

PH352, PH452 HYDRAULIC SHEARS

OPERATION & PARTS MANUAL



ROPER WHITNEY

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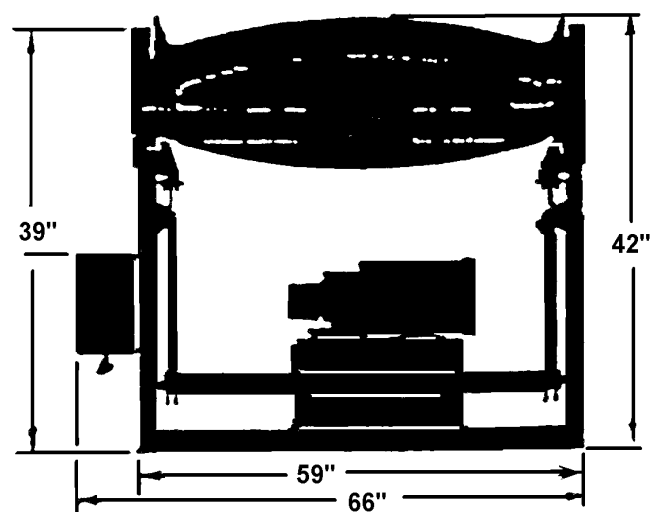
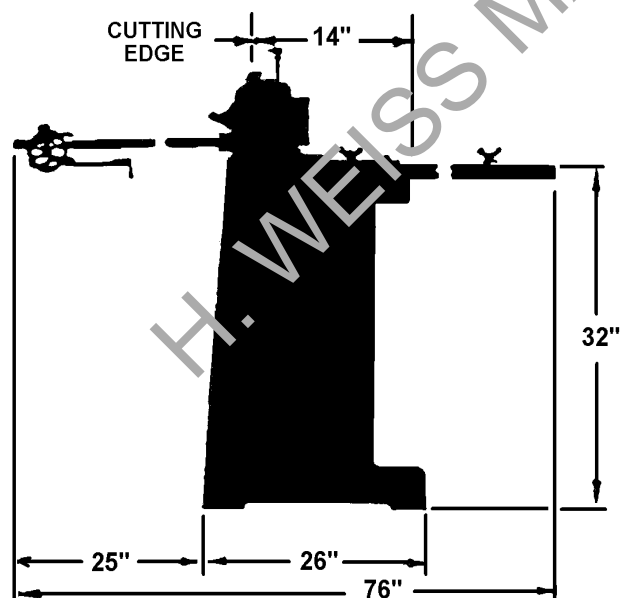
Website: www.roperwhitney.com * Email: info@roperwhitney.com

SPECIFICATIONS

	<u>PH 352</u>	<u>PH 452</u>
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 PH352 comes with no table (front gauge), bevel gauge or front arms.

The PH452 comes with no table (front gauge), bevel gauge or front arms.



BEFORE INSTALLING THIS SHEAR, READ AND UNDERSTAND THIS MANUAL.

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.
12. Keep work areas clean and in proper order.
13. Be alert to all potential hazards.

NOTE: ALL GUARDS MUST BE IN POSITION AND EFFECTIVE BEFORE OPERATING THE POWER SHEAR.

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. (Clock-wise 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; blade 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 on page 7 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 regrinding 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 the mating seat on the bed, 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, preferably 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 starting 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.

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 direction.

CAUTION: Be sure available electric supply conforms to requirements as noted in the Control Box before applying 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 adapter (62C) and a flexible coupling (62D) connect the pump (62E) to the motor (62B). 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.

PREVENTIVE 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.

