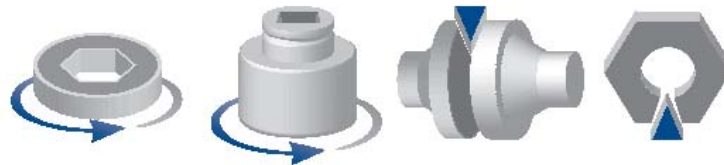




QD 4 SQUARE DRIVE
HYDRAULIC TORQUE WRENCH MANUAL
REVISION 9
2/24/2012

HYDRA*LINKS*
C O N V E R T I B L E B O L T I N G T O O L S



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OPERATIONS / MAINTENANCE MANUAL
MODEL QD4 SQUARE DRIVE

Revision 8

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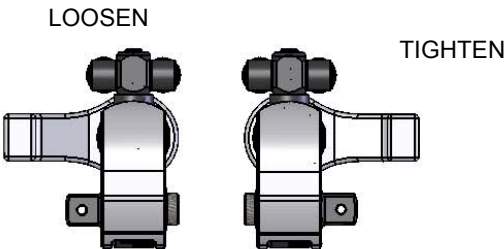
GENERAL

All Bolttech-Mannings Hydraulic Wrenches are supplied completely assembled, ready for use. A hydraulic Power Pack is required to provide the speed and pressure that makes your Wrench System efficient and accurate.

CONNECTING THE SYSTEM

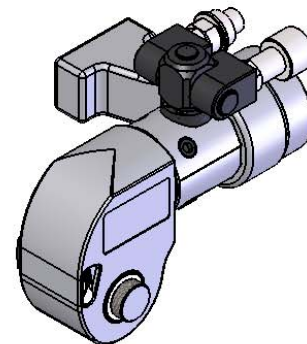
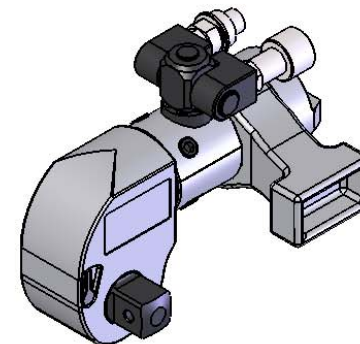
The wrench head and power pack are connected by a 10,000 psi hose assembly which consists of two hoses. One hose has a female connector on each end while the other has male connectors. Connect the twin line hose to the wrench head and pump. Insure the connectors are fully engaged and screwed snugly and completely together.

DRIVE DIRECTION CHANGE FOR SQUARE DRIVE TOOLS ONLY
(to change from loosening to tightening)



Remove the hand wheel in the drive cap which is located on the opposite side of the drive extension and pull the drive out of the tool housing. Place the drive in the desired direction, re-insert the drive cap and secure the hand wheel.

NOTE: The square drives are splined. As you push the spline part of the drive into the tool, align the ratchet and push, while slowly rotating, the square drive into position.



SOFTWARE: SOLID WORKS	DATE	NAME	BOLTTECH We Own the Future of Bolting Technology		
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REACTION ARM

All Bolttech-Mannings Hydraulic Wrenches are equipped with a universal reaction arm. These reaction arms are employed to absorb and counteract reaction forces created as the units operate. The reaction arm should always extend in the same direction of the square drive; however, adjustments may be made to suit your particular application.

To adjust the reaction arm, unscrew the reaction arm retaining clamp and slide the reaction arm off of the housing. Next, rotate the reaction arm to the desired orientation and slide it back onto the housing and secure the retaining clamp.

SETTING TORQUE

With the system fully connected and the proper power supply available, find the desired torque conversion chart supplied for your particular tool model. Read across to the corresponding pressure. This pressure is to be set on the pump. To do so, turn on the pump, press down on the "advance" remote control button and hold, pressure will build up on the gauge. To adjust pressure, loosen the locking ring on the pressure regulator valve and turn the thumbscrew clockwise to increase pressure, counterclockwise to decrease pressure.

NOTE: When decreasing pressure, it is necessary to turn the thumb-screw to a pressure setting BELOW what is desired and gradually increase the pressure to the desired level.

Once the desired pressure is stabilized, re tighten the locking ring.

PRIOR TO BEGINNING TO TORQUE - PRESS DOWN ON REMOTE CONTROL BUTTON AND CONFIRM THE CORRECT PRESSURE HAS BEEN SET.

APPLYING THE TORQUE WRENCH

Place the proper size impact socket on the square drive and secure properly with a locking ring and pin.

Place the tool and the socket on the nut making sure that the socket has fully engaged the nut and that the square drive is fully into the socket.

Make sure the reaction arm is firmly abutted against a stationary object (i.e. an adjacent nut, flange, equipment housing, etc.)

Make sure that the hoses are not placed between the reaction members.

Apply momentary pressure to the system to ensure proper tool placement.

SAFETY PRECAUTIONS

Your Bolttech-Mannings torque wrench is a power tool, and as with any power tool, certain safety precautions should be observed to avoid accidents or personal injury. The following tips will assist you:

. Do not kink the hydraulic hoses, and be sure they're clear of any possible reaction surface during operation.

. Do not use the hoses or any hydraulic connection as a "handle".

. All in-line links are supplied with a boot. The boot is to be used as a reaction surface. Always use a boot with an in-line link, failure to do so will cause permanent damage to the cylinder and void the manufacturer's warranty.

. All square drive links are supplied with a reaction bar. The reaction bar is to be used as a reaction surface. Always use the reaction bar with a square drive link, failure to do so will cause permanent damage to the cylinder and void the manufacturer's warranty.

. Be sure the reaction boot retaining clamp is fully engaged. The reaction bar or boot should be located on a solid, secure reaction point. For added safety, remain clear of the rear of the reaction bar or boot during operation. Also, when initially applying the tool, pressurize the system momentarily; if the tool tends to "ride up" or "creep", stop and re-adjust the reaction bar or boot to a more solid and secure position.

. Always use top quality impact sockets in good condition, which are the correct size and fully engage the nut. Hidden flaws, however, remain a possibility which could cause breakage, so stay clear of sockets during operation.

. In most cases, the tool will allow "hands-free" operation. If the tool must be held or steadied during operation, avoid handling the area around the reaction bar or boot.

. Electric pumps should never be used in any atmosphere which could be considered potentially volatile. If there is any doubt, use an air pump.
At Bolttech, safety is one of our primary concerns. By following these few, simple precautions, you'll be sure to obtain the most beneficial use of your Bolttech-Mannings wrench system in the safest manner possible.

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OPERATING THE WRENCH SYSTEM

By depressing the remote control button, the rear of the tool will be pushed back until its reaction arm contacts its reaction member. Continue to hold down the button as the socket turns until you hear an audible "click" which will signify that the hydraulic cylinder inside the tool is fully extended and will not turn the nut any further. There will be a rapid buildup of pressure to the point of where the pressure was preset prior to applying the wrench.

IMPORTANT: This rapid buildup of pressure does not indicate that this pressure (torque) is being applied to the fastener. It only indicates that the cylinder is fully extended and can not turn the socket further until the tool is retracted to pick up the next tooth on the ratchet wheel.

Releasing the remote control button will retract the cylinder, the tool will automatically reset itself and the operator will hear an audible "click" indicating he can again push the remote control button and the socket will turn. Each time the cylinder is extended and retracted, it is called a cycle. Successive cycles are made until the tool "stalls" at the pre set pressure (torque).

NOTE: Always attempt one final cycle to insure the "stall" point has been reached.

Should the tool "lock on" after the final cycle, push down the remote control button to build pressure. While maintaining this pressure rotate the release mechanism and relieve the pump pressure. This will allow the tool to be easily removed.

LOOSENING PROCEDURES

First, set the pump to 10,000 psi. Change the drive and reaction arm to the loosening mode and apply the tool, assuring the reaction arm abuts squarely off a solid reaction point. Press and hold the remote control button. Pressure will build up as the socket begins to turn. Cycle the wrench until the fastener is loose enough to turn by hand.

If the socket does not turn using the above procedure, it is an indication that you will require the next larger size tool to loosen the fastener.

PREVENTIVE MAINTENANCE

Tool failure does occur. Such failure is most often in the hydraulic connectors or hoses. These items are repairable/replaceable immediately, since they are available universally. Failure of structural members of the tool are quite rare, but replacement parts are available from stock.

Special tools are required for the disassembly of the hydraulic cylinder and drive mechanism.

LUBRICATION: All moving parts should periodically be coated with a good quality molybdenum disulfide grease. Under harsh environmental conditions, cleaning and lubricating should be done more frequently.

HYDRAULIC HOSES: Hoses should be checked for cracks and leaks after each job. Hydraulic fittings can become plugged with dirt and should be flushed periodically.

QUICK-CONNECTS: Fittings should be kept clean and not allowed to be dragged along the ground or floor, as even small particles of dirt can cause internal valves to malfunction. External leakage can be eliminated by applying a fresh coat of good quality sealant to the threads and tightening securely.

