TRANSFER CASE

3240-01/3410-01/4116-01/8510-47

TRANSFER CASE

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TRANSFER CASE

3240-01

GENERAL

1. OVERVIEW

By using the planetary gear sets, two-gears shift type part time transfer case achieves direct connection when selecting 4WD "HIGH" and 2.48 of reduction gear ratio when selecting 4WD "LOW". The silent chain in transfer case transfers the output power to front wheels.

The simple operation of switches on instrument panel allows to shift between "2H" and "4H" easily while driving (for 4L: stop vehicle first). The warning lamp warns the driver when the system is defective.

The 4WD system integrated in ACTYON does not have big difference in comparison to the conventional part time transfer case, but the changes in comparison to the conventional transfer case are as follows:

- 1. No additional coding is required when replacing TCCU.
- 2. Delete the devices (tone wheel speed sensor, wiring etc.) related to the speed sensor in the transfer case.

This system receives the speed signals from ABS/ESP HECU or instrument panel (for non-ABS vehicle(Note 1)) through the CAN communication.

3. The new TCCU is available to install on the vehicle with the conventional DI engine part time TCCU.



∛ NOTE

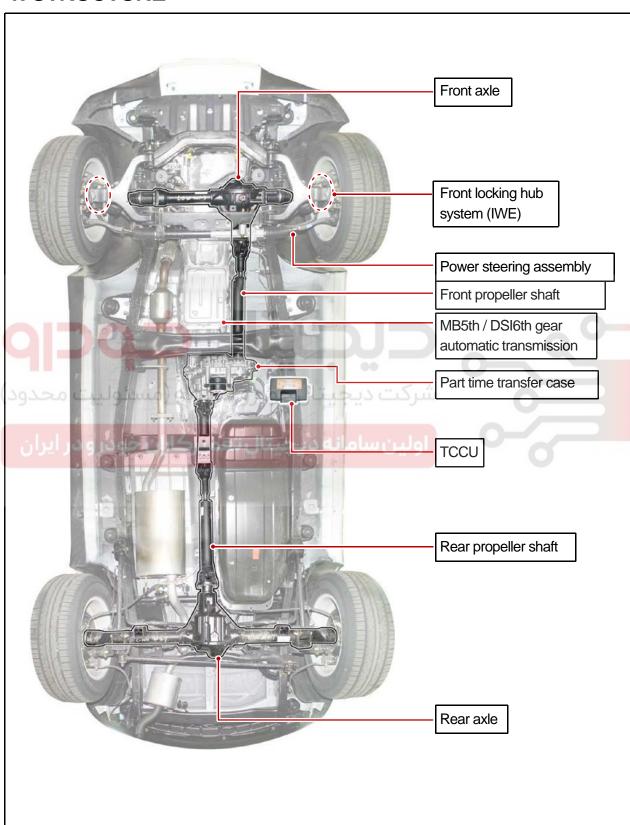
In non-ABS vehicle, the vehicle speed sensor is installed on the rear drive axle. The engine ECU sends the speed signal to the instrument panel, and then the instrument panel provides the information to TCCU and other devices.

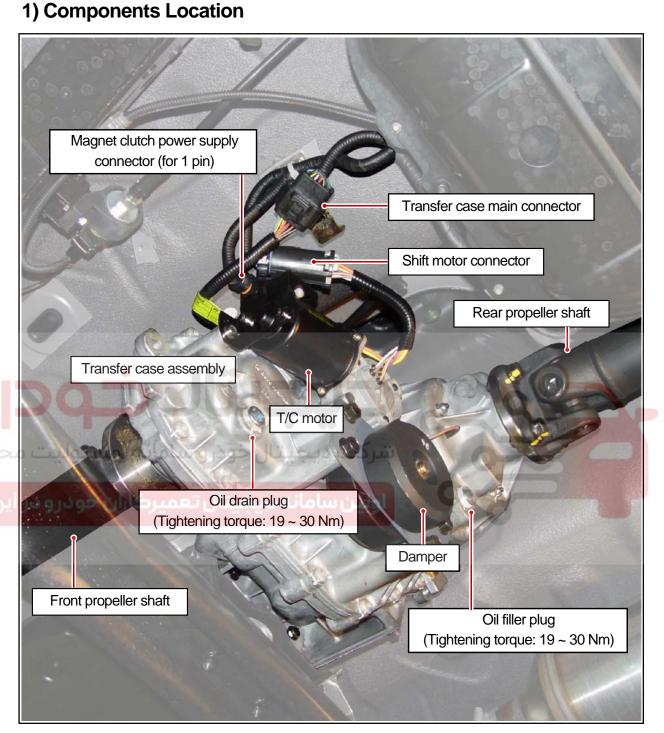
2. SPECIFICATIONS

Description		Part Time T/C		
Total length		343 mm		
Mating surface of fro	nt flange	40 mm		
Weight		33.9 Kg (without oil)		
Oil capacity		1.4 L		
Location		Transfer case		
Major elements Housing		Part time		
	Tightening bolt	11EA, M8 x 1.25		
	Input shaft	A/T: External spline		
		M/T: Internal spline		
	Ring gear	Inserted into housing groove		
	Sun gear	Separated input shaft and sun gear		

OVERVIEW AND OPERATION PROCESS

1. STRUCTURE

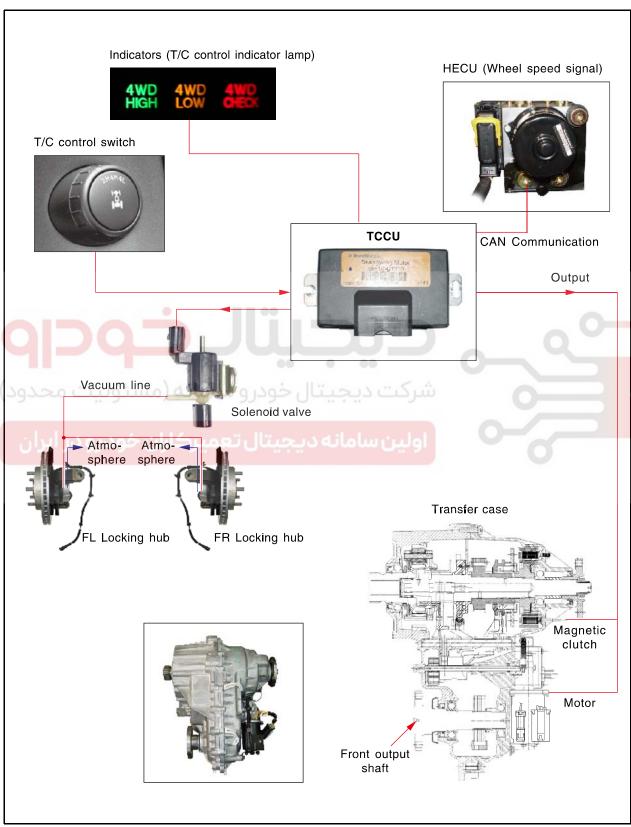






2. SYSTEM LAYOUT AND OPERATION

1) System Layout



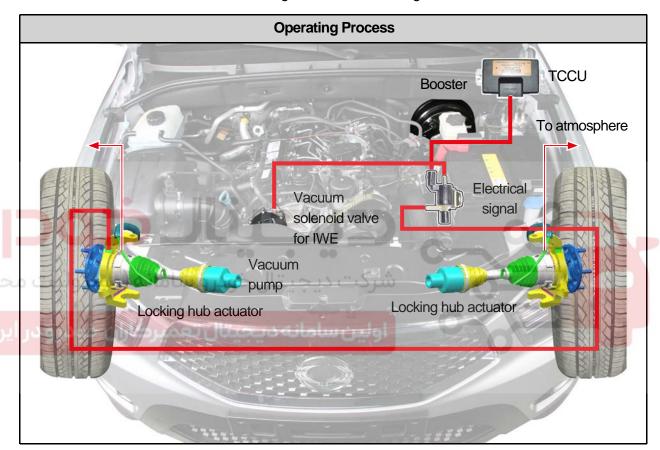
VCLAON

3. LOCKING HUB SYSTEM

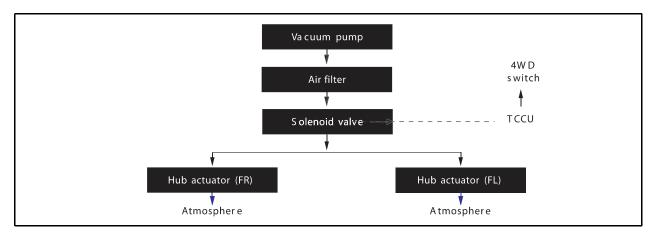
The transfer case and the TCCU differ from previous models only in the speed sensor related parts. However, the operating process of the vacuum locking hub operation system works oppositely from previous models and its components also have changed.