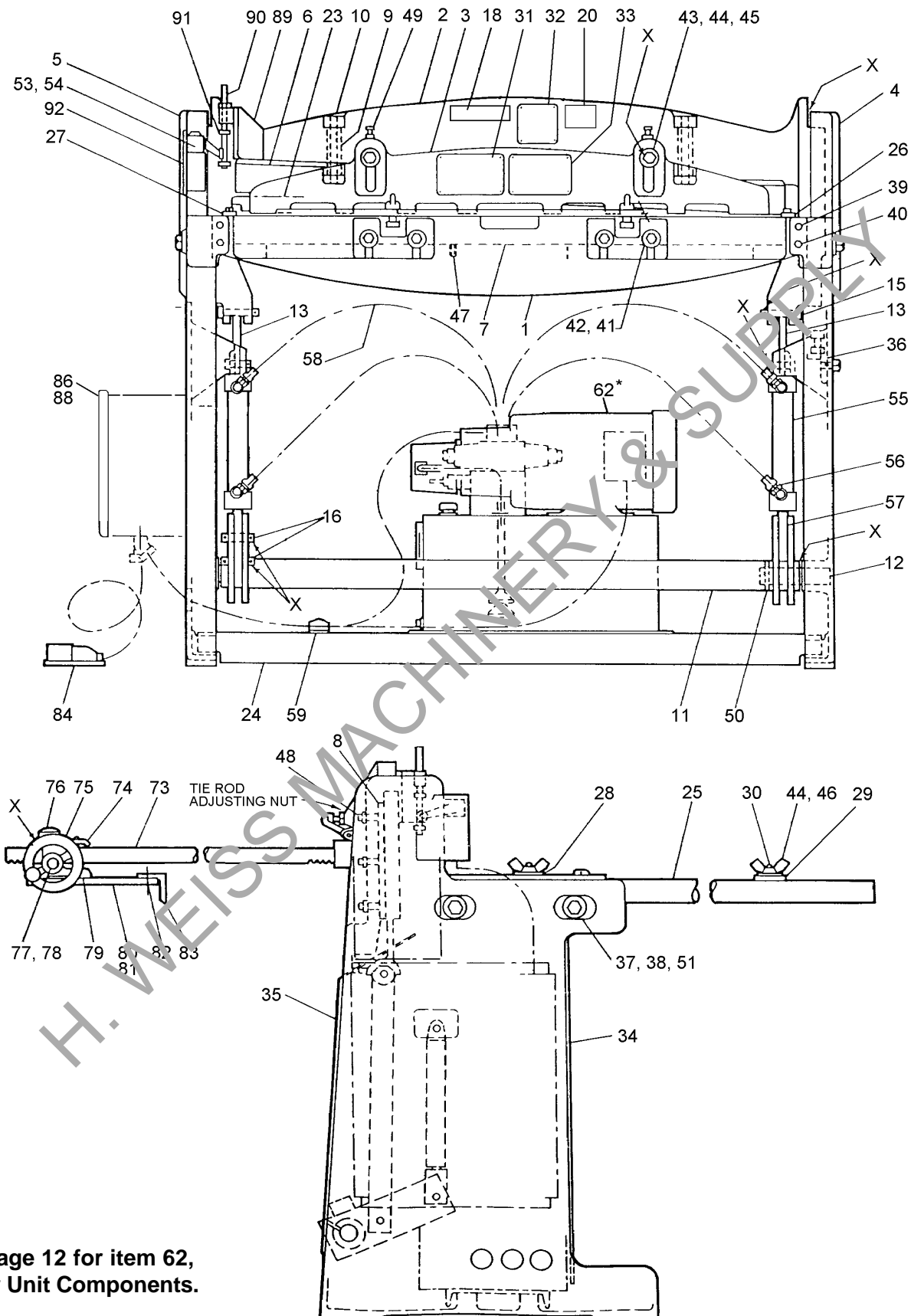
BLEEDING AIR FROM HYDRAULIC LINES: Air in hydraulic circuit causes a slow, spongy erratic action in the hydraulic cylinder, with a similar action at the crosshead. When one cylinder, because of air in the lines, travels faster than the other, the gibs of the crosshead may bind, resulting in a loss of 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.

