

**2002 GENERAL INFORMATION****Computer Relearn Procedures - Domestic****INTRODUCTION****BODY CONTROLS**

Vehicles equipped with body, air conditioning, anti-lock brake or memory computers may require a computer relearn procedure after components are replaced or the vehicle battery is disconnected. Vehicle computers memorize and store vehicle information and operation selections. When the vehicle battery is disconnected, vehicle computer memory may be lost, requiring relearning or resetting. Depending on the vehicle and how it is equipped, the following secondary memories may exist:

- Air conditioning. See appropriate AUTOMATIC A/C-HEATER SYSTEMS article in AIR CONDITIONING & HEATING.
- Clock.
- Power window operation. See appropriate POWER WINDOWS article in ACCESSORIES & EQUIPMENT.
- Power sliding door operation. See appropriate POWER SLIDING DOORS article in ACCESSORIES & EQUIPMENT.
- Radio presets.
- Remote keyless entry and/or keyless entry keypad custom features. See appropriate REMOTE KEYLESS ENTRY SYSTEMS article in ACCESSORIES & EQUIPMENT.
- Sun roof operation. See appropriate POWER SUN ROOF article in ACCESSORIES & EQUIPMENT.

These do not affect primary vehicle systems. For secondary vehicle systems, see appropriate article for relearn procedures. Other computer relearn procedures are required for primary vehicle system operation. These may include:

- Initial control unit programming.
- Traction control yaw sensor initializing.
- Multiplex communication.
- Anti-theft system or engine immobilizer system passwords.

**ENGINE CONTROLS**

Vehicles equipped with an engine control module, may require a computer relearn procedure after vehicle battery is disconnected. Vehicle computers memorize and store vehicle operation patterns for optimum driveability and performance. When the vehicle battery is disconnected, this memory is lost, which may result in a driveability problem. Depending on

the vehicle and how it is equipped, the following driveability problems may exist:

- Rough or unstable idle.
- Hesitation or stumble.
- Rich or lean running.
- Poor fuel mileage.
- Harsh or poor transmission/transaxle shift quality.

Default data is used until NEW data from each key start is stored. As the computer restores its memory from each new key start, driveability is restored.

Driveability problems may occur during the computer relearn stage. To accelerate computer relearn process after battery removal and installation, specified computer relearn procedures should be performed. See appropriate procedures for specified manufacturer.

## **CHRYSLER CORP.**

### **A/C CALIBRATION (CARAVAN, TOWN & COUNTRY, & VOYAGER)**

#### **Description**

Automatic Temperature Control (ATC) module must be reset or recalibrated each time a door actuator is replaced or when ATC module is replaced. It is necessary for ATC module to learn feedback voltage values for each door stop position for all doors in front HVAC unit housing and rear HVAC unit housing. If an actuator blend door, mode door, or if recirculation door, or door actuator are out of calibration, ATC system will not perform at maximum efficiency.

#### **Procedure**

1. Turn the ignition switch to the ON position. Simultaneously depress and hold the Power and Recirculation buttons on the heater-A/C control for at least five seconds. The manual heater-A/C control power Light Emitting Diode (LED) and Recirculation LED, or the Automatic Temperature Control (ATC) heater-A/C control Delay and Recirculation graphics will begin to flash when the calibration procedure has begun.
2. The calibration procedure should take less than two minutes to complete, for the manual heater-A/C control, and less than twenty seconds for the ATC heater-A/C control. When the LEDs or graphics stop flashing, the calibration procedure is complete.
3. If the LEDs or graphics continue to flash beyond the normal three minute (manual) or twenty second (ATC) calibration time, it indicates, that the heater-A/C control has detected a failure and a Diagnostic Trouble Code (DTC), has been set. Use a DRBIII (R) scan tool to perform further diagnosis.
4. The LEDs or graphics will continue to flash, even after the ignition switch is cycled Off

and On, until a successful calibration is completed or until the vehicle has been driven about 8 miles. For diagnostic procedures for calibration test failure, see SELF-DIAGNOSTIC SYSTEM in appropriate AUTOMATIC A/C-HEATER SYSTEMS article in AIR CONDITIONING & HEATING.

**A/C CALIBRATION (CONCORDE, INTREPID & 300M)**

This procedure may be performed on both the automatic climate control system and the manual climate control system. Start engine and allow it to idle. If the vehicle is equipped with the automatic climate control system, turn the control head on. On all climate control systems, set the temperature controls to the full cold position for 2 minutes. Then, set the temperature controls to full heat position for the next 5 minutes. The A/C system should now be calibrated.

**BODY CONTROL MODULE (CONCORDE, INTREPID, SEBRING CONVERTIBLE, SEBRING SEDAN, STRATUS SEDAN & 300M)**

Turn ignition switch to ON position for at least 15 seconds (to learn VIN). On vehicles equipped with Vehicle Theft Security System (VTSS), use scan tool to enable VTSS. Using scan tool, program all other options as necessary.

**DRIVE LEARN PROCEDURE (DAKOTA - 4.7L, DURANGO - 4.7L & RAM PICKUP 1500 - 4.7L)**

**NOTE:** Using DRBIII(R), perform the following transmission drive learn procedures based on customer complaint or if symptom exists.

**Procedure To Learn A Smooth 1st Neutral To Drive Shift**

**NOTE:** Transmission fluid temperature must be between 80-110°F (27-43°C).

Perform this procedure only if the complaint is for a delayed or harsh shift the first time the transmission is put into gear after the vehicle is allowed to set with the engine not running for at least 10 minutes. Use the following steps to have the TCM learn the 1st N-1 UD Clutch Volume Index (CVI).

1. Start vehicle only when the engine and ignition have been off for at least 10 minutes.
2. With the vehicle at a stop and the service brake applied, record the UD CVI while performing a Neutral to Drive shift. During the shift, the UD CVI will temporarily show a different value which is the 1st N-1 UD CVI. The 1st N-1 UD CVI account for air entrapment in the UD clutch that may occur after the engine has been off for a period of time.
3. Repeat steps 1 and 2 until the recorded 1st N-1 UD CVI value stabilizes.

**Procedure To Learn A Smooth Neutral To Drive Garage Shift**

**NOTE:** It is important that this procedure be performed when the transmission fluid temperature is between 80-110°F (27-43°C). If this procedure takes too long to complete fully for the allowed transmission fluid temperature, the vehicle may be returned to the customer with an explanation that the shift will improve daily during normal vehicle usage. TCM also learns at higher fluid temperatures, but these values (line pressure correction values) are not available for viewing on the DRBIII(R).

**NOTE:** The transmission fluid temperature must be between 80-110°F (27-43°C) to learn the UD CVI. Additional learning occurs at temperatures as low as 0°F (-17°C) and as high as 200°F (94°C). This procedure may be performed at any temperature that experiences poor shift quality. Although the UD CVI may not change, shift quality should improve.

Perform this procedure if the complaint is for a delayed or harsh shift when the transmission is put into gear after the vehicle has had its first shift. Use the following steps to have the TCM learn the N-1 UD Clutch Volume Index (CVI).

1. Start the engine and shift to Drive.
2. Move the vehicle forward to a speed of at least 10 MPH and come to a stop. This ensures no air is present in the UD hydraulic circuit.
3. Perform repeated N-1 shifts at a stop while pausing in Neutral for at least 2-3 seconds and monitor UD CVI volume until the value stabilizes. The value will change during the N-D shift. This is normal since the UD value is different for the N-1 shift than the normal value shown, which is used for 4-3 coastdown and kickdowns. Perform repeated shifts in this temperature range until the UD CVI value stabilizes and the N-1 shifts become smooth.
4. This procedure may be performed at any temperature that experiences poor N-1 shift quality. Although the UD CVI may not change, shift quality should improve.

**Procedure To Learn The 1st 2-3 Shift After A Restart Or Shift To Reverse**

**NOTE:** The transmission fluid temperature must be above 80°F (27°C).

Use the following steps to have the TCM learn the 1st 2-3 shift OD Clutch Volume Index (CVI).

1. With the engine running, select Reverse gear for over 2 seconds.
2. Shift the transmission to Drive and accelerate the vehicle from a stop at a steady 15 degree throttle opening and perform a 2-3 shift while noting the OD CVI. During the

shift, a different value may appear on the DRBIII(R) screen, which is the 1st 2-3 OD CVI.

3. Repeat steps 1 and 2 until the 1st 2-3 upshift becomes smooth and the 1st 2-3 OD CVI stabilizes.

**Procedure To Learn A Smooth 2-3 & 3-4 Upshift**

**NOTE: Transmission fluid temperature must be above 110°F (43°C).**

Use the following steps to have the TCM learn the OD and 4C Clutch Volume Index (CVIs).

1. Accelerate the vehicle from a stop at a steady 15 degree throttle opening and perform multiple 1-2, 2-3 and 3-4 upshifts. The 2nd 2-3 shift following a restart or shift to Reverse will be shown during the shift as a value between the 1st 2-3 OD CVI and the normal OD CVI. Updates to the normal OD CVI will occur after the 2nd shift into 3rd gear, following a restart or shift to Reverse.
2. Repeat step 1 until the 2-3 and 3-4 shifts become smooth and the OD and 4C CVI become stable.

**Procedure To Learn A Smooth 4-3 Coastdown & Part Throttle 4-3 Kickdown**

**NOTE: Transmission fluid temperature must be above 110°F (43°C).**

Use the following steps to have the TCM learn the UD shift volume.

1. At a vehicle speed between 40-60 MPH, perform repeated 4-3 kickdown shifts.
2. Repeat step 1 until the UD volume becomes somewhat stable and the shift becomes smooth.

**Procedure To Learn A Smooth 1-2 Upshift & 3-2 Kickdown**

**NOTE: Transmission fluid temperature must be above 110°F (43°C).**

Use the following steps to have the TCM learn the 2C shift volume.

1. With a vehicle speed below 30 MPH and the transmission in 3rd gear, perform multiple 3-2 kickdowns.
2. Repeat step 1 until the 3-2 kickdowns become smooth and the 2C CVI becomes stable.

**Procedure To Learn A Smooth Manual 2-1 Pulldown Shift As Well As A Neutral To Reverse Shift**

**NOTE: Transmission fluid temperature must be above 110°F (43° C).**

Use the following steps to have the TCM learn the LR volume.

1. With the vehicle speed around 25-30 MPH in manual 2nd, perform manual pulldowns to Low or 1st gear at closed throttle.
2. Repeat step 1 until the LR CVI become stable and the manual 2-1 becomes smooth.

#### **Procedure To Learn A Smooth Neutral To Reverse Shift**

**NOTE: Transmission fluid temperature must be above 110°F (43° C).**

Perform the following shifts. With the vehicle at a stop, perform Neutral to Reverse shifts until the shift is smooth. An unlearned Neutral to Reverse shift may be harsh or exhibit a double bump. If any of the shifts are still not smooth after the clutch volume stabilizes, an internal transmission problem may be present.

#### **Procedure To Learn A Smooth 4-5 Upshift for 545RFE**

**NOTE: Transmission fluid temperature must be above 110°F (43° C).**

Use the following steps to have the TCM learn the 2CA CVI.

1. Accelerate the vehicle through 55 MPH at a steady 10-15 degree throttle opening and perform multiple 4-5 upshifts.
2. Repeat step 1 until the 4-5 shift becomes smooth and the 2C(A) CVI becomes stable. There is a separate 2C volume used and learned for 4-5 shifts, 2C(A). It is independent of the 2C CVI learned on 3-2 kickdowns

#### **ENGINE CONTROL MODULE PROGRAMMING (DIESEL)**

**NOTE: If battery is disconnected, Engine Control Module (ECM) is disconnected or replaced, or Accelerator Pedal Position Sensor (APPS) has been disconnected or replaced, ECM must be programmed to match the APPS.**

Ensure all components are connected. Turn ignition switch to ON position, engine off. Slowly depress accelerator pedal to the floor and release accelerator pedal to idle position one time. This ensures that APPS calibration has been programmed into the ECM. Turn ignition switch to OFF position.

**IMMOBILIZER SYSTEM (SEBRING COUPE & STRATUS COUPE)**

If immobilizer ECU, PCM (2.4L A/T and 3.0L) or ECM (2.4L M/T) is replaced, all keys will have to be reprogrammed. If immobilizer ECU is replaced, vehicle secret code and password will need to be registered into new immobilizer ECU.

**Encrypted Code Registration**

1. Obtain vehicle secret code from customer or manufacturer. Connect scan tool to Data Link Connector (DLC) located under left side of instrument panel. Insert valid ignition key and turn the ignition switch to ON position. Under MAIN MENU select SYSTEM SELECT and press YES. Select IMMOBILIZER and press YES.
2. Select SPECIAL FUNC and press YES. Select PASSWORD SET and press YES. Enter vehicle secret code and 4-digit password into new immobilizer ECU. If an incorrect code is entered 5 times in a row, immobilizer ECU will detect tampering and enter start-prevention mode. Engine operation and special functions will be disabled.
3. To clear start-prevention mode, turn the ignition switch to ON position and leave in ON position for 20 minutes. Connect a battery charger if necessary. Start-prevention mode will cancel after 20 minutes. After completing encrypted code registration procedure, all ignition keys will need to be input. See **KEY ID REGISTRATION** .

**Key ID Registration**

Ensure all ignition keys (new and existing) for vehicle are available during key ID registration. All ignition keys will need to be input into immobilizer ECU.

1. Connect scan tool to Data Link Connector (DLC) located under left side of instrument panel. Insert valid ignition key and turn the ignition switch to ON position. Under MAIN MENU select SYSTEM SELECT and press YES.
2. Select IMMOBILIZER and press YES. Select SPECIAL FUNC and press YES. Select KEY ID REGISTR and press YES. If DTC 11 is set, scan tool will display CAN'T EXECUTE. If CAN'T EXECUTE is not displayed, go to next step. If CAN'T EXECUTE is displayed, go to DTC NO. 11: TRANSPONDER COMMUNICATION SYSTEM OR RADIO INTERFERENCE OF ENCRYPTED CODE under DIAGNOSTIC TESTS in ANTI-THEFT SYSTEMS - SEBRING COUPE & STRATUS COUPE article in ACCESSORIES & EQUIPMENT.
3. Scan tool will display PLEASE ENTER PASSWORD. Using arrow keys, select password. Press YES when correct 4-digit password is selected.

**NOTE:** If an incorrect code is entered 5 times in a row, immobilizer ECU will detect tampering and enter start-prevention mode. Engine operation and special functions will be disabled. To clear start-prevention mode, turn the ignition switch to ON position and leave in ON position for 20 minutes. Connect a

**battery charger if necessary. Start-prevention mode will cancel after 20 minutes.**

4. Scan tool will display ARE YOU READY?. Press YES to begin registration. When registration is complete, scan tool will display COMPLETE. If an error occurs during registration, scan tool will display CAN'T EXECUTE. If ignition key is already registered, scan tool will display KEY ID HAS BEEN REGISTERED.
5. Scan tool will display number of keys registered. To register additional keys (up to 8 different keys), insert next key and turn the ignition switch to ON position within 5 seconds. Then press YES on scan tool. After all ignition keys are registered, press NO on scan tool. This will complete key ID registration. Turn ignition to OFF position and leave off for a minimum of 10 seconds.
6. Check that vehicle can be started with each key. Check that no MFI or immobilizer ECU DTCs did not set. If DTCs set, repair as necessary. If no DTCs set, turn the ignition switch to LOCK position and disconnect scan tool. Procedure is complete.

**INSTRUMENT CLUSTER (RAM VAN & RAM WAGON)**

Cruise, overdrive off and transmission temperature indicators are programmable. New instrument cluster will automatically program itself according to vehicle equipment when ignition is turned on.

**PINION FACTOR PROCEDURE**

**Except Concorde, Durango - With NGC, Intrepid & 300M**

1. Electronic pinion factor procedure must be performed to provide proper speedometer operation if Transmission Control Module (TCM) is replaced. The TCM must be calibrated to the different combinations of equipment (final drive and tires) available. If pinion factor procedure is not performed, improper speedometer readings may exist or speedometer may not operate. Pinion factor procedure must be performed using Chrysler's Diagnostic Readout Box (DRBIII(R)) scan tool.
2. Connect scan tool to Data Link Connector (DLC) below driver's side of instrument panel.
3. Select TRANSMISSION system, MISCELLANEOUS functions, then PINION FACTOR. Follow the instructions on the DRBIII(R) screen.

**Concorde, Durango - With NGC, Intrepid & 300M**

1. The vehicle speed readings for the speedometer are taken from the output speed sensor. The Powertrain Control Module (PCM) must be calibrated to the different combinations of equipment available. Pinion factor procedure allows the technician to set the PCM initial setting so that the speedometer readings will be correct.
2. This procedure must be performed if the PCM has been replaced. Failure to perform



this procedure will result in an inoperative speedometer. Pinion factor procedure must be performed using Chrysler's Diagnostic Readout Box (DRBIII(R)) scan tool.

3. Connect scan tool to Data Link Connector (DLC) located below driver's side of instrument panel. Select the TRANSMISSION menu, MISCELLANEOUS menu, then PINION FACTOR. Follow the instructions on the DRBIII(R) screen.

### **POWER LIFTGATE LEARN CYCLE (CARAVAN & TOWN & COUNTRY)**

#### **Description**

Any time a power liftgate component is removed, replaced, liftgate adjustment is performed or diagnostic trouble codes are addressed and erased, a learn cycle must be performed. This learn cycle enables the power liftgate control module to learn or relearn its critical information (travel limits, resistance to door travel, etc.) which allows it to perform properly and safely. It also tells the technician that the system is performing properly and is able to be returned to service.

#### **Procedure**

1. Connect the DRBIII(R) scan tool to the Data Link Connector (DLC), located on lower left edge of instrument panel. Turn ignition switch to ON position. Check for power liftgate door codes (fault messages). Clear any DTCs that are set.
2. Operate power liftgate and recheck for DTCs. If any DTCs exist, diagnose and repair as necessary before performing the learn cycle. See appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.
3. If DRBIII(R) scan tool is not available, the learn cycle can be performed by opening and closing the power liftgate using any of the normal open/close command switches. Be certain to cycle the liftgate through a complete open and close cycle or the procedure will not be complete.
4. Using the DRBIII(R), go into the Test Routine Menu and select a power open command.
5. Using the DRBIII(R), select a power close command.
6. The power liftgate learn cycle is complete. If power liftgate door does not fully open or close, a problem still exists. Diagnose and repair as necessary.

### **POWER SLIDING DOOR LEARN CYCLE (CARAVAN & TOWN & COUNTRY)**

#### **Description**

Any time a power sliding door component is removed, replaced, door adjustment is performed or diagnostic trouble codes are addressed and erased, a learn cycle must be performed. This learn cycle enables the power sliding door control module to learn or relearn its critical information (travel limits, resistance to door travel, etc.) which allows it to perform properly and safely. It also tells the technician that the system is performing

properly and is able to be returned to service.

**Procedure**

1. Connect the DRBIII(R) scan tool to the Data Link Connector (DLC), located on lower left edge of instrument panel. Turn ignition switch to ON position. Check for power sliding door codes (fault messages). Clear any DTCs that are set.
2. Operate power sliding door and recheck for DTCs. If any DTCs exist, diagnose and repair as necessary before performing the learn cycle. See appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.
3. If DRBIII(R) scan tool is not available, the learn cycle can be performed by opening and closing the power sliding door using any of the normal open/close command switches. Be certain to cycle the sliding door through a complete open and close cycle or the procedure will not be complete.
4. Using the DRBIII(R), go into the Test Routine Menu and select a power open command.
5. Using the DRBIII(R), select a power close command.
6. The power sliding door learn cycle is complete. If power sliding door does not fully open or close, a problem still exists. Diagnose and repair as necessary.

**POWERTRAIN CONTROL MODULE PROGRAMMING (EXCEPT RAM PICKUP 2500 & 3500 - GASOLINE, RAM VAN & RAM WAGON)**

**NOTE:** ECM/PCM programming for Sebring Coupe and Stratus Coupe is not available from manufacturer.

**NOTE:** On Concorde, Intrepid, 300M and some Durango models, the PCM and the Transmission Control Module (TCM) are incorporated into one control module and may be referred to as the New Generation Controller (NGC). The NGC PCM has 4 harness connectors. After replacing the NGC PCM, reprogram pinion factor and perform shift quality quick learn procedures.

**NOTE:** If replacing Powertrain Control Module (PCM), the correct vehicle mileage and Vehicle Identification Number (VIN) must be programmed into the PCM to prevent Diagnostic Trouble Codes (DTC) from being set in the Controller Anti-Lock Brake (CAB) module, Sentry Key Immobilizer Module (SKIM) and Air Bag Control Module (ACM).

**NOTE:** If replacing both PCM and SKIM at the same time, first program PCM, then program SKIM. Replace all ignition keys and program them to new SKIM.

## 2002 Chevrolet Camaro

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1. Connect scan tool to Data Link Connector (DLC), located under left side of instrument panel. Using scan tool, select THEFT ALARM, SKIM, then MISC. Select PCM REPLACED (GAS ENGINE). Obtain 4-digit Personal Identification Number (PIN) from vehicle owner or manufacturer.

