FILE: SERVICE: GROUP 00 OF SERVICE INFORMATION BINDER
PARTS: GROUP I OF INFORMATION _ PARTS & ACCESSORIES BINDER

Campaign No. 2011120006, February 2013

Revision	Date	Purpose
B	02/01/13	Updates to Work Procedure and Special Tools
A	05/24/12	Updates to Work Procedure
–	1/13/12	Initial release

TO: ALL MERCEDES-BENZ CENTERS

SUBJECT: **Model 451, Model Year 2011**
Update Electric Drive

This Service Campaign has been initiated because Daimler AG (DAG) has determined that the electric drive software may not meet current specifications. smart dealers will update the electric drive software at the next workshop visit.

smart dealers not yet trained or not yet properly equipped with the required tools and equipment need to direct any smart electric drive vehicle customer to the nearest properly trained and equipped smart electric drive dealer due to risk of technician personal injury and/or damage to the vehicle.

Prior to performing this Service Campaign:

- Please check VMI to determine if the vehicle is involved in the Campaign and if it has been previously repaired.
- Please review the entire Service Campaign bulletin and follow the repair procedure exactly as described.

Please note that Recall and Service Campaigns **do not expire** and may also be performed on a vehicle with a vehicle status indicator.

Approximately 512 vehicles are affected.

Order No. SM-SC-2011120006
This bulletin has been created and maintained in accordance with MBUSA-SLP S423QH001, Document and Data Control, and MBUSA-SLP S424HH001, Control of Quality Records.

Procedure

Note:
Work on a electric drive system components may only be conducted by certified workshop personnel who have completed training courses: Tech 961 and Tech 717.

For the scopes of work described below, the safety regulations and hazard notes apply for work on high-voltage systems.
Information on this in WIS under AS 54.00-Z-0001-02MEV

WARNING! Risk of death and personal injury may occur when touching components on vehicles with high-voltage on-board electrical system if not done properly. Do not touch components and open lines of the high-voltage on-board electrical system.

Persons who are carriers of electronic implants (e.g. cardiac pacemakers) should not carry out any work on high-voltage on-board electrical systems due to increased risk of death or personal injury.
Work on a high-voltage system components may only be conducted by certified workshop personnel. NO OTHER WORKSHOP PERSONNEL may perform work on the high voltage system.

MBUSA High-Voltage Awareness e-Learning course, TECH717 must be successfully completed before diagnosing a HV vehicle and proceeding with service has even further requirements. Service work that is not HV-related, such as tire replacement, can also be done by professionals meeting the same minimum requirement of high voltage awareness training.

Important! Before the actual update at the vehicle, an update of the Zytek/Tesla diagnostic unit is first required.
This update must be performed once at the diagnostic unit before the vehicles can be processed as per the following work instructions (refer to subject A).

The following software versions must be present:

Battery (BMS)	= 1.3.9 (.teslaupdate)
EVCM/EDCM/OS	= 2E1
On-board charger	= 02.** (.teslaupdate)
Tesla Firmware Update Tool	= 2.0.8.81

In order to update the diagnostic unit to the current status, please proceed with the update at the vehicle as per the instructions in subject A. You can also find additional information in following documents on smart TekInfo: LI00.30-P-053002, LI00.30-P-053003, LI00.30-P-051650.
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A. Update of the Diagnostic Unit (required once at diagnostic unit)

Download the software files from the download area of smart TekInfo and install them on the Zytek/Tesla diagnostic unit as per the training documents.
All the software packages are compressed archives.
To access the download area, launch smart TekInfo => select Daimler Special Tools (see attachments, visit http://www.smarttekinfo.com/SmartTek/jsp/doclist.jsp) => then click on the link under "document" and download all items listed.

1. System requirements

The following requirements must be met in order to install the program:

- Windows XP Service Pack 2
- A free USB connection (USB 1.1 or USB 2.0)

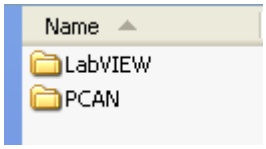
Note:
Steps 5 and 6 must be performed. Step 6.1 is new. If tesla tool 2.0.81 is already installed then steps 2, 3, 4 are not required.
If OBL software V.02xx is already installed, then step 7 from the attachment is not required.

2. Basic requirements for installation

2.1 Preparation of the installation

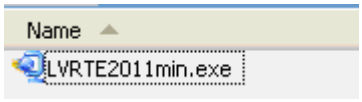
- Create a new folder (e.g. "SW-Temp") on the desktop of the workshop computer
- Copy the file "Tesla Battery & Charger Update Tool Support.zip"
  in the newly created folder "SW-Temp" and extract file (right click on file then select extract).

- The folder now contains the following directories

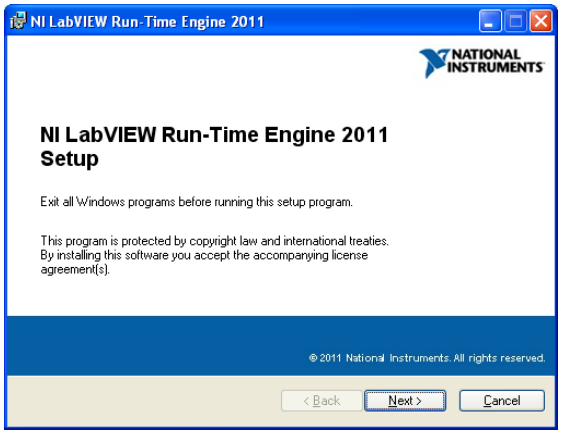


2.2 Installation of the "LabVIEW Runtime Engine"

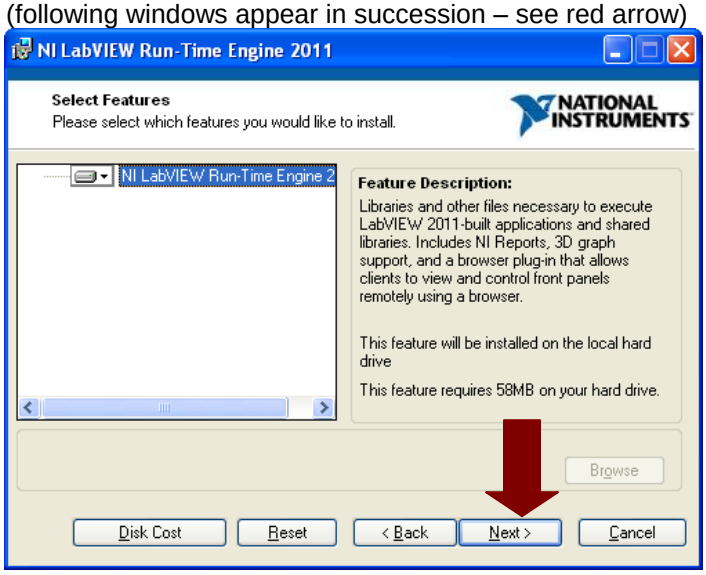
- Open the "LabVIEW" folder in the "SW-Temp" folder on the desktop
- The folder contains the following file

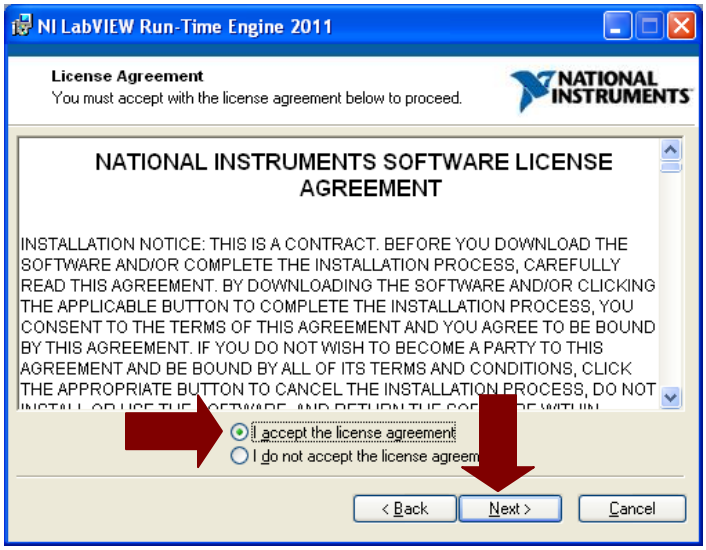


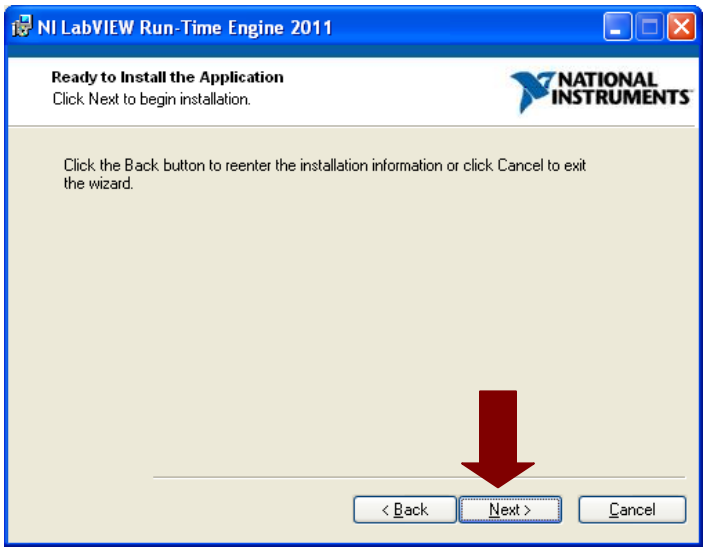
- Double click on the "LVRTE2011min.exe" file
- Unzip file.
- The following window opens



