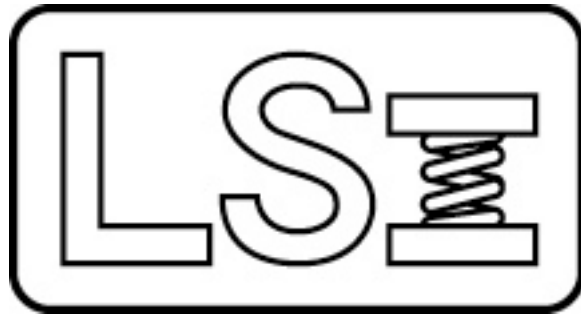


Larson Systems Inc.



060-1000-0053-00
Super Sorter User Manual



Current to Software
Version 4.25

About This Manual

This manual could contain technical inaccuracies or typographical errors. Changes are periodically made to the information contained herein. These changes will be incorporated in new editions of the manual.

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1 INTRODUCTION

LSI's Super Sorter is a hand-loaded sorting system that is pneumatically powered for minimum operator fatigue. Program the front panel outputs to light up indicating low, good, or high test conditions with the Limit Lights feature. Testing can be cycled automatically and the frequency set to match the user's application. The force capacity is limited to 200 lbs and is regulated by adjusting the pneumatic controller for safe operation. Hand loaded test rates can be done as fast as 2,000 per hour. When the Super Sorter is used in fatigue cycling it can perform up to 3,000 iterations per hour. An automatic shut off can be programmed to occur after a certain number of cycles or if the load tolerance has been exceeded.

Easily sort parts on this hand tester equipped with practical functionality at a reasonable price.

1.1 Standard Features

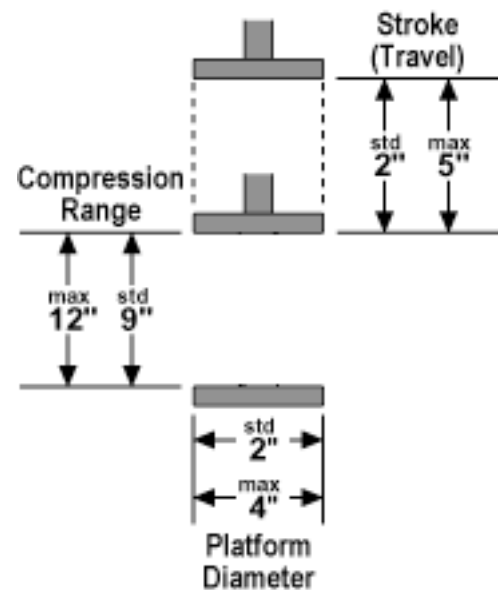
- Compression testing of force
- 110 lb or 200 lb capacity with 2-inch stroke, 9-inch range
- Hand-loaded testing and sorting up to 2,000 per hour
- Fatigue cycle rates up to 3,000 per hour
- Pneumatically powered (adjustable) to 150 PSI max
- Auto shut-off programming
- 110 – 250 V AC, 50 – 60 Hz power requirements

1.2 Optional Features and Equipment

- Limit lights and full statistical analysis
- Extended 5-inch stroke
- Extended 5-inch stroke with 12-inch range
- 4-inch platform diameter

1.3 Specifications

The Super Sorter can accommodate springs up to 12 inches in height and up to 4 inches in diameter. A combination of the standard and optional configurations shown at right may be selected to customize a Super Sorter for a specific application.



Super Sorter – Force Specifications		Length Specifications
Capacity	Resolution	None. The Super Sorter can be set to compress to a certain length but is not equipped to measure length.
110 lb	0.05 lb	
50 kg	0.02 kg	
489 N	0.2 N	
200 lb	.1 lb	
91 kg	.05 kg	
890 N	.5 N	
Accuracy = ± Resolution x 2		

2 GETTING STARTED

2.1 Unpacking

The Super sorter from LSI is shipped completely assembled. Once the shipping container is opened, this User Manual is easily found with instructions to READ FIRST. Use care when removing the Super Sorter from the packaging and protective poly bag to avoid damage. Other items ordered may be in their own carton(s) secured inside the shipping container or shipped separately.

2.2 Items Shipped

Locate the following items inside the shipping container:

- Super Sorter testing unit
- Power adapter
- Two 8 ½" x 11" white envelopes

1 – User Manual
2 – Packing List

- Optional equipment ordered
- Any large equipment ordered is shipped separately

Check the packing list and make sure all items listed were received. Safely store items not needed right away and retain shipping container with packaging for future use.

2.3 Using the Manual

Have the Super Sorter accessible and installed as described in section 2.4 when following along with this manual.

- Be sure to read the Safety and Use Guidelines in section 2.5 before starting.
- Testing procedures and setup are found in section 3.3 and 3.4. The Super Sorter is shipped with a standard sequence programmed that can be used immediately by selecting **Start [F2]** after the machine is turned on and hooked up properly. Setup and sequence programming instructions are also found in section 3.3.
- An instruction in brackets and bold type refers to a button on the keypad.
- The software and control panel faceplate used for the Super Sorter application is the same as normally used with the LSI Super Digital Hand Testing equipment with modifications to Sorting and Fatigue testing.
- The instructions cover all menus and keypad buttons – keep in mind that some are not applicable to the Super Sorter and will be so stated.

2.4 Installation and Setup

2.4.1 Location

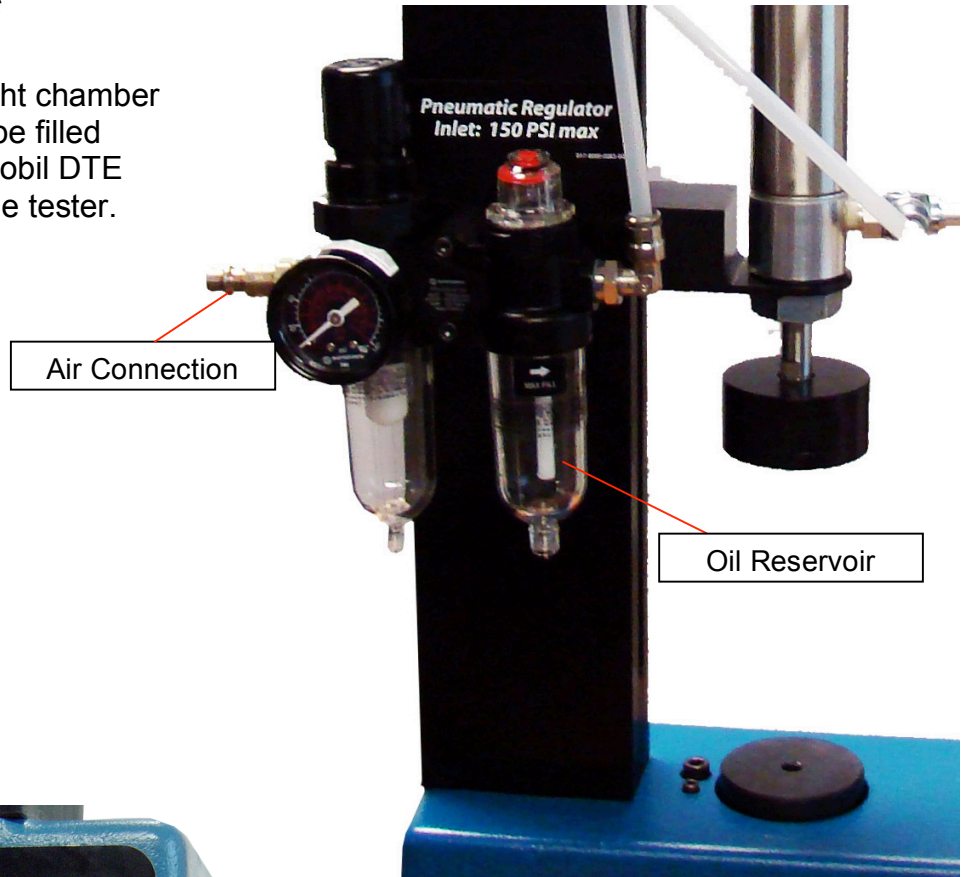
Place the Super Sorter on a level and stable work surface where sorting or fatigue testing can be performed in a comfortable manner. The height of the work surface should allow ease of loading, testing and removing parts from the testing area. Accessibility to a power source and air compressor is also required for operation

