

Programming and Setup

Diagnostic Information and Procedures

Control Module References

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Repair Instructions

Body Control Module Programming and Setup

Special Tools

- EL-49642 SPS Programming Support Tool
- EL-46079 Tire Pressure Monitor Diagnostic Tool

For equivalent regional tools, refer to *Special Tools* on page 6-14.

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the control module is not properly configured with the correct calibration software, the control module will not control all of the vehicle features properly.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.

- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required install the EL-49642 SPS Programming Support Tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply. DO NOT connect a battery charger.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Replace and Program Control Module

To program a replacement Body Control Module (BCM), perform the following procedure:

1. Install EL-49642 SPS programming support tool.

Note: Make sure the vehicle ignition switch state is in appropriate position for the following step.

- For Key Ignition System, begin with the ignition in the RUN position.
 - For Push Button Start System, begin with the vehicle in vehicle OFF power mode. The Service Programming System will power mode the vehicle.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.

Note: The BCM Configuration is only required if this option is available on the SPS Supported Controllers screen.

3. On the SPS Supported Controllers screen, select BCM Body Control Module - Configuration and follow the on-screen instructions (if applicable).
4. On the SPS Supported Controllers screen, select BCM Body Control Module - Programming and follow the on-screen instructions.
5. Perform the following for the appropriate ignition type prior to proceeding with the next step:
 - Key Ignition System: Key in the ignition and any additional keys must be away from the vehicle at least 3 meters.
 - Push Button Start System: Keyless entry transmitter must be in the programming pocket. Refer to the owner manual for the exact pocket location. All additional transmitters must be away from the vehicle at least 3 meters.

Note: The following programming step may take between 10–12 min. and progress will appear to have stopped during this process. This is a normal security timer response and a restart should not be performed. If the DTC B389A set immediately after programming a replacement BCM, the Immobilizer Learn procedure was not properly completed. The Immobilizer Learn procedure needs to be performed again.

6. On the SPS Supported Controllers screen, select IMMO Immobilizer Learn - Setup. On the next screen, select Body Control Module IMMO Learn with Existing Transponder or Remote Key and follow the on-screen instructions. When Immobilizer Learn is complete, press the Unlock button on the keyless entry transmitter to allow the keyless entry transmitter to exit the Immobilizer Learn mode.

Note: When performing the Tire Pressure Monitor Sensor Learn during BCM setup, the *EL-46079* tire pressure monitor diagnostic tool must be used to activate each tire pressure sensor for vehicles with UJM.

- For Key Ignition System, begin with the ignition in the RUN position.
 - For Push Button Start System, begin with the vehicle in vehicle ON power mode.
7. On the SPS Supported Controllers screen, select BCM Body Control Module - Setup and follow the on-screen instructions.

8. Check the driver information center display for additional messages regarding further calibration instructions. If there are no additional driver information center instructions present, programming is complete.
9. At the end of programming, choose the "Clear DTCs" function on the SPS screen.
10. If ABS, Traction Control and/or Stabilitrak indicators are ON and DTC C0161 is set in the electronic brake control module after performing BCM programming and setup, do the following:
 - 10.1. Disconnect the scan tool from the data link connector.
 - 10.2. Ignition OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 meters away from the vehicle. It may take up to 2 minutes to power down.
 - 10.3. Ignition ON, verify DTC C0161 is in history. If not, repeat the above step to make sure the vehicle is in sleep mode.
 - 10.4. Use the scan tool to clear the DTCs.

Reprogram Control Module

To program an existing BCM, perform the following procedure:

1. Install *EL-49642* SPS programming support tool.

Note: Make sure the vehicle ignition switch state is in appropriate position for the following step.

- For Key Ignition System, begin with the ignition in the RUN position.
 - For Push Button Start System, begin with the vehicle in vehicle ON power mode.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
 3. On the SPS Supported Controllers screen, select BCM Body Control Module - Programming and follow the on-screen instructions.

