Operation Manual

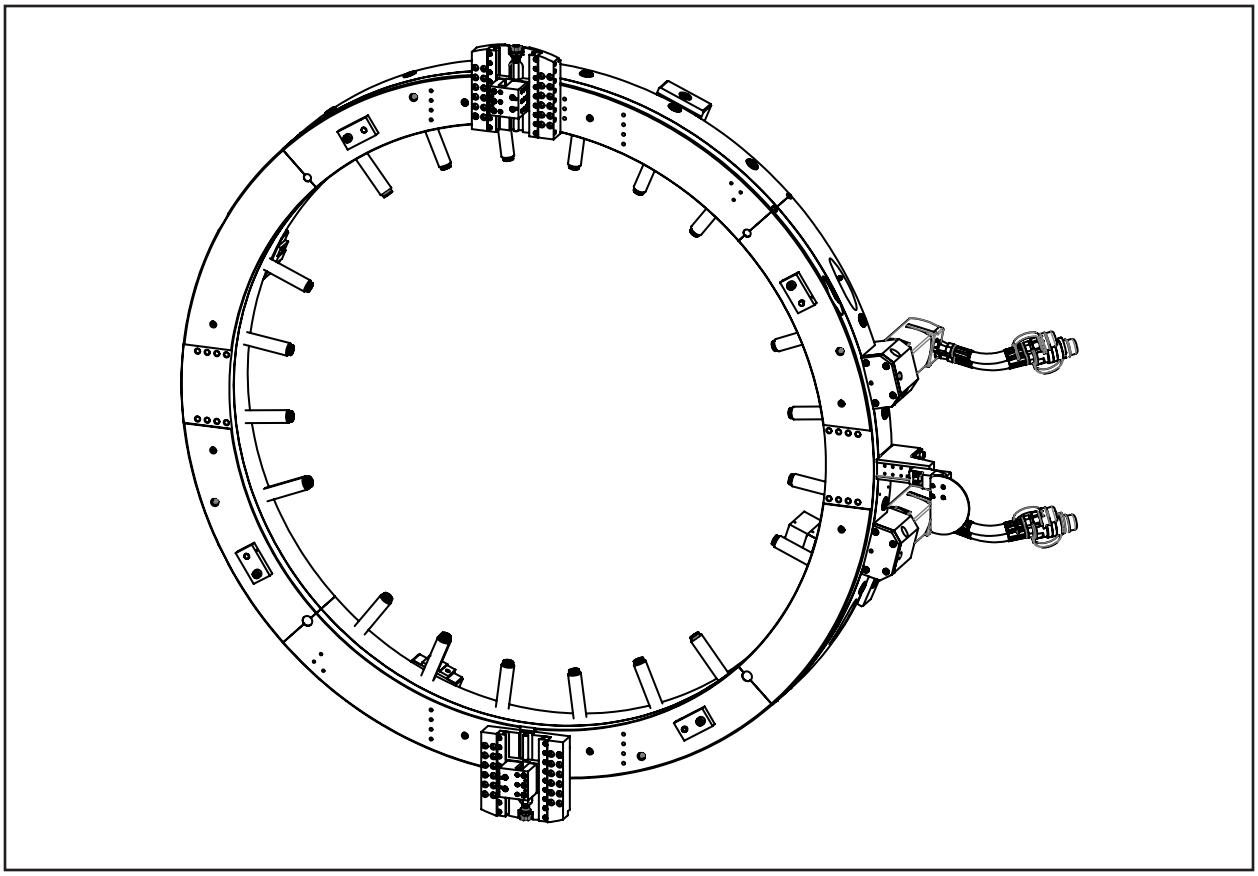
92-1613 Rev. 241205
Model 660RBL Low Profile Clamshell

TRI TOOL TECHNOLOGIES

ABOUT TRI TOOL TECHNOLOGIES

At Tri Tool Technologies, we are committed to your success through relentless innovation and powerful partnership. We insist on developing tools and equipment that exceed your expectations of performance, precision, safety, and durability. As a full-service engineering firm, we are here to support you every step of the way.

For more information on engineered solutions, products, and trainings, visit tritool.com or contact our engineers at +1 (916) 288-6100.



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Tri Tool Technologies Warranty

LIMITED WARRANTY: All products manufactured by Seller are warranted to be free from defects in materials and workmanship under normal use. The period of this warranty shall be three years from the date of shipment for all products, except for welding and Non-Standard Products which shall be one year from the date of shipment. The Buyer shall bear all shipping, packing and insurance costs and all other costs to and from a designated repair service center. All return goods must be authorized in advance and communicated upon issuance of a Return Material Authorization (RMA) by Seller. The product will be returned to the Seller accompanied by a RMA number and associated paperwork, freight prepaid and billed to the Buyer. This warranty is not transferable and will not apply to tool bits or other consumables, or to any Goods to have been (i) mishandled, misused, abused or damaged by Buyer or any third party; (ii) altered without the express permission in writing by Seller, (iii) repaired by a party other than Seller without Seller's prior written approval; or (iv) improperly stored, installed, operated, or maintained in a manner inconsistent with Seller's instructions. This warranty does not apply to defects attributed to (i) normal wear and tear or (ii) failure to comply with Seller's safety warnings.

No warranty for any parts or other supplies provided to seller by buyer, whether or not they are incorporated into goods. Goods supplied by seller which are designed or manufactured by a third party are subject strictly to the third party's warranty for those goods. Seller makes no warranty and disclaims all statutory or implied warranties for these goods, including the implied warranties of merchantability, freedom from patent infringement and fitness for a particular purpose.

Neither this warranty nor any other warranty, expressed or implied, including implied warranties of mechanical ability, fitness for a particular use, or merchantability, shall extend beyond the warranty period. No responsibility is assumed for any incidental or consequential damages. Some states do not allow limitations on how long an implied warranty lasts and some states do not allow the exclusion or limitations incidental or consequential damages, so the above limitation of exclusion does not apply to all Buyers. This warranty gives the Buyer specific legal rights. Other rights vary from state to state.

Warranty Claims and Remedies

Buyer must promptly notify Seller in writing during the applicable warranty period, of any defective Goods covered by Seller's warranties under the Limited Warranty section herein, and no later than fifteen (15) calendar days after discovery of the defect. Seller has no obligation to honor any warranty claim made after the expiration of the warranty period. However, despite the expiration of the warranty period, Seller, at its reasonable discretion, may accept warranty claims submitted up to fifteen (15) calendar days after the expiration of the warranty period provided that Buyer provides Seller with credible and persuasive documentary evidence that the defect was discovered during the warranty period. No warranty claims submitted after this fifteen (15) day calendar period will be considered by Seller.

Buyer's notice of a defective Goods must identify the specific Goods affected, and the nature of the defect. It is required when returning the defective Goods, that it is suitably packed, fully insured, and transportation and insurance prepaid in accordance with instructions issued by Seller. Seller, at its sole option, will either repair or replace any Goods authorized for return to Seller. Such repair, replacement, or credit shall be Buyer's sole remedy for defective Goods. Buyer must promptly provide Seller with all information requested regarding the identified defect.

If the defect claimed by Buyer cannot be reproduced or otherwise verified by Seller, the Goods will be returned to Buyer unmodified at Buyer's expense.

The warranty period for repaired or replaced Goods shall be (i) ninety (90) days or (ii) the unexpired portion of the original warranty period. Under no circumstances is Seller liable for recall, retrieval, removal, dismantling, re-installation, redeployment, or re-commissioning of any defective Goods or any costs associated therewith.

Tool Bit Resharpening Policy

Buyer is required to check all tool bits prior to returning and ensure they are packaged well for shipment. The price structure is available from the Seller's sales coordinator. Seller cannot resharpen badly gouged, chipped, or broken tool bits. Seller will return tool bits that are not suitable for resharpening with the tool bits that were resharpened upon Buyer's request. Buyer is responsible for all shipping charges to and from Seller.

1. ABOUT THE MANUAL

Copyright

Disclaimer

The instructions and descriptions in this manual were accurate when the manual was written. However, the information in the manual is subject to change without notice. Check for updated information before you start any job. The Tri Tool Technologies web site has the most current information.

Do not operate or work on this equipment unless you have read and understood the instructions in this Manual. Failure to follow the instructions or follow the safety instructions could result in serious injury or death. This manual describes conditions and hazards that are common and anticipated during equipment operation. No manual can address all conditions which may occur.

Safety Symbols

The manual may contain one or more safety symbols. These symbols and the associated text warn you of potentially hazardous conditions. Examples of the safety symbols and the associated text follow:

DANGER

DANGER: Indicates a hazardous situation that, if not avoided, will result in serious injury or death.

WARNING

WARNING: Indicates a hazardous situation that, if not avoided, could result in serious injury or death.

CAUTION

CAUTION: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury, or cause property damage.

GLASSES

SAFETY GLASSES: Indicates a hazardous situation that requires the use of safety glasses.

HOT SURFACE

HOT SURFACE: Indicates a hazardous situation that hot surfaces may be present.

GLOVES

GLOVES: Indicates a hazardous situation that requires gloves.

SHOCK HAZARD

ARC FLASH & SHOCK HAZARD: High voltage. Entry by authorized personnel only. Appropriate PPE and tools required when working on this equipment.

READ MANUAL

READ MANUAL: Read manual before use, refer to manual for Tri Tool Technologies machine being used.

DISCONNECT FROM POWER

DISCONNECT FROM POWER: Disconnect main plug from electrical outlet before performing all maintenance.

2. SAFETY PRECAUTIONS

In General

Use standard safety equipment such as: hard hats, safety shoes, safety harnesses, protective clothes, and other safety devices when appropriate.

Operate this tool only in accordance with specific operating instructions.

WARNING: Do not override the deadman switch on the power unit. Locking down, obstructing, or in any way defeating the deadman switch on the power drive unit may result in serious injury.

Personal Protective Equipment

Use standard safety equipment such as: hard hats, safety shoes, safety harnesses, protective clothes, and other safety devices when appropriate.

Wear safety glasses.

Do not wear loose clothing or jewelry.

Wear nonskid footwear.

Put long hair in a cap or a net to make sure hair does not get tangled in equipment.

Personnel

Only personnel who are trained or are being trained may operate the equipment.

Keep the operation manual available where the equipment is used.

The operator must read the operation manual before using the equipment.

The equipment must be operated in accordance with the manual information.

The operator must follow the safety precautions in this manual and good engineering practices to reduce the risk of injury.

Before using the equipment, the operator must ensure that all safety messages on the equipment are legible.

Work Area

Keep the work area clean.

Keep the area well lit.

Keep items such as electrical cords, cables, rags, rigging straps, away from rotating equipment.

Do not use power-cutting tools in the presence of flammable liquids and gases.

Do not let visitors or untrained personnel near tools that are in use.

Ensure all observers wear eye protection.

Keep proper footing at all times.

Area Equipment

Secure the pipe with clamps, vises, chains or straps.

Ensure that both sides of the pipe at the cut site are fully supported so that the pipe will not move after the cut is completed. Long lengths of pipe may be under load and the separation of the pipe can release pressure. This pressure can cause both sides of the pipe to move.

Tool Care

Keep tools in good operating condition. Sharp tool bits perform better and are safer than dull tool bits.

Do not use damaged tools. Always check your tools for damage especially if a tool has malfunctioned, been dropped or hit, check it for damage.

Before you start operating the equipment, do no-load tests and feed function checks.

Tool Use

Use the right tool and tool bit for the job. Contact Tri Tool Technologies to help with your application.

Keep the tool bits fully engaged in the tool bit holders. Loose bits are sharp and can cause cuts or punctures.

Disconnect power supply during setup and maintenance. Use all ‘Stop’ or Shut off’ features available when changing or adjusting tool bits, maintaining the tool, or when the tool is not in use.

Remove adjusting keys and wrenches before applying power to the equipment. Check the tool before turning it on to make sure that all keys and wrenches have been removed.

Do not force tools. Tools and tool bits function better and safer when used at the recommended speeds.

Do not reach into rotating equipment.

Do not reach into the rotating head stock to remove chips, to make adjustments, or to check the surface finish.

Handle chips with care. Chips have very sharp edges and are hot. Do not try to pull chips apart with bare hands.

Store tools properly. Disconnect tools from the power source, remove the tool bits, and store in a safe place.

3. GENERAL DESCRIPTION

The Model 660RBL Low Profile Clamshell is a four-piece split-frame pipe lathe designed for severing and beveling inline pipe with a minimum range of 54” through 60” pipe with minimal radial and axial clearance.

Using extended Tool Blocks, the Model 660RBL may be configured to perform the following operations:

- Sever inline pipe.
- Sever and bevel inline pipe.
- Sever and double bevel inline pipe.

Design and Operating Features

The easily adjustable precision 90° Vee Bearings pre-load and stabilize the rotating head to provide long life, low maintenance, stability and precision.

The Clamshell splits into four (4) quarters for mounting on closed loop systems.

All parts are secured to the four (4) quarters, thus avoiding the loss of parts and at the same time providing maximum ease of handling.

The Clamshell is equipped with Jackscrews and Adjustable Mounting Pads for out-of-round pipe conditions.

Dual Tool Blocks with Auto-Feed Sprockets and Adjustable Slides provide maximum maintainability, life, and operator safety, with a minimum of operator training.

The Auto-Feed Sprockets provide .004” (.10mm) of radial feed per revolution of the Headstock for a controlled depth of cut.

The drive gears and bearing surfaces are covered for operator safety and are sealed to provide protection from dust and chips.

The operator’s controls are located away from the rotating Headstock for the operator’s safety.

A Modular design concept provides quick, easy maintenance and maximum versatility in the drive and tooling options.

Two (2) detachable motors provide maximum handling ease and low axial clearance.

4. SPECIFICATIONS

Weight 1073 lbs [Less Motor] (487 kg)

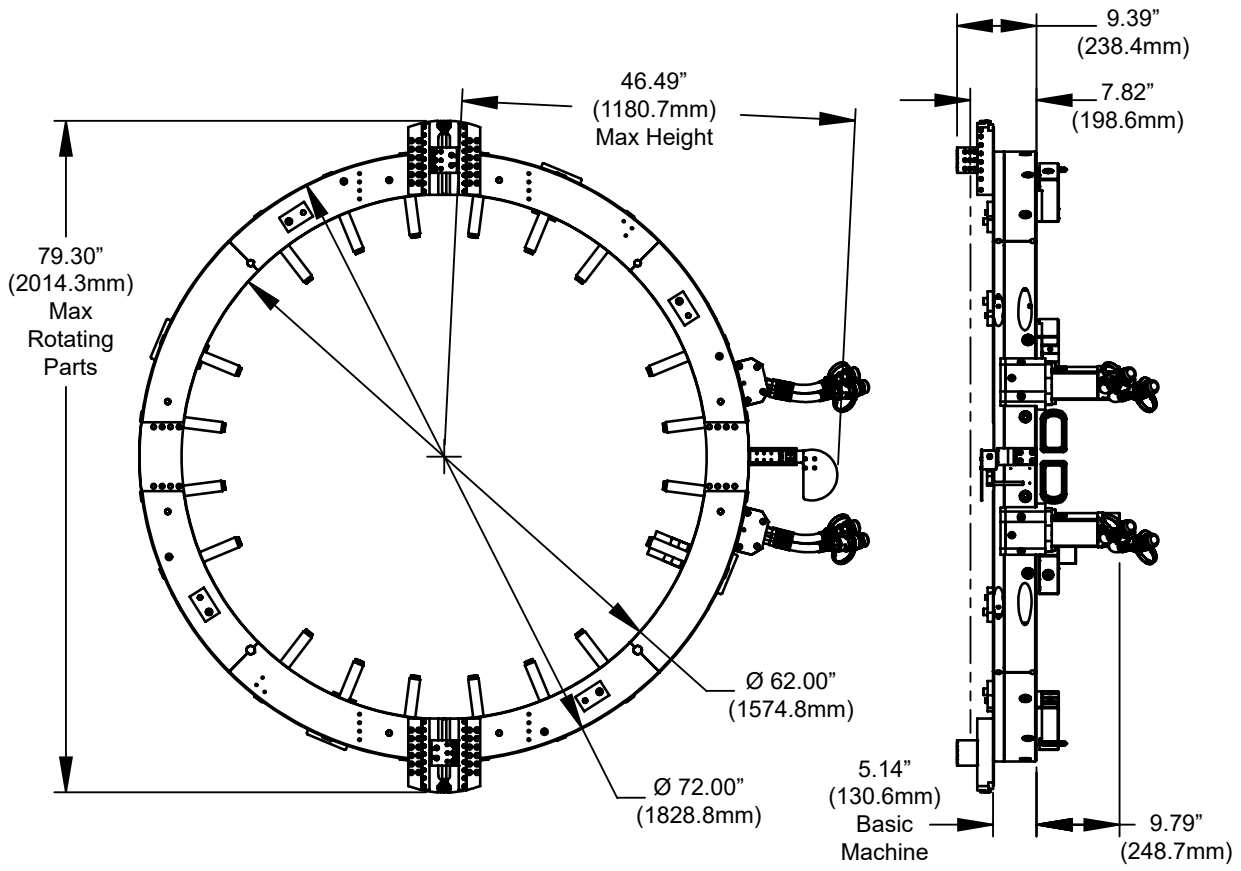


Figure 1: Model 660RBL Envelope Drawing

Cutting Capacities on 42” through 60” Pipe

Capacity may exceed the maximum wall thickness for small pipe sizes.

