Husqvarna

Engine Diagnostic Tool - AutoTune™/ Carb Control

Service Tool - Handheld

Contents

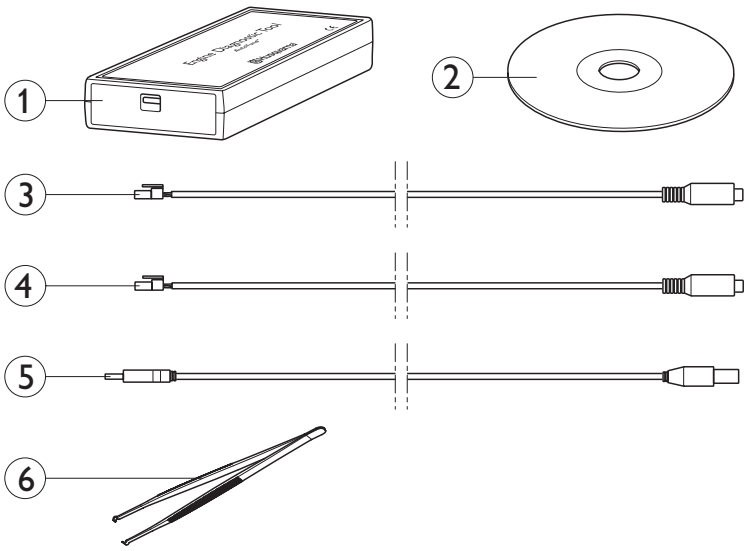
About Engine Diagnostic Tool

The Engine Diagnostic Tool is a service tool for Husqvarna Group's petrol-operated products that are equipped with AutoTune™ / Carb Control (Electronically controlled carburettor). It is intended to be used with a computer (PC) which is not included.

The service tool transmits different data from the product to the computer, such as run times, temperature, number of starts and speed. It is also possible to enter service notes linked to the product ID. These records can then be read, for example at the next service.

There is also a troubleshooting guide in the form of a diagnostic tool and a list of saved error codes. The software in AutoTune / Carb Control can also be updated via the Engine Diagnostic Tool.

The Engine Diagnostic Tool contains the following:



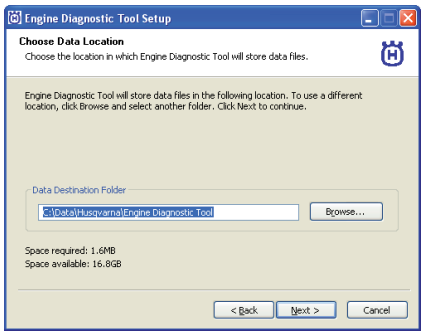
1. A communication adapter
2. A CD with the Engine Diagnostic Tool software and user instructions
3. Adapter cable (Part number 576 18 34-01) white connection
4. Adapter cable (Part number 576 95 22-01) black connection
5. A USB cable
6. Tweezers

Installing the Engine Diagnostic Tool software

The Engine Diagnostic Tool can only be installed on a PC with Windows XP or later. The PC must be equipped with a USB port.

Install the Engine Diagnostic Tool from the CD

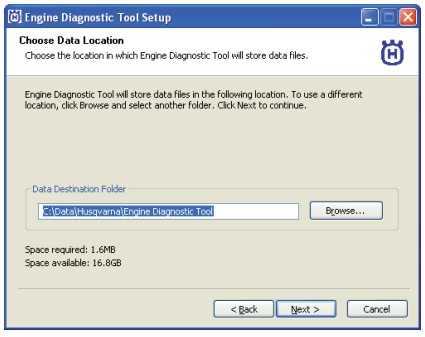
1. Quit all open applications on your computer.
2. Insert the Engine Diagnostic Tool CD in the computer's CD or DVD reader. The disc should run automatically, but if it does not, open and start it manually from My Computer or Windows Explorer.
3. Follow the instructions given on screen. When asked for the license key, enter the number that is shown on the CD cover. It is also possible to install the program without a license key, but then the function of the program will be restricted to only reading information from AutoTune / Carb Control.



NOTE! The place where data and service records are stored will be selected during installation. This is normally on the local hard disk drive, but it is also possible to select a network drive if the information needs to be accessible from other computers.
When the installation is done, the Engine Diagnostic Tool folder is created in the computer's start menu. It also creates a shortcut on the desktop.

Update the Engine Diagnostic Tool from a file

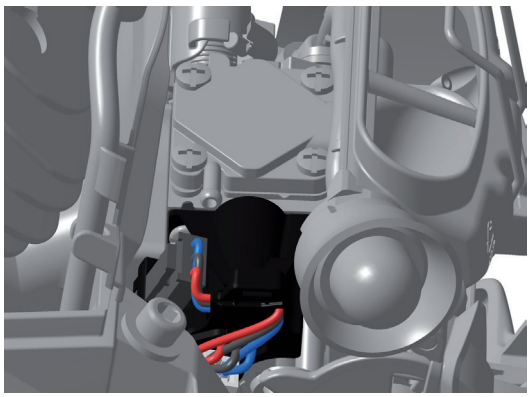
This type of installation is used when updating the program.
1. Download the installer from support.husqvarna.com and save it to the disk in any folder.
2. Quit all open applications on your computer.
3. Start the installation program.
4. Follow the instructions given on screen. When asked for the license key, enter the number that is shown on the CD cover. It is also possible to install the program without a license key, but then the function of the program will be restricted to only reading information from AutoTune / Carb Control.