(connections are shown in the following diagrams). Once a location is selected and the Super Sorter is in place, the control panel should be positioned for viewing and be easily accessed during operation.

The mounting holes on the base of the unit may be used to secure the Super Sorter for increased stability. Keep the work area clean, dry and protected from debris.

2.4.2 *Pneumatic Regulator*

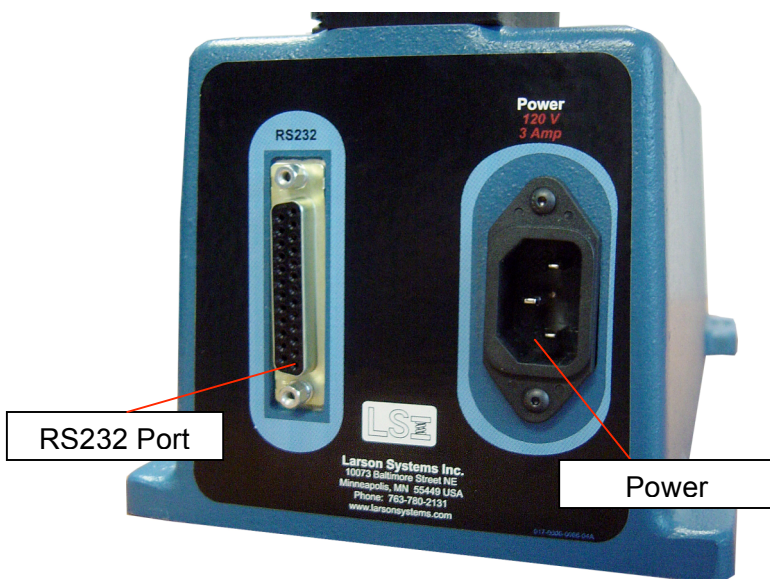
The oil reservoir or right chamber of the regulator must be filled about half full using Mobil DTE Lite oil before using the tester.



2.4.3 *Power and RS232 Port*

Follow marked guidelines for power connection. Adapter is included.

RS232 connector allows user to add a printer using an RS232 cable or adapter. View statistical report in hard copy.



Back View of Tester Base

2.5 Safety and Use Guidelines

Read this manual before operating the Super Sorter to learn how to use properly. Important considerations are:

- **Compressed springs have stored potential energy proportional to the spring constant.** Use care and release this energy in a controlled manner to avoid injury.
- Do not apply force greater than the tester is designed to accommodate.
- Use care when hand-feeding and removing parts from the platform during automatic timed delay testing and sorting to avoid injury.
- Be sure the operating area is clean and dry.
- All parts to be tested / cycled should be free of oil and contaminants.
- Keep the Super Sorter from contact with liquid.
- This user Manual should be kept available for quick reference.
- Use of protective eyewear is recommended for safety.
- Follow all instructions and warnings associated with and labeled on the Super Sorter.

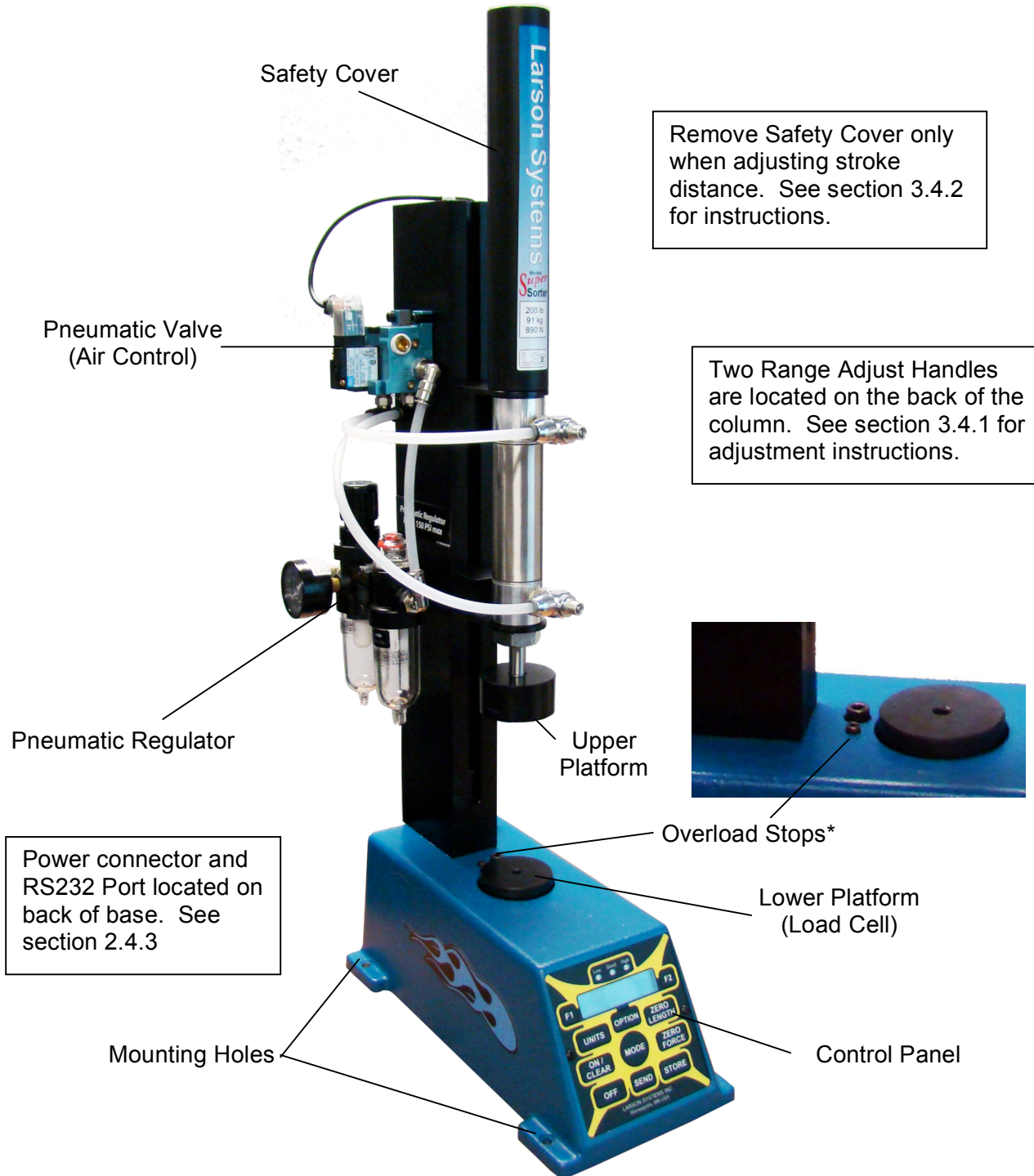
IN AN EMERGENCY:

- Press **[ON / CLEAR]** to abort and stop the current sequence, follow subsequent display instructions to continue.
- Press **[OFF]** to turn off the machine immediately.
- Press any other key to **Pause** the operation, follow display instructions to continue or stop the current operation.

