



SUBARU.



DCA-8000

Diagnostic Battery Charger

Instruction Manual

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General Safety Precautions

IMPORTANT SAFETY INSTRUCTIONS. WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF THE UTMOST IMPORTANCE THAT THESE INSTRUCTIONS ARE FOLLOWED EACH TIME THE CHARGER IS USED.

For safe, efficient and accurate charging and testing, review the safety and operating instructions in this manual before using the charger. In addition, follow all manufacturers' instructions and BCI (Battery Council International) safety recommendations.

1 General Safety Precautions

⚠ CAUTION	
	<p>Charging a non-rechargeable battery may cause the battery to burst.</p> <p>To reduce the risk of injury, only charge rechargeable lead-acid type batteries including maintenance-free, low-maintenance, or deep-cycle batteries.</p>

⚠ WARNING
<p>Risk of explosive gases.</p> <p>Batteries generate explosive gases during normal operation, and when discharged or charged.</p>

1.1 To reduce risk of battery explosion, follow these safety instructions and those published by the battery manufacturer and the manufacturer of any equipment you intend to use in the vicinity of a battery. Review cautionary markings on these products and on the engine and on the vehicle or equipment containing the battery.

If you are uncertain as to the type of battery you are attempting to charge or the correct procedure for checking the battery's state of charge, contact the seller or battery manufacturer.

1.2 Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock or injury to persons.

1.3 To reduce risk of damage to the electric plug and cord, pull by the plug rather than by the cord when disconnecting the charger from the AC outlet.

1.4 Position the AC and DC leads to avoid tripping over them and to prevent damage from moving engine parts; protect from heat, oil and sharp edges.

1.5 Do not operate the charger if it has received a sharp blow, been dropped or otherwise damaged in any way; take it to a qualified service center.

1.6 Do not disassemble charger; take it to a qualified service center when repair is required. Incorrect reassembly may result in a risk of electric shock or fire.

1.7 To reduce risk of electric shock, unplug the charger from the AC outlet before attempting any maintenance or cleaning. Turning off the controls will not reduce this risk.

1.8 Connect and disconnect the battery leads only when the AC supply cord is disconnected.

1.9 Do not overcharge the battery.

1.10 Charge the battery in a dry, well-ventilated area.

1.11 Never place articles on or around the charger, or locate the charger in a way that will restrict the flow of cooling air through the cabinet.

1.12 An extension cord should not be used unless absolutely necessary. (See paragraph 4.2)

1.13 Have a damaged cord or plug replaced immediately.

1.14 Do not expose the charger to rain or snow.

2 Personal Precautions

- 2.1 This charger is not to be used by people with reduced physical, sensory or mental capabilities- or lack of experience and knowledge unless they have been given supervision or instruction.
- 2.2 Children should be supervised to ensure they do not play with the charger.
- 2.3 Always have someone within range of your voice, or close enough to come to your aid when working around lead acid batteries.
- 2.4 Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes.
- 2.5 Wear complete eye protection, clothing protection and wear rubber soled shoes. Place damp cloth over battery to protect against acid spray. When ground is very wet or covered with snow, wear rubber boots. Avoid touching eyes while working near battery.
- 2.6 If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters the eye, immediately flush with cold running water for at least 10 minutes and seek medical attention.
- 2.7 NEVER smoke or allow a spark or flame in vicinity of a battery or engine.
- 2.8 Be extra cautious to reduce risk of dropping a metal tool onto the battery. It might spark or short circuit the battery or other electrical part that may cause an explosion.
- 2.9 Before working with a lead-acid battery, remove personal metal items such as rings, bracelets, necklaces, watches etc. A lead-acid battery can produce a short circuit current high enough to weld such items causing a severe burn.

CAUTION

To avoid electrical shock or burn, never alter the charger's original AC cord and plug. Disconnect plug from outlet when charger is idle.

The charger is not intended to supply power to a low-voltage electrical system other than applications using rechargeable, lead-acid type batteries. Do not use the battery charger for charging dry-cell batteries commonly used with home appliances. These batteries may burst and cause personal injury and property damage.

- 2.10 **NEVER** charge a frozen battery; always thaw it out first.

3 Preparing To Charge The Battery

WARNING

In the event of charging failure may generate sparks.

Only attempt to charge rechargeable batteries.


- 3.1 If it is necessary to remove the battery from vehicle to charge it, always remove the grounded terminal from the battery first. Make sure all accessories in the vehicle are off, so as not to cause an arc.
- 3.2 Be sure the area around the battery is well ventilated while the battery is being charged. Gas can be forcefully blown away using a piece of cardboard or other non-metallic material as a fan.
- 3.3 Clean the battery terminals. Be careful to keep corrosion from coming into contact with your eyes.
- 3.4 Add distilled water in each cell until the battery acid reaches the level specified by the manufacturer. This helps purge excessive gas from the cells. Do not overfill. For a battery without caps, carefully follow the manufacturer's recharging instructions.
- 3.5 Study all battery manufacturer's specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.

- 3.6 Determine the voltage of the battery by referring to the car Owner's Manual and make sure the output voltage selector switch is set at the correct voltage. If the charger has an adjustable charge rate, charge the battery initially at lowest rate. If the charger has only one voltage selection, verify the battery voltage matches the voltage of charger.

For a charger not having an output voltage selector switch, determine the voltage of the battery by referring to car Owner's Manual and make sure it matches the output rating of the battery charger.

4 Grounding & Power Cord Connections


- 4.1 The charger must be grounded to reduce risk of electric shock. The charger is equipped with an electric cord having an equipment grounding conductor and a grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

⚠ DANGER	
	<p>Hazardous voltage. An improper connection can result in electric shock.</p> <p>To avoid electrical shock or burn, never alter the charger's original AC cord and plug. Disconnect plug from outlet when charger is idle.</p>



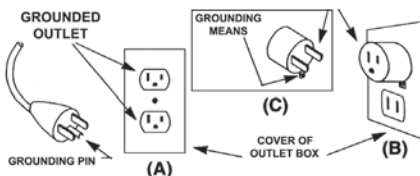
IMPORTANT: If the plug does not fit the outlet, have a proper outlet installed by a qualified electrician.

- 4.2 This battery charger is for use on a nominal 120-volt circuit and has a grounding plug that looks like the plug illustrated in Figure A. A temporary adapter, which looks like the adapter illustrated in Figures B and C, may be used to connect this plug to a two-pole receptacle as shown in Figure B, if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet can be installed by a qualified electrician.

⚠ DANGER	
	<p>Hazardous voltage. An improper connection can result in electric shock.</p> <p>Before using an adapter be certain the center screw of the outlet plate is grounded. The rigid ear or lug extending from the adapter must be connected to a properly grounded outlet. Make certain it is grounded. If necessary, replace the original screw that secures the adapter ear or lug to the cover plate and make the ground connection to the grounded outlet.</p>



IMPORTANT: Use of an adapter is not allowed in Canada. If a grounding-type receptacle is not available, do not use this appliance until the proper outlet is installed by a qualified electrician.



- 4.3 An extension cord should not be used unless absolutely necessary. Use of an improper extension cord could result in a risk of fire and electric shock. If an extension cord must be used, make sure:
- The pins on plugs of the extension cord are the same number, size, and shape as those of the plug on the charger;
 - The extension cord is properly wired and in good electrical condition;
 - The wire size is large enough for the AC ampere rating of the charger as specified in the following table.

Recommended minimum AWG* size for extension cords for battery chargers					
AC input rating Amps		AWG* size of cord			
Equal or greater than:	But less than:	Length of cord, feet (m)			
		25 (7.6)	50 (15.2)	100 (30.5)	150 (45.6)
8	10	18	14	12	10
10	12	16	14	10	8
12	14	16	12	10	8
14	16	16	12	10	8
16	18	14	12	8	8

*American Wire Gauge

5 Charger Location

Not for permanent installation: Modifying this charger for permanent installation in a vehicle or installing this charger in a vehicle for permanent use is not recommended.


This charger is **NOT** designed for outside use or wet location mounting. The charger must always be protected from direct contact with water.

- The charger must be located in an area with sufficient air space to allow unrestricted airflow in and around the charger.
- Locate the charger as far away from the battery as the charger cables permit.
- Never place the charger directly above the battery being charged as gases from the battery will corrode and damage the charger.
- Never allow battery acid to drip on the charger when taking gravity readings or filling a flooded cell battery.
- Operate the charger only in a well-ventilated area free of dangerous vapors.
- Store the charger in safe, dry location and maintain it in perfect condition.
- Do not set the battery on top of the charger or where its acid might drip onto the charger.

