

2018 ACCESSORIES & EQUIPMENT

Programming And Setup - Equinox & Terrain

DIAGNOSTIC INFORMATION AND PROCEDURES

CONTROL MODULE REFERENCES

Reference Information

- [Data Link References](#)
- [Diagnostic System Check - Vehicle](#)
- [Diagnostic Trouble Code \(DTC\) List - Vehicle](#)
- [Symptoms - Vehicle](#)

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
A11	A11 Radio: Scan Tool Information	Radio/Navigation System Wiring Schematics (IOB) Radio/Navigation System Wiring Schematics (IO5/IO6) Radio/Navigation System Wiring Schematics (IOR) Radio/Navigation System Wiring Schematics (IOS/IOT/IOU)	Radio Replacement (IO5, IO6, IOB, IOR) Radio Replacement (IOT, IOU) Radio Replacement (IOS)	A11 Radio: Programming and Setup (IO5/IO6) A11 Radio: Programming and Setup (IOB) A11 Radio: Programming and Setup (IOU/IOT/IOR)
A22	Radio Controls	Radio/Navigation System Wiring Schematics (IOB) Radio/Navigation System Wiring Schematics (IO5/IO6) Radio/Navigation System Wiring Schematics (IOR) Radio/Navigation System Wiring Schematics (IOS/IOT/IOU)	Radio Control Assembly Replacement (Equinox) Radio Control Assembly Replacement (Terrain)	A22 Radio Controls: Programming and Setup (IOB) A22 Radio Controls: Programming and Setup (without IOB)
B174W	B174W Frontview Camera: Scan Tool Information	Driver Assistance Systems Wiring Schematics	Front View Camera Replacement	B174W Frontview Camera - Windshield: Programming and Setup

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
B218R/L	<u>B218L Side Object Sensor Module - Left: Scan Tool Information</u> <u>B218R Side Object Sensor Module - Right: Scan Tool Information</u>	<u>Driver Assistance Systems Wiring Schematics</u>	<u>Side Object Sensing Alert Module Replacement</u>	<u>B218L Side Object Sensor Module - Left: Programming and Setup</u> <u>B218R Side Object Sensor Module - Right: Programming and Setup</u>
K9	<u>K9 Body Control Module: Scan Tool Information</u>	<u>Body Control System Wiring Schematics</u>	<u>Body Control Module Replacement (Equinox) Body Control Module Replacement (Terrain)</u>	<u>K9 Body Control Module: Programming and Setup</u>
K17	<u>K17 Electronic Brake Control Module: Scan Tool Information</u>	<u>Antilock Brake System Wiring Schematics</u>	<u>Electronic Brake Control Module Replacement</u>	<u>K17 Electronic Brake Control Module: Programming and Setup</u>
K20	<u>K20 Engine Control Module: Scan Tool Information</u>	<u>Engine Controls Wiring Schematics (1.5L (LYX))</u> <u>Engine Controls Wiring Schematics (1.6L (LH7))</u> <u>Engine Controls Wiring Schematics (2.0L (LTG))</u>	<u>Engine Control Module Replacement - (1.5L (LYX)) Engine</u> <u>Engine Control Module Replacement - (1.6L (LH7)) Engine</u> <u>Engine Control Module Replacement - (2.0L (LTG)) Engine</u>	<u>K20 Engine Control Module: Programming and Setup</u>
K26L/R	Headlamp Control Module	<u>Headlights/Daytime Running Lights (DRL) Wiring Schematics</u>	<u>Headlamp Replacement (Chevrolet) Headlamp Replacement (GMC)</u>	<u>K26 Headlamp Control Module: Programming and Setup</u>
K29F	Driver Seat and Passenger Seat Heater Control Module	<u>Heated/Cooled Seat Wiring Schematics</u>	<u>Front Seat Heater Vent Control Module Replacement</u>	<u>K29F Seat Heating Control Module - Front: Programming and Setup</u>

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
K29R	Rear Seat Heater Control Module	<u>Heated/Cooled Seat Wiring Schematics</u>	<u>Rear Seat Heater Control Module Replacement</u>	<u>K29R Seat Heating Control Module - Rear: Programming and Setup</u>
K32	Steering Wheel Heating Control Module	<u>Steering Wheel Wiring Schematics</u>	<u>Steering Wheel Heat Control Module Replacement (Equinox). Steering Wheel Heat Control Module Replacement (Terrain).</u>	<u>K32 Steering Wheel Heating Control Module: Programming and Setup</u>
K33	<u>K33 HVAC Control Module: Scan Tool Information</u>	• <u>HVAC Wiring Schematics</u> - Automatic • <u>HVAC Wiring Schematics</u> - Manual	• <u>Heater and Air Conditioning Remote Control Replacement (Equinox). Heater and Air Conditioning Remote Control Replacement (Terrain) - Automatic</u> • <u>Heater and Air Conditioning Remote Control Replacement (Equinox C4P C67) Heater and Air Conditioning Remote Control Replacement (Terrain C67 C4P) - Manual</u>	<u>K33 HVAC Control Module: Programming and Setup</u>
K36	<u>K36 Inflatable Restraint Sensing and Diagnostic Module: Scan Tool Information</u>	<u>SIR Wiring Schematics</u>	<u>Airbag Sensing and Diagnostic Module Replacement (Equinox). Airbag Sensing and Diagnostic Module Replacement (Terrain).</u>	<u>K36 Inflatable Restraint Sensing and Diagnostic Module: Programming and Setup</u>
K39	<u>K39 Liftgate Control Module: Scan Tool Information</u>	<u>Liftgate Wiring Schematics</u>	<u>Accessory and Liftgate Control Module Replacement</u>	<u>K39 Liftgate Control Module: Programming and Setup</u>
K40D	<u>K40D Seat Memory Control Module - Driver: Scan Tool Information</u>	<u>Driver Seat Wiring Schematics</u>	<u>Driver Seat Adjuster Memory Module Replacement</u>	<u>K40D Seat Memory Control Module - Driver: Programming and Setup</u>

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
K43	<u>K43 Power Steering Control Module: Scan Tool Information</u>	<u>Power Steering Wiring Schematics</u>	<u>Power Steering Assist Motor Replacement</u>	<u>K43 Power Steering Control Module: Programming and Setup</u>
K47	<u>K47 Rear Differential Clutch Control Module: Scan Tool Information</u>	<u>Rear Axle Wiring Schematics</u>	<u>Rear Differential Clutch Control Module Replacement</u>	<u>K47 Rear Differential Clutch Control Module: Programming and Setup</u>
K56	Serial Data Gateway Module	<u>Data Communication Wiring Schematics</u>	<u>Serial Data Gateway Module Replacement (Equinox) Serial Data Gateway Module Replacement (Terrain with MNH, NMK, or MHG) Serial Data Gateway Module Replacement (Terrain with M3U, M3D, or M3H)</u>	<u>K56 Serial Data Gateway Module: Programming and Setup</u>
K71	<u>K71 Transmission Control Module: Scan Tool Information (6T40/45/50) K71 Transmission Control Module: Scan Tool Information (9T45 (M3U) or 9T50 (M3D, M3H)) K71 Transmission Control Module: Scan Tool Information (6T40/45/50) K71 Transmission Control Module: Scan Tool Information (9T45 (M3U) or 9T50 (M3D, M3H))</u>	<u>Automatic Transmission Controls Wiring Schematics (6T40 (MNH MNK) or 6T45 (MHG))</u> <u>Automatic Transmission Controls Wiring Schematics (9T45 (M3U) or 9T50 (M3D M3H))</u>	<u>Control Solenoid Valve and Transmission Control Module Assembly Replacement - 6T40 (MNH/MNK) or 6T45 (MHG)</u> <u>Transmission Control Module Replacement - 9T45 (M3U) or 9T50 (M3D/M3H)</u>	<u>K71 Transmission Control Module or Q8 Control Solenoid Valve Assembly: Programming and Setup (6T40 (MNH MNK) or 6T45 (MHG))</u> <u>K71 Transmission Control Module: Programming and Setup (9T45 (M3U) or 9T50 (M3D, M3H))</u>

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
K73	<u>K73 Telematics Communication Interface Control Module: Scan Tool Information</u>	<u>OnStar/Telematics Wiring Schematics</u>	<u>Communication Interface Module Replacement (Equinox). Communication Interface Module Replacement (Terrain with IOS, IOT, IOU). Communication Interface Module Replacement (Terrain with IOR).</u>	<u>K73 Telematics Communication Interface Control Module: Programming and Setup (IOB/IO5/IO6)K73 Telematics Communication Interface Control Module: Programming and Setup (IOR/IOS/IOT/IOU).</u>
K74	<u>K74 Human Machine Interface Control Module: Scan Tool Information</u>	<u>Radio/Navigation System Wiring Schematics (IOB). Radio/Navigation System Wiring Schematics (IO5/IO6). Radio/Navigation System Wiring Schematics (IOR). Radio/Navigation System Wiring Schematics (IOS/IOT/IOU).</u>	<u>Human Machine Interface Control Module Replacement</u>	<u>K74 Human Machine Interface Control Module: Programming and Setup</u>
K84	Keyless Entry Control Module	<u>Remote Function Wiring Schematics</u>	<u>Keyless Entry Control Module Replacement (Equinox). Keyless Entry Control Module Replacement (Terrain).</u>	<u>K84 Keyless Entry. Control Module: Programming and Setup</u>
K89	Immobilizer Control Module	<u>Immobilizer Wiring Schematics</u>	<u>Theft Deterrent Module Replacement (Equinox). Theft Deterrent Module Replacement (Terrain).</u>	<u>K89 Immobilizer Control Module: Programming and Setup</u>