Be sure a compatible power source is used and the air compressor is properly connected to and oil added to the pneumatic regulator before operating. See Section 2.4 - Installation and Setup for information.

Warning: Tampering with the overload stops may void warranty. See diagram on the next page – section 2.6.

2.6 Super Sorter Diagram



- *Overload Stops are set at factory, tampering may void warranty.

3 SUPER SORTER USER GUIDE

3.1 The Control Panel

Current Software: PN 050-1000-0005-00P, Version 4.25

The Super Sorter model is configured with the same control panel as is used on LSI's Digital Hand Testers.



[F1] [F2] – Use in the Option menus to make selections from LED display, enter data, or navigate screen fields.

[OPTION] – Scroll forward through the Option menu items and the submenus as selected.

[UNITS] – Use in navigation to move in the reverse direction of **[F1]** when entering numbers or letters in a field within the Option menus.

[ZERO LENGTH] – Use in navigation to move in the reverse direction of **[F2]** when entering numbers or letters in a field within the Option menus.

[ON / CLEAR] – Turns the Super Sorter on and acts as an “enter” or “save settings” button in the Option menu and defaults back to the main Sorter menu shown above. Use to abort the sequence in progress during a sorting and testing operation.

[MODE] – Use to scroll in reverse through the Option menu items.

[ZERO FORCE] – Use to zero the force reading on the display.

[OFF] – Use to turn power off.

[SEND] – Use in the Option menus to back out of individual menu levels.

[STORE] – Not used.

3.2 Test Modes

There are two test modes available on the Super Sorter: **Manual** and **Peak** mode. Manual mode is the default when the tester is first turned on. Press **[MODE]** to switch to Peak mode. It is important that the same mode be used for testing the same parts. The testing display looks as follows for each mode:



3.2.1 Manual Mode

The display shows the current force applied at all times.

3.2.2 Peak Mode

When force is applied during an iteration, the display stays at the maximum force recorded until stored or cleared.

3.3 The Option Menus

When the Super Sorter is turned on using **[ON / CLEAR]**, the LED display shows startup information and stops at a force measurement screen. Touch **[OPTION]** to enter and scroll through each menu. Information about using each Option Menu is described in order of appearance. Navigate using the following keys:

[OPTION] is used to scroll forward through the menu items

[MODE] scrolls in reverse through the menu items

[F1] and **[F2]** are used to make selections and also to navigate and enter data

[SEND] backs out of menu levels to the main menu

[UNITS] does the reverse of **[F1]** when entering numbers or letters in a field

[ZERO LENGTH] does the reverse of **[F2]** when entering numbers or letters in a field

[ON / CLEAR] saves entered data or current selection and returns to the main menu

3.3.1 Sequence Mode: Setup / Start

A green rounded rectangular button with the text 'Sequence Mode' on the top line and 'Setup Start' on the bottom line.

The Sequence Mode menu is the first menu displayed and is the primary menu used in the operation of the tester. This menu allows the user to program a test / sort sequence (**Setup**) and run the sequence programmed (**Start**). A generic testing and sorting sequence has been programmed at the factory and can be run as soon as the Super Sorter is turned on and set up properly. Instruction for using this program and machine setup begins at section 3.3.

Setup

With the Sequence Mode menu displayed, press **[F1]** to select **Setup**.



Timed Delay and **Manual** sequence modes are the two choices for the sorting and testing operation. Use the **[F1]** or **[F2]** to toggle between the selections.

Timed Delay sequence mode allows a specified amount of time from selecting **Start [F2]** to the initiation of the first sequence step. After the last step in the sequence has been performed the Super Sorter will automatically repeat the sequence.

In the **Manual** sequence mode, the operator must press a button to repeat the sequence.

When the desired selection is displayed, press **[OPTION]** to continue to the next **Setup** item. The next setup item will correspond to the sequence mode selected. If **Timed Delay** is selected, the next menu item allows the user to enter the amount of time to delay the first step in the sequence.

```
Seq. Start Delay
nxt  003.0 sec +
```

The amount of time entered represents the delay from the time **Start** is selected and the first step of the sequence programmed is initiated. The values in the underlined fields may be changed using **[F1]** and **[F2]**. **[F1]** moves the cursor to the next field. To back up a field, press **[UNITS]**. Press **[F2]** to increase the value at the flashing cursor. To decrease the value, press **[ZERO LENGTH]**.

Press **[OPTION]** to continue when finished. The following screen appears after the **Sequence Start Delay** time is entered or **Manual** mode is selected from the first menu:

```
Seq. Iterations
nxt  Infinite +
```

```
Seq. Iterations
nxt  000001 +
```

The first display example represents an entry of “000000” for an Infinite number of iterations. Press **[F2]** to access the second screen above. Enter the number of desired iterations or repetitions of the sequence that the Super Sorter should perform. Use **[F1]** and **[F2]** to navigate and enter values as previously described. Press **[OPTION]** to continue. The first screen that follows appears. Press **[F2]** to scroll through each option for a step. Move backwards using **[F1]**.

A single iteration is usually made up of multiple Sequence Steps. For each sequence step, choose one of the available selections shown above. To make a selection scroll to the selection desired and press **[OPTION]**. Once a selection is made, the display advances to the next step:

```
Sequence Step  2
- Output 1 On +
```

Scroll through to the desired operation for the next step and select. Some of the selections require a time value (in seconds) to be entered. Once a sequence of steps has been selected with the last step being “End Sequence” a test sequence is ready to be performed.

In section 3.3.5 – Sequence Setup there are more details about programming a test and sort sequence. In addition, the last section of this manual contains some examples to assist in customizing a sequence for a specific application.

Start

Press **[F2]** to select. The sequence programmed begins immediately and runs until an **End Sequence** step is reached. The sequence repeats automatically if **Timed Delay** mode was selected in the **Setup** menu for the number of iterations entered in the Setup

menu. If Manual mode was selected, the operator must press **[F1]** to start the sequence again. The manual mode is also subject to the number of iterations entered.

3.3.2 Option: Store / EndPrint

Option
Store EndPrint

Store

From this selection, view stored test point data, clear a single test point from memory, or clear all test points from memory. Scroll through test points saved using **[F1]** or **[F2]**. To select a test point as in the first example below, press **[OPTION]**. The display will read like the second example below. Press **[F1]** to clear that test point or press **[OPTION]** again and the third example below will be displayed. Here, press **[F1]** to clear all test points from memory or **[OPTION]** to return to the test point reading. Unless **[F1]** is used to clear any test points, they will be saved.

