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TA71
Vehicle
Diagnostics
Software
and
Hardware

ABRITES TA71 Vehicle Diagnostics Software and Hardware User Manual

Contents

ABRITES TA71 Vehicle Diagnostics Software and Hardware

Product Information

Specifications:

- **Product Name:** Abrites Diagnostics for Toyota/Lexus/Scion Online
- **User Manual Version:** 1.3
- **Manufacturer:** Abrites Ltd.
- **Functions:** Diagnostic scanning, Key programming, Module replacement, ECU programming, Configuration and coding

Product Usage Instructions

Introduction
ABRITES DIAGNOSTICS FOR TOYOTA/LEXUS/SCION ONLINE is designed to provide comprehensive diagnostic solutions for Toyota, Lexus, and Scion vehicles.

Getting Started
Ensure the hardware product is properly connected and follow the safety instructions provided in the manual. Install any necessary software on your computer before proceeding.

Using the Abrites Diagnostic for Toyota Online
This section covers general diagnostics, including reading/clearing Diagnostic Trouble Codes (DTCs) and live values monitoring.

1. **General Diagnostics – Read/Clear DTCs**

   Access the diagnostic tool on the software interface, connect to the vehicle's onboard computer, and follow the prompts to read and clear DTCs for troubleshooting purposes.

2. **Live Values Monitoring**

Monitor real-time data from various vehicle sensors and systems to assess performance and identify potential issues.

Special Functions
Explore special functions such as key learning, airbag diagnostics, mileage calibration, ID code box reset, and smart system synchronization for advanced vehicle maintenance tasks.

Key Learning
Follow the detailed instructions provided to learn, program, or delete keys for the supported vehicles.

Airbag
Access airbag diagnostics features to ensure proper functionality and safety compliance.

Mileage Calibration
Calibrate the mileage readings on the vehicle for accurate reporting and maintenance tracking.

ID Code Box Reset
Reset the ID code box following the specified connections and procedures outlined in the manual.

Smart System Synchronization
Synchronize smart systems within the vehicle using the recommended connections and procedures.

FAQ

Q: How do I claim warranty for Abrites hardware products?
A: To claim warranty, ensure proper usage according to instructions and contact Abrites Support Team at **support@abrites.com** with evidence of the defect or malfunction.

Important notes

The Abrites software and hardware products are developed, designed and manufactured by Abrites Ltd. During the production process we comply to all safety and quality regulations and standards, aiming at highest production quality. The Abrites hardware and software products are designed to build a coherent ecosystem, which effectively solves a wide range of vehicle-related tasks, such as:

- Diagnostic scanning;
- Key programming;
- Module replacement,
- ECU programming;
- Configuration and coding.

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Warranty

You, as a purchaser of Abrites hardware products, are entitled of a two-year warranty. If the hardware product you have purchased has been properly connected, and used according to its respective instruc-tions, it should function

correctly. In case the product does not function as expected, you are able to claim warranty within the stated terms. Abrites Ltd. is entitled to require evidence of the defect or malfunction, upon which the decision to repair or substitute the product shall be made.

There are certain conditions, upon which the warranty cannot be applied. The warranty shall not apply to damages and defects caused by natural disaster, misuse, improper use, unusual use, negligence, failure to observe the instructions for use issued by Abrites, modifications of the device, repair works performed by unauthorized persons. For example, when the damage of the hardware has occurred due to incompatible electricity supply, mechanical or water damage, as well as fire, flood or thunderstorm, the warranty does not apply.

Each warranty claim is inspected individually by our team and the decision is based upon thorough case consideration.
Read the full hardware warranty terms on our website.

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statements accompanying the product. Nothing herein should be construed as constituting any additional warranty.
- Abrites assumes no responsibility for any damage resulting from the use, misuse, or negligent use of the hardware or any software application.

Safety information

The Abrites products are to be used by trained and experienced users in diagnostics and reprogramming of vehicles and equipment. The user is assumed to have a good understanding of vehicle electronic systems, as well as potential hazards while working around vehicles. There are numerous safety situations that cannot be foreseen, thus we recommend that the user read and follow all safety messages in the available manual, on all equipment they use, including vehicle manuals, as well as internal shop documents and operating procedures.

Some important points:
Block all wheels of the vehicle when testing. Be cautious when working around electricity.

- Do not ignore the risk of shock from vehicle and building-level voltages.
- Do not smoke, or allow sparks/flame near any part of the vehicle fuel system or batteries.
- Always work in an adequately ventilated area, vehicle exhaust fumes should be directed towards the exit of the

shop.

- Do not use this product where fuel, fuel vapours, or other combustibles could ignite.

List of revisions

Date	Chapter	Description	Revision
26.04.2022	ALL	Document created.	1.0
24.11.2022	3	Update	1.1
17.07.2023	ALL	General Update and added supported models	1.2
08.09.2023	ALL	TN014, TN015, TN016 supported models, Airbag, Diagnostic	1.3
01.10.2024	ALL	TN017 & TN018 related	1.4

Introduction

Congratulations on choosing our wonderful product!
The "Abrites Diagnostics for Toyota/Lexus/Scion Online" is an Online server based Abrites software for Toyota, Lexus and Scion vehicles.
With the help of this software you can perform key learning operations of many Toyota vehicles, produced after 2018, including vehicles equipped with Tokai Rika Smart System with BA-type HT-AES keys and vehicles equipped with a Denso Smart System with BA-type DST-AES keys.

For proper operation of your diagnostic software you will need a corresponding interface for connection between your PC and vehicle named "AVDI".
AVDI is an interface produced by Abrites Ltd. intended to act as an interface between the PC and the electronic control units.
AVDI should be used with ABRITES software produced by Abrites Ltd.

ABRITES is a trademark of Abrites Ltd

Vehicle diagnostics with Abrites for Toyota

Scope of the manual
This document describes the usage of Abrites Diagnostics for Toyota / Lexus / Scion Online. The document is applicable for the latest software version. In this manual we suppose that the software for your AVDI interface is already installed. Please refer the "AVDI Common User's Manual" in case it is not.

System requirements:

- Minimum system requirements – Windows 7 SP1 + 2GB RAM (recommended 4GB)

Getting Started
You can start Abrites Diagnostics for Toyota/Lexus/Scion Online by starting the Abrites Quick Start ap-plication and selecting Toyota. On the 2nd page of the Toyota option, you need to select the following button.
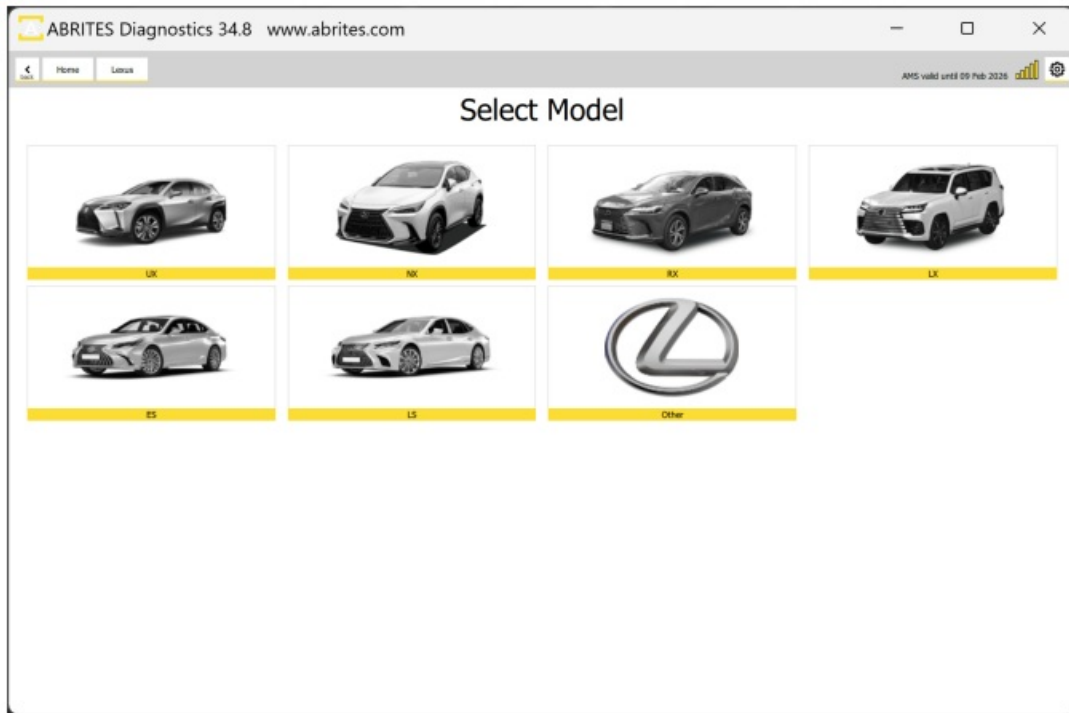When the Abrites Diagnostics for Toyota/Lexus/Scion Online application is started the main screen of the application will appear where you can select the brand desired- Toyota or Lexus:
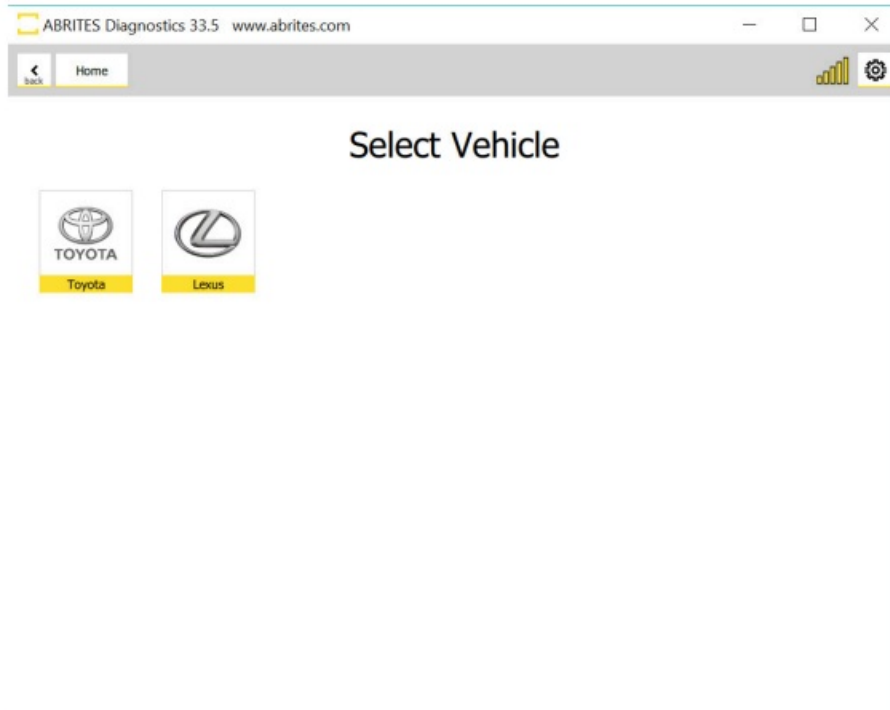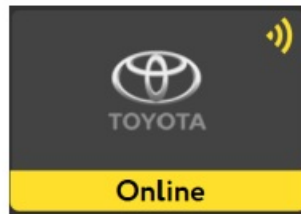
If Toyota is selected, you will have the possibility to select the model you're working on:
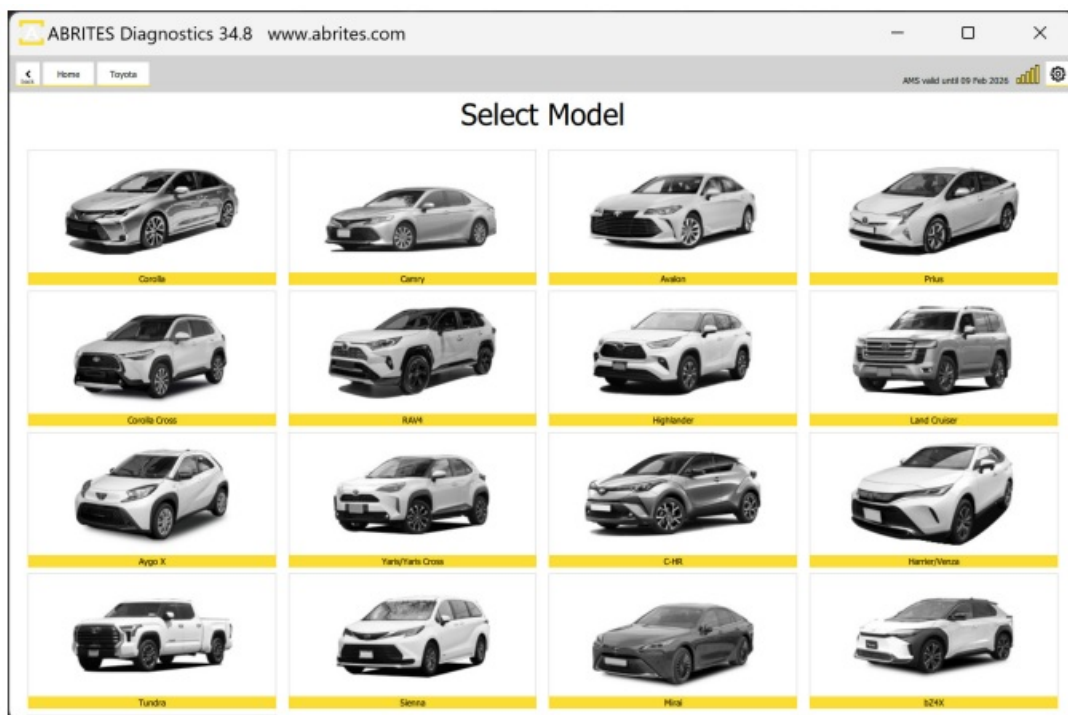
If Lexus is selected, the following models will appear for selection:

Using the Abrites Diagnostic for Toyota Online

The latest software version of the Toyota Online introduces diagnostic procedures.

