



SB-10056302-8220 Technical Service Bulletin

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| SUBJECT: ELECTRIC POWER STEERING MOTOR SERVICE PROCEDURES – SERVICE MANUAL REVISION | | | No: TSB-14-37-003 |
| | | | DATE: June, 2014 |
| | | | MODEL: 2011-14 Outlander Sport/RVR |
| CIRCULATE TO: | <input type="checkbox"/> GENERAL MANAGER | <input checked="" type="checkbox"/> PARTS MANAGER | <input checked="" type="checkbox"/> TECHNICIAN |
| <input checked="" type="checkbox"/> SERVICE ADVISOR | <input checked="" type="checkbox"/> SERVICE MANAGER | <input checked="" type="checkbox"/> WARRANTY PROCESSOR | <input type="checkbox"/> SALES MANAGER |

PURPOSE

This TSB updates the service procedures for the electric power steering (EPS) motor including adding a procedure for EPS motor replacement.

AFFECTED VEHICLES

2011-14 Outlander Sport/RVR

AFFECTED SERVICE MANUALS

2011 -2014 Outlander Sport/RVR service manual, Group 37 – Electric Power Steering (EPS)

- Sealant
- Power Steering Diagnosis -> Diagnostic Trouble Code Procedures
 - Code No. C1530 – Motor FET driver
 - Code No. C1531 – Motor current too low
 - Code No. C1532 – Motor output current too large
 - Code No. C1533 – Motor terminal initial voltage
 - Code No. C1534 – Motor terminal monitor voltage
 - Code No. C1535 – Motor output current
 - Code No. C1536 – Motor terminal voltage abnormality (high voltage)
- Steering Column Shaft Assembly -> Disassembly and Assembly
- Steering Column Shaft Assembly -> Inspection

Please make the indicated addition to the 2011 –2014 Outlander Sport/RVR service manual, Group 37 – Electric Power Steering (EPS) -> Sealant

SERVICE SPECIFICATIONS

M1372000302133

| Item | | Standard value | Limit |
|---|-------------------------|-------------------------|------------------|
| Steering wheel free play mm (in) | Engine stopped | – | 30 (1.2) or less |
| | Engine running | 16.5 (0.65) or less | – |
| Steering angle | Inner wheel | 38° 50' ± 1° 30' | – |
| | Outer wheel (reference) | 32° 20' | – |
| Tie rod end ball joint rotation torque N·m (in-lb) | | 3.92 (35) or less | – |
| Stationary steering force N (lb) | Steering force | 27 (6.1) or less | – |
| | Fluctuation band | 5.9 (1.33) or less | – |
| Steering column shaft total rotation torque N·m (in-lb) | Total rotational torque | 1.77 (16) or less | – |
| | Torque fluctuation | 0.6 (5) or less | – |
| Pinion total rotation torque N·m (in-lb) | Total rotational torque | 0.7 – 1.3 (7 – 11) | – |
| | Torque fluctuation | 0.7 (6) or less | – |
| Band crimped value mm (in) | | 2.4 – 2.8 (0.10 – 0.11) | – |

NOTE: *: Difference between right and left wheels must be 2°00' or less

LUBRICANT

M1372000401074

| Item | Specified lubricant | Quantity |
|-----------------|---------------------|-------------|
| Tie-rod bellows | Silicone grease | As required |

<Added>

SEALANT

M1372000500885

| Item | Specified sealant | Quantity |
|----------------------------|------------------------------------|-------------|
| Serrations of the motor | Motor grease | 0.4 g |
| Tie-rod bellows outer side | 3M™ AAD Part No.8663 or equivalent | As required |

POWER STEERING DIAGNOSIS

DIAGNOSIS TROUBLESHOOTING FLOW

M1372007300309

Refer to GROUP 00 – Troubleshooting Contents .