SPRINGS: Springs are used for the drive pawl assembly and ratchet device. These springs should be checked twice a year and replaced, if necessary.

HYDRAULIC SEALS: If the cylinder packing should require replacement because of leaks, it is recommended that all other seals and o-rings be replaced at the same time. Seal Kits are readily available.

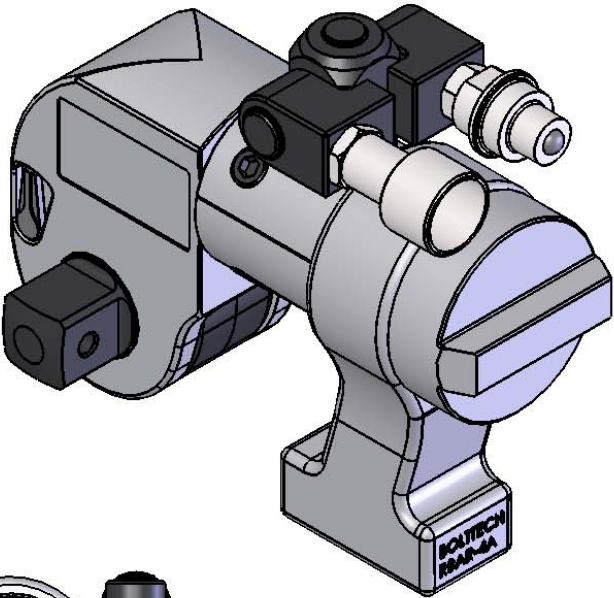
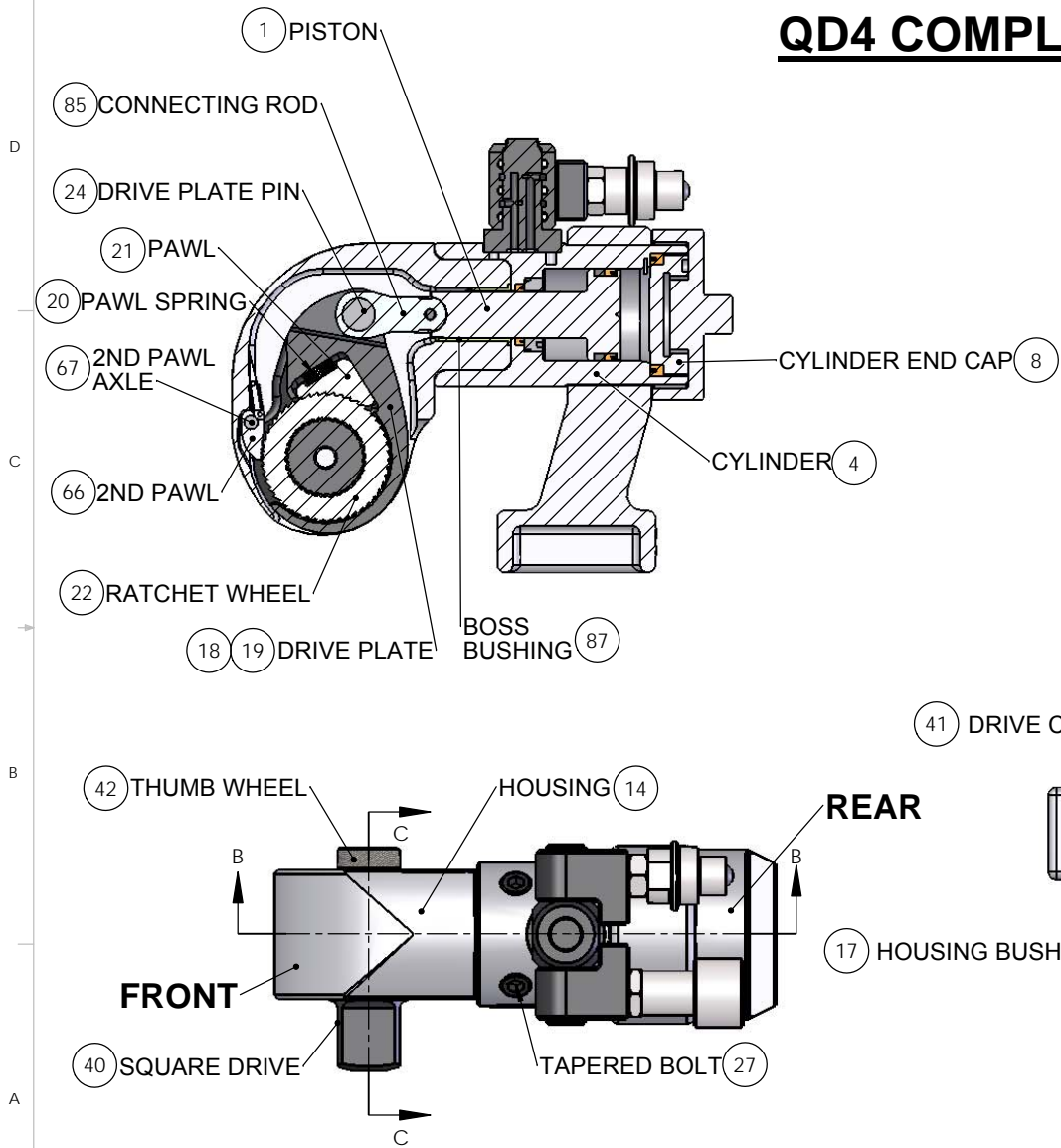
MACHINE PARTS: All components that are included on the tool should be inspected once a year to determine if there are any cracks, chips, or deformities. If so, immediate replacement is required.

CYLINDER BOLTS: Periodically check to see if the cylinder bolts are properly torqued. Torque cylinder bolts in a criss-cross pattern to the following values
QD2 8 ft-lbs
QD4 8 ft-lbs
QD8 15 ft-lbs
QD14 15 ft-lbs
QD30 25 ft-lbs

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QD4 COMPLETE ASSEMBLY

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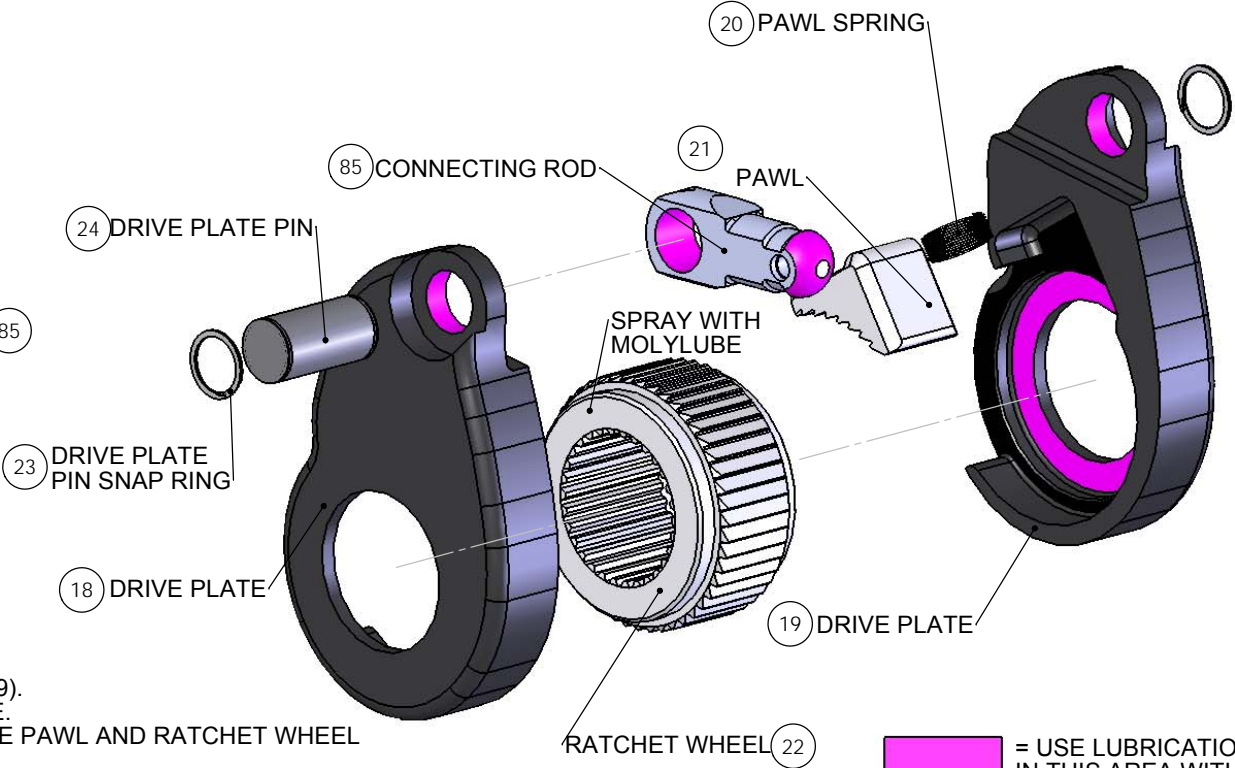
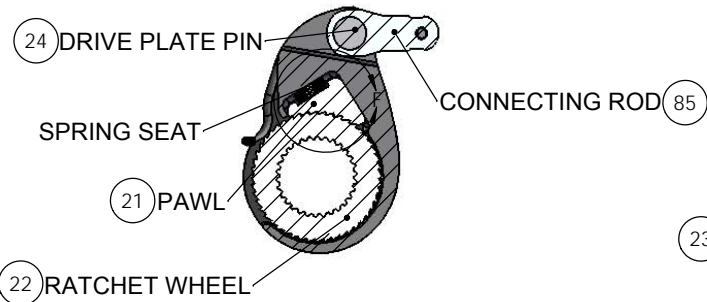
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QD4 DRIVE PLATE ASSEMBLY

