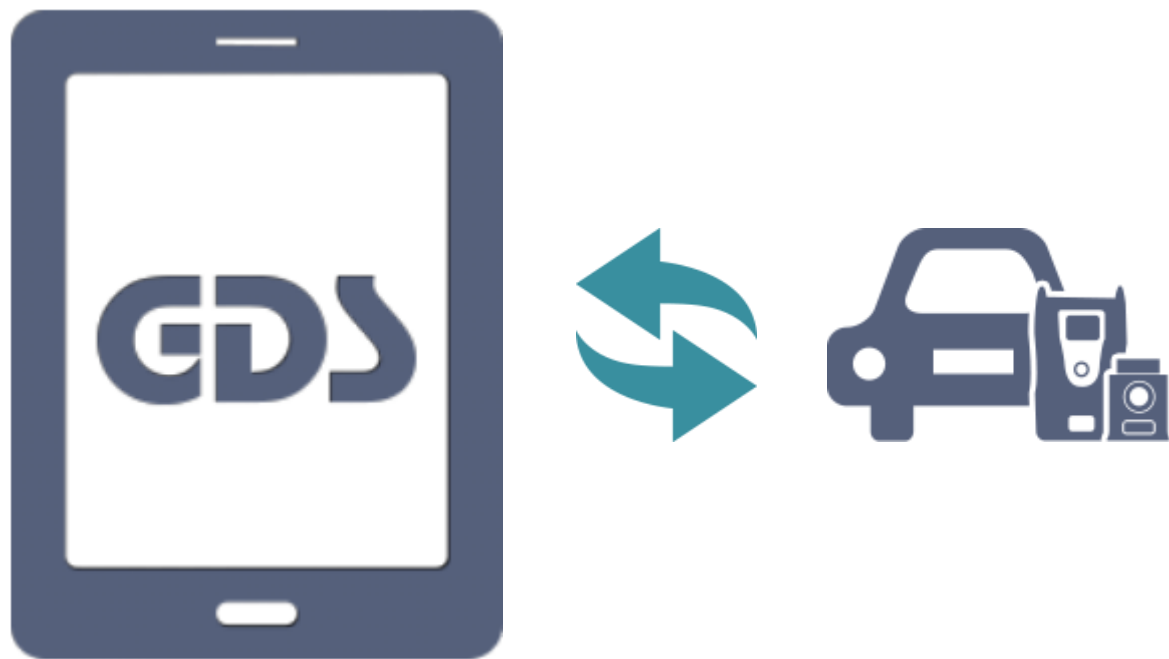
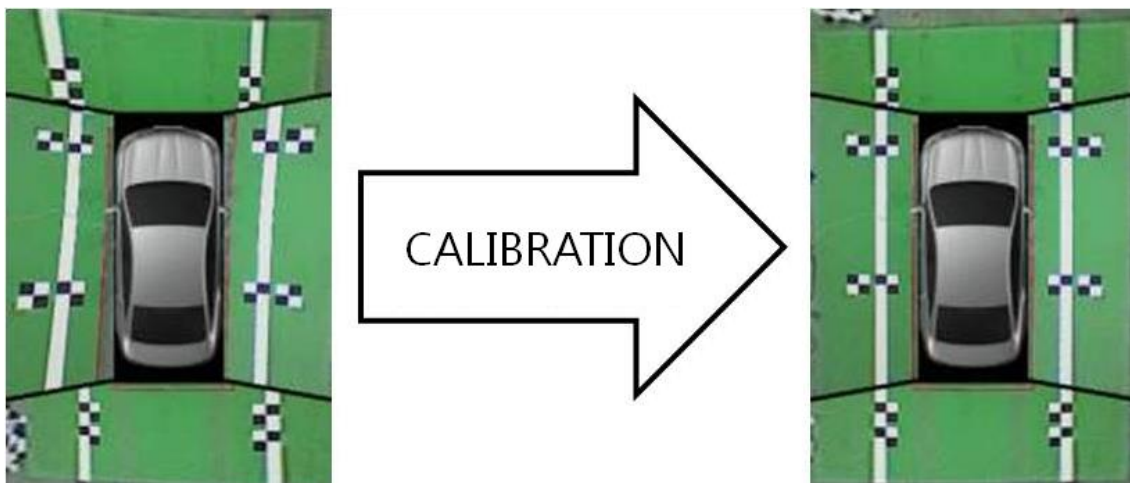


AVM



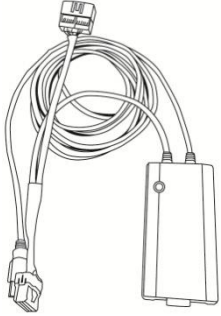
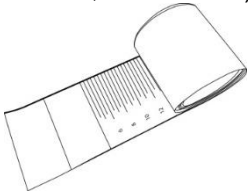
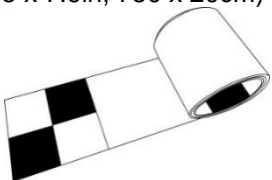



Around View Monitor (AVM) is a system that allows video monitoring of 360 degrees around the vehicle. The system consists of 4 cameras mounted around the vehicle (front, both sides and rear). It shows 360 degrees sky-view image of the vehicle's surrounding area, as well as various other view modes.

MCS Image Capture Module is a special service tool used in conjunction with GDS Mobile for the use of image Calibration when the camera module is exchanged or re-assembled.

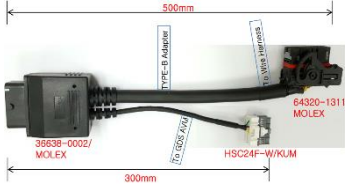
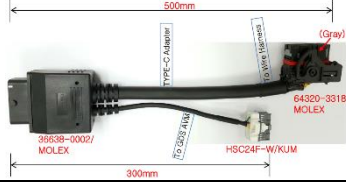


It is possible to check vehicle's AVM image information with the naked eye and calibrate it easily through the MCS Image Capture Module.

MCS Image Capture Module Components


Part Name	Part Number	Explanation	Q'ty
MCS Image Capture Module 	G0AKDM0001	<p>AVM is used to capture the image on GDS Mobile screen which is acquired from each camera to the AVM control unit for AVM calibration.</p> <p>The AVM control unit is connected between the wiring harness of the vehicle and the vehicle's AVM module.</p>	1
MCS ruler (126 x 7.9in, 320 x 20cm) 	G1GTD0K002	<p>Two MCS rulers are used to align the vehicle's cameras by installing them between front and rear axles.</p> <p>(Two MCS rulers are the same size.)</p>	2
MCS reference line (295 x 7.9in, 750 x 20cm) 	G1GTD0K001	<p>Two MCS reference lines should be installed in parallel to the left/right side of vehicle and they have a target point to calibrate the front/ rear image tolerance.</p> <p>(The two MCS reference lines are the same size.)</p>	2
MCS target point plate (27.6 x 7.9in, 70 x 20cm) 	G1GTD0K003	<p>Four MCS target point are for left/right Image tolerance calibration.</p> <p>Place them on mark of the MCS reference line.</p> <p>(All four MCS target point plates are the same size.)</p>	4
Basic Adapter 	G1GDDCH003	<p>Applied Vehicle : HG, HG HEV, AG, VI</p>	1
TYPE-A Adapter 	G0ADDMN003	<p>Applied Vehicle : DH, DM, DMA, NC</p>	1

◆ Extra adapters

Part Name	Part Number	Explanation	Q'ty
TYPE-B Adapter 	G0ADDMN004	Applied Vehicle : None	1
TYPE-C Adapter 	G0ADDMN005	Applied Vehicle : None	1

The TYPE B&C adapters are optional products. Contact the place of purchase if you need them.

◆ Power adapter

Part Name	Part Number	Explanation	Q'ty
Cigar DC Adapter 	G1PDDCA008	Cigar DC Adapter is a unit to supply electrical power for MCS Image Capture Module.	1

The Cigar DC Adapter is an optional product but an essential part to use MCS Image Capture Module with GDS Mobile. Contact the place of purchase if you not have it.

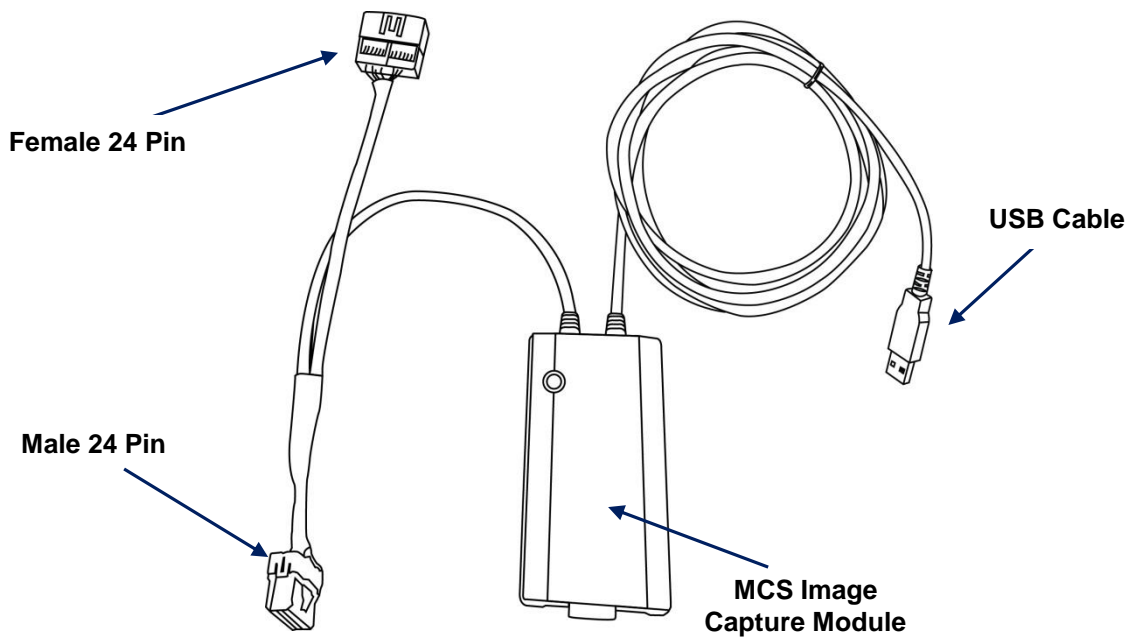


Notice

- ☞ Components specification and design are subject to change without prior notice for quality improvement.
- ☞ Applied vehicles for each adapter may be added later without prior notice.
- ☞ Refer to Shop manual to check an adapter of the vehicle.