DIAGNOSTIC FUNCTION

M1372007400083

HOW TO CONNECT THE SCAN TOOL (M.U.T.-III)

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)

Please make the indicated changes to the 2011 –2014 Outlander Sport/RVR service manual, Group 37 – Electric Power Steering (EPS) –>

Power Steering Diagnosis –> Diagnostic Trouble Code Procedures:

Code No. C1530 – Motor FET driver, Code No. C1531 – Motor current too low, Code No. C1532 – Motor output current too large, Code No. C1533 – Motor terminal initial voltage, Code No. C1534 – Motor terminal monitor voltage, Code No. C1535 – Motor output current
Code No. C1536 – Motor terminal voltage abnormality (high voltage)

EPS-ECU connector terminal No.12 and the body ground point for damage or other problem.

YES : Go to Step 8.
NO : Go to Step 6.

Q: Is the wiring harness in good condition?

YES : Go to Step 5.
NO : Go to Step 7.

STEP 5. Using scan tool MB991958, check the data list

Check the following data list.

- Item No. 04: Motor current
- Item No. 05: Motor current (target)
- Item No. 16: Motor current (unlimited target)
- Item No. 17: Motor electric angle
- Item No. 18: Motor speed
- Item No. 19: Motor voltage
- Item No. 25: Motor relay
- Item No. A12: Motor current (target): rec.A1
- Item No. A13: Motor cur. (unltd target): rec.A1
- Item No. A14: Motor current: rec.A1
- Item No. A22: Motor current (target): rec.A2
- Item No. A23: Motor cur. (unltd target): rec.A2
- Item No. A24: Motor current: rec.A2
- Item No. A32: Motor current (target): rec.A3
- Item No. A33: Motor cur. (unltd target): rec.A3
- Item No. A34: Motor current: rec.A3
- Item No. A42: Motor current (target): rec.A4
- Item No. A43: Motor cur. (unltd target): rec.A4
- Item No. A44: Motor current: rec.A4
- Item No. A52: Motor current (target): rec.A5
- Item No. A53: Motor cur. (unltd target): rec.A5
- Item No. A54: Motor current: rec.A5
- Item No. B12: Power relay voltage: rec V1
- Item No. B22: Power relay voltage: rec V2
- Item No. B32: Power relay voltage: rec V3
- Item No. B42: Power relay voltage: rec V4
- Item No. B52: Power relay voltage: rec V5

Q: Is the check result normal?

STEP 6. Check whether the DTC is stored again.

- (1) Erase the DTC.
- (2) Turn the ignition switch from the "LOCK" (OFF) position to the "ON" position.
- (3) Check if the DTC is stored.

Q: Is DTC C1530, C1531, C1532, C1533, C1534, C1535 or C1536 stored?

YES : Replace the EPS-ECU. Then go to Step 7.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 7. Check whether the DTC is stored again.

- (1) Erase the DTC.
- (2) Turn the ignition switch from the "LOCK" (OFF) position to the "ON" position.
- (3) Check if the DTC is stored.

Q: Is DTC C1530, C1531, C1532, C1533, C1534, C1535 or C1536 stored?

YES : **Replace the steering column shaft assembly** <Old> Then go to Step 8.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

Replace the motor. <New>

STEP 8. Check whether the DTC is stored again.

- (1) Erase the DTC.
- (2) Turn the ignition switch from the "LOCK" (OFF) position to the "ON" position.
- (3) Check if the DTC is stored.

Q: Is DTC C1530, C1531, C1532, C1533, C1534, C1535 or C1536 stored?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C1540 Power supply voltage abnormality (high voltage)

CAUTION

- If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).
- Whenever ECU is replaced, ensure that the CAN bus lines are normal.

OPERATION

Power is supplied to the EPS-ECU from the battery or the ignition switch.

FUNCTION

To control the steering column shaft assembly, the battery voltage is supplied to the EPS-ECU.

TROUBLE JUDGEMENT

Judgement Criterion

The power supply monitor voltage does not meet a predetermined voltage stored in the microcomputer, and the microcomputer determines that there is a problem in the power supply system.

