

2017 GENERAL INFORMATION

Programming and Setup - Sierra, Silverado

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	Radio Scan Tool Information (without IOB) Radio Scan Tool Information (with IOB)	Radio/Navigation System Schematics (IO3) Radio/Navigation System Schematics (IO5, IO6) Radio/Navigation System Schematics (IOB)	Radio Replacement (With IO3, IO5, IO6) Radio Replacement (With IOB)	Radio Programming and Setup (without IOB) Radio Programming and Setup (IOB)
A22	Radio Controls	Radio/Navigation System Schematics (IO3) Radio/Navigation System Schematics (IO5, IO6) Radio/Navigation System Schematics (IOB)	Radio Control Assembly Replacement	Radio Control Programming and Setup
A33	Media Disc Player	Radio/Navigation System Schematics (IO3) Radio/Navigation System Schematics (IO5, IO6) Radio/Navigation System Schematics (IOB)	Disc Player Replacement (With IO3, IO5, IO6) Disc Player Replacement (With IOB)	Media Disc Player Programming and Setup If equipped with TG5, no programming required
K4	Assist Step Control Module Scan Tool Information	Step/Running Board Schematics	Assist Step Control Module Replacement (BRS)	Assist Step Control Module Programming and Setup
K9	Body Control Module Scan Tool Information	Body Control System Schematics	Body Control Module Replacement	Body Control Module Programming and Setup

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
K17	<u>Electronic Brake Control Module Scan Tool Information</u>	• <u>Antilock Brake System Schematics</u> - Non-Hybrid Greater than/Equal to 3900 kg (8600 lb) GVW • <u>Antilock Brake System Schematics</u> - Non-Hybrid Less than 3900 kg (8600 lb) GVW	• <u>Electronic Brake Control Module Replacement</u> - Non-Hybrid Greater than/Equal to 3900 kg (8600 lb) GVW • <u>Electronic Brake Control Module Replacement</u> - Non-Hybrid Less than 3900 kg (8600 lb) GVW	<u>Electronic Brake Control Module Programming and Setup</u>
K19	<u>Suspension Control Module Scan Tool Information</u>	<u>Electronic Suspension Control Schematics</u>	<u>Electronic Suspension Control Module Replacement</u>	<u>Suspension Control Module Programming and Setup</u>
K20	<u>K20 Engine Control Module: Scan Tool Information (L5P)</u> <u>K20 Engine Control Module: Scan Tool Information (Except Diesel)</u>	• <u>Engine Controls Schematics</u> - 4.3L (LV3) engine • <u>Engine Controls Schematics</u> - 6.0L (L96 LC8) engine • <u>Engine Controls Schematics</u> - 5.3L (L83 L8B) or 6.2L (L86) engine • <u>Engine Controls Schematics</u> - 6.6L (L5P) engine	• <u>Engine Control Module Replacement</u> - 4.3L (LV3) engine • <u>Engine Control Module Replacement</u> - 6.0L (L96 LC8) engine • <u>Engine Control Module Replacement</u> - 5.3L (L83 L8B) or 6.2L (L86) engine • <u>Engine Control Module Replacement</u> - 6.6L (L5P) engine	<u>K20 Engine Control Module: Programming and Setup</u>
K29	Seat Heating Control Module	<u>Heated/Cooled Seat Schematics</u>	<u>Front Seat Heater Control Module Replacement</u>	<u>Seat Heating Control Module Programming and Setup</u>

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
K32	Steering Heating Control Module	<u>Steering Wheel Schematics</u>	<u>Steering Wheel Replacement</u>	<u>Steering Wheel Heat Control Module Programming and Setup</u>
K33	<u>Heating, Ventilation and Air Conditioning Control Module Scan Tool Information</u>	<u>HVAC Schematics</u> - Automatic or <u>HVAC Schematics</u> - Manual	<u>Heater and Air Conditioning Remote Control Replacement</u> - Automatic or <u>Heater and Air Conditioning Remote Control Replacement</u> - Manual	<u>HVAC Control Module Programming and Setup</u>
K34	Glow Plug Control Module	<u>Engine Controls Schematics</u>	<u>Glow Plug Control Module Replacement</u>	<u>Glow Plug Control Module Programming and Setup</u>
K36	<u>Inflatable Restraint Sensing and Diagnostic Module Scan Tool Information</u>	<u>SIR Schematics</u>	<u>Airbag Sensing and Diagnostic Module Replacement (Crew Cab Without HP5)</u> <u>Airbag Sensing and Diagnostic Module Replacement (Extended Cab, Regular Cab Without HP5)</u> <u>Airbag Sensing and Diagnostic Module Replacement (Crew Cab With HP5)</u> <u>Airbag Sensing and Diagnostic Module Replacement (Extended Cab, Regular Cab With HP5)</u>	<u>Inflatable Restraint Sensing and Diagnostic Module Programming and Setup</u>
K38	<u>Chassis Control Module Scan Tool Information</u>	<u>Active Grille Air Shutter Schematics</u> or <u>Trailer Brake Control Schematics</u>	<u>Chassis Control Module Replacement (Without Active Air Shutter)</u> <u>Chassis Control Module Replacement (With Active Air Shutter)</u> - 4.3L (LV1 LV3) engine	<u>Chassis Control Module Programming and Setup</u>

