



# **PINNACLE**

**DRILLING PRODUCTS**



**MANUAL-6620-0-3, 2024-09**

**BREAKOUT BENCH 400,000 FT-LB**

## Table of Contents

1.0	Summary of Features
2.0	Technical Specifications
3.0	Transportation
4.0	Operation
5.0	Maintenance
6.0	Parts List

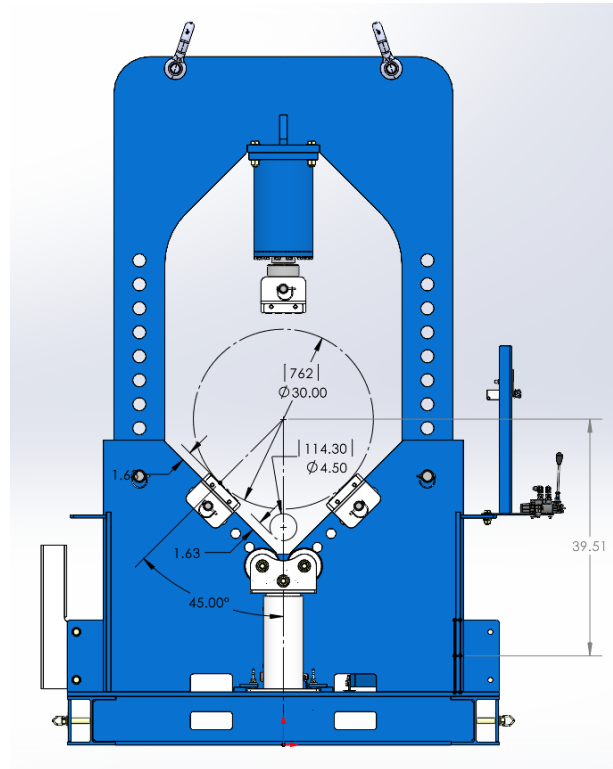
### 1.0 Summary of Features

Breakout Bench is used to make and break threaded pipe connections, generally for assembly & disassembly of DTH Hammer chucks, top subs and shock absorbers in the horizontal position with the use of an overhead crane, hydraulic power unit and breakout wrenches. It is able to generate 400,000 ft-lb of torque and can grip diameters from 4-1/2" up to 30" with the standard jaws. Roller rams are used to help lift and rotate hammers to position the wrench against the torque cylinder.

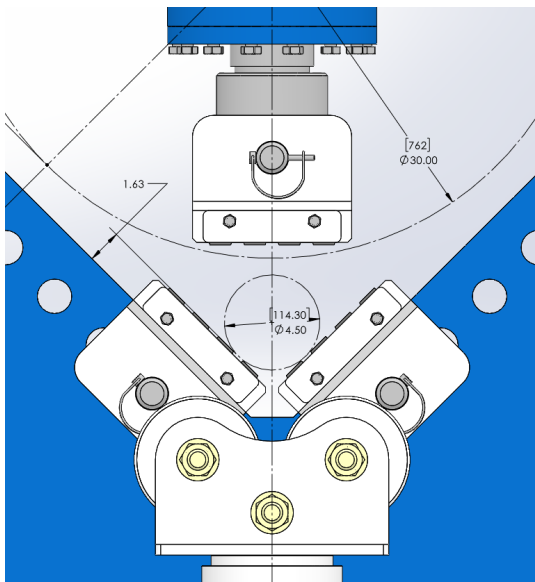
### 2.0 Technical Specifications

Dimension Transport:	96" L X 94" W X 83" H
Dimension Operation Max:	126" L X 94" W X 115" H
Weight:	7700 lb
Torque Max:	400,000 ft-lb
Gauge Accuracy:	Grade B, ( $\pm 3-2-3\%$ )
Diameter Grip Range:	30" to 4-1/2"
Hydraulic Pressure Working / Max	2500 psi / 3000 psi
Hydraulic Flow Working / Max:	3 gpm / 12 gpm
Hydraulic Cylinder 1	200mm bore x 150mm stroke (288 cu-in)
Hydraulic Cylinder 2	3" bore x 8" stroke (57cu-in)
Hydraulic Oil Required	690 cu-in (2.99 gal)
Hydraulic Hose:	3/8" FORSAFLEX BN250-06