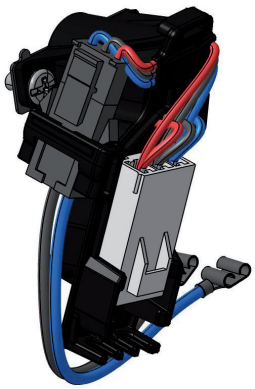


NOTE! The place where data and service records are stored will be selected during installation. This is normally on the local hard disk drive, but it is also possible to select a network drive if the information needs to be accessible from other computers.
When the installation is done, the Engine Diagnostic Tool folder is created in the computer's start menu. It also creates a shortcut on the desktop.

Using the Engine Diagnostic Tool

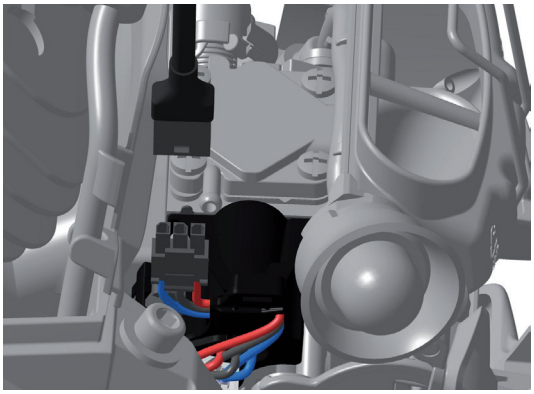
1. Connect the communication adapter to the PC using the USB cable.
2. Connect the communication adapter to the product with one of the two adapter cables. Which adapter cable to use depends on which service connection the product is equipped with. If the product is equipped with the black cable connector, this should be used. Otherwise the white one can be used instead, see images below.

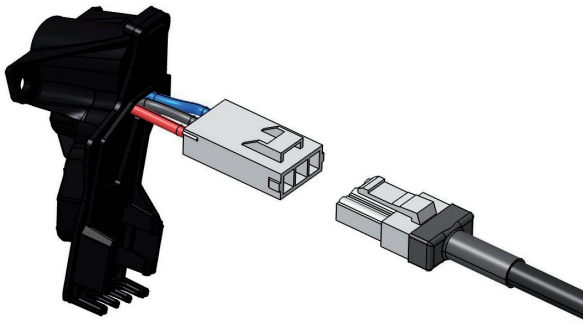


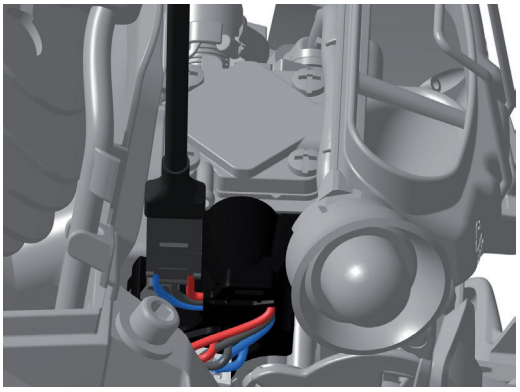


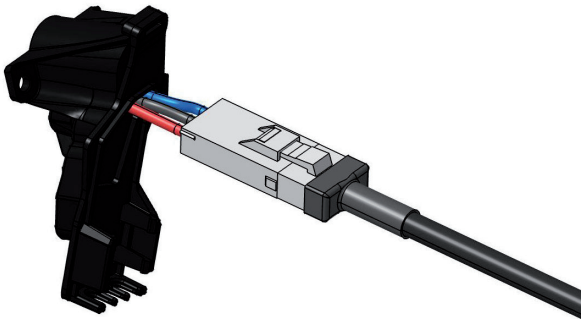
Depending on the model, different parts must be removed first to access the service connection. See the workshop manual of each model for how this is done.

The adapter cable is connected to the service connection as shown below. Black connector (left) or white connector (right). Use the tweezers to loosen the black connector from its bracket.









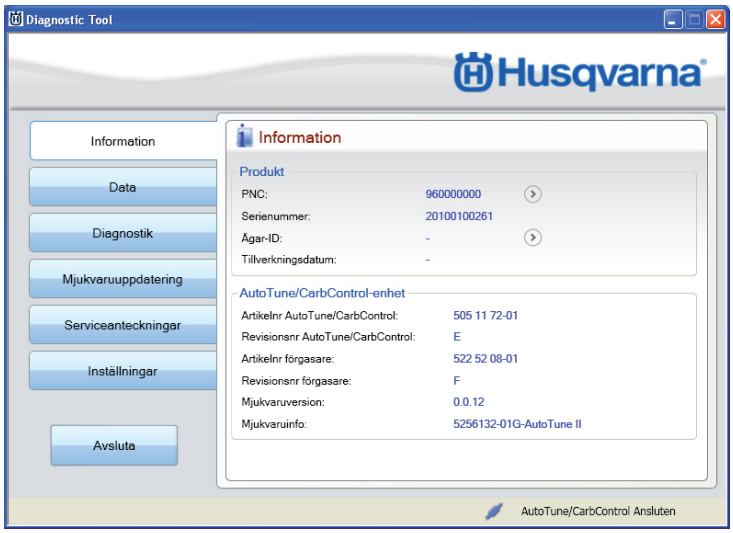
3. Start the Engine Diagnostic Tool program on the computer. (Quit the Engine Diagnostic Tool by clicking on the "Exit" button in the bottom left hand corner of the window or by clicking the X in the upper right corner in the window.)
4. Check that "AutoTune/CarbControl Connected" is shown in the bottom right corner of the screen. If it's not, check the connections.

