Hello, I’m Mike Sculthorpe. Welcome to this Service Programming System Update Service Know-How video.

The purpose of this video is to bring you up to date on the latest hardware, software and procedures associated with General Motors’ Service Programming System.

- We’ll begin with an overview of the Service Programming System, or SPS.
- Then we’ll talk about how SPS has evolved, and where it’s heading.
- We’ll also take a look at the various SPS Programming methods and the tools required.
- To bring all this information together, we’ll take a step-by-step look at a complex example of programming...
- and to help us sort it all out, we’ll be joined by Mike Magyar, Brand Quality Manager for SPS who will provide additional insights into SPS.

General Motors’ Service Programming System is a PC-based application that allows for the reprogramming of vehicle electronic control modules.

Initially, programming was accomplished using the Remote method. The scan tool was used to gather the necessary information from the vehicle. Next, the scan tool was connected to the Techline Terminal to upload the vehicle data and receive the latest software programming calibrations.

The scan tool was reconnected to the DLC to update the vehicle’s on-board controller.

Starting with the 2008 model year, Pass-Thru programming was introduced. It’s called Pass-Thru programming because the scan tool acts as a Pass-Thru for data passing between the Techline Terminal and the vehicle.

With Pass-Thru programming, the scan tool remains connected to the vehicle and the Techline Terminal for the entire programming event.

In 2007, the Multiple Diagnostic Interface (or MDI) was introduced. The MDI allows for faster data transfer between the Techline Terminal and the vehicle. It has the additional advantage of working wirelessly over Wi-Fi. The MDI can be used to perform Pass-Thru programming on all vehicles built since 1996.

Over time, the Techline Information System (or TIS) on the Techline Terminal has evolved into the internet-based TIS2Web.

Along with GDS2, and several other applications, SPS can be launched from the TIS2Web homepage.

Note: You must have a valid TIS2Web subscription in order to access SPS.

Having the ability to program as many GM vehicles as possible requires these tools.

- A Tech2 scan tool for pre-Global A vehicles.
- A CANdi module to allow the Tech2 to work on vehicles with a CAN bus.
- An MDI or MDI2.
• GDS2.
• And a PC with an active TIS2Web subscription

As of the time we produced this video, GM supports business grade PCs with Intel i series processors running Windows 7. Windows 10 has also recently been approved for support. Also, Internet Explorer 11 is the only supported web browser at this time. Other browsers, including Edge, are not approved and may not properly display graphics from SI.

GM recommends that Techline PCs have at least 4 GB of RAM, 500 GB of hard drive space for laptops and 1 TB of space for desktop TDS systems, a CD/DVD drive, 4 or more USB ports, a 100 megabits per second Ethernet connection, and an optional WAN 802.11g wireless connection.

Techline also recommends at least 1 laptop for every 2 technicians and 1 MDI or MDI2 for every Techline PC.

More details on minimum requirements and specifications can be found on the gmdesolutions.com website.

Now that we know a little about the history of SPS and the tools required, let’s look at the preliminary steps of programming. A note of caution first: DO NOT program a control module unless you are directed by a service procedure or service bulletin.

A successful programming event begins with preparation. Be sure to become familiar with all precautions in the bulletin or procedure you are following before starting any programming. The precautions are either listed as “Important” or “Note.”

Begin by making sure that the TIS Terminal, MDI and the Scan Tool are updated with the latest software version available.

In order to make sure that adequate voltage is maintained during the programming process, connect the EL-49642 SPS Programming Support Tool to the battery. The GR8 can also be used in power supply mode to maintain voltage during programming.

The reason for using the EL-49642 is the voltage fluctuations that can occur with a non-rectified battery charger. These peaks and valleys, whether they’re high spikes or low spikes, can cause programming issues.

The EL-49642 provides a clean, even signal, without spikes or noise on the line.

With everything prepped and ready, it’s time to start programming. For our example, we’ve chosen the radio reprogramming procedure that is part of Bulletin 15-NA-081. We’ve chosen this as our example because of its complexity. It is a two-part process that begins with programming from a USB flash drive. The second half of the process is SPS programming.

The subject vehicle for this video was a 2016 Buick Cascada. Be aware that the programming steps required will vary somewhat from vehicle to vehicle. Be sure to carefully follow the instructions in the bulletin.
After navigating to the Service Programming System in TIS2web, select either J-2534 MDI or MDI2 on the Select Diagnostic Tool screen and Reprogram ECU.