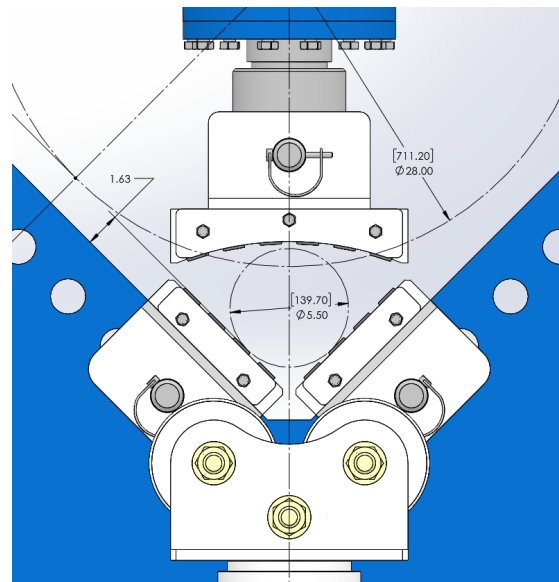




Arch clamp max grip  $\text{Ø}30''$



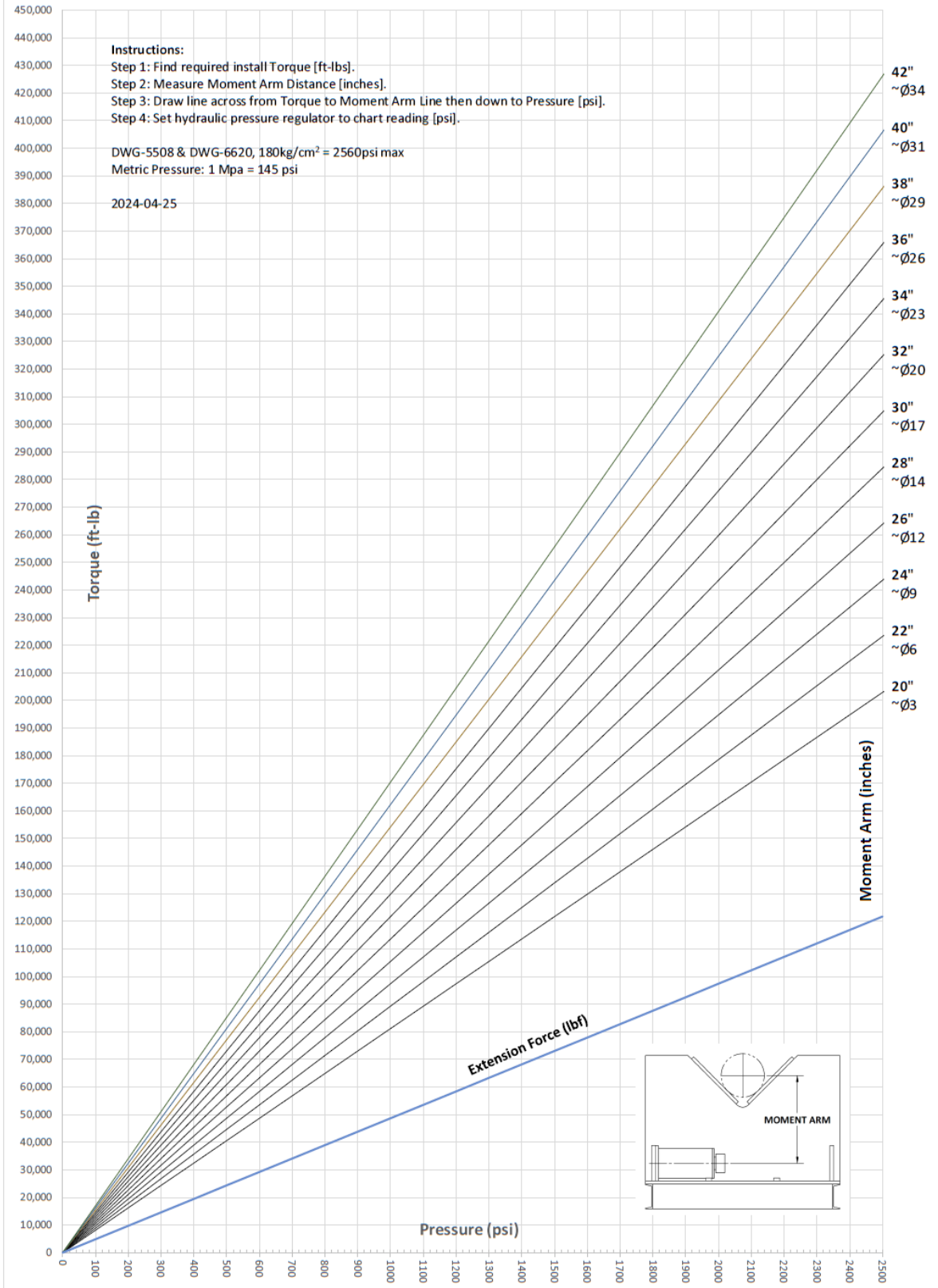
Arch with 6620-4-1-0, JAW FLAT-4



Arch with 6620-4-2-0, JAW D28-6



## Pressure vs Torque Chart For 200mm Bore Cylinder Extension



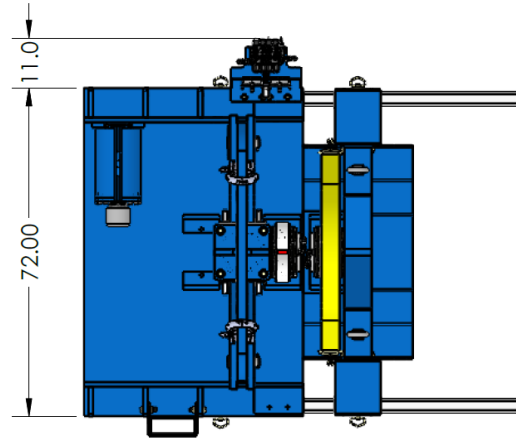
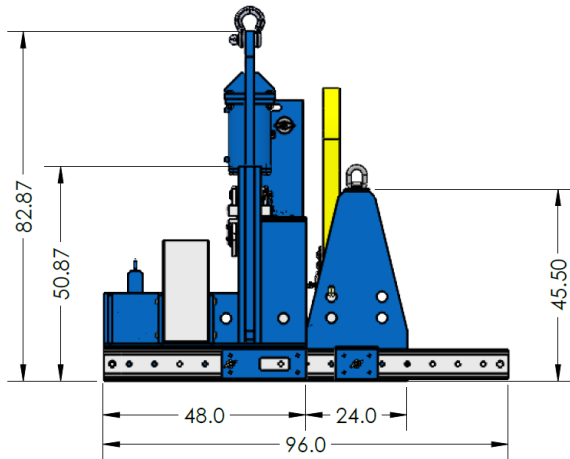
**Example Make Up Torques**

Suggested make up torques for DTH hammers and shock absorbers will vary significantly based off part design, thread type and size used. Consult DTH hammer and shock absorber manufacturer for actual torque values to avoid damage or loosening of connection during use. Below values shown as generic example only.

4"	2500 ft-lb
5"	6000 ft-lb
6"	7000 ft-lb
8"	10,000 ft-lb
10"	12,000 ft-lb
12"	18,000 ft-lb
18"	50,000 ft-lb
24"	80,000 ft-lb
30"	100,000 ft-lb

### 3.0 Transportation

Breakout bench should be fully retracted, pinned and all loose items secured before moving. It may be lifted using the supplied 17T screw pin shackles or forklift pockets.