**NOTE:** If 3 attempts are made incorrectly to enter PIN, secured access mode will be locked out for one hour. To exit lock out mode, leave ignition switch in ON position for one hour. Ensure battery voltage is maintained with battery charger, if necessary.

2. Enter secured access mode by entering PIN code for vehicle. Select ENTER to update PCM VIN. SKIM will now send secret key data to PCM.
3. Select BACK to go to SELECT SYSTEM menu. Select ENGINE, MISC then SRI MEMORY CHECK. Scan tool will display IS ODOMETER READING BETWEEN XX AND XX?
4. Select YES or NO. If NO is selected, scan tool will display ENTER ODOMETER READING. Enter odometer reading from instrument panel odometer and press ENTER.

### POWERTRAIN CONTROL MODULE PROGRAMMING (RAM PICKUP 2500 & 3500 - GASOLINE, RAM VAN & RAM WAGON)

**NOTE:** If replacing Powertrain Control Module (PCM), the correct vehicle mileage and Vehicle Identification Number (VIN) must be programmed into PCM to prevent Diagnostic Trouble Codes (DTC) from being set in Controller Anti-Lock Brake (CAB) module and Air Bag Control Module (ACM).

Connect scan tool to Data Link Connector (DLC). DLC is located below driver's side of instrument panel. Turn ignition on. Using scan tool, enter correct VIN and mileage into PCM. Using scan tool manufacturer's instructions, clear DTCs from CAB module and ACM.

### SENTRY KEY IMMOBILIZER MODULE PROGRAMMING

**CAUTION:** Large metallic objects, or items such as magnetic pass-keys, may cause vehicle starting problems. These devices do not cause damage to system. Devices may cause intermittent malfunctions if positioned too close to ignition lock cylinder during vehicle start-up. Move objects away from ignition lock cylinder and try to start vehicle.

**NOTE:** If the PCM and the SKIM are replaced at the same time, program

**the VIN into the PCM first. All vehicle keys will then need to be replaced and programmed to the new SKIM.**

1. Connect scan tool to Data Link Connector (DLC), located under left side of instrument panel. Turn the ignition on (transmission in Park/Neutral).
2. Using scan tool, select THEFT ALARM, SKIM, then MISCELLANEOUS.
3. Select SKIM MODULE REPLACEMENT (GASOLINE).
4. Obtain 4-digit Personal Identification Number (PIN) from vehicle owner or manufacturer. Enter secured access mode by entering PIN code for vehicle.

**CAUTION: Enter correct country code in SKIM. If incorrect country code is entered, SKIM must be replaced.**

5. Select COUNTRY CODE. Enter correct country. Select UPDATE VIN. SKIM will learn VIN from Powertrain Control Module (PCM). Press ENTER to transfer secret key data from PCM to SKIM. This will ensure the current vehicle ignition keys will still operate the SKIS system.

## **PROGRAMMING IGNITION KEYS TO SENTRY KEY IMMOBILIZER MODULE**

### **Using Scan Tool**

1. Turn the ignition on (transmission in Park/Neutral).
2. Use the DRBIII(R) and select THEFT ALARM, SKIM, then MISCELLANEOUS.
3. Select PROGRAM IGNITION KEYS.
4. Enter secured access mode by entering the vehicle 4-digit PIN.
5. A maximum of eight keys can be learned to each SKIM AT ONE TIME. Once a key is learned to a SKIM it (the key) cannot be transferred to another vehicle.

If ignition key programming is unsuccessful, the DRBIII(R) will display one of the following messages:

### **Programming Not Attempted**

The DRBIII(R) attempts to read the programmed key status and there are no keys programmed in the SKIM memory.

### **Programming Key Failed**

Possible used key from wrong vehicle. SKIM is unable to program key due to one of the following: Faulty ignition key transponder. Ignition key is programmed to another vehicle.

## **8 Keys Already Learned, Programming Not Done**

SKIM transponder ID memory is full. Obtain ignition keys to be programmed from customer (8 keys maximum). Using the DRBIII(R), erase all ignition keys by selecting MISCELLANEOUS and ERASE ALL CURRENT IGN. KEYS. Program all ignition keys.

### **Learned Key In Ignition**

Ignition key transponder ID is currently programmed in SKIM memory.

#### **Programming Ignition Keys Using Customer Learn Method**

To program ignition keys using customer learn method, 2 programmed valid ignition keys must be available. If 2 programmed valid ignition keys are not available, scan tool method must be used.

1. Insert first valid ignition key into ignition lock cylinder. Turn ignition on for at least 3 seconds, but no more than 15 seconds. Turn ignition off and remove key.
2. Within 15 seconds, insert second valid ignition key and turn ignition on. After 10 seconds a chime will sound and theft alarm indicator will flash. Turn ignition off and remove key.
3. Within 60 seconds, insert new ignition key and turn ignition on. After 10 seconds a chime will sound and theft alarm indicator will stop flashing then turn on for 3 seconds and turn off. New key is now programmed to SKIM.
4. Repeat this procedure for additional new keys. A maximum of 8 keys can be programmed to vehicle. Customer learn method will automatically exit if SKIM senses a non-blank ignition key when a blank ignition key should be sensed, if 8 keys are already programmed or ignition switch is turned off for more than 50 seconds.

#### **TORQUE CONVERTER CLUTCH BREAK-IN PROCEDURE (CONCORDE, INTREPID & 300M)**

##### **Description**

The Transmission Control Module (TCM) employs a strategy which modifies Torque Converter Clutch (TCC) operation. This strategy conditions the TCC disc for optimum converter clutch engagement and feel throughout the life of the transaxle. The cycle inhibits Full Electronically Modulated Converter Clutch (FEMCC) until six hours of Partial Electronically Modulated Converter Clutch (PEMCC) operation have taken place, or the vehicle has been driven 3750 miles. The cycle automatically terminates when either the time or mileage has been achieved, however, the mileage may vary slightly from vehicle to vehicle. The TCC break-in cycle must be restarted using the DRBIII(R) scan tool, and upon the following:

- Replacement of TCM on vehicle with less than 3750 miles or less than 6 hours of PEMCC operation.
- Replacement of torque converter assembly at any vehicle mileage.

This procedure is used to properly condition TCC to prevent shudder during clutch engagement. Break-in procedure must be used if torque converter is replaced at any vehicle mileage, or PCM is replaced with vehicle mileage less than 3750 miles.

**Break-In Procedure**

Connect scan tool to data link connector located below instrument panel, near steering column. Follow scan tool prompts to TCC BREAK-IN, in the TRANSMISSION CONTROL MODULE/MISCELLANEOUS section. View or Start procedure as commanded by scan tool.

**TRANSMISSION SHIFT QUALITY QUICK LEARN PROCEDURE (DAKOTA - 4.7L, DURANGO - 4.7L & RAM PICKUP 1500 - 4.7L)**

This program allows the electronic transmission system to recalibrate itself. This will provide the best possible transmission operation.

1. Transmission shift quality quick learn procedure must be performed to provide proper transmission operation if any of the following have been done:
  - Transmission assembly was replaced.
  - Transmission Control Module (TCM) was replaced.
  - Solenoid pack was replaced.
  - Clutch plate and/or seal replaced.
  - Valve body was reconditioned or replaced.
2. Transmission shift quality quick learn procedure must be performed using Chrysler's Diagnostic Readout Box (DRBIII(R)) scan tool. Following conditions must be met when performing transmission shift quality quick learn procedure:
  - Brakes must be applied.
  - Engine speed must be greater than 500 RPM.
  - Throttle position sensor angle must be less than 3 degrees.
  - Shift lever must remain in designated position until prompted to shift to overdrive.
  - Shift lever must remain in overdrive after the shift to overdrive until scan tool indicates procedure is complete.
  - Calculated oil temperature must be 60-200°F (16-93°C).
3. Connect DRBIII(R) to Data Link Connector (DLC) below driver's side of instrument panel. Go to TRANSMISSION display on scan tool.
4. Go to MISCELLANEOUS display on scan tool. Select QUICK LEARN

PROCEDURE display on scan tool. Follow instructions displayed on scan tool to perform transmission shift quality quick learn procedure. After quick-learn procedure is completed, perform **DRIVE LEARN PROCEDURE (DAKOTA - 4.7L, DURANGO - 4.7L & RAM PICKUP 1500 - 4.7L)** .

### **TRANSAXLE SHIFT QUALITY QUICK LEARN PROCEDURE**

This program allows the electronic transaxles system to recalibrate itself. This will provide the best possible transaxle operation.

1. Transaxle shift quality quick learn procedure must be performed to provide proper transaxle operation if any of the following have been done:
  - Transaxle assembly was replaced.
  - Transmission Control Module (TCM) was replaced.
  - Solenoid/pressure switch assembly was replaced.
  - Clutch plate and/or seal replaced.
  - Valve body was reconditioned or replaced.
2. Transaxle shift quality quick learn procedure must be performed using Chrysler's Diagnostic Readout Box (DRBIII(R)) scan tool. Following conditions must be met when performing transaxle shift quality quick learn procedure:
  - Brakes must be applied.
  - Engine speed must be greater than 500 RPM.
  - Throttle position sensor angle must be less than 3 degrees.
  - Shift lever must remain in designated position until prompted to shift to overdrive.
  - Shift lever must remain in overdrive after the shift to overdrive until scan tool indicates procedure is complete.
  - Calculated oil temperature must be 60-200°F (16-93°C).
3. Connect scan tool to Data Link Connector (DLC) below driver's side of instrument panel. Go to TRANSMISSION display on scan tool.
4. Go to MISCELLANEOUS display on scan tool. Select QUICK LEARN PROCEDURE display on scan tool. Follow instructions displayed on scan tool to perform transaxle shift quality quick learn procedure.

### **VEHICLE DRIVEABILITY COMPUTER RELEARN PROCEDURE**

Manufacturer does not provide a specified computer relearn procedure for obtaining proper driveability. If vehicle battery was disconnected or Powertrain Control Module (PCM) was replaced, driving the vehicle will enable the PCM to perform a computer relearn procedure for obtaining proper driveability. Inform customer that driveability may differ from what they are accustomed to until the PCM completes the computer relearn procedure.

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**NOTE:** When battery is disconnected and reconnected, some abnormal drive symptoms may occur while vehicle relearns its adaptive strategy. Vehicle may need to be driven for approximately 10 miles or more to relearn strategy.

On Windstar, if battery was disconnected during diagnosis or repair, power sliding doors must be initialized. Perform **POWER SLIDING DOOR INITIALIZATION (WINDSTAR ONLY)**. On all models, if directed here due to component replacement, see **CONTROL MODULE PROGRAMMING**.

**CONTROL MODULE PROGRAMMING**

Some control modules require programming after replacement for proper system operation. See appropriate application table for programming information. If replacing a programmable module, see **PROGRAMMABLE MODULE INSTALLATION PROCEDURE**. Some modules have the ability to have customer preferences configured such as belt minder, chimes, autolock/relock, etc. For programming customer preferences, see **CUSTOMER PREFERENCES**.

**CONTROL MODULE APPLICATION (BLACKWOOD)**

<b>Module</b>	<b>Configuration</b>
Air Suspension Control Module	(1)
Central Security Module	(2) Programmable Module
Driver Seat Module	(2) Programmable Module
Electronic Automatic Temperature Control Module	(3)
Generic Electronic Module	(2) Programmable Module
Hybrid Electronic Instrument Cluster Module	(4)
Parking Aid Module	(3)
Powertrain Control Module	(5)
Restraint Control Module	(3)
4-Wheel Anti-Lock Brake System Module	(3)

(1) See **REAR RIDE HEIGHT INITIALIZING PROCEDURE (BLACKWOOD ONLY)**.

(2) If replacing a programmable module, see **PROGRAMMABLE MODULE INSTALLATION PROCEDURE**.

(3) No programming required.



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(4) See **INSTRUMENT CLUSTER PROGRAMMING** .

(5) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

### CONTROL MODULE APPLICATION (CONTINENTAL)

Module	Configuration
Anti-Lock Brake System Module	(1)
Audio Control Module	(1)
Cellular Phone Transceiver	(1)
Driver Door Module	(1)
Driver Seat Module	(1)
Electronic Automatic Temperature Control Module	(1)
Lighting Control Module	(2) Programmable Module
Next Generation Speed Control Servo	(1)
Powertrain Control Module	(3)
Remote Emergency Satellite Cellular Unit Module	(1)
Restraint Control Module	(2) Programmable Module
Vehicle Dynamics Module	(1)
Virtual Image Instrument Cluster	(4)

(1) No programming required.

(2) If replacing a programmable module, see **PROGRAMMABLE MODULE INSTALLATION PROCEDURE** .

(3) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

(4) See **INSTRUMENT CLUSTER PROGRAMMING** .

### CONTROL MODULE APPLICATION (COUGAR)

Module	Configuration
Air Bag Control Module	(1)
Anti-Lock Brake System Module	(1)
Central Security Module	(1)
Instrument Cluster	(1)

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Powertrain Control Module <sup>(2)</sup>	(3)
<p>(1) No programming required.</p> <p>(2) Includes passive anti-theft system.</p> <p>(3) For powertrain control module programming, see <b>PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)</b> .</p>	

### CONTROL MODULE APPLICATION (CROWN VICTORIA & GRAND MARQUIS)

Module	Configuration
Anti-Lock Brake System Module	(1)
Driver Door Module	(2) Programmable Module
Electronic Automatic Temperature Control Module	(1)
Electronic Crash Sensor	(1)
Lighting Control Module	(2) Programmable Module
Natural Gas Vehicle Module <sup>(3)</sup>	(1)
Passive Anti-Theft System Module	(4)
Powertrain Control Module	(5)
<p>(1) No programming required.</p> <p>(2) If replacing a programmable module, see <b>PROGRAMMABLE MODULE INSTALLATION PROCEDURE</b> .</p> <p>(3) Natural gas vehicles only.</p> <p>(4) See appropriate PASSIVE ANTI-THEFT SYSTEMS article in ACCESSORIES &amp; EQUIPMENT.</p> <p>(5) For powertrain control module programming, see <b>PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)</b> .</p>	

### CONTROL MODULE APPLICATION (ECONOLINE)

Module	Configuration
4-Wheel Anti-Lock Brake System Module	(1)
Electronic Crash Sensor	(1)
Natural Gas Vehicle Module <sup>(2)</sup>	(1)
Powertrain Control Module	(3)
<p>(1) No programming required.</p>	

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(2) Natural gas vehicles only.

(3) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

### CONTROL MODULE APPLICATION (ESCAPE)

Module	Configuration
4-Wheel Anti-Lock Brake System Module	(1)
Generic Electronic Module	(2) Programmable Module
Instrument Cluster Module	(2) Programmable Module
Powertrain Control Module	(3)
Restraint Control Module	(1)

(1) No programming required.

(2) If replacing a programmable module, see **PROGRAMMABLE MODULE INSTALLATION PROCEDURE** .

(3) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

### CONTROL MODULE APPLICATION (ESCORT & ESCORT ZX2)

Module	Configuration
Electronic Crash Sensor Module	(1)
Instrument Cluster	(1)
Powertrain Control Module	(2)
Remote Anti-Theft Personality Module	(1)
4-Wheel Anti-Lock Brake System Module	(1)

(1) No programming required.

(2) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

### CONTROL MODULE APPLICATION (EXCURSION)

Module	Configuration
Driver Seat Module	(1)
Electronic Automatic Temperature Control Module	(1)
Generic Electronic Module (4WD Control Module)	(2) Programmable Module
Instrument Cluster	

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	(1)
Overhead Trip Computer (Optional)	(1)
Parking Aid Module (Optional)	(1)
Passive Anti-Theft System Module	(3)
Powertrain Control Module	(4)
Restraint Control Module	(1)
Vehicle Security Module	(2) Programmable Module
4-Wheel Anti-Lock Brake System Module (Optional)	(1)
<p>(1) No programming required.</p> <p>(2) If replacing a programmable module, see <b>PROGRAMMABLE MODULE INSTALLATION PROCEDURE</b> .</p> <p>(3) See appropriate PASSIVE ANTI-THEFT SYSTEMS article in ACCESSORIES &amp; EQUIPMENT.</p> <p>(4) For powertrain control module programming, see <b>PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)</b> .</p>	

### CONTROL MODULE APPLICATION (EXPEDITION & NAVIGATOR)

Module	Configuration
Air Suspension Control Module	(1)
Central Security Module	(2) Programmable Module
Driver Seat Module	(1)
Electronic Automatic Temperature Control Module	(1)
Generic Electronic Module	(2) Programmable Module
Instrument Cluster Module	(3)
Parking Aid Module	(1)
Powertrain Control Module	(4)
Restraint Control Module	(1)
4-Wheel Anti-Lock Brake System Module	(1)

- (1) No programming required.
- (2) If replacing a programmable module, see **PROGRAMMABLE MODULE INSTALLATION PROCEDURE** .
- (3) See **INSTRUMENT CLUSTER PROGRAMMING** .

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(4) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

### CONTROL MODULE APPLICATION (EXPLORER & MOUNTAINEER)

Module	Configuration
Air Suspension Control Module	(1)
Central Security Module <sup>(2)</sup>	(1)
Driver Seat Module	(1)
Dual Electronic Automatic Temperature Control Module	(1)
Generic Electronic Module	(3)
Instrument Cluster Module	(3)
Passive Anti-Theft System Module	(4)
Powertrain Control Module	(5)
Parking Aid Module	(1)
Remote Anti-Theft Personality Module	(1)
Restraint Control Module	(1)
Vehicle Security Module <sup>(2)</sup>	(3)
4-Wheel Anti-Lock Brake System Module	(1)

(1) No programming required.

(2) Vehicles built through March 2002 are equipped with a central security module. Vehicles built after March 2002 are equipped with a vehicle security module. Vehicle security module is a programmable module.

(3) If replacing a programmable module, see **PROGRAMMABLE MODULE INSTALLATION PROCEDURE** .

(4) See appropriate PASSIVE ANTI-THEFT SYSTEMS article in ACCESSORIES & EQUIPMENT.

(5) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

### CONTROL MODULE APPLICATION (EXPLORER SPORT & EXPLORER SPORT TRAC)

Module	Configuration
Anti-Lock Brake Control Module	(1)
Central Security Module/Vehicle Security Module	(2) Programmable Module

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Generic Electronic Module	(2) Programmable Module
Passive Anti-Theft System Module	(3)
Powertrain Control Module	(4)
Restraint Control Module	(1)
4-Wheel Anti-Lock Brake System Module (Optional)	(1)
<p>(1) No programming required.</p> <p>(2) If replacing a programmable module, see <b>PROGRAMMABLE MODULE INSTALLATION PROCEDURE</b> .</p> <p>(3) See appropriate PASSIVE ANTI-THEFT SYSTEMS article in ACCESSORIES &amp; EQUIPMENT.</p> <p>(4) For powertrain control module programming, see <b>PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)</b> .</p>	

### CONTROL MODULE APPLICATION (F150 PICKUP)

Module	Configuration
Central Security Module	(1)
Generic Electronic Module/Central Timer Module	(2) Programmable Module
Natural Gas Vehicle Module <sup>(3)</sup>	(1)
Powertrain Control Module	(4)
Restraint Control Module	(1)
Central Security Module	(1)
4-Wheel Anti-Lock Brake System Module	(1)
<p>(1) No programming required.</p> <p>(2) If replacing a programmable module, see <b>PROGRAMMABLE MODULE INSTALLATION PROCEDURE</b> .</p> <p>(3) Natural gas vehicles only.</p> <p>(4) For powertrain control module programming, see <b>PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)</b> .</p>	

### CONTROL MODULE APPLICATION (F250-550 PICKUP)

Module	Configuration
Air Suspension Control Module (Optional)	(1)
Auxiliary Powertrain Control Module (Optional)	(1)

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Generic Electronic Module (4WD Control Module)	(2) Programmable Module
Instrument Cluster	(1)
Overhead Trip Computer (Optional)	(1)
Parking Aid Module (Optional)	(1)
Powertrain Control Module	(3)
Restraint Control Module	(1)
Vehicle Security Module	(2) Programmable Module
4-Wheel Anti-Lock Brake System Module (Optional)	(1)

(1) No programming required.

(2) If replacing a programmable module, see **PROGRAMMABLE MODULE INSTALLATION PROCEDURE** .

(3) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

### CONTROL MODULE APPLICATION (FOCUS)

Module	Configuration
Airbag Module	(1)
Anti-Lock Brake System Module	(1)
Anti-Theft System/Double Locking Module	(1)
Electronic Stability Program Module	(1)
Generic Electronic Module/Central Timer Module	(2) Programmable Module
Hybrid Electronic Instrument Cluster	(2) Programmable Module
Powertrain Control Module <sup>(3)</sup>	(4)
Travel Communication System Radio/Module	(1)
Trip Computer Module	(1)

(1) No programming required.

(2) If replacing a programmable module, see **PROGRAMMABLE MODULE INSTALLATION PROCEDURE** .

(3) Includes passive anti-theft system.