Severing with Standard Procedures	2.50” (63.5mm) wall
Severing and Single Beveling	1.25” (31.8mm) wall
Severing and Double Beveling	1.25” (31.8mm) wall
Severing and Beveling with Special Procedures	2.00” (50.8mm) wall

Clearances

Main Frame Diameter 72.00” (1828.8mm)

5. MAINTENANCE

Recommended Maintenance Schedule

Daily Maintenance When the Unit Is In Operation

Wipe the unit down and spray with rust preventative under severe humidity conditions.

Visually inspect for loose screws, missing screws, damage, etc.

After 20 Hours of Actual Operation

Lubricate the male and female Tool Block Slides and the Feed Screw.

After 40 Hours of Actual Operation

Thoroughly clean and lubricate Main Gear, Drive Gear, male and female Tool Slides, Feed Screws, and Tripper Block Assembly.

Non-Scheduled Maintenance

Thoroughly clean and check the Tool Blocks in the event of feed problems.

Readjust the 90° Vee bearings if the Headstock becomes loose on the Clamshell.

Storage

When the Clamshell is to be stored or will remain out of service for a significant period of time (30 days or more), it should be thoroughly cleaned, lubricated and sprayed with a rust preventative prior to storage.

Adjustment of the 90° Vee Bearings Pre-Load

Adjustment is done without the drive housing(s) attached.

Loosen all of the bearing lock screws and bearing adjustment eccentric nuts about 1/4 turn.

Turn the four (4) bearing adjustment eccentric nuts in so that they are snugged tightly.

The OD of the gear is centered with the OD of the Housing.

Lightly turn in the remaining bearing adjustment eccentric nuts until all of the bearings make contact with the Headstock.

The safe torque range on the bearing adjustment eccentric nuts is 1 in-lbs (.1 N m) to 3 in-lbs (.3 N m).

Relax the four (4) bearing adjustment eccentric nuts and resnug them, so that all of the bearings are evenly loaded against the gear race.

NOTE: Overtightening the bearing adjustment eccentric nuts will result in accelerated bearing wear and lower available power.

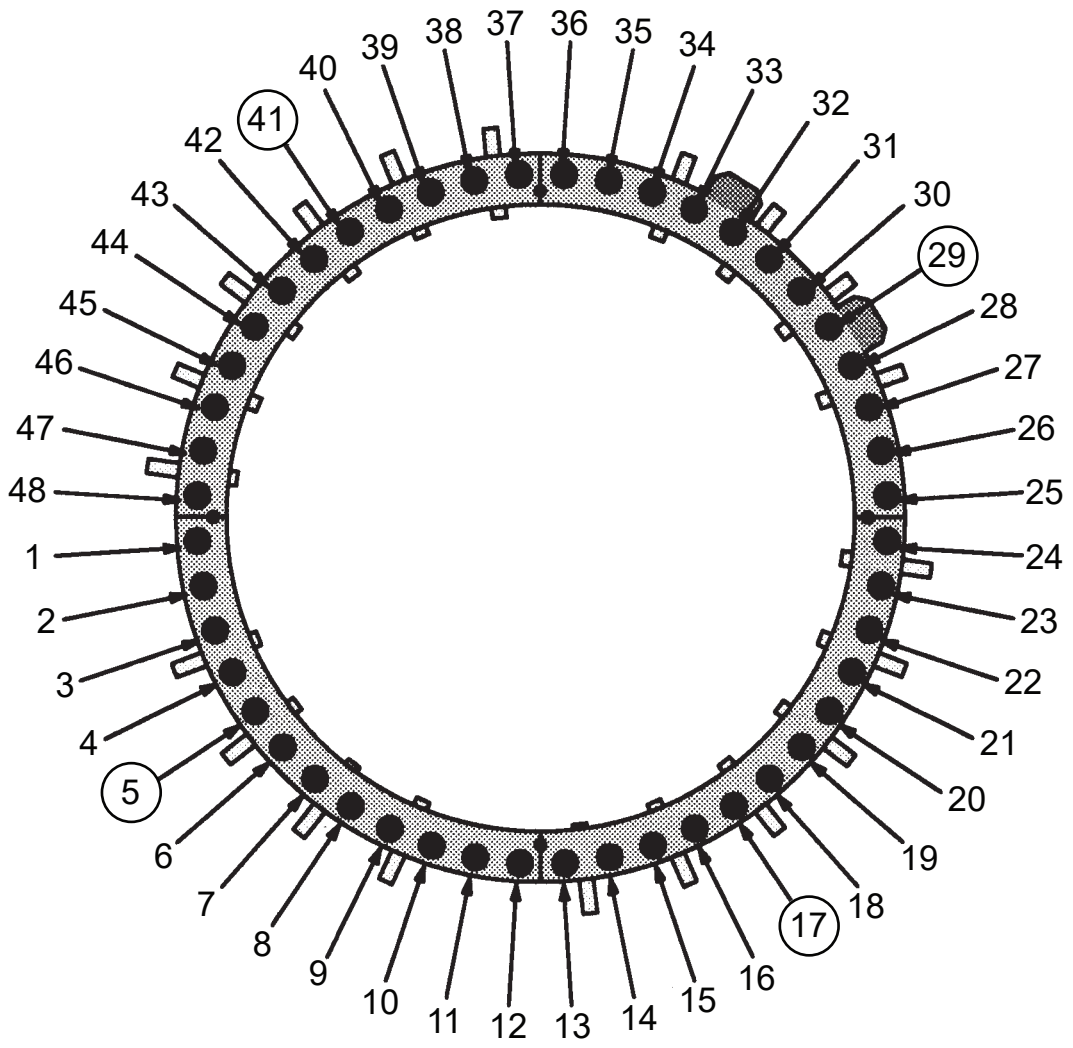


Figure 2: Bearing Adjustment Screw Locations

Inspection of the Main Gear

When the Headstock does not run smoothly, even after adjustment, inspect the Main Gear to ensure that no chips, dirt or dust have damaged the gear.

Drive Gear and Main Gear Lubrication

Remove the Drive Housings.

Inspect both Drive and Main Gears for chips or burrs, and clean as required.

Coat the teeth of the Drive and Main Gears with a grease that is approved by Tri Tool Technologies.

NOTE: For further information, see “Lubricant Recommendations” later in this section.

Tool Block Maintenance

Clean the Slide Rails, the Feed Nut, the Sprocket Assembly, and the Feed Screw. Inspect for damage and replace as required.

Lubricate and Reassemble the Tool Block

Use lubricant on the Feed Screw sparingly or wipe to a film condition.

NOTE: Excess lubricant will collect grit and/or chips and tend to cause thread jamming and/or damage.

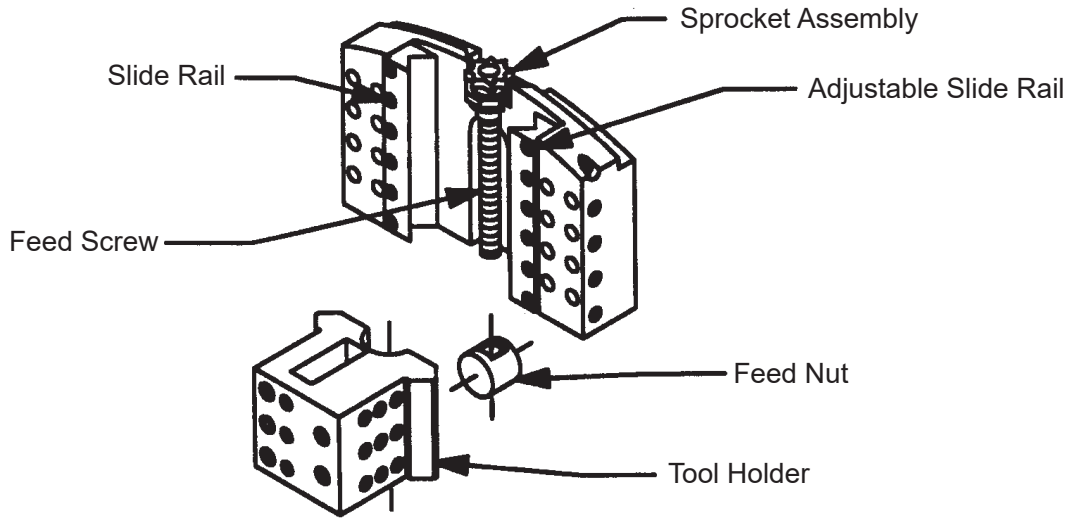


Figure 3: Tool Block Assembly

Adjust the adjustable Slide Rail to provide a firm, but not excessive, rotational pressure on the Sprocket.

The Slide Rails must be over-tightened to squeeze the oil into a thin film against the male and female surfaces of the Slide Rails.

Reset for proper operation.

NOTE: When the mounting bracket has been overstressed, the Slide Rails may appear to loosen when mounted if they were adjusted off of the Clamshell. Adjustment when mounted provides the most satisfactory results.

Tool Holder Adjustment

Loosen the Hold-down Screws on the Adjustable Slide Rail.

Run the Tool Holder to the most outward position.

Using the Adjustment Set Screws, apply light force to the side of the Adjustable Slide Rail so that it is in positive contact with the Tool Holder.

Adjust only those screws that bear directly in line with the Tool Holder.

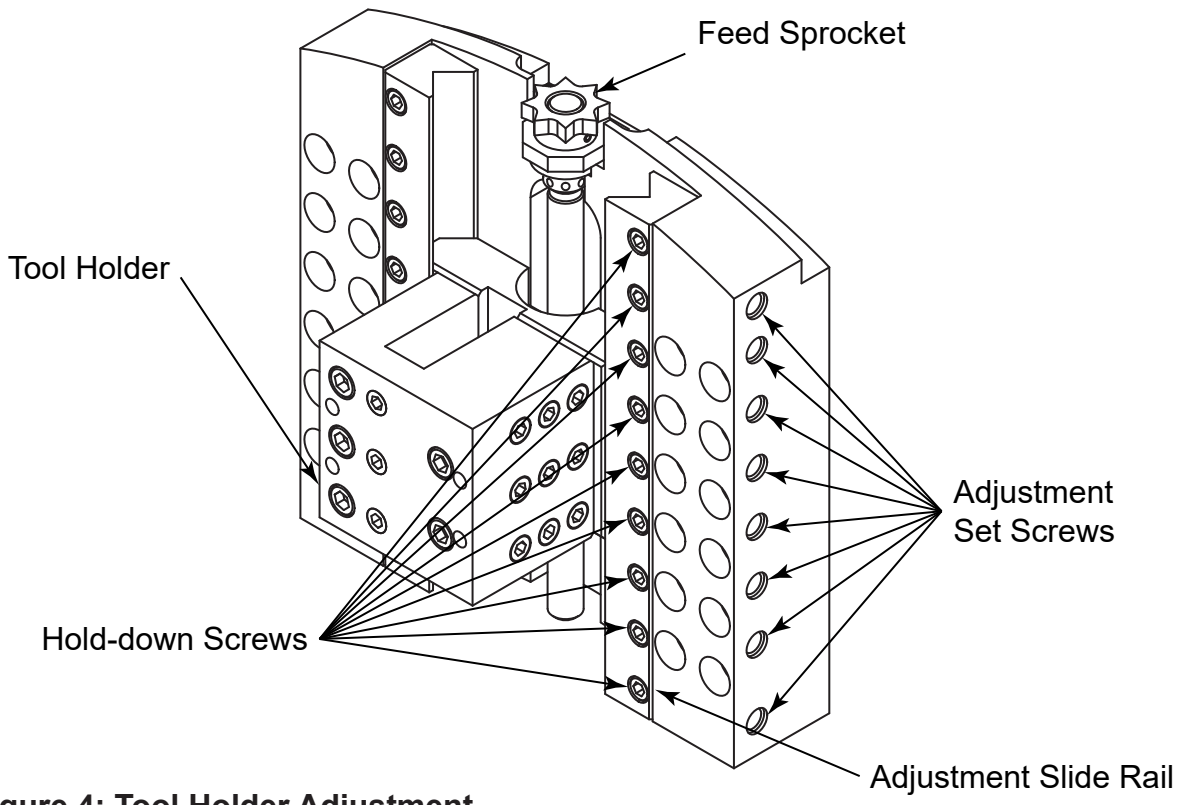


Figure 4: Tool Holder Adjustment

Tighten the Hold-down Screws to about 12 in-lbs (1.4 N m) to 24 in-lbs (2.7 N m).

Finger-tighten using a Hex Key.

Using the Hex Wrench, run the Tool Holder to the inward most position. Note any changes in the feed pressure.

Adjust the remaining Adjustment Set Screws so that the Tool Holder has a smooth, even feel.

Run the Tool Holder the full length of the Slide Rail.

Tightly lock the Adjustable Slide Rail in place with the Hold-down Screws and fully snug the adjustment set screws.

Check that the Tool Holder runs smoothly and evenly for the full length of travel. Readjust as necessary.

The Tool Holder should move with some resistance.

In general, when the Slide Rail is set correctly, the Feed Sprocket cannot be turned by hand, but may be turned easily with the Spanner Wrench.

NOTE: The torque on the Spanner Wrench should be about 2 ft-lbs (2.7 N m) to 5 ft-lbs (6.8 N m).

Tripper Block Assembly Lubrication and Tripper Shaft Adjustment

Remove the Tripper Guard.

Back off the Ball Plunger Set Screw until it disengages from the Tripper Shaft Assembly.

Remove the Shoulder Bolt and then remove the Tripper Lever.

Remove the Tripper Shaft Assembly from the block and then degrease and clean all parts.

Apply fresh lubrication to the Tripper Shaft Assembly and to the Shoulder Bolt.

Reassemble in reverse order.