IMPORTANT! If the black connector is used, it must be remounted in the mating connector after use. Always start the product after service and confirm that the stop function is working.

Functions in the Engine Diagnostic Tool

Information

This page contains information relating to the identity of the product and AutoTune / Carb Control.



PNC and Serial no

Product and serial number (product id). These fields are normally filled in at the factory. However, product details must be filled in when replacing a carburettor (spare part). To provide the details, enter them in the fields on the right and click "Set"

Owner ID

Owner's name and/or dealer's customer no. It is also possible to fill in customer description. To do so, fill the fields on the right and click "Set".

Manufacture date

The date the product was manufactured (the first six numbers in the serial number, year and week).

AutoTune/CarbControl Article no

The article and spare part number of the AutoTune / Carb Control unit.

AutoTune/CarbControl Revision no

The A-Z revision number of the AutoTune / Carb Control unit.

Carburator Article no

The article and spare part number for the carburettor.

Carburator Revision no

The carburettor's revision number. A-Z.

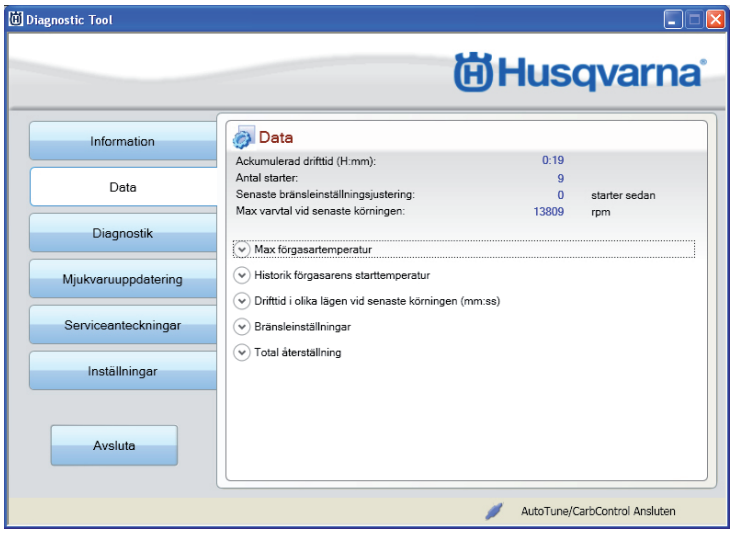
Software Version

The software version in the AutoTune / Carb Control unit.

Software Info

The software's article number.

Data



Data is saved every two minutes, except the first save after a start, which varies depending on the type of data. This is described under each data section.

Acc. operating time

Total operating time for the product, hours:minutes. Data is first saved after 1 minute runtime.

Number of starts

Number of starts for the product with at least 60 seconds run time.

Most recent engine fuel settings adjust.

Latest automatic adjustment of carburettor settings. Adjustments are made continuously to achieve an optimum setting. Data is first saved after 1 minute runtime.

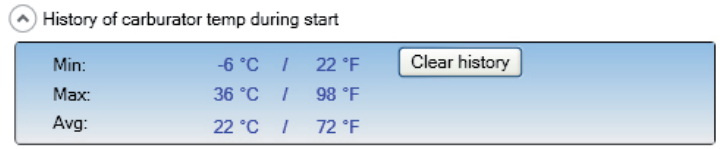
Max speed during last run

The highest motor speed in rpm (revs per minute) achieved, when last operated. Data is first saved after 5 minutes runtime.

Max carburator temp

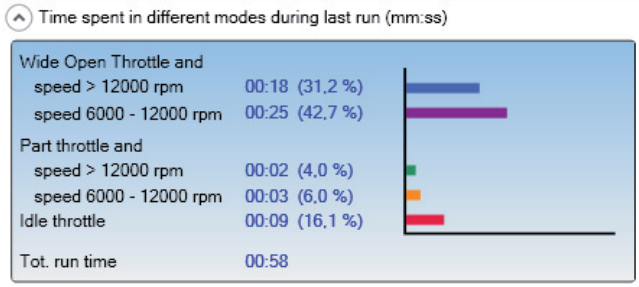
The highest measured carburettor temperature in degrees Celsius and degrees Fahrenheit (since the last cleared history). Data is first saved after 1 minute runtime.

History of carburettor temp during start



Lowest (Min) and highest (Max) measured start temperature and an average (Avg) in degrees Celsius and degrees Fahrenheit (since the last cleared history). Temperature recorded at start is saved after 1 minute runtime.

