

COMPUTER RELEARN PROCEDURES

2001 Chevrolet Camaro

GENERAL INFORMATION
2001 Domestic Computer Relearn Procedures

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.
- * 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 powertrain control computers may require a computer relearn procedure after the 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 TEST (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.

Test Procedure

1) Turn ignition switch to ON position. Simultaneously depress and hold power (PWR) button and recirculation icon button of ATC control panel for 5 seconds, then release. DELAY and recirculation symbol of ATC control panel Vacuum Fluorescent (VF) display window will flash when calibration procedure has begun. Calibration procedure should take less than 20 seconds to complete.

2) When DELAY and recirculation icon in ATC control panel VF display stop flashing, calibration procedure has been completed successfully. If VF display remains flashing for longer than 20 seconds, ATC module has detected a fault with a actuator or actuator door operation during calibration test, and DTC/fault message has been stored in ATC module. VF display icons will continuously flash, even after ignition switch has been cycled off and on, until either another calibration test is successfully completed, or until vehicle has been driven about 3 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-HEATER SYSTEM (SEBRING CONVERTIBLE, SEBRING SEDAN & STRATUS SEDAN)

Anytime negative battery cable is disconnected or battery voltage to Body Control Module (BCM) is less than 10 volts, blend, mode and recirculation door actuators for A/C and heater system must be recalibrated. Prior to replacing suspect part, disconnect negative battery cable for one minute. This will automatically initiate calibration.

BODY CONTROL MODULE (CARAVAN, TOWN & COUNTRY, & VOYAGER)

NOTE: If vehicle is equipped with Vehicle Theft Security System (VTSS) and procedure is not performed, vehicle may not start.

Turn ignition switch to ON position for 15 minutes to allow BCM to learn VIN. If vehicle is equipped with VTSS, connect scan tool and follow on-screen instructions to enable VTSS after installing new BCM.

BODY CONTROL MODULE (SEBRING CONVERTIBLE, SEBRING SEDAN & STRATUS SEDAN)

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.

BODY CONTROL MODULE (300M, CONCORDE, DAKOTA, DURANGO, INTREPID, LHS, RAM PICKUP, RAM VAN & RAM WAGON)

NOTE: This applies to Central Timer Module (CTM), Integrated Electronic Module (IEM) or power lock and Remote Keyless Entry (RKE) module

Using scan tool, record settings and customer preferences before replacement. After installation, use scan tool to program new module. Follow scan tool directions. For more information, see appropriate BODY CONTROL MODULES article.

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.

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.

PCM PROGRAMMING & CLEARING DTCS FROM ABS & SRS MODULES (EXCEPT SEBRING & STRATUS)

NOTE: If Powertrain Control Module (PCM) was replaced, 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 Anti-Lock Brake System (ABS) module and Supplemental Restraint System (SRS) module. To program PCM and clear DTCs from ABS and SRS modules, proceed to appropriate procedure listed. If replacing Powertrain Control Module (PCM) on models equipped with a Sentry Key Immobilizer System (SKIS), the secret key data must also be updated to enable engine starting. To update secret key data, perform SKIS procedure. See SENTRY KEY IMMOBILIZER SYSTEM INITIALIZATION PROCEDURE (EXCEPT SEBRING COUPE, STRATUS COUPE, SEBRING CONVERTIBLE, SEBRING SEDAN & STRATUS SEDAN).

Connect scan tool to Data Link Connector (DLC) below driver's side of instrument panel. Using scan tool, enter correct VIN and mileage into PCM. Using scan tool manufacturer's instructions, clear DTCs from ABS and SRS modules.

PCM PROGRAMMING (SEBRING CONVERTIBLE, SEBRING SEDAN & STRATUS SEDAN)

This procedure needs to be completed every time a PCM is replaced. Secret key data must be programmed into SKIM from PCM. See SKIM MODULE (SEBRING CONVERTIBLE, SEBRING SEDAN & STRATUS SEDAN).

Connect scan tool to Data Link Connector (DLC). Turn ignition switch to ON position. Using scan tool, select THEFT ALARM, SKIM then MISCELLANEOUS. Then select PCM REPLACED. Enter secured access mode by entering 4-digit pin. Press enter to transfer secret key to new PCM. Now enter VIN and mileage into new PCM. Using scan tool, clear DTCs from ABS and ACM.

PINION FACTOR PROCEDURE (ALL FWD CARS EXCEPT NEON, SEBRING CONVERTIBLE, SEBRING SEDAN & STRATUS SEDAN, & ALL FWD VANS)

1) Electronic pinion factor procedure must be performed to provide proper speedometer operation if Transmission Control Module (TCM) is replaced. 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. For DLC location, see appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

3) Select TRANSMISSION system, MISCELLANEOUS functions, then PINION FACTOR. Scan tool will now display tire size. If tire size is incorrect, press ENTER key and select correct size. Press PAGE BACK key to exit procedure.

POWER LIFTGATE & POWER SLIDING DOOR LEARN CYCLE (CARAVAN & TOWN & COUNTRY)

Description

Learn cycle is necessary if any power liftgate or power sliding door component has been removed or replaced, liftgate or door has been adjusted, battery has been disconnected or DTCs have been cleared. Power Sliding Door Module (PSDM) learns travel limits and door travel resistance. Power Liftgate Module (PLGM) learns liftgate travel resistance.

Procedure

Connect scan tool to Data Link Connector (DLC), located on lower left edge of instrument panel. Turn ignition switch to ON position. Check for power liftgate and power sliding door codes. Clear any DTCs. Operate power liftgate or power sliding door and recheck for DTCs. If any DTCs exist, diagnose and repair as necessary. See BODY CONTROL MODULES - CARAVAN, TOWN & COUNTRY, & VOYAGER article. Using scan tool, select test routine menu and command power open. Select power close. If scan tool is not available, open and close power liftgate or power sliding door using switches. Ensure power liftgate or power sliding door cycles through complete open and close cycle. If power liftgate or power sliding door will not fully open or close, a problem still exists. Diagnose and repair as necessary.

SENTRY KEY IMMOBILIZER SYSTEM INITIALIZATION PROCEDURE (EXCEPT SEBRING COUPE, STRATUS COUPE, SEBRING CONVERTIBLE, SEBRING SEDAN & STRATUS SEDAN)

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.

General Information

If Powertrain Control Module (PCM) is replaced, unique secret

key data must be transferred from Sentry Key Immobilizer Module (SKIM) to PCM. This procedure requires SKIM to be placed in SECURED ACCESS mode using 4-digit Personal Identification Number (PIN) code.

If PCM and SKIM are replaced at the same time, program Vehicle Identification Number (VIN) into PCM first. All vehicle keys will need to be replaced and programmed into new SKIM.

SECURED ACCESS mode is not required to check programmed status of key.

If 3 attempts are made to enter secured access mode using an incorrect PIN code, SECURED ACCESS mode will be locked out for one hour. To exit lock out mode, turn ignition switch to on position continuously for one hour then enter the correct PIN code. Ensure all accessories are turned off. Monitor battery state and connect battery charger as necessary.

To program smart keys using "customer programming method" requires 2 valid smart keys. See appropriate ANTI-THEFT SYSTEMS article.

CAUTION: If wrong country code is programmed into SKIM when requested, SKIM must be replaced.

Initialization Procedure

Obtain vehicle's unique PIN code assigned to it's original SKIM module from vehicle owner or Chrysler's customer center before performing the following procedure.

1) Turn ignition switch to ON position and ensure vehicle transmission is in Park position. Using scan tool, select THEFT ALARM, SKIM, then MISCELLANEOUS. Select SKIM MODULE REPLACEMENT (GASOLINE) function.

2) Program unique 4-digit PIN code into SKIM. Select COUNTRY CODE and program correct country code into SKIM's memory (U.S.).

3) Select UPDATE VIN and press ENTER. PCM will transfer vehicle's VIN to SKIM automatically.

4) Scan tool will ask if "Secret Key" data is to be transferred. Press ENTER to transfer vehicle's unique "Secret Key" data from PCM. This process will ensure all current vehicle keys will still operate the SKIS system.

SKIM MODULE (SEBRING CONVERTIBLE, SEBRING SEDAN & STRATUS SEDAN)

General Information

SECURED ACCESS mode is not required to check programmed status of key. If Powertrain Control Module (PCM) is replaced, unique secret key data must be transferred from Sentry Key Immobilizer Module (SKIM) to PCM. This procedure requires SKIM to be placed in SECURED ACCESS mode using 4-digit PIN code.

SKIM will only remain in secured access mode for 60 seconds. If incorrect unique Personal Identification Number (PIN) is entered 3 times, SKIM will be locked for one hour. To exit lock out mode, turn ignition switch to RUN position continuously for one hour. Ensure all accessories are turned off. Monitor battery state and connect battery charger is necessary. To program smart keys using "customer programming method" requires 2 valid smart keys. See owner's manual.

Initialization Procedure

1) Obtain vehicle's unique PIN number assigned to it's

original SKIM module from vehicle owner or Chrysler's customer center.

2) Using scan tool, select THEFT ALARM, SKIM, then MISCELLANEOUS. Select SKIM MODULE REPLACED function.

3) Enter SECURED ACCESS mode using unique 4-digit PIN number.

4) Program vehicle's VIN number into SKIM's memory.

5) Program country code into SKIM's memory (U.S.).

6) Transfer vehicle's unique Secret Key data from PCM. This process will require SKIM module to be in SECURED ACCESS mode. PIN number must be entered into scan tool before SKIM will enter SECURED ACCESS mode. Once SECURED ACCESS mode is active, SKIM will remain in that mode for 60 seconds.

7) Program all customer keys into SKIM's memory. This requires that SKIM be in SECURED ACCESS mode. SKIM will immediately exit SECURED ACCESS mode after each key is programmed.

TRANSAXLE/TRANSMISSION SHIFT QUALITY QUICK LEARN PROCEDURE

(CARS EXCEPT SEBRING COUPE & STRATUS COUPE, ALL FWD VANS & DAKOTA 4.7L, DURANGO 4.7L & GRAND CHEROKEE 4.7L)

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 assembly was 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. For DLC location, see appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

4) Go to TRANSMISSION display on scan tool. 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. Remove scan tool.

TRANSMISSION CONTROL MODULE (SEBRING CONVERTIBLE, SEBRING SEDAN & STRATUS SEDAN)

Transaxle Quick-Learn Procedure

Connect scan tool to Data Link Connector (DLC). Using scan tool, select TRANSMISSION, MISCELLANEOUS, then TCC BREAK IN. Follow steps displayed on scan tool to complete TCC BREAK IN procedure.

Pinion Factor Procedure

Connect scan tool to Data Link Connector (DLC). Using scan tool, select TRANSMISSION, MISCELLANEOUS, then PINION FACTOR. Follow steps displayed on scan tool to complete 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. For programming customer preferences, see CUSTOMER PREFERENCES.

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	Programmable Module
Next Generation Speed Control Servo	(1)
Powertrain Control Module	(2)
Remote Emergency Satellite Cellular Unit Module	(1)
Restraint Control Module	Programmable Module
Vehicle Dynamics Module	(1)
Virtual Image Instrument Cluster	(3)

(1) - No programming required.

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

(3) - 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)
Powertrain Control Module (2)	(3)

- (1) - No programming required.
(2) - Includes passive anti-theft system.
(3) - For powertrain control module programming, see
PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .
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CONTROL MODULE APPLICATION (CROWN VICTORIA & GRAND MARQUIS)

Module	Configuration
Anti-Lock Brake System Module	(1)
Driver Door Module	Customer Preference
Electronic Automatic Temperature Control Module	(1)
Electronic Crash Sensor	(1)
Lighting Control Module	Customer Preference
Natural Gas Vehicle Module (2)	(1)
Passive Anti-Theft System Module	(3)
Powertrain Control Module	(4)

- (1) - No programming required.
(2) - Natural gas vehicles only.
(3) - See PASSIVE ANTI-THEFT SYSTEM.
(4) - For powertrain control module programming, see
PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .
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CONTROL MODULE APPLICATION (ECONOLINE)

Module	Configuration
4-Wheel Anti-Lock Brake System Module	(1)
Electronic Crash Sensor	(1)
Powertrain Control Module	(2)

- (1) - No programming required.
(2) - For powertrain control module programming, see
PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .
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CONTROL MODULE APPLICATION (ESCAPE)

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

- (1) - No programming required.
(2) - For powertrain control module programming, see
PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .
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CONTROL MODULE APPLICATION (ESCORT)

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

- (1) - No programming required.
(2) - For powertrain control module programming, see
PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .
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CONTROL MODULE APPLICATION (EXCURSION)

Module	Configuration
4-Wheel Anti-Lock Brake System Module (Optional)	(1)
Electronic Crash Sensor Module	(1)
Generic Electronic Module	Programmable Module
Overhead Trip Computer (Optional)	(1)
Parking Aid Module (Optional)	(1)
Passive Anti-Theft System Module	(2)
Powertrain Control Module	(3)

- (1) - No programming required.
(2) - See PASSIVE ANTI-THEFT SYSTEM.
(3) - For powertrain control module programming, see
PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .
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CONTROL MODULE APPLICATION (EXPEDITION & NAVIGATOR)

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

- (1) - No programming required.
(2) - See INSTRUMENT CLUSTER PROGRAMMING.
(3) - For powertrain control module programming, see
PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .
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CONTROL MODULE APPLICATION (EXPLORER & MOUNTAINEER)

Module	Configuration
Air Suspension Control Module	(1)
Driver Seat Module	(1)

Electronic Automatic Temperature Control Module	(1)
Generic Electronic Module/Central Timer Module	(1)
Passive Anti-Theft System Module	(2)
Powertrain Control Module	(3)
Parking Aid Module	(1)
Remote Anti-Theft Personality Module	(1)
Restraint Control Module	(1)
4-Wheel Anti-Lock Brake System Module	(1)

- (1) - No programming required.
(2) - See PASSIVE ANTI-THEFT SYSTEM.
(3) - For powertrain control module programming, see
PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .

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

Module	Configuration
Generic Electronic Module	Programmable Module
Passive Anti-Theft System Module	(1)
Powertrain Control Module	(2)
Parking Aid Module	(3)
Rear Anti-Lock Brake Control Module	Programmable Module
Remote Anti-Theft Personality Module/Central Security Module	Programmable Module
Restraint Control Module	(3)
4-Wheel Anti-Lock Brake System Module	(3)

- (1) - See PASSIVE ANTI-THEFT SYSTEM.
(2) - For powertrain control module programming, see
PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .
(3) - No programming required.

CONTROL MODULE APPLICATION (F150 PICKUP)

Module	Configuration
4-Wheel Anti-Lock Brake System Module	(1)
Generic Electronic Module/Central Time Module ..	Programmable Module
Natural Gas Vehicle Module (2)	(1)
Instrument Cluster	(3)
Powertrain Control Module	(4)
Restraint Control Module	(1)
Remote Anti-Theft Personality/Central Security Module	Programmable Module

- (1) - No programming required.
(2) - Natural gas vehicles only.
(3) - See PASSIVE ANTI-THEFT SYSTEM.
(4) - For powertrain control module programming, see
PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .

CONTROL MODULE APPLICATION (F-SUPER DUTY PICKUP)

Module	Configuration
Auxiliary Powertrain Control Module (Optional)	(1)
4-Wheel Anti-Lock Brake System Module	

(Optional)	(2)
Electronic Crash Sensor Module	Programmable Module
Generic Electronic Module	Programmable Module
Overhead Trip Computer (Optional)	Programmable Module
Parking Aid Module (Optional)	(2)
Powertrain Control Module	(1)
Rear Anti-Lock Brake Control Module	Programmable Module

- (1) - For powertrain control module programming, see PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .
- (2) - No programming required.

CONTROL MODULE APPLICATION (FOCUS)

Module	Configuration
4-Wheel Anti-Lock Brake System Module	(1)
Central Security Module	(1)
Central Timer Module	Programmable Module
Electronic Crash Sensor Module	Programmable Module
Hybrid Electronic Instrument Cluster	Programmable Module
Powertrain Control Module (2)	(3)

- (1) - No programming required.
- (2) - Includes passive anti-theft system.
- (3) - For powertrain control module programming, see PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .

