



# Technical Service Bulletin

SUBJECT:			No: <b>TSB-24-37-001</b>
<b>NOISE AND VIBRATION WHEN TURNING THE STEERING WHEEL</b>			DATE: <b>March 2024</b>
			MODEL: <b>Outlander</b>
<b>CIRCULATE TO:</b>	<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 provides instructions on how to resolve a noise heard and vibration felt during steering wheel operation. When turning the steering wheel after the vehicle stops for more than 15 minutes, a clunk sound may be heard from the driver's side floor and a vibration felt. Please perform the repair upon customer complaint basis. Additionally, please perform the programming, auto configuration of EPS Control Unit and calibration of the Torque Sensor.

## BACKGROUND

When grease located between the rack and support yoke seat of the steering gear box becomes thin, friction increases. As a result during steering operation, the support yoke is drug along the motion of the rack, causing it to come into contact with the rack housing and generating an abnormal noise. The concern is resolved by changing the grease between the rack and support yoke seat by replacing the Steering Gear Box-ASSY.



## AFFECTED VEHICLES

2022-2024 Outlander VIN cut-off JA4J4VA86RZ037292 (12/7/2023)

2023-2024 Outlander Plug-in Hybrid VIN cut-off JA4T5UA93RZ037291 (12/7/2023)

## AFFECTED SERVICE MANUAL

- 2022-2024 Outlander Service Manual, Volume 2, Steering System, Steering Gear and Linkage and Volume 2, Steering Control System, Additional Service when replacing Power Steering Control Module Control Unit
- 2023-2024 Outlander Plug-in Hybrid Service Manual, Volume 2, Steering System and Steering Control System, Steering Gear and Linkage and Volume 2, Steering Control System, Additional Service when replacing Power Steering Control Module Control Unit



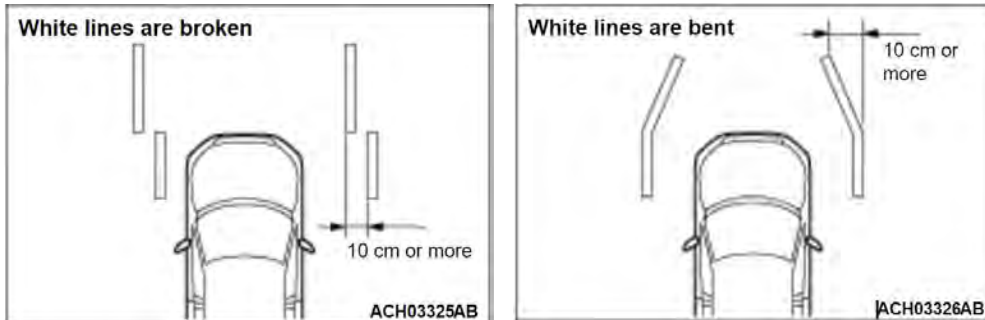
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## PROCEDURE

Follow the Service Manual to replace the Steering Gear Box-ASSY. The content within this procedure was taken from the 2024 Outlander Service Manual. In addition, perform programming and auto configuration of EPS Control Unit and perform calibration of the Torque Sensor. **Verify that the multi-around functions properly upon completion of repair.**

**PLEASE NOTE:** Prior to performing calibration, please take a photo as shown in the sample below.



## PRECAUTIONS

- Please use a Steering Wheel Lock during repair.



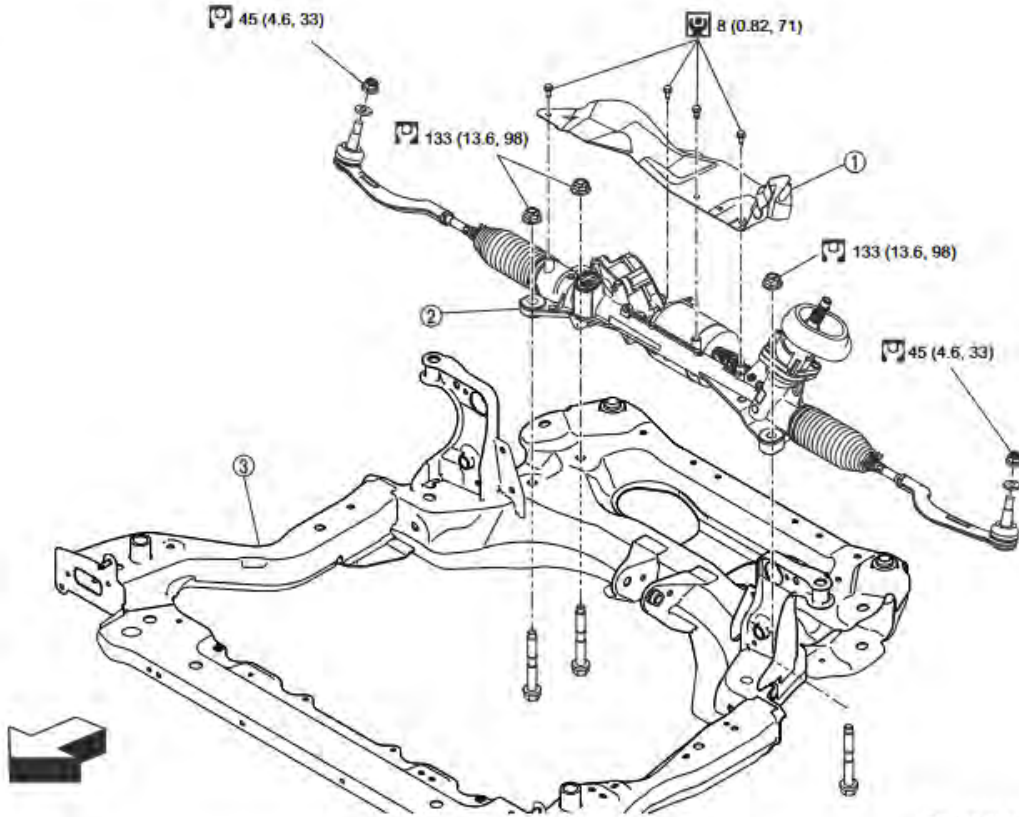
- It may be necessary to use a lift during repair if other technicians are not available to assist.



