

# — THE — **TORQUE GUN™** — COMPANY —

## Operations Manual

jGun  
Dual Speed jGun  
FRL Unit  
HYTORC Reaction Washer



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— COMPANY —**



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## Warranty

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The jGun has a one year limited warranty. Every TORCGUN tool is tested before leaving the factory and is warranted to be free from defects in workmanship and materials. TORCGUN will repair or replace, without charge, any tool which upon examination proves to be defective in workmanship or materials for one (1) year after the date of purchase. This warranty does not cover damage from repairs made or attempted by other than TORCGUN authorized repair facilities.

The repair and replacement remedies described herein are exclusive. In no event shall TORCGUN be liable for any incidental, special, or consequential damages, including loss of profits.

This warranty is exclusive and in lieu of all other warranties or conditions, written or oral, expressed or implied for merchantability or fitness for particular use or purpose.

This warranty gives you specific legal rights. You may also have other rights that vary from state to state and province to province. In those states that do not allow the exclusion of implied warranties or limitation of incidental or consequential damages, the above limitations or exclusions may not apply to you.

If you have questions about the  warranty, contact our customer service center at 201-828-5270.

## jGun Overview

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The jGun pneumatic torque wrench is designed to safely and accurately deliver up to 5,200 ft-lbs of torque onto a fastener. This is accomplished using a patented planetary gearbox torque multiplier system and an appropriate reaction arm or HYTORC Reaction Washer™ and HYTORC Nut™. The torque multiplier produces torque ratios of up to 1450:1 while the reaction arm or washer is used to absorb the high counter rotational force produced as the final torque value is reached. At final torque value, the jGun safely stalls out, leaving the fastener tightened to specification.

Unlike impact wrenches, the jGun never transmits working torque to the operator. The torque is applied between the fastener and the reaction surface.

This manual provides information for both the standard jGun and the dual-speed jGun.

## jGun Safety

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Only qualified personnel who have thoroughly read this document may operate this tool. Failure to safely operate this tool may result in serious injury or death.

- Inspect all jGun components as they are removed from the shipping container. If damage is found to any component, contact your 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.
- jGun maintenance and repair must be performed by a qualified pneumatic technician.
- Modifying a jGun or jGun accessory is dangerous and invalidates the warranty.
- Inspect the tool before each use. Replace any obviously worn or damaged parts.
- When not in use, store the jGun and jGun 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 jGun including gloves, safety goggles, hearing protection, hard hat, and safety shoes

### Air Supply Requirements

- The air supply line must be ½-inch minimum diameter to allow adequate air flow to the jGun.
- The air supply must provide a minimum of 90 psi at 30 cfm.
- Ensure that air line fittings are tight and leak free. Do not over tighten air line fittings.

- Always use the Filter Regulator Lubricator (FRL) Unit provided with the jGun. Never use a substitute oiler and regulator.

### NOTE

Set the air pressure at the FRL *while the tool is running* as described in [FRL Setup and Use](#).

- Open the air supply connected to the FRL unit and run the jGun while setting the pressure on the regulator gauge.
- Set the air pressure to the PSI needed to achieve desired torque shown on the provided pressure/torque conversion chart, also shown in [Pressure / Torque Conversion Charts](#).

### Reaction Arm or Washer

- Choose the correct reaction arm for the job. The jGun is shipped with a standard length reaction arm, but your gun may have been ordered with a custom reaction arm for a specific purpose.

Figure 1. Reaction Arm



- The universal HYTORC Washer <sup>TM</sup> may be used for all applications in place of a standard reaction arm.

Figure 2. HYTORC Washer and Socket



- Never modify a reaction arm.

**⚠ CAUTION**

Never modify a reaction arm. Modifying a reaction arm may cause personal injury and tool damage.

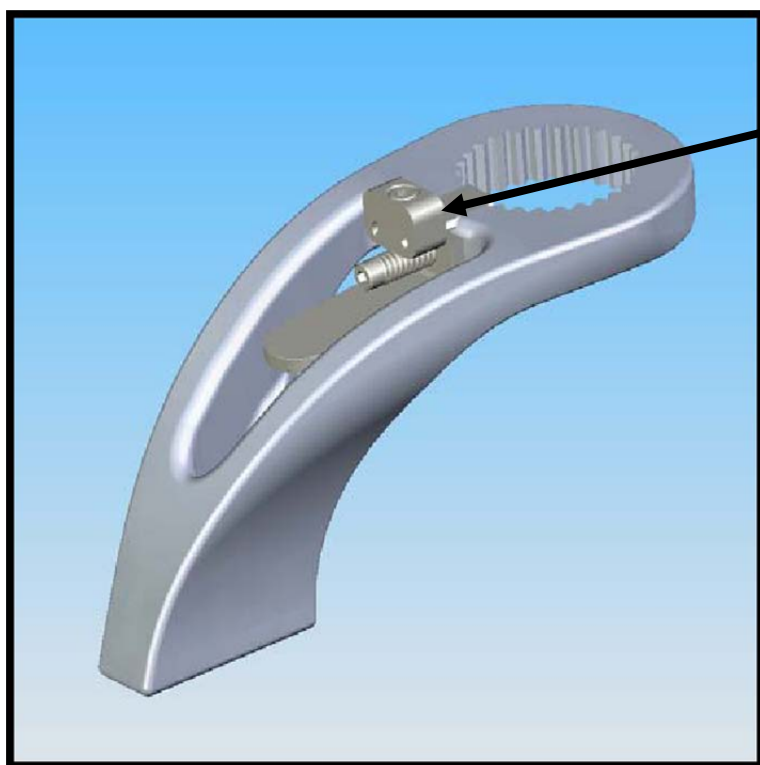
**NOTE**

Modifying a reaction arm voids the reaction arm and jGun warranty. Contact the jGun factory to have a custom reaction arm manufactured.



