scorpio-LK Ltd.
Hardware and Software Development

MQB Dashboard Calibration Skoda Octavia (A7) Johnson Controls Instrument Cluster 5E0 920 851 A

I. Getting Started

Introduction

This document relates to Barracuda programmer software version 8 (April 2019) and up.

The system allows to calibrate mileage and add keys to Skoda Octavia (A7) equipped with JCI MQB Instrument cluster 5E0 920 851 A

**System requirements for dashboard calibration :**

- Barracuda programmer
- Barracuda adapter set JTAG
- Activation SKODA MQB JCI 5E0 920 851 A
- J2534 PassThru OBD Adapter
- EEPROM programmer (Orange-5 or similar)
- Vehicle must have at least one working key

System requirements for key addition :

- Barracuda programmer
- Barracuda adapter set JTAG
- Activation SKODA MQB JCI 5E0 920 851 A

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- J2534 PassThru OBD Adapter
- EEPROM programmer (Orange-5 or similar)
- Tango programmer
- Vehicle must have at least one working key

Barracuda Adapter JTAG
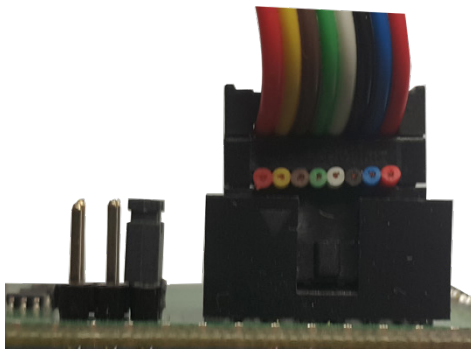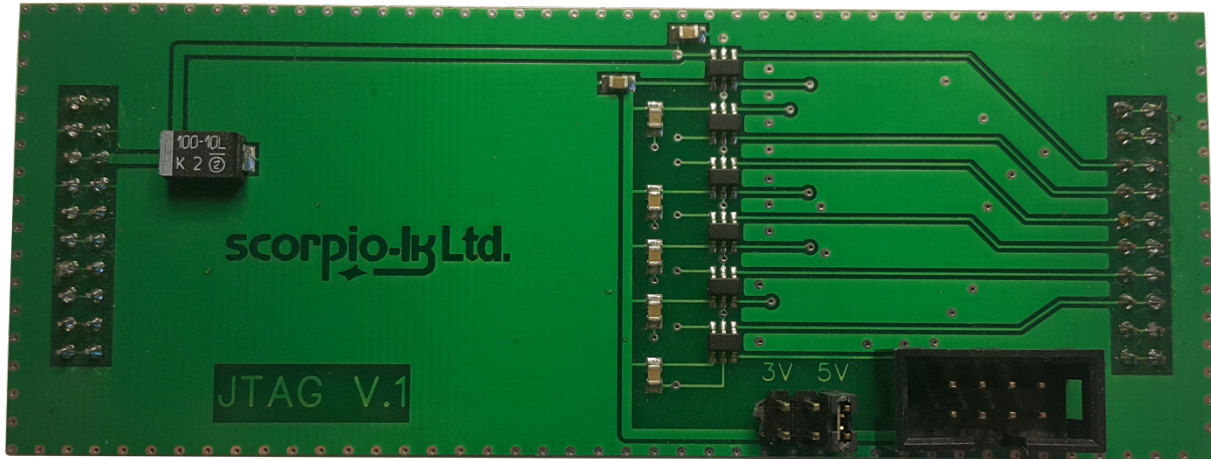
Adapter set JTAG includes cable.

J2534 PassThru OBD Adapter

The software uses the Pass Thru adapter to communicate with the car's network.

Our company neither manufactures nor sells the Pass Thru adapters.

Pass Thru adapters are quite common and there are many different manufacturers worldwide. Usually there are no special differences between all these adapters.

Each manufacturer supplies a driver for its adapter. The driver is suitable for adapters of this manufacturer.

The drivers and adapters are not interchangeable along all manufacturers. You should avoid assigning a driver of one manufacturer to an adapter of another manufacturer.

Barracuda software allows user to assign any of installed drivers to his adapter, but this does not mean that the wrong assign will operate correctly.

1.Install the driver as required and supplied by the adapter manufacturer.

2.Make sure that Windows OS administrator privileges are given to Barracuda.exe.

3.Launch Barracuda.exe (physically adapter is not needed).

4.Select ECU Maker -> Skoda - > Instrument Cluster)