The vacuum locking hub that is applied to Kyron uses the IWE (Integrated Wheel End) system, and in this system, the vacuum is generated only within the hub actuator.

It is structured to transmit power to the front section after the actuator hub is engaged following the release of vacuum from the drive shaft end gear and the hub end gear.



Vacuum generation process in front hub actuator:





1) Vacuum System Related to 4WD



Vacuum operation during 2WD mode

During 2WD mode, the vacuum pressure from vacuum pump is continuously

transmitted to the locking hub system.

This vacuum pressure pulls in the locking hub actuator so that it will not be engaged with the front end hub gear.



In 4WD mode, the TCCU blocks the transferring of vacuum pressure from vacuum pump to locking hub by supplying the power to solenoid valve.

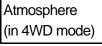
Air filter

Hub actuator (LH)



2WD (applying vacuum pressure to hub actuator)
The vacuum pressure pulls in the locking hub actuator so that it will not be engaged with the front

Hub actuator (RH)





4WD (releasing vacuum pressure from hub actuator)

The vacuum pressure is released from the hub actuator. At this time, the front hub end gear is engaged.

TRANSFER CASE

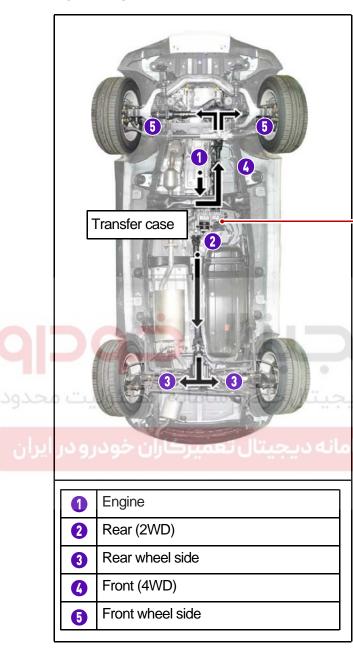
end hub gear.

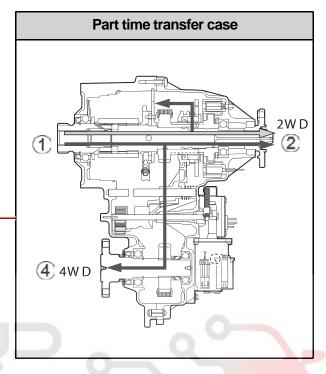
ACTYON 2013.11 WWW.DIGITALKHODRO.COM

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Modification basis				
Application basis	004.00.0			
Affected VIN	021 62 9	9	92	92

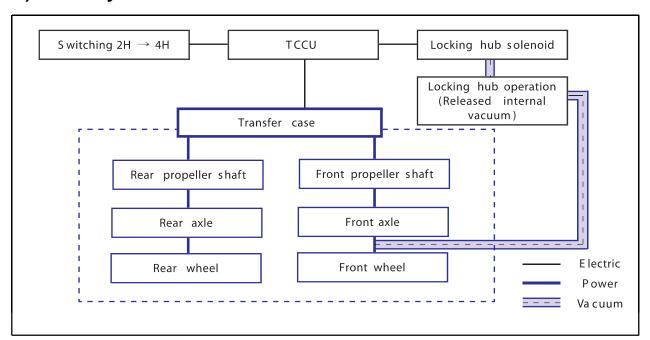
4. POWER FLOW

1) Components of Power Flow





2) Flow Layout

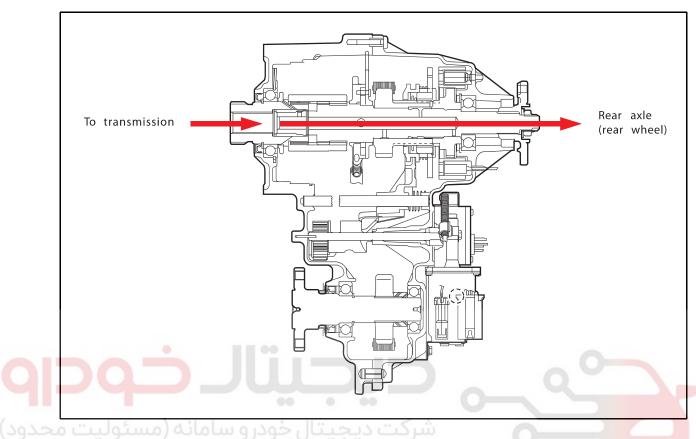




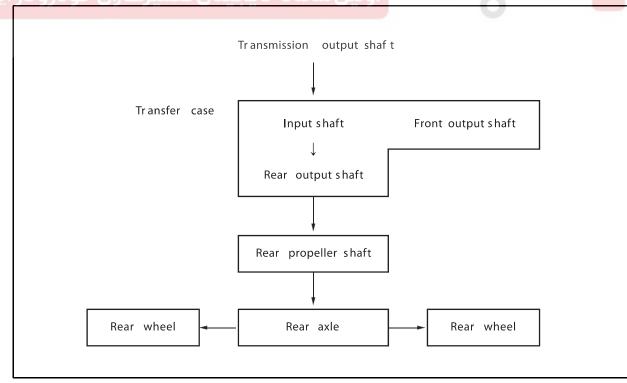


TRANSFER CASE

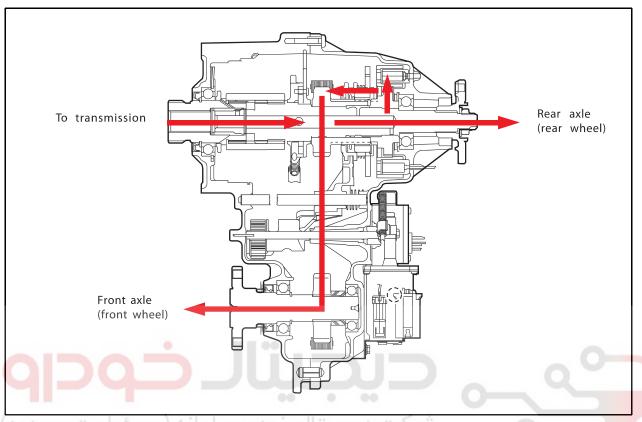
3) 2H Mode (Rear Wheel Drive)



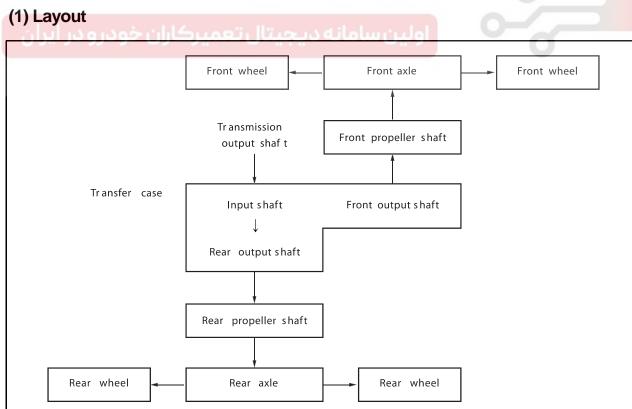
(1) Layout



4) 4H Mode (4 Wheel Drive - High speed)



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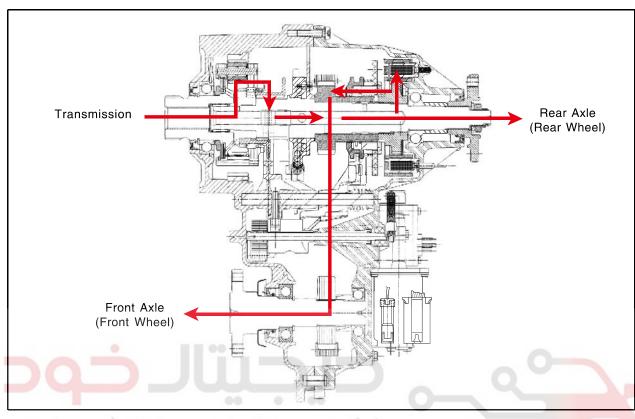
TRANSFER CASE

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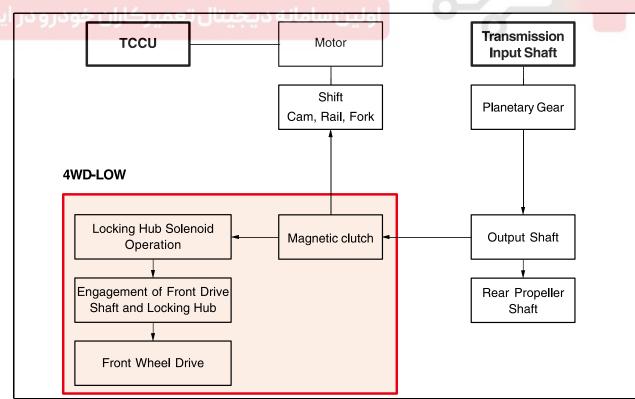
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Modification basis				
Application basis				
Affected VIN	021 62 9	9	92	9

