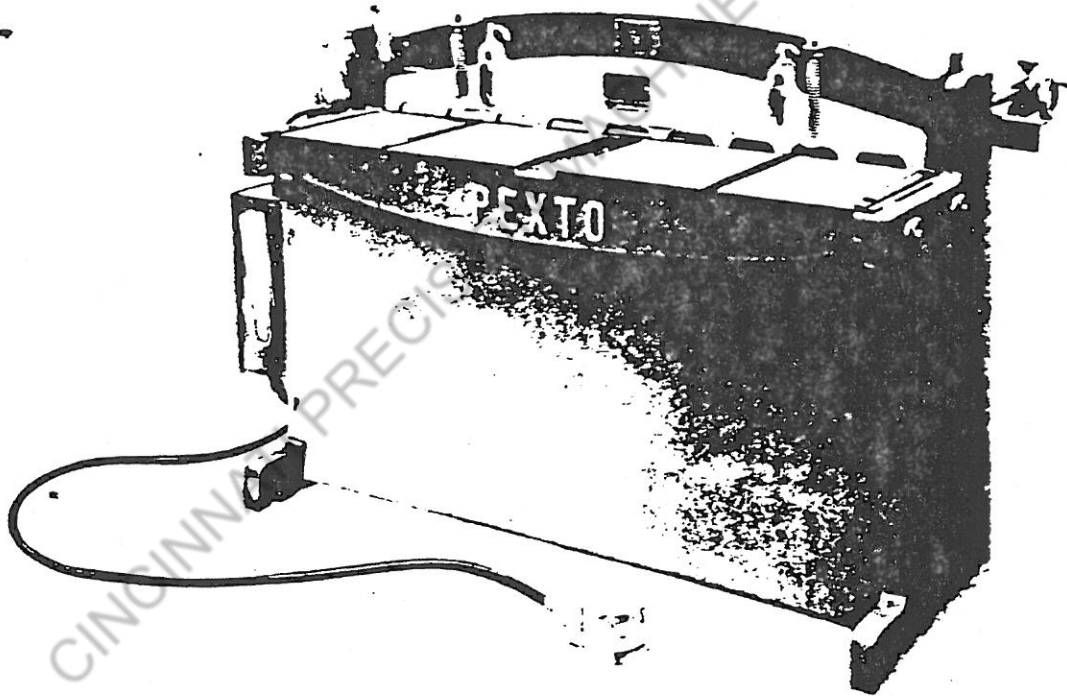




# OPERATION AND PARTS MANUAL For PH352, PH452 Hydraulic Shears

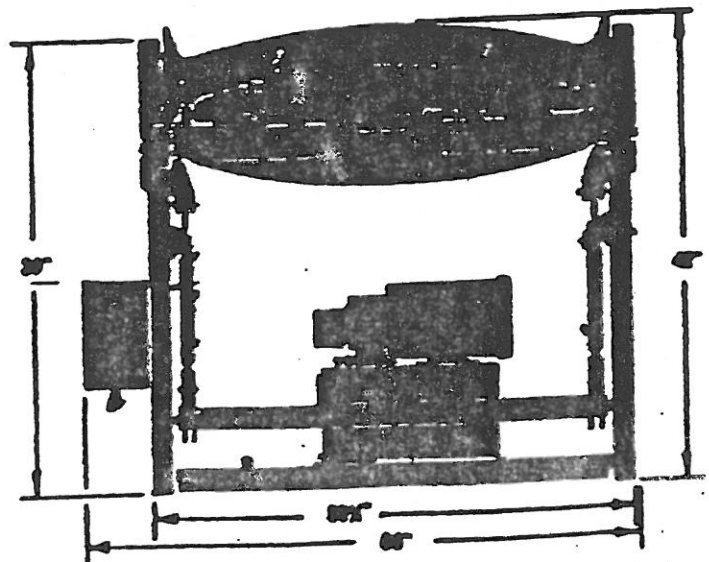
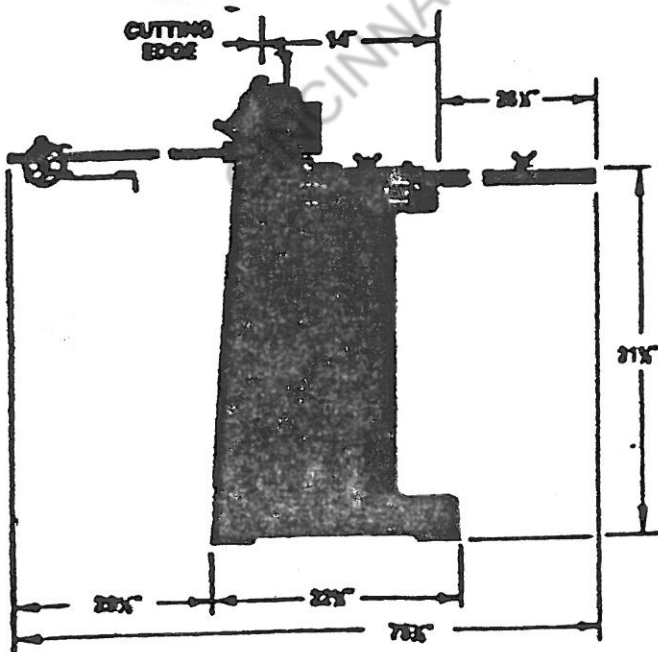