6 DC Connection Precautions

- Connect and disconnect the charger clamps only after the charger has been turned off and the AC supply cord is disconnected from the electric outlet.
- Never allow the charger clamps to touch each other.

- 6.3 When attaching the charger clamps, be certain to make the best possible mechanical as well as electrical connection. This will tend to prevent the clamps from slipping off the connections, avoid dangerous sparking and assure safer, more efficient charging. The clamps should always be kept clean.

⚠ DANGER	
	<p>Hazardous voltage. Can cause death or serious personal injury.</p> <p>Setting the switches to "OFF" does not always disconnect the charger electrical circuit from the AC power cord or the DC charger clamps.</p>

7 Installing The Battery

⚠ WARNING	
<p>Risk of explosive gases.</p> <p>A spark near the battery may cause a battery explosion. Follow these steps when the battery is installed in the vehicle to reduce the risk of explosion.</p>	

- 7.1 Locate the charger as far away from the battery as the charger cords permit. Position the AC and DC cords to avoid stepping on or tripping over them and to prevent damage by moving engine parts.
- 7.2 Turn **OFF** all vehicle loads, including door lights, and correct any defects in the vehicle's electrical system that may have caused a low battery condition.
- 7.3 First, connect the **POSITIVE (RED)** clamp from the charger to the **POSITIVE (POS., P, +)** ungrounded post of the battery. Then connect the **NEGATIVE (BLACK)** clamp to the **NEGATIVE (NEG., N,-)** post of the battery. Do not connect the clamp to the carburetor, fuel lines, or sheet-metal body parts.

8 Removing the Battery

- 8.1 If it is necessary to remove the battery from the vehicle or equipment, always remove the grounded terminal from the battery first.

⚠ WARNING	
<p>Risk of explosive gases.</p> <p>A spark near the battery may cause a battery explosion. Follow these steps when the battery is installed in the vehicle to reduce the risk of explosion.</p>	

⚠ WARNING	
<p>Risk of explosive gases.</p> <p>Make sure all vehicle loads are OFF to prevent a possible arc.</p>	

- 8.2 Check the polarity of battery posts.
- 8.3 Connect the **POSITIVE (RED)** charger clamp to the **POSITIVE (POS., P, +)** post of battery.
- 8.4 Position yourself and the free end of cable as far away from the battery as possible. Do not face the battery when making the final connection. Then connect the **NEGATIVE (BLACK)** charger clamp to the free end of the cable.
- 8.5 When disconnecting the charger, always do so in the reverse sequence of the connecting procedure; break the first connection while staying as far away from the battery as practical.

9 Maintenance & Storage

Follow these guidelines to protect the charger and test cables from damage and premature wear:

- 9.1 The grease, dirt, and sulfation that build up on battery terminals are highly corrosive and can damage the clamps over time. Before connecting the clamps, ensure accurate test readings and protect the clamps by cleaning the battery case and terminals using a wire brush and a mixture of water and baking soda.
- 9.2 Periodically clean the clamps using a mixture of baking soda and water, or a mild hand-soap, and a small bristle brush.
- 9.3 Clean the battery terminals. If stud adapters are required, fasten them with the proper tool. Do not use the battery clamps to tighten adapters.
- 9.4 Never remove the clamps from a battery to abort an active charging session. Always press the red **STOP** button before removing the clamps.
- 9.5 Do not leave the clamps laying in battery acid.

Locking Power Cord

Always pull back on the red tab on the side of the power cord connector to release/remove it from the charger's power socket.



Storage

Always store the charger in safe, dry location and maintain it in perfect condition.

10 Wireless Safety



The operation of this equipment is subject to the following two conditions:

1. This equipment or device may not cause harmful interference.
2. This equipment or device must accept any interference, including interference that may cause undesired operation.

SAVE THESE INSTRUCTIONS

Product Specifications

Power

Input: 100 – 240 , 50/60 Hz; 13.5A max.
Output: 12 V , 70A

Charge Cable

- 3m

Power Cord

Accepts C19 locking connector for region-specific power cables:

- United States: EMA 5-15 termination, rated at 15A/125V UL CSA

Applications

- | | |
|--|--|
| <ul style="list-style-type: none"> • Automotive • Heavy-Duty • Power Sports | <ul style="list-style-type: none"> • Marine • Group 31 • Commercial 4D/8D |
|--|--|



Battery Chemistries

- | | |
|--|--|
| <ul style="list-style-type: none"> • Lead acid • AGM | <ul style="list-style-type: none"> • EFB • Lithium ion |
|--|--|

Rating System

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> • CCA • CA • MCA | <ul style="list-style-type: none"> • JIS • DIN • SAE | <ul style="list-style-type: none"> • IEC • EN |
|--|---|---|

Operating Parameters

- Input Voltage: 100 – 240 , 50/60 Hz; 13.5A max.
- Output: 14VDC ; 70A maximum

Humidity

- 15% to 85% R.H., non-condensing

Dimensions

(without handle or base)

- Weight: 34 lbs (15.45 kg)

Temperature

- Operating temperature range: 0°C to +60°C (32°F to +140°F)
- Storage temperature range: -10°C to + 85°C (14°F to 185°F)

Certifications

- | | |
|---|--|
| <ul style="list-style-type: none"> • CUL • ETL • FCC | <ul style="list-style-type: none"> • RoHS • VL |
|---|--|

Connectivity

WiFi

- 802.11 b/g/n 2.4GHz
- Security – WEP, WP, WPA-2 Enterprise

Bluetooth

- 2.0
- USB 2.0 connection

CAN bus interface

Protection Features

- | | |
|--|--|
| <ul style="list-style-type: none"> • Reverse polarity • Non-12V battery connection • Clamp connection | <ul style="list-style-type: none"> • Battery voltage too low (< 5.5 V) • Clamp high temperature detection |
|--|--|

BMIS-Enabled

- Remote “over the air” software updates
- Remote diagnostics
- Enterprise asset management
- Reporting and analytic tools
- Communication with next generation Midtronics platforms and tools

User Interface

- Advanced navigation and charge applications
- Remote notifications (WiFi- or Bluetooth-enabled)
- Intuitive charge cycle feedback
- 5” Touch Screen

Consent to Collection and Use of Data:

You agree that Midtronics, Inc. may collect, store, transmit, and use technical data and related information, including but not limited to technical information about this device, system and application software, and accessories, that is gathered periodically to facilitate the provision of product support, product improvements, product development, and other services related to use of this device. If electing to collect personal data (such as e-mail addresses) the user is solely responsible for obtaining any necessary permissions, and agrees to indemnify and hold harmless Midtronics, Inc. its subsidiaries, officers, employees and agents from any liability associated with collecting, storing, and transmitting such personal data.


1 – Introduction & Overview

Safety Reminder

For safe, efficient, and accurate charging and testing, review the safety and operating instructions in this manual before using the charger. In addition, follow all manufacturer instructions and BCI (Battery Council International) safety recommendations.

Safety Precautions

Inspect the battery for damages and check the electrolyte level. If the electrolyte level is too low, replenish it and fully charge the battery. Always use the necessary safety precautions when working with batteries to prevent severe injury or death. Follow all manufacturers’ instructions and BCI (Battery Council International) safety recommendations, which include the following precautions:





⚠ DANGER	
	<p>Risk of explosive gases. Never smoke or allow a spark or flame in the vicinity of a battery.</p> <p>Batteries can produce a highly explosive mix of hydrogen gas and oxygen, even when the battery is not in operation. Always work in a well-ventilated area.</p>

⚠ CAUTION	
<p>Wash hands after handling.</p> <p>REQUIRED BY CALIFORNIA PROP. 65: Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.</p>	

- ✓ Battery acid is highly corrosive. If acid enters your eyes, immediately flush them thoroughly with cold running water for at least 15 minutes and seek medical attention. If battery acid gets on your skin or clothing, wash immediately with a mixture of water and baking soda.
- ✓ Always wear proper safety glasses or face shield when working with or around batteries.
- ✓ Keep hair, hands, and clothing as well as the charger cords and cables away from moving engine parts.
- ✓ Remove any jewelry or watches before you start servicing the battery.
- ✓ Use caution when working with metallic tools to prevent sparks or short circuits.
- ✓ Never lean over a battery when testing, charging or jump starting.
- ✓ Never charge a frozen battery. Gases may form, crack the case and spray out battery acid.