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
			• <u>Chassis Control Module Replacement</u> - 4.8L, 5.3L, 6.0L, 6.2L, or 7.0L engine • <u>Chassis Control Module Replacement</u> - 5.3L (L83) or 6.2L (L86 LT1 LT4) engine	
K38A	<u>K38A Chassis Control Module - Auxiliary: Scan Tool Information</u>	<u>Trailer Brake Control Schematics</u>	<u>Auxiliary Chassis Control Module Replacement - Trailer Brake</u>	<u>K38A Chassis Control Module - Auxiliary: Programming and Setup</u>
K40	<u>Seat Memory Control Module Scan Tool Information</u>	<u>Driver Seat Schematics</u>	<u>Driver or Passenger Seat Adjuster Memory Module Replacement</u>	<u>Seat Memory Control Module Programming and Setup</u>
K43	<u>Power Steering Control Module Scan Tool Information (Light Duty) Power Steering Control Module Scan Tool Information (Heavy Duty)</u>	<u>Power Steering Schematics</u>	• <u>Power Steering Assist Motor Replacement (Light Duty)</u> - Light Duty • <u>Electronic Power Steering Motor Control Module Replacement (Heavy Duty, With NV8)</u> - Heavy Duty	<u>Power Steering Control Module Programming and Setup</u>
K44	<u>Engine Speed Power Take-Off Control Module Scan Tool Information</u>	<u>Power Take-Off (PTO) Schematics</u>	<u>Engine Speed Power Take-Off Control Module Replacement</u>	<u>Engine Speed Power Take-Off Control Module Programming and Setup</u>
K56	Serial Data Gateway Module	<u>Data Communication Schematics</u>	<u>Serial Data Gateway Module Replacement</u>	<u>Serial Data Gateway Module Programming and Setup</u>
K68	Trailer Lamp Control Module	<u>Exterior Lights Schematics</u>	Dealership installed part	<u>Trailer Lamp Control Module Programming and Setup</u>

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
K69	<u>Transfer Case Control Module Scan Tool Information (NQH) Transfer Case Control Module Scan Tool Information (NQF)</u>	• <u>Transfer Case Control Schematics</u> - MP 1222/1225/1226 (NQG) • <u>Transfer Case Control Schematics</u> - MP 1625/1626 (NQF) • <u>Transfer Case Control Schematics</u> - MP 3023/3024 (NQH)	• <u>Transfer Case Control Module Replacement</u> - MP 1625/1626 (NQF) • <u>Transfer Case Control Module Replacement</u> - MP 3023/3024 (NQH)	<u>Transfer Case Control Module Programming and Setup</u>
K71	Control Solenoid Valve and Transmission Control Module Assembly <u>Transmission Control Module Scan Tool Information (6L80, 6L90) Transmission Control Module Scan Tool Information (Allison) Transmission Control Module Scan Tool Information (8L90)</u>	• <u>Automatic Transmission Controls Schematics</u> - 6L45/6L50 /6L80/6L90 transmission • <u>Automatic Transmission Controls Schematics</u> - 8L90 transmission • <u>Automatic Transmission Controls Schematics</u> - Allison transmission	• <u>Control Solenoid Valve and Transmission Control Module Assembly Replacement</u> - 6L45/6L50 /6L80/6L90 transmission • <u>Transmission Control Module Replacement</u> - 8L90 transmission • <u>Transmission Control Module Replacement</u> - Allison Transmission	• <u>Control Solenoid Valve and Transmission Control Module Assembly Programming and Setup (6L80, 6L90)</u> - 6L45/6L50 /6L80/6L90 transmission • <u>K71 Transmission Control Module: Programming and Setup</u> - 8L45/8L90 transmission • <u>Transmission Control Module Programming and Setup (Allison)</u> - Allison transmission
K73	<u>Telematics Communication Interface Control Module Scan Tool Information</u>	<u>OnStar/Telematics Schematics</u>	<u>Communication Interface Module Replacement</u>	<u>Telematics Communication Interface Control Module Programming and Setup</u>

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
K74	<u>Human Machine Interface Control Module Scan Tool Information</u>	<u>Radio/Navigation System Schematics (IO3) Radio/Navigation System Schematics (IO5, IO6) Radio/Navigation System Schematics (IOB)</u>	<u>Human Machine Interface Control Module Replacement</u>	<u>Human Machine Interface Control Module Programming and Setup</u>
K89	Immobilizer Control Module	<u>Immobilizer Schematics</u>	<u>Theft Deterrent Module Replacement</u>	<u>Immobilizer Control Module Programming and Setup</u>
K109	<u>Front View Camera Module Scan Tool Information</u>	<u>Object Detection Schematics</u>	<u>Front View Camera Replacement</u>	<u>Front View Camera Module Programming and Setup</u>
K111	Fuel Pump Driver Control Module Refer to <u>K20 Engine Control Module: Scan Tool Information (L5P) K20 Engine Control Module: Scan Tool Information (Except Diesel)</u>	• <u>Engine Controls Schematics</u> - 4.3L (LV1 LV3) engine • <u>Engine Controls Schematics</u> - 4.8L, 5.3L, 6.0L, 6.2L, or 7.0L engine • <u>Engine Controls Schematics</u> - 5.3L (L83) or 6.2L (L86 LT1 LT4) engine	• <u>Fuel Pump Power Control Module Replacement</u> - 4.3L (LV1 LV3) engine • <u>Fuel Pump Power Control Module Replacement</u> - 4.8L, 5.3L, 6.0L, 6.2L, or 7.0L engine • <u>Fuel Pump Power Control Module Replacement</u> - 5.3L (L83) or 6.2L (L86 LT1 LT4) engine (AKA: Fuel Pump Driver Control Module)	<u>Fuel Pump Power Control Module Programming and Setup</u> (AKA: Fuel Pump Driver Control Module)
K112	Hybrid Battery Interface Control Module Refer to <u>Hybrid Powertrain Control Module 2 Scan Tool</u>	<u>Hybrid/EV Energy Storage Schematics</u>	<u>High Voltage Battery Interface Control Module Replacement (Cell Battery Module 1) High Voltage Battery Interface Control Module</u>	<u>Hybrid Battery Interface Control Module Programming and Setup</u>

