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Operating Instructions 3000-Series **Exacta® 2** Digital Torque Wrenches (All Models)



The 3000-Series **Exacta® 2** Digital Torque Wrenches are designed for use in applications where accuracy, control and recording of the torque data are of high importance. They are the electro-mechanical tool portion of an integrated system that includes Exacta Plus software from Sturtevant Richmond.

Safety

- Always wear appropriate safety equipment when using this or any other hand tool.
- Never use the tool for other than its designed purpose.
- Never use the tool outside of its rated capacity.

Batteries and Battery Chargers

These tools were designed to use only and solely NiMH batteries having specific dimensions and operating characteristics. Within NAFTA countries, the only batteries that are to be used with 3000-Series **Exacta® 2** digital torque wrenches are those immediately below.

<u>P/N</u>	<u>Model</u>	<u>Description</u>
21259	Charger & 4 AA	NiMH 4 AA NiMH 2200 mAh batteries & charger, NAFTA only
21258	4 AA NiMH	Batteries 2500 mAh NiMH batteries, spare

Battery Caution!

- Use of any other NiMH batteries may cause inaccurate torque readings.
- Use of any other NiMH batteries may damage the tool and may void the warranty.
- Use of any Alkaline battery **will** damage the tool and **will** void the warranty.

In countries outside of NAFTA, go to the S/R website page given below to select the correct batteries for use with the 3000-Series **Exacta® 2** digital torque wrenches. The same cautions listed above apply to all of the 3000-Series **Exacta® 2** digital torque wrenches, regardless of the country in which the tool is purchased and used. The URL for the needed information is:

<http://www.srtorque.com/batteries.html>

Battery Installation

At the end of the grip is a battery cap that covers the battery compartment inside the grip. To install the batteries:

1. Insure that the correct batteries are those to be used, and that they are completely charged. Follow the instructions that come with the charger to charge the batteries before installing them.
2. The battery cap is screwed into an internal thread inside the grip. Remove the battery cap by unscrewing it from the grip (CCW).
3. The battery compartment will be exposed. There are two labels inside the compartment. Install the batteries in the locations given by the labels and maintaining the battery orientation shown by the labels and in the photo here.
4. Reinstall the battery cap. Tighten the cap only to snug; do not overtighten the cap.



The 3000-Series Exacta® 2 has a Low Battery Indicator on the display. If the battery voltage falls below 4.1 volts, a battery icon will appear in the upper right-hand section of the display, the “BAD” icon will illuminate and “bAtt” will be displayed in the main display. When this occurs it is time to replace the batteries. Wrench will continue to operate until the battery voltage drops below 4.0 volts. At that time the display will show the message “bAtt” and the ability to operate the wrench will be lost. Readings stored prior to that point will remain in memory. The tool will remain inoperable until the batteries have been replaced with charged batteries.

Interchangeable Heads

The 3000-Series **Exacta® 2** digital torque wrenches of 150 foot-pound capacity and below use the S/R dovetail system. The tools are calibrated for use with S/R Interchangeable Heads having a $1 \frac{7}{16}$ ” Common Centerline. Any S/R heads with this centerline length may be used without affecting torque accuracy. If an interchangeable head of a different centerline length is to be used, the tool must be recalibrated with that head (or one of the same centerline length) before the tool is used.

3000-Series **Exacta® 2** digital torque wrenches of 250 foot-pound capacity and above (except 400 ft. lb.) use S/R slide pin ratchets. The ratchets should be disassembled and cleaned periodically. Ratchet renewal kits having the appropriate parts for each ratchet are available.

Power Switch, Serial Port and Cover

On the top of the electronics housing are the power switch and serial port for the tool. These are protected by a rubber that can be lifted to expose them for use. The cover should be closed at all times when access to the serial port and/or power switch is not immediately needed.



The tool power is enabled (power On) by sliding the switch away from the grip as shown here. Power to the tool is disabled (power Off) by sliding the power switch towards the grip.

The serial cable for the wrench connects to the round serial port that is also used to hold the cover in place. The cable should first be connected to the computer (9-pin connector) then to the tool (single-pin connector) when the tool is to communicate with the computer and software.

Display Sections, Contents and Icons

The 3000-Series **Exacta® 2** digital torque wrench uses a backlit liquid crystal Display (LCD) as the primary method of communication with the operator. This display has several sections and icons. Different sections and icons are used to communicate with the operator; the information displayed at different times changes to fit the context of the current operation.

Text Indicators and Triangular Icons

There are four words of text above the LCD. Each of the words: Target, Residual, Peak, and Stored has a triangular icon underneath it along the top of the LCD. The icons are used in conjunction with the values in other areas of the display. Note: The display will vary slightly from the depiction here due to differences in the fonts used.



Target

When the triangular icon beneath this is illuminated, it means that the target value for the torque specification is displayed in the main section of the display. The target value is the midpoint between the minimum and maximum torque specification values.

Residual

When the triangular icon beneath this is illuminated, it means that the Residual mode is the current torque measurement mode.

