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Super Cruise Increases Compatible Highway Network



GM is expanding the mileage of Super Cruise-enabled roads to include over 70,000 additional miles (112,000 additional km) by the end of 2019, bringing the total number of Super Cruiseenabled roads to over 200,000 miles (320,000 km). Currently, customers have traveled 2.5 million miles using the Super Cruise driver assistance feature.



New AFIT Adapters Released for 2019MY Engines

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Super Cruise Increases Compatible Highway Network

Building on Super Cruise's unique combination of precision LiDAR map data, high-precision GPS, a state-of-the-art Driver Attention System and a network of camera and radar sensors, the mileage expansion allows for Super Cruise to be engaged on divided, high-speed main roads that contain some limited intersections and traffic control devices. On roads with railroad crossings and stop lights, for example, Super Cruise will alert drivers to take back control of the vehicle. As always, it remains important for drivers to stay engaged and vigilant at all times while Super Cruise is engaged.



Active Super Cruise system





Lidar map image of a compatible, divided highway

In addition to the mileage expansion, there are additional improvements to the Super Cruise system, including:

- Driver Attention System updates to enhance driver engagement.
- Performance improvements to make the driving experience more natural.
- Enhancements to increase the overall functionality of Super Cruise.

REPROGRAMMING CONTROL MODULES

The map updates and system enhancements require reprogramming the Active Safety Control Module and the Digital Map Control Module on 2018-2019 CT6 models equipped with Super Cruise (RPO UKL).

Refer to K124 Active Safety Control Module Programming and Setup in the appropriate Service Information for more information about reprogramming the Active Safety Control Module.

Also refer to K179 Digital Map Control Module Programming and Setup in the appropriate Service Information when reprogramming the Digital Map Module.

If the Calibration Not Recognized warning message is displayed, contact the Techline Customer Support Center (TCSC).

USB MAP UPDATE

After reprogramming, verify the Digital Map Version. In the Digital Map Module in GDS2, enter the Data Display screen and verify that the Digital Map Version is 84743195 or a later version (higher number).

- If the Digital Map Version is 84743195 or later, reprogram the Digital Map Control Module but do not perform the USB Map Update.
- If the Digital Map Version is lower than 84743195, reprogram the Digital Map Control Module and perform the USB Map Update.

Data Display	a create				
Diagnostic Data Display Graphical Data Display Line Graph					
Digital Map Data					
Parameter Name	Value	Unit			
Date of Last Successful Scan Tool-Initiated Digital Map Download	January 1, 1901	Digit			
Date of Last Unsuccessful Scan Tool-Initiated Digital Map Download	June 17, 2019	Digit			
Digital Map Version	84743195	Digit			
Digital Map Update Failure Reason - Transmission Not in Park	No	Digit			
Digital Map Update Failure Reason - Transmission Shifted Out of Park	No	Digit			
Digital Map Update Failure Reason - Low Battery Voltage	No	Digit			
Digital Map Update Failure Reason - Key Out	No	Digit			
Digital Map Update Failure Reason - Insufficient Free Space	No	Digit			
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Verify that the Digital Map Version is 84743195 or a later version.

PROGRAMMING TIPS

- Ensure the programming tool is equipped with the latest software and is securely connected to the DLC.
- Maintain stable battery voltage during programming.
- Turn off or disable any systems that may put a load on the vehicle's battery.
- Clear DTCs after programming.
- If the Same Calibration/Software Warning is displayed in SPS, select OK and follow the screen instructions. Be sure to record the Warranty Claim Code from the SPS Action Complete screen.



TIP: After completing programming, be sure to note the SPS Warranty Claim Code on the job card (R.O.). Document all Warranty Claim Codes in the Correction field on the job card. Also ensure the VIN and job card number on the transaction match the VIN and job card number associated with the reprogramming event in SPS.

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After cor	npleting programming, note the SPS Warranty Claim Code on the job card.

Once reprogramming is complete, print and install the appropriate owner's manual inserts in the owner's manual.

Thanks to Katul Patel

Active Fuel Management/Dynamic Fuel Management on GM Models

SEMIBLY (LUMA)

Active Fuel Management (AFM) or Dynamic Fuel Management (DFM) is available on a number of recent GM models to help improve fuel economy, including 2014-2019 Corvette, Silverado LD, Sierra Limited; 2015-2019 Escalade, Suburban, Tahoe, Yukon; 2016-2019 CTS-V, Camaro; 2019 Silverado 1500, Sierra 1500; 2020 Silverado 2500/3500 and Sierra 2500/3500 models.

