

LITTLE DAVID

OWNER'S MANUAL



LD2D

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GENERAL SAFETY PRECAUTIONS

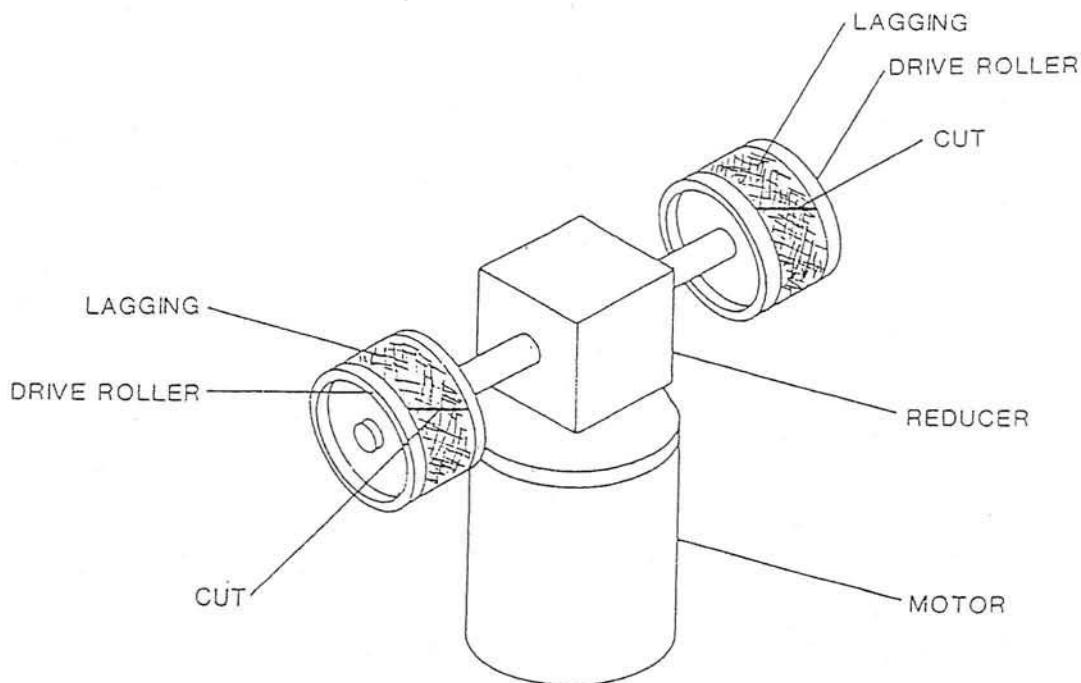
BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT READ THE FOLLOWING PRECAUTIONS CAREFULLY:

- * This machine is equipped with moving belts. Do not place hands near the rear of this machine when belts are moving, as fingers may be pinched where belts enter frame. Always use a roller type exit conveyor and always remove boxes after they clear the exit end of the machine.
- * Finger guards are provided to minimize belt gap as drive belts wear. Gap should be 1/32" between guard and belt. See table of contents for drawing.
- * Observe caution when near cartridge knife or when threading tape. Knife is very sharp, automatically operated and is linked to the wipe down rollers.
- * Do not attempt to open or work on electrical box, junction boxes, or other electrical components without first disconnecting power to the machine. Shock hazard exists if power is not disconnected.
- * Do not bypass any designed-in safety features such as interlocks, guards or shields.
- * Fully automatic machines are equipped with a rear flap kicker. Do not place any part of the body near this area without first disconnecting power and air supply.
- * Do not place hands or body inside confines of random type machines. The side rails and head operate automatically.
- * Do not place hands or body inside confines of uniform type machines unless head is securely locked and power and air are disconnected.
- * Always disconnect power source and air supply (if applicable) before servicing machine.
- * When operating a semi-automatic machine, hold box flaps down at the trailing edge of the box. Release hands as soon as the belts take the box.
- * Do not wear jewelry, loose clothing, such as ties, scarfs, etc., and long hair should be pulled back when operating the machine.

LOVESHAW

BELT LAGGING INSTALLATION

1. If the belt moves to the left or right at the exit end of the machine, then the belt lagging (friction) material on the drive roller must be cut on the same side that the belt is moving towards. To accomplish this, first remove the belt or belts that is moving out of line as described above, so that the exit roller can turn freely, after the machine is turned on.
2. Turn on machine and with a utility knife, cut about 1/8" off the belt lagging material by placing the point of the knife on the lagging material while the drive roller is turning. Be sure to place the knife on the roller so that the roller is moving away from the point of the knife.
3. After a complete cut is made, turn machine off and with the point of the knife, lift up a section of the cut lagging and pull off until it is removed from the drive roller completely. (This can be done by jogging the machine on and off while pulling the cut strip of lagging).
4. Replace belt and check alignment. Belt will have moved to the opposite side that was cut. This procedure may have to be repeated until the belts are centered.



LOVESHAW

SUBJECT	PAGE
MACHINE SPECIFICATIONS	2
INTRODUCTION	3
INSTALLATION	4
OPERATION	5
MACHINE OVERVIEW - FRONT	6
MACHINE OVERVIEW - REAR	7
MAIN FRAME	8
BELT THREADING DIAGRAM	10
ELECTRICAL SYSTEM	11
ELECTRICAL DIAGRAMS	12
PNEUMATIC SYSTEM	13
PNEUMATIC DIAGRAM	15
HEAD	16
TAPE CARTRIDGE	20
TAPE THREADING DIAGRAM	22
LUBRICATION	23
TROUBLE-SHOOTING	24
OPTIONAL EQUIPMENT	29
ILLUSTRATED REPLACEMENT PARTS -	
TABLE OF CONTENTS	30
WARRANTY	78

MACHINE SPECIFICATIONS**MACHINE DIMENSIONS**

HEIGHT:	56"	1422mm
WIDTH:	30"	720mm
LENGTH:	34"	980mm

TABLE HEIGHT (adjustable)

MINIMUM:	22"	559mm
MAXIMUM:	33"	840mm

ELECTRICAL

STANDARD:	115V, 1-Phase, 60 Cycles
	240V, 1-Phase, 50 Cycles
OPTIONAL:	220V, 1-Phase, 50/60 Cycles
	220V, 3-Phase, 50/60 Cycles
	380V, 3-Phase, 50 Cycles
	440V, 3-Phase, 50 Cycles
	440V, 3-Phase, 60 Cycles

AIR REQUIREMENTS

65psi/min	4.5atm
1/10cu.ft.(free air)/cycle	3 litres (free air)/cycle

BOX CAPACITY

LENGTH:	6" to unlimited max.	152mm to unlimited max.
WIDTH:	4½" to 20"	114mm to 508mm
HEIGHT:	4½" to 20"	114mm to 508mm

OPERATING SPEED

BELT SPEED:	60ft/min.	18m/min.
NUMBER OF BOXES/MIN.:	Depends upon box size and operator's dexterity	

CLOSURE MATERIAL: PRESSURE SENSITIVE TAPE

WIDTH:	1½" to 2"	38mm to 51mm
MAXIMUM ROLL DIAMETER:	15"	381mm

MACHINE WEIGHT

UNCRATED:	1751bs.	145kg
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LOVESHAW

The LITTLE DAVID MODEL LD2D RANDOM PRESSURE SENSITIVE TAPER is designed to tape the top and bottom flaps of a wide variety of box sizes. The operator only has to fold the flaps and push the box against the sensing paddle after which the machine will automatically set itself to the box size, tape the top and bottom flaps and discharge the box.

The simple design insures a minimum of maintenance problems and the machine can be easily operated. Due to its small size and simple plug-in electrical and pneumatic connections, it can be quickly moved to the area where it is needed. It may stand alone or if desired be incorporated in a conveyor system. All fastenings used on the LD2D are metric, and a set of metric wrenches is included in the spare parts kit.

The finest of materials and workmanship have been used in the fabrication of your LD2D. If repairs do become necessary, you will find simple instructions outlined in this manual. If a problem occurs that is not covered, please contact our Service Department at the address below.

Pages 6 and 7 have been provided to help locate the area of the machine that need adjustments or repairs. Also provided are the assembly names and page numbers for the illustrated replacement parts located in the rear of the manual.

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SERVICE DEPARTMENT
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OR YOUR NEAREST LITTLE DAVID DISTRIBUTOR
SERVICE DEPARTMENT

LOVESHAW

When uncrated, the LD2D is ready for operation after plugging it into an appropriate grounded electrical outlet, the adequate source of air and the tape cartridges are loaded with tape, see page 22. The electrical and pneumatic connections are located on the rear of the machine, see page 7.

