

HYTORC

The World's Most Trusted Industrial Bolting Systems



LION GUN® Electric Torque Tool Electric

Operations Manual

Firmware Version: 1.23

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Mahwah, NJ 07430
USA

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This manual applies to all tool part numbers in the LION Product Families. The complete part number matrix which applies to this manual can be found in Appendix A and B respectively. It is recommended the manual is kept up-to-date by checking the edition and date code at the bottom of this page by utilizing the HYTORC website and downloading a copy of the most recent edition as needed.

LION GUN PRODUCT FAMILY:

LION-.25, LION-.7

EN, EN-ISO, ISO Standards:

EN ISO 12100-1:2011	EN 982:2009
EN ISO 12100-2:2011	EN 61310-2:2008
EN ISO 14121-1:2007	EN 61310-3:2008
EN ISO 11148-6:2012	ISO 3744:2011

For a complete EC declaration of conformity or if you require any further assistance please contact your local HYTORC representative or 1-800-FOR-HYTORC (1-800-367-4986) or on the web at www.hytorc.com.

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Product Modifications: *HYTORC Corporation DOES NOT ALLOW any of the products listed in this manual to be modified by any end user without exception. Should an application require a modification to the tool, or any of the standard accessories please consult with your local HYTORC representative and they will be able to obtain the assistance for any modification that may be required.*

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LION

LIMITED WARRANTY

This limited warranty gives you specific legal rights and you may also have other rights, which vary from state to state. The limited warranty can also be found online at www.hytorc.com and in the documentation we provide with the product. We warrant that during the warranty period, the product will be free from defects in material and workmanship. We expressly disclaim any and all implied warranties, including without limitation the warranties of merchantability and fitness for a particular purpose to the duration of this express limited warranty. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Our responsibility for defective goods is limited to repair or replacement as described below in this warranty statement.

Who may use this warranty? The HYTORC Industrial Bolting Company located at 333 State Rt. 17, Mahwah NJ 07430 extends this limited warranty only to the individual who originally purchased the product (“you”). It does not extend to any subsequent owner or other transferee of the product.

What does this warranty cover? This limited warranty covers defects in materials and workmanship of the LION Gun (the “product”) for the Warranty Period as defined below.

What does this warranty not cover? This limited warranty does not cover any damage due to: (a) transportation; (b) storage; (c) improper use; (d) failure to follow the product instructions or to perform any preventive maintenance; (e) modifications; (f) unauthorized repair; (g) normal wear and tear; or (h) external causes such as accidents, abuse, or other actions or events beyond our reasonable control.

What is the period of coverage? This limited warranty starts on the date of your purchase and lasts for one (1) year (the “Warranty Period”). The Warranty Period is not extended if we repair or replace the product. We may change the availability of this limited warranty at our discretion, but any changes will not be retroactive.

What are your remedies under this warranty? With respect to any defective product during the Warranty Period, we will repair or replace such product or the defective part free of charge. We will also pay for shipping and handling fees to return the repaired or replacement product to you, if we elect to repair or replace the defective product.

How do you Obtain warranty service? To obtain warranty service, you must call 800-FOR-HYTORC or email our Customer Service Department at info@hytorc.com during the Warranty Period to obtain a Defective Merchandise Authorization (“DMA”) number. No warranty service will be provided without a DMA number.

Limitation of liability. The remedies described above are your sole and exclusive remedies and our entire liability for any breach of this limited warranty. Our liability shall under no circumstances exceed the actual amount paid by you for the defective product, nor shall we under any circumstances be liable for any consequential, incidental, special or punitive damages or losses, whether direct or indirect. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusion may not apply to you.

IMPORTANT SAFETY INFORMATION

Read and understand this material before operating or servicing this equipment. Failure to understand how to safely operate this tool could result in an accident causing serious injury or death.

- Inspect all LION Gun components as they are removed from the shipping container. If damage is found to any component, contact the shipper immediately. Do not use the tool.
- Failure to follow correct tool usage could result in personal injury, co-worker injury, and/or damaged tools and equipment.
- Ensure your working area is clean and unobstructed before beginning work.
- LION maintenance and repair must be performed by a qualified technician.
- Modifying a LION Gun or accessory is dangerous and invalidates the warranty.
- Inspect the tool before each use. Have any obviously worn or damaged parts replaced.
- When not in use, store the LION Gun and accessories in the plastic storage case supplied with the tool. Do not expose the gun to high humidity or large temperature variations.

Personal Protective Equipment

- Always wear the appropriate personal protective equipment when operating a LION Gun including gloves, safety goggles, hearing protection, hard hat, and safety shoes.



LION Gun Safety Warnings:

WARNING Read all safety warnings and all instruction. Failure to follow the warnings and instructions may result in electric shock, fire, and/or serious injury.

Save all warnings and instructions for future reference.

1) Work Area Safety

- **Keep work area clean and well lit.** Cluttered or dark areas invite accidents.
- **Do not operate the LION Gun in explosive atmospheres, such as in the presence of flammable liquids, gases or dusts.** The LION Gun can create sparks which may ignite the dusts or fumes.
- **Keep children and bystanders away while operating the LION Gun.** Distractions can cause you to lose control.

2) Personal Safety

- **Stay alert, watch what you are doing and use common sense when operating the LION Gun. Do not use the LION Gun while you are tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating the LION Gun may result in serious personal injury.
- **Use personal protective equipment. Always wear eye protection.** Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.
- **Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and or battery pack, picking up or carrying the tool.** Carrying the LION Gun with your finger on the switch or energizing power tools that have the switch on invites accidents.
- **Remove any adjusting key or wrench before turning the LION Gun on.** A wrench or a key left attached to a rotating part of the LION Gun may result in personal injury.
- **Do not overreach. Keep proper footing and balance at all times.** This enables better control of the LION Gun in unexpected situations.
- **Dress properly. Do not wear loose clothing or jewelry. Keep your hair, clothing and gloves away from the moving parts.** Loose clothes, jewelry or long hair can be caught in moving parts.
- **If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used.** Use of dust collection can reduce dust-related hazards.

3) LION Gun use and care

- **Do not force the LION Gun. Use the correct LION Gun for your application.** The correct LION Gun will do the job better and at a safe rate for which it is designed.
- **Do not use the LION Gun if the switch does not turn it on and off.** Any LION Gun that cannot be controlled with the switch is dangerous and must be repaired.
- **Disconnect the plug from the power source and/or the battery pack from the LION Gun before making any adjustments, changing accessories, or storing LION Gun.** Such preventive safety measures reduce the risk of starting the LION Gun accidentally.

- **Store idle LION Guns out of the reach of children and do not allow persons unfamiliar with the LION Gun or these instructions to operate the LION Gun.** LION Guns are dangerous in the hands of untrained users.
- **Maintain LION Guns. Check the misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power of tool's operation. If damaged, have the LION Gun repaired before use.** Many accidents are caused by poorly maintained LION Gun.
- **Use the LION Gun and accessories in accordance with these instructions, taking into account the working conditions and the work to be performed.** Using the LION Gun for the operations different from those intended could result in a hazardous situation.

4) Service

- **Have your LION Gun serviced by a qualified repair person using identical replacement parts.** This will ensure that the safety of the LION Gun is maintained.

IMPORTANT BATTERY PACK INSTRUCTIONS

- **NEVER** drop the LION Gun battery.
- **NEVER** hit or puncture the battery.
- **DO NOT** splash or immerse in water or other liquids.
- **The LION Gun battery should be stored at 30 degrees or cooler. Batteries can only be used from -20C to 40C.**
- **Do not incinerate the battery pack even if it is severely damaged or is completely worn out.** The battery pack can explode in a fire. Toxic fumes and materials are created when LION Gun battery packs are burned.
- **Do not charge or use the battery in explosive atmospheres, such as in the presence of flammable liquids, gases or dust.** Inserting or removing the battery from the charger may ignite dust or fumes.
- **If battery contents come into contact with the skin, immediately wash area with mild soap and water.**
- **If battery liquid gets into the eyes, rinse over the open eye for 15 minutes or until irritation ceases. If medical attention is needed, the battery electrolyte is composed of a mixture of liquid organic carbonates and lithium salts.**
- **Contents of opened battery cells may cause respiratory irritation.** Provide fresh air. If symptoms persist, seek medical attention.
- **Recharge the LION Gun only with the charger specified by the manufacturer.** A charger that is suitable for one type of battery pack may create as risk of fire when used with another battery pack.
- **Use the LION Gun only with specifically designated battery packs.** Use of any other battery pack my risk injury and fire.

- **When the battery pack is not in use, keep it away from other metal objects, like paper clips, coins, keys, nails, screws and other small metal objects that can make a connection from one terminal to another.** Shorting the battery terminals together may cause burns or a fire.
- **Under abusive conditions, liquid may be ejected from the battery; avoid contact. If contact accidentally occurs, flush it with water. If liquid contacts eyes, additionally seek medical help.** Liquid ejected from the battery may cause irritation or burns.

Reaction Arm

Use the appropriately sized reaction arm or HYTORC Washer based on your application. The LION Gun is usually supplied with a reaction arm in standard length. However, a custom reaction arm may have been delivered for your special application.



WARNING!