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED




DIAGRAM 2A



ASSEMBLY INSTRUCTIONS

1. INSERT PAWL (21) INTO RIGHT-SIDE DRIVE PLATE (19).
 2. PLACE RATCHET WHEEL (22) INTO THE DRIVE PLATE.
 - **NOTE: THE DIRECTION OF THE MESHING TEETH OF THE PAWL AND RATCHET WHEEL MUST BE AS SHOWN IN DIAGRAM 2A.
 3. INSERT PAWL SPRING (20) INTO THE POCKET IN THE RIGHT SIDE DRIVE PLATE.
 4. SLIDE THE LEFT SIDE DRIVE PLATE ONTO THE RATCHET WHEEL HUB.
 5. THE DRIVE PLATE PIN (24) CAN THEN BE INSERTED IN EACH OF THE DRIVE PLATES.
 6. PLACE THE RETAINING RINGS (23) ON THE DRIVE PLATE PIN.
- THIS WILL HOLD THE DRIVE PLATE ASSEMBLY TOGETHER.

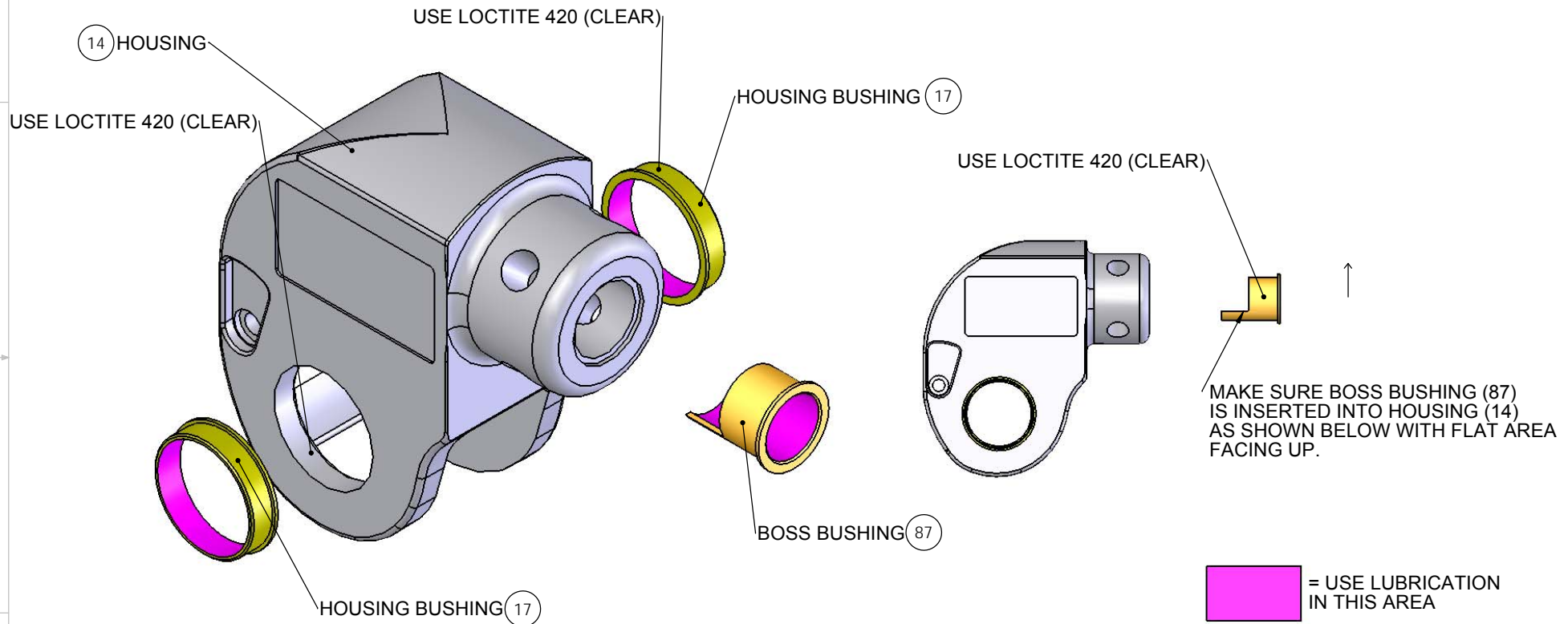
**NOTE: ONCE ASSEMBLED, ONE SHOULD BE ABLE TO ROTATE THE RATCHET WHEEL WHILE HOLDING THE DRIVE PLATES STATIONARY. REVERSE ROTATION OF THE RATCHET WHEEL SHOULD TURN THE ENTIRE ASSEMBLY, WHICH WOULD INDICATE THE TEETH ARE MESHING PROPERLY. IF EITHER OF THE BEFORE-MENTIONED IS NOT THE CASE SOMETHING IS IMPROPERLY ASSEMBLED.

 = USE LUBRICATION IN THIS AREA WITH MOLYCOTE PASTE

SOFTWARE: SOLID WORKS		DATE	NAME	<div><div><div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><d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QD4 HOUSING BUSHING & BOSS BUSHING ASSEMBLY

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED



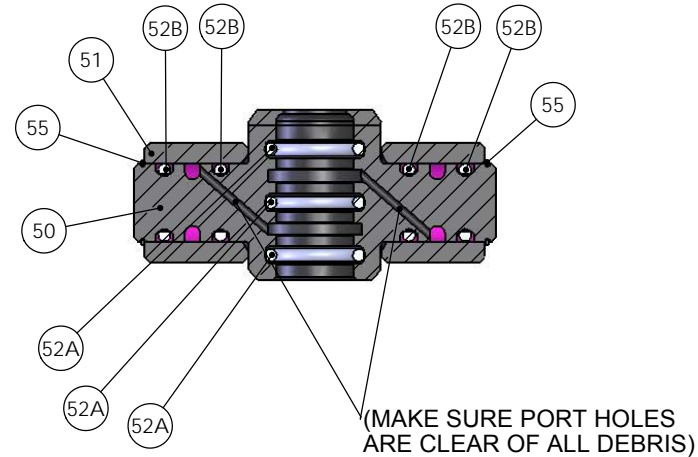
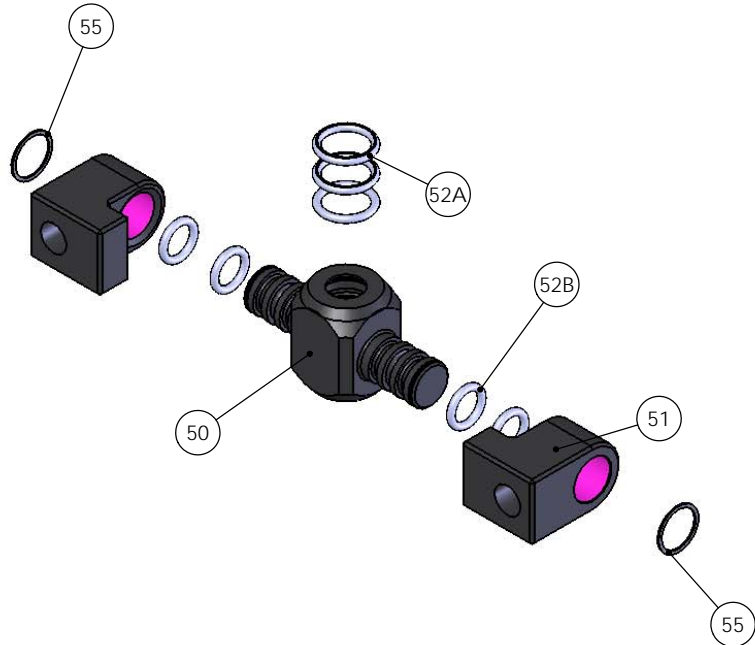
ASSEMBLY INSTRUCTIONS

1. INSERT HOUSING BUSHINGS (17) FROM THE INSIDE OF THE HOUSING (14) WITH THE BUSHING FACING THE DIRECTION SHOWN.
- ** NOTE: HOUSING BUSHING MUST BE FULLY SEATED IN THE HOUSING.**

USE LOCTITE # 420 TO GLUE HOUSING BUSHINGS(17) TO HOUSING(14).
LUBRICATE PARTS AS SHOWN.