Connect the selected tool to the vehicle.

With the ignition on, engine off, turn on the radio so that audio is playing.

Programming will return the radio to its factory default settings. The customer’s custom radio settings should be recorded so they can be reset after the update.

Build the vehicle in SPS.

Ensure the VIN is correct and select Next.

From the list of controllers, select A11 – Radio.

Ensure USB File Transfer and USB Copy are highlighted. Click Next.

Follow any subsequent on-screen instructions carefully.

At this point, you may be asked to select the proper RPO choice for the vehicle being programmed. The RPO information for the vehicle can be found on the SPID label or by building the vehicle in Global Warranty Management – VIS.

Once the proper option code has been selected, click Next.

On rare occasions, the radio part number can’t be read by TIS2web. If this occurs, follow the directions outlined in the bulletin.

With the programming type, RPO code and part number selected, insert a flash drive into the computer.

Important! The flash drive should be a name brand USB 2.0 drive. USB 3.0 drives are not supported at the time of this video’s production.

The drive should be formatted to FAT32 and have a capacity of at least 4 gigabytes.

All data will be erased from the flash drive when the update software is downloaded. No additional data should be added to the flash drive after the download is completed.

To avoid errors, it’s recommended that calibrations be downloaded every time a vehicle is programmed.

Select “Next.”

Select the USB drive from the list on screen.

On the “Summary” screen, write down the USB Calibration Part Number that is about to be installed. It is required for verification at the end of programming. Select “Next” to begin the process of downloading the calibration to the flash drive.

When the download has completed, a message will be displayed indicating that the flash drive can be removed.
On the radio, select “Home”, “Config”, “Phone Settings”, and “Bluetooth” in order to reach the “Device List.” All of the paired devices stored in the radio should be deleted to prevent interruptions to the programming process.

With both the ignition and the radio on and the engine off, insert the flash drive into the vehicle USB Data Port.

If “No Music Files Found” displays, click OK to dismiss the message.


A “Searching and Verifying Files” message will display for up to 20 minutes as the files on the USB Flash Drive are checked. This is normal.

It is important to distinguish between operations that take a long time to complete and a lock up of the radio.

If a lock up is suspected, wait for a full hour to pass without the screen changing before aborting the update.

If the radio does lock up, unlocking and recovering it is possible. It is unlikely that the radio will need to be replaced.

First, remove the flash drive.

Remove the radio fuse. Keep the fuse out for at least 30 seconds before reinstalling it.

Start the programming process again from the beginning.

Once the “Searching and Verifying Files” message goes away, the process may vary, depending on the vehicle, model year and what software is present.

If the “Press the Key Sequence” screen is displayed, carefully press and release the “Seek Up” and “Seek Down” buttons in the order displayed on the screen to continue with the update.

The “Files Found” screen will display the list of the five files to be installed. If the update doesn’t start automatically, press “Start Software Update.”

If the “You are about to start a software update session” screen is displayed and the update doesn’t start automatically, press continue.

Important: As the files are being installed, a progress bar will be displayed along with the number of the file being installed. The exact display will depend on year, model, and software. As these files are installing, it is normal for the screen to go momentarily blank, for the audio to drop out and for a “splash screen” to appear. Do not interrupt programming if any of these things occur. Be patient and allow the programming to completely finish. Typically this step will take 30 to 60 minutes for USB files 1 through 5 to be installed into the radio.
When the programming event has completed, the screen on some vehicles will display a message advising that the update is complete. Press OK to restart the radio. If OK is not pressed within 10-20 seconds, the radio will restart by itself.

Once the radio has restarted, remove the USB drive and turn off the ignition. Open and close the driver door.

Wait for at least 60 seconds before turning the ignition back on with the engine off. Allow the radio to start up and play audio again.

With the USB Programming complete, the SPS Programming can proceed.

Select “Proceed with the Same VIN.”

At this point, the SPS Programming Procedure is very similar to USB Programming. Select either J-2534 MDI or MDI2 on the Select Diagnostic Tool and Programming Process screen.

From the list of controllers, select A11 – Radio.

Ensure that Programming and Normal are highlighted.

Follow any subsequent on-screen instructions carefully.

