

TPMS

4190-01/4190-05/4190-06/

INDEX

TPMS

GENERAL INFORMATION

1. SPECIFICATIONS.....	3
2. SPECIAL TOOLS.....	4
3. CAUTIONS.....	5

CONFIGURATION AND FUNCTIONS

4190-01 WHEEL MODULE.....	22
4190-06 TPMS ECU.....	24

OVERVIEW AND OPERATING PROCESS

1. OVERVIEW.....	8
2. COMPONENTS.....	8
3. INPUT/OUTPUT DIAGRAM.....	10
4. TPMS PRESSURE VALUE DISPLAYING PROCESS.....	11
5. TPMS DISPLAY AND WARNING LAMPS.....	12
6. LOW TIRE PRESSURE WARNING.....	18
7. TIRE INFLATION PROCEDURE FOR VEHICLE WITH TPMS.....	19
8. CIRCUIT DIAGRAM.....	21

REMOVAL AND INSTALLATION

4190-01 WHEEL MODULE.....	26
4190-06 TPMS ECU.....	38

CODING PROCESS

1. WHEEL MODULE ID INPUT.....	41
2. VARIANT CODING.....	44

TPMS**4190-05****GENERAL INFORMATION****1. SPECIFICATIONS**

Item	Category		Specifications	Remarks
TPMS ECU	Voltage range		9 V to 16 V	-
	Current consumption	Active mode	55 mA or lower	CAN wake-up
		Sleep mode	60 uA or lower	CAN sleep
	CAN communication speed		500 Kbps/ High speed CAN	-
	Modulation type		FSK (Frequency Modulation)	-
	Frequency		433.92 Mhz	-
Wheel module	Pressure measuring range		Up to 700 kpa	-
	Tolerance range for measured pressure		-15 kpa to 15 kpa	-40°C to 100°C
			-10 kpa to 10 kpa	-20°C to 70°C
			-20 kpa to 20 kpa	100°C to 120°C
	Tolerance range for measured temperature		-5°C to 5°C	-40°C to 120°C
			-3°C to 3°C	-20°C to 70°C
	Temperature measuring range		-40°C to 120°C	-
Tire	Inflation pressure		16 inch	35 psi
			18 inch	32 psi
				-

Modification basis	
Application basis	
Affected VIN	

TPMS

TIVOLI 2015.06

AISIN 6
SPEED6-SPEED
M/T

CLUTCH

PROPELLER

DRIVE
SHAFT

AWD

SUSPENSION

BRAKE
SYSTEM

ESP

ABS

ELECTRIC
POWERWHEEL
AND TIRE

TPMS

SUB
FRAME

2. SPECIAL TOOLS

The following torque wrench and connection adapter should be prepared when installing the TPMS wheel module.

CAUTION

When fitting the wheel module, tighten the mounting bolt to the specified tightening torque (1.25 Nm).

- Excessive tightening torque may result in wheel module damage.
- Lack of tightening torque may result in the wheel module unit displaced from the valve during driving.



Torque wrench (0.1 to 5.0 Nm)



Star socket T-10

Remover & installer tool for TPMS wheel module & valve body

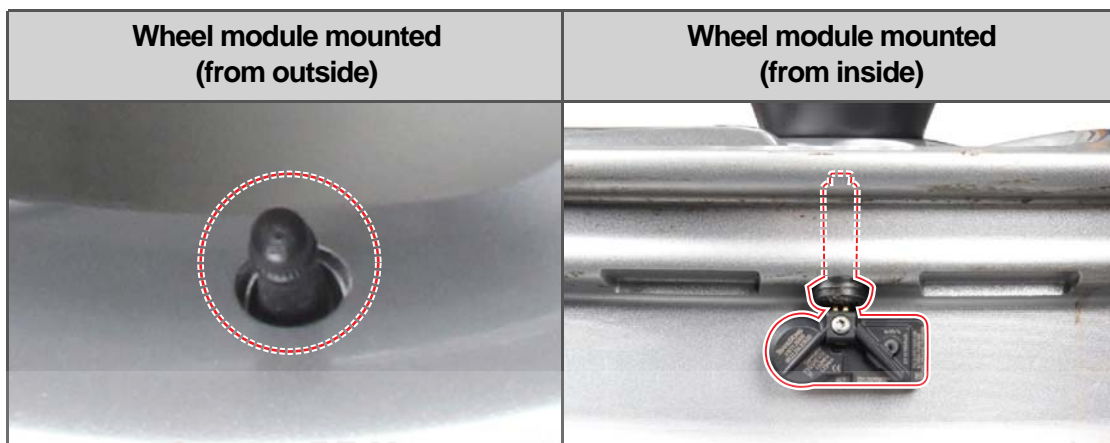



How to use	
Torque wrench	To remove and install valve insert
	
	<p style="background-color: #cccccc; margin-bottom: 5px;">To remove and install valve body</p> 

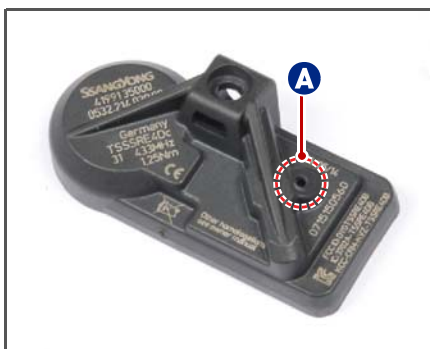
3. CAUTIONS

⚠ CAUTION

- If the vehicle is equipped with the TPMS, all wheels are equipped with the wheel modules. In this case, the wheel module may be interfered with the wheel rim depending on the mounting surface type of the rim. Therefore, always use the Ssangyong Motor Company genuine wheel and wheel module for the vehicle.



- Make sure that the rim hole is clean without foreign materials when assembling the valve.
- Apply the soapy water which can reduce the friction force before assembling the valve. Avoid getting the water or soapy water on the wheel module (housing).
- The sensor assembling direction and rim/rim hole should have the same angle when assembling the valve.
- Make sure that the sealing part of the valve sits correctly on the rim hole after assembling the valve.
- Always check that there is interference between the rim bead and wheel module after assembling the valve.
- Always use a new valve and wheel module mounting screw.
- The removed parts cannot be used again.
- Do not use other special tools other than specified by Ssangyong Motor Company.




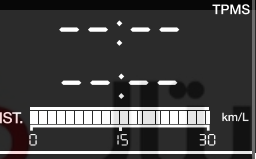


⚠ WARNING

- If you have injected sealant into one of your tire for repairing, drive the vehicle to a Ssangyong Authorized Service Center located within a driving distance of 200 km at a speed of 80 km/h or slower and replace the repaired tire with a new one.
- When replacing the sealant injected tire, the TPMS sensors should be checked for appearance and abnormality at a Ssangyong Authorized Service Center.

Modification basis	
Application basis	
Affected VIN	

⚠ CAUTION

- The wheel sensor sends message for 5 minutes after the vehicle is stopped. The tire pressure check is not available after the ignition is turned from off to on.
- The tire pressure check is not available when the ignition is turned from off to on 5 minutes after the vehicle is stopped. The tire pressure will be displayed on the instrument cluster after the vehicle has been driven for 1 minute at 20 km/h or higher.

Instrument cluster display			
At initial start		Pressure value displayed after detecting position automatically	
Supervision	Standard	Supervision	Standard
<p>Tire pressure OK</p> 	<p>NORMAL</p> 	<p>Tire pressure OK</p> 	<p>NORMAL</p> 

- The TPMS ECU communicates with the wheel module via radio waves. Therefore, the TPMS may not work properly when electronics which can electrically interfere with the TPMS are installed to the vehicle body, or when the vehicle is driven through the areas with high electromagnetic fields.



NOTE

The specified inflation pressure is 35 psi for 16 inch tires, and 32 psi for 18 inch tire. The TPMS is set to this specified pressure according to the tire size.

Modification basis	
Application basis	
Affected VIN	

Memo

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



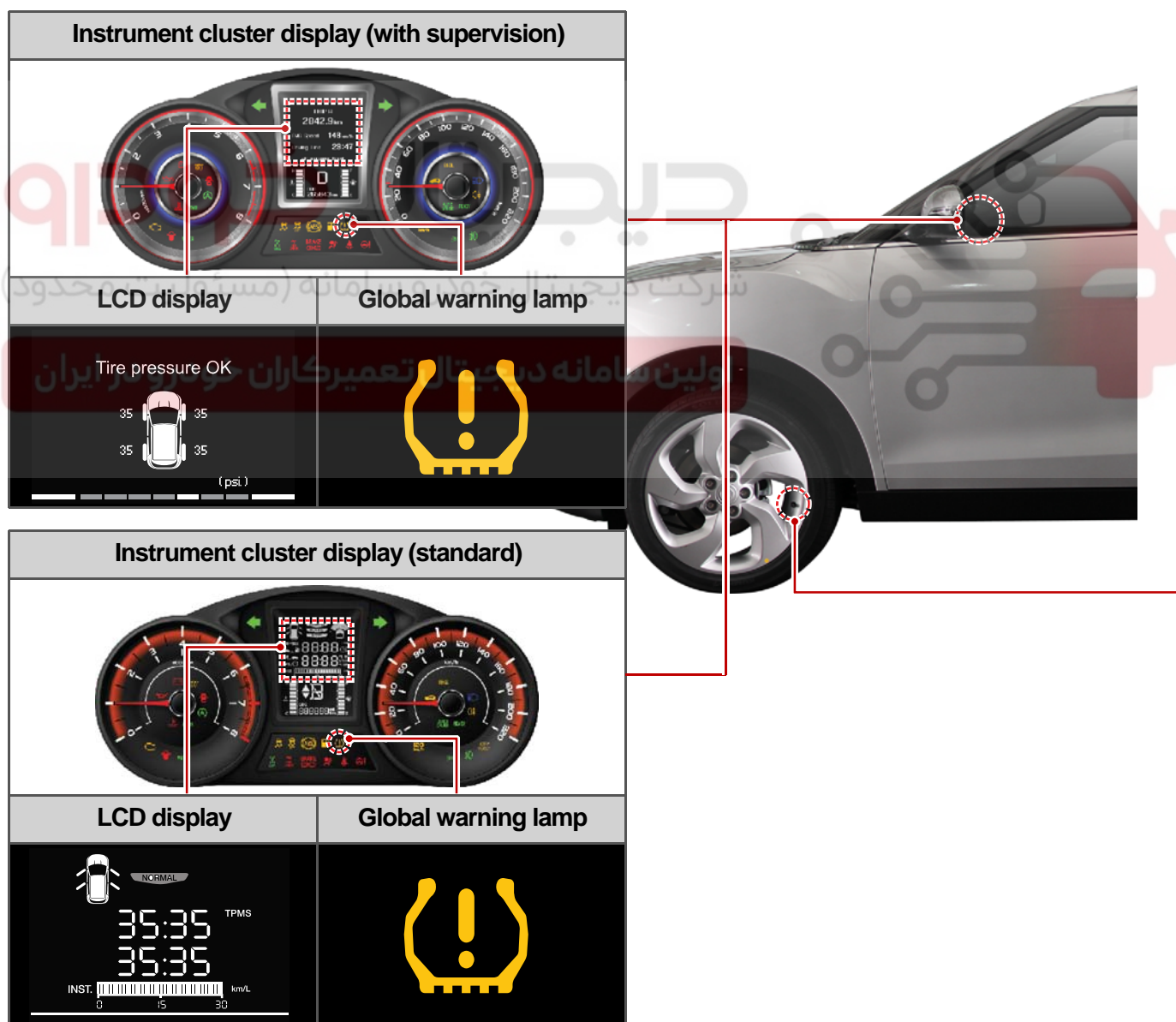
OVERVIEW AND OPERATING PROCESS

1. OVERVIEW

The tire pressure monitoring system (TPMS) is used to reduce the accident rate, enhance driving stability and avoid an unnecessary fuel consumption and tire wear by monitoring the tire pressure and temperature. The TPMS informs the driver of tire pressure information and its status through the instrument cluster.

