General Information

Specifications

Tightening Torques

Items	N.m	Kgf.m	lb-ft
Transfer assembly mounting bolts	60.8~65.7	6.2~6.7	44.8~48.5
4WD ECM mounting nuts	9.8~11.8	1.0~1.2	7.2~8.7
Coupling assembly mounting bolts	56.9~64.7	5.8~6.6	42.0~47.7
Propeller shaft mounting bolts	49.0~68.6	5.0~7.0	36.2~50.6
Transfer oil drain plug	39.2~58.8	4.0~6.0	28.9~43.4
Transfer oil filler plug	39.2~58.8	4.0~6.0	28.9~43.4

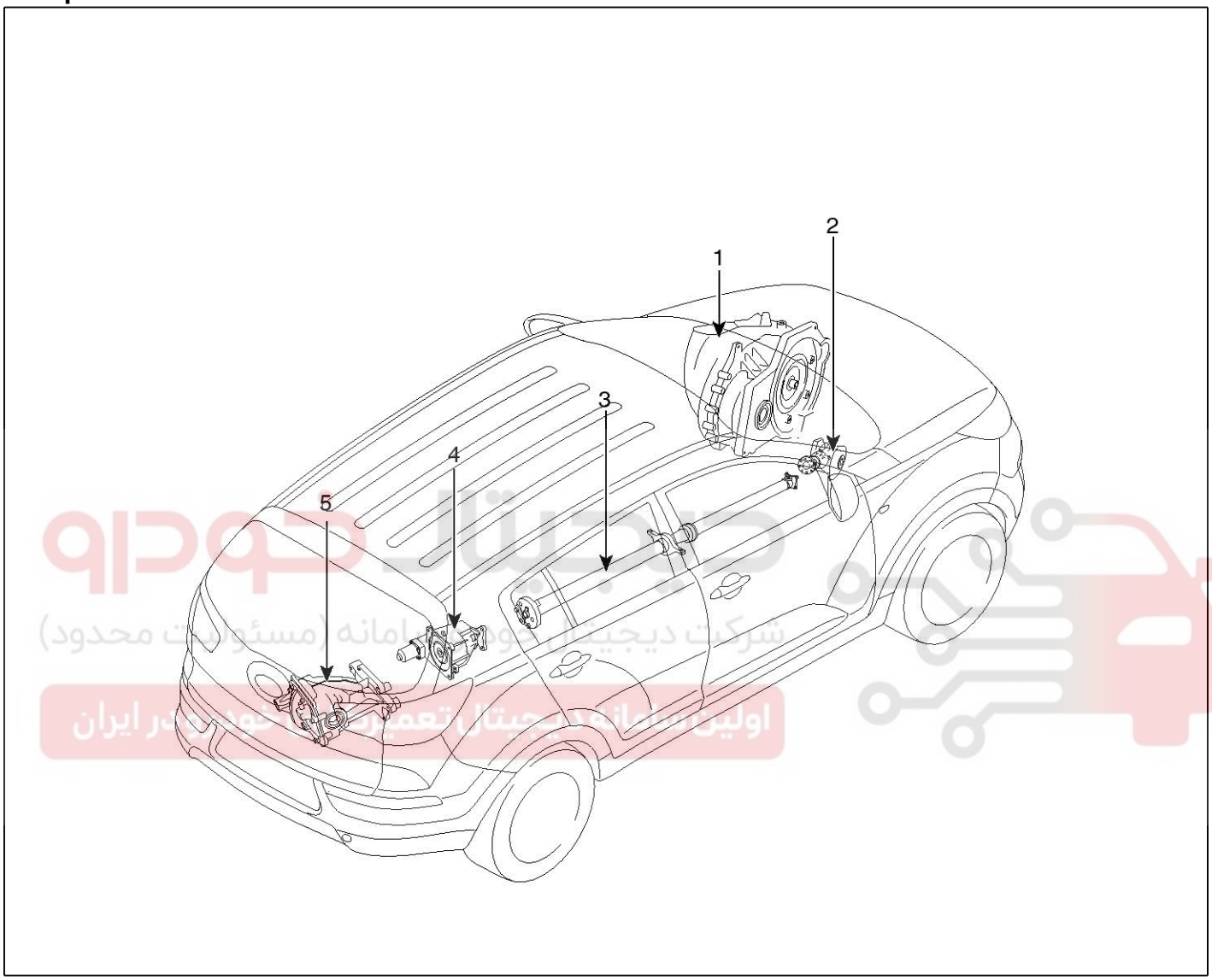
Lubricants

Items	Specification	Capacity
Transfer oil	Hypoid gear oil, SAE 75w/90, API GL-5	0.6L (0.16 U.S.gal., 0.63 U.S.qt, 0.53 Imp.qt.)
Coupling oil	SHELL TF0870	0.485L(0.13 U.S.gal.,0.51U.S.qt,0.43Imp.qt.)

Transfer Assembly

Front Wheel Transfer Assembly

Components Location



SSLWD1001D

1. Automatic transaxle
2. Transfer assembly
3. Propeller shaft
4. Coupling assembly
5. Differential assembly

Inspection

Transfer Oil Inspection

Transfer oil should be inspected and refilled every 30 months or 37,500 miles.

Transfer Oil Replacement

1. Transfer oil is not replaced in normal condition.But it shoud be replaced every 75,000 miles in severe driving conditions.

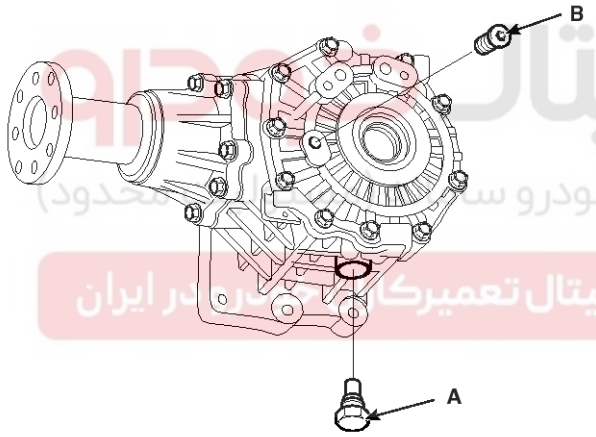
NOTICE

Severe driving conditions

1. *Driving in dusty, rough roads*
2. *Drivng in mountains areas*
3. *Driving for patrol car, taxi, commercial car or vehicle towing*
4. *Driving over 170Km/h*

CAUTION

Transfer oil should be replaced if the transfer assembly is fall into the water.



SCMWD0002N

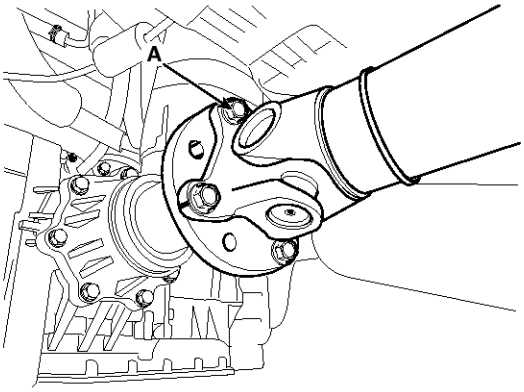
Tightening torque

Oil drain plug(A) :
39.2~58.8N.m (4.0~6.0kgf.m, 28.9~43.4lb-ft)
Filler plug(B) :
39.2~58.8N.m (4.0~6.0kgf.m, 28.9~43.4lb-ft)

Removal

1. Lift up the vehicle.
2. Remove the propeller shaft bolts.(A-4ea)

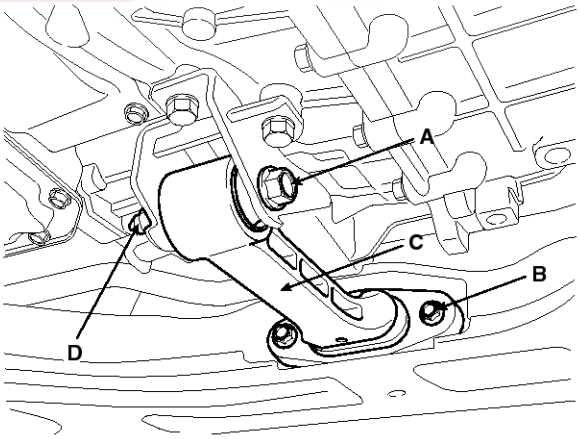
Tightening torque :
49.0~68.6N.m (5.0~7.0kgf.m, 36.2~50.6lb-ft)



SSLWD1016D

3. Remove the right driveshaft (passenger side) from the transfer case. (Refer to "Drive shaft" in DS group)
4. Remove the roll rod bracket(C) after removing bolt(A,B).