ACTIVE FUEL MANAGEMENT

AFM was designed to provide maximum fuel economy under light load driving conditions by deactivating the lifters on specific cylinders. On V8 engines, half of the cylinders are deactivated

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Comparison of AFM to DFM

		AFM/I	DFM Usage	<u>;</u>		
Model	AFM VLOM	4 Cylinder Deactivation	DFM OCV	FDFM	None	Notes
CTS-V 6.2L LT4	Yes	Yes	No	No		Always active
Camaro 6.2L LT1	Yes	Yes	No	No		Automatic only. AFM not active with manual trans
Camaro 6.2L LT4	Yes	No	No	No		Has the hardware, not active
Corvette 6.2L LT1, LT4	Yes	Yes	No	No		Auto trans active, manual trans active in ECO only
Corvette 6.2L LT5	No	No	No	No	Yes	No hardware on LT5
Escalade 6.2L L86	Yes	Yes	No	No		
Suburban/Tahoe/Yukon 5.3L L83, 6.2L L86	Yes	Yes	No	No		
Silverado LD/Sierra LD 5.3L L83, 6.2L L86	Yes	Yes	No	No		
Silverado/Sierra 4.3L LV3	Yes	Yes	No	No		
Silverado 1500/Sierra 1500 5.3L L82	No	Yes	Yes	No		
Silverado 1500/Sierra 1500 5.3L L84, 6.2L L87	No	No	Yes	Yes		
Silverado/Sierra HD 6.6L L8T	No	No	No	No		No hardware on L8T
Express/Savana 4.3L LV1	No	No	No	No		No hardware on LV1
Express/Savana 6.6L L8T	No	No	No	No		No hardware on L8T

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and on V6 engines, two of the cylinders are deactivated.

Under certain operating conditions, the Engine Control Module (ECM) commands the cylinder deactivation system to deactivate engine cylinders 1, 7, 6, and 4 on V8 engines or to deactivate engine cylinders 3 and 6 on a V6 engine. The engine will operate on all cylinders during engine starting, engine idling and medium-to-heavy throttle applications.

The Lifter Oil Manifold Assembly (LOMA) is only used on AFM applications.

DYNAMIC FUEL MANAGEMENT

DFM is the next generation in cylinder deactivation systems. It features AFM technology with the additional ability to deactivate any combination of cylinder valves to optimize fuel consumption. The control of every cylinder event allows peak efficiency to be obtained throughout the range of engine operation.

By extending cylinder deactivation to all cylinders, DFM allows for a large variety of firing sequences. DFM can have rotating cylinder deactivation patterns, such as 1/5, 1/3, 2/5, or 2/3, as well as fixed patterns, such as 1/4, 1/2, or 3/4. For rotating patterns, which are only available on small block engine (L84,L87), the cylinders being deactivated can change with each subsequent engine cycle. Transitions between firing sequences is done in a continuous fashion, making the transitions seamless and transparent to the driver.

Oil Control Valves (OCV), only used on small block engines, replace the LOMA. OCVs provide faster response times than the LOMA and are required for DFM. OCVs also are used on L82 engines with AFM.

For additional information, refer to #PIP5663.

Thanks to Richard Renshaw

Latest AFIT Software Adds 2020MY Vehicles

CH-47976 Active Fuel Injection Tester (AFIT)



Software Link

AFIT (Active Fuel Injector Tester) Software Update – V11.00

Support Document(s) AFIT Update instructions

AFIT DMU Instructions Guide AFIT Diesel Diagnostics Reference Guide AFIT Quick Reference Guide AFIT User Guide AFIT SIDI Diagnostic Guide

Look for software update V11.00

The latest software update (CH-47976-SWV11) for the CH-47976 Active Fuel Injector Tester (AFIT) has recently been released. The new update adds 2020 model year applications (as of December 1, 2019).

In addition, software release V11.00 includes:

- PC Application Software V4.0 (Windows 10/7 compatible)
- MCU Firmware V3.41 (includes new G9 Adapter coverage)
- DMU Firmware V1.20 (improves LT4 engine testing)
- USB to Serial Driver improved compatibility.

Software Download

The CH-47976-SWV11 software update is available through the Service Workbench selection of "Essential Tools – Software Updates" in GM Global-Connect (U.S. only). Select the link for AFIT (Active Fuel Injector Tester) Software Update – V11.00 and follow the instructions.

In Canada, the software is available for download through the Service Application selection of GM Special Tools & Equipment – Software Updates in GM GlobalConnect.