Please make the additions indicated on pages 4-6 to the 2011 -2014 Outlander Sport/RVR service manual, Group 37 - Electric Power Steering (EPS) -> Steering Column Shaft Assembly -> Disassembly and Assembly

<Added>

EPS MOTOR

REMOVAL AND INSTALLATION

M1372022000037

⚠ CAUTION

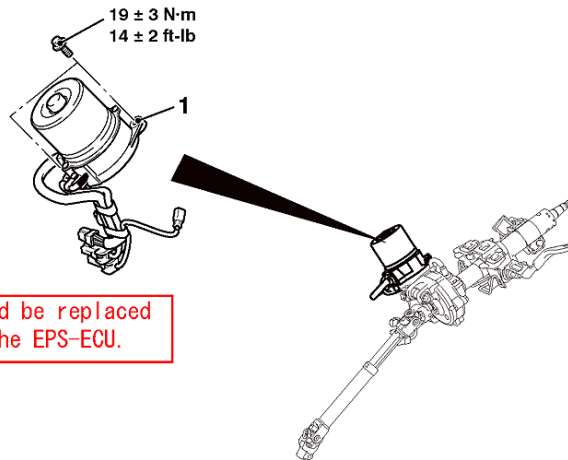
- Do not reuse the product that has been dropped because its internal components may be defective even if it has no apparent damage.
- Always keep motor away from the matter that generates magnetic force.
- Handle carefully to prevent binding or damage of the wiring harness.

Pre-removal Operation

Steering Column Shaft Assembly Removal (Refer to).

Post-installation Operation

Steering Column Shaft Assembly Installation (Refer to).



<Added>

- The motor should be replaced together with the EPS-ECU.

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1.

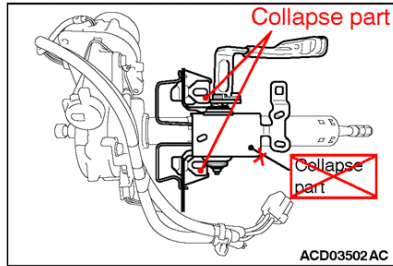
Removal
Motor

<Added>

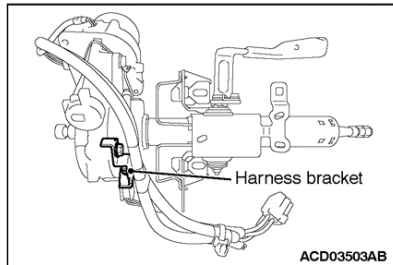
REMOVAL SERVICE POINT

<<A>> MOTOR REMOVAL

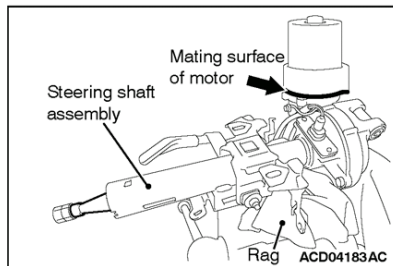
CAUTION



Do not remove the collapse part (shown in the illustration).



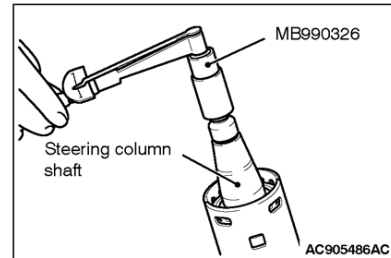
1. Remove the wiring harness bracket.
2. Remove the wiring harness.



3. Clamp the worm housing of the steering shaft assembly in a vice.

NOTE:

- While clamping, be sure to keep the mating surface of the motor horizontal.
- Clamp the worm housing in a vice via rag to prevent damage.



4. Install the nut to the end of the steering column shaft. Then use the preload socket (Special tool: MB990326) to rotate the shaft at a rate of one turn per 4 to 6 seconds, and then measure the total rotation torque.