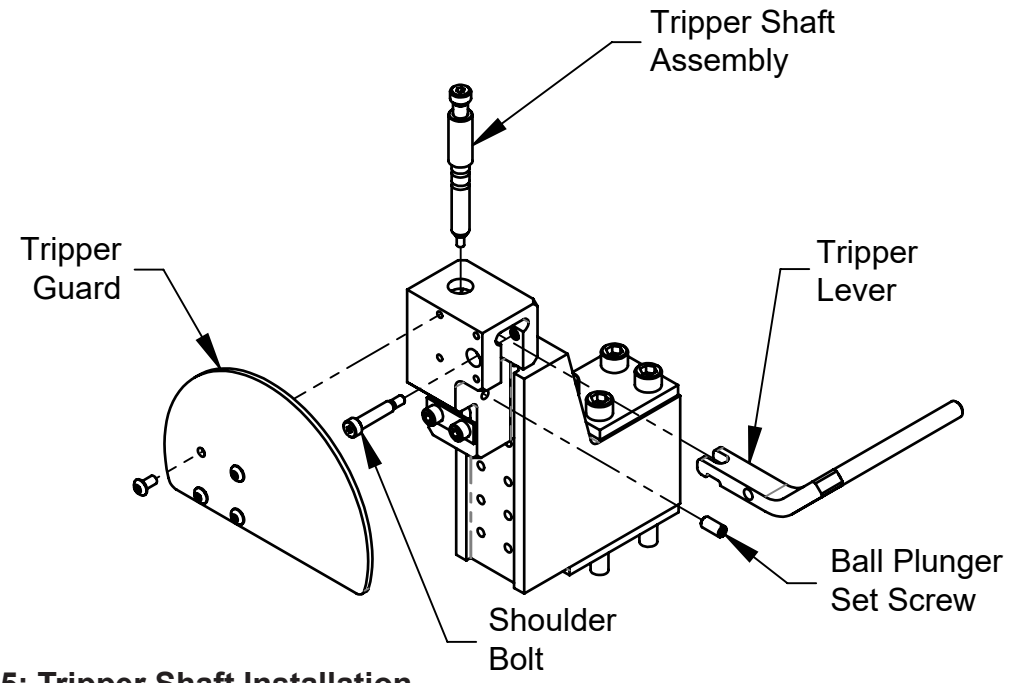


Figure 5: Tripper Shaft Installation

Lubricant Recommendations

The drive gears require a high string lubrication grease such as ‘Chevron Utility Grease, light.’

The Slide Rails and Tool Blocks require a light oil such as SAE 10 light machine oil.

The Feed Screw for the Tool Block and the Tripper Block Assembly require a SAE 10 light machine oil for normal conditions, and under dusty conditions a silicone, graphite or molybdenum disulfide ‘dry’ lubricant.

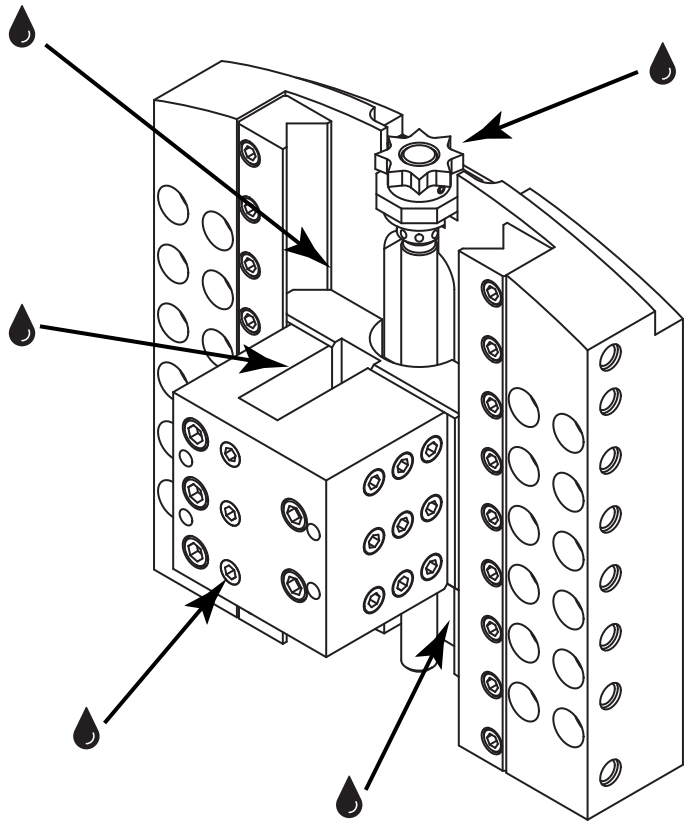


Figure 6: Cleanup

WARNING

WARNING: A light film of all-purpose grease may be used, but it must be checked for grit contamination frequently.

NOTE: The bearings in the hydraulic motors are sealed and do not require any lubrication.

6. OPERATION

Always read the operating instructions carefully/completely before attempting to operate the Model 660RBL Clamshell.

When operating any/all Tri Tool Technologies equipment follow the ‘NOTE’ statements through the manual for equipment safety/warranty voids and ‘WARNING’ and/or ‘CAUTION’ notes for operator safety.

A Filter/Regulator/Lubricator (FRL) is required to protect the warranty on all Tri Tool Technologies air- or hydraulic-driven tools.

NOTE: The motor warranty is void if damage occurs from contaminated air or lack of lubrication.

The FRL unit must be maintained as required. The frequency will depend on the basic air supply. Keep the water trap drained, filter cleaned, and the lubricator oil reservoir filled so that a drop of oil every two (2) to five (5) seconds is flowing.

If the unit is to be left idle for 24 hours or more after being run on ‘wet’ air, it is advisable to squirt oil directly into the air motor inlet and run the motor for two (2) to three (3) seconds. This will prevent rusting and ‘freezing’ of the rotor vanes.

For Hydraulic Motors, refer to the Operator’s Manual for those products for specifics.

When the unit is operated in the vertical position, Cutting Head up, it should be turned upside down and the chips and/or other debris removed after each cutting operation has been completed.

NOTE: Tool life may be severely shortened, unless chips and/or other debris that have been deposited on the Cutting Head during the machining operation are removed.

Configure the Clamshell for the Specific Task

1. Mount the Tool Blocks and Tripper Bracket onto the Clamshell.
2. Select and install the proper Clamping Pad Set into the Clamshell.

NOTE: Do not install the Tool Bits until the Clamshell has been installed on the pipe.

Installation of Clamshell on Inline Pipe

1. Separate the Clamshell into two (2) halves or four (4) quarters.

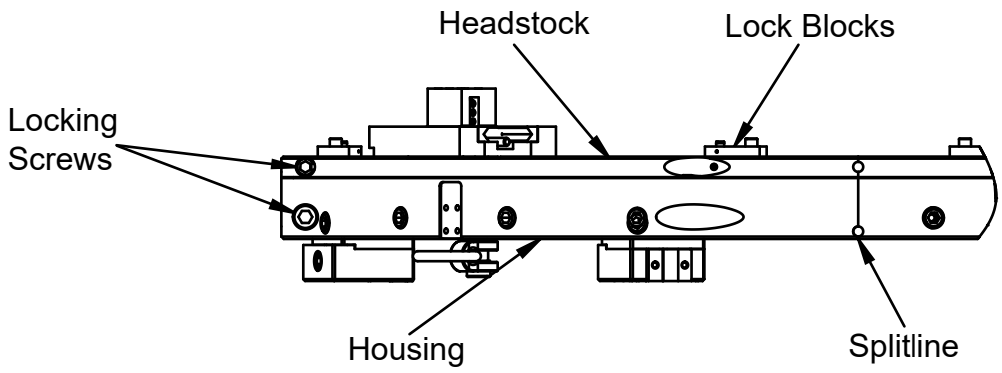


Figure 7: Locking Screw Locations

2. Rotate the Headstock until the splitlines of the Headstock match the splitlines of the Housing.
3. Unbolt the Red Lock Blocks attached to the Headstock, flip them over, and reattach them with the Dowel Pin going through the Headstock and into the Housing.
4. This is to prevent the Headstock from rotating out of the Housing while the Clamshell is split in half.
5. Unbolt the Clamshell.
6. The locking screws are located on the Housing and Headstock.

NOTE: The Locking Screws are captured in their holes so that they will not come totally free of the Clamshell.

7. Separate the Clamshell sections evenly by pulling straight apart.

WARNING

WARNING: DO NOT FORCE OPEN.

Securing the Clamshell to Pipe

1. Clean the mating surfaces and the contact surface of the Mounting Pads and the Jackscrews on each half of the Clamshell.
2. Wipe clean the mounting surface on the pipe.
3. Check to ensure that the Tool Blocks will clear the pipe when the Clamshell is mounted.
4. Close the sections of the Clamshell around the pipe, keeping the mating surfaces clean.
5. Check that the Alignment Pins have seated the splitlines properly.
6. Bolt the sections of the Clamshell together using the Locking Screws in the Housing and Headstock.
    - Tightening torque should be 50 ft-lbs (68 N m) to 60 ft-lbs (81 N m).
7. Tighten the Adjustable Bars while centering the Clamshell around the pipe.
8. Wiggle the Clamshell around during this step to ensure that the Space Bars are setting squarely on the pipe.
9. Tighten the Adjustable Bars 1 and 3 to no more than 10 ft-lbs (14 N m) of torque.
10. Tighten the Adjustable Bars 2 and 4 to no more than 10 ft-lbs (14 N m) of torque.
11. Fine center the Clamshell as you would a 4-jaw chuck.
12. Take measurements from the pipe OD to the Housing ID or use a dial indicator to sweep around the pipe's outside diameter.

NOTE: If additional precision in squaring is required, consult Tri Tool Technologies about alternate methods of squaring.

If additional squaring or centering is required, loosen the Adjustable Bars before attempting to move the Clamshell.

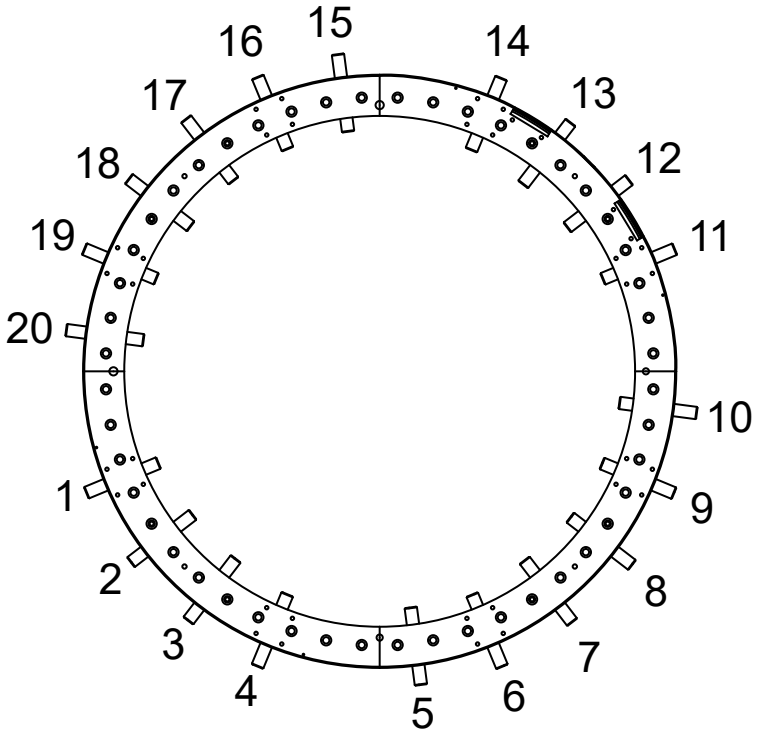


Figure 8: Identification of Jackscrews

13. Once the Clamshell is centered about the pipe and the four (4) Adjustable Bars are evenly torqued down then it is time to tighten the Jackscrews, in the following order:
    - Tighten 5 and 15 down to 10 ft-lbs (14 N m) of torque.
    - Tighten 1 and 11 down to 10 ft-lbs (14 N m) of torque.
    - Tighten 4 and 14 down to 10 ft-lbs (14 N m) of torque.
    - Tighten 10 and 20 down to 10 ft-lbs (14 N m) of torque.
    - Tighten 3 and 13 down to 10 ft-lbs (14 N m) of torque.
    - Tighten 2 and 12 down to 10 ft-lbs (14 N m) of torque.
    - Tighten 6 and 16 down to 10 ft-lbs (14 N m) of torque.
    - Tighten 7 and 17 down to 10 ft-lbs (14 N m) of torque.
    - Tighten 8 and 18 down to 10 ft-lbs (14 N m) of torque.
    - Tighten 9 and 19 down to 10 ft-lbs (14 N m) of torque.
14. Verify that the Clamshell is mounted squarely and centered to the pipe.
15. Adjust the Jackscrews and Adjustable Bars in opposing pairs to correct any off-center positioning.

16. Once the Clamshell is mounted squarely and centered to the pipe, tighten all of the Adjustable Bars and Jackscrews to 25 ft-lbs (34 N m) to 30 ft-lbs (41 N m) of torque, following the same sequence that was followed to set them up.
17. The Headstock should be able to be rotated by hand with the Motor(s) removed.
    - If not, the Jackscrews and/or the Adjustable Bars are too tight and will need to be loosened before the Clamshell is powered up.

General Machining Sequence

1. Install the Motor(s) Drive Housing(s), if required, into the slots and bolt them to the Clamshell.

CAUTION

CAUTION: The Motor Mount reacts to the torque of the Motor only when the Motor Hold-down Bolts are in place.

2. Connect the power supply to the Model 660RBL.
3. Rotate the Headstock slowly with the Tripper Shaft pushed 'in' for one full revolution to ensure that the Feed Pin to Sprocket is set correctly on both Tool Blocks.

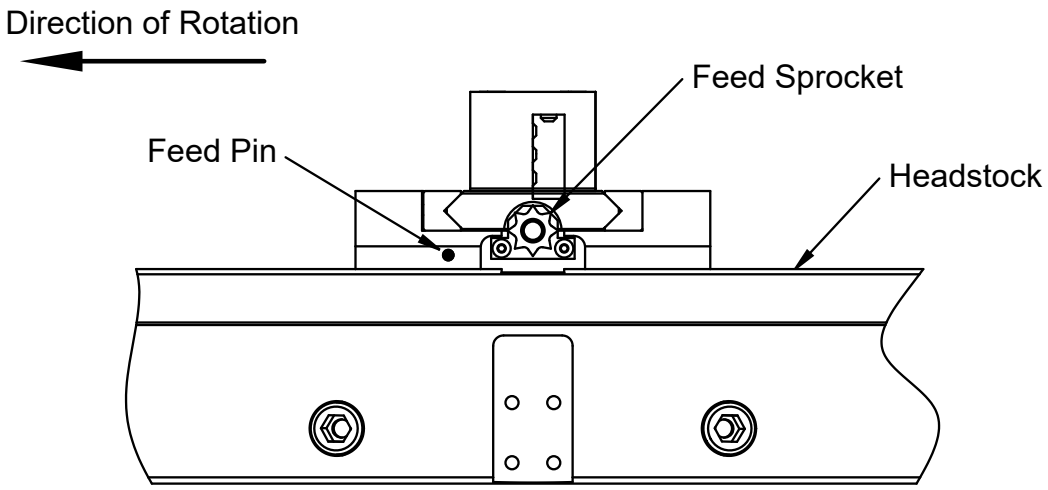


Figure 9: Approach of the Feed Pin to the Feed Sprocket

WARNING

WARNING: You will break the Feed Pin if the Feed Pin to Sprocket alignment is incorrect.

NOTE: To check the Feed Pin to Sprocket engagement, reference the "Feed Pin to Sprocket Engagement" information later in this section.

