

Remy

®

With PM TEST
AGM Compatible

U.S. Patent No.

6,061,638

6,359,442

D442,503

6,771,073

VDROP is a
trademark of
Auto Meter Products



Engineered &
Manufactured by



BCT-200J Instruction Manual

**Battery Load, Charging System, Starting System and
Voltage Drop Tester for Truck Maintenance
Optional J1708 Hookup**

Complement your battery testing with complete system test including a voltage drop test that measures the voltage drop of the starting and charging circuit. The BCT-200J is automated and menu driven with simple hook-up methods for testing the negative and positive legs in one operation. Special tests are included for the magnetic switch circuit.

CONGRATULATIONS!

You have purchased one of Auto Meter's hand-held Voltage Drop Analyzers. It is designed to test each circuit of a trucks starting and charging circuit with speed and accuracy. If you should have any questions about your tester or the testing procedures please see back cover for contact information.

BCT-200J

Test Capacity	120 Amp algorithmic load
Battery sizes	200-1600 CCA
Digital Display with backlight...1" x 2.5" - 4 line x 16 character	
Volt Ranges.....	Digital 0-40V
Cooling.....	Vented
Load Clamps	4 ft., 6 Gauge
External Leads	20ft 16 Gauge
Size	6" x 9 1/2" x 1 7/8"
Memory	stores the last 80 tests
Internal Battery.....	9 Volt Alkaline
Post Adapter Kit	For group 31 batteries
<i>Optional AC-25</i>	6 pin to 9 pin J1708 Adapter
<i>Optional AC-26</i>	J1708 Cable
<i>Optional PR-15</i>	Infrared printer
<i>Optional AC24J</i>	carrying case
<i>Optional AC-10</i>	PC Interface adapter cord
<i>Optional AC-27</i>	Alternator Adapters
<i>Optional AC-35</i>	PC download program
Weight.....	4.27 lbs.

What to Expect from the BCT-200J:

Immediately recognize a bad battery. Also perform a complete voltage drop test analysis on 12 and 24 Volt systems. Load test 12 Volt batteries, load a 12 Volt alternator and do a check on a 24 Volt alternator. The BCT-200J is a portable full-featured menu-driven battery tester and voltage drop tester that provides quick, professional load results using Auto Meter's advanced algorithmic load. The BCT-200J has the option of using a J1708 cable. It is professionally accurate and detailed test results are LCD displayed after each test and can be reviewed and printed from memory.

CAUTION: The BCT-200J grill may get hot after repeated use. Be sure to hold the unit from the side grips only. Keep hands away from the grill.

SAFETY

- Carefully read all operating instructions before operating the BCT-200J
- Wear eye protection when working on batteries.
- Be sure each test is complete 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 battery.
- Keep hair, hands, and clothing as well as tester leads and cords away from moving blades and belt.
- Provide adequate ventilation to remove exhaust.
- In extremely cold temperatures check for frozen electrolyte fluid or swelled case before applying load. Do not attempt to Load Test or charge a battery under 20° F. (-7°C.). Allow the battery to warm to room temperature before testing or charging.
- **Warning!** BCT-200J can only be attached to a Delco Remy Bench Tester and used in prescribed manner. It should never be attached to any other tester or charging unit. Damage may result.



**Wear
Safety
Glasses**

WARNING!

TESTING OF HYBRID VEHICLES

DO NOT test the starter, alternator and/or 12 volt starting battery while it is in the vehicle.

DO NOT remove, service or test the hybrid battery pack under any circumstances.

Remove the 12 volt starting battery, starter or alternator from the vehicle prior to testing.

CAUSE OF BATTERY FAILURE

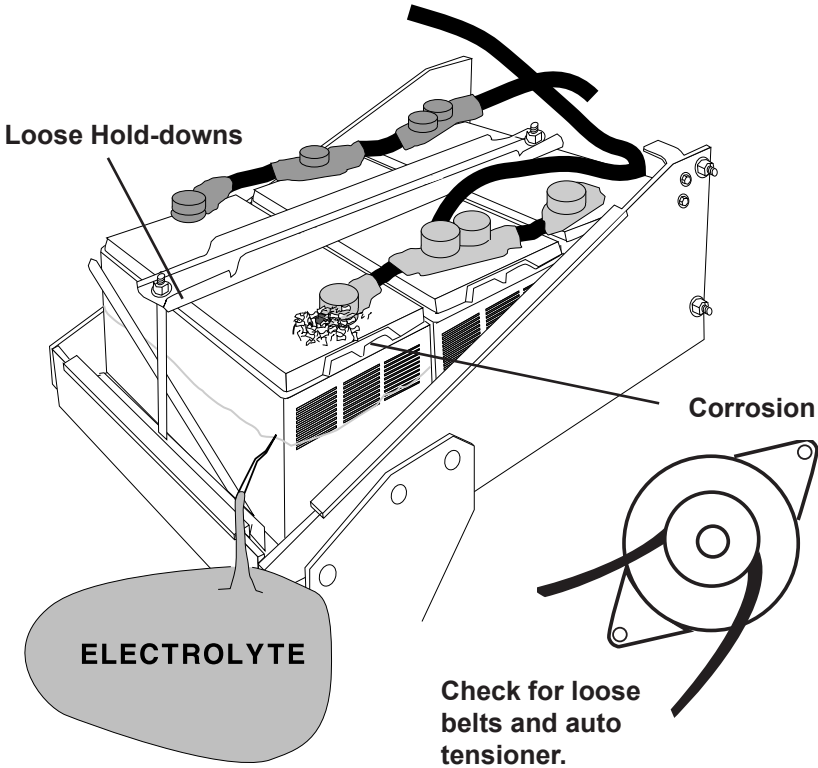
- **Incorrect Application:** Wrong size battery may have inadequate cold cranking rating for original vehicle specifications.
- **Incorrect Installation:** Loose battery hold-downs cause excessive vibration, which can result in damage to the plates.
- **Improper Maintenance:** Low electrolytic fluid and corrosion on battery connections can greatly reduce battery life and effect battery performance.
- **Internal Connections:** Make sure internal connections of entire charging system meet proper specifications.
- **Age of Battery:** If the date code on the battery is old, test failure may indicate the need of replacement.
- **Overcharging:** Overcharging caused by a high voltage regulator setting or incorrect battery charging can cause excessive gas, heat and water loss.
- **Undercharging:** Undercharging caused by a faulty charging system or low voltage regulator setting can cause lead sulfate to gradually build up and crystallize on the plates, greatly reducing the battery's capacity and ability to be recharged.
- **Cycling:** Excessive drain on battery when alternator is not operating.

INSPECTION

Valid automotive 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 before attempting electrical diagnosis.

VISUAL CHECK

- **Inspect Battery** for terminal corrosion, loose broken posts, cracks in the case, loose hold-downs, low electrolyte level, moisture, and dirt around the terminal.



- **Important Note:** *A known defective battery must be replaced before proceeding with any test on the charging or starting system.*
- **Inspect Belts** for cracks, glazed surface and fraying. Tighten loose belts. Inspect auto-tensioner for proper belt tension.
- **Inspect Starting System.** Check starter, solenoid, and alternator for loose connections, loose mounts and frayed or cracked wires.

CONTROLS AND FUNCTIONS

LCD:

Displays menus and test results.

KEYS:

When each key is pressed, a beep sounds to assure contact has been made.

On/Off Key:

This is the manual on/off key.

Y Enter Key:

This key selects the next menu, the cursor line item and answers 'yes' to a test progression.

+Up Key:

This key moves the cursor up in order to select a menu line item. It also increments a value.

-Down Arrow Key:

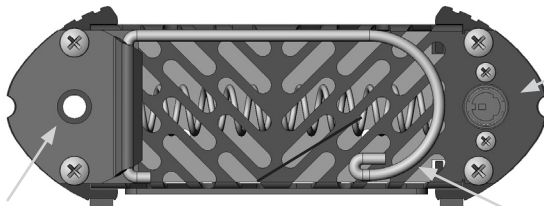
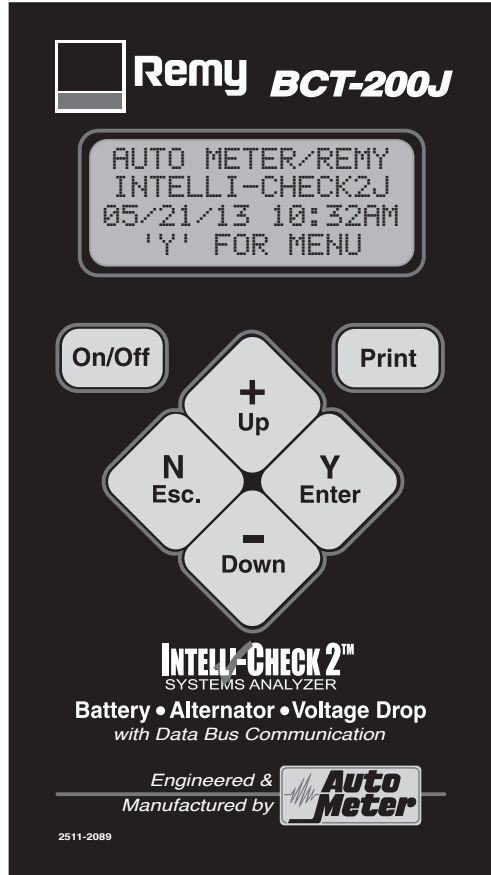
This key moves the cursor down in order to select a menu line. It also decrements a value.

N Esc Key:

This key cancels a test or progression. It also returns to the previous menu.

Print Key:

When the BCT-200J is pointed toward or at the optional PR-15 printer, pressing the print key will cause the test results to be printed.



J1708 and PC Download Jack:
Adapter cord inserts here.

Infrared Print Light:

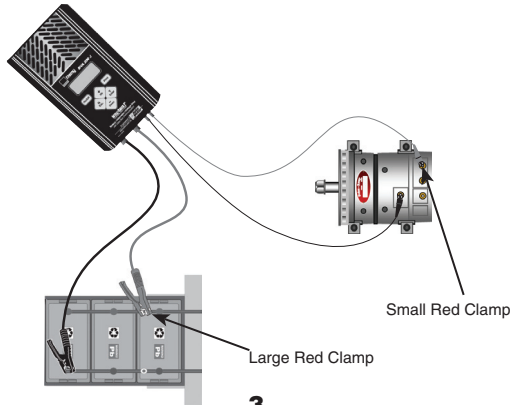
Data is sent to the infrared printer when the print button is pressed.

Retractable Hanging Hook:

Hang unit at various points to free hands for clamp attachment.

1 PM TEST

The PM Test should only be used during a time when the vehicle is in the shop for a PM Service, NOT when the vehicle is having electrical system issues. For a vehicle with a suspected electrical problem use the individual tests starting with the batteries, then the cables, and finally the alternator or starter.



1. AUTOMETER/REMY INTELLI-CHECK2J 05/21/13 'Y' FOR MENU
2. >PM TEST BATTERY TEST BATTERY BANK V DROP MENU
3. >ENTER NUMBER OF BATTERIES: 4 USE +/- 'Y' TO CONTINUE
4. [Empty screen]
5. >BANK MUST BE STABILIZED FOR VALID RESULTS 'Y' TO CONTINUE
6. >ENTER BATTERY TEMP: 40F 12.89 V 'Y' TO CONTINUE
7. >ENTER BATT TYPE AGM USE +/- 12.89 V 'Y' TO CONTINUE
8. >ENTER SINGLE CCA: 700 12.89 V 'Y' TO CONTINUE
9. TESTING BANK PLEASE WAIT [Progress bar]
10. >CONNECT SMALL CLIPS TO THE ALTERNATOR 'Y' TO CONTINUE
11. LOAD BATTERY PLEASE WAIT [Progress bar]
12. >START ENGINE AND THEN REV TO GOVERNED SPEED 'N' TO CANCEL
13. TESTING STARTER PLEASE WAIT [Progress bar]
14. TESTING ALT. PLEASE WAIT [Progress bar]
15. TESTING ALT. AT GOVERNED SPEED 14.12 V [Progress bar]
16. >SET IDLE AT ABOUT 1000 R.P.M. 'Y' TO CONTINUE
17. TESTING ALT. PLEASE WAIT [Progress bar]
18. #13 PM CHECK BATTERIES: PASS STARTING: PASS CHARGING: PASS
19. #13 PM TEST GOOD BATTERIES 12.89 V CHRG 100%
20. #13 PM TEST CRANK V: 10.91 V CRANK A: 570A VDROPO500A: 0.41
21. #13 PM TEST GOOD REG: 14.09 V RIPPLE: 2.70M V

2

BATTERY BANK TEST

NOTE: When performing a PM Test the tester will automatically run the Battery Bank Test to make sure that the battery bank passes. Therefore, you need only use the Battery Bank Test for testing the battery bank only. The Battery Bank Test is designed for preventative maintenance only. If there is an electrical problem you should test each battery individually.

```
>ENTER NUMBER OF  
BATTERIES: 3  
USE +/-.  
'Y' TO CONTINUE
```

You will be asked to enter the number of batteries in the system. The number selected in the last test will appear. Simply use the (+) or (-) key to select the correct number. Then press ('Y' Enter) to continue.

```
>INSPECT BANK FOR  
DIRT, LEAKS OR  
CRACKS.  
'Y' TO CONTINUE
```

```
>INSPECT POSTS  
AND CONNECTIONS  
'Y' TO CONTINUE
```

Always check batteries, battery posts and connections before testing the batteries. If the batteries or posts are damaged replace the batteries. Make sure the batteries are free from dirt, cracks and leaks and that the connections are clean and secure.

BATTERY BANK (Cont.)

```
>CONNECT LARGE  
LEADS TO THE  
BATTERY BANK  
'Y' TO CONTINUE
```

You will be instructed to connect the large leads. Connect the red clamp to the main positive cable coming to the bank and the black clamp to the main negative cable leaving the bank.

```
>BANK MUST BE  
STABILIZED FOR  
VALID RESULTS  
'Y' TO CONTINUE
```

For the most accurate and repeatable tests always allow the batteries to stabilize for at least 10 minutes after being charged or loaded before running a test.

Black Clamp at Negative Main

Red Clamp at Positive Main

Connect large alligator clips as far apart as possible.



Battery Bank of 3 Batteries

```
>ENTER BATTERY  
TEMP. 70F.  
12.39V  
'Y' TO CONTINUE
```

Using the (+) or (-) key adjust the temperature in units of 10 degrees. This should be the temperature of the battery(S). Consider where the vehicle has been before adjusting.

```
>ENTER BATT TYPE  
AGM USE +/-  
12.39V  
'Y' TO CONTINUE
```

Use the (+) or (-) key to select the battery type, either AGM or regular lead-acid.

```
>ENTER SINGLE  
CCA 650  
12.39V  
'Y' TO BEGIN
```

Using the (+) or (-) key adjust the CCA of an individual battery. If each battery varies in CCA approximate an average. If the CCA is unknown consider that most truck batteries range from 625-950 CCA.

```
TESTING BANK  
PLEASE WAIT...
```

Press (Y Enter) to begin the test and wait for results. Example is at the top of page 10 (Individual Battery Test).

3

INDIVIDUAL BATTERY TEST

```
#211 12V BANK  
GOOD BATTERIES  
12.70V CHRG 100%  
11.50V LOADED
```

When the test results appear as **GOOD BATTERIES** after running the PM Check or Battery Bank Test there is no need to run the individual battery tests. Press (N Esc.) to return to the menu

```
#211 12V BANK  
TEST SEPARATELY  
12.38V CHRG 66%
```

If the battery bank test results are low you will be instructed to test each battery separately. Press (Y Enter) to continue.

```
PM TEST  
>BATTERY TEST  
BATTERY BANK  
UDROP TEST
```

Select **BATTERY TEST** from the main menu.

```
>INSPECT BATTERY  
FOR DIRT, LEAKS  
OR CRACKS  
'Y' TO CONTINUE
```

Always check for dirt and cracks or leaks in the battery.

```
>INSPECT POSTS  
AND CONNECTIONS  
'Y' TO CONTINUE
```

IMPORTANT

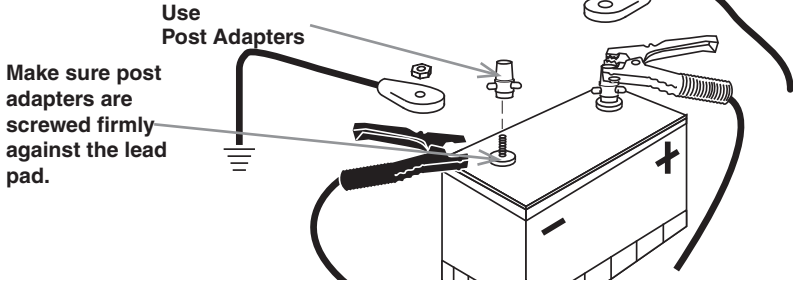
Poor connections may be the reason for battery bank failure. Clean posts and connections are essential when checking each battery. Make sure batteries not being tested are disconnected.