The wheel module fitted in the tire transmits the internal information of the tire to the TPMS ECU periodically through the wireless transmission. The TPMS ECU can detect the position of the wheel module fitted to each wheel automatically and sends the signal about the tire conditions through the CAN line to the instrument cluster so that the driver can identify the wheel module in question.

2. COMPONENTS



TPMS ECU

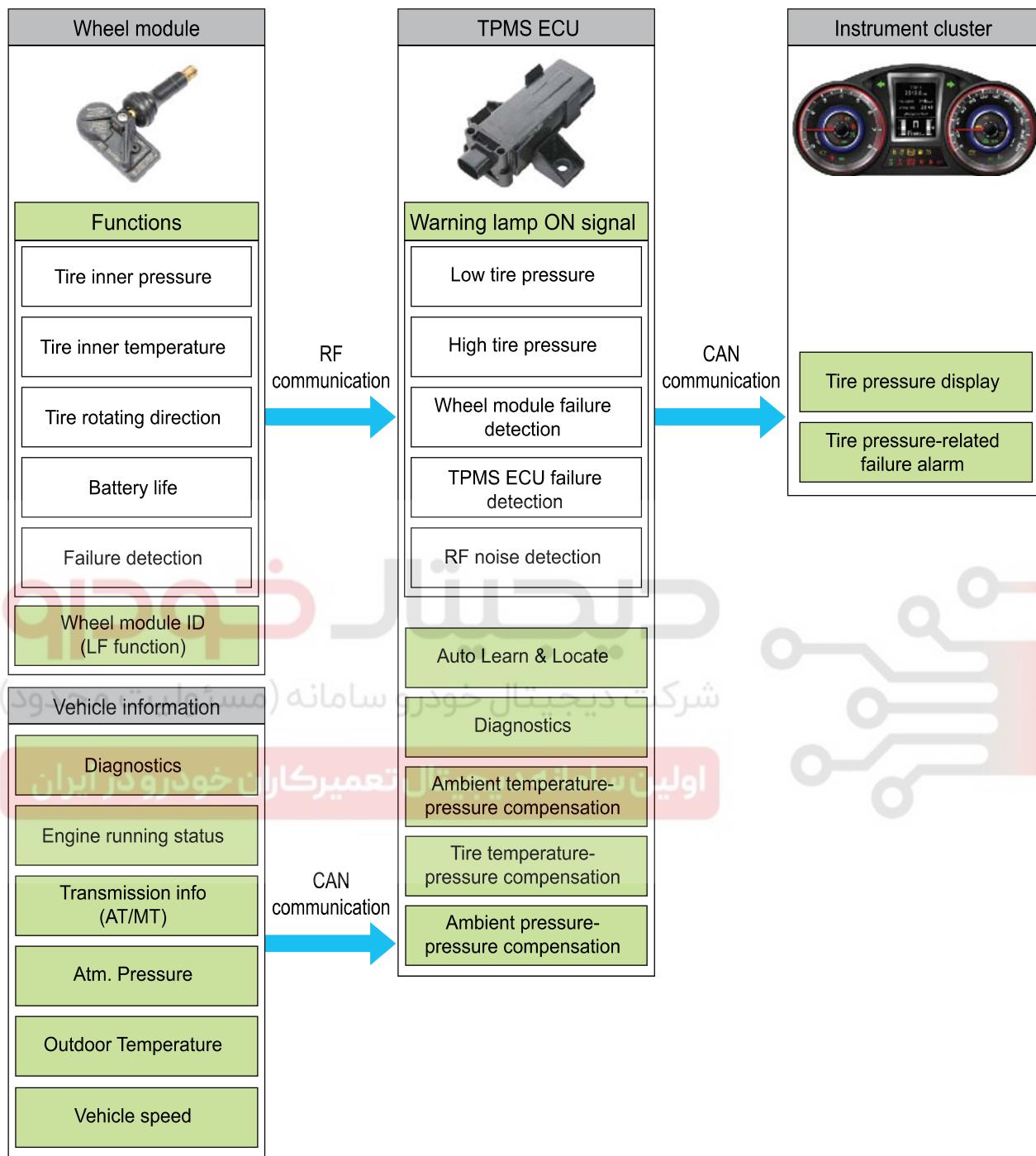


Wheel module assembly



Modification basis	
Application basis	
Affected VIN	

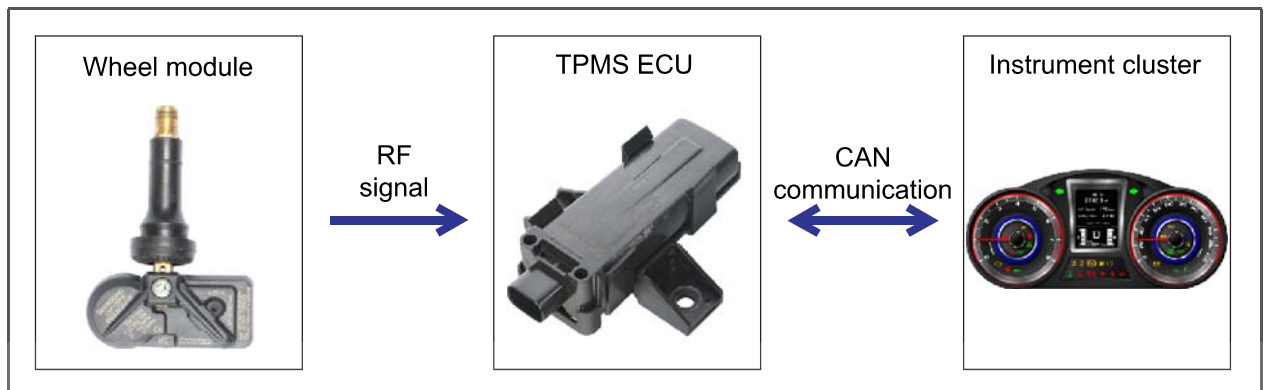
3. INPUT/OUTPUT DIAGRAM



4. TPMS PRESSURE VALUE DISPLAYING PROCESS

The wheel sensor sends the RF signal to the TPMS ECU as soon as the vehicle is driven. Once the vehicle has been stopped, the sensor sends messages only for 5 minutes. (The wheel sensor will not send signals 5 minutes after the vehicle is stopped.)

The tire pressure check is not available when the ignition is turned from off to on 5 minutes after the vehicle is stopped. The tire pressure will be displayed on the instrument cluster after the vehicle has been driven for 1 minute at 20 km/h or higher.



NOTE

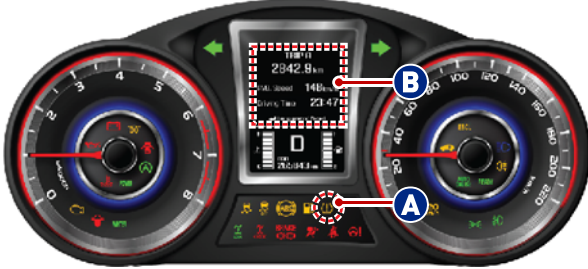
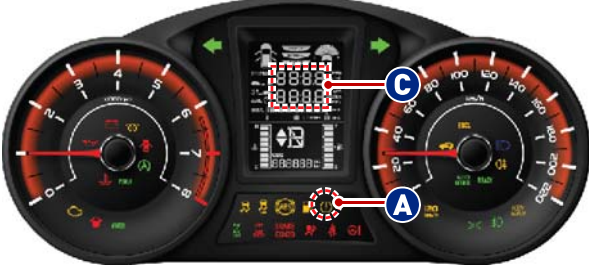


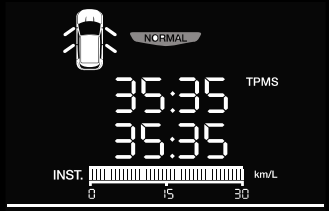
Under normal circumstances, it transmits the tire pressure value and temperature value together with its ID (Identification) once every about 30 seconds to reduce the load on the wheel module's battery. However, in the event of emergency or situation (ex: tire inflation pressure changes 2.9 psi per minute) in which should give a warning to the driver, it transmits the data once every about 1 second.

- The tire pressure is displayed through the following sequence. The procedures shown below are processed at the same time.

Wheel module detection (Auto Learn & Auto location)	<p>Auto learn is completed when the IDs of wheel modules are identified by checking the IDs of sensors installed to the wheels. (4 IDs received) (Auto Learn)</p> <p>The position of each sensor is determined by the strength of FR signal (front/rear) and direction of the acceleration sensor (front/rear). (Auto Location)</p>
--	---

Modification basis	
Application basis	
Affected VIN	

5. TPMS DISPLAY AND WARNING LAMPS

Instrument cluster display (with supervision)		Instrument cluster display (standard)	
			
Display on cluster	Failures	Remarks	
A. Global warning lamp	<ul style="list-style-type: none"> - TPMS ECU failure and CAN communication error - Faulty wheel module - Wheel module auto learn disabled - Unable to receive signal because of RF noise 	Stays on after flashing every 0.2 seconds for 70 seconds (The illumination logic of the supervision version is the same with the standard instrument cluster)	
	<ul style="list-style-type: none"> - Tire check - Too low inflation pressure - Flat tire 	Stays on	
B. LCD of supervision instrument cluster	<ul style="list-style-type: none"> - Low inflation pressure - Too low inflation pressure 	Indicator of the corresponding tire comes on (inverse shading)	
	<ul style="list-style-type: none"> - Flat tire - Too high inflation pressure 	Indicator of the corresponding tire flashes (inverse shading)	
	<ul style="list-style-type: none"> - Pressure out of balance 	Left and right indicators of the corresponding axle (front/rear) flash alternately at an interval of 1 second (inverse shading)	
C. LCD of standard instrument cluster	<ul style="list-style-type: none"> - Current tire pressure values are displayed regardless of the warning 	-	
			

Warning	Display on cluster (Supervision instrument cluster)	Global warning lamp	
		Stays on after flashing every 0.2 seconds for 70 seconds	Stays on
Faulty wheel module	<ul style="list-style-type: none"> - If 2 or more wheel modules are faulty, dashes (- -) are displayed for all 4 wheels - If only one wheel module is faulty, dashes (- -) are displayed for the corresponding wheel 	O	X
Faulty TPMS ECU	Dashes (- -) are displayed for all 4 wheels	O	X
Wheel module auto learn disabled		O	X
Unable to receive signal because of RF noise		O	X
Too low inflation pressure	Inverse shading on the corresponding tire	X	O
Low inflation pressure		X	O
Flat tire	Indicator of the corresponding tire flashes (inverse shading)	X	O
Too high inflation pressure		X	X
Pressure out of balance, on the left and right sides	Left and right indicators of the corresponding axle (front/rear) flash alternately at an interval of 1 second (inverse shading)	X	X

**NOTE**

The LCD screen on the standard instrument cluster only displays current tire pressure values and dashes (- -) regardless the warning (inverse shading and flashing).