STEERING GEAR AND LINKAGE

Exploded View

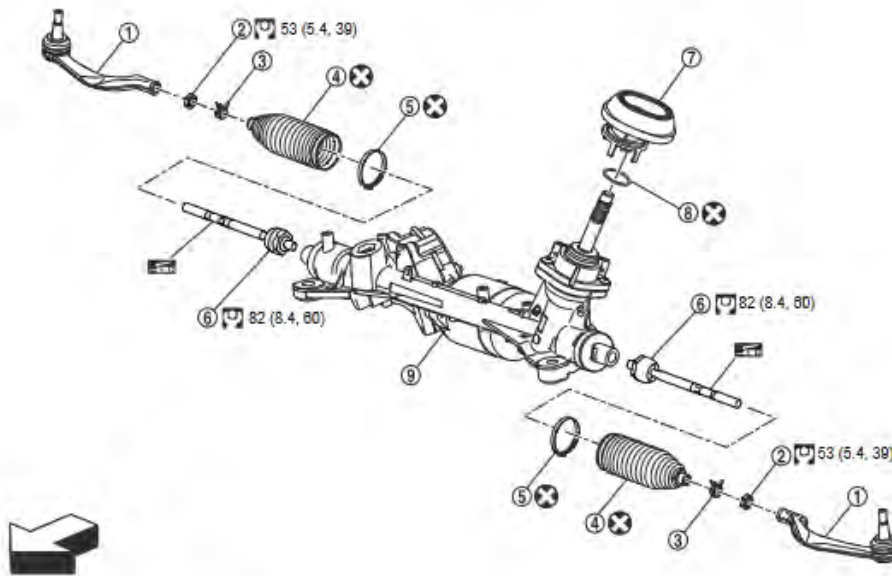
REMOVAL



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①	Heat insulator	②	Steering gear assembly	③	Front suspension member
←	Vehicle front				
⊙	: N m (kg-m, ft-lb)				
⊕	: N m (kg-m, in-lb)				

DISASSEMBLY



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①	Outer socket	②	Outer socket lock nut	③	Boot clamp (small diameter)
④	Boot	⑤	Boot clamp (large diameter)	⑥	Inner socket
⑦	Fire wall seal	⑧	O-ring	⑨	Gear housing assembly
	: Nm (kg-m, ft-lb)				
	: Apply Dow corning 111 or equivalent.				
	: Always replace after every disassembly.				

**CAUTION:**

Never apply the grease to the surface between steering rack and inner socket core part.

**Removal and Installation**

**REMOVAL**

1. Set vehicle to the straight-ahead position.
2. Remove front suspension member. Refer to [Removal and Installation](#).
3. Remove front stabilizer bar. Refer to [Removal and Installation](#).
4. Remove steering gear assembly.

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## INSTALLATION

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Note the following, and install in the reverse order of removal.

**CAUTION:**

- Spiral cable may be out if steering wheel turns while separating steering column assembly and steering gear assembly. Always fix the steering wheel using string to avoid turning.
- 
- Before installation, check that the tilt position is at the middle level.
  - Clean mounting surface on the body side of fire wall seal when installing steering gear assembly.
  - Perform final tightening of nuts and bolts on each part under unladen conditions with tires on level ground when removing steering gear assembly. Check wheel alignment.
  - Rotate steering wheel to check for decentered condition, binding, noise or excessive steering effort.
  - Perform inspection after installation. Refer to [Inspection](#).
  - Perform steering torque calibration after replacing or removal and installation the gear housing assembly (integrated with power steering control unit). Refer to [Work Procedure](#).
  - If equipped with MI-PILOT Assist, perform steering torque calibration after replacing or removing and installing the steering gear assembly. Refer to [Work Procedure](#).
  - Perform steering torque calibration after replacing or removal and installation the steering gear assembly. Refer to [Work Procedure](#).

