



Specifications

Item		Specifications	
Engine type		Gasoline 2.0GDI	
Transaxle type		A6MF1	A6MF1-1
Drive system		4WD	2WD
Gear ratio	1st	4.612	4.440
	2nd	2.575	2.726
	3rd	1.772	1.834
	4th	1.369	1.392
	5th	1.000	1.000
	6th	0.778	0.774
	Reverse	3.500	3.440
Final gear ratio		3.648	3.510
Torque converter type		3-element, 1-stage, 2-phase type	
Torque converter size		Ø236 mm (9.291 in.)	
Oil pump system		Mechanical internal gear pump	
Friction elements		Clutch: 2EA	
		Brake: 3EA	
		OWC: 1EA	
Planetary gear		3EA	
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

Sensors

Input Speed Sensor

▷ Type: Hall effect sensor

▷ Specifications

Operation condition (°C)°F		(-40 ~ 150) -40 ~ 302
Output voltage(V)	High	1.18 ~ 1.68
	Low	0.59 ~ 0.84

Output Speed Sensor

▷ Type: Hall effect sensor

▷ Specifications

Operation condition (°C)°F		(-40 ~ 150) -40 ~ 302
Output voltage	High	1.18 ~ 1.68
	Low	0.59 ~ 0.84

Oil Temperature Sensor

▷ Type: Negative Thermal Coefficient (NTC)

▷ Specifications

Temp. [(°C)°F]	Resistance (kΩ)
(-40) -40	48.1
(-20) -4.0	15.6
(0) 32.0	5.88
(20) 68.0	2.51
(40) 104.0	1.19
(60) 140.0	0.61
(80) 176.0	0.32
(100) 212.0	0.18
(120) 248.0	0.11

(140) 284.0	0.07
(160) 320.0	0.04

Inhibitor Switch

▷ Type: Combination of output signals from 4 terminals

▷ Specifications

Power supply (V)	12
Output type	Combination of output signals

Solenoid Valves

Clutch/Brake control VFS[26/B, T/CON]

▷ Control type : Normally low type

Control Pressure [kpa (kgf/cm ² , psi)]	9.81 ~ 500.14 (0.1 ~ 5.1, 1.42 ~ 72.54)
Current value(mA)	50 ~ 850
Internal resistance(Ω)	5.1

Clutch/Brake control VFS[UD/B, OD/C, 35R/C]

▷ Control Type : Normally high type

Control Pressure [kpa (kgf/cm ² , psi)]	500.14 ~ 9.81 (5.1 ~ 0.1, 72.54 ~ 1.42)
Current value(mA)	850 ~ 50
Internal resistance(Ω)	5.1

Line Pressure Control VFS[Line pressure]

▷ Control type : Normally high type

Control Pressure [kpa (kgf/cm ² , psi)]	500.14 ~ 9.81 (5.1 ~ 0.1, 72.54 ~ 1.42)
Current value(mA)	850 ~ 50
Internal resistance(Ω)	5.1

ON/OFF Solenoid Valve(SS-A, SS-B)

▷ Control type : Normally low type

Control Pressure [kpa (kgf/cm ² , psi)]	490.33 (5.0, 71.12)
Internal resistance(Ω)	10 ~ 11

Solenoid Valve Operation Table

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

● : Connected status

Δ : Connected at vehicle speed above 8km/h

Tightening Torques

Item	N.m	Kgf.m	lb-ft
Shift cable bracket mounting bolt	14.7 ~ 21.6	1.5 ~ 2.2	10.8 ~ 15.9
Fixing nut of shift cable in the manual lever	9.8 ~ 13.7	1.0 ~ 1.5	7.2 ~ 10.8

Automatic transaxle upper mounting bolt (TM=>Eng)	42.2 ~ 53.9	4.3 ~ 5.5	31.1 ~ 39.8
Automatic transaxle mounting bracket bolt	88.3 ~ 107.9	9.0 ~ 11.0	65.1 ~ 79.6
Automatic transaxle support bracket mounting bolt	58.9 ~ 78.5	6.0 ~ 8.0	43.4 ~ 57.8
Torque converter mounting bolt	45.1 ~ 52.0	4.6 ~ 5.3	33.3 ~ 38.3
Automatic transaxle lower mounting bolt (Eng=>TM)	42.2 ~ 48.1	4.3 ~ 4.9	31.1 ~ 35.4
	42.2 ~ 53.9	4.3 ~ 5.5	31.1 ~ 39.8
TCM mounting nut	9.8 ~ 11.8	1.0 ~ 1.2	7.2 ~ 8.7
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 bolt	8.8 ~ 13.7	0.9 ~ 1.4	9.4 ~ 10.8
Inhibitor switch mounting bolt	9.8 ~ 11.8	1.0 ~ 1.2	7.2 ~ 8.7
Valve body cover mounting bolt	11.8 ~ 13.7	1.2 ~ 1.4	8.7 ~ 10.1
Injection hole(eyebolt)	4.9 ~ 5.9	0.5 ~ 0.6	3.6 ~ 4.3
ATF drain plug	33.3 ~ 43.1	3.4 ~ 4.4	24.6 ~ 31.8
Starter mounting bolt	42.2 ~ 54.0	4.3 ~ 5.5	31.1 ~ 39.8

Lubricants

Fluid

ATF Grade	Recommended	Allowed
	ATF SP-IV	SK ATF SP-IV, MICHANG ATF SP-IV, NOCA ATF SP-IV, Hyundai Genuine ATF SP-IV or other brands meeting the above specification approved by Hyundai Motors Corp.
ATF Quantity	A6MF1(4WD): 7.1L (1.88 U.S gal., 7.50 U.S.qt., 6.24 Imp.qt.)	
	A6MF1-1(2WD): 7.3L (1.93 U.S gal., 7.71 U.S.qt., 6.42 Imp.qt.)	

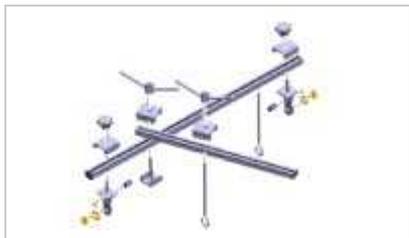
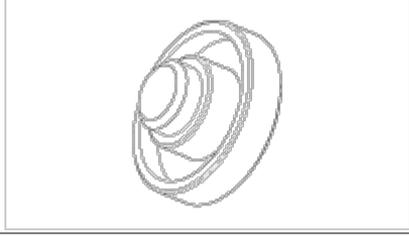
Sealant

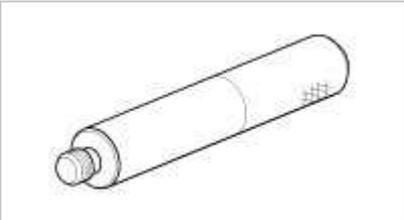
Item	Specified sealant
Rear cover	LOCTITE FMD-546
Torque converter housing	

Automatic Transaxle System

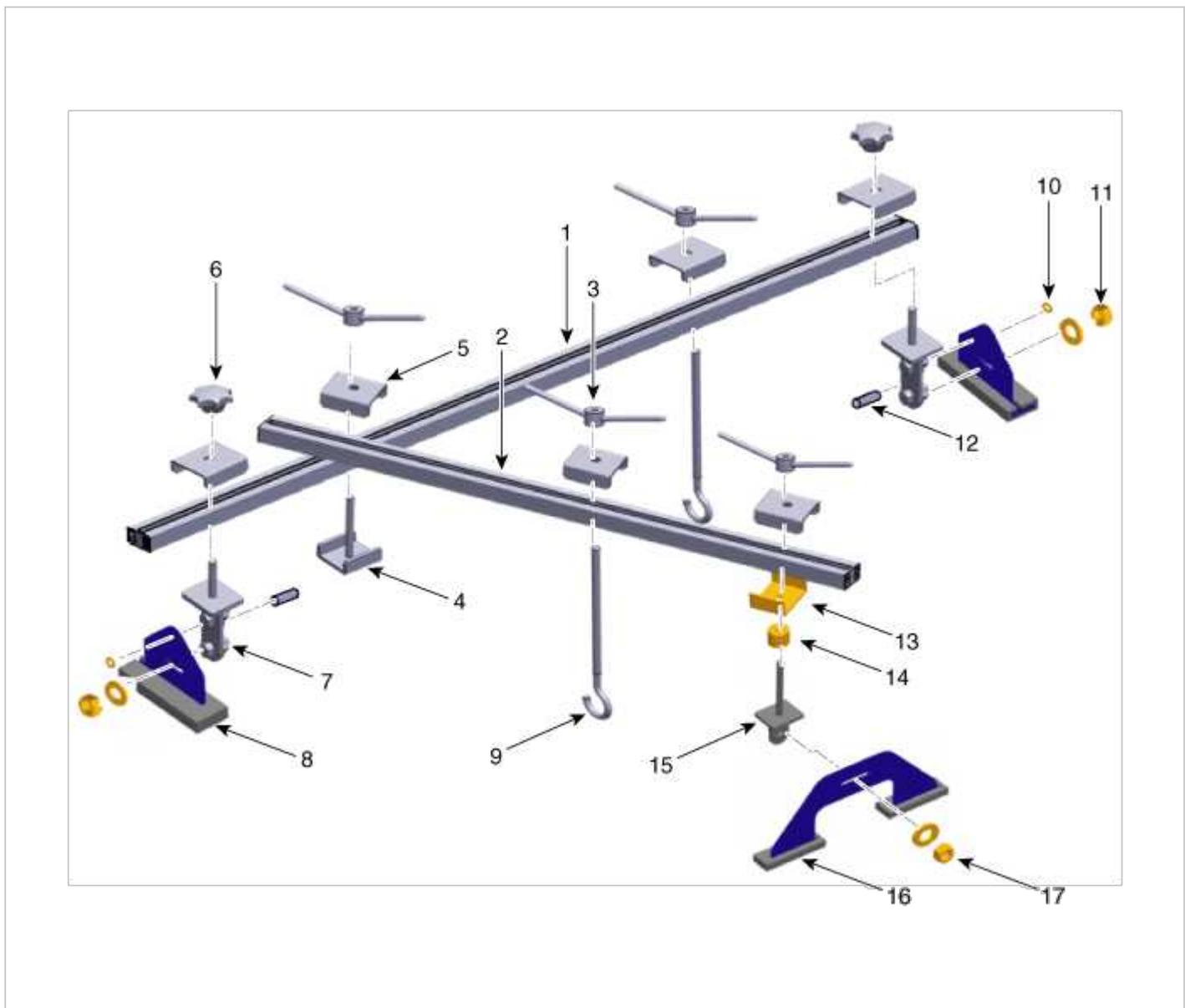


Special Service Tools

Tools (Number and name)	Illustration	Use
09200-3N000 Engine support fixture (Beam)		Removal and installation of the transaxle. Use this beam (SST No. : 09200-3N000) with the supporter (SST No. : 09200-2S000). ※Permit operating with 09200-38001. ※Refer to the engine support fixture assembly drawing below.
09200-2S000 Engine support fixture (Supporter)		Removal and installation of the transaxle. Use this supporter (SST No. : 09200-2S000) with the beam (SST No. : 09200-38001/3N000). ※Refer to the engine support fixture assembly drawing below.
09453-3L241 Oil seal installer		Installation of the differential oil seal in the transaxle case side. [Using with bar (SST No.09231-H1100)]
09453-2W100 Oil seal installer		Installation of the differential oil seal in the transaxle housing side. [Using with bar (SST No.09231-H1100)]

		
<p>09231-H1100 Bar</p>		<p>Installation of the differential oil seal in the transaxle case and housing side. [Using with oil seal installer (SST No.:09453-3L241, 09453-2W100)]</p>
<p>09480-A3800 Inhibitor switch neutral fixed pin</p>		<p>When installing the manual control lever on the inhibitor switch, used to align the neutral position.</p>

※ Engine support fixture special tool assembly drawing



- 1. Main bar
- 2. Sub bar
- 3. Handle

- 10. Clip
- 11. Nut
- 12. Pin

4. Stopper
5. Stopper
6. Knobe
7. Adapter
8. Supporter
9. Hanger

13. Stopper
14. Spacer
15. Adapter
16. Supporter
17. Nut

Automatic Transaxle System



► Fault Diagnosis

Features a fail-safe mechanism that provides "limp-home" 4th gear hold to enable the vehicle to be driven to the owner's home or dealer shop.

NOTICE

- **Fail-Safe** :The TCM provides 4th gear hold and Reverse gear in the event of a malfunction.
- **Limp Home** :
Maintains minimal functionality (Drive(4th gear hold), Reverse) in the event of a malfunction, making it possible for the vehicle to reach the dealer shop.

► Troubleshooting

Trouble symptom	Suspect area	Remedy
Shift delay	Damaged clutch / brake	Replace the brake or clutch.
	Faulty hydraulic control	Inspect the solenoid valve.
	Faulty hydraulic supply	Check the fluid level.
	Not performed TCM learning	TCM learning is required.
Vibration of the vehicle when shifting	Damaged clutch / brake	Replace the brake or clutch.
	Not performed TCM learning	TCM learning is required.
	Faulty hydraulic control	Inspect the solenoid valve.
	Faulty hydraulic supply	Check the fluid level.
Fixed gear (shift impossible)	Faulty hydraulic control	Inspect the solenoid valve. Replace the solenoid valve or valve body.
	Faulty harness & connector connection	Check the harness & connector of transaxle.
	Faulty TCM	Replace the TCM.
	Faulty CAN Communication	Inspect the CAN communication line.
limited gear (shift possible)	Faulty inhibitor switch	Inspect the inhibitor switch.
	Faulty input & output speed sensor	Inspect the input & output speed sensor.
	Faulty harness & connector connection	Check the harness & connector of transaxle.
Poor acceleration	Faulty hydraulic control	Inspect the solenoid valve.
	Faulty hydraulic supply	Check the fluid level.
	Faulty oil pump	Replace the oil pump.

► Self-diagnosis

Transaxle Control Module (TCM) is in constant communication with the control system's components (sensors and solenoids). If an abnormal signal is received for longer than the predefined duration, TCM recognizes a fault, stores the fault code in memory, and then sends out a fault signal through the self-diagnosis terminal. Such fault codes are independently backed up and will not be cleared even if the ignition switch is turned off, the battery is disconnected, or the TCM connector is disconnected.

CAUTION

- Disconnecting a sensor or an actuator connector while the ignition switch is in the "On" position generates a Diagnostic Trouble Code (DTC) and commits the code to memory. In such event, disconnecting the battery will not clear the fault diagnosis memory. The diagnosis tool must be used to clear the fault diagnosis memory.
- Before disconnecting the cable from battery terminal, turn the ignition switch to OFF. Removal or connection of the battery cable during engine operation or while the ignition switch is ON could cause damage to the Transaxle Control Module (TCM).
- When checking the generator for the charging state, do not disconnect the battery "+" terminal to prevent the Engine Control Module (ECM) from damage due to the voltage.
- When charging the battery with the external charger, disconnect the vehicle side battery terminals to prevent damage to the TCM.

Checking Procedure (Self-diagnosis)

CAUTION

- When battery voltage is excessively low, diagnostic trouble codes can not be read. Be sure to check the battery for voltage and the charging system before starting the test.

Inspection Procedure (Using the GDS)

1. Turn OFF the ignition switch.
2. Connect the GDS to the data link connector on the lower crash pad.
3. Turn ON the ignition switch.
4. Use the GDS to check the diagnostic trouble code.
5. Repair the faulty part from the diagnosis chart.
6. Erase the diagnostic trouble code.
7. Disconnect the GDS.

Automatic Transaxle System



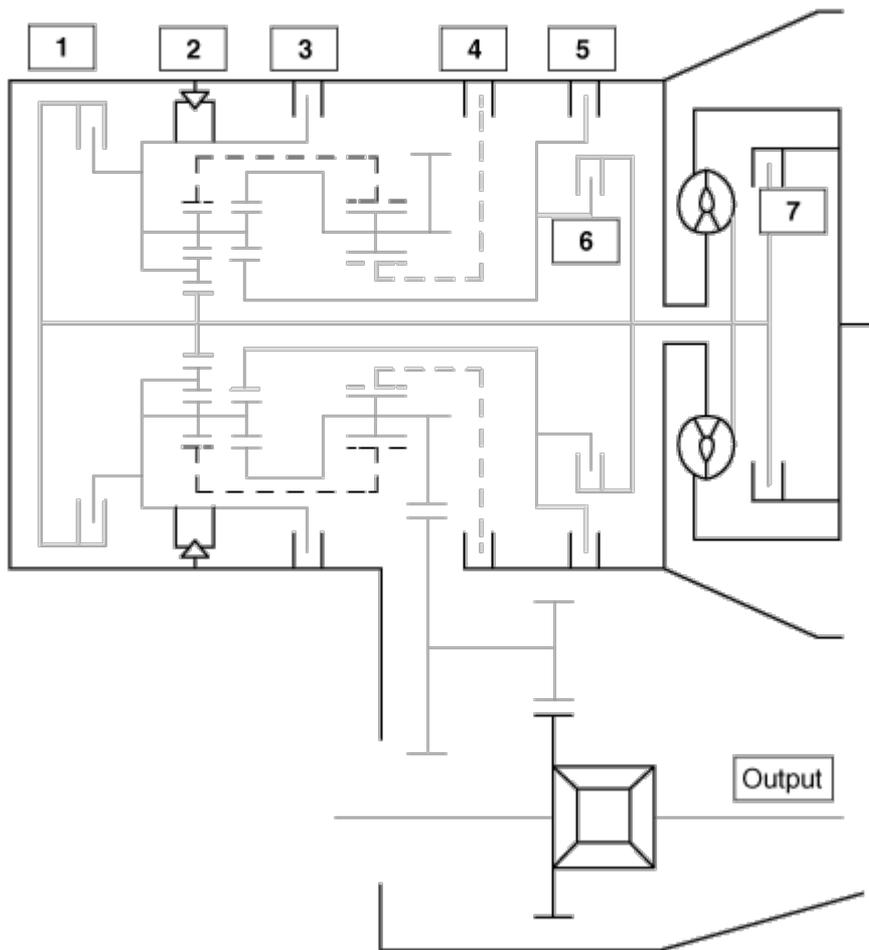
Description

The 6-speed automatic transaxle consists of an overdrive clutch (OD/C), a one-way clutch (OWC), a lower and reverse brake (LR/B), an underdrive brake (UD/B), a 26 brake (26/B), and a 35R clutch (35R/C). These clutches and brakes are operated by controlling the hydraulic pressure.

Automatic Transaxle System



Components Location



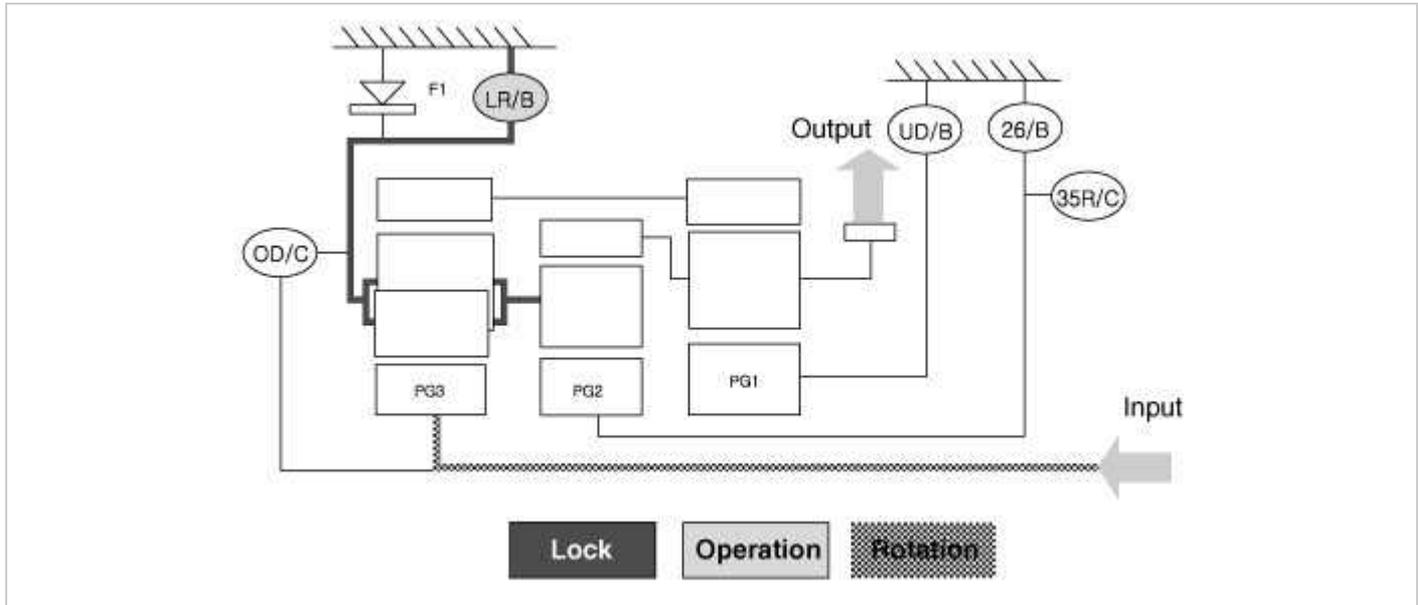
- | | |
|-------------------------------|------------------------|
| 1. Overdrive clutch (OD/C) | 5. 26 brake(26/B) |
| 2. One way clutch (OWC) | 6. 35R clutch (35R/C) |
| 3. Low & Reverse brake (LR/B) | 7. Damper clutch (D/C) |
| 4. Underdrive brake (UD/B) | |

Automatic Transaxle System



Power Flow Chart

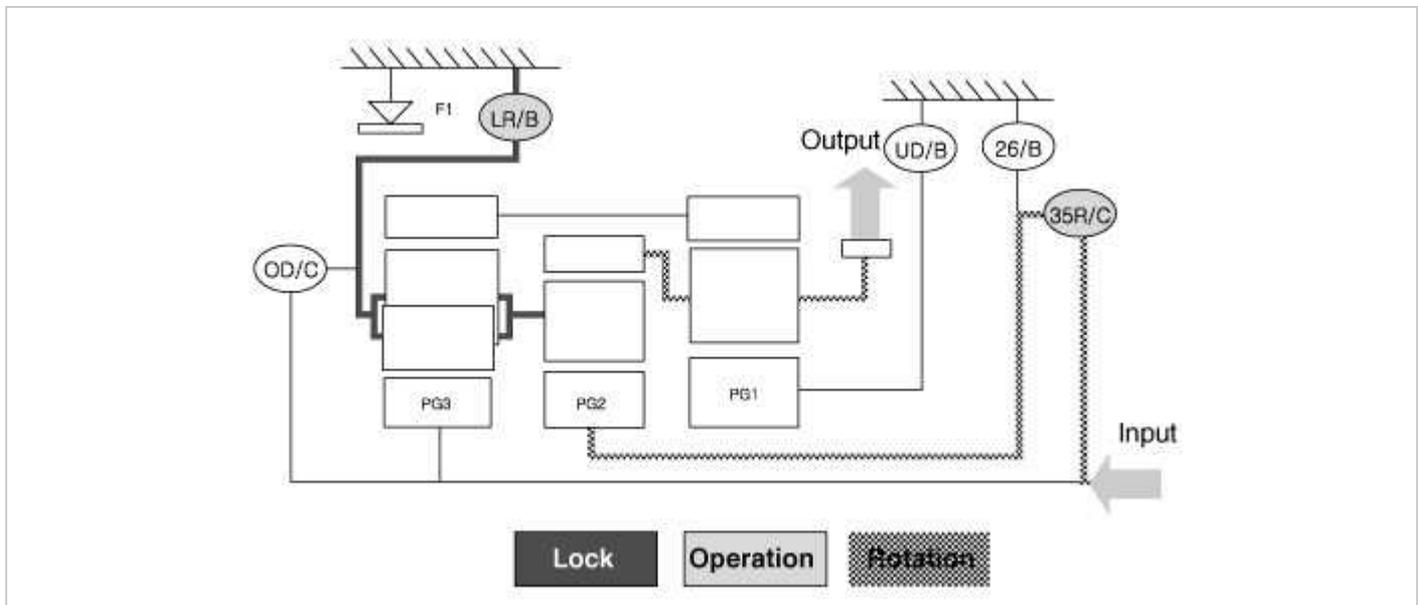
P,N	UD/B	LR/B	26/B	35R/C	OD/C	OWC
		•				



Direction of Rotation

- ▶ Lower & Reverse Brake (LR/B) Activation → Overdrive (O/D) Hub Lock → Mid & Rear P/C Lock
- ▶ Input Shaft Rotation → Rear Sun Gear Rotation → Rear Inner Pinion Rotation (Reverse) → Rear Outer Pinion Rotation → Rear Annulus Gear Rotation → Front Annulus Gear Rotation → Front Pinion Rotation → Front Sun Gear Rotation (Reverse) → Underdrive (U/D) Hub Rotation (Reverse)
- ▶ Input shaft rotation → Overdrive Clutch (OD/C) Retainer Rotation
- ▶ Input shaft rotation → 35R Clutch Rotation

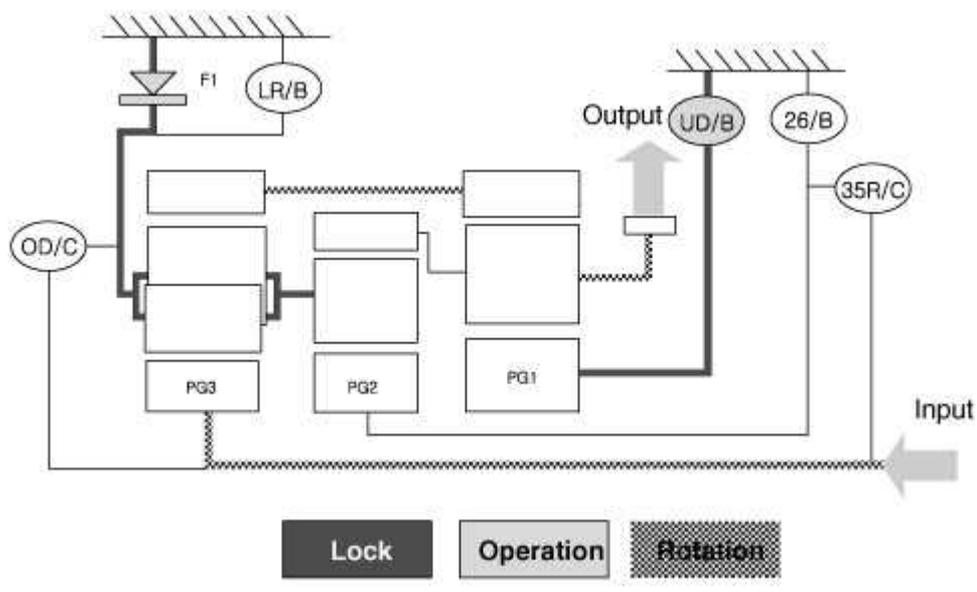
R	UD/B	LR/B	26/B	35R/C	OD/C	OWC
		•		•		



Power Delivery Route

- ▶ Middle carrier locked and middle sun gear in rotation
- ▶ Rotating the middle planetary gear's sun gear while its carrier is locked in place slows down and reverse rotates the annulus gear (front carrier), resulting in power transfer to the front carrier.
- ▶ The rear planetary gear's rear and front annulus gears rotate at a reduced rate, resulting in reverse, zero load rotation of the front planetary gear's front sun gear.

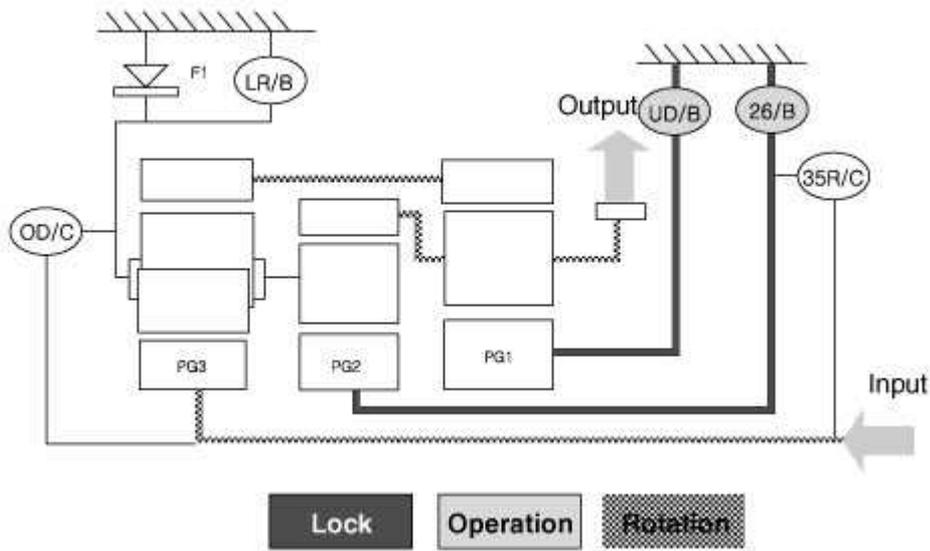
D1	UD/B	LR/B	26/B	35R/C	OD/C	OWC
	•	(○)				•



▣ Power Delivery Route

- ▶ Front sun gear and middle & rear carrier locked and rear sun gear in constant rotation
- ▶ When the rear sun gear is rotated, power is reduced at the rear planetary gear and then delivered to the rear and front annulus gears. The power is then reduced again at the front planetary gear, whose sun gear is locked in place, and then delivered to the front carrier.
- ▶ Here, the middle annulus gear, which comprises of a single unit with the front carrier, rotates and results in reverse, zero load rotation of the middle sun gear.

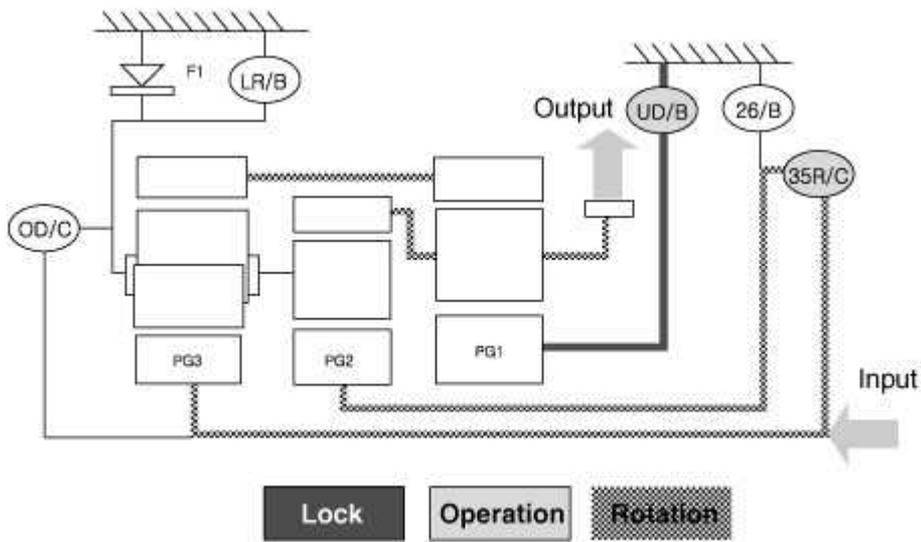
D2	UD/B	LR/B	26/B	35R/C	OD/C	OWC
	•		•			



▣ Power Delivery Route

- ▶ Front sun gear and middle sun gear locked and rear sun gear in constant rotation
- ▶ Rotating the rear sun gear delivers power to the rear & front annulus gears, and reaction from the front carrier and the middle annulus gear, to which the sun gear is attached, transfers to the middle and rear carriers, resulting in power equilibrium and power transfer to the front carrier.

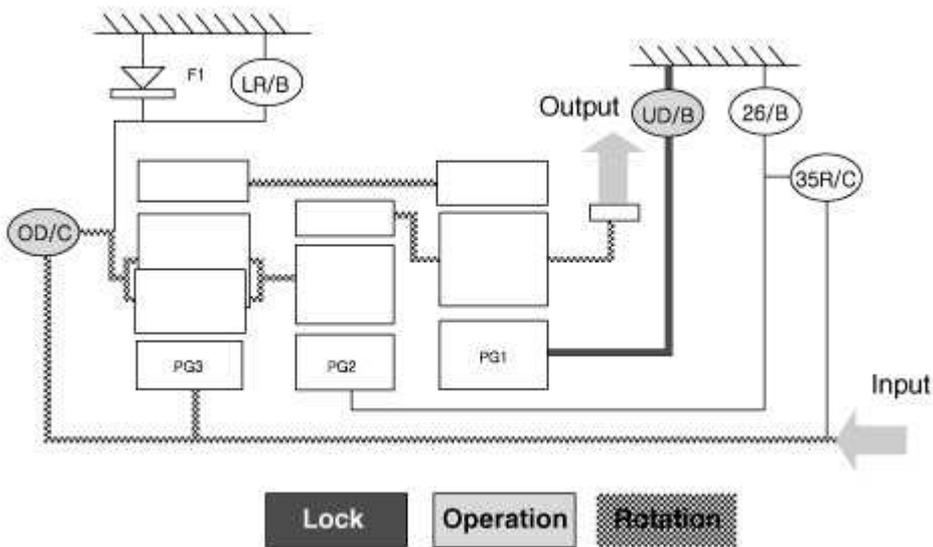
D3	UD/B	LR/B	26/B	35R/C	OD/C	OWC
	•			•		



▣ Power Delivery Route

- ▶ Front sun gear locked and middle and rear sun gears in rotation
- ▶ Rotating the middle sun gear and the rear sun gear transfers power to the rear and front annulus gears, and reaction from the front carrier and the middle annulus gear, to which the sun gear is attached, transfers to the middle and rear carriers, resulting in power equilibrium and power transfer to the front carrier.

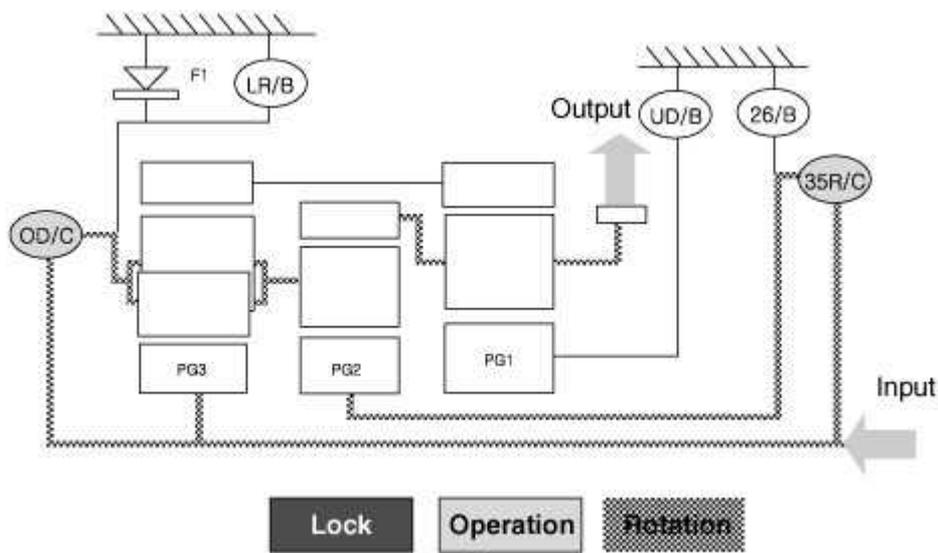
D4	UD/B	LR/B	26/B	35R/C	OD/C	OWC
	•				•	



▣ Power Delivery Route

- ▶ Front sun gear locked and rear carrier and rear sun gears in rotation
- ▶ Activation of the overdrive clutch (OD/C) synchronizes the rear planetary gear's carrier and sun gears. The 1:1 rotation ratio passes through the rear and front annulus gears and reaches the front planetary gear's front carrier, to which the sun gear is attached.
- ▶ Here, the middle planetary gear's middle sun gear rotates at a faster rate in the normal direction and at zero load due to the actions of the reduced annulus gear and the carrier having a 1:1 rotation ratio.

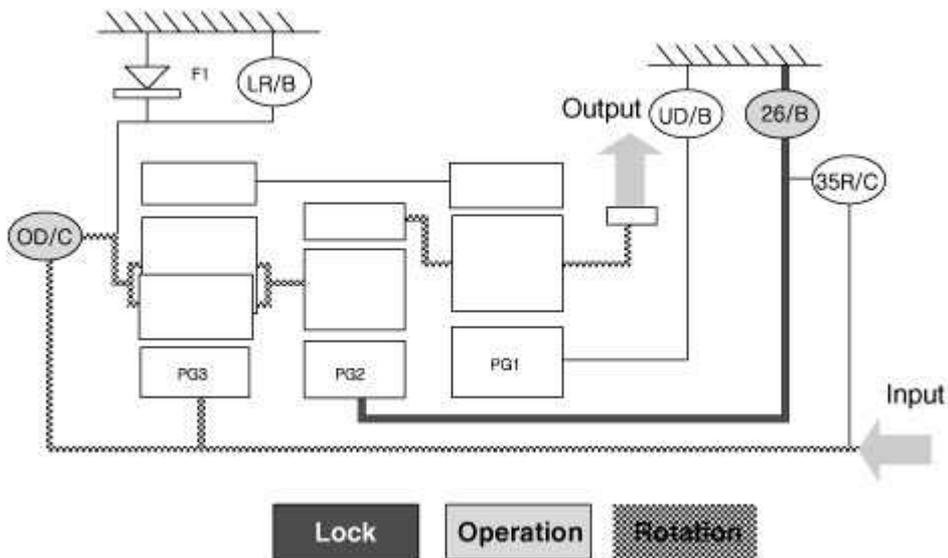
D5	UD/B	LR/B	26/B	35R/C	OD/C	OWC
				•	•	



Power Delivery Route

- ▶ Middle and rear carriers, middle sun gear, and rear sun gear in rotation
- ▶ The middle planetary gear's middle carrier and sun gear rotate simultaneously, resulting in the 1:1 rotation ratio being transferred to the middle annulus gear (front carrier).
- ▶ Here, the rear planetary gear rotates in a 1:1 rotation ratio, as it would when the 4th gear is engaged; however, the front planetary gear remains unrestrained and the front sun gear rotates in the normal direction, at a zero load, and at a rotation ratio of 1:1.

D6	UD/B	LR/B	26/B	35R/C	OD/C	OWC
			•		•	



Power Delivery Route

- ▶ Middle carrier in rotation and middle sun gear locked
- ▶ When the middle planetary gear's sun gear is locked in place and the train's carrier's allowed to rotate, the middle annulus gear increases its rate of rotation and transfers power to the front carrier.
- ▶ Here, the rear planetary gear maintains a 1:1 rotation ratio as it would when 4th or 5th gear is engaged; however, the front planetary gear remains unrestrained and the front sun gear rotates at a faster rate in the normal direction and at zero load.

Automatic Transaxle System

Removal

NOTICE

- Disassembly and reassembly procedures of the clutch & brake, refer to the overhaul manual.

Automatic Transaxle System

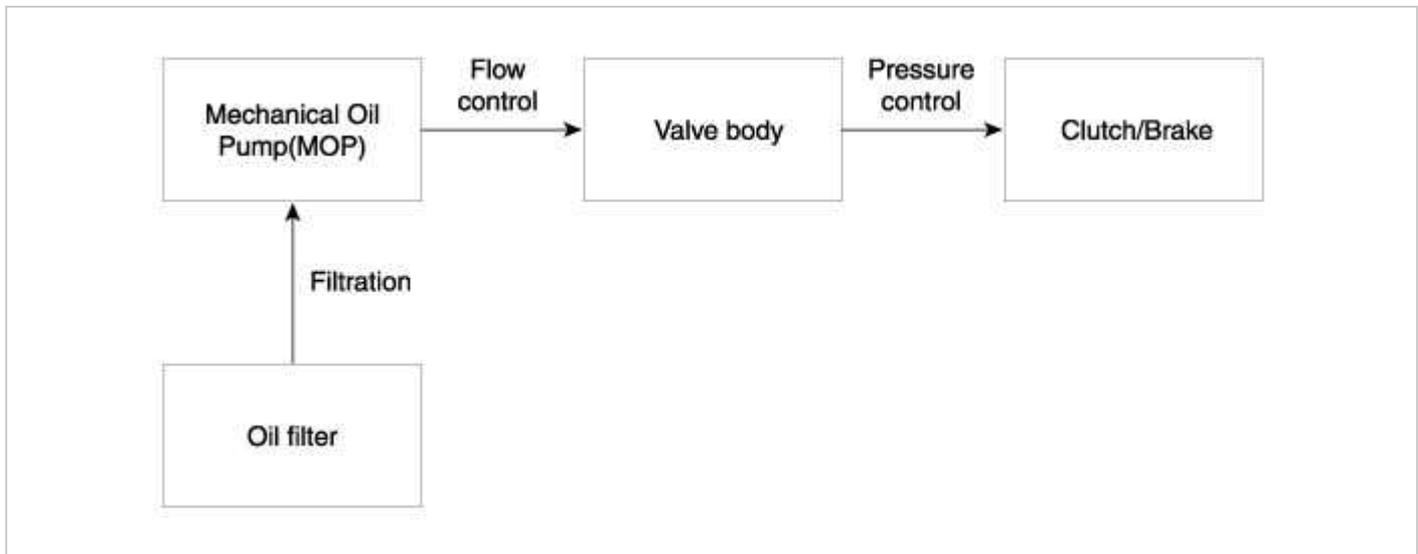
Description

- The oil pump is powered by the engine. ATF passes through the oil filter and gets distributed along the oil channels.