Modification basis	
Application basis	
Affected VIN	

**NOTE**

There may be two types of errors depending on the vehicle conditions.

If this is the case, the warning messages are displayed in order of priority stated below.

Warning message display priority

1. Faulty ECU
2. Wheel sensor malfunction
3. Auto learn disabled
4. RF interference
5. Low inflation pressure (Driving inflation pressure loss is 20%)
6. Low inflation pressure (minimum inflation pressure)
7. Rapid loss of inflation pressure
8. Too high inflation pressure
9. Pressure out of balance, on the left and right sides

دیجیتال خودرو

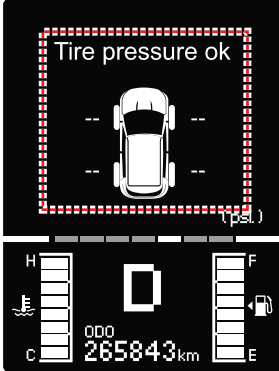
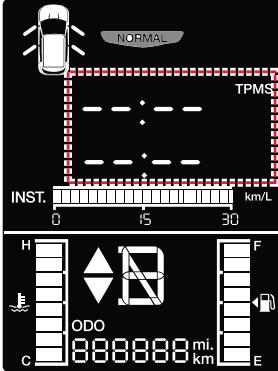

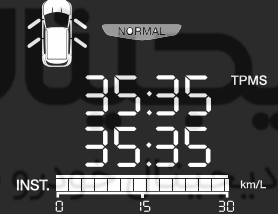


شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

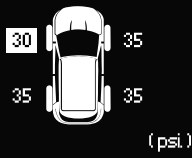
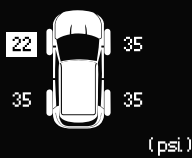
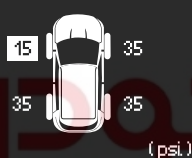


Modification basis	
Application basis	
Affected VIN	

► LCD display related to TPMS

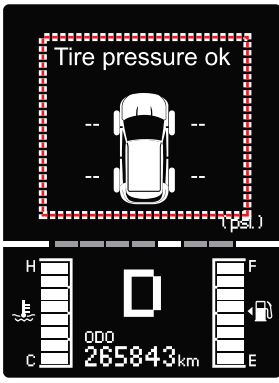
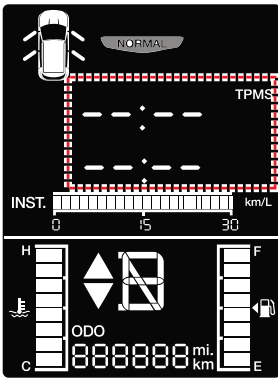

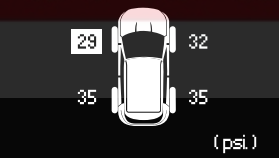
Supervision instrument cluster	Standard instrument cluster	Operating conditions
		Warning message display priority <ol style="list-style-type: none"> 1. Faulty ECU 2. Wheel sensor malfunction 3. Auto learn disabled 4. RF interference 5. Low inflation pressure (Driving inflation pressure loss is 20%) 6. Low inflation pressure (minimum inflation pressure) 7. Rapid loss of inflation pressure 8. Too high inflation pressure 9. Pressure out of balance, on the left and right sides <p>* For a vehicle with standard instrument cluster, the tire inflation pressure can be checked in only TPMS setting mode.</p>
		When the tire inflation pressure is normal
		The message before turning the ignition off is displayed after turning the ignition on. If the system does not recognize the tire pressure, dashes (--) will be displayed.

Modification basis	
Application basis	
Affected VIN	

Supervision instrument cluster	Standard instrument cluster	Operating conditions
<p>Check Tire</p>  <p>(psi.)</p>	<p>The LCD screen on the standard instrument cluster only displays current tire pressure values and dashes (- -) regardless the warning (inverse shading and flashing).</p>	<p>When the current tire pressure differs a lot from the specified pressure. The global warning lamp flashes every 0.4 seconds for 70 seconds. After that, an inverse shading will be displayed on the corresponding tire.</p>
<p>Low pressure</p>  <p>(psi.)</p>		<p>When the current tire pressure is too low. The global warning lamp stays on. After that, an inverse shading will be displayed on the corresponding tire.</p>
<p>Puncture</p>  <p>(psi.)</p>		<p>When the current tire pressure drops rapidly or when one or more tires are flat. The global warning lamp stays on. After that, an inverse shading will be displayed on the corresponding tire.</p>

شرکت دیجیتال خودرو (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

Supervision instrument cluster	Standard instrument cluster	Operating conditions
		Warning message display priority <ol style="list-style-type: none"> 1. Faulty ECU 2. Wheel sensor malfunction 3. Auto learn disabled 4. RF interference 5. Low inflation pressure (Driving inflation pressure loss is 20%) 6. Low inflation pressure (minimum inflation pressure) 7. Rapid loss of inflation pressure 8. Too high inflation pressure 9. Pressure out of balance, on the left and right sides <p>* For a vehicle with standard instrument cluster, the tire inflation pressure can be checked in only TPMS setting mode.</p>
	<p>The LCD screen on the standard instrument cluster only displays current tire pressure values and dashes (--) regardless the warning (inverse shading and flashing).</p>	<p>When the current tire pressure is too high. The corresponding tire flashes with the shading inverted alternatively.</p>
		<p>When the tire pressure difference between the front and rear tires is great enough to affect the safe driving. The left and right indicators flash every 1 second for 70 seconds with the shading inverted alternatively.</p>

**NOTE**

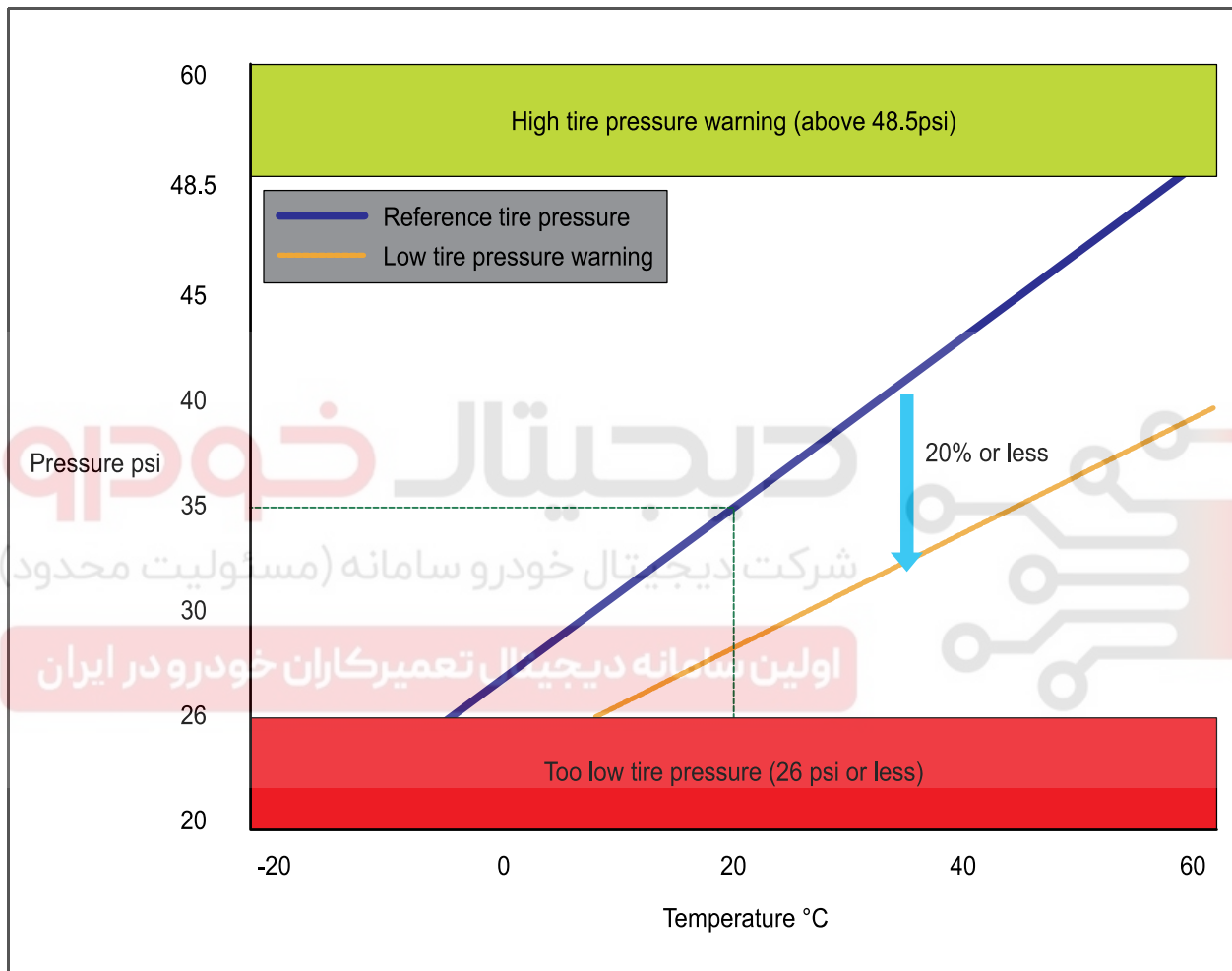
Check the TPMS when the global warning lamp flashes or stays on.

Modification basis	
Application basis	
Affected VIN	

6. LOW TIRE PRESSURE WARNING

The proper tire pressure is 35 psi for 16 inch tires and 32 psi for 18 inch tires. However, the tire pressure changes depending on the ambient temperature. The TPMS ECU receives the ambient temperature signal from the instrument cluster through CAN communication and calculates the proper tire pressure to correct.

► At room temperature of 20°C (for 16 inch tires)



NOTE

18 inch tire inflation pressure: 32 psi

- Too low tire pressure: 24 psi

Modification basis	
Application basis	
Affected VIN	

7. TIRE INFLATION PROCEDURE FOR VEHICLE WITH TPMS

1) Overview

For a vehicle with TPMS, the tire should be inflated in a method different from the conventional method since the tire pressure values displayed on the tire pressure gauge and instrument cluster are different after inflation.

The tire pressure displayed on the instrument cluster should be checked after a certain time delay (wireless transmission time for wheel module).

The displayed value can be changed after driving even if it was set to the specified value.

2) Tire Inflation Procedure

- A. Park the vehicle on a flat ground and let everyone get off the vehicle. (When the vehicle has been driven before it stops, allow the tires cool down so that the inside temperature of the tires becomes the same as the ambient temperature.)



CAUTION

- If there is another vehicle equipped with the TPMS, keep the distance (at least 5 m) from this vehicle to prevent interference of wheel module transmission.
- Unload any cargo, which is not usually loaded, from the vehicle.
- The instrument cluster does not display every pressure change while the air is injected to or discharged from the tire. This is because the wheel module sends the pressure value to the TPMS ECU with the specified time interval.

In addition, if there is other vehicle with TPMS nearby, it may take several minutes to display the pressure values because of radio jamming and weather condition.

