# General Information

## Specifications

| Item | | Specifications |
|---|---|---|
| Transmission type | | A6MF2 |
| Engine model | | Gasoline 2.4 GDI |
| Torque converter type | | 3-element, 1-stage, 2-phase type |
| Torque converter size | | Ø236 mm (9.2913 in.) |
| Oil pump system | | Parachoid |
| Friction elements | | Clutch: 2EA |
| | | Brake: 3EA |
| | | OWC : 1EA |
| Planetary gear | | 3EA |
| Gear ratio | 1st | 4.212 |
| | 2nd | 2.637 |
| | 3rd | 1.800 |
| | 4th | 1.386 |
| | 5th | 1.000 |
| | 6th | 0.772 |
| | Reverse | 3.385 |
| Final gear ratio | | 2.885 |
| 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 |
| Air gap(mm)in. | | (0.95~1.65)0.037~0.065 |
| 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 |
| Air gap(mm)in. | | (0.55~1)0.0217~0.0394 |
| Output voltage | High | 1.18~1.68 |
| | Low | 0.59~0.84 |

## Oil Temperature Sensor

▷ Type: Negative thermal coefficient type

▷ 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 | 1.11 |
| (60)140.0 | 0.61 |
| (80)176.0 | 0.32 |
| (100)212.0 | 0.18 |
| (120)248.0 | 0.10 |
| (140)284.0 | 0.06 |
| (150)302.0 | 0.05 |

## Inhibitor Switch

▷ Type: Combination of output signals from 4 terminals

▷ Specifications

| | |
|---|---|
| Power supply (V) | 12 |
| Output type | Pin to Pin |

## Solenoid Valves

Direct control VFS[26/B, T/CON]

▷ Control type : Normal low type

| | |
|---|---|
| Control Pressure kpa (kgf/㎠, psi) | 9.81~500.14 (0.1~5.1,1.42~72.54) |
| Current value(mA) | 50~850 |
| Internal resistance(Ω) | 5.1 |

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

▷ Control Type : Normal high type

| | |
|---|---|
| Control Pressure kpa (kgf/㎠, psi) | 500.14~9.81 (5.1~0.1,72.54~1.42) |
| Current value(mA) | 50~850 |
| Internal resistance(Ω) | 5.1 |

Line Pressure Control VFS

▷ Control type : Normal high type

| | |
|---|---|
| Control Pressure kpa (kgf/㎠, psi) | 500.14~9.81 (5.1~0.1,72.54~1.42) |
| Current value(mA) | 50~850 |
| Internal resistance(Ω) | 5.1 |

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

▷ Control type : Normal low type

| | |
|---|---|
| Control pressure kpa (kgf/㎠, 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 | △ | | | △ | ● | |
| 2 | | | | ● | ● | ● |
| 3 | | ● | | ● | | |
| 4 | | | | | ● | |
| 5 | | ● | ● | | | |
| 6 | | | ● | | ● | ● |
| L | ● | | | | ● | |
| R | ● | ● | ● | | | |

● : Connected status

△ : Connected at vehicle speed above 8km/h

### Tightening Torques

| Item | N.m | Kgf.m | lb-ft |
|---|---|---|---|
| TCM installation mounting bolt | 9.8~11.8 | 1.0~1.2 | 7.2~8.7 |
| Shift cable bracket mounting bolt | 14.7~21.6 | 1.5~2.2 | 10.8~15.9 |
| 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 | 9.8~14.7 | 1.0~1.5 | 7.2~10.8 |
| Inhibitor switch mounting bolt | 9.8~11.8 | 1.0~1.2 | 7.2~8.7 |
| Valve body cover mounting bolt | 13.8~14.7 | 1.3~1.5 | 9.4~10.8 |
| Eyebolt | 34.3~44.1 | 3.5~4.5 | 25.3~32.6 |
| Oil drain plug | 34.3~44.1 | 3.5~4.5 | 25.3~32.6 |
| Oil level plug | 34.3~44.1 | 3.5~4.5 | 25.3~32.6 |
| Torque converter mounting bolt | 45.1~52.0 | 4.6~5.3 | 33.3~38.3 |
| Starter motor mounting bolts | 42.2~53.9 | 4.3~5.5 | 31.1~39.8 |
| Automatic transaxle upper mounting bolt (TM=>Eng) | 42.2~53.9 | 4.3~5.5 | 31.1~39.8 |
| 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 |
| Automatic transaxle support bracket bolt | 88.3~107.9 | 9.0~11.0 | 65.1~79.6 |

### Lubricants

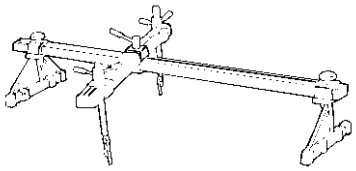
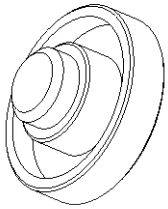
| Item | Specified lubricant | Quantity |
|---|---|---|
| Transaxle fluid | SK ATF SP-IV, MICHANG ATF SP-IV, NOCA ATF SP-IV, Kia Genuine ATF SP-IV | 7.1L (1.88 U.S gal., 7.50 U.S.qt., 6.24 Imp.qt.) |

| Item | Specified sealant |
|---|---|

### Sealant

| | |
|---|---|
| Rear cover | LOCTITE FMD-546 or THREE-BOND TB1281B |
| Torque converter housing | |
| Valve body cover | |

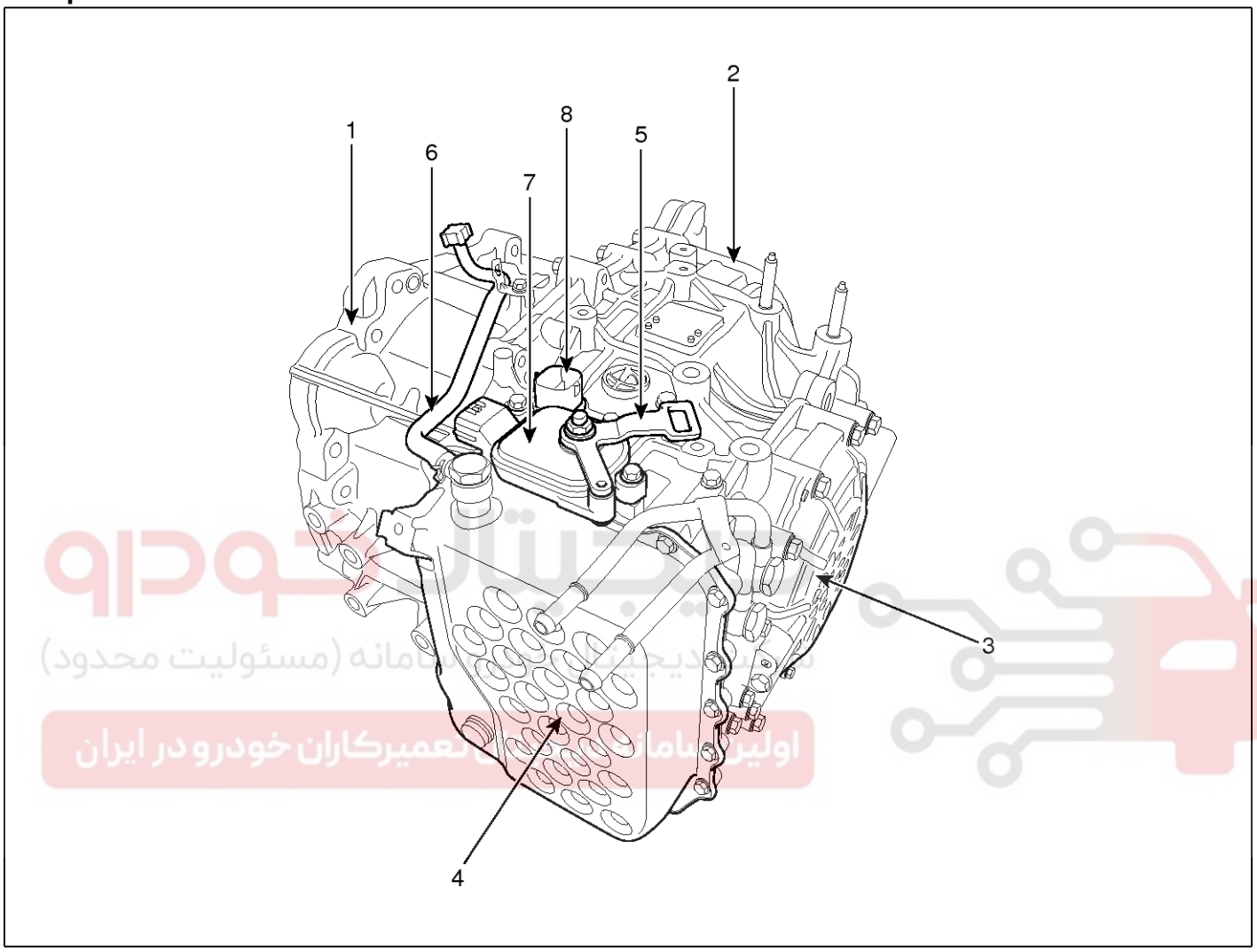
## Special Service Tools

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

# Automatic Transaxle System

## Automatic Transaxle

### Components Location

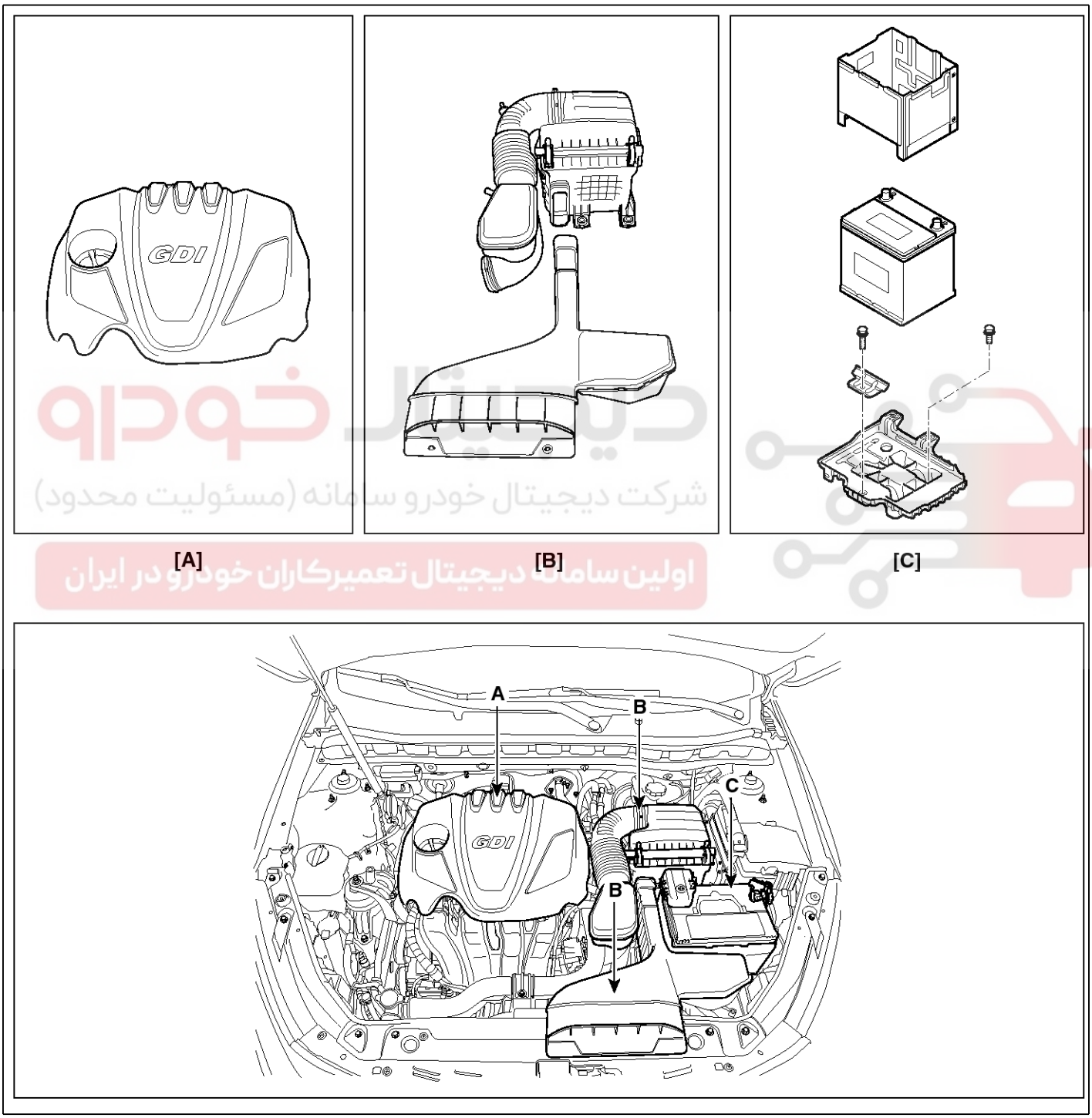



STFAT1001D

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

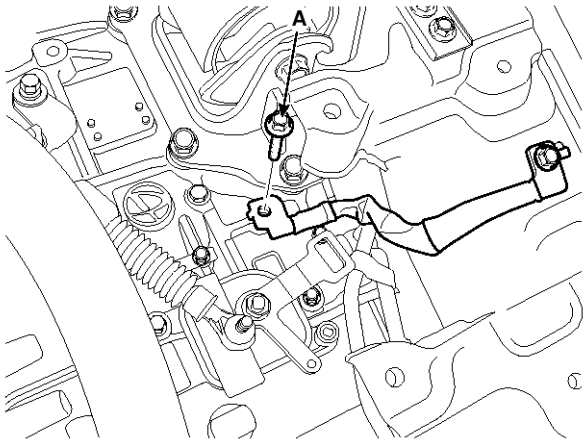
## Removal

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



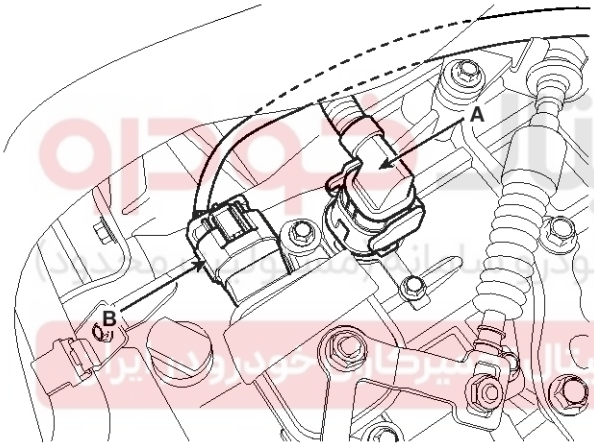

STFAA1002D

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




STFAT1003N

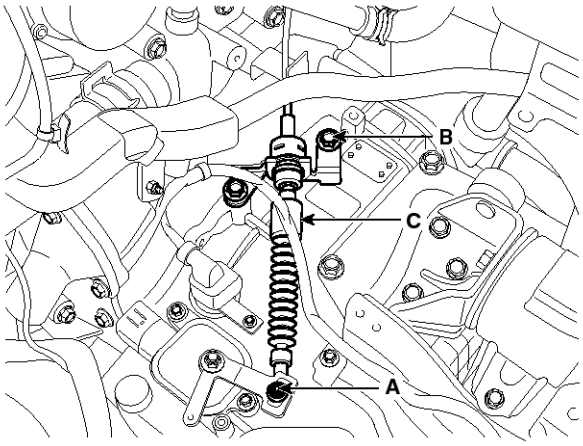
3. Disconnect the solenoid valve connector (A) and inhibitor switch connector (B).




STFAT1004N

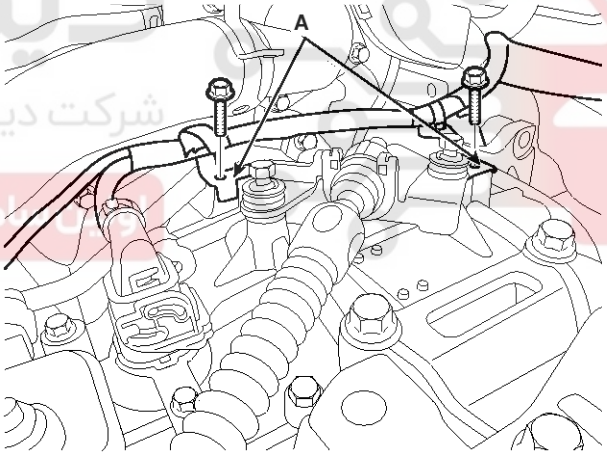
4. Remove the control cable (C) after removing the nut (A) and the bolt (B).

**Tightening torque:**
(A) 9.8 ~ 14.7 N.m (1.0 ~ 1.5 kgf.m, 7.2 ~ 10.8 lb-ft)
(B) 14.7 ~ 21.6 N.m(1.5 ~ 2.2 kgf.m, 10.9 ~ 15.9 lb-ft)



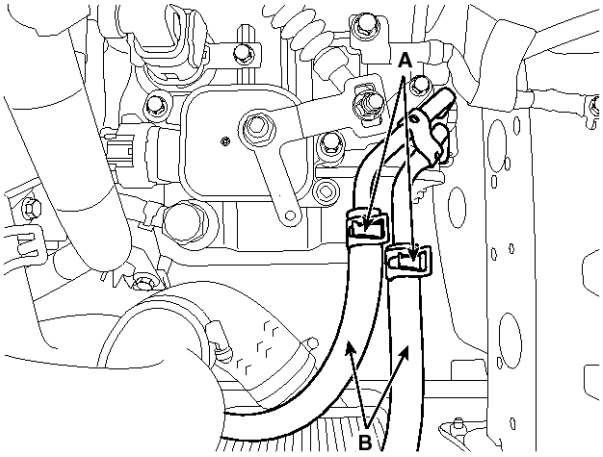

SLMAT0005D

5. Remove the solenoid valve connector and inhibitor switch connector wiring mounting bracket (A).



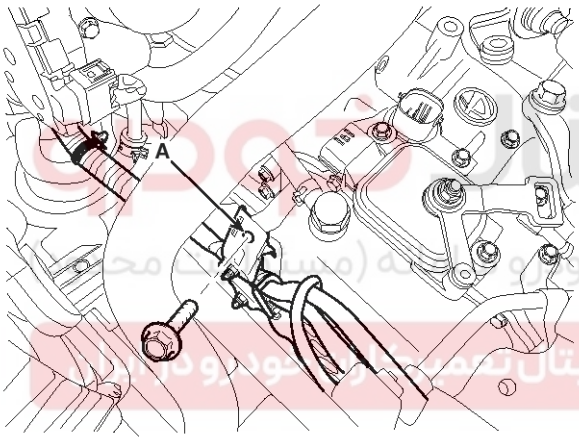

SSLAT0046D

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




SSLAT0042D

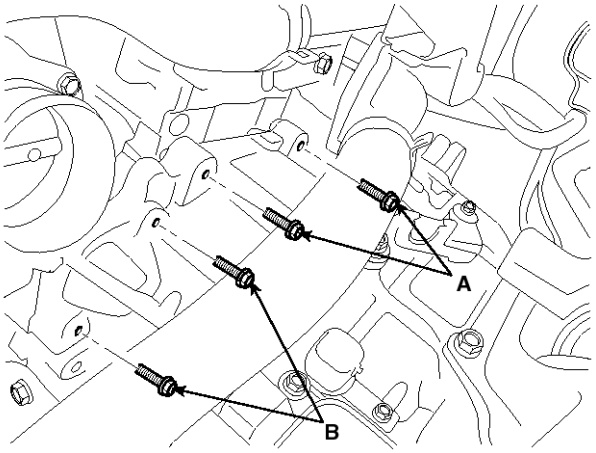
7. Remove the wiring bracket installation bolt (A).




STFAT1003D

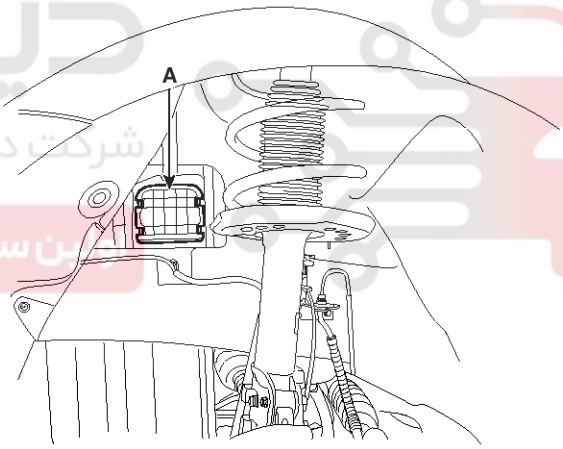
8. Remove the automatic transaxle upper mounting bolt (A-2ea) and the starter motor mounting bolt (B-2ea).

**Tightening torque:**
(A),(B): 42.2 ~ 54.0 N.m (4.3 ~ 5.5 kgf.m, 31.1 ~ 39.8 lb-ft)




SYFAT0001D

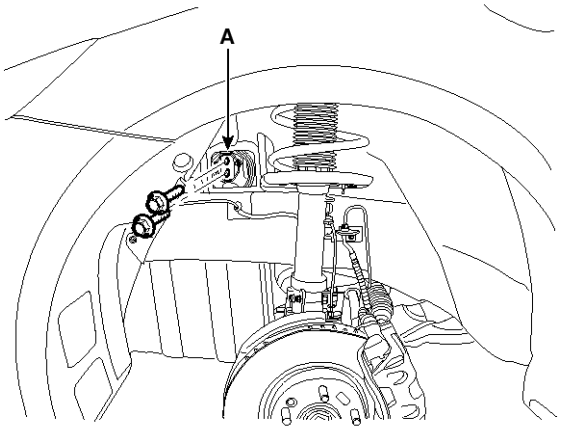
9. Remove the mounting cover (A).




STFAT1004D

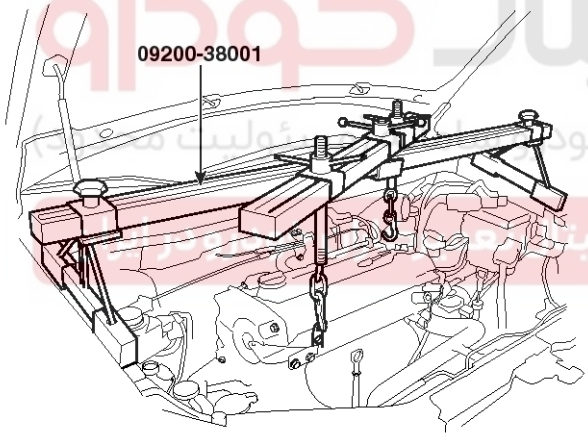
10. Remove the support bracket mounting bolts (A).

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




STFAT1005D

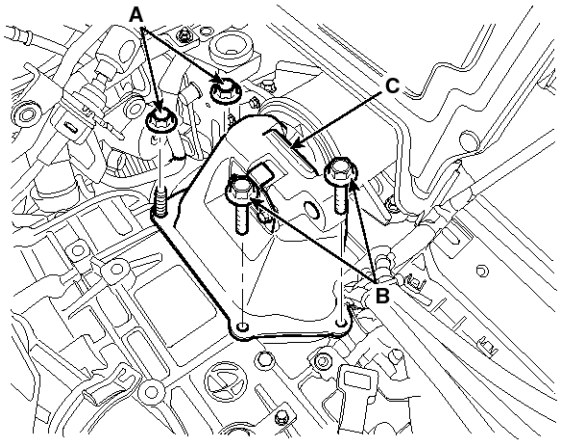
11. Using the engine support fixture (SST No.: 09200-38001), hold the engine and transaxle assembly safely.




SHDAA6002D

12. Remove the automatic transaxle mounting support bracket (C).

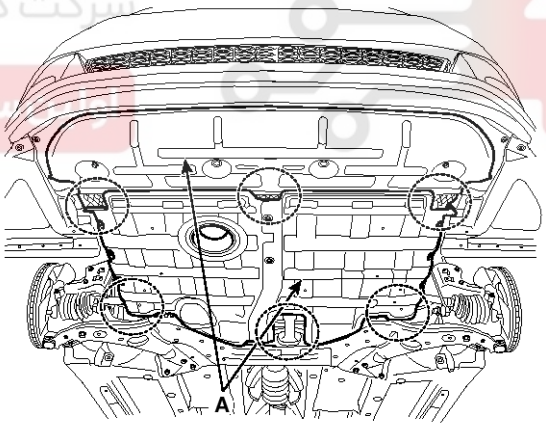
**Tightening torque:**
(A) 78.5 ~ 98.1 N.m (8.0 ~ 10.0 kgf.m, 57.9 ~ 72.3 lb-ft)
(B) 58.9 ~ 78.5 N.m (6.0 ~ 8.0 kgf.m, 43.4 ~ 57.9 lb-ft)




STFAT1006N

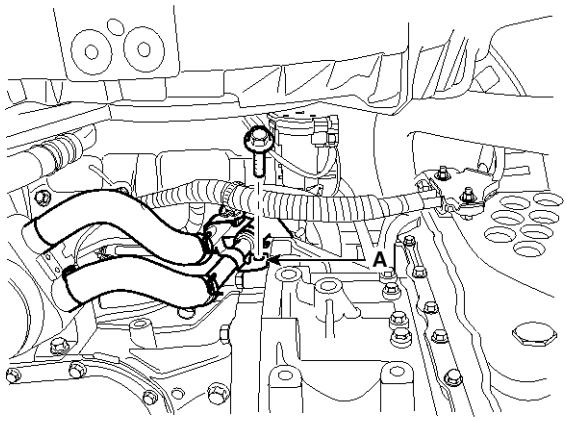
13. Lift the vehicle with a jack.
14. Remove the under cover (A).

**Tightening torque:**
7.8 ~ 11.8 N.m (0.8 ~ 1.2 kgf.m, 5.8 ~ 8.7 lb-ft)



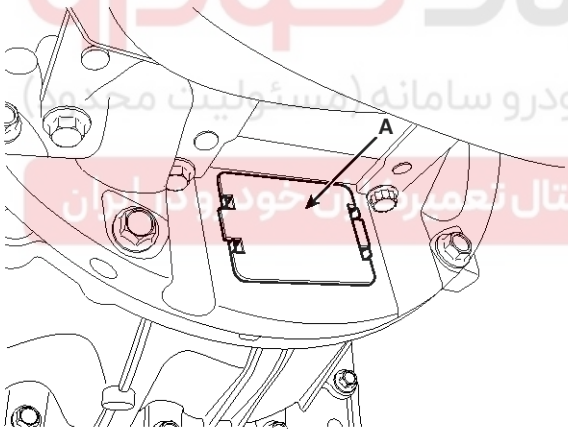

STFAT1007D

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




STFAT1008D

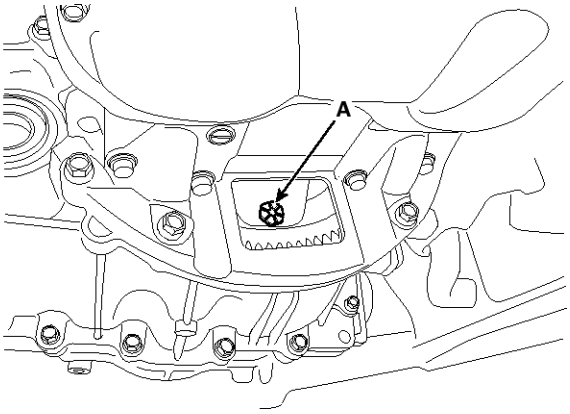
16. Remove the following items;
    - Sub frame assembly. (Refer to "Front suspension system" in SS group.)
    - Drive shaft assembly. (Refer to "Drive shaft assembly " in DS group.)
17. Remove the dust cover (A).




SYFAT0025D

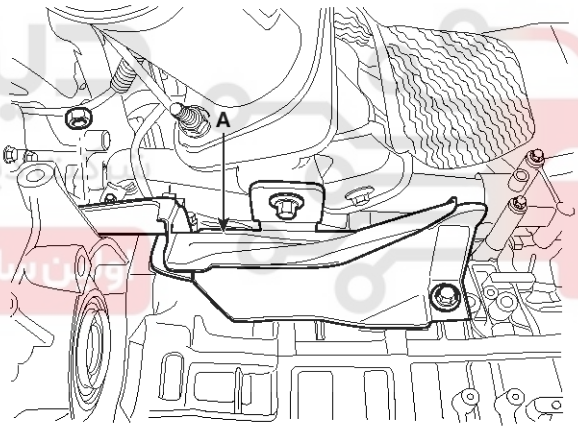
18. Remove the torque converter mounting bolt (A-4ea) with rotating the crankshaft.

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




SYFAT0004D

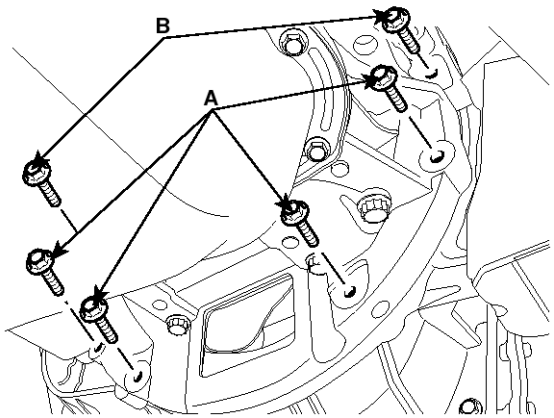
19. Remove the drive shaft cover mounting bolt (A).