The oil becomes highly pressurized as it exits the oil pump and passes through the line pressure valve before being fed to the clutch & brake control valve, clutch, and brakes.

- TCM controls the hydraulic pressure using solenoid valves and controls clutch and brake operations.

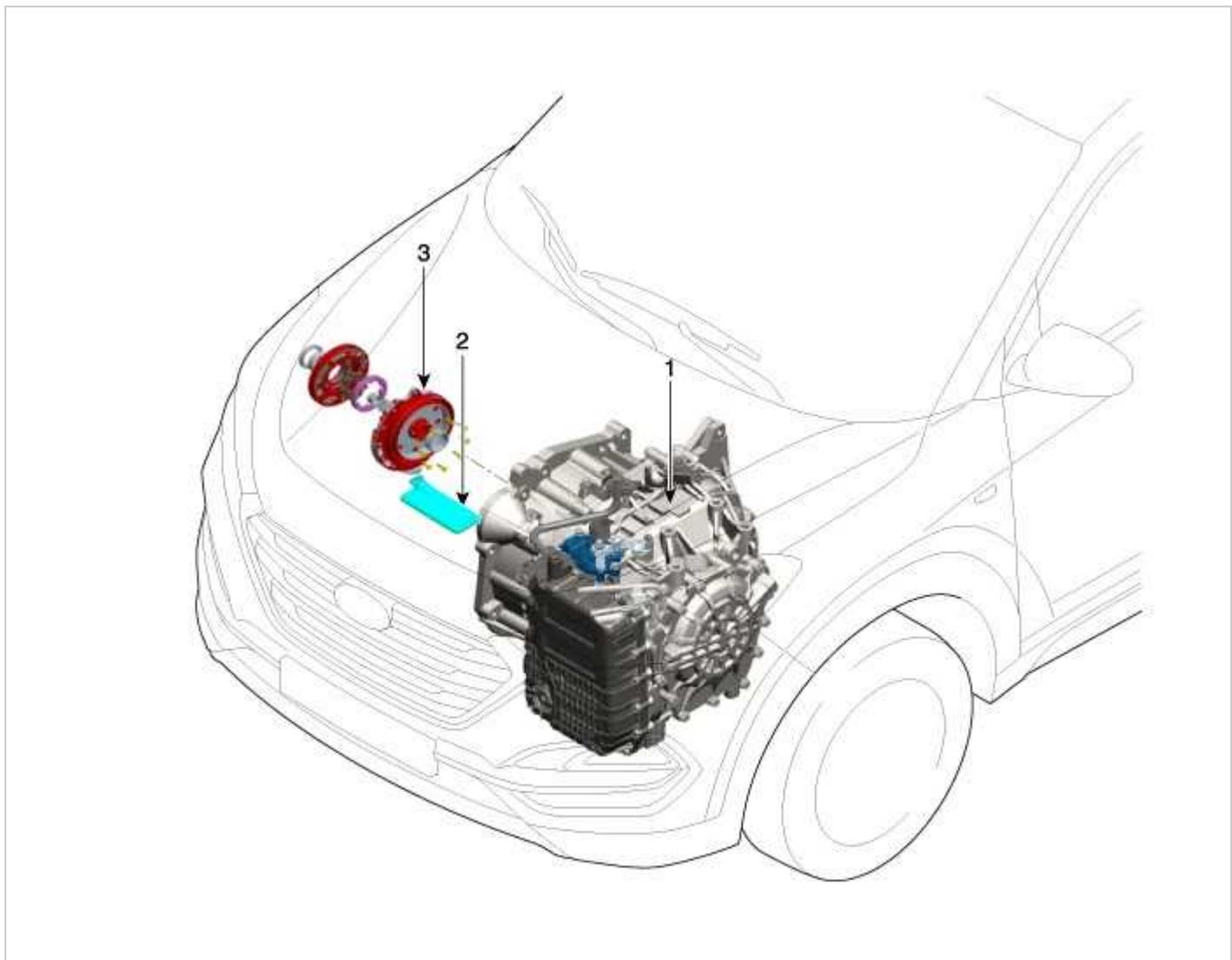
Flow of the hydraulic system



Automatic Transaxle System



Components Location



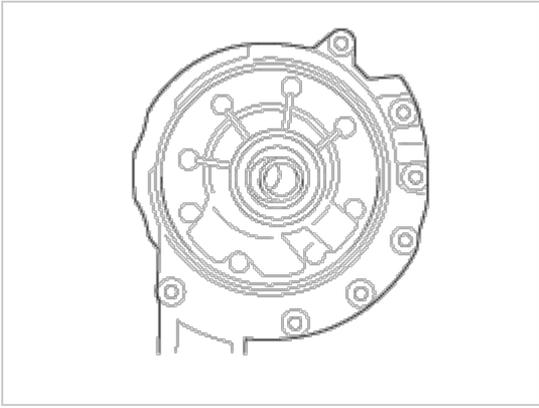
1. Automatic transaxle
2. Oil filter
3. Mechanical oil pump

Automatic Transaxle System

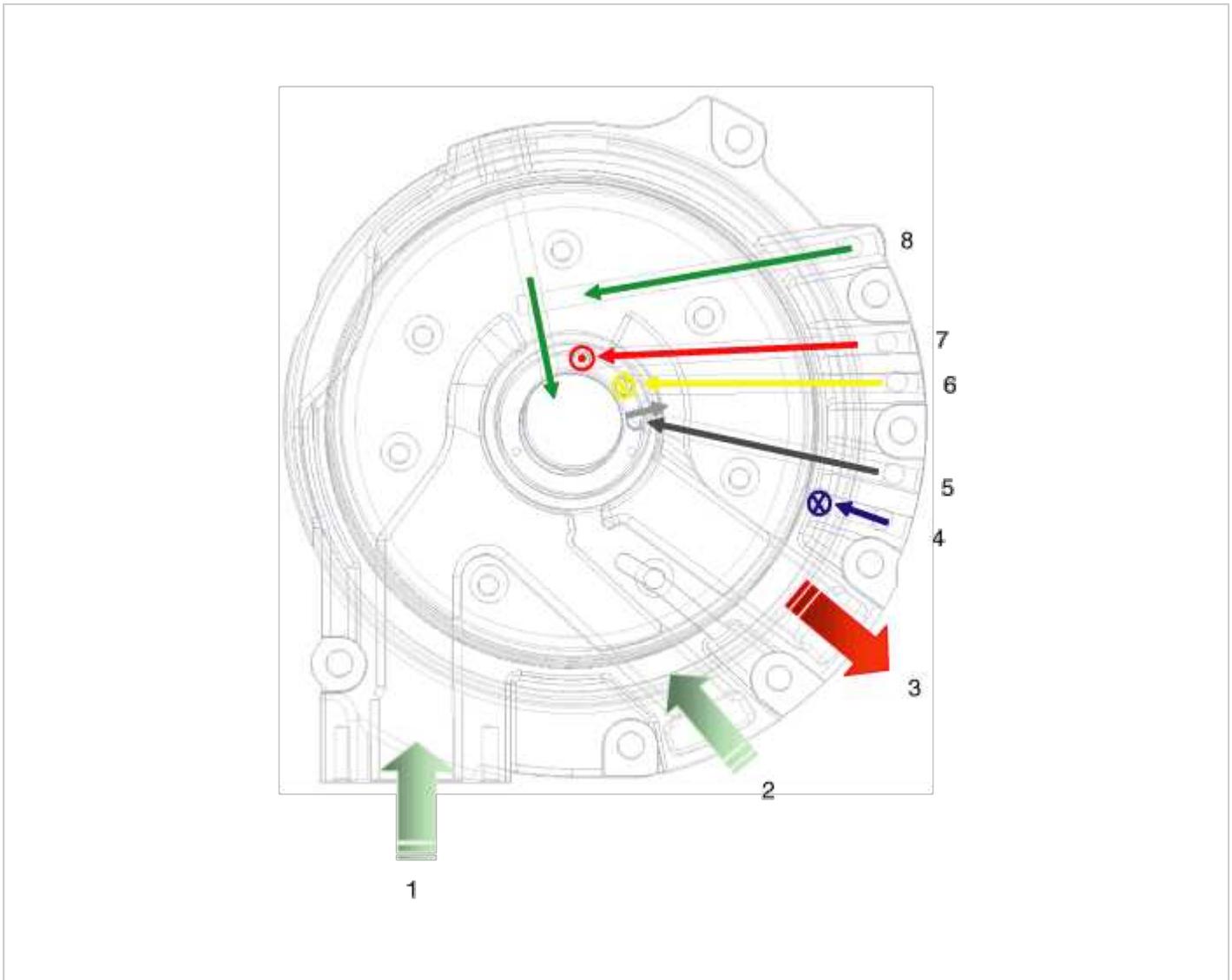


Description

- The oil pump is built-in as a single unit with the 26 Brake chamber.
- Rotation of the pump builds the hydraulic pressure needed for the lubrication of the various parts of the transaxle and operation of the clutch and brakes.
- The oil also circulates through the torque converter and the cooler.

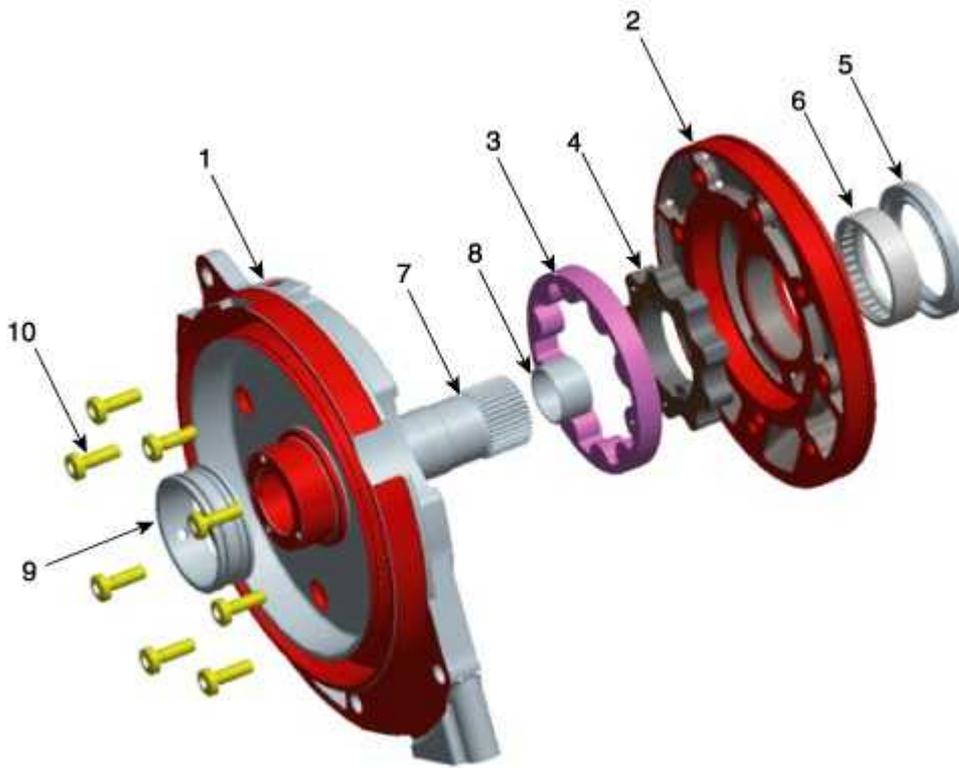


Operation flow of the mechanical oil pump



- | | |
|----------------------------|--------------------------------------|
| 1. Inhale(Oil filter) | 5. 35R/C operation pressure |
| 2. Inhale(Valve body) | 6. Lubrication |
| 3. Outlet | 7. Lock up clutch operation pressure |
| 4. 26/B operation pressure | 8. Lock up clutch cancellation |





- 1. Reaction shaft support assembly
- 2. Oil pump housing
- 3. Driven gear
- 4. Drive gear
- 5. Oil seal

- 6. Bearing-housing
- 7. Reaction shaft
- 8. Bush- Reaction shaft
- 9. Sleeve
- 10. Flange bolt

Automatic Transaxle System



Repair procedures

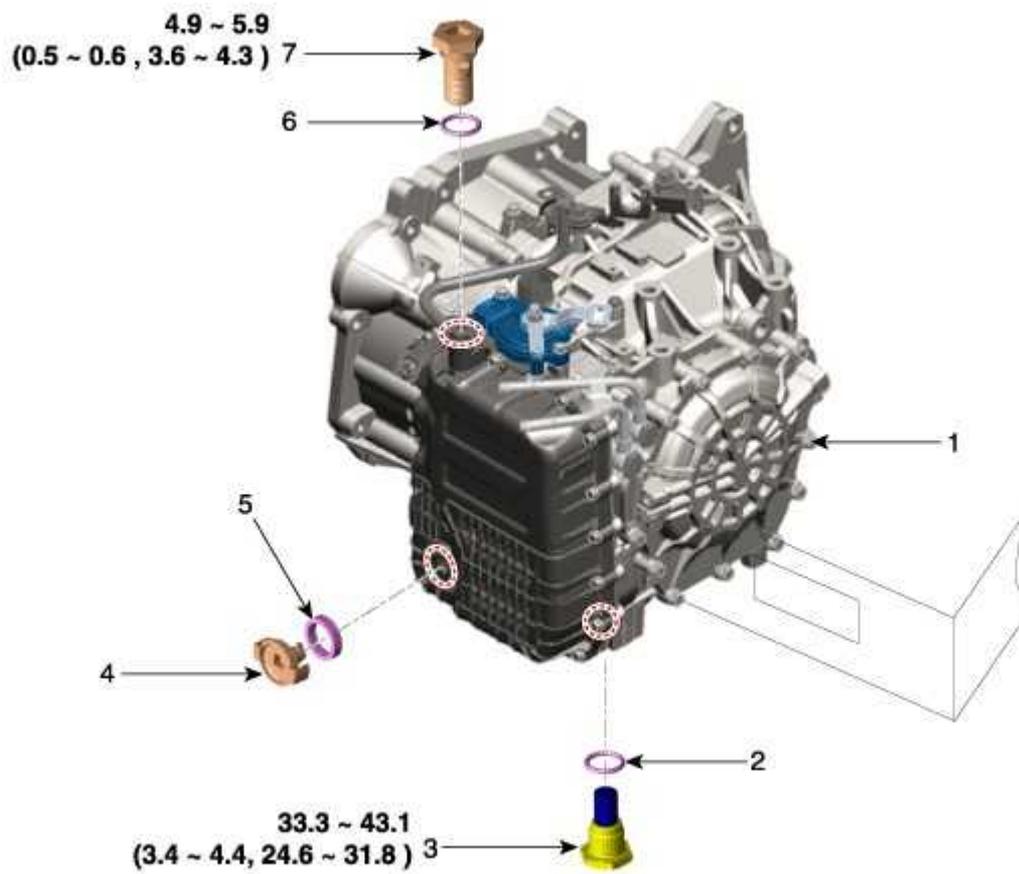
NOTICE

Disassembly and reassembly procedures of the oil pump, refer to the overhaul manual.

Automatic Transaxle System



Components Location



Torque : N.m (kgf.m, lb-ft)

- | | |
|-------------------------|---------------------------------|
| 1. Automatic transaxle | 5. ATF level check plug gasket |
| 2. Drain plug gasket | 6. ATF injection plug O-Ring |
| 3. Drain plug | 7. ATF injection plug (Eyebolt) |
| 4. ATF level check plug | |

Automatic Transaxle System

Service Adjustment Procedure

ATF level Check

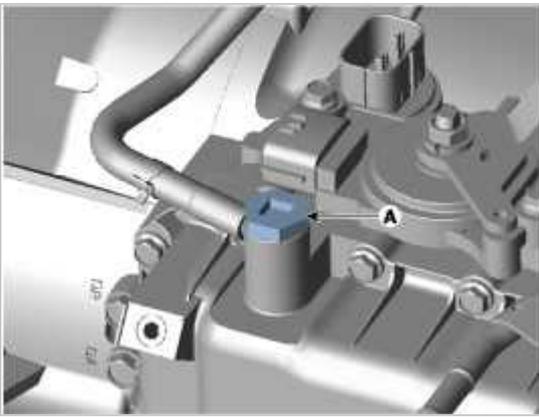
NOTICE

- A check of ATF level is not normally required during scheduled services. If an ATF leak is found, perform the ATF 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).
2. Add ATF SP-IV 700cc to the ATF injection hole.

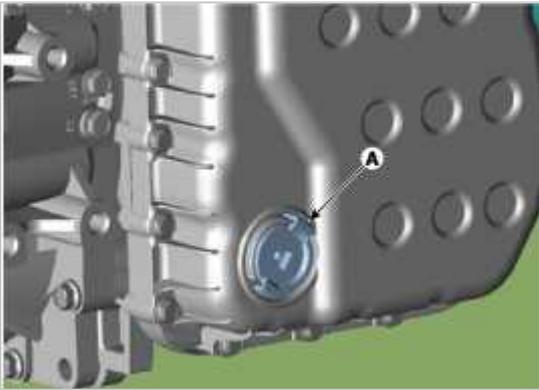


3. Start the engine.
(Don't step on brake and accelerator simultaneously.)
4. Confirm that the temperature of the automatic transaxle oil temperature sensor is 50 ~ 60°C (122 ~ 140°F) with the GDS.
5. Shift the select lever slowly from "P" to "D", then "D" to "P" and repeat one more at idle.

CAUTION

- Pause at each gear position more than 2 seconds.

6. Lift the vehicle, then remove the under cover.
(Refer to Engine Mechanical System - "Engine room under cover")
7. Remove the ATF level check plug (A) from the valve body cover.



CAUTION

- At this time, the vehicle must be at a level state.

8. If the ATF flows out of the overflow plug in thin steady stream, the ATF level is correct.
Then finish the procedure and tighten the ATF level check plug.

NOTICE

Oil level check (excess or shortage) method

- Excess: Drain quantity exceed 900cc for tow minutes.{50 ~ 60°C (122 ~ 140°F)}
- Shortage: No ATF 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 drip out after performing above 1 to 7 procedures. After performing above 1 to 7 procedures, if the oil doesn't drip out, inspect the automatic transaxle assembly.

- Replace the gasket before reinstalling the ATF level check plug.
- Turn the oil level check plug clockwise until it is set.
- If there is no damage at the automatic transaxle and the ATF cooler, the ATF cooler hose, transaxle case, valve body tightening state are normal, ATF must drip out after performing above 1 to 7 procedures. After performing above 1 to 7 procedures, if the oil doesn't drip out, inspect the automatic transaxle assembly.

9. Install the under cover.
(Refer to Engine Mechanical System - "Engine room under cover")
10. Put down the vehicle with the lift and then tighten the eyebolt.

Eyebolt tightening torque:

4.9 ~ 5.9 N.m (0.5 ~ 0.6 kgf.m, 3.6 ~ 4.3 lb-ft)

CAUTION

- Replace the gasket (A) before reinstalling 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.

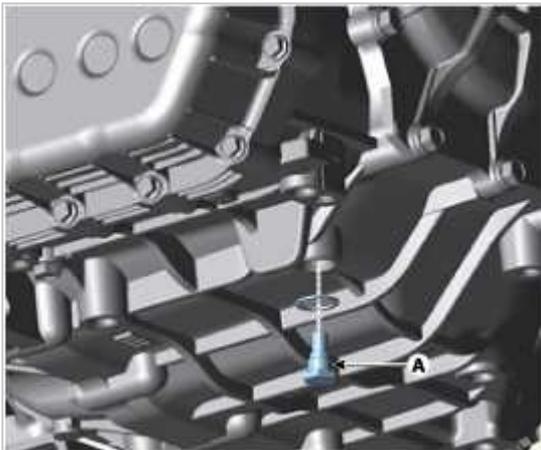
1. Lift the vehicle, then remove the under cover.
(Refer to Engine Mechanical System - "Engine room under cover")
2. Remove the drain plug (A) and reinstall the drain plug after draining ATF totally.

CAUTION

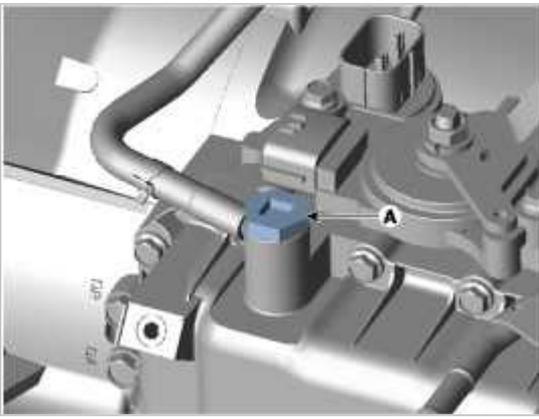
- Replace the gasket before reinstalling the drain plug.

Drain plug tightening torque:

33.3 ~ 43.1 N.m (3.4 ~ 4.4 kgf.m, 24.6 ~ 31.8 lb-ft)



3. Put down the vehicle with the lift and then remove the eyebolt (A).
4. Fill the ATF about 5 liters to the injection hole.



5. Check the ATF level.
(Refer to Hydraulic System - "Fluid")
6. Then finish check the ATF level procedure and install the under cover.
(Refer to Engine Mechanical System - "Engine room under cover")
7. Put down the vehicle with the lift and then tighten the eyebolt.

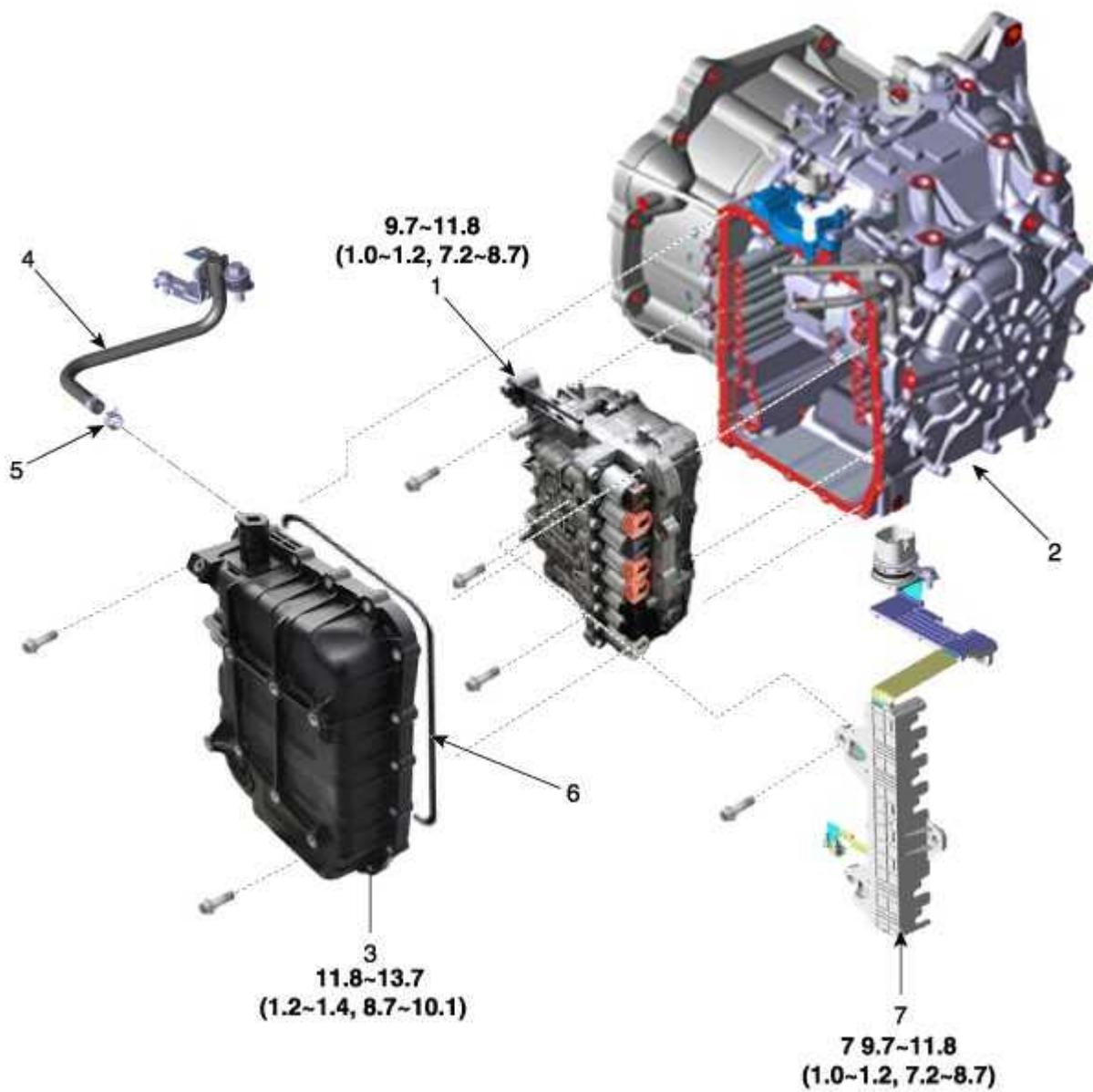
Eyebolt tightening torque :

4.9 ~ 5.9 N.m (0.5 ~ 0.6 kgf.m, 3.6 ~ 4.3 lb-ft)

⚠ CAUTION

- Replace the gasket (A) before reinstalling the eyebolt.





Torque : N.m (kgf.m, lb-ft)

- 1. Valve body assembly
- 2. Automatic transaxle
- 3. Valve body cover
- 4. Air breather hose

- 5. Air breather hose clamp
- 6. Valve body cover gasket
- 7. Solenoid valve connector

Automatic Transaxle System

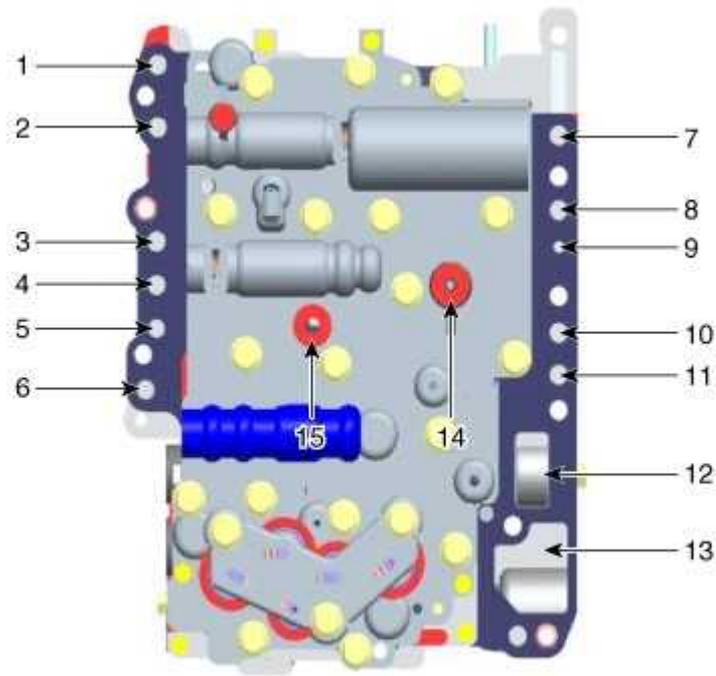


Description

The valve body is essential to automatic transaxle control and consists of various valves used to control the oil feed from the oil pump. Specifically, these valves consist of pressure regulator valves, oil redirection valves, shift valves, and manual valves. The body also features electronic solenoid valves that ensure smooth gear changes.



Valve Body Flow



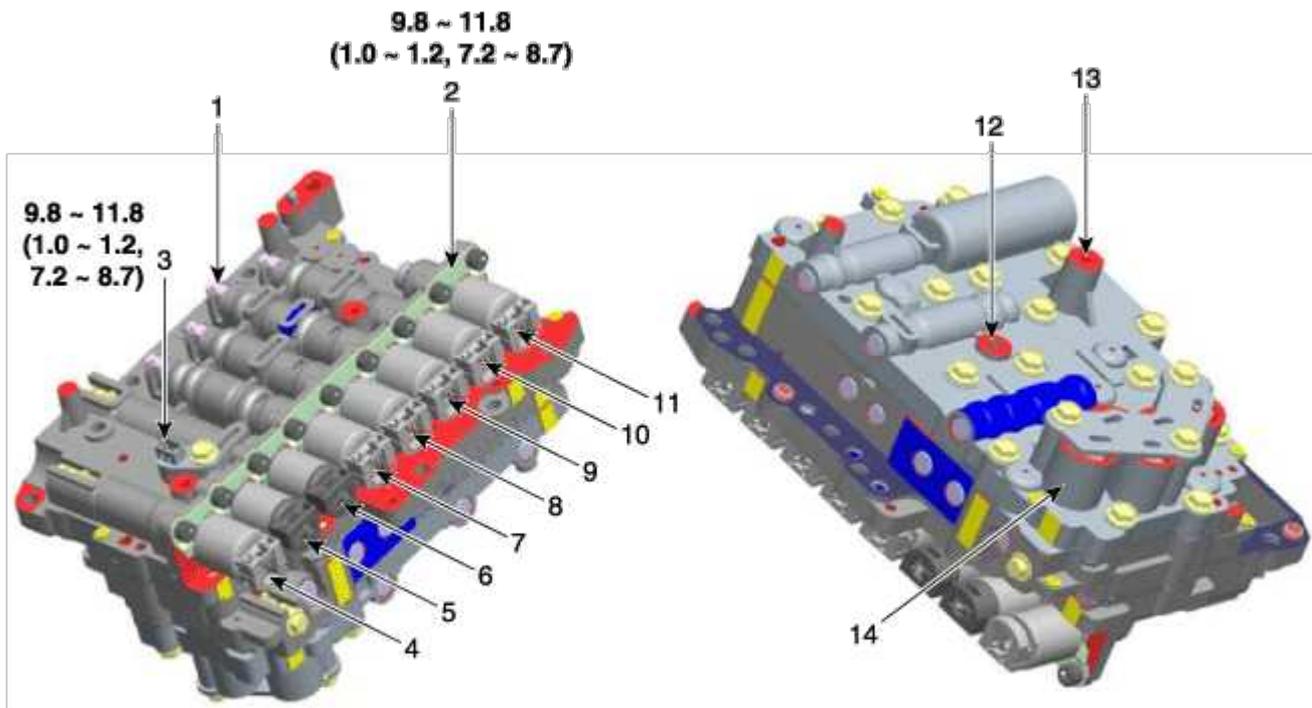
1. To cooler
2. From cooler
3. Lubrication (rear)
4. OD Clutch pressure
5. Reducing pressure (red2)
6. Reducing pressure (red1)
7. Damper release pressure
8. Damper apply pressure

9. Lubrication (front)
10. 35R Clutch pressure
11. 26 Brake pressure
12. From oil pump
13. To oil pump
14. Underdrive (UD) Brake pressure
15. Low & reverse pressure

Automatic Transaxle System

Components Location





Torque : N.m (kgf.m, lb-ft)

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Pressure Control Valve (PCV) adjust screw 2. Solenoid valve bracket 3. Oil temperature sensor 4. Line Pressure Control Solenoid Valve 5. SS-A Solenoid Valve (ON/OFF) 6. SS-B Solenoid Valve (ON/OFF) 7. Overdrive Clutch Control Solenoid Valve (OD/C) | <ol style="list-style-type: none"> 8. Underdrive Brake Control Solenoid Valve (UD/B) 9. 26 Brake Control Solenoid Valve (26/B) 10. 35R Clutch Control Solenoid Valve (35R/C) 11. Torque Converter Control Solenoid Valve (T/CON) 12. LR/B pressure flow hole 13. UD/B pressure flow hole 14. Accumulator |
|--|---|

Automatic Transaxle System

Removal

1. Remove the under cover.
(Refer to Engine Mechanical System - "Engine room under cover")
2. Remove the battery and battery tray.
(Refer to Engine Electrical System - "Battery")
3. Remove the drain plug (A) and drain the ATF totally and then reinstall the drain plug.

Tightening torque :

33.3 ~ 43.1 N.m (3.4 ~ 4.4 kgf.m, 24.6 ~ 31.8 lb-ft)



CAUTION

- Replace the gasket before reinstalling the drain plug.
- After the installation, start the engine and then check if there are any leakages from the drain plug.

4. Remove the wiring mounting bolt (A) or clip.

Tightening torque :

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



5. Disconnect the air breather hose (A) from the valve body cover.



6. Remove the valve body cover (A).

Tightening torque :

11.8 ~ 13.7 N.m (1.2 ~ 1.4 kgf.m, 8.7 ~ 10.1 lb-ft)



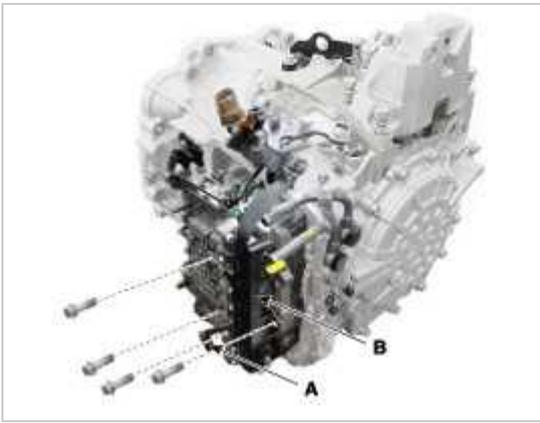
CAUTION

- Replace the gasket (B) before reinstalling the valve body cover.
- After the installation, start the engine and then check if there are any leakages from the valve body cover.

7. Disconnect the oil temperature sensor (A) and solenoid valve connector (B) from the valve body.

Tightening torque

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



CAUTION

- Check for the looseness, poor connection, bending, corrosion, contamination, deterioration, or damage before reinstalling the solenoid valve connector.

8. 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)



NOTICE

- Reassembly and disassembly procedures of the valve body assembly, refer to overhaul manual.

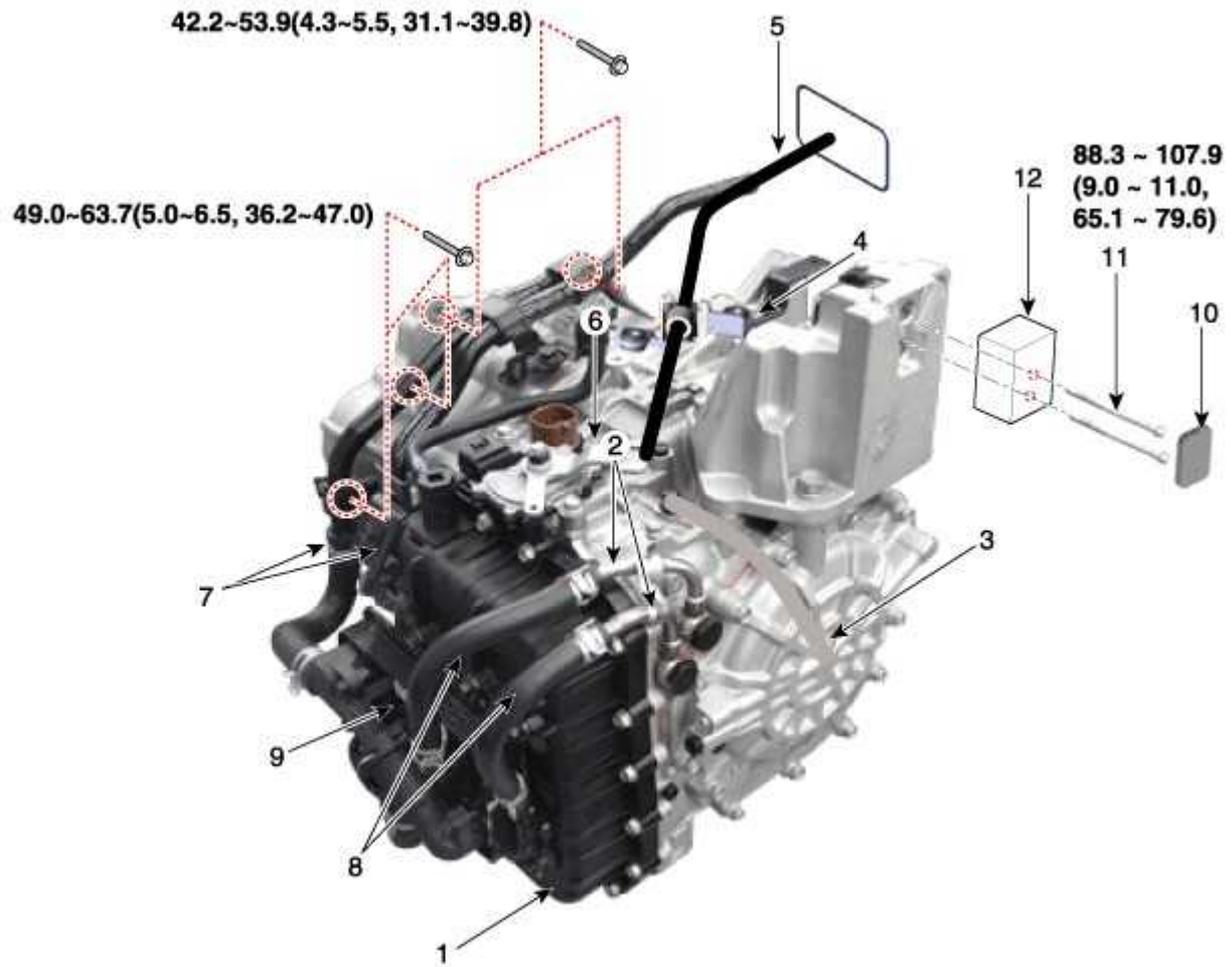
Installation

1. Install in the reverse order of removal.
2. Check fluid level, after filling the automatic transaxle with fluid.
(Refer to Hydraulic System - "Fluid")
3. Reset the automatic transaxle adaptive values using the GDS.
4. Perform the TCM adaptive values learning procedure.
(Refer to Automatic Transaxle Control System - "Repair procedures")

Automatic Transaxle System



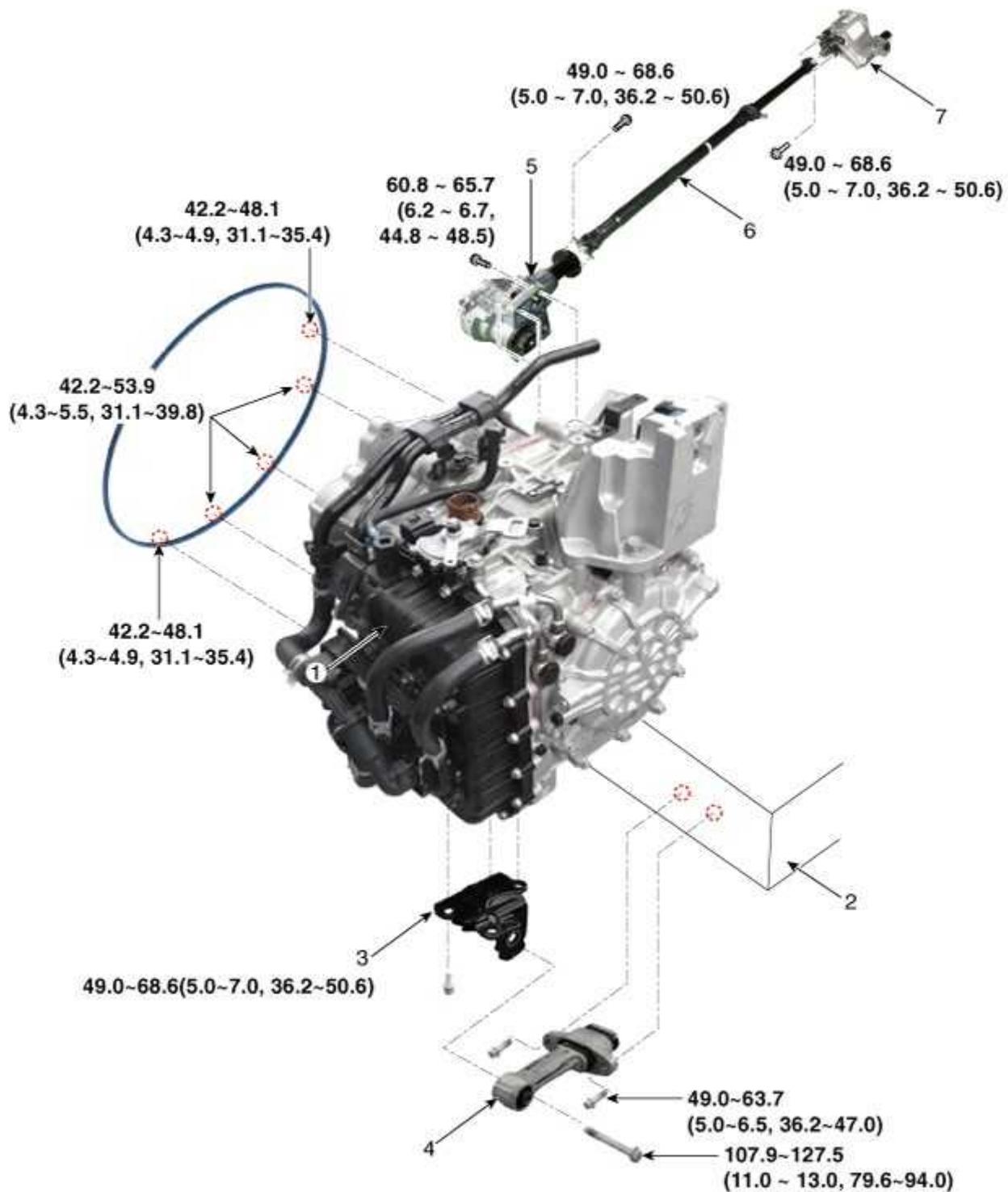
Components Location(1)



Torque : N.m (kgf.m, lb-ft)

- | | |
|--|-----------------------------------|
| 1. Automatic transaxle assembly | 7. Coolant hose & pipe |
| 2. ATF cooler tube | 8. ATF cooler hose |
| 3. Ground line | 9. ATF warmer |
| 4. Shift cable mounting bracket | 10. Mounting bracket cover |
| 5. Shift cable | 11. Support bracket mounting bolt |
| 6. Inhibitor switch & manual control lever | 12. Automatic mounting bracket |

Components Location(2)



Torque : N.m (kgf.m, lb-ft)

1. Automatic transaxle assembly
2. Subframe assembly
3. Roll rod support bracket

4. Roll rod bracket
5. Transfer assembly
6. Propeller shaft assembly
7. Coupling assembly

Automatic Transaxle System

Removal

1. Remove the engine cover.
(Refer to Engine Mechanical System - "Engine cover")
2. Remove the air cleaner assembly and air duct.
(Refer to Engine Mechanical System - "Air cleaner")
3. Remove the battery and battery tray.
(Refer to Engine Electrical System - "Battery")
4. Remove the ground line after removing the bolt (A).