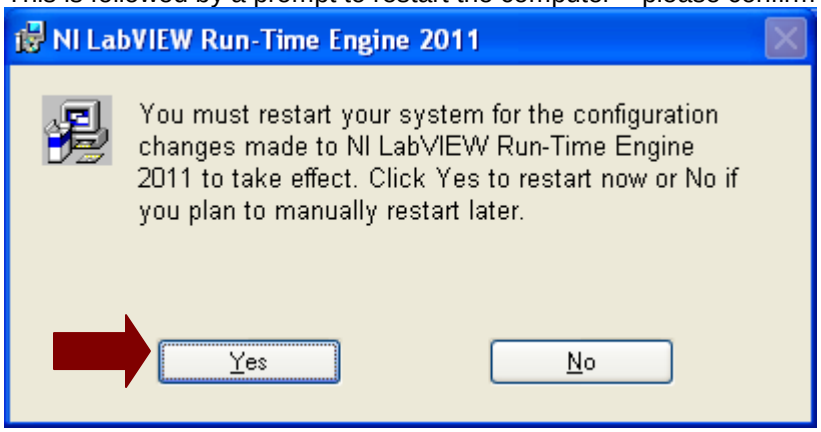
- Please now follow the installation wizard (following windows appear in succession – see red arrow)







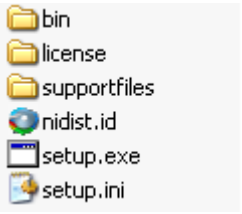
- This is followed by a prompt to restart the computer – please confirm this message



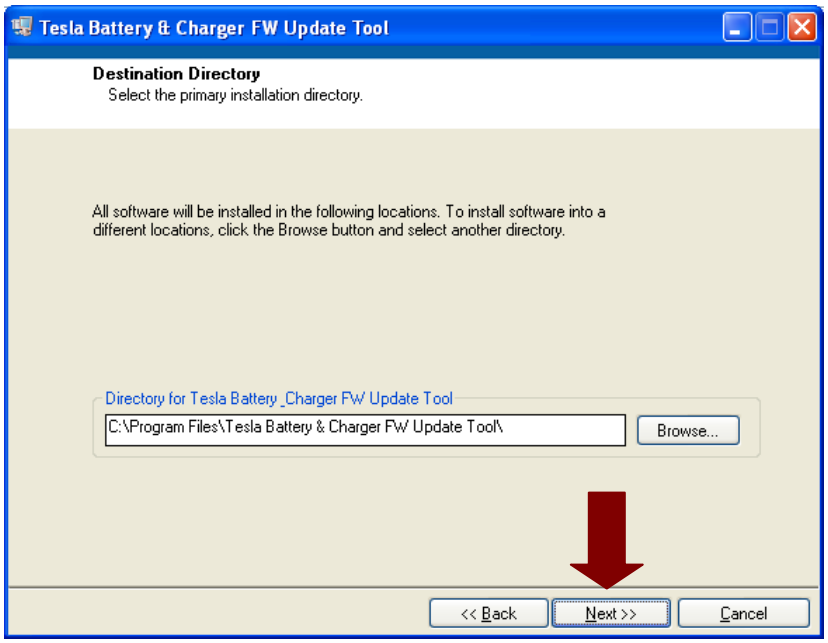
- The installation of the "LabVIEW Runtime Engine" is thus completed

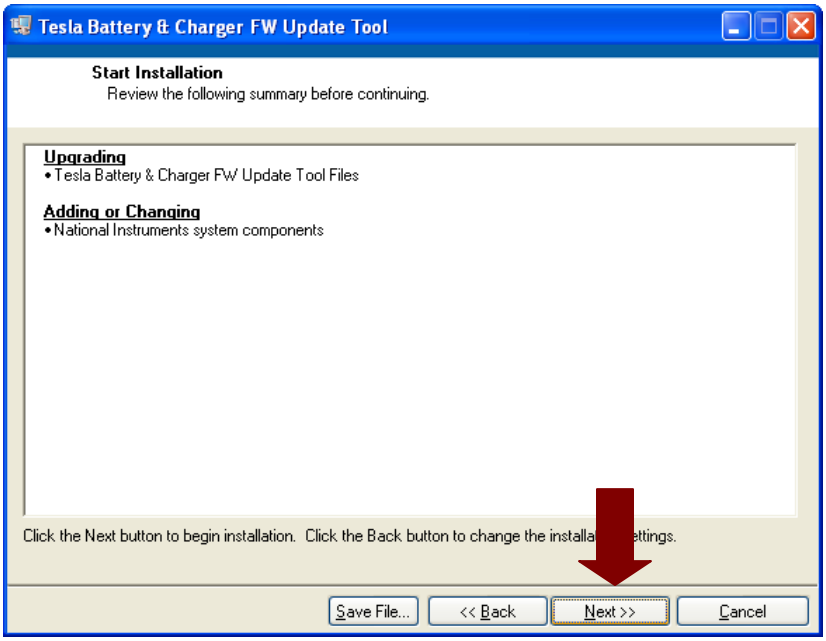
3. Installation of "Tesla Battery & Charger Firmware Update Tool"

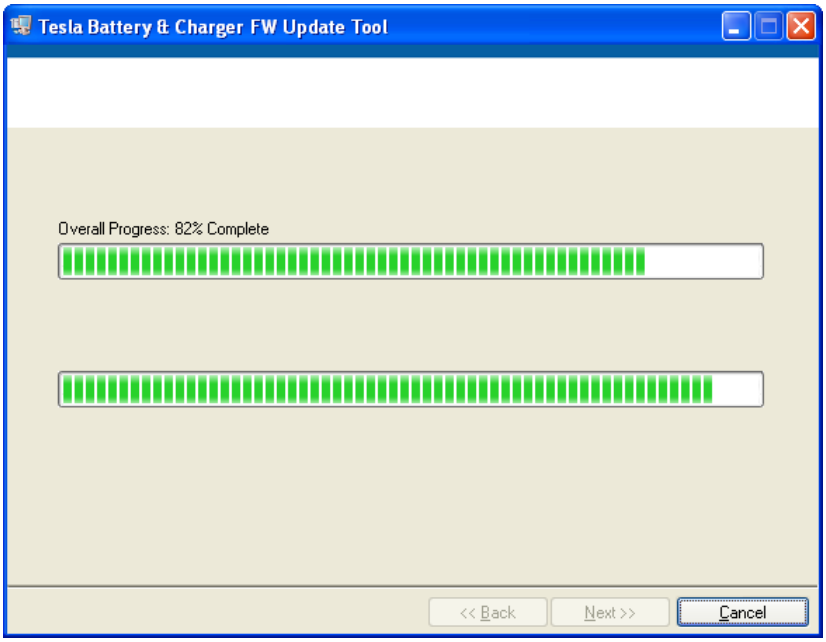
- Copy the "Tesla Battery & Charger Firmware Update Tool 2.0.8.81.zip" file and extract the contents of the file, also in the folder "SW-Temp" on the desktop (right click on file then select extract).
- The folder now contains the following files