# SPECIFICATIONS

	PH 352	PH 452
Blade length	53 1/2	53 1/2
Capacity Mild Steel	16 ga	16 ga
Capacity Stainless Steel	20 ga	20 ga
Back Gauge Range	25"	25"
Front Gauge Range	37"	37"
Strokes per minute Full Length, Full Capacity	45	45
Motor - 1800 RPM 3 Phase	2 HP	2 HP
Oil Reserve Capacity	5 gal	5 gal
Length	66"	66"
Height	42"	42"
Width F to B (with gauges)	76"	76"
Width F to B (without gauges)	26"	26"
Shipping Weight (approximate)	1300 lbs	1300 lbs
Type of Back Gauge	Quick Slip	Parallel

THE PH 352 COMES WITH NO TABLE (FRONT GA.), BEVEL GAUGE OR FRONT ARMS.

THE PH 452 COMES WITH NO TABLE (FRONT GA.), BEVEL GAUGE OR FRONT ARMS.



BEFORE INSTALLING THIS SHEAR, READ AND UNDERSTAND THIS MANUAL AND "SAFETY REQUIREMENTS FOR THE CONSTRUCTION, AND CARE OF USE OF SHEARS".

### INSTALLATION

#### Receiving-

Immediately upon receiving the shear, check it very carefully for damage or loss of parts in transit. Since all equipment is sold F.O.B., the Roper Whitney facility responsibility for transit damages ceases when the transportation company signs the bill of lading indicating that it has received all of the items listed on the bill of lading in good condition. Report any loss or damage to the delivering carrier promptly to insure proper handling of your claim.

Shortages not appearing on the bill of lading or discrepancies between equipment received and the order should be reported immediately to the Roper Whitney distributor supplying your shear.

### WARRANTY

Refer to Terms and Conditions at the time of sale

## WARNING - SAFETY INSTRUCTIONS

The Following Safety Rules Are Applicable:

1. Electrical Danger - Misuse or improper installation of machinery connected to a source of electricity may result in accidental shock that could cause injury or death. Installation must conform to National Electrical Code (Article 250-Grounding, etc.)

Electrical connections must be made by a qualified electrician. Electrical characteristics shown on motor plate and control panel must match the power source; and all electrically powered equipment must be grounded.

2. Mechanical Danger - Mechanical movement of the blade crosshead also actuates the holddown and back gauge assemblies. Be aware of their movement by staying away from the points of operation; specifically -- never place any part of the body under the crosshead or within the blade area. Failure to comply may lead to bodily injury.

Safety guards must not be removed that guard the metal cutting blade, holddown, hydraulic cylinders, controls and motor pump. Any removal of a guard may lead to bodily injury.

3. Do not operate power shear without reading Operator's Manual and without proper supervisory instructions.
4. Machine to be operated by authorized personnel who have been trained by their supervisor with the working and safety features of the machine, and by reading and understanding the Operator's Manual.
5. Perform all installation and set-up operations before applying power for electrical start-up.
6. Never operate machine with any guard removed; i.e., all required guarding to be installed and effective.
7. Never leave machine running unattended. When not in use, turn off electrical power.
8. Never adjust machine with power ON.
9. Avoid accidental start-up.
10. Do not use machine if servicing is required.
11. Use safety glasses and required protective tools

## CLEANING

In spite of precautions taken in preparing the shear for shipment, dirt and foreign material may find their way into the ways and other parts during transit, and can cause considerable damage unless thoroughly cleaned. It is extremely important to inspect ways, cylinder rods, gages, etc., and thoroughly clean off any dirt and foreign material that may have accumulated. DO NOT attempt to blow dirt out with an air hose as this may force some foreign material into undesirable areas. Remove rust proofing compound with an acceptable solvent.

## LUBRICATION

The specially compounded lubricants or their equivalent as specified on the lubrication chart must be used.

### HYDRAULIC OIL

Certain oils and hydraulic fluids are not compatible with the hydraulic system of this shear, their use will cause damage. Roper Whitney recommends the use of SAE 10\*

It is essential that the oil be clean and precautions should be taken to prevent it's contamination with any foreign material. When adding or refilling, use only the recommended oil or it's equivalent, filtering it carefully when putting it into the reservoir.

