



BCT-460NAV **Operator's Manual**

Hand Held-Accuracy with a Pulsed 120 Amp Load Heavy Duty

The BCT-460NAV is the ultimate hand-held tester. It is the industry's answer to portability in a professionally accurate load tester and system analyzer.

TABLE OF CONTENTS

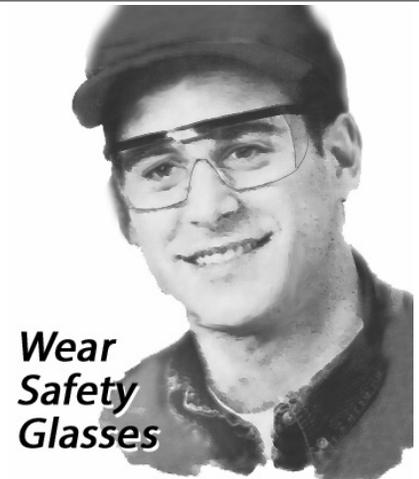


| | |
|---|-------|
| Specifications | 2 |
| User Agreement..... | 2 |
| Table of Contents..... | 3 |
| Safety | 4 |
| Inspection and Visual Check | 5 |
| Wireless Communication..... | 6 |
| Controls and Functions/Review Results/About | 6-8 |
| Set Up | 9 |
| Tester Configuration/Settings | 10 |
| Saving Data to USB Flash Drive | 11 |
| Hook Up..... | 12 |
| Heavy Duty PM Test..... | 13-16 |
| Full System Tests | 17-24 |
| Light Duty PM Test | 25-27 |
| Individual Tests | |
| Battery Test | 28-30 |
| Starter Test | 31-34 |
| Alternator Test | 35-37 |
| Voltmeter | 42 |
| Current Probe` | 42 |
| Voltage Drop Tests | |
| Starter Cable Test..... | 38 |
| Charging Cable Test..... | 39 |
| Generic Cable Test..... | 40-41 |
| Magnetic Circuit..... | 41 |
| Voltage Drop Test Results | 41 |
| Using the Optional Current Probe | 42 |
| Trouble Shooting | 43-44 |
| Warranty | 45 |
| Contact Information | 46 |

Note: The BCT-460NAV performs a complete electrical system test that checks the battery pack, starter cable voltage drop, starter test, alternator cable voltage drop, and alternator test.

SAFETY

- Carefully read all operating instructions before using the BCT-460NAV
- Wear eye protection when working around batteries.
- Be sure each test is completed before removing load clamps to prevent arcing and potential explosion from battery gases. Never remove load clamps while testing. Keep sparks flames, or cigarettes away from batteries.
- Keep hair, hands, and clothing as well as tester leads and cords away from moving blades and belts.
- Provide adequate ventilation to remove vehicle exhaust.
- In extremely cold temperatures, check for frozen electrolytic fluid before applying load. Do not attempt to Load Test or charge a battery under 20 degrees. Allow the battery to warm to room temperature before testing or charging.
- **Warning!** Never attach the BCT-460NAV to a battery that is connected to any other tester or charging unit. Damage may result.



WARNING!

This device is only to be used on 12V and 24V electrical systems. Not for use on high voltage electrical systems.

CAUSE OF BATTERY FAILURE

- **Incorrect Application:** Wrong size battery may have inadequate cold cranking rating for original vehicle specifications.
- **Incorrect Installation:** Loose battery hold-downs cause excessive vibration, which can result in damage to the plates.
- **Improper Maintenance:** Low electrolytic fluid and corrosion on battery connections can greatly reduce battery life and affect battery performance.
- **Age of Battery:** If the date code on the battery indicates it is fairly old, the failure may be due to natural causes.
- **Overcharging:** Overcharging caused by a high voltage regulator setting or incorrect battery charging can cause excessive gassing, heat and water loss.
- **Undercharging:** Undercharging caused by a faulty charging system or low voltage regulation can cause lead sulfate to gradually build up and crystallize on the plates greatly reducing the battery's capacity and ability to be recharged.

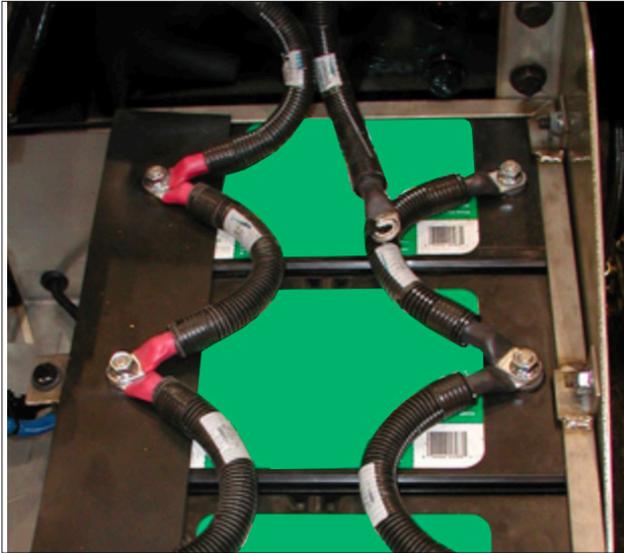
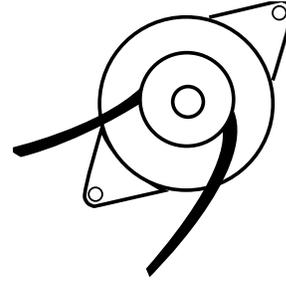
INSPECTION



- Valid heavy duty electrical system testing depends on all the components being in good operating condition. In addition, the battery **MUST** have sufficient charge for testing. Carefully perform the following steps before attempting any electrical diagnosis.

VISUAL CHECK

- **Inspect Belts** for cracks, glazed surface and fraying. Tighten loose belts.



- **Inspect Battery** for terminal corrosion, loose or broken posts, cracks in the case, loose hold-downs, low electrolyte level, moisture, and dirt around the terminals.
- If the battery terminals are corroded or dirty, clean terminals before performing any tests.

- **Inspect Starting System.** Check starter, solenoid, and regulator for loose connections, loose mounts and frayed or cracked wires.
- **Important Note:** A damaged battery must be replaced before proceeding.

WIRELESS COMMUNICATION



BLUETOOTH

The BCT-460NAV uses Bluetooth to communicate between the control module and load module. This allows you to make the connections, remove the control module and the run the tests from inside the vehicle.

The BCT-460NAV control module and load module come paired from the factory.

Bluetooth will work as long as the distance between the load module and control module is less than 30 feet. Walls, windows and other objects between the control module and load module will affect the range.

If you do experience any communication issues please look at the troubleshooting guide at the back of this manual on how to correct them.

Wi-Fi

The BCT-460NAV uses WiFi to communicate between the control module and AMPNET server. The AMPNET service will provide firmware updates for the control module and the load module. You will need to pair the control module with your local wireless LAN. See Wi-Fi section for instructions on setting up the wireless connection.

AMPNET

The data from your BCT-460NAV can be downloaded to the data management software known as AMPNET (purchased separately). This software that can be used to display and track your battery, starting system, and charging system test results in graphical form.

CONTROLS AND FUNCTIONS

Control and Load Module Mated and Latched



Control Module Latch

Control Module



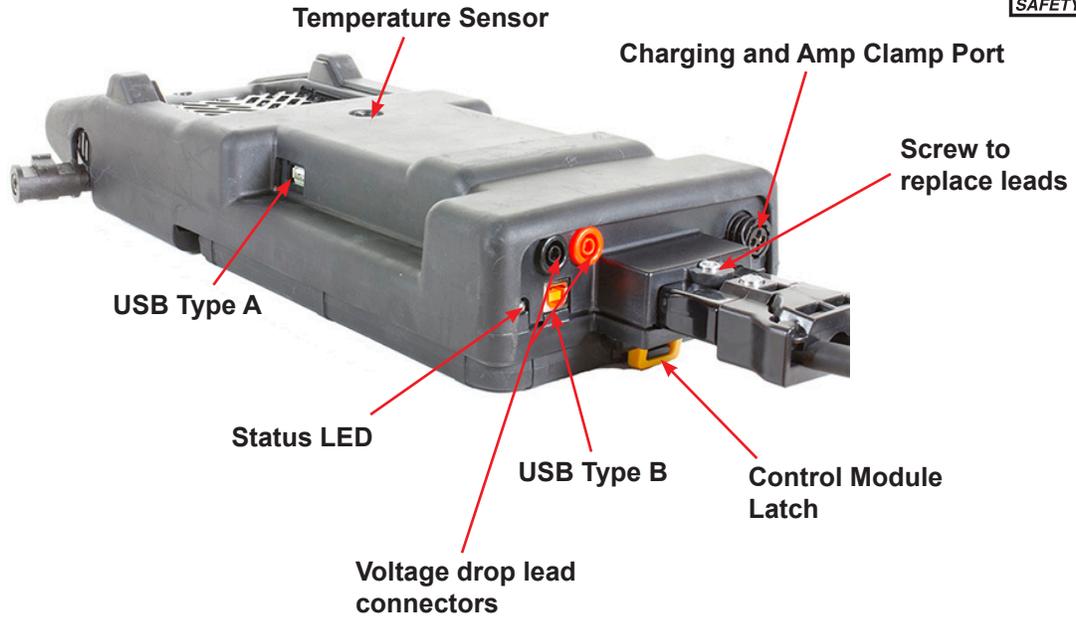
Control Module Power Button
Briefly touch to wake up screen.
2 second push and hold to power unit off or restart. 3 to 4 second push and hold to turn unit on, if unit is off.

Load Module



Load Module Push Button
Power on: Push and hold button for 1 second
Power off: Push and hold for more than 5 seconds
Reboot/Reset: Push and hold button for 3 to 4 seconds

CONTROLS AND FUNCTIONS cont.



BCT-460NAV I/O Items

USB Type A - This port is used to connect USB memory sticks to save test data. The Control module must be docked to the Load module to use this feature.

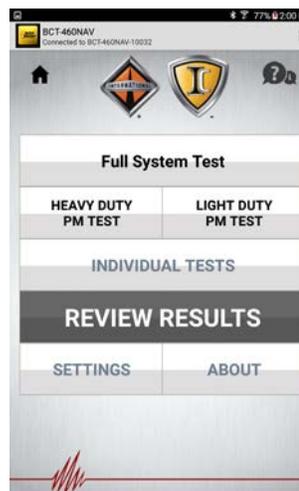
NOTE: The Load Module must not be connected to a battery or the battery charger to use the Type A USB Port.

USB Type B - Factory use only.

Temperature Sensor: The Load module has an IR temperature sensor that is used to measure the temperature of the battery you are testing.

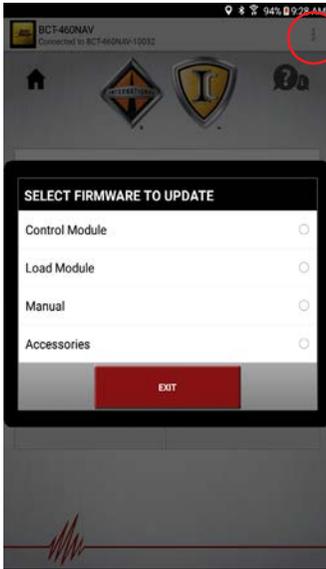
Charging / Port: When the unit is not being used it should be placed on the charger (or optional charging station) to keep the batteries fully charged.

| LED Status | Load Module Mode |
|----------------------------------|-------------------------------------|
| Off | Off |
| Solid Yellow | Initial boot-up or test in progress |
| Fast Blinking Green | Re-Flashing/Firmware Updated |
| Solid Green | Bluetooth Disconnected |
| Blinking Green (Double Flash) | Bluetooth Connected |
| Blinking Green (Slow, once/sec) | Sleeping/Low Power |
| Solid Red | Internal Battery Charging |
| Blinking Red (Slow, once/sec) | Control Module Battery Charging |
| Blinking Red (Fast, twice/sec) | Initializing Bluetooth |

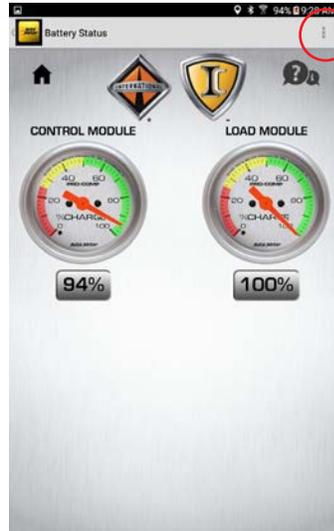


Main Menu: When the Control Module powers up it will go to the main menu. From here the user can access all of the units functions such as, run tests, setup the unit, and review past test data. See page 10 for settings.

CONTROLS AND FUNCTIONS cont.



Touch the 3 dots at upper right corner, then touch Check for Update which allows the user to update both the Control modules application or the Load module firmware.



Touch the 3 dots at upper right corner, then touch Battery Status to show the state of charge of the batteries in the Control module and the Load module.



Touch Review Results screen which shows a list of the tests that have been done and allows the user to view all the details of the test.

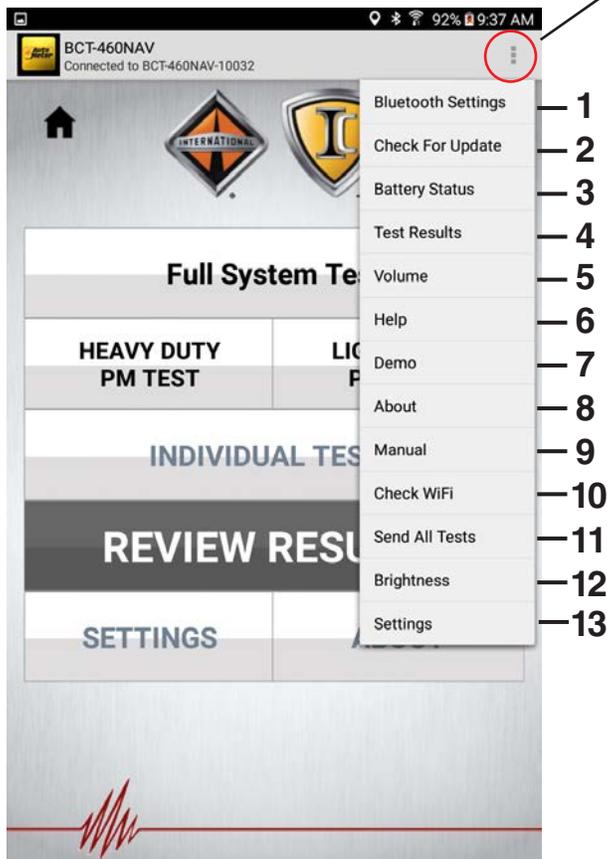


The About screen give user the information about the applications version and how to contact Auto Meter.

SET UP

OPTION MENU DETAILS

Touch the 3 dots to open the menu below



1. Allows pairing to Bluetooth Devices.
2. Update Control Module and Load Module software.
3. Check Battery Status.
4. Show list of Test Results.
5. Adjust Control Module volume.
6. Quick Main Menu help.
7. Starts Demo Mode (if demo mode files are present)
8. About the Tester.
9. Opens Owner's Manual Viewer
10. Check WiFi and Server Connection.
11. Force upload of individual and complete system tests.
12. Screen Brightness.
13. Opens Tester Configuration Screen.

