

DI-ACRO
NO. 6 & NO. 8 POWER BENDER
INSTRUCTION MANUAL



DiAcro®
METAL FABRICATION EQUIPMENT

P: 651-342-1756 - www.diacro.com

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A. Introduction

This instruction manual serves two purposes:

1. It outlines essential information for installation, operation, and maintenance of the PLC controlled No. 6 and No. 8 Power Bender.
2. It gives a complete parts breakdown identified by number, should replacements be required.

It is recommended that the operator become familiar with the bender's instructions and operating details. It is also recommended that the foreman or supervisor familiarize himself with the operating details of the machine to insure its continued efficient service.

The Di-Acro Power Benders are designed to accommodate two different types of tooling.

The No. 6 Bender is designed to handle tubing to 1.125" diameter (.060" wall-mild steel) and mild steel round bars up to .563" diameter.

The No. 8 Bender will handle mild steel round bar up to 1" diameter and tubing to 1.500" diameter (.060" wall-mild steel)

B. Safety – Caution

Always read and understand this instruction manual before operating the No. 6 or No. 8 Bender.

Always make certain that other individuals are not in the working area of this machine before operating.

Always keep fingers, hands, arms, elbows, head, feet, or other parts of the body clear of swinging arm and out of tooling area when machine is in operation.

Always make certain power is off when installing, removing, or changing tooling.

Always make certain power is disconnected when servicing machine.

Never allow untrained personnel to operate this machine.



C. Specifications

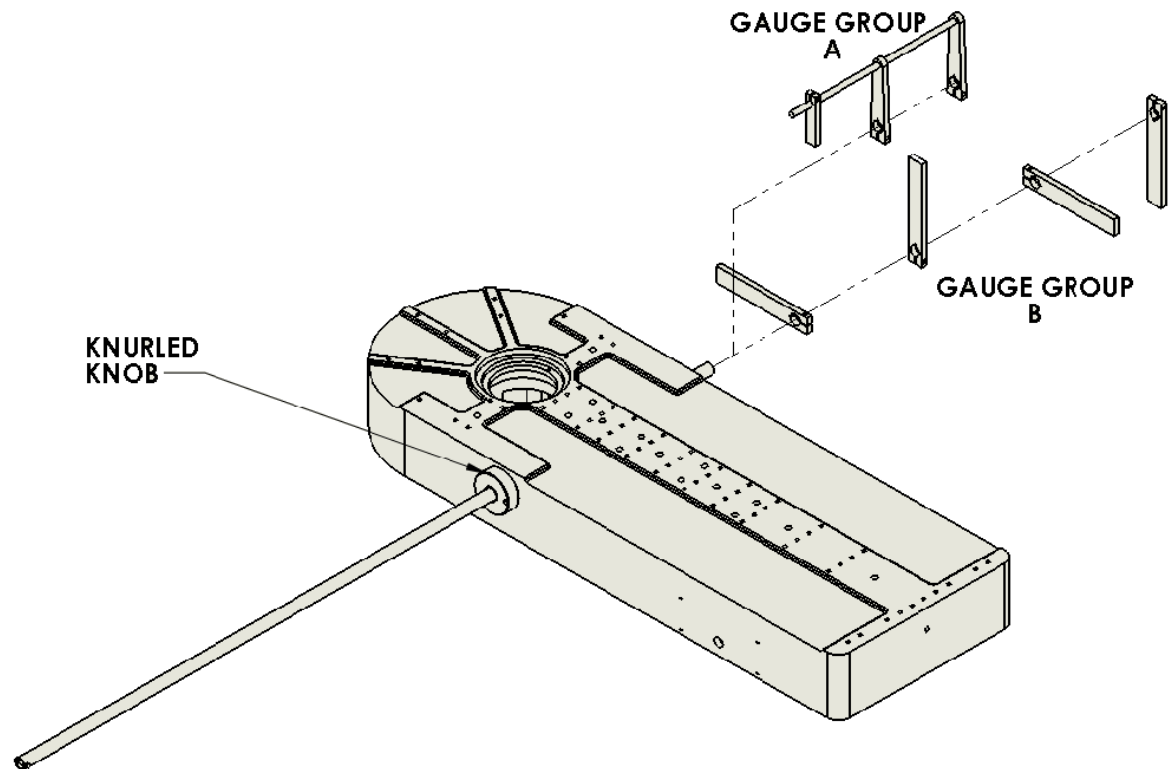
	NO. 6 TOOLING HEAD	NO. 8 TOOLING HEAD
CAPACITY (MATERIAL)*	1-1/4" OD TUBE - .060" WALL	1-1/2" OD TUBE - .060" WALL
	3/4" I.P.S.	1" I.P.S.
	5/8" DIA SOLID ROUND	1" DIA SOLID ROUND
	1/2" SOLID SQUARE	7/8" SOLID SQUARE
	1/4" X 2" FLAT (EASY WAY)	3/8" X 4" FLAT (EASY WAY)
	1/4" X 1" FLAT (HARD WAY)	3/8" X 1" FLAT (HARD WAY)
MAXIMUM RADIUS	9"	24"
HYDRAULIC PRESSURE	1250 PSI	1250 PSI
MOTOR	3 HP	3 HP
CYLINDER BORE	4"	4"
FLOOR SPACE	18" X 62"	18" X 62"
SHIPPING WEIGHT	1,150 LBS	1,150 LBS
SPINDLE TORQUE	3487 FT*LBS	3487 FT*LBS
VOLTAGE REQUIREMENTS	208, 230, OR 460 VAC, 3 PH, 60HZ	
*ALL MATERIAL (EXCEPT I.P.S.) IS SPECIFIED AS MILD STEEL (57 KSI YIELD STRENGTH) OR EQUIVALENT.		

D. Installation

During shipment, the bender may have accumulated a coating of dust or grit. Remove all dirt and rust preventative with cleaning solvent.

WARNING: To prevent serious bodily injury fasten machine to floor through four holes (5/8" diameter) provided in the base of the machine.

When shipped, the gauge is removed for packing purposes. Install one of the two gauge groups as shown below if desired.



Note: The Stop Rod Weldment is inserted through the table assembly from the Operator's Console side of the table. The appropriate Gauge Group is then installed onto this weldment from the opposite side. The "pin" through the Stop Rod Weldment will engage a slot in the hole of the knurled knob to allow the knob assembly to rotate the Gauge Group.

Note: Install gauge group "A" for short or single length bends. Install group "B" for longer or multiple length bends.

Note: It is suggested that all four stop arms be placed at right angles to each other even if only one or two are needed so that the knurled knob can be easily turned to position the stops. IF the

stop arms are not located as above, the group will be out of balance and may cause binding of the knurled knob.

Connect electricity to a three-phase input supply making certain that the transformer and motor are connected properly for power being supplied. (208-230, or 460 VAC).

Check pump rotation. Power up the machine. Start the hydraulics by rotating the emergency stop button clockwise, pressing the power on/reset button, and pressing the green start button on the operator console. Open the door in the base and make sure that the pressure gauge indicates a value around 1250 psi. If no pressure is indicated by the gauge, the motor is spinning the wrong direction. Stop the pump by pressing the red stop button on the operator's console and disconnect power. Swap two of the input power leads at the machine disconnect to change the motor direction.

Check the oil level in the sight glass on the tank in the base of the machine. If oil is required, use the oil detailed in the lubrication section of this manual.

E. Lubrication

If the oil level is low in the sight glass on the side of the hydraulic tank, fill with Shell Tellus S2 M 32 or equivalent. Under no circumstances is a detergent motor oil to be used.

Lubricate the Grease Fitting (No. 29 in the Table Assembly parts breakdown) on the Cam Follower (No. 29) every 500 hours or every 3 months. Use NLGI No 2 grease to lubricate this component.

Bare metal surfaces on the tooling and slides can be lubricated with Boeshield T-9, or an equivalent thin-film lubrication to prevent corrosion in high moisture environments. This can be applied as needed.

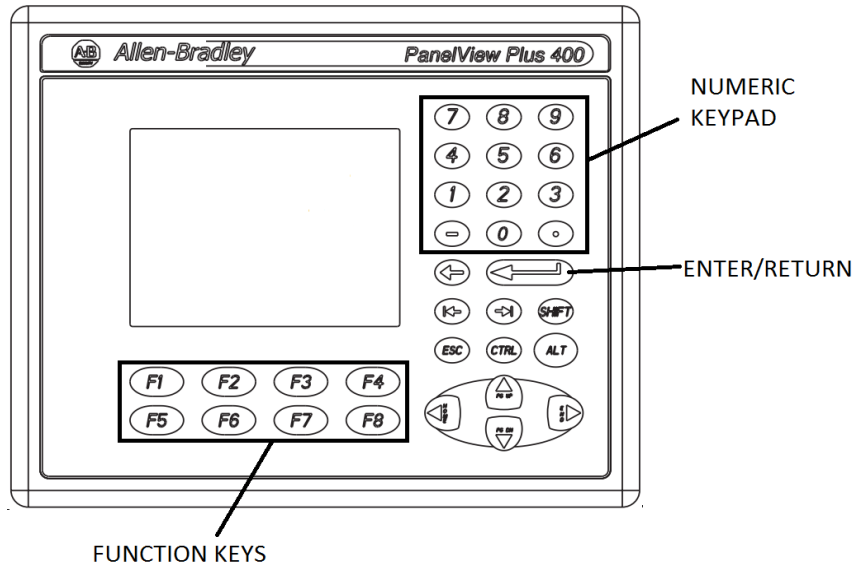
F. Control Description and Operation

1. Initial Power Up

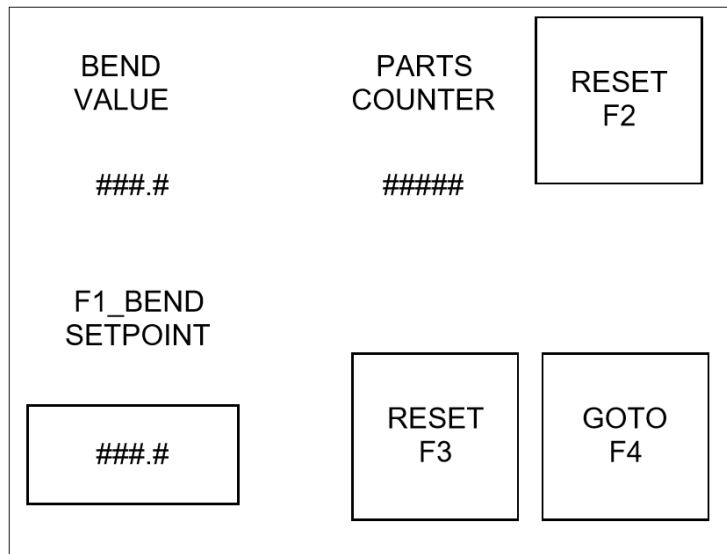
- After providing the proper power source to the main electrical enclosure, rotate the disconnect switch to the "on" position. This will provide power to the PLC and control panel.
- Rotate the Emergency Stop button on the control panel clockwise to deactivate.
- Press the "Power on/Reset" button.
- Press the "Start" button to start the hydraulic system. The "Stop" button will shut down the hydraulic system. NOTE: Stop the pump if the machine will be sitting for a long period. Allowing the pump to run idle can cause the hydraulic oil to heat up and require replacement.

2. HMI Screen Displays (Without Recipe Operation)

- The HMI panel layout is shown in the photo below. Make note of the Function Keys, Numeric Keypad, and Enter/Return key.



- Two screen options are provided with the standard power bender HMI. The Main Screen as shown below is used during production runs.



MAIN SCREEN DISPLAY

- This screen displays the Bend Setpoint, Bend Value, and Parts Counter.

- The “Manual/Homing” Screen is used to run the machine manually and to home the machine. This screen is shown below.

BEND VALUE		HOMING <input checked="" type="radio"/>	
###.#		HOMED <input checked="" type="radio"/>	
AUTO F1	EXTEND F2	HOME F3	RETURN F4

MANUAL/HOMING SCREEN DISPLAY

- This screen displays the Bend Value, and indicates whether the machine is Homing or Homed during the Homing procedure.
- On either screen, the Function Keys are used to perform whatever functions are displayed on the screen at the time, or toggle between different modes as displayed. This is covered in detail in the Homing, Manual, and Automatic Operation sections that follow.