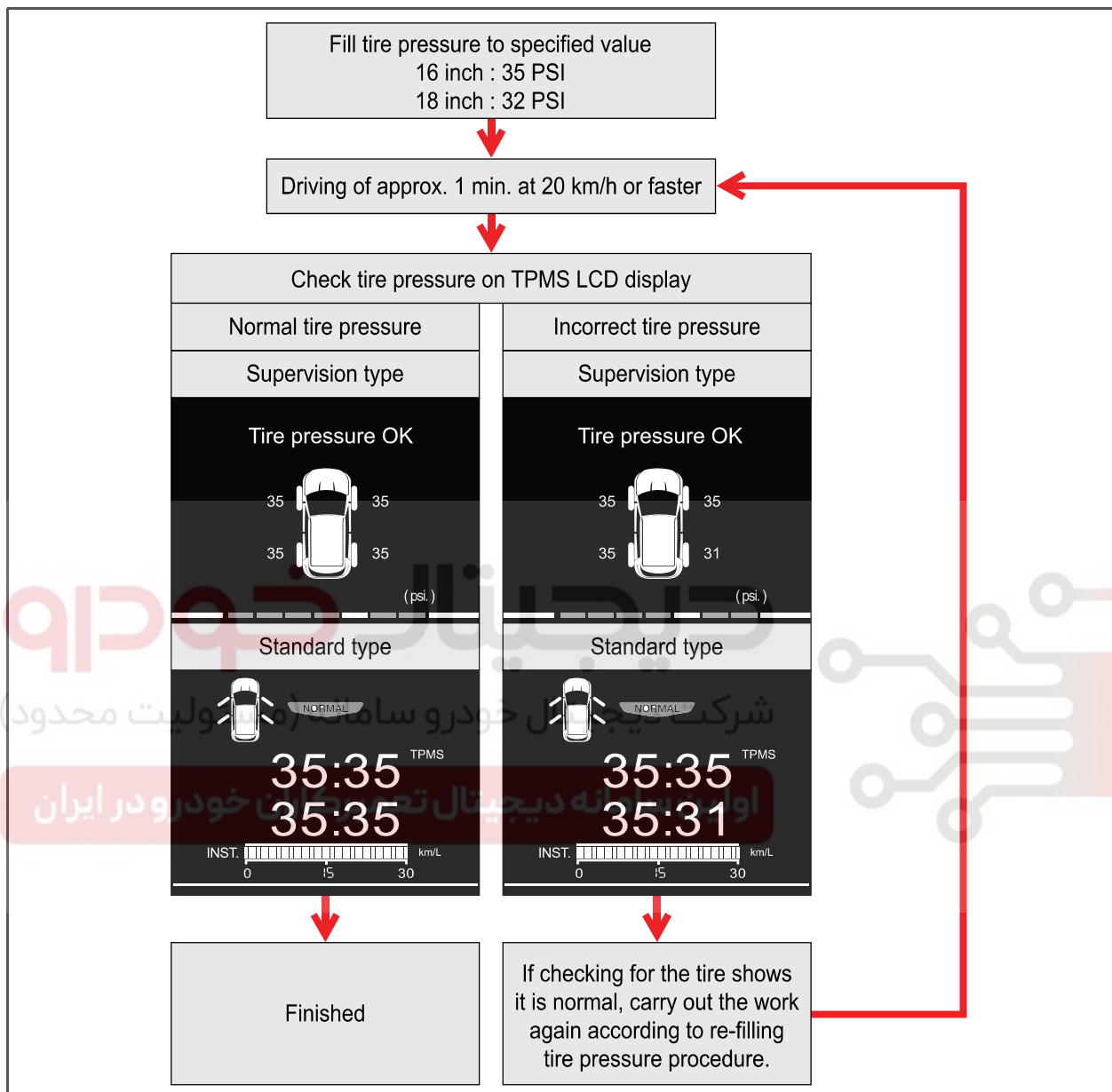
NOTE

The inflation pressure displayed on the instrument cluster changes frequently when the vehicle is driven, because the internal pressure of each tire changed by the load applied to each tire depending on the driving conditions, number of occupants, irregular temperature change in tire and load conditions.

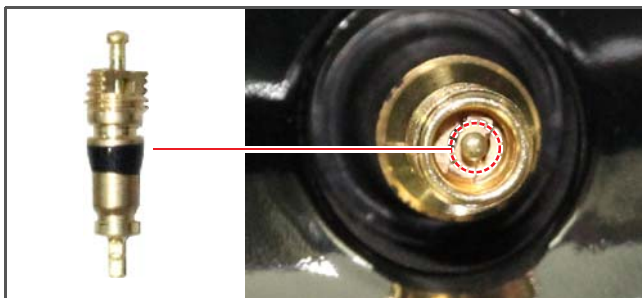
Modification basis	
Application basis	
Affected VIN	

B. Tire inflation & judgment

- Fill the tire pressure (air) according to the tire inflation procedure.

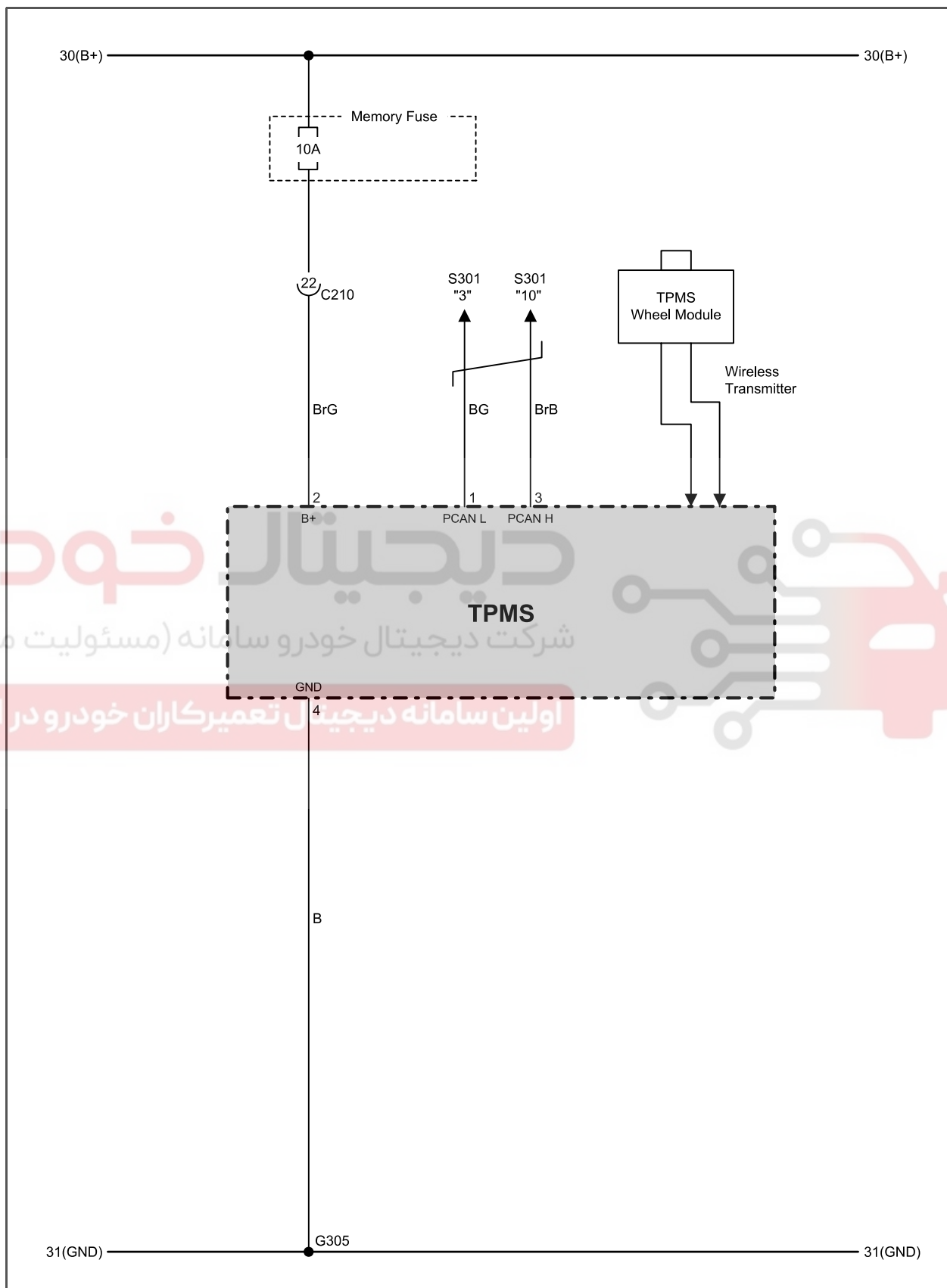


Cautions for TPMS tire inflation



If the tire pressure is 10 psi lower than the specification (35 psi), replace the valve insert on the wheel module valve body with a new one and inject air into the tire.

8. CIRCUIT DIAGRAM



CONFIGURATION AND FUNCTIONS

S.G.N. 4190-01 WHEEL MODULE

1) Overview

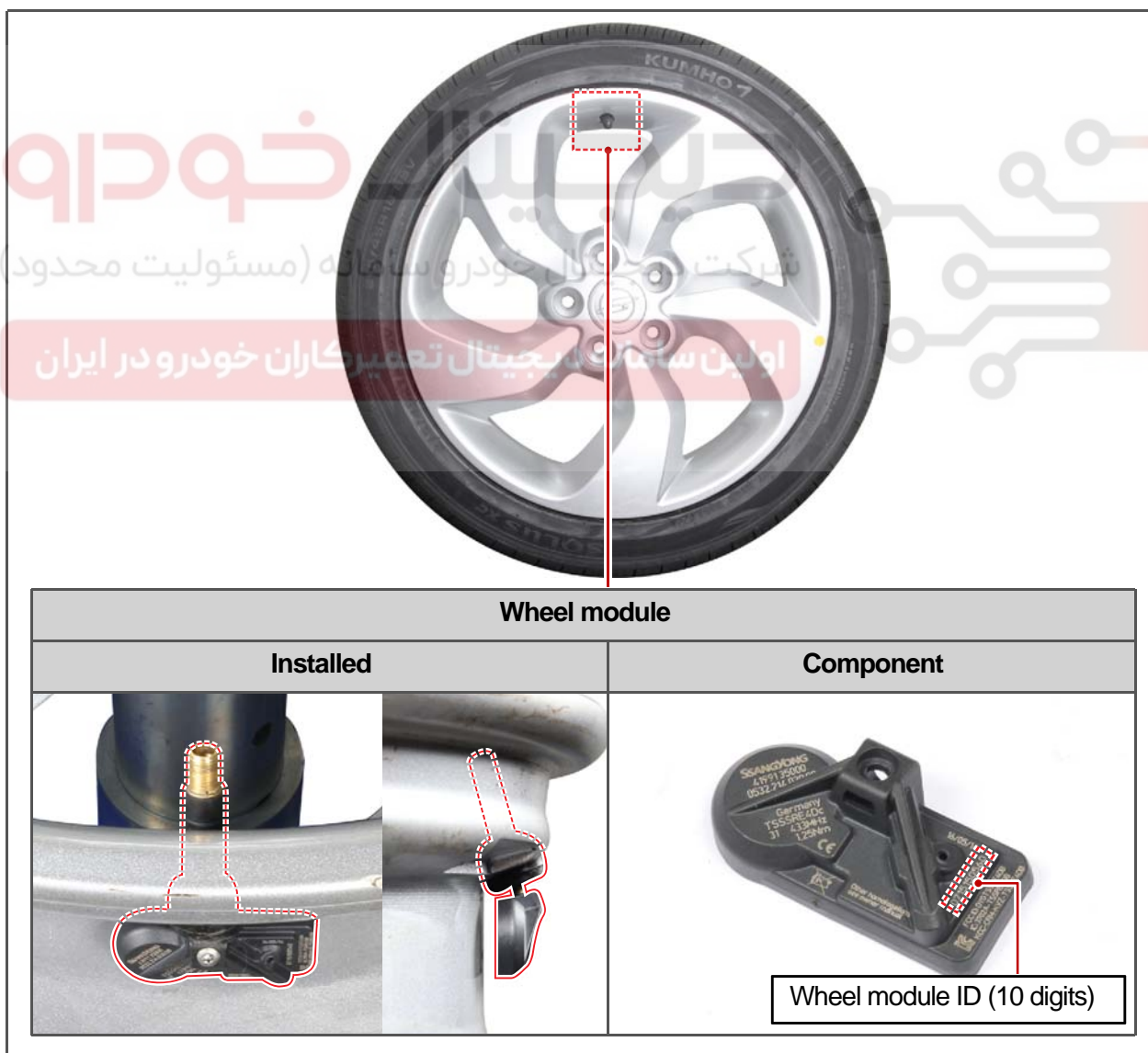
The wheel modules are mounted to the rim hole of each wheel. They transmit the signals about the pressure and temperature in the tires, rotating direction, etc. using the radio frequency to the TPMS ECU with the wheel module IDs.