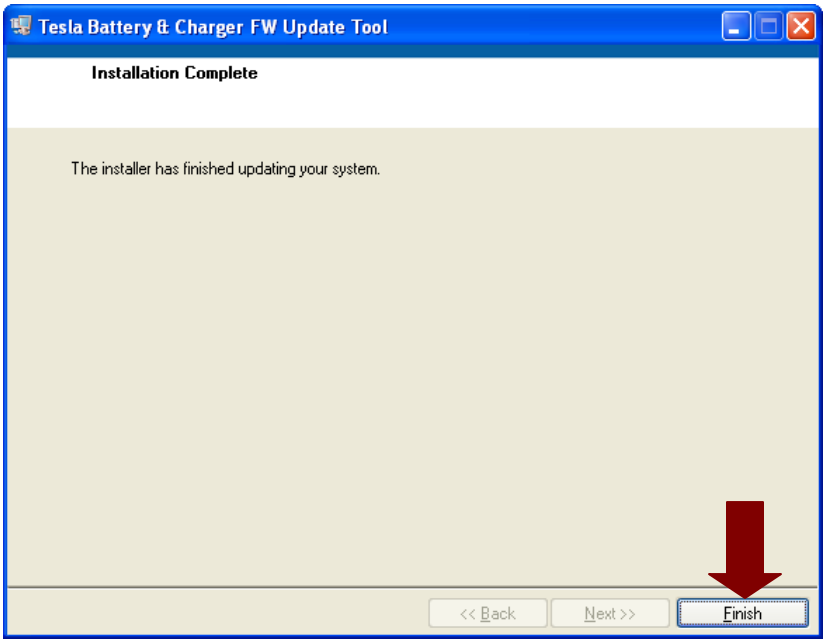


- Now run the "setup.exe" file there
- Please now follow the installation wizard
  (following windows appear in succession – see red arrow)

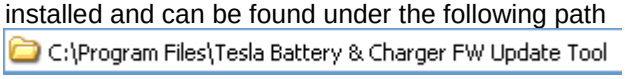



Tesla Battery & Charger FW Update Tool
Start Installation
Review the following summary before continuing.
Upgrading
• Tesla Battery & Charger FW Update Tool Files
Adding or Changing
• National Instruments system components
Click the Next button to begin installation. Click the Back button to change the installa ettings.
Save File...
<< Back
Next >>
Cancel

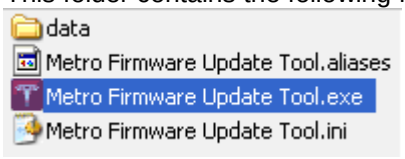

Tesla Battery & Charger FW Update Tool
Overall Progress: 82% Complete
<< Back
Next >>
Cancel



- The "Tesla Battery & Charger Firmware Update Tool" in version 2.0.8.81 was now successfully installed and can be found under the following path



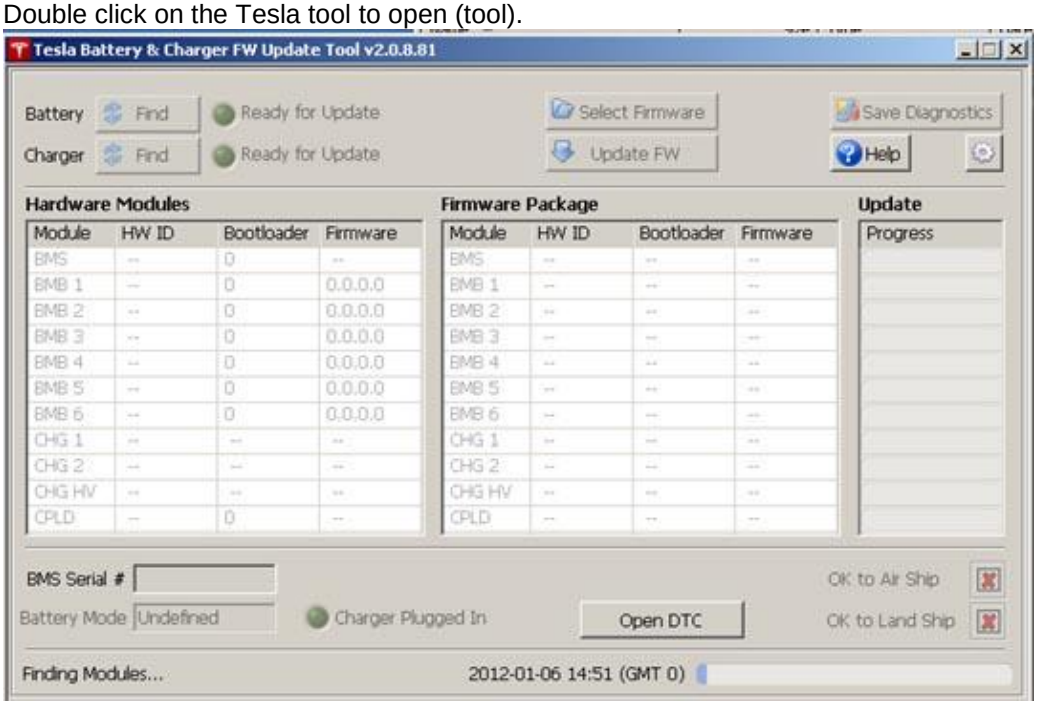
- This folder contains the following files:



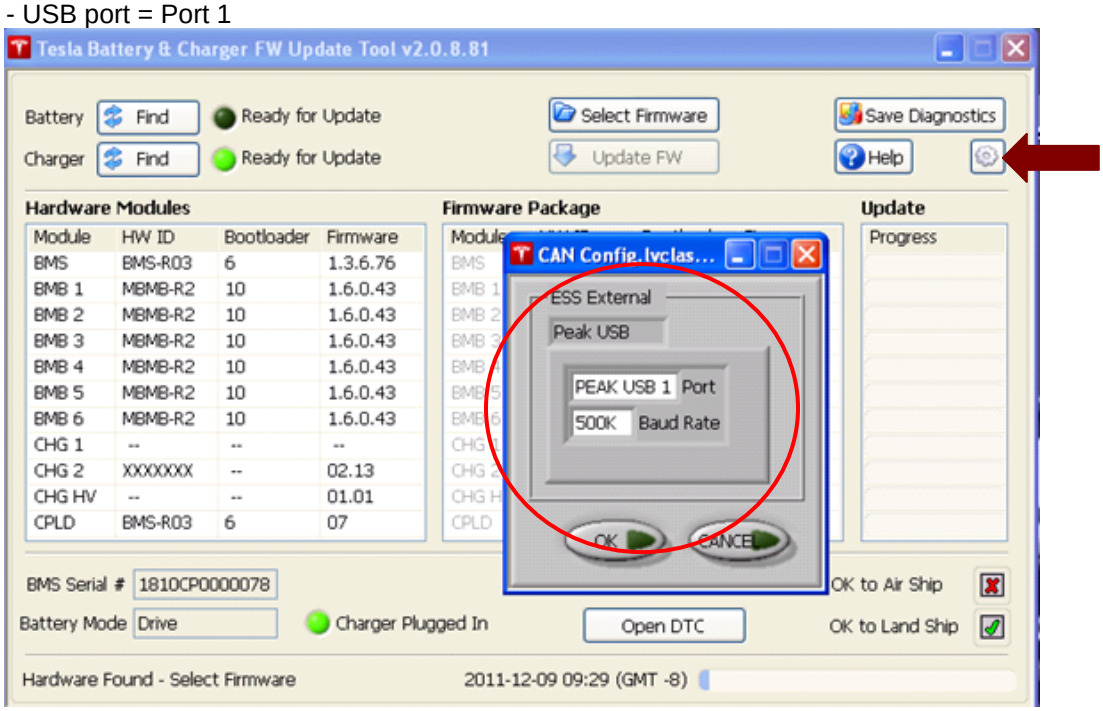
- Now create a shortcut to the file "Metro Firmware Update Tool.exe" on the desktop so that you can directly start the Tesla tool from there
  To do so, proceed as follows:
  - Right-click on the "Metro Firmware Update Tool.exe" file
  - Select "Create shortcut"
  - Now drag the new shortcut created to the desktop

4. Check/correct connection settings

- Double click on the Tesla tool to open (tool).