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
K111	Fuel Pump Power Control Module Scan Tool Information	• Engine Controls Wiring Schematics (1.5L (LYX)) • Engine Controls Wiring Schematics 2.0L (LTG)	• Fuel Pump Power Control Module Replacement (FWD) Fuel Pump Power Control Module Replacement (AWD) - 1.5 L (LYX) Engine • Fuel Pump Power Control Module Replacement (AWD) Fuel Pump Power Control Module Replacement (FWD) - 2.0L (LTG) Engine	Fuel Pump Power Control Module Programming and Setup
K157	K157 Video Processing Control Module: Scan Tool Information	Image Display Camera Wiring Schematics	Video Processing Module Replacement (Equinox) Video Processing Module Replacement (Terrain)	K157 Video Processing Control Module: Programming and Setup
K166L/R	Multifunction LED Control Module	Headlights/Daytime Running Lights (DRL) Wiring Schematics	Headlamp Replacement (Chevrolet) Headlamp Replacement (GMC)	• K166L Multifunction LED Control Module - Left: Programming and Setup • K166R Multifunction LED Control Module - Right: Programming and Setup
K171	Hands-Free Liftgate Sensor Control Module	Liftgate Wiring Schematics	Rear Closure Hands Free Module Replacement	K171 Hands-Free Liftgate Sensor Control Module: Programming and Setup
K173	Transmission Range Control Module	Electronic Transmission Range Selector Wiring Schematics	-	K173 Transmission Range Control Module: Programming and Setup

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
K182	<u>K182 Parking Assist Control Module: Scan Tool Information</u>	<u>Parking Assistance Systems Wiring Schematics</u>	<u>Parking Assist Control Module Replacement (Equinox). Parking Assist Control Module Replacement (Terrain).</u>	<u>K182 Parking Assist Control Module: Programming and Setup</u>
P16	<u>P16 Instrument Cluster: Scan Tool Information</u>	<u>Instrument Cluster Wiring Schematics</u>	<u>Instrument Cluster Replacement (Equinox). Instrument Cluster Replacement (Terrain).</u>	<u>P16 Instrument Cluster: Programming and Setup (Equinox)P16 Instrument Cluster: Programming and Setup (Terrain).</u>
T3	<u>T3 Audio Amplifier: Scan Tool Information</u>	<u>Radio/Navigation System Wiring Schematics (IOB). Radio/Navigation System Wiring Schematics (IO5/IO6). Radio/Navigation System Wiring Schematics (IOR). Radio/Navigation System Wiring Schematics (IOS/IOT/IOU).</u>	<u>Radio Speaker Amplifier Replacement (Equinox). Radio Speaker Amplifier Replacement (Terrain).</u>	<u>T3 Audio Amplifier: Programming and Setup</u>

REPAIR INSTRUCTIONS

A11 RADIO: PROGRAMMING AND SETUP (IO5/IO6)

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.
- 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.

- During programming you may be required to select multiple calibrations dependent 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 additional activation steps after programming to transfer customer subscription information.

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program Control Module or Reprogram Control Module

To program a replacement or an existing control 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 A11 Radio - Programming and follow the on-screen instructions.
4. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

XM Activation (If Equipped)

IMPORTANT: After replacement of an XM receiver, call XM radio to deactivate the receiver that has been removed from the vehicle.

1. Turn the radio ON, tune to the XM channel 0, and record the radio ID. The radio ID will be needed for activation of the receiver.
2. From the USA, Call XM radio at 1 - 800 - 556 - 3600 to activate the receiver. From Canada, call 1 - 877 - 438 - 9677.
3. Park the vehicle outside in an area with an unobstructed view of the southern sky.
4. Leave the vehicle outside with the ignition switch in the ACC position and the radio on for 30 minutes to activate XM service.
5. Once activated, the radio will receive the remaining XM channels.

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**
 1. Ignition OFF for one minute, ignition ON.
 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.
 3. All OK.
 - **Go to next step: If the control module can be reprogrammed**
3. All OK.

Valet Mode Reset

1. Verify no DTCs are set.
 - **If any DTCs are set**

- **Go to next step: If no DTCs are set**
- 2. Select the Radio Configuration/Reset Function Erase Valet Mode Code with the scan tool.
- 3. Select Clear and confirm the selection to erase the code.

A11 RADIO: PROGRAMMING AND SETUP (IOB)

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. 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.**
- **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

- If programming of the control module is being performed at the direction of a bulletin or PI, follow the instructions provided in that document.
- During audio system programming you may be required to select multiple calibrations dependent upon vehicle equipment. Have the vehicle build/RPO information available during the following procedure to ensure the correct calibrations are selected.
- Dependant upon vehicle equipment, the current software level of the module, or the release of updates, USB programming may not be required when replacing/reprogramming the control module. If USB files for the application are not available via SPS, or if the files already in the radio are the same or newer than what is available via SPS, or have not been received in another manner of distribution, the USB update process will not need to be performed.
- All data will be erased from the USB device BEFORE the calibration is downloaded onto the device. To ensure important information is NOT erased, always verify that NO information is stored on the device BEFORE beginning the calibration download. If required, transfer important files to another storage device BEFORE beginning the calibration download.
- The length of time for the USB programming to complete will vary depending on the number and size of the files in the update.
- The USB programming will not allow the installation of the same software. If the same software is detected on the USB stick, Radio will display "Invalid Update" message.
- Make sure USB stick is removed after update is complete. If the USB stick is left connected an "Invalid Update" message will be displayed when the radio is powered on.

Reference Information

Special Tools

- **EL-49642 SPS Programming Support Tool**

- USB 2.0 flash drive with a minimum capacity of 4 GB.

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program Control Module or Reprogram Control Module

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

NOTE: The vehicle must remain in PARK during the programming procedure.

1. Install the **EL-49642** SPS Programming Support Tool.
2. Connect a USB drive to the computer.

NOTE: If using a pre-configured USB drive supplied by General Motors, proceed to step 6.

3. Access the Service Programming System (SPS) and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select A11 Radio - USB Copy/ USB File Transfer, and follow the on-screen instructions.

NOTE:

- If there are no files available for USB transfer via SPS, or if the files already in the radio are the same or newer than what is available via SPS proceed to step 10.
- Software currently loaded on the USB Drive will be verified and if files are incorrect they will be deleted and correct files will be loaded. If files residing on the USB Drive are correct for the vehicle being serviced, the Techline terminal will not delete those files and allow the drive to be re-used.

5. Upon completion of the file transfer, remove the USB drive from the computer.
6. Ignition ON, radio ON.
7. Connect the USB drive to the USB port in the vehicle and follow the instructions.
8. When programming is complete, remove the USB device from the vehicle USB port.
9. Access the Service Programming System (SPS) and follow the on-screen instructions.
10. On the SPS Supported Controllers screen, select A11 Radio - Programming, and follow the on-screen instructions.
11. At the end of programming, choose the "Clear DTCs" function on the SPS screen.

XM Activation (If Equipped)

On the radio being replaced, record the radio/XM ID (also called an ESN or RID) from the **IMPORTANT:** radio parts label or before removal tune to XM channel 0. This will be used during the call to XM radio to deactivate the receiver that has been removed from the vehicle.

1. Turn the replacement radio ON, tune to the XM channel 0, and record the radio ID. The radio ID will be needed for activation of the new receiver.
2. From the USA, Call XM radio at 1 - 800 - 556 - 3600 to activate the receiver. From Canada, call 1 - 877 - 438 - 9677. During this call the consultant will typically ask for dealer and customer information along with the radio ID's.
3. Park the vehicle outside in an area with an unobstructed view of the southern sky.
4. Leave the vehicle outside with the ignition switch in the ACC position and the radio on for 30 minutes to activate XM service.
5. Once activated, the radio will receive the remaining XM channels.

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**
 1. Ignition OFF for one minute, ignition ON.
 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.
 3. All OK.
 - **Go to next step: If the control module can be reprogrammed**
3. All OK.

Valet Mode Reset

1. Verify no DTCs are set.
 - **If any DTCs are set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **Go to next step: If no DTCs are set**
2. Select the Radio control function Erase Valet Mode Code with the scan tool.
3. Select Clear and confirm the selection to erase the code.

A11 RADIO: PROGRAMMING AND SETUP (IOU/IOT/IOR)

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. 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.**
- **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

- Check for Preliminary information or Technical Service bulletins before programming.
- During programming you may be required to select multiple calibrations dependent upon vehicle equipment. Have the vehicle build/RPO information available during the following procedure to ensure the correct calibrations are selected.
- Dependent upon the current software level of the module, or the release of updates, USB programming may not be required when replacing/reprogramming the control module. If USB files for the application are not available via SPS, or have not been received from General Motors in another manner of distribution, the USB update process will not need to be performed.

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program Control Module

To program a replacement control module, perform the following procedure:

NOTE: The vehicle must remain in PARK during the programming procedure.

1. Install the 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 A11 Radio - Programming and follow the on-screen instructions.

NOTE: If using a pre-configured USB drive supplied by General Motors, proceed to step 8.

4. Connect a USB drive to the computer.
5. Access the Service Programming System (SPS) and follow the on-screen instructions.
6. On the SPS Supported Controllers screen, select A11 Radio - USB Copy/ USB File Transfer.

NOTE:

- If there are no files available for USB transfer via SPS, proceed to step 12.
- Software currently loaded on the USB Drive will be verified and if files are incorrect they will be deleted and correct files will be loaded. If files residing on the USB Drive are correct for the vehicle being serviced, the Techline terminal will not delete those files and allow the drive to be re-used.

7. Upon completion of the file transfer, remove the USB drive from the computer.
8. Ignition ON, infotainment system ON.

NOTE: The Radio will not allow the installation of the same software version via USB. If the same software is detected the installation process will not start.

9. Connect the USB drive to the USB port in the vehicle.
10. The infotainment system will recognize that update files are available. Follow the infotainment display on-screen instructions and select Update when prompted. Programming will take several minutes.
11. Upon completion of programming, remove the USB drive. Follow the infotainment display on-screen instructions.

NOTE: The following step is to be performed to ensure latest calibrations are programed.

12. Access the Service Programming System (SPS) and follow the on-screen instructions.
13. On the SPS Supported Controllers screen, select A11 Radio - Programming and follow the on-screen instructions.
14. At the end of programming, choose the "Clear DTCs" function on the SPS screen.
15. Perform the Manufacturer Enable Counter (MEC) reset - Access the Global Diagnostics System 2 (GDS 2) system and identify the vehicle.
16. On the GDS 2 screen select Module Diagnostics - Radio (select appropriate RPO) - Configuration/Reset Functions - Reset Manufacturer Enable Counter and follow the on-screen

instructions.

17. Ignition OFF, Retained Accessory Power (RAP) OFF, remove the key fob from range of the vehicle, and let the vehicle sit for five minutes. Retest system operation to verify the repair.

Reprogram Control Module

To program an existing control module, perform the following procedure:

1. Before proceeding with USB programming check for any Info Sys OTA updates under Settings - Updates. If an update is available, decline the update by selecting Details to expand down to see the Decline Update option. After selecting Decline Update a Decline Update confirmation is then needed. If no Info Sys OTA updates are available proceed with USB programming.

