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SAFETY PRECAUTIONS

IN GENERAL

When using rotating head cutting equipment, basic safety precautions should always be followed to reduce the risk of personal injury.

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.

DRESS CONSIDERATIONS

Use standard safety equipment. Hard hats, safety shoes, safety harnesses, protective clothes, and other safety devices should always be used when appropriate.

Use safety glasses. Do not operate cutting tools without eye protection.

Dress properly. Do not wear loose clothing or jewelry. They can be caught in rotating and moving parts. Avoid slippery floors or wear nonskid footwear. If you have long hair, wear protective hair covering to contain it.

WORK AREA

Keep the work area clean. Cluttered work areas and benches invite injuries.

Consider the work area environment. Keep the area well lit. Keep electrical cords, cables, rags, rigging straps, and etc. clear of rotating equipment. Do not use power-cutting tools in the presence of flammable liquids and gasses.

Keep visitors away. Do not let visitors or untrained personnel at or near operating tools. Enforce eye protection requirements for all observers.

Do not over reach. Keep proper footing at all times.

Stay alert. Watch what you are doing. Use common sense. Do not operate tools when you are tired.

TOOL CARE

Maintain tools with care. Keep tools in good operating condition. Sharp tool bits perform better and safer than dull tool bits. Well maintained tools function properly when needed.

Check for damaged parts. If a tool has malfunctioned, been dropped or hit, it must be checked for damage. Run no-load tests and feed function checks. Do a complete visual inspection.

Electric motors. Use only with proper AC voltage power sources and observe all normal electric shock hazard procedures.

Do not abuse power and control cords. Pulling or running over cords and cables can result in electrical shock hazards and malfunctions. Keep control and power cords out of all cutting fluids and water.

Hydraulic drives. Observe proper procedures for electrically driven power sources. Avoid damage to hydraulic lines. Keep quick-disconnects clean. Grit contamination causes malfunctions.

Air tools. Check the exhaust muffler. Broken or damaged mufflers can restrict air flow or cause excessive noise. Use air motors only with a filtered, lubricated and regulated air supply. Dirty air, low-pressure air or over pressure air will cause malfunctions, including delayed starting.

AREA EQUIPMENT

Secure work. Whenever possible use clamps, vises, chains and straps to secure pipe.

Make sure the tool is secured; it is safer to have both hands free to operate the tool.

TOOL USE

Use the right tool and tool bit for the job. Do not use a tool, which is incorrect for the job you are doing.

Keep the tool bits fully engaged in the tool bit holders. Loose bits are a safety hazard.

Model 648SB Low Profile Clamshell (2 Piece)

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. Develop a habit of checking 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 feed and speed rate for which they were designed.

Do not reach into rotating equipment. Do not reach into the rotating head stock to clear chips, to make adjustments, or to check surface finish. A machine designed to cut steel will not stop for a hand or an arm.

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

Avoid unintentional starts. Do not carry or handle tools with your hand on the operating switches or levers. Do not lay the tool down in a manner that will start the drive. Do not allow the tool to flip around or move when adjusting or changing tool bits.

Store idle tools properly. Disconnect tools from the power source and store in a safe place. Remove tool bits for safe handling of the tool.

GENERAL DESCRIPTION

The Model 648SB Low-Profile Clamshell is a four piece split-frame pipe lathe designed for severing and beveling in-line pipe with a range of 36" through 48" pipe with minimal radial and axial clearance.

Using Extended Tool Blocks the Model 648SB may be configured to perform the following operations.

- Sever in-line pipe.
- Sever and bevel in-line pipe.
- Sever and double bevel in-line pipe.

DESIGN AND OPERATING FEATURES

The easily adjustable precision bearing surfaces 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 Adjustable Clamping Pads and Jackscrews 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" (.10 mm) 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 shielded to provide protection from dust and chips.

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

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

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

An Adapter Plate Kit is provided for use when cutting in the 36" to 40" pipe range.

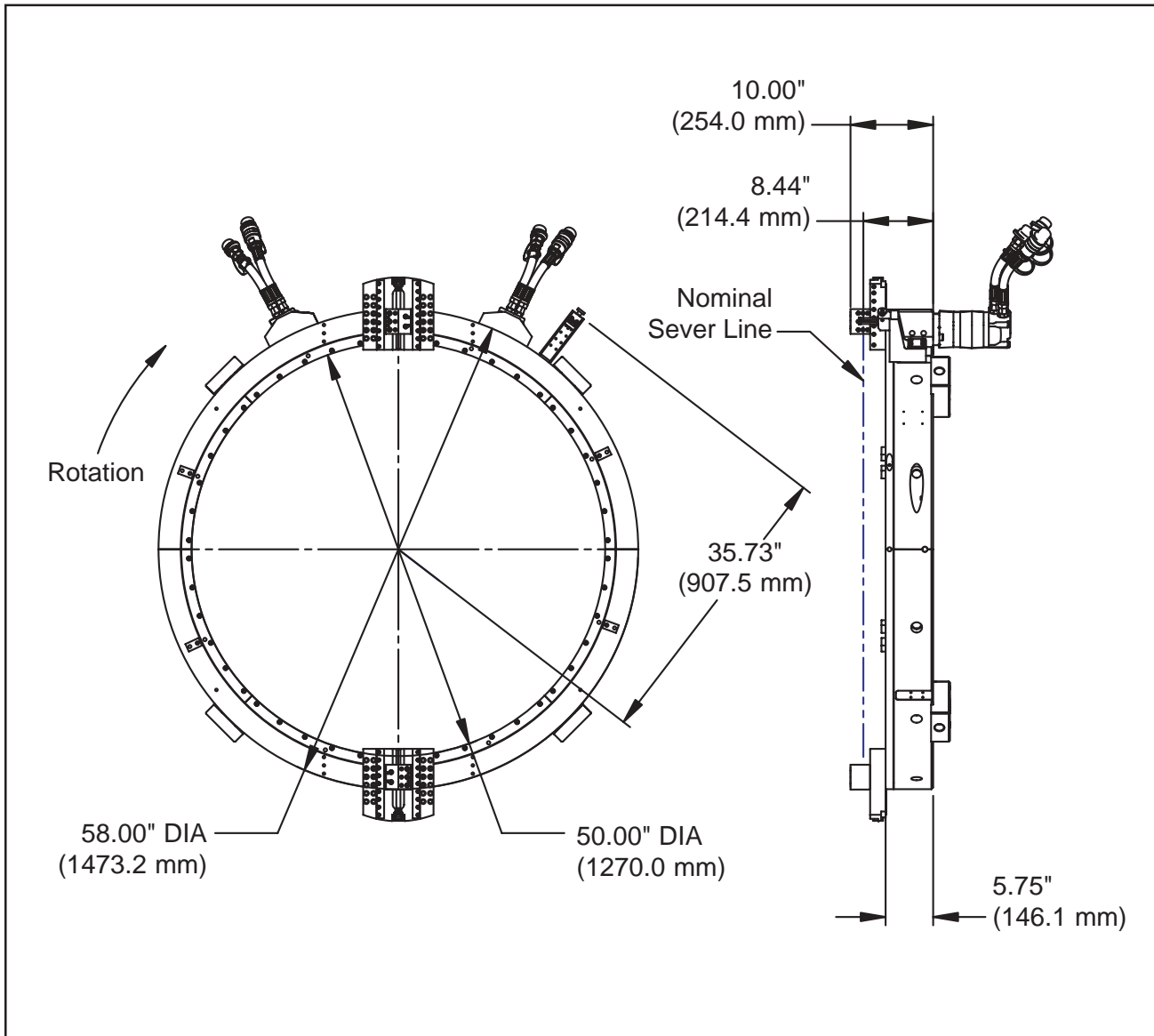
This kit also includes a special Tripper Block Assembly.

SPECIFICATIONS

MODEL 648SB WITH STANDARD HYDRAULIC MOTORS

Power Requirements

20 gpm at 1250 psi (71 L/s at 8619 kPa)



Cutting Capacities on 36" through 48" Pipe

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

Severing with Standard Procedures

2.50" (63.5 mm) wall

Severing and Single Beveling

1.25" (31.8 mm) wall

Severing and Double Beveling

1.25" (31.8 mm) wall

Severing and Beveling with Special Procedures

2.00" (50.8 mm) wall

Clearances

Main Frame Diameter

58.00" (1473.2 mm)

Axial Clearance Required Relative to Center-Line of the Cut

Mounting Side

8.44" (214.4 mm)

Side Opposite of the Frame

1.56" (39.6 mm)

MAINTENANCE

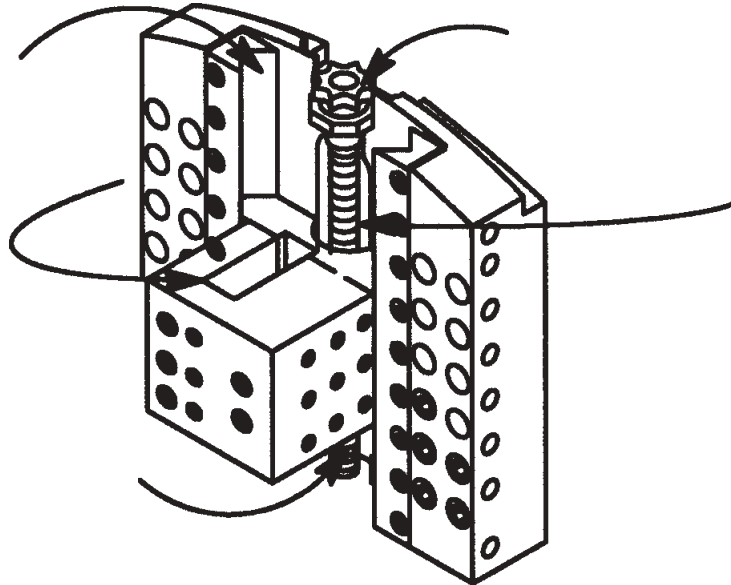
All components should be cleaned and coated with a light film of oil prior to use.

Use a clean, non-detergent oil, preferably SAE 10 (90 SSU) or lighter.

NOTE:

The motor warranty is void if damage occurs from a contaminated hydraulic fluid.

Clean Up



If the Clamshell is operated in such a manner that the Tool Blocks collect debris while cutting, the Tool Blocks and the Feed Screws should be cleaned after each cutting operation.

MAINTENANCE SCHEDULE

Daily

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

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

Every 20 Hours of Operation

Check adjustment of the Main Bearings pre-load.

Lubricate the male and female Tool Block Slides and the Feed Screw.
Reference paragraph, 'Tool Block Maintenance'.

Every 40 Hours of Operation

Thoroughly clean and lubricate the Main Gear, Drive Gear, Male and Female Tool Slides, Feed Screws, and Tripper Block Assembly.

Non-Scheduled Maintenance

Readjust the Main Bearings pre-load if the Clamshell generates excessive heat or the Main Bearings become loose. Reference paragraph, 'Adjustment of the Main Bearings Pre-Load'.

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

STORAGE

When the Clamshell is to be stored or if it 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.

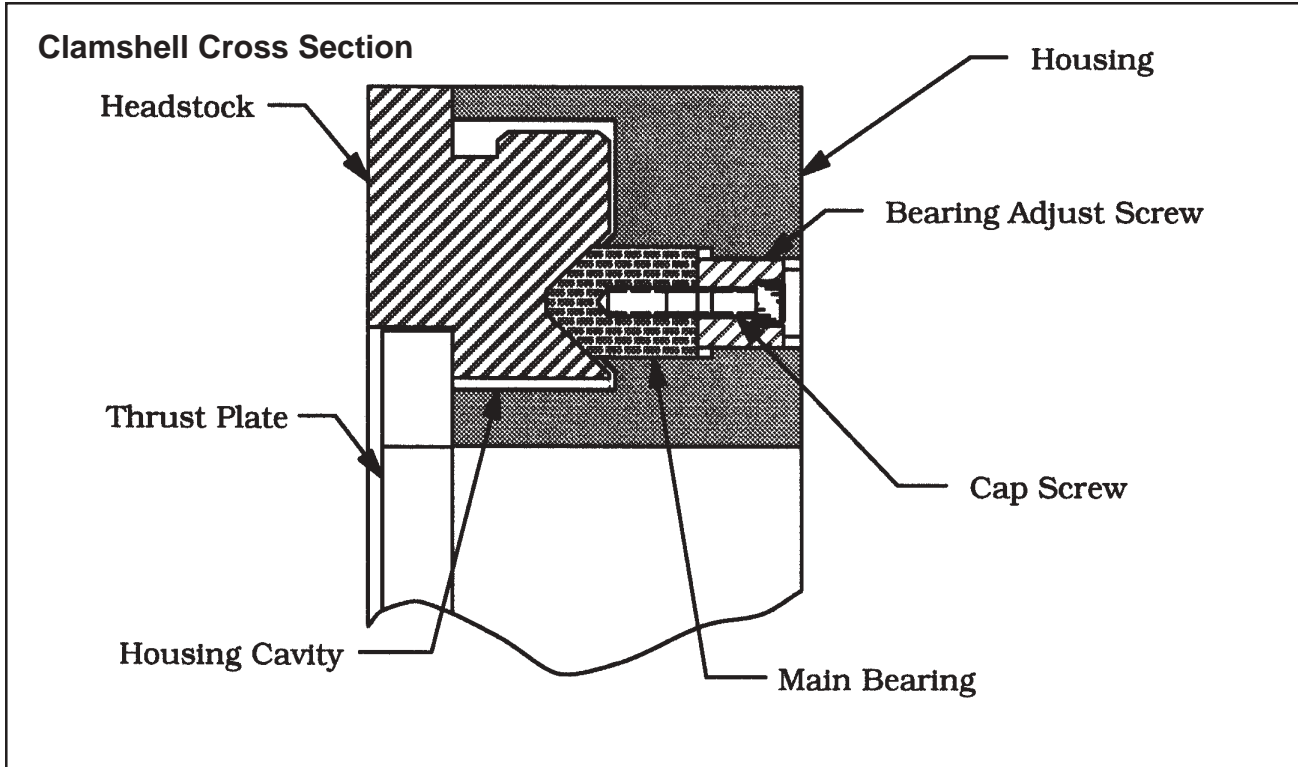
ADJUSTMENT OF THE MAIN BEARINGS PRE-LOAD

Loosen all Bearing Adjustment Lock Screws about 1/2 turn.

Turn in bearing adjustment screws: 1, 6, 11, 16, 21, 26, 31 and 36, so they are snugged tightly.

