12 - Electrical system

PEPS system

Technical specifications

General specifications

Parameters of PEPS controller

Name	Specification
Rated voltage	12V
Operating voltage	(9 ~ 17) V
Storage temperature	(-40 ~ 95)℃
Protection level	IP52
Low frequency communication	134kHz±7kHz ASK
High frequency communication	The frequency hopping is used. The frequency points include 434.42 MHz ± 40 kHz and 433.42 MHz ± 40 kHz
High frequency receiving sensitiviltiy	-100 dbm (typical, direct injection method, BER = 10e-4,ASK, datarate4000bps)
Static sleeping current	≤3mA (testing static sleeping current of entire vehicle)
Service life	3 year or 60000km

Parameters of smart key

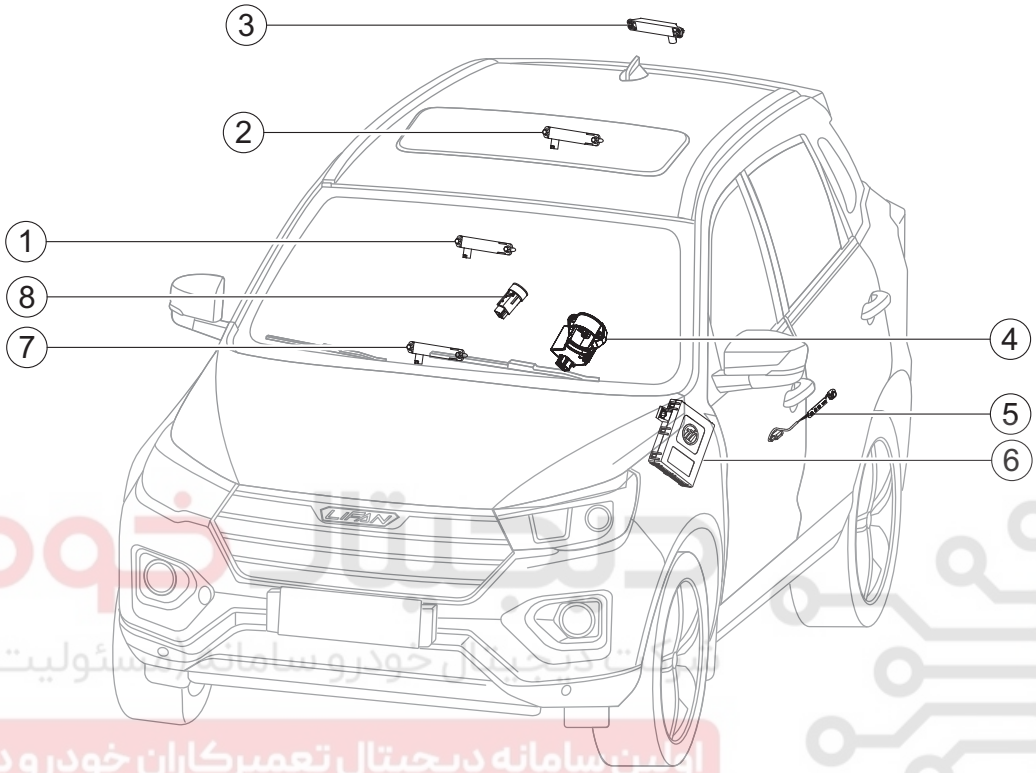
Name	Specification
Rated voltage	3V
Operating voltage	(2.5 ~ 3.5) V
Operating temperature	(-40 ~ 85)℃
Storage temperature	(-40 ~ 95)℃
Operating temperature of battery	(-20 ~ 60) (Operating temperature requried to ensure capacity and use life when the battery is nude)
Static current	<5.5uA
Wave transmission frequency	The frequency hopping is used. The frequency points include 434.42 MHz ± 40 kHz and 433.42 MHz ± 40 kHz
Protection level	IP56 (The key can be controlled remotely after 5min when the key is immersed into 20cm deep water)
Low frequency communication	134kHz±7kHz ASK
High frequency communication	<10mW(e.r.p)
Modualtion mode	FSK
Induction distance	Within 1.5m
Remote control distance	≥ 45m (under open conditions)
Use life of remote controller	≥ 100000 times (one time indicates one cycle with 3 keys) (excluding the use life of the battery)

Switch of start stop engine system

Name	Specification
Rated voltage	12V
Operating voltage	(9 ~ 17) V
Operating temperature	(-40 ~ 85)℃
Storage temperature	(-40 ~ 95)℃
Operating current	10mA
On resistance	<30ohm
Key operation force	(6.5±1) N
Key lift	100000 times
Backlight	Red backlight

Structure and installation location

Part exploded view



LFX60-SM-01400

No.	Part name
1	Middle onboard antenna
2	Rear onboard antenna
3	External antennae
4	Steering column lock

No.	Part name
5	Door knob antennae
6	PEPScontrol module
7	Front onboard antenna
8	Start button assembly

General Inspection

General equipment

Digital universal meter
Diagnostic equipment of vehicle

1. Check installed devices after-sales, which may affect theft prevention system of the engine.
2. Check system components, which are easy to touch or can be seen, to check if they are obviously damaged or include potential failures.
3. If the system displays that the engine is locked, check and confirm if the intelligent key has been learnt prior to failure check. Otherwise, the intelligent key learning program is performed.

Operating Principle

System description

The one-key start system is the smart entry and start system, when the antenna in the vehicle detects the smart key, the control device in the vehicle will activate the vehicle power supply system. When the starting conditions are satisfied, the PEPS controller will control the electronic steering shaft unlocking and communicate with the ECM controller to start the engine together.

The intelligent entry and starting system not only can remotely control the wireless door lock and shut down the engine, but also realize the following functions with a carried key without the need of using the key or transmitter button (entry function and button starting function). This system is very convenient.

- The confirmation postion switch of the CVT gearbox in in P/N position. To push down the brake pedal and simply press the engine start button, the engine can start (button start function).
- To push down the clutch pedal of the MT gearbox and simply press the engine switch, the engien can start (button start function).
- Unlock/lock door (entry unlocking/entry locking function).
- Wireless door lock control

Functions of PEPS controller

The PEPS system can realize the low-frequency magnetic field positioning technology and divide the whole vehicle into the no-key entry area, no-key starting area and luggage carrier unlocking area via antennas at different positions on the vehicle. It will establish the corresponding magnetic fields in different areas of the whole vehicle. The intelligent key will confirm the areas via the magnetic field strengths.

Maximal coverage of PE starting area:

1. Extension from the vehicle window is within 50mm.
2. Extesnion from the front and rear air window glass of the vehicle is within 20mm.
3. Extension from the vehicle A/B/C column, metal ceiling shed, door and lower vehicle body is within 100mm.

PE unlocking (door) coverage

When the key is outside the vehicle and is within 20mm and 150cm area above the ground and 1m radius area, it can be correctly identified. Positions under the vehicle are excluded.

PE unlocking (luggage carrier door) coverage

The key is outside the vehicle and is within 1.5m area above the ground and 1.5 m radius area, it can be correctly identified.

PS key authentication

The PS key authentication includes intelligent key position authentication and spare IMMO authentication. If a key passes any authentication, it indicates successful PS key authentication.

The PEPS controller will first authenticate the position of the intelligent key by using the antenna inside the vehicle (intelligent starting area). if the intelligent starting area includes a legal intelligent key, it indicates successfully PS authentication.

If the antenna inside the vehicle fails to authenticate the intelligent key (e.g. insufficient power of intelligent key or intra-frequency disturbance), the IMMO authenntication function is enabled. If the key passes the spare IMMO authentication, it indicates successful PS key authentication. If the key fails to pass the spare IMMO authentication, it indicates failed PS key authentication.

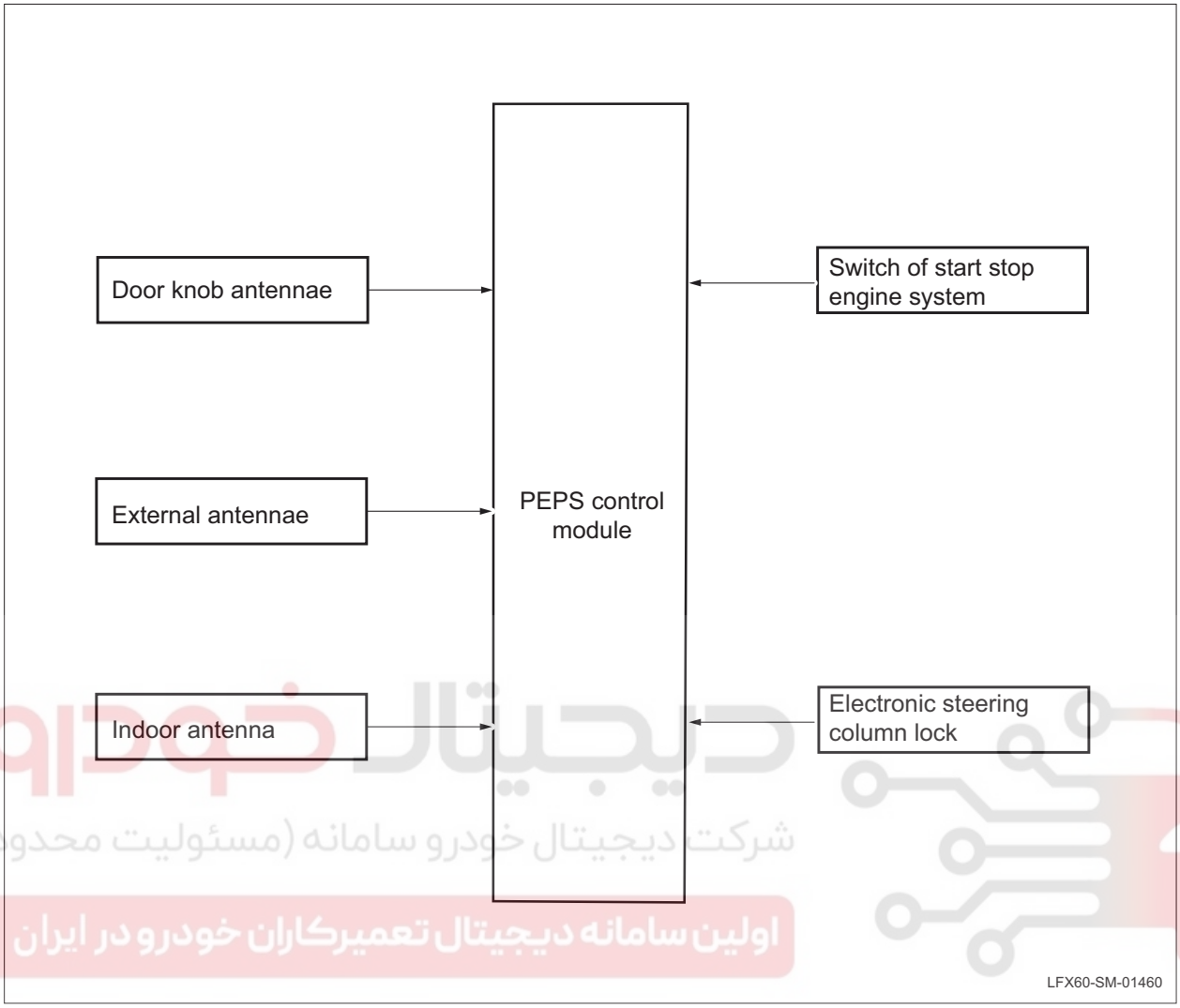
Emergency starting flow:

1. Push down the brake (CVT)/clutch pedal (MT) and press one-push start switch.
2. When the instrument can not find a key, the indicator will flicker. Make the Lifan logo on the rear side of the intelligent key approximate to the start switch center and make the rear side of the intelligent key approximate to the one-push start buttong.
3. If the driving IMMO coil of the controller can not find an illegal key within 10s, the controller will stop finding the key and find the key when next emergency start flow is triggered.