NOTE: The vehicle must remain in PARK during the programming procedure.

2. Install the **EL-49642** SPS Programming Support Tool.

NOTE: If using a pre-configured USB drive supplied by General Motors, proceed to step 6.

3. Connect a USB drive to the computer.
4. Access the Service Programming System (SPS) and follow the on-screen instructions.
5. On the SPS Supported Controllers screen, select A11 Radio - USB Copy/ USB File Transfer.

NOTE:

- If there are no files available for USB transfer via SPS, proceed to step 10.
- Software currently loaded on the USB Drive will be verified and if files are incorrect they will be deleted and correct files will be loaded. If files residing on the USB Drive are correct for the vehicle being serviced, the Techline terminal will not delete those files and allow the drive to be re-used.

6. Upon completion of the file transfer, remove the USB drive from the computer.
7. Ignition ON, infotainment system ON.

NOTE: The Radio will not allow the installation of the same software version via USB. If the same software is detected the installation process will not start.

8. Connect the USB drive to the USB port in the vehicle.
9. The infotainment system will recognize that update files are available. Follow the infotainment display on-screen instructions and select Update when prompted. Programming will take several minutes.
10. Upon completion of programming, remove the USB drive. Follow the infotainment display on-screen instructions.
11. Access the Service Programming System (SPS) and follow the on-screen instructions.
12. On the SPS Supported Controllers screen, select A11 Radio - Programming and follow the on-screen instructions.
13. At the end of programming, choose the "Clear DTCs" function on the SPS screen.
14. Ignition OFF, Retained Accessory Power (RAP) OFF, remove the key fob from range of the vehicle, and let the vehicle sit for five minutes. Retest system operation to verify the repair.

Unsuccessful Programming Recovery

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

NOTE: If USB programming was interrupted, a 5 minute recovery time period may be necessary before the software will reinitialize. Wait 3 minutes with the ignition OFF, all access doors closed, and all vehicle systems OFF. Upon restarting the USB portion of the programming, the display

will show a countdown timer for up to 5 minutes before proceeding with the USB File Transfer.

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**
 1. Ignition OFF, all access doors closed, all vehicle systems OFF for one minute, ignition ON.
 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.
 3. All OK.
 - **Go to next step: If the control module can be reprogrammed**
3. All OK.

A22 RADIO CONTROLS: PROGRAMMING AND SETUP (IOB)

Replace and Program ECU or Reprogram ECU

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

A22 RADIO CONTROLS: PROGRAMMING AND SETUP (WITHOUT IOB)

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.**

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

Replace Control Module

The replacement control module is fully programmed by the supplier and does not require SPS programming or any setup procedures.

Reprogram Control Module

To reprogram an existing control 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, if available select A22 Radio Controls - 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. 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**
 1. Ignition OFF for one minute, ignition ON.
 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.
 3. All OK.
 - **Go to next step: If the control module can be reprogrammed**
3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for control module replacement, programming and setup

A26 HVAC CONTROLS: PROGRAMMING AND SETUP

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)

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.**
- **Verify 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 below mentioned special tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.**
- **Turn Off or disable systems that may put a load on the vehicle's battery. For example, interior lights, daytime running lights, HVAC, and radio.**
- **During the programming procedure, follow the Service Programming System (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.

Programming an Existing or New Control Module

This control module does not require SPS programming or any setup procedures.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: [Diagnostic Repair Verification](#)

For control module replacement, programming, and setup refer to: [Control Module References](#)

B174W FRONTVIEW CAMERA - WINDSHIELD: 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 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.
- If the windshield was replaced, the B174W Frontview Camera - Windshield must be calibrated.
- If the B174W Frontview Camera - Windshield was removed and reinstalled, no action is necessary.

Following Replacement of Windshield

Do not reprogram the frontview camera module when only the windshield is replaced, unless directed by a service procedure, or a service bulletin.

The K109 Frontview Camera Module must be calibrated, refer to [Front View Camera Module Learn](#) .

Replace and Program Frontview Camera Module or Reprogram Frontview Camera Module (without UGN)

NOTE: Due to continuous improvements, the on screen selections may vary from instructions below.

To program a replacement or an existing Front View Camera 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 B174W Frontview Camera - Windshield - Programming and follow the on-screen instructions.

3. On the SPS Supported Controllers screen, select B174W Frontview Camera - Windshield - Setup (**if this option is available**) and follow the on-screen instructions.
4. At the end of programming, choose the "Clear DTCs" function on the SPS screen.
5. Following B174W Frontview Camera - Windshield replacement and reprogramming, the module must be calibrated. Refer to [Front View Camera Module Learn](#) .

Replace and Program Frontview Camera Module or Reprogram Frontview Camera Module (with UGN)

To program a replacement or an existing B174W Frontview Camera - Windshield, 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 B174W Frontview Camera - Windshield - Programming and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select B174W Frontview Camera - Windshield - Setup (**if this option is available**) and follow the on-screen instructions.

NOTE: After programming is performed, it is normal to have DTC B101E 4B set until calibration is complete.

If reprogramming an existing module that was previously calibrated, calibration is not required. The module retains its calibration settings during reprogramming. If a new module was programmed the module alignment must be calibrated. Using a scantool, initiate the learn procedure for B174W Frontview Camera - Windshield. The scan tool must remain connected and on the calibration screen during the entire process.

Refer to [Front View Camera Module Learn](#) .

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 B174W Frontview Camera - Windshield, DLC and programming tool connections are secure and the TIS terminal operating software is up to date.
2. Attempt to reprogram the B174W Frontview Camera - Windshield.
3. If the B174W Frontview Camera - Windshield can still not be programmed, turn the ignition OFF for at least one minute.
4. Turn the ignition ON and attempt to reprogram the B174W Frontview Camera - Windshield. The B174W Frontview Camera - Windshield should program.
 - If the B174W Frontview Camera - Windshield still cannot be programmed, replace the B174W Frontview Camera - Windshield.

B218L SIDE OBJECT SENSOR MODULE - LEFT: 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.**
- **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.**
- **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.

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program ECU or Reprogram ECU

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

NOTE:

- Due to continuous improvements, the on screen selections may vary from instructions below.
- It is recommended to program both the left and right (if programmable) when a programming event is required.
- Some systems only have one programmable Side Object Sensor Module.

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select B218L/R Side Object Sensor Module or B218R Right Side Object Sensor Module or B218L Left Side Object Detection.
3. On the SPS Select Function / Sequence screen, select Sequential Programming or Programming
4. At the end of programming, choose the "Clear 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.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for Control Module replacement, programming and setup

B218R SIDE OBJECT SENSOR MODULE - RIGHT: 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.

- **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.**
- **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.**

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program ECU or Reprogram ECU

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

NOTE:

- **Due to continuous improvements, the on screen selections may vary from instructions below.**
- **It is recommended to program both the left and right (if programmable) when a programming event is required.**
- **Some systems only have one programmable Side Object Sensor Module.**

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select B218L/R Side Object Sensor Module or B218R Right Side Object Sensor Module or B218L Left Side Object Detection.
3. On the SPS Select Function / Sequence screen, select Sequential Programming or Programming
4. At the end of programming, choose the "Clear 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.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for Control Module replacement, programming and setup

K9 BODY 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 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.**

Reference Information**Special Tools**

- **EL-49642** SPS Programming Support Tool
- **EL-46079** Tire Pressure Monitor Diagnostic Tool or **EL-50448** Tire Pressure Monitor Sensor Activation Tool

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program Control Module

To program a replacement K9 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.
 3. On the SPS Supported Controllers screen, select K9 Body Control Module - Programming and follow the on-screen instructions.
 4. 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 m.
 - 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 m.

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.

5. On the SPS Supported Controllers screen, select Z1 Immobilizer Learn. 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.

6. On the SPS Supported Controllers screen, select K9 Body Control Module - Setup (or K9 Body Control Module - Configuration & Setup) and follow the on-screen instructions.
7. 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.
8. At the end of programming, choose the "Clear DTCs" function on the SPS screen.
9. If ABS, Traction Control and/or Stabilitrak indicators are ON and DTC C0161 is set in the K17 Electronic Brake Control Module after performing BCM programming and setup, do the following:
 1. Disconnect the scan tool from the X84 Data Link Connector.
 2. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from the vehicle. It may take up to 2 min to power down.
 3. Ignition ON/Vehicle In Service Mode, verify DTC C0161 is in history. If not, repeat the above step to make sure the vehicle is in sleep mode.
 4. Use the scan tool to clear the DTCs.

Reprogram Control Module

To program an existing K9 Body Control Module, 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 K9 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 K9 Body Control Module - Setup (or K9 Body Control Module - Configuration & 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 DTCs" function on the SPS screen.
7. If ABS, Traction Control and/or Stabilitrak indicators are ON and DTC C0161 is set in the K17 Electronic Brake Control Module after performing BCM programming and setup, do the following:
 1. Disconnect the scan tool from the X84 Data Link Connector.
 2. Ignition/Vehicle OFF, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from the vehicle. It may take up to 2 min to power down.
 3. Ignition ON/Vehicle In Service Mode, verify DTC C0161 is in history. If not, repeat the above step to make sure the vehicle is in sleep mode.
 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/Vehicle In Service Mode. 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**
 1. Ignition/Vehicle OFF for one minute, ignition ON/Vehicle In Service Mode.
 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.
 3. All OK.
 - **Go to next step: If the control module can be reprogrammed**
3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for Control Module replacement, programming and setup

K17 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 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.**

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program Control Module

To program a replacement control 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 K17 Electronic Brake Control Module - Programming and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select K17 Electronic Brake Control Module - Setup and Configuration 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, perform the Electronic Brake Control Module-Control Functions Automated Brake Bleed following the scan tool instructions. Refer to [Antilock Brake System Automated Bleed](#).

Reprogram Control Module

To reprogram an existing 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 K17 Electronic Brake Control Module - Programming and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select K17 Electronic Brake Control Module - Setup and Configuration 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. 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**
 1. Ignition OFF for one minute, ignition ON.
 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.
 3. All OK.
 - **Go to next step: If the control module can be reprogrammed**
3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for Control Module replacement, programming and setup

K20 ENGINE CONTROL MODULE: PROGRAMMING AND SETUP

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

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 (DLC). 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.
- Note the engine oil life remaining percentage.
- If over 14k GVW, program the engine serial number with the scan tool.