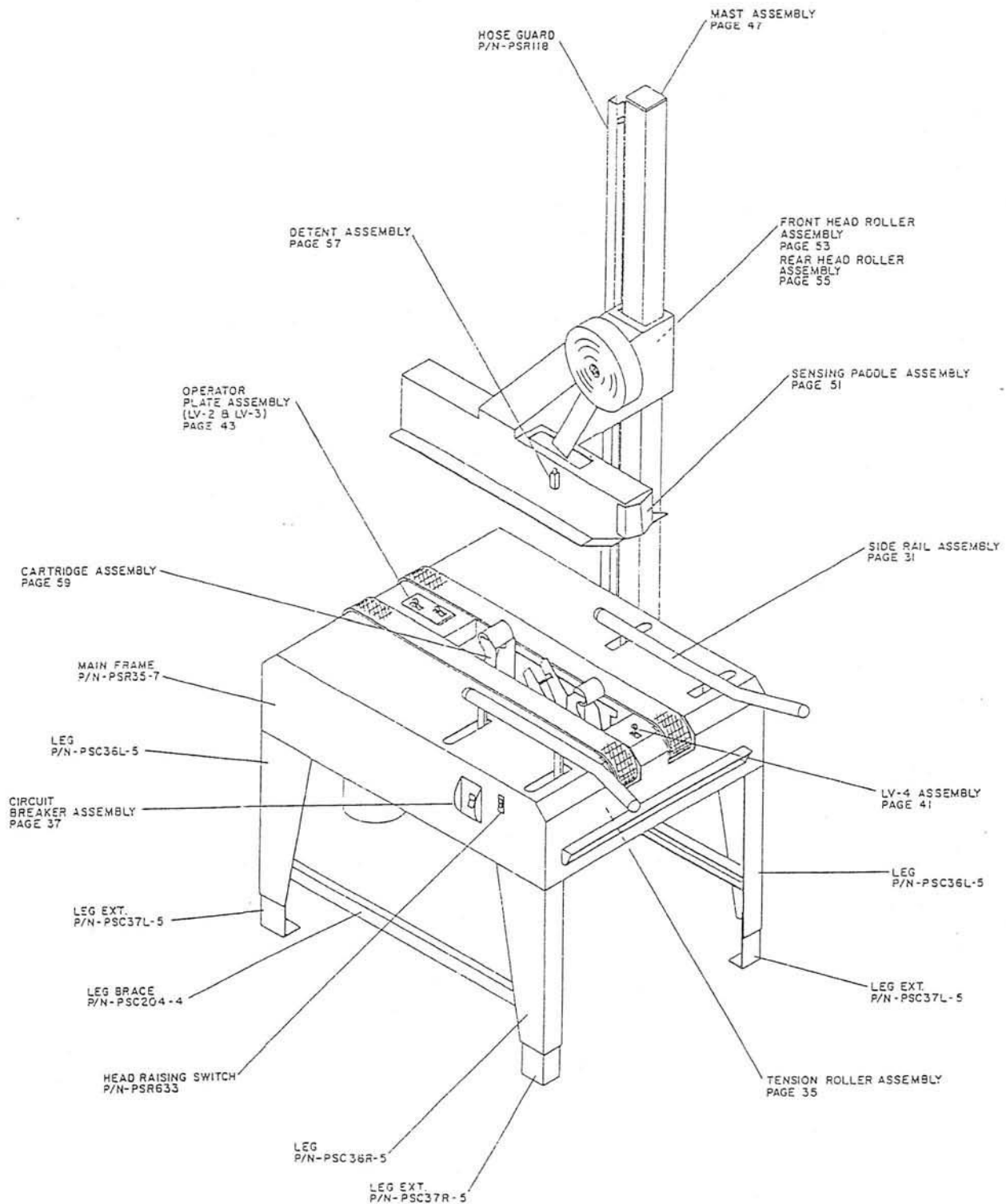
The machine should be placed on a flat level floor so that it does not rock. An optional infeed table can be installed at the infeed end of the machine where the packer can fill the boxes and close the flaps prior to feeding the boxes into the machine, however, a conveyor may be used instead. A conveyor should be provided at the outfeed end of the machine to receive the boxes as they are discharged from the machine. IMPORTANT: BE SURE THE TABLE AND CONVEYOR ARE $\frac{1}{2}$ " (6mm) BELOW THE MACHINE BELT HEIGHT.. Due to its portability and easy plug-in connections, the machine may be quickly moved to various locations as the need arises. Optional castors are available, if required. There are holes provided in the leg extensions for leveling bolts, if required.

Note that the height of the machine can be adjusted from 22" to 33" (560mm to 840mm) in one inch increments by adjusting the height of the leg extensions.

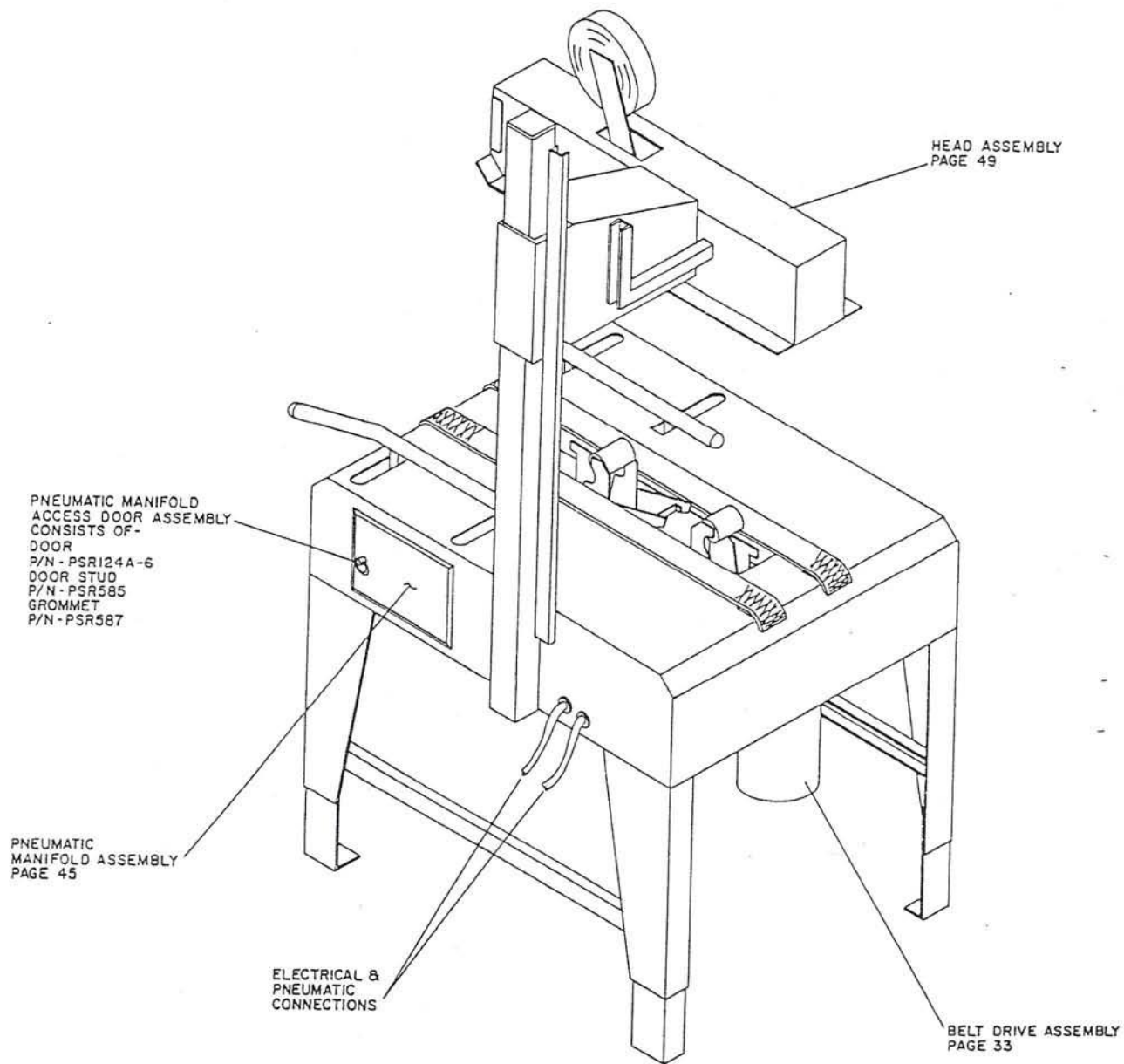
After the tape cartridges are loaded, the machine is ready to seal boxes. Depress the green "ON" button. The red light located on the starter switch will go on and the belts will start moving. Place the head raising switch located to the right of the starter switch in the "DOWN" position or "OPERATE" position, which will bring the head down. The side rails will be open. The machine is ready for operation.

After the operator fills the box, he should fold the flaps in the normal manner and while holding them closed with his hands at or near the rear of the box, he should gently push the box onto the machine table until it butts against the head and depresses the sensing paddle on the front of the head. This will initiate the machine actions. The head will rise to just above the box and descend again on the box as it passes through. Simultaneously, the side rails will come in to center and align the box and the belts will drive the box through the machine. The operator should press the box against the head until it is drawn approximately 2" (50mm) under the head and the belts have taken hold. The flaps will be sealed on the top and bottom, the box will be discharged to the exit table or exit conveyor, and the head and side rails will be reset to their original condition automatically. When sealing small boxes, the operator should avoid placing his hands where the side rails or head contact the box.

MACHINE OVERVIEW - FRONT



LOVESHAW



STARTER SWITCH:

The starter switch is mounted on the front of the machine, see page 6. It incorporates a circuit breaker which is set to trip at the proper rating of the motor, see page 11. To replace this switch, first disconnect the machine from the electrical supply. Remove the switch by loosening the two fastening screws and pull the switch from the electrical box. Remove the wires after first noting their connections to the switch.

To replace the starter switch, reverse the above procedure.

HEAD RAISING SWITCH:

The head raising switch is a pneumatic switch mounted just to the right of the starter switch. When in the "UP" position, the head raises up; when in the "DOWN" position, the head drops down. The switch is placed in the "UP" position when loading the top tape cartridge, or clearing a box jam.

To replace this switch, first disconnect the main air supply. Remove the front panel retaining nut and then remove the switch from inside the main frame. Pull the two pneumatic tubes from their fittings. Reverse the procedure to replace the switch.

LV-2 and LV-3 CONTROL SWITCHES:

There are two control switches mounted between the belts at the outfeed end of the machine. These switches are operated when depressed by the box as it passes over them.

LV-2: This switch is the first encountered by the box as it leaves the machine. When depressed alone, nothing happens; when the box leaves this switch, the head raises. This switch works in conjunction with LV-3.

LV-3: This is the second switch encountered by the box as it leaves the machine. When depressed alone, nothing happens; when the box leaves this switch, the head goes down to its lowest position.

To check the function of LV-2 and LV-3, turn machine off. Depress LV-3 and the head should rise. Release the switch and the head should drop down. When LV-2 is depressed, LV-3 should not function.

To replace either switch, proceed as follows:

1. Remove three screws holding mounting plate and lift plate and switches out.
2. Remove tubes from switch after noting their connections.
3. Remove two fastening nuts and remove switch.
4. Reverse procedure to replace switch. Be sure to replace tubes to proper fittings.

SIDE RAILS:

The side rails center and align the box as it is being processed. They remain in the "out" or "open" position until LV-4 is depressed and they close on the box and automatically center it. The amount of pressure that they exert on the box is controlled by R2 (see page 13). This pressure should be adjusted to the minimum necessary to center the heaviest box well. The side rails automatically open when the box leaves LV-4.

If problems are being experienced with the side rail system, check that there is sufficient main air pressure, that R2 is properly set and that LV-4 is operating normally. Note that there is a speed control, SV-2 on the LV-4 valve which controls the speed with which the side rails open. This should be closed just enough to prevent the side rails from slamming as they open. If the side rails do not open properly, check SV-1.

If a side rail needs replacing, remove the two screws in the top of the side rail and replace with new one. Securely retighten screws when replaced.

If the side rail cylinder must be replaced, disconnect the air and electricity. Turn machine on its side supporting it with a wooden block or box, remove bolt through cylinder clevis and nut and bolt at the cylinders fixed end. Remove two pneumatic tubes noting their connections. Remove bumper, washer, clevis and nut from defective cylinder. When replacing cylinder, reverse procedure. When replacing nut and bolt at the fixed end of cylinder, allow a small amount of play between bolt and cylinder end, then firmly tighten nut to lock the bolt. Be sure to reconnect two pneumatic tubes. After reassembling, open side rails fully and measure the distance from the inside of one side rail to the edge of the cartridge well. The distance should be 8 3/8" (213mm). To adjust, screw cylinder rod into or out of clevis. After making adjustment, tighten lock nut firmly against clevis.

