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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.

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 602.5SBM Low-Profile Clamshell is a split-frame pipe lathe designed for severing and beveling in-line pipe with a minimum range of 1" pipe through 3" tube with minimal radial and axial clearance.

Using standard Tool Blocks the Model 602.5SBM 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.

Do socket weld removal.

DESIGN AND OPERATION 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 two halves for mounting on closed loop systems.

All parts are secured to the two halves, thus avoiding the loss of parts and at the same time providing maximum ease of handling.

The Clamshell may be equipped with self-centering Clamping Pads for quick, easy mounting or may be equipped with Adjustable Clamping 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 .003" (.08mm) 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.

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

A detachable right angle Air Motor provides maximum handling ease and low axial clearance.

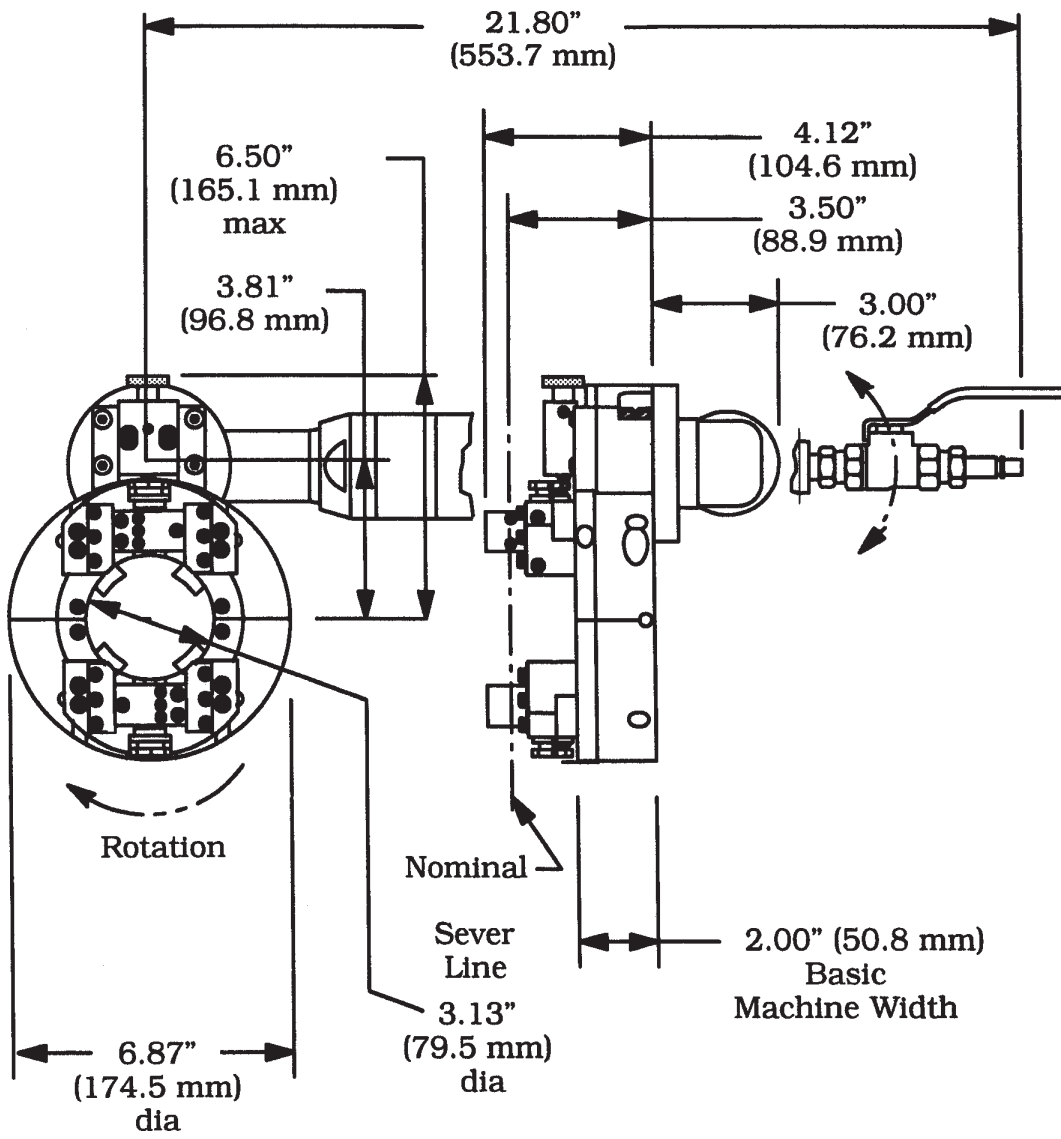
SPECIFICATIONS

Model 602.5SBM with the standard Air Motor.

Weight: 29 lbs. (13 kg)

Power Requirements: 55 cfm at 90 psi (26 lt/sec at 6.3 kg/cm³) with the standard Air Motor.

Envelope, Model 602.5SBM Clamshell



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

CUTTING CAPACITIES ON 1" PIPE THROUGH 3" TUBE		
	Low Profile Tool Blocks	Standard Tool Blocks
Severing with standard procedures	.40" wall (10.2 mm)	.63" wall (16.0 mm)
Severing with special procedures	.80" (20.3 mm)	1.25" wall (31.8 mm)
Severing and single beveling	.40" wall (10.2 mm)	.63" wall (16.0 mm)
Severing and double beveling	.26" wall (6.6 mm)	.40" wall (10.2 mm)
CLEARANCES		
Rotating parts diameter	6.95" (176.5 mm)	6.87" (174.5 mm)
Main Frame diameter	6.87" (174.5 mm)	6.87" (174.5 mm)
AXIAL clearance required relative to Center-line of the cut mounting side	2.51" (63.8 mm)	3.50" (88.9 mm)
Side opposite of the frame	.63" (16.0 mm)	.63" (16.0 mm)

Radial Clearance over the tube or pipe						
Pipe Size	True Diameter		Clearance Low Profile Tool Blocks		Clearance Standard Tool Blocks	
	3.000"	76.2 mm	1.97"	50.0 mm	1.94"	49.3 mm
2 1/2"	2.875"	73.0 mm	2.04"	51.8 mm	2.00"	50.8 mm
2"	2.375"	60.3 mm	2.29"	58.2 mm	2.25"	57.2 mm
1 1/2"	1.900"	48.3 mm	2.52"	64.0 mm	2.49"	63.2 mm
1 1/4"	1.660"	42.2 mm	2.65"	67.3 mm	2.61"	66.3 mm
1"	1.315"	33.4 mm	N/A	N/A	2.78"	70.6 mm

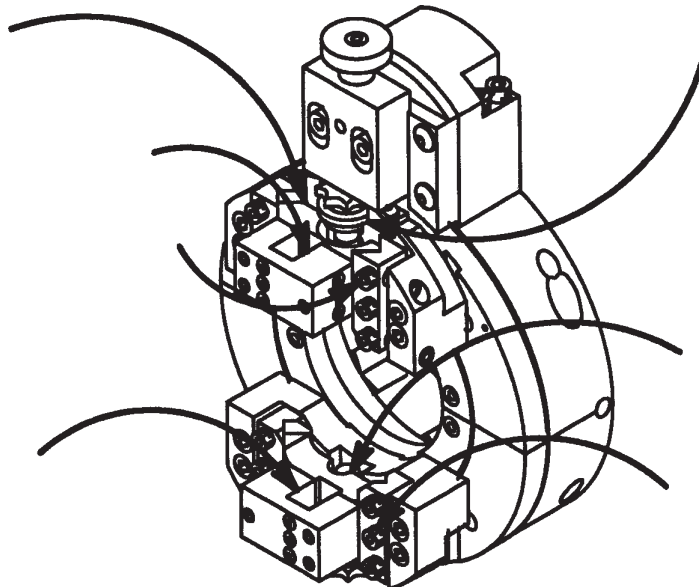
MAINTENANCE

All components should be cleaned and coated with a light film of oil prior to use. Use a clean, non-detergent oil, preferable SAE 10 (90 SSU) or lighter.

Air supply for the Model 602.5SBM Clamshell with an Air Motor requires an adequate filter/regulator/lubricator (FRL) to be used.

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

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 Screw should be cleaned after each cutting operation.

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 every 20 hours of actual operation

Check adjustment of the Main Bearing pre-load.

Drive torque as measured at the Drive Socket should be 5 to 10 ft-lbs. (7 to 14 N-m).

Lubricate the male and female Tool Block Slides and the Feed Screw. Refer to the Tool Block Maintenance located later in this section.

After every 40 hours of actual operation

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

Non-scheduled maintenance

Readjust the Main Bearing pre-load if the Clamshell generates excessive heat or if the Main Bearing becomes loose. Refer to the Adjustment of the Main Bearing pre-load.

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

STORAGE

If 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.

Remove the airline Quick Disconnect and spray it with a lightweight oil.

Squirt oil into the male Quick Disconnect.

Reconnect the airline and turn on the Air Motor for 1 or 2 seconds to disperse oil throughout the vanes and rotor.

ADJUSTMENT OF THE MAIN BEARING PRE-LOAD

Loosen all Bearing Adjustment Lock Screws (A through F).

Loosen all Bearing Adjustment Set Screws about ½ turn. (1 through 12).

Turn in Bearing Adjustment Set Screws (1, 4, 7, and 10) so that they are snugged tightly. This insures that the Bearing is fully pushed forward. Refer to the Bearing Adjustment Screw locations.

Lightly turn in the remaining Bearing Adjustment SetScrews in the order shown until they all touch the Bearing.

Relax Bearing Adjustment Set Screws (1,4,7, and 10) and resnug them so that all of the Bearing Adjustment Set Screws are evenly loaded against the Bearing.

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

Adjust the SetScrews (1 through 12) so that the Clamshell rotation slows slightly.

Listen for a change in the sound of the Air Motor. Refer to the Bearing Adjustment Screw locations for the recommended sequence.

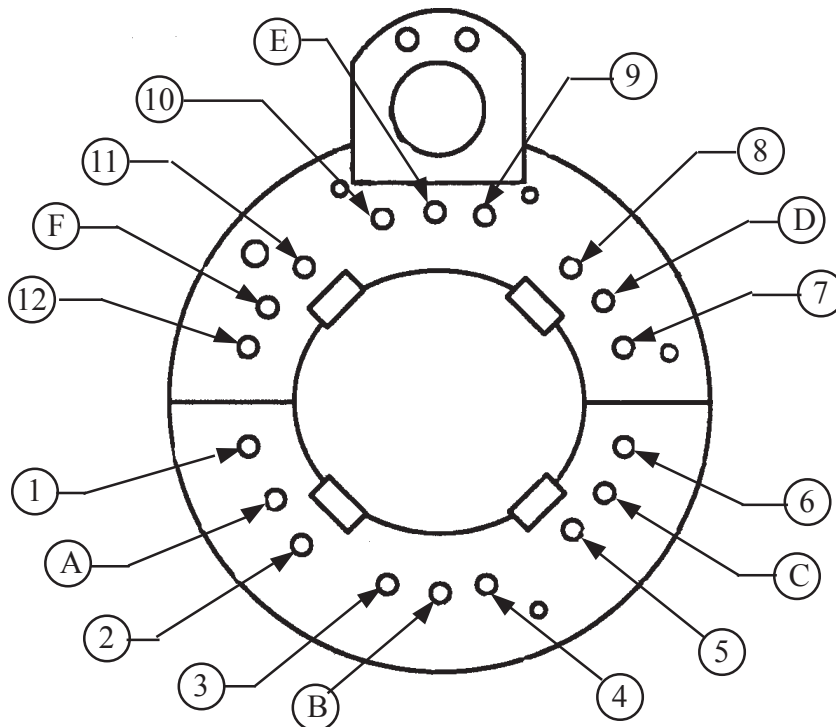
Adjust the SetScrews in small increments so that the bearing is loaded evenly.

All of the SetScrews should be snugged to ensure that the bearing is uniformly loaded.

Drive torque as measured at the drive socket should be 5 to 10 ft-lbs. (7 to 14 N-m).

The safe torque range on the Bearing Adjustment Set Screws is 1 to 3 in-lbs. (.1 to .3 N-m).

Bearing Adjustment Screw locations



Over-tightening the Bearing Adjustment Set Screws will result in accelerated bearing wear and lower available power.

Lock the Bearing pre-load by tightening the Bearing Adjustment Lock Screws (A through F).

The safe torque should be 6 to 10 ft-lbs. (11 to 14 N-m).

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

If 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 both of the front Thrust Plates by removing the eight (8) Hold Down Screws.

Lift the Headstock from the Housing. Refer to the Clamshell cross section.

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

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

All surfaces 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.