SET DATE/TIME & TIME ZONE

Time Zone

- From Main Menu press SETTINGS.
- Scroll down and press Set Date and Time
- From Date & Time menu press Set Time Zone
- From resulting list choose your local time zone

Date and Time

- If the tester will have a Wi-Fi connection to the Internet leave Automatic date & time selected (check mark)
- If there will be no Internet connection press Automatic date & time to deselect option and continue to set the local date and time.

Date

- Press Set date and enter today's date in the resulting setting box.

Time

- Press Set time and enter the local time in the resulting setting box.
- Press the Back Arrow  twice to return to the main menu.

Setup Wi-Fi

- From Main Menu press SETTINGS.
- Scroll down and press Wi-Fi Setup
- Select your local Wi-Fi from resulting list
- Enter password for your local Wi-Fi in resulting setting box
- Once password has been entered press Connect
- Press the Back Arrow  twice to return to the main menu

TESTER CONFIGURATION



Tester Configuration

Dealer Code

Dealer Name

Address

City

State

Zip Code

Store Phone Number

Default Email
Do not send default email

Customer Email
Do not send customer receipt

INDIVIDUAL TEST DATA ENTRY

Vehicle ID
ON - Entry is optional

Technician ID
ON - Entry is required

Battery Date Code
ON - Entry is optional

Battery Serial Number
ON - Entry is required

Vehicle VIN
ON - Entry is required

Vehicle Odometer
ON - Entry is required

Repair Order ID
ON - Entry is optional

Visual Checks
Do not show visual checks

SYSTEM/PM TEST DATA ENTRY

Vehicle ID
ON - Entry is optional

Technician ID
ON - Entry is required

Vehicle VIN
ON - Entry is required

Vehicle Odometer
ON - Entry is required

Repair Order ID
ON - Entry is optional

TEST DEFAULTS

Temperature Scale
Fahrenheit

Use previous battery type
Defaults to battery type used on previous test

Use Previous Rating Unit
Rating defaults to CCA

Use Previous Rating Value
Defaults to value used on previous test

Use Near End of Life as Result
Battery results are either Good or Bad

Default CCA
925

Reserve Capacity
No Reserve Capacity

Send Results to i360
Will send results to i360

MISCELLANEOUS SETTINGS

Language
English

WiFi Setup
"ZymerNet" MAC Address 58:C5:CB:2A:D6:85

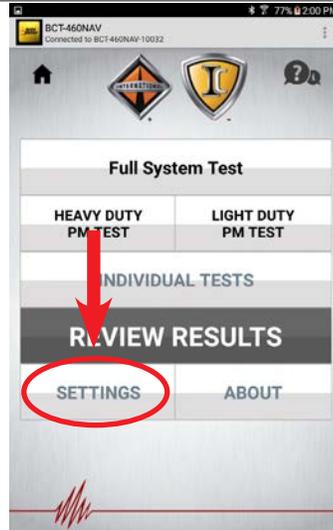
Set Date and Time
09/16/2021 10:11AM

Advanced Setup

PRINTERS

Printer Preference

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16



To access, from home screen touch settings

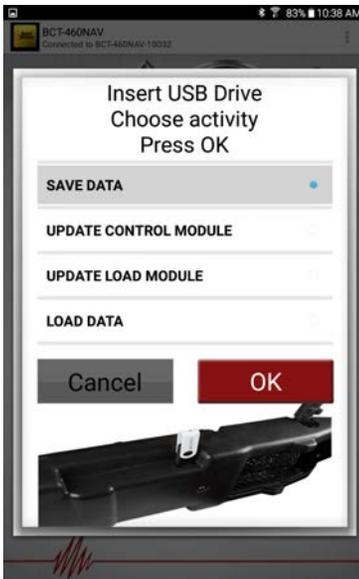
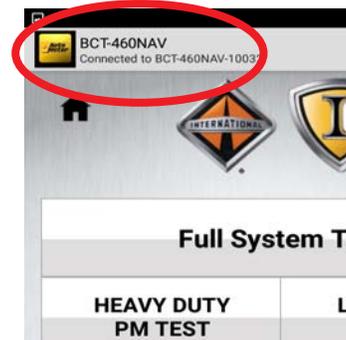
1. Dealer Information
2. For use with AMPNET. Set if email is desired for test result.
Default Email: Email will be sent to the account associated with AMPNET Subscription.
Customer Email: Allows the customer to provide a new email address to receive results.
3. Additional test information settings for Navistar.
4. Temperature °F or °C.
5. Check to use previously tested Battery Type.
6. Set to default to use previously used battery rating unit. Clear to use default rating value.
7. Set to default to use previously used rating value. Clear to use default rating value.
8. Set to show a Near End of Life result. Clear to show only Good and Bad battery result.
9. "Default CCA" Value.
10. Set to show health of Reserve Capacity on Group 31 Standard/Flooded Batteries
11. Check to enable sending data to other services.
12. Choose language for tester.
13. Wi-Fi Setup.
14. Date and Time Setup.
15. Advance Setup
16. Select print device.

SAVING DATA to a USB FLASH DRIVE



1. Control Module must be docked to Load Module.
2. Tester must be disconnected from all charging sources.
3. Start from Main Menu.

4. Make sure Control Module and Load Module are "Connected" as shown in upper left of the home screen. (See Picture Below)
5. Plug USB flash drive into connector on the right side of tester.



6. Wait a few seconds for the USB flash drive to be detected. The screen to the left will be displayed.

7. Choose SAVE DATA and press OK.



8. Choose data format and press SAVE.

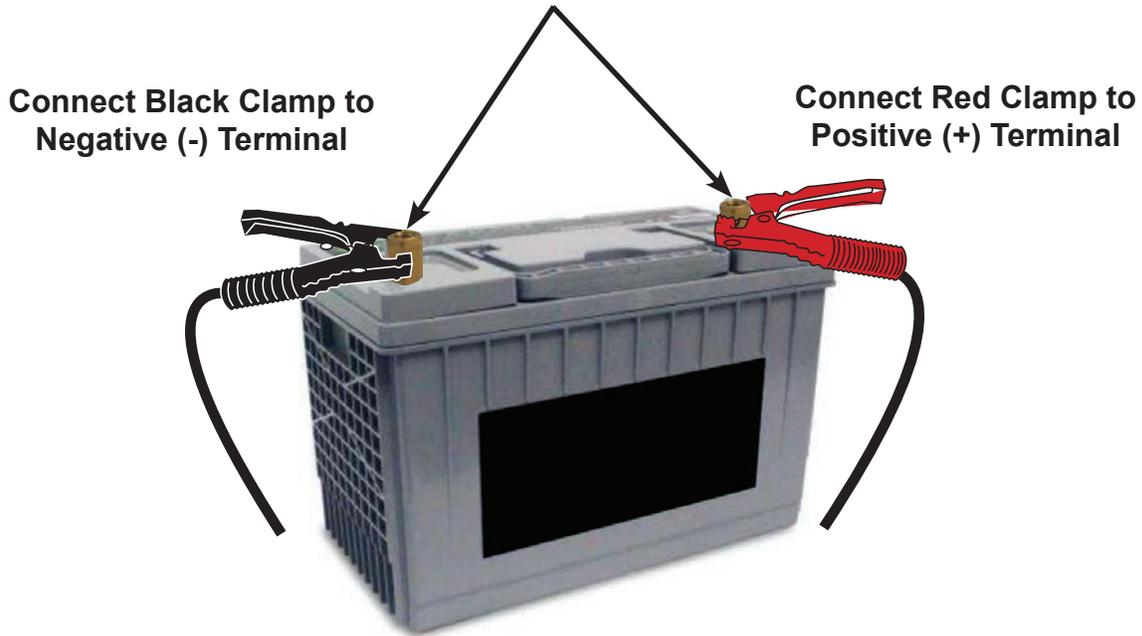
9. Wait 10 seconds and remove USB flash drive.

HOOK UP



Note: Brass battery terminal adapters must be used when performing individual battery tests.

See page 44 for list of available adapters



CONNECTION ERRORS

- If the clamps are reversed the Reversed Connection warning will be displayed on the Control Module with an audible beeping.
- If one or both of the clamps are not in complete contact (both sides of each clamp jaws) A "Check Connections" screen will appear on the control module.
- Clean battery terminals with a wire brush if battery terminals are corroded or dirty.
- Clean clamp jaws with 1 part ammonia and 10 parts water if clamp jaws are corroded or dirty.



Clean Clamps

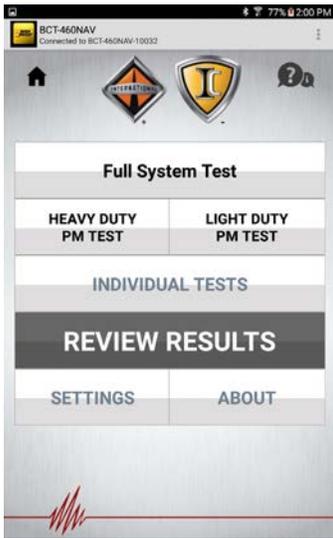


Corroded Clamps

HEAVY DUTY PM TEST

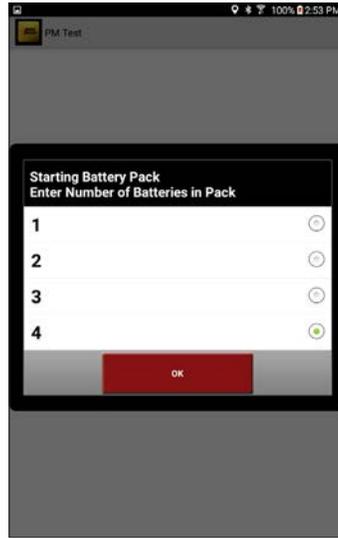


The Heavy Duty PM test is intended to only be used during a time when the vehicle is in the shop for a Preventative Maintenance service.



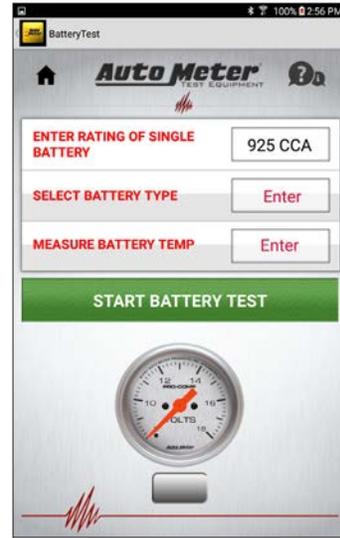
Touch Heavy Duty PM Test.

1



Enter the number of batteries in the pack then touch OK.

4



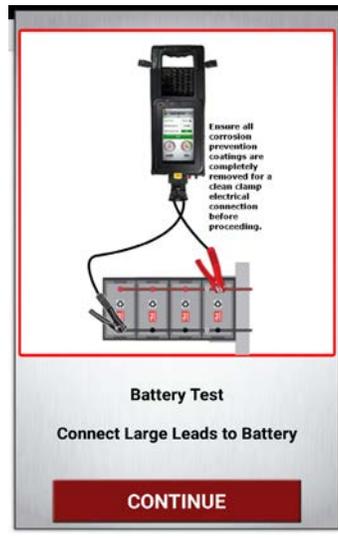
Enter the battery information. When you enter BATTERY TEMP, the following screen will appear.

7



Read warnings then touch OK

2



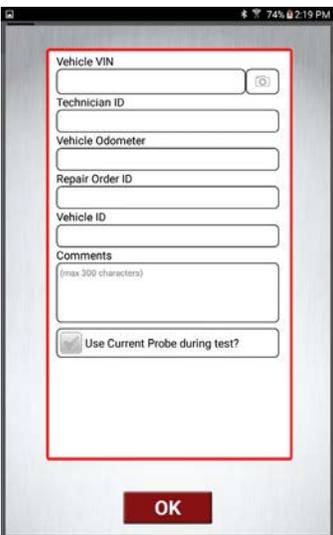
Connect the large leads/clamps. Multi Battery Hook Up

5



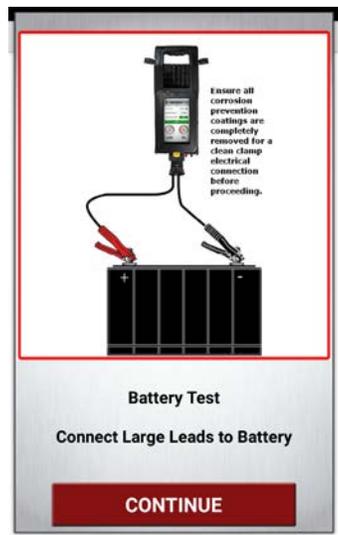
Aim the back of the tester Load Module at the battery for temperature reference then touch save

8



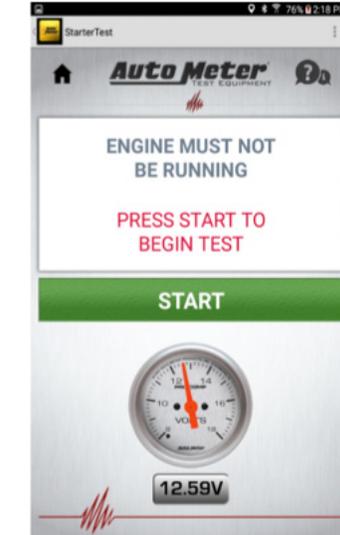
Enter the vehicle information, then touch OK. Also choose whether you are going to use the Current Probe for additional charging information.

3



Connect the large leads/clamps. Single Battery Hook Up

6

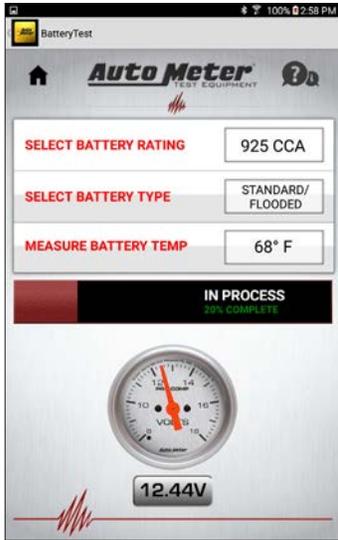


Press START to begin the test.

9

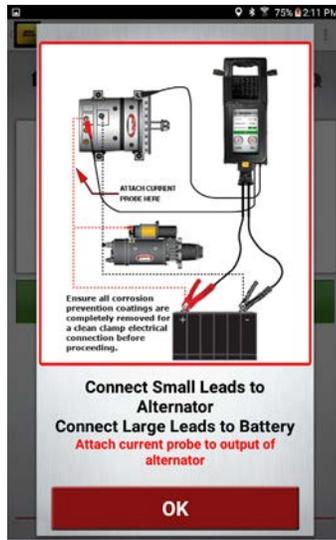


HEAVY DUTY PM TEST (cont.)