Note: When performing the Tire Pressure Monitor Sensor Learn during BCM setup, the *EL-46079* tire pressure monitor diagnostic tool must be used to activate each tire pressure sensor for vehicles with UJM.

4. On the SPS Supported Controllers screen, select BCM Body Control Module - Setup and follow the on-screen instructions.
5. Check the driver information center display for additional messages regarding further calibration instructions. If there are no additional driver information center instructions present, programming is complete.
6. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

7. If ABS, Traction Control and/or Stabilitrak indicators are ON and DTC C0161 is set in the electronic brake control module after performing BCM programming and setup, do the following:
 - 7.1. Disconnect the scan tool from the data link connector.
 - 7.2. Ignition OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 meters away from the vehicle. It may take up to 2 minutes to power down.
 - 7.3. Ignition ON, verify DTC C0161 is in history. If not, repeat the above step to make sure the vehicle is in sleep mode.
 - 7.4. Use the scan tool to clear the DTCs.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Ignition ON. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the control module can be reprogrammed.
 - ⇒ **If the control module cannot be reprogrammed**
 - 2.1. Ignition OFF for one minute, ignition ON.
 - 2.2. Verify the control module can be reprogrammed.
 - ⇒ If the control module cannot be reprogrammed, replace the control module.
 - ⇓ If the control module can be reprogrammed.
 - 2.3. All OK.
 - ⇓ **If the control module can be reprogrammed**
3. All OK.

Repair Instructions

Perform the *Diagnostic Repair Verification* on page 6-92 after completing the repair.

Control Module References on page 6-3 for Control Module replacement, programming and setup

Communication Interface Module Programming and Setup

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to *Special Tools* on page 6-14.

Each of the following service procedures require programming or setup procedures to be performed on the communication interface module.

Communication Interface Module Replacement

Note:

- It is critical to use the service replacement Communication Interface Module only in the vehicle for which it was ordered.
- Failure to perform the following procedures will result in a red LED, DTC(s) being set, and limited or incomplete OnStar® services.

- An OnStar® button press to the OnStar® call center is not required to complete the procedure.
 - It may take up to 24 hours for OnStar® service to become fully activated after performing the procedures.
 - Perform the following procedure only once. Repeat attempts of the procedure may result in a delay of the activation process.
 - To fully activate an OnStar® module, both the setup and activation request procedures must be completed on all vehicles with and without an active OnStar® subscription to insure the unit has been setup properly for the vehicle it has been installed into and also to update the OnStar® with the correct unit information.
 - To initialize the Turn-by-Turn feature, the vehicle must first be driven in open sky condition at speeds greater than 10 mph (16 kph) or more for a minimum of 5 miles (8 km), and perform at least 2 left and 2 right 90 degree turns coming to complete stops prior to each turn.
 - On vehicles up fitted with TTY capabilities, it is necessary to perform a power cycle of the OnStar® Interface Module (OTIM), and toggle the TTY mode after completing the Communication Interface Module installation and setup procedures.
1. Install EL-49642 SPS programming support tool.
 2. Access the Service Programming System (SPS) and follow the on-screen instructions.
 3. On the SPS Supported Controllers screen, select ONSU Onstar® Module Setup and Service Activation and follow the on-screen instructions.
 4. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.
 5. The default language for the new Communication Interface Module is English. To change to an alternate language, access the scan tool.
 6. Inform the customer that it may take up to 24 hours for the OnStar® service to become fully activated.

Control Solenoid Valve and Transmission Control Module Assembly Programming and Setup (6T30/6T40/6T45/6T50)

The following service procedures require either a programming or a setup event be performed for a complete repair. The transmission control module (TCM) is part of the control solenoid valve assembly, and is not serviced separately.

Transmission Control Module (TCM) Replacement

If the TCM is replaced, the following procedures must be performed:

1. TCM Reprogramming
2. The Transmission Adaptive Values Learn. Refer to *Transmission Adaptive Values Learn* on page 17-163.