STFAT1009D

20. Remove the automatic transaxle with a jack after removing the mounting bolt (A-4ea, B-2ea).

**Tightening torque:**
(A) 42.2 ~ 48.1 N.m (4.3 ~ 4.9 kgf.m, 31.1 ~ 35.4 lb-ft)
(B) 42.2 ~ 54.0 N.m (4.3 ~ 5.5 kgf.m, 31.1 ~ 39.8 lb-ft)




SYFAT0024D

## Installation

1. Installation is the reverse of removal.

**CAUTION**
**If the oil seal on the transaxle case side is damaged and fluid is leaking, replace the oil seal with a new unit. When installing the new oil seal, use the specialized tool (oil seal installer, 09453-3L240).**

**NOTICE**
*After replacement or reinstallation procedure of the automatic transaxle assembly, must perform procedures below.*

- *Adding automatic transaxle fluid. (Refer to "Hydraulic system (Fluid)" in this group)*
- *After servicing the automatic transaxle or TCM, clear the diagnostic trouble codes (DTC) using the GDS tool.*

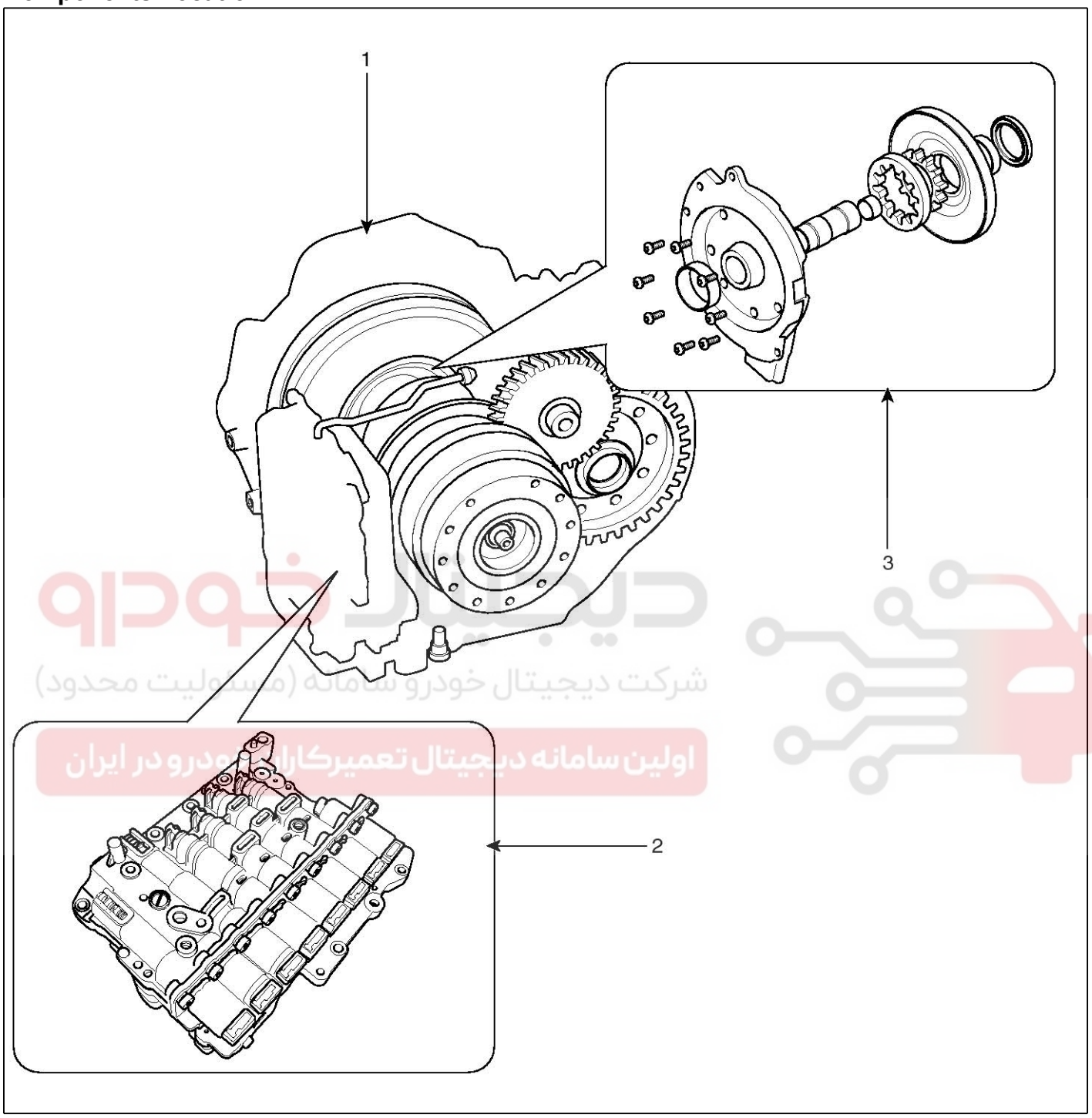
  *Diagnostic trouble codes (DTC) cannot be cleared by disconnecting the battery.*
- *When deleting diagnostic trouble code, use the GDS as possible.*
- *When replacing the automatic transaxle, reset the automatic transaxle's values by using the GDS.*
- *Perform TCM learning after replacing the transaxle to prevent slow transaxle response, jerky acceleration and jerky startup. (Refer to "Automatic transaxle control system (Repair procedures)" in this group)*

# Hydraulic System

## Description

The hydraulic system consists of oil, an oil filter, an oil pump, and a valve body (valves and solenoid valves). 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.

## Components Location



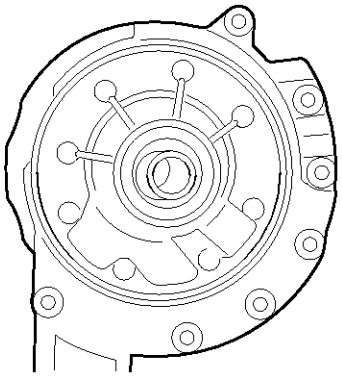

SSLAT0001D

1. Automatic transaxle
2. Valve body assembly
3. Oil pump assembly

## Oil Pump

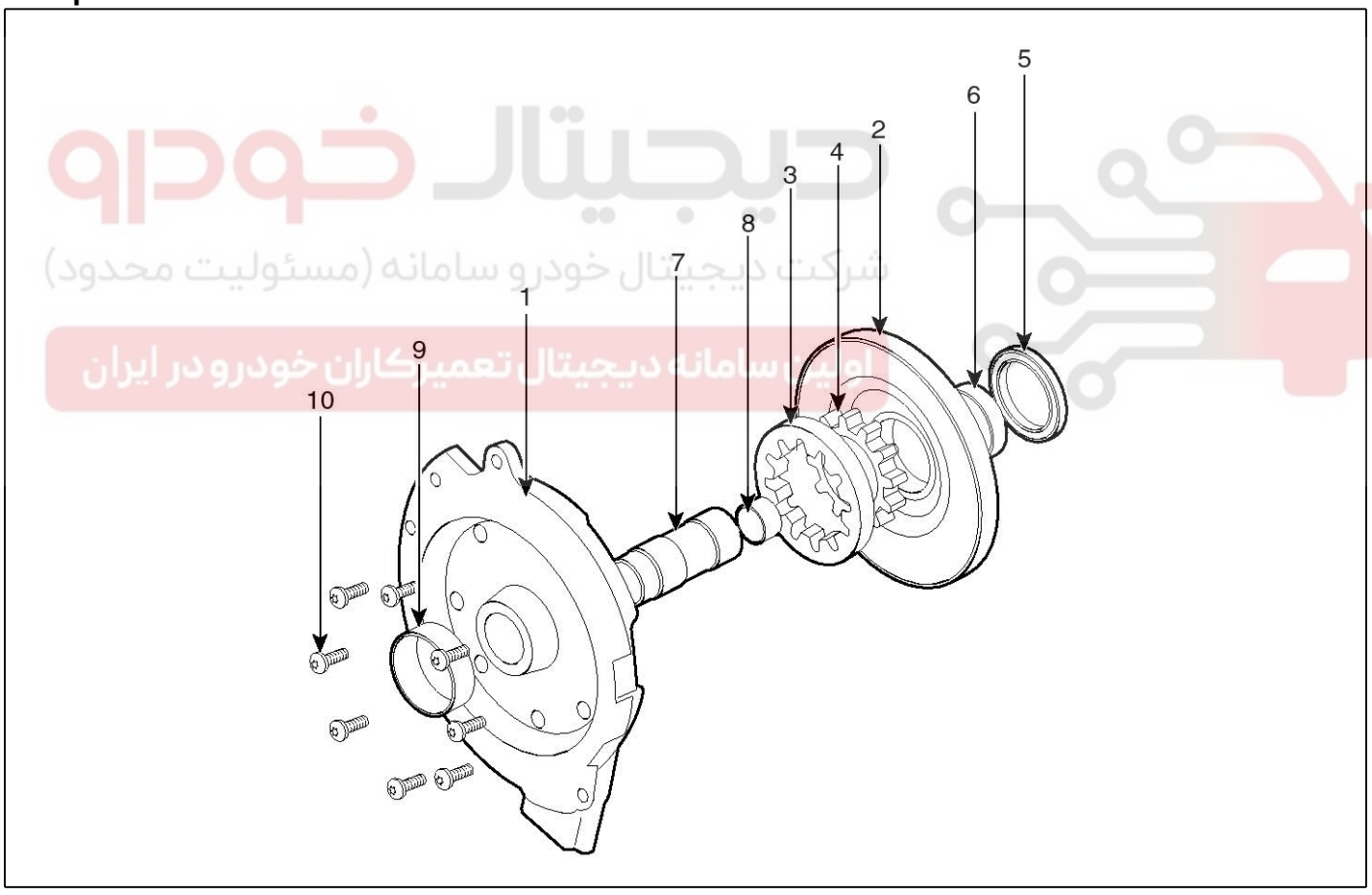
### Description

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.



SSLAT0101D

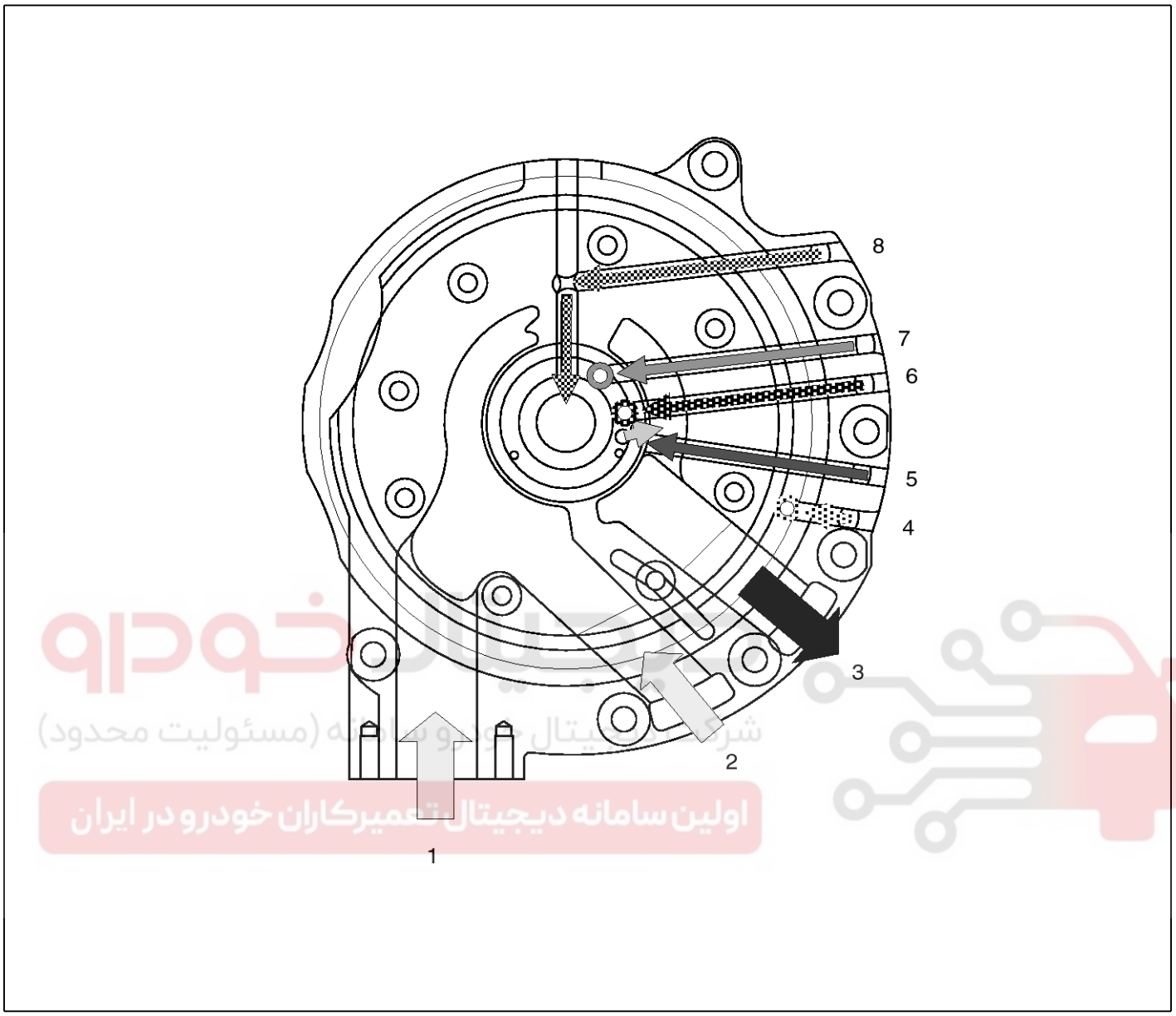
### Components




SSLAT0002D

1. Reaction shaft support assembly
2. Oil pump housing
3. Driven gear
4. Drive gear
5. Oil seal
6. Bushing-Housing
7. Reaction shaft
8. Bushing-Reaction shaft
9. Sleeve
10. Bolt

**Oil Pump Operation Flow**

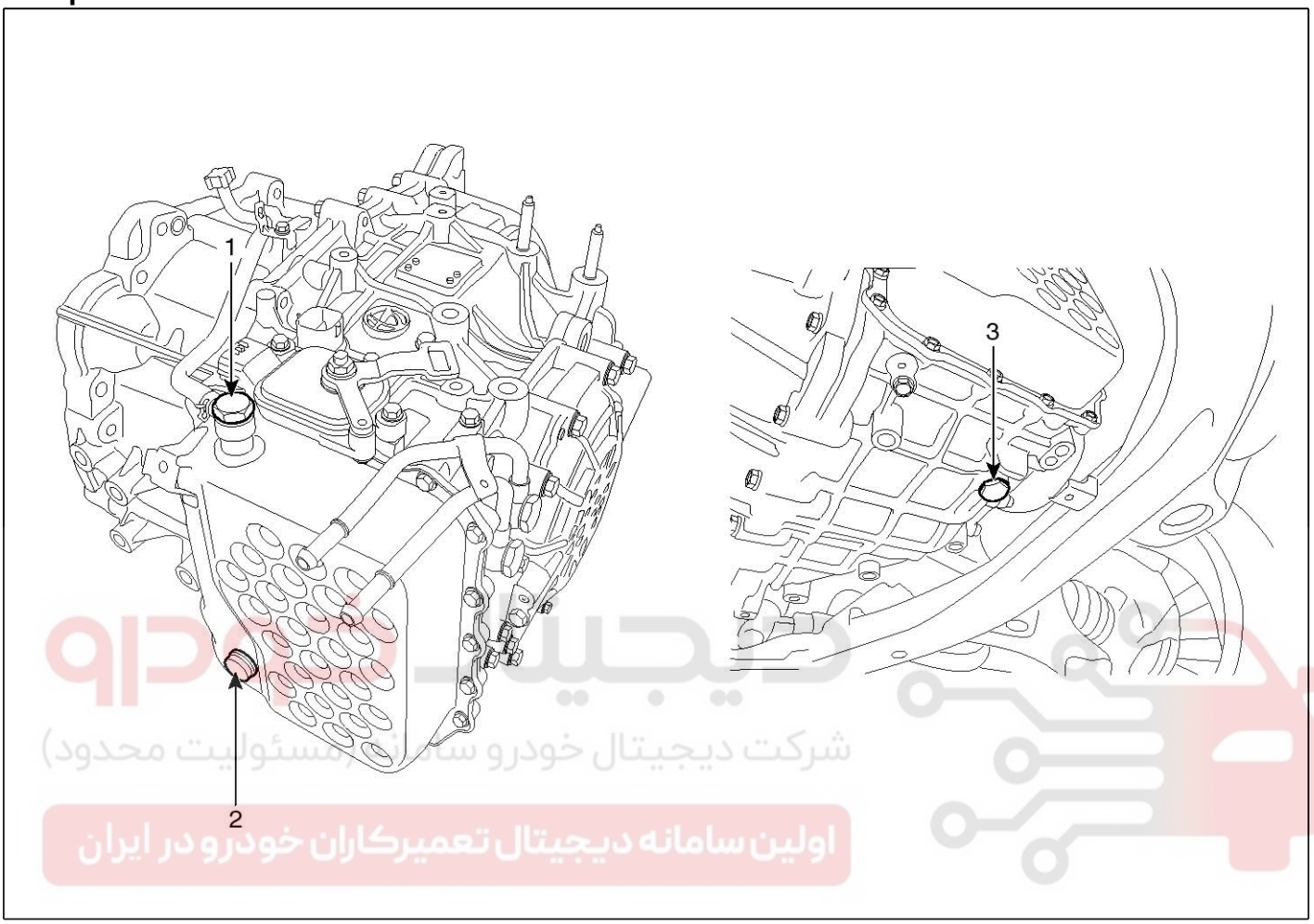



SSLAT0003D

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

## Fluid

### Components Location




STFAT1017D

1. Injection hole(eyebolt)
2. Oil level plug
3. Oil drain plug

## Service Adjustment Procedure

### Oil level Check

**NOTICE**

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

**CAUTION**

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

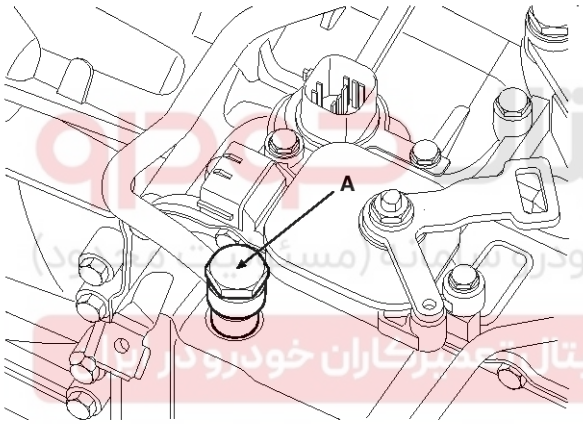
1. Remove the eyebolt (A).

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

**CAUTION**

**Always replace the gasket of the eyebolt use new one whenever loosening eyebolt.**

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



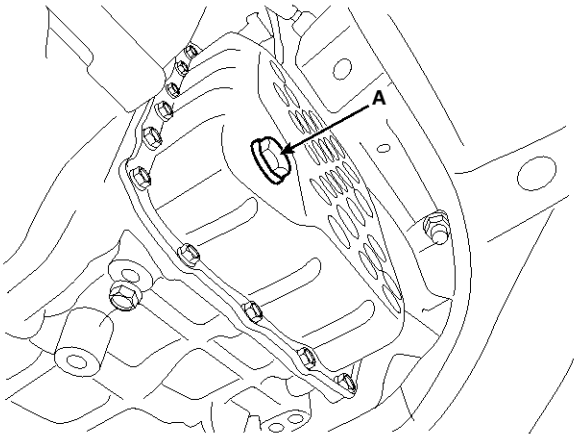

SLMAT0008D

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

**CAUTION**

**Keep on each speed position more than 2 sec.**

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




SVGAT0002D

**CAUTION**

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

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

   Then finish the procedure and tighten the oil plug.

**NOTICE**

*Oil level check (excess or shortage) method*

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

**CAUTION**

**If there is no damage at the automatic transaxle and the oil cooler, the oil cooler hose, transaxle case, valve body tightening state are normal,ATF must 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.**

**CAUTION**

**Replace the gasket of the oil level plug and use new one whenever loosening the oil level plug.**

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

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

## Replacement

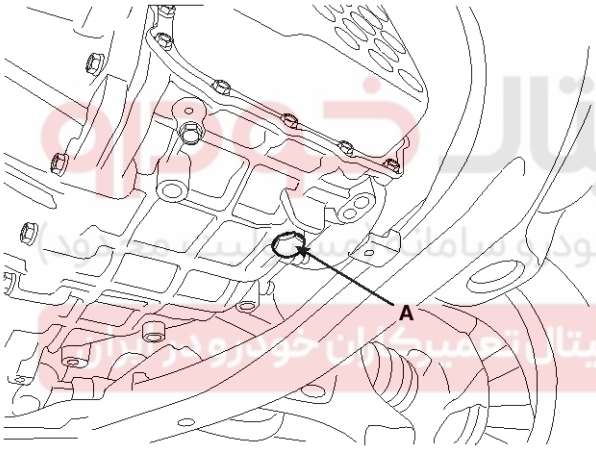
**NOTICE**

*ATF of 6 speed automatic transaxle doesn't need to be replaced. If the vehicle is used severely in business or personal use, replace ATF every 60,000 miles.*

*Severe usage is defined as*

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

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




SYFAT0003D

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

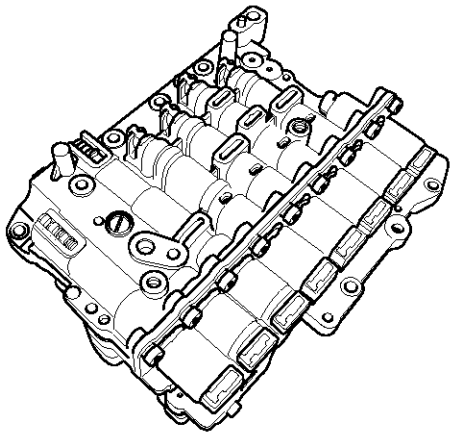
**CAUTION**
**The gasket of the drain plug use new one.**

2. Fill the oil about 5 liters through eyebolt.
3. Check the oil level. (Refer to "Hydraulic system (Fluid)" in this group)

## Valve Body

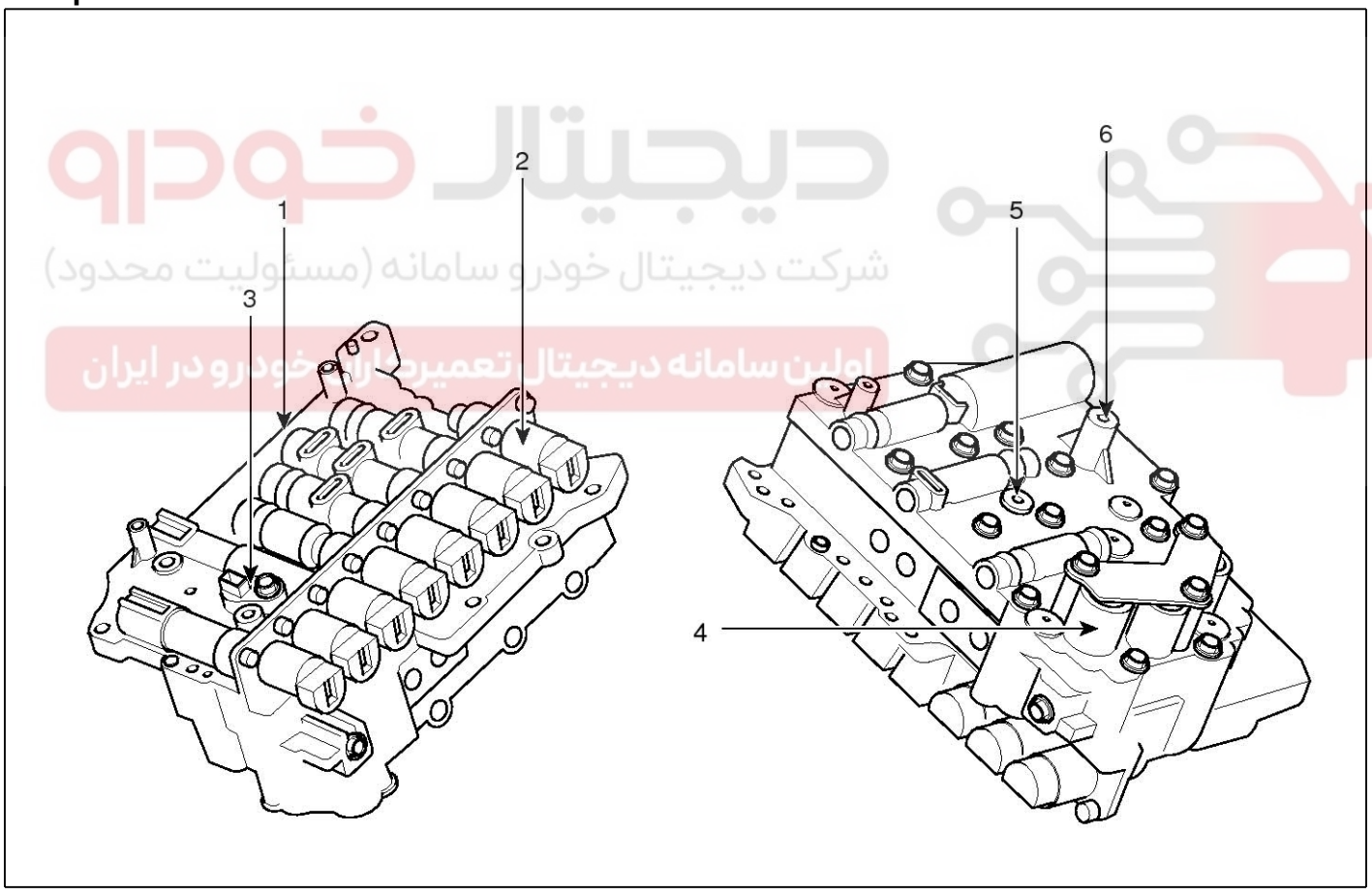
### Description

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.