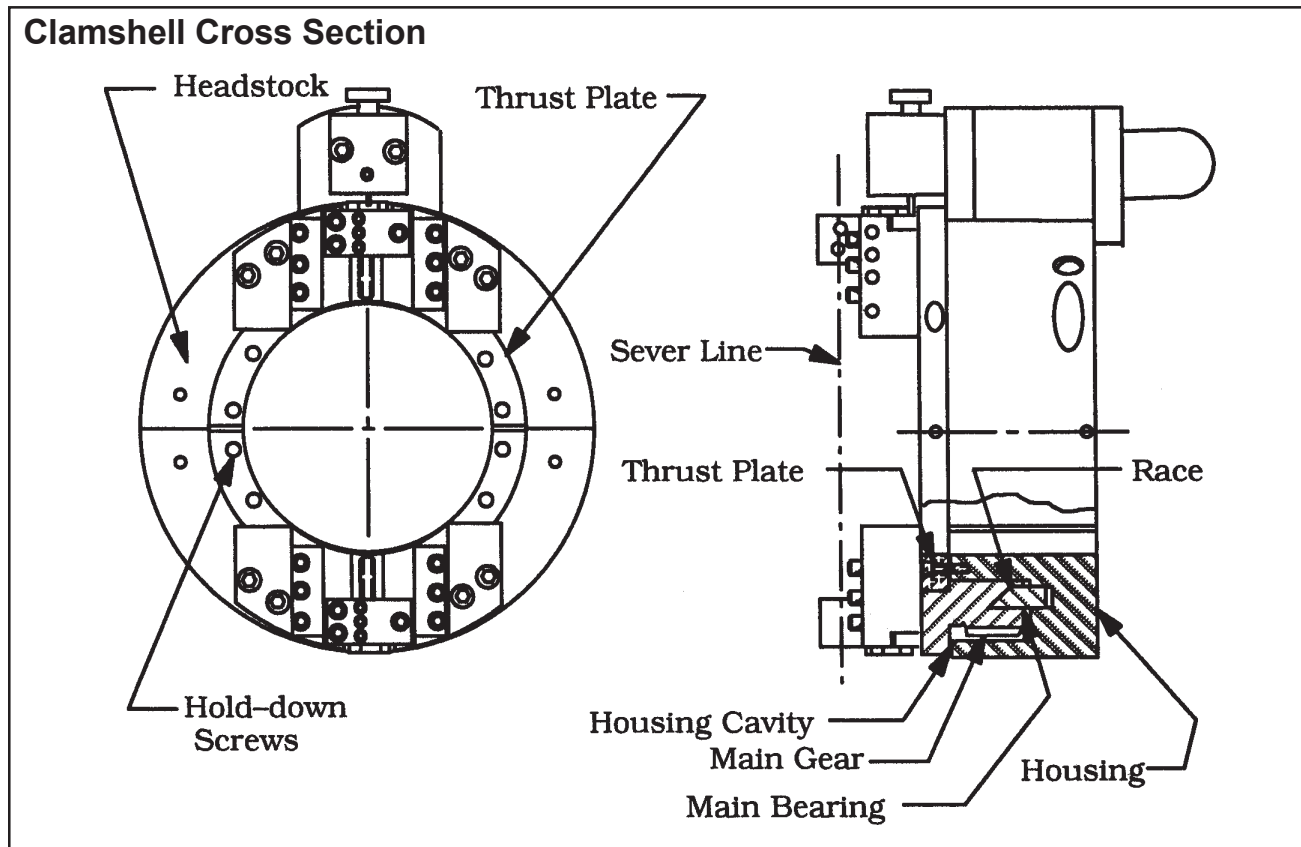
To reassemble, wipe clean all of the Bearing surfaces and clean the Housing cavity.

Re-grease the Gear using a lubricant approved by Tri Tool. Refer to the Lubricant Recommendations located later in this section.

Place the Headstock carefully back into the Housing.

Bolt the Front Thrust Plates back into place.

If 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 Housing.

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

Coat the teeth of the Drive Gear and the Main Gear with a grease which is approved by Tri Tool. Refer to the lubricant recommendations located later in this section.

TOOL BLOCK MAINTENANCE

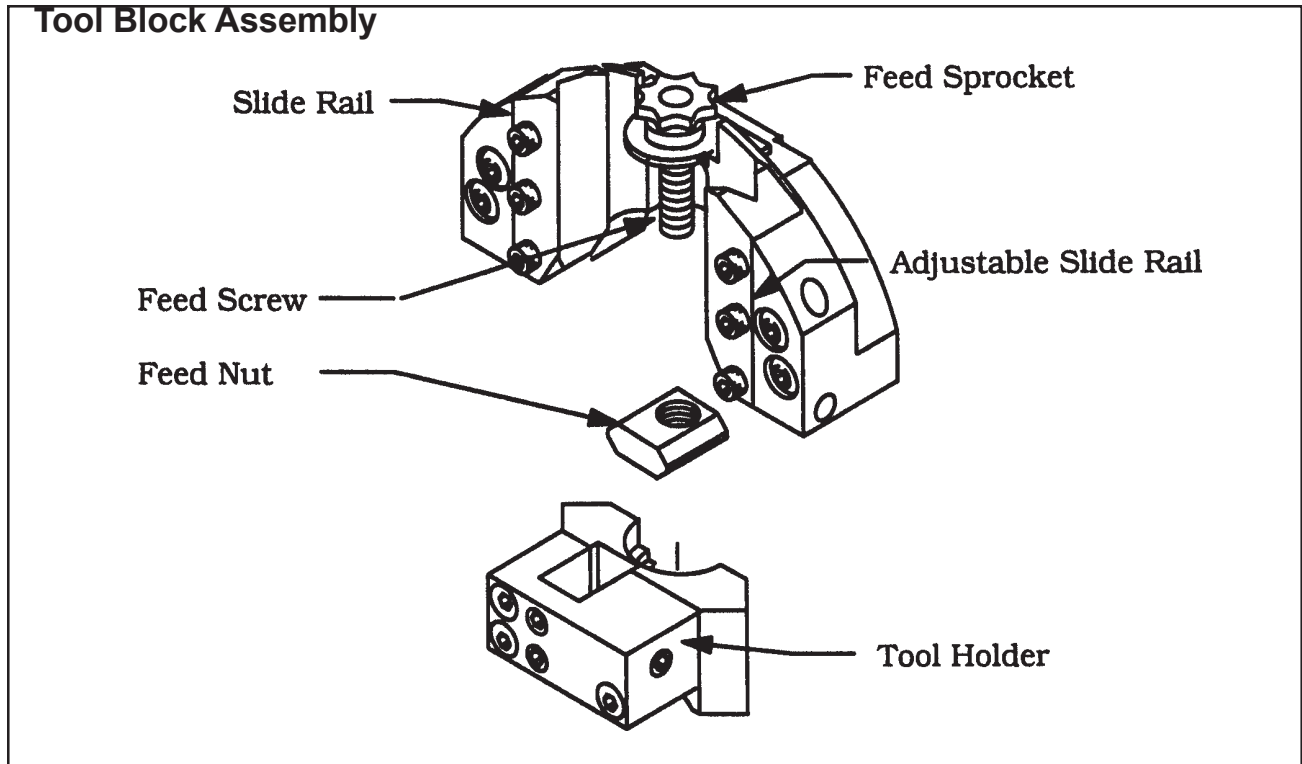
Clean the Slide Rails, the Feed Nut, the Sprocket Assy. and the Feed Screw.

Inspect these parts for damage and replace as required.

Lubricate and reassemble the Tool Block. Refer to the picture Tool Block Assembly.

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 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:

If 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 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, which bear directly inline with the Tool Holder.

Tighten the Hold down Screws to about 12 to 24 in-lbs. (1.4 to 2.7 N-m). (Finger tight using a hex key)

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.

Tightly lock the Adjustable Slide Rail in place with the Hold-down Screws and fully snug the Adjustment Set Screws.

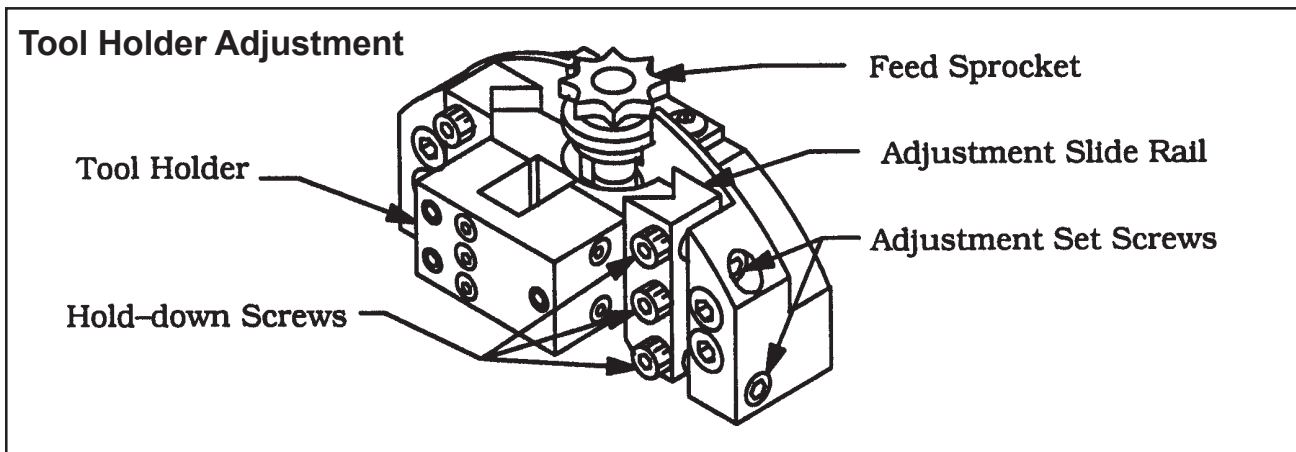
Check that the Tool Holder runs smoothly and evenly for the full length of travel.

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 1 to 3 ft-lbs. (1 to 4 N-m).



AIR MOTOR LUBRICATION

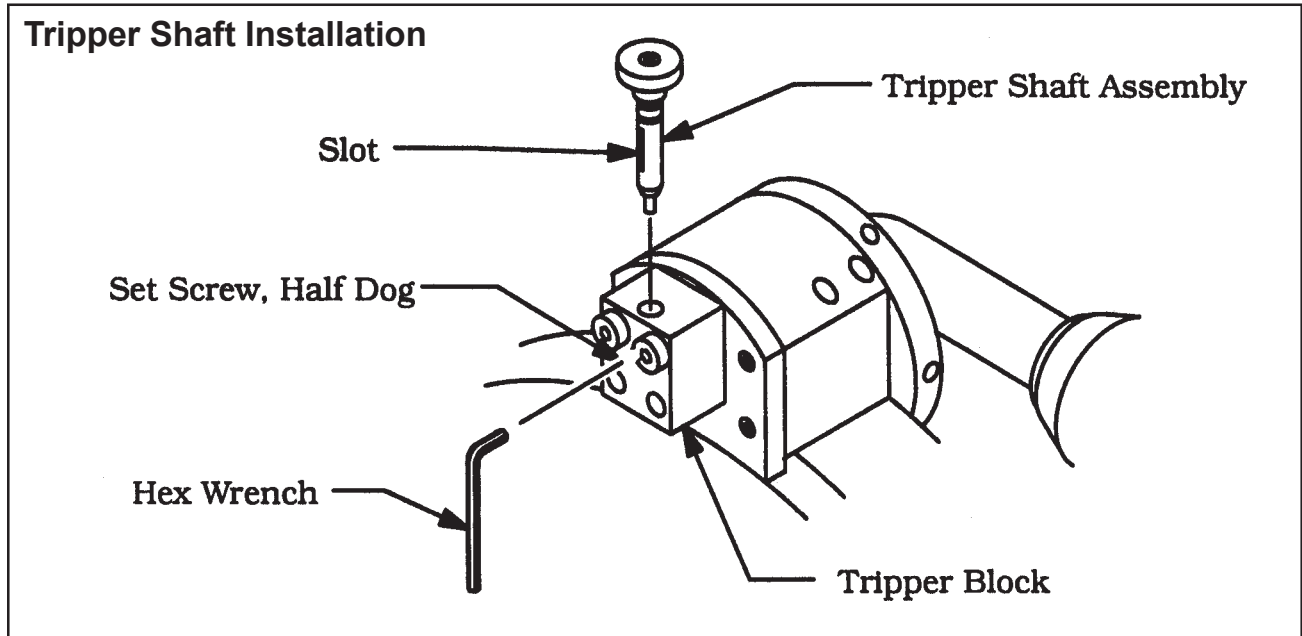
No direct maintenance is normally required on the Air Motor.

However, the air supply must flow through a filter/regulator/lubricator (FRL) unit or separate units before arriving at the motor.

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

If the Clamshell 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 motor inlet and run the motor for 2 to 3 seconds.

This will prevent rusting and 'freezing' of the rotor vanes.



TRIPPER BLOCK ASSY LUBRICATION AND TRIPPER SHAFT ADJUSTMENT

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

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

Apply a fresh lubrication to the Tripper Shaft Assy and re-install it in the Block.

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

See Operating Instructions later in the booklet for Feed Pin to Sprocket adjustment.

LUBRICANT RECOMMENDATIONS

The Drive Gears require a high string lubrication grease such as "Chevron Utility Grease, light, high string for gears" (P/N 68-0020).

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

TRI TOOL INC.

The Feed Screw for the Tool Block and the Tripper Block Assy 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 Air Motor requires a Class 2 lubricant, viscosity of 100 to 200 SSU at 100°F (38°C) minimum aniline point of 200°F (93°C).

Tri Tool Inc.– Air Tool Lubricant (P/N 68-0022)

AMOCO – American Industrial Oil No. 32

Atlantic Richfield – Duro Oil S-150

Chevron – A.W. Machine Oil 32

Exxon – Nuto H32

Shell – Tellus Oil 32

The bearings in the Air Motor are sealed and do not require any lubrication.