Function description

Function	Description
Indoor and outdoor lamplight control	Dipped headlight, front and rear position light, license plate light, (front, side and rear) steering light and laser light
Load of other electric appliances of vehicle body	Glass ascending/descending motor, door lock motor, luggage carrier lock motor and automatic folding motor of rearview mirror
PE (no key) entry function	PE unlocking (door lock) function
	PE locking (door lock) function
	PE unlocking (luggage carrier) function
PS Start function without a key	PS key authentication
	Power distribution function
	Intelligent start/stop function
	Emergency start function
	Emergency stop function
Engine theft prevention	EMS certification
ESCL	Unlock/lock
Hint function	Engine authentication failure hint
	Low power capacity hint of intelligent key
	Smart key leaving prompt function 1
	Smart key leaving prompt function 2
	No brake padel pressing hint
	No P/N position hint upon start
	No P/N position hint upon parking
	ESCL unlocking failure hint
	ESCL locking failure hint
	Start button failure hint
	No power OFF status hint upon intelligent locking
	Key in vehicle hint upon intelligent locking
	No intelligent key detected or illegal intelligent key alarm

Electrical Schematic Diagram



Diagnostic Information and Procedures

Diagnosis Instructions

Before the PEPS failure is diagnosed, please first read the system overview to know and familiarize the working principle of the PEPS systen and then start PEPS system diagnosis. When a failure occurs, these knowledge can assist you to identify correct failure diagnosis steps. More importantly, these knowledge can assist you to check if conditions described by the customer are normal.

Any failure diagnisis of the PEPS system should start with PEPS system check. It can guide repairers to take enxt logic step and diagnose failures. Understanding and using the diagnostic flowchart correctly reduces diagnostic time and avoids misjudgment of components.

General equipment

Name
Diagnostic equipment of vehicle
Digital multimeter

Visual Inspection

1. Confirm the problem raised by the customer.
2. Check for the evident mechanical or electrical damage trace and collision deformation trace through the visual check.

Visual inspection table

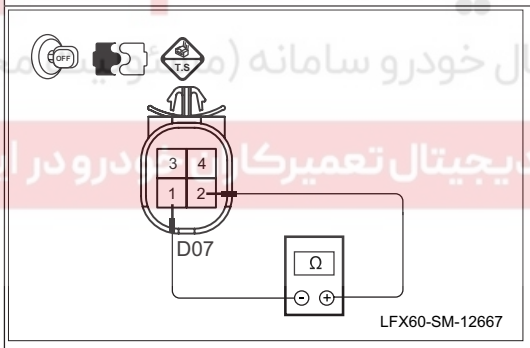
Mechanical	Electrical
• One-touch start switch • Antennae • PEPS module	• Fuse • Line

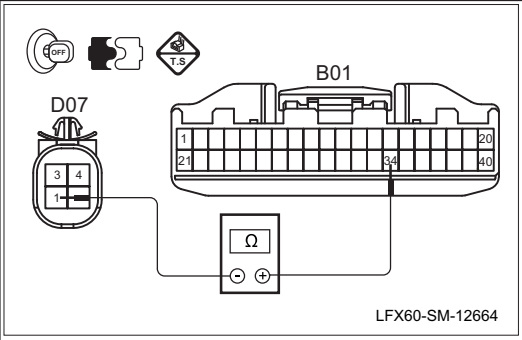
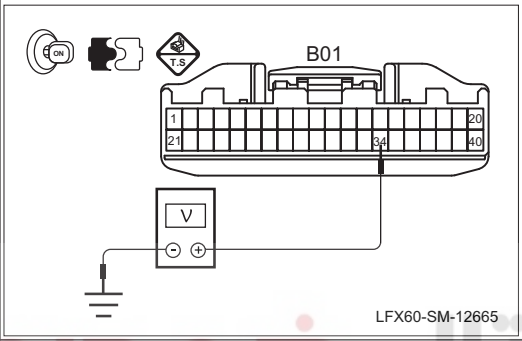
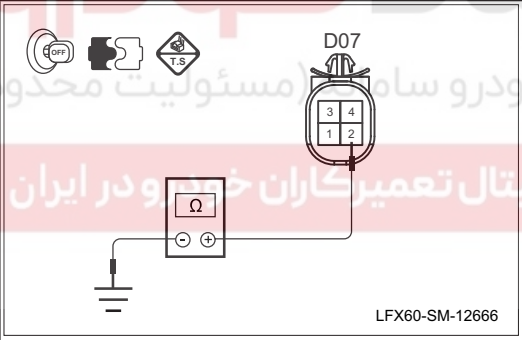
3. Solve the detected problems before the next step inspection.
4. If the observed or raised problem is the evident and the cause has been found, ensure to fix this fault before proceeding with the next step.
5. If no problem is found through the visual check, confirm the fault and refer to the fault symptom list.

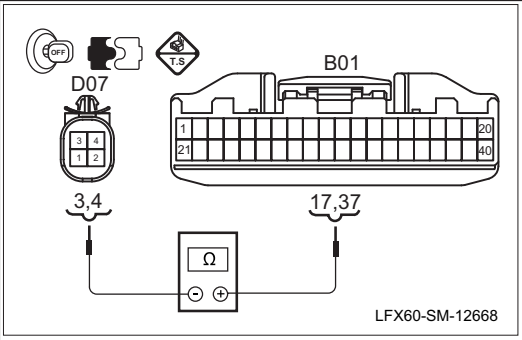
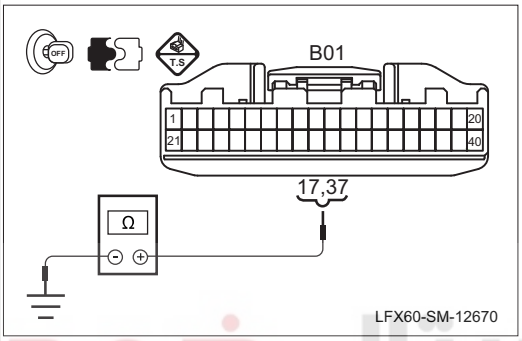
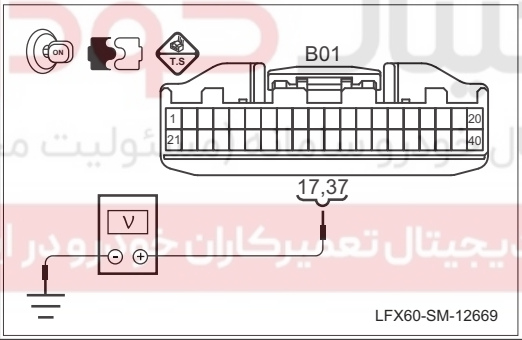
List of fault symptoms

Symptom	Possible point of failure	Recommended Measures
The door can not be locked by using a remote controller	• The remote controller is disturbed	• Keep away from the disturbance source.
	• The remote controller battery runs donw	• Replace the remote controller battery
	• The line from the controller to the door lock motor fails	**Refer to: Key locking/unlocking abnormal diagnosis flow**
	• The controller's door lock power has no input	
The door cannot be opened by PEPS (driver's side)	• Fuse • Harness • PEPS control module • Antennae	**Refer to: Failed to enter the system without a key and open the diagnosis current of the vehicle door (on the main driver side)**
Failed to start the vehicle	• Fuse	• Replace the damaged fuse
	• One-touch start switch	• Replace one-push start switch **Refer to: Replacement of one-touch start switch**
	• PEPS control module	• Check the PEPS control module line or replace the PEPS module
	• Engine system	• Check engine system failures

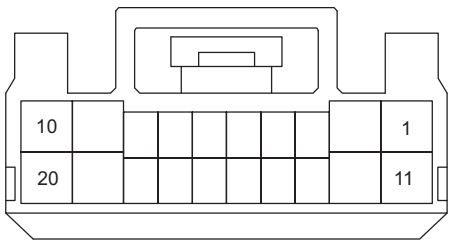
The door cannot be opened by PEPS (driver's side)

Test condition	Details/results/measures
1. Check the key.	
	A. Check if the remote control key is disturbed. B. Check the remote control key battery. Is it OK after checking? →**Yes** To step 2. →**No** Keep away from the disturbance source and replace the remote control key battery.
2. Check the trouble code.	
	A. Connect the diagnostic equipment. B. Operate the start switch to turn the power to ON state. C. Check the failure code of the PEPS system. Check if the PEPS system failure code is avaialble. →**Yes** Make a diagnosis of the trouble code. **Refer to: DTC diagnosis flow index** →**No** Diagnosis flow index →**No** To step 3.
3. Check the left front door handle switch.	
	A. Operate the start switch to turn the power to ON state. B. Disconnect the battery negative connector. C. Disconnect the front left door pull antennae harness plug D07. D. Press the left front door handle switch and measure the resistance between the terminal 1 and 2 of the left front door handle by using a multimeter. Standard value: less than 1Ω Is the resistance normal? →**Yes** To step 4. →**No** Replace the left front door handle.