Select and Install the Desired Tool Bit Set

1. Reference “Tool Bit Setup” later in this section.
2. Turn the Motor(s) on to full speed.
3. Engage the feed by pushing the Tripper Shaft ‘in’.
4. Monitor the cutting operation.
5. Apply cutting fluid as necessary.
6. When chips build up so much that they tangle in the Clamshell, disengage the feed for two (2) to three (3) revolutions to clear the chip.
7. Stop the Clamshell and remove the chips.

NOTE: Reference the “Severing” information later in this section for specific machining procedures.

CAUTION: Inline pipe stores energy.

NOTE: When the pipe is severed, the pipe may move. To prevent accidents due to the spring in the pipe system, be sure to secure the pipe on both sides of the sever line in order to prevent differential movement of the pipe ends.

8. When the machining operation is finished, disengage the Feed Pin by pulling the Tripper Shaft to the ‘out’ position.
9. Allow the Headstock to continue for three (3) revolutions to complete the cutting operation.
10. Turn the Motor(s) off.
11. Retract the Tool Holders so that the Tool Bit(s) clear the Pipe OD.
12. The Tool Holders are retracted by rotating the Feed Sprocket clockwise using the special Spanner Wrench supplied with the Clamshell.
13. Run the Motor(s) until the splitlines of the Headstock and the Housing match. Loosen the Jackscrews.
14. Remove the Clamshell from the pipe.
    - When the Clamshell must be split to remove it, refer back to the information under “Installation of Clamshell on Inline Pipe.”
15. You should have a complete pipe sever at this time.

Feed Pin to Sprocket Engagement

1. Rotate the Headstock until the Sprocket on the Tool Block begins to approach the Feed Pin.
2. The Feed Pin must strike the Sprocket on the edge of the Tooth.

WARNING

WARNING: The Feed Pin must not strike the Sprocket tooth straight on. This action would damage or break the Feed Pin and/or the Sprocket (refer to Figs. 10 and 11).

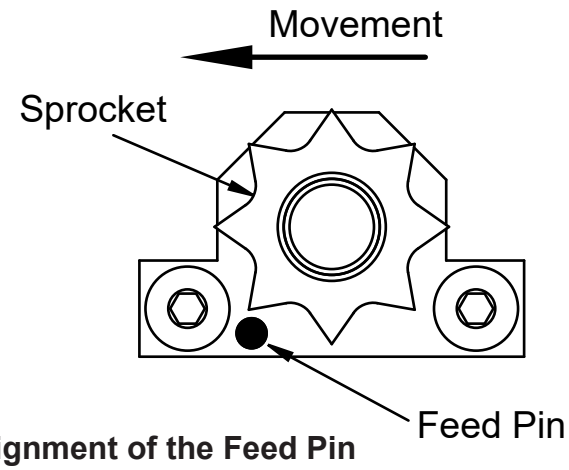


Figure 10: Correct Alignment of the Feed Pin

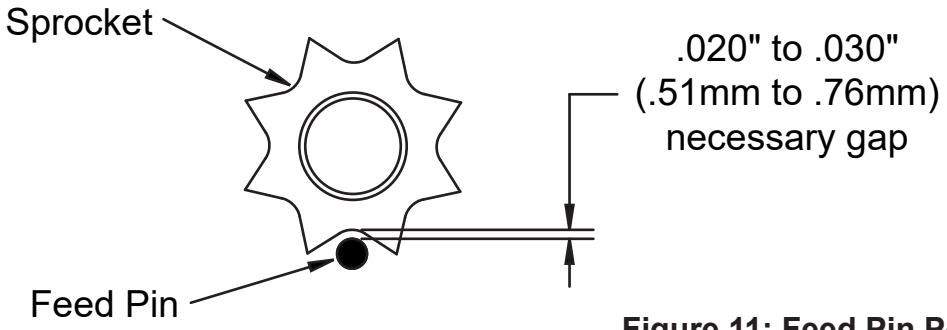


Figure 11: Feed Pin Positioning

NOTE: When the Feed Pin to Sprocket engagement is not as illustrated in the images, operation of the Clamshell may cause serious damage or destroy the Feed Pin and/or the Sprocket.

3. When the Feed Pin to Sprocket engagement is as illustrated, then it will be necessary to loosen the four (4) Cap Screws on the Tripper Bracket, so that it may be adjusted to the proper gap, .020” (.51mm) to .030” (.76mm), required for proper engagement.

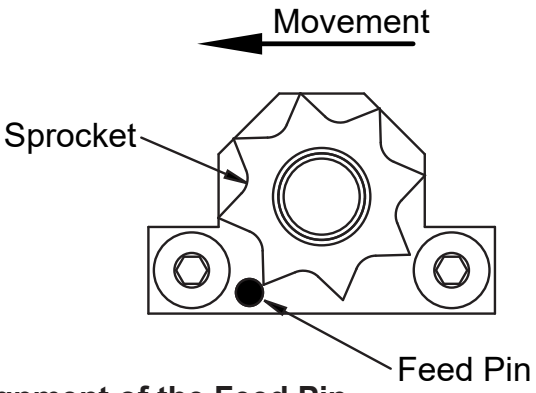


Figure 12: Incorrect Alignment of the Feed Pin

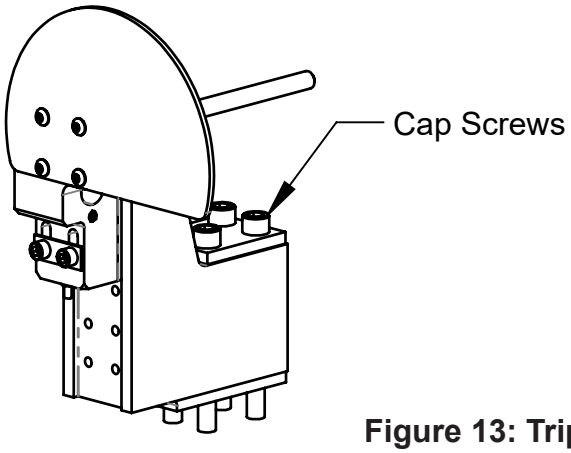


Figure 13: Tripper Block Adjustment

Tool Bit Setup

Refer to TOOL BITS section to select the proper Tool Bit.

WARNING

WARNING: Use of dull or improperly designed Tool Bits or Tool Bits not manufactured by Tri Tool Technologies may result in poor performance and may constitute abuse of this machine and therefore void the Tri Tool Technologies factory warranty.

1. Install the Tool Bits into the Tool Holders. Refer to TOOL BITS section of this manual for installation drawings.

NOTE: The wall thickness plus 3/4” (19.0mm) of Tool Bit should be protruding from the end of the Tool Holder.

2. Tighten the Tool Bit set screws, then verify that there is adequate clearance between the Tool Bits and the pipe by rotating the Headstock.

   - The Leading Tool Bit should contact the pipe approximately .020” (.51mm) to .040” (1.02mm) before the Trailing Tool Bit.

Severing

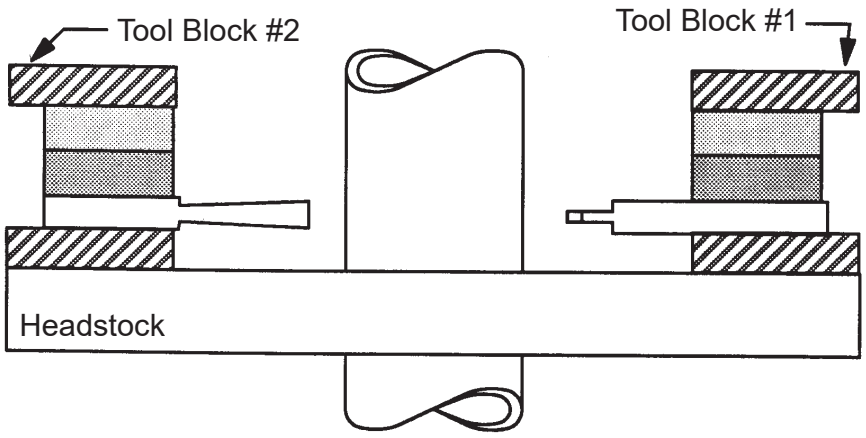


Figure 14: Severing Tool Bits

1. When the Tool Bits sever the pipe, disengage the Feed Pin and let the Headstock rotate two (2) to three (3) times to clear the chip.
2. When the machining operation is finished, disengage the Feed Pin by pulling the Tripper Shaft to the ‘out’ position.
3. Allow the Headstock to continue for three (3) revolutions to complete the cutting operation.
4. Turn the Motor(s) off.
5. Retract the Tool Holders so that the Tool Bit(s) clear the Pipe OD.
    - The Tool Holders are retracted by rotating the Feed Sprocket clockwise using the special Spanner Wrench supplied with the Clamshell.
6. Run the Motor(s) until the splitlines of the Headstock and the Housing match.
7. Loosen the Jackscrews.
8. Remove the Clamshell from the pipe.
    - When the Clamshell must be split to remove it, refer to “Installation of Clamshell on Inline Pipe” earlier in this section.
9. You should have a complete pipe sever at this time.

7. CUTTING SPEEDS AND FEEDS

Pipe Size	True Diameter	RPM for 200 in/min (5080 mm/min)	RPM for 250 in/min (6350 mm/min)	RPM for 300 in/min (7620 mm/min)
60"	60.00" (1524.0mm)	1.1	1.3	1.6
58"	58.00" (1473.2mm)	1.1	1.4	1.6
56"	56.00" (1422.4mm)	1.1	1.4	1.7
54"	54.00" (1371.6mm)	1.2	1.5	1.8

Cutting Speed (Approximate)

Use 200 surface inches per minute (508 surface centimeters per minute) for:

- Stainless steels in general when no coolant is allowed, all heavy-wall tube and some of the chrome/molybdenum steels.

Use 250 surface inches per minute (635 surface centimeters per minute) for:

- Mild steels and some thin-wall stainless steels when coolants are permitted and applied.

Use 300 surface inches per minute (762 surface centimeters per minute) for:

- Aluminum and thin-wall mild steel and tube with coolants.

8. CLAMPING PAD SETS

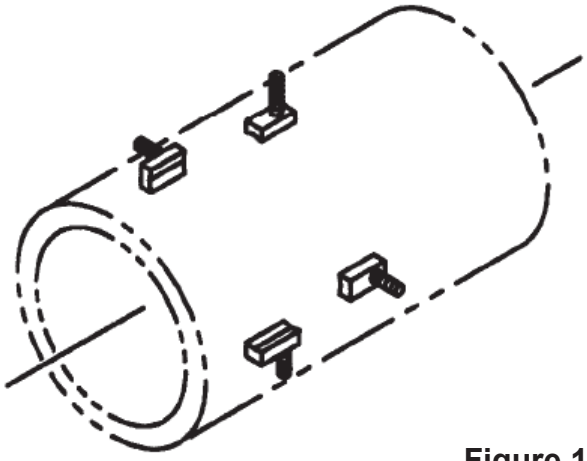


Figure 15: Clamping Pad Sets

Pipe DIA	True OD		Bar Assembly P/N (4 Required)
54”	54.00”	1371.6mm	26-0477
56”	56.00”	1422.4mm	26-0478
58”	58.00”	1473.2mm	26-0479
60”	60.00”	1524.0mm	26-0480

9. TOOL BITS

Sever Tool Bit Sets

Sever Tool Bits will sever up to 2-1/2” (63.5mm) pipe with a 1/2” (12.7mm) wide cut.

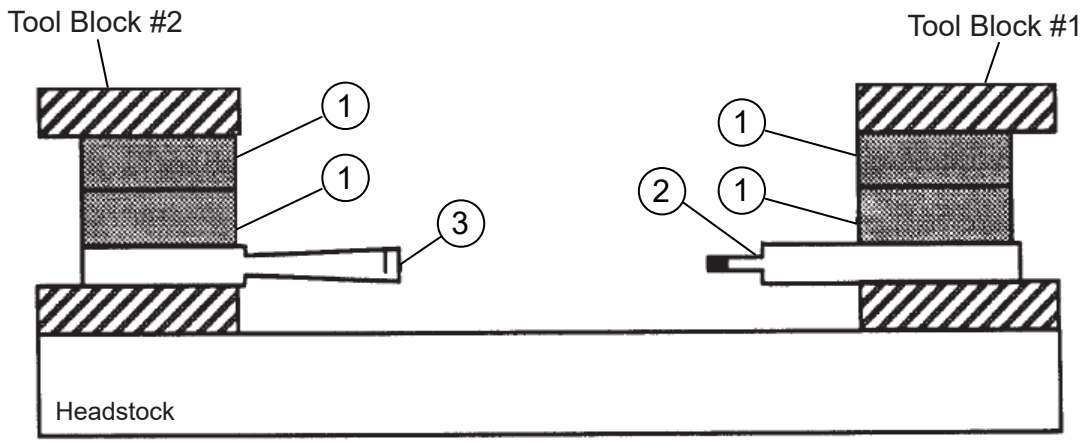


Figure 16: Sever Tool Bit Set

Item No.	Part No.	Description	Qty
1	30-0295	SPACER	4
2	99-0821	TOOL BIT, LEADING SEVER	1
3	99-0822	TOOL BIT, TRAILING SEVER	1

Left Hand Sever and Single Bevel Tool Bit Sets

Left Hand Sever and Single Bevel Tool Bits will sever and 37.5° bevel up to a 1-1/4” (31.8mm) pipe on the end being cut off.

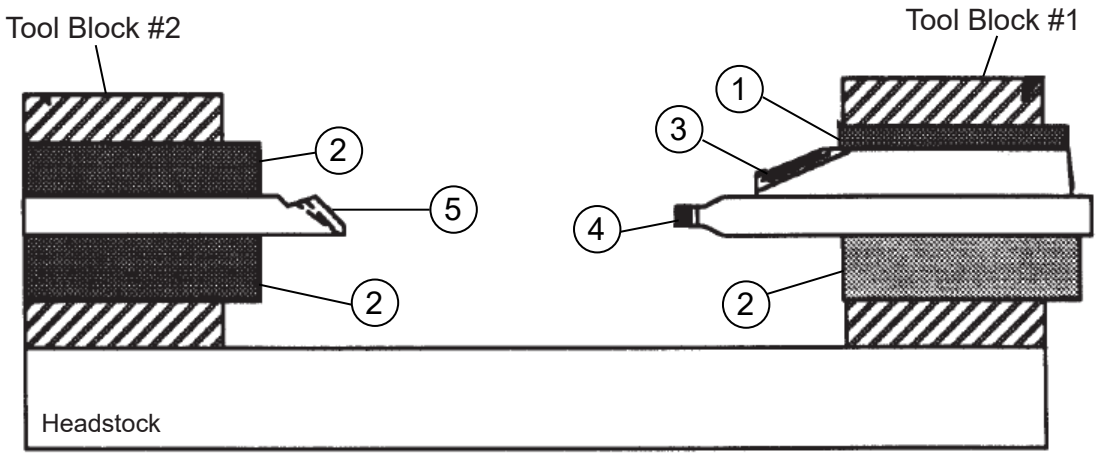


Figure 17: Left Hand Sever and Single Bevel Tool Bit Set

Item No.	Part No.	Description	Qty
1	30-0223	SPACER	1
2	30-0310	SPACER	3
3	99-4347	TOOL BIT, TRAILING BEVEL	1
4	99-4078	TOOL BIT, SEVER	1
5	99-4082	TOOL BIT, LEADING BEVEL	1

Right Hand Sever and Single Bevel Tool Bit Sets

Right Hand Sever and Single Bevel Tool Bits will sever and 37.5° bevel up to 1-1/4” (31.8mm) pipe on the end on which the Clamshell is mounted.