Manual Conventions

This manual uses these symbols and typographical conventions:

Symbol	Description
	The safety symbol indicates instructions for avoiding hazardous conditions and personal injury.
	The safety symbol with the words CAUTION, WARNING, or DANGER indicates instructions for avoiding hazardous conditions and personal injury.
	The wrench symbol indicates procedural notes and helpful information.
	These symbols indicate which arrow keys on the keypad to press for a given function.
Bold Letters	The text for screen options are in Bold letters.

Front View



- | | |
|------------------------|------------|
| ① Touch Screen Display | ③ USB Port |
| ② Charger Power Button | |

Rear View

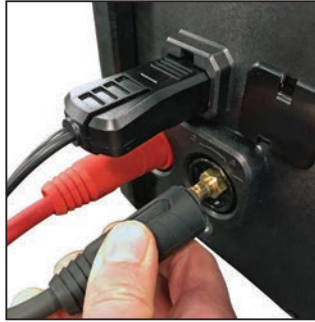


- | | |
|----------------------------------|-----------------------------------|
| ① Communication Cable Connection | ④ Circuit Breaker Reset |
| ② Charge Cable Connections | ⑤ Power Cord Socket |
| ③ VIN Scanner Connection (DB-9) | ⑥ For Charger Cart Mounting Bolts |

Connections

Charging Cables

1. Insert the communication cable.
2. Insert and rotate the charge cable quick connectors clockwise 180° to lock them onto the Quick Connector Locking Posts on the charger.



3. The connection process is complete when all three cables are properly connected to the charger.

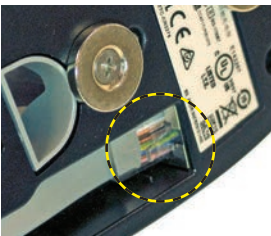
Locking Power Cord

Pull back on the red tab on the side of the connector to release/remove the power cord from the charger's power socket.



Wireless Barcode Scanner Cable

Insert the RJ50 connector in the bottom of the scanner base. Then use the screws on the DB9 connector to secure the cable from the dock to the charger.



Initial Setup

- Upon initial power-up, the Language Settings screen is displayed. Tap **Next** to continue.


System Language	Select the Charger default language displayed on the screen.
Test Result Language	Select the charger default language for all displayed tests and test results.
Email Language	Select the default standard language for the charger to use for all tests and results sent via email.
Print Language	Select the default standard language for the charger to use for all tests and results printed using a networked printer.

- A Consent to collect data screen is displayed. Tap the Consent check box then tap **Next** to continue.
- The Date/Time Settings are displayed. Tap **Next** to continue after making any adjustments.

Select Time Format:	12-hour or 24-hour format
Select Date Format:	DD/MM/YYYY, MM/DD/YYYY, or YYYY/MM/DD
Select Time Zone:	Time zone offset from Greenwich Mean Time
Set Date:	Set the current date
Set Time:	Set the current time in the selected time zone

- The Test Settings are displayed. Tap **Next** to continue after making any adjustments.

Battery Rating	Default: CCA (Cold Cranking Amps)
Temperature Units	Select Fahrenheit or Celsius
Decimal Separator	Select decimal point or comma

- The Location Selection screen (Admin Only) is displayed. Scroll to find the correct location or tap  to search for a specific location. Tap **Next** to continue.
- The Configured WiFi Networks screen is displayed. By default “subtronics01” is displayed. Tap **Next** to continue.




NOTE: If available, the DCA-8000 will automatically connect to the subtronics01 WiFi network installed at each dealer during initial set-up. This network is for use by Midtronics tools.

SSID = “subtronics01”
 Password = “m1dtr0n1c\$”
 WPA2 security



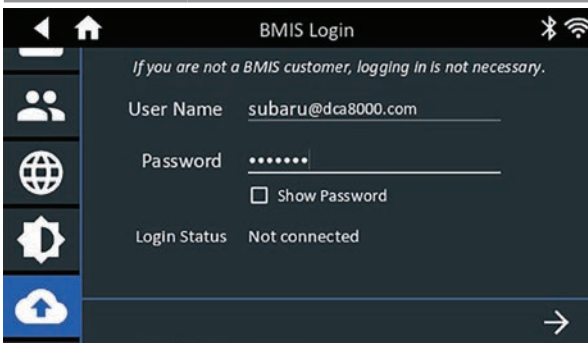
IMPORTANT: The “subtronics01” network is only available to U.S. dealers.

7. Select the country in which the tool will be used (U.S. or Canada).
8. The BMIS (Battery Management Information System) Account screen is displayed.

 **IMPORTANT:** If no WiFi connection has been made, follow the procedure described in the WiFi section of Chapter 10: Settings.

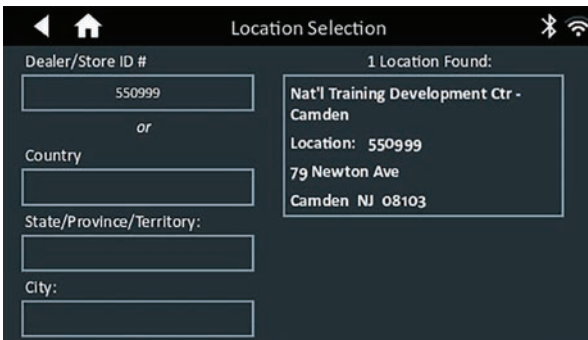
9. If the username and password are not displayed, enter the correct username and password from the following table.

Country	Username	Password
U.S. Dealers	subaru@dca8000.com	subaru1
Canadian Dealers	subarucanada@dca8000.com	subaru1



Press → to download the list of BMIS locations.


10. Enter the Dealer/Store ID# or location information. The selected dealer information is displayed.



11. Tap the Location to select it and continue.
12. The Email Address Book screen (Admin Only) is displayed.

To add an email address: Tap the plus (+) sign then use the displayed keyboard to add the address.

To edit an email address: Tap the pencil  icon then use the displayed keyboard to edit the address.

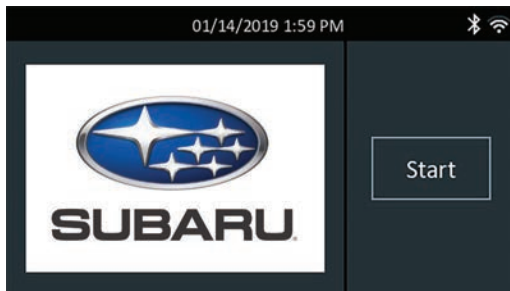
To delete an email address: Tap a displayed email address to select it. Tap the trash can icon  to delete it.

To use the Default Email Server Settings: Tap the gear  icon to use the default.

13. The Shop Information screen is displayed and populated based on the entered Dealer/Store ID#.

Store Name	Nat'l Training De
Street Address	79 Newton Ave
Street Address 2	
City	Camden
State	NJ
Zipcode	08103
Phone #	1-630-323-2800

14. The login screen is displayed.



15. Tap a user name to access the Main Menu.

Main Menu



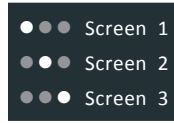
1 Menu Bar

Log Out	Log out current user	Bluetooth connectivity status
	Measured battery voltage (When a battery is connected)	
	WiFi signal strength	

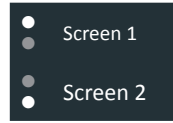
2 Main Menu Selection Area

Additional Screens

The dots at the bottom or side of a menu or results screen indicate additional screens are available. Use your finger to swipe horizontally left, right, up or down across the Controller screen to view all of the available information.



Swipe Horizontally



Swipe Vertically

Main Menu Icons

Icon	Description	Icon	Description
In Vehicle Test & Charge	Automates battery testing for quickly testing vehicles using the fewest steps.	After New Battery Install	For testing newly installed batteries in a vehicle. Also includes vehicle electronics reset information after battery installation.
Out of Vehicle Charge	For testing out-of-vehicle customer batteries for possible return.	History	Access archived test histories or search test history by VIN or by Technician.
Manual Charge	Provides a timed charge ranging from 5 to 120 minutes or a continuous charge that ends when STOP is pressed.	Messages	Displays alerts, notifications, and tool software updates.
Power Supply Mode	Evaluates and maintains battery voltage at 13.5 volts to provide uninterrupted reprogramming and retention of a vehicle's system settings.	Settings	Setup/adjust: WiFi, printer setup, email settings, user information, default language, display/sound settings, BMIS, shop info, connected devices, tool software version information.
Jump Start	Makes high output current available to boost charge an in-vehicle battery and assist in starting the engine.	Support	Access the charger Self-Test and a digitized version of the Instruction Manual shipped with the charger.

