

2010 GENERAL INFORMATION

Programming and Setup - Equinox & Terrain

DIAGNOSTIC INFORMATION AND PROCEDURES

CONTROL MODULE REFERENCES

Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
• <u>Data Link References</u> • <u>Diagnostic System Check - Vehicle</u> • <u>Diagnostic Trouble Code (DTC) List - Vehicle</u> • <u>Symptoms - Vehicle</u>			
Accessory and Liftgate Control Module <u>Liftgate Close Actuator Motor Control Module Scan Tool Information</u>	<u>Liftgate Schematics</u>	<u>Accessory and Liftgate Control Module Replacement</u>	<u>Liftgate Control Module Programming and Setup</u>
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<u>Body Control Module Scan Tool Information</u>	<u>Body Control System Schematics</u>	<u>Body Control Module Replacement</u>	<u>Body Control Module Programming and Setup</u>
<u>Communication Interface Module Scan Tool Information</u>	<u>OnStar Schematics</u>	<u>Communication Interface Module Replacement</u>	<u>Communication Interface Module Programming and Setup</u>
Control Solenoid Valve and Transmission Control Module Assembly <u>Transmission Control Module Scan Tool Information (6T30/6T40/6T45/6T50) or Transmission Control Module Scan Tool Information (6T70/6T75)</u>	<u>Automatic Transmission Controls Schematics</u> for the 6T30/6T40/6T45 transmission or <u>Automatic Transmission Controls Schematics</u> for the 6T70/6T75 transmission	<u>Control Solenoid Valve and Transmission Control Module Assembly Replacement</u> for the 6T30/6T40/6T45 transmission or <u>Control Solenoid Valve and Transmission Control Module Assembly Replacement</u> for the 6T70/6T75 transmission	<u>Control Solenoid Valve and Transmission Control Module Assembly Programming and Setup (6T70/6T75) or Control Solenoid Valve and Transmission Control Module Assembly Programming and Setup (6T30/6T40/6T45/6T50)</u>

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<u>Electronic Brake Control Module Scan Tool Information</u>	<u>Antilock Brake System Schematics</u>	<u>Electronic Brake Control Module Replacement</u>	<u>Electronic Brake Control Module Programming and Setup</u>
<u>Engine Control Module Scan Tool Information (LF1,LFW) or Engine Control Module Scan Tool Information (LAF)</u>	<u>Engine Controls Schematics</u> for the 2.2L or 2.4L engine or <u>Engine Controls Schematics</u> for the 2.8L, 3.0L, 3.2L, or 3.6L engines	<u>Engine Control Module Replacement (LE5)</u> for the 2.2L or 2.4L engine or <u>Engine Control Module Replacement</u> for the 2.8L, 3.0L, 3.2L, or 3.6L engines	<u>Engine Control Module Programming and Setup (without LF1) or Engine Control Module Programming and Setup (LF1)</u>
<u>Fuel Pump Flow Control Module Scan Tool Information</u>	<u>Engine Controls Schematics</u> for the 2.2L or 2.4L engine or <u>Engine Controls Schematics</u> for the 2.8L, 3.0L, 3.2L, or 3.6L engines	<u>Fuel Pump Flow Control Module Replacement</u> for the 2.2L or 2.4L engine or <u>Fuel Pump Flow Control Module Replacement</u> for the 2.8L, 3.0L, 3.2L, or 3.6L engines	<u>Fuel Pump Flow Control Module Programming and Setup</u>
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REPAIR INSTRUCTIONS

ACTIVE NOISE CANCELLATION MODULE PROGRAMMING AND SETUP

This device requires no programming or setup.

AUDIO AMPLIFIER PROGRAMMING AND SETUP

Replace and Program ECU or Reprogram ECU

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

BLOWER MOTOR CONTROL MODULE PROGRAMMING AND SETUP

Blower Motor Control Module Replacement

There is no setup procedure that needs to be performed for the blower motor control module on this vehicle.