TCM Reprogramming

Note:

- Use a scan tool to view and record the Transmission Control Module – End Model Part Number in the original TCM prior to starting the TCM reprogramming procedure.
 - In some cases, the TCM and ECM may have to be reprogrammed. When a selection for TCM Transmission Control Module – Programming is not available, select SEQ Programming Sequence ECM/TCM (Automatic Transmission Only).
1. If the TCM needs to be reprogrammed. Refer to *Service Programming System (SPS) on page 6-13*.
 2. Perform the Transmission Adaptive Values Learn. Refer to *Transmission Adaptive Values Learn on page 17-163*.

Note: After programming, perform the following to avoid future misdiagnosis:

1. Turn the ignition OFF for 30 seconds.
2. Turn the ignition ON with the engine OFF.
3. Use the scan tool in order to retrieve history DTCs from all modules.
4. Clear all history DTCs.

Setup for Component Replacement

The replacement of some components will require a setup procedure for complete repair.

If any of the following components are replaced, the *Transmission Adaptive Values Learn on page 17-163* procedure must be performed:

- Transmission replacement
- Any internal transmission repair
- Any speed sensor

Refer to *Transmission Adaptive Values Learn on page 17-163*.

Electronic Brake Control Module Programming and Setup

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the ECU is not properly configured with the correct calibration software, the ECU will not control all of the vehicle features properly.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or ECU damage may occur.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.

- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Replace and Program Electronic Brake Control Module or Reprogram Electronic Brake Control Module

To program a replacement or an existing Electronic Brake Control Module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select Electronic Brake Control Module-Programming and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select Electronic Brake Control Module-Setup and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select Electronic Brake Control Module-Configuration and follow the on-screen instructions.
5. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.
6. With a scan tool, access the Electronic Brake Control Module, Configuration/Reset Functions, Steering Wheel Angle Sensor Learn. Refer to *Steering Angle Sensor Centering on page 5-39*.
7. With a scan tool, access the Electronic Brake Control Module, Configuration/Reset Functions, Yaw Rate Sensor Learn. Refer to *Vehicle Yaw Sensor Learn on page 5-49*.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. DO NOT turn the Ignition OFF. Ensure that all ECU, DLC and programming tool connections are secure and the TIS terminal operating software is up to date.
2. Attempt to reprogram the ECU.
3. If the ECU can still not be programmed, turn the Ignition OFF for at least one minute.
4. Turn the Ignition ON, and attempt to reprogram the ECU. The ECU should program.
 - ⇒ If the ECU still cannot be programmed, replace the ECU.

Engine Control Module Programming and Setup

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the control module is not properly configured with the correct calibration software, the control module will not control all of the vehicle features properly.

- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install the EL-49642 SPS Programming Support Tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply. DO NOT connect a battery charger.
- Turn OFF or disable systems that may put a load on the vehicle's battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.
- Prior to programming, record the engine oil life percentage remaining.

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to *Special Tools* on page 6-14.

Replace and Program Control Module

To program a replacement engine control module (ECM), perform the following procedure:

1. Install EL-49642 SPS Programming Support Tool.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select Engine Control Module - Programming and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select Engine Control Module - Setup and follow the on-screen instructions.
5. On the SPS Supported Controllers screen, select Engine Control Module - Configuration and follow the on-screen instructions.
6. On the SPS Supported Controllers screen, select Engine Function - Learn/Setup and follow the on-screen instructions.
7. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.
8. With a scan tool, perform the Theft Deterrent Programming. Refer to *Immobilizer System Component Programming* on page 13-29.

Warning: Replacement or reprogramming of the ECM, or replacement of the clutch pedal position sensor (CPPS) or clutch pedal requires that a CPPS learn procedure be performed. Failure to perform the CPPS learn procedure may result in personal injury or damage to the vehicle or its components if the vehicle is in gear and the starter motor is accidentally engaged.