Note! When testing batteries individually each battery should be disconnected. Avoid improper results and damage to the posts by using the included post adapters on threaded post batteries.

```
>CONNECT LARGE  
LEADS TO THE  
BATTERY.  
'Y' TO CONTINUE
```

Connect the large red clamp to the positive and the large black to the negative battery terminal. If the clamps are connected improperly you will be prompted to correct the problem. The tester will then revert back to the beginning or main menu. Be sure to use post adapters on threaded steel posts as illustrated on the next page then press (Y Enter).

INDIVIDUAL BATTERY TEST (Cont.)



```
>ENTER BATTERY  
DATE CODE: A4  
USE +/- . 01/04  
'Y' TO CONTINUE
```

The prompt only appears if the user requests it in the SETUP. The first letter should be flashing, this is the month. Using the (+) or (-) adjust the month, then press enter. the year will then flash use the (+) or(-) to select the correct year. 'Y' to continue.

```
>ENTER BATTERY  
TEMP. 70F.  
12.39V  
'Y' TO CONTINUE
```

Using the (+) or (-) key adjust the temperature in units of 10 degrees. This should be the temperature of the battery.

```
>ENTER BATT TYPE  
AGM USE +/- .  
12.39V  
'Y' TO CONTINUE
```

Use the (+) or (-) key to select the battery type, either AGM or regular lead-acid.

```
>ENTER RATED CCA  
650  
12.39V  
'Y' TO BEGIN
```

Using the (+) or (-) key adjust the CCA of the battery. Press (Y Enter) to begin test.

```
TESTING BATTERY  
PLEASE WAIT...
```

Wait for results.

There are five test results which are explained in detail on Pg. 12

Make sure they are correct when done.

```
#220 12V BATTERY  
GOOD NEEDS CHRG.  
12.28 CHARGE 54%  
EST CCA 840
```

FIVE TEST RESULTS

GOOD BATTERY

- The battery has passed the load and capacity tests and is at a high enough state of charge to continue all electrical test or operate.

MARGINAL BATTERY

- The battery has lost capacity and should be replaced if in a critical or harsh situation.

BAD BATTERY

- The battery was at a high enough state of charge to test and failed. Replace battery.

GOOD, NEEDS CHARGING

- Battery tested good, however it needs to be charged before going into operation, normal vehicle operation might not charge this battery(s). All batteries need to leave the repair facility at or near 100% state of charge for good electrical performance.

CHARGE AND TEST

- The battery is at a low state of charge and can not be accurately tested unless it has been charged, Depending on the charger model, several hours may be needed to fully recharge and be ready to test.

4

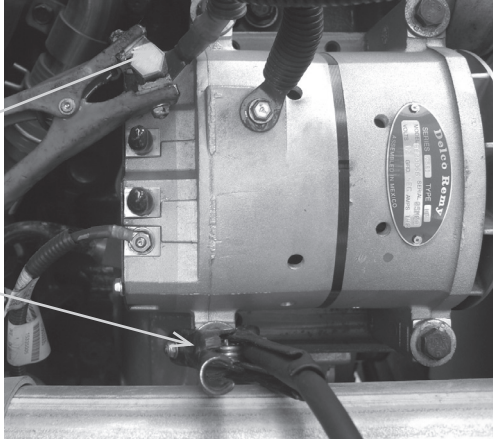
CHARGING CABLE VDROP™ TEST

ALTERNATOR HOOKUP

Red to Positive

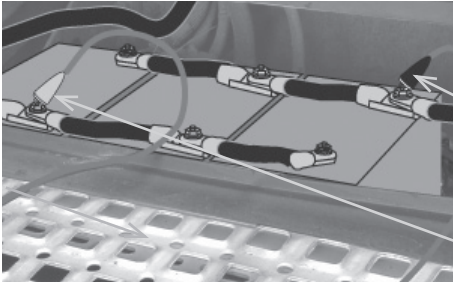
Black to Ground

Connect the large leads to the alternator pos. on output terminal and neg. on case.



>CONNECT SMALL
LEADS TO THE
BATTERY
'Y' TO BEGIN

Connect the small leads to the battery bank - the red on the positive main and the black on the negative main and not to an individual battery. The added small external leads will check the cables before the alternator is tested. This is the individual VDrop Test



Black Clamp at Negative Main

BATTERY HOOKUP

Red Clamp at Positive Main

PM TEST
BATTERY TEST
BATTERY BANK
>VDROP MENU

This same test and hookup can be run individually by selecting VDrop Menu

>CHARGING CABLES
STR MAIN CABLES
MAG. CIRCUIT
LIFEGATE VDORP

...and then Charging Cables.

CHARGING CABLE VDROPTM (Cont.)

LOADING
PLEASE WAIT...

The Charging System Test performs this individual VDrop Test before allowing you to test the alternator's output.

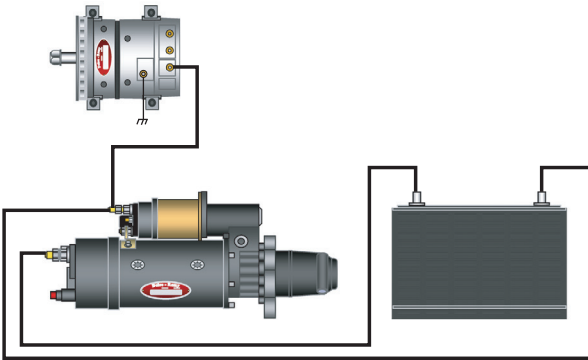
If all connections are correct press (Y Enter) to begin VDrop Test. Wait for a load to be applied.

#7 CHRG CABLES
PASSED @ 130A
GOOD TO 192A
0.15POS 0.19NEG

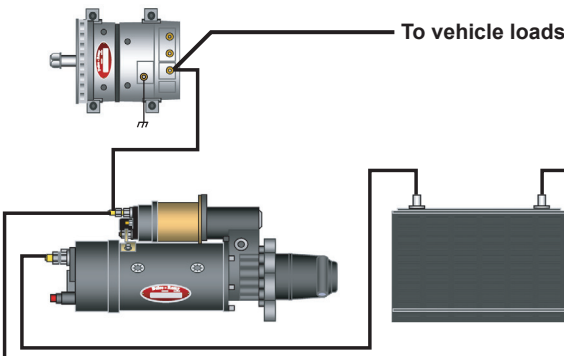
#8 CHRG CABLES
OUT OF SPEC @
135A GOOD TO 123A
0.16POS 0.46NEG.

The results will vary depending upon the conditions of the cables. Both the positive and negative circuit results will be indicated. If the test does not pass, correct the connection or replace the cable and run the test again. The BCT-200J will automatically resume the test after it is disconnected. Just answer 'YES' when prompted.

Determining if the charging circuit is a "single" or "dual" system



Single has one cable from the alternator output terminal.



Dual system has two cables attached to the output terminal. Every load that the tractor and trailer utilize must be subtracted from the amount of current that can go to the batteries.

CHARGING CABLE VDROPTM (Cont.)

VDROP ERROR MESSAGES

One of the following may appear during any drop test sequence. Correct the situation before continuing.

```
ERROR:  
LARGE LEADS  
NOT CONNECTED  
'Y' TO CONTINUE
```

One or both of the large leads are not connected.

```
ERROR:  
BAD CONNECTION  
ON LARGE LEADS  
'Y' TO CONTINUE
```

Tester detected that one of the large leads does not have a good connection.



Tester detected that the large black lead is not connected properly



Tester detected that the large red lead is not connected properly

Note: On the large leads, both sides of the jaws must make a good connection

```
ERROR:  
SMALL LEADS  
NOT CONNECTED  
'Y' TO CONTINUE
```

One or both of the small external leads is not connected

```
ERROR:  
SMALL LEADS  
REVERSED  
'Y' TO CONTINUE
```

The tester detected that the small leads are hooked up backwards the tester should also beep when it occurs

5

STANDARD ALTERNATOR OUTPUT TEST

After the battery or batteries have been tested and were good (or have been replaced) and after the charging cables have been tested and were good (or were repaired or replaced) you may proceed to test the alternator.

```
BATTERY TEST  ↑  
BATTERY BANK  
VDROP TEST  
>ALTERNATOR  ↓
```

This test can also be selected from the main menu by selecting Alternator Test then press (Y Enter).

```
>INSPECT BELT  
CONDITION.  
  
'Y' TO CONTINUE
```

If the unit is setup to require visual checks you will be asked to inspect belt condition...

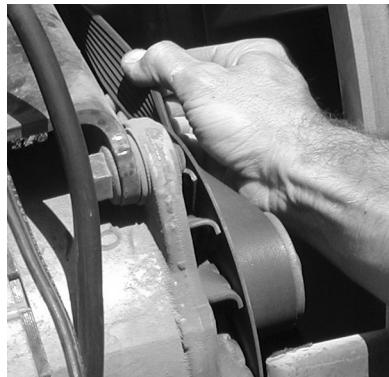
See picture below
...and tension.

```
>INSPECT BELT  
TENSION.  
  
'Y' TO CONTINUE
```

```
>INSPECT CABLES  
AND CONNECTIONS  
  
'Y' TO CONTINUE
```

Inspect cables and connections before alternator rating is entered.

```
CONNECT LARGE LEADS  
TO THE ALTERNATOR  
  
'Y' TO CONTINUE
```



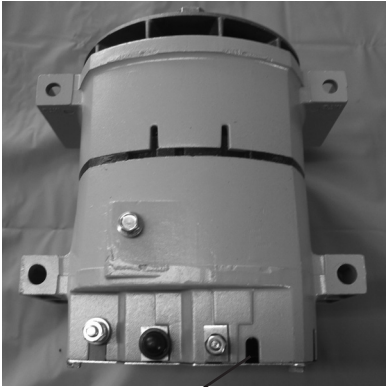
Red to output terminal and Black to ground / case output adapters recommended.

```
CONNECT LARGE LEADS  
TO THE ALTERNATOR  
  
'Y' TO CONTINUE
```

Check the alternator tag or housing and use the +/- key to select the rated output

STANDARD ALTERNATOR OUTPUT TEST (Cont.)

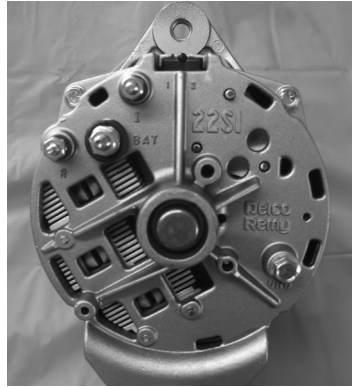
DOES ALTERNATOR
HAVE A
REMOTE SENSE?
'N' OR 'Y'



Non Remote Sense (empty port)

See photo of non remote sense
alternator below "N" for
Non-remote sense alternator

Non Remote Sense Alternator



DOES VEHICLE HAVE
J-1708 DATA PORT?
'N' OR 'Y'

If vehicle is equipped with a J-1708
port and you have the optional
cable. Select "Y". If vehicle is not
equipped with J-1708 data port or
you don't have an optional J-1708
cable select "N"

If NO skip the next two steps.

>ATTACH J-170
DATA CABLE
'N' TO CANCEL

Attach the cable from the tester to
the data port on the vehicle.

NOTE: if the tester does not detect it
is hooked to the data port it will not
go beyond this screen.

TURN IGNITION
SWITCH ON

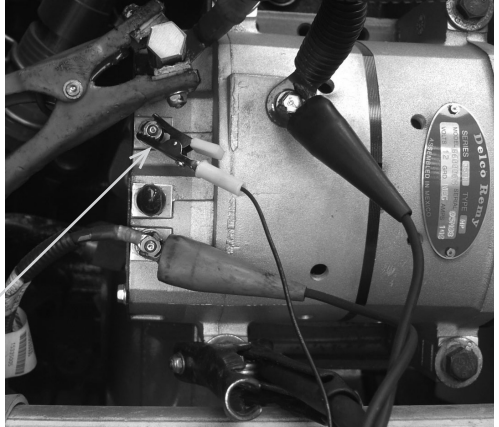
Once it detects it is hooked up
properly it will prompt you to turn
the ignition key to the run position.

STANDARD ALTERNATOR TEST RESULTS

```
>CONNECT R CLIP  
TO THE R TERM  
ON ALTERNATOR  
'Y' TO CONTINUE
```

Connect the single alligator clip from the AC-26 J1708 cable to the R terminal on the alternator.

Output terminal adapter utilized



```
>START ENGINE.  
SET IDLE AT  
ABOUT 1000 RPM  
'N' TO CANCEL
```

Make sure all is clear. Start engine and run at fast idle - 1,000 RPM.

```
>ALLOW VOLTAGE  
TO STABILIZE.  
14.20V  
'Y' TO BEGIN
```

You MUST allow voltage to stabilize for an accurate test. If, voltage is low, tester will start a one minute clock to ensure proper test.

```
>REV ENGINE TO  
GOV. FOR 10 S.  
  
'N' TO CANCEL
```

Rev the engine to governed speed for 10 seconds. If no results appear press (Y Enter).

STANDARD ALTERNATOR TEST RESULTS

```
TESTING ALT.  
PLEASE WAIT...
```

Wait for test to complete its testing cycle.

```
#147 12V ALTER.  
GOOD REG. 14.15V  
GOOD DIODE  
GOOD OUTPUT
```

This result indicates the alternator is in good working order.

```
#149 12V ALTER.  
LOW REG. 12.74V  
BAD DIODE  
LOW OUTPUT
```

This is a defective alternator. It has a defective component and is producing high ripple.

```
#151 12V ALTER.  
HIGH REG. 15.02V  
BAD DIODE  
PARTIAL OUTPUT
```

This is a defective alternator. Not only does it have defective components the regulation set point is high.

```
#148 12V ALTER.  
LOW REG. 12.74V  
LOW OUTPUT
```

This is a defective alternator. The output and regulation are low. Defective batteries can cause this condition.

```
#150 12V ALTER.  
HIGH REG. 15.02V  
GOOD DIODE  
LOW OUTPUT
```

Defective alternator. It can not handle the load and it is regulating high.

REMOTE SENSE ALTERNATOR OUTPUT TEST

After the battery or batteries have been tested and were good (or have been replaced) and after the charging cables have been tested and were good (or were repaired or replaced) you may proceed to test the alternator.

```
BATTERY TEST      ↑
BATTERY BANK
VDROP TEST
>ALTERNATOR      ↓
```

This test can also be selected from the main menu by selecting Alternator Test then press (Y Enter).

```
>INSPECT BELT
CONDITION.

'Y' TO CONTINUE
```

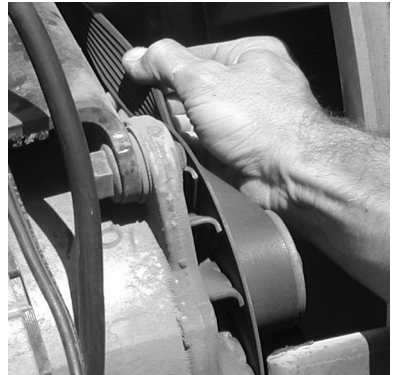
If the unit is setup to require visual checks you will be asked to inspect belt condition...

See picture below

...and tension.

```
>INSPECT BELT
TENSION.

'Y' TO CONTINUE
```



```
>INSPECT CABLES
AND CONNECTIONS

'Y' TO CONTINUE
```

Inspect cables and connections before alternator rating is entered.

```
CONNECT LARGE LEADS
TO THE ALTERNATOR

'Y' TO CONTINUE
```

Red to output terminal and Black to ground / case output adapters recommended.

```
CONNECT LARGE LEADS
TO THE ALTERNATOR

'Y' TO CONTINUE
```

Check the alternator tag or housing and use the +/- key to select the rated output.

REMOTE SENSE ALTERNATOR TEST (Cont.)

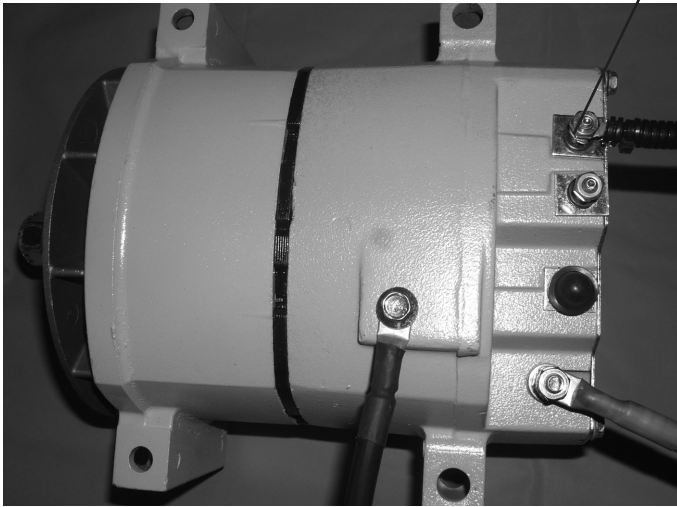
DOES ALTERNATOR
HAVE A REMOTE SENSE?

'N' OR 'Y'

See photo of remote sense
alternator.

Select 'Y' for remote sense

Remote Sense



Use the small ext leads and connect
the red to the remote sense port and
the black to the Alt ground.

If the tester does not see battery
voltage this error will appear.

DOES VEHICLE HAVE
J-1708 DATA PORT?