BODY CONTROL MODULE PROGRAMMING AND SETUP

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

Ensure that the following conditions exist in order to prepare for BCM 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 control modules and devices are reconnected securely.
5. This entire procedure has been reviewed before proceeding.

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

Replace and Program BCM

To program and setup a replacement BCM, perform the following procedure:

1. With a scan tool, 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 BCM Body Control Module - Programming and follow the on-screen instructions.
3. Perform the following for the appropriate ignition type prior to proceeding with the next step:
 - Key Ignition System: Key in the ignition and any additional keys must be away from the vehicle at least 3 meters.
 - Push Button Start System: Key Fob must be in the console programming pocket. Refer to the Help selection button on the SPS Immobilizer Setup screen for the exact pocket location. All additional Key Fobs must be away from the vehicle at least 3 meters.

NOTE: **The following programming step may take between 10-12 minutes and progress will appear to have stopped during this process. This is a normal security timer response and a restart should not be performed.**

4. 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 Key Fob to allow the Key Fob to exit the Immobilizer Learn mode.

NOTE: **When performing the Tire Pressure Monitor Sensor Learn during BCM setup, the J-46079 Tire Pressure Monitor Diagnostic Tool must be used to activate each tire pressure sensor.**

5. On the SPS Supported Controllers screen, select BCM Body Control Module - Setup and follow the on-screen instructions.
6. Check the driver information center display for additional messages regarding further calibration instructions. If there are no addition driver information center instructions present, programming is complete.

Reprogram Existing BCM

To program and setup an existing BCM, perform the following procedure:

1. With a scan tool, 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 BCM Body Control Module - Programming and follow the on-screen instructions.

NOTE: **When performing the Tire Pressure Monitor Sensor Learn during BCM setup, the J-46079 Tire Pressure Monitor Diagnostic Tool must be used to activate each tire pressure sensor.**

3. On the SPS Supported Controllers screen, select BCM Body Control Module - Setup and follow the on-screen instructions.

4. 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.

If the BCM fails to accept the program, verify all scan tool and BCM 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. With a scan tool, clear all DTCs from all control modules.

COMMUNICATION INTERFACE MODULE PROGRAMMING AND SETUP

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

Communication Interface Module Replacement

NOTE:

- It is critical to use the service replacement Communication Interface Module (CIM) only in the vehicle for which it was ordered.
- Failure to perform the following procedures will result in a red LED, DTC(s) being set, and limited or incomplete OnStar® services
- An OnStar® button-press to the OnStar® call center is not required to complete the procedure.
- It may take up to 24 hours for OnStar® service to become fully activated after performing the procedures.
- Perform the following procedure only once. Repeat attempts of the procedure may result in a delay of the activation process.
- To fully activate an OnStar® module, both the setup and activation request procedures must be completed on all vehicles with AND without an active OnStar® subscription to insure the unit has been setup properly for the vehicle it has been installed into and also to update the OnStar® with the correct unit information.
- To initialize the Turn-by-Turn feature, the vehicle must first be driven 8-16 km (5-10 miles) in order to allow the system to self-calibrate the dead reckoning feature.
- Use of a J 2534-compatible diagnostic tool interface is required when performing the SPS supported OnStar® Setup and Activation (ONSU) procedure.

- **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 CIM installation and setup procedures.**

1. Connect the scan tool to the vehicle.
2. Connect the Techline Information System (TIS) terminal to the scan tool.
3. Select the OnStar® Setup and Activation (ONSU) option using the service programming system (SPS).
4. The default language for the new CIM is English. To change the language to French or Spanish, access the scan tool.
5. Inform the customer that it may take up to 24 hours for the OnStar® service to become fully activated.

CONTROL SOLENOID VALVE AND TRANSMISSION CONTROL MODULE ASSEMBLY PROGRAMMING AND SETUP (6T70/6T75)

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. Perform the Transmission Adaptive Values Learn - Refer to **Transmission Adaptive Values Learn** .