SSLAT0103D

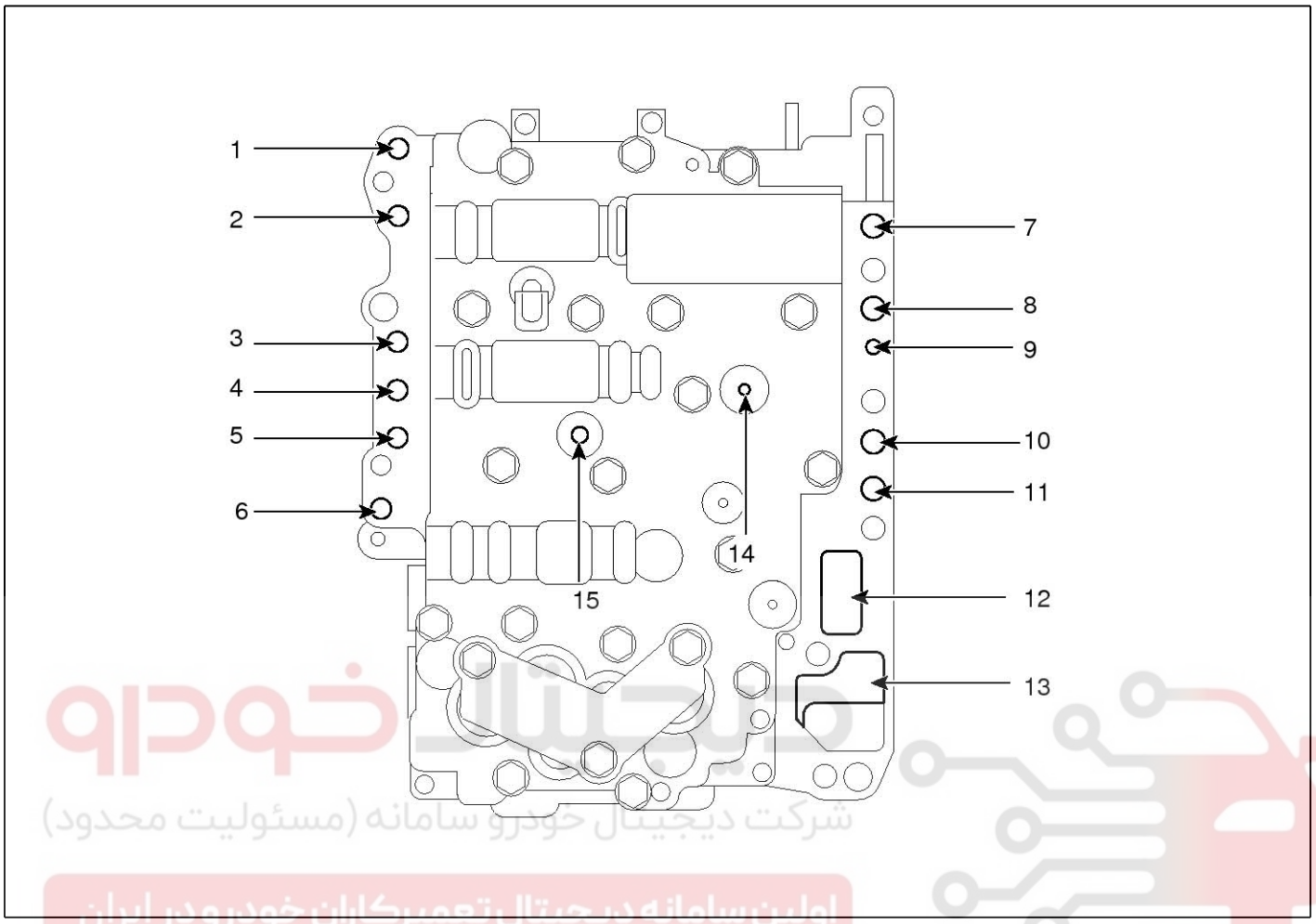
### Components Location




SSLAT0004D

1. PCV adjust screw
2. Solenoid valve
3. Oil temperature sensor
4. Accumulator
5. Low & reverse brake(LR/B) pressure flow hole
6. Under drive brake (UD/B) pressure flow hole

**Valve Body Flow**



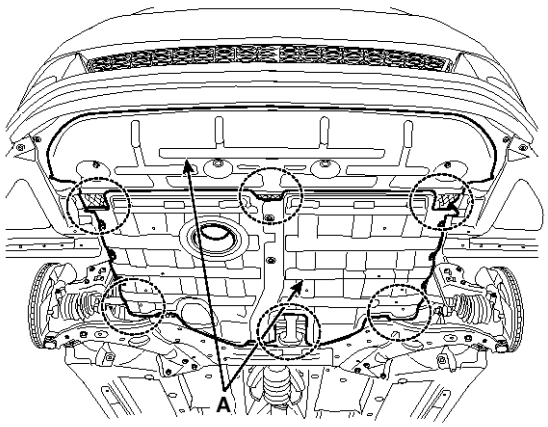

SSLAT0005D

1. To cooler
2. From cooler
3. Lubrication(rear)
4. Overdrive pressure
5. Reducing pressure (red2)
6. Reducing pressure (red1)
7. From damper pressure
8. To damper pressure
9. Lubrication(front)
10. 35R clutch pressure
11. 26 brake pressure
12. From oil pump
13. To oil pump
14. Underdrive pressure
15. Low & reverse pressure

## Removal

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

**Tightening torque:**
7.8 ~ 11.8 N.m (0.8 ~ 1.2 kgf.m, 5.8 ~ 8.7 lb-ft)

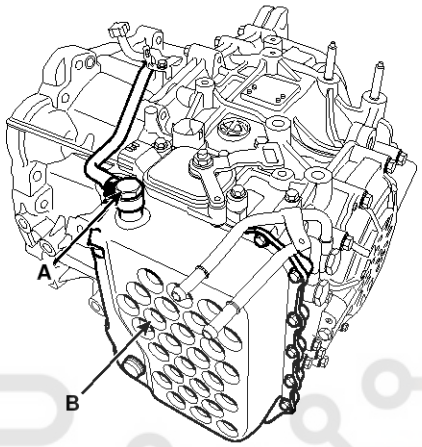



STFAT1007D

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

**Tightening torque:**
(A) 34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~ 32.6 lb-ft)
(B) 13.8 ~ 14.7 N.m (1.3 ~ 1.5 kgf.m, 9.4 ~ 10.8 lb-ft)

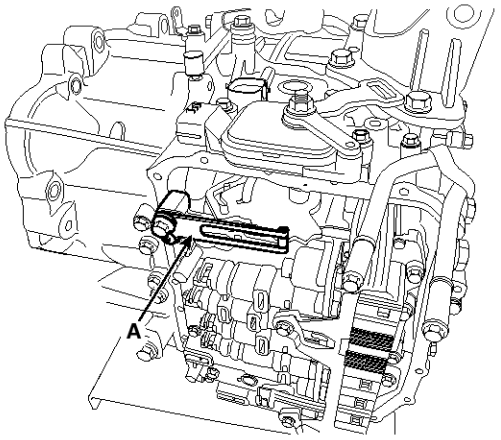
**⚠CAUTION**
**Always replace the gasket of the eyebolt use new one whenever loosening eyebolt.**




STFAT1018D

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

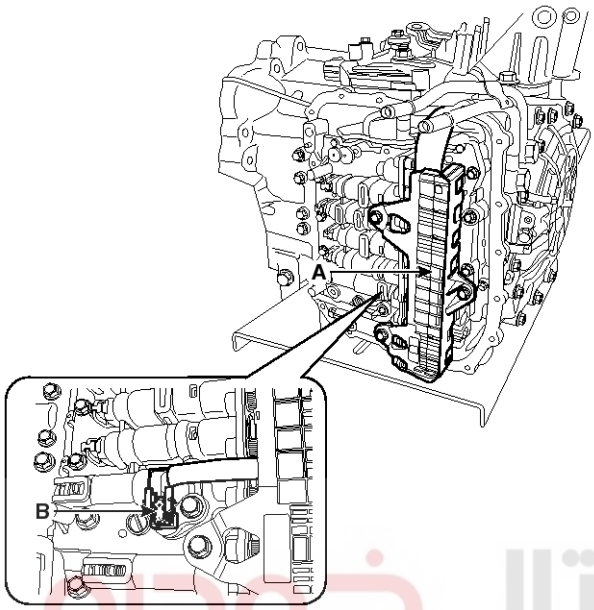
**Tightening torque:**
24.5 ~ 35.3 N.m (2.5 ~ 3.6 kgf.m, 18.1 ~ 26.0 lb-ft)




SLMAT0023D

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

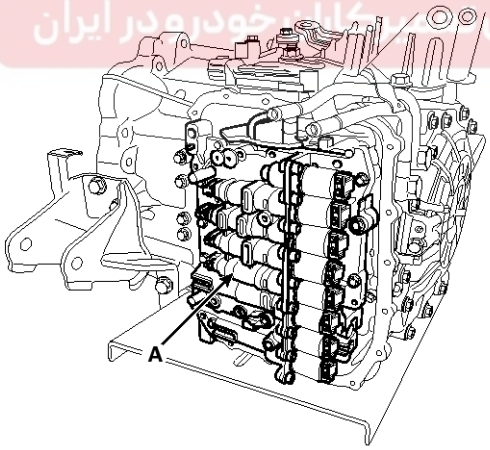
**Tightening torque:**
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)




SSLAT1112N

7. Remove the valve body assembly (A).

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




SCMAT0008L

## Installation

1. Installation is the reverse of removal.

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

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

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

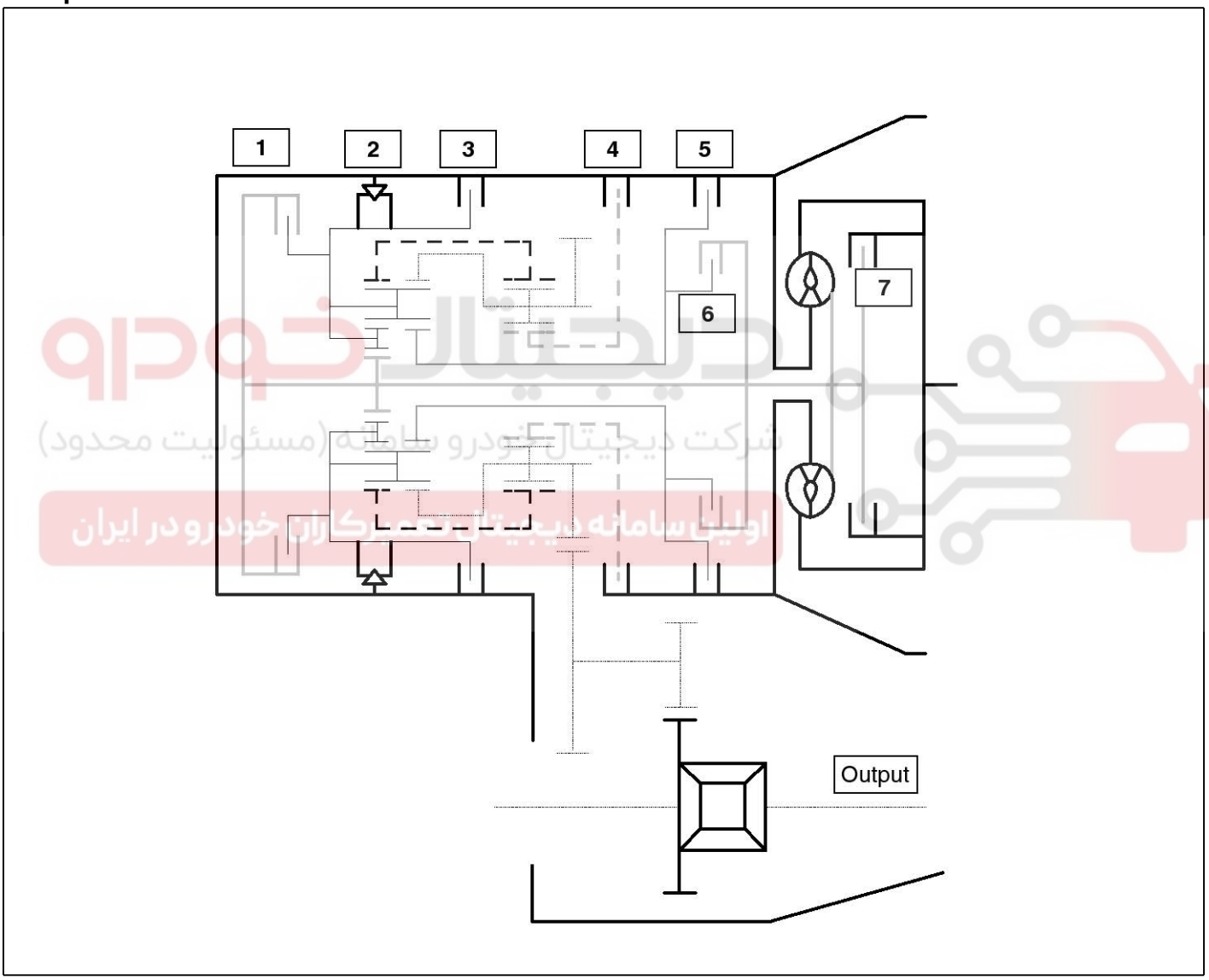
- *Adding automatic transaxle fluid. (Refer to "Hydraulic system (Fluid)" in this group)*
- *Perform TCM learning after replacing the valve body to prevent slow transaxle response, jerky acceleration and jerky startup. (Refer to "Automatic transaxle control system (Repair procedures)" in this group)*

# Clutch & Brake

## Description

The 6-spd 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.

## Components Location

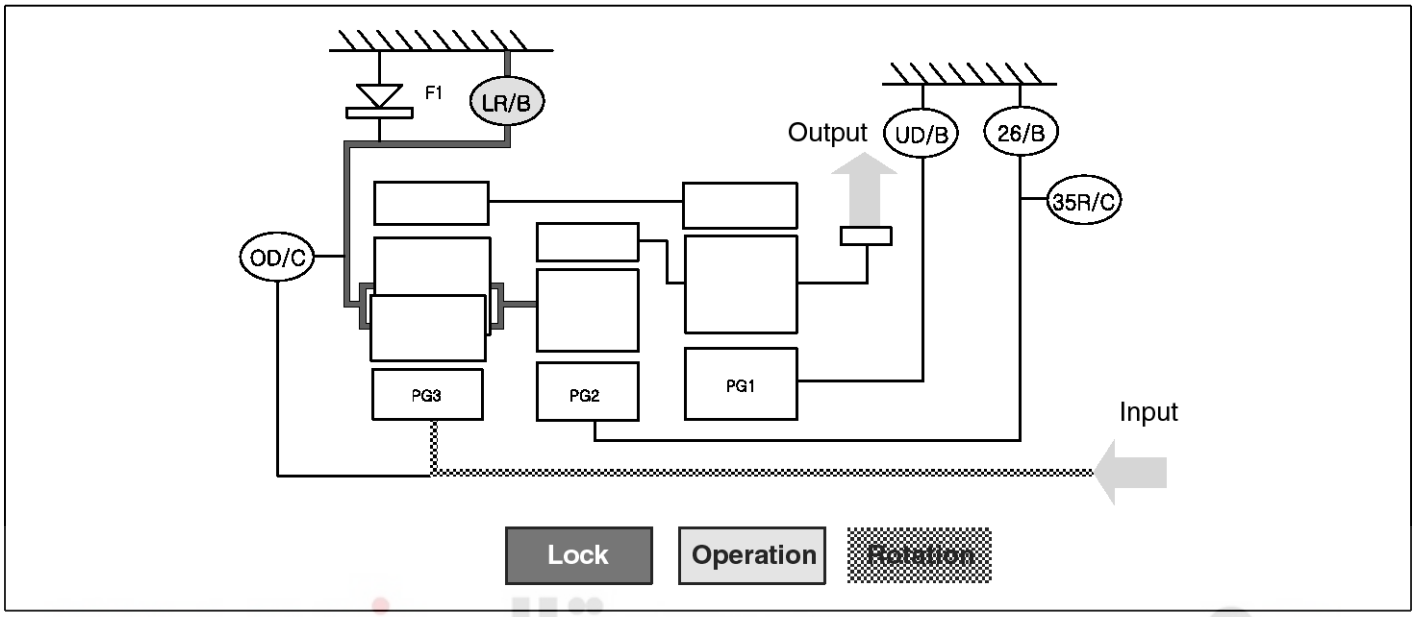



SSLAT1006N

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

## Power Flow Chart

| P,N | UD/B | LR/B | 26/B | 35R/C | OD/C | OWC |
|---|---|---|---|---|---|---|
| | | ● | | | | |




SSLAT1007N

▣ Direction of Rotation

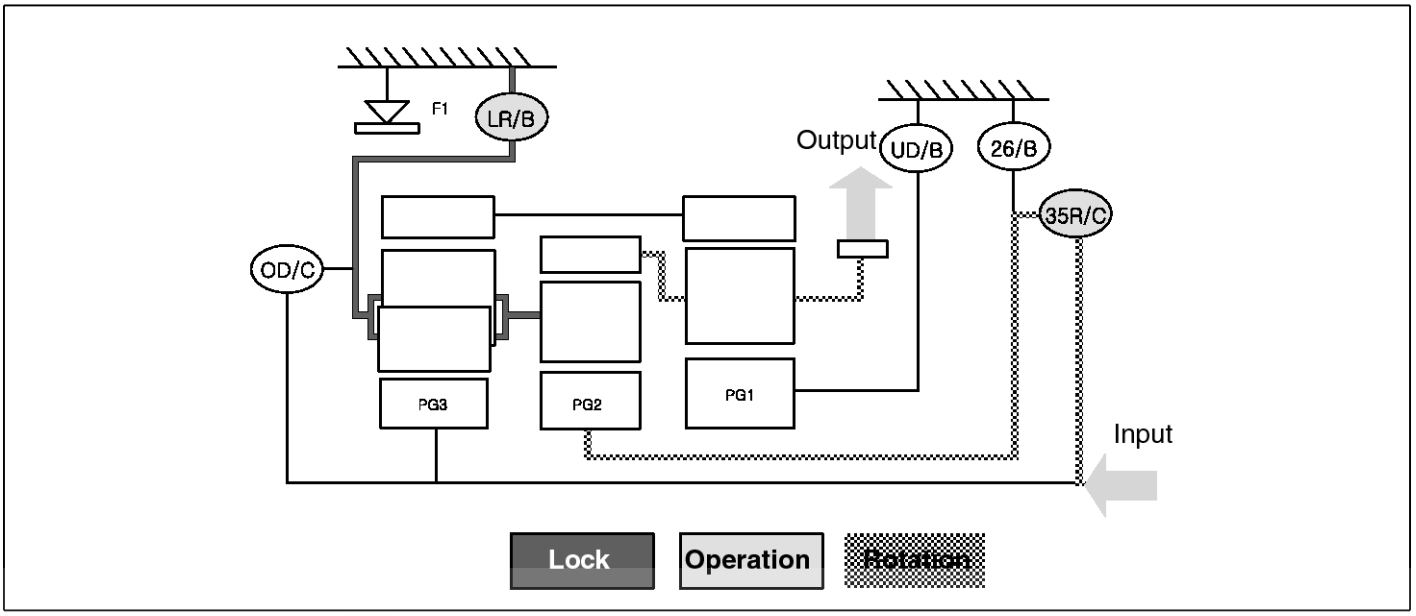
▶Lower & Reverse Brake (LR/B) Activation → Overdrive (O/D) Hub Lock → Mid & Rear P/C Lock

▶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 |
|---|---|---|---|---|---|---|
| | | ● | | ● | | |




SSLAT1008N

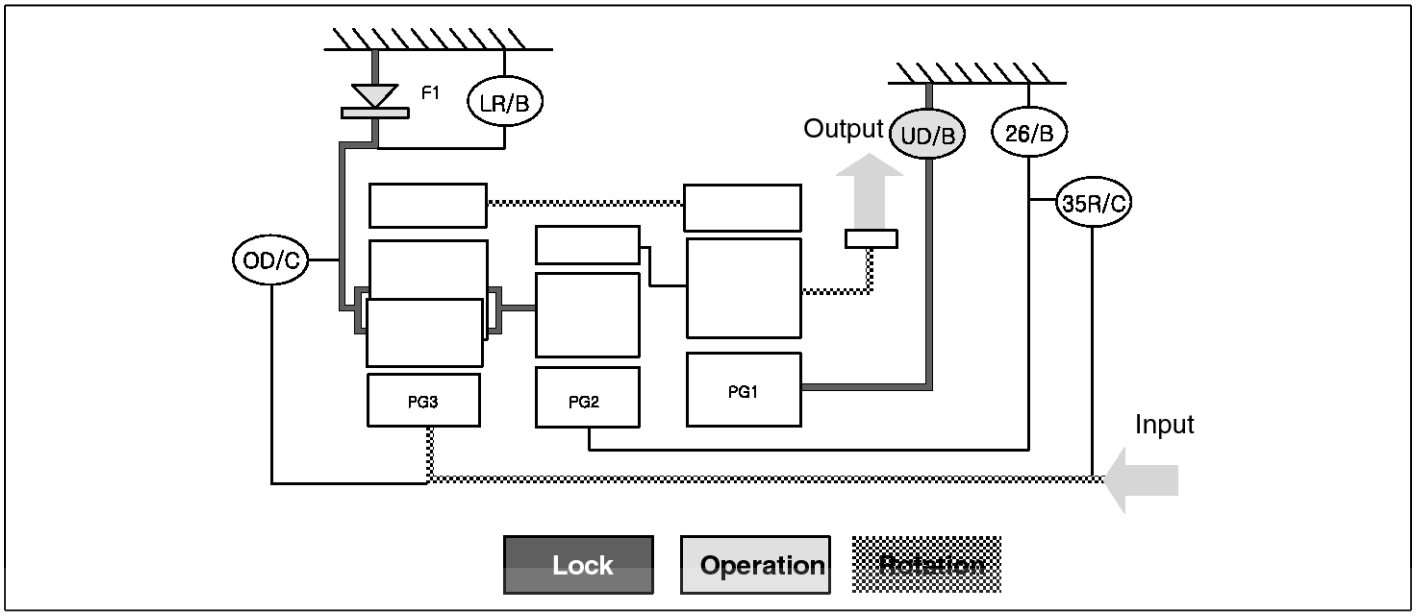
▣ Power Delivery Route

▶ 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 |
|---|---|---|---|---|---|---|
| | ● | (○) | | | | ● |




SSLAT1009N

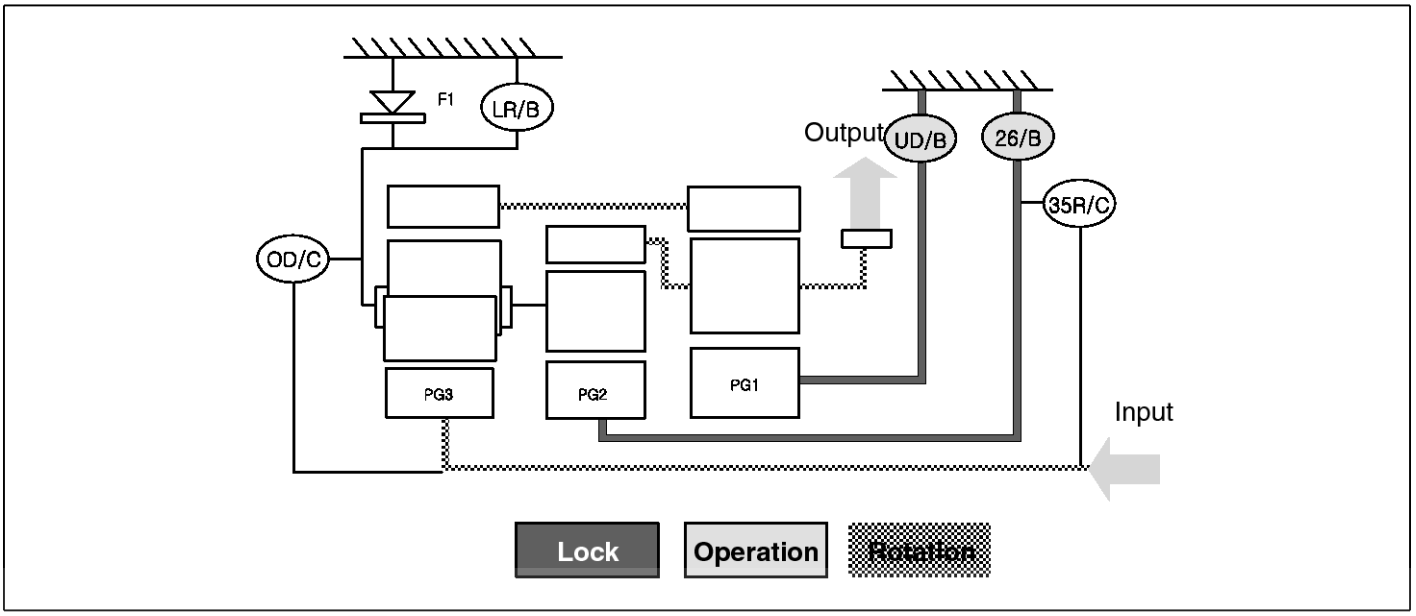
▣ Power Delivery Route

▶ 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 |
|---|---|---|---|---|---|---|
| | ● | | ● | | | |



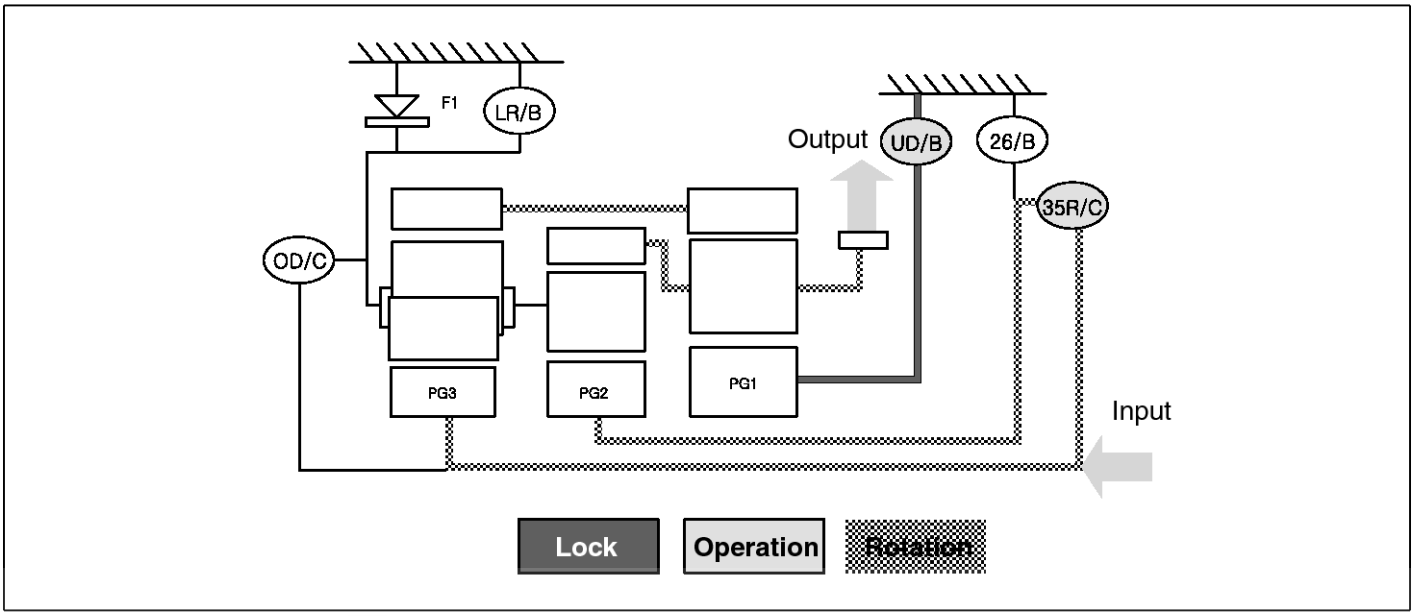

SSLAT1010N

▣ 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 |
|---|---|---|---|---|---|---|
| | ● | | | ● | | |



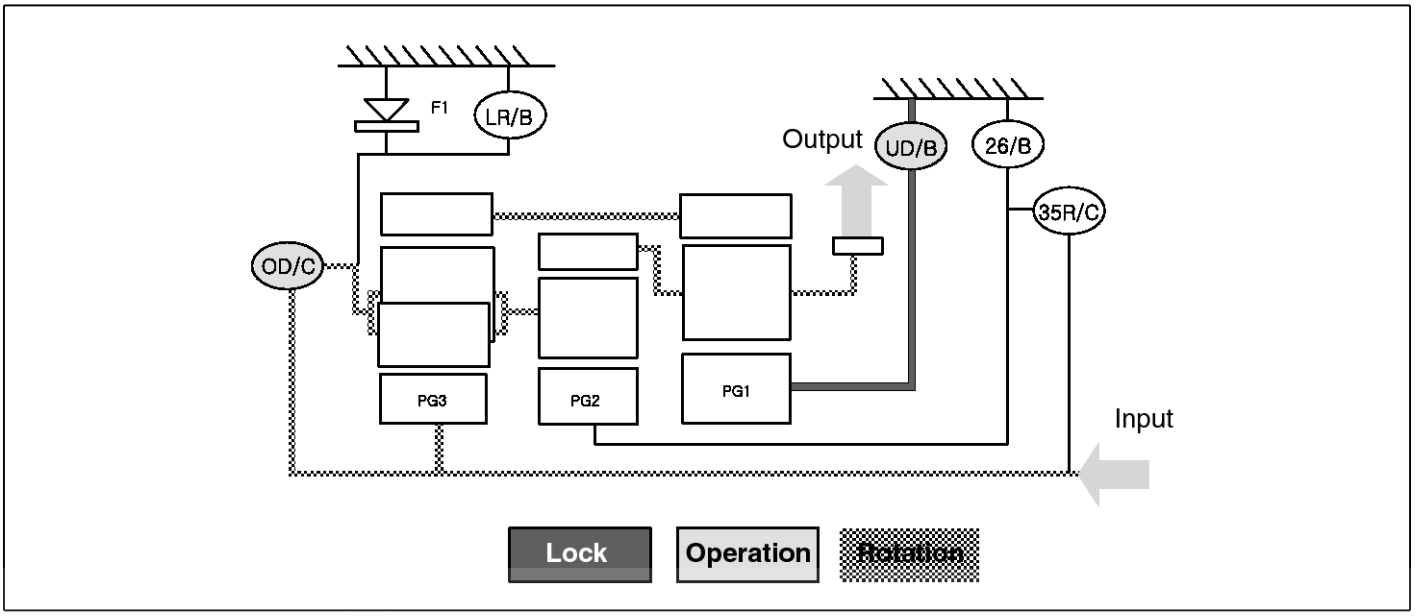

SSLAT1011N

▣ 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.

| | UD/B | LR/B | 26/B | 35R/C | OD/C | OWC |
|---|---|---|---|---|---|---|
| D4 | ● | | | | ● | |




SSLAT1012N

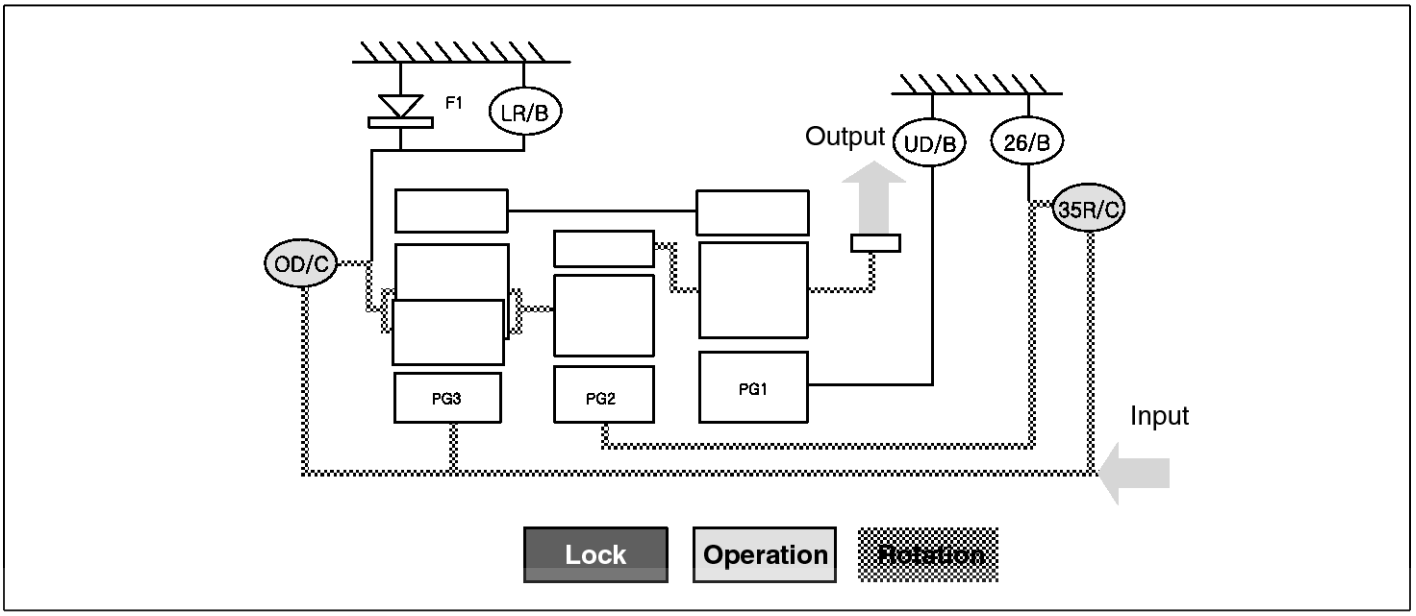
▣ Power Delivery Route

▶ 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 |
|---|---|---|---|---|---|---|
| | | | | ● | ● | |




SSLAT1013N

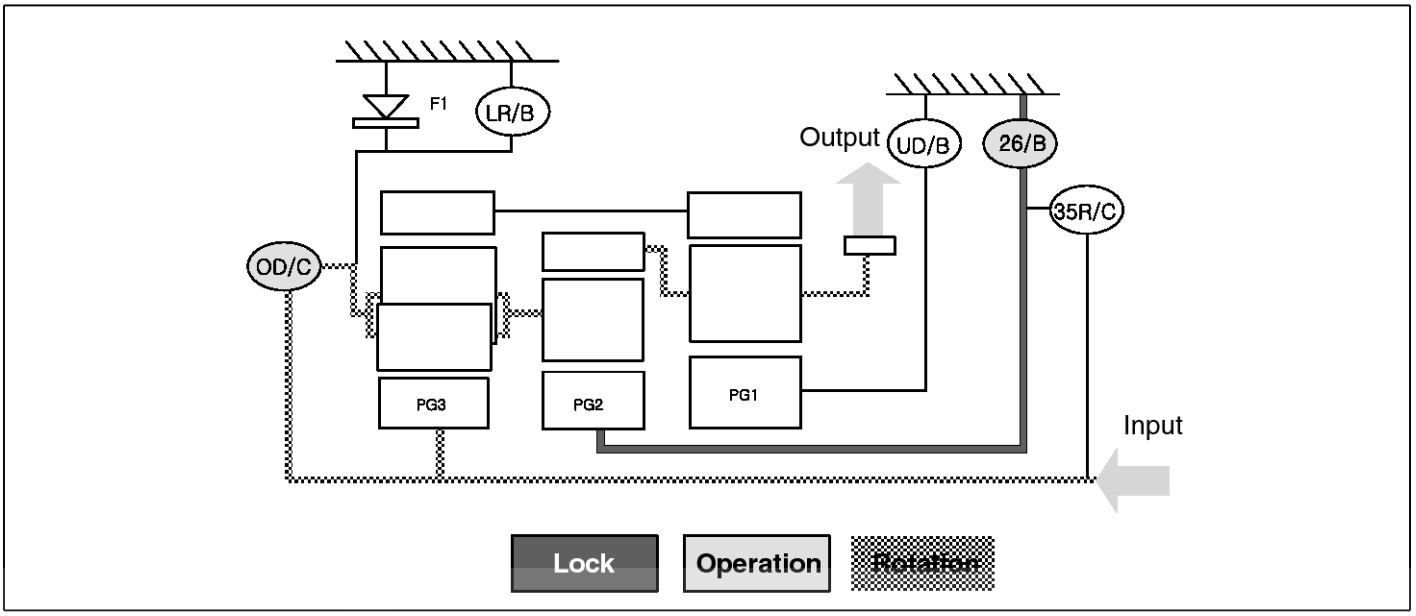
▣ Power Delivery Route

▶ 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 |
|---|---|---|---|---|---|---|
| | | | ● | | ● | |




SSLAT1014N

▣ 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.