CONTROL MODULE APPLICATION (LS)

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

- (1) - Type of module depends on optional equipment level.
- (2) - No programming required.
- (3) - See INSTRUMENT CLUSTER PROGRAMMING .
- (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 (1)	(2)
Hybrid Electronic Instrument Cluster	(3)
Generic Electronic Module	Programmable Module
Powertrain Control Module	(4)
Restraint Control Module	(2)

- (1) - Type of module depends on optional equipment level.
- (2) - No programming required.
- (3) - See INSTRUMENT CLUSTER PROGRAMMING.
- (4) - For powertrain control module programming, see PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .

CONTROL MODULE APPLICATION (RANGER)

Module Configuration

Central Security Module	Programmable Module
Generic Electronic Module	Programmable Module
Powertrain Control Module (1)	(2)
Restraint Control Module	(3)
4-Wheel Anti-Lock Brake System Module (Optional)	(3)
4-Wheel Drive Control Module	(3)

- (1) - Includes passive anti-theft system.
- (2) - For powertrain control module programming, see PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .
- (3) - No programming required.

CONTROL MODULE APPLICATION (SABLE & TAURUS)

Module Configuration

Anti-Lock Brake Control Module	(1)
Generic Electronic Module	Programmable Module
Powertrain Control Module (2)	(3)
Remote Climate Control Module	(1)
Restraint Control Module	(1)

- (1) - No programming required.
- (2) - Includes passive anti-theft system.
- (3) - 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	(1)
Driver Door Module	Programmable Module
Driver Seat Module (Optional)	Programmable Module
Electronic Automatic Temperature Control Module	(1)
Hybrid Electronic Instrument Cluster	(2)
Lighting Control Module	Programmable Module
Next Generation Speed Control Servo	(1)

Powertrain Control Module	(3)
Rear Air Suspension Module	(1)
Restraint Control Module	Air Bag Configuration

- (1) - No programming required.
- (2) - See INSTRUMENT CLUSTER PROGRAMMING.
- (3) - For powertrain control module programming, see
PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .

CONTROL MODULE APPLICATION (VILLAGER)

Module	Configuration
Air Bag Diagnostic Monitor	(1)
Anti-Lock Brake Control Module	(1)
Powertrain Control Module	(2)
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	Programmable Module
Front Electronic Module/Generic Electronic Module	Programmable Module
Instrument Cluster (Message Center Optional) (1)	Programmable Module
Left Power Sliding Door Module (Optional)	(2)
Next Generation Speed Control Servo	(2)
Parking Aid Module (Optional)	(2)
Powertrain Control Module	(3)
Rear Electronic Module	Programmable Module
Remote Keyless Entry/Driver Door Module (4)	Programmable Module
Restraint Control Module	Air Bag Configuration
Right Power Sliding Door Module (Optional)	(2)

- (1) - Includes passive anti-theft system. See
PASSIVE ANTI-THEFT SYSTEM.
- (2) - No programming required.
- (3) - For powertrain control module programming, see
PROGRAMMING POWERTRAIN CONTROL MODULE (ALL MODELS) .
- (4) - Type of module depends on optional equipment level.

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

Programmable Module Installation Procedure

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 and reset procedure.

Remove ignition key from ignition lock cylinder. Close and open driver's door. Connect NGS tester and use service function card. Select SCLM, then ENTER SECURITY ACCESS. Wait 8 minutes for security access to be granted. Select PARAMETER RESET. Insert ignition key into ignition lock cylinder and turn ignition switch to RUN position. Select ICM, then select ENTER SECURITY ACCESS. Wait 10 minutes for security access to be granted. Select RESET SCLM PARAMETER. Disconnect NGS tester. 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)

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

CUSTOMER PREFERENCE INDEX (CROWN VICTORIA & GRAND MARQUIS)

System	Programmable Parameter Item
Security	Horn Chirp
	Auto Locks
Warnings & Chime	Belt Minder

CUSTOMER PREFERENCE INDEX (ESCAPE)

System	Programmable Parameter Item
Warnings & Chime	Belt Minder

CUSTOMER PREFERENCE INDEX (EXCURSION & F250/350 SUPER DUTY)

System	Programmable Parameter Item
Tire Size & Axle Ratio	Tire Size
Warnings & Chime	Belt Minder

CUSTOMER PREFERENCE INDEX (EXPEDITION & NAVIGATOR)

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

CUSTOMER PREFERENCE INDEX (EXPLORER & MOUNTAINEER)

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

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

System	Programmable Parameter Item
Body	Belt Minder

CUSTOMER PREFERENCE INDEX (F150 PICKUP ONLY)

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

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 Sliding Door Caution Smart Lock

INSTRUMENT CLUSTER PROGRAMMING

Some models equipped with passive anti-theft systems 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 (1)	Instrument Cluster Type	Procedure
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Continental	Virtual Instrument Cluster	"B"
Escape	Hybrid Electronic Instrument Cluster	"A"
Expedition	Hybrid Electronic Instrument Cluster	"C"
F150 Pickup	Hybrid Electronic Instrument Cluster	"A"
LS	Instrument Cluster Module	"A"
Mustang	Instrument Cluster Module	"A"
Navigator	Hybrid Electronic Instrument Cluster	"C"
Town Car	Hybrid Electronic Instrument Cluster	"B"

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

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

Instrument Cluster Programming Procedure "A"

Prior to removal of Instrument Cluster Module (ICM), upload module configuration information by performing PROGRAMMABLE MODULE INSTALLATION PROCEDURE using manufacturer's instructions for New Generation Star (NGS) tester. Once ICM has been replaced, download module configuration information from NGS tester into new ICM.

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.

Instrument Cluster Programming Procedure "B"

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.

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.

Instrument Cluster Programming Procedure "C"

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.

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.

Security Access Procedure

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 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.

PASSIVE ANTI-THEFT SYSTEM

Various models use different control modules to operate Passive Anti-Theft System (PATS). To identify PATS control module and for appropriate programming procedure, see PATS CONTROL MODULE IDENTIFICATION table.

PATS CONTROL MODULE IDENTIFICATION

Application	Control Module
Continental	(1) Instrument Cluster Module
Cougar	(2) PCM
Crown Victoria	(2) PATS Module
Escape	(1) Instrument Cluster Module
Excursion	(2) PATS Module
Expedition	(1) Instrument Cluster Module
Explorer	(2) PATS Module
Explorer Sport & Explorer Sport-Trac	(2) PATS Module
Focus	(2) PCM
F150 Pickup	(1) Instrument Cluster Module
Grand Marquis	(2) PATS Module
LS	(1) Instrument Cluster Module
Mountaineer	(2) PATS Module
Mustang	(1) Instrument Cluster Module
Navigator	(1) Instrument Cluster Module
Ranger	(2) PATS Module
Sable	(2) PCM
Taurus	(2) PCM
Town Car	(1) Instrument Cluster Module

Windstar (1) Instrument Cluster Module

- (1) - See INSTRUMENT CLUSTER PROGRAMMING.
 - (2) - See appropriate PASSIVE ANTI-THEFT SYSTEMS article in ACCESSORIES & EQUIPMENT.
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POWER SLIDING DOOR INITIALIZATION (WINDSTAR ONLY)

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). When 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 is in ON position.
- 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 Vehicle Identification (VID) area 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) tester or equivalent. See FLASH VEHICLE IDENTIFICATION (VID) BLOCK PROCEDURE. If original PCM is nonfunctional, it will be necessary to manually reprogram VID block. This procedure can only be performed using Ford's Service Bay Technical System (SBTS) or equivalent.

NOTE: If using a generic scan tool, follow scan tool manufacturer's

instructions to perform FLASH VEHICLE IDENTIFICATION (VID) BLOCK PROCEDURE.

Flash Vehicle Identification (VID) Block Procedure

1) To perform this procedure, NGS tester, Ford Service Function (FSF) card and NGS Flash Cable (007-00531) must be used. Plug flash cable into NGS tester. Plug other end of flash cable into Data Link Connector (DLC), located under instrument panel next to steering column. From the NGS tester main menu, select SERVICE BAY FUNCTIONS, PCM-POWERTRAIN CONTROL MODULE and then PROGRAMMABLE MODULE INSTALLATION.

2) NGS tester display should show 2 selections. The first selection is for old PCM information to be retrieved and stored. The second selection is for loading 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 Vehicle Identification (VID) block has been reprogrammed previously, NGS tester will display a message indicating the need to reflash entire Integrated Circuit (IC). This procedure can only be performed using Ford's Service Bay Technical System (SBTS) or equivalent.

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.

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NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

Crankshaft Position (CKP) Sensor Variation Learn Procedure (2.4L)

1) Procedure must be performed if any of the following have been done or exist:

- * EEPROM was reprogrammed.
- * Diagnostic Trouble Code (DTC) P1336 exists.
- * Crankshaft, crankshaft position sensor, engine or Powertrain Control Module (PCM) have been replaced.
- * Any repairs have been performed that disturbs the crankshaft or vibration damper-to-crankshaft position sensor relationship.

2) CKP sensor variation compensating values are stored in PCM after a learn procedure has been performed. If actual CKP sensor values are not within specification, DTC P0300 will be stored in the PCM.

3) Ensure battery is fully charged. Ensure cable is properly connected on Data Link Connector (DLC). Apply parking brake. Block front wheels. Ensure hood is closed.

4) Place transaxle in Park or Neutral. Ensure all accessories are off. Start engine and warm engine until engine coolant temperature is at least 185°F (85°C).

5) Apply service brakes. With engine idling, use scan tool to select and enable CKP sensor variation learn procedure.

6) Press and hold brake pedal firmly and raise engine speed

to 3920 RPM, releasing throttle as soon as engine cuts out.

CAUTION: Ensure throttle is quickly released to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate or cut out.

7) Using scan tool, verify that CKP sensor variation learn procedure was completed. If CKP sensor variation learn procedure was not completed, go to next step. If CKP sensor variation learn procedure was completed, shut engine off and remove scan tool.

8) If CKP sensor variation learn procedure was not completed, repeat entire procedure up to 10 times. If PCM will not learn the CKP sensor variation compensating values, a DTC P1336 should be stored in the PCM. Perform test procedures for DTC P1336 and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Crankshaft Position (CKP) Sensor Variation Learn Procedure (3.1L & 3.4L)

1) Procedure must be performed if any of the following have been done or exist:

- * EEPROM was reprogrammed.
- * If Diagnostic Trouble Code (DTC) P1336 exists.
- * If crankshaft, crankshaft position sensor, engine, Powertrain Control Module (PCM) or vibration damper have been replaced.

2) CKP sensor variation compensating values are stored in PCM after a learn procedure has been performed. If actual CKP sensor values are not within specification, DTC P0300 will be stored in the PCM.

3) Using scan tool, check for stored DTCs. If no DTCs exist, or if DTC P1336 exists, go to next step. If any DTCs exist except for P1336, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure all DTCs are cleared from PCM. Go to next step.

4) Ensure ignition is off. Apply parking brake. Block front wheels. Ensure hood is closed. Start engine and warm engine until engine coolant temperature is at least 158°F (70°C). Turn ignition switch to OFF position.

NOTE: Ensure engine coolant temperature is at least 158°F (70°C) before performing CKP sensor variation learn procedure.

5) Using scan tool, select and enable crankshaft position system variation learn procedure. Set parking brake when instructed by scan tool.

6) Start vehicle. Apply and hold service brake pedal firmly. Ensure transaxle is in Park. Steadily increase accelerator pedal until fuel cut-off is reached at 5150 RPM and hold. Release accelerator pedal after second fuel cut-off has been reached. Crankshaft position system variation compensating values are learned when RPM decreases back to idle.

7) Check scan tool for status of DTC P1336. If scan tool indicates DTC P1336 ran and passed, CKP sensor variation learn procedure fuel cut-off is complete. If scan tool indicates DTC P1336 failed or was not run, check for any other DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If any other DTCs exist, perform test procedures for specified DTC and repair as necessary. If no other DTCs exist, repeat CKP sensor variation learn procedure.

(EEPROM) Programming (2.4L)

1) If Powertrain Control Module (PCM) was replaced, the EEPROM in the PCM must be programmed. If EEPROM is not programmed, a Diagnostic Trouble Code (DTC) will be set in the PCM or PCM may be damaged. Perform EEPROM programming using the Techline equipment manufacturer's instructions and latest software applicable for the vehicle model.

2) Once EEPROM is reprogrammed, the Crankshaft Position (CKP) sensor variation learn procedure and password learn procedure for anti-theft system must be performed. See CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE (2.4L) and PASSWORD LEARN PROCEDURE FOR ANTI-THEFT SYSTEM.

Electronically Erasable Programmable Read Only Memory
(EEPROM) Programming (3.1L & 3.4L)

1) If Powertrain Control Module (PCM) was replaced, the EEPROM in the PCM must be programmed. If EEPROM is not programmed, a Diagnostic Trouble Code (DTC) will be set in the PCM.

2) Ensure battery is fully charged. If battery is being charged, ensure battery charger is disconnected before performing EEPROM programming procedure.

3) Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using the Techline equipment manufacturer's instructions and latest software applicable for the vehicle model.

4) Once EEPROM is reprogrammed, the Crankshaft Position (CKP) sensor variation learn procedure and password learn procedure for anti-theft system must be performed. See CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE (3.1L & 3.4L) and PASSWORD LEARN PROCEDURE FOR ANTI-THEFT SYSTEM.

5) Perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure engine is idling for one minute before checking for DTCs when performing powertrain OBD system check.

NOTE: If EEPROM programming fails, ensure all electrical connections on PCM are okay. Check Techline for latest software. If EEPROM programming still fails, replace PCM.

Password Learn Procedure For Anti-Theft System

NOTE: If Tech 2 scan tool and Techline terminal is available, a 10 minute procedure is available. Follow scan tool manufacturer's instructions.

1) Turn ignition switch to ON position, engine off. Attempt to start engine, then release key to ON position (vehicle will not start). Observe SECURITY telltale, after approximately 10 minutes, telltale will turn off. Turn ignition switch to OFF position and wait 5 seconds.

2) Repeat step 1) two more times for a total of 3 cycles/30 minutes. Vehicle is now ready to relearn Passlock(TM) Sensor Data Code and/or passwords on next ignition switch transition from off to crank.

NOTE: Vehicle learns Passlock(TM) Sensor Data Code and/or password on next ignition switch transition from off to crank. You must turn ignition off before attempting to start vehicle.

3) Start engine (vehicle has now learned Passlock(TM) Sensor Data Code and/or password). Using scan tool, clear DTCs.

Vehicle Driveability Computer Relearn Procedure (A/T Models)

1) If vehicle battery was disconnected or Powertrain Control Module (PCM) was replaced, turn ignition off. Reconnect PCM battery feed. Turn A/C off. Set parking brake and block drive wheels. Start engine.

2) Idle engine until it reaches operating temperature. Shift transmission into Drive. Allow engine to idle for 5 minutes. Shift transmission selector into Park. Allow engine to idle another 5 minutes. Turn engine off for 30 seconds. Vehicle should now be returned to learned idle.

Vehicle Driveability Computer Relearn Procedure (M/T Models)

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: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

Crankshaft Position (CKP) Sensor Variation Learn Procedure (3.5L)

1) Procedure must be performed if any of the following have been done or exist:

- * EEPROM was reprogrammed.
- * If Diagnostic Trouble Code (DTC) P1336 exists.
- * If crankshaft, crankshaft position sensor, engine, Powertrain Control Module (PCM) or vibration damper have been replaced.

2) CKP sensor variation compensating values are stored in PCM after a learn procedure has been performed. If actual CKP sensor values are not within specification, DTC P0300 will be stored in the PCM.

3) Using scan tool, check for stored DTCs. If no DTCs exist, or if DTC P1336 exists, go to next step. If any DTCs exist except for P1336, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure all DTCs are cleared from PCM. Go to next step.

