Module Configuration - System Operation and Component Description

System Operation

Programmable Module Installation (PMI)

PMI is a diagnostic scan tool process which configures settings in a new module. Data used for the PMI process is automatically downloaded from the original module and stored when a diagnostic scan tool session is started. If this data cannot be retrieved from the module being replaced, the diagnostic scan tool may prompt for Configuration data entry or display a list of parameter values that need to be manually selected. Some modules are reprogrammed during PMI when a strategy/calibration update is available.

It is important the diagnostic scan tool identifies the vehicle and obtains configuration data prior to removing any modules. The new module must be able to communicate with the diagnostic scan tool in order to carry out PMI .

Module Reprogramming

Module reprogramming (also referred to as flashing) is a diagnostic scan tool process which updates the strategy/calibration in a module. Reprogramming a module with the same level of software does not improve module operation or repair a hardware failure. Module reprogramming is automatically carried out during PMI when a later strategy/calibration is available.

Limit module reprogramming to circumstances where a published TSB , GSB , SSM or FSA recommends doing so.

A module cannot communicate with other modules on the communication network while being reprogrammed. After the reprogramming process, clear any network communication Diagnostic Trouble Codes (DTCs) which may have been set in other modules.

Some modules are reprogrammed in coordination with other modules.

The following modules with an Ethernet connection can be reprogrammed using a diagnostic scan tool and USB flash drive: APIM , GWM , IPC , IPMA and TCU .

Programmable Parameters

Programmable parameters are customer preference items that may be modified by the dealer via the diagnostic scan tool, or in some cases, modified by the customer following a procedure listed in the Owner Literature. While many configuration options may exist for a module, only a few of these options are programmable parameters. Some parameters must be changed in multiple modules at the same time.

Adaptive Learning and Calibration

Some modules require a separate learning procedure be carried out if replaced as part of a repair procedure. For adaptive learning and calibration instructions, refer to the specific module removal and installation procedures.

Direct Configuration Data (formerly known as VID block)

The direct configuration data commonly stores powertrain configuration items such as tire size, axle ratio, and whether or not the vehicle is equipped with cruise control.

Configuration data is a VIN -specific module configuration record. During vehicle build, the configuration from all modules is downloaded and stored in the configuration database. Configuration data does not reflect customer preference items that have been changed from the default state. These items need to be changed using programmable parameters after the module is configured.

It is not necessary to obtain configuration data unless directed to do so by the diagnostic scan tool. This data may be accessed from the PTS web site.

Module Configuration and Parameter Chart

The chart describes specific module configuration information:

Module Name	Module Address	Programmable Module Installation (PMI) Available	Reprogram/Flash Capable	Requires Adaptive Learning or Calibration	Available Programmable Parameters
ABS module	760	Yes	Yes	• ABS calibration • PATS key programming	None
ACCM	7C7	No	No	No	None
ACM	727	Yes	Yes	No	Subwoofer enable
APIM	7D0	Yes	Yes (diagnostic scan tool and USB flash drive)	No	• Rear camera present/not present • CTA enable/disable • Easy entry exit enable/disable • Perimeter alarm with reduced guard control function enable/disable • Remote start - climate settings enable/disable • Remote start - driver seat enable/disable • Remote start - feature enable/disable • Remote start - passenger seat enable/disable • Remote start - rear defroster enable/disable • Remote start - steering wheel enable/disable • Side detect enable/disable • Trailer blind spot enable/disable • Trailer brake controller enable/disable • Park aid control rear blockage warning enable/disable
ATCM	792	Yes	Yes	No	None

BCM	726	Yes	Yes	• PATS key programming
				• PATS parameter reset
				• CEI
				• BMS reset
				• If equipped with rear video parking aid, BCM
					• Trailer connect configuration enable/disable
					• DRL by auto lamps configuration
					  ○ park lamps
					  ○ fog lamps
					  ○ turn lamps
					  ○ rear fog with

