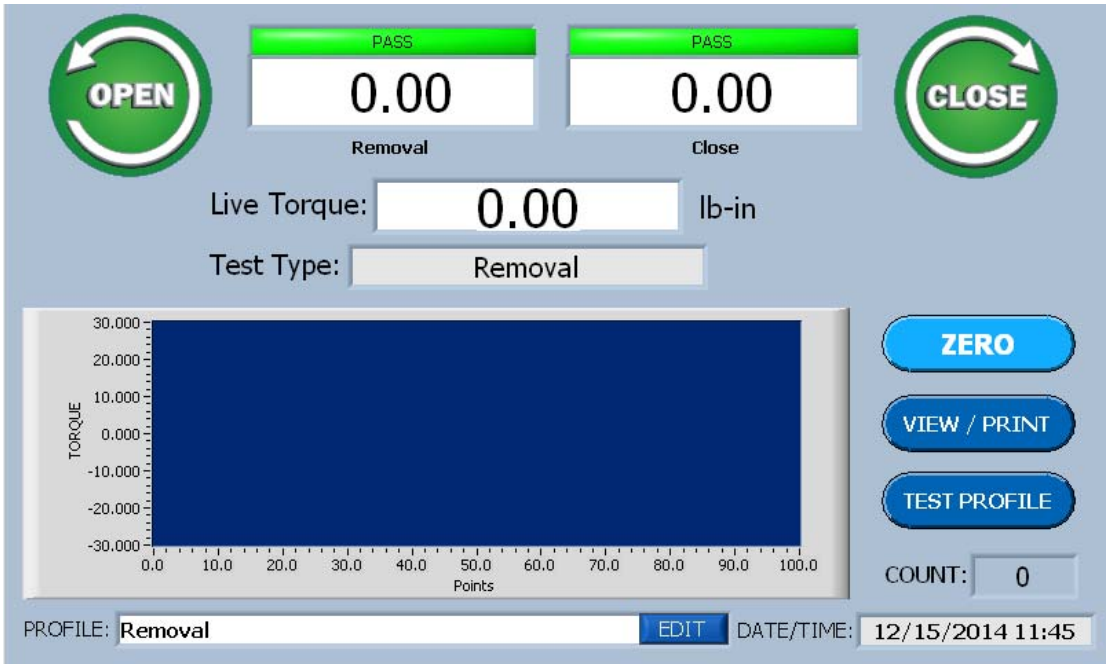
User Guide Ver. 7.1.0

2100 Cap Inspector

By Vibrac LLC



Vibrac®
PRECISION TEST SYSTEMS
1050 Perimeter Road
Manchester, NH 03103
Tel: 603.882.6777 Fax: 603.886.3857
www.vibrac.com

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Overview

Introduction

Vibrac is an industry leader in the manufacture of precision torque measuring equipment. Over fifty years of experience in the torque-testing field is reflected in every new system.

Vibrac's commitment to supplying state of the art products has resulted in the development of the Model 2100 series of cap Inspectors.

A Windows 7 computer with an IP65 panel and a Resistive Touch screen operator interface will provide the user with years of trouble free service.

What's Inside

This manual is designed to provide the user with a step-by-step procedure from receipt of the system through operation, maintenance and calibration.

Following the steps in the first three chapters of this manual will enable the user to rapidly become familiar with the basic operation of the system.

About This Manual

For convenience, this manual is divided into a number of chapters. A brief description of each chapter follows.

Chapter 1: Unpacking and Inspection

This chapter is a guide to insure that the Cap Inspector is received in proper condition and that all the necessary components have been located.

Chapter 2: System Power Up

This chapter contains the required information for electrically connecting the system components and then powering up the system.

Chapter 3: System Check

This chapter contains a step-by-step procedure to help the user become familiar with the basic operation of the Model 2101C Cap Inspector by performing a system check.

Chapter 4: Modes of Operation

This chapter describes the functionality of the Run Mode and the Program Mode as well as how to limit access to the program mode with a password.

Chapter 5: Profile Manager

This chapter contains a description of the programming features that can be used to create a profile for a specific test type and the menus that are used in the process.

Chapter 6: Test Types

This chapter contains a description of the test types that can be selected.

Chapter 7: Creating a Removal Torque Test

This chapter contains a step-by-step procedure for creating a Removal Torque Test.

Chapter 8: Creating an Incremental Test

This chapter contains a step-by-step procedure for creating an Incremental Torque Test.

Chapter 9: Creating a Removal & Bridge Test

This chapter contains a step-by-step procedure for creating a Removal and Bridge Torque Test.

Chapter 10: Creating a Reverse Ratchet Test

This chapter contains a step-by-step procedure for creating a Reverse Ratchet Torque Test.

Chapter 11: Creating a Strip Torque Test

This chapter contains a step-by-step procedure for creating a Strip Torque Test.

Chapter 12: Creating an ROPP Test

This chapter contains a step-by-step procedure for creating an ROPP Cap Torque Test.

Chapter 13: Selecting the System Options

This chapter contains a step-by-step procedure for selecting the system options that best suit the application.

Chapter 14: Quick Start

This chapter contains a step-by-step procedure for creating a new profile; with an appropriate name that will measure the removal torque, re-apply the cap and compare the measurements with the programmed pass fail limits when the test is performed.

Chapter 15: Viewing and Saving Test Results

This chapter contains a description of the procedure for saving test results and then viewing and printing these results.

Chapter 16: Modifying Test Reports

This chapter contains a description of the procedure for modifying reports to fit the application.

Chapter 17: Transmitting Test Results

This chapter provides a description of the output port, requirements, communication protocol and procedure for transmitting test results automatically.

Chapter 18: Using The USB Features

This chapter describes in detail the use of a USB drive to backup the system and to restore profiles.

Chapter 19: Gold Standard Verification

This chapter describes the calibration verification of the Cap Inspector with a Vibrac Gold Standard.

Chapter 20: Cap Inspector Calibration

This chapter describes the entire calibration process, from the initial verification through the performance of a user calibration.

Chapter 21: Setting the Date and Time

This chapter contains a description of the procedure for setting the Date and Time.

Chapter 22: Down Force Option

This chapter describes the down force mechanism that is used for testing Child Resistant caps.

Conventions

The following conventions are used in this manual.

Note:

Provides additional information related to the current topic.

Warning:

Alerts you to a danger that might result from doing or not doing a specific action

Caution:

Suggests precautionary measures to avoid problems.

Important:

Reminds you to take specific action relevant to the procedure at hand.

Tip:

Tells how to accomplish a procedure with the minimum number of steps.

Unpacking And Inspection

What's Inside

This chapter provides the user with a checklist for the receipt of a new Model 2002C series Conversion Kit.

Unpacking and Inspection

Your torque meter was carefully inspected, both electrically and mechanically before shipment. Upon receiving this system, carefully unpack all items from the shipping container and check for any signs of damage that may have occurred during shipment.

Immediately report any shipping damage to the shipping agent

Retain and use the original packing materials in case re-shipment is necessary.

Checklist for Items supplied with the system

The following items are shipped with all 2101 Cap Inspectors.

Input power cable.

External Power Supply.

Operator's manual.

When calibration equipment is purchased with the system, the certificates of calibration for the beam and weights are included behind the front cover of the manual.

System Power Up and Down

What's Inside

This chapter contains the required information for powering up the Model 2101 Cap Inspector and turning it off.

Powering Up the Cap Inspector

Following the steps below will energizes the system.

1. Insert the AC power cable into the power supply.
2. Connect the Power Supply to the receptacle, marked 24V DC on the rear of the Drive Tower.
3. Plug the other end of the AC power cable into an AC outlet.

The Model 2101 is supplied for use with 120 or 220 VAC 50 or 60 HZ. Consult the factory or your local sales representative for operation with other voltages.

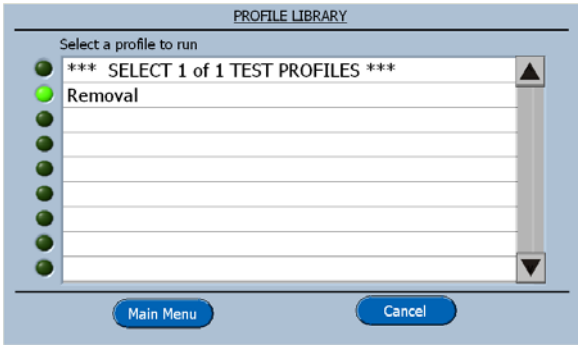
The use of a surge protector with the system is recommended as a protective measure against electrical noise.

Now by actuating the switch on the rear of the tower the system will be energized and ready for use.

Initial Display After Power-up

From the time the power switch is actuated, 2 to 3 minutes will pass while Windows and the 2101 programs are recalled from memory and loaded for use.

The Profile Library will appear on the touch screen when the system is ready.



Now by touching the word Removal, this profile will be selected to run.

The green LED next to it will be illuminated and the software will advance to the Run screen.

Selecting a Profile from the Library

Remember to touch the word when making a selection not the green LED.

Powering Down the Cap Inspector

Always use the Power Switch on the rear of the tower to turn the system off.

Do not exit to Windows and shut down like turning off a computer.

This will cause the software to get out of synchronization with the power off relay on the controller card.

The system will now be looked up and cannot be restarted with the Power Switch.

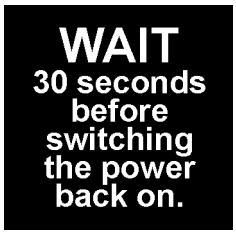
Correcting The Power On Lockup Condition

The solution is to disconnect the AC power cord from the AC Outlet.

Please observe the Label on the rear panel of the tower.

See below

Wait 30 Seconds



This 30-second delay will insure that the relay has enough time for its contacts to open before the power is turned back on.

System Check

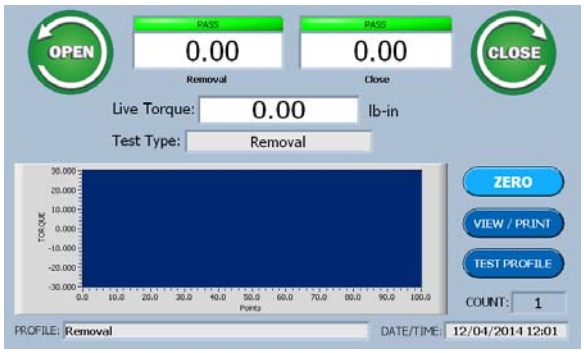
What's Inside

This chapter contains a step-by-step procedure to help the user become familiar with the basic operation of the Model 2101 Cap Inspector by performing a system check to verify that the drive is performing properly upon receipt.

Performing the System Check

In the previous chapter the Removal Test was selected and therefore the Run Screen for the Removal Test will now be displayed.

Run Screen



The Run Screen is the starting point for all tests. Its appearance will change slightly to match the selected test type.

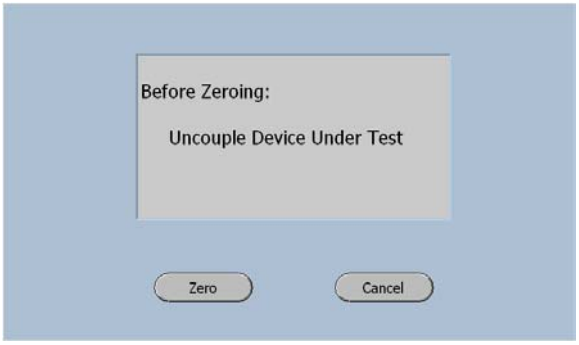
Observe the Live Torque display in the center of the screen.

When the drive shaft is in the up position and not connected to a sample to be tested, this display should read zero.

Zeroing the System

If the display does not read zero, press the **Zero Key**.

Zero Instruction Screen



The zero instruction screen will now be displayed as a precautionary measure.

The system must never be zeroed when the shaft is coupled to the DUT. (Device Under Test)

This action can result in an offset that will effect the measurements.

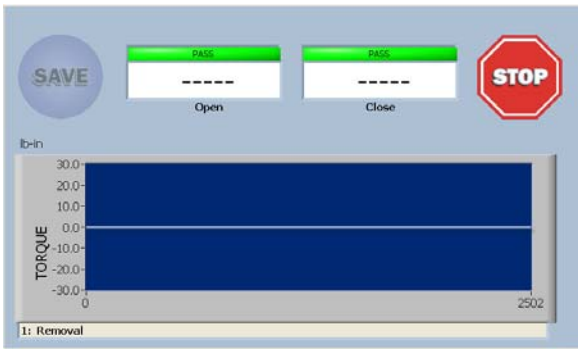
Performing The System Check

At this time, do not connect the Drive Shaft to anything.

The dynamic operation of the system can now be verified by pressing the Open Button and later the Close Button.

Open Button

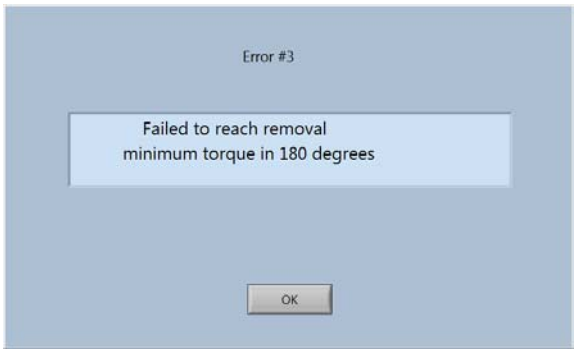
Observe the Drive shaft. It should be rotating in the same direction as the arrow on the Open Button when viewed from above. (CCW)



On the screen a live graph of the measured torque will be displayed.

The test will continue for 180 degrees looking for a value greater than 2 % of the full scale torque of the system

A line will be drawn across the graph at the zero position since there is no torque when the drive is not coupled to anything.

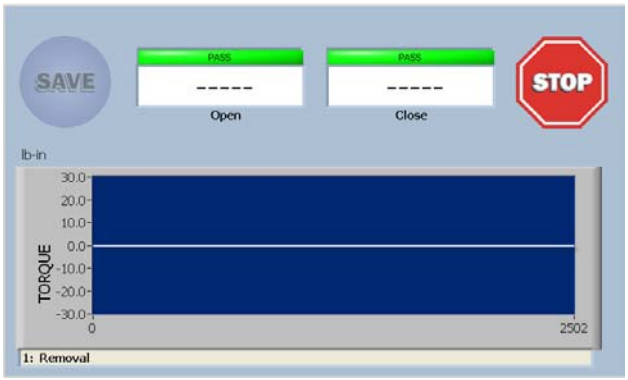


Since the torque is zero, when the 180-degree point is reached this error message will be displayed on the screen.

Selecting OK will return the program to the Run Screen.

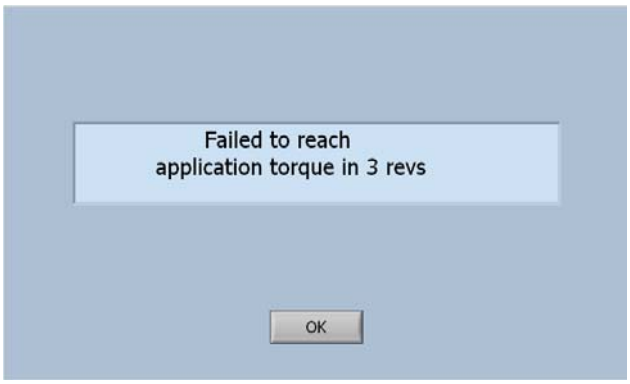
Close Button

Now by touching the Close button, the operation of the drive in the clockwise direction can be verified.



Once again a live display of torque will appear on the graph at the zero position.

The system will drive for 3 revolutions looking for the programmed application torque.



Since the torque is zero, after 3 revolutions this error message will be displayed.

Selecting OK will return the program to the Run Screen.

We have now verified that the drive is performing correctly.

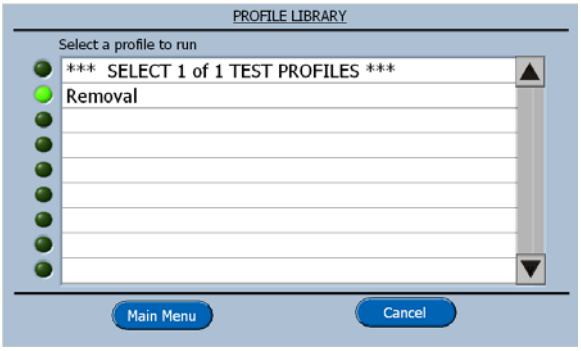
Modes of Operation

What's Inside

This chapter describes the functionality of the Run Mode and the Program Mode as well as how to limit access to the program mode with a password.

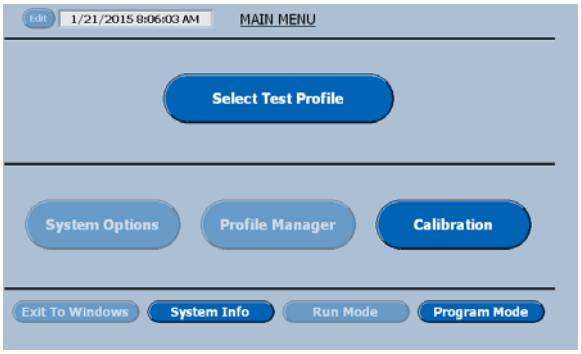
Selecting a Mode

Profile Library



The Profile Library is displayed at power up for the selection of the profile to be executed or the selection of the main menu for accessing other system features. When the main menu is selected here, the following screen will be displayed.

Run Mode (Main Menu)

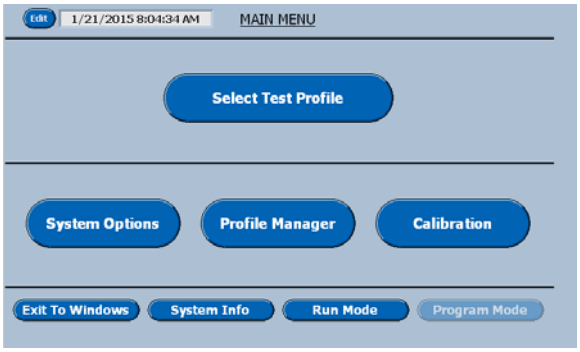


On power up, the software is defaulted to the Run Mode, when the Main Menu Button is selected.

A grayed out or dimmed button is either the **Selected Mode** or a feature that cannot be selected in the current mode.

Touching Program Mode Button will toggle the selection from the Run Mode to the Program Mode.

Program Mode (Main Menu)



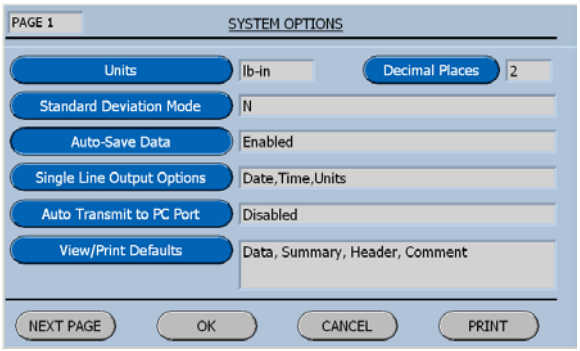
In the program mode all the software features in the system are available to the user for creating and editing test profiles and selecting the options that best suit the application. Both calibration verifications and user calibrations can be initiated here. Each button on this menu will be the title of a chapter in this manual.

Touching the Run Mode Button will toggle the selection back to the Run Mode.

Password Protecting the System

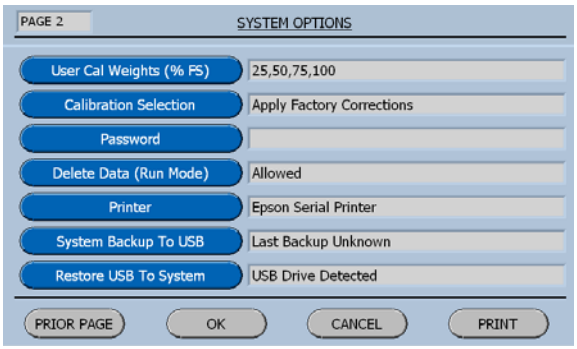
The following procedure will provide for locking the system in the Run Mode and graying out the Program Mode Button.

On the Main Menu select Program Mode.