SOFTWARE: SOLID WORKS	DATE	NAME	BOLTTECH We Own the Future of Bolting Technology		
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES FRACTIONAL +/- 1/32" ANGULAR +/- 1/2 DEGREE TWO PLACE DECIMAL +/- 0.01 THREE PLACE DECIMAL +/- 0.005	DRAWN		CUSTOMER:		
	CHECKED		TITLE:		
	ENG APPR.				
	MFG APPR.				
	Q.A.				
MATERIAL	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BOLTTECH. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BOLTTECH IS PROHIBITED.		SIZE	DWG. NO.	REV
HEAT TREAT			B		
FINISH			SCALE: 1:4	WEIGHT:	SHEET 7 OF 18

QD4 SWIVEL ASSEMBLY




ASSEMBLY INSTRUCTIONS

1. INSERT SWIVEL POST O-RINGS (ITEM 52A) INTO SWIVEL BODY (ITEM 50) AS SHOWN IN SECTION A-A.
2. SLIDE SWIVEL ARM O-RINGS (ITEM 52B) OVER SWIVEL BODY AS SHOWN IN SECTION A-A
3. SLIDE SWIVELS (ITEM 51) OVER SWIVEL BODY AND SECURE WITH SWIVEL SNAP RINGS (ITEM 55) AS SHOWN IN SECTION A-A.

NOTE: USING A PIECE OF WIRE, MAKE SURE PORT HOLES ARE CLEAR OF DEBRIS.

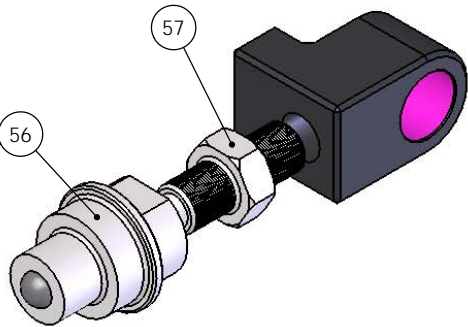
ALL O-RINGS COME IN THE SWIVEL SEAL KIT

 = USE LUBRICATION IN THIS AREA

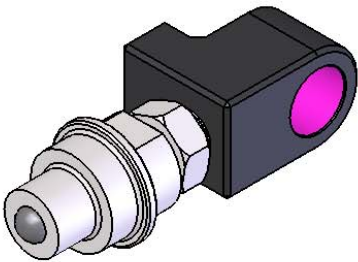
SOFTWARE: SOLID WORKS		DATE	NAME	BOLTTECH We Own the Future of Bolting Technology	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES FRACTIONAL +/- 1/32" ANGULAR +/- 1/2 DEGREE TWO PLACE DECIMAL +/- 0.01 THREE PLACE DECIMAL +/- 0.005		DRAWN		CUSTOMER:	
MATERIAL		CHECKED		TITLE:	
HEAT TREAT		ENG APPR.		SIZE B DWG. NO.	
FINISH		MFG APPR.		REV	
		Q.A.		SCALE: 1:2 WEIGHT: SHEET 8 OF 18	
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QD4 FITTING ASSEMBLY

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED



BEFORE ASSEMBLY



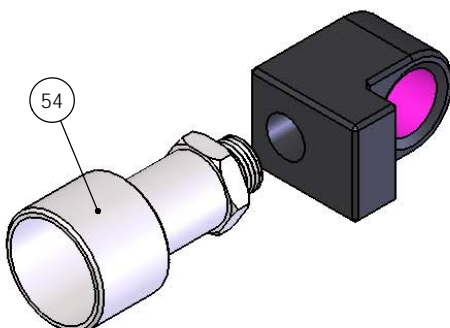
AFTER ASSEMBLY

HIGH PRESSURE (MALE-END)
HYDRAULIC CONNECTOR ASSEMBLY 2HM

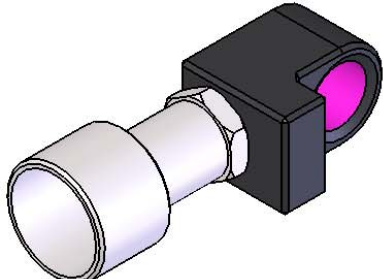
ASSEMBLY INSTRUCTIONS

- 1. THREAD MALE QUICK CONNECT (ITEM 56) INTO NIPPLE (ITEM 57)
- 2. THREAD ASSEMBLED ITEMS 56 & 57 INTO HYDRAULIC SUB-ASSEMBLY 1H.

NOTE:
(THE USE OF SEALING PIPE TAPE ON THREADED PORTIONS OF FITTING IS RECOMMENDED TO ASSURE A PROPER SEAL)



BEFORE ASSEMBLY



AFTER ASSEMBLY

LOW PRESSURE (FEMALE-END)
HYDRAULIC CONNECTOR ASSEMBLY 2HF

ASSEMBLY INSTRUCTIONS

- 1. THREAD FEMALE QUICK CONNECT (ITEM 54) INTO HYDRAULIC SUB-ASSEMBLY 1H.

NOTE:
(THE USE OF SEALING PIPE TAPE ON THREADED PORTIONS OF FITTING IS RECOMMENDED TO ASSURE A PROPER SEAL)

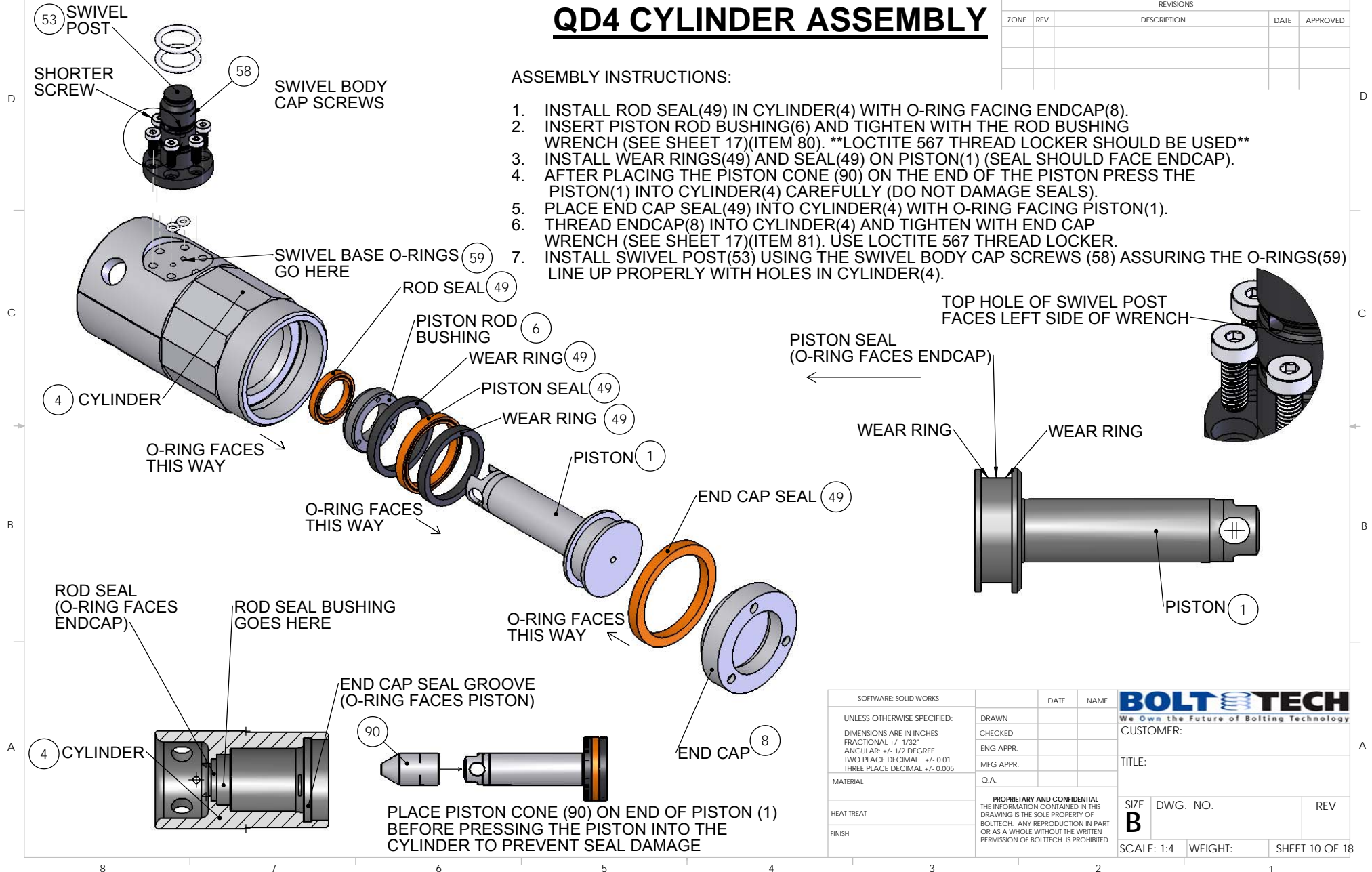
SOFTWARE: SOLID WORKS		DATE	NAME	<div>BOLTTECH</div> <div>We Own the Future of Bolting Technology</div>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES FRACTIONAL +/- 1/32" ANGULAR: +/- 1/2 DEGREE TWO PLACE DECIMAL +/- 0.01 THREE PLACE DECIMAL +/- 0.005		DRAWN		CUSTOMER:			
MATERIAL		CHECKED		TITLE:			
		ENG APPR.					
		MFG APPR.					
		Q.A.					
HEAT TREAT		PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BOLTTECH. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BOLTTECH IS PROHIBITED.			SIZE	DWG. NO.	REV
FINISH					B		
		SCALE: 1:2		WEIGHT:		SHEET 9 OF 18	