'N' OR 'Y'

If vehicle is equipped with a J-1708
port and you have the optional
cable. Select 'Y'. If vehicle is not
equipped with J-1708 data port or
you don't have an optional J-1708
cable select 'N' If NO skip the next
two steps.

REMOTE SENSE ALTERNATOR TEST (Cont.)

>ATTACH J-1708
DATA CABLE

'N' TO CANCEL

Attach the cable from the tester to the data port on the vehicle.

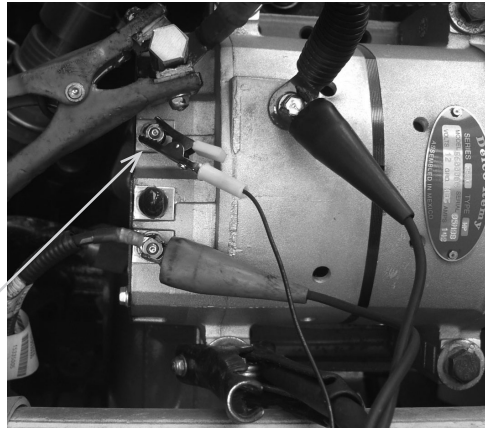
NOTE: if the tester does not detect it is hooked to the data port it will not go beyond this screen.

TURN IGNITION
SWITCH ON

Once it detects it is hooked up properly it will prompt you to turn the ignition key to the run position.

>CONNECT R CLIP
TO THE R TERM
ON ALTERNATOR
'Y' TO CONTINUE

Connect the single alligator clip from the AC-26 J1708 cable to the R terminal on the alternator.



Output terminal adapter utilized

>START ENGINE.
SET IDLE AT
ABOUT 1000 RPM
'N' TO CANCEL

Make sure all is clear. Start engine and run at fast idle - 1,000 RPM

>ALLOW VOLTAGE
TO STABILIZE.
14.20V
'Y' TO BEGIN

You **MUST** allow voltage to stabilize for an accurate test. If, voltage is low, tester will start a one minute clock to ensure proper test.

REMOTE SENSE ALTERNATOR TEST (Cont.)

```
>REV ENGINE TO  
GOV. FOR 10 S.  
  
'N' TO CANCEL
```

Rev the engine to governed speed for 10 seconds. If no results appear press (Y Enter).

```
TESTING ALT.  
PLEASE WAIT...
```

Wait for test to complete its testing cycle.

```
#147 12V ALTER.  
GOOD REG. 14.15V  
GOOD DIODE  
GOOD OUTPUT
```

This result indicates the alternator is in good working order.

```
#149 12V ALTER.  
LOW REG. 12.74V  
BAD DIODE  
LOW OUTPUT
```

This is a defective alternator. It has a defective component and is producing high ripple.

```
#151 12V ALTER.  
HIGH REG. 15.02V  
BAD DIODE  
PARTIAL OUTPUT
```

This is a defective alternator. Not only does it have defective components - the regulation set point is high.

```
#148 12V ALTER.  
LOW REG. 12.74V  
LOW OUTPUT
```

This is a defective alternator. The output and regulation are low. Defective batteries can cause this condition.

```
#150 12V ALTER.  
HIGH REG. 15.02V  
GOOD DIODE  
LOW OUTPUT
```

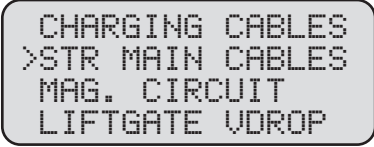
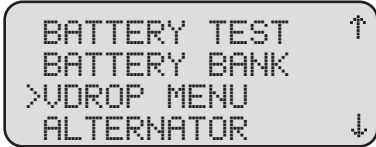
Defective alternator. It can not handle the loa and it is regulating high.

6

STARTING SYSTEM MAIN CABLE VDROPTM TEST

The circuit from the battery to the starter junction is being tested.

Note: If a split battery bank is used go to the Generic Starter Drop Test and perform a split battery procedure. See section 11. By disconnecting each bank and testing the other using the Generic Voltage Drop Test and entering one half the starter draw you can test the starter main cables individually. First of all determine if the system you are going to test is a "split" or "single" system.

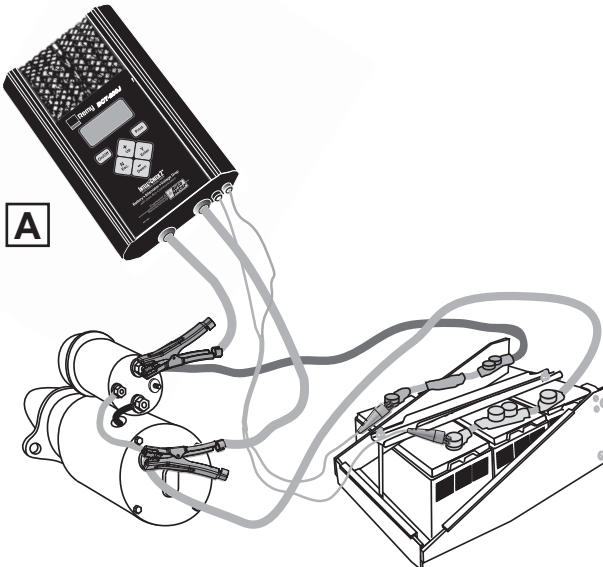


This test can be selected from the main menu by selecting VDROP MENU then by pressing (Y Enter).

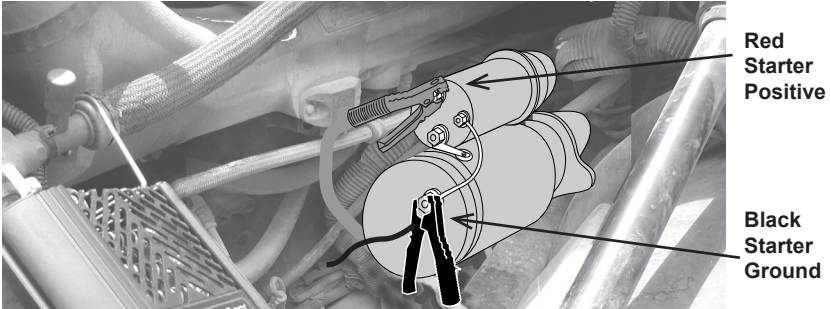
...select >STR. MAIN CABLES and press (Y Enter).

How to Determine if Single or Dual Cable System Chart

	# of Battery Boxes	# of Positive Cables	Type of System
A	1	1	Single
B	1	2	Dual
C	2	2	Dual



STARTING VDROPTM MAIN CABLE. . . SINGLE

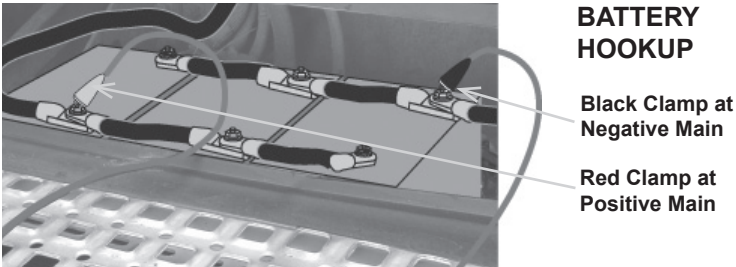


```
>CONNECT LARGE  
LEADS TO THE  
STARTER  
'Y' TO CONTINUE
```

Connect large leads to the Starter

```
>CONNECT SMALL  
LEADS TO THE  
BATTERY  
'Y' TO BEGIN
```

Then connect small leads to the battery bank – the red on the positive main and the black on the negative main and not to an individual battery. The added small external leads will check the main cables. Press (Y Enter).



Just as the System Test checks the Magnetic Circuit first it also checks the main starting cables.

```
LOADING  
PLEASE WAIT...
```

If all connections are correct, wait for a load test to be performed.

The results will vary depending upon and the conditions of the cables. Both the positive and negative circuit results will be indicated from the single test. If the test does not pass, correct the connection or replace the cable and run the test again. The BCT-200J will automatically resume the test after it is disconnected. Just answer "Yes" when prompted.

STARTING MAIN CABLE VDROPTM (Cont.) SINGLE

#10 MAIN CABLES
PASSED @ 500A
GOOD TO 545A
0.18 POS 0.13 NEG

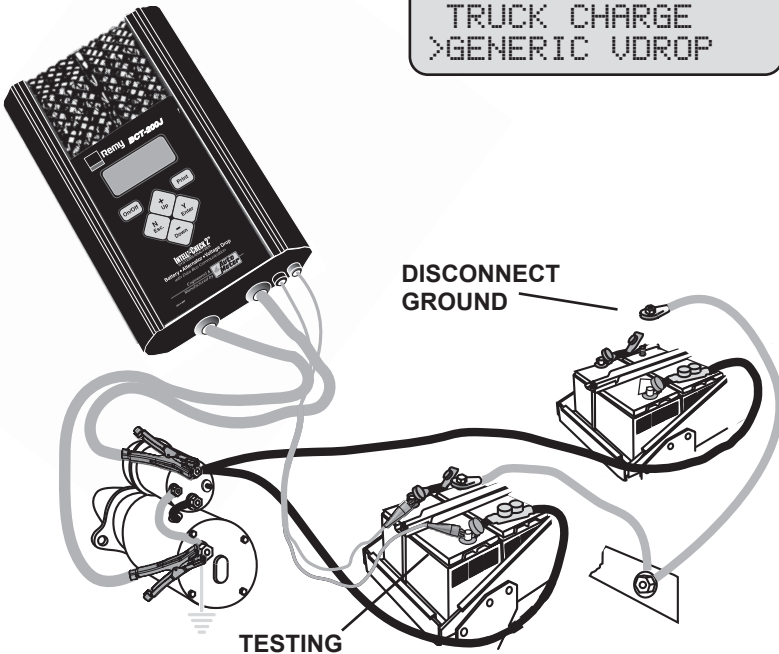
#11 MAIN CABLES
OUT OF SPEC @ 500A
GOOD TO 375A
0.21POS 0.36NEG.

STARTING VDROPTM ... SPLIT SYSTEM TESTING PART A

BATTERY TEST
BATTERY BANK
>VDROP MENU
ALTERNATOR

CHARGING CABLES
STR MAIN CABLES
MAG. CIRCUIT
>LIFTGATE VDROPTM

TRAILER CHARGE
TRAILER MOTOR
TRUCK CHARGE
>GENERIC VDROPTM



SPLIT SYSTEM TESTING (Cont.) PART A

```
ENTER RATED  
CURRENT: 250
```

Scroll to 250 amps.

```
'Y' TO CONTINUE
```

```
CONNECT LARGE  
LEADS TO THE  
SYSTEM  
'Y' TO CONTINUE
```

Red to Starter battery post.
Black to Starter ground post.

```
CONNECT SMALL  
CLIPS TO THE  
SYSTEM  
'Y' TO BEGIN
```

Red to battery positive.
Black to battery negative.

```
LOADING . . .
```

```
#5 GENERIC VDROPS  
VOLTAGE DROPS  
AT 250 AMPS  
.21 POS .16 NEG
```

You are allowed a total of 0.5 VDrop combined. Add the negative and positive voltage drop for total voltage drop. This example is within spec with a combined drop of only .37V

```
#6 GENERIC VDROPS  
VOLTAGE DROPS  
AT 250 AMPS  
.35 POS .29 NEG
```

This example is out of spec with a total drop of .64V

The results will vary depending upon and the conditions of the cables. Both the positive and negative circuit results will be indicated from the single test. If the test does not pass, correct the connection or replace the cable and run the test again. The BCT-200J will automatically resume the test after it is disconnected. Just answer 'Yes' when prompted.

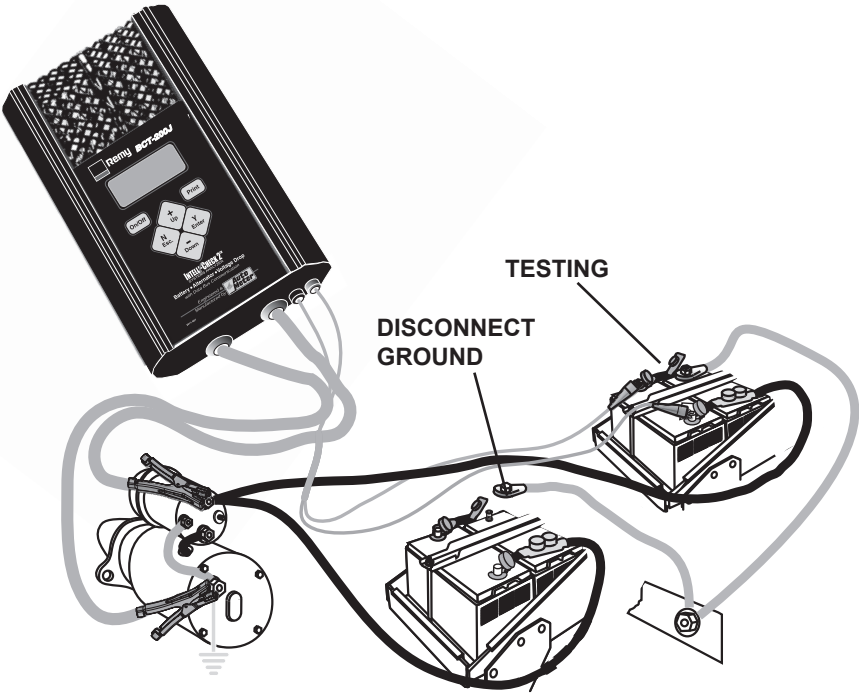
SPLIT SYSTEM TESTING (Cont.) PART B

Now test the other battery pack.

BATTERY TEST
BATTERY BANK
>VDROP MENU
ALTERNATOR

CHARGING CABLES
STR MAIN CABLES
MAG. CIRCUIT
>LIFTGATE VDROP

TRAILER CHARGE
TRAILER MOTOR
TRUCK CHARGE
>GENERIC VDROP



SPLIT SYSTEM TESTING (Cont.) PART B

```
ENTER RATED  
CURRENT: 250  
  
'Y' TO CONTINUE
```

Scroll to 250 amps.

```
CONNECT LARGE  
LEADS TO THE  
SYSTEM  
'Y' TO CONTINUE
```

Red to Starter Solenoid battery post.
Black to Starter ground post.

```
CONNECT SMALL  
CLIPS TO THE  
SYSTEM  
'Y' TO BEGIN
```

Red to battery positive.
Black to battery negative.

```
LOADING . . .
```

```
#5 GENERIC VDROPS  
VOLTAGE DROPS  
AT 250 AMPS  
.15 POS .19 NEG
```

You are allowed a total of 0.5 VDrop combined. Add the negative and positive voltage drop for total voltage drop. This example is within spec with a combined drop of only .34V

```
#6 GENERIC VDROPS  
VOLTAGE DROPS  
AT 250 AMPS  
.18 POS .41 NEG
```

This example is out of spec with a total drop of .59V

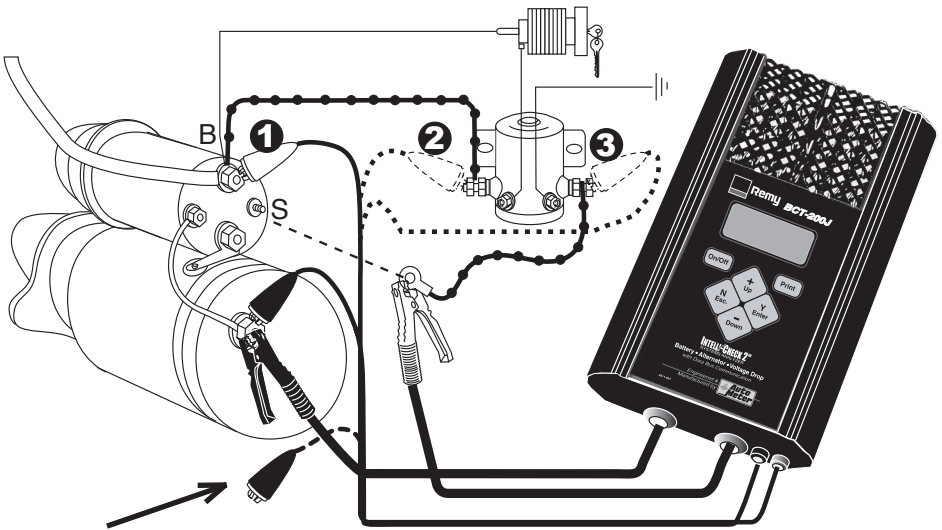
The results will vary depending upon and the conditions of the cables. Both the positive and negative circuit results will be indicated from the single test. If the test does not pass, correct the connection or replace the cable and run the test again. The BCT-200J will automatically resume the test after it is disconnected. Just answer "Yes" when prompted.

7

MAGNETIC CIRCUIT VDROP™ 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 below. 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.

Magnetic Circuit 3-Step Setup



NOTE: ON 12 VOLT SYSTEMS THE SMALL BLACK LEAD CAN BE LEFT DISCONNECTED OR CAN BE CONNECTED TO ANY GROUND. ON 24 VOLT SYSTEMS THIS LEAD MUST BE CONNECTED TO THE STARTER GROUND.

```
CHARGING CABLES
STR MAIN CABLES
>MAG. CIRCUIT
LIFTGATE VDROP
```

This is a continuation of the Starting System Test, but can also be selected from the VDrop Menu by selecting >MAG. CIRCUIT then press Enter. In the individual test you will be asked to disconnect the Magnetic circuit from the "S" terminal on the starter solenoid as explained on the previous page. This is necessary to avoid starting the engine during this test sequence.

