remove the bolt (3ea) after disconnecting the solenoid valve connector (B) and the oil temperature sensor connector (A).

Tightening torque:
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



SLMAT0024D

6. Remove the solenoid valve (A) after removing the solenoid support.



SCMAT0018L

CAUTION
When installing, apply the ATF oil or White Vaseline to the O-ring not to be damaged.

Installation

1. Installation is the reverse of removal.

⚠CAUTION

After replacement or reinstallation procedure of the valve body assembly, must perform procedures below.

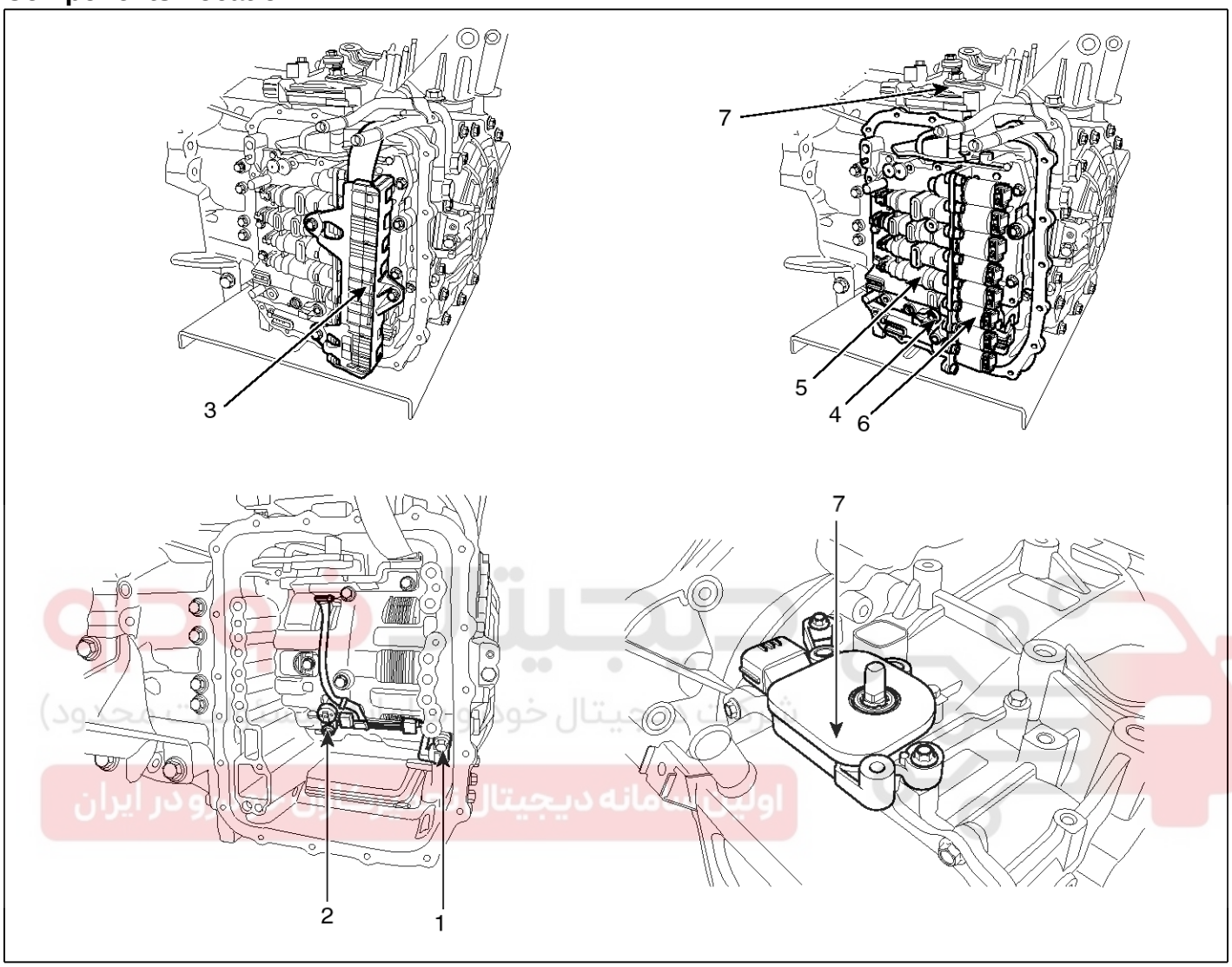
- **Continue to apply liquid gasket at application points at the valve body cover with Ø2.5mm (0.0984in.) thickness.**

Liquid gasket Part name :
Threebond 1281B or LOCTITE FMD-546

- **Adding automatic transaxle fluid. (Refer to "automatic transaxle assembly" in this group.)**