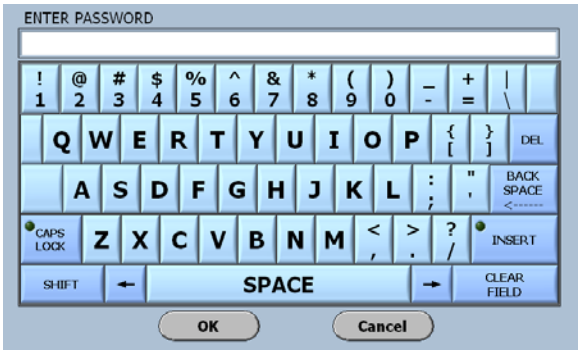
On page 1 of the System Options menu select Next Page.

Now on page 2 of the System Options menu, select Password.



The Password Button will display the input screen for creating a password.

Enter Password Menu



Carefully key in the password just as you intend to remember it.

Once entered here and accepted with the OK Button, the user will be required to enter it when attempting to enter the program mode.

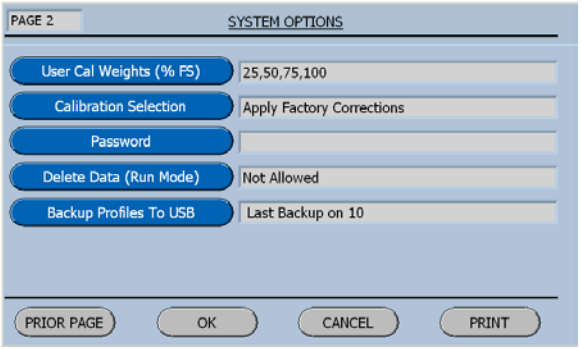
Once a password has been entered the user cannot enter the program mode without entering the password again.

The Password is case sensitive and must be entered precisely as it was first entered!

RECORD THE PASSWORD IN A SAFE PLACE!

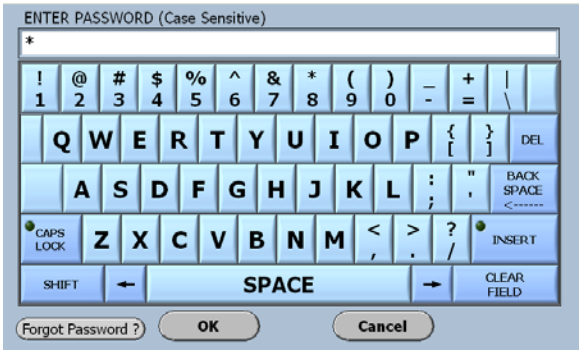
Deleting The Password

In order to delete the password, the user must return to the System Option Menu page 2.



Now on page 2 of the System Options menu, select Password.

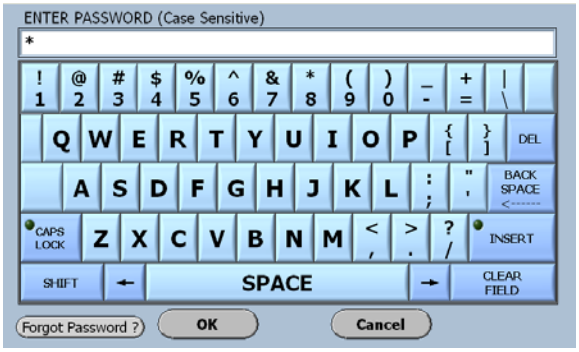
When Password is selected the following screen will be displayed.



When a Password has been entered an Asterisk will be displayed for each character that was entered.

Now by entering the correct password and selecting OK the software will advance to the Main Menu.

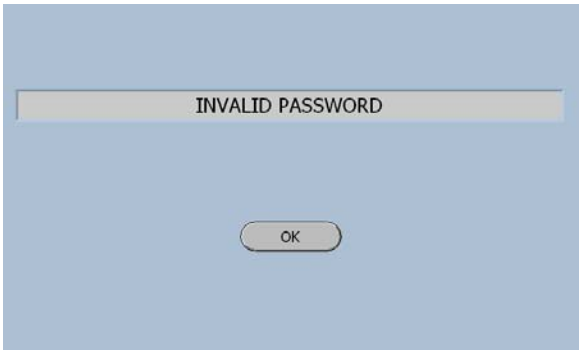
Now on the Main Menu select System Options and advance to page 2 and then select Password.



Now select the Clear Field Key and the displayed Asterisks will be deleted.

The Password is now deleted.

Invalid Password Screen



The Invalid Password Screen will be displayed when an Invalid Password is entered. The OK Button will return the software to the Enter Password Screen wear the Forget Password Button can be selected.

Forgot Password

The following screen will be displayed when this Button is pressed.

Contact Vibrac

The contact person at Vibrac will first ask for the serial number of the system.

This is necessary to provide the proper code to correct the problem.

Have you recorded the password in a safe place?

Profile Manager

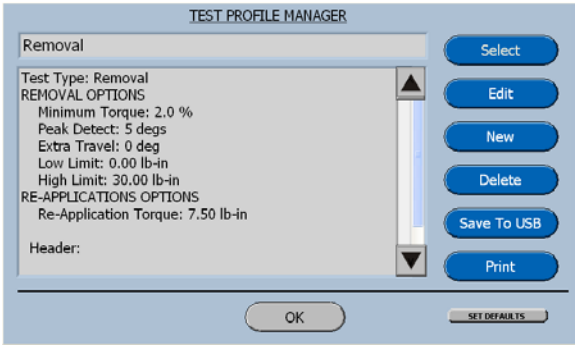
What's Inside

This chapter contains a description of the programming features that can be used to create a Profile for a specific test type and the menus that are used in the process.

Profile Manager Button

Touching this button accesses the profile manager screen.

Test Profile Manager Screen



The Test Profile Manager screen displays the features of the currently selected test. The buttons on the right side of screen are used to create additional tests, edit the selected test, save tests to a USB drive and print the test profiles.

This button will return all the features of the current profile to their factory default value.

Select Button

This button will advance the software to the Test Profile Library that is displayed on power up.

Edit Button

This button will advance the software to the Test setup screen for the currently selected test Profile.

New Button

This button will advance the software to the select test type menu for creating a new profile.

Delete Button

This button will delete the currently selected Profile.

Save to USB

This button enables the user to make a copy of the currently displayed Profile on a memory stick

Print

This button will send the profile data in serial form to the RS232 port.

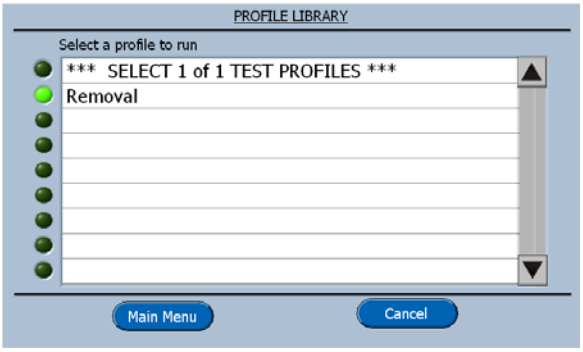
Test Types

What's Inside

This chapter contains a description of the test types that can be selected and the procedure for selecting a test type.

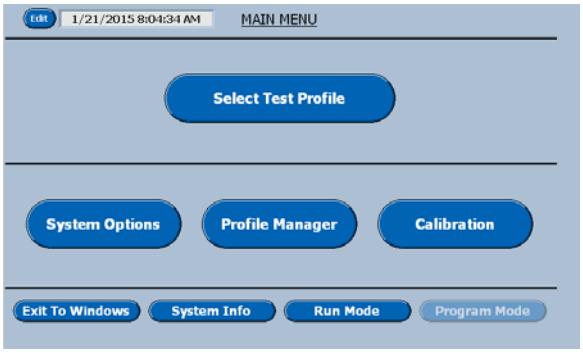
Test Types

To view the Test Types follow the steps below.

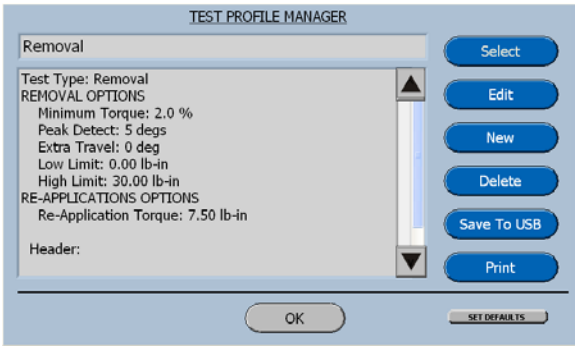


On the Profile Library screen touch the Main Menu Button.

The software will then advance to the Main Menu shown below.

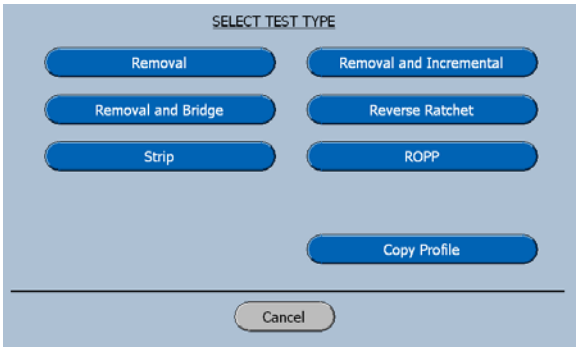


Now touch the Profile Manager Button and the software will display the features of the currently selected Profile.



Now on the Test Profile Manager Screen select **New** and the software will advance to the Select Test Type Menu.

Select Test Type



This menu displays the six basic test types that can be used for creating new profiles.

When a Test Type is selected the software will advance to the Keyboard for naming the new profile.

Each of the items displayed here will be described in a chapter with the same name, with the exception of Copy Profile.

Copy Profile

In many cases it will be quicker to copy a profile and then edit a couple items rather than create a whole new profile.

Test Definitions

Removal

The counter clockwise turning force required to remove an applied closure from a bottle finish.

Removal and Incremental

The Removal portion of this test is the same as described above.

The Incremental portion is the clockwise turning force required to tighten an applied closure six degrees beyond its initial applied position.

The Removal and Incremental Test per Industry Standards is always performed at 1 RPM and the distance to drive is always six degrees when re-applying the cap.

Removal and Bridge

The Removal portion of this test is the same as described above.

The Bridge portion is the counter clockwise turning force required to break the small strips of material that span the gap between the cap and the tamper evident band.

Reverse Ratchet

The counter clockwise turning force required to rotate an applied child resistant closure without any down force.

Strip

The clockwise turning force required to rotate the cap until the threads on the bottle or in the cap fail.

ROPP

The Removal and the Bridge potion of this test is the same as described above. The Strip portion of this test measures the turning force required in the clockwise direction to cause the threads in the Aluminum Cap to fail.

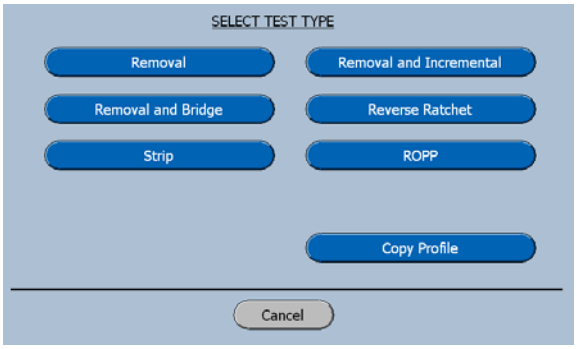
Creating a Removal Torque Test

What's Inside

This chapter contains a step-by-step procedure for creating a Removal Torque Test.

The procedure for displaying the select test type screen was described in the previous chapter.

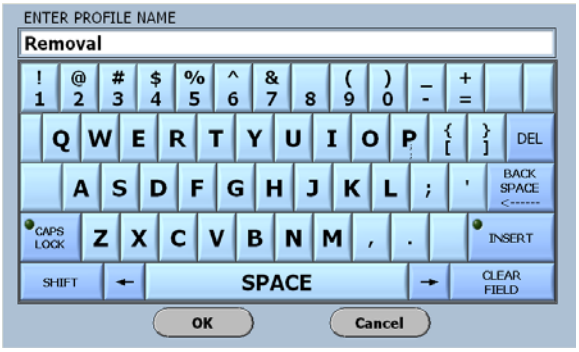
Select Test Type



On the Select Test Type screen select Removal.

The software will advance to the Enter Profile Name screen as shown below.

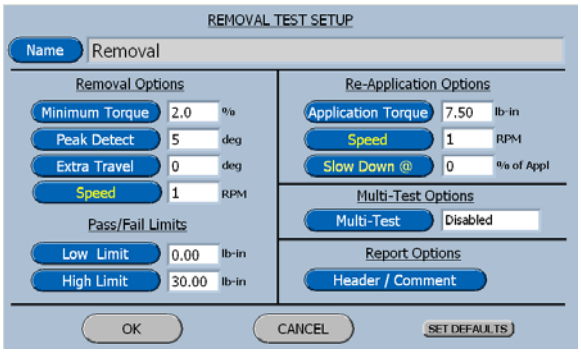
Keyboard For Removal Test



For this manual the profile name, **Removal** has been entered.

Selecting OK will advance the software to the Removal Test Setup Screen shown below.

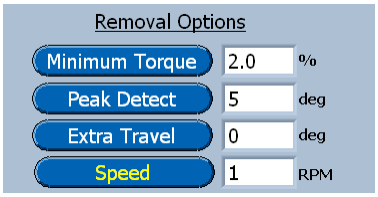
Removal Test Setup Screen



The Removal Test Setup screen is divided into 5 groupings.

1. Removal Options
2. Pass/Fail Limits
3. Re-Application Options
4. Multi-Test Options
5. Report Options

Removal Options



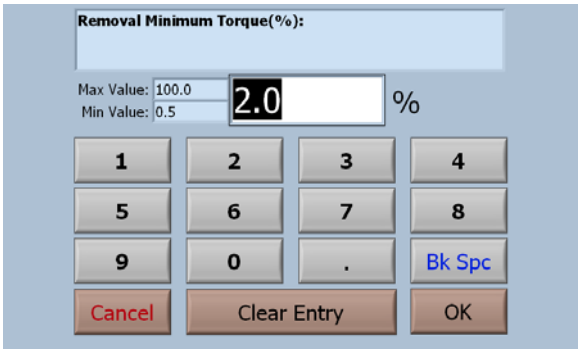
Minimum Torque: The torque value that must be exceeded before the removal torque is considered valid.

Peak Detect: The number of degrees of rotation after a peak has been measured for the software to accept this peak as the removal torque value.

Extra Travel: The distance to drive in the opening direction to leave the cap loose.

Speed: The drive speed to be used for the test.

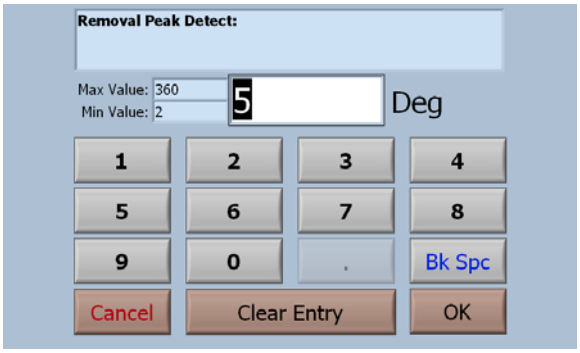
Removal Minimum Torque



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Removal Peak Detect



Observe the minimum and maximum values.

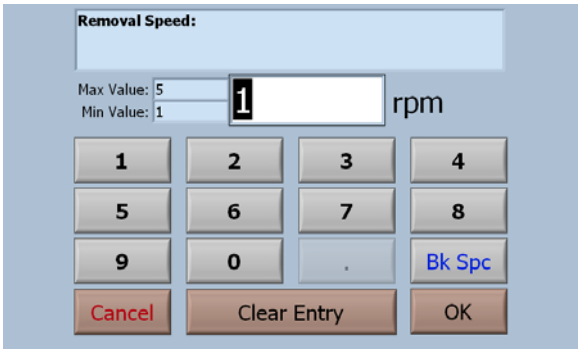
To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Extra Travel

Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

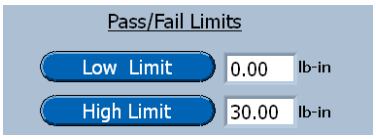
Removal Speed



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

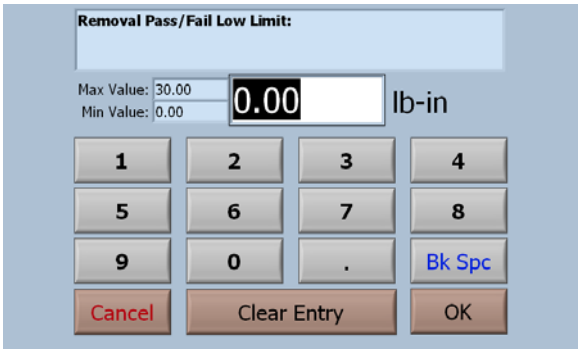
Pass / Fail Limits



Low Limit: The Torque value that must be exceeded for the test to pass.

High Limit: The torque value that must not be exceeded for the test to pass.

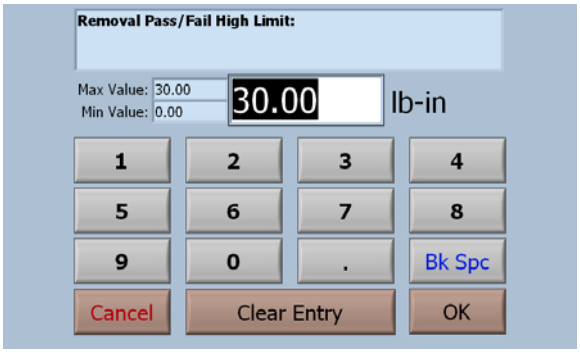
Removal Pass / Fail Low Limit



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Removal Pass / Fail High Limit



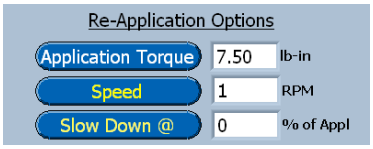
Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

The Pass / Fail Numeric Key Pads shown on this page will be used for programming the limits throughout this manual.

However they will not be displayed in each chapter.

Re-Application Options

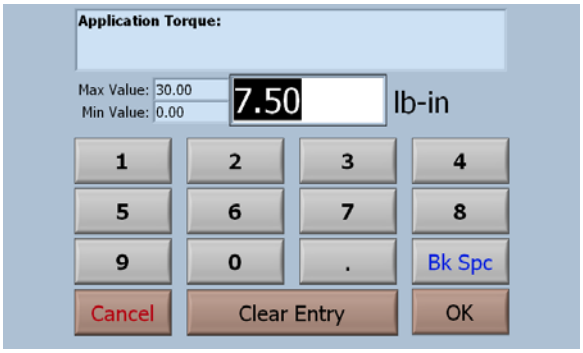


Re-application Torque: This is the torque that the cap will be re-applied to after the removal test when Extra Travel is set to zero.

Speed: This is the speed at which the drive will rotate prior to the slow down to 1 RPM.

Slow Down @: This is the percent of application torque at which the drive will slow down to 1 RPM.

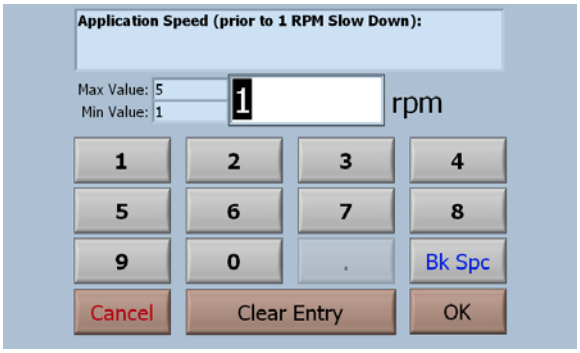
Application Torque



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

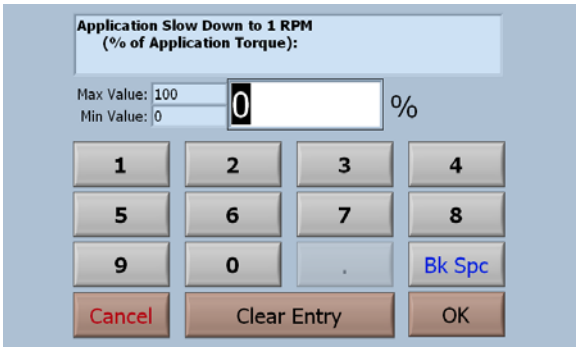
Application Speed Prior to Slow Down



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

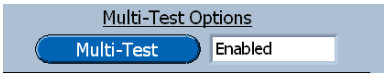
Application Slow Down At



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Multi-Test Options



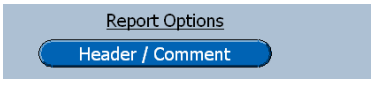
When Multi is enabled the following screen will be displayed.