4) 4L Mode (4 Wheel Drive - Low speed)



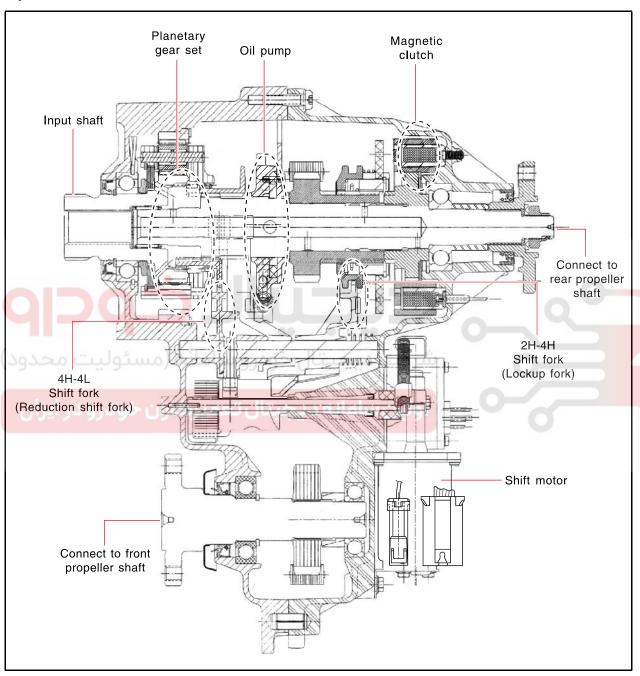




CONFIGURATION AND FUNCTION

3240-01 TRANSFER CASE

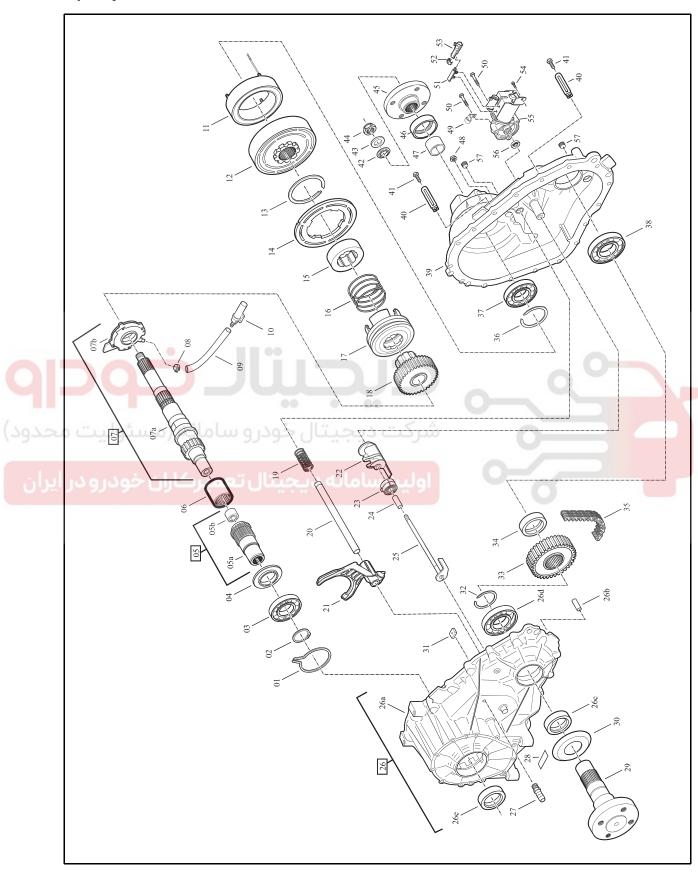
1) Internal Structure



(1) Difference From The Conventional Part time T/C

- · Deletion of 4L (LOW 4WD), planetary gear, reduction hub and 4H-4L shift fork
- · Deletion of parts related to the speed signal: speed sensor, tone wheel and wiring
- · Addition of the coupling which connects the input shaft with the output shaft

2) Exploded View of New Transfer Case

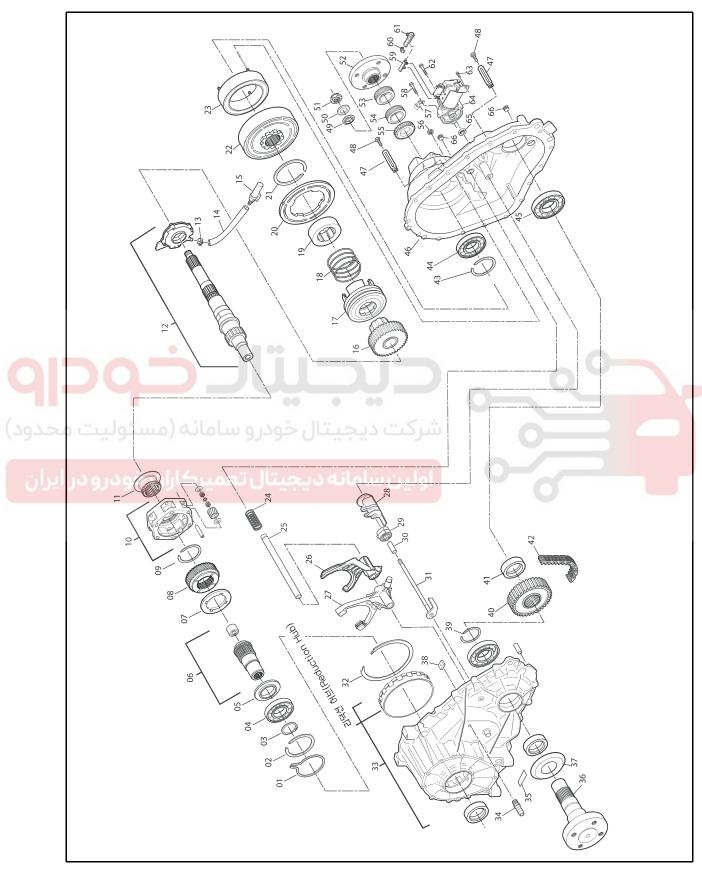


1. Snap ring	27. Breather
2. Snap ring	28. Sticker
3. Bearing	29. Output shaft
4. Hub	30. Dust deflector
5. Input shaft assembly	31. Magnet
5a. Input shaft	32. Snap ring
5b. Bearing	33. Lower sprocket
6. Collar	34. Spacer
7. Main shaft assembly	35. Chain
7a. Main shaft	36. Ring
7b. Oil pump	37. Bearing
8. Clamp	38. Bearing
9. Hose	39. Cover
10. Filter	40. Bendible clip
11. Electric coil assembly	41. Bolt
12. Cam/Coil housing assembly	42. Oil seal
13. Snap ring	43. Washer
14. Armature	44. Nut
15. Lockup hub	45. Companion flange
16. Sleeve return spring	46. Oil seal
بتال خودرو سامانه (مستو 17. Lockup collar	47. Spacer
18. Driving sprocket	48. Nut
19. Return spring	49. Clip
20. Shift rail	50. Bolt
21. Shift fork	51. Relay mounting bracket
22. Electric shift cam	52. Locking clip
23. Torsion spring	53. Connector
24. Spacer	54. Bolt
25. Shift shaft	55. Electric motor assembly
26. Transfer case assembly	56. Oil seal
26a. Transfer case	57. Plug
26b. Cover dowel	
26c. Oil seal	
26d. Ball bearing	

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26e. Input seal

3) Exploded View for Conventional Transfer Case



1. Snap ring	34. Breather
2. Snap ring	35. Name plate
3. Snap ring	36. Output shaft
4. Bearing	37. Dust deflector
5. Hub	38. Magnet
6. Input shaft assembly	39. Snap ring
7. Thrust plate	40. Lower sprocket
8. Sun gear	41. Spacer
9. Snap ring	42. Chain
10. Carrier assembly	43. Retaining ring
11. Reduction hub	44. Bearing
12. Main shaft	45. Bearing
13. Clamp	46. Cover
14. Hose	47. Clip
15. Filter assembly	48. Bolt
16. Driving sprocket	49. Clip
17. Lockup collar	50. Washer
18. Spring	51. Nut
19. Lockup hub	52. Companion flange
20. Armature	53. Oil seal
21. Snap ring	54. Spacer
22. Cam/coil housing assembly	55. Tone wheel
23. Electric coil assembly	56. Nut
24. Return spring	57. Clip
25. Shift rail	58. Screw
26. Shift fork	59. Clip
27. Shift fork assembly	60. Connector lock
28. Electric shift cam	61. Connector
29. Spring	62. Bolt
30. Spacer	63. Cap screw
31. Shift shaft	64. Transfer case control motor assembly
32. Retaining ring	65. Oil seal
33. Transfer case assembly	66. Plug

TRANSFER	CASE
110 (140) E11	O, 10 L

4) Shift Motor Connector

When selecting a position in the 4WD switch (2H, 4H, 4L), TOD control unit exactly changes the motor position to 2H, 4H and 4L by detecting the electric signals from position encoder that monitors motor position.