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
	<u>Information</u>		<u>Replacement (Cell Battery Module 2)</u>	
K114B	<u>Hybrid Powertrain Control Module 2 Scan Tool Information</u>	<u>Hybrid/EV Cooling Schematics</u> or <u>Hybrid/EV Energy Storage Schematics</u>	<u>Hybrid Powertrain Control Module 2 Replacement</u>	<u>Hybrid Powertrain Control Module 2 Programming and Setup</u>
K115	Reductant Control Module	<u>Engine Controls Schematics</u> - 6.6L (L5P) engine	<u>Emission Reduction Fluid Controller Replacement</u>	<u>K115 Reductant Control Module: Programming and Setup</u>
K119	<u>CNG Control Module Scan Tool Information</u>	<u>Engine Controls Schematics</u>	<u>CNG Control Module Replacement (Fuel Injection)</u>	<u>CNG Control Module Programming and Setup</u>
K133	<u>Trailer Brake Control Module Scan Tool Information</u>	<u>Trailer Brake Control Schematics</u>	<u>Trailer Brake Power Control Module Replacement (JD9)</u> <u>Trailer Brake Power Control Module Replacement (J95, J96)</u>	<u>K38A Chassis Control Module - Auxiliary: Programming and Setup</u>
K182	<u>Parking Assist Control Module Scan Tool Information</u>	<u>Object Detection Schematics</u>	<u>Parking Assist Control Module Replacement</u>	<u>Parking Assist Control Module Programming and Setup</u>
K188	Human Machine Interface Control Module Bypass Module	<u>Object Detection Schematics</u>	<u>Human Machine Interface Control Module Bypass Module Replacement</u>	<u>K188 Human Machine Interface Control Module Bypass Module Programming and Setup</u>
P16	<u>Instrument Cluster Scan Tool Information</u>	<u>Instrument Cluster Schematics</u>	<u>Instrument Cluster Replacement</u>	<u>Instrument Cluster Programming and Setup</u>
T1	Accessory AC and DC Power Control Module	<u>Cigar Lighter/Power Outlet Schematics</u>	<u>Accessory AC and DC Power Control Module Replacement</u>	<u>Accessory AC and DC Power Control Module Programming and Setup</u>
T3	<u>Audio Amplifier Scan Tool Information</u>	<u>Radio/Navigation System Schematics (IO3)</u> <u>Radio/Navigation System Schematics (IO5, IO6)</u> <u>Radio/Navigation System Schematics (IOB)</u>	<u>Radio Speaker Amplifier Replacement</u>	<u>Audio Amplifier Programming and Setup</u>

REPAIR INSTRUCTIONS

K20 ENGINE 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 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.

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. 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. 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 SPS 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.

• **If the programming is successful**

5. All OK..

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

Control Module References for ECM replacement, programming and setup

K38A CHASSIS CONTROL MODULE - AUXILIARY: 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 K38A Chassis Control Module-Auxiliary - Programming and follow the on-screen instructions.
4. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.
5. With a scan tool, perform the Suspension Sensor Trim Height Calibration, if applicable.

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.

- 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.

K71 TRANSMISSION 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:K71 Transmission Control Module - Programming
4. After the programming is complete, select:Setup - If available

If Setup is not available in SPS - Perform the appropriate learn/reset procedure with the scan tool

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

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 SPS 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:K71 Transmission Control Module - Programming

Verify the control module programming is successful.

• If the programming is not successful

1. Ignition/Vehicle - Off - For greater than 2 min
2. Ignition - On / Vehicle - In Service Mode
3. Perform the SPS function:K71 Transmission Control Module - Programming

- If the programming is not successful - Replace the component: K71 Transmission Control Module

1. Perform the SPS function:K71 Transmission Control Module - Programming
2. After the programming is complete, select:Setup - If available

If Setup is not available in SPS - Perform the appropriate learn/reset procedure with the scan tool

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

- If the programming is successful

4. Perform the following steps:Setup - If available

If Setup is not available in SPS - Perform the appropriate learn/reset procedure with the scan tool

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

6. All OK.

• If the programming is successful

4. Perform the following steps:Setup - If available

If Setup is not available in SPS - Perform the appropriate learn/reset procedure with the scan tool

5. Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to No.
6. 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](#)

K115 REDUCTANT CONTROL MODULE: PROGRAMMING AND SETUP

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

K133 TRAILER BRAKE POWER CONTROL MODULE: PROGRAMMING AND SETUP

Replace and Program ECU or Reprogram ECU

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

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.

ACCESSORY AC AND DC POWER CONTROL MODULE PROGRAMMING AND SETUP

The T1 Accessory DC/AC Power Inverter Module does not require SPS programming or any setup procedures.

ASSIST STEP CONTROL MODULE PROGRAMMING AND SETUP

Replace and Program Control Module or Reprogram Control Module

This ECU does not require SPS programming or any setup procedures with the scan tool.

Refer to [Running Board Description](#) for information on enabling the assist step and the learn procedure.

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.

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 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.
 - **If the control module can be reprogrammed**
3. All OK.

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

NOTE:

If the vehicle has keyless entry transmitters separated from the keys, all transmitters have to be present before proceeding with the following steps.

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

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

- For Key Ignition System, begin with the ignition in the RUN position.
- For Push Button Start System, begin with the vehicle in vehicle ON power mode.

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.

NOTE: If the vehicle has keys with integrated transmitters, this step is not required because the integrated transmitters were already learned during the immobilizer learn process along with the keys.

9. If the vehicle has keyless entry transmitters separated from the keys, refer to [Remote Control Door Lock Transmitter Learn](#) to re-learn all transmitters.
10. 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 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, 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

NOTE: If the vehicle has keyless entry transmitters separated from the keys, all transmitters have to be present before proceeding with the following steps.

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.

NOTE: If the vehicle has keys with integrated transmitters, this step is not required because the integrated transmitters were already learned during the immobilizer learn process along with the keys.

7. If the vehicle has keyless entry transmitters separated from the keys, refer to [Remote Control Door Lock Transmitter Learn](#) to re-learn all transmitters.
8. 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 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, 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. 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.
 - **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

CHASSIS 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 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 K38 Chassis 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.
5. With a scan tool, perform the Suspension Sensor Trim Height Calibration, if applicable.

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.
 - **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

CNG CONTROL MODULE PROGRAMMING AND SETUP

Replace and Program ECU or Reprogram ECU

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

CONTROL SOLENOID VALVE AND TRANSMISSION CONTROL MODULE ASSEMBLY PROGRAMMING AND SETUP (6L80, 6L90)

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

Transmission Control Module (TCM) Replacement

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

1. TCM Reprogramming
2. The Reset Transmission Adapts - Refer to [Reset Transmission Adapts](#)

TCM Reprogramming

1. If the TCM needs to be reprogrammed, refer to [Service Programming System \(SPS\)](#).
2. Perform the Reset Transmission Adapts - Refer to [Reset Transmission Adapts](#).