Never modify a Reaction Arm! Changes in the reaction arm may lead to personal injury or damage to the tool.

NOTE:

Reaction modifications result in loss of warranty for the reaction arm and the LION Gun. If you need a custom reaction arm, please consult with your local HYTORC dealer.

Reaction Assembly and Drive

- Please clean the splined surface of the LION Gun before mounting the reaction arm.
- Slide the reaction arm over the square drive with the extension of the arm facing away from the tool.
- Press the lock button on the side of the reaction arm and slide onto the housing spline until it seats against the shoulder, then release the button.



WARNING!

Always attach the reaction arm so that the foot points away from the body of the gun. Incorrect installation of the reaction arm can cause the reaction arm to come into contact with your hand or other body parts causing injury.



Hold the button on the reaction arm while sliding it onto the splined section past the square drive and release the button once the arm is fully seated. Test the connection by attempting to pull the arm off without pushing the release button.



Secure the socket using a locking pin through the square drive and a retaining ring.



Store the reaction arm and LION gun in the tool box supplied after use and during work breaks.

Basic Safety Instructions for Handling

Make sure the reaction arm sits directly in contact with a suitable immovable object before you start to tighten the nut.



- Keep all body parts from the reaction point.
- Make sure the operator is safe and secure in place before starting.
- Make sure the square drive is seated correctly and completely onto the socket.



WARNING!

If the reaction arm is not firmly seated and in direct contact with an immovable object before the fastening process is started, serious injury may occur. Make sure that all body parts and clothing are clear from the reaction area during the bolting process. To eliminate the exposed reaction area please inquire about the HYTORC Washer with your local representative or dealer.



WARNING: Burn hazard. Battery liquid may be flammable if it's exposed to other liquids, air, spark or flame.

- Charge the battery packs only in battery chargers supplied for charging this product.
- DO NOT pack with conductive items.



WARNING: Never attempt to open the battery pack for any reason. If battery pack case is cracked or damaged, do not insert into charger or tool. Do not crush, drop, or damage battery pack. Do not use a battery pack or charger that has received a sharp blow, has been dropped or has been run over or damaged in any way (i.e. pierced with a nail, hit with a hammer, stepped on). Damaged battery packs should be returned to an authorized HYTORC service center for recycling.

WARNING: Fire hazard. Do not store or carry battery so that metal objects can contact exposed battery terminals. For example, do not place battery in aprons, pockets, tool boxes, product kit boxes, drawers with loose nails, screws, keys etc. **Transporting batteries can possibly cause fires if the battery terminals inadvertently come in contact with conductive materials such as keys, coins, hand tools and the like.**

The US Department of Transportation Hazardous Materials Regulations (HMR) actually prohibit transporting batteries in commerce or on airplanes, (i.e. packed in suitcases and carry-on luggage). When transporting individual batteries, make sure that the battery terminals are protected and well insulated from materials that could contact them and cause a short circuit. For any other concerns in regarding the transportation of LION batteries, consult your Transportation Carrier.

THE RBRC™ SEAL

The RBRC™ (Rechargeable Battery Recycling Corporation) Seal on the LION Gun battery (or battery pack) indicates that the costs to recycle the battery (or battery pack) at the end of its useful life have already been paid by HYTORC.

The RBRC™ in cooperation with HYTORC and other battery users, has established programs in the United States to facilitate the collection of spent LION Gun batteries. Help protect our environment and conserve natural resources by returning the spent LION Gun battery to an authorized HYTORC service center for recycling. You may also contact your local recycling center for information on where to drop off the spent battery. RBRC™ is a registered trademark of the Rechargeable Battery Recycling Corporation.

IMPORTANT BATTERY CHARGER SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS: This manual contains important safety instructions for battery chargers:

- Before using charger, read all instructions and cautionary markings on charger, battery pack and product using battery pack.



WARNING: Shock hazard. Do not allow any liquid to get inside charger.

CAUTION: Burn Hazard. To reduce the risk of injury, charge only torque gun batteries. Other types of batteries may burst causing personal injury and damage.

CAUTION: Under certain conditions, with the charger plugged into the power supply, the charger can be shorted by foreign material. Foreign materials of a conductive nature such as, but not limited to, steel wool, aluminium foil, or any buildup of metallic particles should be kept away from charger cavities. Always unplug the charger from the power supply when there is no battery pack in the cavity. Unplug charger before attempting to clean.

- **DO NOT attempt to charge the battery pack with any chargers other than the one in this manual.** The charger and battery pack are specifically designed to work together.
- **These chargers are not intended for any uses other than batteries supplied with LION and Lithium series guns as described in this manual.** Any other uses may result in risk of fire, electric shock or electrocution.
- **Do not expose charger to rain or snow.**
- **To disconnect charger, firmly grasp plug and remove. Do not disconnect the charger by pulling on the cord.**
- **Make sure the cord is located so that it will not be stepped on, tripped over, or otherwise subjected to damage or stress.**

- **Do not use an extension cord unless it is absolutely necessary.**
- **An extension cord must have adequate wire size (AWG) for safety. In general the larger the wire size the greater the capacity of the cable.**
- **Do not block any ventilation slots on charger power supply.**
- **Do not mount charger on wall or permanently fix charger to any surface.** The charger is intended to be used on a flat surface (i.e. table top, bench top).
- **Do not operate charger with damaged cord or plug.** Have any damaged plug or cord replaced immediately.
- **Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way.**
- **Do not disassemble charger; take it to an authorized HYTORC service center when service or repair is required.**
- **This charger is designed to operate on standard household electrical power (100-240 VAC 50/60hz).**

OPERATION

General

Each 18V LION Gun is supplied completely assembled and ready for use. A full kit contains:

- LION Gun
- One 18V LION 4.1Ah Battery Pack
- 18V Battery Charger
- Battery Charger Power Supply
- Reaction Arm



SETUP

Battery Pack Installation and Removal

To install the battery pack into the tool handle, align the base of the tool with the rails in the tool handle and slide the battery pack firmly into the handle until you hear the lock snap in to place.

To remove the battery pack from the tool, press the release button (as shown below) and firmly slide the battery pack out of the tool handle.



Charging Procedure

1. Plug the charger power supply into the charger cradle using the coax barrel.
2. Plug the charger power supply into an appropriate outlet before inserting a battery pack.
3. Insert the battery pack into the charger cradle. The charger is equipped with a two light charge indicator that will be either red or green according to the charged level of the battery pack.

4. The completion of the charge is indicated by a green light which also indicates an idle state. The pack is fully charged and may be used at this time or left on the charger.

LED Indicators:

- | | |
|--------------------|----------------------|
| • No Battery | Solid Green Light |
| • Charging | Blinking Green Light |
| • Fully Charged | Solid Green Light |
| • Short Circuit | Flashing Red Light |
| • Reverse Polarity | Flashing Red Light |
| • Damaged Battery | Flashing Red Light |



1. Basic Function Descriptions

Torque: Allows the operator to enter the target torque that the gun will seek when the trigger is pulled and held.

Angle: If an angle setting is above “0” the gun will add this angle of rotation to a completed torque operation using the maximum output of the unit.

Release Angle: After completing an operation, the gun will automatically run backwards to the specified angle to release windup from reaction torque. This will allow the operator to remove the tool without loosening the fastener.

Torque and Angle Operation Caution: If the additional torque required to rotate the fastener through the selected angle is unknown, the overall torque may exceed the capacity of the tool in which case a failure warning will be displayed: “Motor Stalled at Full Power.”

In order to determine if the tool is capable of meeting a specific Torque and Angle requirement the following is suggested:

Note: This procedure will subject the fastener to max tool output torque. If unsure the fastener can safely handle max torque do not perform this operation.

1. Tighten the fastener to the desired torque in Torque Mode.
2. Mark the position of the fastener.
3. With the tool still in Torque Mode set the tool to max output and measure how far the fastener rotates.
4. If the fastener does not meet the angle requirement (with some margin) the torque to achieve the angle is beyond the tools capacity and a larger tool should be used.

2. Operating the Control Panel

Primary Control Features

- Press any button to power-on tool (the tool automatically turns off after 5 minutes)
- A new tool shows the factory default settings
- A tool that has been used before displays the last settings used on the tool before it was powered off
- Left Button Increases the Torque Value
- Right Button Decreases the Torque Value
- Screen Features: Torque, Angle, Release, Direction, Battery Status, Fastener Type, Data Record Indicator

Navigating The Menus



Shortcuts

- From the Home Screen, press and hold the left and center buttons simultaneously for approximately 3 seconds to display the MAIN menu.
- Press and hold the right and left buttons simultaneously to display the list of job profiles.
- Press and hold the right and center buttons simultaneously for approximately 3 seconds to enter unlock code for system level access.