Please wait a few moments until the battery is tested

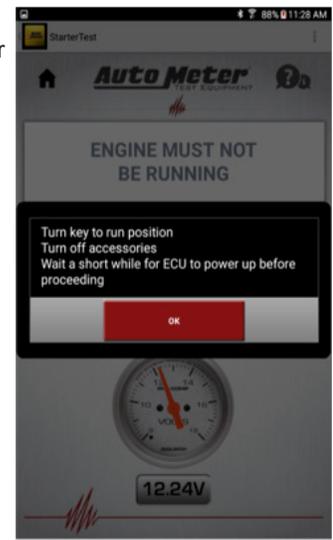
10



This screen shows the proper connections.

The Current Probe will only show if it was chosen earlier.

13



Follow the on screen prompts, then touch OK.

16

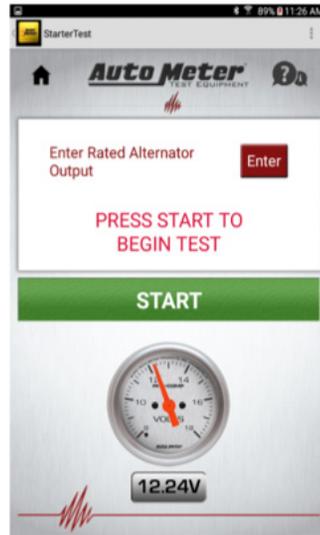


The battery test results are then displayed.

Touch PROCEED TO STARTER TEST icon.

Skip to image 16 if no Current Probe selected.

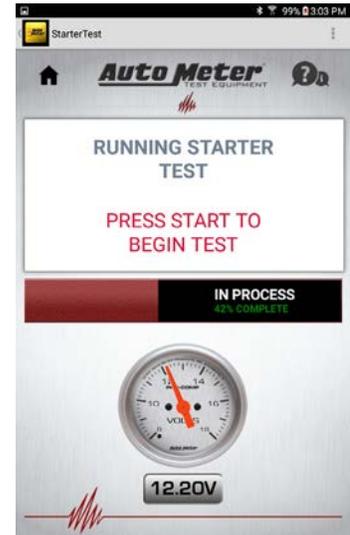
11



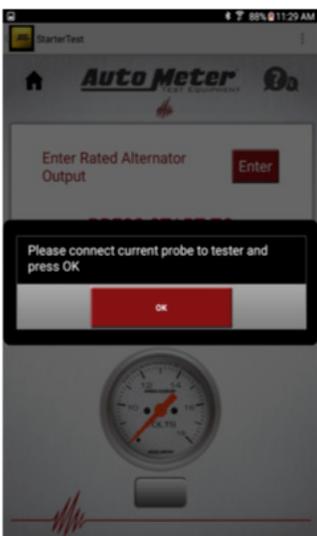
This screen only shows for the Current Probe option.

Touch Enter to continue.

14



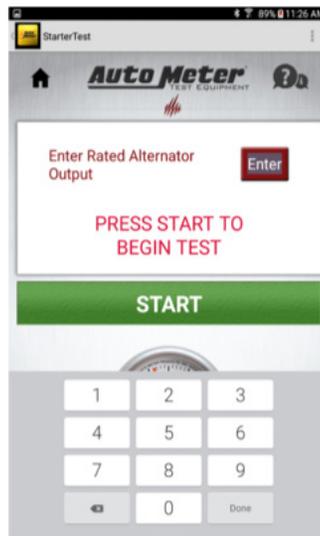
17



If the Current Probe option was chosen, this screen will appear. Touch the Ok icon.

This screen will NOT appear if the Current Probe was not chosen earlier.

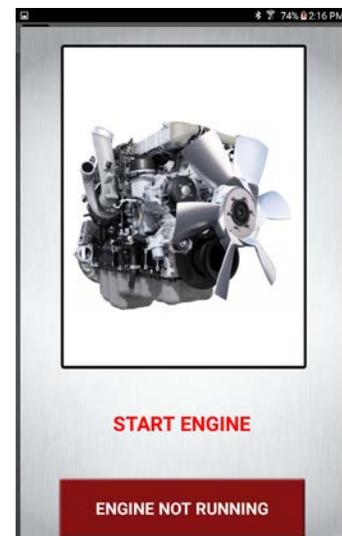
12



Enter the rated output of the alternator, then touch Done.

Then touch START.

16

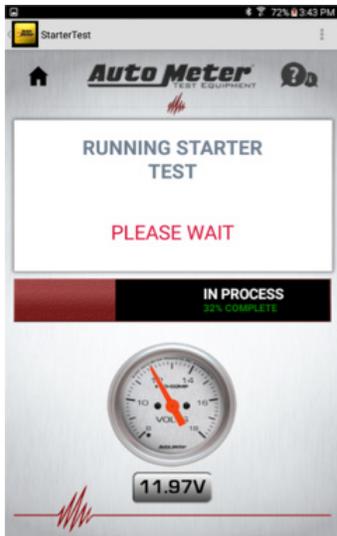


Start the Engine

18



HEAVY DUTY PM TEST (cont.)



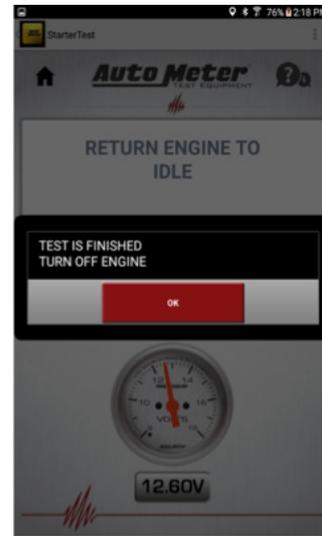
Running Starter Test.

19



Return to Idle. Touch OK.

22



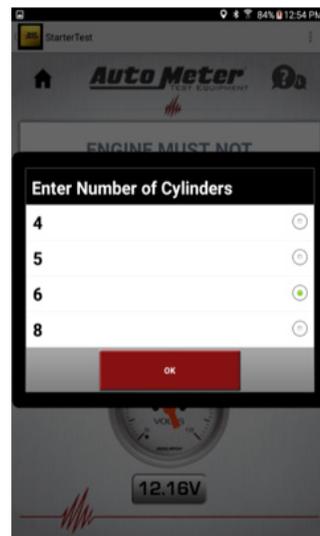
The test is finished. Turn off the engine, and touch OK.

25



Follow the on screen prompts. Rev Engine and hold RPM.

20



If more information is needed, this screen may appear.

Choose the number of cylinders, then touch OK.

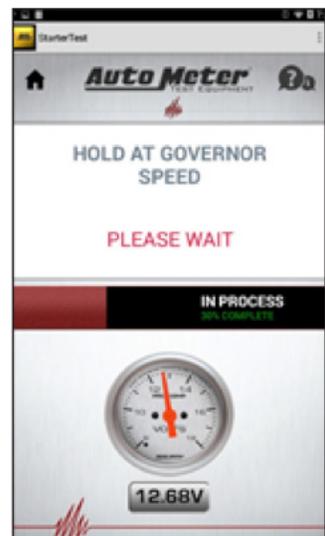
23



Starting System results.

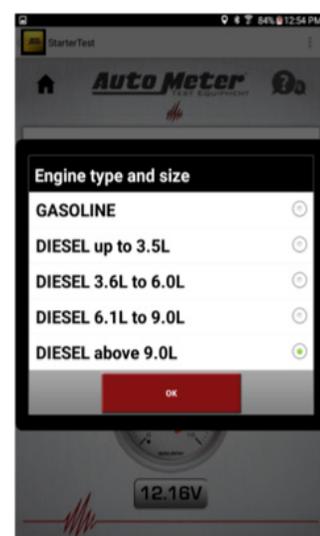
Touch MORE RESULTS to view Alternator Results.

26



Follow the on screen prompts. The charging system is now being tested.

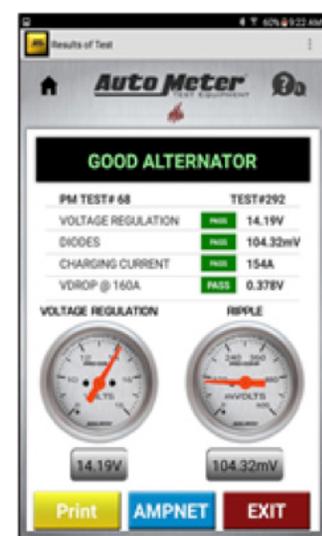
21



If more information is needed, this screen may appear.

Choose engine type, and displacement, if diesel then touch OK.

24



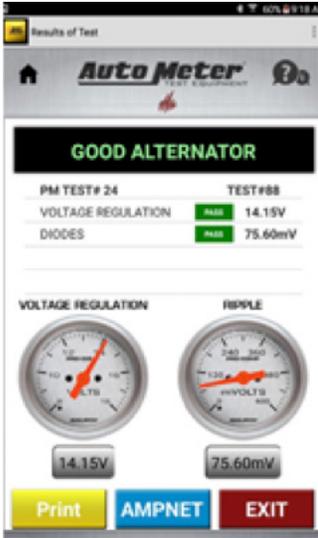
Charging results (with current probe used)

Also shows output charging current and Vdrop results.

27



HEAVY DUTY PM TEST (cont.)



Charging results (with no current probe used).

This will show voltage regulation & diodes results.

Touch exit to continue.

28



Test Summary will now be displayed.

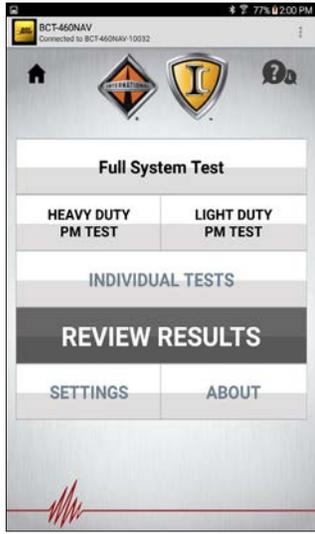
Touch Next, this will bring you back to the home screen.

29

FULL SYSTEM TEST



The Full System Test is intended to be used in Heavy Duty applications where there is a suspected electrical system fault.



From Home Screen touch Full System Test

1



Answer (touch) Yes or No to continue.

5



Connect as shown, then touch Ok.

8



Choose any that apply, then touch Next.

2



3



Choose the total number of batteries. If only one battery was chosen, you will skip steps 7 & 15 thru 20.

6



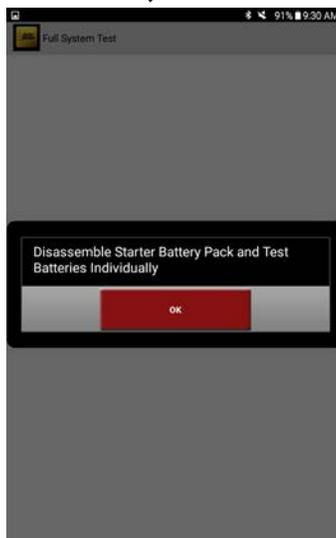
Check off as you inspect. Once checked, Ok will appear. Touch Ok to continue.

9



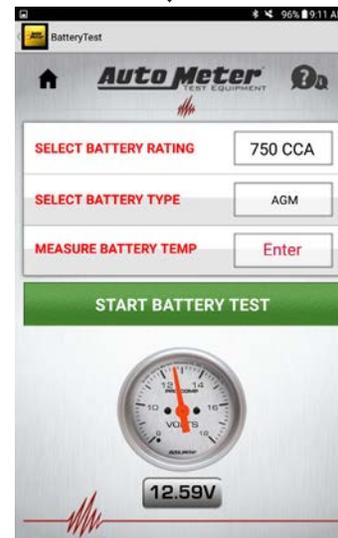
Enter the vehicle information, then touch DONE. Also choose whether you are going to use the Current Probe to eliminate the need for connections at the starter, and for quicker testing.

4



Electrically separate the batteries for individual testing, then touch OK.

7



Touch Battery Rating box to enter value. Touch Battery Type to choose type. Touch Measure Battery Temp

10

17

FULL SYSTEM TEST



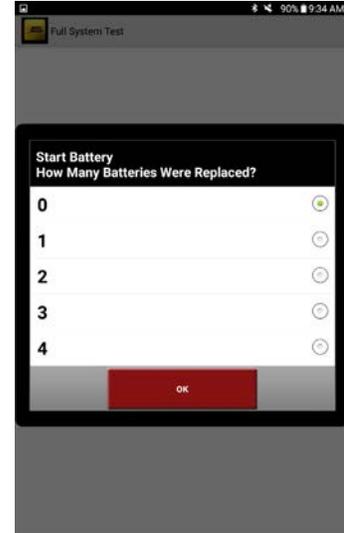
Follow prompt and touch Save

11



Here are your battery results. Touch next to continue.

14



Choose how many batteries were replaced then touch OK.

17



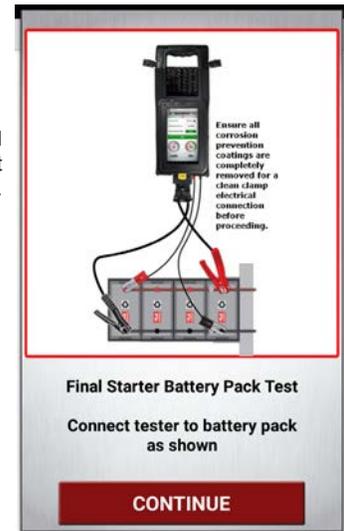
Touch Start Battery Test

12



If earlier you chose that the vehicle is equipped with more than 1 battery, you will now repeat test for all batteries.

15



Connect both sets of leads as shown, then touch Continue.

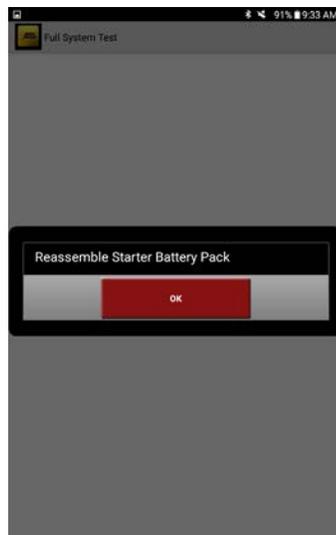
18



The battery test will begin, and be in Process.

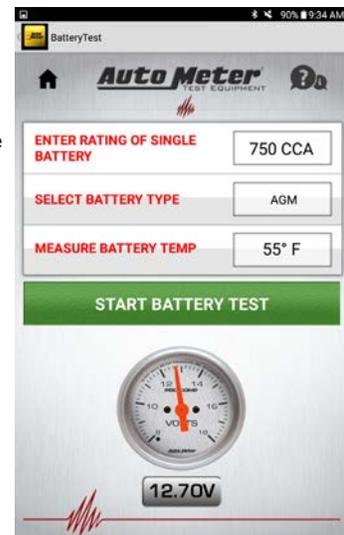
Please Wait

13



When all batteries have been individually tested, you will now reassemble the battery pack, then touch OK.

