

# HYTORC

The World's Most Trusted Industrial Bolting Systems



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## **jGun® PNEUMATIC TORQUE TOOLS** (SINGLE SPEED and DUAL SPEED Models)

### **Operations Manual**

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## TECHNICAL CERTIFICATIONS

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### Models

jGun® SINGLE SPEED:  
J-.25, J-.5, J-1, J-3, J-5, J-8

jGun® DUAL SPEED:  
J-A.5-AP, J-A1-AP, J-A3-AP,  
J-A5-AP, J-A8-AP

### Technical Certifications

For a complete EC declaration of conformity or if you require any further assistance please call your local HYTORC Representative or 1-800-FOR-HYTORC (1-800-367-4986). Please visit us at HYTORC.com.



EN ISO 12100-1:2011  
EN ISO 12100-2:2011  
EN ISO 14121-1:2007  
EN ISO 11148-6:2012  
EN ISO 4414:2010  
EN 61310-2:2008  
EN 61310-3:2008  
ISO 3744:2011

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**Warranty.** The jGun® Pneumatic Torque Tools (SINGLE SPEED and DUAL SPEED Models) have a one-year limited warranty. Every tool is tested before leaving the factory and is warranted to be free from defects in workmanship and materials. HYTORC 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 resulting from repairs made or attempted by unauthorized repair facilities. The repair and replacement remedies described herein are exclusive. In no event shall HYTORC 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.

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## FREE SERVICES\*

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- User safety training upon receipt of merchandise
- Semi-Annual user safety training on request
- Annual safety seminar on appointment
- Loaner tools in event of product failure within 24 hours
- Torque/Tension consultation/seminar
- Half-Day, first-use supervision
- User training for first-time rentals
- Warranty repairs including return-freight
- Annual product inspection on request
- Product demonstrations
- 12-Month no-questions-asked warranty
- Upgrades during the lifetime of the tool to enhance safety, durability, and function

\*Above services are not subject to travel expense charges.

## REPAIRS

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- All repairs are guaranteed for 6 months.
- All repairs are subject to labor and part cost as outlined in the official HYTORC price list.
- All repairs will be tested and calibrated to ensure the highest quality repairs.
- All warranty repairs are free of all charges including return-freight.

## TOOL RENTALS

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- 100% of all paid rentals will be applied as a discount towards any new purchase in that calendar year
- User training for first-time rentals is free of all cost
- Rental tools are guaranteed to perform and are subject to the free loaner tool policy of HYTORC

## HELP

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If you require any further assistance, please call your local HYTORC Representative or 1-800-FOR-HYTORC (1-800-367-4986). Please visit us at [HYTORC.com](http://HYTORC.com).

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# Warranty

The jGun has a one year limited warranty. Every HYTORC tool is tested before leaving the factory and is warranted to be free from defects in workmanship and materials. HYTORC 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 HYTORC authorized repair facilities.

The repair and replacement remedies described herein are exclusive. In no event shall HYTORC 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 HYTORC warranty, contact our customer service center at 201-828-5270.

## HYTORC

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# jGun Overview

The jGun pneumatic torque wrench is designed to safely and accurately deliver up to 8,000 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® SINGLE SPEED and the jGun® DUAL SPEED.

# EC Declaration (ISO 11148-6:2012)

## 6.2 Instructions handbook

### 6.2.1 General

For the information provided to the user, the content of Clause 6 together with ISO 12100:2010, 6.4.5.2 and 6.4.5.3, apply.

The information provided by the manufacturer is an important, but not exclusive, basis for the safe use of the assembly power tool for threaded fasteners. It shall provide sufficient information for the end user to perform an initial risk assessment. The hazards identified in 6.2.2.4 to 6.2.2.12 are foreseeable in the general use of hand-held assembly power tools for threaded fasteners. The information provided with the tool shall state that the user or the user's employer shall assess the specific risks that can be present as a result of each use.

The instructions handbook shall contain information relating to at least the following:

- name and address of the manufacturer or supplier or any other agent responsible for placing the assembly power tool for threaded fasteners on the market;
- designation of the series or type;
- operating instructions; see 6.3;
- information on noise emission; see 6.4.2;
- information on vibration transmitted to the hands of the operator; see 6.4.3;
- maintenance instructions; see 6.5;
- explanations of any symbols marked on the assembly power tool for threaded fasteners; see Annex C;
- information about residual risks and how to control them.

### 6.2.2 Operator's instructions

#### 6.2.2.1 General

The instructions and warnings stated in 6.2.2 to 6.2.4 shall be given with all assembly power tools for threaded fasteners unless the risk assessment shows that they are not relevant to a particular assembly power tool for threaded fasteners. Words of equivalent meaning may be used.

#### 6.2.2.2 Statement of use

The operator's instructions shall include a description of the correct use of the assembly power tool for threaded fasteners and make reference to the appropriate inserted tools. The operator's instructions shall state that any other use is forbidden. Foreseeable misuse of the assembly power tool for threaded fasteners, which experience has shown to occur, shall be warned against.

#### 6.2.2.3 Allowance for user

The operator's instructions shall be written primarily for professional users. Where a tool can be used by nonprofessional users, additional information for use shall be provided.

#### **6.2.2.4 General safety rules**

– For multiple hazards, read and understand the safety instructions before installing, operating, repairing, maintaining, changing accessories on, or working near the assembly power tool for threaded fasteners.

Failure to do so can result in serious bodily injury.

– Only qualified and trained operators should install, adjust or use the assembly power tool for threaded fasteners.