MCS Image Capture Module Specification

Item		Specifications
Micro Controller		8Bit MCU (MB95F136) @4MHz
Operating Voltage		5VDC
Communication Port Specification		USB 2.0
Temperature	Operating	0°C~60°C(32°F~113°F) : Battery Charging
Ex Lamp	POWER LED	RED(Power On) / GREEN(Active)
Module Size		127 X 86 X 36 mm
Weight		350 g
Case		ABS



MCS Targets Installation procedure

◆ Preparation

1

Park the vehicle on the flat area(126in x 7.9in, 750cm x 420cm) for AVM Calibration.

(Place the shift lever 'N' position and then lock the parking brake to prevent movement of the vehicle.)

2

Set Automatic Suspension System height to "Normal" and check that tire pressure is set at the recommended pressure.

3

Check Hood / Trunk / Doors are closed and outside mirrors unfolded and ignition is in the OFF position.

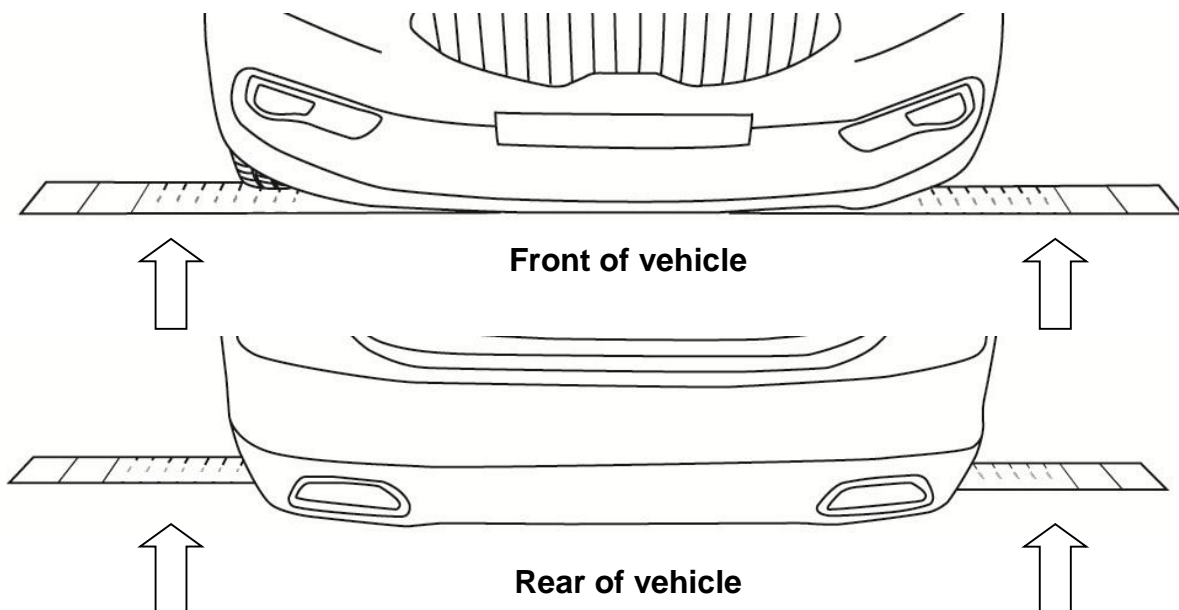
◆ MCS ruler Installation



MCS ruler (126in x 7.9in, 320cm x 20cm) or Front and Rear wheels

1

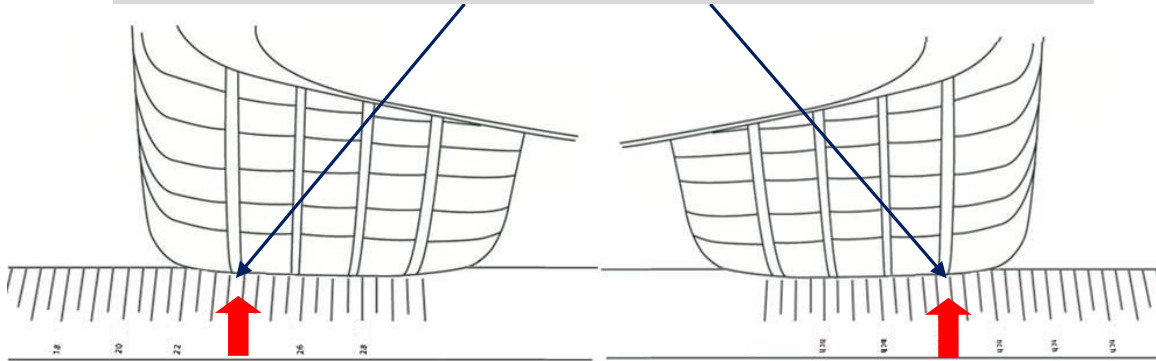
After preparing the vehicle, position the MCS rulers in front of the front wheels and at the behind the rear wheels.



2

The Vehicle must be centered using the MCS Rulers. Move the MCS Rulers so that the measurement is equal on both side without causing wrinkles or creases in the MCS Rulers.

The measurement of both left and right sides must equal



Left tire MCS Ruler installation

Right tire MCS Ruler installation



Notice

- ☞ If a customer has replaced a tire of a different size from the other tires, MCS calibration may not be correct.
- ☞ The dimensions of the front and rear tires may be different.

◆ MCS reference line Installation

1

The MCS reference line should be installed according to the end point of MCS ruler. And then, align the right-front wheel center of the tire with the Base line on the MCS reference line.

Rear

Front



Base Line(TYPE-B)

Base Line(TYPE-A)

MCS Reference Line (295in x 7.9in, 750cm x 20cm)



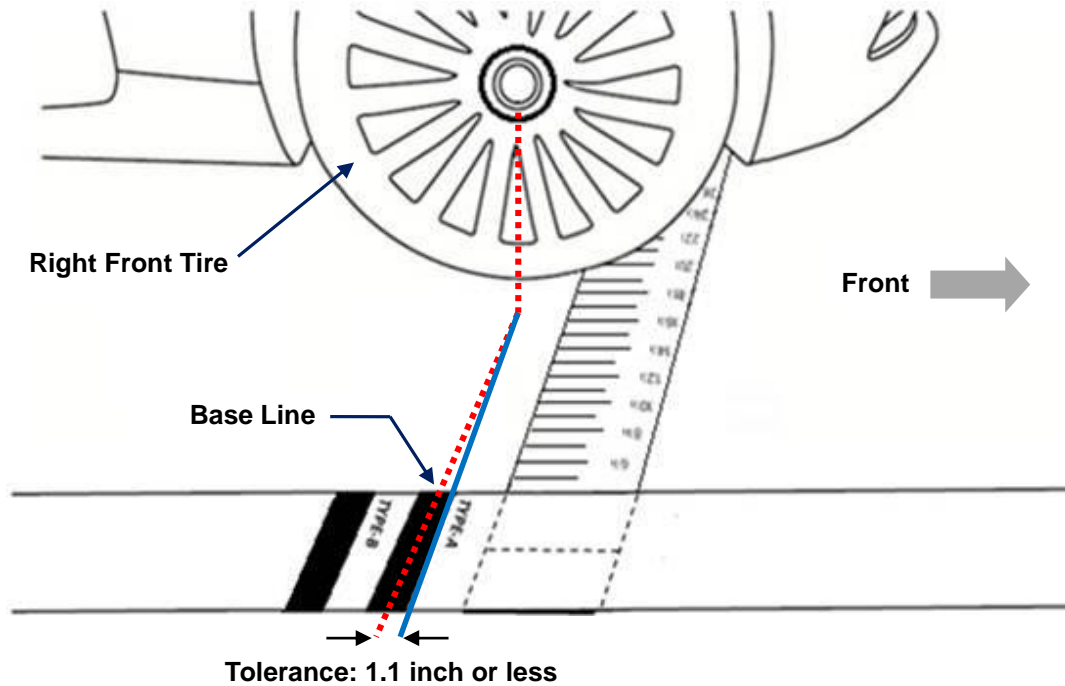
Notice

- ☞ There are two types(TYPE A & B) and the Base line should be matched to vehicle type.
- ☞ Tolerance between the front wheel center's imaginary line

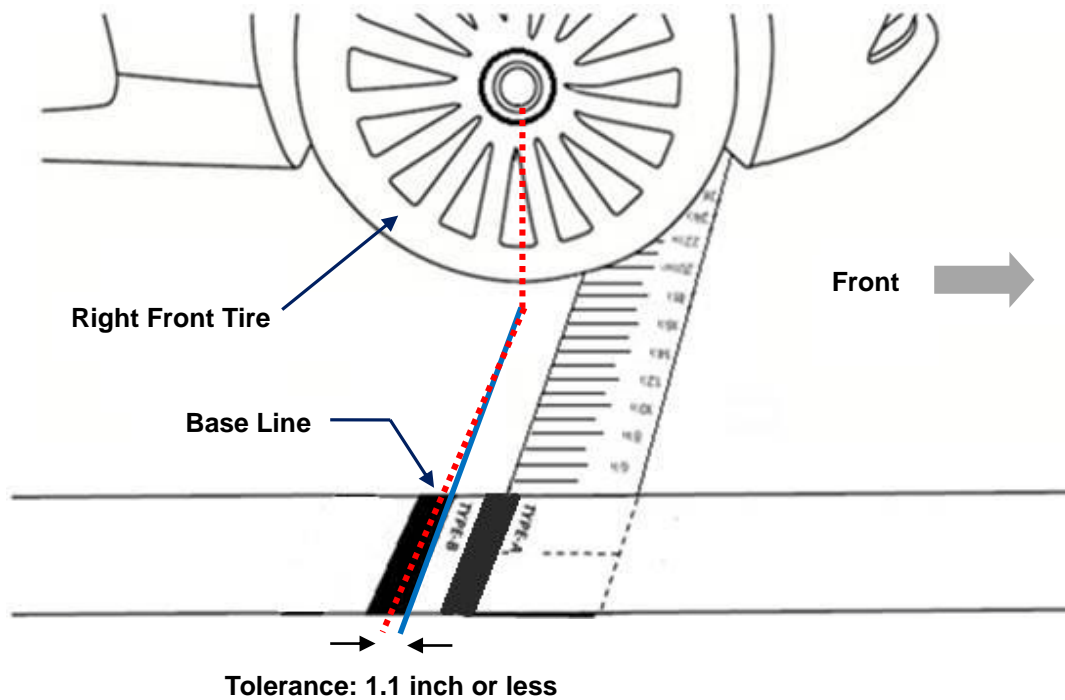
2

Base Line should be ± 1.1 inch(3cm).