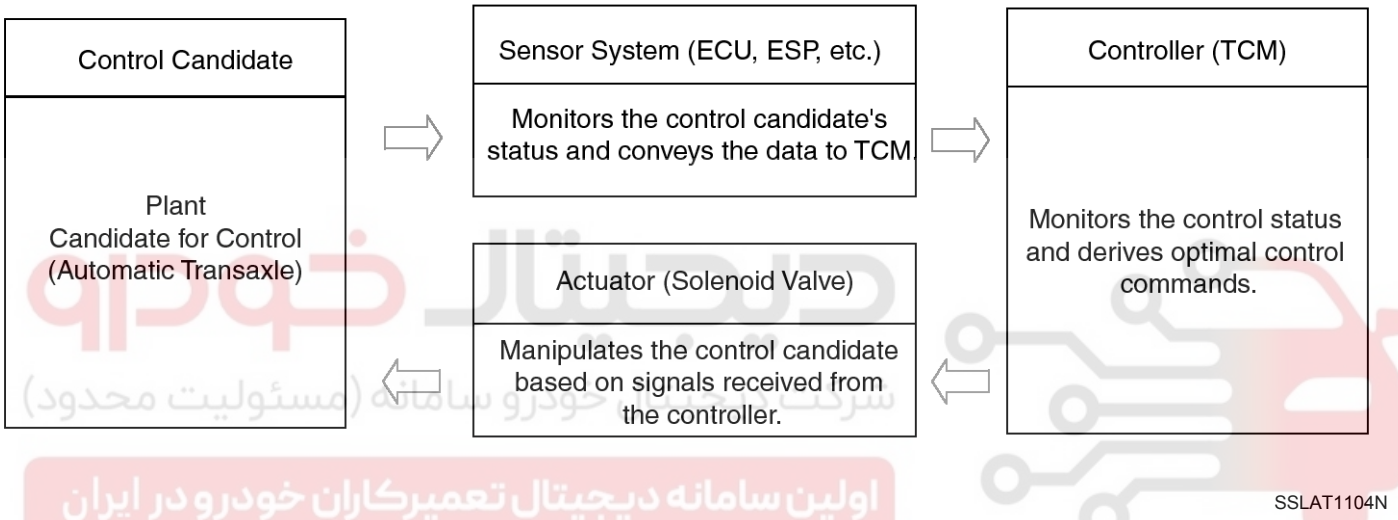
▶ Here, the rear planetary gear maintains a 1:1 rotation ratio as it would when 4th or 5th gear is engaged; however, the front planetary gear remains unrestrained and the front sun gear rotates at a faster rate in the normal direction and at zero load.

# Automatic Transaxle Control 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



## Fault Diagnosis

Features a fail-safe mechanism that prevents dangerous situations from developing in the event of a transaxle failure. The limp home mode engages if the transaxle malfunctions. In this mode, the transaxle operates at a minimal functionality level, making it possible for the vehicle to reach a service center.

Fail-Safe: Prevents dangerous situations from developing in the event of a malfunction.

Limp Home: Maintains minimal functionality (*) in the event of a malfunction, making it possible for the vehicle to reach a service center.

(*) Minimal Functionality: Drive (fixed gear setting), Reverse, and Neutral

## Self-diagnosis

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.**

**⚠CAUTION**

- **Before removing or installing any part, read the diagnostic trouble codes and then disconnect the battery negative (-) terminal.**
- **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 TCM.**
- **When checking the generator for the charging state, do not disconnect the battery '+' terminal to prevent the 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**
- **Diagnosis memory is erased if the battery or the TCM connector is disconnected. Do not disconnect the battery before the diagnostic trouble codes (DTC) are completely read and recorded.**

## 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.

**⚠CAUTION**

- **Perform TCM learning after replacing the automatic transaxle to prevent slow automatic transaxle response, jerky acceleration and jerky startup. (Refer to "Automatic transaxle control system (Repair procedures)" in this group)**
- **Adding automatic transaxle fluid. (Refer to "Hydraulic system (Fluid)" in this group)**
- **After servicing the automatic transaxle or TCM, clear the diagnostic trouble code (DTC) using the GDS tool. Diagnostic trouble codes (DTC) cannot be cleared by disconnecting the battery.**

## Adjustment

### TCM Learning

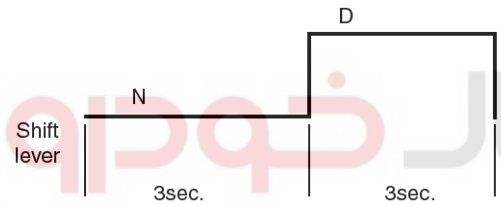
When shift shock is occurred or parts related with the transaxle are replaced, TCM learning should be performed.

In the following case, TCM learning is required.

- Transaxle assembly replacement
- TCM replacement
- TCM upgrading

1. TCM learning condition
   - ATF temperature: 40~100°C (104~212°F)
2. TCM learning procedure
   A. Stop learning

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




- Brake ON
- Throttle open: 0%

SVQAT0090L

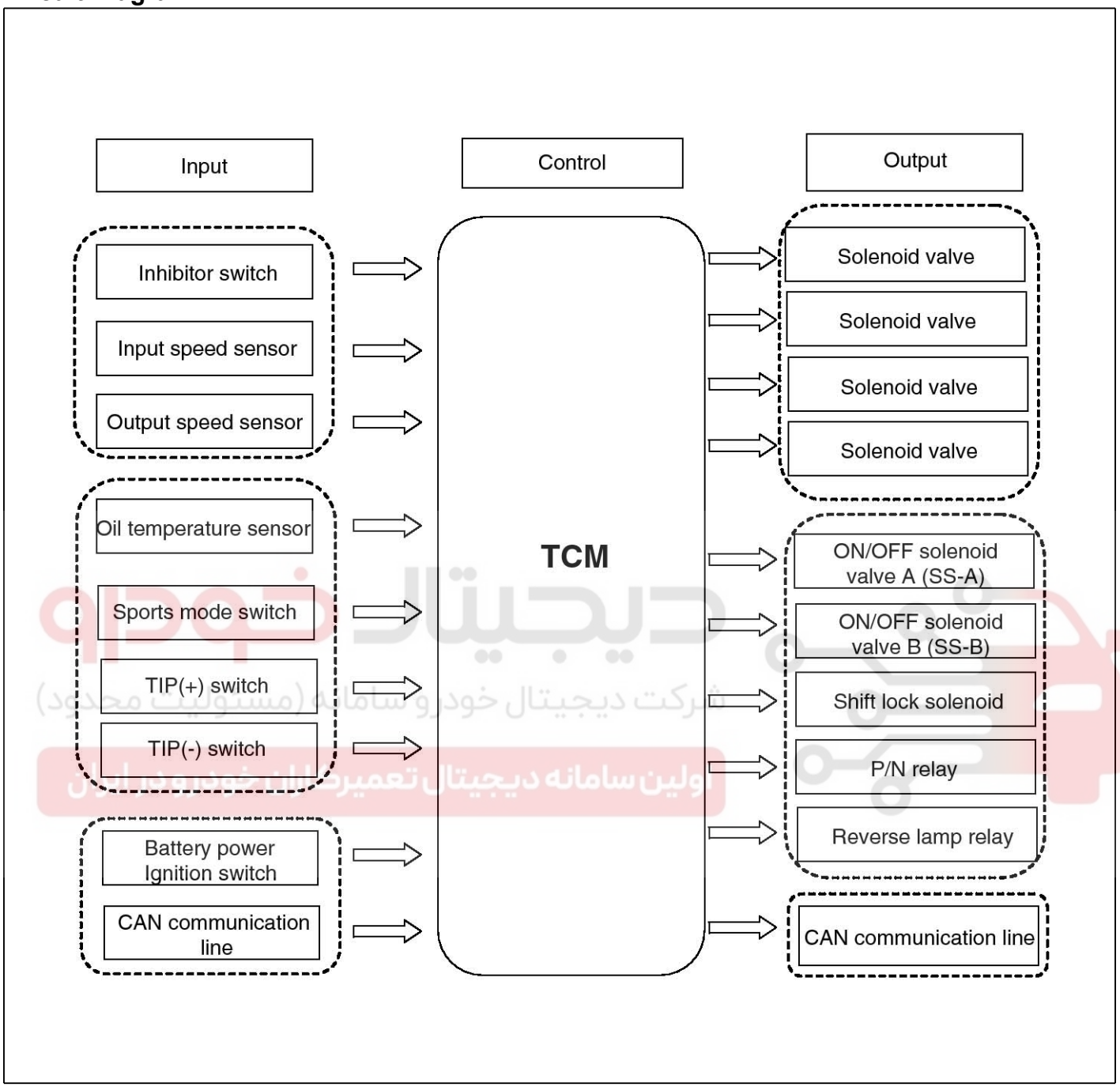


B. Driving learning

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

   Up-shift throttle open : 15~25%

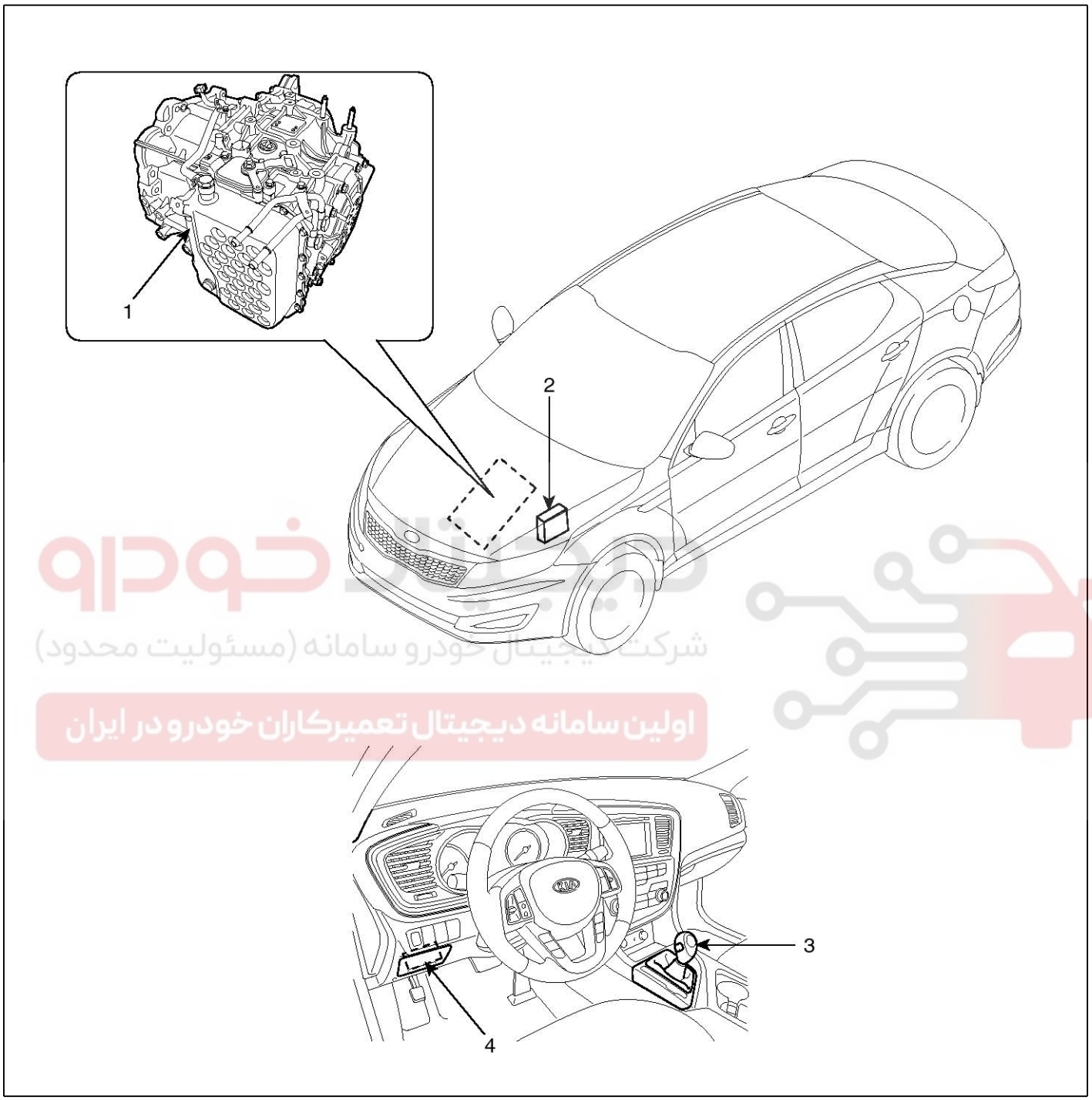
## Circuit Diagram




SSLAT1106N

## Components Location

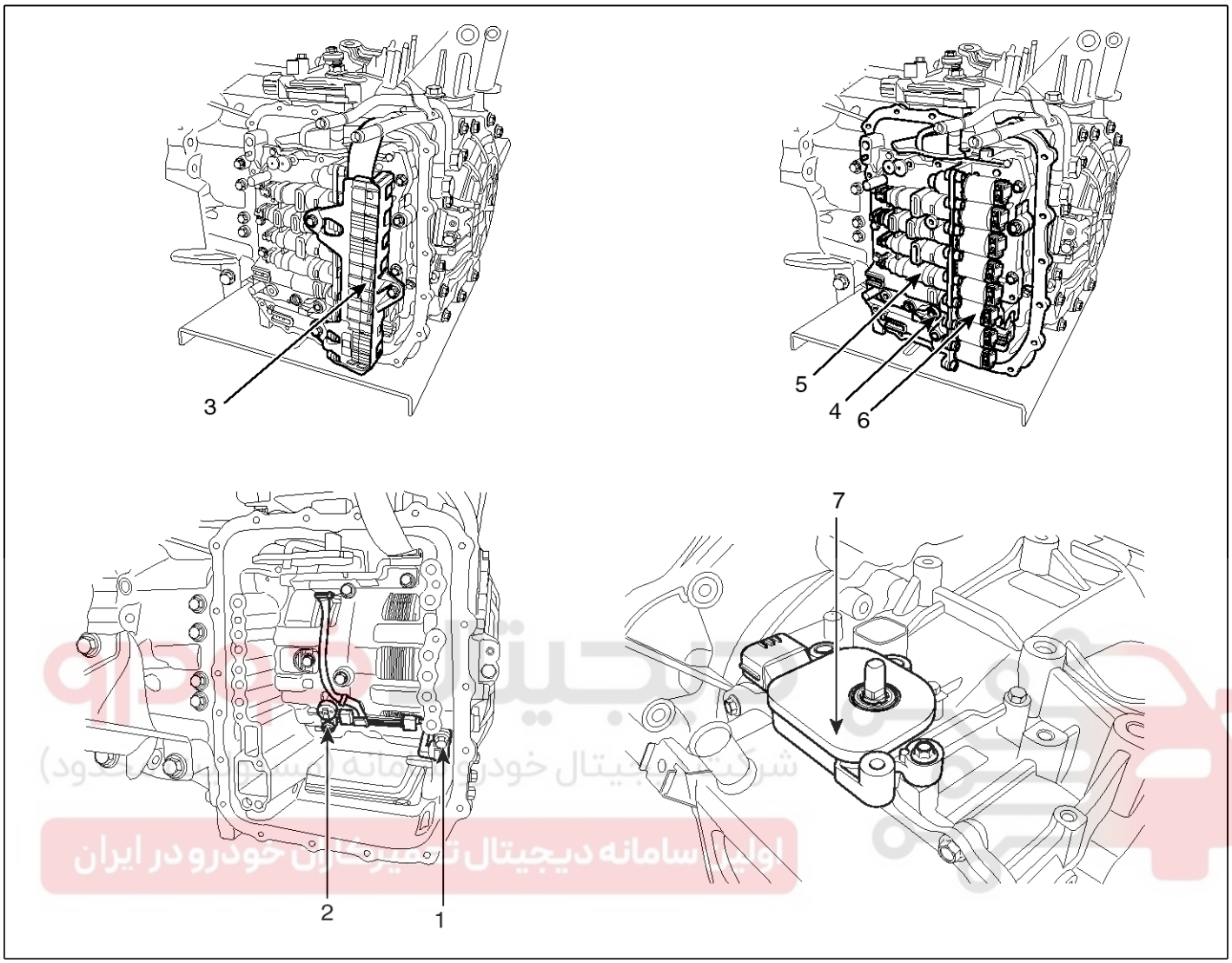
**[Vehicle Components]**




STFAT1019D

1. Automatic transaxle
2. Transaxle control module (TCM)
3. Shift lever
4. DLC

**[Transaxle Components]**




STFAT1026D

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

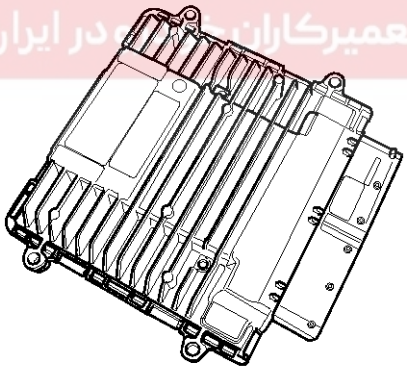
## Transaxle Control Module (TCM)

### Description

Transaxle Control Module (TCM) is the automatic transaxle's brain. The module receives and processes signals from various sensors and implements a wide range of transaxle controls to ensure optimal driving conditions for the driver. TCM is programmed for optimal response to any on-road situation. In the event of a transaxle failure or malfunction, TCM stores the fault information in memory so that the technician may reference the code and quickly repair the transaxle.

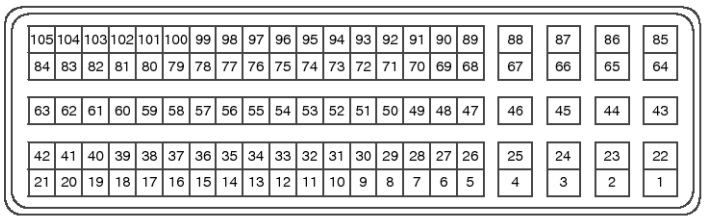
### Functions

- 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.

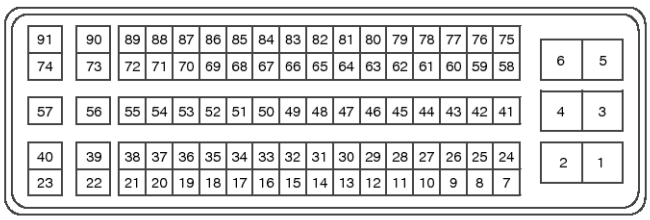


STFAT1015D

## 1. TCM Connector and Terminal Function




Connector [CHG-AG]




Connector [CHG-BG]

SYFFL0400N

## 2. TCM Terminal Function

### Connector [CHG-AG]

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | - | 54 | - |
| 2 | Line pressure control solenoid valve (LINE_VFS) | 55 | - |
| 3 | Torque converter control solenoid valve (T/CON_VFS) | 56 | - |
| 4 | 35R clutch control solenoid valve (35R/C_VFS) | 57 | - |
| 5 | - | 58 | - |
| 6 | - | 59 | - |
| 7 | Inhibitor switch signal "S1" | 60 | - |
| 8 | Inhibitor switch signal "S2" | 61 | - |
| 9 | Inhibitor switch signal "S3" | 62 | - |
| 10 | Inhibitor switch signal "S4" | 63 | - |
| 11 | - | 64 | - |
| 12 | - | 65 | ON/OFF solenoid valve B(SS-B) |
| 13 | - | 66 | ON/OFF solenoid valve B(SS-A) |
| 14 | - | 67 | Battery ($B^+$) |
| 15 | - | 68 | - |
| 16 | - | 69 | Oil temperature sensor ($^+$) |
| 17 | - | 70 | - |
| 18 | - | 71 | - |
| 19 | - | 72 | - |
| 20 | - | 73 | Output speed sensor signal |
| 21 | - | 74 | Sports mode up switch |
| 22 | - | 75 | - |
| 23 | Underdrive brake control solenoid valve (UD/B_V-FS) | 76 | - |
| 24 | 26 brake control solenoid valve (26/B_VFS) | 77 | - |

| Pin | Description | Pin | Description |
|---|---|---|---|
| 25 | Overdrive clutch control solenoid valve (OD/C_VF-S) | 78 | - |
| 26 | - | 79 | - |
| 27 | - | 80 | - |
| 28 | - | 81 | - |
| 29 | - | 82 | - |
| 30 | - | 83 | - |
| 31 | - | 84 | - |
| 32 | - | 85 | - |
| 33 | - | 86 | Solenoid supply power 1 |
| 34 | - | 87 | Solenoid supply power 2 |
| 35 | - | 88 | Battery ($B^+$) |
| 36 | - | 89 | - |
| 37 | - | 90 | Output speed sensor power |
| 38 | - | 91 | Input speed sensor power |
| 39 | - | 92 | - |
| 40 | - | 93 | - |
| 41 | - | 94 | Input speed sensor signal |
| 42 | - | 95 | Sports mode down switch |
| 43 | - | 96 | - |
| 44 | Ground (Power 1) | 97 | - |
| 45 | Ground (Power 2) | 98 | - |
| 46 | Shift lock solenoid | 99 | - |
| 47 | - | 100 | - |
| 48 | Oil temperature sensor (-) | 101 | - |
| 49 | - | 102 | - |
| 50 | - | 103 | - |
| 51 | - | 104 | - |
| 52 | Sports mode select switch | 105 | - |
| 53 | - | | |

## TCM Terminal Input/ Output Signal

### Connector [CHG-AG]

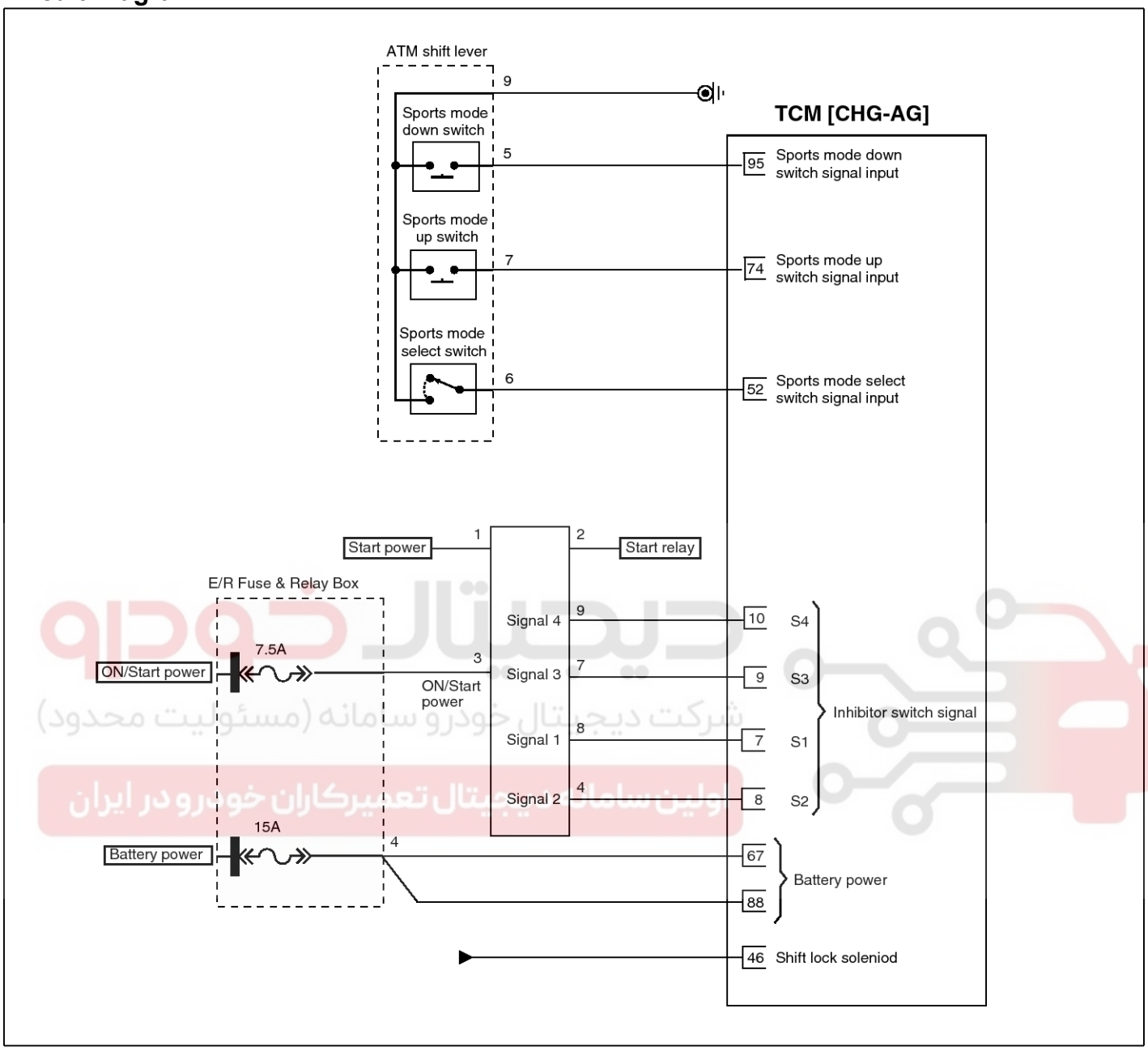
| Pin | Description | Condition | Input/output value | |
|---|---|---|---|---|
| | | | Type | Level |
| 1 | - | | | |
| 2 | Line pressure control solenoid valve (LINE_VFS) | | Output | 0V/Battery voltage level<br>9V < Battery voltage level < 16V |
| 3 | Torque converter control solenoid valve (T/CON_VFS) | | Output | 0V/Battery voltage level<br>9V < Battery voltage level < 16V |
| 4 | 35R clutch control solenoid valve (35R/C_VFS) | | Output | 0V/Battery voltage level<br>9V < Battery voltage level < 16V |
| 5 | - | | | |
| 6 | - | | | |
| 7 | Inhibitor switch signal "S1" | High<br>Low | Input | 0V/Battery voltage level<br>9V < Battery voltage level < 16V |
| 8 | Inhibitor switch signal "S2" | High<br>Low | Input | 0V/Battery voltage level<br>9V < Battery voltage level < 16V |
| 9 | Inhibitor switch signal "S3" | High<br>Low | Input | 0V/Battery voltage level<br>9V < Battery voltage level < 16V |
| 10 | Inhibitor switch signal "S4" | High<br>Low | Input | 0V/Battery voltage level<br>9V < Battery voltage level < 16V |
| 11 | - | | | |
| 12 | - | | | |
| 13 | - | | | |
| 14 | - | | | |
| 15 | - | | | |
| 16 | - | | | |
| 17 | - | | | |
| 18 | - | | | |
| 19 | - | | | |
| 20 | - | | | |
| 21 | - | | | |
| 22 | - | | | |
| 23 | Underdrive brake control solenoid valve (UD/B_VFS) | | Output | 0V/Battery voltage level<br>9V < Battery voltage level < 16V<br>Power supply : V_SOL2 |

| Pin | Description | Condition | Input/output value | |
|---|---|---|---|---|
| | | | Type | Level |
| 24 | 26 brake control solenoid valve (26/B_VFS) | | Output | 0V/Battery voltage level<br>9V < Battery voltage level < 16V<br>Power supply : V_SOL2 |
| 25 | Overdrive clutch control solenoid valve (OD/C_VFS) | | Output | 0V/Battery voltage level<br>9V < Battery voltage level < 16V<br>Power supply : V_SOL1 |
| 26 | - | | | |
| 27 | - | | | |
| 28 | - | | | |
| 29 | - | | | |
| 30 | - | | | |
| 31 | - | | | |
| 32 | - | | | |
| 33 | - | | | |
| 34 | - | | | |
| 35 | - | | | |
| 36 | - | | | |
| 37 | - | | | |
| 38 | - | | | |
| 39 | - | | | |
| 40 | - | | | |
| 41 | - | | | |
| 42 | - | | | |
| 43 | - | | | |
| 44 | Ground (Power 1) | | Ground | 0V |
| 45 | Ground (Power 2) | | Ground | 0V |
| 46 | Shift lock solenoid | High | Output | 0V/Battery voltage level |
| | | Low | | 9V < Battery voltage level < 16V |
| 47 | - | | | |
| 48 | Oil temperature sensor (-) | | Ground | 0V |
| 49 | - | | | |
| 50 | - | | | |
| 51 | - | | | |