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

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

Setup for Component Replacement

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

If any of the following components are replaced, the [Reset Transmission Adapts](#) procedure must be performed:

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

Refer to [Reset Transmission Adapts](#).

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

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 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 - Configuration and 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.
 - **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

ENGINE SPEED POWER TAKE-OFF CONTROL MODULE PROGRAMMING AND SETUP

Programming

The power take-off module (PTOM) requires no programming or setup. When the PTOM is replaced, all programmable parameters will be defaulted back to factory settings. Remote start, if equipped and previously enabled, will have to be re-enabled through the body control module (BCM).

Module Setup

The power take-off module requires that several parameters be setup according to customer requirements. Refer to the table below for available parameters and recommended setting. Refer to the GM Upfitter Integration website, <www.gmupfitter.com>, for bulletins #79 and #80, which have extensive descriptive information about the power take-off system.

NOTE: When programming the PTO control module be sure to verify the ECM PTO options (stationary, variable or mobile) are synchronized with the PTOM. Example, if the PTOM is set to stationary mode then the ECM must also be set to stationary mode. If the two modules are not synchronized no PTO idle up will occur. The critical parameters are listed below:

- Remote engine shutdown
- Maximum PTO engine speed

Power Take-Off Module Programmable Parameters

Parameter	Available In Mode			Factory Default Setting
	Stationary Preset	Stationary Variable	Mobile	
PTO Mode	X	X	X	Preset
PTO In-Cab Control	Y	Y	Y	Enabled
PTO Remote Control	Y	Y	N	Disabled
Type Of (Exterior) Set Switch Operation	Y	Y	N	Momentary
Press "ON" Then Go To Preset 1 Speed	Y	N	N	Disabled
PTO Standby RPM	Y	Y	Y	850 RPM
PTO Preset 1 Speed	Y	Y	Y	1250 RPM
PTO Preset 2 Speed	Y	Y	Y	1700 RPM
Maximum PTO Operating Speed	Y	Y	Y	2100 RPM
Tap Step	N	Y	Y	100 RPM
Ramp Rate	Y	Y	Y	200 RPM/Sec
Maximum Vehicle Speed	N	N	Y	129 KPH (80 MPH)

Parameter	Available In Mode			Factory Default Setting
	Stationary Preset	Stationary Variable	Mobile	
Minimum Remote Accelerator Voltage	Y	Y	N	0.25 V
Maximum Remote Accelerator Voltage	Y	Y	N	4.75 V
Action When Remote Set Switch Transitions To Low Voltage (<1.66 V)	Y	N	N	Go to Set Speed 1
Remote Set Switch Transition To Open State (Between >1.66 V And <3.33 V)	Y	N	N	Go to Standby Speed
Remote Set Switch Transition To High Voltage (>3.33 V)	Y	N	N	Go to Set Speed 2
Remote Engine Start	Y	Y	N	Disabled
Remote Engine Shutdown	Y	Y	N	Disabled
Load Feedback	Y	Y	Y	Disabled
Engage Relay	Y	Y	Y	Disabled
Keep Relay Engaged During Braking	N	N	Y	Disabled
Action After Brake Is Released	N	N	Y	RETURN TO BASE IDLE RPM
Auto Engine Shutdown Timer	Y	Y	N	Disabled
Engine Shutdown Due To Critical Engine Condition	Y	Y	N	Disabled
Engine Shutdown Warning	Y	Y	N	Disabled
Set Low Fuel Level For Engine	Y	Y	N	Disabled
Maximum PTO Engine Speed	Y	Y	Y	1800 RPM
Maximum PTO Engage Speed	Y	Y	Y	1500 RPM

Recommended Settings For PTOM Parameters

Programmable Parameter	Preset	Variable	Mobile	Range	Notes
PTO Mode	Default	Available	Available	-	-
PTO In-Cab Control	Enable/Disable	Enable/Disable	Enable/Disable	-	-
PTO Remote Control	Enable/Disable	Enable/Disable	Enable/Disable	-	-

Programmable Parameter	Preset	Variable	Mobile	Range	Notes
Type Of (Exterior) Set Switch Operation	Momentary/Latching	Momentary/Latching	Momentary/Latching	-	-
Press "ON" Then Go to Preset 1 Speed	Disabled	Enable/Disable	N/A	N/A	In cab ON switch. Remote enable after arming.
PTO Standby RPM	Within Range	Within Range	Within Range	Base Idle-3100 RPM	Base idle overrides if higher.
PTO Preset 1 Speed	Within Range	RPM Capture Or Tap Down	RPM Capture Or Tap Down	Above Standby-3100 RPM	Set (-) switch internal. Set switch external-disabled in mobile. Both can be enabled simultaneously.
PTO Preset 2 Speed	Within Range	Resume Or Tap Up	Resume Or Tap Up	Above Standby-3100 RPM	Set (+) switch internal. Set switch external-disabled in mobile. Both can be enabled simultaneously.
Maximum PTO Operating Speed	Within Range	Within Range	Within Range	Base Idle-3100 RPM	-
Tap Step	Within Range	Within Range	Within Range	4-500 RPM	-
Ramp Rate	Within Range	Within Range	Within Range	4-1000 RPM/Second	Setting applies to remote switch inputs and remote throttle (Potentiometer) inputs.
Maximum Vehicle Speed	N/A	N/A	Within Range	30 KPH (19 MPH) to 129 KPH (80 MPH)	Applies to mobile only.
Minimum Remote Accelerator	N/A	Within Range	N/A	0-2.5 V	Remote throttle must be enabled for