OPERATION

Read the operation instructions carefully before attempting to operate the Model 602.5SBM Low Profile Clamshell.

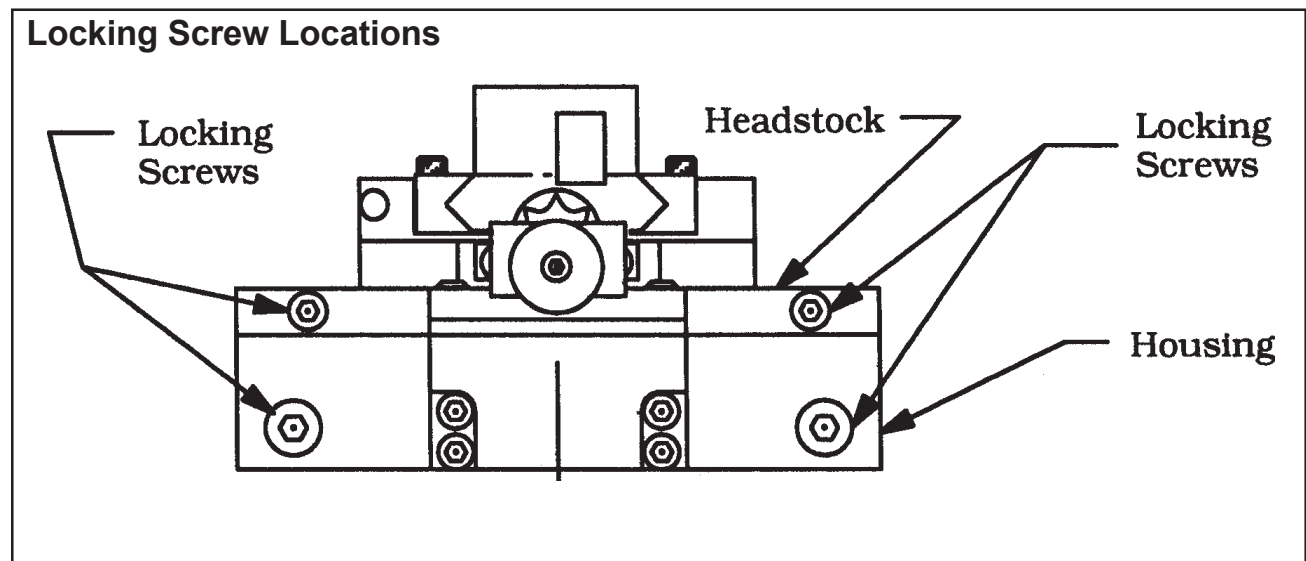
See 'Configure the Clamshell for the specific task required' later in this section to configure the machine.

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

INSTALLATION OF THE CLAMSHELL ON AN IN-LINE PIPE

Separate the two halves of the Clamshell.

Disengage the Air Motor by removing the Motor Hold-down Bolt and removing the Air Motor from the drive socket.



By hand, rotate the Headstock until the split-lines of the Headstock match the split-line of the Housing.

Unbolt the two halves of the Clamshell.

Two Locking Screws are located on the Housing and two more on the Headstock.

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

Separate the Clamshell halves evenly by pulling straight apart.

DO NOT FORCE OPEN.

SECURE THE CLAMSHELL TO THE PIPE.

Clean the mating surfaces and the ID of the Clamshell halves.

Wipe clean the mounting surface of the pipe.

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

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

Check that the Alignment Pins have seated the two halves properly.

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

Tightening torque should be 35 to 40 ft-lbs. (47 to 54 N-m).

If using Fixed Clamping Pads, clamp the Clamshell to the pipe as follows: if not, go to "If using the fully adjustable Clamping Pads." (see below)

Tighten the Adjustable Pads lightly so that all four of the Clamping Pads contact the pipe.

Gently rock the Clamshell as you tighten the Adjustable Clamping Pads to seat the Clamshell square on the pipe.

Check that all four Clamping Pads fully contact the pipe.

If not, repeat the last three steps.

Tighten the Clamping Pads.

Tightening torque should be 40 to 50 ft-lbs. (54 to 68 N-m).

Go to "General machining sequence".

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

Model 602.5SBM, Low Profile Clamshell

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

Check the center and squareness by eye.

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

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

Fine center the Clamshell as you would a 4-jaw check.

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

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

GENERAL MACHINING SEQUENCE

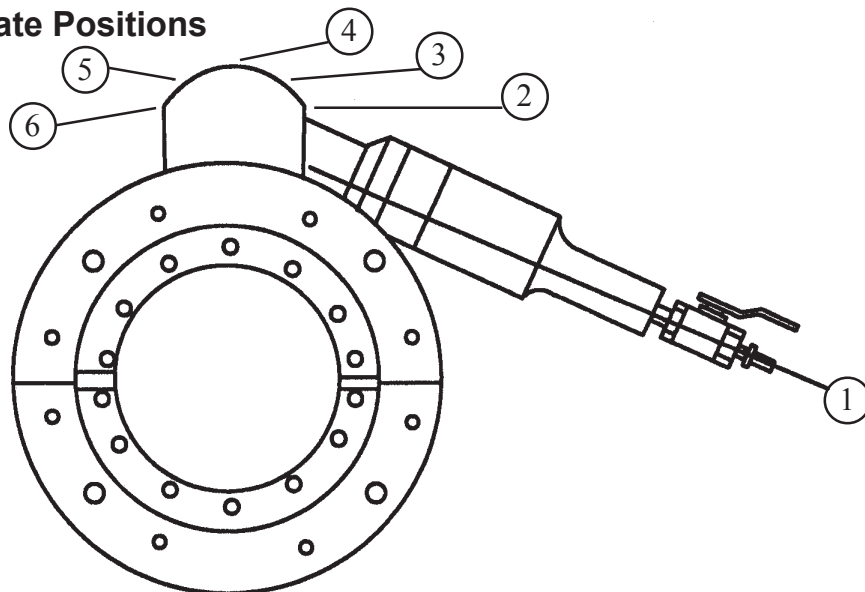
To set Tool Bits, go to “Tool Bit set up”, for set up instructions.

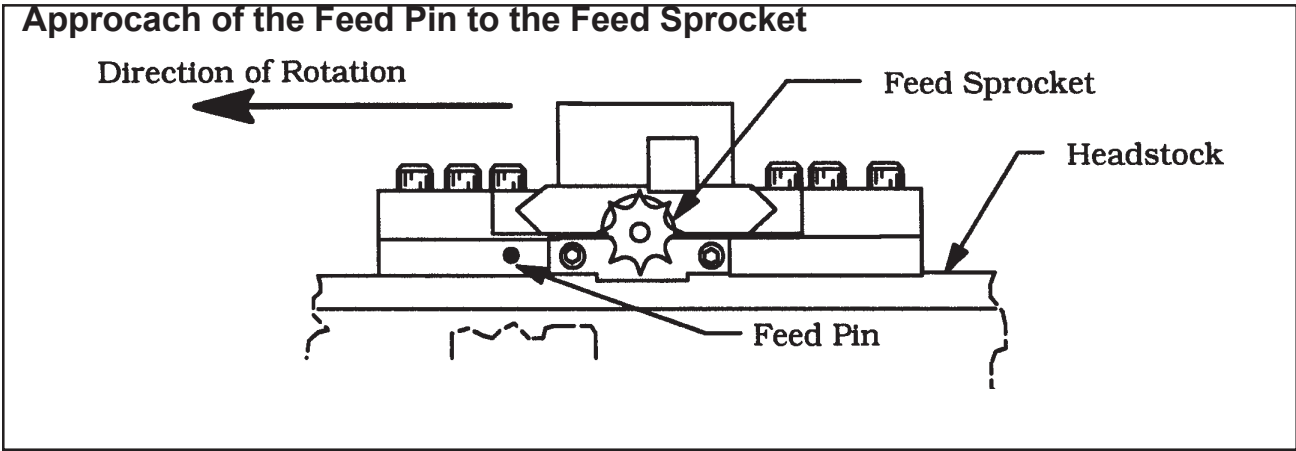
Install the Air Motor into the drive socket and bolt it to the Clamshell.

There are 6 various orientations available so that clearance for the Air Motor may be obtained. Refer to the picture “Air Motor alternate positions”.

CAUTION: The Motor Mount reacts the torque of the Air Motor only when the Motor Holddown bolt is in place.

Air Motor Alternate Positions





NOTE: Check that the air supply filter/regulator/lubricator is installed and set properly.

Check for proper alignment of the Feed Sprockets. Refer to the picture “Approach of the Feed Pin to the Feed Sprocket”.

Run the Headstock slowly with the Feed Pin ‘in’ to insure that the Sprocket is set right. (Do not run at full speed during the first revolution.)

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

Deadman Switch Warning

WARNING

DO NOT OVERRIDE THE DEADMAN SWITCH ON THIS UNIT. Locking down, obstructing, or in any way defeating the deadman switch on this unit may result in serious injury.

Deadman Switch

Flow Control Valve

Turn on the Air Motor to full speed by opening the Throttle control Valve.

NOTE: The Air Motor working speed will be about one half of the no-load speed. (Refer to “Cutting Speeds” for speed selection chart).

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 2-3 revolutions to clear the chip.

Then stop the Clamshell and remove the chips.

Refer to “Severing and single beveling or severing and double beveling simultaneously” through the end of this chapter for specific machining procedures.

When the machine operation is finished, turn off the Air Motor by closing the Throttle Control Valve.

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.

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 Air Motor until the split-lines of the Headstock and the Housing match.

Loosen the Clamping Pads.

Remove the Clamshell from the pipe.

If the Clamshell must be split to remove it, be sure that both halves are properly supported.

CONFIGURE THE CLAMSHELL FOR THE SPECIFIC TASK REQUIRED

Select the proper Tool Blocks

Tool Block Selection				
Tool Block Assy	Height from Centerline of the cut to the Headstock Face		Tool Block Travel	
	08-0036	1.50"	38.1 mm	.63"
08-0096	.51"	13.0 mm	.40"	10.2 mm

Mount the Tool Blocks and Tripper Block to the Clamshell.

Check the adjustment of the slides and mesh of the Tripper Pin with the Feed sprocket.

Select the proper Clamping Pad Set.

Install the Clamping Pad Set into the Clamshell.

If using the Fixed Clamping Pad Set then install the Clamping Pad Set so that the pipe lays on the Fixed Pads or vice versa.

Fixed Pads should be located 90 degrees from each other.

Pad Set Selection			
Pipe Size	OD		P/N of Pad Sets
		3.000	
2 1/2"	2.875	73.0 mm	67-3179
	2.750	69.9 mm	67-3159
	2.625	66.7 mm	67-3181
	2.500	63.5 mm	67-3182
2"	2.375	60.3 mm	67-3183
	2.250	57.2 mm	67-3184
	2.125	54.0 mm	67-3185
	2.000	50.8 mm	67-3186

Pad Set Selection Continues on next page

Pad Set Selection Continued			
Pipe Size	OD		P/N of Pad Sets
	1 1/2"	1.900	
	1.875	47.6 mm	67-3188
	1.750	44.5 mm	67-3189
1 1/4"	1.660	42.2 mm	67-3190
	1.625	41.3 mm	67-3191
	1.500	38.1 mm	67-3192
	1.375	34.9 mm	67-3193
1"	1.315	33.4 mm	67-3194

TOOL BIT SET-UP

Select the proper Tool Bit set (Refer to “Tool Bits”)

WARNING: The 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.

Install the tool Bits into the Tool blocks. Refer to “Tool Bits” for installation drawings.

Approximately .50” (13 mm) should be protruding from the end of the Tool Holders.

Tighten the Tool Bit Set Screws, then verify that there is adequate clearance between the Tool Bits and the pipe by rotating the Headstock by hand.

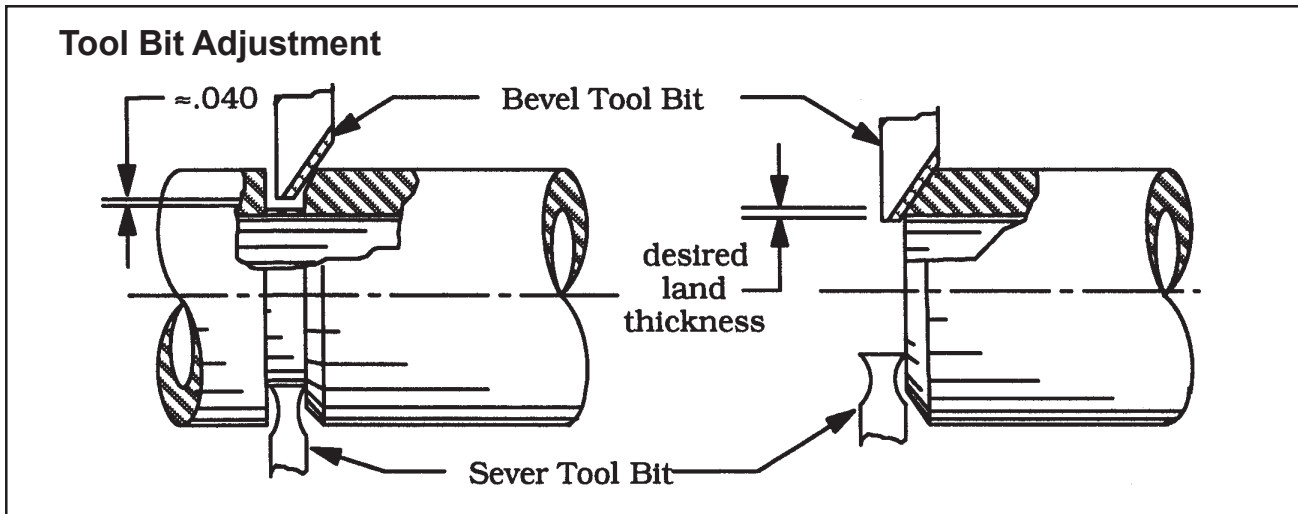
The Leading Tool Bit should contact the pipe approximately .020” to .040” (.51 mm to 1.02 mm) before the Trailing Tool Bit.