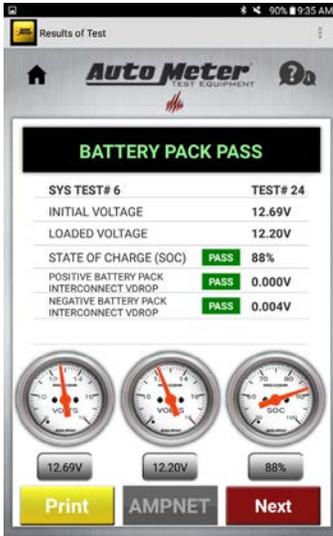
16



Once selection and temperature have been chosen, touch Start Battery Test to continue.

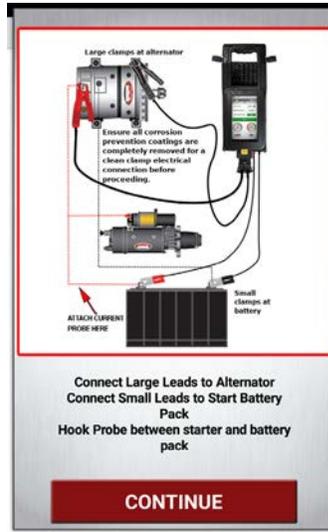
19

FULL SYSTEM TEST



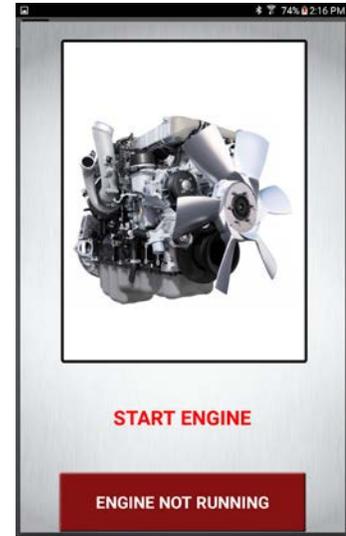
Battery pack results. Touch next to continue.

20



Follow this diagram. Probe placement is important for proper results. Be sure it is placed on the cable between the battery pack, and starter.

23



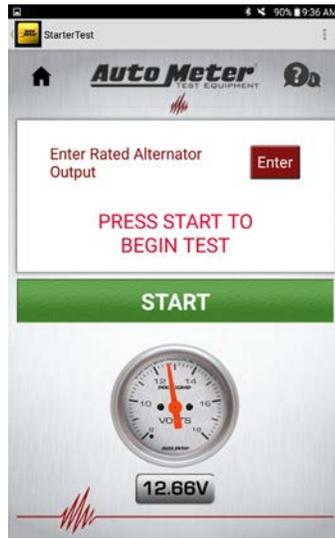
Follow on screen prompt. The tester will recognize when the engine is cranked and started.

26



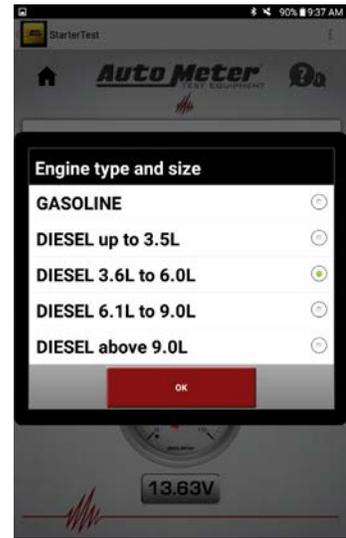
Perform inspection, correct any found issues, then check the box, and touch OK.

21



Touch the red enter box, to enter the rated output of the alternator. Then touch start.

24



If more information is needed, this screen may appear.

Choose engine type, and displacement. If diesel, then touch OK.

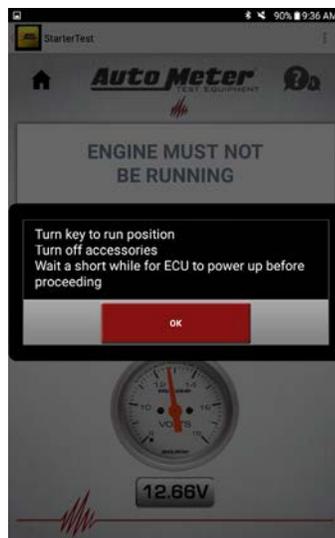
27



Repeat, same as above, but for charging system.

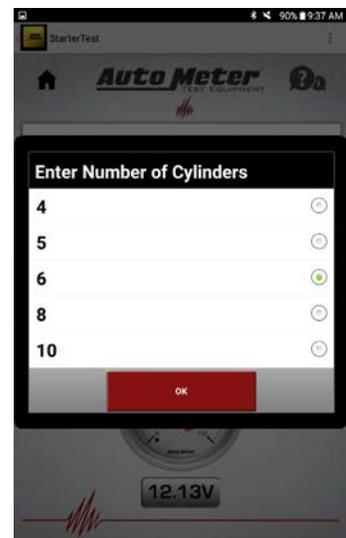
If not using Probe, skip to page 6, under heading of "Testing W/O Probe, (at step 41).

22



Follow on screen prompt, then touch OK.

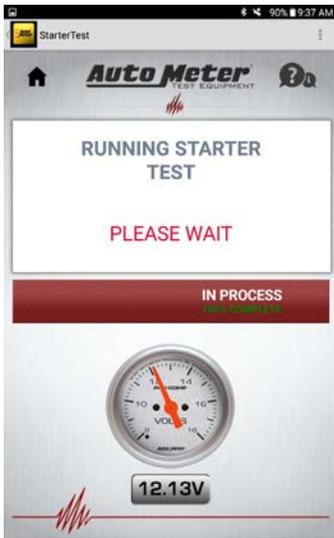
25



Choose the number of cylinders, then touch Ok.

28

FULL SYSTEM TEST



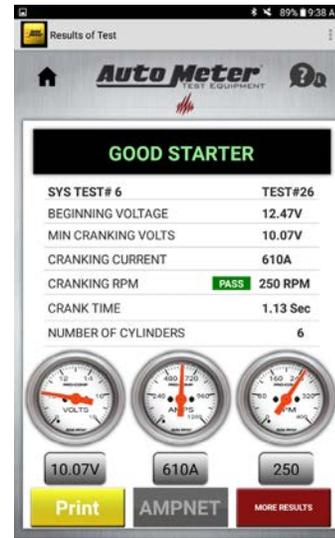
Please wait. No action needed.

29



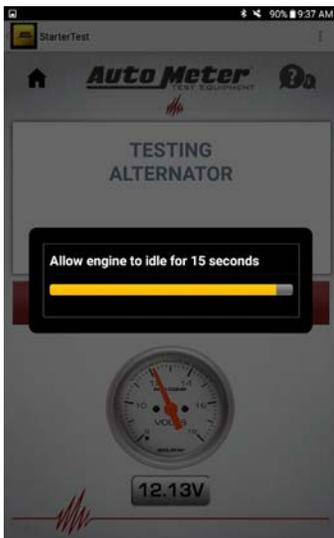
Once idling touch Ok.

32



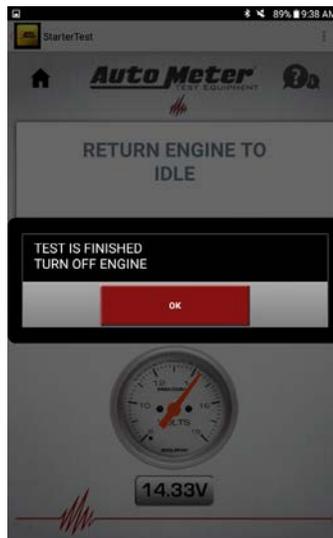
Review results, then touch MORE RESULTS.

35



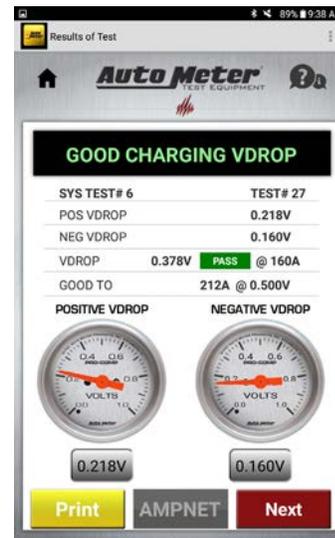
Please wait. No action needed.

30



Turn off engine then touch Ok.

33



Review results then touch NEXT..

36



Follow on screen prompt. Please wait

31



Review results then touch Ok.

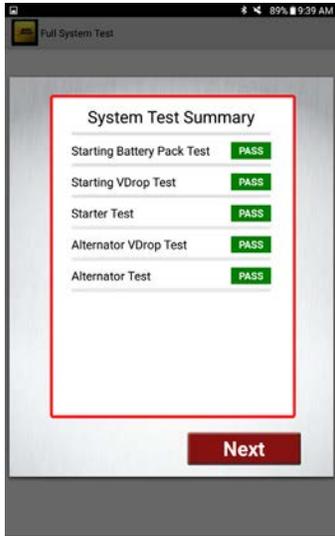
34



Review results, then touch EXIT for Summary.

37

FULL SYSTEM TEST



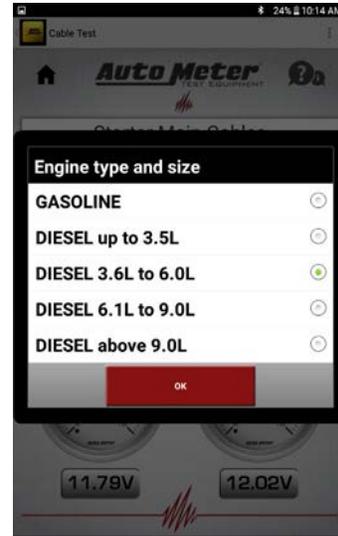
Review results, then touch Next.

38



Follow this diagram. Starter post adapters are available through Auto Meter Products for easier connections in tight areas.

40



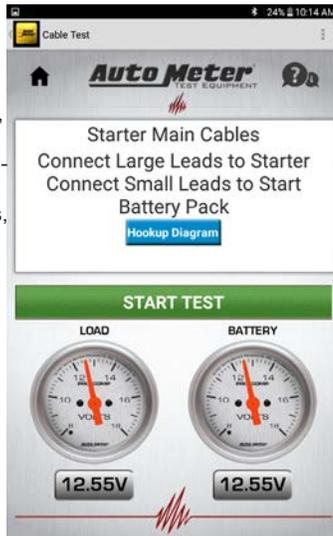
This screen will not always appear. It only appears if more information is needed for the current test.

43



Here you can check any replaced components, or add notes, then touch Done. If nothing replaced, and no notes, you can simply touch Done.

39



Both gauges will show power when connected correctly. Touch START TEST to continue.

41



With good starting VDROP (as shown), touch Next.

If failed VDROP, follow on screen prompts for retest.

44

Testing complete "With Probe". The following refer to testing W/O the current probe.

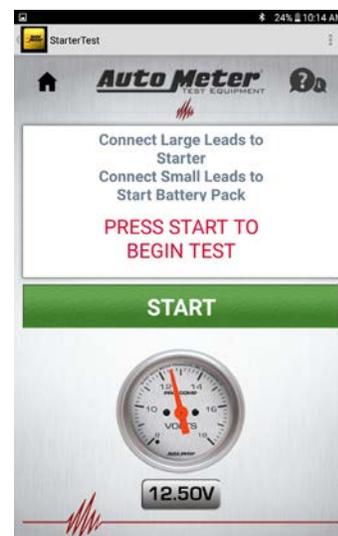
Testing W/O Probe/Amp Clamp See Below.

For testing with NO PROBE, steps 1 thru 22 remain the same (except step 5, make sure probe option is "unchecked"). We will now pick up from step 22 for NO PROBE testing.



In process, please wait.

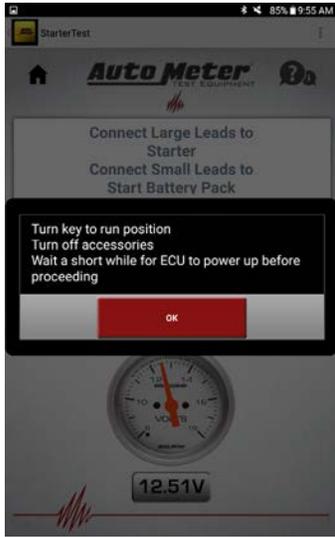
42



Touch START to begin.

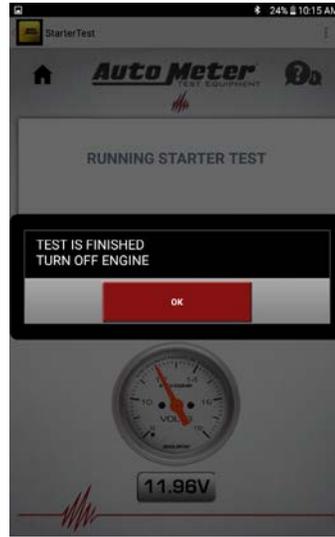
45

FULL SYSTEM TEST



Follow on screen prompt then touch Ok.

46



Touch Ok.

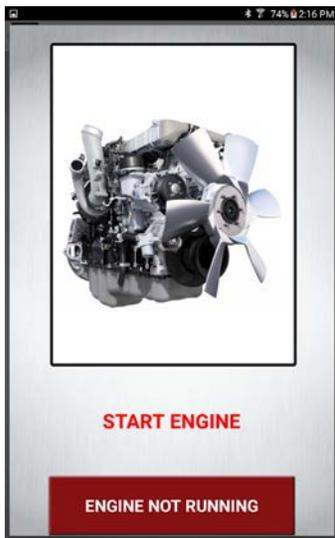
49



Follow this diagram.

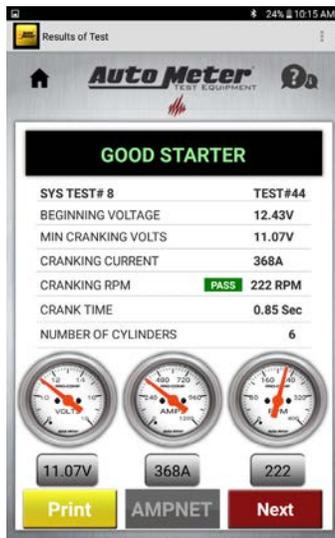
Alternator post adapters are available through AutoMeter Products for easier connections in tight areas.

52



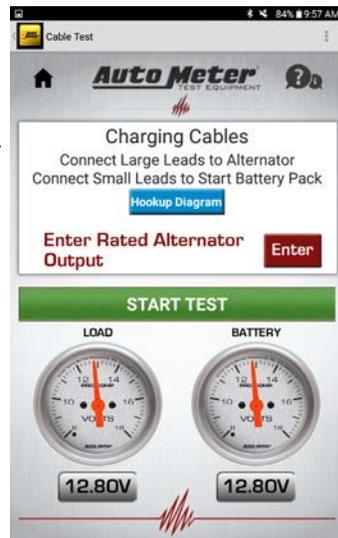
Start Engine, the tester will recognize when the engine is started.

