STEERING SYSTEM

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ELECTRONIC POWER STEERING CONTROL SYSTEM

Warnings and precautions

Precautions

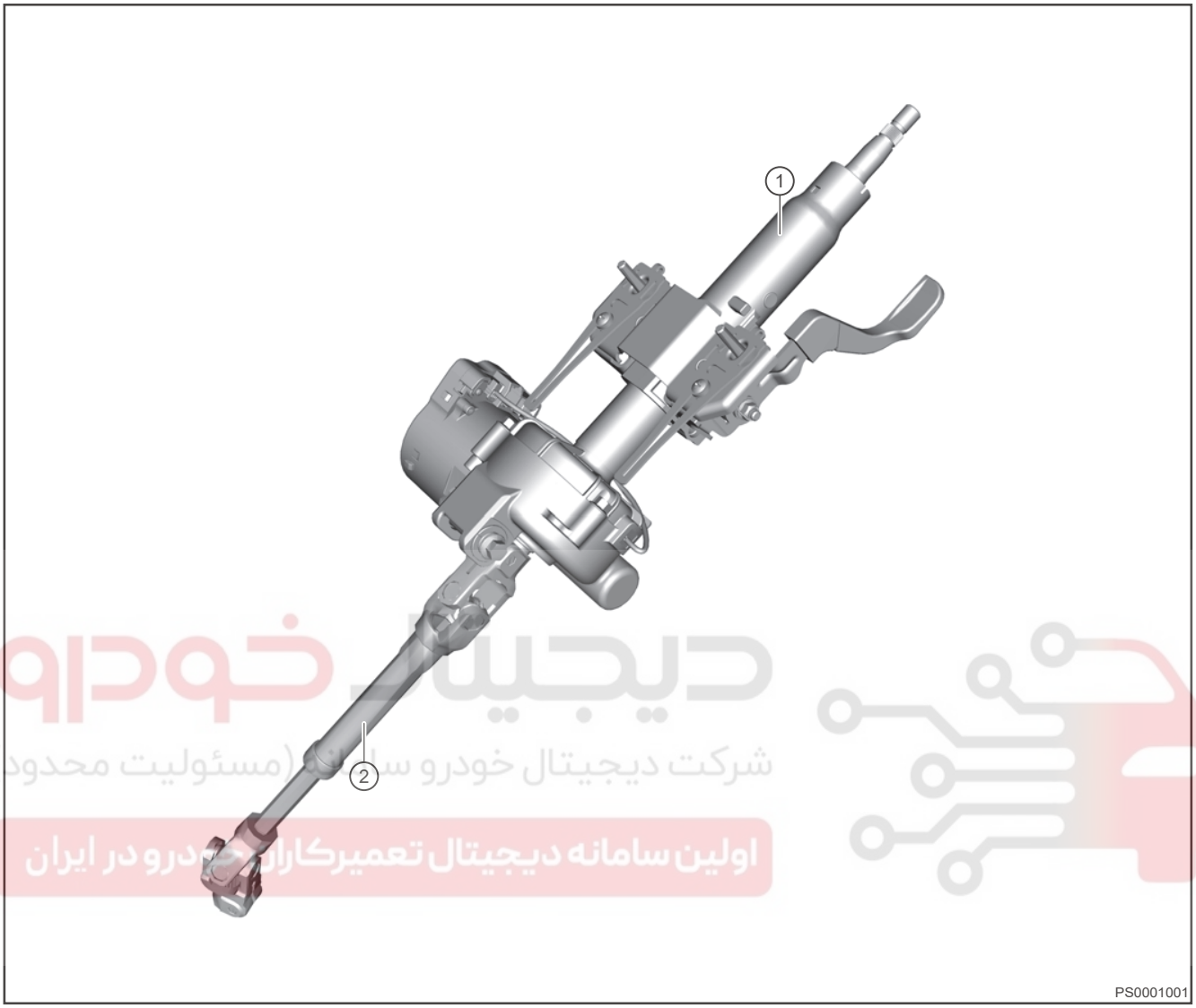
1. Calibration requirements: Keep vehicle stationary and steering wheel centered to ensure that the left and right errors are within 10°.
2. Battery voltage is higher than 10 V and lower than 16 V.
3. When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.
4. It is necessary to perform steering angle calibration after replacing electronic power steering column assembly, steering gear, four-wheel alignment etc.
5. When removing and installing steering system, suspension system, brake, tire, etc., it is necessary to turn off power supply of EPS (vehicle power supply is turned off), so as to avoid reverse impact, resulting in EPS internal protection circuit breakdown.

System Overview

System Description

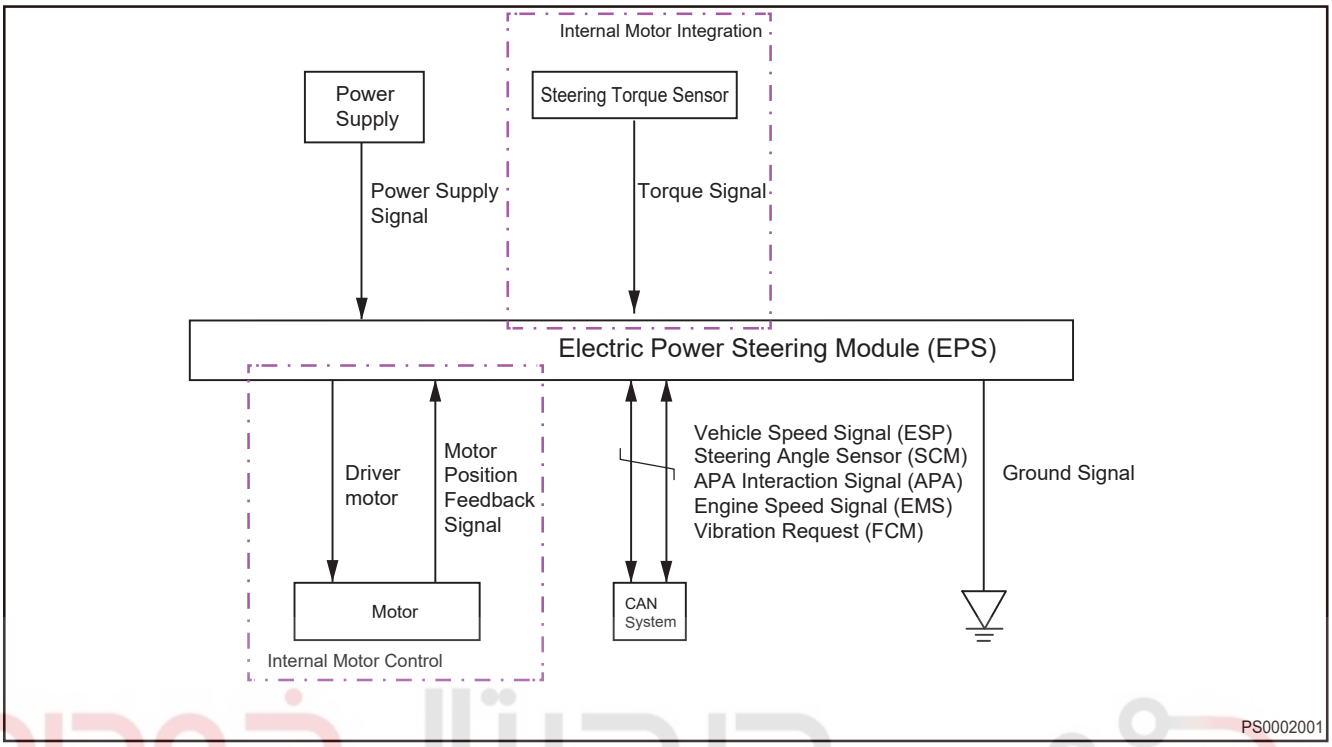
The steering column is the component of the steering system that connects the steering wheel and the steering gear. Through the steering column, the driver transfers torque to the steering gear, which drives the steering gear to achieve steering.

System Components Diagram



1	Electric Steering Column	2	Steering Intermediate Shaft Assembly

System Schematic Diagram



Electronic power steering module is integrated into steering column.

Operation

When driver rotates the steering wheel, torque sensor installed on steering column sends detected torque acting on steering wheel to steering assist control unit. Based on information such as steering torque, vehicle speed (provided by vehicle CAN line), steering wheel rotation angle, steering wheel rotation speed and characteristic curve stored in control unit, control unit calculates required steering torque based on specified algorithm, and controls motor operation. The steering assist is provided by motor drive column, thus steering rack operates.

Component Operation Description

Steering angle sensor

The steering angle sensor of vehicle is used to detect rotation angle and direction of steering wheel. Turning steering wheel to left and right will be detected by steering angle sensor, so as to make electronic control unit of vehicle send correct steering command. Rotation angle of steering wheel provides basis for steering extent of vehicle, so that the vehicle drives according to driver’ s steering intention.

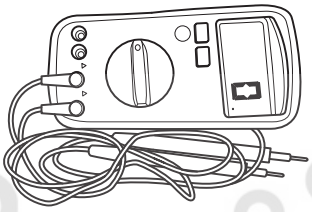
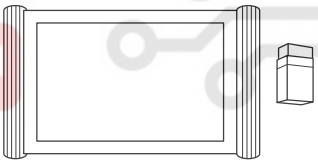
EPS Corner Calibration and Soft Stop Learning (for Offline Calibration of Four-wheel Alignment Station Electrical Inspection Equipment)

1. Start vehicle;
2. Turn steering wheel to left and right more than ± 45° at a speed of < 200°/s;
3. Perform four-wheel alignment on vehicle;
4. The ignition switch is turned off and turned on within 3 seconds (+15 on);
5. Fix the steering wheel horizontally;
6. Connect the electrical inspection equipment, enter corner calibration interface, and confirm directly until the calibration is completed according to the prompt of electrical inspection equipment;
7. Calibration is completed;

8. (After the four-wheel alignment is completed), drive out the four-wheel alignment station, turn the steering wheel left and right to the limit position, and keep the hand force not less than 10 N·m for more than 1 second, and ensure that the steering wheel hits the limit position and then returns to the center position;
9. The software completes soft stop position learning.

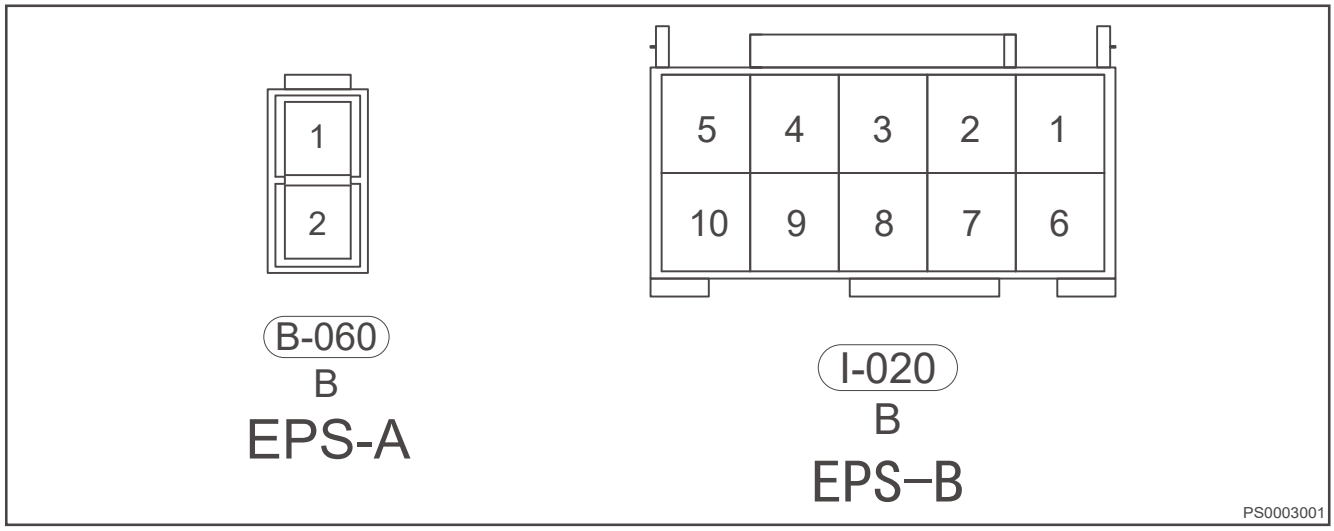
⚠ Caution
In step 2, if the steering speed is too fast or the steering angle is insufficient, it cannot be calibrated. In step 4, if the vehicle is not powered on in 3 seconds, it cannot be calibrated. In step 8, if the steering wheel limit position (turned to strike position) has not reached, it will cause soft stop position learning to be advanced for the first time, resulting in an power assist loss prior to the limit position.

Tools

Tool Name	Tool Drawing
Digital Multimeter	 S00002
Diagnostic tester	 S00001

System Circuit Diagram

Module Terminal Definition



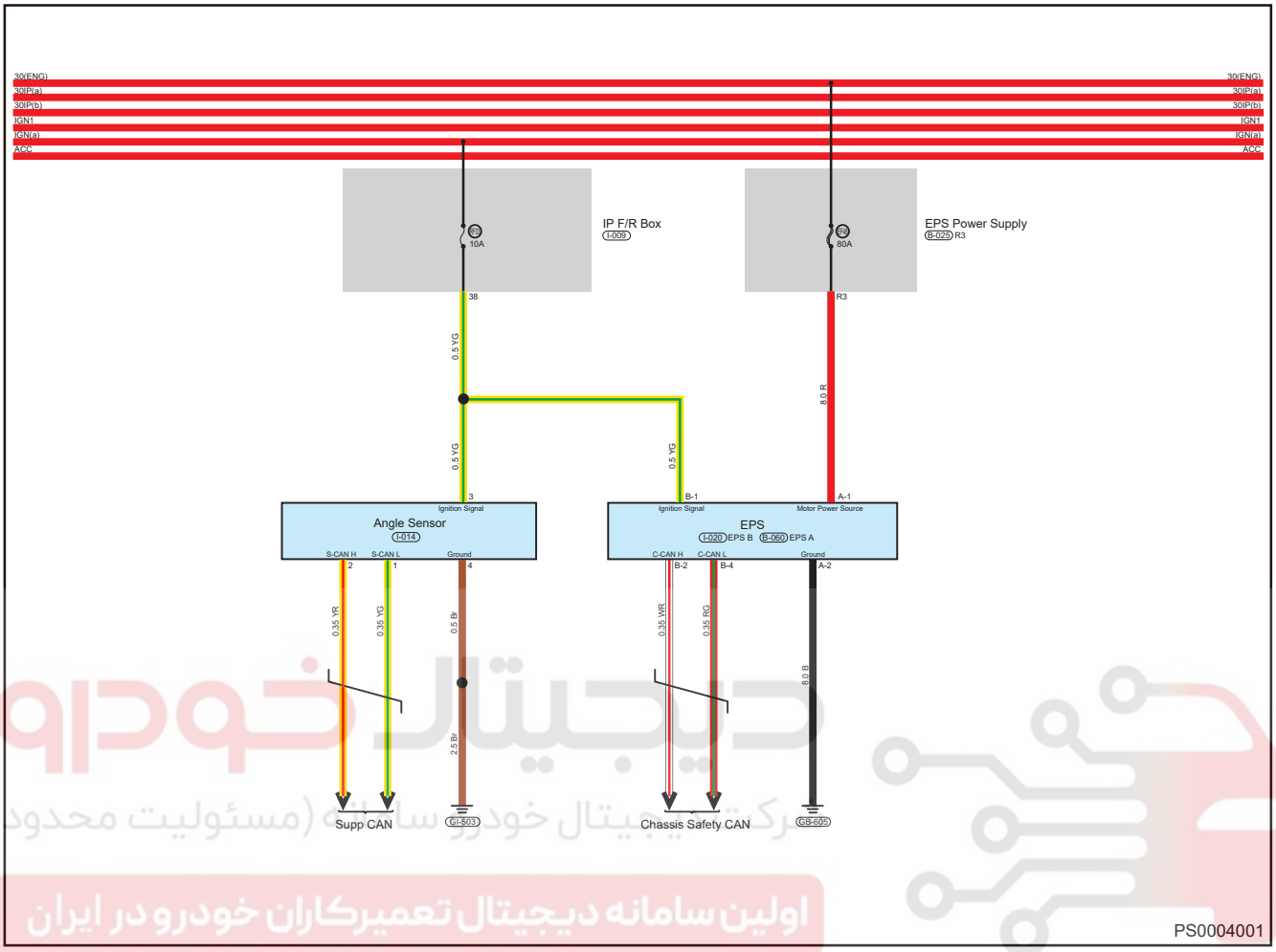
Vehicle power supply: Controller power supply connector (connector A)

Pin	Definition	Pin	Definition
1	Motor Power Source	2	Ground

Vehicle signal: Controller signal connector (connector B)

Pin	Definition	Pin	Definition
1	Ignition Signal	2	C-CAN H
3	-	4	C-CAN L
5	-	6	-
7	-	8	-
9	-	10	-

Circuit Diagram



Diagnostic Information and Steps

Diagnostic Help

- Connect diagnostic tester and make it communicate with vehicle electronic module through data network.
- Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
- If DTC cannot be deleted, malfunction is current.
- Only use a digital multimeter to measure voltage of electronic system.
- Refer to any Technical Bulletin that applied to the malfunction.
- Visually check the related wire harness.
- Check and clean Electronic Power Steering controller (EPS controller) ground related to latest DTC.
- If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

Intermittent DTC Troubleshooting

If malfunction is intermittent, perform the following:

- Check if connector is loose.
- Check if wire harness is worn, pierced, pinched or partially broken.

- Wiggle related wire harness and connector and observe if signal in related circuit is interrupted.
- If possible, try to duplicate conditions under which DTC was set.
- Look for data that has changed or DTC to reset during wiggling test.
- Look for broken, bent, protruded or corroded terminals.
- Inspect sensors and mounting areas for damage, foreign matter, etc. that will cause incorrect signals.
- Check and clean all wire harness connectors and ground parts related to DTC.
- If multiple trouble codes were set, refer to circuit diagrams to look for any common ground circuit or power supply circuit applied to DTC.
- Refer to any Technical Bulletin that may apply to this malfunction.

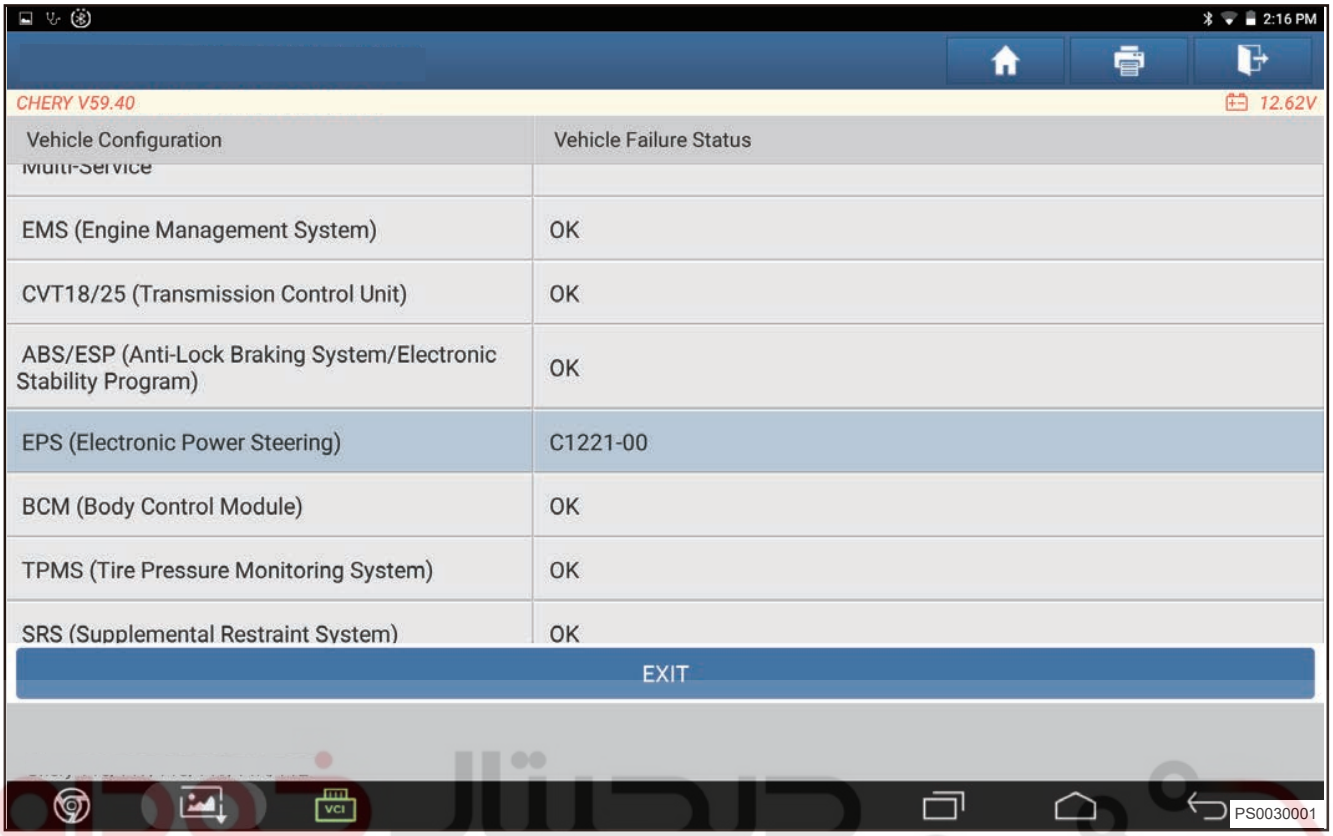
Ground Inspection

Ground points are very important to the proper operation of circuits. Ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) may increase load resistance. This situation may change the way in which a circuit operates. Circuits are very sensitive to proper grounding. A loose or corroded ground can seriously affect the control circuit. Check the ground points as follows:

1. Remove ground bolt or nut.
2. Check all contact surfaces for tarnish, dirt and rust, etc.
3. Clean as necessary to ensure that contact is in good condition.
4. Reinstall ground bolt or nut securely.
5. Check if any additional accessories interfere with ground circuit.
6. If several wire harnesses are crimped into one ground terminal, check for proper crimp condition. Make sure that all wire harnesses are clean and securely fastened while providing a proper ground path.