5.Press PassThru Settings
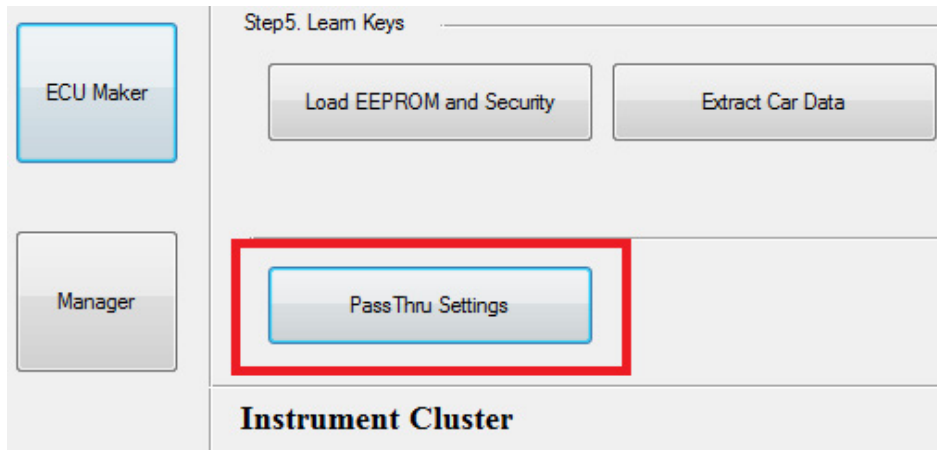

6.If PassThru drivers are correctly installed the following Window will appear:
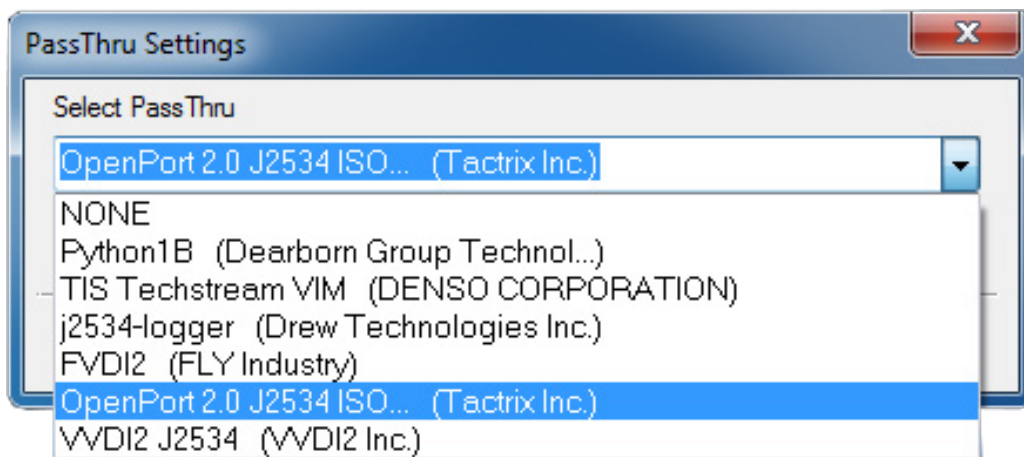
7.In the example used multiple PassThru adapter drivers are installed on the system.

Select the driver corresponding to the adapter you intend to use.

8.Once selected press OK. Barracuda software will continue use the selected driver.

If you want to use a different adapter its driver have to be selected.