When starting the software it is recommended to have the vehicle connected to an external power source in order to be sure that the vehicle does not loose power during the time spent working on it. When the software is started the vehicle can be selected, and than the software checks is the selection is correct and makes a suggestion for the correct vehicle. Then the General Diagnostics screen will be displayed and you can select the "Scan" button to start the diagnostic scan, which will also display the list of modules.
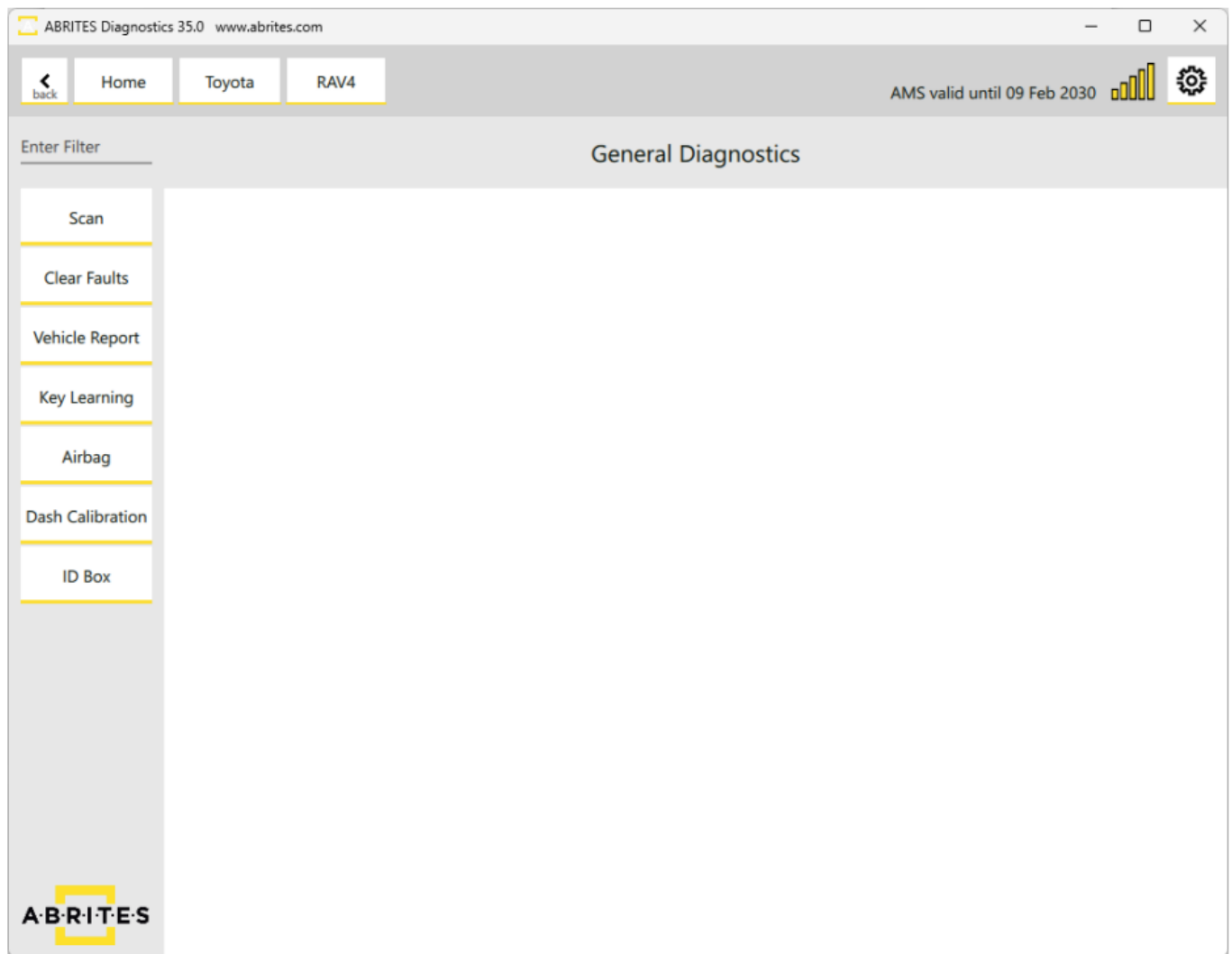
General Diagnostics – read/clear DTCs

Once started, the software will go through all available protocols and will identify all available modules in the vehicle you are working on. You could then enter each module and you will see all available options for it – identification, live/measured values, actuator testing, clearing DTCs. In order to read and clear the DTCs of a module you have to enter it, and open the "Fault Codes" menu on the left side. You are able to get details about each DTC, save the scan report to a file, and clear the DTCs by pressing the "Clear Faults" button.

Electronic Control Unit identification

Actuators

Live Values

Fault Codes

Custom Request

Identification	
Software version	896630ZT8000
Serial	

List of Fault Codes

Save to File

Clear Faults

Read Faults

Fault	Code
A Camshaft Position Actuator Bank 1 Circuit Open	P001013
Mass or Volume Air Flow Sensor "A" Circuit Short to Ground or Open	P010014
Manifold Absolute Pressure/Barometric Pressure Sensor Circuit Short to Battery or Open	P010515
Intake Air Temperature Sensor 1 Bank 1 Circuit Short to Battery or Open	P011015
Engine Coolant Temperature Sensor 1 Circuit Short to Battery or Open	P011515
Throttle/Pedal Position Sensor/Switch "A" Circuit Short to Battery or Open	P012015
Throttle/Pedal Position Sensor/Switch "A" Circuit Voltage Out of Range	P01201C
Engine Coolant Temperature Sensor 3 Circuit Short to Battery or Open	P01E315
Camshaft Position Sensor "A" Bank 1 or Single Sensor Circuit Short to Battery or Open	P034015
System Voltage Circuit Short to Ground or Open	P056014
Actuator Supply Voltage "A" Circuit Short to Ground or Open	P065714
Throttle/Pedal Position Sensor/Switch "A"/"B" Voltage Correlation Signal Cross Coupled	P21352B
Particulate Filter Pressure Sensor "A" Circuit Short to Battery or Open	P245215
Coolant Pump "B" Circuit Short to Ground or Open	P261A14
Engine Coolant Bypass Valve Circuit Short to Ground	P268111
Lost Communication with Drive Motor Control Module "A" Missing Message	U011087

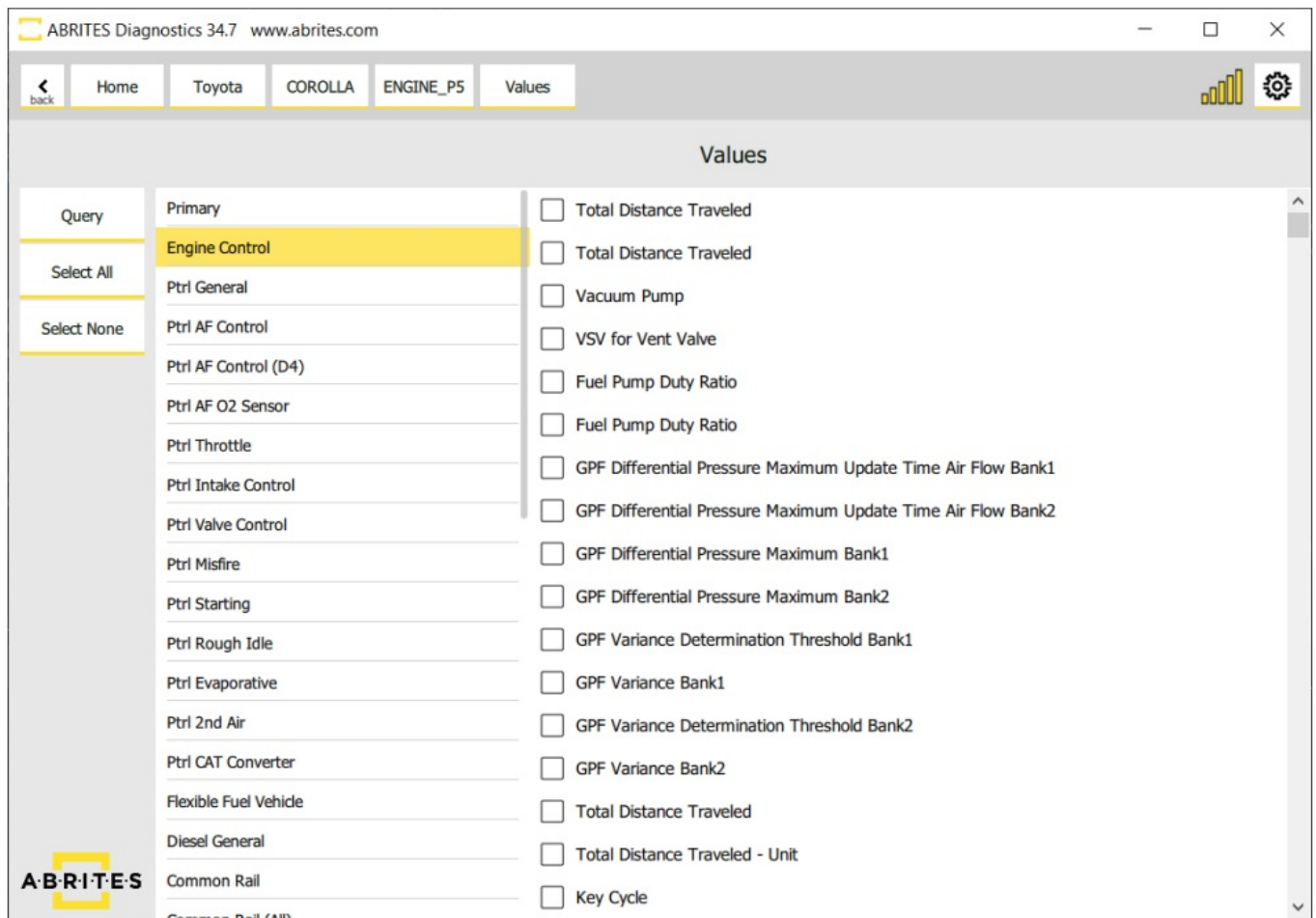**Live Values Monitoring**

The software gives you the option to monitor live values for diagnostic purposes. Live values are accessed by

opening the module you want to work with from the main screen, and selecting the "Live Values" but-ton on the left side. Then you will see a list of options you can select for monitoring as in the screenshots below:
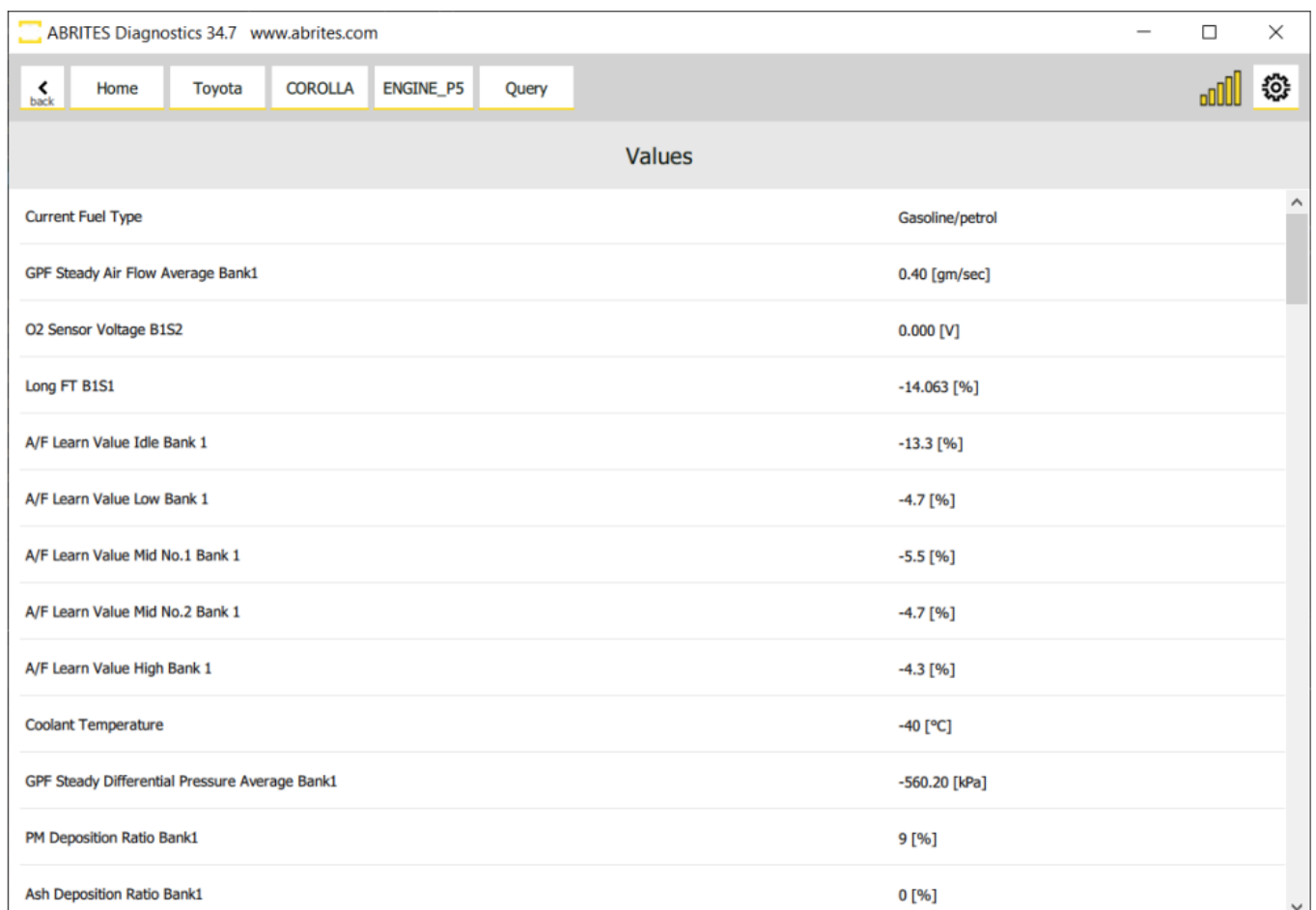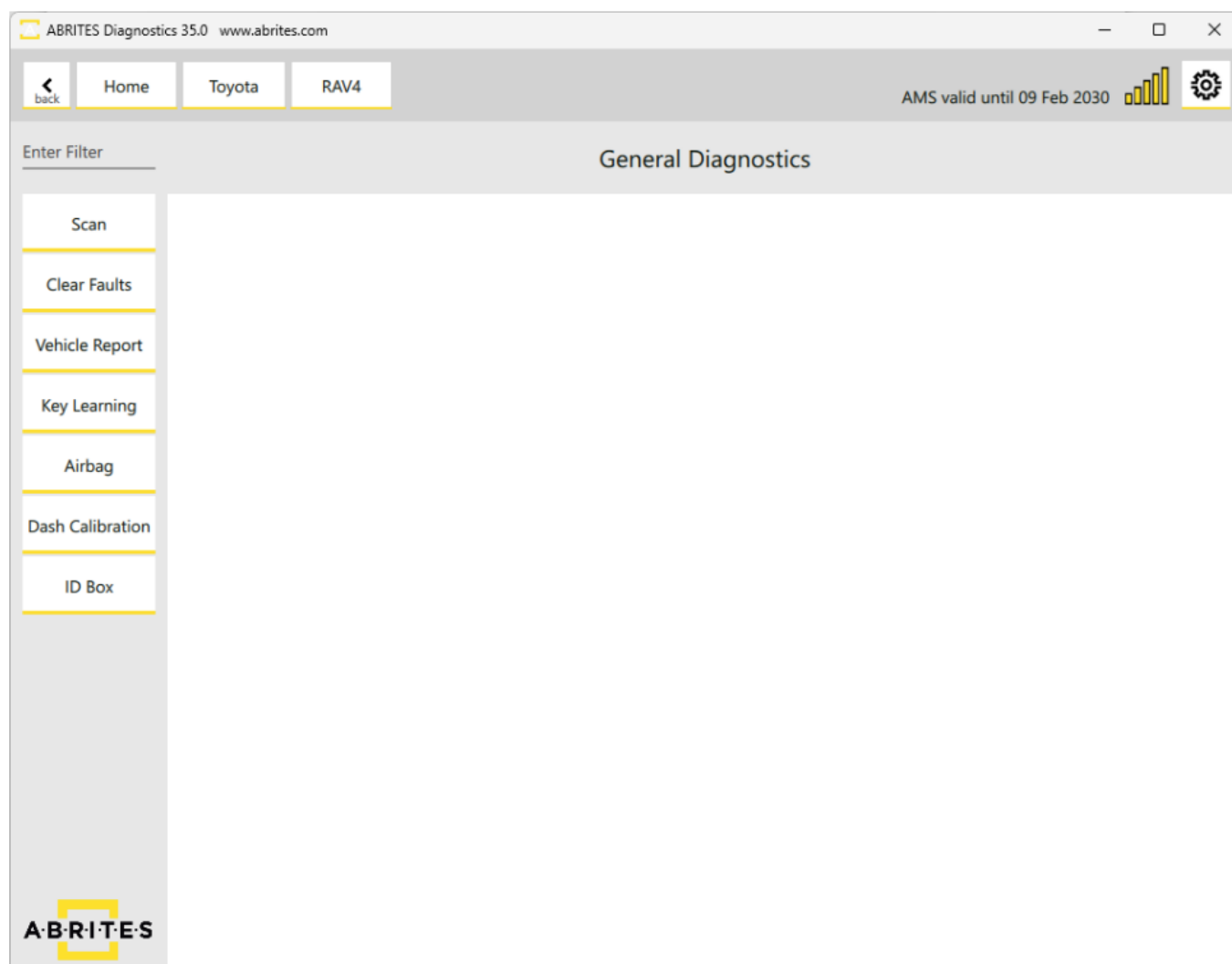
Special Functions

The ABRITES Diagnostics for Toyota/ Lexus/ Scion Online is a powerful tool for vehicles of these brands. In the current version the software offers the following special functions:

- Key Learning
- Airbag 2020+ clear crash
- Read/write DFLASH
- Dashboard (Mileage) Calibration
- ID Code box reset

Please, note that depending on the version you have purchased some of these functions may not be available in your configuration. In this case a message will inform you that you need to acquire an additional software license.