5. Disconnect the solenoid valve connector (B) and inhibitor switch connector (A).



6. Remove the control cable (B) after removing the nut (C) and the bolt (A).

Tightening torque:

(A) 14.7 ~ 21.6 N.m (1.5 ~ 2.2 kgf.m, 10.9 ~ 15.9 lb-ft)

(C) 9.8 ~ 14.7 N.m (1.0 ~ 1.5 kgf.m, 7.2 ~ 10.8 lb-ft)



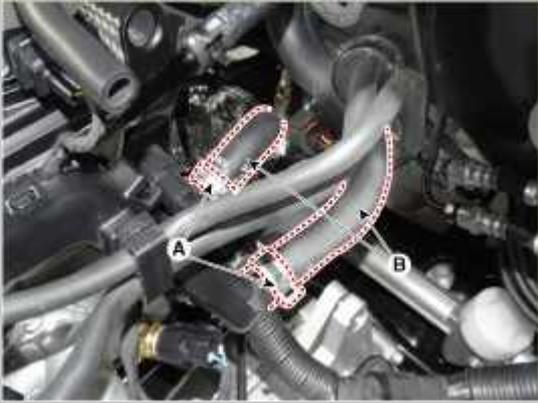
7. Remove the fixing clips(A) and (B) of wiring.



8. Remove the fixing clips (A) of wiring.



9. Disconnect the coolant hose (B) after removing the automatic transaxle coolant hose clamp (A).

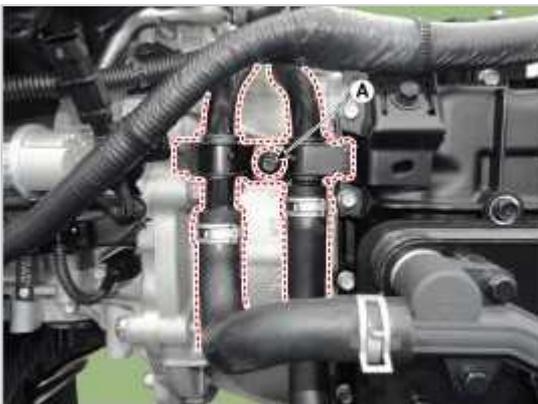


10. Remove the coolant pipe mounting bolts (A).

11. Remove the coolant pipe (B).

Tightening torque :

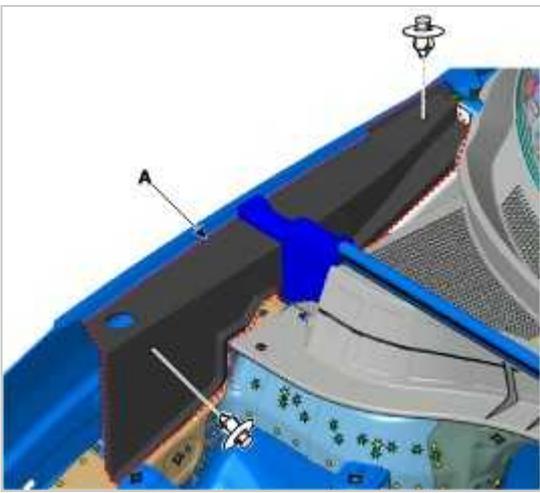
(A) 8.8 ~ 13.7 N.m (0.9 ~ 1.4 kgf.m, 6.5 ~ 10.1 lb-ft)



CAUTION

- Carefully install the clamp not to damage the hose.
- Install the clamp in a correct direction not to be interfered with other parts.
- After the installation, start the engine and then check if there are any leakages from the hose.

12. Remove the fender apron cover (A) on both sides.



13. Assemble the engine support fixture (beam No.: 09200-38001 or 09200-3N000, supporter No.: 09200-2S000). (Refer to Special Service Tools - "Engine support fixture assembly drawing")

14. Using the engine support fixture (A), hold the engine and transaxle assembly safely.



15. Remove the automatic transaxle upper mounting bolt (A-2ea) and the starter mounting bolt (B-2ea).

Tightening torque:

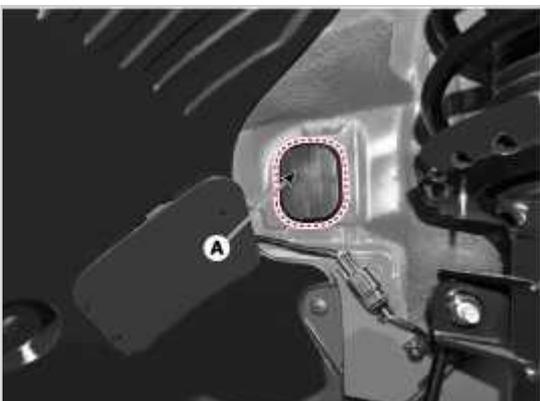
(A) 42.2 ~ 54.0 N.m (4.3 ~ 5.5 kgf.m, 31.1 ~ 39.8 lb-ft)

(B) 42.2 ~ 54.0 N.m (4.3 ~ 5.5 kgf.m, 31.1 ~ 39.8 lb-ft)



16. Remove the mud guard. (Refer to Body - "Body side molding")

17. Remove the automatic transaxle mounting bracket cover (A).



18. Remove the automatic transaxle support bracket mounting bolts (A).

Tightening torque:

88.3 ~ 107.9 N.m (9.0 ~ 11.0 kgf.m, 65.1 ~ 79.8 lb-ft)



19. Remove the automatic transaxle support bracket (A).
-

Tightening torque:

58.8 ~ 78.5 N.m (6.0 ~ 8.0 kgf.m, 43.4 ~ 57.9 lb-ft)



20. Lift the vehicle with a jack.
21. Remove the under cover. (Refer to Engine Mechanical System - "Engine room under cover")
22. Remove the drive shaft assembly. (Refer to Driveshaft and Axle - "Front Driveshaft")
23. In case of 4WD vehicle, remove the transfer assembly. (Refer to 4 Wheel Drive System - "Transfer Assembly")
24. Remove the roll road support bracket (A).
-

Tightening torque:

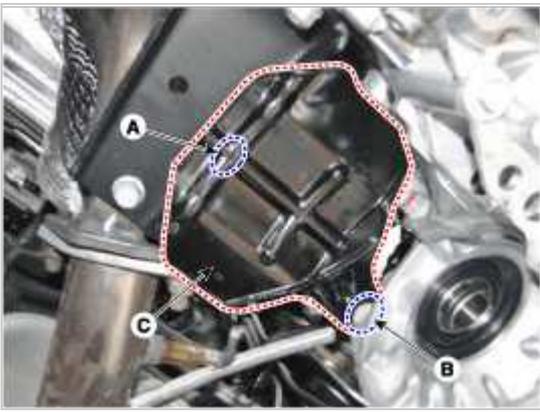
49.0 ~ 68.6 N.m (5.0 ~ 7.0 kgf.m, 36.2 ~ 50.6 lb-ft)



25. Remove the transfer assembly.(Refer to 4Wheel Drive System - "Transfer Assembly")
26. Remove the heater protector (C) after removing the bolt (A) and (B).
-

Tightening torque:

(A) 11.8 ~ 13.7 N.m (1.2 ~ 1.4 kgf.m, 8.7 ~ 10.1 lb-ft)
(B) 21.6 ~ 25.5 N.m (2.2 ~ 2.6 kgf.m, 15.9 ~ 18.8 lb-ft)



27. Remove the dust cover (A).

Tightening torque:

42.2 ~ 48.1 N.m (4.3 ~ 4.9 kgf.m, 31.1 ~ 35.4 lb-ft)



28. Remove the torque converter mounting bolts (A) with rotating the crankshaft.



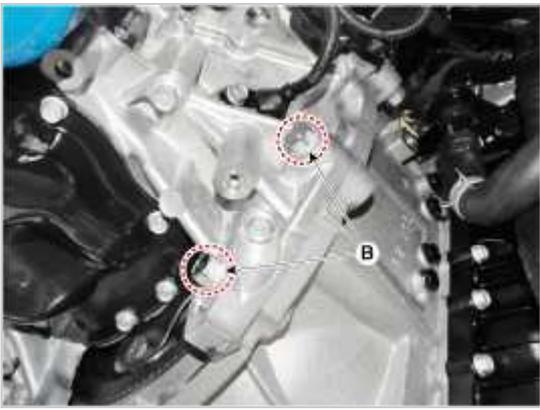
29. Remove the automatic transaxle with a jack after removing the mounting bolts (A, B).

Tightening torque:

(A) 42.2 ~ 53.9 N.m (4.3 ~ 5.5 kgf.m, 31.1 ~ 39.8 lb-ft)

(B) 42.2 ~ 48.1 N.m (4.3 ~ 4.9 kgf.m, 31.1 ~ 35.4 lb-ft)





⚠ CAUTION

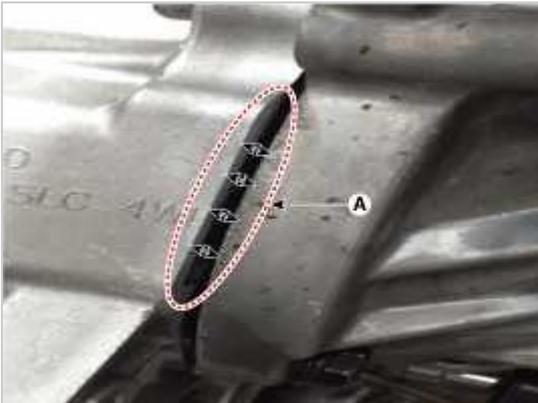
- Be careful not to damage other system or parts near by when removing the transaxle assembly.

Installation

1. Install in the reverse order of removal.

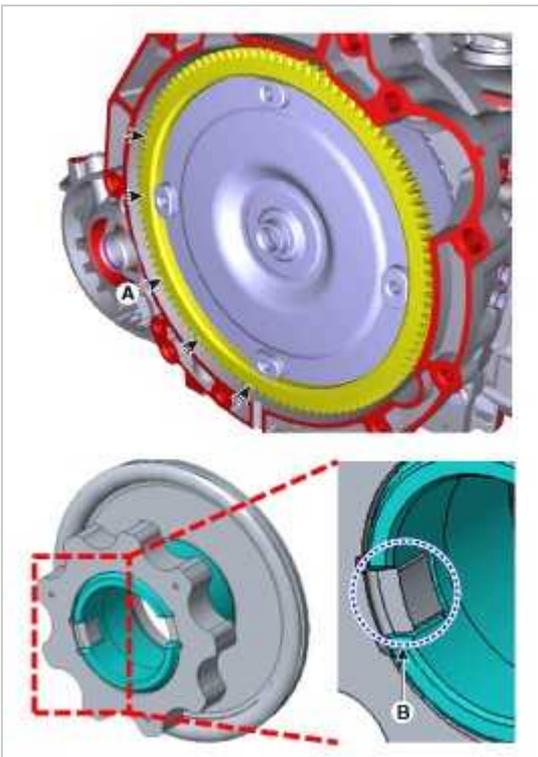
⚠ CAUTION

- 1) Before reassembling the automatic transaxle to the engine assembly, make sure that there is no gap (A) between automatic transaxle and engine assembly as below illustration. Do not reassemble the automatic transaxle to the engine assembly when this gap (A) exist.

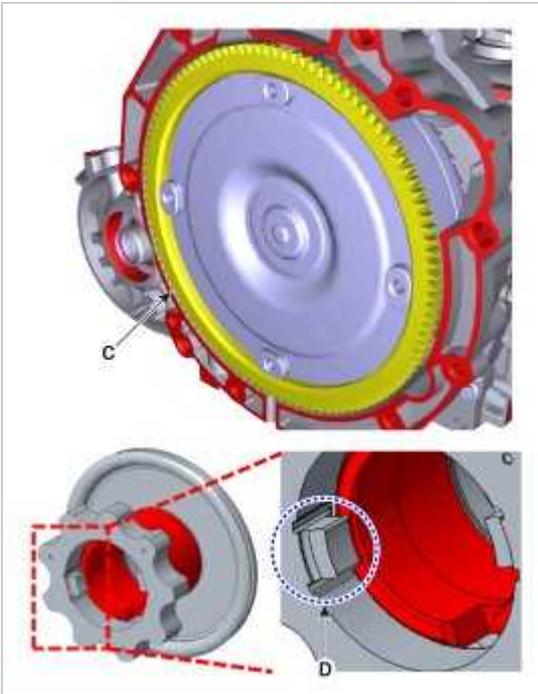


- 2) While there is a gap, It would be meaning that the key of oil pump gear is not assembled properly to the torque converter hub. In this case, remove the automatic transaxle assembly and then reinstall the torque converter to automatic transaxle assembly according to the key shape of oil pump gear.

[Correct Assembly (A) - Oil Pump Key Part (B) Engaged Properly]



[Incorrect Assembly (C) - Torque Converter Protruded due to Interference with the Oil Pump Key Part (D)]



3) If the mounting bolt is tightened forcibly in spite of a gap, key of oil pump gear will be damaged or broken. In this case, replace the automatic transaxle assembly.

NOTICE

- Follow the separated each procedure as below according to reinstallation or replacing with a new automatic transaxle.

2. In case of the reinstallation.

(1) Replace the oil seal with a new one when ATF leak occurred because of differential oil seal damage.

i Information

When installing the new oil seal, use the special service tool(SST No.:09453-3L241, 09453-2W100, 09231-H1100).

(2) Check the ATF level after refilling the automatic transaxle with fluid. (Refer to Hydraulic System - "Fluid")

(3) Clear the diagnostic trouble codes (DTC) using the GDS.

i Information

Even though disconnecting the battery negative terminal, the DTCs will not be cleared. So, be sure to clear the DTCs using the GDS.

3. In case of the replacing with a new automatic transaxle.

NOTICE

New automatic transaxle is already filled with specified quantity ATF.

For that reason, it does not necessary to refill and check the ATF but the remaining ATF inside of ATF cooler have to be removed.

(1) Set the air blow gun in front of the ATF cooler hose (A).

(2) Remove the remaining ATF by blowing air into ATF cooler hose (A).

(3) Install the ATF cooler hose (A) and (B).

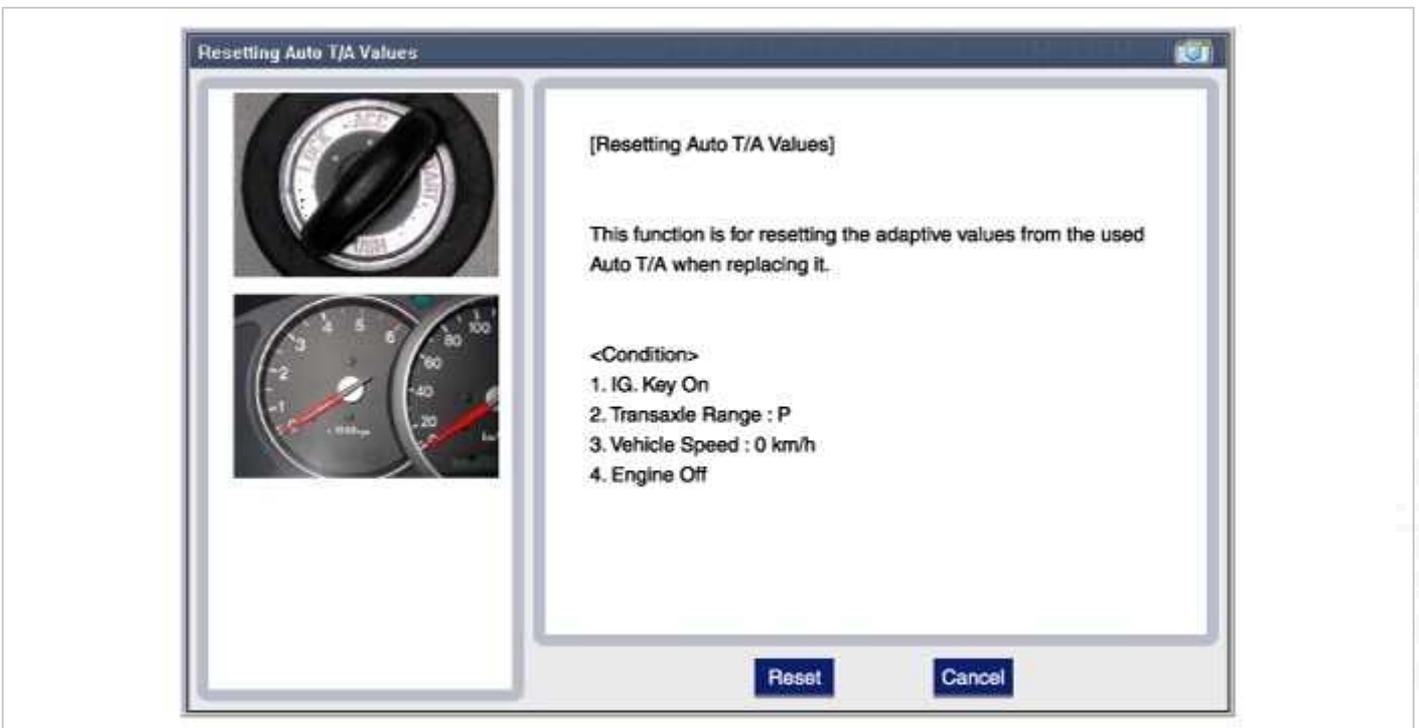


(4) Clear the diagnostic trouble codes (DTC) using the GDS.

Information

Even though disconnecting the battery negative terminal, the DTCs will not be cleared. So, be sure to clear the DTCs using the GDS.

(5) Reset the automatic transaxle adaptive values using the GDS.



(6) Perform the TCM adaptive values learning procedure.
(Refer to Automatic Transaxle Control System - "Repair procedures")

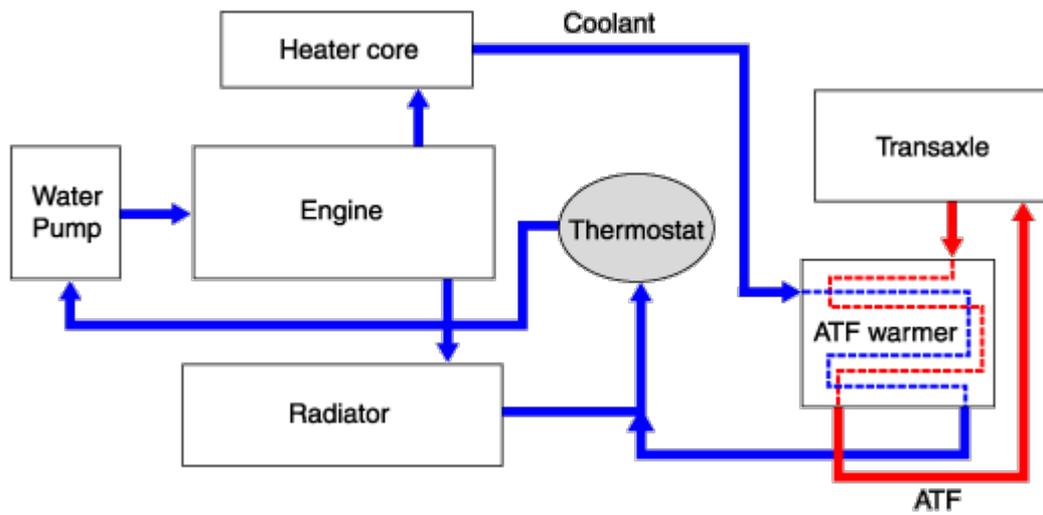
Automatic Transaxle System



Description

- Engine coolant is used for circulating heat in order to heat and cool the transaxle oil.
- Prevents over heating of the transaxle oil while the vehicle is moving.

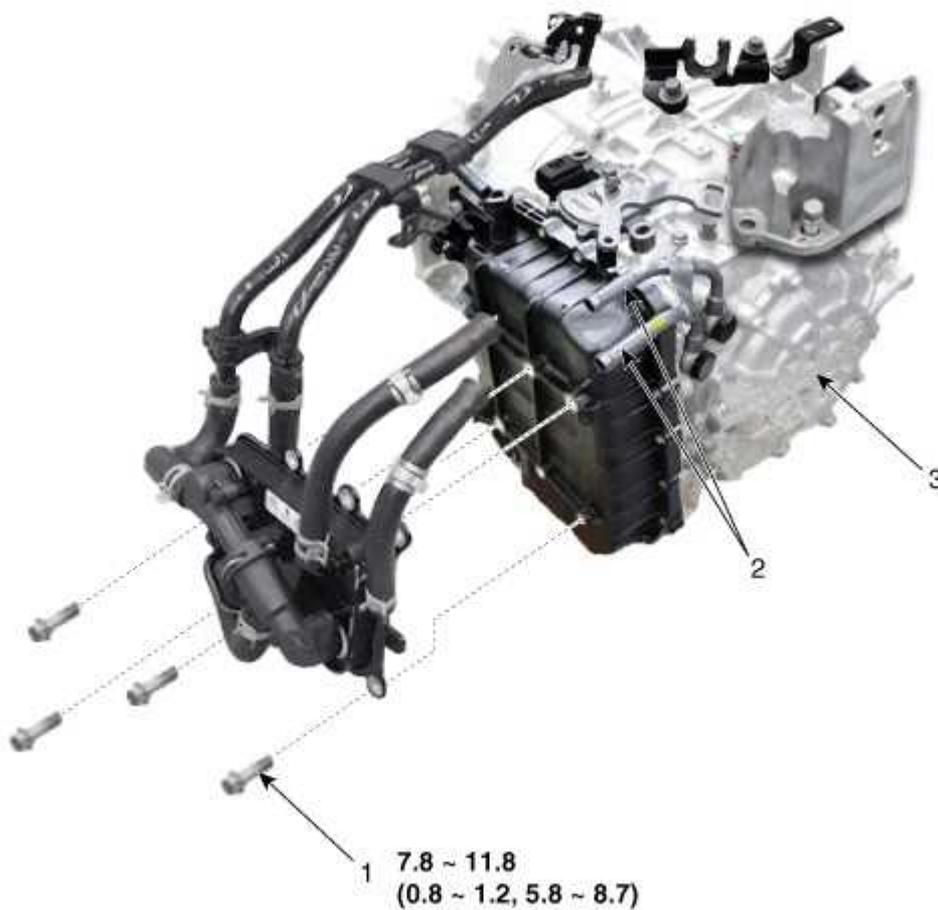
Coolant Flow



Automatic Transaxle System



Components Location



Torque : N.m (kgf.m, lb-ft)

1. Radiator (ATF cooler)
2. ATF cooling hose

3. Automatic transaxle

Automatic Transaxle System

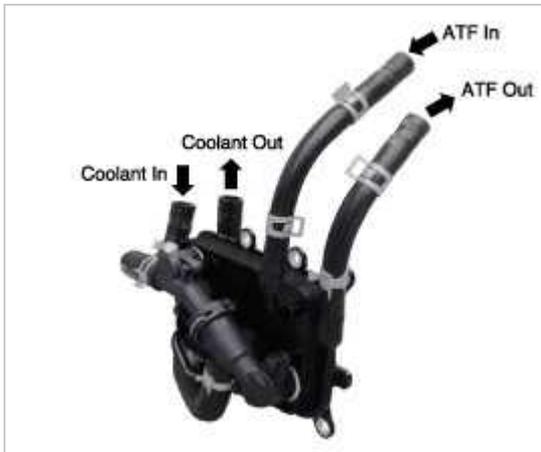


Description

- The ATF warmer is mounted on the valve body cover.
- Engine coolant is used for circulating heat in order to heat and cool the transaxle oil.
- Rapidly elevates the transaxle oil temperature during the initial cold start of the engine.
-

Prevents over heating of the transaxle oil while the vehicle is moving.

- Transaxle oil warm-up and cooling can be done with a single system.
- The water coolant and oil are separate in order to exchange heat.



Automatic Transaxle System



Components



Torque : N.m (kgf.m, lb-ft)

1. ATF warmer
2. Bypass valve

3. ATF hose & pipe
4. Coolant hose & pipe

Automatic Transaxle System

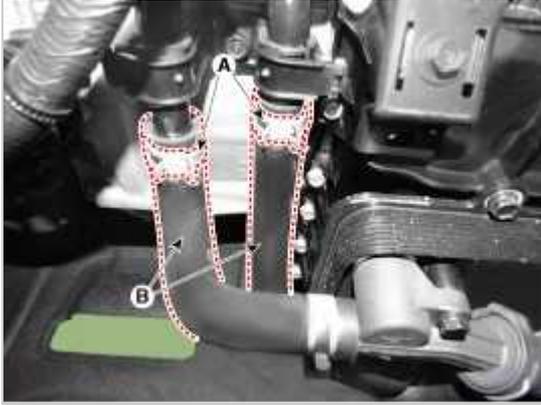


Removal

1. Remove the under cover.

(Refer to Engine Mechanical System - "Engine room under cover")

- Loosen the drain plug and drain the engine coolant.
(Refer to Cooling System - "Coolant")
- Disconnect the cooling hose (B) after separated the clamp (A).

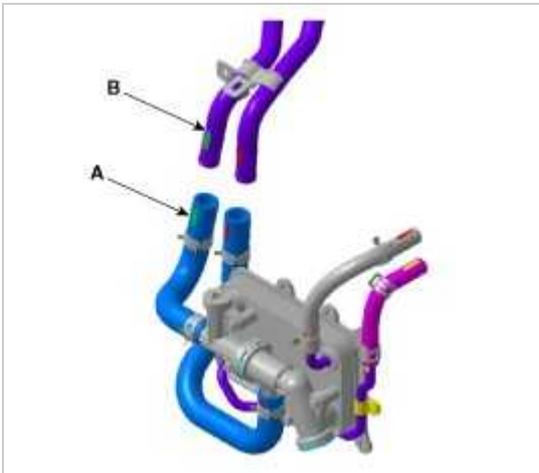


- Disconnect the hose (B) after removing the automatic transaxle fluid cooler hose clamp (A).



CAUTION

- When hose & pipe assembly
Align marking of pipe (B), marking of hose (A), and matching color each other.



- Carefully install the clamp not to damage the hose.
- Install the clamp in a correct direction not to be interfered with other parts.
- After the installation, start the engine and then check if there are any leakages from the hose.

- Remove the ATF warmer (A) from the valve body cover.

Tightening torque :

7.8 ~ 11.8 N.m (0.8 ~ 1.5 kgf.m, 5.8 ~ 8.7 lb-ft)



Installation

1. Install in the reverse order of removal.

NOTICE

Perform the procedures below after replacing the ATF warmer.

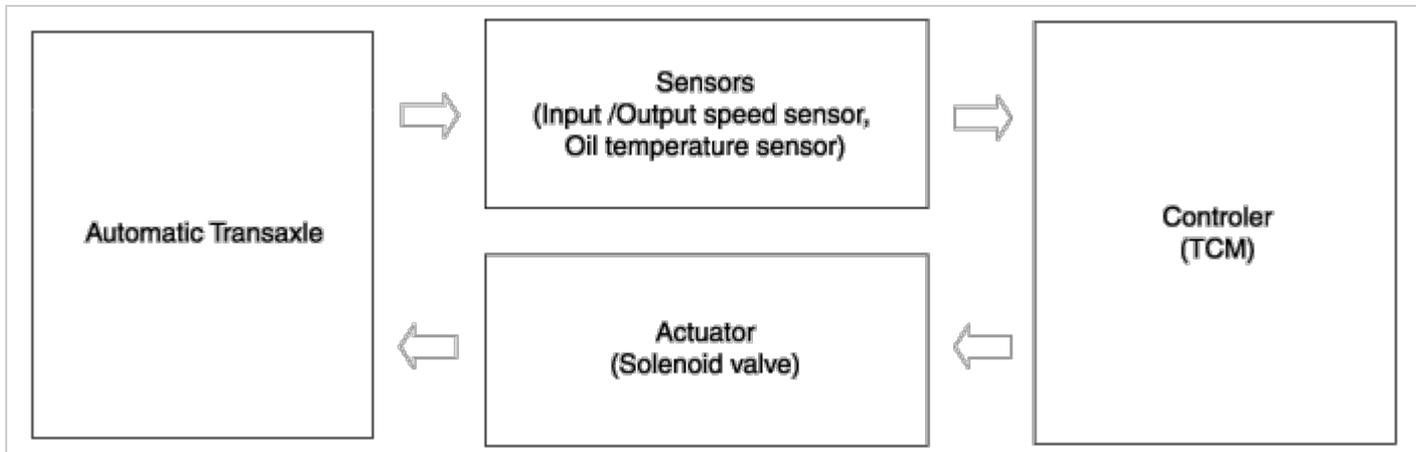
- Refill the engine with coolant.
(Refer to Cooling System - "Coolant")
- After fluid level check, refill the automatic transaxle with fluid.
(Refer to Hydraulic System - "Fluid")

Automatic Transaxle System

Description

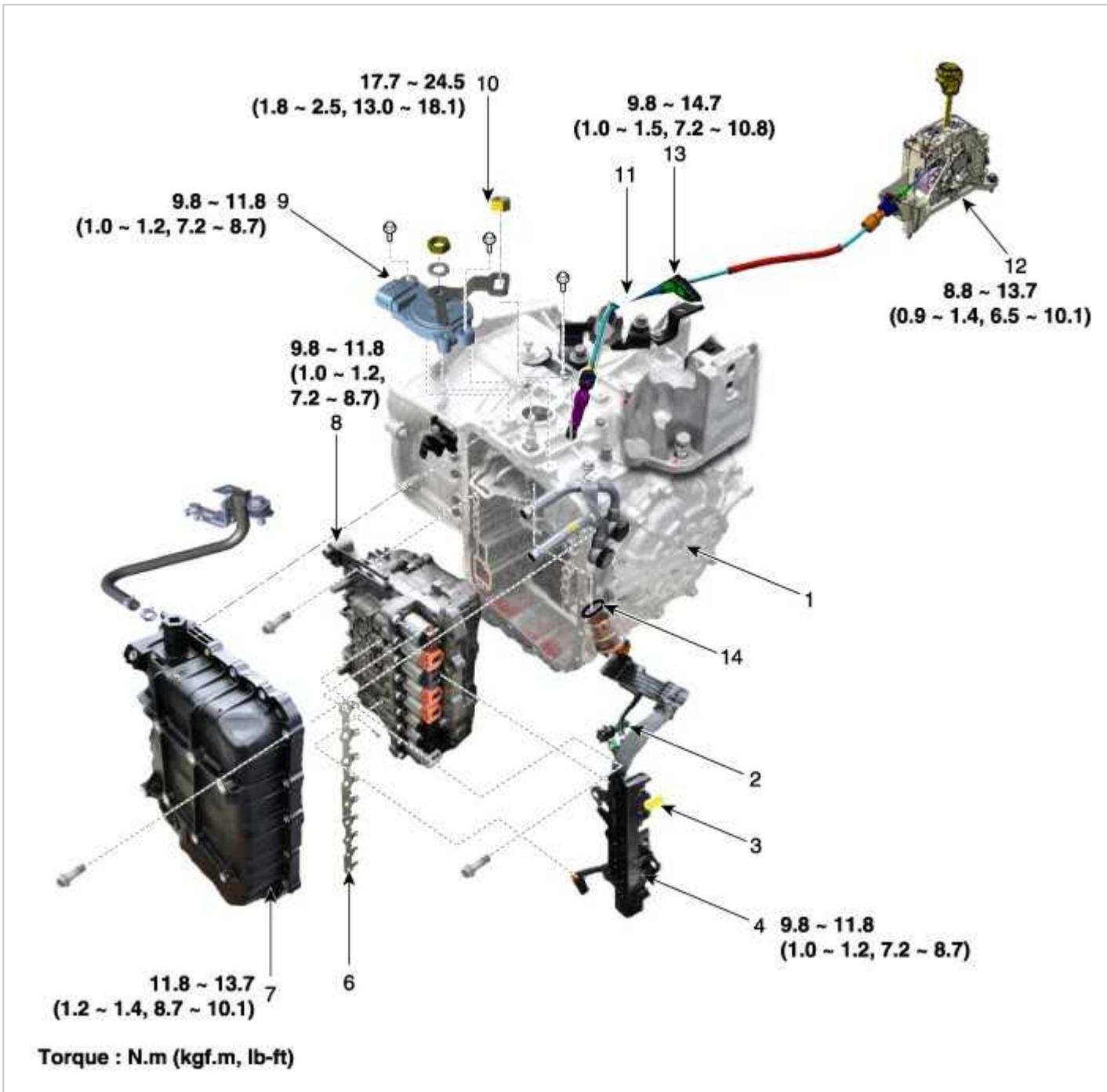
- Automatic transaxle system relies on various measurement data to determine the current control status and extrapolate the necessary compensation values.
- These values are used to control the actuators and achieve the desired control output.
- If a problem with the drivetrain, including the transaxle, has been identified, perform self-diagnosis and basic transaxle inspection (oil and fluid inspection) and then check the control system's components using the diagnosis tool.

Control System Composition



Automatic Transaxle System

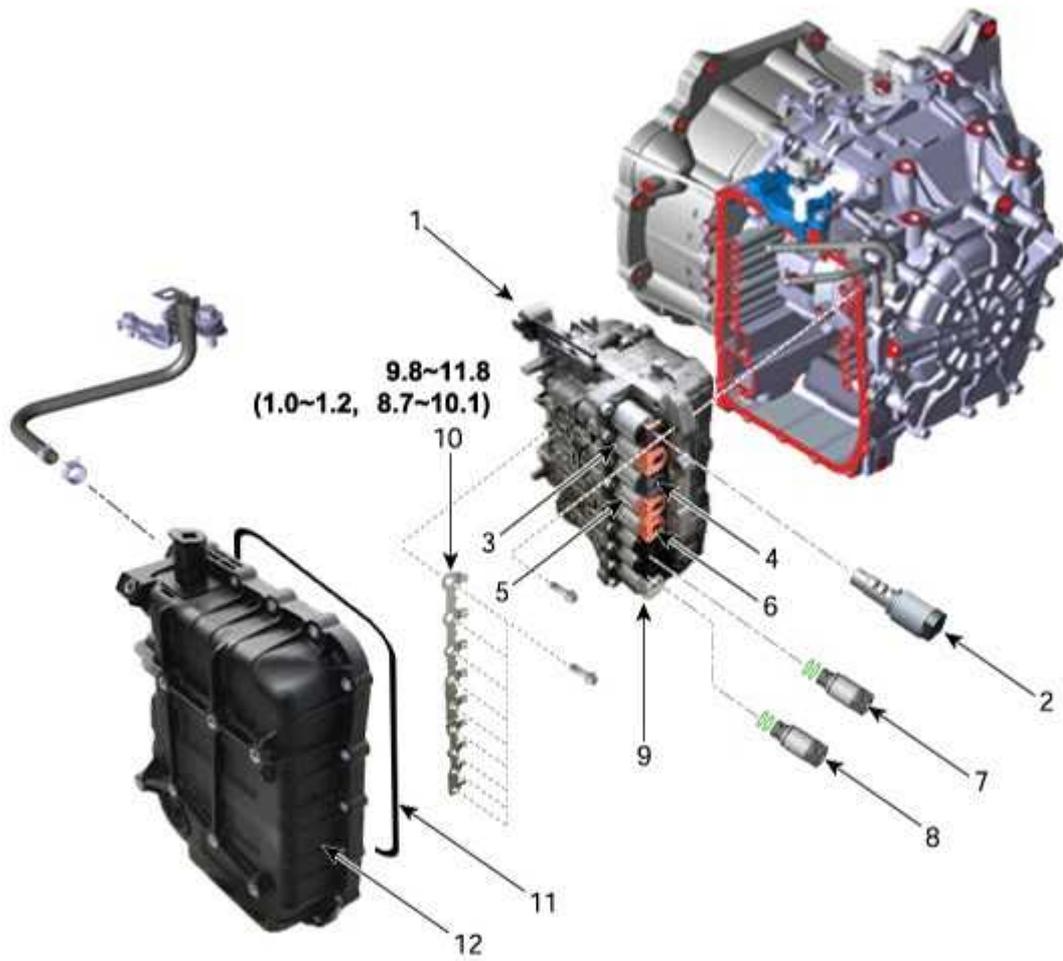
Components Location(1)



cardiagn.com

- | | |
|------------------------------------|--------------------------|
| 1. Automatic transaxle | 8. Valve body assembly |
| 2. Output speed sensor | 9. Inhibitor switch |
| 3. Input speed sensor | 10. Manual control lever |
| 4. Solenoid valve connector | 11. Shift cable |
| 5. Oil temperature sensor | 12. Shift lever |
| 6. Solenoid valve mounting bracket | 13. Shift cable retainer |
| 7. Valve body cover | 14. O-Ring |

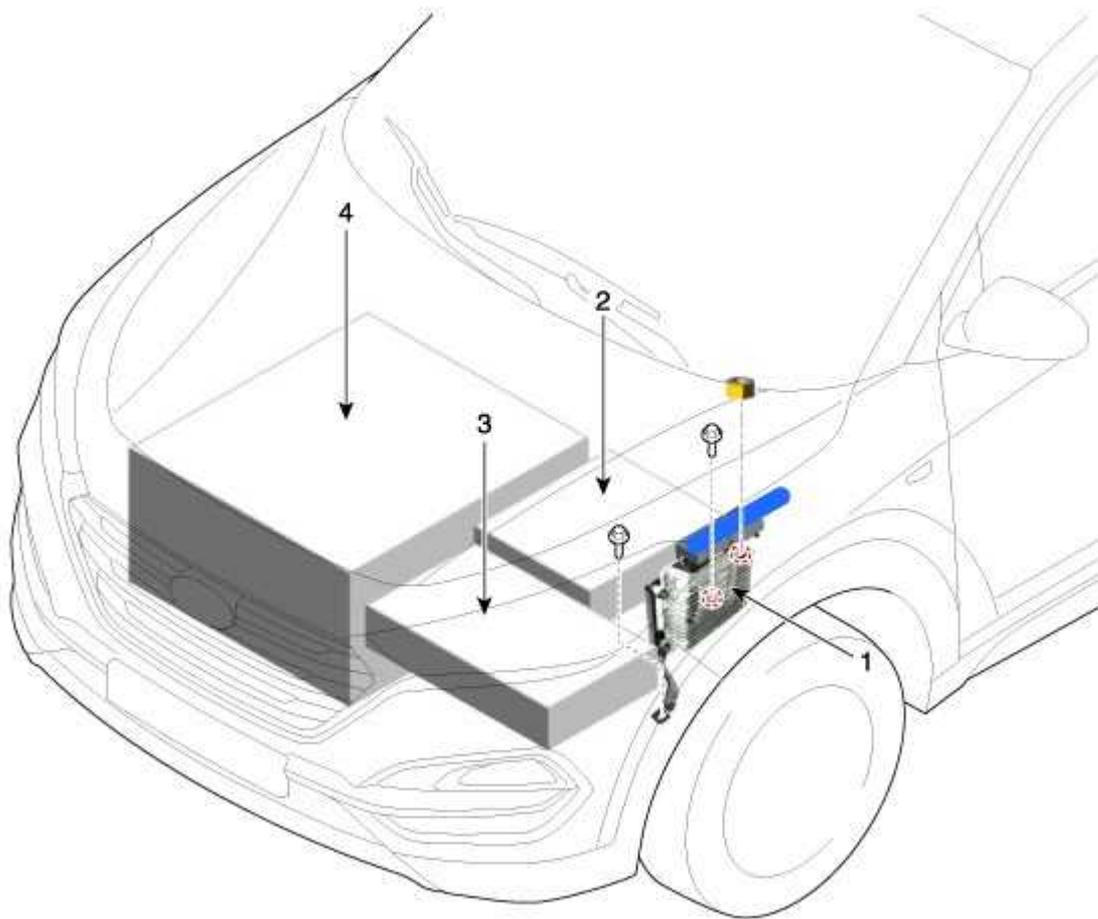
Components Location(2)



Torque : N.m (kgf.m, lb-ft)

- | | |
|--|---|
| 1. Valve body assembly | 7. SS-B Solenoid Valve (ON/OFF) |
| 2. Torque Converter Control Solenoid Valve (T/CON) | 8. SS-A Solenoid Valve (ON/OFF) |
| 3. 35R Clutch Control Solenoid Valve (35R/C) | 9. Line Pressure Control Solenoid Valve |
| 4. 26 Brake Control Solenoid Valve (26/B) | 10. Solenoid valve mounting bracket |
| 5. Underdrive Brake Control Solenoid Valve (UD/B) | 11. Valve body cover gasket |
| 6. Overdrive Clutch Control Solenoid Valve (OD/C) | 12. Valve body cover |

Components Location(3)

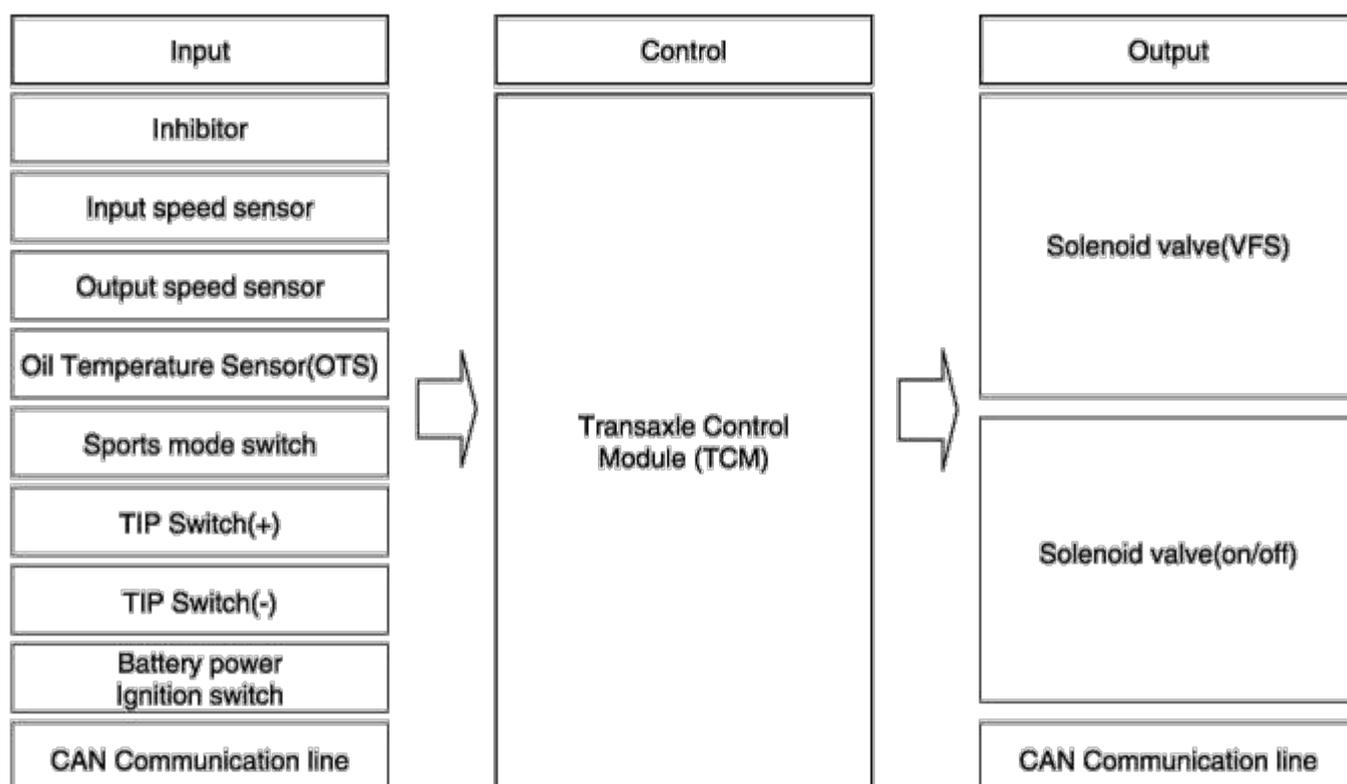


- 1. Transaxle control module(TCM)
- 2. Air cleaner assembly

- 3. Battery and battery tray
- 4. Engine assembly

Automatic Transaxle System

Circuit Diagram



Adjustment

Transaxle Control Module(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.