Rear view of connector				
3 (Brown/	4 (Orange/			
White)	- White)			
2 (White)	5 (Yellow/			
6 (Yellow)	- White)			
1 (Violet)	- 7 (Orange)			

Pin	Functio n		
1	Position A		
2	Position B		
3	Position C		
4	Position D		
5	Position ground		
6	Control (4L - 4H -2H)		
7	Control (2H - 4H - 4L)		



شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



5) Magnetic Clutch Coil Power Supply Connector

The transfer case integrated in ACTYON doesn't have an internal speed sensor and receives the speed signal from ABS/ESP HECU or the instrument panel (Non-ABS vehicle) via CAN communication. Therefore, there are not extra terminals for speed sensor power supply and ground.

Transfer case side	Supply side

Pin	Functio n
А	Magnetic clutch coil power supply



Pin	Functio n	
A Clutch coil		
В	Sensor power (5V)	
C Sensor signal		
D	Sensor ground	

The rear speed sensor utilizes the hall effect. It generates 0V and 5V of square type digital wave according to the rotation of the wheel with teeth of transfer case rear output shaft.

The speed signal from rear propeller shaft is entered into control unit. When the control unit determines that 4WD HIGH operation is available, electric current flows into the clutch coil. The coil magnetized by this electric current pull in the lockup hub to engage into output spline. Accordingly, the power is transferred to

front wheels.

4116-01 COMPONENTS OF IWE

(INTEGRATED WHEEL END)

Front Hub Assembly

The front hub assembly is connected to the tire and it drives the wheel by receiving the rotation force from the drive shaft during 4WD mode. When the hub actuator is moved to the gear (vacuum pressure released), the 4WD mode is engaged. When the hub actuator is out of the gear (vacuum pressure applied), the 4WD mode is concelled.

Rubber O-ring

Replace it with a new one when removing. Function: preventing moisture and foreign matter from entering into gears.

Steel O-ring

Preventing the actuator hub from pressing against the wheel end hub

> Apply the grease to the steel O-ring before installation.

Gear

A CAUTION

- Rubber O-ring: Replace it with a new one when removing/installing the front hub.

Front Drive Shaft

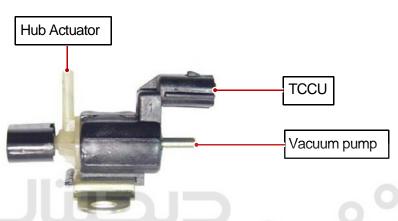
The front drive shaft is the part that receives the power when the transfer case operates in 4WD mode.

During the 2WD mode, the hub actuator is positioned at the drive shaft end, and during the 4WD mode, the hub actuator is interlocked to the drive shaft end gear and the front hub end gear.



Solenoid Valve

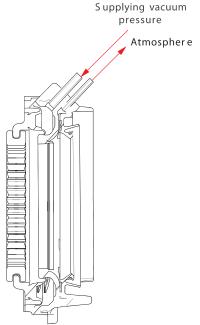
The vacuum solenoid valve is installed at bottom of the battery tray and serves the function that allows to connect and block the vacuum pressure from vacuum pump to hub actuator. During the 2WD mode, a vacuum line is established between vacuum pump and hub actuator. During the 4WD mode, the TCCU applies 12V to the vacuum solenoid to block the vacuum pressure.



Locking Hub Actuator

This device transfers or blocks the output from drive shaft to the front wheel end according to the vacuum pressure. Unlike the conventional systems, the vacuum pressure to the front wheel end operates only within the actuator.





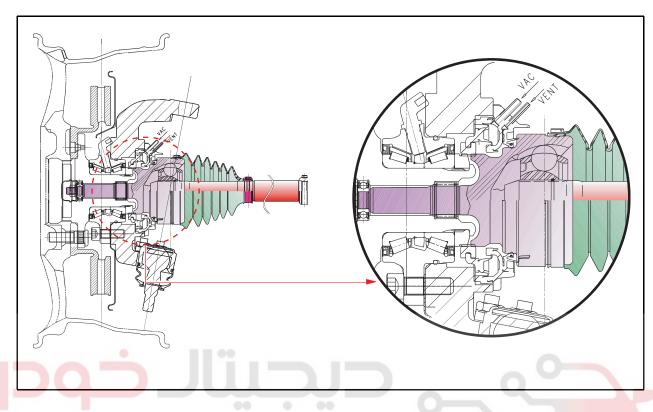
TRANSFER CASE

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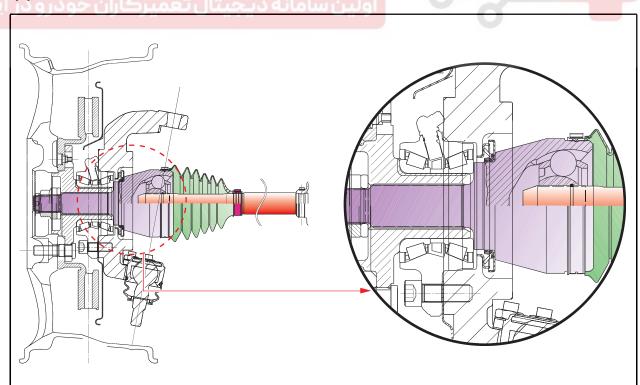
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Modification basis				
Application basis	004.00.0			
Affected VIN	021 62 9	9	92	92

(1) Front Wheel End in Vehicle with 4WD



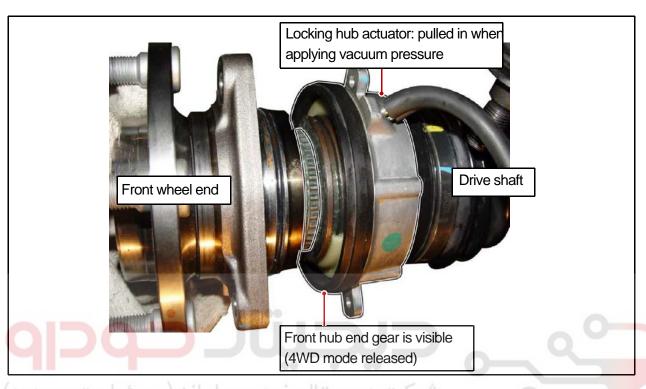
(2) Front Wheel End in Vehicle without 4WD





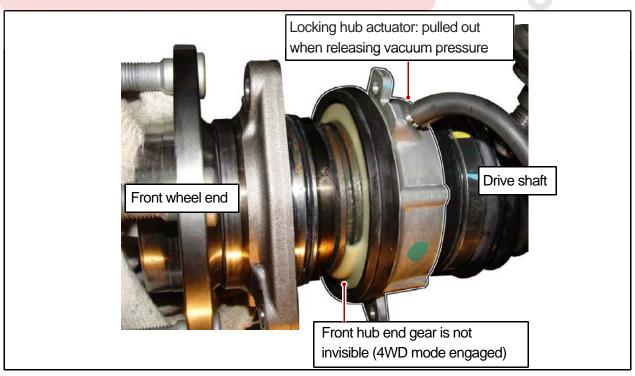
1) 2WD

The locking hub actuator is out of the front wheel hub end gear when applying the vacuum pressure.



2) 4WD

The locking hub actuator is engaged with the front wheel hub end gear when releasing the vacuum pressure.



TRANSFER CASE

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Modification basis			
Application basis	004.00.0		
Affected VIN	021 62 9	9	92

92

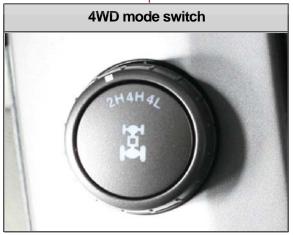
8510-47 4WD MODE SWITCH

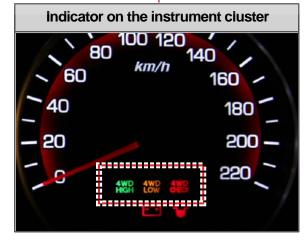
1) Overview

4WD mode switch is the rotary type switch that sends the position signals to TCCU.