If no drivers are installed or are not compatible with the Windows OS you are using, the following error message will appear and selection menu will be empty (NONE)
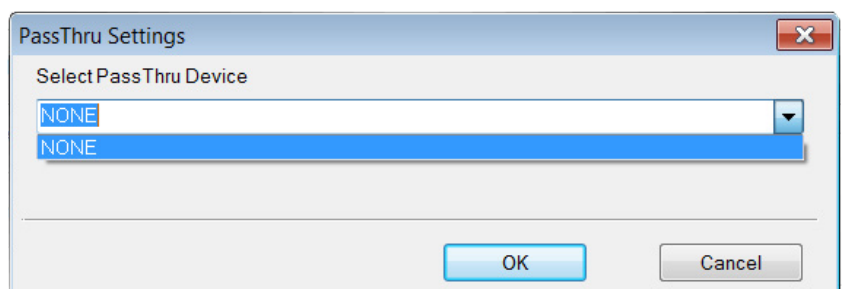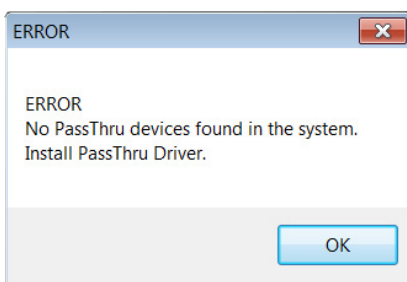
Interface Overview
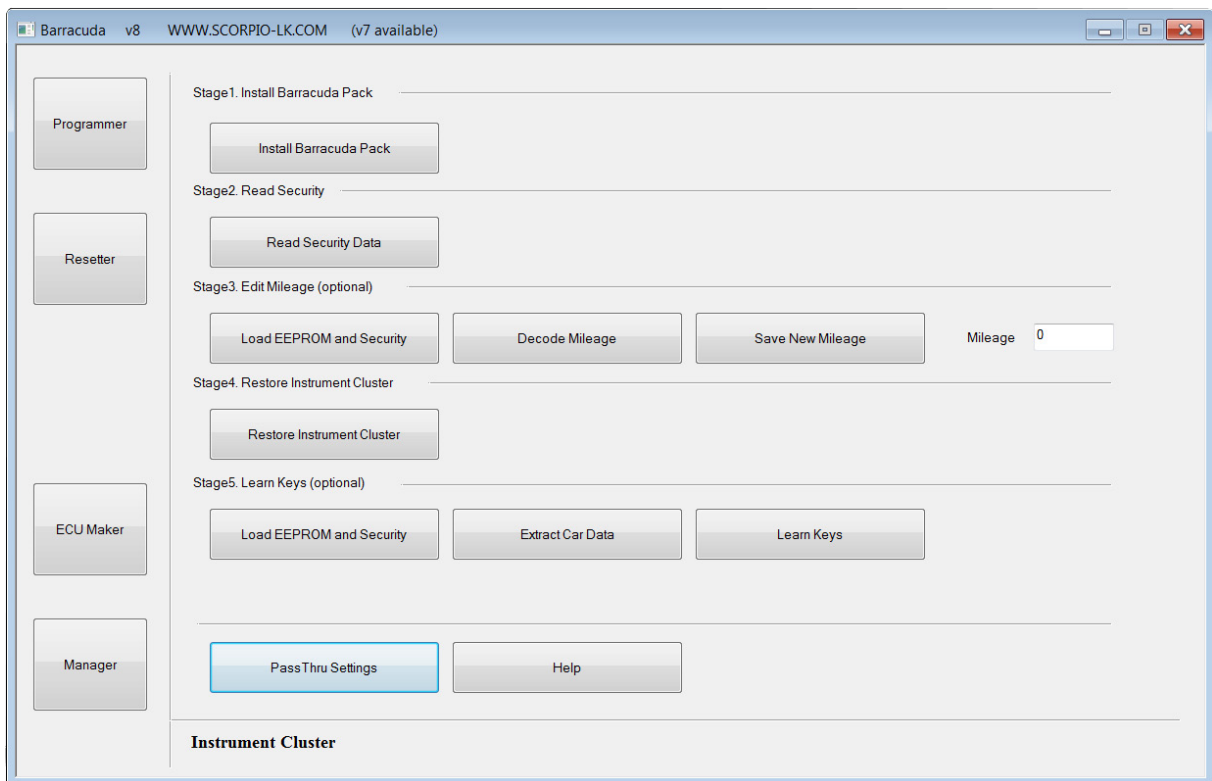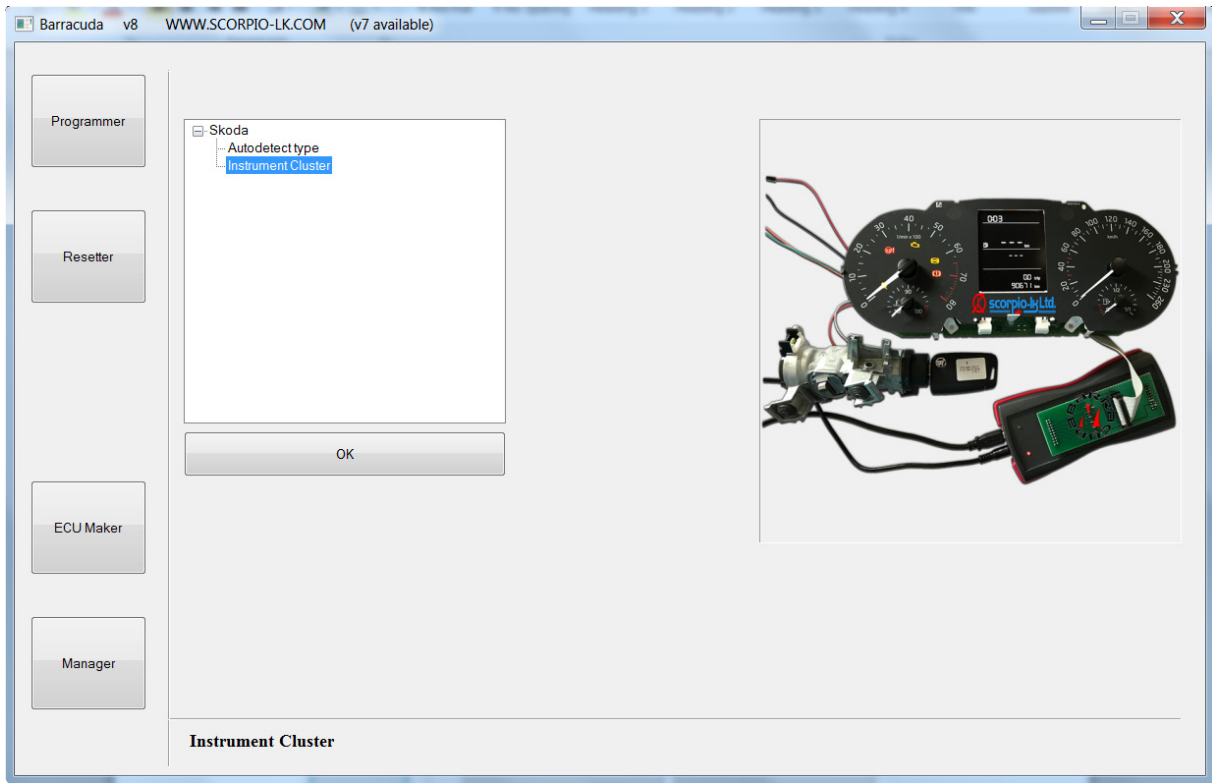
II. Dashboard Calibration

Due to the nature of JCI MQB platform a creative approach is needed in order to calibrate cluster mileage. The solution currently implemented in Barracuda can be summarized in four main stages, which are described below:

Stage 1 - Install Barracuda Pack
Stage 2 - Read EEPROM & Security Data
Stage 3 - Edit Mileage
Stage 4 - Restore Instrument Cluster

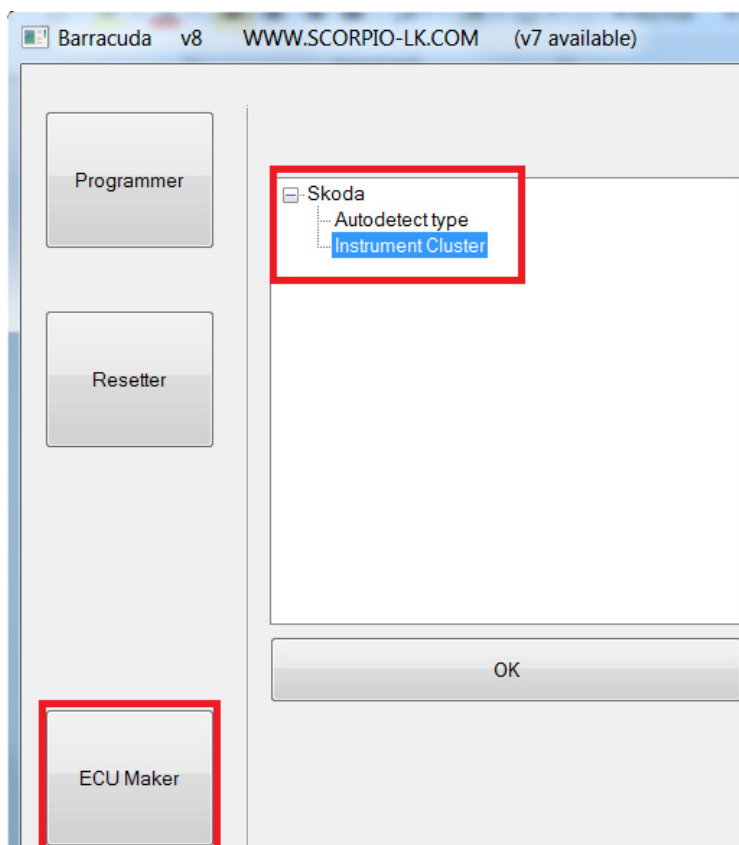## Stage 1 - Install Barracuda Pack

Preliminary Step
It is recommended before starting the procedure to save ABS coding of the vehicle, or turn off ABS by removing its fuse !

*As example initial mileage value is **99847**km Note that for this stage it is **not** necessary to have Barracuda programmer connected.*

We realize that due to the external power supply of Barracuda it won't be convenient to use it directly in car, just start software and perform the steps.

1. Connect J2534 PassThru OBD adapter to vehicle
2. Start Barracuda software (Select ECU Maker -> Skoda - > Instrument Cluster)

3. Turn Ignition **ON**
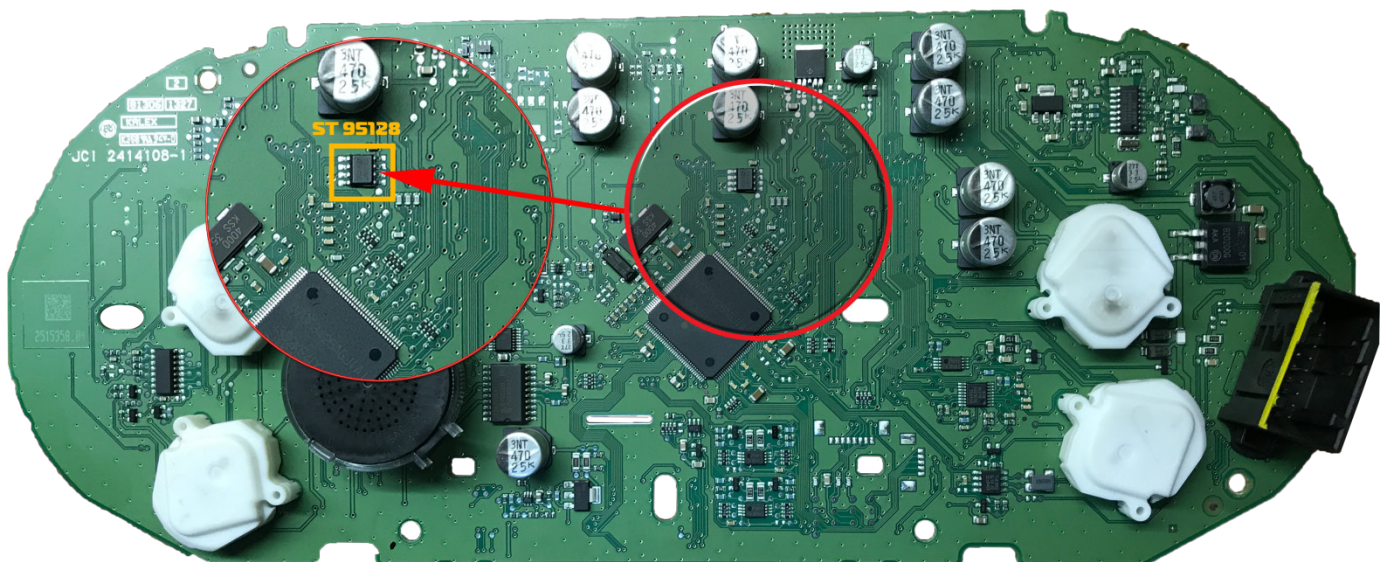
4. Press Install Barracuda Pack

5. After procedure is finished cluster will turn **OFF**

6. Turn Ignition **OFF** and remove key

Stage 2 - Read EEPROM & Security Data

This stage requires removing the cluster from vehicle.