– Do not modify this assembly power tool for threaded fasteners. Modifications can reduce the effectiveness of safety measures and increase the risks to the operator.

– Do not discard the safety instructions; give them to the operator.

– Do not use the assembly power tool for threaded fasteners if it has been damaged.

– Tools shall be inspected periodically to verify that the ratings and markings required by this part of

ISO 11148 are legibly marked on the tool. The employer/user shall contact the manufacturer to obtain replacement marking labels when necessary.

#### **6.2.2.5 Projectile hazards**

– Failure of the workpiece, of accessories or even of the inserted tool itself can generate high-velocity projectiles.

– Always wear impact-resistant eye protection during the operation of the assembly power tool for threaded fasteners. The grade of protection required should be assessed for each use.

– Ensure that the workpiece is securely fixed.

#### **6.2.2.6 Entanglement hazards**

– Entanglement hazards can result in choking, scalping and/or lacerations if loose clothing, personal jewellery, neckware, hair or gloves are not kept away from the tool and accessories.

– Gloves can become entangled with the rotating drive, causing severed or broken fingers.

– Rotating drive sockets and drive extensions can easily entangle rubber-coated or metal-reinforced gloves.

– Do not wear loose-fitting gloves or gloves with cut or frayed fingers.

– Never hold the drive, socket or drive extension.

– Keep hands away from rotating drives.

#### **6.2.2.7 Operating hazards**

– The use of the tool can expose the operator's hands to hazards including crushing, impacts, cuts and abrasions and heat. Wear suitable gloves to protect hands.

– Operators and maintenance personnel shall be physically able to handle the bulk, weight and power of the tool.

– Hold the tool correctly; be ready to counteract normal or sudden movements and have both hands available.

– Maintain a balanced body position and secure footing.

– In cases where the means to absorb the reaction torque are requested, it is recommended to use a suspension arm whenever possible. If that is not possible, side handles are recommended for straightcase and pistol-grip tools. Reaction bars are recommended for angle nutrunners. In any case, it is recommended to use a means to absorb the reaction torque above 4 N·m for straight tools, above 10 N·m for pistol-grip tools, and above 60 N·m for angle nutrunners.

– Release the start-and-stop device in the case of an interruption of the energy supply.

– Use only lubricants recommended by the manufacturer.

– Fingers can be crushed in open-ended crow-foot nutrunners.

– Do not use in confined spaces and beware of crushing hands between tool and workpiece, especially when unscrewing.



#### **6.2.2.8 Repetitive motions hazards**

- When using a power tool for, the operator can experience discomfort in the hands, arms, shoulders, neck, or other parts of the body.
- While using an assembly power tool for threaded fasteners, the operator should adopt a comfortable posture while maintaining secure footing and avoiding awkward or off-balanced postures. The operator should change posture during extended tasks, which can help avoid discomfort and fatigue.
- If the operator experiences symptoms such as persistent or recurring discomfort, pain, throbbing, aching, tingling, numbness, burning sensations or stiffness, these warning signs should not be ignored. The operator should tell the employer and consult a qualified health professional.

#### **6.2.2.9 Accessory hazards**

- Disconnect the assembly power tool for threaded fasteners from the energy supply before changing the inserted tool or accessory.
- Do not touch sockets or accessories during impacting, as this increases the risk of cuts, burns or vibration injuries.
- Use only sizes and types of accessories and consumables that are recommended by the assembly power tool for threaded fasteners manufacturer; do not use other types or sizes of accessories and consumables.
- Use only impact-wrench-rated sockets in good condition, as poor condition or hand sockets and accessories used with impact wrenches can shatter and become a projectile.

#### **6.2.2.10 Workplace hazards**

- Slips, trips and falls are major causes of workplace injury. Be aware of slippery surfaces caused by the use of the tool and also of trip hazards caused by the air line or hydraulic hose.
- Proceed with care in unfamiliar surroundings. Hidden hazards, such as electricity or other utility lines, can exist.
- The assembly power tool for threaded fasteners is not intended for use in potentially explosive atmospheres and is not insulated against coming into contact with electric power.
- Make sure there are no electrical cables, gas pipes, etc., that can cause a hazard if damaged by use of the tool.

#### **6.2.2.11 Dust and fume hazards**

- Dust and fumes generated when using assembly power tools for threaded fasteners can cause ill health (for example cancer, birth defects, asthma and/or dermatitis); risk assessment and implementation of appropriate controls for these hazards are essential.
- Risk assessment should include dust created by the use of the tool and the potential for disturbing existing dust.
- Direct the exhaust so as to minimize disturbance of dust in a dust-filled environment.
- Where dust or fumes are created, the priority shall be to control them at the point of emission.
- All integral features or accessories for the collection, extraction or suppression of airborne dust or fumes should be correctly used and maintained in accordance with the manufacturer's instructions.
- Use respiratory protection in accordance with employer's instructions and as required by occupational health and safety regulations.

#### **6.2.2.12 Noise hazards**

- Exposure to high noise levels can cause permanent, disabling hearing loss and other problems, such as tinnitus (ringing, buzzing, whistling or humming in the ears). Therefore a risk assessment and implementation of appropriate controls for these hazards are essential.
- Appropriate controls to reduce the risk may include actions such as damping materials to prevent workpieces from “ringing”.
- Use hearing protection in accordance with employer’s instructions and as required by occupational health and safety regulations.
- Operate and maintain the assembly power tool for threaded fasteners as recommended in the instructions handbook, to prevent an unnecessary increase in noise levels.
- If the assembly power tool for threaded fasteners has a silencer, always ensure it is in place and in good working order when the assembly power tool for threaded fasteners is operating.
- Select, maintain and replace the consumable/inserted tool as recommended in the instructions handbook, to prevent an unnecessary increase in noise.