3. Manual Operation

CAUTION: When operating the power bender in manual mode, it is possible to crash the tooling setup more readily than when it is set up in automatic mode. Make sure you are familiar with all the controls and the direction of travel prior to actuating the machine.

- When the machine is initially powered up, the Main Screen will be displayed. Press F4 to advance to the Manual/Homing Screen display.
- The Manual/Homing screen shows the Bend Value, Mode (Automatic or Manual), direction of travel (Extend or Retract), and Homing/Home State.
- The Function Keys will toggle the values shown above each function key descriptor in each box (F1, F2, etc.)
- The value displayed above F1 is what mode the bender is in. Use the F1 button to toggle between Auto and Manual
- The value displayed above F2 displays the direction of travel that the bender will move when it is actuated. Extend moves the tooling head counter-clockwise when viewed from above, and Retract moves the tooling head clockwise. Extend will also increase the bend value displayed, while Retract decreases the bend value.
- Note that neither the Home Position Proximity Switch nor the Bend Setpoint will stop the bender when in Manual Mode.

- Once the desired bend has been set up, place your fingers in the two-hand safety switches located on either side of the Operator's Console. Note that the machine will begin moving when your fingers enter these switches. It will not stop until your fingers are removed or the machine runs out of travel.
- When the desired travel has been reached, take your fingers off the safety switches. Press F2 to reverse the travel if desired. Actuate the safety switches to move the bender back to the point you started.

4. Homing the Bender

- When the machine is initially powered up, the Main Screen will be displayed. Press F4 to advance to the Manual/Homing Screen display.
- Once in the Manual/Homing Screen, note that the Homing and Homed indicator circles are initially unfilled. This is normal, and should be the case regardless of the Bend Value. This is because any time that the hydraulic system is powered down, the PLC unlatches the home position.
- Ensure that the Bend Value displayed is a positive number or zero. If the Bend Value displayed is a negative number, refer to the Manual Operation section and extend the bender until the Bend Value is zero or positive.
- Press F1 until Auto is displayed in the box above F1.
- Press F2 to put the machine in Retract Mode if it is in Extend Mode.
- Press F3 to begin the Homing Sequence. If the Bend Value is 0.0, the indicator circle next to Homing will briefly flash, then the circle next to Homed will be filled. If the Bend Value is not 0.0, the indicator circle next to Homing will be filled.
- Actuate the machine by putting your fingers into the safety switches on the sides of the operator console. The bender will then retract to 0.0, and the indicator circles will show that the machine has been homed.

NOTE: The machine will only retract during the Homing sequence. If you happen to begin this sequence from a negative Bend Value, and cannot move the machine in Manual Mode, you will need to shut off the hydraulic system. You may then restart the hydraulics and extend the machine in Manual Mode until the Bend Value is positive prior to attempting to home the machine.

5. Automatic Operation

NOTE: The machine will not operate in Automatic Mode without being homed. Follow the procedure outlined above for Homing the Bender to home the machine prior to Automatic Operation.

NOTE: Most ductile materials will exhibit some spring back when bending. Parts can be overbent to compensate for spring back. Spring back is determined by material type, part geometry, and even grain direction. Because of this, you will need to determine the amount of overbending required experimentally in manual mode. This will allow you to determine the exact bend set point for your specific application.

- The Automatic Mode of operation allows the operator to set a desired bend set point for the machine to repeat. To set up this mode of operation from the

Manual/Homing Screen, press F4 (Return). This will toggle the HMI display back to the Main Screen.

- In the Main Screen, press F1 to enter the Bend Set Point. The Bend Set Point value should be highlighted on the HMI. Use the numeric keypad to enter the desired Bend Set Point. Save the Bend Set Point by pressing Enter/Return.
- Press F1 to exit the Bend Set Point mode.
- If desired, the production counter can be reset in this screen by pressing F2.
- Activate the bender by actuating the two-hand safety switches on the sides of the operator console. The bender will then extend until the safety switches are not actuated or the bend set point is reached, whichever comes first.
- Once the bend set point is reached, remove your hands from the switches.
- To retract the machine, return your hands to the safety switches. The Bender will automatically change directions and retract home so long as the switches are actuated.

NOTE: During Automatic Operation, the bender extends to the Bend Set Point. Once it reaches the set point, the PLC switches to Homing mode internally, and will re-home upon retraction. The machine is coded this way to combat any drift introduced by delays in the mechanical or hydraulic system.

6. Recipe Operation (If Installed)

- The optional Recipe Operation function allows the user to save recipes of up to 4 consecutive bends in a recipe that may be recalled when needed for production. Up to 75 unique recipes can be saved in the internal memory.

HMI Screen Displays

- The Manual/Homing Screen Display is unchanged from the screen shown above. Homing and manual operation is also the same as listed above.
- The Main Screen is shown below.

BEND ### SETPOINT		PRODUCTION COUNTER #####
###.# DEG		
###.# BEND POSITION		
GOTO RECIPE F1	RESET PROD. COUNTER F3	GOTO MANUAL F4

MAIN SCREEN DISPLAY - RECIPE OPTION

- For Automatic operation with the recipe option, a recipe must be programmed and selected. Press F1 to advance to the recipe screen.
- The Recipe Setup Screen Display is shown below.

BEND 1 F5	BEND 2 F6	BEND 3 F7	BEND 4 F8
###.#	###.#	###.#	###.#
RECIPE NUMBER F1			
##	SAVE RECIPE F3	RETURN TO MAIN F4	

RECIPE SETUP SCREEN - RECIPE OPTION

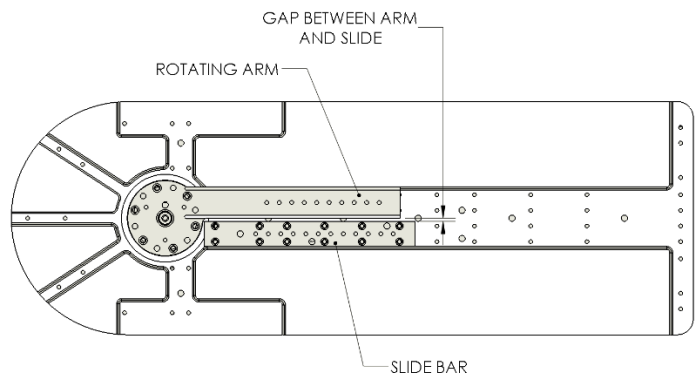
- When this screen is displayed, recipes can be programmed and selected. Press F1 to bring up the recipe selection popup. Use the numeric keypad to enter the desired recipe (1 to 75 are available for use), and press Enter/Return to close the popup. The recipe number should be displayed in the box under Recipe Number on the display.
- To Program bends, press the function key (F5-F8) for the corresponding bend value to program that value. When one of these function keys is

pressed, a popup will be displayed to enter the value. Use the numeric keypad to enter the desired value. Press Return/Enter to save this value.

- If less than four bends are desired, leave the bends that are not desired set to zero.
- Once the desired bend angles have been programmed, press F3 to save the recipe.
- Press F4 to return to the Main Screen. Production runs are performed from this screen.
- Recipe operation is similar to Automatic Operation. When the bender is activated, it will advance to the first bend set point, or until the safety switches are released. Once the bend set point has been reached, the bender will stop until the safety switches are released, then retract once the safety switches are re-actuated.
- After the first bend, re-set the part and tooling to perform bend two, if a second bend is desired. The bender will automatically advance to the next programmed bend, if bend two has a nonzero value programmed. Repeat this step for all of the programmed bends.
- Once the bender has performed the last non-zero bend in the program, the production counter will increase by one and the bend value will display the programmed bend angle for bend one.

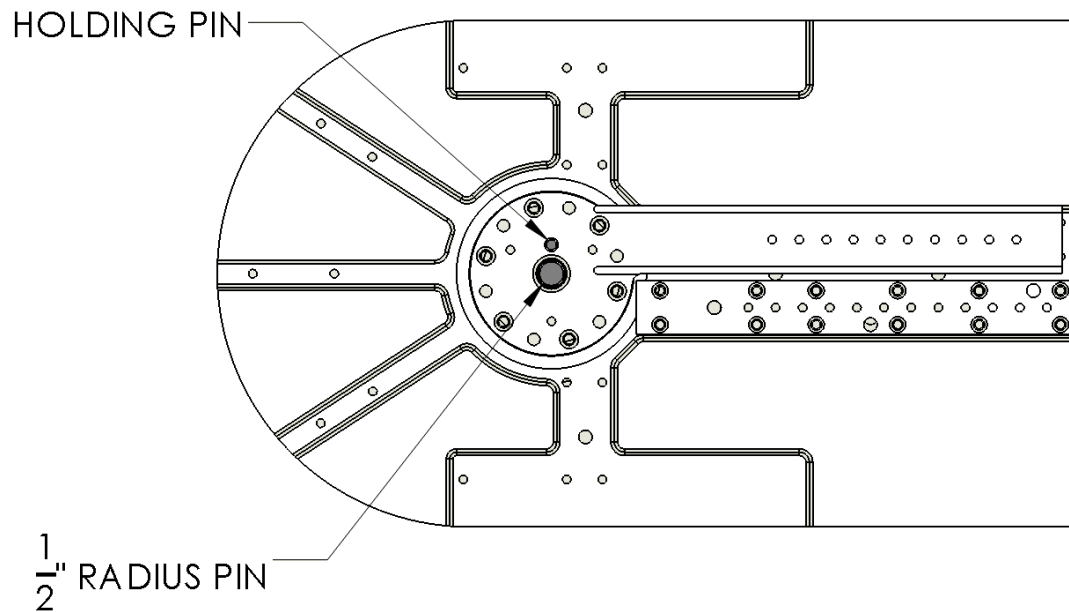
G. No. 6 Bender Set-up and Run

1. Turn power on. Make sure rack assembly is fully retracted into the cylinder. If you ordered the machine complete with the No. 6 tooling assembly, the machine was set up at the factory for this position to be aligned properly for this tooling assembly.
2. Turn power off. Set Rotating arm on top of the Table per the diagram below.

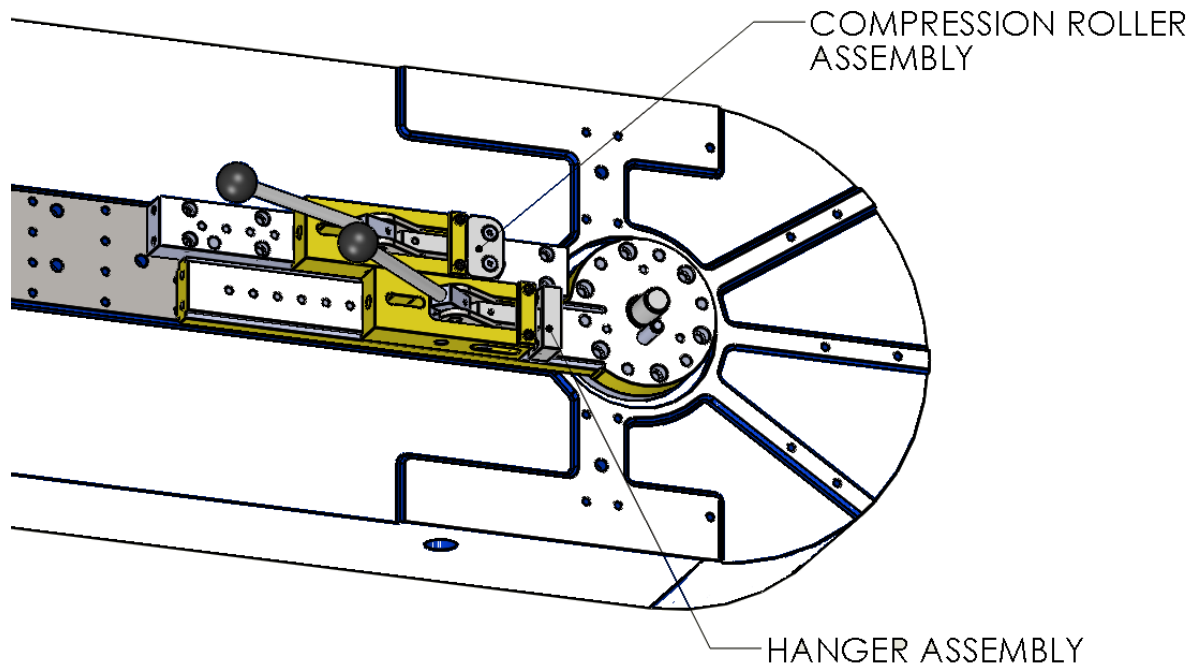


3. Place the slide onto the table adjacent to the rotating arm as shown. Insert the 3/8" socket head cap screws into the slide and loosely thread into the table top.
4. Insert the three 1/2" dowel pins (provided) into the 1/2" holes in the slide and tap down until they are flush with the top of the slide. Tighten the cap screws in the slide at this time.