The maximum safe operating temperature of hydraulic oil is 150 F. Under normal operating conditions this temperature will not be exceeded. Excessive oil temperature is generally an indication of potential trouble such as excessive pressure, clogged filters, worn pump or high ambient temperature.

No-foam Hydraulic Oils are a blend of virgin base stocks which provide excellent natural seal swell characteristics. They possess anti-foaming and anti-rust properties. Excellent service is provided by these oils in light and medium duty hydraulic service.

\* For reference - any equivalent is acceptable

LUBRICATION CHART

COMPONENT	LUBRICANT		INTERVAL
	Mobil	Texaco	
Hydraulic Reservoir	*DTE OIL 25 SAE 10	*RANDO OIL HD 46	Refill Annually
GIBS	Any Type mineral oil SAE 30		40 hours of operation

\* For reference - any equivalent is acceptable

## LEVELING AND ANCHORING

The machine is shipped on a pallet, so be sure to remove from pallet and place directly onto flooring.

A special foundation is not required for this shear, but it should be placed on a floor of adequate strength and rigidity to support it's weight, and maintain it's level.

Be sure machine is solid and reasonably level on all four points so there is no camber or twist to the machine.

The feet on each leg are provided with holes for lagging in place. Lag screws should be drawn firmly against the feet. They are intended to prevent the shear from moving after it has been properly leveled.

## CONNECTING ELECTRICAL SERVICES

Connect the line side of the disconnect switch to an electrical line of proper voltage, phase, Hertz and size. Only one power connection is required. Use at least the SAME SIZE service entrance cable as the cable connecting the starter to the motor. The motor must rotate in the proper direction. (Clockwise when viewed from fan end, or arrow that is on decal on motor.)

CAUTION: Electricians checking direction of rotation should be cautioned not to operate the shear until it has been thoroughly checked, cleaned, leveled, and lubricated. A wiring diagram is furnished in this manual.

## INITIAL STARTING PROCEDURE

1. Lubricate gibs.
2. Check hydraulic reservoir hydraulic oil level.
3. Start motor (previously checked for proper rotation).
4. Remove shipping blocks from blade.
5. Check blade clearance with feeler gage (See Blade Clearance).
6. Depress footswitch to stroke shear

## SETTING BLADES

### Determining Blade Clearance -

Universal blade clearance is preferred by many shear users as it permits shearing of a wide range of thicknesses without having to change the blade clearance. For example: the shears are shipped from the factory with a blade clearance of 0.002" at the ends and 0.0015" at the center of the shear. With this setting, acceptable cuts may be obtained on mild steel all the way down to very light gage materials. (Note: this is an arbitrary setting for shipment as clearance may close during transit and installation. Once installed a closer universal blade clearance can be set; never any closer than 0.0015" at the center and 0.002" at the ends, so the blades do not rub.)

A good rule of thumb for universal blade clearance is to set the clearance as wide open as practical for the thinnest material to be sheared without an objectionable burr and then use this setting up through capacity thickness.

Under certain conditions a more optimum blade clearance may be desired. Wide off-cuts of steel that is harder than normal or somewhat thicker (on high side of mill tolerance) may not cut through with a close blade setting. In such a case merely increase the blade clearance not to exceed 15% of the material thickness. Conversely very thin materials may require a reduction in blade clearance to minimize burring. When a shear is used exclusively on a given thickness of steel, an optimum clearance of 10% of material thickness will usually produce the best appearing edge.

A word of caution on too large a blade clearance - All shear manufacturers will tell you that hydraulic shears cannot be overloaded. This is true - BUT too great a clearance may cause the material to fold and wedge between the blades. This wedging action can damage the shear. Hydraulic design does not prevent this type of damage.

## CHECKING SHEAR BLADE CLEARANCE SETTINGS

Remove holddown studs (10) and holddown springs (9). Remove holddown bolts (43) and holddown washers (44). This will allow removal of holddown (3) giving full access to blades for checking blade clearances. Note: Check blade clearance with feeler gauge at point of blades meshing - if clearance is not the proper tolerance, follow procedure below for adjusting blade clearances. To reassemble holddown, reverse above procedure.



## ADJUSTING BLADE CLEARANCE

Remove front and rear panels. Loosen all leg-to-bed bolts, items (37) & (38). Loosen two upper bed adjusting screws, item (39) by two complete turns. Then tighten two lower adjustment screws, item (40) only one complete turn. This adjustment will move the bed and lower shear blade away from the crosshead blade. Check underneath the bed with feeler gauges to be sure bed is seated on the machined ledges on right and left hand leg at all four corners.