Time spent in different modes during last run

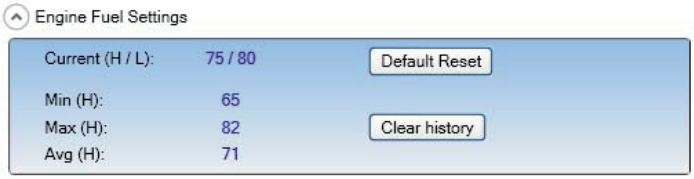


Measured time (minutes:seconds) at following modes:

- Wide Open Throttle and speed > 12,000 rpm (no load)
- Wide Open Throttle and speed 6,000 - 12,000 rpm (under load)
- Part throttle and speed > 12,000 rpm (no load)
- Part throttle and speed 6,000 - 12,000 rpm (under load)
- Idle throttle
- Total run time

Data is first saved after 5 minutes runtime.

Engine Fuel Settings



When the product is used, AutoTune / Carb Control automatically sets the carburettor optimally in spite of variations in conditions, for instance, type of fuel. The fictional values below indicate a comparison between different types of fuel.

- Commercial petrol, 95 octane, high energy fuel 70-90
- Alkylate fuel e.g. Aspen 60-80
- E25, commercial petrol with 25% ethanol 40-60

The values are fictional and indicate a comparison between the different fuels. The range is due to other variations of the product deciding where your product has its optimum setting for a specific fuel. The higher the number, the higher energy content in the fuel and thus lower fuel consumption.
Data is first saved after 1 minute runtime. "Current" is also saved at stop.

Current

This value indicates the product's current setting. Click "Default Reset" to reset the carburettor settings to the factory setting.

Min

The lowest value for the setting in use (since last time history was cleared).

Max

The highest value for the setting used (since the last time history was cleared).

Avg

The average value of the setting used (since the last time history was cleared).

Default Reset

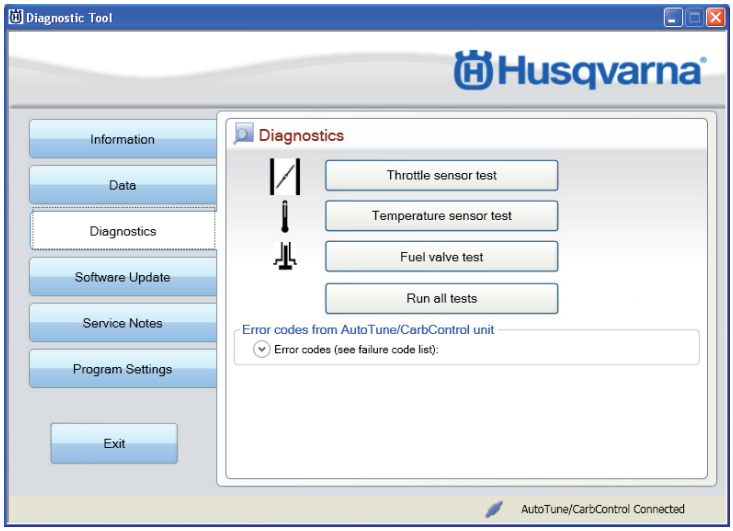
Click on "Default Reset" to set the fuel settings to factory setting.

Clear history
Click on "Clear history" to clear the fuel settings history.

Master Reset

Click on "Master Reset" to reset all settings to factory setting.
NOTE! A master reset should never be done unless there have been a mechanical failure in the engine, e.g. a broken intake rubber, a cracked muffler, a missing or clogged air filter, or after a major repair of the engine or fuel system.

Diagnostics



In the diagnostics section, there are a number of tests that can be performed as part of a trouble shooting if the engine is behaving strangely or as a measure when different error codes have been generated by the AutoTune / Carb Control unit.

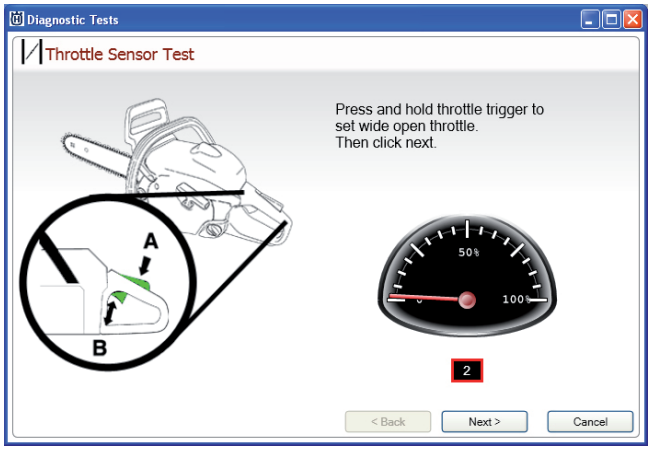
The following tests can be performed:

- Throttle sensor test
- Temperature sensor test
- Fuel valve test

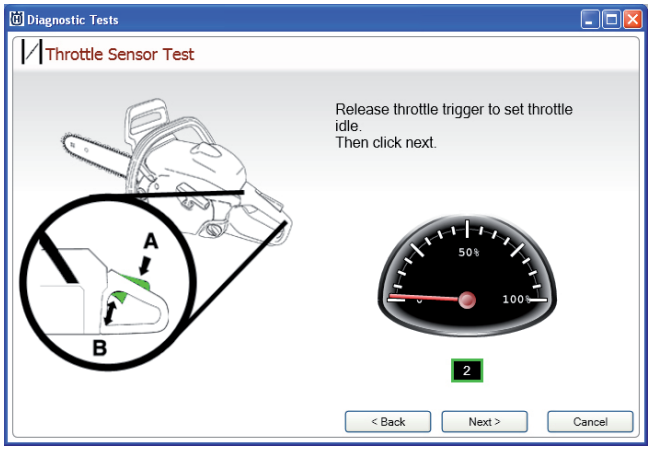
Throttle sensor test

1. Begin the test by pressing the ”Throttle sensor test” button and carefully following the instructions.

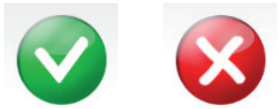
2. Press and hold throttle trigger to set wide open throttle. Then click "Next".



3. Release throttle to set throttle idle. Then click "Next".



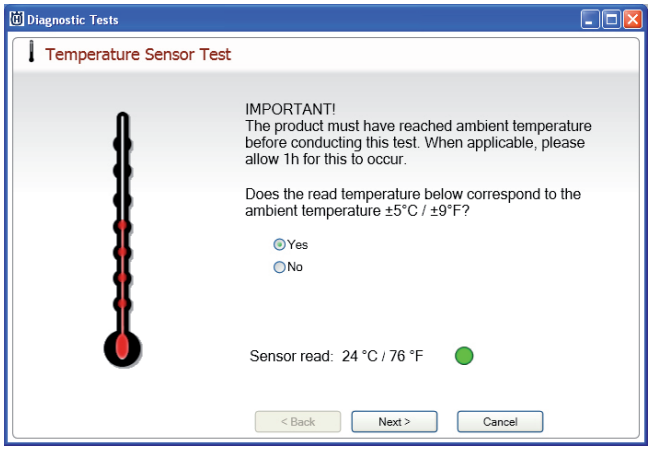
4. Check that the test result was approved (indicated by a green light) or failed (indicated by a red X).



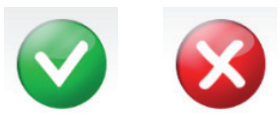
5. Search through the workshop manual if the test result failed (red x).

Temp. sensor test

1. Begin the test by pressing the ”Temp. sensor test” button and carefully following the instructions.



2. Check that the test result was approved (indicated by a green light) or failed (indicated by a red X).

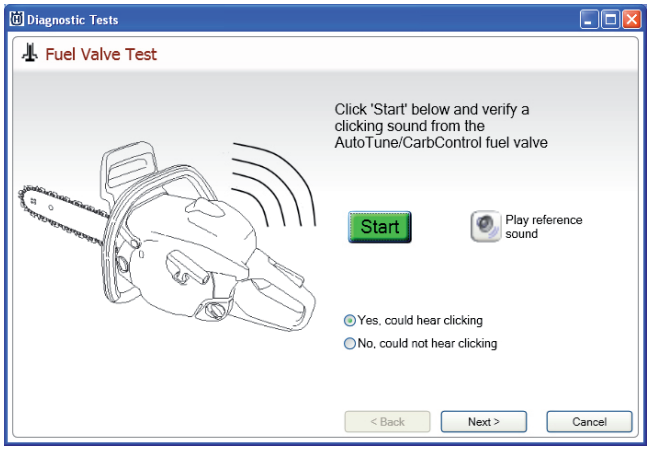


3. Search through the workshop manual if the test result failed (red x).

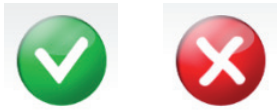
Fuel valve test

1. Begin the test by pressing the ”Fuel valve test” button and carefully following the instructions.

2. Click "Start" and verify a clicking sound from the AutoTune / Carb Control fuel valve. Note that the clicking sound may differ from the reference sound, both in volume and frequency. This is okay, the important thing is that a clicking sound is heard at all.
If a clicking sound is difficult to hear, make sure that there is fuel in the tank and press the purge diaphragm repeatedly until fuel begins to fill the diaphragm (about 10-15 times) and wait a minute, then try again.

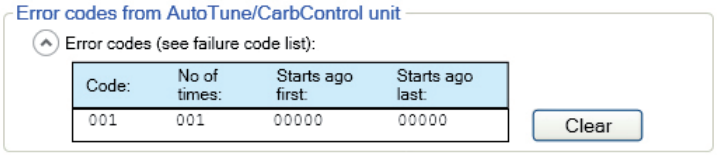


3. Choose "Yes" or "No" and click "Next".
4. Check to see if the test result was approved (indicated by a green light) or failed (indicated by a red X).