Set Torque

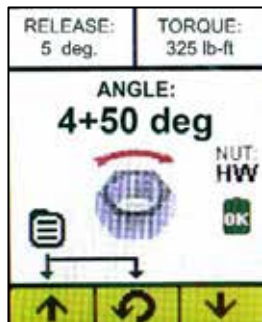


- The Torque Value is set by simply pushing the left button ↑ to increase the torque or by pushing the right button ↓ to decrease the torque.
- Torque may be set to any value from the minimum to the maximum capability of the tool (or MAX MIN Torque Limits set in the ADMIN menu).
- Output units may be displayed in lb-ft, N-m, kgf-m or %.
(Refer to Output Unit Settings under the Operations menu)
- The Torque rotational direction arrow and the rotating nut icon reflect the fastener clockwise or counter clockwise rotation associate with the specific fastener type.
(The fastener type may be set under the Operation – Fastener Type menu: Right-Hand, Left-Hand, HYTORC NUT and HYTORC Washer).

Set Angle and Release

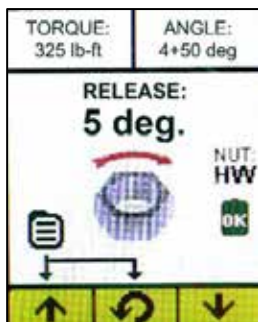


Press and hold center key to toggle through screens for setting Torque, Angle and Release Angle. While on screen, use the up and down arrow keys to select value.



The current Angle setting will be displayed in “TT + DDD” format. Where TT = number of turns and DDD = angle. Value can be increased or decreased using arrow buttons from “0 + 0” to “99 + 359”.

The Angle Value is increased simply by pushing the left button to increase the angle or by pushing the right button to decrease the angle. Press and hold the center button for approximately 3 seconds and release it to access the Release Angle setup screen. The Angle value selected will now be shown in the ANGLE box at the top of the screen.



Press the left button to increase the RELEASE ANGLE and the right button to decrease the release angle value. RELEASE ANGLES may be adjusted based on job conditions anywhere from 0 degrees to 359 degrees. Typical release angles for conventional torque are 3 to 7 degrees and for the HYTORC washer 1-to-3 degrees. Press and hold the center button to return to the home screen. The Release value selected will now be shown in the RELEASE box at the top of the screen.



Torque is preset to 500ft lbs. If desired, press the left button to increase the Torque value and the right button to decrease the Torque value.

NOTES

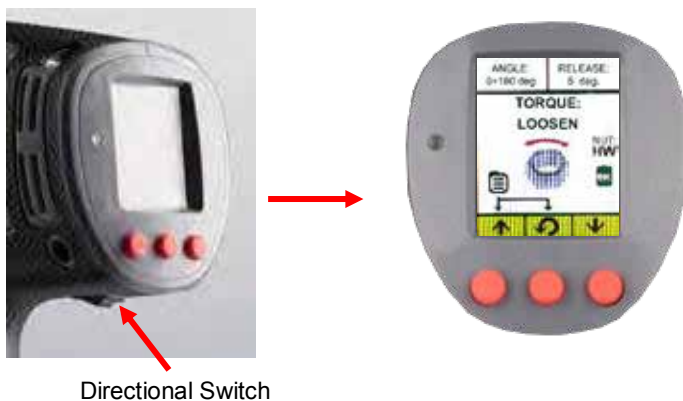
Angle

- Certain bolt tightening specifications may require an Angle Value in-addition to or instead of a Torque Value.
- If an Angle is set, the value will be added to the TORQUE-ANGLE sequence by applying additional torque after the completed torque operation to turn the fastener through the specified angle up to the maximum output of the tool.
- The angle feature is actuated by continuing to hold the trigger after the tool successfully completes the TORQUE.
- If an angle delay has been set using the angle delay option on the operations menu (refer to section 4), the angle force is applied after the specified delay (Range 0-3000msec; Default = 0msec).

Release

- When the tool achieves the TORQUE value (and ANGLE if set) the motor automatically stalls and the gear box continues to exert force (and reaction force) essentially locking the tool onto the nut.
- A Release feature is provided to release the tool from the nut by setting a RELEASE Angle to reverse the motor slightly thus taking the applied force off the gear box and reaction point and releasing the tool from the nut without loosening the nut.
- The RELEASE Angle Setting may vary depending on the application and may need to be developed iteratively by testing the value on the application; the objective is to set the minimum RELEASE angle required to release the tool without applying a force in the opposite direction that would turn or loosen the nut.
- Under certain conditions the operator may need higher RELEASE Angle settings and these should be verified to make sure that the nut is not being loosened by the higher setting.
- The automatic release feature is actuated by continuing to hold the trigger after the tool successfully completes TORQUE (and ANGLE if set).
- During the operation the screen will change to show the release angle and direction, the tool motor will reverse by the desired release angle and then stall again to allow the tool to be removed from the nut
- If a RELEASE angle has been set using the release angle option on the operations menu (refer to section 4), the RELEASE Angle is applied following application of TORQUE (and ANGLE if set) and after an additional time delay set in the Angle Delay menu (Range 0-3000msec; Default = 0msec).

Loosen Mode



Directional Switch

The Lion Gun is equipped with a directional switch at the rear of the gun, under the control panel.

To set the tool to loosen mode, toggle the position of the directional switch. The Home Screen will now display TORQUE: LOOSEN., toggle the directional switch to the loosen mode. If no angle is set, the maximum rated torque will be applied in the loosen direction.

Set Loosen Angle

The Loosen Angle feature allows the user to loosen by number of full turns (expressed as TT with a range of 0-99), and degrees of angle (expressed as DDD with a fastener by some number 0-359).



Use the directional switch to put the tool in Loosen mode. Press and hold the center button for approximately 3 seconds to enter a new Loosen Angle.

The current Loosen Angle setting will be displayed in "TT + DDD" format. Where TT = number of turns and DDD = angle. Value can be increased or decreased using arrow buttons from "0 + 0" to "99 + 359".

Press and hold the center button for approximately 3 seconds and release it to access the Loosen Release screen. A release is required in some applications.



Press the left button to increase the RELEASE ANGLE and the right button to decrease the release angle value. RELEASE ANGLES may be adjusted based on job conditions anywhere from 0 degrees to 999 degrees.

Press and hold the center button for approximately 3 seconds to return to the Loosen Mode screen.

LION GUN OPERATION

Tightening

1. Use the options menu to specify the type of fastener being used.
2. Set the tool to the desired torque level.
3. Set the tool to the desired post-torque angle. (**REMEMBER:** the gun will apply AT LEAST its maximum rated torque while turning the fastener through this requested angle. Accidental application of this post-torque angle feature, or accidental retorquing of a fastener while using angle feature, can lead to damage of the fastener and fastened equipment.)
4. Set the tool to the desired release angle. (**REMEMBER:** the gun will apply AT LEAST its maximum rated torque while turning the system in the “Loosen” direction. Depending on the reaction arrangement of your system, and the requested release angle, this could cause the fastener itself to loosen.)
5. Make sure the LION Gun and fastener equipment are positioned properly.
6. If using a standard RH or LH fastener, make sure the reaction fixture is placed securely (Reaction Arm). If using the HW or HN, reaction arm is not needed.
7. **Safety Feature:** Pull the trigger to start the torqueing operation. If using RH or LH fastener, press any button.
8. The tool will torque the fastener until the requested torque value is reached.
9. If a post-torque angle has been set, the tool will turn the fastener the requested angle after the torqueing operation.
10. If a release angle has been specified the tool will back-off the requested angle at the end of the operation.

Loosening

1. Use the options menu to specify the type of fastener being used.
2. Make sure the LION Gun and fastener equipment are positioned properly.
3. Make sure the reaction fixture is placed securely (Reaction Arm) same as above.
4. Put the tool into loosening mode by pressing the center button. **CAUTION:** the tool will use AT LEAST the maximum rated torque of the tool to loosen the fastener.
5. Pull the trigger to start the loosening operation.
6. Release the trigger to stop loosening the fastener.



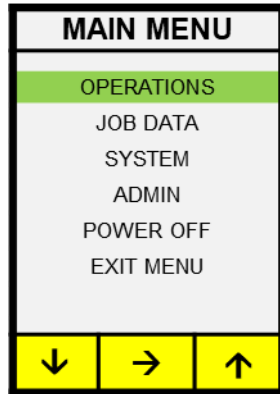
CAUTION

In reverse direction, the gun is set to the MAXIMUM torque setting in order to loosen the nut. Use extreme caution when running in this mode.

3. Main Menu and Sub-Menus

The Main Menu provides Operations, Job Data, System, Admin and the Power Off and EXIT MENU options.