Replace and Program Control Module

To program a replacement K20 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. Before removing the old control module, perform the SPS function Prepare Control Module for Removal, if available.

NOTE: The Prepare Control Module for Removal function can only be performed when communication with the old control module is still possible.

4. Replace the ECM.
5. Perform one of the following SPS Programming functions:

NOTE: If both controller options below are listed, select K20/K71 Engine and Transmission Control Modules.

- K20/K71 Engine and Transmission Control Modules and follow the on-screen instructions.
 - K20 Engine Control Module and follow on-screen instructions.
6. Clear the DTCs after completing the Programming procedure.
 7. If equipped, perform the SPS function Immobilizer Learn and follow the on-screen instructions. Refer to [Immobilizer System Component Programming](#).
 8. Perform the following SPS function:
 1. Setup

NOTE: If both controller options below are listed, select K20 Engine Control Module.

- K20/K71 Engine and Transmission Control Modules and follow the on-screen instructions.
- K20 Engine Control Module and follow on-screen instructions.

2. Configuration - If applicable

9. If equipped, perform the Fuel Pressure Regulator Learn via GDS2, Engine Control Module, Configuration/Reset Functions, Learn Functions.

10. Clear DTCs.

Reprogram Control Module

To reprogram an existing K20 Engine Control 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. Perform one of the following SPS Programming functions:

NOTE: If both controller options below are listed, select K20/K71 Engine and Transmission Control Modules.

- K20/K71 Engine and Transmission Control Modules and follow the on-screen instructions.
 - K20 Engine Control Module and follow on-screen instructions.
4. Clear DTCs after completing the Programming procedure.

NOTE: If vehicle fails to start during Configuration and Setup, perform the SPS Function Immobilizer Learn and follow the on-screen instructions.

5. Perform the following SPS function:

1. Setup

NOTE: If both controller options below are listed, select K20 Engine Control Module.

- K20/K71 Engine and Transmission Control Modules and follow the on-screen instructions.
 - K20 Engine Control Module and follow on-screen instructions.
2. Configuration - If applicable
6. If equipped, perform the Fuel Pressure Regulator Learn via GDS2, Engine Control Module, Configuration/Reset Functions, Learn Functions.
7. Clear DTCs.

Unsuccessful Programming Recovery

If programming a control module is not successful, perform the following procedure:

1. Verify the control module, data link connector and programming tool connections are secure and the tool software is up to date.
2. Ignition - On / Vehicle - In Service Mode
3. Perform one of the following SPS Programming functions:

NOTE: If both controller options below are listed, select K20/K71 Engine and Transmission Control Modules.

- K20/K71 Engine and Transmission Control Modules and follow the on-screen instructions.
- K20 Engine Control Module and follow on-screen instructions.

4. Verify the control module programming is successful.

- **If the programming is not successful**

1. Ignition/Vehicle - Off - For greater than 1 min
2. Ignition - On / Vehicle - In Service Mode
3. Perform one of the following SPS Programming functions:

NOTE: If both controller options below are listed, select K20/K71 Engine and Transmission Control Modules.

- K20/K71 Engine and Transmission Control Modules and follow the on-screen instructions.
- K20 Engine Control Module and follow on-screen instructions.
- If the programming is not successful Replace the appropriate component:K20 Engine Control Module or K71 Transmission Control Module
- If the programming is successful

4. All OK.

- **Go to next step: If the programming is successful**

5. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for control module replacement, programming and setup.

K26 HEADLAMP 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 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.

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

[Replace and Program Control Module or Reprogram Control Module](#)

To program a replacement or existing control 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 K26 Headlamp Control Module - Programming and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select K26 Headlamp Control Module - Setup while following 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. 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**
 1. Ignition OFF for one minute, ignition ON.
 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.
 3. All OK.
 - **Go to next step: If the control module can be reprogrammed**
3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for Control Module replacement, programming and setup

K29F SEAT HEATING CONTROL MODULE - FRONT: PROGRAMMING AND SETUP

This device does not require programming or setup.

K29R SEAT HEATING CONTROL MODULE - REAR: PROGRAMMING AND SETUP

This device does not require programming or setup.

K32 STEERING WHEEL HEATING CONTROL MODULE: PROGRAMMING AND SETUP

This device requires no programming or setup.

K33 HVAC CONTROL MODULE: PROGRAMMING AND SETUP

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)

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.**
- **Verify 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 below mentioned special tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- **Turn Off or disable systems that may put a load on the vehicle's battery.** For example, interior lights, daytime running lights, HVAC, and radio.
- **During the programming procedure, follow the Service Programming System (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.

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

Equivalent regional tools: [Special Tools](#).

Programming an Existing or New Control Module

To program an existing or new control module, perform the following procedure:

1. Install the special tool : EL-49642 SPS Programming Support Tool
2. Ignition - On / Vehicle - In Service Mode
3. Access SPS and follow the on-screen instructions for the control module: K33 HVAC Control Module
4. Perform the SPS function: Programming

Unsuccessful Programming Recovery

If programming a control module is not successful, perform the following procedure:

1. Verify the control module, data link connector and programming tool connections are secure and the tool software is up to date.
2. Ignition - On / Vehicle - In Service Mode
3. Perform the SPS function: Programming

Verify the control module programming is successful.

- **If the programming is not successful**

1. Ignition/Vehicle - Off - For greater than 1 min
2. Ignition - On / Vehicle - In Service Mode
3. Perform the SPS function: Programming

- If the programming is not successful - Replace the component: K33 HVAC Control Module
- If the programming is successful

4. All OK.

- **Go to next step: If the programming is successful**

4. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: [Diagnostic Repair Verification](#)

For control module replacement, programming, and setup refer to: [Control Module References](#)

K36 INFLATABLE RESTRAINT SENSING AND DIAGNOSTIC 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 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.
- The air bag indicator light may remain ON after the body control module (BCM), or Inflatable Restraint Sensing and Diagnostic Modules replaced, and during the programming procedure for the BCM until after the procedure is completed. When installing a new Inflatable Restraint Sensing and Diagnostic Module, there may be several DTCs set prior to programming. Once programmed, these DTCs should be in history and can be cleared.
- Failure to complete the following Setup procedure may cause DTC B1001 to be set in the Inflatable Restraint Sensing and Diagnostic Module.

Replace and Program Control Module or Reprogram Control Module

To program a replacement control module, perform the following procedure:

If "K36 Inflatable Restraint Sensing and Diagnostic Module - Programming and Setup" is shown

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select K36 Inflatable Restraint Sensing and Diagnostic Module - Programming and Setup and follow the on-screen instructions.
3. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

If "K36 Inflatable Restraint Sensing and Diagnostic Module - Programming and Setup" is not shown

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select K36 Inflatable Restraint Sensing and Diagnostic Module - Programming and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select K36 Inflatable Restraint Sensing and Diagnostic Module - Setup 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

NOTE:

GMNA Regions: When SPS failure message E4489 occurs during programming or calibration, do not call TCSC immediately. Record at which point the failure occurred before it displayed the E4489 message. When this occurs, proceed to GDS2. Download the appropriate vehicle configuration and select the Inflatable Restraint Sensing and Diagnostic Module. Under Identification Information, look at parameters: Software Module 1 Identifier and Software Module 2 Identifier. If either of these are populated with a value of 1 or more, replace the Inflatable Restraint Sensing and Diagnostic Module. Record these parameter values on the back of the job card.

Non GMNA Regions: When SPS displays message indicating that programming may fail and the programming event fails at 0%, replace the Inflatable Restraint Sensing and Diagnostic Module. Verify no other DTC's or issues exist with the module prior to replacement. Record all DTCs and relevant information on the back of the job card.

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**
 1. Ignition OFF for one minute, ignition ON.
 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.
 3. All OK.
 - **Go to next step: If the control module can be reprogrammed**
3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for Control Module replacement, programming and setup

K39 LIFTGATE 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 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.

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

Replace and Program Control Module

NOTE: Some vehicles may be equipped with the handsfree liftgate control option (TC2), it is important to select the correct calibration software for vehicles with or without this option as programming the liftgate with the incorrect software will cause the power liftgate system to become inoperative without any DTCs indicated

NOTE: The liftgate must be completely closed and latched, if the liftgate is open or ajar during programming, the power liftgate system may become inoperative without any DTCs indicated

To program a replacement control 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 K39 Liftgate Control Module - Programming and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select K39 Liftgate Control Module - Setup 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, perform the Liftgate Relearn. Refer to [Liftgate Calibration](#)

Reprogram Control Module

NOTE: Some vehicles may be equipped with the handsfree liftgate control option (TC2), it is important to select the correct calibration software for vehicles with or without this option as programming the liftgate with the incorrect software will cause the power liftgate system to become inoperative without any DTCs indicated

NOTE: The liftgate must be completely closed and latched, if the liftgate is open or ajar during programming, the power liftgate system may become inoperative without any DTCs indicated

To reprogram an existing control 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 K39 Liftgate Control Module - Programming and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select K39 Liftgate Control Module - Setup 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, perform the Liftgate Relearn Refer to [Liftgate Calibration](#)

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

K40D SEAT MEMORY CONTROL MODULE - DRIVER: 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 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.

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program Control Module or Reprogram Control Module

To program a replacement or an existing control 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 K40D Seat Memory Control Module - Driver - Programming and follow the on-screen instructions.
4. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.
5. Move the seat to a central, middle range position, then perform the memory store operation for memory "1", "2", and "Exit" or "3" if equipped. Refer to the Owner Manual for storing memory seat positions.

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**
 1. Ignition OFF for one minute, ignition ON.
 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.

3. All OK.

- **Go to next step: If the control module can be reprogrammed**

3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for Control Module replacement, programming and setup

K43 POWER STEERING 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 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

The Electric Power Steering Control Module is part of the power steering assist motor assembly and is electronically paired with the steering gear's sensors.

If communication with the OLD power steering control module cannot be established, then replace the entire steering gear as an assembly. Do NOT proceed with replacement of just the power steering assist motor.

Refer to [Electric Dual Pinion Rack and Pinion Steering Gear Replacement](#)

Replace and Program Control Module

NOTE:

During the procedures listed below, critical data is retrieved from vehicle components and stored in the scan tool computer's hard drive. This data is needed during the programming and setup sequences.