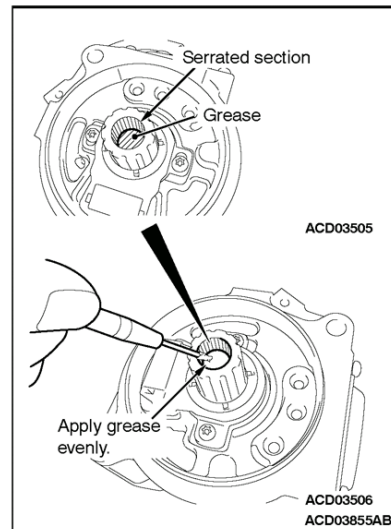
NOTE:

- Be sure to make a note of the measured value, as the value will be used when installing the motor.
- Rotate by 180° in left and right directions from the neutral position, and measure the total rotation torque.

5. Remove the motor mounting bolts.

INSTALLATION SERVICE POINT

>>A<< MOTOR INSTALLATION



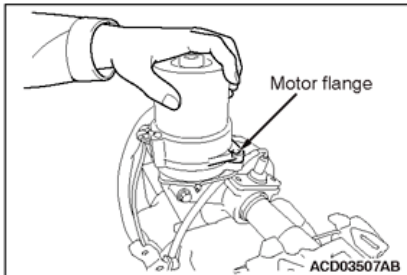
1. Take grease from the bottom of the motor boss and apply it to the serrated section.

Grease: Motor grease
Usage: 0.4 g

<Added>

CAUTION

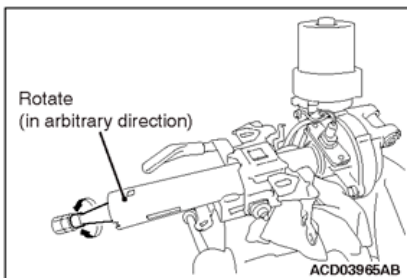
Be sure to apply grease evenly to prevent abnormal noise.



2. Insert the motor, and check that the motor flange moves with the bolts not tightened.

CAUTION

Be careful to avoid scratches or intrusion of foreign materials on the mating surface of the motor and the worm housing.



3. To prevent generation of abnormal noise by dislocation of the motor, temporarily tighten the motor mounting bolts alternately while rotating the steering shaft in the arbitrary direction at a speed of approximately one rotation per second.
4. Temporarily tighten the motor mounting bolts. Then, tighten them securely.
Tightening torque: $19 \pm 3 \text{ N}\cdot\text{m}$ ($14 \pm 2 \text{ ft}\cdot\text{lb}$)
5. Repeat the total rotation torque measurement performed in removal step 4.

CAUTION

If the total rotation torque fluctuation compared with the value measured at removal is $\pm 10\%$ or more, remove the motor again and repeat installation steps 2, 3 and 4.

6. Connect the wiring harness.
7. Install the wiring harness bracket and harness clip.

Tightening torque: $19 \pm 3 \text{ N}\cdot\text{m}$ ($14 \pm 2 \text{ ft}\cdot\text{lb}$)

NOTE: Make a mark beside the label with a black felt pen to indicate that the motor has been replaced.

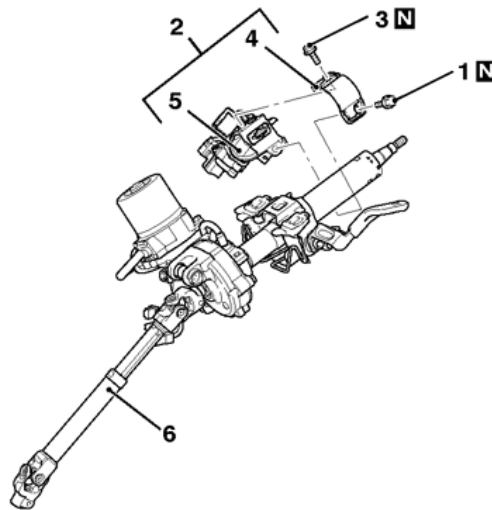
Please make the indicated changes to the 2011 –2014 Outlander Sport/RVR service manual, Group 37 – Electric Power Steering (EPS) –> Steering Column Shaft Assembly –> Disassembly and Assembly

The steering column shaft assembly should be replaced together with the EPS-ECU.