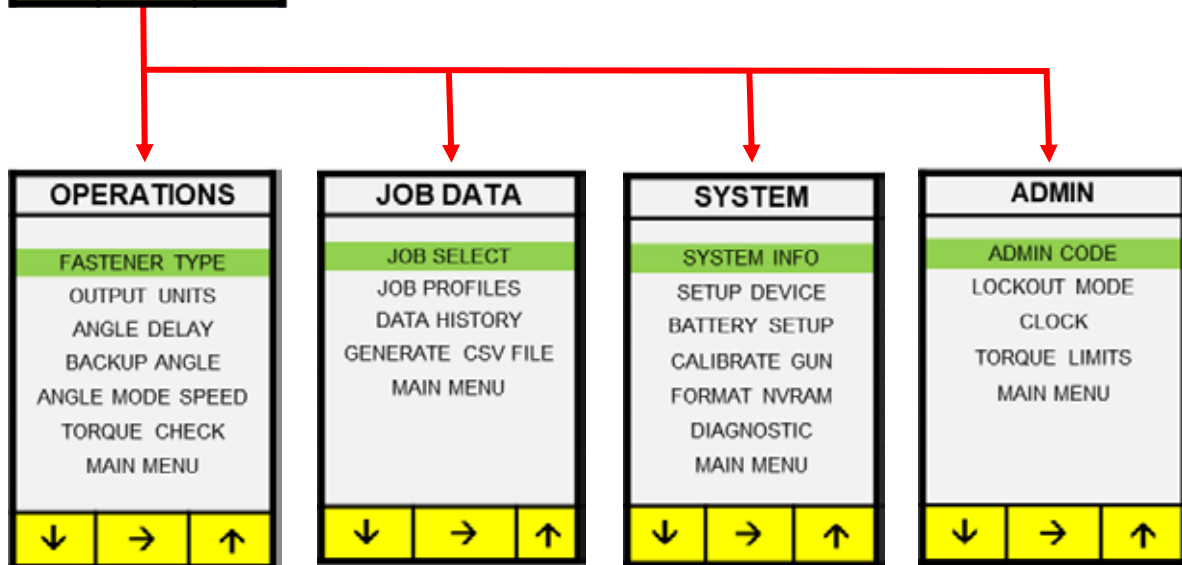
From the Home Screen, Press and hold the left and center buttons simultaneously for approximately 3 seconds to display the MAIN menu



The green bar highlights the current position

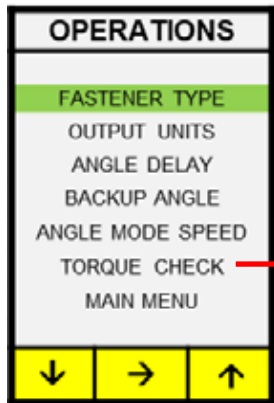
Press left button (↓) to scroll down, right button (↑) to scroll up

Press the center button (→) to select and display a sub-menu



4. Operations Menu

The Operations menu contains most functions for everyday operation.



The green bar highlights the current position

Press left button (↓) to scroll down, right button (↑) to scroll up

Press the center button (→) to select and display a sub-menu

NOTE: NOT AVAILABLE IN THIS MODEL



Press appropriate button ↓↑ to scroll up or down, push → select fastener type:

RH RIGHT HAND bolts tightened clockwise.

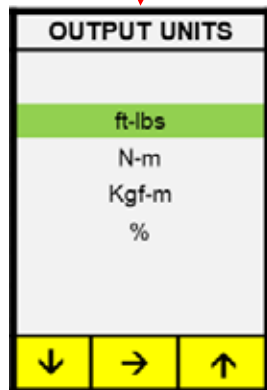
LH LEFT HAND bolts tightened counterclockwise.

HN HYTORC NUT tightened counterclockwise.

HW HYTORC WASHER tightened clockwise.

Any selection → returns user to OPERATIONS menu.

NOTE: When HYTORC WASHER or HN is selected, the safety feature requiring a push of the button before operation is disabled. Tool should never be used with a reaction arm in this setting.



Allows the operator to select the preferred units of the torque display.

Press buttons to scroll ↑ or ↓ to highlight the desired units, press → to select desired units and return to the OPERATIONS menu.

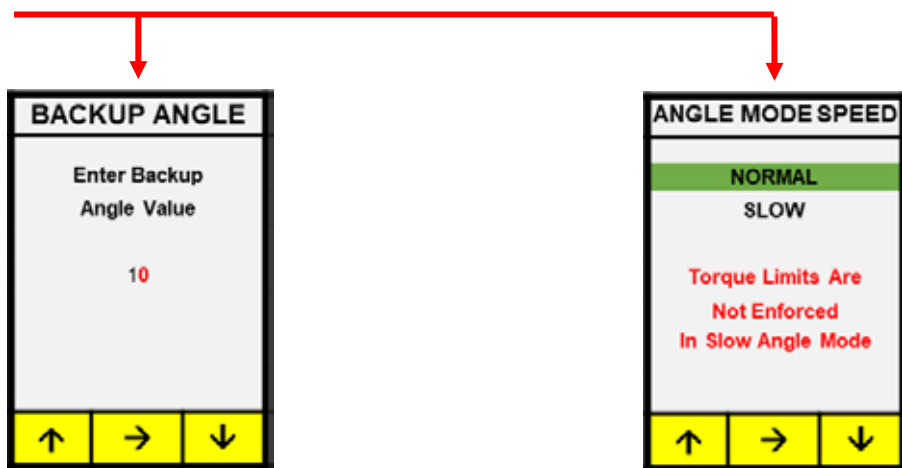


The user can adjust the time delay for applying the ANGLE and RELEASE following the TORQUE operation – the delay can range from 0ms to 3000ms.

The time delay is applied after the TORQUE value by continuing to hold the trigger.

Press up button ↑ to increase the delay or down button ↓ to decrease the delay. Select → to return to the OPERATIONS menu.

Operations Menu (Continued)



The Backup Angle will turn the fastener through a specified angle range (0-10 degrees) in the direction opposite to the current torque direction.

Backup Angle is required in certain bolting applications to avoid a Failure to Reach Torque Speed (FRTS) error. For example, a situation where an operator has already partially tightened a bolt (e.g., after the first pass in ASME 4 pass tightening).

Push up button ↑ to increase the Backup angle or down button ↓ to decrease it. Select → to return to the OPERATIONS menu.

Provides capability to change motor speed during Angle operation.

NORMAL Normal Angle Mode Speed

SLOW Turns the fastener slowly during Angle operation for alignment purposes (e.g. Aligning safety pin holes for aircraft wheels).

Scroll down ↓ or scroll up ↑ to select the Angle Mode Speed and push → to select the desired option and return to the Home Screen.

5. Job Data Menu

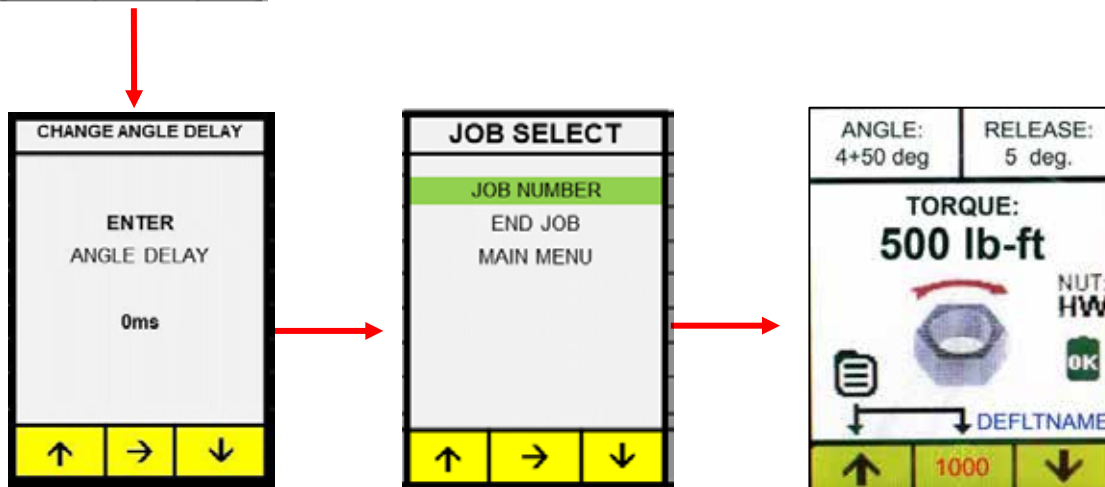
The Job Data menu contains settings needed to record and download data from the tool.