The wheel module communicates via RF (wireless) using the power supplied from the built-in battery.

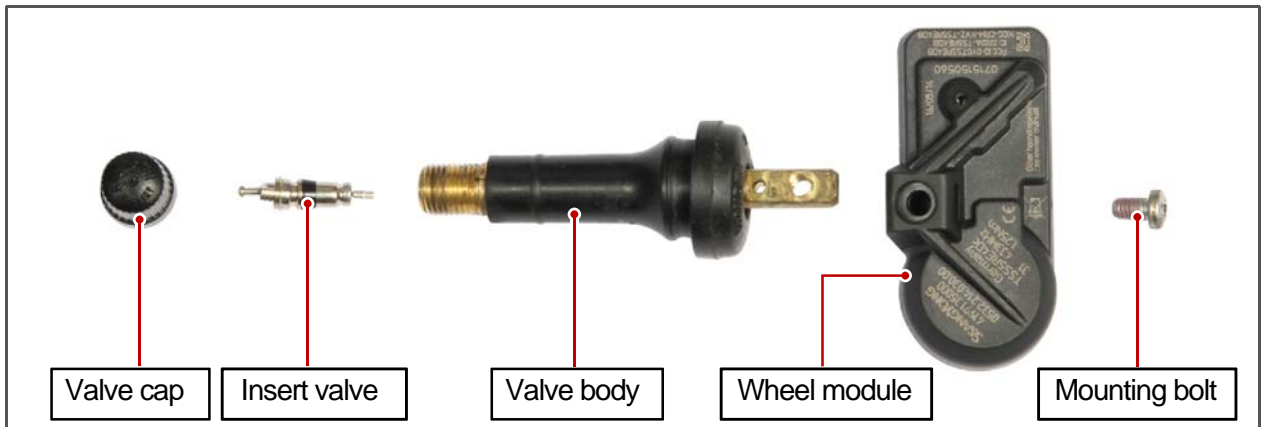
The module consists of valve body section (air inlet) and module section.

If a tire is flat or a new tire is installed, check the wheel module of that tire for contamination and operating status. Replace or re-install, if needed.

2) Mounting Location



3) Configuration



4) Major Functions

- Measures pressure and temperature inside tire
- Detects rotating direction of wheel
- Transmits wheel module ID
- Sends signal to TPMS ECU in the event of low battery

5) Case Needed for Wheel Module Replacement

(1) Malfunctioning or damaged wheel module

It is possible to check the condition of the wheel module using a diagnostic device.

If malfunction of the wheel module is detected by the diagnostic device, its cause can be an error in data reception due to faulty TPMS ECU.

(2) Wheel module battery discharge

The lifespan of the wheel module battery is approx. 7 to 10 years in a normal condition. However, it is greatly reduced if the vehicle is kept driven with a faulty TPMS or under any extreme conditions.

The battery in the wheel module cannot be replaced alone. Therefore the wheel module should be replaced as a whole.

(3) Tire wheel replacement

If the wheel should be replaced because of the damage or other reasons, its wheel module should be moved to a new wheel. At this time, the valve body and mounting screw should be replaced with new ones.

(4) Contamination of wheel module filter and pressure detection part

If the filter or pressure detection part is contaminated with oil or foreign materials, tire pressure may be mistakenly detected or an error can occur.

Modification basis	
Application basis	
Affected VIN	

S.G.N.

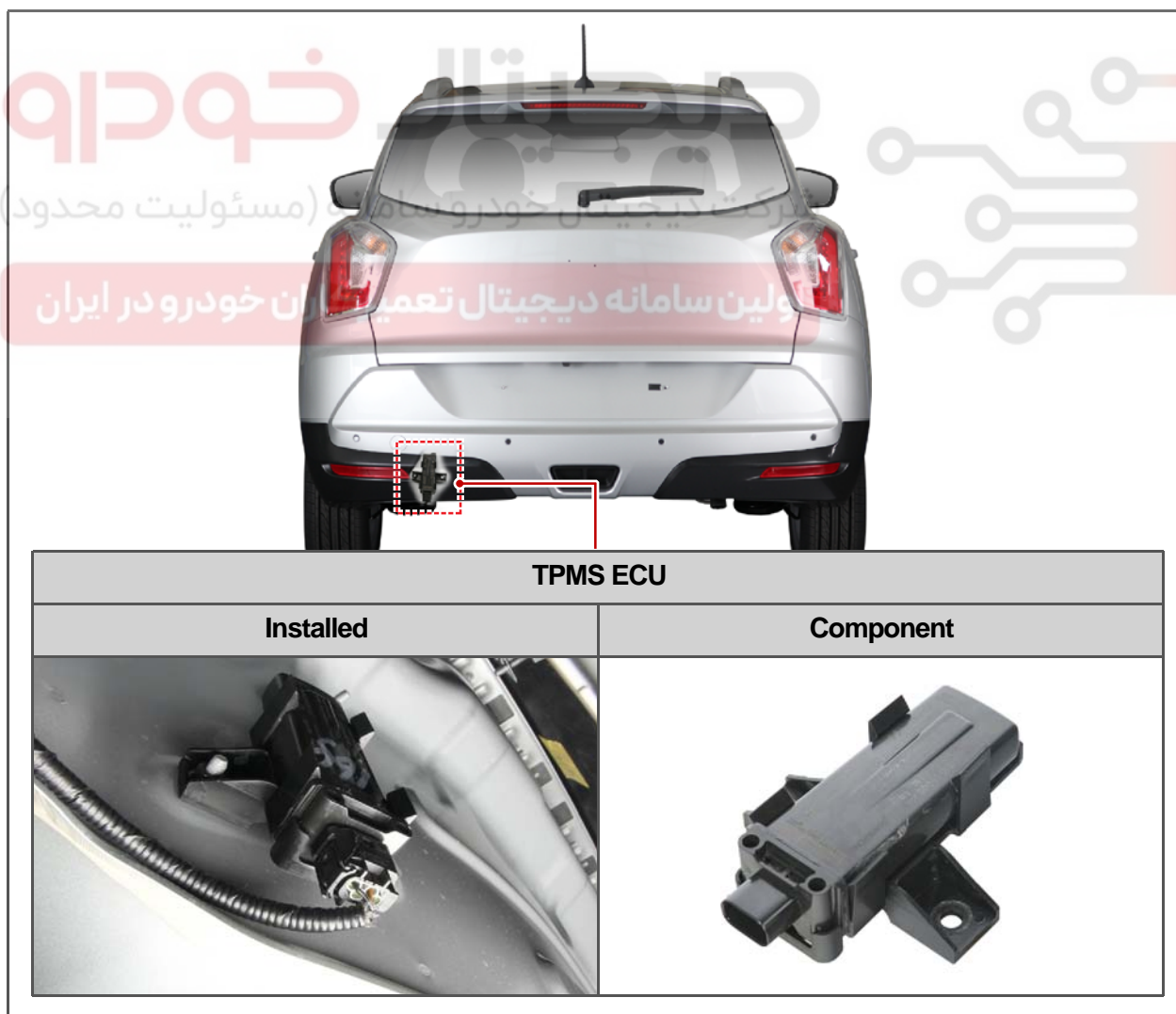
4190-06 TPMS ECU**1) Overview**

The TPMS ECU is installed with the mounting bracket to the back beam in the rear bumper.

This ECU identifies front and rear axles by detecting the strength of the RF signals, and identifies the left and right wheels using the acceleration sensors built in the wheel modules.

The TPMS ECU receives the internal information of the tire (including pressure, temperature, direction of rotation, battery condition, malfunction, wheel module ID) from the wheel module, and receives the vehicle information (including transmission information, atmospheric pressure, ambient temperature, vehicle speed) to compensate the pressure according to the vehicle conditions and external environment.

The TPMS ECU displays more accurate pressure values in the tires and each wheel status on the instrument cluster, based on the different information, and sets a diagnostic trouble code (DTC) related to the failure.

2) Mounting Location

3) Connector



Pin No.	Function
1	CAN LOW
2	B+
3	CAN HIGH
4	Ground

دیجیتال خودرو
شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

Modification basis	
Application basis	
Affected VIN	

REMOVAL AND INSTALLATION

S.G.N.

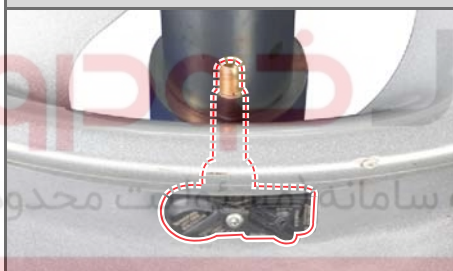
4190-01 WHEEL MODULE



Wheel module

Installed

Component



► Removed

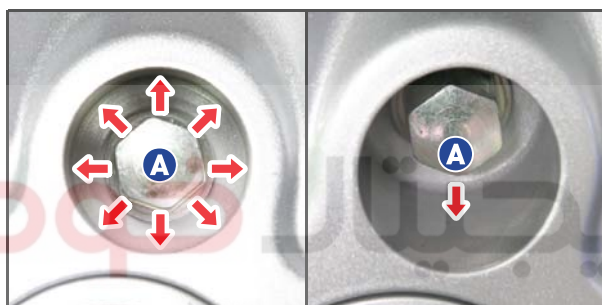
1



1. Support the vehicle with a lift safely and unscrew the wheel bolts in the specified sequence by referring to the precautions.

Tightening torque 127 to 157 Nm

Cautions for removing wheel nut



⚠ CAUTION

When removing the wheel nut using a wheel nut long socket (17 mm), the scratches may appear on the outer surface of the long socket from being chafed by inner surface of the wheel nut hole (A). To prevent the long socket (17 mm) from being scratched, wrap it with tape before removing the wheel nut.



2. Remove the valve insert by using a dedicated tool for removing valve insert to bleed the air from the tire completely.



⚠ CAUTION

Always replace the valve insert with a new one when installing.