2.1 Read EEPROM

Target of this step is to acquire dump file (*.bin) from the Cluster 's **EEPROM (ST95128)** located here:

This requires any EEPROM programmer. Example used in current document is Orange-5 Universal EEPROM & MCU Programmer.

1. Remove the EEPROM

2. Solder on Adapter SOIC8 14 93Cxx and insert it in STD part of the ZIF socket

3. Start Orange-5 software and select EEPROM->ST95128
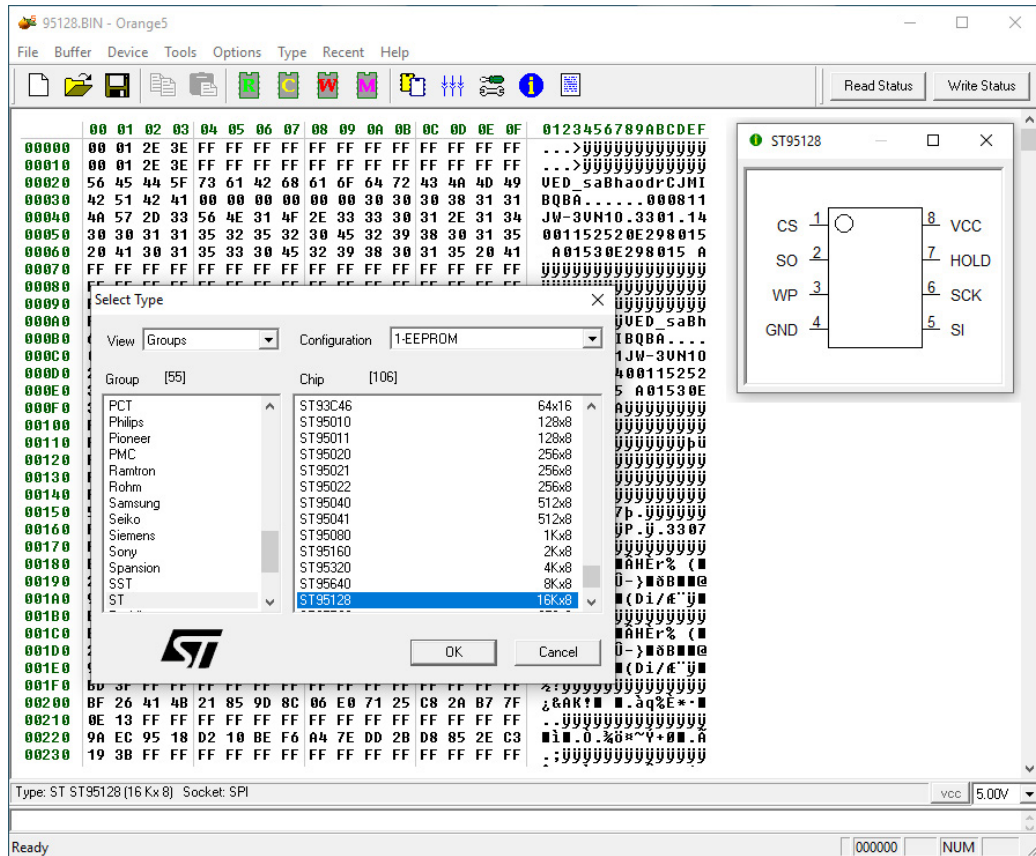
4. Press Read then save the file.

After this step it is **not** necessary to solder back EEPROM. During next procedure stage there will be a new dump file which has to be written back in the EEPROM.

2.1 Read Security Data

Target of this step is to acquire **Security Data dump file** (*.bin) from the Cluster