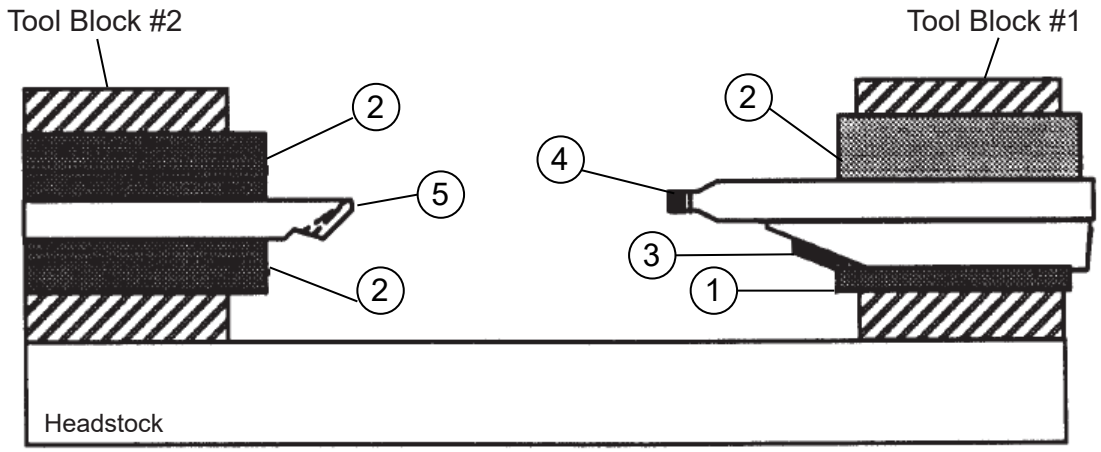


Figure 18: Right Hand Sever and Single Bevel Tool Bit Set

Item No.	Part No.	Description	Qty
1	30-0223	SPACER	1
2	30-0310	SPACER	3
3	99-4346	TOOL BIT, TRAILING BEVEL	1
4	99-4077	TOOL BIT, SEVER	1
5	99-4081	TOOL BIT, LEADING BEVEL	1

Sever and Double Bevel Tool Bit Sets

Sever and Double Bevel Tool Bits will sever and 37.5° bevel on both sections of pipe up to 1-1/4” (31.8mm).

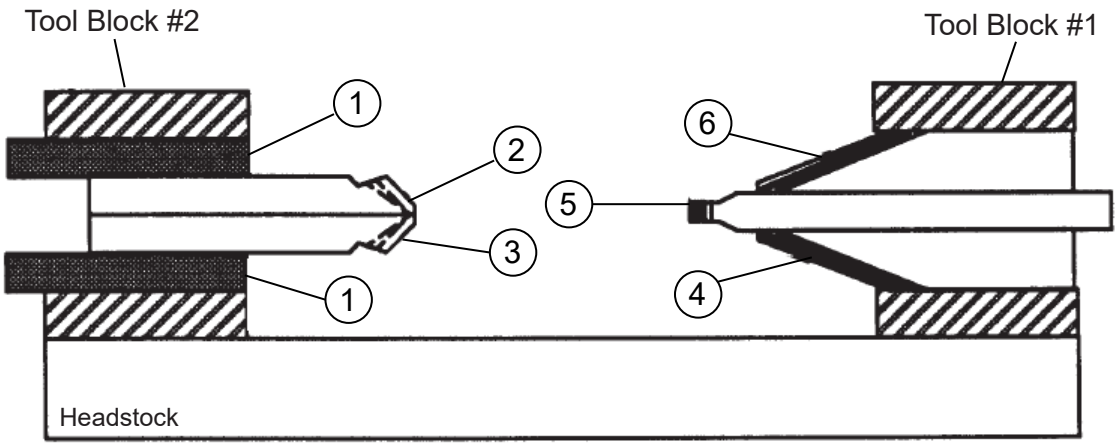


Figure 19: Sever and Double Bevel Tool Bit Set

Item No.	Part No.	Description	Qty
1	30-0206	SPACER	2
2	99-0561	TOOL BIT, LEADING BEVEL, LH	1
3	99-0562	TOOL BIT, LEADING BEVEL, RH	1
4	99-4346	TOOL BIT, TRAILING BEVEL, RH	1
5	99-0564	TOOL BIT, SEVER	1
6	99-4347	TOOL BIT, TRAILING BEVEL, LH	1

Sever and Double J-Bevel Tool Bit Sets

Sever and Double J-Bevel Tool Bits will sever and 22 1/2° bevel with a 3/16” (4.8mm) radius J up to 1-3/8” (35.1mm) pipe on both ends of pipe.

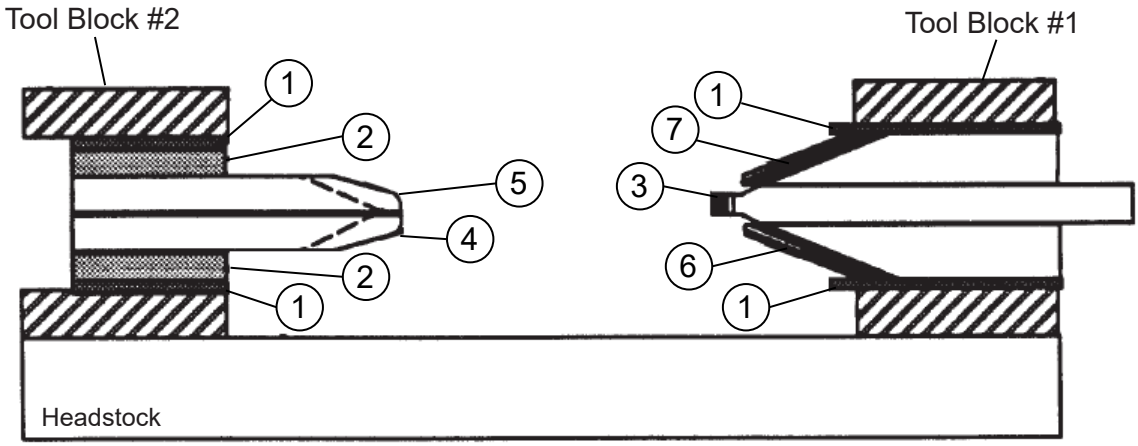


Figure 20: Sever and Double J-Bevel Tool Bit Set

Item No.	Part No.	Description	Qty
1	30-0223	SPACER	4
2	30-0206	SPACER	2
3	99-1524	TOOL BIT, SEVER	1
4	99-2630	TOOL BIT, LEADING BEVEL, RH	1
5	99-2631	TOOL BIT, LEADING BEVEL, LH	1
6	99-2632	TOOL BIT, TRAILING BEVEL, RH	1
7	99-2633	TOOL BIT, TRAILING BEVEL, LH	1

Sever and Double Compound Bevel Tool Bit Sets (10° Compound Bevel)

Sever and Double Compound Bevel Tool Bits (10° Compound Bevel) will sever and 37.5°/10° compound bevel with 3/4” (19.1mm) transition up to 1-3/8” (35.1 mm) pipe.

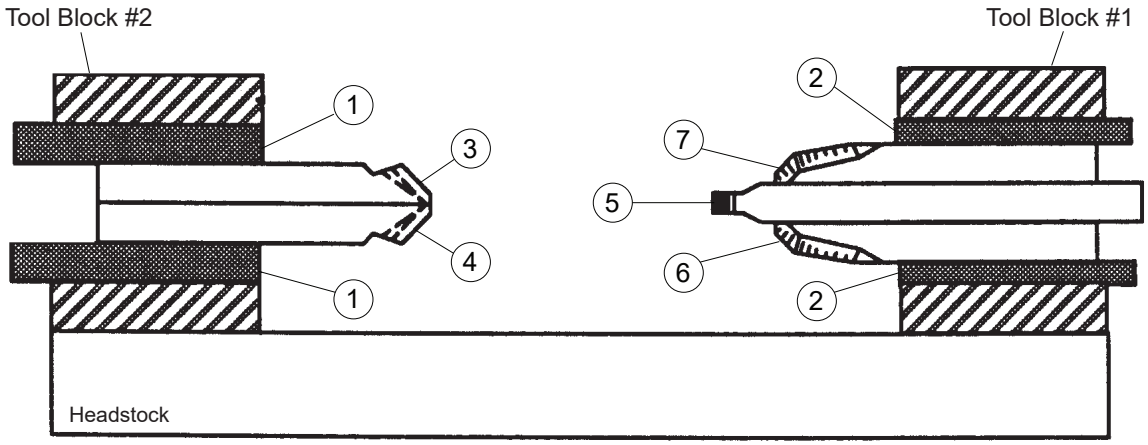


Figure 21: Sever and Double Compound Bevel Tool Bit Set (10° Compound Bevel)

Item No.	Part No.	Description	Qty
1	30-0206	SPACER	2
2	30-0227	SPACER	2
3	99-0561	TOOL BIT, LEADING BEVEL, LH	1
4	99-0562	TOOL BIT, LEADING BEVEL, RH	1
5	99-0564	TOOL BIT, SEVER	1
6	99-0678	TOOL BIT, TRAILING BEVEL, RH	1
7	99-0679	TOOL BIT, TRAILING BEVEL, LH	1

Sever and Double Compound Bevel Tool Bit Sets (15° Compound Bevel)

Sever and Double Compound Bevel Tool Bits (15° Compound Bevel) will sever and 37.5° /15° compound bevel with 3/4” (19.1mm) transition up to 1-3/8” (35.1mm) pipe.

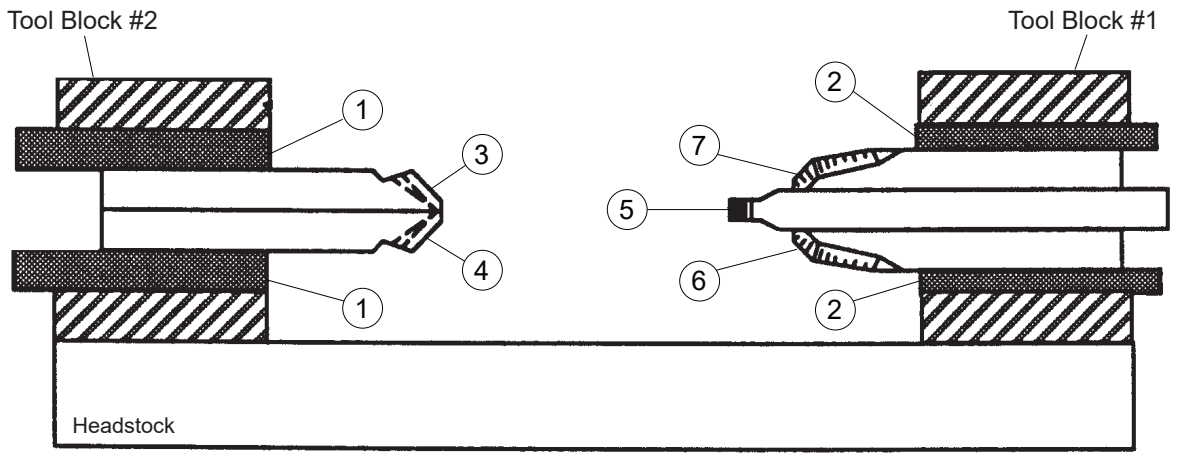


Figure 22: Sever and Double Compound Bevel Tool Bit Set (15° Compound Bevel)

Item No.	Part No.	Description	Qty
1	30-0206	SPACER	2
2	30-0227	SPACER	2
3	99-0561	TOOL BIT, LEADING BEVEL, LH	1
4	99-0562	TOOL BIT, LEADING BEVEL, RH	1
5	99-0564	TOOL BIT, CUT-OFF	1
6	99-1442	TOOL BIT, TRAILING BEVEL, RH	1
7	99-1443	TOOL BIT, TRAILING BEVEL, LH	1

10. TROUBLESHOOTING

Problem: Tool Bit Chatters

The tool bit is loose or overextended.

The tool bit is damaged.

The tool holder is too loose in the slides.

The cutting speed is too fast.

The clamping pads are loose on the pipe or tube.

Cutting fluid is required.

The main bearing pre-load is loose.

Problem: Excessive Tool Bit Wear

The pipe or tube material is too hard or abrasive.

The cutting speed is too fast.

Cutting fluid is required.

A dull Tool Bit is causing surface hardening conditions (Stainless pipe or tubing).

There is scale or other foreign matter on the pipe or tube, which is dulling the tool bit at the start of the cut.

The tool bit is incorrect for the material being cut.

Problem: Rough Surface Finish

The tool bit is dull, chipped, etc.

Metal build-up on the cutting edge of the tool bit is creating a false cutting edge.

Cutting fluid is required.

The cutting speed is incorrect.

Problem: Tool Holder Is Not Feeding

The feed pin is broken or out of position.

The feed sprocket shear pin is broken.

The feed screw is stripped.

The feed nut is stripped.

The slide rails are too tight.

Problem: Tool Bit Does Not Reach Work

Incorrect tool blocks are installed for the size of the pipe or tube being worked on.

Incorrect tool bit is installed.

Problem: Tool Bit Is Diving And Clamshell Is Stalling

The Feed Pin is broken or out of position.

The Feed Sprocket shear pin is broken.

The Tool Bit is dull, chipped, etc.

The Tool Holder Adjustment Slide is too loose.

The Parting Tool Bit is leading the Beveling Tool Bit by too much for proper chip clearance.

The Tool Bit is over-extended.

The Main Bearing pre-load is too loose.

Problem: Headstock Is Hard To Rotate By Hand

The Air Motor is still engaged.

The Clamping Pads are too tight on the pipe or tube.

Foreign material is on the mating surface of the splitlines.

Chips and/or other foreign material are in the rotating section.

The Tool Bit or Tool Block is in contact with the pipe or tube.

Problem: The Clamshell Is Slipping On The Pipe Or Tube

The Clamping Pads are not in full contact with the pipe or tube.

The clamping pressure is too light.

Scale and/or other foreign material is present on the pipe or tube.

Weld seams, swelling, or bumps under the Clamping Pads are preventing full contact.

Dull Tool Bits are causing extra force in the axial and/or radial direction.

The pipe or tube wall is too thin, which allows the tube wall to flex and the machine to move.

Problem: The Clamshell Will Not Center On The Pipe Or Tube

The Clamshell will not center on the pipe or tube. (Fixed Pads)

Incorrect Clamping Pad Set is installed.

Scale and/or foreign material is present on the pipe or tube.

One of the Clamping Pads is on a seam.

The pipe or tube has an out-of-round condition or is oversized or undersized.