AFIT Update Instructions are available on the GM Tools and Equipment website under the Support Documents link for the software download.

For questions regarding the software release, contact Bosch Automotive Service Solutions Technical Support at 1-800-GM-TOOLS (1-800-468-6657).

Thanks to Rick Jackson

New AFIT Adapters Released for 2019MY Engines

The Active Fuel Injector Tester (AFIT) Spark Ignited Direct Injection (SIDI) Diagnostic Kit, essential tool CH-47976, was released several years ago for port and direct injected engine applications to help reduce misdiagnosis of fuel systems. The AFIT can aid in diagnosis to pinpoint the source of a vehicle drivability issue and avoid unnecessary replacement of fuel system components, especially fuel injectors that are not the cause of the condition.



TIP: The AFIT Kit, CH-47976, was an essential tool for Tier 1, 2, 3, and 4 dealerships only. Tier 5 dealerships may order the tool at gmtoolsandequipment.com.

The AFIT uses a microprocessor and software program to completely automate the fuel injection test procedure, eliminating the possibility of math errors and omitted calculations. Complete test results, including balance percentages and flow rates, are displayed on the Main Control Unit (MCU) and can be downloaded to a PC for printing and attaching to the repair order.

The AFIT tests include:

- Injector Test tests the fuel injector flow characteristics
- Pressure Test tests the fuel system pressure
- Leak Down Test pressurizes the fuel system and allows a leak down test to the vehicle's specifications

The CH-47976-500A kit included a Drive/Measurement Unit (DMU) along with several adapters and cables to connect to a variety of GM engines. Since the release of the CH-47976-500A kit, a number of other adapters also have been made available. To help in determining which adapter to use, the AFIT will display the correct adapter during the testing process. The latest software must be used in order to display all correct adapter and cable selections. Download the latest AFIT software through the Service Workbench selection of "Essential Tools – Software Updates" in GM GlobalConnect (U.S. only). In Canada, the software is available for download through the Service Application selection of GM Special Tools & Equipment – Software Updates in GM GlobalConnect.

With pinout location changes on new Engine Control Modules (ECM), a number of new adapters and a universal cable have been released for several new GM models, including the 2019 Silverado 1500, Sierra 1500, and XT4.

CH-47976-515 – UNIVERSAL AFIT CABLE

Applications: 5.3L V8 (RPO L82, L84), 6.2L V8 (RPO L87), 4.3L V6 (RPO LV3), 2.0L I4 (RPO LSY), 4.2L V8 (RPO LTA)

CH-47976-515 is a universal cable designed to avoid the need for new cables when ECM connector changes or connector pin loca-

	AFIT Adapters	
CH-47976-500A	AFIT, SIDI DIAGNOSTIC KIT	DMU includes G1 & G2a
CH-47976-501	ADAPTER CABLE E92 ECM	G1
CH-47976-502A	ADAPTER CABLE SIDI 14, V6 & V8	G2a
CH-47976-503	CABLE, ADAPTER, AFIT SIDI G3	G3
CH-47976-504	ADAPTER CONN, AFIT SIDI G2B	G2b
CH-47976-506	DMU only (No SENT module)	Included in -500A
CH-47976-507	ADAPTER, SENT FUEL PRESSURE	SENT Adapter for DMU
CH-47976-509	CABLE, AFIT SIDI G4	G4
CH-47976-511	CABLE, AFIT SIDI G5	G5
CH-47976-512	ADAPTER, AFIT SIDI G3B	G3b
CH-47976-513	ADAPTER, AFIT SIDI G2C	G2c
CH-47976-514	CABLE, AFIT SIDI G6	G6
CH-47976-515	CABLE, UNIVERSAL AFIT	Cable for G7, G8, G9
CH-47976-516	ADAPTER, G7 AFIT	G7
CH-47976-517	ADAPTER, G8 AFIT	G8
CH-47976-518	ADAPTER, G9 AFIT	G9 (Cadillac CT6 4.2L TT LTA)





tion changes occur in new vehicles. One end of the cable plugs in to the appropriate adapter and the other end to the AFIT SIDI DMU. The DMU plugs into the AFIT MCU and links the entire AFIT system together for injector flow testing and fuel pump pressure and regulator testing

CH-47976-516 – G7 AFIT ADAPTER



Applications: 5.3L V8 (RPO L82, L84) with ECM E90, 6.2L V8 (RPO L87) with ECM E90, 4.3L V6 (RPO LV3) with ECM E93

The CH-47976-516 G7 Adapter is one of the first adapters used with the CH-47976-515 Universal Cable for engine diagnostics using the CH-47976 AFIT. It's used on the 2019 Silverado 1500 and Sierra 1500 with the E90 and E93 controllers.