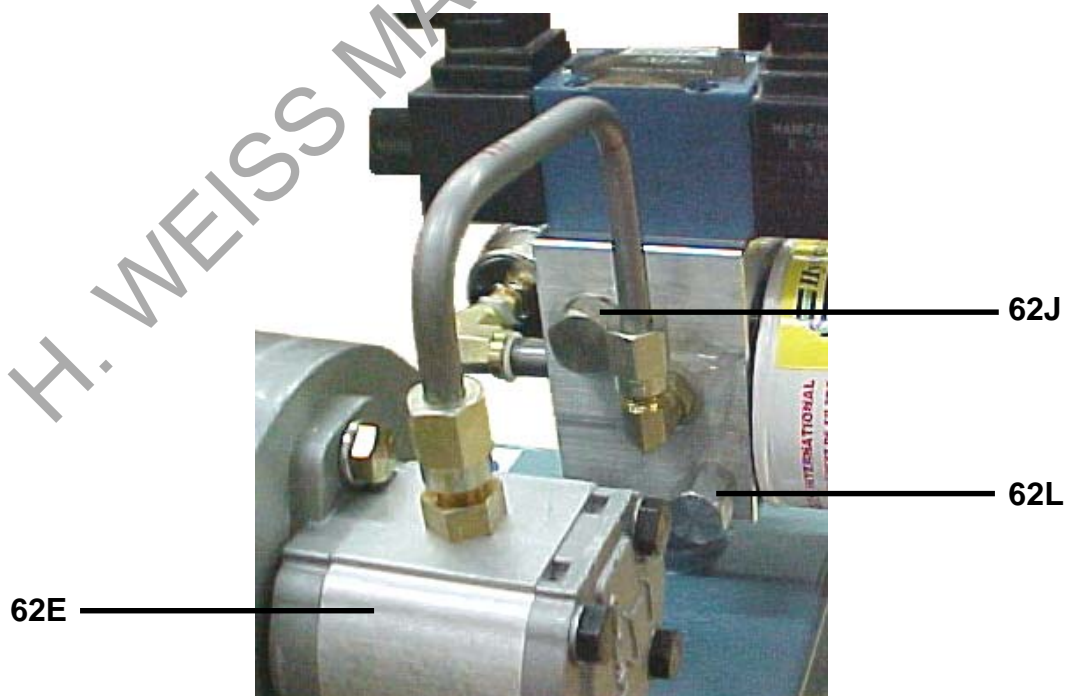
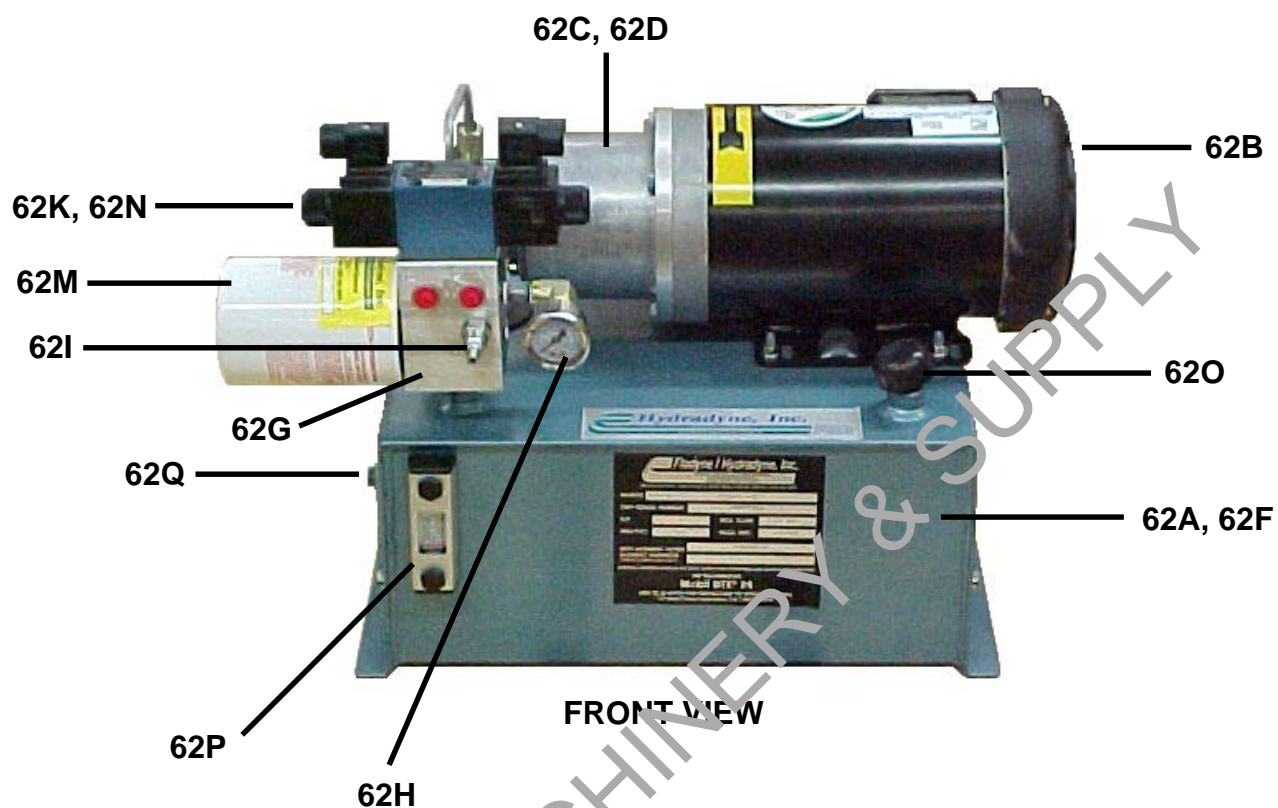
BLADES: To insure precision cutting, return dull blades to factory in Rockford, Illinois, via prepaid transportation. For resharpening, call for price and turnaround time - 815-962-3011.