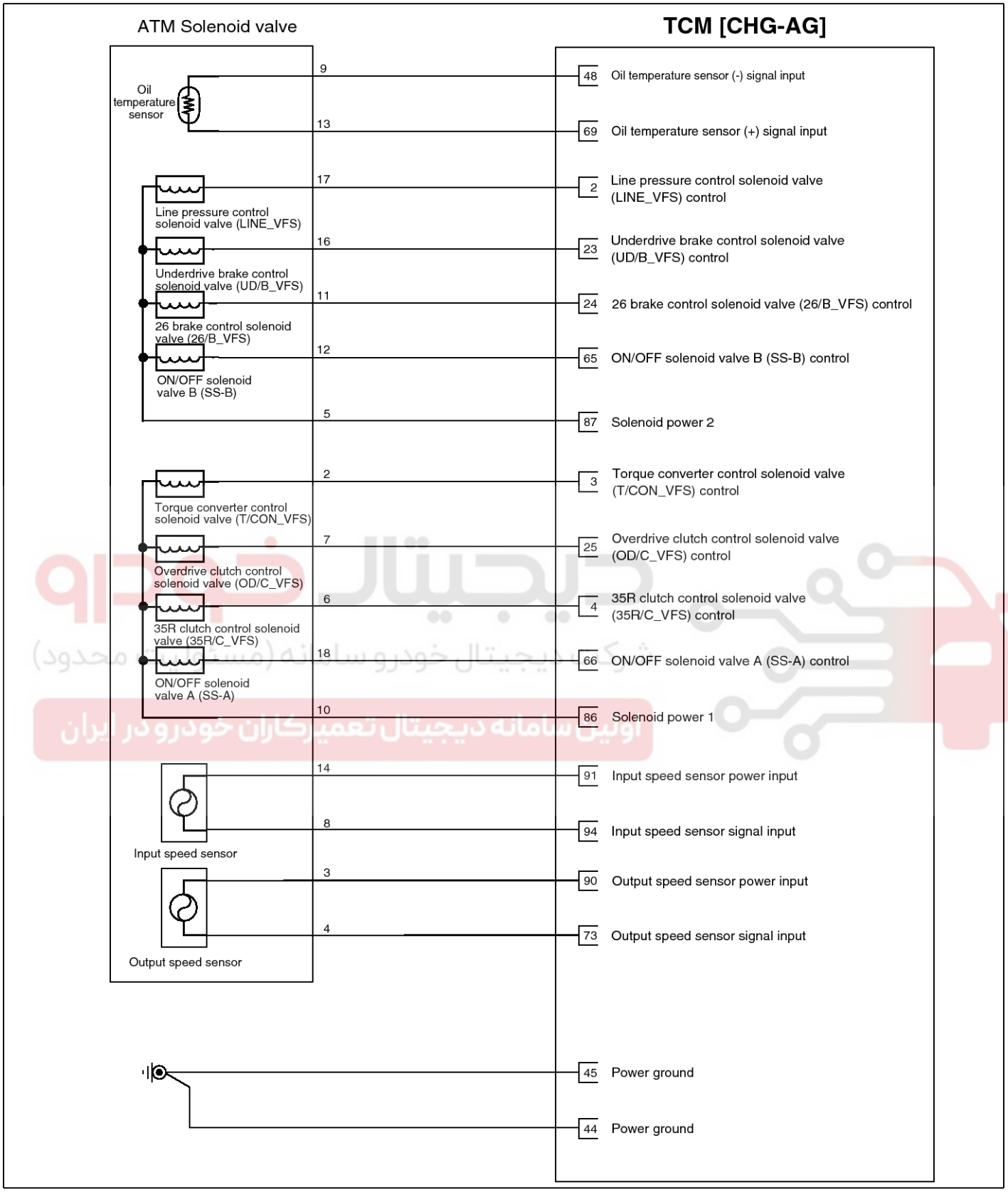
| Pin | Description | Condition | Input/output value | |
|---|---|---|---|---|
| | | | Type | Level |
| 52 | Sports mode select switch | Sport mode | Input | 0V/Battery voltage level |
| | | Other | | 9V < Battery voltage level < 16V |
| 53 | - | | | |
| 54 | - | | | |
| 55 | - | | | |
| 56 | - | | | |
| 57 | - | | | |
| 58 | - | | | |
| 59 | - | | | |
| 60 | - | | | |
| 61 | - | | | |
| 62 | - | | | |
| 63 | - | | | |
| 64 | - | | | |
| 65 | ON/OFF solenoid valve B(SS-B) | High | Output | 0V/Battery voltage level |
| | | Low | | 9V < Battery voltage level < 16V |
| 66 | ON/OFF solenoid valve A (SS-A) | High | Output | 0V/Battery voltage level |
| | | Low | | 9V < Battery voltage level < 16V |
| 67 | Battery power ($B^+$) | ON | Power | 0V/Battery voltage level |
| | | OFF | | 9V < Battery voltage level < 16V |
| 68 | - | | | |
| 69 | Oil temperature sensor (+) | ON | Input | 0V/3.3V |
| | | OFF | | |
| 70 | - | | | |
| 71 | - | | | |
| 72 | - | | | |
| 73 | Output speed sensor signal | High | Input | 0.7V/1.4V |
| | | Low | | |
| 74 | Sports mode up switch | Up ON | Input | 0V/Battery voltage level |
| | | Other | | 9V < Battery voltage level < 16V |
| 75 | - | | | |
| 76 | - | | | |
| 77 | - | | | |
| 78 | - | | | |

| Pin | Description | Condition | Input/output value | |
|---|---|---|---|---|
| | | | Type | Level |
| 79 | - | | | |
| 80 | - | | | |
| 81 | - | | | |
| 82 | - | | | |
| 83 | - | | | |
| 84 | - | | | |
| 85 | - | | | |
| 86 | Solenoid supply power 1 | ON | Power | 0V/Battery voltage level |
| | | OFF | | 9V < Battery voltage level < 16V |
| 87 | Solenoid supply power 2 | ON | Power | 0V/Battery voltage level |
| | | OFF | | 9V < Battery voltage level < 16V |
| 88 | Battery power (B+) | ON | Power | 0V/Battery voltage level |
| | | OFF | | 9V < Battery voltage level < 16V |
| 89 | - | | | |
| 90 | Output speed sensor power | ON | Power | 0V/7.5V |
| | | OFF | | |
| 91 | Input speed sensor power | ON | Power | 0V/7.5V |
| | | OFF | | |
| 92 | - | | | |
| 93 | - | | | |
| 94 | Input speed sensor signal | High | Input | 0.7V/1.4V |
| | | Low | | |
| 95 | Sports mode down switch | Down ON | Input | 0V/Battery voltage level |
| | | Other | | 9V < Battery voltage level < 16V |
| 96 | - | | | |
| 97 | - | | | |
| 98 | - | | | |
| 99 | - | | | |
| 100 | - | | | |
| 101 | - | | | |
| 102 | - | | | |
| 103 | - | | | |
| 104 | - | | | |
| 105 | - | | | |

## Circuit Diagram




STFAT1107N




STFAT1108N

## Inspection

### TCM Problem Inspection Procedure

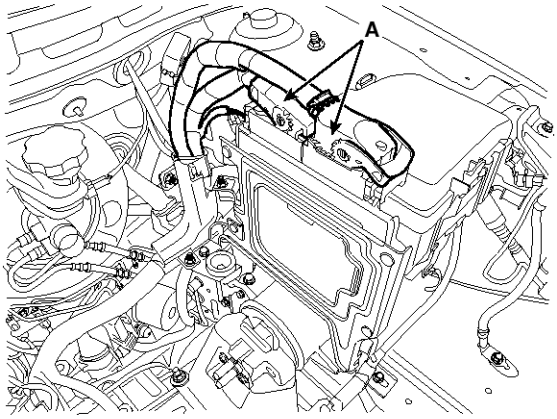
1. TEST TCM GROUND CIRCUIT: Measure resistance between TCM and chassis ground using the backside of TCM harness connector as TCM side check point. If the problem is found, repair it.

**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).

## Replacement

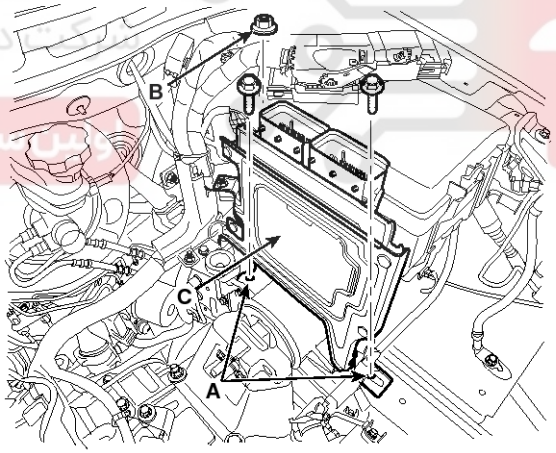
1. Turn ignition switch OFF.
2. Disconnect the negative (-) battery cable.
3. Disconnect the TCM connector (A).




STFAT1010D

4. Remove the TCM (C) after removing the mounting bolts (A) and nut (B).

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




STFAT1011D

## Installation

1. Installation is reverse of removal.

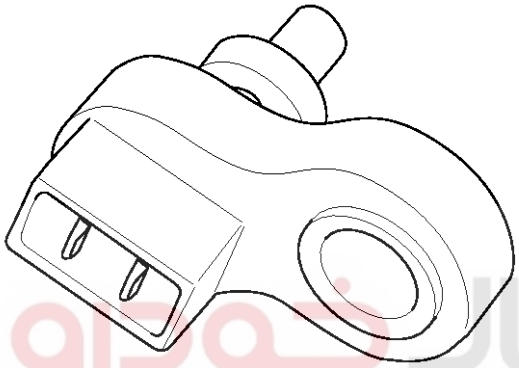
**NOTICE**

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

## Transaxle Oil Temperature Sensor

### 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.

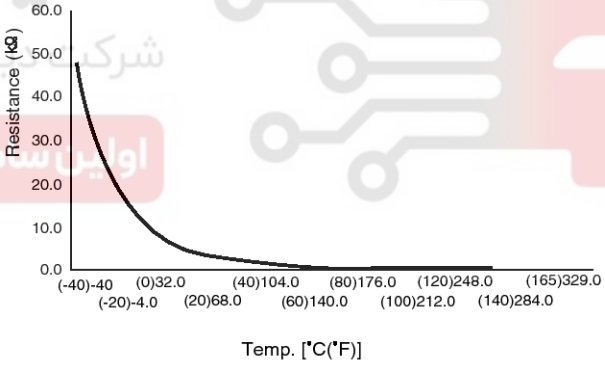


SSLAT0109D

### Specifications

▷ Type: Negative Thermal Coefficient Type

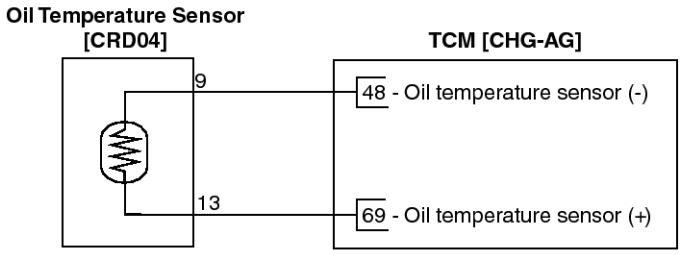
| Temp.[(˚C)˚F] | Resistance (kΩ) |
|---|---|
| (-40)-40 | 48.1 |
| (-20)-4.0 | 15.6 |
| (0)32.0 | 5.88 |
| (20)68.0 | 2.51 |
| (40)104.0 | 1.11 |
| (60)140.0 | 0.61 |
| (80)176.0 | 0.32 |
| (100)212.0 | 0.18 |
| (120)248.0 | 0.10 |
| (140)284.0 | 0.06 |
| (150)302.0 | 0.05 |




SSLAT1110N

## Circuit Diagram

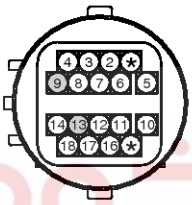
[Circuit Diagram]

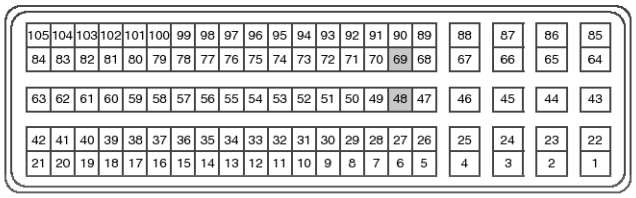



[Connection Information]

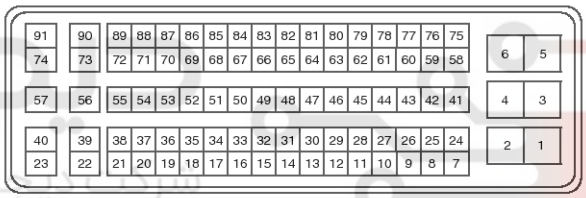
| Terminal | Connected to | Function |
|---|---|---|
| 9 | TCM CHG-AG (48) | Oil temperature sensor (-) |
| 13 | TCM CHG-AG (69) | Oil temperature sensor (+) |

[Harness Connector]




TCM Connector [CHG-AG]




TCM Connector [CHG-BG]

STFAT1120N

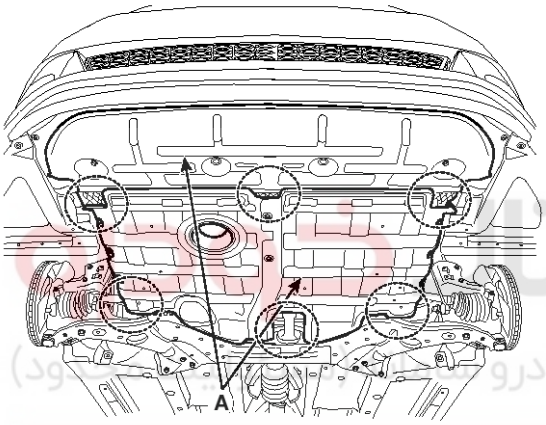
## Inspection

1. Turn ignition switch OFF.
2. Disconnect the oil temperature sensor connector.
3. Measure resistance between sensor signal terminal and sensor ground terminal.
4. Check that the resistance is within the specification.

## Removal

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

**Tightening torque:**
7.8 ~ 11.8 N.m (0.8 ~ 1.2 kgf.m, 5.8 ~ 8.7 lb-ft)

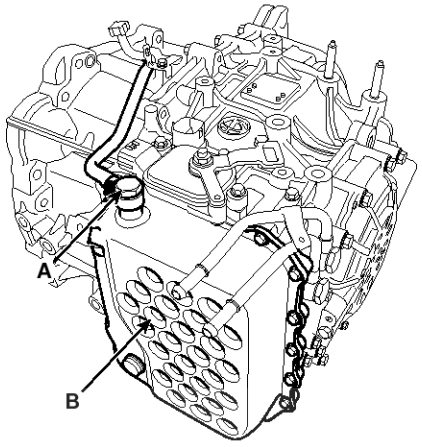



STFAT1007D

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

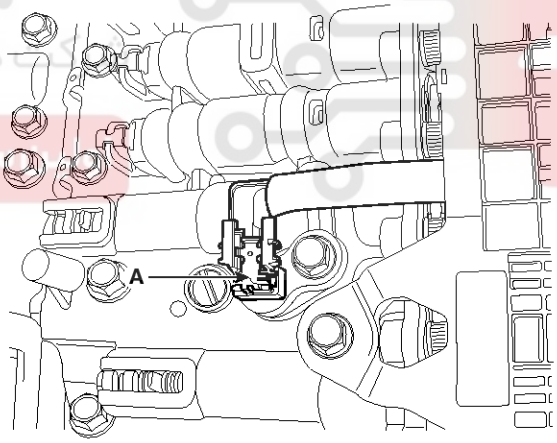
**Tightening torque:**
(A) 34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~ 32.6 lb-ft)
(B) 13.8 ~ 14.7 N.m (1.3 ~ 1.5 kgf.m, 9.4 ~ 10.8 lb-ft)

**⚠CAUTION**
**Always replace the gasket of the eyebolt use new one whenever loosening eyebolt.**




STFAT1018D

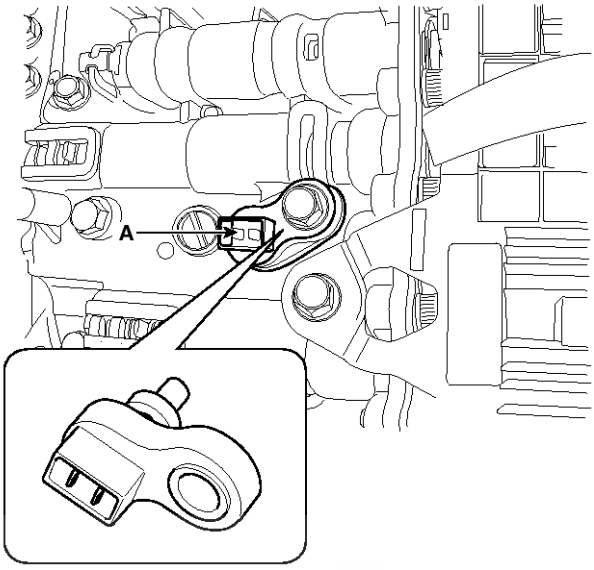
5. Disconnect the oil temperature sensor connector (A).




SCMAT0012L

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

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




SCMAT0013L

## Installation

1. Installation is the reverse of removal.

**NOTICE**

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

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

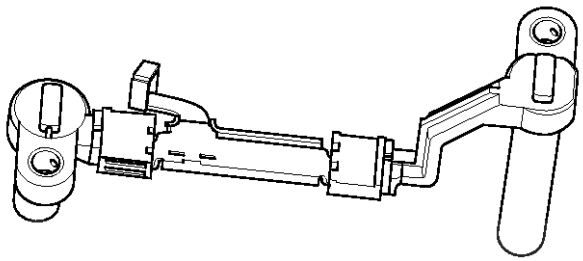
*Liquid gasket Part name :*
*Threebond 1281B or LOCTITE FMD-546*

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

## Input Speed Sensor

### 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.



SSLAT0016D

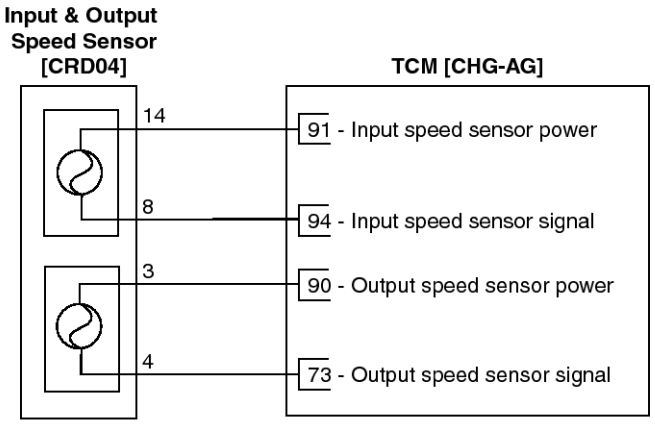
### Specifications

▷ Type: Hall effect sensor

| | | |
|---|---|---|
| Operation condition [˚C(˚F)] | | ((-)40~150)) -40~302 |
| Air gap(mm)in. | | (0.95~1.65)0.037~0.065 |
| Output voltage(V) | High | 1.18~1.68 |
| | Low | 0.59~0.84 |

## Circuit Diagram

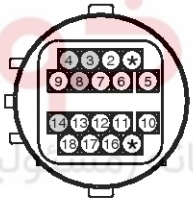
[Circuit Diagram]

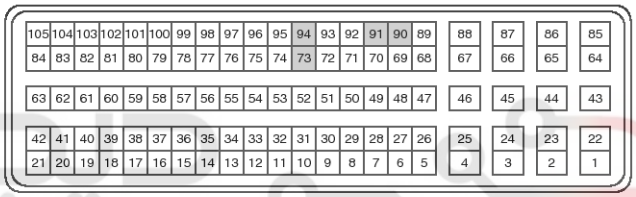



[Connection Information]

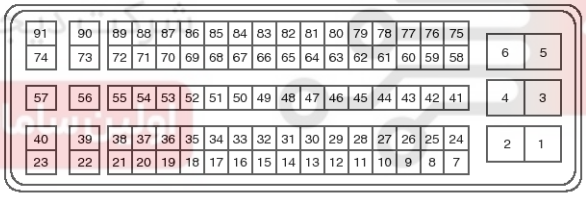
| Terminal | Connected to | Function |
|---|---|---|
| 14 | TCM CHG-AG (91) | Input speed sensor power |
| 8 | TCM CHG-AG (94) | Input speed sensor signal |
| 3 | TCM CHG-AG (90) | Output speed sensor power |
| 4 | TCM CHG-AG (73) | Output speed sensor signal |

[Harness Connector]




TCM Connector [CHG-AG]




TCM Connector [CHG-BG]

STFAT1121N

## Signal Waveform

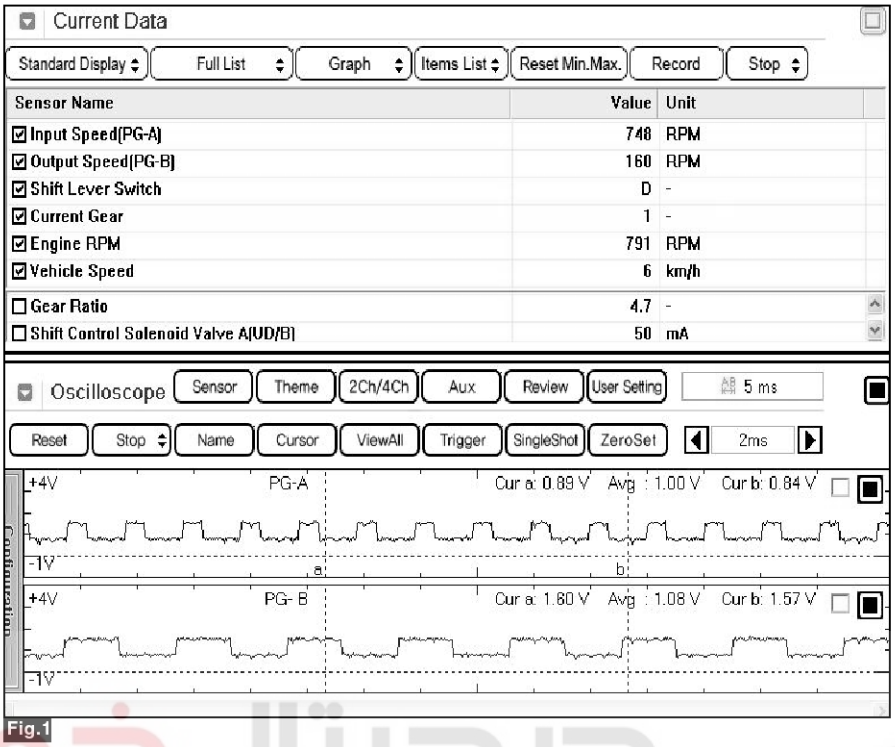



Fig.1

SSLAA1002N

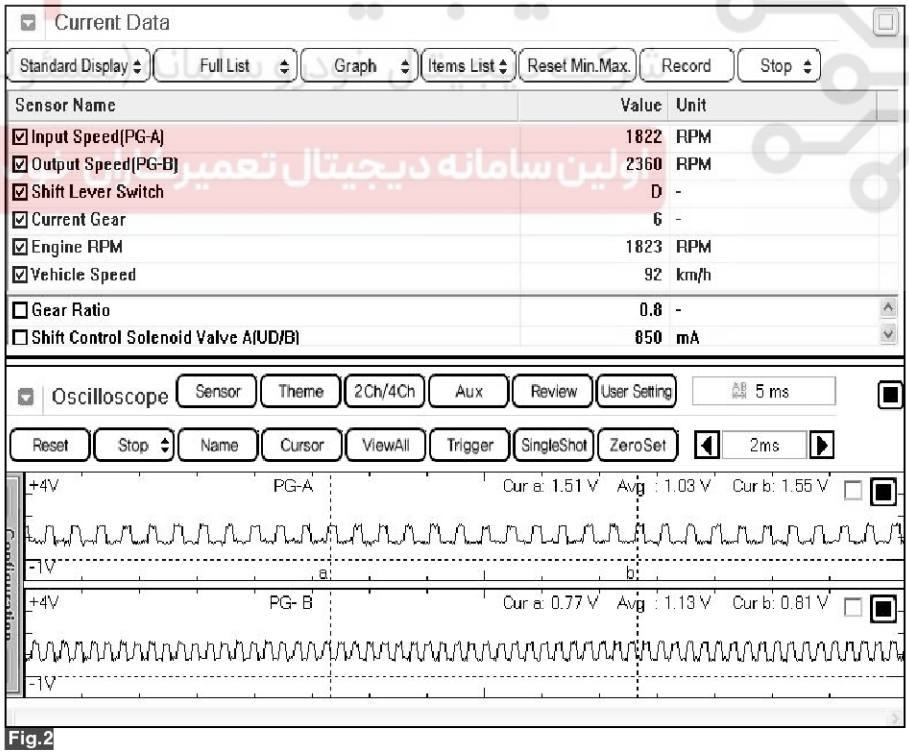



Fig.2

SSLAA1003N

Fig 1) Input/Output speed sensor at low speed

Fig 2) Input/Output speed sensor at high speed

## Inspection

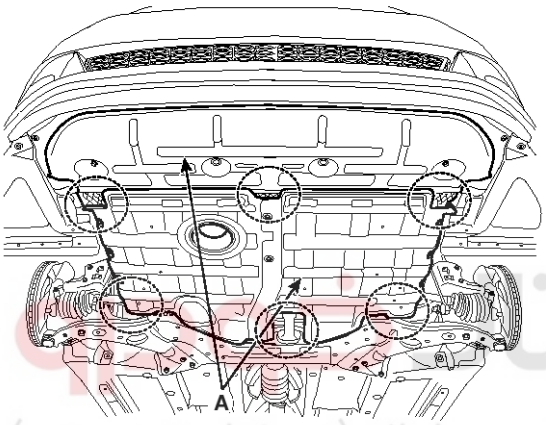
1. Check signal waveform of Input & output speed sensor using the GDS.