				• LIN initialization • TPMS training	trailer ○ outage trailer ○ headlamp style • Bed lamp enable/disable • TBM available configuration • Trailer tow configuration
BCMC [BJB]	6F0	Yes	Yes	No	None
BECM	7E4	No	No	No	None
CCM	764	Yes	Yes	CCM radar alignment	None
Driver Status Monitor Camera Module [CMR]	7C1	Yes	Yes	No	None
DCACA	6F1	Yes	Yes	No	None
DCDC	746	No	No	No	None
DDM	740	Yes	Yes	Windows initialization	BLIS indicator configuration enable/disable
DSM / RBM	744	Yes	Yes	• Memory pedal calibration • Memory steering column calibration	None
DSP	783	Yes	Yes	No	None
GSM	732	Yes	Yes	Stay in Neutral calibration (Column shift)	None
GWM	716	Yes	Yes (diagnostic scan tool and USB flash drive)	No	None
HCM	734	Yes	Yes	HCM calibration	None
HVAC module	733	Yes	Yes	No	None
IPC	720	Yes	Yes (diagnostic scan tool and USB flash drive)	No	• CTA enable/disable • Park aid control rear enable/disable • Side detect enable/disable • Park aid fault warning rear and front enable/disable • Trailer brake controller enable/disable • Trailer blind spot enable/disable • Park aid control rear blockage warning enable/disable
IPMA	706	Yes	Yes (diagnostic scan tool and USB flash drive)	No	• BLIS / CTA enable/disable • TBM present/not present

OCS module	765	No	No	OCSM re-zero	None
PACM	750	No	No	No	None
PCM	7E0	Yes	Yes	• PATS parameter reset • Misfire Monitor Neutral Profile Correction	None
PDM	741	Yes	Yes	Windows initialization	BLIS indicator configuration enable/disable
PSCM	730	Yes	Yes	No	None
RCM	737	Yes	Yes	ABS calibration service functions	None
RGTM	775	No	No	No	None
RTM	751	Yes	Yes	No	None
SASM	797	Yes	Yes	• Steering wheel angle trim service routine • Steering motor angle trim service routine • Front toe adjustment	None
SCCM	724	Yes	Yes	No	None
SCMG	712	Yes	Yes	No	None
SCMH	713	Yes	Yes	No	None
SECM	7C5	Yes	Yes	No	None
SOBDMC	7E6	Yes	Yes	• PATS module initialization • Transmission strategy download	None
SODCMC	6F2	Yes	Yes	No	None
SODCMD	6F3	Yes	Yes	No	None
SODL	7C4	Yes	Yes	No	None
SODR	7C6	Yes	Yes	No	None
TCCM	761	Yes	Yes	No	None
TCM	7E9	Yes	Yes	Transmission Strategy Download	None
TCU	754	Yes	Yes (diagnostic scan tool and USB flash drive)	No	None
TRM / TBM	791	Yes	Yes	No	None
VDM	721	Yes	Yes	Height sensor calibration	None
WACM	725	Yes	Yes	No	None

Module Configuration - Electric - System Operation and Component Description

System Operation

Programmable Module Installation (PMI)

PMI is a diagnostic scan tool process which configures settings in a new module. Data used for the PMI process is automatically downloaded from the original module and stored when a diagnostic scan tool session is started. If this data cannot be retrieved from the module being replaced, the diagnostic scan tool may prompt for Configuration data entry or display a list of parameter values that need to be manually selected. Some modules are reprogrammed during PMI when a strategy/calibration update is available.

It is important the diagnostic scan tool identifies the vehicle and obtains configuration data prior to removing any modules. The new module must be able to communicate with the diagnostic scan tool in order to carry out PMI .

Module Reprogramming

Module reprogramming (also referred to as flashing) is a diagnostic scan tool process which updates the strategy/calibration in a module. Reprogramming a module with the same level of software does not improve module operation or repair a hardware failure. Module reprogramming is automatically carried out during PMI when a later strategy/calibration is available.

Limit module reprogramming to circumstances where a published TSB , GSB , SSM or FSA recommends doing so.