Multi-Test Run Options

This menu enables the user to perform a number of tests with a nap between tests to prevent over heating the threads.

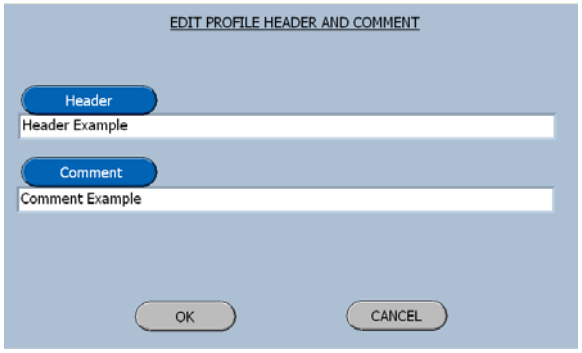
It is frequently used for life testing a closure.

Report Options



The Header and Comment Button will display the following menu.

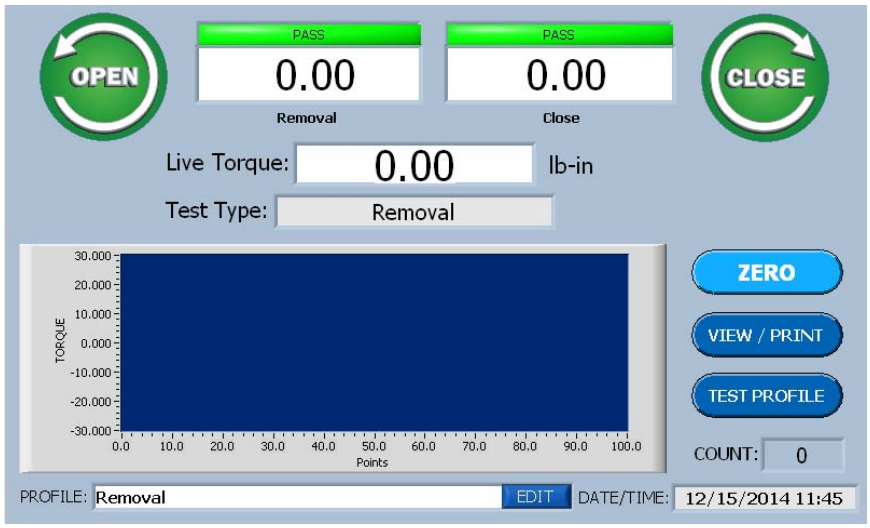
Edit Profile Header And Comment



The Header and Comment entered here will appear on all reports.

Removal Test Run Screen

When the removal test has been programmed and selected the run screen, shown below, will be displayed

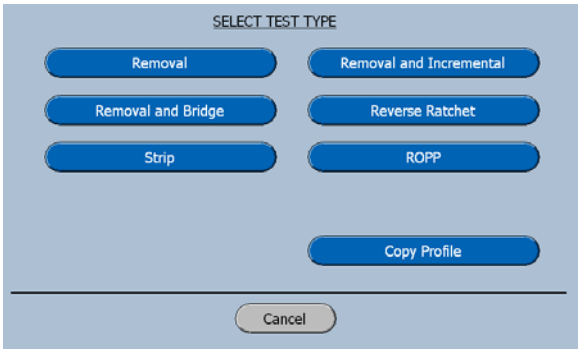


Creating an Incremental Test

What's Inside

This chapter contains a step-by-step procedure for creating an Incremental Torque Test.

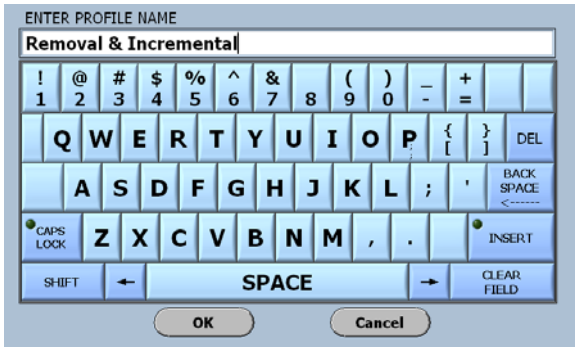
Select Test Type



On the Select Test Type screen select Removal and Incremental

The software will advance to the Enter Profile Name screen as shown below.

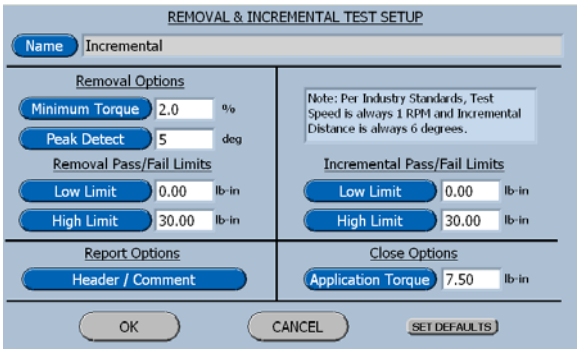
Keyboard for the Incremental Test



For this manual the profile name, **Removal & Incremental** has been entered.

Selecting OK will advance the software to the Removal and Incremental Test Setup Screen shown below.

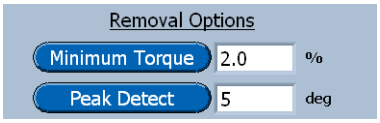
Removal & Incremental Test Setup Screen



The Removal & Incremental Test Setup screen is divided into 5 groupings.

1. Removal Options
2. Pass/Fail Limits
3. Re-Application Options
4. Report Options
5. Close Options

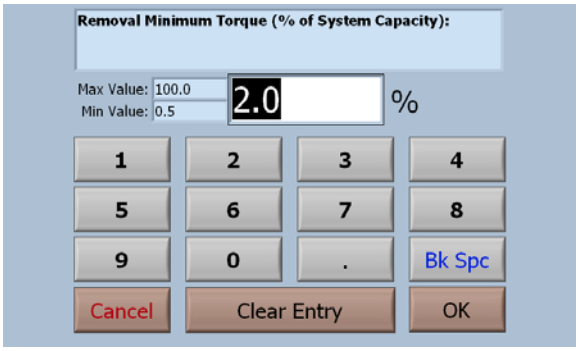
Removal Options



Minimum Torque: The torque value that must be exceeded before the removal torque is measured,

Peak Detect: The number of degrees of rotation after a peak has been measured for the software to accept this peak as the removal torque value.

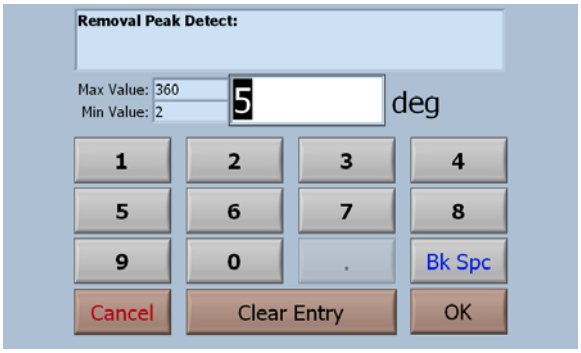
Removal Minimum Torque



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

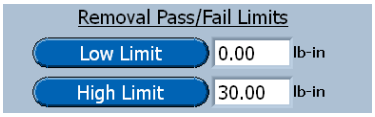
Removal Peak Detect



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Removal Pass / Fail Limits



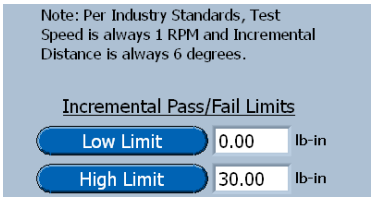
Low Limit: The Torque value that must be exceeded for the test to pass.

High Limit: The torque value that must not be exceeded for the test to pass.

Report Options

The Header and Comment will be displayed on all test reports for this test profile.

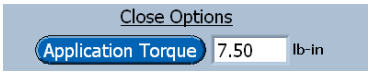
Incremental Pass / Fail Limits



Low Limit: The Torque value that must be exceeded for the test to pass.

High Limit: The torque value that must not be exceeded for the test to pass.

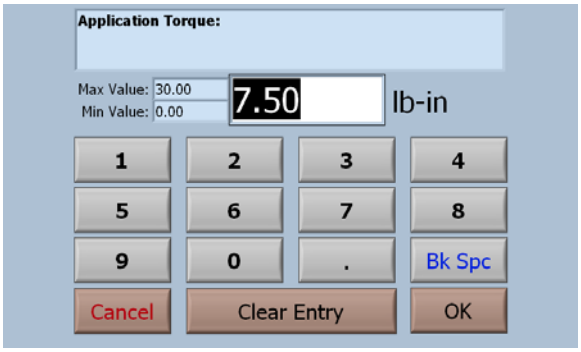
Close Options



This is the torque value that will be used when the Close Button is pressed in the Incremental Test Mode.

The Close Option is seldom used in the Incremental Test Mode.

Application Torque

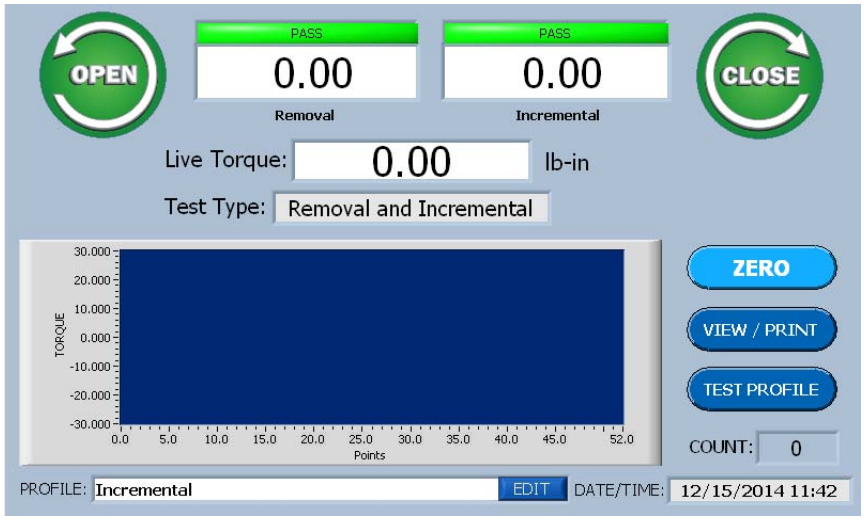


Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Removal & Incremental Test Run Screen

When the Removal & Incremental test has been programmed and selected the run screen, shown below, will be displayed

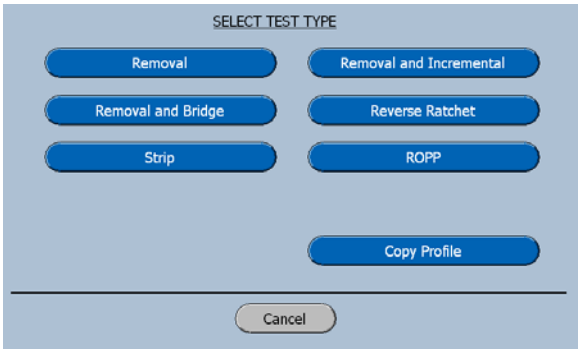


Creating a Removal & Bridge Test

What's Inside

This chapter contains a step-by-step procedure for creating a Removal and Bridge Test.

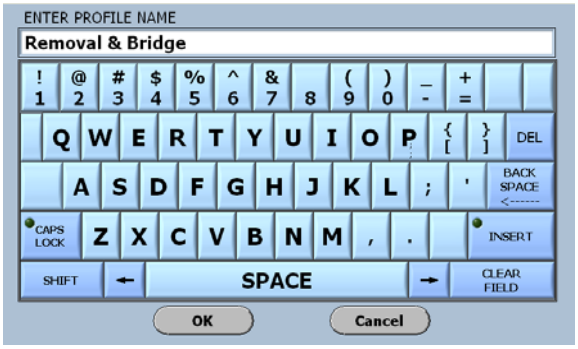
Select Test Type



On the Select Test Type screen select Removal and Bridge.

The software will advance to the Enter Profile Name screen as shown below.

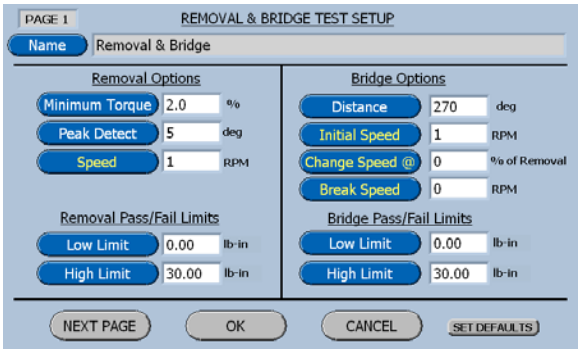
Keyboard For Removal and Bridge Test



For this manual the profile name, **Removal & Bridge** has been entered.

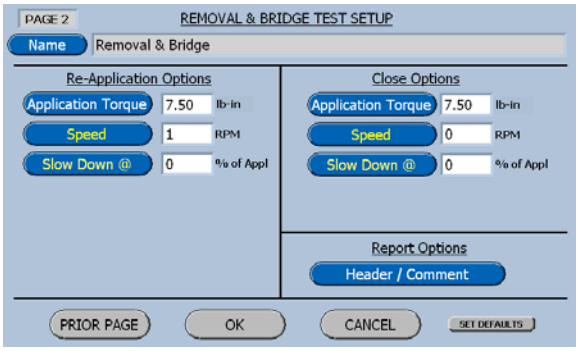
Selecting OK will advance the software to the Removal and Bridge Test Setup Screen shown below.

Removal and Bridge Test Setup Screens



The Removal and Bridge test setup screen, page 1, is divided into 4 groupings.

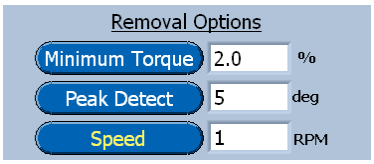
1. Removal Options
2. Removal Pass / Fail Options
3. Bridge Options
4. Bridge Pass / Fail Options



The Removal and Bridge test setup screen, page 2, is divided into 3 groupings.

1. Re-Application Option
2. Close Option
3. Report Options

Removal Options

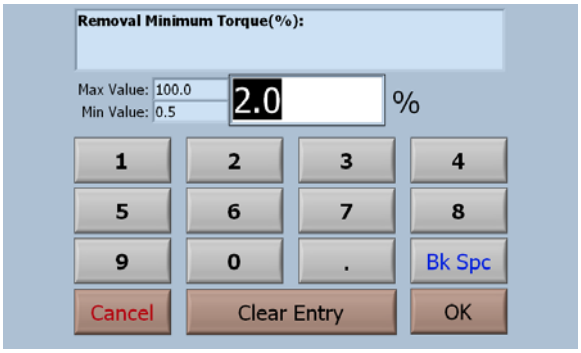


Minimum Torque: The torque value that must be exceeded before the removal torque is considered valid.

Peak Detect: The number of degrees of rotation after a peak has been measured for the software to accept this peak as the removal torque value.

Speed: The drive speed to be used for the test.

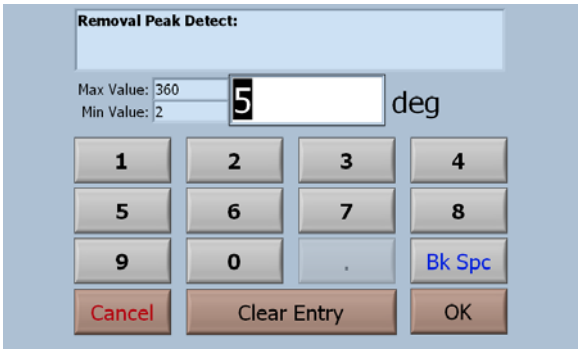
Removal Minimum Torque



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

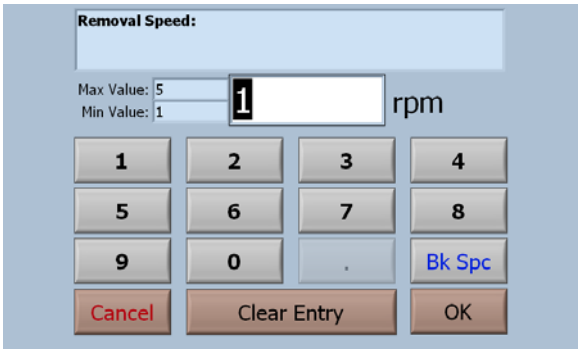
Removal Peak Detect



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

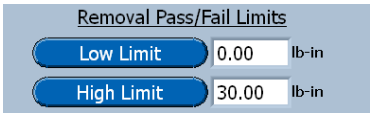
Removal Speed



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

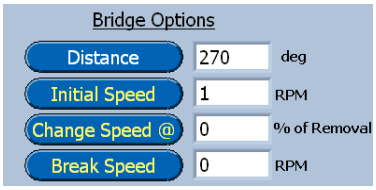
Removal Pass / Fail Limits



Low Limit: The Torque value that must be exceeded for the test to pass.

High Light: The torque value that must not be exceeded for the test to pass.

Bridge Options



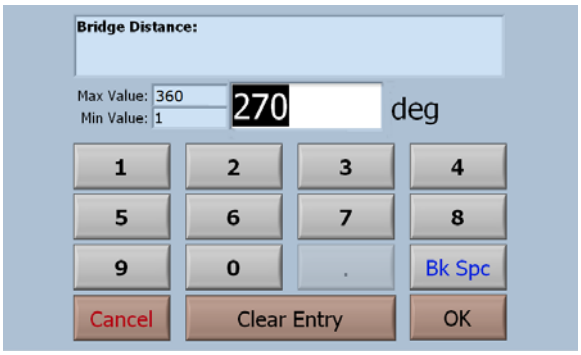
Distance: This is the distance to drive when measuring the torque required to break the Bridges after the removal torque has been measured.

Initial Speed: This is the speed that the system will drive at until the change speed torque value is reached.

Change Speed: This is the percentage of removal torque at which the system will change speed to perform the Bridge break test.

Break Speed: This is the speed that the system will drive at when breaking the bridges.

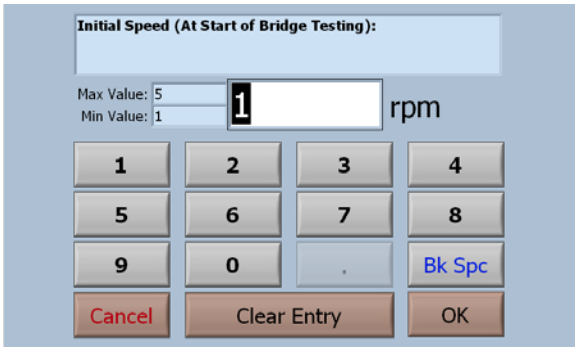
Bridge Distance



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

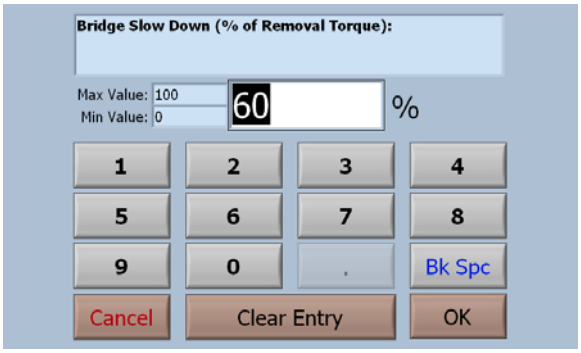
Bridge Initial Speed



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

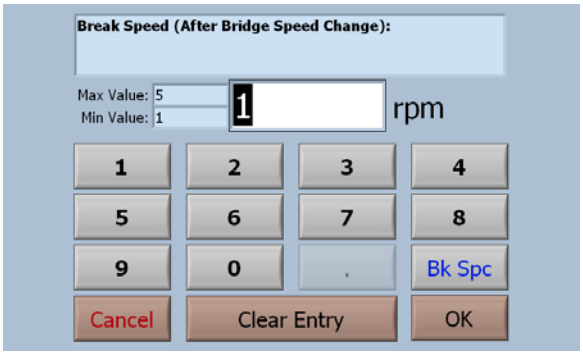
Bridge Change Speed



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

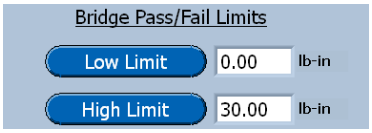
Bridge Break Speed



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

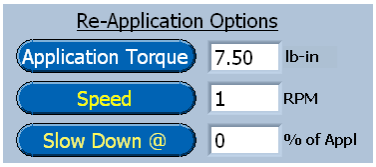
Bridge Pass / Fail Limits



Low Limit: The Torque value that must be exceeded for the test to pass.