IMPORTANT: Leave the DCA-8000 plugged into power overnight so the tool can automatically check for and install any available software updates.

Inspecting the Battery

Before starting the test, visually inspect the battery for:

- Cracked, buckled or leaking case: if you see any of these defects, replace the battery.
- Corroded, loose, or damaged cables and connections: repair or replace as needed.
- Corrosion on the battery terminals, and dirt or acid on the case top: clean the case and terminals using a wire brush and a mixture of water and baking soda.
- Low electrolyte level: if the electrolyte level is low, add distilled water to fill up to 1/2" above the top of the plates and fully charge the battery. Do not overfill.
- Corroded or loose battery tray and hold-down fixture: tighten or replace as needed.

Connecting To The Battery

Connect the charging clamps to the battery in accordance with all precautions and safety instructions. **Do not connect either clamp to the vehicle's chassis.**

Connect the **Red** clamp to the positive (+) terminal and the **Black** clamp to the negative (-) terminal. An alert is displayed if the clamps are reversed on the battery terminals.

To make sure both sides of the clamps are gripping the terminals, rock the each clamp back and forth. A poor connection will prevent testing and the charger will display the message CHECK CONNECTION. If the message reappears after you have correctly reconnected the clamps, clean the terminals, reconnect and retry.

Charging Out-of-Vehicle (Battery Test)

The preferred battery charging location is in the vehicle. However, if you plan to charge out of the vehicle:

- Always disconnect the negative cable from the battery first and reconnect it last.
- Always use a carry tool or strap to lift and transport the battery.

CAUTION

Do not test at the battery's steel bolts.

Failure to properly install lead terminal adapters, or using adapters that are dirty or worn, may cause false test results. Always use lead terminal adapters provided with the charger when testing side-post or Group 31 batteries



IMPORTANT: To avoid damage, never use a wrench to tighten the adapters.

2 – In Vehicle Test & Charge



Use In Vehicle Charge to charge a battery installed and connected in a vehicle using test parameters determined by vehicle VIN or year, make and model of the vehicle being tested.



NOTE: An In Vehicle Test test will always associate the in-vehicle battery with the VIN of the vehicle in which it is installed.

At any time during the test, tap ◀ to return to the previous screen or 🏠 to return to the Main Menu.

Battery Test

1. Connect the charger clamps to the appropriate battery posts.
2. At the Main Menu, tap **In Vehicle Test & Charge**. The Acquire VIN screen is displayed.
3. Use a connected bar code scanner to scan the VIN bar code, usually located on the driver's side door frame. The VIN can also be entered manually.

For best results, use the barcode located near the bottom of the driver's side door frame. The VIN is also displayed behind the windshield on the driver's side dashboard.



NOTE: Refer to Appendix A on pg. 45 for recommended scanning procedures and VIN scanning help.



Windshield



Drivers Door Frame

Manual Entry: Use the on-screen keypad to manually type the 17-digit VIN and tap **Next**.



The displayed digit counter will count up the alphanumeric characters as they are entered on the keypad.

4. The Edit Battery Information screen displays vehicle information based on the VIN.

If the displayed information is correct, tap **Next** to begin the Battery Test or **Reset** to reset the parameters to the factory defaults.



NOTE: For new, previously untested VIN, confirm and manually enter the CCA. The entered value will be matched to the VIN and used for future testing. Always confirm battery CCA in case the battery was changed between battery tests.

5. Tap the box across from each displayed parameter and select the correct information from the displayed list.



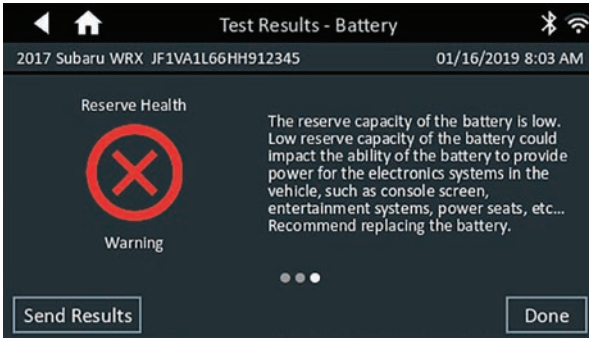
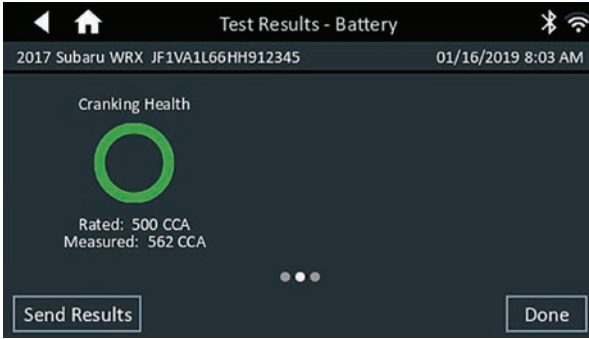
NOTE: See Appendix B on pg. 46 for complete parameter descriptions.

The charger performs a series of tests to determine the overall condition of the battery before applying a charge. Those steps include: measuring the ambient battery temperature, Cranking Health, Reserve Capacity, Charge Acceptance, and applying a Load Test to the battery.

The test results are then displayed on the charger screen as follows:

Battery Test Results

Parameter	Result
Cranking Result:	Good Battery
Reserve Result:	Warning
Voltage:	12.38 V
Measured:	562 CCA
Rated:	500 CCA
Temperature:	76° F



Icons are color-coded to indicate status.

Green:	All test parameters were completed and have passed.	Red:	The battery has failed the test.
Yellow:	Some test parameters may require further testing.	White:	Insufficient data to perform the test.

To print or send the test results to a configured printer or via email, tap **Send Results** and select an option. To return to the Home Screen, tap **Done** or **System Test** to continue with the System Test.



NOTE: Refer to Appendix C: Test Result Decision Tables on pg.47 for a complete explanation of possible test results.

System Test

1. Start the engine and let it idle.
2. Turn off all electrical accessories such as headlights and the interior ventilation blower fan and tap **Next**.
3. The charger tests the alternator output at idle.
4. When prompted, rev and hold the engine to between 2000 to 3000 RPM and tap **Next**. The charger will test the alternator output again.
5. When prompted, idle the engine.
6. Turn on the high beam headlights and interior ventilation blower motor and tap **Next**.
7. The charger will test the alternator output at idle again
8. When prompted, rev and hold the engine to between 2000 to 3000 RPM and tap **Next**.
9. The charger will test the alternator output again.
10. When prompted, turn off all loads and idle the engine.
11. Tap **Next** to display the test results.

System Test Results-Summary



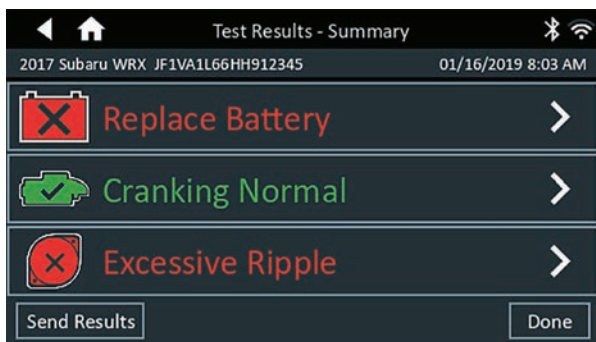
Battery Test



Starter Test



Alternator Test



Test Results - Summary

A Test Results - Summary screen is displayed following a System Test. Tap > to view detailed test results for each part of the test.



NOTE: Refer to Appendix C: Test Result Decision Tables on pg. 47 for a complete explanation of possible test results.

To send the test results to a configured printer or via email, tap **Send Results** and select an option. To return to the Home Screen, tap **Done** or to return to the Main Menu.

3 – Out Of Vehicle Charge



Out Of Vehicle Charge

Use the Out Of Vehicle Charge function to charge a battery not installed and connected in a vehicle.