**Specification:** Refer to "Signal Wave Form" section.

## Removal

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

**Tightening torque:**
7.8 ~ 11.8 N.m (0.8 ~ 1.2 kgf.m, 5.8 ~ 8.7 lb-ft)



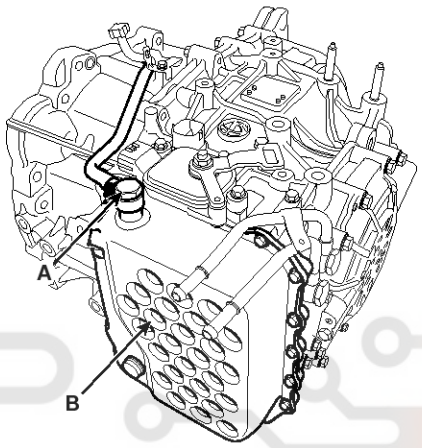

STFAT1007D

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

**Tightening torque:**
(A) 34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~ 32.6 lb-ft)
(B) 13.8 ~ 14.7 N.m (1.3 ~ 1.5 kgf.m, 9.4 ~ 10.8 lb-ft)

**CAUTION**
**Always replace the gasket of the eyebolt use new one whenever loosening eyebolt.**

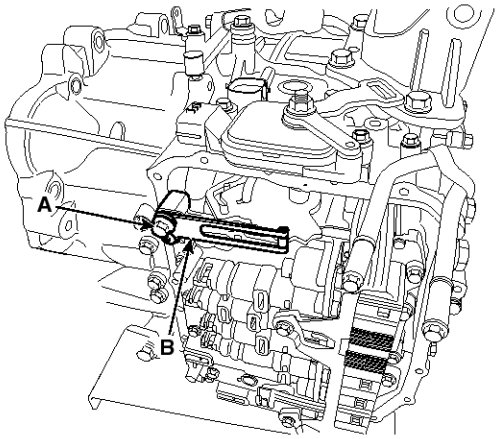
**NOTICE**
*Remove installation bolts in the engine compartmentfirst and then remove others under the vehicle.*




STFAT1018D

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

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

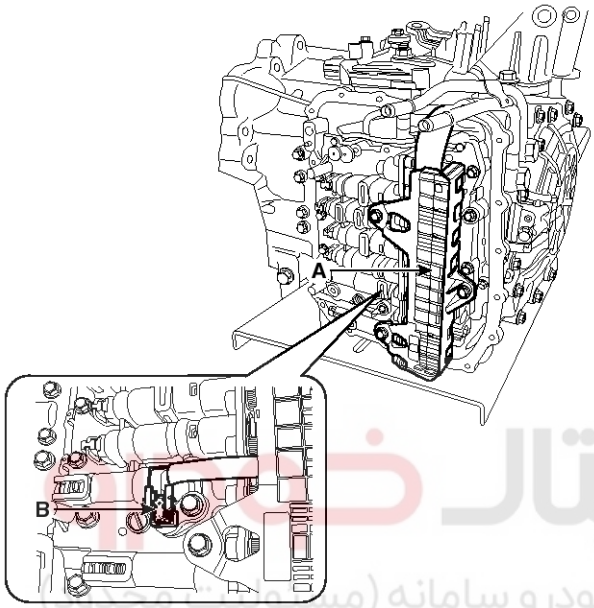



SVGAA0006D

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

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

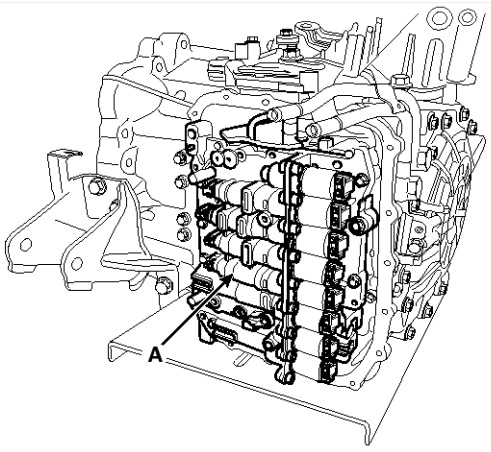
**CAUTION**
**Be careful not to damage the harness lock connector.**




SSLAT1112N

7. Remove the valve body assembly (A).

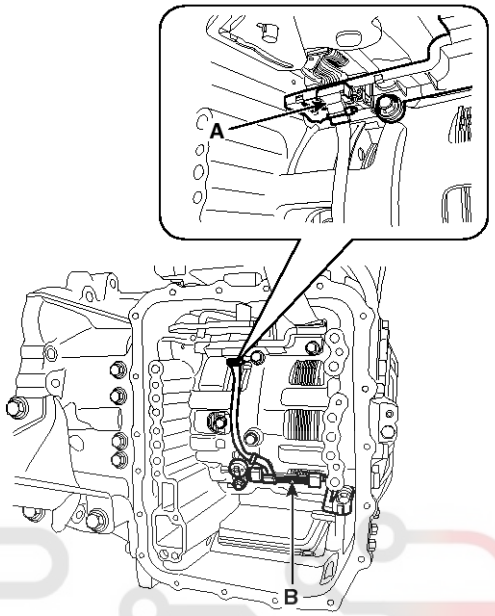
**Tightening torque:**
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)




SCMAT0008L

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

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




SCMAT0011L

## Installation

1. Installation is the reverse of removal.

**NOTICE**

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

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

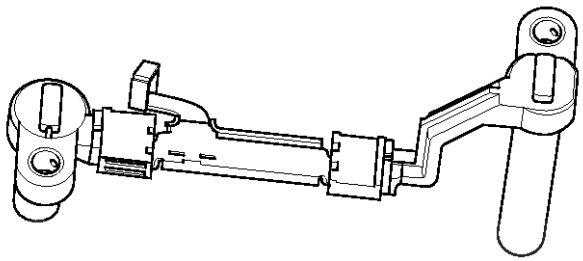
*Liquid gasket Part name :*
*Threebond 1281B or LOCTITE FMD-546*

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

## Output Speed Sensor

### 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.



SSLAT0016D

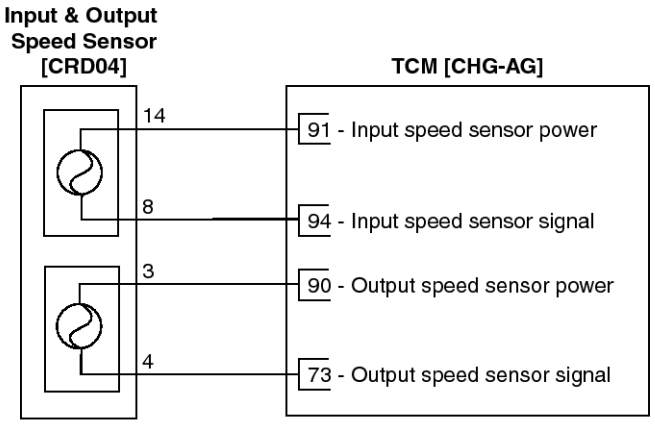
### Specifications

▷ Type: Hall effect sensor

| | | |
|---|---|---|
| Operation condition [˚C(˚F)] | | ((-)40~150)) -40~302 |
| Air gap(mm)in. | | (0.55~1) 0.0217~0.0394 |
| Output voltage | High | 1.18~1.68 |
| | Low | 0.59~0.84 |

## Circuit Diagram

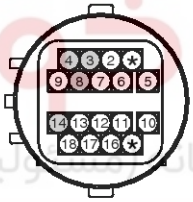
[Circuit Diagram]



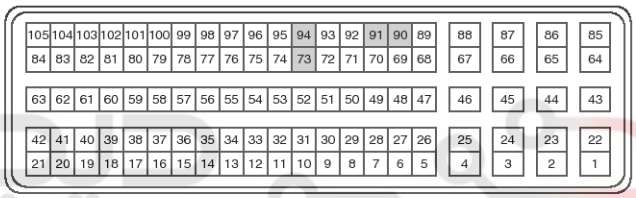

[Connection Information]

| Terminal | Connected to | Function |
|---|---|---|
| 14 | TCM CHG-AG (91) | Input speed sensor power |
| 8 | TCM CHG-AG (94) | Input speed sensor signal |
| 3 | TCM CHG-AG (90) | Output speed sensor power |
| 4 | TCM CHG-AG (73) | Output speed sensor signal |

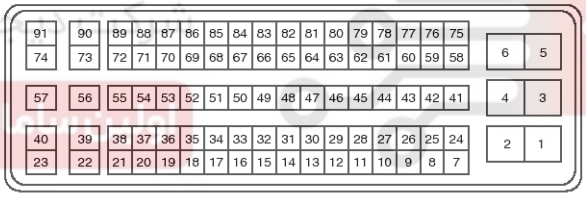
[Harness Connector]



Solenoid Valve Connector [CRD04]




TCM Connector [CHG-AG]




TCM Connector [CHG-BG]

STFAT1121N

## Signal Waveform

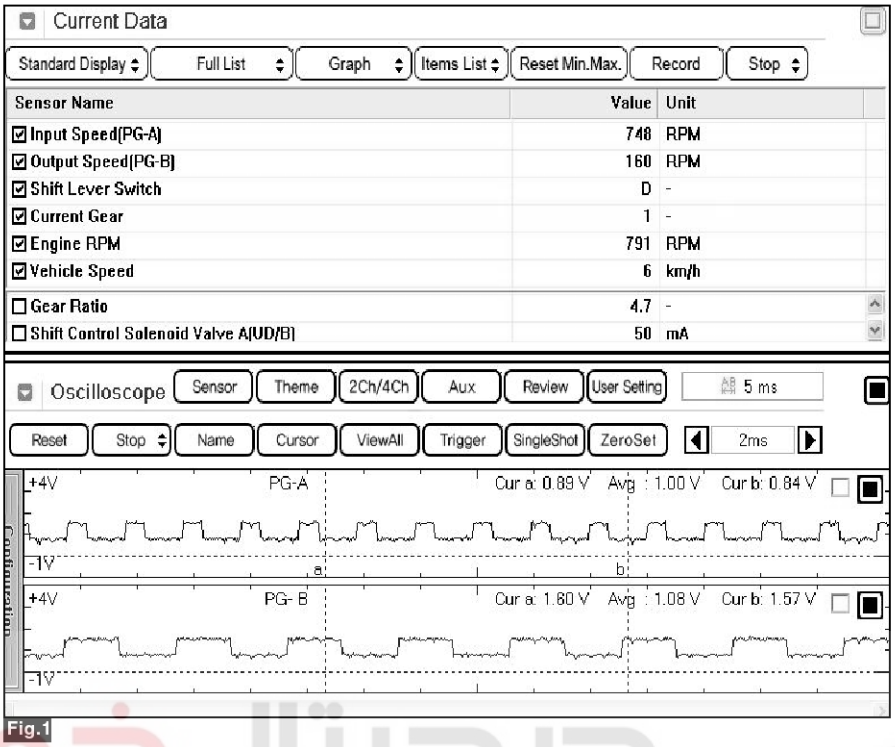



Fig.1

SSLAA1002N

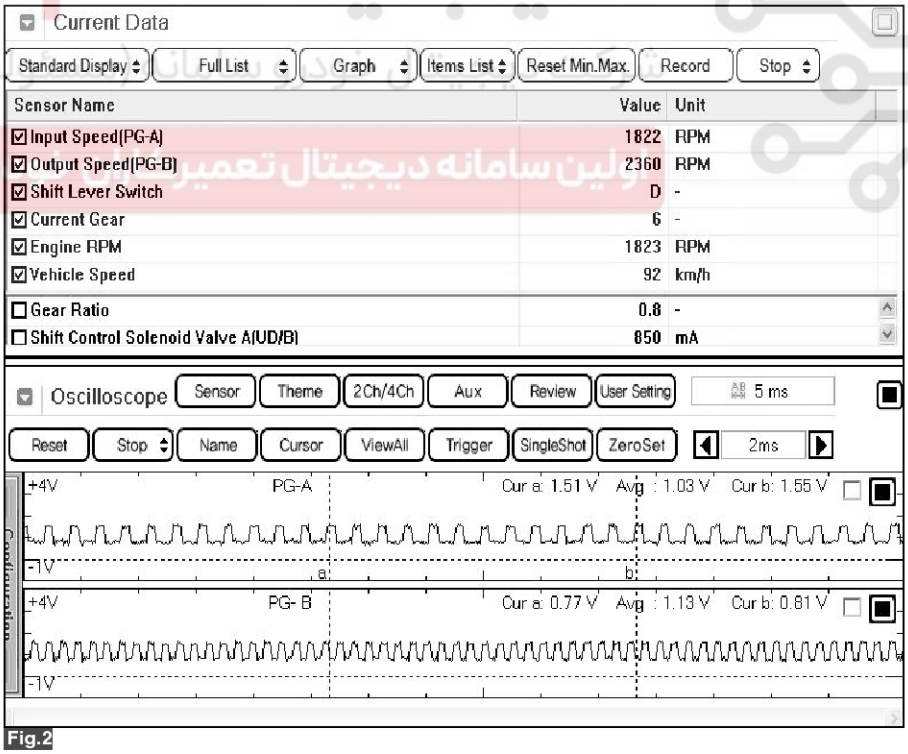



Fig.2

SSLAA1003N

Fig 1) Input/Output speed sensor at low speed

Fig 2) Input/Output speed sensor at high speed

## Inspection

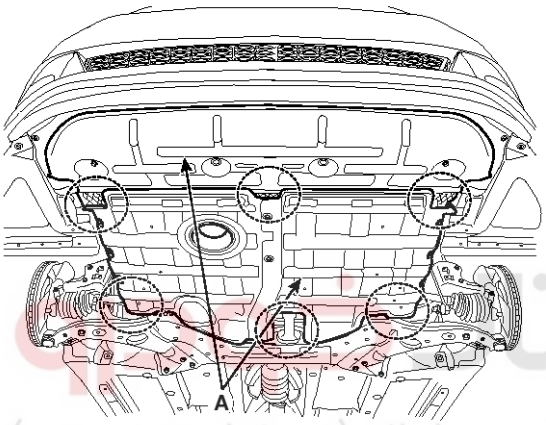
1. Check signal waveform of Input & output speed sensor using the GDS.

**Specification:** Refer to "Signal Wave Form" section.

## Removal

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

**Tightening torque:**
7.8 ~ 11.8 N.m (0.8 ~ 1.2 kgf.m, 5.8 ~ 8.7 lb-ft)



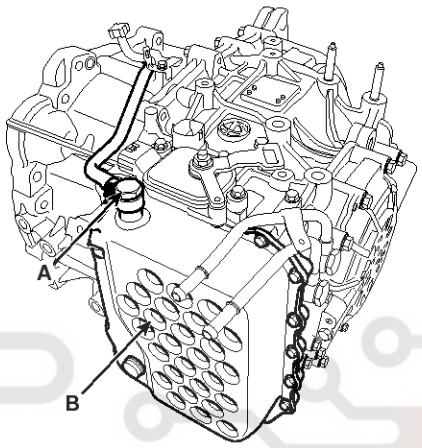

STFAT1007D

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

**Tightening torque:**
(A) 34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~ 32.6 lb-ft)
(B) 13.8 ~ 14.7 N.m (1.3 ~ 1.5 kgf.m, 9.4 ~ 10.8 lb-ft)

**CAUTION**
**Always replace the gasket of the eyebolt use new one whenever loosening eyebolt.**

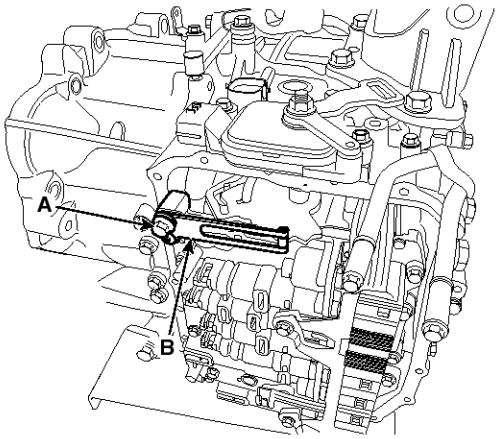
**NOTICE**
*Remove installation bolts in the engine compartmentfirst and then remove others under the vehicle.*




STFAT1018D

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

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

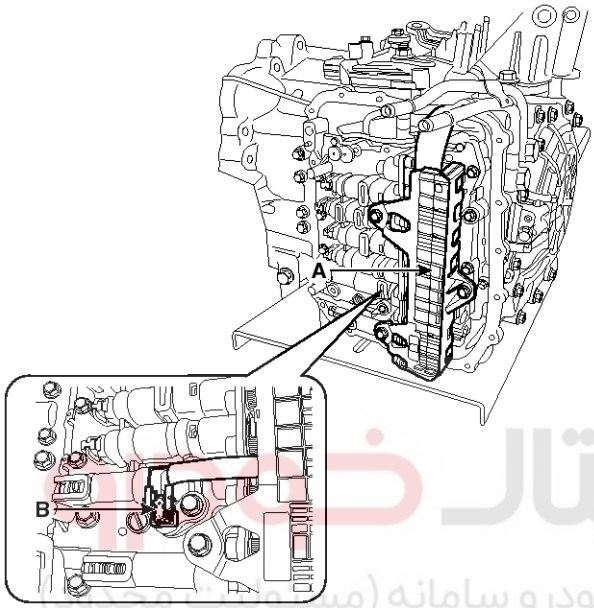



SVGAA0006D

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

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

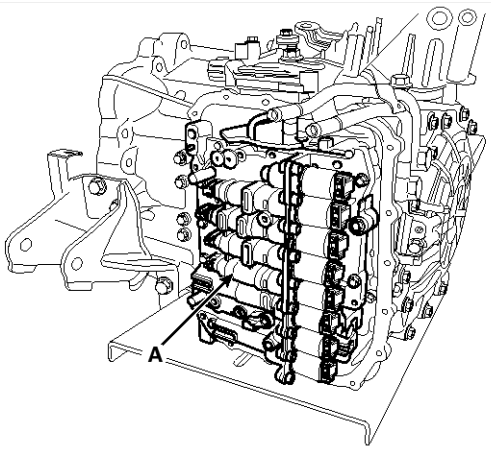
**CAUTION**
**Be careful not to damage the harness lock connector.**




SSLAT1112N

7. Remove the valve body assembly (A).

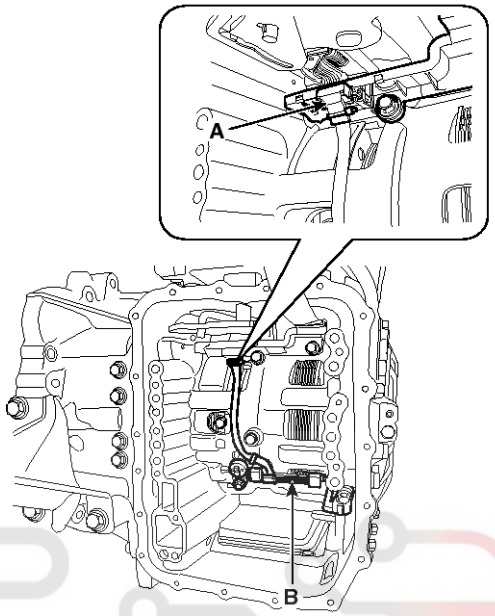
**Tightening torque:**
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)




SCMAT0008L

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

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




SCMAT0011L

## Installation

1. Installation is the reverse of removal.

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

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

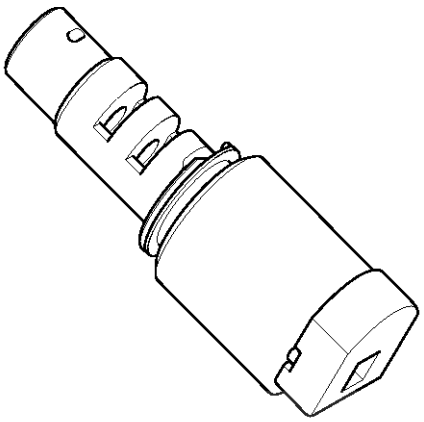
*Liquid gasket Part name :*
*Threebond 1281B or LOCTITE FMD-546*

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

## Torque Converter Control Solenoid Valve (T/CON_VFS)

### Description

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



SSLAT0018D

### Specifications

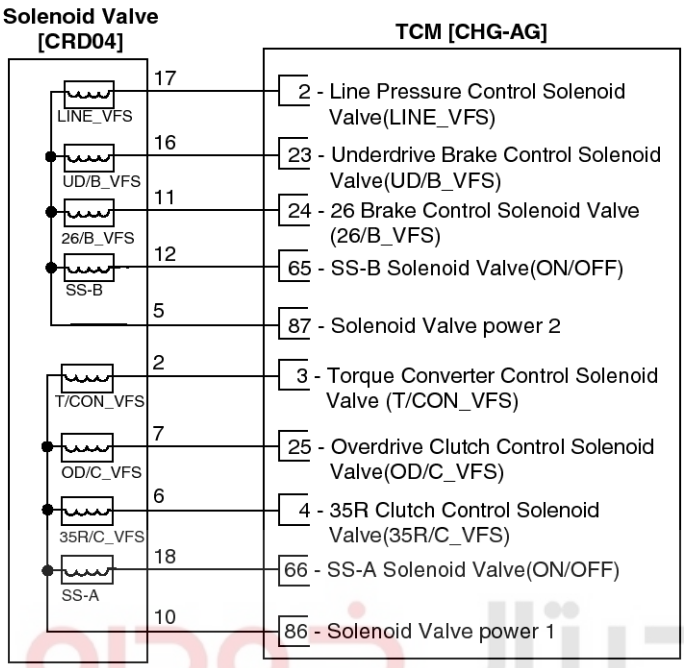
Direct control VFS[T/CON]

▷ Control type : Normal low type

| | |
|---|---|
| Control Pressure kpa (kgf/㎠, 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

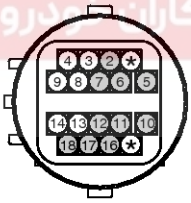
[Circuit Diagram]



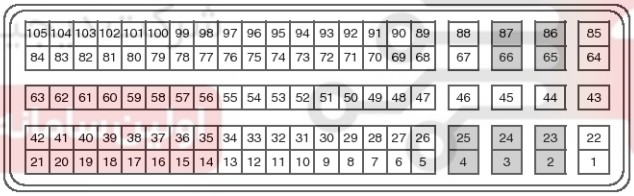

[Connection Information]

| Terminal | Connected to | Function |
|---|---|---|
| 17 | TCM CHG-AG (2) | Line Pressure Control Solenoid Valve (LINE_VFS) |
| 16 | TCM CHG-AG (23) | Underdrive Brake Control Solenoid Valve(UD/B_VFS) |
| 11 | TCM CHG-AG (24) | 26 Brake Control Solenoid Valve (26/B_VFS) |
| 12 | TCM CHG-AG (65) | SS-B Solenoid Valve(ON/OFF) |
| 5 | TCM CHG-AG (87) | Solenoid Valve power 2 |
| 2 | TCM CHG-AG (3) | Torque Converter Control Solenoid Valve(T/CON_VFS) |
| 7 | TCM CHG-AG (25) | Overdrive Clutch Control Solenoid Valve(OD/C_VFS) |
| 6 | TCM CHG-AG (4) | 35R Clutch Control Solenoid Valve (35R/C_VFS) |
| 18 | TCM CHG-AG (66) | SS-A Solenoid Valve(ON/OFF) |
| 10 | TCM CHG-AG (86) | Solenoid Valve power 1 |

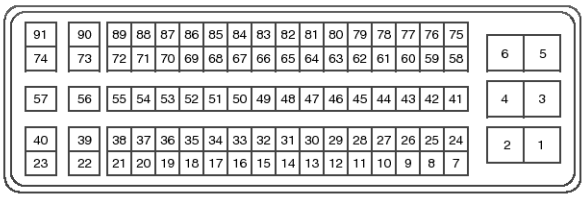
[Harness Connector]



Solenoid Valve Connector [CRD04]



TCM Connector [CHG-AG]



TCM Connector [CHG-BG]

STFAT1124N

## Inspection

1. Turn ignition switch OFF.
2. Disconnect the oil temperature sensor connector.
3. Measure resistance between sensor signal terminal and sensor ground terminal.
4. Check that the resistance is within the specification.

## Removal

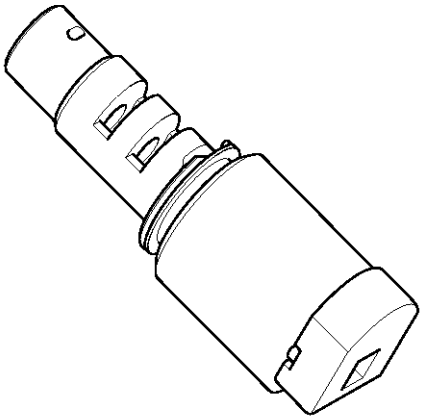
**NOTICE**

*Replacing an on/off solenoid valve (SS-A, SS-B) does not require additional hydraulic pressure adjustment; however, the hydraulic pressure will need to be adjusted after replacing the VFS solenoid valve. If replacing the VFS solenoid valve; also replace the valve body assembly. (Refer to "Valve Body" in this group)*

## 26 Brake Control Solenoid Valve(26/B_VFS)

### Description

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



SSLAT0018D

### Specifications

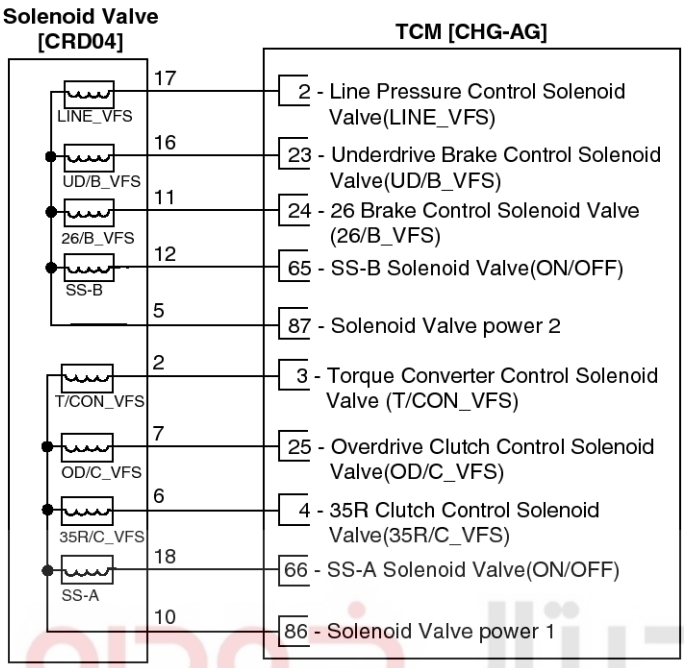
Direct control VFS[26/B]

▷ Control type : Normal low type

| | |
|---|---|
| Control Pressure kpa (kgf/㎠, 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

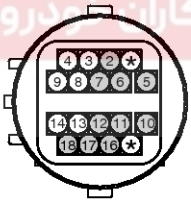
[Circuit Diagram]



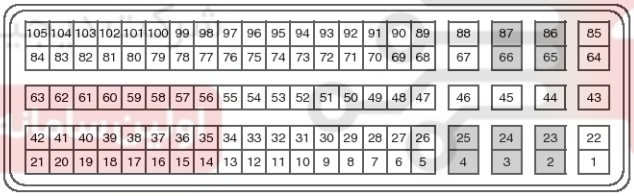

[Connection Information]

| Terminal | Connected to | Function |
|---|---|---|
| 17 | TCM CHG-AG (2) | Line Pressure Control Solenoid Valve (LINE_VFS) |
| 16 | TCM CHG-AG (23) | Underdrive Brake Control Solenoid Valve(UD/B_VFS) |
| 11 | TCM CHG-AG (24) | 26 Brake Control Solenoid Valve (26/B_VFS) |
| 12 | TCM CHG-AG (65) | SS-B Solenoid Valve(ON/OFF) |
| 5 | TCM CHG-AG (87) | Solenoid Valve power 2 |
| 2 | TCM CHG-AG (3) | Torque Converter Control Solenoid Valve(T/CON_VFS) |
| 7 | TCM CHG-AG (25) | Overdrive Clutch Control Solenoid Valve(OD/C_VFS) |
| 6 | TCM CHG-AG (4) | 35R Clutch Control Solenoid Valve (35R/C_VFS) |
| 18 | TCM CHG-AG (66) | SS-A Solenoid Valve(ON/OFF) |
| 10 | TCM CHG-AG (86) | Solenoid Valve power 1 |

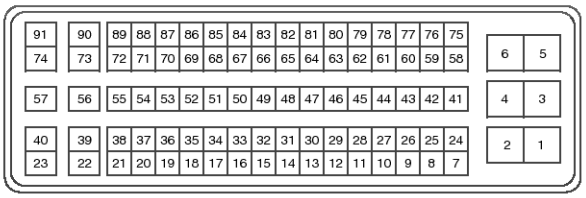
[Harness Connector]



Solenoid Valve Connector [CRD04]



TCM Connector [CHG-AG]



TCM Connector [CHG-BG]

STFAT1124N

## Inspection

1. Turn ignition switch OFF.
2. Disconnect the oil temperature sensor connector.
3. Measure resistance between sensor signal terminal and sensor ground terminal.
4. Check that the resistance is within the specification.