A module cannot communicate with other modules on the communication network while being reprogrammed. After the reprogramming process, clear any network communication Diagnostic Trouble Codes (DTCs) which may have been set in other modules.

Some modules are reprogrammed in coordination with other modules.

The following modules with an Ethernet connection can be reprogrammed using a diagnostic scan tool and USB flash drive: APIM , GWM , IPC , IPMA and TCU .

Programmable Parameters

Programmable parameters are customer preference items that may be modified by the dealer via the diagnostic scan tool, or in some cases, modified by the customer following a procedure listed in the Owner Literature. While many configuration options may exist for a module, only a few of these options are programmable parameters. Some parameters must be changed in multiple modules at the same time.

Adaptive Learning and Calibration

Some modules require a separate learning procedure be carried out if replaced as part of a repair procedure. For adaptive learning and calibration instructions, refer to the specific module removal and installation procedures.

Direct Configuration Data (formerly known as VID block)

The direct configuration data commonly stores configuration items such as tire size, axle ratio, and whether or not the vehicle is equipped with cruise control.

Configuration data is a VIN -specific module configuration record. During vehicle build, the configuration from all modules is downloaded and stored in the configuration database. Configuration data does not reflect customer preference items that have been changed from the default state. These items need to be changed using programmable parameters after the module is configured.

It is not necessary to obtain configuration data unless directed to do so by the diagnostic scan tool. This data may be accessed from the PTS web site.

Module Configuration and Parameter Chart

The chart describes specific module configuration information:

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ABS module	760	Yes	Yes	• ABS calibration • PATS key programming	None
ACCM	7C7	No	No	No	None
ACCMB	6E0	No	No	No	None
ACM	727	Yes	Yes	No	Subwoofer enable
APIM	7D0	Yes	Yes (diagnostic scan tool and USB flash drive)	No	• Trailer brake controller enable/disable
BCM	726	Yes	Yes	• PATS key programming • PATS parameter reset • BMS reset • If equipped with rear video parking aid, BCM LIN initialization • TPMS training	• TBM available configuration
BCMC [BJB]	6F0	Yes	Yes	No	None
BECM	7E4	No	No	No	None
CCM (Private CAN)	764	Yes	Yes	CCM radar alignment	None
CMR	7C1	Yes	Yes	No	None
DCACA	6F1	Yes	Yes	No	None
DCACB	707	Yes	Yes	No	None
DCDC	746	No	No	No	None
DDM	740	Yes	Yes	Windows initialization	None
DSM / RBM	744	Yes	Yes	• Memory pedal calibration • Memory steering column calibration	None
DSP	783	Yes	Yes	No	None
FHCM	6E3	Yes	Yes	No	None
GFM2 [Battery Charger Control Module B (BCCMB)] (Private CAN)	7D2	Yes	Yes	No	None
GSM	732	Yes	Yes	No	None
GWM	716	Yes	Yes (diagnostic scan tool and USB flash	No	None

			drive)		
HCM	734	Yes	Yes	HCM calibration	None
HVAC module	733	Yes	Yes	No	None
IPC	720	Yes	Yes (diagnostic scan tool and USB flash drive)	No	• CTA enable/disable • Park aid control rear enable/disable • Side detect enable/disable • Park aid fault warning rear and front enable/disable • Park aid control rear blockage warning enable/disable • Trailer brake controller enable/disable • Trailer blind spot enable/disable • Trailer TPMS enable/disable
IPMA	706	Yes	Yes (diagnostic scan tool and USB flash drive)	No	• TBM present/not present
LDCMA (Private CAN)	6F6	Yes	Yes	No	None
LDCMB (Private CAN)	6F7	Yes	Yes	No	None
OBCC	6F5	No	No	No	None
OCS module	765	No	No	OCSM re-zero	None
PACM	750	No	No	No	None
PCM	7E0	Yes	Yes	• PATS parameter reset	None
PDM	741	Yes	Yes	Windows initialization	None
PSCM	730	Yes	Yes	No	None
RCM	737	Yes	Yes	ABS calibration service functions	None
RFA	731	Yes	Yes	• PATS module initialization • Secure code unlock	None
RGTM	775	No	No	No	None
RTM	751	Yes	Yes	No	None
SCCM	724	Yes	Yes	No	None
SCMG	712	Yes	Yes	No	None
SCMH	713	Yes	Yes	No	None
SOBDM (Battery Charging Control Module [BCCM])	7E2	Yes	Yes	No	None