2) Location







8510-47

ACTYON

A CAUTION

- There could be mechanical noises and shocks during mode changes. However, these are normal conditions due to the mode changing operations.
- Use only the 2H mode on a normal paved surface. Do not drive your vehicle in the "4H" position on paved road surfaces. Doing so will result in damages to the drive train.
- Driving in a 4WD mode on a normal paved surface will cause unwanted noises, premature wear of tires, or increased fuel consumption.
- Depress the brake pedal in low driving speed when changing the driving mode to/from "4L".
- If the "4WD CHECK" warning light stays on, have the 4WD system checked by the nearest Ssangyong Dealer or Ssangyong Authorized Service Center.
- When cornering a curved road in a 4-wheel drive mode, there could be some mechanical shocks and resistances in vehicle's drive train. These are normal conditions due to internal resistance in the drive train when the 4-wheel drive mode is properly working. To avoid damages to the drive train, do not drive your vehicle at an excessively high speed on a sharply curved road. If the driving mode cannot be changed or the corresponding indicator does not come on even when
- operating the 4WD switch, move the vehicle a little and move the gear shift lever to :N" position. Then turn the 4WD switch to desired driving mode again. This helps to make the mode change easily

3410-01 TCCU(TRANSFER CASE CONTROL UNIT)

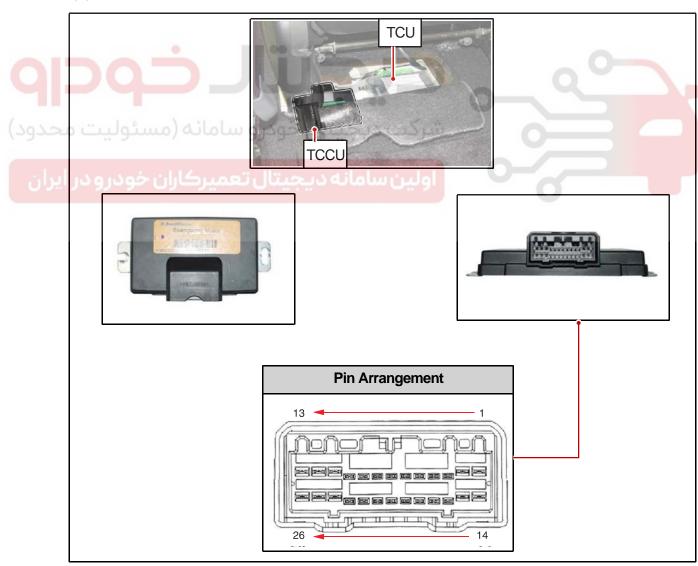
1) Major Changes in TCCU

TCCU controls the 4WD system and is located under the driver's seat.

The new TCCU makes some difference compared with TCCU for the conventional part time transfer case and the differences are as follows:

- 1. No additional coding is required when replacing TCCU.
- 2. Delete the devices (tone wheel, wiring etc.) related to the speed sensor in the transfer case. Delete the pin related to the speed sensor from TCCU pins.
- 3. Change the transfer case wiring connector from No.4 pin to No.1 pin.
- 4. The new TCCU is available to install on the vehicle with the conventional DI engine part
- 5. time TCCU.

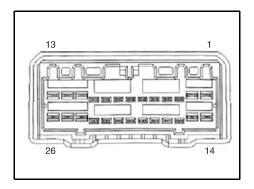
(1) Location





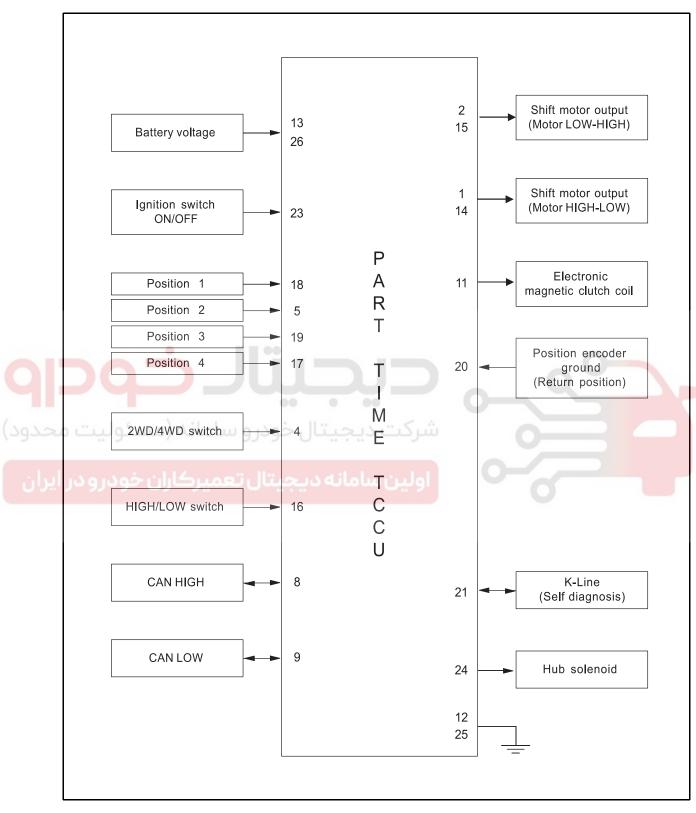
(2) TCCU Pin Numbers and Description



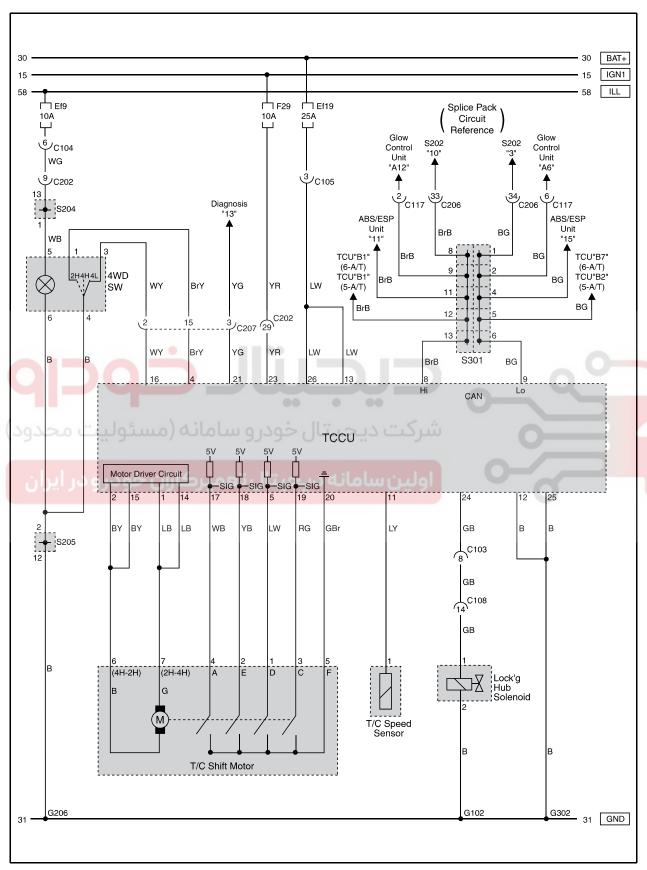


Pin No.	Function	Input/Output	Description
1	Motor HI - LO	Output	This is a terminal that outputs the input signal to the T/C motor during the 4WD switch operation. When switching the 2WD mode
2	Motor LO - HI	Output	to 4WD mode, the battery power is supplied to "Motor Hi-Lo" and the opposite side is earthed, and vice versa.
3	-	_	-
4	4WD switch	Input	Switch position converting (2H-4H) recognition
5	Position 2	Input	Detecting shift motor position 2 position.
6			
7	-	-	
8	CAN H	Both	These lines are sharing the information among the related units through the CAN communication. The differences from the conventional part time T/C models are that the speed sensing type tone
9	CAN L		wheel in T/C has been eliminated and the speed signal comes from
بدن	ن خودرو در ا	تعميركار	the ABS/ESP HECU or the instrument panel.
10	-	-	
11	EMC (Electronic	Output	Supplying the voltage to clutch coil for all shifting operations
	magnetic clutch)		When supplying power: Battery voltage
			When no power supplied: Ground power
12	Ground	Input	Provide the ground to TCCU
13	Battery	Input	Battery voltage supplying terminal to operate the system
14	Motor High-Low	Output	Same as No.1, 2 pin
15	Motor Low-High	Output	
16	High-Low switch	Input	Recognition converting switch between 4H and 4L
17	Position 4	Input	Detecting shift motor position 4 position.
18	Position 1	Input	Detecting shift motor position 1 position.
19	Position 3		Detecting shift motor position 3 position.
20	Position return	Input	Providing the ground related to shift motor sensor plate.
21	Diagnosis "13"	Both	Connected to trouble diagnosis connector
22	-	-	•
23	Ignition power	Input	Power supply terminal when ignition switch is ON
24	Solenoid power	Output	Locking hub system applied to KYRON makes difference in related
	supply		to the conventional part time system and the vacuum supply in
			operating process.
25	Ground		
26	Battery		

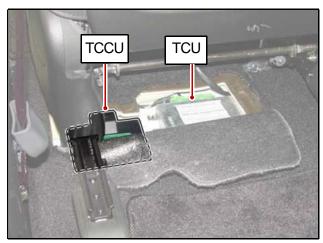
2) TCCU Diagram



3) Circuit Diagram of TCCU



4) System Operation







(1) 4WD Operation

TCCU is located under the driver's seat and permits the vehicle to shift from the two-wheel drive to the four-wheel drive (and back shift) according to driver's switch operation during driving (for the shifting between 4WD HIGH and 4WD LOW, stop the vehicle).