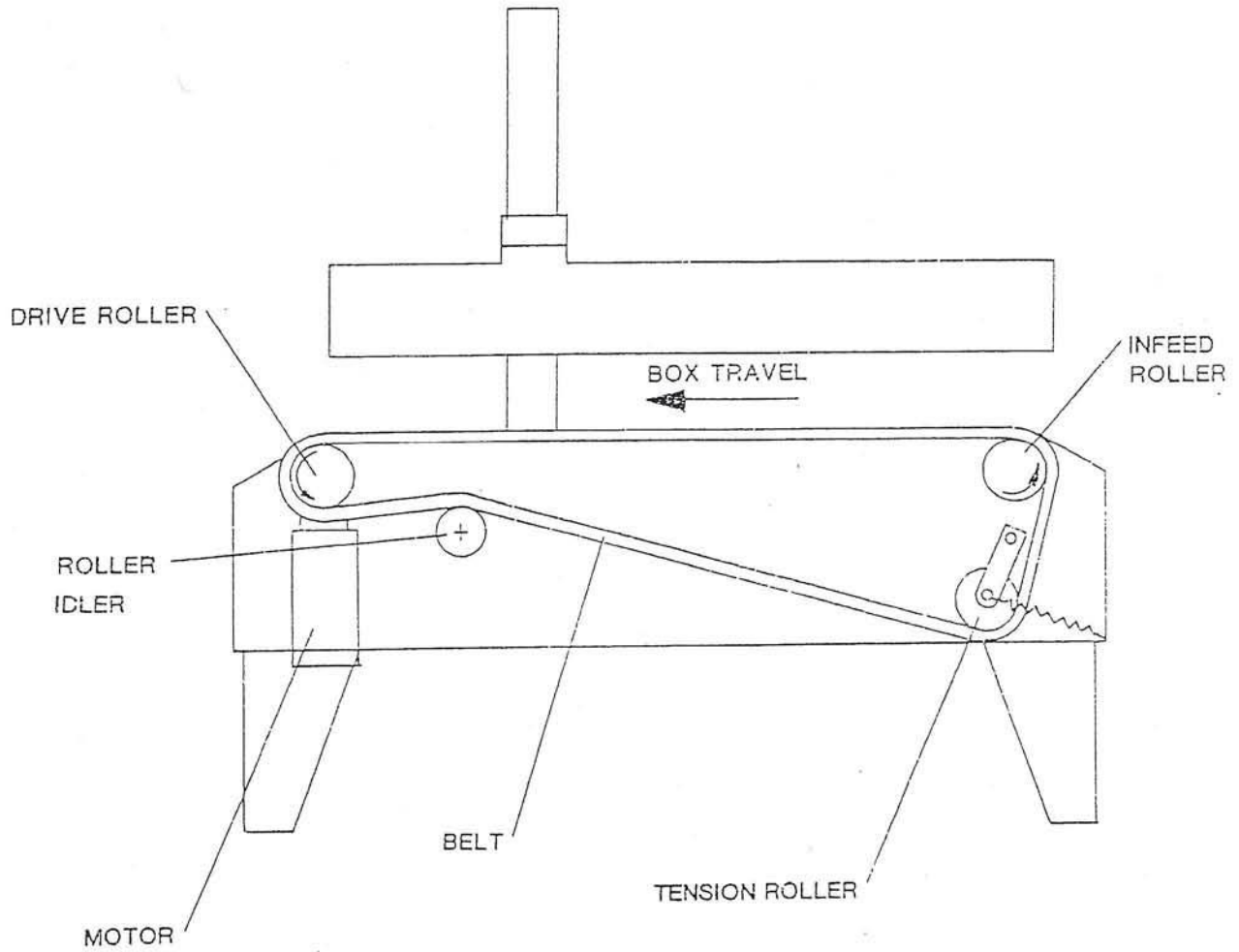
BELTS:

The box is driven through the machine by two belts located on the bed of the machine. The belts run over a drive roller at the discharge end of the machine, then threaded over the infeed rollers. It is important that only factory supplied belts are used since they are of special construction.

To replace a belt, unhook the two tensioning springs from the belt idler roller. Pull the lacing pin from the belt. Remove the old belt and replace with new one using the belt threading diagram on page 10. Make sure that springs on the tension roller bracket are in place.

Each belt is replaced separately, however, it is recommended that both belts be replaced at the same time.

BELT THREADING DIAGRAM



The electrical system consists of the drive motor which incorporates a fractional hp A.C. motor and the starter switch. The motor and frame are grounded through the electrical connector.

The circuit breaker is factory set. If it trips, a qualified electrician should check the electrical system, then reset the circuit breaker.

The belts are driven by the drive motor on the discharge end of the machine. The motor is controlled by the starter switch in which the heater is factory set to the proper trip setting to protect the motor.

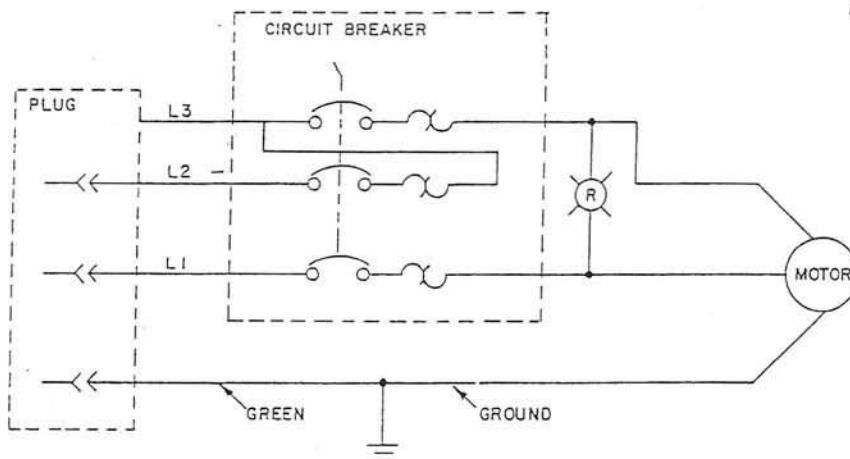
If trouble is being experienced with the drive motor, a qualified electrician should first check the starter switch, then the electrical system.

To replace the drive motor, proceed as follows:

- Disconnect the electrical connections.
- Remove motor from gear reducer, replace motor.
- To connect motor, refer to wiring diagram in motor junction box.
- Check motor for proper rotation.

ELECTRICAL DIAGRAMS

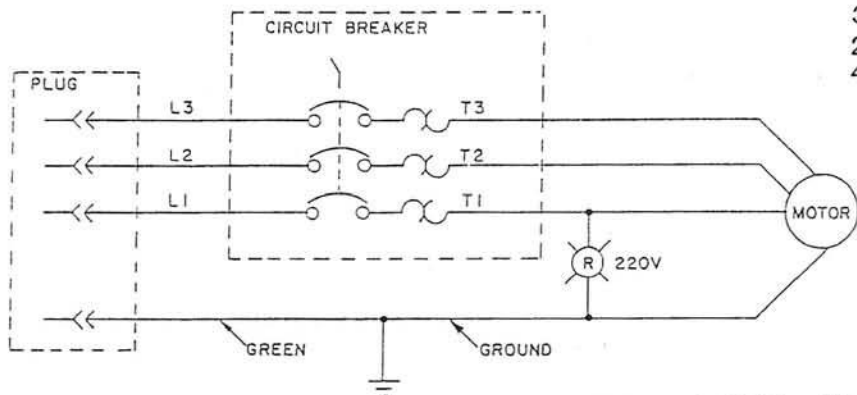
115V/1/60
220V/1/50



TO CONNECT MOTOR
SEE DIAGRAM IN
MOTOR JUNCTION
BOX OR ON MOTOR

LINE	PHASE	HERTZ
115V	1	60

190V/3/50
380V/3/50
230V/3/60
440V/3/60

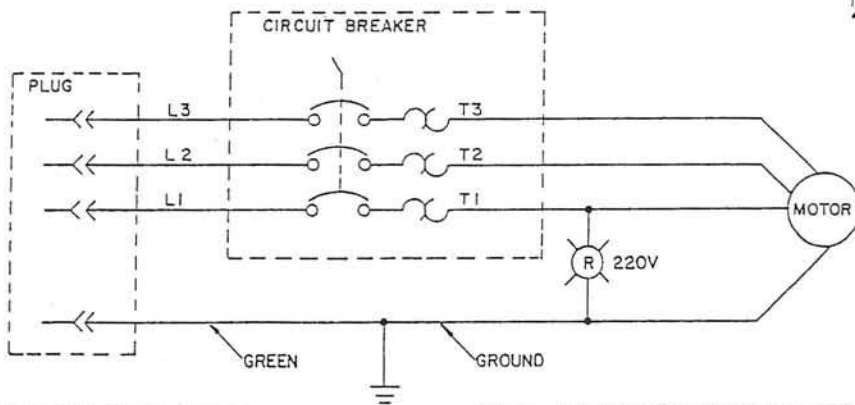


TO CONNECT MOTOR
SEE DIAGRAM IN
MOTOR JUNCTION
BOX OR ON MOTOR

LINE	PHASE	HERTZ
440V	3	60
380V	3	50

NOTE - TO REVERSE, SWITCH L1 AND L2

400V/3/50
440V/3/50



TO CONNECT MOTOR
SEE DIAGRAM IN
MOTOR JUNCTION
BOX OR ON MOTOR

LINE	PHASE	HERTZ
440V	3	50
440V	3	50

NOTE - TO REVERSE, SWITCH L1 AND L2

All machine operations on the LD2D are pneumatically operated with the exception of the belt drive system. The pneumatic panel located on the rear of the main frame (see page 7) and can be accessed by opening the pneumatic panel door. It is necessary to connect the machine to an air supply of sufficient volume and with a minimum pressure of 65psi (4.5kg/cm). If the air supply is insufficient and the pressure drops excessively during operation, it is recommended that a small accumulator be placed in the air supply adjacent to the machine. The main air pressure regulator, R1, the lubricator, L1, and the filter, F1, are located on the left hand side. The filter removes excess moisture and dirt from the air and automatically drains water out when full. A pan may be placed on the floor beneath the filter to catch this water, or if desired, a 3/8" (10mm) I.D. tube may be connected to the bottom outlet of the filter and then connected to a drain.