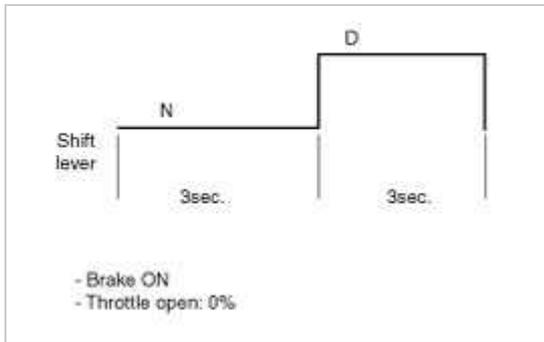
- Transaxle assembly replacement
- TCM replacement
- TCM upgrading

TCM learning procedure

1. Automatic Transaxle Fluid (ATF) temperature: 40 ~ 100 °C (104 ~ 212 °F)

2. Static learning

Repeat the below shift pattern four times or more with stepping on the brake.



3. Driving learning

Drive the vehicle from a stop in D through all gears 1st, 2nd, 3rd, 4th, 5th and 6th gear while holding the throttle steady at the specified Throttle Position Sensor (TPS) value (15 ~ 25%).

Automatic Transaxle System

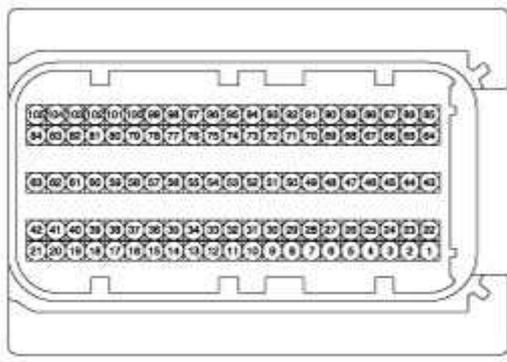
Description

- Monitors the vehicle's operating conditions to determine the optimal gear setting.
- Performs a gear change if the current gear setting differs from the identified optimal gear setting.
- Determines the need for damper clutch (D/C) activation and engages the clutch accordingly.
- Calculates the optimal line pressure level by constantly monitoring the torque level and adjusts the pressure accordingly.
- Diagnoses the automatic transaxle for faults and failures.

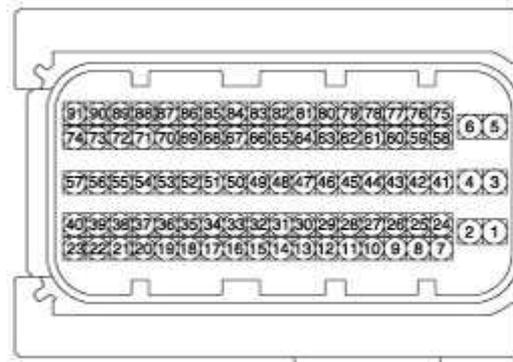


Automatic Transaxle System

1. TCM Connector and Terminal Function



Connector [A]



Connector [B]

2. TCM Terminal Function

Connector [A]

Pin	Description	Pin	Description
22	Overdrive clutch control solenoid valve (OD/C_VFS)	73	Inhibitor switch signal "S4"
23	Pressure control solenoid (VFS-LINE)	74	Inhibitor switch signal "S2"
26	ON/OFF solenoid valve B (SS-B)	75	Inhibitor switch signal "S3"
37	Sports mode up switch	87	Solenoid power 1
38	Sports mode select switch	88	Solenoid power 2
39	Oil temperature sensor (+)	89	ON/OFF solenoid valve A (SS-A)
43	Underdrive brake control solenoid valve (UD/B_VFS)	94	Inhibitor switch signal "S1"
44	35R clutch control solenoid valve (35R/C_VFS)	95	Output speed sensor power
45	Torque converter control solenoid (T/CON_VFS)	96	Input speed sensor power
46	26 brake control solenoid valve (26/B_VFS)	99	Input speed sensor signal
58	Sports mode down switch	100	Output speed sensor signal
59	Oil temperature sensor (-)		

Connector [B]

Pin	Description	Pin	Description
1	GND (Power)	5	VB (Battery voltage)
2	GND (Power)	60	CAN High
3	VB (Battery voltage)	68	IG.1 (Ignition key)
4	Ground (Power)	77	CAN Low

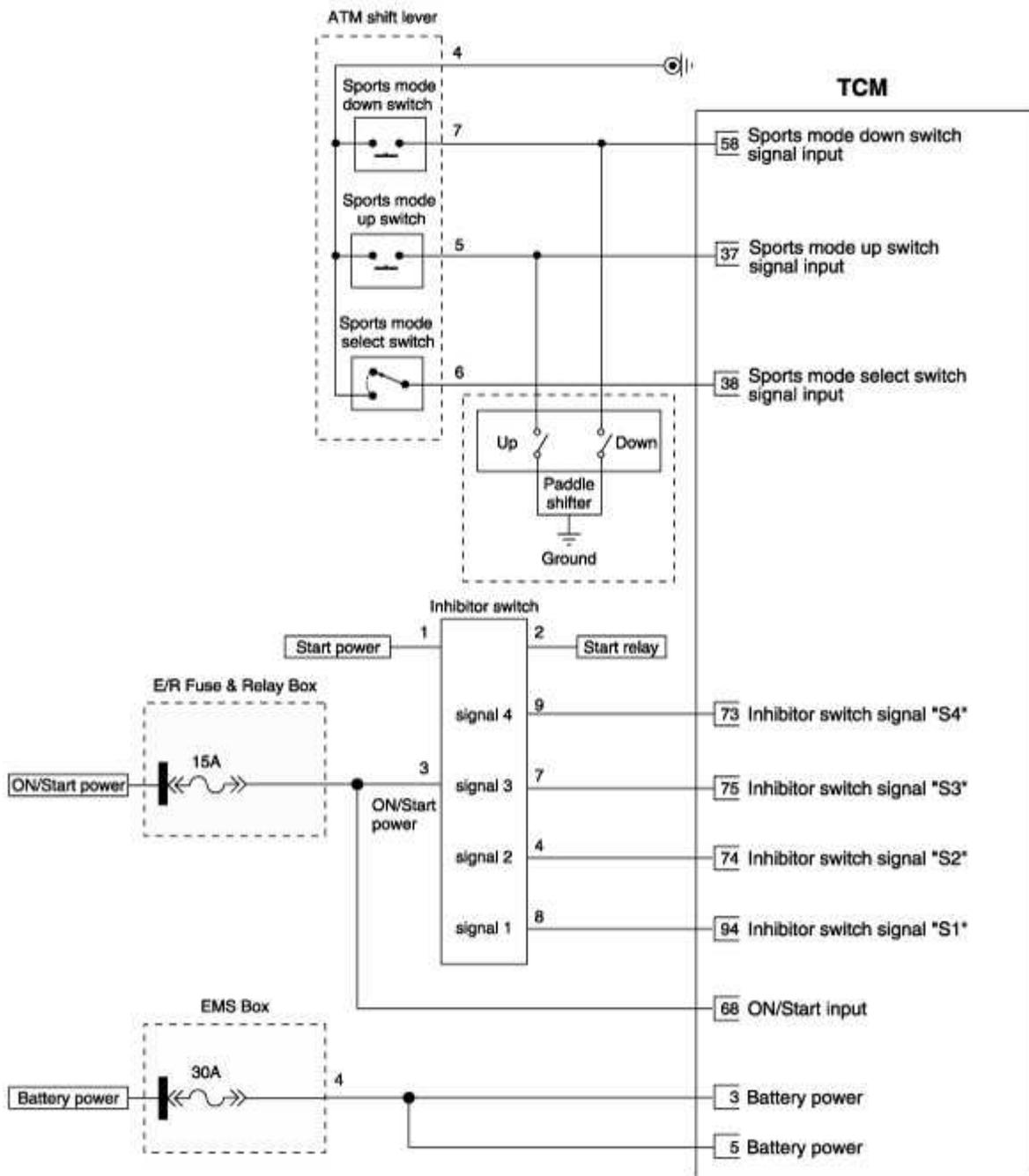
TCM Terminal input/ output signal

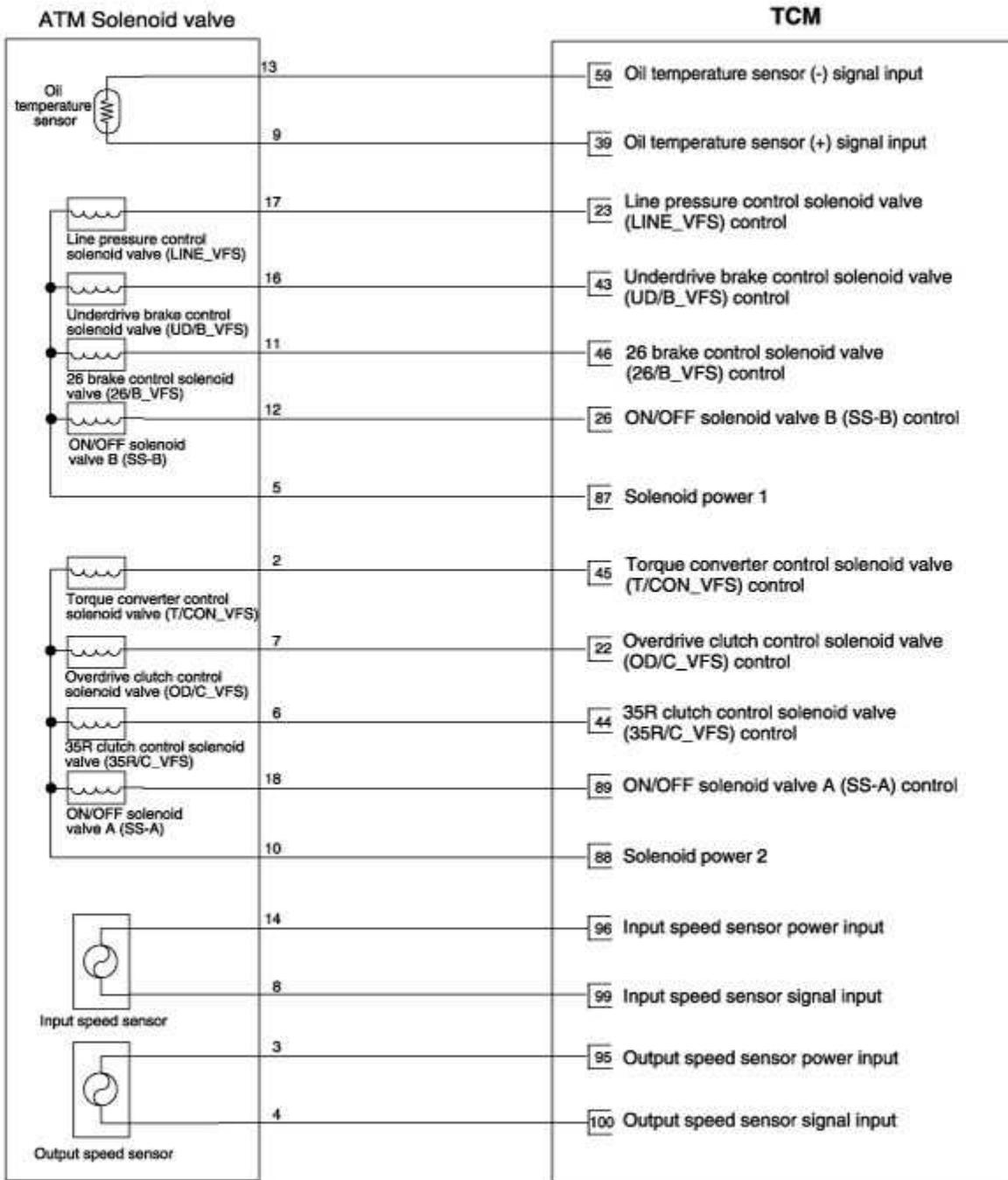
Connector [A]

Pin	Description	Condition	Input/output value	
			Type	Level
22	Overdrive clutch control solenoid valve (OD/C_VFS)	-	Output	0V/Battery voltage level
				9V < Battery voltage level < 16V
23	Line pressure control solenoid valve (LINE_VFS)	-	Output	0V/Battery voltage level
				9V < Battery voltage level < 16V
26	ON/OFF solenoid valve B(SS-B)	High	Output	0V/Battery voltage level
		Low		9V < Battery voltage level < 16V
37	Sports mode up switch	Up ON	Input	0V/Battery voltage level
		Other		9V < Battery voltage level < 16V
38	Sports mode select switch	Sport mode	Input	0V/Battery voltage level
		Other		9V < Battery voltage level < 16V
39	Oil temperature sensor (+)	ON	Input	0V/3.3V
		OFF		
43	Underdrive brake control solenoid valve (UD/B_VFS)	-	Output	0V/Battery voltage level
				9V < Battery voltage level < 16V
				Power supply : V_SOL2

44	35R clutch control solenoid valve (35R/C_VFS)	-	Output	0V/Battery voltage level
				9V < Battery voltage level < 16V
45	Torque converter control solenoid valve (T/CON_VFS)	-	Output	0V/Battery voltage level
				9V < Battery voltage level < 16V
46	26 brake control solenoid valve (26/B_VFS)	-	Output	0V/Battery voltage level
				9V < Battery voltage level < 16V
				Power supply : V_SOL2
58	Sports mode down switch	Down ON	Input	0V/Battery voltage level
		Other		9V < Battery voltage level < 16V
59	Oil temperature sensor (-)	-	Ground	0V
73	Inhibitor switch signal "S4"	High	Input	0V/Battery voltage level
		Low		9V < Battery voltage level < 16V
74	Inhibitor switch signal "S2"	High	Input	0V/Battery voltage level
		Low		9V < Battery voltage level < 16V
75	Inhibitor switch signal "S3"	High	Input	0V/Battery voltage level
		Low		9V < Battery voltage level < 16V
89	ON/OFF solenoid valve A (SS-A)	High	Output	0V/Battery voltage level
		Low		9V < Battery voltage level < 16V
94	Inhibitor switch signal "S1"	High	Input	0V/Battery voltage level
		Low		9V < Battery voltage level < 16V
95	Output speed sensor power	ON	Power	0V/7.5V
		OFF		
96	Input speed sensor power	ON	Power	0V/7.5V
		OFF		
99	Input speed sensor signal	High	Input	0.7V/1.4V
		Low		
100	Output speed sensor signal	High	Input	0.7V/1.4V
		Low		

Circuit Diagram





Automatic Transaxle System

Inspection

Transaxle Control Module(TCM) Problem Inspection Procedure

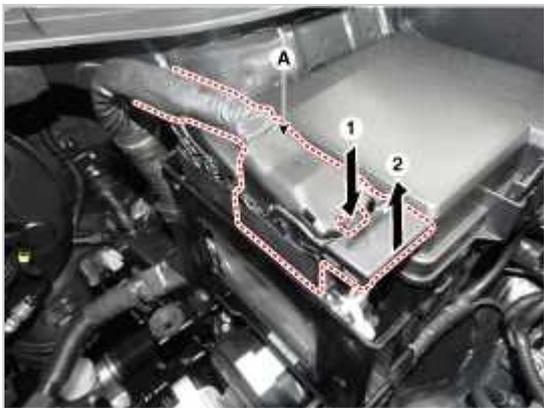
1. TEST TCM GROUND CIRCUIT: Measure resistance between TCM and chassis ground using the backside of TCM harness connector as TCM side check point. If the problem is found, repair it.
Specification: Below 1Ω
2. TEST TCM CONNECTOR: Disconnect the TCM connector and visually check the ground terminals on 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).

Removal

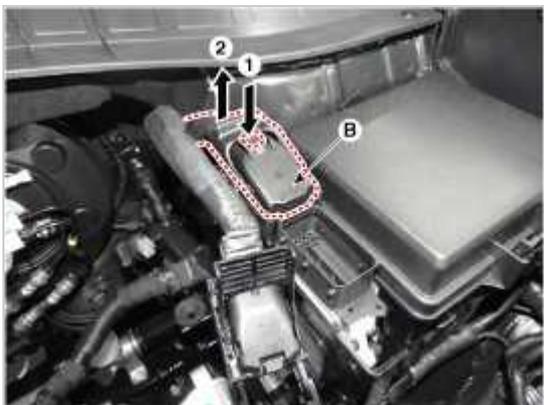
1. Turn ignition switch OFF.
2. Disconnect the negative (-) battery cable.
3. Remove the air cleaner assembly and air duct. (Refer to Engine Mechanical System - "Air cleaner")



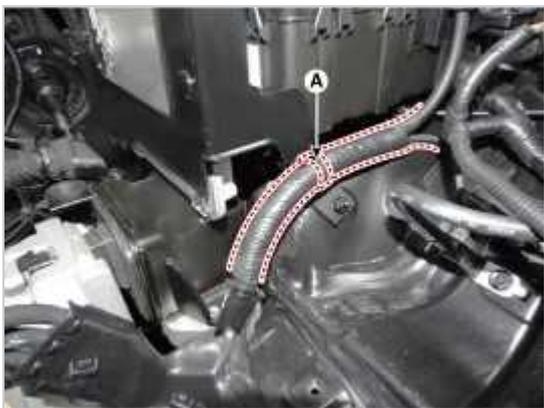
4. Disconnect the TCM connector (A).



5. Disconnect the TCM connector(B).



6. Remove the fixing clip(A) of wiring.



7. Remove the TCM (A) after removing the mounting nuts and bolts (B).

TCM installation nut :

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



Installation

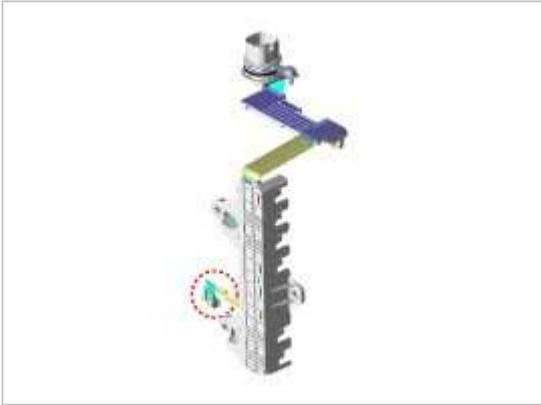
1. Install in the reverse order of removal.
2. Perform the procedures related in the ECM after replacing the TCM.
(Refer to Engine Control / Fuel System - "Engine Control Module")
3. Perform TCM learning after replacing the transaxle to prevent slow transaxle response, jerky acceleration and jerky startup.

Automatic Transaxle System



Description

- Transaxle oil temperature sensor monitors the automatic transaxle fluid's temperature and conveys the readings to TCM.
- It is an NTC (Negative Thermal Coefficient) sensor whose resistance has an inversely proportional relationship with the temperature level.
- Data produced by this sensor is used to identify damper clutch activation and deactivation zones within the low temperature and high temperature range and to compensate hydraulic pressure levels during gear changes.



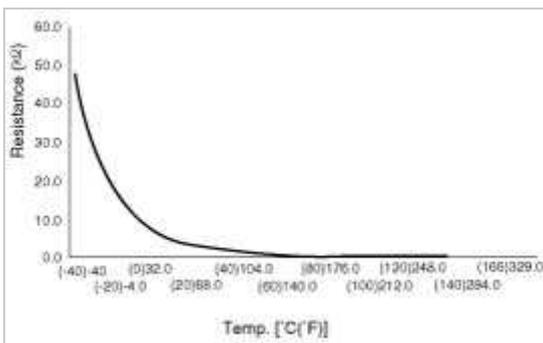
Automatic Transaxle System



Specifications

▷ Type: Negative Thermal Coefficient Type

Temp. [(°C)°F]	Resistance (kΩ)
(-40) -40	48.1
(-20) -4.0	15.6
(0) 32.0	5.88
(20) 68.0	2.51
(40) 104.0	1.19
(60) 140.0	0.61
(80) 176.0	0.32
(100) 212.0	0.18
(120) 248.0	0.11
(140) 284.0	0.07
(160) 320.0	0.04



Automatic Transaxle System

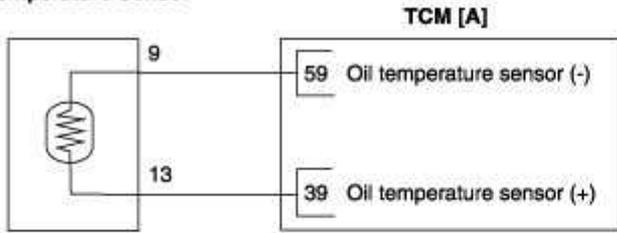


Circuit Diagram

[Circuit Diagram]

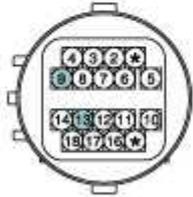
[Connection Information]

Oil Temperature Sensor

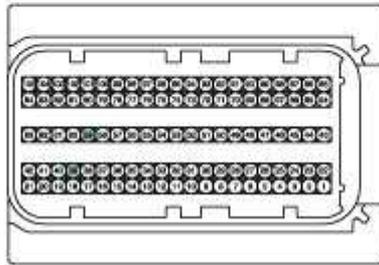


Terminal	Connected to	Function
9	TCM(59)	Oil temperature sensor (-)
13	TCM(39)	Oil temperature sensor (+)

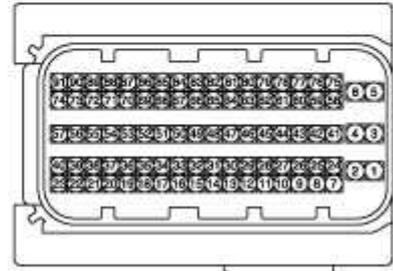
[Harness Connector]



Solenoid Valve Connector



Connector [A]



Connector [B]

Automatic Transaxle System

Inspection

1. Turn ignition switch OFF.
2. Remove the battery and battery tray.
3. Disconnect the solenoid valve connector (A).



4. Measure resistance between sensor signal terminal and sensor ground terminal.
5. Check that the resistance is within the specification.

NOTICE

- If DTC about the input/output speed sensor is found, replace according to the procedures removal/installation.

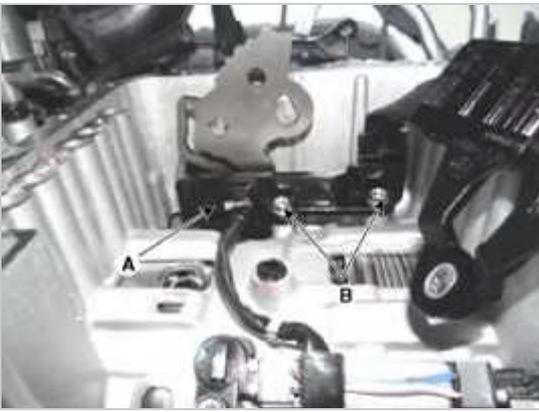
Removal

1. Remove the valve body assembly.
(Refer to Valve body System - "Valve Body")
2. Disconnect the input & output speed sensor connector (A).
3. Loosen the main connector bolt (B).

Tightening torque :

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





4. Disconnect the solenoid valve connector (A).
(1) Press the lock
(2) Pull up lever



5. Remove the solenoid valve connector mounting clip (A).

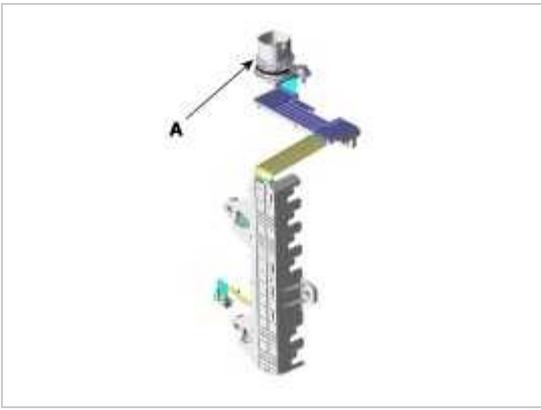


6. Remove the solenoid valve connector (A) by pushing down from the transaxle.



⚠ CAUTION

- Replace the O-Ring(A) before reinstalling solenoid valve connector.



Installation

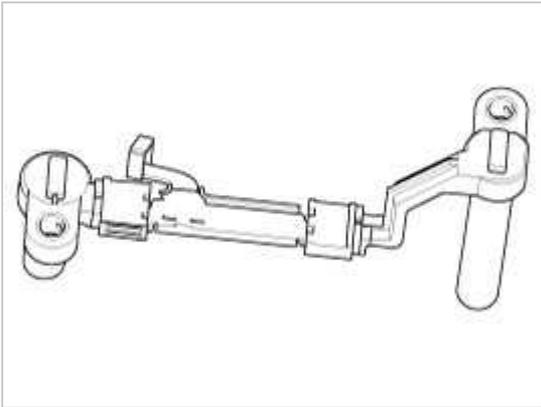
1. Install in the reverse order of removal.
2. Check fluid level, after filling the automatic transaxle with fluid.
(Refer to Hydraulic System - "Fluid")

Automatic Transaxle System



Description

Input speed sensor is a vital unit that measures the rate of rotation of the input shaft inside the transaxle and delivers the readings to the TCM. The sensor provides critical input data that's used in feedback control, damper clutch control, gear setting control, line pressure control, clutch activation pressure control, and sensor fault analysis.



Automatic Transaxle System



Specifications

▷ Type: Hall effect sensor

Operation condition [°C(°F)]		(-40 ~ 150) -40 ~ 302
Output voltage(V)	High	1.18 ~ 1.68
	Low	0.59 ~ 0.84

Automatic Transaxle System

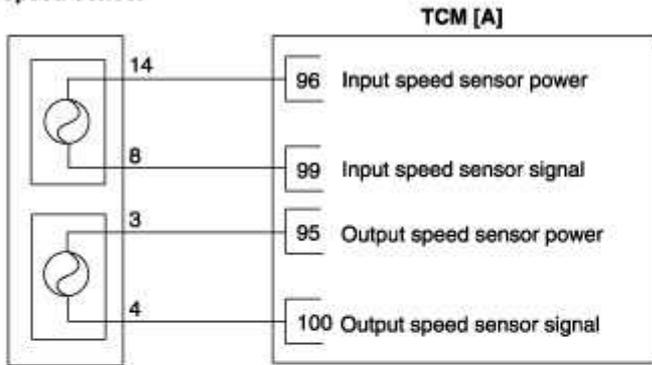


Circuit Diagram

[Circuit Diagram]

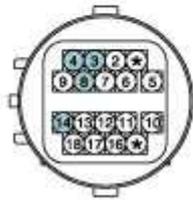
[Connection Information]

Input & Output Speed Sensor

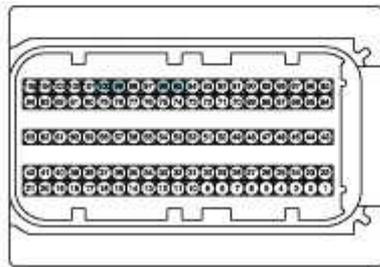


Terminal	Connected to	Function
14	TCM(96)	Input speed sensor power
8	TCM(99)	Input speed sensor signal
3	TCM(95)	Output speed sensor power
4	TCM(100)	Output speed sensor signal

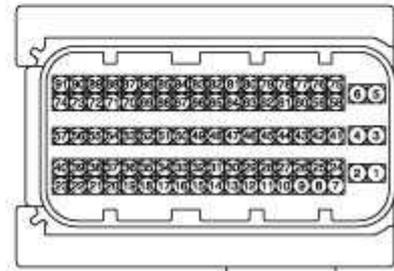
[Harness Connector]



Solenoid Valve Connector



TCM connector [A]



TCM connector [B]

Automatic Transaxle System

Inspection

1. Using the GDS, check the input/output speed sensor waveforms.
 - Turn OFF the ignition switch.
 - Connect the GDS to the Data Link Connector(DLC) on the lower crash pad.
 - Ignition "ON" & Engine "ON".
 - Check the input/output speed sensor waveforms at high speed and low speed.

Fig 1) Input/Output speed sensor at low speed



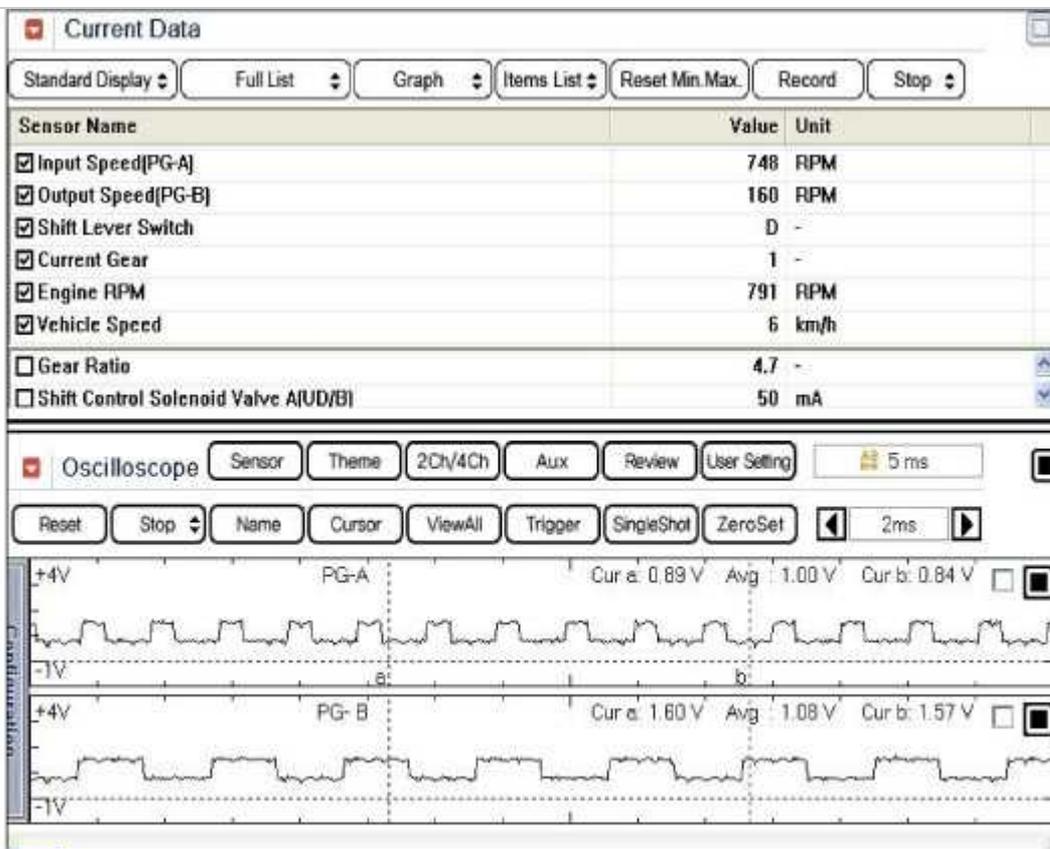
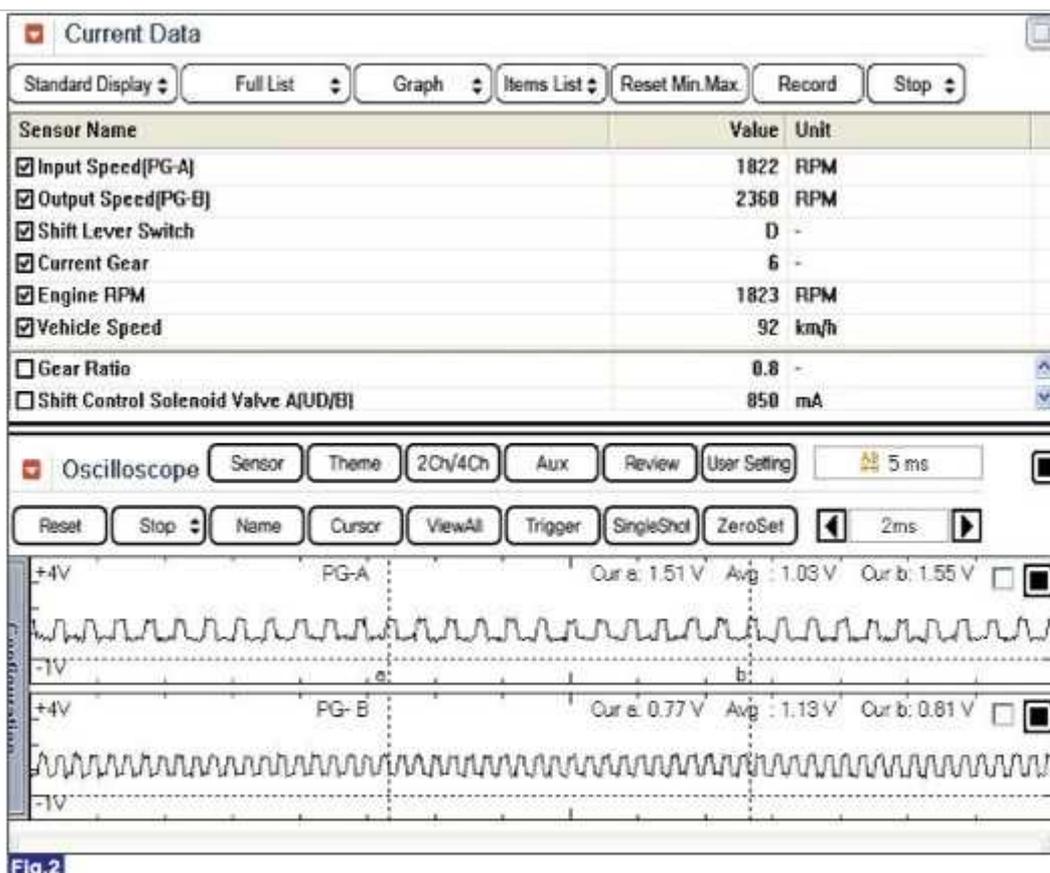


Fig 2) Input/Output speed sensor at high speed

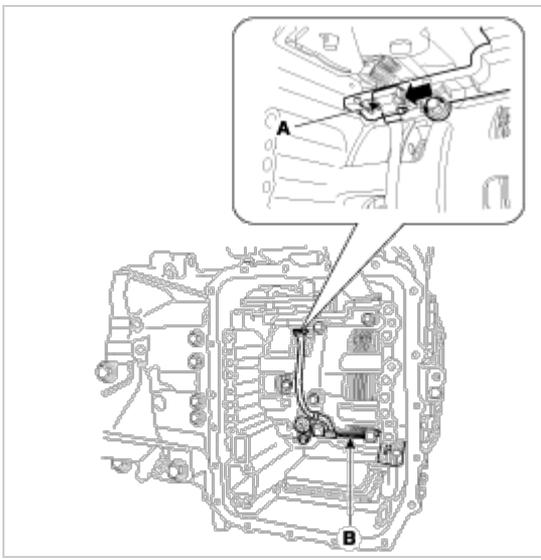


Removal

1. Remove the valve body assembly.
(Refer to Valve body System - "Valve Body")
2. Disconnect the input & output speed sensor connector (A) from the main wiring.
3. 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)



Installation

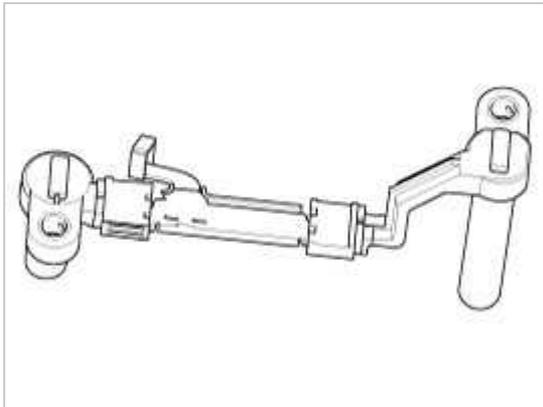
1. Install in the reverse order of removal.
2. Check fluid level after filling the automatic transaxle with fluid.
(Refer to Hydraulic System - "Fluid")

Automatic Transaxle System



Description

The output speed sensor is a vital unit that measures the rate of rotation of the transaxle's turbine shaft and output shaft, and delivers the readings to the TCM. The sensor provides critical input data that's used in feedback control, damper clutch control, gear setting control, line pressure control, clutch activation pressure control, and sensor fault analysis.