#### **6.2.2.13 Vibration hazards**

The information for use shall draw attention to vibration hazards that have not been eliminated by design and construction and remain as residual vibration risks. It shall enable employers to identify the circumstances in which the operator is likely to be at risk from vibration exposure. If the vibration emission value obtained using ISO 28927-2 does not adequately represent the vibration emission in the intended uses (and foreseeable misuses) of the machine, additional information shall be supplied to enable the risks arising from vibration to be assessed and managed.

For recommended interface dimensions for spindles and drive adapters to help reduce vibrations, see ISO/TS 21108.

- Exposure to vibration can cause disabling damage to the nerves and blood supply of the hands and arms.
- Keep the hands away from the nutrunner sockets.
- Wear warm clothing when working in cold conditions and keep your hands warm and dry.
- If you experience numbness, tingling, pain or whitening of the skin in your fingers or hands, stop using the assembly power tool for threaded fasteners, tell your employer and consult a physician.
- Operate and maintain the assembly power tool for threaded fasteners as recommended in the instructions handbook, to prevent an unnecessary increase in vibration levels.
- Do not use worn or ill-fitting sockets or extensions, as this is likely to cause a substantial increase in vibration.
- Select, maintain and replace the consumable/inserted tool as recommended in the instructions handbook, to prevent an unnecessary increase in vibration levels.
- Sleeve fittings should be used where practicable.
- Support the weight of the tool in a stand, tensioner or balancer, if possible.
- Hold the tool with a light but safe grip, taking account of the required hand reaction forces, because the risk from vibration is generally greater when the grip force is higher.

### **6.2.3 Additional safety instructions for pneumatic power tools**

- Air under pressure can cause severe injury:
  - always shut off air supply, drain hose of air pressure and disconnect tool from air supply when not in use, before changing accessories or when making repairs;
  - never direct air at yourself or anyone else.
- Whipping hoses can cause severe injury. Always check for damaged or loose hoses and fittings.
- Cold air shall be directed away from the hands.
- Do not use quick-disconnect couplings at tool inlet for impact and air-hydraulic impulse wrenches. Use hardened steel (or material with comparable shock resistance) threaded hose fittings.
- Whenever universal twist couplings (claw couplings) are used, lock pins shall be installed and whipcheck safety cables shall be used to safeguard against possible hose-to-tool and hose-and-hose connection failure.
- Do not exceed the maximum air pressure stated on the tool.
- For torque-control and continuous-rotation tools, the air pressure has a safety critical effect on performance. Therefore, requirements for length and diameter of the hose shall be specified.
- Never carry an air tool by the hose.

### **6.2.4 Additional safety instructions for hydraulic power tools**

- Do not exceed the maximum relief-valve setting stated on the tool.
- Carry out a daily check for damaged or worn hoses or hydraulic connections and replace if necessary.
- Use only clean oil and filling equipment.
- Power units require a free flow of air for cooling purposes and should, therefore, be positioned in a well ventilated area free from hazardous fumes.
- Ensure that couplings are clean and correctly engaged before operation.
- Do not inspect or clean the tool while the hydraulic power source is connected. Accidental engagement of the tool can cause serious injury.
- Do not install or remove the tool while the hydraulic power source is connected. Accidental engagement of the tool can cause serious injury.
- Be sure all hose connections are tight.
- Wipe all couplers clean before connecting. Failure to do so can result in damage to the quick couplers and cause overheating. Instructions shall be given that only hydraulic fluid recommended by the manufacturer shall be used.

**NOTE:** It is advisable to enquire of the manufacturer whether or not non-flammable fluids can be used.

### **6.2.5 Specific safety instructions**

Warnings shall be given about any specific or unusual hazards associated with the use of the assembly power tool for threaded fasteners. Such warnings shall indicate the nature of the hazard, the risk of injury and the avoidance action to take.

### **6.3 Operating instructions**

The instructions shall include, where appropriate,

- instructions for setting up or fixing the assembly power tool for threaded fasteners in a stable position, appropriate for assembly power tools for threaded fasteners that can be mounted in a support;
- assembly instructions, accessories and inserted tools;
- illustrated description of functions;
- limitation on tool use due to environmental conditions;
- instructions for setting and testing;
- general instructions for use, including changing inserted tools and limits on the size and type of workpiece.

## 6.4 Data

### 6.4.1 General

The instructions shall include the information on the data plate and the following:

- mass of the assembly power tool for threaded fasteners;
- for hydraulic assembly power tools for threaded fasteners:
  - specification of the coupling,
  - specification of hoses with regard to pressure and flow,
  - maximum inlet temperature of the inlet fluid.

### 6.4.2 Noise

#### 6.4.2.1 Declaration of emission

The instructions shall include a noise-emission declaration in accordance with ISO 15744.

#### 6.4.2.2 Additional information

If the values for noise emissions obtained using the appropriate tests defined in 5.2 do not adequately represent the emissions during the intended uses of the machine, additional information and/or warnings shall be supplied to enable an assessment and the management of the associated risks. Information on noise emission shall also be provided in the sales literature describing the performance characteristics of machinery.