47



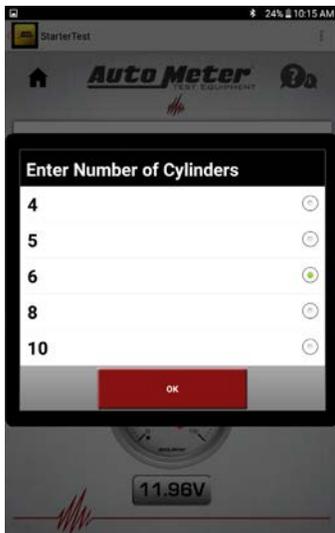
Review results, then touch NEXT to continue to Charging System testing.

50



Touch the red Enter box to enter the rated output of the alternator. Then touch Start.

53



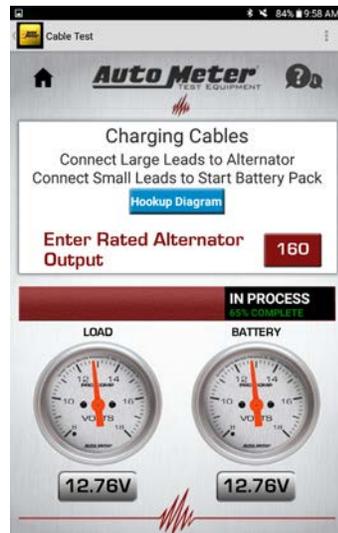
Touch the number of cylinder, then touch Ok.

48



Perform inspection, correct and found issues, check the box, then touch Ok.

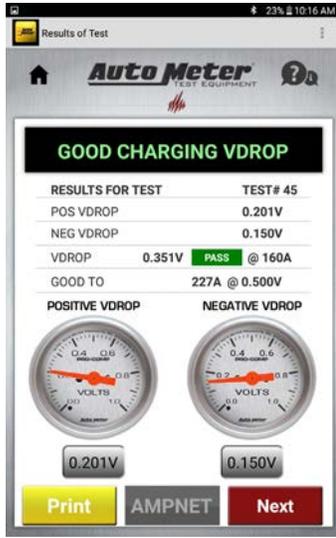
51



In process, please wait.

54

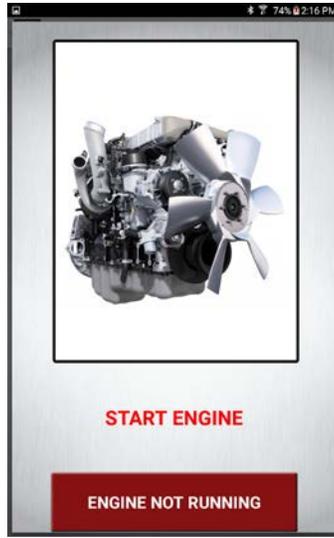
FULL SYSTEM TEST



With Good Charging VDROP (as shown), touch Next.

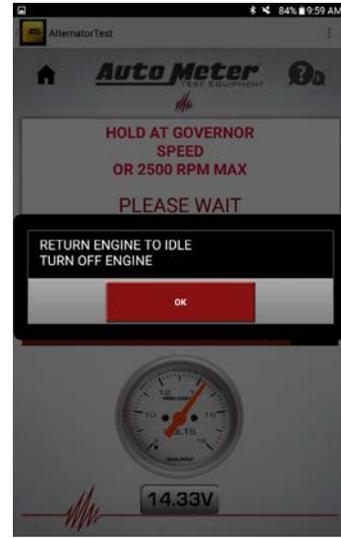
If failed VDROP, follow on screen prompts for retest.

55



Start engine as prompted.

58



Follow on screen prompts, then touch Ok.

62



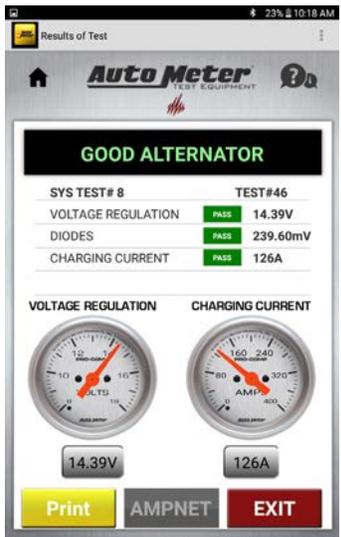
Touch START to continue

56



Press when (voltage) is stable.

59



Review results, then touch EXIT to continue to System Test Summary.

63



Please Wait.

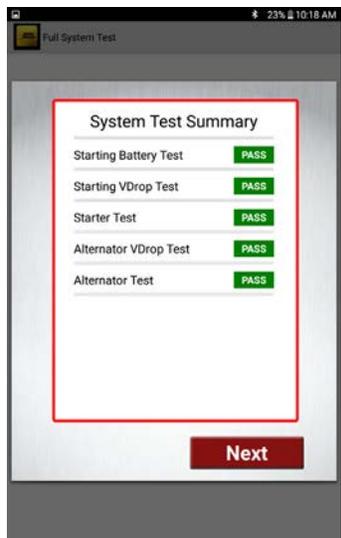
57



Follow on screen prompts.

60

61



Review results, then touch NEXT.

64

FULL SYSTEM TEST

The screenshot shows a mobile application interface for a 'Full System Test'. At the top, the status bar displays '23%' battery and '10:19 AM'. The app title is 'Full System Test'. The main screen is titled 'Parts Replaced' with the instruction 'Check All That Apply'. Under the heading 'Parts', there is a list of five items, each with a checked checkbox: 'Battery Inter-connect Harness', 'Starter Cable', 'Starter', 'Alternator Cable', and 'Alternator'. Below this list is a text input field labeled 'Other Parts Replaced - Comments' with a note '(max 300 characters)'. At the bottom of the screen are two red buttons: 'Previous' and 'Done'.

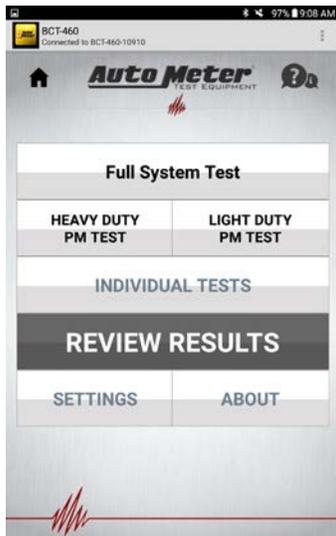
Here you can check any replaced components, or add notes, then touch Done.

If nothing replaced, and no notes, you can simply touch Done.

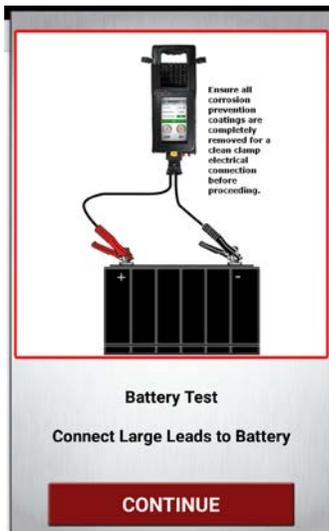
65

LIGHT DUTY PM TEST

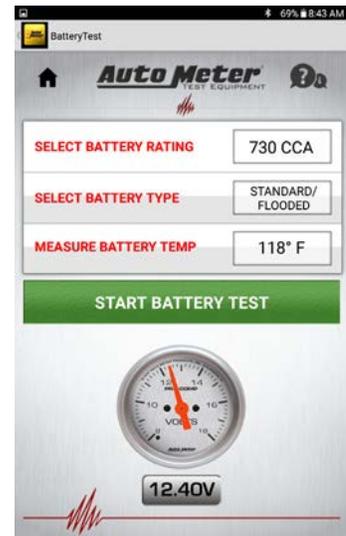
The Light Duty PM Test is a preventative maintenance test for vehicles with 1 individual battery.



From the Home screen, Touch Light Duty PM Test. This test uses no other connections, other than the main tester cables at the battery.



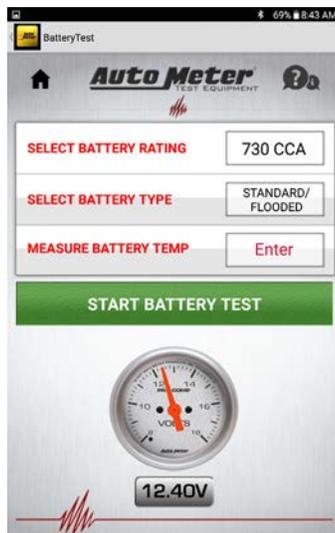
Connect the large leads/clamps, then touch CONTINUE.



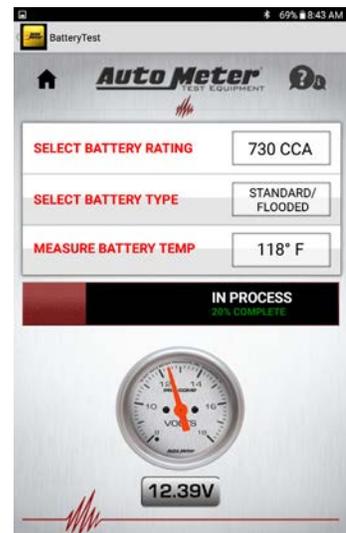
Touch START BATTERY TEST to continue.



Read Warnings, then touch OK



Enter the battery information. When you enter BATTERY TEMP, the following screen will appear.



Please wait a few moments while the battery is tested.



Enter the vehicle information, then touch OK



Aim the back of the tester Load Module at the battery for temperature reference, then touch Save.



In the event that you get any result, other than "Good Battery", you will have to make the necessary repair before you can continue. For this example, you would have to charge the battery, then retest.

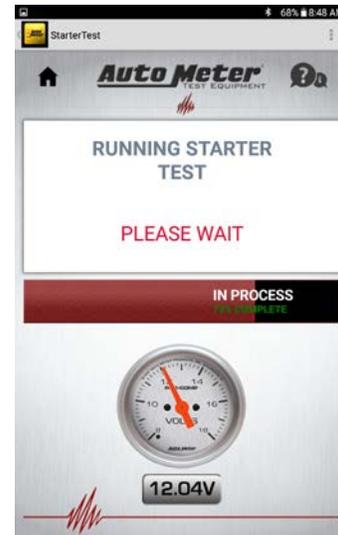
LIGHT DUTY PM TEST



Make any necessary repairs to continue. This screen will not show if the result was GOOD BATTERY.



Touch START to continue



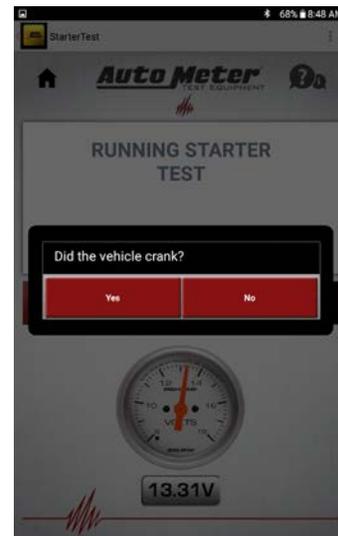
Running Starter Test.



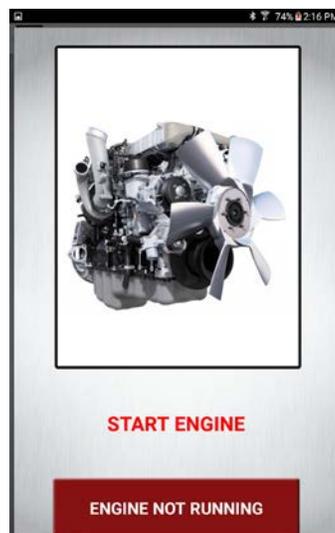
Touch PROCEED TO STARTER TEST to continue.



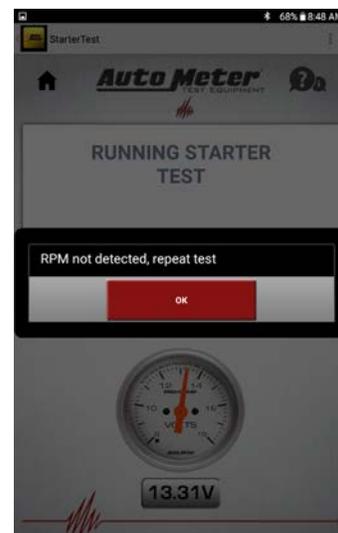
Please wait a few moments while the battery is tested.



This message (Did the vehicle crank) will pop up if the engine started too quickly for the tester to record cranking RPM.



Start the engine.



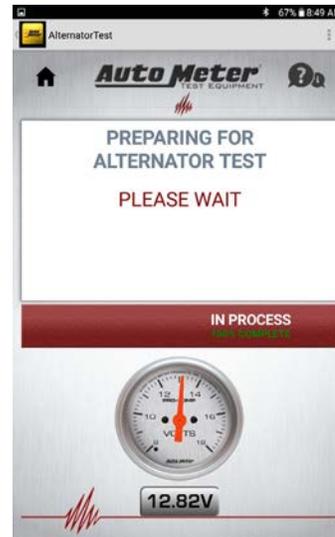
"RPM not detected". Repeat test. Should the vehicle continue to start too quickly, on gas engines you can floor the accelerator for the first second of cranking, which puts the engine into "Clear Flood Mode", which prevents the engine from starting immediately. After the 1st second, let off the accelerator, and let the engine start.

LIGHT DUTY PM TEST

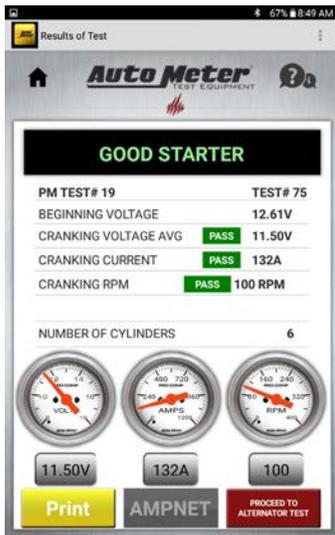


If more information is needed, this screen may appear.

Choose the number of cylinders, then touch OK.



The tester will now load the system to check the charging system.

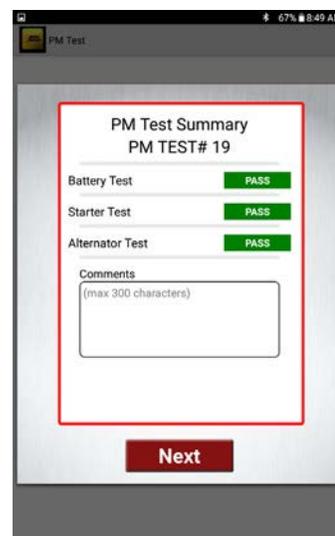


Starter test results. Touch PROCEED TO ALTERNATOR TEST to continue. Leave the engine running.



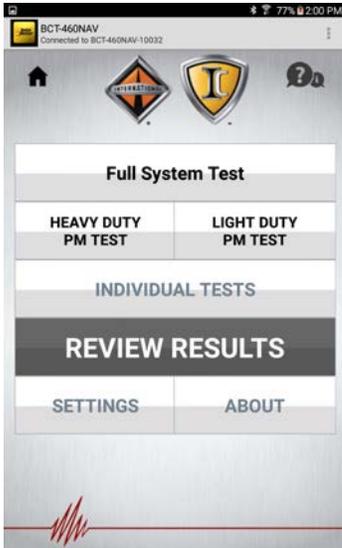
Alternator test results.