Automatic Transaxle System



Specifications

▷ Type: Hall effect sensor

Operation condition [°C(°F)]		(-40 ~ 150) -40 ~ 302
Output voltage	High	1.18 ~ 1.68
	Low	0.59 ~ 0.84

Automatic Transaxle System

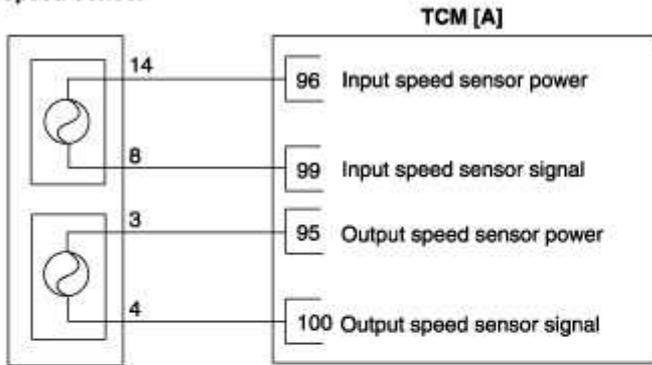


Circuit Diagram

[Circuit Diagram]

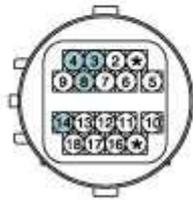
[Connection Information]

Input & Output Speed Sensor

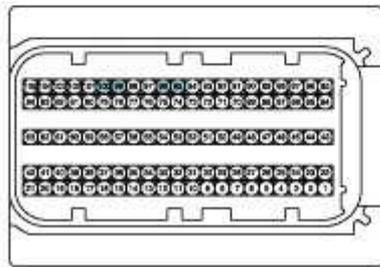


Terminal	Connected to	Function
14	TCM(96)	Input speed sensor power
8	TCM(99)	Input speed sensor signal
3	TCM(95)	Output speed sensor power
4	TCM(100)	Output speed sensor signal

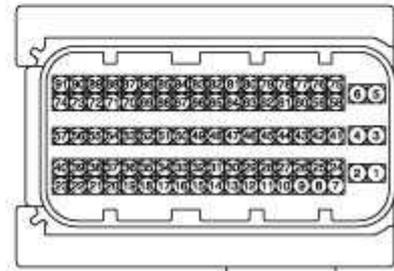
[Harness Connector]



Solenoid Valve Connector



TCM connector [A]



TCM connector [B]

Automatic Transaxle System

Inspection

1. Using the GDS, check the input/output speed sensor waveforms.
 - Turn OFF the ignition switch.
 - Connect the GDS to the Data Link Connector(DLC) on the lower crash pad.
 - Ignition "ON" & Engine "ON".
 - Check the input/output speed sensor waveforms at high speed and low speed.

Fig 1) Input/Output speed sensor at low speed



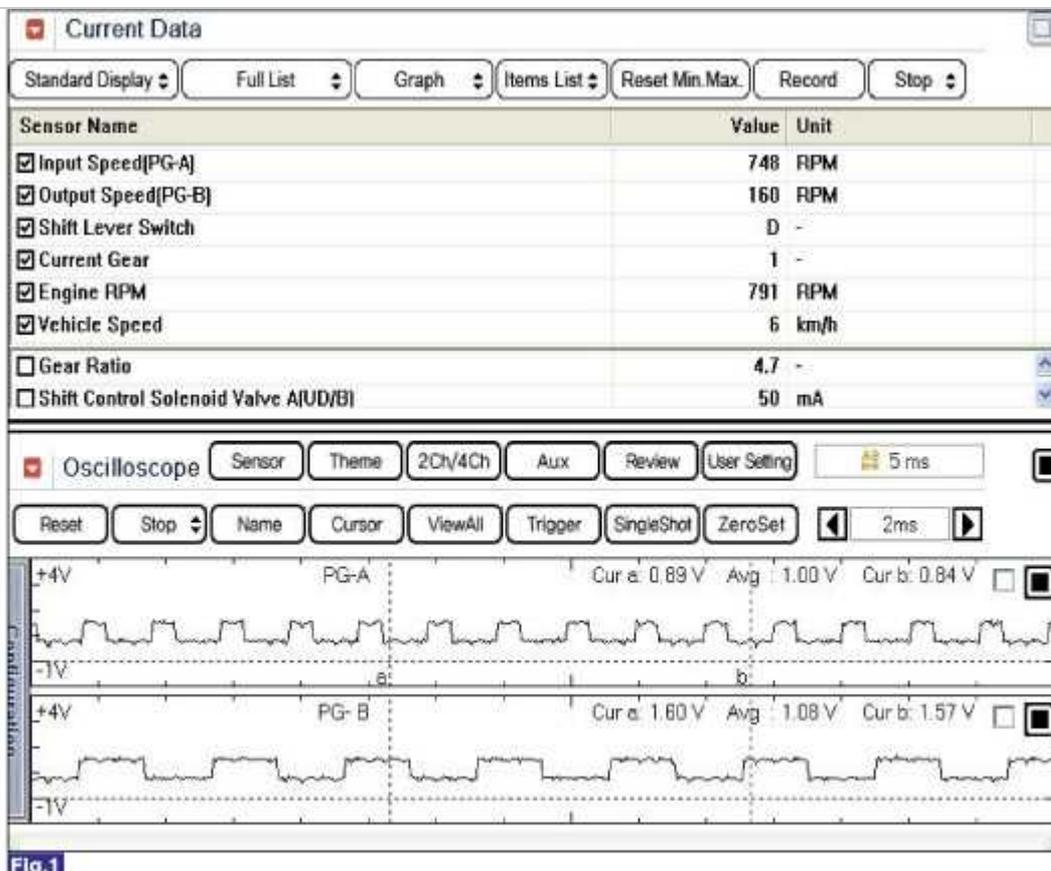
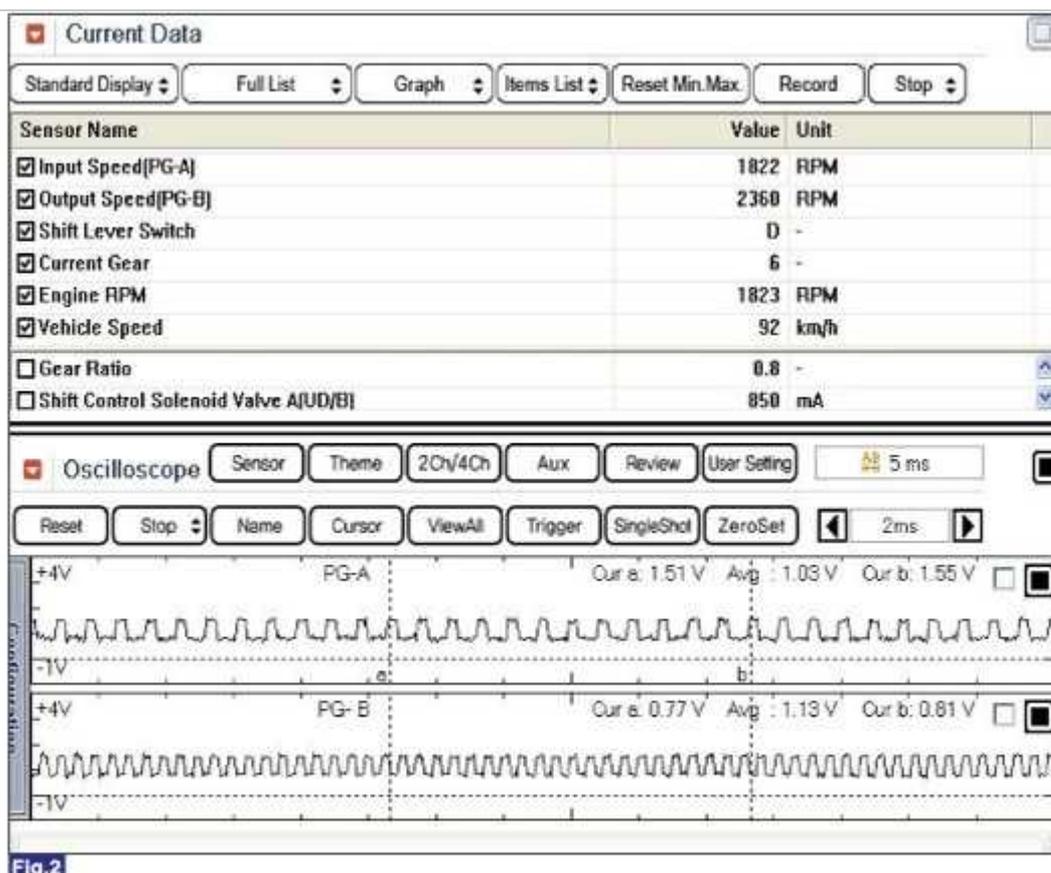


Fig 2) Input/Output speed sensor at high speed

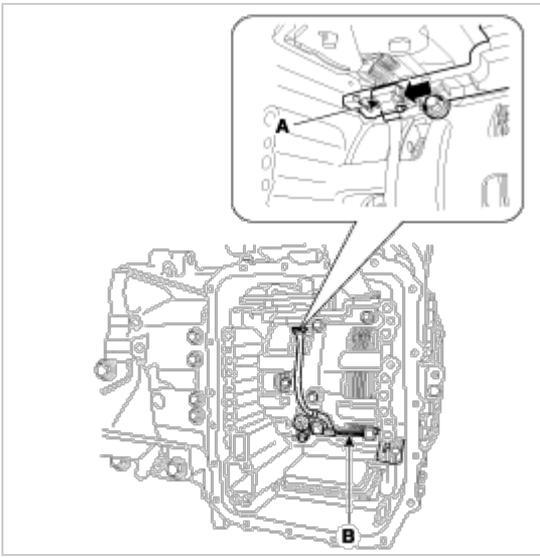


Removal

1. Remove the valve body assembly.
(Refer to Hydraulic System - "Valve Body")
2. Disconnect the input & output speed sensor connector (A) from the main wiring.
3. 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)



Installation

1. Install in the reverse order of removal.
2. Check fluid level after filling the automatic transaxle with fluid.
(Refer to Hydraulic System - "Fluid")

Automatic Transaxle System

Description

- Torque converter control solenoid valve (T/CON_VFS) is attached to the valve body.
- This variable force solenoid valve indirectly controls the hydraulic pressure inside the torque converter.



Automatic Transaxle System

Specifications

Clutch/Brake control VFS[T/CON]

▷ Control type : Normally low type

Control Pressure[kpa (kgf/cm ² , psi)]	9.81 ~ 500.14 (0.1 ~ 5.1, 1.42 ~ 72.54)
Current value(mA)	50 ~ 850
Internal resistance(Ω)	5.1

Automatic Transaxle System

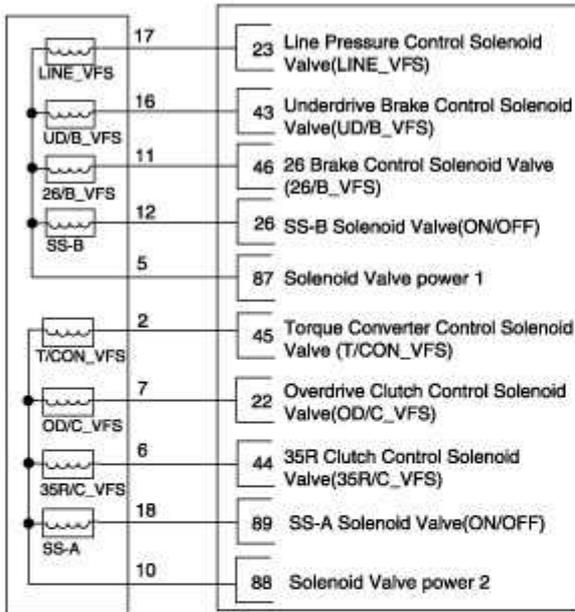
Circuit Diagram

[Circuit Diagram]

[Connection Information]

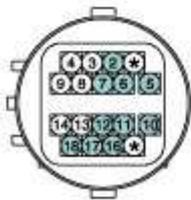
Solenoid Valve

TCM [A]

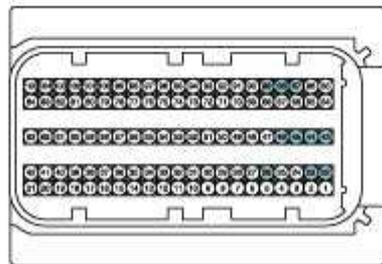


Terminal	Connected to	Function
17	TCM(23)	Line Pressure Control Solenoid Valve (LINE_VFS)
16	TCM(43)	Underdrive Brake Control Solenoid Valve (UD/B_VFS)
11	TCM(46)	26 Brake Control Solenoid Valve (26/B_VFS)
12	TCM(26)	SS-B Solenoid Valve (ON/OFF)
5	TCM(87)	Solenoid Valve power 1
2	TCM(45)	Torque Converter Control Solenoid Valve (T/CON_VFS)
7	TCM(22)	Overdrive Clutch Control Solenoid Valve (OD/C_VFS)
6	TCM(44)	35R Clutch Control Solenoid Valve (35R/C_VFS)
18	TCM(89)	SS-A Solenoid Valve (ON/OFF)
10	TCM(88)	Solenoid Valve power 2

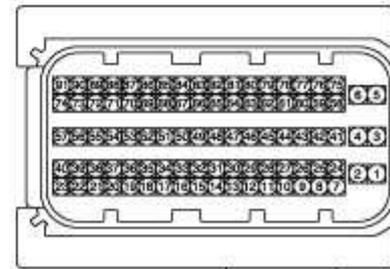
[Harness Connector]



Solenoid Valve Connector



TCM connector [A]



TCM connector [B]

Automatic Transaxle System

Inspection

1. Turn ignition switch OFF.
2. Remove the air duct.
(Refer to Engine Mechanical System - "Air cleaner")
3. Disconnect the solenoid valve connector(A).



4. Measure resistance between sensor signal terminal and sensor ground terminal.
5. Check that the resistance is within the specification.

Removal

CAUTION

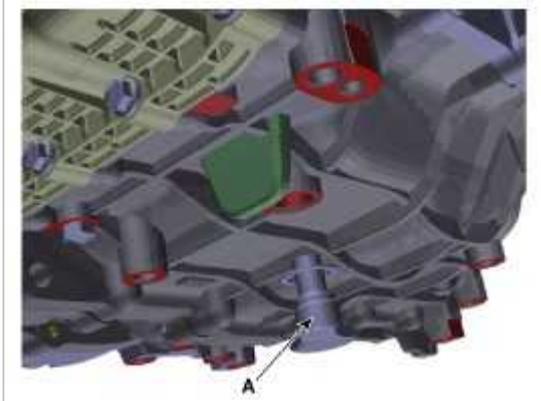


- When the solenoid valve failure code (DTC) is on, perform the following procedure to replace it.
- Automatic transaxle is composed of delicate components. Be careful not to cause any damage on the component in the course of assembly and disassembly.
- Maintain clean condition so that foreign substance does not get into the automatic transaxle.
- Use a coated apron, latex gloves, and stainless tray to prevent foreign substance from getting into the transaxle.
- Automatic transaxle fluid (ATF) can be reused. Collect it using a clean 10-liter beaker.

1. Remove the air duct.(Refer to Engine Mechanical System - "Air cleaner")
2. Remove the battery and the battery tray.(Refer to Engine Electrical System - "Battery")
3. Remove the under cover.(Refer to Engine Mechanical System - "Engine Room Under Cover")
4. Remove the ATF warmer.(Refer to Automatic Transaxle System-"ATF Warmer") (if equipped ATF warmer)
5. Remove the drain plug (A) and reinstall the drain plug after draining ATF totally.

Tightening torque :

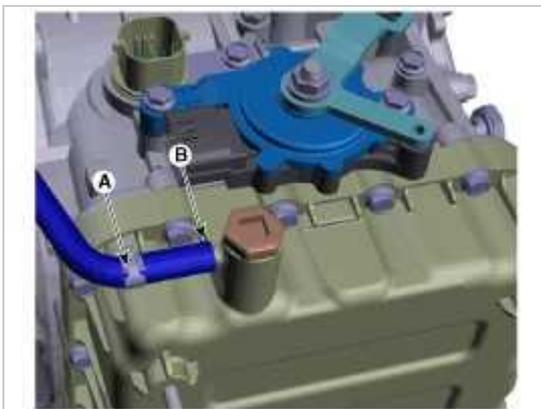
38.2 ~ 48.1 N.m (3.9 ~ 4.9 kgf.m, 28.2 ~ 35.4 lb-ft)



⚠ CAUTION

- Replace the gasket before reinstalling the drain plug.

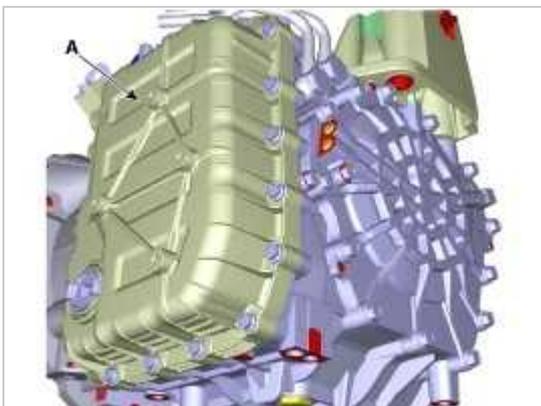
6. Remove the air bleeder hose (B) after removing the clamp (A).



7. Disconnect the clip for fixing wiring from the valve body cover.
8. Remove the valve body cover (A).

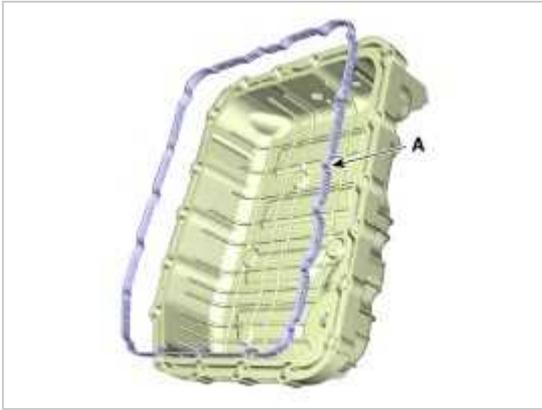
Tightening torque:

(A) 13.7 ~ 15.7 N.m (1.4 ~ 1.6 kgf.m, 10.1 ~ 11.6 lb-ft)



CAUTION

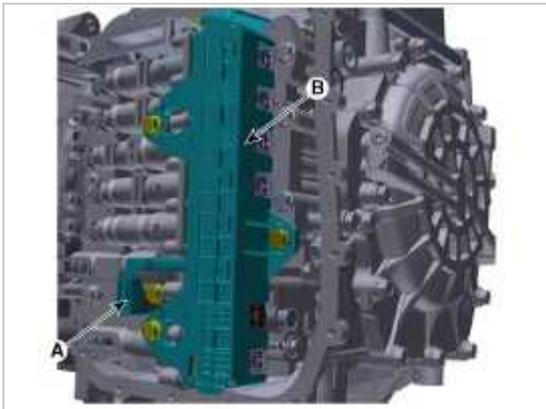
- When re-mounting the valve body cover, replace the gasket (A) with a new one.
- After mounting the valve body cover, check for oil leakage on the connecting part while the engine is on.



9. Disconnect the solenoid valve connector (B) and the oil temperature sensor (A) after removing the bolts.

Tightening torque :

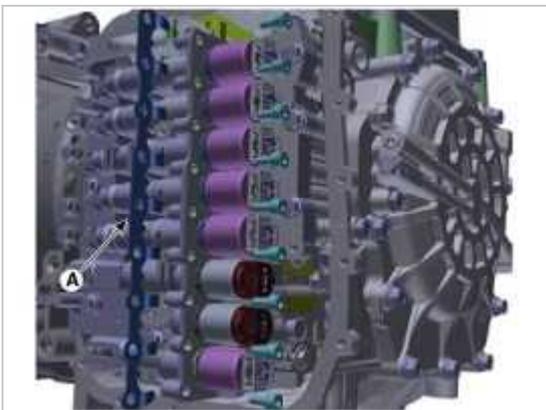
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



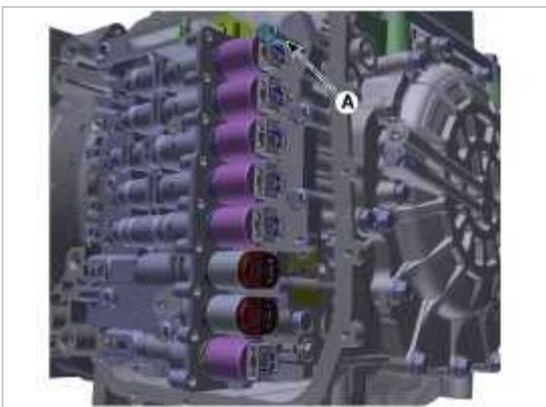
10. Remove the solenoid valve support bracket (A).

Tightening torque :

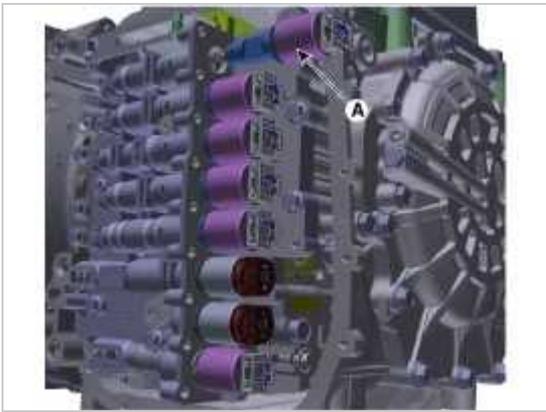
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



11. Remove the valve body mounting bolt (A-1ea).



12. Remove the torque converter control solenoid valve (A).



Installation

1. To install, reverse the removal procedure.
2. Check the ATF level after refilling the automatic transaxle with fluid.
(Refer to Automatic Transaxle System-"Fluid")
3. Clear the diagnostic trouble codes (DTC) using the GDS.

CAUTION

Even though disconnecting the battery negative terminal, the DTCs will not be cleared. So, be sure to clear the DTCs using the GDS.

4. Perform Transaxle Control Module (TCM) learning after replacing the solenoid valve, TCM, automatic transaxle to prevent slow transaxle response, jerky acceleration and jerky startup.

NOTICE

TCM Learning

1) Learning Overview and Purpose

- It aims to correct the deviation between transaxle products to reduce learning time and secure initial driving safety.
- When gear shift shock has occurred at the 1-2-3-4-5-6 positions, delete the previous learning values using GDS device and perform TCM learning again.

2) Conditions that Require Learning

- After replacing automatic transaxle
- After replacing TCM
- After performing TCM reprogramming

3) TCM Learning Method

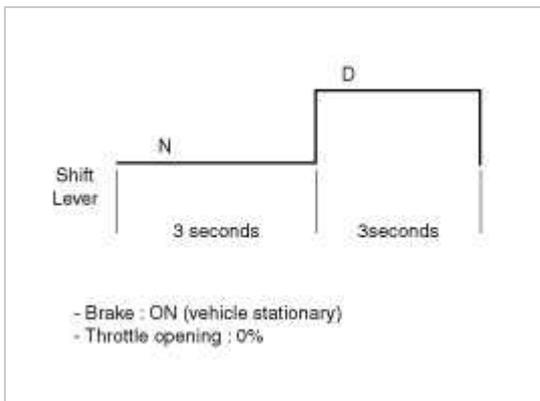
(1) Condition

- ATF temperature : 40 - 100°C

(2) Learning Method

a. Learning with the vehicle stopped

- While pressing and holding the brake (vehicle is stationary), set the throttle opening to 0% and repeat the following procedure four times.



b. Learning with the vehicle running

- Maintain a consistent throttle opening at the D position and gradually shift from 1st gear position to 6th gear position one by one. Then, gradually shift from 6th gear position to 1st gear position one by one (brake : on, throttle opening : 0%).
- Throttle opening (for shifting to upper gear) : 10 - 50% (less than 5% of throttle opening (APS) change)
- Repeat the above procedure four times.



Description

- 26 brake control solenoid valve(26/B_VFS) is attached to the valve body.
- This variable force solenoid valve indirectly controls the hydraulic pressure inside the 26Brake.



Specifications

Clutch/Brake control VFS[26/B]

▷ Control type : Normally low type

Control Pressure [kpa (kgf/cm ² , psi)]	9.81 ~ 500.14 (0.1 ~ 5.1, 1.42 ~ 72.54)
Current value(mA)	50 ~ 850
Internal resistance(Ω)	5.1



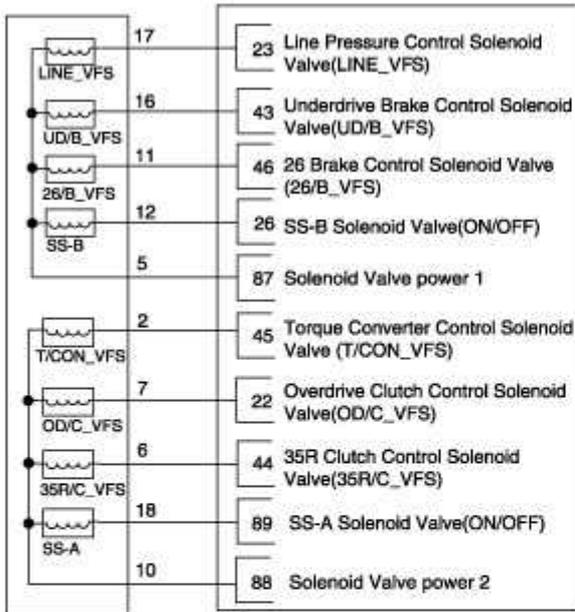
Circuit Diagram

[Circuit Diagram]

[Connection Information]

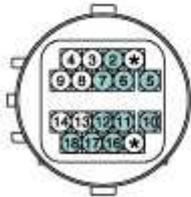
Solenoid Valve

TCM [A]

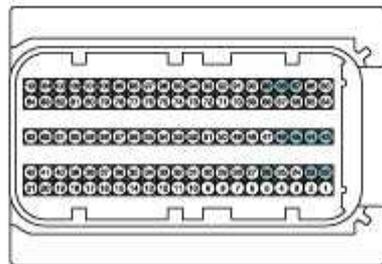


Terminal	Connected to	Function
17	TCM(23)	Line Pressure Control Solenoid Valve (LINE_VFS)
16	TCM(43)	Underdrive Brake Control Solenoid Valve (UD/B_VFS)
11	TCM(46)	26 Brake Control Solenoid Valve (26/B_VFS)
12	TCM(26)	SS-B Solenoid Valve (ON/OFF)
5	TCM(87)	Solenoid Valve power 1
2	TCM(45)	Torque Converter Control Solenoid Valve (T/CON_VFS)
7	TCM(22)	Overdrive Clutch Control Solenoid Valve (OD/C_VFS)
6	TCM(44)	35R Clutch Control Solenoid Valve (35R/C_VFS)
18	TCM(89)	SS-A Solenoid Valve (ON/OFF)
10	TCM(88)	Solenoid Valve power 2

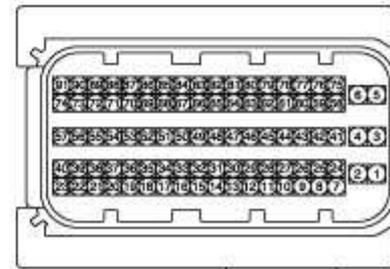
[Harness Connector]



Solenoid Valve Connector



TCM connector [A]



TCM connector [B]

Automatic Transaxle System

Inspection

1. Turn ignition switch OFF.
2. Remove the air duct.
(Refer to Engine Mechanical System - "Air cleaner")
3. Disconnect the solenoid valve connector(A).



4. Measure resistance between sensor signal terminal and sensor ground terminal.
5. Check that the resistance is within the specification.

Removal

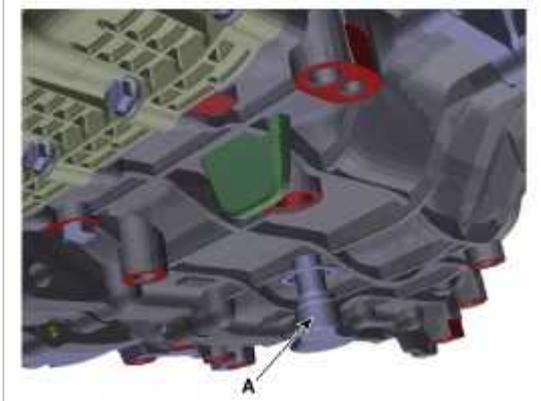
CAUTION

- When the solenoid valve failure code (DTC) is on, perform the following procedure to replace it.
- Automatic transaxle is composed of delicate components. Be careful not to cause any damage on the component in the course of assembly and disassembly.
- Maintain clean condition so that foreign substance does not get into the automatic transaxle.
- Use a coated apron, latex gloves, and stainless tray to prevent foreign substance from getting into the transaxle.
- Automatic transaxle fluid (ATF) can be reused. Collect it using a clean 10-liter beaker.

1. Remove the air duct.(Refer to Engine Mechanical System - "Air cleaner")
2. Remove the battery and the battery tray.(Refer to Engine Electrical System - "Battery")
3. Remove the under cover.(Refer to Engine Mechanical System - "Engine Room Under Cover")
4. Remove the ATF warmer.(Refer to Automatic Transaxle System-"ATF Warmer") (if equipped ATF warmer)
5. Remove the drain plug (A) and reinstall the drain plug after draining ATF totally.

Tightening torque :

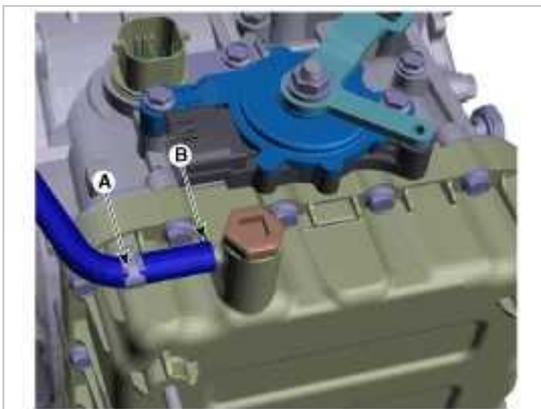
38.2 ~ 48.1 N.m (3.9 ~ 4.9 kgf.m, 28.2 ~ 35.4 lb-ft)



CAUTION

- Replace the gasket before reinstalling the drain plug.

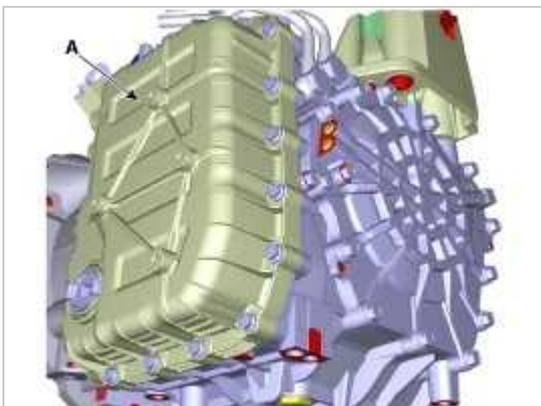
6. Remove the air bleeder hose (B) after removing the clamp (A).



7. Disconnect the clip for fixing wiring from the valve body cover.
8. Remove the valve body cover (A).

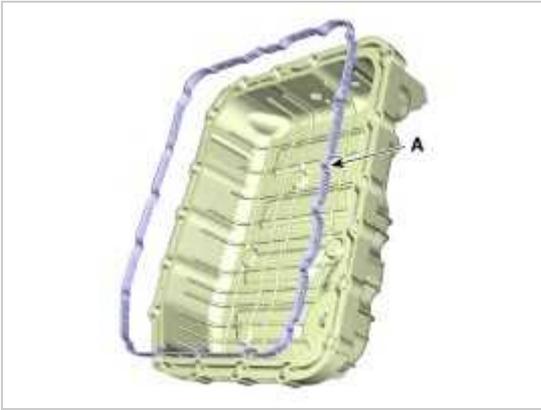
Tightening torque :

(A) 13.7 ~ 15.7 N.m (1.4 ~ 1.6 kgf.m, 10.1 ~ 11.6 lb-ft)



CAUTION

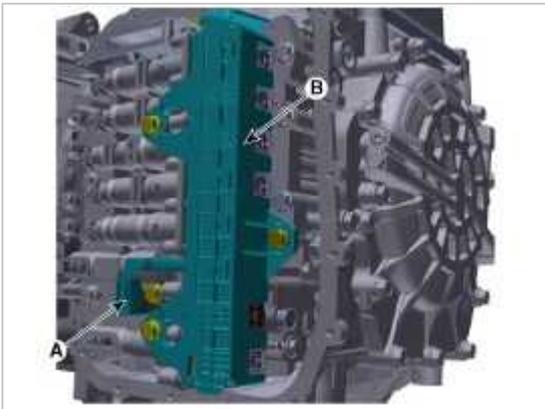
- When re-mounting the valve body cover, replace the gasket (A) with a new one.
- After mounting the valve body cover, check for oil leakage on the connecting part while the engine is on.



9. Disconnect the solenoid valve connector (B) and the oil temperature sensor (A) after removing the bolts.

Tightening torque :

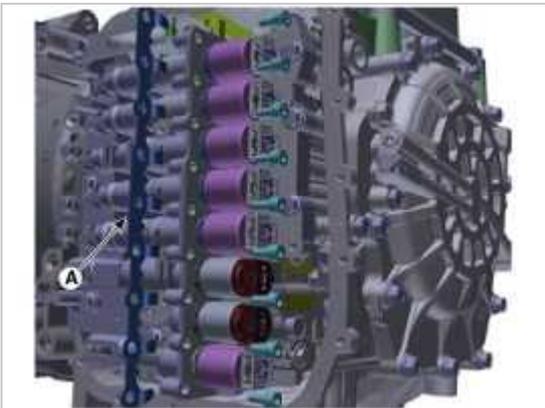
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



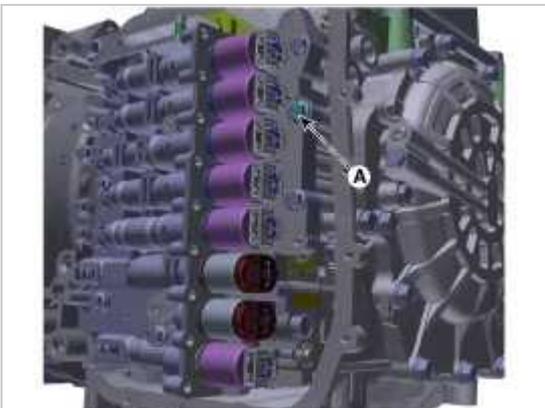
10. Remove the solenoid valve support bracket (A).

Tightening torque :

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



11. Remove the valve body mounting bolt (A-1ea).



12. Remove the 26 Brake control solenoid valve (A).



Installation

1. To install, reverse the removal procedure.
2. Check the ATF level after refilling the automatic transaxle with fluid.
(Refer to Automatic Transaxle System-"Fluid")
3. Clear the diagnostic trouble codes (DTC) using the GDS.

CAUTION

Even though disconnecting the battery negative terminal, the DTCs will not be cleared. So, be sure to clear the DTCs using the GDS.

4. Perform Transaxle Control Module (TCM) learning after replacing the solenoid valve, TCM, automatic transaxle to prevent slow transaxle response, jerky acceleration and jerky startup.

NOTICE

TCM Learning

1) Learning Overview and Purpose

- It aims to correct the deviation between transaxle products to reduce learning time and secure initial driving safety.
- When gear shift shock has occurred at the 1-2-3-4-5-6 positions, delete the previous learning values using GDS device and perform TCM learning again.

2) Conditions that Require Learning

- After replacing automatic transaxle
- After replacing TCM
- After performing TCM reprogramming

3) TCM Learning Method

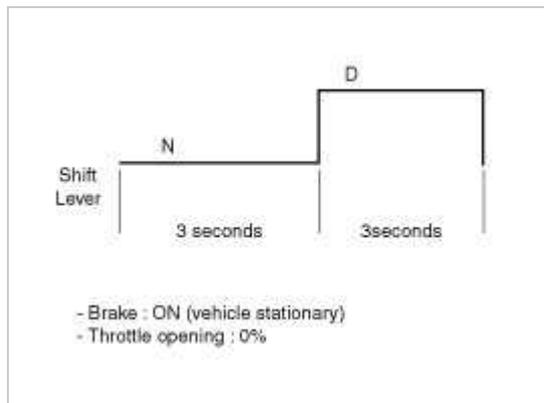
(1) Condition

- ATF temperature : 40 - 100°C

(2) Learning Method

a. Learning with the vehicle stopped

- While pressing and holding the brake (vehicle is stationary), set the throttle opening to 0% and repeat the following procedure four times.



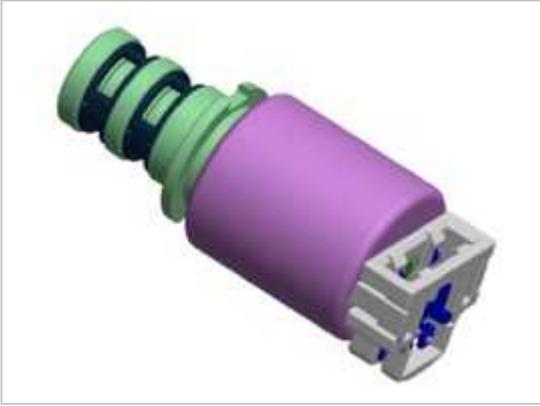
b. Learning with the vehicle running

- Maintain a consistent throttle opening at the D position and gradually shift from 1st gear position to 6th gear position one by one. Then, gradually shift from 6th gear position to 1st gear position one by one (brake : on, throttle opening : 0%).
- Throttle opening (for shifting to upper gear) : 10 - 50% (less than 5% of throttle opening (APS) change)
- Repeat the above procedure four times.



Description

- Line pressure control solenoid valve is attached to the valve body.
- This variable force solenoid valve indirectly controls the hydraulic pressure inside the line pressure.



Specifications

Line Pressure Control VFS [LINE Pressure]

▷ Control type : Normally high type

Control Pressure [kpa (kgf/cm ² , psi)]	500.14 ~ 9.81 (5.1 ~ 0.1, 72.54 ~ 1.42)
Current value(mA)	850 ~ 50
Internal resistance(Ω)	5.1



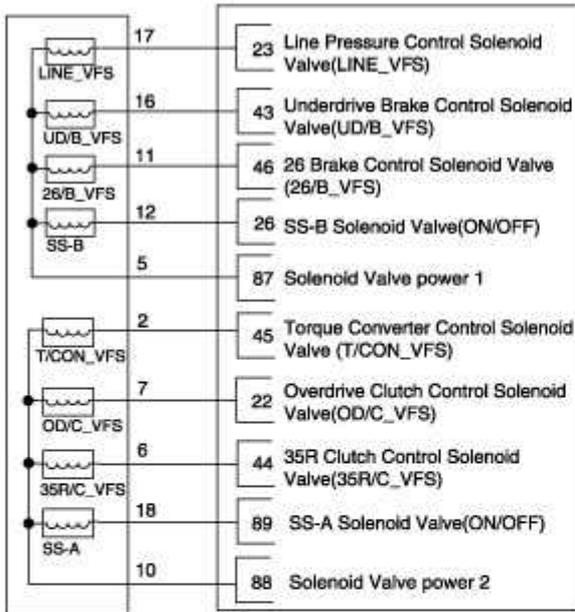
Circuit Diagram

[Circuit Diagram]

[Connection Information]

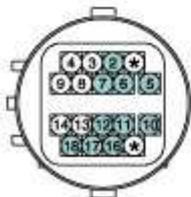
Solenoid Valve

TCM [A]

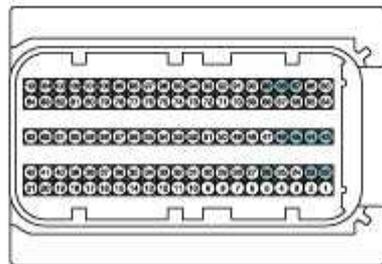


Terminal	Connected to	Function
17	TCM(23)	Line Pressure Control Solenoid Valve (LINE_VFS)
16	TCM(43)	Underdrive Brake Control Solenoid Valve (UD/B_VFS)
11	TCM(46)	26 Brake Control Solenoid Valve (26/B_VFS)
12	TCM(26)	SS-B Solenoid Valve (ON/OFF)
5	TCM(87)	Solenoid Valve power 1
2	TCM(45)	Torque Converter Control Solenoid Valve (T/CON_VFS)
7	TCM(22)	Overdrive Clutch Control Solenoid Valve (OD/C_VFS)
6	TCM(44)	35R Clutch Control Solenoid Valve (35R/C_VFS)
18	TCM(89)	SS-A Solenoid Valve (ON/OFF)
10	TCM(88)	Solenoid Valve power 2

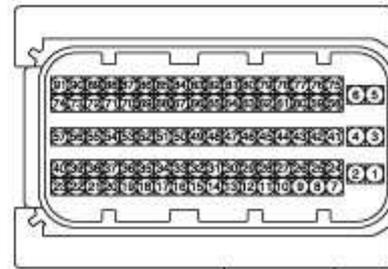
[Harness Connector]



Solenoid Valve Connector



TCM connector [A]



TCM connector [B]

Automatic Transaxle System

Inspection

1. Turn ignition switch OFF.
2. Remove the air duct.
(Refer to Engine Mechanical System - "Air cleaner")
3. Disconnect the solenoid valve connector(A).