▶ 2H → 4H

- Change the 4WD switch in instrument panel from 2H to 4H.
- This shift is available during driving.
- The "4WD HIGH" indicator in meter cluster comes on.
- ▶ When the System is Defective
- The "4WD CHECK" warning lamp comes on.
- AH → 2H
- Change the 4WD switch in instrument panel from 4H to 2H.
- This shift is available during driving.
- The "4WD HIGH" indicator in meter cluster goes out.
- ▶ 4H → 4L
 - This function is only available when the speed signal from speed sensor is about to stop (below 2 km/h).
 - This function is only available when the clutch pedal is depressed (manual transmission) or the selector lever is selected to the "N" position (automatic transmission). (TCCU must recognize the clutch pedal signal or "N" signal.)
 - Change the 4WD switch in instrument panel from 4H to 4L.
 - The "4WD LOW" warning lamp in meter cluster flickers during this process, then goes out when the shift is completed.
 - The "4WD CHECK" warning lamp comes on when the system is defective.

(2) Position Encoder

The position encoder is the code that TCCU can determine the shift motor position.

Position Code			Motor Desition	Damanuli	
1	2	3	4	Motor Positio n	Remark
0	0	0	0	Left Stop	
1	0	1	0	2 H	
0	0	1	0	Zone 1	Input voltage
0	1	1	0	Zone 2	1: above 4.5V (HIGH) 0: below 0.5V (LOW)
0	0	1	0	Zone 3	
0	0	1	1	4 H	

(3) Operation

► TCCU initialization and operation

- TCCU sends relevant data to meter cluster via CAN to diagnose and check the indicators when the ignition switch is turned to ON. At this time, the 4WD indicators (4WD LOW and 4WD HIGH) come on for 0.6 seconds.
- 2. TCCU starts diagnosis by operating clutch coil and hub solenoid for 1.5 seconds.
- 3. The shift operation is controlled to move only toward selector switch position if the selector switch position is not met with shift motor position code when the ignition switch is turned to ON.

▶ Drive Mode Change

The shift operation is only allowed when some conditions are satisfied. These shift conditions should be satisfied for 2 seconds before starting motor. The motor has three seconds of delay at its initial operation to do trouble diagnosis. Once the motor starts, the shift conditions are no longer checked.

▶ Shift conditions are as follows:

- 1. Normal battery voltage and shift motor for all gears
- 2. 2H and 4H shifts has nothing to do with the vehicle speed, the "N" position in the automatic transmission or the clutch signal.

► Motor Controls

- TCCU operates the shift motor until it reads the required position code. If it detects the faulty code, the system is operated with the compensation mode.
- Once the shift operation is started, it is completed regardless of the ignition power. If there are not operating signals from the position sensor, the shifting failure occurs due to timeout. This failure appears when the shifting time between 2H and 4H is delayed over 5 seconds compared to normal shift. Once the shifting time exceeds the specified time, TCCU cannot properly supply the voltage to shift motor and is operated in compensation mode.
- Even though the system recognizes a fault before motor starts, it is considered as a fault.
- Motor stops operation when it reaches target range.

▶ Synchronization

Synchronization occurs during shifting from 2WD (2H) to 4WD (4H). The synchronizer clutch and the hub solenoid are controlled during the synchronization as follows:

- 1. The clutch coil operates when the selector changes from 2H to 4H.
- 2. The shift motor moves in 4H mode.
- 3. The locking hub solenoid starts its operation 4 seconds after shifted to 4H.
- 4. The clutch coil stops its operation 5 seconds after the hub solenoid is activated.

Compensation

The motor stops when the encoder related to troubles are detected during shift operation. It moves toward LOWHIGH direction for 5 seconds so that the motor is not left in unidentified position.

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REMOVAL AND INSTALLATION

3240-01 PART TIME TRANSFER CASE GENERAL DIAGNOSIS

Symptom s	Check	Actio n
Electric shift problems		Overhaul and check, replace if necessary
	Damaged or worn shift cam, hub, fork and rail shift	Overhaul and check for wear and damage.
	Binding shift fork, hub collar or gear	Check sliding parts, replace if necessary.
Cannot drive front wheel when shifting to 4H, 4L	Broken drive chain	Check internal parts and replace drive chain.
Noise in 4WD operation	Improper or low oil	Drain and replace with specified oil.
	Loosened bolts or mounted parts	Retighten as specified.
	Noisy T/C bearing	Disassemble bearings and parts and check for wear or damage. Replace if necessary.
	Gear abnormal noise	Check for wear and damage including speed- ometer gear. Replace if necessary.
Noi <mark>se in</mark> 4H or 4L	Worn or damaged sprockets or drive chain Incorrect tire pressure	Disassemble and check for wear and damage. Replace if necessary. Adjust tire pressure.
Transfer case oil	Cracked transfer case	Replace the case.
leakage	Leakage from other parts	Clean case and parts and check for leakage.
	Breather clogging	Remove breather hose and clean. Replace if necessary.
	Improper or too much oil	Use specified oil and adjust oil level.
	Loosened sealing bolts	Retighten.
	Improperly applied sealant	Use specified sealant and retighten.
	Worn or damaged oil seal	Replace oil seal.

TCCU periodically monitors the input and output while the system is in operation. When a fault is detected, the trouble code is stored into TCCU memory.

If the ignition switch is turned to "OFF", TCCU stops monitoring for input and output, however, when the ignition switch is turned to "OFF" before shifting completes, TCCU continues monitoring for input and output required for the shifting.

Modification basis
Application basis
Affected VIN

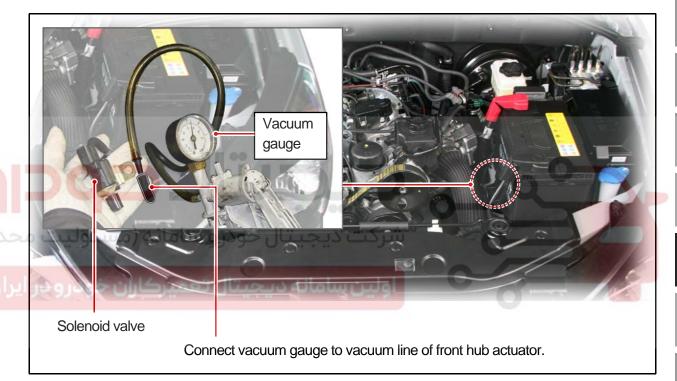
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4116-01 VACUUM LOCKING HUB CHECK

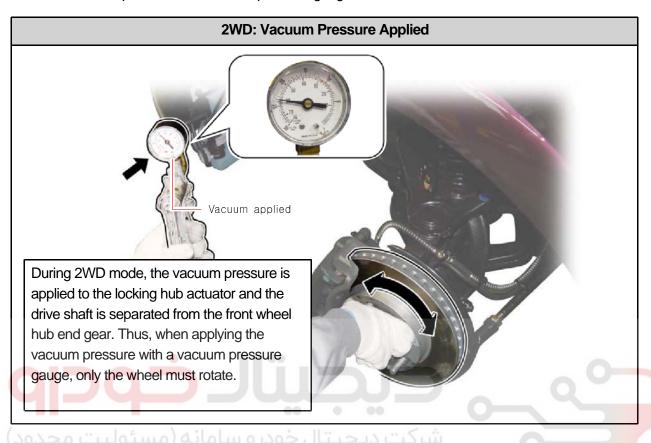
Compared to conventional locking hub systems, when the vehicle is in 2WD mode, the vacuum pressure from vacuum pump is continuously applied to the locking hub actuator. If any vacuum line is leaking, it may be engaged with the front drive shaft and the front locking hub and also it may cause leakage in the vacuum system supplied to the brake booster. Make sure that the vacuum lines are not leaking.