This insures that the Bearings are fully pushed forward.

Lightly turn in the remaining Bearing Adjustment Screws in the order shown until all of the bearings make contact with the Headstock.



Relax Bearing Adjustment Screws: 1, 6, 11, 16, 21, 26, 31 and 36. Re-slug them so they all are evenly loaded against the Bearings.

Connect the hydraulic supply and apply power to the Clamshell so that it is running at full speed.

Adjust the Bearing Adjustment Screws 1 through 40 so that the Clamshell rotation slows slightly.

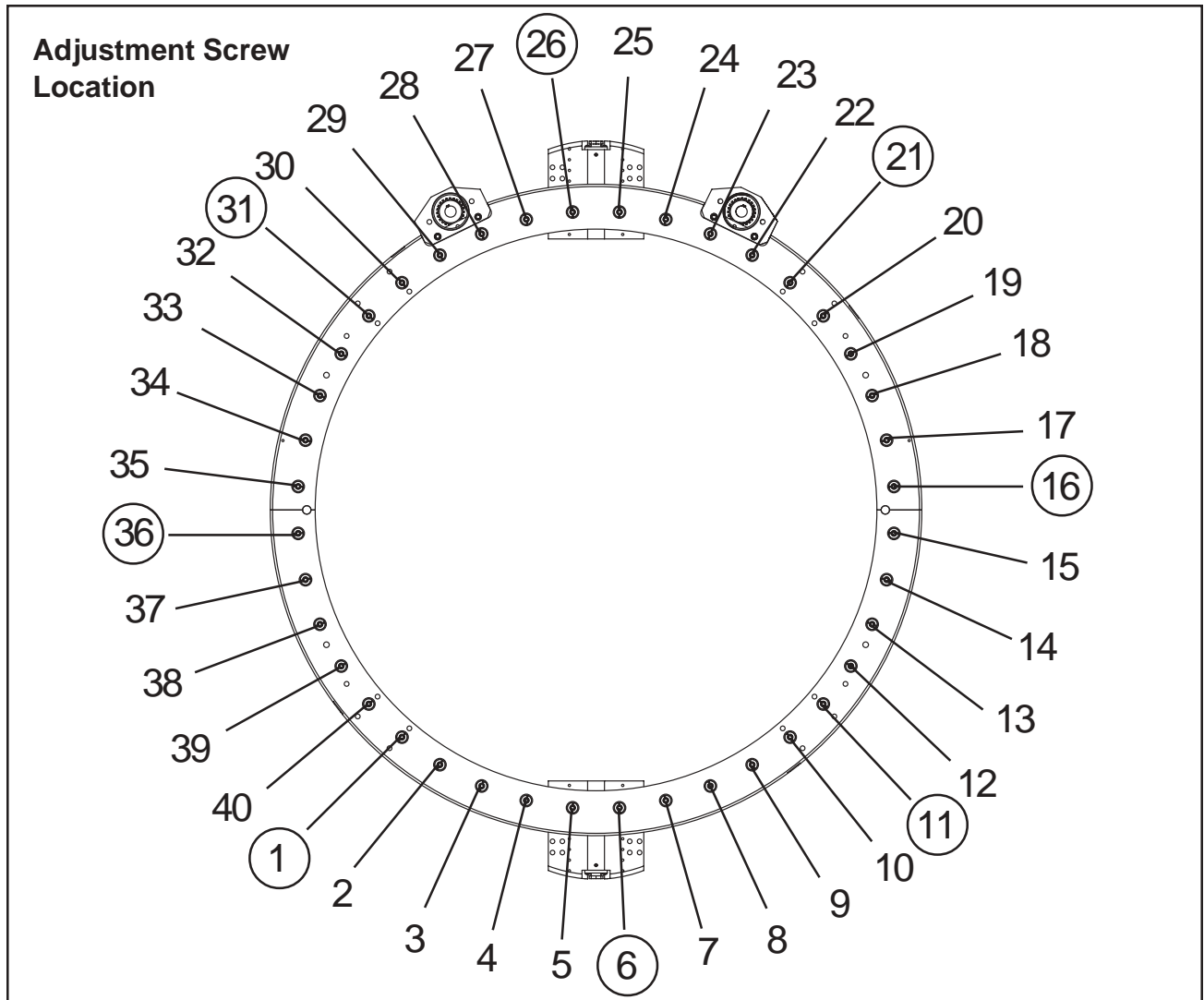
Listen for a change in the sound of the Hydraulic Motors.

Adjust the Bearing Adjustment screws in small increments so that the Bearings are loaded evenly.

All of the Bearing Adjustment Screws should be snugged to ensure that the Bearings are uniformly loaded.

The safe torque range on the Bearing Adjustment Screws is 2 in-lbs. (.2 Nm) to 8 (.8 Nm) in-lbs..

Overtightening the Bearing Adjustment screws will result in accelerated bearing wear and lower available power.



Lock the Bearing pre-load by tightening the Bearing Adjustment Lock Screws, 1 through 40.

The safe torque should be 5 in-lbs. (7 Nm) to 10 in-lbs. (14 Nm).

WARNING: Too much torque may crack the Bearing while too little torque may allow the Bearing pre-load to relax.

INSPECTION OF THE MAIN GEAR

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

Remove the front Thrust Plates by removing the forty-eight (48) Hold Down Screws.

Lift the Headstock from the Housing.

The Main Gear and the Main bearings may now be inspected.

Check the Bearings, Housing, and the race on the Gear.

All Surfaces should be smooth, without scratches, and they should be smooth, without scratches, and they should feature even wear patterns over the entire surface.

Check the Housing cavity for chips, dirt and/or corrosion.

To reassemble, wipe clean all of the Bearing surfaces and clean the Housing cavity.

Re-grease the Gear using a lubricant approved by TRI TOOL Inc.

Place the Headstock carefully back into the Housing.

Bolt the Front Thrust Plates back into place.

When the bearing pre-load was properly adjusted before disassembly, then it will still be adjusted when reassembled.

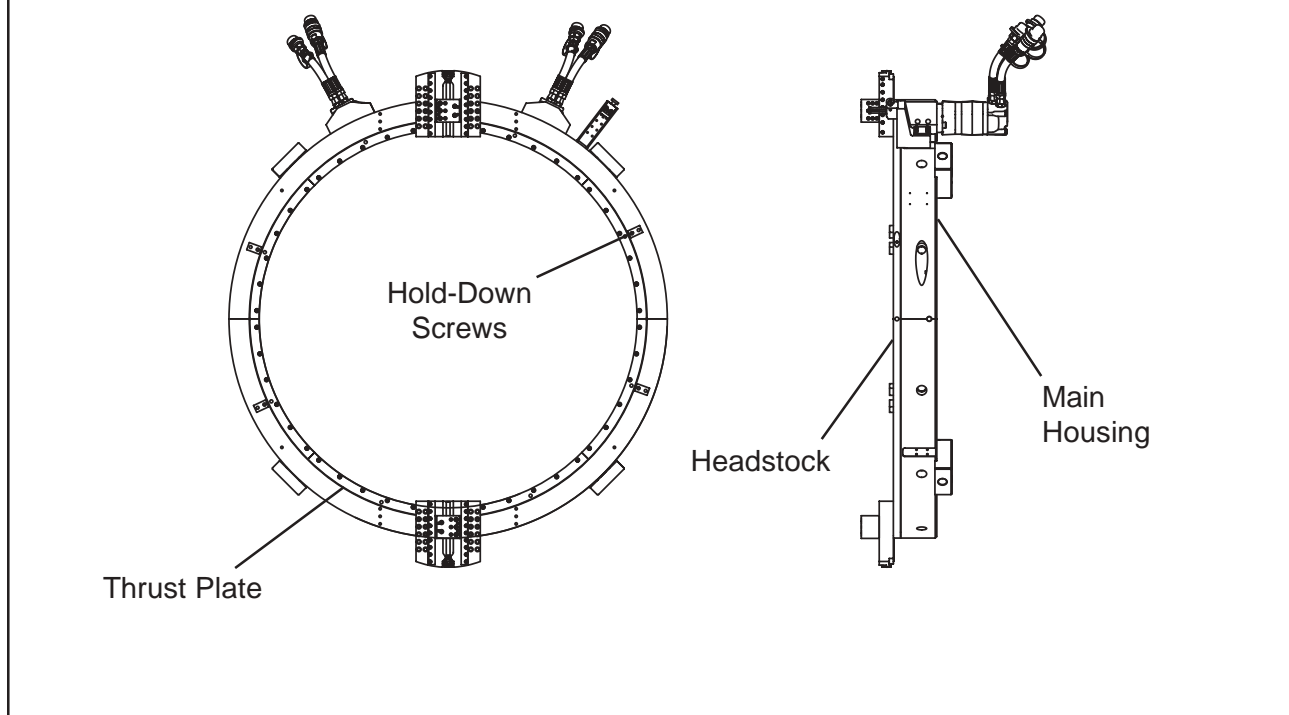
Drive Gear and Main Gear Lubrication

Remove the Drive Housings.

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

Coat the teeth of the Drive Gear and the Main Gear with a grease that is approved by TRI TOOL Inc.

Clamshell Nomenclature



Tool Block Maintenance

Clean the Slide Rails, the Feed Nut, the Sprocket Assembly and the Feed Screw.

Inspect these parts for damage and replace as required.

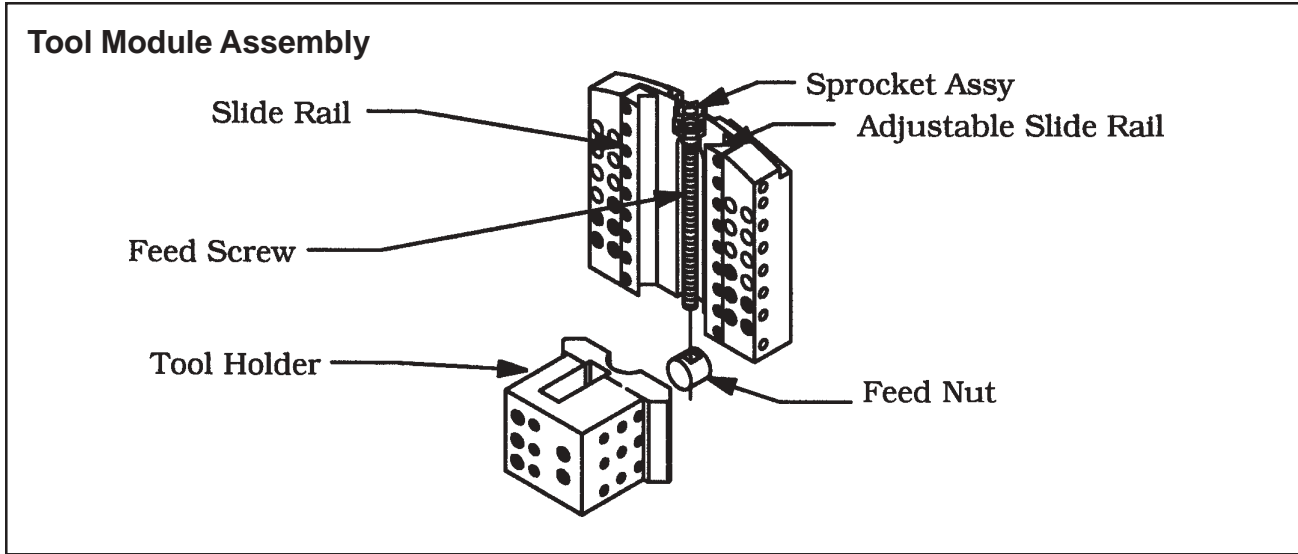
Lubricate and reassemble the Tool Block.

NOTE: Use lubricant on the Feed screw sparingly or wipe to a film condition.

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

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

The Slide Rails must be overtightened 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 Rails.

Run the Tool Holder to the most outward position.

Using the Adjustment Set Screws, apply a 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.

Finger-tighten the Hold Down Screws using a hex key to about 12 in-lbs. (1.4 Nm) to 24 in-lbs. (2.7 Nm).

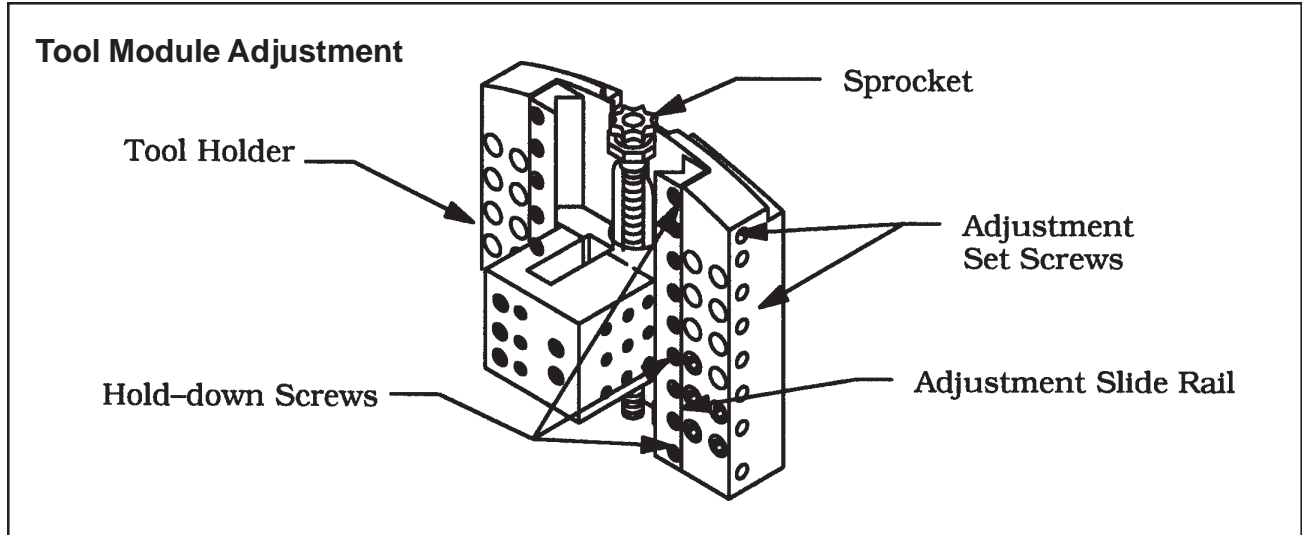
Using the Spanner Wrench, run the Tool Holder to the inward most position.

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.

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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 snugly.

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.

The torque on the Spanner Wrench should be about 2 ft-lbs (3 Nm) to 5 ft-lbs (7 Nm).