Each special function is described in a dedicated section of this user manual
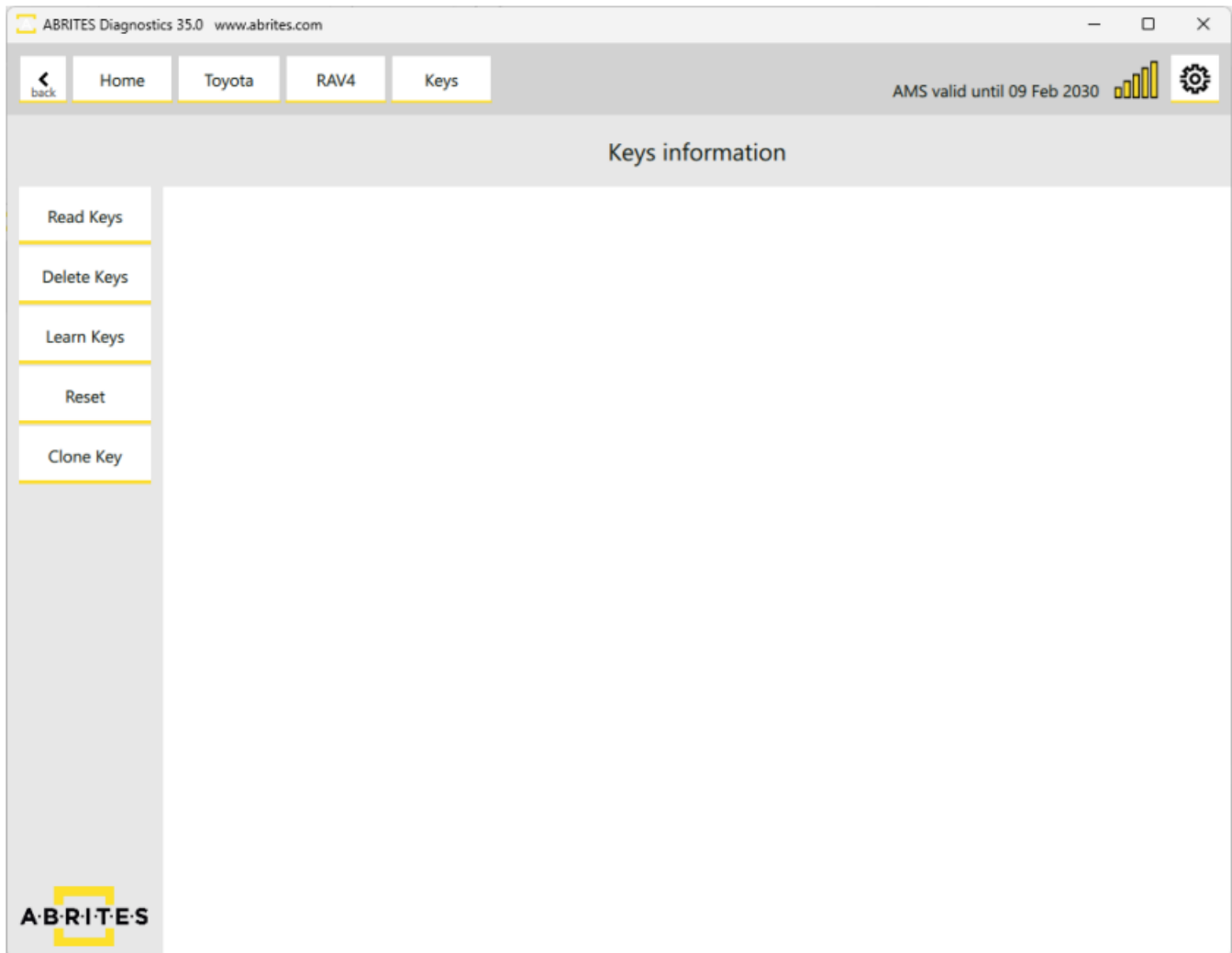

Key Learning

When the "Key learning" special function is selected it is very important to follow the exact directions of the application.

Required Hardware:

Depending on the type of key the vehicle is using you will need a DST AES or a HITAG AES transponder emulator:
TA64 HITAG-AES transponder emulator
TA68 DST-AES transponder emulator

CB012 – Cable set for direct can-bus connection – required for the latest Toyota and Lexus models CB031 – Extension Cable for Direct Connecting to Toyota/Lexus Smart System with B9/BA Key (recommended)
TA71 – Key for TOYOTA – "BA" (recommended)

Once the model is selected, you have the option to learn keys under the "Key Learning" menu:

The Key Learning functionality for Toyota supports both spare key programming and when all working keys are lost. This software covers models listed below, regardless of the market on which they are offered – all versions of the models are supported (US, European, UK, Asia). Smart system reset is NOT needed, nor a connection to Toyota servers. Depending on the transponder type in the vehicle, either a DST-AES or a HITAG-AES emulator will be required.
TA71 – Key for TOYOTA – "BA" type is a key developed by Abrites for vehicles using HT-AES BA-Type key. It can be learned to Toyota vehicles 2021+ with Tokai Riki smart system, with the use of TN014 license.

Supported models:

Toyota:

- Corolla 2018+ AA HT-AES
- Camry 2018+ A9 DST-AES

- Highlander 2018+ AA DST-AES
- Mirai 2020+ AA DST-AES
- CH-R 2018+ A9 DST-AES
- Prius 2018+ A9 DST-AES
- Avalon 2018+ AA DST-AES
- RAV4 2018+ AA DST-AES
- Yaris 2020+ (XP210) BA HT-AES
- Yaris Cross 2021+ (XP210) BA HT-AES
- Corolla Facelift 2022+ (E210) BA HT-AES
- Corolla Cross Facelift 2022+ (XG10) BA HT-AES
- Sienna 2020+ (XL40) BA DST-AES
- Harrier/Venza 2020+ (XU80) BA DST-AES
- Tundra 2021+ (XK70) BA DST-AES
- Land Cruiser 2021+ (J300) BA DST-AES
- RAV4 Facelift 2022+ (XA50) BA DST-AES
- Aygo X 2022+
- Yaris GR 2021+
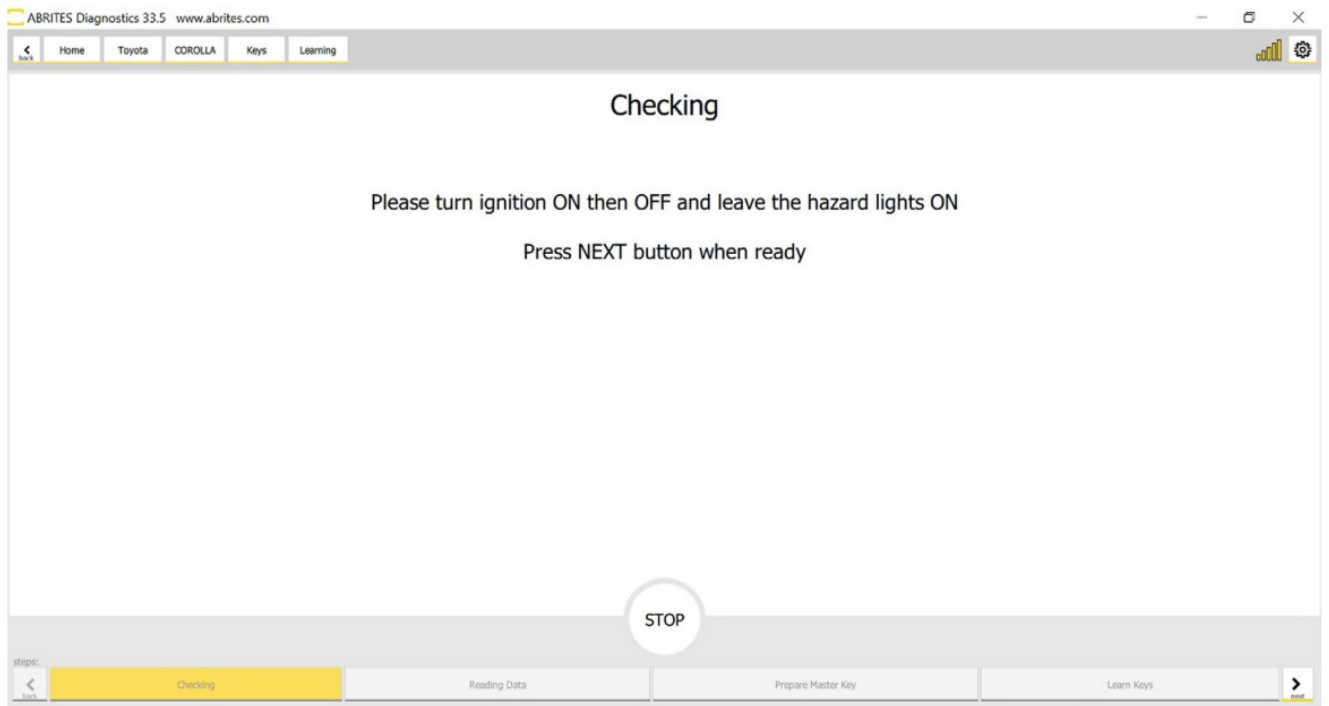- Prius WX60 2022+
- BZ4X 2022+

Lexus

- Lexus RX DST-AES
- Lexus RXL DST-AES
- Lexus ES DST-AES
- Lexus LS DST-AES
- Lexus UX DST-AES
- Lexus RX 2022+ B9 DST-AES
- Lexus NX 2021+ B9 DST-AES
- Lexus LX 2021+