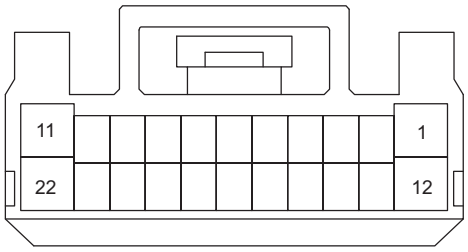
Test condition	Details/results/measures
4. Check the switch signal line of the left front door handle.	
 LFX60-SM-12664  LFX60-SM-12665	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the front left door pull antennae harness plug D07. D. Disconnect the PEPS module harness plug B01. E. Measure the resistance between the terminal 1 of the left front door handle harness plug D07 and the terminal 34 of the PEPS module harness plug B01 by using a multimeter. **Standard value: less than 5Ω** F. Connect the battery negative terminal. G. Measure the voltage between the terminal 34 of the PEPE module harness plug B01 and reliable grounding point by using a multimeter. Is it OK after checking? →**Yes** To step 5. →**No** Repair signal line failures of the left front door handle. If necessary, replace the harness.
5. Check the switch grounding line of the left front door handle.	
 LFX60-SM-12666	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the front left door pull antennae harness plug D07. D. Measure the resistance between the terminal 2 of the left front door handle switch harness plug D07 and reliable grounding point by using a multimeter. **Standard value: less than 5Ω** Is the resistance normal? →**Yes** To step 6. →**No** Repair grounding line failures of the left front door handle. If necessary, replace the harness.

Test condition	Details/results/measures
6. Check antenna signal line of the left front door handle.	
  	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the front left door pull antennae harness plug D07. D. Disconnect the PEPS module harness plug B01. E. Measure the resistance between the terminal 17 and 37 of the PEPS module harness plug B01 and the terminal 3 and 4 of the left front door handle harness plug D07 by using a multimeter. **Standard value: less than 5Ω** F. Measure the resistance between the terminal 17 and 37 of the PEPS ECU harness plug B01 and reliable grounding point by using a multimeter. **Standard value: 10MΩ or higher** G. Connect the battery negative terminal. H. Measure the voltage between the terminal 17 and 37 of the PEPS module harness plug B01 and reliable grounding point by using a multimeter. **Standard value: 0 V** Is it OK after checking? →**Yes** To step 7. →**No** Repair antenna signal line failures of the left front door handle. If necessary, replace the harness.
7. Replace the left front door handle antenna.	
	A. Replace the left front door handle antenna. **Refer to: Replacement of door handle antenna** Is the system normal? →**Yes** The system is normal and the fault is solved. →**No** To step 8.
8. Replace the PEPS module.	
	A. Replace the PEPS module. **Refer to: PEPS Replacement of control module** Confirm the system is normal.

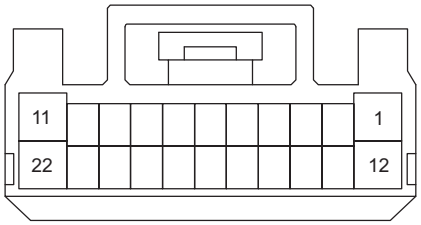
Control module terminal list



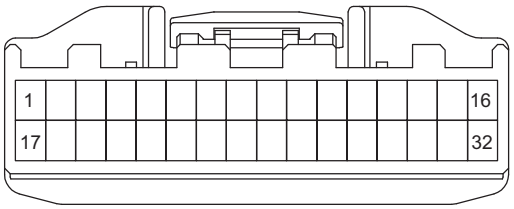
I23



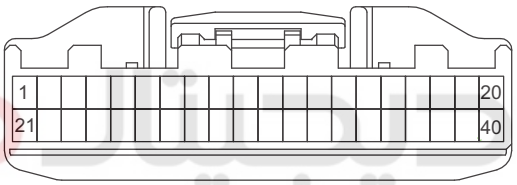
I24



I25



I26



B01

LFX60-SM-12676

Terminal No.	Wire diameter/color	Terminal description
I23-01	0.30Br/B	ESCL GND
I23-02	0.30 Br/W	ESCL power output
I23-03	0.30 G/Bl	Switching signal of right steering light
I23-04	0.30 G/W	Overtaking lamp switch signal
I23-05	0.30 G/Br	Low beam switch signal
I23-06	0.30 Bl	Simulation grounding
I23-07	0.50 Br/G	Hatch unlocking signal
I23-08	0.50 Br/R	Front left door unlocking
I23-09	0.50 Br/Bl	4-door locking
I23-10	0.50 Br/Y	3-door unlocking
I23-11	1.25 R/W	ESCL power supply
I23-12	-	-
I23-13	0.30 G/B	Distant light on/off signal

Terminal No.	Wire diameter/color	Terminal description
I23-14	0.30 G	Small lamp switch signal
I23-15	-	-
I23-16	0.30 Br/O	Collision signal input
I23-17	-	-
I23-18	0.50 R/G	Energy-saving output
I23-19	0.85W	Lock power
I23-20	1.25 B	Central lock ground
I24-01	1.25 B	Front left window/ rear right window ground
I24-02	0.50 G/B	Rear right door glass lift motor down signal
I24-03	0.50 G	Rear right door glass lift motor up signal
I24-04	0.50 Y/W	Front left door glass lift motor up signal
I24-05	0.50 Y/R	Front left door glass lift motor down signal
I24-06	0.30 G/W	Skylight control signal
I24-07	0.50 Y/Bl	Front right door glass lift motor up signal
I24-08	0.50 Y/G	Front right door glass lift motor down signal
I24-09	0.50 Y/V	Rear left door glass lift motor down signal
I24-10	0.50 Y/Br	Rear left door glass lift motor up signal
I24-11	1.25 B	Front right window/ rear left window ground
I24-12	1.25 R/Y	Front left window/rear right window glass lift power
I24-13	0.30 Bl/W	High beam control signal
I24-14	0.30 Bl/Y	Low beam control signal
I24-15	0.30 Bl	Reverse lamp signal
I24-16	-	-
I24-17	0.30 Bl/R	AUTO lamp switch signal
I24-18	0.30 Bl/W	Rear fog lamp switch signal
I24-19	0.30 Bl/Gr	Front fog lamp switch signal
I24-20	0.30 Br/B	Hazard warning lamp switch signal
I24-21	0.30 Br/W	Left turn lamp switch signal
I24-22	1.25 G/Y	Front right window/rear left window glass lift power
I25-01	0.50 R/G	Controller power

Terminal No.	Wire diameter/color	Terminal description
I25-02	0.30 BI/B	PCAN-H
I25-03	-	-
I25-04	0.30 Br/Y	Immobilizer indicator lamp power
I25-05	0.30 G/BI	Dome lamp drive output
I25-06	-	-
I25-07	0.30 BI/G	Front right turn lamp power
I25-08	0.30 G/Y	Front left turn lamp power
I25-09	0.30 Y/G	Exterior rearview mirror deployment signal output
I25-10	0.30 Y/Br	Folding signal output of external rearview mirror
I25-11	0.50 Y/W	Outside lamp power
I25-12	0.85 B	Controller grounding
I25-13	0.30 BI/W	PCAN-L
I25-14	-	-
I25-15	0.30 Y/B	Position light driving signal of right front door
I25-16	0.30 G/W	Position light driving signal of left front door
I25-17	0.30 G	Daytime light driving signal of right front door
I25-18	0.30 G/O	Daytime light driving signal of left front door
I25-19	0.30 Br/R	Sensor power supply
I25-20	0.30 Y	Rear fog lamp drive output
I25-21	0.30 BI/B	Front fog lamp control signal
I25-22	0.30 P/B	Electric horn driving output
I26-01	0.30 Br	IMMO antenna +
I26-02	0.30 Br/Y	Inside front antennae signal
I26-03	0.30 Br/R	ESCL LIN
I26-04	0.50 Br/G	Clutch TDC signal
I26-05	0.30W	Start switch signal 1
I26-06	0.30 Br/R	ESCL feedback
I26-07	0.30 R/BI	IG1 signal feedback
I26-08	0.30 BI/W	Brake signal input
I26-09	0.30 B/Y	Start signal feedback
I26-10	0.30 W/O	Start switch LED1

Terminal No.	Wire diameter/color	Terminal description
I26-11	0.30 Bl/R	IG1 power driving output
I26-12	0.30 Bl/Y	IG2 power driving output
I26-13	0.30 V	ACC power driving output
I26-14	0.30 B/O	Driving power output of starting power
I26-15	0.30 B/W	ESCL enable
I26-16	-	-
I26-17	0.30 Br/B	IMMO antenna -
I26-18	0.30 Br/W	Inside front antennae signal
I26-19	0.30 P/G	Wheel rate signal input
I26-20	0.30 W/B	P/N switch signal
I26-21	0.30 W/R	Start switch signal 2
I26-22	0.30 V/W	ACC signal feedback
I26-23	0.30 R/Y	IG2 signal feedback
I26-24	0.50 Y	Clutch LDC signal
I26-25	0.50 G/O	Glass lift working indicator lamp
I26-26	0.30 W/G	Start switch LED2
I26-27	0.30 W/Bl	Background indicator of start switch
I26-28	0.30 B/G	Start switch grounding
I26-29	-	-
I26-30	-	-
I26-31	-	-
I26-32	-	
B01-01	0.30 G/Y	Backlight power supply
B01-02	-	-
B01-03	0.50 Y/Gr	Central switch unlocking signal
B01-04	0.50 Y/Bl	Driver control – left front door glass ascending/descending signal
B01-05	0.50 Y/Br	Driver control – left rear door glass ascending/descending signal
B01-06	0.50 Y/R	Front right door glass lift signal
B01-07	0.30 G/O	Sensor analog signal
B01-08	0.30 Y/B	Trunk status signal
B01-09	0.30 Br	Key locking/locking signal
B01-10	0.30 G/W	Exterior rearview mirror deployment signal input

Terminal No.	Wire diameter/color	Terminal description
B01-11	0.30 G/B	Exterior rearview mirror folding signal input
B01-12	0.30 B/W	Front left door status signal
B01-13	0.30 B/R	Rear left door status signal
B01-14	0.50 Y	Window locking signal
B01-15	-	-
B01-16	-	-
B01-17	0.30 V/W	Left front door handle antenna signal +
B01-18	0.30 Br/R	Luggage carrier antenna signal +
B01-19	0.30 Br/Y	Indoor middle antenna signal +
B01-20	0.30 Br	Indoor rear antenna signal +
B01-21	0.30 Bl/R	Rear left turn lamp power
B01-22	0.30 Bl/Y	Rear right turn lamp power
B01-23	-	-
B01-24	0.50 Y/G	Driver control-Front right door glass lift signal
B01-25	0.50 Y/O	Driver control-Rear right door glass lift signal
B01-26	0.50 Y/W	Rear left door glass lift signal
B01-27	0.50 Y/V	Rear right door glass lift signal
B01-28	0.30 G/Bl	Hatch inching switch status signal
B01-29	Y/P	Central switch locking signal
B01-30	B/Bl	Left front door lock status signal
B01-31	-	-
B01-32	0.30 B/O	Front right door status signal
B01-33	0.30 B/G	Rear right door status signal
B01-34	0.30 G	Left front door handle switch signal
B01-35	0.50 B/Y	Window simulation ground
B01-36	-	-
B01-37	0.30 V/G	Front left door pull antennae signals -
B01-38	0.30 Br/O	Luggage carrier antenna signals
B01-39	0.30 Br/B	Indoor middle antenna signal -
B01-40	0.30 Br/W	Indoor rear antenna signal -