Go to "General machining sequence".

SEVERING AND SINGLE BEVELING OR SEVERING AND DOUBLE BEVELING SIMULTANEOUSLY

When the Tool Bits are within about .040" (1.02 mm) of severing the pipe, disengage the Feed Pin and let the Headstock rotate 2 to 3 times to clear the chip.

Retract the Tool Holder which holds the Bevel Tool Bit, be sure that the Feed Sprocket is aligned properly. Refer to the picture "Tool Bit adjustment".



Complete the sever.

After the sever is completed, reposition the Bevel Tool Bit so that it continues cutting until the desired land thickness is obtained.

Go to "Monitor the cutting operation".

SOCKET WELD REMOVAL

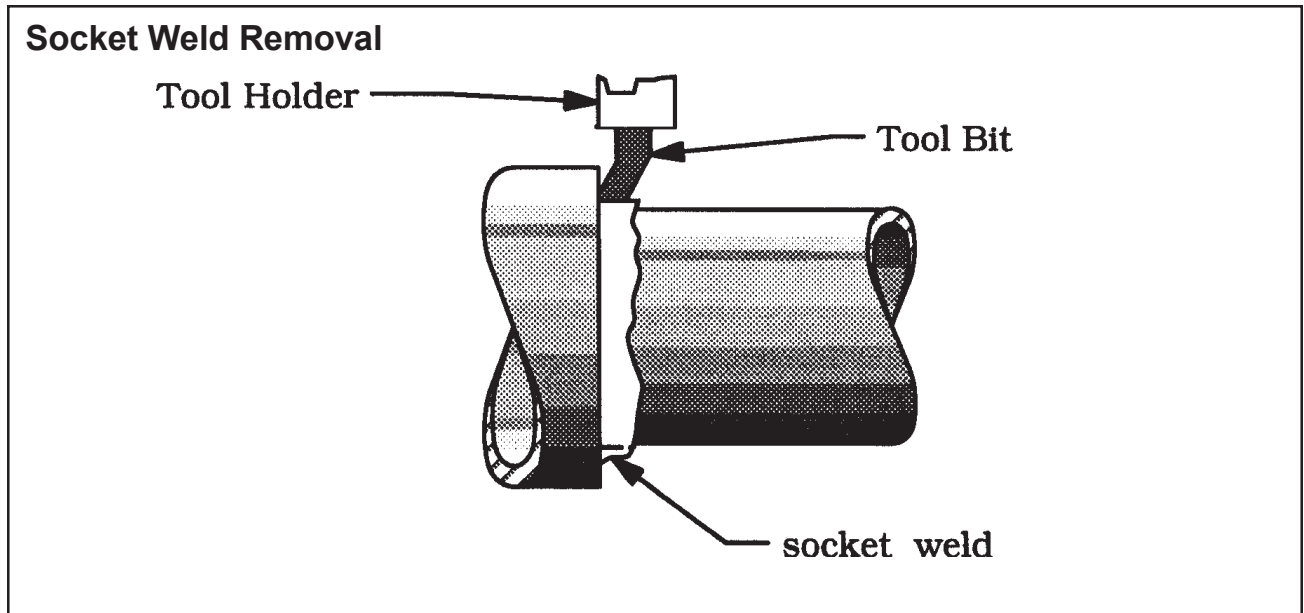
Install the Tool Bit in the Socket Weld Tool Holder (Optional) as shown. Refer to the picture "Socket weld removal".

When the Tool Bit first cuts the parent metal, stop the machine and retract the Tool Holder.

Strike the pipe end and twist it out of the socket.

If the pipe will not separate from the socket, then continue cutting.

After every 3 to 4 revolutions, try again to break the pipe free.



COUNTERBORING

Counterboring requires the use of a Counterboring Module (P/N 05-0128).

Refer to the Instruction manual for the Counterboring Module for its use with the Clamshell

CUTTING SPEEDS

The chart shows RPM to obtain specified Tool Bit surface cutting speed on the surface of the pipe.

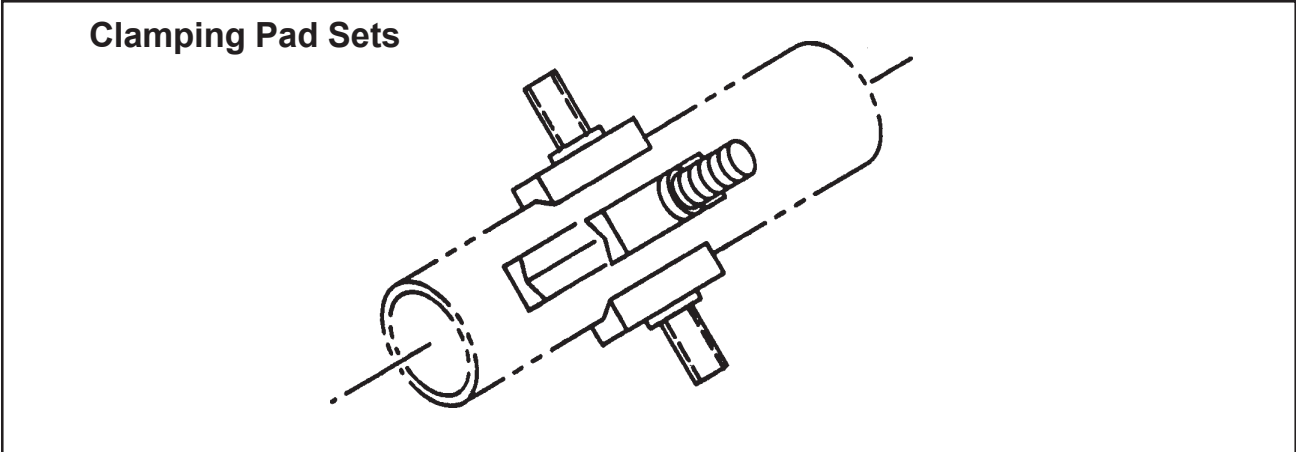
Cutting Speeds (Approximately)					
Pipe Size	True Diameter		RPM for 200 in/min (508 cm/min)	RPM for 250 in/min (635 cm/min)	RPM for 300 in/min (762 cm/min)
	-	3.000"	76.2 mm	21	27
2 1/2"	2.875"	73.0 mm	22	28	33
2"	2.375"	60.3 mm	27	34	40
1 1/2"	1.900"	48.3 mm	34	42	50
1 1/4"	1.660"	42.2 mm	38	48	58
1"	1.312"	33.4 mm	48	61	73

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.

CLAMPING PAD SETS



Clamping Pad Sets					
		Clamping Pad Sets			
Pipe Dia	True OD		Set Part No.	Adjustable Bar Assy (2 req'd)	Fixed Bar Assy (2 req'd)
	3.000"	76.2 mm	67-3178	26-0517	26-0578
2 1/2"	2.875"	73.0 mm	67-3179	26-0612	26-0580
	2.750"	69.9 mm	67-3159	26-0527	26-0525
	2.625"	66.7 mm	67-3181	26-0614	26-0584
	2.500"	63.5 mm	67-3182	26-0614	26-0586
2"	2.375"	60.3 mm	67-3183	26-0616	26-0588
	2.250"	57.2 mm	67-3184	26-0616	26-0590
	2.125"	54.0 mm	67-3185	26-0618	26-0592
	2.000"	50.8 mm	67-3186	26-0618	26-0594
1 1/2"	1.900"	48.3 mm	67-3187	26-0620	26-0596
Contact TRI TOOL Inc. for sizes not listed					

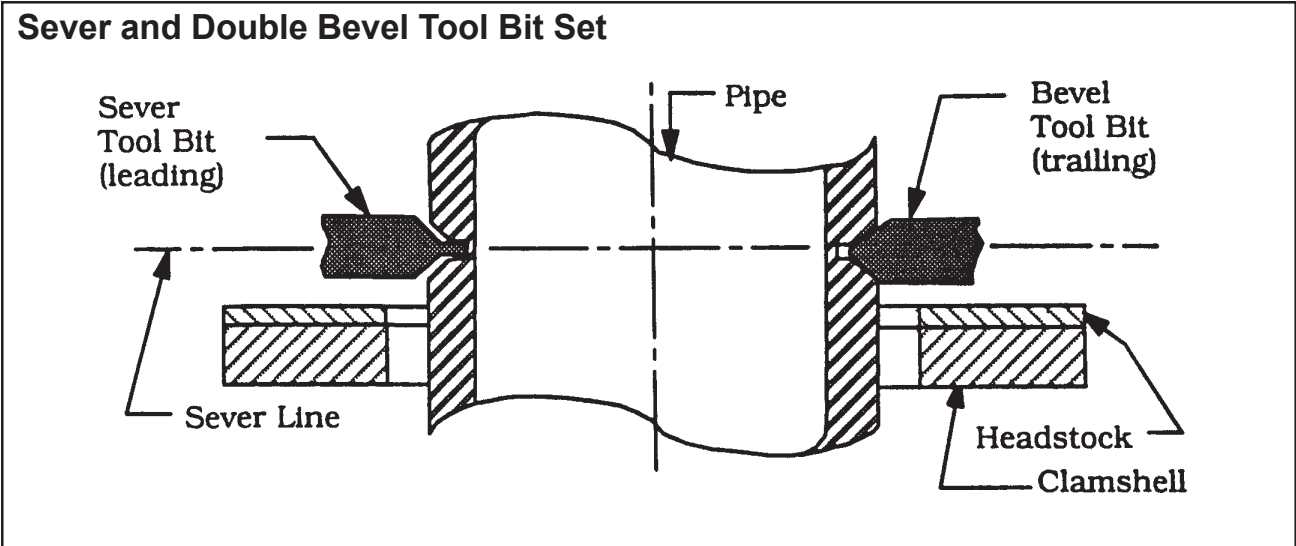
Clamping Pad Sets Continued on next page

Clamping Pad Sets, Continued					
			Clamping Pad Sets		
Pipe Dia	True OD		Set Part No.	Adjustable Bar Assy (2 req'd)	Fixed Bar Assy (2 req'd)
	1.875	47.6 mm	67-3188	26-0620	26-0598
	1.750"	44.5 mm	67-3189	26-0622	26-0600
1 1/4"	1.660"	42.2 mm	67-3190	26-0624	26-0602
	1.625"	41.3 mm	67-3191	26-0624	26-0604
	1.500"	38.1 mm	67-3192	26-0626	26-0606
	1.375"	34.9 mm	67-3193	26-0626	26-0608
1"	1.315"	33.4 mm	67-3194	26-0628	26-0610
Contact TRI TOOL Inc. for sizes not listed					

TOOL BITS

SEVER AND DOUBLE BEVEL TOOL BIT SETS

Sever and Double Bevel Tool Bit Sets have been designed to leave a bevel on both pieces of pipe or tube which has been severed.