Starting the Key Learning procedure is executed via OBDII, and consists of the following easy steps. These steps are the same when using any of the available Toyota Licenses. The only difference is the key transponder type used:
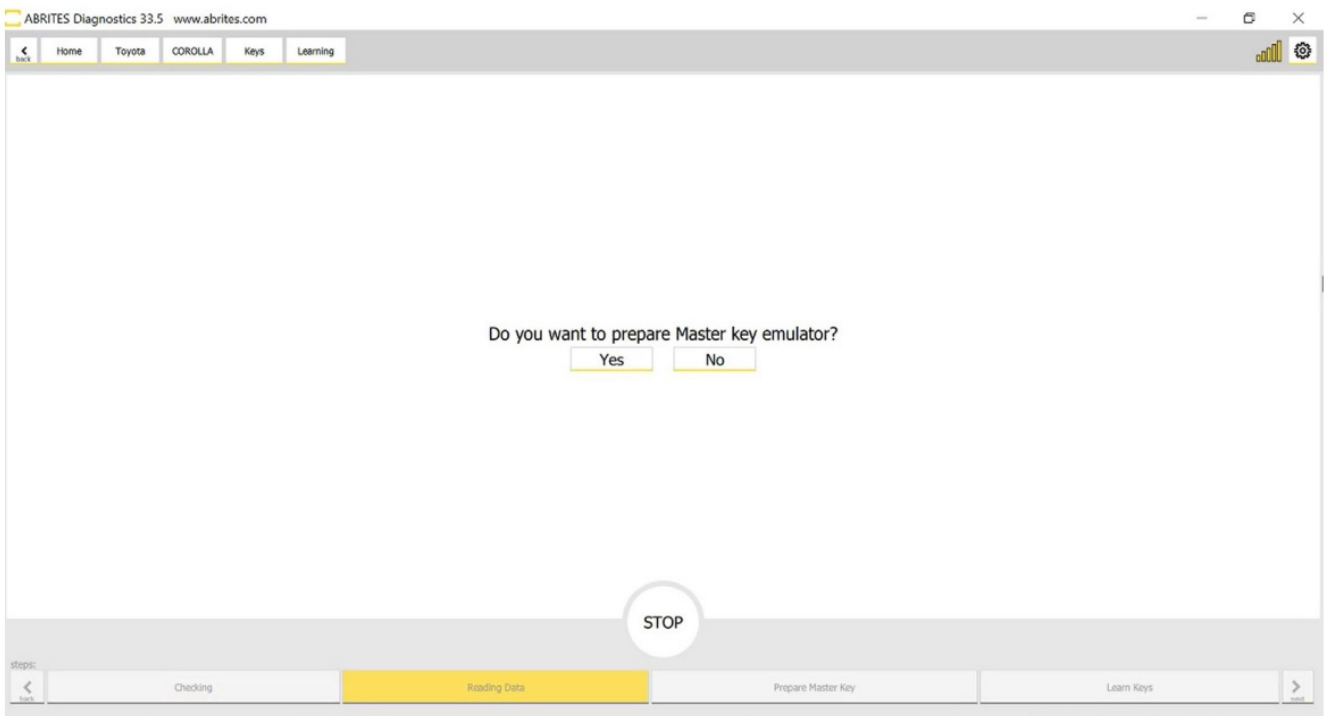
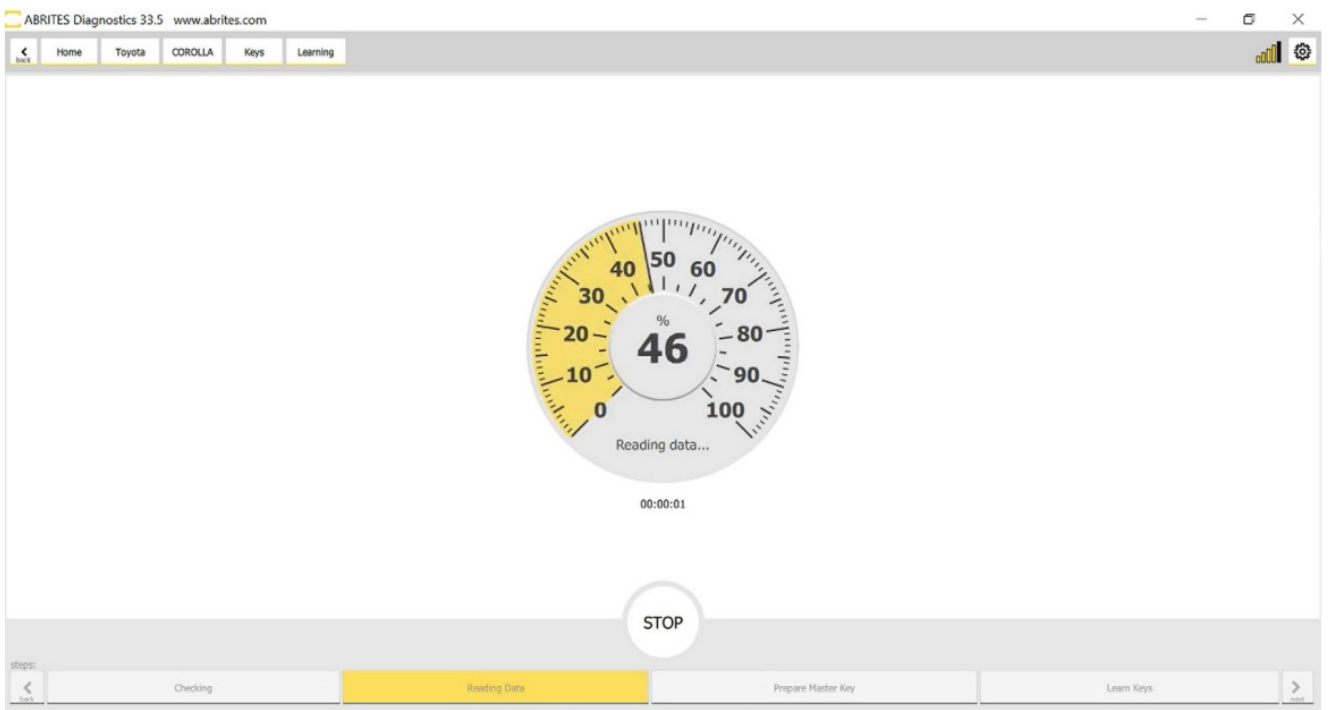1. Press and hold the START button to begin the procedure
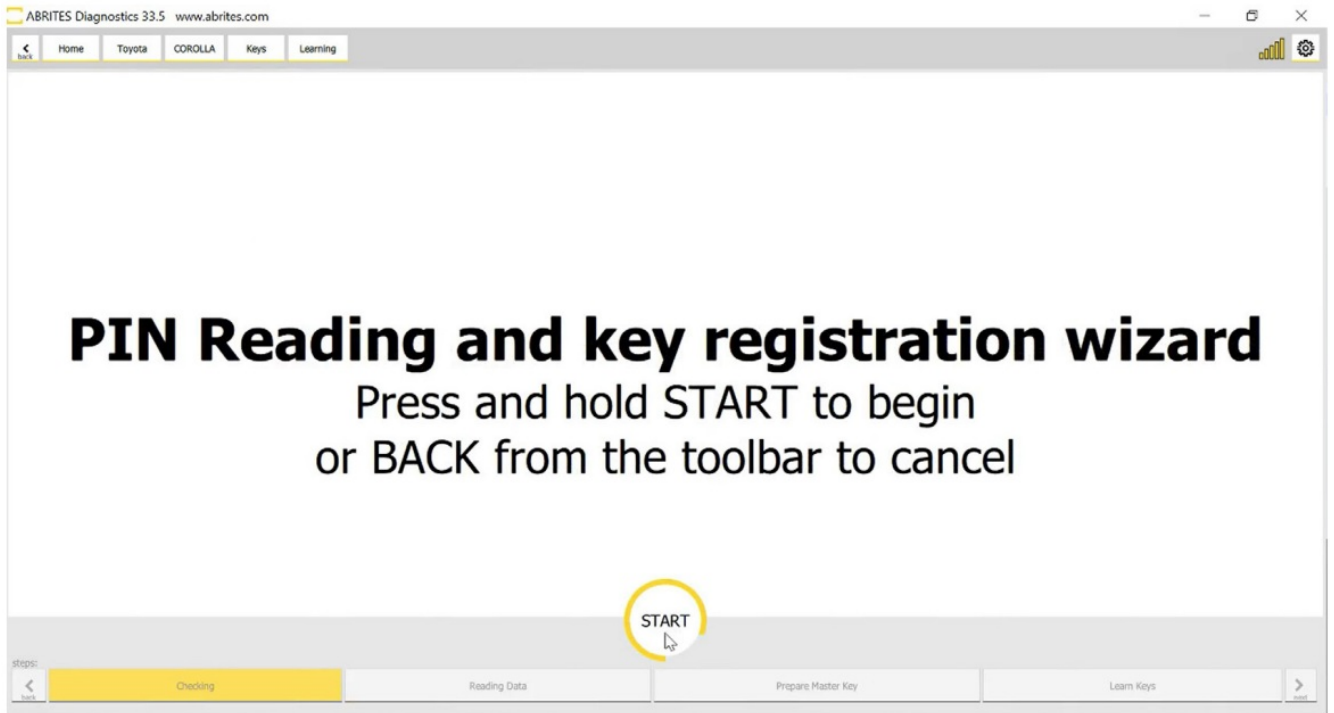
2. Switch IGN ON and then OFF while leaving hazard lights ON

3. Confirm whether you want to prepare a Master Key emulator

Home | Toyota | COROLLA | Keys | Learning

Do you want to prepare Master key emulator?

Yes | No

STOP

steps:

Checking | Reading Data | Prepare Master Key | Learn Keys

4. Reading and modifying the required data

Home | Toyota | COROLLA | Keys | Learning

%
46

Reading data...

00:00:01

STOP

steps:

Checking | Reading Data | Prepare Master Key | Learn Keys

5. Insert the HT-AES (TA64) key emulator in the ProTag programmer
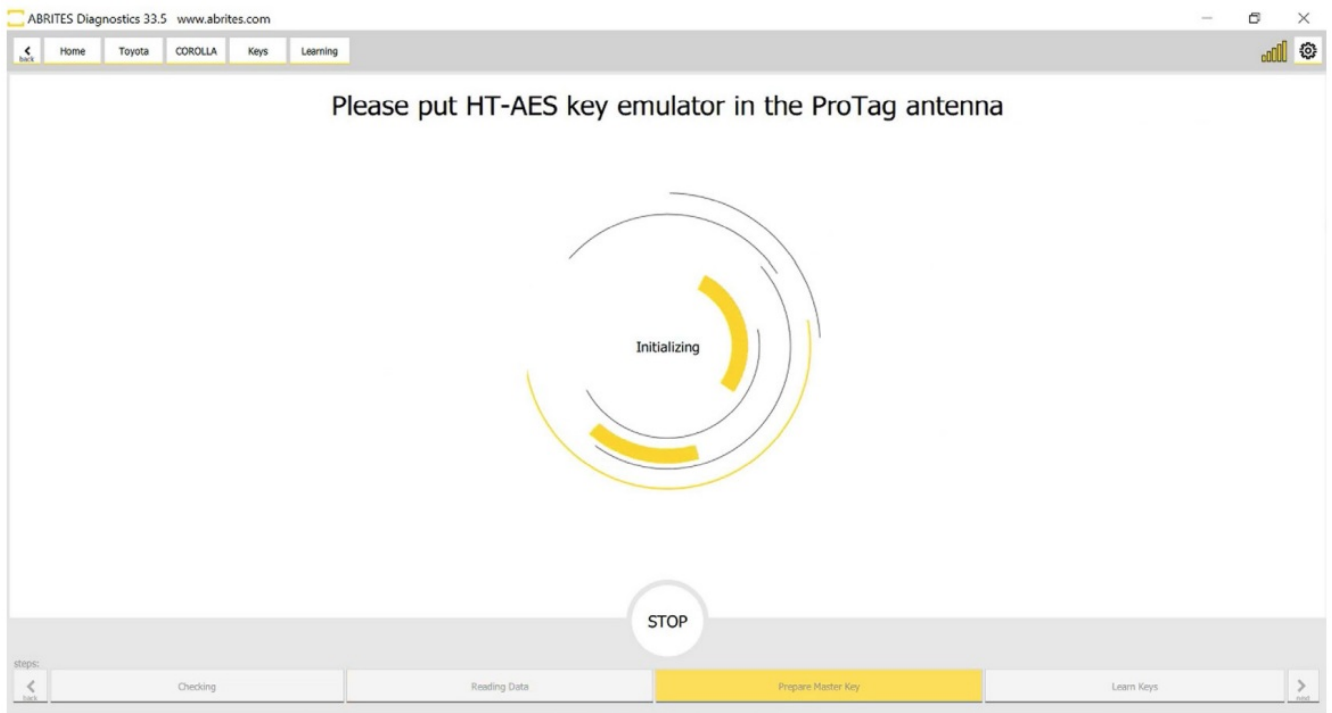
6. TA64 has been detected and is being prepared as Master Key
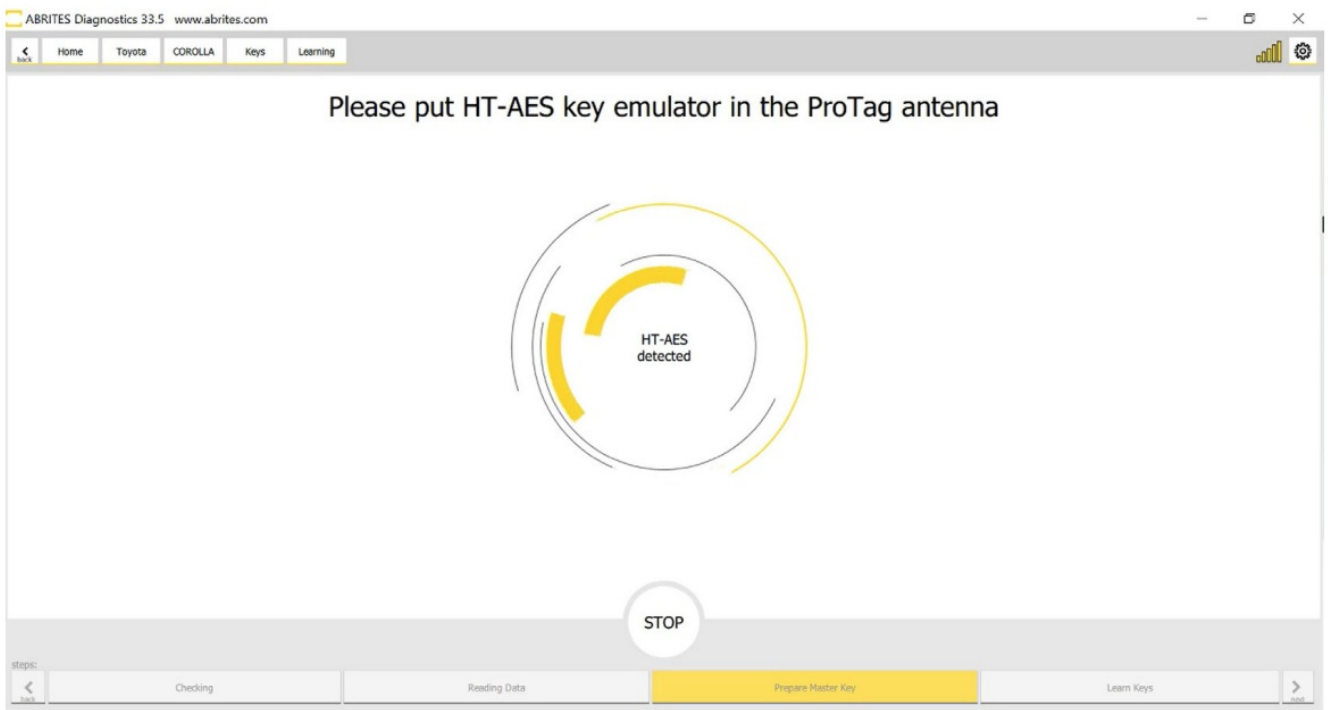
7. Use the prepared TA64 to switch IGN ON
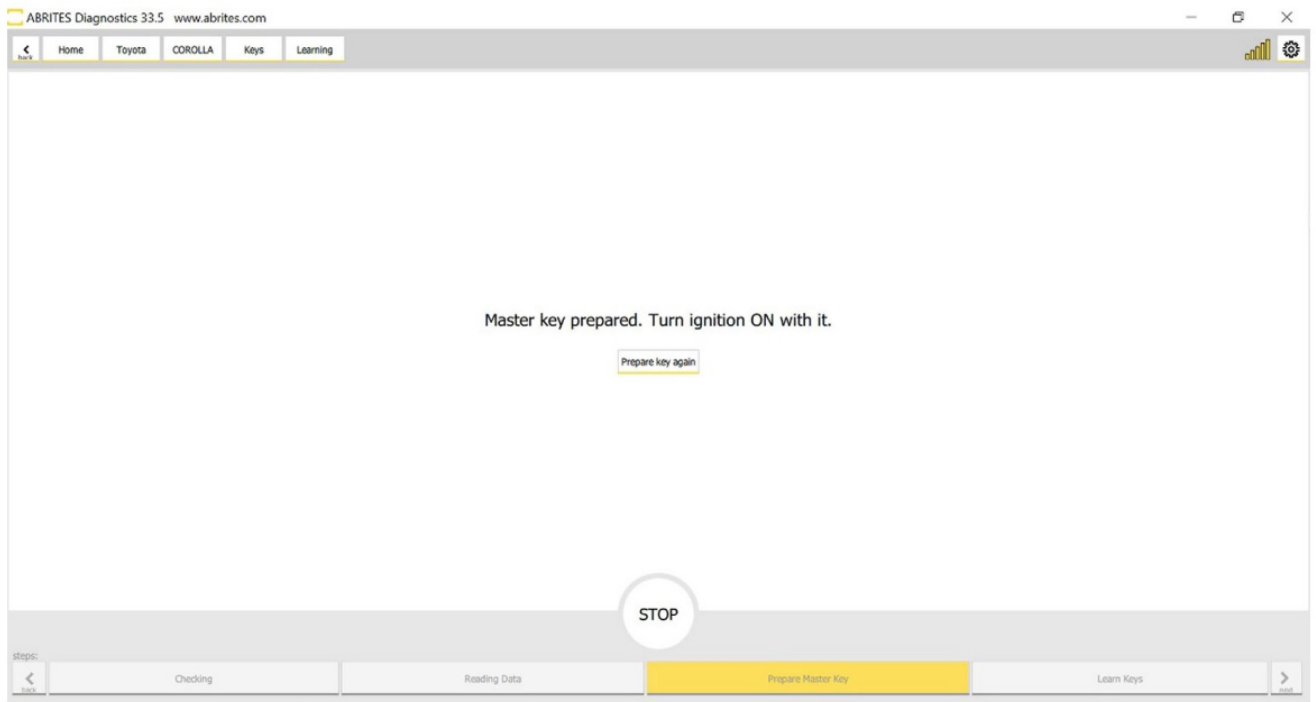
8. Leave IGN to the ON position and open the driver's door