(4) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

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### CONTROL MODULE APPLICATION (LS)

Module	Configuration
Anti-Lock Brake System/Traction Control/Stability Assist Module <sup>(1)</sup>	(2) Programmable Module
Audio Control Module	(3)
Dual Automatic Temperature Control Module	(3)
Driver Door Module	(2) Programmable Module
Driver Seat Module	(3)
Front Electronic Module	(2) Programmable Module
Hybrid Electronic Instrument Cluster	(2) Programmable Module
Message Control Module <sup>(4)</sup>	(2) Programmable Module
Powertrain Control Module	(5)
Rear Electronic Module	(2) Programmable Module
Remote Emergency Satellite Cellular Unit Module	(2) Programmable Module
Restraint Control Module	(3)
Steering Column Lock Module	(6)

(1) Type of module depends on optional equipment level.

(2) If replacing a programmable module, see **PROGRAMMABLE MODULE INSTALLATION PROCEDURE** .

(3) No programming required.

(4) Built into instrument cluster.

(5) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

(6) For steering column lock module programming, see **STEERING COLUMN LOCK ACTUATOR MODULE PARAMETER RESET (LS - MANUAL TRANSMISSION ONLY)** .

### CONTROL MODULE APPLICATION (MUSTANG)

Module	Configuration
Anti-Lock Brake System/Traction Control Module <sup>(1)</sup>	(2)
Hybrid Electronic Instrument Cluster	(3) Programmable Module



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Generic Electronic Module	(2)
Powertrain Control Module	(4)
Restraint Control Module	(2)
<p>(1) Type of module depends on optional equipment level.</p> <p>(2) No programming required.</p> <p>(3) See <b>INSTRUMENT CLUSTER PROGRAMMING</b> .</p> <p>(4) For powertrain control module programming, see <b>PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)</b> .</p>	

### CONTROL MODULE APPLICATION (RANGER)

Module	Configuration
Central Security Module	(1)
Generic Electronic Module	(2) Programmable Module
Powertrain Control Module <sup>(3)</sup>	(4)
Restraint Control Module	(1)
4-Wheel Anti-Lock Brake System Module (Optional)	(1)
4-Wheel Drive Control Module	(1)
<p>(1) No programming required.</p> <p>(2) If replacing a programmable module, see <b>PROGRAMMABLE MODULE INSTALLATION PROCEDURE</b> .</p> <p>(3) Includes passive anti-theft system.</p> <p>(4) For powertrain control module programming, see <b>PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)</b> .</p>	

### CONTROL MODULE APPLICATION (SABLE & TAURUS)

Module	Configuration
Anti-Lock Brake Control Module	(1)
Generic Electronic Module	(2) Programmable Module
Powertrain Control Module <sup>(3)</sup>	(4)
Remote Climate Control Module	(1)
Restraint Control Module	(1)

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- (1) No programming required.
- (2) If replacing a programmable module, see **PROGRAMMABLE MODULE INSTALLATION PROCEDURE** .
- (3) Includes passive anti-theft system.
- (4) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

### CONTROL MODULE APPLICATION (THUNDERBIRD)

Module	Configuration
Anti-Lock Brake System/Traction Control/Stability Assist Module <sup>(1)</sup>	(2) Programmable Module
Audio Control Module	(3)
Dual Automatic Temperature Control Module	(2) Programmable Module
Front Electronic Module	(2) Programmable Module
Hybrid Electronic Instrument Cluster Module	(2) Programmable Module
Powertrain Control Module	(4)
Rear Electronic Module	(2) Programmable Module
Remote Keyless Entry Module	(2) Programmable Module
Restraint Control Module	(3)

- (1) Type of module depends on optional equipment level.
- (2) If replacing a programmable module, see **PROGRAMMABLE MODULE INSTALLATION PROCEDURE** .
- (3) No programming required.
- (4) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

### CONTROL MODULE APPLICATION (TOWN CAR)

Module	Configuration
Anti-Lock Brake Control Module	(1)
Audio Control Module (Optional)	(1)
Driver Door Module	(2) Programmable Module
Driver Seat Module (Optional)	(1)

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Electronic Automatic Temperature Control Module	(1)
Hybrid Electronic Instrument Cluster	(3)
Lighting Control Module	(2) Programmable Module
Next Generation Speed Control Servo	(1)
Powertrain Control Module	(4)
Rear Air Suspension Module	(1)
Restraint Control Module	(5) Air Bag Configuration
Telematics Control Module	(2) Programmable Module

(1) No programming required.

(2) If replacing a programmable module, see **PROGRAMMABLE MODULE INSTALLATION PROCEDURE** .

(3) See **INSTRUMENT CLUSTER PROGRAMMING** .

(4) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

(5) See appropriate AIR BAG RESTRAINT SYSTEMS article in ACCESSORIES & EQUIPMENT.

### CONTROL MODULE APPLICATION (VILLAGER)

Module	Configuration
Air Bag Diagnostic Monitor	(1)
Anti-Lock Brake Control Module	(1)
Driver Seat Control Module	(1)
Powertrain Control Module	(2)
Smart Entry Control/Timer Module	(1)
Transmission Control Module	(1)

(1) No programming required.

(2) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

### CONTROL MODULE APPLICATION (WINDSTAR)

Module	Configuration
Anti-Lock Brake System/Traction Control/Interactive Vehicle Dynamic Module	(1) Programmable Module
Front Electronic Module/Generic Electronic Module	

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	(1) Programmable Module
Hybrid Electronic Instrument Cluster (Message Center Optional)	(1) Programmable Module
Left Power Sliding Door Module (Optional)	(2) (3)
Next Generation Speed Control Servo	(3)
Parking Aid Module (Optional)	(3)
Powertrain Control Module	(4)
Rear Electronic Module	(1) Programmable Module
Remote Keyless Entry (Optional)	(1) Programmable Module
Restraint Control Module	(5) Air Bag Configuration
Right Power Sliding Door Module (Optional)	(2) (3)

(1) If replacing a programmable module, see **PROGRAMMABLE MODULE INSTALLATION PROCEDURE** .

(2) Perform **POWER SLIDING DOOR INITIALIZATION (WINDSTAR ONLY)** .

(3) No programming required.

(4) For powertrain control module programming, see **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)** .

(5) See appropriate AIR BAG RESTRAINT SYSTEMS article in ACCESSORIES & EQUIPMENT.

### Programmable Module Installation Procedure

**NOTE:**     **NGS tester will only store module configuration information for 24 hours.**

Prior to removal of applicable programmable module, perform Programmable Module Installation (PMI) procedure by uploading module configuration information to New Generation Star (NGS) tester using manufacturer's instructions. Once new programmable module has been installed in vehicle, download module configuration information from NGS tester into new module. On some models, module configuration information is also retained in Powertrain Control Module (PCM). If module information cannot be accessed from module, use NGS tester with Ford Service Function (FSF) card and flash cable to upload module configuration information from PCM following scan tool instructions.

### Steering Column Lock Actuator Module Parameter Reset (LS - Manual Transmission Only)

**NOTE:**     **Steering Column Lock (SCL) actuator will only allow**

**communication with NGS tester after SCL has been activated. SCL can be activated 2 ways: open driver's door and DO NOT put key in ignition lock cylinder, or press a single button on key fob with ignition key removed from ignition lock cylinder. SCL actuator will stay activated for 30 minutes after driver door is opened or a key fob button has been pressed.**

**NOTE: DO NOT take more than 30 minutes to complete step 1) . SCL will not stay actuated after 30 minutes.**

1. Remove ignition key from ignition lock cylinder. Close and open driver's door. Connect NGS tester to Data Link Connector (DLC) and use service function card. Select SCLM, then ENTER SECURITY ACCESS. Wait 8 minutes for security access to be granted. Select PARAMETER RESET.
2. Insert ignition key into ignition lock cylinder and turn ignition switch to RUN position. Using scan tool, select ICM, then select ENTER SECURITY ACCESS. Wait 10 minutes for security access to be granted. Select RESET SCLM PARAMETER. Disconnect NGS tester.
3. Turn ignition switch to OFF position. Remove ignition key from ignition lock cylinder. Insert ignition key into ignition lock cylinder. Turn ignition switch to RUN position. Turn ignition switch to OFF position and remove ignition key from ignition lock cylinder.

**CUSTOMER PREFERENCES**

**NOTE: New Generation Star (NGS) tester will not store information for more than 24 hours.**

There are customer preferences that can be configured on certain vehicles. Customer may or may not want some preferences enabled. To carry out customer configuration process, connect New Generation Star (NGS) tester to Data Link Connector (DLC), located under instrument panel next to steering column. Insert Ford Service Function (FSF) card into NGS tester. Using NGS tester, set customer preferences as necessary. See appropriate CUSTOMER PREFERENCE INDEX table. Use appropriate commands on NGS tester to set preferences for customer.

**CUSTOMER PREFERENCE INDEX (CONTINENTAL)**

<b>System</b>	<b>Programmable Parameter Item</b>
Restraints	Air Bag Configuration
Warnings & Chime	Belt Minder
Exterior Lighting	Daytime Running Lights Headlights On With Wipers Bulb Outage Strategy

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**CUSTOMER PREFERENCE INDEX (CROWN VICTORIA & GRAND MARQUIS)**

<b>System</b>	<b>Programmable Parameter Item</b>
Security	Horn Chirp Auto Locks
Warnings & Chime	Belt Minder

**CUSTOMER PREFERENCE INDEX (ESCAPE)**

<b>System</b>	<b>Programmable Parameter Item</b>
Warnings & Chime	Belt Minder

**CUSTOMER PREFERENCE INDEX (EXCURSION & F250-550 SUPER DUTY)**

<b>System</b>	<b>Programmable Parameter Item</b>
Tire Size & Axle Ratio	Tire Size
Warnings & Chime	Belt Minder

**CUSTOMER PREFERENCE INDEX (EXPEDITION & NAVIGATOR)**

<b>System</b>	<b>Programmable Parameter Item</b>
Security	Auto Lock/Relock Horn Chirp LED Flash When Armed Personality
Wiper/Washer	Speed Dependent Wipers

**CUSTOMER PREFERENCE INDEX (EXPLORER & MOUNTAINEER)**

<b>System</b>	<b>Programmable Parameter Item</b>
4WABS & GEM Control Module	Tire Size & Axle Ratio
4WABS Control Module	Operational Strategy (2WD Or 4WD)

**CUSTOMER PREFERENCE INDEX (EXPLORER SPORT & EXPLORER SPORT-TRAC)**

<b>System</b>	<b>Programmable Parameter Item</b>
Body	Belt Minder

**CUSTOMER PREFERENCE INDEX (F150 PICKUP ONLY)**

<b>System</b>	<b>Programmable Parameter Item</b>
Security	Auto Lock/Relock Horn Chirp LED Flash When Armed Personality
Wiper/Washer	Speed Dependent Wipers

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### CUSTOMER PREFERENCE INDEX (LS)

System	Programmable Parameter Item
Message Center	Default Oil Life Warning Threshold
Security	Auto Lock/Relock Easy Entry/Exit Horn Chirp 2-Stage Unlock
Warnings & Chime	Belt Minder

### CUSTOMER PREFERENCE INDEX (MUSTANG)

System	Programmable Parameter Item
Warnings & Chime	Belt Minder

### CUSTOMER PREFERENCE INDEX (RANGER)

System	Programmable Parameter Item
Body	Belt Minder

### CUSTOMER PREFERENCE INDEX (SABLE & TAURUS)

System	Programmable Parameter Item
Security	Automatic Door Locks
Warnings & Chimes	Belt Minder (Default Is ON)

### CUSTOMER PREFERENCE INDEX (TOWN CAR)

System	Programmable Parameter Item
Exterior Lighting	Daytime Running Lights
Power Seats	Easy Entry/Easy Exit
Restraints	Air Bag Configuration
Security	Horn Chirp Auto Lock
Warnings & Chime	Belt Minder Turn Signal Warning Chime

### CUSTOMER PREFERENCE INDEX (WINDSTAR)

System	Programmable Parameter Item
Body	ABS Tire Warning Automatic Locks Belt Minder Horn Chirp Illuminated Exit Oil Life Status & Warning Perimeter Anti-Theft Horn

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Sliding Door Caution  
Smart Lock

### INSTRUMENT CLUSTER PROGRAMMING

Some models equipped with Passive Anti-Theft Systems (PATS) require programming of instrument cluster after replacement. Vehicle will not start until instrument cluster is programmed. Perform appropriate instrument cluster programming procedure. See **INSTRUMENT CLUSTER APPLICATION** table.

### INSTRUMENT CLUSTER APPLICATION

Application <sup>(1)</sup>	Instrument Cluster Type	Procedure
Blackwood	Hybrid Electronic Instrument Cluster	"A"
Continental	Virtual Instrument Cluster	"B"
Expedition	Hybrid Electronic Instrument Cluster	"A"
Mustang	Hybrid Electronic Instrument Cluster	"A"
Navigator	Hybrid Electronic Instrument Cluster	"A"
Town Car	Hybrid Electronic Instrument Cluster	"B"

(1) Only models with programmable instrument clusters are listed.

#### Instrument Cluster Programming Procedure "A"

**NOTE:** After Hybrid Electronic Instrument Cluster (HEC) has been replaced, PCM ID MUST be reset and Passive Anti-Theft System (PATS) parameter reset procedure MUST be performed. See **SECURITY ACCESS PROCEDURE** .

Perform security access for instrument cluster. See **SECURITY ACCESS PROCEDURE** . Using NGS tester, select PARAMETER RESET command for instrument cluster. Using NGS tester, select PARAMETER RESET command for PCM. Disconnect negative battery cable and wait 3 minutes for PCM Keep Alive Memory (KAM) to clear. Reconnect negative battery cable. Cycle ignition switch from OFF to ON position using 2 encoded ignition keys. Both PATS keys and PCM ID should be set in instrument cluster.

#### Instrument Cluster Programming Procedure "B"

**NOTE:** Passive Anti-Theft System (PATS) MUST be reconfigured after replacement of Virtual Instrument Cluster (VIC). Perform **INSTRUMENT CLUSTER PROGRAMMING PROCEDURE "B"**. Then erase and program all ignition keys to be used on vehicle. See appropriate **PASSIVE ANTI-THEFT SYSTEMS** article in **ACCESSORIES & EQUIPMENT**.



1. Turn ignition switch to OFF position. Using NGS tester, retrieve and record continuous DTCs. Clear continuous DTCs and perform instrument cluster self-test. If DTC B2139 is retrieved, go to next step. If DTC B2139 is not retrieved, system is okay at this time.
2. Perform security access for instrument cluster. See **SECURITY ACCESS PROCEDURE** . Using NGS tester, select PARAMETER RESET command for instrument cluster. Using NGS tester, select PARAMETER RESET command for PCM. Turn ignition switch to RUN position for 3 seconds. Clear Continuous Memory DTCs.
3. Turn ignition switch to OFF position. Using NGS tester, perform instrument cluster self-test. If DTC B2139 is not retrieved, system is okay at this time. If DTC B2139 is retrieved, verify PCM calibration is correct for vehicle. If calibration is okay, repeat steps 2 and 3 . If DTC B2139 still exists, replace instrument cluster. Cycle ignition switch from OFF to ON position using 2 encoded ignition keys. Repeat steps 1 -3 . Clear Continuous Memory DTCs. Repeat instrument cluster self-test. If DTC B2139 still exists, replace PCM.

#### Security Access Procedure

**NOTE:** Security access must be granted to erase ignition keys, enable/disable spare key programming switch, or perform parameter resets for instrument cluster and PCM. This procedure has a 10-minute time delay prior to granting security access during which the New Generation Star (NGS) or Worldwide Diagnostic System (WDS) tester must remain connected to vehicle. After security access has been granted, security access command menu is displayed which offers various command options. Multiple security access commands can be executed (if necessary) prior to exiting security access command menu. Execution of all necessary security access commands prior to exiting command menu avoids the performance of an additional security access procedure and the associated 10-minute time delay.

Insert Ford Service Function (FSF) card into NGS/WDS tester. Turn ignition switch from OFF to RUN position. With NGS/WDS tester connected to vehicle, select HEC or VIC, then select SECURITY ACCESS PROCEDURE. This procedure will take 10 minutes to perform. After the security access procedure has been completed, a new menu will be displayed with command options. DO NOT perform ignition key code erase. Before exiting SECURITY ACCESS PROCEDURE menu, PARAMETER RESET command must be selected. Once SECURITY ACCESS PROCEDURE menu is exited, security access procedure must be performed again to perform additional commands.

#### POWER SLIDING DOOR INITIALIZATION (WINDSTAR ONLY)

**NOTE: If overhead console on/off switch is in OFF position, PSD will not operate from "B" pillar switch and power assist operation will be disabled.**

Disconnecting battery, removing Fuse Junction Box (FJB) fuse No. 6 (15-amp), disconnecting modules or removing power supply from some modules could cause PSD module to lose memory. PSD initialization procedure must be performed before PSD will operate under all conditions. Power sliding door initialization procedure is a learning process for modules to identify PSD full open position and PSD full close position. After power is restored to vehicle, initialize PSD(s) with following procedure:

1. Ensure both PSDs are fully closed, latched and unlocked. Ensure vehicle is in Park and fuel filler door is closed. Switch overhead console on/off switch to ON position.

**NOTE: When overhead console on/off switch is in ON position, remote keyless entry transmitter or "B" pillar open/close switches may be used in place of overhead console open/close switch to initialize power assist operation for Power Sliding Doors (PSD).**

2. Press driver's and passenger's overhead console open/close switch to open driver-side and passenger-side PSD. After PSD is fully open and stopped, press driver-side and passenger-side overhead console open/close switches to close both PSDs.

#### **PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS)**

**NOTE: Before performing PCM programming procedure, check for any applicable Technical Service Bulletins (TSBs) that may apply to vehicle application.**

#### **Description**

Flash Electronically Erasable Programmable Read Only Memory (EEPROM) is contained in an Integrated Circuit (IC) inside of Powertrain Control Module (PCM). The EEPROM contains the vehicle strategy and any calibration information specific to vehicle. The IC is reprogrammable and at times it may become necessary to reprogram or reflash the entire contents. This is usually due to an after production strategy change or the Flash Vehicle Identification (VID) Block has been previously reprogrammed and has reached its limit. The VID block can be tailored to accommodate various hardware changes made since vehicle production. This procedure can only be performed using Ford's Service Bay Technical System (SBTS) or equivalent.

A replacement PCM will have a label stating PROGRAMMING REQUIRED. This indicates that it is necessary to retrieve VID data from the original PCM before removing PCM from

vehicle. This procedure can be performed using New Generation Star (007-00500) scan tool or equivalent. See **FLASH VEHICLE IDENTIFICATION (VID) BLOCK PROCEDURE** . If original PCM is damaged, nonfunctional or incapable of communicating, it will be necessary to manually reprogram VID block. This procedure can only be performed by contacting the "AS BUILT" data center for programming information.

#### Flash Vehicle Identification (VID) Block Procedure

**NOTE: If using a generic scan tool, follow scan tool manufacturer's instructions to perform FLASH VEHICLE IDENTIFICATION (VID) BLOCK PROCEDURE.**

1. To perform this procedure NGS scan tool, Ford Service Function (FSF) card and NGS Flash Cable (007-00531) must be used. Plug flash cable into scan tool. Plug other end of flash cable into Data Link Connector (DLC). From the scan tool main menu, select SERVICE BAY FUNCTIONS, POWERTRAIN CONTROL MODULE and then PROGRAMMABLE MODULE INSTALLATION.
2. Scan tool display should show 2 selections. The first is selection is for old PCM information to be retrieved and stored. The second selection is for restoring new PCM with information that has been retrieved from the old PCM. Follow scan tool display instructions or refer to instruction sheet included with FSF card. If Flash Vehicle Identification (VID) Block has been reprogrammed previously, scan tool will display a message indicating the need to reflash entire Integrated Circuit (IC). This procedure can only be performed using Ford's Worldwide Diagnostic System (WDS).

#### REAR RIDE HEIGHT INITIALIZING PROCEDURE (BLACKWOOD ONLY)

##### Calibration Procedure

**NOTE: DO NOT save original rear ride heights. Air suspension module has pre-calibrated values already stored.**

Turn ignition off and then on. Exit vehicle, close all doors and allow system to vent vehicle down to kneel height (about 30 seconds). Connect NGS tester to Data Link Connector (DLC). Using NGS tester, select AIR SUSPENSION MODULE. Select "Save Calibration Values (Store Ride Height)" from scan tool menu to calibrate air suspension module. Press "Trigger" to by-pass warning message(s) and save "Initialization". Press "Trigger" to toggle from OFF to ON.

#### GENERAL MOTORS (CARS)

**NOTE: Before performing Electronically Erasable Programmable Read Only Memory (EEPROM) programming procedure, check for any applicable Technical Service Bulletins (TSBs) that may apply to**

**vehicle application. Body Control Module (BCM) must be programmed with proper Regular Production Option (RPO) configurations. Follow instructions on Techline Terminal and scan tool to program BCM.**

#### **CRANKSHAFT POSITION SENSOR SYSTEM VARIATION LEARN PROCEDURE**

Alero, Aurora - 4.0L, Bonneville, Cavalier - 2.2L, Century, Corvette, Deville, Eldorado, Grand Am, Grand Prix, Impala, LeSabre, Malibu, Monte Carlo, Park Avenue, Regal, Seville & Sunfire - 2.2L

**CAUTION:** Before performing crankshaft position system variation learn procedure, always set parking brake and block drive wheels in order to prevent personal injury. Release throttle immediately when engine starts to decelerate in order to eliminate over-revving engine. Once learn procedure has been completed, control module will return engine control to operator and engine will respond to throttle position.