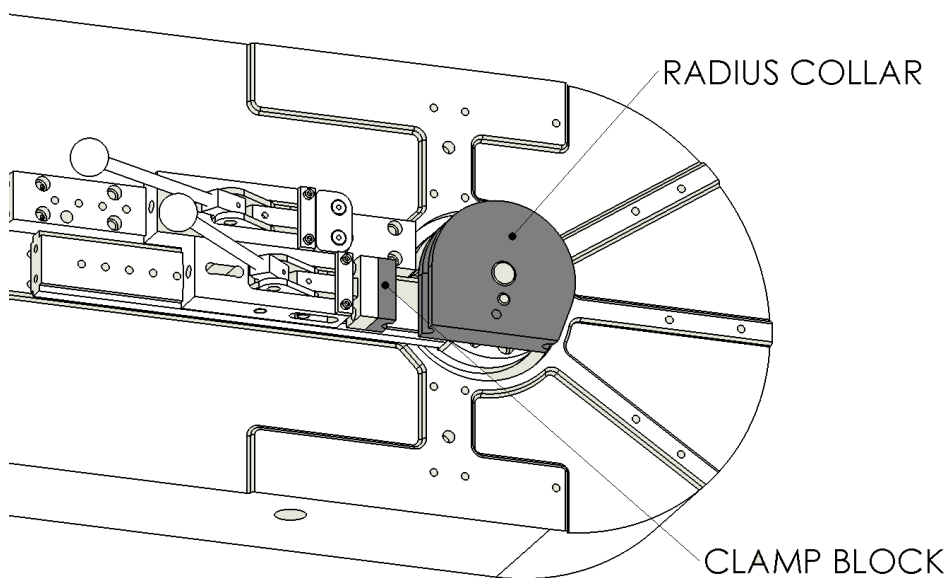
5. Position the rotating arm on top of the pinion so that it is near parallel with the slide. The gap between the slide and arm should be close to even for the entire length of the slide.
6. Turn the power on and follow the manual operation instructions to rotate the pinion assembly so that the tapped holes in the pinion align with the clearance holes in the rotating arm in this position. Turn the power off to continue.
7. Insert and tighten the six 7/16" socket head cap screws (provided) through the rotating arm into the threaded holes in the pinion assembly.
8. Insert the holding pin and 1/2" radius pin into the proper holes per the diagram below.



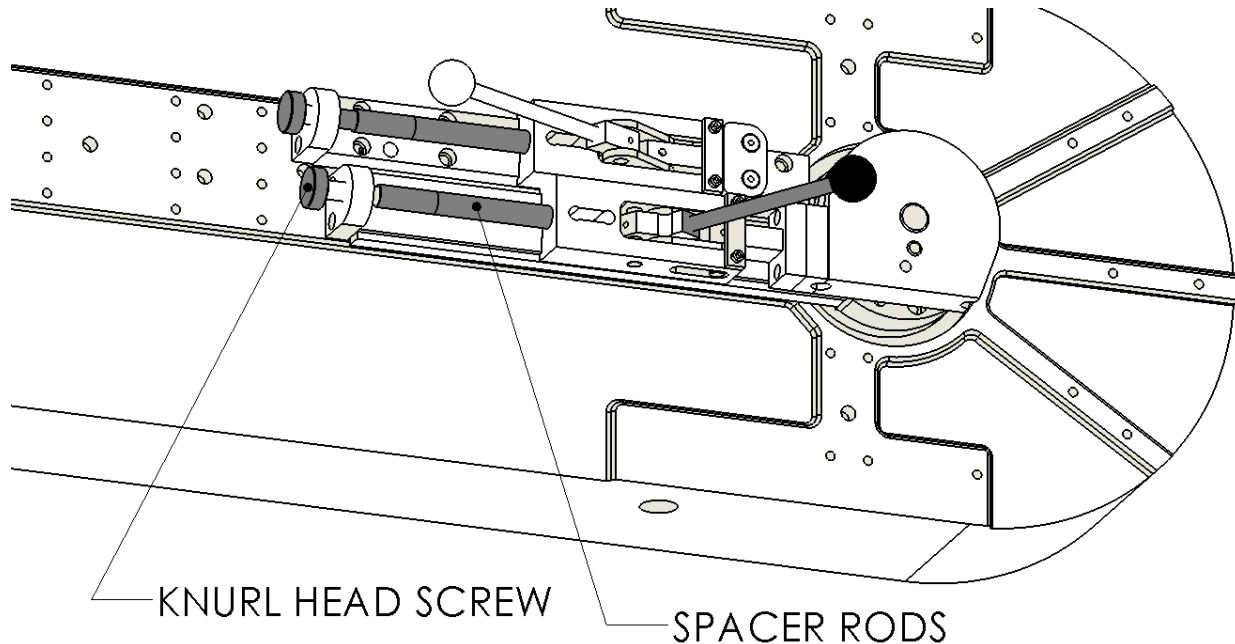
9. Set the Quik-Lok Hanger Assembly onto the rotating arm and the Quik-Lok Compression Roller Assembly onto the Slide as Shown Below.



10. Install the proper bending collar and clamp block as shown. Bolt the clamp block to the Quik-Lok hanger assembly using socket head cap screws.



11. Adjust the Quik-Lok hanger that controls the clamp block.
 - a. Advance the Quik-Lok hanger handle toward the radius collar so that it is in the position closest to the radius collar.
 - b. Slide the hanger forward so that the clamp block touches the radius collar.
 - c. Insert spacer rods in between the hanger and knurl head screw to hold the hanger in this position, shown below. Spacer rods should be removed or added depending on the bend radius. Some experimentation may be needed to determine the proper number and type of spacer rods used.
 - d. Insert and tighten bolts to bolt the hanger down to the rotating arm.



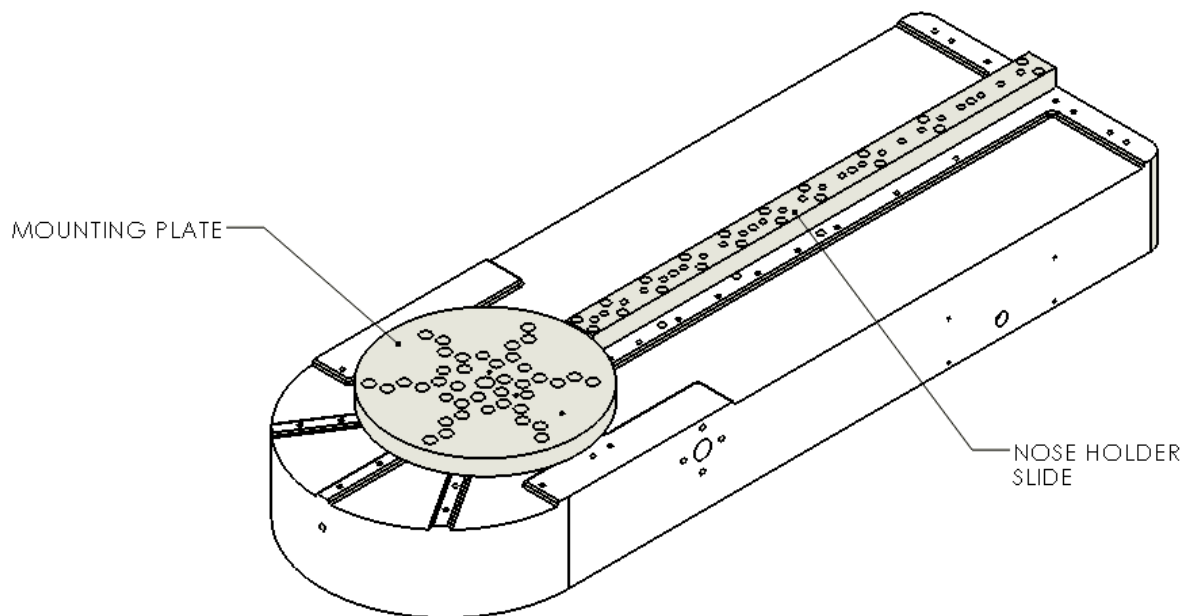
- e. Pull the handle back and insert a piece of desired bend material in between the clamp block and radius collar. Move the handle forward to make sure that the material is clamped tightly into place. If adjustment is needed, loosen the hanger bolt and make fine adjustments via the knurl head screw. The Quik-Lok should lock into place when the material to be bent is clamped tightly.
12. Adjust the Compression Roller Assembly per above, using the proper follow bar in lieu of the clamp block. It may be easier to have material clamped in place to bend during this adjustment since the follow bar does not bolt to the compression rollers.
13. Power up the machine and perform test bends in Manual mode until the desired bend is achieved. Once the desired bend has been determined, use the Bend Value number to program the machine in Automatic Mode to duplicate this bend. Please reference the Operation section of this manual for instructions on the operation of manual and automatic modes.

NOTE: The No. 6 Bender tooling and PLC is designed to run in the counter-clockwise direction. However, it is possible to set up the machine to perform clockwise bends. If you have a need to run the bender in this manner, please contact Di-Acro for further instruction.

H. No. 8 Bender Set-up and Run

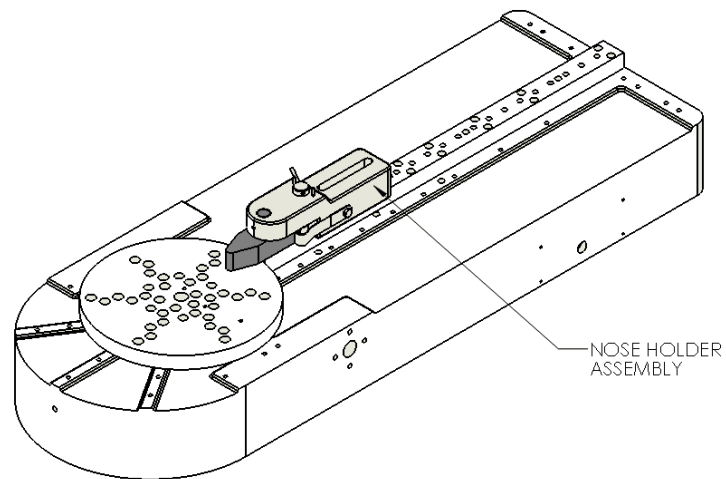
NOTE: This procedure details the setup of this tooling for bending in the counter-clockwise direction. The tooling and PLC package is designed to run in this direction. If clockwise bending is desired, please contact Di-Acro for assistance.

1. When you receive your machine, verify that all parts for this tooling head have been included. Refer to the parts breakdown on pages 20 and 21 for a list of these components.
2. Turn power on. Make sure that the rack assembly is retracted fully into the cylinder by retracting the machine until it stops in manual mode. See the operation section of this manual for instructions on operating the machine.
3. Place Mounting Plate and Nose Holder Slide into position on top of the machine as shown below. The Mounting plate is centered on the Pinion Assembly by a small Spacer located on top of the pinion. The Nose Holder Slide should be lined up with the holes in the table.