4) Ensure ignition is off. Apply parking brake. Block front wheels. Ensure hood is closed. Start engine and warm engine until engine coolant temperature is at least 158°F (70°C). Turn ignition switch to OFF position.

NOTE: Ensure engine coolant temperature is at least 158°F (70°C) before performing CKP sensor variation learn procedure.

5) Using scan tool, select and enable CKP sensor variation learn procedure. Start engine. Apply service brakes. Ensure transaxle is in Park.

6) Increase accelerator pedal position until CKP system variation learn fuel cut-off is reached. CKP system variation learn fuel cut-off is reached at 4050 RPM. Do not release accelerator pedal until second fuel cut-off is reached. Crankshaft position system variation compensating values are learned when RPM decreases back to idle.

7) Check scan tool for status of DTC P1336. If scan tool indicates DTC P1336 ran and passed, CKP sensor variation learn

procedure fuel cut-off is complete. If scan tool indicates DTC P1336 failed or was not run, check for any other DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If any other DTCs exist, perform test procedures for specified DTC and repair as necessary. If no other DTCs exist, repeat CKP sensor variation learn procedure.

Crankshaft Position (CKP) Sensor Variation Learn Procedure (4.0L)

1) Procedure must be performed if any of the following have been done or exist:

- * EEPROM was reprogrammed.
- * If Diagnostic Trouble Code (DTC) P1336 exists.
- * If crankshaft, crankshaft position sensor, engine, Powertrain Control Module (PCM) or vibration damper have been replaced.

2) CKP sensor variation compensating values are stored in PCM after a learn procedure has been performed. If actual CKP sensor values are not within specification, DTC P0300 will be stored in the PCM.

3) Using scan tool, check for stored DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If no DTCs exist, or if DTC P1336 exists, go to next step. If any DTCs exist except for P1336, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure all DTCs are cleared from PCM. Go to next step.

4) Ensure ignition is off. Apply parking brake. Block front wheels. Ensure hood is closed. Start engine and warm engine until engine coolant temperature is at least 158°F (70°C). Turn ignition switch to OFF position.

NOTE: Ensure engine coolant temperature is at least 158°F (70°C) before performing CKP sensor variation learn procedure.

5) Using scan tool, select and enable CKP sensor variation learn procedure. Start engine. Apply service brakes. Ensure transaxle is in Park.

6) Accelerate engine until CKP sensor variation learn procedure fuel cut-off is obtained at 5150 RPM. Quickly release throttle to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate. Once CKP sensor variation values are learned, the PCM will return engine control to the operator and engine will respond to throttle position.

7) Check scan tool for status of DTC P1336. If scan tool indicates DTC P1336 ran and passed, CKP sensor variation learn procedure fuel cut-off is complete. If scan tool indicates DTC P1336 failed or was not run, check for any other DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If any other DTCs exist, perform test procedures for specified DTC and repair as necessary. If no other DTCs exist, repeat CKP sensor variation learn procedure.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming

1) If Powertrain Control Module (PCM) was replaced, the EEPROM in the PCM must be programmed. If EEPROM is not programmed, a Diagnostic Trouble Code (DTC) will be set in the PCM.

2) Ensure battery is fully charged. If battery is being charged, ensure battery charger is disconnected before performing EEPROM programming procedure.

3) Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using the Techline equipment manufacturer's instructions and latest

software applicable for the vehicle model.

4) Once EEPROM is reprogrammed, the Crankshaft Position (CKP) sensor variation learn procedure and password learn procedure for anti-theft system must be performed. See CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE (3.5L) or CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE (4.0L) and PASS-KEY(R) III SYSTEM AUTO LEARN PROCEDURE.

5) Perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure engine is idling for one minute before checking for DTCs when performing powertrain OBD system check.

NOTE: If EEPROM programming fails, ensure all electrical connections on PCM are okay. Check Techline for latest software. If EEPROM programming still fails, replace PCM.

PASS-Key(R) III System Auto Learn Procedure

1) Insert a valid mechanical coded unlearned ignition key in the ignition switch. Place ignition switch in the RUN position. The SECURITY indicator light will come on for 10 minutes, the length of the auto learn timer.

2) When auto learn timer expires and SECURITY indicator light goes off, place ignition switch in OFF position. Remove ignition key from ignition. Wait 5 seconds.

3) Repeat steps 1) and 2) 2 more times. Insert the newly learned ignition key in ignition switch.

4) Start vehicle, vehicle has now learned key and password information. Using scan tool, clear any DTCs.

PASS-Key(R) III System Quick Learn Procedure

NOTE: PASS-Key(R) III system quick learn procedure is used to learn additional ignition keys (Black master or Gray valet). A learned Black master key must be used to initiate procedure. Up to 10 ignition keys can be learned.

1) Using a previously learned master key (Black), turn ignition switch to ON position, engine off. Turn ignition switch to OFF position and remove the key.

2) Within 10 seconds, insert new valid mechanical code unlearned key and turn ignition switch to ON position, engine off. Vehicle has now learned the new key.

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NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

Crankshaft Position (CKP) Sensor Variation Learn Procedure

1) Procedure must be performed if any of the following have been done or exist:

- * EEPROM was reprogrammed.
- * If Diagnostic Trouble Code (DTC) P1336 exists.
- * If crankshaft, crankshaft position sensor, engine, Powertrain Control Module (PCM) or vibration damper have been replaced.

2) CKP sensor variation compensating values are stored in PCM after a learn procedure has been performed. If actual CKP sensor values are not within specification, DTC P0300 will be stored in the

PCM.

3) Using scan tool, check for stored DTCs. If no DTCs exist, or if DTC P1336 exists, go to next step. If any DTCs exist except for P1336, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure all DTCs are cleared from PCM. Go to next step.

4) Ensure ignition is off. Apply parking brake. Block front wheels. Ensure hood is closed. Start engine and warm engine until engine coolant temperature is at least 158°F (70°C). Turn ignition switch to OFF position.

NOTE: Ensure engine coolant temperature is at least 158°F (70°C) before performing CKP sensor variation learn procedure.

5) Using scan tool, select and enable CKP sensor variation learn procedure. Start engine. Apply service brakes. Ensure transaxle is in Park.

6) Increase accelerator pedal position until CKP system variation learn fuel cut-off is reached. CKP system variation learn fuel cut-off is reached at 5150 RPM. Do not release accelerator pedal until second fuel cut-off is reached. Crankshaft position system variation compensating values are learned when RPM decreases back to idle.

7) Check scan tool for status of DTC P1336. If scan tool indicates DTC P1336 ran and passed, CKP sensor variation learn procedure fuel cut-off is complete. If scan tool indicates DTC P1336 failed or was not run, check for any other DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If any other DTCs exist, perform test procedures for specified DTC and repair as necessary. If no other DTCs exist, repeat CKP sensor variation learn procedure.

Dash Integration Module (DIM) Programming

Prior to replacing DIM, note vehicle personalization features. To program DIM, see appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming

1) If Powertrain Control Module (PCM) was replaced, the EEPROM in the PCM must be programmed. If EEPROM is not programmed, a Diagnostic Trouble Code (DTC) will be set in the PCM.

2) Ensure battery is fully charged. If battery is being charged, ensure battery charger is disconnected before performing EEPROM programming procedure.

3) Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using the Techline equipment manufacturer's instructions and latest software applicable for the vehicle model.

4) Once EEPROM is reprogrammed, the Crankshaft Position (CKP) sensor variation learn procedure and password learn procedure for anti-theft system must be performed. See CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE and PASS-KEY(R) III SYSTEM AUTO LEARN PROCEDURE.

5) Perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure engine is idling for one minute before checking for DTCs when performing powertrain OBD system check.

NOTE: If EEPROM programming fails, ensure all electrical connections on PCM are okay. Check Techline for latest software. If EEPROM programming still fails, replace PCM.

NOTE: PASS-Key(R) III system auto learn procedure must be performed if Powertrain Control Module (PCM), ignition lock cylinder, reader/exciter or ignition key are replaced.

PASS-Key(R) III System Auto Learn Procedure

- 1) Insert a valid mechanical coded unlearned ignition key in the ignition switch. Place ignition switch in the RUN position. The SECURITY indicator light will come on for 10 minutes, the length of the auto learn timer.
- 2) When auto learn timer expires and SECURITY indicator light goes off, place ignition switch in OFF position. Remove ignition key from ignition. Wait 5 seconds.
- 3) Repeat steps 1) and 2) 2 more times. Insert the newly learned ignition key in ignition switch.
- 4) Start vehicle, vehicle has now learned key and password information. Using scan tool, clear any DTCs.

PASS-Key(R) III System Quick Learn Procedure

NOTE: PASS-Key(R) III system quick learn procedure is used to learn additional ignition keys (Black master or Gray valet). A learned Black master key must be used to initiate procedure. Up to 10 ignition keys can be learned.

- 1) Using a previously learned master key (Black), turn ignition switch to ON position, engine off. Turn ignition switch to OFF position and remove the key.
- 2) Within 10 seconds, insert new valid mechanical code unlearned key and turn ignition switch to ON position, engine off. Vehicle has now learned the new key.

Rear Integration Module (RIM) Programming

Prior to replacing RIM, note vehicle personalization features. To set or change features, install scan tool. Turn ignition switch to ON position, engine off. Under CHASSIS MAIN MENU, select Rear Integration Module (RIM). Under RIM Main Menu, select RECALIBRATION. Follow scan tool on screen instructions to recalibrate automatic level control. Perform vehicle personalization to reset owner's desired personalization settings.

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.

CAMARO & FIREBIRD

NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

Crankshaft Position (CKP) Sensor Variation Learn Procedure (3.8L)

1) Procedure must be performed if any of the following have been done or exist:

- * EEPROM was reprogrammed.
- * If Diagnostic Trouble Code (DTC) P1336 exists.
- * If crankshaft, crankshaft position sensor, engine, Powertrain Control Module (PCM) or vibration damper

have been replaced.

2) CKP sensor variation compensating values are stored in PCM after a learn procedure has been performed. If actual CKP sensor values are not within specification, DTC P0300 will be stored in the PCM.

3) Using scan tool, check for stored DTCs. If no DTCs exist, or if DTC P1336 exists, go to next step. If any DTCs exist except for P1336, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure all DTCs are cleared from PCM. Go to next step.

4) Ensure ignition is off. Apply parking brake. Block rear wheels. Ensure hood is closed. Start engine and warm engine until engine coolant temperature is at least 158°F (70°C). Turn ignition switch to OFF position.

NOTE: Ensure engine coolant temperature is at least 158°F (70°C) before performing CKP sensor variation learn procedure.

5) Using scan tool, select and enable CKP sensor variation learn procedure. Start engine. DO NOT start engine until instructed to do so by scan tool. Apply service brakes. Ensure transmission is in Park.

6) Increase accelerator pedal position until CKP system variation learn fuel cut-off is reached. CKP system variation learn fuel cut-off is reached at 5150 RPM. Do not release accelerator pedal until second fuel cut-off is reached. Crankshaft position system variation compensating values are learned when RPM decreases back to idle.

7) Check scan tool for status of DTC P1336. If scan tool indicates DTC P1336 ran and passed, CKP sensor variation learn procedure fuel cut-off is complete. If scan tool indicates DTC P1336 failed or was not run, check for any other DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If any other DTCs exist, perform test procedures for specified DTC and repair as necessary. If no other DTCs exist, repeat CKP sensor variation learn procedure.

Crankshaft Position (CKP) Sensor Variation Learn Procedure (5.7L)

1) Procedure must be performed if any of the following have been done:

- * EEPROM was reprogrammed.
- * If crankshaft position sensor was removed or replaced.
- * Powertrain Control Module (PCM) has been replaced.

2) Install scan tool on Data Link Connector (DLC). Apply parking brake. Block rear wheels. Ensure hood is closed. Ensure transmission is in Park (A/T models) or Neutral (M/T models). Start engine and allow engine to idle until engine coolant temperature is at least 150°F (65°C). Ensure all accessories are off.

3) Apply brakes. Ensure brakes remain applied during remaining duration of this procedure. Using scan tool, select and enable CKP sensor variation learn procedure.

4) Gradually accelerate engine to 4000 RPM. Quickly release throttle to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate. Once CKP sensor variation values are learned, the PCM will return engine control to the operator and engine will respond to throttle position.

5) If CKP sensor variation learn procedure was not terminated, turn ignition off for at least 15 seconds. CKP sensor variation learn procedure is complete. If CKP sensor variation learn procedure was terminated, turn ignition off. Refer to Diagnostic

Trouble Code (DTC) P1336 for additional diagnostic information. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming

1) If Powertrain Control Module (PCM) was replaced, the EEPROM in the PCM must be programmed. If EEPROM is not programmed, a Diagnostic Trouble Code (DTC) will be set in the PCM.

2) Ensure battery is fully charged. Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using the Techline equipment manufacturer's instructions and latest software applicable for the vehicle model.

3) On 3.8L, once EEPROM is reprogrammed, perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure engine is idling for one minute before checking for DTCs when performing powertrain OBD system check. Perform Crankshaft Position (CKP) sensor variation learn procedure. See CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE (3.8L).

NOTE: If EEPROM programming fails, ensure all electrical connections on PCM are okay. Check Techline for latest software. If EEPROM programming still fails, replace PCM.

4) On 5.7L, once EEPROM is reprogrammed, perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure engine is idling for one minute before checking for DTCs when performing powertrain OBD system check. Also, after EEPROM is reprogrammed, the idle learn procedure and then Crankshaft Position (CKP) sensor variation learn procedure must be performed using proper procedures. See IDLE LEARN PROCEDURE (5.7L). See CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE (5.7L).

Idle Learn Procedure (5.7L)

1) Idle learn procedure must be performed to provide proper positioning of Idle Air Control (IAC) valve to obtain proper engine idle. If idle learn procedure is not performed, engine idle may become unstable. Procedure must be performed if any of the following have been done:

- * Vehicle battery was disconnected.
- * PCM was disconnected or PCM loses battery voltage. On A/T models, go to next step. On M/T models, go to step 4).

2) On A/T models, ensure ignition is off. Restore battery voltage to PCM. Ensure A/C is turned off. Apply parking brake. Block rear wheels. Start engine. Place transmission in Drive. Allow engine to idle for 5 minutes. Place transmission in Park.

3) Allow engine to idle for 5 minutes. Shut engine off for 30 seconds. Clear Diagnostic Trouble Codes (DTC) from PCM. Perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure engine is idling for one minute before checking for DTCs when performing powertrain OBD system check.

4) On M/T models, ensure ignition is off. Restore battery voltage to PCM. Ensure A/C is turned off. Apply parking brake. Block rear wheels. Place transmission in Neutral. Start engine. Allow engine to idle for 5 minutes.

5) Shut engine off for 30 seconds. Clear Diagnostic Trouble Codes (DTC) from PCM. Perform powertrain On-Board Diagnostic (OBD)

system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure engine is idling for one minute before checking for DTCs when performing powertrain OBD system check.

NOTE: New modules are unprogrammed. New module must be programmed with code that matches customer's key for PASS-Key(R) II operation. New module can only be programmed once.

Programming New Body Control Module (BCM)

1) To program a NEW Body Control Module (BCM), install new module into vehicle. Insert customer's key into ignition lock cylinder and turn to RUN position. Start engine to verify operation.

2) Observe SECURITY indicator. SECURITY indicator should illuminate for about 5 seconds and go out (BCM is programmed). If SECURITY indicator flashes one flash per second and engine starts, check wiring, contacts to key resistance pellet, and key for defects or intermittents. Repair or replace as necessary. Repeat procedure because module did not program key code.

Vehicle Driveability Computer Relearn Procedure (All Models)

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.

CATERA

NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

Content Theft Deterrent Systems & Immobilizer

NOTE: All theft deterrent module and Engine Control Module (ECM) functions must be programmed using GM Tech 2 scan tool.