DTC list

DTC	DTC information
B12E3	EMS key error
B12E4	Immobilizer coil fault
B1020	Central lock state fault
B1021	Front left turn lamp open circuit fault
B1022	Front left turn lamp short circuit fault
B1023	Front right turn lamp open circuit fault
B1024	Front right turn lamp short circuit fault
B1025	Rear left turn lamp open circuit fault
B1026	Rear left turn lamp short circuit fault
B1027	Rear right turn lamp open circuit fault
B1028	Rear right turn lamp short circuit fault
B1029	Front left door pull antennae fault
B1030	Inside front antennae fault
B1031	Inside middle antennae fault
B1032	Inside rear antennae fault
B1033	Trunk exterior antennae fault
B1034	ACC relay short to ground/relay open circuit
B1035	IG1 relay short to ground/relay open circuit
B1036	IG2 relay short to ground/relay open circuit
B1037	ESCL power supply failure
B1038	ESCL power supply failure
B1039	ESCL internal fault
B1040	ESCL and PEPS communication line fault
B1041	Operating voltage exceeding limit or abnormal
B1042	RKE synchronous code fault
B1043	Start switch fault
U2503	EMS not initiate authentication request
U0073	CAN BUSOFF fault

U0121	EMS_082 node missing fault
U0122	EMS_28A node missing fault
U0124	EMS_094 node missing fault
U0125	EMS_120 node missing fault
U0126	ABS node missing fault
U0127	TCU node missing fault
U0128	IC node missing fault

DTC diagnosis flow index

DTC	Description	Diagnostic process
B1021	Front left turn lamp open circuit fault	**Refer to: DTC B1021, B1022, B1023, B1024, B1025, B1026, B1027, B1028**
B1022	Front left turn lamp short circuit fault	
B1023	Front right turn lamp open circuit fault	
B1024	Front right turn lamp short circuit fault	
B1025	Rear left turn lamp open circuit fault	
B1026	Rear left turn lamp short circuit fault	
B1027	Rear right turn lamp open circuit fault	
B1028	Rear right turn lamp short circuit fault	
B1029	Front left door pull antennae fault	**Refer to: DTC B1029, B1030, B1031, B1032, B1033**
B1030	Inside front antennae fault	
B1031	Inside middle antennae fault	
B1032	Inside rear antennae fault	
B1033	Trunk exterior antennae fault	
B1034	ACC relay short to ground/relay open circuit	**Refer to: DTC B1034**
B1035	IG1 relay short to ground/relay open circuit	**Refer to: DTC B1035**
B1036	IG2 relay short to ground/relay open circuit	**Refer to: DTC B1036**
B1037	ESCL power supply failure	**Refer to: DTC B1037, B1038, B1039, B1040, B1041, B1042, B1043**
B1038	ESCL power supply failure	
B1039	ESCL internal fault	
B1040	ESCL and PEPS communication line fault	
B1041	Operating voltage exceeding limit or abnormal	
B1042	RKE synchronous code fault	
B1043	Start switch fault	

B12E3	EMS key error	**Refer to: DTC B12E3, B12E4, B1020, U2503, U0073, U0121, U0122, U0123, U0124, U0125, U0126, U0127, U0128**
B12E4	Immobilizer coil fault	
B1020	Central lock state fault	
U2503	EMS not initiate authentication request	
U0073	CAN BUSOFF fault	
U0121	EMS_082 node missing fault	
U0122	EMS_28A node missing fault	
U0123	EMS_094 node missing fault	
U0124	EMS_120 node missing fault	
U0125	EMS not initiate authentication request	
U0126	ABS node missing fault	
U0127	TCU node missing fault	
U0128	IC node missing fault	

DTC B1021, B1022, B1023, B1024, B1025, B1026, B1027, B1028

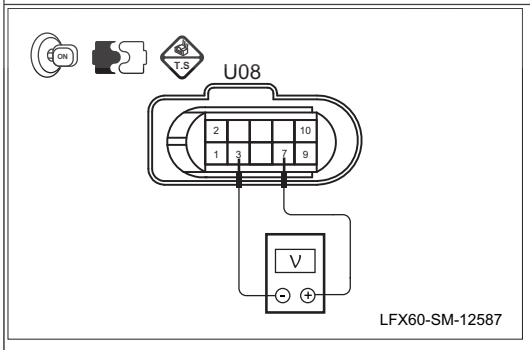
Trouble code description

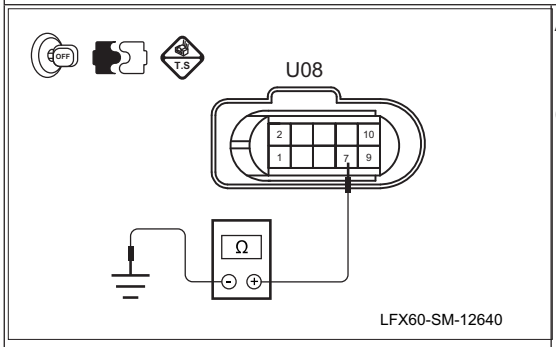
DTC	Description
B1021	Front left turn lamp open circuit fault
B1022	Front left turn lamp short circuit fault
B1023	Front right turn lamp open circuit fault
B1024	Front right turn lamp short circuit fault
B1025	Rear left turn lamp open circuit fault
B1026	Rear left turn lamp short circuit fault
B1027	Rear right turn lamp open circuit fault
B1028	Rear right turn lamp short circuit fault

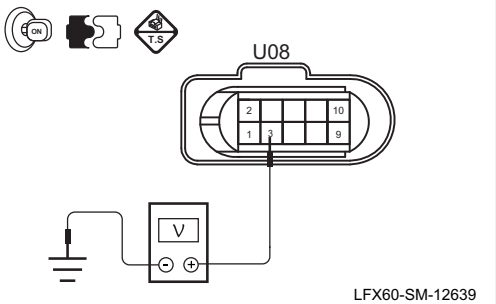
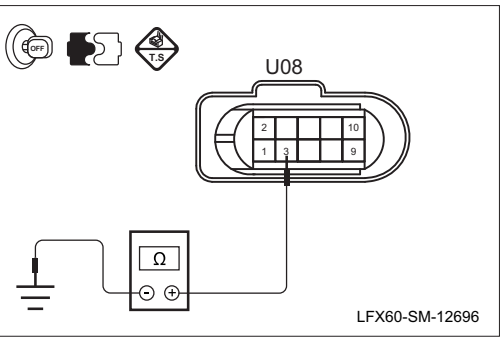
DTC conditions

DTC	DTC activation conditions	DTC clear conditions
B1021	The left front steering light flickers continuously 10 times in cycle and the open circuit failure is detected	No open circuit detected within 10 times blinking of left turn lamp continuously
B1022	The left front steering light turns off/on continuously 3 times and the open circuit failure is detected	Short circuit not detected within 3 times of switching on of left turn lamp continuously
B1023	The right front steering light flickers continuously 10 times in cycle and the open circuit failure is detected	No open circuit detected within 10 times blinking of right turn lamp continuously
B1024	The right front steering light turns off/on continuously 3 times and the open circuit failure is detected	Short circuit not detected within 3 times of switching on of right turn lamp continuously
B1025	The left rear steering light flickers continuously 10 times in cycle and the open circuit failure is detected	No open circuit detected within 10 times blinking of left turn lamp continuously
B1026	The left rear steering light turns off/on continuously 3 times and the open circuit failure is detected	Short circuit not detected within 3 times of switching on of left turn lamp continuously
B1027	The right rear steering light flickers continuously 10 times in cycle and the open circuit failure is detected	No open circuit detected within 10 times blinking of right turn lamp continuously
B1028	The right rear steering light turns off/on continuously 3 times and the open circuit failure is detected	Short circuit not detected within 3 times of switching on of right turn lamp continuously

Diagnostic process

Test condition	Details/results/measures
1. General inspection.	
	A. Check the related harness plugs for breakage, loose contact, aging or looseness. Is it OK after checking? →**Yes** To step 2. →**No** Repair the fault position.
2. Read the DTC with the diagnostic meter.	
	A. Connect the diagnostic meter and check the system for the other relevant DTCs. Is it OK after checking? →**Yes** To step 3. →**No** Carry out the relevant fault diagnosis according to the DTCs.
3. Check whether the DTC can be cleared.	
	A. Connect the diagnostic meter and access the PEPS system to clear DTC. B. Start the engine and check whether the DTC occurs again. Does DTC occur? →**Yes** To step 4. →**No** System normal.
4. Check the front left turn lamp power voltage (with this lamp as example).	
	A. Operate the start switch to set the power mode to the “OFF” state. B. Disconnect the battery negative connector. C. Disconnect the front left combination lamp harness plug U08. D. Connect the battery negative terminal. E. Start the switch to turn the power to ON mode. F. Turn on the left front steering light and measure the voltage between the terminal 3 and 7 of the left front combined light harness plug U08 by using a multimeter. **Standard value: 11 ~ 14 V** Is the voltage normal? →**No** To step 5. →**Yes** Replace the front left turn lamp bulb. **Refer to: Replace the bulb of the left steering light**

5. Check the front left turn lamp ground line.	
	A. Operate the start switch to set the power mode to the "OFF" state. B. Disconnect the battery negative connector. C. Disconnect the front left combination lamp harness plug U08. D. Measure the resistance between the terminal 7 of the left front combined light harness plug U08 and reliable grounding point by using a multimeter. **Standard value: less than 5Ω** Is the resistance normal? →**Yes** To step 6. →**No** Repair grounding line failures of the left front steering light. If necessary, replace the harness.
6. Check the power line of the left front steering light.	
	A. Operate the start switch to set the power mode to the "OFF" state. B. Disconnect the battery negative connector. C. Disconnect the front left combination lamp harness plug U08. D. Disconnect the harness plug I25 of the PEPS module E. Measure the resistance between the terminal 3 of the left front combined harness plug U08 and the terminal 8 of the PEPS module harness plug I25 by using a multimeter. **Standard value: less than 5Ω** F. Connect the battery negative terminal. G. Measure the voltage between the terminal 1 of the PEPS harness plug I25 and the reliabile grounding point. **Standard value: 0 V** Is it OK after checking? →**Yes** To step 7. →**No** Repair the front left turn lamp power line fault and replace the harness if necessary.
6. Check the power line voltage of the left front steering light.	