5. Search through the workshop manual if the test result failed (red x).

Error codes from AutoTune/CarbControl unit

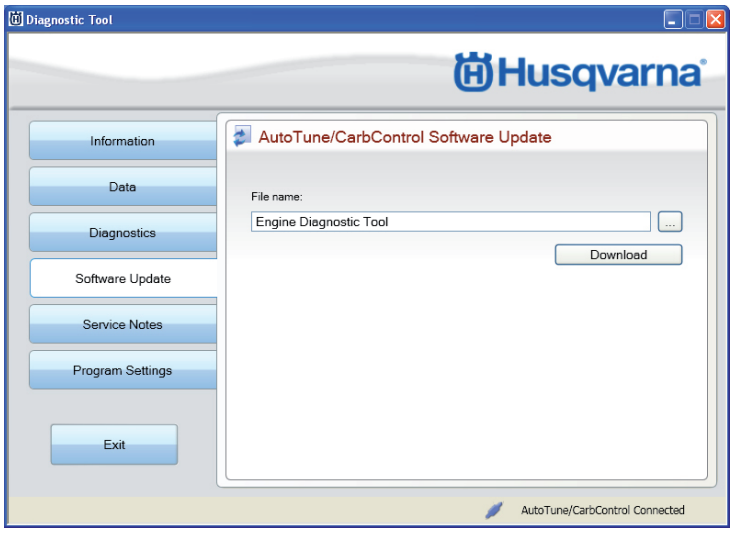


This page shows the error codes that are generated by the AutoTune / Carb Control unit. See the table below for a description of the various codes and how to rectify them.

Error code	Explanation / Cause	Action
001	Not in use.	Not in use.
002	Incorrect information discovered. The information has been reset..	Clear the error codes. Run the product at an arbitrary speed for at least 90 seconds. If the fault remains, check that a radio-suppressed spark plug is used. Make sure the ignition cable and the spark plug cap are not damaged.
003	Not in use.	Not in use.
004	Speeds over the ignition systems maximum speed have been reached.	Check the ignition module regarding maximum speed. Check that the spark arrestor mesh in the muffler isn't blocked.
005	Faulty throttle sensor function.	Check the throttle sensor using the Engine Diagnostic Tool diagnostics. Check that the throttle sensor is installed and not damaged. Two magnets must be available in the magnetic sensor. Clean away any metallic objects if required.
006	Faulty throttle sensor signal. Throttle valve not working correctly.	Check the throttle sensor using the Engine Diagnostic Tool diagnostics. Check to see a throttle sensor is installed and not damaged. Two magnets must be available in the magnetic sensor. Clean away any metallic objects if required. Check that the throttle valve is fully open at full throttle.

Error code	Explanation / Cause	Action
007	Faulty throttle sensor function. Throttle valve not working correctly. Air is leaking into the engine.	Check the throttle sensor using the Engine Diagnostic Tool diagnostics. Check to see a throttle sensor is installed and not damaged. Two magnets must be available in the magnetic sensor. Clean away any metallic objects if required. Check that the throttle valve is closed completely on idling. Pressure test the engine and rectify any leakage.
008	Faulty temperature sensor function in AutoTune / Carb Control.	Check the temperature sensor using the Engine Diagnostic Tool diagnostics. If the Engine Diagnostic Tool indicates a fault, replace the AutoTune / Carb Control unit. Otherwise clear the error codes.
009	Loose contact in the blue wire connecting the ignition module to the AutoTune / Carb Control unit.	Clear the error codes and test run the product at an arbitrary speed for at least 90 seconds and check again for any error codes. Check the blue wire connecting the ignition module to the AutoTune / Carb Control unit for resistance or bad contact. It the fault remains, replace the ignition module, the AutoTune / Carb Control unit or the wiring.
010	Not in use.	Not in use.
011	Loose contact in the red wire connecting the ignition module to the AutoTune / Carb Control unit	Clear the error codes and test run the product at speeds > 6000 rpm. The product must run for at least 90 seconds. Then check for any error codes. Check the red wire connecting the ignition module to the AutoTune / Carb Control unit for resistance or bad contact. Check the airgap between ignition module and flywheel. If the fault remains, replace the ignition module, the AutoTune / Carb Control unit or the wiring.
012	Malfunction when not using radio-suppressed spark plug or internal fault in the AutoTune / Carb Control unit.	Make sure a radio-suppressed spark plug is used. Clear the error codes and test run the product at an arbitrary speed. The product must run for at least 90 seconds. Check then for any error codes. Replace the AutoTune / Carb Control unit if the fault remains.
013	The engine takes too long to reach idling. May be the case if an high ethanol fuel mix is used or when there is air leakage.	Check the throttle sensor using the Engine Diagnostic Tool diagnostics. Check that the throttle sensor is installed and not damaged. Two magnets must be available in the magnetic sensor. Clean away any metallic objects if required. Check that the air valve is closed completely on idling. Pressure test the engine and rectify any leakage.
014	The carburettor wants to provide more fuel than is possible at high speed. Probable causes: Faulty throttle sensor signal. Air leakage in the engine. Faulty carburettor. Incorrect fuel quality, e.g too high alcohol mix.	Check the throttle sensor using the Engine Diagnostic Tool diagnostics. Check that the throttle sensor is installed and not damaged. Two magnets must be available in the magnetic sensor. Clean away any metallic objects if required. Check and replace the pump diaphragm or the fuel hose if required. Pressure test the engine and rectify any leakage.
015	The carburettor wants to give less fuel than what is possible at high speed. Probable causes: Faulty throttle sensor signal. Throttle valve not working correctly.	Check the throttle sensor using the Engine Diagnostic Tool diagnostics. Check that the throttle sensor is installed and not damaged. Two magnets must be available in the magnetic sensor. Clean away any metallic objects if required. Check that the air valve is fully open at full throttle.
016	High idling speed or maximum fuel level for idling fuel control is reached. Probable causes: Faulty throttle sensor signal. Air leak into the engine. Faulty carburettor. Incorrect fuel quality, e.g. too high alcohol mix.	Check the throttle sensor using the Engine Diagnostic Tool diagnostics. Check that the throttle sensor is in place and not damaged. The sensor must have two magnets. Clean away any metallic objects if required. Check that the air valve is closed completely on idling. Pressure test the engine and rectify any leakage. Check and replace the pump diaphragm or fuel hose if required.
017	Low idling speed or minimum fuel level for idling fuel control is reached. Probable causes: Stiff or weak engine e.g. seized up cylinder or piston.	Check the throttle sensor using the Engine Diagnostic Tool diagnostics. Check the level arm in the carburettor.
018	Run time zeroed. Cause: Incorrect information regarding operation time in the AutoTune / Carb Control unit.	Clear the error codes. Run the product at an arbitrary speed for at least 90 seconds. If the fault remains, replace the AutoTune / Carb Control unit if the product does not run correctly.
019	Counter for number of starts zeroed. Cause: Incorrect information regarding operation time in the AutoTune / Carb Control unit.	Clear the error codes. Run the product at an arbitrary speed for at least 90 seconds. If the fault remains, replace the AutoTune / Carb Control unit if the product does not run correctly.