Ensure the same scan tool is used and capable of reading, storing, and writing the vehicle's system data.

To program a replacement control module, perform the following procedure:

NOTE:

Step 1 copies the worm gear wear counter data from the power steering control module PRIOR to the module's removal and stores it on the scan tool computer's hard drive.

AFTER completing step 1, the power steering control module can now be removed and replaced.

1. On the SPS Supported Controllers screen, select K43 Power Steering Control Module - Prepare Control Module for Removal and follow the on-screen instructions.
2. Replace the Power Steering Control Module. Refer to [Control Module References](#).

NOTE: The next two steps will transfer the vehicle's critical data, including the worm gear wear counter data saved in step 1, back to the vehicle components.

3. On the SPS Supported Controllers screen, select K43 Power Steering Control Module - Programming and follow the on-screen instructions.
4. Ignition OFF and all vehicle systems OFF. It may take up to 2 minutes for all vehicle systems to power down.
5. Ignition ON.
6. On the SPS Supported Controllers screen, select K43 Power Steering Control Module - Setup and Configuration and follow the on-screen instructions.
7. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

Reprogram Control Module

To reprogram an existing 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 K43 Power Steering Control Module - Programming and follow the on-screen instructions.
3. Ignition OFF and all vehicle systems OFF. It may take up to 2 minutes for all vehicle systems to power down.
4. Ignition ON.
5. On the SPS Supported Controllers screen, select K43 Power Steering Control Module - Setup and 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. 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**
 1. Ignition OFF for one minute, ignition ON.
 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.
 3. All OK.
 - **Go to next step: If the control module can be reprogrammed**
3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for control module replacement, programming and setup

K47 REAR DIFFERENTIAL CLUTCH 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.
- 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.
- 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

- If replacing the Rear Differential Clutch Control Module, but not the assembly, the module needs to be configured with the rear differential clutch service calibration values. The rear differential clutch calibration values will need to be retrieved from the old Rear Differential Clutch Control Module during Prepare the Control Module for Removal process and programmed into the new Rear Differential Clutch Control Module using SPS.
- If replacing only the Rear Differential Clutch Control Module, run Prepare the Control Module for Removal.
- If replacing the rear differential clutch assembly and keeping the old RDCM, the RDCM will only need to be configured with the number stamped on the housing using a scan tool.

Reference Information**Special Tools**

EL-49642 SPS Programming Support Tool.

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program Control Module Using Existing Rear Differential Assembly

To program a replacement control module, perform the following procedure:

NOTE: Steps 1-3 must be performed BEFORE the old K47 Rear Differential Clutch Control Module is removed from the vehicle.

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 K47 Rear Differential Clutch Control Module - Prepare the Control Module for Removal and follow the on-screen instructions.
4. Replace the K47 Rear Differential Clutch Control Module.
5. On the SPS Supported Controllers screen, select K47 Rear Differential Clutch Control Module - Programming and follow the on-screen instructions.
6. On the SPS Supported Controllers screen, select K47 Rear Differential Clutch Control Module - Setup and follow the on-screen instructions.
7. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

Replace and Program Control Module With New Rear Differential Assembly

To program a replacement control module, perform the following procedure:

NOTE: When replacing a rear differential assembly in a 2015 - 2017 vehicle, the service assembly will include a new K47 Rear Differential Clutch Control Module. This new K47 Rear Differential Clutch Control Module has advanced cyber security features for 2018 and newer vehicles and is incompatible with 2015 - 2017 vehicles. To ensure compatibility, the rear differential clutch calibrations must be extracted from the new K47 Rear Differential Clutch Control Module and programmed to the original K47 Rear Differential Clutch Control Module. The following must be performed in the specified order to ensure the calibration is successfully transferred.

1. Install the new rear differential assembly with new K47 Rear Differential Clutch Control Module.
2. Install **EL-49642** SPS Programming Support Tool.
3. Access the Service Programming System (SPS) and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select K47 Rear Differential Clutch Control Module - Prepare the Control Module for Removal and follow the on-screen instructions.
5. Replace the new K47 Rear Differential Clutch Control Module with the original K47 Rear Differential Clutch Control Module.
6. On the SPS Supported Controllers screen, select K47 Rear Differential Clutch Control Module - Programming and follow the on-screen instructions.
7. On the SPS Supported Controllers screen, select K47 Rear Differential Clutch Control Module - Setup and follow the on-screen instructions.
8. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

Reprogram Control Module

To reprogram an existing control 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 K47 Rear Differential Clutch Control Module - Programming and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select K47 Rear Differential Clutch Control 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. Ignition ON. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the K47 Rear Differential Clutch Control Module can be reprogrammed.
 - **If the K47 Rear Differential Clutch Control Module cannot be reprogrammed**
 1. Ignition OFF for one minute, ignition ON.
 2. Verify the K47 Rear Differential Clutch Control Module can be reprogrammed.
 - If the control module cannot be reprogrammed, replace the K47 Rear Differential Clutch Control Module.
 - If the control module can be reprogrammed.
3. All OK.
 - **Go to next step: If the K47 Rear Differential Clutch Control Module can be reprogrammed**
3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for control module replacement, programming and setup

K56 SERIAL DATA GATEWAY 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 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.

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

Replace and Program Control Module or Reprogram Control Module

To program a replacement or an existing K56 Serial Data Gateway 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 K56 Serial Data Gateway Module - Programming and follow the on-screen instructions.
4. At the end of programming, choose the "Clear DTCs" function on the SPS screen.

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**
 1. Ignition OFF for one minute, ignition ON.
 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.

3. All OK.

- Go to next step: If the control module can be reprogrammed

3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for Control Module replacement, programming and setup

K62 SUNROOF SUNSHADE CONTROL MODULE: PROGRAMMING AND SETUP

This device requires no programming or setup.

K71 TRANSMISSION CONTROL MODULE: PROGRAMMING AND SETUP (9T45 (M3U) OR 9T50 (M3D, M3H))

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

NOTE:

- **DO NOT** program a control module unless directed to do by a service procedure or 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 (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.

Replace and Program Control Module

To program a replacement K71 Transmission Control Module (TCM), perform the following procedure:

1. Replace the K71 Transmission Control Module.
2. Install **EL-49642** SPS programming support tool
3. Access the Service Programming System (SPS) and follow the on-screen instructions.
4. Perform one of the following SPS Programming functions:

NOTE:

If both controller options below are listed, select K71 Transmission Control Module

- K20/ K71 Engine and Transmission Control Modules and follow the on-screen instructions
- K71 Transmission Control Module and follow on-screen instructions.

5. Perform the Refresh Characterization Data at the MCVVM Characterization procedure, follow the on-screen instructions.
6. Perform the Vehicle Setup, follow the on screen instructions.
7. With a scan tool, clear DTCs from the K71 Transmission Control Module.
8. Ignition OFF for 2 minutes.

Reprogram Control Module

To program an existing K71 Transmission Control 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. Perform one of the following SPS Programming functions:

NOTE: If both controller options below are listed, select K71 Transmission Control Module

- K20/ K71 Engine and Transmission Control Modules and follow the on-screen instructions
 - K71 Transmission Control Module and follow on-screen instructions.
4. Perform the Vehicle Setup, follow the on screen instructions.
 5. With a scan tool, clear DTCs from the K71 Transmission Control Module.
 6. Ignition OFF, allow vehicle systems to power down.

NOTE: It may take up to 2 minutes for all vehicle systems to power down.

7. Perform the Service Fast Learn (SFL), follow the on screen instructions.

NOTE: If the transmission fluid temperature is not between 75 Å, Å°C (167 to 185 Å, Å°F) the scan tool will not allow the procedure to be performed.

8. Ignition OFF for 2 minutes.

Reprogram Control Module after Transmission Repair/Replacement

To program an existing K71 Transmission Control Module, after a transmission repair/replacement, 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. Perform one of the following SPS Programming functions:

NOTE: If both controller options below are listed, select K71 Transmission Control Module

- K20/ K71 Engine and Transmission Control Modules and follow the on-screen instructions
 - K71 Transmission Control Module and follow on-screen instructions.
4. Perform the Refresh Characterization Data at the MCVVM Characterization procedure, follow the on-screen instructions.
 5. Perform the Vehicle Setup, follow the on screen instructions.
 6. With a scan tool, clear DTCs from the K71 Transmission Control Module.
 7. Ignition OFF, allow vehicle systems to power down.

NOTE: It may take up to 2 minutes for all vehicle systems to power down.

8. Perform the Service Fast Learn (SFL), follow the on screen instructions.

NOTE: If the transmission fluid temperature is not between 75 Å, Å°C (167 Å, Å°F) and 85 Å, Å°C (185 Å, Å°F) the scan tool will not allow the procedure to be

performed.

9. Ignition OFF for 2 minutes.

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 programmed**
 1. Ignition OFF for 2 minutes, ignition ON.
 2. Verify the control module can be reprogrammed.
 - If the control module cannot be programmed, replace the K71 Transmission Control Module.
 - **Go to next step: If the control module can be reprogrammed**
3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for TCM replacement, programming and setup

K73 TELEMATICS COMMUNICATION INTERFACE CONTROL MODULE: PROGRAMMING AND SETUP (IOB/IO5/IO6)

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.

Diagnostic Aids

- Before beginning any programming first determine which Generation of the K73 Telematics Communication Interface Control Module you are working with. One way to accomplish this is by using a scan tool. The K73 Telematics Communication Interface Control Module Generation will be listed under the Selected Vehicle Configuration section, in addition the Generation (9 or 10) can be determined from the Module ID data table. Additional programming steps may be necessary depending on the generation of the module.

- 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 required to complete the procedure.
- 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.
- If the vehicle is equipped with RPO VV4 the K73 Telematics Communication Interface Control Module WiFi Enable (Gen 10 only) Programming step must be performed AFTER the Programming and Service Activation step. Failure to complete this step in the proper sequence will result in WiFi being disabled.
- 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.

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program Control Module or Reprogram Control Module

To program a replacement or an existing control 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. In the SPS Supported Controllers screen, select K73 Telematics Communication Interface Control Module Programming 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. After Control Module Programming and Service Activation, if the vehicle is equipped with RPO VV4, on the Supported Controllers screen select K73 Telematics Communication Interface Control Module WiFi Enable (Gen 10 only) Programming and follow the on-screen instructions.