**NOTE:** Battery must be fully charged and in good condition. Scan tool connection at Data Link Connector (DLC) should be clean and tight before starting crankshaft position system variation learn procedure.

1. Install scan tool. Close hood.
2. With a scan tool, monitor the powertrain control module for DTCs. If other DTCs are set, except DTC P1336, diagnose affected DTC(s). See appropriate SELF-DIAGNOSTICS article.
3. With a scan tool, select the Crankshaft Position (CKP) variation learn procedure.
4. Observe the fuel cut-off for the engine that you are performing the learn procedure on.
5. The scan tool instructs you to perform the following:
  - Block drive wheels.
  - Apply parking brakes.
  - Cycle ignition from OFF to ON.
  - Apply and hold brake pedal.
  - Start and idle engine.
  - Turn OFF A/C.
  - Place transmission in Park (A/T) or Neutral (M/T).
  - The scan tool monitors certain component signals to determine if all the conditions are met to continue with the procedure. The scan tool only displays the condition that inhibits the procedure. The scan tool monitors the following components:

- A. CKP sensor activity. If there is a CKP sensor condition, refer to the applicable DTC that set. See appropriate SELF-DIAGNOSTICS article.
  - B. CMP sensor activity. If there is a CMP sensor condition, refer to the applicable DTC that set. See appropriate SELF-DIAGNOSTICS article.
  - C. If ECT is not warm enough, idle engine until engine coolant temperature reaches correct temperature.
6. With the scan tool, enable the CKP system variation learn procedure.

**NOTE: While learn procedure is in progress, release throttle immediately when engine starts to decelerate. The engine control is returned to operator and engine responds to throttle position after the learn procedure is complete.**

7. Slowly increase the engine speed to the RPM that you observed.
8. Immediately release the throttle when fuel cut-off is reached.
9. The scan tool displays Learn Status: Learned this ignition. If scan tool does NOT display this message and no additional DTCs set, diagnose for an engine mechanical problem. If a DTC set, diagnose affected DTC(s). See appropriate SELF-DIAGNOSTICS article.
10. Turn ignition off for 30 seconds after the learn procedure is completed successfully.

#### **Camaro & Firebird - 3.8L**

The Crankshaft Position (CKP) system variation compensating values are stored in the PCM non-volatile memory after a learn procedure has been performed. If the actual crankshaft position system variation is not within the crankshaft position system variation compensating values stored in the PCM, DTC P0300 may set, see appropriate SELF-DIAGNOSTICS article. The Crankshaft Position (CKP) system variation learn procedure should be performed if any of the following conditions are true:

- DTC P1336 is set.
- The PCM has been replaced.
- The engine has been replaced.
- The crankshaft has been replaced.
- The crankshaft harmonic balancer has been replaced.
- The CKP sensor has been replaced.

**NOTE: Set the vehicle parking brake and block the drive wheels when performing the Crankshaft Position (CKP) system variation learn procedure in order to prevent personal injury. Release the throttle when the engine reaches the SECOND fuel cut off. Leaving the**

**throttle open during the fuel cut-off will allow the engine to decel at an even rate. Once the learn procedure is completed, the PCM will return the engine control to the operator and the engine will respond to the throttle position.**

**The scan tool crankshaft position system variation learn function will be inhibited if engine coolant temperature is less than 158°F (70°C). Allow the engine to warm to at least 158°F (70°C) before attempting the crankshaft position system variation learn procedure.**

**The scan tool crankshaft position system variation learn function will be inhibited if any powertrain DTCs other than DTC P1336 are set before or during the Crankshaft Position (CKP) system variation learn procedure. Diagnose and repair any DTCs if set.**

**The crankshaft position system variation learn function will be inhibited if the PCM detects a malfunction involving the camshaft position signal circuit, the 3X reference circuit, or the 18X reference circuit.**

- **If the scan tool indicates a problem with the cam signal, see appropriate SELF-DIAGNOSTICS article.**
- **If the scan tool indicates a problem with the 3X crank signal, see appropriate SELF-DIAGNOSTICS article.**
- **If the scan tool indicates a problem with the 18X crank signal, see appropriate SELF-DIAGNOSTICS article.**

1. Set the parking brake.
2. Block the driver wheels.
3. Ensure that the hood is closed.
4. Start the engine and allow Engine Coolant Temperature (ECT) to reach at least 158°F (70°C).
5. Turn OFF the ignition.
6. Select and enable the Crankshaft Position (CKP) system variation learn procedure with the scan tool.
7. Start the vehicle.
8. Apply and hold the service brake pedal firmly.
9. Ensure that the transaxle is in Park.
10. Increase accelerator pedal position until CKP system variation learn fuel cut-off is reached. CKP system variation learn fuel cutoff is reached at 5150 RPM. Release the

accelerator pedal when the second fuel cutoff is reached.

11. The crankshaft position system variation compensating values are learned when RPM decreases back to idle.
12. Observe DTC status for DTC P1336.
13. If the scan tool indicates that DTC P1336 ran and passed, the CKP system variation learn procedure is complete. If the scan tool indicates DTC P1336 failed or did not run, check for other DTCs. If no DTCs other than P1336 are set, repeat the CKP system variation learn procedure as necessary.

**Camaro & Firebird - 5.7L**

**NOTE: While the learn procedure is in progress, release the throttle immediately when the engine starts to decelerate. The engine control is returned to the operator and the engine responds to throttle position after the learn procedure is complete.**

1. Install a scan tool.
2. Apply the parking brake.
3. Block the drive wheels.
4. Close the hood.
5. Place the transmission in Park if the vehicle has an automatic transmission, or in Neutral if the vehicle has a manual transmission.
6. Idle the engine until the engine coolant temperature reaches 150°F (66°C).
7. Turn OFF all of the accessories.
8. Apply the brakes for the duration of the procedure.

**NOTE: If the CKP System Variation Learn Procedure cannot be completed successfully, see appropriate SELF-DIAGNOSTICS article.**

9. Use the scan tool in order to enable the Crankshaft Position System Variation Learn Procedure.
10. Slowly raise the engine speed to 4000 RPM.
11. Immediately release the throttle when the engine speed decreases.
12. Turn OFF the ignition for 15 seconds after the learn procedure is completed successfully.

**Cavalier & Sunfire - 2.4L**

**NOTE: A Crankshaft Position (CKP) system variation learn procedure must be performed any time a change is made to the crankshaft**

**sensor-to-crankshaft relationship. Changing the crank sensor to crankshaft relationship will not allow the PCM to detect misfire at all speeds and loads accurately, resulting in a possible false misfire DTC being set.**

Removing a part for inspection and then reinstalling the same part is considered a disturbance. A false DTC P0300 could be set if this procedure is not performed.

The learn procedure is required after the following service procedures have been performed, regardless of whether or not DTC P1336 is set: A PCM replacement, an engine replacement, crankshaft replacement, CKP sensor replacement, or any engine repair which disturbs the crankshaft/harmonic balancer relationship to the crankshaft position sensor.

A fully warmed up engine is critical to learning the variation correctly. If a valid learn occurs, no other learns can be completed on that ignition cycle.

If the engine cuts out before the specified learn procedure engine speed or at normal fuel cut-off RPM, the PCM is not in the learn procedure mode. Review the crankshaft position system variation learn procedure and re-enable the learn procedure. Verify that the scan tool displays Test In Progress.

**WARNING: Before performing the Crankshaft Position System Variation Learning Procedure, always set vehicle parking brake and block drive wheels in order to prevent personal injury. Release throttle immediately when engine starts to decelerate in order to eliminate over-revving engine. Once learn procedure is completed, control module will return engine control to operator and engine will respond to throttle position.**

**NOTE: The battery must be fully charged and in good condition. Verify that the scan tool connection at the Data Link Connector (DLC) is clean and tight before starting the crankshaft position system variation learn procedure.**

1. Close hood.
2. Block drive wheels and set vehicle parking brake.
3. Place vehicle in Park or Neutral.
4. Turn all accessories OFF.
5. Connect scan tool.
6. Start and operate engine to normal operating temperature of 185°F (85°C).
7. With engine still running, use scan tool in order to enable the Crankshaft Position



(CKP) system variation learn procedure.

8. Depress and hold brake pedal firmly and raise engine speed to 3920 RPM, **RELEASING** the throttle as soon as engine cuts out.
9. Verify with scan tool that crankshaft variation has been learned.

A fully warmed up engine is critical to learning the variation correctly. If a valid learn occurs, no other learns can be completed on that ignition cycle.

If the engine cuts out before the specified learn procedure engine speed or at normal fuel cut-off RPM, the PCM is not in the learn procedure mode. Review the crankshaft position system variation learn procedure and re-enable the learn procedure. Verify that the scan tool displays Test In Progress.

If the variation will not learn, perform this test procedure up to 10 times.

Excessive crankshaft variation can be caused by the following factors. See **EXCESSIVE CRANKSHAFT VARIATION SYMPTOMS** table.

### **EXCESSIVE CRANKSHAFT VARIATION SYMPTOMS**

<b>Scan Tool Display</b>	<b>Possible Cause</b>
Factors Out Of Range	Reluctor Wheel - Machining Quality, Run-Out or Incorrect Air Gap.
Opposing Factors Out Of Range	Disturbance - Noise on CKP Sensor Circuit. Re-attempt Learn Procedure.
Sum Out Of Range	Engine Too Cold. Re-attempt Learn Procedure.
Crank Pulse Count Error	Crank Or Cam Sensor DTC Is Set. Repair Affected DTC First.

**Intrigue - 3.5L**

**WARNING:** Before performing crankshaft position system variation learn procedure, always set parking brake and block drive wheels in order to prevent personal injury. Release throttle immediately when engine starts to decelerate in order to eliminate over revving engine. Once learn procedure has been completed, control module will return engine control to operator and engine will respond to throttle position.

Battery must be fully charged and in good condition. Scan tool connection at Data Link Connector (DLC) should be clean and tight before starting crankshaft position system variation learn procedure.

## 2002 Chevrolet Camaro

2002 GENERAL INFORMATION Computer Relearn Procedures - Domestic

1. Close hood. Block drive wheels and set vehicle parking brake. Turn all accessories off. Start engine. Ensure engine is at least 158°F (70°C). Turn ignition off. Using scan tool, select and enable CRANKSHAFT POSITION SYSTEM VARIATION LEARNING PROCEDURE. Start engine.
2. Ensure transaxle is Park. Press and hold brake pedal firmly. Increase engine speed until fuel cutoff is reached at 4050 RPM. Immediately release accelerator pedal after fuel cutoff is reached. The crankshaft position system variation compensating values are learned when the RPM decreases back to idle. Monitor status for DTC P1336.
3. If scan tool indicates DTC P1336 ran and passed, crankshaft position system variation learn procedure is complete. If scan tool indicates DTC P1336 failed or did not run, check for additional DTCs and repair as necessary. See appropriate SELF-DIAGNOSTICS article. If only DTC P1336 is set, repeat crankshaft position system variation learn procedure as necessary.

### Saturn - 1.9L

1. The Powertrain Control Module (PCM) uses crankshaft velocity calculations to determine engine misfire and to operate engine misfire self-diagnostics. PCM must know precisely the variation between notches on the crankshaft. PCM contains crankshaft learn procedure which learns the variation between notches on crankshaft. The crankshaft learn procedure must be reset if PCM, crankshaft, or crankshaft position sensor are replaced.
2. If crankshaft learn procedure is being performed as a result of replacing the crankshaft, reset crankshaft learn procedure using scan tool or Service Stall System (SSS) equipment and manufacturer's instructions. If replacing PCM with a replacement PCM, procedure will be prompted automatically. Allow engine to idle until SERVICE light flashes. Hold engine speed at 3000-4000 RPM. PCM will take 2 engine revolutions to learn crankshaft notch variation.

**NOTE: If any Diagnostic Trouble Codes (DTC) exist that relate to an engine misfire, crankshaft learn procedure will not be initiated. Any DTCs for engine misfire must be corrected before performing crankshaft learn procedure.**

### Saturn - 2.2L

1. Start engine and allow ECT to reach more than 158°F (70°C).
2. Turn A/C off and place transaxle in Park or Neutral.
3. Using scan tool, perform CRANKSHAFT POS. VARIATION LEARN procedure.

Procedure requires accelerator to be depressed to wide open throttle and then released. PCM will cut fuel off at speeds more than 4000 RPM and will allow engine to decelerate. PCM will learn crankshaft as engine decelerates.

## 2002 Chevrolet Camaro

2002 GENERAL INFORMATION Computer Relearn Procedures - Domestic

If PCM will not learn crankshaft, see **EXCESSIVE CRANKSHAFT VARIATION SYMPTOM** table for diagnostic aids.

### EXCESSIVE CRANKSHAFT VARIATION SYMPTOM

Scan Tool Display	Possible Causes
Factors Out Of Range	Reluctor Wheel Machining Quality, Run Out, Incorrect Air Gap
Opposing Factors Out Of Range	Disturbance Or Noise In Crank Sensor Circuit
Sum Out Of Range	Engine Too Cold
Crank Pulse Count Error	CKP Or CMP Sensor DTC Set

### ENGINE CONTROL MODULE

Saturn - 3.0L

After replacing ECM or if program needs to be updated, refer to latest Techline information on ECM reprogramming. After reprogramming, perform PROGRAMMING THEFT DETERRENT SYSTEM COMPONENTS.

### IDLE AIR CONTROL VALVE LEARN PROCEDURE

Deville, Eldorado & Seville

1. Start and idle the engine for 15 seconds.
2. Turn the ignition switch to the LOCK/OFF position.
3. Wait 15 seconds.
4. Restart the engine, and check for proper idle operation.

### POWERTRAIN CONTROL MODULE

Alero - 2.2L, Cavalier, Grand Am - 2.2L, Saturn - 1.9L & Sunfire

After replacing PCM or if program needs to be updated, refer to latest Techline information on PCM reprogramming. After reprogramming, perform **CRANKSHAFT POSITION SENSOR SYSTEM VARIATION LEARN PROCEDURE**, INSPECTION/MAINTENANCE COMPLETE SYSTEM SET PROCEDURE (see appropriate SELF-DIAGNOSTICS article) and **THEFT DETERRENT SYSTEM COMPONENTS**.

Remote Programming (Alero - 3.4L, Aurora, Bonneville, Camaro, Century, Deville, Eldorado, Firebird, Grand Am, Grand Prix, Impala, Intrigue, LeSabre, Malibu, Monte Carlo, Park Avenue, Regal & Seville)

**NOTE:** After replacing Powertrain Control Module (PCM) or if program needs to be updated, refer to latest Techline information on PCM reprogramming. PCM can only be programmed using Tech 2(tm)

**and Techline terminal, or by using a personal computer equipped with the current service programming system software installed.**

**NOTE: DO NOT program a control module unless you are directed by a service procedure or you are directed by a technical service bulletin. Programming a control module at any other time will not permanently correct a customer's concern.**

### **Before Remote Programming A Control Module**

1. Vehicle system voltage:

- Ensure there is no charging system concern. All charging system concerns must be repaired before programming a control module.
- Ensure battery voltage is greater than 12 volts but less than 16 volts. The battery must be charged before programming the control module if the battery voltage is low.
- Ensure battery charger is NOT connected to the vehicle's battery. Incorrect system voltage or voltage fluctuations from a battery charger, may cause programming failure or control module damage.
- Turn off or disable any system that may put a load on the vehicle's battery.
  - A. Twilight sentinel.
  - B. Interior lights.
  - C. Daytime Running Lights (DRL). Applying the parking brake, on most vehicles, disables the DRL system.
  - D. Heating, Ventilation and Air Conditioning (HVAC) systems.
  - E. Engine cooling fans, etc.

2. Ensure ignition switch is in the proper position. The scan tool 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.

3. Ensure all tool connections are secure.

- RS-232.
- The connection at the Data Link Connector (DLC) is secure.
- Voltage supply circuits.

4. DO NOT disturb the tool harnesses while programming. If an interruption occurs during the programming procedure, programming failure or control module damage may occur.

### **Remote Programming Procedure**

1. Turn ignition off.

2. Install the Tech 2(tm) to the data link connector (DLC).
3. Turn ignition on, with engine off.
4. Turn off all vehicle accessories.
5. With the Tech 2(tm), select Service Programming.
6. Identify vehicle information as requested by the Tech 2(tm).
7. Select the type of module you are programming.
8. Select the type of programming to be performed.
9. Verify the displayed VIN with the vehicle VIN. If the displayed VIN does not match the actual VIN, write down the actual VIN and correct the VIN at the Techline(tm) terminal.
10. When complete, exit Service Programming.
11. Turn off the Tech 2(tm) and disconnect the Tech 2(tm) from the vehicle.
12. Turn ignition off.
13. Connect the Tech 2(tm) to the Techline(tm) terminal.
14. Select Service Programming.
15. Select Tech 2(tm) as the tool you are using.
16. Select the type of programming to be performed.
17. Verify the displayed VIN with the vehicle VIN. Correct the VIN as necessary.
18. Select the type of module you are programming.
19. Identify what type of programming that you are performing.
  - Normal. This type of programming is for updating an existing calibration or programming a new controller.
  - Vehicle Configuration Index (VCI). This selection is used if the vehicle VIN is unavailable or not recognized by the Techline(tm) terminal. You will need to contact the Techline(tm) Customer Support center to use this option.
  - Reconfigure. This is to reconfigure a vehicle, such as tire size and axle ratio changes.
20. Select the appropriate calibration file.
21. Ensure all connections are secure.
22. Select Reprog to initiate the download of the new calibration to the Tech 2(tm).
23. After the download is complete, turn off the Tech 2(tm).
24. Disconnect the Tech 2(tm) from the Techline(tm) terminal.
25. Install the Tech 2(tm) to the data link connector (DLC).
26. Turn ON the Tech 2(tm).
27. Turn ignition on, with engine off.
28. Select Service Programming.

**NOTE:** DO NOT turn off the ignition if the programming procedure is interrupted or unsuccessful. Ensure that all the PCM and DLC connections are secure and the Techline(tm) operating software is up to date. Attempt to reprogram the control module. If the control module cannot be programmed, replace the control module. See appropriate **REMOVAL, OVERHAUL & INSTALLATION** article.

29. Select Program.
30. After the download is complete, EXIT Service Programming.
31. Turn ignition off for 30 seconds.
32. Turn off the Tech 2(tm).
33. If a control module is replaced the following service procedures must be performed: CKP System Variation Learn Procedure. See **CRANKSHAFT POSITION SENSOR SYSTEM VARIATION LEARN PROCEDURE** . Oil Life System - Resetting. See **ENGINE OIL LIFE RESET. INSPECTION/MAINTENANCE COMPLETE SYSTEM SET PROCEDURE**, see appropriate **SELF-DIAGNOSTICS** article. Programming Theft Deterrent System (except Camaro and Firebird). See **THEFT DETERRENT SYSTEM COMPONENTS** .

### Remote Programming Verification

1. With a scan tool, clear the DTCs.
2. Attempt to start engine.
3. Repeat the Service Programming procedure if the engine does not start or operates poorly. Perform the following procedures before programming the PCM:
  - Ensure control module and DLC connections are okay.
  - Ensure Techline(tm) operating software is up to date.
  - Ensure calibration part number is correct for the vehicle.
4. Attempt to program the control module. If the control module still cannot be programmed properly, replace the control module. See appropriate **REMOVAL, OVERHAUL & INSTALLATION** article. You must program the replacement control module.

Off-Board Programming (Alero - 3.4L, Aurora, Bonneville, Camaro, Century, Deville, Eldorado, Firebird, Grand Am, Grand Prix, Impala, Intrigue, LeSabre, Malibu, Monte Carlo, Park Avenue, Regal & Seville)

**NOTE:** DO NOT program a control module unless you are directed by a service procedure or you are directed by a technical service bulletin. Programming a control module at any other time will not permanently correct a customer's concern.

**NOTE: DO NOT disturb the tool harnesses while programming. If an interruption occurs during the programming procedure, programming failure or control module damage may occur.**

The Off-Board Programming is used in situations where a control module must be programmed without having the vehicle present. The Off-Board Programming Adapter must be used to perform the Off-Board Programming procedure. The adapter allows the control module to power up and allows the Tech 2(tm) to communicate with the control module.

### **Before Off-Board Programming A Control Module**

Ensure that all connections are secure at the following locations:

- A. The Off-Board Programming Adapter.
- B. The Tech 2(tm).
- C. The control module.
- D. The Techline(tm) terminal.