CH-47976-517 – AFIT G8 ADAPTER

Application: 2.0L I4 (RPO LSY) with ECM E01

The CH-47976-517 G8 Adapter is used with the CH-47976-515 Universal Cable for engine diagnostics using the CH-47976 AFIT on the 2019 XT4 with the E01 controller.



CH-47976-518 – G9 AFIT ADAPTER

Application: 4.2L V8 (RPO LTA) with ECM E68

The CH-47976-518 G9 Adapter is used with the CH-47976-515 Universal AFIT DMU Cable to allow injector and fuel system diagnosis with the CH-47976 AFIT on the 2019 CT6 with the E68 controller.



VEHICLE APPLICATION CHART

An updated 1996-2020 AFIT Vehicle Application Chart has been released to help identify cable adapters for each GM model. The chart lists the model applications, engine RPO, cable components, type of communication, SENT (Single Edge Nibble Transmission) applications and Stop/Start applications.

Thanks to Rick Jackson and Todd Hayes

Hydraulic Brake Conditions on Hybrid Vehicles Update

Several brake system conditions that may be found on some 2016-2019 Volt and Malibu Hybrid (RPO HP4) models could be related to the hydraulic components. Be sure to not overlook kinks in the brake lines, brake fluid leaks, damaged brake calipers and other types of hydraulic brake system issues when diagnosing a brake condition on hybrid models.

Following are some examples of possible conditions that may occur on the hydraulic brake systems of hybrid vehicles.

Misrouted Brake Line – A misrouted metal brake line may cause the line to kink, which would reduce the brake apply pressure to the wheel. DTC C05AD (Brake Blending System Performance) may set. This condition could occur if the misrouted line hits the shock tower when the wheel is turned. Repair the kinked metal brake line.



Misrouted front brake line

Worn Rubber Brake Hose – If the anti-rotation bracket is not seated into the retaining hole properly or the hose is not properly secured, the rubber brake hose could rub through on the front tire. DTCs C05AD, C0580 (Brake Pedal Position Sensor Performance) and/or P05FF (Brake Pressure Sensor and Brake Pedal Position Sensor Correlation) may set. This condition could lead to a loss of brake fluid. Replace and properly secure the brake hose.



Brake hose rubbing on the wheel

Twisted Rubber Brake Hose – A flexible brake hose that is kinked or twisted at the master cylinder may cause pressure to get trapped in the brake system. DTC C05AD may set. This condition may cause reduced brake fluid apply pressure to the wheels, resulting in brake performance issues. Replace the flexible brake hose at the master cylinder.



Bent Brake Fluid Bleeder Valve – Each brake caliper has a brake fluid valve. If any of the front or rear brake fluid bleeder valves are bent or cracked, which may be caused by a road debris impact, replace the damaged bleeder valve.



Bent bleeder valve

Damaged Brake Caliper Guide Pins – The brake caliper guide pins are designed to align the brake pads to meet the rotor at the correct angle in order to ensure complete application. If the brake caliper guide pins are suspected of causing a brake performance issue, remove the pins and check for any corrosion, damage, distortion, lack of high temperature lubrication, looseness in the caliper mounting bracket, a missing or damaged lower guide pin bushing, a missing or improperly seated guide pin seal, restricted pin movement, damaged guide pin boots, or seized or binding caliper guide pins. DTC C05AD may set. If any of these conditions are found, replace the guide pins.



TIP: The Malibu Hybrid and Volt brake caliper guide pins have several design differences and different removal and installation procedures. Refer to the appropriate Service Information when servicing the brake caliper guide pins.

Leak at Caliper Brake Hose to Caliper – A brake hose caliper crush washer can only be used one time. Reusing a brass crush washer may cause a leak. Look for the crush washer to have an

oval shape and witness lines, which indicate multiple use. Always discard the washer and replace with a new brass crush washer.



TIP: On Malibu Hybrid applications, the brake hose caliper crush washers are also identified as brake hose fitting gaskets. On Volt applications, the sealing washers are also identified as brake hose fitting gaskets.

A leak also may be due to the crush washer bolt being cross-threaded and retightened. When tightening the crush washer bolt, make sure to finger tighten the bolt first to avoid cross-threading when reinstalling.



Avoid cross-threading the crush washer bolt.