NOTE: The WiFi Enable step must be performed AFTER the Programming and Service Activation step, or WiFi will not function. If Programming and Service Activation step is performed after the WiFi Enable step, WiFi will be disabled.

6. Press the OnStar[®] Blue Button to call OnStar[®] and have the system activated. If the customer refused OnStar[®] services (terms and conditions) and the vehicle is equipped with RPO VV4 have the OnStar[®] consultant turn off the WiFi demo message that occurs after every ignition on event.

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**
 1. Ignition OFF for one minute, ignition ON.

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.

3. All OK.

- **Go to next step: If the control module can be reprogrammed**

3. All OK.

K73 TELEMATICS COMMUNICATION INTERFACE CONTROL MODULE: PROGRAMMING AND SETUP (IOR/IOS/IOT/IOU)

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.**

Diagnostic Aids

- Before beginning any programming first determine which Generation of the K73 Telematics Communication Interface Control Module you are working with. One way to accomplish this is by using a scan tool. The K73 Telematics Communication Interface Control Module Generation will be listed under the Selected Vehicle Configuration section, in addition the Generation (9 or 10) can be determined from the Module ID data table. Additional programming steps may be necessary depending on the generation of the module.
- It is critical to use the service replacement K73 Telematics 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 required to complete the procedure.
- 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.

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program Control Module or Reprogram Control Module

To program a replacement or an existing control 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. In the SPS Supported Controllers screen, select K73 Telematics Communication Interface Control Module Programming 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. Press the OnStar[®] Blue Button to call OnStar[®] and have the system activated.

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**
 1. Ignition OFF for one minute, ignition ON.
 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.
 3. All OK.
 - **Go to next step: If the control module can be reprogrammed**
3. All OK.

K74 HUMAN MACHINE INTERFACE 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. 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.
- 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

- Check for Preliminary information or Technical Service bulletins before programming.
- During programming you may be required to select multiple calibrations dependent upon vehicle equipment. Have the vehicle build/RPO information available during the following procedure to ensure the correct calibrations are selected.
- Dependent upon the current software level of the module, or the release of updates, USB programming may not be required when replacing/reprogramming the control module. If USB files for the application are not available via SPS, or have not been received from General Motors in another manner of distribution, the USB update process will not need to be performed.

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program Control Module

To program a replacement control module, perform the following procedure:

NOTE: The vehicle must remain in PARK during the programming procedure.

1. Install the 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 K74 Human Machine Interface Control Module - Programming and follow the on-screen instructions.

NOTE: If using a pre-configured USB drive supplied by General Motors, proceed to step 8.

4. Connect a USB drive to the computer.
5. Access the Service Programming System (SPS) and follow the on-screen instructions.
6. On the SPS Supported Controllers screen, select K74 Human Machine Interface Control Module - USB Copy/ USB File Transfer.

NOTE:

- If there are no files available for USB transfer via SPS or if the current file number matches the selected file number, proceed to step 12.
- Software currently loaded on the USB Drive will be verified and if files are incorrect they will be deleted and correct files will be loaded. If files residing on the USB Drive are correct for the vehicle being serviced, the Techline terminal will not delete those files and allow the drive to be re-used.

7. Upon completion of the file transfer, remove the USB drive from the computer.
8. Ignition ON, infotainment system ON.

NOTE: On certain model years the HMI will not allow the installation of the same software version via USB. If the same software is detected the installation process will not start.

9. Connect the USB drive to the USB port in the vehicle.
10. The infotainment system will recognize that update files are available. Follow the infotainment display on-screen instructions and select Update when prompted. Programming will take several minutes.

11. Upon completion of programming, remove the USB drive. Follow the infotainment display on-screen instructions.

NOTE: The following step is to be performed to ensure latest calibrations are programmed.

12. Access the Service Programming System (SPS) and follow the on-screen instructions.
13. On the SPS Supported Controllers screen, select K74 Human Machine Interface Control Module - Programming and follow the on-screen instructions.
14. At the end of programming, choose the "Clear DTCs" function on the SPS screen.

Reprogram Control Module

To program an existing control module, perform the following procedure:

NOTE: The vehicle must remain in PARK during the programming procedure.

1. Install the **EL-49642** SPS Programming Support Tool.

NOTE: If using a pre-configured USB drive supplied by General Motors, proceed to step 6.

2. Connect a USB drive to the computer.
3. Access the Service Programming System (SPS) and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select K74 Human Machine Interface Control Module - USB Copy/ USB File Transfer.

NOTE:

- If there are no files available for USB transfer via SPS or if the current file number matches the selected file number, proceed to step 10.
- Software currently loaded on the USB Drive will be verified and if files are incorrect they will be deleted and correct files will be loaded. If files residing on the USB Drive are correct for the vehicle being serviced, the Techline terminal will not delete those files and allow the drive to be re-used.

5. Upon completion of the file transfer, remove the USB drive from the computer.
6. Ignition ON, infotainment system ON.

NOTE: On certain model years the HMI will not allow the installation of the same software version via USB. If the same software is detected the installation process will not start.

7. Connect the USB drive to the USB port in the vehicle.
8. The infotainment system will recognize that update files are available. Follow the infotainment display on-screen instructions and select Update when prompted. Programming will take several minutes.
9. Upon completion of programming, remove the USB drive. Follow the infotainment display on-screen instructions.
10. Access the Service Programming System (SPS) and follow the on-screen instructions.
11. On the SPS Supported Controllers screen, select K74 Human Machine Interface Control Module - Programming and follow the on-screen instructions.
12. At the end of programming, choose the "Clear DTCs" function on the SPS screen.

Unsuccessful Programming Recovery

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

NOTE: If USB programming was interrupted, a 5 minute recovery time period

may be necessary before the software will reinitialize. Wait 3 minutes with the ignition OFF, all access doors closed, and all vehicle systems OFF. Upon restarting the USB portion of the programming, the display will show a countdown timer for up to 5 minutes before proceeding with the USB File Transfer.

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**
 1. Ignition OFF, all access doors closed, all vehicle systems OFF for one minute, ignition ON.
 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.
 3. All OK.
 - **Go to next step: If the control module can be reprogrammed**
3. All OK.

K84 KEYLESS ENTRY CONTROL MODULE: PROGRAMMING AND SETUP

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

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 K84 Keyless Entry Control Module - 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.

K85 PASSENGER PRESENCE MODULE: PROGRAMMING AND SETUP

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)

Programming an Existing or New Control Module

This control module does not require SPS programming but does require the following setup procedures after a new control module is installed: [Passenger Presence System Rezeroing](#)

K89 IMMOBILIZER CONTROL MODULE: PROGRAMMING AND SETUP

Replace and Program ECU or Reprogram ECU

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

K109 FRONTVIEW CAMERA 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.
- 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.
- If the Frontview camera module was removed and reinstalled, no action is necessary.

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

Following Replacement of Windshield

Do not reprogram the frontview camera module when only the windshield is replaced, unless directed by a service procedure, or a service bulletin.

The K109 Frontview Camera Module must be calibrated, refer to [Front View Camera Module Learn](#) .

Replace and Program Frontview Camera Module or Reprogram Frontview Camera Module (without UGN)

NOTE: Due to continuous improvements, the on screen selections may vary from instructions below.

To program a replacement or an existing Front View Camera 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 K109 Frontview Camera Module - Programming and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select K109 Frontview Camera Module - Setup (**if this option is available**) and follow the on-screen instructions.
4. At the end of programming, choose the "Clear DTCs" function on the SPS screen.
5. Following K109 Frontview Camera Module replacement and reprogramming, the module must be calibrated. Refer to [Front View Camera Module Learn](#) .

Replace and Program Frontview Camera Module or Reprogram Frontview Camera Module (with UGN)

To program a replacement or an existing Front View Camera 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 K109 Frontview Camera Module - Programming and follow the on-screen instructions.

NOTE: After programming is performed, it is normal to have DTC B101E 4B set until calibration is complete.

3. On the SPS Supported Controllers screen, select K109 Frontview Camera Module - Setup (**if this option is available**) and follow the on-screen instructions.

If reprogramming an existing module that was previously calibrated, calibration is not required. The module retains its calibration settings during reprogramming. If a new module was programmed the module alignment must be calibrated. Using a scantool, initiate the learn procedure for Frontview Camera Module. The scantool must remain connected and on the calibration screen during the entire process.

Refer to [Front View Camera Module Learn](#) .

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 Frontview Camera Module, DLC and programming tool connections are secure and the TIS terminal operating software is up to date.
2. Attempt to reprogram the Frontview Camera Module.
3. If the Frontview Camera 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 Frontview Camera Module. The Frontview Camera Module should program.
 - If the Frontview Camera Module still cannot be programmed, replace the Frontview Camera Module.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

K157 VIDEO PROCESSING 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 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 or an existing 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 K157 Video Processing Control Module - Programming and follow the on-screen instructions.
3. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.
4. With a scan tool, perform the K157 Video Processing Control Module calibration. Refer to [Video Processing Control Module Calibration](#)

Reprogram Control Module

To program a replacement or an existing 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 K157 Video Processing Control Module - 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. 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**
 1. Ignition OFF for one minute, ignition ON.
 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.

3. All OK.

- **Go to next step: If the control module can be reprogrammed**

3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for Control Module replacement, programming and setup

K166L MULTIFUNCTION LED CONTROL MODULE - LEFT: PROGRAMMING AND SETUP

This device does not require programming or setup.

K166R MULTIFUNCTION LED CONTROL MODULE - RIGHT: PROGRAMMING AND SETUP

This device does not require programming or setup.

K171 HANDS-FREE LIFTGATE SENSOR CONTROL MODULE: PROGRAMMING AND SETUP

Replace and Program The Control Module

To program a replacement hands-free liftgate sensor control module, perform the following procedure:

1. Connect the scan tool to the vehicle.
2. Select Module Diagnosis:
3. Select Liftgate Control Module:
4. Select Configuration/Reset Functions:
5. Select Remove/Reset Module:
6. Select Hands-Free Liftgate Sensor Control Module Calibration:
7. Press "Enter" and follow the on screen instructions:

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for the hands-free liftgate sensor control module replacement, programming and setup

K173 TRANSMISSION RANGE 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.
- 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.
- 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

- Resolve any current DTC's that are present relating to the Electronic Transmission Range Select system prior to programming module. Refer to [Electronic Transmission Range Selector Description](#). Faults in any component or module that work together in this system may cause the programming/setup failure.
- Replacement of Transmission Range Control Module requires proper installation of module and in some cases a linkage between the module and the transmission. If installation is not performed properly, programming or setup procedure may fail.
- If programming/setup failure occurs, refer to the wiring diagnostics to resolve any electrical faults, check Transmission Range Control Module and linkage installation if applicable and attempt reprogramming 2 additional times before replacing Transmission Range Control Module.