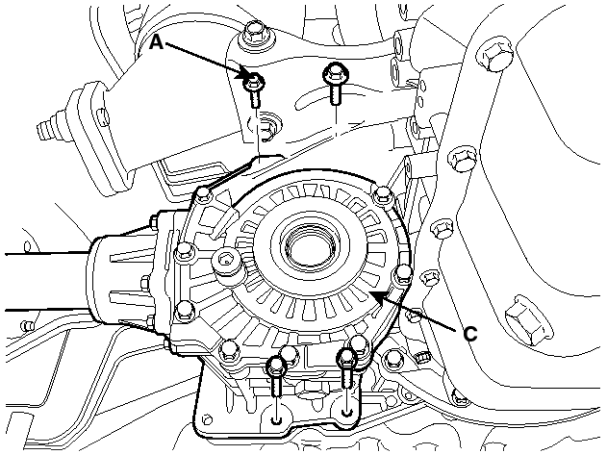
Tightening torque :
(B) 49.0~63.7N.m (5.0~6.5kgf.m, 36.2~47.0lb-ft)
(D) 107.9~127.5N.m (11~13kgf.m, 79.6~94.1lb-ft)



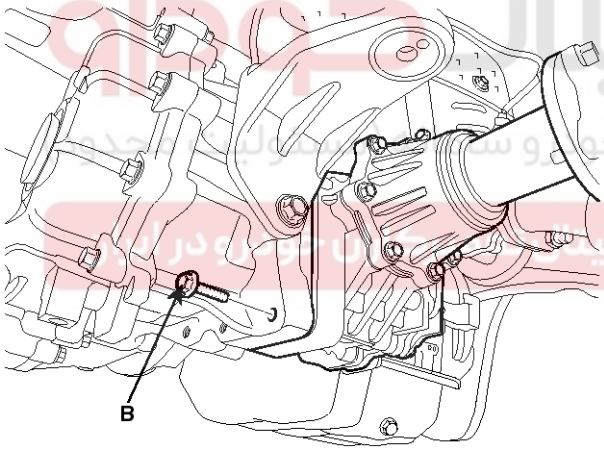
SSLWD1030N

5. Remove the sub frame. ("Front suspension system" in SS group)
6. Remove the transfer case up and down mounting bolt (A-4ea, B-1ea).

Tightening torque :
(A, B) 60.8~65.7N.m (6.2~6.7kgf.m, 44.8~48.5lb-ft)



SSLWD1020D



SLMWD0023D

7. Remove the transfer case (C) with the lever after supporting the transfer case with a jack.

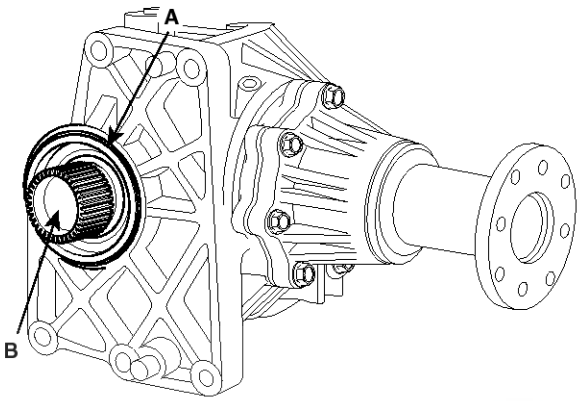
Installation

1. Installation is the reverse of removal.

NOTICE

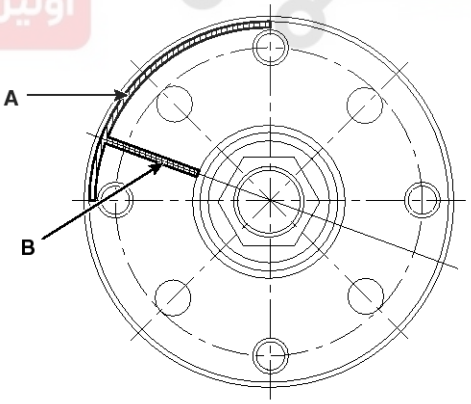
1. *Be careful not to damage the O-ring (A). If the O-ring is damaged, replace with a new one.*
2. *Smear and cover splines (B) withmolybdenum type high pressure grease.*

TECHLUBE MEGAMAX - ALPHA OR EQUIVALENT



SCMWD0001N

3. *Install the propeller shaft near runout marking (Transfer assembly 1ea(A), propeller shaft 1ea(B)).*



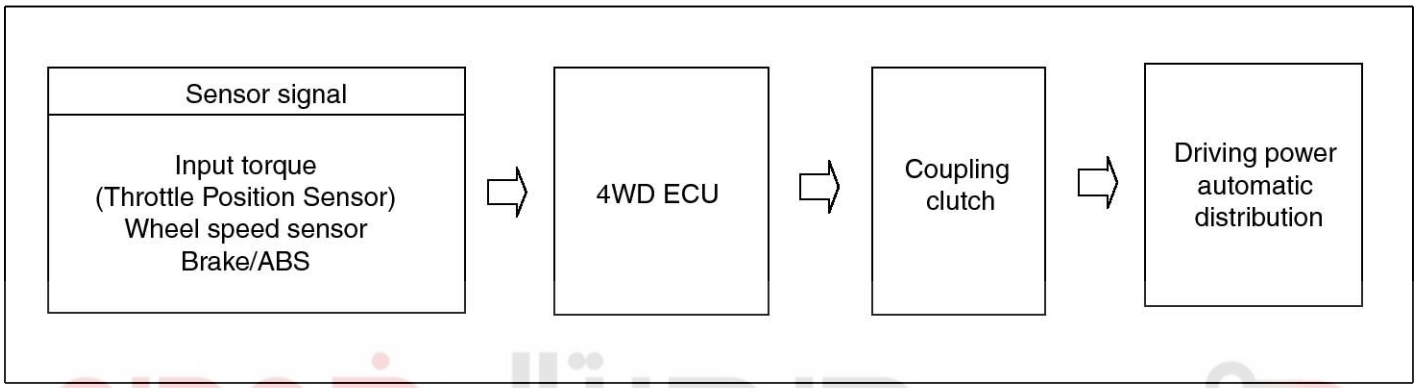
SSLWD1002D

4WD Control System

4WD ECU

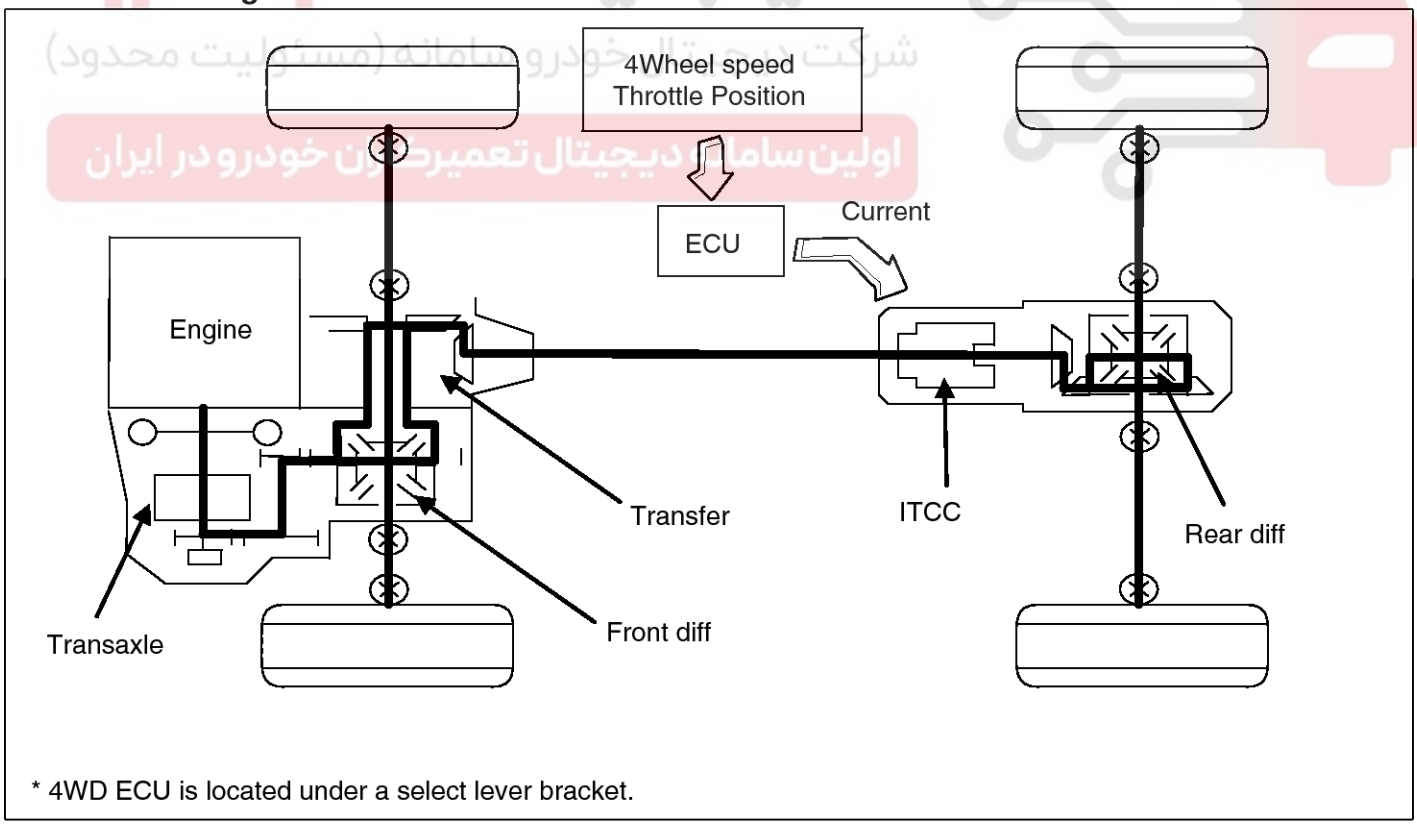
Description

4WD ECU processes signals from various sensors and determines the current road and driving conditions. The ECU then utilizes this information to implement precision control over the 4WD coupling's multi-plate clutch and variably adjust the amount of torque delivered tothe rear wheels.