The lubricator glass should be checked periodically and filled with a non-detergent SAE-10 oil to the fill line. To fill the lubricator, proceed as follows:

1. Disconnect air.
2. Unscrew plastic cup on bottom of lubricator and fill cup with oil to fill line.

The usage rate of the lubricator can be observed through the plastic viewport at the top and it may be adjusted by turning the slotted adjustment screw located on the front of the lubricator. Turning the screw to the "+" mark will increase the rate of lubrication and turning it to the "-" mark will decrease the rate of lubrication. To check for proper lubrication, it is advisable to bring the head up and down thirty to forty times by pressing the sensing paddle or the operator plate. After the head has moved thirty to forty times throughout the full stroke of the cylinder, one drop of oil should drip out of the oiler.

Pressure regulator R3 controls the downward pressure of the head against the box. This regulator can be adjusted by turning its knob clockwise to increase the pressure. The pressure should be zero or the minimum necessary so that the lightest box being processed will be driven through the machine by the belts without slipping. Higher head pressure will give more traction between the box and the belts. The head down pressure can also be used to stabilize unstable boxes by holding the box firmly against the belts.

NOTE: Pressure regulator R3 is factory set to zero and should only be changed if absolutely necessary. Do not adjust the pressure higher than 10psi (.6kg/cm).

The pressure for raising the head is the full pressure as set on the main pressure regulator R1 and is not affected by the setting on pressure regulator R3.

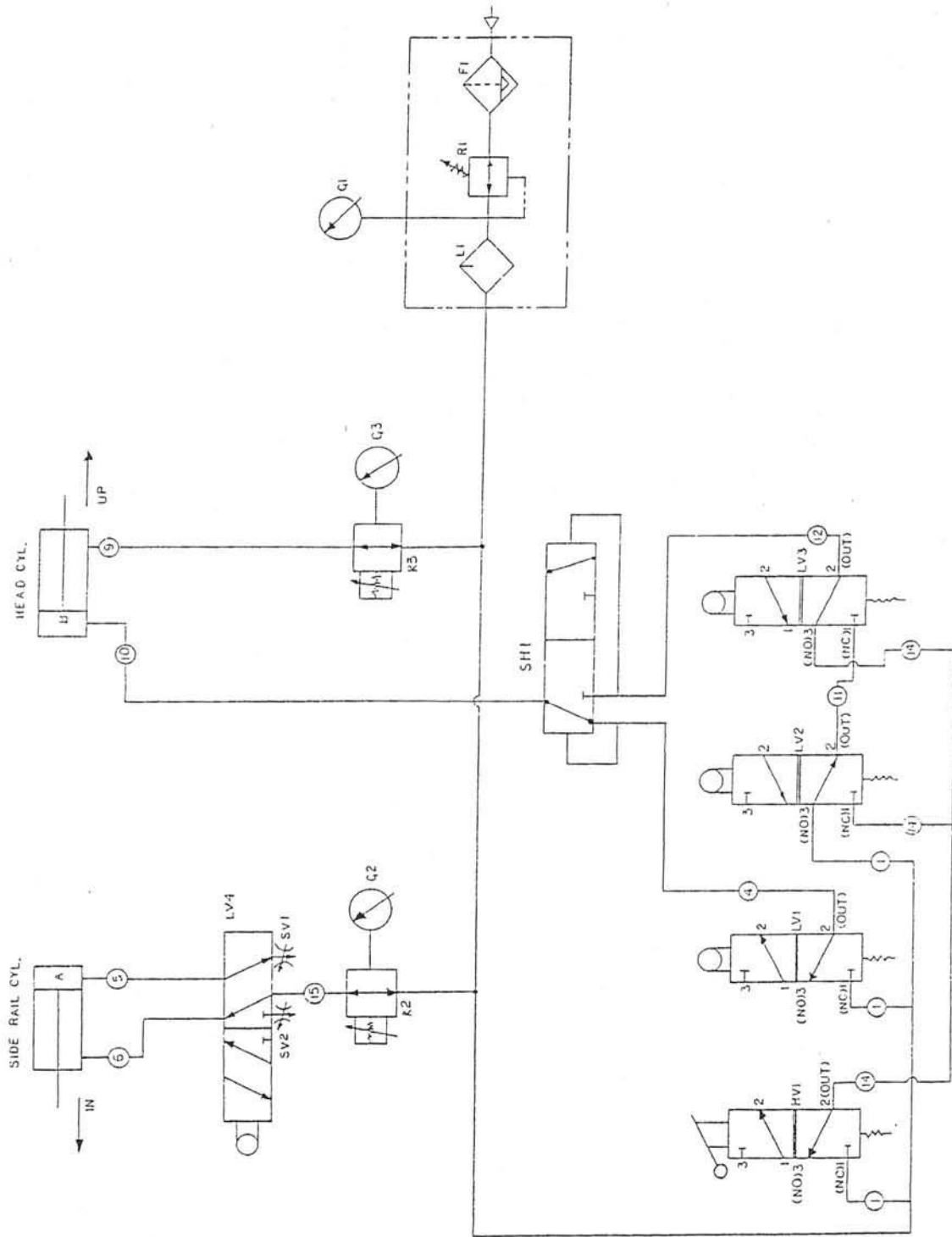
Pressure regulator R2 sets the pressure on the side rails for both opening and closing. The pressure setting should be just high enough to ensure that the heaviest box is properly centered. Excessive pressure will increase the friction on the box as it is traveling through the machine and should be avoided.

The distance that the head rises above the box is adjustable by regulator R1. Turning the knob clockwise will increase the distance. The head should be adjusted so that it rises approximately 1" (24mm) above the box so that the box can easily be inserted underneath the head.

The speed with which the side rails open and close is adjusted with SV1 and SV2 speed controls. SV1 and SV2 are located on valve LV4. Turning these speed controls clockwise will reduce the speed; and turning them counterclockwise will increase the speed. The setting should be adjusted so that the side rails do not slam against the stops. If the side rails do not open properly, SV1 and SV2 should be checked. It is possible that they are closed too far.

The following is a description of the pneumatic functions during the box sealing sequence:

- As the box enters the machine, LV4 is depressed, closing the side rails and connecting line 15 to line 5; and line 6 to SV2.
- Now the box depresses LV1, thereby connecting line 1 to line 4. The air is now entering line 4 and going through shuttle valve SH1 to line 10, entering chamber B of the head cylinder. Now the head will raise until the sensing paddle leaves the box. At this time, LV1 is released and the air flow from line 1 to line 4 is interrupted. The remaining air in line 4 is discharged through port 3 of LV1.
- Now the operator has inserted the box underneath the head and the box will start to travel through the machine, depressing LV2 and then LV3. The instant that these valves are depressed, no pneumatic function will occur. The rear edge of the box will now release LV2. At this instance a connection is made from port 3 of LV2 to port 2 and the air out of line 1 will flow through LV2 through jumper 11 into LV3, which is depressed, and thereby connecting line 11 and 12.
- The air therefore will flow to line 12 and go directly to SH1, shifting connections in SH1 so that line 12 will connect with line 10 causing the head to go up until LV3 has been released by the box. When the rear end of the box releases LV4, the air signal to the side rail cylinder is reversed, thereby opening the side rails.
- The function of head raising valve HV1 located next to the circuit breaker, is as follows:
If this valve is activated, the air will flow from line 1 on port 1 of this valve to line 14 connected to port 2. It will go through line 14 and flow to port 3 of LV3. The air will then go to port 2 and enter line 12, it will go to SH1 and automatically connect line 12 to line 10, which will pressurize chamber B of the head cylinder, causing the head to go up. The head will remain in the up position as long as HV1 is activated. As soon as HV1 is de-activated, the head cylinder will reverse since the pressure out of line 4 will be relieved and the head will go to the down position.



The head rides along the mast on eight ball bearings. Mounted on the infeed end of the head is the sensing paddle which initiates the machine actions when a box is pressed against it. When the machine is in the operating mode, the head is in its lowest position. When loading tape, the head is set in its upper position by means of the head raising switch. The head is driven up and down by means of an air cylinder mounted inside the mast.

The head motion is controlled by the pneumatic system so that it is driven up by the full pressure as set by the main pressure regulator R1, and is driven down under the control of pressure regulator R3. R3 should be set so that the pressure of the head on the top of the box is just sufficient to prevent the lightest box being processed from slipping against the belts. Normally, a pressure setting of 0 is satisfactory.

SENSING PADDLE:

A pneumatic switch, LV-1, is mounted inside the head behind the sensing paddle. Depressing this switch starts the machine actions by raising the head. To replace this switch, first disconnect the air supply and then remove the sensing paddle by removing the retaining rings, washers, and shafts holding it. Remove the two mounting screws on the pneumatic switch after which the switch can be removed from inside the head. Refer to page 52 to reassemble. Remove the two pneumatic tubes by pulling them straight out of the fittings. Replace the switch by reversing the above procedure.

ROLLERS:

If any of the rollers which run against the mast need to be replaced, proceed as follows:

- Disconnect electrical supply. Place a sturdy box or block on bed of machine and lower head onto it.
- Remove cover from back of head to expose rollers. Loosen outside nuts on threaded shaft.
- Back off nuts between rollers while turning threaded shaft with a screwdriver until defective roller can be removed.
- Reverse above procedure to replace roller.
- The front rollers are accessible through the bottom of the head.

Whenever the rollers have been changed, the clearance between the head and the mast must be re-adjusted. The clearance between the teflon slides and the sides of the mast should be adjusted to approximately .020" (.5mm). This should be checked through the masts full range of travel to insure that this clearance exists at the high points.

The clearance between the rollers and the front and rear surfaces of the mast should be such that the head moves freely and does not cock or sag. To adjust the clearance, proceed as follows:

- Remove cover from rear of head.
- Adjust clearance of teflon slides from sides of mast by loosening left nut on threaded shaft located on the outside of head, and tighten nut located against inside of roller a corresponding amount. This has the effect of spreading open the sides of the head. Adjust the front and rear threaded shafts together to keep the teflon slides parallel to the mast. First adjust the upper pair of shafts then the lower pair.
- Move head through its full travel and check that teflon slides have proper clearance at the high points.
- Next adjust the fore and aft adjustment screws. These are the set screws that are located in the four blocks to which the head cover is mounted. Turning them clockwise will move the adjacent rear rollers in toward the upright. They should be adjusted so that the roller just clears the mast. Loosen the four outside nuts of the two rear threaded shafts before making this adjustment so that the shafts can move in their over-sized holes. Be sure to tighten the outside nuts after adjusting. When properly adjusted, the head will be parallel to the bed of the machine and will not cock on the mast and the rollers should run freely.
- Move the head through its full travel and check that there is proper clearance at the high points.
- Replace head cover.