# WARNING

DUAL-SPEED GUNS MUST ONLY BE OPERATED WITH THE PROPER REACTION ARM SHOWN IN THE PICTURE BELOW.



SAFETY APPARATUS MUST NOT BE TAMPERED WITH. DOING SO WILL PUT THE OPERATOR AT RISK OF INJURY.

WITH THIS ARM IN PLACE THE GUN IS PREVENTED FROM GOING INTO HIGH-SPEED MODE.

THE REACTION ARM IS NOT USED IN HIGH SPEED MODE.

## Reaction Arm and Socket Installation

- Choose the correct reaction arm for the job. The jGun is shipped with a standard length reaction arm, but your gun may have been ordered with custom-length reaction arm for a specific purpose.
- If using the HYTORC Washer™, follow installation instructions in [HYTORC Reaction Washer Overview](#).
- Clean the reaction arm and jGun barrel mating surfaces before installing the reaction arm.
- Slide the reaction arm onto the jGun barrel with the reaction arm extension facing out.

Figure 3. Installing a Reaction Arm



### ⚠ CAUTION



Always install the reaction arm with the extension facing away from the gun.

Failure to install the reaction arm correctly could result in the reaction arm coming in contact with your hand or other another part of your body, causing personal injury.

Figure 4. Reaction Arm Installed



- Lock the reaction arm to the jGun by aligning the set-screw with the hole in the splined section and then tightening the set screw firmly.

Figure 5. Tightening Reaction Arm Set Screw



- Place the appropriately sized socket onto the jGun barrel.



Figure 6. Installing jGun Socket



- Install the socket locking pin and retaining ring.

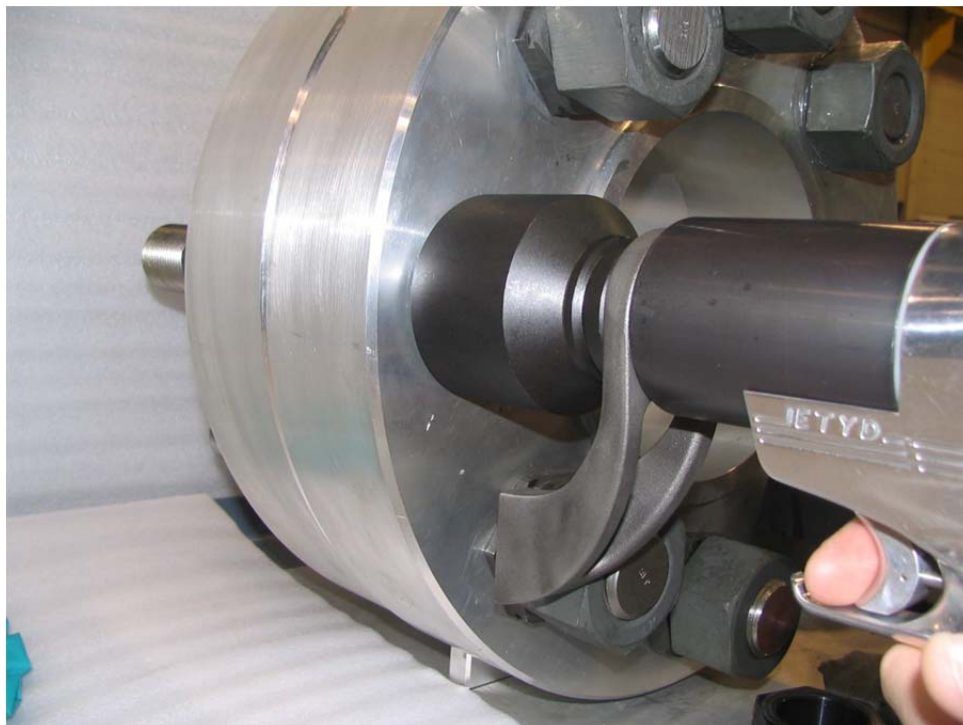
Figure 7. Installing Socket Locking Pin and Retaining Ring



## Key Operating Safety Points

- Ensure that the reaction arm is in direct contact with an appropriate immovable object before beginning to tighten the fastener.

Figure 8. Placement of Reaction Arm



- Using the HYTORC Washer™ eliminates external moving parts and increases worker safety. Refer to [HYTORC Reaction Washer Overview](#).

### ⚠ CAUTION



Failure to have the reaction arm in direct contact with an appropriate immovable object before beginning to tighten the fastener could result in loss of control of the tool and personal injury.

- Keep all body parts clear of the reaction arm and reaction arm contact point (immovable object).



Do not place any part of your body between the reaction arm and an appropriate immovable object at any time while a fastener is being torqued.

Personal injury may occur if any portion of your body is located between the reaction arm and the immovable object when the fastener is being torqued.

- Ensure the jGun barrel is in a straight line with relation to the stud and that the socket is fully engaged onto the fastener.
- As the tool takes up the bolt load, the jGun may shift.

## jGun Setup and Use

Proper setup and use of the jGun before and during installation ensures accurate results and safe operation. The FRL Unit provided with the jGun must be used with the hose provided to ensure the tool's durability. See the [FRL Unit Overview](#) section below for more information.

Proper installation and use of reaction arms increases worker safety and job efficiency. The HYTORC reaction washer is a universal solution for tool reaction on all applications and may be used in place of a reaction arm. See [HYTORC Reaction Washer Overview](#) for more details.