Theft Deterrent module must be programmed after installation with (in order) security code, engine type, key cylinder number and VIN number. ECM must be programmed to learn new frequency code. To obtain security code and key cylinder number, contact dealer or vehicle manufacturer.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming

1) The replacement Powertrain Control Module (PCM) comes with the EEPROM already programmed. However, the PCM must be programmed with proper immobilizer signal for anti-theft system before the vehicle will start. See CONTENT THEFT DETERRENT SYSTEMS & IMMOBILIZER.

2) Once PCM is programmed, perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Idle Relearn Procedure

Using scan tool, verify DTCs are not set. Turn ignition switch to OFF position for 30 seconds. Turn ignition switch to ON position, engine off for 30 seconds. Turn ignition switch to OFF position.

Sun Roof Actuator Programming

- 1) Procedure must be performed when vehicle battery is disconnected. Turn ignition switch to ON position.
- 2) Rotate knob on sun roof control switch to CLOSED position. Sun roof control switch is located on the overhead console near the windshield. After sun roof is fully closed, press and hold knob on sun roof control switch inward for 3 seconds.
- 3) Rotate knob on sun roof control switch to the VENT position. After sun roof moves to the vent position, press and hold knob on sun roof control switch inward for 3 seconds.
- 4) Rotate knob on sun roof control switch to the OPEN position. After sun roof fully opens, press and hold knob on sun roof control switch inward for 3 seconds.
- 5) Rotate knob on sun roof control switch to CLOSED position. After sun roof is fully closed, press and hold knob on sun roof control switch inward for 3 seconds.
- 6) Sun roof actuator is now programmed. If after programming the sun roof actuator, the sun roof opens after being closed, it may be necessary to reprogram actuator up to 3 more times.

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.

CAVALIER & SUNFIRE

NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

Crankshaft Position (CKP) Sensor Variation Learn Procedure

- 1) Procedure must be performed if any of the following have been done or exist:
 - * EEPROM was reprogrammed.
 - * If Diagnostic Trouble Code (DTC) P1336 exists.
 - * If crankshaft, crankshaft position sensor, engine or Powertrain Control Module (PCM) have been replaced.
 - * Any repairs have been performed that disturbs the crankshaft or vibration damper to the crankshaft position sensor relationship.
- 2) CKP sensor variation compensating values are stored in PCM after a learn procedure has been performed. If actual CKP sensor values are not within specification, DTC P0300 will be stored in the PCM.
- 3) Ensure battery is fully charged. Ensure cable is properly connected on Data Link Connector (DLC). Apply parking brake. Block front wheels. Ensure hood is closed.
- 4) Place transaxle in Park (A/T models) or Neutral (M/T models). Ensure all accessories are off. Start engine and warm engine until engine coolant temperature is at least 185°F (85°C).
- 5) Apply service brakes. With engine idling, use scan tool to select and enable CKP sensor variation learn procedure.
- 6) Accelerate engine until CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate or cut out. Quickly release throttle to idle position once CKP sensor variation learn procedure is obtained and engine decelerates or cuts out. Once CKP sensor variation values are learned, the PCM will return engine control to the operator and engine will respond to throttle

position.

CAUTION: Ensure throttle is quickly released to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate or cut out.

7) Using scan tool, verify that CKP sensor variation learn procedure was completed. If CKP sensor variation learn procedure was not completed, go to next step. If CKP sensor variation learn procedure was completed, shut engine off and remove scan tool.

8) If CKP sensor variation learn procedure was not completed, repeat entire procedure up to 10 times. If PCM will not learn the CKP sensor variation compensating values, a DTC P1336 should be stored in the PCM. Perform test procedures for DTC P1336 and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming

1) If Powertrain Control Module (PCM) was replaced, the EEPROM in the PCM must be programmed. If EEPROM is not programmed, a Diagnostic Trouble Code (DTC) will be set in the PCM or PCM may be damaged. Perform EEPROM programming using the Techline equipment manufacturer's instructions and latest software applicable for the vehicle model.

2) Once EEPROM is reprogrammed, the Crankshaft Position (CKP) sensor variation learn procedure must be performed using proper procedure. See CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE.

NOTE: Password must be learned when Passlock(TM) sensor, BCM or PCM is replaced. BCM must be programmed with proper RPO configurations before performing relearn procedures. If PCM is replaced, after programming, PCM will immediately learn the first password it receives. If password needs to be changed, learn procedure will need to be performed.

Password Learn Procedure For Anti-Theft System

1) Clear all DTCs. Turn ignition switch to OFF position. Replace component(s) as necessary.

2) With transmission in Park (A/T) or Neutral (M/T), turn ignition switch momentarily to START position (engine will not start). Leave ignition switch in RUN position (engine off). If Passlock(TM) sensor was replaced, SECURITY indicator light will flash for 10 minutes. If Passlock(TM) module was replaced, SECURITY indicator light will flash for a few seconds, then stay on for 10 minutes. If PCM was replaced, vehicle may start and procedure may not be needed. If replacement PCM was used even momentarily, SECURITY indicator light will flash for a few seconds, then stay on for 10 minutes. After 10 minutes, when light turns off, turn ignition switch to OFF position for 5 seconds.

3) Repeat step 2) twice more. Ignition switch must be turned to OFF position. Auto learn procedure will be completed during next start attempt. Clear all DTCs.

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.

**CENTURY, GRAND PRIX, IMPALA, INTRIGUE, LUMINA, MONTE CARLO &
REGAL**

NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

Crankshaft Position (CKP) Sensor Variation Learn Procedure
(3.1L & 3.4L)

1) Procedure must be performed if any of the following have been done or exist:

- * EEPROM was reprogrammed.
- * If Diagnostic Trouble Code (DTC) P1336 exists.
- * If crankshaft, crankshaft position sensor, engine, Powertrain Control Module (PCM) or vibration damper have been replaced.

2) CKP sensor variation compensating values are stored in PCM after a learn procedure has been performed. If actual CKP sensor values are not within specification, DTC P0300 will be stored in the PCM.

3) Using scan tool, check for stored DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If no DTCs exist, or if DTC P1336 exists, go to next step. If any DTCs exist except for P1336, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure all DTCs are cleared from PCM. Go to next step.

4) Ensure ignition is off. Apply parking brake. Block front wheels. Ensure hood is closed. Start engine and warm engine until engine coolant temperature is at least 158°F (70°C). Turn ignition switch to OFF position.

NOTE: Ensure engine coolant temperature is at least 158°F (70°C) before performing CKP sensor variation learn procedure.

5) Using scan tool, select and enable CKP sensor variation learn procedure. Start engine. Apply service brakes. Ensure transaxle is in Park.

6) Increase accelerator pedal position until CKP system variation learn fuel cut-off is reached. CKP system variation learn fuel cut-off is reached at 5150 RPM. Do not release accelerator pedal until second fuel cut-off is reached. Crankshaft position system variation compensating values are learned when RPM decreases back to idle.

7) Check scan tool for status of DTC P1336. If scan tool indicates DTC P1336 ran and passed, CKP sensor variation learn procedure is complete. If scan tool indicates DTC P1336 failed or was not run, check for any other DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If any other DTCs exist, perform test procedures for specified DTC and repair as necessary. If no other DTCs exist, repeat CKP sensor variation learn procedure.

Crankshaft Position (CKP) Sensor Variation Learn Procedure
(3.5L & 3.8L)

1) Procedure must be performed if any of the following have been done or exist:

- * EEPROM was reprogrammed.
- * If Diagnostic Trouble Code (DTC) P1336 exists.
- * If crankshaft, crankshaft position sensor, engine, Powertrain Control Module (PCM) or vibration damper have been replaced.

2) CKP sensor variation compensating values are stored in PCM after a learn procedure has been performed. If actual CKP sensor values are not within specification, DTC P0300 will be stored in the PCM.

3) Using scan tool, check for stored DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If no DTCs exist, or if DTC P1336 exists, go to next step. If any DTCs exist except for P1336, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure all DTCs are cleared from PCM. Go to next step.

4) Ensure ignition is off. Apply parking brake. Block front wheels. Ensure hood is closed. Start engine and warm engine until engine coolant temperature is at least 158°F (70°C). Turn ignition switch to OFF position.

NOTE: Ensure engine coolant temperature is at least 158°F (70°C) before performing CKP sensor variation learn procedure.

5) Using scan tool, select and enable CKP sensor variation learn procedure. Start engine. Apply service brakes. Ensure transaxle is in Park.

6) Increase accelerator pedal position until CKP system variation learn fuel cut-off is reached. CKP system variation learn fuel cut-off is reached at 4050 RPM (3.5L) or 5150 RPM (3.8L). Do not release accelerator pedal until second fuel cut-off is reached. Crankshaft position system variation compensating values are learned when RPM decreases back to idle.

7) Check scan tool for status of DTC P1336. If scan tool indicates DTC P1336 ran and passed, CKP sensor variation learn procedure is complete. If scan tool indicates DTC P1336 failed or was not run, check for any other DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If any other DTCs exist, perform test procedures for specified DTC and repair as necessary. If no other DTCs exist, repeat CKP sensor variation learn procedure.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming

1) If Powertrain Control Module (PCM) was replaced, the EEPROM in the PCM must be programmed. If EEPROM is not programmed, a Diagnostic Trouble Code (DTC) will be set in the PCM.

2) Ensure battery is fully charged. If battery is being charged, ensure battery charger is disconnected before performing EEPROM programming procedure.

3) Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using the Techline equipment manufacturer's instructions and latest software applicable for the vehicle model.

4) Once EEPROM is reprogrammed, perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure engine is idling for one minute before checking for DTCs when performing powertrain OBD system check. After EEPROM is reprogrammed, the proper Crankshaft Position (CKP) sensor variation learn procedure must be performed. For 3.1L or 3.4L, see CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE (3.1L & 3.4L). For 3.5L or 3.8L, see CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE (3.5L & 3.8L).

NOTE: If EEPROM programming fails, ensure all electrical connections on PCM are okay. Check Techline for latest software. If EEPROM programming still fails, replace PCM.

PASS-Key(R) III Module Programming (Grand Prix)

- * If replacing a theft deterrent module, the new module will learn keys immediately. However, the existing Powertrain Control Module (PCM) must learn the new fuel continue password when theft deterrent module is replaced.
- * If replacing a PCM, after programming, these modules will learn 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 current vehicle's password.
- * When performing 30 minute relearn procedure, all previously learned keys will be erased from theft deterrent module's memory
- * Additional keys may be learned immediately after 30 minute relearn procedure by inserting additional key to be learned and turning ignition switch to RUN position within 10 seconds of removing previously learned key.
- * When performing 30 minute relearn procedure, be sure to use only a master key (Black) during procedure. If a valet key (Gray) is learned first, theft deterrent module will not allow additional keys to be learned.

NOTE: PASS-Key(R) III system auto learn procedure must be performed if all keys are lost, or Powertrain Control Module (PCM), PASS-Key(R) III module, ignition lock cylinder, steering column assembly or ignition key are replaced. A password is communicated between PASS-Key(R) III module and PCM to provide engine operation. If PCM is replaced, the PCM must learn the password from the PASS-Key(R) III module.

PASS-Key(R) III System Auto Learn Procedure (Grand Prix)

- 1) Insert a valid mechanical coded unlearned master ignition key (Black) in the ignition switch. Place ignition switch in RUN position. The SECURITY indicator light will flash once per second for 10 minutes for the length of the auto learn timer.
- 2) When auto learn timer expires and SECURITY indicator light goes off, place ignition switch in LOCK position. Wait 5 seconds.
- 3) Repeat steps 1) and 2) 2 more times. Insert the newly learned ignition key in ignition switch.
- 4) Place ignition switch in RUN position. The SECURITY indicator light should remain off to indicate that ignition key was learned. This will be the only learned key. To program more keys, see PASS-KEY(R) III SYSTEM QUICK LEARN PROCEDURE (GRAND PRIX). If security indicator does not remain off, repeat procedure. Use scan tool to clear any DTCs.

NOTE: PASS-Key(R) III system quick learn procedure is used to learn additional ignition keys. A learned key must be used to initiate procedure. Up to 10 ignition keys can be learned.

PASS-Key(R) III System Quick Learn Procedure (Grand Prix)

- 1) Insert a valid ignition key in the ignition switch. Turn ignition switch to ON position. After 2 second bulb test, turn ignition off and remove key.
- 2) Within 10 seconds, insert new valid mechanical code unlearned key and turn ignition switch to RUN position. Security light will illuminate until key is learned. This may happen so quickly

security light illumination is not observed. Turn ignition switch to OFF position. Remove ignition key 10 seconds after light goes out.

3) To learn additional keys, repeat step 2). To exit procedure, turn ignition off for more than 10 seconds.

Passlock(TM) Theft Deterrent Relearn (Intrigue)

Password must be learned when Passlock(TM) sensor, BCM or PCM is replaced. This procedure must be performed after ignition switch replacement. If BCM is replaced, BCM must be programmed with proper RPO configurations before performing relearn procedures. If PCM is replaced, after programming, PCM will immediately learn the first password it receives. If password needs to be changed, learn procedure will need to be performed.

Turn ignition switch to OFF position. Turn ignition switch from OFF to START position, then leave turned to ON position. SECURITY indicator will come on and stay on for at least 10 minutes. After SECURITY indicator goes out, turn ignition off for 5 seconds. Repeat this procedure 2 more times. After third time, turn ignition off. Turn ignition switch to START position, engine should start and run. Recheck BCM for Diagnostic Trouble Codes (DTC).

NOTE: 10 minute procedure requires special equipment to perform. If special equipment is not available, 30 minute procedure may be used. This procedure allows relearning of BCM or PCM learned data code after replacement of Passlock(TM) module, Passlock(TM) sensor or VCM. DTC B3031 will set when entering programming mode. Reprogram BCM with proper RPO configurations before performing 30 minute relearn procedure. After reprogramming a new PCM, PCM will learn incoming fuel continue password immediately. After initial password is learned, relearn procedure will have to be performed to change password.

PASSLOCK(TM) 30 Minute Relearn Procedure (Impala & Monte Carlo)

1) Clear all DTCs. See scan tool manufacturer's instructions.

Turn ignition switch to OFF position. Replace component(s) as necessary.

2) With transmission in Park (A/T) or Neutral (M/T), turn ignition switch momentarily to START position (engine will not start). Leave ignition switch in RUN position (engine off). After 10 minutes, when SECURITY light turns off, turn ignition switch to OFF position for 5 seconds.

3) Repeat step 2) twice more. Turn ignition switch to OFF position. Auto learn procedure will be completed during next start attempt. Clear all DTCs.

NOTE: New module can only be programmed once. Verify customer's code prior to programming to ensure key code is correct.

Programming New Theft Deterrent Module (Lumina)

1) With new theft deterrent module installed and connected, insert customer's key into ignition key lock cylinder and turn ignition switch to RUN position. New modules are programmed to store first pellet resistance detected. Start engine to verify system operation. If engine starts, go to next step. If engine does not start, diagnose and repair anti-theft system. See appropriate ANTI-THEFT SYSTEMS - LUMINA article under ACCESSORIES & EQUIPMENT.

2) Observe SECURITY indicator light. Indicator light should illuminate for about 5 seconds and go out. This indicates module programming has been successfully completed. If indicator light flashes once per second and engine starts, module did not program.

Check wiring, connectors, contacts to key resistance pellet, and key for defects or intermittents. Repair or replace as necessary and repeat programing 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.

CORVETTE

NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

Crankshaft Position (CKP) Sensor Variation Learn Procedure

1) Procedure must be performed if any of the following have been done or exist:

- * EEPROM was reprogrammed.
- * If Diagnostic Trouble Code (DTC) P1336 exists.
- * If crankshaft, crankshaft position sensor, engine, Powertrain Control Module (PCM) or vibration damper have been replaced.

2) CKP sensor variation compensating values are stored in PCM after a learn procedure has been performed. If actual CKP sensor values are not within specification, DTC P0300 will be stored in the PCM.

