General Information

Specifications

Item		F4A42-2
Tightening torque converter type		3-element, 1-stage, 2-phase type
Transaxle type		4-speed forward, 1-speed reverse
Engine displacement		2.0L GSL
Gear ratio	1st	2.842
	2nd	1.529
	3rd	1.000
	4th	0.712
	Reverse	2.480
Final gear ratio		4.438
Shift pattern	Variable	
Shift range	4range (P-R-N-D) + Sports mode	
Shift range valve	PWM ; 5EA(Duty control) , VFS	
Stall speed	2100~2900rpm	
Planetary gear	2EA(Output planetary/Overdrive planetary)	
Clutch	3EA	
Brake	2EA	
OWC	1EA	

Tightening Torques

Item	Nm	kgf.m	lb-ft
Wiring harness bracket	20 ~ 26	2.0 ~ 2.6	14 ~ 18
Control cable bracket bolt	20 ~ 26	2.0 ~ 2.6	14 ~ 18
Eye bolt	27 ~ 33	2.7 ~ 3.3	20 ~ 25
Oil cooler feed tube	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	18 ~ 25	1.8 ~ 2.5	13 ~ 18
Transaxle range switch	10 ~ 12	1.0 ~1.2	7 ~ 8
Speedometer gear	4 ~ 6	0.4 ~ 0.6	3 ~ 4
Valve body cover	8 ~ 10	0.8 ~ 1.0	6 ~ 7
Valve body mounting bolt	10 ~ 12	1.0 ~1.2	7 ~ 8
Oil temperature sensor	10 ~ 12	1.0 ~1.2	7 ~ 8
Manual control shaft detent	5 ~ 7	0.5 ~ 0.7	4 ~ 5
Rear cover	20 ~ 26	2.0 ~ 2.6	14 ~ 18
Torque converter housing	42 ~ 54	4.2 ~ 5.4	29 ~ 38
Oil pump	20 ~ 26	2.0 ~ 2.6	14 ~ 18
Transfer drive gear	16 ~ 22	1.6 ~ 2.2	11 ~ 15
Output shaft lock nut	160 ~ 180	16.0 ~ 18.0	110 ~ 126
Output shaft bearing retainer	20 ~ 26	2.0 ~ 2.6	14 ~ 18
Oil filler plug	29 ~ 34	2.9 ~ 3.4	21.4 ~ 25.1
Oil drain plug	40 ~ 50	4.0 ~ 5.0	29 ~ 36
Transfer drive gear lock nut	180 ~ 210	18.0 ~ 21.0	126 ~ 147
Differential drive gear to subframe bolts	130 ~ 140	13.0 ~ 14.0	91 ~ 98
Valve body	10 ~ 12	1.0 ~ 1.2	7 ~ 8
Solenoid valve support	5 ~ 7	0.5 ~ 0.7	4 ~ 5
Plate	5 ~ 7	0.5 ~ 0.7	4 ~ 5
Pressure check plug	8 ~ 10	0.8 ~ 1.0	6 ~ 7
Front roll stopper bracket to subframe bolts	40 ~ 55	4.0 ~ 5.5	29 ~ 40
Front roll stopper insulator bolt and nut	50 ~ 65	5.0 ~ 6.5	36 ~ 47
Front roll stopper bracket to transaxle bolts	60 ~ 80	6.0 ~ 8.0	43 ~ 58
Rear roll stopper bracket	40 ~ 55	4.0 ~ 5.5	29 ~ 40
Rear roll stopper insulator bolt and nut	50 ~ 65	5.0 ~ 6.5	36 ~ 47
Rear roll stopper bracket to transaxle bolts	60 ~ 80	6.0 ~ 8.0	43 ~ 58
Transaxle mounting sub bracket nut	60 ~ 80	6.0 ~ 8.0	43 ~ 58

Item	Nm	kgf.m	lb-ft
Transaxle mounting bracket bolts	40 ~ 55	4.0 ~ 5.5	29 ~ 40
Transaxle mounting insulator bolt	90 ~ 110	9.0 ~ 11.0	65 ~ 80

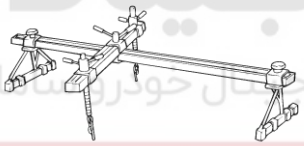
Lubricant

Item	Specified lubricant	Quantity
Transmission oil	Diamond ATF SP-III	7.8ℓ(8.2 Us qt, 6.9Imp.qt)

Sealant

Item	Specified Sealant
Rear cover Torque converter housing Valve body cover	Three Bond - TB 1281B or LOCTITE - FMD - 546
Transmission case side cover	Three Bond - TB 1389 or LOCTITE - 518
Side cover	Three Bond - TB 1389 or LOCTITE - 518/587

Special Service Tools

Tool (Number and name)	Illustration	Use
09200 - 38001 Engine support fixture	 D0038001	Removal and installation of transaxle.

Automatic Transaxle System

Description

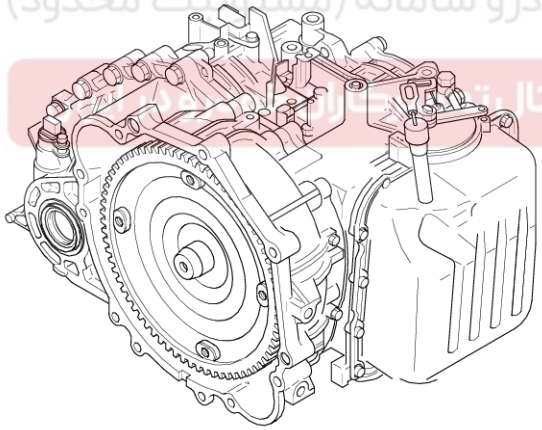
The automatic transmission is a combination of 3-element 2-phase 1-stage torque converter and double shaft electrocally-controlled unit which provides 4 speeds forward and 1 reverse. To improve the efficiency of power transmission, the line pressure control was changed applying “Variable Force Solenoid (VFS) valve” on this model.

However, adopting VFS on this model, the line pressure is variably changed according to TPS and the vehicle speed, this will enable more improved efficiency of power transmission and fuel consumption.

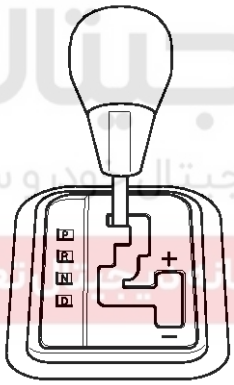
Characteristics

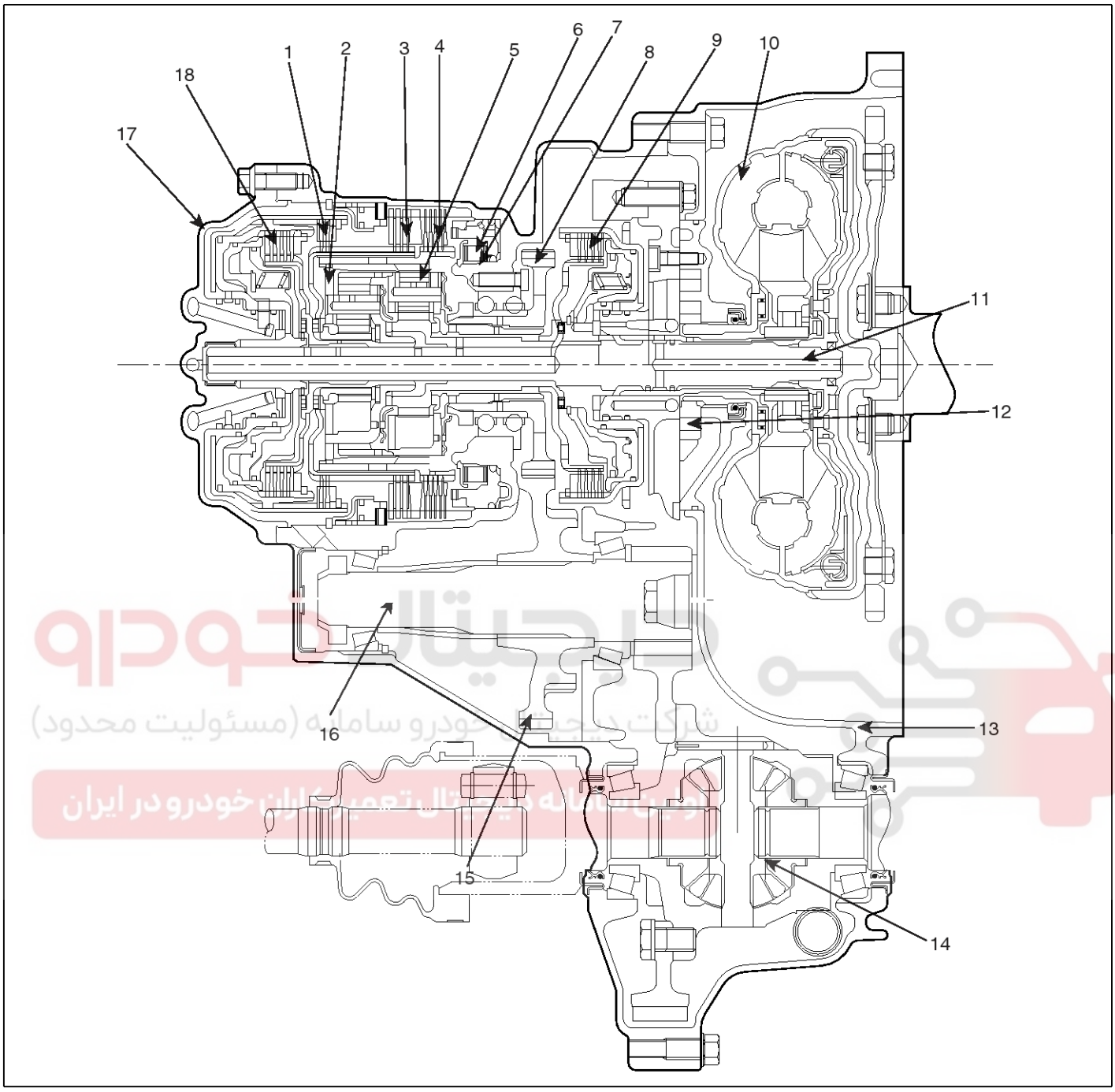
Some of the characteristics include:

- ▶Different power transfer
- ▶Different component layout
- ▶New shift logic(HIVEC) to improve shift feeling
- ▶Position of Valve Body
- ▶Variable shift pattern
- ▶Communication protocol and method
- ▶Step gate type shift lever.



EKRF071A

Item	Details
Weight Reduction	1. Aluminum oil pump - 2.3kg Approx 2. Pressed parts - Retainer and hub of brakes and clutches - Carrier of planetary gear set
Better shift quality	1. Independent control of clutches and brakes enabled better control of hydraulic pressure and skiped shifts (4 to 2, 3 to 1) 2. During N to D or N to R shift, feedback control adopted. 3. When starting from Creep condition, reduction of shock.(Creep condition is controlled with 1st gear) 4. Solenoid valve frequency is increased for more accurate control. 35Hz to 61.3 Hz except DCCSV that is 35Hz and VFS that is 600Hz. 5. HIVEC adoption for better shift feeling. 6. Variable shift pattern.
Increase in Power train efficiency	1. Fully Variable Line Pressure 2. VFS(Variable Force Solenoid)
Dynamic drive by sports mode	- Manual shifting possible - Step gate type shift lever  EKRF072A



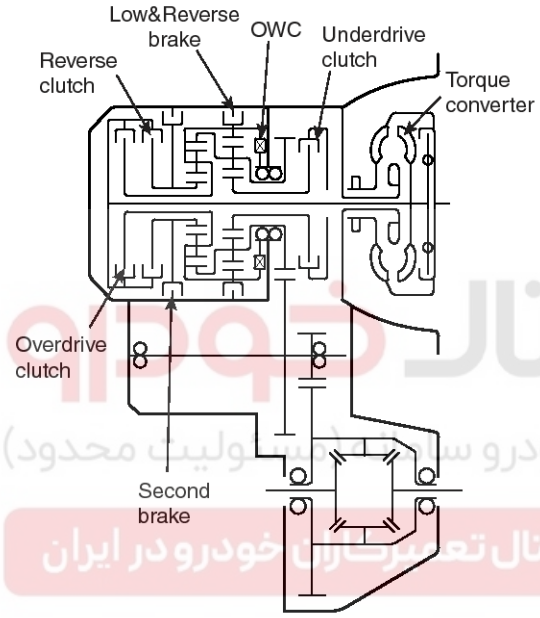
SNFAT8002L

1.Reverse clutch
2.Overdrive planetary gear set
3.Second brake
4.Low-reverse brake
5.Output plantary gear set
6.Oneway clutch
7.Oneway clutch inner race
8.Transfer drive gear
9.Underdrive clutch
10.Torque converter
11.Input shaft
12.Oil pump
13.Converter housing
14.Differential
15.Transfer driven gear
16.Output shaft
17.Rear cover
18.Overdrive clutch

Mechanical System

Operation Components And Function

Operating Element	Symbol	Function
Under drive clutch	UD	Connect input shaft and under drive sun gear
Reverse clutch	REV	Connect input shaft and reverse sun gear
Overdrive clutch	OD	Connect input shaft and over drive carrier
Low&Reverse brake	LR	Hold LR annulus gear and OD carrier
Second brake	2ND	Hold reverse sun gear
One way clutch	OWC	Restrict the rotating direction of low & reverse annulus gear



EKRF002A

Operating Elements

	UD/C	OD/C	REV/C	2ND/B	LR/B	OWC
P					●	
R			●		●	
N					●	
D1	●				●	○
D2	●			●		
D3	●	●				
D4		●		●		

1) ○ : OWC is operated when shifts from 1st gear to 2nd gear.

2) L&R brake is released in 1st gear when the vehicle speed is more than 5KPH approximately.

Torque Converter And Shaft

The torque converter consists of an impeller(pump), turbine and stator assembly in a single unit. The pump is connected to the engine crankshaft and turns as the engine turns. This drawing force is transmitted to the turbine through the oil which is recycled by the stator.

The transmission has two parallel shafts ; the input shaft and the output shaft. Both shafts are in line with the engine crankshaft. The input shaft includes the overdrive clutch, reverse clutch, underdrive clutch, one way clutch, 2ND brake, low&reverse brake, overdrive planetary carrier, output planetary carrier and transfer drive gear. The output shaft includes the transfer driven gear.

Clutches

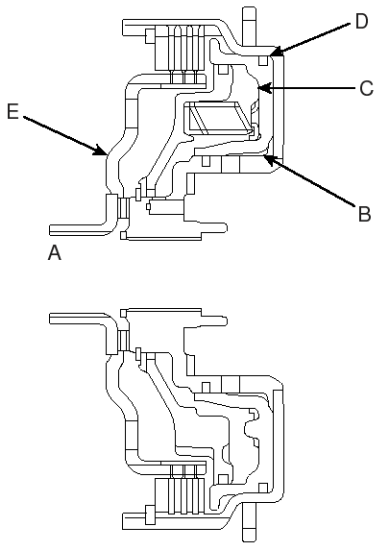
The gear changing mechanism utilizes three multi-disc clutches. The retainers of these clutches are fabricated from high-precision sheet metal for lightness and ease of production. Also, more responsive gearshifts at high engine speeds are achieved by a pressure-balanced piston mechanism that cancels out centrifugal hydraulic pressure. This mechanism replaces the conventional ball check valve.

Underdrive Clutch

The underdrive clutch operates in 1st, 2nd, and 3rd gears and transmits driving force from the input shaft to the underdrive sun gear(A).

The components comprising the under clutch are as illustrated below.

Hydraulic pressure acts in the piston pressure chamber(B) (between the piston(c) and retainer) and thus pushes the piston(C). In turn, the piston depresses the clutch discs and thereby transmits driving force from the retainer(D) to the hub(E) side.

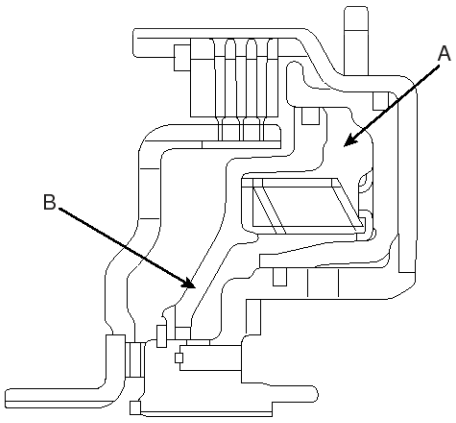


EKRF002B

At high speed, fluid remaining in the piston pressure chamber is subjected to centrifugal force and attempts to push the piston.

However, fluid in the balance fluid chamber(A) (the space between the piston and return spring retainer(B)) is also subjected to centrifugal force.

Thus, the hydraulic pressure on one side of the piston cancels out the hydraulic pressure on the other side, and the piston does not move.

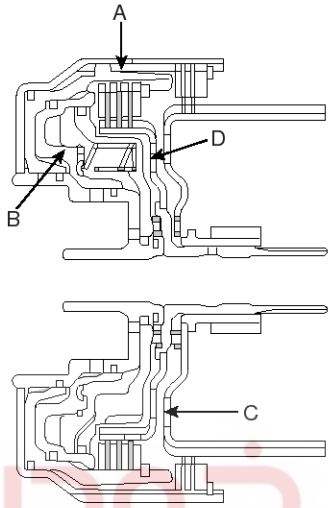


EKRF002C

Reverse Clutch And Overdrive Clutch

The reverse clutch(C) operates when the reverse gear is selected and transmits driving force from the input shaft to the reverse sun gear.

The overdrive clutch(D) operates in 3rd and 4th gears and transmits driving force from the input shaft to the overdrive planetary carrier and low-reverse annulus gear.



EKRF002D

Brakes

The gear changing mechanism utilizes two multi-disc brakes.

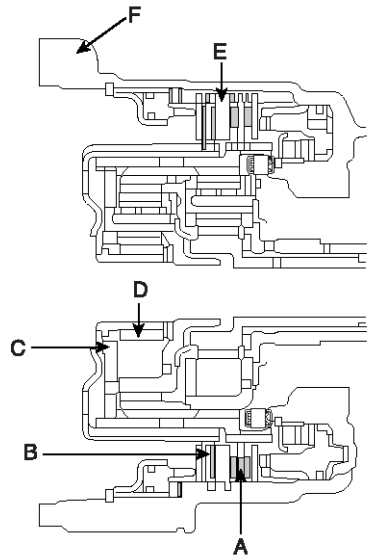
Low&reverse Brake And Second Brake

The low&reverse brake(A) operates in 1st and reverse gears, when the vehicle is parked, and during manual operation. It locks the low&reverse annulus gear and overdrive planetary carrier to the case.

The second(C) brake(B) operates in 2nd and 4th gears and locks the reverse sun gear(D) to the case.

The components comprising the low&reverse brake and second brake are as illustrated below.

As shown, the discs and plates of the two brakes are arranged on either side of the rear cushion plate(E), which is itself secured to the case(F) by a snap ring.



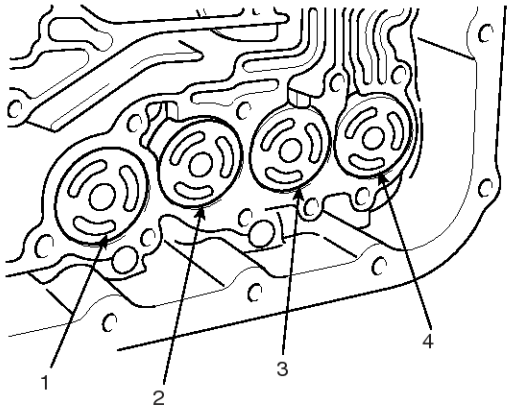
EKRF002E

OWC

To improve the shift feeling from 1st to 2nd gear, OWC was adopted on the low&reverse brake annulus gear. Instead of hydraulic fixing by Low&reverse brake at the 1st gear, this mechanical fixing device was used. This structure is not a new concept, because this OWC already has been installed on the previous models.

Accumulators

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



EKRF002F

Objective

* Energy (hydraulic pressure) storage
* Impact and pulsation damping when solenoid valves operating
* Operation as spring element
* Smooth shifting by preventing sudden operation of clutches and brakes

Transfer Drive Gear

With the transfer drive gear, increased tooth height and a higher contact ratio have reduced gear noise.

