

# Bolting Solutions to Reduce Hand Injuries

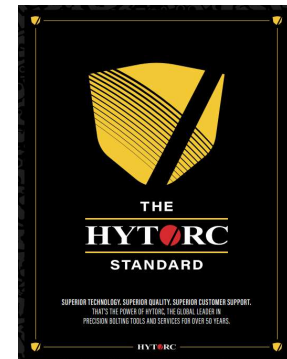
Presented By:  
Jay B. Knudsen – PEG Oil and Gas Growth Manager

**HYTORC**

The World's Most Trusted Industrial Bolting Systems

# HYTORC Background

- *Invented Hydraulic Torque Tools Over 50 Years Ago*
- *Continuously Innovating to Make Bolting Safer and Easier*
- *Headquartered in Mahwah, NJ*
- *Over 500 Dedicated Sales Representatives Worldwide*
- *Mobile Van Technicians with Repair and Calibration Capabilities around the World*
- *Tooling can be Purchased or Rented*
- *Tool Kitting Available*



# HYTORC Mission Statement

HYTORC's Mission is to Optimize Safety, Quality and Schedule in Industrial Bolting Through Innovative Solutions and an Unyielding Commitment to Customer Satisfaction



# HYTORC Tool Types

- *Hydraulic Square Drive Tools*
- *Hydraulic Low Clearance Tools*
- *Battery Driven Tools*
- *Pneumatic Tools*
- *Digital Power Packs*



Square Drive  
-Hydraulic-



Low Clearance  
-Hydraulic-



Square Drive  
-Battery Power-



Power Unit  
-Hydraulic-



Square Drive  
-Pneumatic-

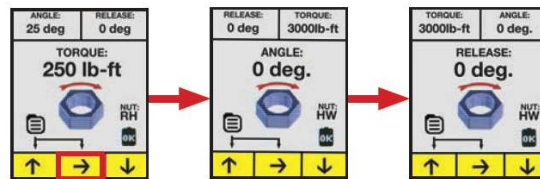
# Data Collection Techniques

## Advancing Quality and Traceability with Data Collection

- Available for Hydraulic and Battery Torque Tools
- Data Output Through USB & Bluetooth Connectivity
- Capable of Preprogramming Bolting Routines & Sequences
- Torque and Rotational Angle Output Control
- Torque and Rotation Angle Monitoring and Recording
- Compatible with HYTORC Sockets & Extensions
- Compatible with HYTORC Self Reacting Fasteners
- Standardized Soft Key Driven 3 Button Graphical User Interface

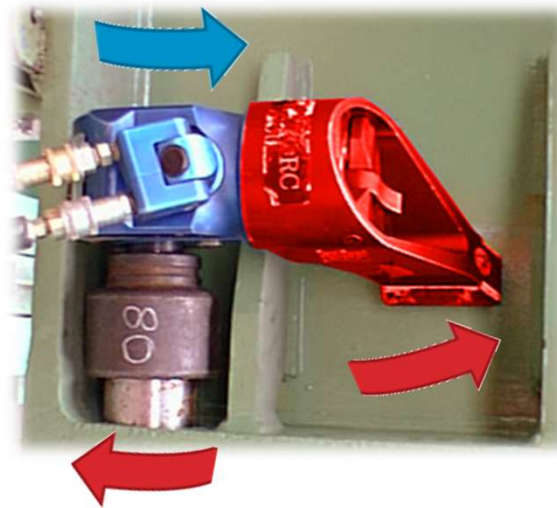


Increase Value      Go to Next Screen      Decrease Value



# Torque Tool Reaction Arms

## *Tool Side Load & Reaction Arms*



# Torque Tool Forces

$$T = F \times D$$

Conventional Bolts  
Increase “D” distance



Example:  
(T) 400 ft-lbs = (F)100 lbs x (D) 4'

Industrial Bolts  
Increase “F” Force



Example:  
(T) 400 ft-lbs = (F)400 lbs x (D) 1'