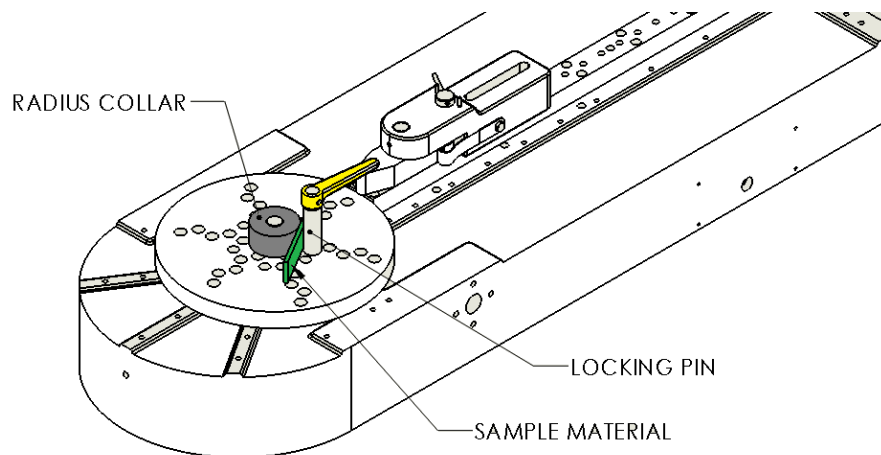


4. Locate 3/8-16NC x 1-1/2" socket head cap screws (20), and loosely thread them into the table through the holes in the nose holder slide.
5. Insert the five 1/2" DIA x 1-3/4" long dowel pins through the slide into the table through the slide. Tap them down so that they are flush with the top of the slide. Tighten the socket head cap screws.

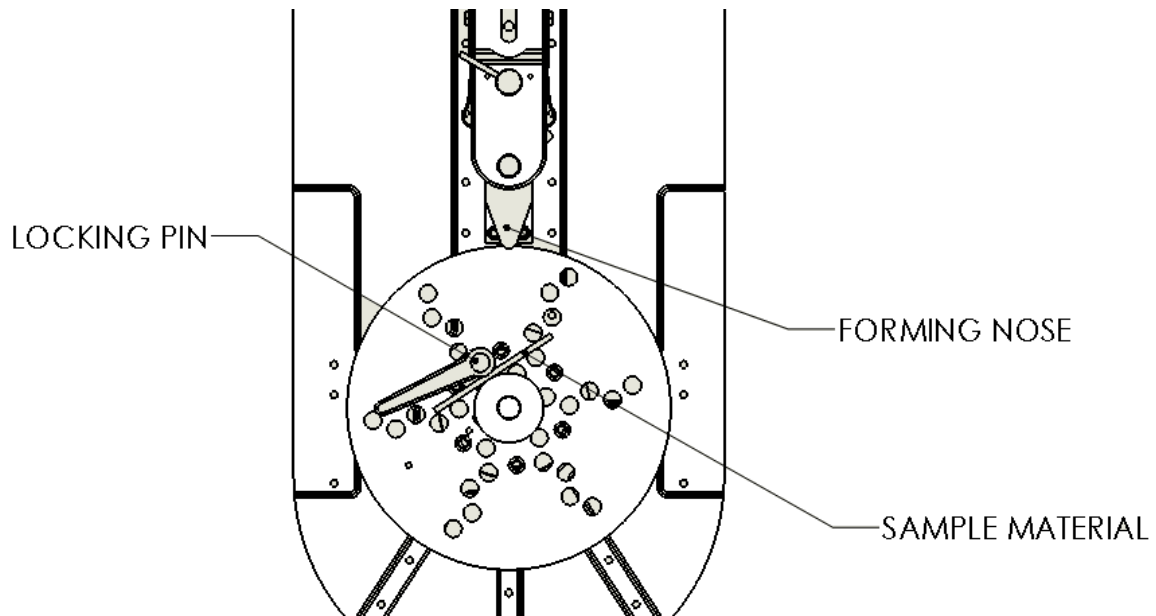
6. Place the nose holder assembly on the slide as shown. Do not bolt down at this time.



7. Insert desired radius pin into center hole on mounting plate. If a radius collar is desired, insert a $\frac{1}{2}$ " radius pin into this hole, then slip the radius collar over it.
8. To complete setup, you will need a piece of the desired bend material to properly locate the locking pin and forming nose assembly. Place the material against the radius collar in the desired bend orientation. Locate the hole in the mounting plate that allows a locking pin, when rotated counter-clockwise, to lock tightly against the material, holding it against the radius collar. An example of this is shown below.



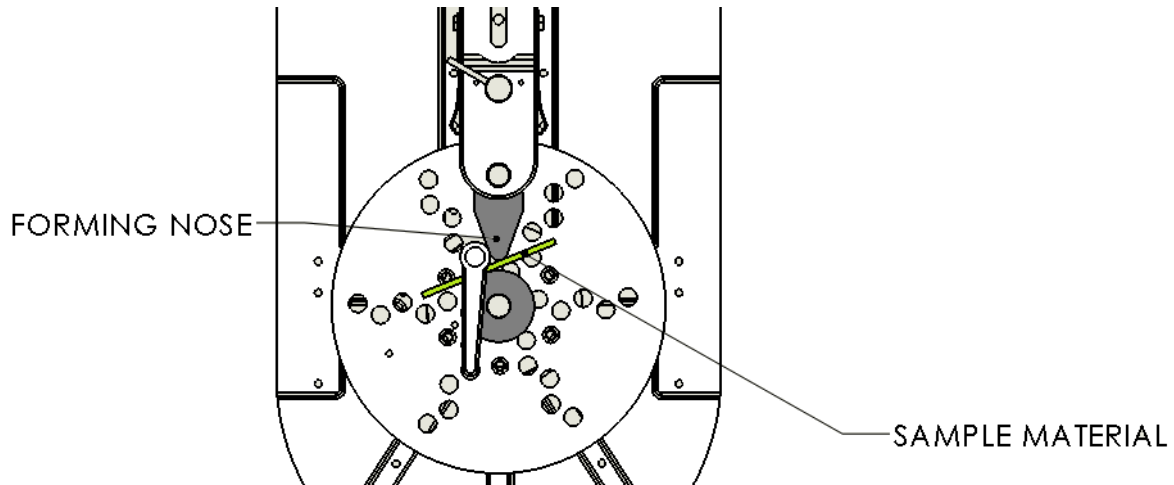
9. The mounting plate should now be rotated so that the locking pin will move away from the forming nose assembly when the mounting plate moves counter-clockwise, in a position similar to the diagram below.



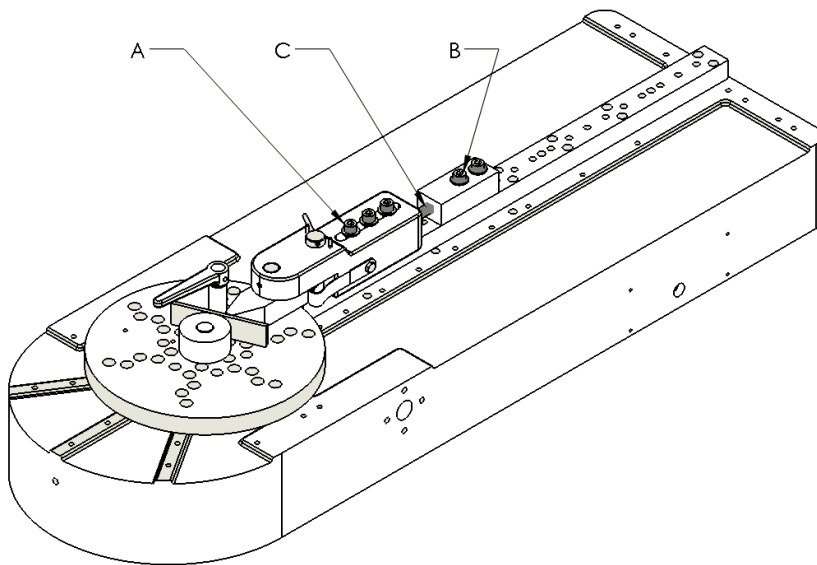
10. Once the mounting plate is rotated to the proper position, power up the machine and rotate the spur pinion so that the threaded holes in it align with the counterbored holes in the mounting plate. Use manual mode to move the machine, noting that Extend will move the pinion counter-clockwise, and Retract clockwise. Once the holes are aligned, insert the six 7/16-14 socket head cap screws into the holes and tighten to lock the mounting plate to the spur pinion assembly.
11. Rotate the locking pin counter-clockwise and lock the material against the radius collar.

12. Adjust the nose holder assembly.

- a. Push the nose holder assembly so that the nose holder touches the sample material, as shown below.



- b. Place the Nose Holder Support onto the Slide behind the Nose Holder Assembly so that the Nose Holder Support Screw is facing the Nose Holder Assembly. Align the bolt holes with threaded holes in the slide so that the support screw can be extended to push the nose holder assembly toward the work piece.

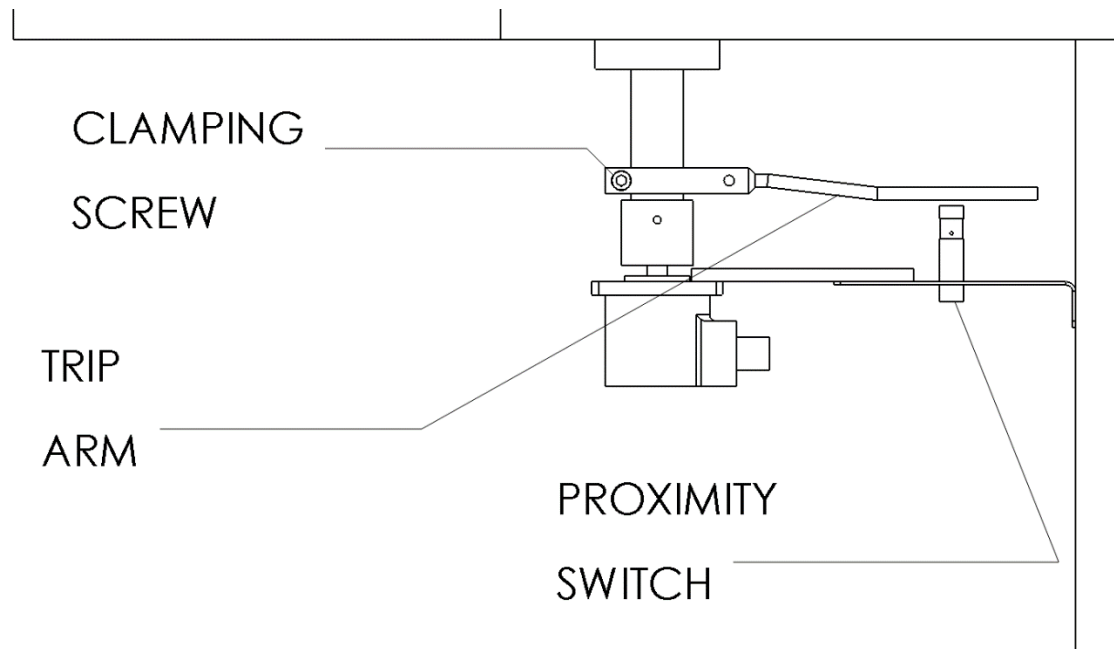


- c. Tighten bolts "B" securely.
 - d. Finger tighten bolts "A"
 - e. Adjust Nose Holder Support Screw "C" until nose comes in contact with work piece.
 - f. Tighten bolts "A" securely.
13. Follow Manual Operation instructions to test bend a part.