Programmable Parameter	Preset	Variable	Mobile	Range	Notes
Voltage					parameter to apply.
Maximum Remote Accelerator Voltage	N/A	Within Range	N/A	2.5-5.0 V	Remote throttle must be enabled for parameter to apply.
Action When Remote Set Switch Transitions To Low Voltage (<1.66 V)	See Range	N/A	N/A	Go To Standby, Set 1 Or Set 2	Defines PTO system action when remote set switch input goes low.
Remote Set Switch Transition To Open State (Between >1.66 V And <3.33 V)	See Range	N/A	N/A	Go To Standby, Set 1 Or Set 2	Defines PTO system action when remote set switch input goes to open state.
Remote Set Switch Transition To High Voltage (>3.33 V)	See Range	N/A	N/A	Go To Standby, Set 1 Or Set 2	Defines PTO system action when remote set switch input goes to +5 V reference.
Remote Engine Start	Enable/Disable	Enable/Disable	N/A	-	Requires remote switches.
Remote Engine Shutdown	Enable/Disable	Enable/Disable	N/A	-	Requires remote Switches.
Load Feedback	Enable/Disable	Enable/Disable	Enable/Disable	-	Requires remote wiring.
Engage Relay	Enable/Disable	Enable/Disable	Enable/Disable	-	Requires remote relay.
Keep Relay Engaged During Braking	N/A	N/A	Enable/Disable	-	-
Action After Brake Is Released	N/A	N/A	Return to base idle RPM - Return to standby RPM	-	-
Auto Engine Shutdown Timer	Enable/Disable	Enable/Disable	N/A	4 minutes - 7 hours	-

Programmable Parameter	Preset	Variable	Mobile	Range	Notes
Engine Shutdown Due To Critical Engine Condition	Enable/Disable	Enable/Disable	N/A	-	Oil Pressure, Hot Engine, Hot Transmission, Low Oil, Low Fuel, Diesel Particulate Filter Regeneration Required
Engine Shutdown Warning	Enable/Disable	Enable/Disable	N/A	7 minutes	If PTO operation is continued when critical engine conditions are present, a horn chirp warning will occur after 2 to 5 minutes. The engine will be shutdown 2 minutes after the horn warning.
Set Low Fuel Level For Engine	N/A	Enable/Disable	N/A	15-25 % Fuel Level	-
Maximum PTO Engine Speed	Within Range	Within Range	Within Range	950-3100 RPM	-
Maximum PTO Engage Speed	-	-	-	Base Idle-1800 RPM	-

FRONT VIEW 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.
- 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 Frontview camera module must be calibrated.
- If the Frontview camera module 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](#) .

Front View Camera Module Replacement

If the Front View Camera Module needs to be replaced, the following procedures must be performed:

1. Connect a scan tool to the vehicle and access Service Programming System (SPS).
2. Perform the SPS function Front View Camera Module - Programming and follow the on-screen instructions.
3. Clear DTCs after completing the programming procedure.

NOTE: After programming is performed, it is normal to have DTC B1008 4B set until calibration is complete.

4. Following programming, the module will require calibration. Refer to [Front View Camera Module Learn](#) .

Front View Camera Module Reprogramming

Do not reprogram the frontview camera module, unless directed by a service procedure, or a service bulletin.

To program an existing frontview 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. 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 K109 Frontview Camera Module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the K109 Frontview Camera Module can be reprogrammed.
 - **If the K109 Frontview Camera Module cannot be reprogrammed**
 1. Ignition OFF for 1 min, ignition ON.
 2. Verify the K109 Frontview Camera Module can be reprogrammed.
 - If the K109 Frontview Camera Module cannot be reprogrammed, replace the K109 Frontview Camera Module.
 - If the K109 Frontview Camera Module can be reprogrammed.
 3. All OK.
 - **If the K109 Frontview Camera Module can be reprogrammed**
3. All OK.

Repair Instructions

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

[Control Module References](#) for K109 Frontview Camera Module replacement, programming and setup.

FUEL INJECTOR CONTROL MODULE PROGRAMMING AND SETUP

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

Ensure that the following conditions exist in order to prepare for FICM programming:

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

Do not reprogram the FICM unless directed by a service procedure or a service bulletin.

Fuel Injector Control Module Programming

To program and setup an existing or new replacement FICM, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions. Refer to [Service Programming System \(SPS\)](#).
2. On the SPS Supported Controllers screen, select FICM Fuel Injector Control Module - Programming and follow the on-screen instructions.

If the FICM fails to accept the program, verify all scan tool and FICM connections are secure.

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

misdiagnosis:

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

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.

GENERATOR 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 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 Generator 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 1 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.

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 \(SPS\)](#).
- [Fuel Injector Flow Rate Programming](#) for fuel injector flow rate programming.

Setup for Component Replacement

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

If any of the following components are replaced, the Fuel Injector Flow Rate Programming must be performed. Refer to [Fuel Injector Flow Rate Programming](#).

- Fuel injector

- Engine control module (ECM)
- GPCM

SEAT HEATING CONTROL MODULE PROGRAMMING AND SETUP

This device does not require programming or setup.

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, 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 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.
15. 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:

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, 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: 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.
13. 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.
 - **If the control module can be reprogrammed**
3. All OK.

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 SPS 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.

- **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](#)

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](#)

HYBRID BATTERY INTERFACE CONTROL MODULE PROGRAMMING AND SETUP

This device requires no programming or setup.

HYBRID POWERTRAIN CONTROL MODULE 2 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 Hybrid Powertrain Control Module 2 - Programming and follow the on-screen instructions.
4. At the end of programming, choose the "Clear All DTCs"
5. With a scan tool, perform the [Clear Secured High Voltage DTCs](#) and follow the on-screen instructions.
6. With a scan tool, Clear All DTCs.

Reprogram Control Module

To program 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 Hybrid Powertrain Control Module 2 - Programming and follow the on-screen instructions.
4. At the end of programming, choose the "Clear All DTCs".

Unsuccessful Programming Recovery

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

1. Ignition ON. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the control module can be reprogrammed.
 - **If the control module cannot be reprogrammed**

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.
 - **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 hybrid/EV powertrain control module 2 replacement, programming and setup.

IMMOBILIZER CONTROL MODULE PROGRAMMING AND SETUP

Replace and Program ECU or Reprogram ECU

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

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 Module is 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 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 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.