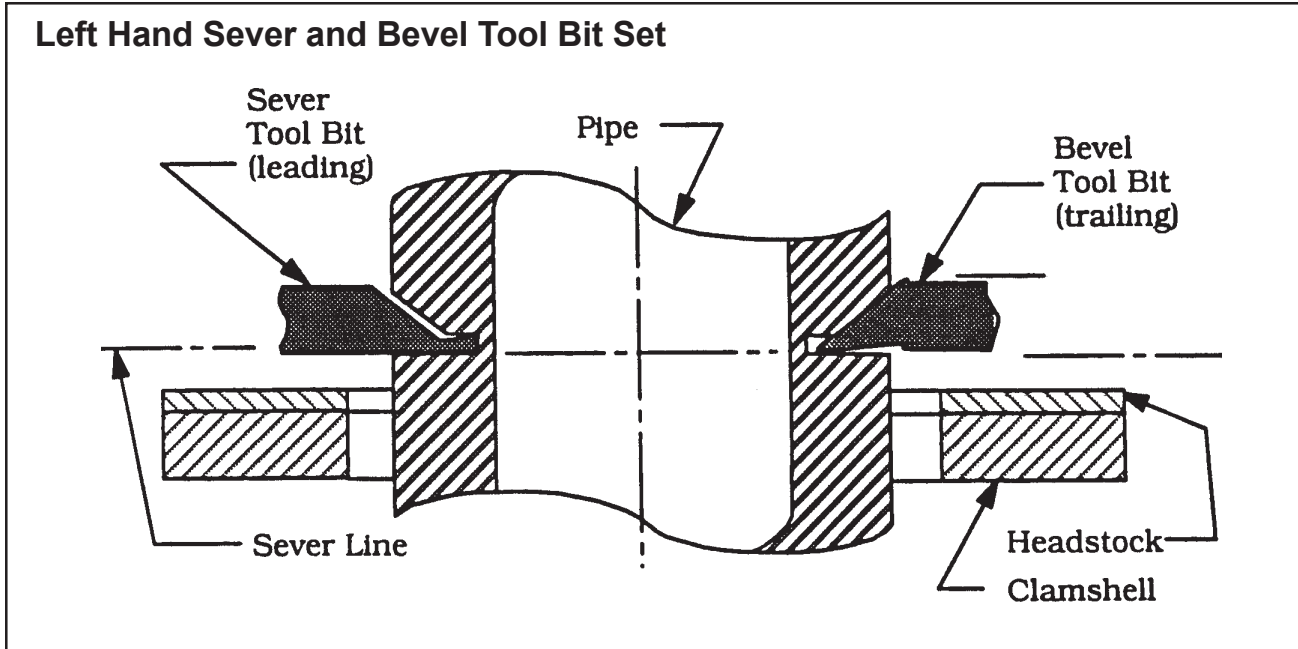


Sever and Double Bevel Tool Bit Sets

Range	Max Wall Thk	Pipe or Tube Mat'l	Bevel Tool Bit P/N	Sever Tool Bit P/N
Sever and Double 37.5° Bevel Tool Bits for use with the Standard Tool Block (P/N 08-0036)				
1 1/2" pipe sch 5 & 10 2" & 2 1/2" pipe sch 5 thru 160 3" (76.2 mm) OD tube	.400"	10.2 mm	CS, SS	99-1632
1" thru 1 1/2" pipe all sch 2" & 2 1/2" pipe sch 5 thru 160 3" (76.2 mm) OD tube				99-0987
Sever and Double 37.5° Bevel Tool Bits for use with the Low Profile Tool Block (P/N 08-096)				
1 1/2" pipe sch 5 thru 40 2" pipe sch 5 thru 80 2 1/2" pipe sch 5 thru 40 3" (76.2 mm) OD tube	.240"	6.1 mm	CS, SS	99-1952
				99-1953

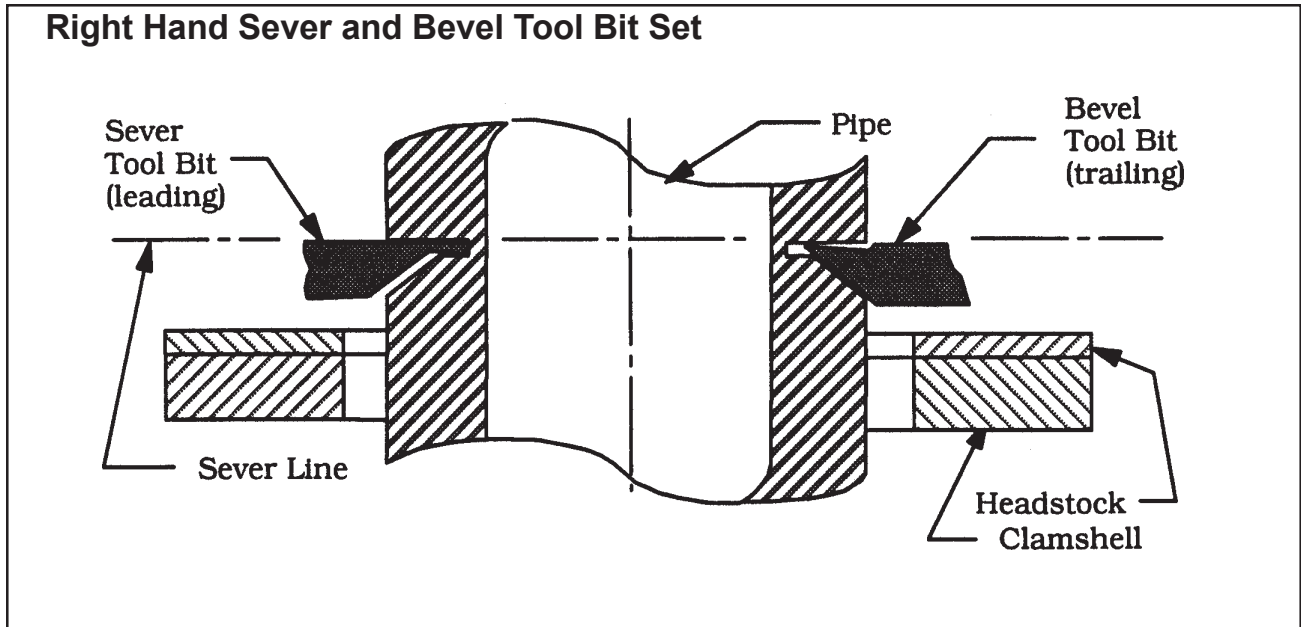
SEVER AND BEVEL TOOL BIT SETS

Left Hand Sever and Bevel Tool Bit Sets have been designed to bevel the end of the pipe or tube, which is cut from the pipe, or tube on which the Clamshell is mounted.



Left Hand Sever and Bevel Tool Bit Sets					
Range	Max Wall Thk	Pipe or Tube Mat'l	Bevel Tool Bit P/N	Sever Tool Bit P/N	
Left Hand Sever and 37.5° Bevel Tool Bits for use with the Standard Tool Block (P/N 08-0036)					
1 1/2" pipe sch 5 & 10 2" & 2 1/2" pipe sch 5 thru 160 3" (76.2 mm) OD tube	.450"	11.4 mm	CS, SS	99-1636	99-1637
1" thru 2" pipe all sch 2 1/2" pipe sch 5 thru 160 3" (76.2 mm) OD tube				99-1264	99-1265
Left Hand Sever and 37.5° Bevel Tool Bits for use with the Low Profile Tool Block (P/N 08-0096)					
1 1/2" pipe sch 5 thru 40 2" & 2 1/2" pipe sch 5 thru 160 3" (76.2 mm) OD tube	.450"	11.4 mm	CS, SS	99-1956	99-1957

Right Hand Sever and Bevel Tool Bit Sets have been designed to bevel the end of the pipe or tube on which the Clamshell is mounted.

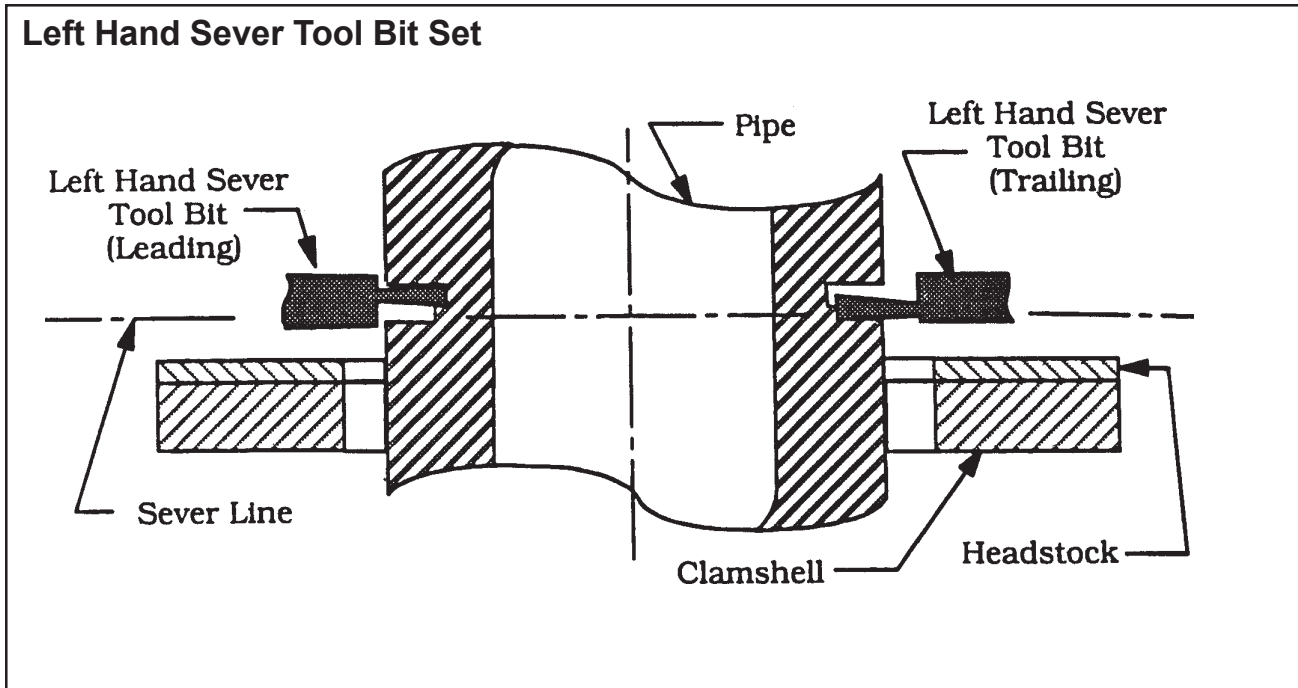


Right Hand Sever and Bevel Tool Bit Sets

Range	Max Wall Thk	Pipe or Tube Mat'l	Bevel Tool Bit P/N	Sever Tool Bit P/N	
Right Hand Sever and 37.5° Bevel Tool Bits for use with the Standard Tool Block (P/N 08-0036)					
1 1/2" pipe sch 5 & 10 2" & 2 1/2" pipe sch 5 thru 160 3" (76.2 mm) OD tube	.450"	11.4 mm	CS, SS	99-1634	99-1635
1" thru 2" pipe all sch 2 1/2" pipe sch 5 thru 160 3" (76.2 mm) OD tube				99-1266	99-1267
Right Hand Sever and 37.5° Bevel Tool Bits for use with the Low Profile Tool Block (P/N 08-0096)					
1 1/2" pipe sch 5 thru 40 2" & 2 1/2" pipe sch 5 thru 160 3" (76.2 mm) OD tube	.450"	11.4 mm	CS, SS	99-1954	99-1955

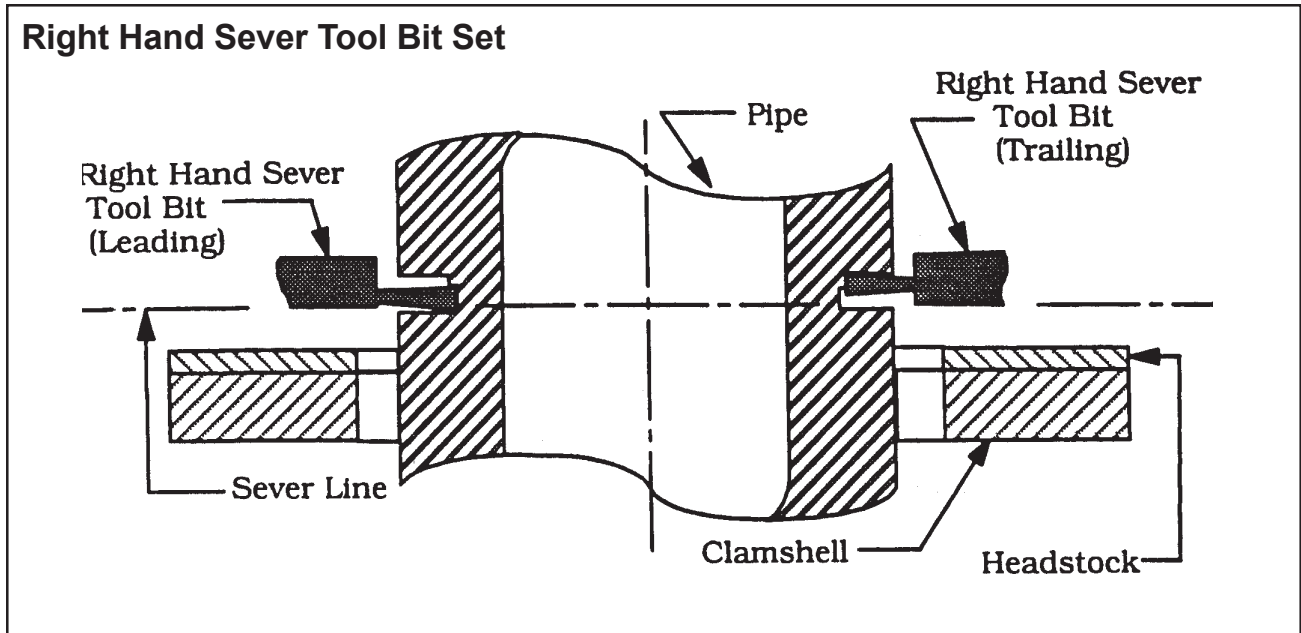
SEVER TOOL BIT SETS

Left Hand Sever Tool Bit Sets have been designed to sever the pipe or tube away from the clamshell relative to the Tool Holder.



Left Hand Sever Tool Bit Sets					
Range	Max Wall Thk		Pipe or Tube Mat'l	Leading Sever Tool Bit P/N	Trailing Sever Tool Bit P/N
Left Hand Sever Tool Bits for use with the Standard Tool Block (P/N 08-0036)					
1 1/2" pipe sch 5 & 10 2" pipe sch 5 thru 160 2 1/2" pipe all sch 3" (76.2 mm) OD tube	.630"	16.0 mm	CS, SS	99-1628	99-1629
1" thru 2"-2 1/2" pipe all sch 3" (76.2 mm) OD tube	1.00"	25.4 mm		99-1596	99-1595
Left Hand Sever Tool Bits for use with the Low Profile Tool Block (P/N 08-0096)					
1 1/2" pipe sch 5 thru 10 2" & 2 1/2" pipe sch 5 thru 160 3" (76.2 mm) OD tube	.380"	9.6 mm	CS, SS	99-1948	99-1949

Right Hand Sever Tool Bit Sets have been designed to sever the pipe or tube close to the clamshell relative to the Tool Holder.