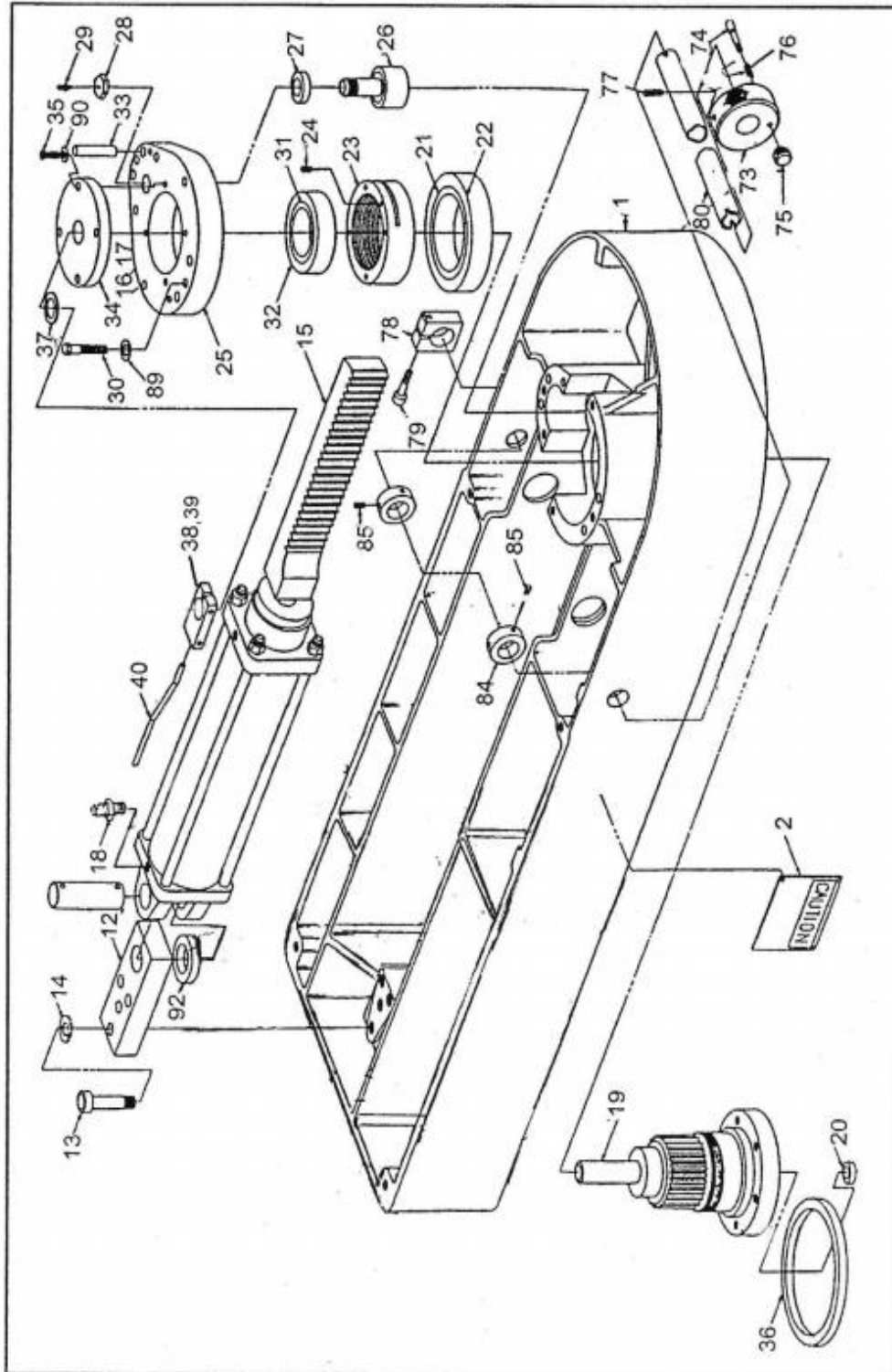
I. Changing the Home Position.

On some setups, it may be necessary to change the home position of the bender. This is simple to do if you follow the procedure below:

1. Without tooling on the tooling head setup, retract the bender all the way in Manual mode.
2. Place the tooling, locking pin, and test material onto the tooling head.
3. If the tooling is 60 degrees or more out of alignment with the forming nose, rotate the tooling head to get closer to the proper alignment.
4. Extend the bender in manual mode until the tooling is aligned with the forming nose.
5. Loosen the clamping screw that clamps the trip clamp to the bottom of the spur pinion assembly under the table. Rotate the trip clamp on the pinion assembly so that the trip arm illuminates the LEDs on the proximity switch.
6. Tighten the socket head cap screw to lock the assembly in this position.
7. Home the machine per the instructions in the Operation section of this manual (page 9).



J. Table Assembly



POWER BENDER – TABLE ASSEMBLY PARTS LIST**ASSEMBLY #: 8700000-060**

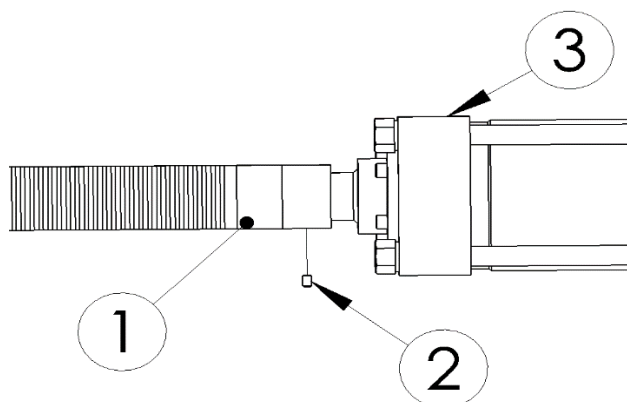
ITEM	PART NUMBER	DESCRIPTION	QUANTITIY
1	8150110-505	TABLE	1
2	8156650-300	DANGER SIGN	1
12	8991111-000	CYLINDER MOUNT	1
13	20A0508C2104	5/8-11 X 2-1/4 SHCS	4
14	62X0508	5/8" LOCK WASHER	4
15	8150371-170	CYLINDER ASSEMBLY (SEE SECTION K)	1
16	0120646-000	SHIM	2
19	8150390-108	PINION ASSEMBLY	1
	8150390-109	SPUR PINION	1
	8150121-109	PINION SHAFT	1
20	8150120-308	LOCATING BUSHING	1
21	8310301-100	CONE	1
22	8310100-400	CUP	1
23	8150470-509	LOCKING RING	1
24	23A0104C0308	¼-20 X 3/8 SSS	1
25	8000110-608	GEAR CASE COVER	1
26	8310301-100	CAM FOLLOWER	1
27	8150110-808	CAM FOLLOWER SPACER	1
28	8150470-400	NUT	1
29	8690110-200	DRIVE FITTING	1
30	21A0308C2000	3/8-16 X 2 HHCS	6
31	8310100-100	CONE	1
32	8310100-200	CUP	1
33	19A0102X2104	½ X 2-1/4 DOWEL PIN	4
34	8150111-008	TAKE-UP CAP	1
35	20B0516C0708	5/16-18 X 7/8 BHSCS	4
36	8371005-600	OIL SEAL	1
38	8200130-108	TRIP CLAMP	1
39	20A0104C1104	¼-20 X 1-1/4 SHCS	1
40	8000130-108	TRIP ARM	1
*	23A0104C0304	¼-20 X ¾ SHCS	1
73	8150120-805	INDEX KNOB	1
74	8151120-307	PIN	1
75	8200120-307	KNOB	1
76	8151510-206	SPRING	1
77	23A0104C1000	¼-20 X 1 SSS	2
78	8150130-400	CLAMP	1
79	20A0516C1102	5/16-18 X 1-1/2 SHCS	1
80	8151142-007	STOP ROD SUPPORT	1

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
84	8300142-007	MATERIAL STOP ROD SUPPORT	2
85	23A0516C0104	5/16-18 X ¼ SSS	4
89	62X0308	3/8 LOCK WASHER	6
90	62X0516	5/16 LOCK WASHER	4
92	8150110-800	SPACER	2
*	8150740-101	PROXIMITY SWITCH MOUNT	1
*	8150740-102	ENCODER FLEX PLATE	1
*	8150740-103	ENCODER ADAPTER	1
*	23A0X10C0104	10-24 X ¼ SSS	2
*	23A0X10C0102	10-24 X ½ SSS	1
*	20A0X08C0304	8-32 X ¾ SHCS	6
*	31X0X08C	8-32 JAM NUT	6
*	61X0X10	#10 FLAT WASHER	10
*	62X0X10	#10 LOCK WASHER	6
*	62X0104	¼ LOCK WASHER	4
*	21A0104C0708	¼-20 X 7/8 HHCS	4

PARTS SHOWN WITH () IN ITEM COLUMN ARE NOT SHOWN ON ASSEMBLY DRAWING

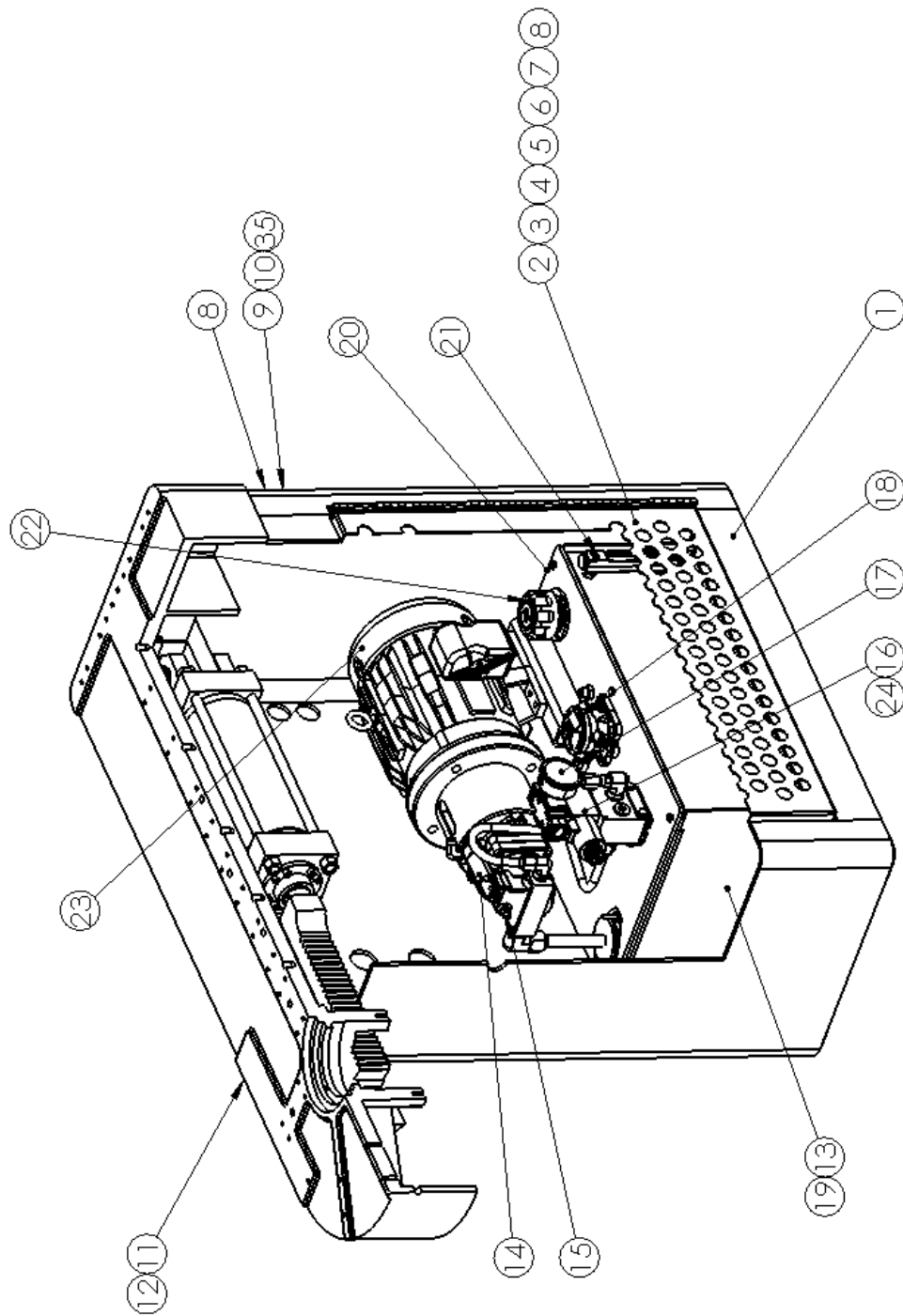
K. 4" Cylinder Assembly

As of April 2011, the new style Rack (P/N 8150122-607) was threaded onto the cylinder piston shaft and locked with a jam nut. Beginning December 2012, a ¼-20 set screw was used to lock the thread, as shown.