Bed must be level from end to end and front to back. With bed level in both directions, shear must be securely bolted to foundation. Re-check bed to be sure it is correctly seated on both legs. Now remove upper cylinder hinge pins. Snug down on leg to bed bolts, finger tight, to allow take up on adjusting screws, items (39) & (40). Insert a 1/2" diameter rod, approximately 18" long into the hole in the "welded on block" at the lower left side of the lever assembly, item (11). Using this bar as a lever, the crosshead can be lowered and raised easily to set the shear blades to the proper clearance. Using feeler gauges, carefully move the bed towards crosshead blade by adjusting screws, item (39) & (40), constantly raising and lowering crosshead with the help of the 1/2" diameter lever bar. Check clearance along entire length as crosshead moves up and down, but do not allow blades to rub together or overlap. Position blades within .0015 to .002 inch. Place a sheet of heavy paper (approximately .005") full length of cut between blades. Move crosshead down with lever bar. If shear does not cut paper, move bed blade toward upper blade as necessary by carefully readjusting screws (39) and (40) at either or both sides. If shear cuts paper on ends, but not in the center, it will be necessary to turn crosshead tie rod adjusting nut clockwise until paper cuts full length of blades. If shear cuts in center, but not on ends, reverse direction of turn on crosshead tie rod adjusting nut.

NOTE: This adjustment of crosshead tie rod adjusting nut is carefully made at the factory and should not be necessary on a new shear.

When blades are properly adjusted, tighten leg-to-bed bolts (37) & (38) securely. With crosshead blade in upper position, replace cylinders, cylinder hinge pins, and cotter pins.

The above set up is necessary to adjust for blade clearances and when changing blades.

Reground Shear Blades Adjustment - After regrounding shear blades, height of blades have decreased. No compensation

for height is required on upper blade, but lower blade is now below surface of table top. Lower blade must be flush with top of table the entire width of table. Place lower blade in hold in place and install the 9 hex head bolts that hold lower blade in place. Do not tighten bolts, just snug up. With lower blade in place, turn the 9 lower blade adjusting screws (47) clockwise raising lower blade until flush with top of table. Tighten the 9 hex head bolts holding lower blade in place.

#### MAINTENANCE OF SHEAR BLADES

STORAGE: When not in use, the blades should be stored, preferable in wooden boxes, in a dry, protected area. Do not store the blades where heavy objects can drop or be thrown on them. Following regrinding and prior to storage, the blades should be recoated with heavy rust-inhibiting oil. This will prevent pits resulting from corrosion on the blade surfaces that become focal points for cracks.

HANDLING: Shear blades can resist considerable shock when well supported throughout their full length in the rigid knife seats of the shear. However, they can be severely chipped or broken if dropped while being moved between the storage area and the shear or the grinder.

GRINDING: Blades must be kept sharp to perform well on the shear. It is false economy to delay sharpening of dull blades. If the blades are used beyond the point when they should have been reground, an excessive amount of blade material will have to be removed to bring the edges to a proper cutting condition. Further damage which can result from using dull blades is broken or chipped blades. Heavy burrs on the stock being cut and excessive wear on the ram slides of the shear also are a result of using dull blades. Shearing with dull blades also may result in overloading the shear.

The accuracy and quality of a cut made by a blade are partially dependent on how the blade was ground. The thickness and width of the blade must be held parallel within very close limits throughout the length of the blade. Therefore, the grinding machine used must be in top condition. The type of abrasive used on your grinder will vary, depending on the grade and hardness of the blades being ground as well as the wheel speed and table speeds of the grinder. Since these conditions are so variable, we cannot be specific in regard to grinding wheel or segment specifications. However, as a general rule, Aluminum Oxide grain and vitrified bond should be used. The grain size and wheel hardness should range from 46 grain "H" hardness for plate and bar shear blades to 60 grain "G" hardness for light gauge shear blades.

## OPERATING INSTRUCTIONS

This shear has been tested to capacity at the factory. Do not exceed maximum rated capacity of 16 gauge in mild steel.

Warning: To prevent serious injury, never place any part of the body under the crosshead or within the blades unless the motor is turned off.

Never operate, install blades, or perform maintenance work on this shear without proper instruction, and without first reading and understanding this manual.

Also provide all proper protective devices that may be necessary or advisable for any particular use, operation, set-up or service.

Electrical Connections: Must be made by a qualified electrician. When wiring, check to see that the electrical characteristics shown on the motor plate and control panel match the supply source. Decal on panel indicates voltage, phase, and frequency required. On-off push buttons to operate the motor are mounted on the control panel.

Caution: Proper ground connection must be made or personal injury or death may result. Motor must rotate clockwise when facing the shaft end of the motor indicated by arrow decal on motor housing. Jog motor on and off to determine correct rotation. If motor is running in wrong direction, reverse any 2 incoming 3-phase lead connections. Caution: Disconnect power on incoming source before making this change. Motor should now run in proper rotation.