Option
Store EndPrint

Option
Store EndPrint

Option
Store EndPrint

If **Store** is selected when no data has been stored, the display will read **No information stored**. Press **[SEND]** to return to the previous menu or **[ON / CLEAR]** to return to the main Option menu.

EndPrint

This selection is used with a Super Sorter tester that is equipped with an RS232 port for printing capability. If selected the display will read **Print-out Not in Progress** when not connected to a printer and return to the force measurement display.

3.3.3 Limit Option: On / Off (Optional Feature)

If this display does not appear on the tester, this feature may not have been purchased. Consult LSI if this feature should be enabled.

Limit Option
On Off

Limit Option On

Be sure to select **Manual** or **Peak** mode and the unit of measurement desired before entering the Option menus to set the Limit Option values. Press **[OPTION]** until the **Limit Option** menu is displayed. Turn on the **Limit Option** feature by pressing **[F1]**.

A low limit and a high limit can be set. The low limit input appears first as shown below. The top line of the display indicates the testing mode, **Low** or **High** limit input along with the unit of measurement being used. On the second line the limit value is entered. The first field underlined before the digits is used to input the value as positive (blank) or negative (-). Use **[F2]** to set. Press **[F1]** to advance to the next field and **[UNITS]** to reverse. Change the value of a field using **[F2]** to increase, **[ZERO LENGTH]** to decrease. Press **[OPTION]** to advance the High limit input. When both limit values have been entered, press **[SEND]** to save and return to the **Limit Option** menu and **[OPTION]** to continue. Or press **[ON / CLEAR]** to save and return to the testing display exiting the Option menus.

Manual Mode

Man. Low lb
nxt 010.000 +

Man. High lb
nxt 020.000 +

Peak Mode

Peak Low lb
nxt 0010.00 +

Peak High lb
nxt 0020.00 +

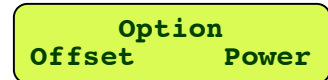
When the Limit Option is on and limits have been set the Low indicator light on the front panel will be on. In addition, the test display will show a star * between the force measurement and the units. The Low, Good, and High indicator lights will work automatically when a test is performed.

Limit Option Off

Turn off the limit option by pressing **[F2]** at the Limit Option menu. The Low indicator light will turn off. Limits that have been entered are not lost when the Limit Option is turned off.

Note: The unit of measurement may only be changed when in testing mode; however, the limits previously set will show the unit change but the actual limit set will not reflect conversion to the new unit selection and may need to be changed.

3.3.4 Option: Offset / Power

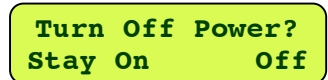


Offset

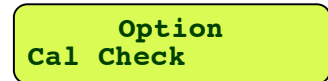
A force offset may be entered using this selection **[F1]**. This means when **[ZERO FORCE]** is pressed, the force displayed will adjust to the offset specified as opposed to zero. When finished, press **[ON / CLEAR]** to accept and exit or **[SEND]** to return to the previous menu.

Power [F2]

This option has only two choices. They are **Stay On [F1]** or **Off [F2]**.

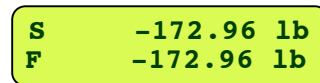
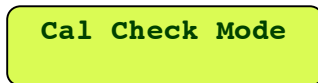
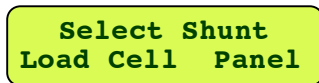


3.3.5 Option: Cal Check



Cal Check

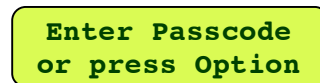
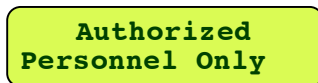
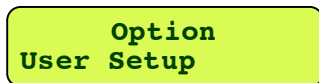
Select **[F1]** to verify calibration of the load cell. This can be done as often as daily or before each use. It is recommended to follow your company policy for determining frequency of calibration verification. When **Cal Check** is selected, the options displayed are **Load Cell** or **Panel**. Press **[F1]** to select **Load Cell**. Two numbers will display following instruction cues. The numbers should be negative and match or be relatively close to each other as shown in the third LED example below. The top number is the shunt calibration reading established at the factory during calibration and recorded in memory. To exit when finished comparing the numbers, press **[ON / CLEAR]**. If the numbers do not closely match, call LSI for assistance.



3.3.6 Option: User Setup

User Setup [F1]

To enter the main **User Setup** menu press **[F1]**. Enter pass code or press **[OPTION]** to continue to the next Option menu. To enter pass code, press **[UNITS]**, **[SEND]**, and **[F1]** in sequence.



There are several submenus for entering printing parameters, time and date, company information, backlight timer preference, direction of testing, etc. Menu items that are not

applicable to the Super Sorter are identified as items not used. Press **[OPTION]** to move to each menu. Brief explanations of the unused items are included but not necessary to the operation of the Super Sorter.

3.3.6.1 User Setup: RS232 / Power RS232

User Setup
RS232 Power

By selecting **RS232 [F1]**, the communication can be set up to send raw data or a report to equipment such as a data logger or printer. The following is a list of data format options to be defined within the RS 232 menu before data can be sent and printed. Next to each item in the first column are the choices available. Use **[F1]** or **[F2]** to select or scroll to the choice desired. Press **[OPTION]** to move to the next item once selection or input has been made.

Output Format:	Report	Data
Print Report:	Yes	No
Print Out Format	Standard	Full Stats
Printer Format:	Print Heading	No Heading
Printer Format:	Print Summary	No Summary
Printer ch, width	80, Single	80, Double
Printer Protocol*	Hardware, None, Delay .01 sec, Delay .025 sec, Delay .05 sec	
Printer Baud Rate*	9600, 19200, 1200, 2400, 4800	
Paper Type	Plain Paper	Roll Feed
Lines per Page	[F1] advance to next digit [F2] increment digit	
Dbl Wdth On / Off	Oki – 1F / 1E, Epson – OE / 14, Other	
Define Dbl Wdth	On Str	Off Str
	[F1] advance to next digit [F2] increment digit	
Define in	Decimal	Hex
	[F1] advance to next digit [F2] increment digit	

*Factory setup for Printer Protocol is Hardware; for Printer Baud Rate, 9600

When finished, press **[SEND]** to accept and return to previous menu.
Or press **[ON / CLEAR]** to accept and exit the Option menus.

Power

User Setup
RS232 Power

Power Time-out
next 00:00 +

Select **Power [F2]** to set or turn off the timer to use the auto shut-off feature. The timer is displayed in HH:MM format and starts each time a button is pressed. When the machine is idle for the time set, it will turn off automatically. To set the timer, move the cursor **[F1]** to the field to be modified (underlined in LED example above). Use **[F2]** to change each value. Enter 99:99 to turn off the Power Time-out feature. When finished, press **[SEND]** to save and return to the previous menu. Press **[OPTION]** to move to the next User Setup menu.