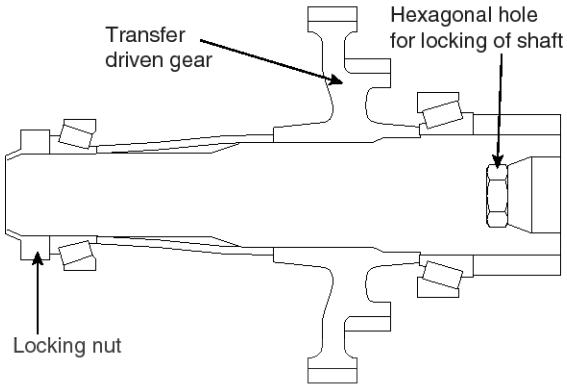
Also, the bearing that supports the drive gear is a preloaded type that eliminates rattle, and the rigidity of the gear mounting has been increased by bolting the bearing directly onto the case.

EKRF002G

Output Shaft/transfer Driven Gear

As shown in the illustration below, the transfer driven gear is press-fitted onto the output shaft, and the output shaft is secured by a locking nut and supported by bearings.

The locking nut has a left-handed thread, and a hexagonal hole in the other end of the shaft enables the shaft to be held in position for locking nut removal.



EKRF002H

Manual Control System

Manual Control Lever

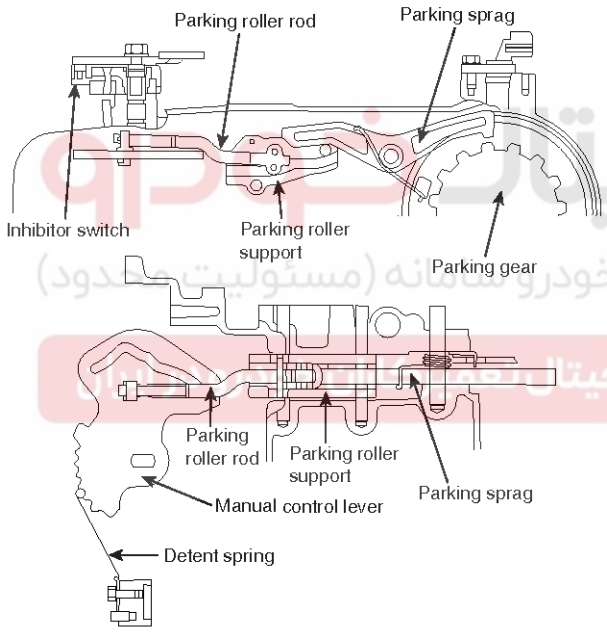
The manual control lever is fitted to the top of the valve body and is linked to the parking roller rod and manual control valve pin.

A detent mechanism is provided to improve the gear shift feeling during manual selection.

Parking Mechanism

When the manual control lever is moved to the parking position, the parking roller rod moves along the parking roller support and pushes up the parking sprag.

As a result, the parking sprag meshes with the transfer driven gear (parking gear), thereby locking the output shaft. To minimize the operating force required, a roller is fitted to the end of the rod.



EKRF002I

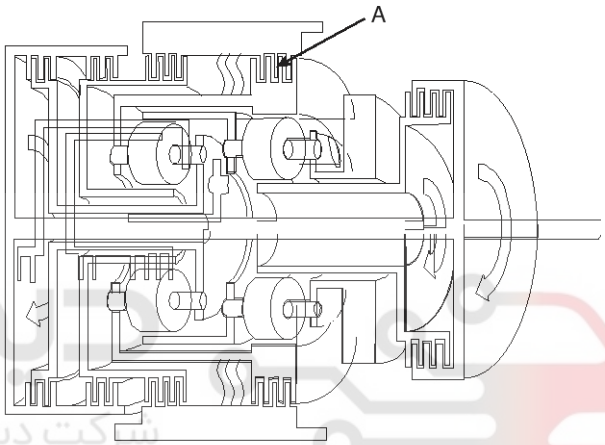
Power Train

P Position

Hydraulic pressure is applied to the LR brake and the RED brake, so power is not transmitted from the input shaft to the UD clutch or OD clutch, and the output shaft is locked by the park brake pawl interlocking the park gear.

N Position

Hydraulic pressure is applied to the LR brake(A) and the RED brake, so power is not transmitted from the input shaft to the UD clutch or OD clutch.



EKRF003A

1st Gear Power Flow

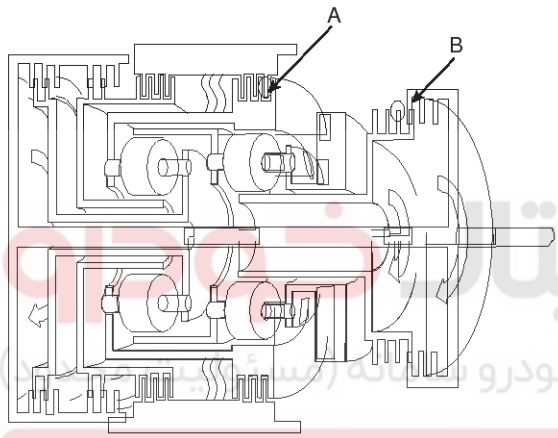
Hydraulic pressure is applied to the UD clutch(B) the LR brake(A) and the one way clutch(OWC), then the UD clutch transmits driving force from the input shaft to the UD sun gear, and the LR brake locks the LR annulus gear to the case. The UD sun gear of the planetary gear drives

the output pinion gear, and the LR brake locks the annulus gear, and the output pinion drives the output carriers,

and the output carrier drives the transfer drive gear, and

the transfer drive gear drives the transfer driven gear of

the output shaft, and power is transmitted to the differential gear through the differential drive gear.



EKRF003B

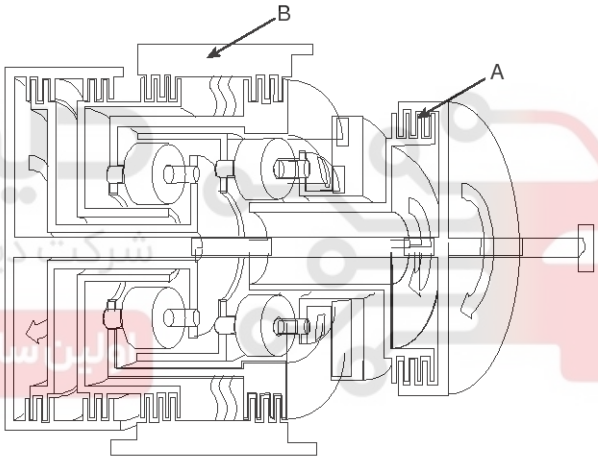
2nd Gear Power Flow

Hydraulic pressure is applied to the UD clutch(A) the 2nd brake(B) and the one way clutch(OWC), then the UD clutch transmits driving force from the input shaft to the UD sun gear, and the 2nd brake locks the reverse sun gear

to the case. The UD sun gear of the planetary gear drives the output pinion gear and the LR annulus gear, and the LR annulus gear drives the OD planetary carriers, and

OD planetary carriers drives OD pinion gear, and the OD pinion gear drives the output carriers, and the output carrier drives the transfer drive gear, and the transfer drive gear drives the transfer driven gear of the output shaft,

and power is transmitted to the differential gear through the differential drive gear.



EKRF003C

3rd Gear Power Flow

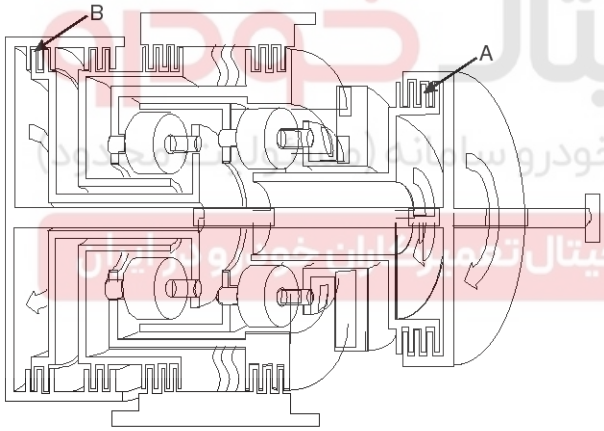
Hydraulic pressure is applied to the UD clutch(A) and the OD clutch(B), then the UD clutch transmits driving force

from the input shaft to the UD sun gear, and the OD clutch transmits driving force from the input shaft to the overdrive planetary carrier and low&reverse annulus gear. The UD sun gear of the planetary gear drives the output pinion gear and the LR annulus gear, and the LR annulus

gear drives the OD pinion gear through the OD planetary carrier, and the OD pinion gear drives the reverse sun

gear and the output carrier. The OD clutch drives the OD carrier, and the OD carrier drives the OD pinion gear, and the OD pinion gear drives the reverse sun gear and the output carrier, and the output carrier drives the transfer

drive gear, and the transfer drive gear drives the transfer driven gear of the output shaft, and power is transmitted to the differential gear through the differential drive gear.



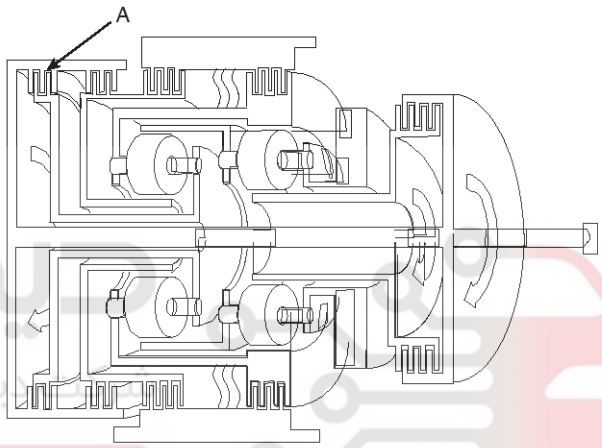
EKRF003D

4th Gear Power Flow

Hydraulic pressure is applied to the OD clutch(A) and the 2nd brake(B), then the OD clutch transmits driving force from the input shaft to the OD planetary carrier and LR

annulus gear, and the 2nd brake locks the reverse sun gear to the case. The OD clutch drives the OD carrier, and the OD carrier drives the OD pinion gear and the LR annulus gear, and the OD pinion gear drives the output carrier, and the output carrier drives the transfer drive gear,

and the transfer drive gear drives the transfer driven gear of the output shaft, and power is transmitted to the differential gear through the differential drive gear.

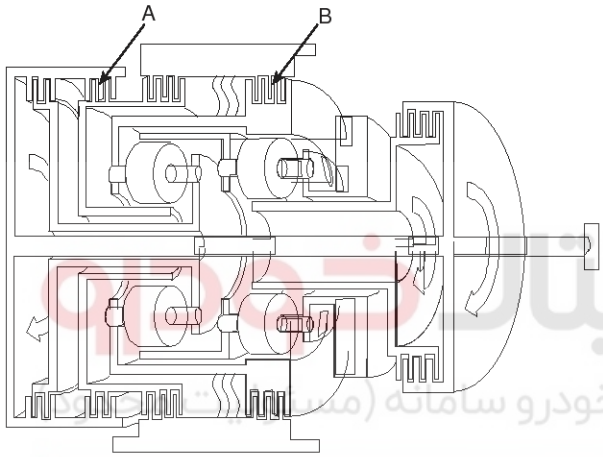


EKRF003E

Reverse Gear Power Flow

Hydraulic pressure is applied to the reverse clutch(A) and the LR brake(B), then the reverse clutch transmits driving force from the input shaft to the reverse sun gear, and the LR brake locks the LR annulus gear and OD planetary carrier to the case. The reverse clutch drives the reverse sun gear, and the reverse sun gear drives the output carrier through the OD pinion gear, and the output carrier drives the transfer drive gear, and the transfer drive gear

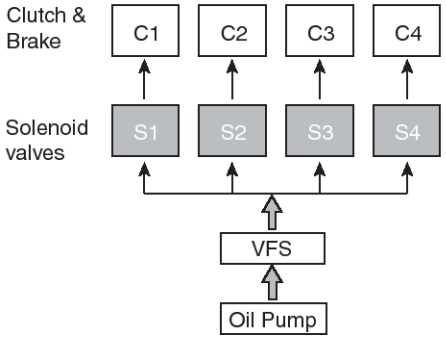
drives the transfer driven gear of the output shaft, and power is transmitted to the differential gear through the differential drive gear.



EKRF003F

Hydraulic Control System

Description



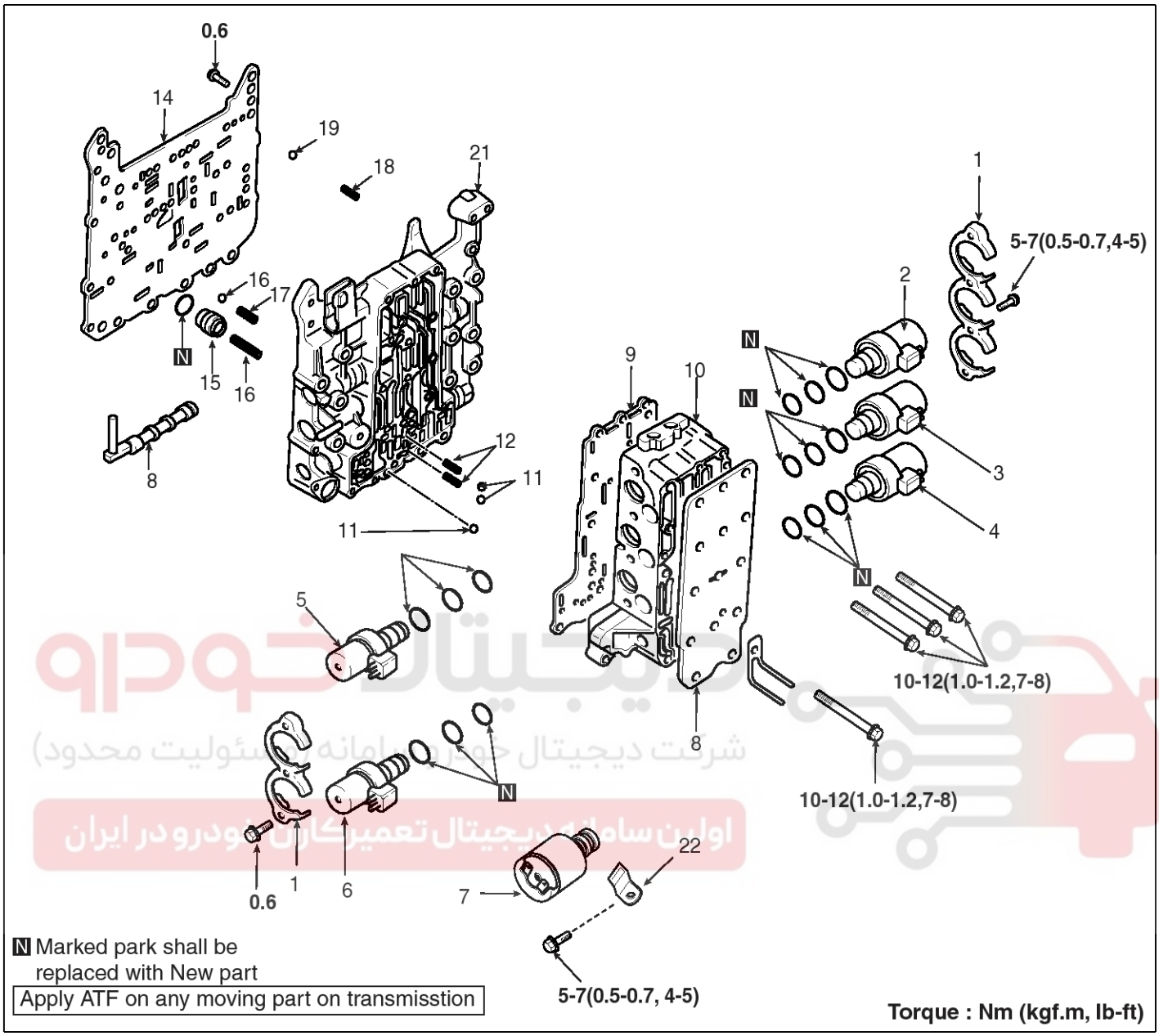
Each clutch and brake have a Solenoid valve for independent control of hydraulic pressure

EKRF003G

- Better and smoother shift quality.
- In order to prevent ATF leakage from the valve body or each elements, the exhaust ports have been grouped into only one with an addition of a check ball.
- If a failure occurs in its electric control, the switch valve and fail safe valve is able to move to enable 3rd

  speed drive or reverse.
- The hydraulic system consists of oil pump, regulator valve, solenoid valves, pressure control valve and valve body.
- In order to control the optimal line pressure and inprove the efficiency of power transmission according to maximize the efficiency of the oil pump, VFS(Variable Force Solenoid) valve has been added in the valve

  body hydralic circuit.



SNFAT8003L

Disassembly steps
1. Solenoid valve support
2. UD clutch solenoid valve
3. 2nd brake solenoid valve
4. Damper clutch control solenoid\oid valve
5. OD clutch solenoid valve
6. Low and reverse brake solenoid valve
7. VFS solenoid valve
8. Manual valve
9. Cover
10. Plate
11. Outside valve body assembly
12. Steel ball (Orifice check ball)
13. Spring
14. Plate
15. Damping valve
16. Damping valve spring
17. Steel ball (line relief)
18. Spring
19. Steel ball (Orifice check ball)
20. Spring
21. Inside valve body assembly
22. VFS plate

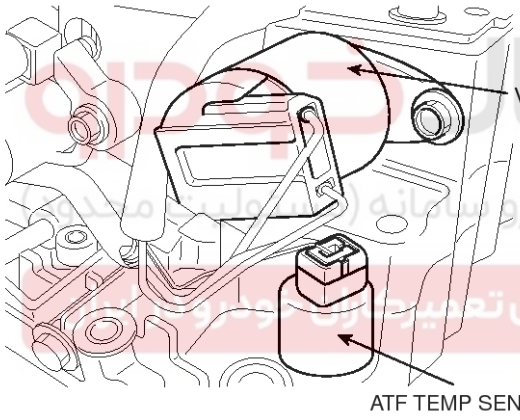
VFS (Variable Force Solenoid)

VRS Function

The spool rod in VFS is not duty cycled like one of PWM, it minutely vibrates at the range between the control port and exhaust port to control the hydraulic pressure. That is, it uses the equilibrium effect between the spring force and the magnetic force, the spring force is mechanical characteristics decided at the stage of design and the magnetic force is controlled by TCM. This electrical magnetic force is proportional to the current. So TCM will control the current.

In case of VFS valve, the electrical 'time constant' is considered to decide the frequency for the current not to be fluctuated even though turns on or off the input signal.

The electrical 'time constant' is much more fast than one of mechanical so the frequency of VFS is extremely higher than the conventional PWM type.



EKRF081A

Characteristics of Bosch VFS:

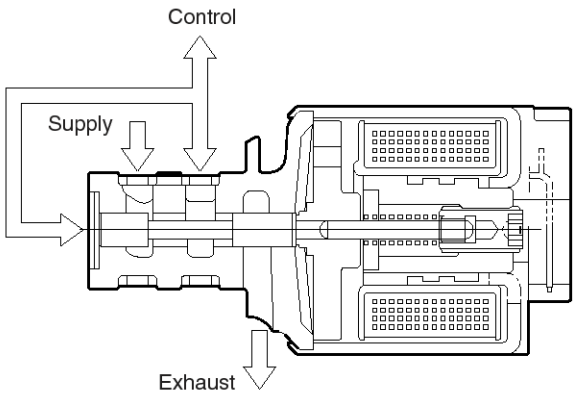
Supply pressure : 700～1600kPa

Control pressure: typically 600～0 kPa

Current range: typically 0～1,000 mA

Dither frequency: Up to 600 Hz

Dimension: 32 mm protrusion reach 42 mm

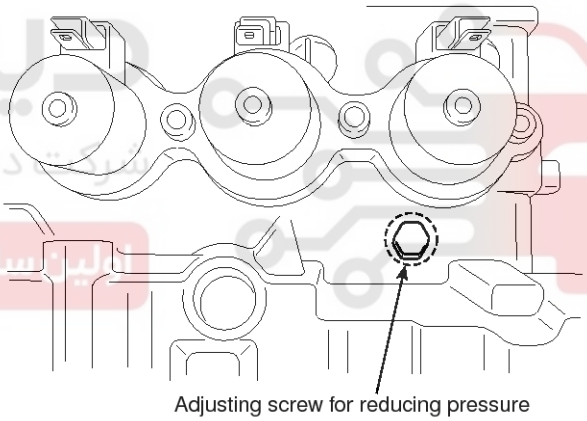


EKRF082A

The reducing pressure will be supplied to the 'Supply' port of the VFS valve on the above illustration to control the line pressure.