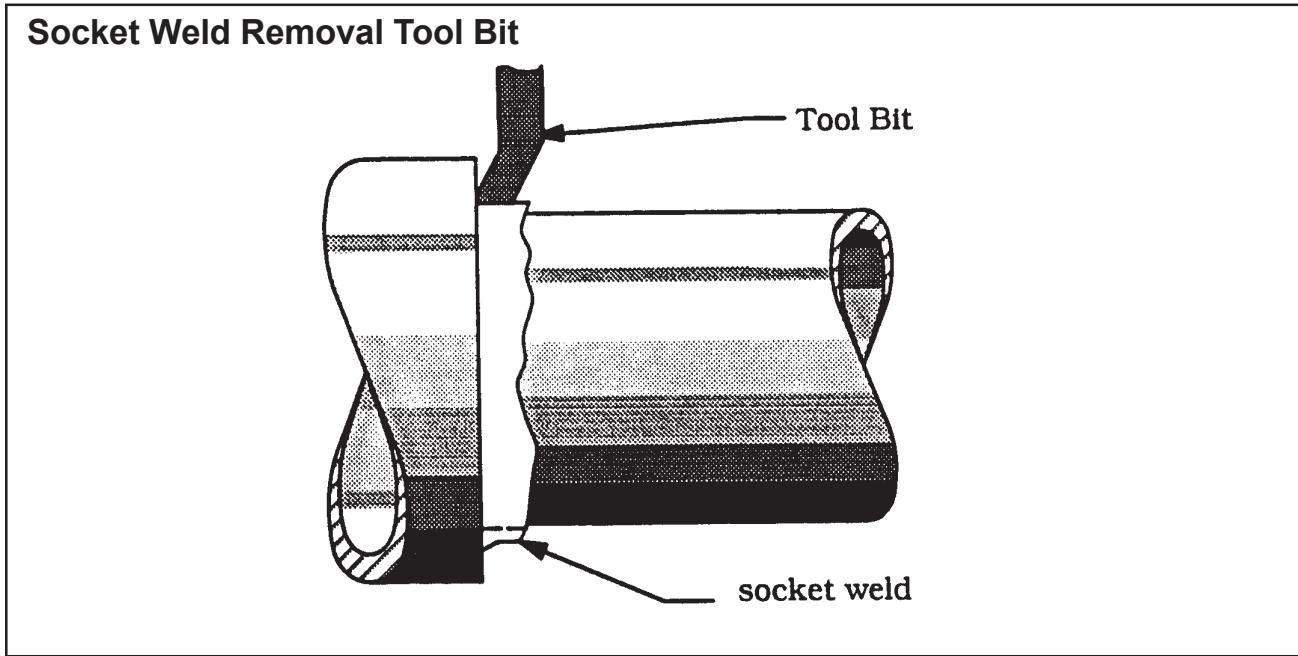
Right Hand Sever Tool Bit Sets

Range	Max Wall Thk	Pipe or Tube Mat'l	Leading Sever Tool Bit P/N	Trailing Sever Tool Bit P/N	
Right Hand Sever Tool Bits for use with the Standard Tool Block (P/N 08-0036)					
1 1/2" pipe sch 5 & 10 2" pipe sch 5 thru 160 2 1/2" pipe all sch 3" (76.2 mm) OD tube	.630"	16.0 mm	CS, SS	99-1630	99-1631
1" thru 2"-2 1/2" pipe all sch 3" (76.2 mm) OD tube	1.00"	25.4 mm		99-1597	99-1598
Right Hand Sever Tool Bits for use with the Low Profile Tool Block (P/N 08-0096)					
1 1/2" pipe sch 5 thru 10 2" & 2 1/2" pipe sch 5 thru 160 3" (76.2 mm) OD tube	.380"	9.6 mm	CS, SS	99-1950	99-1951

SPECIAL TOOL BIT SETS

Socket Weld Removal Tool bits have been designed to remove the weld from a weld type socket joint.

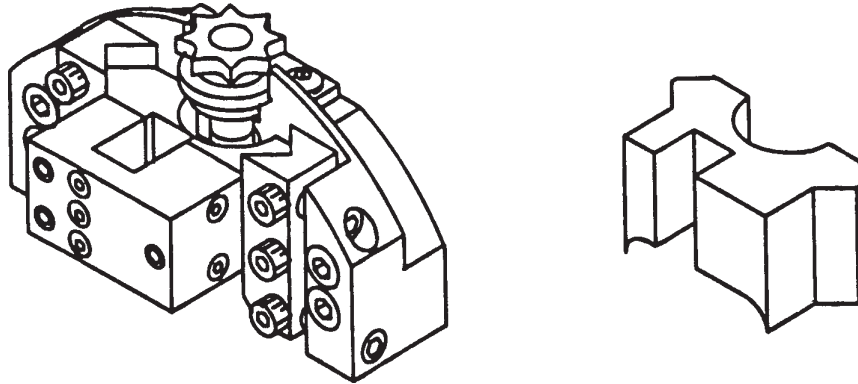
These Tool Bits also require special Tool Holders.



Socket Weld Removal Tool Bit					
Range	Max Wall Thk	Pipe or Tube Mat'l	Socket Weld Removal Tool Bit P/N	Tool Bit Length	
Socket Weld Removal Tool Bit for use with the Standard Tool Block (P/N 08-0036) using the Socket Weld Removal Tool Holder (P/N 49-0046)					
1.315" (33.4 mm) min OD	.400"	CS, SS	99-1853	2.00"	50.8 mm
3.000" (76.2 mm) max OD			99-1600	2.38"	60.5 mm
Socket Weld Removal Tool Bit for use with the Low Profile Tool Block (P/N 08-0096) using the Socket Weld Removal Tool Holder (P/N 49-0039)					
1.780" (45.2 mm) min OD	.400"	CS, SS	99-2148	1.38"	35.1 mm
3.000" (76.2 mm) max OD					

TOOL BLOCKS

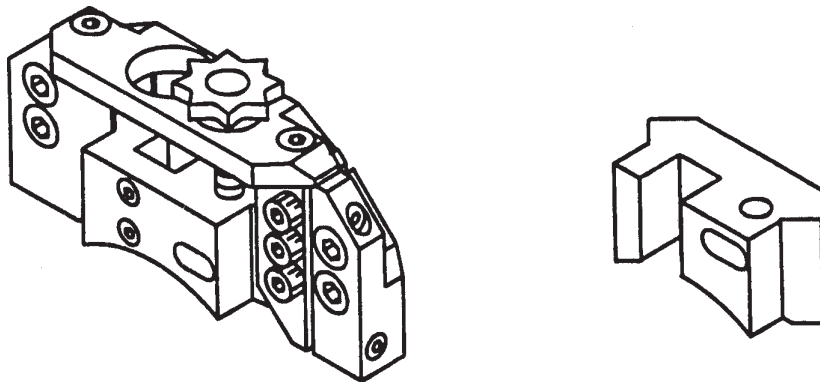
Standard Tool Block and Socket Weld Removal Tool Holder Kit



TOOL BLOCK, STANDARD

Part No.	Description
08-0036	Tool Block, Standard
49-0046	Tool Holder Kit, Socket Weld Removal

Low Profile Tool Block and Socket Weld Removal Tool Holder Kit



TOOL BLOCK, LOW PROFILE

Part No.	Description
08-0096	Tool Holder, Low Profile
49-0039	Tool Holder Kit, Socket Weld Removal

TROUBLE SHOOTING

Problem: The Tool Bit Chatters

Probable Causes:

- 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

Probable Causes:

- 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 Tool Bit is diving and the clamshell is stalling

Probable Causes:

- 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 Tool Holder is over-extended.
- The Main Bearing pre-load is too loose.

Problem: The surface finish is rough

Probable Causes:

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: The Headstock is hard to rotate by hand.

Probable Causes:

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 split-lines.

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

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

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

The Main Bearing pre-load is too tight.

Problem: The tool holder is not feeding

Probable Causes:

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

Probable Causes:

The air supply pressure is too low.

The air filter is plugged.

The Air Motor is not properly lubricated.

The Exhaust is plugged.

The Air line size is insufficient.

The Air line is too long.

The Motor is icing up because the water trap in the FRL has not been drained.

Problem: The Clamshell is slipping on the pipe or tube. (Fixed Pads)

Probable Causes:

- The Clamping Pads are not in full contact with the pipe or tube.
- Clamping pressure is too light.
- Scale and/or other foreign material are 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 tool bit will not reach the work

Probable Causes:

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

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

Probable Causes:

- Incorrect Clamping Pad Set is installed.
- Scale and/or foreign material are 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.

Problem: The Air Motor will not start.

Probable Causes:

- The air supply is shut off.
- The Air Motor will not run free.
 - The Air Motor needs lubrication.
 - Add lubrication and do not run the Air Motor for a few minutes.
 - Then try again.
 - Tap on the Air Motor casing lightly with a piece of wood or with a soft rubber mallet.
 - The vanes may be sticking.
- Sand or other foreign material is in the vanes of the Air Motor.

ACCESSORIES

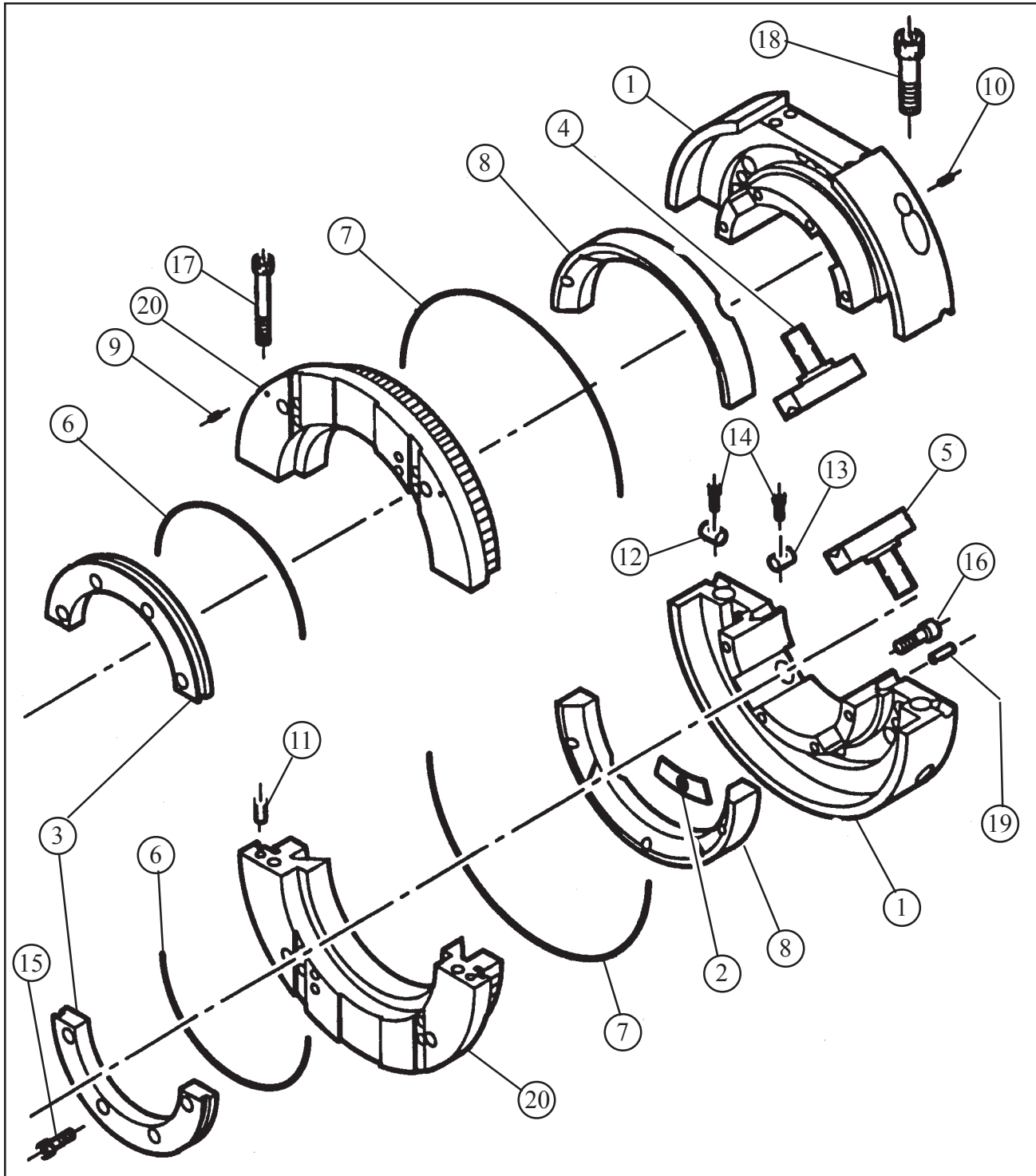
The following accessories are recommended for use with the Model 602.5SBM Clamshell and are available from TRI TOOL INC.