9. Touch the START button with the TA64

Touch the start button with the MASTER key

STOP

steps:
| Checking | Reading Data | Prepare Master Key | Learn Keys |
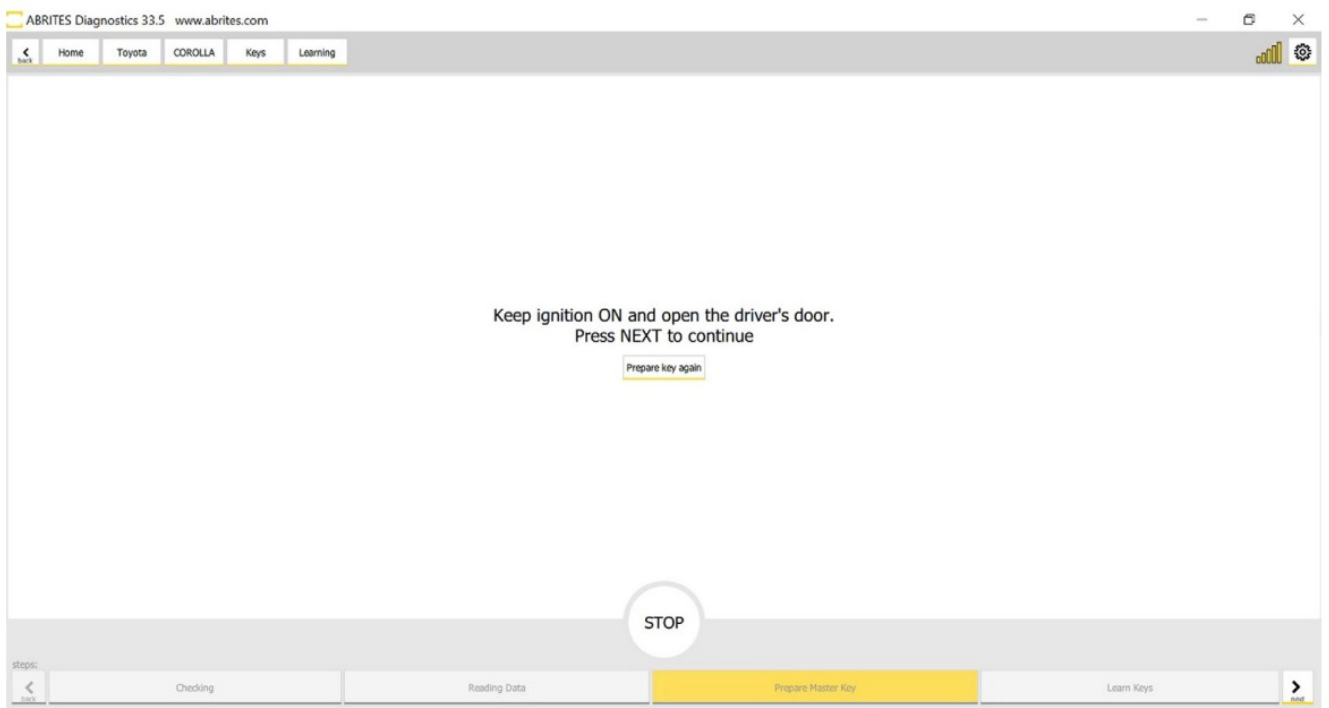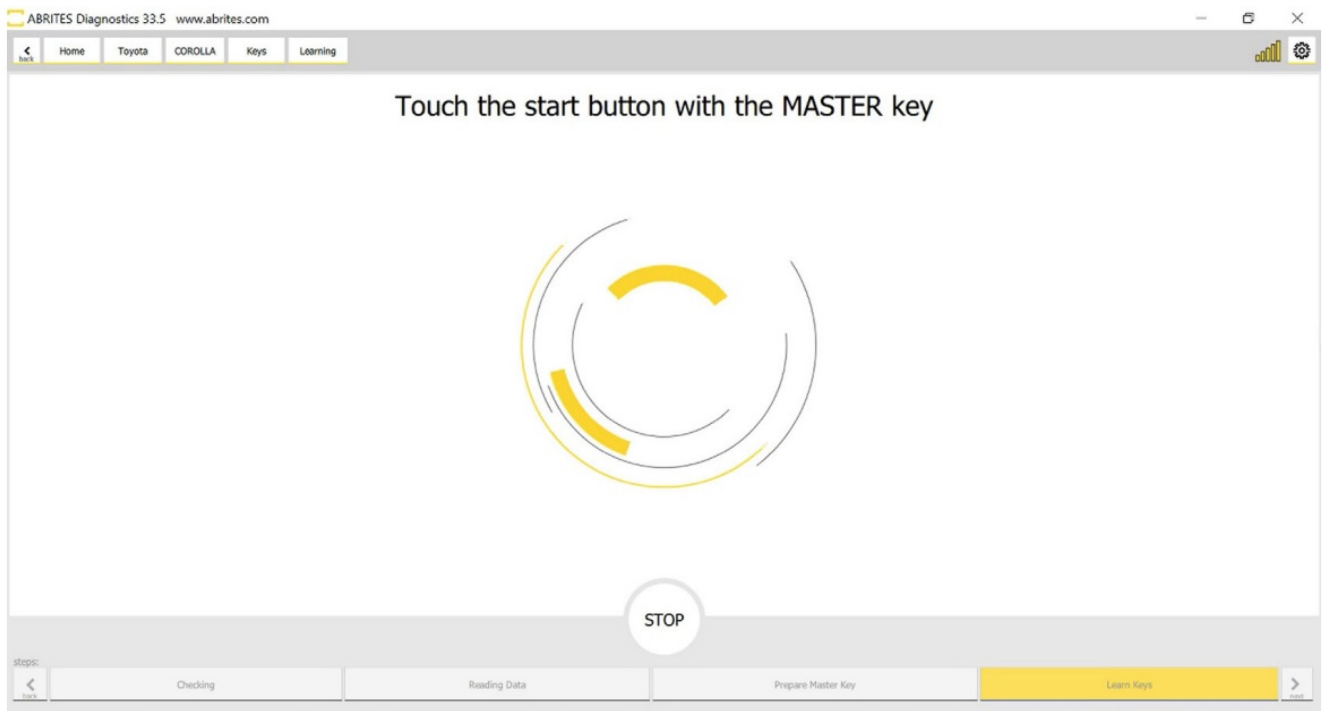
10. TA64 detected as Master Key

MASTER key detected

STOP

steps:
| Checking | Reading Data | Prepare Master Key | Learn Keys |
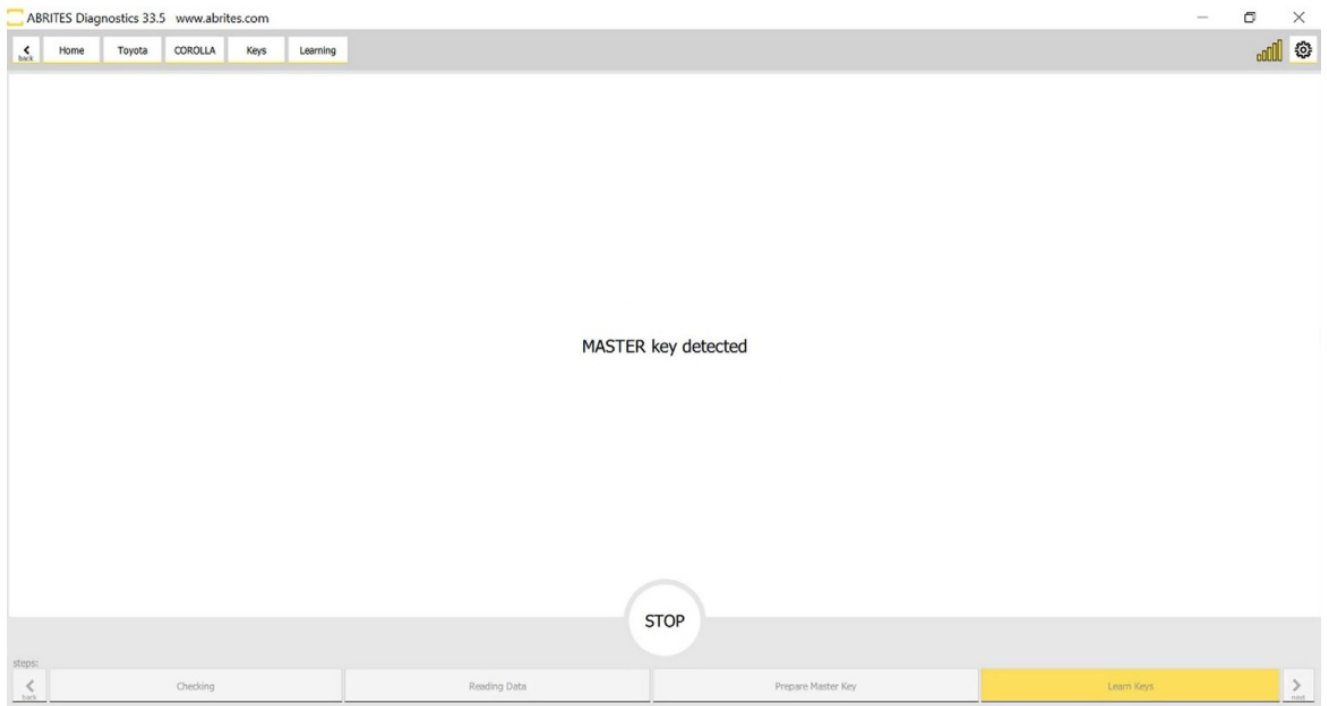
11. Use the new key to touch the START button and learn it

Touch the start button with the NEW key

STOP

| Checking | Reading Data | Prepare Master Key | Learn Keys |
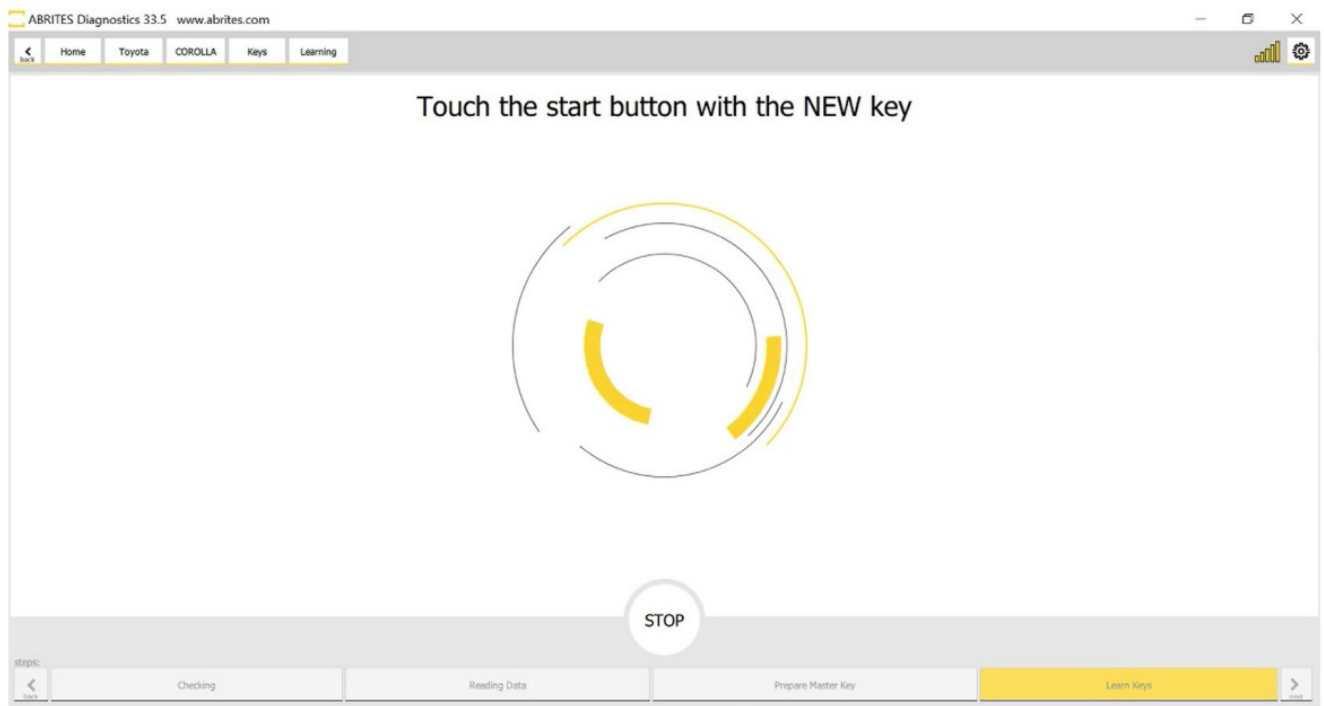
12. The new key is detected