3) Using scan tool, check for stored DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If no DTCs exist, or if DTC P1336 exists, go to next step. If any DTCs exist except for P1336, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure all DTCs are cleared from PCM. Go to next step.

4) Ensure ignition is off. Apply parking brake. Block rear wheels. Ensure hood is closed. Start engine and warm engine until engine coolant temperature is at least 158°F (70°C). Turn ignition switch to OFF position.

5) Using scan tool, select and enable CKP sensor variation learn procedure. Start engine. Apply service brakes. Ensure transaxle is in Park.

6) Increase accelerator pedal position until CKP system variation learn fuel cut-off is reached. CKP system variation learn fuel cut-off is reached at 5150 RPM. Do not release accelerator pedal until second fuel cut-off is reached. Crankshaft position system variation compensating values are learned when RPM decreases back to idle.

7) If CKP sensor variation learn procedure was not terminated, go to next step. If CKP sensor variation learn procedure was terminated, this may be caused by PCM detecting a problem in cam signal causing DTC P0341, 3X crank signal causing DTC P1374, or 18X crank signal causing DTC P0336. Using scan tool, check for stored DTCs. Perform test procedures for specified DTCs and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

8) Check scan tool for status of DTC P1336. If scan tool indicates DTC P1336 ran and passed, CKP sensor variation learn procedure is complete. If scan tool indicates DTC P1336 failed or was not run, check for any other DTCs. See appropriate SELF-DIAGNOSTICS

article in ENGINE PERFORMANCE. If any other DTCs exist, perform test procedures for specified DTC and repair as necessary. If no other DTCs exist, repeat CKP sensor variation learn procedure.

Door Control Module (DCM) Programming

On hardtop models, when a Door Control Module (DCM) is replaced, the DCM must be reprogrammed. Using scan tool, select RH DCM for right DCM or LH DCM for left DCM. Select DCM REPROGRAM and follow scan tool instructions.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming

1) If Powertrain Control Module (PCM) was replaced, the EEPROM in the PCM must be programmed. If EEPROM is not programmed, a Diagnostic Trouble Code (DTC) will be set in the PCM.

2) Ensure battery is fully charged. Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using the Techline equipment manufacturer's instructions and latest software applicable for the vehicle model.

3) Once EEPROM is reprogrammed, perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure engine is idling for one minute before checking for DTCs when performing powertrain OBD system check. Also after EEPROM is reprogrammed, the password learn procedure for the anti-theft system must be performed. See PASS-KEY RELEARN PROCEDURE FOR ANTI-THEFT SYSTEM.

NOTE: If EEPROM programming fails, ensure all electrical connections on PCM are okay. Check Techline for latest software. If EEPROM programming still fails, replace PCM.

Idle Learn Procedure

1) Idle learn procedure must be performed to provide proper positioning of Idle Air Control (IAC) valve to obtain proper engine idle. If idle learn procedure is not performed, engine idle may become unstable. Procedure must be performed if any of the following have been done:

- * Vehicle battery was disconnected.
- * PCM was disconnected or PCM loses battery voltage. On A/T models, go to next step. On M/T models, go to step 4).

2) On A/T models, ensure ignition is off. Restore battery voltage to PCM. Ensure A/C is turned off. Apply parking brake. Block rear wheels. Start engine. Place transmission in Drive. Allow engine to idle for 5 minutes. Place transmission in Park.

3) Allow engine to idle for 5 minutes. Shut engine off for 30 seconds. Clear Diagnostic Trouble Codes (DTC) from PCM. Perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure engine is idling for one minute before checking for DTCs when performing powertrain OBD system check.

4) On M/T models, ensure ignition is off. Restore battery voltage to PCM. Ensure A/C is turned off. Apply parking brake. Block rear wheels. Place transmission in Neutral. Start engine. Allow engine to idle for 5 minutes.

5) Shut engine off for 30 seconds. Clear Diagnostic Trouble Codes (DTC) from PCM. Perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure

engine is idling for one minute before checking for DTCs when performing powertrain OBD system check.

PASS-KEY Relearn Procedure For Anti-Theft System

Password must be learned when Passlock(TM) sensor, BCM or PCM is replaced. This procedure must be performed after ignition switch replacement. If BCM is replaced, BCM must be programmed with proper RPO configurations before performing relearn procedures. If PCM is replaced, after programming, PCM will immediately learn the first password it receives. If password needs to be changed, learn procedure will need to be performed.

Turn ignition switch to OFF position. Turn ignition switch from OFF to START position, then leave in on position. SECURITY indicator will come on and stay on for at least 10 minutes. After SECURITY indicator goes out, turn ignition off for 5 seconds. Repeat this procedure 2 more times. After third time, turn ignition off. Turn ignition switch to START position, engine should start and run. Recheck BCM for Diagnostic Trouble Codes (DTC).

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.

DEVILLE, ELDORADO & SEVILLE

NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

Crankshaft Position (CKP) Sensor Variation Learn Procedure

1) Procedure must be performed if any of the following have been done or exist:

- * EEPROM was reprogrammed.
- * If Diagnostic Trouble Code (DTC) P1336 exists.
- * If crankshaft, crankshaft position sensor, engine, Powertrain Control Module (PCM) or vibration damper have been replaced.

2) CKP sensor variation compensating values are stored in PCM after a learn procedure has been performed. If actual CKP sensor values are not within specification, DTC P0300 will be stored in the PCM.

3) Using scan tool, check for stored DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If no DTCs exist, or if DTC P1336 exists, go to next step. If any DTCs exist except for P1336, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure all DTCs are cleared from PCM. Go to next step.

4) Ensure ignition is off. Apply parking brake. Block rear wheels. Ensure hood is closed. Start engine and warm engine until engine coolant temperature is at least 158°F (70°C). Turn ignition switch to OFF position.

5) Using scan tool, select and enable CKP sensor variation learn procedure. Start engine. Apply service brakes. Ensure transaxle is in Park.

6) Accelerate engine until CKP sensor variation learn procedure fuel cut-off is obtained at 5150 RPM. Quickly release

throttle to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate. Once CKP sensor variation values are learned, the PCM will return engine control to the operator and engine will respond to throttle position.

CAUTION: Ensure throttle is quickly released to idle position once CKP sensor variation learn procedure fuel cut-off is obtained.

7) Check scan tool for status of DTC P1336. If scan tool indicates DTC P1336 ran and passed, CKP sensor variation learn procedure is complete. If scan tool indicates DTC P1336 failed or was not run, check for any other DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If any other DTCs exist, perform test procedures for specified DTC and repair as necessary. If no other DTCs exist, repeat CKP sensor variation learn procedure.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming

1) If Powertrain Control Module (PCM) was replaced, the EEPROM in the PCM must be programmed. If EEPROM is not programmed, a Diagnostic Trouble Code (DTC) will be set in the PCM or PCM may be damaged. Perform EEPROM programming using the Techline equipment manufacturer's instructions and latest software applicable for the vehicle model. Perform Vehicle Theft Deterrent (VTD) system auto learn procedure. See VEHICLE THEFT DETERRENT SYSTEM AUTO LEARN PROCEDURE. Perform idle air control and throttle position sensor relearn procedures. See IDLE AIR CONTROL VALVE RELEARN PROCEDURE and THROTTLE POSITION SENSOR RELEARN PROCEDURE.

2) To verify proper EEPROM programming, start engine. If engine starts, go to next step. If engine fails to start, ensure all electrical connections on PCM are okay and all fuses are okay. Check Techline for latest software. Once engine is repaired so it will start, go to next step.

3) Once EEPROM is programmed, use scan tool to clear DTC P0603 from PCM. Engine oil life interval and transaxle fluid life interval must now be reprogrammed. See ENGINE OIL LIFE INTERVAL PROGRAMMING. See TRANSAXLE FLUID LIFE INTERVAL PROGRAMMING.

Engine Oil Life Interval Programming

1) Engine oil life interval programming must be performed if any of the following have been done:

- * Battery voltage was disconnected from PCM before ignition switch was placed in LOCK position for a minimum of 30 seconds.
- * EEPROM was reprogrammed.
- * Powertrain Control Module (PCM) was replaced.

2) Engine oil life interval is calculated by the PCM. The PCM uses many engine parameters to determine the percentage of engine oil life remaining before engine oil should be changed.

3) Engine oil life interval may be read by the operator by depressing INFO button on Driver Information Center (DIC). Engine oil life interval will be displayed as a percentage when DIC indicates OIL LIFE LEFT.

4) If battery voltage was disconnected from PCM before ignition switch was placed in LOCK position for a minimum of 30 seconds, or PCM was replaced, engine oil life interval must be reprogrammed or reset. Engine oil life interval may be programmed or reset by using a scan tool or the DIC.

5) If using scan tool to reprogram or reset engine oil life interval, use scan tool manufacturer's instructions and reprogram or reset engine oil life interval back to the closest original interval

index that was recorded on original PCM. Scan tool may reset engine oil life interval index in 10 percent intervals.

NOTE: Scan tool may reset engine oil life interval index in 10 percent intervals. The DIC can only reprogram or reset engine oil life interval to 100 percent.

6) If using DIC to reprogram or reset engine oil life interval, depress INFO button on DIC to display ENGINE OIL LIFE. Depress and hold INFO RESET button on DIC until 100 percent OIL LIFE LEFT is displayed on instrument panel. Release all buttons. The DIC can only reprogram or reset engine oil life interval to 100 percent.

Idle Air Control valve relearn procedure

Start and idle engine for 15 seconds. Turn ignition switch to OFF position. Wait 15 seconds. Restart engine and check for proper idle operation.

Throttle Position Sensor Relearn Procedure

Turn ignition switch to ON position. Wait one minute. Turn ignition switch to OFF position. Wait 15 seconds.

Transaxle Fluid Life Interval Programming

1) Transaxle fluid life interval programming must be performed if any of the following have been done:

- * Battery voltage was disconnected from PCM before ignition switch was placed in LOCK position for a minimum of 30 seconds.
- * EEPROM was reprogrammed.
- * Powertrain Control Module (PCM) was replaced.

2) Transaxle fluid life interval is calculated by the PCM. The PCM uses many engine parameters to determine the percentage of transaxle fluid life interval remaining before fluid should be changed.

3) When PCM determines transaxle fluid should be changed, a signal is sent to the instrument cluster and warning light is displayed. If battery voltage was disconnected from PCM before ignition switch was placed in LOCK position for a minimum of 30 seconds, or PCM was replaced, transaxle fluid life interval must be reprogrammed or reset.

4) To reprogram or reset transaxle fluid life interval to original interval set in the PCM, connect scan tool to Data Link Connector (DLC). Using scan tool manufacturer's instructions and reprogram or reset transaxle fluid life interval back to the closest original interval index that was recorded on original PCM.

5) If using DIC to reprogram or reset transaxle fluid life interval, depress INFO button on DIC to display TRANSAXLE FLUID LIFE. Depress and hold INFO RESET button on DIC until 100 percent TRANSAXLE FLUID LIFE LEFT is displayed on instrument panel. Release all buttons. The DIC can only reprogram or reset transaxle fluid life interval to 100 percent.

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.

NOTE: Vehicle Theft Deterrent (VTD) system auto learn procedure must be performed if Powertrain Control Module (PCM), VTD module, ignition lock cylinder, steering column assembly or ignition key are replaced. A password is communicated between VTD module and PCM to provide engine operation. If PCM is replaced, the PCM must learn the password from the VTD module.

Vehicle Theft Deterrent System Auto Learn Procedure

1) Insert a valid mechanical coded unlearned ignition key in the ignition switch. Place ignition switch in RUN position. The SECURITY indicator light will come on for 10 minutes for the length of the auto learn timer.

2) When auto learn timer expires and SECURITY indicator light goes off, place ignition switch in OFF position. Wait 5 seconds.

3) Repeat steps 1) and 2), 2 more times. Insert the newly learned ignition key in ignition switch.

4) Place ignition switch in RUN position. The SECURITY indicator light should remain off to indicate that ignition key was learned. If security indicator does not remain off, repeat procedure.

METRO

NOTE: Powertrain Control Module (PCM) does not have a reprogrammable EEPROM. No special procedures are required for programming the PCM.

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.

PARK AVENUE

NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

Crankshaft Position (CKP) Sensor Variation Learn Procedure

1) Procedure must be performed if any of the following have been done or exist:

- * EEPROM was reprogrammed.
- * If Diagnostic Trouble Code (DTC) P1336 exists.
- * If crankshaft, crankshaft position sensor, engine, Powertrain Control Module (PCM) or vibration damper have been replaced.

2) CKP sensor variation compensating values are stored in PCM after a learn procedure has been performed. If actual CKP sensor values are not within specification, DTC P0300 will be stored in the PCM.

3) Using scan tool, check for stored DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If no DTCs exist, or if DTC P1336 exists, go to next step. If any DTCs exist except for P1336, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure all DTCs are cleared from PCM. Go to next step.

NOTE: Ensure engine coolant temperature is at least 158°F (70°C)

before performing CKP sensor variation learn procedure.

4) Ensure ignition is off. Apply parking brake. Block front wheels. Ensure hood is closed. Start engine and warm engine until engine coolant temperature is at least 158°F (70°C). Turn ignition switch to OFF position.

5) Using scan tool, select and enable CKP sensor variation learn procedure. Start engine. Apply service brakes. Ensure transaxle is in Park.

6) Increase accelerator pedal position until CKP system variation learn fuel cut-off is reached. CKP system variation learn fuel cut-off is reached at 5150 RPM. Do not release accelerator pedal until second fuel cut-off is reached. Crankshaft position system variation compensating values are learned when RPM decreases back to idle.

7) Check scan tool for status of DTC P1336. If scan tool indicates DTC P1336 ran and passed, CKP sensor variation learn procedure fuel cut-off is complete. If scan tool indicates DTC P1336 failed or was not run, check for any other DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If any other DTCs exist, perform test procedures for specified DTC and repair as necessary. If no other DTCs exist, repeat CKP sensor variation learn procedure.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming

1) If Powertrain Control Module (PCM) was replaced, the EEPROM in the PCM must be programmed. If EEPROM is not programmed, a Diagnostic Trouble Code (DTC) will be set in the PCM.

2) Ensure battery is fully charged. If battery is being charged, ensure battery charger is disconnected before performing EEPROM programming procedure.

3) Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using the Techline equipment manufacturer's instructions and latest software applicable for the vehicle model. Perform password learn procedure. See PASSWORD LEARN PROCEDURE FOR PASS-KEY(R) III ANTI-THEFT SYSTEM.

NOTE: If EEPROM programming fails, ensure all electrical connections on PCM are okay. Check Techline for latest software. If EEPROM programming still fails, replace PCM.

4) Once EEPROM is reprogrammed, perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure engine is idling for one minute before checking for DTCs when performing powertrain OBD system check. Also after EEPROM is reprogrammed, the Crankshaft Position (CKP) sensor variation learn procedure must be performed. See CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE.

Engine Oil Life Interval Programming

Turn ignition switch to ON position. While OIL LIFE INDEX is being displayed, press and hold DIC RESET button for more than 5 seconds until display reads 100%. Engine oil life monitor is now reset. Turn ignition switch to OFF position.

Password Learn Procedure For Pass-Key(R) III Anti-Theft System

1) Password learn procedure must be performed if Powertrain Control Module (PCM), Pass-Key(R) III module, ignition lock cylinder, steering column assembly or ignition key are replaced. A password is communicated between Pass-Key(R) III module and PCM to provide engine

operation. If PCM is replaced, the PCM must learn the password from the Pass-Key(R) III module.

2) Insert a valid mechanical coded unlearned ignition key in the ignition switch. Place ignition switch in the RUN position. The SECURITY indicator light will come on for 10 minutes for the length of the auto learn timer. SECURITY indicator light is located on instrument panel, just below the fuel gauge.

3) When auto learn timer expires and SECURITY indicator light goes off, place ignition switch in OFF position. Remove ignition key from ignition. Wait 5 seconds.

4) Repeat steps 2) and 3) 2 more times, for a total of 30 minutes. Insert the newly learned ignition key in ignition switch.