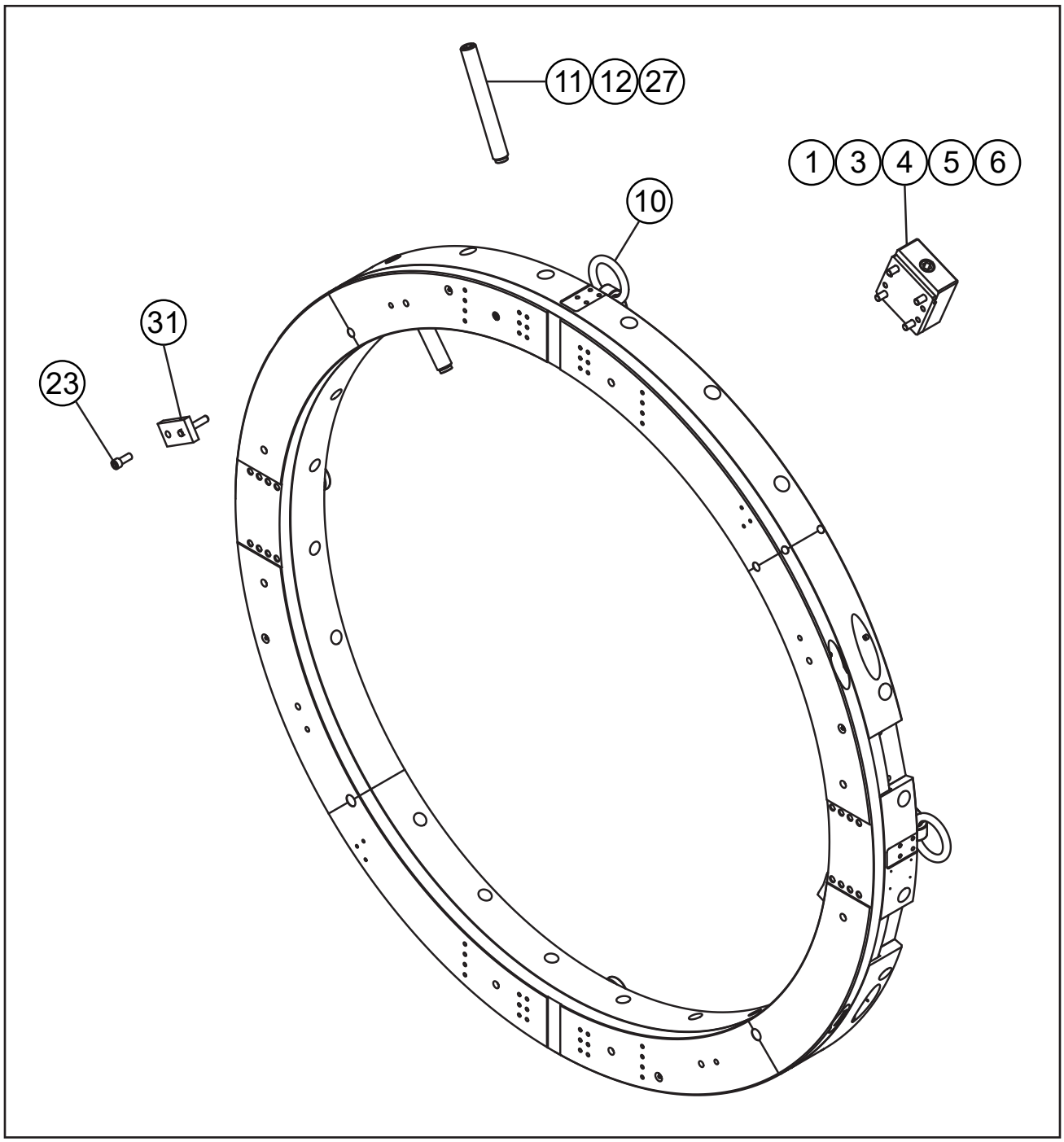
11. ACCESSORIES

The following accessories are recommended for use with the Model 660RBL and are available from Tri Tool Technologies.

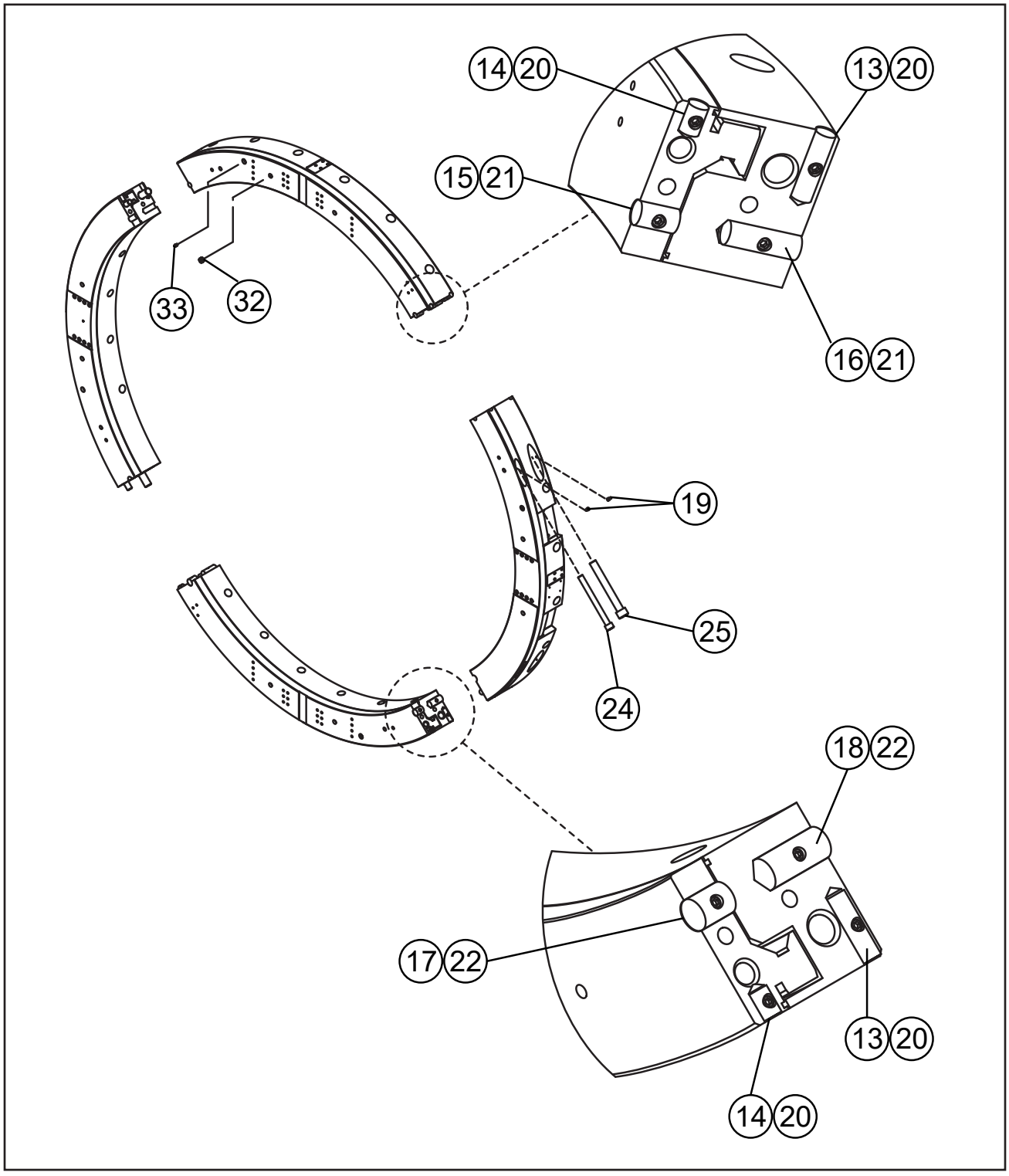
- Model 765RVC Hydraulic Power Supply
  - Available in 480 volt, 380 volt and 240 volt configurations.
- Single Point Module

12. ILLUSTRATED PARTS BREAKDOWN

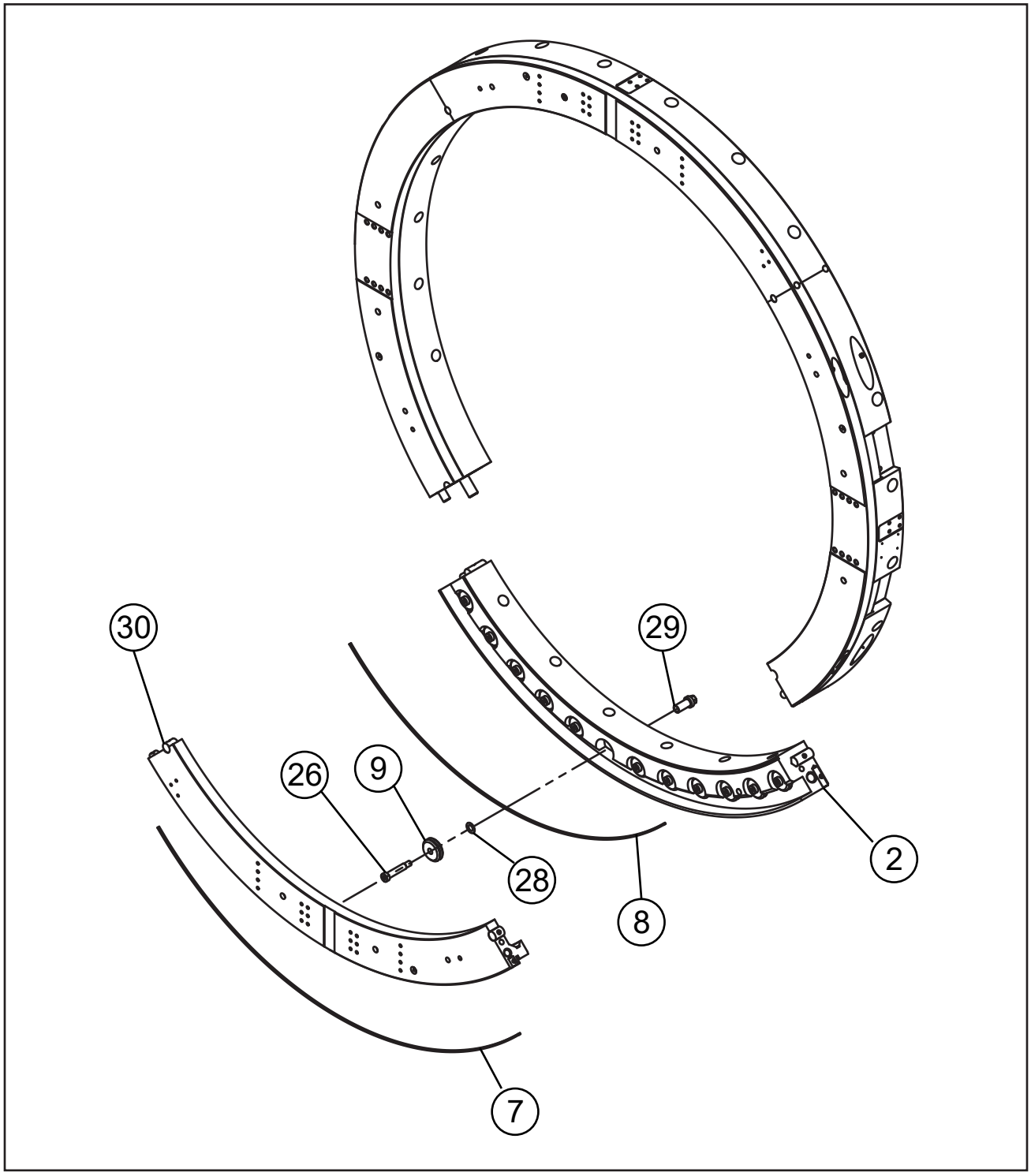
MODEL 660RBL CLAMSHELL SUB-ASSEMBLY (P/N 02-2820) *1 of 3*



MODEL 660RBL CLAMSHELL SUB-ASSEMBLY (P/N 02-2820) *2 of 3*



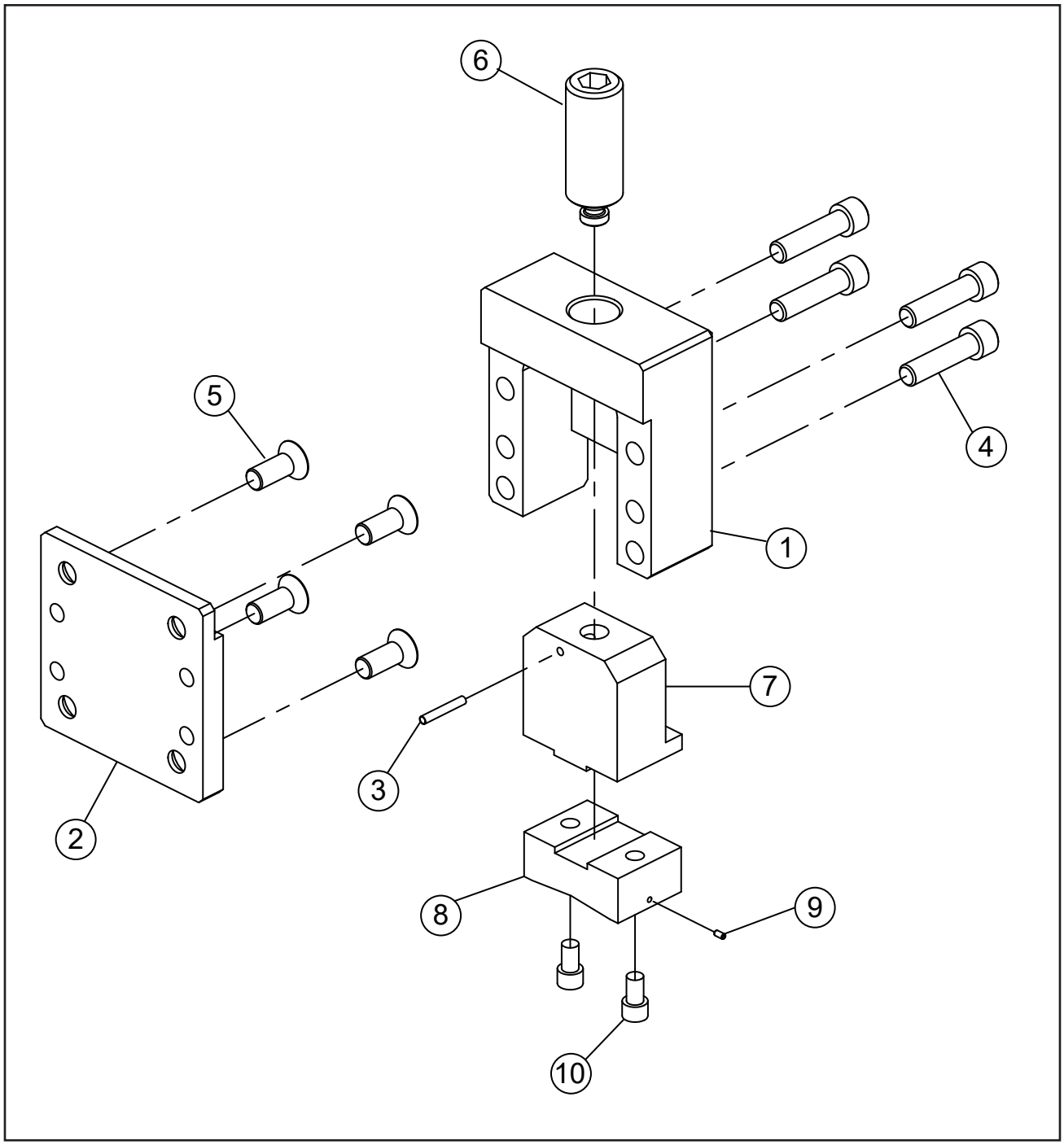
MODEL 660RBL CLAMSHELL SUB-ASSEMBLY (P/N 02-2820) *3 of 3*



Parts List, Model 660RBL Clamshell Sub-Assembly (P/N 02-2820)