1. Portable Air Filter Caddy (P/N 75-0115), Standard Duty.
2. An ASO (Automatic Shut Off) (Special order only)
3. Counterbore Module Kit (P/N 05-0128)
4. Tool Bits (Refer to the Chapter on Tool Bits)
5. Tool Blocks (Refer to the Chapter on Tool Blocks)
6. Clamping Pad Sets (Refer to the Chapter on Clamping Pad Sets)
7. Lathe Stand Kit (P/N 60-0043)

A portable Air Caddy (FRL) is required to protect the warranty on all TRI TOOL INC air driven tools.

ILLUSTRATED PARTS BREAKDOWN

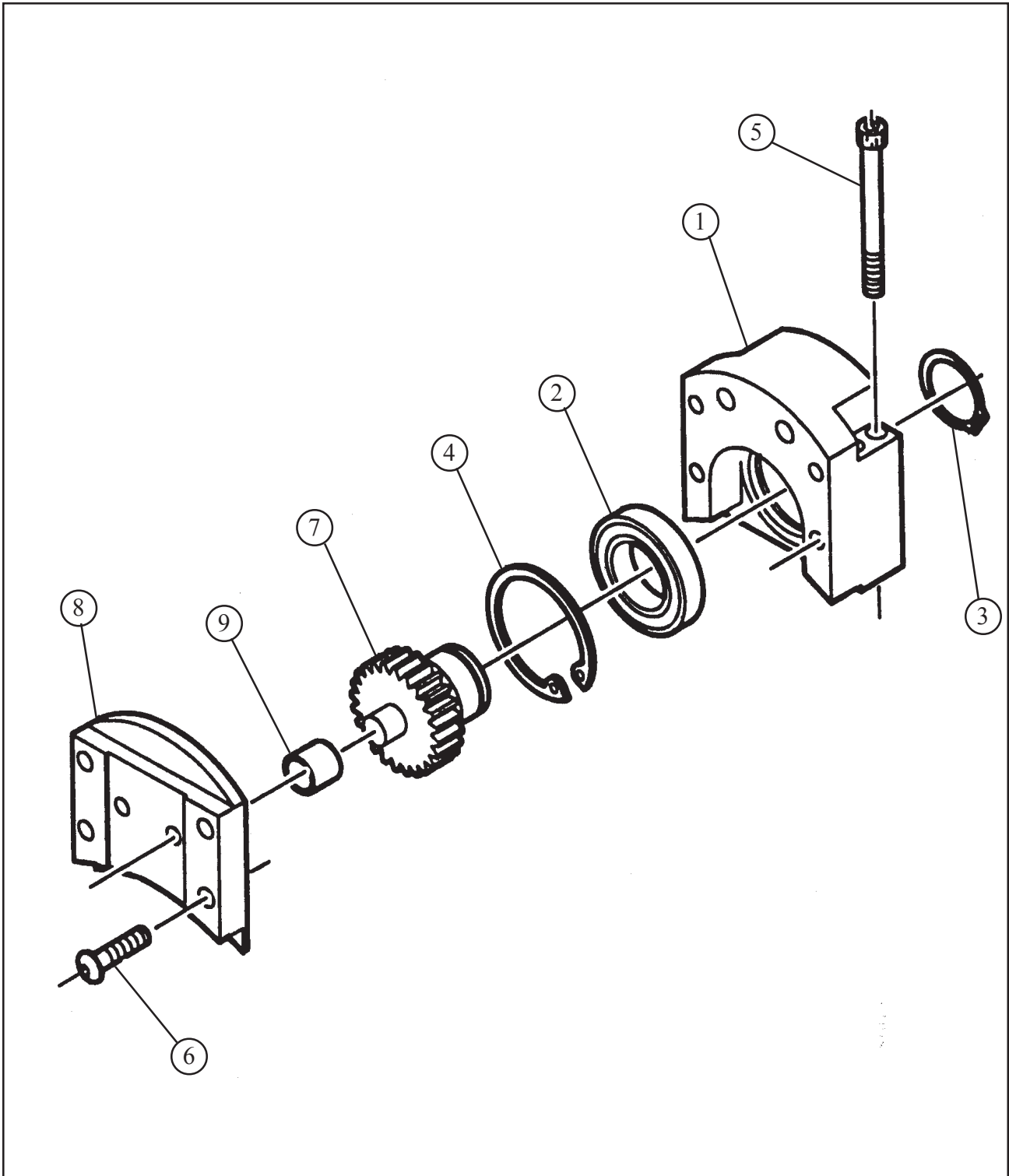
MODEL 602.5SBM CLAMSHELL SUB-ASSY.



Parts List, Model 602.5SBM Clamshell Sub-Assy.

Item No.	Part No.	Description	Qty
1.	19-0296	HOUSING, MAIN	1
2.	24-0370	PLATE, BEARING BACKING	6
3.	24-0519	PLATE, THRUST	1
4.		BAR ASSY, ADJUSTABLE	2
5.		REFER TO CLAMPING PAD SETS FOR OPTIONS BAR ASSY, FIXED	2
6.	28-0057	REFER TO CLAMPING PAD SETS FOR OPTIONS SEAL, FELT, 1/8 X 3/16	15" (38 cm)
7.	28-0057	SEAL, FELT	22" (56 cm)
8.	29-0131	BEARING, MAIN	1
9.	32-0008	PIN, ROLL, 5/64 DIA X 1/4	2
10.	32-0015	PIN, ROLL, 3/32 DIA X 15/16	
2			
11.	32-0153	PIN, DOWEL 3/16 DIA X 1/2	2
12.	32-0211	PIN, ALIGNMENT, 5/16 DIA X 29/64	2
13.	32-0255	PIN, ALIGNMENT	2
14.	33-0012	SCREW, CAP, 6-32 X 3/8	4
15.	33-0029	SCREW, CAP, 10-24 X 5/8	8
16.	33-0040	SCREW, CAP, 1/4-20 X 3/4	6
17.	33-0045	SCREW, SPLITLINE, 1/4-20 X 1 3/4	2
18.	33-0073	SCREW, SPLITLINE, 3/8-16 X 1 1/2	2
19.	33-1369	SCREW, SET, 3/8-24 X 1/2, HDOG	12
20.	39-0296	HEADSTOCK	1
NOT SHOWN			
	05-1081	SHIPPING KIT, 602.5SBM	1
	36-0003	WRENCH, L, 3/32" HEX	1
	36-0005	WRENCH, L, 1/8" HEX	1
	36-0007	WRENCH, L, 5/32" HEX	1
	36-0008	WRENCH, L, 3/16" HEX	1
	36-0010	WRENCH, L, 1/4" HEX	1
	36-0011	WRENCH, L, 5/16" HEX	1
	36-0018	WRENCH, L, 1/8" HEX	1
	36-0020	WRENCH, L, 5/32" HEX	1
	36-0021	WRENCH, L, 3/16" HEX	1
	36-0051	WRENCH, SPANNER	1
	86-0058	CARRYING CASE	1

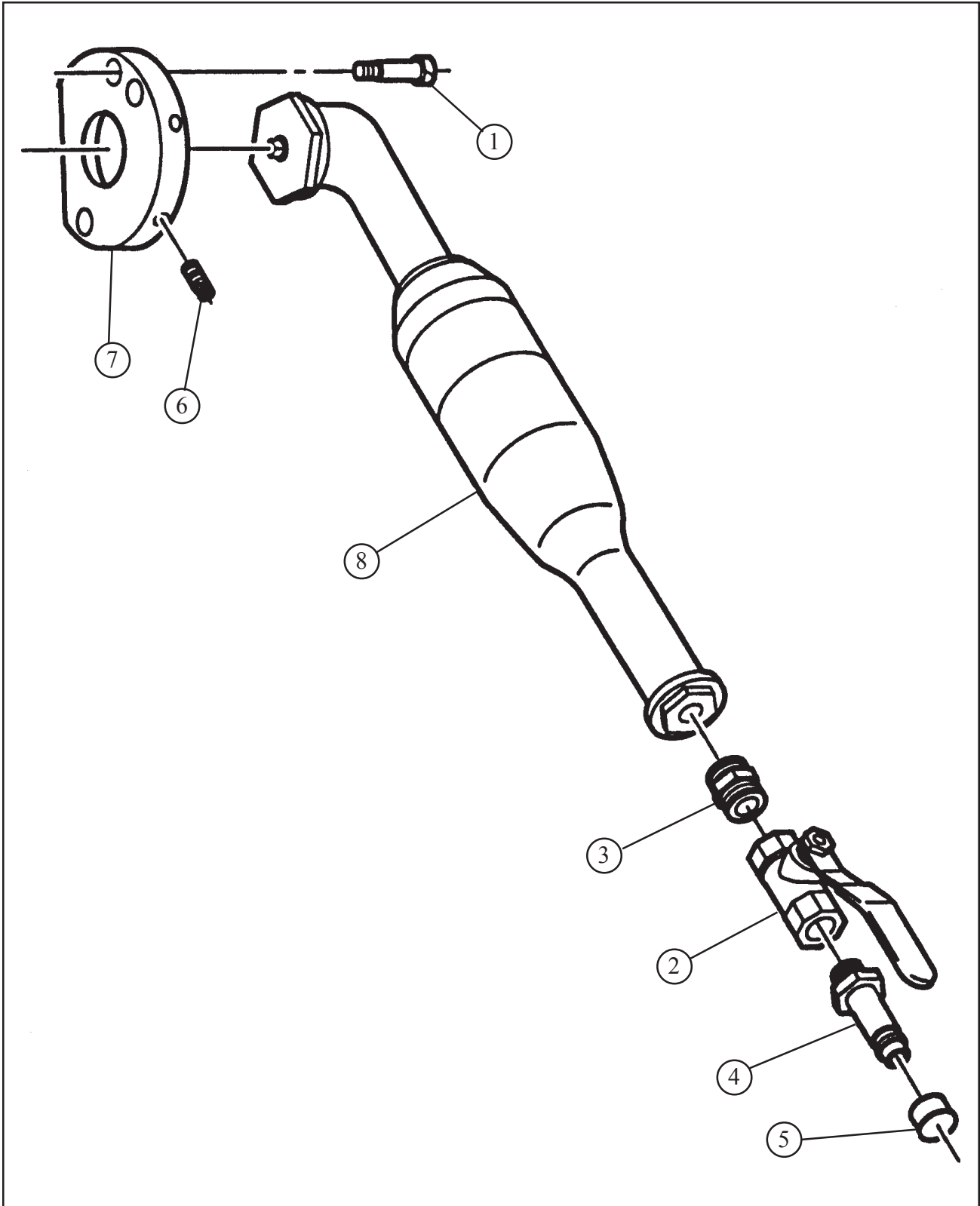
HOUSING, ASSY, DRIVE (P/N 19-0285)



Parts List, Housing Assy, Drive (P/N 19-0285)

Item No.	Part No.	Description	Qty
1.	19-0284	HOUSING, MAIN	1
2.	29-0065	BEARING, BALL	1
3.	30-0294	RING, RETAINING, EXTERNAL	1
4.	30-0411	RING, RETAINING, INTERNAL	1
5.	33-0048	SCREW, CAP, 1/4-20 X 2 1/2	4
6.	33-0288	SCREW, BUTTON HEAD, 1/4-20 X 7/8	4
7.	39-0277	GEAR, DRIVE	1
8.	43-0236	COVER	1
9.	45-0095	BUSHING, BRONZE	1

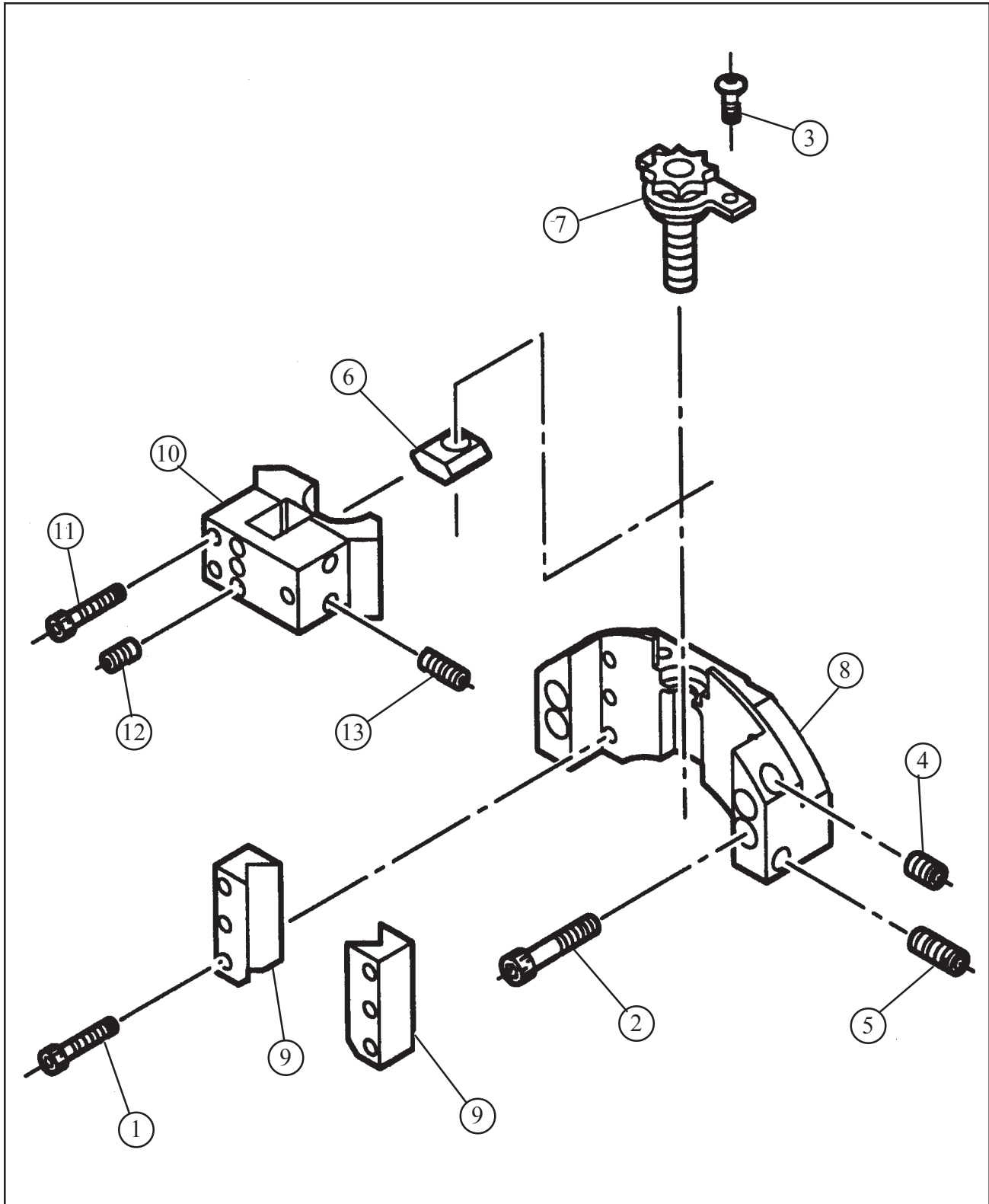
MOTOR ASSY, AIR (P/N 57-0083)