MAGNETIC CIRCUIT TEST (Cont.)

DISCONNECT THE
S-TERMINAL FROM
STARTER SOL.
'Y' TO CONTINUE

This is the small wire on the starter solenoid that activates the starter

SELECT STARTER TYPE.
STRAIGHT DRIVE/GEAR
REDUCTION
'Y' TO CONTINUE

Use the + / - key to select the type of starter you are testing.

>CONNECT LARGE
LEADS TO THE
S-TERMINAL/GND.
'Y' TO CONTINUE

Connect the large red clamp (+) to the disconnected ring from the S-terminal magnetic circuit. Connect the large black clamp (-) to the starter ground (See Illustration)

>CONNECT SMALL
LEADS TO THE
STARTER SOL/GND
'Y' TO CONTINUE

Connect the small red lead (+) to the 'B' terminal (+) of the starter solenoid. Attach the small black lead (-) to the starter ground (See Illustration - small clamp position 1)

>ENERGIZE THE
MAG SWITCH FOR
3-5 SECONDS.
'N' TO CANCEL

Reconnect the negative terminal on the battery. Then energize the Magnetic Switch for 3-5 seconds. Note. This can be done by a remote starter or by a second person turning the ignition.

LOADING
PLEASE WAIT...

Wait for results.

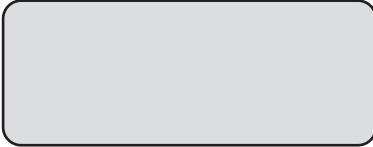
#337 MAG/CIRCUIT
PASSED!
DROP WITHIN SPEC
DROP @80A. 0.65V

If voltage drop is within specifications the whole circuit passes. This test should be done THREE TIMES when rotating contact magnetic switches are utilized.

MAGNETIC CIRCUIT TEST (Cont.)

```
#338 MAG/CIRCUIT  
OUT OF SPEC!  
DROP @ 80A: 1.54V  
'Y' TO CONTINUE
```

If the test was out of spec Press 'Y' and the BCT-200J will advance to the next menu. Excessive drop at rated load is indicated by more than 1 Volt drop at 80 Amps.



Move the small red lead to the magnetic switch hot side connection from the battery (2), press enter and energize the switch again for 3-5 seconds (See Illustration - small clamp position 2).

```
>MOVE SMALL RED  
LEAD TO OTHER  
SIDE OF MAG.  
'Y' TO CONTINUE
```

Move the small red lead to the negative (-) side of the magnetic switch (3), press enter and energize again for 3-5 seconds (See Illustration - small clamp position 3).

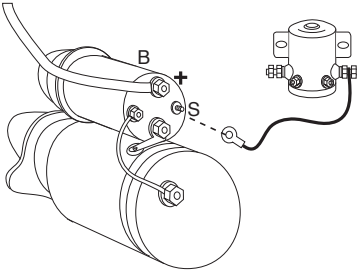
```
#340 MAG/CABLES  
LEG1: 2.22V FAIL  
MAG.: 0.41V FAIL  
LEG2: 0.12V PASS
```

The final results will appear indicating the section of the circuit or switch that is in need of repair.

8

KEY SWITCH VDROPTM TEST

Note: This is a real time test and the operator must observe and record the data when the key switch is energized.



S-terminal wire must be removed from the solenoid so that the starter does not engage.

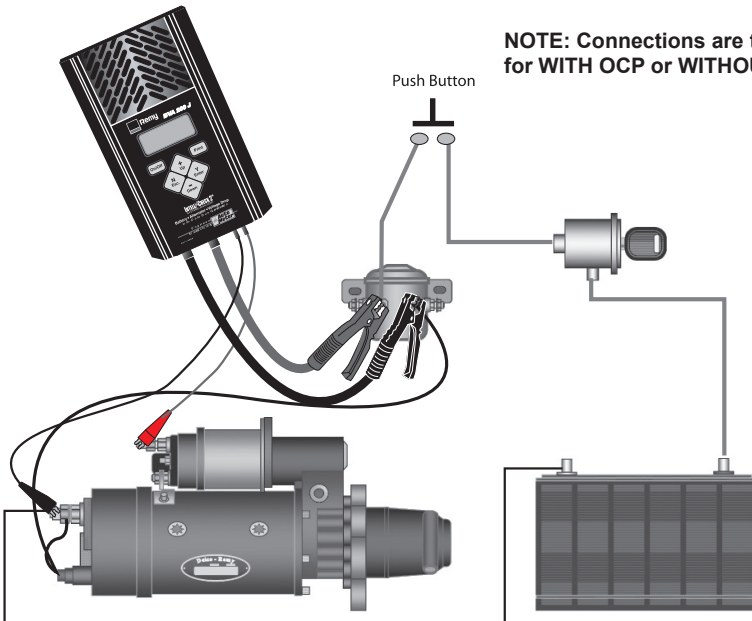


Scroll to Voltmeter

Connect large clips to magnetic switch coil.

Connect small leads to starter.

NOTE: Connections are the same for WITH OCP or WITHOUT OCP.



KEY SWITCH VDROPTM TEST (Cont.)

```
-VOLTMETER-  
VOLTS      0.00V  
EXT. V     12.63V  
0.00 POS  0.00 NEG
```

Should read voltage at ext. V. No voltage at magnetic switch coil with ignition key off.

```
-VOLTMETER-  
VOLTS      12.15V  
EXT. V     12.40V  
.15 POS   .10 NEG
```

Turn the ignition key to start position and hold. Observe both volt results Voltage is at magnetic switch coil leads. External V is voltage at starter.

```
-VOLTMETER-  
VOLTS      12.15V  
EXT. V     12.40V  
.15 POS   .10 NEG
```

In this example the system passed, the total voltage drop is .25V which is less than the .5V drop allowed.

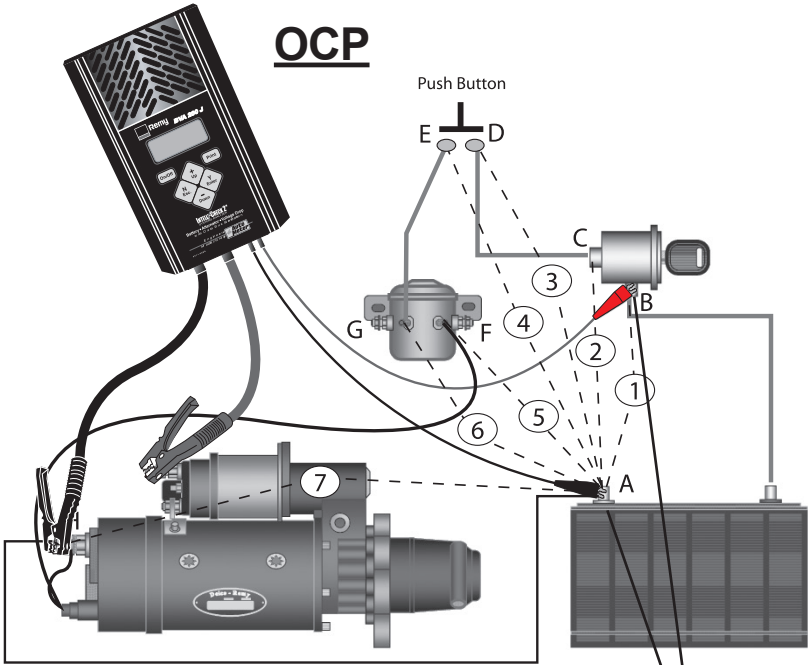
End of test.

```
-VOLTMETER-  
VOLTS      11.08V  
EXT. V     12V  
.33 POS   1.02 NEG
```

In this example the system is out of spec. The 1.35 volt drop exceeds the allowable .5 volt drop.

Continue testing each leg of the circuit.

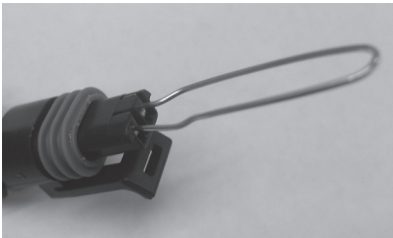
KEY SWITCH VDROPTM TEST (Cont.) (OCP)



- A= will always be the small black lead
- A to B tests power at key switch
- A to C tests power out of keyswitch
- A to D tests power at the push button
- A to E tests power out of the push button
- A to F tests ground at the mag switch
- A to G tests power at mag switch
- A to H tests ground at starter

Note: D & E tests only pertain to vehicles equipped with push button start

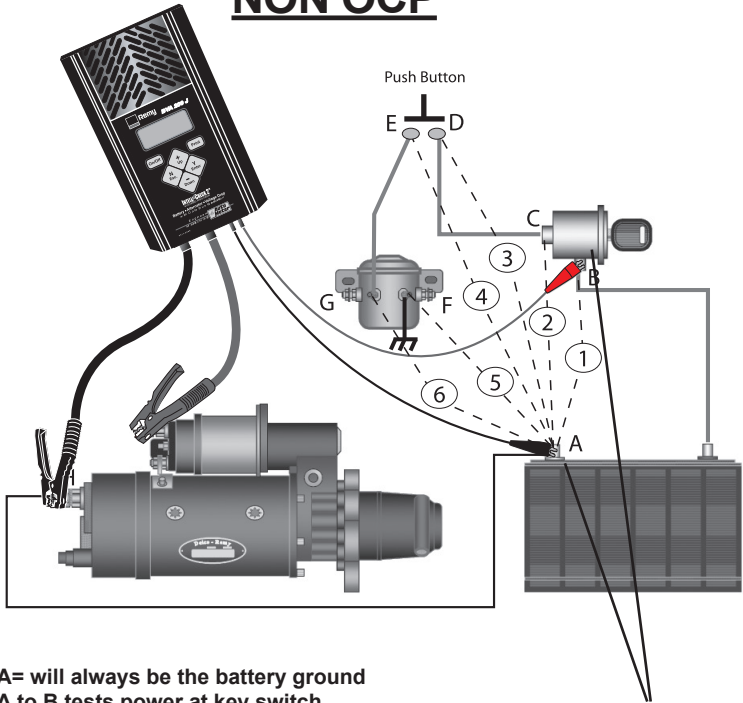
Example: Connect small black lead at A and small red lead on B



Note: For testing the OCP wiring the plug should be removed and a paper clip inserted in the connector body. (see picture)

KEY SWITCH VDROPTM TEST (Cont.) (NON OCP)

NON OCP



- A= will always be the battery ground
- A to B tests power at key switch
- A to C tests power out of keyswitch
- A to D tests power at the push button
- A to E tests power out of the push button
- A to F tests ground at the mag switch
- A to G tests power at mag switch

Note: D & E tests only pertain to vehicles equipped with push button start

Example: Connect small black lead at A and small red lead on B

9

LIFTGATE VDROP™ TESTS

The various liftgate circuit voltage drop tests and the generic voltage drop test can be used to test the liftgate charging and motor circuits as well as any other circuit that includes a battery and cables and is designed to operate a load of 20 amps or more.

BATTERY TEST ↑

↓

After selecting >VOLTAGE
DROP from the main menu...

CHARGING CABLES
STR MAIN CABLES
MAG. CIRCUIT
>LIFTGATE VDROP

...select >LIFTGATE V DROP and
press (Y Enter).

>TRAILER CHARGE
TRAILER MOTOR
TRUCK CHARGE
GENERIC VDROP

Select TRAILER CHARGE, TRAILER MOTOR or TRUCK CHARGE to perform a voltage drop test on the trailer charge circuit, trailer liftgate motor circuit or the truck's liftgate power circuit respectively.

The liftgate charging circuit includes the positive cables from the front of the trailer to the liftgate batteries and the negative cables and/or frame from the front of the trailer to the liftgate batteries.

The liftgate motor circuit includes the positive cables and the solenoid from the liftgate batteries to the liftgate motor and the negative cables and/or frame from the liftgate batteries to the liftgate motor.

The liftgate truck circuit includes the positive cables and the negative cables and/or frame from the trucks batteries to the front of the trailer (end of the "stinger" cord).

Adapters are available from Auto Meter to facilitate connecting the BCT-200J to single pole and dual pole connectors on both trucks and trailers. See the manual supplement that is included with those adapters for more detailed information on testing and trouble shooting the liftgate charging circuits and liftgate motor circuits.

TRAILER CHARGE
TRAILER MOTOR
TRUCK CHARGE
>GENERIC VDROP

Select >GENERIC VDROP
and press (Y Enter) to run the
generic voltage drop test.

>ENTER RATED
CURRENT: 150A

'Y' TO CONTINUE

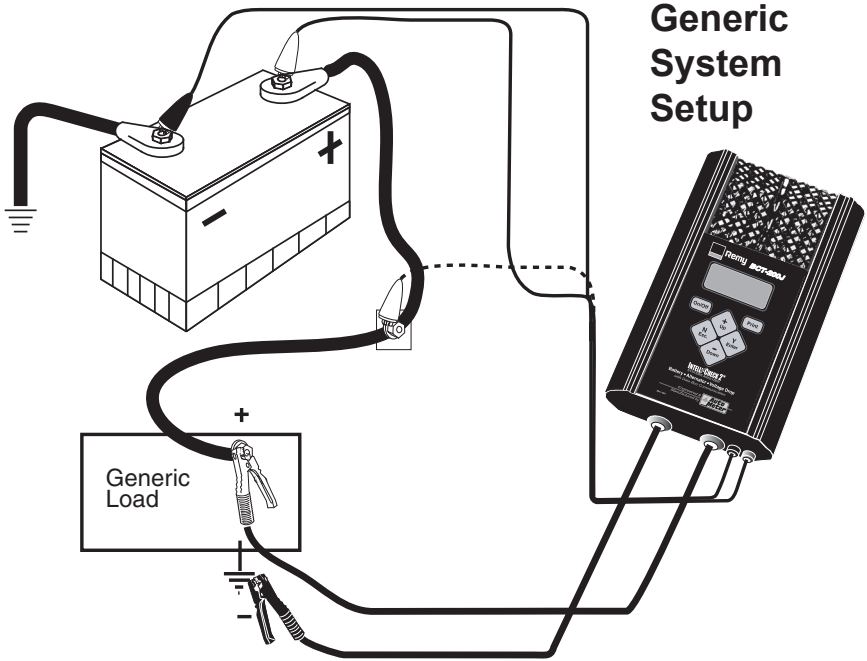
Using the (+/-) key adjust Amp
rating to that of the generic load
device.

>CONNECT LARGE
LEADS TO THE
SYSTEM.
'Y' TO CONTINUE

Connect large leads to the generic
load.

LIFTGATE VDROP™ TESTS (Cont.)

Generic System Setup



```
>CONNECT SMALL  
LEADS TO THE  
SYSTEM.  
'Y' TO CONTINUE
```

Then connect small leads to the battery or along the circuit being tested as illustrated in the setup and press (Y Enter).

```
LOADING  
PLEASE WAIT...
```

If all connections are correct, wait for a load to be applied.

```
#28 GEN. VDROP  
VOLTAGE DROPS  
AT 150 AMPS  
0.33 POS 0.32 NEG
```

The results will vary depending upon and the conditions of the cables. Both the positive and negative circuit results will be indicated from the single test.

If the overall voltage drop is not within the desired specifications the small leads can be moved closer along the line being tested and the test run again (see dotted lead on previous page). If the results are desirable, it is the section not included in the last test. If the results are not desirable the problem is most likely in the section being tested. Repair and test the entire section again.

DEFINITIONS - SYSTEM SPECIFICATIONS

BATTERY TEST

During each battery test the BCT-200J uses various results that are displayed after each test. The definition of those results are as follows:

- **% Charge** = an approximate amount of charge the battery is currently holding. This is based upon the batteries voltage.
- **Est. CCA** = is the approximate CCA of the fully charged battery.
- **GOOD BATTERY** = a battery that is good and is charged.
- **GOOD NEEDS CHARGE** = a battery that is good but is low on charge.
- **MARGINAL BATTERY** = a battery that has passed the load test but the estimated CCA is getting low or the battery is approaching its end of life.
- **CHARGE and RETEST** = a battery with insufficient charge to provide accurate test results.
- **BAD BATTERY** = a battery that is bad and should be replaced. A bad battery is a battery that failed the load test or had an estimated CCA below about 70% of the rated value.

VOLTAGE DROP TESTS

The specifications for those tests are listed below.