HEAD CYLINDER:

The head is driven up and down by the head cylinder mounted inside the mast. The head is driven up by the full air pressure as set by the main pressure regulator R1. This pressure should not be less than 65psi (4.5atm) and of sufficient volume. The head is driven down under control of pressure regulator R3.

If trouble is being experienced with the head, check the pneumatic system first. If the head does not rise or rises too slowly, check the main pressure regulator R1 to ensure this pressure is available on the gage and that the pressure does not drop off as the head moves. If this problem is being experienced, check the air supply and if necessary, install an accumulator in the air supply near the machine. Also check the head raising adjustment.

If the problem is being experienced with the box slipping against the belts, first check for obstructions to the box travel, then increase the setting of pressure regulator R3.

If the cylinder still does not seem to be operating properly, it should be replaced. However, always check the pneumatic system for proper operation and also check the rollers that ride along the mast before replacing cylinder.

To replace the head cylinder:

Refer to page 47 to locate parts:

1. Disconnect air and power to machine.
2. Dump any remaining air by operating the head raising switch several times.
3. Lay machine on its control side with wood blocks under it so as to protect the controls, etc.
4. Pull head to the top of the mast and place a wood block under it for support.
5. Remove mast cap from top of mast.
6. With a pair of pliers, reach into top of mast and remove spring clip on clevis pin.
7. Slide clevis pin to the right until L-arm disengages from clevis.
8. Remove two screws holding cylinder mount at base of mast.
9. From the bottom of the mast, slide cylinder mount and cylinder out of mast until lower air connections are exposed.
10. Remove tubing from lower air connection.
11. Slide cylinder out further until the upper air connection is exposed.
12. Remove tubing from upper air connection.
13. Remove cylinder and cylinder mount completely.
14. Remove clevis, washer, jam nut and rubber bumper from cylinder rod.
15. Carefully note placement of washers between fixed end of cylinder and cylinder mount. Remove retaining nut, cylinder mount and washers. Note that retaining nut has a set screw which must be loosened.
16. Reassemble cylinder mount, washers and retaining nut on new cylinder. Be sure to reassemble washers in the same order in which they were removed. Tighten retaining nut - hand tighten only.
17. Assemble rubber bumper, clevis, lock nut, and washer on cylinder rod. Thread cylinder rod 1/2" (13mm) into clevis before tightening lock nut.
18. Extend cylinder rod fully, line up clevis with L-arm at top of mast and insert cylinder into mast with upper air connection in upper left corner of mast.

19. Connect tube to upper air connection, then insert cylinder further until lower air connection tube can be connected.
20. Insert cylinder fully, lining up clevis and L-arm with a screw driver, if necessary.
21. Insert clevis pin.
22. Slide spring clip onto end of connecting pin.
23. Line up cylinder mount and insert two retaining screws in mast. Firmly tighten retaining nut on bottom on cylinder. Tighten set screw in retaining nut.
24. Return machine to upright position and reconnect it to air and electricity. Check its operation.

NOTE: If the head does not go to its highest or lowest positions and it is desired to readjust the travel, proceed as follows:

Determine the direction and amount of correction needed. Note that correcting at one end of the head travel will cause a corresponding change at the other end. Turn off air and power and remove the two retaining screws on the cylinder mount. Drop the end of the cylinder until it is clear of the bottom of the mast. Remove the retaining nut and rearrange the washers as required to adjust the cylinder up or down. Reassemble and refasten the cylinder mount in the mast.

The illustration on page 59 shows the tape cartridge. The top and bottom tape cartridges are identical and interchangeable. Refer to pages 21 and 22 for instructions on removing the cartridges and loading the tape. The cartridge will accept pressure sensitive tape rolls varying in width from 1½" to 2" (40mm to 50mm) and with a maximum diameter of 15" (375mm).

TAPE CORE:

The roll of tape is retained on the tape core by two springs pressing against the inside of the tape roll. The drag of the tape core is adjusted by turning the knurled adjustment nut. Turning the adjustment nut clockwise or counterclockwise will increase or decrease the drag. This adjustment should always be the minimum necessary to prevent the tape from overrunning. Too much drag, especially with stretchy tape, may result in poor taping, bad cutoffs, tape snapbacks, or jams.

The width adjustment screw is used to center the tape. This is the slotted screw located in the center of the tape core.

WIPE DOWN ROLLERS:

The rubber wipe down rollers wipe down the tape as the box passes through the machine. The pressure exerted by the roller is adjustable by changing the position of the main spring to different hole on the cartridge tie bar. The pressure should be no more than necessary to obtain a good wipe. It should be reduced for boxes with compressible contents if the flaps are being depressed excessively during wiping.

KNIFE:

The knife is normally self-cleaning. If it should accumulate a deposit of adhesive, it may be cleaned with an oily rag. Be careful when handling the knife as it is very sharp.

When the knife becomes dull, it should be replaced or resharpened. When replacing the knife, mount the knife so that the center hole matches the center pin on the knife arm. Then fasten the clamping plate with the (2) M5 x 8 fastening screws.

Resharpen the knife by lightly grinding across the back of the teeth removing about .010" (.3mm) of material. This should be done only with a surface grinder. Do not grind below the base of the teeth. Be careful not to overheat the knife since it is heat treated.

The knife arm should project 1 7/8" (48mm) below the box line. This dimension may be adjusted by turning the knife stop.

GUIDE PLATE:

The tape is guided to the front roller by the guide plate. The flat portion of the guide plate must be tangent to the roller for proper operation. This is adjustable by rotating the eccentric stop that it bears against. The eccentric stop is an off-center spacer fastened with a hex screw.

FINGER PLATE:

The finger plate presses against the adhesive side of the tape and forces the tape to take the shape of the guide plate for stiffening. It is important that the fingers just make contact with the guide plate when there is no tape. If the guide plate is pushed back, the finger plate should move. If an adjustment is necessary, gently bend the fingers near the points. Only bend a small amount at a time and check the result before making a further adjustment.

The top and bottom tape cartridges are identical and may be interchanged. Both cartridges are removeable from the machine but only the lower cartridge must be removed to load the tape.

REMOVING BOTTOM CARTRIDGE:

CAUTION: WHEN HANDLING CARTRIDGES AVOID CONTACT WITH SERRATED KNIFE - IT IS VERY SHARP.

- Raise head to its upper position.
- Standing at the control side of machine, grasp cartridge at points "A" and "B", see page 59.
- Lift cartridge clear of machine raising left end (point "A") slightly higher than right end.

REPLACING BOTTOM CARTRIDGE:

- Grasp cartridge at points "A" and "B" with tape roll down and lower it into place with right end (point "B") slightly lower than left end.

REMOVING TOP CARTRIDGE:

- Raise head to its upper position.
- Standing at the control side of the machine, release the detent plate on head with left hand, and with right hand slide cartridge to the right as far as it will go while pressing **upward** at point "B" with right hand.
- While still supporting cartridge with right hand, transfer left hand to point "A". Lower cartridge by dropping right end (point "B") slightly lower than left end until cartridge is clear of head.

REPLACING TOP CARTRIDGE:

- Grasp cartridge at points "A" and "B" with tape roll up.
- With left end higher than the right, raise cartridge until it is seated.
- Slide cartridge as far to the left as it will go. Check that detent plate has engaged in the slot in cartridge.

LOVESHAW

BOTTOM CARTRIDGE MUST BE REMOVED BEFORE PERFORMING THE FOLLOWING TASKS.

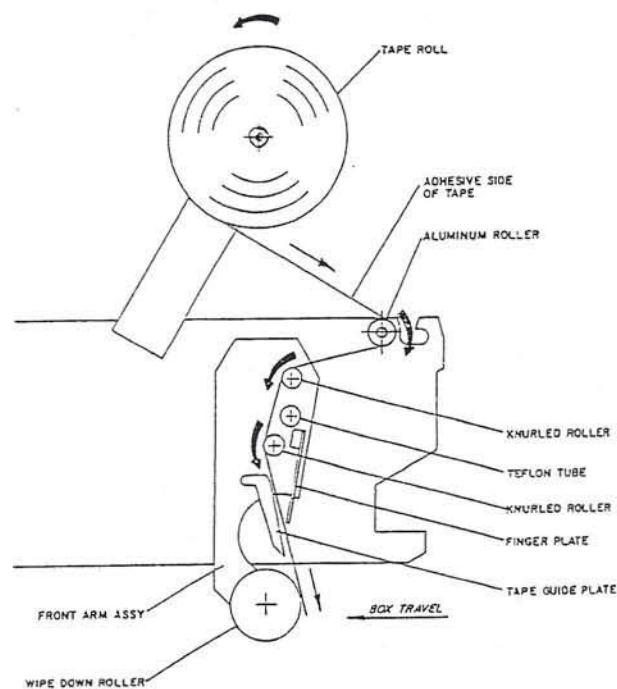
INITIAL LOADING OF TAPE:

- Push tape roll onto tape core with tape feeding counterclockwise. Tape roll should be pushed to the back of the tape core. If the tape roll width is less than 2" (50mm) adjust the tape core, see page 20.
- Fold back about 12" (304mm) of tape and stick it to itself to form a leader. Thread tape as shown on Tape Threading Diagram below. There is also a tape threading decal located on the top and bottom cartridge frames.

SPLICING PROCEDURE:

- With a pair of scissors, cut tape on expiring roll where tape feeds into cartridge. Remove butt roll of tape from tape core.
- Install a new roll of tape onto tape core with tape feeding counterclockwise.
- Splice a $\frac{1}{2}$ " lap to cut end of tape. Pull tape through cartridge until splice is out of cartridge. Cut splice off.

TAPE THREADING DIAGRAM



LOVESHAW

All mechanical parts of the LITTLE DAVID are permanently lubricated and sealed bearings are used throughout.

The reducer uses 600W cylinder oil, and should not be filled more than half way.

The mast should be cleaned and sprayed with a silicone lubricant - this should be done on a weekly basis to insure free movement of the head.

The lubricator uses 10W non-detergent oil. One drop should fall from spout after cycling machine 30-40 times.

TAPING DIFFICULTIES:

TAPE DOES NOT ADHERE WELL TO BOX:

1. Check that box is not waxy or oily.
2. Check that box is properly cut and scored so that flaps do not overlap. If the tape adheres to the top and bottom but not to the end panels, the box may be skewed forming a parallelogram. If this condition exists, bring it to the attention of your box supplier.
3. Check the pressure on the wipe down rollers. See page 20 to increase the tension of the main spring.
Check that spring is not broken.