QD4 CYLINDER ASSEMBLY

ASSEMBLY INSTRUCTIONS:

1. INSTALL ROD SEAL(49) IN CYLINDER(4) WITH O-RING FACING ENDCAP(8).
2. INSERT PISTON ROD BUSHING(6) AND TIGHTEN WITH THE ROD BUSHING WRENCH (SEE SHEET 17)(ITEM 80). **LOCTITE 567 THREAD LOCKER SHOULD BE USED**
3. INSTALL WEAR RINGS(49) AND SEAL(49) ON PISTON(1) (SEAL SHOULD FACE ENDCAP).
4. AFTER PLACING THE PISTON CONE (90) ON THE END OF THE PISTON PRESS THE PISTON(1) INTO CYLINDER(4) CAREFULLY (DO NOT DAMAGE SEALS).
5. PLACE END CAP SEAL(49) INTO CYLINDER(4) WITH O-RING FACING PISTON(1).
6. THREAD ENDCAP(8) INTO CYLINDER(4) AND TIGHTEN WITH END CAP WRENCH (SEE SHEET 17)(ITEM 81). USE LOCTITE 567 THREAD LOCKER.
7. INSTALL SWIVEL POST(53) USING THE SWIVEL BODY CAP SCREWS (58) ASSURING THE O-RINGS(59) LINE UP PROPERLY WITH HOLES IN CYLINDER(4).

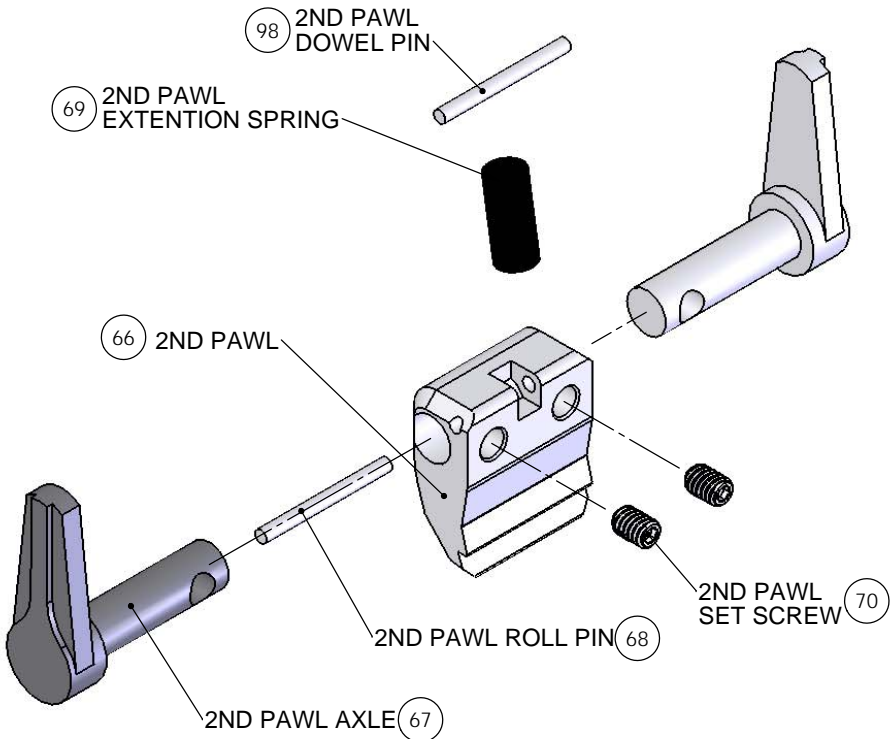
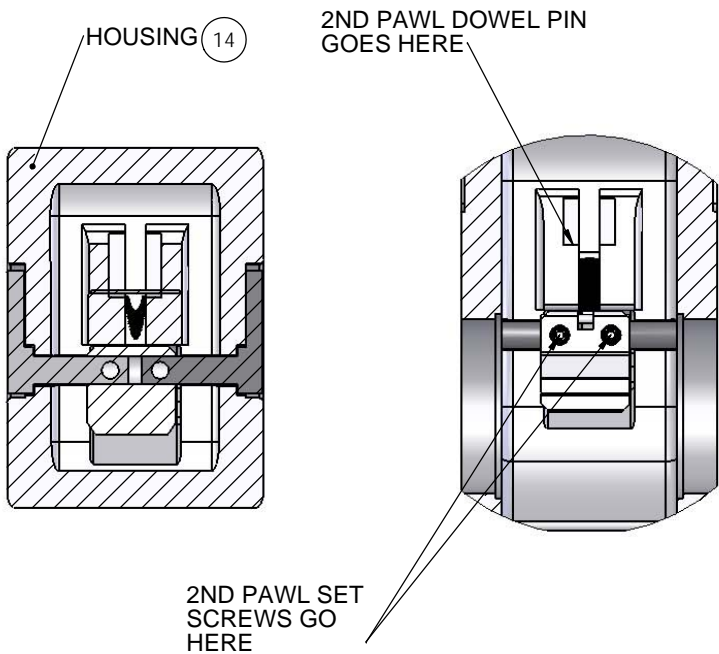
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED



SOFTWARE: SOLID WORKS	DATE	NAME	<div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></d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QD4 2ND PAWL ASSEMBLY

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED



ASSEMBLY INSTRUCTIONS

1. INSERT 2ND PAWL EXTENSION SPRING (ITEM 69) AS SHOWN THEN SLIDE 2ND PAWL ROLL PIN (ITEM 68) INTO PLACE.
2. INSERT 2ND PAWL DOWL PIN (ITEM 98) THROUGH 2ND PAWL EXTENSION SPRING. PLACE 2ND PAWL ROLL PIN INTO SLOT PROVIDED IN HOUSING THEN PULL ASSEMBLED 2ND PAWL DOWN INTO POCKET.
3. INSERT 2ND PAWL AXLES (ITEMS 67) INTO HOUSING AND INTO 2ND PAWL ASSEMBLY. ALIGN HOLE IN HOUSING WITH THREADED HOLE IN 2ND PAWL ASSEMBLY. THREAD 2ND PAWL SET SCREWS (ITEMS 70) INTO THREADED HOLE IN 2ND PAWL. TIGHTEN 2ND PAWL SET SCREWS WITH ALLEN WRENCH.

NOTE: A NON-PERMANENT THREAD SEIZING COMPOUND SUCH AS (LOCTITE 222 THREAD LOCKER) SHOULD BE USED TO PREVENT 2ND PAWL SET SCREWS FROM COMING LOOSE.