Reducing Pressure

Function

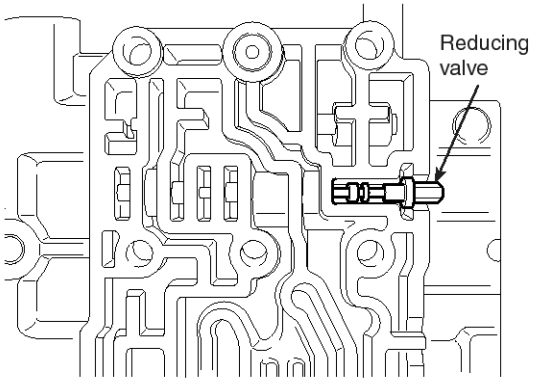


EKRF083A

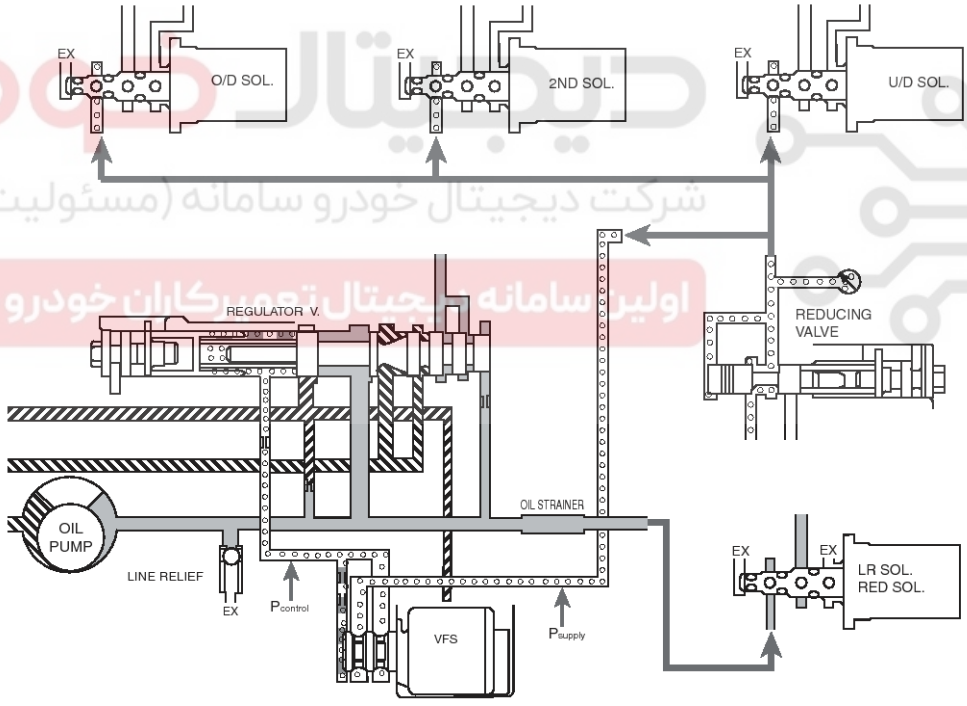
As same as one of Alpha or Beta automatic transaxle system, this reducing valve length can be adjusted by rotating the screw on the picture. As you rotate the screw toward clockwise by 90˚, the reducing pressure will increase about 1.0bar. However, the reducing pressure is used just as a 'supply pressure' for the solenoid valves (except Low&Reverse, Reduction and Damper Clutch control solen), so this may not be handled to rotate in the field service shop. VFS is operated based on the 'supply pressure' and it outputs the 'control pressure' to control the regulator valve indirectly. While developing the VFS system, the line pressure was used as a 'supply pressure' for VFS

and other solenoid valves but it has been changed into additional 'reducing pressure' because the line pressure is variably changed by VFS so the control pressure

becomes unstable and some hydraulic pressure oscillation occurred. That is why the reducing pressure has been added in the hydraulic circuit of VFS system for both 4th and 5th speed A/T.



EKRF084A



EKRF085A

The reducing pressure is about 6.5bar and this value does not be changed regardless of the driving or engine load condition. Be sure that the conventional line pressure is used for the 'supply pressure' of Low&Reverse, Reduction solenoid because the variable line pressure is not

available at reverse range.

Hydraulic Pressure Table

Under the constant current amount of VFS (200mA), the line pressure will become as below table. Be sure that the following data can be achieved by specific special facility or device to check the performance of A/T assembly (not on the vehicle), however we can refer the maximum pressure value according to each element.

Solenoid valve Duty(%)					Measured Element	Pressure kPa(Psi)
LR	2ND	UD	OD	RED*		
0	100	0	100	0	LR	1030±20(149±3)
60	↑	↑	↑	↑		520±40(75±6)
75	↑	↑	↑	↑		230±40(33±6)
100	↑	↑	↑	↑		0
100	0	0	100	0	2ND	1030±20(149±3)
↑	60	↑	↑	↑		550±40(80±6)
↑	75	↑	↑	↑		220±40(32±6)
↑	100	↑	↑	↑		0
100	100	0	0	0	OD	1030±20(149±3)
↑	↑	↑	60	↑		520±40(75±6)
↑	↑	↑	75	↑		210±40(30±6)
↑	↑	↑	100	↑		0
100	100	0	0	0	UD	1030±20(149±3)
↑	↑	60	↑	↑		470±40(68±6)
↑	↑	75	↑	↑		170±40(25±6)
↑	↑	100	↑	↑		0
100	0	100	0	100	DIR*	0
75	↑	↑	↑	↑		270±40(39±6)
60	↑	↑	↑	↑		540±40(78±6)
0	↑	↑	↑	↑		1030±20(149±3)

Measuring condition:

1. PG-A (Input speed): 2,500rpm
2. Manual valve position: D
3. DCC Solenoid duty: 0%

Electronic Control System

Description

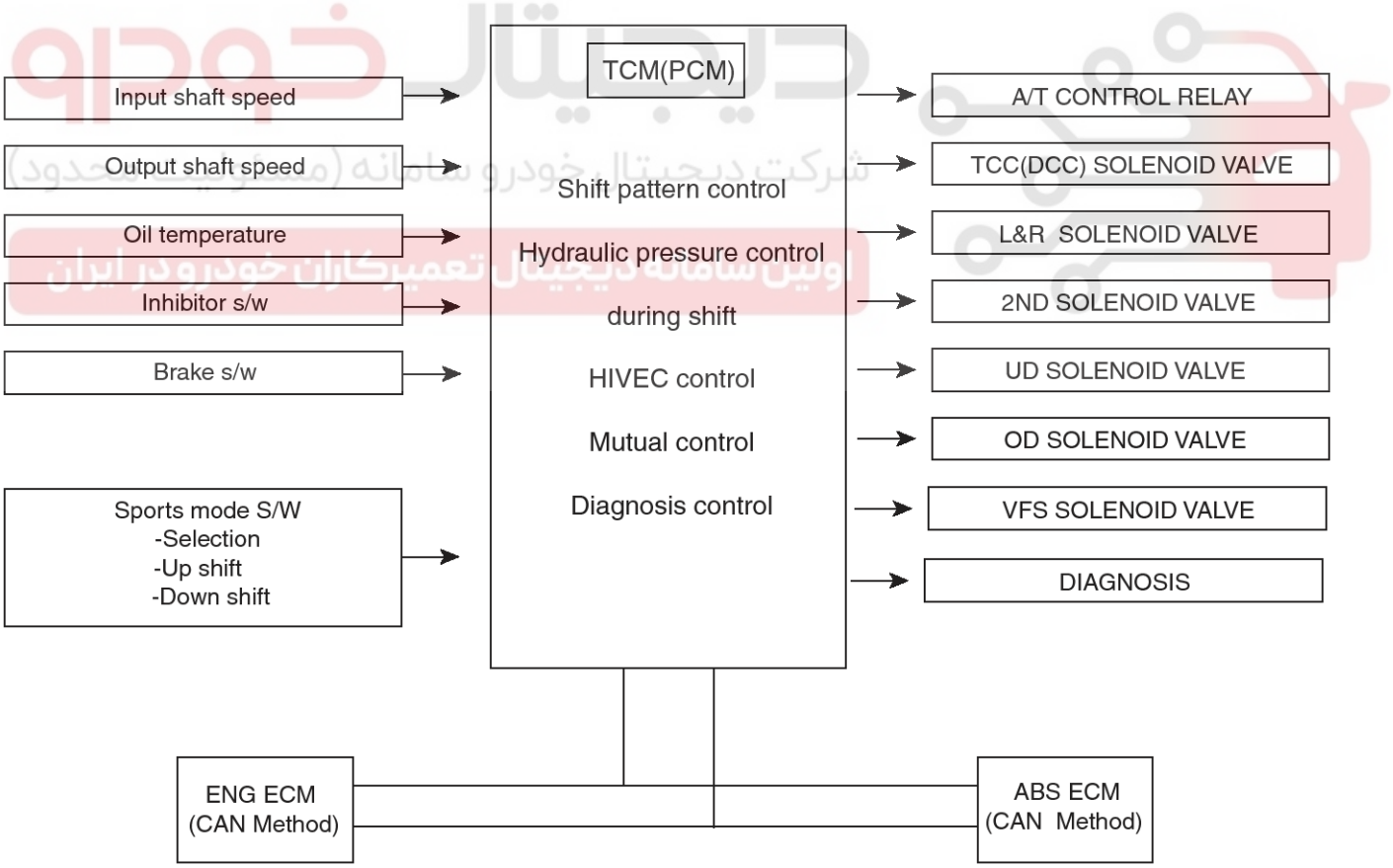
The electronic control system used in the new generation auto transaxle is far superior to the previous systems.

This system is able to adopt a variable shift pattern for smooth and problem free shifting.

A solenoid valve is applied to each of the clutches and brakes and is independently controlled. Feedback control and correction control is performed in all gears as well as utilization of mutual control system to increase shift feeling.

The torque converter damper clutch uses a partial lock up and full lock-up system. An additional control method called the HIVEC system (neural network) is adopted to increase shift feeling.

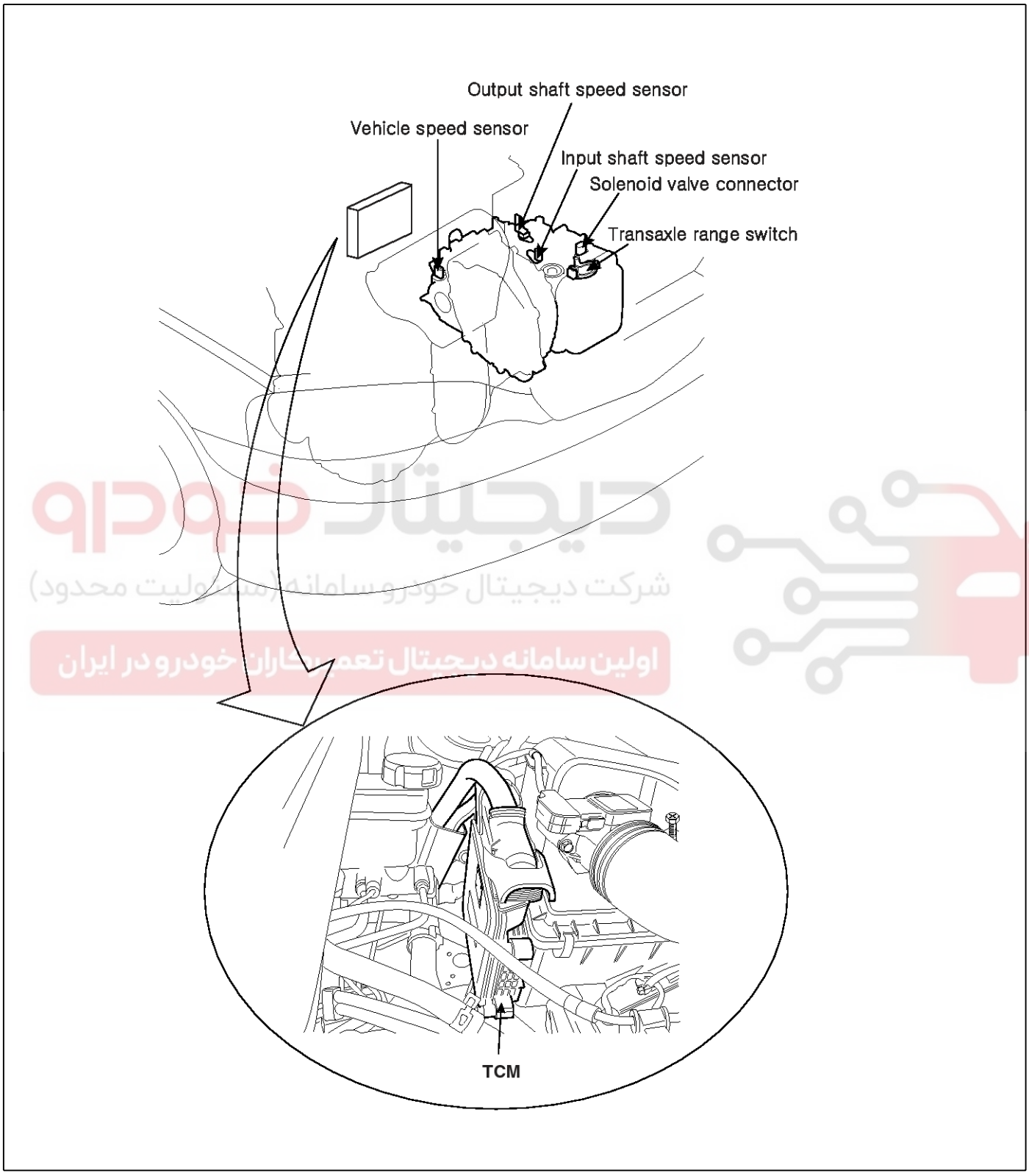
Block Diagram (CAN)



EKRF004G

Electric Control Location

The TCM(PCM) is located on the intake manifold in the engine room.



EKRF087A

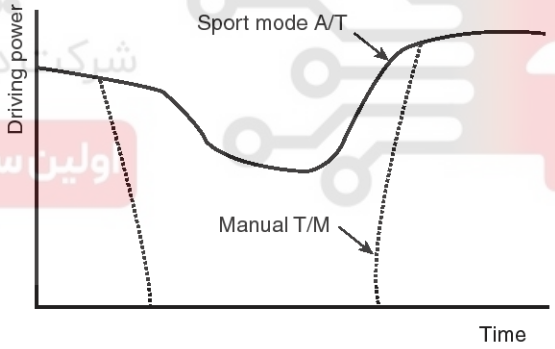
Operating Components And Functions

Sensor	Function
Input shaft speed sensor	Detect turbine speed at UD retainer
Output shaft speed sensor	Detect T/F drive gear speed at T/F driven gear (4A/T)
Crank angle sensor	Detect engine speed
TPS(Gasoline)	Throttle opening ratio by potentiometer
Air conditioner switch	A/C load by thermister
Inhibitor switch	Select lever position by contact switch
Brake switch	Brake pedal position
Vehicle speed sensor	Detect vehicle speed by speedometer driven gear
Sport mode switch	Sport mode On/Off signal
Vehicle speed sensor	Vehicle speed
Sport mode up-shift switch	Sport mode up-shift signal
Sport mode downshift switch	Sport mode downshift signal
Request of torque reduction	Send the request of torque reduction to ECM
ABS-ECM, Engine ECM	In case of CAN communication

Sports Mode

Sports Mode Switch

EKRF005B



EKRF005C

Sports mode allows the manual up-shift and downshift with the accelerator pedal is depressed. The prompt response and shift would be obtained due to the continuous shifting without cutting of driving power. The shifting time

is also decreased about 0.1sec during up-shift, 0.2sec during downshift. As the selector lever is pushed upward or downward one time, the gear is up shifted or downshifted by one gear.

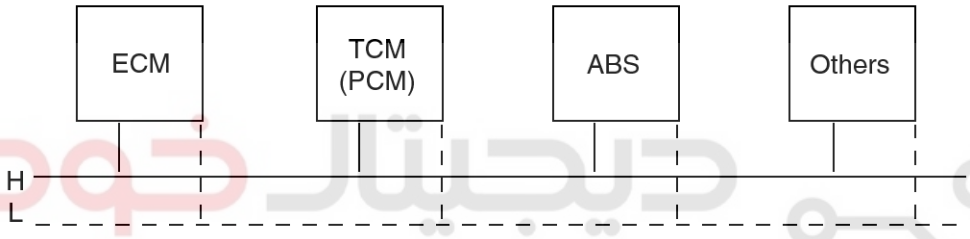
Signals of sports mode switch

Items	Mode S/W	UP S/W	DOWN S/W
D range selection	OFF	OFF	OFF
Sports mode selection	ON	OFF	OFF
Sports mode up-shift selection	ON	ON	OFF
Sports mode downshift selection	ON	OFF	ON

Controller Area Network (CAN)

Previously, for different computers in the vehicle to share the same information, each signal required a different pin and wiring. However, with the introduction of a CAN system, only two lines are required to achieve the same function. The information is in digital format. This method does not use an integrated ECM.

Frequency: 500Kbit/sec



EKRF005D

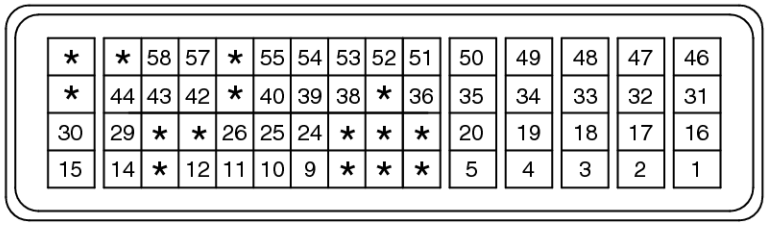
Input signals to TCM(PCM) through 'CAN communication'

- Engine rpm, TPS signal
- A/CON signal, Engine coolant temperature
- Quantity of intake airflow, Vehicle speed
- Shift holding signal (FTCS ON)

Output signals from TCM(PCM) through 'CAN communication'

- Request signal for torque reduction
- ATF temperature, TCM(PCM) type, TCM(PCM) error or not
- Damper clutch ON, OFF / Gear position

TCM Pin Description



TCM harness connector

SMGAT9002L

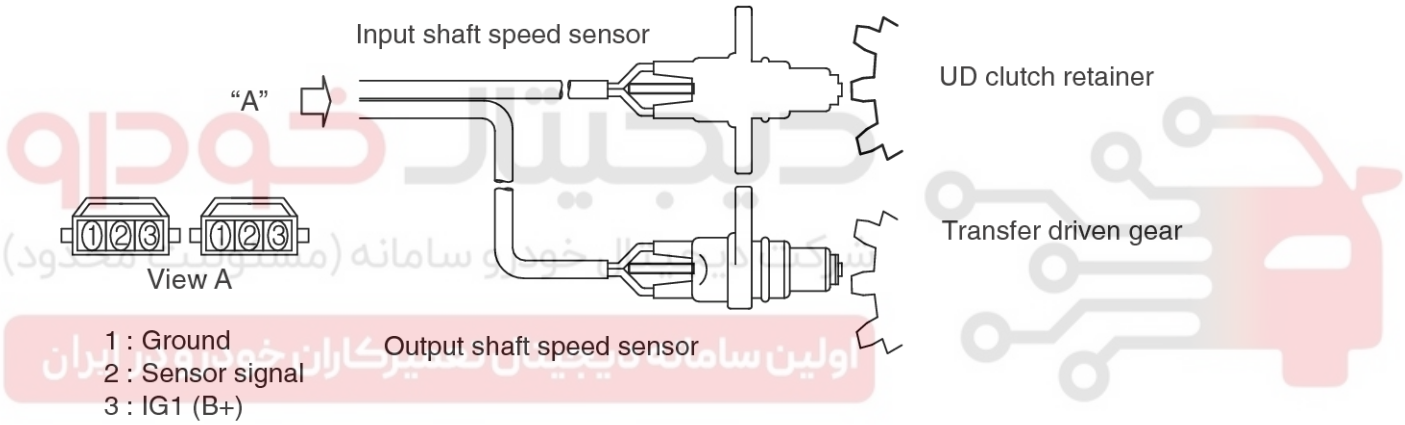
Terminal Number	Description	Terminal Number	Description
Gasoline		Gasoline	
1	CYL.4/ CYL.1	31	CYL.1/ CYL.4
2	Shield ground	32	2ND Solenoid Valve
3	VFS Solenoid Valve	33	UD Solenoid Valve
4	OD Solenoid Valve	34	Ground
5	LR Solenoid Valve	35	Ground
6	—	36	PWM Signal
7	—	37	—
8	—	38	Pulse generator 'A'
9	D input	39	Ground
10	Select Switch	40	Oil temp sensor
11	UP Shift	41	—
12	DOWN Shift	42	A/C comp switch
13	—	43	Clutch switch input
14	ALT (FR)	44	Brake test switch
15	Cruise switch ground	45	—
16	CYL.2/ CYL.3	46	CYL.3/CYL.2
17	DCC Solenoid Valve	47	V_Solenoid_1
18	V_VFS Solenoid Valve	48	V_Solenoid_2
19	RED Solenoid Valve	49	Shunt relay ON input
20	Ground	50	Shunt relay ON input
21	—	51	Speed signal
22	—	52	Stop lamp switch
23	—	53	Ground
24	N input	54	Pulse generator 'B'
25	R input	55	Sensor Ground
26	P input	56	—

Terminal Number	Description	Terminal Number	Description
Gasoline		Gasoline	
27	—	57	A/C request switch
28	—	57	P_Steering_SW_Signal
29	Brake light switch	59	—
30	Cruise switch	60	—

Sensors

Input Shaft & Output Shaft Speed Sensor

- Type: Hall sensor
- Current consumption: 22mA (MAX.)
- Sensor body and sensor connector have been unified as one.