Tripper Block Assembly lubrication and Tripper Shaft Adjustment

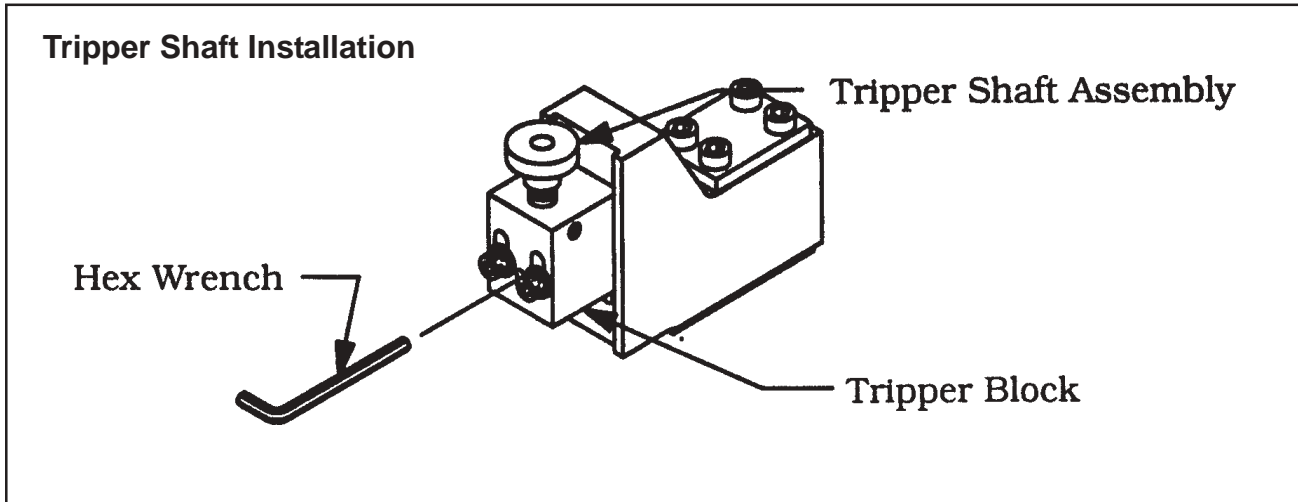
Back off the Half Dog Set Screw until it disengages from the Tripper Shaft.

Remove the Tripper Shaft Assembly from the Block and clean off all of the old lubrication.

Apply a fresh lubrication to the Tripper Shaft Assembly and reinstall it in the Block.

Screw in the Half Dog Set Screw until it locates itself in the slot on the Tripper Shaft.

See the 'Operation' section for Feed Pin to Sprocket adjustment.



Lubrication Recommendations

The Drive Gears require a high string lubrication grease such as 'Chevron Utility Grease' (P/N 68-0020).

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.

NOTE:

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

The bearings in the Drive Motors are sealed and do not require any lubrication.

OPERATION

Read the 'Operation' section carefully before attempting to operate the Model 648SB Low Profile Clamshell.

Configure the Clamshell for the specific task required.

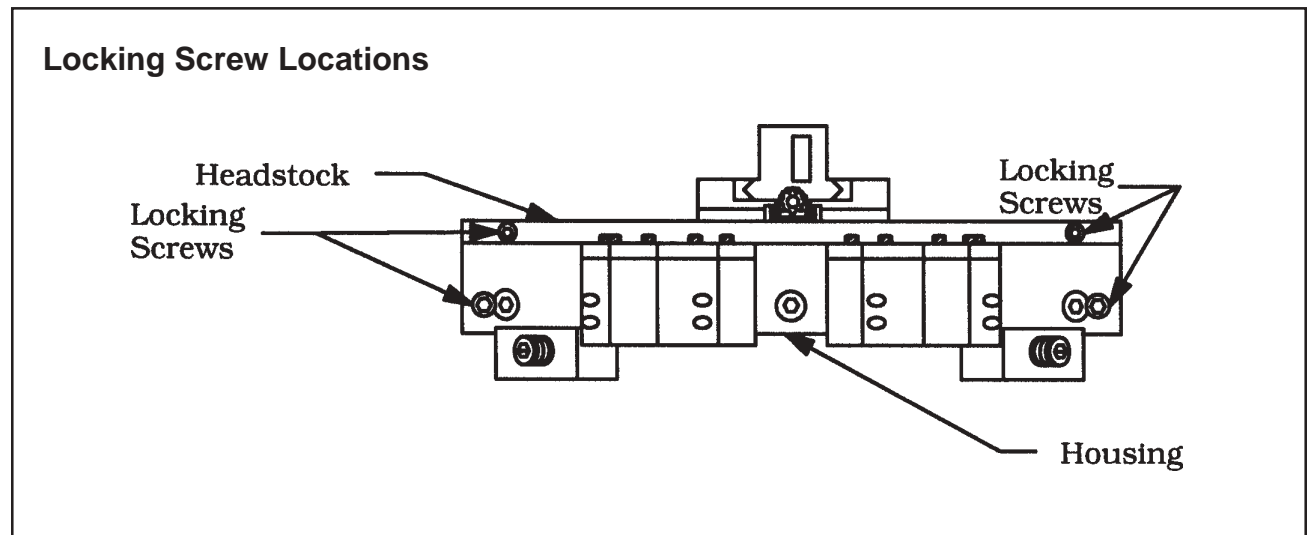
Mount the Tool Blocks and Tripper Bracket onto the Clamshell.

Select and install the proper Clamping Pad Set into the Clamshell.

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

INSTALLATION OF THE CLAMSHELL ON AN IN-LINE PIPE

Separate the Clamshell into two (2) halves.



Rotate the Headstock until the split-lines of the Headstock match the split-lines of the Housing.

Fasten the four (4) Lock Blocks from the Headstock to the Thrust Plate; there is one on each half of the Clamshell.

This is to prevent the headstock from rotating out of the Housing while the Clamshell is split into halves.

Unbolt the Clamshell.

The Locking Screws are located on the Housing and the Headstock.

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

Separate the Clamshell sections evenly by pulling straight apart.

DO NOT FORCE OPEN.

Secure the Clamshell to the pipe.

Clean the mating surfaces and the contact surface of the Mounting Pads and the jackscrews on each half of the Clamshell.

Wipe clean the mounting surface on the pipe.

Check to insure that the Tool Blocks will clear the pipe when the Clamshell is mounted.

Close the sections of the Clamshell around the pipe, keeping the mating surfaces clean.

Check that the Alignment Pins have seated the split-lines properly.

Bolt the sections of the Clamshell together using the Locking Screws in the Housing and in the Headstock.

Tightening torque should be 50 ft-lbs (68 Nm) to 60 ft-lbs (81 Nm).

Loosen the Lock Blocks, rotate and refasten them to the Headstock.

Using the fully Adjustable Clamping Pads, clamp the Clamshell to the pipe as follows.

Rough center and square the Clamshell by tightening the four (4) Clamping Pads independently.

Check the center and square by eye.

The Adjustable Pads tend to square the Clamshell to the pipe.

If additional precision in squaring is required, consult TRI TOOL Inc. about alternate methods of squaring.

Model 648SB Low Profile Clamshell (2 Piece)

Fine center the Clamshell as you would a four-jaw chuck.

Take measurements from the pipe OD to the Housing ID or use a dial indicator to sweep around the pipe's outside diameter.

Adjust the four (4) Clamping Pads so that the measurements at opposing Clamping Pads are the same.

Tighten the Clamping Pads using a tightening torque of 50 ft-lbs (68 Nm) to 75 ft-lbs (102 Nm).

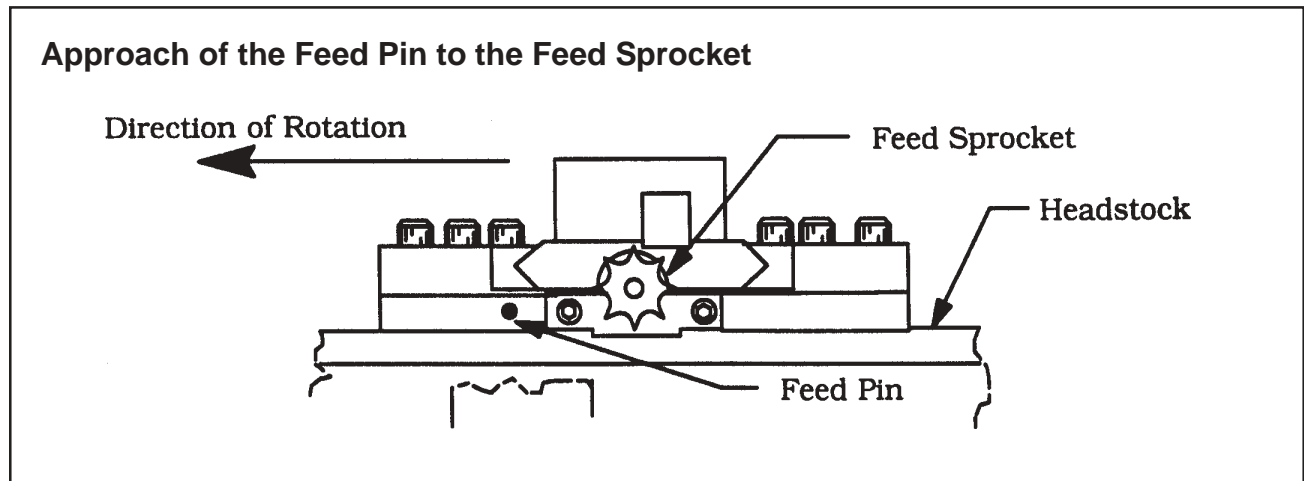
Tighten the Jackscrews against the pipe using a tightening torque of 35 ft-lbs (47 Nm) to 50 ft-lbs (68 Nm) for added stability.

GENERAL MACHINING SEQUENCE

Install the Hydraulic Motors into the Drive Sprockets and bolt them to the Clamshell.

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

Rotate the Headstock slowly with the Tripper Shaft pushed 'in' for one full revolution to insure that the Feed Pin to Sprocket is set right on both Tool Blocks.



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

To check the Feed Pin to Sprocket engagement go to the 'Feed Pin to Sprocket Engagement' information later in this section.

Select and Install the desired Tool Bit Set.

Reference 'Tool Bit Set-Up' for selection and setup instructions located later in this section.

Turn the Hydraulic Motors on to full speed.

Engage the feed by pushing the Tripper Shaft in.

Monitor the cutting operation.

Apply cutting fluid as necessary.

If 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.

Stop the Clamshell and remove the chips.

Reference 'Severing' for the specific machining procedures located later in this section.

CAUTION: In-Line pipe stores energy.

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.

When the machining operation is finished, disengage the Feed Pin by pulling the Tripper Shaft to the 'out' position.

Allow the Headstock to continue for three (3) revolutions to complete the cutting operation.

Turn off the Hydraulic Motors by closing the Throttle Control Valve.

Retract the Tool holders so that the Tool Bit(s) clear the pipe OD.

NOTE: The Tool Holders are retracted by rotating the Feed Sprocket clockwise using the special Spanner Wrench supplied with the Clamshell.

Run the Hydraulic Motors until the split-lines of the Headstock and the Housing match.

Model 648SB Low Profile Clamshell (2 Piece)

Loosen the Clamping Pads and Jackscrews.

Remove the Clamshell from the pipe.

When the Clamshell must be split to remove it, refer to 'Installation of the Clamshell on an In-Line Pipe' located at the beginning of this section.

You should have a complete pipe sever at this time.

FEED PIN TO SPROCKET ENGAGEMENT

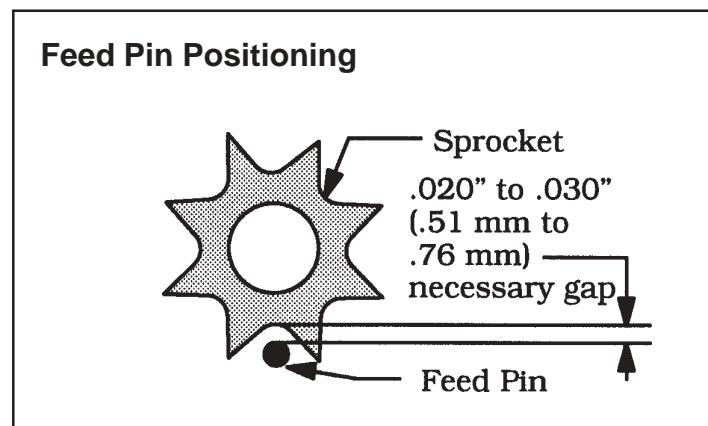
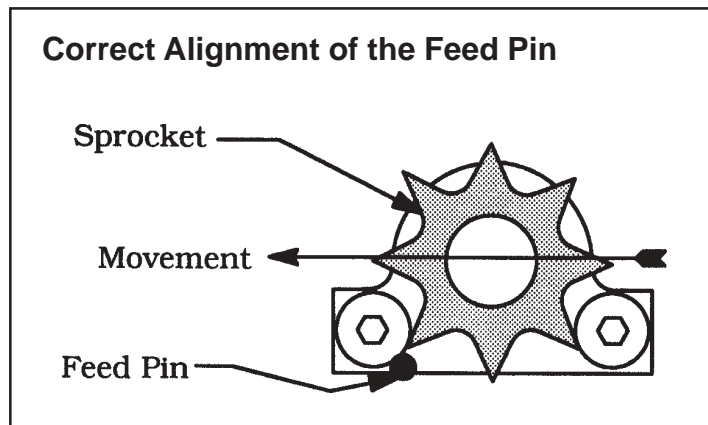
Rotate the Headstock until the Sprocket on the Tool Block begins to approach the Feed Pin.

The Feed Pin must not strike the Sprocket Tooth straight on.

This action would damage or break the Feed Pin and/or the Sprocket.