Caution: Be sure available electric supply conforms to requirements as noted in the Control Box before apply power.

Hydraulics: Mobil DTE 25 hydraulic oil is supplied in the tank.

Caution: Keep tank filled to proper level with a clean hydraulic oil as specified (or equal). Air in hydraulics can prevent correct operation of shear. The lines are bled of air at the factory before shipment and all units have been tested thoroughly. However, it may be necessary at times to bleed the air from the lines. Instructions for this are covered under "Preventative Maintenance."

A flanged pump/motor mount (64) and a flexible coupling (65) connect the pump (66) to the motor (62). A relief valve is provided in the hydraulic circuit and is set at the factory for ample pressure to shear a maximum 16 gauge mild steel sheet. When this pressure is exceeded, the hydraulic oil is directed back to the tank and the crosshead will stop at that point, returning to the top of the stroke when the foot switch is released. The hydraulic pressure is set at approximately 1100 to 1150 P.S.I. Adjusting the pressure on the shears should be done by qualified personnel, using a pressure gauge. Before adjusting the pressure, it is advisable to check all installation and mechanical adjustments to be sure that the shear is in proper operating condition. Do not set above recommended working pressure, as serious, irreparable damage may occur. Such action may also result in a loss of warranty. Contact Roper Whitney for information if necessary.

Operation of Shear: Maximum capacity is 16 gauge mild steel. Do not exceed rated capacity. Before using check for: proper foundation installation, correct setting of blades, correct electrical connections, correct direction of rotation of motor, check level of hydraulic fluid in sight gauge, and note location and use of all controls. The control panel is located on the left leg, with Start/Stop motor control push buttons. With motor on, depress the footswitch. The crosshead will go down and shear the stock. Releasing of the foot switch will send the crosshead back up where the limit switch is actuated and the cycle stops. To recycle, the operator must remove his foot and again press the footswitch. If the foot is removed while the crosshead is descending, it will return immediately to top of stroke and stop.

If operator does not remove pressure on the footswitch, the crosshead will come down against mechanical stops (one mounted on each leg), and the relief valve on the hydraulic power unit will be opened. The crosshead will remain in this position until the footswitch is released.

Caution: Care should be taken to avoid extended engagement of the crosshead on the stops as excessive heating of the oil will occur, resulting in premature breakdown of the oil and possible damage to other hydraulic components.

Set backgauge for desired cut. For accuracy, trim cut before shearing to gauge. Use care to locate sheet metal positively against backgauge and side gauge. During long cutting runs, an occasional wiping of the blades with an oil soaked cloth will serve to reduce wear and prevent slag or chip buildup. Caution: Shut off power before oiling blades. Avoid oil or grease on bed or holddown contact points for better holding of sheet during cut.

## PREVENTATIVE MAINTENANCE

Periodic lubrication is required where indicated (X) on drawing. The hydraulic oil level must be maintained. Add Rando HD-A hydraulic oil, or equivalent when required and make complete oil change approximately every 2000 hours.

Note: When tank is drained and refilled, the oil filter, breather filler and tank should be cleaned. When cleaning the tank, use lint free rags.

Holddown adjustment should be maintained so the holddown clamps the material before the blades start to cut.

Bleeding air from hydraulic lines - Air in hydraulic circuit causes a slow, spongy erratic action in the hydraulic cylinder, with a similar action at the crosshead. When one cylinder, because of air in the lines, travels faster than the other, the gibs of the crosshead may bind, resulting in a loss of shearing power and costly damage.

Air in the hydraulic lines is caused by lower oil level in the reservoir, loose hydraulic connections, or a failure to bleed the lines properly after adding or changing component parts of the circuit. Cavitation of the pump is another. When a pump cavitates (starves for oil) because of lower oil level, plugged air breather or oil filter, it may pump some air from the reservoir into the lines. In all cases, this air must be removed. If oil level is low, fill reservoir to proper level with hydraulic oil (Rando HD-A) and bleed the system.