### Setting a Torque Value

1. Determine the torque value for the fastener to be tightened, as shown in the [Bolt Torque Specifications](#) table.

Table 1. Bolt Torque Specifications

SAE1 SAE2 30,000PSI	ASTM 193 Grade B7 Bolt	Gr. 7 A/F Heavy Hex Nut	Foot Pounds	Estimated Load
1 inch	7/8 inch	1-7/16 inches	300	18,150 lbf
1-1/8 inches	1 inch	1-5/8 inches	425	23,690 lbf
1-1/4 inches			600	29,955 lbf
1-3/8 inches	1-1/8 inches	1-3/16 inches	700	36,990 lbf
	1-1/4 inches	2 inches	800	46,776 lbf
1-1/2 inches			900	44,760 lbf
1-5/8 inches	1-3/8 inches	2-3/16 inches	1,250	53,400 lbf
	1-1/2 inches	2-3/8 inches	1,500	64,617 lbf
1-3/4 inches			1,600	62,400 lbf
1-7/8 inches			1,800	72,300 lbs
	1-5/8 inches	2-9/16 inches	2,000	76,540 lbs
2 inches			2,200	83,100 lbs
	1-3/4 inches	2-3/4 inches	2,600	89,440 lbs
2-1/4 inches			3,000	106,800 lbs
	1-7/8 inches	2-15/16 inches	3,700	110,680 lbs
2-1/2 inches	2 inches	3-1/8 inches	4,000	133,200 lbs
2-3/4 inches			5,100	162,900 lbs
	2-1/4 inches	3-1/2 inches	6,000	168,200 lbs
3 inches			7,000	195,300 lbs
	2-1/2 inches	3-7/8 inches	8,000	213,120 lbs
3-1/4 inches			9,000	230,700 lbs
3-1/2 inches	2-3/4 inches	4-1/4 inches	10,000	268,800 lbs
3-3/4 inches	3 inches	4-5/8 inches	13,000	310,200 lbs
4 inches			14,500	354,000 lbs
	3-1/4 inches	5 inches	16,500	369,120 lbs
4-1/4 inches			19,500	401,400 lbs

The Data Above is based on bolts lubricated to manufacturer's specifications. Due to a variation in friction, we recommend in extreme cases to check with the bolt manufacturer, as the chart represents a guideline only.

2. Determine the air pressure needed to achieve the desired torque by consulting the Pressure/Torque Conversion Chart provided with each tool.

3. Open the air supply connected to the FRL unit and run the torque wrench while setting the pressure on the gauge.

### NOTE

The torque wrench must be running while the pressure is being set. When the torque wrench is stopped, the gauge displays a slightly higher pressure than was set with the jGun running. This is normal, proper torque is delivered under working load.

## Changing the Drive Direction

1. To change the square drive direction from forward to reverse or vice versa:
2. Move the directional lever on the back cover to the left (**T**ighten) or right (**L**ooseen).

Figure 9. jGun Drive Direction Lever



3. Be sure the lever is fully engaged in either direction before operating the gun.

## Operating the jGun

To operate the jGun:

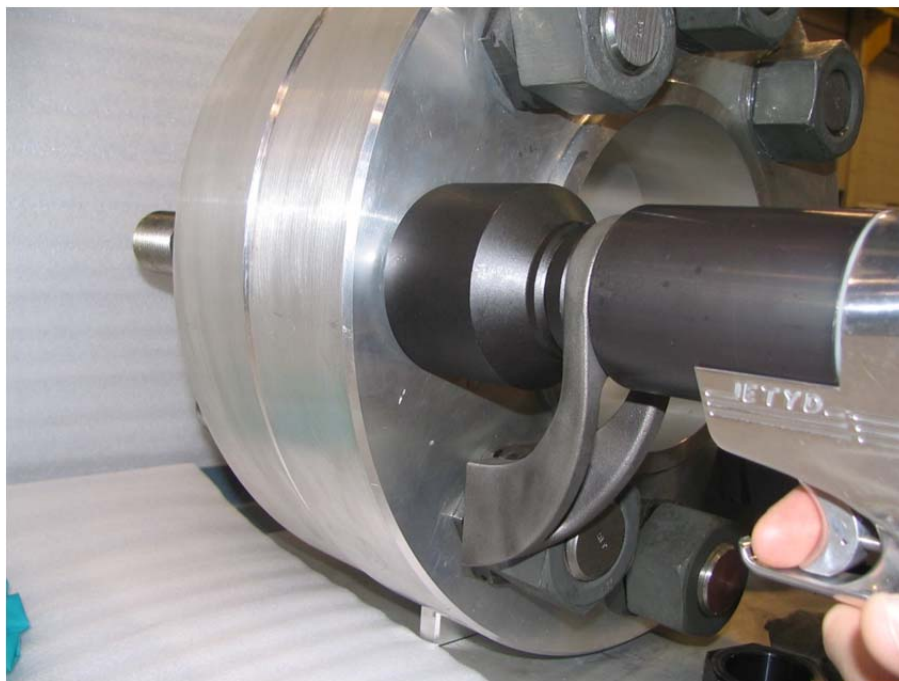
1. Place the correct size impact socket on the square drive and secure it with the locking pin and ring.
2. Ensure that the square drive is fully engaged into the socket.
3. Engage the socket onto the nut.
4. Make sure the socket is fully engaged onto the nut.
5. Ensure that the reaction arm is placed firmly against a stationary surface such as an adjacent nut, a flange, or equipment housing. (If using the HYTORC™ reaction washer



in place of a standard reaction arm ensure that it is setup according to the steps in the [HYTORC Reaction Washer Overview](#) section.)

6. Apply momentary pressure to the torque wrench trigger to ensure proper socket engagement and reaction arm placement.

Figure 10. jGun Operation



7. Torque the fastener by depressing the trigger until socket stops turning and air bypasses the motor.



### ⚠ CAUTION

Be sure the reaction arm is fully engaged and located on a solid, secure reaction point. For added safety, remain clear of the rear of the reaction arm during operation. Also, when initially applying the tool, pressurize the system momentarily; if the tool tends to ride up or creep, stop and readjust the reaction arm to a more solid and secure position.

## Loosening a Fastener

1. Set the FRL Pressure to max PSI as listed on Pressure/Torque Conversion Chart.
2. Fully engage the torque wrench socket on the nut.
3. Either place the reaction arm firmly against a stationary surface or engage the HYTORC Washer Driver over the reaction washer.