SSLWD1021N

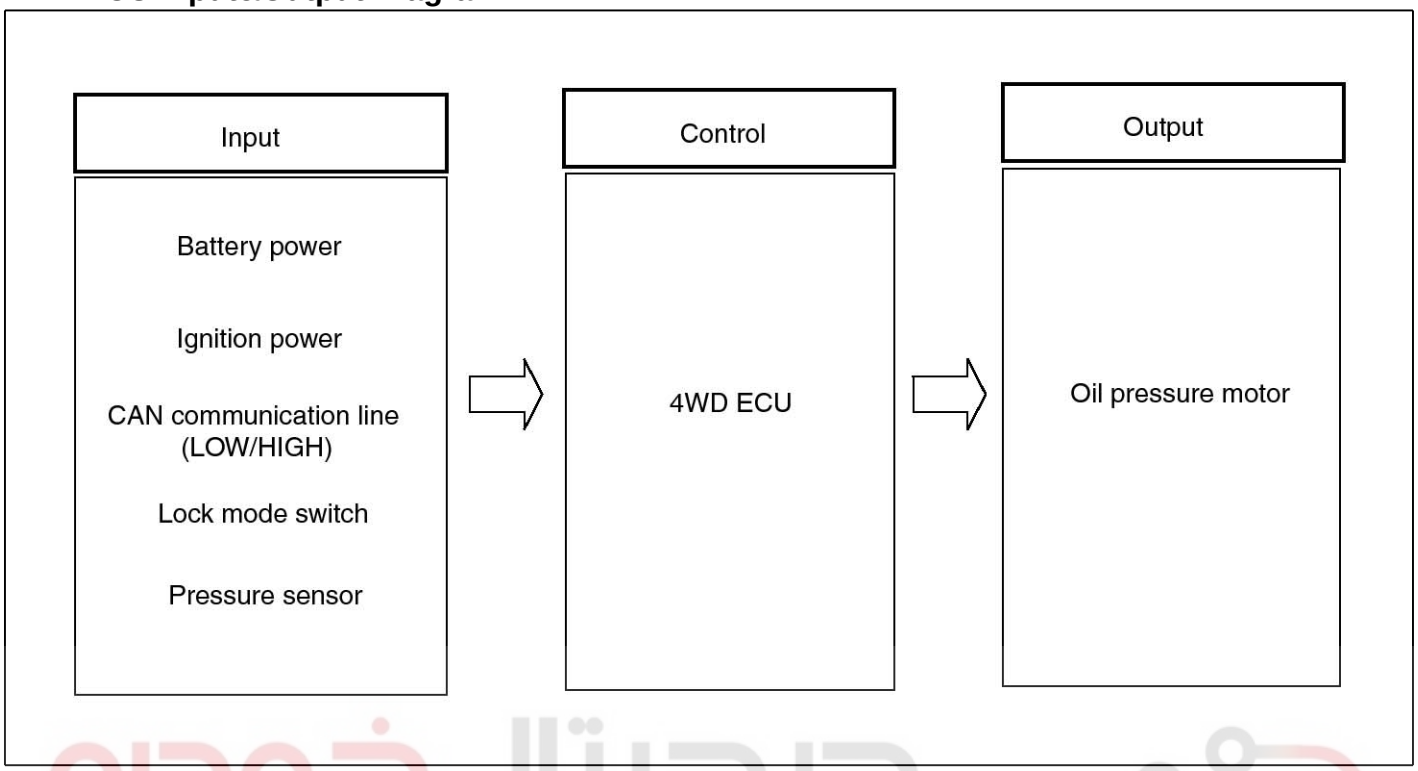
Power Flow Diagram



* 4WD ECU is located under a select lever bracket.