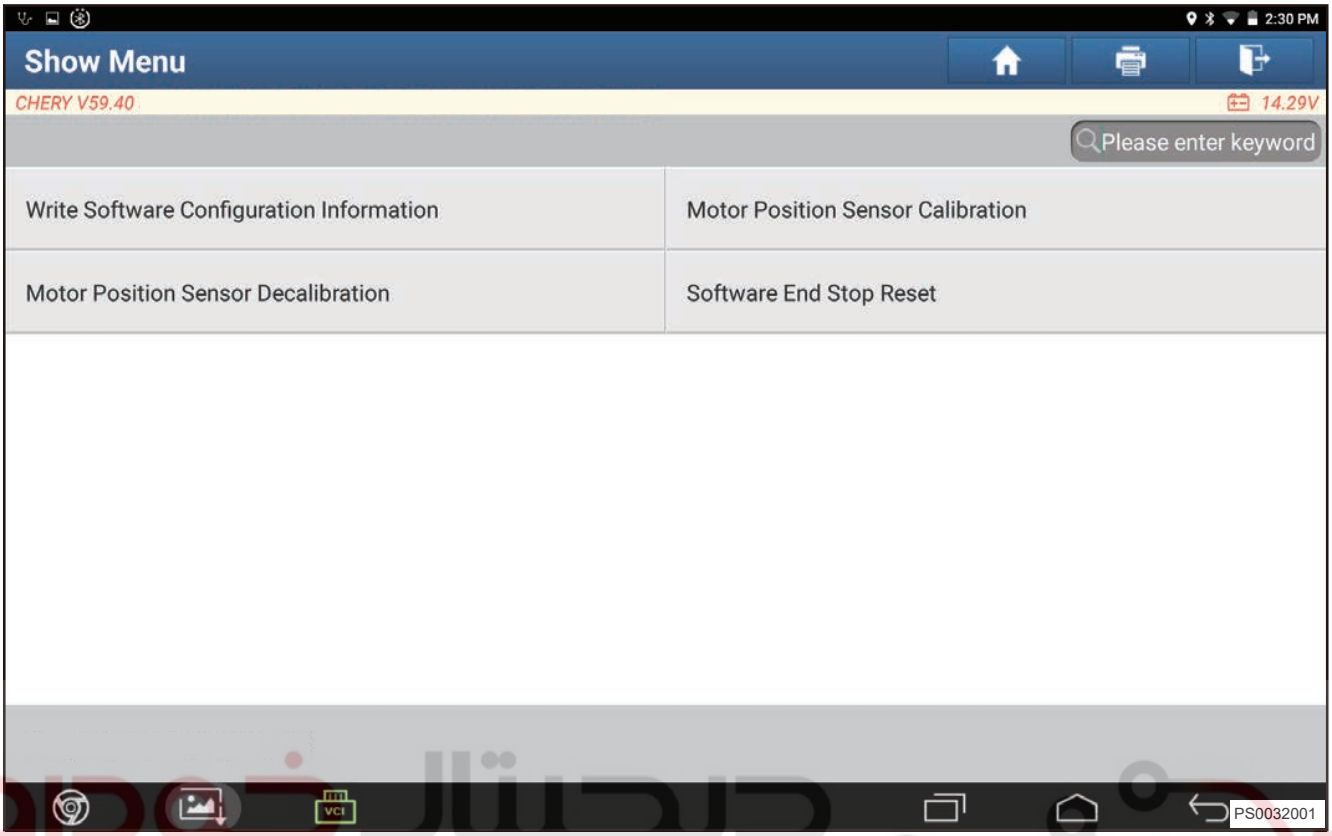
Motor Position Sensor Calibration

1. Connect diagnostic tester, turn ignition switch ON.
2. Select the "OMODA" model.
3. Select “EPS (Electronic Power Steering)”.

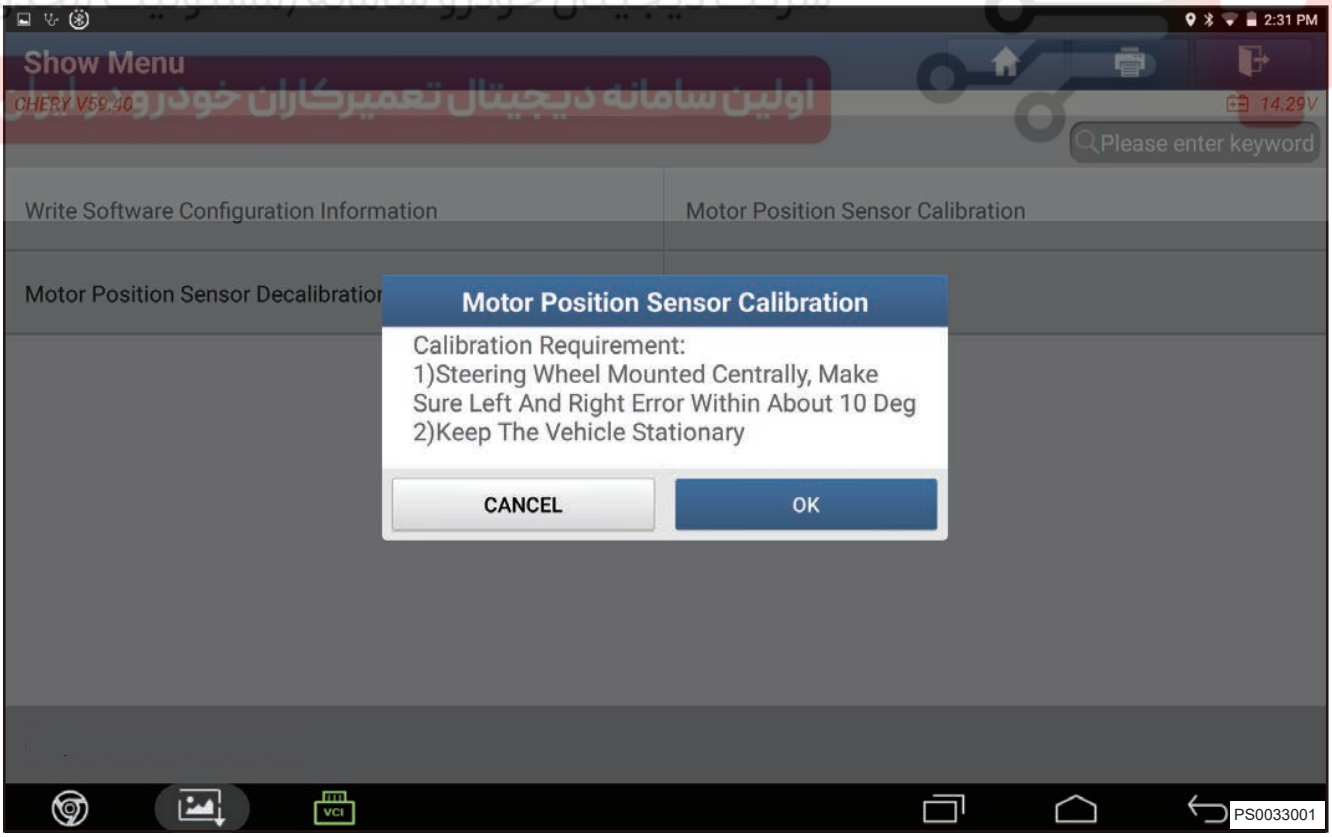


4. Click “Special Function”.

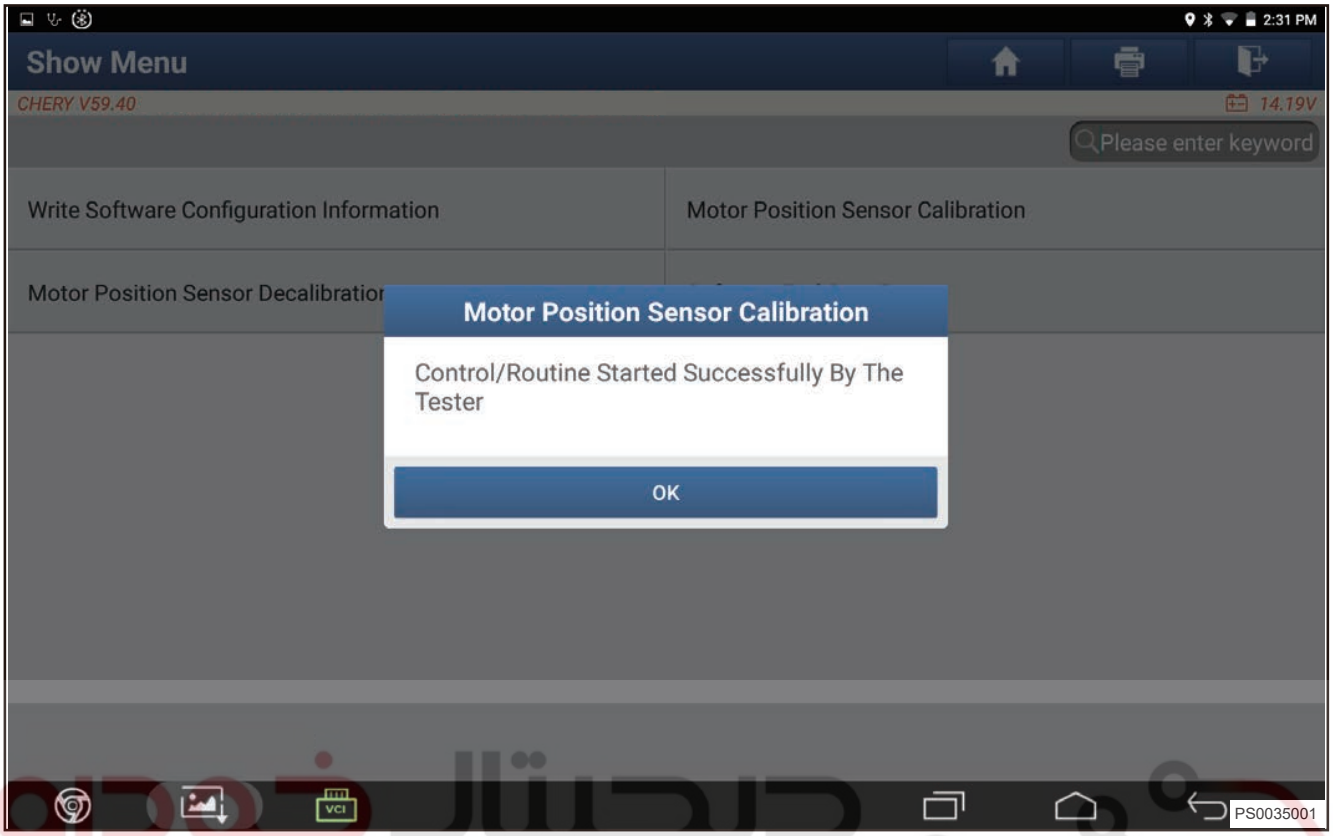
5. Go to next interface, click “Motor Position Sensor Calibration”



6. Hint: “Calibration requirement: (1) Steering wheel mounted centrally. Make sure left and right error within about 10 deg (2) Keep the vehicle stationary” Then click “OK”.

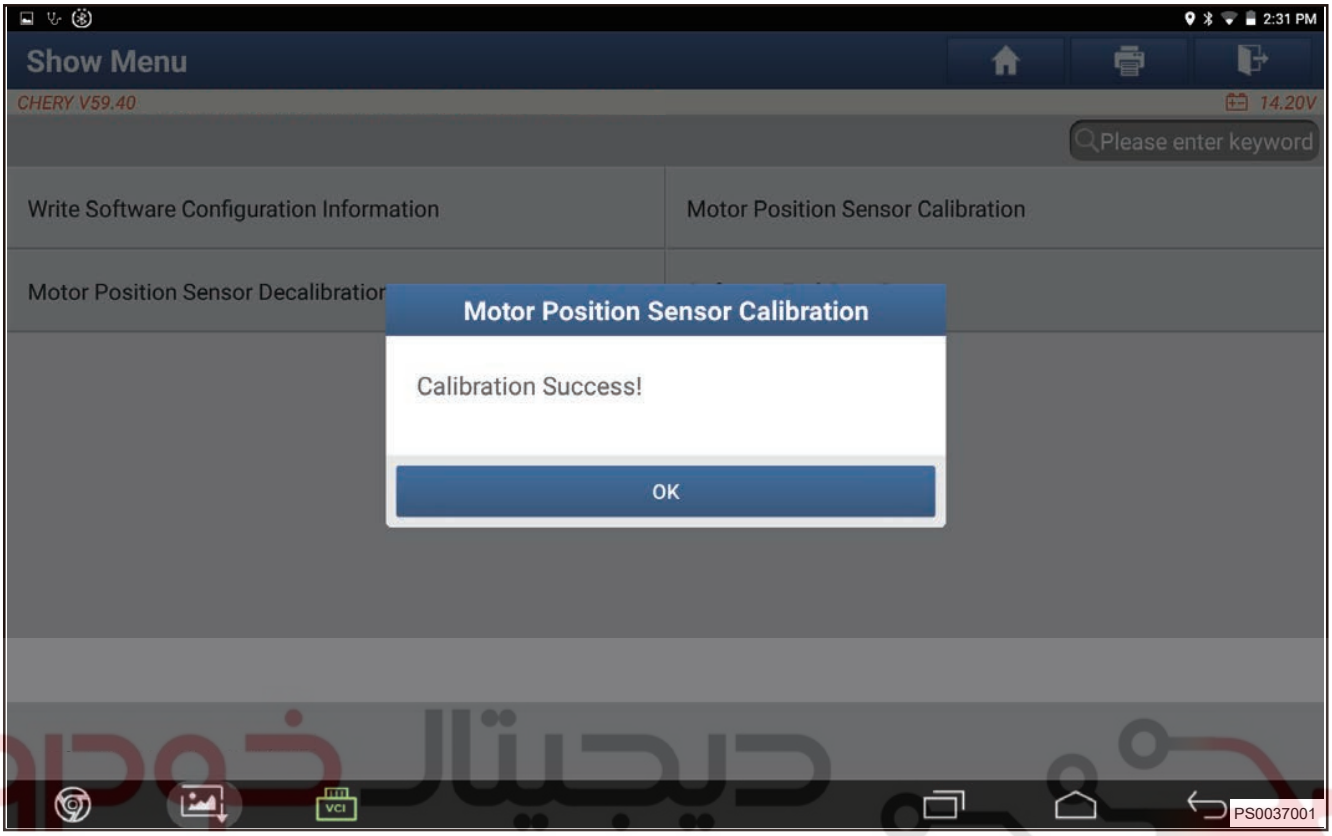


7. Hint: “Control/Routine Started successfully by the tester” Then click “OK”.



8. Hint: “Please follow this step: In the middle position of the steering wheel to the left slowly rotate more than 45 deg, then slowly rotate to the right is greater than 45 deg, back to the middle position (Speed < 200 deg/s)” and click “OK”.

9. Hint: “Calibration success!” Then click “OK”.



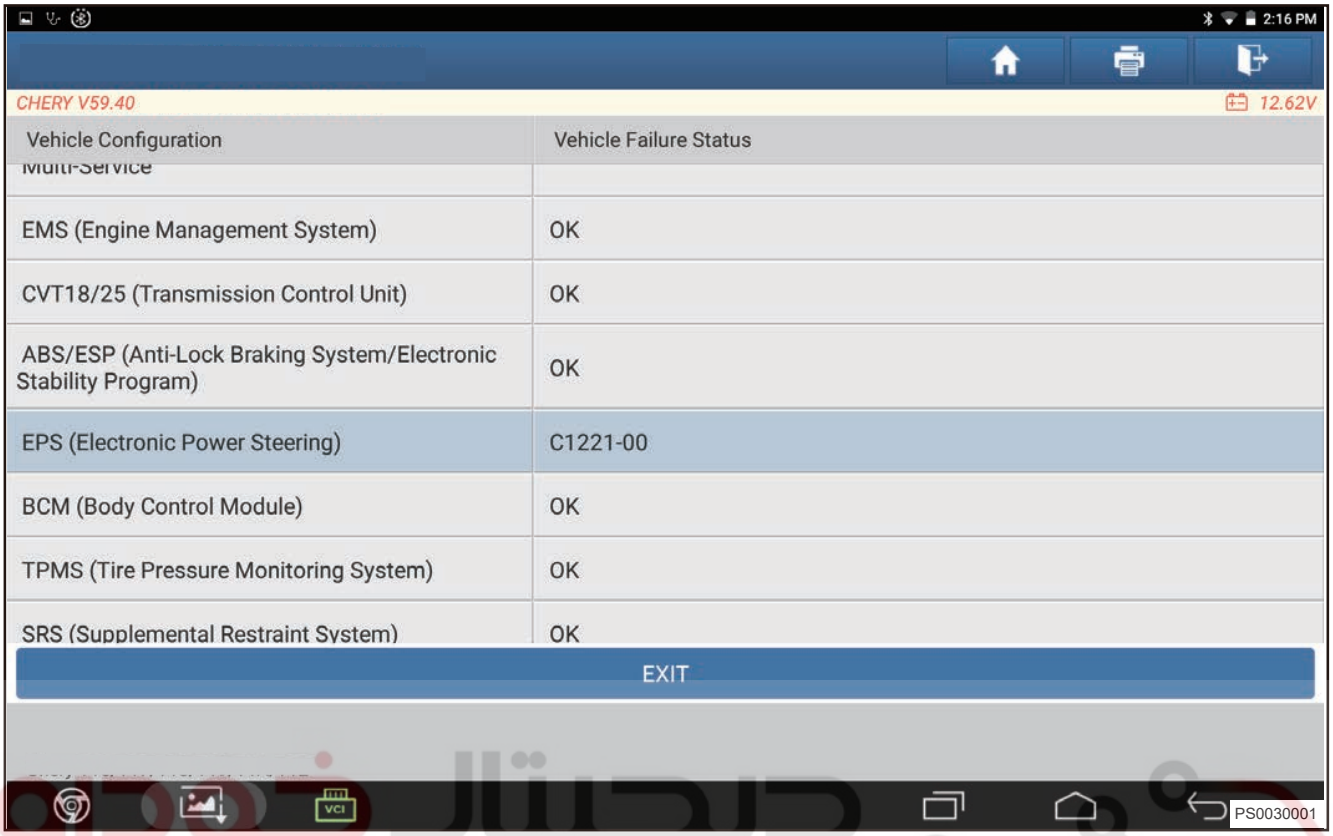
Caution

- Calibration requirements: Keep vehicle stationary and steering wheel centered to ensure that the left and right errors are within 10°.
- Battery voltage is higher than 9 V and lower than 16 V.