The green bar highlights the current position

Press left button (↓) to scroll down, right button (↑) to scroll up

Press the center button (→) to select and display a sub-menu



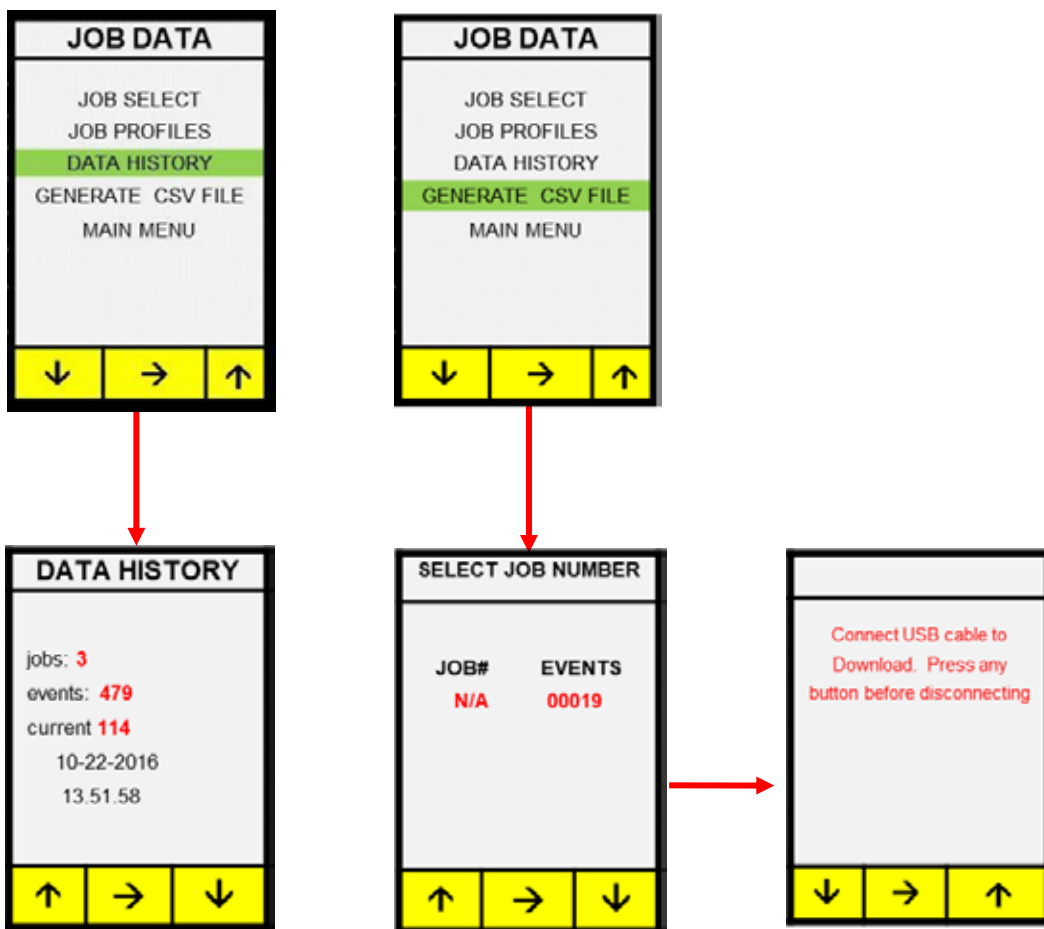
In order to record Job, the user must first enter the 4-digit GENERAL UNLOCK CODE (see Section 7 for description of the tools two access levels- GENERAL and SYSTEM). to unlock the tool. To enter the code press button ↑ to increase the digit or ↓ to decrease the digit, press → to advance to the next digit until the correct code is entered (default 0000). When the correct 4-digit code is entered press → again to proceed to JOB SELECT MODE.

NOTE: Wrong code returns user to previous screen. No limit on number of attempts. See administrator for correct code.

User selects JOB NUMBER to turn on Data Recording for a particular job. After selecting JOB NUMBER the user is prompted for a 4 digit job number to begin recording data.

Alternatively, if there is an active job (e.g. A Job ID has been previously entered) the user may select END JOBS to stop recording.

The user is asked to enter a 4 digit JOB NUMBER (0001 to 9999) for identifying the data record. To enter the job number press ↑ to increase the digit or ↓ to decrease the digit, press → to advance to the next digit until the code is entered. When the 4 digit Job number has been correctly entered, press → to begin DATA RECORDING and return to the JOB DATA menu. The tool is now recording and the JOB ON and JOB NUMBER are now displayed on the home screen to indicate the tool is now recording all job data.



The DATA HISTORY option provides a summary of jobs and events currently being saved in memory.

Press the buttons $\uparrow\downarrow$ to scroll through the job numbers to select the data set you want to download. Press \rightarrow to select the job number and to generate the CSV file.

This screen prompts the user to connect a standard USB cable between the PC (Type A) to the tool (Micro A). The tool is discovered by the PC just as any mass storage device. The PC will display a folder allowing the user to click to open the JOB DAT file in Excel format. This Excel file must then be saved to a folder on the PC to provide a permanent record of your Job Data. The file serves as an electronic record of the JOB DATA. When the file has been saved, press \rightarrow button to exit the GENERATE CSV FILE mode and return to the JOB DATA menu.

Job Profiles Sub-Menu

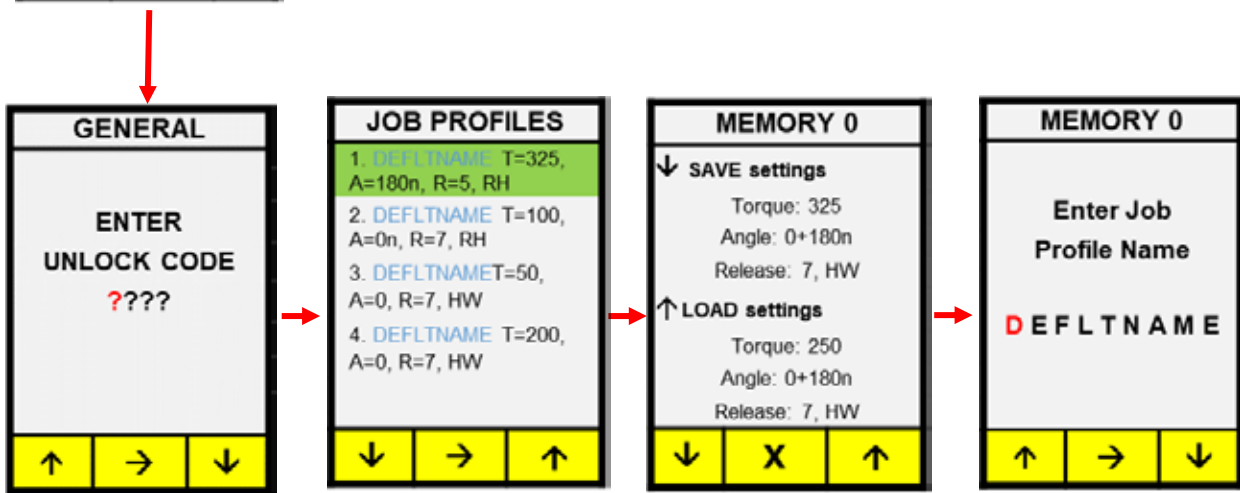
The Job Profiles sub-menu allows access to Job Profile parameters.



The green bar highlights the current position

Press left button (↓) to scroll down, right button (↑) to scroll up

Press the center button (→) to select and display a sub-menu



In order to save or load a job profile the user must first enter the 4-digit code to unlock the tool. To enter the code press button ↑ to increase the digit or ↓ to decrease the digit, press → to advance to the next digit until the correct code is entered (default 0000). When the 4-digit code is entered correctly press → again to JOB DATA.

NOTE: Wrong code returns user to previous screen. No limit on number of attempts. See administrator for correct code.

Allows the user to save tool parameters to memory as a Saved Job Profile (SJP), or to load previously saved parameters (SJPs) from memory. Each profile includes saved values for JOB NAME, TORQUE (T), ANGLE (A) [as total number of degrees], including indicator for NORMAL (n) or SLOW (s) angle mode speed, RELEASE (R) and fastener type.

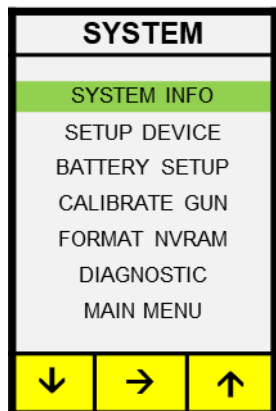
The tool can save up to 8 job profiles; scroll and select the desired setup values – then select →, or if saving new setup values select →, to access submenu to either SAVE or LOAD settings.

The user can SAVE the settings currently on the home display – now shown in SAVE settings - by pushing the left button ↓ also adds the profile to the top of JOB PROFILES. Alternatively the user can LOAD the selected profile – now shown in LOAD settings - by pushing the right button ↑. Exit to JOB DATA without load or save by hitting the center button X.

The user must enter a 9-character alphanumeric Job Profile name. To enter the name, press button ↑ to increase the character or ↓ to decrease the character. Press → to advance to the next character. When the Job Profile name is entered correctly, press → again to return to the JOB DATA menu.

6. System Menu

The System Menu contains additional settings for tool configuration.

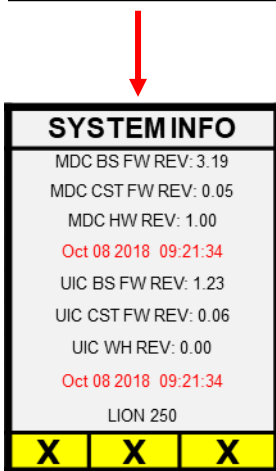


The green bar highlights the current position

Press left button (↓) to scroll down, right button (↑) to scroll up

Press the center button (→) to select and display a sub-menu

NOTE: BATTERY SETUP, CALIBRATE GUN, FORMAT NVRAM and DIAGNOSTIC options are not intended for field use, these are only accessed by HYTORC authorized service personnel.

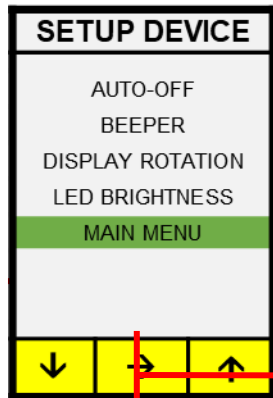


Displays Firmware (FW) and Hardware (HW) versions for MDC (Motor Drive Control) and UIC (User Interface Control) and the tool model.

Press any button to return to SYSTEM menu.

System Menu | Setup Device Sub Menu

The Setup Device Sub-menu contains device-level settings.