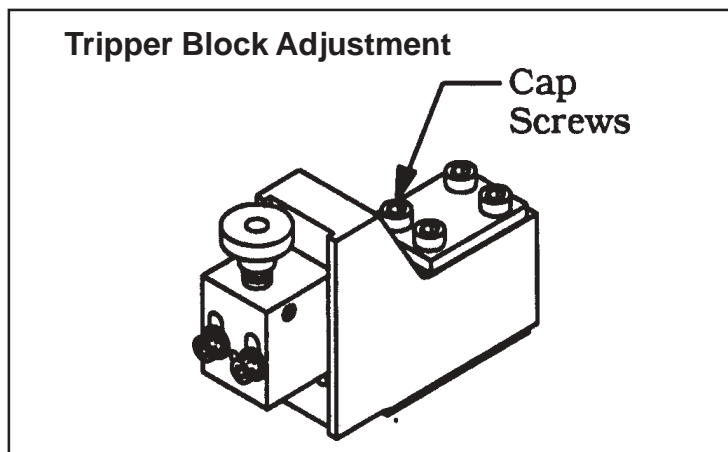
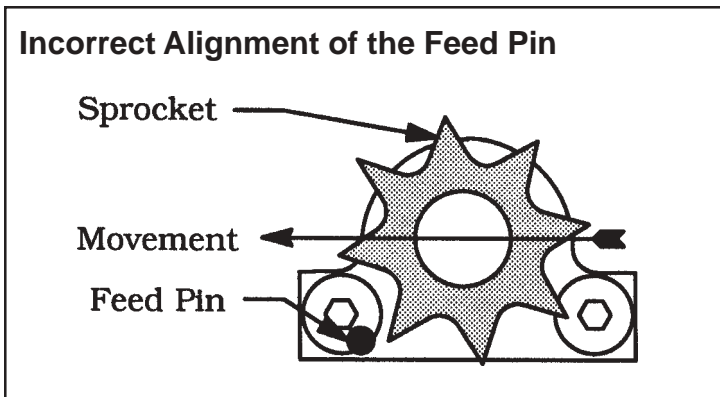
The Feed Pin must strike the Sprocket on the edge of the Tooth.

The correct Feed Pin to Sprocket engagement is shown in the following two images.



CAUTION:

When the Feed Pin to Sprocket engagement is not as shown above, operation of the Clamshell may cause serious damage or destroy the Feed Pin and/or the Sprocket.



When the Feed Pin to Sprocket engagement is as shown in the figure above 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" (.51 mm) to .030" (.76 mm), required for proper engagement.

Go back to 'Select and Install the Desired Tool Bit Set' located in the previous information of this section.

Tool Bit Setup

Select the proper Tool Bit set.

WARNING:

Use of dull or improperly designed Tool Bits or Tool Bits not manufactured by TRI TOOL Inc. may result in poor performance and may constitute abuse of this machine and therefore voids the TRI TOOL Inc. factory warranty.

Model 648SB Low Profile Clamshell (2 Piece)

Install the Tool Bits into the Tool Holders.

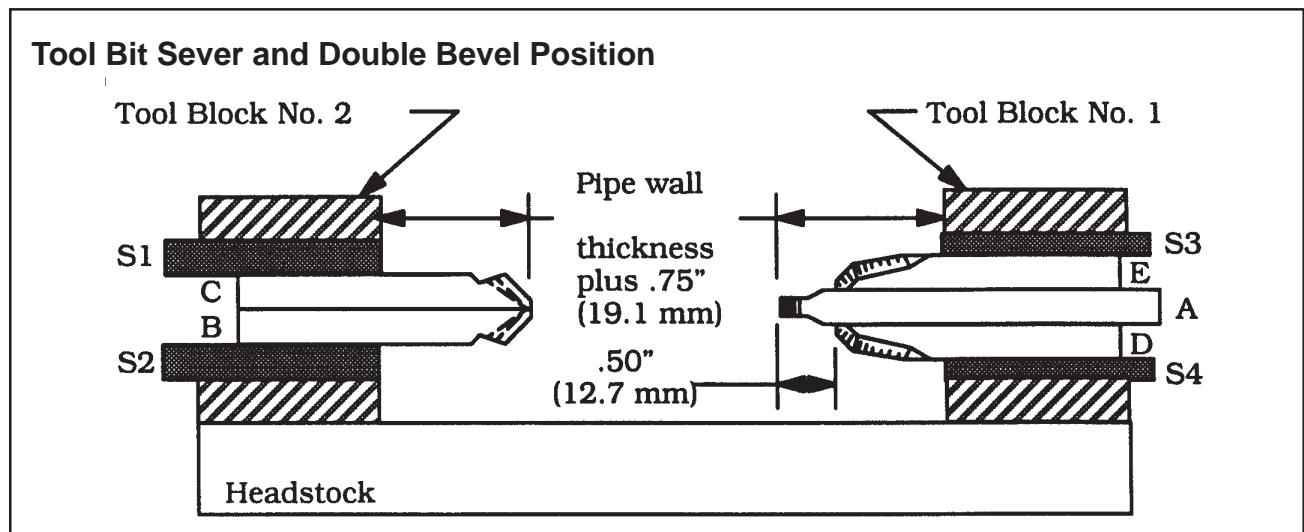
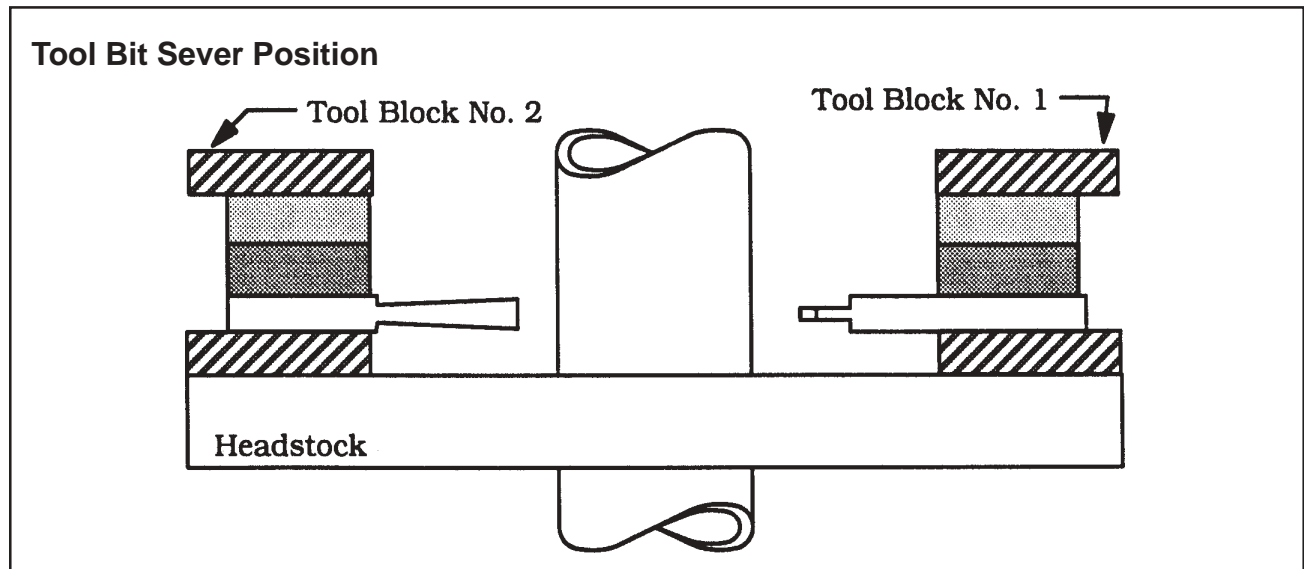
NOTE: Reference the 'Tool Bits' section of this manual for installation drawings for each of the Tool Bits.

The wall thickness plus $3/4"$ (19 mm) of Tool Bit should be protruding from the end of the Tool Holder.

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

The Leading Tool Bit should contact the pipe approximately $.020"$ (.5 mm) to $.040"$ (1.0 mm) before the Trailing Tool Bit.

SEVERING



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.

Go back to paragraph 'Turn off the Hydraulic Motors by closing the Throttle Control Valve' and proceed from there.

TOOL BIT ADJUSTMENT FOR PART OFF AND DOUBLE BEVEL

Install Tool Bits A, D and E into the Tool Blocks No. 1 along with two (2) spacers, S3 and S4.

NOTE: Either Tool Block may be designated as No. 1.

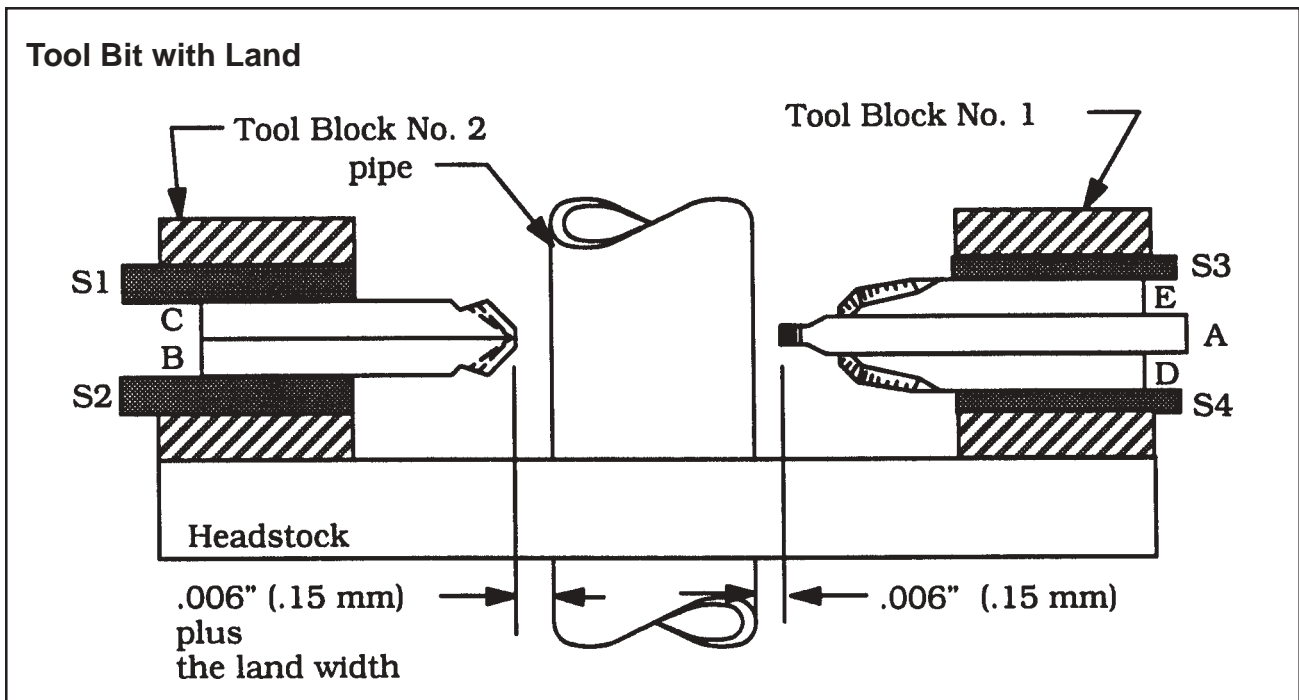
Position the Spacers flush with the inside face of the Tool Holder.

Position Tool Bits D and E approximately 1/2" (12.7 mm) outward from the cutting edge of Tool Bit A.

NOTE: Tool Bits D and E will be repositioned to contact the beveled surface as the cutting progresses.

Tighten the Set Screws holding Tool Bits A, D and E.

Install the Tool Bits B and C into Tool Block No. 2 along with the two (2) spacers S1 and S2.



Model 648SB Low Profile Clamshell (2 Piece)

Position the Spacers flush with the inside face of the Tool Holder.

Tool Bits B and C should be the same distance inward from the tool Holder.

Tighten the Set Screws holding Tool Bits B and C.

Set Tool Bit A to lead Tool Bit B and C by the desired land width as follows:

CAUTION: Make sure that the Tripper Shaft is in the 'out' position.

Rotate the Headstock slowly.

While rotating the Headstock, visually determine the point on the surface where Tool Bit A comes closest to the pipe.

Rotate the Feed Sprocket until Tool Bit A allows .006" (.2 mm) minimum clearance between Tool Bit A makes contact with the pipe.

Back the Tool Holder away from the pipe about 1/4 of a revolution, approximately .008" (.2 mm).

Each full revolution of the Feed Sprocket moves the Tool Bit .031" (.8 mm) toward or from the pipe.

Continue to rotate the Headstock through 360° slowly, in order to verify that the position of Tool Bit A and the pipe surface at the closest point.

Readjust Tool Bit A if necessary.

Mark the pipe surface to define Tool Bit A's closest approach to the pipe.

Continue to rotate the Headstock slowly.

Position Tool Bits B and C directly over the mark that you made to define the closest approach of Tool Bit A to the pipe.

Rotate the Feed Sprocket until Tool Bits B and C make contact with the pipe surface.

Back the Tool Holder off 1/4 revolution of the Feed Sprocket, approximately .008" (.2 mm), plus the desired land width.

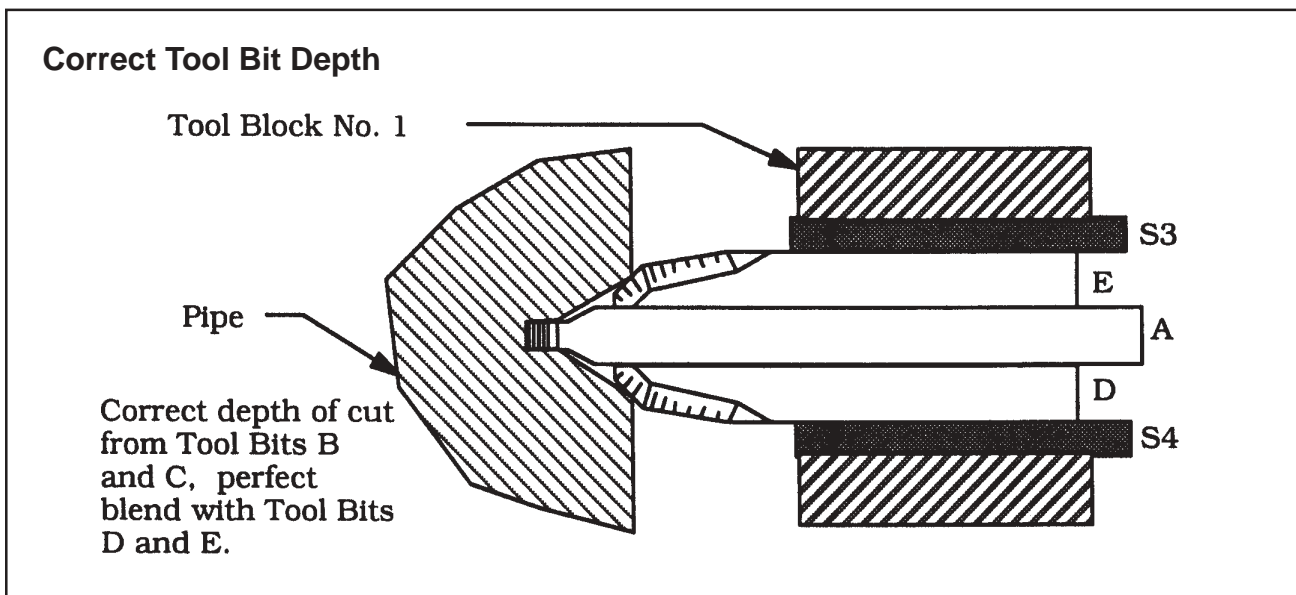
Each revolution of the Feed Sprocket moves the Tool Bit .031" (.8 mm) toward or from the pipe.