3.3.6.2 User Setup: Dampening / Date and Time

User Setup
Dampening Date

Dampening

Press **[F1]** to choose Dampening. This feature is used to provide varied levels of noise reduction or dampening that may contribute to false readings when testing. Dampening averages the force measurements to eliminate the noise in the display caused by vibration. Because the dampening feature slows the measurement process it is recommended the dampening be set at the minimum level necessary to achieve a stable, readable display. Use **[F1]** or **[F2]** to select between None, Low, Medium, and High. Press **[SEND]** to save and return to the menu where **Date** may be selected.

Date

This menu item may be used if desired on the Super Sorter to indicate the current date and time on the start up LED screen that displays. The Date and Time at the factory location has been preset. Use the following instructions to change if necessary.

User Setup
Dampening Date

Date Format
- MM/DD/YY +

MM:DD:YY
Next 02 01 07 +

Choose **Date [F2]** from the first menu above and the next menu shown will appear. Scroll through the three format choices using **[F1]** or **[F2]**. Press **[Option]** to select when the desired format is displayed. Enter the correct date using **[F1]** to advance cursor to the next digit field and **[F2]** to increase digit value. When finished, press **[OPTION]** to advance to the **Time** setting menu.

Time Format
- 12 Hour a/pm +

Time Format
- 24 Hour +

View the two format choices above using **[F1]** or **[F2]**. Press **[OPTION]** to select the format displayed. Enter the current time in the corresponding screen shown below in the underlined fields. Use **[F1]** to advance to the next digit field and **[F2]** to increase digit value.

HH:MM a/pm
next 12:19 p +

HH:MM
next 12:19 +

Press **[OPTION]** to review the Date and Time entries or **[SEND]** to save and return to the previous menu. Press **[OPTION]** to continue to the next menu item.

3.3.6.3 User Setup: Company / City

Company / City

This menu item may be used if desired to enter your Company (Name) and City (Location). Entering this information allows the Company and City to print out on statistical reports. Press **[OPTION]** to advance to the next menu item.

User Setup
Company City

Company Name 1/4
next _____ +

City Name 1/4
next _____ +

To use this feature: Choose **[F1]** to enter your **Company** name, **[F2]** to enter your **City**. In the corresponding screens above where underlined, enter the first letter or digit in field marked using **[F2]** or **[ZERO LENGTH]**. Advance to next character using **[F1]** or go back a field using **[UNITS]** to edit. There are eight characters on each of four possible screen lines. Advance to the next line if needed using **[OPTION]**. Review the entries using **[OPTION]** or when done press **[SEND]** to save and return to the previous menu. Press **[OPTION]** to continue to the next menu item.

3.3.6.4 User Setup: Backlight / Units

Backlight

User Setup
Backlight Units

Light Time-out
next 00:00 +

Sleeping, press
a key to wake up

Choose **Backlight [F1]** to enter Backlight Time-out setting in HH:MM format. Advance between the digit fields underlined in the example above using **[F1]** and **[UNITS]**. Adjust digit values using **[F2]** and **[ZERO LENGTH]**. When finished, press **[SEND]** to save and return to the previous menu. If tester is idle for the amount of time entered, it will go to sleep. The display will read the third LED example above, except the backlight will be dark. Enter 99:99 to turn off the Backlight Time-out feature, the default setting from the factory.

Units

User Setup
Backlight Units

Choose **Units [F2]** to remove any unit measurements that will not be needed from the **[UNITS]** selection menu. Scroll through unit measurements using **[OPTION]**. Units listed will show as used if included as a menu selection. See first display example below. When removed – **[F1]**, that unit will be listed as not available as in the next display example. If a unit has been removed, it may be added back at any time through this User Setup menu by pressing + **[F2]** when unit needed is displayed. When done, press **[SEND]** to save and return to the previous menu. Press **[OPTION]** to continue to next User Setup menu item.

Units Used
- Use lb +

Units Used
- Don't use lb +

3.3.6.5 User Setup: 1st Peak / Filter (Not Used)

1st Peak (Not Used)

Used on LSI testers which test the calibration of click-type torque tools and provide torque measurements using a load cell. If selected press **[SEND]** to return to the previous menu.

Filter

This feature is set at the factory and should not need any adjustment depending on the testing environment or sensitivity of the load cell.

User Setup
1st Peak Filter

Filtering
- None +

Display Filter
- Yes +

Filtering is the first submenu under **Filter [F2]**. Using **[F1]** or **[F2]** choose between None, Low, Medium, High, User #1, User #2, User #3, or User #4. Once the desired selection is displayed, press **[OPTION]**. Toggle between **Yes** and **No** using **[F1]** or **[F2]** to display filter. Press **[OPTION]** to select. The next four submenus are accessed using the **[OPTION]** key after each. The directions follow along with filtering information.

Dampening (Kd)	Enter % value using [F1] and [F2]
Dampen Min (M)	Enter % value using [F1] and [F2]
Decay Rate (C)	Enter % value using [F1] and [F2]
Recovery (R)	Enter value using [F1] and [F2]

To review entries made under **Filtering** press **[OPTION]**. Press **[SEND]** to save and return to the previous menu. Press **[OPTION]** to continue to next User Setup menu item.

During normal operation the display shows some number of discrete force values every second. These values can be thought of as the value being displayed and the next value to be displayed. When the two values are subtracted from each other, the result is an error. Filtering works by multiplying this error by a percentage and then adding that partial error to the displayed value and displaying that as the new value. The percentage that the error is multiplied by is **Kd**. **Kd** changes over time. While the force is stable, **Kd** decreases from the **Kd** entered in the User Setup menu to the **Dampen Min (M)** value at a rate defined by the **Decay Rate (C)**. The **Recovery (R)** value is used to increase **Kd** when the force starts to change based on duration and amount of change. The **Kd** value will be shown as it changes over time when **Display Filter** is chosen.

3.3.6.6 User Setup: + / - Rule

+ / - Rule

If only performing tests in compression and positive readings are displayed, this setting will not need to be changed. This item is only used to allow the tester to give correct measurement (positive or negative) when test is performed in an opposite direction. For clockwise or counter clockwise testing on torsion testers; compression or tension testing on force testers.

User Setup
+/- Rule

+/- Force Rule
- Compress Pos +

+/- Length Rule
- Up Positive +

Choose +/- Rule using [F1]. Go to +/- Force Rule using [OPTION]. (Length Rule not active on this model.) Select Compress Pos using [F1] or [F2]. To change for Tension press [OPTION] and select Tension Pos using [F1] or [F2]. This setting corresponds to the direction the part is being tested and displays the readings taken in the direction selected as positive numbers. When done press [SEND] to return to the previous menu. Press [SEND] again to return to the User Setup main menu.

User Setup: I / O Polarity

I / O Polarity (Input / Output)

This menu feature is not commonly used. Users that would benefit from using this feature should contact LSI for further instruction.