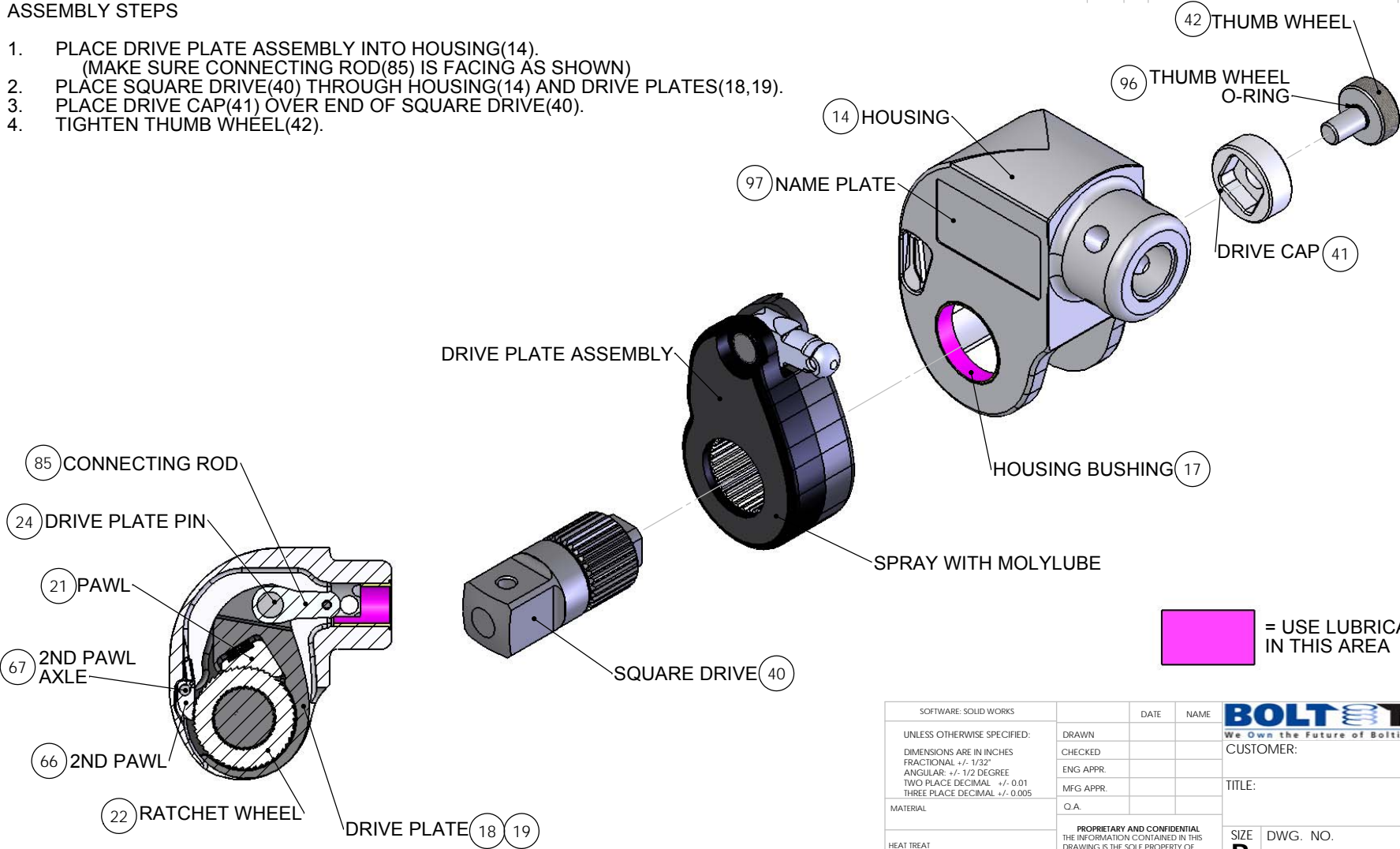
SOFTWARE: SOLID WORKS	DATE	NAME	BOLTTECH We Own the Future of Bolting Technology	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES FRACTIONAL +/- 1/32" ANGULAR +/- 1/2 DEGREE TWO PLACE DECIMAL +/- 0.01 THREE PLACE DECIMAL +/- 0.005	DRAWN			
MATERIAL	CHECKED		CUSTOMER:	
HEAT TREAT	ENG APPR.		TITLE:	
FINISH	MFG APPR.		SIZE DWG. NO. REV	
	Q.A.		SCALE: 1:2 WEIGHT: SHEET 11 OF 18	
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QD4 HOUSING ASSEMBLY


REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED

ASSEMBLY STEPS

1. PLACE DRIVE PLATE ASSEMBLY INTO HOUSING(14).
(MAKE SURE CONNECTING ROD(85) IS FACING AS SHOWN)
2. PLACE SQUARE DRIVE(40) THROUGH HOUSING(14) AND DRIVE PLATES(18,19).
3. PLACE DRIVE CAP(41) OVER END OF SQUARE DRIVE(40).
4. TIGHTEN THUMB WHEEL(42).



[Pink shaded area] = USE LUBRICATION IN THIS AREA

SOFTWARE: SOLID WORKS		DATE	NAME	<div> We Own the Future of Bolting Technology</div>	
UNLESS OTHERWISE SPECIFIED:		DRAWN		CUSTOMER:	
DIMENSIONS ARE IN INCHES		CHECKED		TITLE:	
FRACTIONAL +/- 1/32		ENG APPR.			
ANGULAR: +/- 1/2 DEGREE		MFG APPR.			
TWO PLACE DECIMAL +/- 0.01					
THREE PLACE DECIMAL +/- 0.005					
MATERIAL		Q.A.		<div>SIZE DWG. NO. REV</div> <div><div>B</div><div>SCALE: 1:8</div><div>WEIGHT:</div><div>SHEET 12 OF 18</div></div>	
HEAT TREAT		PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BOLTECH. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BOLTECH IS PROHIBITED.			
FINISH					

QD4 ENGAGEMENT BOLT ATTACHMENT

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED

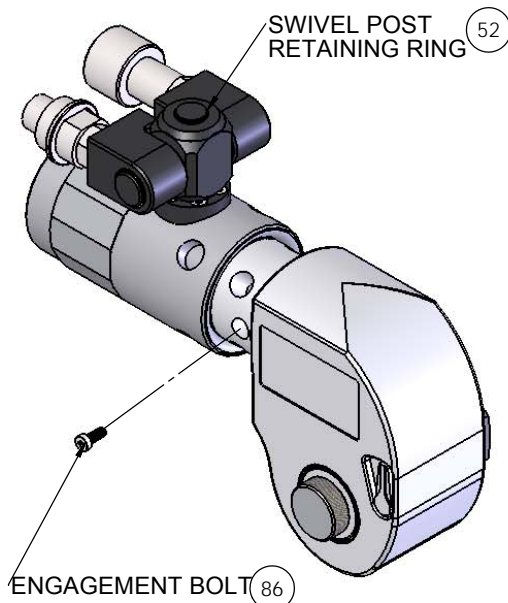


FIGURE 1

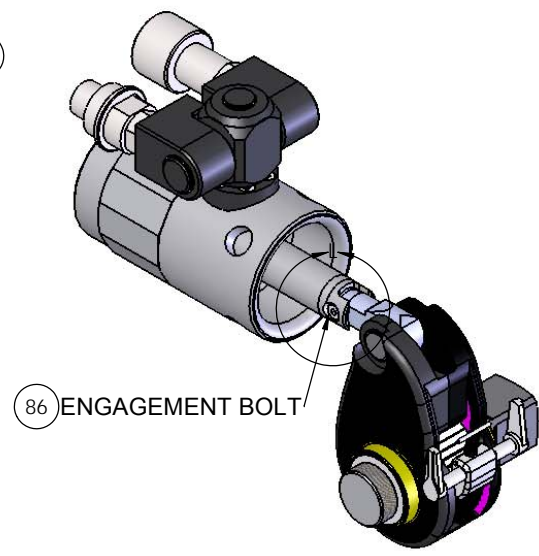
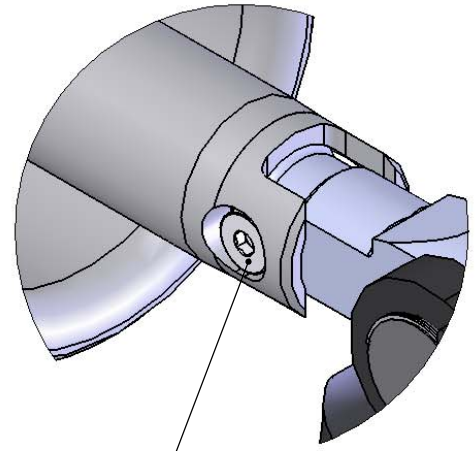



FIGURE 2




ENGAGEMENT BOLT
NEEDS TO BOTTOM
OUT ON FLAT SURFACE
OF CONNECTING ROD

FIGURE 3

 = USE LUBRICATION
IN THIS AREA

ASSEMBLY INSTRUCTIONS:

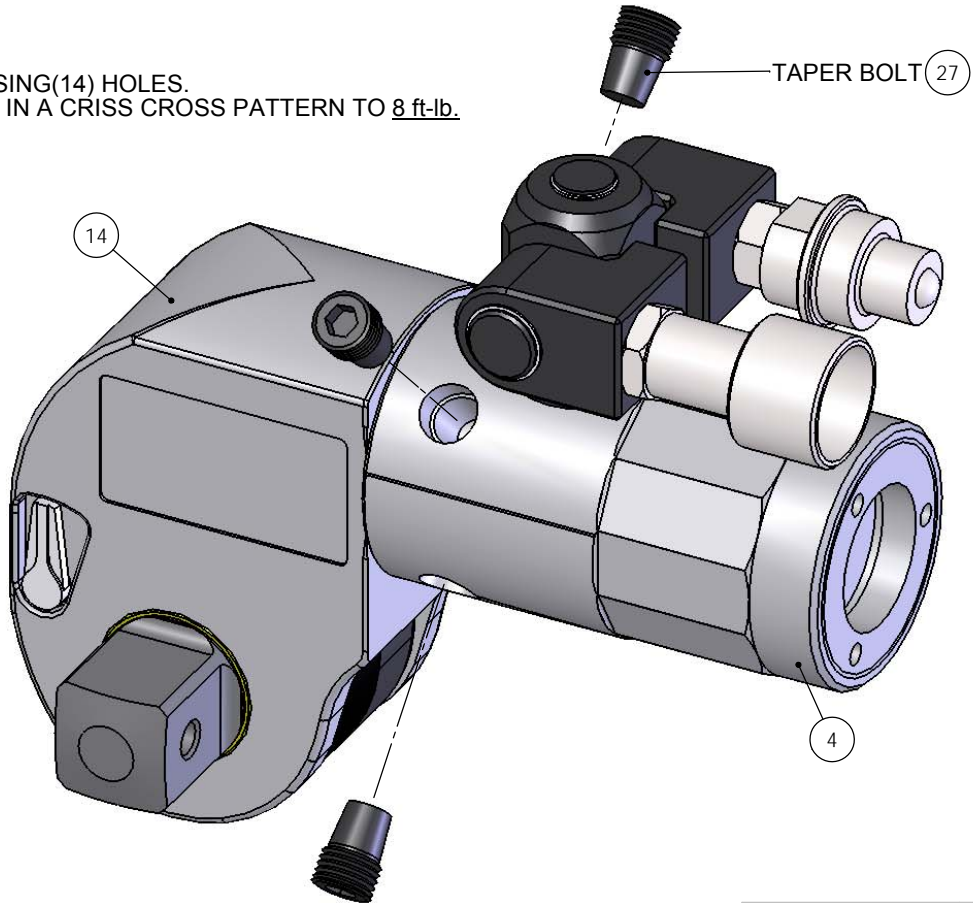
1. ALIGN THE CONNECTING ROD AND THE END OF THE PISTON SO THEY SLIDE TOGETHER SMOOTHLY (SHOWN IN FIGURE 2).
 2. WITH THE HOLES LINED UP, THREAD THE ENGAGEMENT BOLT(86) UNTIL IT BOTTOMS OUT ON THE FLAT SURFACE OF THE CONNECTING ROD (SHOWN IN FIGURE 3).
- **NOTE: MAKE SURE BOTH THE PISTON END AND THE CONNECTING ROD ARE LUBRICATED BEFORE ASSEMBLING.**