You may be asked to select the proper RPO choice for the vehicle being programmed. The RPO information for the vehicle can be found on the SPID label or by building the vehicle in Global Warranty Management – VIS.

Once the proper option code has been selected, click Next.

Write down the Operational Software number you are installing from the Summary screen. It’s required for verification at the end of the process. Select “Next” to start the installation of the calibrations.

Again, if the radio appears to lock up during the installation, be sure to wait for at least 60 minutes without progress before aborting and starting the SPS Programming process over.

Once SPS programming is finished, the radio display will go momentarily blank, then return to the Home screen with audio resuming. If a “No VIN Stored” message is displayed, it can be ignored.

The radio must be reset at this point in order for the update to take effect. On the radio, select “Config”, “Radio Settings”, “Software Versions Menu”, and “Clear and Reset Radio.” Select “Yes” to reset the radio.

Once the radio has restarted, be sure to clear all DTCs.

Some vehicles allow DTCs to be cleared right from SPS, otherwise codes can be cleared using GDS2.

Two methods are available for confirming the USB and SPS calibrations that are present in the radio. On the radio, select “Home”, “Config”, “Radio Settings”, “Software Versions Menu”, and “Software Versions Information.” Make sure that the USB and SPS Calibrations listed match the one’s written down earlier.
The second method involves using TIS2web to attempt the update again. At the USB Summary screen, compare the “Current” and “Selected” calibrations. If they match, press “Cancel” to abort the Programming process.

Repeat the SPS Programming process. At the Summary screen, compare the “Current” and “Selected” calibrations. If they match, press “Cancel” to abort the Programming process.

If the update was performed because of phone to vehicle Bluetooth concerns, the customer should update their phone to the latest available software. After a soft reset of the phone, the customer should close all applications before re-pairing to the vehicle.

If any concerns or SPS Programming Errors occur, call Techline (or TCSC) for help. Contact information for TCSC is in the bulletin.

SCULTHORPE
Don't forget to restore the customer's radio settings after programming.

Some modules require additional steps after they're programmed to ensure full functionality.

The OnStar Telematics Communication Interface Control, for instance, must have WiFi enabled and the system reactivated after programming.

I'm joined now by Mike Magyar, Mike is the Brand Quality Manager for SPS.

Mike, thanks for coming in.

MAGYAR
Glad to be here Mike.

SCULTHORPE
My first question is what is the difference between "software", "update" and "calibration"

MAGYAR
Just like on your home computer, there is an operating system and there are programs like Word or Powerpoint.

Sometimes we have an update to the operating system, of the vehicle. Just like you would see an update to windows.

Sometimes we have updates to existing programs in the vehicle or sometimes times we are installing an all new operating system or program. Software is what the operating system uses to run certain jobs, an update is simply an update to the software and a calibration is a requirement for a certain job in the software.

SCULTHORPE
Regarding the radio programming we just saw performed. What is the reason that the process is broken down into two separate methods - USB and SPS?
MAGYAR

We separate programming between SPS and USB basically for speed. For smaller updates, or calibrations where the files are small we will use SPS programming.

For larger updates to software or new software installation we will use USB programming so that the TDS system can download the update overnight so that computer is not tied up for a lengthy programming event.

SCULTHORPE

One of the notes at the beginning of Bulletin 15-NA-081 says that the USB and SPS software calibration downloads from TIS2Web will take longer without the TechLine DVD installed in the dealer server.

Why is that the case?

MAGYAR

That is the case because the download speeds through the network or internet are going to be much slower than the speeds from the hard drive of your computer to the usb drive.

SCULTHORPE

Earlier, I mentioned some specifications for USB Flash drives.

Do you have any additional recommendations?

MAGYAR

We recommend using USB 2.0 drives between 8 and 16 gb because those drives will work with all computers that meet our TechLine specifications.

SCULTHORPE

What are the most common problems that technicians have when performing a fairly complex programming event like the one for Bulletin 15-NA-081?

MAGYAR

Vehicle Battery voltage not being maintained with a voltage maintainer is the most common problem we see. It is very important to keep the battery at voltage during programming.

SCULTHORPE

Earlier, we saw some steps to take if a radio locks up during programming.

Can you share any advice on what to do in the case of a programming failure or lock-up with any module?

MAGYAR

The first thing you'll want to do is to follow all of the steps in the bulletin.
If you still think there is a lock up the best thing to do disconnect the battery and leave it disconnected for about an hour.