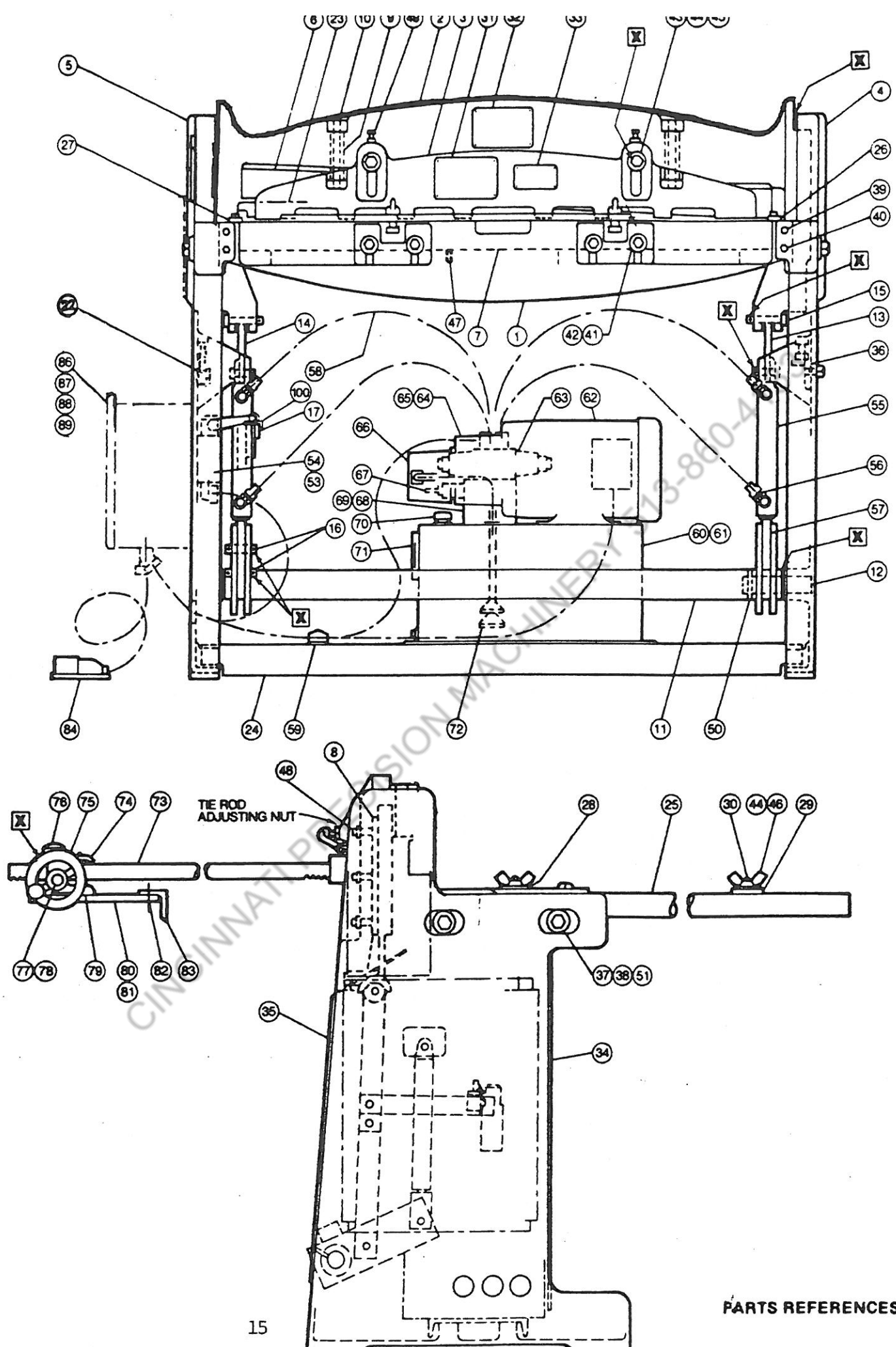
To bleed the hydraulic system of air, follow this procedure. Push START button. If ram is not at the top of stroke, it should automatically go to that position and stop. Remove front panel, item (34). Loosen swivel hose fitting, item (56), approximately 1 to 1-1/2 revolutions at one (1) of the top cylinder ports. Insert a 3/4" to 1" thick x 3" wide hardwood board between the blades, from the back side, with the blades across the grain. Force the block tightly between the blades in order to keep the upper blade from lowering. Then depress the footswitch in short bursts until a solid stream of oil comes from the open fitting. There should be no air or bubbles. Tighten fitting and repeat the process on other top cylinder port. Be sure to tighten that fitting. This should be done with the loss of only 1 to 2 cups of oil. Next, loosen two (2) lower hose fittings approximately 1-1/2 turns each. Remove the wood block and depress switch. As the ram lowers, air and air filled oil should spurt out of lower cylinder fittings, which should now be tightened. Then release footswitch allowing ram to return to top of stroke and stop. Any remaining air in circuit should soon purge itself from the system. If, however, the ram lowers in a jerky manner, or tends to drift



downward when unit is turned off, it may be necessary to repeat the entire bleeding operation.

Blades: To insure precision cutting, return dull blades to factory in Rockford, Illinois, via prepaid transportation. For resharpening, call for price and turnaround time - (815) 962-3011.