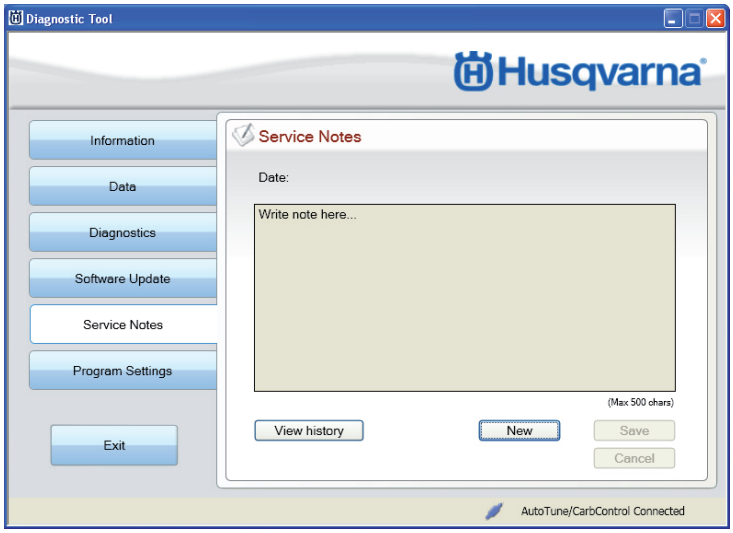
Software Update



AutoTune/CarbControl Software Update

When any software updates are available for the AutoTune / Carb Control unit, these will be available for download from the local support site. Follow the download instructions on the support site. Connect the AutoTune / Carb Control unit and then click on the "Software Update" tab in the Engine Diagnostic Tool and select the file from the folder in which it has been saved. Then click on "Download" and wait until the update has been performed.

Service Notes



In this field, notes related to service and repair work performed on the product can be filled in and saved.