TCM Reprogramming

1. If the TCM needs to be reprogrammed, refer to **Service Programming System (SPS)**.
2. Perform the Transmission Adaptive Values Learn - Refer to **Transmission Adaptive Values Learn** .

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

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

Setup for Component Replacement

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

If any of the following components are replaced, the **Transmission Adaptive Values Learn** procedure must be performed:

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

Refer to **Transmission Adaptive Values Learn** .

CONTROL SOLENOID VALVE AND TRANSMISSION CONTROL MODULE ASSEMBLY PROGRAMMING AND SETUP (6T30/6T40/6T45/6T50)

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

Transmission Control Module (TCM) Replacement

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

1. TCM Reprogramming
2. The Transmission Adaptive Values Learn - Refer to **Transmission Adaptive Values Learn**

TCM Reprogramming

1. If the TCM needs to be reprogrammed, refer to **Service Programming System (SPS)**.
2. Perform the Transmission Adaptive Values Learn - Refer to **Transmission Adaptive Values Learn** .

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

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

Setup for Component Replacement

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

If any of the following components are replaced, the **Transmission Adaptive Values Learn** procedure must be performed:

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

Refer to **Transmission Adaptive Values Learn** .

ELECTRONIC BRAKE CONTROL MODULE PROGRAMMING AND SETUP

The electronic brake control module (EBCM) 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 EBCM will not control all of the vehicle features properly.

Ensure that the following conditions exist in order to prepare for EBCM 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 EBCM unless directed by a service procedure or a service bulletin.

Electronic Brake Control Module (EBCM) Programming

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

1. With a scan tool, 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 EBCM Electronic Brake Control Module - Programming and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select EBCM Electronic Brake Control Module - Setup and follow the on-screen instructions.

If the EBCM fails to accept the program, verify all scan tool and EBCM 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. With a scan tool, clear all DTC's from all modules.

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

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 corresponding procedure must be performed.

Steering Angle Sensor

Calibrate the steering angle sensor. Refer to **Steering Angle Sensor Centering** .

Multi-Axis Acceleration Sensor

NOTE: **The Multi-axis Acceleration Sensor is also known as the Inertia Sensor Module (IMU) in SPS. The sensor must be configured using SPS before the vehicle yaw sensor learn is performed with the scan tool.**

Calibrate the multi-axis acceleration sensor module. Refer to **Multi-Axis Acceleration Sensor Module Programming and Setup**.

Brake Pressure Modulator Valve Assembly

Calibrate the brake pressure sensor. Refer to **Brake Pressure Modulator Valve Pressure Sensor Calibration** .

ENGINE CONTROL MODULE PROGRAMMING AND SETUP (WITHOUT LF1)

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

ECM Replacement

If the engine control module (ECM) is replaced, the following procedures must be performed:

1. ECM Reprogramming-Refer to **Service Programming System (SPS)**.
2. Theft Deterrent-Refer to **Immobilizer System Component Programming** . The ECM will learn the incoming fuel continue password immediately upon receipt of a password message. Once a password message is received, and a password is learned, a learn procedure must be performed to change this password again. An ECM which has been previously installed in another vehicle will have learned the other vehicle's fuel continue password, and will require a learn procedure after programming to learn the current vehicle's password.
3. Throttle Learn Procedure-Refer to **Throttle/Idle Learn** .
4. Engine Oil Life Remaining-When available, use a scan tool to reset the Engine Oil Life Remaining back to the original percentage recorded before the module was replaced.
5. Transmission Fluid Life Remaining-When available, use the scan tool to reset the Transmission Fluid Life Remaining back to the original percentage recorded before the module was replaced.

ECM Reprogramming

- If the engine control module (ECM) needs to be reprogrammed, refer to **Service Programming System (SPS)**.
- Engine Oil Life Remaining-When available, use a scan tool to reset the Engine Oil Life Remaining back

to the original percentage recorded before the module was reprogrammed.

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, an Idle Learn Procedure must be performed. Refer to **Throttle/Idle Learn** .