TAPE END STICKS TO ITSELF OR MECHANISM:

1. Check that there is not too much drag on the tape causing stretching and snapback at cutoff. Reduce the tape core drag setting, see page 20.
2. Check the tape threading path. See tape threading diagram on page 22.
3. Check for defective tape roll by pulling off tape manually. The pull should be even and should not vary suddenly.

TAPE BREAKS OR JAMS:

1. Check the tape by pulling off manually. The pull should be even and should not vary suddenly. Check the tape core drag setting, see page 20.
2. Check the tape threading path. See tape threading diagram on page 22.
3. Check for nicks in edge of tape roll. Pull off damaged tape.

TAPE WRINKLES:

1. Check the tape by pulling off manually. The pull should be even and should not vary suddenly.
2. Check the pressure of the rollers. Too much or not enough pressure may cause wrinkles. Pressure that is too high may depress the flaps causing problems. See page 20 to adjust the pressure.

3. Check that the rollers turn freely on their shafts.
4. Check the contents of the box. Partially full boxes or very compressible contents may allow the flaps to depress excessively causing wrinkles.
5. Check the drag of the tape. Too much drag may cause problems. Too little drag may cause overrunning of the tape roll. Adjust the tape core drag setting, see page 20.
6. Check that the tape is properly threaded and the tape core is properly centered, see page 20.
7. Check the pressure of the head against the box. If the pressure is insufficient, the box may slip against the belts and hesitate as it is being fed through the machine.
8. Check that the belts are not slipping.
9. Check adjustment of the guide plate and finger plate, see pages 20 and 21.

TAPE HAS LENGTHWISE SCRAPES OR CUTS:

1. Check knife setting, see page 20.

BOX PROBLEMS:**BOXES JAMMING IN MACHINE:****JAM CLEARING PROCEDURE:**

1. Stop machine.
2. Move the head raising switch to the "UP" position to raise the head.
3. Remove jammed box. Cut tape flush with end of rollers.
4. Move the head raising switch back to "OPERATE" position.
5. Press the "ON" button. Machine is now ready to process the next box.

INCORRECT BOX SIZE OR SHAPE:

1. Check boxes to make sure the size falls within the limits of the machine.
2. Machine will not process unstable boxes.

CONTENTS BULGING THROUGH TOP OF BOX:

1. Check to be sure the box is not overfilled with contents.

BOX SLIPPING AGAINST BELTS:

1. Increase head down pressure, see page 13.

BOX SLIPPING ON DRIVE ROLLER:

1. Check belt tensioning springs, see page 9.

SIDE RAIL PRESSURE TOO HIGH:

1. Reduce side rail pressure slightly, see page 13.

HEAD PRESSURE TOO HIGH:

1. Reduce head pressure, see page 13.

BOXES TIPPING AT DISCHARGE END OF MACHINE:

1. Check the operation of LV2 and LV3 control switches, replace if necessary, see page 8.
2. Head down pressure too high, see page 13.
3. Main pressure regulator R1 is set too low, see page 13.

BELT DRIVE PROBLEMS:**BELTS DO NOT MOVE:**

1. Check that machine is connected to a live electrical source.
2. If "ON" switch trips out when depressed, check for shorts. Check the drive motor. Check that the trip setting on the circuit breaker in the starter switch is correct.
3. If the circuit breaker trips out only when processing a box, check that the head down pressure is not too high, see page 13.
4. Check for mechanical obstructions to the belt system.

BELTS SLIP:

1. Decrease head down pressure, see page 13.
2. Check belt tensioning springs, replace is necessary. See page 9.

BOX SLIPS AGAINST BELTS:

1. Increase head down pressure, see page 13.

BELTS RUBBING AGAINST FRAME OF MACHINE:

1. Check that belts are positioned correctly in between the belt guide rollers, see page 9.
2. Check for missing belt tensioning springs.

BOX SENSING PROBLEMS:**HEAD DOES NOT RISE WHEN SENSING PADDLE IS DEPRESSED:**

1. Air pressure is too low. Check main air pressure regulator R1 for 65psi (4.5atm) minimum, see page 13.
2. Check that head raising switch is in the "DOWN" or "OPERATE" position.
3. Sensing paddle switch LV1 is defective, replace, see page 16.

HEAD DOES NOT RAISE OR LOWER WHEN HEAD RAISING SWITCH IS OPERATED:

1. Head raising switch is defective, replace, see page 8.
2. Control valve LV3 is defective, replace, see page 8.
3. Head cylinder is defective, replace, see pages 17 and 18.
4. Check head rollers and slides for free operation, see pages 16 and 17.

HEAD DOES NOT RAISE SLIGHTLY AS BOX IS BEING DISCHARGED:

1. Control switch LV2 or LV3 is defective, replace, see page 8.

HEAD REMAINS DOWN ON BACK OF BOX AS BOX IS DISCHARGED, THEREFORE TIPPING BOX:

1. Control switch LV3 is defective, replace, see page 8.

HEAD ACTIONS SLUGGISH:

1. Check main air pressure regulator R1. Pressure should not be less than 65psi (4.5atm). Check that the volume of the air supply is sufficient.
2. Check lubricator. Too little or too much oil can slow down the actions, see page 13.

SIDE RAIL PROBLEMS:**SIDE RAIL DO NOT OPEN OR CLOSE AND HEAD ACTION IS NORMAL:**

1. Check setting of pressure regulator R2.
2. LV4 is defective, replace.
3. Side rail cylinder is defective, replace, see page 9.

4. Check side rails mechanical linkages for free operation.
5. Check speed control SV2 if side rails do not open, see page 9.

SIDE RAIL ACTIONS SLUGGISH:

1. Check main air pressure regulator R1. Pressure should not be less than 65psi (4.5atm). Check that the volume of the air supply is sufficient.
2. Check lubricator. Too little or too much oil can slow down the actions, see page 13.

CASTORS: Part Number - OPC508 - Rigid Castor
- OPC507 - Swivel Castor

Optional castors are available when it is desired to roll the machine to various locations. These castors are bolted through the holes provided in the bottom of the leg extensions. Two of the four castors are fixed and the other two swivel. The swiveling castors should be installed at one end of the machine and are provided with locks which should be always set when the machine is in operation.

HEAVY DUTY CASTORS: Assembly Number - .HDC100B

See page 74 for assembly drawing.

HEAD LIMITER:

See pages 75 to 77 for technical information and assembly drawing.

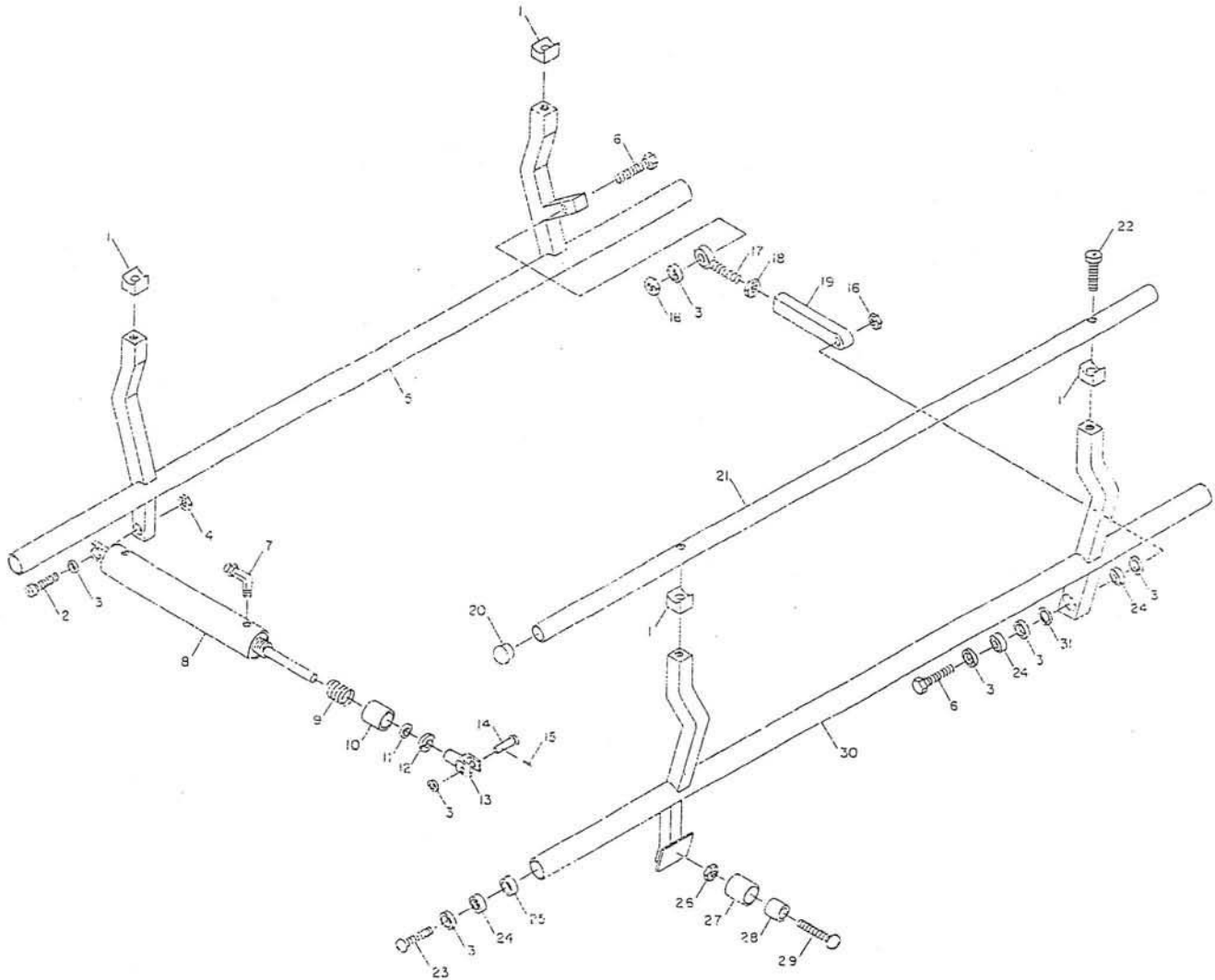
INFEEED TABLE: Assembly Number - .ITA100

This table can be mounted on the front of the machine so the operator can easily fill the boxes before sealing them.