Automatic Transaxle Control System

Components Location

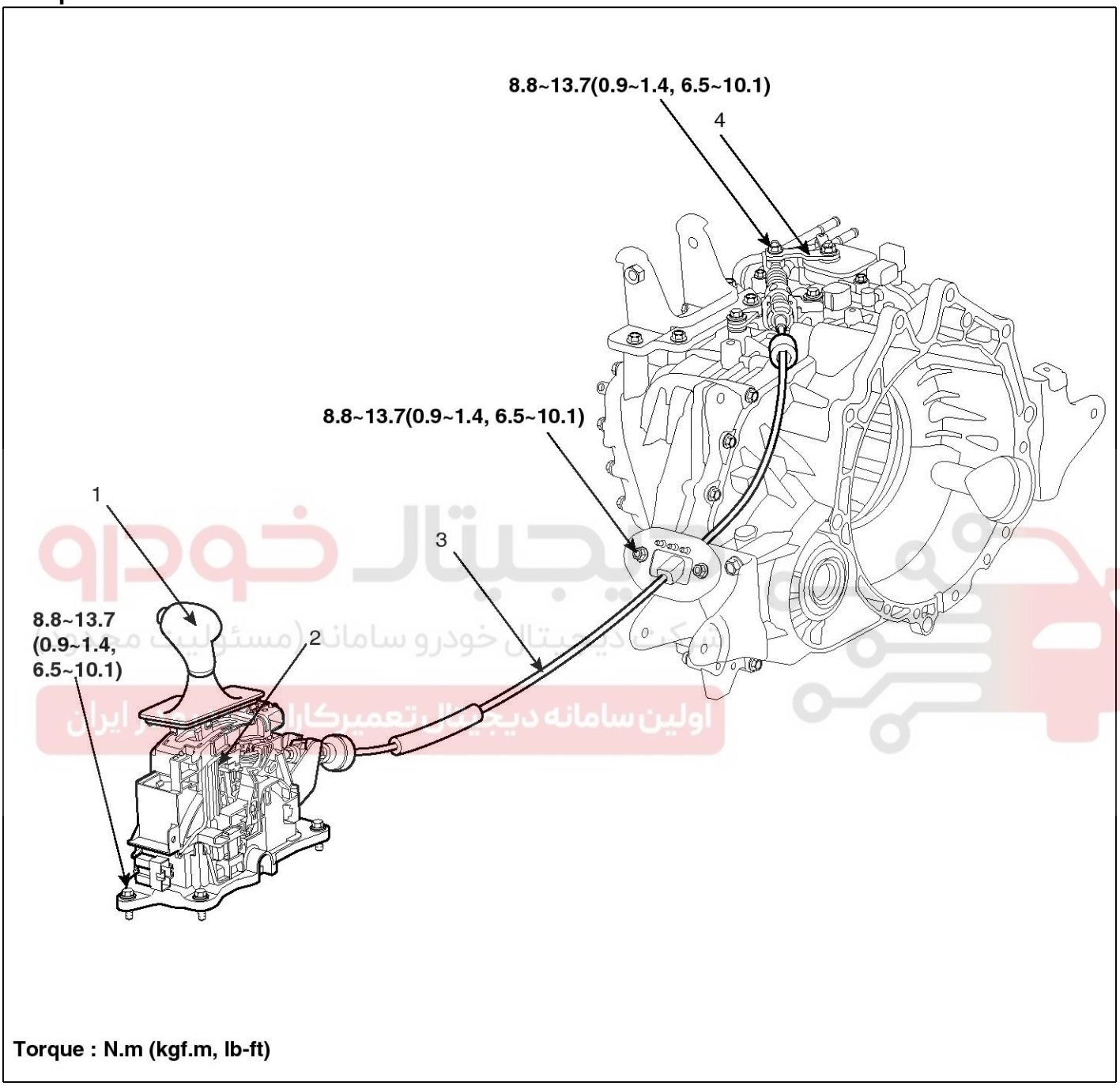


SLMAT0026D

1. Input speed sensor
2. Output speed sensor
3. Solenoid valve connector
4. Oil temperature sensor
5. Valve body assembly
6. Solenoid valve
7. Inhibitor switch

Shift Lever

Components



SVGAT0100L

1. Shift lever knob & Boots assembly
2. Shift lever assembly
3. Control cable assembly
4. Automatic transaxle assembly

Removal

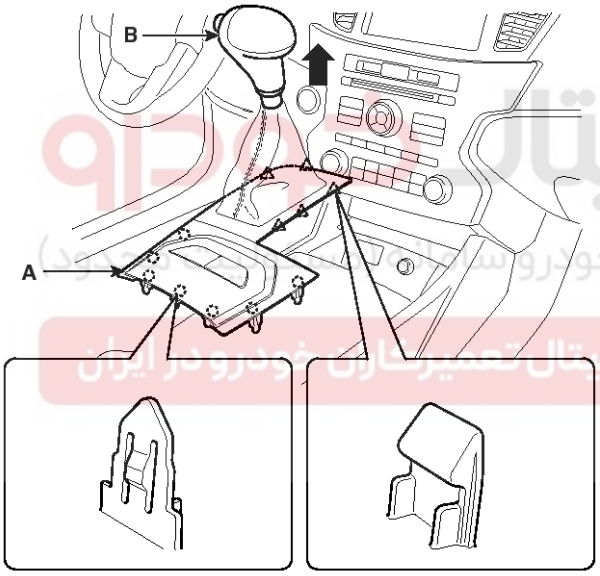
1. Using a screwdriver or remover, remove the floor console upper cover (A).
2. Remove the knob (B) after pulling it up and then remove the floor console upper cover (A). (Pulling power : 55 ± 10kgf)

CAUTION

- **Be careful not to damage the knob when removing it. If you rotate the knob when removing it, it may be broken.**
- **Should not rotate the knob when removing it.**

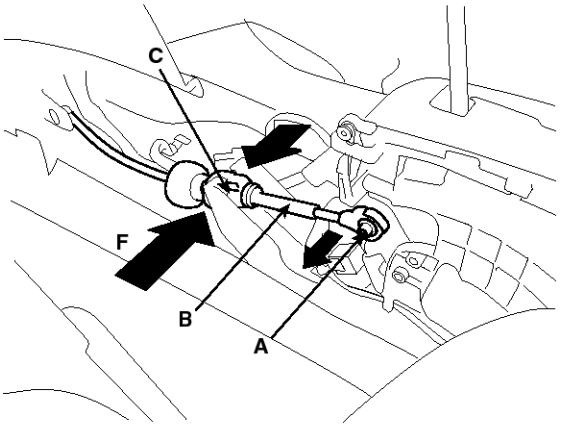
NOTICE

- *Hit the knob with a rubber mallet after installing the knob to the lever rod. (Pushing power : 30 ± 10 kgf)*
- *Hit the knob until the discernment line on the rod is not seen.*



SVGAT0053D

3. Remove the center console assembly. (Refer to "Interior" in BD group.)
4. Disconnect the shift cable (A) and then remove the shift cable (B) after pressing the shift cable socket (C) in the direction of "F".

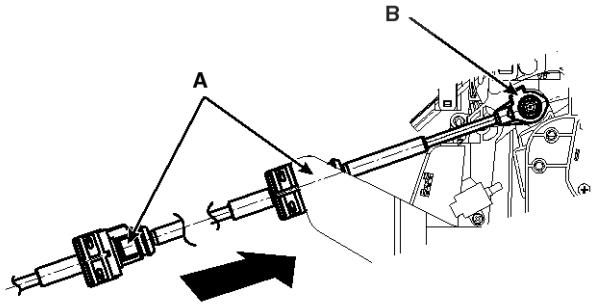


SVGAA0107D

NOTICE

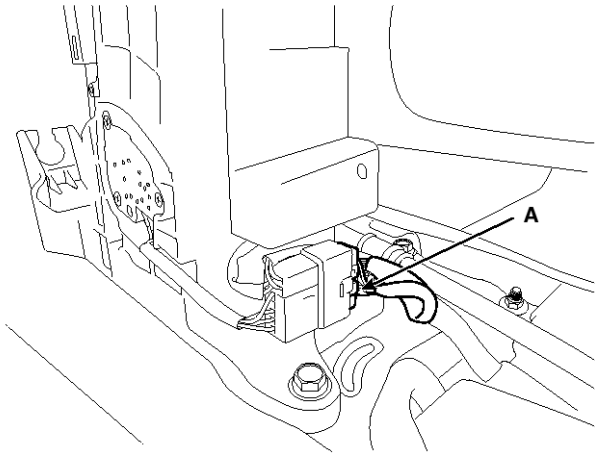
Installating method for shift cable lever side