### 6.4.3 Vibration

#### 6.4.3.1 Declaration of emission

The instructions handbook shall include the vibration-emission value and uncertainty as specified in 5.3 and the reference number of the test code, ISO 28927-2.

#### 6.4.3.2 Additional information

If the values for vibration emissions obtained using the appropriate tests defined in 5.3 do not adequately represent the emissions during the intended uses of the machine, additional information and/or warnings shall be supplied to enable the potential risks to be assessed and managed. Information on vibration emission should also be provided in the sales literature.

## 6.5 Maintenance instructions

The maintenance instructions shall contain

- instructions to keep the assembly power tools for threaded fasteners safe by regular preventative maintenance;
- information on when the regular preventative maintenance shall be carried out, for instance, after a specified time of operation, a specified number of cycles/operations or a stated number of times per year;
- instructions for disposal so as not to expose personnel and the environment to hazards;
- list of the service operations that the user should carry out;
- instructions for lubrication, if required;
- instructions to check the speed and make a simple check of the vibration level after each service;
- instructions to check the speed regularly;
- specifications of the spare parts for use when these affect the health and safety of operators.

Maintenance instructions shall include the precautions to take to avoid exposure to hazardous substances deposited (due to work processes) on the tool.

**NOTE:** Skin exposure to hazardous dust can cause severe dermatitis. If dust is generated or disturbed during the maintenance procedure, it can be inhaled.

## Annex A (informative)

### List of significant hazards

This annex contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this part of ISO 11148, identified by risk assessment as significant for this type of machinery and that require action to eliminate or reduce the risk. The following significant hazards are associated with the use of assembly power tools for threaded fasteners. For additional hazards that can occur in assembly power tools for threaded fasteners driven by an internal combustion engine, see Annex D.

Hazard Type	Reference to Safety Requirement	
	By Design or Guarding	Information for Use
<b>1 Mechanical hazards:</b> – Crushing – Cutting – Drawing in or trapping (caused by hair, clothing, etc., Getting entangled in a rotating assembly power tool for threaded fasteners) – Friction or abrasion hazard – Loss of stability – Whipping hose – Ejection from high-pressure hydraulic systems – Ejection of parts – Hose and hose coupling specifications	4.2.5, 4.8.1, 4.8.2, 4.8.4 4.2.1, 4.8.1, 4.8.2, 4.8.3 4.8.1, 4.8.2, 4.8.3 4.2.1, 4.8.1, 4.8.2 4.2.2 4.2.3 4.2.4, 4.2.6, 4.2.7	6.2.2.5, 6.2.2.6 6.2.2.5, 6.2.2.6, 6.2.2.8 6.2.2.5, 6.2.2.8 6.2.2.6, 6.2.2.8 6.2.3, 6.2.4 6.2.2.4, 6.2.2.8 6.2.3, 6.2.4
<b>2 Electrical hazards</b>		6.2.2.9
<b>3 Thermal hazards:</b> – Explosions – Health damage due to hot or cold surfaces	4.3 4.3	6.2.2.9 6.2.2.8
<b>4 Hazards caused by noise</b>	4.4	6.2.2.11
<b>5 Hazards generated by vibration</b> – Hazards caused by the operator putting hands on the nut-running socket	4.5	6.2.2.12 6.2.2.5, 6.2.2.8
<b>6 Hazards generated by materials and substances processed, used or exhausted:</b> – Exhaust air or gas – Lubricants – Hydraulic fluid	4.6.1 4.6.2 4.2.3	6.2.3, 6.2.2.10 6.2.2.6 6.2.4
<b>7 Hazards caused by neglecting ergonomic principles:</b> – Repetitive strain injuries – Unsuitable postures – Inadequate grip design and tool balance – Effects of reaction forces upon operator – Neglected use of personal protection equipment	4.7.1, 4.7.2, 4.7.3, 4.8.3 4.7.3	6.2.2.6, 6.2.2.7 6.2.2.6, 6.2.2.7 6.2.2.6 6.2.2.6 6.2.2.4, 6.2.2.5, 6.2.2.6, 6.2.2.10
<b>8 Hazards caused by the energy supply:</b> – Unexpected return of energy supply after a breakdown – Discharge of high-pressure air or hydraulic fluid – Incorrect hydraulic fluid flow and outlet pressure		6.2.4, 6.2.2.6 6.2.4 6.2.4
<b>9 Hazards caused by missing and/or incorrectly positioned safety-related means:</b> – Start-and-stop device – Unintentional start	4.8.1 4.8.2	6.2.2.6

# EC Declaration - ISO 12100:2010(E)

## 6.4 Information for use

### 6.4.1 General requirements

**6.4.1.1** Drafting information for use is an integral part of the design of a machine (see Figure 2). Information for use consists of communication links, such as texts, words, signs, signals, symbols or diagrams, used separately or in combination to convey information to the user. Information for use is intended for professional and/or non-professional users.

**NOTE:** See also IEC 62079 for structuring and presentation of information for use.

**6.4.1.2** Information shall be provided to the user about the intended use of the machine, taking into account, notably, all its operating modes.

The information shall contain all directions required to ensure safe and correct use of the machine. With this in view, it shall inform and warn the user about residual risk.

The information shall indicate, as appropriate,

- the need for training,
- the need for personal protective equipment, and
- the possible need for additional guards or protective devices (see Figure 2, Footnote d).

It shall not exclude uses of the machine that can reasonably be expected from its designation and description and shall also warn about the risk which would result from using the machine in other ways than the ones described in the information, especially considering its reasonably foreseeable misuse.