High Light: The torque value that must not be exceeded for the test to pass.

Re-Application Options

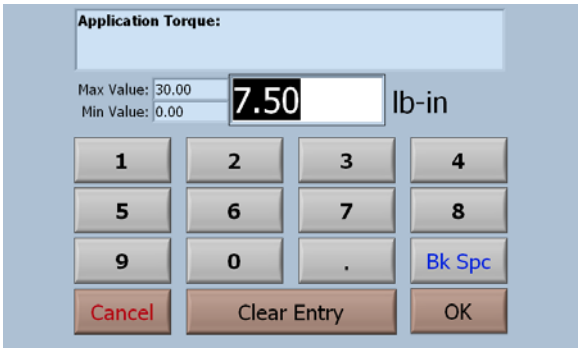


Application Torque: This is the torque that the cap will be re-applied to after the removal and bridge measurements are made.

Speed: This is the speed that the system will drive at until the slow down point is reached.

Slow Down At: This is the torque value at which point the drive will slow down to re-apply the cap at 1 RPM

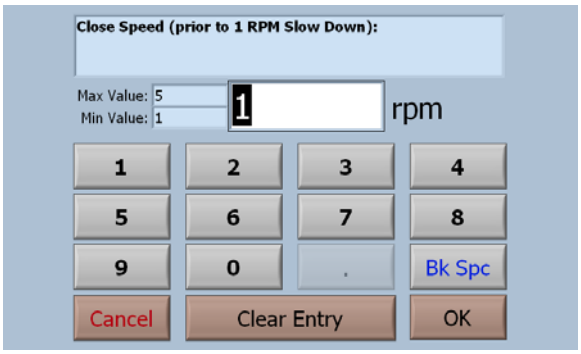
Re-Application Torque



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

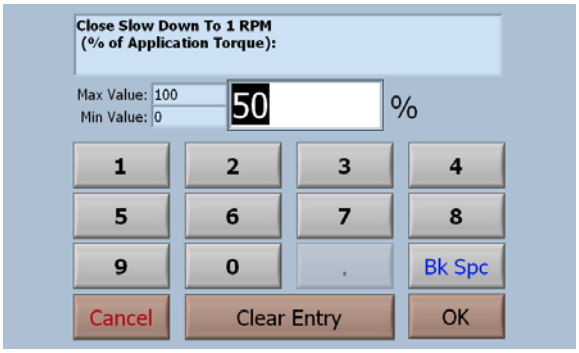
Re-Application Speed



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

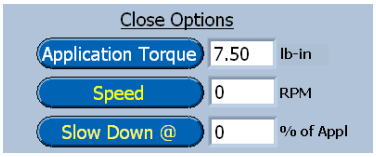
Re–Application Slow Down



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

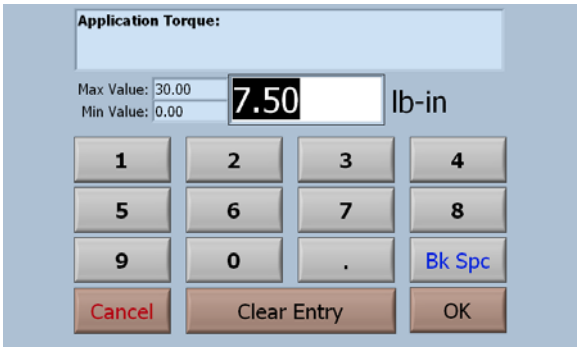
Close Options



Application Torque: This is the value that will be used when the Close Button is pressed in the Removal and Bridge Test Mode.

Speed:

Application Torque



Observe the minimum and maximum values.

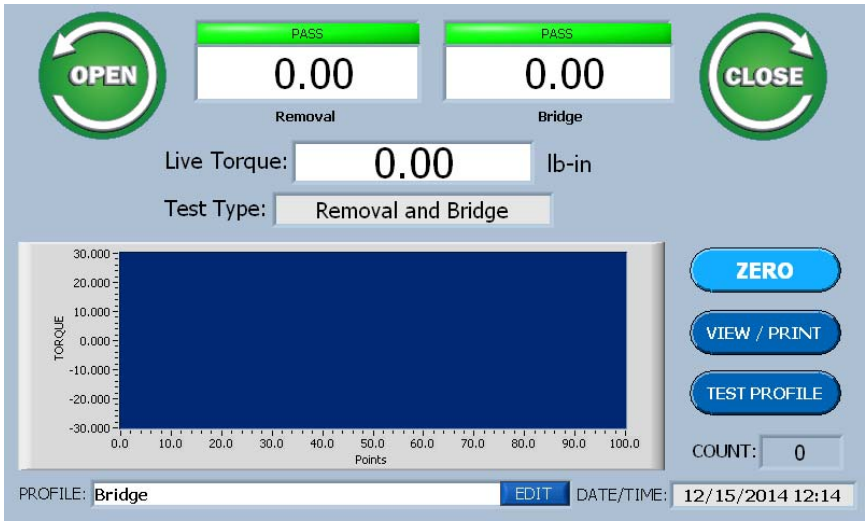
To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Report Options

The Header and Comment will be displayed on all test reports for this test profile.

Removal & Bridge Test Run Screen

When the Removal & Bridge test has been programmed and selected the run screen, shown below, will be displayed.

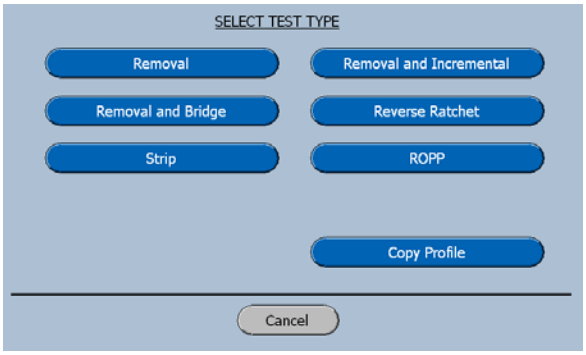


Creating a Reverse Ratchet Test

What's Inside

This chapter contains a step-by-step procedure for creating a Reverse Ratchet Torque Test.

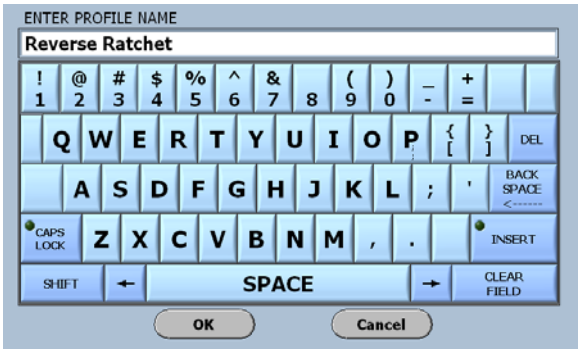
Select Test Type



On the Select Test Type screen select Reverse Ratchet

The software will advance to the Enter Profile Name screen as shown below.

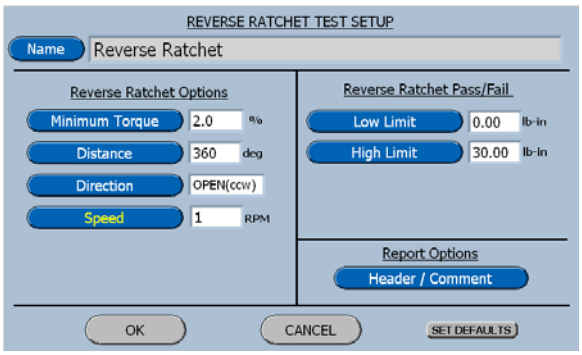
Keyboard For Reverse Ratchet Test



For this manual the profile name, Reverse Ratchet has been entered.

Selecting OK will advance the software to the Reverse Ratchet Test Setup Screen shown below.

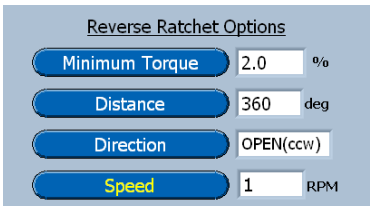
Reverse Ratchet Test Setup Screen



The test setup screen is divided into 3 parts.

1. Reverse Ratchet Options
2. Reverse Ratchet Pass / Fail Limits
3. Report Options

Reverse Ratchet Options



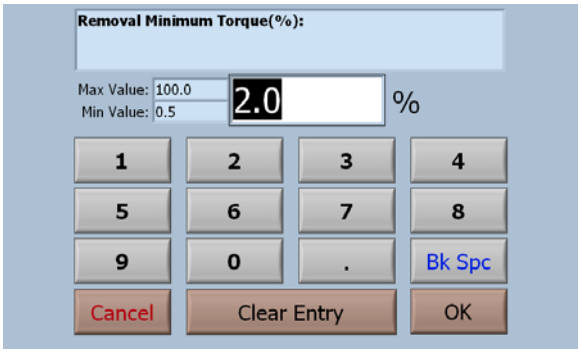
Minimum Torque: The torque value that must be exceeded before the torque test is considered valid.

Distance: This is the distance in degrees that the cap will be rotated while looking for the maximum torque.

Direction: This is the direction that will be used for the test

Speed: The drive speed to be used for the test.

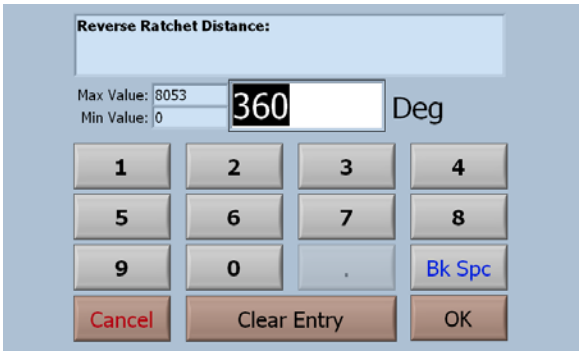
Reverse Ratchet Minimum Torque



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Reverse Ratchet Distance



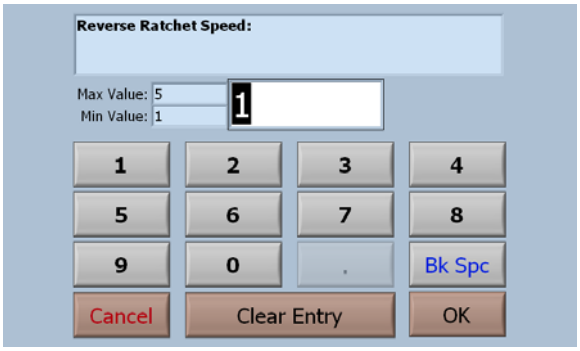
Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Reverse Ratchet Direction

The Direction Button is an alternate action switch that changes the direction with each actuation.

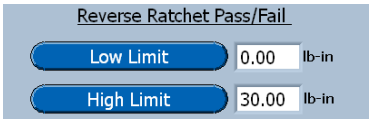
Reverse Ratchet Speed



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Reverse Ratchet Pass / Fail Limits



Low Limit: The Torque value that must be exceeded for the test to pass.

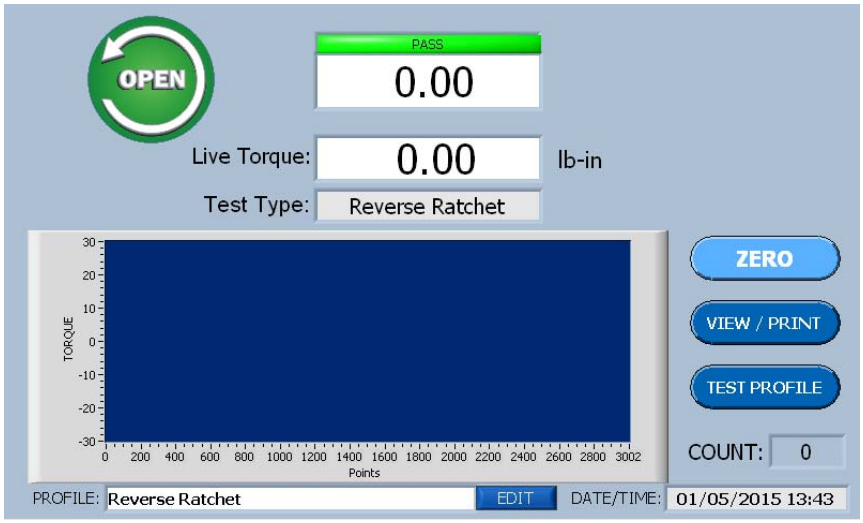
High Light: The torque value that must not be exceeded for the test to pass.

Report Options

The Header and Comment will be displayed on all test reports for this test profile.

Reverse Ratchet Test Run Screen

When the Reverse Ratchet test has been programmed and selected the run screen, shown below, will be displayed.

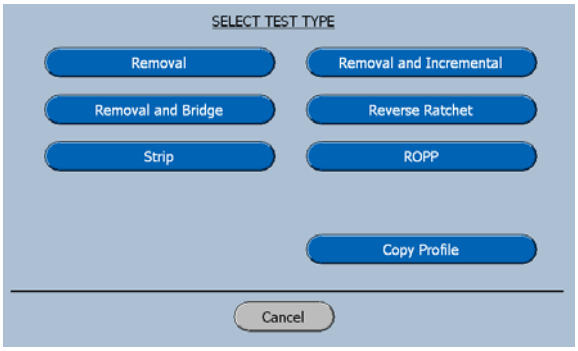


Creating a Strip Torque Test

What's Inside

This chapter contains a step-by-step procedure for creating a Strip Torque Test.

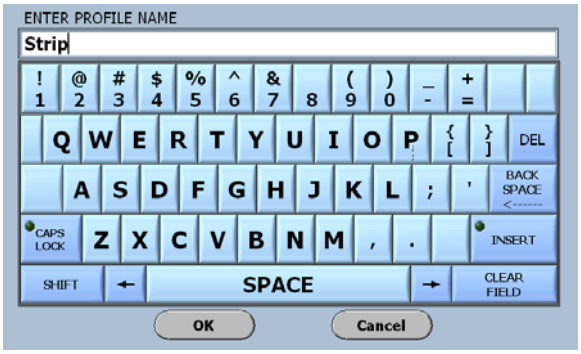
Select Test Type



On the Select Test Type screen select Strip.

The software will advance to the Enter Profile Name screen as shown below.

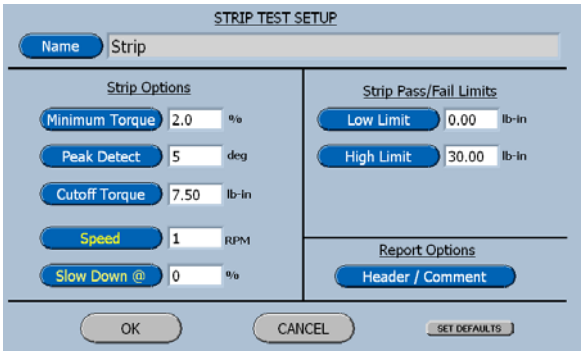
Keyboard For Strip Torque Test



For this manual the profile name, Strip has been entered.

Selecting OK will advance the software to the Strip Test Setup Screen shown below.

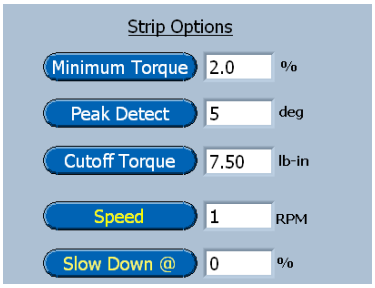
Strip Test Setup Screen



The Strip Test Setup screen is divided into 3 parts.

1. Strip Options
2. Strip Pass / Fail Limits
3. Report Options

Strip Test Options



Minimum Torque: The torque value that must be exceeded before the Strip Torque is measured.

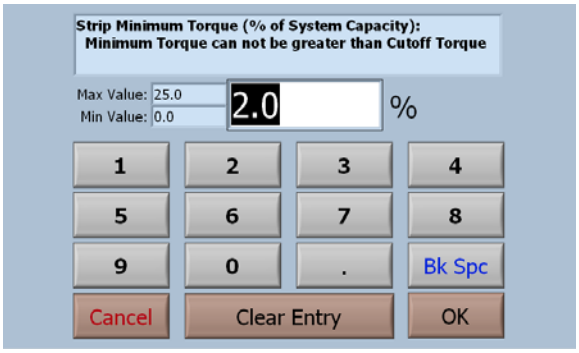
Peak Detect: The number of degrees of rotation after a peak has been measured for the software to accept this peak as the Strip Torque value.

Cutoff Torque: When the Cutoff Torque is reached the test will end.

Speed: The drive speed prior to slow down to 1 RPM test speed.

Slow Down At: A programmed percent of application torque to 1 RPM.

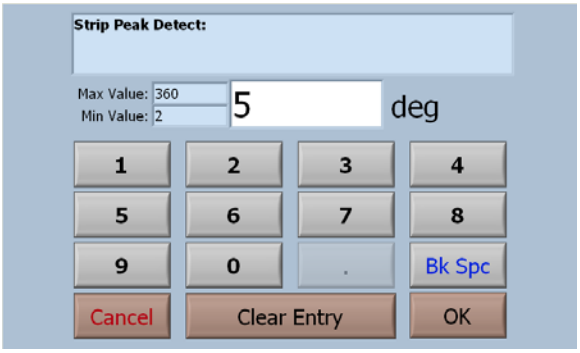
Strip Minimum Torque



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Strip Peak Detect



Observe the minimum and maximum values.

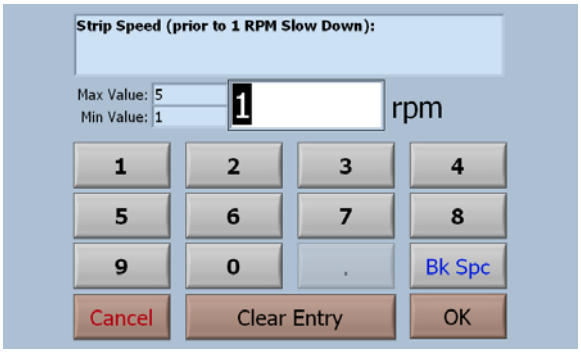
To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Strip Cutoff Torque

Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

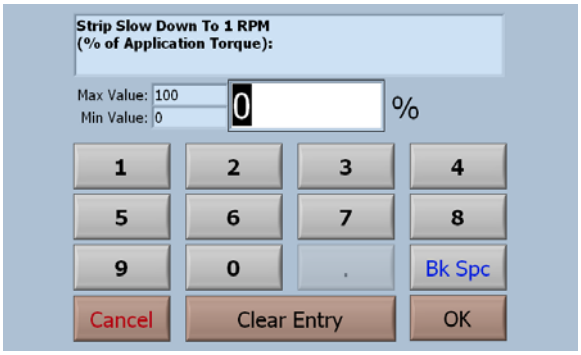
Strip Speed



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

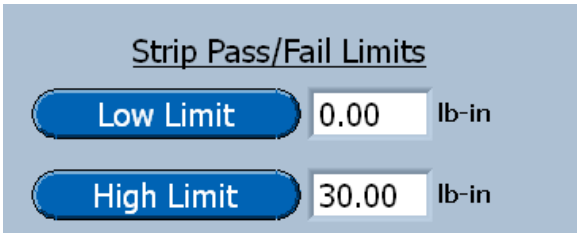
Strip Slow Down At



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Strip Pass / Fail Limit



Low Limit: The Torque value that must be exceeded for the test to pass.