Figure 11. Using the jGun with a Reaction Washer



4. Ensure the torque wrench is set to the loosening direction.
5. Remove the fastener.

## jGun Repair and Maintenance

Although the FRL Unit keeps the jGun self-maintained by continuously provided pneumatic tool oil to the tool during operation, proper repair and preventative maintenance will ensure the full life span of your tool.

### Maintaining Hoses and Fittings

- Visually inspect air lines and air line fittings before tool use
- Replace worn or leaking air lines
- Tighten leaky fittings



### ⚠ CAUTION

Loose fittings can be potentially dangerous when pressurized. Over tightening fittings can cause permanent thread failure.

Loose fittings or over tightened fittings can cause personal injury and tool damage.

Ensure that air line fittings are tight, but not overly tight.

### Lubricating the Air Motor

To lubricate the air motor:

1. Turn the jGun upside down and disconnect the air hose at the hose coupling connection.
2. Pour approximately one ounce of air tool oil, or spray a lubricant, into the hose coupling on the gun.
3. Reconnect the hose and operate the gun, while standing clear of the exhaust opening at the base of the handle. Excess lubricant will release from this opening upon initial operation.

### Calibration

TORCGUN provides a pressure / torque conversion chart with every tool. The stated accuracy is +/- 5%. If you properly maintain your tool and keep it in good working condition, it will stay within this stated accuracy. Proper maintenance procedures can be found in this TORCGUN Operations Manual.

If the torque required is for a critical application or if the torque output is in question, the torque accuracy or output of a tool can and should be verified through calibration. Calibration is available by TORCGUN Corporation for a minimal fee.

## Dual Speed jGun

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The Dual Speed jGun is the newest implementation of our pneumatic torque wrenches. It gives a user the ability to select whether they want to run the tool with high speed or with maximum torque. Physically, the Dual Speed gun is identical to the standard jGun with the exception of a handle which guides the shifting mechanism.

Figure 12. Dual Speed jGun with Handle



The handle shown above can be positioned on either side for right or left handed operation.

## Shifting Between Modes

The Dual Speed gun has two settings: High Speed and Maximum Torque

Figure 13. Maximum Torque Setting (Left) and Maximum Speed Setting (Right)



### Maximum Torque Setting

- This mode is activated when the tool is in its initial position (Figure 13 – left photo), where the shifter is back against the body of the gun.
- Operation during the maximum torque mode is similar to that of the single speed jGun. The torque is applied until the bolts reach the desired load for any specific application.

### High Speed Setting

- Shifting into high speed requires pushing the handle forward as shown (Figure 13 – right photo). Once engaged, the housing will rotate with the square drive at a much higher rate than the maximum torque setting.
- Use this feature when you want to run nuts on or off studs in a quick and efficient manner.

### NOTE



When shifting between High Speed and Maximum Torque modes, make sure the tool is stopped and fully engage in either the forward or backward position. Failure to fully engage tool may affect the operation of the tool and ultimately result in loss of control and/or damage to the tool.

## Tool Operation

Before operating the tool, be sure to follow the safety precautions listed in jGun Safety on page 2.



**⚠CAUTION**

Keep loose clothing or jewelry away from the tool as loose items may interfere with tool while it is in motion and possibly cause injury.

**Operation with a Socket and Reaction Arm**

Read this section carefully before proceeding.

The dual speed gun requires using a special reaction arm provided with the tool by the TORCGUN Company. This arm includes:

- A snap fitting which secures the tool on the housing
- A stopper that prevents accidental mode shifting.

Figure 14. Reaction Arm for dual-speed jGun

**⚠CAUTION**

**DO NOT USE ANY OTHER REACTION ARM WITH THE DUAL SPEED GUN THAN THE ONE PICTURED ABOVE.**

**PROCEDURE:**

- Initially, the reaction arm should be left off the tool until all the nuts are run down to their desired position. During high speed operation the Dual Speed jGun should only be equipped with the locking pin, the retaining ring, and the socket.
- Push the handle forward and make sure the tool is set for High Speed operation. Use the tool to run the nuts down the stud.
- Once the nuts are run down to their final position, pull the lever back to set the tool into its Maximum Torque mode. Once engaged, the tool behaves in the same manner as the single speed tool.
- Remove the jGun socket and install the reaction arm as shown in Figure 15. Remember that the reaction arm must be locked with easy snap lock.
- After setting up the Dual Speed jGun with a reaction arm, torque the nuts to the desired load.

**⚠ CAUTION**

Remember, a reaction arm should never be used with the Dual Speed gun when it is in its high speed mode. Failure to comply with this warning may result in injury as the tool may spin out of control and possibly cause physical injury.

**Operation with a Load Disc**

- The HYTORC Washer socket should be removed from the jGun until the nuts are spun down to the correct depth. During high speed operation the Dual Speed jGun should only be equipped with the locking pin, the retaining ring, and socket.
- Place the tool in its High Speed Mode and spin the HYTORC Washer down to the desired position. After completing this, run the standard nuts down until they reach the HYTORC Washer already in place in the stud.
- Install the HYTORC Washer socket driver assembly provided. Refer to the HYTORC Washer Reaction Washer Overview for any further questions about setup.
- Once the HYTORC Washer socket driver assembly is properly installed, place the jGun over the nut and HYTORC Washer and tighten until operator reaches the desired torque.

## Dual Speed Plus jGun

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The Dual Speed Plus jGun is another innovation of our pneumatic torque wrenches. It gives a user the ability to select between 2 speeds; high speed or maximum torque. Physically, the Dual Speed Plus gun is identical to the Dual Speed jGun, with the exception of the clutch wheel located on the barrel of the gun which guides the shifting mechanism through a twisting action rather than the push and pull of the standard Dual Speed jGun.