NEW key detected

STOP

| Checking | Reading Data | Prepare Master Key | Learn Keys |
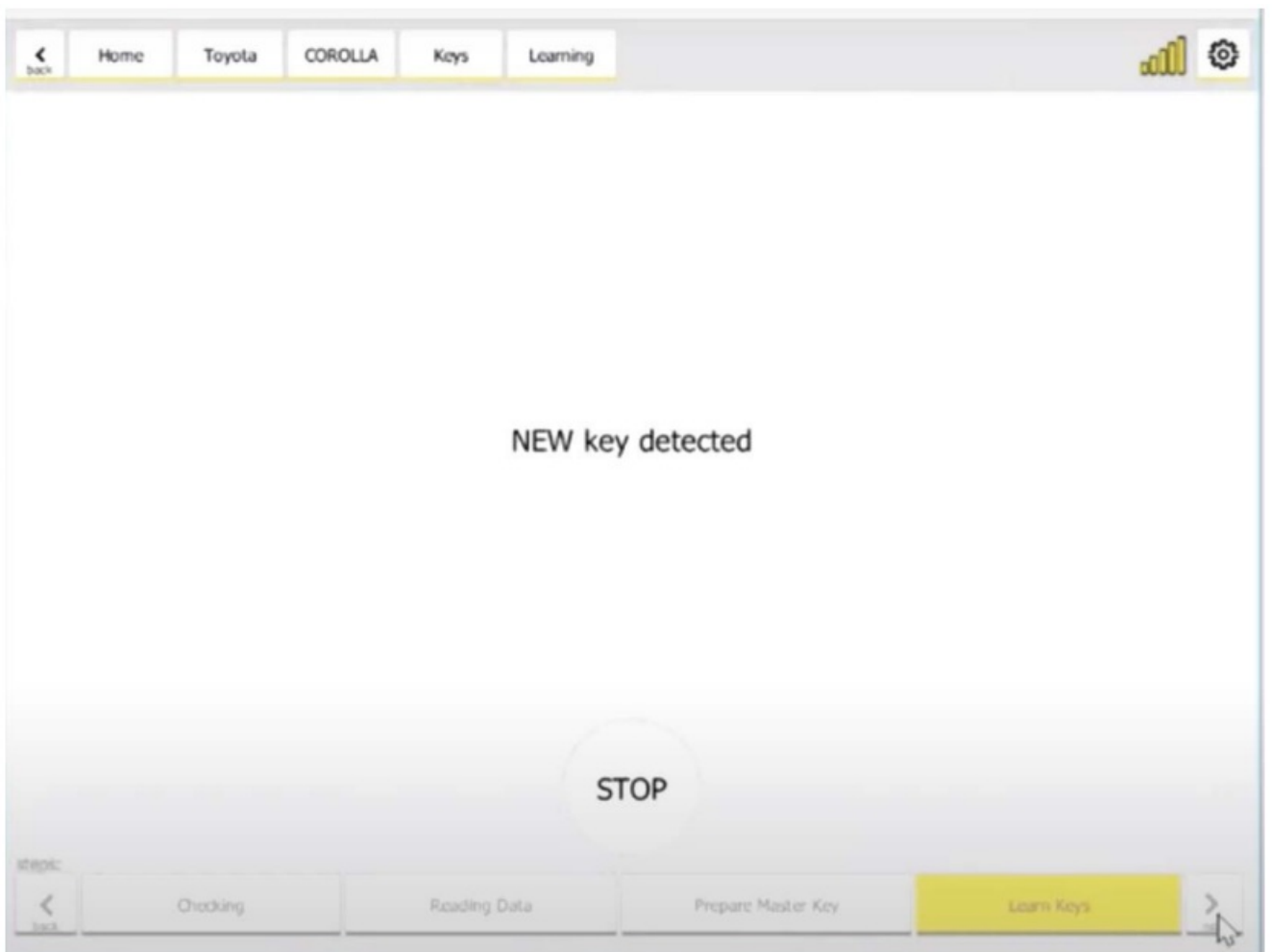
13. The key is now learned and the procedure has successfully finished

The NEW key learned successfully

Learn another   Finish

STOP

steps:

‹ back | Checking | Reading Data | Prepare Master Key | Learn Keys | ›
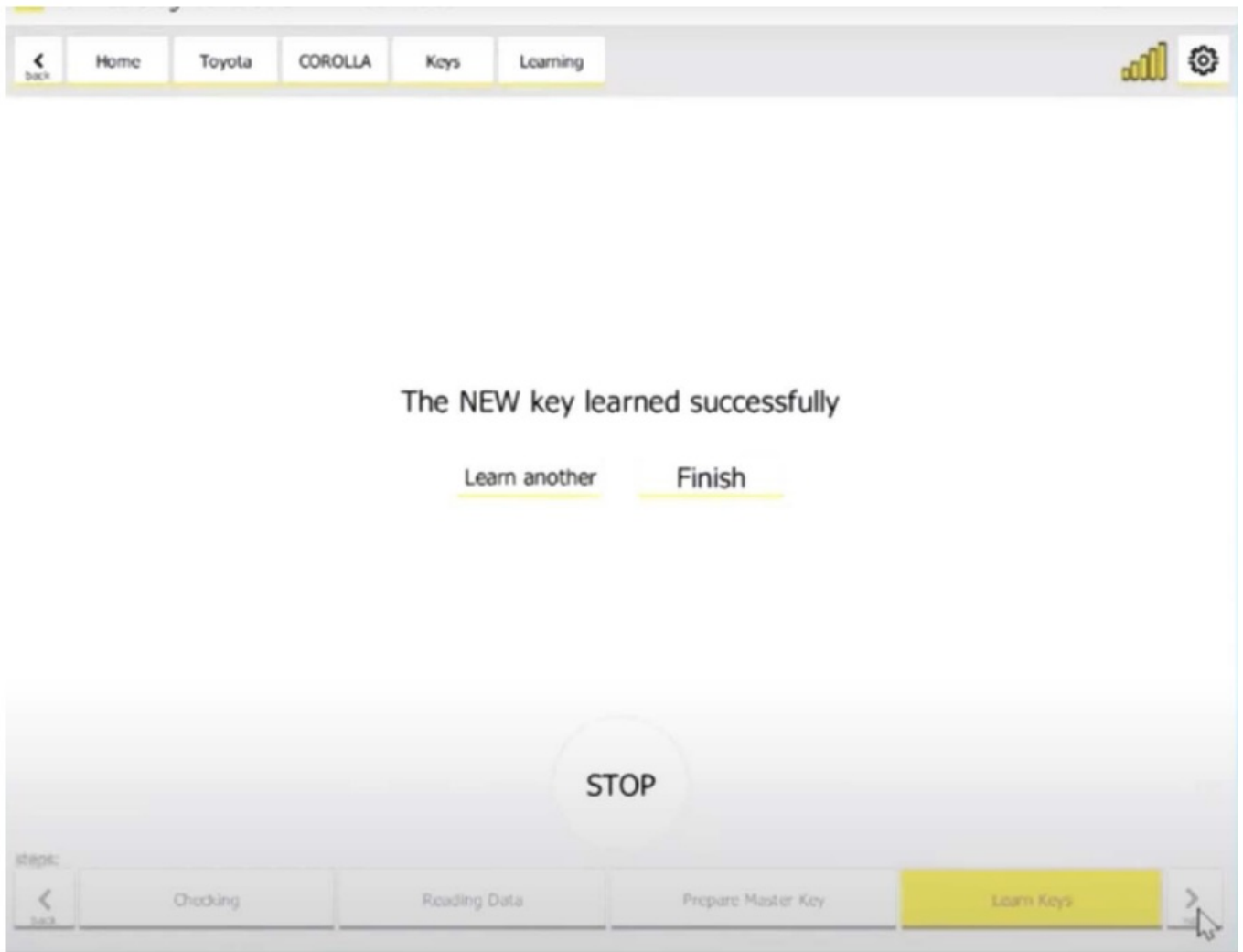
Additional Connections

The software used to require Internal CAN Connection with the use of CB012, which is not required anymore for the majority of the models. In some rare cases the software might ask for internal CAN Connection using CB012. Models covered by TN014, TN015, and TN016 require the CB012 connection:

- Yaris 2020+ (XP210) BA HT-AES
- Yaris Cross 2021+ (XP210) BA HT-AES
- Corolla Facelift 2022+ (E210) BA HT-AES
- Corolla Cross Facelift 2022+ (XG10) BA HT-AES
- Sienna 2020+ (XL40) BA DST-AES
- Harrier/Venza 2020+ (XU80) BA DST-AES
- Tundra 2021+ (XK70) BA DST-AES
- Land Cruiser 2021+ (J300) BA DST-AES
- RAV4 Facelift 2022+ (XA50) BA DST-AES
- Aygo X 2022+
- Yaris GR 2021+
- Prius WX60 2022+
- BZ4X 2022+
- Lexus RX 2022+ B9 DST-AES key
- Lexus NX 2021+ B9 DST-AES key
- Lexus LX 2021+

All of the Toyota/Lexus models that are covered by the TN011, TN012 and TN013 licenses share the same Smart System pin out when connecting to the internal CAN BUS where pin 1 is the CAN H and PIN 2 is CAN L.

This is what the connector looks like and what pins to connect to when working with CB012:
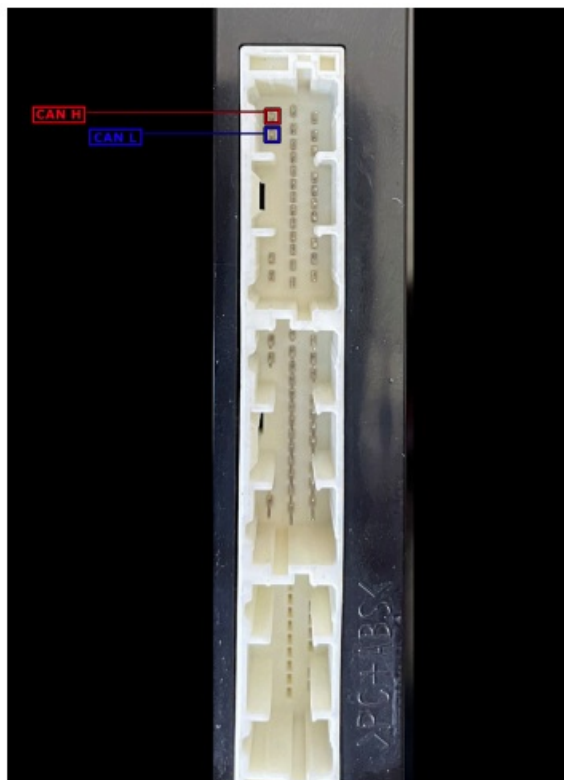
CB031 – Extension Cable for Direct Connecting to Toyota/Lexus Smart System with B9/BA Key – will let you make the connection to vehicles Toyota/Lexus equipped with Smart System with B9/BA Key. The connection to the smart system of the vehicle much easier, without the need to search for the CAN wires and puncture them. It helps in All Keys lost situation, when you need to read the Smart System Module.

In order to use CB031:

- Disconnect the smart system connector
- Connect CB031 to the smart system and to the wire (connector) from the vehicle – it works as a bypass
- Connect dedicated slots to the CB012 CAN connectors (Red and Blue)
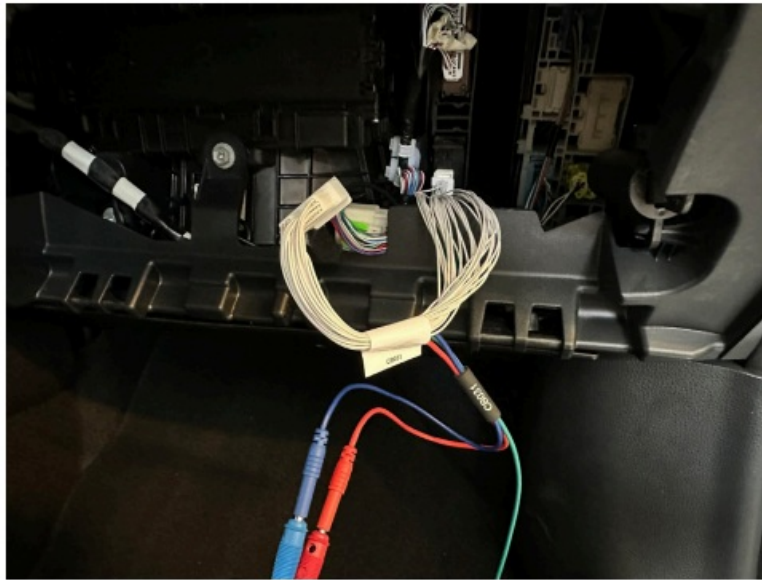
Deleting keys

Toyota Online software gives you the option to delete lost keys from the memory of the vehicle. In order to complete the task, you have to open the "Key Learning" special function and select "Delete Keys" menu. You then need to follow the on-screen instructions.

Important: Make sure you have a working key for the vehicle so that the procedure can be completed with success – the car will remain with the working key learned to the vehicle, and the rest of the keys deleted.
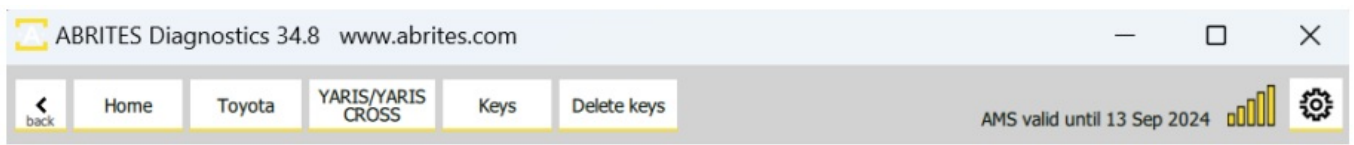
You are about to delete all keys except last used master key

Continue

Airbag

The latest update of the Toyota Online software introduces the option to read/write Dflash and clear Crash Data of Airbag modules 2020+. This option is access from the main screen, on the left hand side you will see a button "Airbag", which will open the menu and the functionality. The software is intuitive, from the buttons you are able to read the Dflash, clear the crash data, and then write the file back to the unit.

ABRITES Diagnostics 34.7   www.abrites.com

back   Home   Toyota   COROLLA   Clear Crash

Select operation

Read DFLASH   Write DFLASH   Clear Crash
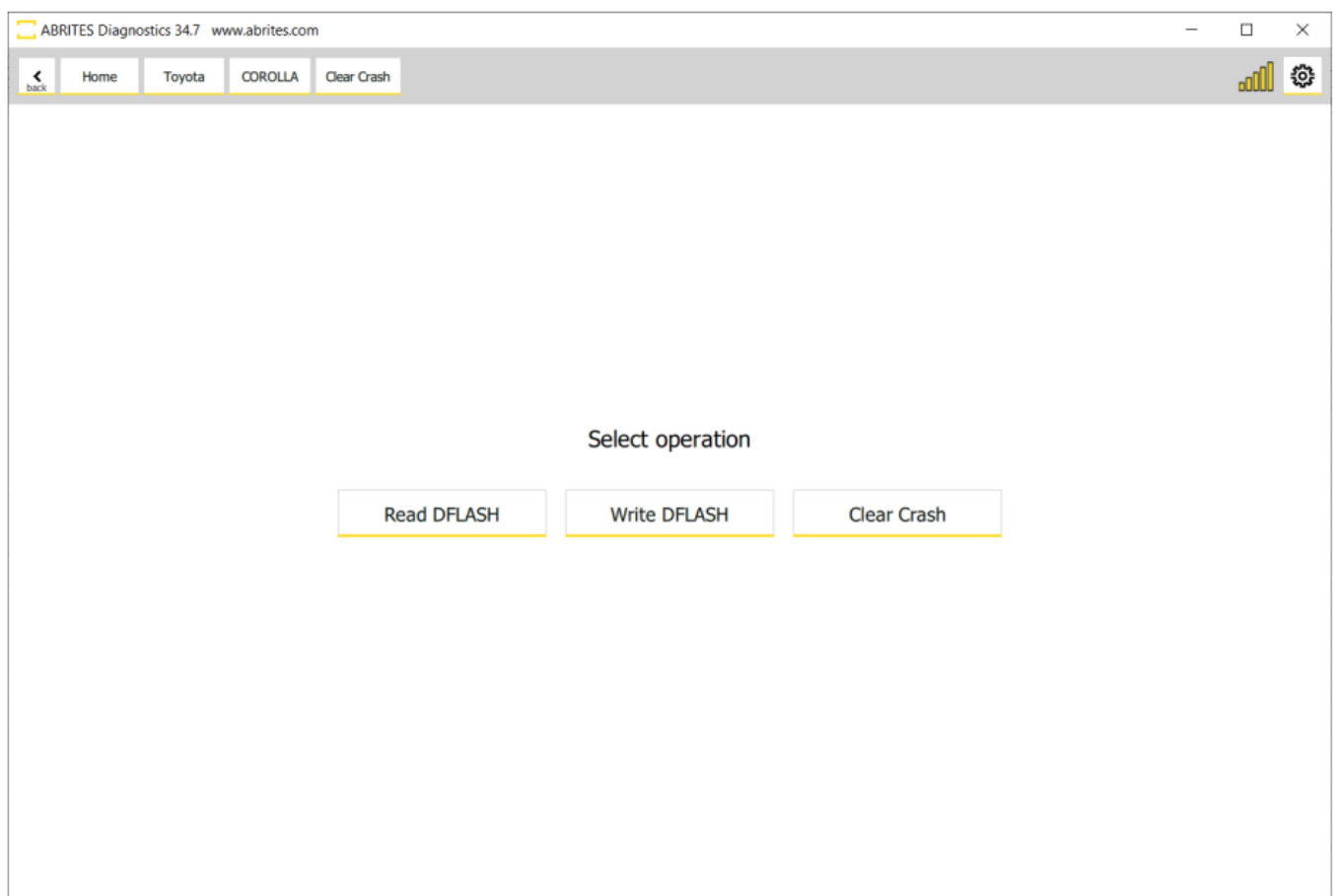
Mileage Calibration

The Toyota/Lexus Online software provides the mileage calibration option for instrument clusters using S6J3 unlocked MCUs. Under the "Dash Calibration" menu there are 4 options:

- "Read" – to read dashboard and display the current odometer value (During this procedure a backup file is created)
- "Write" – to write the new value of the odometer. Write procedure will also create a backup file.
- "Restore" – to restore the original file to the unit, by selecting a file from a drop-down menu
- "Wiring diagrams" – it will show the available dashboards and corresponding wiring connection diagram.