VIN Code Configuration Code Writing

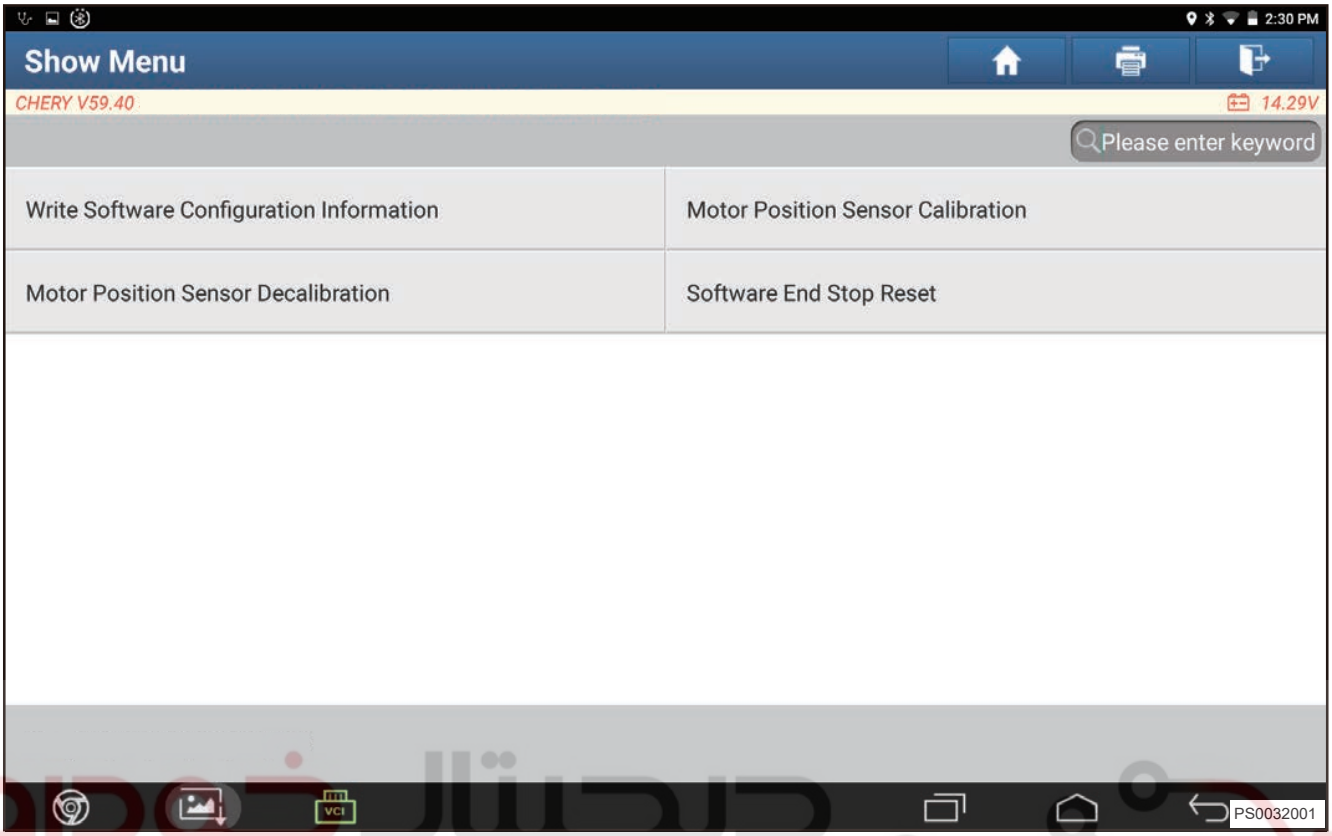
Automatic Writing

1. Connect diagnostic tester, turn ignition switch ON.
2. Select the "OMODA" model.
3. Select “EPS (Electronic Power Steering)”.

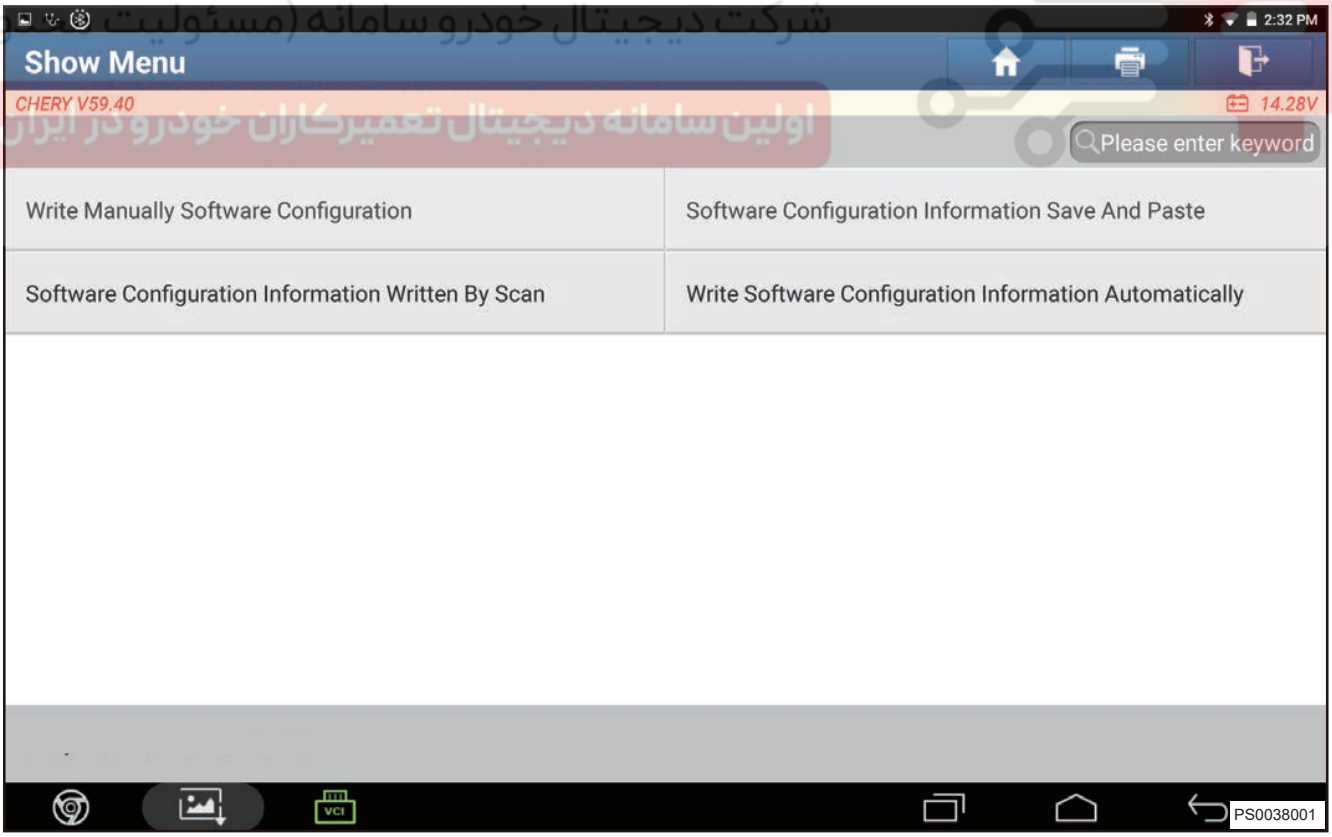


4. Click “Special Function”.

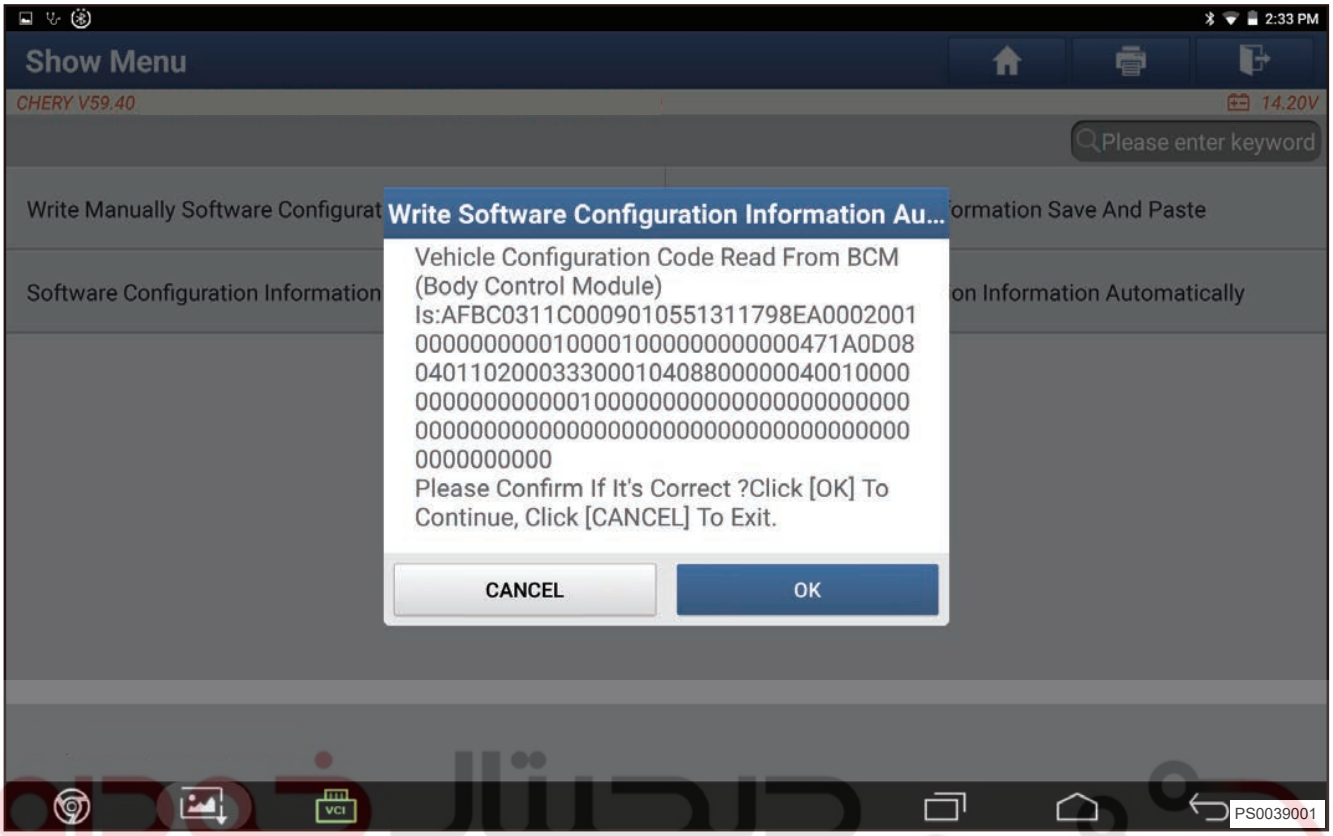
5. Enter next screen and click “Write Software Configuration Information”



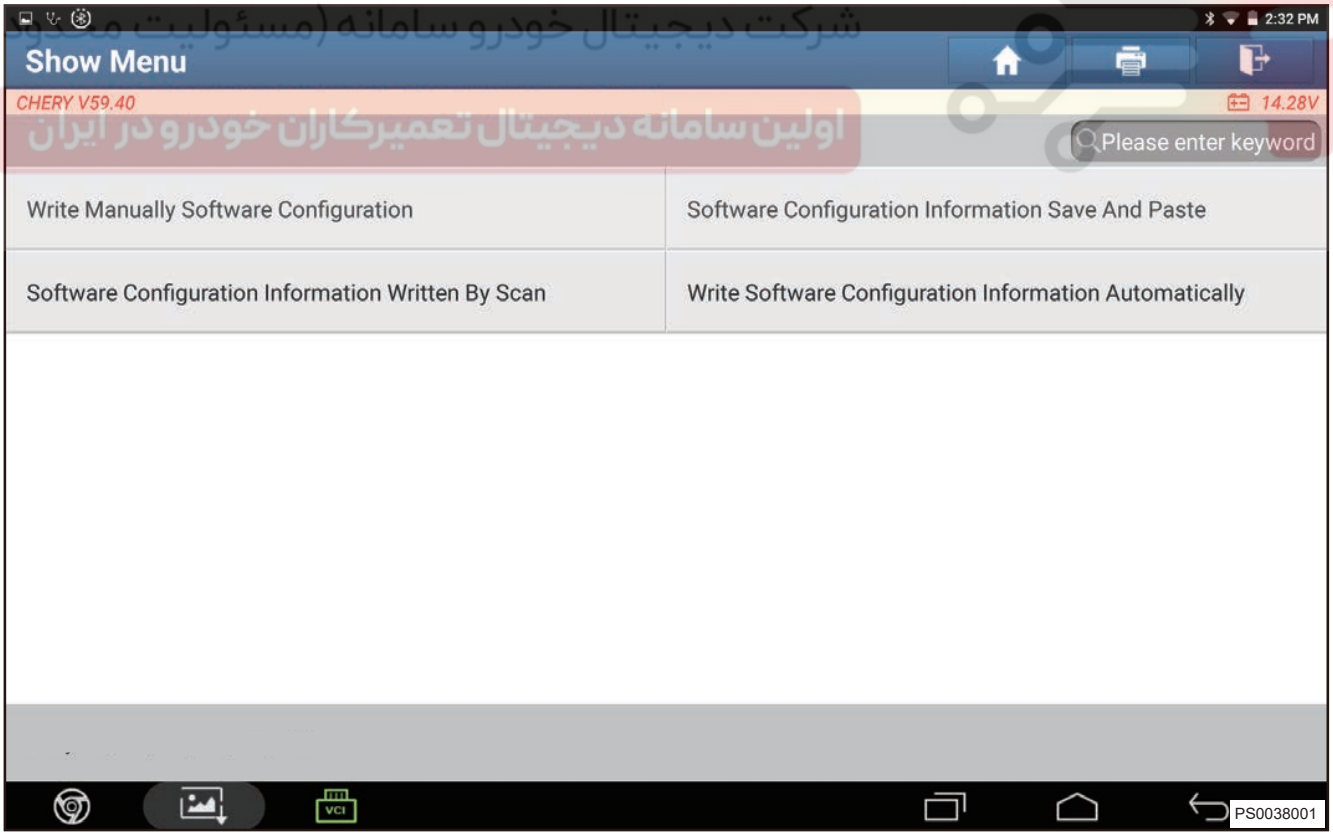
6. Enter next screen and click “Software Configuration Information Save And Paste”



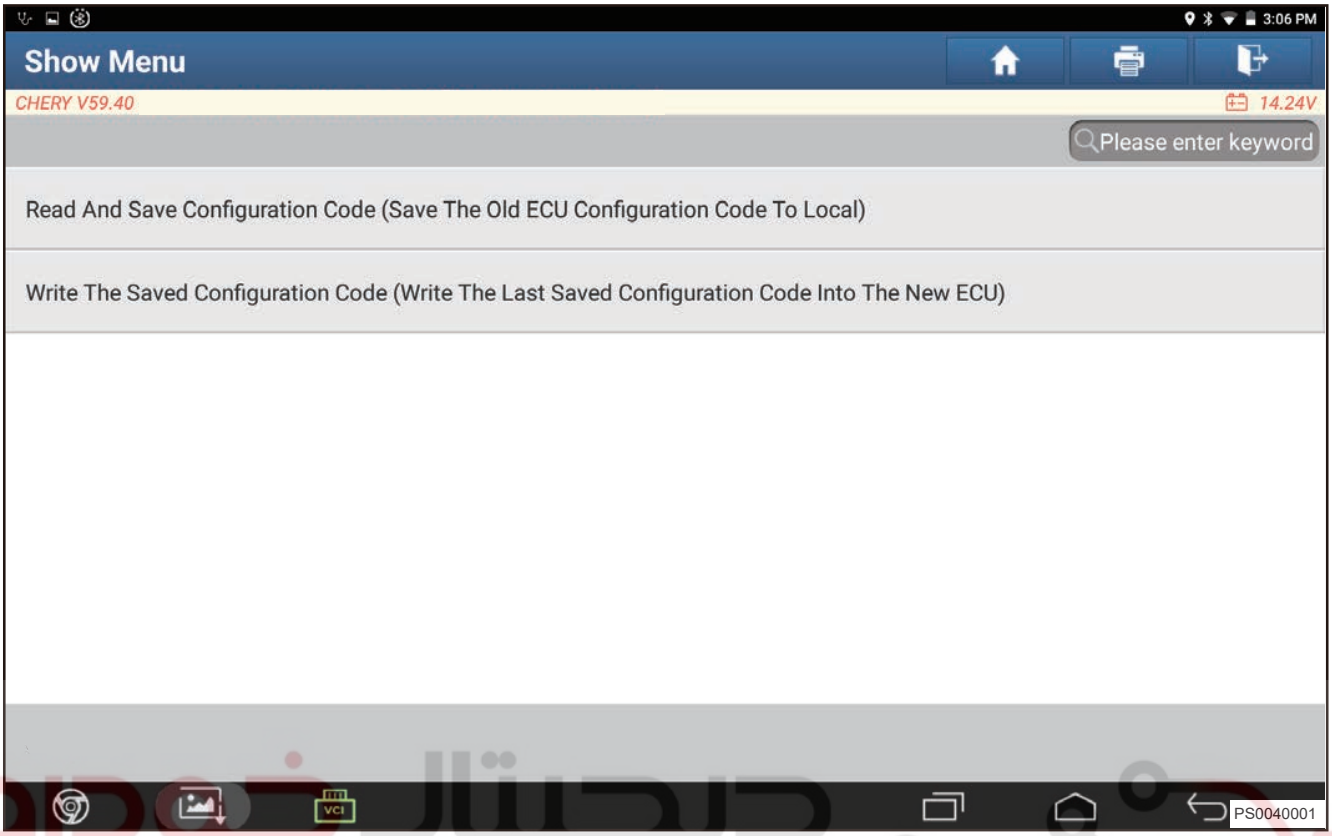
7. Hint: “Vehicle Configuration Code Read From BCM (Body Control Module)”. Then click “OK”.



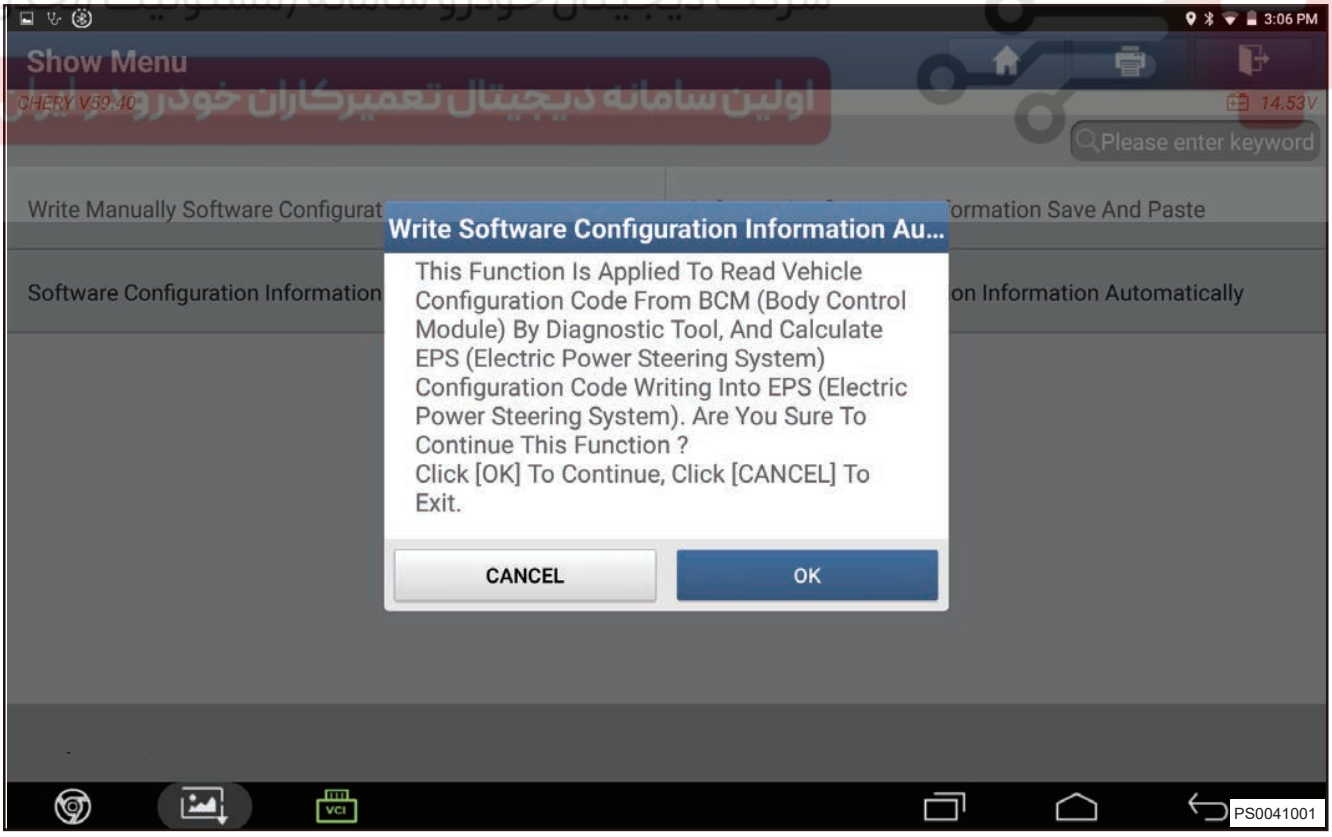
8. Go back to previous screen and click “Write Software Configuration Information Automatically”.