4. Measure resistance between sensor signal terminal and sensor ground terminal.
5. Check that the resistance is within the specification.

Removal

CAUTION

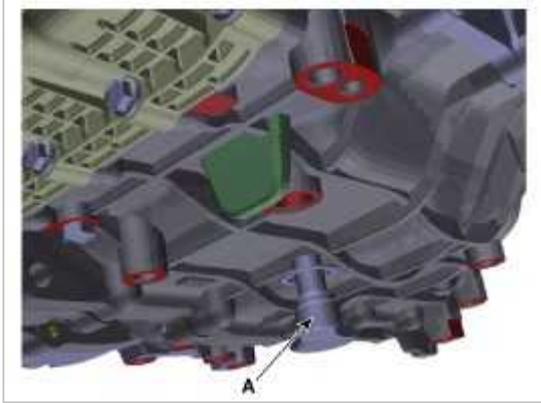


- When the solenoid valve failure code (DTC) is on, perform the following procedure to replace it.
- Automatic transaxle is composed of delicate components. Be careful not to cause any damage on the component in the course of assembly and disassembly.
- Maintain clean condition so that foreign substance does not get into the automatic transaxle.
- Use a coated apron, latex gloves, and stainless tray to prevent foreign substance from getting into the transaxle.
- Automatic transaxle fluid (ATF) can be reused. Collect it using a clean 10-liter beaker.

1. Remove the air duct.(Refer to Engine Mechanical System - "Air cleaner")
2. Remove the battery and the battery tray.(Refer to Engine Electrical System - "Battery")
3. Remove the under cover.(Refer to Engine Mechanical System - "Engine Room Under Cover")
4. Remove the ATF warmer.(Refer to Automatic Transaxle System-"ATF Warmer") (if equipped ATF warmer)
5. Remove the drain plug (A) and reinstall the drain plug after draining ATF totally.

Tightening torque :

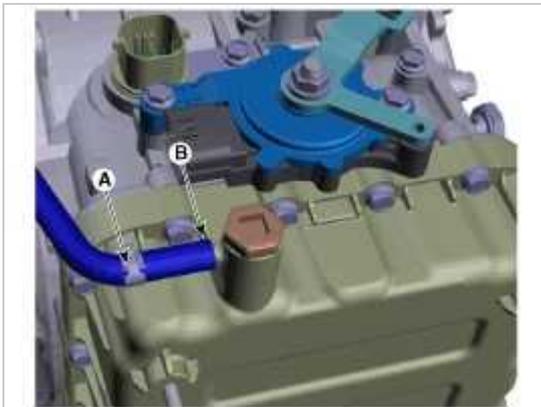
38.2 ~ 48.1 N.m (3.9 ~ 4.9 kgf.m, 28.2 ~ 35.4 lb-ft)



⚠ CAUTION

- Replace the gasket before reinstalling the drain plug.

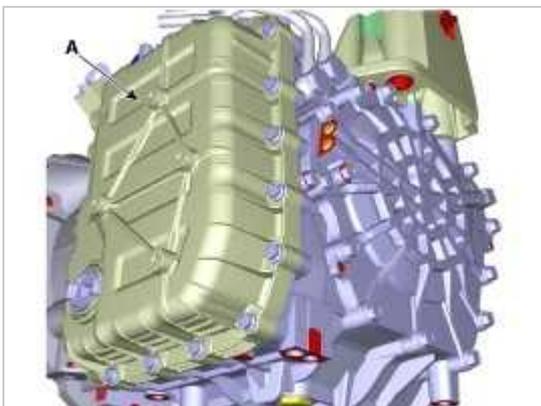
6. Remove the air bleeder hose (B) after removing the clamp (A).



7. Disconnect the clip for fixing wiring from the valve body cover.
8. Remove the valve body cover (A).

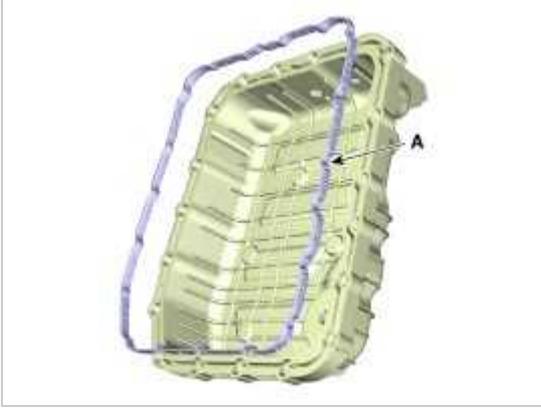
Tightening torque :

(A) 13.7 ~ 15.7 N.m (1.4 ~ 1.6 kgf.m, 10.1 ~ 11.6 lb-ft)



CAUTION

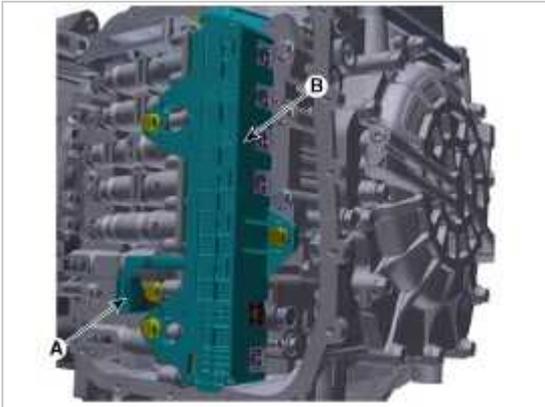
- When re-mounting the valve body cover, replace the gasket (A) with a new one.
- After mounting the valve body cover, check for oil leakage on the connecting part while the engine is on.



9. Disconnect the solenoid valve connector (B) and the oil temperature sensor (A) after removing the bolts.

Tightening torque :

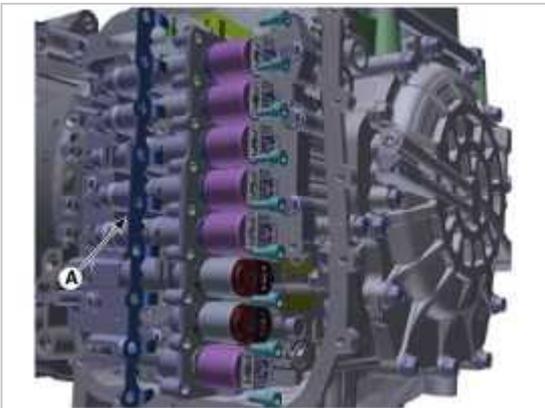
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



10. Remove the solenoid valve support bracket (A).

Tightening torque :

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



11. Remove the Line pressure control solenoid valve (A).



Installation

1. To install, reverse the removal procedure.
2. Check the ATF level after refilling the automatic transaxle with fluid.
(Refer to Automatic Transaxle System-"Fluid")
3. Clear the diagnostic trouble codes (DTC) using the GDS.

CAUTION

Even though disconnecting the battery negative terminal, the DTCs will not be cleared. So, be sure to clear the DTCs using the GDS.

4. Perform Transaxle Control Module (TCM) learning after replacing the solenoid valve, TCM, automatic transaxle to prevent slow transaxle response, jerky acceleration and jerky startup.

NOTICE

TCM Learning

1) Learning Overview and Purpose

- It aims to correct the deviation between transaxle products to reduce learning time and secure initial driving safety.
- When gear shift shock has occurred at the 1-2-3-4-5-6 positions, delete the previous learning values using GDS device and perform TCM learning again.

2) Conditions that Require Learning

- After replacing automatic transaxle
- After replacing TCM
- After performing TCM reprogramming

3) TCM Learning Method

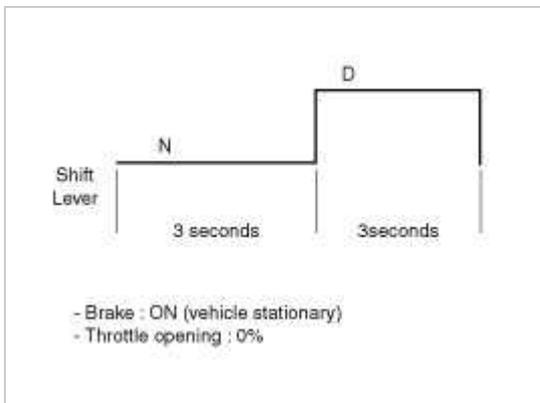
(1) Condition

- ATF temperature : 40 - 100°C

(2) Learning Method

a. Learning with the vehicle stopped

- While pressing and holding the brake (vehicle is stationary), set the throttle opening to 0% and repeat the following procedure four times.



b. Learning with the vehicle running

- Maintain a consistent throttle opening at the D position and gradually shift from 1st gear position to 6th gear position one by one. Then, gradually shift from 6th gear position to 1st gear position one by one (brake : on, throttle opening : 0%).
- Throttle opening (for shifting to upper gear) : 10 - 50% (less than 5% of throttle opening (APS) change)
- Repeat the above procedure four times.

Automatic Transaxle System



Description

- 35R Clutch control solenoid valve(35R/C) is attached to the valve body.
- This variable force solenoid valve indirectly controls the hydraulic pressure inside the 35R clutch.



Automatic Transaxle System



Specifications

Clutch/Brake control VFS[35R/C]

▷ Control type : Normally high type

Control Pressure [kpa (kgf/cm ² , psi)]	500.14 ~ 9.81 (5.1 ~ 0.1, 72.54 ~ 1.42)
Current value(mA)	850 ~ 50
Internal resistance(Ω)	5.1

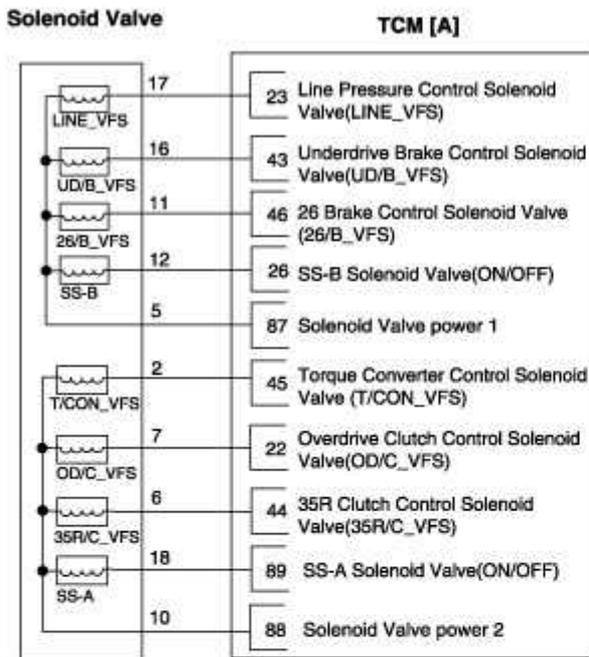
Automatic Transaxle System



Circuit Diagram

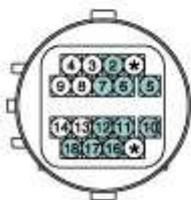
[Circuit Diagram]

[Connection Information]

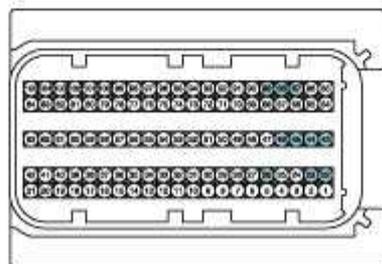


Terminal	Connected to	Function
17	TCM(23)	Line Pressure Control Solenoid Valve (LINE_VFS)
16	TCM(43)	Underdrive Brake Control Solenoid Valve (UD/B_VFS)
11	TCM(46)	26 Brake Control Solenoid Valve (26/B_VFS)
12	TCM(26)	SS-B Solenoid Valve (ON/OFF)
5	TCM(87)	Solenoid Valve power 1
2	TCM(45)	Torque Converter Control Solenoid Valve (T/CON_VFS)
7	TCM(22)	Overdrive Clutch Control Solenoid Valve (OD/C_VFS)
6	TCM(44)	35R Clutch Control Solenoid Valve (35R/C_VFS)
18	TCM(89)	SS-A Solenoid Valve (ON/OFF)
10	TCM(88)	Solenoid Valve power 2

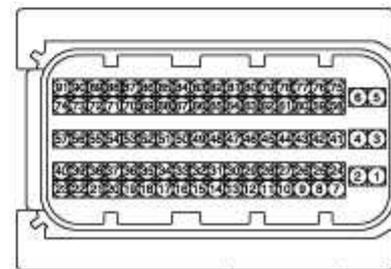
[Harness Connector]



Solenoid Valve Connector



TCM connector [A]



TCM connector [B]

Automatic Transaxle System



Inspection

1. Turn ignition switch OFF.
2. Remove the air duct.
(Refer to Engine Mechanical System - "Air cleaner")
3. Disconnect the solenoid valve connector(A).



4. Measure resistance between sensor signal terminal and sensor ground terminal.
5. Check that the resistance is within the specification.

Removal

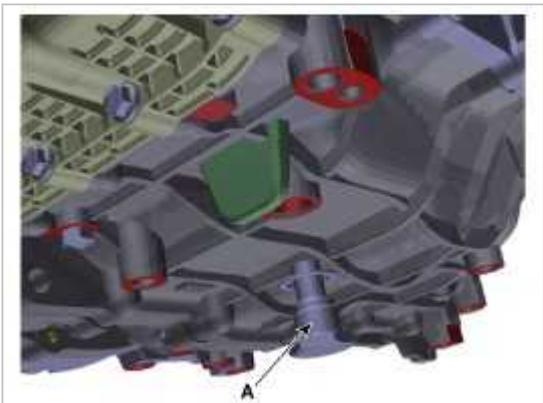
⚠ CAUTION

- When the solenoid valve failure code (DTC) is on, perform the following procedure to replace it.
- Automatic transaxle is composed of delicate components. Be careful not to cause any damage on the component in the course of assembly and disassembly.
- Maintain clean condition so that foreign substance does not get into the automatic transaxle.
- Use a coated apron, latex gloves, and stainless tray to prevent foreign substance from getting into the transaxle.
- Automatic transaxle fluid (ATF) can be reused. Collect it using a clean 10-liter beaker.

1. Remove the air duct.(Refer to Engine Mechanical System - "Air cleaner")
2. Remove the battery and the battery tray.(Refer to Engine Electrical System - "Battery")
3. Remove the under cover.(Refer to Engine Mechanical System - "Engine Room Under Cover")
4. Remove the ATF warmer.(Refer to Automatic Transaxle System-"ATF Warmer") (if equipped ATF warmer)
5. Remove the drain plug (A) and reinstall the drain plug after draining ATF totally.

Tightening torque :

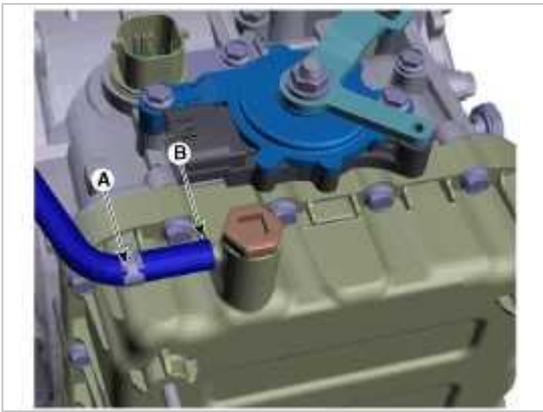
38.2 ~ 48.1 N.m (3.9 ~ 4.9 kgf.m, 28.2 ~ 35.4 lb-ft)



⚠ CAUTION

- Replace the gasket before reinstalling the drain plug.

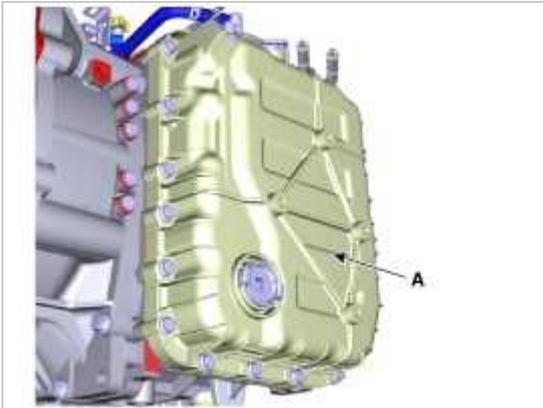
6. Remove the air bleeder hose (B) after removing the clamp (A).



7. Disconnect the clip for fixing wiring from the valve body cover.
8. Remove the valve body cover (A).

Tightening torque :

(A) 13.7 ~ 15.7 N.m (1.4 ~ 1.6 kgf.m, 10.1 ~ 11.6 lb-ft)



⚠ CAUTION

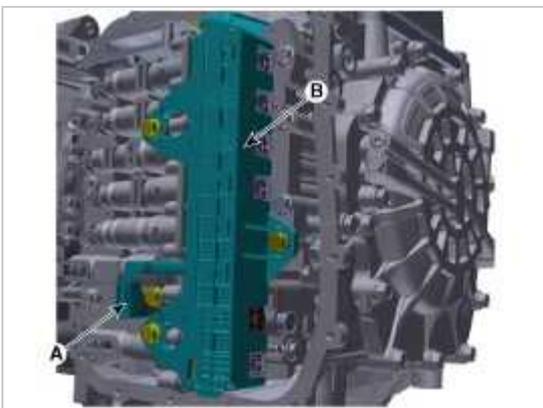
- When re-mounting the valve body cover, replace the gasket (A) with a new one.
- After mounting the valve body cover, check for oil leakage on the connecting part while the engine is on.



9. Disconnect the solenoid valve connector (B) and the oil temperature sensor (A) after removing the bolts.

Tightening torque :

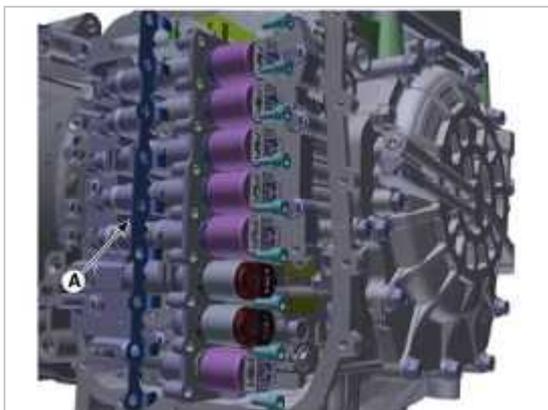
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



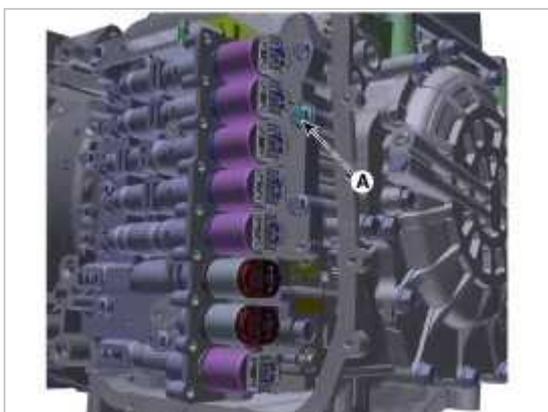
10. Remove the solenoid valve support bracket (A).

Tightening torque :

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



11. Remove the valve body mounting bolt (A-1ea).



12. Remove the 35R Clutch control solenoid valve (A).



Installation

1. To install, reverse the removal procedure.
2. Check the ATF level after refilling the automatic transaxle with fluid.
(Refer to Automatic Transaxle System-"Fluid")
3. Clear the diagnostic trouble codes (DTC) using the GDS.

CAUTION

Even though disconnecting the battery negative terminal, the DTCs will not be cleared. So, be sure to clear the DTCs using the GDS.

4. Perform Transaxle Control Module (TCM) learning after replacing the solenoid valve, TCM, automatic transaxle to prevent slow transaxle response, jerky acceleration and jerky startup.

NOTICE

TCM Learning

- 1) Learning Overview and Purpose

– It aims to correct the deviation between transaxle products to reduce learning time and secure initial driving safety.

- When gear shift shock has occurred at the 1-2-3-4-5-6 positions, delete the previous learning values using GDS device and perform TCM learning again.

2) Conditions that Require Learning

- After replacing automatic transaxle
- After replacing TCM
- After performing TCM reprogramming

3) TCM Learning Method

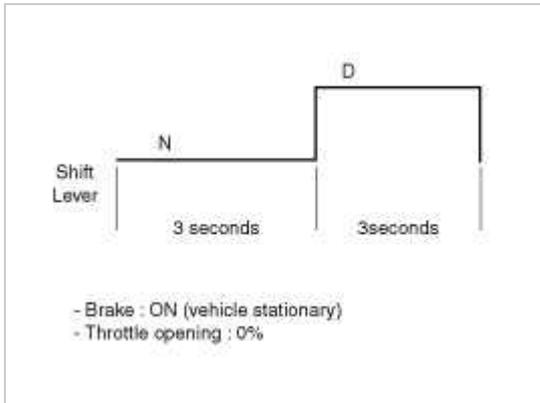
(1) Condition

- ATF temperature : 40 - 100°C

(2) Learning Method

a. Learning with the vehicle stopped

- While pressing and holding the brake (vehicle is stationary), set the throttle opening to 0% and repeat the following procedure four times.



b. Learning with the vehicle running

- Maintain a consistent throttle opening at the D position and gradually shift from 1st gear position to 6th gear position one by one. Then, gradually shift from 6th gear position to 1st gear position one by one (brake : on, throttle opening : 0%).
- Throttle opening (for shifting to upper gear) : 10 - 50% (less than 5% of throttle opening (APS) change)
- Repeat the above procedure four times.

Automatic Transaxle System



Description

- Underdrive brake control solenoid valve(UD/B) is attached to the valve body.
- This variable force solenoid valve indirectly controls the hydraulic pressure inside the underdrive brake.



Automatic Transaxle System



Specifications

Clutch/Brake control VFS[UD/B]

▷ Control type : Normally high type

Control Pressure [kpa (kgf/cm ² , psi)]	500.14 ~ 9.81 (5.1 ~ 0.1, 72.54 ~ 1.42)
Current value(mA)	850 ~ 50
Internal resistance(Ω)	5.1

Automatic Transaxle System



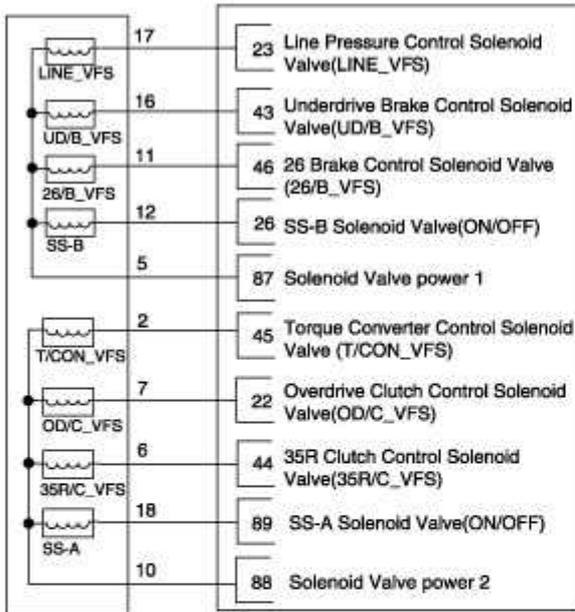
Circuit Diagram

[Circuit Diagram]

[Connection Information]

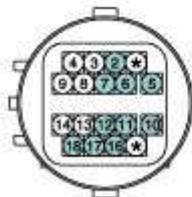
Solenoid Valve

TCM [A]

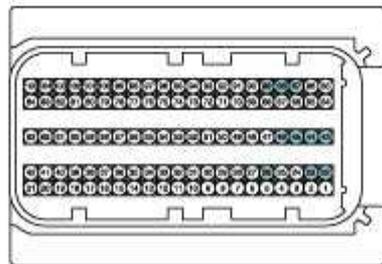


Terminal	Connected to	Function
17	TCM(23)	Line Pressure Control Solenoid Valve (LINE_VFS)
16	TCM(43)	Underdrive Brake Control Solenoid Valve (UD/B_VFS)
11	TCM(46)	26 Brake Control Solenoid Valve (26/B_VFS)
12	TCM(26)	SS-B Solenoid Valve (ON/OFF)
5	TCM(87)	Solenoid Valve power 1
2	TCM(45)	Torque Converter Control Solenoid Valve (T/CON_VFS)
7	TCM(22)	Overdrive Clutch Control Solenoid Valve (OD/C_VFS)
6	TCM(44)	35R Clutch Control Solenoid Valve (35R/C_VFS)
18	TCM(89)	SS-A Solenoid Valve (ON/OFF)
10	TCM(88)	Solenoid Valve power 2

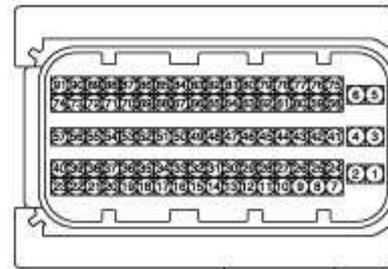
[Harness Connector]



Solenoid Valve Connector



TCM connector [A]



TCM connector [B]

Automatic Transaxle System

Inspection

1. Turn ignition switch OFF.
2. Remove the air duct.
(Refer to Engine Mechanical System - "Air cleaner")
3. Disconnect the solenoid valve connector(A).



4. Measure resistance between sensor signal terminal and sensor ground terminal.
5. Check that the resistance is within the specification.

Removal

CAUTION

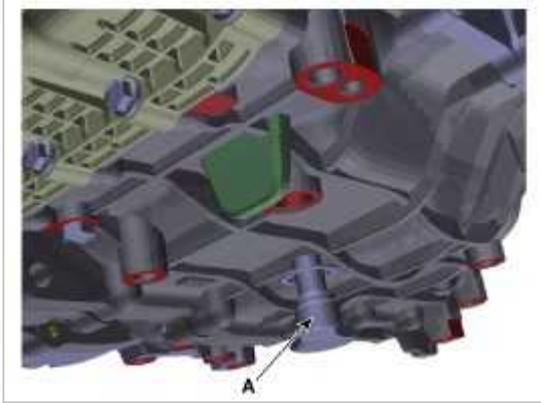


- When the solenoid valve failure code (DTC) is on, perform the following procedure to replace it.
- Automatic transaxle is composed of delicate components. Be careful not to cause any damage on the component in the course of assembly and disassembly.
- Maintain clean condition so that foreign substance does not get into the automatic transaxle.
- Use a coated apron, latex gloves, and stainless tray to prevent foreign substance from getting into the transaxle.
- Automatic transaxle fluid (ATF) can be reused. Collect it using a clean 10-liter beaker.

1. Remove the air duct.(Refer to Engine Mechanical System - "Air cleaner")
2. Remove the battery and the battery tray.(Refer to Engine Electrical System - "Battery")
3. Remove the under cover.(Refer to Engine Mechanical System - "Engine Room Under Cover")
4. Remove the ATF warmer.(Refer to Automatic Transaxle System-"ATF Warmer") (if equipped ATF warmer)
5. Remove the drain plug (A) and reinstall the drain plug after draining ATF totally.

Tightening torque :

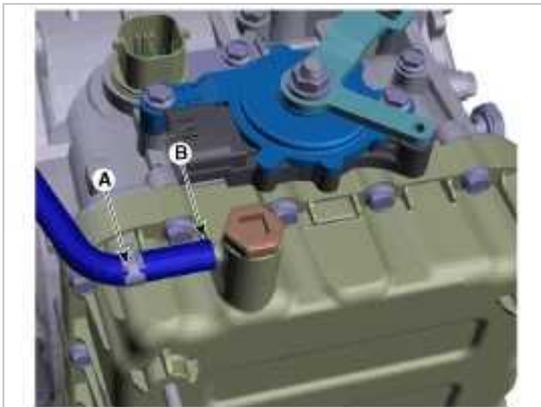
38.2 ~ 48.1 N.m (3.9 ~ 4.9 kgf.m, 28.2 ~ 35.4 lb-ft)



CAUTION

- Replace the gasket before reinstalling the drain plug.

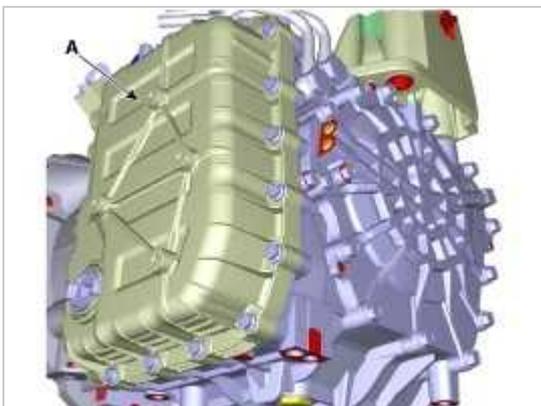
6. Remove the air bleeder hose (B) after removing the clamp (A).



7. Disconnect the clip for fixing wiring from the valve body cover.
8. Remove the valve body cover (A).

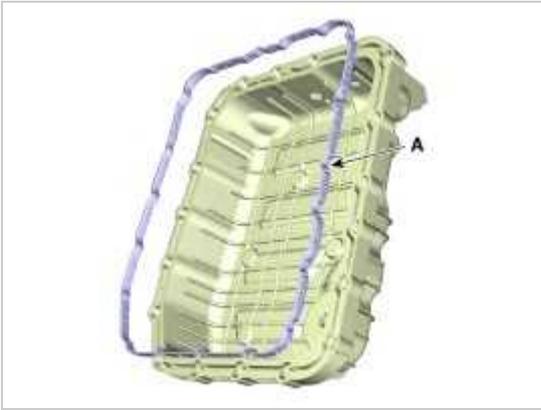
Tightening torque :

(A) 13.7 ~ 15.7 N.m (1.4 ~ 1.6 kgf.m, 10.1 ~ 11.6 lb-ft)



CAUTION

- When re-mounting the valve body cover, replace the gasket (A) with a new one.
- After mounting the valve body cover, check for oil leakage on the connecting part while the engine is on.



9. Disconnect the solenoid valve connector (B) and the oil temperature sensor (A) after removing the bolts.

Tightening torque :

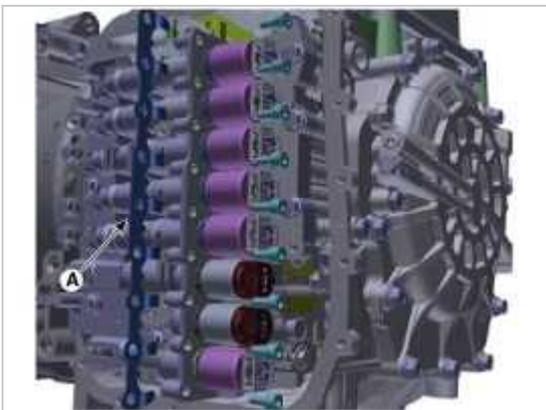
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



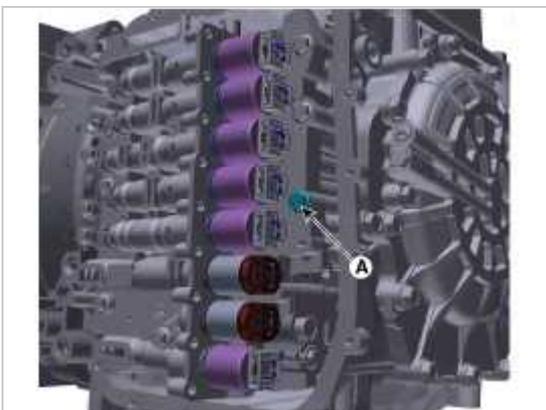
10. Remove the solenoid valve support bracket (A).

Tightening torque :

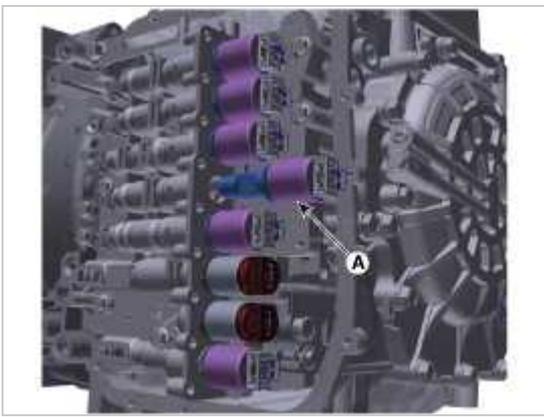
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



11. Remove the valve body mounting bolt (A-1ea).



12. Remove the Underdrive brake control solenoid valve (A).



Installation

1. To install, reverse the removal procedure.
2. Check the ATF level after refilling the automatic transaxle with fluid.
(Refer to Automatic Transaxle System-"Fluid")
3. Clear the diagnostic trouble codes (DTC) using the GDS.

CAUTION

Even though disconnecting the battery negative terminal, the DTCs will not be cleared. So, be sure to clear the DTCs using the GDS.

4. Perform Transaxle Control Module (TCM) learning after replacing the solenoid valve, TCM, automatic transaxle to prevent slow transaxle response, jerky acceleration and jerky startup.

NOTICE

TCM Learning

1) Learning Overview and Purpose

- It aims to correct the deviation between transaxle products to reduce learning time and secure initial driving safety.
- When gear shift shock has occurred at the 1-2-3-4-5-6 positions, delete the previous learning values using GDS device and perform TCM learning again.

2) Conditions that Require Learning

- After replacing automatic transaxle
- After replacing TCM
- After performing TCM reprogramming

3) TCM Learning Method

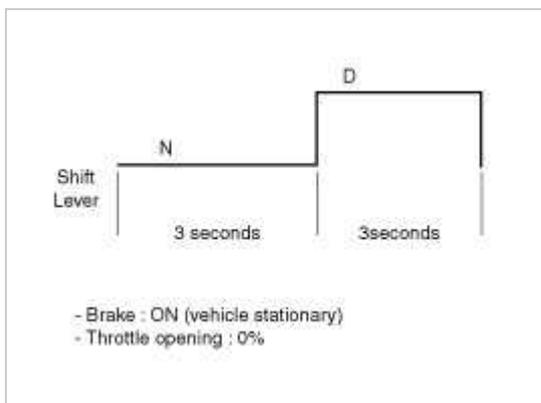
(1) Condition

- ATF temperature : 40 - 100°C

(2) Learning Method

a. Learning with the vehicle stopped

- While pressing and holding the brake (vehicle is stationary), set the throttle opening to 0% and repeat the following procedure four times.



b. Learning with the vehicle running

- Maintain a consistent throttle opening at the D position and gradually shift from 1st gear position to 6th gear position one by one. Then, gradually shift from 6th gear position to 1st gear position one by one (brake : on, throttle opening : 0%).
- Throttle opening (for shifting to upper gear) : 10 - 50% (less than 5% of throttle opening (APS) change)
- Repeat the above procedure four times.



Description

- Overdrive clutch control solenoid valve(OD/C_VFS) is attached to the valve body.
- This variable force solenoid valve indirectly controls the hydraulic pressure inside the overdrive clutch.



Specifications

Clutch/Brake control VFS[OD/C]

▷ Control type : Normally high type

Control Pressure [kpa (kgf/cm ² , psi)]	500.14 ~ 9.81 (5.1 ~ 0.1, 72.54 ~ 1.42)
Current value(mA)	850 ~ 50
Internal resistance(Ω)	5.1



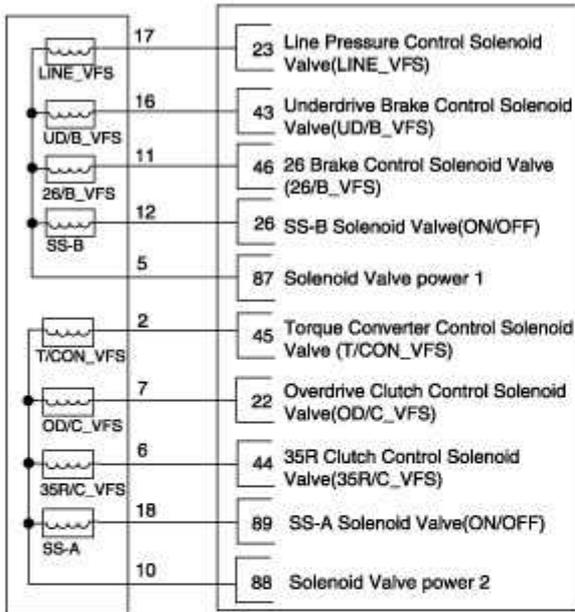
Circuit Diagram

[Circuit Diagram]

[Connection Information]

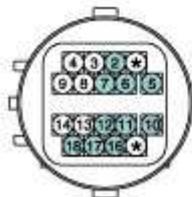
Solenoid Valve

TCM [A]

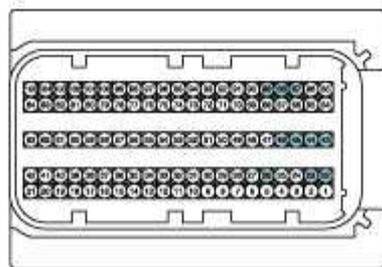


Terminal	Connected to	Function
17	TCM(23)	Line Pressure Control Solenoid Valve (LINE_VFS)
16	TCM(43)	Underdrive Brake Control Solenoid Valve (UD/B_VFS)
11	TCM(46)	26 Brake Control Solenoid Valve (26/B_VFS)
12	TCM(26)	SS-B Solenoid Valve (ON/OFF)
5	TCM(87)	Solenoid Valve power 1
2	TCM(45)	Torque Converter Control Solenoid Valve (T/CON_VFS)
7	TCM(22)	Overdrive Clutch Control Solenoid Valve (OD/C_VFS)
6	TCM(44)	35R Clutch Control Solenoid Valve (35R/C_VFS)
18	TCM(89)	SS-A Solenoid Valve (ON/OFF)
10	TCM(88)	Solenoid Valve power 2

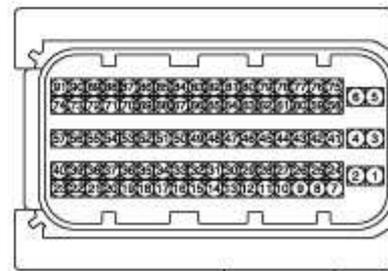
[Harness Connector]



Solenoid Valve Connector



TCM connector [A]



TCM connector [B]

Automatic Transaxle System

Inspection

1. Turn ignition switch OFF.
2. Remove the air duct.
(Refer to Engine Mechanical System - "Air cleaner")
3. Disconnect the solenoid valve connector(A).



4. Measure resistance between sensor signal terminal and sensor ground terminal.
5. Check that the resistance is within the specification.

Removal

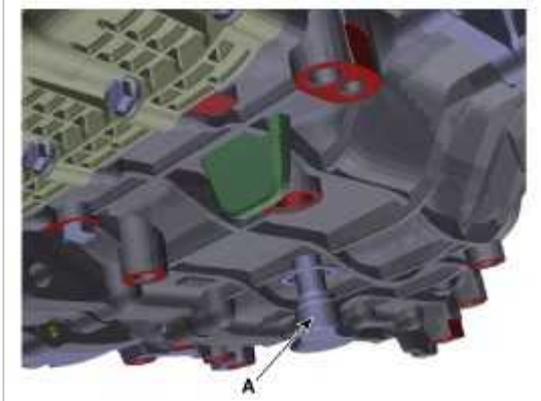
CAUTION

- When the solenoid valve failure code (DTC) is on, perform the following procedure to replace it.
- Automatic transaxle is composed of delicate components. Be careful not to cause any damage on the component in the course of assembly and disassembly.
- Maintain clean condition so that foreign substance does not get into the automatic transaxle.
- Use a coated apron, latex gloves, and stainless tray to prevent foreign substance from getting into the transaxle.
- Automatic transaxle fluid (ATF) can be reused. Collect it using a clean 10-liter beaker.

1. Remove the air duct.(Refer to Engine Mechanical System - "Air cleaner")
2. Remove the battery and the battery tray.(Refer to Engine Electrical System - "Battery")
3. Remove the under cover.(Refer to Engine Mechanical System - "Engine Room Under Cover")
4. Remove the ATF warmer.(Refer to Automatic Transaxle System-"ATF Warmer") (if equipped ATF warmer)
5. Remove the drain plug (A) and reinstall the drain plug after draining ATF totally.

Tightening torque :

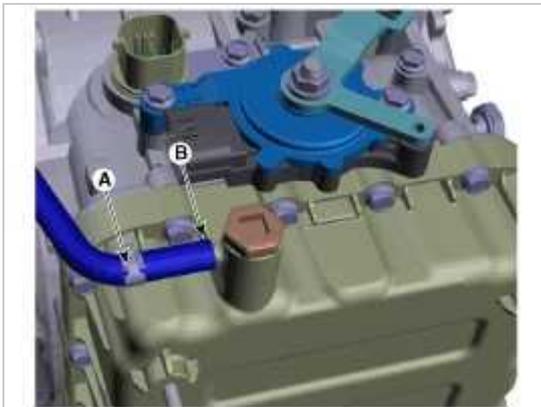
38.2 ~ 48.1 N.m (3.9 ~ 4.9 kgf.m, 28.2 ~ 35.4 lb-ft)



CAUTION

- Replace the gasket before reinstalling the drain plug.