◆ Front tire MCS Reference Line Installation (TYPE-A Vehicle)



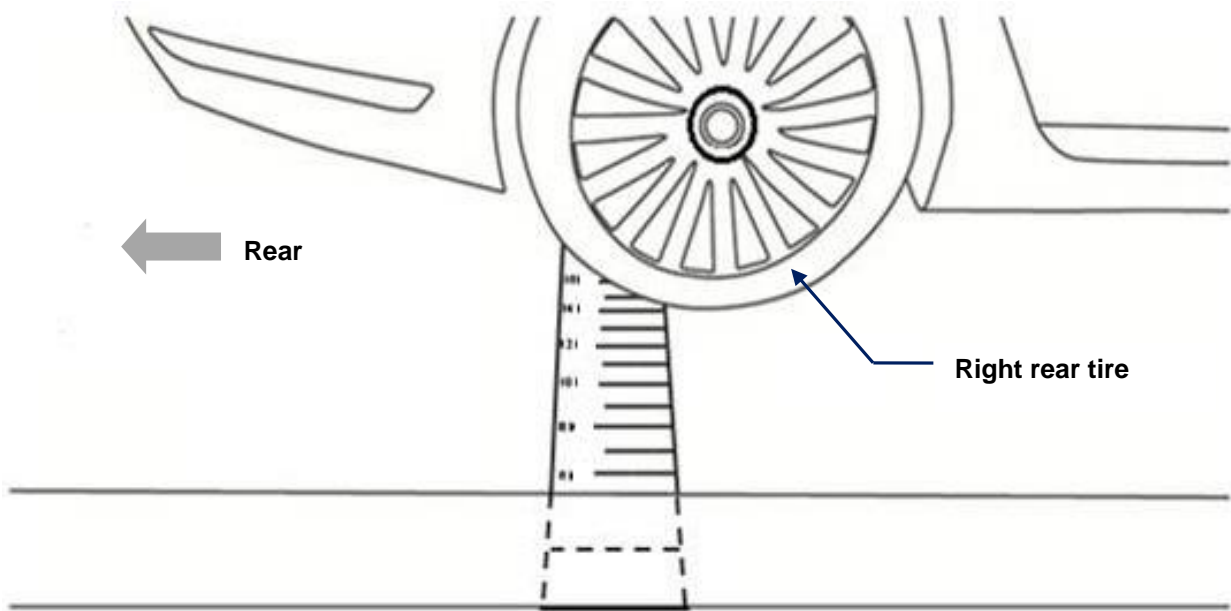
◆ Front tire MCS Reference Line Installation (TYPE-B Vehicle)



3

Install the MC reference line on MC ruler behind the rear wheels, be careful not to wrinkle or crease when installing.

◆ Rear tire MCS Reference Line Installation

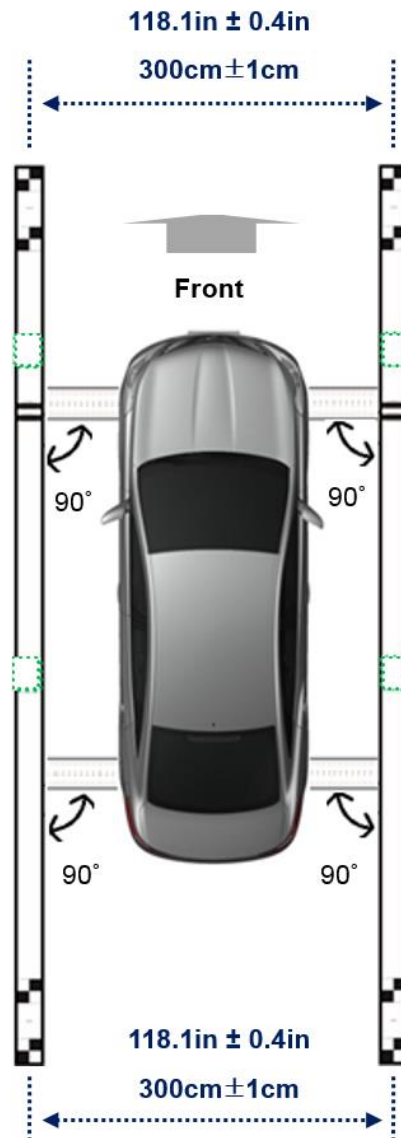


4

Repeat the MCS Reference Line installation on the left side of the vehicle.

5

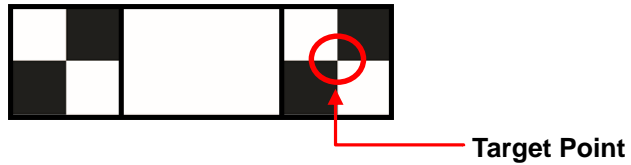
After installation MC rulers and MC reference lines, measurement should be made to ensure that the left and right MCS reference line are installed parallel to each other. As shown in the figure below, the distance between the left and the right Reference Line should be same.



Notice

☞ The allowance distance range from left line and right line is $118.1\text{in} \pm 0.4\text{in}$ ($300\text{cm} \pm 1\text{cm}$).

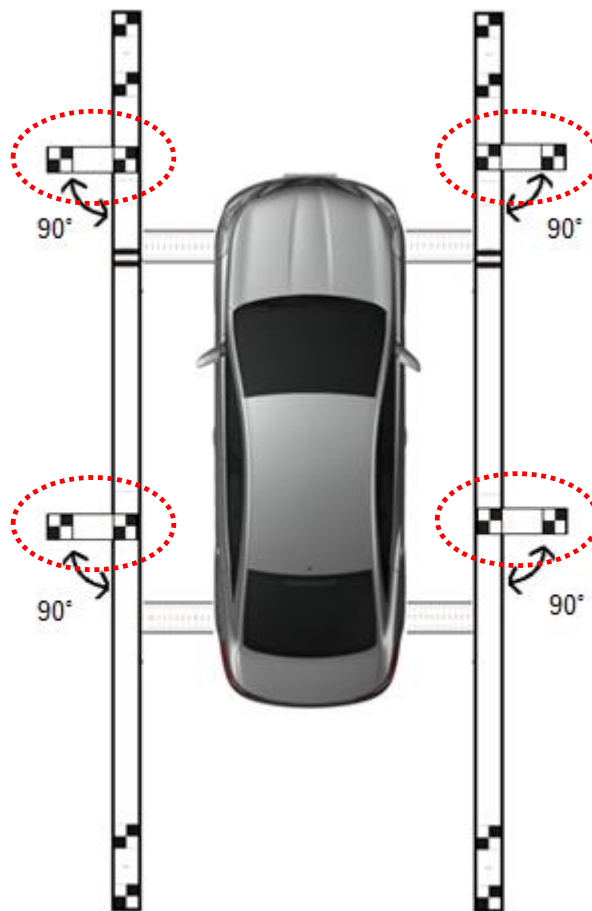
◆ MCS target point plates installation



MCS target point plate (27.6in × 7.9in, 70cm x 20cm)

1

Put the angle of 90° between MCS reference line and MCS target point.

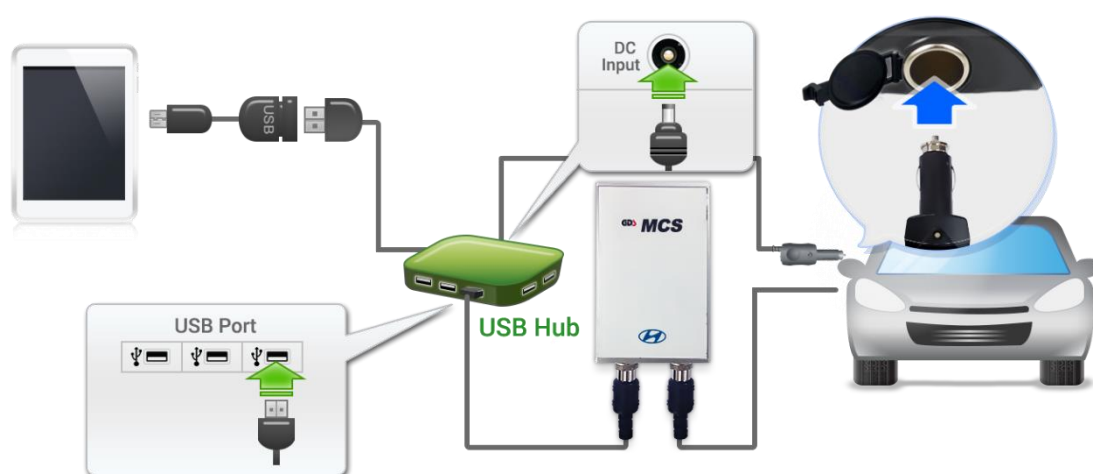


Notice

- ☞ Do not store with MCS rulers, MCS reference lines and the target point plates folded.
- ☞ Clean any debris found on the MCS rulers, MCS reference lines or the target point before storing them in their container.