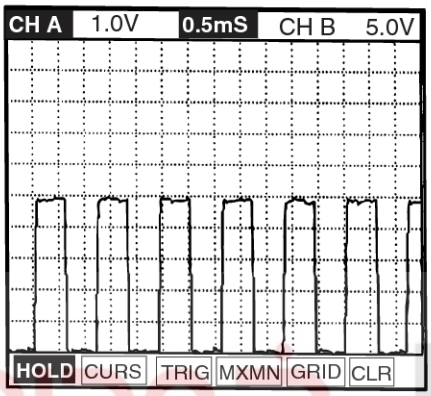


EKRF018A

Hall Type Sensor: Specification

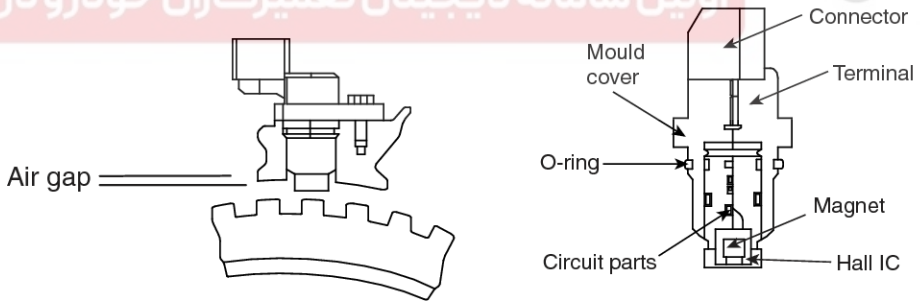
Air gap (mm)	Input shaft speed sensor	1.3
	Output shaft speed sensor	0.85
Coil Resistance	Input shaft speed sensor	over 1MΩ
	Output shaft speed sensor	over 1MΩ
Peak-Peak Voltage	High	4.8~5.2V
	Low	0.8V

Wave Form With High-scan

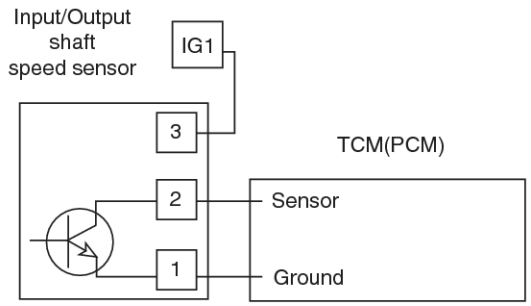


EKRF018B

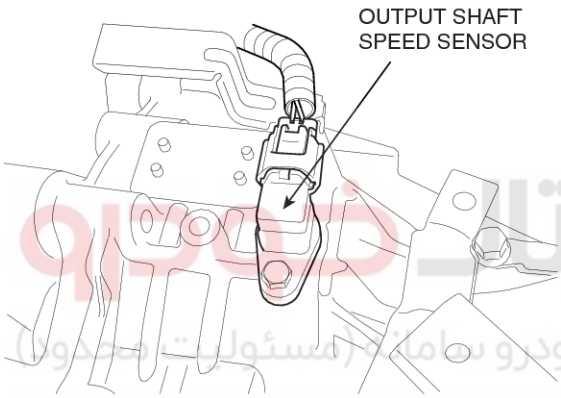
Hall Type Sensor: Structure & Interface



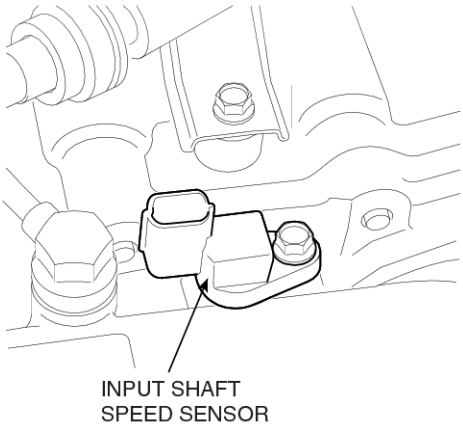
EKRF018E



EKRF018C



EKRF018F



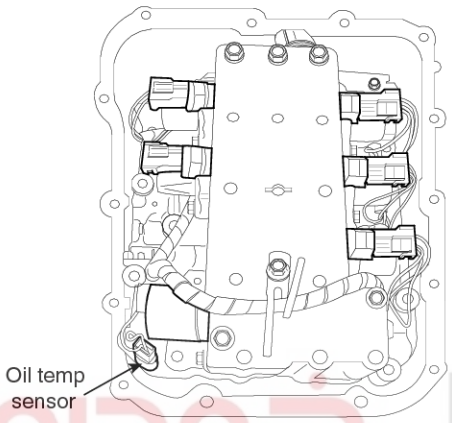
EKRF018D

Oil Temperature Sensor

The oil temperature sensor is of the thermistor type, and senses the automatic transaxle fluid temperature. Using the signal from this sensor, TCM(PCM) controls the shift pattern optimally during shift. In order to operate the damper clutch, this signal is also referred.

- Range of temperature : -40˚C～145˚C
- Type: Separated type (High / Low temperature)
- Standard value of internal resistance

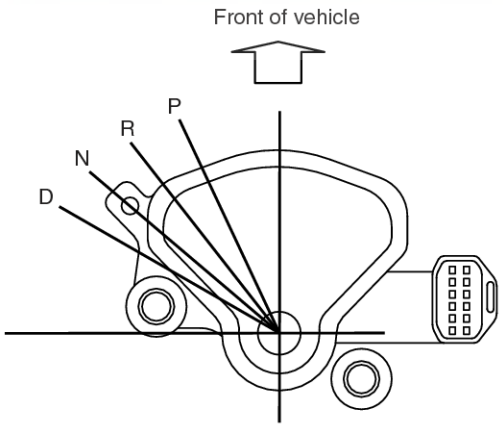
Temp.[°C(°F)]	Resistance(kΩ)	Temp.[°C(°F)]	Resistance(kΩ)
-40(-40)	139.5	80(176)	1.08
-20(-4)	47.7	100(212)	0.63
0(32)	18.6	120(248)	0.38
20(68)	8.1	140(284)	0.25
40(104)	3.8	160(320)	0.16
60(140)	1.98		



EKRF018G

Inhibitor Switch

- Type: Rotary contact type
- Range of temperature : -40°C~145°C(-40°F~293°F)



EKRF018H

Inhibitor Switch - Continuity check(Sports mode)

Range	Terminal Number									
	1	2	3	4	5	6	7	8	9	10
P			○					○	○	○
R							○	○		
N				○				○	○	○
D	○							○		

EKRF018I

Actuators

Solenoid Valve for Pressure Control

- Sensor type: Normal open 3-way
- Operating temperature : -30˚C～130˚C(-22˚F～266˚F)
- Frequency:

LR, 2ND, UD, OD: 61.27Hz (at the ATF temp. above -20˚C(-4˚F))

DCC: 30.64Hz

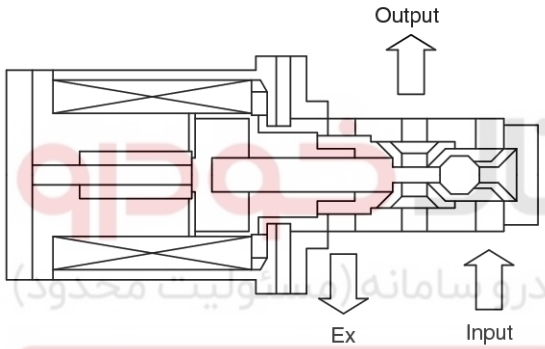
- Internal resistance:

3.0 ± 0.5 Ω (LR, 2ND, UD, OD, TCC)

4.35 ± 0.5 Ω (VFS)

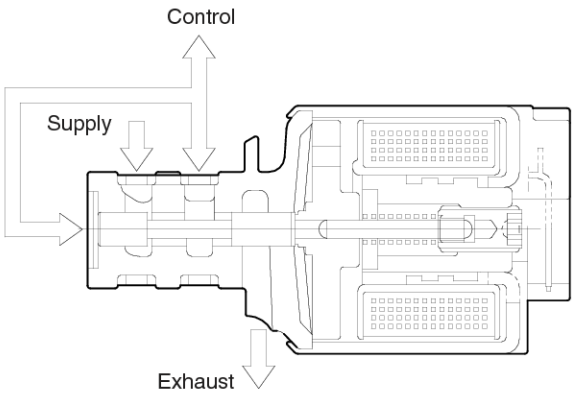
- Surge voltage: 56 V (Except VFS)

(LR, 2ND, UD, OD, DCC)



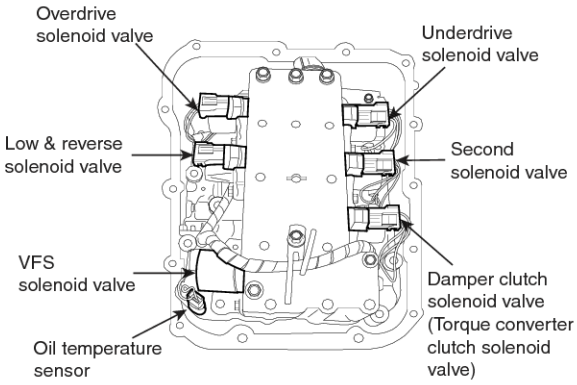
EKRF018J

(VFS)



EKRF082A

Location



EKRF018K

VFS Control pressure

Input Current(mA)	Control Pressure (No line pressure)			
	Increasing Current			Decreasing Current
	MAX. (Kgf/㎠) Kpa]	MIN. (Kgf/㎠) Kpa]	△ (Kgf/㎠) Kpa]	MIN. (Kgf/㎠) Kpa]
100	6.52 [639]	5.87 [575]	[64]	
200	6.23 [611]	5.70 [559]	[52]	5.43 [532]
300	5.76 [564]	5.24 [514]	[50]	4.49 [484]
400	5.08 [498]	4.59 [450]	[48]	4.30 [421]
500	4.24 [416]	3.78 [370]	[46]	3.52 [345]
700	2.29 [224]	1.82 [178]	[46]	1.51 [148]
800	1.41 [138]	0.09 [88]	[50]	0.58 [57]
900	0.65 [64]	0.14 [14]	[50]	0 [0]
1,000	0.24 [24]	0 [0]	[24]	
1,100	0.24 [24]	0 [0]	[24]	

*Test condition:

Ps : Supply Pressure (Ps = 7.1 ± 0.3 KGf/㎠)

Pc : Control Pressure

Pex : Exhaust Pressure (Atmosphere pressure)

ATF : DIAMOND ATF SP-III

ATF temperature : 30 ± 3°C (86°F)

- Coil resistance : 4.35 ± 35Ω
- Dither Frequency : 600 ± 20Hz

In case of VFS solenoid valve, the relation between Duty and oil pressure can't be expressed.

Solenoid Valves Schedule

PstoPsto	SIni avsoeodvle				
Operation	LR	2ND	UD	OD	* DCC
1st gear	OFF	ON	OFF	ON	OFF
2nd gear	ON	OFF	OFF	ON	OFF
3rd gear	ON	ON	OFF	OFF	ON
4th gear	ON	OFF	ON	OFF	ON
Reverse	OFF	ON	ON	ON	OFF
N, P (STD. mode)	OFF	ON	ON	ON	OFF
N, P (Hold mode)	ON	OFF	ON	ON	OFF

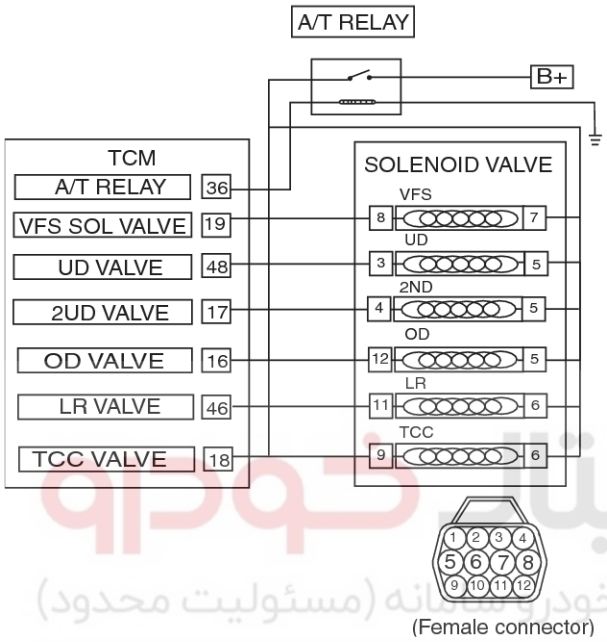
*: Reference value.

(DCC solenoid valve will be ON when the operating condition is satisfied)

A/T Control Relay

The control relay supplies power to the solenoid valves.

As soon as the A/T control relay is ON, the battery voltage is directly supplied to solenoid valves and each solenoid valve is operated when the TCM grounds the opposite terminal. ☞ (-) Control at fail safe condition, the power is cut causing 3 gear hold.



EKRF006B

Torque Converter Stall Test

This test measures the maximum engine speed when the selector lever is in the D or R position. The torque converter stalls to test the operation of the torque converter, starter motor, one-way clutch operation, the holding performance of the clutches, and brakes in the transaxle.

⚠CAUTION

Do not let anybody stand in front of or behind the vehicle while this test is being carried out

1. Check the automatic transmission fluid level and temperature, and the engine coolant temperature.
   - Fluid level : At the HOT mark on the oil level gauge
   - Fluid temperature : 80~100˚C (176~212˚F)
   - Engine coolant temperature : 80~100˚C(176~212˚F)
2. Prevent all the wheels from moving during the test.
3. Pull the parking brake lever up, with the brake pedal fully depressed.
4. Start the engine.
5. Move the selector lever to the "D" position, fully depress the accelerator pedal and take a reading of the maximum engine speed at this time.

Stall speed : 2,100~2,900rpm

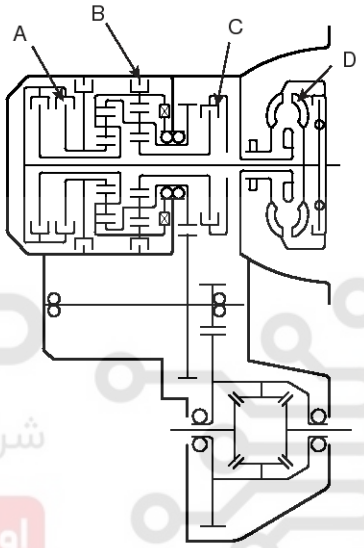
⚠CAUTION

- **The throttle should not be left fully open for any more than five seconds.**
- **If carrying out the stall test two or more times, move the selector lever to the "N" position and run the engine at 1,000 r/min to let the automatic transaxle fluid cool down before carrying out subsequent tests.**

6. Move the selector lever to the "R" position and carry out the same test again.

Torque Converter Stall Test Conclusion

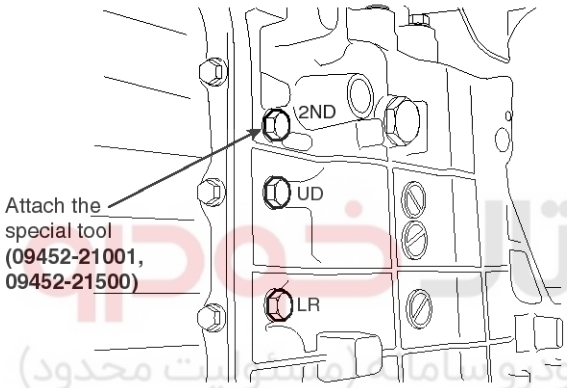
1. Stall speed is too high in both "D" and "R" ranges
   - Low line pressure
   - Low & reverse brake(B) slippage
2. Stall speed is to high in "D" range only
   - Underdrive clutch(C) slippage
3. Stall speed is too high in "R" range only
   - Reverse clutch(A) slippage
4. Stall speed too low in both "D" and "R" ranges
   - Malfunction of torque converter(D)
   - Insufficient engine output



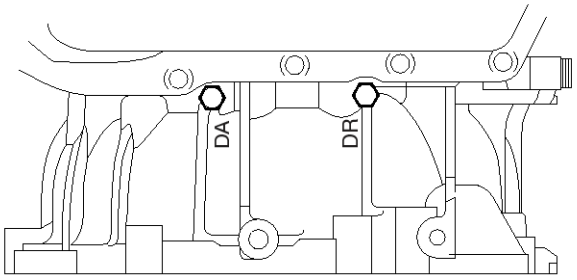
EKRF007F

Hydraulic Pressure Test

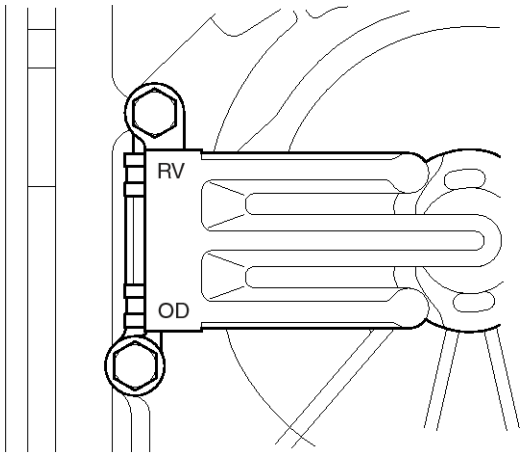
1. Warm up the engine until the automatic transaxle fluid temperature is 80-100˚C.
2. Lift up the vehicle so that the wheels are free to turn.
3. Connect the special tool (oil pressure gauge) to each pressure discharge port.
4. Measure the hydraulic pressure at each port under the conditions given in the standard hydraulic pressure table, and check that the measured values are within the standard value ranges.
5. If a value is outside the standard range, correct the problem while referring to the hydraulic pressure test diagnosis table.



EKRF007G



EKRF007H



EKRF007I

Standard Hydraulic Pressure Test

Measurement condition			Standard hydraulic pressure kPa (psi)						
Selector lever position	Shift position	Engine speed (rpm)	Under drive clutch pressure	Reverse clutch pressure	Overdrive clutch pressure	Low&reve-rse brake pressure	Second brake pressure	Damper clutch Apply pressure (DA)	Damper clutch Release pressure (DR)
P	-	2,500	-	-	-	260-340 (38-50)	-	-	-
R	Reverse	2,500	-	1,270-1,770 (185-256)	-	1,270-1,770 (185-256)	-	-	-
N	-	2,500	-	-	-	260-340 (38-50)	-	-	-
D	1st gear	2,500	430-510 (62-74)	-	-	1,010-1,050 (146-152)	-	-	-
	2nd gear	2,500	430-510 (62-74)	-	-	-	430-510 (62-74)	-	-
	3rd gear	2,500	430-510 (62-74)	-	430-510 (62-74)	-	-	More than 730 (100)	0-10 (0-1)
	4th gear	2,500	-	-	430-510 (62-74)	-	780-880 (110-130)	More than 730 (100)	0-10 (0-1)

※ The values are subject to change according to vehicle model or condition

※ Depress the acceleration pedal "GENTLY" under no load when measuring the hydraulic pressure.