Required Hardware:
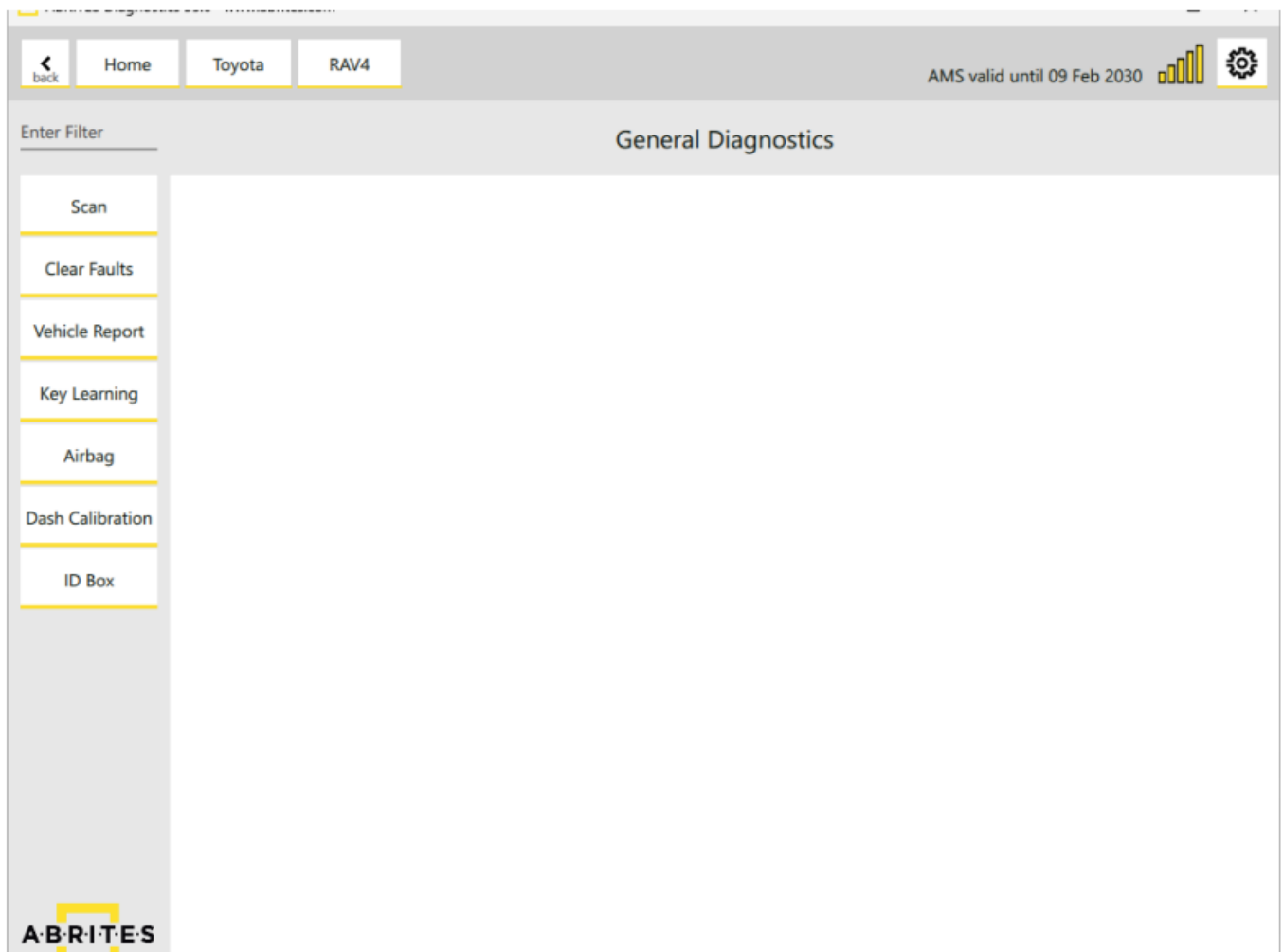
- AVDI
- ZN030 (ABPROG)
- ZN078 (V850ES Adapter for ABPROG

Connection:
The wiring diagram is provided within the Toyota/Lexus Online Software > Dash Calibration > Wiring Diagrams
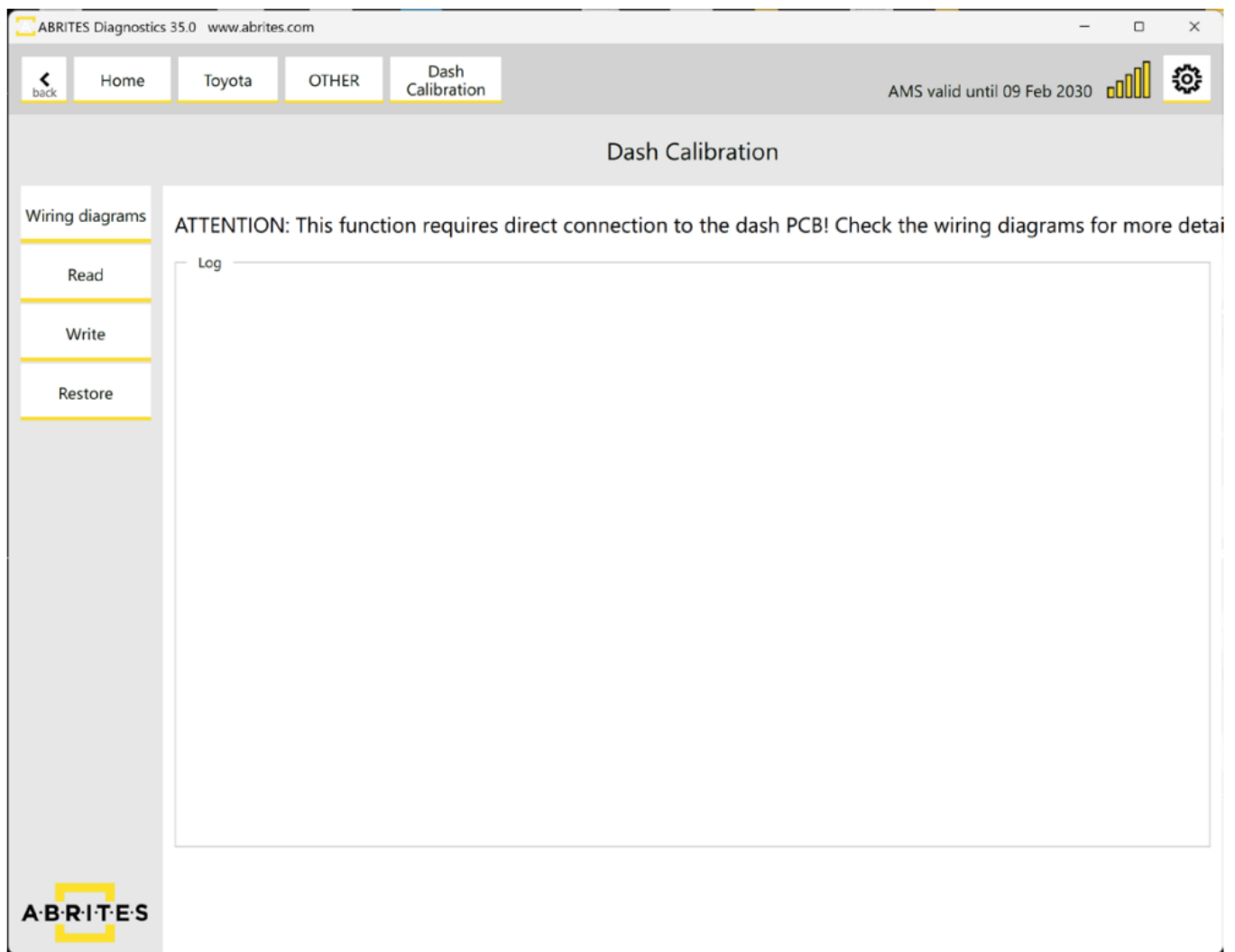
Procedure steps and sequence:

- Solder the wires of the ZN078 adapter on the points provided in the wiring diagram menu.
- Connect to the ZN078 Adapter the ABPROG and then connect the ABPROG to the AVDI interface
- Connect the AVDI interface to the PC's USB Port
- Start the Toyota/Lexus Online software, and select the vehicle Select "Dash Calibration" special function

Enter Filter

General Diagnostics

- Scan
- Clear Faults
- Vehicle Report
- Key Learning
- Airbag
- Dash Calibration
- ID Box

A·B·R·I·T·E·S

Next, you can proceed to reading the unit, which will display the current mileage value. You can then set the new value and press "write," which will set the new value into the unit.

You can always restore the unit, backup is automatically created, and you can select the file you need from a drop down menu.

Dash Calibration

Wiring diagrams

Read

Write

Restore

ATTENTION: This function requires direct connection to the dash PCB! Check the wiring diagrams for more detai

Log

A·B·R·I·T·E·S

ID Code Box Reset

ID Code box reset is necessary if the smart system, the ECU, or the ESL is replaced. The replacement module should be paired with the ID Code Box. For this synchronization, a "virgin" or new ID Code Box is needed.
ID-Code Box 2021+ reset and adaptation functionality helps in immobilizer module replacement situations in all Toyota and Lexus models, produced until 2024.
Legacy functionality of TN009 is also included, and it works for resetting ID Code Box units of vehicle up to 2020, with or without an ELS.

A working key for the vehicle is needed!
In case of a Smart System replacement, you will most probably have no working key for the replacement smart system. At this point you will have to first execute a key learning procedure, and continue with the ID Code box reset once a working key is present.

NOTE: Without the ID Code Box reset functionality, replacing any immobilizer-related module in Toyota vehicles would require swapping the entire immobilizer system – the Smart System, ID Code Box, Engine Control Unit (ECU), and ESL (if present). This would mean extensive disassembly and significant costs for both labor and replacement parts. However, with the ID Code Box reset functionality, you can simply reset the ID Code Box and synchronize a used module. This allows for seamless integration without the need to replace additional system components, saving time and reducing overall costs.

When a virgin ID-code box is installed in the vehicle, synchronization with the ECU and Smart system is required!

**Supported vehicles:**

All Toyota and Lexus models up to 2024
N.B. In case the ID-Code-Box reset function is not possible for the module you are working with, please contact us at **support@abrites.com**

Connections
In order to perform ID-Code-Box reset procedure, internal LIN-BUS connections is needed. For the purpose use the CB012 (mandatory) and CB031 (recommended) cables for this purpose.

1. CB012 needs to be connected between the AVDI and the CB106, the red connector of the CB012 is connected to the green connector of the CB031.