At any time during the test, tap ◀ to return to the previous screen or 🏠 to return to the Main Menu.

1. Connect the charger clamps to the appropriate battery posts.
2. At the Main Menu, tap **Out Of Vehicle Charge**. The Edit Battery Information screen is displayed.

3. Tap the box across from each displayed parameter and select the correct information from the displayed list.



NOTE: Refer to Appendix A on pg. 45 for recommended scanning procedures and VIN scanning help.

4. Tap **Next** to begin the Battery Test or **Reset** to return to the default settings.

The charger performs a series of tests to determine the overall condition of the battery before applying a charge. Those steps include: measuring the ambient battery temperature, Cranking Health, Reserve Capacity, Charge Acceptance and applying a Load Test to the battery.

The test results are then displayed on the charger screen.

Battery Test Results

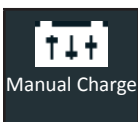
See Chapter 2 - In Vehicle Charge for screen images.



NOTE: Refer to Appendix C: Test Result Decision Tables on pg. 47 for a complete explanation of possible test results.

To send the test results to a configured printer or via email, tap **Send Results** and select an option. To return to the Home Screen, tap **Done** or 🏠 to return to the Main Menu.

4 – Manual Charge



Use Manual Charge to charge a battery using user-selectable parameters including voltage, current, or time.

At any time during the test tap to return to the previous screen or to return to the Main Menu.

1. Connect the Diagnostic Device test clamps to the battery.
2. At the Main Menu, tap **Manual Charge**. The Edit Battery Information screen is displayed.
3. Enter the battery information and charging parameters.



NOTE: See Appendix B on pg 46 for complete parameter descriptions.

If the displayed information is correct, tap **Continue** to begin the Battery Test. Tap on the corresponding box to edit the parameter information.

The charger goes through a series of steps to determine the overall condition of the battery before applying a charge. Those steps include: measuring ambient battery temperature, Cranking Health, Reserve Capacity, Charge Acceptance and applying a Load Test on the battery.

The test results are displayed on the charger screen.

To send the test results to a configured printer or via email tap **Send Results** and select an option. To return to the Home Screen, tap **Done** or to return to the Main Menu.

5 – Power Supply Mode




Use Power Supply Mode to test and maintain battery voltage at 13.5 volts to allow for uninterrupted reprogramming of vehicle's computers, retain vehicle system settings or simply to maintain battery voltage.

At any time during the test, tap ◀ to return to the previous screen or 🏠 to return to the Main Menu.

1. Connect the Diagnostic Device test clamps to the battery.
2. At the Main Menu tap **Refresh**. The Acquire VIN screen is displayed.
3. Use a connected bar code scanner to scan the VIN bar code, usually located on the driver's side door frame. The VIN can also be entered manually.

For best results, use the barcode located on the driver's side door frame. The VIN is also displayed behind the windshield on the driver's side dashboard.

 **NOTE:** Refer to Appendix A on pg. 45 for recommended scanning procedures and VIN scanning help.



Windshield



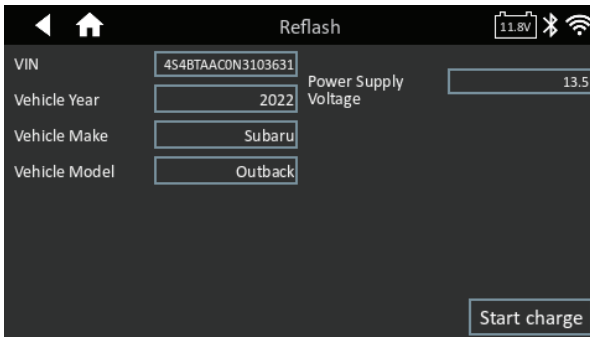
Drivers Door Frame

Manual Entry: Use the on-screen keypad to manually type the 17-digit VIN and tap **Next**.



The displayed digit counter will count up the alphanumeric characters as they are entered on the keypad.

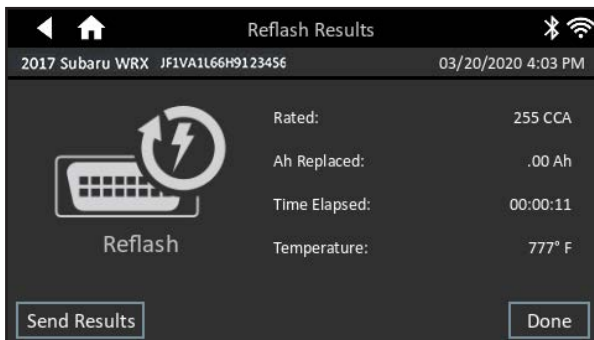
4. Enter the battery information and reflashing parameters.





NOTE: See Appendix B on pg.46 for complete parameter descriptions.

5. If the displayed information is correct, tap **Start Reflash** to begin.



The test results are displayed on the charger screen.

To send the test results to a configured printer or via email, tap **Send Results** and select an option. To return to the Home Screen, tap **Done** or to return to the Main Menu.

6 – Jump Start

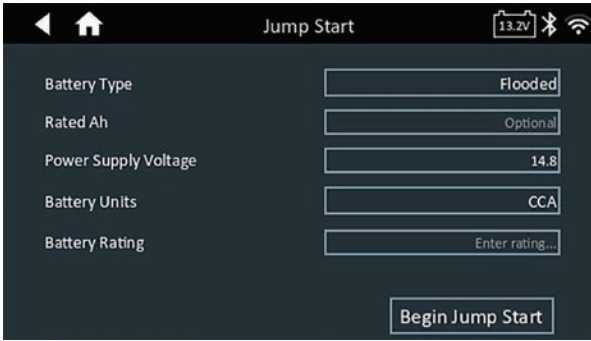


This charging mode makes high output current available to boost charge an in-vehicle battery as well as assist in starting the engine. Press **STOP** to abort at any time.

IMPORTANT: Before entering the Jump Start Mode, verify that all vehicle loads are off and the key is not in the ignition.

At any time during the test, tap ◀ to return to the previous screen or 🏠 to return to the Main Menu.

1. Connect the charger clamps to the appropriate battery posts.
2. At the Main Menu, tap **Jump Start**. The Jump Start screen is displayed.



3. Tap the box across from each displayed parameter and select the correct information from the displayed list.
4. Tap **Begin Jump Start** to begin the Jump Start process.

The charger performs a series of tests to determine the overall condition of the battery before applying a boost charge to the battery.

IMPORTANT: *Do not* crank the engine during the boost charging process.

NOTE: The maximum charge time is 10 minutes.

NOTE: The charger will not boost charge a battery that has tested unsafe.

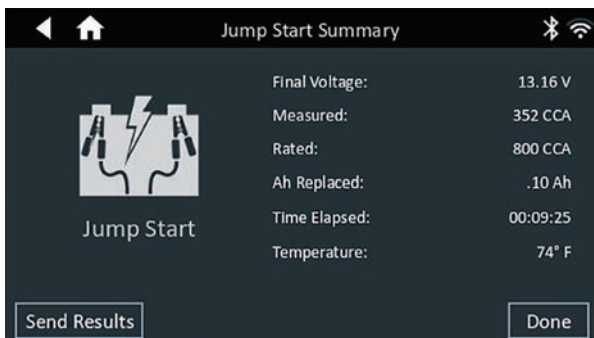
- Following a successful boost charge, the charger screen displays Start Engine. The engine can now be cranked for up to five seconds.




- When the charger displays “JUMP START COMPLETE,” press **STOP** key. (The warning tone sounds every second until you press **STOP**.)

Jump Start Summary

The results of the Jump Start session are displayed on the charger screen at the end of session.



To send the test results to a configured printer or via email, tap **Send Results** and select an option. To return to the Home Screen, tap **Done** or  to return to the Main Menu.

7 – After New Battery Install



After New Battery Install

Use After New Battery Install to test a newly installed battery in a vehicle. Where applicable, the process will also include registering the battery in the vehicle and a Reset Electronics checklist.

At any time during the test, tap < to return to the previous screen or to return to the Main Menu.

Battery Test

1. Connect the charger clamps to the appropriate battery posts.
2. At the Main Menu, tap **In Vehicle Charge**. The Acquire VIN screen is displayed.
3. Use a connected bar code scanner to scan the VIN bar code, usually located on the driver's side door frame. The VIN can also be entered manually.