9. With a scan tool, perform the Clutch Pedal Position Sensor Learn, if applicable. Refer to *Clutch Pedal Position Sensor Learn* on page 17-562.
10. With a scan tool, perform the CKP System Variation Learn. Refer to the following:
 - *Crankshaft Position System Variation Learn* on page 9-243 for the 1.4L engine
 - *Crankshaft Position System Variation Learn* on page 9-532 for the 1.6L or 1.8L engine
11. With a scan tool, perform the Throttle/Idle Learn procedure. Refer to the following:
 - *Throttle/Idle Learn* on page 9-278 for the 1.4L engine
 - *Throttle/Idle Learn* on page 9-533 for the 1.6L or 1.8L engine
12. With a scan tool, reset the Engine Oil Life Remaining back to the original percentage recorded before the control module was replaced, if available.

Reprogram Control Module

To reprogram an existing ECM, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select Engine Control Module - Programming and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select Engine Control Module - Setup and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select Engine Control Module - Configuration and follow the on-screen instructions.
5. On the SPS Supported Controllers screen, select Engine Function - Learn/Setup and follow the on-screen instructions.
6. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.
7. With a scan tool, reset the Engine Oil Life Remaining back to the original percentage recorded before the control module was replaced, if available.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following:

1. Ignition ON. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.

2. Verify the control module can be reprogrammed.
 - ⇒ **If the control module cannot be reprogrammed**
 - 2.1. Ignition OFF for one minute, ignition ON.
 - 2.2. Verify the control module can be reprogrammed.
 - ⇒ If the control module cannot be reprogrammed, replace the control module.
 - ⇓ If the control module can be reprogrammed.
 - 2.3. All OK.
 - ⇓ **If the control module can be reprogrammed**
3. All OK.

Repair Instructions

Perform the *Diagnostic Repair Verification* on page 6-92 after completing the repair.

Refer to *Control Module References* on page 6-3 for control module replacement, programming, and setup.

Fuel Pump Control Module Programming and Setup

The fuel pump control module must be programmed with the proper calibration software. The module stores and utilizes this information however if it is not properly configured with the correct calibration software, the fuel pump control module will not control all of the vehicle features properly.

Ensure that the following conditions exist in order to prepare for fuel pump control module programming:

1. The battery is fully charged.
2. The MDI data link connectors are secure.
3. The scan tool is loaded with the most current software version.
4. All disconnected modules and devices are reconnected securely.
5. This entire procedure has been reviewed before proceeding.

Do not reprogram the fuel pump control module unless directed by a service procedure or a service bulletin.

Fuel Pump Control Module Programming

To program and setup an existing or new replacement fuel pump control module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select FPCM Fuel Pump Flow Control Module - Programming and follow the on-screen instructions.

If the fuel pump control module fails to accept the program, verify all scan tool and fuel pump control module connections are secure.

Note: After programming is completed, perform the following to avoid future misdiagnosis:

1. Turn the Vehicle OFF for 10 seconds.
2. Open and close the door.
3. Connect the scan tool to the data link connector.
4. Vehicle in Service Mode, engine OFF.
5. Clear all DTC's from all modules.

Heated Seat Control Module Programming and Setup

The seat heating control module must be programmed with the proper calibration software. The module stores and utilizes this information however if it is not properly configured with the correct calibration software, the seat heating control module will not control all of the vehicle features properly.

Ensure that the following conditions exist in order to prepare for seat heating control module programming:

1. The battery is fully charged.
2. The MDI data link connectors are secure.
3. The scan tool is loaded with the most current software version.
4. All disconnected modules and devices are reconnected securely.
5. This entire procedure has been reviewed before proceeding.

Do not reprogram the seat heating control module unless directed by a service procedure or a service bulletin.

Seat Heating Control Module Programming

To program and setup an existing or new replacement seat heating control module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions. Refer to *Service Programming System (SPS)* on page 6-13.
2. On the SPS Supported Controllers screen, select HVSMF Front Seat Heating Control Module - Programming and follow the on-screen instructions.