You may now shut the engine off. Touch EXIT to continue

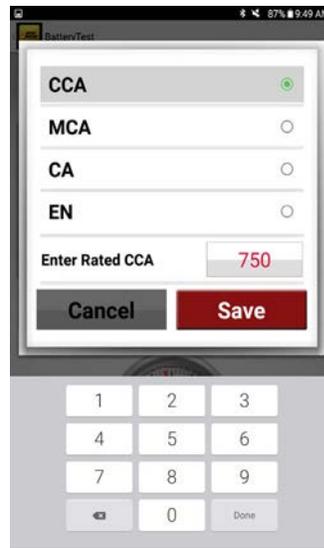


Once reviewed, touch Next, which will take you back to the Home page.

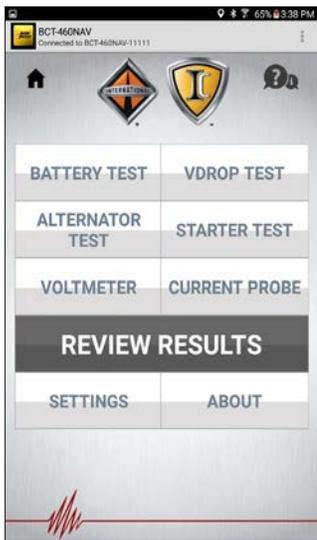
INDIVIDUAL TESTS (BATTERY TEST)



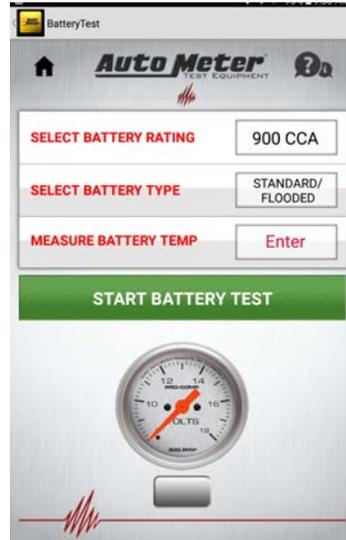
Select Individual Tests from the main menu. Then select battery test.



When the Select Battery Rating area is pressed, the battery rating type can be changed by tapping on the rating type you need. The rating can be changed by pressing Enter, then a keyboard will appear and the rating can be typed in. Press save to go back to the Battery Test screen.



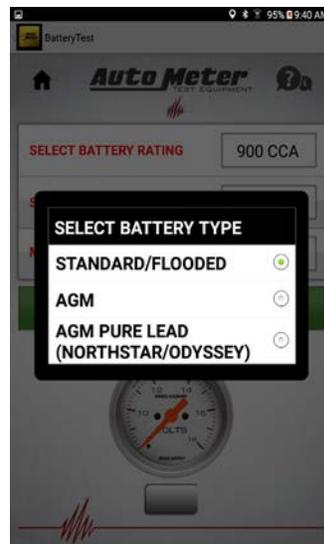
Select battery test.



The following screen will appear with default values for the the battery rating, type and temperature. These can be changed by pressing the button on the right for the value you want to change. Press the Start Battery Test when all the entries are correct and you are ready to test the battery.



Enter number of batteries in pack then touch OK.



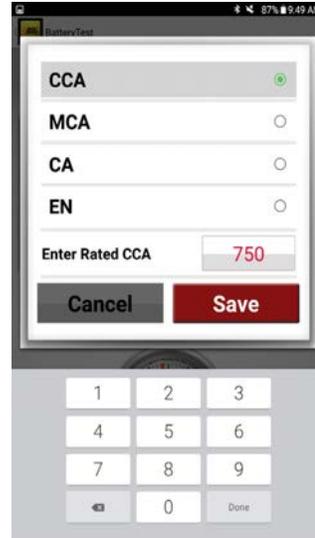
When the Select Battery Type area is pressed, the battery type can be selected. Press the battery type you are testing and the unit will go back to the Battery Test screen. The battery types the BCT-460NAV can test are Starting Standard and Starting AGM.



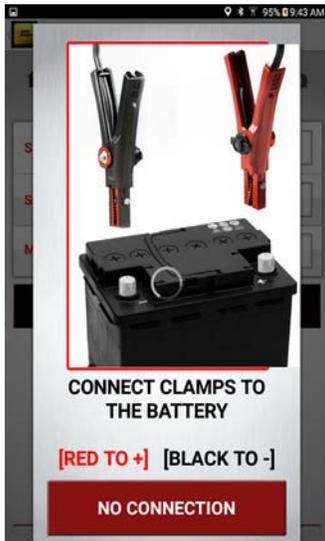
INDIVIDUAL TESTS (BATTERY TEST)



When the Measure Battery Temp area is pressed. The temperature probe screen is activated. Aim the probe at the battery from a distance of 4 to 6 inches. Press save to store the temperature reading and go back to the Battery Test screen.



The BCT-460NAV will display the progress of the battery test



If there is a connection issue the following screen will appear. Check the connections and make sure the battery post and clamps are clear of any corrosion.

These screens show the results the BCT-460NAV will return after a battery test. The information shown is test number, measured capacity, rated capacity, the state of health and the battery's initial voltage. All tests are saved internally in the BCT-460NAV.



If the engine is running the charging system will affect the battery test. The BCT-460NAV will detect that and prompt you to shut off the engine before running the battery test.



The battery passed the test and can be returned to service.



The battery passed the test but had a low initial voltage. Charge the battery and then return to service.



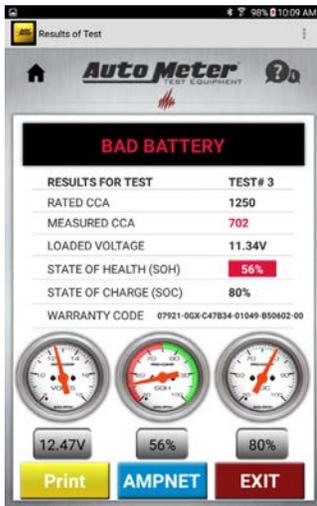
INDIVIDUAL TESTS (BATTERY TEST)



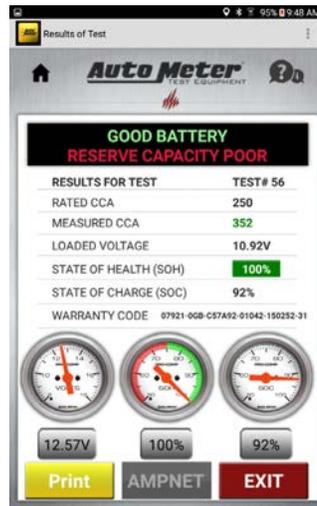
The battery passed the test, but is near its end of life. The battery is OK for mild conditions, but may not start a vehicle in hot or cold conditions.



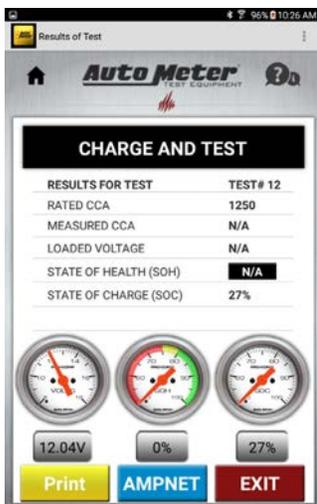
The battery did not have a sufficient charge to do an accurate test. Charge the battery and then test the battery.



The battery did not have sufficient remaining capacity to pass the test. The battery should be replaced immediately.

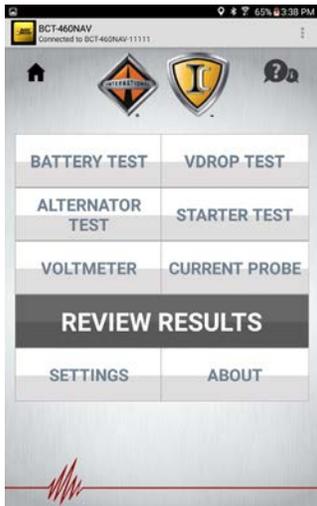


Good battery, though it failed Reserve Capacity Test. Reserve Capacity is an option that can be turned on or off in settings.



The battery did not have sufficient remaining capacity to pass the loaded portion of the test. The battery should be replaced immediately.

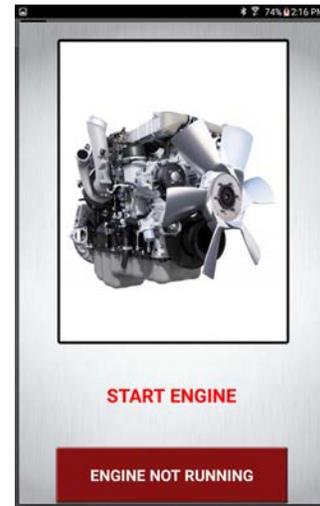
INDIVIDUAL TESTS (STARTER TEST W/O PROBE)



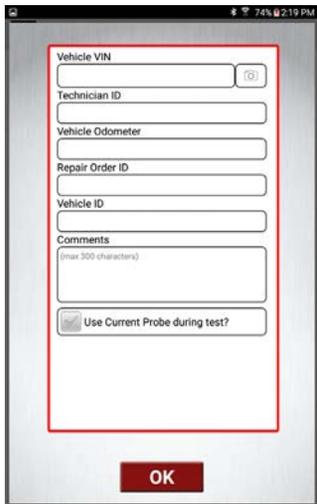
From home screen, touch Starter Test.



Connect as shown.



Start the Engine



Leave box "unchecked" regarding use of probe, then touch ok.

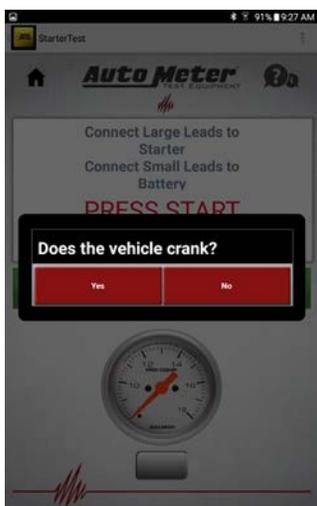


Press the Start key to begin the test. The unit will take some preliminary measurements.

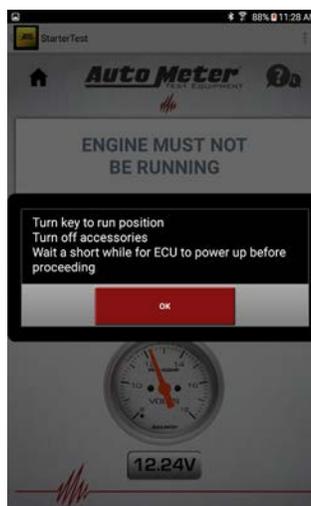


The BCT-460NAV will monitor the starter current and voltage while the engine is cranking.

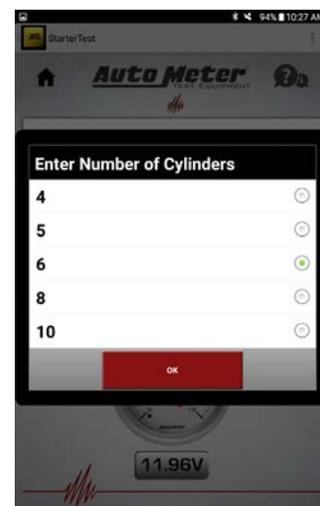
The BCT-460NAV will use the logged data to determine the current, cranking current, cranking voltage, cranking time, and cranking RPM



The BCT-460NAV will ask if the vehicle cranks.



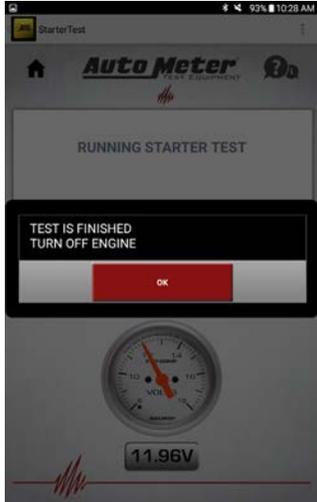
Turn the key to the run position. Wait for the ECU to power up.



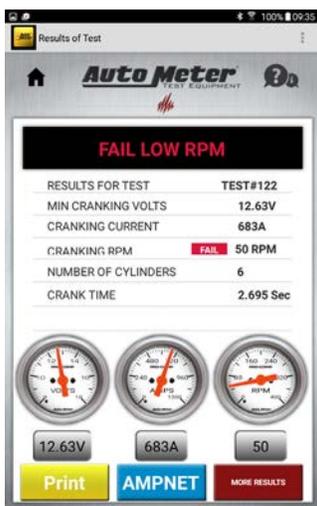
If the engine starting RPM was detected, the BCT-460NAV will ask how many cylinders the engine has to determine the starting RPM. If not then the BCT-460NAV will ask the user to repeat the test.



INDIVIDUAL TESTS (STARTER TEST W/O PROBE)

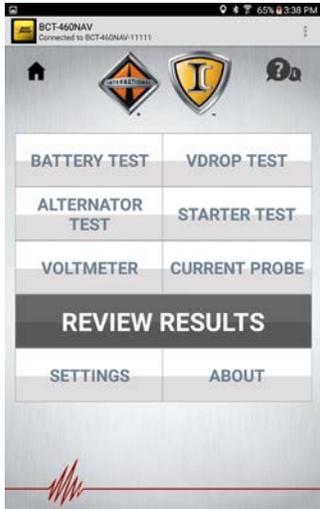


Good Starter.

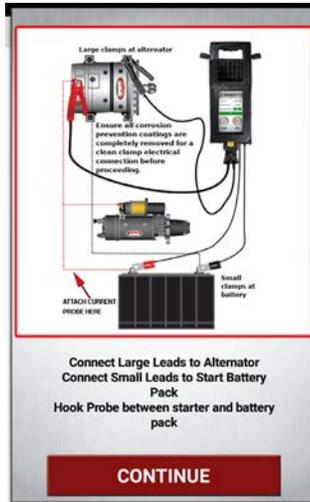


Failed Starter

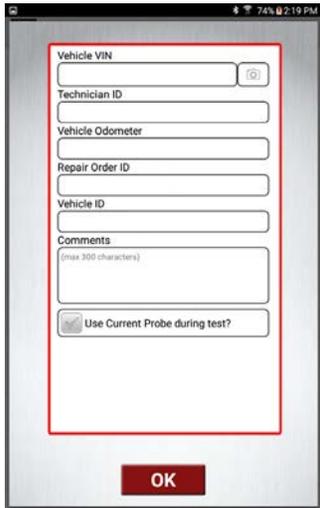
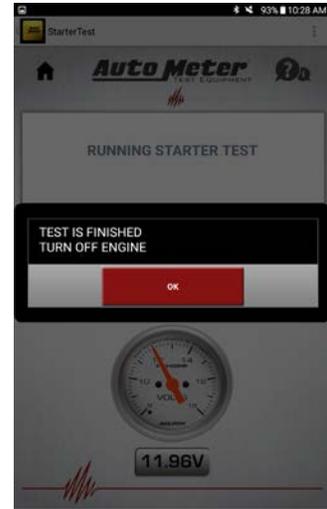
INDIVIDUAL TESTS (STARTER TEST W/PROBE)



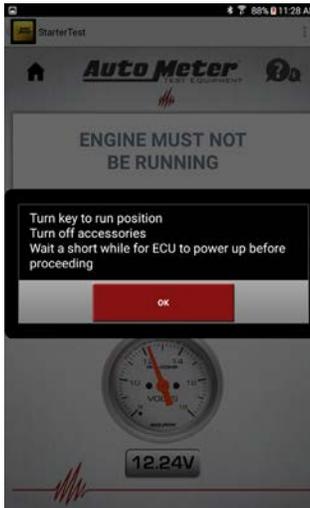
From home page touch Starter Test.