SOBDMB (All Wheel Drive Control [AWDC])	7E7	Yes	Yes	No	None
SOBDMC	7E6	Yes	Yes	• PATS module initialization	None
SODCMC (Private CAN)	6F2	Yes	Yes	No	None
SODCMD (Private CAN)	6F3	Yes	Yes	No	None
SODL (Private CAN)	7C4	Yes	Yes	No	None
SODR (Private CAN)	7C6	Yes	Yes	No	None
TCU	754	Yes	Yes (diagnostic scan tool and USB flash drive)	No	None
TRM / TBM	791	Yes	Yes	No	None
VDM	721	Yes	Yes	Height sensor calibration	None
WACM	725	Yes	Yes	No	None

Module Programming

Check

NOTE: *Perform the following pre-checks to make sure module programming completes without errors.*

1. Start the programming session in Key OFF, Engine OFF and prior to initiating programming, turn to KOEO .

2. Make sure the vehicle battery is fully charged or is connected to a battery charger. The battery state of charge should be 12.6 - 13.6 volts during vehicle programming.

3. **NOTE:** *A good internet connection is necessary.*

   Inspect the VCM II, VCMM or later level device and cables for damage. Make sure cables remain connected throughout the programming procedure.

4. Turn off all unnecessary accessories, such as radio, A/C , climate controlled seats, headlamps, interior and demand lamps.

5. Disconnect any aftermarket accessories, such as remote start, security alarm and power inverter.

6. For Plug-in hybrid and electric vehicles, disconnect the external charge cord from the charge port.

7. Disable Microsoft Windows sleep mode, screensaver and hibernation modes.

8. **NOTE:** *If the diagnostic software does not load or if the vehicle cannot be identified properly.*

   Make sure there is a good internet connection and the VCM II, VCMM or later level device is properly connected to the DLC .

Programming

1. **NOTE:** *If a new module is being installed, install the new module before carrying out the following procedure.*
   - *If replacing the module **do not** connect the new module to a Wi-Fi network before completing the scan tool module replacement programming as it may cause programming concerns.*
   - *This programming procedure deletes any phones that are paired with the SYNC system when programming the APIM .*
   - *To prevent time-out errors and minimize programming time, a wired internet connection is strongly recommended when programming.*
   - *Make sure the FDRS version and patch software levels are up to date.*

   Connect a battery charger to the vehicle and select the low charge setting. The negative battery charger lead must be connected to a clean chassis ground, **not** the negative battery post.

2. Connect the diagnostic scan tool to a power supply. The length of time required for programming may extend past the duration of the diagnostic scan tool.

3. Connect the diagnostic scan tool to the DLC .

4. Log into FDRS .

5. Identify/enter the vehicle being programmed on FDRS .

6. **NOTE:** *Vehicle information is automatically retrieved by the diagnostic software and a Network Test is run. Vehicle identification data appears on the screen when this is complete.*

   Click 'Read VIN from Vehicle' or manually enter the VIN .

7. **NOTE:** *Available modules are shown on the LH side of the screen, and available procedures are listed on the RH side of the screen. Modules that are communicating are highlighted in green.*

Select Toolbox tab.

8. **NOTE:** *If a module is integrated within another module, both modules will automatically program during this process. For example, if the ACM is selected, the DACMC (if integrated with the ACM) is also programmed.*

   From the list on the LH side of the screen, select the module that requires a programming procedure to be completed.