Parts List, Motor Assy, Air (P/N 57-0083)

Item No.	Part No.	Description	Qty
1.	33-0965	SCREW, SHOULDER	1
	53-0029	VALVE ASSY, FLOW CONTROL	REF
2.	53-0016	VALVE, FLOW CONTROL	1
3.	54-0050	NIPPLE, EXT PIPE TO EXT PIPE	1
4.	54-0126	COUPLING, MALE, QUICK DISCONNECT	1
5.	54-0201	CAP, PLASTIC	1
6.	33-0518	SCREW, SET, 5/16-18 X 3/4, CUP PT	3
7.	47-0243	BRACKET, TORQUE RESTRAINT	1
8.	57-0043	MOTOR, AIR	1

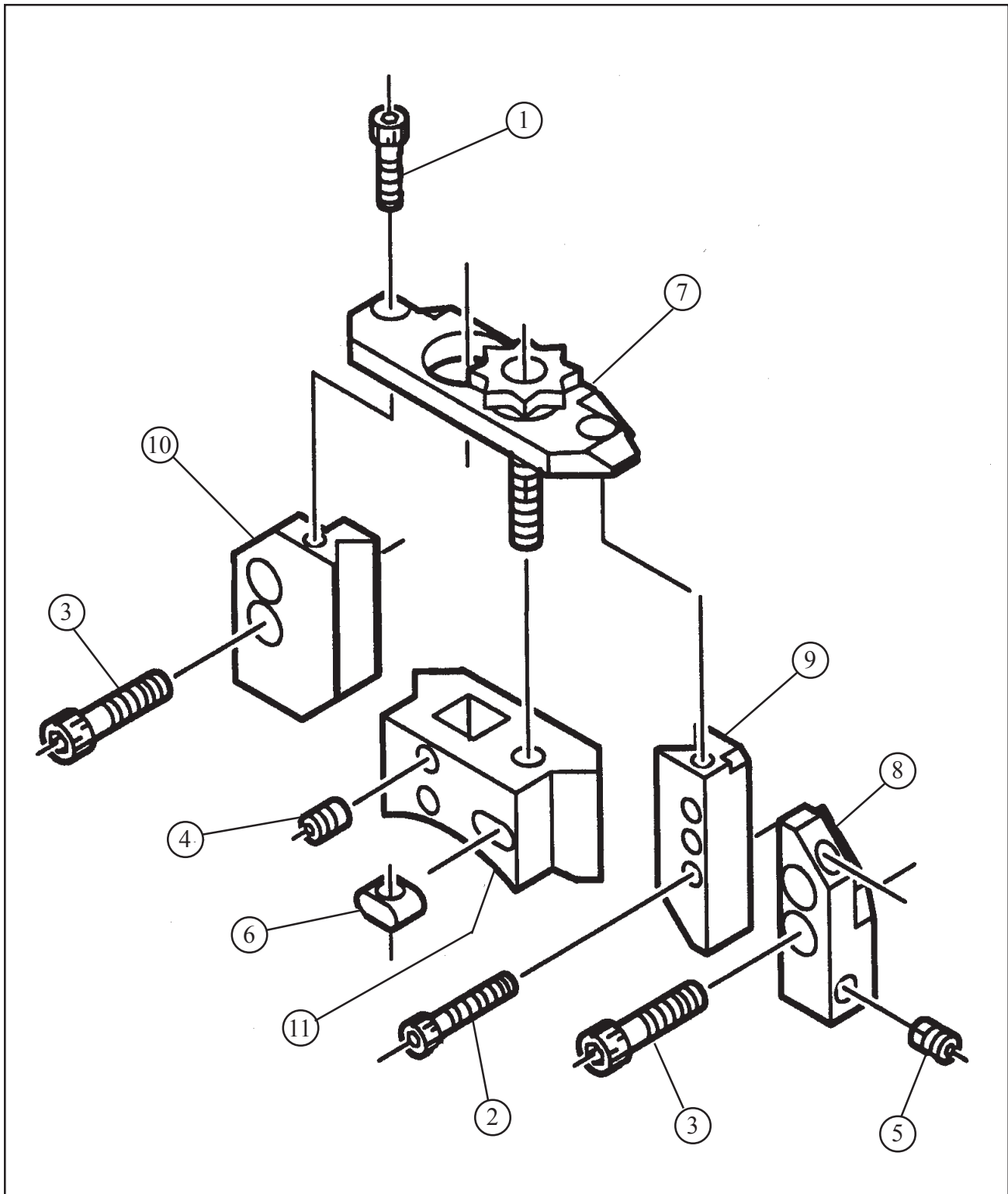
TOOL BLOCK, STANDARD (P/N 08-0036)



Parts List, Tool Block, Standard (P/N 08-0036)

Item No.	Part No.	Description	Qty
1.	33-0032	SCREW, CAP, #10-24 X 1"	6
2.	33-0043	SCREW, CAP, 1/4-20 X 1 1/4"	4
3.	33-0279	SCREW, BUTTON HEAD, #10-24 X 1/2"	2
4.	33-0639	SCREW, SET, 5/16-24 X 5/16" CUP PT	1
5.	33-0642	SCREW, SET, 5/16-24 X 1/2" CUP PT	1
6.	35-0176	NUT, FEED	1
7.	38-0052	SPROCKET ASSY	1
8.	47-0235	BRACKET	1
9.	48-0225	RAIL, SLIDE	2
10.	49-0020	HOLDER ASSY, TOOL	1
11.	33-0204	SCREW, CAP, #10-32 X 1"	3
12.	33-0500	SCREW, SET, 1/4-20 X 5/16" CUP PT	3
13.	33-0505	SCREW, SET, 1/4-20 X 3/4" CUP PT	2

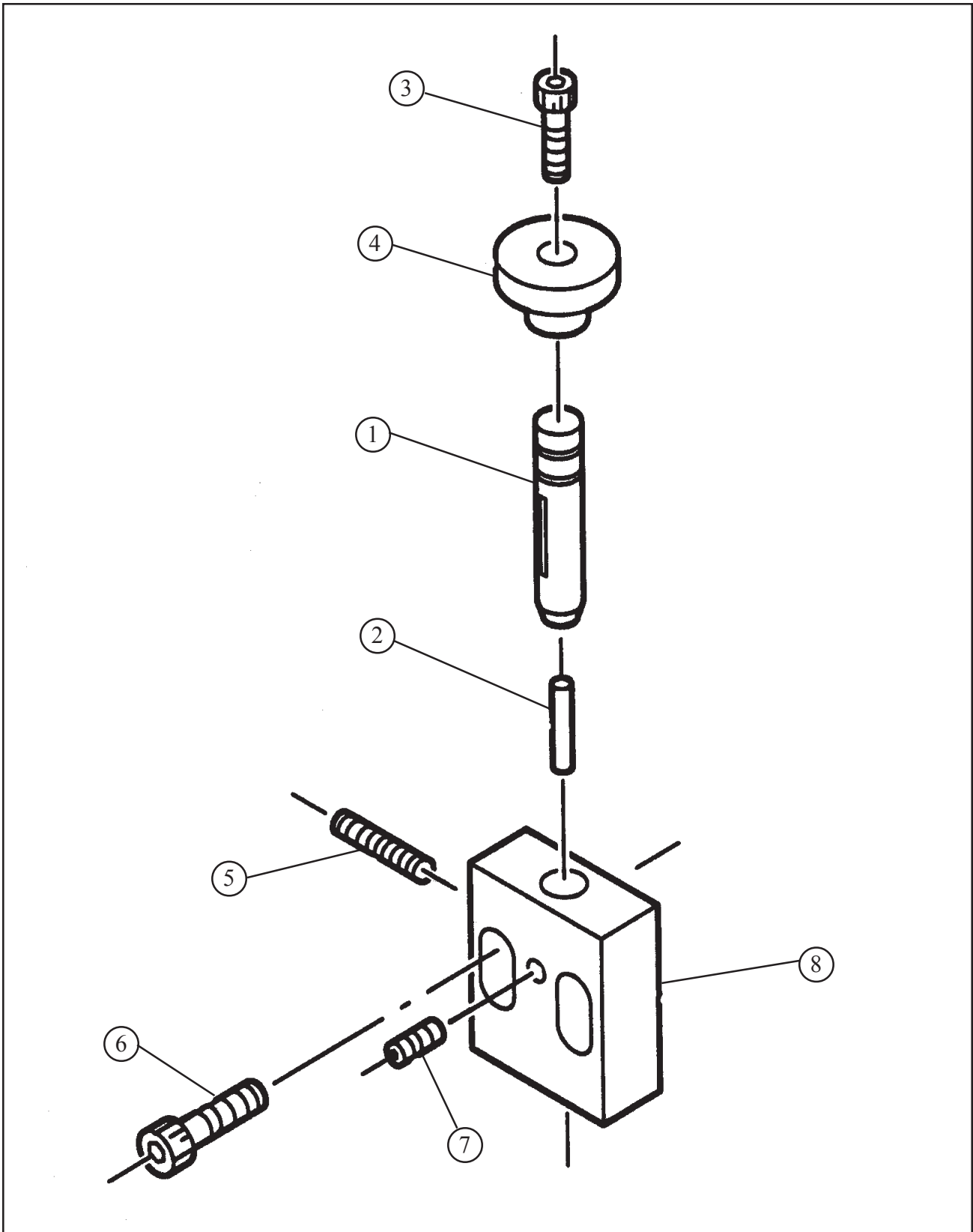
TOOL BLOCK, LOW PROFILE (P/N 08-0096)



Parts List, Tool Block, Low Profile (P/N 08-0096)

Item No.	Part No.	Description	Qty
1.	33-0027	SCREW, CAP, #10-24 X 3/8"	2
2.	33-0031	SCREW, CAP, #10-24 X 7/8"	2
3.	33-0040	SCREW, CAP, 1/4-20 X 3/4"	4
4.	33-0501	SCREW, SET, 1/4-20 X 3/8" CUP PT	2
5.	33-1377	SCREW, SET, 1/4-28 X 3/8" HDOG	2
6.	35-0149	NUT, FEED	1
7.	38-0058	SPROCKET ASSY	1
8.	48-0237	BLOCK, ADJUSTMENT	1
9.	48-0238	BLOCK, ADJUSTMENT SLIDE	1
10.	48-0239	BLOCK, FIXED SLIDE	1
11.	48-0240	BLOCK, TOOL MODULE	1

BLOCK, ASSY, TRIPPER (P/N 47-0301)



Parts List, Block Assy, Tripper (P/N 47-0301)

Item No.	Part No.	Description	Qty
	14-0011	SHAFT, ASSY	1
1.	20-0023	SHAFT, TRIPPER	1
2.	32-0084	PIN, DOWEL, 5/32 DIA X 3/16"	1
3.	33-0030	SCREW, CAP, #10-24 X 3/4"	1
4.	42-0023	KNOB, ROUND	1
5.	30-0125	PLUNGER, BALL	1
6.	33-0042	SCREW, CAP, 1/4-20 X 1"	2
7.	33-0954	SCREW, SET, #10-24 X 1/4" HDOG	1
8.	47-0250	BLOCK, TRIPPER	1

SPARE PARTS

Recommended Spares for the Model 602.5SBM Low Profile Clamshell

Item No.	Part No.	Description	Qty
1.	14-0011	SHAFT, ASSY	2
2.	32-0126	PIN, FEED SPROCKET	2
3.	33-0040	SCREW, CAP, 1/4-20 X 3/4"	8
4.	33-0043	SCREW, CAP, 1/4-20 X 1 1/4"	4
5.	33-0965	SCREW, SHOULDER	1
6.	38-0023	SPROCKET, FEED	2