For best results, use the barcode located on the driver's side door frame. The VIN is also displayed behind the windshield on the driver's side dashboard.



NOTE: Refer to Appendix A on pg. 45 for recommended scanning procedures and VIN scanning help.



Windshield



Drivers Door Frame

Manual Entry: Use the on-screen keypad to manually type the 17-digit VIN and tap **Next**.



The displayed digit counter will count up the alphanumeric characters as they are entered on the keypad.

4. The Edit Battery Information screen displays vehicle information based on VIN.

5. Tap the box across from each displayed parameter and alter the information from the displayed list. If the information is correct, tap **Next** to begin the Battery Test.



NOTE: See Appendix B on pg.46 for complete parameter descriptions.



NOTE: Tap **Find Battery** to search for the battery location based on the vehicle year, make, and model based on the VIN or vehicle year, make, and model selected.

The charger performs a series of tests to determine the overall condition of the battery before applying a charge. Those steps include: measuring the ambient battery temperature, Cranking Health, Reserve Capacity, Charge Acceptance and applying a Load Test to the battery.

The test results are then displayed on the charger screen.

Battery Test Results

See Chapter 2: In Vehicle Test, Battery Test Results for screen images and descriptions.

Reset Electronics

Use this function as a checklist for resetting vehicle electronics following a new battery installation. Options displayed are determined by the VIN of the vehicle tested.

Option

All models:

Electric windows and sunroof:

Additional systems:

System Test Results-Summary

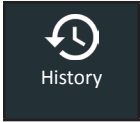
See Chapter 2: In Vehicle Test, System Test for screen images and descriptions.



NOTE: Refer to Appendix C: Test Result Decision Tables on pg. 47 for a complete explanation of possible test results.

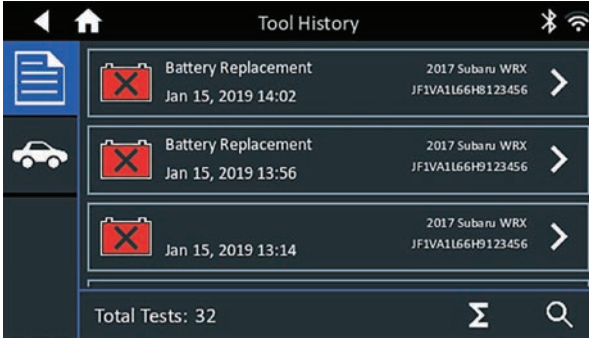
To send the test results to a configured printer or via email, tap **Send Results** and select an option. To return to the Home Screen, tap **Done** or to return to the Main Menu.

8 – History



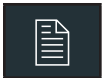
Use History to access the tool usage history, a vehicle history based on VIN and user histories. The search function can also be used find test records for specific vehicles and Technicians.

At the Main Menu, tap **History**. By default, the Tool History screen is displayed.



	Tool History		User History
	Vehicle History		Totals
	Ro Number Lookup		

Tool History



Use Tool History to view test total history as well as in vehicle and out of vehicle test totals. Individual test results are also displayed.

Tap > to view individual test details.

Tap Σ to view Total By Test Decision, Total By Test Type and Total By Date And Location.

Tap **Done** to return to the Tool History screen.

Totals By Test Decision

Good Battery	Charge & Retest
Good Recharge	Replace Battery
Aborted	Short Replace

Totals By Charge Decision

Good Battery	Replace Battery
Good Recharge	Short Replace
Aborted	NO DECISION

Totals By Test Type

Out Of Vehicle Charge	Jump Start
Battery Diagnostics	Battery Replacement
In Vehicle Charge	Manual Charge

Totals By Date And Location

Last 7 Days	In Vehicle
Last 30 Days	Out Vehicle
Last 90 Days	

Ro Number Lookup

Use the displayed keypad to enter the Ro number.



Vehicle History



Vehicle History displays test totals conducted on specific vehicles based on the VIN. It is also possible to enter a VIN to search for test records for a specific vehicle by tapping the displayed buttons.

Tap on the records displayed on the right side of the screen to view the individual test results.



NOTE: Refer to Appendix C: Test Result Decision Tables on pg. 47 for a complete explanation of possible test results.

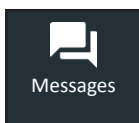
Vehicle Select Option

Tap **Q** to select vehicle search option.

Manual VIN Lookup: Use the on-screen keypad to manually type the 17-digit VIN and tap **Next**.

VIN Scan: Use a connected scanner to capture a VIN barcode, usually located on the driver's side door frame.

9 – Messages



The Messages function displays alerts and notifications for upcoming tests and activities. This includes scheduled testing as well as tool software updates and maintenance opportunities.



Mark Read Or Unread



Delete Notification

Perform Message Action

Tap to return to the previous screen or to return to the Main Menu.

Accessing Messages



A number is displayed next to the Messages icon when the charger has received any critical messages. The number does not include non-critical Notifications.

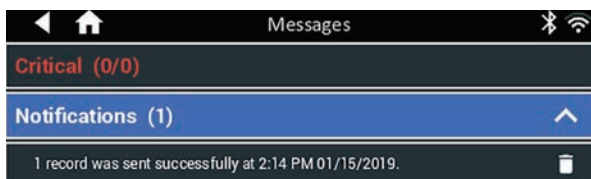


Unread Critical Messages



Read Critical Messages

1. Tap **Messages** on the Main Menu screen.



2. Tap to read a message.
Tap to perform the message action item.
Tap to delete a message.
3. Tap to collapse a list of messages or to expand the list.

Message Types

Critical: Indicates an important action cannot be performed and may require user action.

Notifications: Indicates an action has been performed or data has been sent.

10 – Settings



Settings

Use the Setup options to setup and adjust WiFi, printer setup and selection, email settings, user information, default language, display settings, sound settings, BMIS login information, shop information, user management, connected accessories, and device information.

Tap to return to the previous screen or to return to the Main Menu.

WiFi



Use WiFi to view, add, and delete wireless networks.

Tap on the WiFi icon to display a list of detected and configured WiFi networks.



Add Network



Delete Selected Network



Connect Highlighted Network



Refresh Network List

Adding A Network

1. Tap to add a WiFi network.
A list of detected wireless networks is displayed with next to the selected network.
2. Tap to access the network Security and IP Settings.

Security	None WEP WPA/WPA2 PSK
IP Address	DHCP Static

3. Tap to configure the selected network.
4. Once the network has been successfully configured, tap to return to the list of available configured networks. A indicates the selected network.

Deleting A Network

1. Tap a displayed network.
2. Tap to delete the network and tap Yes to confirm.

Printer Settings



The Printer Setup function detects and displays a list of connected and available WiFi and Bluetooth printers.



NOTE: WiFi network communication must be successfully established before a printer or printers can be detected and setup.

Tap on the Printer icon to display a list of available printers on the configured WiFi and Bluetooth networks.

	Edit Printer Settings		Printer Setup
	Delete Selected Network		Configured Printers
	Print Test Page		

Adding A WiFi Printer (Admin Only)

1. Tap to access the Printer Setup functions.
2. Tap to add a WiFi printer.
Confirm the printer is on and connected to the same wireless network as the charger.
3. Tap to add the printer to the list of eligible printers.
4. Tap to connect to the selected printer. A message is displayed when the configuration is successful.
5. Tap to return to the printer list.

Adding A Bluetooth Printer (Admin Only)

1. Tap the sign to add a Bluetooth printer.
2. Make sure the printer(s) is on.
3. Tap to add the printer to the list of eligible printers.
4. Tap to connect to the selected printer.
5. When prompted, enter the device PIN and tap . A message is displayed when the pairing is successful.
6. Tap to return to the printer list.

Deleting A Printer (Admin Only)

1. Tap to access the Printer Setup functions.
2. Tap a displayed printer.
3. Tap to delete the printer and tap Yes to confirm.

Email



Displays all entered email addresses. Addresses can be added, edited, and deleted (Admin Only). Entered email accounts are added to the email address book. Frequently used email addresses can be selected from the displayed address list rather than being re-typed each time.



Add Address



Server Settings



Edit Address



Address Book




Delete Selected Address




Send Test Email


Add Address (Admin Only)

1. Tap  to add an email address.
2. Use the displayed keypad to enter the contact name and email address.
3. Tap Add to add the address to the email list or Cancel to exit and return to the email list.