ITEM	PART NUMBER	DESCRIPTION	QTY
1	8150122-607	RACK	1
2	23A0104C0308	¼-20 X 3/8 SSS	1
3	8150372-100	CYLINDER	1

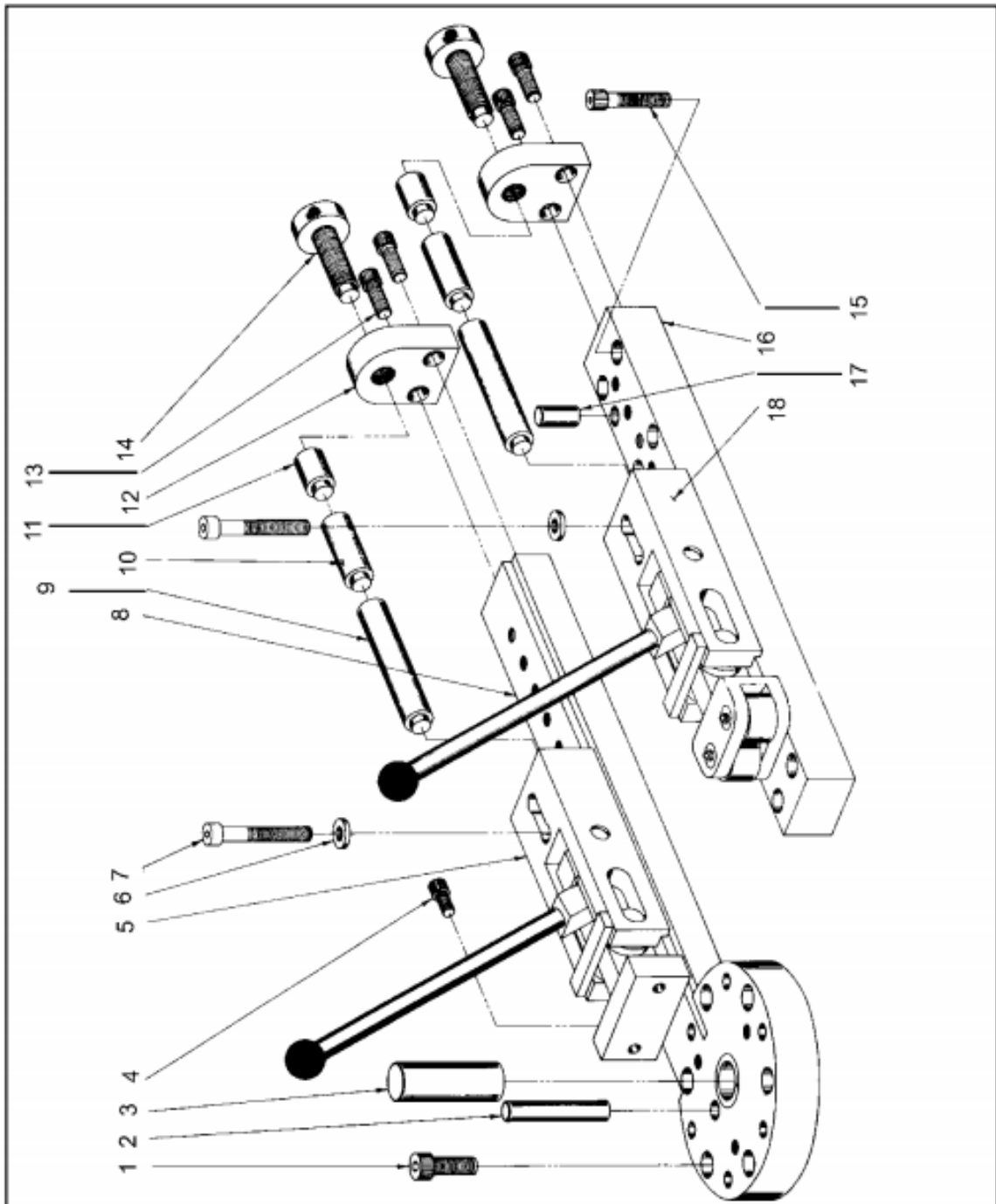
L. Base Assembly



POWER BENDER – BASE ASSEMBLY PARTS LIST
ASSEMBLY # 121871-000

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	121871-100	BASE – SUB ASSEMBLY	1
2	121871-200	DOOR ASSEMBLY	1
3	8150720-108	DOOR	1
4	8150720-109	HINGE	1
5	8033343-000	LATCH	1
6	20A0104C0304	¼-20 X ¾ SHCS	5
7	62X0104	¼ LOCK WASHER	5
8	30X0104C	¼-20 FULL NUT	5
9	21A0308C0304	3/8-16 X ¾ HHCS	4
10	62X0308	3/8 LOCK WASHER	4
11	20A0102X1104	½-13 X 1-1/4 SHCS	4
12	62X0102	½ LOCK WASHER	4
13	1000307-000	HYDRAULIC POWER SUPPLY	1
14	8150730-103	HYDRAULIC PUMP	1
15	8150730-104	PRESSURE ADJUSTMENT	1
16	8150730-106	DIRECTIONAL VALVE	1
17	8150730-107	PRESSURE GAUGE	1
18	8150730-108	RETURN FILTER	1
19	8150730-109	RESERVOIR	1
20	8150730-110	DRAIN PLUG	1
21	8150730-111	SIGHT LEVEL/TEMP GAUGE	1
22	8150730-112	FILLER / BREATHER CAP	1
23	8150730-113	MOTOR	1
24	8150730-115	PO CHECK VALVE	1
25*	130-0221-P	HYDRAULIC HOSE	8 FEET
26*	130-0213-P	90 DEG. MALE ELBOW	2
27*	130-0214-P	SWIVEL FITTING	4
28*	8150730-114	BUSHING	2
29*	20A0102C1304	½-13 X 1-3/4 SHCS	4
30*	62X0102	½ LOCK WASHER	4
31*	61X0102	½ FLAT WASHER	4
32*	30X0102C	½-13 FULL NUT	4
33*	8150750-101	TAMPER PROOF LOCK	1
34*	100-0135-P	NAMEPLATE	1
ITEMS MARKED WITH AN ASTERISK (*) ARE NOT SHOWN			

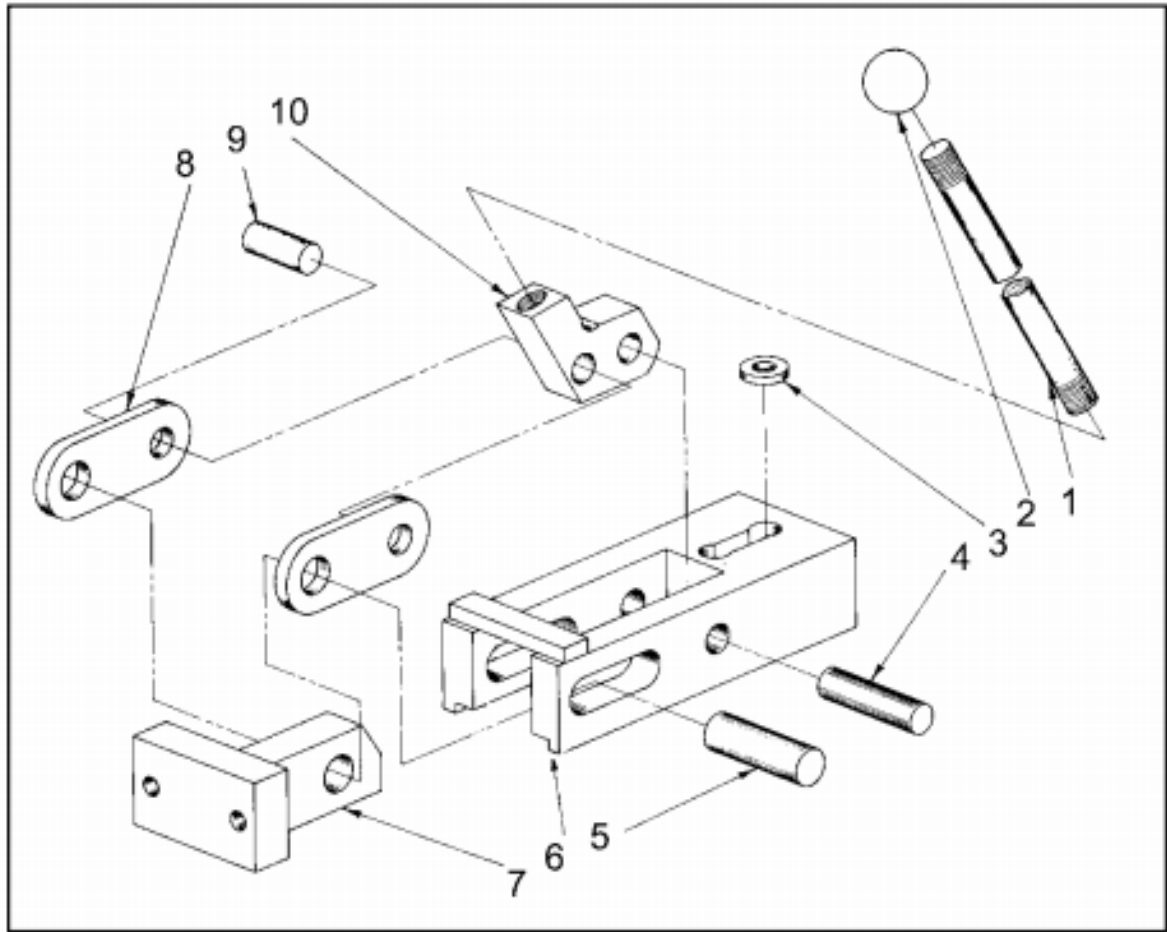
M. No. 6 Tooling Head Assembly



NO. 6 TOOLING HEAD ASSEMBLY – PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	20A0716C1104	7/16-14 X 1-1/4 SHCS	6
2	8156120-302	HOLDING PIN	1
3	8130016-970	RADIUS PIN	1
4	20A0516C0508	5/16-18 X 5/8 SHCS	2
5	8156111-371	HANGER ASSEMBLY	1
6	0308WILLIAMS WASHER	3/8 WILLIAMS WASHER	4
7	20A0308C2102	3/8-16 X 2-1/2 SHCS	4
8	8200111-371	ROTATING ARM ASSEMBLY	1
9	8400111-301	SPACER ROD C – 4"	2
10	8300111-301	SPACER ROD B – 2"	2
11	8156111-301	SPACER ROD A – 1"	2
12	8700111-301	SCREW SUPPORT	2
13	20A0308C1102	3/8-16 X 1-1/2 SHCS	4
14	8500111-301	SCREW SUPPORT	2
15	20A0308C1102	3/8-16 X 1-1/2 SHCS	12
16	8910111-300	SLIDE	1
17	19A0102X1304	½ X 1-3/4 DOWEL PIN	3
18	8000111-371	COMPRESSION ROLLER ASSEMBLY	1