DISASSEMBLY AND ASSEMBLY

CAUTION

When replacing the electric steering lock, complete the chassis number registration (Refer to GROUP 42B – On-vehicle Service, Registration when Replacing OSS-ECU and Electric Steering Lock) <Vehicles with KOS>.



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Disassembly steps

- | | | |
|-------|-------|--|
| <<A>> | >>A<< | 1. Steering lock bolt (lower) |
| <<A>> | >>A<< | 2. Steering lock bracket and steering lock |
| <<A>> | >>A<< | 3. Steering lock bolt (upper) |
| | >>A<< | 4. Steering lock bracket |
| | >>A<< | 5. Mechanical steering lock <Vehicles without KOS> or electric steering lock <Vehicles with KOS> |
| | | 6. Steering column shaft |

Required Special Tools:

- MB992678: Screw extractor

NOTE:

- A steering lock, a steering lock bracket and a steering lock bolt are supplied as a single unit. A

mechanical steering lock assembly (a mechanical steering lock, a steering lock bracket, a steering lock bolt, a key reminder switch/key ring antenna assembly and an ignition switch are included.) <Vehicles without KOS> or an electric steering lock assembly (a electric steering lock, a steering lock bracket and a steering lock bolt are included.) <Vehicles with KOS> is also supplied.

- When the steering lock assembly is supplied, the steering lock bracket is assembled to the steering lock and the steering lock bolt head (upper) is broken off.
- For removal and installation of key reminder switch/key ring antenna and ignition switch, Refer to GROUP 54A – Ignition Switch Removal and Installation.

DISASSEMBLY SERVICE POINT

<<A>> STEERING LOCK BOLT REMOVAL

1. Use a drill to make a hole just deeply enough for the tap to stand on the steering lock bolt.

Please make the indicated addition to the 2011 -2014 Outlander Sport/RVR service manual, Group 37
- Electric Power Steering (EPS) -> Steering Column Shaft Assembly -> Inspection

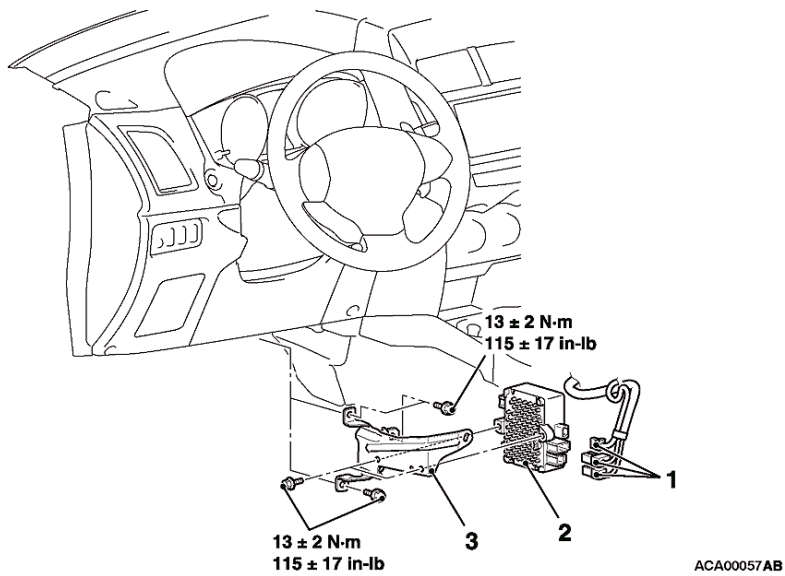
<Added>

• The EPS-ECU should be replaced together with the motor.

REMOVAL AND INSTALLATION

⚠ CAUTION

- Do not reuse the product that has been dropped because its internal components may be defective even if it has no apparent damage.
- Always keep EPS-ECU away from the matter that generates magnetic force.



>>A<< **Removal steps**
1. EPS-ECU connector

Removal steps
2. EPS-ECU
3. EPS-ECU bracket