 LFX60-SM-12639  LFX60-SM-12696	A. Operate the Enable switch and shift the power mode to "OFF" status. B. Disconnect the battery negative connector. C. Disconnect the front left combination lamp harness plug U08. D. Connect the battery negative terminal. E. Start the switch to turn the power to ON mode. F. Turn on the left front steering light and measure the resistance between the terminal 3 of the left front combined light harness plug U08 and reliable grounding point by using a multimeter. Standard value: 11 ~ 14 V Is the voltage normal? →**Yes** To step 7. →**No** Repair the front left turn lamp power line fault and replace the harness if necessary.
7. Replace the PEPS control module.	
	A. Replace the PEPS. **Refer to: Replacement of the PEPS control unit.** Confirm the system is normal.

DTC B1029, B1030, B1031, B1032, B1033

DTC description

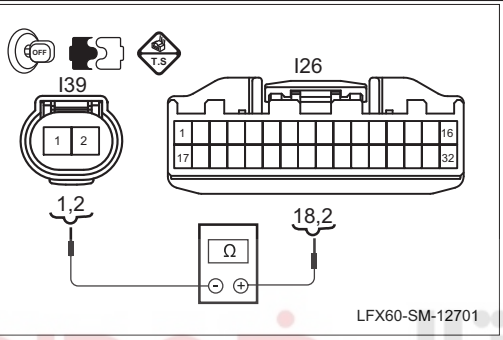
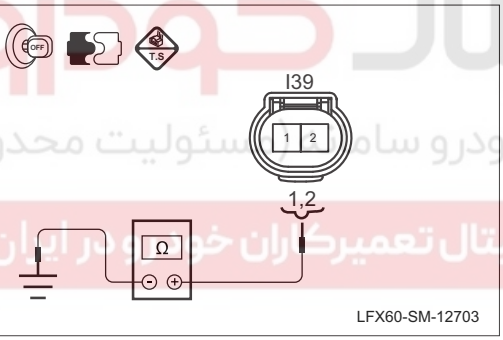
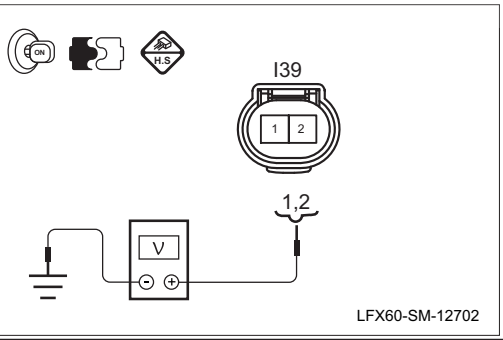
DTC	Description
B1029	Front left door pull antennae fault
B1030	Inside front antennae fault
B1031	Inside middle antennae fault
B1032	Inside rear antennae fault
B1033	Trunk exterior antennae fault

DTC conditions

DTC	DTC activation conditions	DTC clear conditions
B1029	PEPS detects antennae transmitter current error when executing PE/PS emitting low frequency data	PEPS detects antennae transmitter current correct when executing PE/PS emitting low frequency data
B1030	PEPS detects antennae transmitter current error when executing PE/PS emitting low frequency data	PEPS detects antennae transmitter current correct when executing PE/PS emitting low frequency data
B1031	PEPS detects antennae transmitter current error when executing PE/PS emitting low frequency data	PEPS detects antennae transmitter current correct when executing PE/PS emitting low frequency data
B1032	PEPS detects antennae transmitter current error when executing PE/PS emitting low frequency data	PEPS detects antennae transmitter current correct when executing PE/PS emitting low frequency data
B1033	PEPS detects antennae transmitter current error when executing PE/PS emitting low frequency data	PEPS detects antennae transmitter current correct when executing PE/PS emitting low frequency data

Diagnostic process

Test condition	Details/results/measures
1. General inspection.	
	A. Check the related harness plugs for breakage, loose contact, aging or looseness. Is it OK after checking? →**Yes** To step 2. →**No** Repair the fault position.
2. Read the DTC with the diagnostic meter.	
	A. Connect the diagnostic meter and check the system for the other relevant DTCs. Is it OK after checking? →**Yes** To step 3. →**No** Carry out the relevant fault diagnosis according to the DTCs.

Test condition	Details/results/measures
3. Check whether the DTC can be cleared.	
	A. Connect the diagnostic meter and access the PEPS system to clear DTC. B. Start the engine and check whether the DTC occurs again. Does DTC occur? →**Yes** To step 4. →**No** System normal.
4. Check the indoor front antenna signal line (with the indoor front antenna as one example)	
  	A. Operate the start switch to set the power mode to the "OFF" state. B. Disconnect the battery negative connector. C. Disconnect the indoor front antenna harness plug I39. D. Disconnect the PEPS harness plug I39. E. Measure the resistance between the terminal 1 and 2 of the indoor front antenna harness plug I39 and the terminal 18 and 2 of the PEPS harness plug I26 by using a multimeter **Standard value: less than 5Ω** F. Measure the resistance between the terminal 1 and 2 of the indoor front antenna harness plug I39 and the reliabile grounding point by using a multimeter. **Standard value: 10MΩ or higher** G. Connect the battery negative terminal. H. Measure the voltage between the terminal 1 and 2 of the indoor front antenna harness plug I39 and the reliabile grounding point by using a multimeter. **Standard value: 0 V** Is it OK after checking? →**Yes** To step 5. →**No** Repair signal line failures of the indoor front antenna. If necessary, replace the harness.

Test condition	Details/results/measures
5. Replace indoor front antenna.	
	A. Replace indoor front antenna. Check whether the system is normal. →**Yes** The fault is solved and the system is normal. →**No** To step 6.
6. Replace the PEPS control unit.	
	A. Replace the PEPS. **Refer to: Replacement of the PEPS control unit.** Confirm the system is normal.

DTC B1034

DTC description

DTC	Description
B1034	ACC relay short to ground/relay open circuit

DTC conditions

DTC	DTC activation conditions	DTC clear conditions
B1034	PEPS detects that the ACC driving circuit feedback is different from output in the power ACC position.	PEPS detects that the ACC driving circuit feedback is same as output in the power ACC position.

Diagnostic process

Test condition	Details/results/measures
1. General inspection.	
	A. Check the related harness plugs for breakage, loose contact, aging or looseness. Is it OK after checking? →**Yes** To step 2. →**No** Repair the fault position.
2. Read the DTC with the diagnostic meter.	
	A. Connect the diagnostic meter and check the system for the other relevant DTCs. Is it OK after checking? →**Yes** To step 3. →**No** Carry out the relevant fault diagnosis according to the DTCs.
3. Check whether the DTC can be cleared.	
	A. Connect the diagnostic meter and access the PEPS system to clear DTC. B. Start the engine and check whether the DTC occurs again. Does DTC occur? →**Yes** To step 4. →**No** System normal.

Test condition	Details/results/measures
4. Check ACC relay.	
	A. Operate the start switch to set the power mode to the "OFF" state. B. Disassemble the ACC relay K02. C. Replace the K02 with the ACC relay of same model. Is it OK after checking? →**Yes** To step 5. →**No** Replace the ACC relay K02.
5. Check the control grounding line of the ACC relay.	
	A. Operate the start switch to set the power mode to the "OFF" state. B. Disconnect the battery negative connector. C. Remove the ACC relay K02. D. Measure the resistance between the terminal 1 of the ACC relay K02 and reliable grounding point by using a multimeter. **Standard value: less than 5Ω** Is the resistance normal? →**Yes** To step 6. →**No** Repair control grounding line failures of the ACC relay. If necessary, replace the harness.
6. Check ACC driving output line.	
	A. Operate the start switch to set the power mode to the "OFF" state. B. Disconnect the battery negative connector. C. Remove the ACC relay K02. D. Disconnect the PEPS module harness plug. E. Measure the resistance between the terminal 2 of the ACC relay K02 and the terminal 13 of the PEPS module harness plug I26 by using a multimeter. **Standard value: less than 5Ω** F. Measure the resistance between the PEPS harness plug I26 terminal 13 and the fixed ground point. **Standard value: 10MΩ or higher** Is the resistance normal? →**Yes** To step 7. →**No** Repair driving output line failures of the ACC. If necessary, replace the harness.

Test condition	Details/results/measures
7. Check the K02 power line of the ACC relay.	
	A. Operate the start switch to set the power mode to the "OFF" state. B. Disconnect the battery negative connector. C. Remove the ACC relay K02. D. Connect the battery negative terminal. E. Start the switch to turn the power to ON mode. F. Measure the voltage between the terminal 3 of the ACC relay K02 and reliable grounding. **Standard value: 11 ~ 14 V** Is the voltage normal? →**Yes** To step 8. →**No** Repair the K02 power line failure of the ACC relay. If necessary, replace the harness.
8. Check the ACC signal feedbac line.	
	A. Operate the start switch to set the power mode to the "OFF" state. B. Disconnect the battery negative connector. C. Disconnect the PEPS harness plug I26. D. Disconnect the ACC relay K02. E. Measure the resistance between the terminal 22 of the PEPS harness plug I26 and terminal 5 of the ACC relay K02. **Standard value: less than 5Ω** Is the resistance normal? →**Yes** To step 9. →**No** Repair the feedback line failure of the ACC signals. If necesasry, replace the harness.
9. Replace the PEPS control unit.	
	A. Replace the PEPS control unit. **Refer to: Replacement of the PEPS control unit.** Confirm the system is normal.

DTC B1035

DTC description

DTC	Description
B1035	IG1 relay short to ground/relay open circuit

DTC conditions

DTC	DTC activation conditions	DTC clear conditions
B1035	The power is in ON/START position and PEPS detects that the IG1 driving circuit feedback is not consistent with output.	The power is in ON/START position and PEPS detects that the IG1 driving circuit feedback is not consistent with output.

Diagnostic process

Test condition	Details/results/measures
1. General inspection.	
	A. Check the related harness plugs for breakage, loose contact, aging or looseness. Is it OK after checking? →**Yes** To step 2. →**No** Repair the fault position.
2. Read the DTC with the diagnostic meter.	
	A. Connect the diagnostic meter and check the system for the other relevant DTCs. Is it OK after checking? →**Yes** To step 3. →**No** Carry out the relevant fault diagnosis according to the DTCs.
3. Check whether the DTC can be cleared.	
	A. Connect the diagnostic meter and access the PEPS system to clear DTC. B. Start the engine and check whether the DTC occurs again. Does DTC occur? →**Yes** To step 4. →**No** System normal.