SOFTWARE: SOLID WORKS		DATE	NAME	<div><div>BOLTTECH</div><div>We Own the Future of Bolting Technology</div></div>	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES FRACTIONAL +/- 1/32" ANGULAR +/- 1/2 DEGREE TWO PLACE DECIMAL +/- 0.01 THREE PLACE DECIMAL +/- 0.005	DRAWN			CUSTOMER:	
	CHECKED				
	ENG APPR.			TITLE:	
	MFG APPR.				
MATERIAL	Q.A.			<div>SIZE DWG. NO. REV</div> <div>B</div> <div>SCALE: 1:2 WEIGHT: SHEET 13 OF 18</div>	
HEAT TREAT	<div>PROPRIETARY AND CONFIDENTIAL</div> <div>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BOLTECH. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BOLTECH IS PROHIBITED.</div>				
FINISH					

QD4 HOUSING/CYLINDER ASSEMBLY

FINAL INSTALLATION


1. ALIGN CYLINDER(4) AND HOUSING(14) HOLES.
2. TIGHTEN TAPERED BOLTS(27) IN A CRISS CROSS PATTERN TO 8 ft-lb.



ASSEMBLY INSTRUCTIONS:

1. FULLY EXTEND PISTON(1).
2. FULLY RETRACT DRIVE PLATES(18,19).
3. LUBRICATE SPHERICAL BALL ON CONNECTING ROD(85).
4. ATTACH ONE END OF CONNECTING ROD(85) TO DRIVE PLATE(18 OR 19) USING DRIVE PLATE PIN(26).
5. SECURE DRIVE PLATE PIN(26) WITH A SNAP RING(23) ON EACH SIDE.

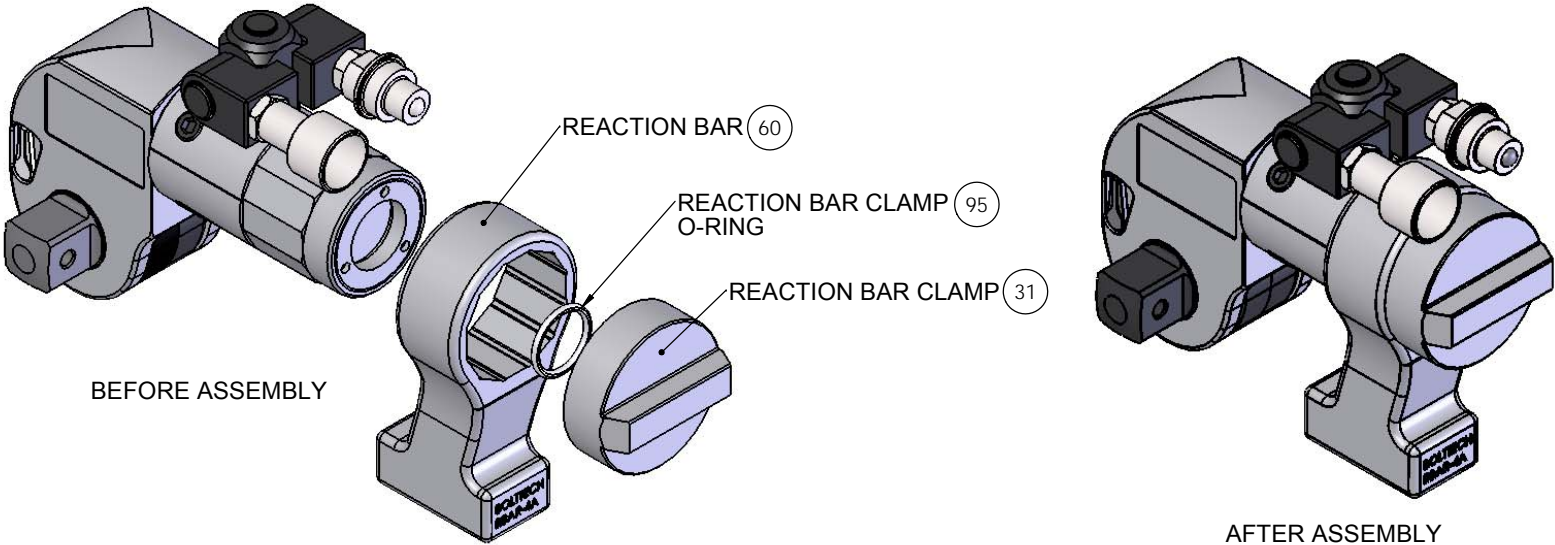
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED

SOFTWARE: SOLID WORKS		DATE	NAME	<div><div>BOLT</div><div></div><div>TECH</div></div> <div>We Own the Future of Bolting Technology</div>					
UNLESS OTHERWISE SPECIFIED:		DRAWN		CUSTOMER:					
DIMENSIONS ARE IN INCHES		CHECKED		TITLE:					
FRACTIONAL +/- 1/32"		ENG APPR.							
ANGULAR +/- 1/2 DEGREE		MFG APPR.							
TWO PLACE DECIMAL +/- 0.01									
THREE PLACE DECIMAL +/- 0.005									
MATERIAL		Q.A.							
		PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BOLTECH. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BOLTECH IS PROHIBITED.			SIZE	DWG. NO.	REV		
HEAT TREAT					B				
FINISH					SCALE: 1:4			WEIGHT:	SHEET 14 OF 18

8 7 6 5 4 3 2 1

QD4 REACTION BAR ASSEMBLY

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED



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ASSEMBLY INSTRUCTIONS

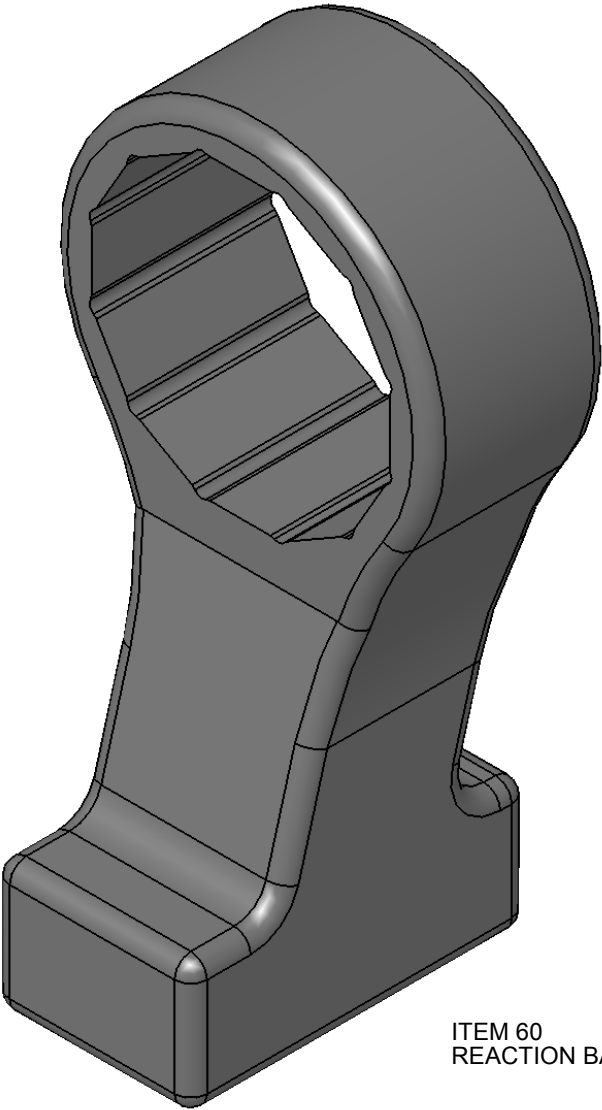
1. SLIDE REACTION BAR(60) OVER CYLINDER AS SHOWN.
2. PLACE REACTION BAR CLAMP O-RING (93) OVER THREADED PORTION OF THE REACTION BAR CLAMP.
3. THREAD REACTION BAR CLAMP (31) ONTO CYLINDER END CAP.