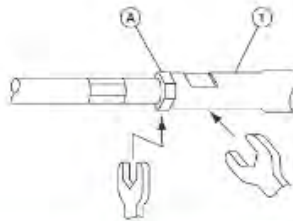
## Disassembly and Assembly

## DISASSEMBLY

**CAUTION:**

Disassemble and assemble steering gear assembly by fixing the mounting area with a vice using copper plates.

1. Loosen inner socket lock nut (A).



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**CAUTION:**

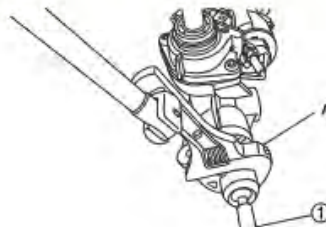
To prevent damage, hold outer socket (1) across flats using suitable tool while loosening inner socket lock nut (A).

2. Remove outer socket.  
3. Remove boot clamps, and then remove boot from inner socket.

**CAUTION:**

Never damage inner socket part of gear housing assembly when removing boot. Steering gear assembly must be replaced if gear housing assembly are damaged because it may cause foreign material interfusion.

4. Remove inner socket (1) using variable spanner (BST: MB992245) (A).

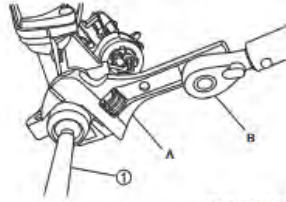


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5. Remove tire wall seal.  
6. Remove O-ring.  
7. Perform inspection after disassembly. Refer to [Inspection](#).

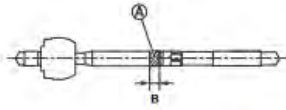
**ASSEMBLY**

1. Install O-ring.
2. Install the seal seal to gear housing assembly.
3. Install inner socket (1), tighten specified torque with variable spanner (SST: M2222242) (A) and torque wrench (B).



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4. Apply recommended grease to inner socket part (A) of gear housing assembly, and install boot to gear housing assembly.



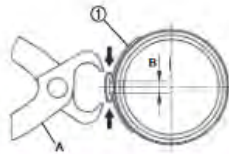
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5. Use Dow coming (1) (manufactured by TOURE DAUKONINGU) or equivalent.

**CAUTION:**  
Never reuse boot.

Grease application position (Reference)	
B	±10 mm (0.39 in)

6. Install boot clamp (large diameter) (1) to boot using boot band crimping tool (SST: K040107200) (A).



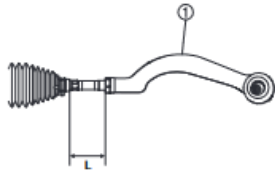
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**CAUTION:**

- Never reuse boot clamp (large diameter).
- Install boot clamp (large diameter) securely to boot groove, and crimp it so as to have clearance (B) of 3 mm (0.12 in) or less as shown.

7. Install boot clamp (small diameter) to boot.

5. Adjust inner socket to standard length (L), and then tighten lock nut ① to the specified torque. Check length again after tightening lock nut.



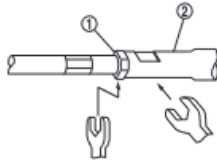
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Inner socket length (L)

: Steering Gear and Linkage

**CAUTION:**

- When tightening the lock nut ①, be sure to fix outer socket ② with a wrench or an equivalent to prevent the ball joint from getting contact with the knuckle.



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- Adjust toe-in after this procedure. The length achieved after toe-in adjustment is not necessarily the above value.

**Inspection****INSPECTION AFTER DISASSEMBLY****Boot**

- Check boot for cracks, and replace it if a malfunction is detected.

**Gear Housing Assembly**

- Check gear housing assembly for damage and scratches (inner wall). Replace if there are any abnormal conditions.

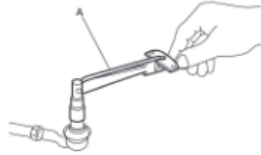


**Outer Socket and Inner Socket**

- Check the following items and replace the component if it does not meet the standard.

**BALL JOINT ROTATING TORQUE**

- Make sure that the reading is within the following specified range using suitable tool (A). Replace outer socket if the reading is outside the specification.



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Rotating torque : Refer to [Steering Gear and Linkage](#)

**INSPECTION AFTER INSTALLATION**

- Check if steering wheel turns smoothly when it is turned several times fully to the end of the left and right.
- Check the steering wheel play, neutral position steering wheel, steering wheel turning force, and front wheel turning angle.
  - Steering wheel play: Refer to [Inspection](#).
  - Neutral position steering wheel, steering wheel turning force, and front wheel turning angle: Refer to [Inspection](#).