- Throttle body assembly
- ECM

ENGINE CONTROL MODULE PROGRAMMING AND SETUP (LF1)

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

ECM Replacement

If the engine control module (ECM) is replaced, the following procedures must be performed:

1. ECM Reprogramming-Refer to **Service Programming System (SPS)**.
2. Theft Deterrent-Refer to **Immobilizer System Component Programming** .
3. The CKP System Variation Learn-Refer to **Crankshaft Position System Variation Learn** .
4. The Throttle/Idle Learn procedure-Refer to **Throttle/Idle Learn (LF1, LFW)** .
5. Engine Oil Life Remaining-When available, use a scan tool to reset the Engine Oil Life Remaining back to the original percentage recorded before the module was replaced.
6. Transmission Fluid Life Remaining-When available, use the scan tool to reset the Transmission Fluid Life Remaining back to the original percentage recorded before the module was replaced.

ECM Reprogramming

- If the ECM needs to be reprogrammed, refer to **Service Programming System (SPS)**.
- Engine Oil Life Remaining-When available, use a scan tool to reset the Engine Oil Life Remaining back to the original percentage recorded before the module was reprogrammed.

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

- Turn the ignition OFF for 30 seconds.
- Turn the ignition ON with the engine OFF.
- Use the scan tool in order to retrieve history DTCs from all modules.
- 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 CKP Variation Learn Procedure must be performed. Refer to **Crankshaft Position System Variation Learn** .

- Engine replacement
- Any engine repair that disturbs the CKP sensor or its relationship with the crankshaft reluctor wheel
- CKP sensor

If the throttle body is replaced or a throttle body cleaning procedure is completed, the Throttle/Idle Learn Procedure must be performed. Refer to **Throttle/Idle Learn (LF1, LFW)** .

FUEL PUMP FLOW CONTROL MODULE PROGRAMMING AND SETUP

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

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

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

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

Fuel Pump Control Module Programming

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

1. With a scan tool, 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 CCM Fuel Pump Flow Control Module - Programming and follow the on-screen instructions.

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

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

1. Turn the 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. With a scan tool, clear all DTC's from all modules.

HEATED SEAT CONTROL MODULE PROGRAMMING AND SETUP

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

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

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

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

Seat Heating Control Module Programming

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

1. With a scan tool, 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 HVSMF Front Seat Heating Control Module - Programming and follow the on-screen instructions.

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

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

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

HVAC SYSTEM CONTROL MODULE PROGRAMMING AND SETUP

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

HVAC Control Module Replacement

If the HVAC control module needs to be replaced, the following procedures must be performed:

1. Connect a scan tool to the vehicle and access SPS. Refer to **Service Programming System (SPS)**.
2. Perform the SPS function Remote Heater and Air Conditioning Control Module - Programming and follow the on-screen instructions.
3. Perform the SPS function Remote Heater and Air Conditioning Control Module - Configuration & Setup and follow the on-screen instructions.
4. Clear DTCs after completing the programming procedure.

HVAC Control Module Reprogramming

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

1. Connect a scan tool to the vehicle and access SPS. Refer to **Service Programming System (SPS)**.
2. Perform the SPS function Remote Heater and Air Conditioning Control Module - Programming and follow the on-screen instructions.
3. Clear DTCs after completing the programming procedure.

Setup for Component Replacement

If an actuator is replaced, the following procedure must be performed:

Recalibrating actuators for the HVAC system. Refer to **Actuator Recalibration** .

INFLATABLE RESTRAINT SENSING AND DIAGNOSTIC MODULE PROGRAMMING AND SETUP

The inflatable restraint sensing and diagnostic module (SDM) 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 SDM will not control all of the vehicle features properly.

Ensure that the following conditions exist in order to prepare for SDM 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 SDM unless directed by a service procedure or a service bulletin.