### **Off-Board Programming Procedure**

1. Obtain the VIN of the vehicle for which the control module is being programmed.
2. With the Techline(tm) terminal, select Service Programming.
3. Select Tech 2(tm), Reprogram ECU, and Off-Board Programming Adapter as the ECU location.
4. Connect the control module, Off-Board Programming Adapter, and the Tech 2(tm) as described on the Techline(tm) terminal. Ensure you use the correct harness connector from the Off-Board Programming Adapter kit.
5. With the Tech 2(tm), select Service Programming Request Information function. The Tech 2(tm) communicates with the control module and receives the access code.
6. With the Tech 2(tm), exit the Service Programming Request Information.
7. Disconnect the Tech 2(tm) from the Off-Board Programming Adapter.
8. Connect the Tech 2(tm) to the Techline(tm) terminal.
9. Turn ON the Tech 2(tm).
10. With the Techline(tm) terminal, enter the VIN of the vehicle that will be receiving the control module.
11. The Techline(tm) terminal will display the message, attaching to database.
12. Identify what type of programming that you are performing.
13. Select the appropriate calibration file.
14. Ensure all connections are secure.
15. The Techline(tm) terminal displays a summary screen that summarizes your selections. After confirming you choices, the Techline(tm) terminal automatically loads the

calibration files to the Tech 2(tm).

16. After the download is complete, turn off the Tech 2(tm).
17. Disconnect the Tech 2(tm) from the Techline(tm) terminal.
18. Connect the Tech 2(tm) to the Off-Board Programming Adapter.
19. With the Tech 2(tm), select Service Programming.

**NOTE: DO NOT turn off the Off-Board Programming Adapter if the programming procedure is interrupted or unsuccessful. Ensure the control module and the Off-Board Programming Adapter connections are secure and the Techline(tm) operating software is up to date. Attempt to reprogram the control module. If the control module cannot be programmed, replace the control module. See appropriate REMOVAL, OVERHAUL & INSTALLATION article.**

20. With the Tech 2(tm), select Program.
21. After the download is complete, exit Service Programming.
22. Turn off the Off-Board Programming Adapter.

#### Remote Programming (Corvette)

**NOTE: Programing Powertrain Control Module requires a compatible scan tool and a Techline(R) terminal. Procedure uses a Tech 2 scanner.**

**NOTE: DO NOT program a control module unless you are directed by a service procedure or you are directed by a technical service bulletin. Programming a control module at any other time will not permanently correct a customer's concern.**

#### Before Remote Programming A Control Module

1. Vehicle system voltage:
  - There is no 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 charged before programming the control module if the battery voltage is low.
  - A battery charger is NOT connected to the vehicle's battery. Incorrect system voltage or voltage fluctuations from a battery charger, may cause programming failure or control module damage.
  - Turn OFF or disable any system that may put a load on the vehicle's battery.



- A. Twilight sentinel and Interior lights.
  - B. Daytime Running Lights (DRL). Applying the parking brake, on most vehicles, disables the DRL system.
  - C. Heating, Ventilation, and Air Conditioning (HVAC) systems.
  - D. Engine cooling fans, etc.
2. The ignition switch is in the proper position. The scan tool 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.
  3. All tool connections are secure.
    - RS-232.
    - The connection at the Data Link Connector (DLC) is secure.
    - Voltage supply circuits.
  4. DO NOT disturb the tool harnesses while programming. If an interruption occurs during the programming procedure, programming failure or control module damage may occur.

### **PCM Programming Set Up With Special Tool**

1. Ensure that the following conditions have been met:
  - The battery is fully charged.
  - The scan tool cable connection at the Data Link Connector (DLC) is secure.
2. Turn OFF the ignition.
3. Remove the passenger side floor access panel.
4. Remove the splice pack/star connector shorting bars from both splice pack/star connectors. It may be necessary to remove splice pack/star connectors from the mounting positions.
5. Install the star connector cable #1 from the J 42236 Serial Data Link Tester to the 12 pin splice pack/star. This is the connector with 8 or 10 wires.
6. Install the star connector cable #2 from the J 42236 to the 12 pin splice pack/star. This is the connector with 4 wires.
7. Select the star connector cable #1 on the J 42236 toggle switch.
8. Select position B on the J 42236.

### **Remote Programming Procedure**

1. Turn ON the ignition, with the engine OFF.
2. Turn OFF all vehicle accessories.
3. With the Tech 2(tm), select Service Programming.
4. Identify vehicle information as requested by the Tech 2(tm).

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5. Select the type of module you are programming.
6. Select the type of programming to be performed.
7. Verify the displayed VIN with the vehicle VIN. If the displayed VIN does not match the actual VIN, write down the actual VIN and correct the VIN at the Techline(tm) terminal.
8. When complete, Exit Service Programming.
9. Turn OFF the Tech 2(tm) and disconnect the Tech 2(tm) from the vehicle.
10. Turn OFF the ignition.
11. Connect the Tech 2(tm) to the Techline(tm) terminal.
12. Select Service Programming.
13. Select Tech 2(tm) as the tool you are using.
14. Select the type of programming to be performed.
15. Verify the displayed VIN with the vehicle VIN. Correct the VIN as necessary.
16. Select the type of module you are programming.
17. Identify what type of programming that you are performing.
  - Normal. This type of programming is for updating an existing calibration or programming a new controller.
  - Vehicle Configuration Index (VCI). This selection is used if the vehicle VIN is unavailable or not recognized by the Techline(tm) terminal. You will need to contact the Techline(tm) Customer Support center to use this option.
  - Reconfigure. This is to reconfigure a vehicle, such as tire size and axle ratio changes.
18. Select the appropriate calibration file.
19. Ensure all connections are secure.
20. Select Reprog to initiate the download of the new calibration to the Tech 2(tm).
21. After the download is complete, turn OFF the Tech 2(tm).
22. Disconnect the Tech 2(tm) from the Techline(tm) terminal.
23. Install the Tech 2(tm) to the Data Link Connector (DLC).
24. Turn ON the Tech 2(tm).
25. Turn ON the ignition, with the engine OFF.
26. Select Service Programming.

**NOTE:** DO NOT turn OFF the ignition if the programming procedure is interrupted or unsuccessful. Ensure that all the PCM and DLC connections are secure and the Techline(tm) operating software is up to date. Attempt to reprogram the control module. If the control module cannot be programmed, replace the control module. See appropriate REMOVAL,

## OVERHAUL & INSTALLATION article.

27. Select Program.
28. After the download is complete, EXIT Service Programming.
29. Turn OFF the ignition for 30 seconds.
30. Turn OFF the Tech 2(tm).
31. If a control module is replaced the following service procedures must be performed: **CRANKSHAFT POSITION SENSOR SYSTEM VARIATION LEARN PROCEDURE** , ENGINE OIL LIFE RESET, INSPECTION/MAINTENANCE COMPLETE SYSTEM SET PROCEDURE, see appropriate SELF-DIAGNOSTICS article, and **THEFT DETERRENT SYSTEM COMPONENTS** .

### Remote Programming Verification

1. With a scan tool, clear the DTCs.
2. Attempt to start the engine.
3. Repeat the Service Programming procedure if the engine does not start or operates poorly. Perform the following procedures before programming the PCM:
  - Ensure the control module and DLC connections are okay.
  - Ensure the Techline(tm) operating software is up to date.
  - Ensure the calibration part number is correct for the vehicle.
4. Attempt to program the control module. If the control module still cannot be programmed properly, replace the control module. See appropriate REMOVAL, OVERHAUL & INSTALLATION article. You must program the replacement control module.

### Off-Board Programming (Corvette)

**NOTE:** DO NOT program a control module unless you are directed by a service procedure or you are directed by a technical service bulletin. Programming a control module at any other time will not permanently correct a customer's concern.

**NOTE:** DO NOT disturb the tool harnesses while programming. If an interruption occurs during the programming procedure, programming failure or control module damage may occur.

### Before Programming a Control Module

Ensure that all connections are secure at the following locations:

- A. The Off-Board Programming Adapter.

- B. The Tech 2(tm).
- C. The control module.
- D. The Techline(tm) terminal.

The Off-Board Programming is used in situations where a control module must be programmed without having the vehicle present. The Off-Board Programming Adapter must be used to perform the Off-Board Programming procedure. The adapter allows the control module to power up and allows the Tech 2(tm) to communicate with the control module.

### Off-Board Programming Procedure

1. Obtain the VIN of the vehicle for which the control module is being programmed.
2. With the Techline(tm) terminal, select Service Programming.
3. Select Tech 2(tm), Reprogram ECU, and Off-Board Programming Adapter as the ECU location.
4. Connect the control module, Off-Board Programming Adapter, and the Tech 2(tm) as described on the Techline(tm) terminal. Ensure you use the correct harness connector from the Off-Board Programming Adapter kit.
5. With the Tech 2(tm), select Service Programming Request Information function. The Tech 2(tm) communicates with the control module and receives the access code.
6. With the Tech 2(tm), exit the Service Programming Request Information.
7. Disconnect the Tech 2(tm) from the Off-Board Programming Adapter.
8. Connect the Tech 2(tm) to the Techline(tm) terminal.
9. Turn ON the Tech 2(tm).
10. With the Techline(tm) terminal, enter the VIN of the vehicle that will be receiving the control module.
11. The Techline(tm) terminal will display the message, attaching to database.
12. Identify what type of programming that you are performing.
13. Select the appropriate calibration file.
14. Ensure all connections are secure.
15. The Techline(tm) terminal displays a summary screen that summarizes your selections. After confirming you choices, the Techline(tm) terminal automatically loads the calibration files to the Tech 2(tm).
16. After the download is complete, turn OFF the Tech 2(tm).
17. Disconnect the Tech 2(tm) from the Techline(tm) terminal.
18. Connect the Tech 2(tm) to the Off-Board Programming Adapter.
19. With the Tech 2(tm), select Service Programming.

**NOTE: DO NOT turn OFF the Off-Board Programming Adapter if the**

**programming procedure is interrupted or unsuccessful. Ensure the control module and the Off-Board Programming Adapter connections are secure and the Techline(tm) operating software is up to date. Attempt to reprogram the control module. If the control module cannot be programmed, replace the control module. See appropriate REMOVAL, OVERHAUL & INSTALLATION article.**

20. With the Tech 2(tm), select Program.
21. After the download is complete, exit Service Programming.
22. Turn OFF the Off-Board Programming Adapter.

#### **THEFT DETERRENT SYSTEM COMPONENTS**

**10-Minute Learn Procedure (Alero, Cavalier, Century, Corvette, Grand Am, Impala, Malibu, Monte Carlo, Regal & Sunfire)**

**NOTE: Due to component variability, the Vehicle Theft Deterrent (VTD) system must have the learn procedure performed regardless if vehicle starts on the first ignition cycle after a VTD repair. All codes in the theft deterrent module must be cleared for a relearn.**

The Body Control Module (BCM) must be programmed with the proper RPO configurations before performing learn procedures. See PROGRAMMING in appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.

If replacing the BCM with a GM Service Parts Operations (SPO) replacement part, the module will learn Passlock(tm) sensor data code immediately. The existing PCM however, must learn the new fuel continue password when the BCM is replaced.

If replacing a PCM with a GM Service Parts Operations (SPO) replacement part, after programming, these modules 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. A PCM 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.

Use this procedure after replacing:

- Passlock(tm) Sensor
- BCM
- PCM

**NOTE: This procedure requires a Tech 2 scan tool and a Techline terminal with current SPS (Service Programming System) software.**

1. Connect Tech 2 to vehicle.
2. Select Request Information under Service Programming.
3. Disconnect Tech 2 from vehicle and connect it to a Techline terminal.
4. On the Techline terminal, select Theft Module Re-Learn under Service Programming.
5. Disconnect Tech 2 from Techline terminal and connect it to vehicle.
6. Turn ignition on, with engine off.
7. Select VTD Re-Learn under Service Programming.
8. Attempt to start engine, then release key to ON (vehicle will not start).
9. Observe the SECURITY telltale, after approximately 10 minutes the telltale will turn OFF (the vehicle is now ready to relearn the Passlock(tm) Sensor Data Code and/or password on the next ignition switch transition from OFF to CRANK).
10. Turn ignition off, and wait 5 seconds.
11. Start engine (vehicle has now learned the password).
12. With Tech 2 scan tool, clear any DTCs.

**30-Minute Learn Procedure (Alero, Cavalier, Century, Corvette, Grand Am, Impala, Malibu, Monte Carlo, Regal & Sunfire)**

**NOTE: Due to component variability, the Vehicle Theft Deterrent (VTD) system must have the learn procedure performed regardless if vehicle starts on the first ignition cycle after a VTD repair. All codes in the theft deterrent module must be cleared for a relearn.**

The Body Control Module (BCM) must be programmed with the proper RPO configurations before performing learn procedures. See PROGRAMMING in appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.

If replacing the BCM with a GM Service Parts Operations (SPO) replacement part, the module will learn Passlock(tm) sensor data code immediately. The existing PCM however, must learn the new fuel continue password when the BCM is replaced.

If replacing a PCM with a GM Service Parts Operations (SPO) replacement part, after programming, these modules 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. A PCM 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.

Use this procedure after replacing:

- Passlock(tm) Sensor
- BCM
- PCM

1. Turn ignition on, with engine off.
2. Attempt to start engine, then release key to ON (vehicle will not start).
3. Observe the SECURITY telltale, after about 10 minutes, the telltale will turn OFF.
4. Turn ignition off, and wait 5 seconds.
5. Repeat steps 1 -4 two more times for a total of 3 cycles/30 minutes (the vehicle is now ready to relearn the Passlock(tm) Sensor Data Code and/or passwords on the next ignition switch transition from OFF to CRANK).

**NOTE: The vehicle learns the Passlock(tm) Sensor Data Code and/or password on the next ignition switch transition from OFF to CRANK. You must turn the ignition OFF before attempting to start vehicle.**

6. Start the engine (the vehicle has now learned the Passlock(tm) Sensor Data Code and/or password).
7. With a scan tool, clear any DTCs if needed (history DTCs will self clear after 100 ignition cycles).

Set Up A New Theft Deterrent Control Module (Aurora, Bonneville, Deville, Eldorado, Intrigue, LeSabre, Park Avenue & Seville)

**NOTE: When replacing a theft deterrent control module with an GM Service Parts Operation (SPO) replacement part, set up the control module prior to the 10-minute relearn procedure or the 30-minute relearn procedure. See SET UP A NEW THEFT DETERRENT CONTROL MODULE.**

**NOTE: Use this procedure only if replacing the theft deterrent control module with an GM SPO Replacement Part.**

1. Connect scan tool to vehicle.
2. Turn ignition on, with engine off.
3. Using scan tool, select Setup New VTD Module in the Vehicle Theft Deterrent, Special Functions data list.
4. Follow scan tool on-screen instructions.

- NOTE:** When replacing a theft deterrent control module with an GM SPO Replacement Part, the module will learn the keys immediately. The existing PCM must learn the new fuel continue password when you replace the theft deterrent control module.
- NOTE:** When replacing a PCM with a GM SPO Replacement Part, the new PCM will learn the incoming fuel continue password immediately after programming and upon receipt of a password message. Once a password message is received and a password is learned, perform the learn procedure to change this password again. A PCM which had been installed in another vehicle will have learned the fuel continue password of the other vehicle's theft deterrent control module. Perform either the 10-minute relearn procedure or 30-minute relearn procedure after programming to learn the fuel continue password of the current vehicle's theft deterrent control modules.
- NOTE:** When performing either relearn procedure, all previously learned keys will be erased from the theft deterrent control module's memory.
- NOTE:** Additional keys may be learned immediately after the first relearn procedure by inserting the additional key and turning the ignition to RUN within 10 seconds of removing the previously learned key.
- NOTE:** Use only a master key when performing the first relearn procedure. If you use a valet key first, the theft deterrent control module will not allow additional keys to be learned.

**10-Minute Learn Procedure (Aurora, Bonneville, Deville, Eldorado, Intrigue, LeSabre, Park Avenue & Seville)**

- NOTE:** This procedure requires a Tech 2(tm) scan tool and a Techline(tm) terminal with current SPS (Service Programming System) software.
- NOTE:** Use this procedure after replacing the Passkey(R) III (PK3) keys, theft deterrent control module or PCM.
- NOTE:** If replacing a theft deterrent control module with a GM SPO Replacement Part, perform the procedure to setup a new theft deterrent control module prior to the 10-minute relearn procedure.



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2002 GENERAL INFORMATION Computer Relearn Procedures - Domestic

1. Connect scan tool to vehicle.
2. Turn ignition on, with engine off.
3. Ensure that all power consuming devices are turned OFF on vehicle.
4. With scan tool, select Request Info. under Service Programming System and follow scan tool on-screen instructions.
5. Disconnect scan tool from vehicle and connect scan tool to a Techline(tm) terminal with the current Service Programming System (SPS) software.
6. On the Techline terminal, select Service Programming System and follow Techline terminal on-screen instructions.
7. Disconnect scan tool from Techline(tm) terminal and reconnect scan tool to vehicle.
8. With a master Passkey(R) III key, turn ON the ignition, with engine OFF.
9. With scan tool, select Program ECU under Service Programming System.
10. At this point the scan tool must remain connected for the duration of the 10-minute relearn procedure.

**NOTE: On some vehicles, the SECURITY telltale maybe illuminated on steady for the duration of the 10-minute relearn procedure.**

11. Observe scan tool, after about 10 minutes, 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 ON.
12. Turn OFF ignition and wait 5 seconds.
13. With master Passkey(R) III key, start engine. The theft deterrent control module has now learned the key transponder information and PCM has now learned the fuel continue password.

**NOTE: Perform this step ONLY on vehicles with EXPORT configured theft deterrent control modules.**

14. Turn OFF the ignition and wait 15 seconds minimum.

**NOTE: Perform this step ONLY on vehicles with EXPORT configured theft deterrent control modules.**

15. With a second master Passkey(R) III key, start engine. The theft deterrent control module has now learned the second master Passkey(R) III key transponder information.
16. Using scan tool, clear any DTCs.

**NOTE:** Use this procedure after replacing the Passkey(R) III (PK3) keys, theft deterrent control module or PCM.

**NOTE:** This procedure is not available on vehicles equipped with option code Z49 or BAE.

**NOTE:** If replacing a theft deterrent control module with an GM SPO replacement part, perform the procedure to setup a new theft deterrent control module prior to the 30-minute relearn procedure.

1. With a master Passkey(R) III key (Black), turn ignition on, with engine off.
2. Observe the SECURITY telltale. After about 10 minutes, the telltale will turn off.
3. Turn OFF ignition, and wait 5 seconds.
4. Repeat steps 1 through 3 for 2 more times for a total of 3 cycles or 30 minutes.

**NOTE:** The vehicle learns the key transponder information and/or passwords on ignition switch transition from OFF to CRANK. You must turn the ignition OFF before attempting to start the engine.

5. With a master Passkey(R) III key, start engine. The vehicle has now learned the key transponder information and PCM has now learned the fuel continue password.
6. Using scan tool, clear any DTCs.

#### Passlock(tm) Anti-Theft Seed & Key Method (Saturn - 1.9L)

Passlock(tm) learn procedure must be performed when Passlock(tm) sensor, BCM or PCM are replaced. If only Passlock(tm) sensor was replaced, Auto Learn method may be used. See PASSLOCK(tm) ANTI-THEFT AUTO LEARN METHOD. BCM or PCM replacement requires seed and key method. Seed and key method requires use of Tech 2 scan tool. See PASSLOCK(tm) ANTI-THEFT SEED & KEY METHOD.

1. Check BCM and PCM for existing codes. If codes exist, repair and proceed to next step. If no codes exist, go to next step.
2. Install scan tool. Turn ignition switch to RUN position. Using Programming System, select Passlock(tm) relearn procedure. Wait for 10 minutes. When security light changes from flashing or on to off, turn ignition switch to OFF position. Vehicle should start on next ignition cycle.

**NOTE:** If ignition is turned off before security light changes state, relearn procedure must be restarted.

**Passlock(tm) Anti-Theft Auto Learn Method (Saturn - 1.9L)**

**NOTE: This method may be used if only the Passlock(tm) sensor was replaced. For PCM or BCM replacement, seed and key method must be used.**

1. Check BCM and PCM for existing codes. If codes exist, repair and proceed to next step. If no codes exist, go to next step.
2. Turn ignition switch to RUN position. Momentarily rotate ignition switch to START position. DO NOT start vehicle. Wait for 10 minutes. When security light changes from flashing to off or on to off, turn ignition switch to OFF position. Perform this process 3 times. After the third time, vehicle should start on next ignition cycle.

**NOTE: If ignition is turned off before security light changes state, relearn procedure must be restarted.**

**Auto Learn Method (Saturn - 2.2L & 3.0L)**

**CAUTION: DO NOT use a BCM from another vehicle to aid in diagnosis. BCM's are not interchangeable after they have been installed.**

**NOTE: Passlock(R) learn procedure must be performed when Passlock (R) sensor, BCM or PCM are replaced. If only Passlock(R) sensor was replaced, auto learn method may be used. BCM or PCM replacement requires Saturn service stall method. Saturn service stall method require use of Tech 2 scan tool.**

**NOTE: If ignition is turned off before SECURITY indicator light changes state, relearn procedure must be restarted.**

1. Check BCM and PCM for existing DTCs. If DTCs exist, repair as necessary and go to next step. If no DTCs exist, go to next step.
2. Turn ignition switch to RUN position. Momentarily turn ignition switch to START position. DO NOT start vehicle. Wait 10 minutes. When SECURITY indicator light changes from flashing to off, or from on to off, turn ignition switch to OFF position. Perform this process 3 times. After third time, vehicle should start on next ignition cycle.