- *Install the cable socket part to the lever assembly securely after adjusting the wings (A) of cable socket part upward.*
- *Install the cable socket part to the lever assembly securely after adjusting the projection (B) to prevent wrong assembly upward.*



SVGAA0106D

5. Shift lever assembly connector (A).

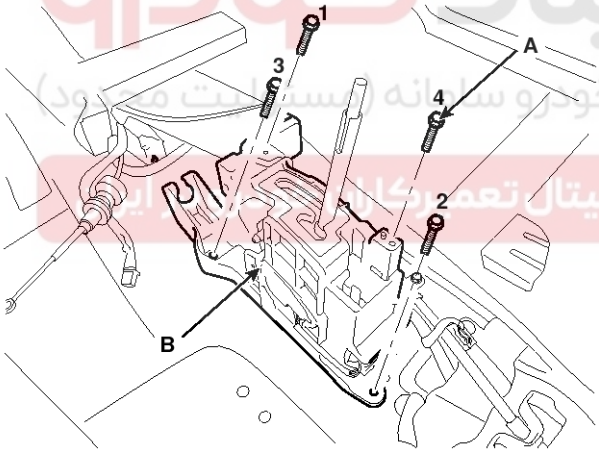


SVGAT0050D

6. Remove the shift lever assembly (B) by removing the bolts (A-4ea).

Tightening torque:
8.8 ~ 13.7 N.m (0.9 ~ 1.4 kgf.m, 6.5 ~ 10.1 lb-ft)

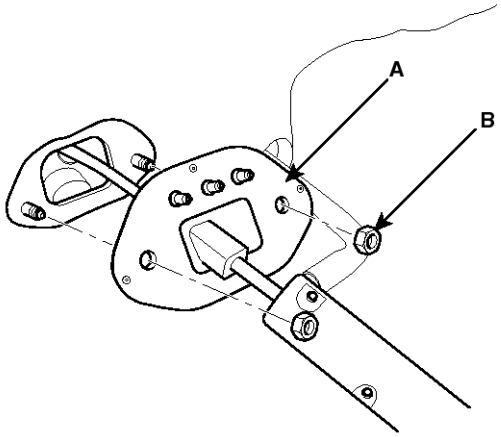
NOTICE
Tighten them in diagonal directions.(1-2-3-4)



SVGAT0051D

7. Remove the shift cable assembly in the vehicle after removing the nuts (B) and the retainer (A).

Tightening torque:
8.8 ~ 13.7 N.m (0.9 ~ 1.4 kgf.m, 6.5 ~ 10.1 lb-ft)



SHDAT6108D

8. Remove the cable from the bracket at transaxle assembly side (Refer to "Automatic Transaxle" in this group).
9. Remove the shift cable at cabin room.

Inspection

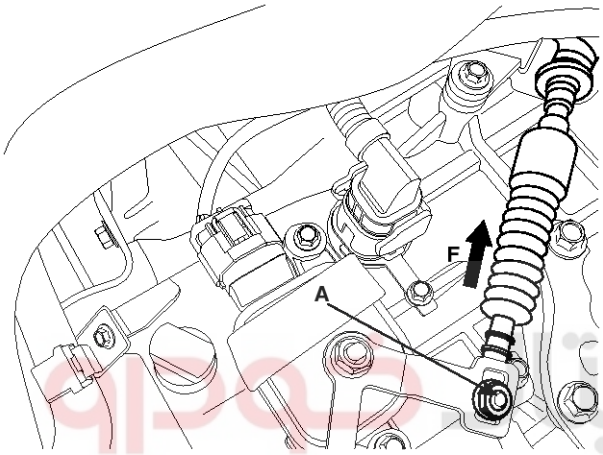
1. Check the damage and operation of the control cable.
2. Check the damage of the boot.
3. Check the damage and corrosion of the bushing.
4. Check the damage or weakening of the spring.

Adjustment

Adjusting method for T/M control cable

1. Set room side lever and T/M side lever to "N" position.
2. Connect room side lever and shift cable.
3. Push cable to "F" direction shown to eliminate FREE PLAY.
4. Tighten adjusting nut (A).

Tightening torque:
8.8 ~ 13.7 N.m (0.9 ~ 1.4 kgf.m, 6.5 ~ 10.1 lb-ft)



SGHAA9034D

5. After adjusting according Check to be sure that this part operates surely at each range of T/M side corresponding to each position of room lever.

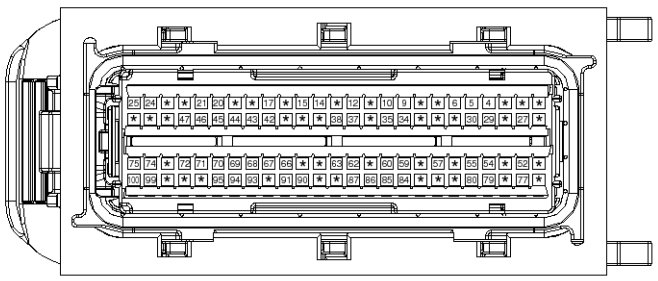
Installation

1. Installation is the reverse of removal.

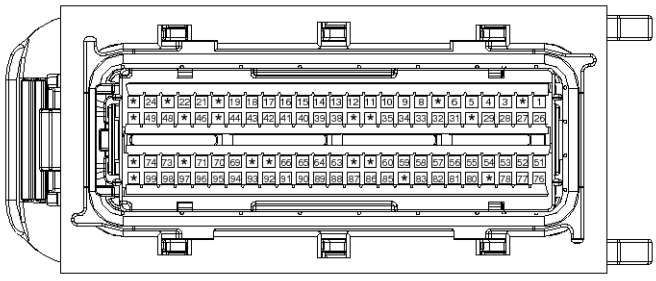
⚠CAUTION
Set room side lever and T/M side lever to "N" position.