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

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

Sensing and Diagnostic Module Replacement and/or Programming

If the inflatable restraint sensing and diagnostic module needs to be replaced and/or reprogrammed, the following procedures must be performed:

1. Connect a scan tool to the vehicle and access SPS. Refer to **Service Programming System (SPS)**
2. Perform the SPS function Inflatable Restraint Sensing and Diagnostic Module - Programming and follow the on-screen instructions.
3. Perform the SPS function Inflatable Restraint Sensing and Diagnostic Module - Setup and follow the on-screen instructions.
4. Clear DTCs after completing the programming procedure.

If the control module fails to program, proceed as follows:

1. Ensure the DLC and APM connections are good.
2. Inspect the Techline equipment for the latest software version.
3. Attempt to program the SDM. If the SDM still cannot be programmed properly, replace the SDM.

Sensing and Diagnostic Module Setup

The replacement of some components will require a setup procedure for complete repair. The SDM Setup Procedure must be performed if any of the following components are replaced:

1. SDM
 2. BCM
1. Connect a scan tool to the vehicle and access SPS. Refer to **Service Programming System (SPS)**
 2. Perform the SPS function Inflatable Restraint Sensing and Diagnostic Module - Setup and follow the on-screen instructions.
 3. Clear any DTCs after completing the Setup procedure.

INSTRUMENT CLUSTER PROGRAMMING AND SETUP

The instrument panel cluster 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 instrument panel cluster will not control all of the vehicle features properly.

Ensure that the following conditions exist in order to prepare for instrument panel cluster 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 instrument panel cluster unless directed by a service procedure or a service bulletin.

Instrument Panel Cluster Programming

To program and setup an existing or new replacement instrument panel cluster, perform the following procedure:

1. With a scan tool, 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 IPC Instrument Cluster - Programming and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select IPC Instrument Cluster - Configuration and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select IPC Instrument Cluster - Setup and follow the on-screen instructions.

If the instrument panel cluster fails to accept the program, verify all scan tool and instrument panel cluster 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. With a scan tool, clear all DTC's from all modules.

LIFTGATE CONTROL MODULE PROGRAMMING AND SETUP

NOTE: **To ensure proper programming of the liftgate, the liftgate assembly must be at room temperature during calibration.**

NOTE: DTC B1019 00 will set automatically as an indicator that the system is in learn mode and not as a fault indicator. Once the travel limits are learned by the liftgate module, the liftgate module will exit calibration mode and DTC B1019 00 become a history code.

Conditions

Use this procedure after replacing, repairing, or disassembling any portion of the power liftgate assembly.

1. Connect the scan tool to the vehicle.
2. Select Module Diagnosis.
3. Select Liftgate Control Module.
4. Select Liftgate Maximum Open Position Learn.
5. Press "Launch" and follow the on screen instructions.

MEMORY SEAT CONTROL MODULE PROGRAMMING AND SETUP

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

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

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

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

Seat Memory Control Module Programming

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

1. With a scan tool, 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 MSM Memory Seat Control Module - Programming and follow the on-screen instructions.

If the MSM Memory Seat Module fails to accept the program, verify all scan tool and seat memory control module connections are secure.

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

misdiagnosis:

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

MULTI-AXIS ACCELERATION SENSOR MODULE PROGRAMMING AND SETUP

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

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

Ensure that the following conditions exist in order to prepare for multi-axis acceleration sensor module programming:

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

Do not reprogram the multi-axis acceleration sensor module unless directed by a service procedure or a service bulletin.

Multi-Axis Acceleration Sensor Module Programming

To program and setup an existing or new replacement multi-axis acceleration sensor module, perform the following procedure:

1. With a scan tool, 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 IMU Inertia Sensor Module - Configuration and follow the on-screen instructions.
3. With a scan tool, clear all DTC's from all modules.
4. Calibrate the yaw sensor using the scan tool. Refer to **Vehicle Yaw Sensor Learn**.

If the multi-axis acceleration sensor module fails to accept the program, verify all scan tool and multi-axis acceleration sensor module connections are secure.