Engage the Feed Pin by pushing the Tripper Shaft to the 'in' position.

Rotate the Headstock 360° while checking the Feed Pin to Sprocket engagement.

Initiate the pipe cutting operations.

Go back to paragraph 'Engage the feed by pushing the Tripper Shaft in.' and proceed from there.



RESETTING THE TOOL BITS FOR A BLEND

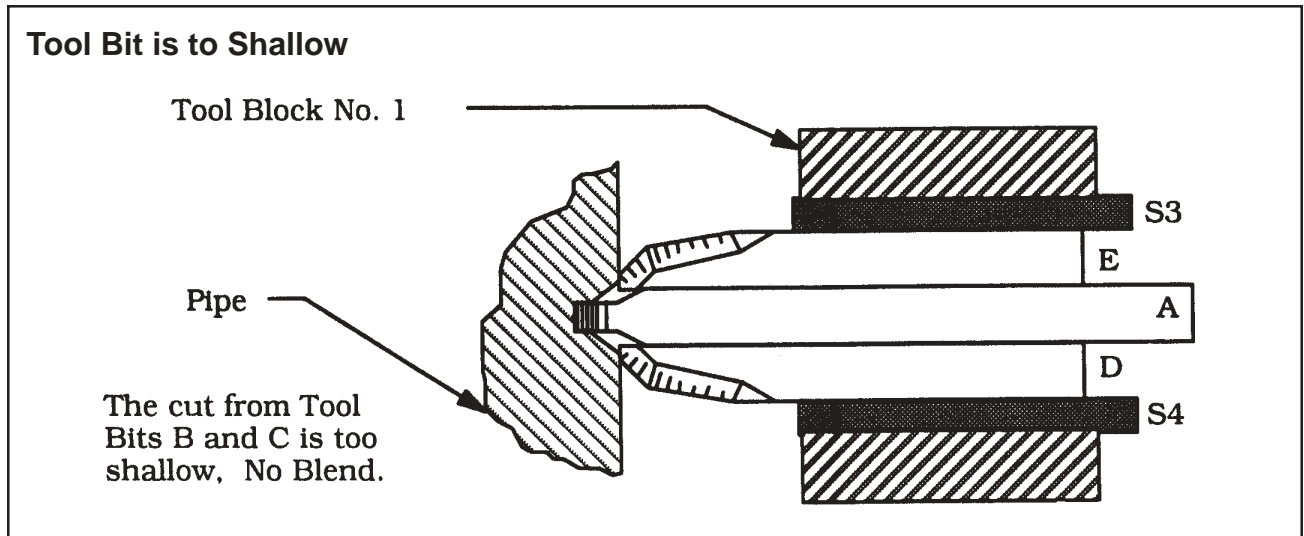
Loosen the Set Screws holding Tool Bits A, D and E.

Slide Tool Bits D and E inward until they make contact with the beveled surface formed by Tool Bits B and C.

The image above shows incorrect blending of the Tool Bit cut.

CAUTION: DO NOT MOVE TOOL BIT A.

If the cut of Tool Bits B and C is too shallow for a blend with Tool Bits D and E as shown in the following image, then proceed to paragraph 'Retract Tool Bits D and E without changing the position of Tool Bit A.' to continue.



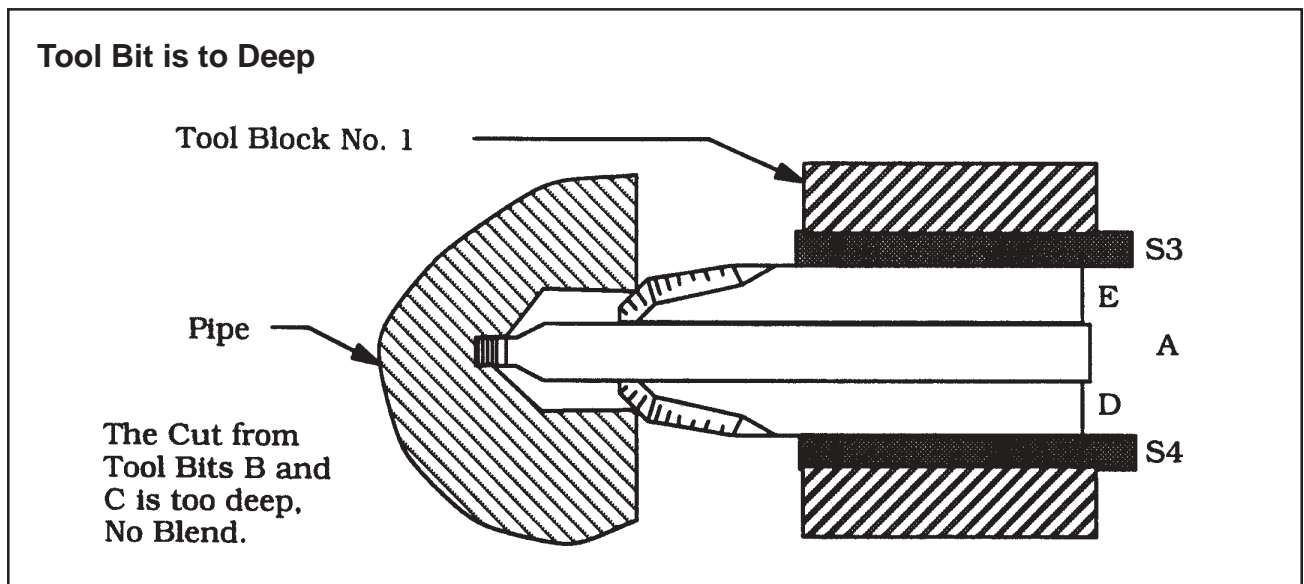
Go to paragraph, 'If too deep a cut has been made by Tool Bits B and C...'

Retract Tool Bits D and E without changing the position of Tool Bit A.

Tighten the Set Screws holding Tool Bits D and E.

Go back to paragraph, 'Turn the Hydraulic motors on to full speed.'

If too deep a cut has been made by Tool Bits B and C, as shown in the following image, then proceed to paragraph 'Loosen the Set Screws holding Tool Bits A, D, and E.'



Go to paragraph, 'Leave Tool Bits D and E in contact with the Beveled surface made by Tool Bits B and C as shown in the previous figure.'

Loosen the Set Screws holding Tool Bits A, D and E.

Push Tool Bit A back flush with the ends of Tool Bits D and E that are in contact with the cut edges made by Tool Bits B and C.

Tighten the Set Screws holding Tool Bits A, D and E.

Rotate the Feed Sprocket of Tool Block No 2 clockwise so as to move the Tool Holder away from the pipe cut far enough so that Tool Bits B and C will not cut during this recovery sequence.

NOTE: During this recovery sequence, the only Tool Bits that are to be cutting are Tool Bits D and E so that they may catch up to the bevel made by Tool Bits B and C.

All other Tool Bits must be pulled back from the cutting surface.

NOTE: When a blend has been achieved, Tool Bit A must be returned to its original position so that the desired land may be cut.

Loosen the Set Screws Holding Tool Bits A, D and E.

Push Tool Bit A forward until it makes contact with the bottom of the slot.

NOTE: Do not move Tool Bits D and E.

Rotate the Feed Sprocket for Tool Block No. 2 counterclockwise to bring Tool Bits B and C back into contact with the bevel that they have previously cut.

Visually check the Feed Pin to Sprocket engagement for Tool Block No. 2.

Leave Tool Bits D and E in contact with the beveled surface made by Tool Bits B and C as shown in the previous figure.

Resume the pipe cutting operation.

Go to paragraph, 'When the machining operation is finished, disengage the Feed Pin by pulling the Tripper Shaft to the 'out' position.'

CUTTING SPEEDS AND FEEDS

True DIA		RPM for 200 in/min (5080 mm/min)	RPM for 250 in/min (6350 mm/min)	RPM for 300 in/min (7620 mm/min)
48.00"	1219.2 mm	1.3	1.7	2.0
46.00"	1168.4 mm	1.4	1.7	2.1
44.00"	1117.6 mm	1.4	1.8	2.2
Cutting Speed (Approximately)				

Use 200 surface inches per minute (5080 surface millimeters per minute) for:

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

Use 250 surface inches per minute (6350 surface millimeters per minute) for:

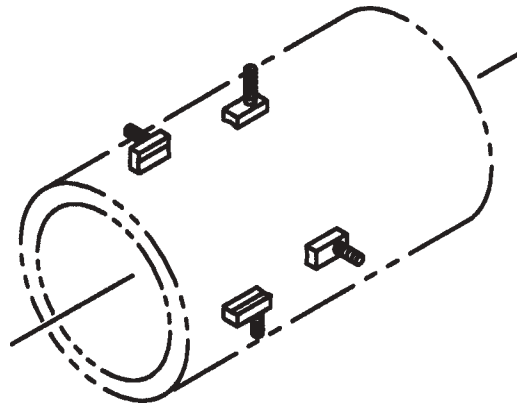
Mild steels and some thin-wall stainless steels when coolants are permitted and applied.

Use 300 surface inches per minute (7620 surface millimeters per minute) for:

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

CLAMPING PAD SETS

Clamping Pad Set

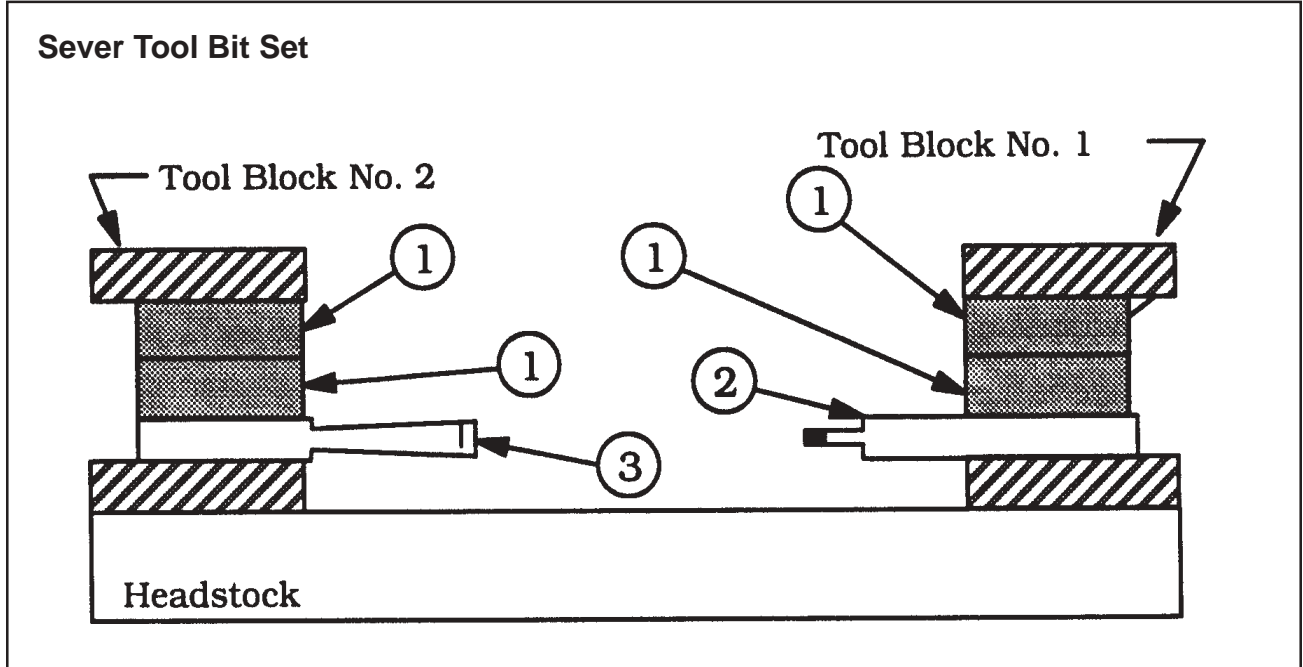


Pipe DIA	True OD		Clamping Pad Assembly (4 Req'd)
48"	48.00"	122 cm	26-0480
46"	46.00"	117 cm	26-0479
44"	44.00"	112 cm	26-0478

TOOL BITS

SEVER TOOL BIT SETS

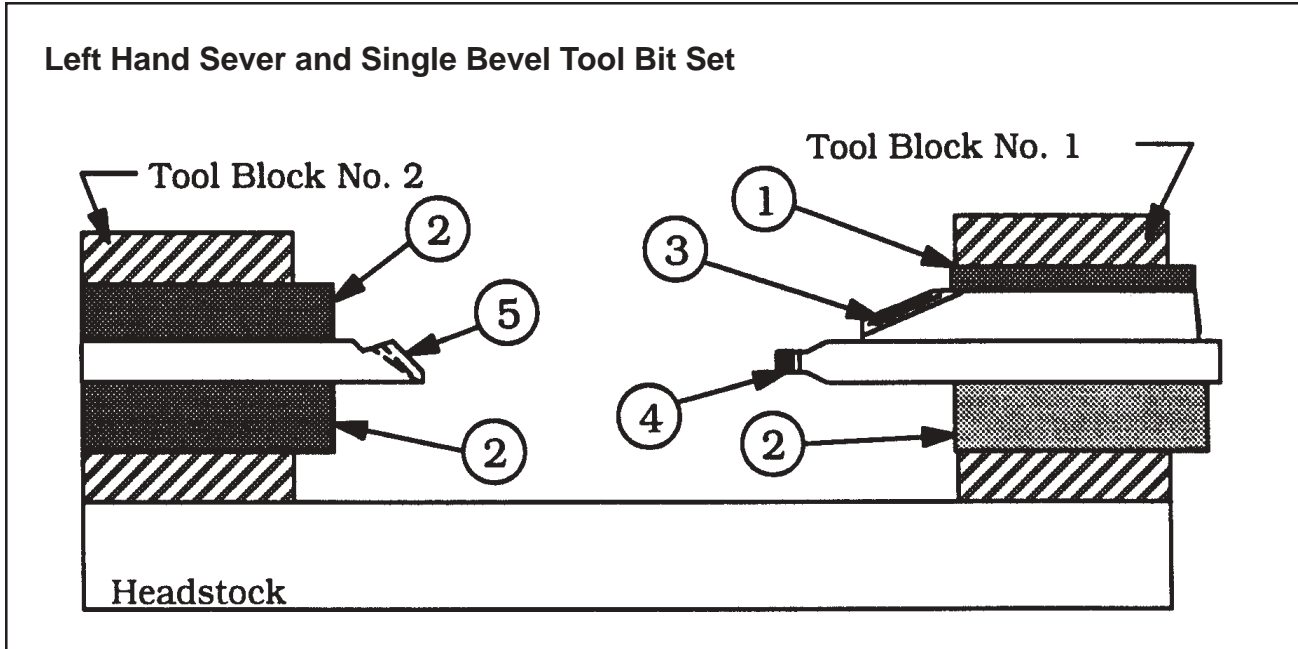
This Tool Bit will sever up to 2 1/2" (63.5 mm) wall with a 1/2" (12.7 mm) wide cut.