User Setup
I/O Polarity

Input 2 Pol.
> LLLLXXXXXXXXX +

Output 6 Pol.
> XXXXLLLLLLLL +

The I / O Polarity menu accesses a setup feature for users who need to use the external inputs and outputs on the tester with certain auxiliary equipment. To select, press [F1] and the second display example shown above appears. Press [F1] to advance through the "L" fields underlined. Press [F2] to change any "L" to "H". These 4 fields represent polarities of Inputs 2,3,4, and 5, respectively, from left to right and define the active voltage level for those polarities as high (H) or low (L). Press [OPTION] to advance to the third display example shown above. This screen operates the same: Press [F1] to advance through the "L" fields underlined and press [F2] to change any "L" to "H". These eight fields represent polarities of Outputs 6, 7, 8, 9, 10, 11, 12 and 13 from left to right. Press [SEND] to save and return to previous menu. The following defines what each input or output field represents:

Inputs

- 2 – Input 1
- 3 – Input 2
- 4 – Input 3
- 5 – Unused

Outputs

- | | |
|-------------------------|------------------------|
| 6 – Sorting Output Low | 10 – Sequence Output 1 |
| 7 – Sorting Output Good | 11 – Sequence Output 2 |
| 8 – Sorting Output High | 12 – Sequence Output 3 |
| 9 – Unused | 13 – Sequence Output 4 |

3.3.6.7 User Setup: Cal. Info

Cal. Info

User Setup
Cal. Info

Use this menu to enter calibration information. This will store the name of the company that performed the last calibration of the tester, the calibrating company's phone number, when calibration was done, and when the tester is due for its next calibration. A new tester will show Larson Systems Inc information.

The display screens below show the 10 data entry screens available for tester calibration information. There are eight fields or characters that may be entered on each screen in the underlined areas as shown. Navigate to each character field by pressing [F1] and backup using [UNITS]. Press [F2] to advance through and make selections from the alphabet in lower case, characters, numerals, spaces, and the alphabet in upper case. To navigate through selections in reverse, press [ZERO LENGTH]. Once finished with a single screen, advance to the next screen by pressing [OPTION]. To go back to a screen, press [MODE].

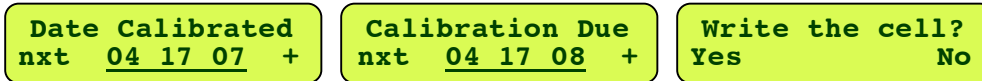
The first four screens are used to enter the name of the calibrating company:



The next four represent the calibrating company's phone number:

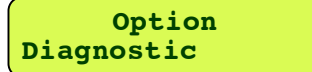


The last two screens are for the date calibrated and the date recalibration is due.



Press [OPTION] to remain in the User Setup menu and scroll through to view or change menu selections. Press [SEND] to display "Write the cell?" Press [F1] to save the calibration information entered and return to the **User Setup: Cal. Info** menu. To exit out of the User Setup menus press [SEND] to return to the **Option: User Setup** menu. Press [OPTION] to continue to the next Option menu.

3.3.7 Option: Diagnostic



Diagnostic [F1]

This function allows user to troubleshoot the Super Sorter and assist in diagnosing a problem. Move through each diagnostic category by pressing [OPTION]. Many of the items are not applicable or critical to operating the Super Sorter, unless there is a problem with the display or keypad. **However, section 3.3.7.5 is helpful to adjust the Super Sorter to the necessary stroke for the application being used.**

3.3.7.1 View Batt Volts (Not Used)



This selection is not applicable to the Super Sorter as it is not equipped with a battery – a power cord is included for operation.

3.3.7.2 Keypad Check



Press [F1] to check the keypad. The second screen above will flash and stop at **Press Any Key**. Check the keys by pressing each one and leave [ON / CLEAR] till last to exit. As each key is pressed the display should show its name – if not, the keypad is not functioning properly. After exiting, press [OPTION] to go to next diagnostic menu item.

3.3.7.3 Screen Check

Perf Screen Chck
Now

Press Clear to
Exit Screen Chck

Press **[F1]** to check the LED screen. When a cursor is on a field, the LED cursor will cycle through each of the fields. When satisfied that each field is operating correctly, press **[ON / CLEAR]** to exit, and then **[OPTION]** to go to next diagnostic menu.

3.3.7.4 External Inputs (Not Used)

Does not apply, information only. Press **[OPTION]** to continue.

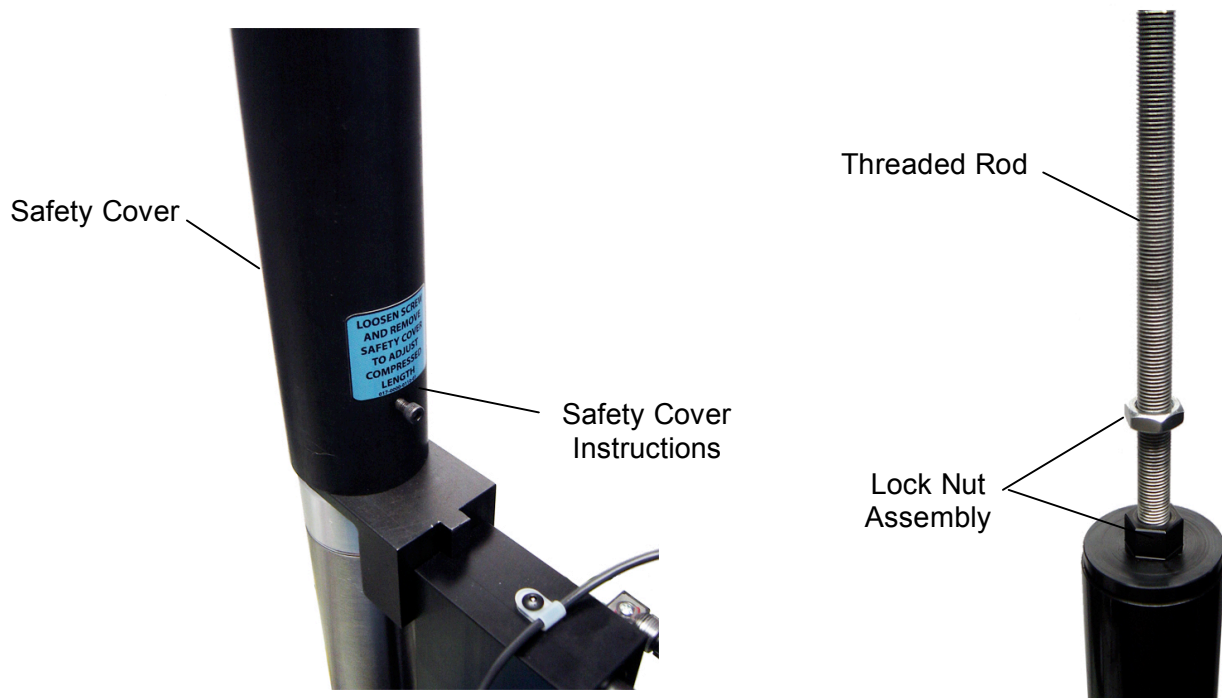
3.3.7.5 Output Diag Test

Output Diag Test
nxt 1 Off tgl

Output Diag Test
nxt 1 On tgl

Press **[F2]** to switch output 1 On. This initiates a full stroke and stops the upper platform at the maximum stroke the machine will allow as set up. The distance from the lower platform to the upper platform in stroke position can be measured at this point. To adjust this distance (if needed), do the following:

1. Turn the Output Off by pressing **[F2]** to release the upper platform.
2. Remove the **Safety Cover** as instructed on the machine exposing the threaded rod and lock nut assembly. (See illustration below)
3. Adjust the lower black nut platform by turning upwards to increase the stroke or downwards to decrease.
4. Recheck by pressing **[F2]** to turn the Output On and take a measurement. Repeat steps 1 through 4 until satisfied with the stroke distance.
5. Leave in Output Off position and tighten silver nut to hold black nut assembly in place.
6. Reinstall and secure the Safety Cover. The Super Sorter should never be operated without the Safety Cover installed and secured.
7. Press **[SEND]** or **[OPTION]** to continue. Or, press **[ON / CLEAR]** to exit to main display.