5) Place ignition switch in RUN position. The SECURITY indicator light should remain off to indicate the ignition key was learned. If security indicator does not remain off, repeat 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.

PRIZM

NOTE: Powertrain Control Module (PCM) does not have a reprogrammable EEPROM. No special procedures are required for programming the PCM.

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.

SATURN

NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming

1) EEPROM must also be programmed if replacing Powertrain Control Module (PCM) or changing Transaxle Control (TC) calibrations. If EEPROM is not programmed, a Diagnostic Trouble Code (DTC) will be set in the PCM.

2) Ensure battery is fully charged. Ensure cable is properly connected on Data Link Connector (DLC). Perform EEPROM programming using the Service Stall System (SSS) equipment manufacturer's instructions and latest software applicable for the vehicle model.

CAUTION: PCM may be damaged if programming procedure is interrupted during the downloading procedure. Ensure cable for scan tool is securely connected to SSS equipment and power supply for SSS is securely connected to power supply before proceeding.

NOTE: Ensure original PCM has the correct Vehicle Identification Number (VIN), vehicle tire size and vehicle options prior to

programming the EEPROM. If original PCM is not available or incapable of communicating, the VIN, vehicle tire size and vehicle options must be manually entered into the replacement PCM.

NOTE: On A/T models, when replacing PCM for an engine related problem, the transaxle adaptives should be transferred from original PCM to replacement PCM. Transaxle adaptives should be reset if replacing PCM for transaxle related failure, transaxle, transaxle line pressure actuator, transaxle valve body or transaxle is overhauled. Transaxle adaptives may be reset using Service Stall System (SSS) equipment or a scan tool. See VEHICLE DRIVEABILITY COMPUTER RELEARN PROCEDURE.

3) Perform anti-theft relearn procedure. See PASSLOCK(TM) ANTI-THEFT LEARN PROCEDURE. Once EEPROM is reprogrammed, check for any Diagnostic Trouble Codes (DTC). See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Also, after EEPROM is reprogrammed, crankshaft learn procedure on 4-cylinder engines, throttle position sensor relearn on 6-cylinder engines and vehicle driveability computer relearn procedure must be performed. See CRANKSHAFT LEARN PROCEDURE (1.9L) or CRANKSHAFT LEARN PROCEDURE (2.2L) or THROTTLE POSITION SENSOR RELEARN (3.0L). See VEHICLE DRIVEABILITY COMPUTER RELEARN PROCEDURE.

Crankshaft Learn Procedure (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 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 to 3500 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.

Crankshaft Learn Procedure (2.2L)

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) Start engine and allow engine to reach at least 158°F (70°C). Turn A/C off and place transmission in Park or Neutral. Using scan tool, perform CRANKSHAFT POSITION VARIATION LEARN. Accelerate engine to 4000 RPM. When fuel cut occurs, release throttle. PCM learns crankshaft as engine decelerates.

Throttle Position Sensor Relearn (3.0L)

Turn ignition switch to ON position, engine off for one

minute to learn throttle position sensor.

Vehicle Driveability Computer Relearn Procedure

1) 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 and engine idle. Until PCM has completed computer relearn procedure, driveability or idle may differ from standard vehicle operation. On A/T models, transaxle shift qualities must be relearned.

2) On all models, start engine and warm engine to normal operating temperature. Perform 10 sets of upshifts (1-2, 2-3 and 3-4) at about 30 percent throttle.

3) On DOHC engine, while coasting at 35 MPH, slowly accelerate to 1/2 throttle to achieve a 4-3 downshift. Place gearshift in "D3" while coasting at 20 MPH, slowly accelerate at 3/4 throttle to achieve a 3-2 downshift.

4) Repeat step 3) 5 times. Vehicle driveability computer relearn procedure is now complete.

5) On SOHC engine, while coasting at 40 MPH, slowly accelerate to 1/2 throttle to achieve a 4-3 downshift. Place gearshift in "D3" while coasting at 30 MPH, slowly accelerate at 1/2 throttle to achieve a 3-2 downshift.

6) Repeat step 5) 5 times. Vehicle driveability computer relearn procedure is now complete.

Passlock(TM) Anti-Theft Learn Procedure

Passlock(TM) learn procedure must be performed when Passlock(TM) sensor, BCM or PCM are replaced. If only Passlock 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.

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 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

NOTE: On "S" series, this method may be used if only the Passlock sensor was replaced. For PCM or BCM replacement, Seed and Key method must be used. On "L" series, if any component is replaced, 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 to START position. DO NOT start vehicle. Wait for 10 minutes. When security light changes from flashing or on to off, turn ignition 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.

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.

ASTRO & SAFARI

NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

Crankshaft Position (CKP) Sensor Variation Learn Procedure

1) Procedure must be performed if any of following have been done:

- * EEPROM was reprogrammed.
- * If CKP sensor was removed or replaced.
- * VCM was replaced.

2) Install scan tool. Apply parking brake. Block rear wheels. Ensure hood is closed.

3) Place transmission in Park (A/T models) or Neutral (M/T models). Start and warm engine until engine coolant temperature is at least 150°F (65°C). Ensure all accessories are off.

4) Apply service brakes. With engine idling, use scan tool to select and enable CKP sensor variation learn procedure.

5) Gradually accelerate engine to 4000 RPM. Quickly release throttle to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate. Once CKP sensor variation values are learned, VCM will return engine control to operator and engine will respond to throttle position.

CAUTION: Ensure throttle is quickly released to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate.

6) If CKP sensor variation learn procedure was completed, turn ignition off for at least 15 seconds and remove scan tool. If CKP sensor variation learn procedure was not completed, DTC P1336 will set. Perform diagnostic test procedures for DTC P1336 and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming

1) If VCM was replaced, the EEPROM in the VCM must be programmed. If EEPROM is not programmed, a DTC will be set.

2) Ensure battery is fully charged. Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using Techline(R) equipment. Follow manufacturer's instructions and latest software applicable for vehicle model.

3) Once EEPROM is reprogrammed, CKP sensor variation learn procedure and password learn procedure for anti-theft system must be performed. See CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE. See PASSWORD LEARN PROCEDURE FOR PASSLOCK(R) ANTI-THEFT SYSTEM.

NOTE: If EEPROM programming fails, ensure all harness connections on VCM are okay. Check Techline(R) for latest software. If EEPROM programming still fails, replace VCM.

4) Once CKP sensor variation learn procedure and password learn procedure for anti-theft system are performed, perform Powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

NOTE: If BCM or VCM are replaced, modules must be programmed with vehicle configuration before performing Passlock(R) reprogramming.

Password Learn Procedure For Passlock(R) Anti-Theft System

1) Password learn procedure must be performed if VCM, Passlock(R) module or sensor is replaced. A password is communicated between VCM and Passlock(R) module to provide engine operation. If VCM is replaced, VCM must learn password from Passlock(R) module.

2) Momentarily turn ignition switch to CRANK position, but do not start engine. Release switch to RUN position, but do not turn off. Wait 10 minutes and observe SECURITY indicator light.

NOTE: Ensure battery is fully charged before proceeding. Ensure steps are followed in correct order or procedure may need to be repeated.

3) If Passlock(R) sensor was replaced, SECURITY indicator will flash for 10 minutes. If Passlock(R) module was replaced, SECURITY indicator will flash for a few seconds, then remain on for 10 minutes. If VCM was replaced with a new programmed VCM and connected to vehicle for the first time, vehicle will start and this procedure is not necessary. If replacement VCM was connected to any other vehicle at any other time, SECURITY indicator will flash for a few seconds, then remain on for 10 minutes.

4) After 10 minutes, SECURITY indicator light will turn off. Turn ignition switch to OFF position and wait 10 seconds.

5) Repeat programming procedure 2 more times. New security code is ready to be communicated. New password is learned on next ignition switch lock cylinder from OFF to CRANK to ON.

Vehicle Driveability Computer Relearn Procedure

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

BLAZER, BRAVADA, ENVOY, JIMMY, PICKUP & SONOMA

NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

BCM Programming

This procedure requires Techline(R) terminal and equipment. Ensure battery is fully charged. Ensure battery and lighter connectors are secure. Ensure DLC is accessible. Turn ignition switch to ON position. Refer to Techline(R) terminal and equipment user's instructions.

If BCM fails to program, check all BCM connections, check Techline(R) terminal and equipment for latest software version. Retry programming. If BCM fails to program again, replace BCM. See appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT. Clear DTCs after programming.

Crankshaft Position (CKP) Sensor Variation Learn Procedure (2.2L & 4.3L)

1) Procedure must be performed if any of following have been done:

- * EEPROM was reprogrammed.
- * If CKP sensor was removed or replaced.
- * VCM was replaced.

2) Install scan tool. Apply parking brake. Block rear wheels. Ensure hood is closed.

3) Place transmission in Park (A/T models) or Neutral (M/T models). Start and warm engine until engine coolant temperature is at least 150°F (65°C). Ensure all accessories are off.

4) Apply service brakes. With engine idling, use scan tool to select and enable CKP sensor variation learn procedure.

5) Gradually accelerate engine to 4000 RPM. Quickly release throttle to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate. Once CKP sensor variation values are learned, VCM will return engine control to operator and engine will respond to throttle position.

CAUTION: Ensure throttle is quickly released to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate.

6) If CKP sensor variation learn procedure was completed, turn ignition off for at least 15 seconds. Remove scan tool. If CKP sensor variation learn procedure was not completed, DTC P1336 will set. Perform diagnostic test procedures for DTC P1336 and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming (2.2L)

1) If PCM was replaced, the EPROM in PCM must be programmed. If EEPROM is not programmed, a DTC will set. Perform EEPROM programming using Techline(R) equipment manufacturer's instructions and latest software applicable for vehicle model.

2) Once EEPROM is reprogrammed, CKP sensor variation learn procedure must be performed. See CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE (2.2L & 4.3L).

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming (4.3L)

1) If VCM was replaced, the EEPROM in VCM must be programmed. If EEPROM is not programmed, a DTC will set.

2) Ensure battery is fully charged. Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using the Techline(R) equipment manufacturer's instructions and latest software applicable for vehicle model.

3) Once EEPROM has been reprogrammed, CKP sensor variation learn procedure and password learn procedure must be performed. See CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE (2.2L & 4.3L). See PASSLOCK(R) ANTI-THEFT LEARN PROCEDURE. Once CKP sensor variation learn procedure and password learn procedure are performed,

perform Powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If EEPROM programming fails, ensure all harness connections on VCM are okay. Check Techline(R) for latest software. If EEPROM programming still fails, replace VCM.

NOTE: This procedure allows relearning of BCM module or VCM/PCM learned data code after replacement of BCM module, Passlock(R) sensor or VCM/PCM. DTC B3031 will set when entering programming mode.

Passlock(R) Anti-Theft Learn Procedure

1) Turn ignition switch to OFF position. Replace failed component.
2) Place transmission in Park (A/T) or Neutral (M/T). Turn ignition switch momentarily to START position (engine will not start), then leave in RUN position. SECURITY indicator will stay on for 10 minutes. After 10 minutes, when indicator light turns off, turn ignition switch to OFF position for 5 seconds.

3) Repeat step 2) two more times. Auto learn procedure will be completed during next start attempt. If VCM/PCM was replaced, reprogram VCM/PCM. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

4) Check for DTCs. If Passlock(R) codes exist, go to appropriate ANTI-THEFT SYSTEMS article in ACCESSORIES & EQUIPMENT. If PCM codes exist, diagnose affected DTC(s). See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Vehicle Driveability Computer Relearn Procedure (2.2L)

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

Vehicle Driveability Computer Relearn Procedure (4.3L)

Manufacturer does not provide a specific computer relearn procedure for obtaining proper driveability. If vehicle battery was disconnected or VCM was replaced, driving vehicle will enable VCM to perform a computer relearn procedure for obtaining proper driveability. Inform customer that driveability may differ from what they are accustomed to until VCM completes computer relearn procedure.

CUTAWAY, EXPRESS, RV CUTAWAY & SAVANA

NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

NOTE: References to California models apply to California emission vehicles, which may be verified by underhood Emission Control label. California emissions may be available in other states.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming (4.3L, 4.8L, 5.0L, 5.3L, 5.7L & 6.0L)

1) If VCM was replaced, EEPROM in VCM must be programmed. If EEPROM is not programmed, a DTC will be set.

2) Ensure battery is fully charged. Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using Techline(R) equipment manufacturer's instructions and latest software applicable for vehicle

model.

3) Once EEPROM is reprogrammed, CKP sensor variation learn procedure and password learn procedure for anti-theft system must be performed using proper procedure. See appropriate ANTI-THEFT SYSTEMS article in ACCESSORIES & EQUIPMENT.

NOTE: If EEPROM programming fails, ensure all electrical connections on VCM are okay. Check Techline(R) for latest software. If EEPROM programming still fails, replace VCM.

4) Once CKP sensor variation learn procedure and password learn procedure for anti-theft system are performed, perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming (7.4L)

1) If VCM was replaced, EEPROM in VCM must be programmed. If EEPROM is not programmed, a DTC will be set.

2) Ensure battery is fully charged. Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using Techline(R) equipment manufacturer's instructions and latest software applicable for vehicle model.

3) Once EEPROM is reprogrammed, use scan tool to reset Idle Air Control (IAC) valve. On Calif. models, go to next step. On except Calif. models, go to step 5).

4) Once EEPROM is reprogrammed, password learn procedure for anti-theft system must be performed. See PASSWORD LEARN PROCEDURE FOR ANTI-THEFT SYSTEM (7.4L). Once password learn procedure for anti-theft system has been performed, perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

NOTE: CKP sensor variation learn procedure should ONLY be performed on except Calif. models. DO NOT perform CKP sensor variation learn procedure on Calif. models. Verify vehicle application by using underhood emission control label. If EEPROM programming fails, ensure all electrical connections on VCM are okay. Check Techline(R) for latest software. If EEPROM programming still fails, replace VCM.

5) Once EEPROM is reprogrammed, CKP sensor variation learn procedure and password learn procedure for anti-theft system must be performed using proper procedure. Once CKP sensor variation learn procedure and password learn procedure for anti-theft system are performed, perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Powertrain Control Module (PCM) Programming (6.5L Diesel)

1) If PCM was replaced, PCM must be programmed. If PCM is not programmed, a DTC will be set.

2) Ensure battery is fully charged. Ensure cable at Data Link Connector (DLC) and power supply for scan tool are properly connected. Turn ignition switch to ON position. Perform EEPROM programming using Techline(R) equipment manufacturer's instructions and latest software applicable for the vehicle model.

3) Perform password learn procedure for anti-theft system. See PASSWORD LEARN PROCEDURE FOR ANTI-THEFT SYSTEM (6.5L DIESEL). Once PCM is programmed, if only the PCM was replaced, go to next step. If crankshaft position sensor, engine or PCM with fuel injection pump

were replaced, perform TDC offset learn procedure. See TDC OFFSET LEARN PROCEDURE (6.5L DIESEL).

NOTE: If PCM programming fails, ensure all electrical connections on PCM are okay. Check Techline(R) for latest software. If EEPROM programming still fails, replace PCM.

4) Start and warm engine until engine coolant temperature is at least 170°F (77°C). This will allow TDC offset to be programmed into the PCM if necessary. PCM has the ability to determine amount of offset required to bring engine to TDC. PCM uses TDC to determine proper fuel injection pump timing. If TDC offset is not programmed, DTC P1214 will be set.

TDC Offset Learn Procedure (6.5L Diesel)

1) Procedure must be performed if any of following have been done or exists:

- * If sent here from DTC P1214.
- * Engine has been replaced.
- * CKP sensor or engine front cover has been replaced.
- * PCM and fuel injection pump have been replaced.

NOTE: DO NOT perform procedure unless sent here from DTC P1214 or one of the components listed above have been replaced.

2) PCM has the ability to determine amount of offset required to bring the engine to TDC when TDC offset is not present or has been cleared. This procedure must be performed to allow PCM to be updated with correct TDC offset for vehicle application.