ILLUSTRATED REPLACEMENT PARTS TABLE OF CONTENTS

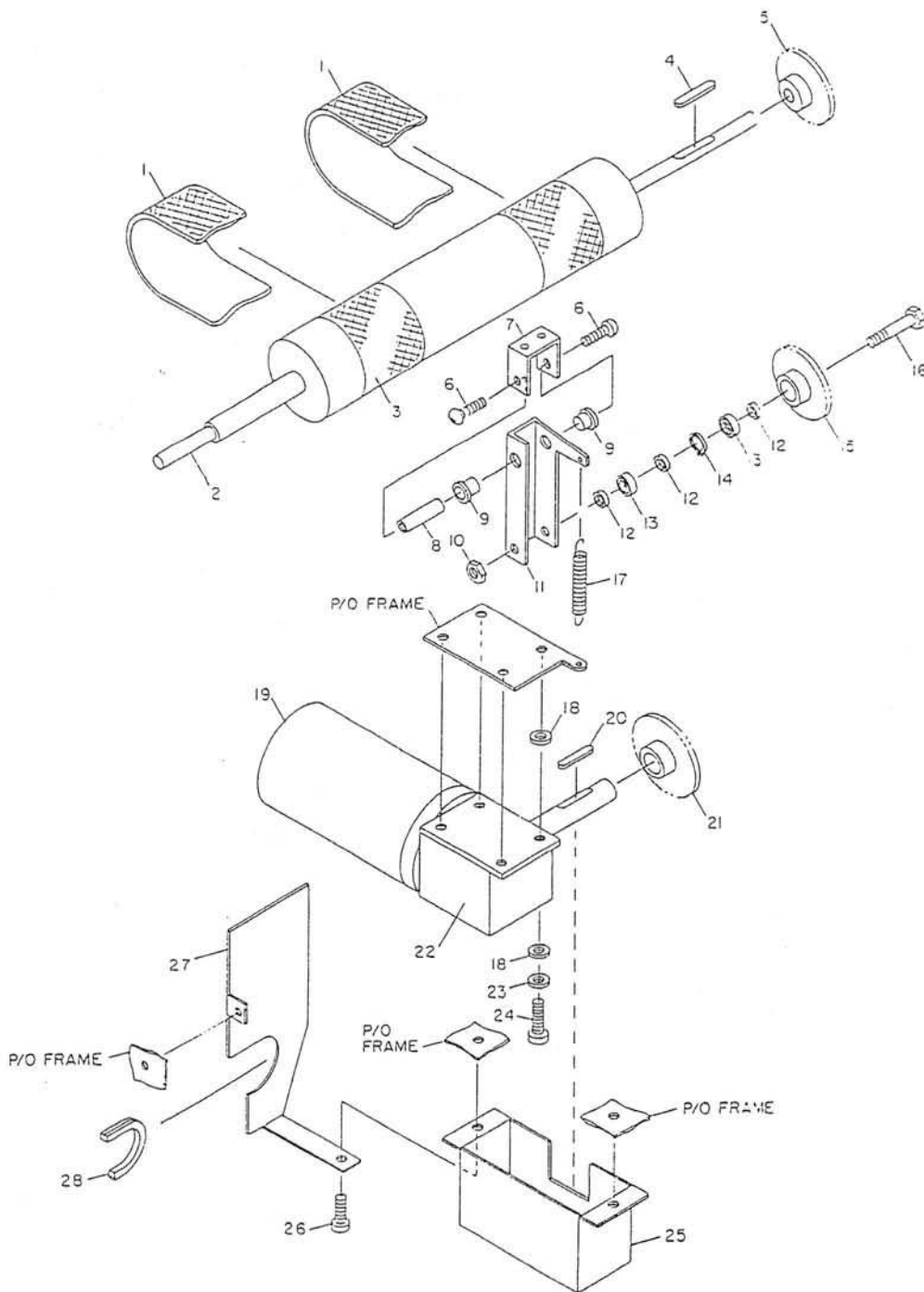
ASSEMBLY	PAGE
SIDE RAILS	31
BELT DRIVE	33
TENSION ROLLER	35
CIRCUIT BREAKERR - 115V	37
CIRCUIT BREAKER - 220V, 380V, 440V	39
LV-4 VALVE	41
OPERATOR PLATE (LV-2 and LV-3)	43
PNEUMATIC MANIFOLD	45
MAST	47
HEAD	49
SENSING PADDLE	51
FRONT HEAD ROLLER	53
REAR HEAD ROLLER	55
DETENT	57
CARTRIDGE OVERVIEW	59
FRONT ROLLER	61
REAR ROLLER	63
KNIFE GUARD	65
TIE BAR	67
KNIFE CARRIER	69
TAPE CORE	71
HEAVY DUTY CASTORS	73
FINGER GUARD	74A
HEAD LIMITER	75

SIDE RAIL ASSEMBLY



KEY	PART NUMBER	DESCRIPTION	QTY
1	PSC212-3	Cradle	4
2	IS1-6-10	Soc. Head 1/4-20 x 1½	1
3	PSC40A-3	Spacer	10
4	IN2-9	1/4-20 Nut	1
5	PSC208L-6	Side Rail Weld. - Left	1
6	MS6M8-45	Hex Head Screw M8 x 45	2
7	PSR636	Elbow Fitting	2
8	PSR101A	Cylinder	1
9	PSR603	Spring	1
10	PSR104-4	Rubber Bumper	1
11	IW10-4	Washer	1
12	PSR101A-3	Cylinder Nut	1
13	PSR101CLA	Clevis	1
14	PSR101CLP-3	Clevis Pin	1
15	HP105	Cotter Pin	1
16	MN2-5	Jam Nut M8	2
17	PSC552	Spherical Bearing	1
18	IN2-12	5/16-24 Nut	1
19	PSC207-3	Connecting Arm	1
20	PSC511	End Cap	4
21	PSR46-6	Side Rail	2
22	MS1M8-10	Soc. Head Screw M8 x 10	4
23	MS3M8-20	Button Head Screw M8 x 20	4
24	PSC613	Ball Bearing	6
25	PSC38-4	Bearing Nut	4
26	MN2-6	M10 Hex Nut	1
27	PSR105-4	Rubber Bumper	1
28	PSR130	Sleeve	1
29	MS3M10-30	Button Head Screw M10 x 30	1
30	PSR171R-6	Side Rail Weld. - Right	1
31	PSC566	Retaining Ring	1

BELT DRIVE ASSEMBLY

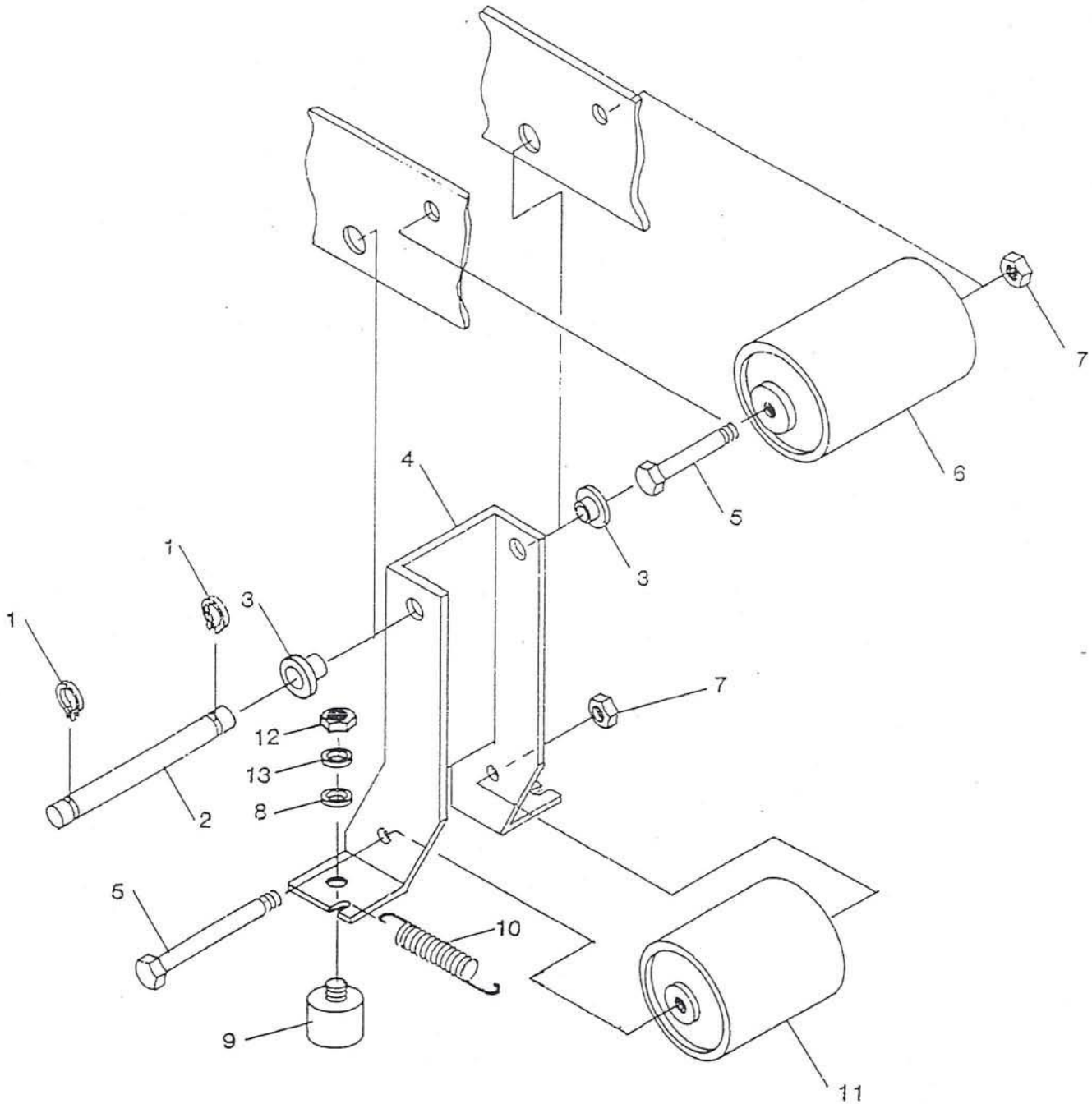


KEY	PART NUMBER	DESCRIPTION	QTY
1	PSC83B-4	Belt	2
2	PSC190A-5	Drive Roller	1
3	PSC614	Belt Lagging	2
4	PSC191A-3	Key	1
5	PSC182A-3	18T Sprocket	1
6	MS3M8-10	Button Head M8 x 10	2
7	PSC183-3	Bracket	1
8	PSC187-3	Pivot Shaft	1
9	PSC633	Nylon Bushing	2
10	MN2-5	Jam Nut M8	1
11	PSC184-4	Idler Arm	1
12	PSC40A-3	Spacer	3
13	PSC613	Ball Bearing	2
14	PSC566	Retaining Ring	1
15	PSC185-3	Idler Sprocket	1
16	MS6M8-30	Hex Head M8 x 30	1
17	PSC629	Spring	1
18	PSC199	Rubber Washer	8
19	*	Motor	1
20	PSC191B-3	Key	1
21	**	16T Sprocket	1
22	PSC634	Reducer	1
23	IW10-4	Flat Washer	4
24	MS1M10-40	Soc. Head M10 x 40	4
25	PSC189A-4	Chain Guard	1
26	MS1M5-16	Soc. Head M5 x 16	2
27	PSR169-5	Chain Guard	1
28	PSC652	Rubber Hose Guard Strip	1