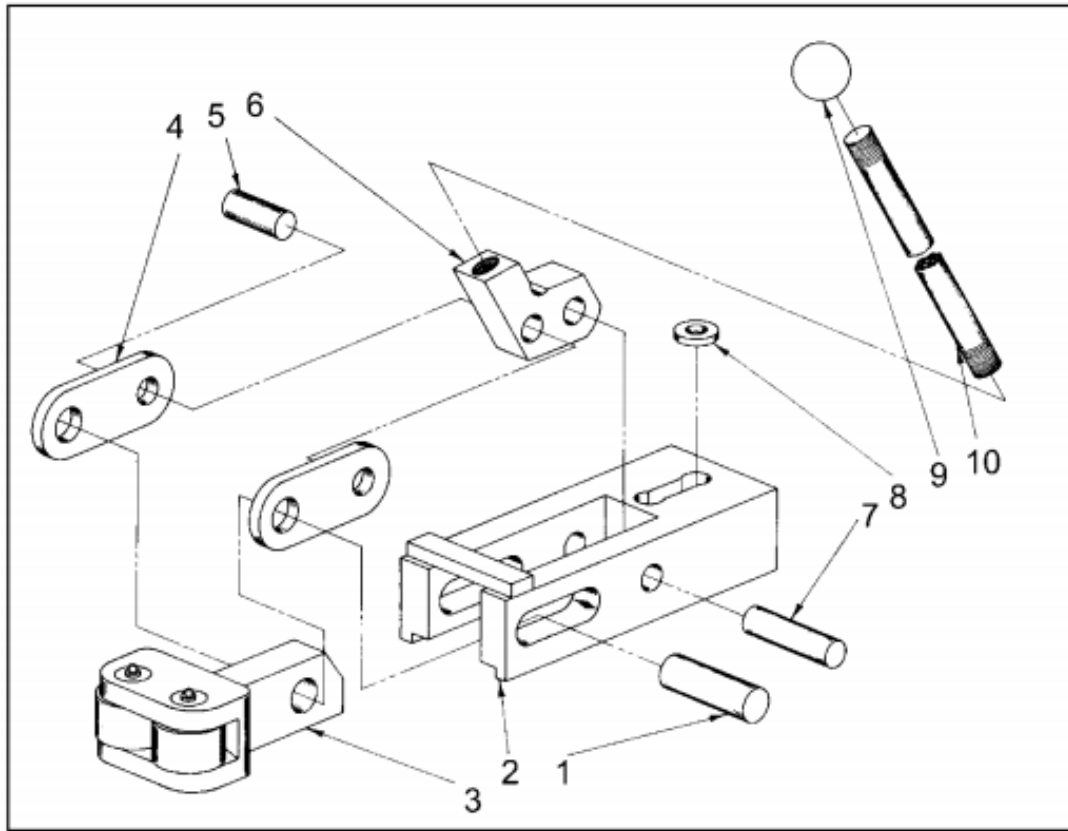
N. Hanger Assembly



HANGER ASSEMBLY PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	8500111-300	HANDLE ROD	1
2	8120810-700	PLASTIC KNOB	1
4	19A0102X2102	1/2 X 2-1/2 DOWEL PIN	1
5	19A0508X2102	5/8 X 2-1/2 DOWEL PIN	1
6	1856111-302	HANGER WELDMENT	1
7	8920111-300	NOSE ASSEMBLY	1
7A	23A0104C0104	1/4-20 X 1/4 SSS	1
8	8930111-300	LINK	2
9	8156120-301	LINK PIN	1
10	8400111-300	HANDLE BLOCK	1
10A	23A0104C0104	1/4-20 X 1/4 SSS	2

O. Pressure Roller Assembly

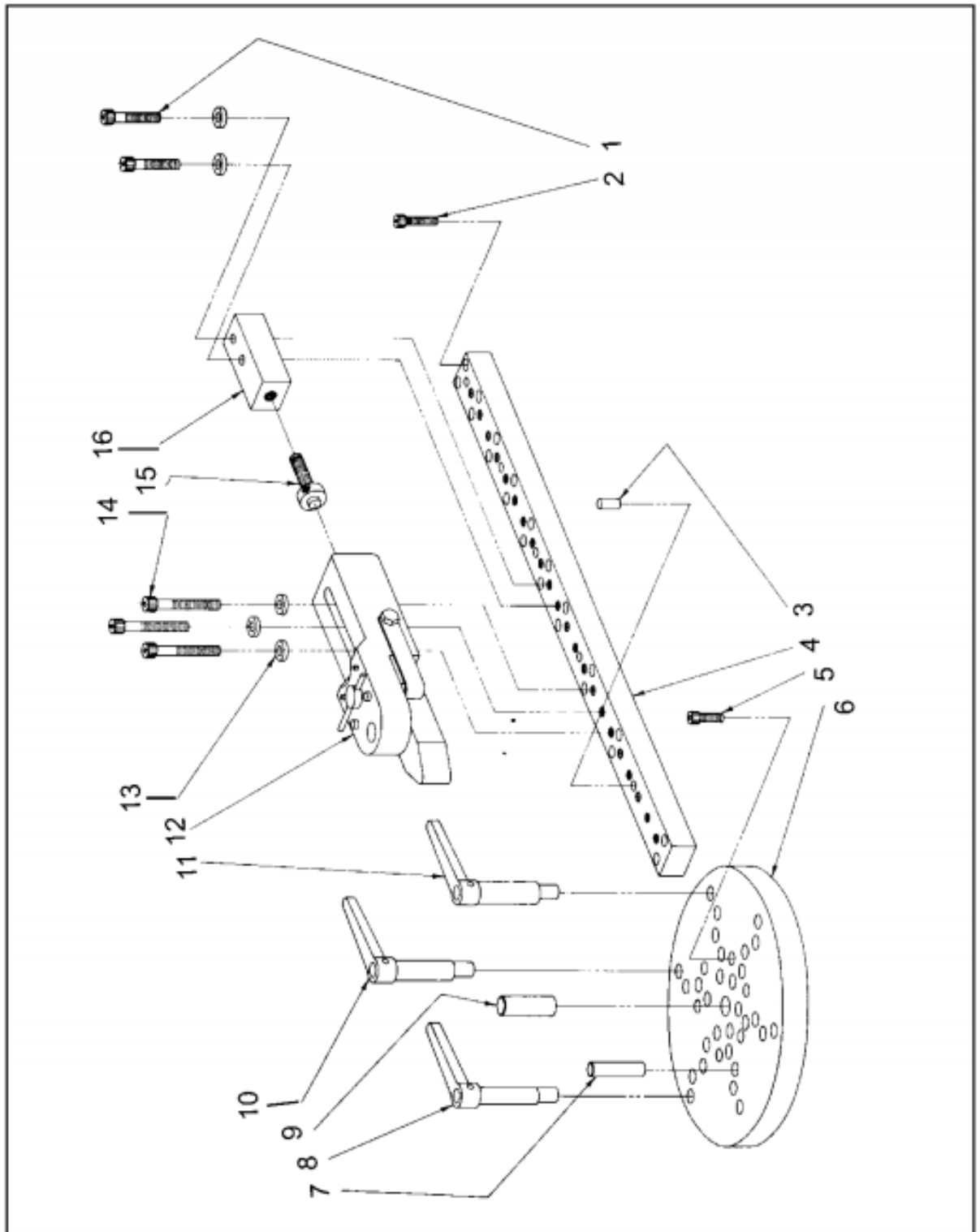


PRESSURE ROLLER ASSEMBLY

PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	19A0508X2102	5/8 X 2-1/2 DOWEL PIN	1
2	8156111-302	HANGER WELDMENT	1
3	8100111-372	ROLLER ASSEMBLY (SEE BELOW)	1
	8600111-301	ROLLER HOLDER	1
	8156111-301	ROLLER	2
	8200120-301	ROLLER PIN	2
	8690100-200	DRIVE FITTING	2
3A	23A0104C0308	1/4-20 X 3/8 SSS	1
4	8930111-300	LINK	2
5	8156120-301	LINK PIN	1
6	8400111-300	HANDLE BLOCK	1
6A	23A0104C0308	1/4-20 X 3/8 SSS	2
7	19A0102X2102	1/2 X 2-1/2 DOWEL PIN	1
9	8120810-700	PLASTIC KNOB	1
10	8500111-300	HANDLE ROD	1

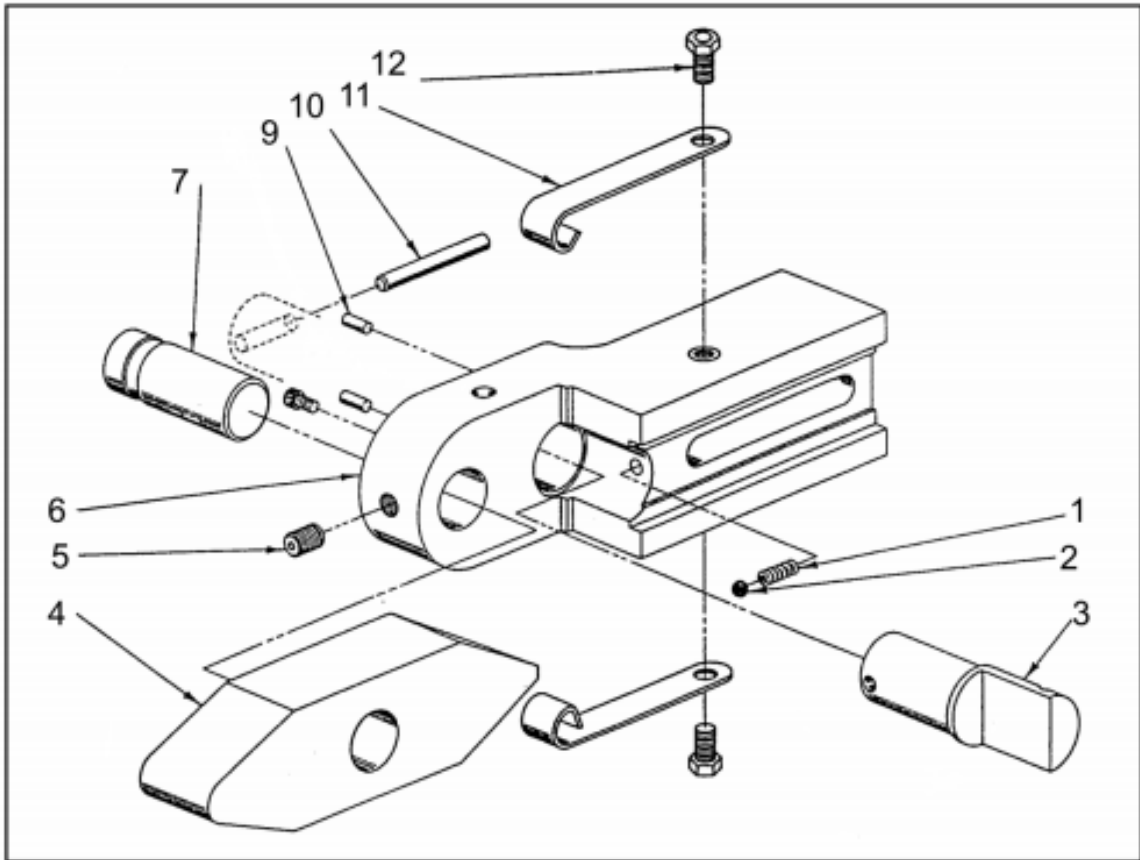
P. No. 8 Tooling Head Assembly



NO. 8 TOOLING HEAD ASSEMBLY**PARTS LIST**

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	20A0102C2102	½-13 X 2-1/2 SHCS	2
2	20A0308C1102	3/8-16 X 1-1/2 SHCS	20
3	19A0308C1102	½ X 1-3/4 DOWEL PIN	5
4	8158121-703	NOSE HOLDER SLIDE	1
5	20A0716C1104	7/16-14 X 1-1/4 SHCS	6
6	8158110-501	MOUNTING PLATE	1
7	8158120-302	PIN	1
8	8158111-370	LOCKING PIN SMALL	1
9	8130016-970	RADIUS PIN	1
10	8000111-370	LOCKING PIN MEDIUM	1
11	8100111-370	LOCKING PIN LARGE	1
12	8158121-771	NOSE HOLDER ASSEMBLY	1
13	0102WILLIAMS WASHER	½ WILLIAMS WASHER	5
14	20A0102C3102	½-13 X 3-1/2 SHCS	3
15	8300121-701	NOSE HOLDER SUPPORT SCREW	1
16	8158121-701	NOSE HOLDER SUPPORT	1