- Click on button (arrow, below) then check the setting after the update of the Tesla tool (circled, below):
  - Adapter selection = Peak USB
  - Baud rate = 500 K
  - USB port = Port 1

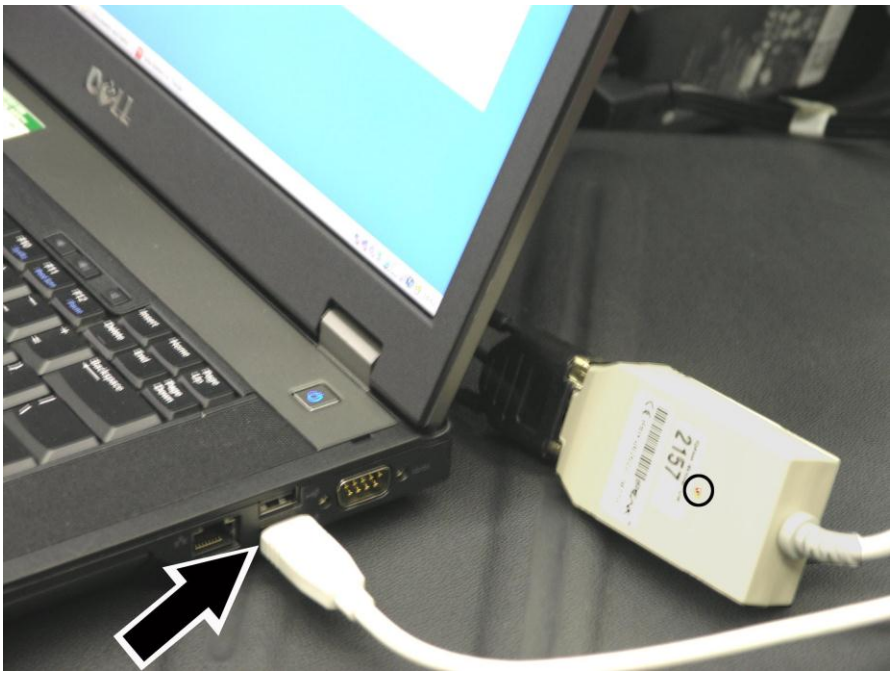


- Close "Tesla Battery & Charger FW Update Tool v2.0.8.81"

Important: When downloading and selecting the file, be sure to note the correct charging current variant is: **12 A**.

4.1 Install drivers for USB cable to laptop:

- Plug in the USB to OBDII interface adapter into the laptop's bottom right USB port (arrow) nearest the serial port (which is USB Port 1). This will force the laptop to load the driver you just loaded onto the laptop.
- Acknowledge any pop-up messages to load this driver. The LED (circled) on the USB to OBDII interface should go solid red in color. This indicates that you found the USB Port 1. If for any reason this LED does not go to solid red, then try a different USB port until it does



5. Preparation of HV battery firmware on the diagnosis computer

Note: This step must be performed! **(refer also to LI00.30-P-053003)**

5.1 Call up the "ESS firmware update" folder (desktop)

5.2 Delete all contents in the "Battery" subfolder

5.3 Extract (right-click to extract>select extract) the "BMS 1.3.9" file (the content is added to the "Battery" folder).

Note:

A subfolder now exists in the "Battery" folder with the designation "1.3.9"

6. Preparation of Zytek software (refer also to LI00.30-P-053002)

Note: This step must be performed!

6.1 Unpack the file OBD.dll.zip in the local directory
C:\Program Files\Zytek Systems Limited\Development Support Tools\Calibration Tool
on the diagnosis computer.

6.2 Copy the "2E1-EVCM.zip" file directly on the desktop then extract (right click on file then select extract to launch extract wizard).

Note:

The folder "2E1 EVCM – for Service" is created here.

6.3 Open this new folder "2E1 EVCM - for Service" on the desktop

6.4 Select the file "C507_EVCM_2E1.ZPF" (click on it once) and create a shortcut (right-click with mouse – 'create shortcut')
6.5 Move this shortcut directly to the desktop
6.6 Copy the "2E1-EDCM.zip" file directly on the desktop then extract (right click on file then select extract to launch extract wizard).

Note:

The folder "2E1 EDCM – for Service" is created here)

6.7 Open this new folder "2E1 EDCM - for Service" on the desktop
6.8 Select the file "C507_EDCM_2E1.ZPF" (click on it once) and create a shortcut (right-click with mouse – 'create shortcut')
6.9 Move this shortcut directly to the desktop
6.10 Extract the "2E1-OS.zip" file directly on the desktop:

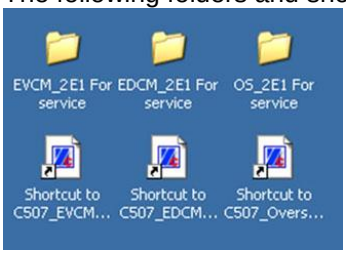
- Right click on the file
- Select extract to launch the extract wizard.

Note:

The folder "2E1 OS – for Service" is created here.

6.11 Open this new folder "2E1 OS - for Service" on the desktop
6.12 Select the file "C507_Overseer_2E1.ZPF" (click on it once) and create a shortcut (right-click with mouse – 'create shortcut')
6.13 Move this shortcut directly to the desktop

The following folders and shortcuts are now on the desktop.



7. Preparation of charger firmware files on the diagnosis computer

The following steps must be successively performed before the actual update process:

7.1 Call up the "ESS firmware update" folder (desktop)
7.2 Delete all respective contents in the "Charger" subfolder
7.3 Extract (right-click to extract>select extract) the "OBL **A V02xx Teslaupdate.zip" folder (the content is added to the "Charger" subfolder).

Note:

A subfolder now exists in the "Charger" folder with the designation "02xx Teslaupdate"

Important: When downloading and selecting the file, be sure to note the correct charging current variant is: 12 A

The preparation for the actual update process is now completed, meaning that the processing of the vehicles as per the instructions can begin.

B. Update Electric Drive Software

Improtant:

Before beginning the work, please ensure that the 12 V battery is completely charged
(i.e. either full charging by means of workshop charger or by switching ignition to position 2 for 1-2 hrs.)
In addition, the charger must also remain connected during the update process.
You must ensure here that the battery supply voltage of the charger is < 15 V.

1. Update BMS (HV battery)

1.1 Switch ignition off and ensure that charging cable is not plugged in.

1.2 Connect diagnostic cable (W 451 589 09 63 00) with the plug-in power supply unit with network connection and the USB adapter (USB/R232) and connect USB cable to the diagnosis computer.

1.3 Connect low-voltage plug (A) of high-voltage battery with branch-off line (35-pin) diagnostic connector (B) of high-voltage battery diagnostic cable.

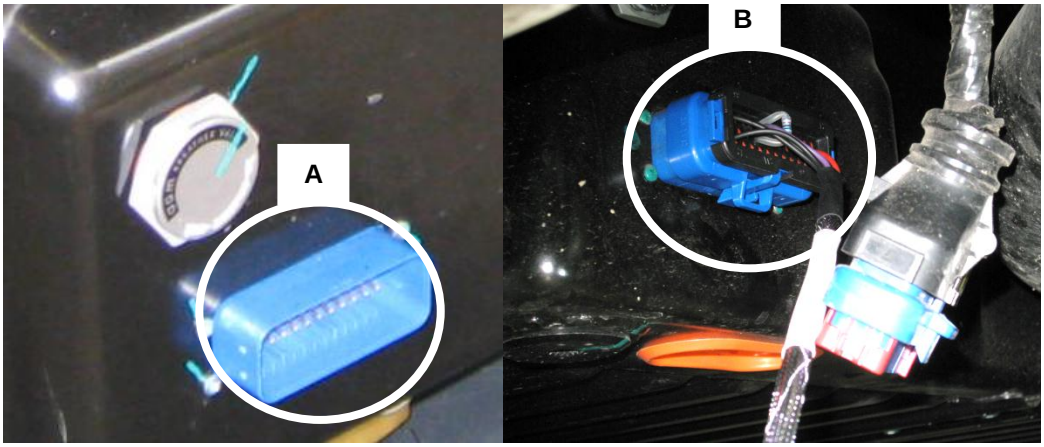


Figure 1 (Connector A is located under vehicle)

1.4 Start the "Tesla Battery & Charger FW Update Tool v2.0.8.81 application"

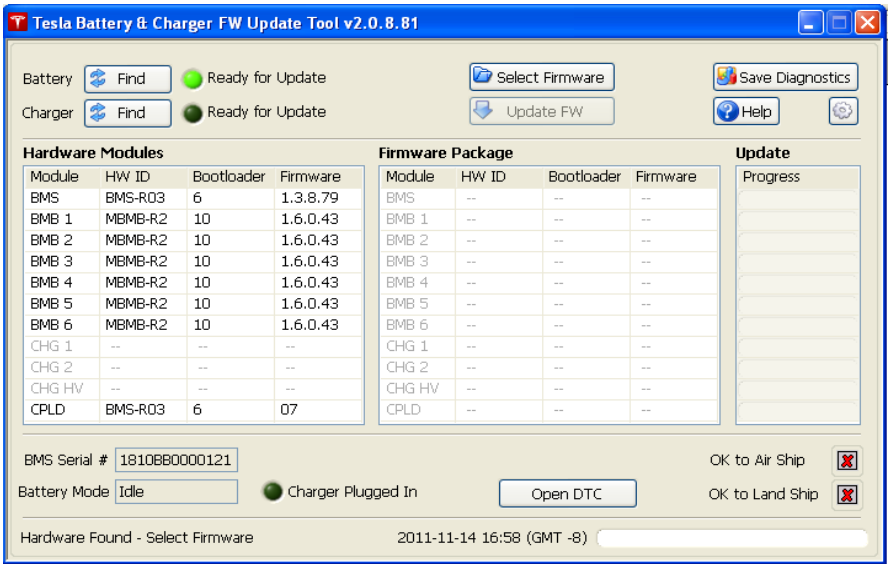


Figure 2

Note:

- Preliminary steps must be performed in order to update BMS.
- When all steps have been performed the green indicator is displayed.