**6.4.1.3** Information for use shall cover, separately or in combination, transport, assembly and installation, commissioning, use of the machine (setting, teaching/programming or process changeover, operation, cleaning, fault-finding and maintenance) and, if necessary, dismantling, disabling and scrapping.

### 6.4.2 Location and nature of information for use

Depending on the risk, the time when the information is needed by the user and the machine design, it shall be decided whether the information — or parts thereof — are to be given

- a) in/on the machine itself (see 6.4.3 and 6.4.4),
- b) in accompanying documents (in particular instruction handbook, see 6.4.5),
- c) on the packaging,
- d) by other means such as signals and warnings outside the machine.

Standardized phrases shall be considered where important messages such as warnings are given (see also IEC 62079).

### 6.4.3 Signals and warning devices

Visual signals, such as flashing lights and audible signals such as sirens may be used to warn of an impending hazardous event such as machine start-up or overspeed. Such signals may also be used to warn the operator before the triggering of automatic protective measures (see 6.3.2.7).

It is essential that these signals

- a) be emitted before the occurrence of the hazardous event,
- b) be unambiguous,
- c) be clearly perceived and differentiated from all other signals used, and
- d) be clearly recognized by the operator and other persons.

The warning devices shall be designed and located such that checking is easy. The information for use shall prescribe regular checking of warning devices.

The attention of designers is drawn to the possibility of “sensorial saturation”, which can result from too many visual and/or acoustic signals and which can also lead to defeating the warning devices.

**NOTE:** Consultation of the user on this subject is often necessary.

#### **6.4.4 Markings, signs (pictograms) and written warnings**

Machinery shall bear all markings which are necessary

- a) for its unambiguous identification, including at least
  - 1) the name and address of the manufacturer,
  - 2) the designation of series or type, and
  - 3) the serial number, if any,
- b) in order to indicate its compliance with mandatory requirements, comprising
  - 1) marking, and
  - 2) written indications, such as the authorized representative of the manufacturer, designation of the machinery, year of construction, and intended use in potentially explosive atmospheres),
- c) for its safe use, for example,
  - 1) maximum speed of rotating parts,
  - 2) maximum diameter of tools,
  - 3) mass (in kilograms) of the machine itself and/or of removable parts,
  - 4) maximum working load,
  - 5) necessity of wearing personal protective equipment,
  - 6) guard adjustment data, and
  - 7) frequency of inspection.

Information printed directly on the machine should be permanent and remain legible throughout the expected life of the machine.

Signs or written warnings indicating only “Danger” shall not be used.

Markings, signs and written warnings shall be readily understandable and unambiguous, especially as regards the part of the function(s) of the machine to which they are related. Readily understandable signs (pictograms) should be used in preference to written warnings.

Signs and pictograms should only be used if they are understood in the culture in which the machinery is to be used.

Written warnings shall be drawn up in the language(s) of the country in which the machine will be used for the first time and, on request, in the language(s) understood by operators.

**NOTE:** In some countries the use of specific language(s) is covered by legal requirements.

Markings shall comply with recognized standards (for example, ISO 2972 or ISO 7000, for pictograms, symbols and colours in particular).

See IEC 60204-1 as regards marking of electrical equipment.

See ISO 4413 and ISO 4414 for hydraulic and pneumatic equipment.

## 6.4.5 Accompanying documents (in particular – instruction handbook)

### 6.4.5.1 Contents

The instruction handbook or other written instructions (for example, on the packaging) shall contain, among others, the following:

- a) information relating to transport, handling and storage of the machine, such as
  - 1) storage conditions for the machine,
  - 2) dimensions, mass value(s), position of the centre(s) of gravity, and
  - 3) indications for handling (for example, drawings indicating application points for lifting equipment);
  
- b) information relating to installation and commissioning of the machine, such as
  - 1) fixing/anchoring and dampening of noise and vibration requirements,
  - 2) assembly and mounting conditions,
  - 3) space needed for use and maintenance,
  - 4) permissible environmental conditions (for example, temperature, moisture, vibration, electromagnetic radiation),
  - 5) instructions for connecting the machine to power supply (particularly on protection against electrical overloading),
  - 6) advice on waste removal/disposal, and
  - 7) if necessary, recommendations related to protective measures which have to be implemented by the user – for example, additional safeguards (see Figure 2, Footnote d), safety distances, safety signs and signals;
  
- c) information relating to the machine itself, such as
  - 1) detailed description of the machine, its fittings, guards and/or protective devices,
  - 2) the comprehensive range of applications for which the machine is intended, including prohibited usages, if any, taking into account variations of the original machine if appropriate,
  - 3) diagrams (especially schematic representation of safety functions),
  - 4) data on noise and vibration generated by the machine, and on radiation, gases, vapours and dust emitted by it, with reference to the measuring methods (including measurement uncertainties) used,
  - 5) technical documentation of electrical equipment (see IEC 60204), and
  - 6) documents attesting that the machine complies with mandatory requirements;
  
- d) information relating to the use of the machine, such as that related to or describing
  - 1) intended use,
  - 2) manual controls (actuators),
  - 3) setting and adjustment,
  - 4) modes and means for stopping (especially emergency stop),
  - 5) risks which could not be eliminated by the protective measures implemented by the designer,
  - 6) particular risks which can be generated by certain applications, by the use of certain fittings, and about specific safeguards necessary for such applications,
  - 7) reasonably foreseeable misuse and prohibited applications,
  - 8) fault identification and location, for repair and for restarting after an intervention, and
  - 9) personal protective equipment needed to be used and the training that is required;