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

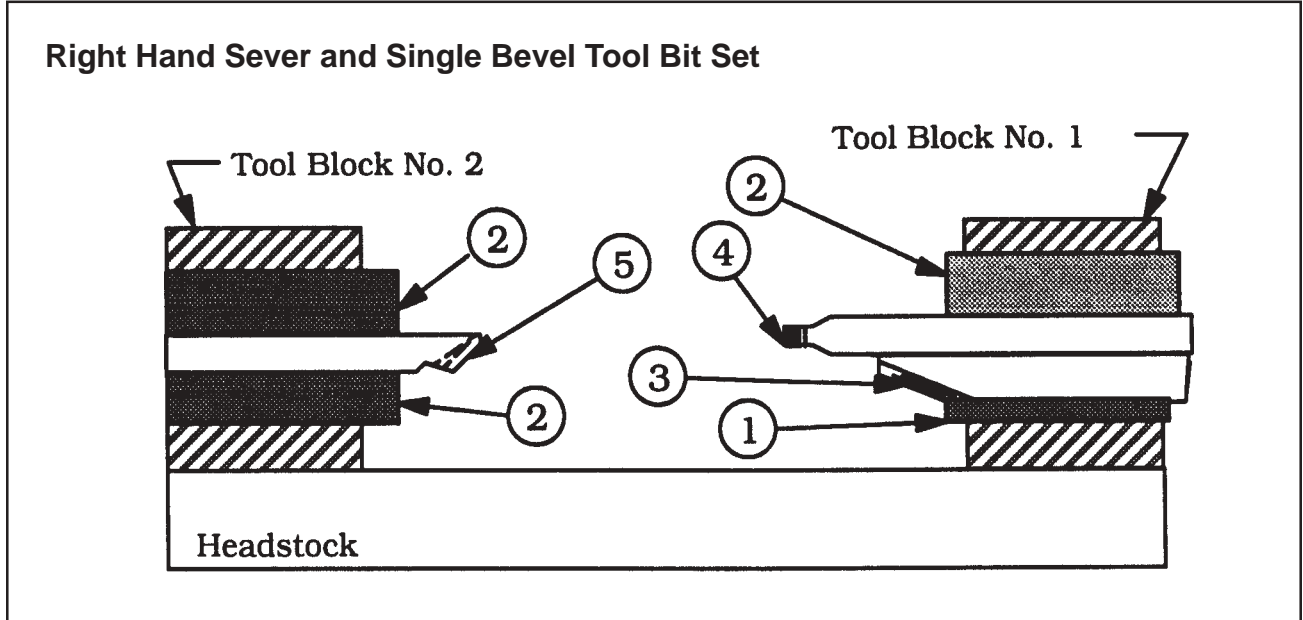
This Tool Bit set will sever and 37.5° bevel up to a 1 1/4" (31.8 mm) wall on the pipe being cut off.



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

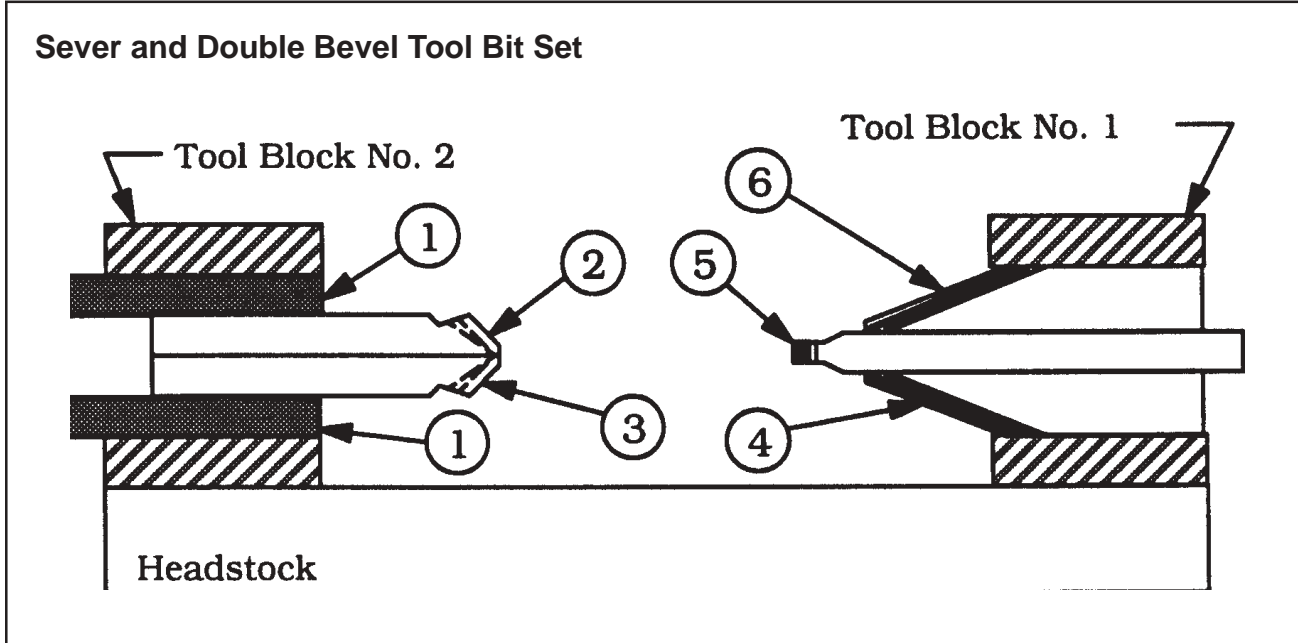
This Tool Bit Set will sever and 37.5° bevel up to 1 1/4" (31.8 mm) wall on the pipe on which the Clamshell is mounted.



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

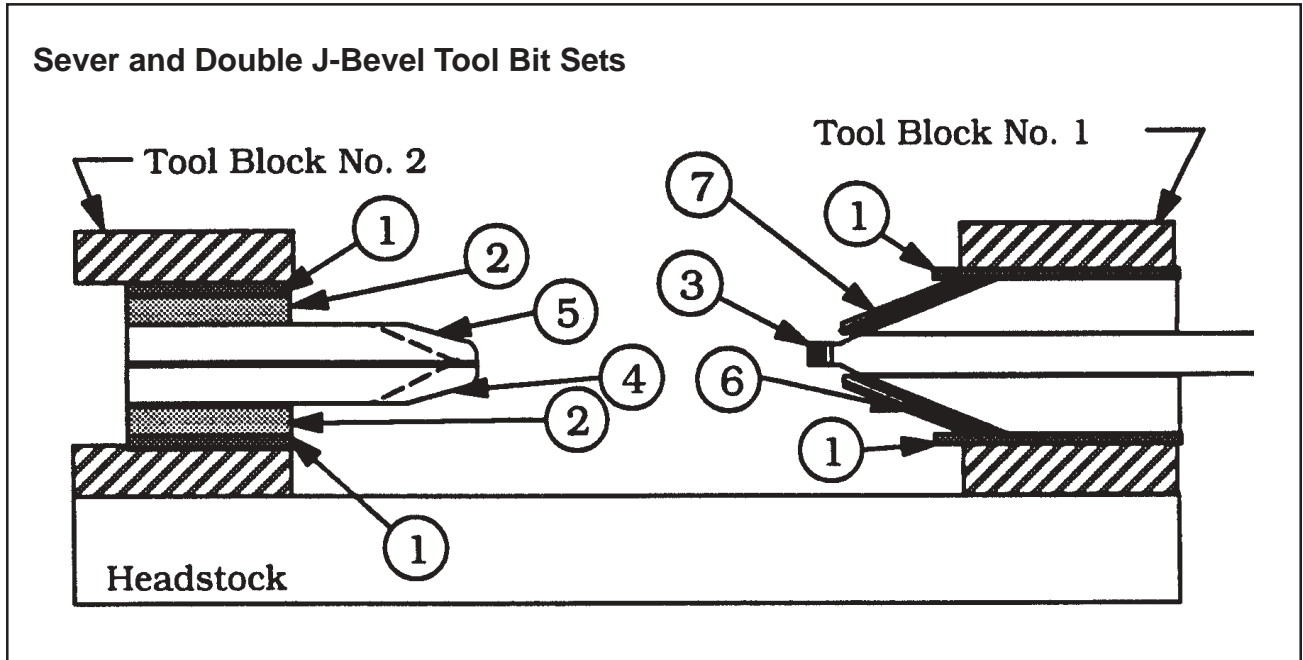
This Tool Bit Set sever and 37.5° bevel on both sections of pipe up to 1 1/4" (31.8 mm) wall.



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

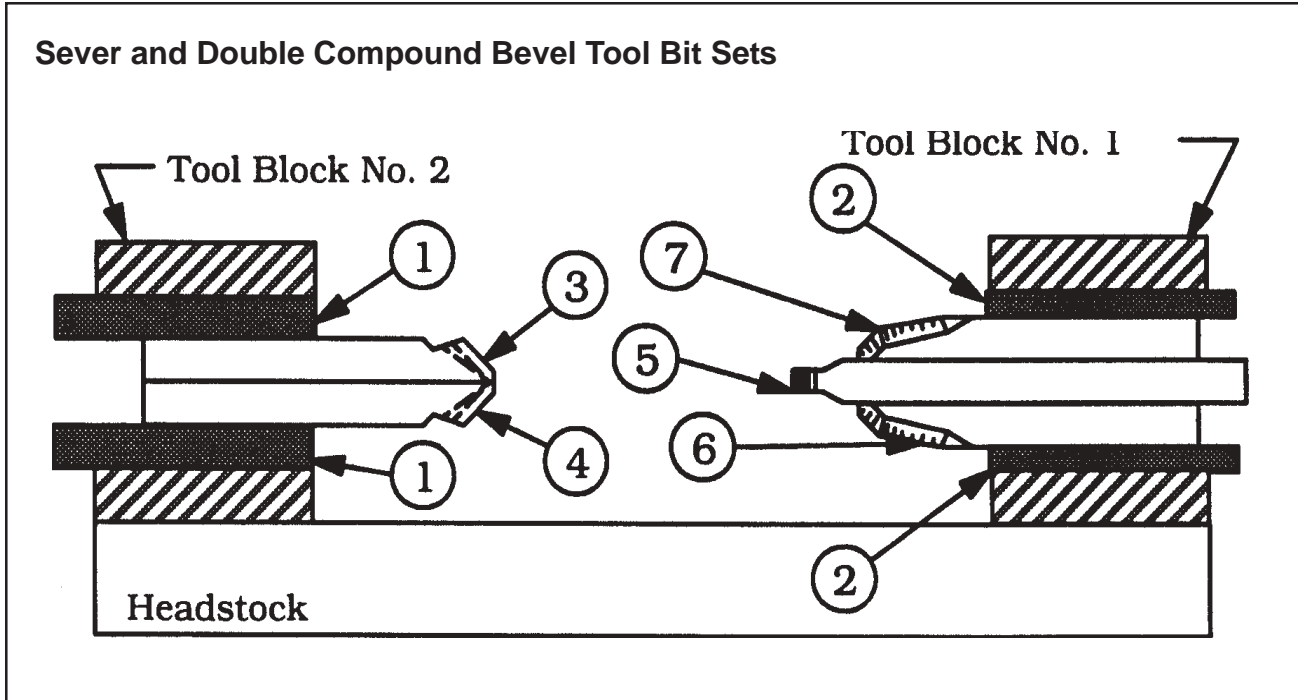
This Tool Bit Set will sever and 22 1/2° bevel with a 3/16" (4.8 mm) radius J up to 1 3/8" (35.1 mm) wall both sections of pipe.



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

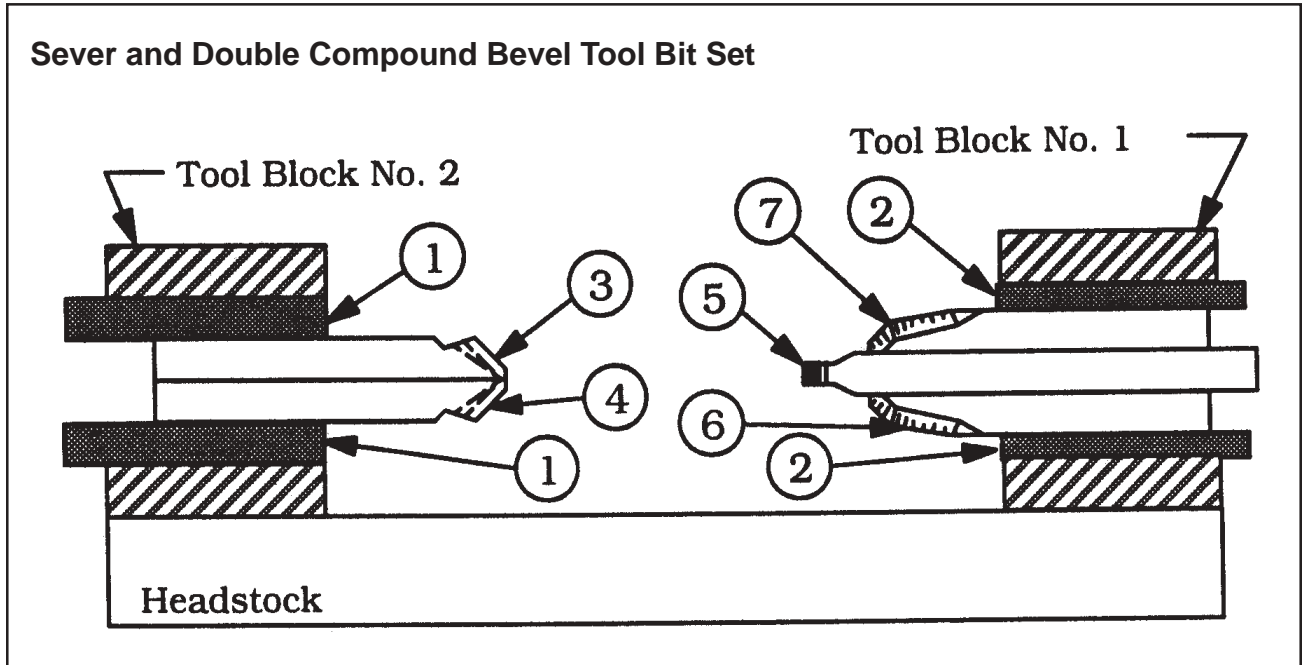
This Tool Bit Set will sever and 37.5° /10° compound bevel with 3/4" (19.1 mm) transition up to 1 3/8" (35.1 mm) wall.