Service Adjustment Procedure

Automatic Transaxle Fluid

Inspection

1. Drive the vehicle until the fluid reaches normal operating temperature [70~80˚C].
2. Place the vehicle on a level surface.
3. Move the selector lever through all gear positions.

   This will fill the torque converter and the hudraulic system with fluid and move the selector lever to the "N"

   (Neutral) or "P"(Park) position.
4. Before removing the oil level gauge, wipe all contaminants from around the oil level gauge. Then take out the oil level gauge and check the condition of the fluid.

   NOTICE

   If the fluid smells as if it is burning, it means that the fluid has been contaminated by fine particles from

   the bushes and friction materials, a transaxle overhaul may be necessary.
5. Check that the fluid level is at the HOT mark on the oil level gauge. If the fluid level is low, add automatic transaxle fluid until the level reaches the "HOT" mark.

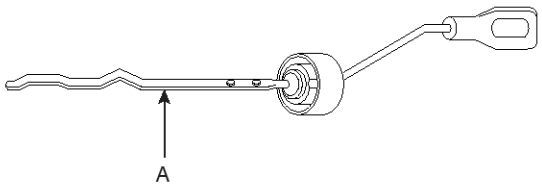
Auto Transaxle Fluid:
DIAMOND ATF SP-III, SK ATF SP-III
Quantity : 7.8ℓ (8.2 US qt, 6.9 Imp.qt)

NOTICE

Low fluid level can cause a variety of a abnormal conditions because it allows the pump to take in air along with fluid. Air trapped in the hydraulic system forms bubbles, which are compressable. Therefore, pressures will be erratic, causing delayed shifting ,slipping clutches and brakes, etc. Improper filling can also raise fluid level too high. When the transaxle has too much fluid, gears churn up foam and acuise the same conditions which occur with low fluid level, resulting in accelerated deterioration of automatic transaxle fluid. In either case, air bubbles can cause overheating, and fluid oxidation, which can interfere with normal valve, clutch, and brake operation. Foaming can also result in fluid escaping from the transaxle

vent where it may be mistaken for a leak.

6. Insert the oil level gauge(A) securely.



EKRF008A

NOTICE

When new, automatic transmission fluid should be red. The red dye is added so the assembly plant can identify it as transmission fluid and distinguish it from engine oil or antifreeze. The red dye, which is not an indicator of fluid quality, is not permanent. As the vehicle is driven the transmission fluid will begin to

look darker. The color may eventually appear light brown.

Replacement

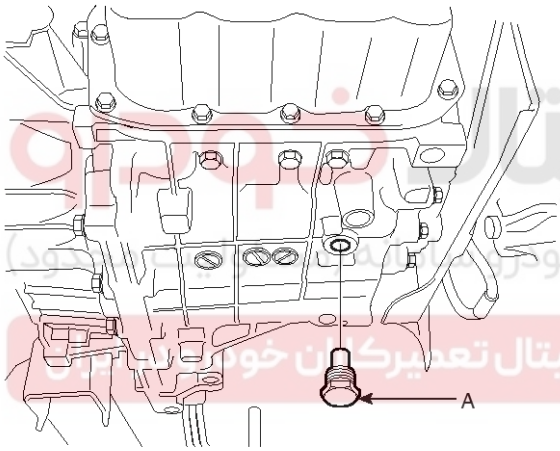
If you have a fluid changer, use this changer to replace the fluid. If you do not, replace it using the following procedure.

1. Disconnect the hose which connects the transmission and the oil cooler which is within the radiator only in 2.4L engine(3.3L-the oil cooler is separated).
2. Start the engine and let the fluid drain out.

Running conditions : "N" range with engine idling.

CAUTION
The engine should be stopped within one minute after it is started. If the fluid has all drained out before then, the engine should be stopped at that point.

3. Romove the drain plug(A) from the bottom of the transmission case to drain the fluid.



EKRF073A

4. Install the drain plug via the gasket, and tighten it to the specified torque.

Tightening torque :
40 ~ 50Nm (4.0 ~ 5.0 kgf.m, 29 ~ 36 lb-ft)

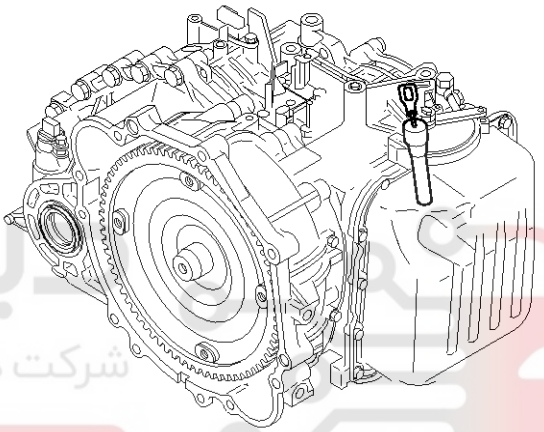
5. Pour the new fluid in through the oil filler tube.

CAUTION
Stop pouring if the full volume of fluid cannot be poured in.

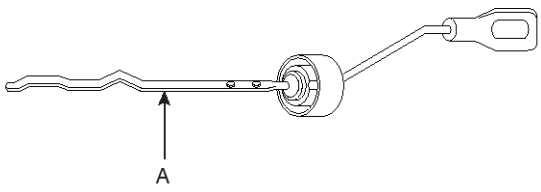
6. Repeat the procedure in step (2).

NOTICE
Check the old fluid for contamination. If it has been contaminated, repeat the steps (5) and (6).

7. Pour the new fluid in through the oil filler tube.
8. Reconnect the hose which was disconnected in step (1) above and firmly replace the oil level gauge.(In case of this "replace", this means after wiping off any dirt around the oil level gauge, insert it into the filler tube.)
9. Start the engine and run it at idle for 1~2 minutes.
10. Move the select lever through all positions, and then move it to the "N" position.
11. Drive the vehicle until the fluid temperature rises to the normal temperature (70~80°C), and then check the fluid level again. The fluid level must be at the HOT mark.
12. Firmly insert the oil level gauge(A) into the oil filler tube.



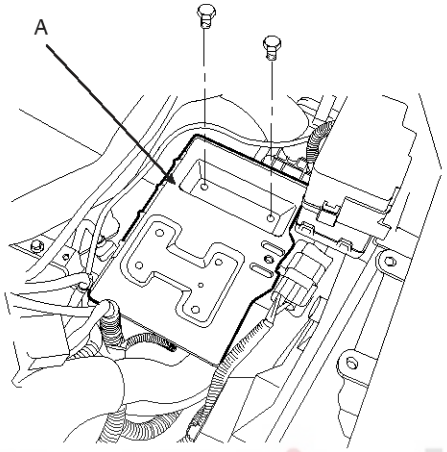
EKRF008B



EKRF008A

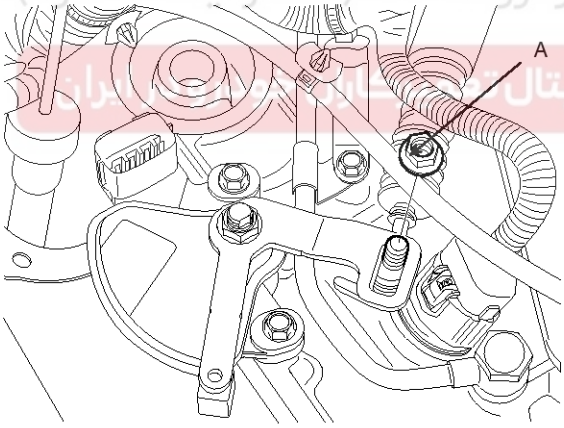
Transaxle Range Switch (Inhibitor Switch) Replacement

1. Pull up the parking brake.
2. Position the shift lever in 'N' range.
3. Remove the air cleaner assembly.
4. Remove the battery.
5. Remove the battery tray(A).



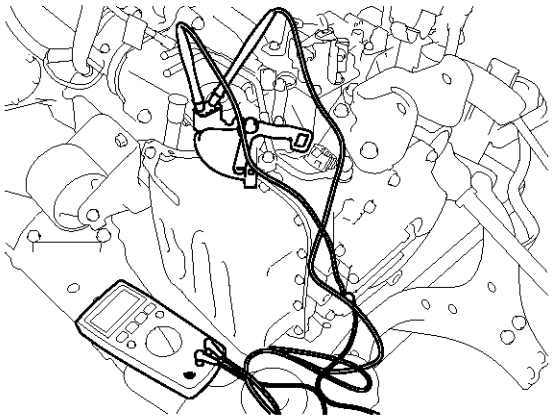
EKRF008D

6. Remove the inhibiter switch connector.
7. Remove the shift cable mounting nut(A).



EKRF008E

8. Remove the inhibiter switch loosening the mounting bolts.
9. Refering to 'Inspection', check for continuity. If there is an error, replace the inhibiter switch.



EKRF008F

10. After tightening the shift cable mounting nut, connect the inhibiter switch.
11. Install the battery, battery tray and the air cleaner assembly.

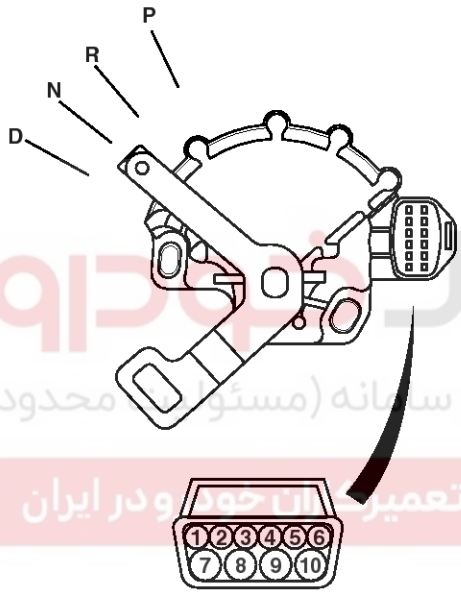
Inspection

1. Check for the starter motor when the ignition switch is at 'START' position and the shift lever at 'P' or 'N' range.
2. Check for the rear lamp when the ignition switch if it does not work properly.
3. Check for the inhibiter switch if it does not work properly.
4. If the inhibiter switch is not fixed in a proper position, reassemble it in the right position.
5. Re-check 1 and 2 procedures.
6. Using a scan tool, confirm the DTCs.
7. Disconnect the battery (-) terminal and the inhibiter switch.

8. Check for continuity between terminals at the switch connector.

Range	Terminal Number									
	1	2	3	4	5	6	7	8	9	10
P			○					○	○	○
R							○	○		
N				○				○	○	○
D	○							○		

EKRF008G

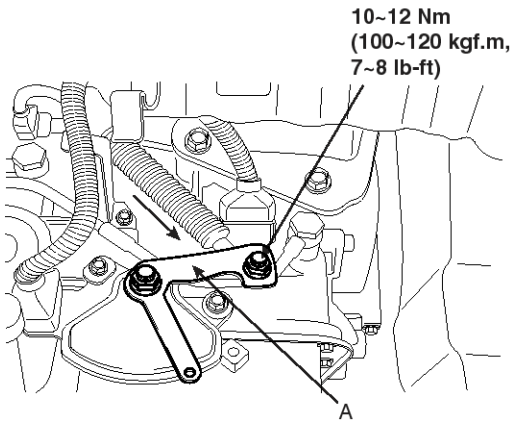


EKRF008H

9. If there is not continuity between the terminals in the table above for each switch position, replace the inhibiter switch.

Adjustment

1. Set the select lever to the "N" position.
2. Loosen the control cable to manual control lever coupling nut to free the cable and lever.
3. Set the manual control lever to the neutral position.

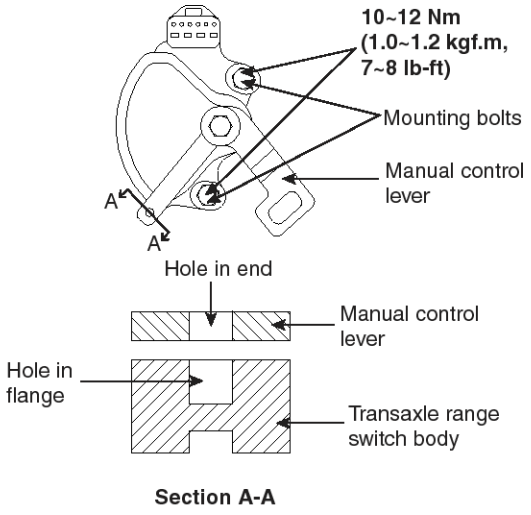


EKRF009A

4. Loosen the transaxle range switch body mounting bolts and then turn the transaxle range switch body so

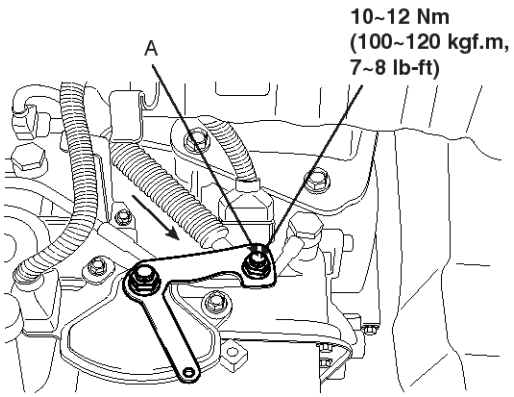
   the hole in the end of the manual control lever and the hole (cross section A-A in the figure) in the flange of the transaxle range switch body flange are aligned.
5. Tighten the transaxle range switch body mounting bolts to the specified torque. Make sure at this time that the position of the switch body did not move.

Tightening torque :
10～12Nm (1.0~1.2kgf.m, 7~8lb-ft)



EKRF009B

6. Gently pull the transmission control cable in the direction of the arrow, and then tighten the adjusting nut.



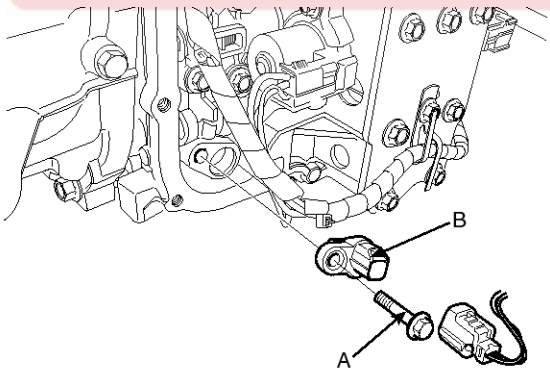
EKRF090A

7. Check that the select lever is in the "N" position.

Oil Temperature Sensor

Replacement

1. Remove the automatic transaxle assembly.
2. Remove the valve body cover(refer to the overhaul manual).
3. Disconnect the oil temperature sensor connector.
4. Remove the oil temperature sensor(B), loosening the mounting bolt(A).

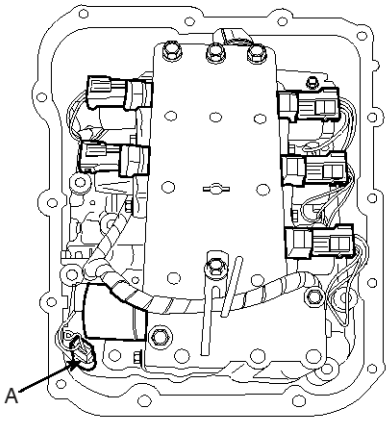


EKRF009C

5. Replace the sensor with the new one and reassemble the rest of the parts.

Inspection

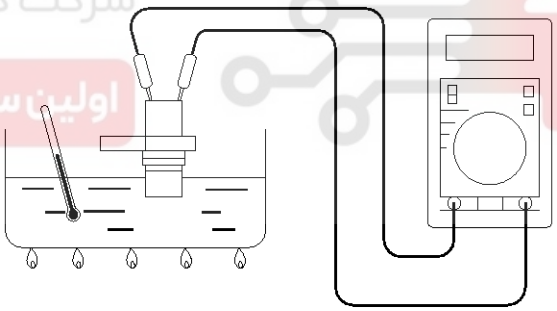
1. Remove the oil temperature sensor(A).



EKRF009D

2. Measure the resistance between the terminal 1 and 2 of the sensor connector.

Temp.[˚C(˚F)]	Resistance(KΩ)
0(32) 100(212)	18.6 0.63



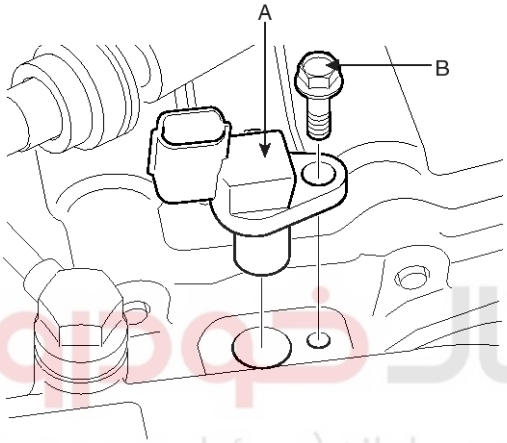
EKRF009E

3. If the value is out of the specfication, replace the oil temperature sensor.

Input Shaft Speed Sensor

Replacement

1. Remove the battery and air cleaner (see "Transaxle range switch replacement").
2. Remove the transaxle range switch connector.
3. Remove the control cable to transaxle range switch mounting nut.
4. Remove the input shaft speed sensor(A).
   1) Disconnect the input shaft speed sensor connector.
   2) Remove the bolt(B).



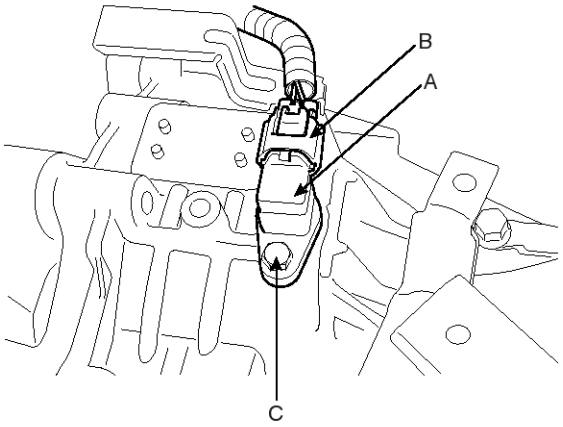
EKRF009F

   3) Inspect the input shaft speed sensor bore.
5. Apply a light coat of automatic transaxle fluid to the O-ring seal before installation.
6. Install the input shaft speed sensor.
7. Install the control cable mounting bracket.
8. Connect the input shaft speed sensor connector.
9. Install the holder of the control cable.
10. Adjust the control cable to transaxle range switch and tighten the transaxle manual lever to the control cable mounting nut. (see "Automatic transaxle shift control installation")
11. Installation is the reverse of removal.

Output Shaft Speed Sensor

Replacement

1. Remove the battery and air cleaner. (see "Transaxle range switch replacement")
2. Remove the output shaft speed sensor(A).



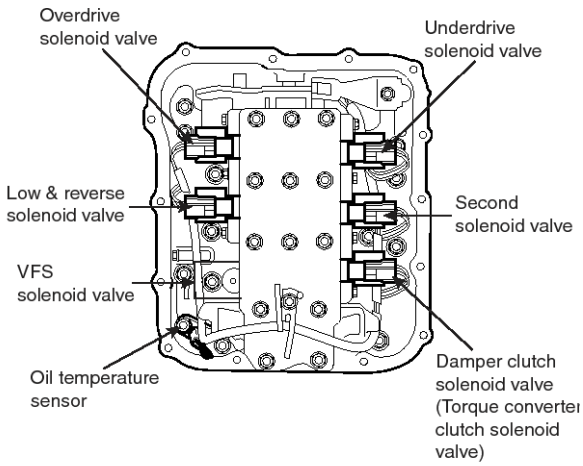
EKRF010A

   1) Disconnect the output shaft speed sensor connector(B).
   2) Remove the bolt(C).
   3) Inspect the output shaft speed sensor bore.
3. Apply a light coat of automatic transaxle fluid to the O-ring seal before installation.
4. Installation is the reverse of removal.

Solenoid Valve

Inspection

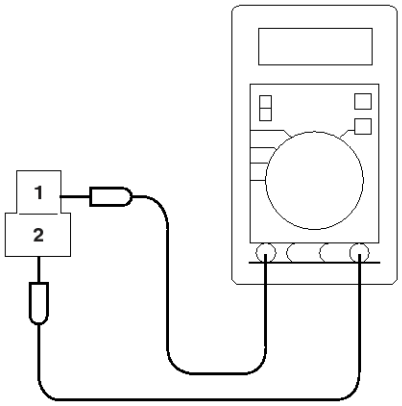
1. If the value is out of specification according to the chart below, remove the valve body cover.