## Removal

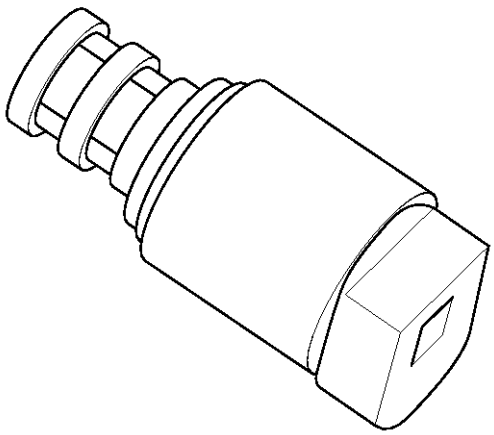
**NOTICE**

*Replacing an on/off solenoid valve (SS-A, SS-B) does not require additional hydraulic pressure adjustment; however, the hydraulic pressure will need to be adjusted after replacing the VFS solenoid valve. If replacing the VFS solenoid valve; also replace the valve body assembly. (Refer to "Valve Body" in this group)*

## Line Pressure Control Solenoid Vale

### Description

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



SSLAT0019D

### Specifications

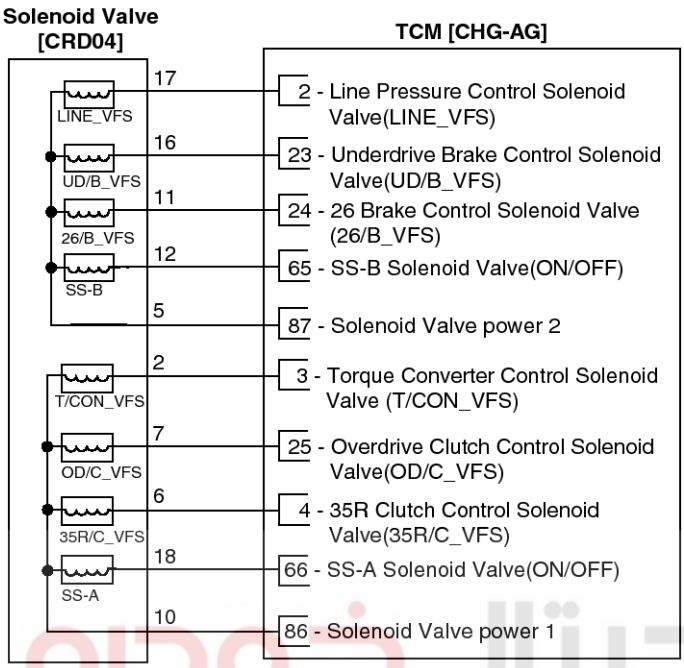
Direct control VFS[LINE Pressure]

▷ Control type : Normal low type

| | |
|---|---|
| Control Pressure kpa (kgf/㎠, psi) | 500.14~9.81 (5.1~0.1,72.54~1.42) |
| Current value(mA) | 50~850 |
| Internal resistance(Ω) | 5.1 |

## Circuit Diagram

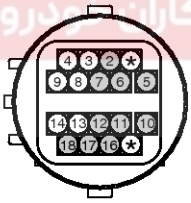
[Circuit Diagram]



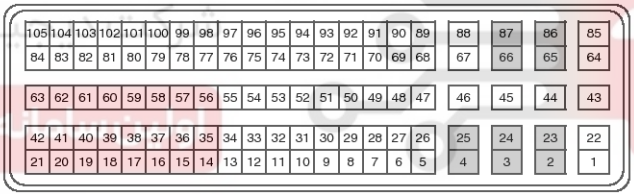

[Connection Information]

| Terminal | Connected to | Function |
|---|---|---|
| 17 | TCM CHG-AG (2) | Line Pressure Control Solenoid Valve (LINE_VFS) |
| 16 | TCM CHG-AG (23) | Underdrive Brake Control Solenoid Valve(UD/B_VFS) |
| 11 | TCM CHG-AG (24) | 26 Brake Control Solenoid Valve (26/B_VFS) |
| 12 | TCM CHG-AG (65) | SS-B Solenoid Valve(ON/OFF) |
| 5 | TCM CHG-AG (87) | Solenoid Valve power 2 |
| 2 | TCM CHG-AG (3) | Torque Converter Control Solenoid Valve(T/CON_VFS) |
| 7 | TCM CHG-AG (25) | Overdrive Clutch Control Solenoid Valve(OD/C_VFS) |
| 6 | TCM CHG-AG (4) | 35R Clutch Control Solenoid Valve (35R/C_VFS) |
| 18 | TCM CHG-AG (66) | SS-A Solenoid Valve(ON/OFF) |
| 10 | TCM CHG-AG (86) | Solenoid Valve power 1 |

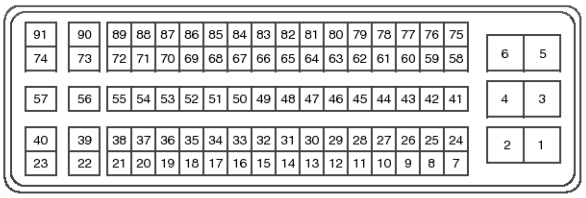
[Harness Connector]



Solenoid Valve Connector [CRD04]



TCM Connector [CHG-AG]



TCM Connector [CHG-BG]

STFAT1124N

## Inspection

1. Turn ignition switch OFF.
2. Disconnect the oil temperature sensor connector.
3. Measure resistance between sensor signal terminal and sensor ground terminal.
4. Check that the resistance is within the specification.

## Removal

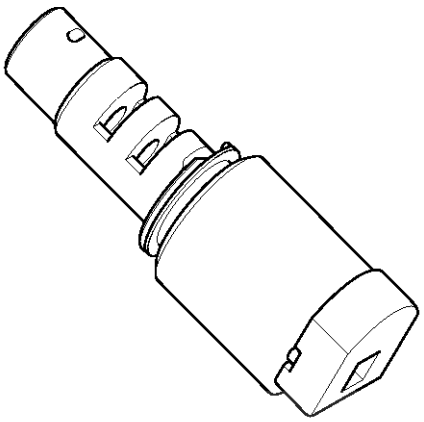
**NOTICE**

*Replacing an on/off solenoid valve (SS-A, SS-B) does not require additional hydraulic pressure adjustment; however, the hydraulic pressure will need to be adjusted after replacing the VFS solenoid valve. If replacing the VFS solenoid valve; also replace the valve body assembly. (Refer to "Valve Body" in this group)*

## 35R Clutch Control Solenoid Valve(35R/C_VFS)

### Description

35R clutch control solenoid valve(35R/C_VFS) is attached to the valve body. This variable force solenoid valve directly controls the hydraulic pressure inside the 35R clutch.



SSLAT0018D

### Specifications

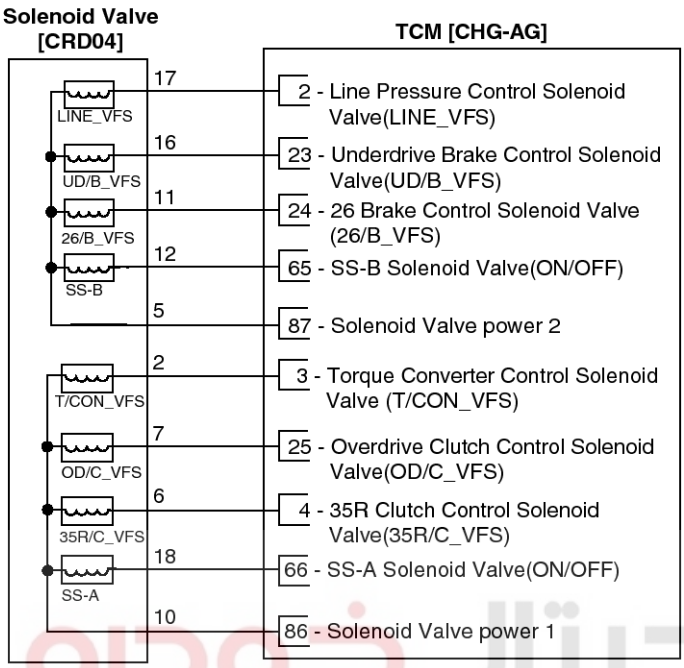
Direct control VFS[35R/C]

▷ Control type : Normal low type

| | |
|---|---|
| Control Pressure kpa (kgf/㎠, psi) | 500.14~9.81 (5.1~0.1,72.54~1.42) |
| Current value(mA) | 50~850 |
| Internal resistance(Ω) | 5.1 |

## Circuit Diagram

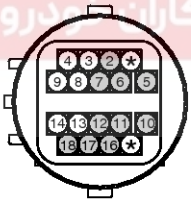
[Circuit Diagram]



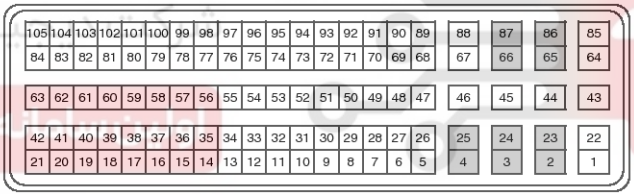

[Connection Information]

| Terminal | Connected to | Function |
|---|---|---|
| 17 | TCM CHG-AG (2) | Line Pressure Control Solenoid Valve (LINE_VFS) |
| 16 | TCM CHG-AG (23) | Underdrive Brake Control Solenoid Valve(UD/B_VFS) |
| 11 | TCM CHG-AG (24) | 26 Brake Control Solenoid Valve (26/B_VFS) |
| 12 | TCM CHG-AG (65) | SS-B Solenoid Valve(ON/OFF) |
| 5 | TCM CHG-AG (87) | Solenoid Valve power 2 |
| 2 | TCM CHG-AG (3) | Torque Converter Control Solenoid Valve(T/CON_VFS) |
| 7 | TCM CHG-AG (25) | Overdrive Clutch Control Solenoid Valve(OD/C_VFS) |
| 6 | TCM CHG-AG (4) | 35R Clutch Control Solenoid Valve (35R/C_VFS) |
| 18 | TCM CHG-AG (66) | SS-A Solenoid Valve(ON/OFF) |
| 10 | TCM CHG-AG (86) | Solenoid Valve power 1 |

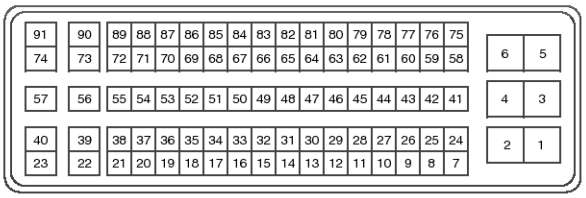
[Harness Connector]



Solenoid Valve Connector [CRD04]



TCM Connector [CHG-AG]



TCM Connector [CHG-BG]

STFAT1124N

## Inspection

1. Turn ignition switch OFF.
2. Disconnect the oil temperature sensor connector.
3. Measure resistance between sensor signal terminal and sensor ground terminal.
4. Check that the resistance is within the specification.

## Removal

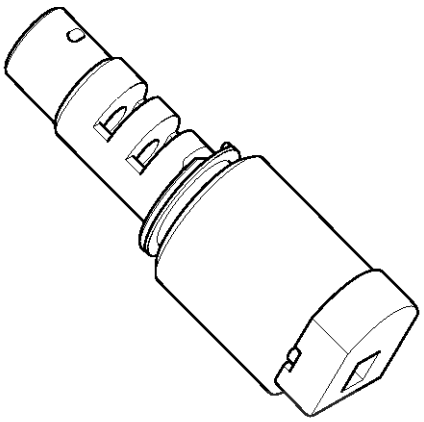
**NOTICE**

*Replacing an on/off solenoid valve (SS-A, SS-B) does not require additional hydraulic pressure adjustment; however, the hydraulic pressure will need to be adjusted after replacing the VFS solenoid valve. If replacing the VFS solenoid valve; also replace the valve body assembly. (Refer to "Valve Body" in this group)*

## Underdrive Brake Control Solenoid Valve(UD/B_VFS)

### Description

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



SSLAT0018D

### Specifications

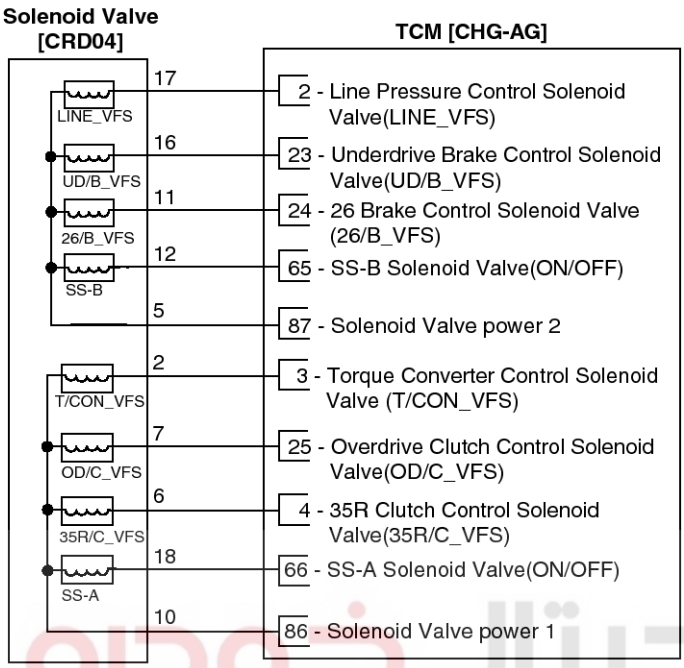
Direct control VFS[35R/C]

▷ Control type : Normal low type

| | |
|---|---|
| Control Pressure kpa (kgf/㎠, psi) | 500.14~9.81 (5.1~0.1,72.54~1.42) |
| Current value(mA) | 50~850 |
| Internal resistance(Ω) | 5.1 |

## Circuit Diagram

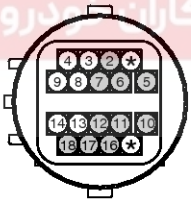
[Circuit Diagram]



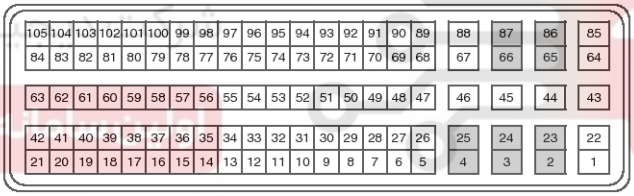

[Connection Information]

| Terminal | Connected to | Function |
|---|---|---|
| 17 | TCM CHG-AG (2) | Line Pressure Control Solenoid Valve (LINE_VFS) |
| 16 | TCM CHG-AG (23) | Underdrive Brake Control Solenoid Valve(UD/B_VFS) |
| 11 | TCM CHG-AG (24) | 26 Brake Control Solenoid Valve (26/B_VFS) |
| 12 | TCM CHG-AG (65) | SS-B Solenoid Valve(ON/OFF) |
| 5 | TCM CHG-AG (87) | Solenoid Valve power 2 |
| 2 | TCM CHG-AG (3) | Torque Converter Control Solenoid Valve(T/CON_VFS) |
| 7 | TCM CHG-AG (25) | Overdrive Clutch Control Solenoid Valve(OD/C_VFS) |
| 6 | TCM CHG-AG (4) | 35R Clutch Control Solenoid Valve (35R/C_VFS) |
| 18 | TCM CHG-AG (66) | SS-A Solenoid Valve(ON/OFF) |
| 10 | TCM CHG-AG (86) | Solenoid Valve power 1 |

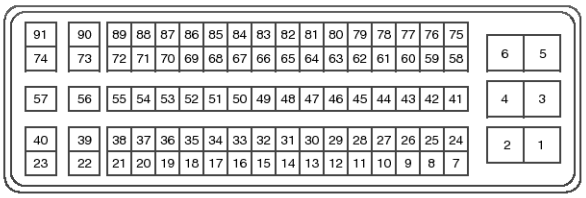
[Harness Connector]



Solenoid Valve Connector [CRD04]



TCM Connector [CHG-AG]



TCM Connector [CHG-BG]

STFAT1124N

## Inspection

1. Turn ignition switch OFF.
2. Disconnect the oil temperature sensor connector.
3. Measure resistance between sensor signal terminal and sensor ground terminal.
4. Check that the resistance is within the specification.

## Removal

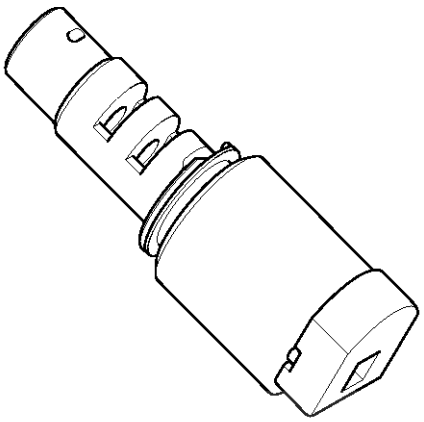
**NOTICE**

*Replacing an on/off solenoid valve (SS-A, SS-B) does not require additional hydraulic pressure adjustment; however, the hydraulic pressure will need to be adjusted after replacing the VFS solenoid valve. If replacing the VFS solenoid valve; also replace the valve body assembly. (Refer to "Valve Body" in this group)*

## Overdrive Clutch Control Solenoid Valve(OD/C_VFS)

### Description

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



SSLAT0018D

### Specifications

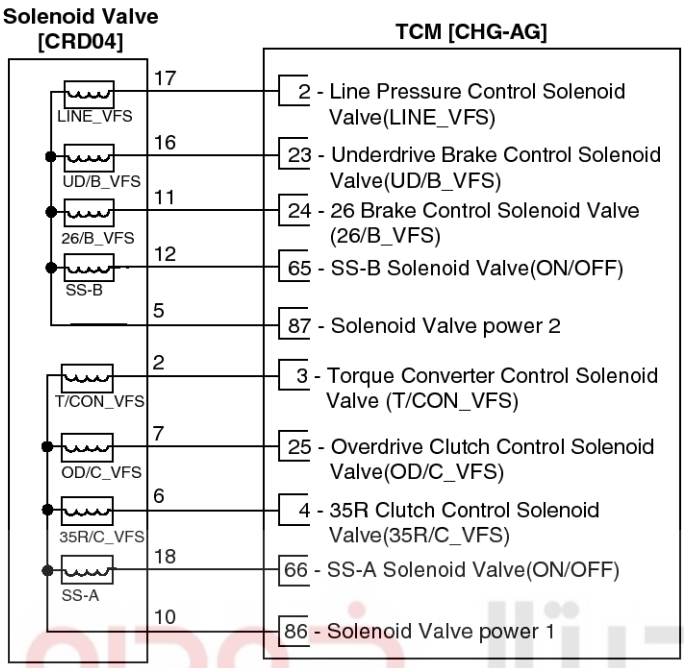
Direct control VFS[35R/C]

▷ Control type : Normal low type

| | |
|---|---|
| Control Pressure kpa (kgf/㎠, psi) | 500.14~9.81 (5.1~0.1,72.54~1.42) |
| Current value(mA) | 50~850 |
| Internal resistance(Ω) | 5.1 |

## Circuit Diagram

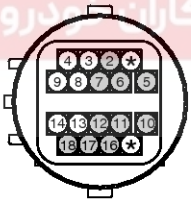
[Circuit Diagram]



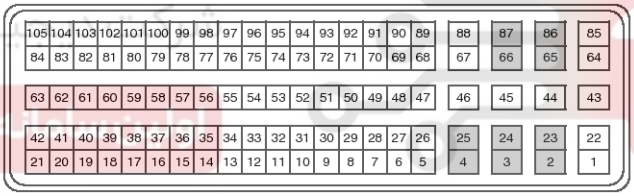

[Connection Information]

| Terminal | Connected to | Function |
|---|---|---|
| 17 | TCM CHG-AG (2) | Line Pressure Control Solenoid Valve (LINE_VFS) |
| 16 | TCM CHG-AG (23) | Underdrive Brake Control Solenoid Valve(UD/B_VFS) |
| 11 | TCM CHG-AG (24) | 26 Brake Control Solenoid Valve (26/B_VFS) |
| 12 | TCM CHG-AG (65) | SS-B Solenoid Valve(ON/OFF) |
| 5 | TCM CHG-AG (87) | Solenoid Valve power 2 |
| 2 | TCM CHG-AG (3) | Torque Converter Control Solenoid Valve(T/CON_VFS) |
| 7 | TCM CHG-AG (25) | Overdrive Clutch Control Solenoid Valve(OD/C_VFS) |
| 6 | TCM CHG-AG (4) | 35R Clutch Control Solenoid Valve (35R/C_VFS) |
| 18 | TCM CHG-AG (66) | SS-A Solenoid Valve(ON/OFF) |
| 10 | TCM CHG-AG (86) | Solenoid Valve power 1 |

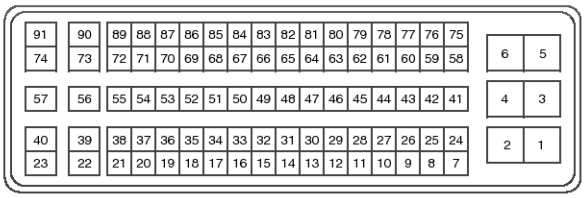
[Harness Connector]



Solenoid Valve Connector [CRD04]



TCM Connector [CHG-AG]



TCM Connector [CHG-BG]

STFAT1124N

## Inspection

1. Turn ignition switch OFF.
2. Disconnect the oil temperature sensor connector.
3. Measure resistance between sensor signal terminal and sensor ground terminal.
4. Check that the resistance is within the specification.

## Removal

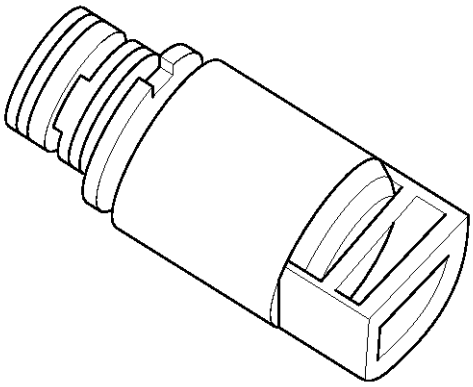
**NOTICE**

*Replacing an on/off solenoid valve (SS-A, SS-B) does not require additional hydraulic pressure adjustment; however, the hydraulic pressure will need to be adjusted after replacing the VFS solenoid valve. If replacing the VFS solenoid valve; also replace the valve body assembly. (Refer to "Valve Body" in this group)*

## SS-A Solenoid Valve(ON/OFF)

### 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.



SSLAT0020D

### Specifications

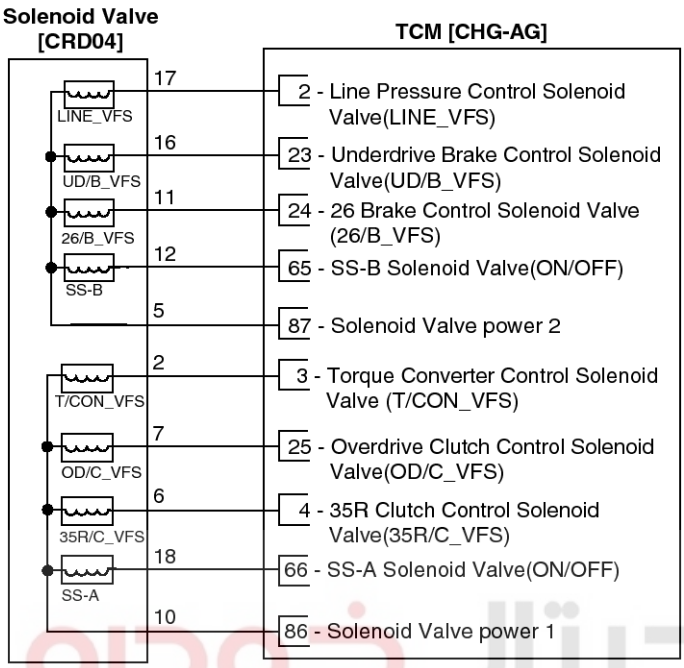
ON/OFF Solenoid Valve(SS-A, SS-B)

▷ Control type : Normal low type

| | |
|---|---|
| Control pressure kpa (kgf/㎠, psi) | 490.33(5.0, 71.12) |
| Internal resistance(Ω) | 10~11 |

## Circuit Diagram

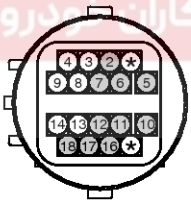
[Circuit Diagram]



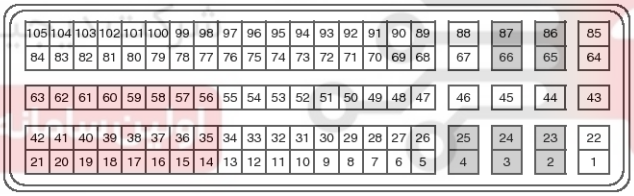

[Connection Information]

| Terminal | Connected to | Function |
|---|---|---|
| 17 | TCM CHG-AG (2) | Line Pressure Control Solenoid Valve (LINE_VFS) |
| 16 | TCM CHG-AG (23) | Underdrive Brake Control Solenoid Valve(UD/B_VFS) |
| 11 | TCM CHG-AG (24) | 26 Brake Control Solenoid Valve (26/B_VFS) |
| 12 | TCM CHG-AG (65) | SS-B Solenoid Valve(ON/OFF) |
| 5 | TCM CHG-AG (87) | Solenoid Valve power 2 |
| 2 | TCM CHG-AG (3) | Torque Converter Control Solenoid Valve(T/CON_VFS) |
| 7 | TCM CHG-AG (25) | Overdrive Clutch Control Solenoid Valve(OD/C_VFS) |
| 6 | TCM CHG-AG (4) | 35R Clutch Control Solenoid Valve (35R/C_VFS) |
| 18 | TCM CHG-AG (66) | SS-A Solenoid Valve(ON/OFF) |
| 10 | TCM CHG-AG (86) | Solenoid Valve power 1 |

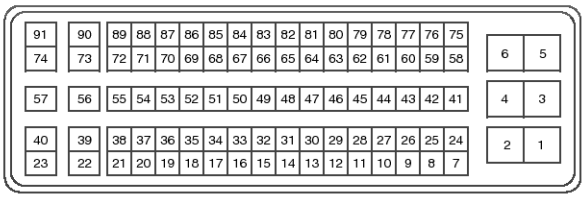
[Harness Connector]



Solenoid Valve Connector [CRD04]



TCM Connector [CHG-AG]



TCM Connector [CHG-BG]

STFAT1124N

## Inspection

1. Turn ignition switch OFF.
2. Disconnect the oil temperature sensor connector.
3. Measure resistance between sensor signal terminal and sensor ground terminal.
4. Check that the resistance is within the specification.

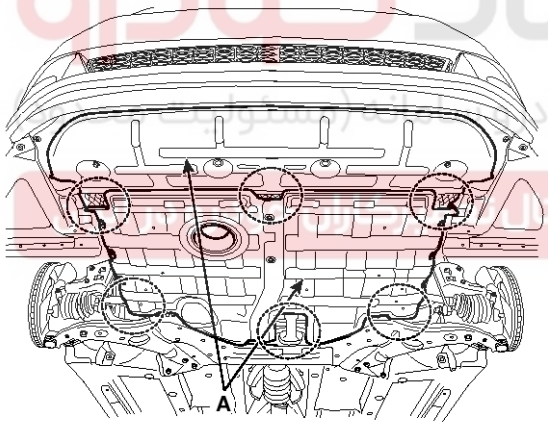
## Removal

**NOTICE**

*Replacing an on/off solenoid valve (SS-A, SS-B) does not require additional hydraulic pressure adjustment; however, the hydraulic pressure will need to be adjusted after replacing the VFS solenoid valve. If replacing the VFS solenoid valve; also replace the valve body assembly. (Refer to "Valve Body" in this group)*

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

**Tightening torque:**
7.8 ~ 11.8 N.m (0.8 ~ 1.2 kgf.m, 5.8 ~ 8.7 lb-ft)



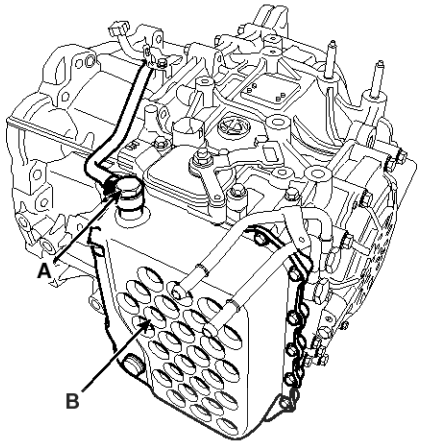

STFAT1007D

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

**Tightening torque:**
(A) 13.8 ~ 14.7 N.m (1.3 ~ 1.5 kgf.m, 9.4 ~ 10.8 lb-ft)
(B) 34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~ 32.6 lb-ft)

**CAUTION**

**Always replace the gasket of the eyebolt use new one whenever loosening eyebolt.**



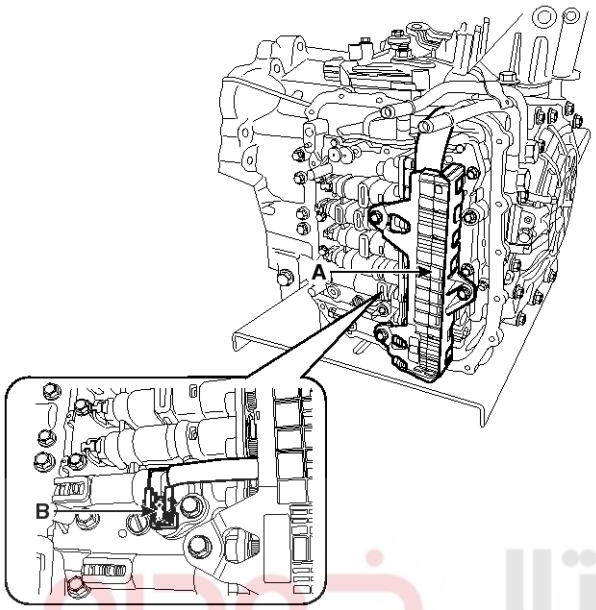

STFAT1018D

**NOTICE**

*Remove installation bolts in the engine compartment first and*

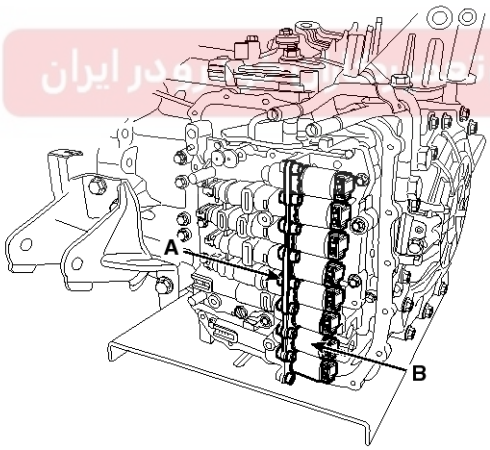
5. Remove the bolt (3ea) after disconnecting the solenoid valve connector (A) and the oil temperature sensor connector (B).