Item No.	Part No.	Description	Qty
1	08-0337	BLOCK ASSEMBLY, JACKSCREW	4
2	19-1547	HOUSING, MAIN, 660RBL	1
3	26-0477	BAR ASSEMBLY, 4.125"/104.8MM HIGH	4
4	26-0478	BAR ASSEMBLY, 3.125"/79.4MM HIGH	4
5	26-0479	BAR ASSEMBLY, 2.125"/54.0MM HIGH	4
6	26-0480	BAR ASSEMBLY, 1.125"/28.6MM HIGH	4
7	28-0057	SEAL, FELT, 1/8” X 3/16” X BULK	197
8	28-0057	SEAL, FELT, 1/8” X 3/16” X BULK	226
9	29-0300	BEARING, DUAL VEE	48
10	30-0282	RING, HOIST, 5/8-11	4
11	30-0615	BALL, HARDENED, 9/16" DIA MINI	20
12	30-0622	SADDLE	20
13	32-0440	PIN, ALIGN, .625" DIA X 2.125"	4
14	32-0441	PIN, ALIGN, .625" DIA X .875"	4
15	32-0442	PIN, ALIGN, .750" DIA X 1.218"	2
16	32-0443	PIN, ALIGN, .750" DIA X 2.25"	2
17	32-0444	PIN, ALIGN, 1.00" DIA X 1.218"	2
18	32-0445	PIN, ALIGN, 1.00" DIA X 2.25"	2
19	33-0037	SCREW, CAP, 1/4-20 X 3/8"	8
20	33-0039	SCREW, CAP, 1/4-20 X 5/8"	8
21	33-0040	SCREW, CAP, 1/4-20 X 3/4"	4
22	33-0042	SCREW, CAP, 1/4-20 X 1"	4
23	33-0106	SCREW, CAP, 1/2-13 X 1-1/4"	8
24	33-0160	SCREW, CAP, 3/4-10 X 8"	4
25	33-0190	SCREW, CAP, 1"-8 X 8"	4
26	33-1801	SCREW, SHOULDER, .590 DIA X 2.50"	48
27	33-1831	JACKSCREW, 1 1/4-7 UNC X 9-3/4"	20
28	34-0275	WASHER, THRUST	48
29	35-0382	NUT, ADJUSTMENT	48
30	39-0690	GEAR, MAIN, 660RBL	1
31	48-0832	LOCK-BLOCK ASSEMBLY	4
32	54-0304	PLUG, PRESSURE, FLUSH SKT 3/8" NPT	8
33	54-0375	FITTING, GREASE	4
	NOT SHOWN		
	05-0634	WRENCH KIT, 660RBL	1

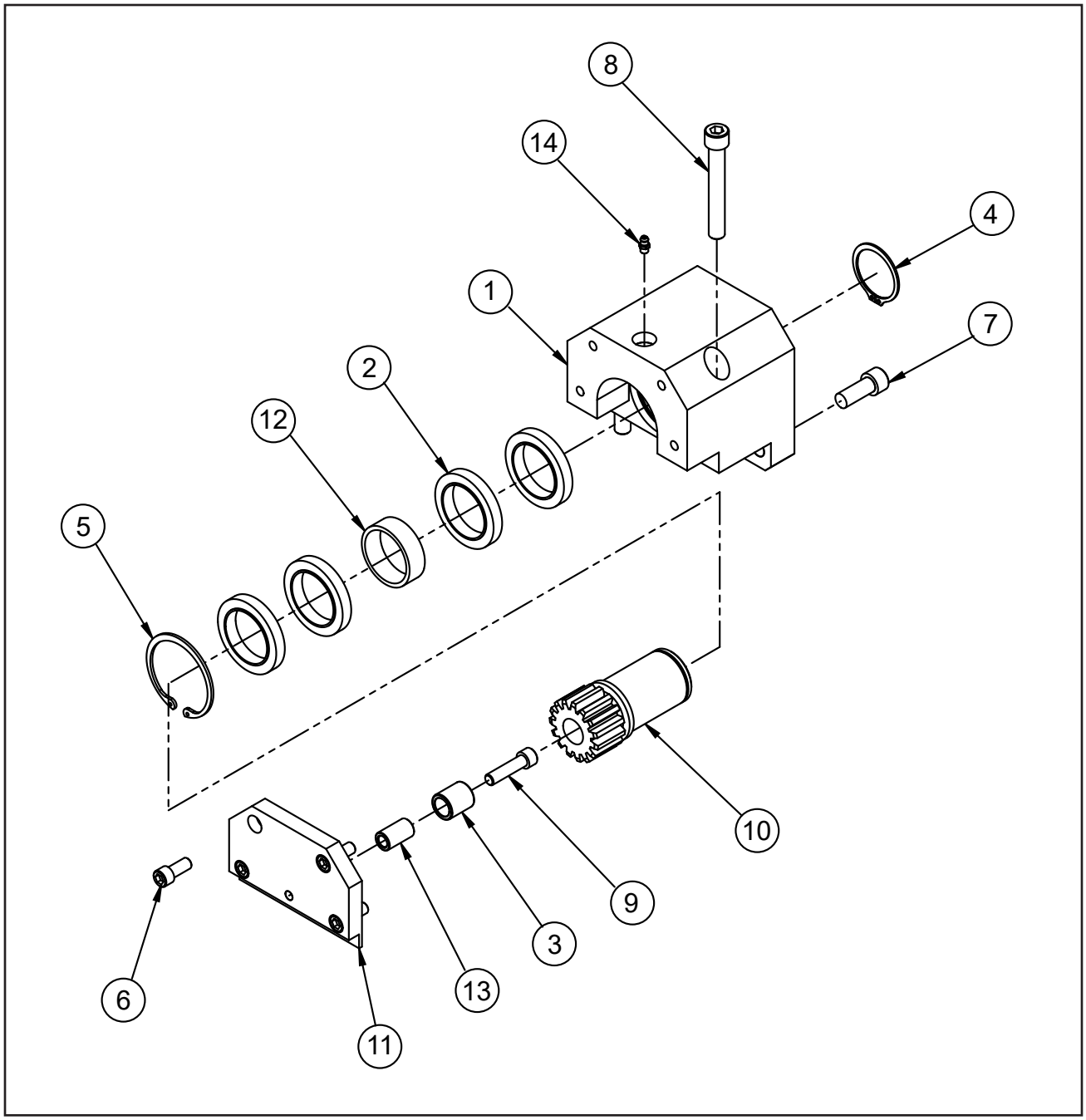
BLOCK ASSEMBLY, CLAMP (P/N 08-0337) & BAR ASSEMBLY, CLAMPING



Parts List, Block Assembly, Clamp (P/N 08-0337) & Bar Assembly, Clamping

Item No.	Part No.	Description	Qty
	08-0337	BLOCK ASSEMBLY, CLAMP	4
1	19-0659	HOUSING	1
2	24-1242	PLATE, ADAPTER	1
3	32-0043	PIN, ROLL	1
4	33-0109	SCREW, CAP	4
5	33-0396	SCREW, FLAT	4
6	33-1343	SCREW, ADJUST	1
7	48-0315	BLOCK, GUIDE	1
	26-0480	BAR ASSEMBLY, CLAMPING, 60"	4
8	26-0476	BAR FIXED	1
9	32-0290	PIN, ROLL	2
10	33-0068	SCREW, CAP	2
	26-0479	BAR ASSEMBLY, CLAMPING, 58"	4
8	26-0475	BAR FIXED	1
9	32-0290	PIN, ROLL	2
10	33-0073	SCREW, CAP	2
	26-0478	BAR ASSEMBLY, CLAMPING, 56"	4
8	26-0474	BAR FIXED	1
9	32-0290	PIN, ROLL	2
10	33-0077	SCREW, CAP	2
	26-0477	BAR ASSEMBLY, CLAMPING, 54"	4
8	26-0473	BAR FIXED	1
9	32-0290	PIN, ROLL	2
10	33-0081	SCREW, CAP	2

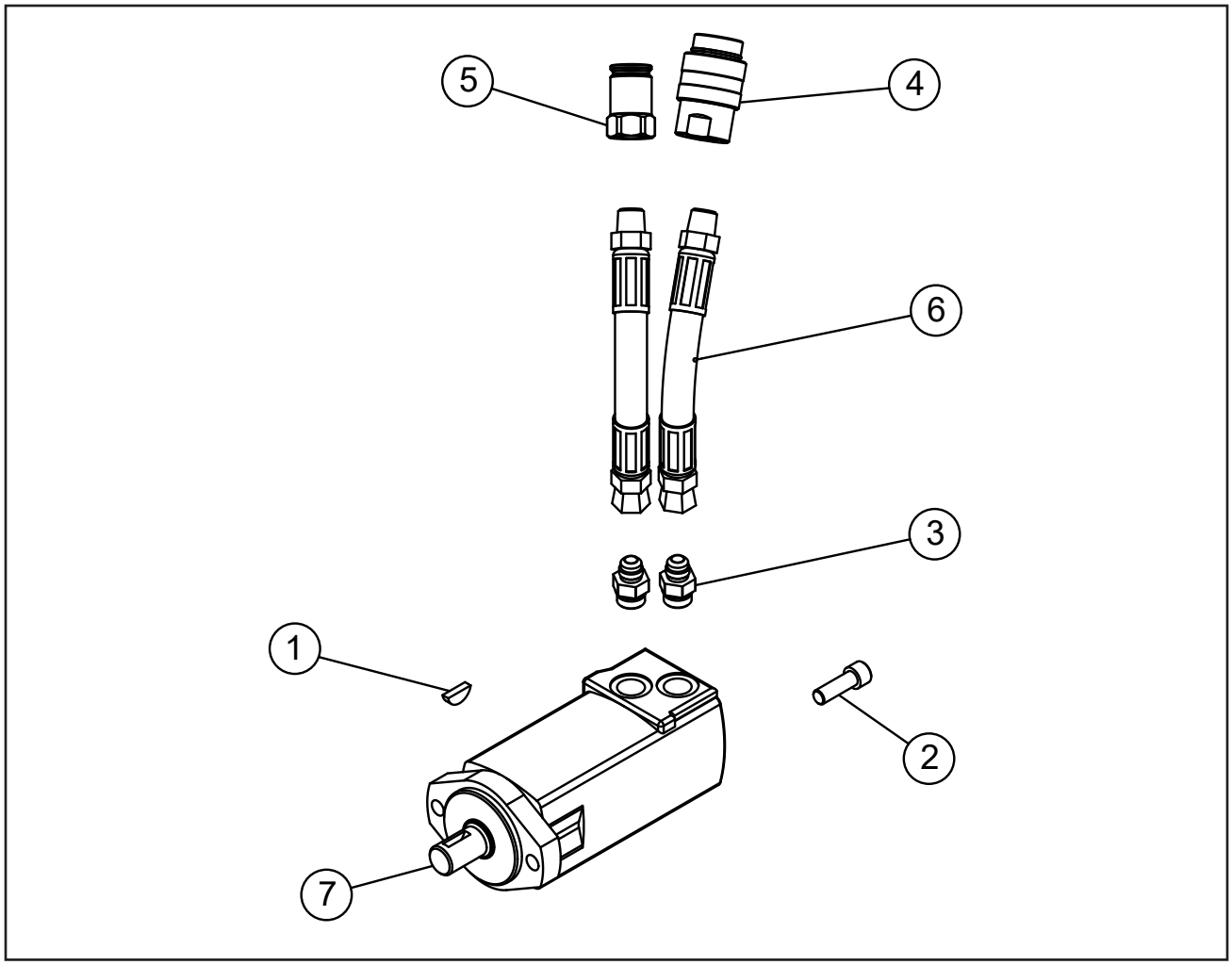
HOUSING ASSEMBLY, DRIVE (P/N 19-0643)



Parts List, Housing Assembly, Drive (P/N 19-0643)

Item No.	Part No.	Description	Qty
1	19-0642	HOUSING, DRIVE	1
2	29-0010	BEARING, BALL	4
3	29-0291	BEARING, NEEDLE	1
4	30-0007	RING, RETAINING, EXTERNAL	1
5	30-0286	RING, RETAINING, INTERNAL	1
6	33-0070	SCREW, CAP	4
7	33-0106	SCREW, CAP	2
8	33-0115	SCREW, CAP	2
9	33-0237	SCREW, CAP	1
10	39-0697	GEAR, PINION	1
11	43-0413	COVER	1
12	44-0397	SPACER	1
13	45-0205	BUSHING	1
14	54-0375	FITTING, GREASE	1

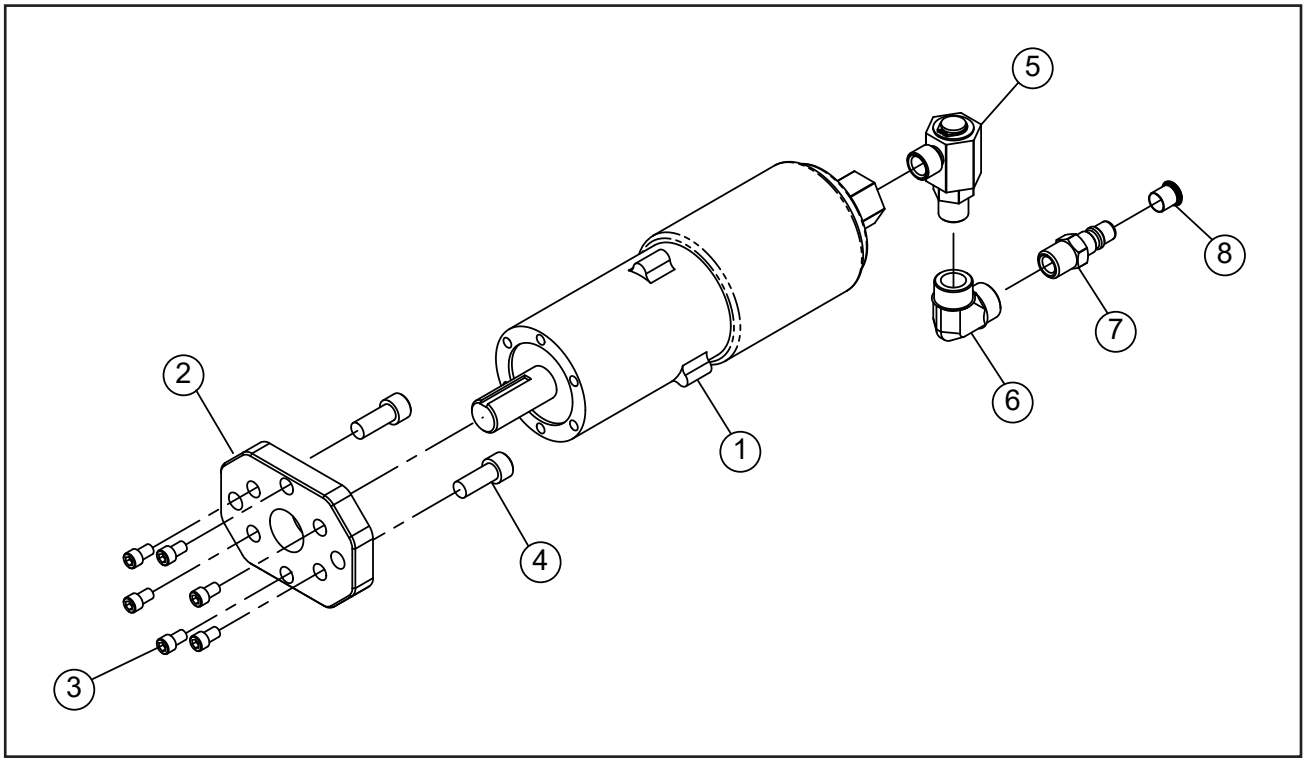
MOTOR ASSEMBLY, HYDRAULIC (P/N 56-0061)



Parts List, Motor Assembly, Hydraulic (P/N 56-0061)

Item No.	Part No.	Description	Qty
1	31-0001	KEY, WDRFF, 1" DIA X 1/4"	1
2	33-0106	SCREW, CAP, 1/2-13 X 1-1/4"	2
3	54-0002	ADAPTER, 7/8" O-RING TO 1/2-37D	2
4	54-0333	COUPLER, QD, HYDRAULIC, DRIPLESS, FEMALE	1
5	54-0334	NIPPLE, QD, HYDRAULIC, DRIPLESS, MALE	1
6	55-0156	HOSE ASSEMBLY, HYDRAULIC	2
7	56-0002	MOTOR, HYDRAULIC	1
	NOT SHOWN		
	54-0335	DUST PLUG, DRIPLESS	2