1. Insert Adapter JTAG in Barracuda programmer (make sure jumper is placed at position **5V**)
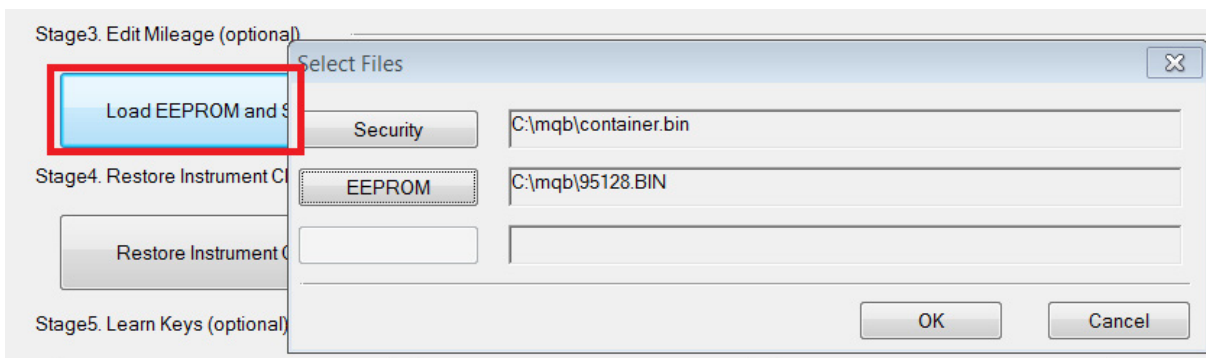2. Solder cable to cluster
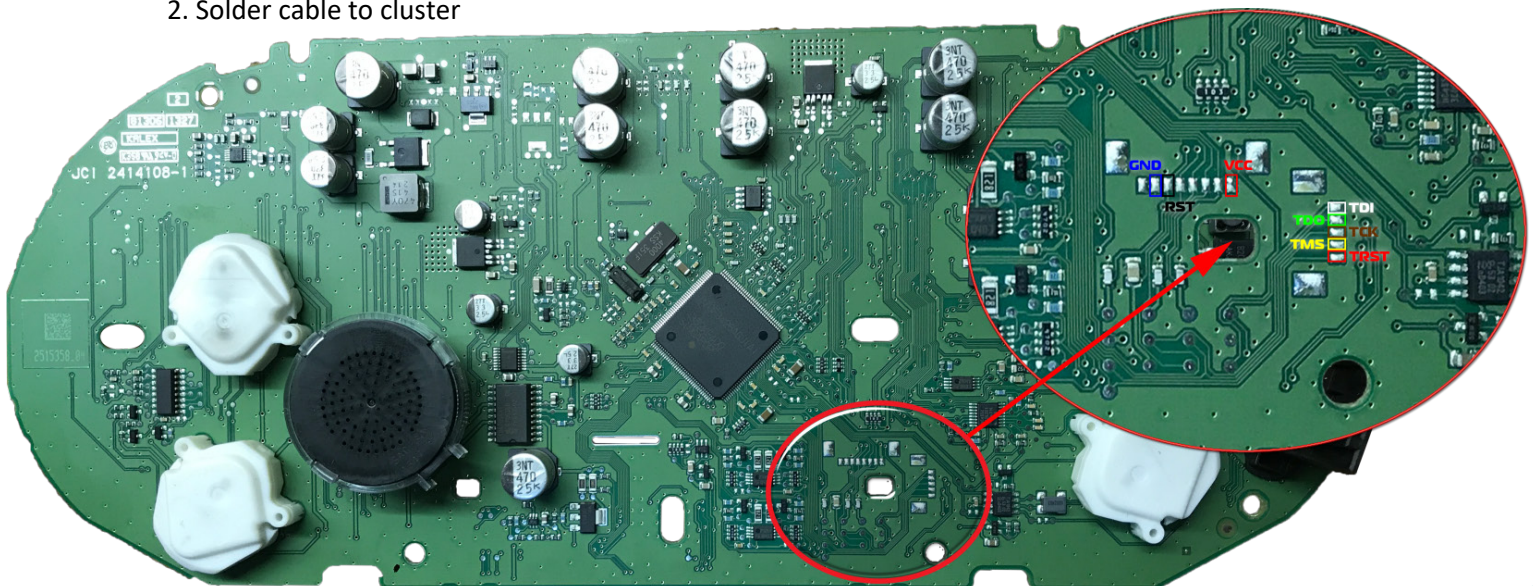
3. Connect Barracuda to PC

4. Start Barracuda software (Select ECU Maker -> Skoda - > Instrument Cluster)

5. Press Read security Data, after completion save file.
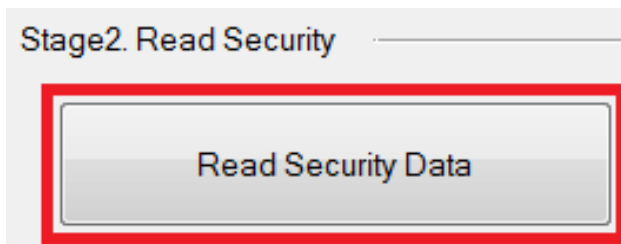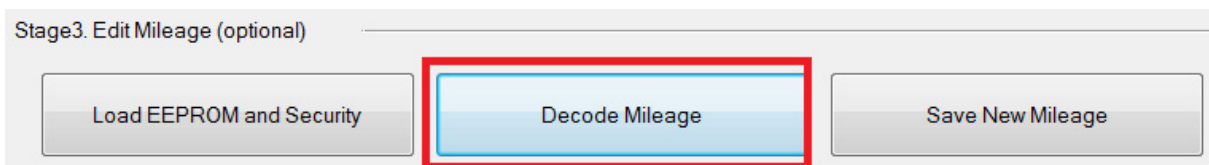

Stage 3 - Edit Mileage

1. Press Load EEPROM and Security

2. Open both dump files acquired in Stage 2

3. Press Decode Mileage (target window will display current value)

4. Input desired new value (range is 0 to 999999)

5. Press Save New Mileage. You will be prompted to save new ST95128 EEPROM dump file.

6. Write new file back in EEPROM, and solder the chip back on the cluster.

Stage 4 - Restore Instrument cluster

*Note that for this stage it is **not** necessary to have Barracuda programmer connected. We realize that due to the external power supply of Barracuda it won't be convenient to use it directly in car, just start software and perform the steps.*