CINCINNATI PRECISION MACHINERY 513-860-4133



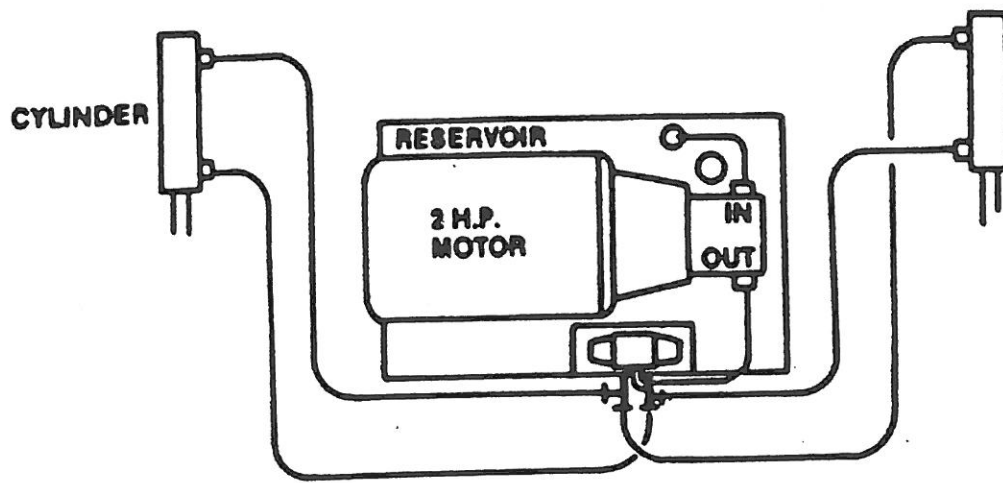
Item No.	Description	PH352 Only	PH352 & PH452	PH452 Only	Req'd
1	Bed		762090083		1
2	Crosshead		262940005		1
3	Holddown		762010084		1
4	R.H. Leg		762140111		1
5	L.H. Leg		762140112		1
6	Upper Blade		350700193		1
7	Lower Blade		350700193		1
8	Gib		762400071		2
9	Holddown Spring		662184548		2
10	Holddown Stud		762160085		2
11	Lever Ass'y		762030129		1
12	Hinge Pin		762160075		2
13	R.H. Link		762240130		1
14	L.H. Link		762240131		1
15	Pin, Crosshead		600000147		2
16	Pin, Link & Tang		762160113		4
17	Actuator Arm		762030115		1
18	Decal, Shear America		600346201		1
*19	Nameplate		600346129		1
*20	Nameplate		600346125		1
*21	Label, Guard Caution		600346160		1
22	L.H. Stop Brkt		762200198		1
23	Finger Guard		762440088		1
24	Tie Brace		762180132		1
**25	Front Arm		762030035		2
26	R.H. Side Gauge		762420031		1
27	L.H. Side Gauge		762420032		1
**28	Bevel Gauge		762420034		1
**29	Front Gauge		762420087		1
**30	Tee Bolt		762160036		3
31	Warning Plate		662346152		1
32	Nameplate		600346123		1
33	Caution Label		600346164		1
34	Front Panel		762440139		1
35	Rear Panel		762440140		1
36	R.H. Stop Brk't		762200120		1
37	Bed To Leg Bolt		601012379		4
38	Special Washer		600033129		4
39	"Bed In" Adj. Screw		621012179		2
40	"Bed Out" Adj. Screw		601012183		2
41	Front Arm Bolt Washers		600033128		13, 16
42	Front Arm Bolt		601012225		4
43	Holddown Bolt		601012279		2
44	Holddown Bolt Washer		678033107		9
45	Holddown Lock Screw		621012266		2
46	1/2-13 Wing Nut		673023007		3
47	Lower Blade Adj. Screw		621012173		9, 6
48	Gib Adj. Screw		633012183		6
49	Holddown Adj. Screw		633012183		2
50	Roll Pin		600053473		2
51	Bed To Leg Nut		659023009		4
52	3/4" Clamp		660172703		1
53	Operating Lever		660152614		1
54	Limit Switch		660152613		1