Test condition	Details/results/measures
4. Check the IG1 relay.	
	A. Operate the start switch to set the power mode to the "OFF" state. B. Remove the IG1 relay K03. C. Replace K03 with the IG1 relay of same model. Is it OK after checking? →**Yes** To step 5. →**No** Replace the IG1 relay K03.
5. Check control grounding line of the IG1 relay.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Remove the IG1 relay K03. D. Measure the resistance between the terminal 1 of the IG1 relay K03 and reliable grounding by using a multimeter. **Standard value: less than 5Ω** Is the resistance normal? →**Yes** To step 6. →**No** Check the control grounding failure of the IG1 relay, if necessary, replace the harness.
6. Check the IG1 driving output line.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Remove the IG1 relay K03. D. Disconnect the PEPS module harness plug. E. Measure the resistance between the terminal 2 of the IG1 relay K03 and No. 11 of the PEPS module harness plug I26 by using a multimeter. **Standard value: less than 5Ω** F. Measure the resistance between the PEPS harness plug I26 terminal 11 and the fixed ground point. **Standard value: 10MΩ or higher** Is the resistance normal? →**Yes** To step 7. →**No** Check if the IG1 driving output line fail. If necessary, replace the harness.

Test condition	Details/results/measures
7. Check the IG1 relay K03 power line.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Remove the IG1 relay K03. D. Connect the battery negative terminal. E. Start switch to turn the power to ON state. F. Measure the voltage between the IG1 relay K03 terminal 3 and the fixed ground point. **Standard value: 11 ~ 14 V** Is the voltage is OK? →**Yes** To step 8. →**No** Repair the IG1 relay K03 power line fault and replace the harness if necessary.
8. Check the IG1 signal feedback line.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the PEPS harness plug I26. D. K03Remove the IG1 relay E. Measure the resistance between PEPS harness plug I26 terminal 7 and IG1 relay K03 terminal 5. **Standard value: Less than 5Ω** Is the resistance normal? →**Yes** To step 9. →**No** Repair IG1 signal feedback line fault and replace the harness if necessary.
9. Replace the PEPS control unit.	
	A. Replace the PEPS control unit. **Refer to: Replacement of PEPS control unit** Confirm the system is normal.

DTC B1036

DTC description

DTC	Description
B1036	IG2 relay short to ground/relay open circuit

DTC conditions

DTC	DTC activation conditions	DTC clear conditions
B1036	The power is in ON/START position and PEPS detects that the IG2 driving circuit feedback is not consistent with output.	The power is in ON/START position and PEPS detects that the IG2 driving circuit feedback is not consistent with output.

Diagnostic process

Test condition	Details/results/measures
1. General inspection.	
	A. Check the related harness plugs for breakage, loose contact, aging or looseness. Is it OK after checking? →**Yes** To step 2. →**No** Repair the fault position.
2. Read the DTC with the diagnostic meter.	
	A. Connect the diagnostic meter and check the system for the other relevant DTCs. Is it OK after checking? →**Yes** To step 3. →**No** Carry out the relevant fault diagnosis according to the DTCs.
3. Check whether the DTC can be cleared.	
	A. Connect the diagnostic meter and access the PEPS system to clear DTC. B. Start the engine and check whether the DTC occurs again. Does DTC occur? →**Yes** To step 4. →**No** System normal.

Test condition	Details/results/measures
4. Check the IG2 relay.	
	A. Operate the start switch to turn the power to OFF state. B. Remove the IG2 relay K04. C. Replace K04 with the IG2 relay of same model. Is it OK after checking? →**Yes** To step 5. →**No** Replace the IG1 relay K03.
5. Check the IG2 relay control grounding line.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Remove the IG2 relay K04. D. Measure the resistance between the IG2 relay K04 terminal 1 and the fixed ground point with the multimeter. **Standard value: Less than 5Ω** Is the resistance normal? →**Yes** To step 6. →**No** Repair IG2 relay control grounding fault and replace the harness if necessary.
6. Check the IG2 drive output line.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Remove the IG2 relay K04. D. Disconnect the PEPS module harness plug. E. Measure the resistance between the IG2 relay K04 terminal 2 and PEPS module harness plug I26 terminal 12 with the multimeter. **Standard value: Less than 5Ω** F. Measure the resistance between the PEPS harness plug I26 terminal 12 and the fixed ground point. **Standard value: 10MΩ or higher** Is the resistance normal? →**Yes** To step 7. →**No** Repair IG2 drive output line fault and replace the harness if necessary.

Test condition	Details/results/measures
7. Check the IG2 relay K04 power line.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Remove the IG2 relay K04. D. Connect the battery negative terminal. E. Start switch to turn the power to ON state. F. Measure the voltage between the IG2 relay K04 terminal 3 and the fixed ground point. **Standard value: 11 ~ 14 V** Is the voltage is OK? →**Yes** To step 8. →**No** Repair IG2 relay K04 power line fault and replace the harness if necessary.
8. Check the IG2 signal feedback line.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the PEPS harness plug I26. D. Remove the IG2 relay K04. E. Measure the resistance between the PEPS harness plug I26 terminal 23 and IG2 relay K04 terminal 5. **Standard value: Less than 5Ω** Is the resistance normal? →**Yes** To step 9. →**No** Repair IG2 signal feedback line fault and replace the harness if necessary.
9. Replace the PEPS control unit.	
	A. Replace the PEPS control unit. **Refer to: Replacement of PEPS control unit** Confirm the system is normal.

DTC B1037, B1038, B1039, B1040, B1041, B1042, B1043

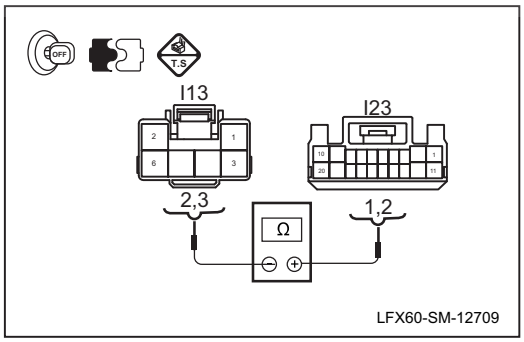
DTC description

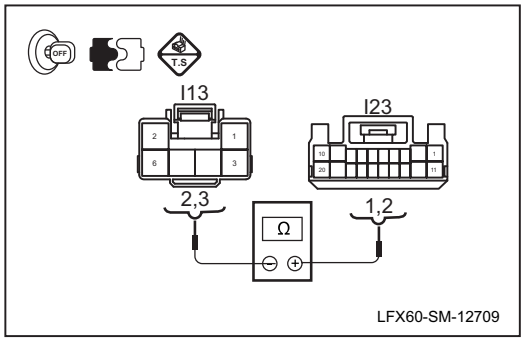
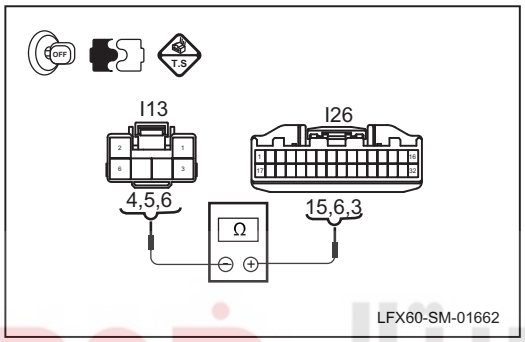
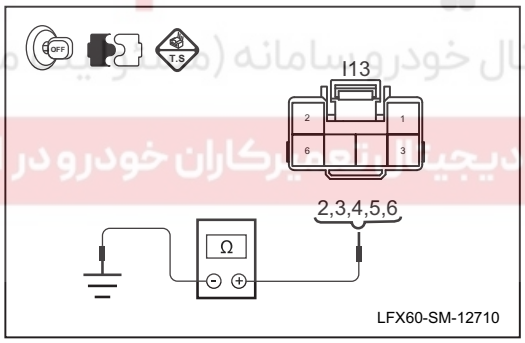
DTC	Description
B1037	ESCL power supply failure
B1038	ESCL power supply failure
B1039	ESCL internal fault
B1040	ESCL and PEPS communication line fault
B1041	Operating voltage exceeding limit or abnormal
B1042	RKE synchronous code fault
B1043	Start switch fault

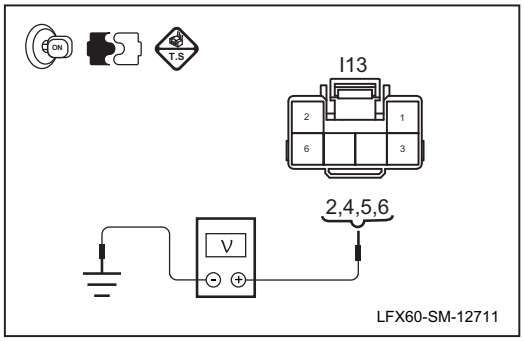
DTC conditions

DTC	DTC activation conditions	DTC clear conditions
B1037	Delect the power supply feedback abnormity when performing ESCL actions	Delect the power supply feedback normal when performing ESCL actions
B1038	Delect the power supply feedback abnormity when performing ESCL actions	Delect the power supply grounding feedback normal when performing ESCL actions
B1039	ESCL feedbacks its internal fault status information when performing ESCL actions	ESCL feedbacks its internal normal status information when performing ESCL actions
B1040	Do not receive the message data from ESCL after ESCL is powered on by PEPS.	PEPS receives the response or status byte data of ESCL
B1041	The voltage is less than 9V or greater than 16V within continuous 2s	The voltage is greater than or equal to 9V or less than or equal to 16V whtin continuous 2s
B1042	In RKE data frame received by PEPS, KEY ID meets the requirements, but FOB roll code has error	-
B1043	Start a contact for continuous valid for more than 1min or only one contact is valid within continuous 5 times	-

Diagnostic process

Test condition	Details/results/measures
1. General inspection.	
	A. Check the related harness plugs for breakage, loose contact, aging or looseness. Is it OK after checking? →**Yes** To step 2. →**No** Repair the fault position.
2. Read the DTC with the diagnostic meter.	
	A. Connect the diagnostic meter and check the system for the other relevant DTCs. Is it OK after checking? →**Yes** To step 3. →**No** Carry out the relevant fault diagnosis according to the DTCs.
3. Check whether the DTC can be cleared.	
	A. Connect the diagnostic meter and access the PEPS system to clear DTC. B. Start the engine and check whether the DTC occurs again. Does DTC occur? →**Yes** To step 4. →**No** System normal.
4. Inspect ESCL power line in PEPS module.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the PEPS harness plug I23. D. Measure the voltage between Terminal 11 of PEPS wiring harness connector I23 and the reliable ground ling with a multimeter. **Standard value: 11 ~ 14V** Is the voltage is OK? →**Yes** To step 5. →**No** Inspect and repair ESCL power line fault in PEPS module; if necessary, replace the wiring harness.