Item No.	Part No.	Description	Qty
1.	30-0206	SPACER	2
2.	30-0227	SPECER	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

This Tool Bit Set will sever and 37.5° /15° compound bevel with 3/4" (19.1 mm) transition up to 1 3/8" (35.1 mm) wall.



Item No.	Part No.	Description	Qty
1.	30-0206	SPACER	2
2.	30-0227	SPECER	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

TROUBLE SHOOTING

Problem: The 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: There is 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: The surface finish is rough

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.

Problem: The 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: There is a loss of air power

The air supply pressure is too low.
The air filter is plugged.
The air line size is insufficient.
The air line is too long.

Problem: There is a loss of hydraulic power

The hydraulic supply pressure is too low.
The hydraulic filter is plugged.
The hydraulic line size is insufficient.
The hydraulic line is too long.

Problem: The tool bit will not reach the work

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

Problem: The hydraulic motor will not start

The hydraulic power supply is shut off.
The hydraulic motor is damaged and will not run free.

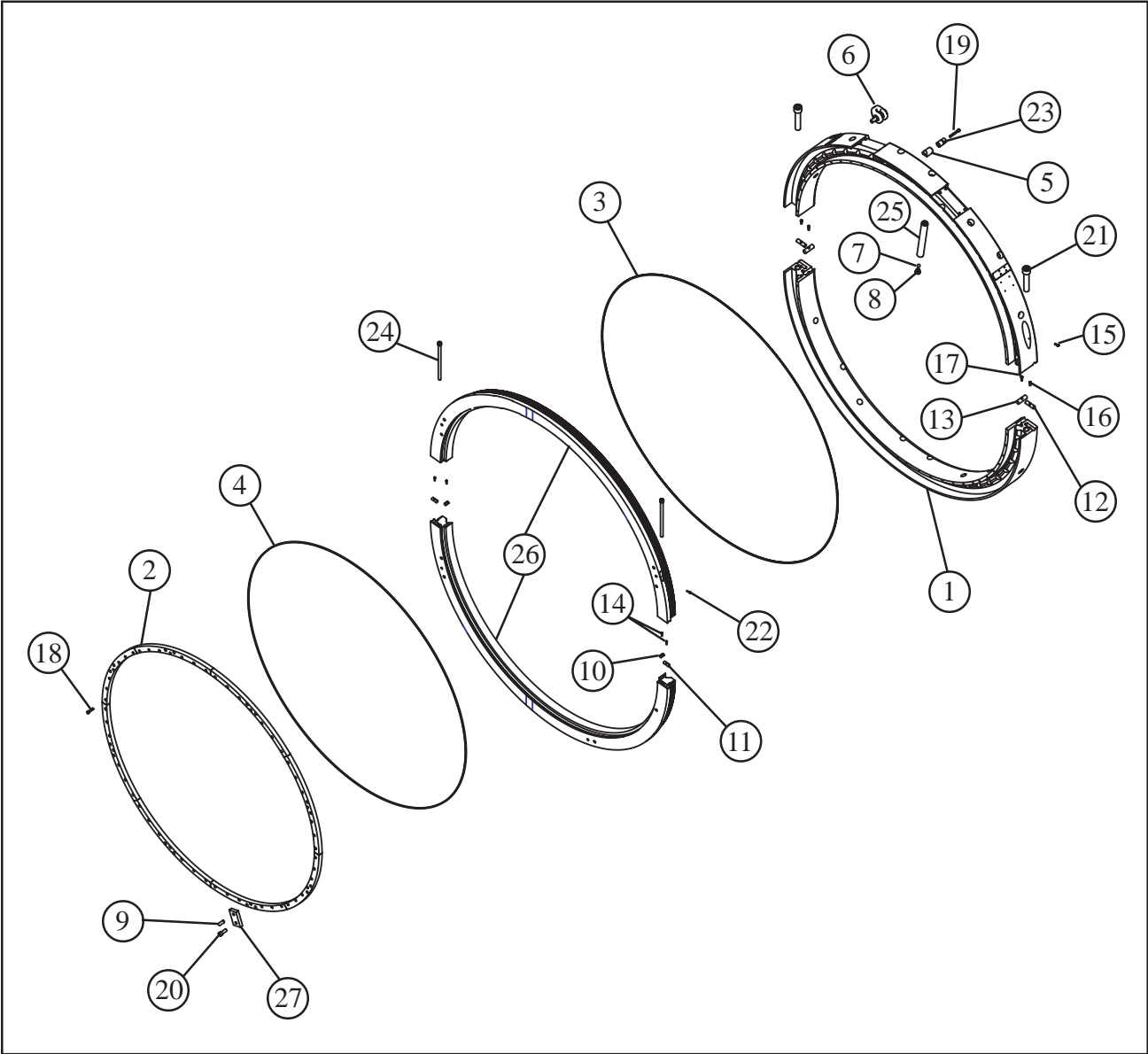
ACCESSORIES

The following accessories are recommended for use with the Model 648SB Clamshell and are available from TRI TOOL INC.

1. Model 765RVC Hydraulic Power Supply (Available in 480, 380 and 240 volt configurations.)
2. Tool Bits (Reference the 'Tool Bits' section of this manual.)
3. Counterboring Module Kit (P/N 05-1260)

ILLUSTRATED PARTS BREAKDOWN

648SB SUB-ASSEMBLY CLAMSHELL

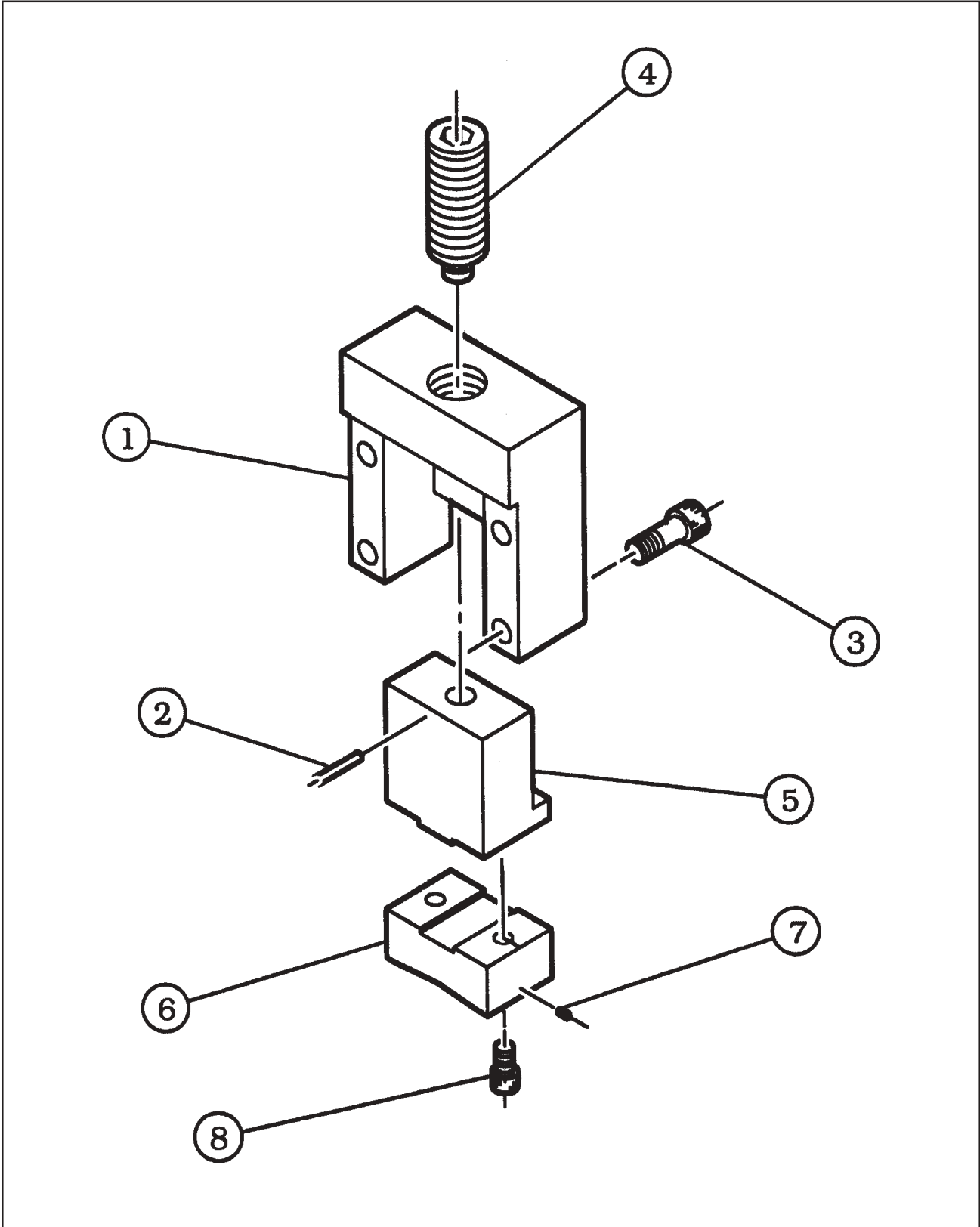


TRI TOOL INC.

Parts List, 648SB Sub-Assembly, Clamshell

Item No.	Part No.	Description	Qty
1.	19-1067	HOUSING, MAIN, AL, 648SB	1
2.	24-1241	PLATE, THRUST,648SB	8
3.	28-0057	SEAL, FELT	182
4.	28-0057	SEAL, FELT	158
5.	29-0309	BEARING, BRONZE, 648SB	40
6.	30-0304	RING, HOIST, 1/2-13	4
7.	30-0615	BALL, HARDND, 9/16 DIA	12
8.	30-0622	SADDLE ASSEMBLY	12
9.	32-0105	PIN, DOWEL	4
10.	32-0184	PIN, ALIGN, 1/2 DIA X .80	2
11.	32-0235	PIN, ALIGN, 1/2 DIA X 1.25	2
12.	32-0440	PIN,ALIGN,.625"DIA X 2.125"	2
13.	32-0443	PIN,ALIGN,.750"DIA X 2.25"	2
14.	33-0021	SCREW,CAP, #8-32 x 5/8 LG	4
15.	33-0038	SCREW,CAP, 1/4-20 x 1/2 LG	2
16.	33-0039	SCREW,CAP,1/4-20 X 5/8	2
17.	33-0040	SCREW,CAP,1/4-20 X 3/4	2
18.	33-0057	SCREW,CAP, 5/16-18 x 1 1/4 LG	48
19.	33-0061	SCREW, CAP, 5/16-18 x 2 1/4 LG	40
20.	33-0071	SCREW, CAP,3/8-16 X 1 LG	4
21.	33-0185	SCREW,CAP,1"-8 X 5	2
22.	33-0503	SCREW,SET, 1/4-20 x 1/2 LG	2
23.	33-1689	SCREW, BRG ADJUST	40
24.	33-1829	SCREW,CAP, 1/2-13 x 9 1/2" LG	2
25.	33-1831	JACKSCREW 1 1/4-7 UNC x 9 3/4 LG	12
26.	39-0992	GEAR, HEADSTOCK, 648SB	1
27.	48-0439	BLOCK, LOCK	4

JACKSCREW BLOCK ASSEMBLY



TRI TOOL INC.