1. Remove all wires from Cluster, put it back together and reinstall in car

2. Connect J2534 PassThru OBD adapter to vehicle

3. Start Barracuda software (Select ECU Maker -> Skoda - > Instrument Cluster)

4. Turn Ignition **ON**

5. Press Restore Instrument Cluster
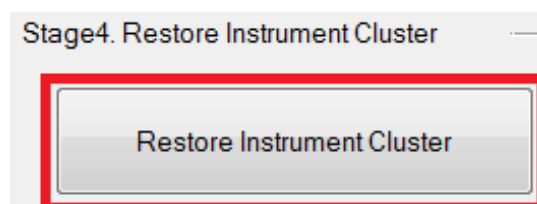
The procedure will start, progress is shown and it takes 5-10 minutes to complete.
After completion software shows OK, at this point Cluster will turn **ON** displaying the edited mileage data. This Stage concludes the Dashboard Calibration process

*Mileage value after procedure - **1234**km*

III. Key Addition

## Obtaining Cluster Data

Preliminary Step
It is recommended before starting the procedure to save ABS coding of the vehicle,
or turn off ABS by removing its fuse !

If you **have** already altered Mileage you can directly load dump files **Security Data** and **EEPROM**
If you **haven't** then perform **Stage 1- Install Barracuda Pack** to **Stage 2 - Read EEPROM & Security Data** of **Dashboard Calibration**. After Stage 2 **solder back** the ST95128 EEPROM.

1. Connect Barracuda to PC
2. Start Barracuda software (Select ECU Maker -> Skoda - > Instrument Cluster)
3. Press Load EEPROM and Security
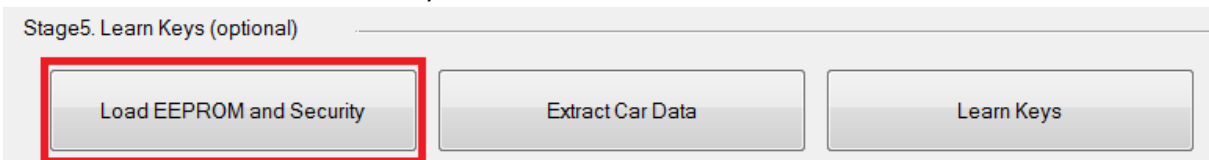
4. Open both dump files acquired in **Stage 2 - Read EEPROM & Security Data**
5. Press Extract Car Data - you will be prompted to **save a new file (Extracted Car Data file)**.
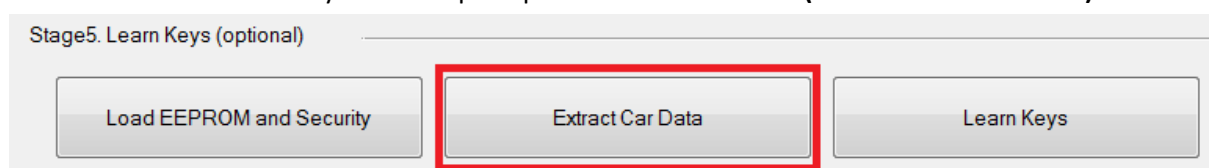
6. Perform **Stage 4 - Restore Instrument Cluster** of **Dashboard Calibration**

Make Dealer Key

In this case the data obtained allows pre-coding of an original key, which can then be learned to the vehicle. Steps can be repeated to create multiple keys. Allowed number of keys in this cluster is 1 to 8. After key learning procedure is complete resulting key will be fully functional.

1. Connect Tango to PC, start its software and select Skoda -> Image Dump ->Barracuda->MQB Platform 2013- ->Dealer Key
2. Open the data file from **Step 5** of **Obtaining Cluster Data** (**Extracted Car Data file**)
3. Insert the key which has to be pre-coded.
4. Press Write. After this the key is pre-coded.

Key Matching

Matching of two keys will be used as an example.

*Note that for this stage it is **not** necessary to have Barracuda programmer connected.*
We realize that due to the external power supply of Barracuda it won't be convenient to use it directly in car, just start software and perform the steps.