PH352, PH452 HYDRAULIC SHEARS PARTS IDENTIFICATION



*See page 12 for item 62,
Power Unit Components.

PH352, PH452
POWER UNIT COMPONENTS IDENTIFICATION
ITEM #62

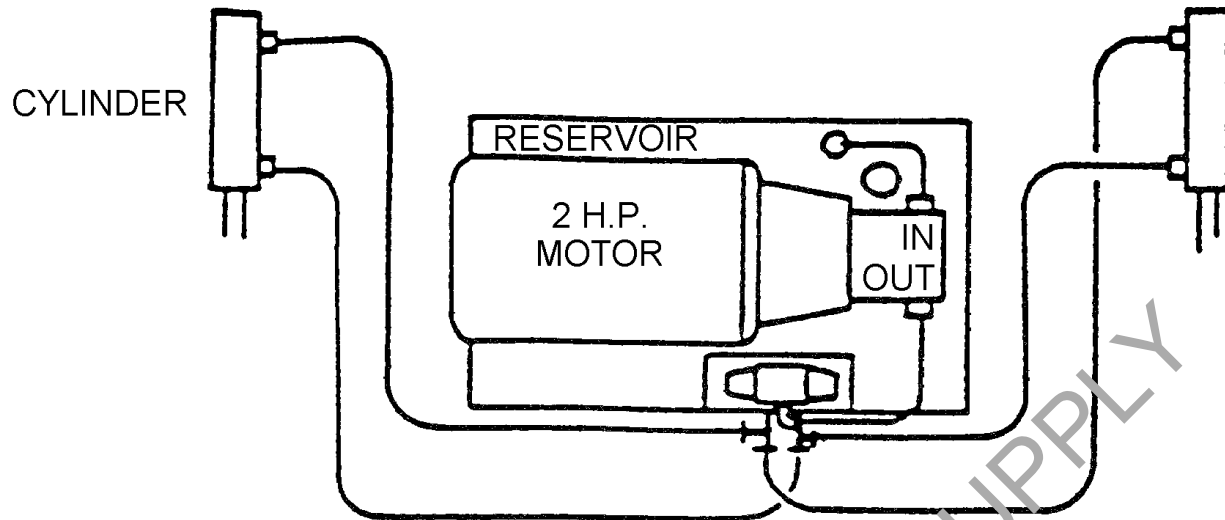


**PH352, PH452
POWER UNIT COMPONENTS IDENTIFICATION
ITEM #62**

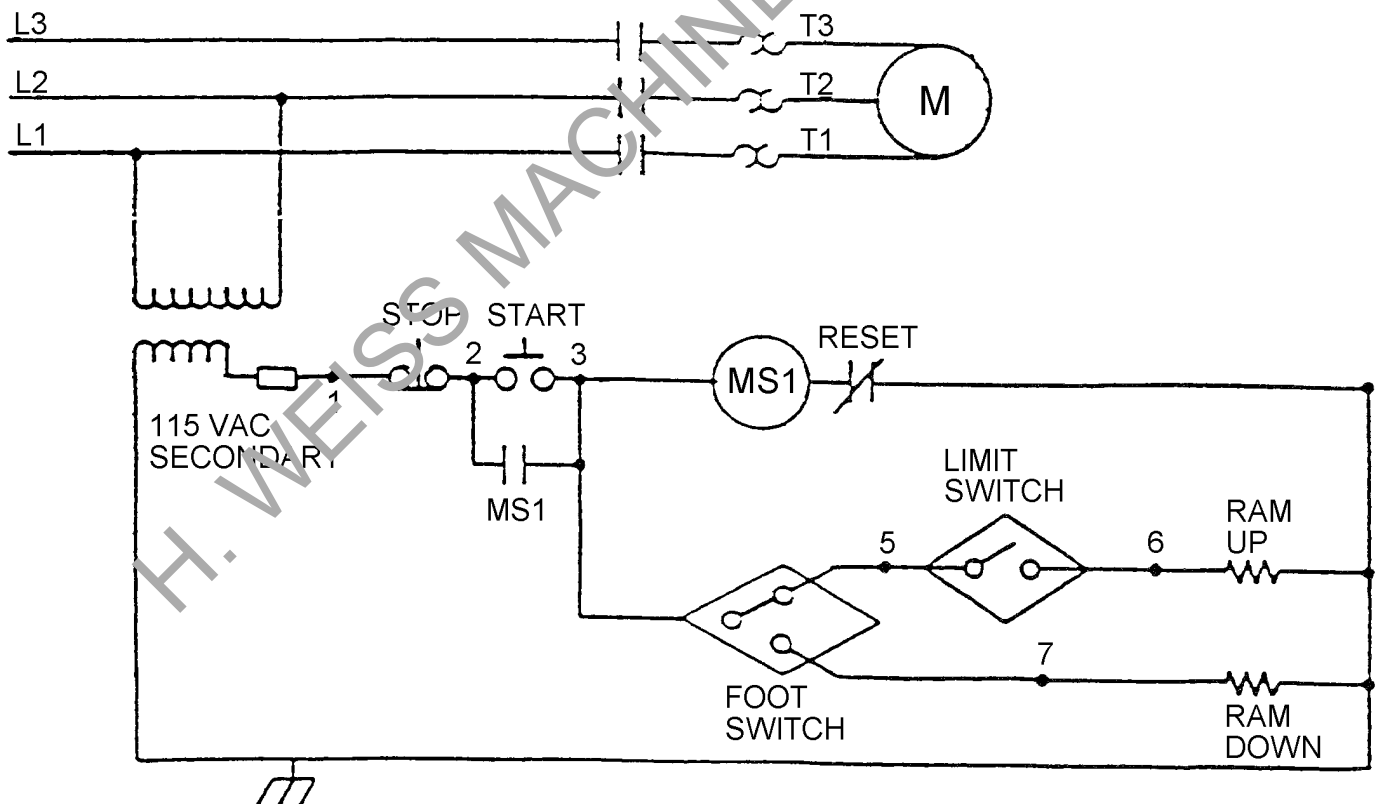


CUSTOM MANIFOLD FITTINGS





PICTORIAL HYDRAULIC DIAGRAM
PH352 & PH452



ELECTRICAL DIAGRAM
PH352 & PH452

PH352 & PH452 PARTS LIST

ITEM NO.	PART # PH352 ONLY	PART # PH352 PH452	PART # PH452 ONLY	DESCRIPTION	QTY.
1		762090083		Bed	1
2		262940005		Crosshead Assembly	1
		(Crosshead Assembly consists of the following parts)			
		762610079		Crosshead	1
		762030002		Tie Rod	1
		762650003		Adjusting Screw	1
		643023009		Nut, Hex Full 5/8-11	1
		643023007		Nut, Hex Full 1/2-13	2
		678033107		Washer, Flat 1/2	2
		678033109		Washer, Flat 5/8	1
3		762010084		Holddown	1
4		762140111		R. H. Leg	1
5		762140112		L. H. Leg	1
6		350700193		Upper Blade	1
7		350700193		Lower Blade	1
8		762400071		Gib	2
9		662184548		Holddown Spring	2
10		762160085		Holddown Stud	2
11		762030129		Lever Assembly	1
12		762160075		Hinge Pin	2
13		762240130		R.H. & L.H. Link	2
15		600000147		Crosshead Pin	2
16		762160113		Pin, Link & Tang	4
18		600346201		Decal, Shear America	1
20		600346125		Decal Re grind	1
23		762140088		Finger Guard	1
24		762180132		Tie Brace	1
**25		762030035		Front Arm	2
26		762420031		R. H. Side Gauge	1
27		762420032		L. H. Side Gauge	1
**28		762420034		Bevel Gauge	1
**29		762420087		Front Gauge	1
**30		762160036		Tee Bolt	3
31		662346152		Warning Plate	1
32		600346123		Nameplate	1
33		600346164		Caution Label	1
34		762440133		Front Panel	1
35		762440134		Rear Panel	1
36		762200120		R. H. Stop Bracket	1
37		601012379		Bed to Leg Bolt	4
38		600033129		Special Washer	4