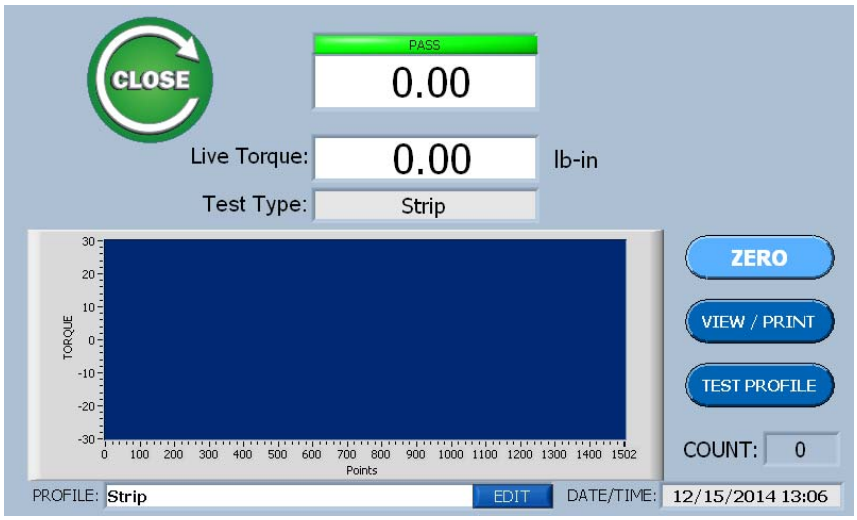
High Light: The torque value that must not be exceeded for the test to pass.

Report Options

The Header and Comment will be displayed on all test reports for this test profile.

Strip Test Run Screen

When the Strip Torque test has been programmed and selected the run screen, shown below, will be displayed.

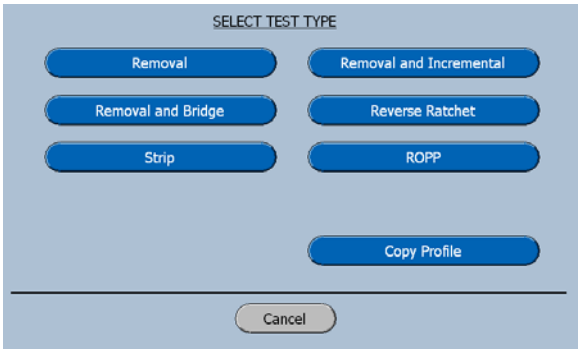


Creating an ROPP CAP Test

What's Inside

This chapter contains a step-by-step procedure for creating an ROPP Cap Torque Test.

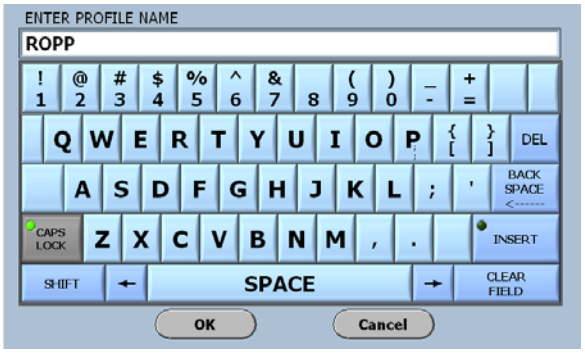
Select Test Type



On the Select Test Type screen select ROPP.

The software will advance to the Enter Profile Name screen as shown below.

Keyboard for ROPP Torque Test

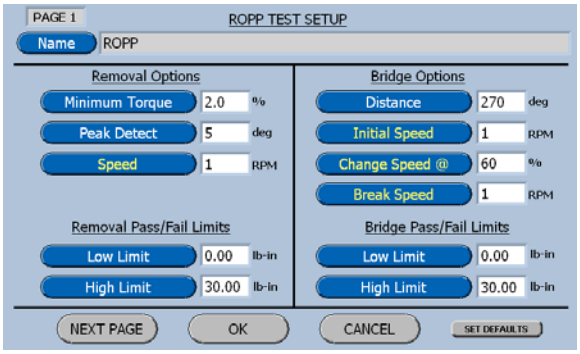


For this manual the profile name, ROPP has been entered.

Selecting OK will advance the software to the ROPP Test Setup Screen shown below.

ROPP Test Setup Screens

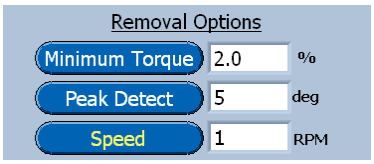
ROPP Screen Page 1



The ROPP Test Setup Screen (page 1) is divided into 4 parts.

1. Removal Options
2. Removal Pass / Fail Limits
3. Bridge Options
4. Bridge Pass / Fail Limits

Removal Options

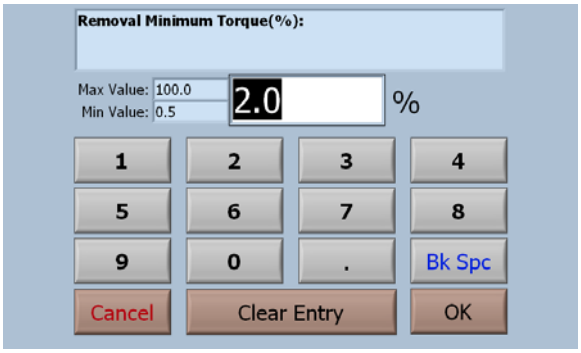


Minimum Torque: The torque value that must be exceeded before the removal torque is considered valid.

Peak Detect: The number of degrees of rotation after a peak has been measured for the software to accept this peak as the removal torque value.

Speed: The drive speed to be used for the test.

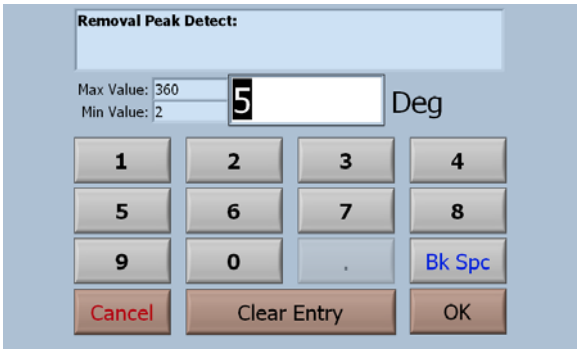
Removal Minimum Torque



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

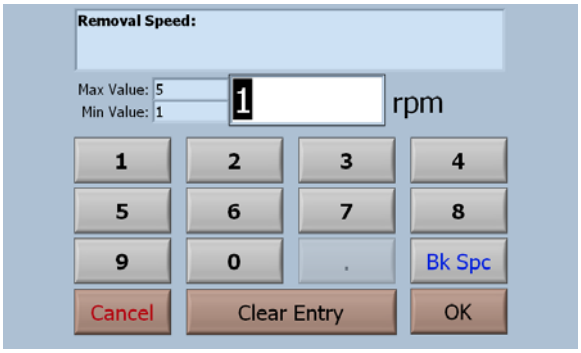
Removal Peak Detect



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

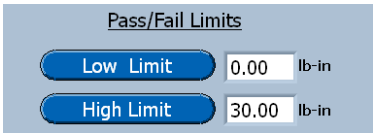
Removal Speed



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

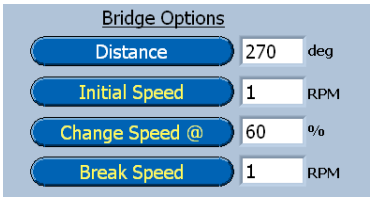
Removal Pass / Fail Limits



Low Limit: The Torque value that must be exceeded for the test to pass.

High Limit: The torque value that must not be exceeded for the test to pass.

Bridge Options



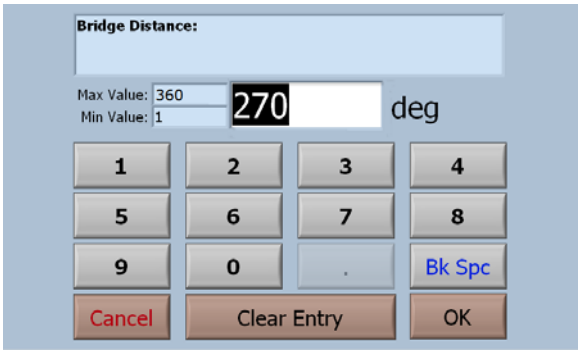
Distance: This is the distance to drive when measuring the torque required to break the Bridges after the removal torque has been measured.

Initial Speed: This is the speed that the system will drive at after the Removal measurement has been made.

Change Speed: This is the torque at which the system will change to the speed for performing the bridge break.

Break Speed: This is the speed at which the bridges will be broken.

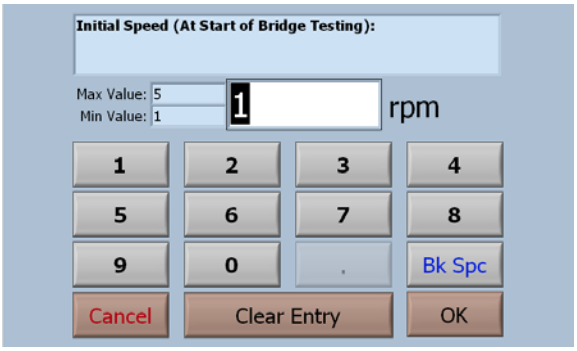
Bridge Distance



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

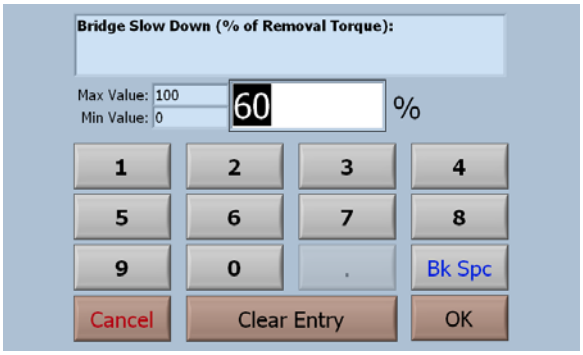
Bridge Initial Speed



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

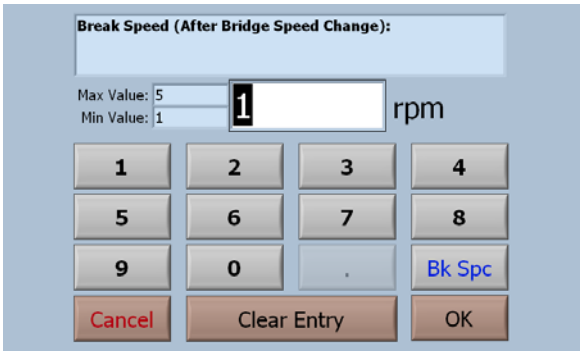
Bridge Change Speed AT



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

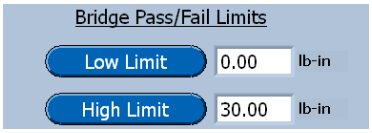
Bridge Break Speed



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

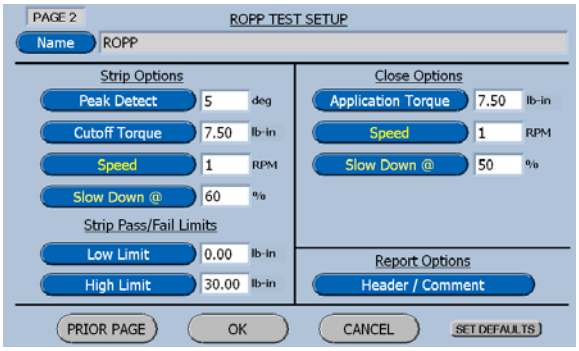
Bridge Pass / Fail Limits



Low Limit: The Torque value that must be exceeded for the test to pass.

High Light: The torque value that must not be exceeded for the test to pass.

ROPP Screen Page 2



The ROPP Test Setup Screen (page 2) is divided into four parts.

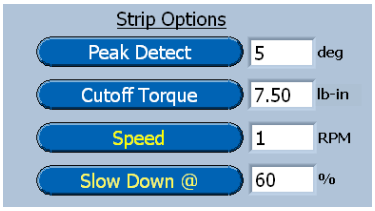
Strip Options

Strip Pass / Fail Limits

Close Options

Report Options

Strip Options



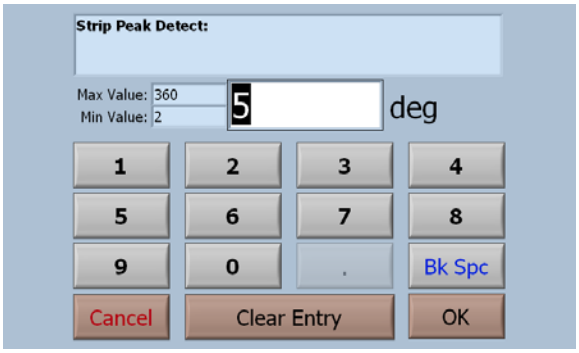
Peak Detect: The number of degrees of rotation after a peak has been measured for the software to accept this peak as the strip torque value.

Cutoff Torque: The torque at which the test will stop.

Speed: The drive speed prior to slow down to 1 RPM test speed.

Slow Down At: This is the torque at which the system will change to the speed for performing the test.

Strip Peak Detect



Observe the minimum and maximum values.

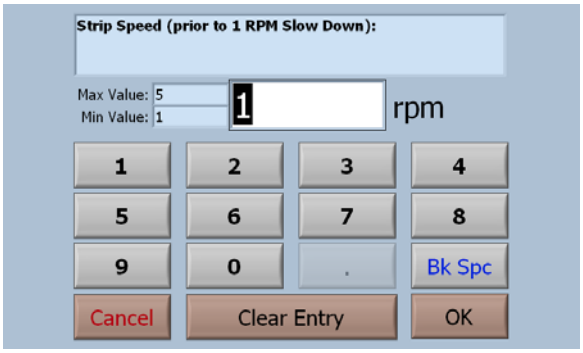
To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Strip Cutoff Torque

Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

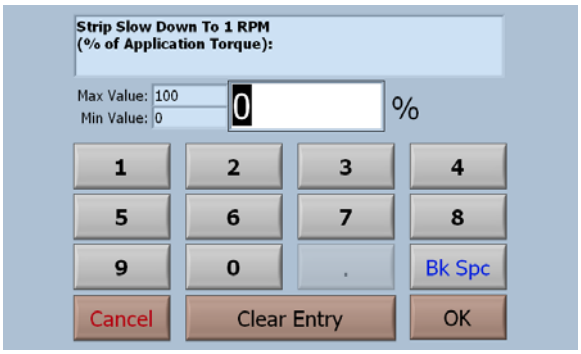
Strip Speed



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

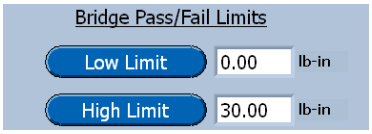
Strip Slow Down At



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

Strip Pass / Fail Limits

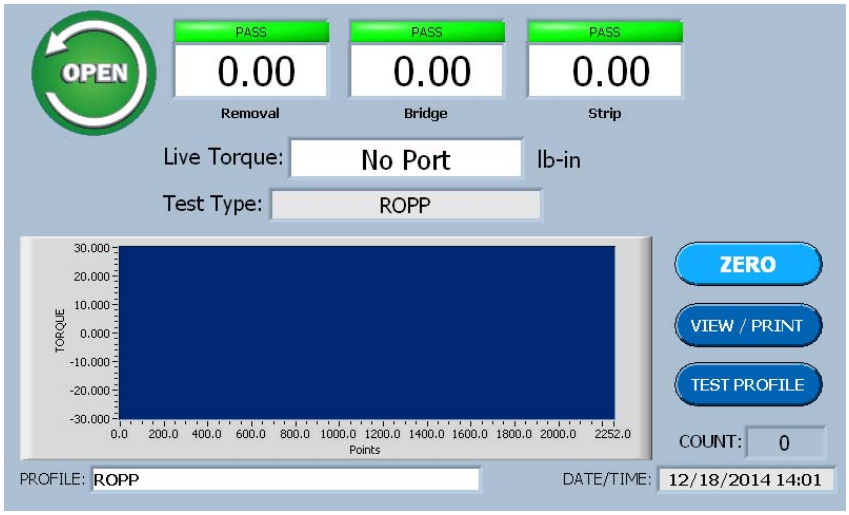


Low Limit: The Torque value that must be exceeded for the test to pass.

High Light: The torque value that must not be exceeded for the test to pass.

ROPP Cap Test Run Screen

When the ROPP Cap Test has been programmed and selected the run screen, shown below, will be displayed.

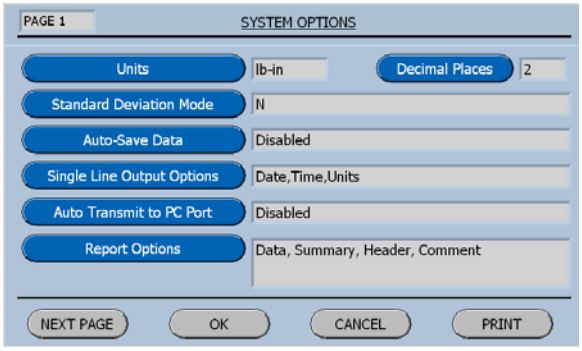


Selecting The System Options

What's Inside

This chapter contains a step-by-step procedure for selecting the system options that best suit the application. System Options are those program features that normally will be selected once, when the system is installed and seldom changed again.

System Options Menu Page 1



The default selections in these option menus have been carefully selected to fit most applications.

Units of Measure

Pressing the Units Button will step the program through the possible settings, for the current system.

lb-in, lb-ft, Nm, Kg-cm, Ncm, oz-in, mNm.

Standard Deviation

Pressing the Standard Deviation key will toggle the selection from N-1 to N for the calculation **(α_x)**. The default selection is N-1.

This formula computes the **mean** value **(μ)** and the **standard deviation (α_x)** of the measured values **(x_i)** for n points.

$$\sigma_x = \sqrt{\frac{1}{n}\sum_{i=0}^{n-1}(x_i - \mu)^2}$$

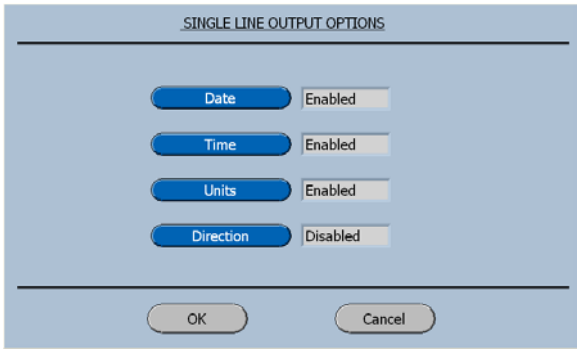
where $\mu = \frac{1}{n}\sum_{i=0}^{n-1} x_i$, and n is the number of elements in **X**.

Auto Save Data

Pressing the Auto-Save Key will toggle the selection from Disabled to Enabled. The default selection is Disabled.

Single Line Output Options

This button will display the selection menu for the data that will be sent to the RS-232 port at the end of a test.

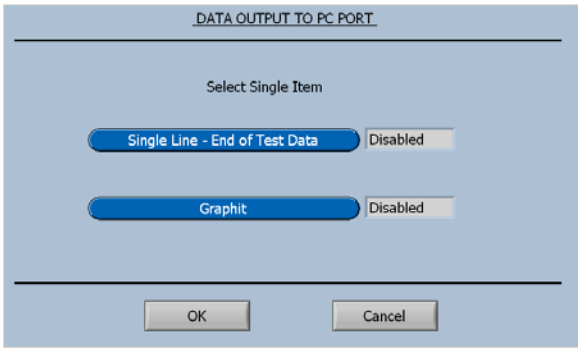


These selections are provided for transmitting to PC programs that may have templates that will already have this information.