## 4.0 Operation

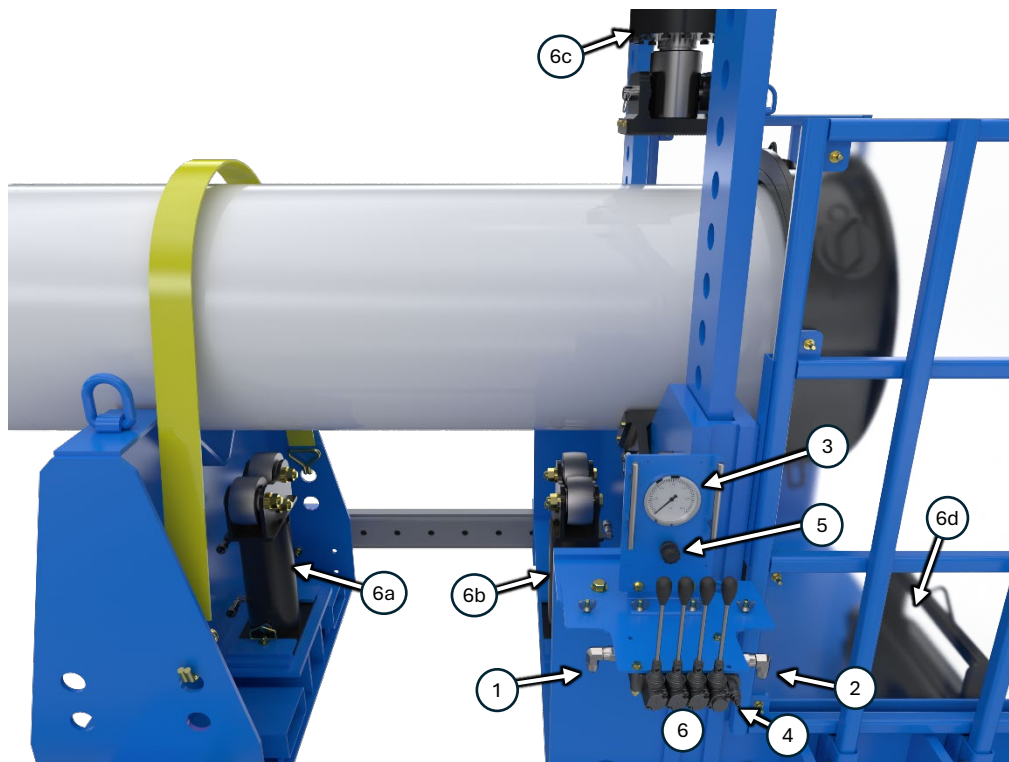
### 4.1 Safety Precautions

**Danger:** Debris may unexpectedly fly off broken or loose parts such as wrenches, jaw insert teeth, hammers, etc. during use when parts are under load. Wear safety glasses & steel toe boots. Operate in an isolated location. Setup debris barriers when possible. Do not exceed 2500 psi or 120,000 lbf or 400,000 ftlb. Use at your own risk.

**Caution:** Hydraulic components may leak, burst or spray when loose or damaged.

### 4.2 Control Panel and Hydraulic Setup

1. Connect outlet to tank, 1/2" quick-disconnect nipple, QAN88FP.
2. Connect inlet to HPU 2500psi, 3gpm. 1/2" quick-disconnect coupler, QAC88FP.
3. Pressure gauge 3000psi to read torque cylinder pressure.
4. Pressure relief screw on valve bank, set to 2500 psi using 4mm hex key.
5. Adjustable pressure control knob for torque cylinder.
6. Directional Control Valve Bank 4-Spool (left to right)
  - a. Roller Ram Far, Up/Down
  - b. Roller Ram Near, Up/Down
  - c. Arch Cylinder, Extend/Retract
  - d. Torque Cylinder, Extend/Retract



Control Panel and Hydraulic Setup



### 4.3 Torque Procedure

1. Remove arch from vee and place in holder as shown using overhead crane.



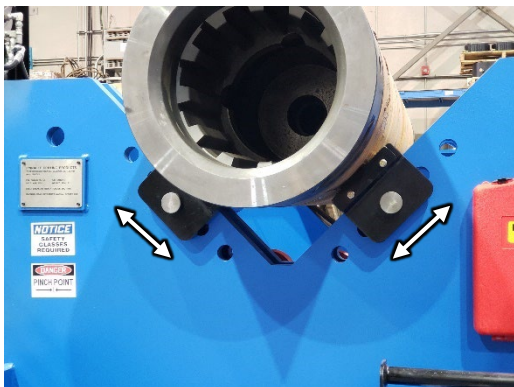
2. Adjust support stand, roller rams and jaw positions to fit hammer length and diameter.

3. Verify all locking pins are fully re-inserted after changes.



4. Place hammer on breakout bench using overhead crane.

5. Use supplied ratchet strap to secure far end from potential tipping on bit end heavy hammers.



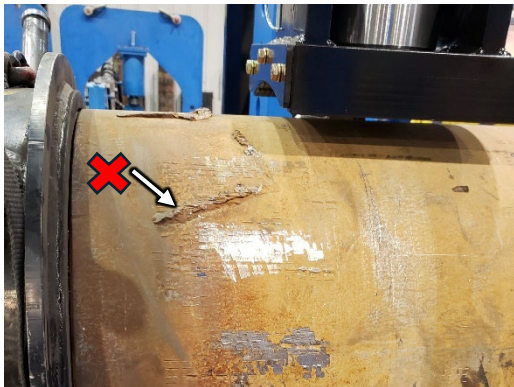
6. Verify vee jaws are best positioned for hammer diameter. Adjust as required.