MCS Image Capture Module Connection Guide

MCS Image Capture Module and vehicle must be connected as described below to perform AVM calibration. Connect the tablet and the MCS Image Capture Module to USB Hub (Android OS compatible) and connect Cigar DC Adapter to a cigar lighter socket in the vehicle as shown below.

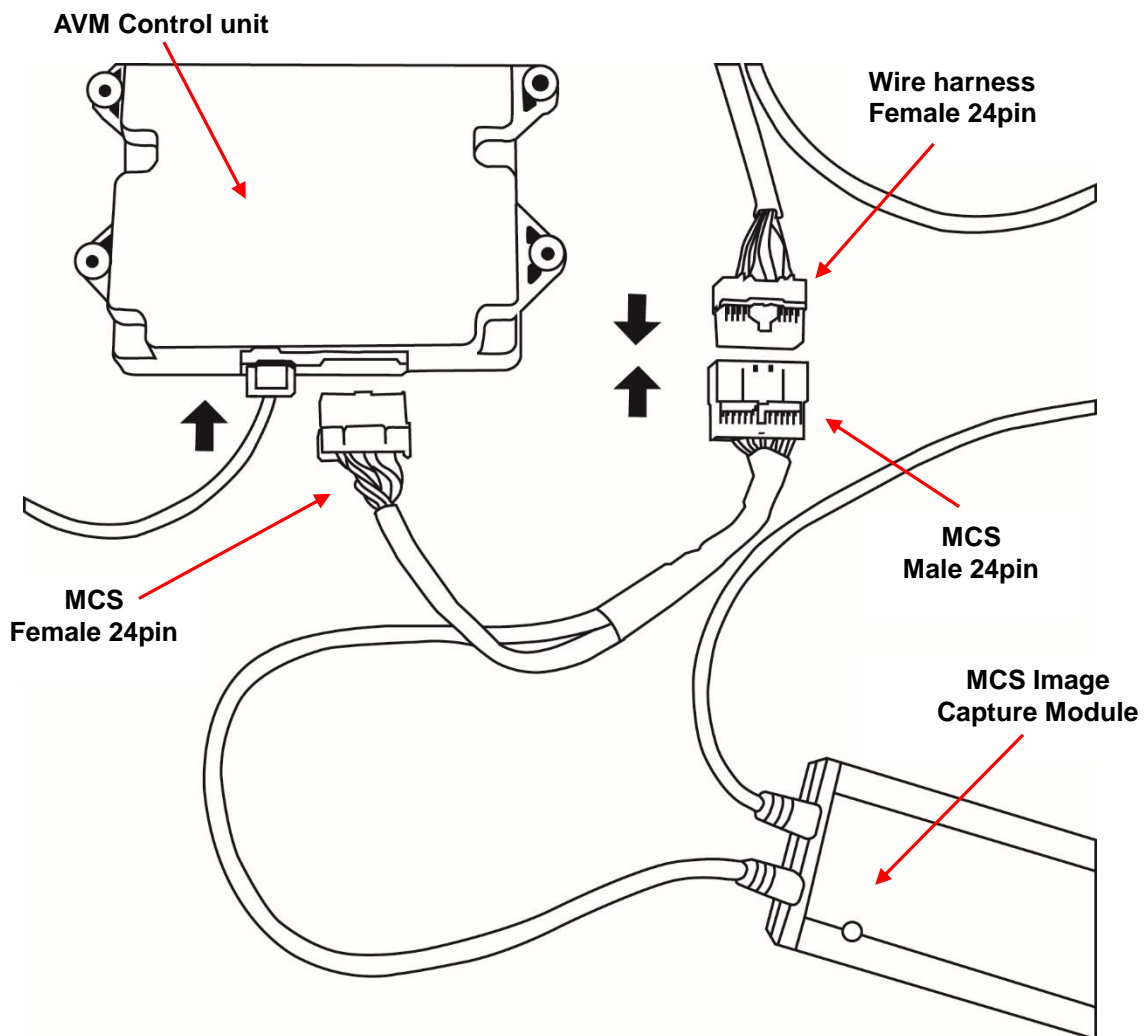


Caution

- ☞ The location of the AVM control unit varies by vehicle.
- ☞ Refer to Shop manual for AVM Control Unit's detailed location.
- ☞ Android OS compatible USB Hub is necessary.
- ☞ Micro USB to USB-F(OTG Cable) is necessary.
- ☞ Cigar DC Adapter is necessary.

MCS Image Capture Module Installation procedure

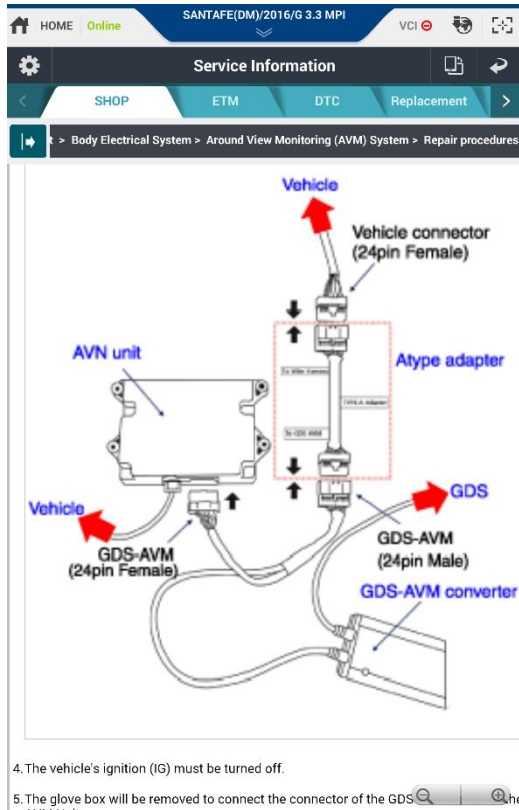
- 1 Turn the ignition to the OFF position.
- 2 Disconnect the wire harness(24pin) from the AVM control unit in the vehicle
- 3 Connect the MCS Image Capture Module's connectors (24pin) between the AVM control unit and the wire harness of the vehicle. Make sure the connectors are fully seated.



Notice

- ☞ The location of the AVM control unit varies by vehicle.
- ☞ Refer to Shop Manual for AVM Control Unit's detailed location.

◆ Extra adapter connection



When connecting an additional adapter, connect it between the vehicle connector(24-pin Female) and the MCS connector(24-pin Male)

Refer to this guide P3 ~ P4 for the basic adapter and TYPE A, B, C adapter information.

4

Pair VCI II to GDS Mobile.

5

Connect the MCS Image Capture Module to USB Hub (Android OS compatible) and connect it to GDS Mobile.



Warning



Do not disconnect the AVM Control unit with the ignition ON. It may cause a malfunction of the control unit.



MCS Firmware Update

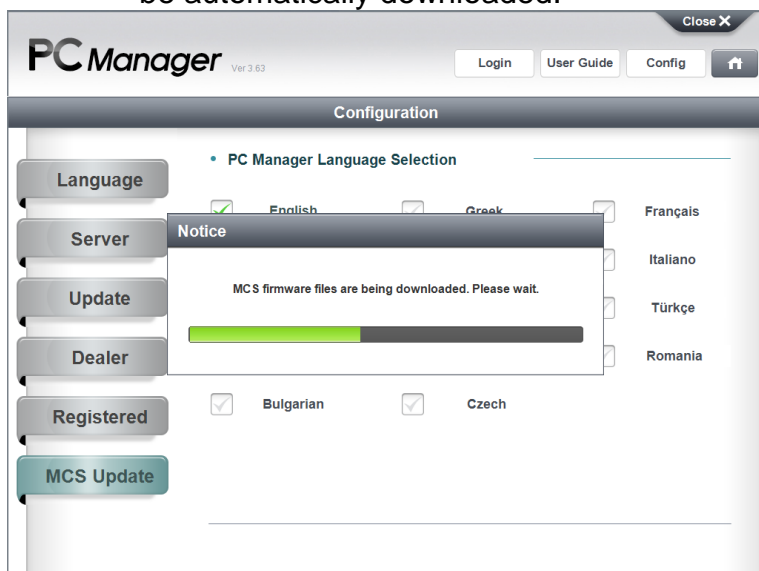


This indicates the MCS Image Capture Module Firmware update process through PC Manager.

- 1 Select [Config] button in the upper-right corner.



- 2 Click [MCS Update] button and MCS Image Capture Module firmware files will be automatically downloaded.



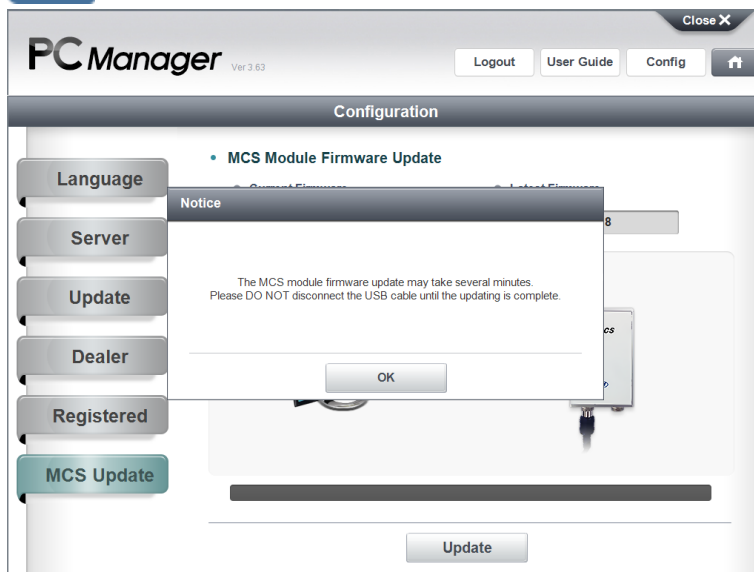
3

Connect MCS Image Capture Module to the PC and click [Update] button.