9. There are 3 types of module programming available:
   - **Programmable Module Installation (PMI)** —When the module is replaced, this type of programming carries out the required provisioning (restores software for newly installed hardware).
   - **Module configuration** — Downloads configuration data to the module. The module may also be programmed, depending on current software level, when this option is selected.
   - **Software Update** — Updates the module and any currently installed applications to the latest software levels. This option is not available if the module is already at the latest level.

10. From the list on the RH side of the screen, select PMI Software Update or Module Configuration.

11. **NOTE:** *Do not disconnect the VCM from the DLC during the module programming process unless directed by the diagnostic scan tool on-screen prompts.*

    Follow all on-screen instructions carefully.

12. After programming is complete, "Programming has been successfully completed" displays.

Programming

NOTE: *If updating using a USB memory device.*

1. Connect a battery charger to the vehicle 12V battery. Set the charger to maintain 12.6 - 13.6 volts.

2. Connect the VCM II, VCMM or later level device to the vehicle DLC and the diagnostic scan tool USB port.

3. Log into FDRS .

4. **NOTE:** *Vehicle information is automatically retrieved by the diagnostic software and a Network Test is run. Vehicle identification data appears on the screen when this is complete.*

   Click 'Read VIN from Vehicle' or manually enter the VIN .

5. **NOTE:** *Available modules are shown on the LH side of the screen, and available procedures are listed on the RH side of the screen. Modules that are communicating are highlighted in green.*

   Select Toolbox tab.

6. **NOTE:** *If the module is already at the latest software level, the software update application will not be available in the diagnostic scan tool.*

   If replacing the module, download and run the PMI . If the module is not being replaced but is receiving a software update in accordance with a TSB or service publication, download and run the software update application for the target module.

7. Close all doors or mechanically latch the door to simulate a closed door.

8. Follow the on-screen prompts to complete the PMI .

9. On-screen prompts are displayed to inform that a USB is required to complete the process.

10. Follow the on-screen instructions to download the required software to the USB memory device and upload to the vehicle though the vehicle USB port.

11. Once the USB memory device is connected to the media hub or USB port, the software update will automatically install. The USB memory device transfers the data through the USB cable to the APIM . The APIM transfers the data to the GWM where it is distributed to the receiving module over the Ethernet network.

12. It is advised that the USB memory device remain connected to the vehicle for a minimum of 2 minutes after the progress bar

displayed on the vehicle display screen has reached 100%, to ensure the upload has completed fully.

13. If an error occurs during the USB programming process an error message is displayed on the vehicle display screen indicating an error has occurred and displays an error number relating to the type of error that occurred. REFER to the Error Condition Table below for a description and action to be taken, if an error message is displayed.