Transmitted data will be space delimited.

Auto Transmit to PC

Pressing the Auto Transmit Key will display the Data Output to PC menu shown below.



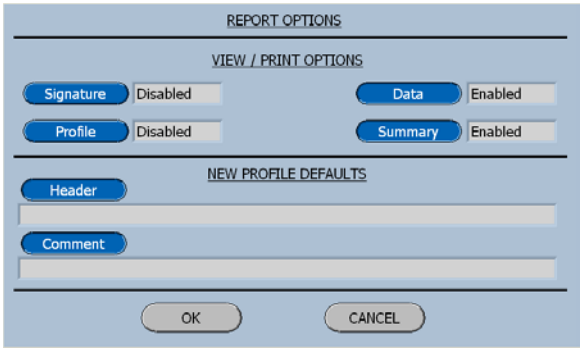
Only one of the two menu items can be enabled at a time.

The single line of data is provided for outputting to commercially available SPC programs.

The Graphit selection is used to output data to Vibrac's comprehensive data analysis program.

Report Options

Pressing the Report Options Key will display the Menu shown below.



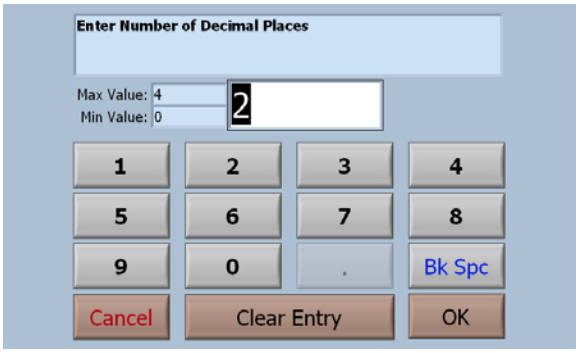
The Report Options that are selectable on this screen will be described later in the chapter titled **Viewing and Printing Test Results**.

However a feature selected here will now be the default setting for all test profiles.

Decimal Places

Pressing the Decimal Place Button will display the input screen for selecting the number of decimal places to be displayed.

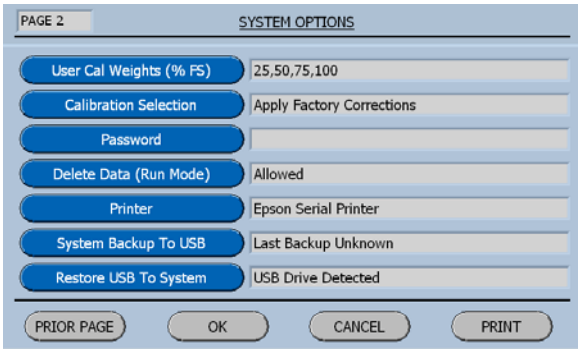
Enter Number of Decimal Places



Observe the minimum and maximum values.

To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

System Options Menu Page 2



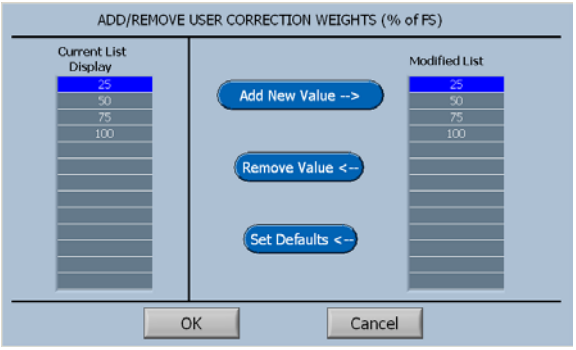
As on page 1 the default values have been carefully selected to fit most applications.

User Cal Weights

This feature enables the user to add additional weights to the calibration table or use customer-supplied weights.

Pressing the User Cal Weights Button will display the screen for editing the list.

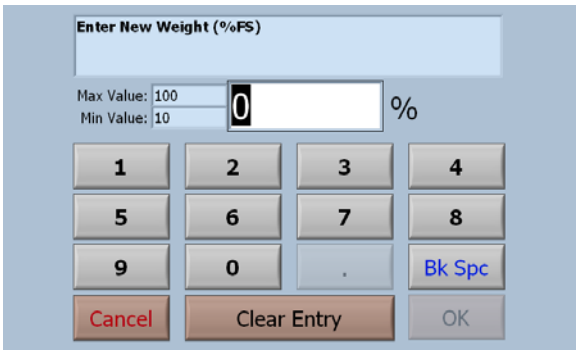
Add and Remove Weights



The Add / Remove Screen displays the current list of weights on the left and the new values as they are added or removed on the right.

When the Final list on the right is accepted by selecting OK, the Current List will be updated.

The Add New Value Button will display the input screen for creating a new value.



Observe the minimum and maximum values.

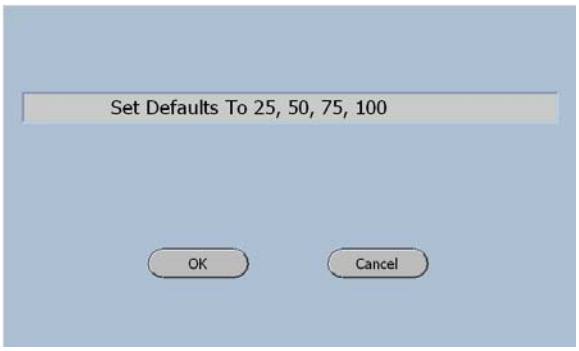
To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.

The Remove Value Button will display a confirmation screen to insure that the right value is removed.

The value that is highlighted in the Final List will be displayed here for confirmation.

The OK key will remove this value.

The Set Defaults Button will display a confirmation screen to ensure that the right values are being entered.



Vibrac's standard default values are 25%, 50%, 75%, and 100%.

The OK key will accept the displayed values.

Calibration Selection

The Calibration Selection Button will toggle the software from use Factory Corrections to use User Corrections.

The use of this feature will be described in the chapter titled System Calibration.

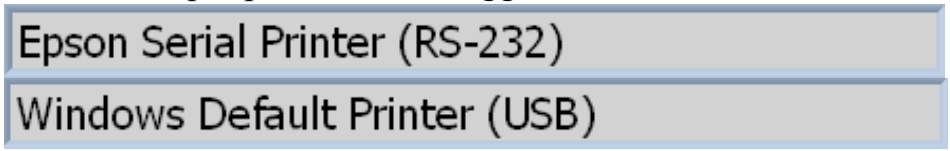
Delete Data

Pressing the Delete Data Button will toggle the selection between Enable and Disable. This feature will be described more thoroughly in the chapter titled Viewing and Printing Test Results.

Printer

The Printer select button will toggle the selection between an Epson Serial Printer and the Windows Default Printer.

When the Printer Button is selected the selection screen will toggle between the two printers described above. Please note that the output port will also toggle.



System Backup To USB

This feature enables the user to create a backup of all the test profiles that have been created.

This Button is normally grayed out; it turns blue when a USB drive is detected.

Restore Profiles from USB

This feature enables the user to restore profiles to the Library that have been copied to a USB drive.

This Button is normally grayed out; it turns blue when a USB drive is detected.

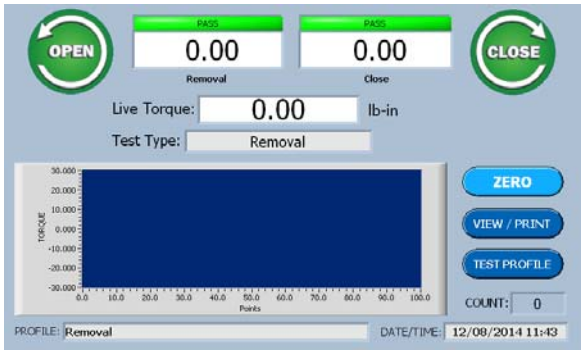
The chapter titled Using the USB Features will describe in detail how to use the above items.

Quick Start

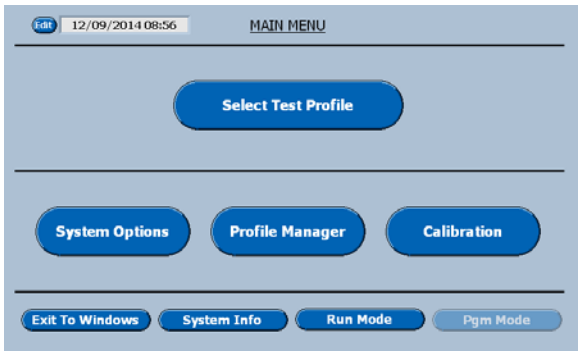
What's Inside

This chapter contains a step-by-step procedure for creating a new profile; with an appropriate name that will measure the removal torque, re-apply the cap and compare the measurements with the programmed pass fail limits when the test is performed.

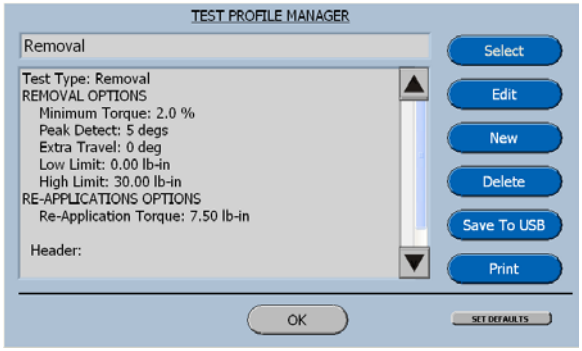
Creating a New Profile



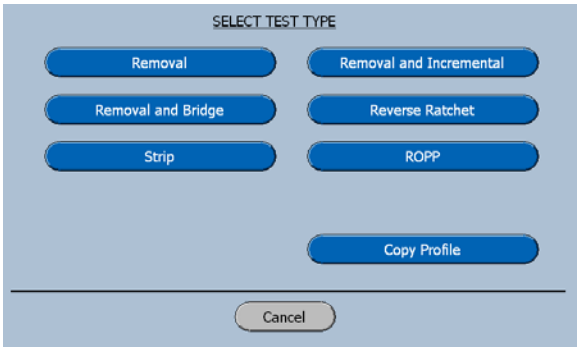
On the Run Screen select Test Profile.



On the Main Menu select Profile Manager.



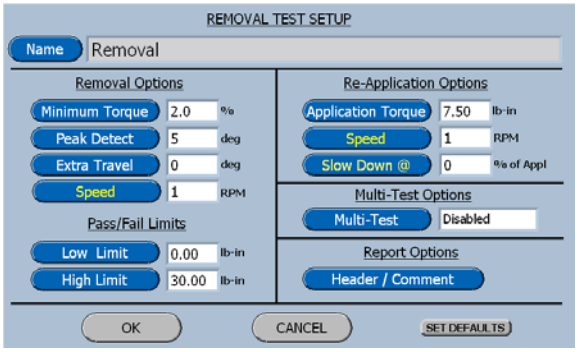
On the Test Profile Manager screen select New.



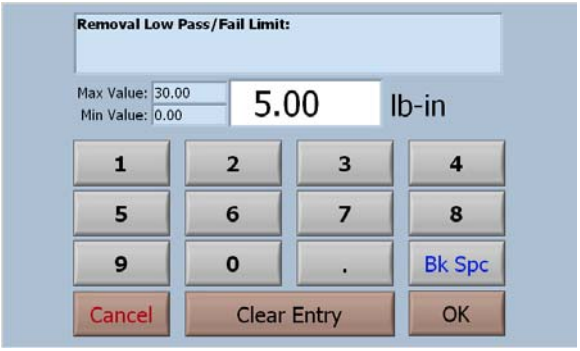
On the Select Test Type screen select Removal.

Enter a name for the test that relates to the product or the specification.

Then press OK.



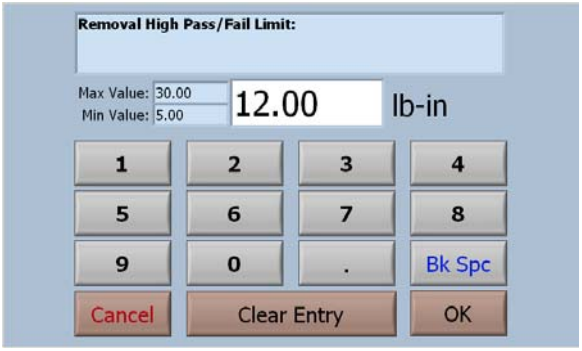
On the Removal test setup screen select Low Limit.



Now select Clear Entry and then enter 5.00.

Press Ok and the software will return to the Removal Test Setup screen.

On the Removal test setup screen select High Limit.



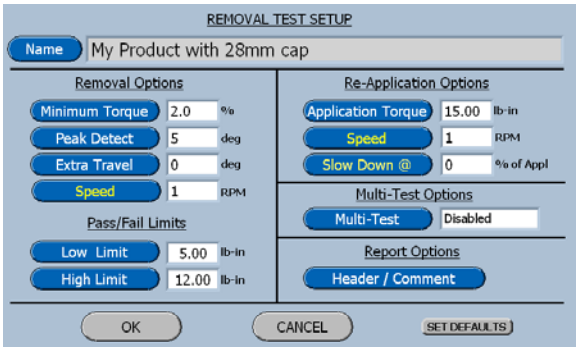
Now select Clear Entry and then enter 12.00

Press Ok and the software will return to the Removal Test Setup screen.

On the Removal test setup screen select Application Torque.

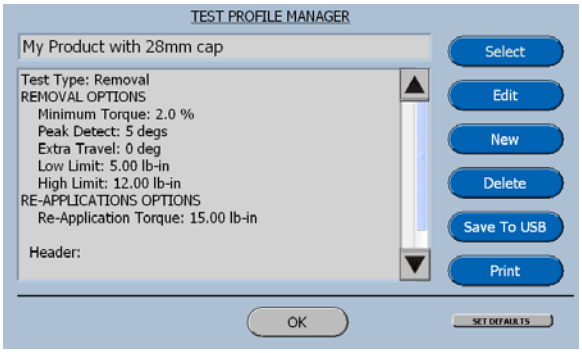
Now select Clear Entry and then enter 15.00.

Press Ok and the software will return to the Removal Test Setup screen.



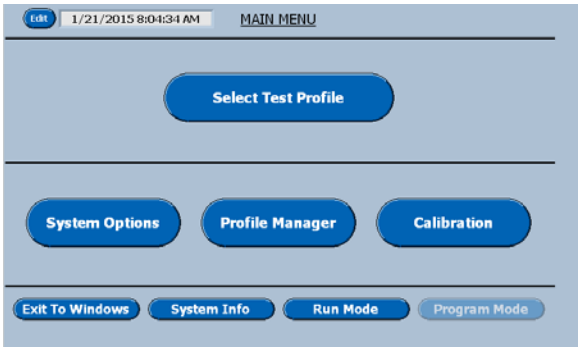
The Removal Test Setup screen now displays the values that have just been entered.

Select Ok and the profile will be saved in memory and software will return to the Test Profile Manager screen.



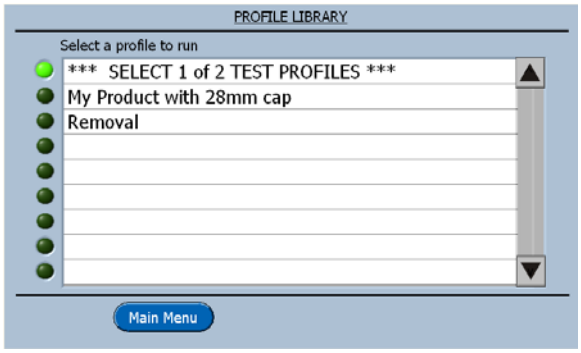
This screen now displays the features that have just been programmed.

Select OK to return to the Main Menu.



On the Main Menu press the Select Test Profile button.

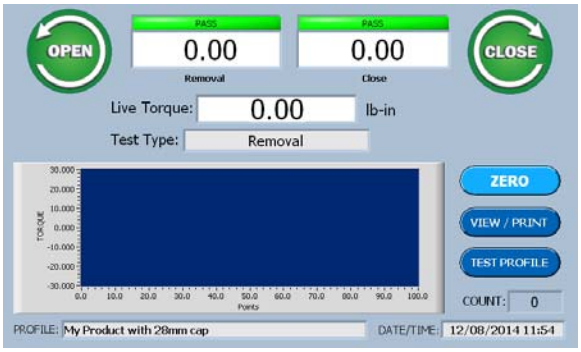
The new profile Library will be displayed.



Now select the new profile My Product with 28mm cap.

The software will now advance to the Run Screen for this profile.

Performing the Test



The run screen is now displayed.

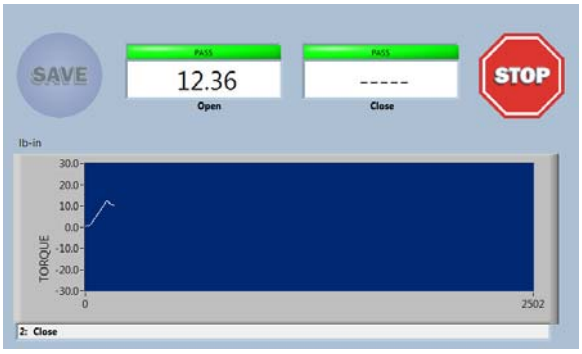
The name of the selected profile appears at the bottom of this screen and the Test Type appears in the center of the screen just beneath the Live Torque display.

Now with the live torque reading Zero, we can position the sample to be tested in the bottle holding tooling.

Once the bottle has been secured, the drive chuck can be placed on the cap of the sample to be tested.

Pressing the Open button will start the test.

Live Run Test Screen



This screen is displayed as the test is being performed.

The Stop Button, when pressed, will immediately stop the drive and terminate the test.

Viewing and Saving Test Results

What's Inside

This chapter contains a description of the procedure for saving test results and then viewing and printing these results.

Saving a Test Result

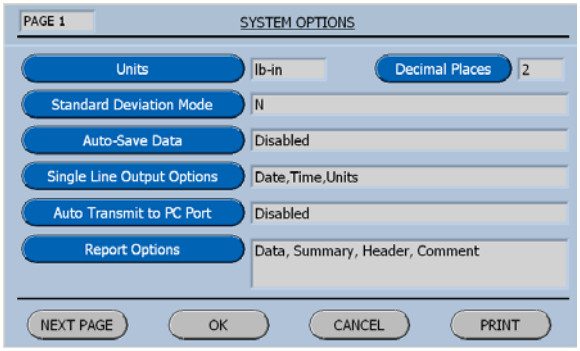
The end of test screen displays the Removal Torque Value with a color flag of green for pass and red for fail.

The re-application torque is also displayed, however it only has pass / fail limits in the incremental test mode.

Pressing the Save Button will save the current test data to memory and return the system to the Run Screen.

Pressing the Clear Button will discard the data and return to the system to the Run Screen.

Auto Save Data



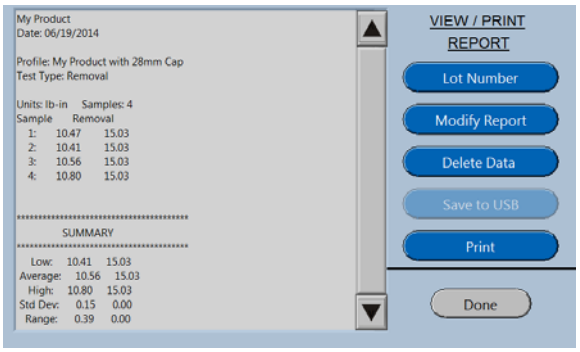
By pressing the Auto Save Data button on the System Option Menu, this feature will be enabled.

When enabled the data will automatically be saved in memory and then the software will return to the Run Screen.

Viewing Test Results

On the Run Screen press the View/Print Button and the Test report for the currently selected profile will be displayed.

View / Print Report



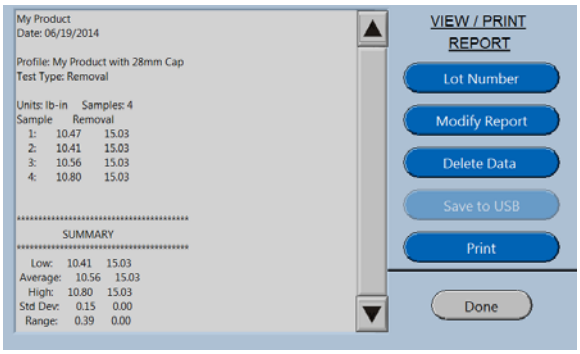
The option keys shown to the right of the report enable the user to customize the report prior to printing.