If the HVSMF Front Seat Heating Control Module fails to accept the program, verify all scan tool and seat heating control module connections are secure.

Note: After programming is completed, perform the following to avoid future misdiagnosis:

1. Turn the ignition OFF for 10 seconds.
2. Open and close the door.
3. Connect the scan tool to the data link connector.
4. Ignition ON, engine OFF.
5. Clear all DTCs from all modules.

HVAC System Control Module Programming and Setup

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the ECU is not properly configured with the correct calibration software, the ECU will not control all of the vehicle features properly.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or ECU damage may occur.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Diagnostic Aids

During HVAC programming you may be required to select multiple calibrations dependant upon vehicle equipment. Have the vehicle build/RPO information available during the following procedure to ensure the correct calibrations are selected.

Replace and Program ECU or Reprogram ECU

To program a replacement or an existing ECU, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select Remote Heater and Air Conditioning – Programming and follow the on-screen instructions.
3. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. DO NOT turn the ignition OFF. Ensure that all ECU, DLC and programming tool connections are secure and the TIS terminal operating software is up to date.
 2. Attempt to reprogram the ECU.
 3. If the ECU can still not be programmed, turn the ignition OFF for at least one minute.
 4. Turn the ignition ON and attempt to reprogram the ECU. The ECU should program.
- ⇒ If the ECU still cannot be programmed, replace the ECU.

Inflatable Restraint Sensing and Diagnostic Module Programming and Setup

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to *Special Tools* on page 6-14.

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the ECU is not properly configured with the correct calibration software, the ECU will not control all of the vehicle features properly.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or ECU damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. Install the EL-49642 SPS Programming Support Tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply. DO NOT connect a battery charger.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct power mode.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Diagnostic Aids

The air bag indicator light may remain ON after the body control module (BCM), or SDM is replaced, and during the programming procedure for the BCM until after the procedure is completed. When installing a new SDM, there may be several DTCs set prior to programming. Once programmed, these DTCs should be history and can be cleared.

Replace and Program ECU or Reprogram ECU

To program a replacement or an existing Inflatable Restraint Sensing and Diagnostic Module, perform the following procedure:

1. Install EL-49642 SPS Programming Support Tool.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select Inflatable Restraint Sensing and Diagnostic Module - Programming and follow the on-screen instructions.

4. On the SPS Supported Controllers screen, select Inflatable Restraint Sensing and Diagnostic Module - Setup and follow the on-screen instructions.
5. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. DO NOT turn the vehicle OFF. Ensure that all ECU, DLC and programming tool connections are secure and the TIS terminal operating software is up to date.
2. Attempt to reprogram the ECU.
3. If the ECU can still not be programmed, turn the vehicle OFF for at least one minute.
4. Vehicle in Service Mode, attempt to reprogram the ECU. The ECU should program.
 - ⇒ If the ECU still cannot be programmed, replace the ECU.

Instrument Cluster Programming and Setup

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to *Special Tools* on page 6-14.

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the ECU is not properly configured with the correct calibration software, the ECU will not control all of the vehicle features properly.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or ECU damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. Install the EL-49642 SPS programming support tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply. DO NOT connect a battery charger.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Replace and Program ECU or Reprogram ECU

To program a replacement or an existing ECU, perform the following procedure:

1. Install EL-49642 SPS programming support tool.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select Instrument Cluster – Programming and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select Instrument Cluster – Setup and follow the on-screen instructions.
5. On the SPS Supported Controllers screen, select Instrument Cluster – Configuration and follow the on-screen instructions.
6. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. DO NOT turn the ignition OFF. Ensure that all ECU, DLC and programming tool connections are secure and the TIS terminal operating software is up to date.
2. Attempt to reprogram the ECU.
3. If the ECU can still not be programmed, turn the ignition OFF for at least one minute.
4. Turn the ignition ON and attempt to reprogram the ECU. The ECU should program.
 - ⇒ If the ECU still cannot be programmed, replace the ECU.