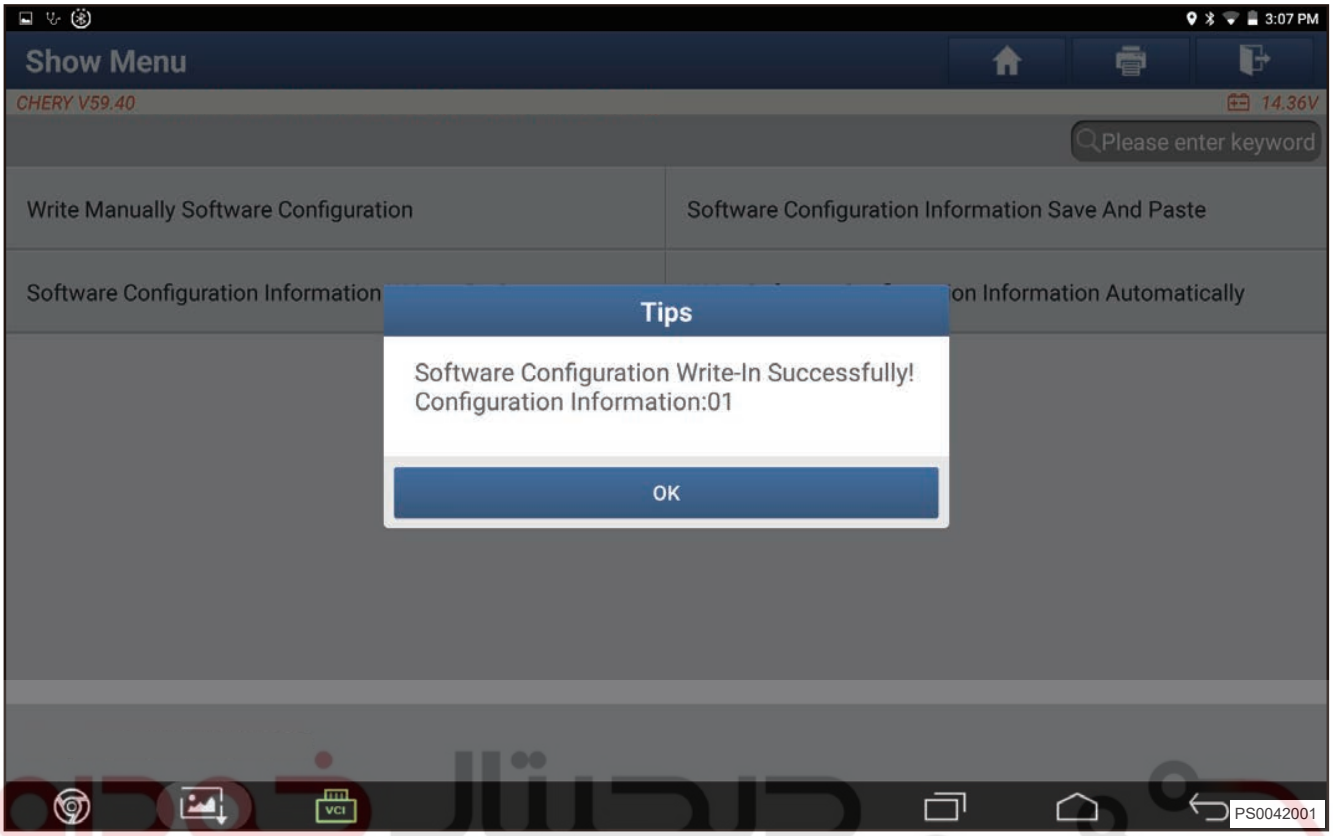
9. Enter next screen and click “Read And Save Configuration Code (Save The Old ECU Configuration Code To Local)”.



10. Hint: “Configuration Code Writing Into EPS (Electronic Power Steering System).” Then click “OK”.

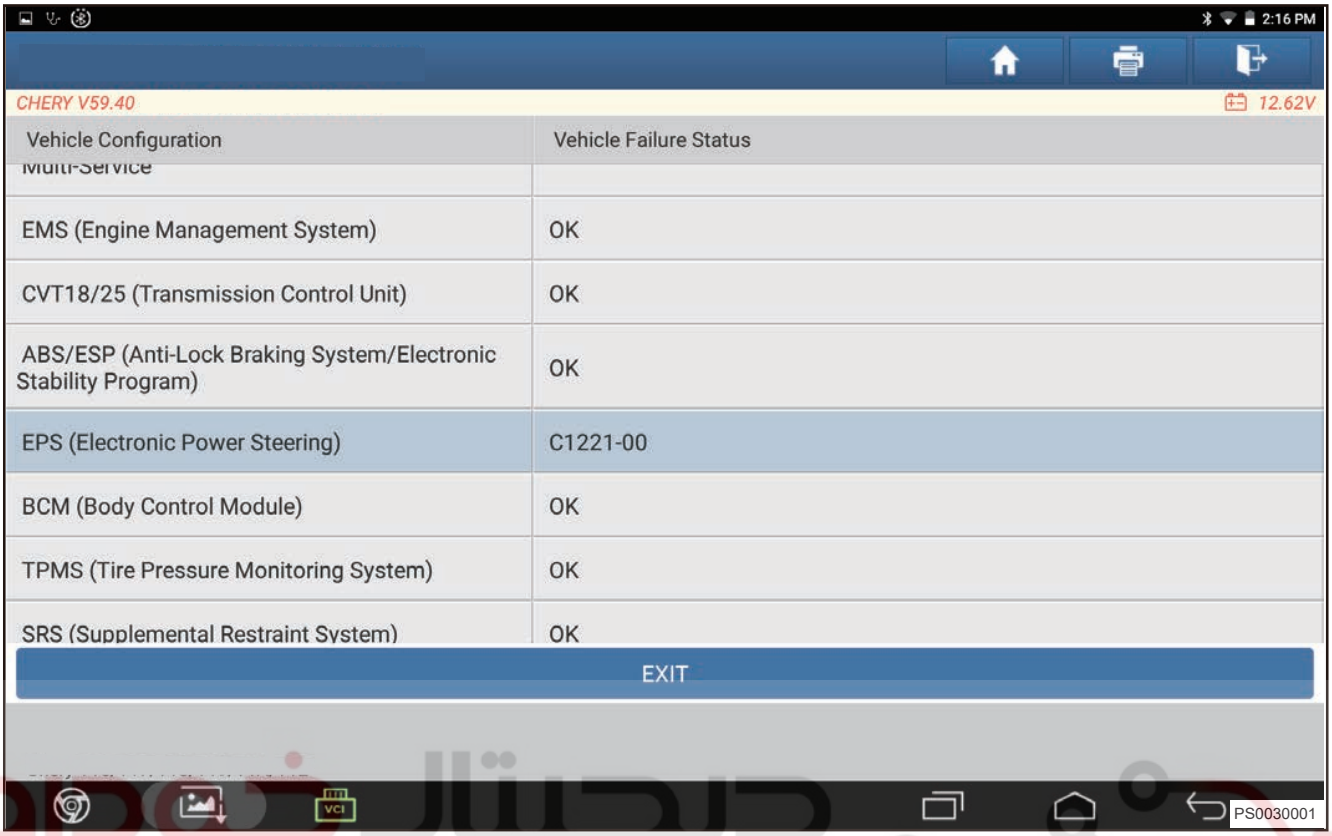


11. Hint: “Software Configuration Write-In Successfully!”.



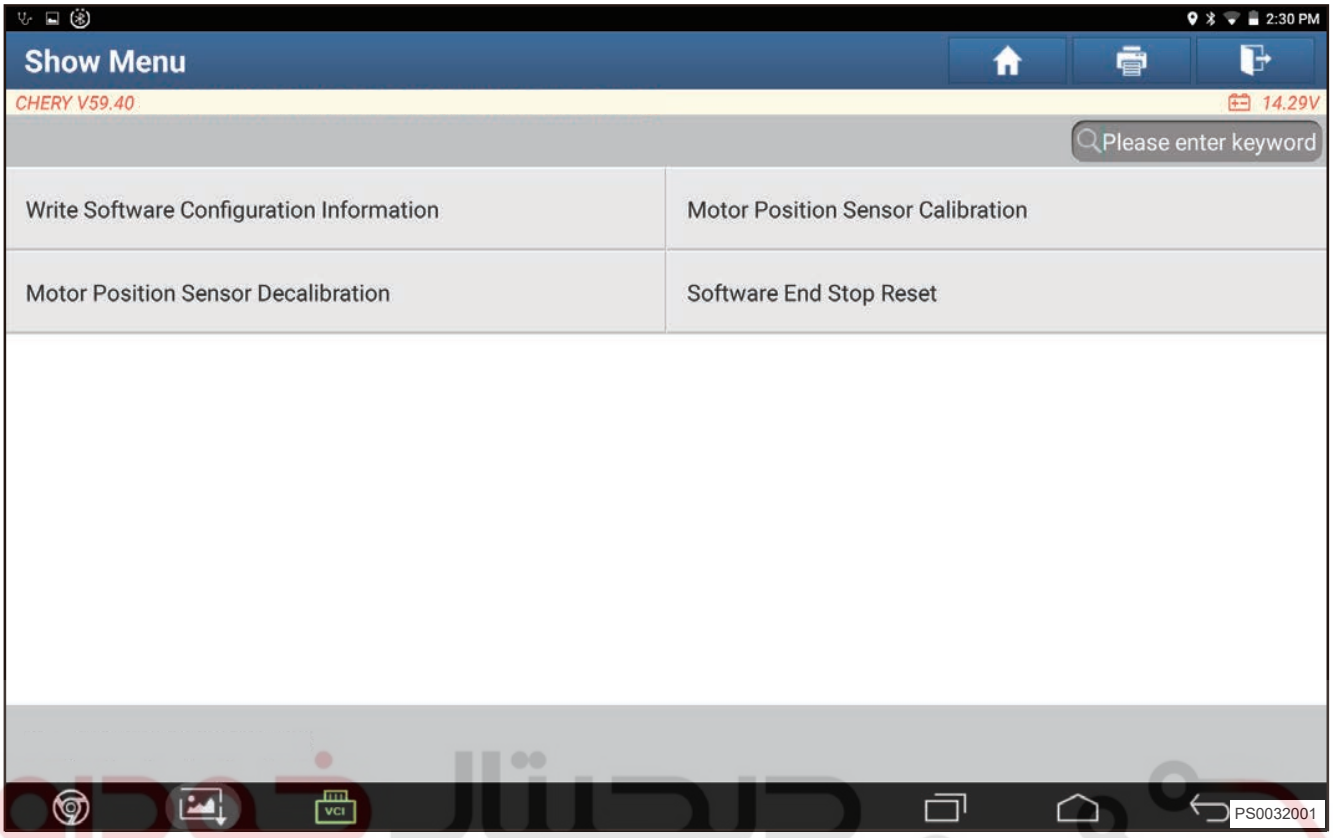
Write Manually

1. Connect diagnostic tester, turn ignition switch ON.
2. Select the "OMODA" model.
3. Select “EPS (Electronic Power Steering)”.

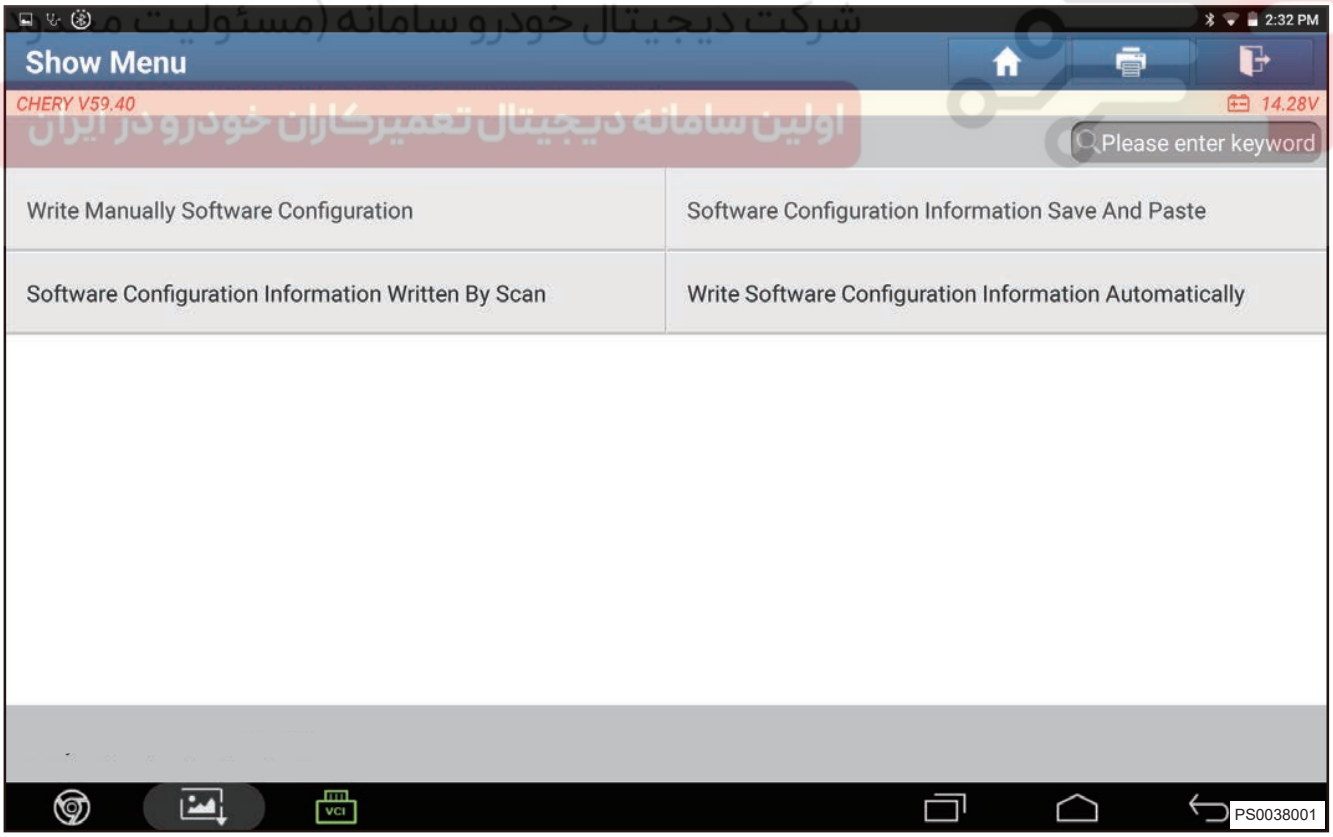


4. Click “Special Function”.

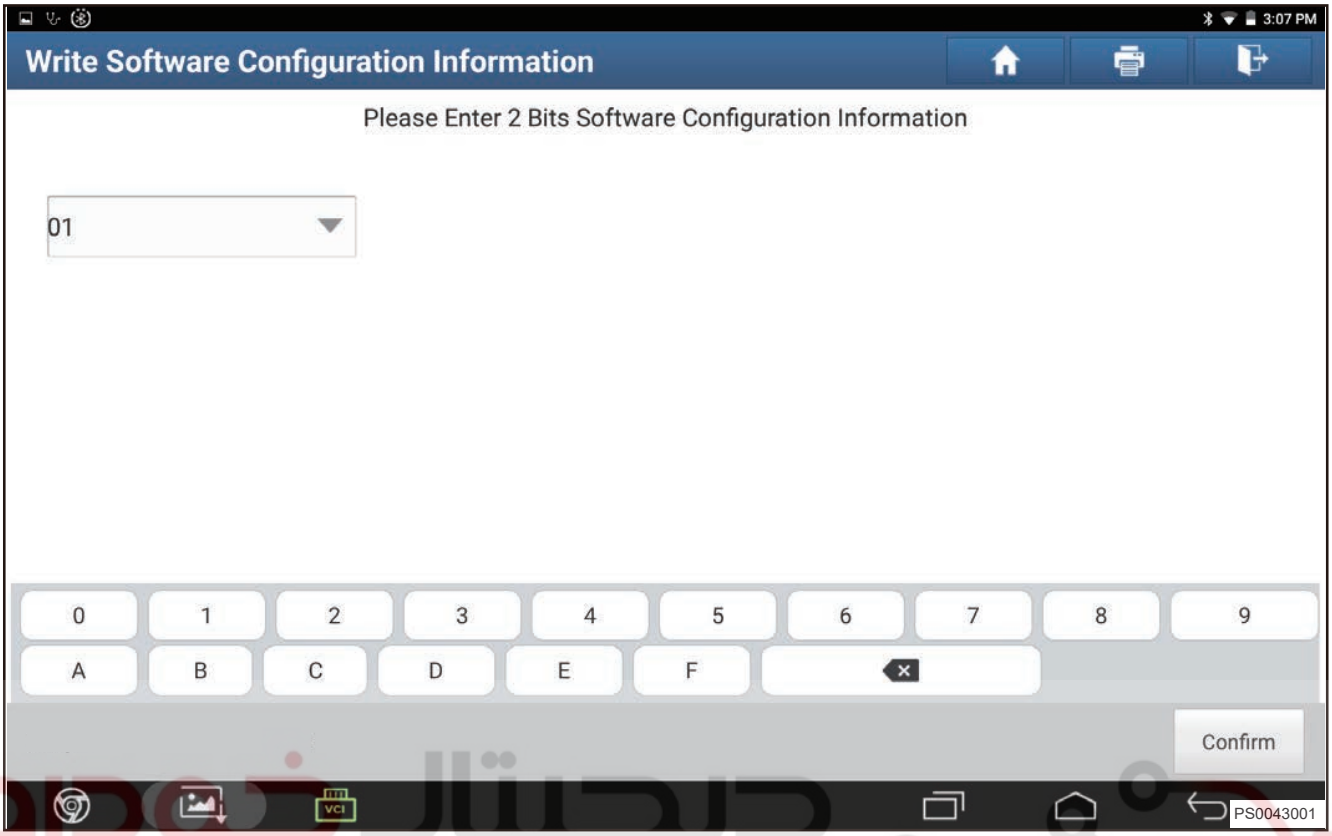
5. Enter next screen and click “Write Software Configuration Information”.