**Saturn Service Stall Method (Saturn - 2.2L & 3.0L)**

**NOTE: If ignition is turned off before SECURITY indicator light changes state, relearn procedure must be restarted.**

1. Check BCM and ECM/PCM for existing DTCs. If DTCs exist, repair as necessary and go to next step. If no DTCs exist, go to next step.
2. Install scan tool. Turn ignition switch to RUN position. Using scan tool, select Passlock (R) relearn procedure. Wait 10 minutes. When SECURITY indicator light changes from flashing to off, or from on to off, turn ignition switch to OFF position. Vehicle should start on next ignition cycle.

### **THROTTLE BODY RELEARN PROCEDURE**

#### **Saturn - 3.0L**

1. Turn ignition off for 10 seconds.
2. Turn ignition on, engine off.
3. Ensure these engine operating parameters are met before proceeding:
  - ECT is 41-212°F (5-100°C).
  - IAT is more than 41°F (5°C).
  - Battery voltage is more than 10 volts.
  - Accelerator pedal angle is less than 14 degrees.
4. Leave ignition on for one minute with engine off.

The ECM will start at 29 seconds to cycle the throttle plate from rest position to full closed, then from the full closed position to around 14 percent. This will take about 3 seconds. The ECM will then return the throttle to the rest position. During this throttle plate cycle, the ECM will have learned the lower and rest position TP sensor values, actuator motor torque to overcome spring pressure as well as both spring return rates.

### **THROTTLE POSITION SENSOR LEARN PROCEDURE**

#### **Deville, Eldorado & Seville**

1. Turn the ignition to the RUN/ON position.
2. Wait 1 minute.
3. Turn the ignition to the LOCK/OFF position.
4. Wait 15 seconds.

### **GENERAL MOTORS (TRUCKS & VANS)**

**NOTE:** Before performing Electronically Erasable Programmable Read Only Memory (EEPROM) programming procedure, check for any applicable Technical Service Bulletins (TSBs) that may apply to vehicle application. BCM/PCM/VCM must be programmed with proper Regular Production Option (RPO) configurations. Follow

## **instructions on Techline(R) terminal and scan tool to program BCM/PCM/VCM.**

### **CRANKSHAFT POSITION SENSOR SYSTEM VARIATION LEARN PROCEDURE**

Avalanche, Astro, Aztek, Blazer, Bravada, Cab & Chassis - 8.1L, Chevy Express - 4.3L, 5.0L, 5.7L & 8.1L, Cutaway - 5.7L & 8.1L, Envoy, Envoy XL, Escalade, Escalade EXT, Montana, Rendezvous, RV Cutaway - 5.7L & 8.1L, S10 Pickup, Safari, Savana - 4.3L, 5.0L, 5.7L & 8.1L, Savana Camper Special -5.7L & 8.1L, Savana Special - 5.7L & 8.1L, Sierra - 4.3L, 4.8L, 5.3L, 6.0L & 8.1L, Silhouette, Silverado - 4.3L, 4.8L, 5.3L, 6.0L & 8.1L, Sonoma, Suburban, Tahoe, Trailblazer, Venture, Yukon & Yukon XL

**CAUTION:** Before performing Crankshaft Position Sensor (CKP) system variation learn procedure, always set parking brake and block drive wheels in order to prevent personal injury. Release throttle immediately when engine starts to decelerate in order to eliminate over revving engine. Once learn procedure has been completed, control module will return engine control to operator and engine will respond to throttle position.

**NOTE:** For additional diagnostic information, see appropriate SELF-DIAGNOSTICS article.

1. Install a scan tool.
2. With a scan tool, monitor the powertrain control module for DTCs. If other DTCs are set, except DTC P1336, see appropriate SELF-DIAGNOSTICS article.
3. With a scan tool, select the crankshaft position variation learn procedure.
4. Observe the fuel cut-off for the engine that you are performing the learn procedure on.
5. The scan tool instructs you to perform the following:
  - Block the drive wheels.
  - Apply the vehicles parking brake.
  - Cycle the ignition from OFF to ON.
  - Apply and hold the brake pedal.
  - Start and idle the engine.
  - Turn OFF the A/C.
  - Place the vehicle's transmission in Park (A/T) or Neutral (M/T).
  - The scan tool monitors certain component signals to determine if all the conditions are met to continue with the procedure. The scan tool only displays the condition that inhibits the procedure. The scan tool monitors the following components:
    - A. Crankshaft Position (CKP) sensor activity. If there is a CKP sensor condition, refer to the applicable DTC that set. See appropriate SELF-

DIAGNOSTICS article.

- B. Camshaft Position (CMP) sensor activity. If there is a CMP sensor condition, refer to the applicable DTC that set. See appropriate SELF-DIAGNOSTICS article.
  - C. Engine Coolant Temperature (ECT). If the engine coolant temperature is not warm enough, idle the engine until the engine coolant temperature reaches the correct temperature.
6. With the scan tool, enable the crankshaft position system variation learn procedure.

**NOTE: While the learn procedure is in progress, release the throttle immediately when the engine starts to decelerate. The engine control is returned to the operator and the engine responds to throttle position after the learn procedure is complete.**

- 7. Slowly increase the engine speed to the RPM that you observed.
- 8. Immediately release the throttle when fuel cut-off is reached.
- 9. The scan tool displays Learn Status: Learned this ignition. If the scan tool does NOT display this message and no additional DTCs set, see appropriate SELF-DIAGNOSTICS article. If a DTC set, see appropriate SELF-DIAGNOSTICS article.
- 10. Turn OFF the ignition for 30 seconds after the learn procedure is completed successfully.

**Vue - 2.2L**

- 1. Start engine and allow ECT to reach more than 158°F (70°C).
- 2. Turn A/C off and place transaxle in Park or Neutral.
- 3. Using scan tool, perform CRANKSHAFT POS. VARIATION LEARN procedure.

Procedure requires accelerator to be depressed to wide open throttle and then released. ECM will cut fuel off at speeds more than 4000 RPM and will allow engine to decelerate. ECM will learn crankshaft as engine decelerates.

If ECM will not learn crankshaft, see **EXCESSIVE CRANKSHAFT VARIATION SYMPTOM** table for diagnostic aids.

**EXCESSIVE CRANKSHAFT VARIATION SYMPTOM**

<b>Scan Tool Display</b>	<b>Possible Causes</b>
Factors Out Of Range	Reluctor Wheel Machining Quality, Run Out, Incorrect Air Gap
Opposing Factors Out Of Range	Disturbance Or Noise In Crank Sensor Circuit
Sum Out Of Range	Engine Too Cold
Crank Pulse Count Error	Cam Or Crank Sensor DTC Set

**ENGINE CONTROL MODULE PROGRAMMING****Remote Programming (Sierra & Silverado - 6.6L)**

**NOTE:** Programming Engine Control Module requires a compatible scan tool and a Techline(R) terminal. Procedure uses a Tech 2 scanner.

**NOTE:** DO NOT program a control module unless you are directed by a service procedure or you are directed by a technical service bulletin. Programming a control module at any other time will not permanently correct a customer's concern.

**Before Remote Programming a Control Module**

## 1. Vehicle system voltage:

- There is no 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 charged before programming the control module if the battery voltage is low.
- A battery charger is NOT connected to the vehicle's battery. Incorrect system voltage or voltage fluctuations from a battery charger, may cause programming failure or control module damage.
- Turn OFF or disable any system that may put a load on the vehicle's battery.
  - A. Twilight sentinel.
  - B. Interior lights.
  - C. Daytime Running Lights (DRL). Applying the parking brake, on most vehicles, disables the DRL system.
  - D. Heating, Ventilation, and Air Conditioning (HVAC) systems.
  - E. Engine cooling fans, etc.

2. The ignition switch is in the proper position. The scan tool 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.

3. All tool connections are secure.

- RS-232.
- The connection at the Data Link Connector (DLC) is secure.
- Voltage supply circuits.

4. DO NOT disturb the tool harnesses while programming. If an interruption occurs during the programming procedure, programming failure or control module damage may occur.

**Remote Programming Procedure**

## 2002 Chevrolet Camaro

### 2002 GENERAL INFORMATION Computer Relearn Procedures - Domestic

1. Turn OFF the ignition.
2. Install the Tech 2(tm) to the Data Link Connector (DLC).
3. Turn ON the ignition, with the engine OFF.
4. Turn OFF all vehicle accessories.
5. With the Tech 2(tm), select Service Programming.
6. Identify vehicle information as requested by the Tech 2(tm).
7. Select the type of module you are programming.
8. Select the type of programming to be performed.
9. Verify the displayed VIN with the vehicle VIN. If the displayed VIN does not match the actual VIN, write down the actual VIN and correct the VIN at the Techline(tm) terminal.
10. When complete, exit Service Programming.
11. Turn OFF the Tech 2(tm) and disconnect the Tech 2(tm) from the vehicle.
12. Turn OFF the ignition.
13. Connect the Tech 2(tm) to the Techline(tm) terminal.
14. Select Service Programming.
15. Select Tech 2(tm) as the tool you are using.
16. Select the type of programming to be performed.
17. Verify the displayed VIN with the vehicle VIN. Correct the VIN as necessary.
18. Select the type of module you are programming.
19. Identify what type of programming that you are performing.
  - Normal. This type of programming is for updating an existing calibration or programming a new controller.
  - Vehicle Configuration Index (VCI). This selection is used if the vehicle VIN is unavailable or not recognized by the Techline(tm) terminal. You will need to contact the Techline(tm) Customer Support center to use this option.
  - Reconfigure. This is to reconfigure a vehicle, such as tire size and axle ratio changes.
20. Select the appropriate calibration file.
21. Ensure all connections are secure.
22. Select Reprog to initiate the download of the new calibration to the Tech 2(tm).
23. After the download is complete, turn OFF the Tech 2(tm).
24. Disconnect the Tech 2(tm) from the Techline(tm) terminal.
25. Install the Tech 2(tm) to the Data Link Connector (DLC).
26. Turn ON the Tech 2(tm).
27. Turn ON the ignition, with the engine OFF.
28. Select Service Programming.



**NOTE:** DO NOT turn OFF the ignition if the programming procedure is interrupted or unsuccessful. Ensure that all the ECM and DLC connections are secure and the Techline(tm) operating software is up to date. Attempt to reprogram the control module. If the control module cannot be programmed, replace the control module. See appropriate REMOVAL, OVERHAUL & INSTALLATION article.

29. Select Program.
30. After the download is complete, exit Service Programming.
31. Turn OFF the ignition for 30 seconds.
32. Turn OFF the Tech 2(tm).
33. If a control module is replaced the following service procedures must be performed: ENGINE OIL LIFE RESET, INSPECTION/MAINTENANCE COMPLETE SYSTEM SET PROCEDURE under INSPECTION/MAINTENANCE PROCEDURES, and THEFT DETERRENT PASSWORD LEARN PROCEDURE.

### Remote Programming Verification

1. With a scan tool, clear the DTCs.
2. Attempt to start the engine.
3. Repeat the Service Programming procedure if the engine does not start or operates poorly. Perform the following procedures before programming the ECM:
  - Ensure the control module and DLC connections are okay.
  - Ensure the Techline(tm) operating software is up to date.
  - Ensure the calibration part number is correct for the vehicle.
4. Attempt to program the control module. If the control module still cannot be programmed properly, replace the control module. See appropriate REMOVAL, OVERHAUL & INSTALLATION article. You must program the replacement control module.

### Off-Board Programming (Sierra & Silverado - 6.6L)

**NOTE:** DO NOT program a control module unless you are directed by a service procedure or you are directed by a technical service bulletin. Programming a control module at any other time will not permanently correct a customer's concern.

**NOTE:** DO NOT disturb the tool harnesses while programming. If an interruption occurs during the programming procedure, programming failure or control module damage may occur.

## **Before Off-Board Programming a Control Module**

Ensure that all connections are secure at the following locations:

- A. The Off-Board Programming Adapter.
- B. The Tech 2(tm).
- C. The control module.
- D. The Techline(tm) terminal.

The Off-Board Programming is used in situations where a control module must be programmed without having the vehicle present. The Off-Board Programming Adapter must be used to perform the Off-Board Programming procedure. The adapter allows the control module to power up and allows the Tech 2(tm) to communicate with the control module.

## **Off-Board Programming Procedure**

1. Obtain the VIN of the vehicle for which the control module is being programmed.
2. With the Techline(tm) terminal, select Service Programming.
3. Select Tech 2(tm), Reprogram ECU, and Off-Board Programming Adapter as the ECU location.
4. Connect the control module, Off-Board Programming Adapter, and the Tech 2(tm) as described on the Techline(tm) terminal. Ensure you use the correct harness connector from the Off-Board Programming Adapter kit.
5. With the Tech 2(tm), select Service Programming Request Information function. The Tech 2(tm) communicates with the control module and receives the access code.
6. With the Tech 2(tm), exit the Service Programming Request Information.
7. Disconnect the Tech 2(tm) from the Off-Board Programming Adapter.
8. Connect the Tech 2(tm) to the Techline(tm) terminal.
9. Turn ON the Tech 2(tm).
10. With the Techline(tm) terminal, enter the VIN of the vehicle that will be receiving the control module.
11. The Techline(tm) terminal will display the message, attaching to database.
12. Identify what type of programming that you are performing.
13. Select the appropriate calibration file.
14. Ensure all connections are secure.
15. The Techline(tm) terminal displays a summary screen that summarizes your selections. After confirming your choices, the Techline(tm) terminal automatically loads the calibration files to the Tech 2(tm).
16. After the download is complete, turn OFF the Tech 2(tm).
17. Disconnect the Tech 2(tm) from the Techline(tm) terminal.

18. Connect the Tech 2(tm) to the Off-Board Programming Adapter.
19. With the Tech 2(tm), select Service Programming.

**NOTE: DO NOT turn OFF the Off-Board Programming Adapter if the programming procedure is interrupted or unsuccessful. Ensure the control module and the Off-Board Programming Adapter connections are secure and the Techline(tm) operating software is up to date. Attempt to reprogram the control module. If the control module cannot be programmed, replace the control module. See appropriate REMOVAL, OVERHAUL & INSTALLATION article.**

20. With the Tech 2(tm), select Program.
21. After the download is complete, exit Service Programming.
22. Turn OFF the Off-Board Programming Adapter.

#### Vue - 2.2L

After replacing ECM or if program needs to be updated, refer to latest Techline information on ECM reprogramming. After reprogramming, perform CRANKSHAFT POSITION VARIATION LEARN PROCEDURE and PROGRAMMING THEFT DETERRENT SYSTEM COMPONENTS.

#### Vue - 3.0L

1. Turn ignition off if the ECM is going to be replaced.
2. Turn ignition on.
3. Use the Service Stall System (SSS) to reprogram the new/old ECM. Refer to the SSS User Guide for procedure or follow the on-screen instructions.
4. After the ECM has been reprogrammed, use the SSS to perform the ECM passlock relearn procedure. Refer to the SSS User Guide for procedure or follow the on-screen instructions.
5. The ECM will automatically go through a throttle body relearn procedure once the reprogram is complete. The ECM normally will go through a throttle body relearn procedure anytime the ignition is left on with the engine off for longer than 29 seconds (if the enable conditions have been met. For enable conditions, see appropriate SELF-DIAGNOSTICS article). The ECM will take about 2-3 seconds to perform the relearn. To ensure that the procedure has been completed, the ignition should be turned off for 10 seconds, then turned on, with the engine off for 1 minute.
6. Clear DTCs in all controllers if any exist. It may be normal for U-type or passlock DTCs to set in other controllers or for the ECM to set U-type, passlock or P0600 DTCs after a reprogram has been performed. Clear DTCs if any are present, then turn the ignition off for 10 seconds. Turn the ignition on and recheck for DTCs. As long as the

## 2002 Chevrolet Camaro

2002 GENERAL INFORMATION Computer Relearn Procedures - Domestic

LAST TEST for a DTC indicates PASSED on scan tool, the DTC is not currently failing and most likely will not cause a problem. Reclear DTCs if any exist.

7. The ECM will continuously and automatically relearn the crankshaft notch variation necessary for correct misfire diagnostics. No manual procedure is required.

After replacing ECM or if program needs to be updated, refer to latest Techline information on ECM reprogramming. After reprogramming, perform PROGRAMMING THEFT DETERRENT SYSTEM COMPONENTS.

### FUEL INJECTION PUMP TOP DEAD CENTER OFFSET ADJUSTMENT

Learning A TDC Offset (Cab & Chassis, Chevy Express, Cutaway, RV Cutaway, Savana, Savana Camper Special & Savana Special - 6.5L)

**NOTE: Do not perform this procedure when only an injection pump has been replaced.**

This procedure should only be used when a Diagnostic Trouble Code (DTC) has directed you to do so, or one of the following repairs has been performed:

- A DTC P1214 is set.
- The engine has been replaced.
- The front engine cover has been replaced.
- The Powertrain Control Module (PCM) and the injection pump have been replaced at the same time.
- The crankshaft position sensor has been replaced.

The PCM has the ability to perform a Top Dead Center (TDC) Offset Learn when one is not present or has been cleared. This procedure allows the PCM to be updated with the correct TDC offset for the vehicle.

The TDC Offset specification is only to be used after the Learn procedure has been performed. See **TDC OFFSET SPECIFICATION** table.

### TDC OFFSET SPECIFICATION

Application	TDC Offset
All	-.25 to -.75

1. One of the above repairs must have been performed. If not, do not continue.
2. Install the scan tool.
3. Start the engine.
4. Operate the vehicle until the Engine Coolant Temperature (ECT) is more than 170°F (77°C).

5. Clear all DTCs and turn the engine OFF.
6. Turn the ignition ON with the engine OFF.
7. Hold the accelerator pedal in the Wide Open Throttle (WOT) position for a minimum of 45 seconds (this step prepares the PCM to activate the offset learn (internal to PCM) and then release pedal.
8. Turn the ignition OFF for 30 seconds. In this step, the PCM powers down (to verify the PCM has powered down, a No Communication With Vehicle screen will display when trying to access a data list).

**NOTE: A new TDC Offset will over write the previous one.**

9. After the PCM has completed the power down, start the engine. Verify in the scan tool that the ECT is more than 170°F (77°C). If not, operate vehicle until desired ECT is achieved (vehicle can be driven or throttle can be depressed until correct coolant temperature is achieved). As soon as the ECT is more than 170°F (77°C) and the engine speed is below 1500 RPM, the PCM automatically learns a new offset (a momentary stumble in engine RPM will indicate that the TDC Offset has been activated).
10. Check the TDC Offset in the scan tool. The TDC Offset should be between -0.25 and -0.75. If the TDC Offset is within the specified value, the procedure is complete. If not, continue to the next step (adjusting the injection pump).
11. Turn the engine OFF.
12. Loosen injection pump flange nuts using the Injection Pump Wrench (J 41089).

**NOTE: In order to achieve a negative (-) TDC Offset number, rotate the pump toward the drivers side of the vehicle. In order to achieve a positive (+) TDC Offset number, rotate the pump towards the passenger side of the vehicle.**

13. Slightly (1 mm equals 2 degrees) rotate the injection pump in the desired direction (use the J 29872-A to rotate the injection pump) and then retighten the injection pump flange nuts (a scribe line across the pump flange and cover can be used as a reference (1 mm equals 2 degrees) which is the approximate width of a scribe line).
14. Repeat steps 3 -13 until the correct TDC Offset has been achieved. It is possible that the injection pump may require multiple adjustments to achieve the specified value. If you are unable to set the correct TDC Offset or the TDC Offset will not learn, check for the following:
  - The coolant temperature is more than 170°F (77°C).
  - Proper time intervals are observed for wide open throttle and PCM power down.
  - All PCM and injection timing stepper motor connections and for DTCs.

- The Techline terminal/equipment for the latest software version.
- For proper base installation of the injection pump (engine shut-down ESO solenoid should be approximately straight up and down).
- If the TDC Offset is stuck on a high + (plus) value, check for a damaged camshaft driven gear key.
- If the TDC Offset is stuck on a high - (negative) value, check for a damaged or improperly installed crankshaft position sensor.
- If all checks have been performed, the injection pump may be malfunctioning, however, this is an extremely unlikely failure.

### **GLOW PLUG SYSTEM RELEARN PROCEDURE**

Cab & Chassis, Chevy Express, Cutaway, RV Cutaway, Savana, Savana Camper Special & Savana Special - 6.5L

**NOTE: The vehicle must be in operating condition before performing this procedure.**

The glow plug system type learn is used to identify the correct system type (Federal or California). The scan tool will display Federal, California or Not Learned (Engine Data List). The glow plug system type needs to be relearned when a new calibration has been flash programmed in to the PCM. The relearn procedure does not need to be done to a glow plug system type after a PCM has been replaced. The new PCM has the ability to perform an auto learn when system is not present. The Not Learned message will display on scan tool. If a system type has not been relearned after the PCM has been flashed, a DTC P0380 will set.