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

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

MULTIMEDIA PLAYER INTERFACE 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. See Special Tools. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply. **DO NOT** connect a battery charger.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Diagnostic Aids

The Multimedia Player Interface Module is programmed with operational software during manufacturing. If it is verified during the following procedure that the latest calibrations are already programmed in the module, no further action is required. Do not attempt to program the module with the same calibration.

Replace and Program ECU or Reprogram ECU

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

1. Install **EL-49642** . See **Special Tools**.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select Multimedia Player Interface Module - Programming and follow the on-screen instructions.
4. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

Unsuccessful Programming Recovery

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

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

OBJECT ALARM MODULE PROGRAMMING AND SETUP

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

Ensure that the following conditions exist in order to prepare for parking assist control module programming:

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

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

Parking Assist Control Module Programming

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

1. With a scan tool, 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 Object Alarm Module - Configuration and follow the on-

screen instructions.

If the Object Alarm Module fails to accept the program, verify all scan tool and parking assist control module connections are secure.

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

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

OUTSIDE REARVIEW MIRROR PROGRAMMING AND SETUP

This device requires no programming or setup.

PASSENGER PRESENCE SYSTEM PROGRAMMING AND SETUP

NOTE: Before performing the preload procedure on the passenger presence detection system, the front passenger seat must be completely empty of all items. The presence of any items on the front passenger seat will affect the calibration and operation of the passenger presence detection system. When performing the preload procedure on the passenger presence detection system, the instrument cluster and dash lights will begin dimming ON and OFF. This is normal operation during the preload procedure and does not indicate additional system faults.

If the passenger presence detection system is replaced or serviced, perform the preload procedure for the passenger presence detection system. Refer to **Passenger Presence System Preload Test** for the preload procedure.

POWER STEERING CONTROL MODULE PROGRAMMING AND SETUP

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

Power Steering Control Module Replacement

If the power steering control module needs to be replaced, the following procedures must be performed:

1. Connect a scan tool to the vehicle and access SPS. Refer to **Service Programming System (SPS)**.
2. Perform the SPS function Electronic Power Steering - Prepare Control Module for Removal and follow the on-screen instructions.

3. Perform the SPS function Electronic Power Steering - Programming and follow the on-screen instructions.
4. Perform the SPS function Electronic Power Steering - Setup and follow the on-screen instructions.
5. Clear DTCs after completing the programming procedure.

Power Steering Control Module Reprogramming

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

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

Steering Angle Sensor Centering and Software Endstop Learning

For the steering angle sensor centering and software endstop learning refer to **Power Steering Control Module Calibration** .

RADIO 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. See **Special Tools**. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply. **DO NOT** connect a battery charger.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the

correct ignition switch position.

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

Diagnostic Aids

- During radio programming you may be required to select multiple calibrations dependant upon vehicle equipment. Have the vehicle build/RPO information available during the following procedure to ensure the correct calibrations are selected.
- The XM satellite radio (if equipped) is integrated into the radio. If XM was activated in the previous radio, the replacement radio will require no additional activation steps. Customer subscription information is transferred to the replacement radio when a replacement radio is ordered.

Replace and Program ECU or Reprogram ECU

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

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

Unsuccessful Programming Recovery

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

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

REAR DIFFERENTIAL CLUTCH CONTROL MODULE PROGRAMMING AND SETUP

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

Ensure that the following conditions exist in order to prepare for rear differential clutch control module programming:

1. The battery is fully charged.
2. The MDI data link connectors are secure.

3. The scan tool is loaded with the most current software version.
4. All disconnected modules and devices are reconnected securely.
5. This entire procedure has been reviewed before proceeding.

Do not reprogram the rear differential clutch control module unless directed by a service procedure or a service bulletin.

Rear Differential Clutch Control Module Programming

To program and setup an existing or new replacement rear differential clutch control module, perform the following procedure:

1. With a scan tool, 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 RDCM Rear Differential Clutch Control Module - Programming and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select RDCM Rear Differential Clutch Control Module - Setup and follow the on-screen instructions.