1.5. Select: "Select Firmware" (circled, Figure 4).

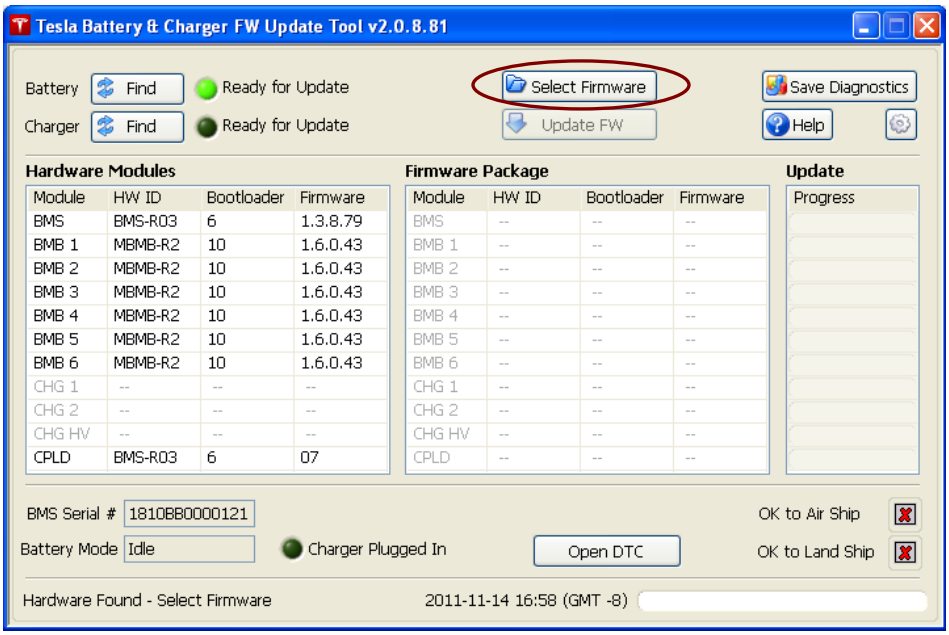


Figure 4

1.6. Manually select the correct Fimware:

- Navigate the following path: Desktop>ESS firmware update Battery>1.3.9
- Select the displayed file and with confirm with OK (circled, Figure 5).

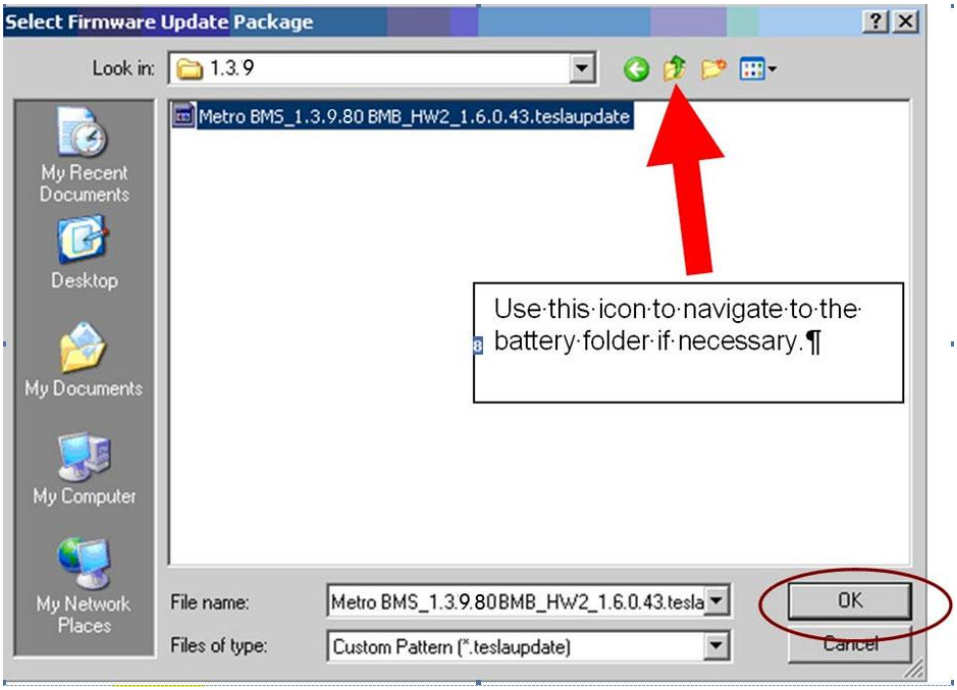
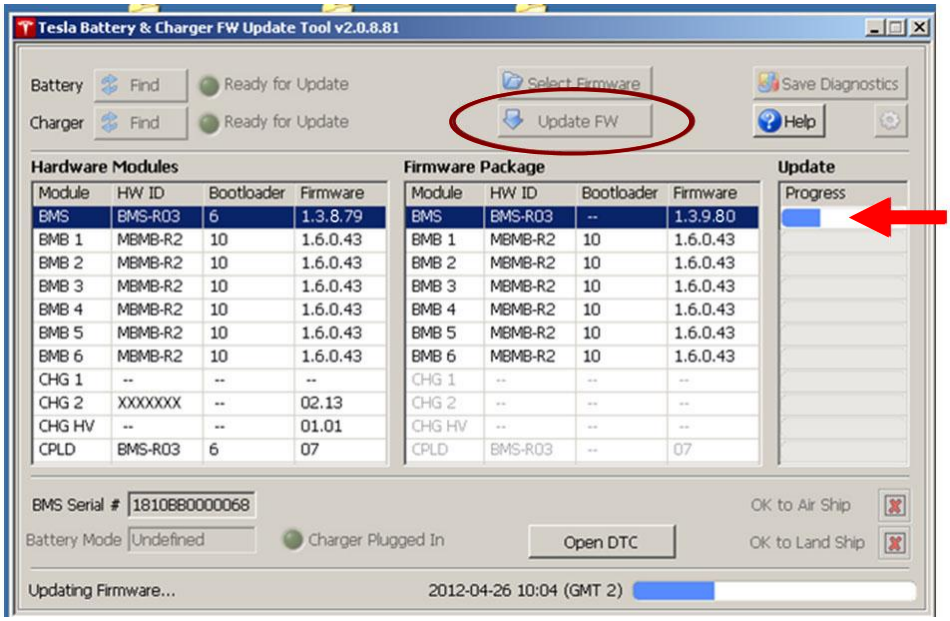


Figure 5

1.7. Start automatic update: Select: "Update FW" (circled, Figure 6).



Module	HW ID	Bootloader	Firmware
BMS	BMS-R03	6	1.3.8.79
BMB 1	MBMB-R2	10	1.6.0.43
BMB 2	MBMB-R2	10	1.6.0.43
BMB 3	MBMB-R2	10	1.6.0.43
BMB 4	MBMB-R2	10	1.6.0.43
BMB 5	MBMB-R2	10	1.6.0.43
BMB 6	MBMB-R2	10	1.6.0.43
CHG 1	--	--	--
CHG 2	XXXXXXX	--	02.13
CHG HV	--	--	01.01
CPLD	BMS-R03	6	07

Module	HW ID	Bootloader	Firmware
BMS	BMS-R03	--	1.3.9.80
BMB 1	MBMB-R2	10	1.6.0.43
BMB 2	MBMB-R2	10	1.6.0.43
BMB 3	MBMB-R2	10	1.6.0.43
BMB 4	MBMB-R2	10	1.6.0.43
BMB 5	MBMB-R2	10	1.6.0.43
BMB 6	MBMB-R2	10	1.6.0.43
CHG 1	--	--	--
CHG 2	--	--	--
CHG HV	--	--	--
CPLD	BMS-R03	--	07

Figure 6

Note:

- When automatic update process begins the indicator bar (arrow) in the update field displays the update progress.
- The percentage value may be displayed in the lower left.

- To check whether the update was successful, please check the firmware versions for BMS and BMB.
- Following the update, the version information must be as follows:
  Current version BMS: 1.3.9.80
  Current version BMB: 1.6.0.43
- After the update has completed there may be a pop-up message indicating 3 requirements that have to be full filled if the car was going to be driven at this stage. **Ignore this message, just confirm by clicking: OK**.