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




SSLAT1112N

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



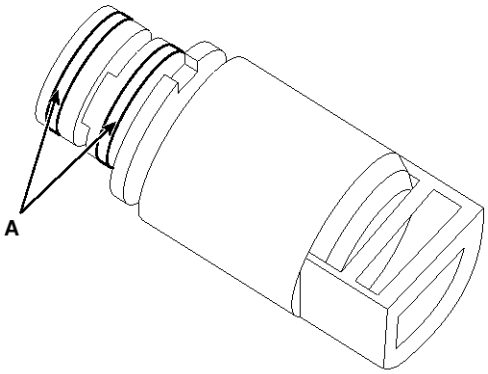

SSLAT0112D

## Installation

1. Installation is the reverse of removal.

**NOTICE**

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




SSLAT0113D

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

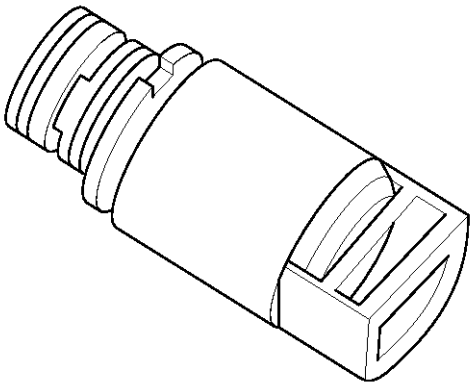
*Liquid gasket Part name :*
*Threebond 1281B or LOCTITE FMD-546*

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

## SS-B Solenoid Valve(ON/OFF)

### 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.



SSLAT0020D

### Specifications

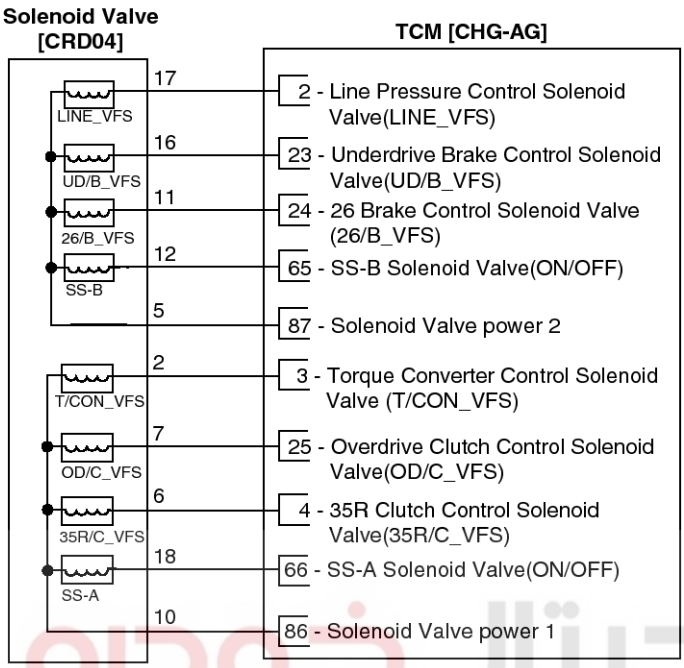
ON/OFF Solenoid Valve(SS-A, SS-B)

▷ Control type : Normal low type

| | |
|---|---|
| Control pressure kpa (kgf/㎠, psi) | 490.33(5.0, 71.12) |
| Internal resistance(Ω) | 10~11 |

## Circuit Diagram

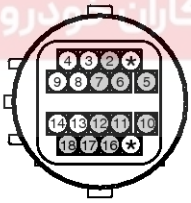
[Circuit Diagram]



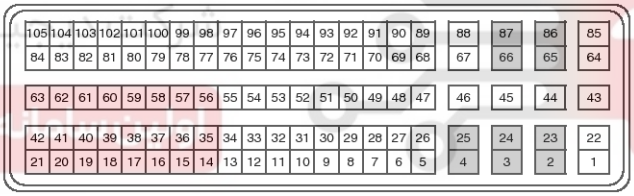

[Connection Information]

| Terminal | Connected to | Function |
|---|---|---|
| 17 | TCM CHG-AG (2) | Line Pressure Control Solenoid Valve (LINE_VFS) |
| 16 | TCM CHG-AG (23) | Underdrive Brake Control Solenoid Valve(UD/B_VFS) |
| 11 | TCM CHG-AG (24) | 26 Brake Control Solenoid Valve (26/B_VFS) |
| 12 | TCM CHG-AG (65) | SS-B Solenoid Valve(ON/OFF) |
| 5 | TCM CHG-AG (87) | Solenoid Valve power 2 |
| 2 | TCM CHG-AG (3) | Torque Converter Control Solenoid Valve(T/CON_VFS) |
| 7 | TCM CHG-AG (25) | Overdrive Clutch Control Solenoid Valve(OD/C_VFS) |
| 6 | TCM CHG-AG (4) | 35R Clutch Control Solenoid Valve (35R/C_VFS) |
| 18 | TCM CHG-AG (66) | SS-A Solenoid Valve(ON/OFF) |
| 10 | TCM CHG-AG (86) | Solenoid Valve power 1 |

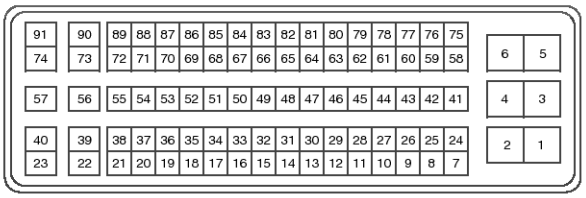
[Harness Connector]



Solenoid Valve Connector [CRD04]



TCM Connector [CHG-AG]



TCM Connector [CHG-BG]

STFAT1124N

## Inspection

1. Turn ignition switch OFF.
2. Disconnect the oil temperature sensor connector.
3. Measure resistance between sensor signal terminal and sensor ground terminal.
4. Check that the resistance is within the specification.

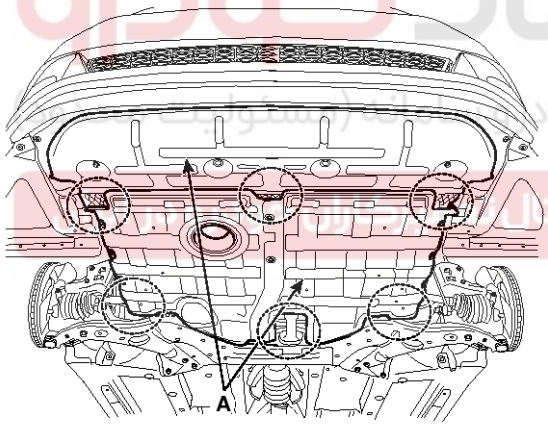
## Removal

**NOTICE**

*Replacing an on/off solenoid valve (SS-A, SS-B) does not require additional hydraulic pressure adjustment; however, the hydraulic pressure will need to be adjusted after replacing the VFS solenoid valve. If replacing the VFS solenoid valve; also replace the valve body assembly. (Refer to "Valve Body" in this group)*

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

**Tightening torque:**
7.8 ~ 11.8 N.m (0.8 ~ 1.2 kgf.m, 5.8 ~ 8.7 lb-ft)



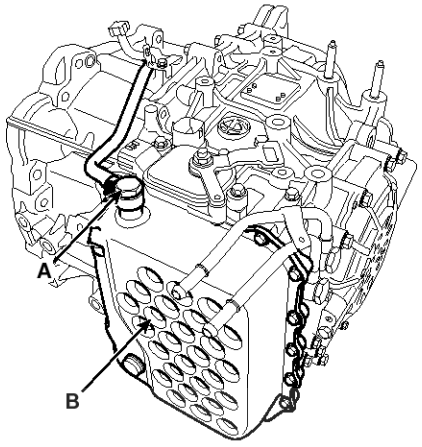

STFAT1007D

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

**Tightening torque:**
(A) 34.3 ~ 44.1 N.m (3.5 ~ 4.5 kgf.m, 25.3 ~ 32.6 lb-ft)
(B) 13.8 ~ 14.7 N.m (1.3 ~ 1.5 kgf.m, 9.4 ~ 10.8 lb-ft)

**CAUTION**

**Always replace the gasket of the eyebolt use new one whenever loosening eyebolt.**



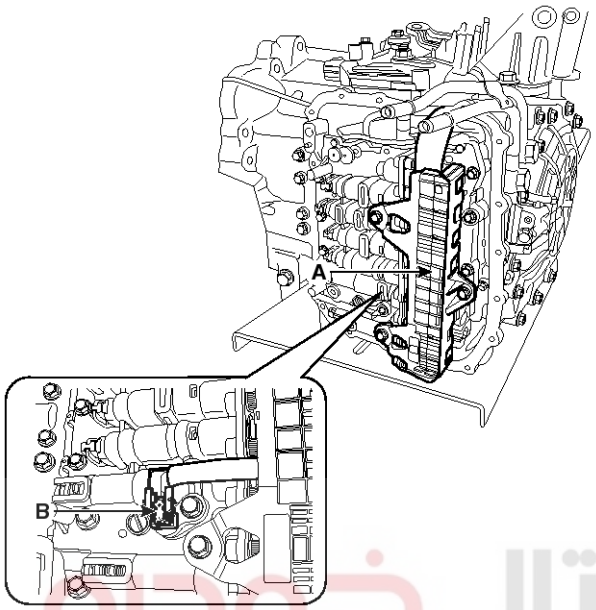

STFAT1018D

**NOTICE**

*Remove installation bolts in the engine compartment first and*

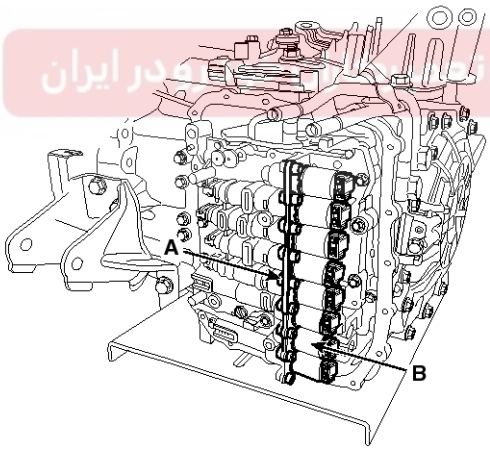
5. Remove the bolt (3ea) after disconnecting the solenoid valve connector (A) and the oil temperature sensor connector (B).

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




SSLAT1112N

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



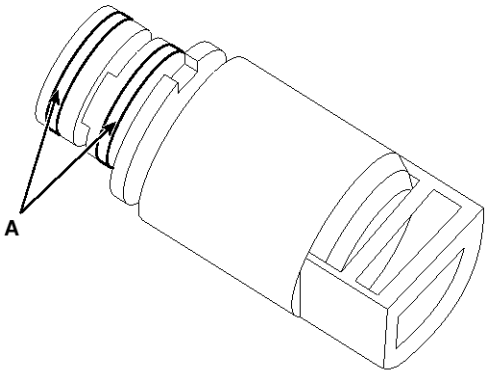

SSLAT0112D

## Installation

1. Installation is the reverse of removal.

**NOTICE**

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




SSLAT0113D

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

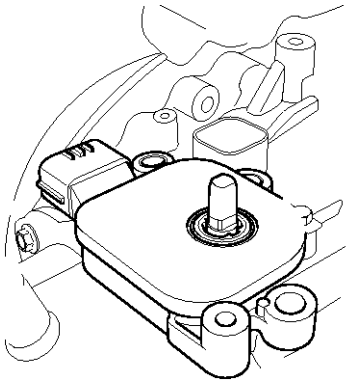
*Liquid gasket Part name :*
*Threebond 1281B or LOCTITE FMD-546*

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

## Inhibitor Switch

### Description

Inhibitor Switch monitors the lever's position(PRND) and is used to control gear setting signals.



SSLAT1113N

### Specifications

▷ Type: Combination of output signals from 4 terminals

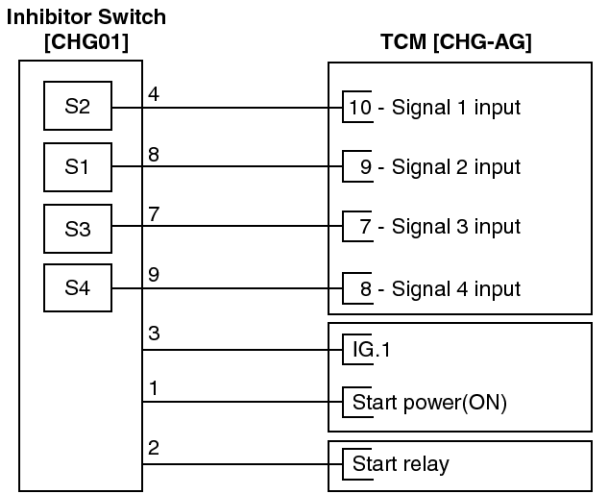
| | |
|---|---|
| Power supply (V) | 12 |
| Output type | Pin to Pin |

### Signal Code Table

| | P | P-R | R | R-N | N | N-D | D |
|---|---|---|---|---|---|---|---|
| Signal 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| Signal 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Signal 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Signal 4 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |

## Circuit Diagram

[Circuit Diagram]

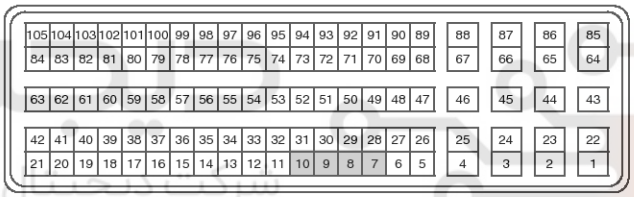



[Connection Information]

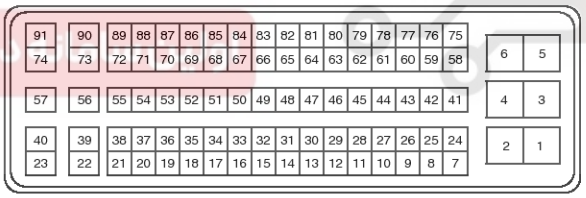
| Terminal | Connected to | Function |
|---|---|---|
| 4 | TCM CHG-AG (10) | Signal 1 input |
| 8 | TCM CHG-AG (9) | Signal 2 input |
| 7 | TCM CHG-AG (7) | Signal 3 input |
| 9 | TCM CHG-AG (8) | Signal 3 input |
| 3 | IG.1 | IG 1 |
| 1 | Start power(ON) | Start power(ON) 12V |
| 2 | Start relay | Start relay |

[Harness Connector]


Solenoid Valve Connector
[CHG01]




TCM Connector [CHG-AG]

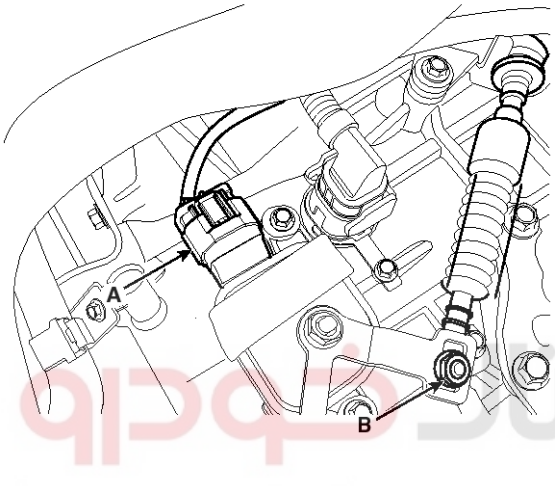



TCM Connector [CHG-BG]

STFAT1123N

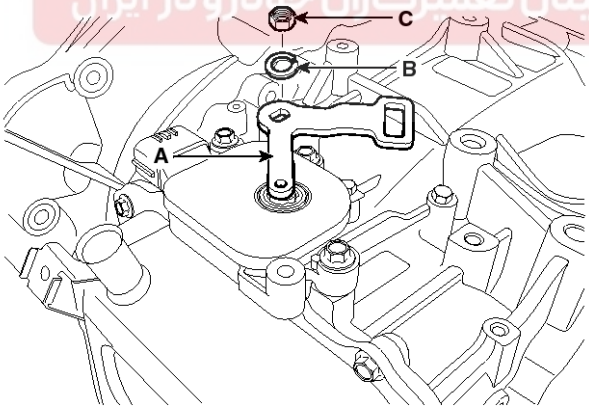
## Removal

1. Make sure vehicle does not roll before setting room side shift lever and T/M side manual control lever to "N" position.
2. Remove the battery and the battery tray. (Refer to "Charging system" in EE group.)
3. Remove the air cleaner assembly. (Refer to "Intake manifold" in EM group.)
4. Remove the shift cable mounting nut (B).
5. Disconnect the inhibitor switch connector (A).




SLMAT0008N

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




SSLAT1115N

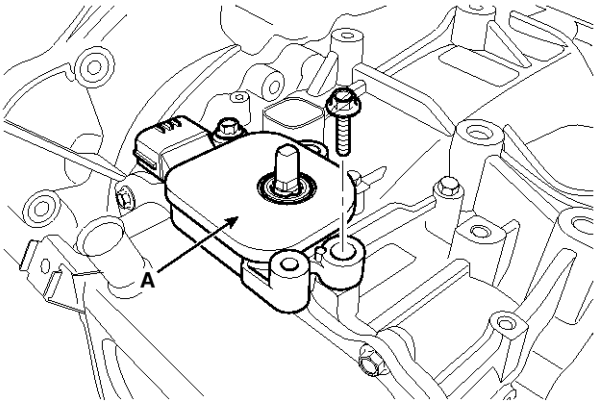
**⚠CAUTION**

**When installing, affix the manual control lever and the inhibitor switch with Ø5mm (0.1969in.). Then tighten the inhibitor assembly mounting bolts.**

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

**Tightening torque:**

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




SSLAT1116N

**⚠CAUTION**

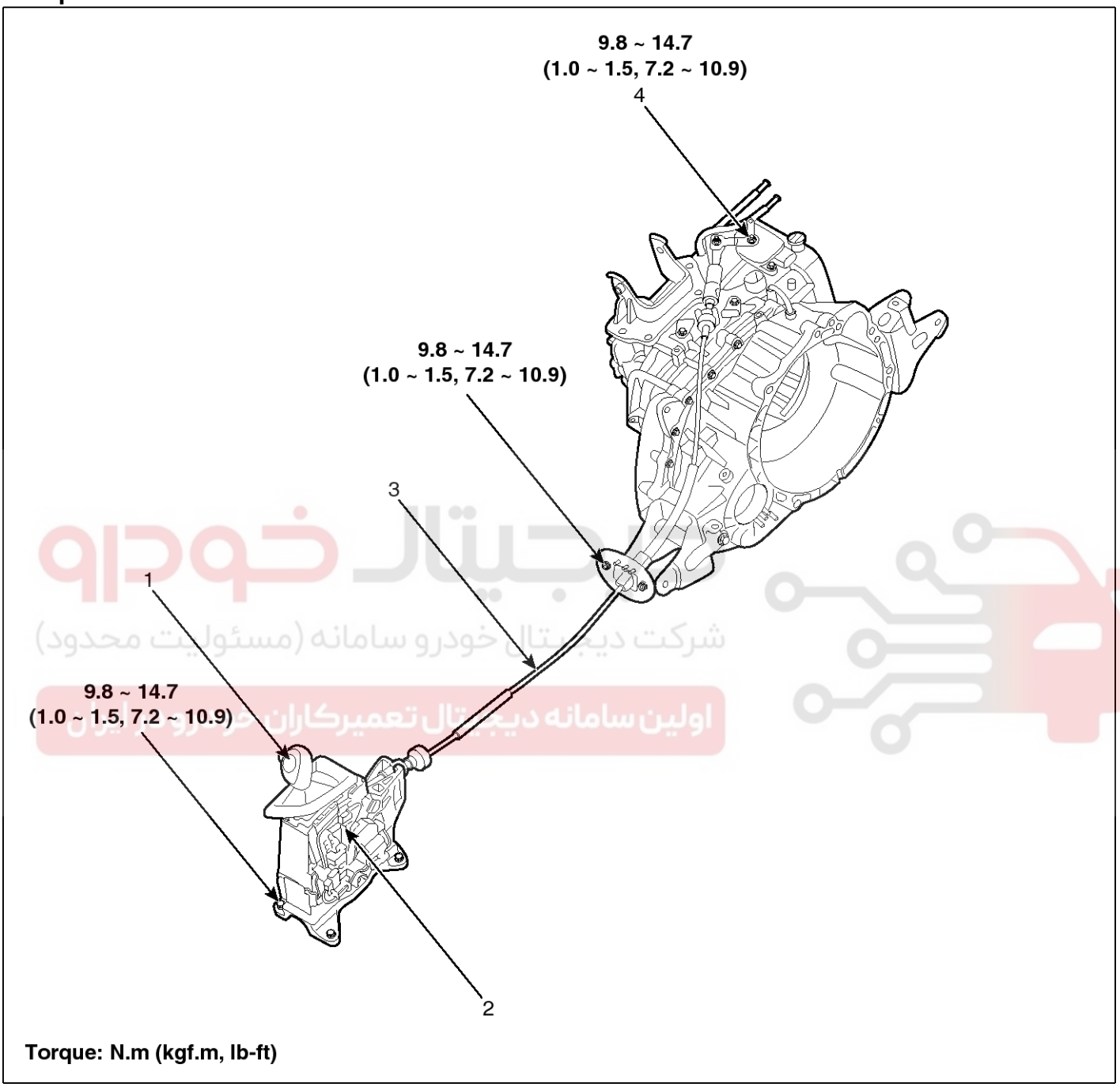
**When installing, tighten the inhibitor assembly mounting bolt lightly, so that necessary adjustments can be made. Tighten to specifications.**

## Installation

1. Installation is the reverse of removal.

## Shift Lever

### Components



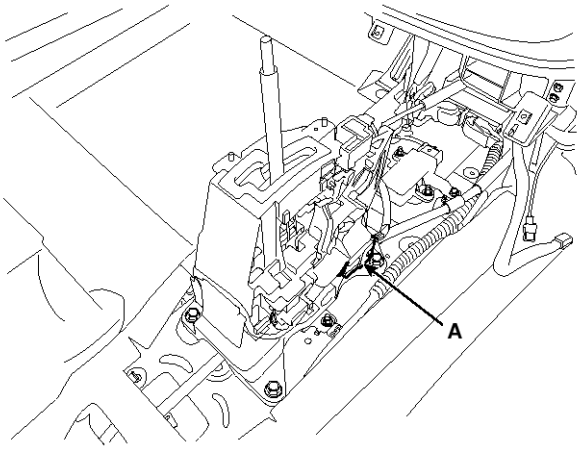

STFAT1020N

1. Shift lever knob & boots assembly
2. Shift lever assembly
3. Control cable assembly
4. Manual control lever (T/M side)

## Removal

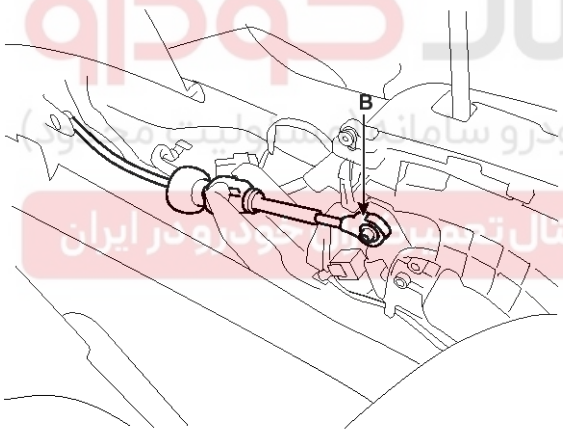
### Shift Lever Assembly Replacement

1. Remove the center console assembly. (Refer to "Interior(console)" in BD group.)
2. Disconnect sports mode connector (A).




STFAT1012D

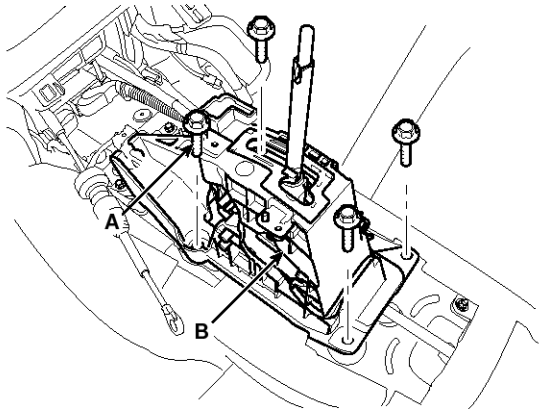
3. Remove the shift cable (B).




STFAT1109N

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

**Tightening torque:**
9.8 ~ 14.7 N.m (1.0 ~ 1.5 kgf.m, 7.2 ~ 10.9 lb-ft)



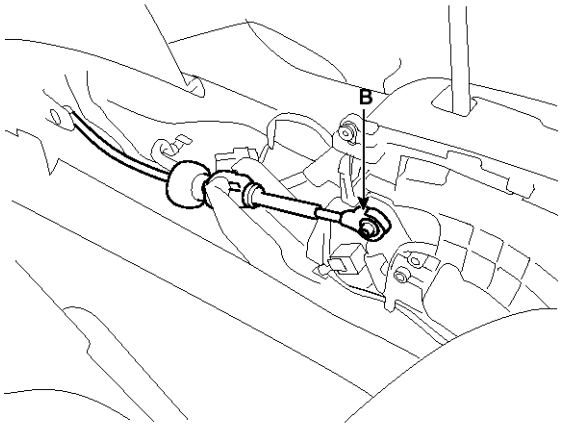

STFAT1014D

5. Installation is the reverse of removal.

**NOTICE**
*Make sure vehicle does not roll before setting room side shift lever and T/M side manual control lever to "N" position.*

### Control Cable Replacement

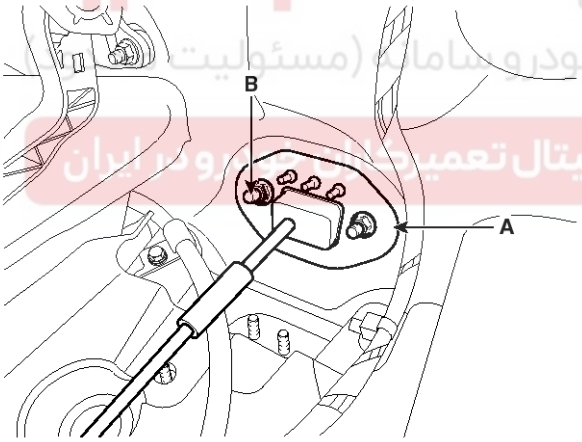
1. Remove the center console assembly. (Refer to "Interior(console)" in BD group.)
2. Remove the control cable (B).




STFAT1109N

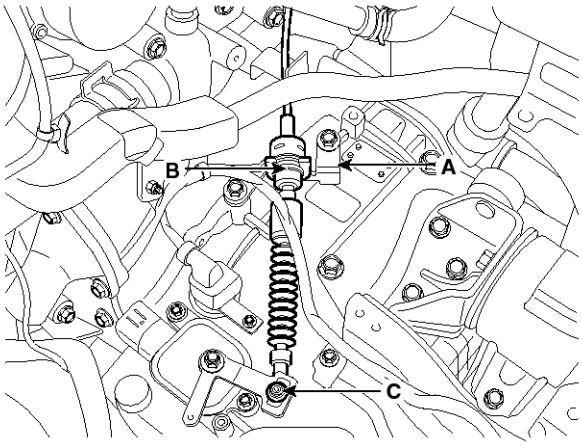
3. Remove the control cable assembly in the vehicle after removing the nuts (B) and the retainer (A).

**Tightening torque:**
9.8 ~ 14.7 N.m (1.0 ~ 1.5 kgf.m, 7.2 ~ 10.9 lb-ft)




SSLAT0032D

4. Remove the nut (C).
5. Remove the cable (B) from the bracket (A) at transaxle assembly side (Refer to "Automatic Transaxle" in this group).




SSLAT1004L

6. Remove the control cable inside of cab.

### Installation

1. Installation is the reverse of removal.

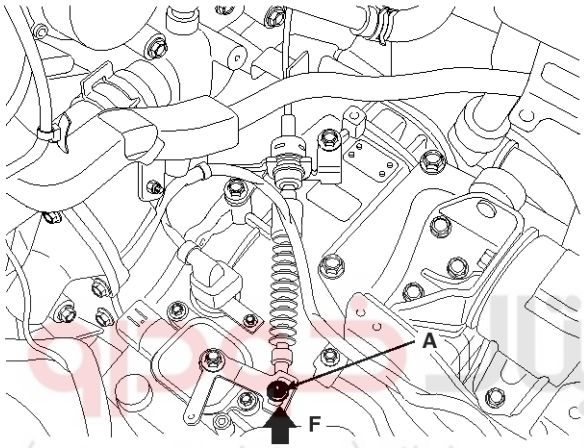
**NOTICE**
*Make sure vehicle does not roll before setting room side shift lever and T/M side manual control lever to "N" position.*

## Adjustment

### Adjusting method for T/M control cable

1. Make sure vehicle does not roll before setting room side shift lever and T/M side manual control lever to "N" position.
2. Connect room side shift lever and control cable.
3. Push cable to "F" direction shown to eliminate FREE PLAY.
4. Tighten adjusting nut (A).

**Tightening torque:**
9.8 ~ 14.7 N.m (1.0 ~ 1.5 kgf.m, 7.2 ~ 10.9 lb-ft)




SLMAT0028D

5. After adjusting, check to be sure that this part operates as designed at each range of T/M side corresponding to each position of room lever.