Once the voltage is drained from the module you can check for communication with the module through GDS2.

If you can’t communicate with the module after you have drained all of the voltage then you will have to replace the module.

SCULTHORPE

Is there any way to tell what is causing a module programming failure?

MAGYAR

The module programming failures that come up will have error codes associated with them.

Technicians can look up the programming error in SI.

If you can’t find the error code in SI then call TCSC and provide them with the line operation error code, which will be listed on the Tis2Web screen at the end of a failed programming event and can identify the issue you are having.

SCULTHORPE

Do you have any advice for technicians on how to stay productive during a long programming event?

MAGYAR

The best thing to do is be strategic as to when you perform different programming events.

It might be best to perform USB programming events during lunch.

The important thing is that your computer does not go to sleep during programming.

The sleep settings for the computer can be changed in the computer settings.

SCULTHORPE

When it comes to choosing the right calibration for a particular vehicle, should a tech always choose the latest version available?

MAGYAR

The technician does not have any choice.

But, sometimes programming is driven by RPO codes. So it is very important to make sure when you are given a choice to pick RPO codes for a vehicle that you pick the correct RPO codes for the vehicle you programming.

SCULTHORPE

Since programming can be such a lengthy process, can you share any timesaving ideas?

MAGYAR
My main suggestion is using the Techline Data Service server. TDS was designed to save time, so that updates can be downloaded to the server and put on USB.

SCULTHORPE

How does the MDI 2 impact programming?

MAGYAR

The MDI2 will allow data to transfer from the computer to the vehicle at a faster rate. The biggest thing is point to point wireless, the MDI2 now connects solely to your computer.

Now that we don't have to work with access points, the wireless connections of the MDI2 are more robust.

SCULTHORPE (SCN 59)

I also asked our Emerging Issues viewers for any questions they may have concerning programming. The first is from Dan Rapp, the Fixed Operations Manager at Dorais Chevrolet Buick GMC in Wabash Indiana who asked:

Like many other dealerships we have installed TDS.

Also like many other dealerships we have vehicles that are put on stop sale awaiting a recall or system update of some sort.

Once the repair procedure is available a bulletin is released and we update the subject vehicle system to complete the recall and release the vehicle for sale.

Prior to TDS we downloaded the vehicle specific file each time directly from GM, so we knew we were getting the correct software.

I don't know of a way we can check our TDS system to be sure it downloaded the latest software.

Do you?

How can we be certain we are programming with the correct software version?

It is my understanding TDS updates automatically.

If the update fails to occur - for any reason - the night prior to a recall release we could potentially believe we completed a recall but actually did not.

MAGYAR

SPS Programming will always query for the latest version of the calibration. If the latest calibration is not on your TDS server, for whatever reason, SPS Programming will automatically download the latest version from the Tis2WEB database and use IT instead.

SCULTHORPE

Our next question is from Matt Pospesil at Burtness Chevrolet in Whitewater Wisconsin.
Matt asked:
Is there any way to tell where the download is coming from? TDS vs over the internet?
And a similar question from Kevin Schwartz at Ganley Chevrolet in Brookpark Ohio who asked: We have the programming system in place but can't tell if it is working.
Is there a simple way to tell if it being downloaded online or off the TDS files?

MAGYAR
If the calibration downloaded is not the most recent, during programming, you will get a message stating that you are attempting to program with the same calibration, or the programming will be skipped altogether. SPS programming should be stopped and the latest calibration should be downloaded from the Tis2Web database.
But if your TDS system is correctly connected to the internet it should be downloading the latest updates.
The best thing to do is to check the internet connection of the TDS machine to make sure it can receive the updates.

SCULTHORPE
Is there anything that you want to technicians to know about programming?

MAGYAR
One of the main things I want techs to know is that they shouldn't program a module unless they are directed to do so by a bulletin.
Just because you see there is a new update to a vehicle does not mean you should perform that update.
Many updates are only meant to fix certain issues, if the customer is not experiencing that issue there may be no need to perform that calibration.

SCULTHORPE
That is all the questions we had Mike, thanks for providing all the answers.
I really appreciate you coming in.

MAGYAR
Glad to do it Mike.

SCULTHORPE
Be sure to take the test for this video by clicking on the Take Test link at the end of the video.
Thanks for watching.