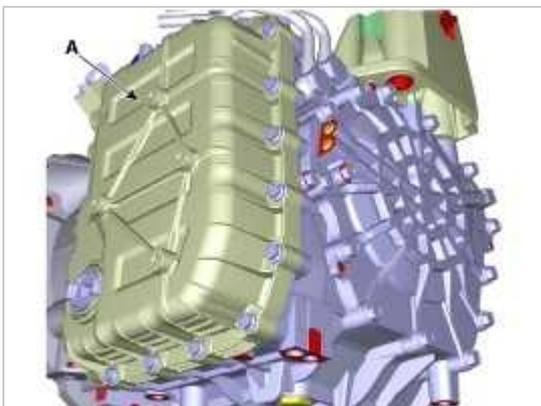
6. Remove the air bleeder hose (B) after removing the clamp (A).



7. Disconnect the clip for fixing wiring from the valve body cover.
8. Remove the valve body cover (A).

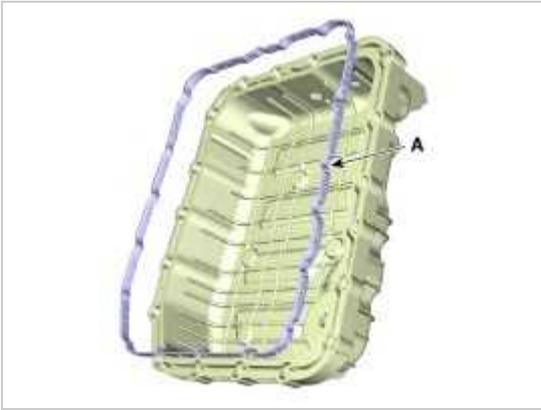
Tightening torque :

(A) 13.7 ~ 15.7 N.m (1.4 ~ 1.6 kgf.m, 10.1 ~ 11.6 lb-ft)



CAUTION

- When re-mounting the valve body cover, replace the gasket (A) with a new one.
- After mounting the valve body cover, check for oil leakage on the connecting part while the engine is on.



9. Disconnect the solenoid valve connector (B) and the oil temperature sensor (A) after removing the bolts.

Tightening torque :

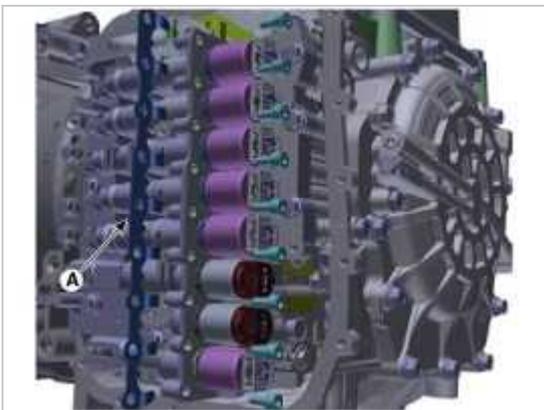
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



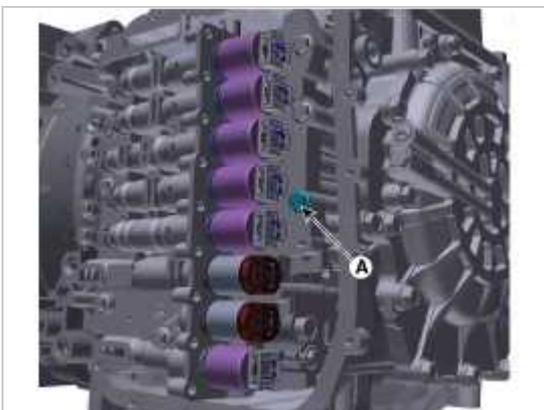
10. Remove the solenoid valve support bracket (A).

Tightening torque :

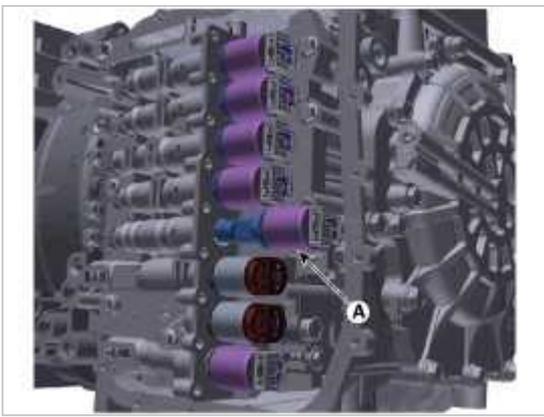
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



11. Remove the valve body mounting bolt (A-1ea).



12. Remove the Overdrive clutch control solenoid valve (A).



Installation

1. To install, reverse the removal procedure.
2. Check the ATF level after refilling the automatic transaxle with fluid.
(Refer to Automatic Transaxle System-"Fluid")
3. Clear the diagnostic trouble codes (DTC) using the GDS.

CAUTION

Even though disconnecting the battery negative terminal, the DTCs will not be cleared. So, be sure to clear the DTCs using the GDS.

4. Perform Transaxle Control Module (TCM) learning after replacing the solenoid valve, TCM, automatic transaxle to prevent slow transaxle response, jerky acceleration and jerky startup.

NOTICE

TCM Learning

1) Learning Overview and Purpose

- It aims to correct the deviation between transaxle products to reduce learning time and secure initial driving safety.
- When gear shift shock has occurred at the 1-2-3-4-5-6 positions, delete the previous learning values using GDS device and perform TCM learning again.

2) Conditions that Require Learning

- After replacing automatic transaxle
- After replacing TCM
- After performing TCM reprogramming

3) TCM Learning Method

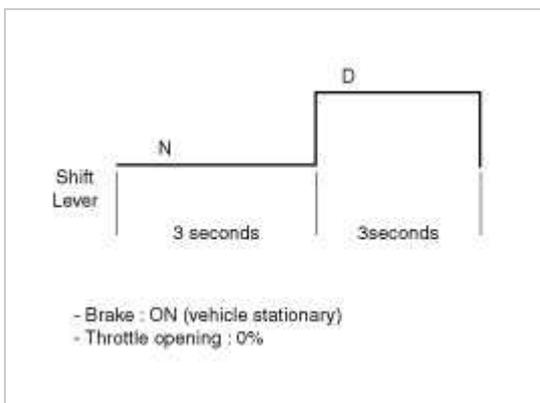
(1) Condition

- ATF temperature : 40 - 100°C

(2) Learning Method

a. Learning with the vehicle stopped

- While pressing and holding the brake (vehicle is stationary), set the throttle opening to 0% and repeat the following procedure four times.



b. Learning with the vehicle running

- Maintain a consistent throttle opening at the D position and gradually shift from 1st gear position to 6th gear position one by one. Then, gradually shift from 6th gear position to 1st gear position one by one (brake : on, throttle opening : 0%).
- Throttle opening (for shifting to upper gear) : 10 - 50% (less than 5% of throttle opening (APS) change)
- Repeat the above procedure four times.



Description

- SS-A solenoid valve is attached to the valve body and is an on/off solenoid valve that is used to change gears.
- SS-A Solenoid valve(ON/OFF) is installed at valve body.



Specifications

ON/OFF Solenoid Valve(SS-A, SS-B)

▷ Control type : Normally low type

Control pressure [kpa (kgf/cm ² , psi)]	490.33(5.0, 71.12)
Internal resistance(Ω)	10 ~ 11



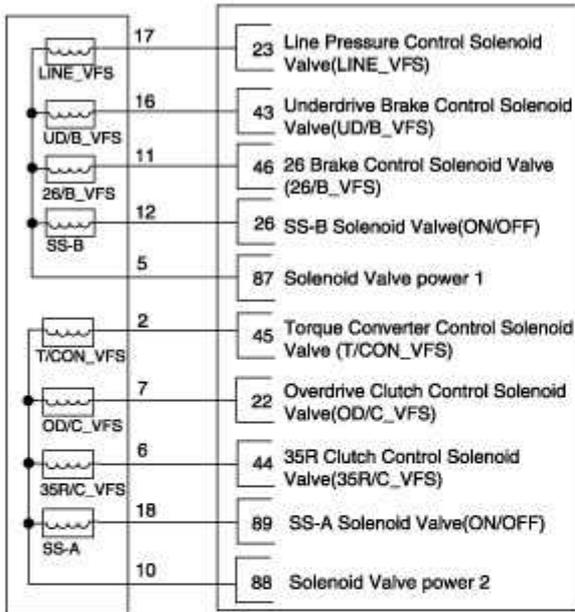
Circuit Diagram

[Circuit Diagram]

[Connection Information]

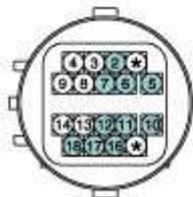
Solenoid Valve

TCM [A]

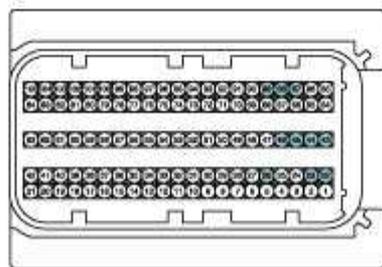


Terminal	Connected to	Function
17	TCM(23)	Line Pressure Control Solenoid Valve (LINE_VFS)
16	TCM(43)	Underdrive Brake Control Solenoid Valve (UD/B_VFS)
11	TCM(46)	26 Brake Control Solenoid Valve (26/B_VFS)
12	TCM(26)	SS-B Solenoid Valve (ON/OFF)
5	TCM(87)	Solenoid Valve power 1
2	TCM(45)	Torque Converter Control Solenoid Valve (T/CON_VFS)
7	TCM(22)	Overdrive Clutch Control Solenoid Valve (OD/C_VFS)
6	TCM(44)	35R Clutch Control Solenoid Valve (35R/C_VFS)
18	TCM(89)	SS-A Solenoid Valve (ON/OFF)
10	TCM(88)	Solenoid Valve power 2

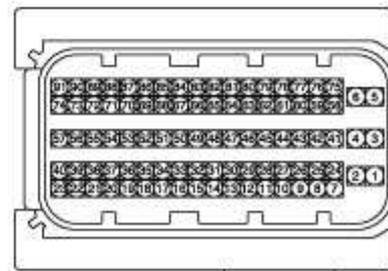
[Harness Connector]



Solenoid Valve Connector



TCM connector [A]



TCM connector [B]

Automatic Transaxle System

Inspection

1. Turn ignition switch OFF.
2. Remove the air duct.
(Refer to Engine Mechanical System - "Air cleaner")
3. Disconnect the solenoid valve connector(A).



4. Measure resistance between sensor signal terminal and sensor ground terminal.
5. Check that the resistance is within the specification.

Removal

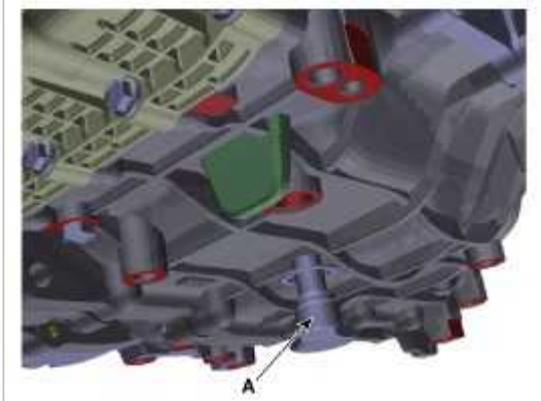
CAUTION

- When the solenoid valve failure code (DTC) is on, perform the following procedure to replace it.
- Automatic transaxle is composed of delicate components. Be careful not to cause any damage on the component in the course of assembly and disassembly.
- Maintain clean condition so that foreign substance does not get into the automatic transaxle.
- Use a coated apron, latex gloves, and stainless tray to prevent foreign substance from getting into the transaxle.
- Automatic transaxle fluid (ATF) can be reused. Collect it using a clean 10-liter beaker.

1. Remove the air duct.(Refer to Engine Mechanical System - "Air cleaner")
2. Remove the battery and the battery tray.(Refer to Engine Electrical System - "Battery")
3. Remove the under cover.(Refer to Engine Mechanical System - "Engine Room Under Cover")
4. Remove the ATF warmer.(Refer to Automatic Transaxle System-"ATF Warmer") (if equipped ATF warmer)
5. Remove the drain plug (A) and reinstall the drain plug after draining ATF totally.

Tightening torque :

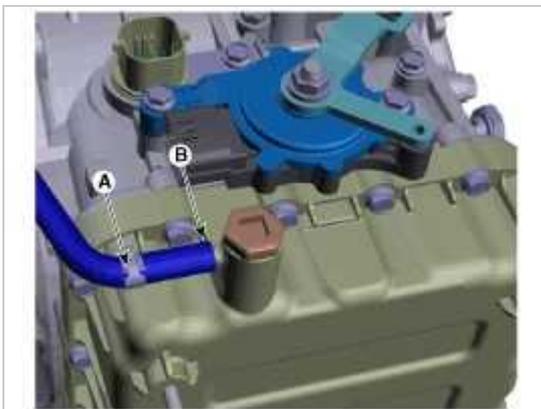
38.2 ~ 48.1 N.m (3.9 ~ 4.9 kgf.m, 28.2 ~ 35.4 lb-ft)



CAUTION

- Replace the gasket before reinstalling the drain plug.

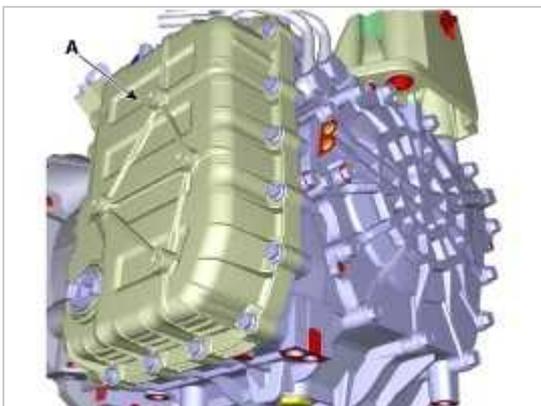
6. Remove the air bleeder hose (B) after removing the clamp (A).



7. Disconnect the clip for fixing wiring from the valve body cover.
8. Remove the valve body cover (A).

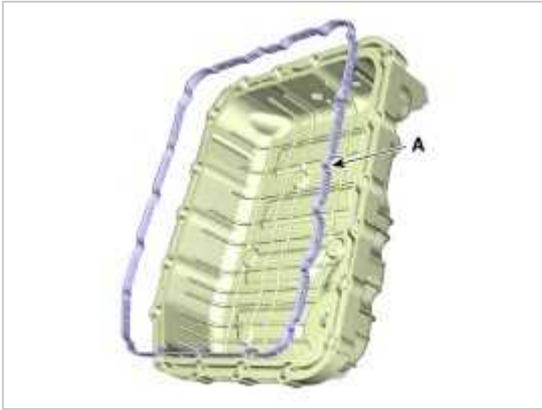
Tightening torque :

(A) 13.7 ~ 15.7 N.m (1.4 ~ 1.6 kgf.m, 10.1 ~ 11.6 lb-ft)



CAUTION

- When re-mounting the valve body cover, replace the gasket (A) with a new one.
- After mounting the valve body cover, check for oil leakage on the connecting part while the engine is on.



9. Disconnect the solenoid valve connector (B) and the oil temperature sensor (A) after removing the bolts.

Tightening torque :

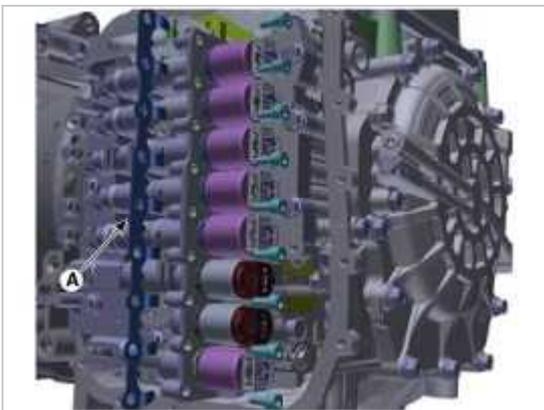
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



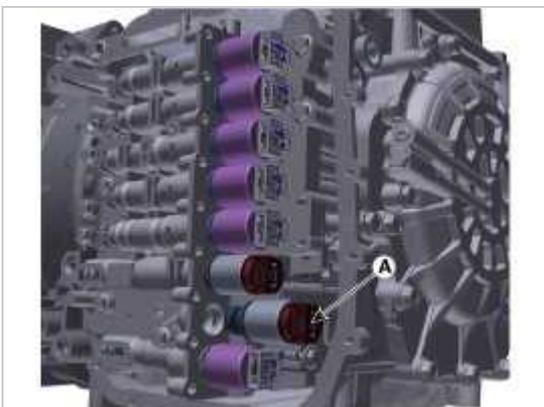
10. Remove the solenoid valve support bracket (A).

Tightening torque :

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



11. Remove the SS-A solenoid valve (A).



CAUTION

- When installing, apply the ATF oil or white vaseline to the O-ring (A) not to be damaged.



Installation

1. To install, reverse the removal procedure.
2. Check the ATF level after refilling the automatic transaxle with fluid.
(Refer to Automatic Transaxle System-"Fluid")
3. Clear the diagnostic trouble codes (DTC) using the GDS.

CAUTION

Even though disconnecting the battery negative terminal, the DTCs will not be cleared. So, be sure to clear the DTCs using the GDS.

4. Perform Transaxle Control Module (TCM) learning after replacing the solenoid valve, TCM, automatic transaxle to prevent slow transaxle response, jerky acceleration and jerky startup.

NOTICE

TCM Learning

1) Learning Overview and Purpose

- It aims to correct the deviation between transaxle products to reduce learning time and secure initial driving safety.
- When gear shift shock has occurred at the 1-2-3-4-5-6 positions, delete the previous learning values using GDS device and perform TCM learning again.

2) Conditions that Require Learning

- After replacing automatic transaxle
- After replacing TCM
- After performing TCM reprogramming

3) TCM Learning Method

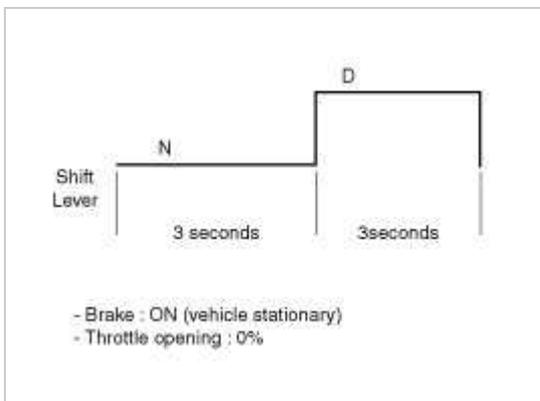
(1) Condition

- ATF temperature : 40 - 100°C

(2) Learning Method

a. Learning with the vehicle stopped

- While pressing and holding the brake (vehicle is stationary), set the throttle opening to 0% and repeat the following procedure four times.



b. Learning with the vehicle running

–

- Maintain a consistent throttle opening at the D position and gradually shift from 1st gear position to 6th gear position one by one. Then, gradually shift from 6th gear position to 1st gear position one by one (brake : on, throttle opening : 0%).
- Throttle opening (for shifting to upper gear) : 10 - 50% (less than 5% of throttle opening (APS) change)
 - Repeat the above procedure four times.

Automatic Transaxle System



Description

- SS-B solenoid valve is attached to the valve body and is an on/off solenoid valve that is used to change gears.
- SS-B Solenoid valve(ON/OFF) is installed at valve body.



Automatic Transaxle System



Specifications

ON/OFF Solenoid Valve(SS-A, SS-B)

▷ Control type : Normally low type

Control pressure [kpa (kgf/cm ² , psi)]	490.33 (5.0, 71.12)
Internal resistance(Ω)	10 ~ 11

Automatic Transaxle System



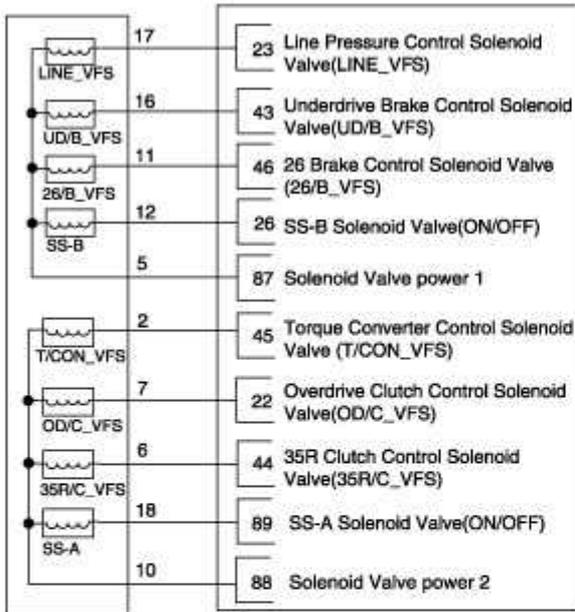
Circuit Diagram

[Circuit Diagram]

[Connection Information]

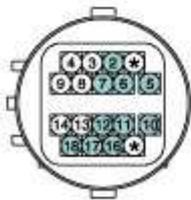
Solenoid Valve

TCM [A]

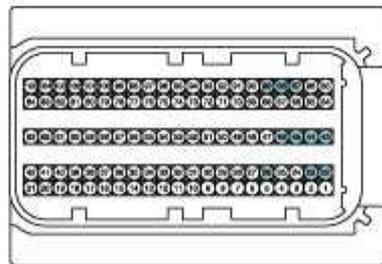


Terminal	Connected to	Function
17	TCM(23)	Line Pressure Control Solenoid Valve (LINE_VFS)
16	TCM(43)	Underdrive Brake Control Solenoid Valve (UD/B_VFS)
11	TCM(46)	26 Brake Control Solenoid Valve (26/B_VFS)
12	TCM(26)	SS-B Solenoid Valve (ON/OFF)
5	TCM(87)	Solenoid Valve power 1
2	TCM(45)	Torque Converter Control Solenoid Valve (T/CON_VFS)
7	TCM(22)	Overdrive Clutch Control Solenoid Valve (OD/C_VFS)
6	TCM(44)	35R Clutch Control Solenoid Valve (35R/C_VFS)
18	TCM(89)	SS-A Solenoid Valve (ON/OFF)
10	TCM(88)	Solenoid Valve power 2

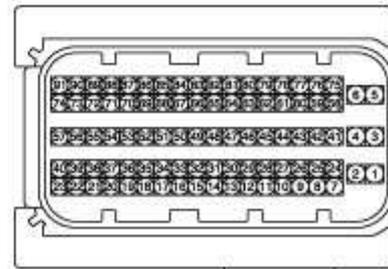
[Harness Connector]



Solenoid Valve Connector



TCM connector [A]



TCM connector [B]

Automatic Transaxle System

Inspection

1. Turn ignition switch OFF.
2. Remove the air duct.
(Refer to Engine Mechanical System - "Air cleaner")
3. Disconnect the solenoid valve connector(A).



4. Measure resistance between sensor signal terminal and sensor ground terminal.
5. Check that the resistance is within the specification.

Removal

CAUTION

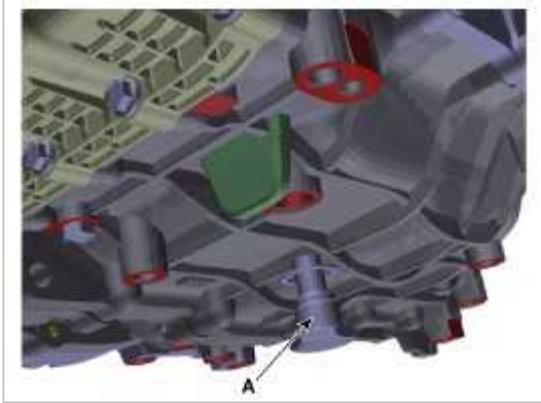


- When the solenoid valve failure code (DTC) is on, perform the following procedure to replace it.
- Automatic transaxle is composed of delicate components. Be careful not to cause any damage on the component in the course of assembly and disassembly.
- Maintain clean condition so that foreign substance does not get into the automatic transaxle.
- Use a coated apron, latex gloves, and stainless tray to prevent foreign substance from getting into the transaxle.
- Automatic transaxle fluid (ATF) can be reused. Collect it using a clean 10-liter beaker.

1. Remove the air duct.(Refer to Engine Mechanical System - "Air cleaner")
2. Remove the battery and the battery tray.(Refer to Engine Electrical System - "Battery")
3. Remove the under cover.(Refer to Engine Mechanical System - "Engine Room Under Cover")
4. Remove the ATF warmer.(Refer to Automatic Transaxle System-"ATF Warmer") (if equipped ATF warmer)
5. Remove the drain plug (A) and reinstall the drain plug after draining ATF totally.

Tightening torque :

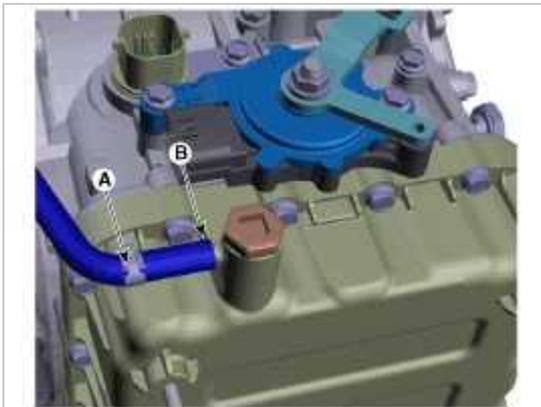
38.2 ~ 48.1 N.m (3.9 ~ 4.9 kgf.m, 28.2 ~ 35.4 lb-ft)



CAUTION

- Replace the gasket before reinstalling the drain plug.

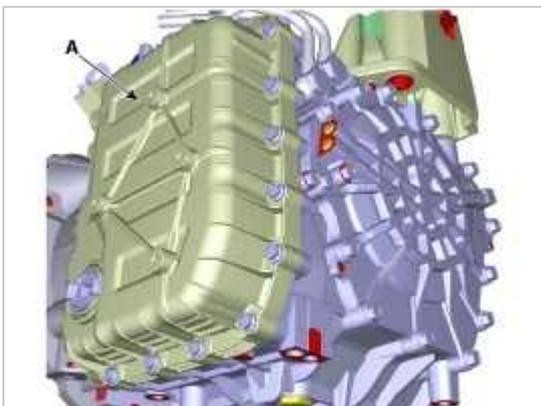
6. Remove the air bleeder hose (B) after removing the clamp (A).



7. Disconnect the clip for fixing wiring from the valve body cover.
8. Remove the valve body cover (A).

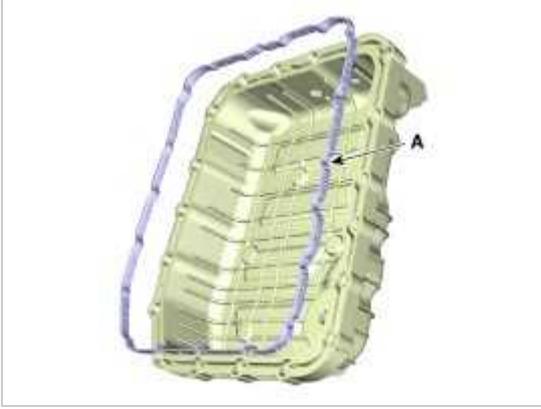
Tightening torque :

(A) 13.7 ~ 15.7 N.m (1.4 ~ 1.6 kgf.m, 10.1 ~ 11.6 lb-ft)



CAUTION

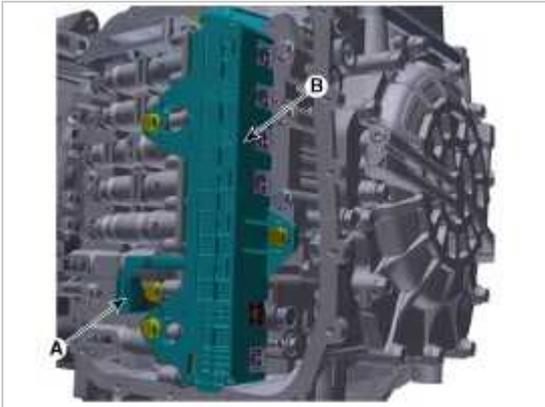
- When re-mounting the valve body cover, replace the gasket (A) with a new one.
- After mounting the valve body cover, check for oil leakage on the connecting part while the engine is on.



9. Disconnect the solenoid valve connector (B) and the oil temperature sensor (A) after removing the bolts.

Tightening torque :

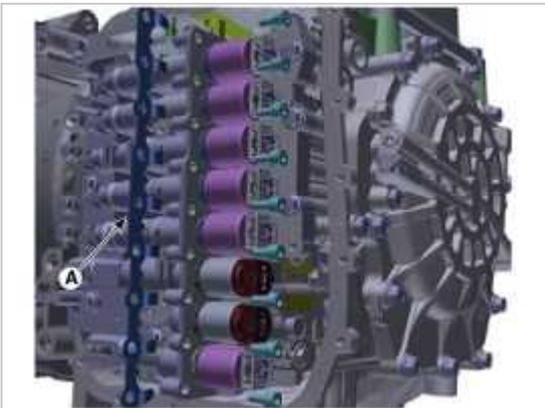
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



10. Remove the solenoid valve support bracket (A).

Tightening torque :

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



11. Remove the SS-B solenoid valve (A).



CAUTION

- When installing, apply the ATF oil or white vaseline to the O-ring (A) not to be damaged.



Installation

1. To install, reverse the removal procedure.
2. Check the ATF level after refilling the automatic transaxle with fluid.
(Refer to Automatic Transaxle System-"Fluid")
3. Clear the diagnostic trouble codes (DTC) using the GDS.

CAUTION

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4. Perform Transaxle Control Module (TCM) learning after replacing the solenoid valve, TCM, automatic transaxle to prevent slow transaxle response, jerky acceleration and jerky startup.

NOTICE

TCM Learning

1) Learning Overview and Purpose

- It aims to correct the deviation between transaxle products to reduce learning time and secure initial driving safety.
- When gear shift shock has occurred at the 1-2-3-4-5-6 positions, delete the previous learning values using GDS device and perform TCM learning again.

2) Conditions that Require Learning

- After replacing automatic transaxle
- After replacing TCM
- After performing TCM reprogramming

3) TCM Learning Method

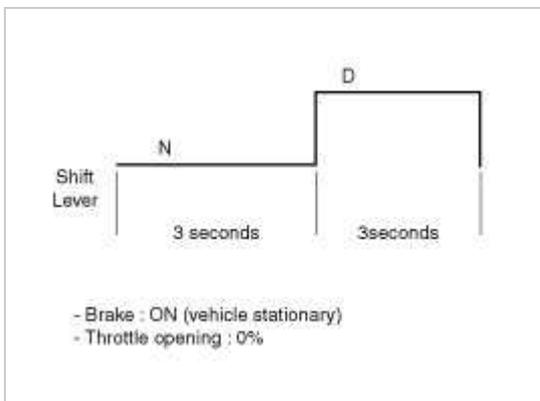
(1) Condition

- ATF temperature : 40 - 100°C

(2) Learning Method

a. Learning with the vehicle stopped

- While pressing and holding the brake (vehicle is stationary), set the throttle opening to 0% and repeat the following procedure four times.



b. Learning with the vehicle running

–

Maintain a consistent throttle opening at the D position and gradually shift from 1st gear position to 6th gear position one by one. Then, gradually shift from 6th gear position to 1st gear position one by one (brake : on, throttle opening : 0%).

- Throttle opening (for shifting to upper gear) : 10 - 50% (less than 5% of throttle opening (APS) change)
- Repeat the above procedure four times.

Automatic Transaxle System



Description

- The inhibitor switch mounted on the upper of transaxle and connected with shifter lever.
- The inhibitor switch has four points of contact and it makes the signals(S1, S2, S3, S4).
- The inhibitor switch signals delivered at the TCM according to control of the shift lever positions(P, R, N, D) and it is used to control of the gear setting.



Automatic Transaxle System



Specifications

▷ Type: Combination of output signals from 4 terminals

Power supply (V)	12
Output type	Combination of output signals

Signal Code Table

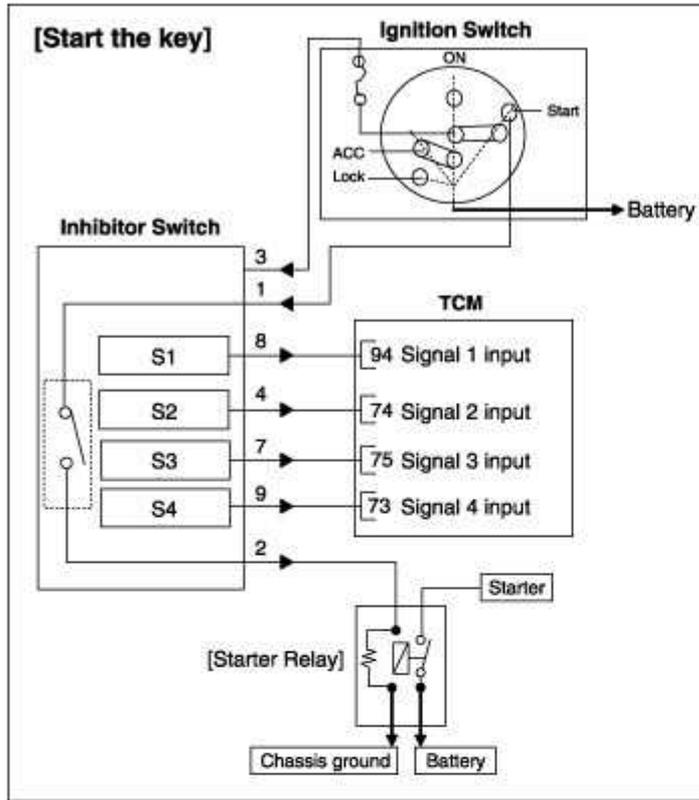
	P	P-R	R	R-N	N	N-D	D
S1	12V	12V	0	0	0	0	0
S2	0	12V	12V	12V	0	0	0
S3	0	0	0	12V	12V	12V	0
S4	0	0	0	0	0	12V	12V

Automatic Transaxle System



Circuit Diagram

[Circuit Diagram]



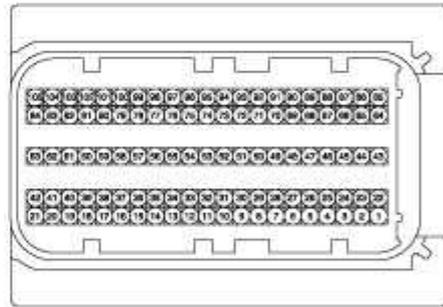
[Connection Information]

Terminal	Connected to	Function
1	Ignition switch(key)	Start power
	IGPM(button)	
2	Starter relay(key)	Start signal
	SMK(button)	
3	Ignition switch(key)	IG1
	PCB(button)	
4	TCM(74)	Signal 2 input
7	TCM(75)	Signal 3 input
8	TCM(94)	Signal 1 input
9	TCM(73)	Signal 4 input

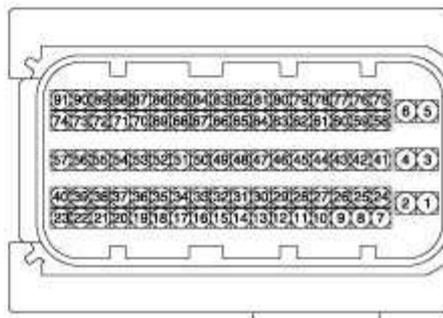
[Harness Connector]



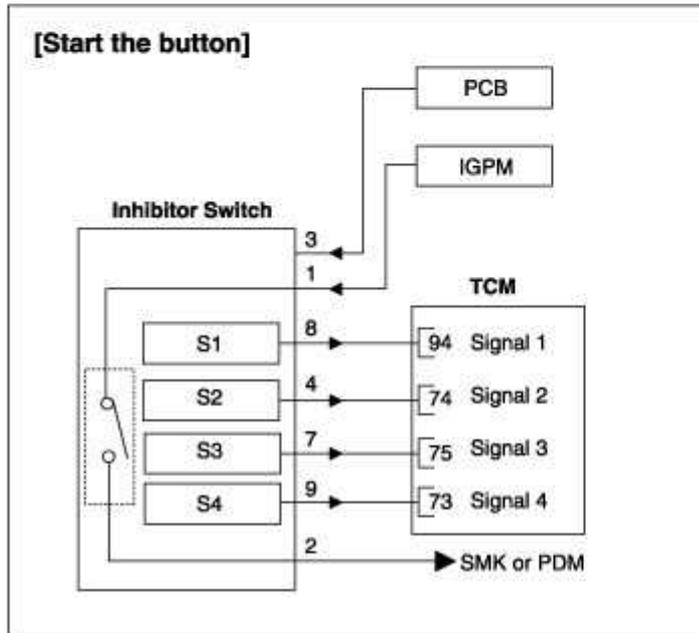
Inhibitor Switch Connector



Connector [A]



Connector [B]



Automatic Transaxle System

Fault Diagnosis

Fault Diagnosis for Symptom

Major Symptom	Expected Cause	Items to Check and Measures
Shift lever inoperable	Faulty shift cable tension	Adjust shift cable tension (refer to "Automatic Transaxle System – Inhibitor Switch")
	Faulty shift cable assembly/connection	Check manual control valve assembly and re-assemble if necessary.
	Faulty shift cable bracket installation	Check cable installation on the shift lever assembly and repair if necessary.
	Faulty inhibitor switch "N" setting	Use the "N" setting jig and adjust the "N" setting. (refer to "Automatic Transaxle System – Inhibitor Switch")
	Faulty oil pressure in the valve body.	



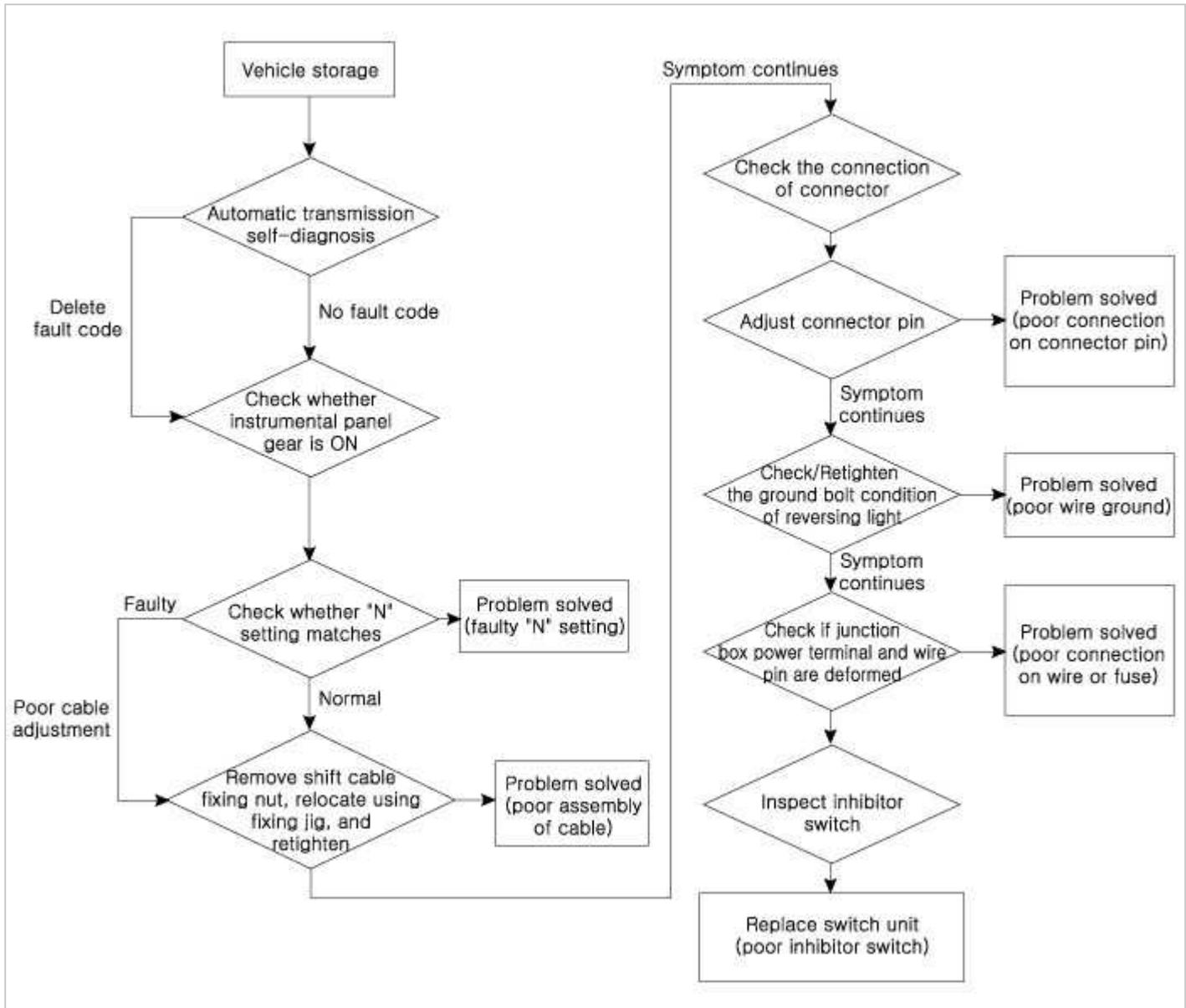
Shock when shifting to and from D/R		Replace valve body assembly or inspect/replace transaxle assembly
Motor run-up when shifting to and from D/R		
Faulty engine start	Faulty CAN terminating resistance/circuit	Check PCU/battery management system module. Check PCU wiring connector connection.
Current gear not indicated in the Cluster	Faulty power supply (IG.1) to inhibitor switch circuit	Check for gap on the junction box power terminal in the engine compartment and fuse (TCU2) connection. Repair terminal or exchange junction box if necessary.
Warning Lamp ON	Faulty inhibitor switch circuit fuse	Check fuse and junction box terminal, and repair.
Engine stall while stopped	Faulty inhibitor switch wiring connector	Check for foreign substance in the wiring connector, and check for gap on the terminal.
Creeping not possible		Check sealing on unused pin, and check for corrosion on the terminal.
Auto parking release disabled	Faulty reverse lamp circuit	Check reverse lamp ground, and reassemble if necessary.
	Faulty inhibitor switch wiring ground	Check wiring ground, and reassemble if necessary.
	Faulty inhibitor switch circuit (unused code)	Inspect in accordance with the inspection flow, then replace inhibitor switch if necessary.
	Faulty inhibitor switch operation (faulty mid-range)	Inspect in accordance with the inspection flow, then replace inhibitor switch if necessary.