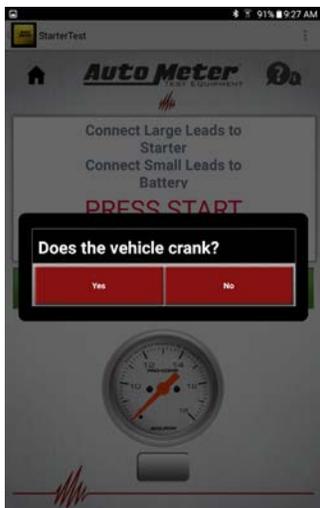
Connect as shown.



Be sure check box is "checked" then touch ok.



Turn the key to the run position. Wait for the ECU to power up.



The BCT-460NAV ask if the vehicle cranks.



Start the Engine

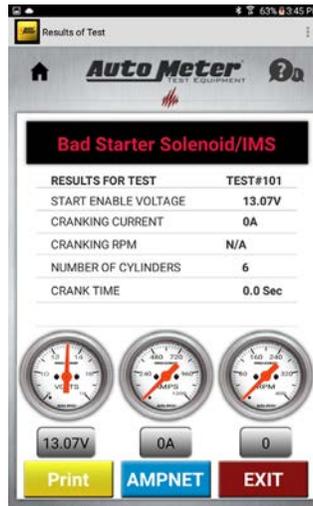


INDIVIDUAL TEST (Starter Test)

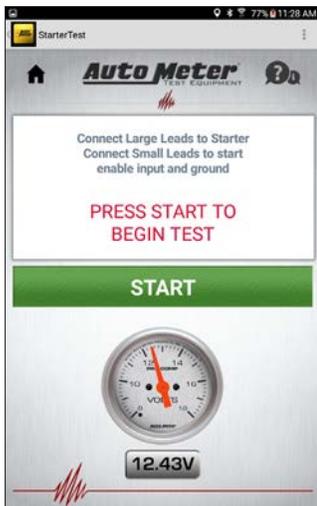
No Crank Situation



The BCT-460NAV will show the user how to connect large red clamp to starter positive. Connect large black clamp to starter ground. Connect small red clamp to start enable input. Connect small black clamp to starter ground.



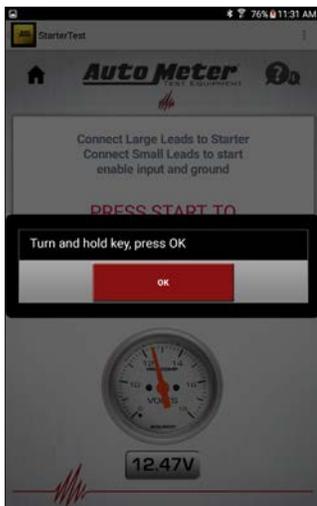
This test will determine whether the problem is with the starter.



Press the Start to begin the test.



Or whether the problem is the start enable circuit.

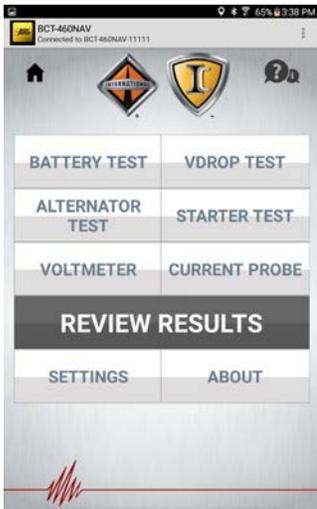


The BCT-460NAV will prompt you to turn and hold key. Press OK while holding key.

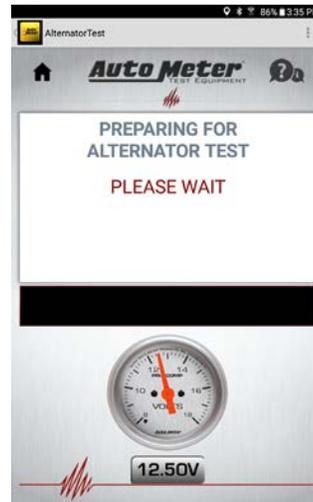
Note: Voltage of 8V or greater at the start enable input points to trouble with the starter. Otherwise there is trouble with the start enable circuit.



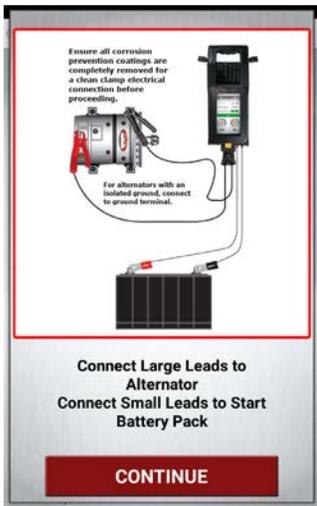
INDIVIDUAL TEST (Alternator Test)



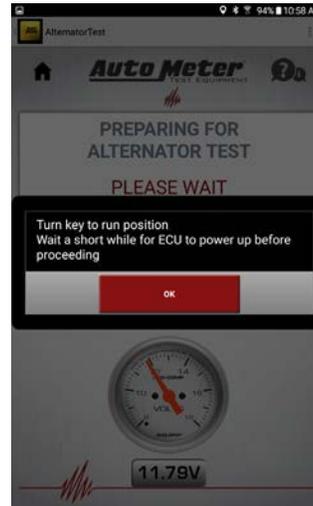
From the home screen, touch Alternator Test.



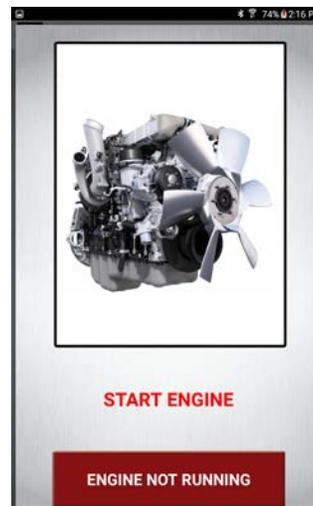
The BCT-460NAV will make some preliminary measurements to prepare for the alternator test.



Connect as shown.



Touch Enter, then Enter the rated alternator output. Press START to continue.



Start the Engine



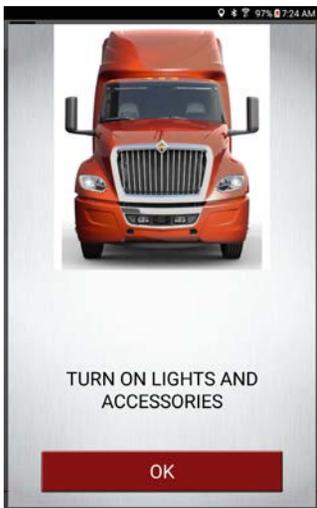
INDIVIDUAL TEST (Alternator Test)



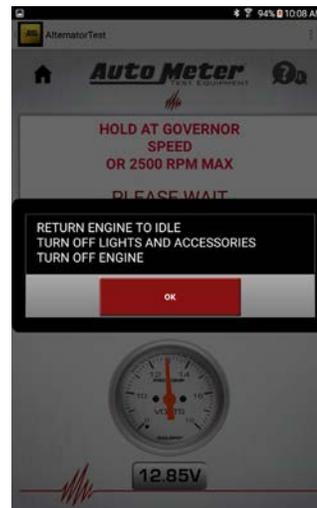
The BCT-460NAV will instruct the user to hold the engine RPM at 1000 and wait for the voltage to stabilize. The user then can press the button when the voltage is stable



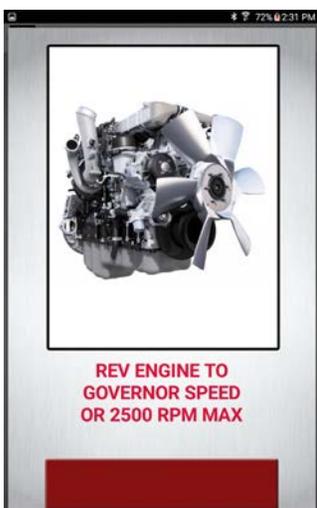
While the engine is at governor speed the unit will look for low and high regulation and measure the output current and the ripple.



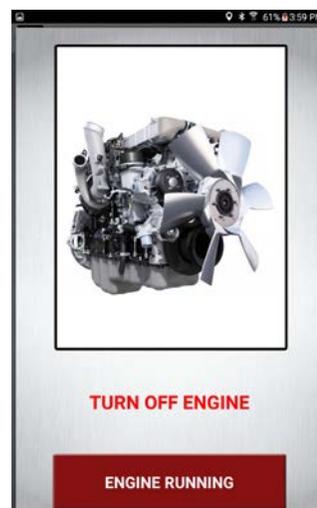
If the BCT-460NAV determines that more loads are needed to fully test the alternator, it will ask the user to turn on the loads such as the headlights and fans. If the loads are OK the the unit skips this screen and proceeds to the governor speed portion of the test.



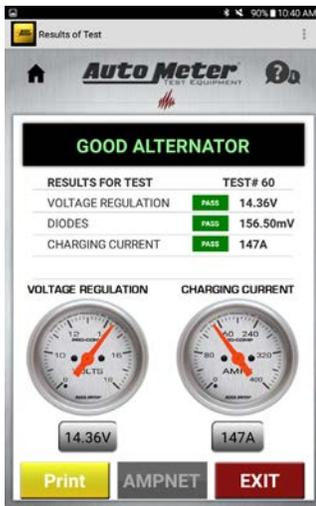
When the test is complete the BCT-460NAV will instruct the user to return to idle. If loads were requested to turn on, this screen will remind the user to turn them off.



The BCT-460NAV will instruct the user to rev the engine to governor speed and hold it there.



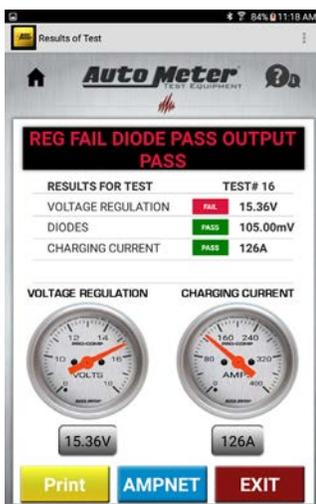
INDIVIDUAL TEST (Alternator Test)



The results of the test will be displayed. Any failure will be highlighted in red.



If the alternator fails due to high voltage regulation and it has remote sense the BCT-460NAV will instruct the user to disconnect the remote sense wire and repeat the governor speed test. If the alternator fails for low voltage regulations high ripple voltage, or low output current, the user will be directed to repair the alternator

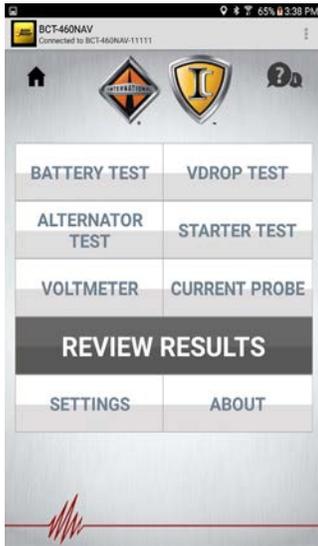


Example of too high regulation fail.

VOLTAGE DROP TEST (Starter Cable Test)



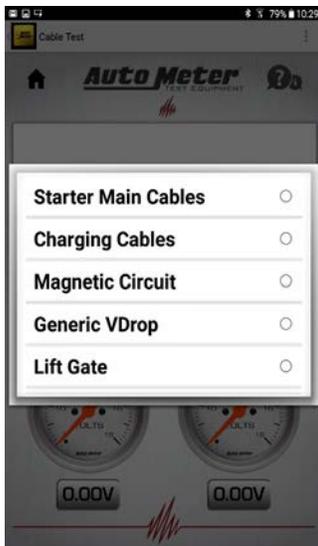
The voltage drop test allows you to measure the voltage drop across both the positive and negative cables running from the battery to the starter and alternator or any other device within your vehicle. This test can be used to determine if the cables or connections are the cause of any problems.



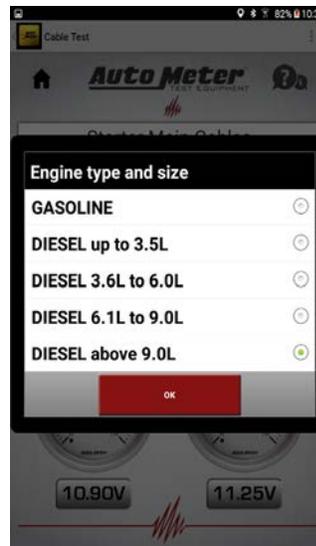
Select individual tests, then select the V DROP Test from the main menu.



Once connections are made press START TEST to initiate test.



Select Starting Cable Test.



If measured voltage drop is greater than 550mV you will be asked to choose engine type and size.

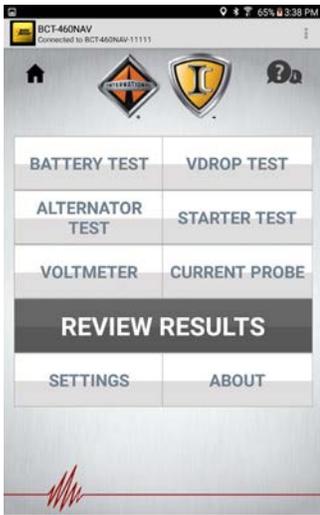


The screen will show you where to make your connections. The large clamps need to be connected to the starter terminals. The red clamp to the starter positive terminal, black to the starter ground. The small clamps need to be connected to the battery posts. The small red clamp to the battery +, the small black clamp to the battery -.



If the combined voltage drop of the positive and negative circuit is less than the allotted value found in the RP129B specification for the type and size of engine, the voltage drop test passes. If the voltage drop test fails you should start by troubleshooting and repairing the side of the circuit with the highest voltage drop.

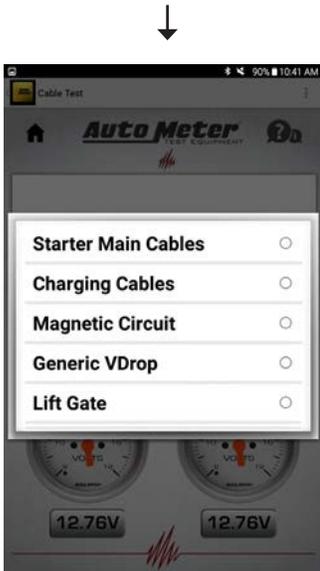
VOLTAGE DROP TEST (Charging Cable Test)



Select individual tests, then select the V DROP Test from the main menu.