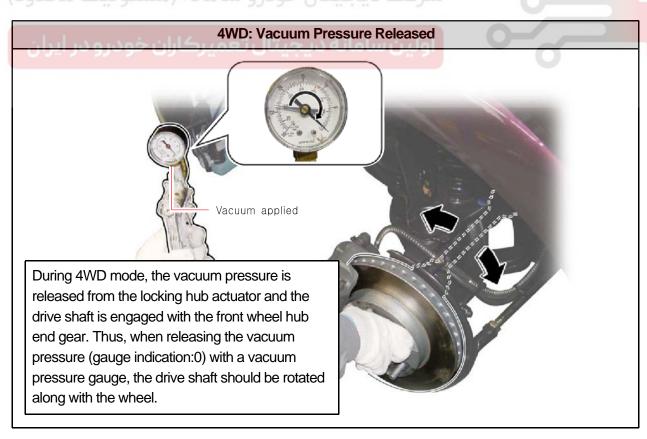
How to check the vacuum locking hub system:

- 1. Disconnect hub actuator vacuum line from vacuum solenoid valve.
- 2. Connect vacuum gauge to vacuum line of hub actuator.



3. Check vacuum pressure with vacuum pressure gauge.





Hub Actuator Check



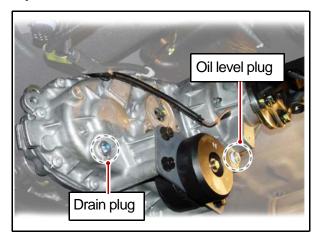
Disconnect the vacuum hose from the hub actuator and install the vacuum pressure gauge to the hub actuator. Apply vacuum pressure to make sure the hub actuator maintains vacuum pressure.

Normal	Leakage		
AD 30 20 TO TO TO THE MILES AND THE MILES AN	TO TO THE MADE BILLS.		
If the vacuum pressure is maintained, the actuator hub component condition is OK.	If the vacuum pressure is not maintained, replace the actuator with a new one.		



3240-01 OIL LEVEL CHECK AND CHANGE

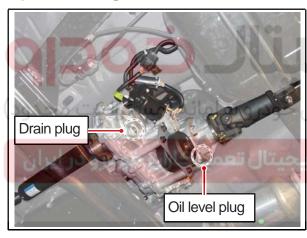
1) Oil Level Check



- 1. Clean the oil level plug (filler plug) and surroundings.
- 2. Remove the oil level plug an check whether oil is spilled out.
- 3. Add oil if necessary. Tighten the oil level plug.

Tightening torque 19 ∼ 30 Nm

2) Oil Change



- 1. Clean the oil level plug, drain plug and surroundings.
- 2. Place a proper container under the transfer case.
- 3. Remove the drain plug and then remove the oil level plug (filler plug).
- 4. Drain the oil and tighten the drain plug.
- 5. Fill the oil through the oil level plug until oil begins to drip out.

Tightening torque 19 ∼ 30 Nm

3) Cautions for Oil Level Check and Plugs

- 1. Be careful of hot oil when draining.
- 2. Do not use an impact wrench to remove or tighten the oil level plug or drain plug since this will damage the threads in the plug.

3410-01 SELF-DIAGNOSIS TEST

- 1. If the 4WD system is abnormal, TCCU turns on the "4WD Warning Lamp" on the meter cluster.
- 2. Defective conditions:
 - The "4WD Warning Lamp" comes on when turn the ignition switch to ON position, and does not go out.
 - The "4WD Warning Lamp" comes on during driving.
- 3. Connect the scan tool and check the DTC with IGN ON.



4. Fix the problem and erase the DTC from TCCU with scan tool.





A CAUTION

Inspect the open wiring and loosened connector before checking the DTC.



3410-01 TCCU DIAGNOSTIC TROUBLE CODE

Code	Descriptio n	Actio n		
P1806	Defective CAN commuication	- Check communication line Replace TCCU if necessary.		
P1805	Defective mode switch	 When the mode switch is defective Check TCCU pin No.4 and 16. Mode change 2H (Pin No. 4: Ground) 4H (No contact: Open) 4L (Pin No.16: Ground) 		
P1821	Open or short to ground in magnetic clutch coil circuit	 Voltage at TCCU pin No.11: 11 ~ 15 V EMC resistance: 2.5 Ω Check the relevant connectors for contact. Replace TCCU if necessary. 		
P1822	Open or short to ground in hub control circuit	- When the hub control circuit is open or short to ground over 0.2 second - Replace TCCU if necessary.		
P1841	Open to ground in shift motor circuit	 When TCCU detects the motor failure for 1 second Check the relevant harnesses for contact. Replace TCCU if necessary. 		
P1842	Short to ground in shift motor output circuit	- When TCCU detects the motor failure for 1 second - Check the relevant harnesses for contact Replace TCCU if necessary.		
P1843	Defective position sensor in motor	 2H-4H: after 1.5 seconds 4H-4L: after 3 seconds Check the relevant harnesses for contact. Replace TCCU if necessary. 		
P1844	Stuck in 4L mode	 When no shifting operation from 4L to 4H, even though the shift conditions are satisfied and no error. Replace TCCU if necessary. 		

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Code	Descriptio n	Actio n
P1850	Defective position encoder	 When the position encoder is defective Check the relevant harnesses. Check the relevant connectors for contact. Check the shift motor.
P1851	Short to ground for position encoder 1	 Short to ground for position encoder 1 in shift motor Check the relevant harnesses for short. TCCU pin No.18 Check the relevant connectors for contact. Check the shift motor.
P1852	Short to ground for position encoder 2	- Short to ground for position encoder 2 in shift motor - Check the relevant harnesses for short TCCU pin No.5 - Check the relevant connectors for contact Check the shift motor.
P1853	Short to ground for position encoder 3	 Short to ground for position encoder 2 in shift motor Check the relevant harnesses for short. TCCU pin No.19 Check the relevant connectors for contact. Check the shift motor.
P1854	Short to ground for position encoder 4	- Short to ground for position encoder 4 in shift motor - Check the relevant harnesses for short.

• TCCU pin No.17

- Check the shift motor.

second through CAN.

- Check TCU.

- Check CAN communication line.

- Check the relevant connectors for contact.

- No neutral signal from automatic transmission over 1

Modification basis
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P1815

Abnormal CAN neutral signal

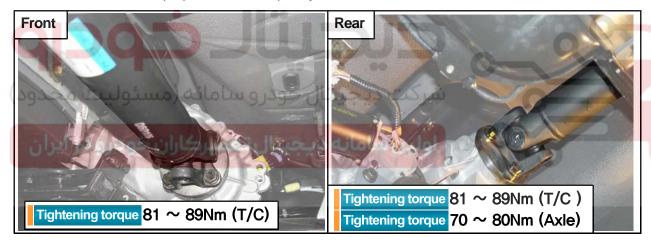
3240-01 PART TIME TRANSFER CASE

1. Disconnect the motor connector from the transfer case.





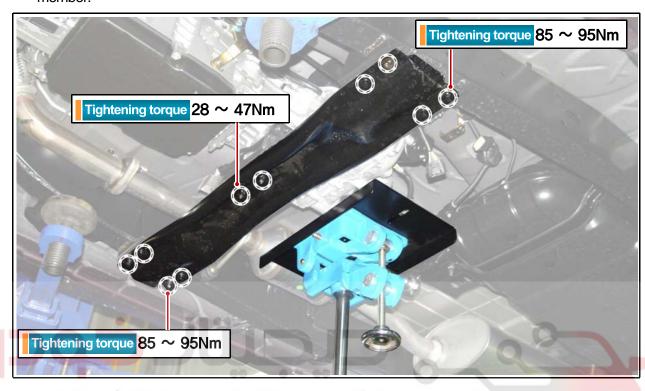
2. remove the front and rear propeller shafts by separating the front propeller shaft from transfer case and remove the rear propeller shaft completely

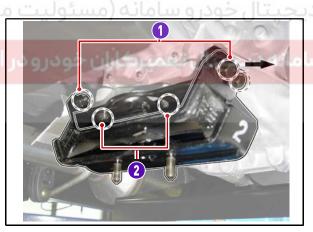




3. Disconnect the air hose from the transfer case.

4. Place the safety jack under the transfer case and automatic transmission. Unscrew the transmission cross member bolts (14 mm) and the center bolt (14 mm), and remove the transmission cross member.