If the rear differential clutch control module fails to accept the program, verify all scan tool and rear differential clutch control module connections are secure.

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

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

REARVIEW CAMERA IMAGE DISPLAY MODULE PROGRAMMING AND SETUP

This device requires no programming or setup.

REMOTE CONTROL DOOR LOCK RECEIVER PROGRAMMING AND SETUP

The remote control door lock receiver only acts as an antenna, receiving the signals sent by the keyless entry transmitter and sending them to the body control module (BCM). Because the keyless entry software is contained in the BCM, the remote control door lock receiver requires no programming or setup after replacement.

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.**
- **Due to the time requirements of programming a controller, install EL-49642 SPS Programming Support Tool to maintain system voltage. See Special Tools. Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. If the above tool is not available, DO NOT connect a battery charger, connect a fully charged 12V jumper or booster pack disconnected from the AC voltage supply.**
- **Some modules will require additional programming/setup events to be performed before or after programming.**
- **Some vehicles may require the use of a CANDi or MDI module for programming.**
- **Review the appropriate service information for these procedures.**
- **DTCs may set during programming. Clear DTCs after programming is complete.**
- **Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.**

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

- Vehicle system voltage:
 - There is not a charging system concern. All charging system concerns must be repaired before programming a control module.
 - Battery voltage is greater than 12 volts but less than 16 volts. The battery must be fully charged before programming the control module.
 - Turn OFF or disable any system that may put a load on the vehicles battery, such as the following components:
 - Interior lights
 - Exterior lights including daytime running lights (DRL)-Applying the parking brake, on most vehicles, disables the DRL system

- Heating, ventilation, and air conditioning (HVAC) systems
- Engine cooling fans
- Radio, etc.
- The ignition switch must be in the proper position. SPS prompts you to turn ON the ignition, with the engine OFF. DO NOT change the position of the ignition switch during the programming procedure, unless instructed to do so.
- Make certain all tool connections are secure, including the following components and circuits:
 - Scan Tool
 - The RS-232 communication cable port
 - The connection at the data link connector (DLC)
 - The voltage supply circuits
 - MDI
 - The USB, Ethernet or Wireless communication port
 - The connection at the data link connector (DLC)
- DO NOT disturb the tool harnesses while programming. If an interruption occurs during the programming procedure, programming failure or control module damage may occur.

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

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

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

STEERING COLUMN LOCK CONTROL MODULE PROGRAMMING AND SETUP

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

Steering Column Lock Control Module Replacement

If the steering column lock control module needs to be replaced, the following procedures must be performed:

1. Connect a scan tool to the vehicle and access SPS. Refer to **Service Programming System (SPS)**.
2. Perform the SPS function Steering Column Lock Control Module - Programming and follow the on-screen instructions.
3. Perform the SPS function Steering Column Lock Control Module - Configuration & Setup and follow the

on-screen instructions. On the screen Control Module - Configuration and Setup Function(s), select both ECU Configuration/Reconfiguration and ECU Setup.

4. Clear DTCs after completing the programming procedure.

Steering Column Lock Control Module Reprogramming

If the steering column lock control module needs to be reprogrammed, the following procedures must be performed:

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

SUNROOF CONTROL MODULE PROGRAMMING AND SETUP (TILT AND SLIDE SYSTEM)

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

Initialization and Learn Procedures

In order for the sunroof system to perform correctly it needs to establish its position and the force profile it will encounter under normal closing conditions. These two procedures need to be run when a new controller is placed on a vehicle, when a service procedure is performed on any mechanical component, or if the system seems to lose track of its known position.

Initialization and Reinitialization

When the sunroof controller is not initialized it will perform all 'Open' requests, but no 'Express close' or LIN-Bus communicated close commands. It will only perform a 'Close' operation requested by the switch with obstacle detection disabled. If an initialization procedure is interrupted the controllers will return to the not initialized state. Which procedure is run depends on the state of the controller.