Transaxle Control Module (TCM)

1. TCM connector and terminal function



Connector [CLG-A]



Connector [CLG-B]

SCMAB0014L

2. TCM terminal function

Connector [CLG-A]

Pin	Description	Pin	Description
1	-	45	Inhibitor switch signal 'S2'
2	-	46	Inhibitor switch signal 'S3'
3	-	47	Inhibitor switch signal 'S4'
4	-	48	-
5	-	49	-
6	-	50	-
7	-	51	-
8	-	52	-
9	-	53	-
10	CAN High	54	Sports mode down switch
11	-	55	-
12	-	56	-
13	-	57	-
14	-	58	-
15	-	59	-
16	-	60	-
17	-	61	-
18	-	62	-
19	-	63	-
20	-	64	-
21	-	65	-
22	-	66	-

Pin	Description	Pin	Description
23	-	67	-
24	-	68	-
25	-	69	-
26	-	70	-
27	IG_1	71	-
28	-	72	-
29	Sports mode up switch	73	-
30	-	74	-
31	-	75	-
32	-	76	-
33	-	77	-
34	-	78	
35	CAN Low	79	Sports mode Select switch
36	-	80	-
37	-	81	-
38	-	82	-
39	-	83	-
40	-	84	Shift lock solenoid
41	-	85	Reverse lamp relay
42	-	86	P/N relay
43	-	87	-
44	Inhibitor switch signal 'S1'	88	-

Connector [CLG-B]

Pin	Description	Pin	Description
1	Shift solenoid D(VFS-OD)	52	Shift solenoid A(VFS-UD)
3	Input speed sensor signal	53	Shift solenoid F(SS-B)
4	Output speed sensor signal	54	Power output speed
26	Torque Converter Clutch solenoid (VFS-T/Con)	55	Oil temperature sensor (-)
27	Shift solenoid C(35R_VFS)	57	Oil temperature sensor (+)
28	Shift solenoid E(SS-A)	76	Solenoid power 1
29	Power input speed	77	Solenoid power 2
51	Pressure control solenoid A(VFS-LINE)	78	Shift solenoid B(VFS-26B)

3. TCM Terminal input/ output signal

Connector [CHG-A]

Pin No.	Signal	Condition	Type	Level
29	Sports mode up switch	UP ON	Input	Off : ATIGN-0.5V Min On : 1.0V Max
		Others		
44	Inhibitor switch signal `S1`	High	Input	On : ATIGN-0.5V Min Off : 1.0V Max
		Low		
45	Inhibitor switch signal `S2`	High	Input	On : ATIGN-0.5V Min Off : 1.0V Max
		Low		
46	Inhibitor switch signal `S3`	High	Input	On : ATIGN-0.5V Min Off : 1.0V Max
		Low		
47	Inhibitor switch signal `S4`	High	Input	On : ATIGN-0.5V Min Off : 1.0V Max
		Low		
54	Sports mode down switch	DOWN ON	Input	Off : ATIGN-0.5V Min On: 1.0V Max
		Others		
79	Sports mode select switch	Sport mode	Input	Off : ATIGN-0.5V Min On: 1.0V Max
		Others		
84	Shift lock solenoid	High	Output	Vhigh =IGN – 0.5V (min) Vlow =1V (max)
		Low		
85	Reverse lamp relay	R ON	Output	Vhigh =IGN – 0.5V (min) Vlow =1V (max)
		Others		
86	P/N relay	High	Output	Vhigh =IGN – 0.5V (min) Vlow =1V (max)
		Low		

Connector [CHG-B]

Pin No.	Signal	Condition	Type	Level
1	Shift solenoid D (VFS-OD)		Ouput	Dither frequency : 250~300Hz Base frequency :2~ 4KHz
3	Input speed sensor signal	High	Input	40% <Duty<60% 0.5Hz <Freq.<10KHz
		Low		
4	Output speed sensor signal	High	Input	40% <Duty<60% 0.5Hz <Freq.<10KHz
		Low		
26	Torque converter clutch solenoid (VFS-T/con)		Ouput	Dither frequency : 250~300Hz Base frequency :2~ 4KHz
27	Shift solenoid C (35R-VFS)		Output	0V/Vbatt Level 9V < Vbatt Level < 16V
28	Shift solenoid E (SS-A)		Output	0V/Vbatt Level 9V < Vbatt Level < 16V
29	Power input speed	ON	Power	Voltage Range : 8V ± 0.25V
		OFF		
51	Pressure control solenoid A(VFS-LINE)		Output	0V/Vbatt Level 9V<Vbatt Level<16V
52	Shift solenoid A(VFS-UD)		Output	0V/Vbatt Level 9V<Vbatt Level<16V
53	Shift solenoid F (SS-B)		Output	0V/Vbatt Level 9V<Vbatt Level<16V
54	Power output speed	ON	Power	Voltage Range : 8V ± 0.25V
		OFF		
55	Oil temperature sensor (-)	ON	GND	Vmax=3.26V @ -40℃ Vmin=0.29V @ 150℃
		OFF		
76	Solenoid power 1	ON	Power	BATT± 0.1V @ 450RPM ↑
		OFF		
77	Solenoid power 2	ON	Power	BATT± 0.1V @ 450RPM ↑
		OFF		
78	Shift solenoid B (VFS-26B)		Output	0V/Vbatt Level 9V < Vbatt Level < 16V

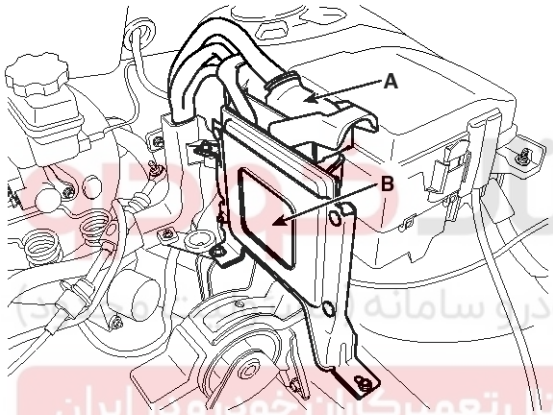
Replacement

NOTICE

In the case of the vehicle equipped with immobilizer or button engine start system, perform "Key Teaching" procedure together (Refer to "Immobilizer" or "Button Engine Start System in BE group).

1. Turn ignition switch OFF and disconnect the negative (-) battery cable.
2. Disconnect the TCM Connector.
3. Remove the air cleaner assembly (Refer to "Intake And Exhaust System" in EM group).
4. Remove the mounting bolts (A), and then remove the TCM (B).

TCM installation bolt/nut :
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



SYFAT0021D

5. Installation is reverse of removal.

TCM Problem Inspection Procedure

1. TEST TCM GROUND CIRCUIT: Measure resistance between TCM and chassis ground using the backside of TCM harness connector as TCM side check point. If the problem is found, repair it.

Specification: Below 1Ω

2. TEST TCM CONNECTOR: Disconnect the TCM connector and visually check the ground terminals on TCM side and harness side for bent pins or poor contact pressure. If the problem is found, repair it.
3. If problem is not found in Step 1 and 2, the TCM could be faulty. If so, make sure there were no DTC's before swapping the TCM with a new one, and then check the vehicle again. If DTC's were found, examine this first before swapping TCM.
4. RE-TEST THE ORIGINAL TCM: Install the original TCM (may be broken) into a known-good vehicle and check the vehicle. If the problem occurs again, replace the original TCM with a new one. If problem does not occur, this is intermittent problem (Refer to “Intermittent Problem Inspection Procedure” in Basic Inspection Procedure).