Parts List, Jackscrew Block Assembly

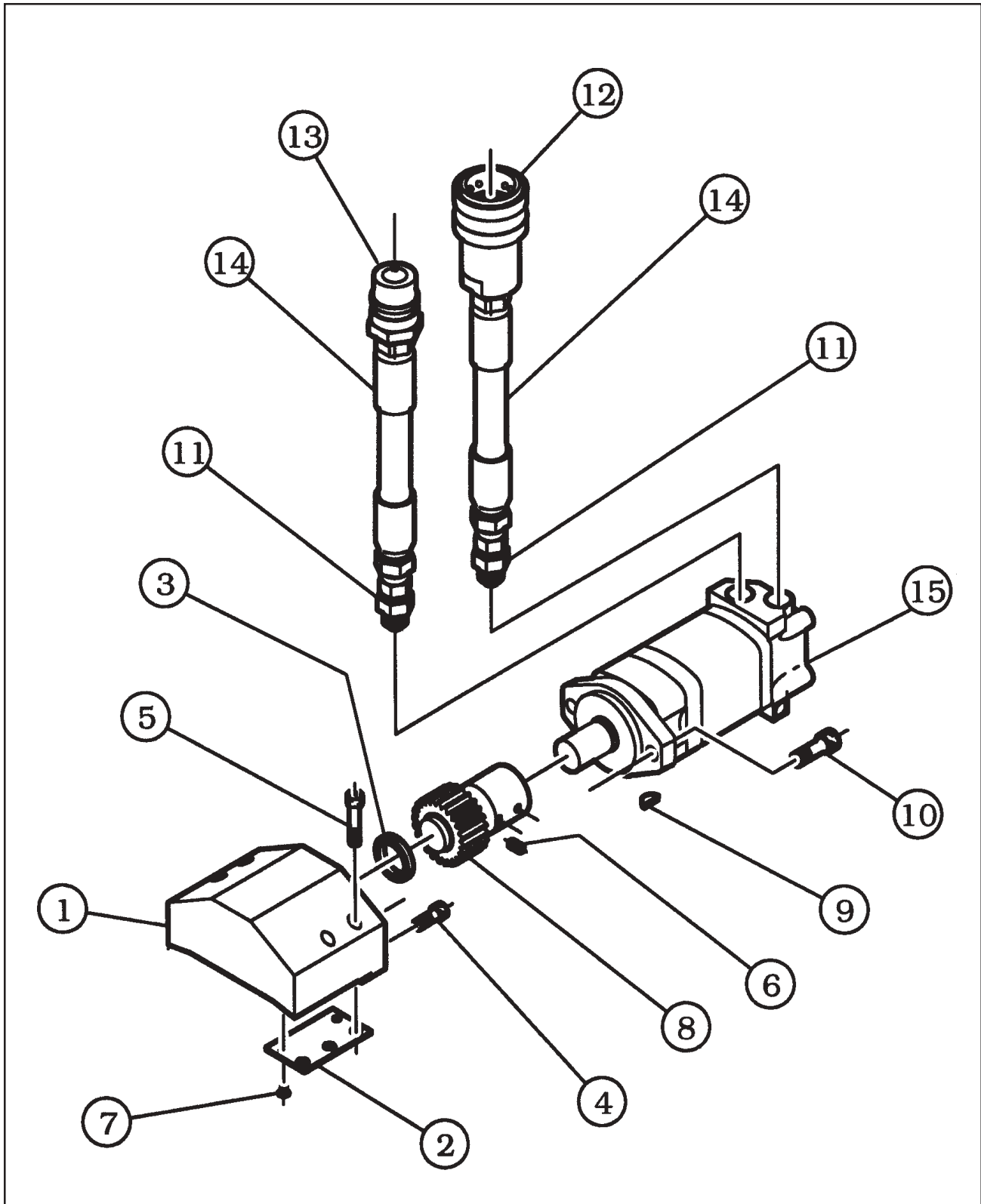
Item No.	Part No.	Description	Qty
	08-0092	BLOCK ASSEMBLY, CLAMP	4
1.	19-0262	HOUSING	1
2.	32-0043	PIN, ROLL	1
3.	33-0110	SCREW, CAP	4
4.	33-1343	SCREW, ADJUST	1
5.	48-0315	BLOCK, GUIDE	1
	26-0478	BAR ASSEMBLY, ADJUSTABLE	4
6.	26-0474	BAR, FIXED	1
7.	32-0290	PIN, ROLL	2
8.	33-0077	SCREW, CAP	2
	26-0479	BAR ASSEMBLY, ADJUSTABLE	4
6.	26-0475	BAR, FIXED	1
7.	32-0290	PIN, ROLL	2
8.	33-0073	SCREW, CAP	2
	26-0480	BAR ASSEMBLY, ADJUSTABLE	4
6.	26-0476	BAR, FIXED	1
7.	32-0290	PIN, ROLL	2
8.	33-0068	SCREW, CAP	2
NOT SHOWN			
	05-1134	SHIPPING KIT, 648SB	1
	32-0084	PIN, DOWEL	3
	36-0003	WRENCH, L, 3/32" HEX	1
	36-0007	WRENCH, L, 5/32" HEX	1
	36-0008	WRENCH, L, 3/16" HEX	1
	36-0009	WRENCH, L, 7/32" HEX	1
	36-0010	WRENCH, L, 1/4" HEX	1
	36-0011	WRENCH, L, 5/16" HEX	1
	36-0012	WRENCH, L, 3/8" HEX	1
	36-0014	WRENCH, L, 5/8" HEX	2
	36-0015	WRENCH, L, 3/4" HEX	1
	36-0021	WRENCH, T, 3/16" HEX	1
	36-0023	WRENCH, T, 1/4" HEX	1
	36-0024	WRENCH, T, 5/16" HEX	1

Model 648SB Low Profile Clamshell (2 Piece)

Parts List, Jackscrew Block Assembly Continued

Item No.	Part No.	Description	Qty
	36-0105	WRENCH, 1/2" DRIVE, HINGE	1
	36-0112	WRENCH, BEARING ADJUSTMENT	2
	36-0115	WRENCH, SPANNER	1
	36-0116	ADAPTER, DRIVE SOCKET	1

HOUSING AND MOTOR ASSEMBLY, HYDRAULIC
(P/N 19-0779 and 56-0044)

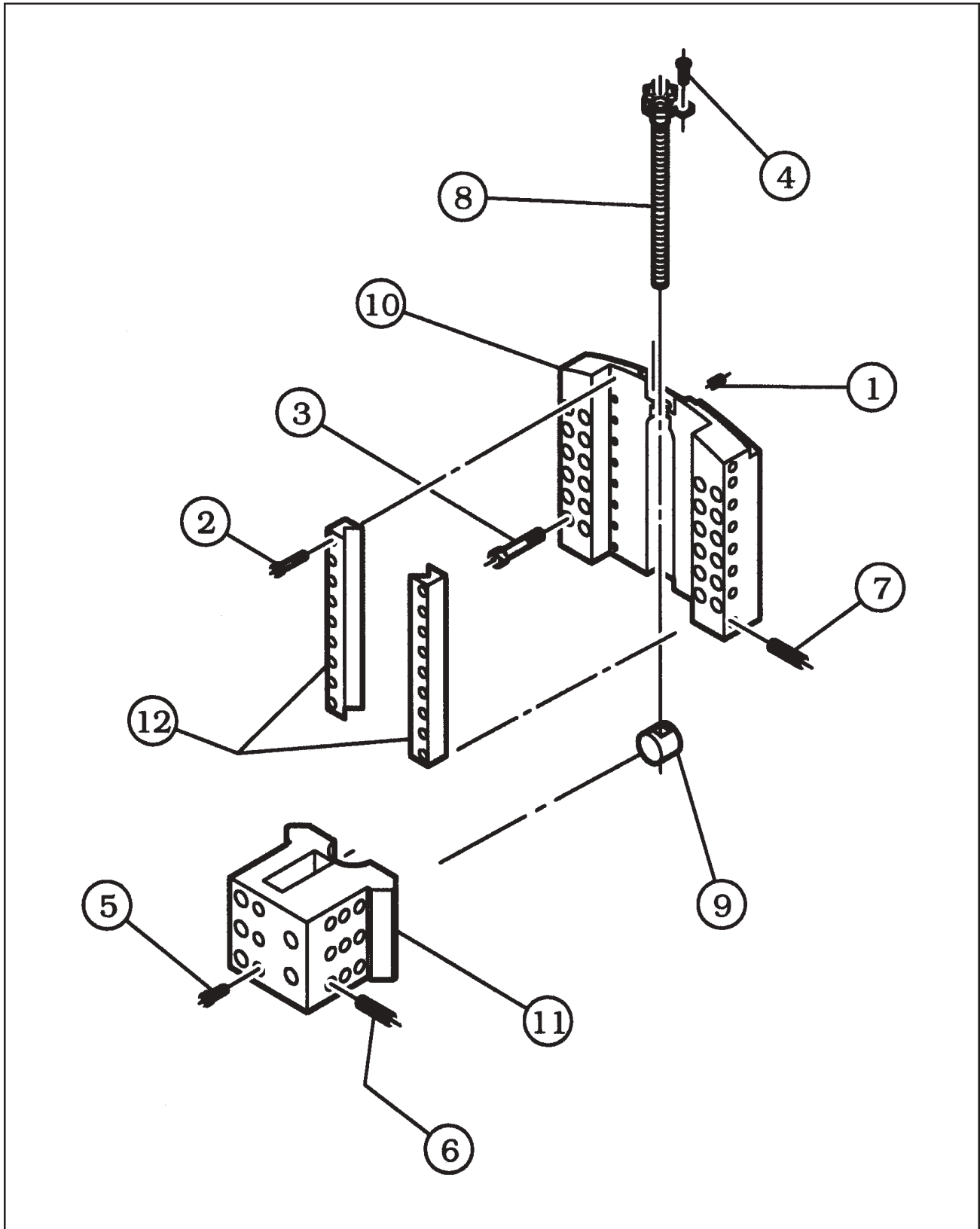


Model 648SB Low Profile Clamshell (2 Piece)

Parts List, xxx

Item No.	Part No.	Description	Qty
	19-0469	HOUSING ASSEMBLY, DRIVE	1
1.	19-0466	HOUSING, DRIVE	1
2.	24-1513	PLATE, SHIM	2
3.	29-0093	BEARING, BALL	1
4.	33-0071	SCREW, CAP	2
5.	33-0074	SCREW, CAP	4
6.	33-0513	SCREW, SET	1
7.	33-0352	SCREW, FLAT HEAD	4
8.	39-0506	GEAR, PINION	1
	56-0044	MOTOR ASSEMBLY, HYDRAULIC	1
9.	31-0001	KEY, WOODRUFF	1
10.	33-0107	SCREW, CAP	2
11.	54-0002	ADAPTER	2
12.	54-0294	COUPLER, QD, BODY	1
13.	54-0295	COUPLER, QD, TIP	1
14.	55-0156	HOSE ASSEMBLY, HYDRAULIC	2
15.	56-0043	MOTOR, HYDRAULIC	1
NOT SHOWN			
	54-0114	CAP, DUST	1
	54-0115	PLUG, DUST	1
REFERENCE: Hose Manifold Assemblies to connect the Dual Hydraulic Motors			
	55-0169	HOSE ASSEMBLY, MANIFOLD, FEMALE	1
	55-0170	HOSE ASSEMBLY, MANIFOLD, MALE	1

TOOL BLOCK (P/N 08-0336)

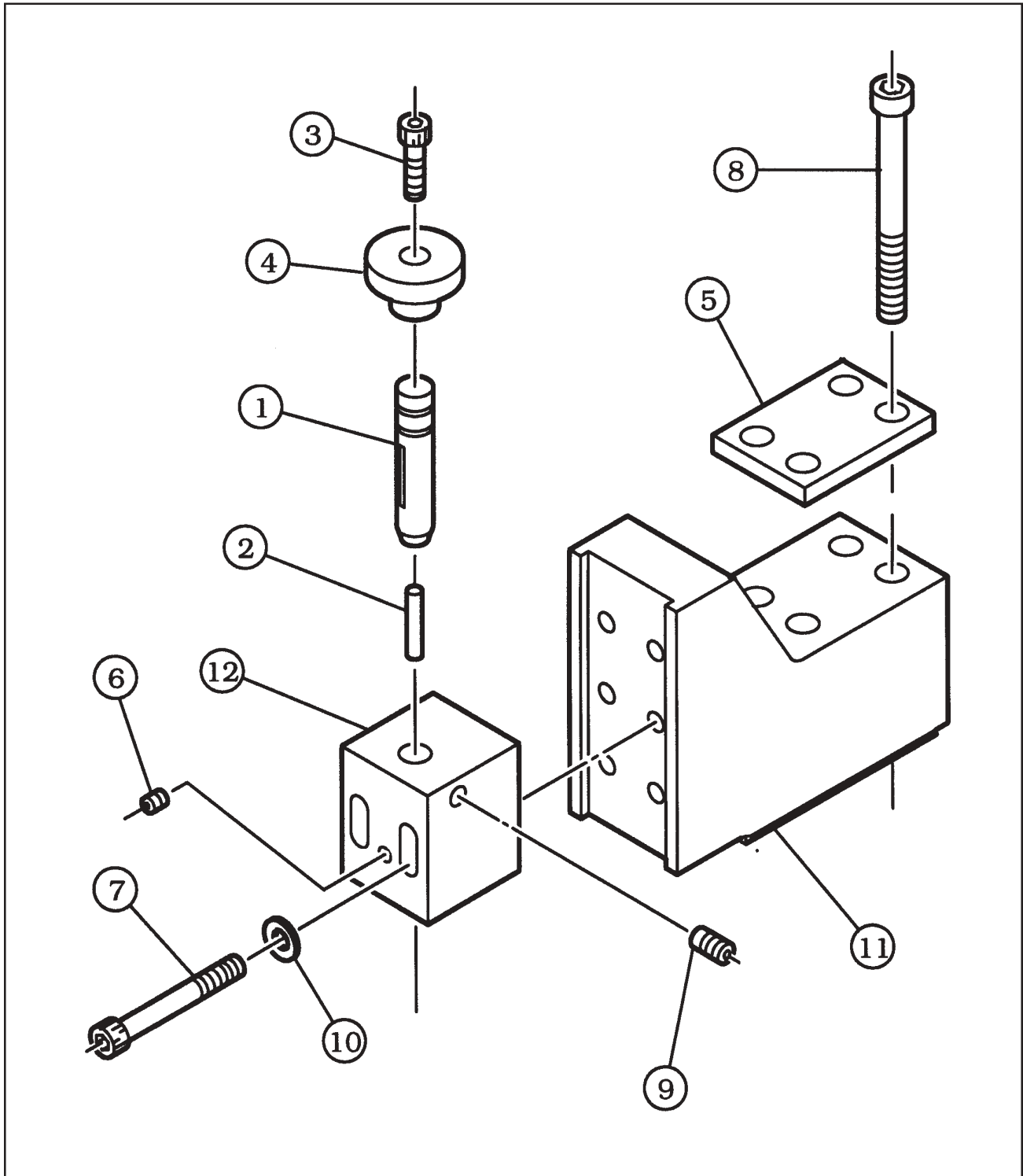


Model 648SB Low Profile Clamshell (2 Piece)

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

BRACKET ASSEMBLY, TRIPPER (P/N 47-0529)



Model 648SB Low Profile Clamshell (2 Piece)

Parts List, Bracket Assembly, Tripper (P/N 47-0529)

Item No.	Part No.	Description	Qty
	14-0011	SHAFT ASSEMBLY	1
1.	20-0023	SHAFT, TRIPPER	1
2.	32-0084	PIN, DOWEL	1
3.	33-0030	SCREW, CAP	1
4.	42-0023	KNOB, ROUND	1
5.	24-0452	PLATE, WASHER	1
6.	30-0125	PLUNGER, BALL	1
7.	33-0046	SCREW, CAP	2
8.	33-0050	SCREW, CAP	4
9.	33-0954	SCREW, SET, HALF DOG	1
10.	34-0026	WASHER, FLAT	2
11.	47-0528	BRACKET, TRIPPER	1
12.	48-0421	BLOCK, TRIPPER	1

SPARE PARTS

Item No.	Part No.	Description	Qty
1.	14-0011	SHAFT ASSEMBLY	2
2.	32-0027	PIN, FEED SPROCKET	2
3.	33-0046	SCREW, CAP	2
4.	33-0075	SCREW, CAP	20
5.	33-0287	SCREW, BUTTON HEAD	4
6.	33-0530	SCREW, SET	6
7.	33-0531	SCREW, SET	18
8.	33-1502	FEEDSCREW ASSEMBLY	2
9.	35-0204	NUT, FEED	2