Multi-Axis Acceleration Sensor Module Programming and Setup

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the Multi-axis Acceleration Sensor or Inertia Sensor Module (IMU) is not properly configured with the correct calibration software, the Electronic Brake Control Module will not control all of the vehicle features properly.
- Stable battery voltage is critical during configuration. Any fluctuation, spiking, over voltage or loss of voltage will interrupt configuration. Install the EL-49642 SPS Programming Support Tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply. DO NOT connect a battery charger.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.

- During the configuration procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after configuration is complete.

Multi-Axis Acceleration Sensor Module Configuration

Note: The Multi-axis Acceleration Sensor is also known as the Inertia Sensor Module (IMU) in SPS. The sensor must be configured using SPS before the vehicle Yaw Sensor Learn is performed.

A replacement Multi-axis Acceleration Sensor Module, requires the following procedure:

1. Install *EL-49642* SPS Programming Support Tool..
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select IMU Inertia Sensor Module - Configuration and follow the on-screen instructions.
4. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.
5. With a scan tool, perform the Yaw Sensor Learn. Refer to *Vehicle Yaw Sensor Learn* on page 5-49.

Passenger Presence System Programming and Setup

When the passenger presence system is replaced or serviced, perform the rezeroing procedure for the passenger presence system. Refer to *Passenger Presence System Rezeroing* on page 13-109 for the rezeroing procedure.

Power Steering Control Module Programming and Setup

The following service procedures require either a programming or a setup event performed for a complete repair.

Power Steering Control Module Replacement

If the steering column power steering control module needs to be replaced, the power steering control module needs to be programmed with the following procedures:

1. Connect a scan tool to the vehicle and access SPS. Refer to *Service Programming System (SPS)* on page 6-13.
2. Perform the SPS function Power Steering Control Module – Programming and follow the on-screen instructions.
3. Clear DTCs after completing the programming procedure.

Power Steering Control Module Reprogramming

Do not reprogram the power steering control module unless directed by a service procedure or a service bulletin.

1. Connect a scan tool to the vehicle and access SPS. Refer to *Service Programming System (SPS)* on page 6-13.
2. Perform the SPS function Power Steering Control Module – Programming and follow the on-screen instructions.
3. Clear DTCs after completing the programming procedure.

Radio Programming and Setup

Special Tools

EL-49642 SPS Programming Support Tool

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the ECU is not properly configured with the correct calibration software, the ECU will not control all of the vehicle features properly.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or ECU damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. Install the *EL-49642* SPS Programming Support Tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply. DO NOT connect a battery charger.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Diagnostic Aids

- During radio programming you may be required to select multiple calibrations dependant upon vehicle equipment. Have the vehicle build/RPO information available during the following procedure to ensure the correct calibrations are selected.

- The XM satellite radio (if equipped) is integrated into the radio. If XM was activated in the previous radio, the replacement radio will require no additional activation steps. Customer subscription information is transferred to the replacement radio when a replacement radio is ordered.

Replace and Program ECU or Reprogram ECU

To program a replacement or an existing ECU, perform the following procedure:

1. Install *EL-49642* SPS Programming Support Tool.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select Radio – Programming and follow the on-screen instructions.
4. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. DO NOT turn the ignition OFF. Ensure that all ECU, DLC and programming tool connections are secure and the TIS terminal operating software is up to date.
2. Attempt to reprogram the ECU.
3. If the ECU can still not be programmed, turn the ignition OFF for at least one minute.
4. Turn the ignition ON and attempt to reprogram the ECU. The ECU should program.
 - ⇒ If the ECU still cannot be programmed, replace the ECU.