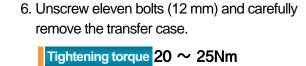




5. Unscrew the bolts (14 mm) and remove the transfer case mounting insulator and insulator bracket.

Tightening torque

Mounting insulator ①	28 ~ 47 Nm
Bracket bolt ②	28 ~ 47 Nm

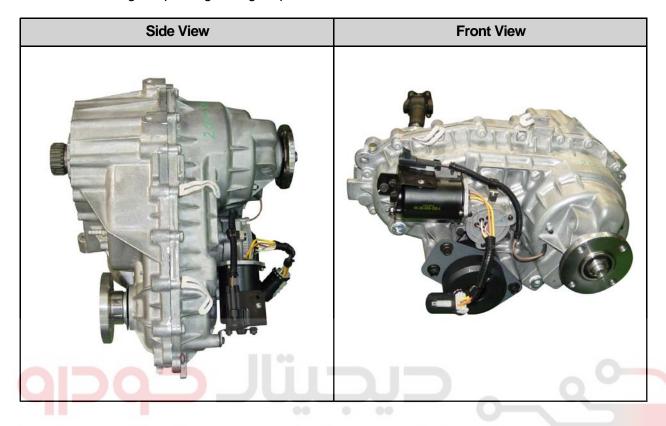




A CAUTION

 When installing the transfer case, make sure that the bolts are facing correct direction.
 From transmission side (upper: 8), From transfer case side (lower: 3)

7. When installing, keep the tightening torque and install in reverse order of removal.



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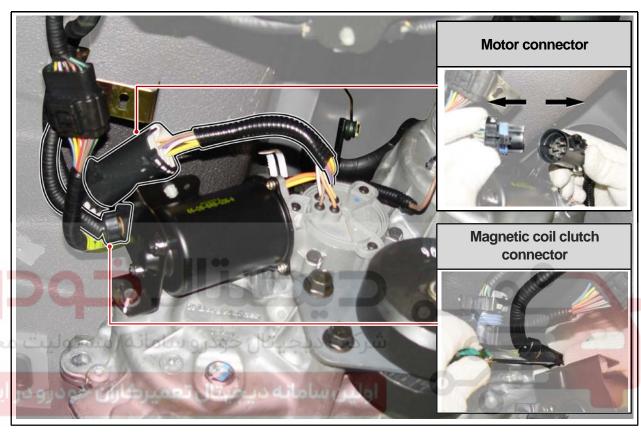
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3240-01 TRANSFER CASE MOTOR

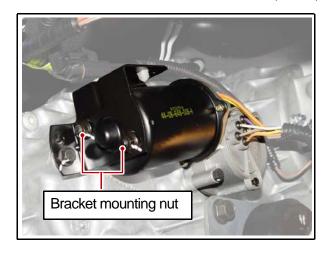
Preceding work

1. TRANSFER CASE MOTOR

- 1. Disconnect the magnetic coil clutch connector and motor connector from the transfer case.
- 2. Unscrew the bolts and remove the transfer case motor with bracket.



3. Unscrew three transfer case motor bolts(10mm) and a bracket bolt to remove the motor



A CAUTION

 Remove two nuts to separate the bracket and motor.



4. Pull the shift motor assembly out while keeping the level. Clean the mating surface of the transfer case and shift motor.

A CAUTION

- Do not disassemble the shift motor since it is replaced as an assembled unit.





- 5. Apply sealant on the mating surface when installing new shift motor assembly.
- 6. Install in the reverse order of removal. Make sure that the mode switch selection is matched with the motor's driving position before installation.

CAUTION

- To do that, install a new shift motor on the same location that the used shift motor was on.

4116-01 IWE(INTEGRATED WHEEL END)

1) Wheel Speed Sensor

Preceding work 1. Disconnect the negative battery cable and remove the tires.

Note: Wheel speed sensor location				
Front side (2WD)	Rear side (5-link type)			

Unscrew the two bolts (19 mm) and set the removed brake caliper on the frame.





2. Unscrew the two screws and remove the brake disc.





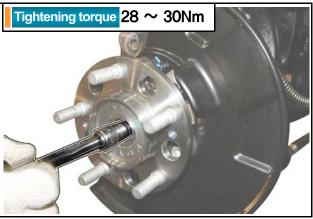
3. Remove the hub cap and unscrew the lock nut.



A CAUTION

- Replace the hub cap with a new one when installing.



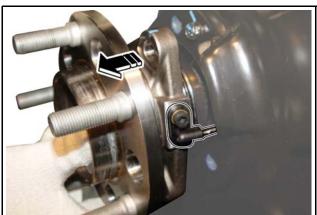




4. Unscrew the three wheel end hub mounting bolts (10 mm).

Tightening torque 100 ∼ 130 Nm

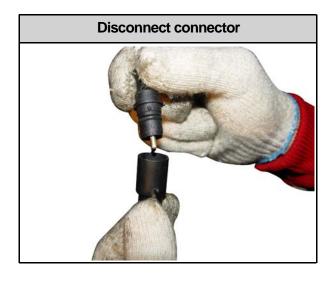
5. Slightly pull the wheel end hub until the wheel speed sensor is visible. Unscrew the mounting bolt (5 mm) and remove the wheel speed sensor.



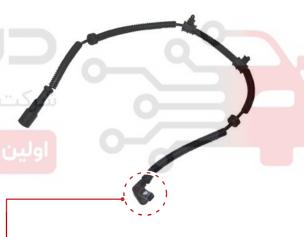


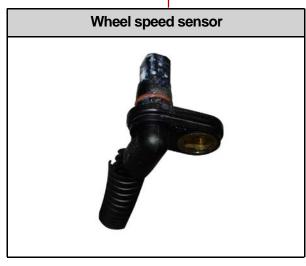
TRANSFER CASE

6. Disconnect the wheel speed sensor and the cable.









4116-01 LOCKING HUB ACTUATOR ASSEMBLY

- Preceding work 1. Remove the tire and the brake disc.
 - 2. Remove the wheel speed sensor.



1. Unscrew the two bolts (10 mm) and remove the brake dust cover.

Tightening torque 4 ∼ 8Nm

2. Pull out the upper arm lock pin and unscrew the mounting nut (19 mm). At this time, do not fully remove the nut.

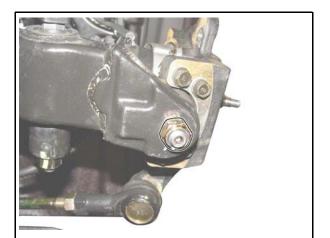


3. Pull out the steering gear linkage lock pin from the knuckle. Unscrew the mounting nut (19 mm) and remove the tie rod end.



TRANSFER CASE

Modification basis Application basis 021 62 99 92 92 Affected VIN



4. Unscrew the lower arm mounting nut (22 mm).

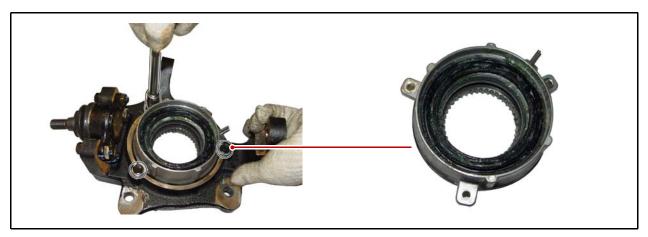
Tightening torque 140 ∼ 160Nm

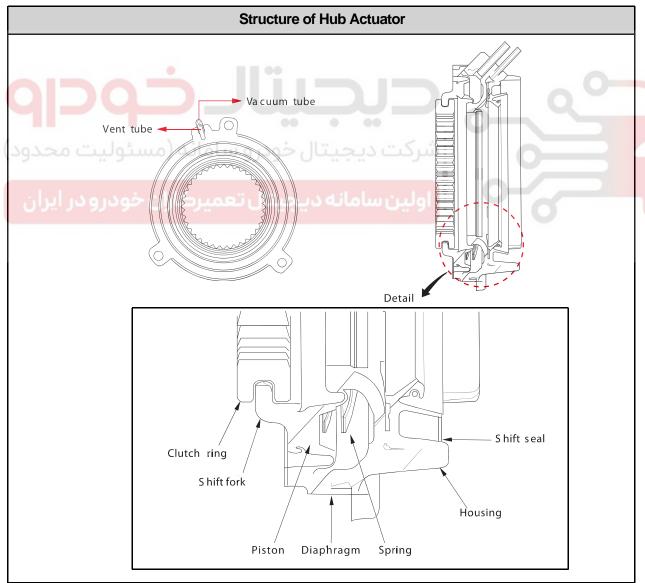
5. Remove the knuckle between upper arm and lower arm with special tool.



1) Hub Actuator

1. Unscrew the three bolts (10 mm) on the disassembled locking hub actuator assembly and remove the hub actuator.





2) Inspection



 Check the internal seal ring of hub actuator for damage.



2. Replace the O-ring of the locking hub end with a new one.

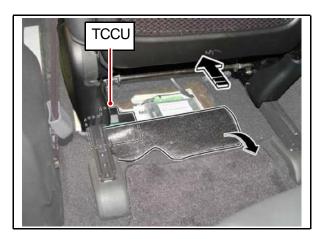
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Installation Notice

- Completely clean the parts and apply the grease them before installation. Be careful not to damage the internal seal ring of the hub actuator.



3410-01 TCCU



1. Slide the drive's seat as far as it goes and fold up the carpet.



2. Unscrew two bolts (10 mm) on the TCCU.

Tightening torque 10 Nm

3. Disconnect the TCCU connector and remove the TCCU.



A CAUTION

- Be careful not to apply any impact to TCCU body.







TRANSFER CASE

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Modification basis				
Application basis				
Affected VIN	021 62 9	9	92	92