Adjustment

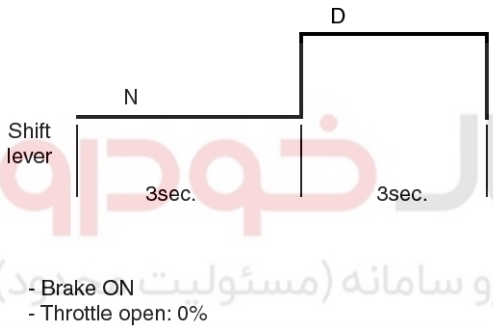
TCM Learning

When shift shock is occurred or parts related with the transaxle are replaced, TCM learning should be performed.

In the following case, TCM learning is required.

- Transaxle assembly replacement
- TCM replacement
- TCM upgrading

1. TCM learning condition
   - ATF temperature: 60~115°C (140~239°F)
2. TCM learning procedure
   A. Stop learning
      Repeat the below shift pattern four times or more with stepping on the brake.



   B. Driving learning
      1. Drive the vehicle through all gears at D range. Drive from stop to 1st to 2nd to 3rd to 4th to 5th to 6th with keeping fixed throttle open.
      2. Down shift from 6th to 5th, 5th to 4th, 4th to 3rd, 3rd to 2nd, 2nd to 1st.
      3. Repeat the above driving pattern four times or more.

NOTICE

Up-shift throttle open : 15~30%

Input Speed Sensor

Description

- Integrated one unit for input & output speed sensor
- Differential current type (low: 7mA, high: 14mA)
- Failsafe: 4th gear hold (D), 2nd ~ 4th manual shift (S)

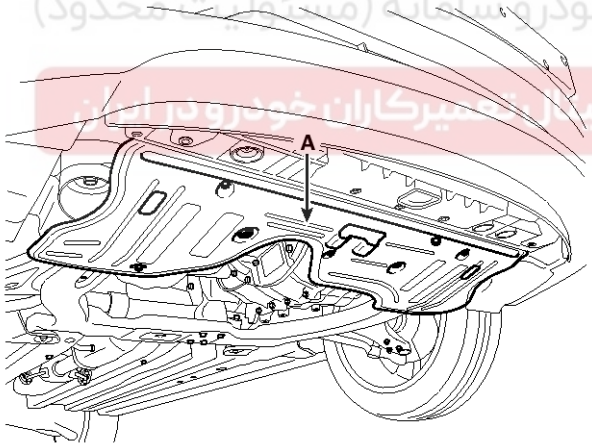
Specification

Item	Specification
Type	Hall Effect Sensor, 2pins (Power: 9V, Signal)
Operation condition	-40 ~150(℃) [-40 ~ 302(°F)]
Sensor length	43.2~43.4 mm (1.7008~1.7087 in.)
Air gap	0.95~1.55 mm (0.0374~0.0610 in.)

Removal

1. Remove the battery and the battery tray. (Refer to "Charging system" in EE group.)
2. Remove the under cover (A).

Under cover installation bolt :
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



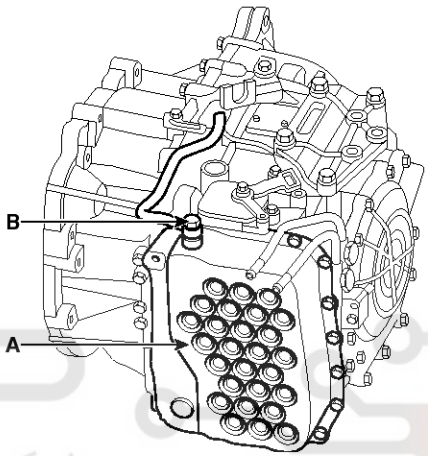
SYFAT0022D

3. Replace new gasket and the plug after drining the automatic transaxle fluid by removing the drain plug.
   (Refer to "Automatic transaxle system" in this group.)
4. Remove the valve body cover (A) and eyebolt (B).

Tightening torque:
(A) 12.8 ~ 14.7 N.m (1.3 ~ 1.5 kgf.m, 9.4 ~ 10.8 lb-ft)
(B) 34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~ 32.6 lb-ft)

CAUTION
The gasket of the eyebolt use new one.

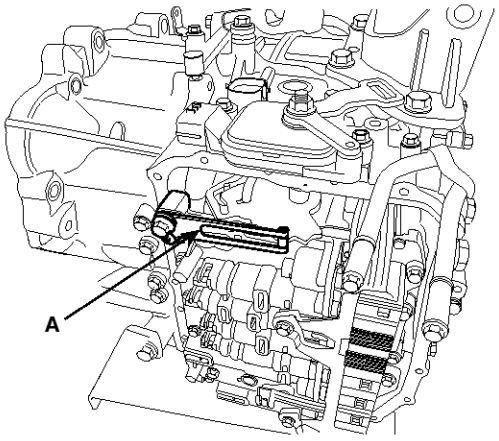
NOTICE
Remove installation bolts in the engin room first and then remove others under the vehicle.



SLMAT0004N

5. Remove the plate and the detend spring (A) after removing the bolt.

Tightening torque:
24.5 ~ 35.3 N.m (2.5 ~ 3.6 kgf.m, 18.1 ~ 26.0 lb-ft)

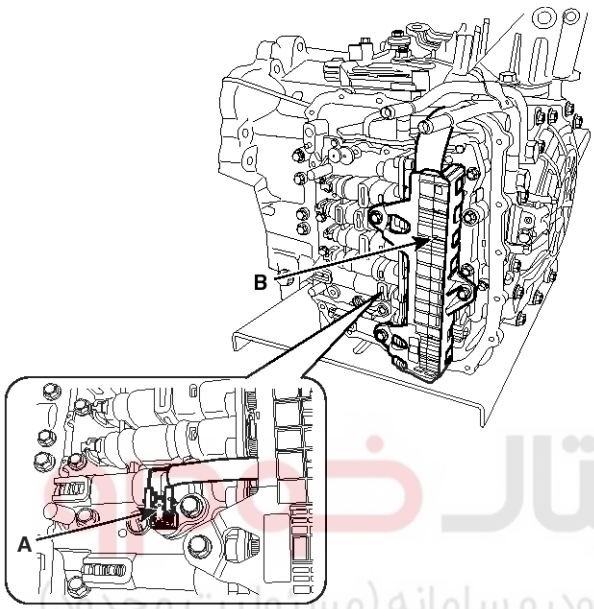


SLMAT0023D

6. Remove the bolt (3ea) after disconnecting the solenoid valve connector (A) and the oil temperature sensor connector (B).