Figure 15. Dual Speed Plus jGun with Reaction Arm

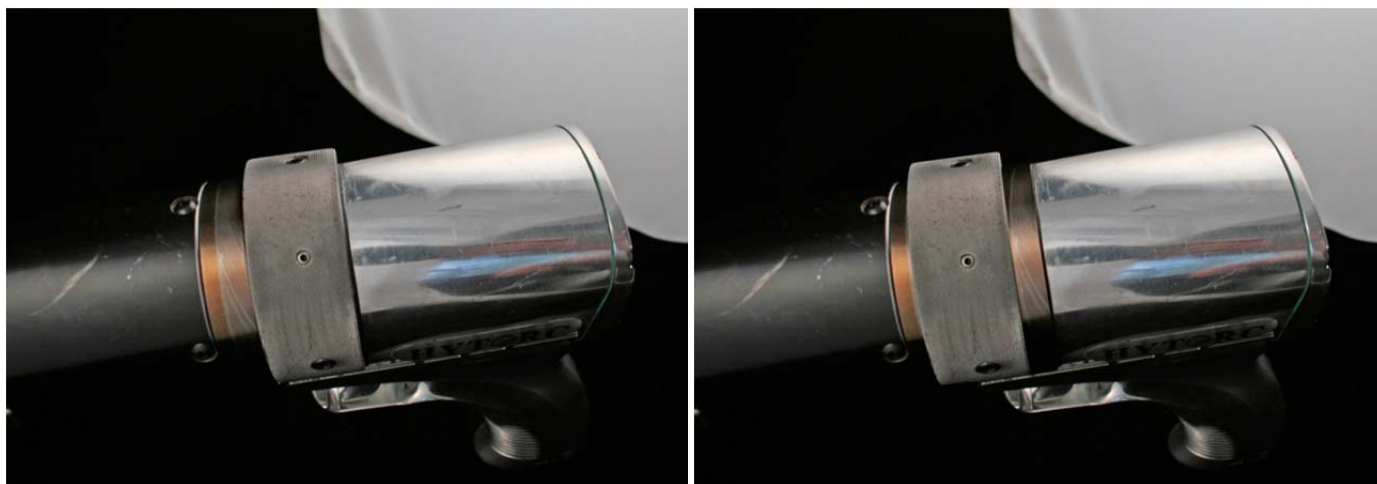




## Shifting Between Modes

The Dual Speed Plus gun has two settings: High Speed and Maximum Torque.

Figure 16. High Speed Setting (Left) and Maximum Torque Setting (Right)



High Speed Setting

- Shifting into high speed requires holding the gear box body and twisting the collar backwards as shown (Figure 137 – left photo). Once engaged, the housing will rotate with the square drive at a much higher rate than the maximum torque setting. The Dual Speed Plus gun offers more torque in rundown mode than the standard Dual Speed jGun.
- Use this feature when you want to run nuts on or off studs in a quick and efficient manner.

Maximum Torque Setting

- To activate this mode twist the collar and move it forward towards the barrel of the gun (Figure 137 – right photo). The collar will lock into place when fully engaged.
- Operation during the maximum torque mode is similar to that of the single speed jGun. The torque is applied until the bolts reach the desired load for any specific application.

### NOTE



**NEVER SWITCH GUN MODES ON THE FLY.** When shifting between High Speed and Maximum Torque modes, make sure the tool is stopped and fully engaged in either the forward or backward position. You may need to jog the gun by gently pulling the trigger to disengage the clutch. Failure to fully engage tool may affect the operation of the tool and ultimately result in loss of control and/or damage to the tool.

## Tool Operation

Before operating the tool, be sure to follow the safety precautions listed in the jGun Safety section on page 2.



### ⚠ CAUTION

Keep loose clothing or jewelry away from the tool as loose items may interfere with tool while it is in motion and possibly cause injury. Use caution as reaction arm will rotate with gear box housing until in fixed position.

## Operation with a Socket and Reaction Arm

Read this section carefully before proceeding.

Please refer to the instructions for [Reaction Arm and Socket Installation](#).

### PROCEDURE:

- Initially, attach the reaction arm and socket; tighten until all the nuts are run down to their desired position. During high speed operation the Dual Speed Plus jGun should be equipped with the reaction arm, locking pin, the retaining ring, and the socket.
- To make sure the tool is set for High Speed operation, twist the collar while moving it backwards until it locks into position. Use the tool to run the nuts down the stud.
- Once the nuts are run down to their final position, twist the collar while moving it forward until it locks into position to set the tool into its Maximum Torque mode. Once engaged, the tool behaves in the same manner as the single speed tool.
- Remove the jGun socket and install the reaction arm as shown in Figure 18. Remember that the reaction arm must be locked with easy snap lock.
- After setting up the Dual Speed Plus jGun with a reaction arm, torque the nuts to the desired load.



### ⚠ CAUTION

Remember, a reaction arm should always be used with the Dual Speed Plus gun when it is in its high speed mode. Failure to comply with this warning may result in injury as the tool may spin out of control and possibly cause physical injury.

## Operation with a HYTORC Washer

- The HYTORC Washer socket should be removed from the jGun until the nuts are spun down to the correct depth. During high speed operation the Dual

Speed Plus jGun should only be equipped with the locking pin, the retaining ring, and socket.

- Place the tool in its High Speed Mode and spin the HYTORC Washer down to the desired position. After completing this, run the standard nuts down until they reach the HYTORC Washer already in place in the stud.
- Install the HYTORC Washer socket driver assembly provided. Refer to the HYTORC Washer Reaction Washer Overview for any further questions about setup.
- Once the HYTORC Washer socket driver assembly is properly installed, place the jGun over the nut and HYTORC Washer and tighten until operator reaches the desired torque.