Test condition	Details/results/measures
5. Inspect the line continuity between PEPS and ESCL.	
 	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the PEPS harness plug I23, I26. D. Disconnect the ESCL harness plug I13. E. Measure the resistance between Terminals 1 and 2 of PEPS wiring harness connector I23 and Terminals 2 and 3 of ESCL wiring harness connector I13 with a multimeter seperately. F. Measure the resistance between Terminals 15, 6 and 3 of PEPS wiring harness connector I26 and Tterminals 4, 5 and 6 of ESCL wiring harness connector I13 with a multimeter seperately. **Standard value: Less than 5Ω** Is the resistance normal? →**Yes** To step 6. →**No** Inspect and repair the open circuit fault between PEPS and ESCL; if necessary, replace the wiring harness.
6. Inspect the line between PEPS or ESCL and the grounding point for shor circit.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the ESCL harness plug I13. D. Disconnect the PEPS harness plug I23 and I26. E. Measure the resistance between Terminals 2, 3, 4, 5, and 6 of ESCL wiring harness connector I13 and the reliable grounding point with a multimeter seperately. **Standard value: 10MΩ or higher** Is the resistance normal? →**Yes** To step 7. →**No** Inspect and repair the line short circuit fault between PEPS or ESCL and the grounding point; if necessary, replace the wiring harness.

Test condition	Details/results/measures
7. Inspect whether the line between PEPS and ESCL and the power supply for short circuit.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the ESCL harness plug I13. D. Disconnect the PEPS harness plug I23 and I26. E. Connect the negative battery terminal. F. Measure the voltage between Terminals 2, 4, 5, 6 of ESCL wiring harness connector I13 and the reliable grounding point with a multimeter. **Standard value: 0 V** Is the voltage is OK? →**Yes** To step 8. →**No** Inpspect and repair the short circuit fault betweem PEPS or ESCL and the power supply; if necessary, replace the wiring harness.
8. Replace the ESCL.	
	A. Replace ESCL steering column lock. Inspect whether the system is normal. →**Yes** The system is normal and the fault is solved. →**No** To step 8.
9. Replace the PEPS.	
	A. Replace the PEPS. **Refer to: Replacement of PEPS control unit** Confirm the system is normal.

DTC B12E3, B12E4, B1020, U2503, U0073, U0121, U0122, U0123, U0124, U0125, U0126, U0127, U0128

DTC description

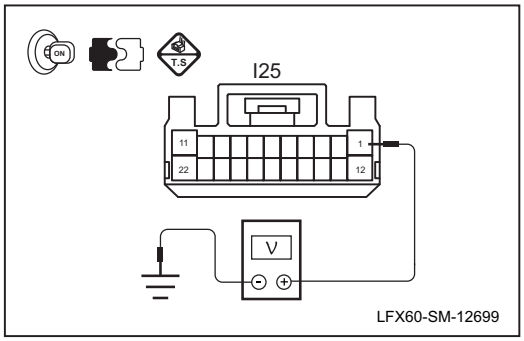
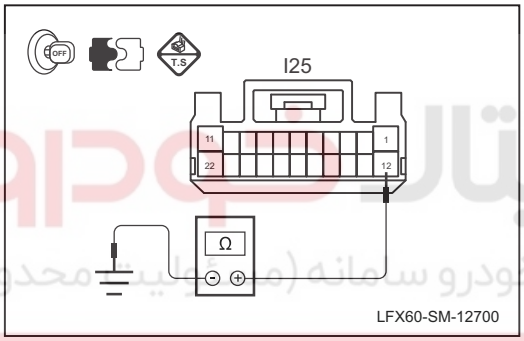
DTC	Description
B12E3	EMS key error
B12E4	Anti-theft coil fault
B1020	Central lock state fault
U2503	EMS not initiate authentication request
U0073	CAN BUSOFF fault
U0121	EMS_082 node missing fault
U0122	EMS_28A node missing fault
U0123	EMS_094 node missing fault
U0124	EMS_288 node missing fault
U0125	EMS_120 node missing fault
U0126	ABS node missing fault
U0127	TCU node missing fault
U0128	IC node missing fault

DTC conditions

DTC	DTC activation conditions	DTC clear conditions
B12E3	EMS encryption results received within a ignition cycle are error	EMS encryption results received within a ignition cycle are correct
B12E4	The coil operation monitored within a ignition cycle is error	The coil operation monitored within a ignition cycle is correct
B1020	The central lock status monitored within consecutive 10 times is inconsistant with the expected status	The central lock status monitored within consecutive 10 times is consistant with the expected status
U2503	EMS certification request is not received during a ignition cycle	EMS certification request is received during a ignition cycle
U0073	After 2s since the ignition switch is turned on and BUS OFF appears, continuous 2 times of BUS OFF reset operations are not successful	BUS OFF does not appear within consecutive 10 ignition cycles
U0121	After IGON2S, no message is received within 4 cycles (50ms) continuous	Message EMS_EngineStatus of 10 cycles (0x120) is received continuously
U0122	After IGON2S, no message is received within 4 cycles (500ms) continuous	Message EMS_EngineStatus of 10 cycles (0x120) is received continuously
U0123	After IGON2S, no message is received within 4 cycles (50ms) continuousEMS_EngineRPM	Message EMS_EngineStatus of 10 cycles (0x120) is received continuously
U0124	After IGON 2S, no message is received within 4 cycles (500ms) continuous	Message EMS_EngineStatus of 10 cycles (0x120) is received continuously
U0125	After IGON 2S, no message is received within 4 cycles (500ms) continuous	Message EMS_EngineStatus of 10 cycles (0x120) is received continuously
U0126	After IGON2S, no message is received within 5 cycles (100ms) continuous	Receive continuously 10 cycles of messages ABS_ VehicleSpeedAndStatus (0x068)
U0127	After IGON2S, no message is received within 4 cycles (50ms) continuous	Message TCU_TorqueStatus of 10 cycles (0x097) is received continuously
U0128	After IGON2S, no message is received within 5 cycles (100ms) continuous	Message IC_VehicleSpeedAndSeatbeltStatus of 10 cycles (0x210) is received continuously

Diagnostic process

Test condition	Details/results/measures
1. General inspection.	
	A. Check the related harness plugs for breakage, loose contact, aging or looseness. Is it OK after checking? →**Yes** To step 2. →**No** Repair the fault position.
2. Read the DTC with the diagnostic meter.	
	A. Connect the diagnostic meter and check the system for the other relevant DTCs. Is it OK after checking? →**Yes** To step 3. →**No** Carry out the relevant fault diagnosis according to the DTCs.
3. Check whether the DTC can be cleared.	
	A. Connect the diagnostic meter and access the PEPS system to clear DTC. B. Start the engine and check whether the DTC occurs again. Does DTC occur? →**Yes** To step 4. →**No** System normal.
4. Check the CAN communication network.	
	A. Check whether the CAN communication network is normal. Is it OK after checking? →**Yes** To step 5. →**No** Repair the CAN communication network fault.

Test condition	Details/results/measures
5. Inspect PEPS power line.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the PEPS harness plug I25. D. Connect the battery negative terminal. E. Start switch to turn the power to ON state. F. Measure the voltage between Terminal 1 of PEPS wiring harness connector I25 and the reliable grounding point with a multimeter. **Standard value: 11 ~ 14 V** Is the voltage is OK? →**Yes** To step 6. →**No** Inspect and repair PEPS power line fault; if necessary, replace the wiring harness.
6. Check the PEPS control module ground line.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the PEPS harness plug I25. D. Measure the resistance between Terminal 12 of PEPS wiring harness connector I25 and the reliable grounding point with a multimeter. **Standard value: Less than 5Ω** Is the resistance normal? →**Yes** To step 7. →**No** Inspect and repair PEPS grounding point fault; if necessary, replace the wiring harness.
7. Replace the PEPS control unit.	
	A. Replace the PEPS control unit. **Refer to: Replacement of PEPS control unit** Is the system normal? →**Yes** The fault is solved and the system is normal. →**No** To step 8.
8. Replace the ECM (with ECM as example).	
	A. Replace ECM. **Refer to: Replacement of ECM control unit** Confirm the system is normal.

Removal and installation

Replacement of the one button start switch

Removal

1. Remove the one button start switch.

(a). Remove the one button start switch; **refer to: Dashboard Assembly Replacement.**

Installation

1. Install the one button start switch.

(a). Install the one button start switch; **refer to: Dashboard Assembly Replacement.**

Replacement of the steering column anti-theft lock

Removal

1. Remove the steering column anti-theft lock.

(a). Disconnect the battery negative connector.

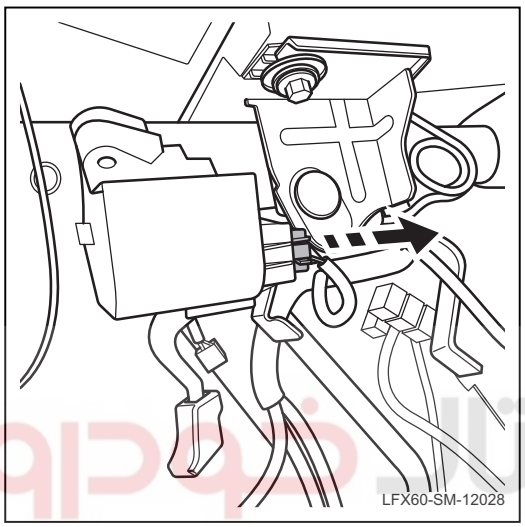
(b). Remove the driver's airbag. **Refer to the replacement of driver's airbag.**

(c). Remove the steering wheel, **refer to: Steering Wheel Replacement.**

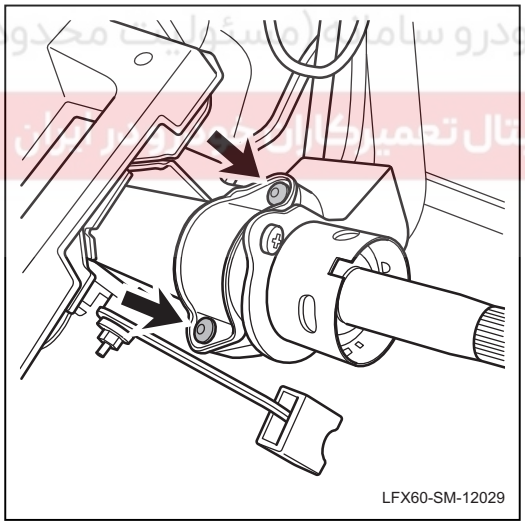
(d). Remove the upper and lower covers on the steering column; **refer to: Replacement of Upper and Lower Covers on Steering Column.**

(e). Remove the combination switch, **refer to: Combination Switch Replacement.**

(f). Remove the clock spring. **Refer to the replacement of clock spring.**



(g). Disconnect the steering column anti-theft lock wiring harness connector.