2. Update on-board charger (OBC/OBL)

2.1. Start the "**Tesla Battery & Charger FW Update Tool v2.0.8.81**"

Note:

The application should still be open, otherwise re-launch the Tesla tool.

Important:

The 12 V battery charger **must** remain connected to the vehicle.

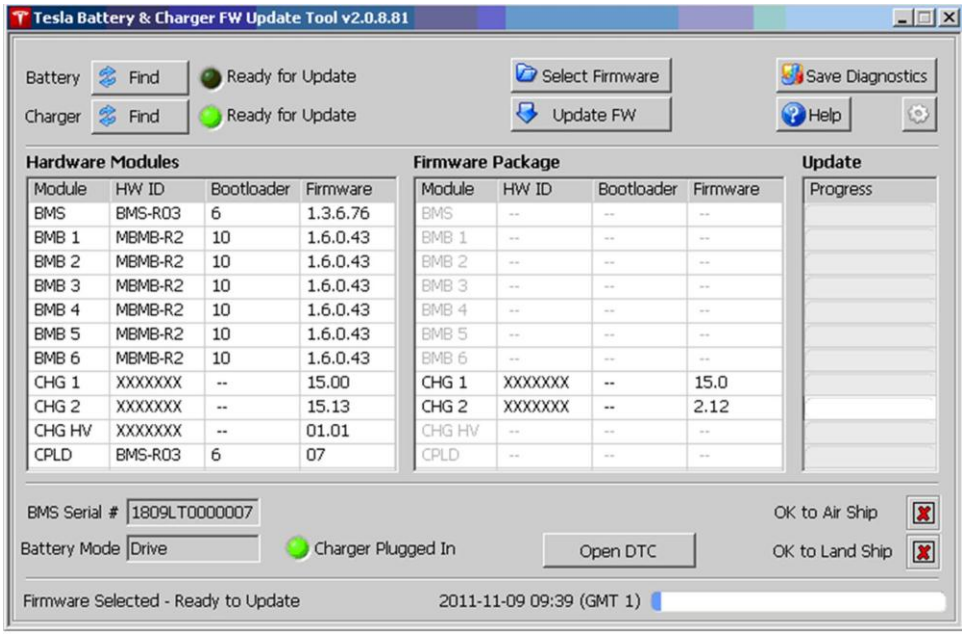


Figure 7

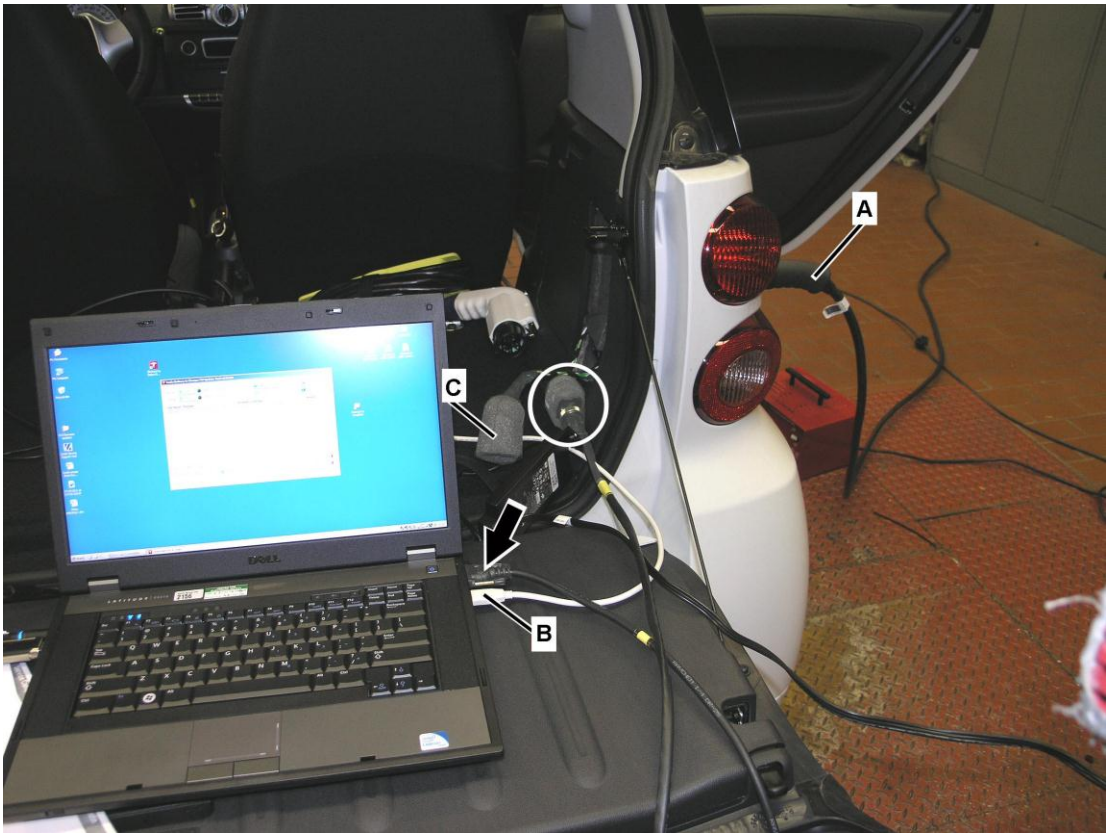


Figure 8
A: HV charging cable
B: USB connector
C: **9** pin traction drive diagnostic socket

2.2 Preliminary steps:

Connect serial connector (arrow, Figure 8) of traction drive diagnostic cable (20-040-0551) to serial port on laptop then connect the round pinned connector end of the traction drive diagnostic cable to the vehicle's **6** pin EV diagnostic socket (circled).

- Connect black HV charging cable (A) to vehicle.
- Ignition: **ON.**

Note:

- Preliminary steps must be performed in order to update On-board charger.
- When all steps have been performed the green indicator is displayed:

2.3. Select "Select Firmware" button (circled, Figure 9).

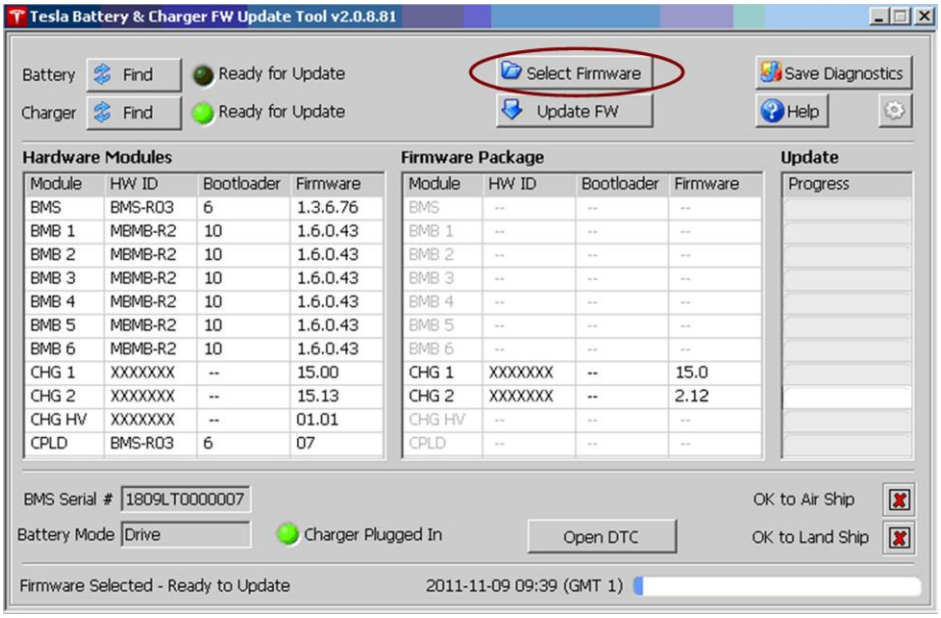


Figure 9

2.4. Manually select the correct Fimware:

- Navigate the following path: Desktop>ESS firmware update>Charger>02xx Teslaupdate>**A)
- Select File: CHG Metro xxx-xxx v15.00-12.teslaupdate and confirm with OK (circled, Figure 10)