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program Control Module

To program a replacement 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 K173 Transmission Range Control Module - Programming and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select K173 Transmission Range Control Module - Setup.
4. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

Reprogram Control Module

NOTE: Reprogramming a TRCM does not require setup. TRCM setup is only required when you have removed the TRCM, loosened the fasteners to the TRCM mounting bracket, modified the adjustment rod/linkage, or tampered with the interface between the TRCM and the transmission.

To program an existing 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 K173 Transmission Range Control Module - 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. 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**
 1. Ignition OFF for one minute, ignition ON.
 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.
3. All OK.
- **Go to next step: If the control module can be reprogrammed**
3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for Control Module replacement, programming and setup

K182 PARKING ASSIST 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 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.**

Sensor Replacement

Following Parking Assist Sensor replacement, the sensors must be calibrated. Refer to [Parking Assist Sensor Learn Calibration](#) .

Replace and Program Control Module

To program a replacement 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 K182 Parking Assist Control Module - Programming and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select K182 Parking Assist Control 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. Following Parking Assist Control Module replacement, the sensors must be calibrated. Refer to [Parking Assist Sensor Learn Calibration](#) .

Reprogram Control Module

Do not reprogram the parking assist control module, unless directed by a service procedure, or a service bulletin.

To reprogram an existing 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 K182 Parking Assist Control Module - 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. Ignition ON. Ensure the K182 Parking Assist Control Module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the parking assist control module can be reprogrammed.
 - **If the K182 Parking Assist Control Module cannot be reprogrammed**
 1. Ignition OFF for one minute, ignition ON.
 2. Verify the parking assist control module can be reprogrammed.
 - If the K182 Parking Assist Control Module cannot be reprogrammed, replace the parking assist control module.
 - If the K182 Parking Assist Control Module can be reprogrammed.
 3. All OK.
 - **Go to next step: If the K182 Parking Assist Control Module can be reprogrammed**
3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for control module replacement, programming and setup

K188 HUMAN MACHINE INTERFACE CONTROL MODULE BYPASS MODULE PROGRAMMING AND SETUP

The Human Machine Interface Control Module Bypass Module does not require SPS programming or any setup procedures.

P16 INSTRUMENT CLUSTER: PROGRAMMING AND SETUP (EQUINOX)

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

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.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), and HVAC.

- 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.
- To prevent programming failure due to unintended wireless drops, It is recommended that a wired MDI connection be used when reprogramming the Instrument Cluster

Diagnostic Aids

The programming steps in the Service Programming System (SPS) screens may not be in functional order. Be sure to follow the programming steps in the order listed below.

Replace and Program 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 P16 Instrument Cluster - Programming and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select P16 Instrument Cluster - Setup and Configuration and follow the on-screen instructions.

NOTE:

- The USB File Transfer procedure is performed after the new Instrument Cluster is installed in the vehicle. This procedure requires the use of a USB memory stick. The radio must be on during this procedure. The USB File Transfer procedure is not required for vehicles with UDC.
- Software currently loaded on the USB Drive will be verified and if files are incorrect they will be deleted and correct files will be loaded. If files residing on the USB Drive are correct for the vehicle being serviced, the Techline terminal will not delete those files and allow the drive to be re-used.

5. On the SPS Supported Controllers screen, select P16 Instrument Cluster - USB File Transfer and follow the on-screen instructions.
6. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

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 P16 Instrument Cluster - Programming and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select P16 Instrument Cluster - Setup and Configuration and follow the on-screen instructions.

NOTE:

- The USB File Transfer procedure requires the use of a USB memory stick. The radio must be on during this procedure. The USB File Transfer procedure is not required for vehicles with UDC.
- Software currently loaded on the USB Drive will be verified and if files are incorrect they will be deleted and correct files will be loaded. If files residing on the USB Drive are correct for the vehicle being serviced, the Techline terminal will not delete those files and allow the drive to be re-used.

5. On the SPS Supported Controllers screen, select P16 Instrument Cluster - USB File Transfer 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.

P16 INSTRUMENT CLUSTER: PROGRAMMING AND SETUP (TERRAIN)

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

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.**
- **Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), and HVAC.**
- **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.**
- **To prevent programming failure due to unintended wireless drops, It is recommended that a wired MDI connection be used when reprogramming the Instrument Cluster**

Diagnostic Aids

The programming steps in the Service Programming System (SPS) screens may not be in functional order. Be sure to follow the programming steps in the order listed below.

Replace and Program 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 Configuration and follow the on-screen instructions.

NOTE:

- The USB File Transfer procedure is performed after the new Instrument Cluster is installed in the vehicle. This procedure requires the use of a USB memory stick. The radio must be on during this procedure.
- Software currently loaded on the USB Drive will be verified and if files are incorrect they will be deleted and correct files will be loaded. If files residing on the USB Drive are correct for the vehicle being serviced, the Techline terminal will not delete those files and allow the drive to be re-used.
- The USB receptacle used only for programming is the X22 USB Drive Data Connector which is located behind the dash, to the left of the steering column

5. On the SPS Supported Controllers screen, select Instrument Cluster - USB File Transfer and follow the on-screen instructions.
6. If Instrument Cluster fails to read file from USB memory stick, refer to [Instrument Cluster Programming Malfunction \(with UDD only\)](#).
7. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

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 Configuration and follow the on-screen instructions.

NOTE:

- The USB File Transfer procedure requires the use of a USB memory stick. The radio must be on during this procedure. The USB File Transfer procedure is not required for vehicles with UDC.
- Software currently loaded on the USB Drive will be verified and if files are incorrect they will be deleted and correct files will be loaded. If files residing on the USB Drive are correct for the vehicle being serviced, the Techline terminal will not delete those files and allow the drive to be re-used.
- The USB Receptacle used only for programming is the X22 USB Drive Data Connector which is located behind the dash, to the left of the steering column

5. On the SPS Supported Controllers screen, select Instrument Cluster - USB File Transfer and follow the on-screen instructions.
6. If Instrument Cluster fails to read file from USB memory stick, refer to [Instrument Cluster Programming Malfunction \(with UDD only\)](#).
7. 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.

K71 TRANSMISSION CONTROL MODULE OR Q8 CONTROL SOLENOID VALVE ASSEMBLY: PROGRAMMING AND SETUP (6T40 (MNH MNK) OR 6T45 (MHG))

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)

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.**
- **Verify 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 below mentioned special tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.**
- **Turn Off or disable systems that may put a load on the vehicle's battery. For example, interior lights, daytime running lights, HVAC, and radio.**
- **During the programming procedure, follow the Service Programming System (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.**

Reference Information

Special Tools

EL-49642 SPS Programming Support Tool

Equivalent regional tools: [Special Tools](#)

Programming an Existing or New Control Module

To program an existing or new control module, perform the following procedure:

1. Install the special tool: EL-49642 SPS Programming Support Tool
2. Ignition - On / Vehicle - In Service Mode
3. Access SPS and follow the on-screen instructions for the control module: Q8 Control Solenoid Valve Assembly or K71 Transmission Control Module
4. Select: Setup

Unsuccessful Programming Recovery

If programming a control module is not successful, perform the following procedure:

1. Verify the control module, data link connector and programming tool connections are secure and the tool software is up to date.
2. Ignition - On / Vehicle - In Service Mode
3. Access SPS and follow the on-screen instructions for the control module: Q8 Control Solenoid Valve Assembly or K71 Transmission Control Module

Verify the control module programming is successful.

- **If the programming is not successful**

1. Ignition/Vehicle - Off - For greater than 1 min
2. Ignition - On / Vehicle - In Service Mode
3. Access SPS and follow the on-screen instructions for the control module: Q8 Control Solenoid Valve Assembly or K71 Transmission Control Module

- If the programming is not successful - Replace the component: Q8 Control Solenoid Valve Assembly
- If the programming is successful

4. Select: Setup

5. All OK.

- **Go to next step: If the programming is successful**

4. Select: Setup

5. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: [Diagnostic Repair Verification](#)

For control module replacement, programming, and setup refer to: [Control Module References](#)

T3 AUDIO AMPLIFIER: 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.
- 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.
- 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, 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 programming you may be required to select multiple calibrations dependent upon vehicle equipment. Have the vehicle build/RPO information available during the following procedure to ensure the correct calibrations are selected.

Special Tools

EL-49642 SPS Programming Support Tool

For equivalent regional tools, refer to [Special Tools](#).

Replace and Program Control Module or Reprogram Control Module

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

1. Install the **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 T3 Audio Amplifier - Programming and follow the on-screen instructions.
4. At the end of programming, choose the "Clear DTCs" function on the SPS screen.

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**
 1. Ignition OFF for one minute, ignition ON.
 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.
 - 3. All OK.
 - **Go to next step: If the control module can be reprogrammed**
3. All OK.

FUEL PUMP POWER CONTROL MODULE PROGRAMMING AND SETUP

Replace and Program ECU or Reprogram ECU

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

GARAGE DOOR OPENER PROGRAMMING AND SETUP

Replace and Program ECU or Reprogram ECU

This ECU does not require SPS programming but does require the following setup procedures after a new ECU is installed:

The customer must learn the device they wish to control. This must be done at the device (garage door opener, electric gate, etc.) and cannot be performed at a dealership. Refer to the vehicle owner's manual for programming instructions.

GLOW PLUG CONTROL MODULE PROGRAMMING AND SETUP

NOTE: The glow plug control module (GPCM) does not allow programming if its temperature is above 60°C (140°F).

The following service procedure requires either a programming or a setup event performed for a complete repair.

GPCM Replacement

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

Enable GPCM programming - Refer to [Service Programming System \(SPS\)](#).

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](#).

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.**
- **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 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](#) for the appropriate control module Programming and Setup document for any required procedures.

Q77 TRANSMISSION CONTROL SOLENOID VALVE CHARACTERIZATION PROGRAMMING

The solenoids in this transmission require unique performance characteristic data in order to function at maximum efficiency. This data is programmed and stored in the vehicle's transmission control module (TCM). When a transmission assembly, TCM, or solenoids are replaced during service, the performance characteristic data for the solenoids must be retrieved from a web server "cloud" repository and reprogrammed into the TCM.