## Filter/Regulator/Lubricator (FRL) Unit Overview

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A Filter/Regulator/Lubricator (FRL) Unit is provided with every jGun and must be used in conjunction with the tool. In addition, the FRL Unit must be used with the 12' hose provided for connection to the jGun to ensure the tool's durability. The FRL Unit removes water and foreign material from your air supply, regulates the air pressure, and mixes pneumatic tool oil into the air to keep your jGun lubricated.

Operating the jGun without the FRL Unit will void the warranty and may cause damage to the air motor and gearbox. Incorrect setting of the lubricator unit may result in a shortage of lubrication to the air motor and gearbox resulting in damage to the tool.

Figure 17. FRL Unit (Shown without silencer)



### FRL Safety

Only qualified personnel who have thoroughly read this document may operate this tool. Failure to safely operate this tool may result in serious injury or death.

- Inspect all FRL components as they are removed from the shipping container. If damage is found to any component, contact your 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 that your working area is clean and unobstructed before beginning work.

- FRL maintenance and repair must be performed by a qualified pneumatic technician.
- Modifying an FRL or FRL accessory is dangerous and invalidates the warranty.
- Inspect the unit before each use. Replace any obviously worn or damaged parts.
- When not in use, properly store the FRL, hoses and couplers.

## Personal Protective Equipment

- Always wear the appropriate personal protective equipment when operating the FRL and jGun including gloves, safety goggles, hearing protection, hard hat, and safety shoes

## Air Supply Requirements

- Air supply line must be ½-inch minimum diameter to allow adequate air flow to the jGun
- Air supply must be 90 psi @ 30 cfm minimum.
- Ensure that air line fittings are tight and leak free. Do not over tighten air line fittings.
- Always use the FRL Unit provided with the jGun. Never use a substitute oiler and regulator with a jGun.

### NOTE

Set the air pressure while the tool is running as described in the [Setup and Use](#) section.

- Open the air supply connected to the FRL unit and run the torque wrench while setting the pressure on the gauge.
- Set the air pressure to the PSI needed to achieve desired torque shown on the provided pressure/torque conversion chart.

## **FRL Setup and Use**

Proper setup and use of the FRL unit will ensure accurate results and safe operation. The three components of the FRL must be checked individually to ensure correct operation.

- Empty the filter reservoir before use.
- If you are using a digital gauge, press the ZERO button on the regulator gauge before setting the operating pressure.
- Adjust the lubricator flow properly.
- Fill the lubricator reservoir with pneumatic tool oil (provided with the FRL unit).

## **Important FRL Operating Procedures**

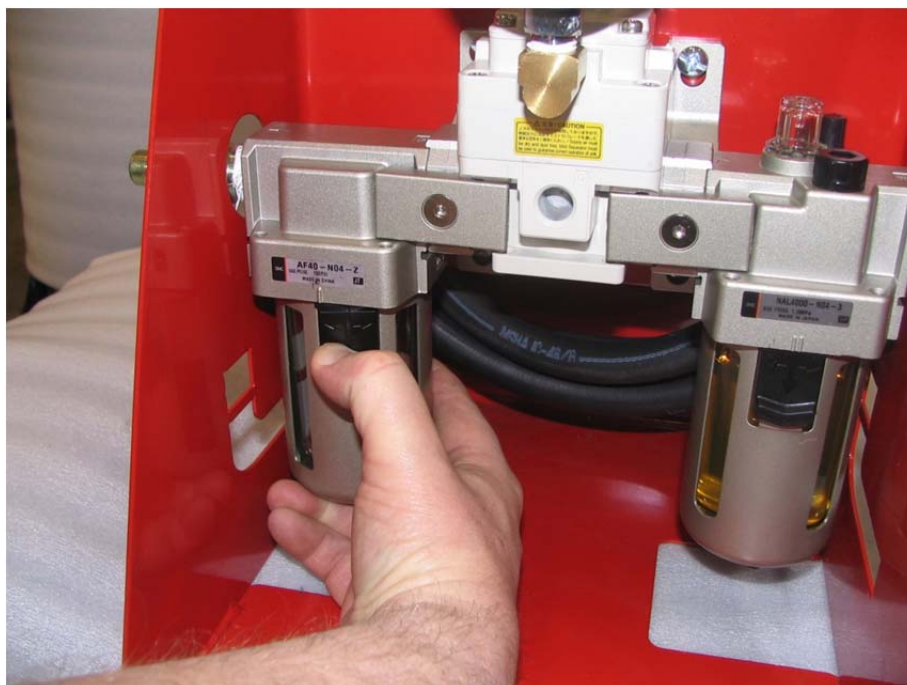
- Only operate the unit with the air flow moving in the direction indicated by the arrows on top of the unit.
- Empty the filter reservoir before each use to remove water and sediment.
- Fill the lubricator reservoir only with pneumatic tool oil before each use.
- Adjust the lubricator flow to one (1) drop per ten (10) seconds (shortage of lubrication may cause motor to seize).
- Use only the hose provided with the FRL for connection to the unit; a change in hose length may affect tool durability and accuracy.

## **Emptying the Filter Reservoir**

You may empty the filter reservoir of water and foreign material in two ways:

- Emptying water through the release valve on the underside of the reservoir. To use the release valve, push the valve until the water or debris drains out of the reservoir.
- Removal of the reservoir. To remove the reservoir from the FRL unit:
  - a. Push down on the black square button to unlock the reservoir.
  - b. Twist the filter reservoir until the two lines on the FRL body and the filter reservoir are aligned.

Figure 18. Emptying the FRL Filter Reservoir



- c. Pull the filter reservoir down to detach from lubricator body.
- d. Discard the contents of the filter reservoir.