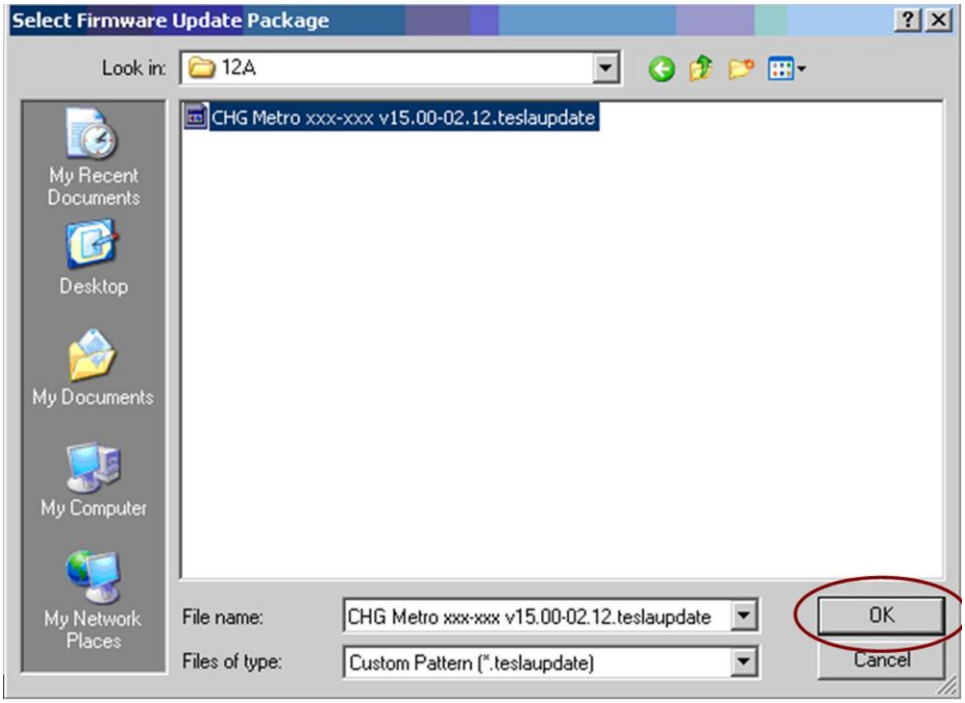
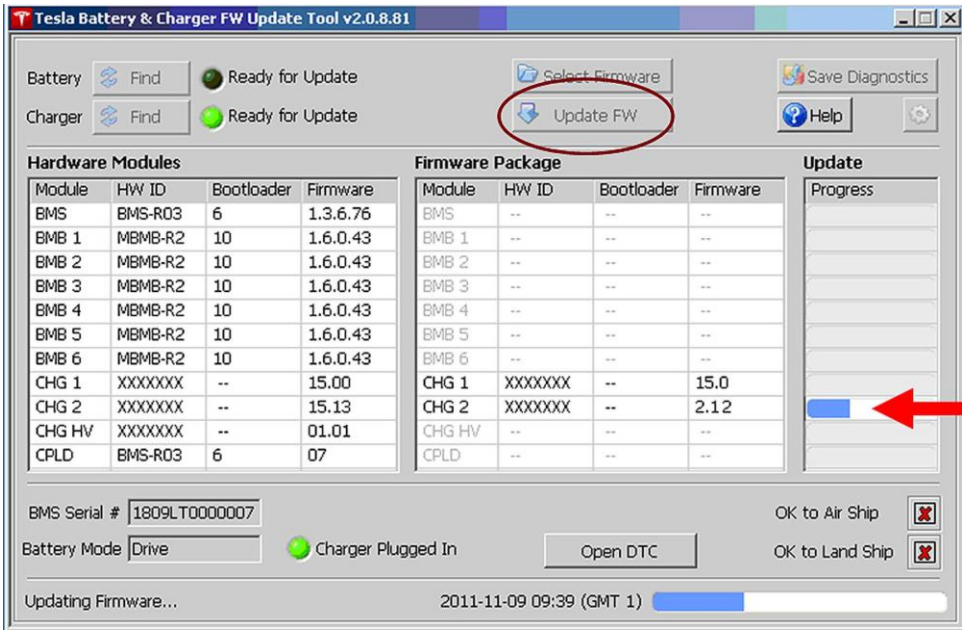


Figure 10

2.5. Select "Update FW" (circled, Figure 11)

Note:

The programming will start.



Module	HW ID	Bootloader	Firmware
BMS	BMS-R03	6	1.3.6.76
BMB 1	MBMB-R2	10	1.6.0.43
BMB 2	MBMB-R2	10	1.6.0.43
BMB 3	MBMB-R2	10	1.6.0.43
BMB 4	MBMB-R2	10	1.6.0.43
BMB 5	MBMB-R2	10	1.6.0.43
BMB 6	MBMB-R2	10	1.6.0.43
CHG 1	XXXXXXX	--	15.00
CHG 2	XXXXXXX	--	15.13
CHG HV	XXXXXXX	--	01.01
CPLD	BMS-R03	6	07

Module	HW ID	Bootloader	Firmware
BMS	--	--	--
BMB 1	--	--	--
BMB 2	--	--	--
BMB 3	--	--	--
BMB 4	--	--	--
BMB 5	--	--	--
BMB 6	--	--	--
CHG 1	XXXXXXX	--	15.0
CHG 2	XXXXXXX	--	2.12
CHG HV	--	--	--
CPLD	--	--	--

Figure 11

Note*:*

- If 02.12 is already installed, a “no newer firmware found” message pops-up and you are complete with this update step.
- When automatic update process begins the indicator bar (arrow) in the update field displays the update progress.
- The percentage value may be displayed in the lower left.
- To check whether the update was successful, please check the firmware versions for CHG1 and CHG2 as well as the set current intensity.
- Following the update, the version information must be as follows:
  Current version CHG1: 15.00
  Current version CHG2: 02.12
- After the update has completed there may be a pop-up message indicating 3 requirements that have to be fulfilled if the car was going to be driven at this stage. **Ignore it, just confirm by clicking OK.**

Important: Depending on the country of use, the respective valid charging current version must be set based on the charging current. As ** 08 stands for 8 A, 12 for 12 A or 13 for 13 A.

CHG1 15.00

Charging current: 12A, CHG1 15.00/CHG2 02.12.

3. Update of the control units relevant for drives (OVERSEER, EDCM, EVCM)

Sequence	Modules	Release	
1	EDCM (Electric Drive Control Module)	2E1EU or **2E1US**	**The US variant is valid for: USA, Canada and Singapore** The EU variant is valid for: All other countries
2	OVERSEER	2E1EU or **2E1US**	
3	EVCM (Electric Vehicle Control Module)	2E1EU or **2E1US**	

Turn ignition switch: **On**.

3.1. Start Zytek diagnosis computer (if not already connected), connect the round pinned connector end of the diagnostic cable (2 0-040-0551) to vehicle's **6**-pin EV diagnostic socket (circled, Figure 8).

- The serial port connector of diagnostic cable 2 0-040-0551 should be already connected to serial port of laptop (refer to Figure 8).
- Make sure that the connection is not interrupted during the programming operation.
- The 12 V battery charger must remain connected to the vehicle.

3.2 Double click the "C507_EVCM_2E1" shortcut (arrow Figure 12) on the computer's desktop to open the calibration tool.

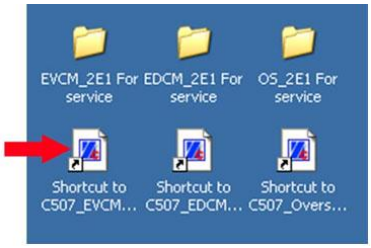


Figure 12

3.3. Erase the fault memory (Functions>OBD Menu>Reset all DTCs) and confirm with: **YES**

Note:

Where applicable, enter additional information on the vehicle if this is prompted by pop-up message.

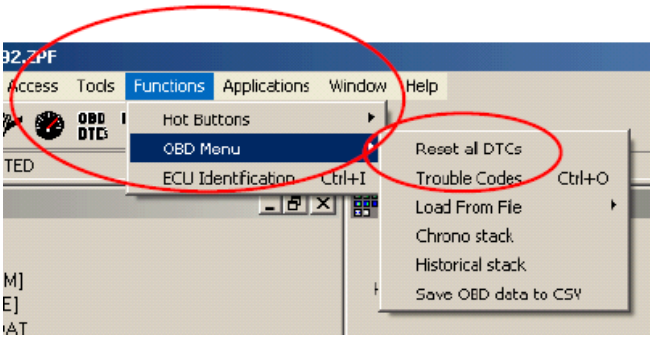


Figure 13

3.4. Close the calibration tool.

3.5. Connect cables:

- Connect traction drive diagnostic cable (2 0-040-0551) to vehicle's **9**-pin diagnostic socket (refer to Figure 8).
- Connect serial port connector of diagnostic cable (2 0-040-0551) to serial port of laptop (refer to Figure 8).