6. Enter next screen and click “Write Manually Software Configuration”.



7. Click and enter vehicle VIN code.



8. Hint: “Software Configuration Write-In Successfully!”.

Diagnostic Trouble Code (DTC) Chart

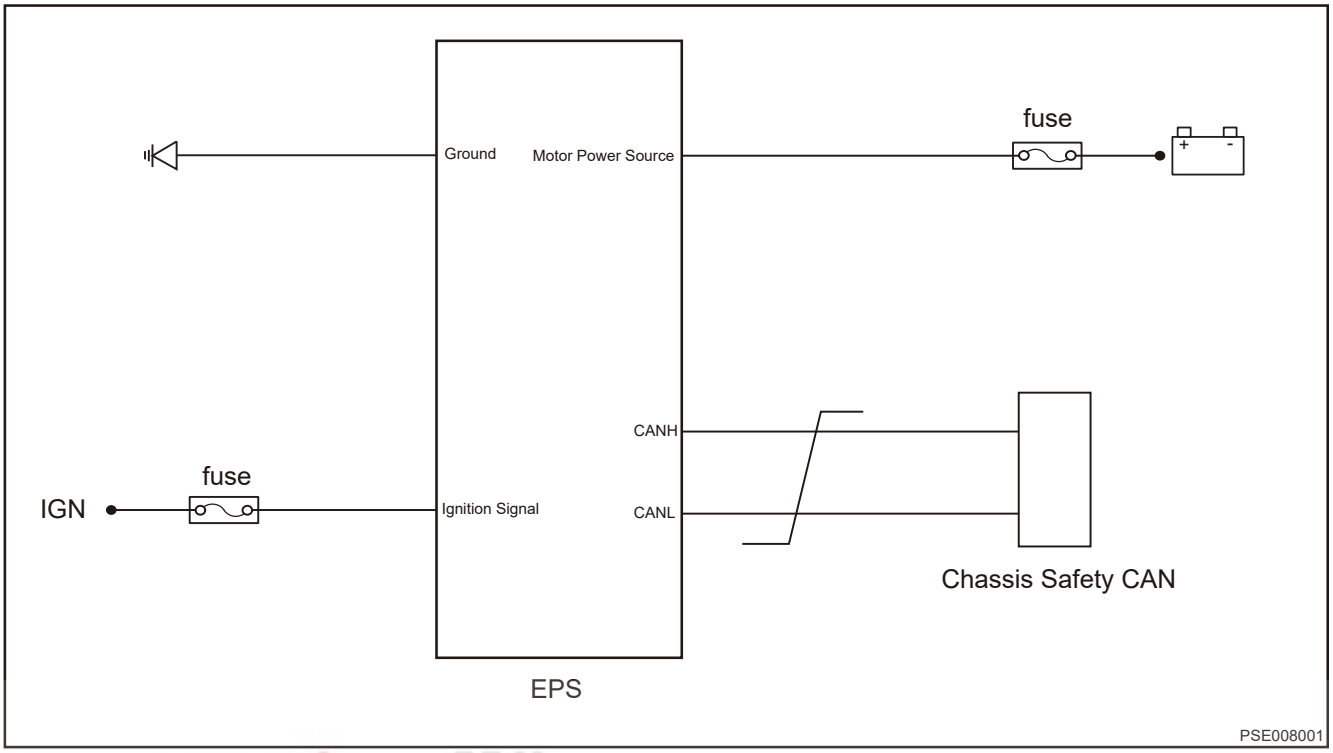
DTC	DTC Definition	Detection Condition	Possible Causes	Maintenance Advice
C1201-44	Data Flash Verify Error-Data Memory Failure	Related error register flag is set	• ECU defected	/
C1202-49	ECU Hardware Error-Internal Electronic Failure	Related error register flag is set		/
C1204-00	ECU Reset Error	Unexpected reset source is detected		/
C1204-48	ECU Sw Monitoring Error	Algorithm error is detected		/
C1206-45	Flash Code Verify Error	Checksum is wrong		/
C1208-49	Output Stage Error	Motor short to Vbat or ground, phase open, or motor current out of range is detected.		/
C1209-49	Phase Current Error	Phase current is out of range		/

DTC	DTC Definition	Detection Condition	Possible Causes	Maintenance Advice
C120A-49	Rotor Position Sensor Error	Resolver signal is out of range		/
C120F-00	Steering Angle Sensor Not Calibrated-No Sub Type Information	Related flag is not set	• ECU or HELLA sensor defected	/
C1214-1C	High Power Supply Voltage	Supply voltage is beyond 16V and below 24	• Battery failure	/
C1214-17	Supply Voltage Too High	Supply voltage is below 24		/
C1217-1C	Low Power Supply Voltage	Supply voltage is below 9V and beyond 6V		/
C1217-16	Supply Voltage Too Low	Supply voltage is beyond 6V		/
C1218-4B	Over Temperature Reduction-Over Temperature	PCB and Output stage(MOSFET) Temperature difference is too high	• Too long time strong steering	/
C121A-4B	Temperature Out Of Range-Over Temperature	System temperature is beyond 100℃	• Environment temperature too high	/
C121A-49	Torque Sensor Error-Internal Electronic Failure	T1 or T2 signal is out of range	• ECU or HELLA sensor defected	/
C121E-44	RAM Check Error	Related error register flag is set	• ECU defected	/
C121F-49	SBC Error	Related error register flag is set		/
C1220-49	Gate Driver Fault	Related error register flag is set		/
C1221-00	Soft End Stop Function no Calibration or Calibration Error	Related flag is not set	• ECU or HELLA sensor defected	/
C1222-49	Switch Power MOSFET Error	Switch Power MOSFET circuit error is detected	• ECU defected	/
C1223-49	Vbat Voltage Detection Circuit Error	Vbat voltage detection circuit error is detected		/

DTC	DTC Definition	Detection Condition	Possible Causes	Maintenance Advice
C1224-49	EEPROM SPI Communication Timeout	EEPROM SPI communication timeout is detected		/
C1225-46	EEPROM Error	Checksum is wrong		/
C1219-4B	Temperature Sensor Signal Out of Range	Temperature signal is out of range		/
C1210-49	Steering Angle Implausible	Steering Angle Sensor diagnostic and communication fault or hardware error	• Internal steering angle sensor defected • Hardware error	/
U0073-88	CAN Bus Off	/	/	/
U0100-87	Lost Communication with EMS	/	/	/
U0129-87	Lost Communication with BSM	/	/	/
U1300-55	Software Configuration Error	/	/	/
U3000-51	Control Module Not Programmed	/	/	/
U0418-81	Invalid Data Received from BSM	/	/	/

DTC Diagnosis Procedure

DTC	**C1201-44**	**Data Flash Verify Error-Data Memory Failure**
DTC	**C1202-49**	**ECU Hardware Error-Internal Electronic Failure**
DTC	**C1204-00**	**ECU Reset Error**
DTC	**C1204-48**	**ECU Sw Monitoring Error**
DTC	**C1206-45**	**Flash Code Verify Error**
DTC	**C121A-49**	**Torque Sensor Error-Internal Electronic Failure**



DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing the following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check battery voltage**

(a) Connect negative battery terminal cable, and turn ENGINE START STOP switch to ON to make engine run normally.

(b) Check battery voltage with voltage band of multimeter.

Specified Condition

Multimeter Connection	Condition	Specified Condition
Battery (+) - Battery (-)	ENGINE START STOP switch ON	Not less than 12 V

NG → **Check and repair battery**

OK

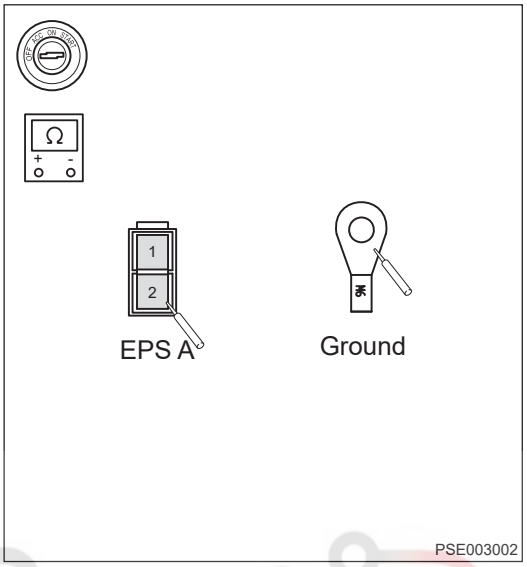
2	Inspect ground and power supply circuit

(a) Turn ENGINE START STOP switch to OFF.

(b) Disconnect the EPS connector.

(c) Check for continuity between EPS (ground terminal) terminal and ground.

(d) Check for continuity between EPS (power supply terminal) and power supply.

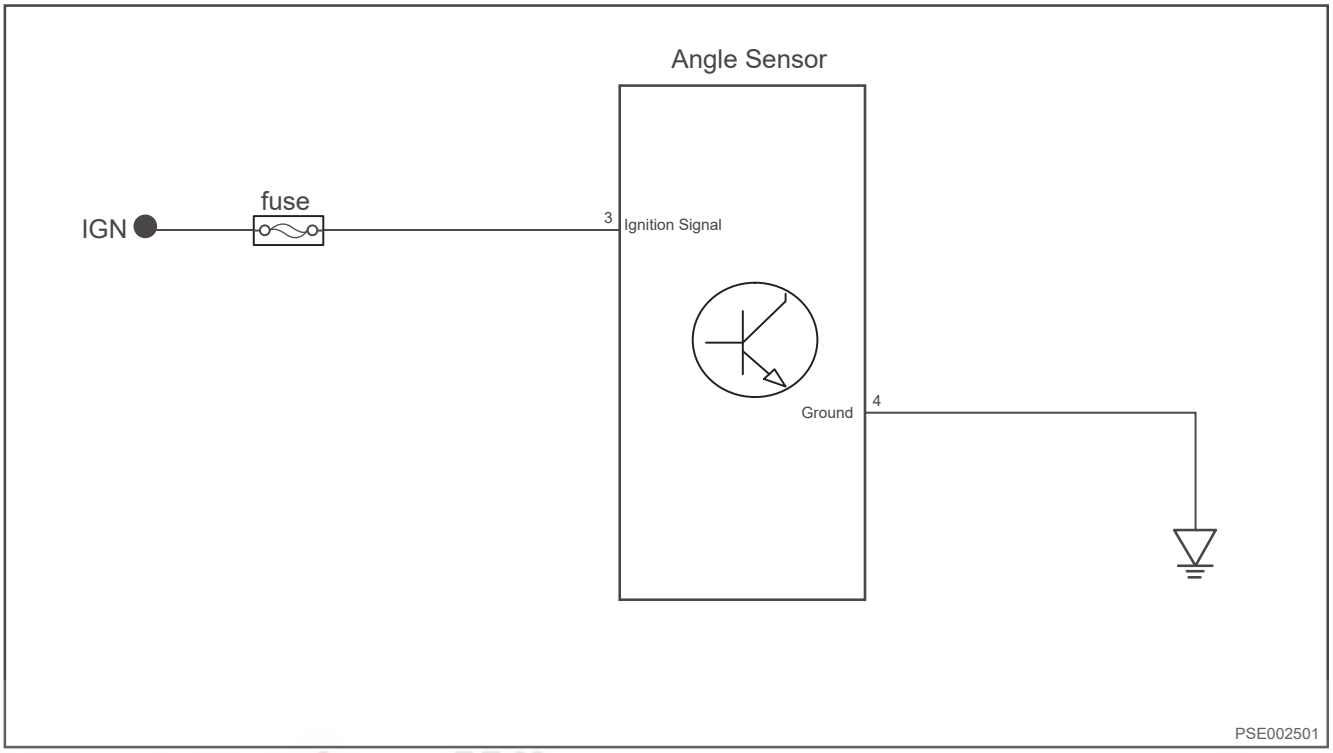


OK → Replace EPS

NG → Replace or repair wire harness

DTC	C120F-00	Steering Angle Sensor Not Calibrated-No Sub Type Information
DTC	C1221-00	Soft End Stop Function no Calibration or Calibration Error
DTC	C1201-49	Steering Angle Implausible

Control Schematic Diagram



DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing the following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check steering angle calibration**

(a) Turn ENGINE START STOP switch to ON.
(b) Connect the diagnostic tester, read data streams of steering angle sensor.
(c) Check if steering angle sensor angle is normal and calibration is successful.

NG → **Recalibrate steering angle sensor**

OK →

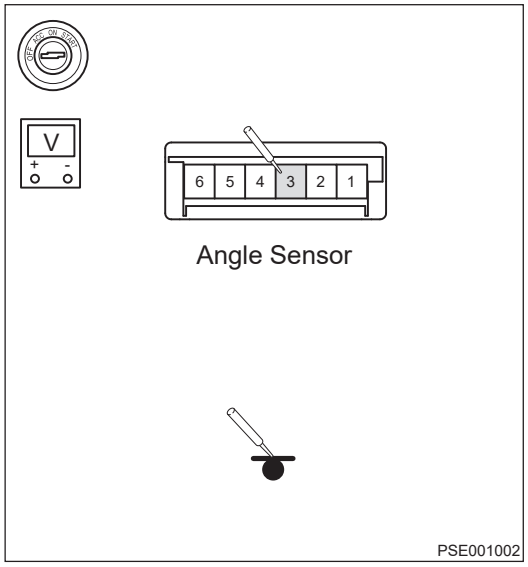
2	**Check angle sensor power supply**

(d) Turn ENGINE START STOP switch to OFF.

(e) Disconnect angel sensor.

(f) Perform the voltage inspection.

Multimeter Connection	Condition	Specified Condition
Angle sensor (3) - body ground	ENGINE START STOP switch ON	12-14V



NG → **Repair or replace power supply wire harness**

OK →

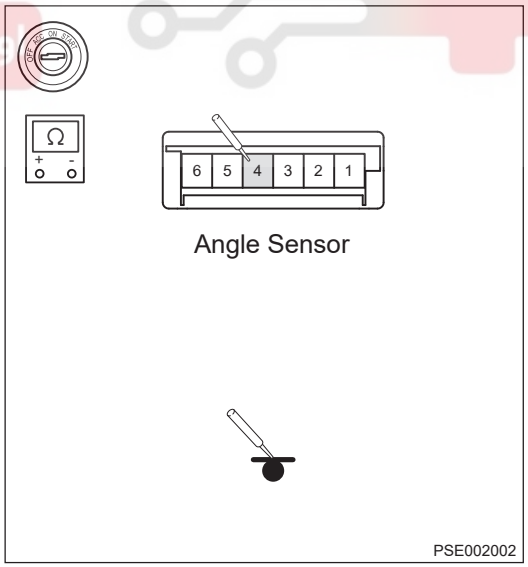
3	**Check angle sensor ground**

(g) Turn ENGINE START STOP switch to OFF.

(h) Disconnect angel sensor.

(i) Check continuity between angle sensor (4) and body ground with multimeter ohm band.

Multimeter Connection	Condition	Specified Condition
Angle sensor (4) - body ground	ENGINE START STOP switch “OFF”	⩽ 1 Ω



NG → **Repair or replace ground point**

OK → **Replace EPS**

DTC	**C1208-49**	**Output Stage Error**
DTC	**C1209-49**	**Phase Current Error**
DTC	**C120A-49**	**Rotor Position Sensor Error**
DTC	**C1222-49**	**Switch Power MOSFET Error**
DTC	**C1223-49**	**Vbat Voltage Detection Circuit Error**
DTC	**C1224-49**	**EEPROM SPI Communication Timeout**
DTC	**C1225-46**	**EEPROM Error**
DTC	**C121E-44**	**RAM Check Error**
DTC	**C121F-49**	**SBC Error**
DTC	**C1220-00**	**Drive Motor Fault**

DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing the following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

1	**Replace EPS**

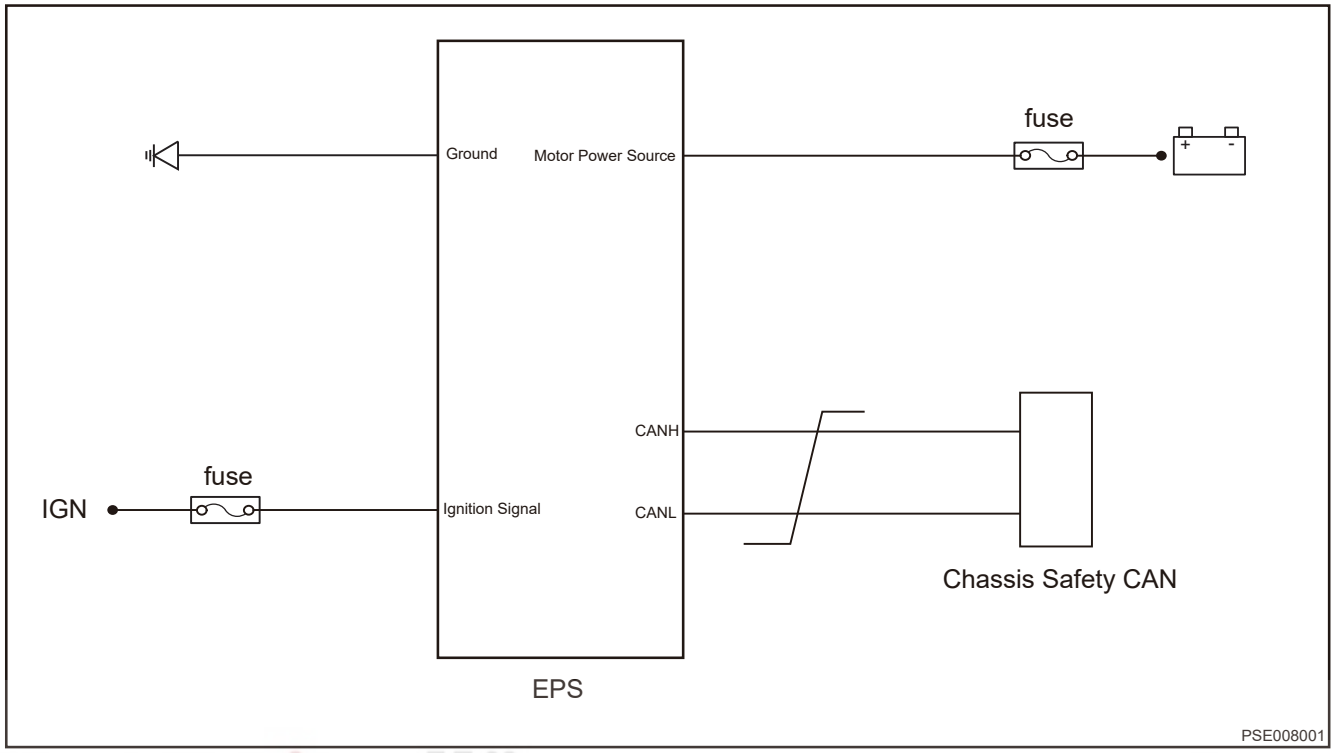
(a) Replace EPS.
(b) Connect diagnostic tester and clear DTCs.
(c) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
(d) Read the fault information and confirm that the fault has been solved.

NG → **Replace with a new ECU to check if fault reoccurs.**

OK → **Conduct test and confirm malfunction has been repaired.**

DTC	**C1214-1C**	**High Power Supply Voltage**
DTC	**C1214-17**	**Supply Voltage Too High**
DTC	**C1217-1C**	**Low Power Supply Voltage**
DTC	**C1217-16**	**Supply Voltage Too Low**

Control Schematic Diagram



DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing the following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check battery voltage**

(a) Check if battery voltage is normal.

(b) Check battery voltage with voltage band of multimeter.

NG → **Check and repair battery**

OK

2	**Check fuse**

(a) Turn ENGINE START STOP switch to OFF.

(b) Remove fuse from engine compartment fuse and relay.

(c) Check if fuse is blown.

NG → **Replace fuse**

OK

3	Check power supply voltage

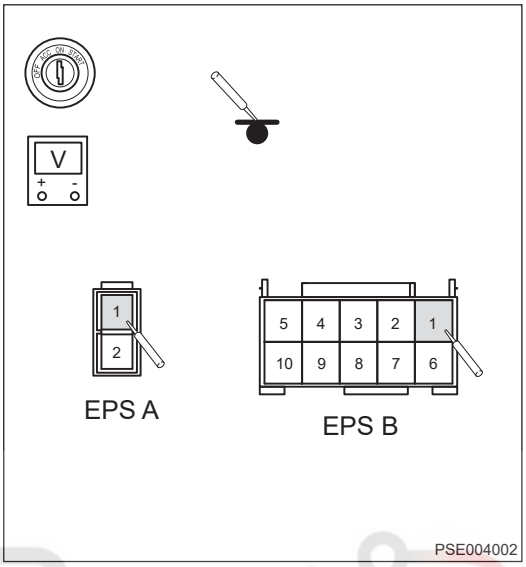
(a) Turn ignition switch to OFF.

(b) Disconnect the EPS signal connector and power supply connector.

(c) Turn ENGINE START STOP switch to ON.

(d) Perform the voltage inspection.

Multimeter Connection	Condition	Specified Condition
EPS signal connector (B1) - body ground	ENGINE START STOP switch ON	12-14V
EPS signal connector (A1) - body ground	ENGINE START STOP switch ON	12-14V



NG → **Repair or replace power supply wire harness**

OK

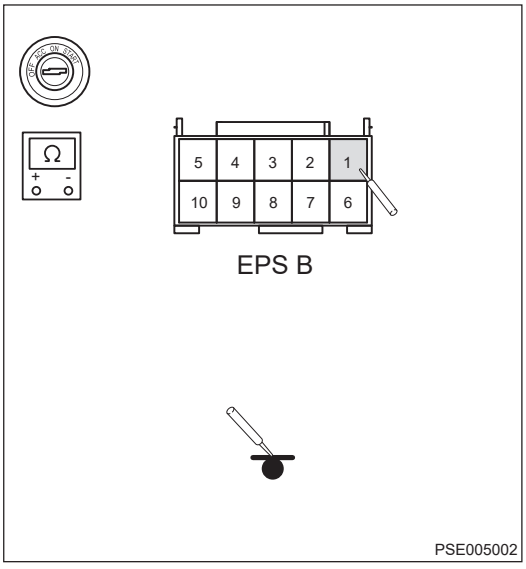
4	Check ground

(a) Turn ENGINE START STOP switch to OFF.

(b) Disconnect electronic power steering signal connector.

(c) Perform the resistance inspection

Multimeter Connection	Condition	Specified Condition
EPS signal connector (B1) - body ground	ENGINE START STOP switch “OFF”	⩽ 1 Ω



NG → **Repair or replace ground point**

OK

5	**Check wire harness and connector**

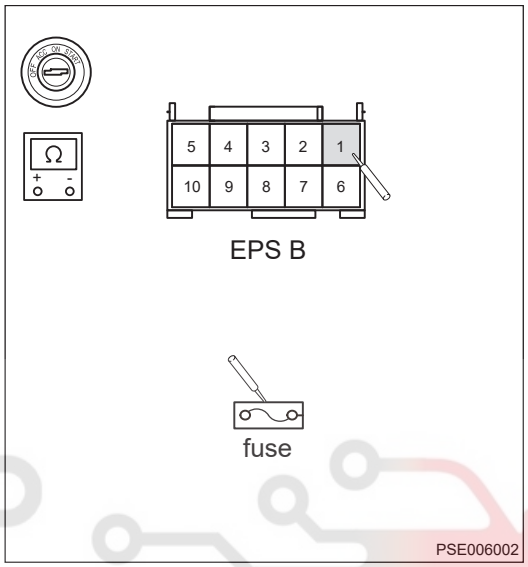
(a) Turn ENGINE START STOP switch to OFF.