**HEATED STEERING WHEEL SWITCH**

**Removal and Installation**

When replacing heated steering wheel switch, replace A/C switch assembly. Refer to Removal and Installation.[REMOVAL AND INSTALLATION](#)

**SERVICE DATA AND SPECIFICATIONS (SDS)**

**SERVICE DATA AND SPECIFICATIONS (SDS)**

**Steering Wheel**

Item	Standard
Steering wheel axial end play	0 mm (0 in)
Steering wheel play on the outer circumference	0 - 25 mm (0 - 1.26 in)
Steering wheel turning force	25 N (2.5 kg-f, 5.6 lb-f) or less

**Steering Angle**

Item	Item	Standard
	Inner wheel	Minimum
Nominal		28° 10' (28.17°)
Maximum		29° 40' (29.67°)
Outer wheel		22° 10' (22.17°)

**Steering Column**

Item	Standard
Steering column length*	274.5 mm (14.75 in)
Tilt operating range*	±25 mm (0.99 in)
Telescopic operating range*	±30 mm (1.18 in)
Rotating torque	0 – 0.4 N·m (0 – 0.04 kg·m, 0 – 4 in·lb)

\* For measuring position, Refer to [Inspection](#).

**Steering Gear and Linkage**

Item	Standard
Rack stroke neutral position	75 mm (3.07 in)
Outer socket ball joint	Ball joint rotating torque 8.0 N·m (0.82 kg·m, 7.1 in·lb) or less
Inner socket length	
Inner socket length	55.7 mm (2.192 in)

\* For measuring position, Refer to [Inspection](#).

Interview sheet					
Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Engine / Traction motor		Mileage	km (Mile)
Operation conditions, etc.		<input type="checkbox"/> Irrelevant <input type="checkbox"/> When engine starts <input type="checkbox"/> During idling <input type="checkbox"/> During driving <input type="checkbox"/> During acceleration <input type="checkbox"/> At constant speed driving <input type="checkbox"/> During deceleration <input type="checkbox"/> During cornering (right curve or left curve) <input type="checkbox"/> During steering			
Other conditions					
Memo					

ADDITIONAL SERVICE WHEN REPLACING POWER STEERING CONTROL MODULE CONTROL UNIT

**Work Procedure**

**DESCRIPTION**

When replacing the power steering control module, the procedures of AFTER REPLACEMENT must be performed. For work procedure, refer to the following:


- After power steering control module replacement.

**AFTER REPLACEMENT**

After replacing the power steering control module, the following items must be performed:

- Power steering control module programming.
- Power steering control module configuration.
- Steering torque sensor calibration.

**WORK PROCEDURE (AFTER REPLACING POWER STEERING CONTROL MODULE)****1. PERFORM PROGRAMMING**

 With M.U.T.-III SE

Perform power steering control module programming according to the procedure of "Programming" in M.U.T.-III SE Operation Manual. Refer to M.U.T.-III SE Operation Manual.

**CAUTION:**

During programming, maintain the following conditions:

- Ignition switch: ON
- Electric load: OFF
- Steering wheel: Not steering
- 12V battery voltage: 8 V or more (Check the value displayed on the M.U.T.-III SE screen.)
- Vehicle speed: 0 km/h (0 MPH)

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[GO TO 2](#)

**2. PERFORM NECESSARY WORK**

1. Perform configuration. Refer to [Description](#).
2. Perform steering torque sensor calibration. Refer to [Work Procedure](#).
3. Turn the steering wheel from full left stop to full right stop three or more times.
4. Perform self-diagnosis for "EPS/DAST 3".
5. Erase the memory of self-diagnosis results.

>>

End of work.

**CONFIGURATION****Description**

Vehicle specification needs to be written with M.U.T.-III SE because it is not written after replacing the power steering control module.

The configuration requires network connection. M.U.T.-III SE connects to network and then it downloads the configuration data from the server. Then M.U.T.-III SE writes the vehicle specification to the power steering control module.

Refer to [Work Procedure](#).

**NOTE:**

For details the network connection and operation, refer to "M.U.T.-III SE Operation Manual".


The configuration no need to "save" configuration data from the power steering control module. The configuration data is always generated freshly at the server and then downloaded to the M.U.T.-III SE.

**CAUTION:**

- Complete the procedure of "Configuration" in order.
- If incorrect "Configuration", incidents might occur.
- Never perform "Configuration" except for new power steering control module.

## Work Procedure

### 1. WRITING VEHICLE SPECIFICATION

 With M.U.T.-III SE

Perform writing vehicle specification to power steering control module following "Automatic Configuration" procedure of "Configuration" according to M.U.T.-III SE Operation Manual.