4

Read the notice carefully and click [OK] button.



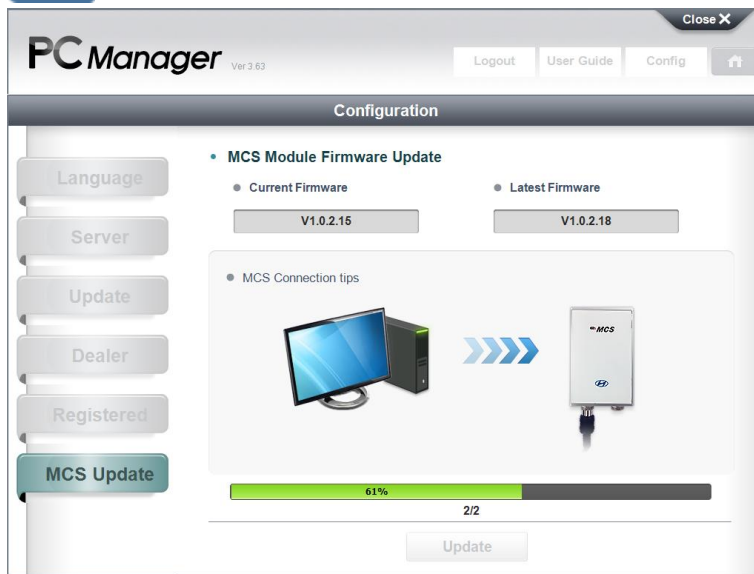
Caution



DO NOT disconnect the USB cable from PC until the update is complete.

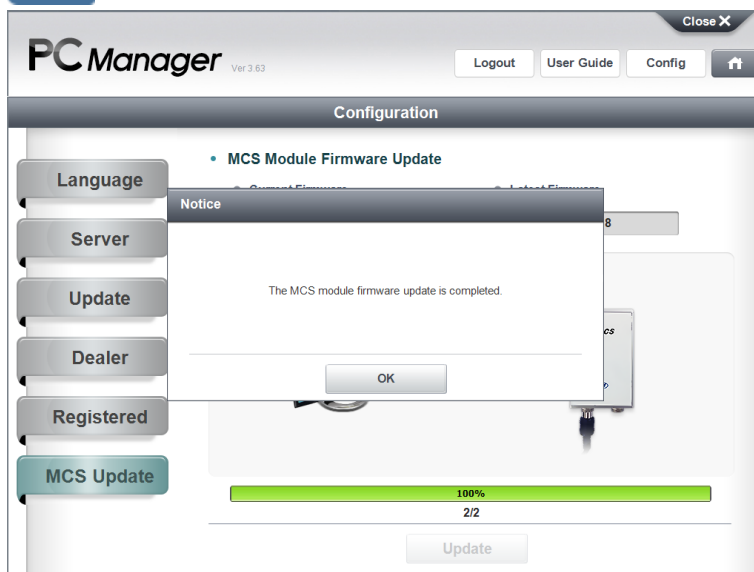
5

The update is in progress.



6

The firmware update is complete.





AVM Calibration




The AVM calibration is used in conjunction with GDS Mobile, after replacement the camera (front/rear, left/right) or AVM module.

There are two types of AVM Calibration: [Analog type] and [Digital type].

The function must be carried out when the following actions are performed:

- **When removing and installing a wide camera.**
- **When conducting a body task such as the trunk task that causes the focus of the wide camera to change.**
- **When replacing the door mirror with a wide camera.**
- **When replacing the surround view monitoring unit.**

DTC occurs if you replace AVM control unit. (B103000: No Camera Tolerance Correction) After the AVM calibration, the DTC will be removed.



DTC Analysis				
Rescan Erase All DTC DTC Guide Freeze Frame				
DTC	Description	State	Link Up	
B103000	No Camera Tolerance Correction	Active		

DTC Occured

HOME

Online

GRAND SANTAF./2017/D 2.2 TCI..

VCI

DTC Analysis

<

Rescan

Erase All DTC

DTC Guide

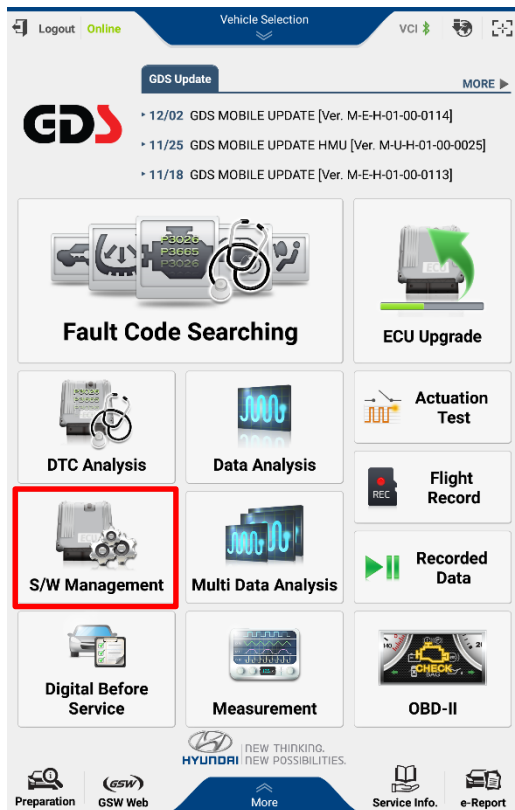
Freeze Frame

>

DTC	Description	State	Link Up
NO DTC			

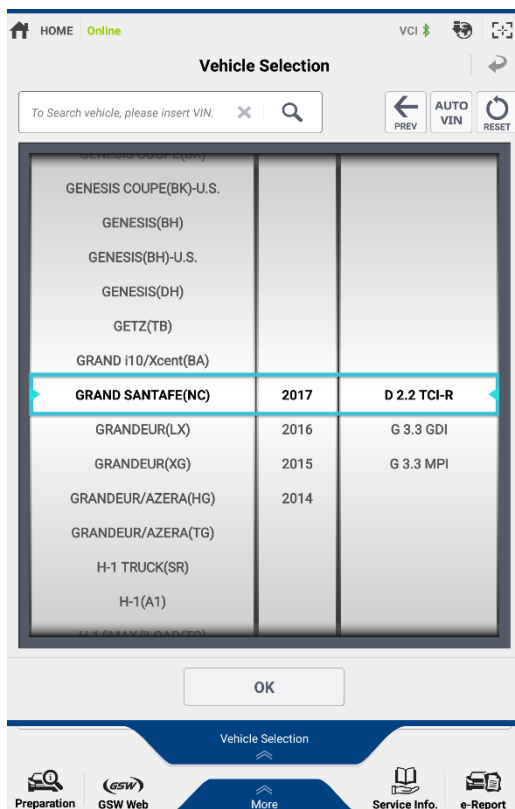
NO DTC

Calibration process - Analog type



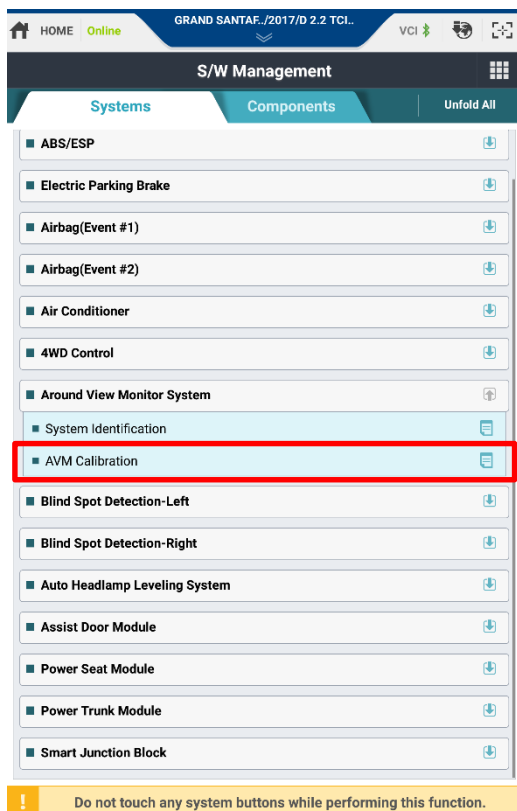
Step1

Select [S/W Management] in GDS Mobile main screen.



Step2

Select the vehicle, model year and engine type.



Step3

Select **AVM Calibration** function.



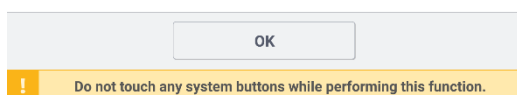
Notice

- ☞ Start the work after check the hood, trunk and doors are fully closed and the outside mirrors on both sides unfolded.
- ☞ Turn the ignition ON and the engine OFF. Even if it is in flat, place the shift lever 'N' position and set the parking brake to prevent a slight movement of the vehicle.
- ☞ Calibration work proceeds in vehicle's AVM switch 'ON' state.



HOME Online GRAND SANTAFÉ./2017/D 2.2 TCI... VCI	
S/W Management	
• AVM Calibration	
Purpose	To calibrate image tolerance when module or cameras are replaced.
Enable Condition	1. Engine Off 2. Ignition Switch On 3. Gear Position N, Parking Brake On 4. Bonnet Closed / Trunk Closed / Door Closed / Side View Mirror Open 5. AVM switch Lamp On
Concerned Component	Around View Monitoring(AVM) Module, Ultra-optical cameras
Concerned DTC	B103000, B1030XX
Fail Safe	AVM LED Indicator blinking, set DTC
Etc	- Do not change the status of the power / gear / AVM switch until this function is completed. - Tolerance correction target is required.