- e) information for maintenance, such as
  - 1) the nature and frequency of inspections for safety functions,
  - 2) specification of the spare parts to be used when these can affect the health and safety of operators,
  - 3) instructions relating to maintenance operations which require a definite technical knowledge or particular skills and hence need to be carried out exclusively by skilled persons (for example, maintenance staff, specialists),
  - 4) instructions relating to maintenance actions (replacement of parts, etc.) which do not require specific skills and hence may be carried out by users (for example, operators), and
  - 5) drawings and diagrams enabling maintenance personnel to carry out their task rationally (especially fault-finding tasks);
- f) information relating to dismantling, disabling and scrapping;
- g) information for emergency situations, such as
  - 1) the operating method to be followed in the event of accident or breakdown,
  - 2) the type of fire-fighting equipment to be used, and
  - 3) a warning of possible emission or leakage of hazardous substance(s) and, if possible, an indication of means for fighting their effects;
- h) maintenance instructions provided for skilled persons [item e) 3) above] and maintenance instructions provided for unskilled persons [item e) 4) above], that need to appear clearly separated from each other.

#### **6.4.5.2 Production of instruction handbook**

The following applies to the production and presentation of the instruction handbook.

- a) The type font and size of print shall ensure the best possible legibility. Safety warnings and/or cautions should be emphasized by the use of colours, symbols and/or large print.
  - b) The information for use shall be given in the language(s) of the country in which the machine will be used for the first time and in the original version. If more than one language is to be used, each should be readily distinguished from another, and efforts should be made to keep the translated text and relevant illustration together.
- NOTE:** In some countries the use of specific language(s) is covered by legal requirements.
- c) Whenever helpful to the understanding, text should be supported by illustrations. These illustrations should be supplemented with written details enabling, for example, manual controls (actuators) to be located and identified. They should not be separated from the accompanying text and should follow sequential operations.
  - d) Consideration should be given to presenting information in tabular form where this will aid understanding. Tables should be adjacent to the relevant text.
  - e) The use of colours should be considered, particularly in relation to components requiring quick identification.
  - f) When information for use is lengthy, a table of contents and/or an index should be provided.
  - g) Safety-relevant instructions which involve immediate action should be provided in a form readily available to the operator.

### **6.4.5.3 Drafting and editing information for use**

The following applies to the drafting and editing of information for use.

- a) Relationship to model: the information shall clearly relate to the specific model of machine and, if necessary, other appropriate identification (for example, by serial number).
- b) Communication principles: when information for use is being prepared, the communication process “see – think – use” should be followed in order to achieve the maximum effect and should follow sequential operations. The questions, “How?” and “Why?” should be anticipated and the answers provided.
- c) Information for use shall be as simple and as brief as possible, and should be expressed in consistent terms and units with a clear explanation of unusual technical terms.
- d) When it is foreseen that a machine will be put to non-professional use, the instructions should be written in a form that is readily understood by the non-professional user. If personal protective equipment is required for the safe use of the machine, clear advice should be given, for example, on the packaging as well as on the machine, so that this information is prominently displayed at the point of sale.
- e) Durability and availability of the documents: documents giving instructions for use should be produced in durable form (i.e. they should be able to survive frequent handling by the user). It can be useful to mark them “keep for future reference”. Where information for use is kept in electronic form (CD, DVD, tape, hard disk, etc.), information on safety-related issues that need immediate action shall always be backed up with a hard copy that is readily available.

# Emissions

The noise emission, measured in accordance with EN ISO 15744, using, as basic standards, EN ISO 3744 and EN ISO 11203, is as follows:

- A-weighted sound pressure level  $L_{pA} = 99.3 \text{ dB(A)}$  and its uncertainty  $K_{pA} = 3\text{dB(A)}$
- A-weighted sound power level  $L_{WA} = 110.3 \text{ dB (A)}$  and its uncertainty  $K_{WA} = 3\text{dB(A)}$
- Operating conditions: No load

**NOTE 1:** The sum of a measured noise emission value and its associated uncertainty represents an upper boundary of the range of values, which is likely to occur in measurements.

The declared vibration emission value and its uncertainty measured in accordance with EN ISO 28927-2, is as follows:

- The declared vibration emission value  $a_{hd} = 1.10 \text{ m/s}^2$  and its uncertainty  $K = 1.50 \text{ m/s}^2$
- The declared vibration total value has been measured in accordance with a standard test method and may be used for comparing one tool with another.
- The declared vibration total value may also be used in a preliminary assessment of exposure
- The vibration emission during actual use of the tool can differ from the declared total value depending on the ways in which the tool is used

Identify safety measures to protect the operator that are based on an estimation of exposure in the actual conditions of use (taking account of all parts of the operating cycle such as the times when the tool is switched off and when it is running idle in addition to the trigger time).

# jGun 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 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.

## THE NEW PATENTED SAFETY LEVER

This patented safety mechanism drastically reduces the chance for operator error which can lead to safety risks.

The lever must be depressed while pulling the trigger, thereby ensuring that the tool operator keeps hands away from pinch points.



## Reaction Arm or HYTORC 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 HYTORC Washer system can be used for all applications instead of reaction arm.