(b) Disconnect the EPS signal connector and EPS power supply connector.

(c) Using ohm band of multimeter, check for continuity between EPS signal connector and instrument panel fuse and relay box fuse.

(d) Using ohm band of multimeter, check for continuity between EPS signal connector and engine compartment fuse and relay box fuse.

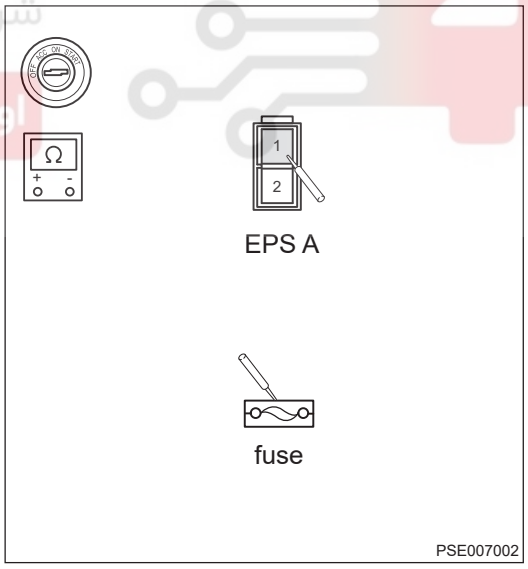
Multimeter Connection	Condition	Specified Condition
EPS signal connector (B1) - fuse	ENGINE START STOP switch “OFF”	⩽ 1 Ω
EPS signal connector (A1) - fuse	ENGINE START STOP switch “OFF”	⩽ 1 Ω



(e) Using ohm band of multimeter, check for continuity between EPS signal connector (B1) and body ground; and check for continuity between EPS power supply connector (A1) and body ground.

Check for short

Multimeter Connection	Condition	Specified Condition
EPS signal connector (B1) - ground	ENGINE START STOP switch “OFF”	∞
EPS power supply connector (A1) - ground	ENGINE START STOP switch “OFF”	∞



NG → **System operates normally**

OK → **Repair or replace control circuit wire harness and connector**

DTC	**C1218-4B**	**Over Temperature Reduction-Over Temperature**
DTC	**C121A-4B**	**Temperature Out Of Range-Over Temperature**

DTC Confirmation Procedure
Confirm that battery voltage is not less than 12 V before performing the following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:
When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Parked in the shade to dissipate heat**

(a) Parked in the shade to dissipate heat.

NG → **Replace EPS**

OK

2	**Reconfirm DTCs**

(a) Connect diagnostic tester and clear DTCs.
(b) Run the vehicle as specified procedure. The operating way should meet the conditions for corresponding fault diagnosis.
(c) Read the fault information and confirm that the fault has been solved.

NG → **Replace with a new ECU to check if fault reoccurs.**

OK → **Conduct test and confirm malfunction has been repaired.**

DTC	**U0073-88**	**CAN Bus Off**
DTC	**U0100-87**	**Lost Communication with EMS**
DTC	**U0129-87**	**Lost Communication with BSM**
DTC	**U1300-55**	**Software Configuration Error**
DTC	**U3000-51**	**Control Module Not Programmed**
DTC	**U0418-81**	**Invalid Data Received from BSM**

DTC Confirmation Procedure
Refer to CAN Network Malfunction Diagnosis.

STEERING WHEEL

Warnings and Precautions

Warnings

In order to avoid possible property loss, personal injury or death, always follow the instructions below before repair.

1. Be sure to read precautions for SRS airbag before removing steering wheel.
2. Be sure to read precautions for SRS airbag before removing multi-function switch.
3. Be sure to read precautions for SRS airbag before removing shift fork.

Precautions

In order to avoid dangerous operation and damage to the vehicle, always follow the instructions below before repair.

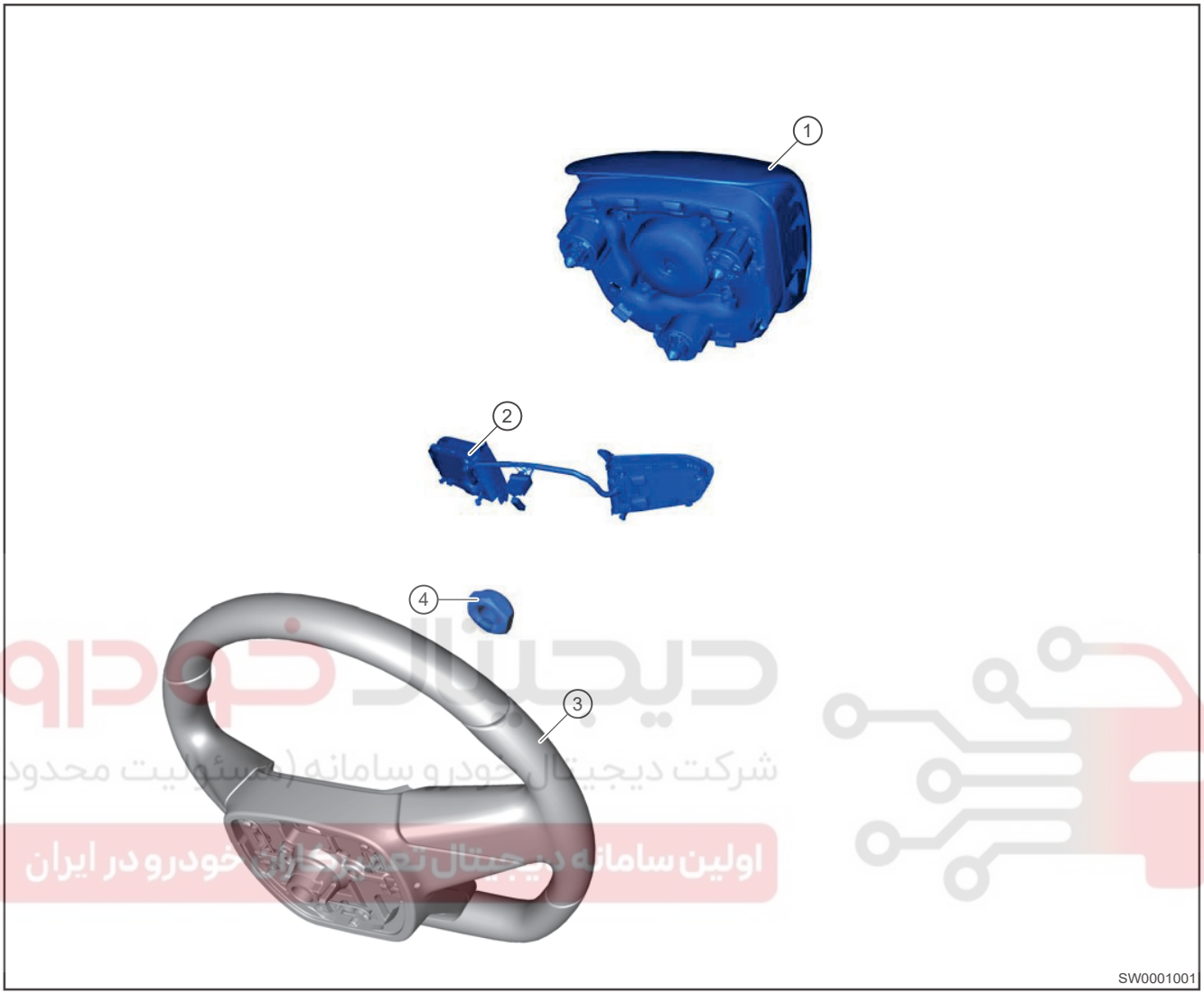
1. Wait at least 90 seconds after disconnecting the negative battery cable to prevent airbag and belt pretensioner from being activated.
2. Vehicle SAM angle sensor provides angle signal to ESP and other related controllers; Motor position sensor in EPS module provides steering angle signal for EPS; Therefore, after replacing electric steering column assembly, steering gear and performing four-wheel alignment, it is necessary to calibrate zero point of SAM steering angle and motor position sensor in EPS module.
3. When removing and installing steering system, suspension system, brake, tire, etc., it is necessary to turn off power supply of EPS (vehicle power supply is turned off), so as to avoid reverse impact, resulting in EPS internal protection circuit breakdown.

System Overview

System Description

Steering wheel is the device that driver controls the driving direction. Through the steering mechanism, steering wheel controls wheels to left and right to change driving direction or keep vehicle driving straight.

System Components Diagram

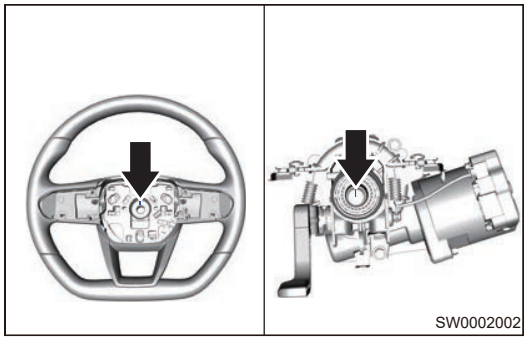


1	Driver Airbag	3	Steering Wheel Body
2	Steering Wheel Multi-function Switch	4	Steering Wheel Locking Nut

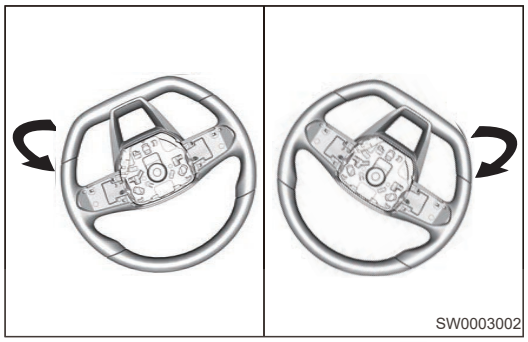
Assembly of Steering Wheel and Electric Steering Column

1. Align steering wheel scale mark with column scale mark, then turn steering wheel to extreme position, check steering wheel angle, and ensure the deviation of both rotation corners is ⩽10°. If the deviation is >10°, check them after checking one side.

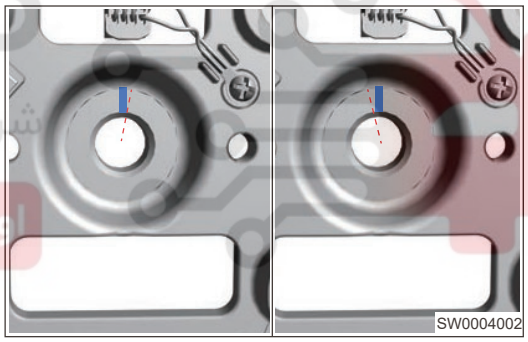
2. Align steering wheel scale mark with column scale mark.



3. Turn steering wheel to limit position, comparing the difference between rotation angles.



4. If visually measure that deviation is between 10° and 20°, pull the steering wheel and turn scale mark to other side of steering wheel.



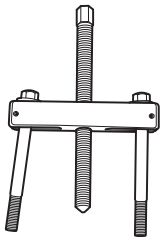
⚠ Caution

The scales of steering wheel and column can only assist in assembly, but it cannot be finally positioned, and check left and right strokes as acceptance standard for final position.

On-vehicle Service

Tool

Special Tool

Tool Name	Part No.	Tool Drawing
Steering Wheel Remover	ECH-0008	 RCH001406

Steering Wheel Assembly

Removal

⚠ Caution

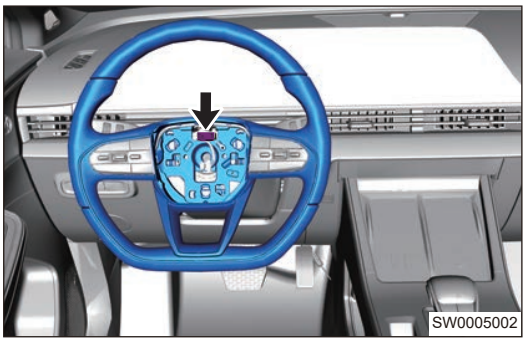
After removing steering wheel, install spiral cable stopper pin fixing combination switch.

1. Adjust steering wheel to the centered position (visually check tire is straight-ahead).
2. Turn ENGINE START STOP switch to OFF.
3. Disconnect the negative battery cable.

⚠ Caution

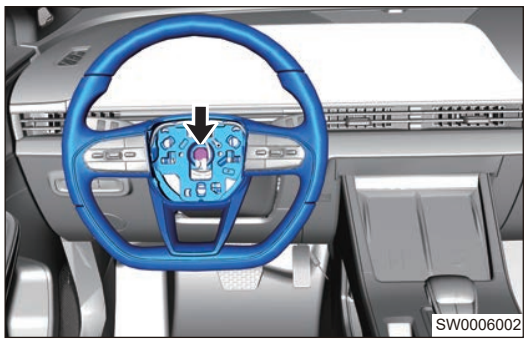
Wait at least 90 seconds after disconnecting the negative battery cable to prevent airbag and belt pretensioner from being activated.

4. Remove the driver airbag assembly.
5. Remove the steering wheel assembly.
   a. Disconnect the steering wheel quick button connector (arrow) and steering wheel heating connector (arrow).

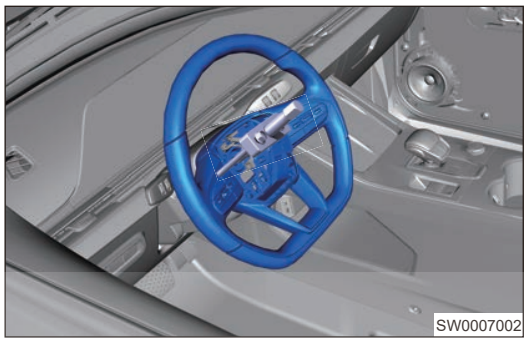

SW0005002

b. Remove the steering wheel locking nut.

Tightening torque: 30 ± 3 N·m



c. Use steering wheel remover to remove steering wheel.



d. Install spiral cable stopper pin fixing combination switch.

Inspection

Hint:

Steering wheel centering or steering performance are affected by manufacturing error, requirements for four wheels alignment toe-in and steering wheel centering are as following:

1. Confirm the left and right strokes of steering wheel after it is assembled.
2. Before performing four-wheel alignment, first rotate steering wheel to left and right to determine rotation angle of one side is not less than 45°, then returns to horizontal position.
3. Fix the steering wheel horizontally.
4. Use calibration device to complete center position calibration of steering wheel rotation angle (for calibration methods, refer to EPS steering angle calibration).
5. When adjusting front wheel toe-in, it is necessary to adjust steering gear left and right tie rods. Loosen locking nut of steering gear tie rod when adjusting, use wrench to rotate inner lever at hexagonal position of outer lever, until toe-in value reaches specified value, then tighten locking nut. If threads exposed outside on left and right levers are greatly not equal (difference between threads exposed outside on left and right levers are more than 3 threads), please recheck if steering wheel is centered. It is necessary to hold the flat and square position of outer lever with wrench while tightening. Tightening torque for nut is 55 ± 5 N·m.
6. After the four wheels alignment is completed and exiting the four wheels alignment station, turn the steering wheel to the limit position (make sure the steering wheel has hit the limit position) and return to the middle position, and the vehicle is turned off.

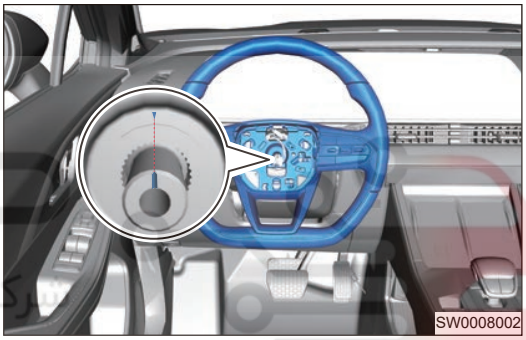
Installation

⚠ Caution

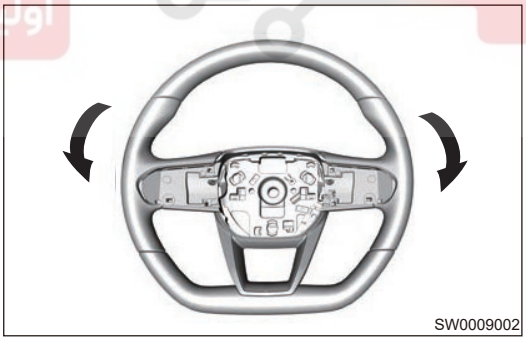
- During the assembly, the wiring harness of coil spring shall not be pressed by steering wheel or other components. After installation is finished, the wiring harness shall remain free;
- During the assembly, if steering wheel is not assembled and coil spring limit pin is pulled out, the coil spring must be adjusted to its original position before assembling the steering wheel (refer to the switch system assembly specification), otherwise the steering wheel cannot be assembled.
- After the installation is finished, it is necessary to check that all connectors have been inserted in place again and the switch harness is pressed into the slot;
- Multi-function switch function is normal.

1. Pull out the spiral cable stopper pin.
2. Visually check tire is straight-ahead (adjust steering wheel to the centered position).
3. Install the steering wheel.

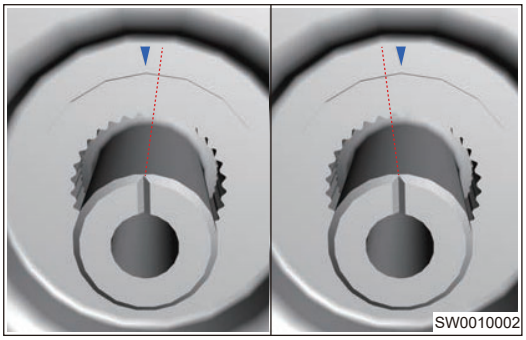
   a. Align scale marks on steering wheel and steering column to assemble.



   b. Turn steering wheel left and right to the limit position, and check steering wheel rotation angle.



   c. Visually check steering wheel rotation angle, and ensure the angle deviation on both sides is no more than 10°. If the deviation is more than 10°, check after adjusting one gear tooth.



4. Install the steering wheel locking nut.
   Tightening torque: 30 ± 3 N·m
5. Connect the steering wheel multi-function switch connector.
6. Install the driver airbag.

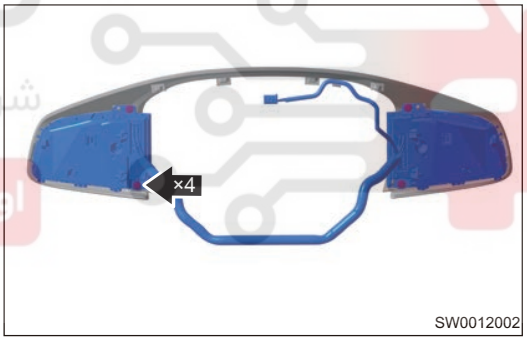
Steering Wheel Multi-function Switch

Removal

1. Remove the driver airbag.
2. Squeeze mounting board clips and steering wheel multi-function switch to push it out.


SW0011002

3. Remove 4 fixing screws between steering wheel multi-function switch and mounting board.



SW0012002

4. Remove the steering wheel multi-function switch.

Installation

1. Installation is in the reverse order of removal.

STEERING COLUMN

Warnings and Precautions

Precautions

In order to avoid dangerous operation and damage to the vehicle, always follow the instructions below before repair.

1. Wear glove during assembling steering column with intermediate shaft assembly, prevent hands are contacted with steering column, which may cause rust.
2. DO NOT hold steering column handle position, but steering column position; do not bump, strike steering column when taking, carrying or assembling it, prevent steering column from collapse.
3. Adjustment handle is in locking state after steering column is assembled, do not transfer to next station, prevent handle is knocked during operation, which may cause person damage or handle breakage.
4. DO NOT touch interior ornaments when removing steering column with intermediate shaft assembly to avoid scratching interior ornaments.
5. The zero point calibration of steering angle sensor must be carried out on four-wheel alignment station, otherwise the zero point calibration of steering angle sensor is not accurate, which will bring the risk of ESP alarm.
6. After installing steering column, perform software configuration and center calibration.
7. When removing and installing steering column, it is necessary to turn off power supply of EPS (vehicle power supply is turned off), so as to avoid reverse impact, resulting in EPS internal protection circuit breakdown.
8. It is necessary to perform steering angle sensor zero point calibration after replacing steering column.

Precautions

In order to avoid dangerous operation and damage to the vehicle, always follow the instructions below before repair.