Figure 19. Detaching FRL Reservoir

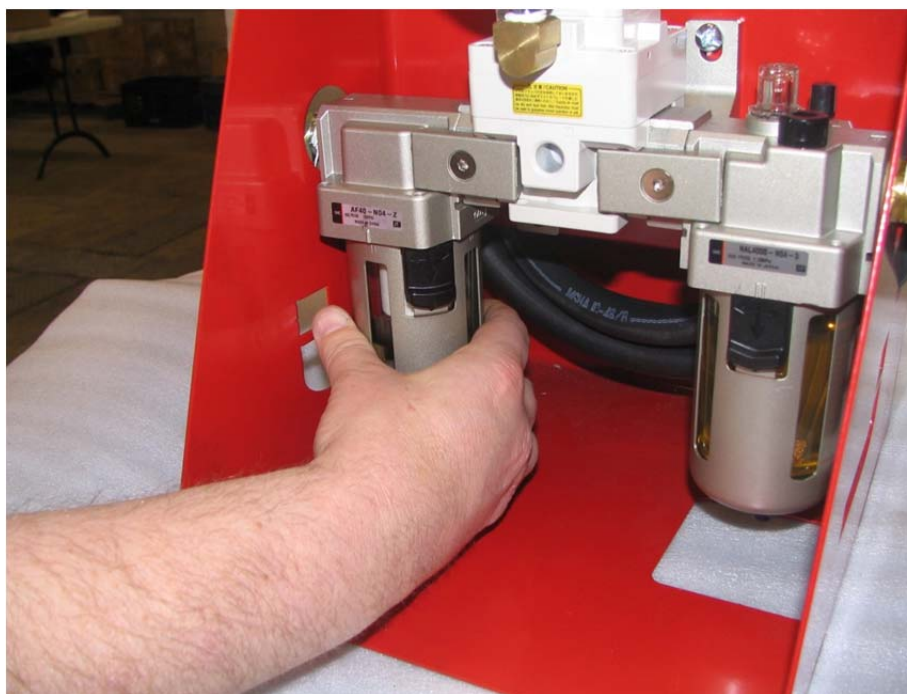




Figure 20. FRL Unit – Lubricator 2/3rds Full of Oil



- e. If needed, refill the reservoir as described on page 29.
- f. Reattach the lubricator by aligning the lines on the filter reservoir and FRL body, and pushing up on the reservoir, then twisting the reservoir to lock it in place. The black locking button should snap into its original position.

## Adjusting Air Pressure

To adjust the air pressure at the regulator:

1. If you are using a digital gauge, press the ON button on the gauge, then press the ZERO button to set the reading to zero. Do not press the ZERO button when the system is under pressure.



Figure 21. Adjusting FRL Regulator



2. A Torque Chart is provided with each tool which gives the conversion from air pressure (PSI) to torque (ft-lbs and N-m). Use the chart to determine the air pressure needed to achieve desired torque output.
3. Connect your air supply to the FRL, and press the ON button to view current air pressure.
4. While operating the tool, turn the regulator knob clockwise to decrease pressure and counter-clockwise to increase pressure. Allow 30 seconds for the digital gauge to settle.

### Filling the Lubricator Reservoir

To fill the lubricator reservoir:

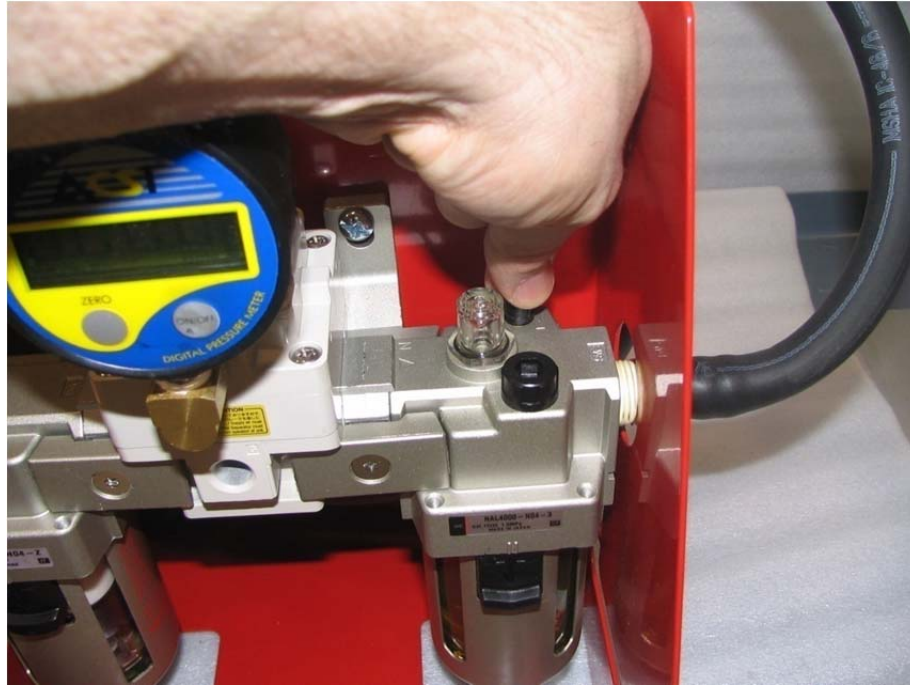
1. Push the black square button down to unlock the reservoir.
2. Twist the lubricator reservoir until the two lines on the lubricator body and the lubricator reservoir are aligned.
3. Pull the lubricator reservoir down to detach it from lubricator body.
4. Pour pneumatic tool oil into the reservoir until it is about two-thirds full.
5. To reattach the lubricator, realign the lines on the lubricator reservoir and main body, then push the two pieces together and twist the reservoir to lock in place.

### Adjusting the Flow

To adjust the oil flow of the FRL device:

1. Remove any attachments from the tool.
2. Run the tool while watching the rate at which oil drips through the acrylic view-glass on the lubricator unit.

Figure 22. Adjusting FRL Oil Flow



3. Turn the flow adjustment knob clockwise or counter-clockwise until the oil is dripping at a rate of at least one drop every ten seconds.

## Repair and Maintenance

Although the FRL is a self-contained unit and does not require heavy maintenance, proper repair and preventative maintenance will ensure the life span of the unit.