 NOTE:

- Log in the network according to M.U.T.-III SE guidance.
- For details the network connection and operation, refer to "M.U.T.-III SE Operation Manual".

>>

WORK END

## STEERING TORQUE SENSOR CALIBRATION

### Diagnosis Procedure


#### CAUTION:

Always perform the steering torque sensor calibration before driving when the following operation is performed. Refer to [Work Procedure](#).

- Replacing power steering control module
- Wheel alignment (Front)
- Removing/installing/replacing steering wheel and steering angle sensor
- Removing/installing/replacing steering gear and linkage
- Removing/installing steering column

## Work Procedure

### 1. STEERING TORQUE SENSOR CALIBRATION

 With M.U.T.-III SE

1. Ignition switch ON.
2. Select "EPS/DAST 3".
3. Select "Special function".
4. Select "Learning".
5. Select and run "Torque sensor neutral position learning".

#### CAUTION:

- Make sure that the tires and the steering wheel are in the straight-ahead position.
- Do not apply torque to the steering wheel while the learning process is executed.

6. Ignition switch OFF to ON.
7. Wait 5 seconds.
8. Ignition switch OFF to ON.
9. Erase self-diagnostic results for "EPS/DAST 3".
10. Pull the parking brake switch.

#### NOTE:

Check the parking brake switch indicator is turn On.

11. Ignition switch OFF.
12. Get out of the vehicle and close all doors.
13. Wait 65 seconds.

#### NOTE:

- Check the parking brake switch indicator turn OFF.
- If the rear brake oilpiper is heated, wait an hour so that parking brake switch indicator does not turn OFF.

14. Ignition switch ON.
15. Perform self-diagnosis for "EPS/DAST 3".

Is DTC C160B-46 or C160B-64 detected?

YES >>

Ignition switch OFF once, and then repeat the procedure from the start.

NO >>

Work End

## EQUIPMENT

The following equipment is needed to configure the EPS/DAST 3 after replacing the Steering Gear Box-ASSY:

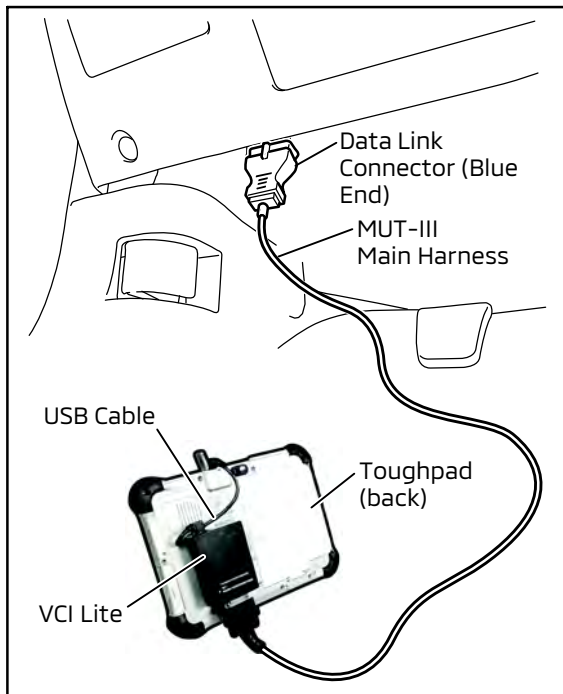
- VCI (Vehicle Communication Interface) or VCI Lite - MB991824 or MB992744V
- MEDIC Laptop/Tablet with A/C Power Adapter - MIT540031 or FZG1MK2
- MUT-III main harness " A" (blue connector at the DLC end) - MB992745V
- USB 2.0 cable - RRAR1MBR108GL
- For Standalone MUT-III units, MUT3-SE Software should be at the latest version: **SEW23121-00 or higher**

## PAIRING VEHICLE TO MUT-III SE

**NOTE: VCI Stand-alone programming is not available for this procedure. The laptop/tablet and the VCI must remain connected for the entire procedure.**

1. Connect the equipment as follows:

**NOTE: VCI Lite and MEDIC 4.0 Toughpad shown for illustration purposes only.**



- Turn the MEDIC PC/tablet on. If the battery indicator in the lower right hand corner of the screen does not show a full charge, it is recommended that either the battery be charged prior to beginning, or be used with the A/C power adaptor connected.
- Connect the USB cable to the VCI/VCI Lite.
- When the laptop/tablet displays the MUT-III main screen, connect the USB cable to the device. Connect the MUT-III main harness with the blue DLC connection to the VCI/VCI Lite. Connect the blue connection of the MUT-III main harness to the vehicle's data link connector.
- For VCI only (p/n MB991824): Turn the VCI power switch ON. Verify that the indicator lamp in the upper right corner of the screen is green.