EKRF011A

2. Measure the resistance again after disconnecting solenoid valve connector.

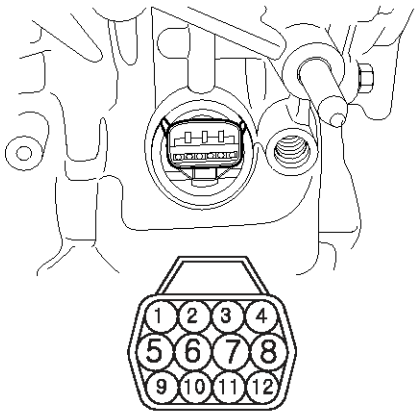
Specification (20˚C):
2.5 ~ 3.5 Ω (LR, 2ND, UD, OD, TCC)
4.3 ~ 4.4Ω (VFS)



EKRF011B

3. If the value is out of specification replace the solenoid valve.

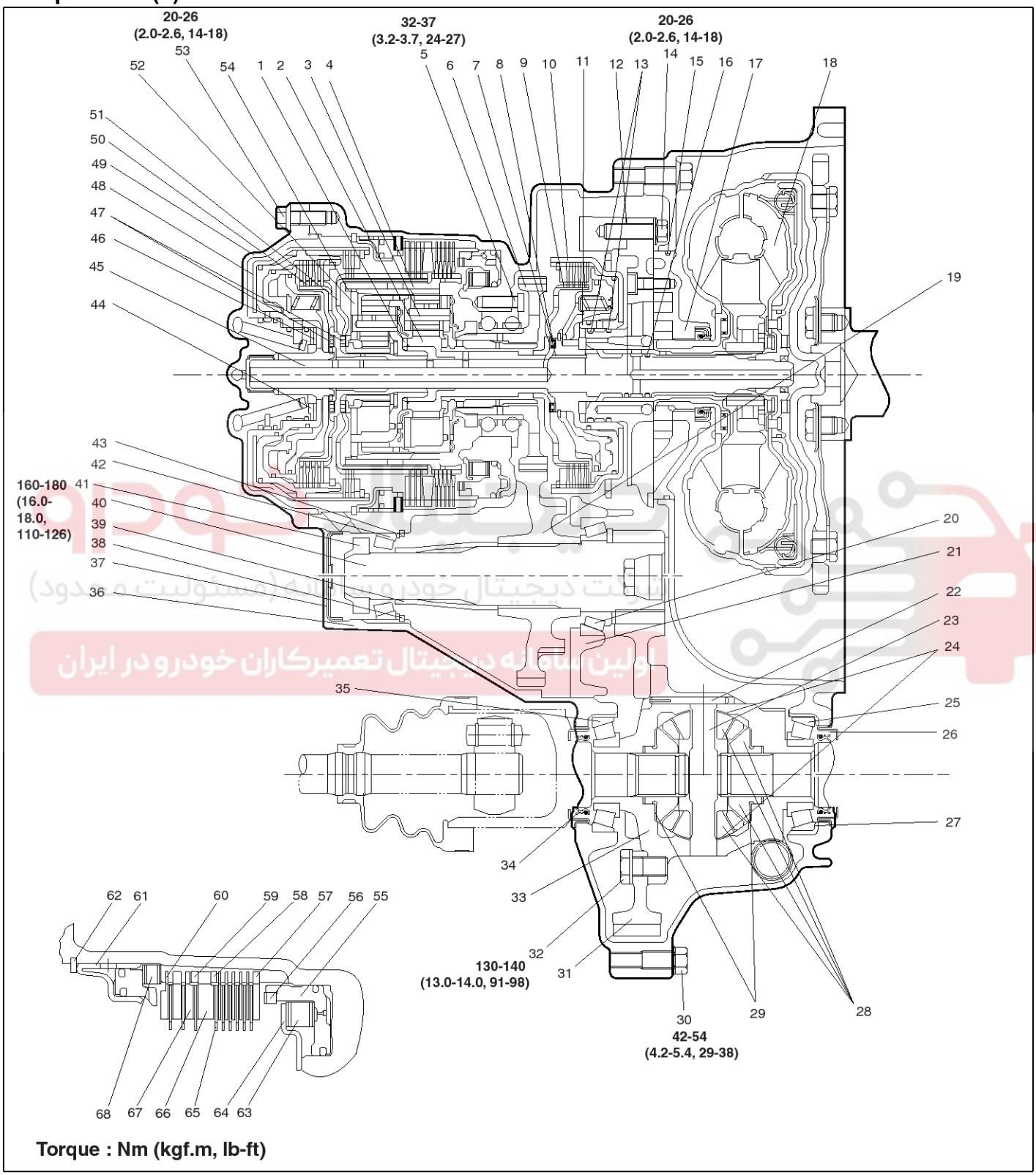
Pin No.	Name	Resistance
6&9	DCC (TCC)	2.5~3.5Ω (20˚C)
6&11	LR	
4&5	2ND	
3&5	UD	
5&12	OD	
7&8	VFS	4.3~4.4Ω (20˚C)



EKRF011C

Automatic Transaxle

Components (1)

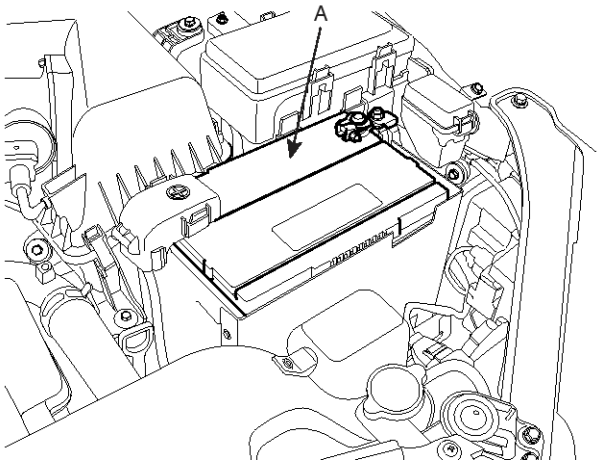


SNFAT8004L

1. Thrust bearing
2. Underdrive sun gear
3. Output carrier
4. Low and reverse annulus gear
5. Bolt
6. Transfer drive gear
7. Snap ring
8. Thrust bearing
9. Underdrive clutch hub
10. Underdrive clutch
11. Thrust washer
12. Oil pump gasket
13. Seal ring
14. Flange bolt
15. O-ring
16. Seal ring
17. Oil pump
18. Torque converter
19. Transfer driven gear
20. Taper roller bearing
21. Bearing retainer
22. Lock pin
23. Pinion shaft
24. Washer
25. Taper roller bearing
26. Oil seal
27. Differential spacer
28. Differential gear
29. Differential spacer set
30. Flange bolt
31. Differential drive gear
32. Fly wheel bolt
33. Differential case
34. Oil seal
35. Transmission case
36. One-way Clutch Inner Race
37. Sealing cap
38. Output spacer set
39. Collar
40. Output shaft
41. Locking pin
42. Roller bearing
43. Snap ring
44. Thrust race
45. Input shaft
46. Thrust bearing
47. Thrust bearing
48. Return & O/D clutch
49. Rear cover
50. O/D clutch hub
51. Return sun gear
52. Output carrier
53. Flange bolt
54. Snap ring
55. Low and reverse brake piston
56. Wave spring
57. Brake pressure plate
58. Snap ring
59. Snap ring set
60. Brake pressure plate
61. 2nd brake retainer
62. Snap ring
63. 2nd brake return spring
64. Brake disc
65. Brake reaction plate
66. Brake plate
67. Brake spring retainer
68. Low and reverse return spring

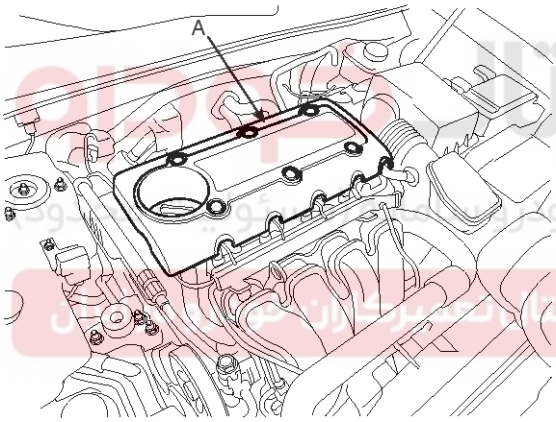
Removal

1. Remove the battery (A).



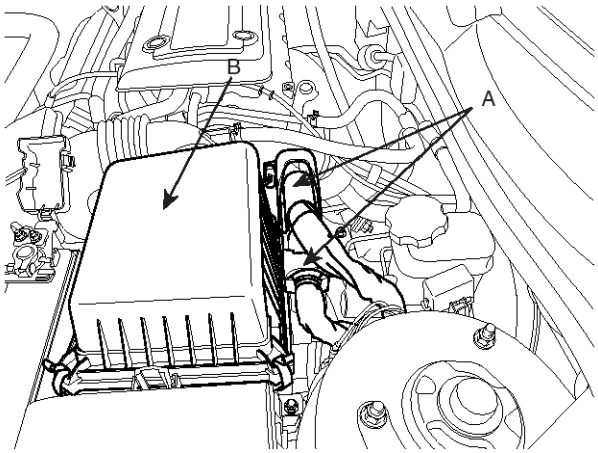
SMGAA9001D

2. Remove the engine cover (A).



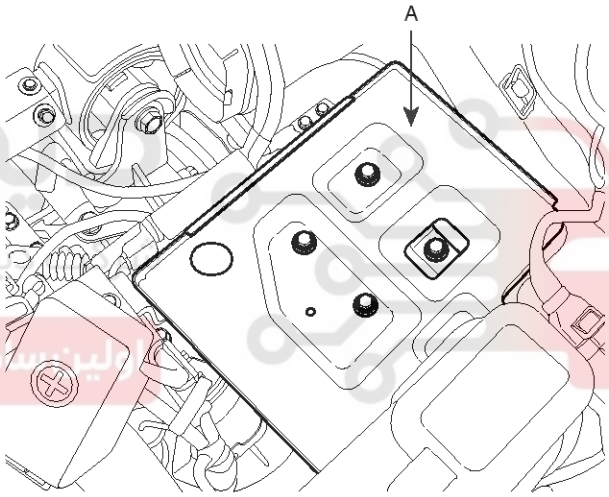
SMGMT9002D

3. After disconnecting the PCM connector (A), remove air cleaner (B).



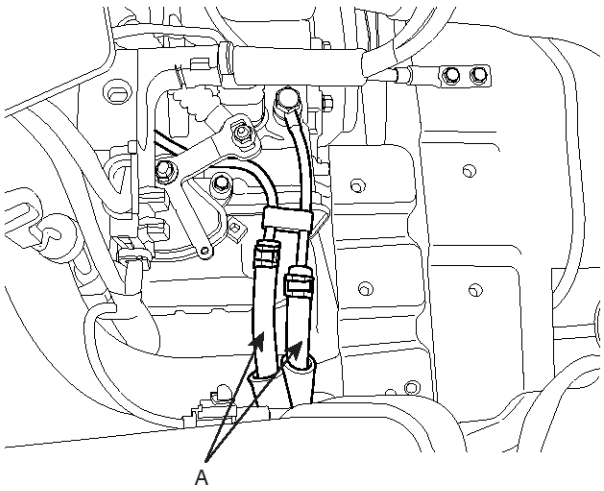
SMGAT9050D

4. Remove the battery tray (A).



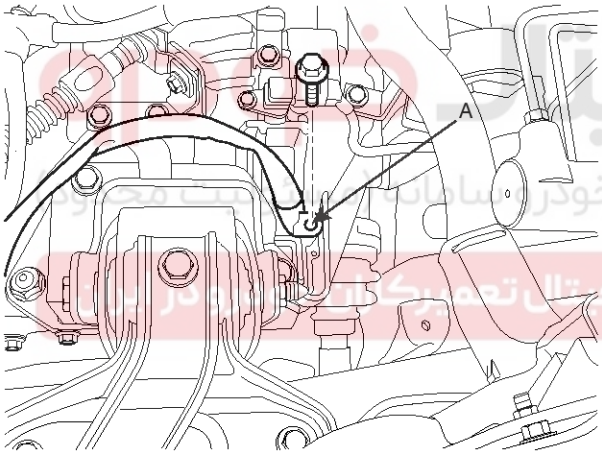
KKBF017A

5. Remove the transaxle oil cooler hoses (A) by releasing the clamps.



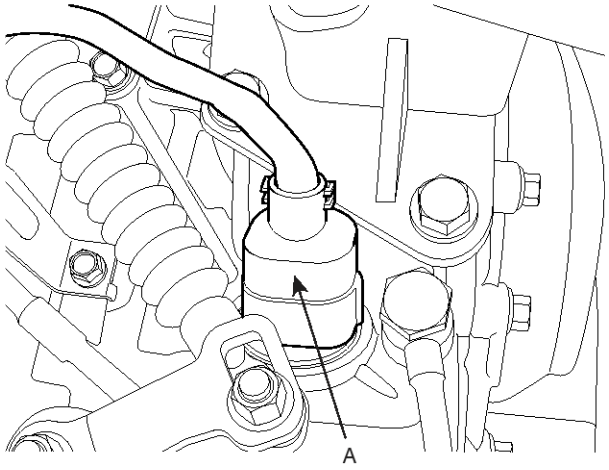
KKBF004A

6. Disconnect the ground wire (A).



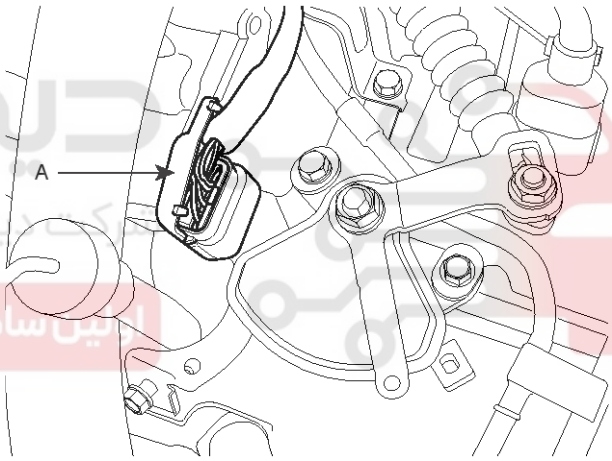
SMGAT9056D

7. Disconnect the solenoid valve connector (A).



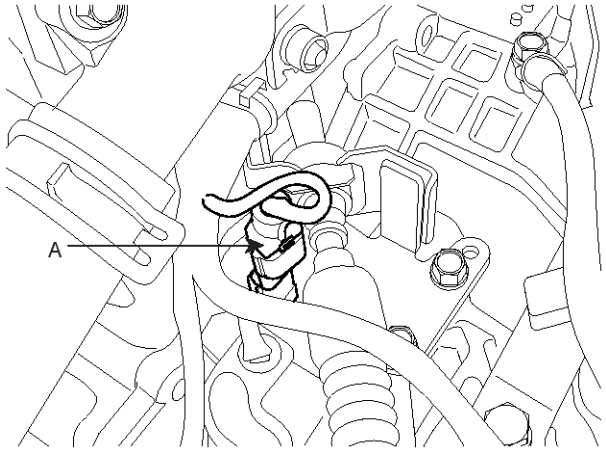
KKBF014A

8. Disconnect the inhibitor switch connector (A).



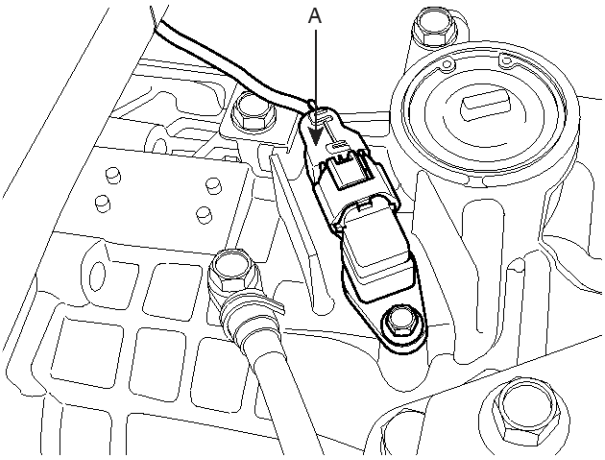
KKBF011A

9. Disconnect the input speed sensor connector (A).



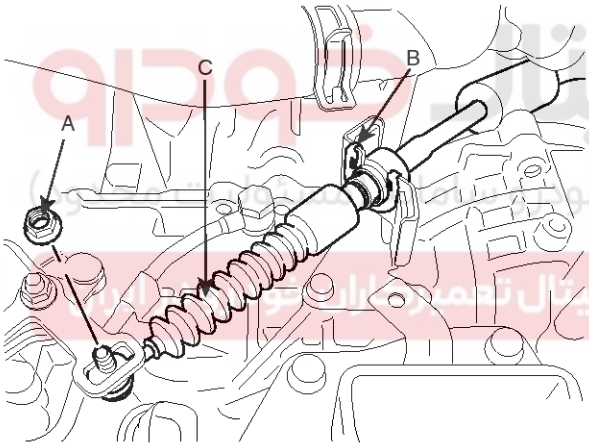
KKBF012A

10. Disconnect the output speed sensor connector (A).



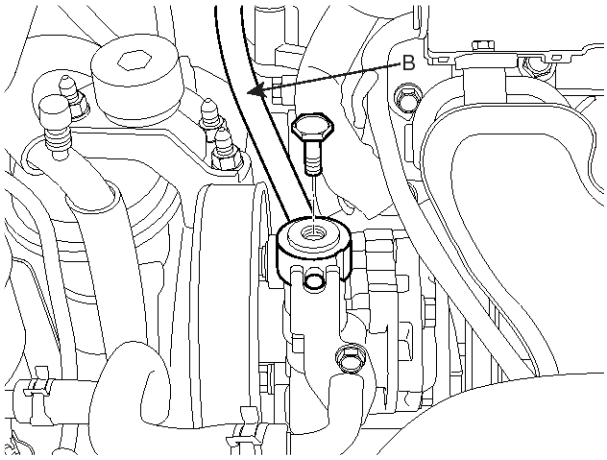
KKBF013A

11. Remove the control cable assembly (C) by removing the nut (A) and one-touch clip (B).



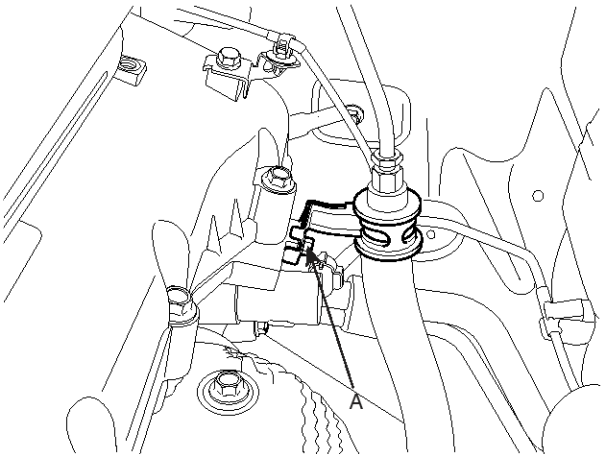
SNFAA6040D

12. Remove the power steering pressure tube bolt(A).



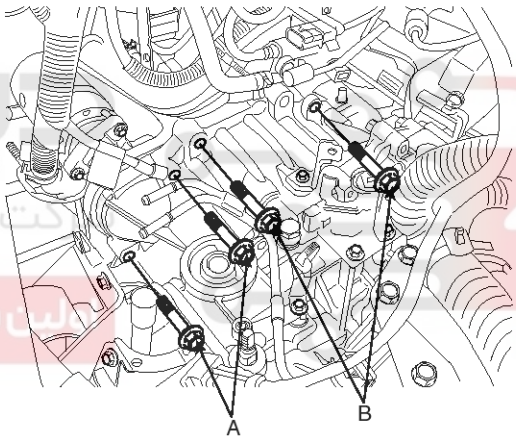
SNFAT8004D

13. Remove the power steering pressure tube bracket bolt(A).



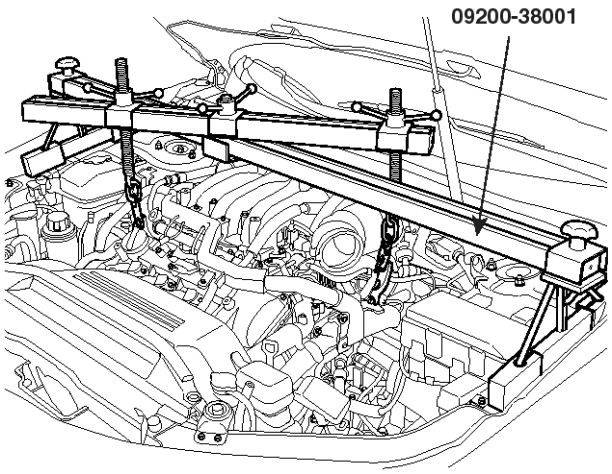
SMGAT9051D

14. Remove the starter motor bolts (A-2ea) and transaxle upper mounting bolts (B-2ea).



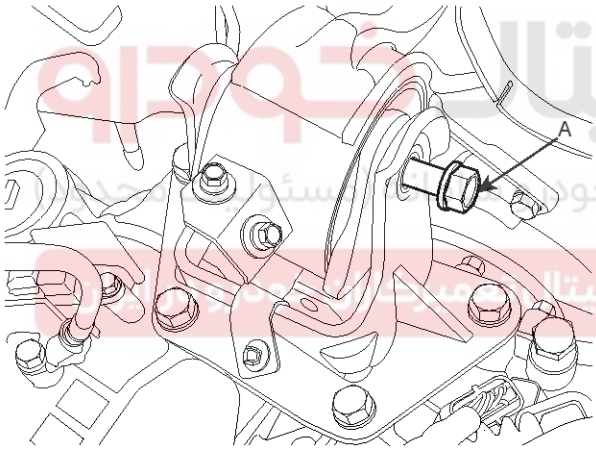
SMGAT9001D

15. Using the SST(09200-38001), support the engine and transaxle assembly safely.



KKBF006A

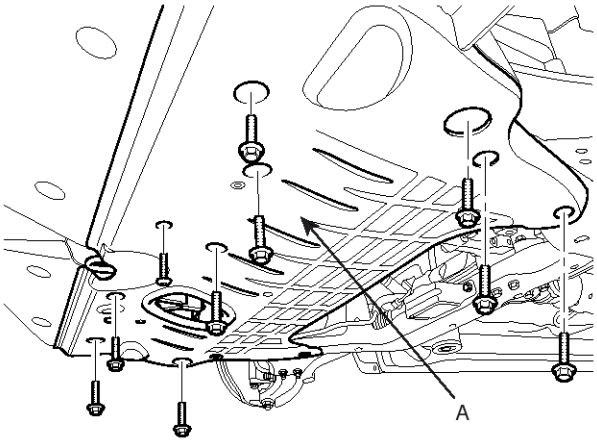
16. Remove the transaxle mounting bolt (A).