Error Condition Table

Vehicle display screen Error Message	Cause	Action
USB Error 1	CacheFull	Delete all contents on the USB memory device/ Format the USB memory device. R run the PMI routine with the diagnostic scan tool and re attempt the PMI . If the PMI fails again, attempt a CAN flash, following the diagnostic scan tool on-screen instructions.
USB Error 2	Manifestinvalid	Delete all contents on the USB memory device/ Format the USB memory device. R run the PMI routine with the diagnostic scan tool and re attempt the PMI . If the PMI fails again, attempt a CAN flash, following the diagnostic scan tool on-screen instructions.
USB Error 3	InstallationPackageError	Delete all contents on the USB memory device/ Format the USB memory device. R run the PMI routine with the diagnostic scan tool and re attempt the PMI . If the PMI fails again, attempt a CAN flash, following the diagnostic scan tool on-screen instructions.
USB Error 4	USBRemoved	• Make sure the USB memory device is installed in the vehicle until the vehicle display screen indicates programming was successful and the USB memory device can be removed. • Using a diagnostic scan tool carry out the APIM self -test and verify there are no USB cable or media hub related Diagnostic Trouble Codes (DTCs). • Verify USB / media hub functionality by using the MIT , a mobile phone connected via a USB charge cord and/or a USB memory device with media files loaded. • Remove and reinsert the USB memory device and retry programming. • Attempt programming with a different USB memory device.
USB Error 5	InstallSignature	Delete all contents on the USB memory device/ Format the USB memory device. R run the PMI routine with the diagnostic scan tool and re attempt the PMI . If the PMI fails again, attempt a CAN flash, following the diagnostic scan tool on-screen instructions.
USB Error 6	RebootReset	• Do not perform a master reset or SYNC hard reset during the USB programming. Make sure active resets are finished and the SYNC system ha rebooted before re-attempting the USB programming. • Test the vehicle's 12 volt vehicle battery using approved diagnostic battery testers. Fully recharge or replace the battery per the test results. Complete th Battery Monitoring System (BMS) reset after the battery service, if directed b the workshop manual procedure. Retry the programming.
USB Error 7	USBReadError	• Make sure the USB memory device is installed in the vehicle until the vehicle display screen indicates programming was successful and the USB can be removed. • Using a diagnostic scan tool carry out the APIM self -test and verify there are no USB cable or media hub related Diagnostic Trouble Codes (DTCs). • Verify USB / media hub functionality by using the MIT , a mobile phone connected via a USB charge cord and/or a USB memory device with media files loaded. • Remove and reinsert the USB memory device and retry programming. • Attempt programming with a different USB memory device.
USB Error 8	USBWriteError	• Make sure the USB memory device used for the update is a 32GB, Exfat formatted USB memory device. • Attempt programming with the correctly formatted USB memory device or a different 32GB, Exfat formatted USB memory device.
USB Error 9	BatVoltageLow	Test the vehicle 12 volt battery using approved diagnostic battery testers. Fully recharge or replace the battery per the test results. Complete the Battery Monitoring System (BMS) reset after the battery service, if directed by the workshop manual procedure. Retry the programming.
USB Error 10	USBWrongFiles	Make sure the correct files have been downloaded to the USB memory device.

USB Error 11	VehicleModes	Make sure the vehicle's ignition is in the key on, engine off state. Verify the vehicle i in park/neutral.
USB Error 12	eCallPhone	Verify that any paired mobile phones are not making a Bluetooth connected call through the SYNC system.
USB Error 13	Crash	Using a diagnostic scan tool carry out the OCSM and RCM self-test. Verify there ar no crash related Diagnostic trouble codes (DTCs) stored. Diagnose any related cod and reattempt to reprogram the vehicle.
USB Error 14	IgnitionCycle	• Make sure the vehicle ignition remains in the key on, engine off state during programming. The LED indicator on the ignition push button remains flashing when in key on, engine off state. Low battery state of charge or battery health may cause battery load shed strategies to shut the ignition off during programming. • Test the 12-volt battery using an approved diagnostic battery tester. Fully recharge or replace the battery per the tester results. Once complete, carry o the Battery Monitor System (BMS) reset with the scan tool. • Reattempt the programming.
USB Error 15	MasterReset	Do not perform a master reset or SYNC hard reset during the USB programming. Make sure active resets are finished and the SYNC system has rebooted before re-attempting the USB programming.

Recovery

NOTE: *Perform the following steps when programming has resulted in a blank module.*

1. Disconnect the VCM II, VCMM or later level device from the DLC and PC.
2. Launch FDRS and log in.
3. In the Device Manager window that populates, select CANCEL.
4. Select the appropriate VIN from the Vehicle Identification menu or use Manual VIN Entry and select GO.
5. In the Vehicle Communication Device Not Detected window that populates, select CONTINUE. If a Device Explorer window populates, select CANCEL.
6. After the session has started, reconnect the VCM II/ VCMM to the DLC and the PC. The VCM II/ VCMM or later level device icon should turn green in the bottom right corner of the screen. If it does not, troubleshoot the FDRS to VCM II, VCMM or later level device connection.
7. In the Toolbox menu, navigate to the failed module and Download/Run PMI . Follow the on-screen prompts. When asked if the original module is installed, select NO and continue through the installation application.
8. Once programming has completed, a screen may list additional steps required to complete the programming process. Make sure all applicable steps are followed in order.