**DO NOT DISTURB THE HARNESS CABLES OR CONNECTIONS DURING THE CODING PROCESS AS IT COULD CAUSE THE CONTROL UNIT TO LOSE DATA. IF THE USB CABLE IS DISCONNECTED DURING THIS PROCEDURE, A WARNING MESSAGE WILL DISPLAY.**

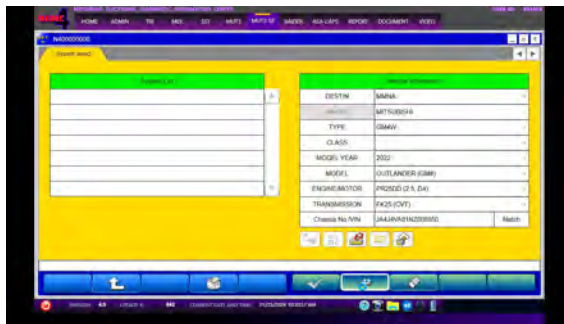
2. Turn the ignition switch to the "ON" position.

# CONFIGURATION PROCEDURE

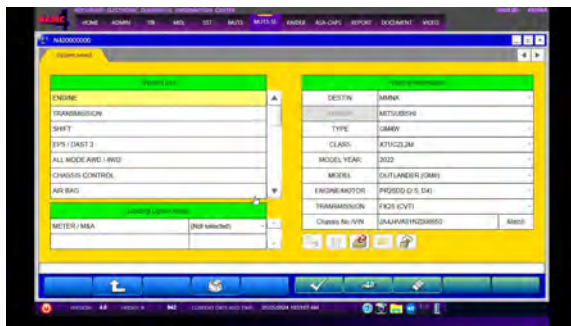


- Using MEDIC, from the main page, click the "MUT3-SE" icon at the top center of the screen to open MUT-III SE. The MUT3-SE Version should be **SEW23121-00 or higher**.

Click the STV button.

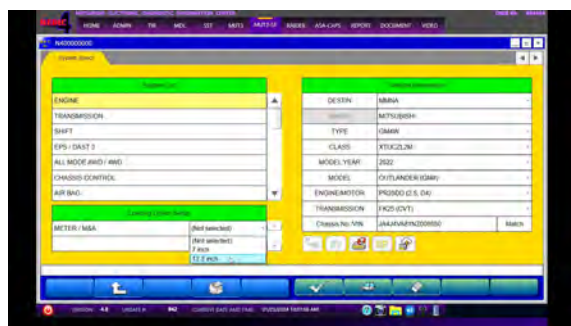


- The System Select screen opens and populates with some basic information from the vehicle.



- Look at the label on the passenger side B pillar to identify the appropriate class.

Then select the correct class from the drop-down list.

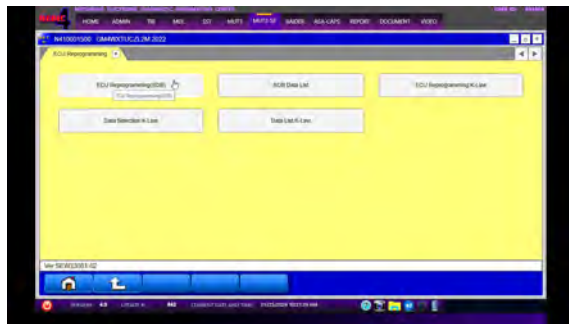
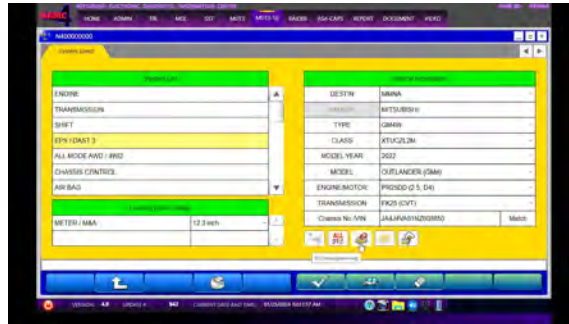
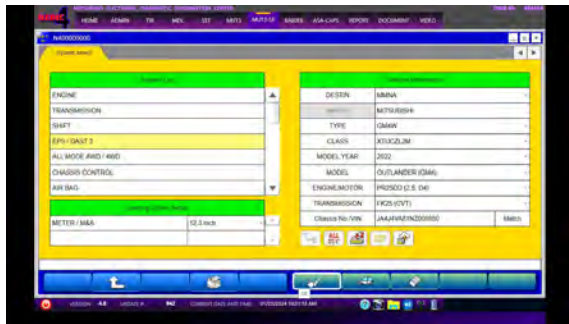


- Select the correct Loading Option Setup METER/M&A from the drop-down list

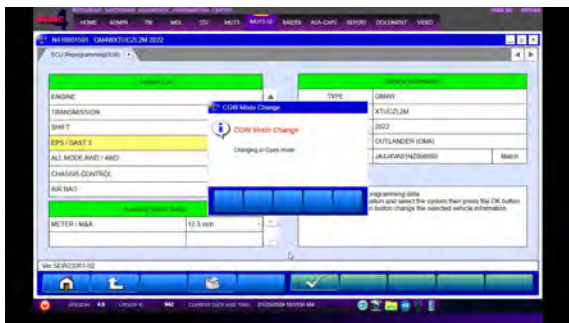


- The System List page should now populate with vehicle information. Select EPS/DAST 3 from the System List and click OK.