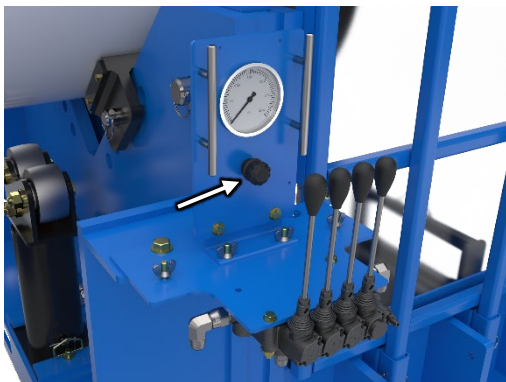


7. Fully retract arch cylinder and place arch back in vee using the lowest pin hole setting possible. Verify 2" pins are fully re-inserted.

8. Lower arch jaw to contact hammer body.

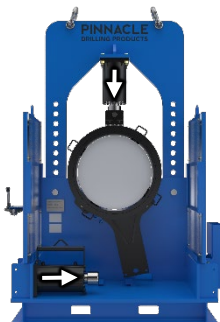


9. Verify 10" long jaw inserts will evenly contact a smooth clean section without high spots, weld marks or debris which will limit grip to only a few teeth. Clean hammer, grind smooth or adjust grip contact position as required.



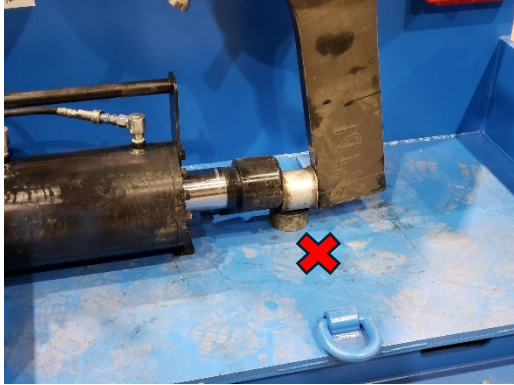
10. Consult DTH hammer manufacturer to determine optimal make and break torques.

11. Consult "Pressure vs Torque Chart" on Page 4 to determine corresponding pressure value. Fully extend Torque Cylinder stroke to build pressure and adjust knob to pressure value.



12. Position breakout wrench as shown over hammer. Depending on wrench design, ensure all loose parts are secured. Do not exceed wrench torque rating.

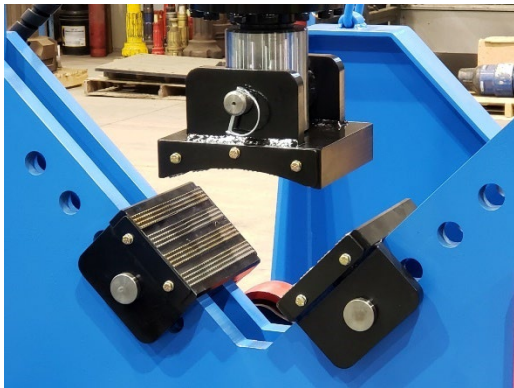
13. Extend Torque Cylinder slowly while monitoring pressure gauge.



14. The use of spacer blocks to artificially extend cylinder stroke is generally not recommended. Loose items may be ejected unexpectedly under load. Use at your own risk. Hammer assembly should be lifted with roller rams and rotated to reset wrench handle angle.



15. Raise arch jaw and lift hammer using roller rams. Rotate hammer to reset wrench handle against retracted Torque Cylinder. Repeat cylinder extension and hammer rotation until pressure and torque values are reached.



16. Inspect jaw insert teeth, insert holders and pins for damage after use. Replace parts as required.

## 5.0 Maintenance

All maintenance should be performed at least once per month.

Check for structural damage, cracked or deformed parts or welds on jaw insert holders, pins & arch. Repair or replace parts as required.

Check jaw inserts for chipped or missing teeth. Replace as required.

Check for hydraulic oil leaks. Tighten fittings as required.