Tightening torque:
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)

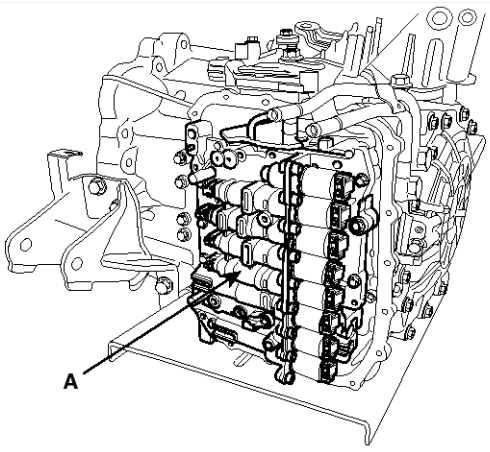
⚠CAUTION
Be careful not to damage the harness lock connector.



SLMAT0024D

7. Remove the valve body assembly (A).

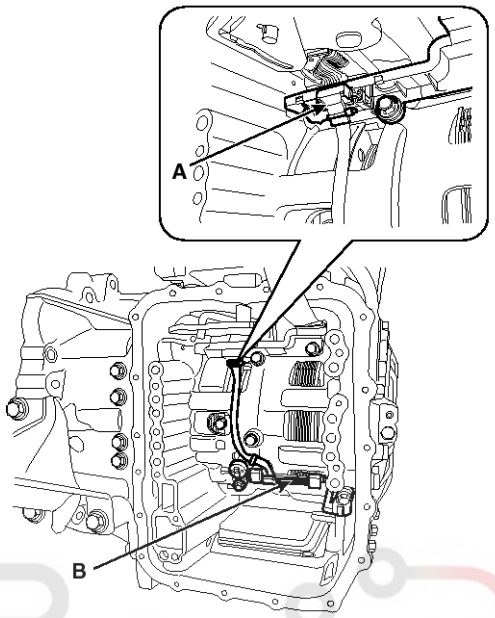
Tightening torque:
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



SCMAT0008L

8. Disconnect the connector (A) from the main wiring.
9. Remove the input & output speed sensor (B) after removing the bolts (2ea)

Tightening torque:
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



SCMAT0011L

Installation

1. Installation is the reverse of removal.

⚠CAUTION
After replacement or reinstallation procedure of the valve body assembly, must perform procedures below.

- **Continue to apply liquid gasket at application points at the valve body cover with Ø2.5mm (0.0984in.) thickness.**

Liquid gasket Part name :
Threebond 1281B or LOCTITE FMD-546

- **Adding automatic transaxle fluid. (Refer to "automatic transaxle system" in this group.)**

Output Speed Sensor

Description

- Integrated one unit for input & output speed sensor
- Differential current type (low: 7mA, high: 14mA)
- Failsafe: 4th gear hold (D), 2nd ~ 4th manual shift (S)

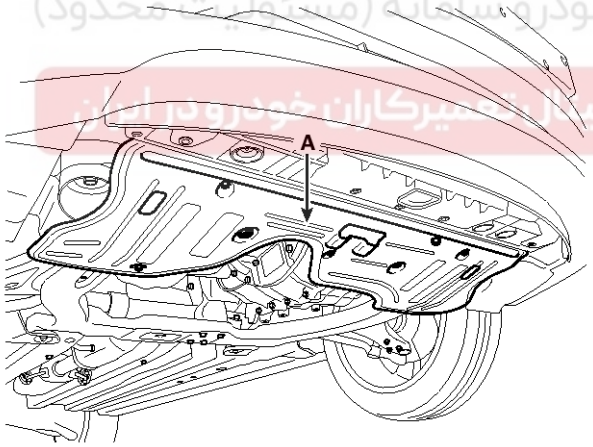
Specification

Item	Specification
Type	Hall Effect Sensor, 2pins (Power: 9V, Signal)
Operation condition	-40 ~150(℃) [-40 ~ 302(°F)]
Sensor length	30.7~30.9 mm (1.2087~1.2165 in.)
Air gap	1~ 0.55 mm (0.0394~0.0217 in.)

Removal

1. Remove the battery and the battery tray. (Refer to "Charging system" in EE group.)
2. Remove the under cover (A).

Under cover installation bolt :
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



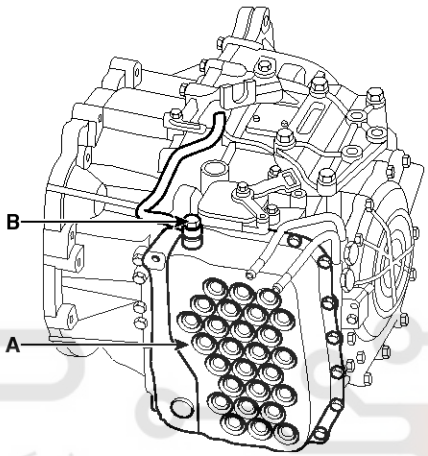
SYFAT0022D

3. Replace new gasket and the plug after drining the automatic transaxle fluid by removing the drain plug.
   (Refer to "Automatic transaxle system" in this group.)
4. Remove the valve body cover (A) and eyebolt (B).

Tightening torque:
(A) 12.8 ~ 14.7 N.m (1.3 ~ 1.5 kgf.m, 9.4 ~ 10.8 lb-ft)
(B) 34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~ 32.6 lb-ft)

CAUTION
The gasket of the eyebolt use new one.

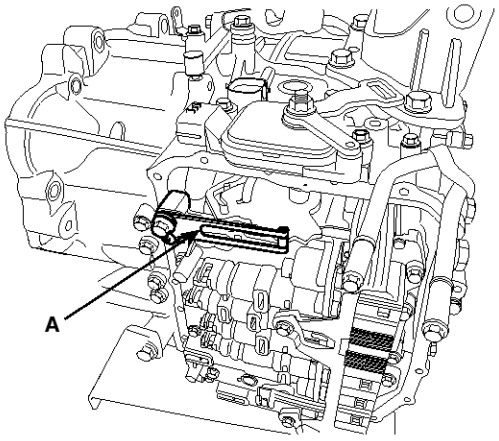
NOTICE
Remove installation bolts in the engin room first and then remove others under the vehicle.