For a module which is not initialized begin the process by holding the sunroof switch in the 'Close' position. The sunroof will move to the end of physical travel in the closed direction and store that position. During this time it is necessary to keep the switch active until the process completes. At the completion of the procedure the sunroof should back off slightly to its soft stops. The rest of the defined positions are determined by offsets from this home position.

For a module which has been previously initialized release the switch after the sunroof is considered fully closed by the software. Then hold the sunroof switch in the closed position for 10 s. The sunroof shall resume motion in the 'Close' direction until the end of travel is detected. During this time it is necessary to keep the switch active until the process completes. At the completion of the procedure the sunroof should back off slightly to its soft stops.

For learning the force profile for anti-pinch algorithm after initialization or re-initialization move the roof to the fully open position and release the switch. Activate the 'Open' function of the switch continuously for more than

15 s. At this point, the sunroof will automatically begin to move to the fully closed position. During this time it is necessary to keep the switch active until the process completes.

THEFT DETERRENT MODULE PROGRAMMING AND SETUP

1. Connect a scan tool to the vehicle in the Pass-thru arrangement.
2. Turn ON the ignition, with the engine OFF.
3. Ensure that all power consuming devices are turned OFF on the vehicle.
4. On the Techline Terminal, select Service Programming System and follow the Techline Terminal on-screen instructions, using the Legacy Pass-Thru method. Ensure the correct programming selection is chosen based on component being replaced or programmed. For this procedure, go to the TDM - Theft Deterrent Module menu and select the proper on-screen options.
5. After the programming has completed, turn the ignition OFF for 30 seconds.
6. Turn ON the ignition with the engine OFF.
7. On the Techline Terminal, now select V.T.D. Vehicle Theft Deterrent Learn from the controller list and follow the on-screen instructions.
8. At this point the scan tool must remain connected for the duration of the 10-minute relearn procedure.

NOTE:

- **The Techline Terminal will initially display 12 Minutes. The first 2 minutes allow the scan tool to initialize the appropriate control module. The remaining 10 minutes is the relearn timer.**
- **On some vehicles the security indicator may be illuminated for the duration of the 10-minute relearn procedure.**

9. Observe the scan tool, after approximately 10 minutes the scan tool will display "Programming Successful, Turn OFF Ignition". The vehicle is now ready to relearn the key information and/or the passwords on the next ignition switch transition from OFF to CRANK.
10. Turn OFF the ignition and wait 2 minutes.
11. With a master vehicle key, turn the ignition to the RUN position for 15 seconds, then start the vehicle. The TDM and ECM have now relearned the pre-release password and the challenge/response data.
12. With a scan tool, clear any DTCs.

TRANSMISSION CONTROL MODULE PROGRAMMING AND SETUP (6T30/6T40/6T45/6T50)

1. The transmission control module (TCM) must be programmed with the proper software/calibrations. Ensure that the following conditions exist in order to prepare for TCM programming:
 - The battery is fully charged.
 - The ignition switch is in the RUN position.
 - The Techline equipment cable connection at the data link connector (DLC) is secure.
2. Program the TCM using the latest software matching the vehicle. Refer to up-to-date Techline equipment user instructions.
3. If the TCM fails to program, proceed as follows:

1. Ensure that the TCM connection is OK.
2. Inspect the Techline equipment for the latest software version.
3. Attempt to program the TCM. If the TCM still cannot be programmed properly, replace the TCM.

TRANSMISSION CONTROL MODULE PROGRAMMING AND SETUP (6T70)

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

Transmission Control Module (TCM) Replacement

If the TCM is replaced, TCM Reprogramming must be performed. Refer to Neutral - Engine Running .

TCM Reprogramming

If the TCM is reprogrammed, TCM Reprogramming must be performed. Refer to Neutral - Engine Running .

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.
- The Techline equipment cable connection at the data link connector (DLC) is secure.

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.

After successful TCM reprogramming, reset the transmission adapts and perform the Transmission Adaptive Learn Procedure. Refer to Transmission Adaptive Functions .

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/ Description
	EL 49642 EL 50113