The green bar highlights the current position

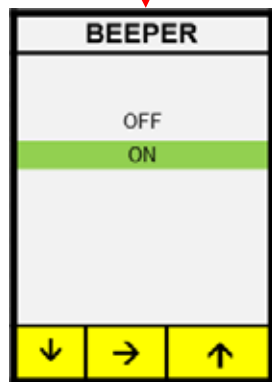
Press left button (↓) to scroll down, right button (↑) to scroll up

Press the center button (→) to select and display a sub-menu



The user can optionally enable or disable AUTO-OFF. If enabled (i.e. set to ON,) AUTO-OFF will power down the tool after 5 minutes of activity. If disabled (i.e. set to OFF,) the tool will remain on until powered off from the Main Menu or until the battery dies.

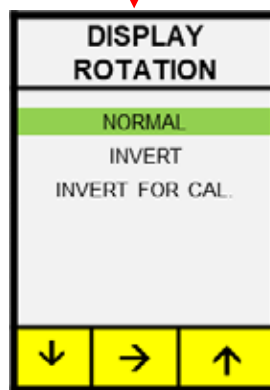
Scroll down ↓ or scroll up ↑ to select AUTO-OFF state and push → to select desired option and return to the SYSTEM menu.



The user can optionally enable or disable the beeper.

Press buttons to scroll ↑ or ↓ to highlight the desired state for the beeper, press → to select beeper OFF or ON and return to the SYSTEM menu.

If enabled, the beeper will sound 1 time for each successful operation and 4 times to indicate an error.



Provides capability to orient the display in normal or inverted mode:
NORMAL Screen is legible when battery is down.
INVERT Screen is legible when battery is up.
INVERT FOR CAL Inverted for calibration

Scroll down ↓ or scroll up ↑ to reach desired orientation for the display and push → to select the orientation and return to the SYSTEM menu.



Provides capability to adjust the brightness of the LED indicator (0 = OFF, 10 = Maximum Brightness)

Press up button ↑ to increase the value, press down button ↓ to decrease the value. Press → to select the current value and return to the SYSTEM menu.

7. Admin Menu

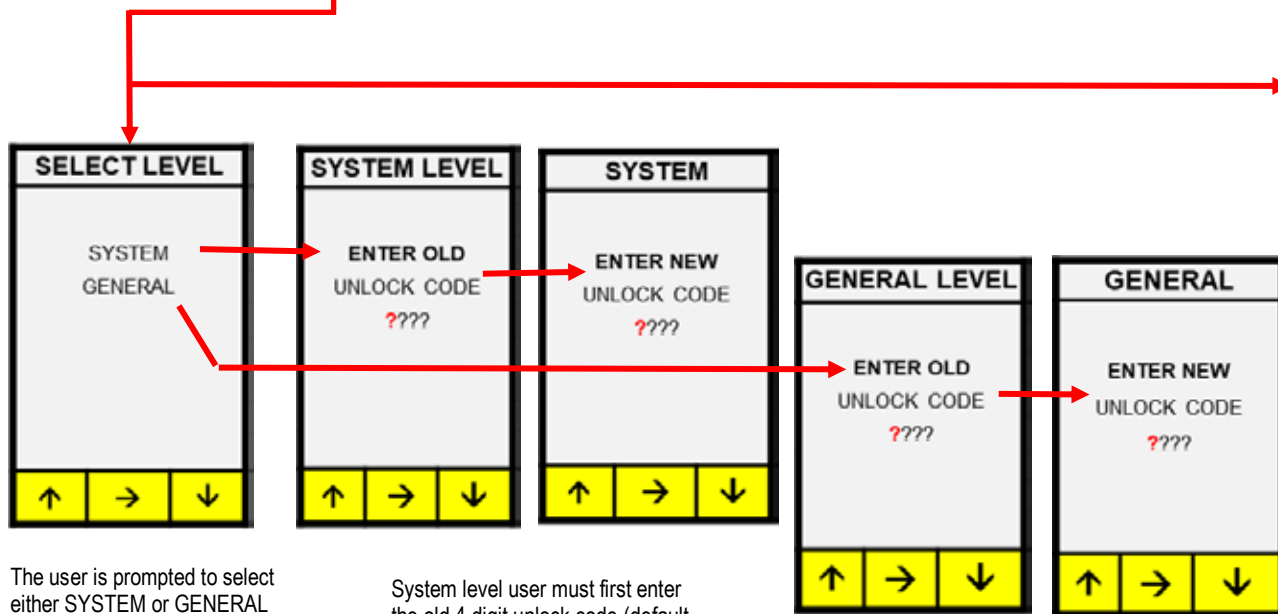
The ADMIN menu contains less seldom used features or those typically only configured by an administrator or supervisor.



The green bar highlights the current position

Press left button (↓) to scroll down, right button (↑) to scroll up

Press the center button (→) to select and display a sub-menu



The user is prompted to select either SYSTEM or GENERAL access level.

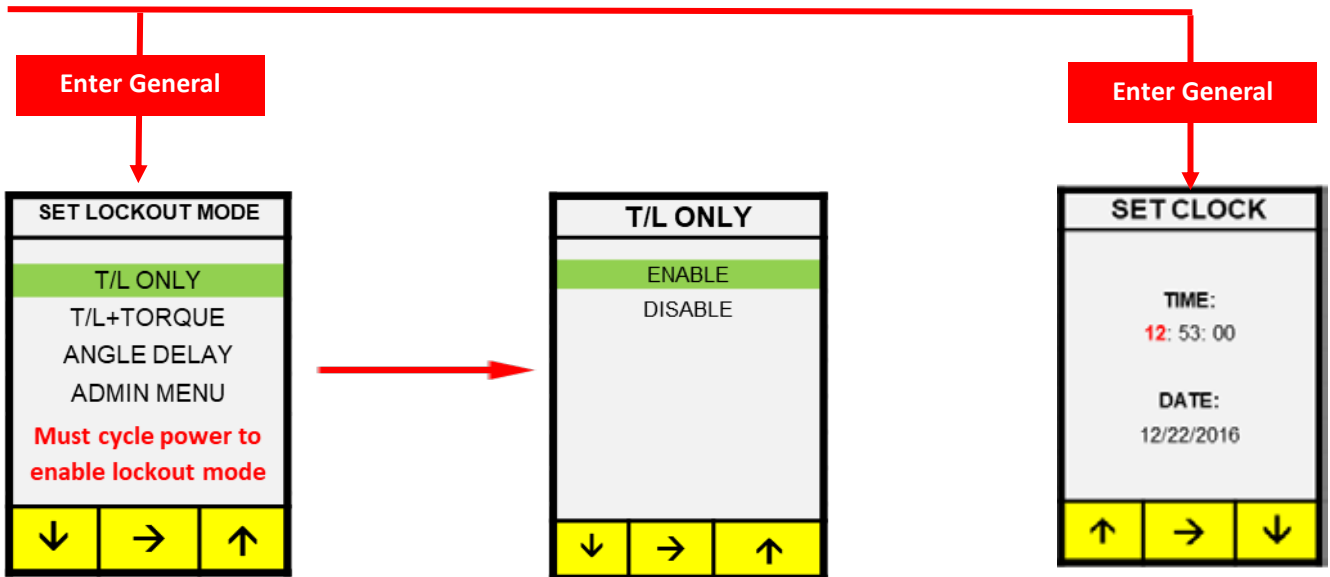
The SYSTEM level is only used by certified HYTORC personnel for calibrating the tool.

The GENERAL level password is assigned by an administrator to provide security for setting torque limits, setting the clock and putting the tool in lockout mode.

System level user must first enter the old 4 digit unlock code (default 0000) for access and then enter a new unlock code for system access.

Note: When System password is entered the General password is cleared to 0000.

General administrator must first enter the old 4 digit unlock code (default 0000) for access and then enter a new unlock code for system level access.



The ADMIN may enable a lockout mode that controls user access to various tool functions:

T/L ONLY Torque/Loosen Only. Users will only be able to tighten and loosen fasteners.

T/L+TORQUE Tighten/Loosen and torque. Users can tighten/loosen and can change torque value.

ANGLE DELAY Angle Only. Users are blocked from changing Angle Delay value. All other functions available.

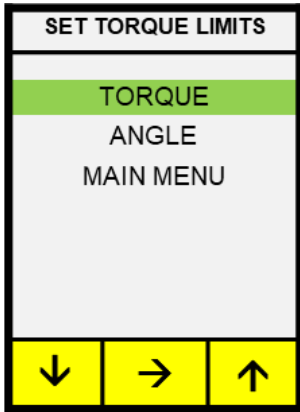
This allows the administrator to lock the tool at desired settings for various users. **NOTE:** The tool must be powered off in order for the settings to take effect.

Scroll down ↓ or scroll up ↑ to select the function to enable or disable lockout mode for and push → to select.

Press the buttons ↑↓ to scroll to ENABLE or DISABLE lockout mode for the selected function and press → to select. The tool will return to the ADMIN menu.

Allows ADMIN to set time and date by entering appropriate numerical values.

Press up button ↑ increases the value and down button ↓ to decrease the value, select → to advance to the next numerical value, after setting year push → to return to ADMIN menu.