Reprogramming also ensures that the characteristic data relationship is properly matched between the solenoids, valve body, and transmission.

Solenoid characterization reprogramming is performed using the TIS2Web Service Programming System (SPS).

Solenoid Reprogramming Procedure

Perform solenoid characterization reprogramming after one of the following service procedures:

NOTE: Select "Replace Transmission" at the MCVN Characterization selection screen.

- Replace transmission assembly

NOTE: Select "Replace Valve Body" at the MCVN Characterization selection screen.

screen.

- Replace valve body assembly

NOTE: Select "Replace Solenoid" at the MCVM Characterization selection screen.

- Replace solenoid (currently not an available Service Procedure)

NOTE: Select "Refresh Characterization Data" at the MCVM Characterization selection screen.

- Replace TCM

NOTE: Select "Refresh Characterization Data" at the MCVM Characterization selection screen.

- Solenoid characterization may also be performed to "refresh" characterization data.

To perform solenoid characterization after a transmission component replacement:

1. Document the new Transmission Unique Number (TUN) or Part Unique Number (PUN) as required.

- The TUN location may be found here: [Transmission Identification Information](#) . Since the TUN can be difficult to access when the transmission is installed in the vehicle, ensure you document the 16-digit TUN prior to installing the transmission in the vehicle.
- The PUN location may be found here: [Control Valve Solenoid Body Identification Information](#) . Before installing the control valve solenoid body onto the transmission, document the 16-digit PUN. If the control valve solenoid body PUN has not been saved for reference, it may be necessary to disassemble the control valve solenoid body from the transmission to clearly read the control valve solenoid body PUN.

2. Log into TIS2Web/SPS.

3. Type the vehicle identification number (VIN).

4. Perform the SPS Transmission Control Module programming event.

- Select "Transmission Control Module - Programming" to update TCM calibrations and Solenoid Characterization data.

OR

- Select "Transmission Control Module - MCVM Operations" to update Solenoid Characterization data only.

5. From the "MCVM (Mechanical Characterization and Virtual Matching) Operation Selection" screen, select the applicable service procedure to be performed. You will be prompted to provide the necessary Transmission Unique Number (TUN) or Part Unique Number (PUN) when replacing a transmission part.

At this point, the system will read the VIN from the engine control module (ECM) using the multiple diagnostic interface (MDI) and then retrieve the applicable genealogy data tree from the cloud. This data tree accesses the original characterization data so that it may be updated with the new component information. The system acquires characterization data for the given TUN/PUN via the cloud and updates the genealogy tree. The TCM is updated with the correct solenoid characterization data, and the cloud is updated with the new genealogy relationship.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/ Description

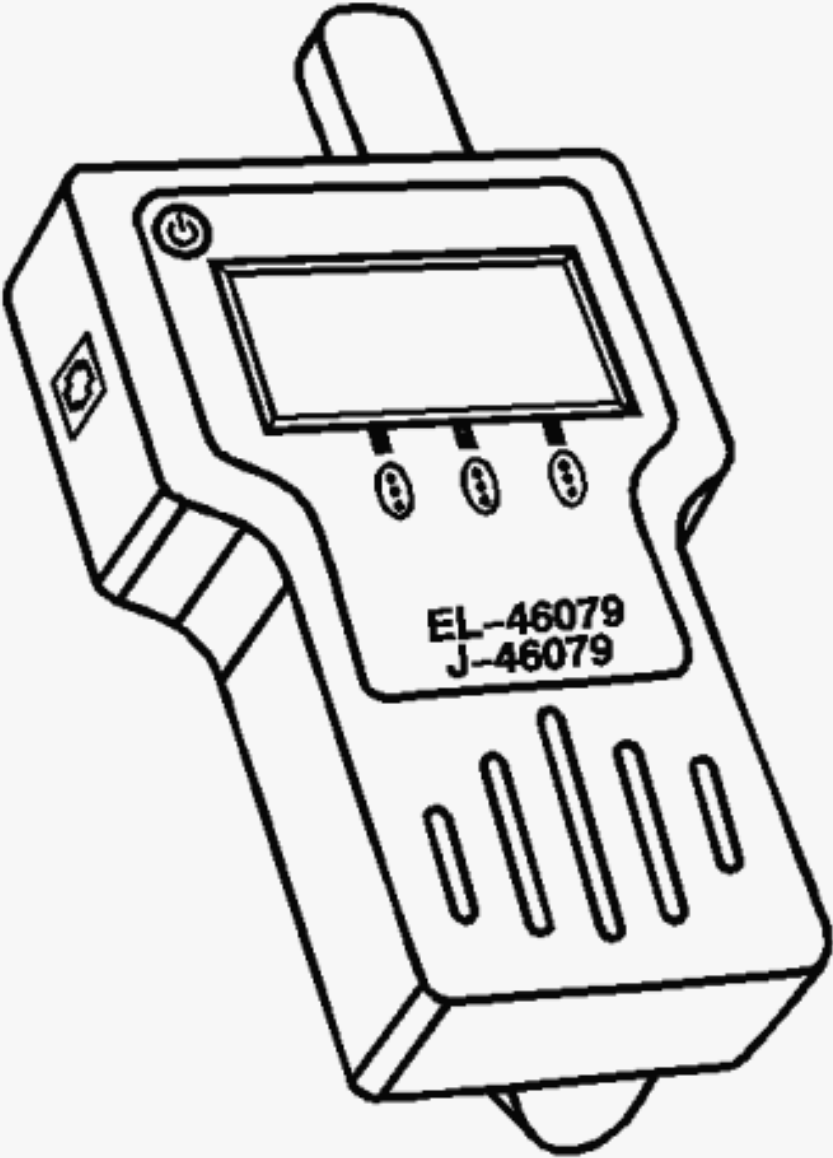
Illustration	Tool Number/ Description
	EL 46079 J 46079 Tire Pressure Monitor Diagnostic Tool

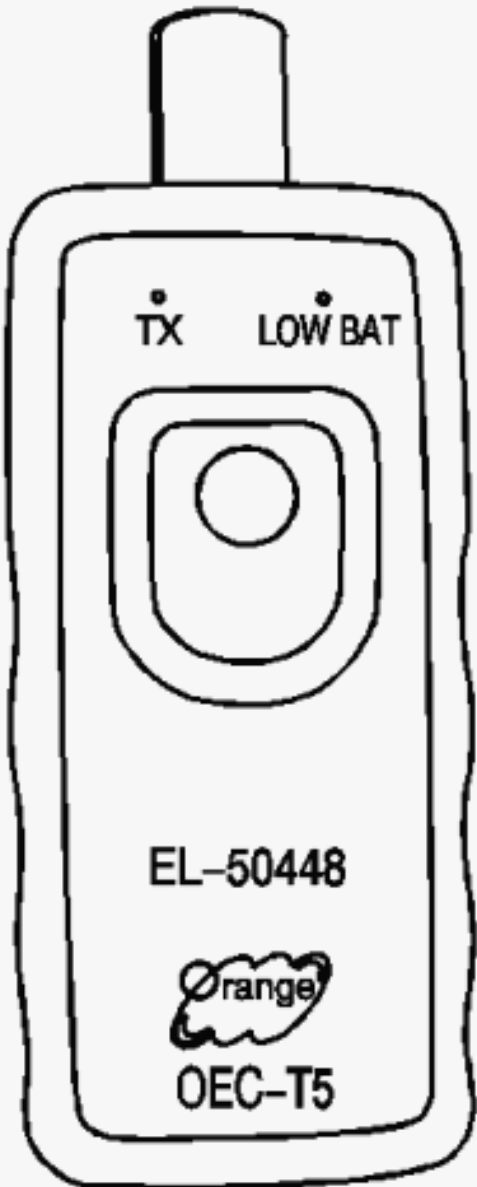
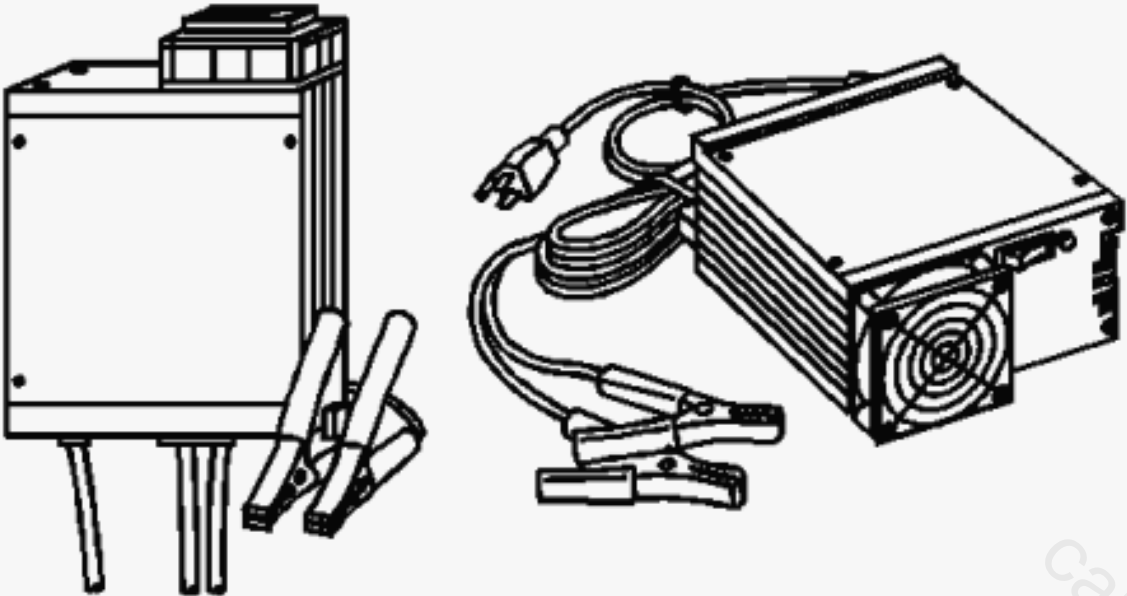
Illustration	Tool Number/ Description
	EL 50448 Tire Pressure Monitor Sensor Activation Tool

Illustration	Tool Number/ Description
	EL 49642 EL 50113 Europe - Use recommended equivalent workshop equipment SPS Programming Support Tool