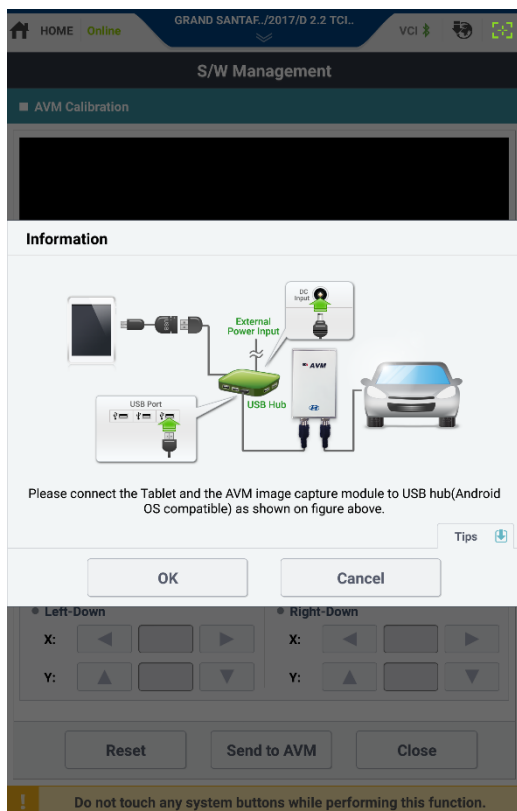
Step4

Read the condition carefully and click [OK] button.



◆ VCI II LED Color during calibration procedure.

 <p>Blue</p>	While uploading calibration data to SVM unit.
 <p>Red</p>	When error is occurred during calibration process.



Step5

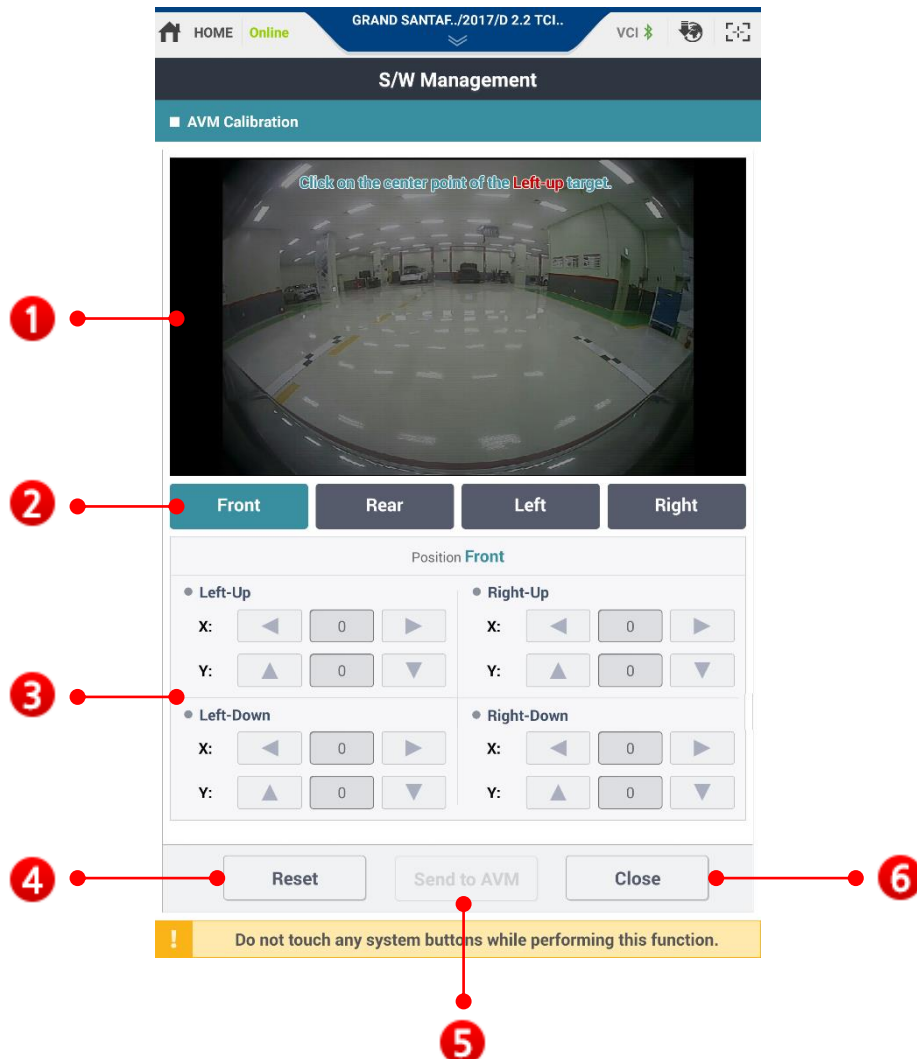
Verify connections as instructed and click [OK] button.



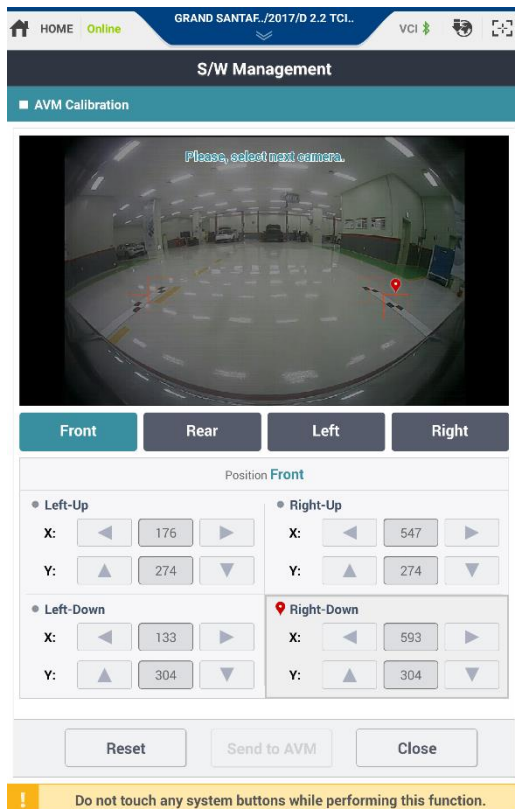
Notice

- ☞ External DC Power must be supplied to the USB hub.
- ☞ Press [OK] button when OS pop-up message is appeared during calibration process when using AVM image capture module.

◆ AVM Calibration screen (Analog type)



-
- 1 Displays image from each camera of the vehicle.
 - 2 These are the Front, Rear, Left, Right camera buttons.
The selected image will display on the screen.
Calibration work should be doing one by one and all direction.
 - 3 Displays Calibration coordinates' screen per calibration point coordinates of the four directions. After that, it can be modified by X(horizontal) and Y(vertical) axes.
 - 4 Deletes all calibration targets on the screen.
 - 5 Sends the calibrated data to AVM control unit in the vehicle.
 - 6 Exits AVM Calibration.
-



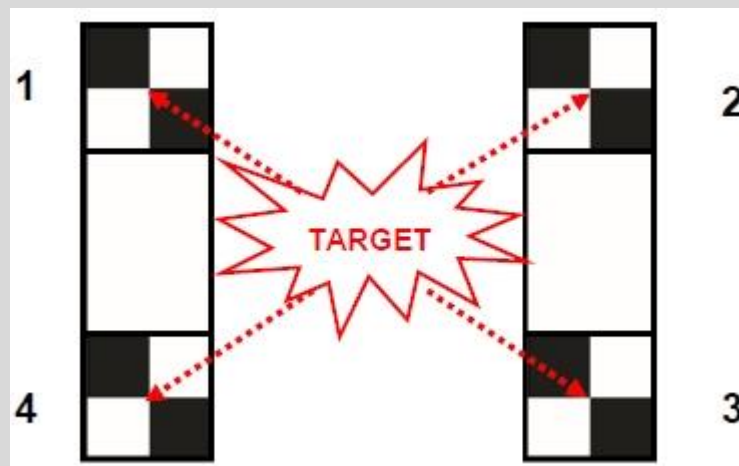
Step6

Place the red point to the center of the each target and select Rear camera.

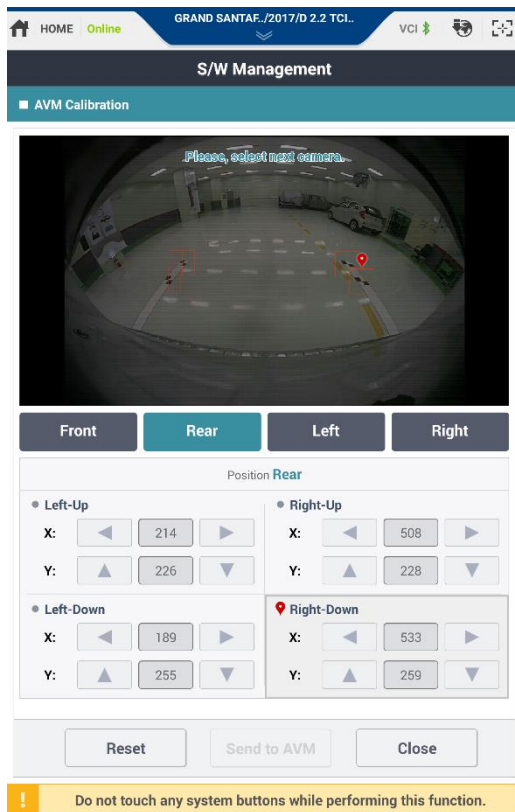


Notice

☞ MCS target points Marking Procedure: Left-Up → Right-Up → Right-Down → Left-Down