2. Disconnect the Smart System (SMT)

3. CB031 is connected to the wiring installation connector that goes normally into the smart system.. (If CB031 is not available, please connect the red cable of CB012 with the use of the needle pinch to the wire that goes to PIN 8 (LIN) of the Smart System Module (SMT),
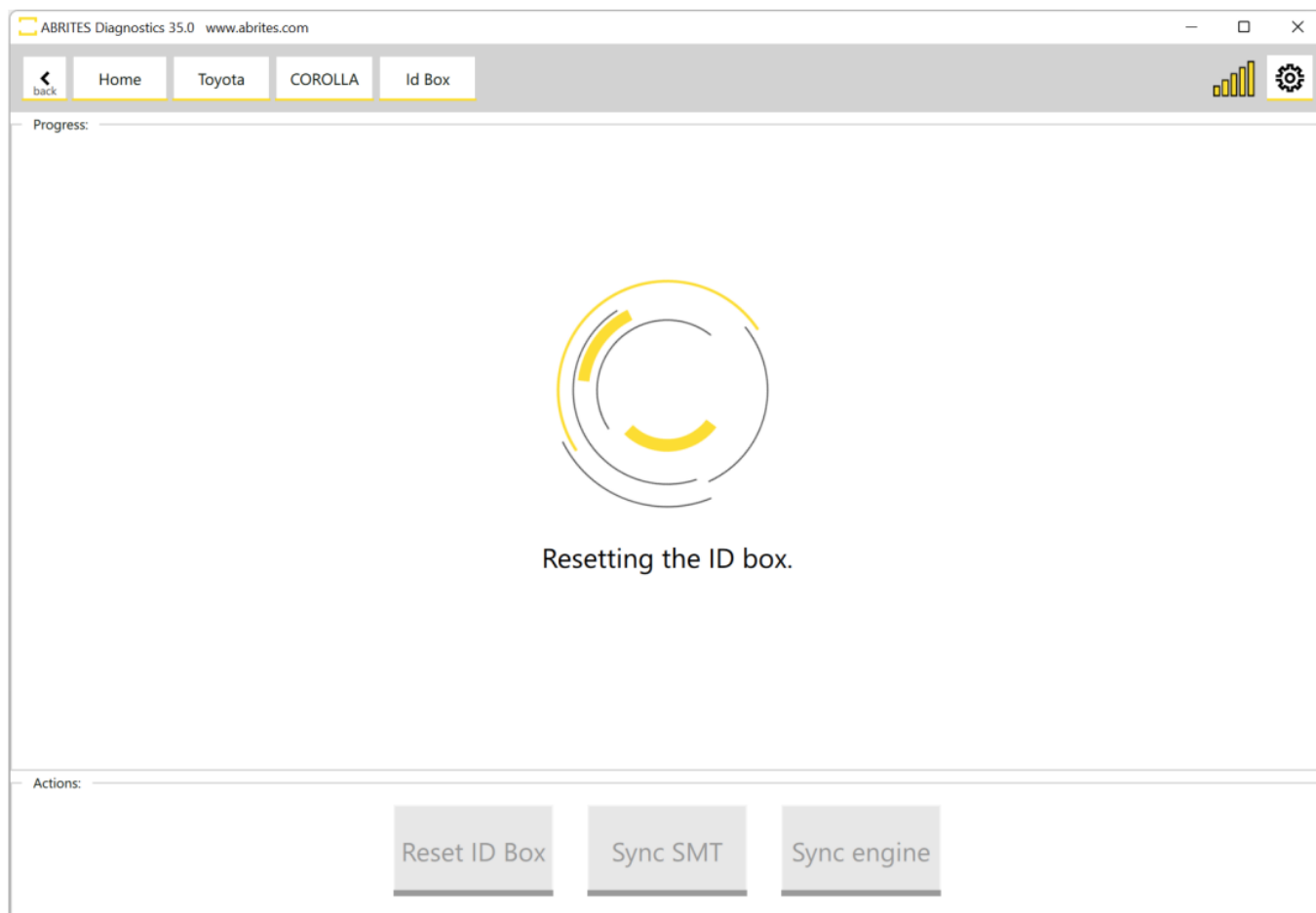
N.B. Make sure the SMT is disconnected and do not connect the other side of the CB031 to the SMT
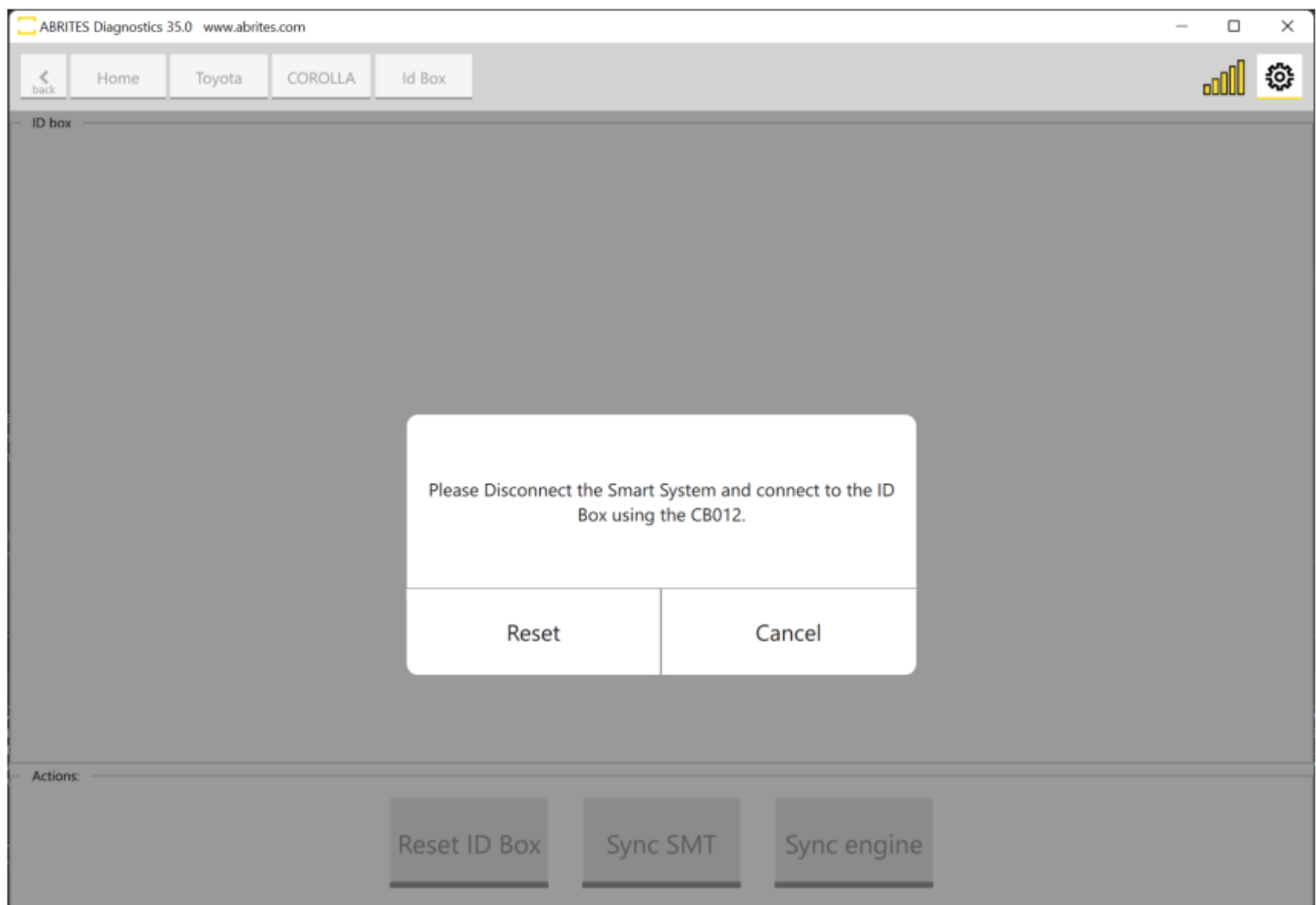
ID Code Box Reset Procedure
Once the connections are done, the procedure is very simple and fast.

1. Open the Toyota Online software

2. Select "ID Code Box" special function

3. Press "Reset"

Progress:

Resetting the ID box.

Actions:

Reset ID Box   Sync SMT   Sync engine

Smart System Synchronization

ID-Code-Box adaptation (synchronization) procedure in vehicle (new or virgin second-hand module) to the Smart System via OBDII is needed after the ID code box reset procedure.

Required connections:
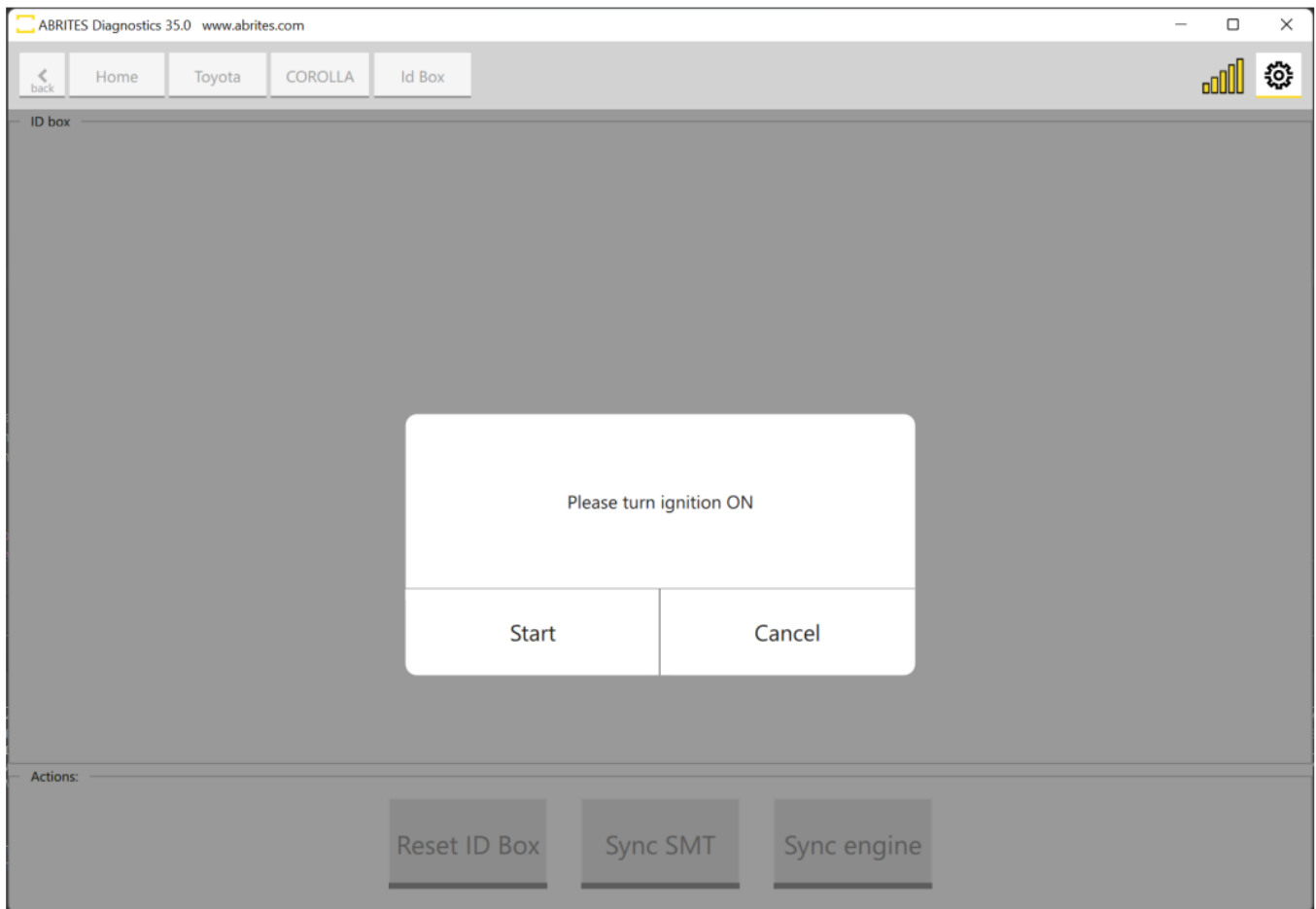Procedure is executed via OBDII
Connect AVDI to CB106 and CB106 to the OBDII port of the vehicle.

Procedure
Once the connections are done, the procedure is very simple and fast.

1. Open the Toyota Online software
2. Select "ID Code Box" special function (at this point you will need IGN ON with a working key)
3. Press "Sync SMT"

Once complete, you will have the Smart System and ID Code Box synchronized. ECU still needs to be synchronized at this point.

ID box

Please turn ignition ON

Start   Cancel

Actions:

Reset ID Box   Sync SMT   Sync engine

ECU Synchronization

ID-Code-Box adaptation (synchronization) with the Engine Control Unit via OBDII is needed after if you are exchanging the ID Code Box or the Engine Control Unit (ECU/HV)

If the synchronization of the ECU is lost you will get the following DTC: "B279986" which will also point you to the necessity of executing the ECU Sync procedure.

Requirements:
External power supply is strongly recommended, as the procedure takes about 40 min.
Procedure is executed via OBDII
Connect AVDI to CB106 and CB106 to the OBDII port of the vehicle.

Procedure
Once the connections are done, the procedure is very simple and it takes about 40 min.

1. Open the Toyota Online software

2. Select "ID Code Box" special function

3. Press "Sync Engine"

4. N.B. "do not touch anything in the vehicle during the procedure"

At this point you should have the vehicle fully functional.
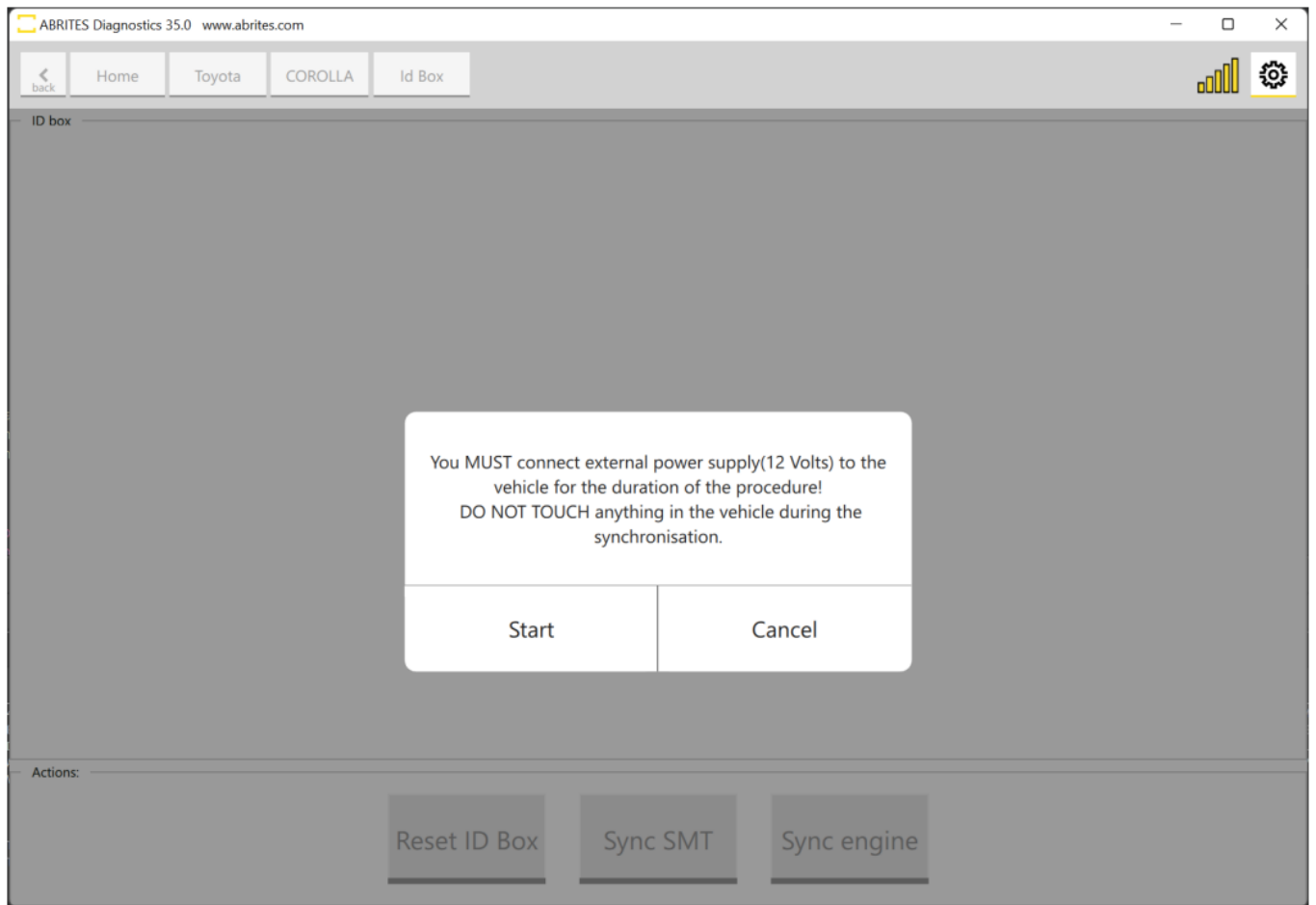
Documents / Resources

ABRITES TA71 Vehicle Diagnostics Software and Hardware [pdf] User Manual
TA71 Vehicle Diagnostics Software and Hardware, TA71, Vehicle Diagnostics Software and Hardware, Diagnostics Software and Hardware, Software and Hardware, Hardware

References

- **User Manual**