SXMWD0001L

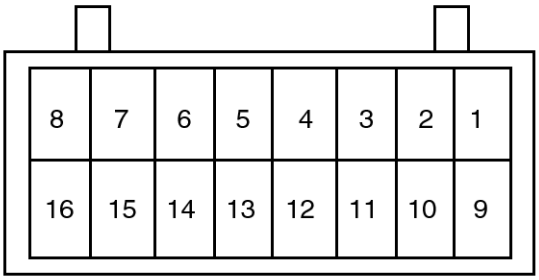
4WD ECU Input&Output Diagram



SSLWD1023N

Circuit Diagram

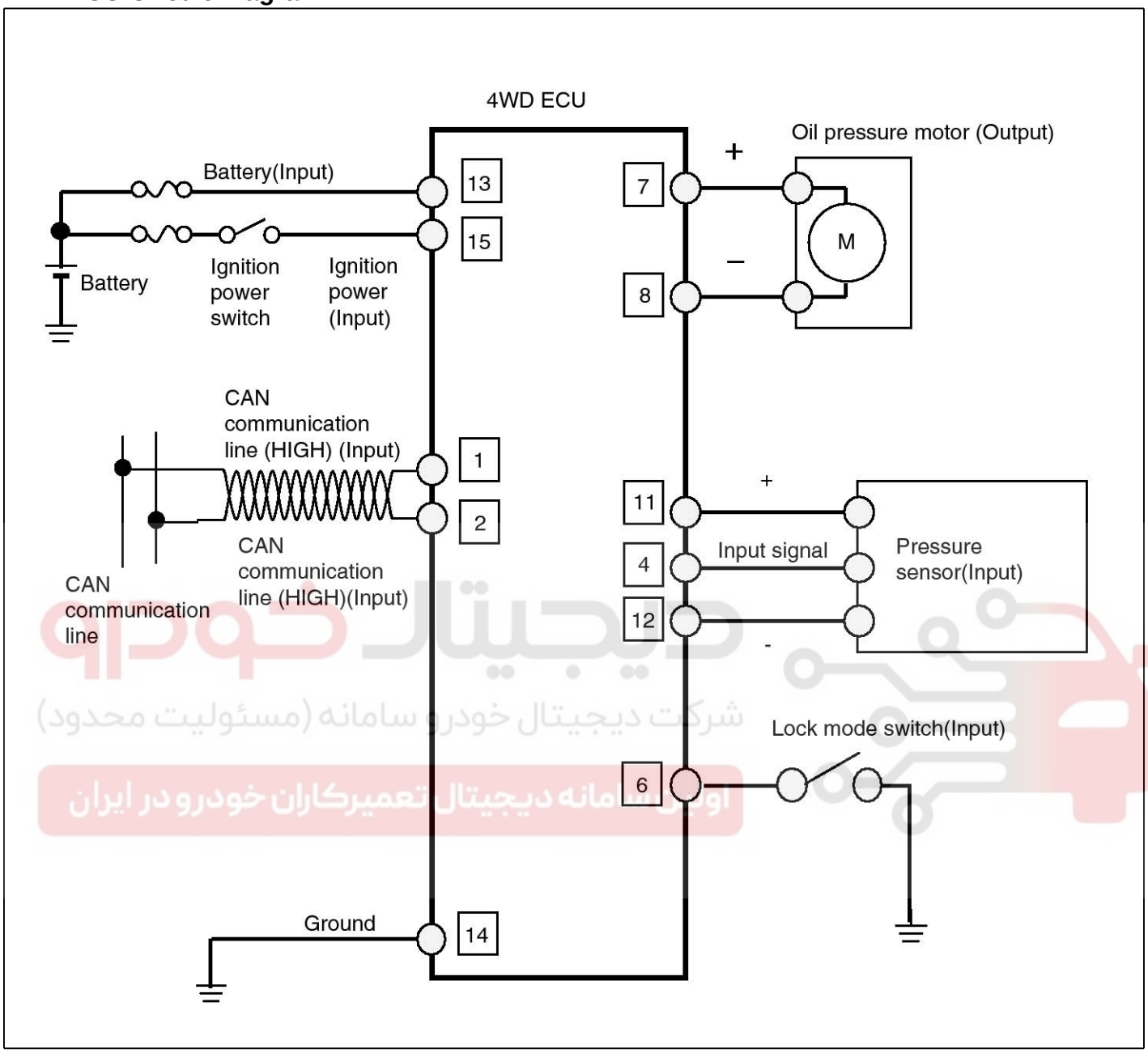
4WD ECU Connector



SXMTS9053D

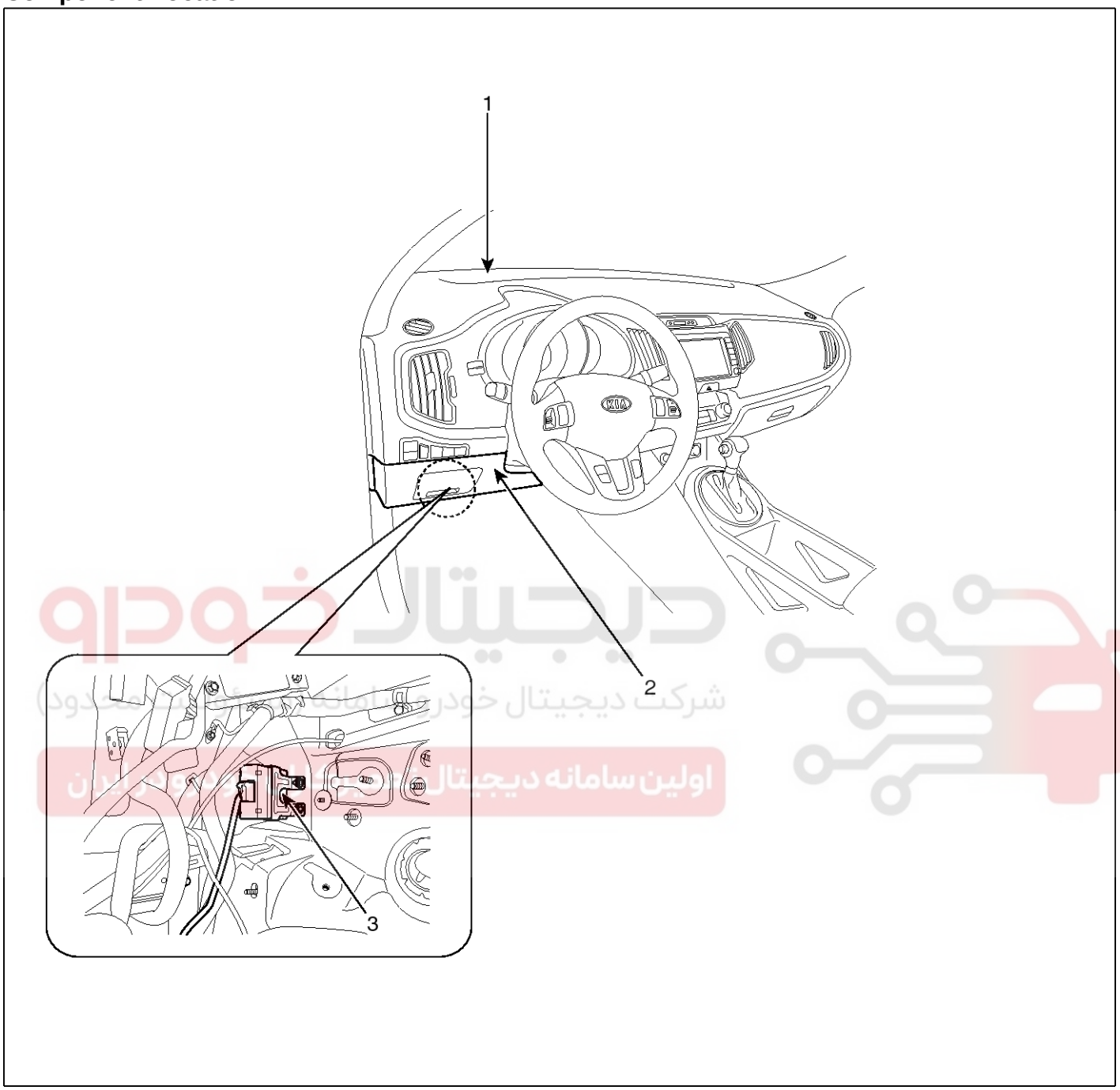
Pin	Function
1	Oil pressure motor A
2	Oil pressure motor B
3	Lock mode switch
4	-
5	Input sensor signal(+)
6	-
7	CAN communication line (High)
8	CAN communication line (Low)
9	-
10	-
11	-
12	IG power
13	Ground
14	Battery power
15	Input sensor signal(-)
16	Pressure sensor(Input)
17	-
18	-

4WD ECU Circuit Diagram



SSLWD1003N

Component Location



SSLWD1024D

1. Crash pad
2. Crash lower panel
3. 4WD ECU

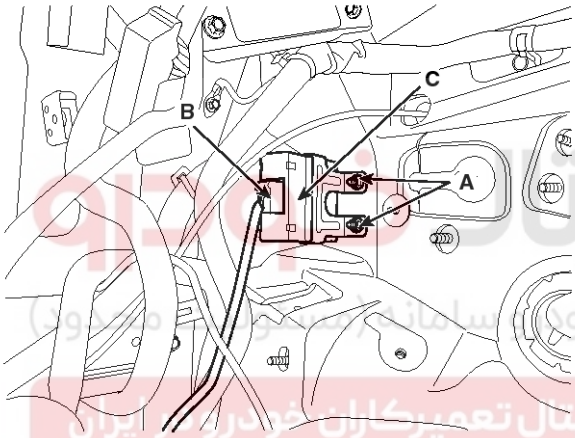
Replacement

⚠CAUTION

Prior to replacing the 4WD ECU, check the 4WD ECU's clutch learing with the GDS tool. (Refer to " Coupling assembly " in 4WD group)

1. Remove the lower panel. (Refer to "Crash Pad" in BD group)
2. Remove the IPM.(Refer to "Fuses and Relays" in BE group)
3. Remove the parking brake pedal.(Refer to "Parking Brake System" in BR group)
4. Remove the 4WD ECU(C) after removing the nut (A-2ea) and the connector (B).

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



SLMWD0001D

5. Installation is the reverse of removal.

⚠CAUTION

Prior to installing a new ECU, upload the original ECU's clutch learing to the replacement ECU using the GDS tool. (Refer to " Coupling assembly " in 4WD group)

Coupling Assembly

Direct Electro Hydraulic Actuator Coupling

Description

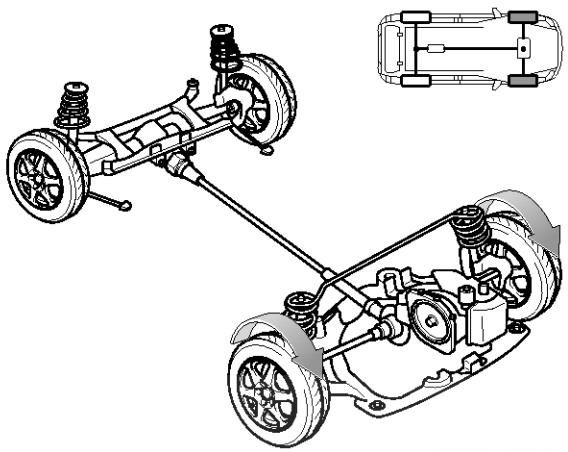
4WD ECU processes signals from various sensors and determines the current road and driving conditions. The ECU then utilizes this information to implement precision control over the 4WD coupling's multi-plate clutch and variably adjust the amount of torque delivered tothe rear wheels.

Four Wheel Drive (4WD) transfer mode selection

1. AUTO MODE:
   - When driving in 4WD AUTO mode, the vehicle operates similar to conventional 2WD vehicles under normal operating conditions. However, if the system determines that there is a need for the 4WD mode, the engine's driving power is distributedto all four wheels automatically without driver intervention.
   - When driving on normal roads and pavement, the vehicle moves similar to conventional 2WD vehicles.
2. LOCK MODE:
   - This mode is used for climbing or descending sharp grades, off-road driving, driving on sandy and muddy roads, etc., to maximize traction.
   - This mode automatically begins to deactivate at speeds above 30 km/h (19 mph) and is shifted to 4WD AUTO mode at speed above 40 km/h (25 mph). If the vehicle speed decelerates to below 30 km/h (19 mph), however, the transfermode is shifted into 4WD LOCK mode again.

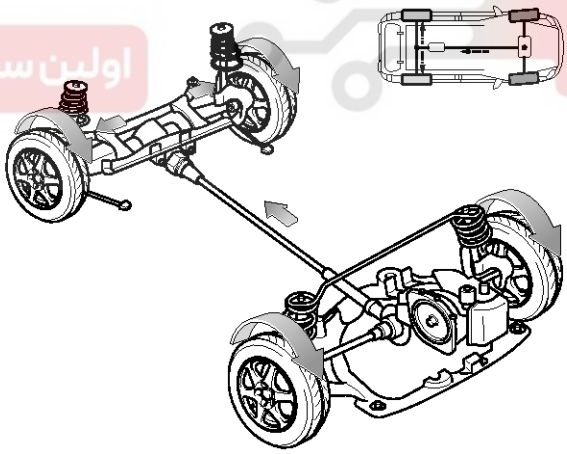
Electronic Coupling - 4WD Control (By Driving Condition)

1. Cruising (Auto Mode)
   - Power is delivered mostly to the front wheels.



SSLWD1004D

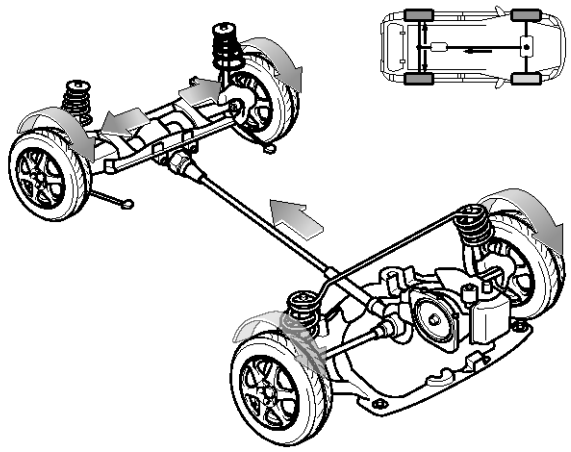
2. Cornering (Auto Mode)
   - Adjusts the amount of power to the rear wheels based on the turning radius and cornering speed.