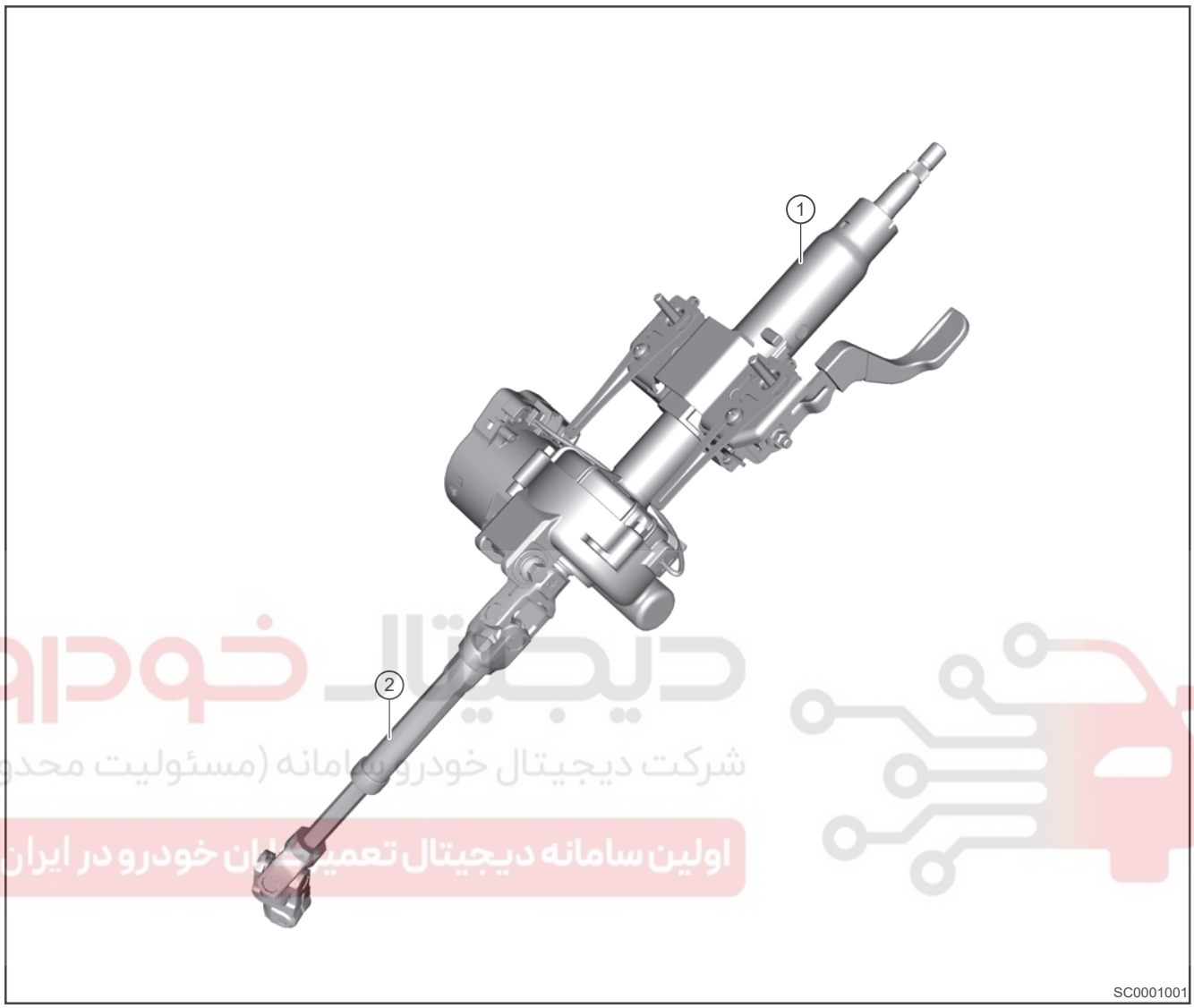
1. Wait at least 90 seconds after disconnecting the negative battery cable to prevent airbag and belt pretensioner from being activated.
2. Vehicle SAM angle sensor provides angle signal to ESP and other related controllers; Motor position sensor in EPS module provides steering angle signal for EPS; Therefore, after replacing electric steering column assembly, steering gear and performing four-wheel alignment, it is necessary to calibrate zero point of SAM steering angle and motor position sensor in EPS module.
3. When removing and installing steering system, suspension system, brake, tire, etc., it is necessary to turn off power supply of EPS (vehicle power supply is turned off), so as to avoid reverse impact, resulting in EPS internal protection circuit breakdown.

System Overview

System Description

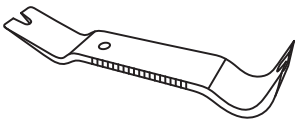
The steering column is the component of the steering system that connects the steering wheel and the steering gear. Through the steering column, the driver transfers torque to the steering gear, which drives the steering gear to achieve steering.

System Components Diagram



1	Electric Steering Column	2	Steering Intermediate Shaft

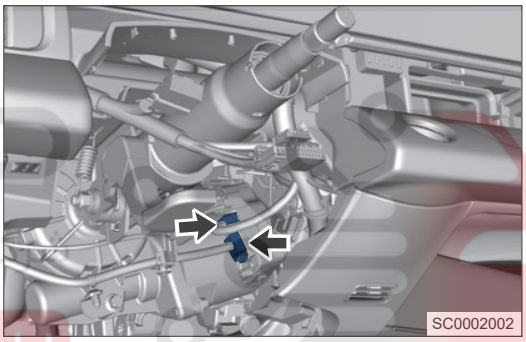
Tool

Tool Name	Tool Drawing
Interior Crow Plate	 S00020

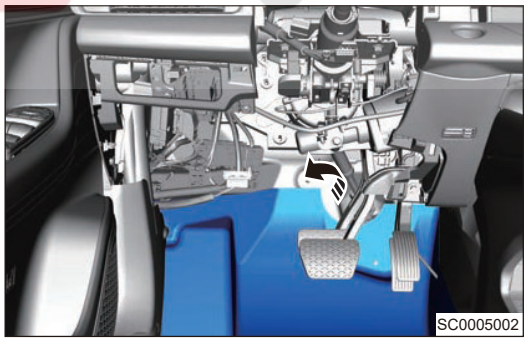
Replacement of Steering Column with Intermediate Shaft Assembly

Removal

1. Set the steering wheel to straight-ahead position.
2. Turn off all electrical equipment and ENGINE START STOP switch.
3. Disconnect the negative battery cable.
4. Remove the driver airbag assembly.
5. Remove the steering wheel assembly.
6. Remove the combination switch cover.
7. Remove the spiral cable.
8. Remove the light combination switch assembly.
9. Disconnect 2 connectors from EPS controller.

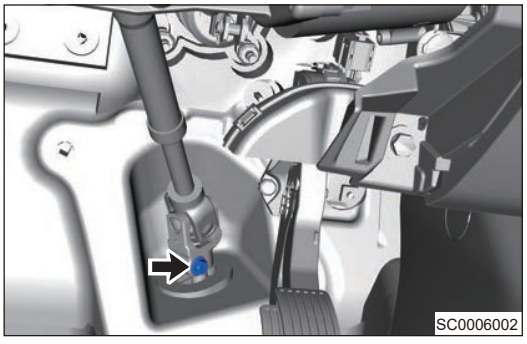


10. Turn over carpet under driver seat in the direction of arrow.



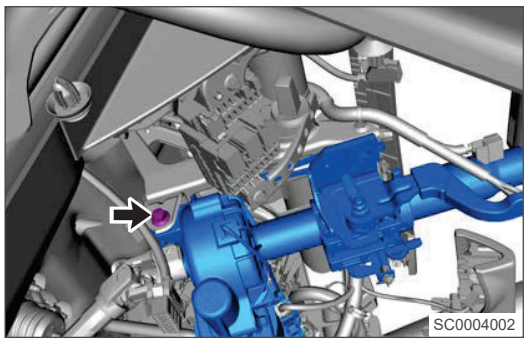
11. Remove coupling bolt between steering column with intermediate shaft assembly and steering gear input shaft.

    Tightening torque: 49 ± 3N·m



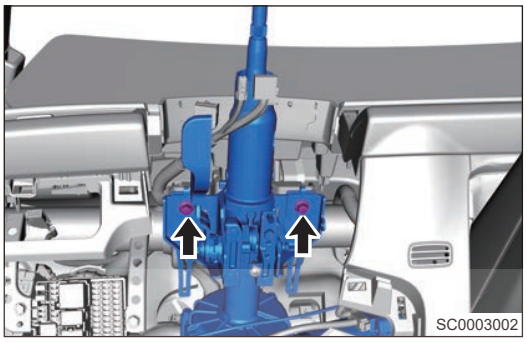
12. Remove fixing bolt from steering column lower bracket.

    Tightening torque: 50 ± 5N·m



13. Remove 2 fixing bolts from steering column upper bracket.

    Tightening torque: 25 ± 3N·m



14. Remove the steering column with intermediate shaft assembly.

Hint:

- Check steering column assembly for wear, crack or deformation. As welding or correction is not allowed, replace steering column assembly if necessary.
- Check steering column bearing for looseness, wear or sticking. Replace steering column assembly if necessary.

Installation

1. Installation is in the reverse order of removal.

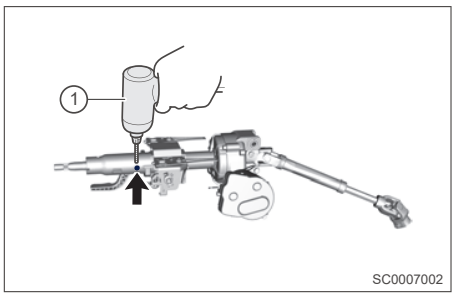
⚠ Caution

- Wear glove during assembling, prevent hands are contacted with steering column, which may cause rust.
- DO NOT hold steering column handle position, but steering column position; do not bump, strike steering column when taking, carrying or assembling it, prevent steering column from collapse.
- Do not loosen the steering column adjusting handle before tightening the upper support bolt to prevent the support from tipping over and not in place.
- Adjustment handle is in locking state after steering column is assembled, do not transfer to next station, prevent handle is knocked during operation, which may cause person damage or handle breakage.
- DO NOT touch interior ornaments when installing steering column with intermediate shaft assembly to avoid scratching interior ornaments.
- It is necessary to perform motor position sensor calibration after assembling.

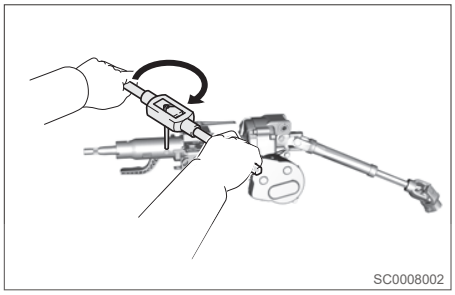
Disassembly

1. Remove the electronic steering column lock.

a. Using an electric drill (1), drill a hole on anti-theft bolt of electronic steering column lock.



b. Using a screw remover, remove anti-theft bolt of electronic steering column lock.



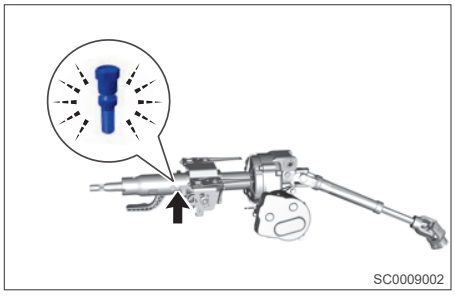
Inspection

1. Check steering column assembly for wear, crack or deformation. As welding or correction is not allowed, replace steering column assembly if necessary.
2. Check steering column bearing for looseness, wear or sticking. Replace steering column assembly if necessary.

Reassembly

1. Install the electronic steering column lock.

a. Install electronic steering column lock to steering column assembly with a new anti-theft bolt of electronic steering column lock and tighten anti-theft bolt until its head falls off.



STEERING GEAR

Warnings and Precautions

Precautions

In order to avoid dangerous operation and damage to the vehicle, always follow the instructions below before repair.

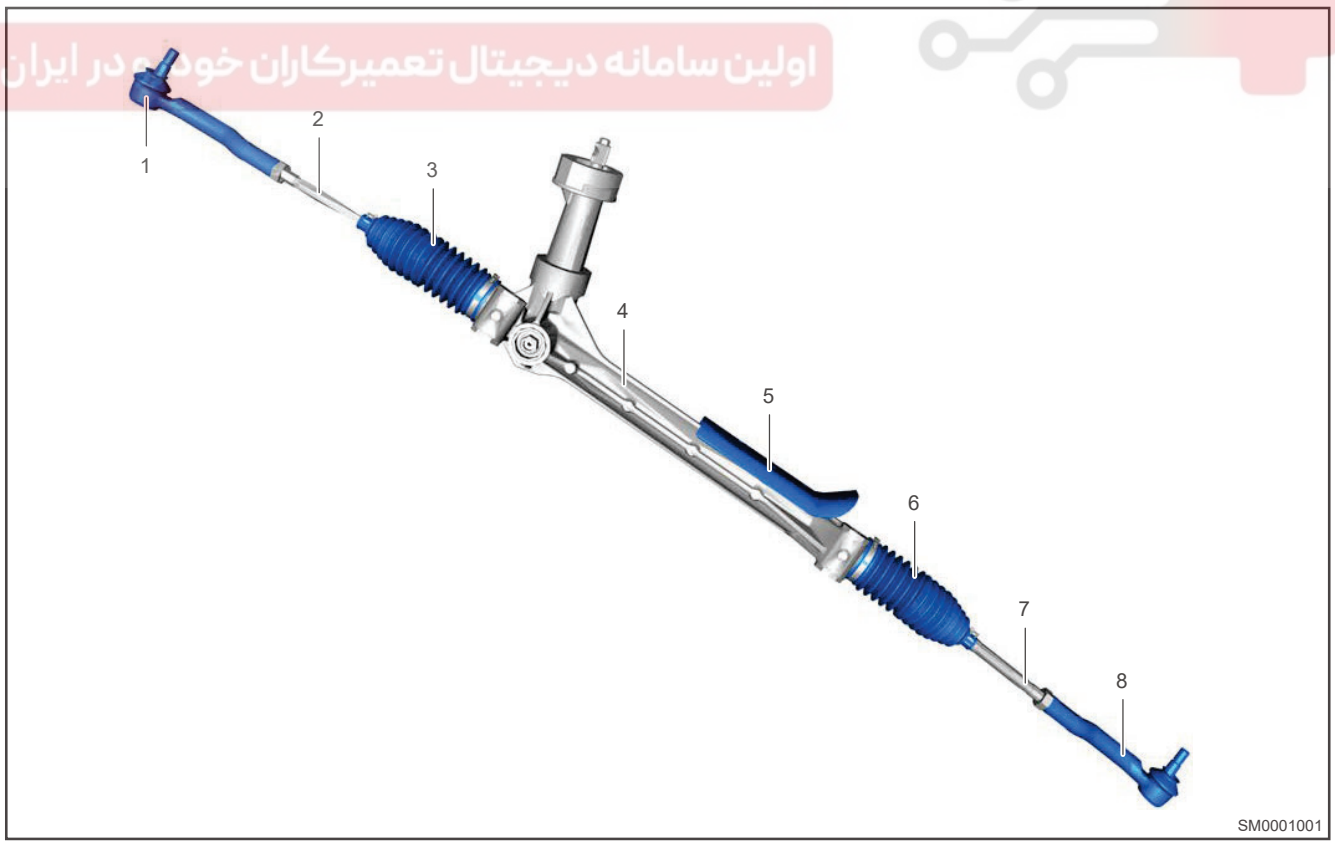
1. To replace steering gear, it is necessary to perform four-wheel alignment and center calibration.
2. After four-wheel alignment, it is necessary to recalibrate center calibration.
3. When removing and installing steering gear, it is necessary to turn off power supply of EPS (vehicle power supply is turned off), so as to avoid reverse impact, resulting in EPS internal protection circuit breakdown.
4. It is necessary to perform steering angle sensor zero point calibration after replacing steering gear.
5. When removing and installing steering system, suspension system, brake, tire, etc., it is necessary to turn off power supply of EPS (vehicle power supply is turned off), so as to avoid reverse impact, resulting in EPS internal protection circuit breakdown.

System Overview

System Description

This vehicle adopts the electronic power steering system, which can reduce the workload when driver operates the steering wheel, thus improving operation convenience and driving safety.

System Components Diagram



1	Left Steering Tie Rod Ball Pin	5	Steering Gear Heat Insulator
2	Left Steering Tie Rod Assembly	6	Right Steering Tie Rod Boot
3	Left Steering Tie Rod Boot	7	Right Steering Tie Rod Assembly
4	Steering Gear Assembly	8	Right Steering Tie Rod Ball Pin

Adjustment of Toe-in and Steering Wheel Angle

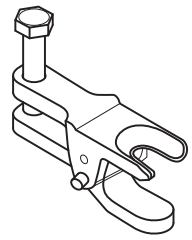
Hint:
Steering wheel centering or steering performance are affected by manufacturing error, requirements for four wheels alignment toe-in and steering wheel centering are as following:

1. Confirm the left and right strokes of steering wheel after it is assembled (Assembly method: Visually align steering column scale with steering wheel scale, then turn left and right to the limit position and check the corner. If the deviation is >10°, move it back by one gear tooth and control the steering deviation angle within the range of 10°. For details, see the assembly of steering wheel and electric steering column);
2. Before performing four-wheel alignment, first rotate steering wheel to left and right to determine rotation angle of one side is not less than 45°, then returns to horizontal position;
3. Fix the steering wheel horizontally;
4. Use calibration device to complete center position calibration of steering wheel rotation angle (for calibration methods, refer to EPS corner calibration);
5. When adjusting front wheel toe-in, it is necessary to adjust steering gear left and right tie rods. Loosen locking nut of steering gear tie rod when adjusting, use wrench to rotate inner lever in hexagonal position of outer lever, until toe-in value reaches specified value, then tighten locking nut. If threads exposed outside on left and right levers are greatly not equal (difference between left and right levers threads exposed outside are more than 3 threads), please recheck if steering wheel is centered. It is necessary to set outer lever flat square position with wrench while tightening, tighten torque of nut is 55 ± 5 Nm.
6. After the four wheels alignment is completed and exiting the four wheels alignment station, turn the steering wheel to the limit position (make sure the steering wheel has hit the limit position) and return to the middle position, and the vehicle is turned off.

On-vehicle Service

Tool

Special Tool

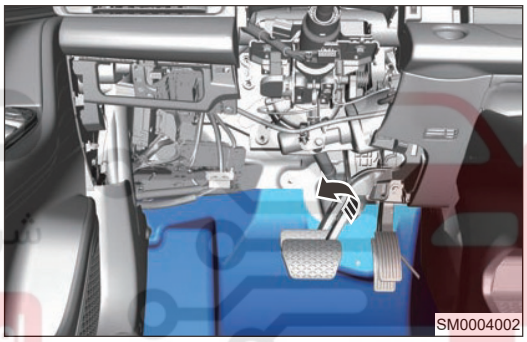
Tool Name	Part No.	Tool Drawing
Ball Separator	ECH-0003	 S00019

Replacement of Steering Gear Assembly

Removal

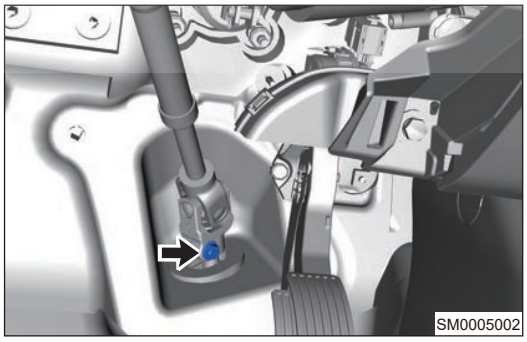
1. Set the front wheels to straight-ahead position.
2. Turn off all electrical equipment and ENGINE START STOP switch.
3. Disconnect the negative battery cable.
4. Remove front left and front right wheels.
5. Remove the engine lower protector.
6. Remove front left and front right control arm assemblies.
7. Remove the front left and front right side rail assembly.
8. Remove coupling bolt between steering column with intermediate shaft assembly and steering gear input shaft.

   a. Turn over carpet under driver seat in the direction of arrow.



   b. Remove coupling bolt (arrow) between steering column with intermediate shaft assembly and steering gear input shaft.

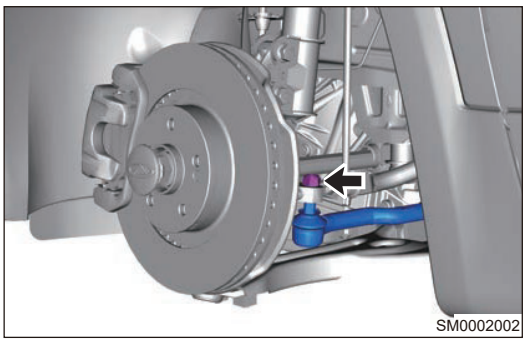
   Tightening torque: 49 ± 3 N·m



9. Remove the tie rod ball pin.

a. Remove coupling nut (arrow) between left steering tie rod ball pin assembly and front left steering knuckle assembly.