Edit Address (Admin Only)





1. Select a displayed email address by tapping it.
2. Tap  to edit the address.
3. Use the displayed keypad to edit the contact name and email address.
4. Tap Add to add the address to the email list or Cancel to exit and return to the email list.

Deleting An Address (Admin Only)

1. Select the email address by tapping it.
2. Tap  to delete the address and tap Yes to confirm or Cancel to exit and return to the email list.

Server Settings

Enter and edit the email settings for sending outgoing email.

1. Tap  to access the email sever settings.
2. Tap  to enter or modify existing server settings including Host, Port, Login, Password, SMTP Authorization, Enable TLS, and From Email Address information.
3. Tap  to clear all server settings.
4. Tap  to return to the email Address Book.

User Settings (Admin Only)



Modify Usernames and Passwords..



Edit Users



Delete Users







User Settings



User Management

User Management (Admin Only)

1. Tap  to access User Management functions.
1. Tap  to display the current logged in Admin user.
2. Select a displayed user by tapping it.
3. Tap  to edit the Username, Password, and User Type (Standard or Admin).
4. Tap **X** when complete to return to the User Management screen.
5. Tap  to delete the selected user and Yes to confirm.

Language Settings



Use the Language & Input function to select the default system language used by the tool. User defaults also include Test Results, Email, and Print languages.

System Language

Select the charger default standard language.

Test Result Language

Select the default language for the charger to use for all displayed tests and results.

Email Language

Select the default standard language for the charger to use for all tests and results sent via email.

Print Language

Select the default standard language for the charger to use for all tests and results printed using a networked printer.

Display Settings



Adjust the charger display including the Brightness, Sleep Time, and Dim Time. Auto Brightness can also be turned on and off.

Brightness

Adjust the display Brightness by tapping and holding the slider, then moving it right or left to make the screen brighter or darker.

Auto Brightness

Enable and disable Auto Brightness by tapping on the check box.

Sleep Time

Adjust the amount of elapsed time before the charger goes into a power saving (Sleep) mode. Default = 2 minutes.

Dim Time

Adjust the amount of elapsed time before the charger goes into a power saving (Dim) mode. Default = 1 minute.

BMIS Login (Admin Only)



Log into a BMIS (Battery Management Information System) account. If the tool has already connected to “subtronics01”, the Username and Password is displayed.

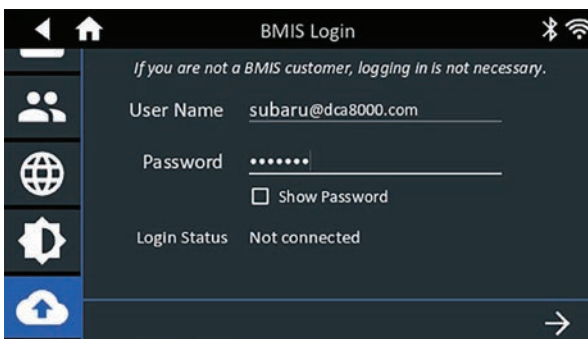


IMPORTANT: If no WiFi connection has been made, follow the procedure described in the WiFi section of Chapter 8: Settings.

1. If the username and password are not displayed, enter the correct username and password from the following table.

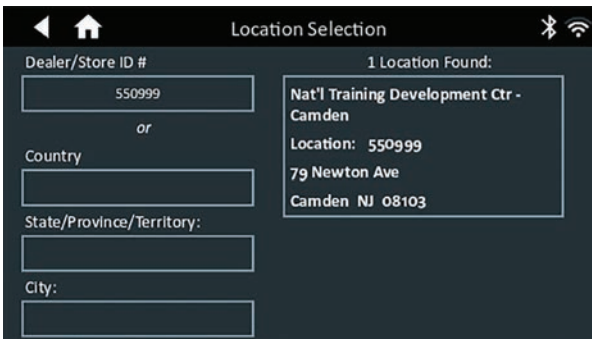
Country	Username	Password
U.S. Dealers	subaru@dss5000.com	subaru1
Canadian Dealers	subarucanada@dss5000.com	subaru1

2. Press → to continue.



Press → to download the list of BMIS locations.

3. Enter the Dealer/Store ID# or location information. The selected dealer information is displayed.

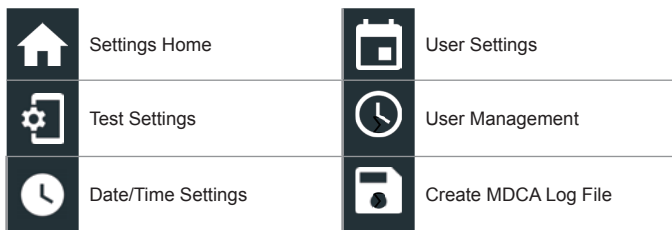


4. Tap the Location to select it and continue.

Shop Information (Admin Only)



Access default Shop Information including Store Name, address, and phone number. Also access battery test defaults including rating, temperature units, and decimal separator. Use also to adjust the tester date and time settings.





Shop Information

Use the onscreen keypad to enter the store name, address, and phone number.

Store Name	Nat'l Training De
Street Address	79 Newton Ave
Street Address 2	
City	Camden
State	NJ
Zipcode	08103
Phone #	1-630-323-2800

Test Settings

1. Tap  to access the test setting defaults. Tap the boxes or icons to change the values.

Battery Rating	<input type="text" value="CCA"/>
Temperature Units	<input type="text" value="° F"/>
Decimal Separator	<input type="text" value="00.00"/>
Create MDCA Log File	

Battery Rating

Default battery rating units used when testing batteries.

Temperature Units


Default temperature units used when measuring battery temperature.

Decimal Separator

Default number display using commas or periods separators.



Create MDCA Log File

The MDCA function is used by Midtronics technical support.

2. Tap  to return to the Shop Information screen.

Date/Time Settings

1. Tap  to access the Date/Time setting defaults.

Select Time Format	<input type="text" value="12 Hour"/>
Select Date Format	<input type="text" value="10/18/2016"/>
Select Time Zone	<input type="text" value="EST"/>
Set Date	
Set Time	

Select Time Format

12 or 24 Hour Format

Select Date Format

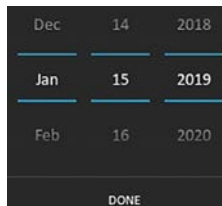
Month/Day/Year, Day/Month/Year, or Year/Day/Month

Select Time Zone

Time zone in which the charger will be operated.

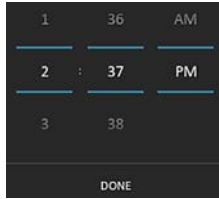
Set Date


Tap ▲ or ▼ to enter the month, day, and year. Tap Set to save the date or Cancel to exit without saving.



Set Time

Tap ▲ or ▼ to enter the hours, minutes, and AM/PM. Tap Set to save the date or Cancel to exit without saving.



2. Tap  to return to the Shop Information screen.

Device List



Displays connected and linked accessory devices. Additional devices can also be detected and linked to the charger.



Version Information



Use Version Information to display WiFi connection data the DSS Controller, Diagnostic Device, and CVG-2 Device software version information.



Serial Number	0987654321
WiFi MAC Address	e0:e5:cf:b3:9b:25
Configuration Version	192-411340-A00-0039
Data Version	192-481341-A01-005
Controller Version	192-001339-A00-0039
Diagnostic Device Version	192-211379A-25
CVG-2 Device Version	No Device Configured
OS Version	dca8000-eng 4.4.2 DEVR10_06

Factory Preset

Use this function to return the tool to the original as built configuration including all history and test settings.



IMPORTANT: All previous modifications to the original settings will be overwritten.

Legal Information

Displays software attribution information via the Midtronics website. The charger must be connected to the Internet.

Check for Updates

Use this function to check via the internet connection for any updates to the tester software.

Appendix A: Recommended Scanning Procedure

VIN Scanning

For scanning VINs, the DCA-8000 Diagnostic Charger uses a handheld scanner connected to the back of charger using a DB-9 style connector. Once successfully scanned, the VIN is cross referenced with the original equipment manufacturer's battery specifications stored in the charger's database and displayed on the screen.