Valve insert

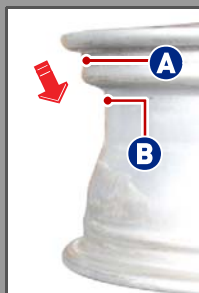


Modification basis	
Application basis	
Affected VIN	

3



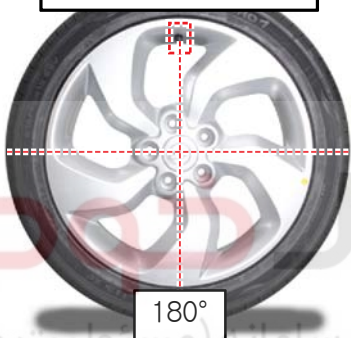
3. Detach the tire outer bead from the wheel rim using a tire changer.

**NOTE**

Detach the tire outer part using a tire changer so that the tire outer bead (A) contacts with the inner part (B) of the wheel.

From wheel module

270°



90°

180°

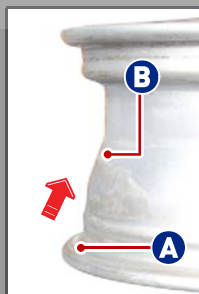
**CAUTION**

Separate the tire outer bead and rim at only 90°, 180°, and 270° directions (3 positions) in reference to the wheel module to prevent the wheel module from being damaged.

4



4. Detach the tire inner bead from the wheel rim using a tire changer.

**NOTE**

Detach the tire inner part using a tire changer so that the tire inner bead (A) contacts with the inner part (B) of the wheel.

From wheel module

240°

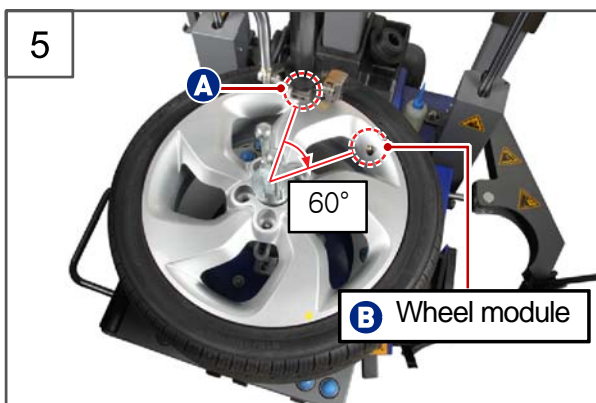


120°

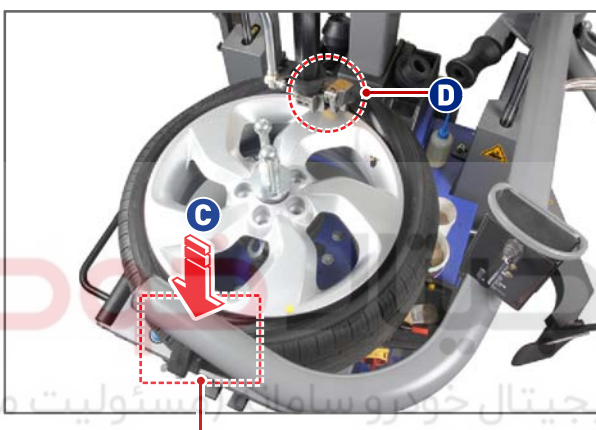
**CAUTION**

Separate the tire inner bead and rim at only 120° and 240° directions (2 positions) in reference to the wheel module to prevent the wheel module from being damaged.

Modification basis	
Application basis	
Affected VIN	



5. When removing the tire outer bead from the wheel, place the wheel so that the wheel module (B) is 60° clockwise away from the tire-removal spot (A).



- Press the part (C) to prise apart from the rim and prise off the tire from the wheel rim at the position (D) using a lever for tire removal.



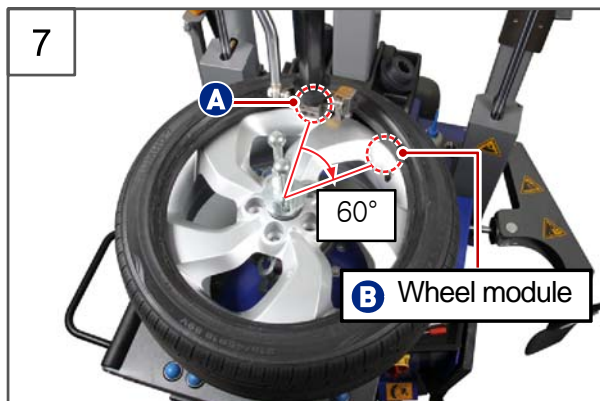
NOTE

Press in the tire in the direction of the arrow shown in the picture, so that the tire outer bead (E) contacts with the inner part (F) of the wheel.

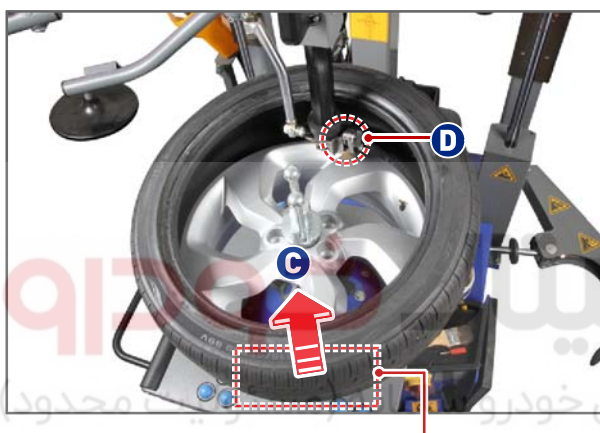


6. Turn the wheel tire clockwise to remove the outer bead.

Modification basis	
Application basis	
Affected VIN	



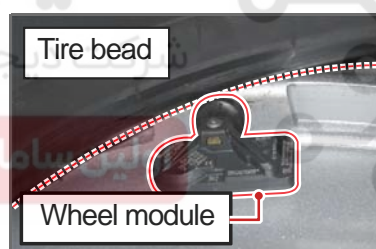
7. When removing the tire inner bead from the wheel, place the wheel so that the wheel module (B) is 60° clockwise away from the tire-removal spot (A).



- Pull up the part (C) to prise apart from the rim and prise off the tire from the wheel rim at the position (D) using a lever for tire removal.

CAUTION

Make sure that the wheel module does not interfere with the tire bead.



NOTE

Lift up the tire in the direction of the arrow shown in the picture, so that the tire inner bead (E) contacts with the inner part (F) of the wheel.



8. Turn the wheel tire clockwise to remove the inner bead.

Modification basis	
Application basis	
Affected VIN	



9. Unscrew the wheel module mounting bolt (Star socket, T-10).

Tightening torque 1.25 Nm



10. Pull out the wheel module from the valve body vertically (arrow direction).

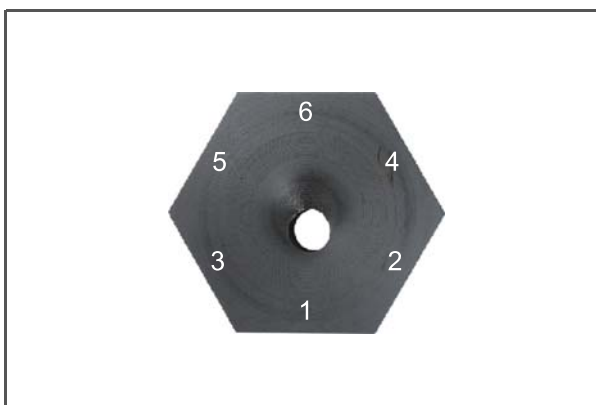


11. Turn the HUF_TPMS wheel module remover/installer clockwise to engage it to the valve body upper thread.

HUF_TPMS wheel module remover/installer



Part no.: X9988 0070A

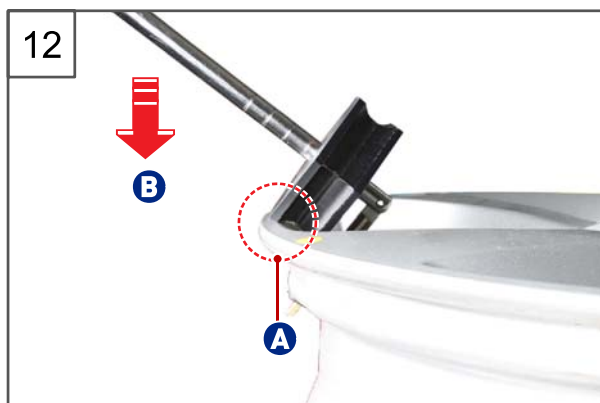


NOTE

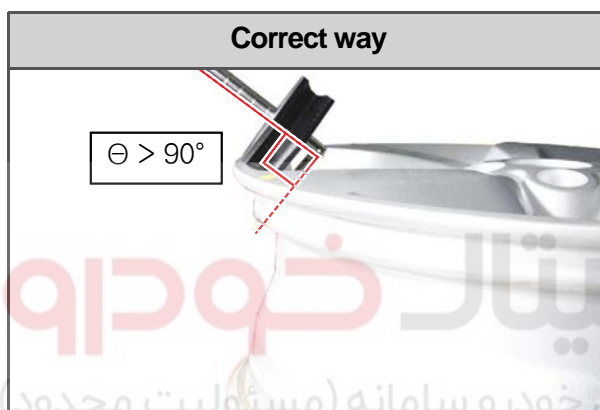
Position to be used for valve body rubber damper

- 18 inch wheel: point no. 4 contacts with the wheel
- 16 inch wheel: point no. 6 contacts with the wheel
- Other point numbers: use the corresponding point according to the vehicle model and wheel type

Modification basis	
Application basis	
Affected VIN	

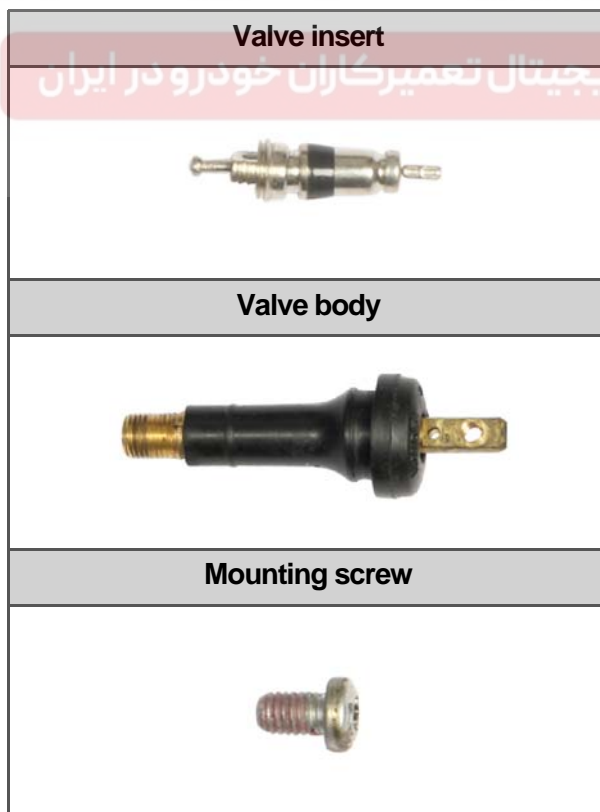


12. Press the HUF_TPMS wheel module remover/installer (tire valve changer) in the direction of the arrow (B) to remove the valve body, provided that the HUF_TPMS wheel module remover/installer is securely mounted at the position (A).



CAUTION

Make sure that the angle between the tire valve changer and the valve body is not 90° or less during removal.