Test Data can also be deleted and corrected prior to printing.

Modifying Test Reports

What's Inside

This chapter contains a description of the procedure for modifying reports to fit the application.

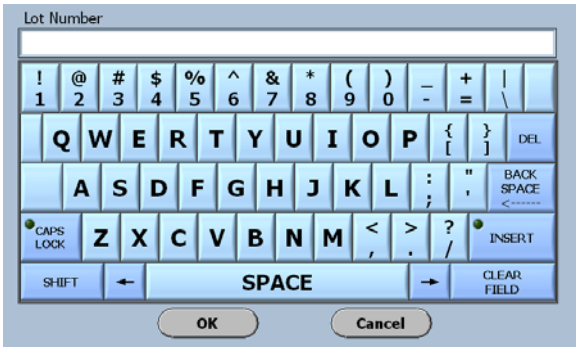


The customizing features are displayed on the right side of the View / Print Screen.

The features that are selected from this screen will be applied to this report only.

Entering a Lot Number

When the Lot Number button is pressed the following screen will be displayed

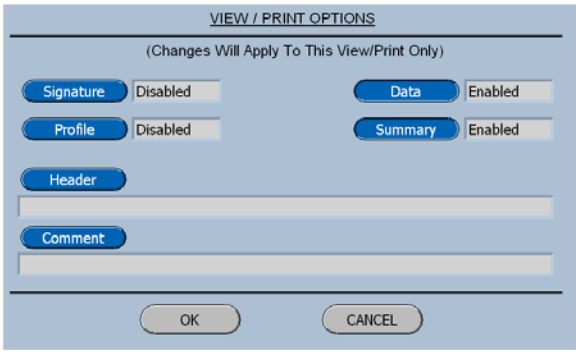


Now type in the desired lot number and then select OK.

The number will now be displayed on the report.

Modifying the Report

When the Modify Report button is pressed the following screen will be displayed.

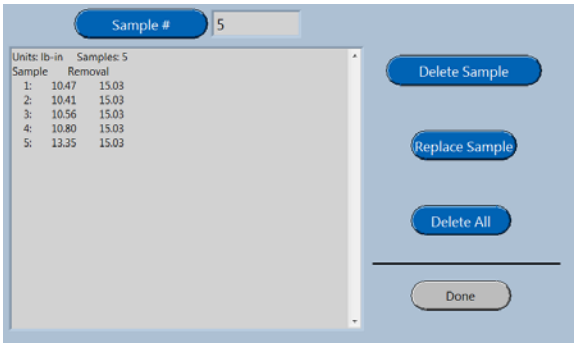


The Signature, Profile, Data and Summary Buttons will toggle the selection from disabled to enabled or vise versa.

The Header and Comment Buttons will display the Keyboard for entering the desired terminology.

Deleting Data

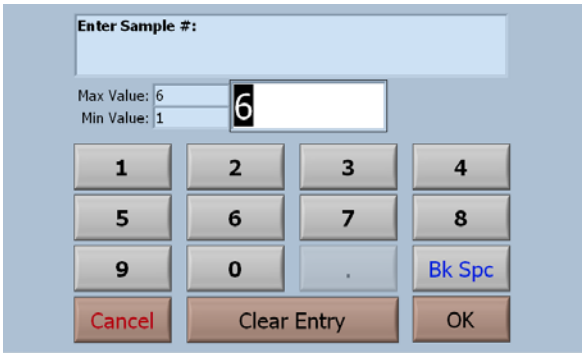
When the Delete Data button is pressed the following screen will be displayed.



The delete all button will display a confirmation screen before deleting the data.

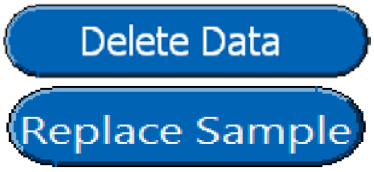
The sample button, replace sample button and delete sample button are used for manipulating or correcting an issue with a specific piece of data.

The Sample # Button will display the screen shown below.



Observe the minimum and maximum values.

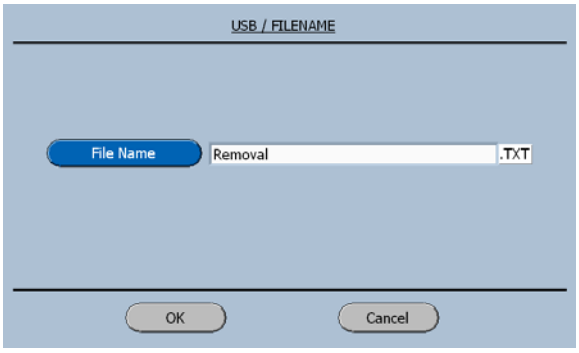
To input a value, just start typing. The first key selected will overwrite the first highlighted value on the screen. When the desired value has been keyed in press OK to save the new value.



Both of these buttons will display a confirmation screen before executing the desired function.

Saving To USB

When a USB device is detected by the software, the dimmed button will be activated. When selected the following screen will be displayed.



Once a file name has been entered and the OK button selected, the data will be saved in a Note Pad Text File. (TXT)

Transmitting Test Results

What's Inside

This chapter provides a description of the output port connector requirements, communication protocol and procedure for transmitting test results automatically.

Output Port

The Cap Inspector is supplied with an RS-232 Serial communication port for connecting to a Printer or Personnel computer.

Connector Requirements

The connector is a female, 9 pin Sub-D style (AMP # 7455201-1).

Amphenol = 17-301-1

Pin Out

02	=	XMIT
03	=	RCV
05	=	GND

Communication Protocol

Data is transmitted in normal ASCII format with the following specifications.

Baud Rate: 9600

Data Bits 8

Stop Bits 1

Parity: No

Xon / Xoff Yes

Data Format Information

When transmitting test results the following data strings are used for the different test modes.

Removal Torque

Date_Time_Units_Torque_Test Type_<CR><LF>

Example:

01/01/00_09:00_lb-in_10.80_removal_<CR><LF>

Incremental Torque

Date_Time_Units_Removal Torque_Test Type_Incremental Torque<CR><LF>

Example:

01/01/00_09:00_lb-in_10.80_inc_12.00<CR><LF>

Bridge Torque

Date_Time_Units_Removal Torque_Test Type_Bridge Torque<CR><LF>

Example:

01/01/00_09:00_lb-in_10.80_brg_1.15<CR><LF>

Reverse Ratchet Torque

Date_Time_Units_Torque_Test Type_<CR><LF>

Example:

01/01/00_09:00_lb-in_10.80_rrt_<CR><LF>

Strip Torque

Date_Time_Units_Torque_Test Type_<CR><LF>

Example:

01/01/00_09:00_lb-in_10.80_stp_<CR><LF>

ROPP Torque

Date_Time_Units_Removal Torque _Test Type_Bridge Torque_Test Type_Strip Torque_<CR><LF>

Example:

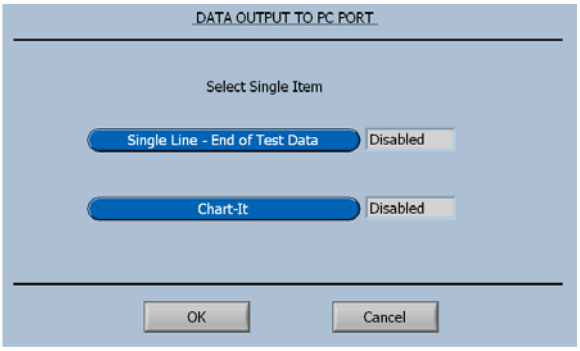
01/01/00_09:00_lb-in_10.80_brg_1.15 stp_ 10.90_<CR><LF>

Transmitting Data Automatically

The Cap Inspector can be programmed to automatically transmit test results at the end of a test or live data during the testing process.

Transmitting End of Test Results Automatically

Pressing the Auto Transmit Key on Page 1 of the System Options Menu will display the Data Output to PC menu shown below.



Only one of the two menu items can be enabled at a time.

The single line of data is provided for outputting to commercially available SPC programs.

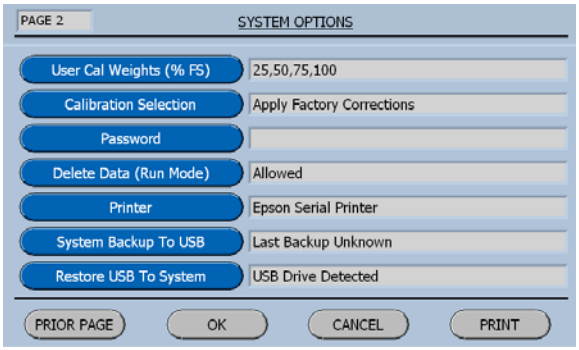
The Chart-It selection is used to output data to Vibrac's comprehensive data analysis program.

Using the USB Features

What's Inside

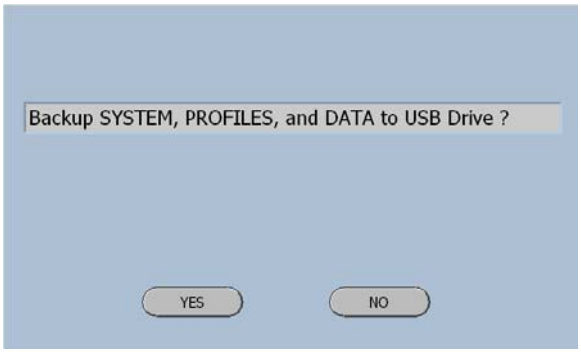
This chapter describes in detail the use of a USB drive to backup the system and to restore profiles.

Backing up the System



The backup process begins by first inserting a USB drive into the USB port on the rear panel of the tower. Now go to page 2 of the System Options and select the system Backup button.

The software will display the following information screen.



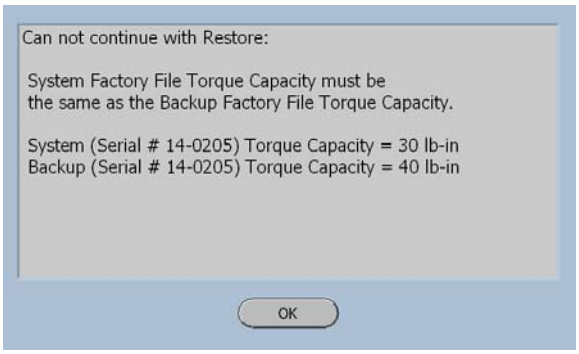
This screen lists the items that will be backed up when the yes key is selected.

Copying and Transferring Profiles

Backing up profiles to a USB drive and then using the Restore feature enables one to transfer the profiles from one machine to another.

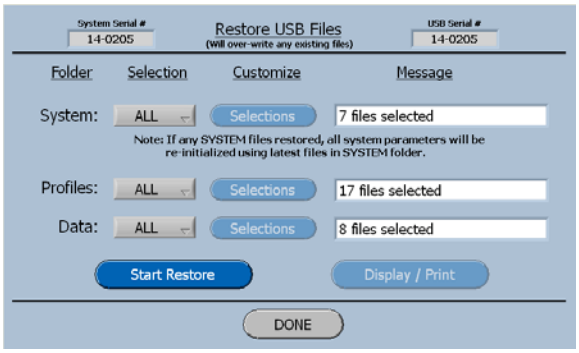
Restoring USB Files to System

Restore USB Button



When the Restore Button is selected the software will compare the torque capacity of the current system with the capacity of the system for the stored files and if they are not alike this screen will be displayed.

Restore USB Screen



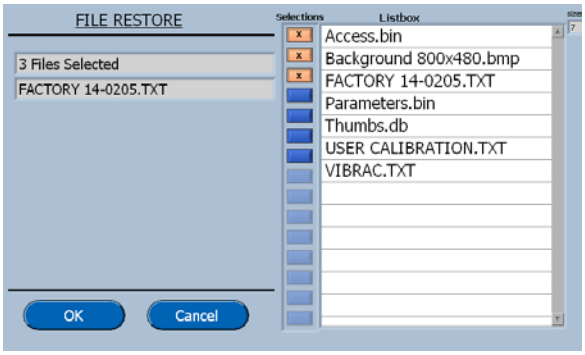
When the System Serial # and the USB Serial # do not match, the System Files cannot be restored, however the Profiles and Data can be restored.

Before selecting the Start Restore Button, make sure the desired files are select. A Restore will over-write any existing files with the same name.

The following procedure will insure that only the desired files are copied.

Select the All button, then change the selection to Custom and the Selection key will be highlighted.

The files for selection will be displayed.



Pressing on the button to the left of the file name will select a file.

This procedure should be followed for all the System Files, Profiles and Data files.

Pressing this button will start the procedure. All of the selected item will be restored.

Gold Standard Verification

What's Inside

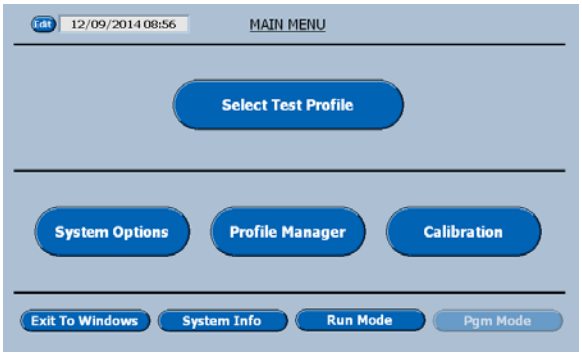
This chapter describes the calibration verification of the Cap Inspector with a Vibrac Gold Standard.

Vibrac Gold Standard Description

The Model C-2112 Gold Standard Verification Tool is used to quickly verify the calibration and operational repeatability of both the 2000 and 2100 Series Cap Inspectors. These devices are pre-set to a torque value that matches the requirements of the customer.

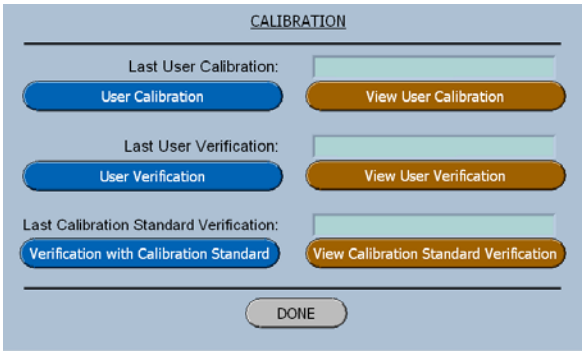
Calibration Verification with the Gold Standard

The following step-by-step procedure will guide the user through this process.



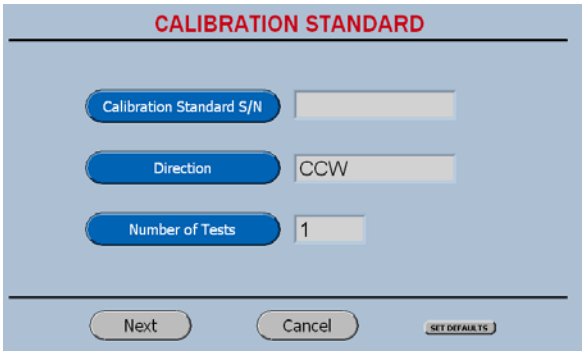
On the Main Menu press the button titled Calibration

The complete Calibration menu will be displayed as shown below.



Now select the Blue Button titled Verification with Calibration Standard.

The software will now advance to the series of menus that will guide the user through the process by just following the steps on the screen.



As a step is selected the appropriate input screen will be displayed.

The direction key acts as a toggle.

The Next key will advance the software to the screen shown below.

It is a good idea to run at least 5 tests. This enables the user to verify the repeatability of the system.

When the torque reads Zero press the continue button.

The software will advance to the Test Screen.

The chuck must now be engaged with the cap on the Calibration Standard.

When the start button is pressed, the Run screen shown below will be displayed.

The measured torque will be displayed graphically and the maximum peak torque will be displayed at the conclusion of the test.

Cap Inspector Calibration

What's Inside

This chapter describes the entire calibration process, from the initial verification through the performance of a user calibration.

General Calibration Information

A factory Calibration is burned into read-only memory when a system is shipped or serviced by a Vibrac trained individual. This insures the user that there is a full back up available if a faulty user calibration is performed.

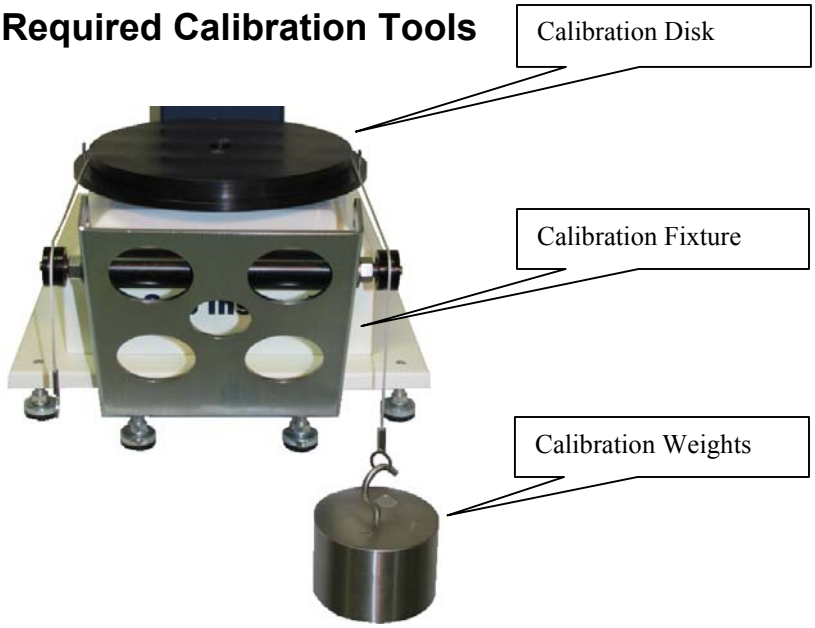
Calibration Frequency

When a system is used on a daily basis, the calibration should be verified at least twice a year.

Calibration Equipment

In accordance with ASTM Standard D3474, a round disk, a pulley supporting fixture and a series of weights are required to calibrate torque meters used in the packaging industry.

Required Calibration Tools



Performing a User Verification

This procedure is used to verify that the system is in calibration.

The first step in this procedure is to install the Calibration Fixture and Calibration Beam on the Cap Inspector.

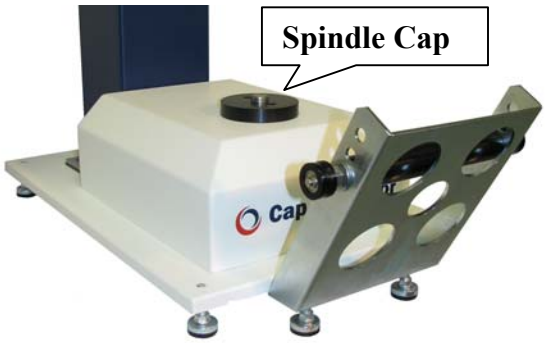
Installing the Calibration Fixture

The calibration fixture mounts on the front of the Cap Inspector as shown in the picture.

To install the fixture, loosen the two $^{5}/_{16}$ Socket Head Cap Screws that are located on the underside of the base plate. Then insert the fixture between the base plate and the head of the screws. Now re-tighten the bolts.

(Wrench Size ¼ " Hex)

Installing the Calibration Beam

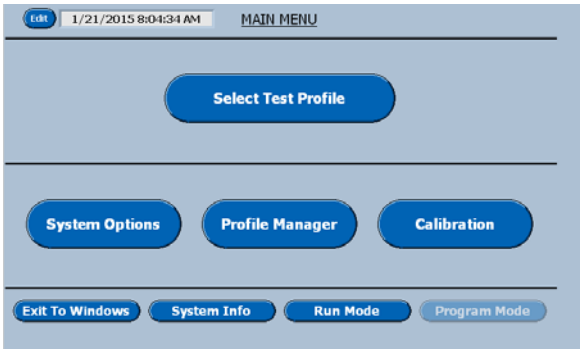


The beam is installed by first removing any bottle holding tooling and then carefully placing the beam on **top of the spindle cap**. Screws are provided for holding the beam in place.