The green bar highlights the current position

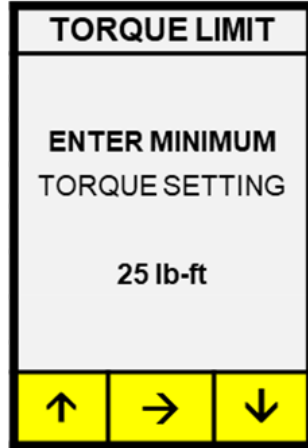
Press left button (↓) to scroll down, right button (↑) to scroll up

Press the center button (→) to select and display a sub-menu

Enter General

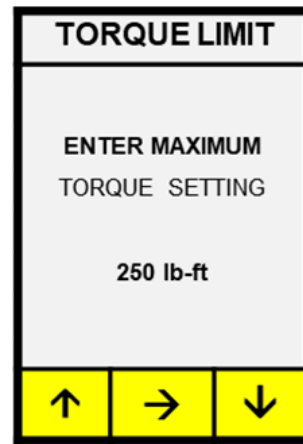


General administrator must first enter the 4 digit unlock code (default 0000) for access.



To adjust the minimum TORQUE limit press button ↑ to increase the value or ↓ to decrease the value.

Press → to save the lower torque limit – screen flashes “Saving setting” and then displays the upper torque limit screen.



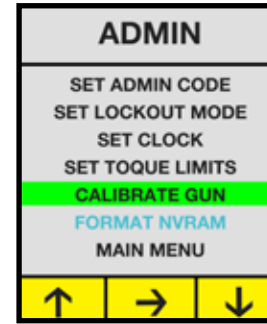
To adjust the maximum TORQUE limit press button ↑ to increase the value or ↓ to decrease the value.

Press → to save the upper torque limit – screen flashes “Saving setting” and then exits to ADMIN menu.

Calibration

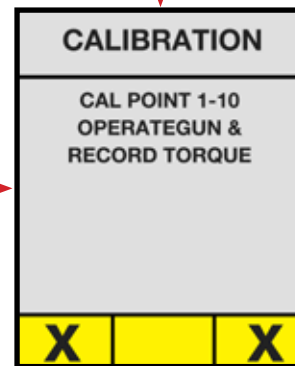
Each Tool is Calibrated with Torque Calibration Equipment in the Factory before shipment.

- Recalibration is recommended at least once a year, or more often for higher use or when changing fastener types.
- Note: Calibration is usually done with the RH fastener selected for consistency.
- Calibration should only be done by qualified personnel according to HYTORC process.



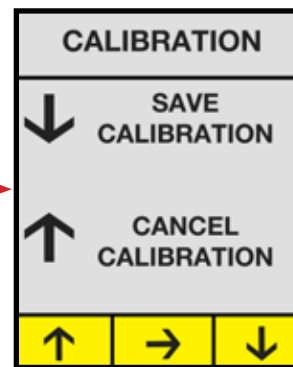
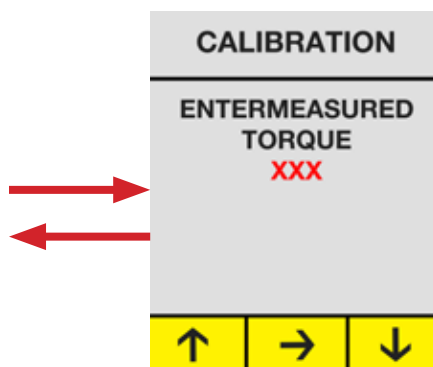
The Calibration menu may be reached by selecting CALIBRATE GUN in the ADMIN menu.

Sub-Menus continued from previous page.



Shortcut: The Calibration menu may also be accessed with a Shortcut. Press and hold Right and Center Buttons approximately 3-seconds and release to display the Calibration Menu. Note if the Unlock code has not been entered yet in the session, the operator will be presented with the ADMIN screen and asked for the unlock code before directing them to the Calibration menu.

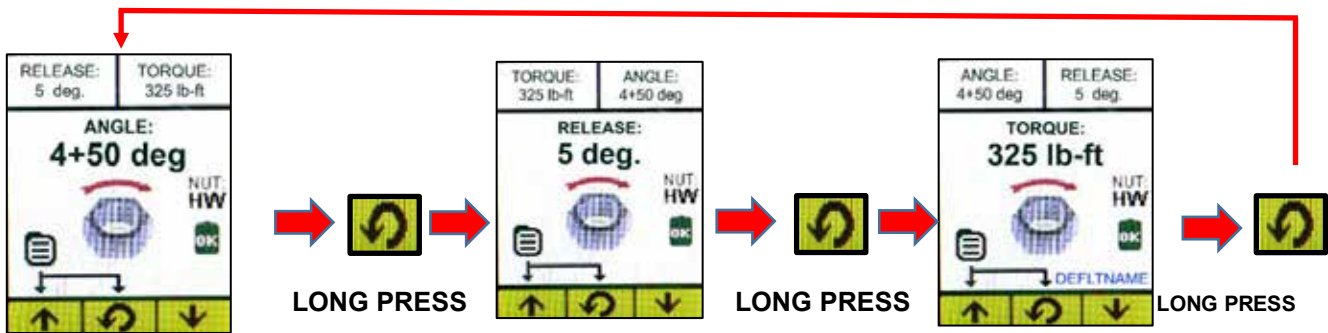
The Tool is installed in the Calibration Equipment which is set at a known torque calibration point. The tool is operated in the calibration fixture until it stalls at the calibration point. When the tool stalls the calibration equipment provides a measured Torque value. The tool displays the next menu prompting the operator to enter the measured value. If the user does not want to calibration press the left or right button X to exit and the Calibration sequence is canceled.



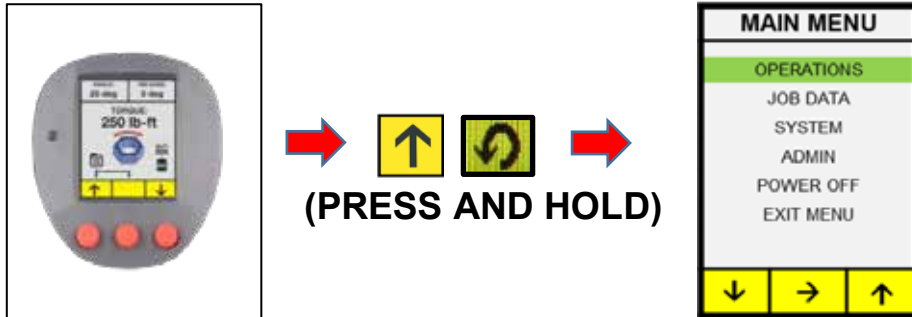
The Torque value measured by the calibration equipment is entered into the tool. To enter the value press left or right $\uparrow\downarrow$ buttons to change the digits in each position to match the measured value, press \rightarrow to advance to the next digit. Press \rightarrow again after the last digit to return to the previous menu and run the tool at the next calibration point in the sequence. This procedure is repeated for all calibration points (typically 1 to 10) allowing the measured value to be entered into the tool at each calibration point.

Following entry of the last (maximum) calibration point a menu appears to allow the calibration values to be saved in the tool. Select SAVE to complete the calibration process or CANCEL to return to the ADMIN menu. Note: Following the calibration process the tool is again tested against known calibration values to ensure accuracy $\pm 5\%$. A calibration sticker is affixed to the tool providing date of calibration and due date for next calibration.

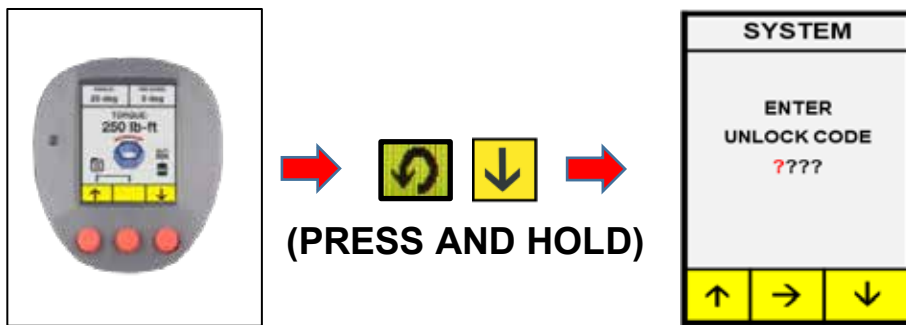
8. SHORTCUTS



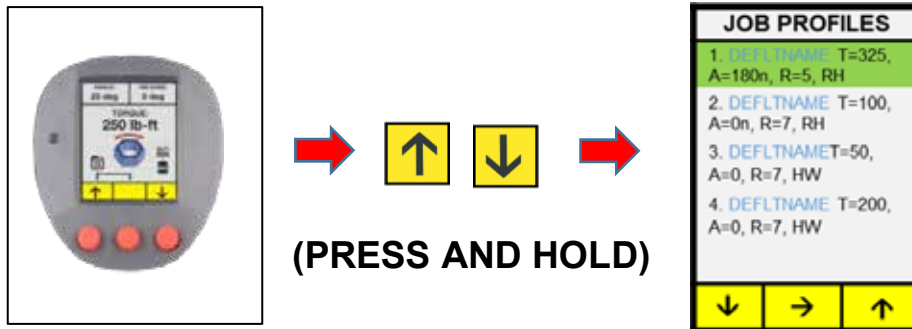
MAIN MENU SHORTCUT



CALIBRATION SHORTCUT



JOB PROFILES SHORTCUT



MAINTENANCE

Preventive Maintenance

Even though the LION Gun can operate virtually maintenance free; good care, proper repairs and preventive maintenance will contribute significantly to longer lasting tool life.