3) Install scan tool. Start and warm engine until engine coolant temperature is at least 170°F (77°C). Using scan tool, clear DTCs from PCM. Turn ignition switch to ON position, engine off. Fully depress and hold throttle at full throttle for at least 45 seconds.

4) Turn ignition switch to OFF position for 30 seconds. Start engine. Verify scan tool indicates TDC offset has been cleared to zero. If TDC offset has been cleared to zero, go to next step. If TDC offset has not been cleared to zero, repeat step 3) until TDC offset has been cleared to zero.

5) With engine running, use scan tool to verify engine coolant temperature is greater than 170°F (77°C). It may be necessary to drive vehicle to obtain correct engine coolant temperature if engine coolant temperature is less than specified.

6) As soon as engine coolant temperature is greater than 170°F (77°C) and engine speed is less than 1500 RPM, the PCM automatically learns a new TDC offset. The new TDC offset will overwrite the previous TDC offset. Using scan tool, note new TDC offset. TDC offset should be -.25 to -.75.

7) Turn engine off. If TDC offset is not within specification, go to next step. If TDC offset is within specification, TDC offset learn procedure is complete.

8) Using Flange Nut Wrench (J41089), loosen fuel injection pump retaining nuts. Fuel injection pump must be rotated to change TDC offset. Rotating fuel injection pump .039" (1.00 mm) will change TDC offset about 2 degrees. Rotating fuel injection pump toward driver's side of vehicle will produce a positive (+) number and rotating fuel injection pump toward passenger's side of vehicle will produce a negative (-) number.

9) Using Fuel Injection Pump Wrench (J 29872-A), slightly rotate fuel injection pump. Tighten fuel injection pump retaining nuts.

10) Repeat step 3) through 9) until TDC offset is within specification. If proper TDC offset cannot be obtained, check the

following:

- * Ensure engine coolant temperature is greater than 170°F (77°C).
- * Harness connectors at PCM are properly installed.
- * Harness connectors at injection timing stepper motor on side of fuel injection pump is correctly installed.
- * Ensure latest Techline(R) software was used.
- * Check for proper base installation of fuel injection pump. The electric engine shutoff solenoid on top of fuel injection pump should be about up and down.
- * Fuel injection pump may be defective, although manufacturer states this is highly unlikely.

Crankshaft Position (CKP) Sensor Variation Learn Procedure (4.3L, 5.0L, 5.7L & 7.4L Except Calif.)

1) Procedure must be performed if any of following have been done:

- * EEPROM was reprogrammed.
- * If CKP sensor was removed or replaced.
- * VCM was replaced.

2) Install scan tool on Data Link Connector (DLC). Apply parking brake. Block rear wheels. Ensure hood is closed.

3) Place transmission in Park (A/T models) or Neutral (M/T models). Start and warm engine until engine coolant temperature is at least 150°F (65°C). Ensure all accessories are off.

4) Apply service brakes. With engine idling, use scan tool to select and enable CKP sensor variation learn procedure.

5) Gradually accelerate engine to 4000 RPM. Quickly release throttle to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate. Once CKP sensor variation values are learned, VCM will return engine control to operator and engine will respond to throttle position.

CAUTION: Ensure throttle is quickly released to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate.

6) If CKP sensor variation learn procedure was completed, turn ignition off for at least 15 seconds. Remove scan tool. If CKP sensor variation learn procedure was not completed, DTC P1336 will set. Perform test procedures for DTC P1336 and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Password Learn Procedure For Anti-Theft System (4.3L, 5.0L & 5.7L)

1) Password learn procedure must be performed if VCM, Passlock(R) module or sensor is replaced. A password is communicated between VCM and Passlock(R) module to provide engine operation. If VCM is replaced, VCM must learn password from Passlock(R) module.

2) Start engine. After engine stalls, leave ignition switch turned to ON position for 10 minutes. The SECURITY indicator light will stay on for 10 minutes and then turn off. The SECURITY indicator light is located on right corner of instrument panel.

NOTE: Ensure battery is fully charged before proceeding. Ensure steps are followed in correct order or procedure may need to be repeated.

3) After SECURITY indicator light turns off, turn ignition off for 30 seconds. Attempt to start engine. After engine stalls,

leave ignition switch turned to ON position for 10 minutes. SECURITY indicator light will stay on for 10 minutes and then turn off. After SECURITY indicator light turns off, turn ignition off for 30 seconds.

4) Attempt to start engine. After engine stalls, leave ignition switch turned to ON position for 10 minutes. SECURITY indicator light will stay on for 10 minutes and then turn off.

5) Turn ignition switch to OFF position for 30 seconds. Turn ignition switch to ON position and wait 30 seconds. Attempt to start engine. If engine starts, password learn procedure is complete. If engine does not start, ensure procedure was properly followed. If procedure was properly followed, check for any DTCs. If any DTCs exist, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Password Learn Procedure For Anti-Theft System (6.5L Diesel)

1) Password learn procedure must be performed if PCM, Passlock(R) module or sensor is replaced. A password is communicated between PCM and Passlock(R) module to provide engine operation. If PCM is replaced, PCM must learn password from Passlock(R) module.

2) Attempt to start engine. Engine will start and then stall. After engine stalls, leave ignition switch turned to ON position for 10 minutes. After engine stalls, the SECURITY indicator light will stay on for 10 minutes and then turn off. SECURITY indicator light is located on right corner of instrument panel.

NOTE: Ensure battery is fully charged before proceeding. Performing this procedure will cause DTC P1630 to be set. It will be necessary to use scan tool to check for DTC P1630 when performing this procedure. Ensure steps are followed in correct order or procedure may need to be repeated.

3) After SECURITY indicator light goes off, turn ignition off for 30 seconds. Attempt to start engine. After engine stalls, leave ignition switch turned to ON position for 10 minutes. SECURITY indicator light will stay on for 10 minutes and then turn off. After SECURITY indicator light turns off, turn ignition off for 30 seconds.

4) Attempt to start. After engine stalls, leave ignition switch turned to ON position for 10 minutes. SECURITY indicator light will stay on for 10 minutes and then turn off or until DTC P1630 is set.

5) Turn ignition switch to OFF position for 30 seconds. Turn ignition switch to ON position and wait 30 seconds. Attempt to start engine. If engine starts, password learn procedure is complete. Ensure DTC P1630 is cleared from PCM by turning ignition off for 30 seconds and then turning ignition switch turned to ON position again. If DTC P1630 is not cleared from PCM, perform test procedures for DTC P1630 and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

NOTE: DTC P1630 will be set in PCM as result of this procedure. DTC P1630 may be cleared from PCM by turning ignition off for 30 seconds and then turning ignition switch to ON position again.

6) If engine does not start, ensure procedure was properly followed. If procedure was properly followed, check for any DTCs. If any DTCs exist, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Password Learn Procedure For Anti-Theft System (7.4L)

1) Password learn procedure must be performed if VCM,

Passlock(R) module or sensor is replaced. A password is communicated between VCM and Passlock(R) module to provide engine operation. If VCM is replaced, VCM must learn password from Passlock(R) module.

2) Attempt to start engine. Engine will start and then stall. After engine stalls, leave ignition switch turned to ON position for 10 minutes. After engine stalls, the SECURITY indicator light will stay on for 10 minutes and then turn off. SECURITY indicator light is located on right corner of instrument panel.

NOTE: Ensure battery is fully charged before proceeding. Performing this procedure will cause DTC P1630 to set. It will be necessary to use scan tool to check for DTC P1630 when performing this procedure. Ensure steps are followed in correct order or procedure may need to be repeated.

3) After SECURITY indicator light turns off, turn ignition off for 30 seconds. Attempt to start engine and then leave ignition switch turned to ON position. After engine stalls, leave ignition switch turned to ON position for 10 minutes. SECURITY indicator light will stay on for 10 minutes and then go off. After SECURITY indicator light turns off, turn ignition off for 30 seconds.

4) Attempt to start engine. After engine stalls, leave ignition switch turned to ON position for 10 minutes. SECURITY indicator light will stay on for 10 minutes and then turn off or until DTC 1630 is set.

5) Turn ignition switch to OFF position for 30 seconds. Turn ignition switch to ON position and wait 30 seconds. Attempt to start engine. If engine starts, password learn procedure is complete. Ensure DTC 1630 is cleared by turning ignition off for 30 seconds and then turning ignition switch to ON position again. If DTC 1630 is not cleared, perform test procedures for DTC 1630 and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

NOTE: DTC 1630 will be set as result of this procedure. DTC P1630 may be cleared from VCM by turning ignition off for 30 seconds and then turning ignition switch to ON position again.

6) If engine does not start, ensure procedure was properly followed. If procedure was properly followed, check for any DTCs. If any DTCs exist, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Vehicle Driveability Computer Relearn Procedure (4.3L, 5.0L, 5.7L & 7.4L)

Manufacturer does not provide a specific computer relearn procedure for obtaining proper driveability. If vehicle battery was disconnected or VCM was replaced, driving vehicle will enable VCM to perform a computer relearn procedure for obtaining proper driveability. Inform customer that driveability may differ from what they are accustomed to until VCM completes computer relearn procedure.

Vehicle Driveability Computer Relearn Procedure (6.5L Diesel)

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

ESCALADE, PICKUP, SIERRA, SILVERADO, TAHOE, YUKON & YUKON XL

NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

NOTE: References to California models apply to California emission vehicles, which may be verified by underhood emission control label. California emissions may be available in other states.

Crankshaft Position (CKP) Sensor Variation Learn Procedure
(4.3L, 4.8L, 5.0L, 5.3L, 5.7L, 6.0L & 7.4L)

1) Procedure must be performed if any of following have been done:

- * EEPROM was reprogrammed.
- * If CKP sensor was removed or replaced.
- * VCM was replaced.

2) Install scan tool on Data Link Connector (DLC). Apply parking brake. Block rear wheels. Ensure hood is closed.

3) Place transmission in Park (A/T models) or Neutral (M/T models). Start and warm engine until engine coolant temperature is at least 150°F (65°C). Ensure all accessories are off.

4) Apply service brakes. With engine idling, use scan tool to select and enable CKP sensor variation learn procedure.

5) Gradually accelerate engine to 4000 RPM. Quickly release throttle to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate. Once CKP sensor variation values are learned, VCM will return engine control to operator and engine will respond to throttle position.

CAUTION: Ensure throttle is quickly released to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate.

6) If CKP sensor variation learn procedure was completed, turn ignition off for at least 15 seconds and remove scan tool. If CKP sensor variation learn procedure was not completed, DTC P1336 will set. Perform test procedures for DTC P1336 and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Electronically Erasable Programmable Read Only Memory
(EEPROM) Programming (4.3L, 5.0L & 5.7L)

1) If VCM was replaced, EEPROM in VCM must be programmed. If EEPROM is not programmed, a DTC will set.

2) Ensure battery is fully charged. Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using the Techline(R) equipment manufacturer's instructions and latest software applicable for the vehicle model.

3) Once EEPROM is reprogrammed, CKP sensor variation learn procedure and password learn procedure for anti-theft system must be performed using proper procedure.

NOTE: If EEPROM programming fails, ensure all harness connections on VCM are okay. Check Techline(R) for latest software. If EEPROM programming still fails, replace VCM.

4) Once CKP sensor variation learn procedure and password learn procedure for anti-theft system are performed, perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Electronically Erasable Programmable Read Only Memory

(EEPROM) Programming (7.4L)

1) If VCM was replaced, EEPROM in VCM must be programmed. If EEPROM is not programmed, a DTC will set.

2) Ensure battery is fully charged. Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using Techline(R) equipment manufacturer's instructions and latest software applicable for vehicle model.

3) CKP sensor variation learn procedure should ONLY be performed on except Calif. models. DO NOT perform CKP sensor variation learn procedure on Calif. models. Verify vehicle application by using underhood emission control label. On Calif. models, go to next step. On except Calif. models, if EEPROM programming fails, ensure all harness connections on VCM are okay. Check Techline(R) for latest software. If EEPROM programming still fails, replace VCM. Once EEPROM is reprogrammed, use scan tool to reset Idle Air Control (IAC) valve and then go to step 5).

4) Once EEPROM is reprogrammed, password learn procedure for anti-theft system must be performed using proper procedure. Once password learn procedure for anti-theft system has been performed, perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

5) Once EEPROM is reprogrammed, CKP sensor variation learn procedure and password learn procedure for anti-theft system must be performed using proper procedure. Once CKP sensor variation learn procedure and password learn procedure for anti-theft system are performed, perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Powertrain Control Module (PCM) Programming (4.8L, 5.3L & 6.0L)

1) Ensure battery is fully charged. Turn ignition switch to ON position. Program PCM using Techline(R) equipment manufacturer's instructions and latest software applicable for vehicle model.

2) Once PCM is reprogrammed, CKP sensor variation learn procedure, password learn procedure for anti-theft system, and PCM idle learn procedure must be performed.

NOTE: If programming fails, ensure all harness connections on PCM are okay. Check Techline(R) for latest software. If programming still fails, replace PCM.

Powertrain Control Module (PCM) Programming (6.5L Diesel)

1) If PCM was replaced, the PCM must be programmed. If PCM is not programmed, a DTC will be set.

2) Ensure battery is fully charged. Ensure cable at Data Link Connector (DLC) and power supply for scan tool are properly connected. Turn ignition switch to ON position. Perform EEPROM programming using Techline(R) equipment manufacturer's instructions and latest software applicable for vehicle model.

3) Perform password learn procedure for anti-theft system using proper procedure. Once PCM is programmed, if only the PCM was replaced, go to next step. If CKP sensor, engine or PCM with fuel injection pump were replaced, perform TDC offset learn procedure. See TDC OFFSET LEARN PROCEDURE (6.5L DIESEL).

NOTE: If PCM programming fails, ensure all harness connections on PCM are okay. Check Techline(R) for latest software. If EEPROM programming still fails, replace PCM.

4) Start and warm engine until engine coolant temperature is at least 170°F (77°C). This will allow TDC offset to be programmed into PCM if necessary. PCM has the ability to determine amount of offset required to bring engine to TDC. PCM uses TDC offset to determine proper fuel injection pump timing. If TDC offset is not programmed, DTC P1214 will be set.

Password Learn Procedure For Anti-Theft System (4.3L, 4.8L, 5.3L & 6.0L)

1) Password relearn procedure must be performed if Passlock(R) sensor, BCM, PCM or VCM are replaced. Ensure battery is fully charged.

2) Using scan tool, clear DTCs. Turn ignition switch from OFF to CRANK position, allowing vehicle to try and start. Vehicle will start and then stall. Leave ignition switch turned to ON position while observing SECURITY indicator on instrument panel. When security indicator turns off (after about 10 minutes), turn ignition off. Wait 10 seconds. Repeat this step 3 more times. New password will be learned on next start attempt.

Password Learn Procedure For Anti-Theft System (5.0L, 5.7L & 7.4L)

1) Password learn procedure must be performed if VCM, Passlock(R) module or sensor is replaced. A password is communicated between VCM and Passlock(R) module to provide engine operation. If VCM is replaced, VCM must learn password from Passlock(R) module.

2) Attempt to start engine. Engine will start and then stall. After engine stalls, leave ignition switch turned to ON position for 10 minutes. After engine stalls, the SECURITY indicator light will stay on for 10 minutes and then turn off. The SECURITY indicator light is located on upper right corner of instrument panel.

NOTE: Ensure battery is fully charged before proceeding. Performing this procedure will cause DTC P1630 to set. Use scan tool to check for DTC P1630 when performing this procedure. Ensure steps are followed in correct order or procedure may need to be repeated.

3) After SECURITY indicator light turns off, turn ignition off for 30 seconds. Start engine. After engine stalls, leave ignition switch turned to ON position for 10 minutes. SECURITY indicator light will stay on for 10 minutes and then go off. After SECURITY indicator light turns off, turn ignition off for 30 seconds.