SSLWD1005D

3. Wheel Slip (Auto Mode)

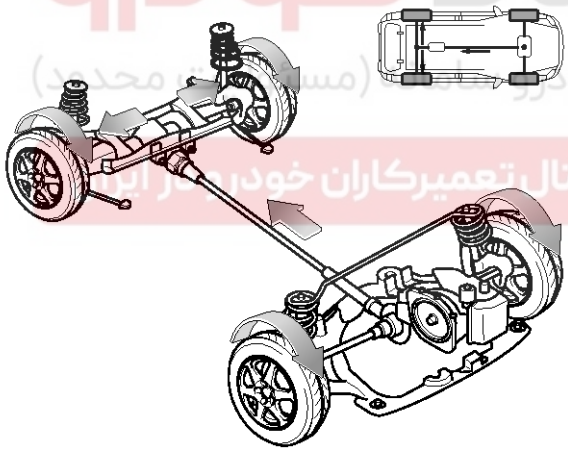
   - If one or both of the front wheels lose traction, the system transfers an appropriate amount of power to the rear wheels based on the slip amount at the front wheels.



SSLWD1006D

4. Lock Mode

   - Maximizes rough terrain performance (active only at speeds below 40 km/h).

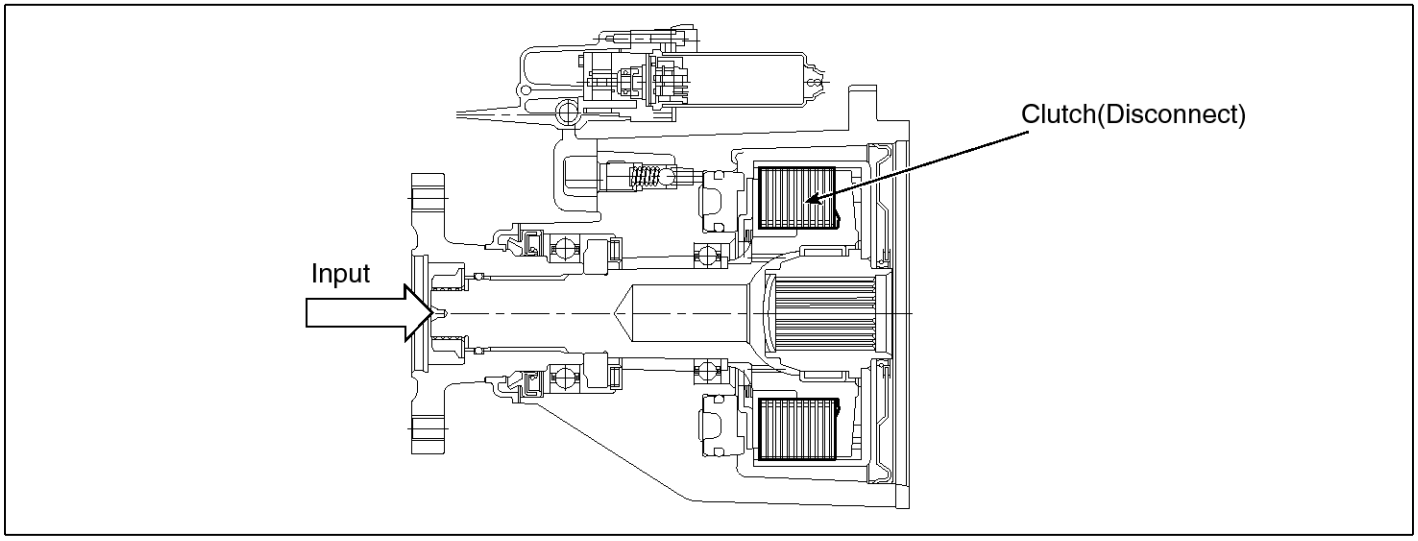


SSLWD1007D

Operation

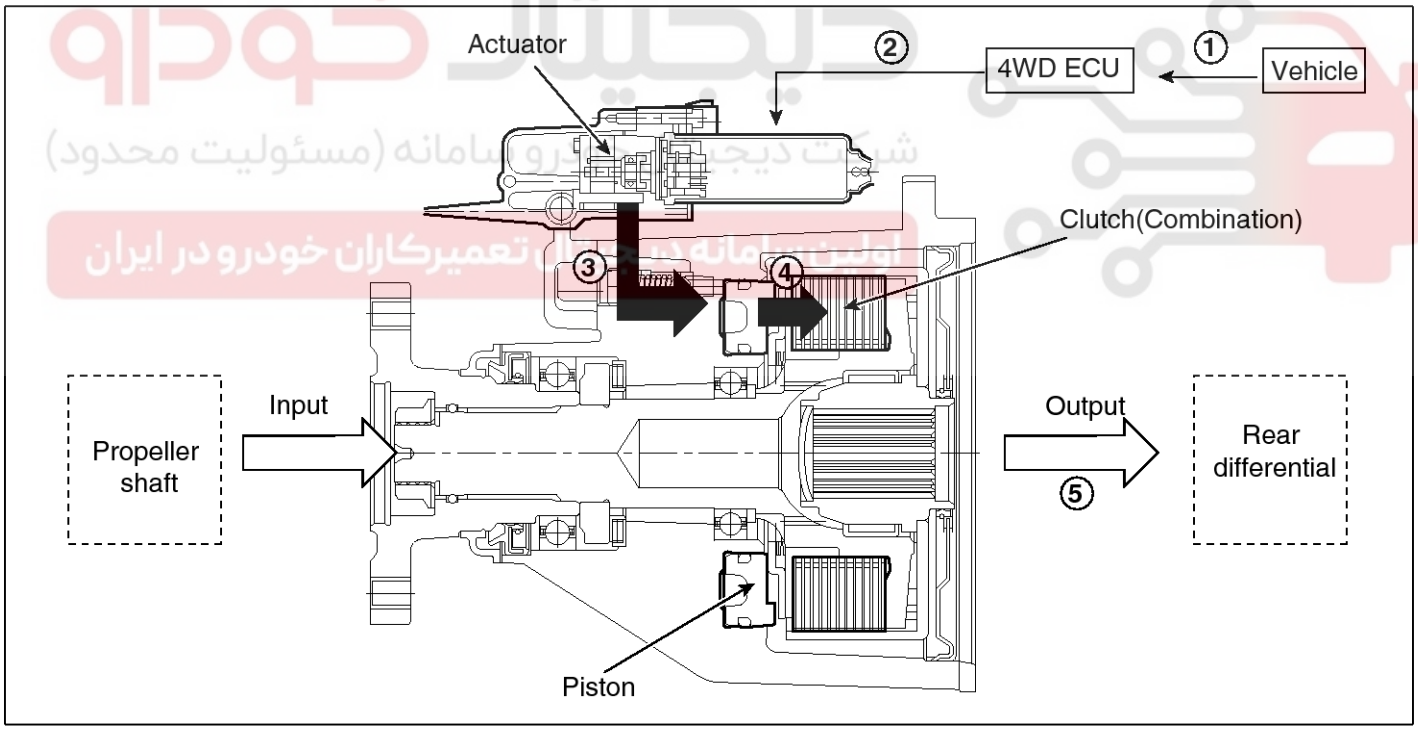
Electronic Coupling

[Inactive]



SSLWD1008N

[Active]