PH352 & PH452 PARTS LIST

ITEM NO.	PART # PH352 ONLY	PART # PH352 PH452	PART # PH452 ONLY	DESCRIPTION	QTY.
39		621012179		"Bed In" Adjusting Screw	2
40		601012183		"Bed Out" Adjusting Screw	2
41		600033128		Front Arm Bolt Washers	13, 16
42		601012225		Front Arm Bolt	4
43		601012279		Holddown Bolt	2
44		678033107		Holddown Bolt Washer	9
45		621012266		Holddown Lock Screw	2
46		673023007		Wing Nut, 1/2-13	3
47		621012173		Lower Blade Adjusting Screw	9, 6
48		633012183		Gib Adjusting Screw	6
49		633012183		Holddown Adjusting Screw	2
50		600063473		Roll Pin	2
51		659023009		Bed to Leg Nut	4
52		660172703		3/4" Clamp	1
53		660152655		Lever Arm	1
54		660152654		Limit Switch	1
55		669011034		Cylinder	2
56		669021253		90° Hose Fitting	4
57		762260110		Cylinder Tang	2
58		669041708		Hose	4
59		660172700		1/2" Clamp	1
*61		669072303		Hydraulic Oil "A" or Rando "B"	5 Gal.
62		669092558		Power Unit, 2 H.P.	1
62A		669133107		Reservoir	1
62B		669082399		Electric Motor	1
62C		669021280		Pump/Motor Adapter	1
62D		6691386630		Pump/Motor Coupling	1
62E		669082400		Pump	1
62F		669031637		Suction Screen	1
62G		669051917		Custom Manifold	1
62H		669102730		Gauge	1
62I		669123008		Relief Valve	1
62J		669123009		PO Check Valve	1
62K		669123007		Directional Valve	1
62L		669123010		Check Valve	1
62M		669031635		Filter Element	1
62N		611012064		Mounting Bolts 10-24 x 2" SHC	4
62O		669031638		Filler/Breather	1
62P		669102726		Sight/Temp Gauge	1
62Q		669000070		Door Assembly	1

PH352 & PH452 PARTS LIST

ITEM NO.	PART # PH352 ONLY	PART # PH352 PH452	PART # PH452 ONLY	DESCRIPTION	QTY.
62R		669021135		Straight Runtree w/O Ring	1
62S		669021111		Swivel 90° Elbow	2
62T		669021255		Swivel Tee	1
62U		669062076		O Ring	1
73	762030141		762030053	Back Gauge Rods	2
74		762420048		Pointer	2
75			762980089	Handwheel	2
76		600356311		Hand Knob	2
77			762680091	Connecting Shaft	1
78			762380092	Pinion, RH & LH	2
79	762200215		762200090	Back Gauge Holder	2
80		762240054		RH Link (Back Gauge)	1
81		762240055		LH Link (Back Gauge)	1
82		762160051		Pivot Stud	3
83		762420056		Back Gauge Bar	1
84		660092104		Footswitch w/Side Guard	1
86		660041589		Overload Block (208V,230V,460V)	1
88				Danger Label	
		600346161		For 460 Volt Units	1
		600346163		For 230 Volt Units	1
		600346162		For 208 Volt Units	1
89		762200116		Stroke Control Bracket	1
90		762160117		Stroke Adjusting Stud	1
91		600050133		Split Collar	2
92		762060114		Limit Switch Mounting Plate	1

*Not Shown

**Optional Equipment

When ordering replacement parts, give model, letter, and serial number shown on the machine name-plate, and part description shown on the parts list.