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.
 - **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

INSTRUMENT CLUSTER 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.
- 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 important 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. It is mandatory to follow the programming steps in the order listed below. The steps must be completed for the Instrument Cluster to be fully functional. Reversing the order or completing only one step could cause the Instrument Cluster to malfunction. If the steps are completed in an incorrect order, performing the steps in the proper order will correct the malfunctions.

Replace and Program ECU (except Cadillac)

To program a replacement or a new 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, 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. Do not use the software on the USB memory stick in multiple vehicles. The USB memory stick must be cleared after each USB programming event.

4. On the SPS Supported Controllers screen, select Instrument Cluster - USB File Transfer and follow the on-screen instructions. When prompted after installing files in vehicle via USB memory stick, select UPDATE on radio display. When update is complete, select DISMISS and remove the USB memory stick.
5. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

Replace and Program ECU (Cadillac)

To program a replacement or a new 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. 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 Instrument Cluster - USB File Transfer and follow the on-screen instructions. When prompted after installing files in vehicle via USB memory stick, select UPDATE on radio display. When update is complete, select DISMISS and remove the USB memory stick.
6. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

Reprogram ECU (except Cadillac)

To program 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, 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.**

4. On the SPS Supported Controllers screen, select Instrument Cluster - USB File Transfer and follow the on-screen instructions. When prompted after installing files in vehicle via USB memory stick, select UPDATE on radio display. When update is complete, select DISMISS and remove the USB memory stick.
5. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

Reprogram ECU (Cadillac)

To program 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. The USB File Transfer procedure is not required for vehicles with UDC. Do not use the software on the USB memory stick in multiple vehicles. The USB memory stick must be cleared after each USB programming event.

5. On the SPS Supported Controllers screen, select Instrument Cluster - USB File Transfer and follow the on-screen instructions. When prompted after installing files in vehicle via USB memory stick, select UPDATE on radio display. When update is complete, select DISMISS and remove the USB memory stick.
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 using the Replace and Program ECU instructions above.

3. If the ECU can still not be programmed, turn the ignition OFF, disconnect battery, and wait for 15 minutes.
4. Connect battery, turn the ignition ON and attempt to reprogram the ECU using the Replace and Program ECU instructions above. The ECU should program.
 - If the ECU still cannot be programmed, replace the ECU.

MEDIA DISC PLAYER 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

- 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.

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:

Without Rear Seat Video Entertainment System

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

With Rear Seat Video Entertainment System

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 8.

3. Access the Service Programming System (SPS) and follow the on-screen instructions.

NOTE: Warehoused parts may not have current software on them. The following step will verify the module has the latest software version.

4. On the SPS Supported Controllers screen, select Media Disc Player - USB File Transfer and follow the on-screen instructions. If no data has been released for this application this option will not be displayed, proceed to step 10.

NOTE:

- If there are no updates available for USB transfer via SPS, proceed to step 10.
- All existing files on the USB drive will be erased when the new files are copied.

5. Upon completion of the file transfer, remove the USB drive from the computer.
6. Ignition ON, infotainment system ON.
7. Connect the USB drive to the rear seat 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. On the SPS Supported Controllers screen, select Media Disc Player - Programming and follow the on-screen instructions.
11. 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.

- If the control module can be reprogrammed

3. All OK.

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.

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.

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.
 - **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

PASSENGER PRESENCE SYSTEM PROGRAMMING AND SETUP

When the passenger presence system is replaced or serviced, perform the rezeroing procedure for the passenger presence system. Refer to [Passenger Presence System Rezeroing](#) for the rezeroing procedure.

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.

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 power steering control module, perform the following procedure:

1. Install **EL-49642** SPS programming support tool.
2. Ignition ON.
3. Access the Service Programming System (SPS) and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select Power Steering Control Module - Programming and follow the on-screen instructions.
5. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.
6. On the SPS Supported Controllers screen, select Power Steering Control Module - Setup and follow the on-screen instructions.
7. With a scan tool, Clear All DTCs.

Reprogram Control Module

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

1. Install **EL-49642** SPS programming support tool.
2. Ignition ON.
3. Access the Service Programming System (SPS) and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select Power Steering Control Module - Programming 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, Clear All DTCs.

Unsuccessful Programming Recovery

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

1. Ignition ON. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the control module can be reprogrammed.
 - **If the control module cannot be reprogrammed**

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.
 - **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 power steering control module replacement, programming and setup.

RADIO CONTROL 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 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.
 - **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

RADIO 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. 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 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.
- Use a USB 2.0 Flash Drive with 4GB - 8GB memory (not to exceed 8GB). Using a USB 3.0 Flash Drive has been known to cause programming issues. A USB 2.0 will have a black 4 pin connector vs. a USB 3.0 which will have a 5 - 6 pin blue connector.

Reference Information

Special Tools

- **EL-49642** SPS Programming Support Tool
- USB 2.0 flash drive with 4GB - 8GB memory (not to exceed 8GB).

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, 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. On the SPS Supported Controllers screen, (if available) select A11 Radio - Setup and Configuration, and follow the on-screen instructions.
12. At the end of programming, choose the "Clear 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.
 - **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**](#) .
 - **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.

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)

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.
 - **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](#) .

- 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.

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.

SEAT MEMORY 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 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 K40 Seat Memory 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.
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.
 - **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

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.
 - **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

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.

STEERING WHEEL HEAT CONTROL MODULE PROGRAMMING AND SETUP

This device requires no programming or setup.

SUNROOF CONTROL MODULE PROGRAMMING AND SETUP

When replacing the sunroof motor/control module, the sunroof motor/actuator initialization/teach procedure must be followed.

Existing or New Motor

For the sunroof motor/actuator initialization/teach procedure refer to [Sunroof Motor/Actuator Initialization/Teach Process](#) .

SUSPENSION 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 or Reprogram Control Module

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 Suspension Control Module - Programming and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select Suspension Control Module - Setup or Configuration and follow the on-screen instructions.
5. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.
6. With a scan tool, perform the suspension system calibration procedure, if applicable.

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.

- 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

TELEMATICS COMMUNICATION 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. 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 Telematics Communication Interface Control Module you are working with. One way to accomplish this is by using a scan tool. The 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 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.