1. Turn ON the ignition, with the engine OFF.
2. Use the scan tool in order to select Special Functions, Engine Output Functions and Glow Plug System Learn.
3. Activate the Glow Plug System Learn by selecting ON. After the learn function has been performed, Not Learned will display on the scan tool. In this step the scan tool is clearing the system type.
4. Use the scan tool in order to select the Special Functions menu, and select Glow Plug.
5. Activate the Glow Plug system by selecting ON. In this step the glow plug relay is now sending the identifying (signature) voltage to the PCM.
6. The PCM will now be able to identify the correct glow plug system type. For visual verification of the glow plug system, see COMPONENT LOCATIONS in appropriate SELF-DIAGNOSTICS article.
7. Clear the DTC P0380.
8. Allow the PCM to power down for at least 45 seconds.
9. Turn ON the ignition leaving the engine OFF. Use the scan tool in order to verify that DTC P0380 has not reset.

10. If DTC P0380 reset, perform the following procedure:

- Check the connections at the glow plug relay.
- Try again to relearn the glow plug system. If the relearn fails again, see appropriate SELF-DIAGNOSTICS article.

## POWERTRAIN CONTROL MODULE

Remote Programming (Avalanche, Astro, Aztek, Blazer, Bravada, Cab & Chassis - 8.1L, Chevy Express - 5.0L, 5.7L & 8.1L, Cutaway - 5.7L & 8.1L, Envoy, Envoy XL, Escalade, Escalade EXT, Montana, Rendezvous, RV Cutaway - 5.7L & 8.1L, S10 Pickup - 4.3L, Safari, Savana - 5.0L, 5.7L & 8.1L, Savana Camper Special - 5.7L & 8.1L, Savana Special - 5.7L & 8.1L, Sierra - 4.3L, 4.8L, 5.3L, 6.0L & 8.1L, Silhouette, Silverado - 4.3L, 4.8L, 5.3L, 6.0L & 8.1L, Sonoma - 4.3L, Suburban, Tahoe, Trailblazer, Venture, Yukon & Yukon XL)

**NOTE:** Programming Powertrain Control Module requires a compatible scan tool and a Techline(R) terminal. Procedure uses a Tech 2 scanner.

**NOTE:** DO NOT program a control module unless you are directed by a service procedure or you are directed by a technical service bulletin. Programming a control module at any other time will not permanently correct a customer's concern.

## Before Remote Programming a Control Module

1. Vehicle system voltage:

- There is no 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 charged before programming the control module if the battery voltage is low.
- A battery charger is NOT connected to the vehicle's battery. Incorrect system voltage or voltage fluctuations from a battery charger, may cause programming failure or control module damage.
- Turn OFF or disable any system that may put a load on the vehicle's battery.
  - A. Twilight sentinel and Interior lights.
  - B. Daytime Running Lights (DRL). Applying the parking brake, on most vehicles, disables the DRL system.
  - C. Heating, Ventilation, and Air Conditioning (HVAC) systems.
  - D. Engine cooling fans, etc.

2. The ignition switch is in the proper position. The scan tool 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.

3. All tool connections are secure.

- RS-232.
  - The connection at the Data Link Connector (DLC) is secure.
  - Voltage supply circuits.
4. DO NOT disturb the tool harnesses while programming. If an interruption occurs during the programming procedure, programming failure or control module damage may occur.

### **Remote Programming Procedure**

1. Turn OFF the ignition.
2. Install the Tech 2(tm) to the Data Link Connector (DLC).
3. Turn ON the ignition, with the engine OFF.
4. Turn OFF all vehicle accessories.
5. With the Tech 2(tm), select Service Programming.
6. Identify vehicle information as requested by the Tech 2(tm).
7. Select the type of module you are programming.
8. Select the type of programming to be performed.
9. Verify the displayed VIN with the vehicle VIN. If the displayed VIN does not match the actual VIN, write down the actual VIN and correct the VIN at the Techline(tm) terminal.
10. When complete, Exit Service Programming.
11. Turn OFF the Tech 2(tm) and disconnect the Tech 2(tm) from the vehicle.
12. Turn OFF the ignition.
13. Connect the Tech 2(tm) to the Techline(tm) terminal.
14. Select Service Programming.
15. Select Tech 2(tm) as the tool you are using.
16. Select the type of programming to be performed.
17. Verify the displayed VIN with the vehicle VIN. Correct the VIN as necessary.
18. Select the type of module you are programming.
19. Identify what type of programming that you are performing.
  - Normal. This type of programming is for updating an existing calibration or programming a new controller.
  - Vehicle Configuration Index (VCI). This selection is used if the vehicle VIN is unavailable or not recognized by the Techline(tm) terminal. You will need to contact the Techline(tm) Customer Support center to use this option.
  - Reconfigure. This is to reconfigure a vehicle, such as tire size and axle ratio changes.
20. Select the appropriate calibration file.



21. Ensure all connections are secure.
22. Select Reprog to initiate the download of the new calibration to the Tech 2(tm).
23. After the download is complete, turn OFF the Tech 2(tm).
24. Disconnect the Tech 2(tm) from the Techline(tm) terminal.
25. Install the Tech 2(tm) to the Data Link Connector (DLC).
26. Turn ON the Tech 2(tm).
27. Turn ON the ignition, with the engine OFF.
28. Select Service Programming.

**NOTE: DO NOT turn OFF the ignition if the programming procedure is interrupted or unsuccessful. Ensure that all the PCM and DLC connections are secure and the Techline(tm) operating software is up to date. Attempt to reprogram the control module. If the control module cannot be programmed, replace the control module. See appropriate REMOVAL, OVERHAUL & INSTALLATION article.**

29. Select Program.
30. After the download is complete, EXIT Service Programming.
31. Turn OFF the ignition for 30 seconds.
32. Turn OFF the Tech 2(tm).
33. If a control module is replaced the following service procedures must be performed: CRANKSHAFT POSITION SENSOR, ENGINE OIL LIFE RESET, INSPECTION/MAINTENANCE COMPLETE SYSTEM SET PROCEDURE under INSPECTION/MAINTENANCE PROCEDURES, and THEFT DETERRENT PASSWORD LEARN PROCEDURE.

### **Remote Programming Verification**

1. With a scan tool, clear the DTCs.
2. Attempt to start the engine.
3. Repeat the Service Programming procedure if the engine does not start or operates poorly. Perform the following procedures before programming the PCM:
  - Ensure the control module and DLC connections are okay.
  - Ensure the Techline(tm) operating software is up to date.
  - Ensure the calibration part number is correct for the vehicle.
4. Attempt to program the control module. If the control module still cannot be programmed properly, replace the control module. See appropriate REMOVAL, OVERHAUL & INSTALLATION article. You must program the replacement control module.

Off-Board Programming (Avalanche, Astro, Aztek, Blazer, Bravada, Cab & Chassis - 8.1L, Chevy Express - 5.0L, 5.7L & 8.1L, Cutaway - 5.7L & 8.1L, Envoy, Envoy XL, Escalade, Escalade EXT, Montana, Rendezvous, RV Cutaway - 5.7L & 8.1L, S10 Pickup - 4.3L, Safari, Savana - 5.0L, 5.7L & 8.1L, Savana Camper Special - 5.7L & 8.1L, Savana Special - 5.7L & 8.1L, Sierra - 4.3L, 4.8L, 5.3L, 6.0L & 8.1L, Silhouette, Silverado - 4.3L, 4.8L, 5.3L, 6.0L & 8.1L, Sonoma - 4.3L, Suburban, Tahoe, Trailblazer, Venture, Yukon & Yukon XL)

**NOTE: DO NOT program a control module unless you are directed by a service procedure or you are directed by a technical service bulletin. Programming a control module at any other time will not permanently correct a customer's concern.**

**NOTE: DO NOT disturb the tool harnesses while programming. If an interruption occurs during the programming procedure, programming failure or control module damage may occur.**

### **Before Off-Board Programming a Control Module**

Ensure that all connections are secure at the following locations:

- A. The Off-Board Programming Adapter.
- B. The Tech 2(tm).
- C. The control module.
- D. The Techline(tm) terminal.

The Off-Board Programming is used in situations where a control module must be programmed without having the vehicle present. The Off-Board Programming Adapter must be used to perform the Off-Board Programming procedure. The adapter allows the control module to power up and allows the Tech 2(tm) to communicate with the control module.

### **Off-Board Programming Procedure**

1. Obtain the VIN of the vehicle for which the control module is being programmed.
2. With the Techline(tm) terminal, select Service Programming.
3. Select Tech 2(tm), Reprogram ECU, and Off-Board Programming Adapter as the ECU location.
4. Connect the control module, Off-Board Programming Adapter, and the Tech 2(tm) as described on the Techline(tm) terminal. Ensure you use the correct harness connector from the Off-Board Programming Adapter kit.
5. With the Tech 2(tm), select Service Programming Request Information function. The Tech 2(tm) communicates with the control module and receives the access code.
6. With the Tech 2(tm), exit the Service Programming Request Information.
7. Disconnect the Tech 2(tm) from the Off-Board Programming Adapter.
8. Connect the Tech 2(tm) to the Techline(tm) terminal.

9. Turn ON the Tech 2(tm).
10. With the Techline(tm) terminal, enter the VIN of the vehicle that will be receiving the control module.
11. The Techline(tm) terminal will display the message, attaching to database.
12. Identify what type of programming that you are performing.
13. Select the appropriate calibration file.
14. Ensure all connections are secure.
15. The Techline(tm) terminal displays a summary screen that summarizes your selections. After confirming you choices, the Techline(tm) terminal automatically loads the calibration files to the Tech 2(tm).
16. After the download is complete, turn OFF the Tech 2(tm).
17. Disconnect the Tech 2(tm) from the Techline(tm) terminal.
18. Connect the Tech 2(tm) to the Off-Board Programming Adapter.
19. With the Tech 2(tm), select Service Programming.

**NOTE: DO NOT turn OFF the Off-Board Programming Adapter if the programming procedure is interrupted or unsuccessful. Ensure the control module and the Off-Board Programming Adapter connections are secure and the Techline(tm) operating software is up to date. Attempt to reprogram the control module. If the control module cannot be programmed, replace the control module. See appropriate REMOVAL, OVERHAUL & INSTALLATION article.**

20. With the Tech 2(tm), select Program.
21. After the download is complete, exit Service Programming.
22. Turn OFF the Off-Board Programming Adapter.

**PCM Programming (Cab & Chassis, Chevy Express, Cutaway, RV Cutaway, Savana, Savana Camper Special & Savana Special - 6.5L)**

1. Verify the following for the setup:
  - The battery is charged.
  - The ignition is ON.
  - The battery/cigarette lighter connection is secure.
  - The Data Link Connector (DLC) is attached.
2. Perform the programming. See the up to date Techline terminal/equipment for user instructions.
3. Perform the Passlock(tm) Learn Procedure. See **THEFT DETERRENT SYSTEM COMPONENTS** .

4. After the vehicle has been programmed, operate the vehicle until the coolant temperature is more than 170°F (77°C). This will allow the Top Dead Center (TDC) offset to be programmed. See **FUEL INJECTION PUMP TOP DEAD CENTER OFFSET ADJUSTMENT** .
5. Check the Data list for a TDC offset.
6. If the PCM fails to reprogram, do the following:
  - Check all the Powertrain Control Module (PCM) connections.
  - Check the Techline terminal/equipment for the latest software version.
  - Try again to reprogram the PCM. If the PCM fails again, replace the PCM. See appropriate REMOVAL, OVERHAUL & INSTALLATION article.

**Programming TDC Offset (Cab & Chassis, Chevy Express, Cutaway, RV Cutaway, Savana, Savana Camper Special & Savana Special - 6.5L)**

The PCM will automatically activate the TDC offset program when the engine coolant is more than 170°F (77°C). If the PCM is not programmed with a TDC offset, a DTC P1214 will set.

**PCM Programming (S10 Pickup - 2.2L, Sonoma - 2.2L & Tracker)**

After replacing Powertrain Control Module (PCM) or if program needs to be updated, refer to latest Techline information on PCM reprogramming. PCM can only be programmed using Tech 2 and Techline terminal, or by using a personal computer equipped with the current service programming system software installed.

## **THEFT DETERRENT SYSTEM COMPONENTS**

**10-Minute Learn Procedure (Avalanche, Astro, Blazer, Cab & Chassis, Chevy Express, Cutaway, Escalade, Escalade EXT, RV Cutaway, S10 Pickup, Safari, Savana, Savana Camper Special & Savana Special, Sierra, Silverado, Sonoma, Suburban, Tahoe, Yukon & Yukon XL)**

**NOTE: If replacing the Passlock(tm) module with a GM Service Parts Operations (SPO) replacement part, the module will learn Passlock(tm) sensor data code immediately. The existing PCM however, must learn the new fuel continue password when the Passlock(tm) module is replaced.**

If replacing a PCM/ECM with a GM Service Parts Operations (SPO) replacement part, after programming, these modules 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. A PCM 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.

Use this procedure after replacing:

- Passlock(tm) Sensor
- Passlock(tm) Module.
- PCM

**NOTE: Ensure current Techline(R) Service Programming System (SPS) software is used.**

1. Connect Tech 2 scan tool to DLC.
2. Select "Request Information" under Service Programming.
3. Disconnect scan tool from vehicle and connect it to a Techline(R) terminal.
4. Using Techline(R) terminal, select "Theft Module Re-Learn" under Service Programming.
5. Disconnect scan tool 2 from Techline(R) terminal and connect scan tool to vehicle.
6. Turn ignition on, with engine off.
7. Select "VTD Re-Learn" under Service Programming on scan tool.
8. Attempt to start engine, then release the key to ON position. Vehicle should not start.
9. Observe SECURITY indicator light for about 10 minutes. Indicator light will turn off and vehicle is now ready to relearn Passlock(tm) sensor data code and/or password on the next ignition switch transition from OFF to CRANK position.
10. Turn ignition off and wait 5 seconds.
11. Start engine. If engine starts, vehicle has now learned the password.
12. Using Tech 2 scan tool, clear any DTCs.

**30-Minute Learn Procedure (Avalanche, Astro, Blazer, Cab & Chassis, Chevy Express, Cutaway, Escalade, Escalade EXT, RV Cutaway, S10 Pickup, Safari, Savana, Savana Camper Special & Savana Special, Sierra, Silverado, Sonoma, Suburban, Tahoe, Yukon & Yukon XL)**

**NOTE: If replacing the Passlock(tm) module with a GM Service Parts Operations (SPO) replacement part, the module will learn Passlock(tm) sensor data code immediately. The existing PCM however, must learn the new fuel continue password when the Passlock(tm) module is replaced.**

If replacing a PCM/ECM with a GM Service Parts Operations (SPO) replacement part, after programming, these modules 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. A PCM 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.

Use this procedure after replacing:

- Passlock(tm) Sensor
- Passlock(tm) Module.
- PCM

**NOTE: Ensure current Techline(R) Service Programming System (SPS) software is used.**

1. Turn ignition on, with engine off.
2. Attempt to start engine, then release key to ON position. Vehicle should not start.
3. Observe SECURITY indicator light for about 10 minutes. Indicator light should turn off.
4. Turn ignition off and wait 5 seconds.
5. Repeat steps 1 -4 two more times for a total of 3 cycles/30 minutes. Vehicle is now ready to relearn the Passlock(tm) sensor data code and/or passwords on the next ignition switch transition from OFF to CRANK position.

**NOTE: Vehicle learns Passlock(tm) sensor data code and/or password on the next ignition switch transition from OFF to CRANK position. Ignition must be turned off before attempting to start vehicle.**

6. Start engine. Vehicle has now learned the Passlock(tm) sensor data code and/or password.
7. Using scan tool, clear any DTCs. History DTCs will self clear after 100 ignition cycles.

Set Up a New Theft Deterrent Control Module (Aztek, Montana, Rendezvous, Silhouette & Venture)

**NOTE: When replacing a theft deterrent control module with an GM Service Parts Operation (SPO) Replacement Part, set up the control module prior to the 10-minute relearn procedure or the 30-minute relearn procedure.**

Use this procedure only if replacing the theft deterrent control module with an GM SPO Replacement Part.

1. Connect a scan tool to the vehicle.
2. Turn ON the ignition, with the engine OFF.
3. With a scan tool, select Setup New VTD Module in the Vehicle Theft Deterrent, Special Functions data list.
4. Follow the scan tool on-screen instructions.

**NOTE: When replacing a theft deterrent control module with an GM SPO Replacement Part, the module will learn the keys immediately. The existing Powertrain Control Module (PCM) must learn the new fuel continue password when you replace the theft deterrent control module.**

When replacing a PCM with a GM SPO Replacement Part, the new PCM will learn the incoming fuel continue password immediately after programming and upon receipt of a password message. Once a password message is received and a password is learned, perform the learn procedure to change this password again. A PCM which had been installed in another vehicle will have learned the fuel continue password of the other vehicle's theft deterrent control module. Perform either the 10-minute relearn procedure or the 30-minute relearn procedure after programming to learn the fuel continue password of the current vehicle's theft deterrent control modules.

When performing either relearn procedure, all previously learned keys will be erased from the theft deterrent control module's memory.

Additional keys may be learned immediately after the first relearn procedure by inserting the additional key and turning the ignition switch to RUN position within 10 seconds of removing the previously learned key.

Use only a master key when performing the first relearn procedure. If you use a valet key first, the theft deterrent control module will not allow additional keys to be learned.

#### **10-Minute Learn Procedure (Aztek, Montana, Rendezvous, Silhouette & Venture)**

**NOTE: Use this procedure after replacing the following components:**

- **The Passkey(R) III (PK3) keys.**
- **The theft deterrent control module.**
- **The PCM.**

**If replacing a theft deterrent control module with a GM SPO Replacement Part, perform the procedure to setup a new theft deterrent control module prior to the 10-minute relearn procedure.**

1. Connect a scan tool to the vehicle.
2. Turn ON the ignition, with the engine OFF.
3. Insure that all power consuming devices are turned OFF on the vehicle.
4. With a scan tool, select Request Info. under Service Programming System and follow the scan tool on-screen instructions.

5. Disconnect the scan tool from the vehicle and connect the scan tool to a Techline Terminal with the current Service Programming System (SPS) software.
6. On the Techline Terminal, select Service Programming System and follow the Techline Terminal on-screen instructions.
7. Disconnect the scan tool from the Techline Terminal and reconnect the scan tool to the vehicle.
8. With a master Passkey(R) III key, turn ON the ignition with the engine OFF.
9. With a scan tool, select Program ECU under Service Programming System.
10. At this point the scan tool must remain connected for the duration of the 10-minute relearn procedure.

**NOTE: On some vehicles the SECURITY telltale maybe illuminated on steady for the duration of the 10-minute relearn procedure.**

11. 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 ON.
12. Turn OFF the ignition and wait 5 seconds.
13. With a master Passkey(R) III key, start the vehicle. The theft deterrent control module has now learned the key transponder information and the PCM has now learned the fuel continue password.

**NOTE: Perform this step ONLY on vehicles with EXPORT configured theft deterrent control modules.**

14. Turn OFF the ignition and wait 15 seconds minimum.

**NOTE: Perform this step ONLY on vehicles with EXPORT configured theft deterrent control modules.**

15. With a second master Passkey(R) III key, start the vehicle. The theft deterrent control module has now learned the second master Passkey(R) III key transponder information.
16. With a scan tool, clear any DTCs.

**30-Minute Learn Procedure (Aztek, Montana, Rendezvous, Silhouette & Venture)**

**NOTE: Use this procedure after replacing the following components:**

- The Passkey(R) III (PK3) keys.



- The theft deterrent control module.
- The PCM.

**This procedure is not available on vehicles equipped with option code (Z49 or BAE).**

**If replacing a theft deterrent control module with an GM SPO Replacement Part, perform the procedure to setup a new theft deterrent control module prior to the 30-minute relearn procedure.**

1. With a master Passkey(R) III key (Black), turn ON the ignition, with the engine OFF.
2. Observe the Security telltale, after approximately 10 minutes the telltale will turn off.
3. Turn OFF the ignition, and wait 5 seconds.
4. Repeat steps 1 -3 two more times for a total of 3 cycles or 30 minutes.

**NOTE: The vehicle learns the key transponder information and/or passwords on the ignition switch transition from OFF to CRANK. You must turn the ignition OFF before attempting to start the vehicle.**

5. With a master Passkey(R) III key, start the vehicle. The vehicle has now learned the key transponder information and the PCM has now learned the fuel continue password.
6. With a scan tool, clear any DTCs.

**10 Minute Learn Procedure With Standard Key (Bravada, Envoy, Envoy XL & Trailblazer)**

**NOTE: The Body Control Module (BCM) must be programmed with the proper RPO configurations before performing learn procedures. See PROGRAMMING in appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.**

**NOTE: This procedure requires a Tech 2 scan tool and a Techline terminal with current SPS (Service Programming System) software.**

If replacing the BCM with a GM Service Parts Operations (SPO) replacement part, the module will learn Passlock(tm) sensor data code immediately. The existing PCM however, must learn the new fuel continue password when the BCM is replaced.

If replacing a PCM with a GM Service Parts Operations (SPO) replacement part, after programming, these modules 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. A PCM 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.