SLMAT0004N

5. Remove the plate and the detend spring (A) after removing the bolt.

Tightening torque:
24.5 ~ 35.3 N.m (2.5 ~ 3.6 kgf.m, 18.1 ~ 26.0 lb-ft)

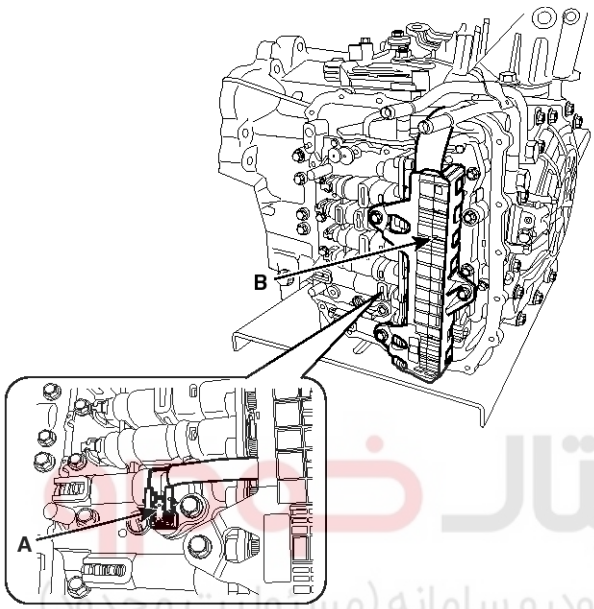


SLMAT0023D

6. Remove the bolt (3ea) after disconnecting the solenoid valve connector (A) and the oil temperature sensor connector (B).

Tightening torque:
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)

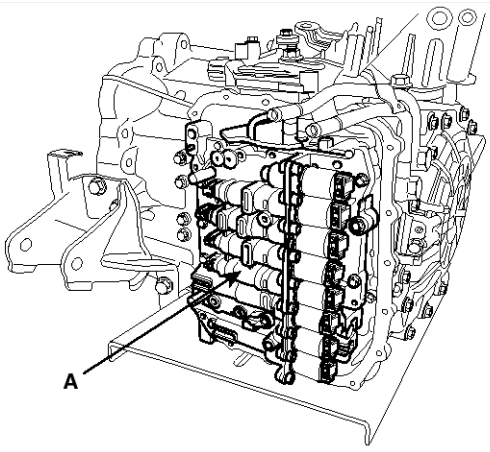
⚠CAUTION
Be careful not to damage the harness lock connector.



SLMAT0024D

7. Remove the valve body assembly (A).

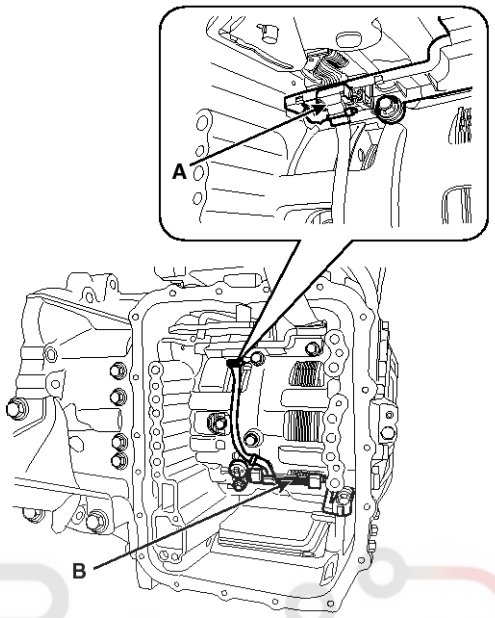
Tightening torque:
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



SCMAT0008L

8. Disconnect the connector (A) from the main wiring.
9. Remove the input & output speed sensor (B) after removing the bolts (2ea)

Tightening torque:
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



SCMAT0011L

Installation

1. Installation is the reverse of removal.

⚠CAUTION
After replacement or reinstallation procedure of the valve body assembly, must perform procedures below.

- **Continue to apply liquid gasket at application points at the valve body cover with Ø2.5mm (0.0984in.) thickness.**

Liquid gasket Part name :
Threebond 1281B or LOCTITE FMD-546

- **Adding automatic transaxle fluid. (Refer to "automatic transaxle system" in this group.)**

Transaxle Oil Temperature Sensor

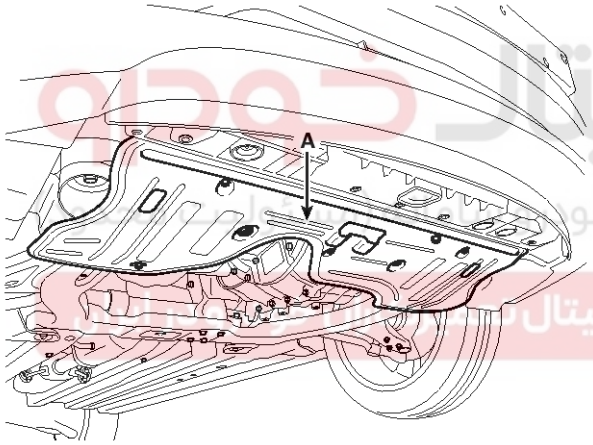
Specification

Item	Specification
Type	Negative Thermal Coefficient Type
Operation temperature	-40~165°C (-40~329°F)
Resistance	4.68kΩ~43 Ω
Failsafe	Oil temperature set to default value [80°C(176°F)]

Removal

1. Remove the battery and the battery tray. (Refer to "Charging system" in EE group.)
2. Remove the under cover (A).

Under cover installation bolt :
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



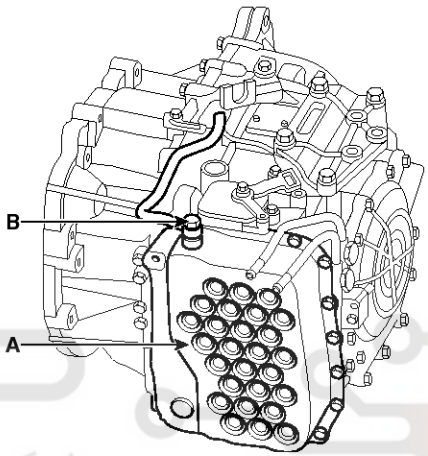
SYFAT0022D

3. Replace new gasket and the plug after drining the automatic transaxle fluid by removing the drain plug.
   (Refer to "Automatic transaxle system" in this group.)
4. Remove the valve body cover (A) and eyebolt (B).