Peak

When the triangular icon beneath this is illuminated, it means that the Peak mode is the current torque measurement mode.

Record

When the triangular icon beneath this is illuminated, it means that the specific record in the lower right-hand corner of the display is being reviewed and the torque for that record is the torque value currently displayed.

Unit of Measure Indicator

Available units of measure include inch-pounds, foot-pounds and Newton metres. The current unit of measure is displayed to the right of the main section of the display.

Main Section

The main section of the display is used to display a variety of information important to the current functioning of the tool. During normal use, the target torque or the current torque will be displayed, depending upon whether the tool is awaiting use or actually tightening a fastener. The triangular icons and text along the top indicate which value is being displayed.

Definitions

Target

A specific torque value: the midpoint between the minimum and maximum torque specification values for the task.

Peak

Mode of operation capturing the highest torque value in a single loading of the wrench.

<i>Residual</i>	Mode of operation for capturing the torque remaining on a previously-installed fastener. In this mode the tool captures the lowest point between two peaks; the peak torque to begin fastener motion (includes inertia) and the peak torque where force application stopped.
<i>Stored</i>	Mode of operation used to review torque values currently stored on the tool.
<i>Task</i>	A set of from 1 - 50 torque applications grouped together and sharing common unit of measure and torque value specification. Tasks are numbered from “00” to “50”.
<i>Record</i>	A single torque application within a specific Task. Numbered from “00” (see below) to 50.
<i>UOM</i>	Currently active Unit of Measure for torque. IN.LB, FT.LB, Nm
<i>Clear Button</i>	The Clear button is used to clear a reading from the tool and make that Task/Record combination the active combination for the next torque application.
<i>Select Button</i>	Used to enter, select, and exit various options on the tool itself.
<i>Up Button</i>	Used to move (increment) upwards among options and increment levels within a selected option.
<i>Down Button</i>	Used to move (increment) downwards among options and increment levels within a selected option.
<i>Task 00</i>	A special task always available, even when specific tasks have been downloaded to the tool. When Task 00 is displayed, the tool functions as a torque wrench with no memory of the torques applied, similar to a beam or dial wrench.
<i>Yellow Light</i>	Color (orange-yellow) projected onto display to indicate that the warning torque level has been reached during use and that the speed of force application should be slowed. Warns user that the torque specification is being approached. Used in all Tasks numbered 01 and above when record 01 and above are active. Not available in “Task 00”.
<i>Green Light</i>	Color projected onto display to indicate that the current torque is within the limits of the minimum and maximum torque specified for that Task. Active in all Tasks numbered greater than “00” when the Record is not “00”. Not available in “Task 00”.
<i>Red Light</i>	Color projected onto display to indicate that the current torque exceeds the maximum torque specified for that Task. Active in all Tasks numbered greater than “00” when the Record is not “00”. Not available in “Task 00”.
<i>OK/BAD Icons</i>	Evaluative icons (attribute data) used in Tasks in Peak and Residual Modes. Active in all Tasks numbered greater than “00” when the Record is not “00”. Not available in “Task 00”.

Onboard Navigation Among Tasks and Records

The Select, Up, and Down buttons are used to navigate among the tasks and records present among the tool, and also to access and leave the special “00” record in which the tool measures torque but does not record the readings.

The operation of the Select button varies according to the current tool status. When the tool is first turned on, and there is no job on the tool (no tasks, no records), the tool is in the “00” record and the Select button performs no function.

Display

Exacta® Plus uses a liquid crystal display and a buzzer to communicate. The display content is grouped into four categories: items displayed during startup when the power is turned on, items displayed during PC communications, items displayed during normal operation, and items displayed when results are being reviewed.

Items Displayed During Startup

1. The tool series number "3000" will be displayed in the center, and "r00N" in the Task and Record markings will be displayed for 1 - 2 seconds. N is the firmware revision number.
2. The tool capacity will be displayed in the center for 1 - 2 seconds.
3. Upon completion of the startup routine, what is displayed is dependent upon whether or not there are tasks in the memory of the tool

If no Tasks are in memory, the following will appear on the display:

Indicator for the Peak mode will be lit.

Indicator for Target will be lit.

IN.LB Unit Of Measure will be lit.

-000.0 will be displayed as the current torque value.

00 will be displayed for the Task number.

00 will be displayed for the Record number.

If one or more Tasks are in tool memory, the following will appear on the display:

Indicator for the active mode will be lit.

The indicator for the active Unit Of Measure will be lit.

The Target torque will be the displayed torque value.

The number of tasks in memory will be displayed in the Task section.

The active task and record at startup are the last task and record worked on when there are tasks in the tool memory. With no tasks in memory, the active task is "00" and active record is "00".

Tool Use Without Job Download

The 3000-Series tools can be used to a limited extent without downloading a job. The tools have default factory settings of inch-pounds as the unit of measure, Peak as the mode of operation, and no data capture in memory. When no job has been downloaded, these default instructions are active.