NOTE:

- **Due to a change in SPS you must select 'Reprogram ECU', for Telematics Communication Interface Control Module Programming from the Selected Programming Process even if the unit is being replaced.**
- **If 'Replace and Program ECU' is selected the Telematics Communication Interface Control Module will not be listed in the Supported Controllers screen. You must go back and select 'Reprogram ECU'.**

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3. In the SPS Supported Controllers screen, select 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 Telematics Communication Interface Control Module Programming and Service Activation, if the vehicle is equipped with RPO VV4, on the Supported Controllers screen select 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.
 - **If the control module can be reprogrammed**
3. All OK.

TRAILER LAMP 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](#).

Diagnostic Aids

Ensure that the following conditions exist in order to prepare for trailer lighting control module programming or configuration:

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

The following service instructions reflect either a re-programming or configuration event performed to complete a repair procedure.

Trailer Lighting Control Module Programming

Do not re-program the trailer lighting control module unless directed by a service procedure or a service bulletin.

1. Access the Service Programming System (SPS) and follow the on-screen instructions. Refer to [Service Programming System \(SPS\)](#).
2. On the SPS Supported Controllers screen, select Trailer Interface (Control) Module - Programming and follow the on-screen instructions.
3. Clear DTCs after completing the programming procedure.

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

Trailer Lighting Control Module Configuration/Reconfiguration and Setup

If the trailer lighting control module is replaced or installed as an after sales accessory, both the configuration/reconfiguration and setup procedures must be performed.

1. Access the Service Programming System (SPS) and follow the on-screen instructions. Refer to [Service Programming System \(SPS\)](#).
2. On the SPS Supported Controllers screen, select Trailer Interface (Control) Module - Configuration and Setup.
3. On the Control Module - Configuration and Setup Function(s) screen, select both ECU Configuration/Reconfiguration and ECU Setup menu options and follow the on-screen instructions.
4. Clear DTCs after completing the configuration/reconfiguration and setup procedures.

If the trailer lighting control module fails to accept the configuration/reconfiguration and setup procedures, verify all scan tool and trailer lighting control module connections are secure.

TRANSFER CASE 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: K69 Transfer Case Control Module
4. Perform the SPS function: K69 Transfer Case Control Module - Programming
5. Perform the SPS function: K69 Transfer Case Control Module - Setup
6. Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to No.

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 SPS software is up to date.
2. Ignition - On / Vehicle - In Service Mode
3. Perform the SPS function:K69 Transfer Case Control Module - 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:K69 Transfer Case Control Module - Programming
 - If the programming is not successful - Replace the component: K69 Transfer Case Control Module
 1. Replace the component: K69 Transfer Case Control Module
 2. Perform the SPS function:K69 Transfer Case Control Module - Setup
 - If the programming is successful
4. Perform the SPS function:K69 Transfer Case Control Module - Setup
 - If the procedure was not successful
 1. Replace the component: A16 Transfer Case Motor
 2. Perform the SPS function:K69 Transfer Case Control Module - Setup
 - If the procedure was successful
5. All OK.

- **If the programming is successful**

4. Perform the SPS function:K69 Transfer Case Control Module - Setup
5. Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to No.
6. 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](#)

TRANSMISSION CONTROL MODULE PROGRAMMING AND SETUP (ALLISON)

The following service procedures require a programming and a setup event be performed for a complete repair.

Transmission Control Module (TCM) Replacement

If the TCM is replaced, TCM Reprogramming must be performed. Refer to [Service Programming System \(SPS\)](#).

TCM Reprogramming

If programming is required, perform the following procedure. Refer to [Service Programming System \(SPS\)](#).

Ensure the following conditions exist in order to prepare for TCM programming or reprogramming:

- The battery is fully charged.
- The ignition switch is in the RUN position.
- Ensure that the TCM has the latest software version.
- The Techline equipment cable connection at the data link connector (DLC) is secure.
- Inspect the Techline equipment for the latest software version.

Program the TCM using the latest software matching the vehicle. Refer to up-to-date Techline equipment user instructions.

If the TCM fails to program, proceed as follows:

- Ensure the TCM connection is good.
- Inspect the Techline equipment for the latest software version.
- Attempt to program the TCM. If the TCM still cannot be programmed properly, replace the TCM.

TCM Setup

Refer to [FastLearn Procedure](#) to complete repair.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

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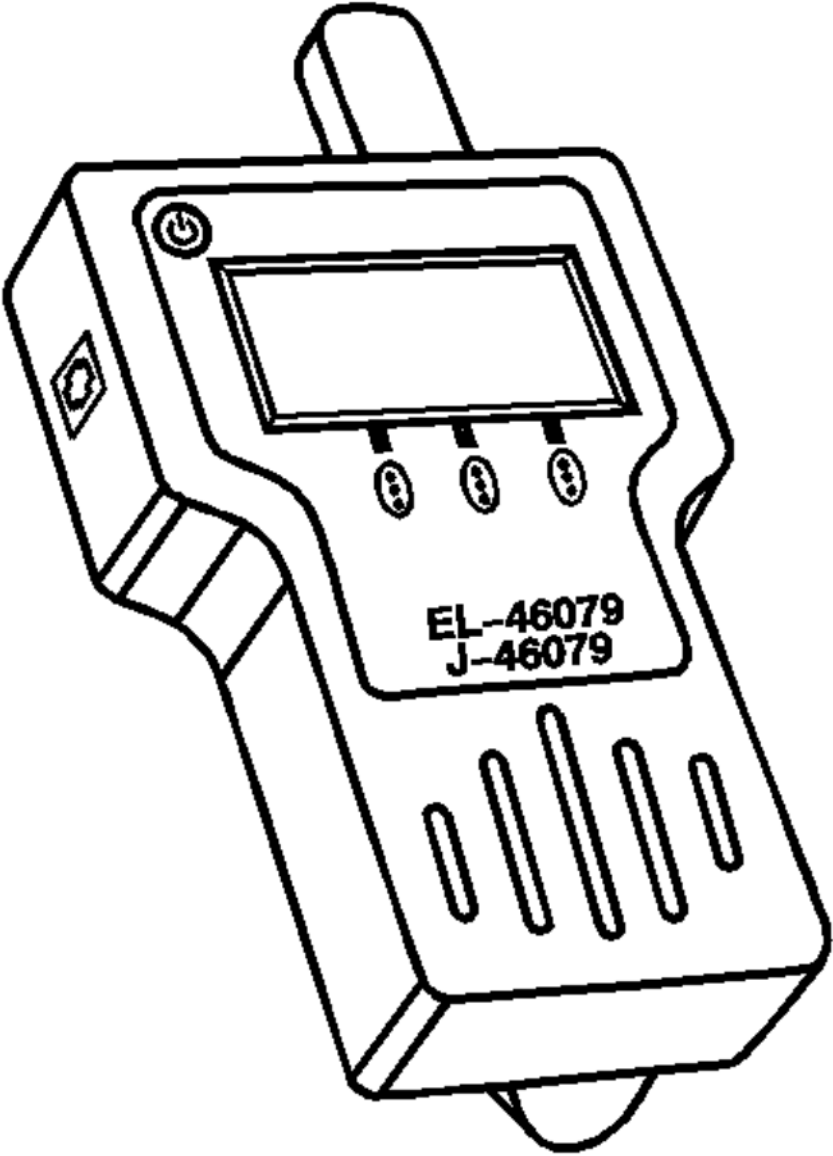
Illustration	Tool Number/ Description
	EL 46079 J 46079 Tire Pressure Monitor Diagnostic Tool