CAUTION

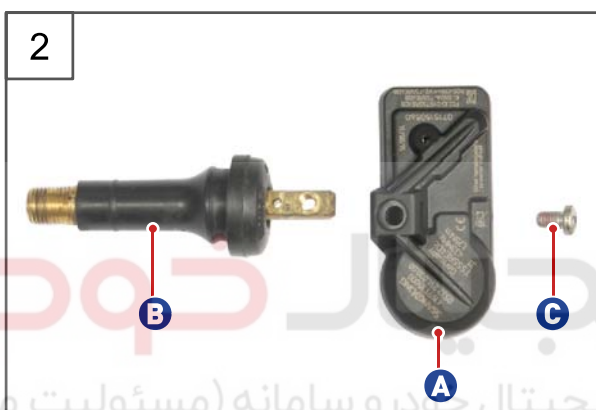
Replace the removed valve insert, valve body, and mounting screw with new ones.

Modification basis	
Application basis	
Affected VIN	

► Installation



1. Wipe out the foreign materials (contaminants) from the mounting point for the wheel module and inner surface of the wheel.



2. Fit the new valve body (B) to the wheel module (A) and screw in the mounting bolt (C) (star wrench T-10) to secure them.

Tightening torque 1.25 Nm

⚠ CAUTION

Tighten the wheel module to the specified torque.



3. Apply small amount of lubricant to the valve body (A).

⚠ CAUTION

Ensure that the lubricant is applied to prevent the valve body damage.



4. Push the wheel module assembly from the inside of the wheel into the rim hole.

Modification basis	
Application basis	
Affected VIN	



5. Turn the HUF_TPMS wheel module remover/installer clockwise to engage it to the valve body upper thread.

HUF_TPMS wheel module remover/installer



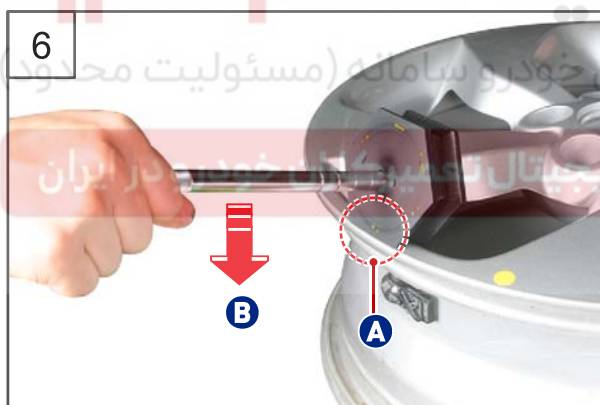
Part no.: X9988 0070A



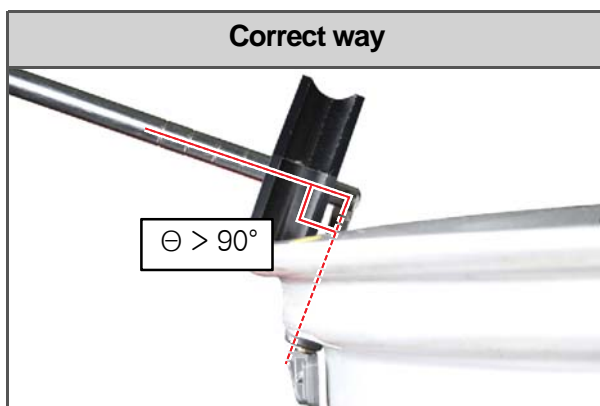
NOTE

Position to be used for valve body rubber damper

- 18 inch wheel: point no. 2 contacts with the wheel
- 16 inch wheel: point no. 4 contacts with the wheel
- Other point numbers: use the corresponding point according to the vehicle model and wheel type



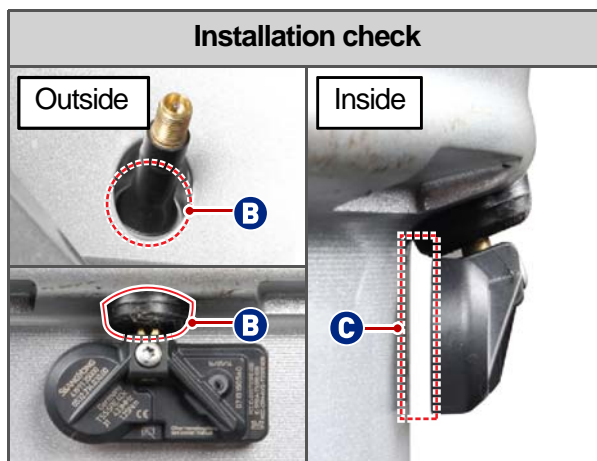
6. Fit a dedicated tool for wheel module to the rubber upper side of the valve body and pull down the tool in the direction of the arrow (A) to install the wheel module assembly.



CAUTION

Always make sure that the angle between the centerline of the tire valve changer and the centerline of the valve body is greater than 90°.

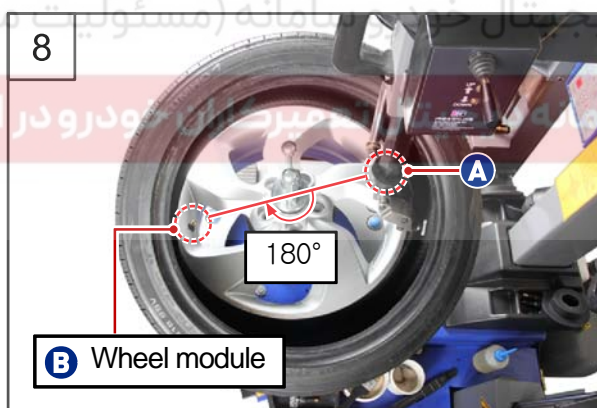
Modification basis	
Application basis	
Affected VIN	

**NOTE**

- After fitting the wheel module assembly (B), check if the valve body is mounted to the rim hole correctly.
- And check that there is enough gap (C) between the wheel module and the wheel. The gap (C) of the wheel module is for the free play of the wheel module when the wheel is spinning.



7. Apply lubricant to the outer and inner beads of the tire.



8. When fitting the tire inner bead to the wheel, place the wheel so that the wheel module (B) is 180° away from the tire-installation spot (A).

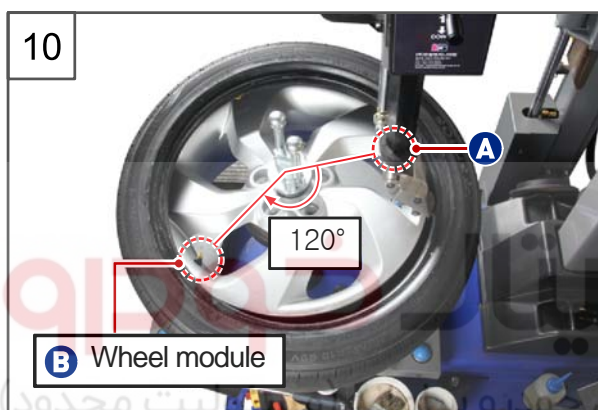
**NOTE**

Press the tire so that the tire inner bead contacts with the inner part (D) of the wheel.

Modification basis	
Application basis	
Affected VIN	



9. Turn the wheel and tire clockwise to fit the tire inner bead.



10. When fitting the tire outer bead to the wheel, place the wheel so that the wheel module (B) is 120° clockwise away from the tire installation spot (A).



- Turn the wheel and tire clockwise to fit the tire outer bead.



11. Inflate the tire to the specified pressure after fitting the tire.

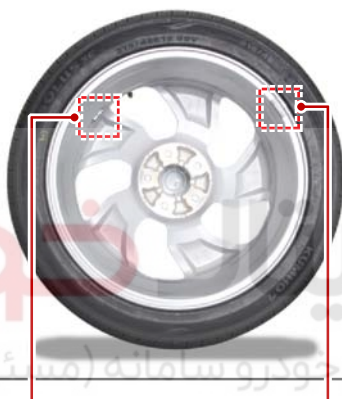
Specified tire pressure	16 inch	35 psi
	18 inch	32 psi

Modification basis	
Application basis	
Affected VIN	

12



12. Adjust the wheel balance.

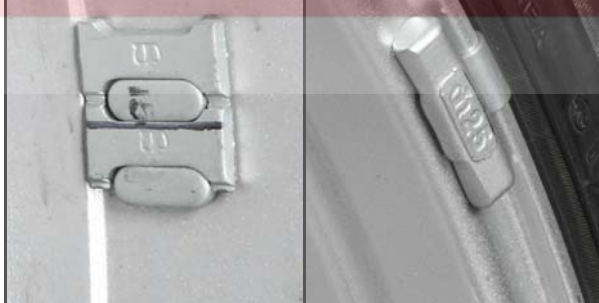


CAUTION

Install the proper balance weight to the wheel according to the wheel specification, aluminum or steel.

Mounting location
(outside)

Mounting location
(inside)



13



13. Tighten the wheel nuts in two or more steps following the order shown in the picture.

CAUTION

Use a hand hinge tool when tightening the wheel nuts to prevent the scratches.

CAUTION

If the wheel module has been replaced with a new one or the tire rotation has been performed, the vehicle should be driven at 20 km/h or faster within 1 minute so that the TPMS ECU detects the wheel modules and identifies their locations.

Modification basis	
Application basis	
Affected VIN	

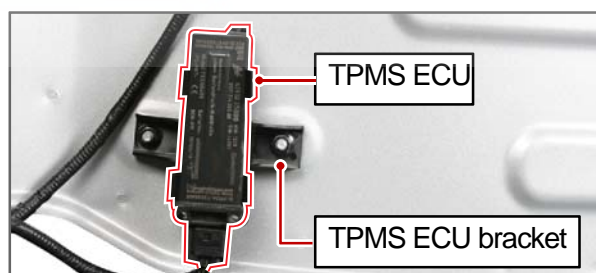
S.G.N.

4190-06 TPMS ECU**Preceding work**

- Disconnect the negative battery cable.



1. Detach the TPMS ECU from the underside of the vehicle.



2. Disconnect the TPMS ECU connector.



Modification basis	
Application basis	
Affected VIN	



3. Remove the TPMS ECU.

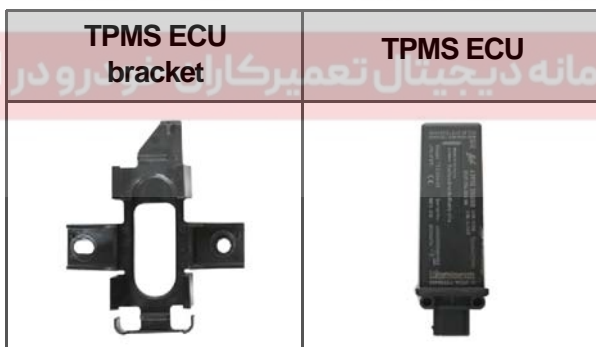


4. Install in the reverse order of removal.

CAUTION

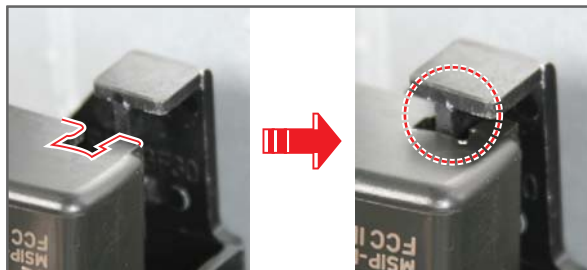
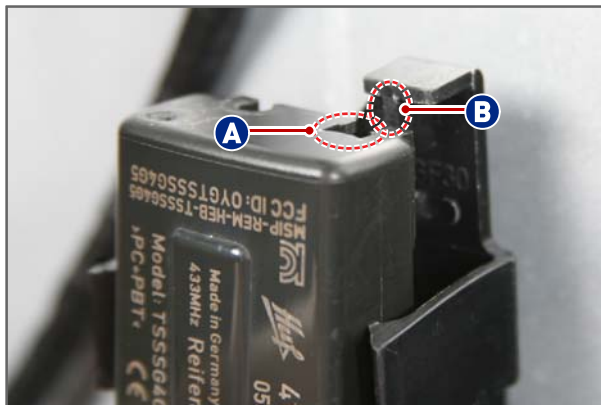
After the TPMS ECU is replaced, the wheel module ID is identified automatically when the vehicle is driven at the speed of 20 km/h or more for at least 10 minutes.