# Torque Tool Forces

$$T = F \times D$$



For #10 Wrench, 10k ft-lbs



$F = 10,000 \text{ lb at } 1\text{ft}$

Industrial Bolt Torque could range from:  
10,000 ft-lbs – 120,000 ft-lbs

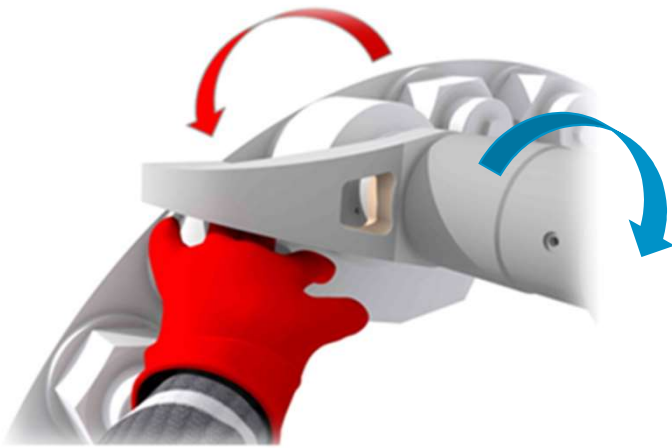
If we alter “D” we would need wrench lengths from:  
100ft to 1,200ft Long “D” while applying 100 lbs of force.

Industrial Tools that Create 10,000 – 120,000 ft-lbs  
Have Reaction Arm Length’s from  
1 foot to 3 feet  
So they need from 10,000lb to 40,000lbs of “F”



# Torque Tool Forces

Understanding Tool Operator Risk Associated with High Levels of Force with Industrial Torque.



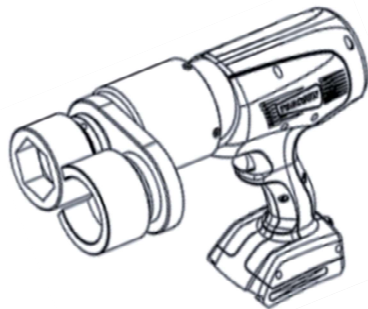
Reaction Arm



Backup Wrench

# Torque Tool Forces

## Strategies & Tooling to Reduce Exposure to Forces and Injury Risk



Reaction Cup Fixtures

Backup & Reaction Washers

# HYTORC Washers

## **HYTORC Washer System**

*Invented to Eliminate Reaction Arm Injuries*



### **Reaction Washer**

*Knurled on Bottom Surface*



### **Backup Washer**

*Knurled on Top & Bottom*



## **HYTORC Washer**

- Eliminates the use of Reaction Arms
- Reduces the Chances of Hand Injury
- Washer can be placed under any Nut or Bolt Head
- Backup Washer Remove the Need for a Backup Wrench
- Stocked In ASTM F436 Material
- ASTM Standard Coming Soon - F3394
- Stocked from 1/2" – 3" (M12 – M80)
- A Special Socket Adapts to All HYTORC Square Drive and Low Clearance Tool Types