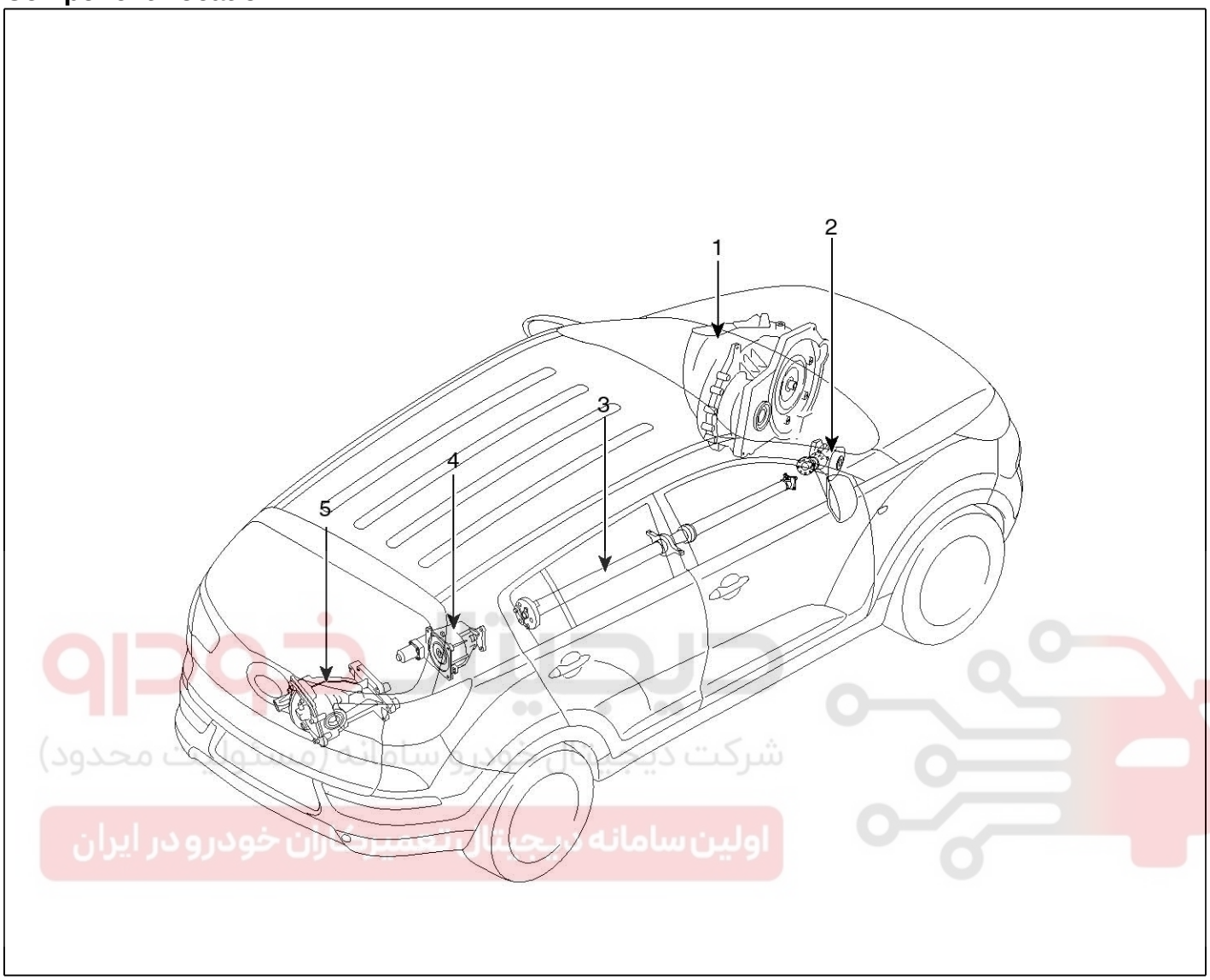


SSLWD1009N

Operation Order

1. 4WD ECU receives CAN signals from the vehicle's sensors.
2. 4WD ECU calculates the necessary amount of rear-wheel torque and sends the corresponding driving current to the actuator (electronic motor and hydraulic pump).
3. Hydraulic pressure generated by the actuator moves the piston.
4. Friction from the piston's movement engages the clutch.
5. Power is delivered to the rear wheels.

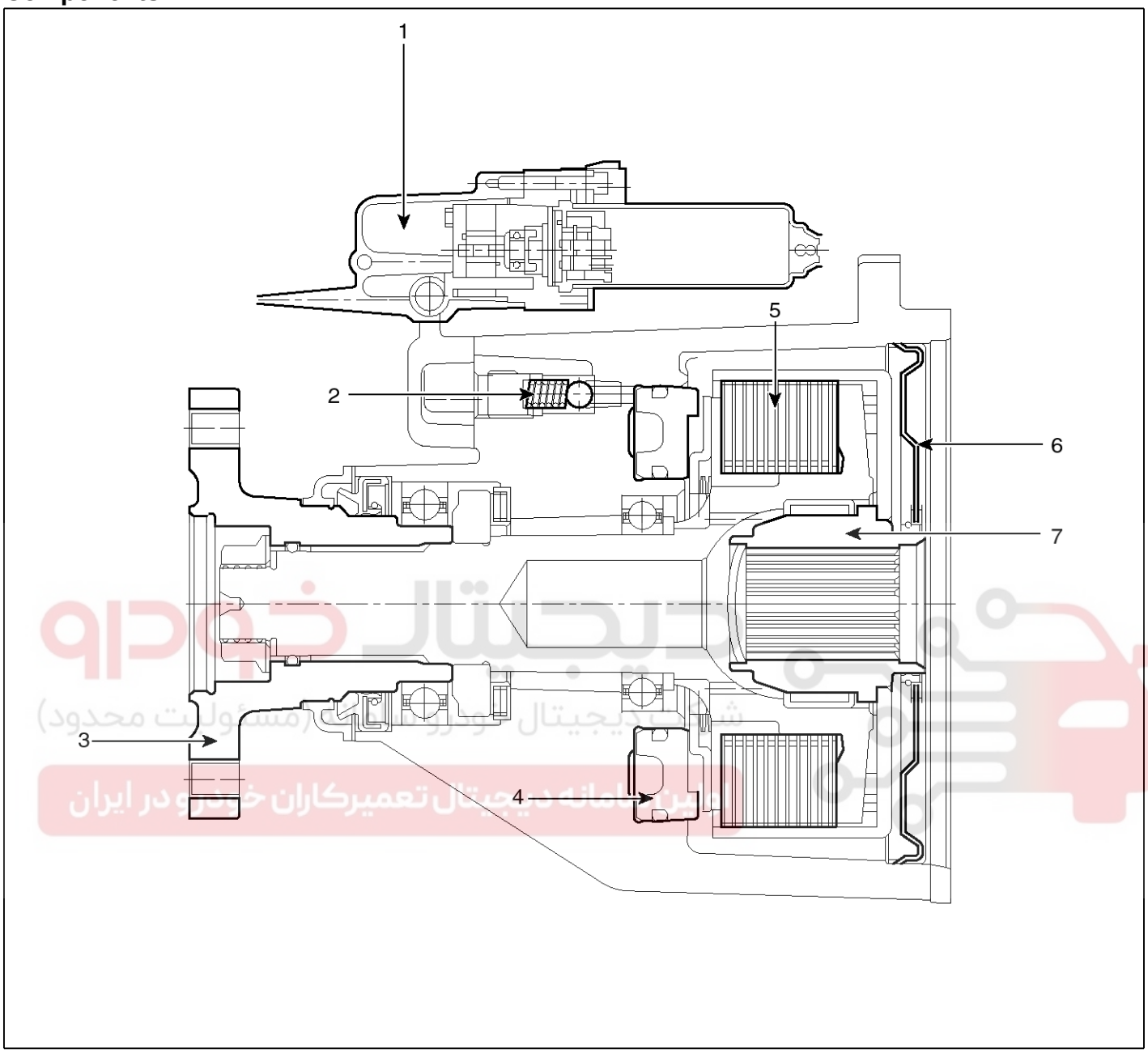
Component Location



SSLWD1015D

1. Automatic transaxle
2. Transfer assembly
3. Propeller shaft
4. Coupling assembly
5. Differential assembly

Components



SSLWD1010D

1. Actuator
2. Bleed valve
3. Flange & Input shaft
4. Piston
5. Clutch pack
6. Oil seal cover
7. Hub

Inspection

NOTICE

All units are filled up with coupling fluid (ultra-low viscosity ATF) prior to shipping. Inspection, fill-up, and replacement of coupling fluid is therefore not necessary (zero maintenance, lifetime fluid).

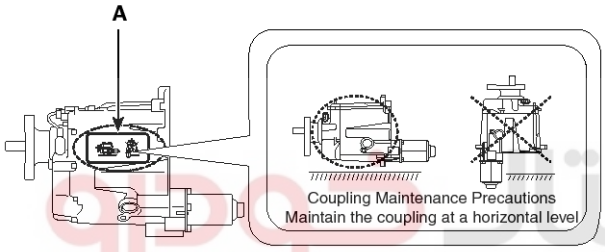
Removal

CAUTION

Coupling Maintenance Precautions

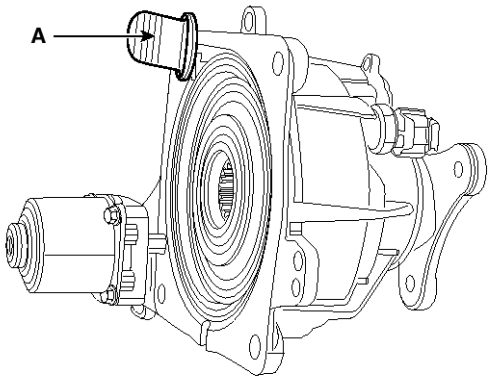
Maintain the coupling at a horizontal level.