To set the test current, press the Test current box and a numeric keypad will appear. Enter in the alternator output for the vehicle you are testing. Press the Done button and then press the Start Test button.



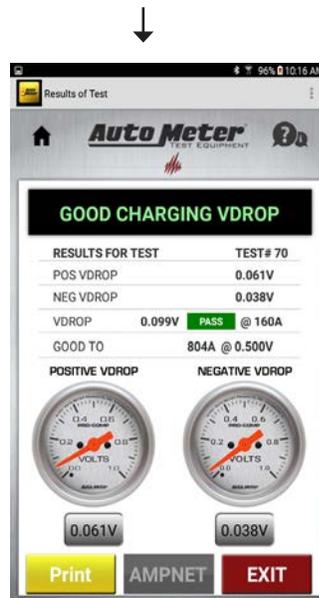
Select Charging Cable Test.



Test in process, please wait.

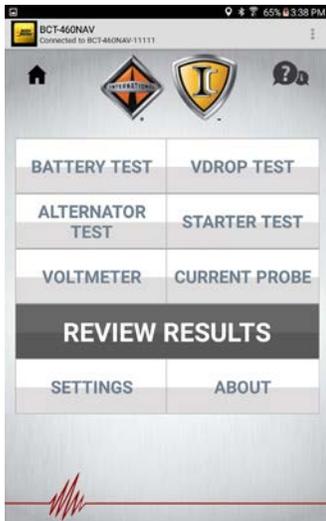


The screen will show you where to make your connections. The large clamps need to be connected to the alternator terminals. The red clamp to the alternator positive terminal, black to the alternator ground. The small clamps need to be connected to the battery posts. The small red clamp to the battery +, the small black clamp to the battery -.

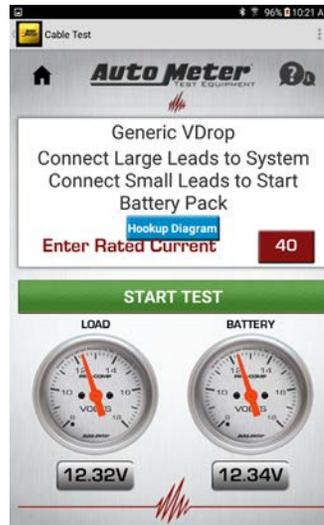


If the combined voltage drop of the positive and negative circuit is less than 500mV, the voltage drop test passes. If the voltage drop test fails you should start by troubleshooting and repairing the side of the circuit with the highest voltage drop.

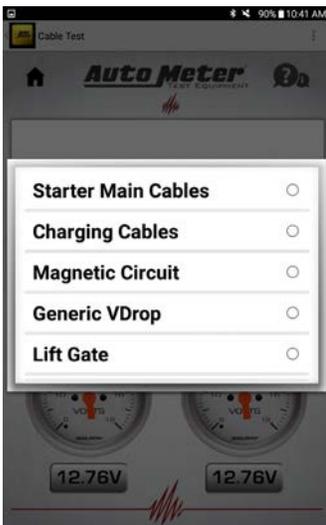
VOLTAGE DROP TEST (Generic Cable Test)



Select individual tests, then select the V DROP Test from the main menu.



To set the test current, press the Test current box and a numeric keypad will appear. Enter in the test current for the circuit you are testing. Press the Done button and then press the Start Test button.



Select Generic Cable Test.



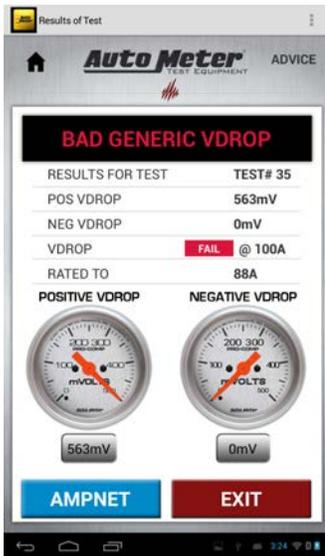
Test in process, please wait.



If you are doing a generic test, the screen will tell you to make your connections. The large clamps need to be connected to the end of the cables you are testing. The red clamp to the positive end, black to ground. The small clamps need to be connected to the battery posts. The small red clamp to the battery +, the small black clamp to the battery -.



VOLTAGE DROP RESULTS



If the voltage drop is high the test will return a bad result. The cable that is bad can be determined by looking at the POS and NEG drop results. In this screen the positive cable is the problem.

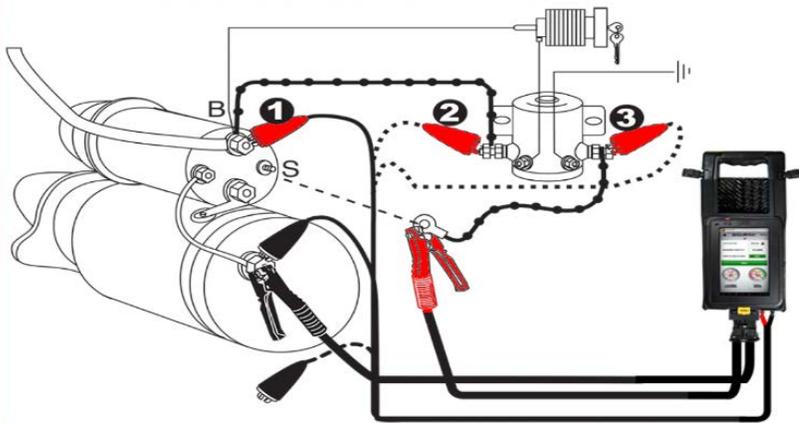


If the combined voltage drop of the positive and negative circuit is less than 500mV, the voltage drop test passes. If the voltage drop test fails you should start by troubleshooting and repairing the side of the circuit with the highest voltage drop.

NOTE: If a total system voltage drop greater than 500mV is measured, the BCT-460NAV will show a failed voltage drop test.



MAGNETIC CIRCUIT TEST



The Magnetic switch circuit supplies a path for current to the coils of the starter solenoid with minimum voltage drop. The Magnetic circuit is indicated by the dotted line on the illustration to the left. The Magnetic circuit test is designed to test the voltage drop of this circuit. It has three steps. If it passes the first test the whole circuit passes and there is no need to continue. If the first test fails the next two tests are completed to obtain results of each leg and the magnetic switch itself. The Magnetic switch is energized by the ignition switch in each test. For safety, disconnect the negative cable from the battery.

USING THE OPTIONAL CURRENT PROBE

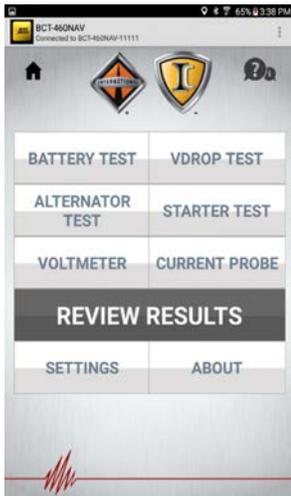


The Current Probe is optional. This section explains the proper use of the Current Probe, but is not required to run any of the tests. It only provides assured accuracy for those wanting these results.

When the probe is not clamped around a cable push and turn to Zero the current probe.
(IC-1/IC-20 Only)

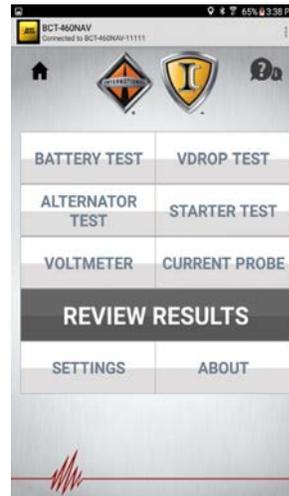


Voltmeter



To use the Voltmeter function, press the Voltmeter button on the Main Menu.

Current Clamp



Select individual tests. To use the Current Probe to measure current going through a cable, Press the Current Probe button.



This screen will appear and show the DC voltages on the large and small clamps. If the engine is running the ripple (AC Voltage) will be measured and displayed.



This screen will appear and display the measured DC current. On IC-1/IC-20 use above procedure to Zero the probe, then perform "Final Zero" using the on screen function. IC-4 uses on screen function only.

TROUBLESHOOTING



| PROBLEM | SOLUTION |
|--|--|
| BCT-460NAV Does Not Read Battery Temperature | <p>This is most commonly due to the LM (load module) not powered on, or a loss of BlueTooth connection between the CM (control module/Tablet) and LM.</p> <ol style="list-style-type: none"> 1) Make sure the LM is powered on & charged. Observe the LED indicator. If the indicator is not lit, push and release the LM button to “wake up” the LM. 2) If the LM does not wake up, has it been charged recently? If not, charge the unit, and try again. 3) If the LM has been charged, try a reset of the LM, by pushing and holding the LM power button for 3 to 4 seconds, then release the button. 4) If the LM does have a lit LED indicator, observe the CM, and in the upper left corner of the screen, look to see if it says “not conencted”, or “connected”. If not connected, and the LM is on, then push & hold the button on the side of the CM for a few seconds until a menu pops up for “power off, airplane mode, restart”. Choose “Restart”. Allow the unit to Restart, and verify that the LM is indeed on. The CM should reconnect to the LM during power up, after just a few seconds. 5) Should all of the above steps fail, verify that the correct CM is “paired” to the matching LM (if there are more than 1 unit in use). Also, make sure the unit has not “lost its pairing” with the LM. To do this, touch the 3 dots in the upper right corner of the screen to open the drop-down menu. Touch BLuetooth Settings. In the upper portion of the screen, it will show “Paired Devices”. The paired device number should match the identification lable on the LM. If the CM is not paired to anything, midway down the screen it will show “Other Available Devices”, with a list. Choose the item that matches the LM module, then touch “Pair”. |
| BCT-460NAV Status LED Indicator Meaning | <p><u>Blinking Red</u>: Indicates that the Control Module (CM) is charging.</p> <p><u>Solid Red</u>: Indicates that the Load Module (LM) is charging, or the LM and CM are both charging.</p> <p><u>Double Blinking Green</u> (Heartbeat pattern): Indicates that the CM is awake and connected via Bluetooth to the LM.</p> <p><u>Solid Green</u>: Indicates that the LM is awake, and the CM not (bluetooth) connected. Most commonly, this will happen when the CM is “asleep”, and when you wake up the CM, by pushing the side button, it will then connect via Bluetooth to the LM, and the solid green will turn to the double (heartbeat) type of flashing green. The solid green will also happen when the LM is fully charged, and the CM is asleep. If charging, the indicator will be solid Red.</p> <p><u>Solid Yellow</u>: Indicates the CM and LM are connected and are busy taking electrical system measurements.</p> <p><u>No LED Illumination</u>: Indicates that the LM is powered off. If the LM is not placed in the charging station and the large clamps are not connected to a 12 V source, the LM will automatically power off in about 2 minutes to conserve battery life. The LM can be turned on by pressing the power button located on the LM under the CM. The LM can also be powered by connecting the LM large clamps to a 12 V source. The LM will also automatically turn on when placed in the charging station.</p> |
| Battery Voltage Too Low For Test | <p>If you get this message, and the on-screen voltmeter is showing exceptionally low voltage, yet the vehicle starts ok, check to be sure the main cables of the tester are securely connected, and connected to clean terminals. A poor connection can trigger this message.</p> |
| Connect Clamps to the Battery | <p>If you get this message, and the on-screen voltmeter is showing exceptionally low voltage, yet the vehicle starts ok, check to be sure the main cables of the tester are securely connected, and connected to clean terminals. A poor connection can trigger this message.</p> |
| Cranking current not detected | <p>If using the current probe, and this message pops up, this is most likely due to improper location of the current probe installation. It must be on the positive cable between the battery pack, and the starter.</p> |

TROUBLESHOOTING

| | |
|---|---|
| The Control Module will not turn on due to a completely discharged Control Module battery | On the Control Module (CM), hold the power button for at least 5 seconds. If the CM still does not turn on, place the CM into the Load Module. Place the entire unit into the wall mounted charging station, and look for the Load Module's LED to go to a solid, or blinking red. Let the CM & LM charge for at least 3 hours. |
| The Load Module LED is off. | Remove the CM, and press the LM button for 1 second, and release. The LED should turn red for about a second, then turn green. If the LED still does not turn on, the LM battery may need to be charged. Reinstall the CM onto the LM, and place the entire unit into the wall mounted charging station. The LED on the LM should turn on, to a solid red while charging. Let the unit charge for at least 3 hours. |
| To power the Control Module on while the Control Module is charging | Press & hold the power button until the Samsung Splash screen appears. A few seconds later, a battery outline will appear on the screen. When it does, press and hold the power button while the battery outline is visible. Once the battery outline goes away, release the button. The Samsung Splash screen will appear, and the CM will continue to boot. |
| The Control Module will not make a Bluetooth connection to the Load Module | Please see BCT-460NAV does not read battery temperature, earlier in this Troubleshooting guide. |

Replacement Parts & Accessories

- AC-31 Group 31 Battery Adapters
- AC-90 Charging Station
- AC-94 20' External Voltage Leads
- AC-95 45' External Voltage Leads (These were not originally included with the BCT-460NAV, but are available if long voltage drop leads are needed).
- AC-98 Starter Adapters
- AC-102 Alternator Adapters
- AC-105 Large Replacement Leads and Clamps
- AC-107 Adapter Kit with Storage Bag (Includes the AC-31, AC-98, and AC-102 adapters)
- AC-108NAV Replacement Control Module
- AC-111 Replacement Wall Charger (Plugs directly into the Load Module)
- AC-112 Replacement Wall Charger for the AC-90 Charging Station
- AC-113 Replacement Load Module Battery

LIMITED WARRANTY



12 MONTHS FROM DATE OF PURCHASE

The manufacturer warrants to the consumer that this product will be free from defects in material or workmanship for a period of twelve (12) months from the date of original purchase. (90 days for cables and clamps).

Products that fail within this 12 month warranty period will be repaired or replaced at the manufacturer's option to the consumer, when determined by the manufacturer that the product failed due to defects in material or workmanship. This warranty is limited to the repair or replacement of parts and the necessary labor by the manufacturer to effect the repair or replacement of the product. In no event shall the manufacturer be responsible for special, incidental or consequential damages or costs incurred due to the failure of this product.

Improper use, accident, water damage, abuse, unauthorized repairs or alterations voids this warranty. The manufacturer disclaims any liability or consequential damages due to breach of any written or implied warranty on its test equipment.

WARRANTY AND SERVICE INFORMATION

Warranty claims to the manufacturer's service department must be transportation prepaid and accompanied with dated proof of purchase. This warranty applies only to the original purchaser and is non-transferable. Shipper damage incurred during return shipments is not covered under this warranty. It is the responsibility of the shipper (the customer returning the Test Equipment) to package the tester properly to prevent any damage during return shipment. Repair costs for such damages will be charged back to shipper (customer returning the Test Equipment). Protect the product by shipping in original carton or add plenty of over-pack cushioning such as crumpled up newspaper.



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