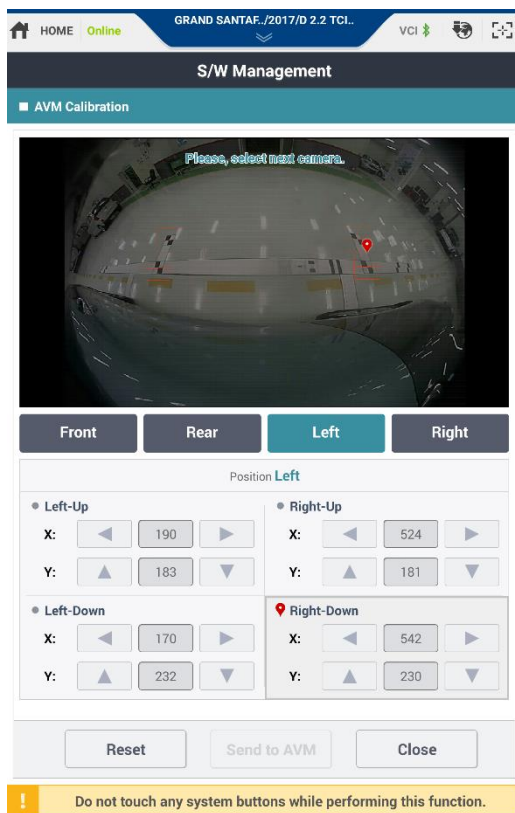


- ☞ [Reset] button deletes all red points on the present image.
- ☞ The modification of coordinates can be performed at the bottom of the screen(X, Y arrows)



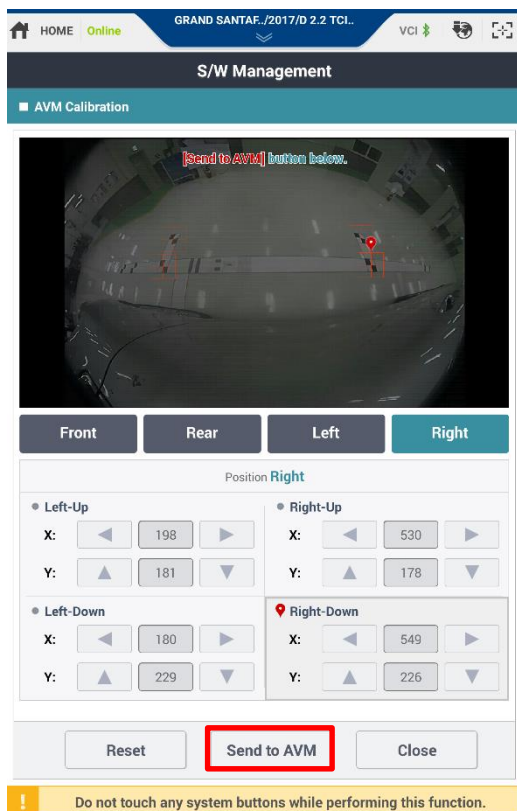
Step7

Place the red point to the center of the each target and select Left camera.



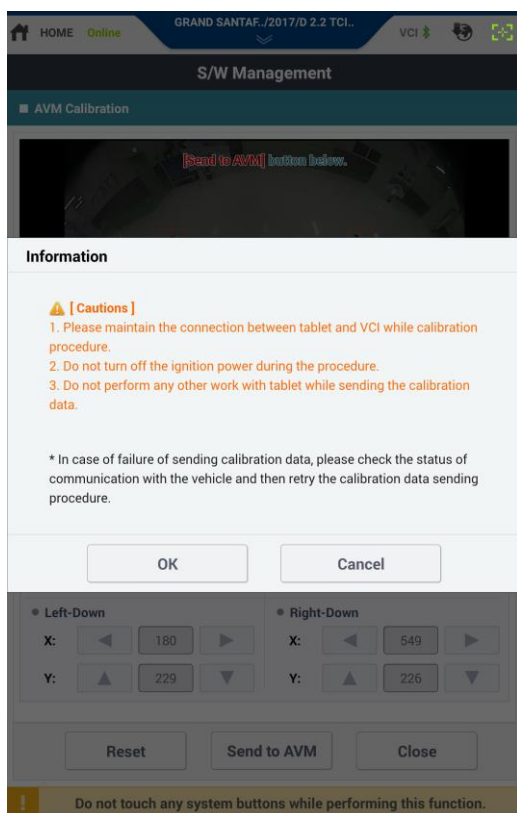
Step8

Place the red point to the center of the each target and select Right camera.



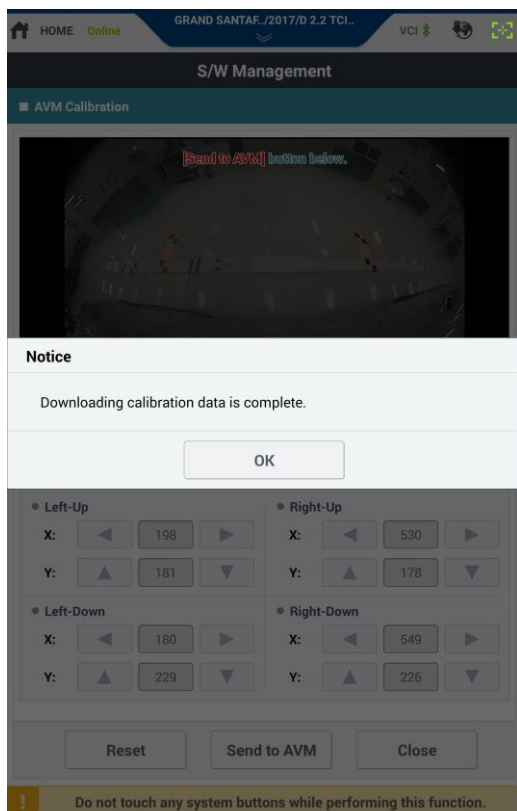
Step9

Place the red point to the center of the each target and select [Send to MCS] button.



Step10

Read the pop-up message carefully and click [OK] button to move on.



Step11

AVM calibration is complete.



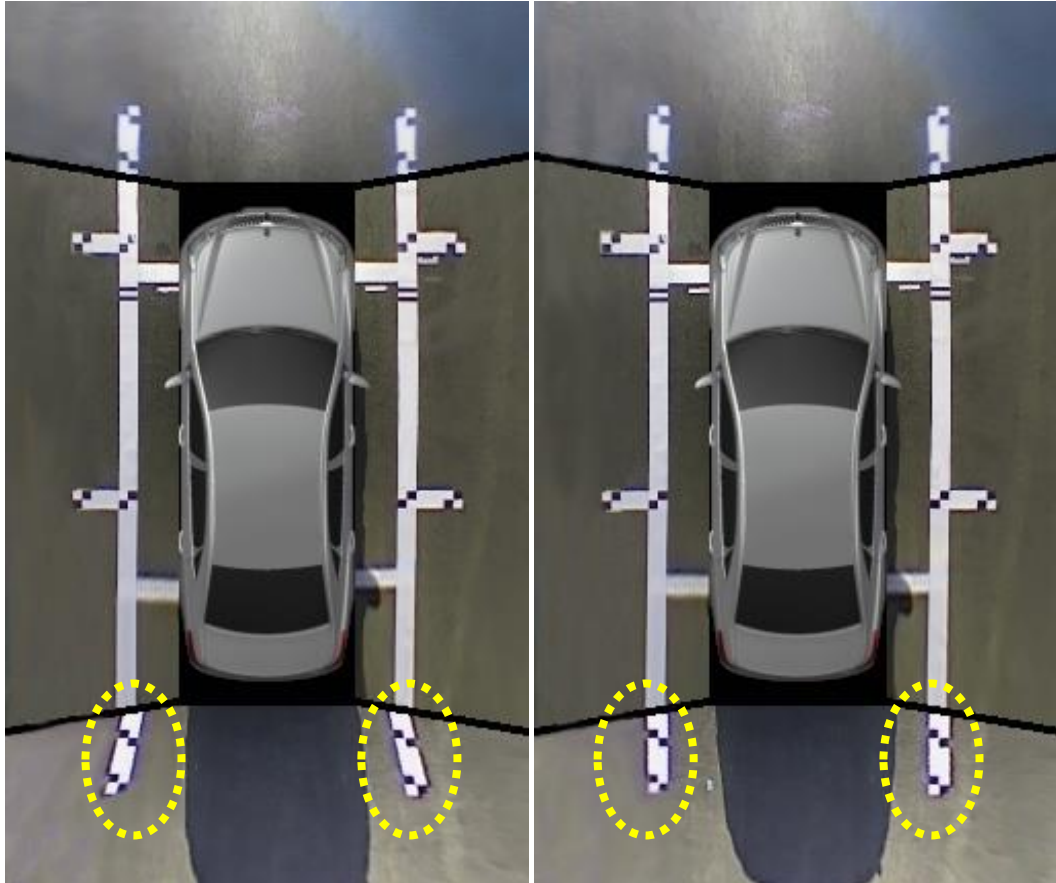
Caution

- ☞ Keep the USB connection linked until be progress ends.
- ☞ Do not start the engine and keep the ignition power ON during the progress.
- ☞ Do not run other programs while downloading is in progress.

◆ Check calibration result

Check the appearance of the white reference line on the screen of your vehicle.

- (1) The MCS reference line must look like straight.
- (2) The bumpers of the vehicle must not be shown after calibration.