(h). Temove the riveted bolt with the appropriate tool.

(i). Remove the steering column anti-theft lock.

Installation

1. Install the steering column anti-theft lock.

(a). The installation sequence is the reverse of the disassembly order.

Replacement of the door handle antenna

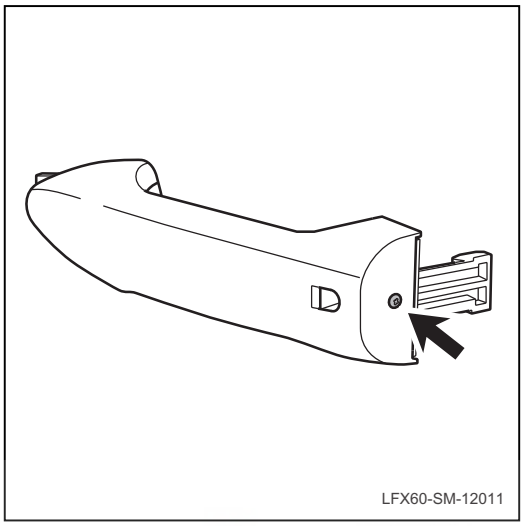
Removal

1. Remove the door handle antenna.

(a). Disconnect the battery negative connector.

(b). Remove the front door lock barrel. **Refer to the replacement of front door lock barrel.**

(c). Remove the front door outer handle, **refer to: Front Door Outer Handle Replacement.**



(d). Remove the outer handle housing fixing screw.

(e). Remove the front door outer handle trim cover.

(f). Remove the door handle antenna.

Installation

1. Install the door handle antenna wiring harness.

(a). The installation sequence is the reverse of the disassembly order.

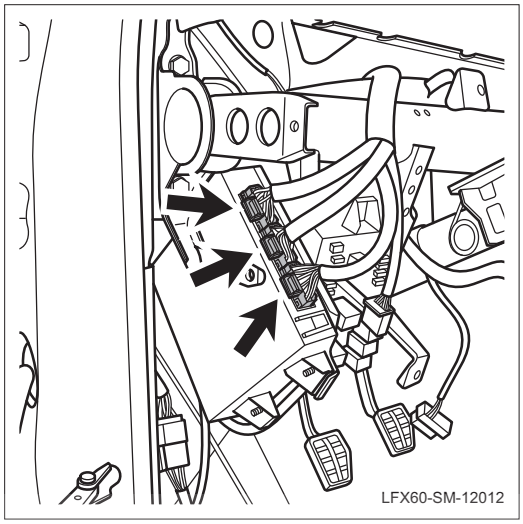
Replacement of the PEPS control module

Removal

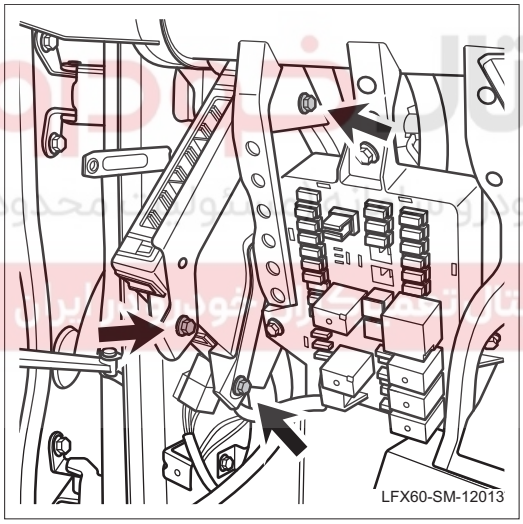
1. Remove PEPS control module.

(a). Disconnect the battery negative connector.

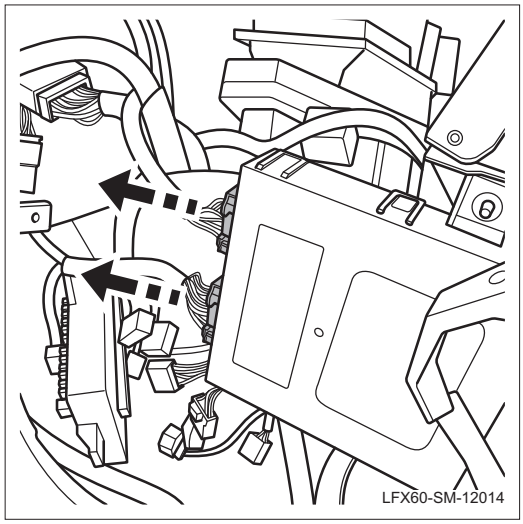
(b). Remove the dashboard. **Refer to the replacement of dashboard assembly.**



(c). Disconnect PEPS control module wiring harness connector.



(d). Remove PEPS control module fixing bolt.



(e). Disconnect the wiring harness connector in PEB control module.
(f). Remove PEPS control module.

Installation

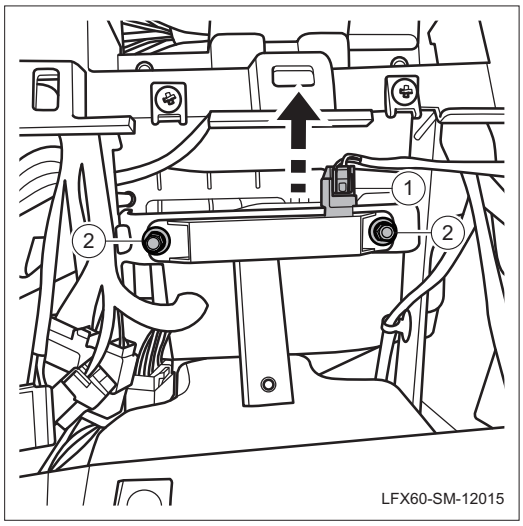
1. Install PEPS control module.
(a). The installation sequence is the reverse of the disassembly order.

Replacement of the inner antenna

Removal

1. Replace the inner antenna

(a). Disconnect the battery negative connector.

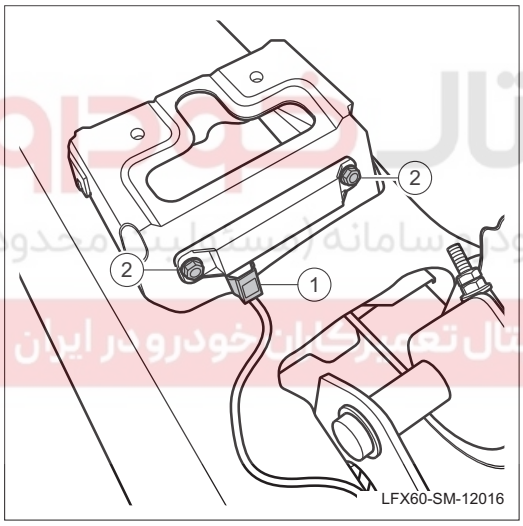


(b). Remove the dashboard. **Refer to the replacement of dashboard assembly.**

(c). Disconnect the front inner antenna wiring harness connector 1.

(d). Remove the front inner antenna fixing bolt 2.

(e). Remove the front inner antenna.

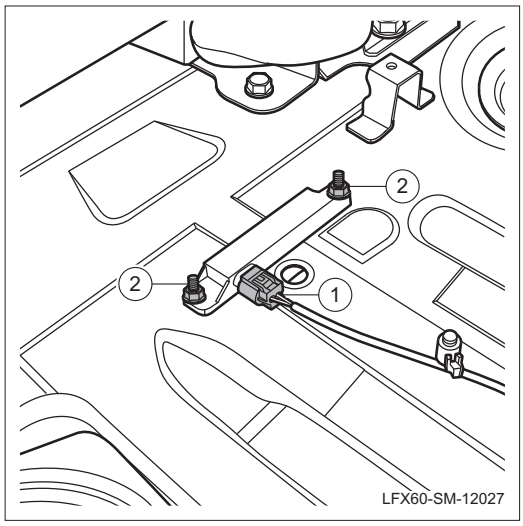


(f). Remove the center console; **refer to: Center Console Assembly Replacement.**

(g). Disconnect the middle inner antenna wiring harness connector 1.

(h). Remove the middle inner antenna fixing bolt 2.

(i). Remove the middle inner antenna.



(j). Open the rear seat back.
(k). Remove the trim panel under C pillar; **refer to: Replacement of Trim Panel under C Pillar.**
(l). Open the floor carpet.
(m). Disconnect the rear innner antenna wiring harness connector 1.
(n). Remove the rear inner antenna fixing nut 2.
(o). Remove the rear inner antenna.

Installation

1. Install the inner antenna.
(a). The installation sequence is the reverse of the disassembly order.

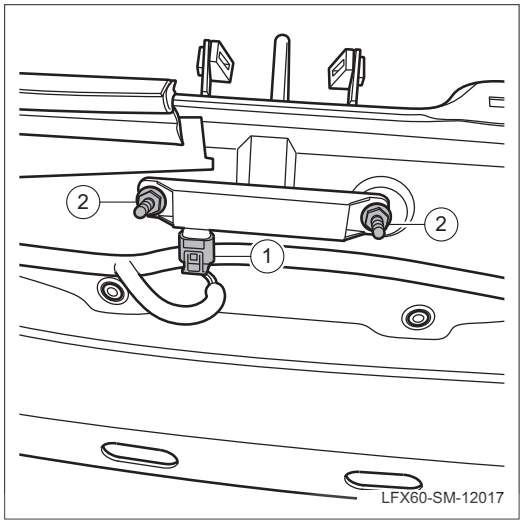
Replacement of the outer antenna

Removal

1. Remove the outer antenna.

(a). Disconnect the battery negative connector.

(b). Remove the rear bumper. **Refer to: Replacement of the rear bumper.**



(c). Disconnect the outer antenna wiring harness connector 1.

(d). Remove the outer antenna fixing bolt 2.

(e). Remove the outer antenna.

Installation

1. Install the outer antenna.

(a). The installation sequence is the reverse of the disassembly order.