Remote Control Door Lock Receiver Programming and Setup

Diagnostic Aids

The remote control door lock receiver only functions as an antenna, receiving the signals sent by the keyless entry transmitter and forwarding them to the body control module (BCM). The keyless entry software is contained wholly within the BCM.

Replace and Program ECU or Reprogram ECU

This ECU does not require SPS programming or any setup procedures.

Service Programming System (SPS)

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to *Special Tools* on page 6-14.

For step-by-step control module programming instructions, please refer to the techline information system (TIS) terminal.

Review the information below to ensure proper programming protocol.

Note:

- DO NOT program a control module unless you are directed by a service procedure or you are directed by a General Motors service bulletin. Programming a control module at any other time will not permanently correct a customers concern.
- It is essential that the TIS terminal, MDI, and/or Scan Tool, is equipped with the latest software before performing service programming.
- Due to the time requirements of programming a controller, install *EL-49642* SPS Programming Support Tool to maintain system voltage. Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. If the above tool is not available, DO NOT connect a battery charger, connect a fully charged 12V jumper or booster pack disconnected from the AC voltage supply.
- Some modules will require additional programming/setup events to be performed before or after programming.
- Some vehicles may require the use of a CANDi or MDI module for programming.
- Review the appropriate service information for these procedures.
- DTCs may set during programming. Clear DTCs after programming is complete.
- Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Ensure the following conditions are met before programming a control module:

- Vehicle system voltage:
 - There is not a charging system concern. All charging system concerns must be repaired before programming a control module.
 - Battery voltage is greater than 12 volts but less than 16 volts. The battery must be fully charged before programming the control module.
 - Turn OFF or disable any system that may put a load on the vehicles battery, such as the following components:
 - Interior lights
 - Exterior lights including daytime running lights (DRL)—Applying the parking brake, on most vehicles, disables the DRL system
 - Heating, ventilation, and air conditioning (HVAC) systems
 - Engine cooling fans
 - Radio, etc.
- The ignition switch must be in the proper position. SPS prompts you to turn ON the ignition, with the engine OFF. DO NOT change the position of the ignition switch during the programming procedure, unless instructed to do so.

- Make certain all tool connections are secure, including the following components and circuits:
 - Scan Tool
 - The RS-232 communication cable port
 - The connection at the data link connector (DLC)
 - The voltage supply circuits
 - MDI
 - The USB, Ethernet or Wireless communication port
 - The connection at the data link connector (DLC)
- DO NOT disturb the tool harnesses while programming. If an interruption occurs during the programming procedure, programming failure or control module damage may occur.

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. DO NOT turn the ignition OFF. Ensure that all control module and DLC connections are secure and the TIS terminal operating software is up to date.
2. Attempt to reprogram the control module.
3. If the control module can still not be programmed, turn the ignition OFF for at least one minute.
4. Turn the ignition ON and attempt to reprogram the control module. The control module should program.
 - ⇒ If the control module still cannot be programmed, replace the control module.

After successfully programming the control module, ensure that all post programming procedures are performed; refer to *Control Module References* on page 6-3 for the appropriate control module Programming and Setup document for any required procedures.

Sunroof Control Module Programming and Setup

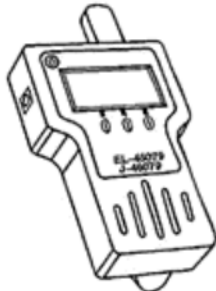
When replacing the sunroof motor/control module, the sunroof motor/actuator initialization/teach procedure must be followed. Refer to *Sunroof Motor/Actuator Initialization/Teach Process* on page 12-12 before starting the repair procedure.

Theft Deterrent Module Programming and Setup

Replace and Program ECU or Reprogram ECU

This ECU does not require SPS programming or any setup procedures.

Special Tools and Equipment

Illustration	Tool Number/ Description
 1493952	EL 46079 J 46079 Tire Pressure Monitor Diagnostic Tool
 2223727	EL 49642 EL 50113 Europe– Use recommended equivalent workshop equipment SPS Programming Support Tool