Figure 2. HYTORC Washer and Driver



**WARNING!**

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

**NOTE:**

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

## 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 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

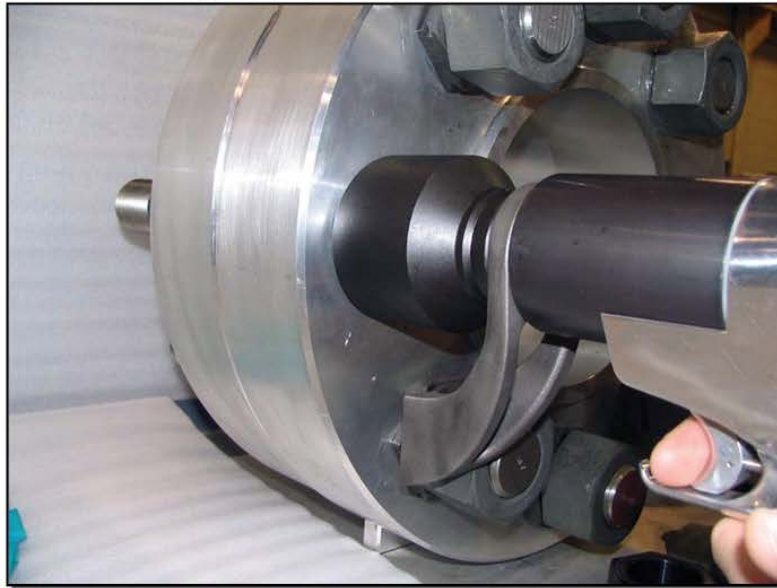




## Key Operating Safety Points

- 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).



### **!! CAUTION !!**

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.

## Setting a Torque Value

1. Determine the torque value for the fastener to be tightened, as shown in the Bolt Torque Specifications table below.

Table 1 - Bolt Torque Specifications

SAE1 SAE2 30,000PSI	ASTM 193 Grade B7 Bolt	Gr. 7 A/F Heavy Hex Nut	FootPounds	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

NOTE: The Data Above is based on bolts lubricated to manufacturer's specifications. Due to a variation in friction, HYTORC recommends 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 (Tighten) or right (Loosen).

Figure 9. jGun Drive Direction Lever



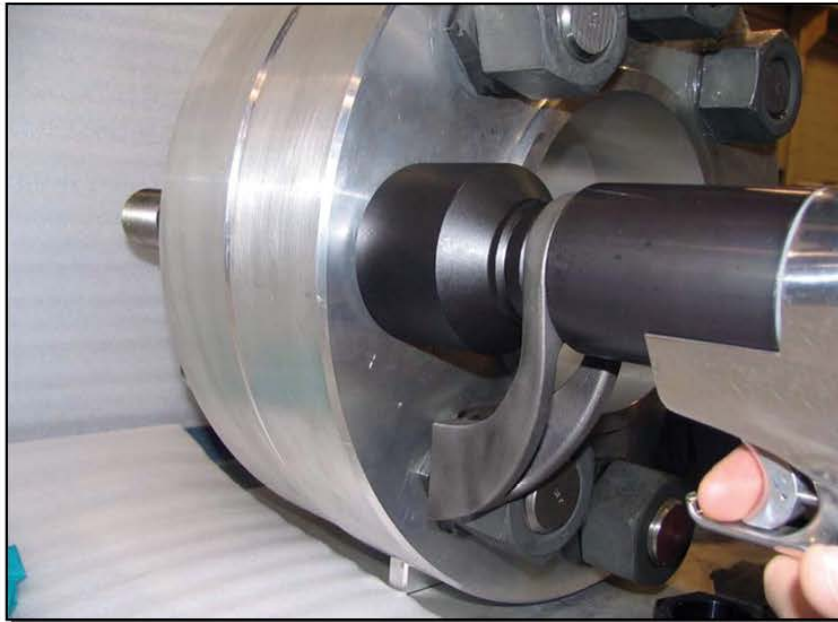
3. Be sure the lever is fully engaged in either direction before operating the gun.

## 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 HYTORC 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

HYTORC 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 jGun 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 HYTORC for a minimal fee.

For the latest torque conversion charts please visit our website: [www.hytorc.com/pneumatic](http://www.hytorc.com/pneumatic).

# jGun® DUAL SPEED Pneumatic Torque Tool

The jGun® DUAL SPEED 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 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 12. jGun® DUAL SPEED



## Shifting Between Modes

The DUAL SPEED gun has two settings: High Speed and Maximum Torque.

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



### High Speed Setting (NEW STYLE SHIFTER COLLAR)

- To shift into high speed mode, push shifter collar down towards the nose of the gun and turn counter-clockwise

### Maximum Torque Setting (NEW STYLE SHIFTER COLLAR)

- To return to Torque mode, simply turn the shifter collar clockwise



## 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. To ensure the shifter is fully engaged in “torque” the red line should be visible and when fully engaged in “run down” the blue line should be visible. **If neither colored line is visible then the shifter is NOT fully engaged and the tool is NOT yet ready for use.** 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 8.



## !! 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 jGun® DUAL SPEED 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 jGun® DUAL SPEED with a reaction arm, torque the nuts to the desired load.



### **!! CAUTION !!**

REMEMBER, A REACTION ARM SHOULD ALWAYS 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 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 jGun® DUAL SPEED 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

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 14. 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.
- Analog gauges are standard to our FRL units. Digital gauges are not recommended for certain applications. Please consult a Technical Representative before using a digital gauge unit.

## 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.
- 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.

### 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.
- 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. Using a different length hose is only recommended after re-calibration of the tool with the desired length hose and after a new calibration certificate is issued.