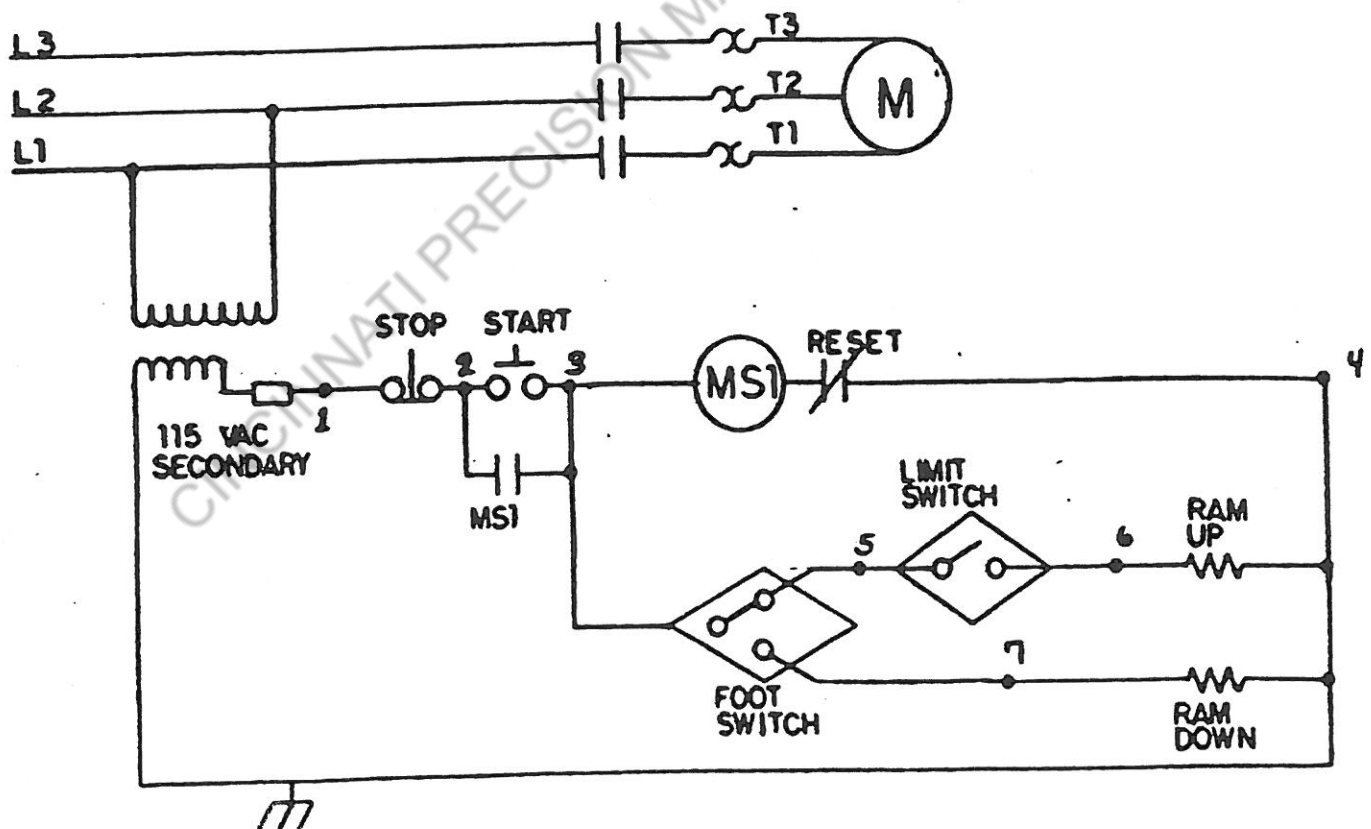
Item No.	Description	Only	PH452	Only	Req'd
55	Cylinder		669011000		2
56	Hose Fitting		669021110		4
57	Cylinder Tang		762260110		2
58	Hose		669041708		4
59	1/2" Clamp		660172700		1
60	Reservoir		669133100		1
61	Hydraulic Oil "A" or Rando "B"		669072303		5 Gal
62	Motor, 2 H.P. 208 220, 440 Volt		669082366		1
63	4 Way Solenoid Control Valve		669122915		1
64	Pump Mount		669000018		1
65	Coupling		669386600		1
66	Pump		669082351		1
67	Relief Valve, External		669122950		1
68	Manifold Block		669051909		1
69	P.O. Check Valve Cartridge		669122961		1
70	Filler-Breather Cap		669031600		1
71	Sight Gauge		669102704		1
72	Filter		669031601		1
73	Back Gauge Rods	762030141		762030053	2
74	Pointer		762420048		2
75	Balcrank Handwheel			762980089	2
76	Hand Knob		600356311		2
77	Connecting Shaft			762680091	1
78	Pinion (RH & LH)			762380092	2
79	Back Gauge Holder	762200215		762200090	2
80	Right Hand Link (Back Gauge)		762240054		1
81	Left Hand Link (Back Gauge)		762240055		1
82	Pivot Stud		762160051		3
83	Back Gauge Bar		762420056		1
84	Footswitch w/Side Guard		660092104		1
85	Return Line Filter		669031615		1
86	Heater Coils For 460 Volt Units		660041501		3
	For 230 Volt Units		660041406		3
	For 208 Volt Units		660041407		3
88	Danger Label For 460 Volt Units		600346161		1
	For 230 Volt Units		600346163		1
	For 208 Volt Units		600346162		1
89	Fuse (FRN-R-6/10)		660051731		1
90	Adjustment Clip		762010118		1

Identify Replacement Parts by Index No., Name and Part No. Include Machine No. Letter and Serial No.

\* Not Shown  
\*\* Optional Equipment



Pictorial Hydraulic Diagram  
PH352 & PH452



Electrical Diagram PH352 & PH452