KKBF010A

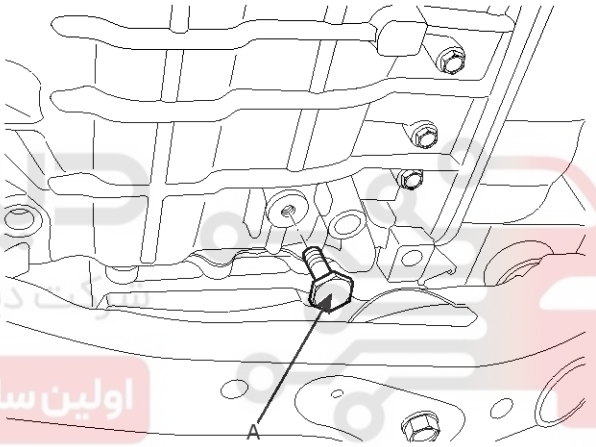
17. Remove the front wheels. (refer to SS group).

18. Remove the under cover (A).



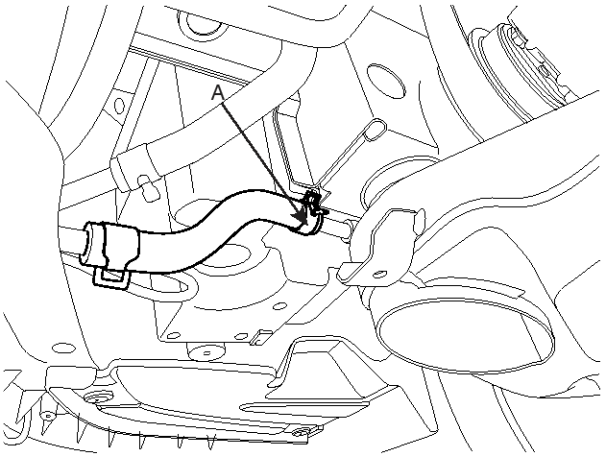
SNFAT8001D

19. After removing the oil drain plug (A), drain the fluid.



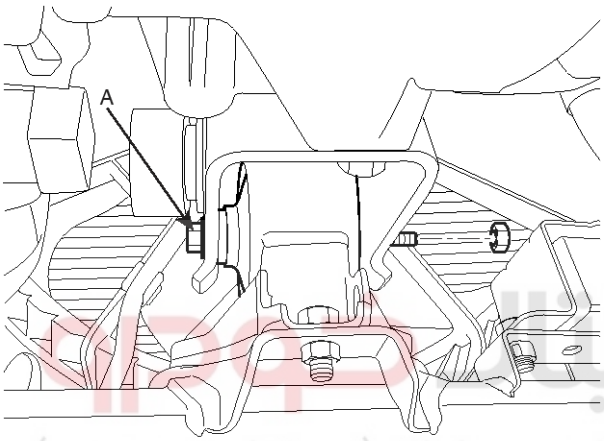
SNFAT8003D

20. Drain power steering fluid through the return tube by loosening the clamp (A).



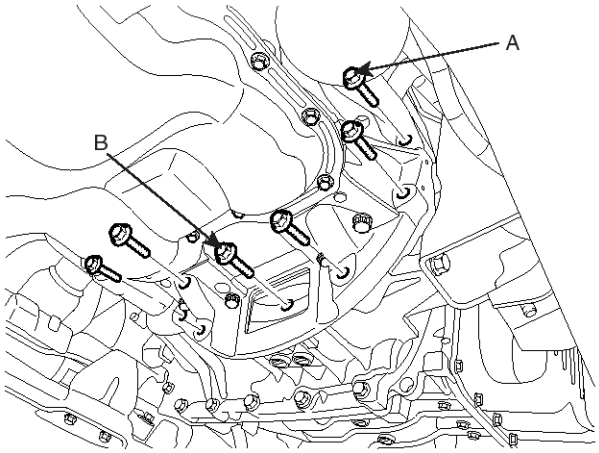
SMGAT9053D

21. Disconnect the lower arm, the tie rod end ball joint, and the stabilizer link from the front knuckle. (refer to SS group)
22. Remove the power steering column joint bolt (A). (refer to ST group).
23. Supporting the sub frame with a jack and the special tool(09624-38000), remove the mounting bolts. (refer to SS group).
24. After removing the inner shaft mounting bolts, remove the drive shafts from transaxle. (refer to DS group)
25. Remove the supporting bracket bolts(A)



SMGAT9052D

26. Remove the torque converter mounting bolts (B-6ea) by rotating the timing gear.
    and the transaxle under mounting bolts (A-4ea)



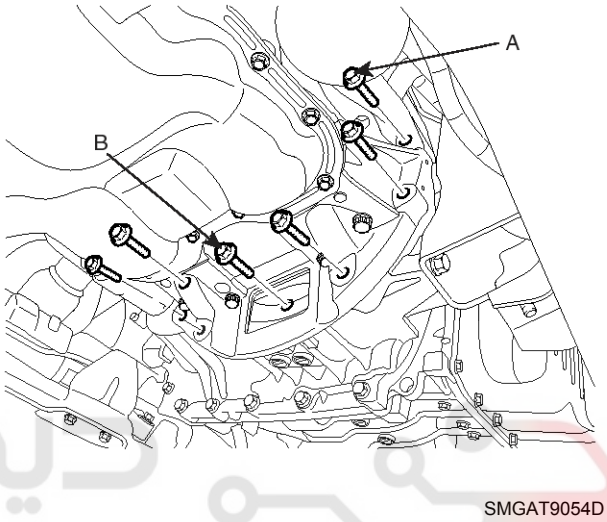
SMGAT9054D

⚠CAUTION
Lifting the vehicle up and lowering the jack slowly, remove the transaxle assembly.

Installation

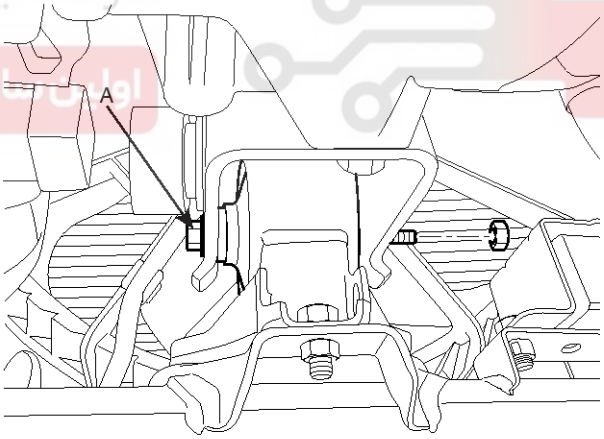
1. Install the transaxle lower mounting bolts(A-4ea) after fitting the transaxle assembly into the engline assembly.
   and install the torque converter mounting bolts (B-6ea) by rotating the timing gear.

Tightening torque :
30 ~ 42Nm (3.0 ~ 4.2 kgf.m , 22.1 ~ 30.3 lb-ft)
46 ~ 53Nm (4.6 ~ 5.3 kgf.m , 33.2 ~ 38.3 lb-ft)



SMGAT9054D

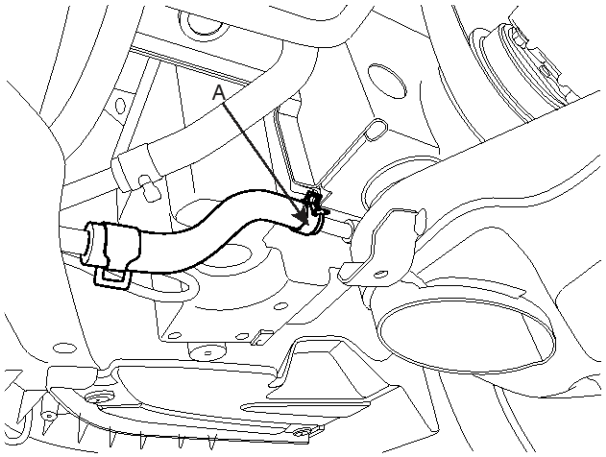
2. Install the supporting bracket bolts(A).



SMGAT9052D

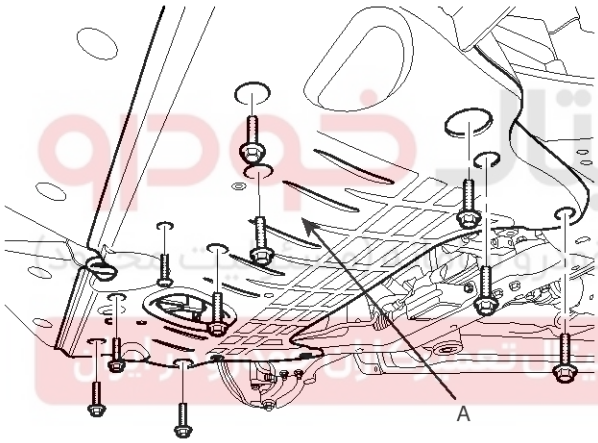
3. Connect the driveshafts to the transaxle and install the inner shaft bracket with two bolts. (refer to DS group)
4. Remove the sub frame(refer to SS group).
5. Supporting the sub frame with a jack and the special tool (09624-38000), install the mounting bolts. (refer to SS group).

6. Connect the the power steering return hose by tightening the clamp (A).



SMGAT9053D

7. Install the under cover (A).

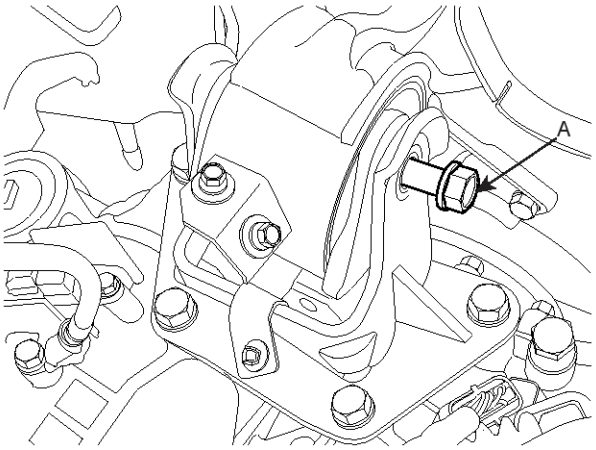


SNFAT8001D

8. Install the front wheels. (refer to SS group).

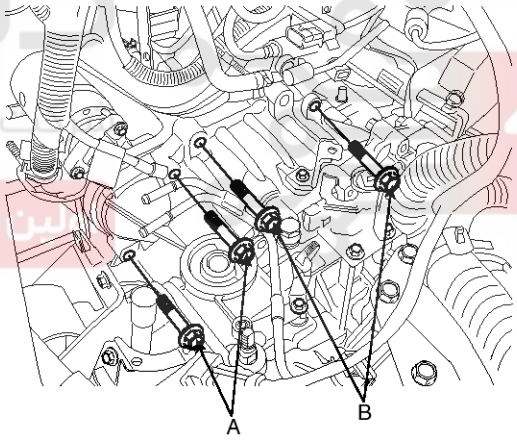
9. Install the transaxle mounting bolt (A).

Tightening torque :
65~85Nm (6.5~8.5kgf.m, 47.0~61.4lb-ft)



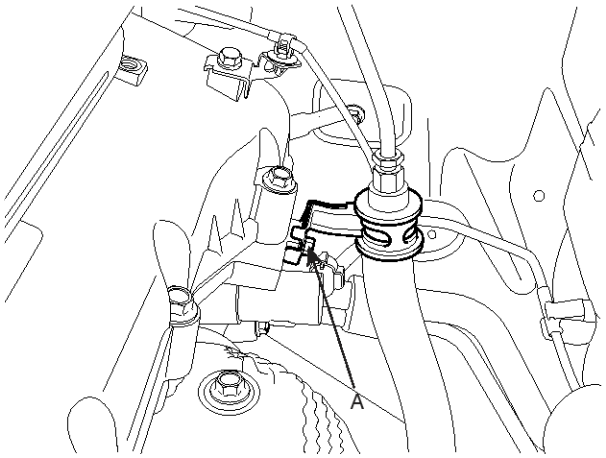
KKBF010A

10. Remove the special tool (09200-38001).
11. Install the starter motor bolts (A-2ea) or transaxle upper mounting bolts (B-2ea).