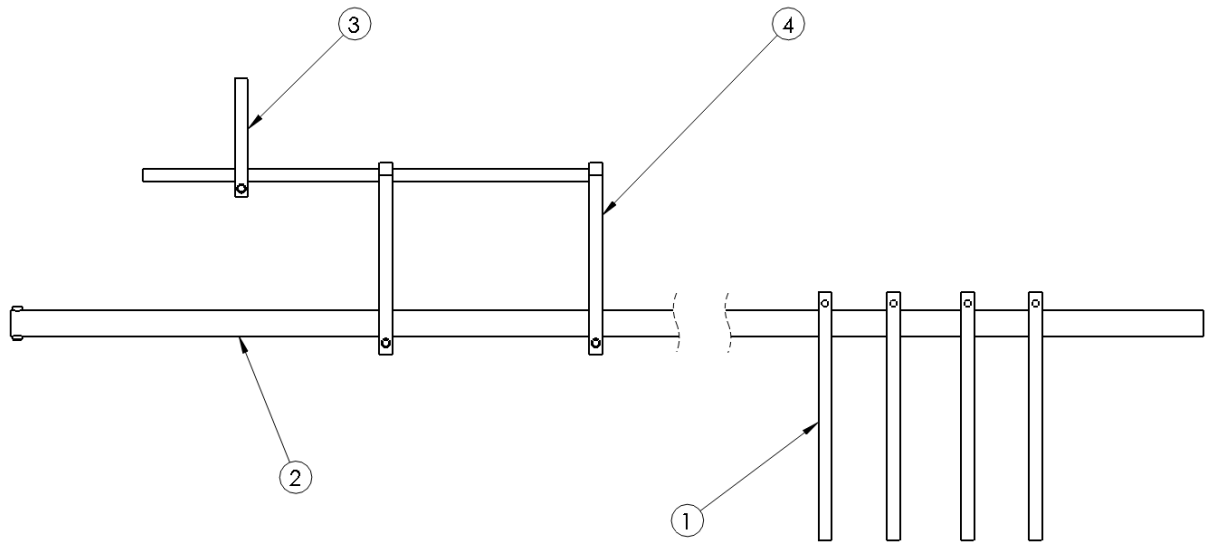
Q. Nose Holder Assembly



**NOSE HOLDER ASSEMBLY
PARTS LIST**

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	8210510-204	SPRING	1
2	8010461-000	STEEL BALL	1
3	8158121-702	TRIGGER	1
4	8500121-701	FORMING NOSE	1
5	23A0308X0102	3/8-16 X 1/2 SSS	1
6	8600121-701	NOSE HOLDER	1
7	8400121-701	NOSE PIN	1
9	8310301-200	NEEDLE ROLLER	2
10	18A0104X3000	1/4 X 3 SPRING PIN	1
11	8158510-401	NOSE SPRING	2
12	21A0516C0102	5/16-18 X 1/2 HHCS	2

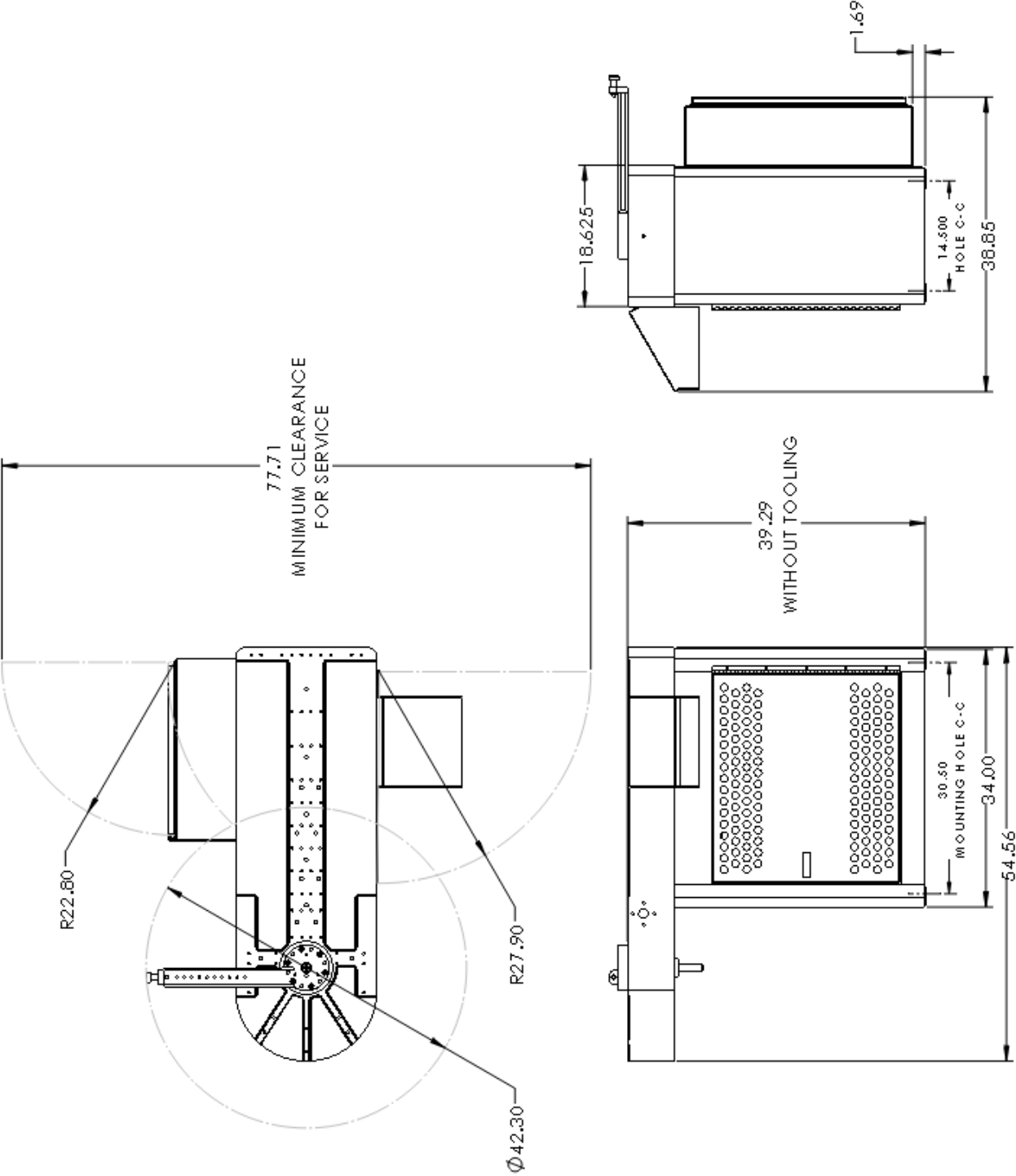
R. Gauge Group



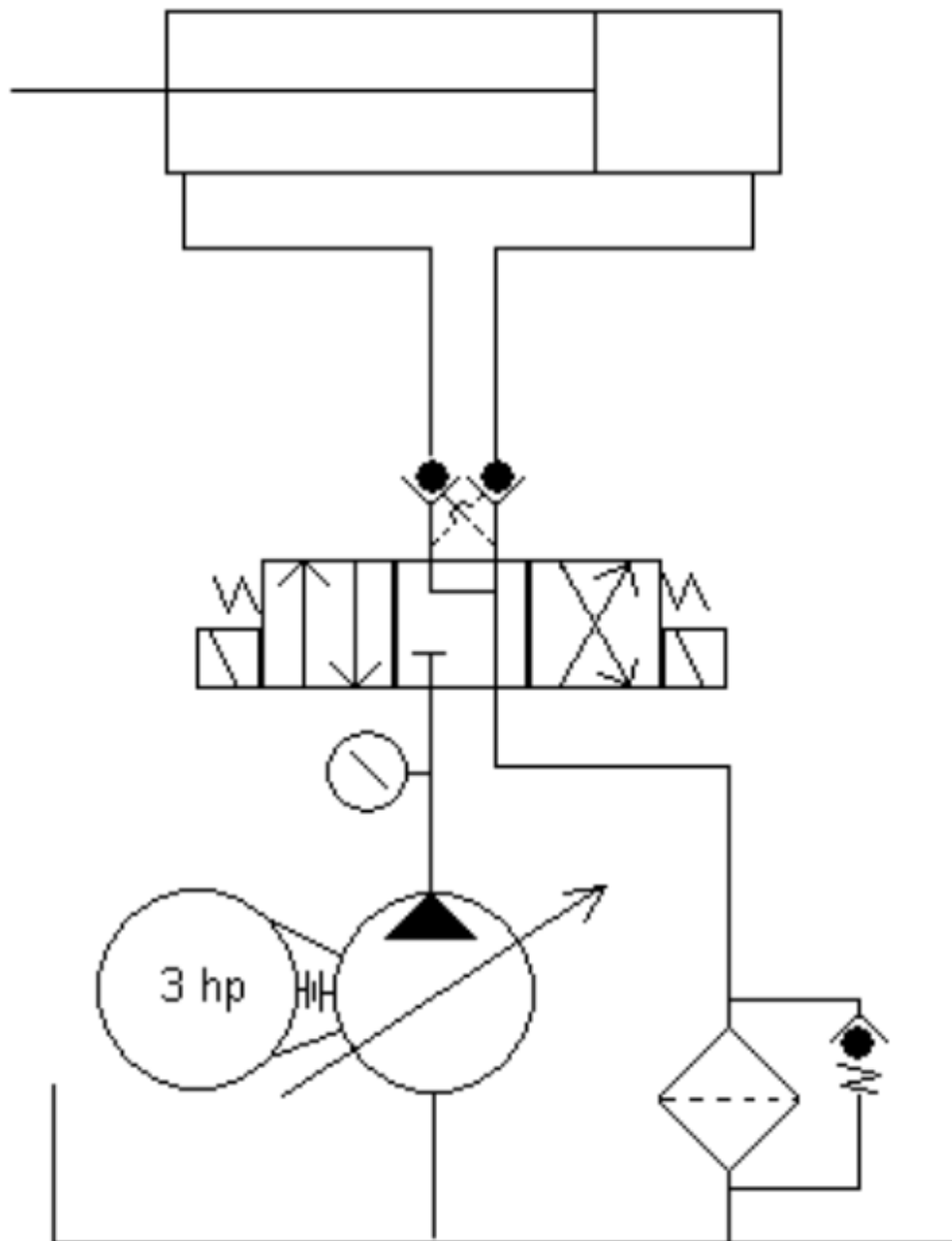
**GAUGE GROUP
PARTS LIST**

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	8000142-007	STOP ARM	4
2	8151142-006	STOP ROD WELDMENT	1
3	8200142-007	STOP BRACKET ARM	1
4	8100142-007	STOP BRACKET ASSEMBLY	1
	20A0516C1104	5/16-18 X 1-1/4 SHCS	6
	20A0516C1000	5/16-18 X 1 SHCS	1

S. Floor Plan



T. Hydraulic Diagram



U. Electrical Diagrams

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Please reference the diagrams that were included with your bender.

V. Warranty and Limitation of Liability

Defective parts, of a product manufactured by DI-ACRO, will be replaced or repaired at no charge for twelve (12) months following delivery to the original purchaser. Labor is included for the first 90 days. This warranty becomes void when products have not been used according to instructions furnished by DI-ACRO, nor does it cover any altered parts or unauthorized repairs. We cannot be responsible for the cost of repairs made or attempted outside of our factory. All other warranty claims are made FOB our plant, providing such item(s) is returned freight prepaid to our plant for examination.

This warranty does not apply to parts, components, or systems not manufactured by DI-ACRO. These products are covered instead by the existing warranties, if any, of their manufacturers. Normal service items with a reasonable life expectancy of less than one year are warranted only to the extent of the reasonable life under normal use and service.

Authorization must be obtained from DI-ACRO before returning parts or equipment to the factory. DI-ACRO will satisfy this warranty by replacing the product or refunding the purchase price upon receipt, inspection, and defect identification.

DI-ACRO's liability under this warranty shall not exceed the amount paid for the product.

THIS IS DI-ACRO'S SOLE WARRANTY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WHICH ARE HEREBY EXCLUDED, INCLUDING IN PARTICULAR ALL WARRANTIES OF MERCHANTABILITY, FITNESS, OR ANY LOSS, DAMAGE OR EXPENSES DIRECTLY OR INDIRECTLY RELATED TO THE USE OF ITS PRODUCT OR FROM ANY OTHER CAUSE OR FOR CONSEQUENTIAL DAMAGES INCLUDING, WITHOUT LIMITATION, LOSS OF TIME AND LOSS OF PRODUCTION.

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