3.6. Double click the "EDCM 2E1" shortcut (arrow Figure 14) on the computer's desktop to open the calibration tool.

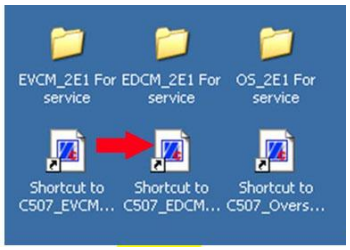


Figure 14

3.7. Log in (Access>Enter Password Level) and enter the user data:
User = **Daimler**; Password = **451ed**

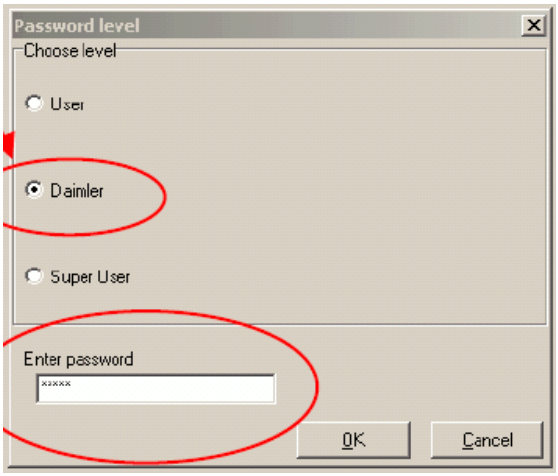


Figure 15

3.8 Click on "ECM-Button"

Figure 16

3.9. Select the 2E1 (arrow, Figure 17) software and confirm with 'GO' and then with: **YES**.

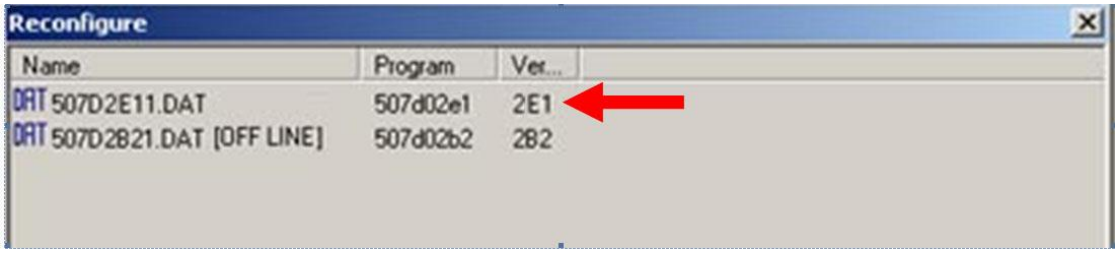


Figure 17

Note:

- The update process now starts (can be recognized on the progress bar).
- After a successful update process, the "Reconfigured successfully" message is shown.

3.10. Close the calibration tool.

3.11. Double click on the "Overseer 2E1" shortcut (arrow Figure 18) on the computer's desktop to launch the calibration tool.

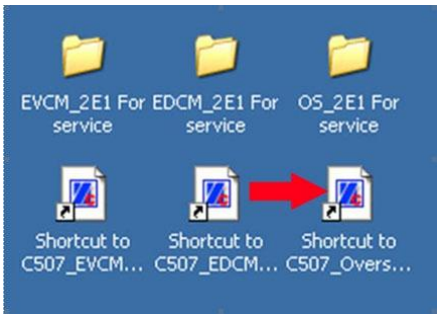


Figure 18

3.12. Log on to the tool: Access>Enter Password Level and enter the user data:
User = **Daimler**; Password = **451ed**.

3.13 Click on "ECM-Button" (on the upper left corner area of the screen).

Figure 19

3.14. Select the 2E1 software (arrow, Figure 20) and confirm with: '**GO**' and then with : '**YES**'

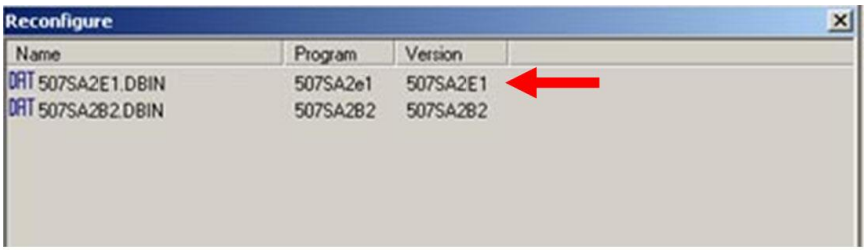


Figure 20

Note:

- The update process is now starting (can be recognized on the progress bar).
- After a successful update process, the "Reconfigured successfully" message is shown.

3.15. Close the calibration tool.

3.16. Turn **OFF** the ignition and wait until the illumination in the instrument cluster goes out (the control unit performs a reset) then turn the ignition back **ON.**

3.17. Connect traction drive diagnostic cable (2 0-040-0551) to vehicle's **6**-pin diagnostic socket (Refer to Figure 8).

Note:

The other serial port connector of diagnostic cable 2 0-040-0551 should be already connected to serial port of laptop (refer to Figure 8)

3.18. Double click on the "EVCM 2E1" shortcut on the desktop (arrow, Figure 21) to open the calibration tool.

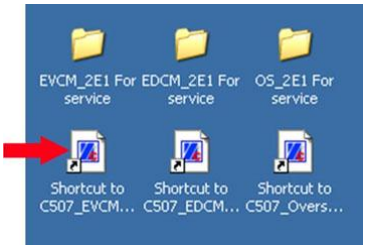


Figure 21

3.19. Log onto the tool: Access>Enter Password Level and enter the user data:
User = **Daimler**; Password = **451ed**

3.20. Click on: "ECM-Button"

Figure 22

3.21. Select the 2E1 software and confirm with '**OK**'.

3.22. Select the **US** (arrow, Figure 23) then confirm your selection with: **GO** and then with **YES**.

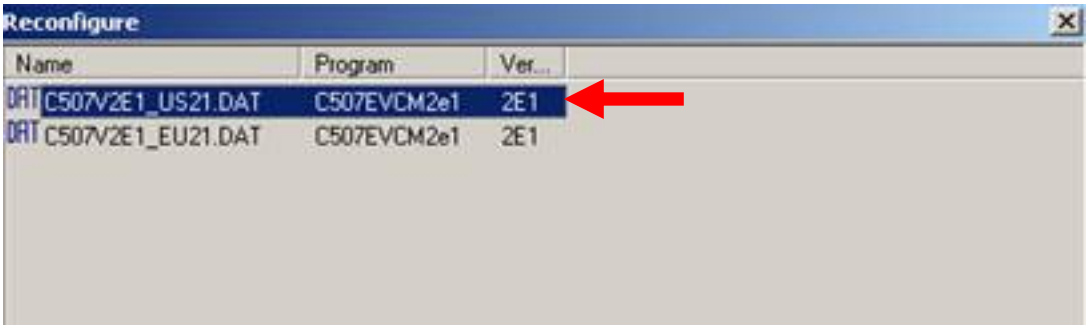


Figure 23

Note:

- The update process now starts (this can be recognized on the progress bar).
- After a successful update process, the "Reconfigured successfully" message is displayed.

3.23. Close the calibration tool.

3.24. Turn **OFF** the ignition and wait until the illumination in the instrument cluster goes out.

Note:

The control unit performs a reset.

3.25. Erase all fault codes, otherwise “check engine light” **may** illuminate.

C. Fasten Wiring Harness with Cable Tie

1. Open tail gate.
2. Open service flap and place outside of vehicle.
3. Attach cable tie to cable harness in front area (see area A, Figure 24)
   Note:
   Ensure that sufficient space is left between the cable set and shield (see area B, Figure 24) along the entire length (contact with the wiring harness must not occur here).
4. Close service flap and trunk.

Figure 24
A: Cable tie
B. Shield

Special tools

Quantity	Designation	Part No.
1	Zytek Diagnosis Tool*	-
1	Diagnostic cable for high-voltage battery (order once for each repair workshop with VIN)	W 451 589 09 63 00

***** Update is only possible if the latest software is installed on the Zytek Diagnosis Tool – refer to subject **A**

Special Tools

2 0-040-0551

Diagnostic cable for traction drive

2 0-040-0552

Diagnostic cable for OBD socket w/USB adapter

W 451 589 09 63 00

Diagnostic cable for high-voltage battery

Primary Parts Information

Qty.	Part Name	Part Number	Estimated Replacement Rate
1	Cable tie	A 002 997 24 90	100%

Note:

The following allowable labor operation should be used when submitting a warranty claim for this repair:

Warranty Information

Operation: Update Electric Drive Software (02 7465)
Attach cable tie at wiring harness (02 7464)

Damage Code	Operation Number	Labor Time (hrs.)	Model Indicator(s)
54 954 32 7	02 7465	0.9	Not Available [1)]
	02 7464	0.1	

[1)] Use vehicle VIN when submitting warranty claim.