Note: If **nxt** is selected under **Output Diag Test**, the display shows the same choices for Outputs 2,3, and 4. However, the Super Sorter only uses Output 1.

3.3.7.6 RS232 Protocols

RS232 Protocols
9600, Hardware

Displays fixed protocols set at the factory. No selection needed. Press [OPTION] to continue.

3.3.7.7 RS232 – Report On

RS232-Report On
Heading Summary

No selection needed. Information only. Press [OPTION] to continue.

3.3.7.8 Check RS232 Port

Perf RS232 Check
Now

Trying to send
info with RS232

RS232 Port Sent
info OK

Press [F1] to check the RS232 port connection. If printer is not connected, a loop back device may be attached to perform the check. When the check is performed, “Greetings User” will appear on the display. If connected to a printer and the RS232 port checks out, a printout is generated. “Greetings user. The RS232 port is working OK. Have a nice day”. Press [OPTION] to continue.

3.3.7.9 Display Processor Data

16MHz processor
with 64Kb RAM

No selection needed. Information only. Press [OPTION] to continue.

3.3.7.10 Display Load Cell Data

SMC1 200.01b
- SN 11093-04 +

Using [F1] or [F2] scroll through the 16 possible locations for any Load Cell assigned to the tester and also show the attached cell. When the display shows SMC “X”, it is showing the connected cell’s location in memory. Press [OPTION] to continue.

3.3.7.11 Print Cell Info

Print Cell Info
One All

On the Super Sorter, up to 16 load cells can be assigned to a tester in locations numbered from 1 to 16. Data about each load cell can be printed individually [F1] or collectively [F2]. Press [OPTION] to continue.

3.3.7.12 Print All E2 Mem

Print All E2 Mem
Now

Choose [F1] to print out specifications currently saved in memory from User Setup and Calibration Setup menus. Press [OPTION] to continue. This concludes the Diagnostic menu items.

3.3.8 Option: Calib Menus

Option
Calib menus

Calib Menus (Do Not Use)

LSI testers equipped with a load cell require calibration using this feature and is only accessible by an LSI authorized technician. Accessed by Passcode.

3.3.9 Option: Factory Setup

Factory Setup [F1]

Used only by LSI.

Option
Factory Setup

3.4 Preparation and Setup

3.4.1 Range Adjust

The range of the Super Sorter must be set to accommodate the spring or part being tested. To adjust, carefully loosen the two **Range Adjust Handles** on the back of the column (pictured at right) while holding the upper platform assembly from the front so it does not abruptly fall. Once loosened, position the platform to allow room for the part itself and to easily remove and reset a new part between sequences. Tighten the Range Adjust Handles to secure the upper assembly in place.

3.4.2 Stroke Adjust

This adjustment is done using the **Output Diag Test** menu within the Option menu under Diagnostic. Instructions and illustrations are found in section 3.3.75.

When finished, press **[ON / CLEAR]** to return to the testing display.

3.4.3 Air Pressure

The air pressure may also be adjusted; however, the factory setting is recommended. If adjustment is needed, set at the lowest pressure needed to achieve the desired results. The maximum pressure allowed is 150 PSI.

3.4.4 Setup Manual Sequence

Press **[F1]** to select **Setup**. Switch between **Manual** and **Timed Delay** using **[F1]** or **[F2]**.

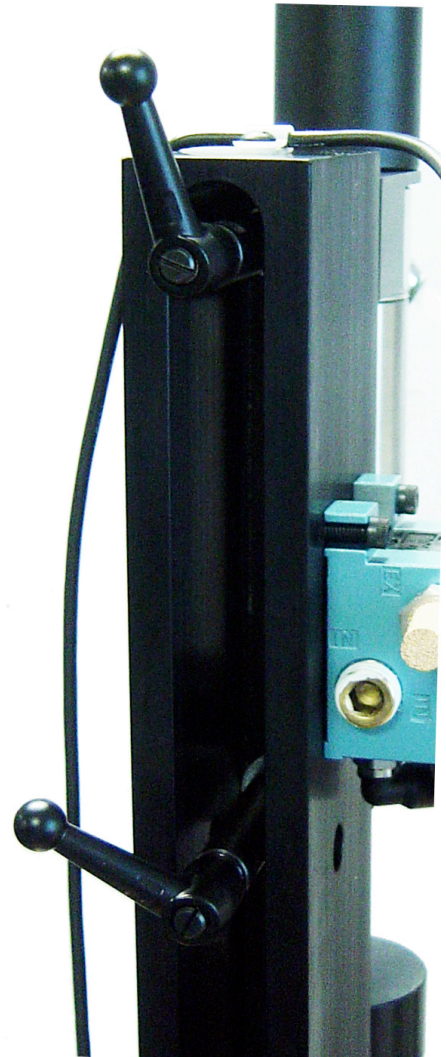
Sequence Start
- Manual +

Sequence Start
- Timed Delay +

To select **Manual**, press **[OPTION]** when displayed and proceed to section 3.3.5 – Sequence Programming. In a **Manual** sequence mode, **[F1]** is used to start each individual sequence.

3.4.5 Setup Automatic Timed Delay Sequence

Press **[F1]** to select **Setup** from the Sequence Mode menu. Switch between **Manual** and **Timed Delay** using **[F1]** or **[F2]**.



To select **Timed Delay** press **[OPTION]** when **Timed Delay** is displayed. The Timed Delay sequence allows the time between iterations (sequence repetitions) to be set. No need to push a start button to run each sequence repeatedly.

```
Seq. Start Delay
nxt  001.0 sec +
```

To select **Timed Delay** press **[OPTION]** when **Timed Delay** is displayed. The Timed Delay sequence allows the time between iterations (sequence repetitions) to be set. No need to push a start button to run each sequence repeatedly.

3.4.6 Sequence Programming

The following should now be displayed:

```
Seq. Iterations
nxt  Infinite +
```

```
Seq. Iterations
nxt  000001 +
```

If a specific number of sequence iterations or repetitions are desired, press **[F2]** to access the second example above. Navigate the fields using **[F1]** or **[UNITS]**. Increase the field value using **[F2]** or use **[ZERO LENGTH]** to decrease. Up to 999999 finite repetitions may be entered. The entry "000000" represents an infinite number of repetitions. Press **[OPTION]** to continue when finished.

```
Sequence Step  1
- Output 1 On  +
```

One iteration, or cycle is made up of multiple Sequence Steps. Each step may be chosen from the following options:

- Output 1 On
- Output 1 Off
- ~~Output 2 On NOT USED~~
- ~~Output 2 Off NOT USED~~
- ~~Output 3 On NOT USED~~
- ~~Output 3 Off NOT USED~~
- ~~Output 4 On NOT USED~~
- ~~Output 4 Off NOT USED~~
- Delay (measured in seconds)
- ~~Perform Send NOT USED~~
- ~~Perform Store NOT USED~~
- Light LEDs (time lights are on measured in seconds)
- End Sequence

These screen selections are identified in detail in section 3.3.1. The following describes the selection of each of the steps that may be used in a sequence setup:

3.5 Operation

Proceed to section 3.5.1 for Manual sequence mode testing operation only. If a Timed Delay sequence mode cycle has been programmed, proceed to section 3.4.2. The sequence mode can easily be changed in Setup as desired without reprogramming.