4) Start engine. After engine stalls, leave ignition switch turned to ON position for 10 minutes. SECURITY indicator light will stay on for 10 minutes and then turn off or until DTC P1630 is set.

5) Turn ignition switch to OFF position for 30 seconds. Turn ignition switch to ON position and wait 30 seconds. Attempt to start engine. If engine starts, password learn procedure is complete. Ensure DTC P1630 is cleared from VCM by turning ignition off for 30 seconds and then turning ignition switch to ON position again. If DTC P1630 is not cleared from VCM, perform test procedures for DTC P1630 and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

NOTE: DTC 1630 will be set in VCM as result of this procedure. DTC P1630 may be cleared from VCM by turning ignition off for 30 seconds and then turning ignition switch turned to ON position again.

6) If engine does not start, ensure procedure was properly followed. If procedure was properly followed, check for any DTCs. If any DTCs exist, perform test procedures for specified DTC and repair

as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

Password Learn Procedure For Anti-Theft System (6.5L Diesel)

1) Password learn procedure must be performed if PCM, Passlock(R) module or sensor is replaced. A password is communicated between PCM and Passlock(R) module to provide engine operation. If PCM is replaced, PCM must learn password from Passlock(R) module.

2) Start engine. After engine stalls, leave ignition switch turned to ON position for 10 minutes, the SECURITY indicator light will stay on for 10 minutes and then turn off. SECURITY indicator light is located on upper right corner of instrument panel. After SECURITY indicator light turns off, turn ignition off for 30 seconds.

NOTE: Ensure battery is fully charged before proceeding. Performing this procedure will cause DTC P1630 to set. Use scan tool to check for DTC P1630 when performing this procedure. Ensure steps are followed in correct order or procedure may need to be repeated.

3) Start engine. After engine stalls, leave ignition switch turned to ON position for 10 minutes. SECURITY indicator light will stay on for 10 minutes and then turn off. After SECURITY indicator light turns off, turn ignition off for 30 seconds.

4) Attempt to start engine. After engine stalls, leave ignition switch turned to ON position for 10 minutes. SECURITY indicator light will stay on for 10 minutes and then turn off or until DTC P1630 is set.

5) Turn ignition switch to OFF position for 30 seconds. Turn ignition switch to ON position and wait 30 seconds. Attempt to start engine. If engine starts, password learn procedure is complete. Ensure DTC P1630 is cleared by turning ignition off for 30 seconds and then turning ignition switch to ON position again. If DTC P1630 is not cleared, perform test procedures for DTC P1630 and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

NOTE: DTC P1630 will be set as a result of this procedure. DTC P1630 may be cleared from PCM by turning ignition off for 30 seconds and then turning ignition switch to ON position again.

6) If engine does not start, ensure procedure was properly followed. If procedure was properly followed, check for any DTCs. If any DTCs exist, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

TDC Offset Learn Procedure (6.5L Diesel)

1) Procedure must be performed if any of following have been done or exists:

- * If sent here from DTC P1214.
- * Engine has been replaced.
- * CKP sensor or engine front cover has been replaced.
- * PCM and fuel injection pump have been replaced.

NOTE: DO NOT perform procedure unless sent here from DTC P1214 or one of the components listed above has been replaced.

2) The PCM has the ability to determine amount of offset required to bring engine to TDC when TDC offset is not present or has been cleared. This procedure must be performed to allow PCM to be

updated with the correct TDC offset for vehicle application.

3) Install scan tool. Start and warm engine until engine coolant temperature is at least 170°F (77°C). Using scan tool, clear DTCs from PCM. Turn ignition switch to ON position, engine off. Fully depress and hold throttle at full throttle for at least 45 seconds.

4) Turn ignition switch to OFF position for 30 seconds. Start engine. Verify scan tool indicates TDC offset has been cleared to zero. If TDC offset has been cleared to zero, go to next step. If TDC offset has not been cleared to zero, repeat step 3) until TDC offset has been cleared to zero.

5) With engine running, use scan tool to verify engine coolant temperature is greater than 170°F (77°C). It may be necessary to drive vehicle to obtain correct engine coolant temperature.

6) As soon as engine coolant temperature is greater than 170°F (77°C) and engine speed is less than 1500 RPM, the PCM automatically learns a new TDC offset. The new TDC offset will overwrite previous TDC offset. Using scan tool, note new TDC offset. TDC offset should be -.25 to -.75.

7) Turn engine off. If TDC offset is not within specification, go to next step. If TDC offset is within specification, TDC offset learn procedure is complete.

8) Using Flange Nut Wrench (J 41089), loosen fuel injection pump retaining nuts. Fuel injection pump must be rotated to change TDC offset. Rotating fuel injection pump .039" (1.00 mm) will change TDC offset about 2 degrees. Rotating fuel injection pump toward driver's side of vehicle will produce a positive (+) number and rotating fuel injection pump toward passenger's side of vehicle will produce a negative (-) number.

9) Using Fuel Injection Pump Wrench (J 29872), slightly rotate fuel injection pump. Tighten fuel injection pump retaining nuts.

10) Repeat steps 3) through 9) until TDC offset is within specification. If proper TDC offset cannot be obtained, check the following:

- * Ensure engine coolant temperature is greater than 170°F (77°C).
- * PCM harness connectors for proper installation.
- * Harness connectors at injection timing stepper motor on side of fuel injection pump for proper installation.
- * Ensure latest Techline(R) software was used.
- * Check for proper base installation of fuel injection pump. The electric engine shutoff solenoid on top of fuel injection pump should be approximately straight up and down.
- * Fuel injection pump may be defective, although manufacturer states this is highly unlikely.

Vehicle Driveability Computer Relearn Procedure (4.8L, 5.3L & 6.0L)

1) On manual transmission vehicles, go to next step. On automatic transmission vehicles, turn ignition off. Reconnect PCM battery connection. Turn A/C off. Set parking brake and block drive wheels. Start and operate engine until coolant reaches 176°F (80°C). Place transmission in Drive. Operate engine at idle for 5 minutes. Place transmission in Park. Idle engine another 5 minutes. Turn engine off for 30 seconds. PCM relearn procedure is complete.

2) On manual transmission vehicles, turn ignition off. Reconnect PCM battery connection. Turn A/C off. Set parking brake and block drive wheels. Place transmission in Neutral. Start and operate engine until coolant reaches 176°F (80°C). Operate engine at idle for 5 minutes. Turn engine off for 30 seconds. PCM relearn procedure is complete.

Vehicle Driveability Computer Relearn Procedure (4.3L, 5.0L, 5.7L & 7.4L)

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

Vehicle Driveability Computer Relearn Procedure (6.5L Diesel)

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

MONTANA, SILHOUETTE & VENTURE

NOTE: Read all procedures listed to determine why and when each procedure is to be performed before proceeding.

Crankshaft Position (CKP) Sensor Variation Learn Procedure

1) Procedure must be performed if any of following have been done or exist:

- * EEPROM was reprogrammed.
- * If DTC P1336 exists.
- * If crankshaft, CKP sensor, engine, PCM or vibration damper have been replaced.

2) CKP sensor variation compensating values are stored in PCM after a learn procedure has been performed. If actual CKP sensor values are not within specification, DTC P0300 will be stored.

3) Using scan tool, check for stored DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If no DTCs exist, or if DTC P1336 exists, go to next step. If any DTCs exist except for P1336, perform test procedures for specified DTC and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure all DTCs are learned from PCM, then go to next step.

4) Ensure ignition is off. Apply parking brakes. Block front wheels. Ensure hood is closed. Start and warm engine until engine coolant temperature is at least 158°F (70°C). Turn ignition switch to OFF position.

NOTE: Ensure engine coolant temperature is at least 158°F (70°C) before performing CKP sensor variation learn procedure.

5) Using scan tool, select and enable CKP sensor variation learn procedure. Start engine. Apply service brakes. Ensure transaxle is in Park.

6) Accelerate engine until CKP sensor variation learn procedure fuel cut-off is obtained at 5150 RPM. Quickly release throttle to idle position once CKP sensor variation learn procedure fuel cut-off is obtained and engine starts to decelerate. Once CKP sensor variation values are learned, PCM will return engine control to operator and engine will respond to throttle position.

CAUTION: Ensure throttle is quickly released to idle position once CKP

sensor variation learn procedure fuel cut-off is obtained.

7) If CKP sensor variation learn procedure was not terminated, go to next step. If CKP sensor variation learn procedure was terminated, this may be caused by PCM detecting a problem in CAM signal setting DTC P0341 or a problem in 3X crank signal setting DTC P1374, or a problem in the 3X or 24X crank signal setting DTC P0336. Using scan tool, check for stored DTCs. Perform test procedures for specified DTCs and repair as necessary. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

8) Check status of DTC P1336 on scan tool. If scan tool indicates DTC P1336 ran and passed, CKP sensor variation learn procedure fuel cut-off is complete. If scan tool indicates that DTC P1336 failed or was not run, check for any other DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If any other DTCs exist, perform test procedures for specified DTC and repair as necessary. If no other DTCs exist, repeat CKP sensor variation learn procedure.

Electronically Erasable Programmable Read Only Memory (EEPROM) Programming

1) If PCM was replaced, the EEPROM in PCM must be programmed. If EEPROM is not programmed, a DTC will set.

2) Ensure battery is fully charged. If battery is being charged, ensure battery charger is disconnected before performing EEPROM programming procedure.

3) Ensure cable is properly connected on Data Link Connector (DLC). Turn ignition switch to ON position. Perform EEPROM programming using Techline(R) equipment manufacturer's instructions and latest software applicable for vehicle model. New PCM must learn PASS-Key(R) password. See PASS-KEY(R) III MODULE PROGRAMMING.

4) Once EEPROM has been reprogrammed, perform powertrain On-Board Diagnostic (OBD) system check. See POWERTRAIN ON-BOARD DIAGNOSTIC (OBD) SYSTEM CHECK in appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Ensure engine is idling for one minute before checking for DTCs when performing powertrain OBD system check. Also, after EEPROM has been reprogrammed, the CKP sensor variation learn procedure must be performed. See CRANKSHAFT POSITION (CKP) SENSOR VARIATION LEARN PROCEDURE.

NOTE: If EEPROM programming fails, ensure all harness connections on PCM are okay. Check Techline(R) for latest software. If EEPROM programming still fails, replace PCM.

PASS-Key(R) III Module Programming

NOTE: New modules are unprogrammed. New module automatically learns first key used to start engine. New module can only be programmed once.

NOTE: PASS-Key(R) III system auto learn procedure must be performed if all keys are lost, or powertrain Control Module (PCM), PASS-Key(R) III module, ignition lock cylinder, steering column assembly or ignition key are replaced. A password is communicated between PASS-Key(R) III module and PCM to provide engine operation. If PCM is replaced, the PCM must learn the password from the PASS-Key(R) III module.

PASS-Key(R) III System Auto Learn Procedure

1) Insert a valid mechanical coded unlearned ignition key in ignition switch. Place ignition switch in RUN position. The SECURITY indicator light will flash once per second for 10 minutes for the length of the auto learn timer.

2) When auto learn timer expires and SECURITY indicator light goes off, place ignition switch in OFF position. Remove ignition key. Wait 10 seconds.

3) Repeat steps 1) and 2) two more times. Insert the newly learned ignition key in ignition switch.

4) Place ignition switch in RUN position. The SECURITY indicator light should remain off to indicate that ignition key was learned. This will be the only learned key. To program more keys, see PASS-KEY(R) III SYSTEM QUICK LEARN PROCEDURE. If security indicator does not remain off, repeat procedure.

NOTE: PASS-Key(R) III system quick learn procedure is used to learn additional ignition keys. A learned key must be used to initiate procedure. Up to 10 ignition keys can be learned.

PASS-Key(R) III System Quick Learn Procedure

1) Insert a valid ignition key in ignition switch. Turn ignition switch to ON position. After 2 second bulb test, turn ignition off and remove key.

2) Within 10 seconds, insert new valid mechanical code unlearned key and turn ignition switch to RUN position. Security light will illuminate until key is learned. This may happen so quickly light illumination is not observed. Turn ignition switch to OFF position. Remove ignition key 10 seconds after light goes out.

3) To learn additional keys, repeat step 2). To exit procedure, turn ignition off for more than 10 seconds.

Vehicle Driveability Computer Relearn Procedure

Manufacturer does not provide a specific computer relearn procedure for obtaining proper driveability. If vehicle battery was disconnected or PCM was replaced, driving the vehicle will enable 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.

TRACKER

NOTE: PCM does not have a reprogrammable EEPROM. No special procedures are required for programming the PCM.

Vehicle Driveability Computer Relearn Procedure

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

JEEP

CHEROKEE, GRAND CHEROKEE & WRANGLER

NOTE: If PCM has been replaced and correct Vehicle Identification Number (VIN) and mileage have not be entered into new PCM, Diagnostic Trouble Codes (DTC) will set in Anti-Lock Brake (ABS), air bag and Sentry Key Immobilizer Module (SKIM). Secret key data must be updated prior to starting vehicle.

Powertrain Control Module (PCM) Programming

1) Connect scan tool to Data Link Connector (DLC). For ABS

and air bag systems, enter correct VIN and current mileage into new PCM. Use scan tool to erase ABS and air bag DTCs.

2) For SKIM, connect scan tool and select THEFT ALARM, SKIM then MISCELLANEOUS. Place SKIM in secured access mode by using 4-digit Personal Identification Number (PIN). Select UPDATE SECRET KEY DATA. SKIM data will automatically be transferred to PCM.

3) Attempt to start engine. If engine starts and runs, programming is complete. If engine is unable to start, verify that programming procedure has been completed and check for related Technical Service Bulletins (TSB).

Sentry Key Immobilizer Module Programming

SECURED ACCESS mode is not required to check programmed status of key.

If PCM is replaced, unique secret key data must be transferred from Sentry Key Immobilizer Module (SKIM) to Powertrain Control Module (PCM). This procedure requires SKIM to be placed in SECURED ACCESS mode using 4-digit PIN code.

If 3 attempts are made to enter secured access mode using an incorrect PIN, SECURED ACCESS mode will be locked out for one hour. To exit lock out mode, turn ignition switch to RUN position and leave there for one hour. Ensure all accessories are turned off. Monitor battery state and connect battery charger is necessary.

To program smart keys using "customer programming method" requires 2 valid smart keys. See appropriate ANTI-THEFT SYSTEMS article.

Initialization Procedure

1) Obtain vehicle's unique PIN number assigned to it's original SKIM module from vehicle owner or Chrysler's customer center.

2) Using scan tool, select THEFT ALARM, SKIM, then MISCELLANEOUS.

3) Select SKIM MODULE REPLACED function.

4) Program vehicle's VIN number into SKIM's memory.

5) Program country code into SKIM's memory (U.S.).

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

7) Press ENTER to transfer VIN from PCM to SKIM.

After programming new SKIM, program all keys to new SKIM. See appropriate ANTI-THEFT SYSTEMS article.

GRAND CHEROKEE

NOTE: This procedure may also be identified as Quick Learn procedure.

Transmission Control Module (TCM) Programming (4.7L Only)

The Transmission Control Module (TCM) must be programmed after replacement. Pinion factor must be set for all new transmission control modules. If pinion factor is not set or set incorrectly, any speedometer, speed control, rolling door locks or other devices operated by Powertrain Control Module (PCM) or Body Control Module (BCM) will not function properly.

Before performing Quick Learn procedure, the following conditions must be met:

- * Transmission must be shifted into Overdrive (OD) with engine running and transmission fluid at correct level.
- * Brakes must be applied.

- * Engine must be at idle.
- * Throttle Position (TP) must be less than 3 degrees.
- * Shift lever must be shifted into Neutral position until prompted by scan tool to be shifted to OD.
- * Shift lever must be in OD position until scan tool indicates procedure is complete.
- * Oil temperature must be 60-200°F (15-93°C).

To perform quick learn procedure, select TRANSMISSION, MISCELLANEOUS then QUICK LEARN on scan tool. Follow on-screen instructions. Ensure conditions listed above have been met or procedure may abort.