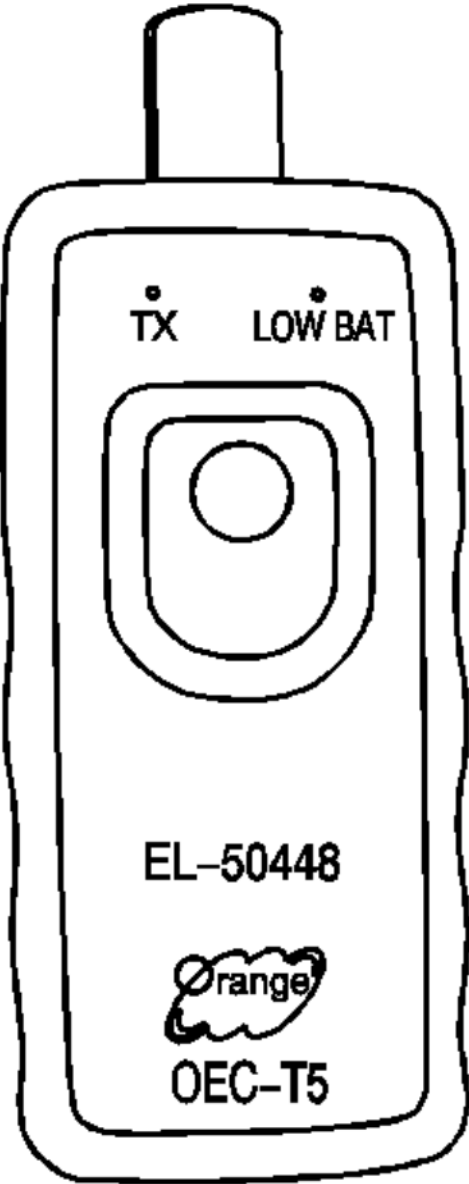
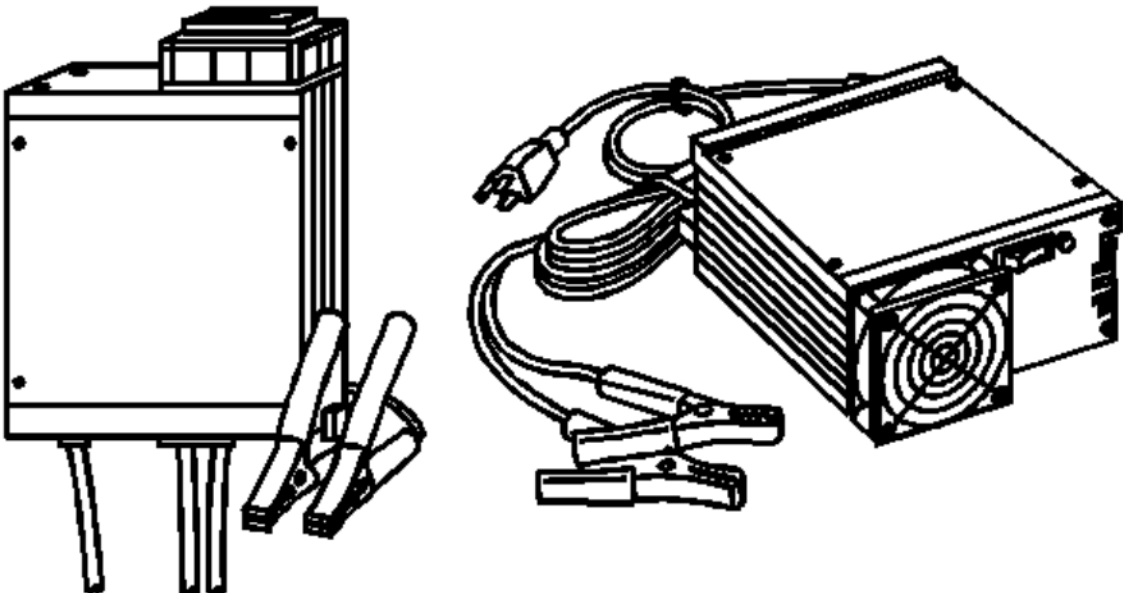
Illustration	Tool Number/ Description
 The illustration shows a handheld electronic device with a rectangular body and rounded corners. At the top is a small, vertical, cylindrical protrusion. Below this, on the left, is a small dot above the letters 'TX'. To its right is another small dot above the text 'LOW BAT'. In the center of the device is a large, rounded rectangular frame containing a smaller circle. Below this frame, the text 'EL-50448' is printed. Underneath that is the 'Orange' logo, which consists of the word 'Orange' in a stylized font inside a cloud-like shape. At the bottom, the text 'OEC-T5' is printed.	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

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