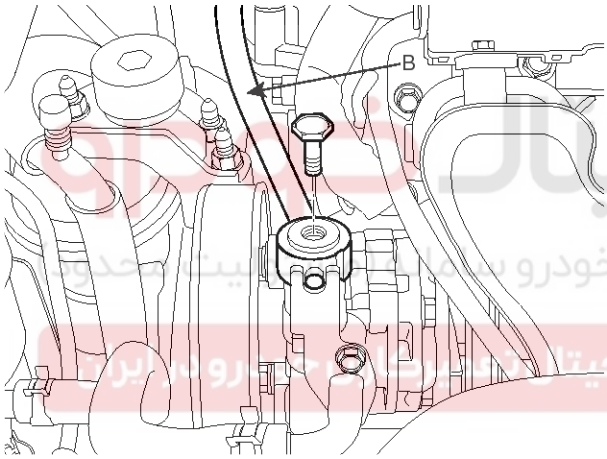
SMGAT9001D

12. Install the power steering pressure tube bracket bolt(A).



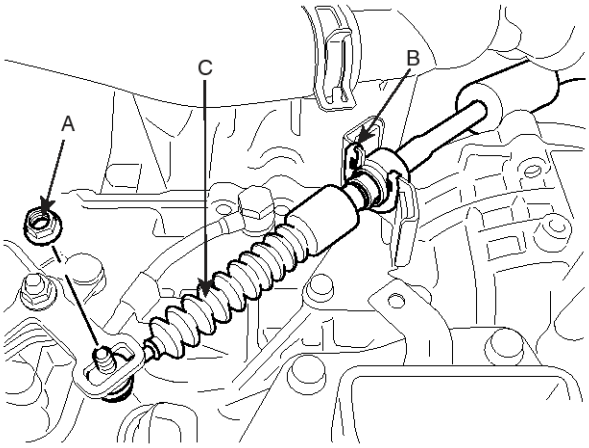
SMGAT9051D

13. Install the power steering pressure tube bolt(A).



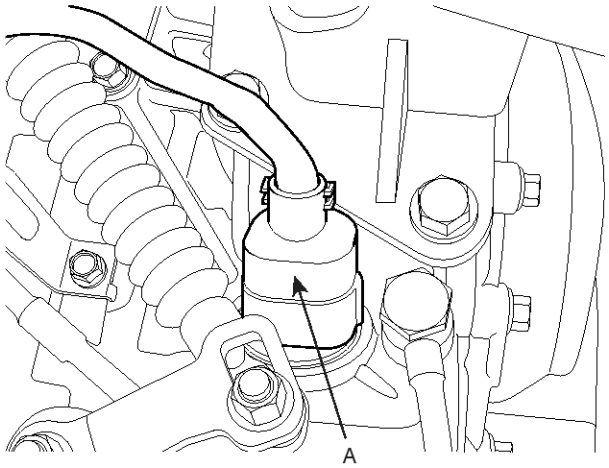
SNFAT8004D

14. Install the control cable assembly (C) by installing the nut (A) and one-touch clip (B).



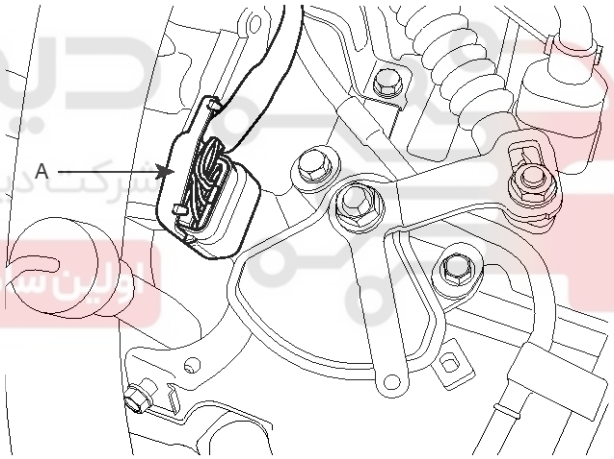
SNFAA6040D

15. Connect the solenoid valve connector (A).



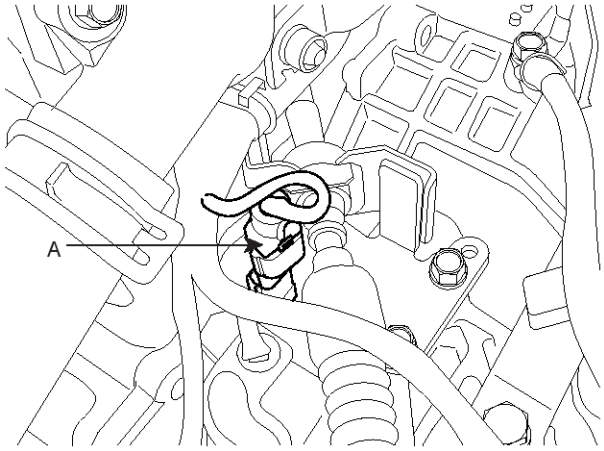
KKBF014A

16. Connect the inhibiter switch connector (A).



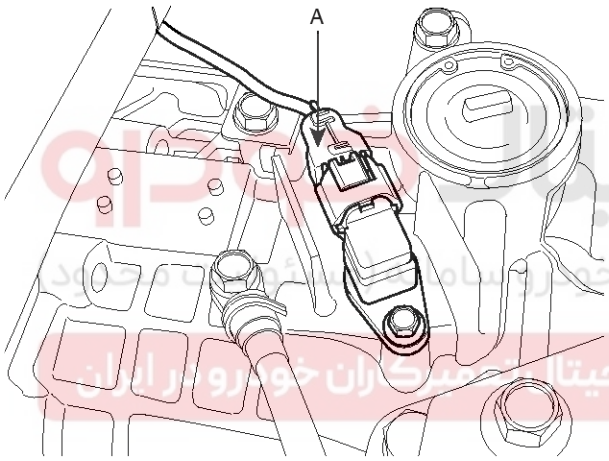
KKBF011A

17. Connect the input speed sensor connector (A).



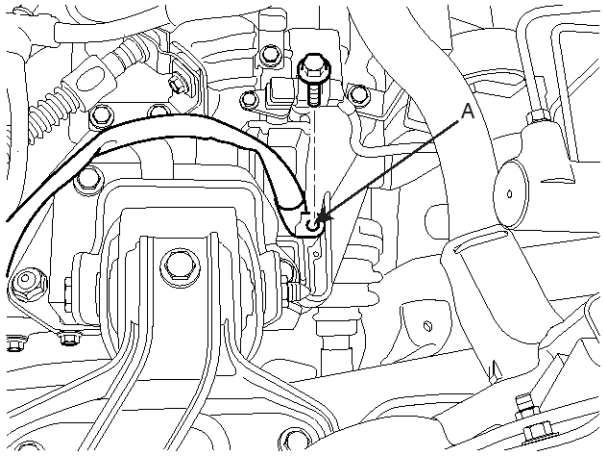
KKBF012A

18. Connect the output speed sensor connector (A).



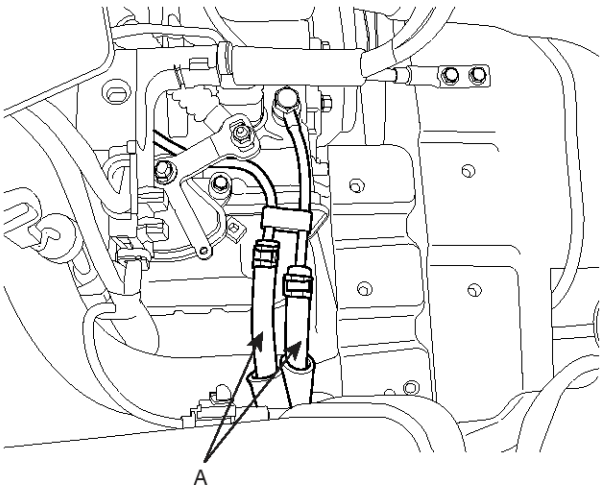
KKBF013A

19. Connect the ground cable (A).



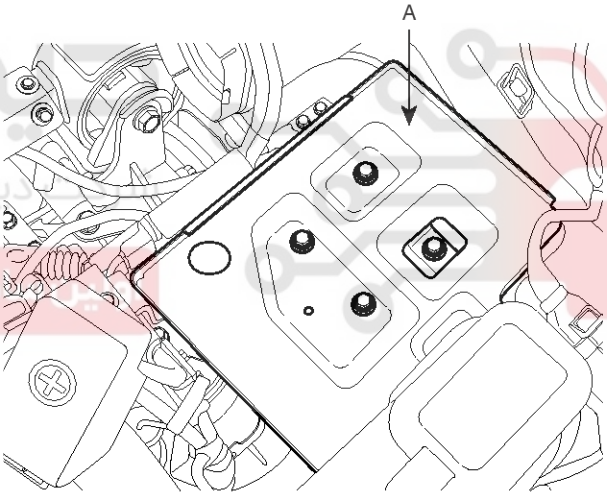
SMGAT9056D

20. Connect the transaxle oil cooler hoses (A) to the tubes by tightening the clamps.



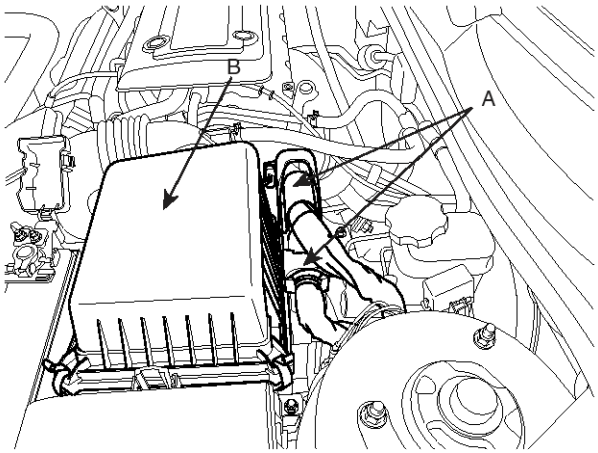
KKBF004A

21. Install the battery tray (A)



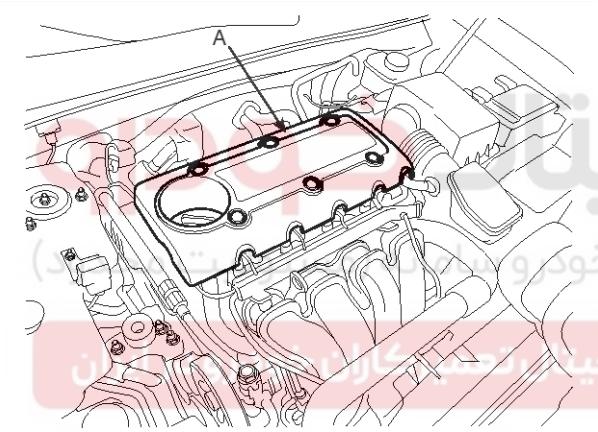
KKBF017A

22. Install air cleaner assembly (A) and the PCM connector (B).



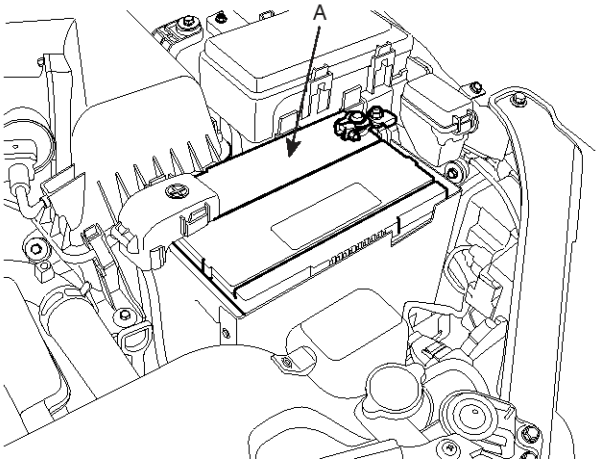
SMGAT9050D

23. Install the engine cover (A).



SMGMT9002D

24. Install the battery (A).



SMGAA9001D

25. Refill the automatic transaxle fluid. (refer to 'Service Adjustment Procedure')

NOTICE

When replacing the automatic transaxle, reset the automatic transaxle's values by using the High-Scan Pro.

1. Connect the Hi-Scan Pro connector to the data link connector under the crash pad and power cable to the cigar jack under the center facia.
2. Turn the ignition switch on and power on the Hi-Scan Pro.
3. Select the vehicle's name.
4. Select 'AUTOMATIC TRANSAXLE'.
5. Select 'RESETTING AUTO T/A VALUES' and perform the procedure.

```
1.7. RESETTING AUTO T/A VALUES

THIS FUNCTION IS FOR RESETTING
THE ADAPTIVE VALUES FROM THE
USED AUTO T/A WHEN REPLACING IT.

IF YOU ARE READY,
PRESS [ENTER] KEY!
```

SCMAT6512L

6. Perform the procedure by pressing F1 (REST).

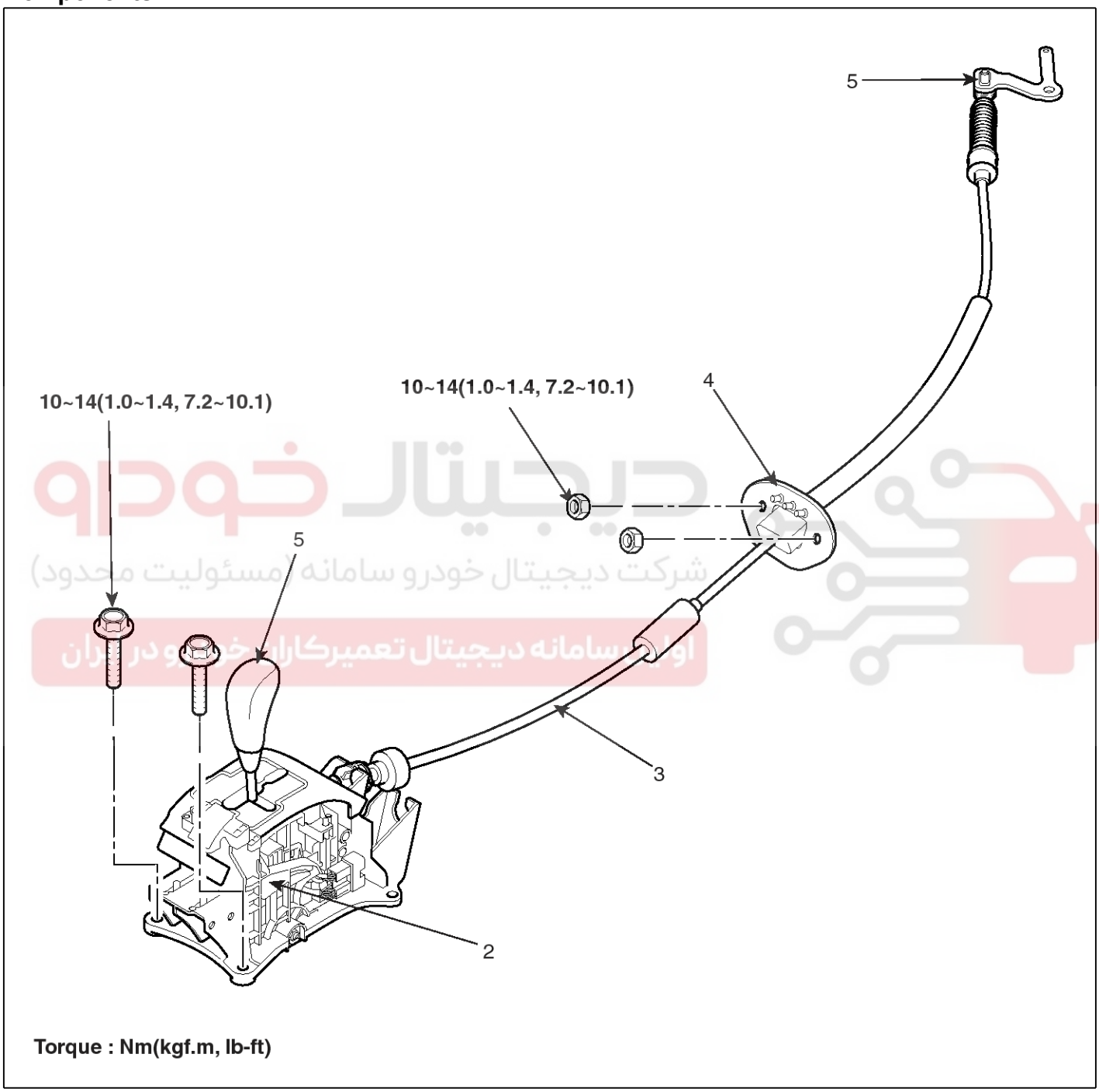
```
1.7. RESETTING AUTO T/A VALUES

RESETTING AUTO T/A VALUES
CONDITION | IG KEY ON
          | TRANSAXLE RANGE : P
          | VEHICLE SPEED : 0
          | ENGINE OFF

PRESS [REST], IF YOU ARE READY !

REST
```

SCMAT6513L

Automatic Transaxle Control System

Shift Lever

Components



SNFAT8001L

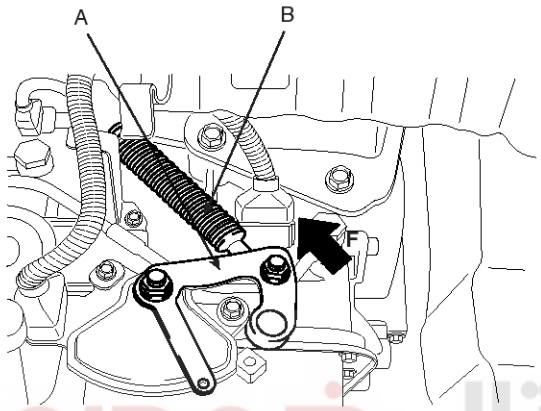
1. Shift lever knob
2. Shift lever assembly
3. Shift cable assembly
4. Retainer
5. Manual lever

Adjustment

Adjusting the shift cable

1. Set the room side lever anvd the manual lever (A) to N position.
2. Push the shift cable (B) lightly to "F" direction shown to eliminate the free play.

Tightening torque :
10-14Nm (1.0-1.4kgf.m, 7.2-10.1lb-ft)

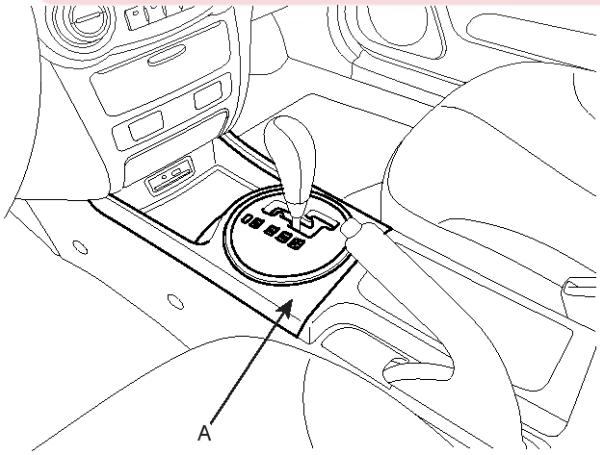


EKRF016A

3. Check that this part operates surely at each range of the manual lever corresponding to each position of the room lever.

Removal

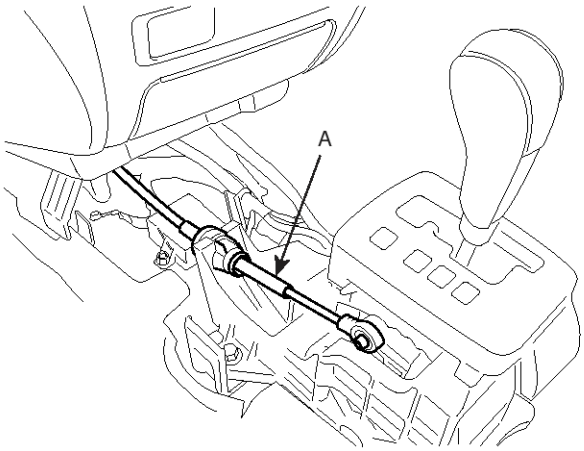
1. Remove the center console cover (A).



SMGAT9055D

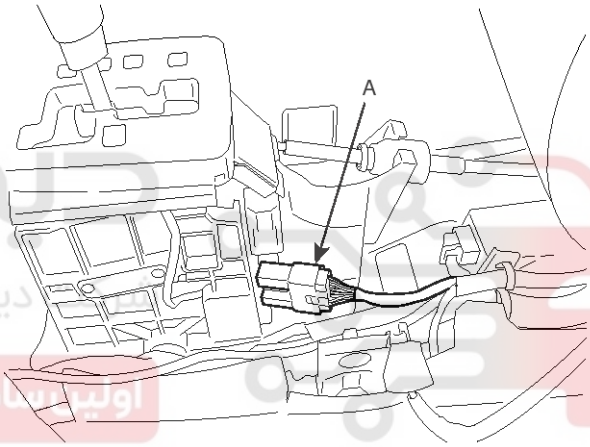
2. Remove the center console(A). (refer to Console in BD group)

3. Disconnect the control cable(A).



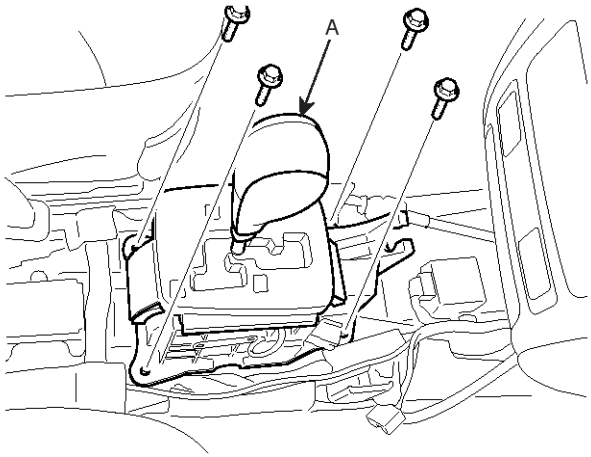
AKLG006A

4. Disconnect the sports mode connector(A).



AKLG005A

5. Remove the shift lever assembly(A)

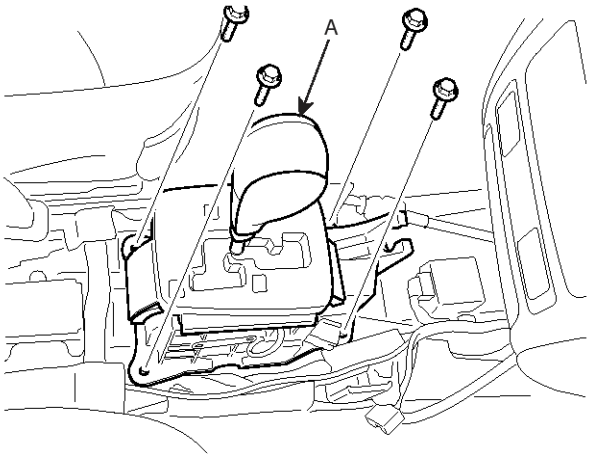


AKLG007A

Installation

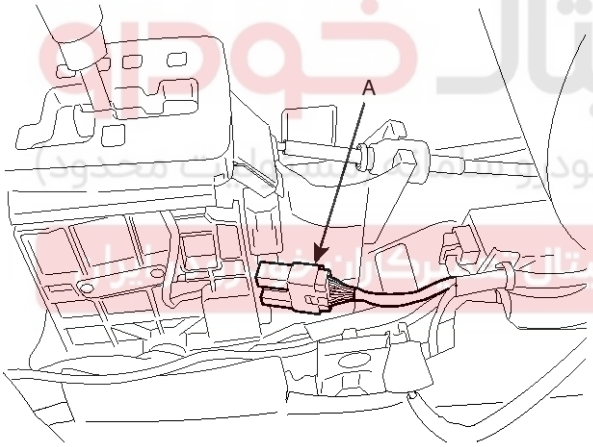
1. Install the shift lever assembly(A)

Tightening torque :
9~14Nm (0.9~1.4kgf.m, 6.5~10.1lb-ft)



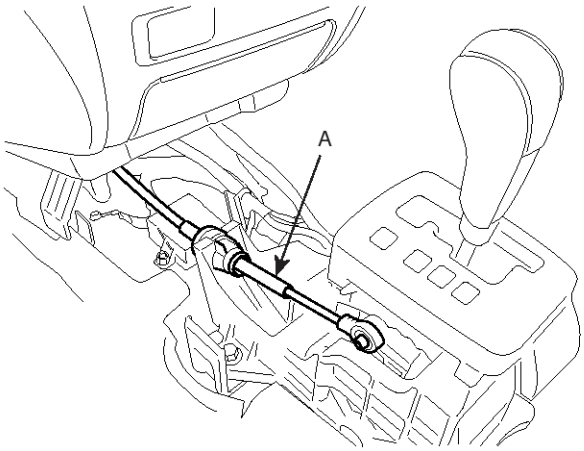
AKLG007A

2. Connect the sports mode connector(A).



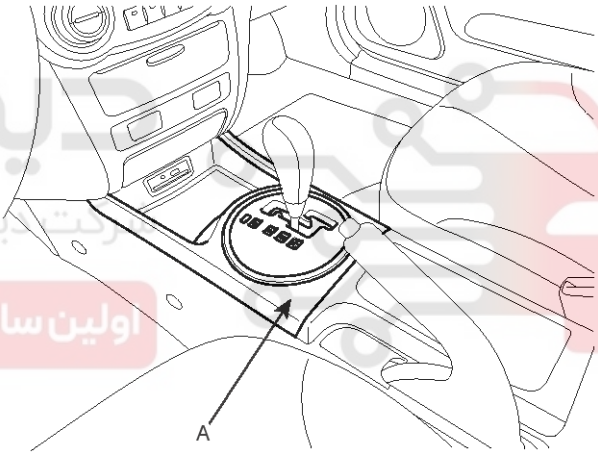
AKLG005A

3. Connect the control cable(A).



AKLG006A

4. Install the center console(A). (refer to Console in BD group)
5. Install the center console cover (A).



SMGAT9055D