TEST	SYSTEM	ASS/FAIL
Charging Cables	12 Volt	Maximum drop at rated alternator output is 0.5 Volts
	24 Volt	Maximum drop at rated alternator output is 1.0 Volts
Main Starting Cables	12 Volt	Maximum drop at 500 Amps is 0.5 Volts
	24 Volt	Maximum drop at 250 Amps is 1.0 Volts
Magnetic Circuit Straight Drive	12 Volt	Maximum drop at 80 Amps is 1.0 Volts
	24 Volt	Maximum drop at 40 Amps is 2.0 Volts
Magnetic Circuit Gear Reduction	12 Volt	Maximum drop at 300 Amps is 1.0 Volts
	24 Volt	Maximum drop at 225 Amps is 2.0 Volts
Generic Voltage Drop Test	12 Volt	Reports the drops at the entered current
	24 Volt	Reports the drops at the entered current

The minimum system voltage to run a test is 12.25 Volts for a 12 Volt system and 24.5 Volts for a 24 Volt system.

10

ALTERNATOR BENCH TESTING

The Bench Test is used to test the alternator that has been removed from the vehicle and setup on an alternator test bench.

```
ALTERNATOR
STARTER TEST
REVIEW/PRINT
>BENCH TEST
```

From the main menu select Bench Test and press Y/Enter.

```
PRESS 'Y' TO
SCROLL THROUGH
BENCH SETUP OR
'+' TO SKIP
```

Press 'Y' to scroll through the prompts for connecting the alternator to the bench or press the +/Up key to skip over the prompts to attach the alternator and the test leads.

```
REMOVE THE
ALTERNATOR PULLEY
'Y' TO SCROLL
```

If the pulley that is on the alternator is a different size or different style than the pulley that comes with the bench, then remove the pulley from the alternator and attach the pulley that goes with the bench to the alternator.

```
ATTACH BENCH
PULLEY TO THE
ALTERNATOR.
'Y' TO SCROLL
```

Utilize the proper size pulley that works with the tester.

```
ATTACH THE
ALTERNATOR TO THE
BENCH.
'Y' TO SCROLL
```

Securely mount the alternator to the bench following the instructions for the bench.

```
ROUTE BELT OVER
LARGE BENCH
PULLEY.
'Y' TO SCROLL
```

It is important that the belt go around the large pulley that is attached to the bench motor. If the small pulley on the bench motor is used or if a larger pulley is used on the alternator then the bench will not spin the alternator at full speed.

ALTERNATOR BENCH TESTING (Cont.)

MAKE SURE THAT
THE BELT IS
STRAIGHT.
'Y' TO SCROLL

Align the belt so that it is straight and will not come off.

TIGHTEN THE BELT
'Y' TO SCROLL

Make sure the belt is tight so that it will be able to properly turn the alternator under load.

ATTACH BLACK
BENCH LEAD TO
GROUND ADAPTER.
'Y' TO SCROLL

Securely attach the black bench lead to the alternator's casing or to the ground adapter post (if the alternator has a ground post instead of a case ground).

ATTACH BLACK
TESTER LEAD TO
ALTERNATOR.
'Y' TO SCROLL

Also attach the black lead from the BCT 200J to the alternator's casing or to the ground post (if the alternator has a ground post instead of a case ground).

ATTACH POSITIVE
ADAPTER TO
ALTERNATOR
'Y' TO SCROLL

The AC-27 adapter makes it possible to attach the red lead from the bench and the red lead from the BCT 200J to the alternator output post. Be sure to thread the adapter completely onto the output post of the alternator and tighten.

ATTACH RED BENCH
LEAD TO POSITIVE
ADAPTER.
'Y' TO SCROLL

ATTACH RED TESTER
LEAD TO POSITIVE
ADAPTER.
'Y' TO SCROLL

ALTERNATOR BENCH TESTING (Cont.)

ALTERNATOR AND
TESTER SHOULD BE
HOOKED UP.
'Y' TO CONTINUE

If the prompts are skipped over by pressing the +/Up key then a prompt is displayed indicating that the alternator and the tester should at this point be connected to the bench. After verifying that the setup is correct press the Y/Enter key to continue.

DOES
ALTERNATOR HAVE A
REMOTE SENSE.
'N' OR 'Y'

Some alternators have a remote sense post to enable the alternator to regulate the voltage at the battery instead of at the alternator. If the alternator has a remote sense post then the remote sense post must be attached to the output post of the alternator to test the alternator on the bench. Otherwise the alternator's regulator will not be connected and the alternator's output voltage will be high.

CONNECT REMOTE
SENSE POST TO
OUTPUT POST.
'Y' TO CONTINUE

TURN BENCH POWER
SWITCH ON.

'Y' TO CONTINUE

Note: Output terminal and ground post adapters utilized. Model AC-27



ALTERNATOR BENCH TESTING (Cont.)



The BCT 200J will check the bench battery to ensure that it is charged and sufficiently good to continue with the alternator test.



If the battery has a charger connected to it the charger must be turned off or disconnected to continue with the alternator test.

BENCH BATTERY OR
CABLES ARE
DEFECTIVE.
'Y' TO CONTINUE

If the bench battery is too weak or if the cables or leads of the bench have too high of a voltage drop then the battery and/or cables will need to be serviced before continuing with the alternator test.

BENCH BATTERY IS
LOW, CHARGE OR
REPLACE.
'Y' TO CONTINUE

If the bench battery is discharged then charge or replace the battery before continuing with the alternator test.

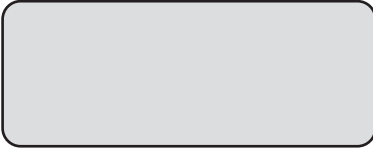
ENTER RATED
ALTERNATOR
OUTPUT: 100A
'Y' TO CONTINUE

Set the rated output of the alternator. The rated output is sometimes marked on the alternator, if it is not marked on the alternator check the manufacturer's documentation.

TURN MOTOR SWITCH
TO FWD.
'Y' TO CONTINUE

Turn the bench motor on to spin the alternator. If the nut to hold the pulley on the alternator has right-hand threads then by turning the motor forward the chances of the pulley coming loose during the test will be reduced.

ALTERNATOR BENCH TESTING (Cont.)



TURN MOTOR SWITCH
OFF.
'Y' TO CONTINUE.

TURN BATTERY
SWITCH OFF.
'N' TO CANCEL

TURN BENCH POWER
SWITCH OFF.
'Y' TO CONTINUE

#45 12V BENCH
GOOD ALTERNATOR
GOOD REG. 14.47V

If this prompt shows up during the alternator test then verify that the belt goes around the large pulley on the bench motor and that the correct pulley is used on the alternator. If the correct pulleys are being used then press Y/Enter to continue otherwise press N/Cancel and use the correct pulleys.

After the BCT-200J has tested the alternator it will prompt for the motor, the battery switch and the bench power to be turned off.

After the bench is turned off the BCT-200J will report the condition of the alternator.

ALTERNATOR BENCH TESTING (Cont.)

```
#48 12V BENCH BAD  
ALTERNATOR HIGH  
RIPPLE  
REG.      14.39V
```

This result indicates the alternator is in good working order

```
#147 12V ALTER.  
GOOD REG.  14.15V  
GOOD DIODE  
GOOD OUTPUT
```

This is a defective alternator. It has a defective component and is producing high ripple

```
#149 12V ALTER.  
LOW REG.   12.74V  
BAD DIODE  
LOW OUTPUT
```

This is a defective alternator. Not only does it have defective components - the regulation set point is high.

```
#151 12V ALTER.  
HIGH REG.  15.02V  
BAD DIODE  
PARTIAL OUTPUT
```

This is a defective alternator. The output and regulation are low. Defective batteries can cause this condition

```
#148 12V ALTER.  
LOW REG.   12.74V  
LOW OUTPUT
```

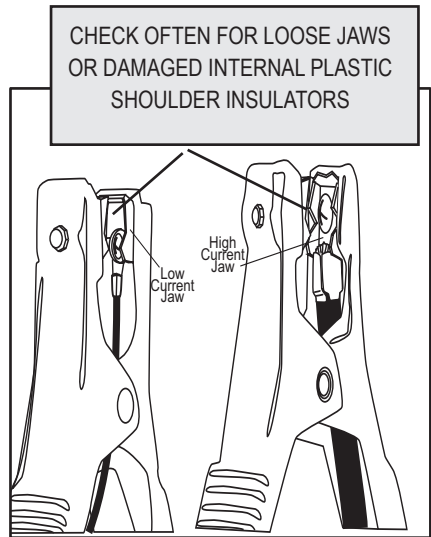
```
#150 12V ALTER.  
HIGH REG.  15.02V  
GOOD DIODE  
LOW OUTPUT
```

Defective alternator. It can not handle the load and it is regulating high.

MAINTENANCE

CLAMP INSPECTION

IMPORTANT: Both jaws of each clamp must firmly engage all terminals. The copper jaw contains the smaller gauge wire that reads the voltage and the silver jaw contains the larger conducting wire that draws the load in each test. Jaw insulation is necessary for accurate readings. Damaged clamps or loose wires will affect the readings. Keep clamps clean and in good repair. **DO NOT ATTEMPT TO REPLACE CLAMPS WITH ANYTHING OTHER THAN AUTO METER CLAMPS.**



BATTERY CLAMP REPLACEMENT

Over time the battery clamps will need to be replaced if the following are indicated:

- CCA values seem to be way off.
- If there is continuity between the silver and copper jaw.
- If there is excessive damage or corrosion to the cables or clamps.

PROCEDURE

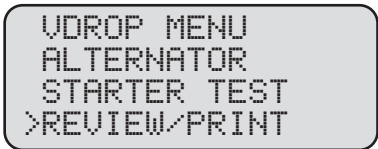
- Disconnect the back cover.
- Remove the battery to prevent shorting.
- Disconnect the two small wires from the PC board.
- Remove the large cables from the copper busses.
- Carefully pull each wire through the grommets.
- Reverse the procedure in replacing new clamps.
- **Caution:** Make sure the red clamp wires are attached to the positive buss and the black clamp is attached to the negative buss. Putting a little mineral spirits on the new cable ends will increase ease of insertion through the grommets.

BATTERY REPLACEMENT

When the LCD indicates a low internal battery. Remove the back cover and replace the battery with a 9 volt Alkaline battery.

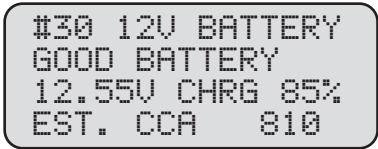
REVIEW TESTS

From the main menu select **REVIEW/PRINT**



The last test will be displayed.

Press (+Up) or (-Down) key to select the desired test. Press



(N Esc.) to select MAIN MENU.

OPTIONAL INFRARED PRINTER

The optional PR-15 printer receives an infrared beam from the BCT-200J up to 40 ft. No connection cords are needed. For more instructions on how to operate the printer consult the printer manual.

Printer Type -----Thermal
Print Speed-----24-char. line per second
Paper-----2.25 in x 80 ft. roll (included)*
Power ----- AC Adapter

Note: Thermal Paper can be purchased at any office supply.

PRINTING TEST RESULTS

Point the BCT-200J in the direction of the optional PR-15 printer with the printer's IR receiver pointed in the direction of the BCT-200J. Press (Print). You should be within 15 ft. of the printer. Wait for the screen to clear before moving the BCT-200J. It takes a moment to send all the test data. The BCT-200J also operates the AC-14 printer installed in Auto Meter's XTC-160 tester/charger or BVA-2100 heavy duty tester/analyzer.

- Make sure the Infrared Printer is properly set up.
- After a test is made with the BCT-200J make sure the results are displayed on the LCD.
- Point the BCT-200J in the direction of the Infrared Printer (within 15 ft.)
- Press the <Print> key and the test results will be printed.
- Depending upon the test made the printer will sometimes yield more information than the LCD.
- Wait until the printer stops printing before you press the BCT-200J print key again.
- **Multiple Test Printing:**
Pressing the print button repeatedly (up to six times) will automatically print the test in review and the previous tests.



For battery, starter, and alternator tests a unique warranty code is generated and printed at the bottom of the printout. This code is used for data and warranty verification.

Example warranty code:

WARRANTY CODE
2BC0813280B012H12

VOLT METER

```
ALTERNATOR      ↑
STARTER TEST
REVIEW PRINT
>VOLT METER     ↓
```

Select VOLT METER from the main menu and press (Y Enter).

This gives the user a chance to check the voltage from the large clamps and the external leads.

```
-VOLT METER-
VOLTS: 12.28V.
EXT VOLTS: 3.77V
0.00 POS 0.00NEG
```

```
-VOLT METER-
VOLTS: 12.28V.
EXT VOLTS: 3.77V
RIPPLE: 0.00MV
```

Press (Y Enter) to switch between screens showing voltage drop or ripple

J1708 DATA

```
STARTER TEST    ↑
REVIEW/PRINT
VOLT METER
>J1708 DATA    ↓
```

Select J1708 for the main menu and press (Y Enter).

```
ERROR: J1708
NOT READING
```

If ERROR appears the connections has not been established.

```
VIN: 12345689A
BATTERY 14.10V.
OIL TEMP 68F.
AMB. TEMP. 75F.
```

```
VIN: 12345689A
BATTERY 14.10V.
OIL TEMP 68F.
AMB. TEMP. 75F.
```

Press (Y Enter) to switch between screens.

This gives the user a chance to check the J1708 connections and obtain pertinent information such as the ambient temperature for later use in testing the battery. Keep in mind that the ambient temperature may not be the actual temperature of the battery unless the vehicle battery has been in the place sufficient time for the battery to reach the surrounding ambient temperature. A low oil temperature would add a greater demand on the starter. This information is used by the BCT-200J to calculate the condition of the starter.

SETUP

```
REVIEW/PRINT  
VOLT METER  
J1708 DATA  
>SETUP
```

From the main menu select
SETUP.

```
>SET TEMPERATURE  
SCALE: F.  
USE +/-.  
'Y' TO SELECT
```

Select the temperature in
Fahrenheit or Centgrade.

```
>REQUIRE VEHICLE  
ID NUMBERS? YES  
USE +/-.  
'Y' TO SELECT
```

```
>ENTER VEHICLE  
ID# 0000  
USE +/-.  
'Y' TO CONTINUE
```

You can require the entry of a vehicle
identification number for each test.
Use the (+) or (-) key to change the
displayed request.

If answered YES the above screen
will appear at the beginning of the
first test for a vehicle. Each digit,
with a total of 6, requires increment
or decrement to the desired
number. The requested digit to
change is flashing. By pressing (Y
Enter) the next digit is selected. On
the last enter the displayed number
will be accepted and remain in
memory.

Note: The ID number will not be
requested again as long as the unit
is not turned off.

```
>REQUIRE TECH.  
NUMBERS? NO  
USE +/-.  
'Y' TO SELECT
```

```
>REQUIRE VISUAL  
CHECKS? NO  
USE +/-.  
'Y' TO CONTINUE
```

To require technician numbers
change YES or NO using the (+) or (-)
key. Press (Y Enter) to select.

To require visual checks change
YES or No using the (+) or (-) key.
Press (Y Enter) to select.

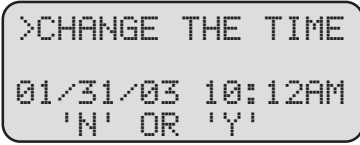
```
>REQUIRE BATTERY  
DATE CODES? NO  
USE +/-.  
'Y' TO SELECT
```

To require battery date codes
change YES or No using the (+) or
(-) key. Press (Y Enter) to select.

SETUP (Cont.)



To require a battery serial number before each battery test select YES. If YES is selected then before each battery test the tester will prompt for a 14 digit alphanumeric serial number. This serial number will be printed near the bottom of the printout along with the warranty code.



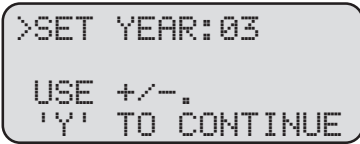
If you select Yes you can change the MONTH, DAY, YEAR, HOUR and MINUTE.



Select the month as 01 to 12



Select the day as 01 to 31



Select the year as 04 to 99



Select the hour as 01 to 12 AM/PM



Select the minute as 01 to 60



Can delete all test data or one item at a time.

PC INTERFACE

1. Scroll down the main menu to DOWNLOAD. Press (Y Enter) to select.

```
VOLT METER  
J1708 DATA  
SETUP  
>DOWNLOAD
```

Using Auto Meter's optional adapter cord AC-10 insert the plug into the jack on the BCT-200J (see page 6) and then plug the serial adapter into a free serial port on your computer.

```
CONNECT ANALYZER  
TO A P.C.  
9600, N, 8, 1.  
'N' TO CANCEL.
```

Note: Most computers are configured with at least one serial port (identified as COM 1), and some have a second serial port, usually identified as (COM 2). Check your computer manual to locate and identify a serial port connector. Even if you have a physical COM port you need to make sure it is working properly before you proceed. Consult your computer manual. If your computer serial port is configured for 25 pin you will need to obtain an adapter from your computer store. If your computer does not have an available serial port and you're planning on using *Windows HYPER Terminal* as illustrated below, you will need to buy and install an adapter card with a serial port.