Tightening torque: 45 ± 5 N·m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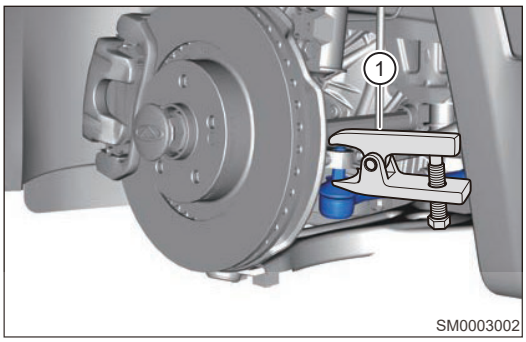
b. Install ball pin separator (1), and separate steering tie rod ball pin from steering knuckle assembly.



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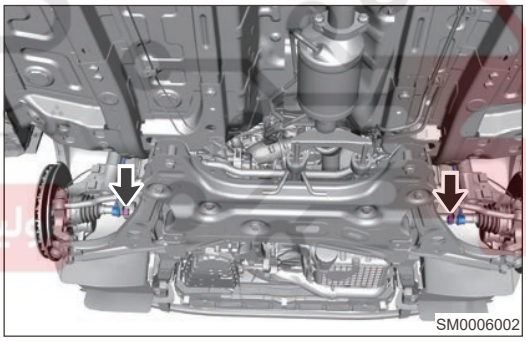
10. Remove 2 locking nuts (arrow) between connecting rod and front stabilizer bar.

Tightening torque: 60 ± 6 N·m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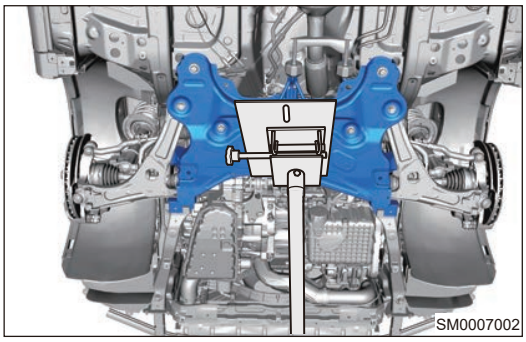
11. Using a transmission carrier, support front sub frame welding assembly.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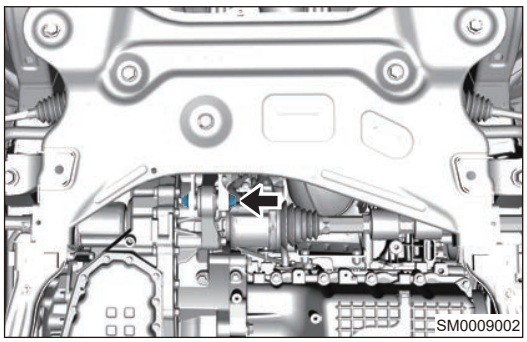
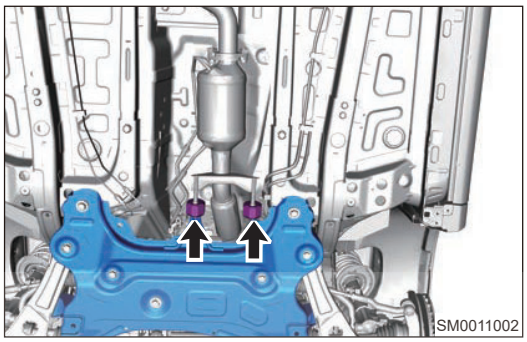
12. Remove the coupling bolt and nut (arrow) between rear mounting cushion assembly upper body and rear mounting cushion assembly lower body.

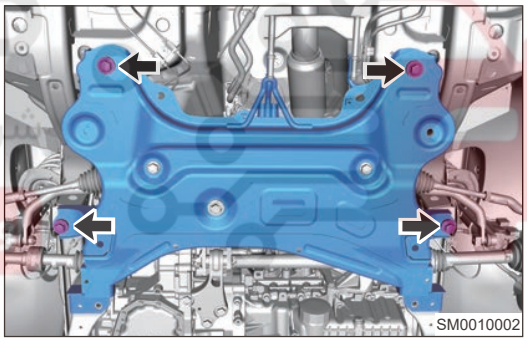


13. Detach exhaust pipe fixing rubber lugs (arrow) from front sub frame welding assembly.



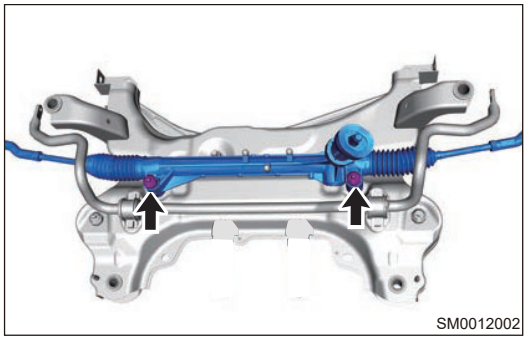
14. Remove 4 fixing bolts (arrow) between sub frame and vehicle body, and lower sub frame slowly.

Tightening torque: 180 ± 18 N·m



15. Remove 2 fixing bolts of steering gear assembly from sub frame, and remove steering gear assembly.

Tightening torque: (110 ±8) Nm+ (240 ±5) °



Inspection

1. Check if steering gear dust boot is damaged, clamp is loose. Replace them if necessary to prevent water and micro dust from entering and causing parts failure prematurely.
2. Check if steering gear is damaged. Replace the steering gear assembly if necessary.

Installation

1. Installation is in the reverse order of removal.

⚠ Caution

- Install coupling bolt between steering column lower joint and steering gear input shaft securely.
- After installing steering gear assembly, perform front wheel alignment procedure.

FOUR-WHEEL ALIGNMENT

Warnings and Precautions

Precautions

In order to avoid dangerous operation and damage to the vehicle, always follow the instructions below before repair.

1. Be sure to perform wheel alignment procedures according to operating instructions of four-wheel alignment device.
2. Periodic maintenance and service for four-wheel alignment device should be performed.
3. After four-wheel alignment, it is necessary to recalibrate center calibration.
4. After four-wheel alignment, it is necessary to calibrate the zero point of SAM steering angle and the motor position sensor inside EPS module.

System Overview

System Description

Installation of four wheels, steering mechanism, front and rear axles should have a certain relative position, and this relative position is a standard value set by manufacturer. This mounting position is adjusted and restored by wheel alignment.
In general, wheel alignment has the following 6 parameters:

1. Check front wheel camber.
2. Check front wheel toe-in.
3. Check kingpin caster.
4. Check kingpin inclination.
5. Check rear wheel camber.
6. Check rear wheel toe-in.

Parameter Operation Description

System Function Introduction

Front wheel alignment includes kingpin caster, kingpin inclination, front wheel camber and front wheel toe-in. Rear wheel alignment includes wheel camber and each rear wheel toe-in. In this way, front wheel alignment and rear wheel alignment are called wheel alignment, which is often called four-wheel alignment. Wheel alignment functions to keep vehicle driving in stable straight line and light steering, and reduce wear of tires and steering gear parts during driving.

Kingpin Caster

Looking at wheel from side, steering kingpin (the center of rotation when the wheel turns) tilts backward, which is called kingpin caster. After setting kingpin caster, there is a distance (called kingpin caster distance, which has the same principle with that of front wheel cross beam of bicycle tilting backward) between ground point of kingpin center line and ground projection point of wheel center. The ground point of wheel is located at rear end of extension line of steering kingpin, and wheel is pulled backward by rolling resistance during driving, so that the direction of wheel is naturally toward driving direction. Setting a large kingpin caster can improve straight line driving performance, and kingpin caster distance is also increased. If kingpin caster distance is too large, steering wheel will be heavy and wheel bumps will be increased due to road interference.

Kingpin Inclination

When looking at the tire from front and rear direction of vehicle, kingpin is inclined toward the inside of vehicle body. This angle is called kingpin inclination. When wheel turns around kingpin, the lowest point of wheel will fall below road surface, but in fact, the lower edge of wheel cannot fall below road surface. Instead, the steering vehicle wheel and entire front of vehicle are lifted up to a corresponding height. The gravity of vehicle has effect of returning steering vehicle wheels to original middle position, so steering wheel is easy to reset.
In addition, kingpin inclination also reduces the distance between intersection of kingpin and road to intersection of wheel center plane and ground, thereby reducing driver's force on steering wheel during steering, making steering easier and reducing the impact force transmitted from steering vehicle wheel to steering wheel. However, kingpin inclination should not be too large, otherwise it will accelerate tire wear.

Front Wheel Camber

When looking at wheel from front and rear direction, tires are not installed vertically, but slightly tilted to show an "八" shape, which is called negative camber, and when it is tilted in opposite direction, it is called positive camber. In heyday of using bias tires, camber was set to be relatively large because it made it easier to operate the steering wheel by tilting the tires to the ground. Vehicle generally sets camber to be very small, close to vertical. The use of flat radial tires for automobiles continues to grow in popularity. Due to characteristics of radial tires (large rigid tire tread pattern and wide outer tread), setting a large camber will cause tire to wear out and reduce tire friction. Also, due to continuous use of power steering mechanism, camber has been continuously reduced. Nevertheless, setting a small camber can apply appropriate lateral thrust to wheel bearings on axle.

Front Wheel Toe-in

Four-wheel alignment toe value
Toe-in, the so-called "pigeon toe", refers to the front left and front right wheels being pointed inward respectively. The purpose of adopting this structure is to correct outward rotation of wheel caused by front wheel camber. As mentioned above, due to camber, the steering wheel operation becomes more easy. On the other hand, due to the tilt of wheels, front left and front right wheels rotate to outside respectively. To correct this problem, the left and right wheels have an inward angle, thus left and right wheels can keep moving in a straight line and reducing tire wear.

Specifications (Parameters Standard for Four-wheel Alignment)

Multi-link Independent Suspension Four-wheel Alignment Parameters

Item		Specified Value
Front Wheel	Front Wheel Camber	-25′ ± 45′
	Kingpin Caster	4°14′ ± 60′
	Kingpin Inclination	11°30′ ± 60′
	Front Wheel Toe-in	5′ ± 5′ (one side)
Rear Wheel	Rear Wheel Camber	-42′ ± 30′
	Rear Wheel Toe-in	5′ ± 10′ (one side)
Sideways Sliding		⩽ 3 m/km

Torsion Beam Semi-independent Suspension Four-wheel Alignment Parameters

Item		Specified Value
Front Wheel	Front Wheel Camber	-25′ ± 45′

	Kingpin Caster	4°14′ ± 60′
	Kingpin Inclination	11°30′ ± 60′
	Front Wheel Toe-in	5′ ± 5′ (one side)
Rear Wheel	Rear Wheel Camber	-1°20′ ± 30′
	Rear Wheel Toe-in	10′ ± 20′ (one side)
Sideways Sliding		⩽ 3 m/km

Diagnostic Information and Steps

Problem Symptoms Table

Hint:
Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair or adjust faulty components, or replace it as necessary.

Symptom	Suspected Area
Vehicle pulls	Front wheel alignment (incorrect)
	Rear wheel alignment (incorrect)
Wheel shimmy	Front wheel alignment (incorrect)
	Rear wheel alignment (incorrect)
Abnormal tire wear	Tire (worn or improperly inflated)
	Front wheel alignment (incorrect)
	Rear wheel alignment (incorrect)

On-vehicle Inspection

Four-wheel Alignment

Inspection before Wheel Alignment
If following components have been removed, installed or replaced, check and perform wheel alignment procedures:

- Front control arm assembly
- Front control arm ball pin assembly
- Front steering knuckle
- Front shock absorber assembly
- Steering gear and steering tie rod
- Drive shaft
- Front sub frame welding assembly
- Rear torsion beam welding assembly

1. Vehicle is in unloaded state.
2. Use a lift to support and raise vehicle to a proper height.
3. Check hub bearing for excessive clearance, and replace hub bearing as necessary.

4. Check suspension components, steering tie rod and ball pin for wear, deformation or damage. Replace malfunctioning parts as necessary.
5. Check shock absorber assembly for proper operation.
6. Check if tire pressure is within specified range and adjust it to specified pressure as necessary.

Item	Front Wheel	Rear Wheel	Spare Tire
Tire Pressure (kPa) (Unloaded)	220	220	420

7. Check the rim and tire.
   a. Visually check rim and tire for scratches, wear or damage.
   b. Perform wheel dynamic balance procedures.

Front Wheel Camber

1. Incorrect front wheel camber will cause abnormal tire wear. Check and adjust front wheel camber as necessary.
   In normal conditions, it is not necessary to adjust camber after assembling the independent suspension and wheel steering knuckle. If wheel camber is not within the tolerance due to other reasons, adjust through the coupling bolt between independent suspension and steering knuckle.
   Specified Value for Front Wheel Camber:

Item	Parameter
Front Wheel Camber	-25′ ± 45′

Inspection

1. Visually check driving system components for deformation and damage before adjustment. Replace deformed or damaged components as necessary.
2. Install wheel alignment device onto front wheel, and perform inspection procedures according to operating instructions for wheel alignment device.

Front Wheel Toe-in

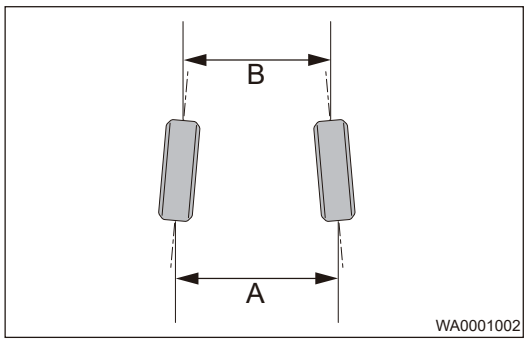
1. Incorrect front wheel toe-in will cause wheel pull and abnormal tire wear. Check and adjust front wheel toe-in as necessary.
   If front wheel toe-in is not within the tolerance due to other reasons, adjust the length of steering tie rod to return the toe-in to specified value.
   Specified Value for Front Wheel Toe-in:

Item	Parameter
Front Wheel Toe-in	5′ ± 5′ (one side)

Inspection

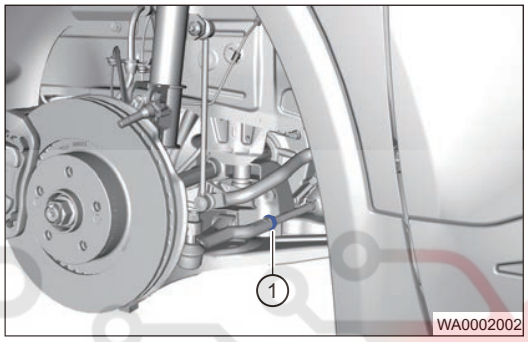
1. Perform inspection with four-wheel alignment device (perform inspection procedures referring to operating instructions for four-wheel alignment device).
2. Manual check:
   a. Park vehicle on level ground, check if front tire pressure is within the specified range and adjust it to specified value as necessary.
   b. Place marks on center position in front of front wheels, and measure distance A between marks with a tape measure.
   c. Push vehicle to rotate wheels 180°, and measure distance B between marks with a tape measure when marks are turned to rear of wheels.

d. Calculation method: Front wheel toe-in = A - B ⩽ 1 mm.



Adjustment

1. Make adjusting preparation for wheel alignment according to requirement of tester.
2. Loosen the locking nut (1) of steering tie rod, and turn the tie rod to adjust the length as required until front wheel toe-in reaches the specified value.



3. Tighten the steering tie rod locking nut and reinstall the elastic jacket snap ring. Check if locking nut is tightened in place and if jacket position is correct.
   Tightening torque: 55 ± 5 N·m

⚠ Caution
• If elasticity of elastic jacket snap ring is not enough, replace it.

4. After adjusting front wheel toe-in, check steering wheel for eccentricity. If necessary, loosen the steering wheel locking nut and adjust the steering wheel to horizontal position, and then tighten the steering wheel locking nut to specified torque.
   Tightening torque: 48 ± 4 N·m

Kingpin Caster & Kingpin Inclination

1. Kingpin caster and kingpin inclination can only be checked by using four-wheel alignment device.

   Kingpin caster and kingpin inclination are assured by design structure and cannot be adjusted.

   If measured value is not within the specified range, check if other components connected to steering knuckle are deformed or damaged. In addition, check the connecting part of steering knuckle for deformation or damage.

   If so, replace corresponding components.

   Specified Value for Kingpin Caster & Kingpin Inclination:

Item	Parameter
Kingpin Caster	4°14′ ± 60′
Kingpin Inclination	11°30′ ±60′

Rear Wheel Camber (Rear Independent Suspension)

1. Incorrect rear wheel camber will cause wheel pull and abnormal tire wear. Check and adjust rear wheel camber as necessary.

   If rear wheel camber is not within the tolerance due to other reasons, adjust eccentric adjusting bolt and eccentric adjusting shim between rear lower control arm assembly and rear sub frame welding assembly to return the camber to specified value.

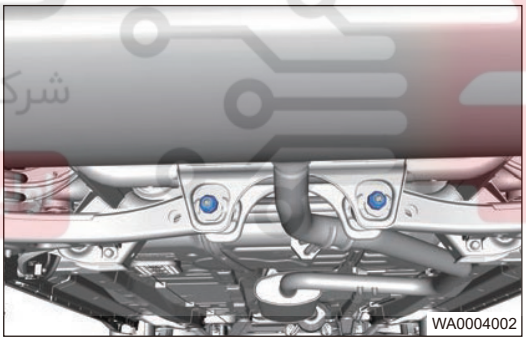
   If rear wheel camber is not as specified, check rear suspension and wheels for damage or deformation. Replace damaged or deformed components as necessary.

   Specified Value for Rear Wheel Camber:

Item	Parameter
Rear Wheel Camber	-42′ ± 30′

Adjustment

1. Make adjusting preparation for wheel alignment according to requirement of tester.
2. Loosen the coupling bolts between rear lower control arm assembly and rear sub frame welding assembly, be careful that eccentric adjusting shim does not detach from groove.



3. Rotate the eccentric adjusting shim and eccentric adjusting bolt to adjust rear wheel camber to specified value.
4. Tighten the coupling bolts between rear lower control arm assembly and rear sub frame welding assembly to specified torque after adjustment (adjusting method of left and right wheels is the same).

   Tightening torque: 115 ± 23N·m

Rear Wheel Camber (Rear Torsion Suspension)

1. Rear wheel camber and rear wheel toe-in are assured by design structure and cannot be adjusted. If measured value is not within the specified range, check if rear suspension components are deformed or damaged. Replace it as necessary. If the rear shaft assembly is deformed due to a very large impact force and the rear wheel positioning parameters change and are beyond the specified range, the rear shaft assembly must be replaced.

Item	Parameter
Rear Wheel Camber	-1°20′ ± 30′

Rear Wheel Toe-in

1. Incorrect rear wheel toe-in will cause wheel pull and abnormal tire wear. Check and adjust rear wheel toe-in as necessary.

   If rear wheel toe-in is not within the tolerance due to other reasons, adjust eccentric adjusting bolt and eccentric adjusting shim between tie rod assembly and rear sub frame welding assembly to return the toe-in to specified value.

   If rear wheel toe-in is not as specified, check rear suspension and wheels for damage or deformation. Replace damaged or deformed components as necessary.

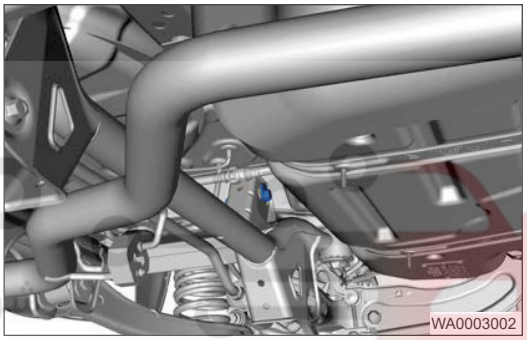
   Specified Value for Rear Wheel Toe-in:

Item	Parameter
Rear Wheel Toe-in	5′ ± 10′ (one side)

Adjustment

1. Make adjusting preparation for wheel alignment according to requirement of tester.

2. Loosen the coupling bolts between tie rod assembly and rear sub frame welding assembly, be careful that eccentric adjusting shim does not detach from groove.



3. Rotate the eccentric adjusting bolt and eccentric adjusting sleeve to adjust rear wheel toe-in to specified value.

4. Tighten the coupling bolts between tie rod assembly and rear sub frame welding assembly to specified torque after adjustment (adjusting method of left and right wheels is the same).

   Tightening torque: 115 ± 23N·m

⚠ Caution

- It is mainly ensured by the design that the torsion beam semi-independent suspension does not need to be adjusted during use.