(2 x .250-20 x 1" Skt Hd Cap Screws)

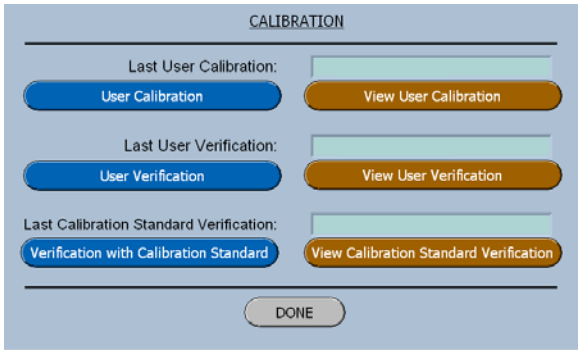
(Wrench size $^{3}/_{16}$" Hex.)

The second step in the procedure is to select User Verification on the Calibration Menu.



On the Main Menu press the button titled Calibration

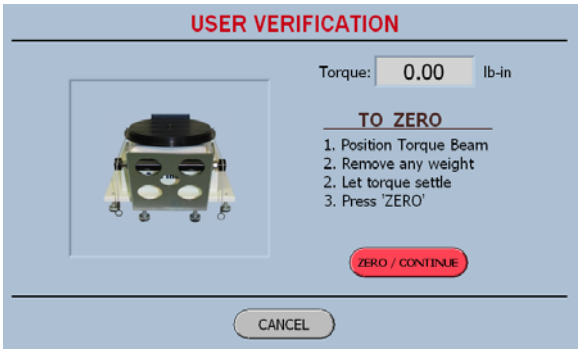
Now the complete Calibration menu will be displayed as shown below.



Now select the Blue Button titled User Verification.

The software will now advance to a series of menus that will guide the user through the process by just following the steps on the screen.

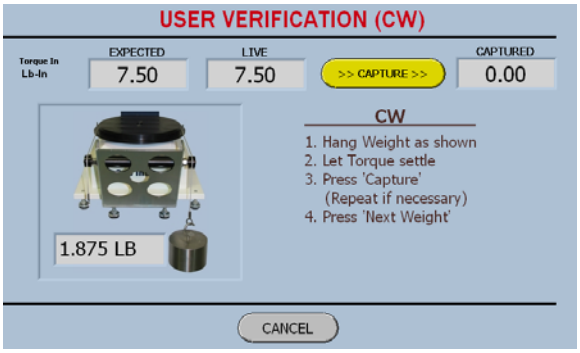
User Verification Zeroing Screen



The first screen forces the user to Zero the system.

When the Zero Button is pressed, the display will be zeroed and then the software will determine the torque capacity of the system in order to determine the value of the weight to be hung.

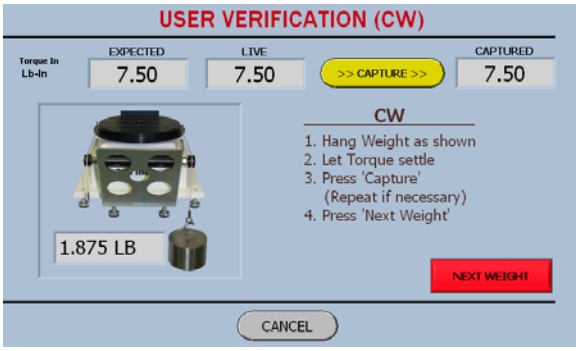
User Verification Weight 1 Screen



When the weight is applied the live torque will be displayed.

When the torque value stops changing, due to the motion of the weight, the capture button should be pressed and then the following screen will be displayed.

User Verification Capture 1 Screen



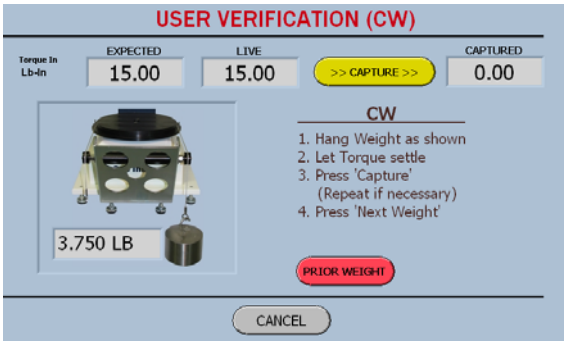
The captured value is now displayed.

It should be the same as the expected value, however if the value is slightly different due to how the process was performed.

(Bumped the table, Bumped the weight)

The Next Weight button will display the following screen from which this problem can be corrected.

User Verification Weight 2 Screen



The user can return to the previous weight by selecting the Prior Weight button.

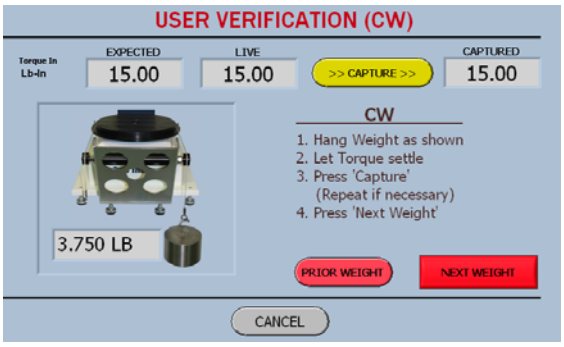
If there is no need to return to the prior weight, screen then the displayed weight should be hung.

When the live display settles, the Capture button should be pressed.

When hanging the weights, the user should try to perform this procedure in a gentle and consistent manner.

If you jump on a scale, the reading will be higher than if you gently step on it.

User Verification Next Weight Screen

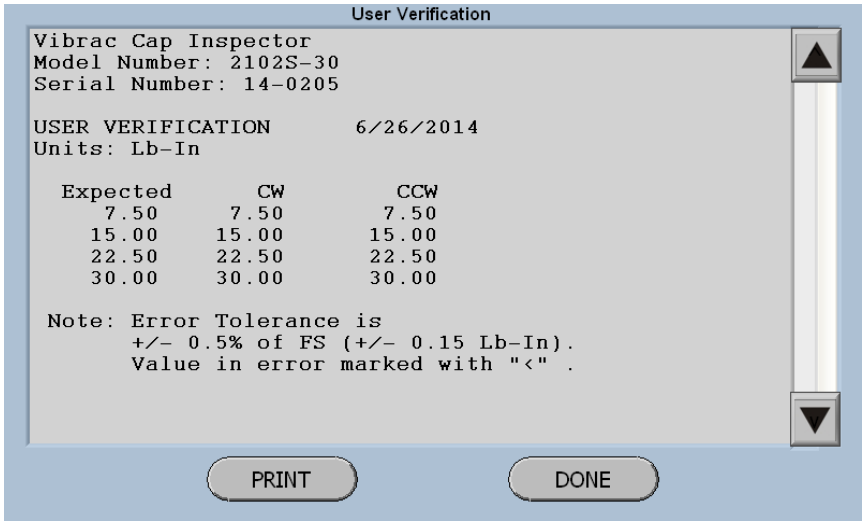


The captured value should be viewed and evaluated as in Screen 2 above.

Once again the Next Weight button will advance the software to the appropriate screen.

Once the torque in both directions of rotation has been verified the following report will be displayed.

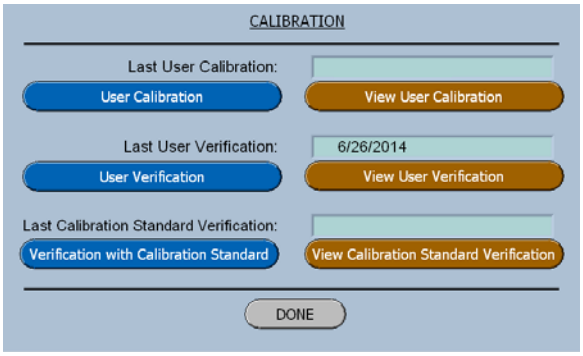
User Verification Report



Observe Note on screen. All readings should be within +/- .5 % of Full Scale Torque.

If the readings are not within the tolerance range, a User Calibration should be performed.

Performing a User Calibration



Now select the Blue Button titled User Calibration.

The software will now advance to the series of menus that will guide the user through this process, by just following the steps on the screen.

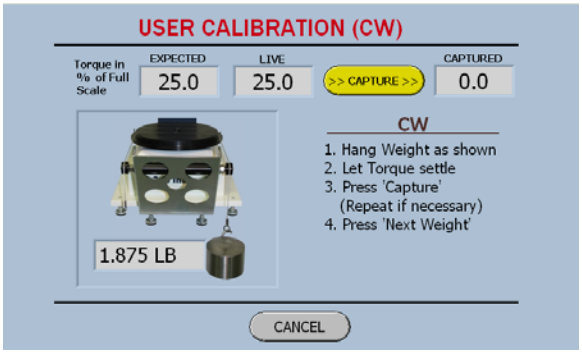
User Calibration Screen 1

The first Calibration Screen forces the user to Zero the system.

When the Zero Button is pressed, the display will be zeroed and then the software will determine the torque capacity of the system in order to show the value of the weight to be hung.

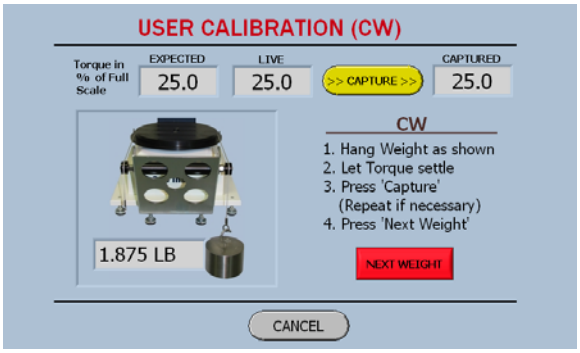
Once again it is very important that the weights be hung carefully and in a consistent manner.

User Calibration Screen 2



Please note the calibration screens display the torque in Percent of Full Scale not in the default units of measure. This is done because the accuracy of the system is specified as a percent of full scale and the weights are supplied for 25%, 50%, and 75%. Then by combining the 25% with the 75% you have 100 %.

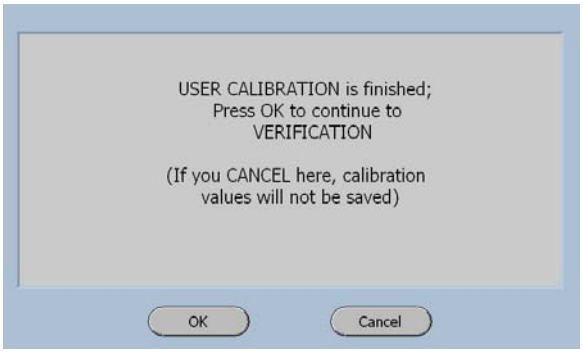
User Calibration Screen 3



As in the User Verification process the Capture button will except the value and then provide the Next Weight button to advance to the next step.

When all the weight s have been hung and captured the software will display the following screen.

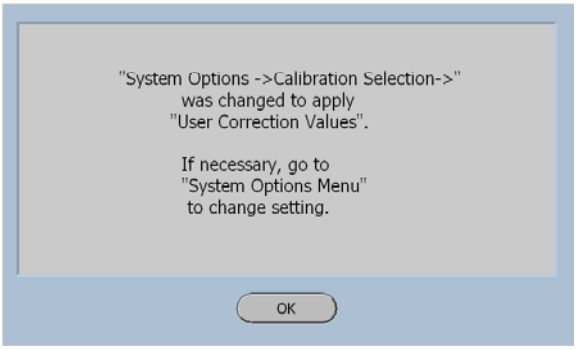
User Calibration / Verification Screen



The software will now force the user to perform a Verification to insure that the Calibration was performed properly.

The OK button will now display the User Verification Weight 1 Screen.

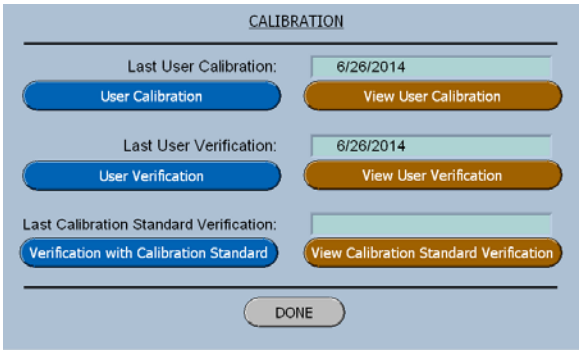
The system does not get re-zeroed between the User Calibration and the User Verification.



This information screen will be displayed at the completion of the User Verification.

Since the Calibration / Verification was performed successfully the software assumes that new Calibration correction values are to be used.

Main Calibration Menu after Calibration



The Main Calibration menu displays the date of the last Calibration and last Verification.

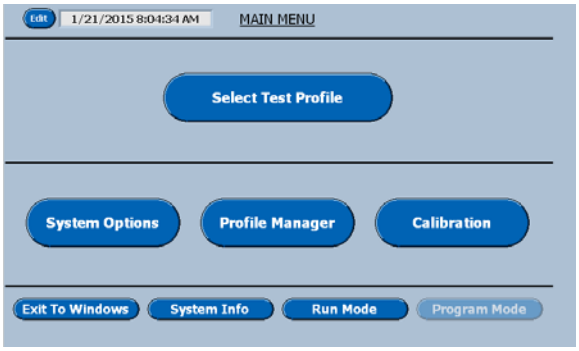
The view button enables the user to view and print the report for each of these functions.

Setting the Data and Time

What's Inside

This chapter contains a step-by-step procedure for setting the Date and Time.

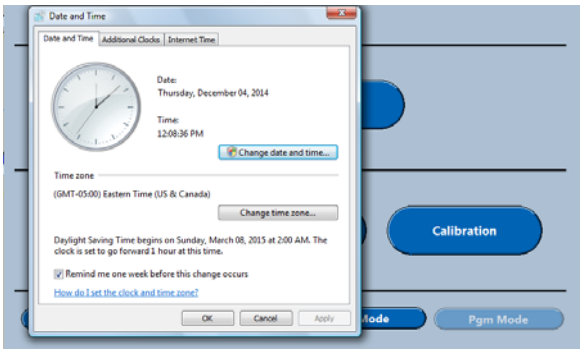
Edit Date and Time



On the Main Menu Screen in the program mode select Edit next to the Date and Time display in the top left corner.

The following screen will be displayed.

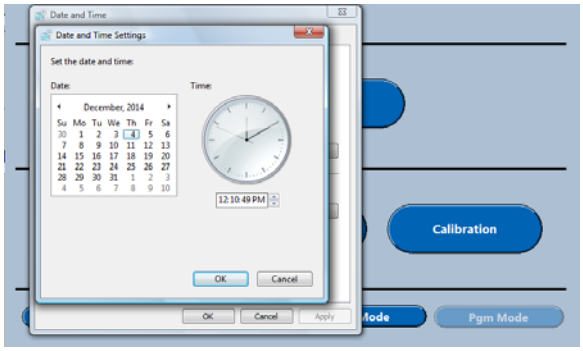
Date and Time Menu



On this menu select Change Date and Time.

The software will now display Edit date and Time screen shown below.

Edit Date and Time Screen

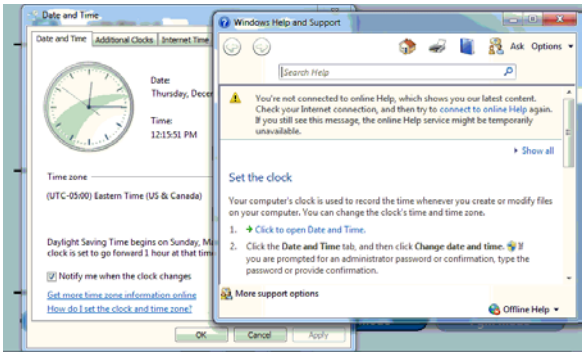


Touching the arrows to the right and left of the displayed month changes the Month.

Touching the desired day changes the Day.

Touching the arrow keys after selecting the value to be changed changes the Time.

Edit Date and Time Help



When how do I set the clock and time zone is selected, this help screen will be displayed.

Down Force Option

What's Inside

This chapter describes the Down Force mechanism that is used for testing Child Resistant caps.

About the Child Resistant Option

This option enables the Cap Inspector to provide a pre-settable down force for push and turn caps.

An air supply with the ability to provide a minimum of 60 PSI is required.

Once connected to the air, the down force can be set to the required force for a given application.

Connecting the Air Supply

The air supply connects to the air filter on the rear of the tower.

This connection is a ⅛ NPT thread.

Both the air filter and regulator are designed for a maximum of 100 PSI however **the Force Gauge is limited to either 60 or 30 PSI.**

Adjusting the Down Force

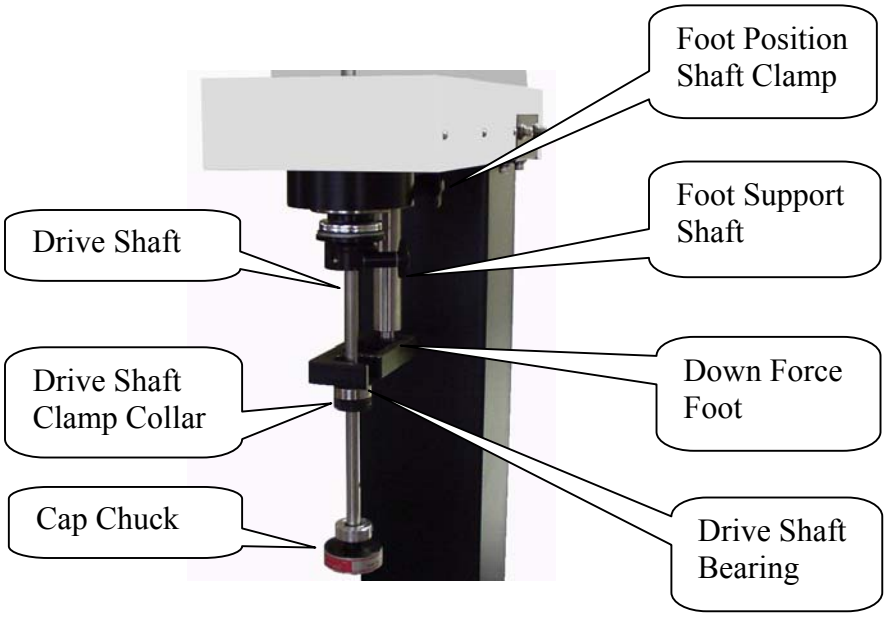
Once connected, the Air Control Knob should be adjusted to provide the required amount of down force.

Observe the down force gauge on the front of the tower cover while adjusting the knob.

In most cases, a down force of 15 to 20 lbs will open a child resistant closure.

Down Force Mechanism Nomenclature

The names in the callouts below will be used when describing the setup and adjustment of the Child Resistant Down Force Mechanism.



Adjusting the Down Force Foot

The Down Force Foot applies the force on the cap by pressing down on the Drive Shaft Bearing when the Down Force Switch is actuated.

To adjust the foot put the Down Force switch in the up position and then place the sample to be tested in the bottle holding fixture.

Now position the Cap Chuck on the cap by lowering the drive shaft.

Pivot the Down Force Foot over the top of the Drive Shaft Bearing and adjust for approximately 1/16 of an inch of clearance. (i.e. the thickness of a quarter)

Loosening the Foot Position Shaft Clamp and sliding the Foot Support Shaft up or down and then retightening the clamp makes this adjustment.

Operating the Child Resistant Mechanism

Once the mechanism has been adjusted, a sample is tested by pivoting the foot into position and actuating the Down Force Switch.

At the conclusion of the test cycle, move the switch to the up position and pivot the foot to the rear.

Repeat this procedure for the next sample.

Glossary of Terms

Bridges

The small strips of material that span the gap between the cap and the tamper evident band.

Incremental Torque

The force required to rotate a cap to a position 6 degrees past the initial application position in the tightening direction.

RS-232

A serial communication standard for data interchange.

Re-application Torque

The force that will be applied to a cap when re-tightening it.

USB

Universal serial bus interface for connecting peripheral devices to a computer. Sometimes used as short for "USB

flash drive".

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