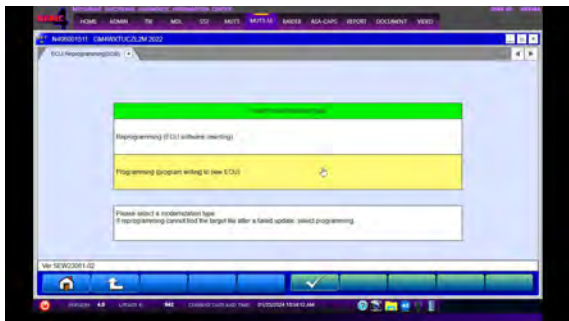
Select ECU programming.



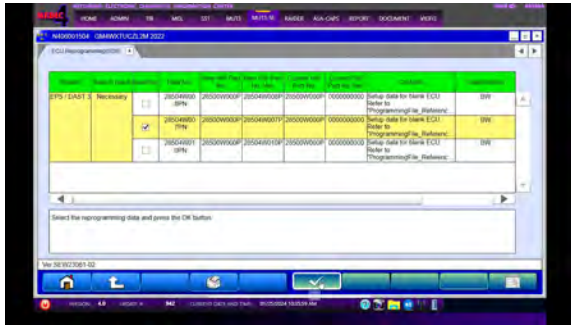
- After CGW Mode Changes to Open, enter AS2 Login ID and password.



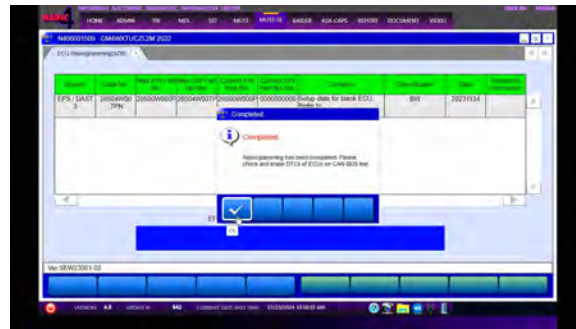
- Under the ECU programming (SDB), select Programming (program writing to new ECU).



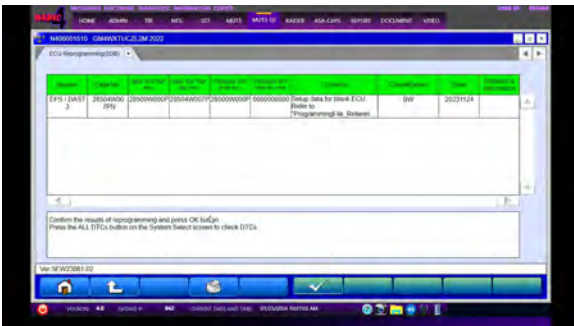
10. Select the appropriate programming data according to the "PROGRAMMING FILE REFERENCE TABLE" located on MDL and press the OK button.



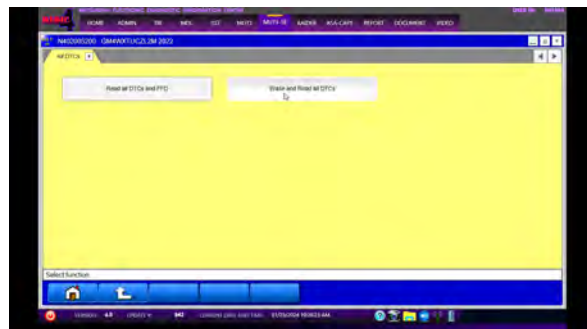
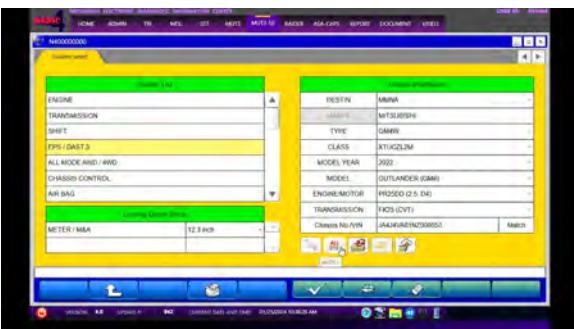
11. A progress bar will display and completion status will appear. Click OK to exit this screen.