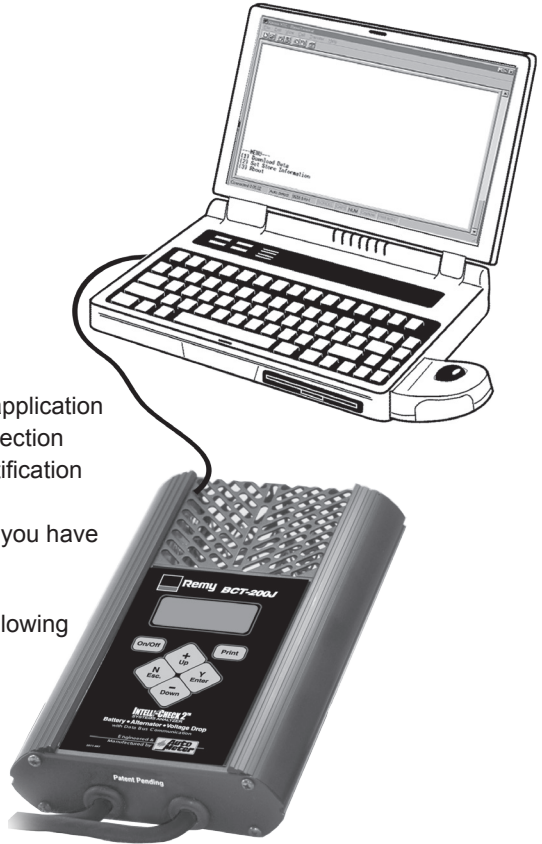
2. Using Auto Meter's AC-35 Application Program
By purchasing Auto Meter's PC Application Program, information that is stored and collected in the BCT 200J can be easily downloaded into a PC program format for storage. The AC-35 comes with a PC cable, installation and user instructions.

USING WINDOWS 98/2000/NT/XP

Note: The BCT-200J will interface with any basic (ANSI) terminal emulation software. Most operating systems contain a program that will do this. Following are instructions for Windows. For other operating systems consult the Manual for that system.

3. Opening Windows HyperTerminal:

- Select Windows Start
- Then “Programs”
- Then “Accessories”
- Then “Communications”
- Then Click “Hyper-Terminal”
- Double Click “Hypetrm.exe” application
- Type in a name for your connection
- Select an icon for future identification
- Select “OK”
- Select the COM port number you have previously identified in step 1.
- Select “OK” and select the following from the pull down menus:
 - Bits per second 9600
 - Data bits 8
 - Parity None
 - Stop Bits 1
 - Flow Control None
- Select “OK”



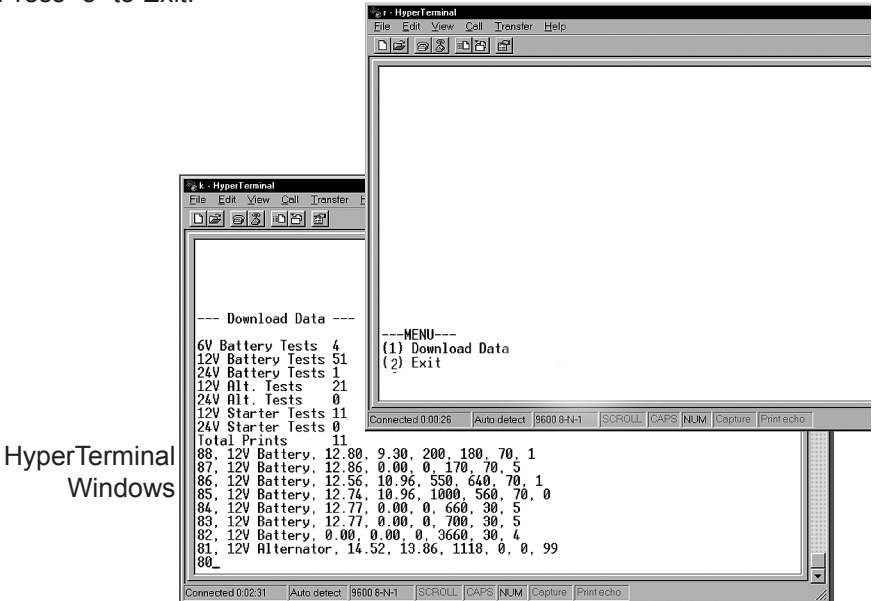
DOWNLOAD TEST INFORMATION

4. PC Screen Menu

- If the BCT-200J is properly connected to your PC and the LCD shows “CONNECT ANALYZER TO A PC” the menu should automatically be displayed in Hyper Terminal.
- Press “1” to download the stored data.

To save the information displayed see “Capture text into Microsoft Excel.” See BCT-200J test labels below for identification.

- Press “Enter” to return to Menu.
- Press “Enter” to return to Menu.
- Press “3” to Exit.



BCT-200J Test Labels

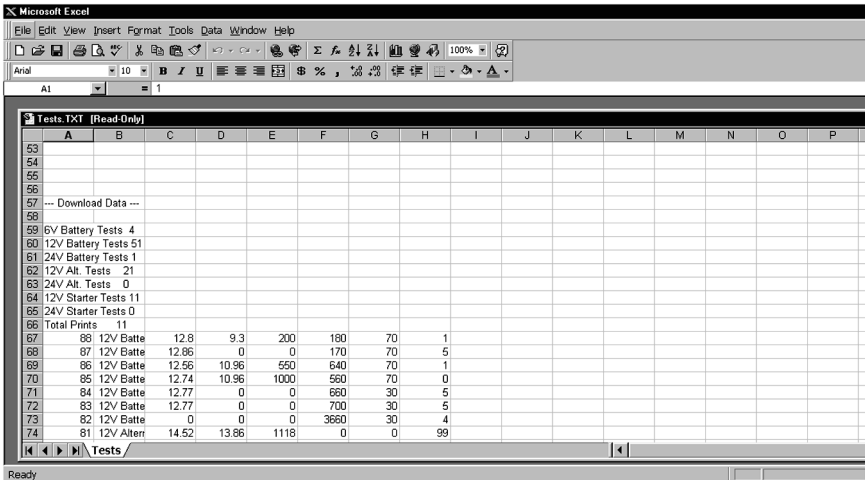
Battery Bank	Beginning Volts	Loaded Volts	Rated CCA	# of Batteries	Temperature	N/A	Amb. Temp
12V Battery	Beginning Volts	Loaded Volts	Rated CCA	Est. CCA	Temperature	1ST CCA	Amb. Temp
24V Battery	Beginning Volts	N/A	N/A	N/A	Temperature	N/A	Amb. Temp
12V Alter.	Beginning Volts	Loaded Volts	mVAC	Peak Volts	mVAC	Rated Current	R-Term
24V Alter.	Beginning Volts	Loaded Volts	mVAC	Peak Volts	N/A	Rated Current	R-Term
12V Starter	Beginning Volts	Loaded Volts	Ext Volts	Pos Drop	Cranking Volts	Pos Drop	Draw

CAPTURING TEXT

5. Using Microsoft Excel

Note: For other software applications consult your software manual.

- Make sure menu is displayed as shown in illustration page 20 step 3.
- Select “Capture Text” in the Transfer Menu.
- Type in **c:\my documents\download.txt** and then select “Start.”
- Press “1” to download. When finished select Capture Text again from the Transfer Menu then select Stop.
- Launch Microsoft Excel and select open file.
- Under “Files of Type” at the bottom of the open file window select All Files (*.*)
- Highlight your “**download.txt**” file then select Open.
- Select “Delimited” and start at row 1 then “Next”
- Select “Comma” then “Next”



- Under Column Date Format select “General” then “Finish”
- After the file is loaded you can delete unwanted rows and format columns as desired. The following are labels for identifying the 8 columns of information.

BCT-200J Test Labels

Date Code	N/A	N/A	N/A	N/A	N/A	Condition	Tech ID	Vehicle ID	VIN	Time/Date
Date Code	N/A	N/A	N/A	N/A	N/A	Condition	Tech ID	Vehicle ID	VIN	Time/Date
Date Code	N/A	N/A	N/A	N/A	N/A	Condition	Tech ID	Vehicle ID	VIN	Time/Date
Engine Speed	R-Term	Engine Speed	N/A	N/A	Code	N/A	Tech ID	Vehicle ID	VIN	Time/Date
Engine Speed	R-Term	Engine Speed	N/A	N/A	Code	N/A	Tech ID	Vehicle ID	VIN	Time/Date
Oil Temp	Amb. Temp	N/A	N/A	N/A	Code	N/A	Tech ID	Vehicle ID	VIN	Time/Date
Oil Temp	Amb. Temp	N/A	N/A	N/A	Code	N/A	Tech ID	Vehicle ID	VIN	Time/Date

ABOUT

```
J1708      ↑  
SETUP  
DOWNLOAD  
>ABOUT
```

```
INTELLI-CHECK2J  
VERSION 4.12  
DATE 05/16/2013  
COPYRIGHT 1999
```

Gives the version of the software.

NOTE: This screen is for reference only. The software version and date shown in the screen illustration may not match what is displayed on the actual tester.

The program can be updated to the most recent version by reflashing the memory. Before turning the unit on hold the (N Exc.) and the (Y Enter) key down simultaneously. The following will appear.

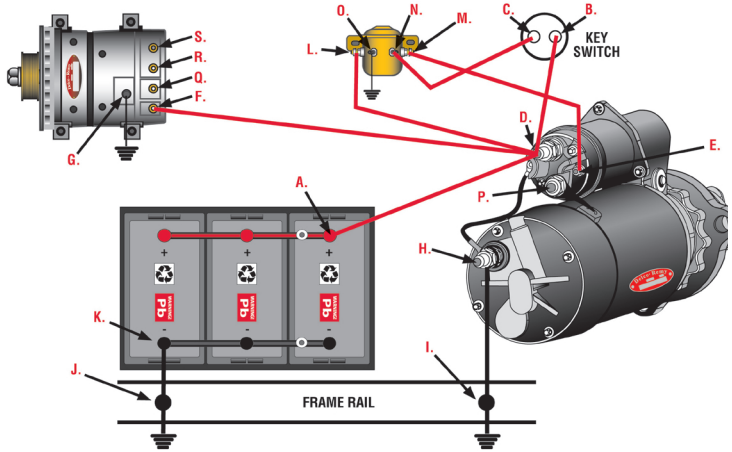
```
READY (V2.00)
```

```
REFLASHING!
```

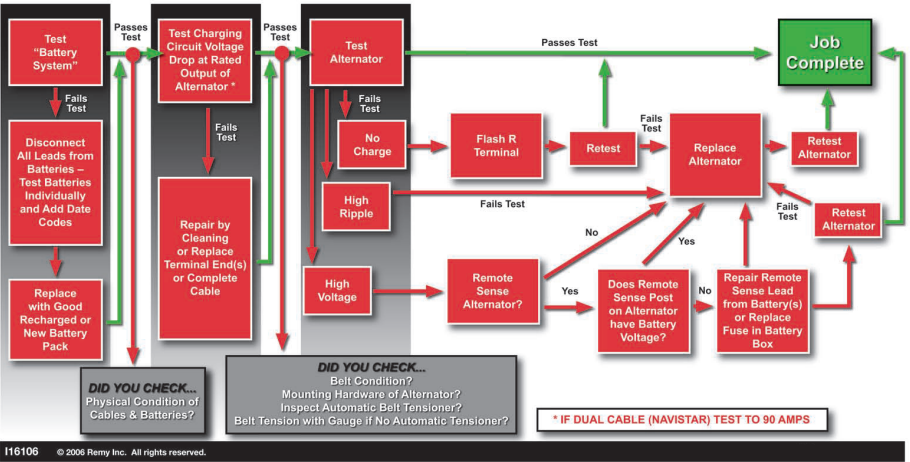
When a computer can be attached to the unit in the same way the test data can be downloaded. "REFLASHING!" will then appear.

Intelli-Check II™ Key Components

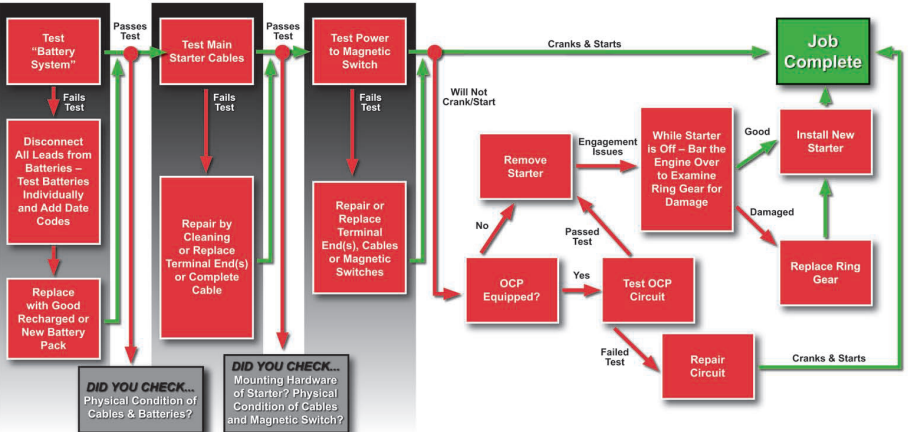
- A. Battery Positive
- B. Hot side of Key Switch
- C. Cold side of Key Switch
- D. Battery Positive on Solenoid
- E. S-Terminal
- F. Alternator Positive (Output Terminal)
- G. Alternator Ground
- H. Starter Ground
- I. Frame Ground - Front
- J. Frame Ground - Back
- K. Battery Ground
- L. Hot Side of Mag Switch
- M. Mag Switch Coil Terminal
- N. Cold Side of Mag Switch
- O. Mag Switch Coil Terminal
- P. Motor Terminal
- Q. R-Terminal
- R. I-Terminal
- S. Remote Sense Terminal



Intelli-Check II™ Charging System Test



Intelli-Check II™ Cranking System Test





BCT-200J Download Application (AC-65) Instruction Manual

Thank you for purchasing the AC-65 Data Download Application for your BCT-200J Handheld Tester from Auto Meter Test Equipment. The AC-65 Data Download Application enables data transfer from your BCT-200J model tester to your PC for storage, record keeping, and analysis. These instructions will help guide you through the AC-65 software installation and operation process.



BCT-200J Download Application

Auto Meter Products, Inc.

Version 2.0.5

Copyright 2005
Auto Meter Products, Inc.

Continue

BCT200J Download Application (AC-36) Instructions

This software will allow data to be downloaded from the BCT200J and saved on a PC. Test results can then be displayed on the PC and can be printed on the PC's printer.

INSTALLATION:

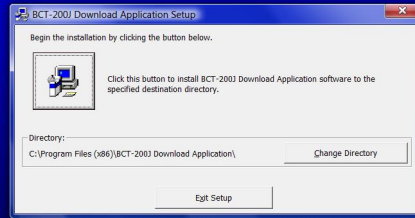
1. Make sure the computer is on and booted up. Save any data and close any open applications. Load the included CD into the computer. If auto run is enabled on the computer, the installation program will start automatically. If auto run is not enabled, go to the CD drive then run setup.exe. The following screen will appear on the computer. Click on the OK button to continue with the installation.

BCT-200J Download Application Setup



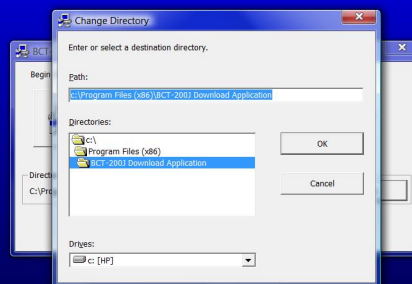
- The next screen will ask where to install the BCT-200J Download Application software. Accept the default location by clicking on the computer icon button or change it by clicking on the Change Directory button.

BCT-200J Download Application Setup

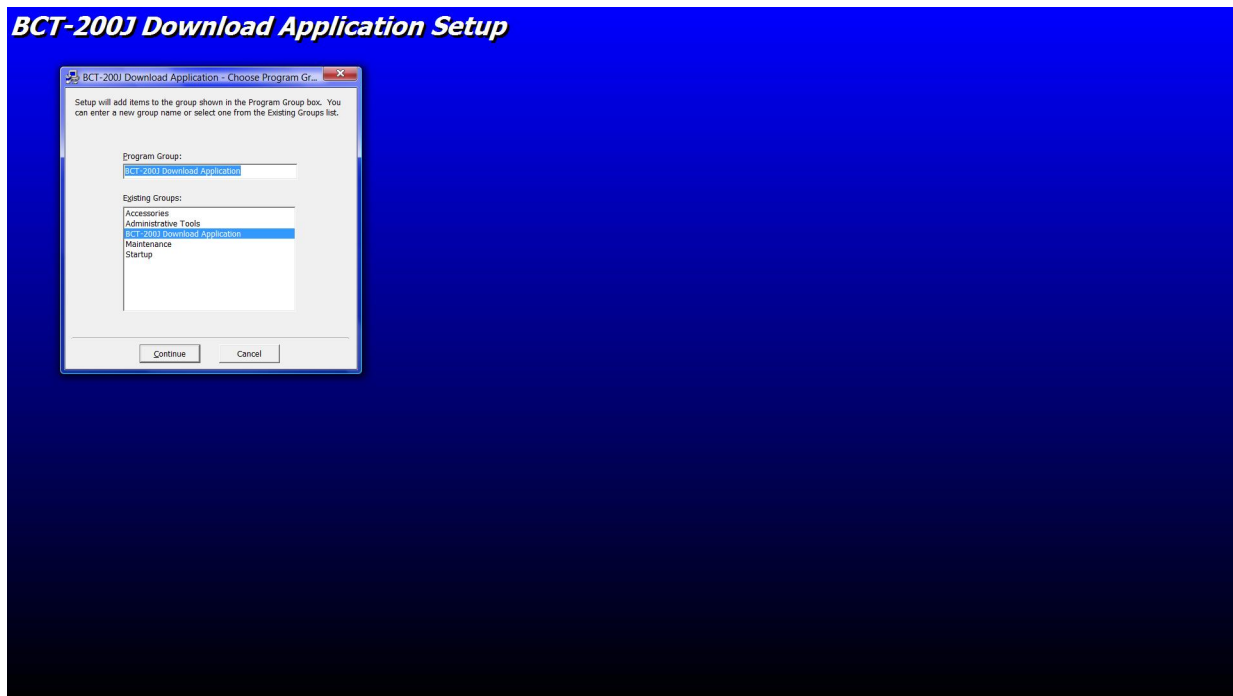


- If you chose to change the directory then enter the new directory where the program will be installed, and then click on OK. Click on the computer icon button to install the BCT-200J Download Application software.