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MATERIAL	ENG APPR.	MFG APPR.	CUSTOMER:	
HEAT TREAT	Q.A.		TITLE:	
FINISH	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BOLTTECH. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BOLTTECH IS PROHIBITED.		SIZE B	DWG. NO.
			REV	
SCALE: 1:2		WEIGHT:		SHEET 15 OF 18

8 7 6 5 4 3 2 1

QD4 REACTION BAR

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ITEM 60
REACTION BAR

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	CHECKED		TITLE:		
	ENG APPR.				
	MFG APPR.				
	Q.A.				
MATERIAL	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BOLTECH. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BOLTECH IS PROHIBITED.		SIZE B	DWG. NO.	REV
HEAT TREAT					
FINISH					
			SCALE: 1:2	WEIGHT:	SHEET 16 OF 18

8 7 6 5 4 3 2 1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED

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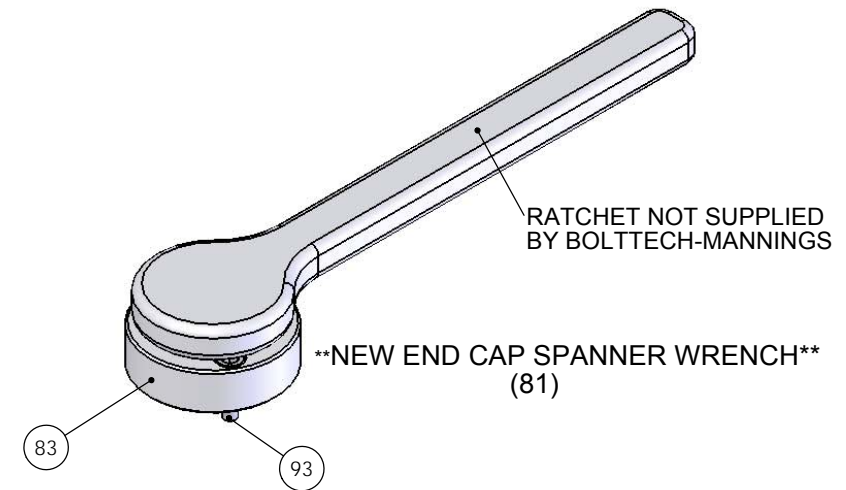
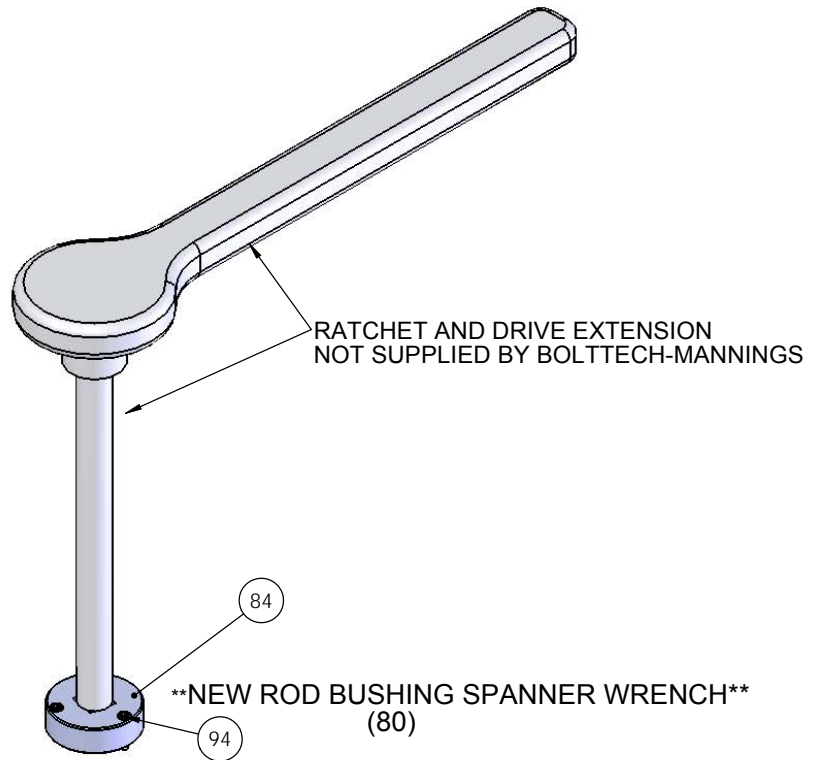
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SOFTWARE: SOLID WORKS	DATE	NAME	BOLTTECH We Own the Future of Bolting Technology	
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	CHECKED		TITLE:	
	ENG APPR.			
	MFG APPR.			
	Q.A.			
MATERIAL	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BOLTTECH. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BOLTTECH IS PROHIBITED.		SIZE B	DWG. NO.
HEAT TREAT				REV
FINISH				
SCALE: 1:2		WEIGHT:	SHEET 17 OF 18	

8 7 6 5 4 3 2 1

	8	7	6	5	4	3	2	1
	ITEM #	PART NAME	PART #	QTY.				
	1	PISTON	QD403E	1				
	4	CYLINDER	QD401	1				
	6	PISTON ROD BUSHING	QD417	1				
	8	CYLINDER END CAP	QD402B	1				
	14	HOUSING	QD4SQDR11	1				
D	17	HOUSING BUSHING	QD4SQDR08	2				
	18,19	DRIVE PLATE (R/L)	QD4SQDR04	2				
	20	PAWL SPRING	C062-L2-S17	1				
	21	PAWL	QD4SQDR03	1				
	22	RATCHET WHEEL	QD4SQDR02	1				
	23	DRIVE PLATE PIN SNAP RING	WS-53N	2				
	24	DRIVE PLATE PIN	QD406E	1				
	27	TAPER BOLT	QD408	4				
	31	REACTION BAR CLAMP	QD4RB01	1				
	40	SQUARE DRIVE	QD4SQDR05	1				
	41	DRIVE CAP	QD4SQDR06-NEW	1				
	42	THUMB WHEEL	QD4SQDR07-1	1				
C	49	QD4 SEAL KIT	QD4_SEAL_KIT	1				
	53	SWIVEL POST	SW13BLK	1				
	52A	BODY O-RING	SW3X-6N	3				
	52B	STEM O-RING	SW3X-5N	4				
	50	SWIVEL BODY	SW3BLK-1	1				
	51	SWIVEL SIDES	SW3BLK-2A	2				
	52	SWIVEL POST RETAINING RING	WS-50N	1				
	55	SWIVEL RETAINING RING	WS-62N	2				
	54	FEMALE QUICK CONNECT	SW04N	1				
	56	MALE QUICK CONNECT	SW05N	1				
	58	SWIVEL BODY CAP SCREWS	M4X10MMLHCSN	5				
	58	SWIVEL BODY CAP SCREW	M4X8MMLHCSN	1				
	59	SWIVEL BASE O-RINGS	005-9250N	2				
B	57	1/4" X 1/4" NPT ADAPTER	1/4_NPTADAPTER	1				
	60	REACTION BAR	QD4RB07	1				
	66	2ND PAWL	QD411	1				
	67	2ND PAWL AXLE	QD412	2				
	68	2ND PAWL ROLL PIN	1/16X3/8RPN	1				
	98	2ND PAWL DOWEL PIN	1/16X1/2DPN	1				
	69	2ND PAWL EXTENSION SPRING	E01200180380MN	1				
	70	2ND PAWL SET SCREW	6/32X3/16SSN	2				
	85	CONNECTING ROD	QD4CR	1				
	86	ENGAGEMENT BOLT	10-24X3/8SHCS	1				
	87	BOSS BUSHING	QD4BB	1				
	90	PISTON CONE	QD4-T04	1				
	81	CYLINDER END CAP WRENCH	QD4-T01	1				
	80	ROD BUSHING WRENCH	QD4-T02	1				
A	93	CYLINDER END CAP WRENCH SCREW	QD4-T01WS	3				
	94	ROD BUSHING WRENCH SET SCREW	QD4-T02WS	3				
	95	REACTION BAR CLAMP O-RING	9452K86	1				
	96	THUMB WHEEL O-RING	70BUNA109N	1				
	97	NAME PLATE	QD4-SNPN	2				
	83	CYLINDER END CAP WRENCH HEAD	QD4-ECH	1				
	84	ROD BUSHING WRENCH HEAD	QD4-RBH	1				

REVISIONS				
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				B		
FINISH				SCALE: 1:4 WEIGHT: SHEET 18 OF 18		