Scanning Tips








- **Hold Steady:** Hold the device steady when scanning the VIN barcode. This allows the user to clearly see the barcode and allows the camera to focus on it.
- **Scan Entire Barcode:** Position the scanner in and out until it covers the entire barcode.
- **Clean Barcode/Window:** Surface dirt can interfere with the scanning process. If necessary, wipe the VIN barcode with a cloth or your finger to remove any surface dirt.
- **Lighting/Glare:** The built-in flashlight will automatically turn on in low light situations. If the flashlight, or sunlight, is shining directly onto the VIN barcode, try pivoting the camera up or down slightly to reduce any glare.

Appendix B: Battery Information Definitions




Battery Application	Automotive, Marine, Powersport, Group 31, Commercial 4D/8D, Lawn and Garden		
Battery Installation	Single Battery or Dual Batteries		
Battery Post	Top Post, Side Post, Dual Post		
Battery Rating	Enter the Battery Rating Units value		
Battery Type	Flooded, AGM (Absorbed Gas Mat), AGM Spiral, Enhanced Flooded		
Battery Units	CCA	Cold Cranking Amps: Battery current at 0 °F (−17.8 °C).	100 to 3000
	CA	Cranking Amps: Battery current at 32°F (0 °C).	100 to 3000
	JIS	Japanese Industrial Standard: Usually printed on battery label.	26A17 to 245H52
	DIN(A)	Deutsche Industrie-Norm	100 to 1000
	SAE(A)	European labeling of CCA	100 to 3000
	IEC(A)	International Electrotechnical Commission	100 to 1000
	EN(A)	Europa-Norm	100 to 1700
	EN2(A)	Europa-Norm	100 to 1700
Charge Limit	Limit charge by Voltage or Amperage		
Charge Value	Maximum amount of applied charge (Voltage or Amperage)		
Rated Ah	Rating of battery being charged in Amp-hours (optional)		
Temperature (Max)	Maximum temperature of battery during a manual charge		
Test Location	Top Post, Side Post, Remote Post		
Time Type	Timed (10 to 120 minutes) or Continuous		
Time Value (Timed Charge Only)	Length (In Minutes) of Manual Timed Charge		
VIN	A unique code, including a serial number, used by the automotive industry to identify individual motor vehicles, motorcycles, scooters and mopeds, as defined by ISO 3833.		
Vehicle Make	Vehicle manufacturer		
Vehicle Model	Vehicle name or number		
Vehicle Technology	Hybrid, Gasoline, Electric, Start-Stop, Hybrid Start-Stop, Diesel		
Vehicle Year	Model year that a vehicle was manufactured.		

Appendix C: Test Results Decision Tables







Battery Test Results

Decision	Cranking Health	Reserve Capacity	SOH Message	RC Message
 Good Battery	Good	Good	The battery shows good cranking performance. Test the battery again at next service opportunity.	The battery has good reserve capacity. The battery is able to provide power for the electronics systems in the vehicle.
 Good Recharge	Good Recharge		The battery shows good cranking performance but low charge. Fully charge the battery for optimal performance and life. Check the starting and charging systems for causes of low charge.	
 Charge & Retest	Charge and Retest		Charge the battery and retest to determine condition.	
 Replace Battery	Good	Warning	The battery shows good cranking performance but low reserve capacity performance. Low reserve capacity will compromise the battery's ability to provide power to the vehicle and hold a charge over time.	The reserve capacity of the battery is low. Low reserve capacity could impact the ability of the battery to provide power for the electronics systems in the vehicle. The battery should be replaced.
	Good Recharge		The battery shows good cranking performance but low charge and low reserve capacity performance. Low reserve capacity will compromise the battery's ability to provide power to the vehicle and hold a charge over time. Check the starting and charging systems for causes of low charge.	
	Charge and Retest		The battery shows low charge and low reserve capacity performance. Low reserve capacity will compromise the battery's ability to provide power to the vehicle and hold a charge over time.	
	Warning			
	Warning	Good		The battery shows low cranking performance. Replace the battery to prevent a no-start situation in your vehicle.
 Short Replace	Bad Cell Replace Short	Good Battery	Battery fails to meet industry accepted standards.	
	Bad Cell Replace Short	Unknown Reserve		





Charge Acceptance Results

Decision	Action
 OK	Battery has sufficient charge acceptance to recover for a proper system functionality.
 Warning	Battery has poor charge acceptance and might not be able to recover for a proper system operation.
 No Test	Test not performed or this test is not applicable for this battery application.






Starter Test Results

Decision	Action
 Cranking Normal	The starter voltage is normal and the battery is fully charged.
 Low Voltage	The starter voltage is low and the battery is fully charged.
 Charge Battery	The starter voltage is low and the battery is discharged. Fully charge the battery and repeat the starter system test.
 Replace Battery	If the battery test result was REPLACE, the battery must be replaced before testing the starter.
 Low Current	The starter voltage is high but the cranking amps are low.
 No Start	The engine didn't start and the test was aborted or the vehicle's starting profile was not detected and the Starter Test was skipped.

Alternator Test Results

Decision	Action
 CHARGING NORMAL	The output from the alternator is normal.
 NO OUTPUT	No output detected. Check belts to ensure alternator is rotating when engine is running. ✓ Check all alternator connections including to the battery. Clean or replace if necessary and retest. ✓ If the belts and connections are in good working condition, replace alternator or external voltage regulator.
 LOW OUTPUT	Alternator not providing enough current to power electrical loads and charge the battery. ✓ Check belts to ensure the alternator is rotating with the engine running. ✓ Check alternator connections to and from the battery. If loose or heavily corroded, clean or replace as necessary and retest.
 HIGH OUTPUT	Alternator voltage to the battery exceeds normal limits of a functioning regulator. ✓ Check for loose and normal ground connections. If no connection problems are found, replace the regulator. The normal high limit of a typical automotive regulator is 14.5 volts +/-0.5. Refer to the manufacturer specifications for the correct limit which may vary by vehicle type.

Diode Test Results

Decision	Action
 NORMAL RIPPLE	The output from the alternator is normal.
 EXCESSIVE RIPPLE	One or more diodes in the alternator are not functioning or there is stator damage shown by an excessive amount of AC ripple current supplied to the battery. ✓ Make sure the alternator mounting is sturdy and the belts are in good shape and functioning properly. If the mounting and belts are good, replace the alternator.
 OPEN PHASE	Replace the alternator.
 OPEN DIODE	
 SHORTED DIODE	

PATENTS

This product is made by Midtronics, Inc., and is protected by one or more U.S. and foreign patents. For specific patent information, contact Midtronics, Inc. at +1 630 323-2800.

LIMITED WARRANTY

Midtronics products are warranted to be free of defects in materials and workmanship for a period of one (1) year from date of purchase. Midtronics will, at our option, repair or replace the unit with a re-manufactured unit. This limited warranty applies only to Midtronics products, and does not cover any other equipment, static damage, water damage, overvoltage damage, dropping the unit, or damage resulting from extraneous causes including owner misuse. Midtronics is not liable for any incidental or consequential damages for breach of this warranty. The warranty is void if owner attempts to disassemble the unit or to modify the cable assembly.

SERVICE

To obtain service, contact Midtronics at 866-592-8052. Have your model and serial numbers ready. This first step is critical as we will trouble-shoot the problem(s) over the phone, and many problems are resolved during this step. If the problem cannot be resolved, then the Customer Service Agent will issue you a Return Material Authorization (RMA). This number becomes your tracking number. The final step is to return the unit to Midtronics freight prepaid (you pay), to the attention of the RMA number obtained.

In USA:

Midtronics, Inc.
Attn: RMA # xxxxx (this is the RMA number that you must obtain from Midtronics)
7000 Monroe St.
Willowbrook, IL 60527

In Canada:

Midtronics c/o FTN (FTN is Fed-ex Trade Networks –this is NOT a Midtronics facility)
Attn: RMA # xxxxx (this is the RMA number that you must obtain from Midtronics)
7075 Ordan Drive
Mississauga, ON L5T1K6

Midtronics will service and return the unit using the same type of service as received. If Midtronics determines that the failure was caused by misuse, alteration, accident, or abnormal condition of operation or handling, purchaser will be billed for the repaired product and it will be returned freight prepaid with shipping & handling charges added to the invoice. Midtronics products beyond the warranty period are subject to the repair charges in place at that time. Optional re-manufacturing service is available to return our products to like-new condition. Out-of-warranty repairs carry a 3-month warranty. Re-manufactured units purchased from Midtronics are covered by a 6-month warranty.



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