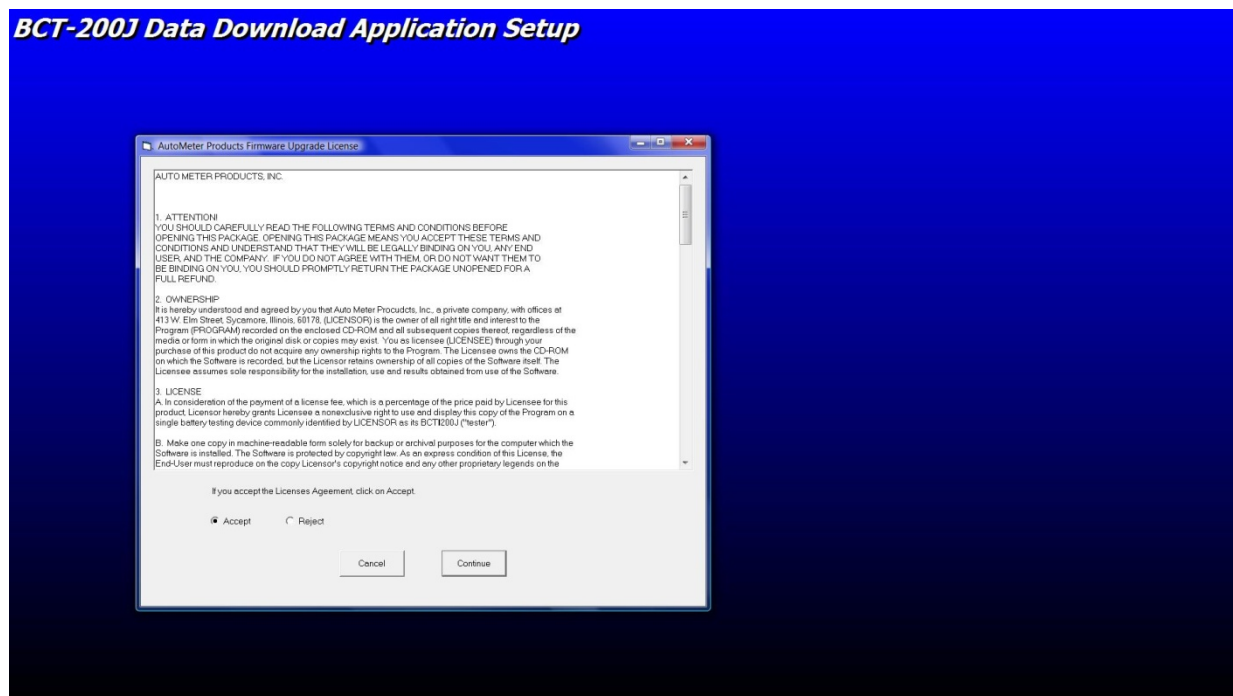
BCT-200J Download Application Setup



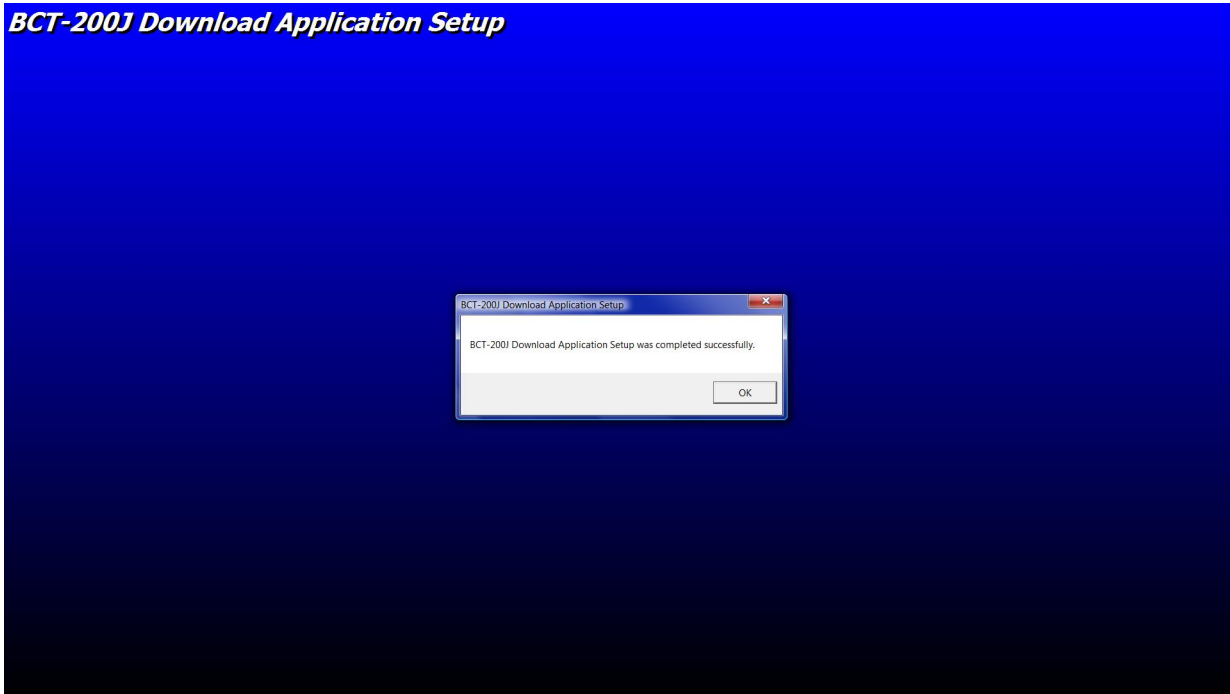
4. The next screen will prompt for the program group in which to place the BCT-200J Download Application. Accept the default location or choose another group by highlighting it, then click on Continue. Clicking on Cancel will exit the installation program.



5. The next screen will display the license agreement. If you agree with the license agreement then click on the Accept button and then click on Continue. If for some reason you disagree with the license agreement then click on Cancel to exit the installation program.



6. The BCT-200J Download Application software will finish installing. Click on OK to return to the desktop.



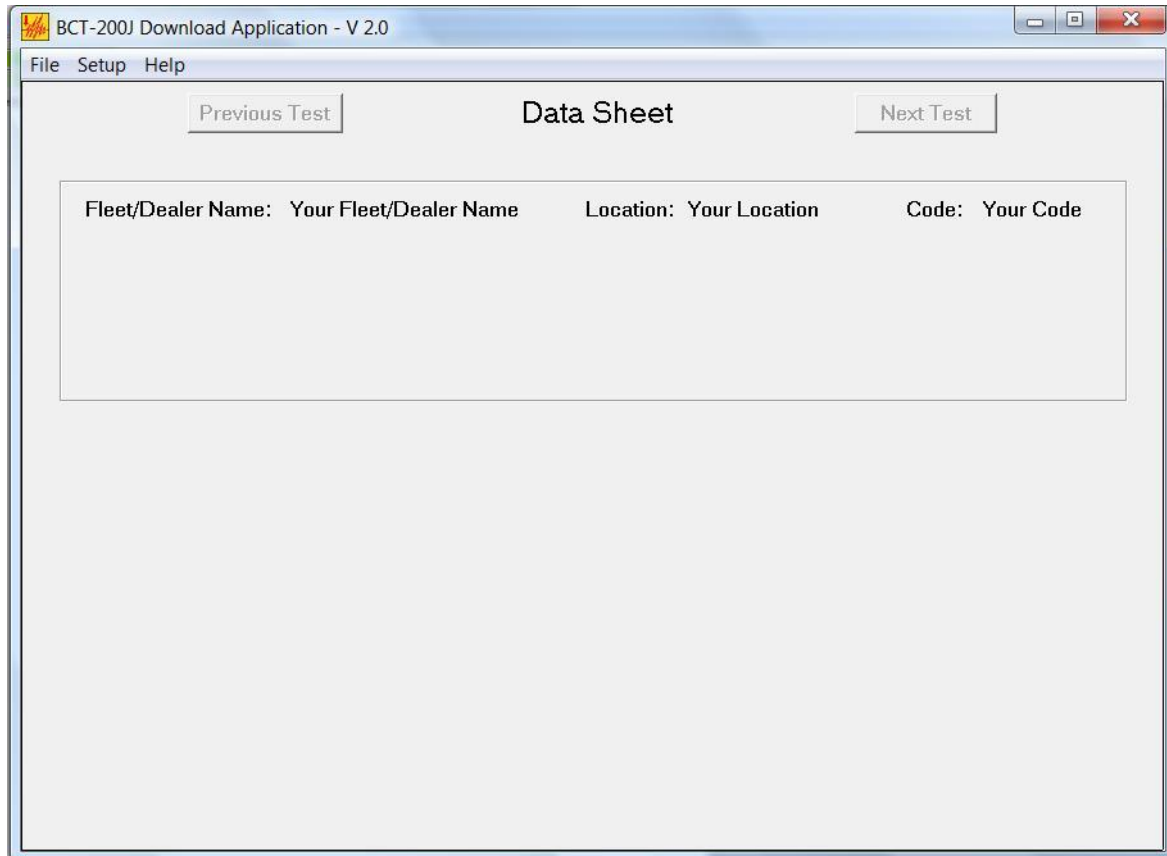
STARTING THE PROGRAM:

1. To run the BCT-200J Download Application software, click on START, PROGRAMS, BCT-200J DOWNLOAD APPLICATION.
2. The BCT-200J Download Application will start and the following screen will appear. Click Continue to move to the main screen.



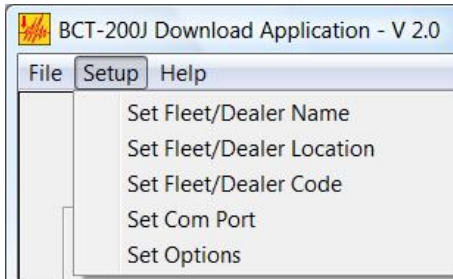
USING THE PROGRAM:

1. From this screen the features of the program can be accessed.

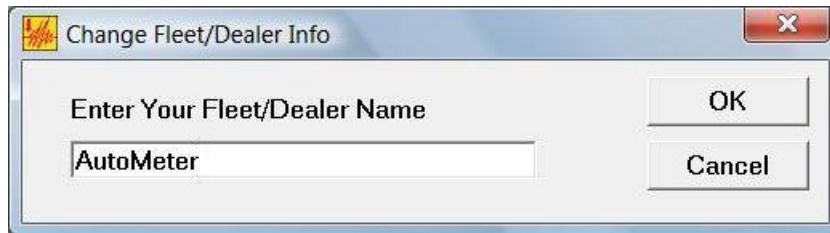


SETUP MENU:

Any changes made from this menu are saved and reloaded each time the program is ran.



1. Set Fleet /Dealer Name. This menu option sets the Fleet/Dealer name that will appear on all displays and printouts. Click on the menu item and the following window will appear.



Enter the Fleet/Dealer Name and click OK to save. Click Cancel to close the window without saving.

2. Set Fleet/Dealer Location. This menu option sets the Fleet/Dealer Location that will appear on all displays and printouts. Click on the menu item and the following window will appear.



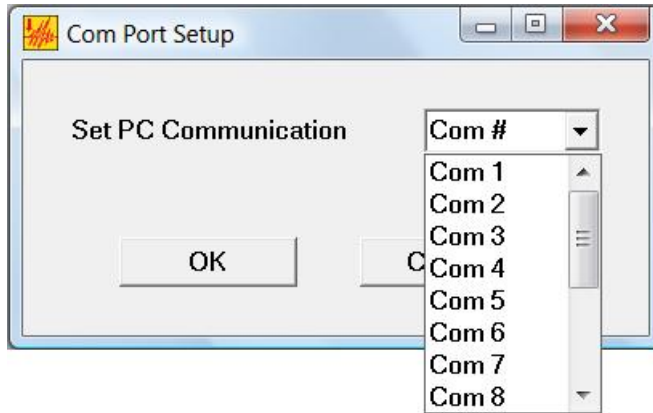
Enter the Fleet/Dealer Location and click OK to save. Click Cancel to close the window without saving.

3. Set Fleet/Dealer Code. This menu option sets the Fleet/Dealer Code that will appear on all displays and printouts. Click on the menu item and the following window will appear.



Enter the Fleet/Dealer Code and click OK to save. Click Cancel to close the window without saving.

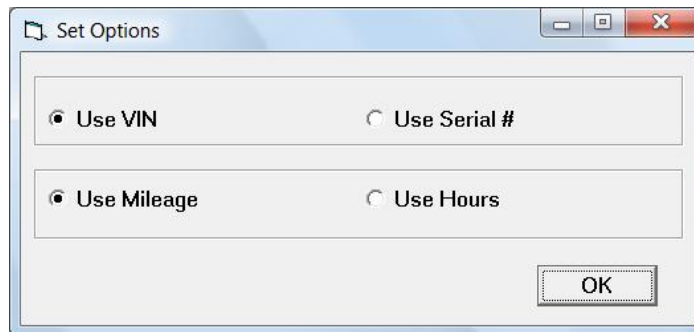
4. Set Com Port. This sets which PC serial port will be used to download the data from the BCT-200J. Click on the menu item and the following window will appear.



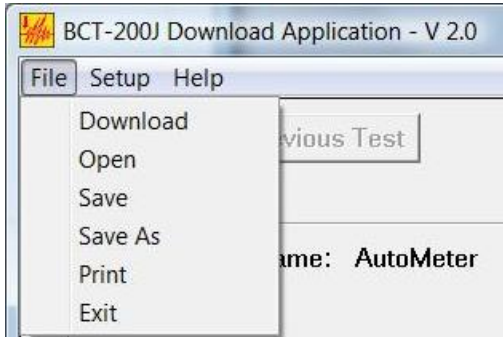
Click on the small arrow on the serial port list box. A list of serial ports will appear. Select the serial port that will be used to connect to the BCT-200J. Click OK to save. Click Cancel to close the window without saving.

Note: The serial port must be set correctly before a download can occur. If a serial port is selected that does not exist then an error will occur while attempting a download and the program will close. If this happens, reopen the program and set the serial port correctly as described above.

5. Set Options allows a selection between showing VIN or Serial # and Mileage or Hours.



FILE MENU:

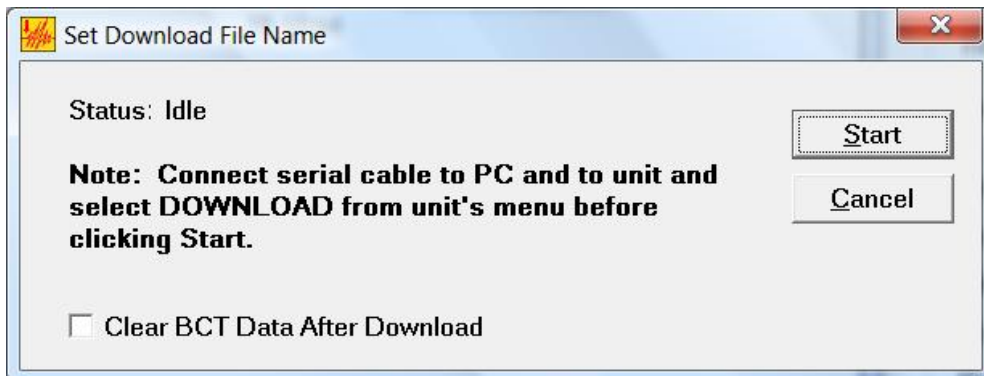


1. Download. This option will download the data from a BCT200J and save the data to a text file on the PC. Before choosing this option connect the round 6 pin plug of the AC-10 cable into the jack at the top of the BCT-200J. Connect the 9-pin DB connector of the AC-10 cable to a serial port on the computer.