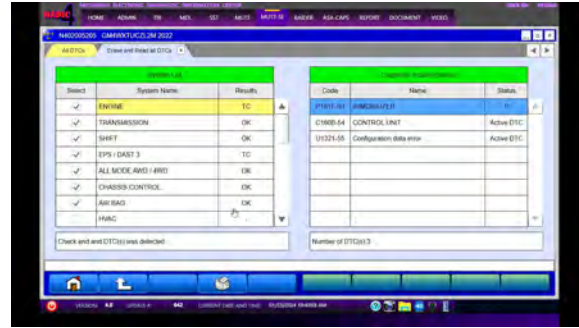
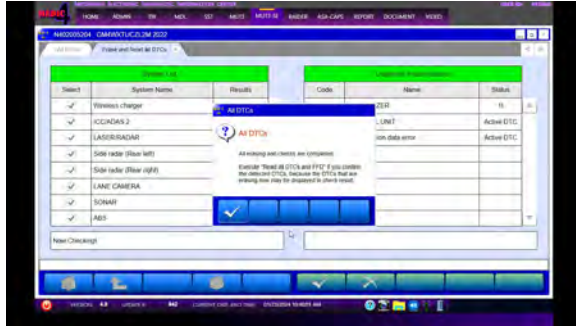
12. Confirm the results and press OK.



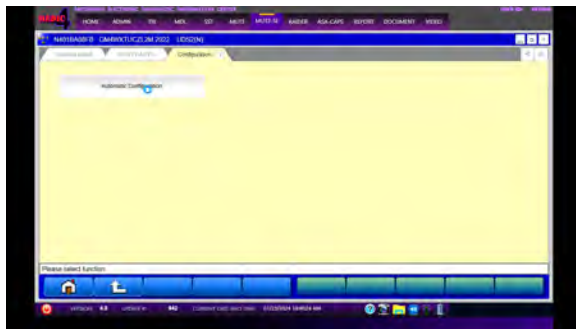
13. Return to the System select tab and click the ALL DTCs button. Select Erase and Read all DTCs.



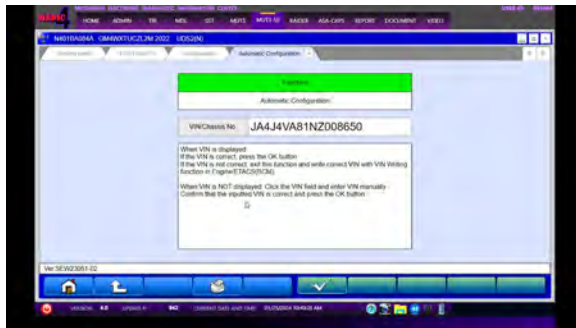
- Click OK after all DTC checks are completed and if a stored DTC appears, click OK to Freeze Frame Data of the selected system.



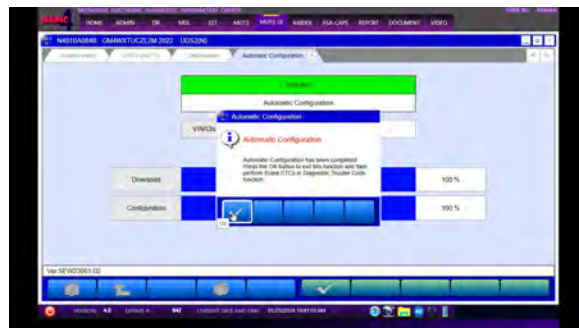
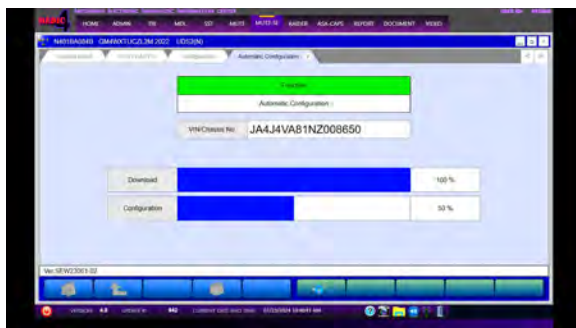
- Select Automatic Configuration from the Configuration tab.



- Verify the correct VIN is displayed and press the OK button. If the correct VIN is not displayed, follow the directions on the screen.



- A progress bar will display and completion of the Automatic Configuration will appear. Click the OK button.





**WARRANTY**

This bulletin is supplied as technical information only and is not an authorization to repair. If an affected vehicle is reported with the described condition, diagnose the condition, repair as described in this bulletin, and submit a normal warranty claim using the information below.

Model	Labor Operation Code	Operation	Quantity	Labor Time
Outlander	374110MY	Replacement	1	4.5H
Outlander Plug-in Hybrid	374110MZ	Replacement	1	6.4H

**PLEASE NOTE:** VIN range qualifies the repair. If you have a situation where a vehicle concern mirrors this TSB but is outside of the VIN range, contact Techline for further assistance.