- Sufficient cooling must always be ensured. The cooling vents must be kept clean, free of adhering dirt and dust, and may not be closed for any reason.
- Keep tools clean and protected from damage.
- Have worn or damaged fittings or cords replaced.



WARNING!

During maintenance, the power supply must be disconnected.
Damaged power cables or cords can be hazardous.

CALIBRATION

Calibration should be done by a qualified technician. For standard bolting work, calibration must be done on a soft joint fixture. The LION Gun can collect and average many samples for each calibration point.

1. Enter the desired number of samples to be taken per calibration point by changing the **“CALIBRATION SAMPLES”** value in the options menu.
2. Enter calibration mode through the **OPTIONS** menu or by pressing, and holding, the middle and right buttons simultaneously.
3. Enter the unlock code (default code is “0000”).
4. Enter optional release angle.
5. Calibration routine will now begin: Be aware, the gun will now operate **WITHOUT** prompting the operator to also press one of the back buttons.
 - When “Cal Point X – Y Operate Gun & Record Torque” is displayed: (**Note:** X = the current calibration point, Y = the current sample of the calibration point).
 - Pull and hold the trigger.
 - The gun will torque until it reaches its calibration point.
 - When it stops, enter the final torque using the rear buttons.
 - The gun will now temporarily store this calibration point.
 - Repeat at the gun prompts.
6. When all calibration points are completed, the torque gun will ask if you would like to save or cancel. If you select **“SAVE”**, the temporary calibration data will now be locked into memory.

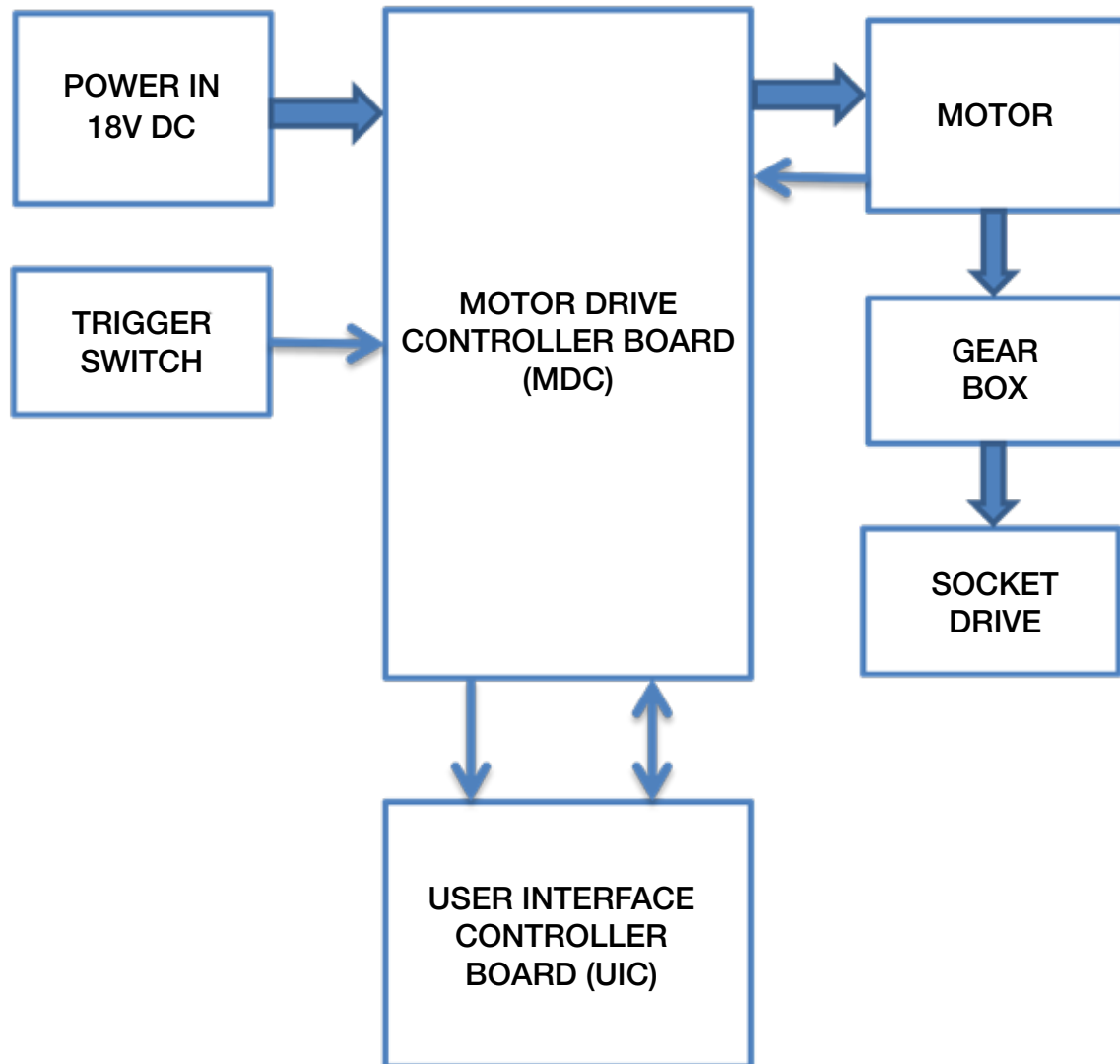
Note: If the first calibration point generated torque values **ABOVE** the minimum rated torque for the tool you are calibrating, the calibration has failed. If by the **LAST** calibration point, the gun failed to generate torque that **EXCEEDS** the maximum rated torque of the gun, the calibration has failed. In either case please contact HYTORC or support.

7. When all calibration points are completed, the torque gun will ask if you would like to save or cancel. If you select **“SAVE”**, the temporary calibration data will now be locked into memory.

APPENDIX A

LION GUN BLOCK DIAGRAM

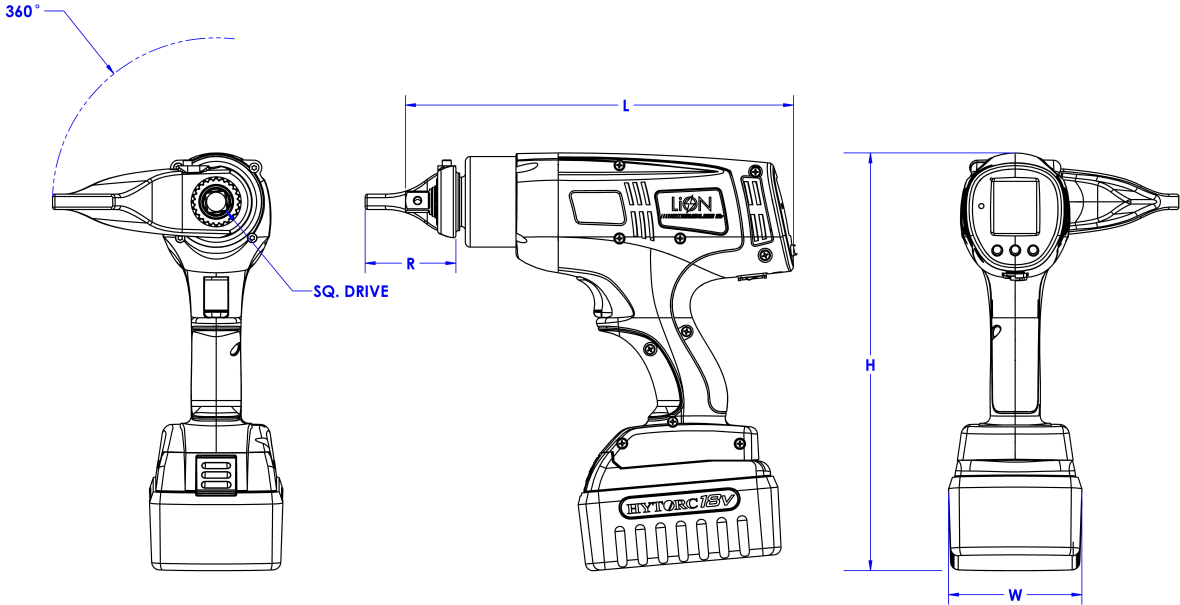
LION Gun 18V Block Diagram



APPENDIX B

LION GUN DIMENSIONS

LION Gun Dimensions



	Torque Range	Drive	H	L	W	R	RPM (No Load)	Final Torque RPM	Weight (With Battery)
Model	Ft. Lbs./Nm		Inches/mm						Lbs./Kg
LION-.25	25-250/47-441	½"	10.83"/275.08	10.16"/258.06	3.46"/87.90	2.45"/64.51	11.60	8.70	7.30/3.31
LION-.7	70-700/95-950	¾"	10.83"/275.08	10.8"/274.32	3.46"/87.90	2.86"/72.64	3.90	2.90	7.81/3.54

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