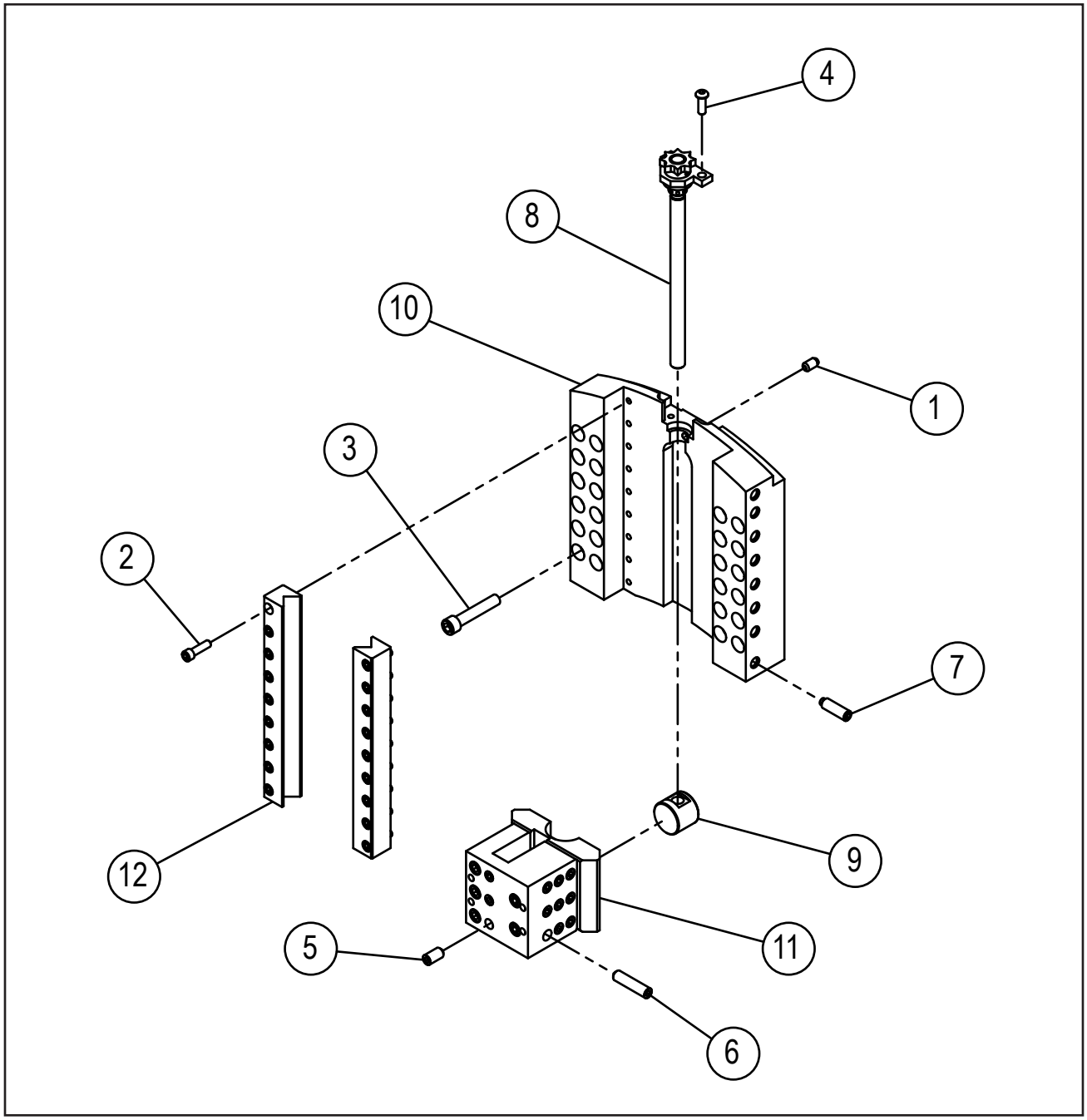
MOTOR ASSEMBLY, AIR (P/N 57-0204)



Parts List, Motor Assembly, Air (P/N 57-0204)

Item No.	Part No.	Description	Qty
1	57-0020	MOTOR, AIR (IR 4800U)	1
2	47-0837	BRACKET	1
3	33-0052	SCREW, 5/16-18 X 1/2"	6
4	33-0106	SCREW, 1/2-13 X 1-1/4"	2
5	54-0204	FITTING, SWIVEL	1
6	54-0062	ELBOW	1
7	54-0126	QD FITTING	1
8	54-0201	CAP	1
	NOT SHOWN		
	30-0508	LABEL	1
	30-0962	LABEL	1

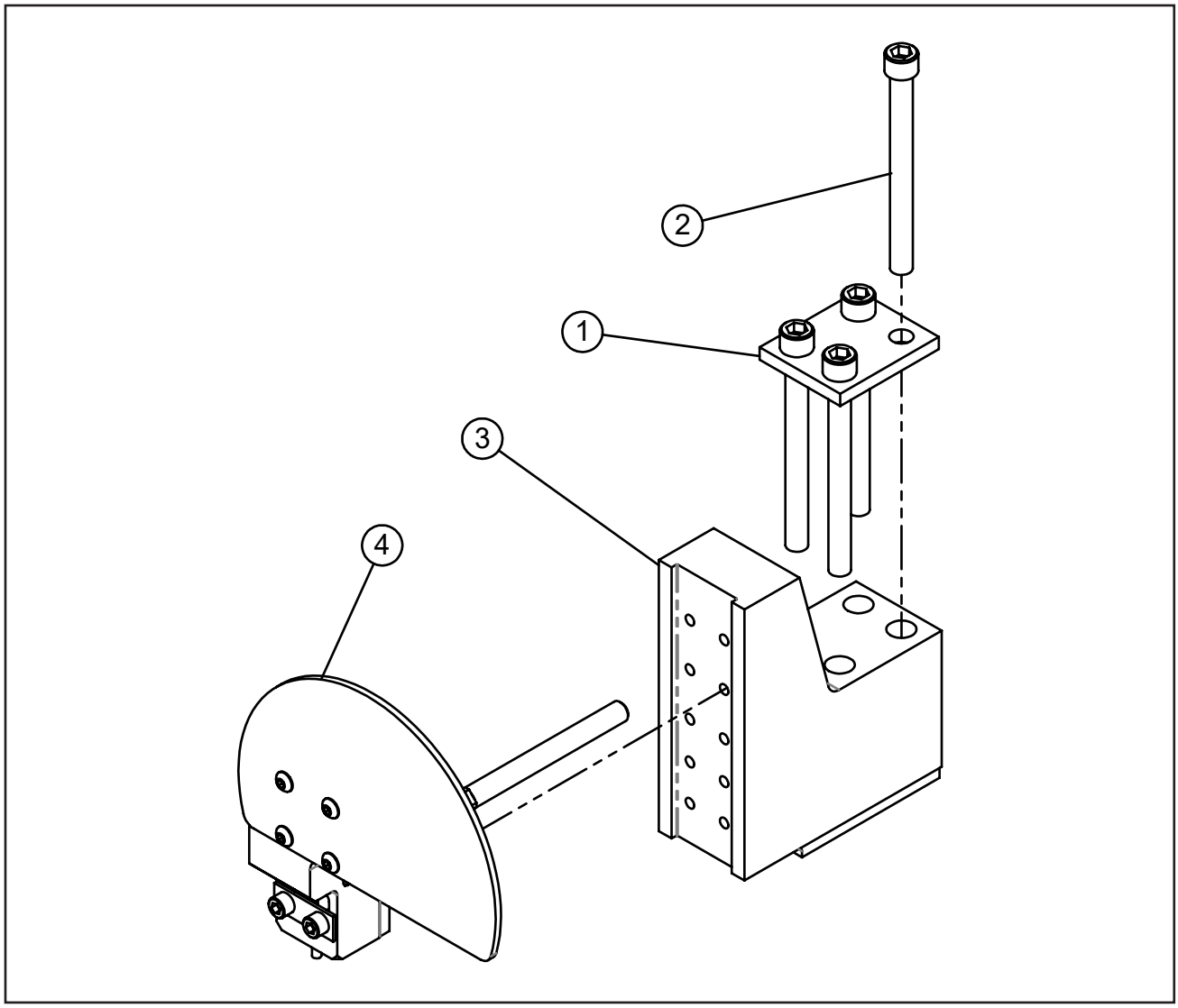
TOOL BLOCK (P/N 08-0336)



Parts List, Tool Block (P/N 08-0336)

Item No.	Part No.	Description	Qty
1	30-0464	PLUNGER, BALL	1
2	33-0043	SCREW, CAP	18
3	33-0075	SCREW, CAP	10
4	33-0287	SCREW, BUTTON HEAD	2
5	33-0530	SCREW, SET	3
6	33-0531	SCREW, SET	9
7	33-1333	SCREW, SET	8
8	33-1502	SCREW ASSEMBLY, LEAD	1
9	35-0204	NUT, FEED	1
10	47-0527	BRACKET, TOOL MODULE	1
11	48-0309	BLOCK ASSEMBLY, TOOL	1
12	66-0090	RAIL, SLIDE	2

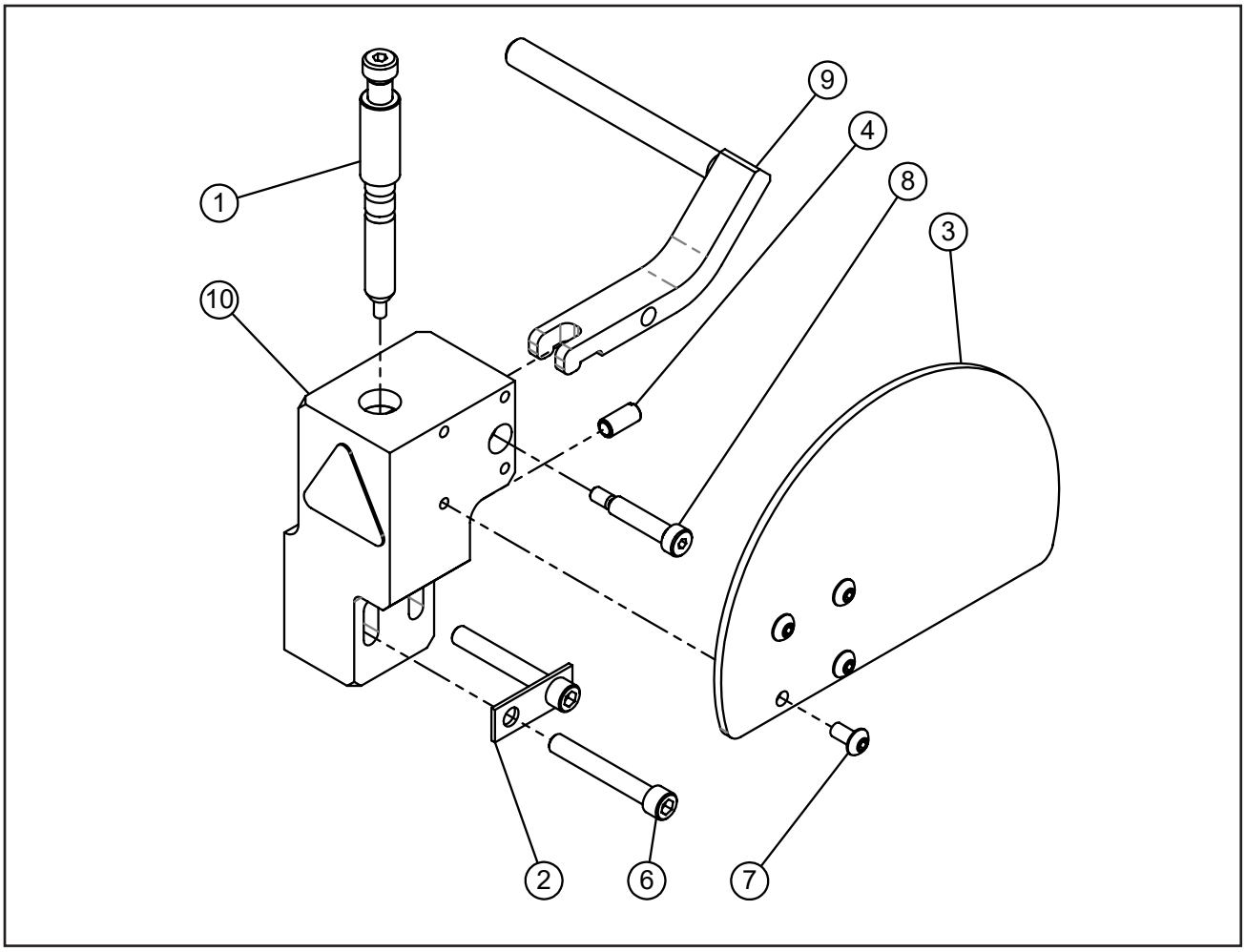
TRIPPER BRACKET ASSEMBLY, LEVER, 660RBL (P/N 47-2483)



Parts List, Tripper Bracket Assembly, Lever, 660RBL (P/N 47-2483)

Item No.	Part No.	Description	Qty
1	24-1210	PLATE, WASHER	1
2	33-0082	SCREW, CAP, 3/8-16 X 4	4
3	47-0848	BRACKET, TRIPPER	1
4	47-2476	BLOCK, TRIPPER, SUB-ASSEMBLY	1

BLOCK TRIPPER SUB-ASSEMBLY, 660RBL (P/N 47-2476)



Parts List, Block Tripper Sub-Assembly, 660RBL (P/N 47-2476)

Item No.	Part No.	Description	Qty
1	14-0138	SHAFT ASSEMBLY, TRIPPER, SB	1
2	24-4002	PLATE, WASHER	1
3	24-4003	GUARD, TRIPPER, ODTM	1
4	30-0125	PLUNGER, BALL, 1/4-20 X 17/32”	1
5	30-5686	LABEL, HAND CRUSH/TRIANGLE	1
6	33-0045	SCREW, CAP, 1/4-20 X 1-3/4”	2
7	33-0278	SCREW, BUTTON, 10-24 X 3/8”	4
8	33-1303	SCREW, SHLDR, 1/4” X 1”	1
9	41-0256	LEVER HANDLE, WELDMENT, ODTM	1
10	47-2474	BLOCK, TRIPPER, ODTM	1

WARNING

Read the manual and be familiar with all safety precautions before operating equipment. The following are general warnings for industrial equipment with moving parts. Refer to the manual for specific warnings applicable to your equipment.

EYE HAZARD - Always wear appropriate eye protection while operating the equipment.

PINCH HAZARD - Keep your hands and clothing away from moving parts.

CRUSH HAZARD - The machinery, pipe, or work piece can shift, separate, lurch, or fall.

CHIP HAZARD - Metal chips may be hot and sharp. Be careful when you clear the tooling path or clean up chips.

TIE DOWN HAZARD - Deliberate overriding of safety triggers can result in serious injury. Never lock or tie down any safety triggers.

SHOCK HAZARD - Ensure that the equipment is properly installed and grounded. Ensure that the equipment is not damaged and that the power cord is intact.

OTHER HAZARDS

• Tool bits are sharp and can cause serious injury.
• Do not defate or modify safety features.
• Disconnect power sources before servicing or moving the equipment.
• Remove all loose articles of clothing and jewelry before operating the equipment.

Be Safety Conscious!

TRI TOOL TECHNOLOGIES

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