- **Refer to the handling caution level (A) when servicing the coupling (removal, installation, replacement, etc.).**



SSLWD1014N

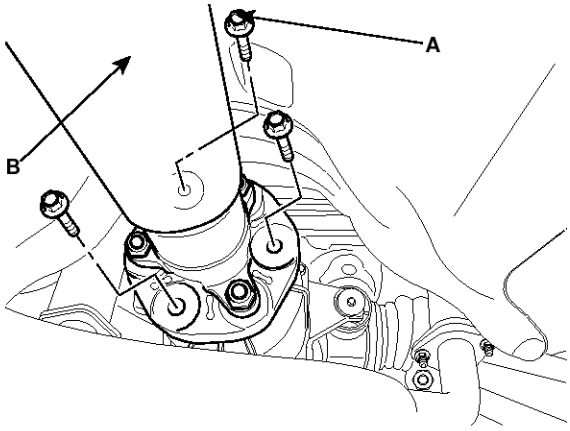
- **Remove the dipstick and then mount the coupling assembly to the rear differential assembly.**
- **Maintain the coupling at a horizontal level after removing the dipstick to prevent the fluid from spilling out.**



SSLWD1060D

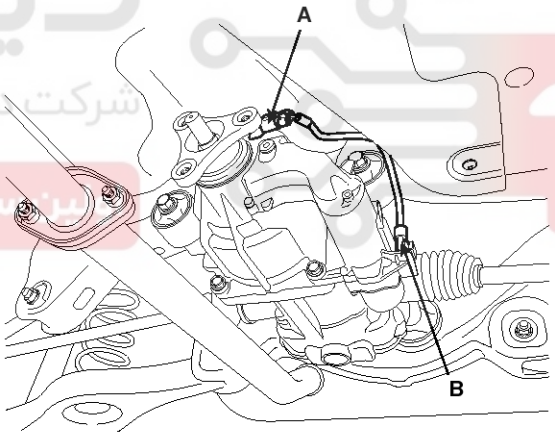
1. Remove the 4WD coupling assembly bolts (A-3ea) mounted to the rear propeller shaft (B).

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



SENMT7206D

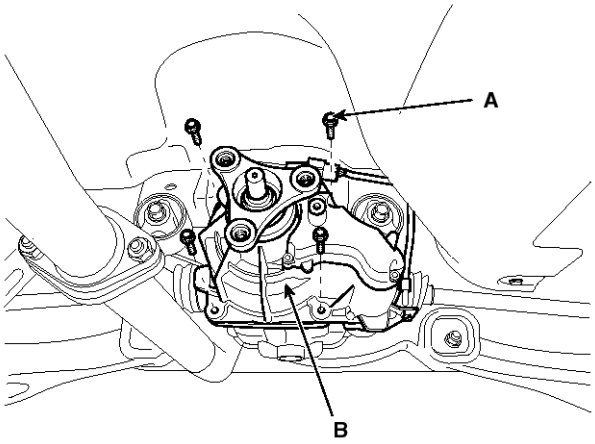
2. Using a flat tool, separate the propellar shaft from 4WD coupling assembly.
3. Remove the electric magnetic clutch connector(A).



SSLWD1011D

4. Remove the 4WD coupling assembly mounting bolts (A-4ea).

Tightening torque :
58.8~63.7N.m (6.0~6.5kgf.m, 43.4~47.0lb-ft)



SSLWD1012D

5. Using a flat tool, separate the 4WD coupling assembly from the rear differential carrier assembly.

Installation

1. Installation is the reverse of removal.

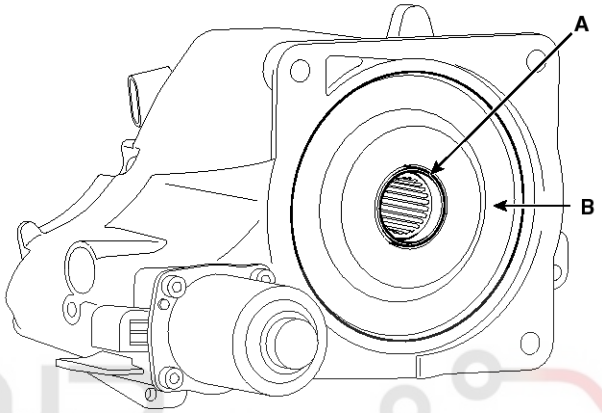
NOTICE

- *Grease the spline hole (A) of the coupling assembly.*

Grease

Extreme Pressure(EP) grease containing molybdenum disulfide(MoS2)

- *When installation the coupling, be careful not to damage the oil seal (B).*



SSLWD1013D

CAUTION

After replacing the coupling, reset the 4WD ECU's clutch learing using the GDS tool. (Refer to " Coupling assembly " in 4WD group)

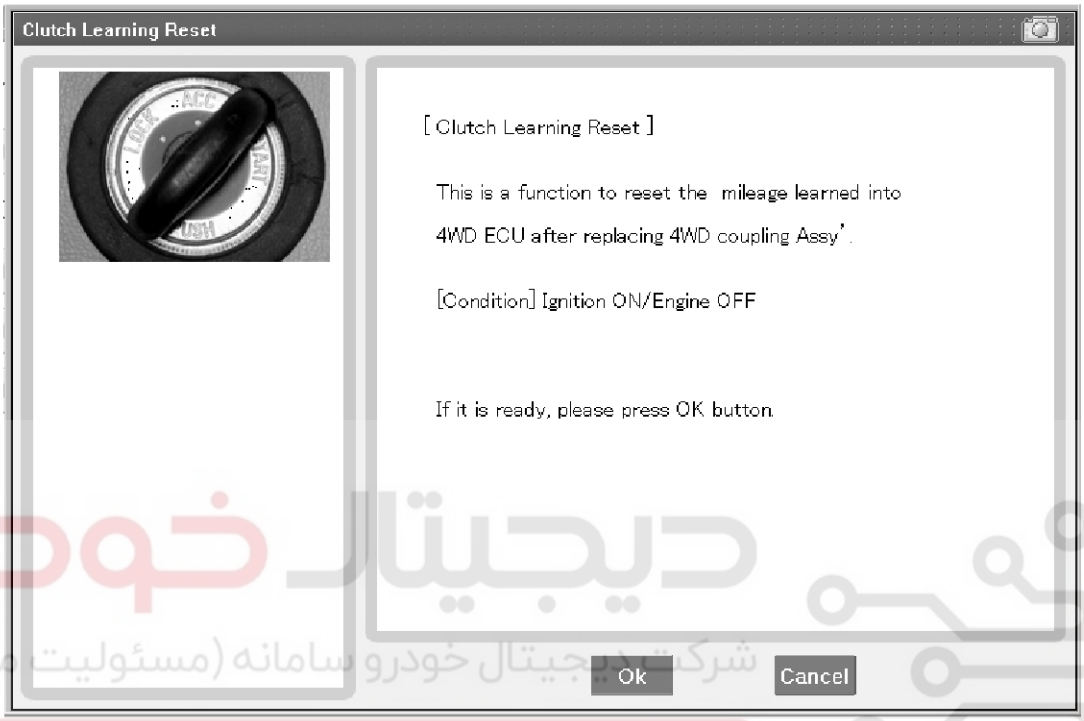
Adjustment

Description

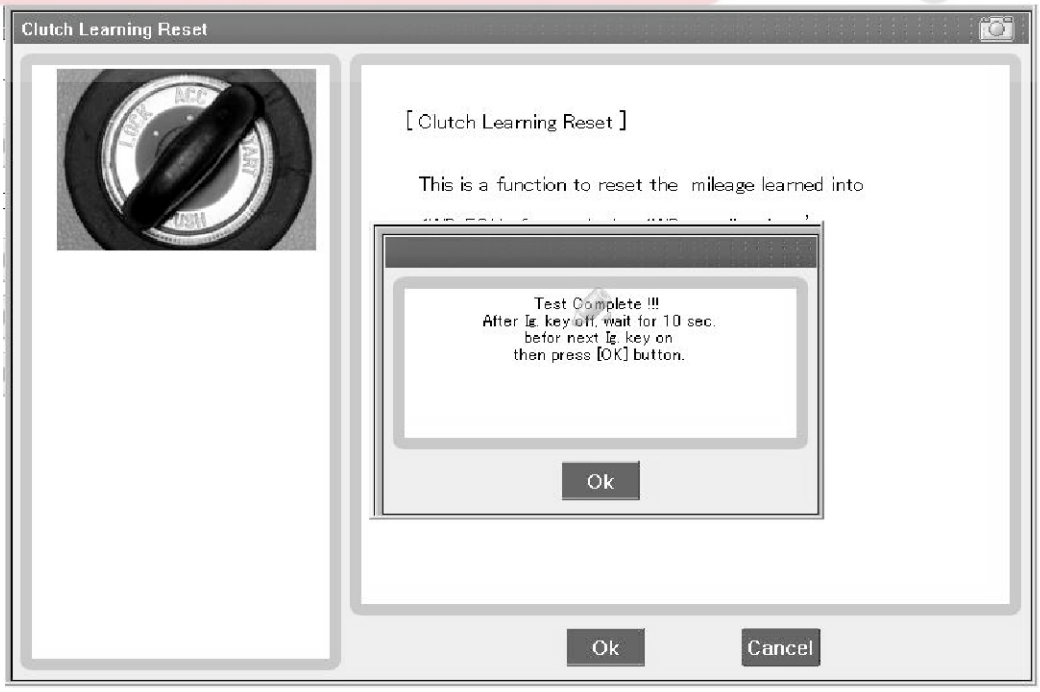
The friction material inside the coupling will degrade over time. Therefore, corresponding compensation values must be referenced and entered after replacing the controller or the coupling.