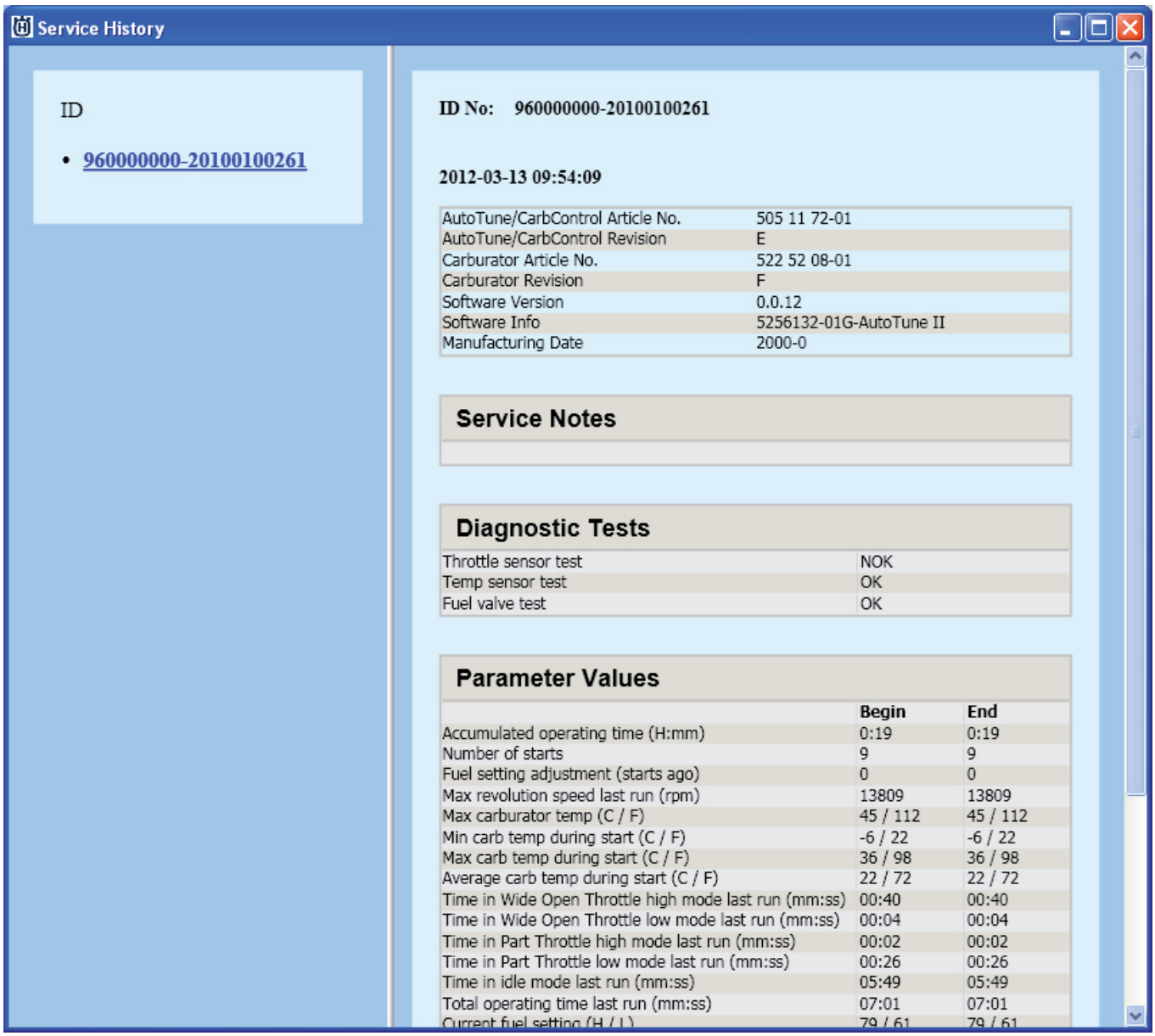
1. Click ”New” to enter any notes.
2. Click "Save" to save any notes.

All saved data is saved in the folder that was selected when the Engine Diagnostic Tool was installed. Note that notes are not saved in the product (e.g the chainsaw).

View History

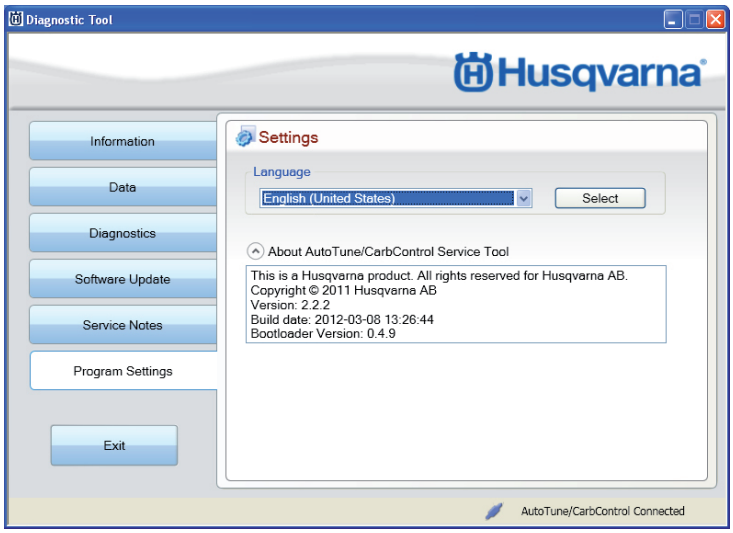
There is a special function in the Engine Diagnostic Tool in order to study previously registered service notes for the connected product. In this function, there is a compilation of all data and performed tests on all products registered.

1. Open the function by clicking on the ”View History” button.
2. Select product ID from the list to the left in the window.



When a product ID is selected, data from different sessions (connection occurrences) for this product can be studied. Use the arrow keys at the bottom of the right hand window to scroll between the various sessions. A new session is saved when any data is altered or service notes are added.

Program Settings



Language

Choose a language from the menu and click on "Select" to change the language used in the program.

About AutoTune/CarbControl Service Tool

Version information for the AutoTune / Carb Control Service Tool.

EC-declaration of conformity

(Applies to Europe only)

We, Husqvarna AB, SE-561 82 Huskvarna, Sweden, tel: +46-36-146500, declare under sole responsibility that the **Engine Diagnostic Tool AutoTune service cable** with date codes from 2010 and onwards comply with the requirements of the COUNCIL'S DIRECTIVE:

- of December 15, 2004 "relating to electromagnetic compability" **2004/108/EC**.

The following standards have been applied: **EN 61000-6-3:2007, EN 61000-6-2:2005, EN 61000-4-2,-3,-4,-6**
The measurements according to the harmonized standards have been carried out by DECTRON EMC-Lab, Thörnblads väg 6, SE-386 90 Färjestaden (Accredited Laboratory ISO/IEC 17025). The report no is 10065.

Huskvarna 25 October 2010

Bo Jonsson, Development manager (Authorized representative for Husqvarna AB and responsible for technical documentation.)

Husqvarna®

www.husqvarna.com

115 41 13-26 GB 2012-04-03