## 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.
  - a. 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 15. 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 16. Detaching FRL Reservoir



Figure 17. FRL Unit – Lubricator 2/3 Full of Oil



- e. If needed, refill the reservoir as described on page 21.
- 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.
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 analog gauge to settle.  
(Pressure Valve is regulated not to exceed 90 PSI)

Figure 18. Adjusting FRL Regulator



## 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 19. 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.



## Anti-Explosion Static Dissipative Hose

The jGun is certified to operate in a gas and dust explosive environment with the following rating:

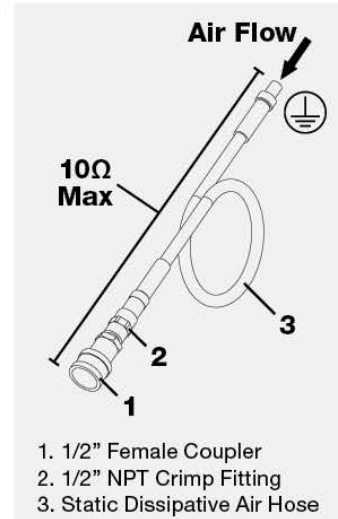
The jGun is certified to operate in a gas and dust explosive environment when used with the with a special static dissipative hose as follows, (See Figure 20):

- Greater than 10ohm resistance equals failure
- Hose connection at air source inlet should be coupled to an earth ground to dissipate static electricity

To order use the following number code:

**HYTORC P/N: JGUN-FRL HOSE ##-ATEX** (Where ## = Hose Length (Ft.))

Figure 20. Static Dissipative Hose



## HYTORC Washer Overview

The HYTORC Washer makes having a Reaction Arm unnecessary. It is sold and distributed exclusively by HYTORC. The HYTORC Washer is a washer that fits under a standard nut and is used in conjunction with the HYTORC Washer Driver. The nut is driven by the inner sleeve of the drive. The reaction of the tool is transmitted to the outer sleeve of the HYTORC Washer drive.

Figure 21. HYTORC Washer and Driver



Safety increases as there are no external moving parts. The system provides a universal HYTORC reaction point for all applications, making custom reaction arms unnecessary. The fact that the tightening and the reaction takes place in the same axis, eliminates lateral forces, balances surface friction and increases bolt load accuracy.

Figure 22. 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**

- Always use the appropriately sized HYTORC Washer for the nuts and bolts you use.
- All specifications of the connection (screw size, material, seal type, etc.) must be coordinated.
- When installing the HYTORC Washer, use only original HYTORC accessories. Never use a wrench or other torque drive.

## **HYTORC Washer Assembly, Use and Service (SETUP)**

Correct preparation and use of HYTORC Washers are a prerequisite for good rundown and for safe handling.

### **Important Preparation Steps for the HYTORC Washer**

- Before using the HYTORC Washer the connection and the connection elements must be carefully checked and cleaned.
- The HYTORC Washer must be completely dry and free from oil and grease.
- The nut to be mounted above the HYTORC Washer must be lubricated according to the specifications and application requirements.

## Important Installation Steps for the HYTORC Washer

- Slide bolts through the bolt hole.
- Determine which side of the connection is more suitable for fastening and tightening the bolts. (Working space for bolting, lighting, accessibility).
- Install the clean, dry nut on the opposite side from which you want to tighten.
- Install the HYTORC Washer on the side which you want to tighten by rotating the bolt clockwise until it is hand tight.
- Now install the lubricated nut (on the same side as the HYTORC Washer) by turning it clockwise until it is hand tightened against the HYTORC Washer.

Figure 23. HYTORC Washer Installed



### **CAUTION**

For a correct installation only 3 to 4 threads should be seen beyond the nut to be tightened.

Once all the bolts are prepared following the previous instructions for assembly, tighten the nuts using the HYTORC Washer Driver.

Figure 24.  
Aligning HYTORC Washer Socket Set Screw with Machined Recess in jGun Splines



8. Tighten the set screw.

Figure 25. Tightening HYTORC Washer Set Screw



## Tightening with the HYTORC Washer

- Put the tool in tightening mode.
- Put the tool in HYTORC Washer mode (Refer to the Options section)
- Place the HYTORC Washer Driver on the battery powered tool and tighten the set screw.
- Engage the HYTORC Washer Driver and tool with the nut by placing it over the top of the bolt to be tightened.
- Repeat the steps for tightening a bolt as shown for standard torque in this manual.

## jGun Maintenance and Troubleshooting Tips

1. Only use your **jGun®** with a factory-specified FRL unit. The FRL unit is designed to filter out dirt, drain water and lubricate the air motor.
2. Always check and drain the water bowl on your FRL unit.
3. Always check and fill up the oil bowl on your FRL unit. Set the oil drip to one (1) drop every ten (10) seconds. Using your **jGun®** 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 **jGun®**.
5. Check the female coupler on your FRL unit's hose and the male coupler on your **jGun®** for dirt. Dirt entering your **jGun®** will result in air motor damage.
6. Before connecting an external air supply to your FRL 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 **jGun®**'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 **jGun®**'s back cover gasket for air leaks. An air leak will result in inaccurate torque.




# HYTORC WORLD HEADQUARTERS

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THE HYTORC UNIVERSE IS MADE UP OF  
OVER 1,000 TRAINED BOLTING SPECIALISTS  
TO SUPPORT YOUR BOLTING NEEDS IN  
OVER 100 COUNTRIES.

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Locate your nearest HYTORC representative:

[HYTORC.COM/WORLD](https://www.hytorc.com/world)