1. Connect J2534 PassThru OBD adapter to vehicle
2. Start Barracuda software (Select ECU Maker -> Skoda - > Instrument Cluster)
3. Press Learn Keys
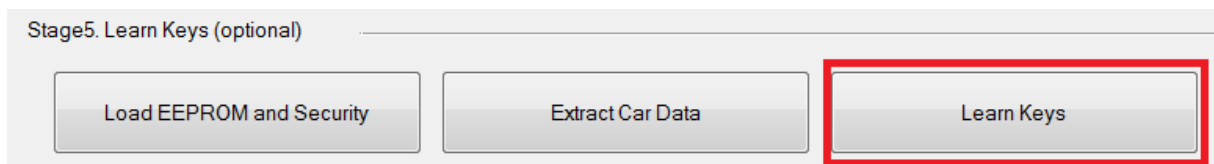
4.Press Browse and open the **Extracted Car Data file**
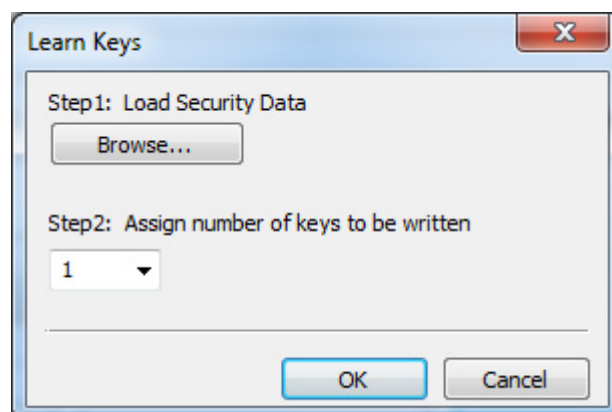
5. Assign number of keys you want to add from the dropdown menu (minimum 1 maximum 8)
6. Insert a key prepared with Tango into the ignition switch
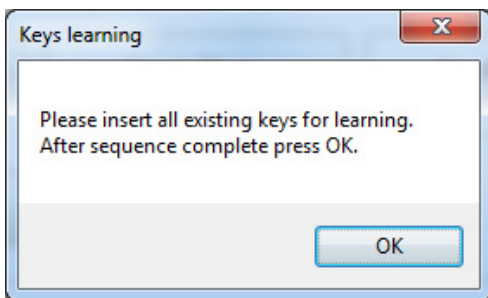7. Turn Ignition **ON** [Cluster will display 0-2 (depends on number of assigned keys in step 5: 0-1 to0-8)]

8.Press OK (this step will erase all current key data from cluster)

9. The following message will appear :

" Please insert all existing keys for learning.

After Sequence is complete press OK."

Don't press OK !!!

10.Cluster will display 1-2

11. Turn Ignition **OFF** and remove key

12. Insert next key ((When the car had one existing key and you wanted to add just one more, insert it)
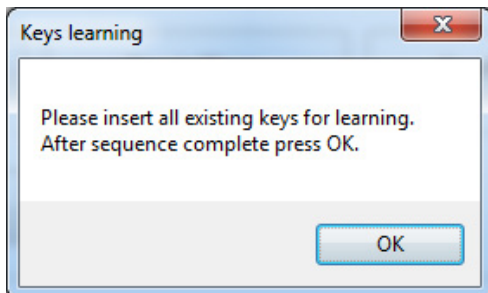
13. Turn Ignition **ON**

14. Cluster will display 2-2, then turn Ignition **OFF**

If more keys were selected in Step 5., just repeat steps 12. to 14. until displayed number matches number of keys . For example 3-3,4-4 ... 8-8.
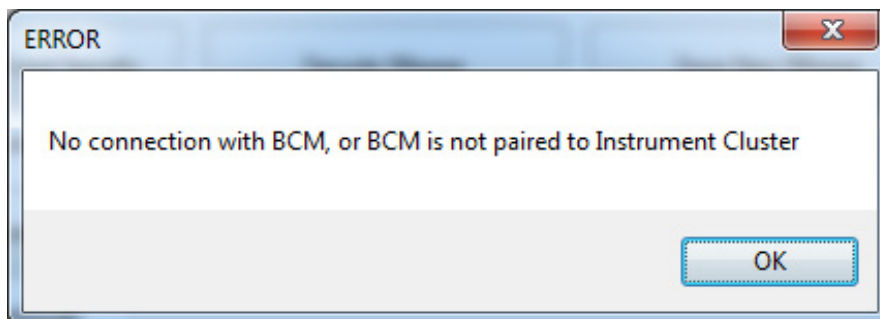
15. After all keys are learned (in example 2-2), turn Ignition **ON** with any of the learned keys

16. Press OK in Barracuda software

Press OK Now

Cluster emergency lights indicator will blink 3 times, message 2-2 will disappear. This concludes the key matching procedure. All learned keys are fully functional

This message will appear if the vehicle BCM was tampered with and/or not matching with the vehicle.

IV. Write Key Directly

This method can be used when just a key able to start the car is required (without working remote, mainly needed for Auto start implementation).

Preliminary Step

It is recommended before starting the procedure to save ABS coding of the vehicle,
or turn off ABS by removing its fuse !

If you **have** already altered Mileage you can directly load dump files **Security Data** and **EEPROM**
If you **haven't** then perform **Stage 1- Install Barracuda Pack** to **Stage 2 - Read EEPROM & Security Data** of **Dashboard Calibration**. After Stage 2 **DON'T** solder back the ST95128 EEPROM.

1. Connect Tango to PC, start its software and select Skoda -> Image Dump ->Barracuda->MQB Platform 2013- ->Key Maker
2. Open both dump files acquired in **Stage 2 - Read EEPROM & Security Data**

Tango will show number of keys, positions, etc...

3. Insert blank key in Tango

4. Select position on which it will be written.

5. Press Write, you will be prompted to save new dump file for the ST95128 EEPROM

6. Write the new dump in ST95128 and solder it back on the cluster.

7. Perform **Stage 4 - Restore Instrument Cluster** of **Dashboard Calibration**