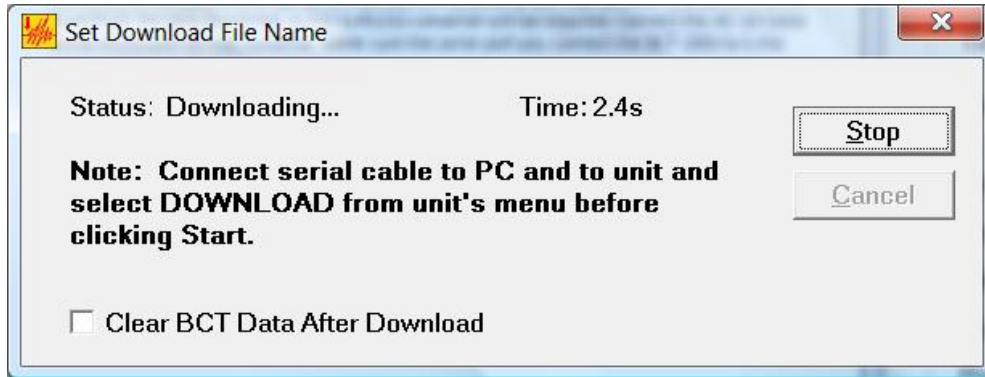
Note: Some newer computers and laptops do not have an RS232 serial port but do have USB ports. In order to perform the data download, a USB to RS232 converter will be required. Connect the AC-10 Cable to the RS232 port on the converter. Make sure the serial port is selected correctly as described above.

Select the Clear BCT Data After Download box before clicking Start to automatically delete the data from the BCT-200J after the download is complete.

Click on the Start button to begin the download.



As the data is downloaded the status line will show downloading and the time duration of the download.

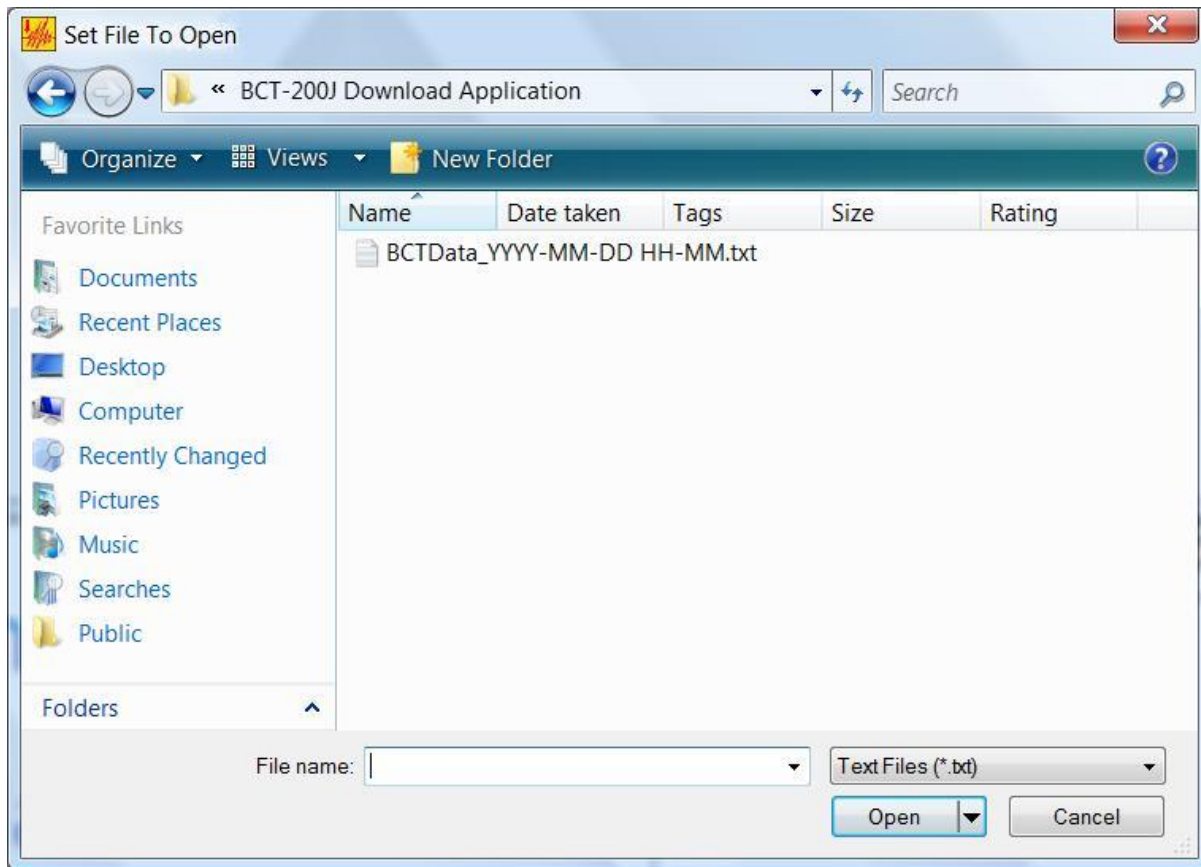


When the download is complete, the data will automatically be saved as a text file with the following filename format:

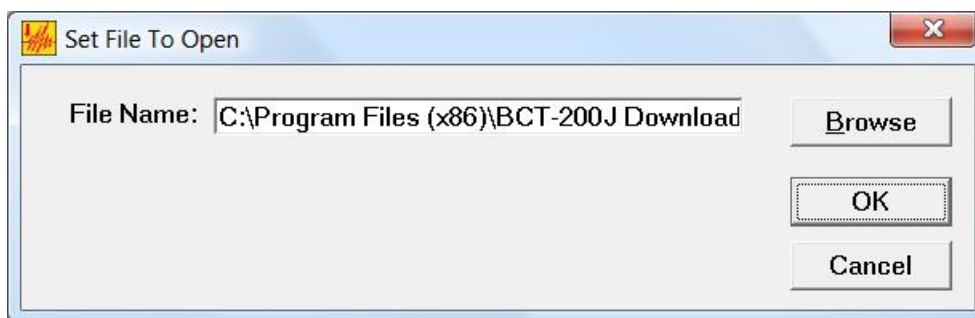
BCTData_YYYY-MM-DD-HH-MM.txt

The data will be saved in the directory where the BCT-200J Download Application software is located. (Refer to INSTALLATION on pages 2 - 5.) After saving, the data will also be loaded into the program.

2. Open: This will open a previously saved file. Select the path and file to be opened.

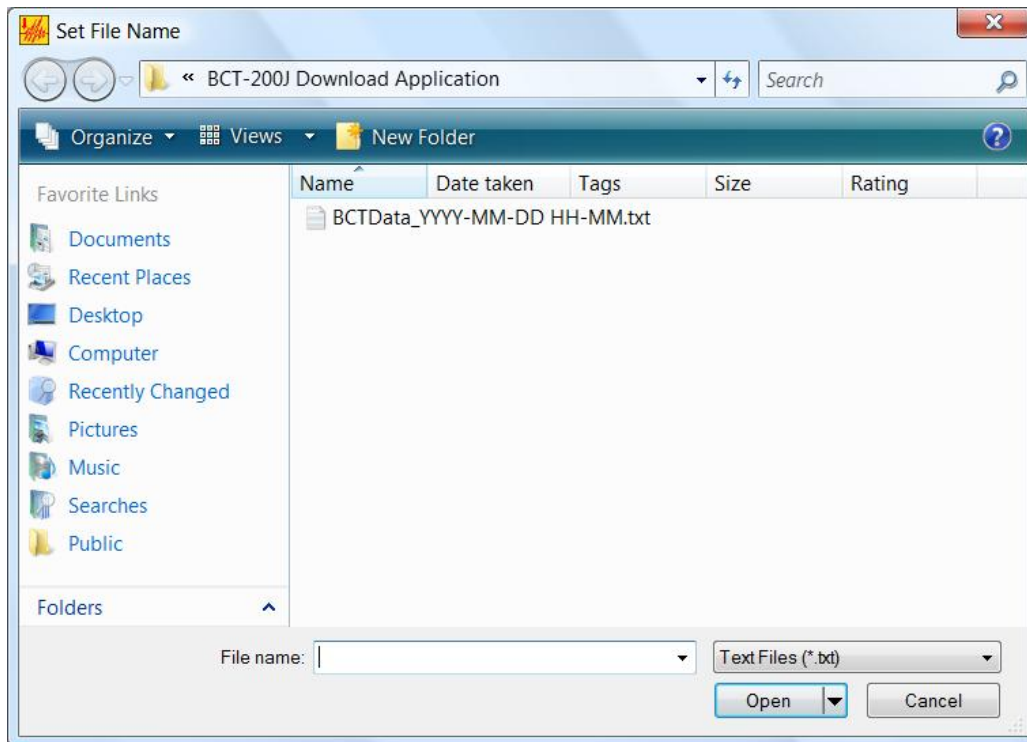


Click Open, a window will be displayed with the file choice. The file choice can be changed by clicking Browse.

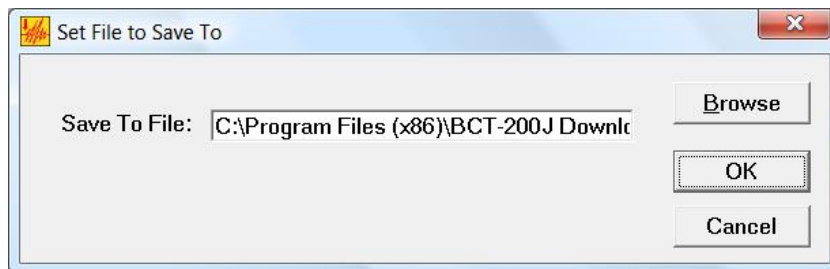


Click OK to load in the file.

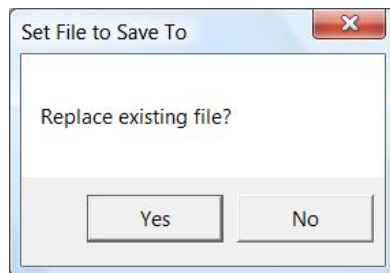
- 3. Save: Clicking this button will save the data in the program to the current file.
- 4. Save As: This will save the data into a file selected by the user.



Select or type in the filename, then click Open. Another window will be displayed with the filename where the data will be saved.



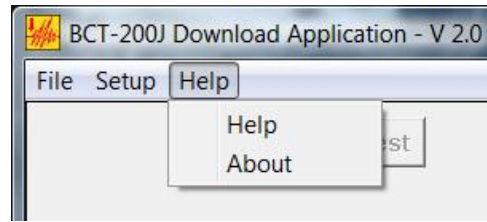
Click OK to save the data. If the file already exists a message box will appear.



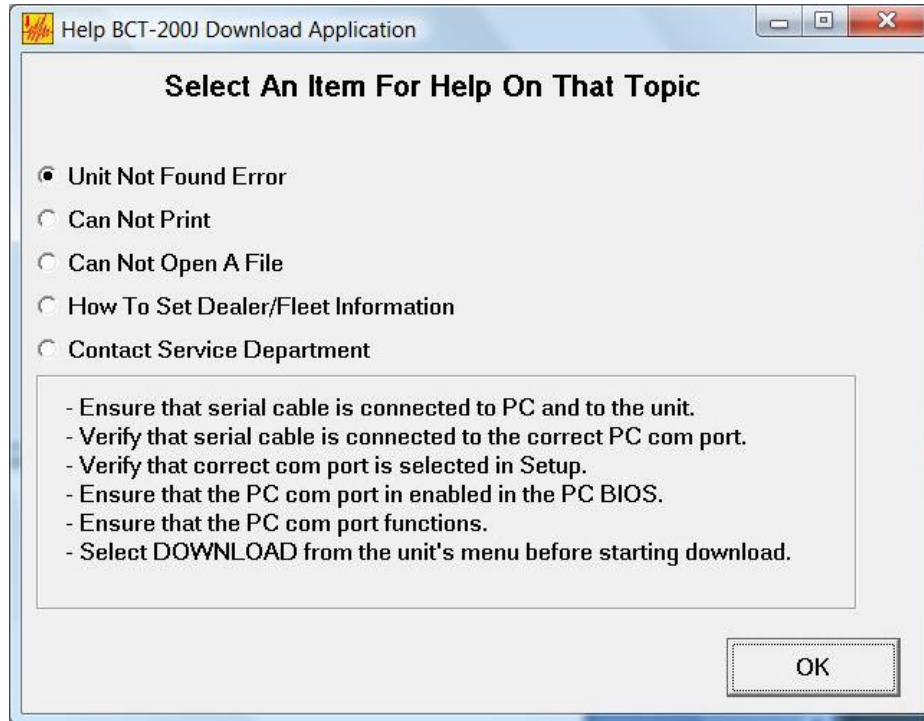
Click Yes to overwrite the file or click No to cancel the save.

- 5. Print: This menu option will print the data that is displayed on the main window.
- 6. Exit: This will exit the program.

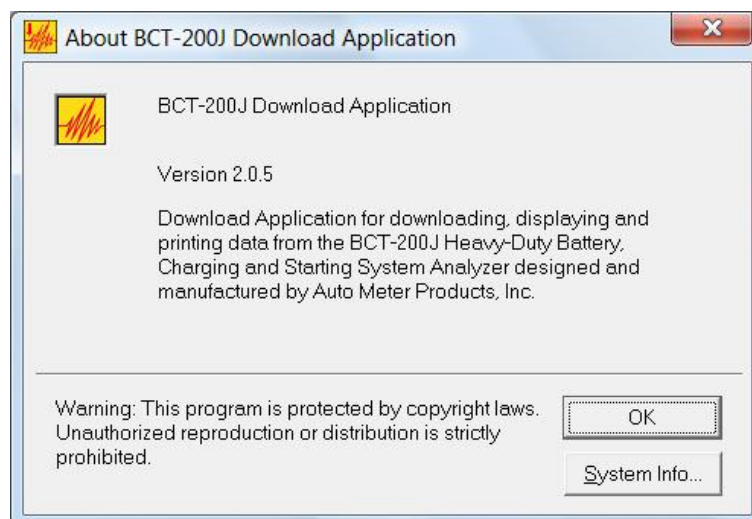
HELP MENU:



1. Help. This will open a window that will display various help topics. Click on the option to display the help for that subject. Click OK to close the help window.



2. About. This will open a window that describes the program. Click OK to close this window.



DATA DISPLAY WINDOW:

This is the window that displays the downloaded and entered information.
The Next and Previous buttons will move forward and backward through the data.

The screenshot shows a software window titled "BCT-200J Download Application - V 2.0" with a menu bar containing "File", "Setup", and "Help". The main content area is titled "Battery Data Sheet" and includes a "Previous Test" button on the left and a "Next Test" button on the right. The version "VERSION 4.06PM" is displayed in the top right corner. The form contains the following fields:

- Fleet/Dealer Name: AutoMeter
- Location: Sycamore, IL
- Code: 0001
- VIN:
- Vehicle ID Number: 000000
- Mileage:
- Technician Number: 0000
- Repair Number:
- Date:
- Time:
- Customer:
- Comments:

Below the form is a section titled "12V Battery Test" containing the following data:

- Test#: 1
- Date/Time: 01/01/05 12:00AM
- GOOD, NEEDS CHARGE**
- Voltage: 11.92V.
- Charge: 13%
- Type: LEAD-ACID
- Rated CCA: 500A.
- Estimated CCA: 530A.
- Temperature: 77F.
- Loaded Voltage: NA
- Date Code:

1. PM Data Sheet
2. Battery Data Sheet
3. Battery Bank Data Sheet
4. Starter Data Sheet
5. Alternator Data Sheet
6. Mag Circuit Data Sheet
7. Main Cables Data Sheet
8. Charge Cables Data Sheet
9. Voltage Drop Data Sheet
10. Liftgate Charge Cables VDrop Data Sheet
11. Liftgate Motor Cables VDrop Data Sheet
12. Liftgate Truck Cables VDrop Data Sheet

Some data sheets have a warranty claim option where the data can be saved to a claim file. Enter the Warranty Claim #, VIN #, Repair number and mileage then click on the Save To Claim File button. A warranty claim file will be created that contains the associated data sheet(s). For alternator and starter claim files the number of tests to save to the claim file can be set so that previous tests (i.e. cable drop tests and battery tests) will also be documented in the claim file.

The format of the claim file name is:

Claim_Code#_VIN#.txt (i.e. Claim_0001_ABCDEF12345.txt)

The file will be saved in the directory where the BCT-200J Download Application software is located. (Refer to INSTALLATION on pages 2 - 5.)

The screenshot shows a software window titled "BCT-200J Download Application - V 2.0" with a menu bar containing "File", "Setup", and "Help". The main window displays a "Battery Warranty Data Sheet" form. At the top of the form are buttons for "Previous Test" and "Next Test", and a "Save To Claim File" button. A "Warranty Claim #" field is followed by the text "VERSION 4.06PM". The form contains several input fields: "Fleet/Dealer Name: AutoMeter", "Location: Sycamore, IL", "Code: 0001", "VIN:", "Vehicle ID Number: 000000", "Mileage:", "Technician Number: 0000", "Repair Number:", "Date:", "Time:", "Customer:", and "Comments:". Below these fields is a section titled "12V Battery Test" which displays test results: "Test#: 4", "Date/Time: 12/01/05 01:10AM", and a red warning "BAD BATTERY". Other test data includes "Voltage: 12.20V.", "Charge: 47%", "Type: LEAD-ACID", "Rated CCA: 500A.", "Estimated CCA: 100A.", "Temperature: 5F.", "Loaded Voltage: NA", and a "Date Code:" field.