If either of these conditions are encountered, replace the brake hose.

For additional information, refer to the latest version of Bulletin #16-NA-286.

Thanks to Sherman Dixon

UPDATED Dealer Infrastructure Guidelines Outline Recommended New PC Specs

	Good Not acceptable for Service Bay Technicians****	Better	Best
Processor	Intel Core 13, 15, 17 4ª Gen	Intel Core 13, 15 5th & 6th Gen* & above	PC: Intel Core 17 7th & 8th Gen* & above Server: Intel Dual core Xeon or better
System memory (RAM)	4GB	8GB	8GB +
Hard Disk Drive	**256 GB +	500 GB +	1TB +
CD / DVD Drive (optional/external)	CD/DVD Combo	CD/DVD Combo	CD/DVD Combo
USB Ports	3	4	4+
Display	13" 1366 x 768 (HD)	15" 1366 x 768 (HD)	15+" 1920 x 1080 (FHD)
Network Adapter	Wired: Gigabit Wireless: 802.11n	Wired: Gigabit+ Wireless: 802.11ac	Wired: Gigabit+ Wireless: 802.11ac
Operating System	***Windows 7 Professional, 64 bit supported up to December 31, 2019	Windows 10 Professional, 64 bit	Windows 10 Professional, 64 bi
Warranty	3 Year on site	3 Year on site	3 Year on site
Note: 7th Gene. Note: For Service For Servic	ration or above have model numb rice Technicians who perform Infi files. Select from the Better or Be oft will no longer provide security work on sophisticated secure vehi t vehicle service application requi- bove.	ers of 7000 or greater (example: I tainment programming the 256G st category: · updates or support for PCs runni icles which require robust comput res 8 GB RAM to perform properly	ntel Core (3-7100U). B drive size is not sufficient for ing Windows 7 after ters and software. New 4. Refer to the Better and

The recently released GM Dealer Infrastructure Guidelines (DIG) have been updated with several changes for recommended dealership infrastructure equipment. The DIG includes guide-lines that are organized in Good, Better, and Best categories for dealerships that are looking to purchase new hardware.

As the end of Windows 7 support approaches (no longer supported by GM after December 31, 2019), dealerships are encouraged to review the GM DIG and take inventory of their PC equipment, including hardware specifications and age. When considering purchasing new equipment, refer to the "Best" column for recommended computer specifications and also be sure to note what is Supported vs. Not Supported in the Hardware section.

In the latest DIG, under the desktop and laptop columns labeled "Good", the statement "Not acceptable for Service Bay Technicians" has been added. As vehicle security increases and Techline Connect (replacement application for TIS2Web) begins launching later in the year, the technician PC will need Windows 10 Professional and 8GB RAM for proper operation of all Techline applications. To view the updated DIG and new PCs that meet the recommended guidelines, visit GMDESolutions.com and select the Dealer Services tab. Dealers can input their BAC and zip code.

For Techline Service Technician applications (TIS2Web, GDS2, MDI, MDI 2, Tech2Win, and Service Information):

- Requires Local Windows Administrative access for software installation and updates to Windows registry
- Recommends one laptop for each technician performing vehicle diagnostics, otherwise, one for every two technicians
- Recommends one Multiple Diagnostic Tool (MDI/MDI 2) for every Techline PC
- Recommends one battery maintainer for every two Multiple Diagnostic Interface (MDI) tools in use
- Recommends use of Tripp-Lite Keyspan USB to serial adapter (Model: USA – 19HS) for computers without serial ports

If you have questions about the guidelines, please contact the Techline Customer Support Center (TCSC) at 1-800-828-6860.

Thanks to Lisa Scott

Possible Open Fuse in Fuse Block–Battery

Some 2019 Silverado and Sierra models equipped with the 2.7L 4-cylinder engine (RPO L3B) may have an engine will not crank condition. If this condition is found and the starter motor does not rotate during an engine crank request, test for an open F3BA 400 amp fuse in the X50D Fuse Block–Battery.

If the F3BA 400 amp fuse is open, test for infinite resistance between the test points: B+ circuit terminal A X2 at the M64 Starter Motor and ground. If there is less than infinite resistance, repair the short to ground condition on the circuit.

If there is infinite resistance, replace the X50D Fuse Block–Battery and retest for proper engine cranking. Do not replace the starter motor.

If the F3BA 400 amp fuse is not open, follow the appropriate starter diagnostic information in the Service Information.

Thanks to Raymond Haglund



F3BA 400 amp fuse in the X50D Fuse Block–Battery



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