Tightening torque:
(A) 12.8 ~ 14.7 N.m (1.3 ~ 1.5 kgf.m, 9.4 ~ 10.8 lb-ft)
(B) 34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~ 32.6 lb-ft)

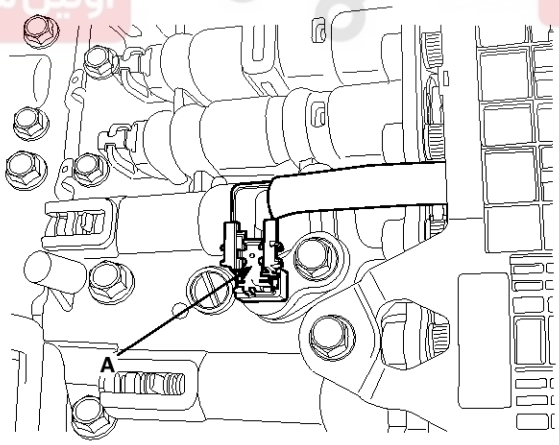
CAUTION
The gasket of the eyebolt use new one.

NOTICE
Remove installation bolts in the engin room first and then remove others under the vehicle.



SLMAT0004N

5. Disconnect the oil temperature sensor connector (A).

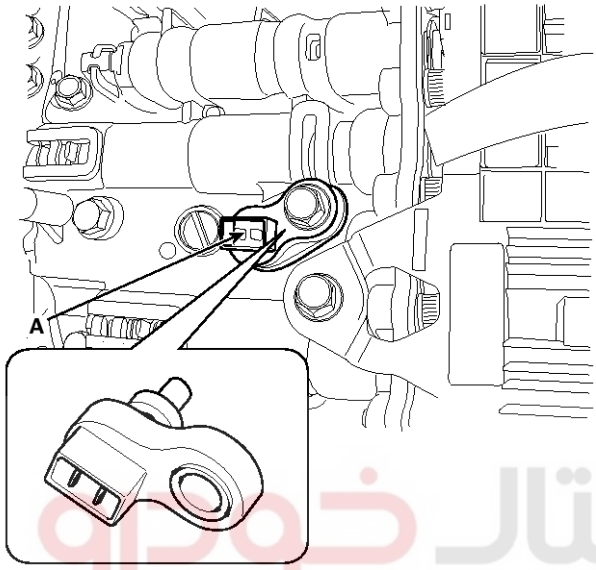


SCMAT0012L

6. Remove the oil temperature sensor (A) after removing a bolt.

Tightening torque:
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)

⚠CAUTION
Be careful not to damage the harness lock connector.



SCMAT0013L

Installation

1. Installation is the reverse of removal.

⚠CAUTION
After replacement or reinstallation procedure of the valve body assembly, must perform procedures below.

- **Continue to apply liquid gasket at application points at the valve body cover with Ø2.5mm (0.0984in.) thickness.**

Liquid gasket Part name :
Threebond 1281B or LOCTITE FMD-546

- **Adding automatic transaxle fluid. (Refer to "automatic transaxle system" in this group.)**

Inhibiter Switch

Description

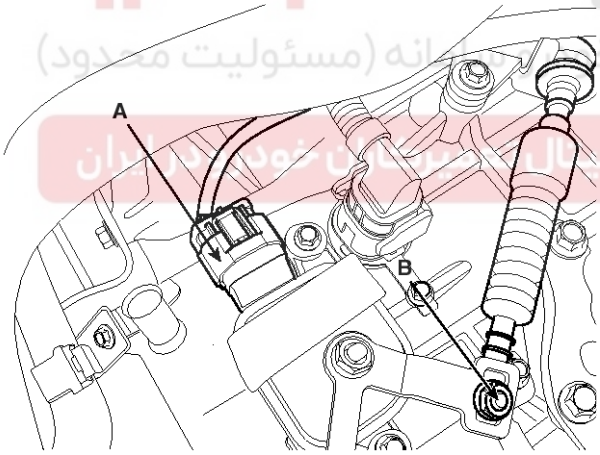
Item	Specification
Type	Combination of output signals from 4 terminals
Power supply	12V
Range detection	7-position (P, R, N, D, X, Y, Z)
Failsafe	1st, 2nd gear is prohibited.

Removal

1. Set room side lever and T/M side lever to "N" position.
2. Remove the battery and the battery tray. (Refer to "Charging system" in EE group.)
3. Remove the air cleaner assembly. (Refer to "Intake manifold" in EM group.)
4. Remove the shift cable mounting nut (B).

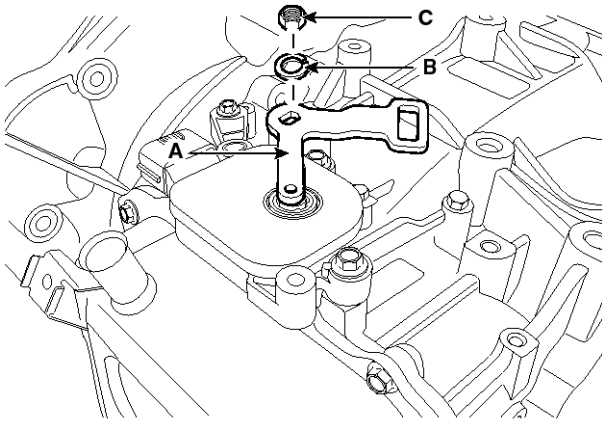
Tightening torque :
8.8 ~ 13.7 N.m (0.9 ~ 1.4 kgf.m, 6.5 ~ 10.1 lb-ft)

5. Disconnect the inhibitor switch connector (A).



SLMAT0008N

6. Remove the manual control lever (A) and the washer (B) after removing a nut (C).



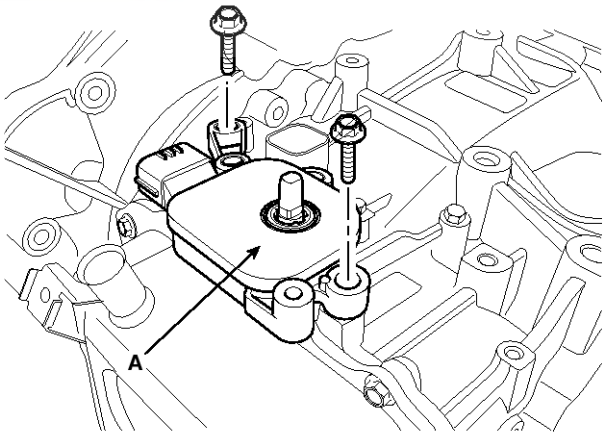
SLMAT0010D

⚠CAUTION
When installing, fix the manual control lever and the inhibitor switch with Ø5mm (0.1969in.) fixing jig.

And then tighten the inhibitor assembly mounting bolts.

7. Remove the inhibitor assembly (A) after removing the bolts (2ea).

Tightening torque:
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



SCMAT0016L

⚠CAUTION
When installing, tighten the inhibitor assembly mounting bolt lightly.

Installation

1. Installation is the reverse of removal.