The tool can be used to measure torque in inch-pounds, to observe the torque during the application, and to briefly (2-3 seconds) display the peak torque once it has been achieved. The data for the use will not be stored in memory and available for later use.

Connecting the Tool to a Computer and Using Exacta Plus Software

Use the supplied serial cable to connect the tool to the computer that has the Exacta Plus software installed.

1. Ensure that the computer has the power enabled and is operating.
2. Connect the 9-pin end of the supplied serial cable to the serial port of the computer.*
3. Ensure that power to the tool is disabled (Power Switch in Off position).
4. Connect the single-pin end of the cable to the serial port on the tool.
5. Enable power on the tool.
6. Start the Exacta Plus software.**

* If the computer has a USB port but does not have a 9-pin serial port then a powered USB to RS-232 converter will be needed. S/R offers one as P/N 10456.

** The Exacta Plus software may be started before this step if desired. There is no need to close the software before connecting the tool if the software is running on the computer.

When the tool is connected to the computer and the Exacta Plus software is being used to communicate with it, avoid touching the buttons on the tool and do not disable the power. Allow the software to perform the communications and complete them before taking further action with the tool.

The software will perform all of the functions required to assure communication with the tool as long as the tool is properly connected, the power is enabled, and the correct communication settings for the

computer and software have been selected and are used. If there is a communication problem check the communication setting first; instructions for this are provided with the software. If there are still problems, it is likely that the connectors on the cable are not properly seated at one end or the other. Check the cable connections to determine which is incorrect or incomplete and correct the problem with the connection.

During the download the display will update as each task is downloaded. The displayed values will include the mode of operation, unit of measure and target (midpoint between minimum and maximum specifications) as the task is received and stored. When the download is complete, the information pertinent to the last task downloaded will be on the display.

Once a job has been downloaded from the software to the tool and the download has been confirmed as successful by the software, close the active communication window(s) on the computer. The tool can now be disconnected from the cable. The same applies when uploading data on a job to the computer.

Normal Operation

When the download was completed, the information on the last task received in the download is on the display. If there is more than one task in the job it is necessary to make the first task to be performed the active task.

- To navigate to the desired task, press the Select button one time. The word “SEt” will appear in the main section of the display. The task number of the last task downloaded will be in the Task section display.
- Use the down arrow to scroll through the task numbers until the desired task number appears.
- Press the SEt button a second time to make that the active task. The display will show the unit of measure, mode and target value for this task.
- The record number will be “00”. To change the record, press the Up button one time to go to the “01” record. Once this is displayed, the tool can be used and recording will start at the first record.

As you start applying torque to the first fastener, the main section of the display will change from the target torque to the current torque value. When you reach the Warning Torque for the task, an LED will backlight the screen and light the lens with a yellow-orange light to alert you that you are approaching the specified torque. When the minimum torque specification is achieved, the illumination will change from yellow-orange to bright green, and the beeper will emit five rapid pulses.

Stop the force application and remove the tool from the fastener. The torque for that fastener and the task and record number for it will remain on the screen for three seconds. The tool will then turn off the LED and index to the next fastener in the task (if more than one). This inform/warn/record/inform/index cycle will repeat until all of the fastening records for that task have been obtained.

Once the last fastener in a task has been completed, the information will be displayed normally, then the screen will display “SEt” in the main section.

Use the Up arrow key to go to the next task in the sequence. When the desired task is displayed, press the Select button again to make this the active task. The tool will be in the “00” record; press the Up button to go to the first fastener in the task.

At any time when the tool is not applying torque you can leave the current task and move to a different task by using the Select button. At the new task you can use the tool in the “00” mode or you can select the fastener(s) in the task to be tightened and use the tool normally.

Correcting an Error

If you make an error in a torque application and wish to correct it and the record for that fastener, this can be achieved easily. There is a slightly different method to be used if the torque was too low than if it was too high.

If the torque was too low:

1. Use the Select, Up and Down buttons to navigate to the applicable task and record.
2. When the correct record is displayed, press the Clear button.
3. Use the tool to apply the correct torque. This will store the new data where the old data was. You can then navigate to the next task and record to be worked on.

If the torque was too high:

1. Use the Select, Up and Down buttons to navigate to the "00" record for that task.
2. Loosen the overtorqued item.
3. Use the Select, Up and Down buttons to navigate to the applicable task and record.
4. When the correct record is displayed, press the Clear button.
5. Use the tool to apply the correct torque. This will store the new data where the old data was. You can then navigate to the next task and record to be worked on.

Uploading Data

To upload data, connect the serial cable from the computer to the tool and use the software to perform the upload function. If communication errors are encountered, check the security of the cable connections and the computer communication settings.

Communication Default Settings

The default settings for serial communications are: 9600 Baud, 1 Start Bit, 8 Data Bits, 1 Stop Bit.

Calibration

Calibration must be performed periodically to maintain the accuracy of the tool. Factory calibration, including a calibration certificate from our ISO/IEC 17025 Accredited Calibration Laboratory is available.

Parts and Repair

Original parts and factory repair services are available when needed. Simply contact us using the information on the first page of this document.