However, if the global warning lamp flashes or stays on during the auto learn & auto location, perform the coding using a diagnostic device.

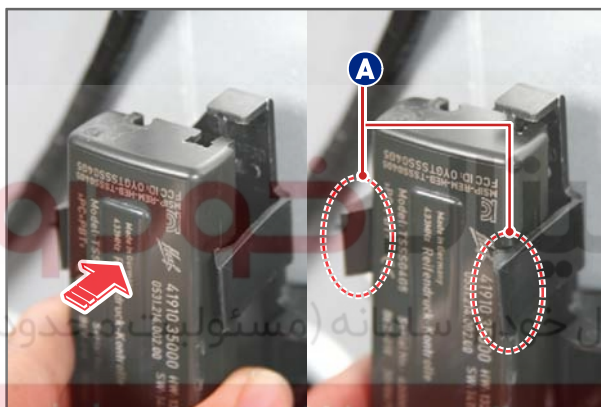


Modification basis	
Application basis	
Affected VIN	

Cautions for installation



Make sure that the groove (A) of the TPMS ECU fits with the protrusion of the TPMS ECU bracket (B).



When installing the TPMS ECU to the bracket, a clicking sound should be heard from the locking part (A).

Modification basis	
Application basis	
Affected VIN	

CODING PROCESS

1. WHEEL MODULE ID INPUT

In general, the TPMS ECU receives the information from the wheel modules installed to the wheels to identify the wheel modules. If the TPMS ECU fails to identify the wheel modules automatically, perform this procedure.

Wheel module detection (Auto Learn & Auto Location)

Auto learn is completed when the IDs of wheel modules are identified by checking the IDs of sensors installed to the wheels. (4 IDs received) (Auto Learn)

The position of each sensor is determined by the strength of FR signal (front/rear) and direction of the acceleration sensor (front/rear). (Auto Location)

Wheel module



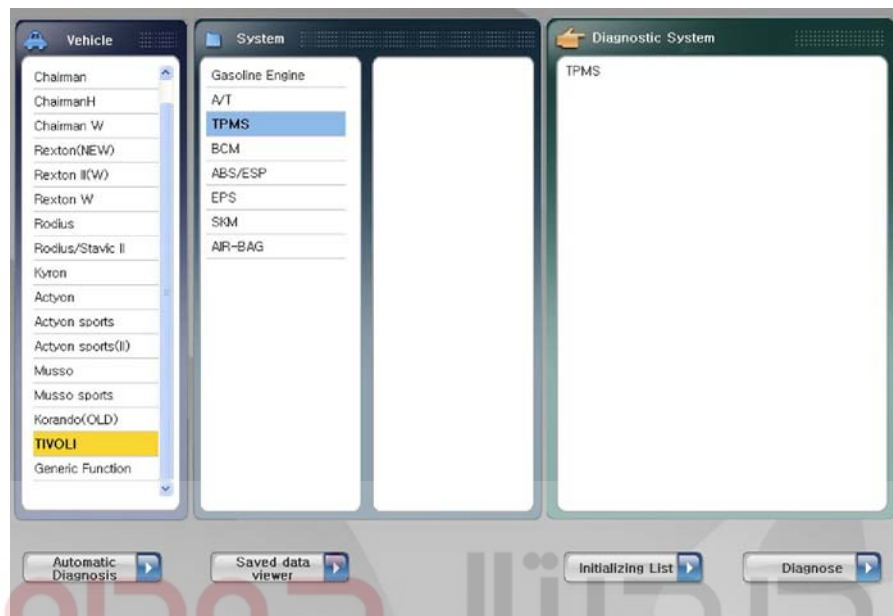
Wheel module ID (10 digits)

► Wheel module ID

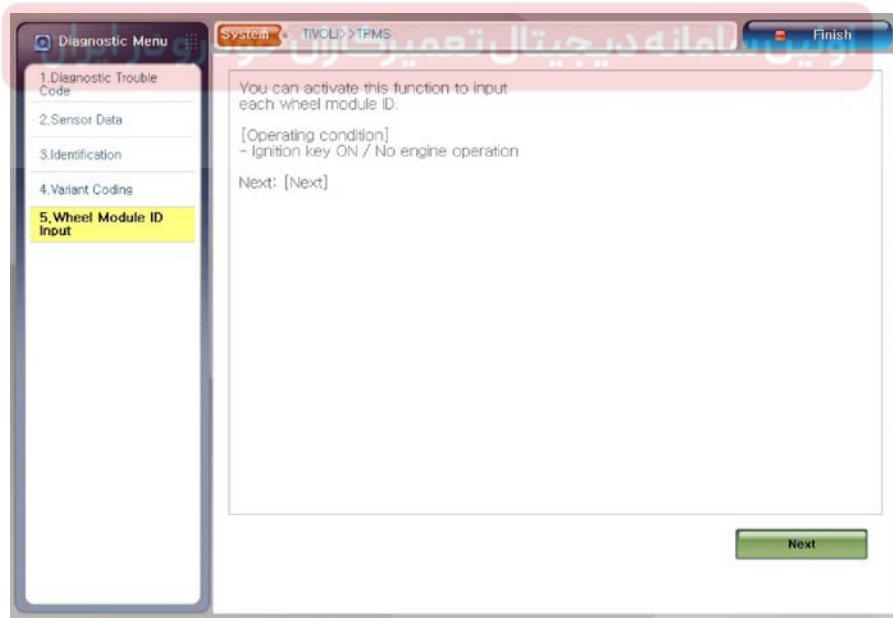
No.	List	Data	Unit
1	Wheel sensor ID left front	740438034	-
2	Wheel sensor ID right front	733991204	-
3	Wheel sensor ID right rear	740438158	-
4	Wheel sensor ID left rear	736391530	-
5	Wheel sensor number 01 - ID	736391530	-
6	Wheel sensor number 01 - position	Rear Left	-
7	Wheel sensor number 01 - last received pressure	370	psi
8	Wheel sensor number 01 - last received temperature	215	°C
9	Wheel sensor number 01 - p placard	35	psi
10	Wheel sensor number 01 - sensor life time counter	127	month
11	Wheel sensor number 02 - ID	733991204	-
12	Wheel sensor number 02 - position	Front Right	-
13	Wheel sensor number 02 - last received pressure	370	psi
14	Wheel sensor number 02 - last received temperature	215	°C
15	Wheel sensor number 02 - P placard	35	psi

Modification basis	
Application basis	
Affected VIN	

1. Turn the ignition ON and select vehicle type and system (TPMS) on the diagnostic program for diagnosis.



2. Select the menu "Wheel module ID input" and press the [Next] button.



3. Check the wheel module IDs (10 digits) and type in each wheel module ID. Press the [Input] button.

Diagnostic Menu

- 1. Diagnostic Trouble Code
- 2. Sensor Data
- 3. Identification
- 4. Variant Coding
- 5. Wheel Module ID Input**

System TIVOLI >> TPMS **Finish**

wheel module ID input

Front left wheel module ID: 740438034

Front right wheel module ID: 739391204

Rear right wheel module ID: 740438158

Rear left wheel module ID: 739391530

<< wheel module ID input >>

#. Operating condition: Ignition key ON / No engine operation

You can activate this function to input each wheel module ID.

- * 'Input' Press the button to proceed with the wheel module ID input.
- * 'Cancel' Press the button to proceed with the wheel module ID input.

Cancel **Input**

4. Press the [OK] button after the wheel module ID input has been completed.

Diagnostic Menu

- 1. Diagnostic Trouble Code
- 2. Sensor Data
- 3. Identification
- 4. Variant Coding
- 5. Wheel Module ID Input**

System TIVOLI >> TPMS **Finish**

Saving wheel module ID completed.

Complete: [OK]

OK

Modification basis	
Application basis	
Affected VIN	

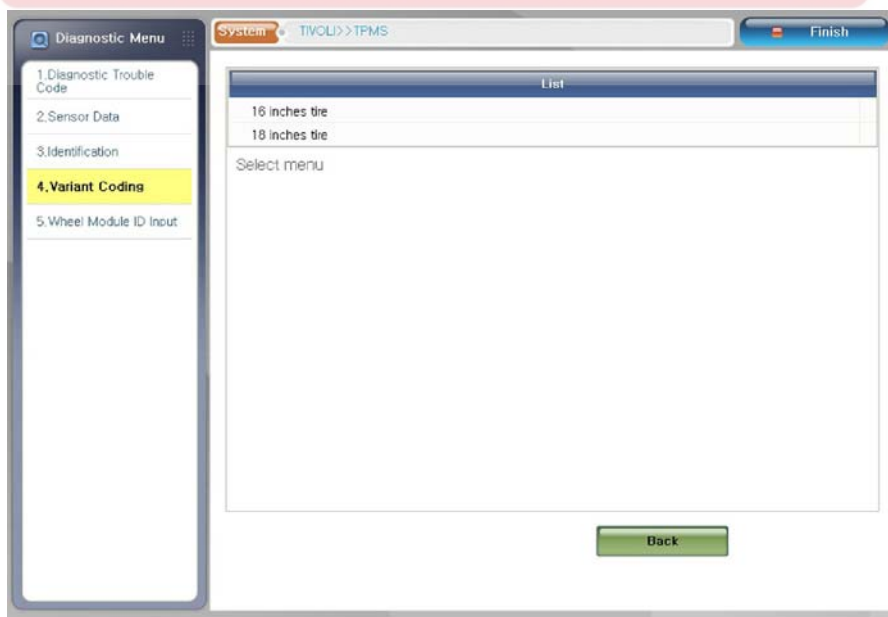
2. VARIANT CODING

► Perform the TPMS variant coding when replacing the TPMS ECU.

1. Turn the ignition ON and select vehicle type and system (TPMS) on the diagnostic program for diagnosis.



2. Select the variant coding menu and select the correct tire size for the vehicle.



Modification basis	
Application basis	
Affected VIN	

3. Press the [Start] button.

Variant	Range	Contents	Unit
Pressure Placard	-	32	psi
Minimum_Tyre_Pressure_Threshold(PMIN)	-	26	psi
High Pressure Threshold	-	49	psi
Ade Imbalance Set Threshold(AXLE.SET)	-	5	psi
Ade Imbalance Clear Threshold(AXLE.CLEAR)	-	2	psi
TPMS ECU Position	-	Rear axle	psi

If exposed information is incorrect, and by selecting the "back" button, Please enters to the item.
If you select the "Start" button, coding is done.

Back Start



NOTE

No additional information is required to enter. Only tire size is needed to be selected.

4. Press the [OK] button after the variant coding has been completed.

Variant coding completed.
Please press the "OK" button.

OK

Modification basis	
Application basis	
Affected VIN	

Memo

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