### Hoses and Fittings

- Visually inspect air lines and air line fittings before tool use
- Replace worn or leaking air lines
- Tighten leaky fittings



### **⚠ CAUTION**

Loose fittings can be potentially dangerous when pressurized. Over tightening fittings can cause permanent thread failure.

Loose fittings or over tightened fittings can cause personal injury and tool damage.

Ensure that air line fittings are tight, but not over tight.

## HYTORC Reaction Washer Overview

The HYTORC Reaction Washer is the first reaction arm replacement device for torque wrenches and is exclusive to TORCGUN Corporation. The HYTORC Washer is a hex shaped washer that fits under a standard nut and is used in conjunction with a double-layered (concentric) socket. The double-layered socket turns the nut using the inner socket, and the gun reacts on the washer with the outer socket.

Figure 23. HYTORC Washer and Socket



In addition to the added safety of having no external moving parts, the HYTORC Washer system provides a universal reaction point for all applications, eliminating the need for custom-designed reaction arms. Concurrently, the threaded segment inside of the washer stops the bolt from turning, eliminating the need for back-up wrenches. By reacting and tightening on the same axis, side-load is eliminated and surface friction from nut-to-nut is equalized, giving you increased bolting accuracy.

Figure 24. HYTORC Washer Socket Mounted on jGun



## **Safety**

Only qualified personnel who have thoroughly read this document may operate this system. Failure to safely install the HYTORC Washer may result in serious injury or death.

- Inspect all HYTORC Washer reaction washers as they are removed from the shipping container. If damage is found to any component, contact your shipper immediately. Do not use the washer.
- Failure to follow correct tool usage could result in personal injury, co-worker injury, and/or damaged tools and equipment.
- Ensure that your working area is clean and unobstructed before beginning work.
- Modifying a HYTORC washer or accessory is dangerous and not recommended.
- Inspect the HYTORC Washer and HYTORC Washer driver before each use. Replace any obviously worn or damaged parts.
- When not in use, properly store the HYTORC Washer drivers and any unused HYTORC Washers.

## **Personal Protective Equipment**

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

## **HYTORC Washer Requirements**

- Use the proper size HYTORC Washer for the bolts and nuts you are using.
- All joint specifications (bolt size, material, gasket type, etc) must be provided or recorded by a trained TORCGUN Representative.
- Always use authentic TORCGUN accessories when installing the HYTORC Washer. Never use a substitute torque wrench or socket/driver.

## **HYTORC Washer Setup and Use**

Proper setup and use of the HYTORC reaction washer ensures accurate results and safe operation.

### **Important Preparation Procedures**

- The joint and fasteners must be properly inspected and cleaned before HYTORC Washer installation.
- The joint surfaces, bolts, and nuts must be properly cleaned and dried before installation.
- The HYTORC reaction washer must be completely dried and free of oil or grease.
- The retaining nut to be installed on top of the HYTORC Washer must be lubricated using the lubrication as specified on the torque/bolt load conversion chart (lubrication may be specified upon ordering for custom calibrations).

### **Important Installation Procedures**

1. Insert the cleaned and dried bolt through the bolt hole.
2. Determine which side of the joint is optimal for tightening (a side providing adequate wrench space, light, accessibility, etc.)
3. Install the clean and dry nut on the side opposite of the one from which you will be tightening.
4. Install the HYTORC Washer on the side you will be tightening from by turning it clockwise down the bolt until it is firmly hand tight.



Figure 25. HYTORC Washer Installed



5. Install the lubricated nut by turning it clockwise down the bolt until it is firmly hand tight against the HYTORC reaction washer.

#### NOTE

For proper installation only 3 or 4 threads should extend beyond the nut to be tightened.

6. After all bolts on the joint have been prepped for installation following the above steps, tighten the nut using a TORCGUN HYTORC Washer socket/driver.
7. Align the set screw on the socket with the drilled section on the splines of the jGun.

Figure 26. Aligning HYTORC Washer Socket Set Screw with Machined Recess in jGun Splines



8. Tighten the set screw.

Figure 27. Tightening HYTORC Washer Set Screw



9. Place the double-socket HYTORC Washer driver over the nut and HYTORC Washer with the directional lever on the jGun set in the “T” direction for tightening.
10. Pull the trigger on the jGun to tighten the nut. (At start of installation the outer socket of the HYTORC Washer driver will make a short turn in the direction opposite of operation). Once the outer socket stops turning it will begin reacting on the washer as the inner socket turns the nut.
11. Continue pulling the trigger until drive stops turning. At this point, the desired torque or bolt load (as set on the pressure regulator of the FRL unit) is achieved.

## **jGun Maintenance and Troubleshooting Tips**

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1. Only use your J-GUN with a **factory-specified** F/R/L unit. The F/R/L unit is designed to filter out dirt, drain water and lubricate the air motor.
2. Always check and drain the water bowl on your F/R/L unit.
3. Always check and fill up the oil bowl on your F/R/L unit. Set the oil drip to one (1) drop every ten (10) seconds. Using your J-GUN without oil will result in air motor damage. **MARVEL AIR TOOL OIL** is recommended.
4. Never exceed the maximum air pressure specified on the torque chart supplied with your J-GUN.
5. Check the female coupler on your F/R/L unit’s hose and the male coupler on your J-GUN for dirt. Dirt entering your J-GUN will result in air motor damage.
6. Before connecting an external air supply to your F/R/L unit, check the air pressure gauge and verify that it is set at “zero” pressure. A damaged air gauge will result in inaccurate torque.
7. Check the air hose for leaks. An air leak will result in inaccurate torque.
8. Check your J-GUN’s gear box for loose or missing screws. **DO NOT** operate if any screws are loose or missing, or serious damage may occur. Use **LOCTITE 262** on screws.
9. Check your J-GUN’s back cover gasket for air leaks. An air leak will result in inaccurate torque.