Automatic Transaxle System



Inspection

Inspection flow of the inhibitor switch

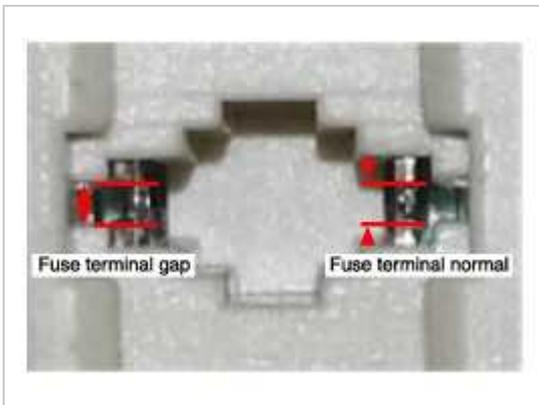


Items to check

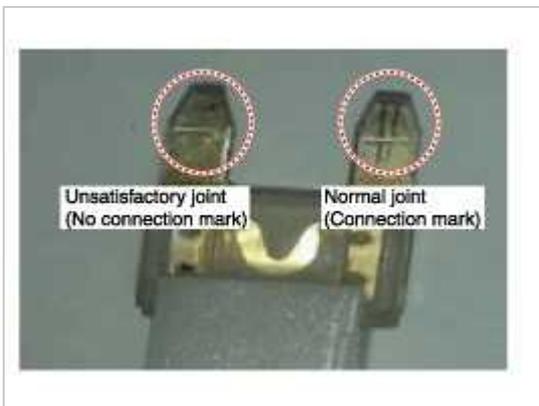
1. Inspect DTC code.
2. Inspect whether N setting matches.
 - Adjust N setting (refer to automatic transmission system - "inhibitor switch")
3. Inspect shift cable separation.
 - Adjust shift cable separation (refer to automatic transmission system - "shift cable")
4. Inspect whether connector is connected.
 - Inspect connector thoroughly for looseness, poor connection, bending, corrosion, contamination, deformation, or damage.
 - Turn ignition key "ON" and engine "OFF" and measure the power supplied to inhibitor switch circuit and voltage between ground.

Specification: approx. 12 V

 - Fix the pin wiring when connector pin wiring is faulty. (refer to ETM - "wiring repair").
5. Inspect ground condition on reversing light circuit.
 - Check the ground location of reversing light (refer to ETM - "harness location map").
 - Reattach reversing light if ground condition is faulty.
6. Inspect wiring connection on junction box power terminal and fuse lamp.
 - Check whether fuse holder is separated and holder is holding the fuse tight.



- Attach tester fuse to check if it is connected appropriately.



- Check whether fuse capacity is appropriate for each circuit.
 - Check if fuse is damaged.
 - Check pulling of fuse fixing wiring, inflow of foreign substance, and arrangement condition of terminal.
 - Relocate the terminal that has been pulled and inspect using the method explained above.
 - When problem is not solved, refer to the circuit diagram wiring repair instructions to fix or replace the terminal.
7. Inspect inhibitor switch signal.
 - Turn ignition key "ON" and engine "OFF".
 - Measure the voltage between each terminal and chassis ground when shifting lever to "P, R, N, D" range.

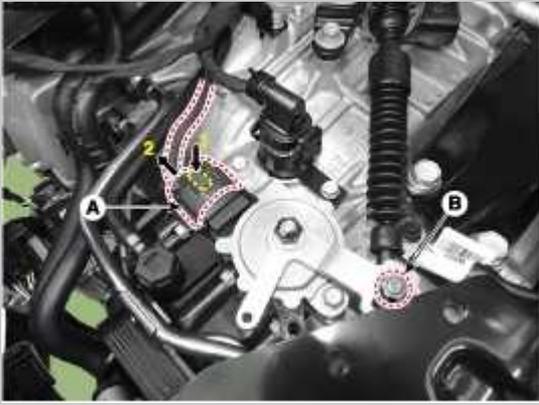
Specified value: refer to specification "signal code" table

Removal

1. Make sure vehicle does not roll before setting shift lever to "N" position.
2. Disconnect the negative (-) battery cable.
3. Remove the air cleaner assembly and air duct. (Refer to Engine Mechanical System - "Air cleaner")
4. Remove the battery and battery tray.

(Refer to Engine Electrical System - "Battery")

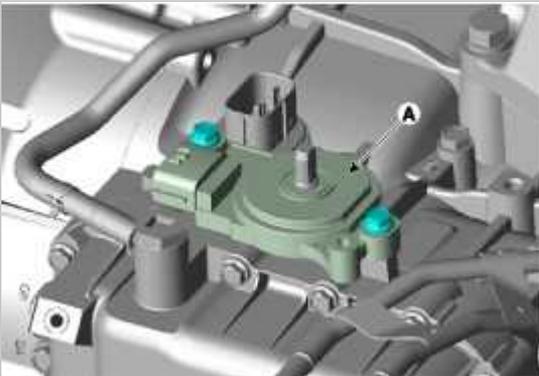
5. Disconnect the inhibitor switch connector (A).
6. Remove the shift cable mounting nut (B).



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

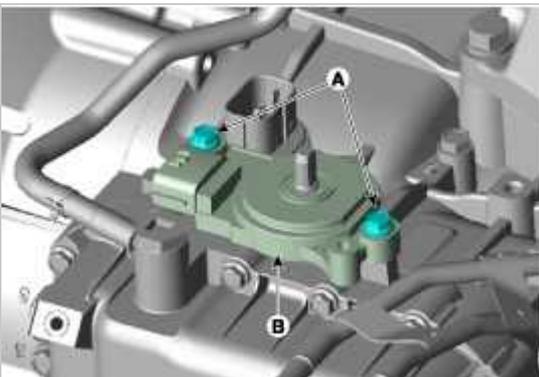


8. Remove the inhibitor switch (A) after removing the bolts (2ea).

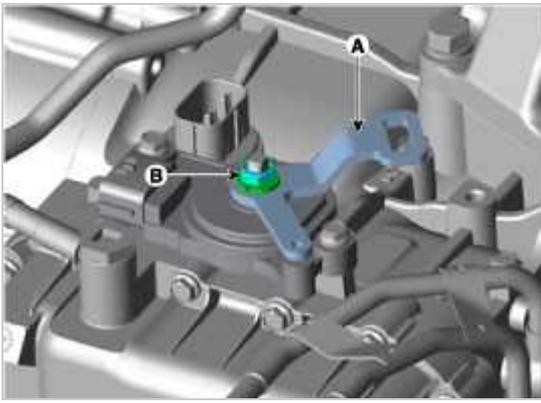


Installation

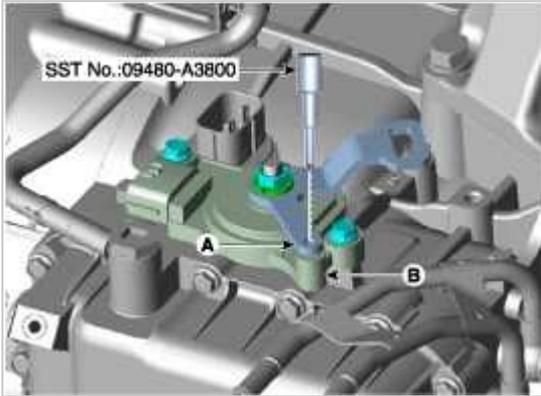
1. Check that the shift lever is placed in the "N" position.
2. Lightly tighten the bolts (A) after installing the inhibitor switch (B).



3. Lightly tighten the nut (A) after installing the manual control lever (B).



- Align the hole (A) in the manual control lever with the "N" position hole (B) of the inhibitor switch and then insert the inhibitor switch guide pin (SST No.:09480-A3800).

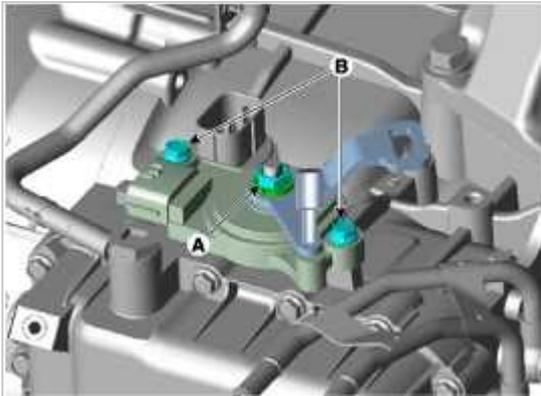


- Tighten the nut (A) and bolts (B) with the specified torque.

Tightening torque :

A : 17.7 ~ 24.5 N.m (1.8 ~ 2.5 kgf.m, 13.0 ~ 18.1 lb-ft)

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



- Lightly tighten the nut (B) after connected the shift cable (C) in the manual control lever (D).

- Push shift cable (C) lightly to "F" direction shown to eliminate free play of shift cable.

- Tighten the nut (B) with the specified torque.

Tightening torque :

9.8 ~ 14.7 N.m (1.0 ~ 1.5 kgf.m, 7.2 ~ 10.8 lb-ft)



- Remove the inhibitor switch guide pin (SST No.:09480-A3800) from the hole.

- Connect the inhibitor switch connector (A).

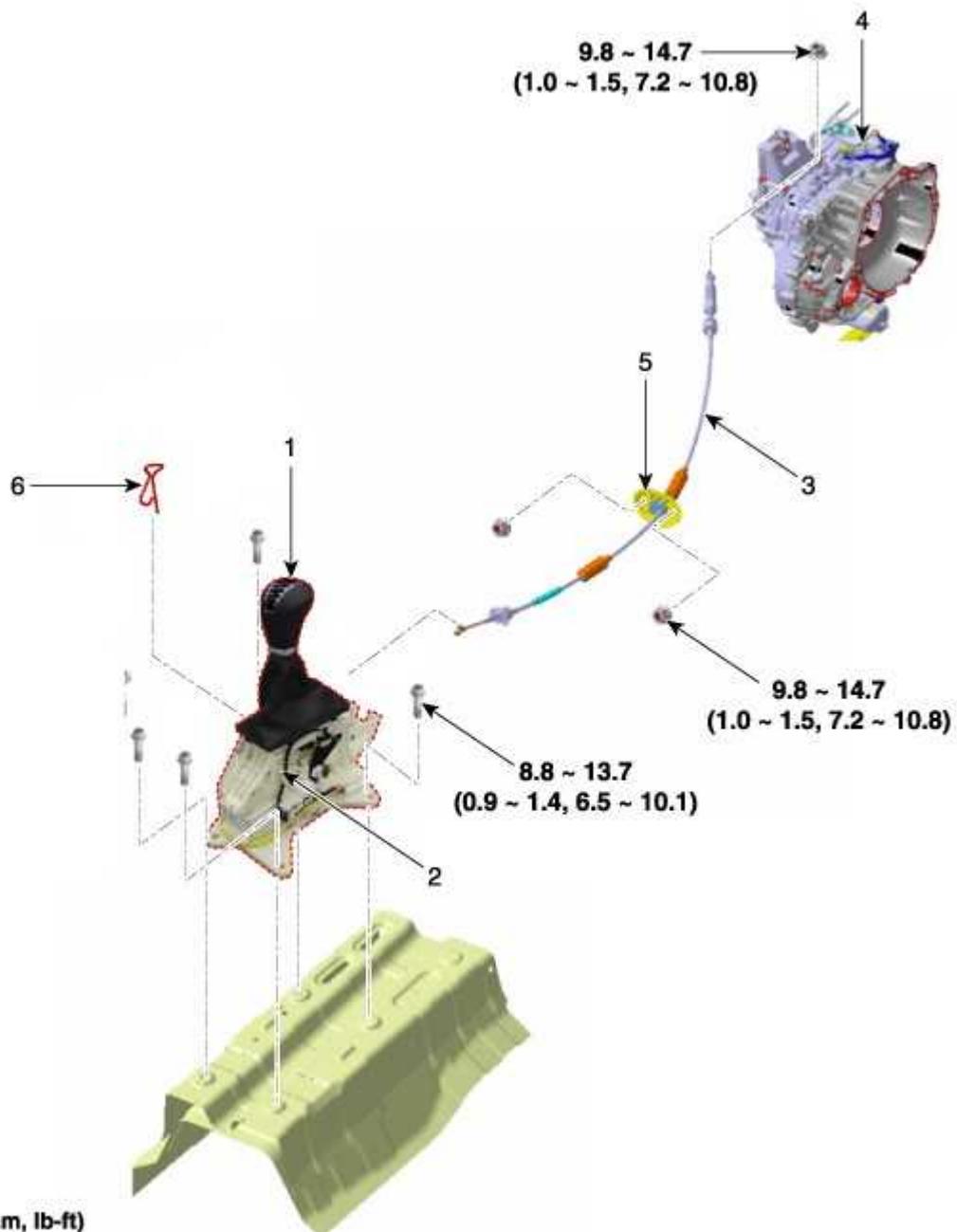


11. Install the battery and battery tray.
(Refer to Engine Electrical System - "Battery")
12. Install the air cleaner assembly and air duct.
(Refer to Engine Mechanical System - "Air cleaner")
13. Connect the battery negative (-) cable.
14. Check that operating surely at each range of the inhibitor switch corresponding to each position of shift lever.

Automatic Transaxle System



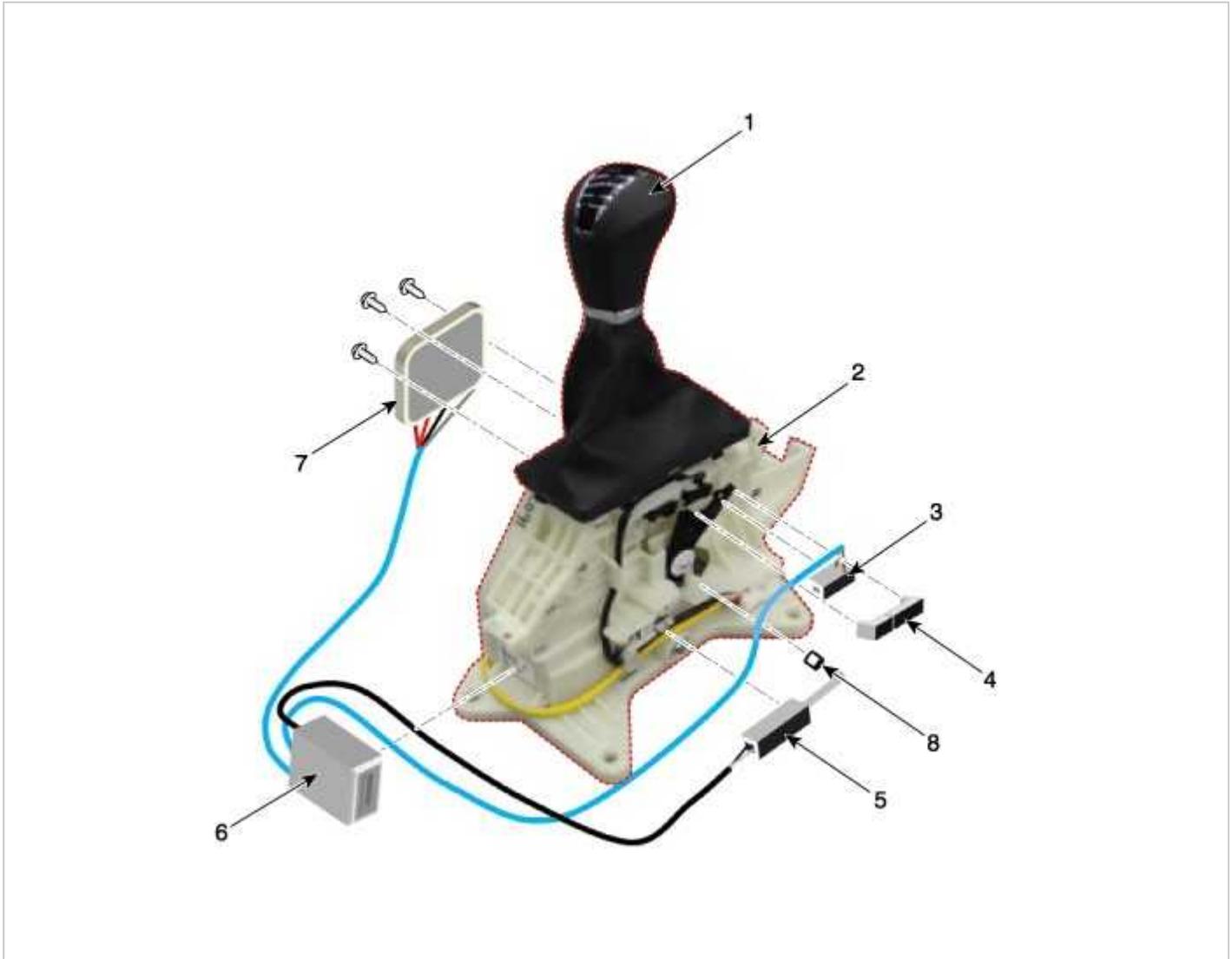
Components Location



1. Shift lever knob & boots
2. Shift lever assembly
3. Shift cable

4. Manual control lever
5. Shift cable retainer
6. Snap pin

Components



1. Shift lever & boots assembly
2. Shift lever assembly
3. P position switch
4. P position switch mounting bracket

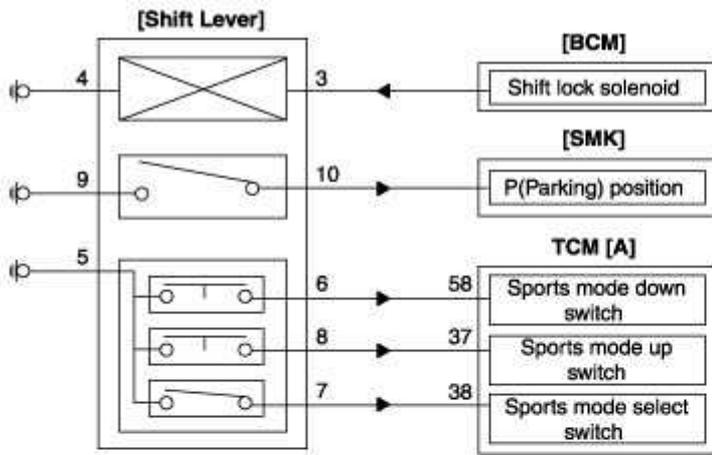
5. Shift lock solenoid
6. Main connector
7. Manual mode switch housing
8. Damper

Automatic Transaxle System

Schematic Diagrams



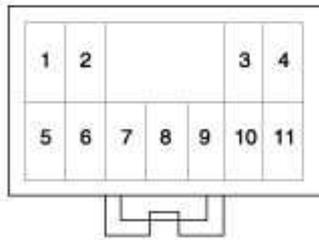
[Circuit Diagram]



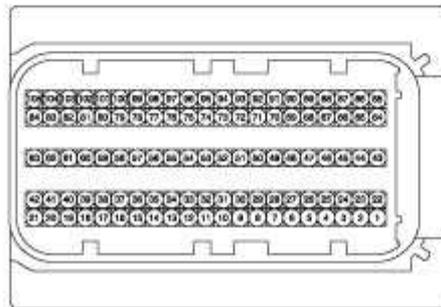
[Connection Information]

Terminal	Connected to	Function
3	BCM	Shift lock solenoid(-)
4	Battery	Shift lock solenoid(+)
5	Battery	Sports mode switch
6	TCM(58)	Sports mode down
7	TCM(38)	Sports mode select
8	TCM(37)	Sports mode up
9	Battery	P Position switch(-)
10	SMK	P Position switch(+)

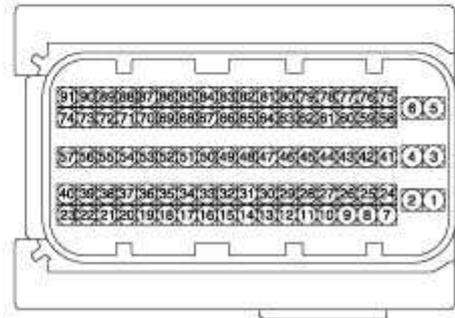
[Harness Connector]



[Shift Lever Connector]



Connector [A]



Connector [B]

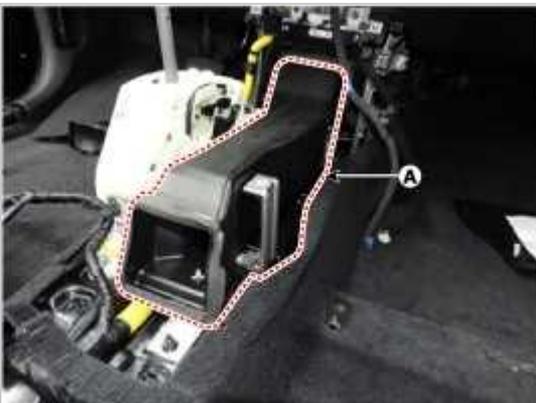
Automatic Transaxle System

Removal

1. Pull the knob (A) in the direction of "F" and remove the knob.



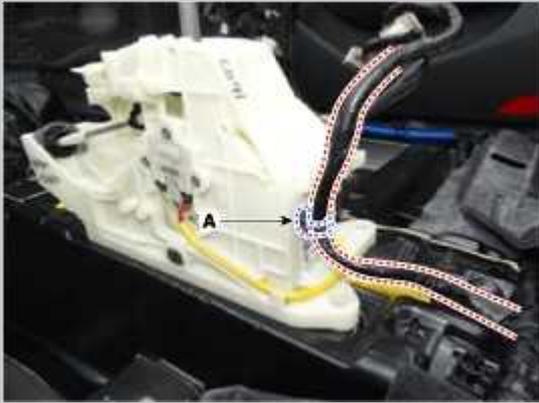
2. Remove the floor console assembly.
(Refer to Body - "Floor Console")
3. Remove the air duct (A).



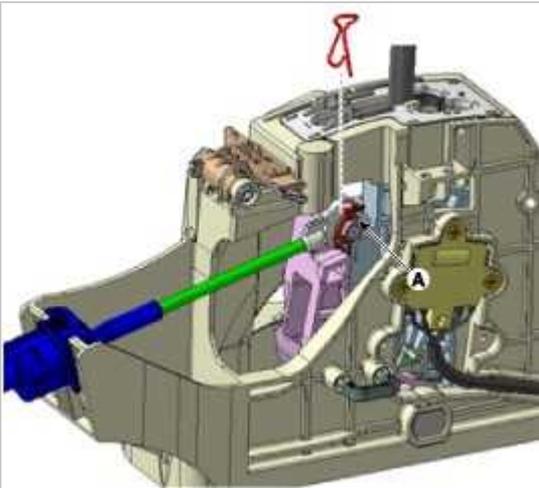
4. Disconnect the connector (A) from the shift lever.



5. Disconnect the fixing clip (A) of wiring.



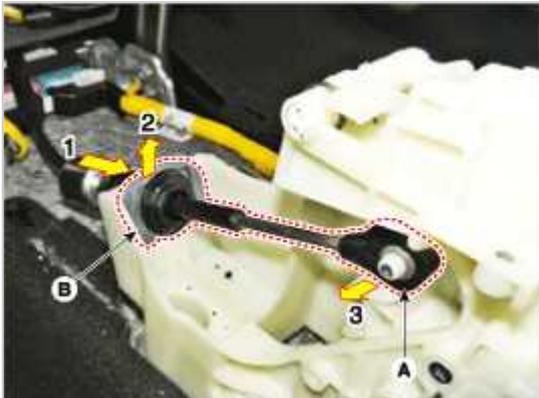
6. Remove the snap pin (A).



7. Disconnect the control cable.

(1) Disconnect the cable holer (A) from the shift lever.

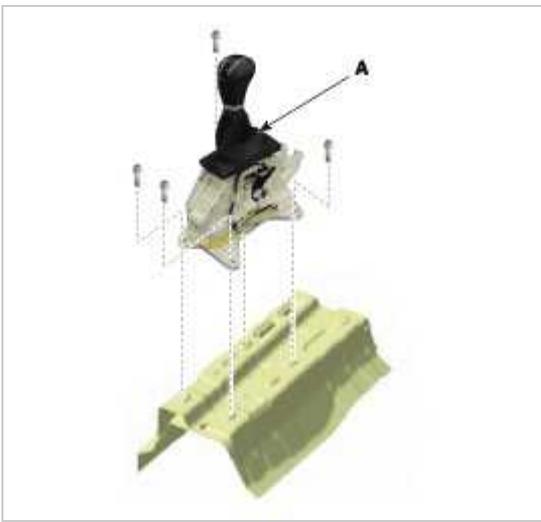
(2) Disconnect the cable bracket (B) from the shift lever after pushing the lock.



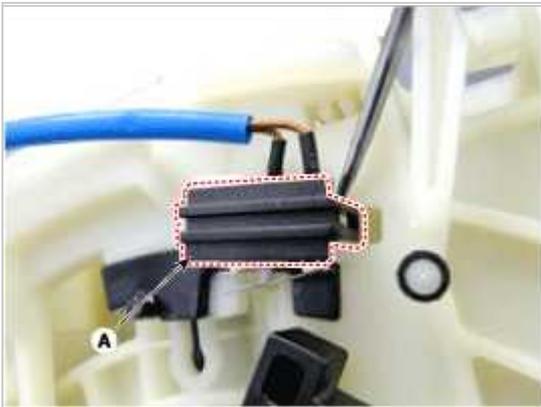
8. Remove the bolts and then shift lever assembly (A).

Tightening torque :

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

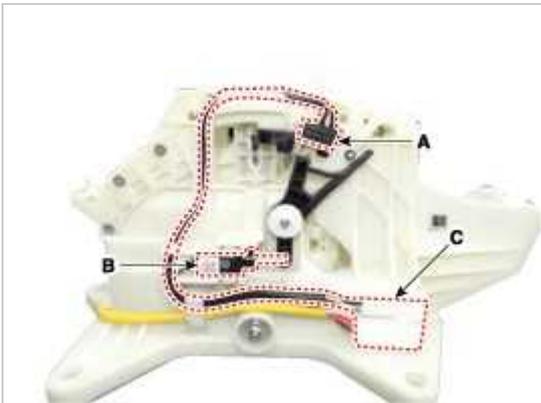


9. Remove the P position switch mounting bracket (A).

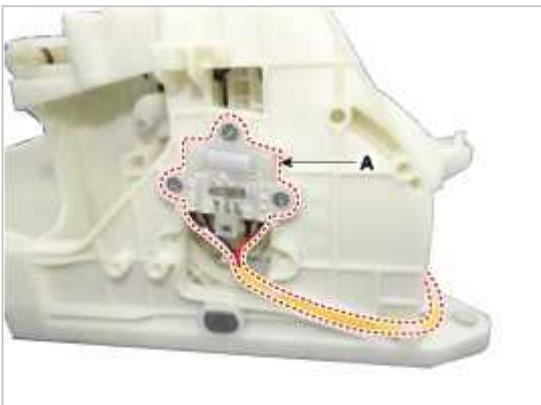


10. Disconnect the P position switch (A) and shift lock solenoid (B).

11. Disconnect the main connector (C) from the shift lever.



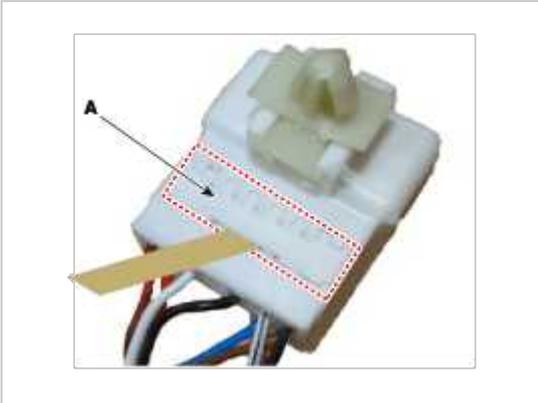
12. Disconnect the manual mode switch housing (A).



13. P position switch, shift lock solenoid, manual mode switch housing, main connector assembly (A).



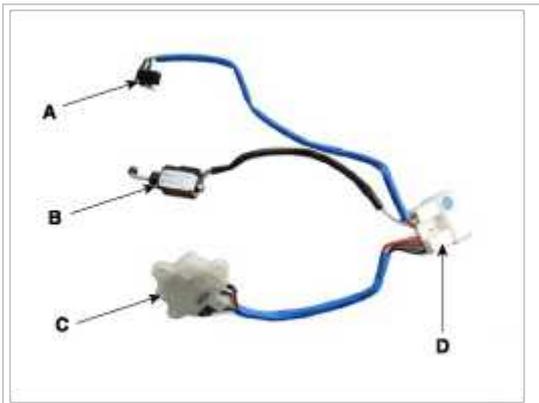
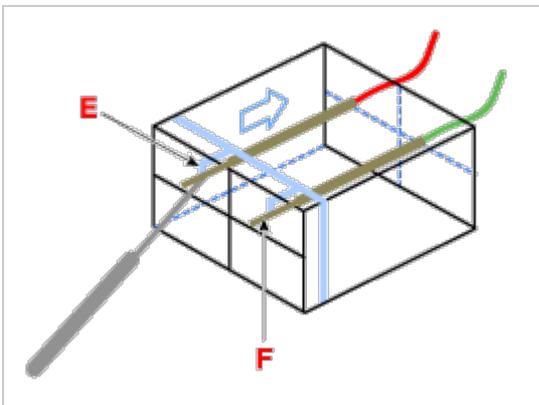
14. Remove the mounting bracket (A) of terminals from the main connector.



15. Remove each terminals (F) of the P position switch (A), shift lock solenoid (B), manual mode switch housing (C) after released lock (E) from the main connector (D).

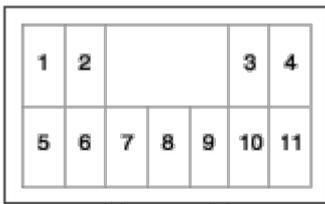
CAUTION

- Record the location of the wiring colors before disconnecting the terminals.



NOTICE

► Connector information



- 3. Shift lock solenoid(+)
- 4. Shift lock solenoid(-)
- 5. Sports mode down switch
- 6. Sports mode select switch
- 7. Sports mode up switch
- 9. Ground
- 10. P(Parking) position switch(-)
- 11. P(Parking) position switch(+)

Installation

1. Install in the reverse order of removal.

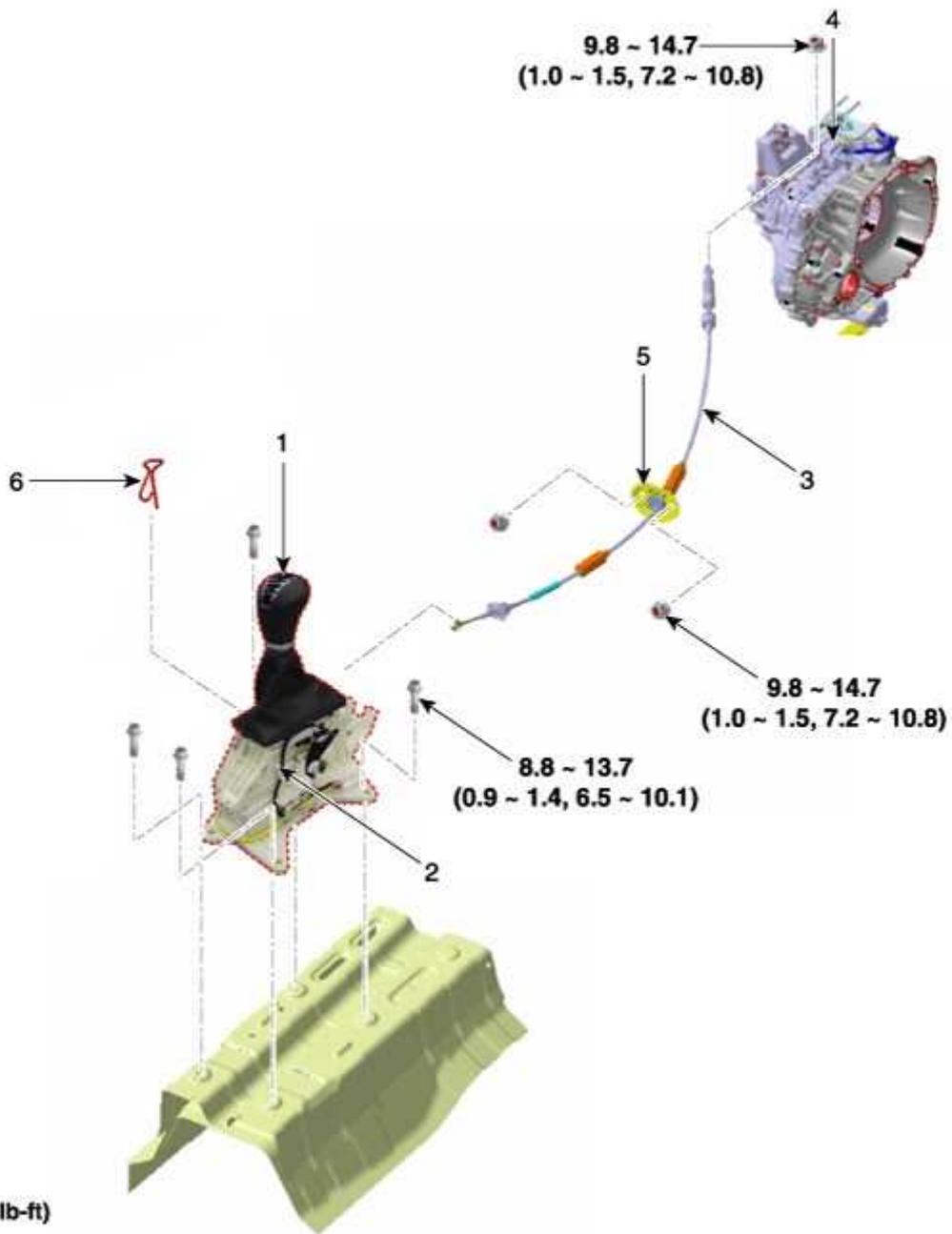
NOTICE

- Install the cable after placing the shift lever and the manual control lever in the N position.

Automatic Transaxle System



Components



1. Shift lever knob & boots
2. Shift lever assembly
3. Shift cable

4. Manual control lever
5. shift cable retainer
6. Snap pin

Automatic Transaxle System

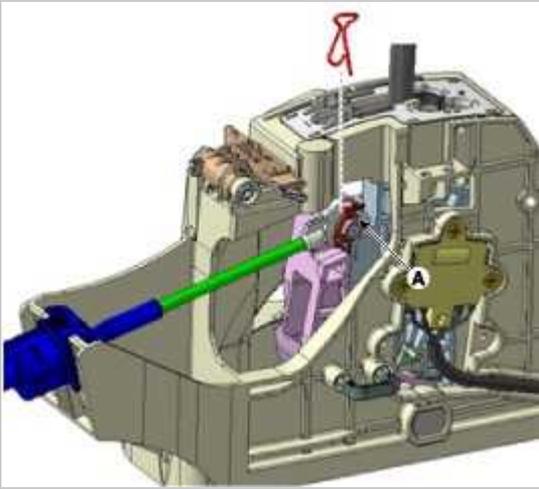
Removal

1. Air cleaner assembly and air duct.
(Refer to Engine Mechanical System - "Air cleaner")
2. Battery and battery tray.
(Refer to Engine Electrical System - "Battery")
3. Remove the nut (A) from the manual control lever.
4. Remove the shift cable (B) from the bracket (C) at transaxle side.





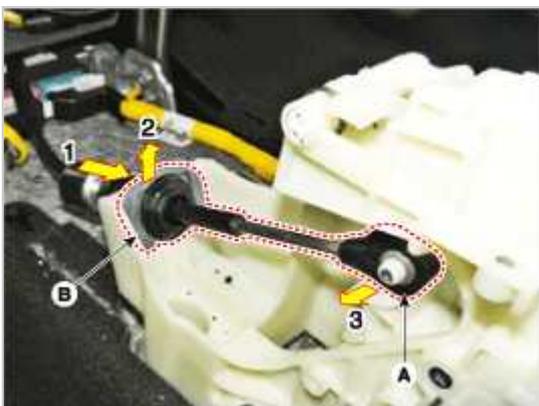
5. Remove the floor console assembly.
(Refer to Body - "Floor Consol")
6. Remove the snap pin (A).



7. Remove the air duct (A).



8. Disconnect the shift cable.
 - (1) Disconnect the cable bracket (B) from the shift lever after pushing the lock.
 - (2) Disconnect the cable holer (A) from the shift lever.



9. Remove the airbag module.
(Refer to Restraint - "Airbag Module")

10. Disconnect the shift cable retainer (B) after removing the nuts.

11. Remove the shift cable by pulling it toward the interior.



Installation

1. Install the shift cable retainer (A).

Tightening torque :

9.8 ~ 14.7 N.m (1.0 ~ 1.5 kgf.m, 7.2 ~ 10.8 lb-ft)



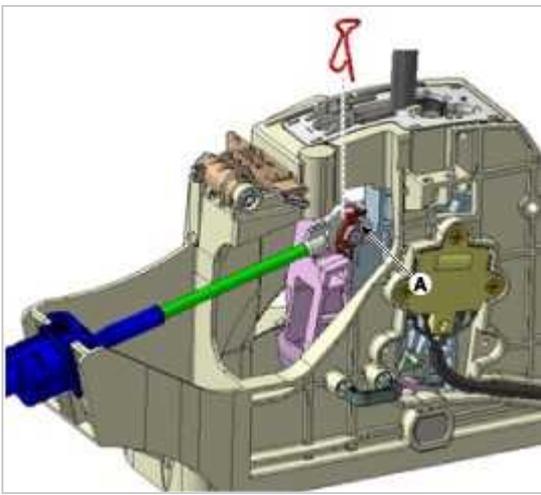
NOTICE

- Install the cable after placing the shift lever and the manual control lever in the N position.

2. Install the shift cable (A) in the shifter lever.



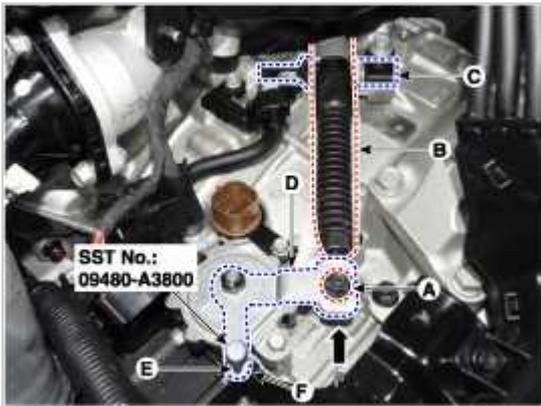
3. Install the snap pin (A).



4. Install the shift cable (B) in the cable bracket (C).
5. Align the hole (E) in the manual control lever with the "N" position hole (F) of the inhibitor switch and then insert the inhibitor switch guide pin (SST No: 09480-A3800).
6. Lightly tighten the nut (A) after connected the shift cable (B) in the manual control lever (D).
7. Push shift cable (B) lightly to "F" direction shown to eliminate free play of shift cable.
8. Tighten the nut (A) to the specified torque.

Tightening torque :

9.8 ~ 14.7 N.m (1.0 ~ 1.5 kgf.m, 7.2 ~ 10.8 lb-ft)



9. Remove the inhibitor switch guide pin (SST No.: 09480-A3800) from the hole.
10. Install the airbag module.
(Refer to Restraint - "Airbag Module")
11. Install the air duct (A).



12. Install the floor console assembly.
(Refer to Body - "Floor Consol")
13. Install the air cleaner assembly.
(Refer to Engine Mechanical System - "Air cleaner")
14. Install the battery and battery tray.
(Refer to Engine Electrical System - "Battery")
15. Install the air duct.
(Refer to Engine Mechanical System - "Air cleaner")

16. Check that operating surely at each range of the inhibitor switch corresponding to each position of shift lever.