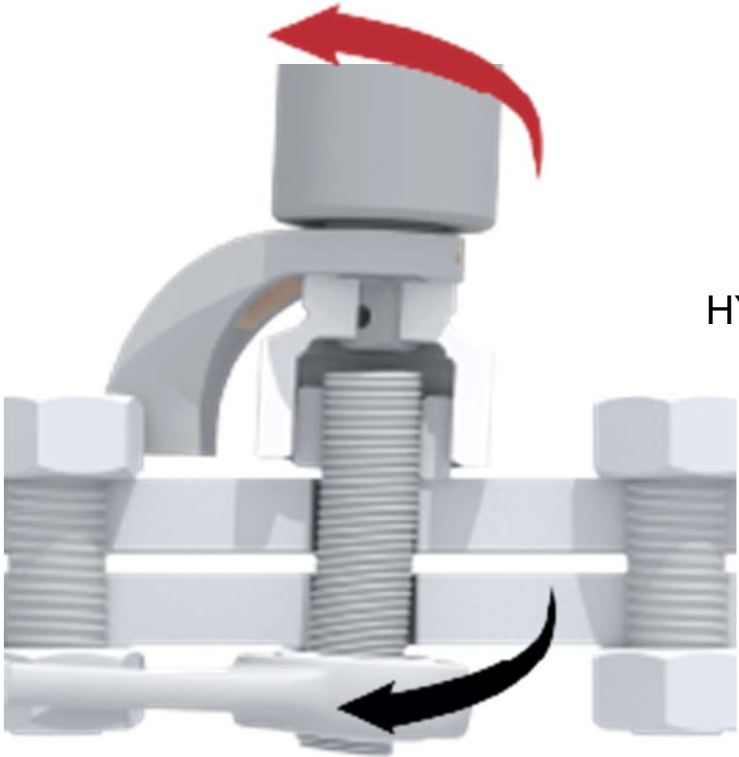
# HYTORC Washer

## ***HYTORC Washer Functionality***

*Removes Reaction Arms, Side Load and Backup Wrenches*



**CONVENTIONAL SETUP**

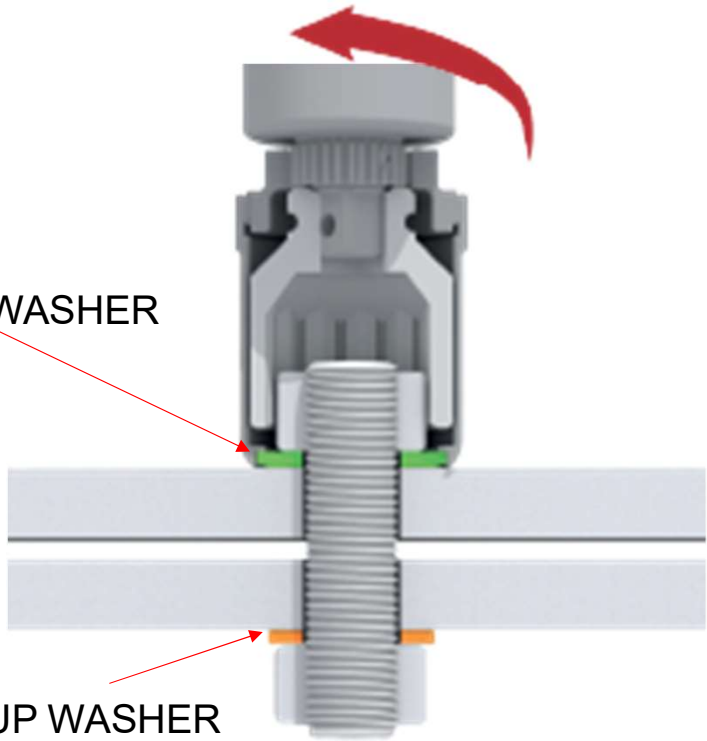


**HYTORC WASHER SETUP**

HYTORC WASHER

BACKUP WASHER

**HYTORC**



# HYTORC Washer

## ***HYTORC Washer Functionality***

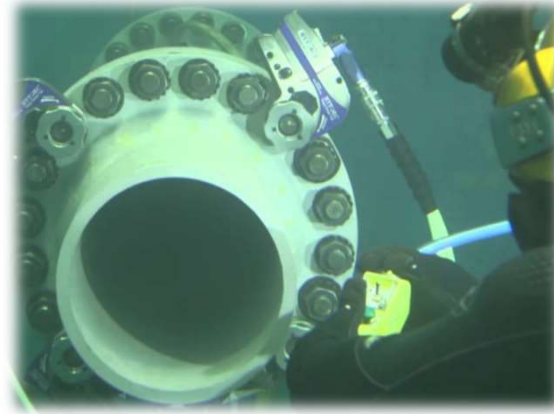
***Removes Reaction Arms, Side Load and Backup Wrenches***

- ***Reaction & Backup Washers Remove Side Load***
- ***Lowers Stress On Bolts During Torque Operations***
- ***Removing Side Load Makes it Easier to Use Extensions***
- ***Marring or Damage from Adjacent Equipment from Reaction Arms is Avoided***
- ***Reaction Washers are Produced from High Strength Hardened Materials***
- ***Backup Washers Remove the Need for an Operator on the Backside of the Flange Reducing Manpower and increasing safety***
- ***Reaction Washers can Make it Easy to Conduct Parallel Bolt Loadings***
- ***Reaction Washers are Functionally Identical to Flat Washers***
- ***Wrench Life is Extended by Removing High Levels of Side Load***



# HYTORC Washer Installs

## Reaction Washers with Various Tools



# HYTORC Washer Installs

## Reaction Washers with Square Drive Tools

Exchangers/Pumps/Valves/Turbines/Reactors/Pressure Vessels



### Reduction Time Exchanger Nozzle (48 Bolts)

HYTORC: 3 hours 0 minutes (*Leak Free*)

Past: 7 hours 15 minutes (*Ultrasonic & Leaking*)

**Savings: 4 hours 15 minutes**



**Thank You for Attending today's Webinar On:  
Bolting Solutions to Reduce Hand Injuries**

**QUESTIONS?**

Quotes or costing inquiries

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