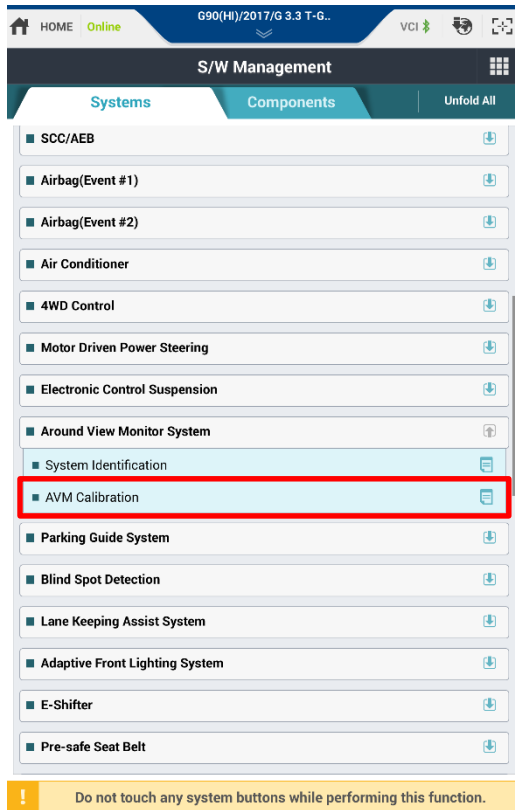


Calibration error

Calibration success

Calibration process - Digital type

The Digital type is a way to perform AVM calibration only via VCI II.



Step1

Select AVM Calibration function.



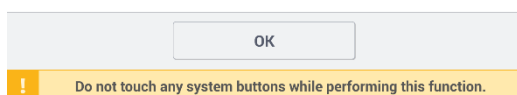
Notice

- ☞ Start the work after check the hood, trunk and doors are fully closed and the outside mirrors on both sides unfolded.
- ☞ Turn the ignition ON and the engine OFF. Even if it is in flat, place the shift lever 'N' position and set the parking brake to prevent a slight movement of the vehicle.
- ☞ Calibration work proceeds in vehicle's AVM switch 'ON' state.

HOME Online 690(HI)/2017/G 3.3 T-G... VCI	
S/W Management	
• AVM Calibration	
Purpose	To calibrate image tolerance when module or cameras are replaced.
Enable Condition	1. Engine Off 2. Ignition Switch On 3. Gear Position N, Parking Brake On 4. Bonnet Closed / Trunk Closed / Door Closed / Side View Mirror Open 5. AVM switch Lamp On
Concerned Component	Around View Monitoring(AVM) Module, Ultra-optical cameras
Concerned DTC	B103000, B1030XX
Fail Safe	AVM LED Indicator blinking, set DTC
Etc	- Do not change the status of the power / gear / AVM switch until this function is completed. - Tolerance correction target is required.

Step2

Read the condition carefully and click [OK] button.



HOME Online 690(HI)/2017/G 3.3 T-G... VCI

S/W Management

■ AVM Calibration

• [AVM Calibration]

This function is to calibrate the image tolerance in AVM system when AVM control unit or the cameras(front, rear, left, right) on the vehicle is replaced.

•[Condition]

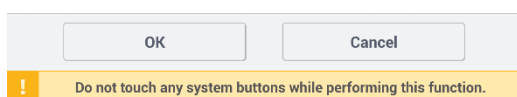
1. Check engine hood/trunk/doors closed and outside mirrors unfolded.
2. Engine stop, IG ON, Gear position 'N', Parking Brake ON.
3. AVM system button 'ON'.
4. Install the AVM calibration target. (Refer to Shop Manual)

If this function is not performed when AVM control unit is replaced, AVM switch lamp will blink and DTC(B103000 : No Camera Tolerance Correction) will be set.

Click [OK] to proceed to next step.

Step3

Read the condition carefully and click [OK] button.



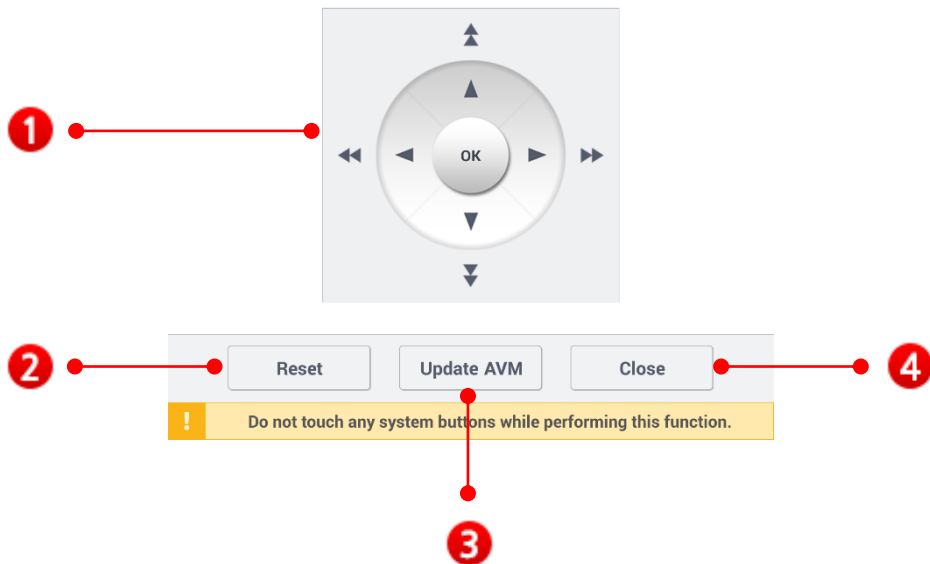
◆ AVM Calibration screen (Digital type)



• [AVM Calibration Information]

1. Overlap the blinking cross box(+) on AVN monitor of vehicle to calibration coordinates of calibration target by using **▶**, **▶▶** and press **[OK]** button.
2. Overlap the other cross boxes to calibration coordinates of calibration target with same method and press **[OK]** button, then press **[Update SVM]** button to proceed to next camera.
3. With same method as front camera, perform the calibration procedure in order of rear → left → right camera.
4. Monitor the SVM update process with monitor after press **[Update SVM]** button when last camera calibration procedure is complete.
5. Check the proper image displaying on monitor.

※ You can re-do the calibration procedure with **[Reset]** button.



-
- 1** Adjusts the direction (Front, Rear, Left, and Right) to be corrected. When you select the direction you want to correct, the video is displayed on the AVN monitor screen in the vehicle. Calibration must be completed in all four directions for each one screen at a time.
-
- 2** Deletes all calibration targets on the screen.
-
- 3** Sends the calibrated data to AVM control unit in the vehicle.
-
- 4** Exits AVM Calibration.
-

5



5

This is AVN monitor of vehicle, which displays an image from each camera of the vehicle and displays calibration coordinates. Overlap the blinking cross box(+) on AVN monitor of vehicle to calibration coordinates of calibration target by using ►, ►► and press [OK] button on GDS Mobile. After you match blinking cross box(+) and click the [OK] button, the green cross box(+) will turn to red. In the same way, place other targets and [OK] button.

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VCI

S/W Management

AVM Calibration

[AVM Calibration Information]

1. Overlap the blinking cross box(+) on AVN monitor of vehicle to calibration coordinates of calibration target by using ►, ►► and press [OK] button.
2. Overlap the other cross boxes to calibration coordinates of calibration target with same method and press [OK] button, then press [Update SVM] button to proceed to next camera.
3. With same method as front camera, perform the calibration procedure in order of rear → left → right camera.
4. Monitor the SVM update process with monitor after press [Update SVM] button when last camera calibration procedure is complete.
5. Check the proper image displaying on monitor.

※ You can re-do the calibration procedure with [Reset] button.

Reset

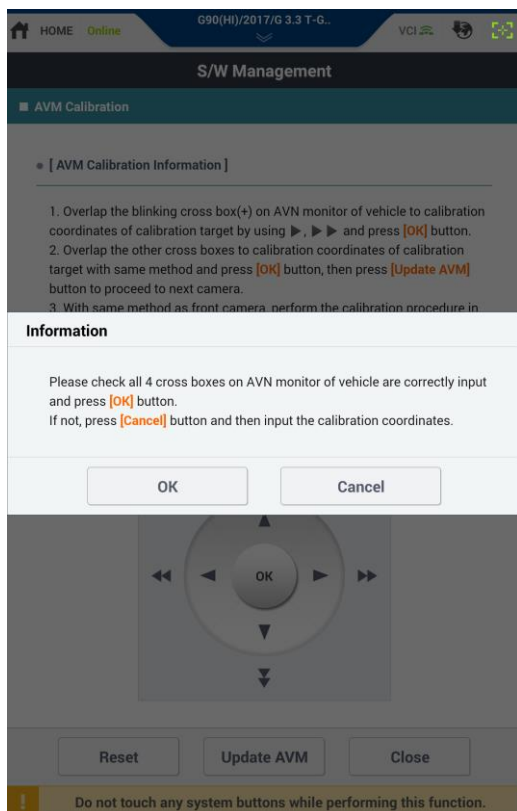
Update AVM

Close

! Do not touch any system buttons while performing this function.

Step4

Read AVM Calibration Information carefully and perform the calibration procedure in order of front, rear, left and right cameras.



Step5

Please check all 4 cross boxes on AVN monitor of vehicle are correctly input and press [OK] button.

If not, press [Cancel] button and then input the calibration coordinates.



Caution

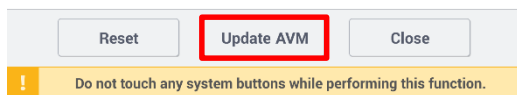
- ☞ If a download failure occurs, retry after checking the status of communication with the vehicle.
- ☞ Camera calibration order is Front, Rear, Left and Right.



● [AVM Calibration Information]

1. Overlap the blinking cross box(+) on AVN monitor of vehicle to calibration coordinates of calibration target by using ►, ◄ and press [OK] button.
2. Overlap the other cross boxes to calibration coordinates of calibration target with same method and press [OK] button, then press [Update SVM] button to proceed to next camera.
3. With same method as front camera, perform the calibration procedure in order of rear → left → right camera.
4. Monitor the SVM update process with monitor after press [Update SVM] button when last camera calibration procedure is complete.
5. Check the proper image displaying on monitor.

※ You can re-do the calibration procedure with [Reset] button.



Step6

After the calibration procedure is complete, select [Update MCS] button.