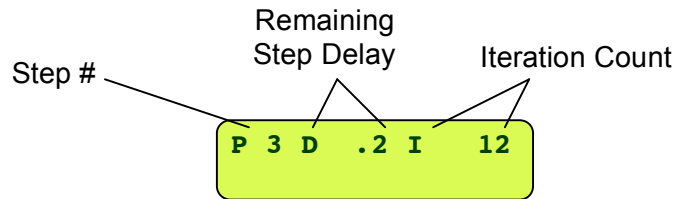
CAUTION: THE UPPER PLATFORM MOVES UP AND DOWN VERY QUICKLY. TAKE CARE TO KEEP HANDS AWAY FROM MOVING PARTS DURING OPERATION.

3.5.1 Manual Sequence

Press **[ON / CLEAR]** to display Super Sorter menu. Select **Start** by pressing **[F2]**. The operator should place the first part to be preset on the center of the lower platform. Any fixtures to make part placement easier should already be installed.

Press **[F1]** to start the first sequence as prompted. When the sequence stops, change out the part and place the next part to be tested on the center of the lower platform. The display again prompts the user to **Hit [F1] To Start**. The sequence runs again. Each time **[F1]** is pressed one iteration is performed. For a set number of iterations the display counts down as each is performed. For an infinite number of iterations the display will count upwards and start over at 999999.

When running a preset sequence this display will very briefly appear:



Actions that stop a sequence in the Manual Sequence mode are:

[ON / CLEAR] – to abort and display the following:
Choose to continue sorting and press **[F1]**.

Hit F1 To Start

[OFF] – turn off the Sorter. Press **[ON / CLEAR]** to turn on again and start over.

Press **ANY OTHER KEY** – to **Pause** the operation. The display to the right appears. Press **[F1]** to **Resume** or **[F2]** to **Stop** the sequence and exit.

Sequence Paused
Resume Stop

3.5.2 Automatic Timed Delay Sequence

Press **[ON / CLEAR]** to display Super Sorter menu. The operator should place the first part to be preset on the center of the lower platform. Any fixtures to make part placement easier should already be installed.

Sequence Mode
Setup Start

Press **[F2]** to select **Start**. The sequence will start and run in an automatic repetition. When each **End Sequence** step is reached, the operator must exchange out the part before the next sequence repetition begins. During **Setup** a delay should be placed before the sequence starts and / or at the back end of the sequence to allow for the exchange time. During the operation the same display shown above in the Manual sequence will indicate the Step #, Remaining Step Delay, and Iteration Count.

Actions that stop a sequence in the Automatic Timed Delay mode are:

[ON / CLEAR] – to abort and display the following:
Select **Setup** or **Start**. Choosing start will begin a new sequence repetition over again.

[OFF] – turn off the Super Sorter. Press [ON / CLEAR] to turn on again and start over.

Press **ANY OTHER KEY** – to **Pause** the operation. The display to the right appears. Press [F1] to **Resume** or [F2] to **Stop** the sequence and exit.

Sequence Paused
Resume Stop

4 EXAMPLES OF SORTING SEQUENCES

The following examples show the display screens to select for each step in a sequence and any resulting delay screens where a time value should be entered. See section 3.3.1 for Setup information that describes the Sequence Step choices and section 3.4.6 – Sequence Programming for more information.

4.1 Single Test Point Manual Sequence

This sequence is setup with no start delay. When the operator starts the testing operation, the sequence runs each time [F1] is pressed. This allows the operator to exchange out and sort a part then set the next part and start the next sequence manually. For a single test point, the machine will perform a single downward movement to compress the part, then release.

Start at the Sequence Mode menu and select Setup [F1].

Sequence Mode
Setup Start

Choose Manual and press [OPTION].

Sequence Start
- Manual +

Press [OPTION] again to select infinite or enter 000000 as the number of iterations.

Seq. Iterations
nxt Infinite +

Next make the following step selections:

Sequence Step 1
- Output 1 On +

Sequence Step 2
- Delay +

Step 2 Delay
nxt 00.4 sec +

Sequence Step 3
- Output 1 Off +

Sequence Step 4
- End sequence +

This is a basic sequence that can be programmed. The only variables that may need adjustment are the Range, Stroke and Air Pressure to run a particular application and achieve the desired results.

4.2 Single Test Point Automatic Timed Delay Sequence

This sequence is setup with a start delay. When the operator starts the testing operation, the sequence automatically runs continuously until stopped or if the user chooses to enter a finite number of repetitions. This operator will need to be aware of the amount of time allowed for part exchange between sequences. In this case it would be three seconds.

Start at the Sequence Mode menu and select **Setup [F1]**.

```
Sequence Mode
Setup          Start
```

Choose **Timed Delay** and press **[OPTION]**.

```
Sequence Start
- Timed Delay +
```

Enter 3 seconds in the **Seq. Start Delay** screen.

```
Seq. Start Delay
nxt 003.0 sec +
```

Press **[OPTION]** to continue.

Press **[OPTION]** to select infinite or enter 000000 as the number of iterations.

```
Seq. Iterations
nxt Infinite +
```

Next, make the following step selections:

```
Sequence Step 1
- Output 1 On +
```

```
Sequence Step 2
- Delay +
```

```
Step 2 Delay
nxt 00.4 sec +
```

```
Sequence Step 3
- Output 1 Off +
```

```
Sequence Step 4
- End sequence +
```

This is a basic sequence that can be programmed. Here, the **Step 2 Delay** may be adjusted for the application as needed or **Delay** added as Step 4, moving **End Sequence** to Step 5. This would be a good thing to do when using a relatively long stroke for presetting. The only other variables that may need adjustment are the Range, Stroke and Air Pressure to run a particular application and achieve the desired results.

5 CARE AND MAINTENANCE

5.1 General

Keep oils and other liquids away from and off of the electronics portion of the tester. If liquid or oil should contact the device wipe it off with a soft cloth or paper towel. Never apply any cleaner or solvent directly to the electronics faceplate; a mild plastic cleaner applied to a wipe may be used. Take measures to protect the Super Sorter from debris or falling objects; the load cell contains sensitive electronics and can be severely damaged by such forces.

5.2 Calibration Verification and Calibration Options

Follow your company policy for frequency of calibration verification, or use the following guidelines to assure the accuracy of the tester. LSI has made the verification of calibration accuracy on its testers easily checked on a daily or more frequent basis, if necessary. It is recommended that the calibration be verified at least daily (when used daily) or before each use. To complete the verification, follow the instructions in section [3.3.5 – Cal Check](#).

5.3 Air Cylinder Lubrication

Check oil reservoir on air cylinder lubricator daily. Fill the reservoir on the left side with Mobil DTE Lite oil as needed. The reservoir should be approximately half full at all times. See section 2.4.2 for more information under Installation and Setup.