Compensation Requirement and Procedure

1. Simultaneous replacement of 4WD ECU (Controller) and coupling
   - Does not require compensation.
2. Replacement of coupling only
   - Reset the 4WD ECU's (Controller) clutch learing.

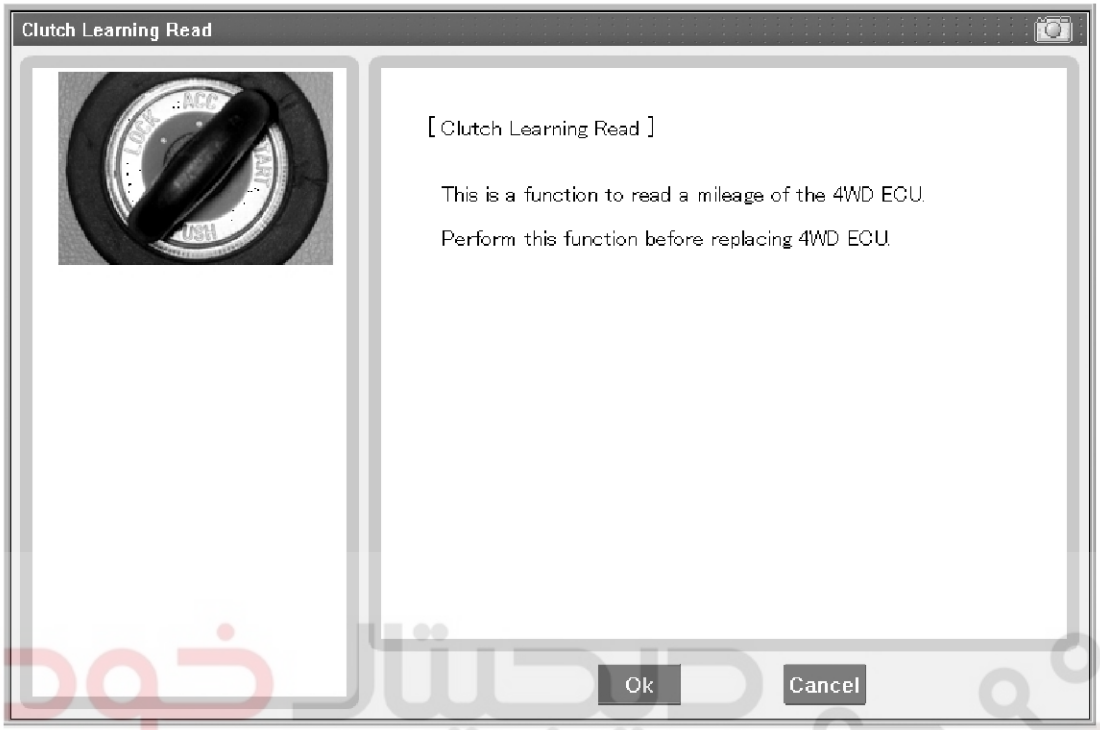


SSLWD1031N

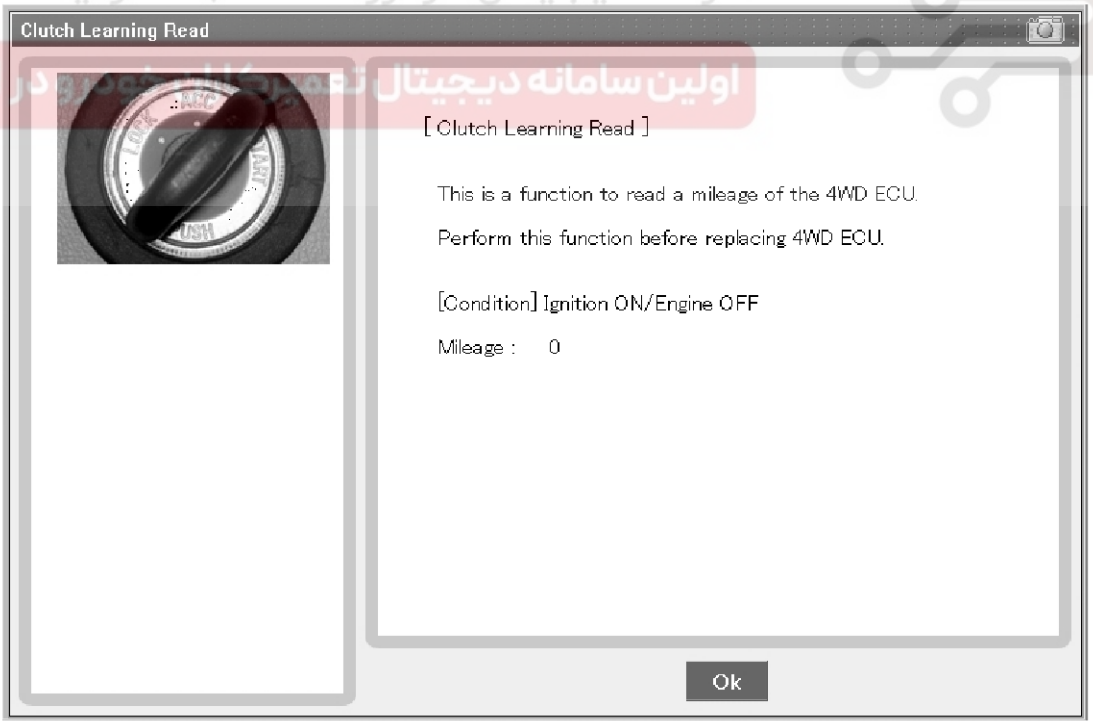


SSLWD1032N

3. Replacement of 4WD ECU (Controller) only
   - Before replacement: Check the ECU's clutch learing.

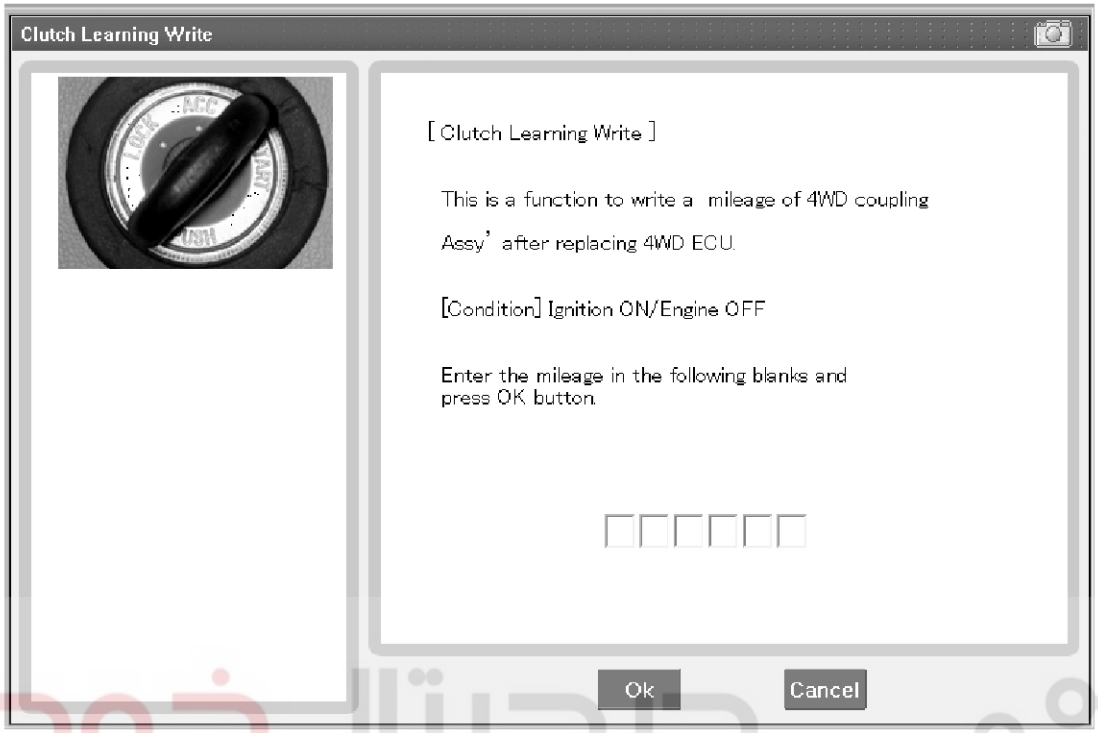


SSLWD1033N



SSLWD1034N

- After replacement: Enter the original ECU's clutch learing into the replacement ECU.



SSLWD1035N