Use this procedure after replacing:

- Passlock(tm) Sensor
- BCM
- PCM

1. Connect the Tech 2 to the vehicle.
2. Select "Request Information" under "Service Programming".
3. Disconnect the Tech 2 from the vehicle and connect it to a techline terminal.
4. On the techline terminal, select "Theft Module Re-Learn" under "Service Programming".
5. Disconnect the Tech 2 from the techline terminal and connect it to the vehicle.
6. Turn ON the ignition, with the engine OFF.
7. Select "VTD Re-Learn" under "Service Programming".
8. Attempt to start the engine, then release the key to ON (vehicle will not start).
9. Observe the SECURITY telltale, after approximately 10 minutes the telltale will turn OFF (the vehicle is now ready to relearn the Passlock(tm) Sensor Data Code and/or password on the next ignition switch transition from OFF to CRANK).
10. Turn OFF the ignition, and wait 5 seconds.
11. Start the engine (the vehicle has now learned the password).
12. With the Tech 2 (scan tool), clear any DTCs.

#### **30 Minute Learn Procedure With Standard Key (Bravada, Envoy, Envoy XL & Trailblazer)**

1. Turn ON the ignition, with the engine OFF.
2. Attempt to start the engine, then release the key to ON (vehicle will not start).
3. Observe the SECURITY telltale, after approximately 10 minutes the telltale will turn OFF.
4. Turn OFF the ignition, and wait 5 seconds.
5. Repeat steps 1 -4 two more times for a total of 3 cycles/30 minutes (the vehicle is now ready to relearn the Passlock(tm) Sensor Data Code and/or passwords on the next ignition switch transition from OFF to CRANK).

**NOTE: The vehicle learns the Passlock(tm) Sensor Data Code and/or**

**password on the next ignition switch transition from OFF to CRANK. You must turn the ignition OFF before attempting to start the vehicle.**

6. Start the engine (the vehicle has now learned the Passlock(tm) Sensor Data Code and/or password).
7. With a scan tool, clear any DTCs if needed (history DTCs will self clear after 100 ignition cycles).

**Procedure To Set Up New Theft Deterrent Control Module With Transponder Key (Bravada, Envoy, Envoy XL & Trailblazer)**

**NOTE:** When replacing a theft deterrent control module with a GM Service Parts Operation (SPO) Replacement Part, the module will learn keys immediately. The existing PCM however, must learn the new fuel continue password when the theft deterrent control module is replaced.

**NOTE:** When replacing a Powertrain Control Module (PCM) with a GM Service Parts Operation (SPO) Replacement Part, after programming, these modules 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 relearn procedure must be performed to change this password again. A PCM which has been previously installed in another vehicle will have learned the fuel continue password of the other vehicles theft deterrent control module and will require performing the 10 Minute Re-Learn Procedure to learn the fuel continue password of the current vehicles theft deterrent control modules.

**NOTE:** When replacing a theft deterrent control module with a GM Service Parts Operation (SPO) Replacement Part, the procedure to setup a new theft deterrent control module must be performed prior to the 10 Minute Re-Learn Procedure.

**NOTE:** Use this procedure only if replacing the theft deterrent control module with a GM Service Parts Operation (SPO) Replacement Part.

1. Connect the Tech 2 diagnostic scan tool to the vehicle.
2. Turn ON the ignition, with the engine OFF.

3. With the scan tool, select Setup New VTD Module in the Vehicle Theft Deterrent, Special Functions data list.
4. Follow the scan tool on-screen instructions.

**10 Minute Re-Learn Procedure (Bravada, Envoy, Envoy XL & Trailblazer)**

**NOTE:** When performing the 10 Minute Re-Learn Procedure, 2 master Passkey(R) III+ (PK3+) keys are required. If a Gray valet key is learned first, the theft deterrent control module will not allow additional keys to be learned.

**NOTE:** When performing the 10 Minute Re-Learn Procedure, all previously learned keys will be erased from the theft deterrent control module's memory.

**NOTE:** Additional keys may be learned immediately after the 10 Minute Re-Learn Procedure.

Use this procedure after replacing any of the following components:

- The Passkey(R) III+ (PK3+) keys.
- The theft deterrent control module.
- The PCM.

**NOTE:** This procedure requires a Tech 2 scan tool and a Techline Terminal with current Service Programing System (SPS) software.

1. Connect the Tech 2 diagnostic scan tool to the vehicle.
2. With the scan tool, select Request Info. under Service Programing System and follow the scan tool on screen instructions.
3. Disconnect the scan tool from the vehicle and connect it to a Techline Terminal with current Service Programing System (SPS) software.
4. On the Techline Terminal, select Service Programming Systems and follow the Techline Terminal on screen instructions.
5. Disconnect the scan tool from the Techline Terminal and reconnect it to the vehicle.
6. With a master Passkey(R) III+ (PK3+) key, turn ON the ignition, with the engine OFF.
7. With the scan tool, select Program ECU under Service Programing System.
8. At this point the scan tool must remain connected for the duration of the 10 Minute Re-Learn Procedure.
9. Observe the SECURITY telltale or the scan tool on screen timer, after approximately 10 minutes the scan tool timer will expire and/or the telltale will turn off. The vehicle is

now ready to relearn the key information and/or passwords on the next ignition switch transition from OFF to CRANK.

10. Turn OFF the ignition and wait 5 seconds.
11. With a master Passkey(R) III+ (PK3+) key, start the vehicle, the theft deterrent control module has now learned the key transponder information and the PCM has now learned the fuel continue password.
12. Turn OFF the ignition and wait 15 seconds minimum.
13. With a second master Passkey(R) III+ (PK3+) key, start the vehicle, the theft deterrent control module has now learned the second master Passkey(R) III+ (PK3+) key transponder information.
14. Learning Additional keys, if required.
15. With the scan tool, clear any DTCs.

#### Auto Learn Method (Vue)

**CAUTION: DO NOT use a BCM from another vehicle to aid in diagnosis. BCM's are not interchangeable after they have been installed.**

**NOTE: Passlock(R) learn procedure must be performed when Passlock (R) sensor, BCM or ECM are replaced. If only Passlock(R) sensor was replaced, auto learn method may be used. BCM or ECM replacement requires Saturn service stall method. Saturn service stall method require use of Tech 2 scan tool.**

**NOTE: If ignition is turned off before SECURITY indicator light changes state, relearn procedure must be restarted.**

1. Check BCM and ECM for existing DTCs. If DTCs exist, repair as necessary and go to next step. If no DTCs exist, go to next step.
2. Turn ignition switch to RUN position. Momentarily turn ignition switch to START position. DO NOT start vehicle. Wait 10 minutes. When SECURITY indicator light changes from flashing to off, or from on to off, turn ignition switch to OFF position. Perform this process 3 times. After third time, vehicle should start on next ignition cycle.

#### Saturn Service Stall Method (Vue)

**NOTE: If ignition is turned off before SECURITY indicator light changes state, relearn procedure must be restarted.**

1. Check BCM and ECM/ECM for existing DTCs. If DTCs exist, repair as necessary and

go to next step. If no DTCs exist, go to next step.

2. Install scan tool. Turn ignition switch to RUN position. Using scan tool, select Passlock (R) relearn procedure. Wait 10 minutes. When SECURITY indicator light changes from flashing to off, or from on to off, turn ignition switch to OFF position. Vehicle should start on next ignition cycle.

## **THROTTLE BODY RELEARN PROCEDURE**

### **Vuc - 3.0L**

1. Turn ignition off for 10 seconds.
2. Turn ignition on, engine off.
3. Ensure these engine operating parameters are met before proceeding:
  - ECT is 41-212°F (5-100°C).
  - IAT is more than 41°F (5°C).
  - Battery voltage is more than 10 volts.
  - Accelerator pedal angle is less than 14 degrees.
4. Leave ignition on for one minute with engine off.

The ECM will start at 29 seconds to cycle the throttle plate from rest position to full closed, then from the full closed position to around 14 percent. This will take about 3 seconds. The ECM will then return the throttle to the rest position. During this throttle plate cycle, the ECM will have learned the lower and rest position TP sensor values, actuator motor torque to overcome spring pressure as well as both spring return rates.

## **JEEP**

### **DRIVE LEARN PROCEDURE (GRAND CHEROKEE & LIBERTY)**

**NOTE:** Using DRBIII(R), perform the following transmission drive learn procedures based on customer complaint or if symptom exists.

#### **Procedure To Learn A Smooth 1st Neutral To Drive Shift**

**NOTE:** Transmission fluid temperature must be between 80-110°F (27-43°C).

Perform this procedure only if the complaint is for a delayed or harsh shift the first time the transmission is put into gear after the vehicle is allowed to set with the engine not running for at least 10 minutes. Use the following steps to have the TCM learn the 1st N-1 UD Clutch Volume Index (CVI).

1. Start vehicle only when the engine and ignition have been off for at least 10 minutes.

2. With the vehicle at a stop and the service brake applied, record the UD CVI while performing a Neutral to Drive shift. During the shift, the UD CVI will temporarily show a different value which is the 1st N-1 UD CVI. The 1st N-1 UD CVI account for air entrapment in the UD clutch that may occur after the engine has been off for a period of time.
3. Repeat steps 1 and 2 until the recorded 1st N-1 UD CVI value stabilizes.

**Procedure To Learn A Smooth Neutral To Drive Garage Shift**

**NOTE:** It is important that this procedure be performed when the transmission fluid temperature is between 80-110°F (27-43°C). If this procedure takes too long to complete fully for the allowed transmission fluid temperature, the vehicle may be returned to the customer with an explanation that the shift will improve daily during normal vehicle usage. TCM also learns at higher fluid temperatures, but these values (line pressure correction values) are not available for viewing on the DRBIII(R).

**NOTE:** The transmission fluid temperature must be between 80-110°F (27-43°C) to learn the UD CVI. Additional learning occurs at temperatures as low as 0°F (-17°C) and as high as 200°F (94°C). This procedure may be performed at any temperature that experiences poor shift quality. Although the UD CVI may not change, shift quality should improve.

Perform this procedure if the complaint is for a delayed or harsh shift when the transmission is put into gear after the vehicle has had its first shift. Use the following steps to have the TCM learn the N-1 UD Clutch Volume Index (CVI).

1. Start the engine and shift to Drive.
2. Move the vehicle forward to a speed of at least 10 MPH and come to a stop. This ensures no air is present in the UD hydraulic circuit.
3. Perform repeated N-1 shifts at a stop while pausing in Neutral for at least 2-3 seconds and monitor UD CVI volume until the value stabilizes. The value will change during the N-D shift. This is normal since the UD value is different for the N-1 shift than the normal value shown, which is used for 4-3 coastdown and kickdowns. Perform repeated shifts in this temperature range until the UD CVI value stabilizes and the N-1 shifts become smooth.
4. This procedure may be performed at any temperature that experiences poor N-1 shift quality. Although the UD CVI may not change, shift quality should improve.

**Procedure To Learn The 1st 2-3 Shift After A Restart Or Shift To Reverse**

**NOTE: The transmission fluid temperature must be above 80°F (27°C).**

Use the following steps to have the TCM learn the 1st 2-3 shift OD Clutch Volume Index (CVI).

1. With the engine running, select Reverse gear for over 2 seconds.
2. Shift the transmission to Drive and accelerate the vehicle from a stop at a steady 15 degree throttle opening and perform a 2-3 shift while noting the OD CVI. During the shift, a different value may appear on the DRBIII(R) screen, which is the 1st 2-3 OD CVI.
3. Repeat steps 1 and 2 until the 1st 2-3 upshift becomes smooth and the 1st 2-3 OD CVI stabilizes.

#### Procedure To Learn A Smooth 2-3 & 3-4 Upshift

**NOTE: Transmission fluid temperature must be above 110°F (43°C).**

Use the following steps to have the TCM learn the OD and 4C Clutch Volume Index (CVIs).

1. Accelerate the vehicle from a stop at a steady 15 degree throttle opening and perform multiple 1-2, 2-3 and 3-4 upshifts. The 2nd 2-3 shift following a restart or shift to Reverse will be shown during the shift as a value between the 1st 2-3 OD CVI and the normal OD CVI. Updates to the normal OD CVI will occur after the 2nd shift into 3rd gear, following a restart or shift to Reverse.
2. Repeat step 1 until the 2-3 and 3-4 shifts become smooth and the OD and 4C CVI become stable.

#### Procedure To Learn A Smooth 4-3 Coastdown & Part Throttle 4-3 Kickdown

**NOTE: Transmission fluid temperature must be above 110°F (43°C).**

Use the following steps to have the TCM learn the UD shift volume.

1. At a vehicle speed between 40-60 MPH, perform repeated 4-3 kickdown shifts.
2. Repeat step 1 until the UD volume becomes somewhat stable and the shift becomes smooth.

#### Procedure To Learn A Smooth 1-2 Upshift & 3-2 Kickdown

**NOTE: Transmission fluid temperature must be above 110°F (43°C).**



Use the following steps to have the TCM learn the 2C shift volume.

1. With a vehicle speed below 30 MPH and the transmission in 3rd gear, perform multiple 3-2 kickdowns.
2. Repeat step 1 until the 3-2 kickdowns become smooth and the 2C CVI becomes stable.

**Procedure To Learn A Smooth Manual 2-1 Pulldown Shift As Well As A Neutral To Reverse Shift**

**NOTE: Transmission fluid temperature must be above 110°F (43° C).**

Use the following steps to have the TCM learn the LR volume.

1. With the vehicle speed around 25-30 MPH in manual 2nd, perform manual pulldowns to Low or 1st gear at closed throttle.
2. Repeat step 1 until the LR CVI become stable and the manual 2-1 becomes smooth.

**Procedure To Learn A Smooth Neutral To Reverse Shift**

**NOTE: Transmission fluid temperature must be above 110°F (43° C).**

Perform the following shifts. With the vehicle at a stop, perform Neutral to Reverse shifts until the shift is smooth. An unlearned Neutral to Reverse shift may be harsh or exhibit a double bump. If any of the shifts are still not smooth after the clutch volume stabilizes, an internal transmission problem may be present.

**Procedure To Learn A Smooth 4-5 Upshift for 545RFE**

**NOTE: Transmission fluid temperature must be above 110°F (43° C).**

Use the following steps to have the TCM learn the 2CA CVI.

1. Accelerate the vehicle through 55 MPH at a steady 10-15 degree throttle opening and perform multiple 4-5 upshifts.
2. Repeat step 1 until the 4-5 shift becomes smooth and the 2C(A) CVI becomes stable. There is a separate 2C volume used and learned for 4-5 shifts, 2C(A). It is independent of the 2C CVI learned on 3-2 kickdowns

#### **POWERTRAIN CONTROL MODULE PROGRAMMING**

**NOTE: If replacing PCM, the correct vehicle mileage and Vehicle Identification Number (VIN) must be programmed into PCM to**

**prevent DTCs from being stored in Controller Anti-Lock Brake (CAB) module and Air Bag Control Module (ACM). If replacing PCM on models equipped with a Sentry Key Immobilizer Module (SKIM), the secret key data must also be updated to enable engine starting.**

Connect scan tool to Data Link Connector (DLC) located below left side of instrument panel. Using scan tool, enter correct VIN and mileage into PCM. Using scan tool manufacturer's instructions, clear DTCs from CAB module and ACM.

#### Updating Secret Key Data

1. Connect DRBIII(R) scan tool to Data Link Connector (DLC) located below left side of instrument panel. Ensure transmission is in Park (A/T) or Neutral (M/T). Turn ignition on. Using scan tool, select THEFT ALARM, SKIM, and then MISCELLANEOUS. Select PCM REPLACED.
2. Place the SKIM in SECURED ACCESS MODE by entering the appropriate 4-digit Personal Identification Number (PIN) for this vehicle. PIN may be obtained from the owner, vehicle's invoice, or from the manufacturer. Press ENTER to transfer secret key data from Sentry Key Immobilizer Module (SKIM) to the PCM. This will enable the vehicle to start.
3. If 3 attempts are made to enter the SECURED ACCESS MODE by using an incorrect PIN, the SECURED ACCESS MODE will be locked out for one hour. To exit lock out mode, leave ignition on with all accessories turned off. After one hour, enter correct PIN. It may be necessary to monitor battery voltage and connect a battery charger.

#### SENTRY KEY IMMOBILIZER MODULE PROGRAMMING

**NOTE: If the PCM and the SKIM are replaced at the same time, program the VIN into the PCM first. All vehicle keys will then need to be replaced and programmed to the new SKIM.**

1. Turn the ignition on (transmission in Park/Neutral).
2. Use the DRBIII(R) and select THEFT ALARM, SKIM then MISCELLANEOUS.
3. Select SKIM MODULE REPLACEMENT (GASOLINE).
4. Program the vehicle 4-digit PIN into the SKIM.
5. Select COUNTRY CODE and enter the correct country.

**NOTE: Be sure to enter the correct country code. If the incorrect country code is programmed into SKIM, the SKIM must be replaced.**

6. Select UPDATE VIN (the SKIM will learn the VIN from the PCM).

7. Press ENTER to transfer the VIN (the PCM will send the VIN to the SKIM)
8. The DRBIII(R) will ask if you want to transfer the secret key. Select ENTER to transfer secret key from the PCM. This will ensure the current vehicle ignition keys will still operate the SKIS.

## **PROGRAMMING IGNITION KEYS TO SENTRY KEY IMMOBILIZER MODULE**

### **Using Scan Tool**

1. Turn the ignition on (transmission in Park/Neutral).
2. Use the DRBIII(R) and select THEFT ALARM, SKIM, then MISCELLANEOUS.
3. Select PROGRAM IGNITION KEYS.
4. Enter secured access mode by entering the vehicle 4-digit PIN.
5. A maximum of eight keys can be learned to each SKIM AT ONE TIME. Once a key is learned to a SKIM it (the key) cannot be transferred to another vehicle.

If ignition key programming is unsuccessful, the DRBIII(R) will display one of the following messages:

### **Programming Not Attempted**

The DRBIII(R) attempts to read the programmed key status and there are no keys programmed in the SKIM memory.

### **Programming Key Failed**

Possible used key from wrong vehicle. SKIM is unable to program key due to one of the following: Faulty ignition key transponder. Ignition key is programmed to another vehicle.

### **8 Keys Already Learned, Programming Not Done**

SKIM transponder ID memory is full. Obtain ignition keys to be programmed from customer (8 keys maximum). Using the DRBIII(R), erase all ignition keys by selecting MISCELLANEOUS and ERASE ALL CURRENT IGN. KEYS. Program all ignition keys.

### **Learned Key In Ignition**

Ignition key transponder ID is currently programmed in SKIM memory.

### **Using Customer Learn Method**

To program ignition keys using customer learn method, 2 programmed valid ignition keys

must be available. If 2 programmed valid ignition keys are not available, scan tool method must be used.

1. Cut the additional Sentry Key Transponder blank(s) to match the ignition switch lock cylinder key code.
2. Insert first valid ignition key into ignition lock cylinder. Turn ignition on for at least 3 seconds, but no more than 15 seconds. Turn ignition off and remove key.
3. Within 15 seconds, insert second valid ignition key and turn ignition on. After 10 seconds a chime will sound and SKIS indicator will begin to flash. Turn ignition off and remove key.
4. Within 60 seconds, insert new ignition key and turn ignition on. After 10 seconds a chime will sound and the SKIS indicator will stop flashing then turn on for 3 seconds and turn off. New key is now programmed to SKIM.
5. Repeat this procedure for additional new keys. A maximum of 8 keys can be programmed to vehicle. Customer learn method will automatically exit if SKIM senses a non-blank ignition key when a blank ignition key should be sensed, if 8 keys are already programmed or ignition switch is turned off for more than 50 seconds.

#### **SHIFT QUALITY QUICK-LEARN PROCEDURE (GRAND CHEROKEE & LIBERTY)**

##### **Overview**

This procedure quickly optimizes shift quality. Procedure must be performed after disconnecting battery or loss of voltage supply to TCM, replacing TCM, transmission internal components, solenoid assembly or torque converter. DRBIII(R) scan tool with proper cartridge must be used to perform shift quality quick-learn procedure.

The following conditions must be met when performing shift quality quick-learn procedure: oil temperature must be greater than 60°F (16°C), brakes must be applied when indicated, engine speed greater than 500 RPM, throttle angle less than 3 degrees, gearshift lever must be in Neutral and moved only when indicated, gearshift lever must remain in Overdrive as indicated until DRBIII(R) indicates procedure is completed.

It is imperative that vehicle be shifted into OD with engine running and ensure fluid level is correct. This will purge air in clutch circuits to prevent erroneous clutch volume values, which could cause poor initial shift quality.

If unused replacement TCM is installed on vehicle with engine at normal operating temperature, shift quality quick-learn procedure will cause TCM to indicate a cold oil temperature. Oil temperature must be monitored with DRBIII(R). If oil temperature is less than 60°F (16°C), allow engine to idle until oil temperature is greater than 60°F (16°C). If oil temperature is greater than 200°F (94°C), allow transmission to cool until oil temperature is less than 200°F (94°C).

## 2002 Chevrolet Camaro

2002 GENERAL INFORMATION Computer Relearn Procedures - Domestic

### Quick-Learn Procedure

Connect DRBIII(R) scan tool to DLC. Using proper cartridge and DRBIII(R) manufacturer's instructions, move through program to enter 45RFE or 545RFE menu. Start vehicle. Select TRANSMISSION, and then MISCELLANEOUS functions. Apply brakes. Select QUICK-LEARN function. Follow manufacturer's instructions displayed on DRBIII(R). After quick-learn procedure is completed, perform **DRIVE LEARN PROCEDURE (GRAND CHEROKEE & LIBERTY)** .