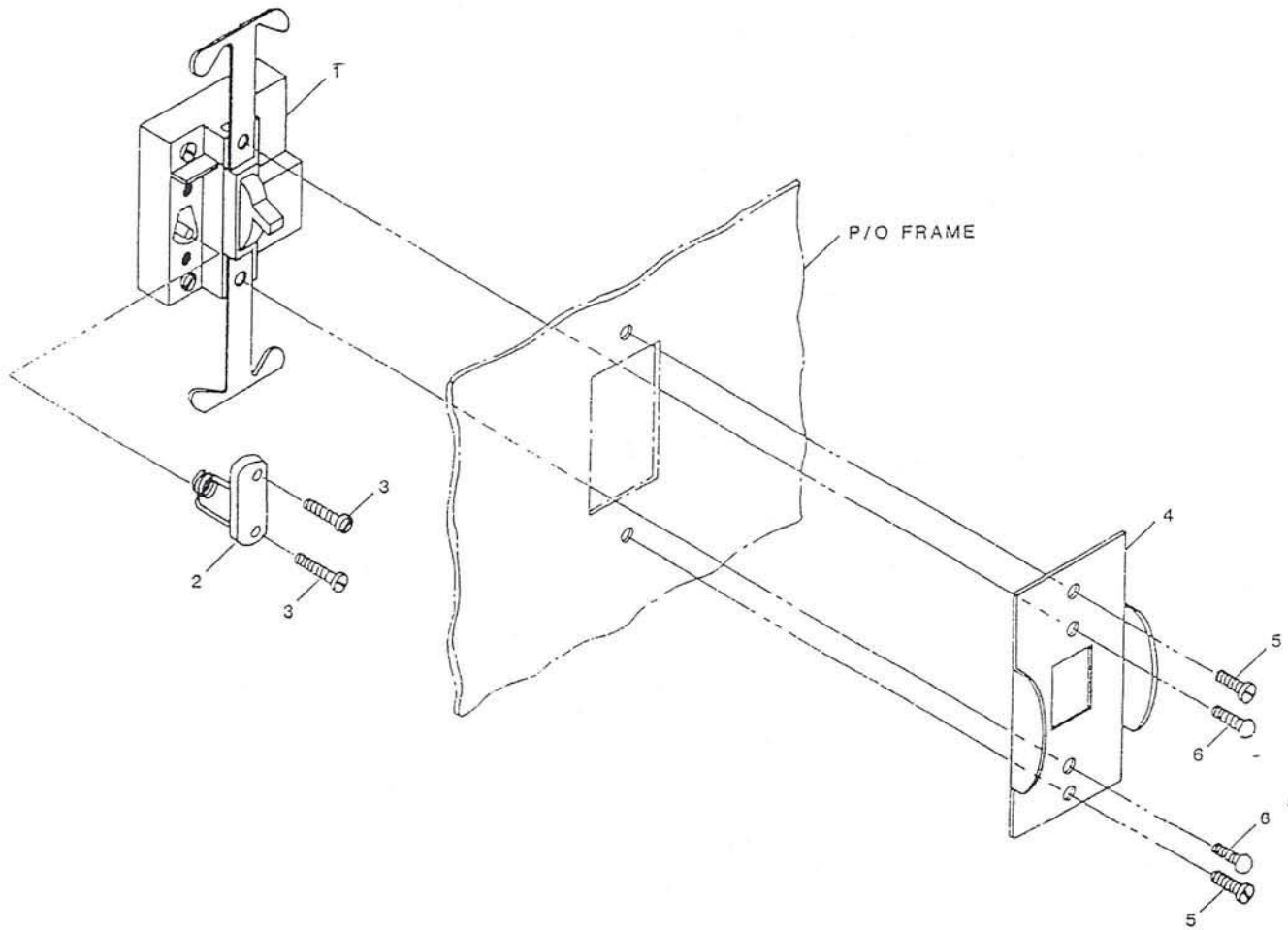
* Use Part Number PSC634A for 115V/1/60 and 220V/1/60
 Use Part Number PSC634B for 220V/3/60 and 440V/3/60
 Use Part Number PSC634E for 240V/1/50
 Use Part Number PSC634BT for 440V/3/50 TEFC

** Use Part Number PSC181-3 for 16T Sprocket on 60 Hz Gear Reducer
 Use Part Number PSC180A-3 for 18T Sprocket on 50 Hz Gear Reducer

TENSION ROLLER ASSEMBLY



KEY	PART NUMBER	DESCRIPTION	QTY
1	PSC641	Retaining Ring	4
2	PSC197-3	Shaft	2
3	PSC21-4	Nylon Bushing	4
4	PSC193-5	Tension Roller Bracket	2
5	MS6M8-120	Hex Head Screw M8 x 120	4
6	PSC196-4	Infeed Roller	2
7	MN1-5	M8 Hex Nut	2
8	MW1-4	Flat Washer M6	4
9	K286D	Belt Guide Roller	4
10	PSC640	Spring	4
11	PSC195-4	Tension Roller	2
12	IN2-9	1/4-20 Hex Nut	4
13	MW2-4	Int. Lock Washer M6	4
	MW2-5	Int. Lock Washer M8	2
	PSC201-4	Tension Roller Guard	2

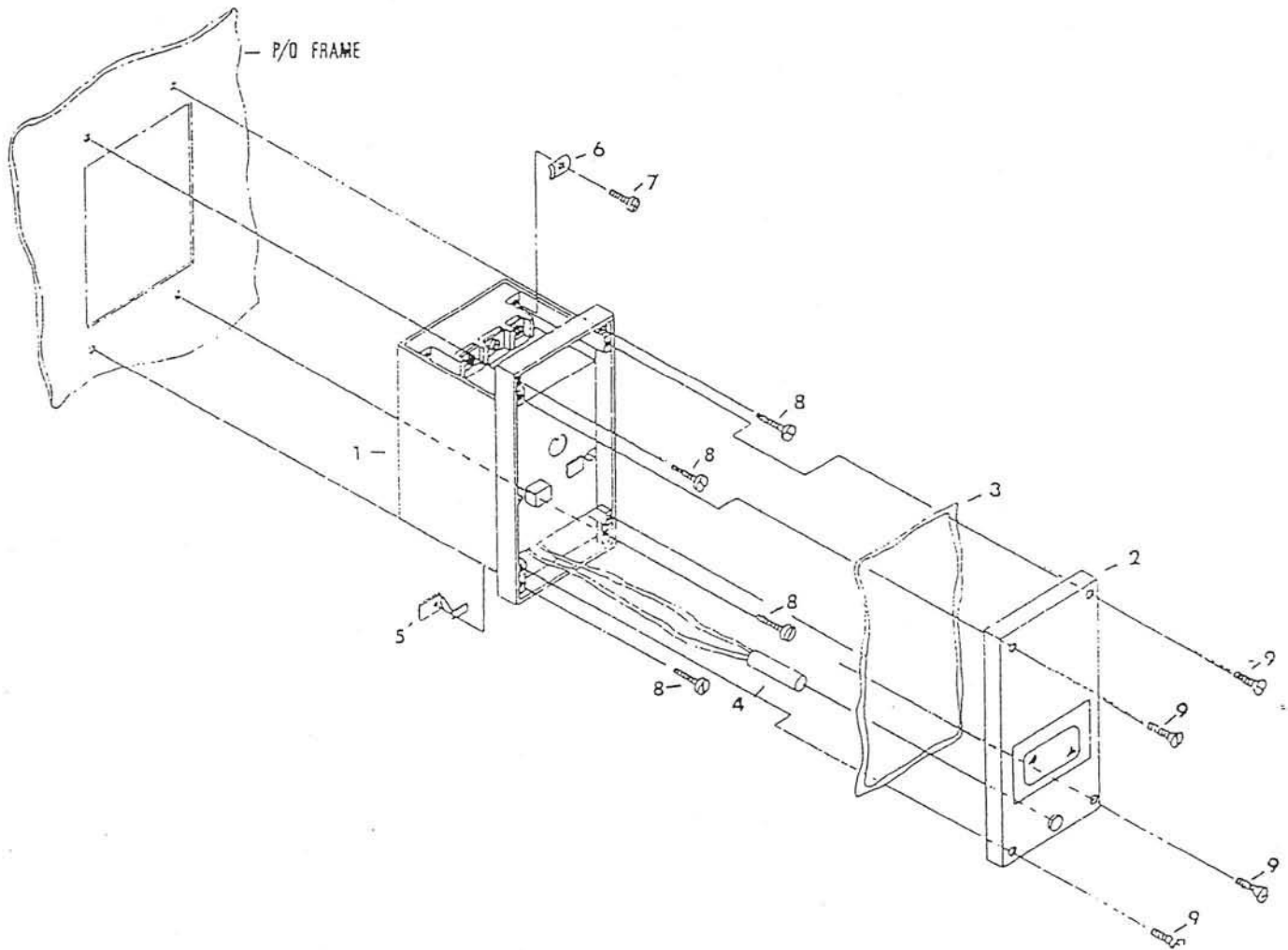


KEY	PART NUMBER	DESCRIPTION	QTY
1	*	Motor Starter	1
2	**	Heater	1
3	---	Screw (supplied with #1)	2
4	PSC188-4	Mounting Plate	1
5	MS7M4-6	Slotted Mach. Screw M4 x 6	2
6	IS9-3-4	6-32 x 1/2 Screw	2

* Use Part Number PSC636 for 115V
Use Part Number PSC301235 for 220V/1/60 and 240V/1/50

** Use Part Number PSC636A for 115V
Use Part Number PSC636B for 220V

CIRCUIT BREAKER ASSEMBLY 220V, 380V, 440V

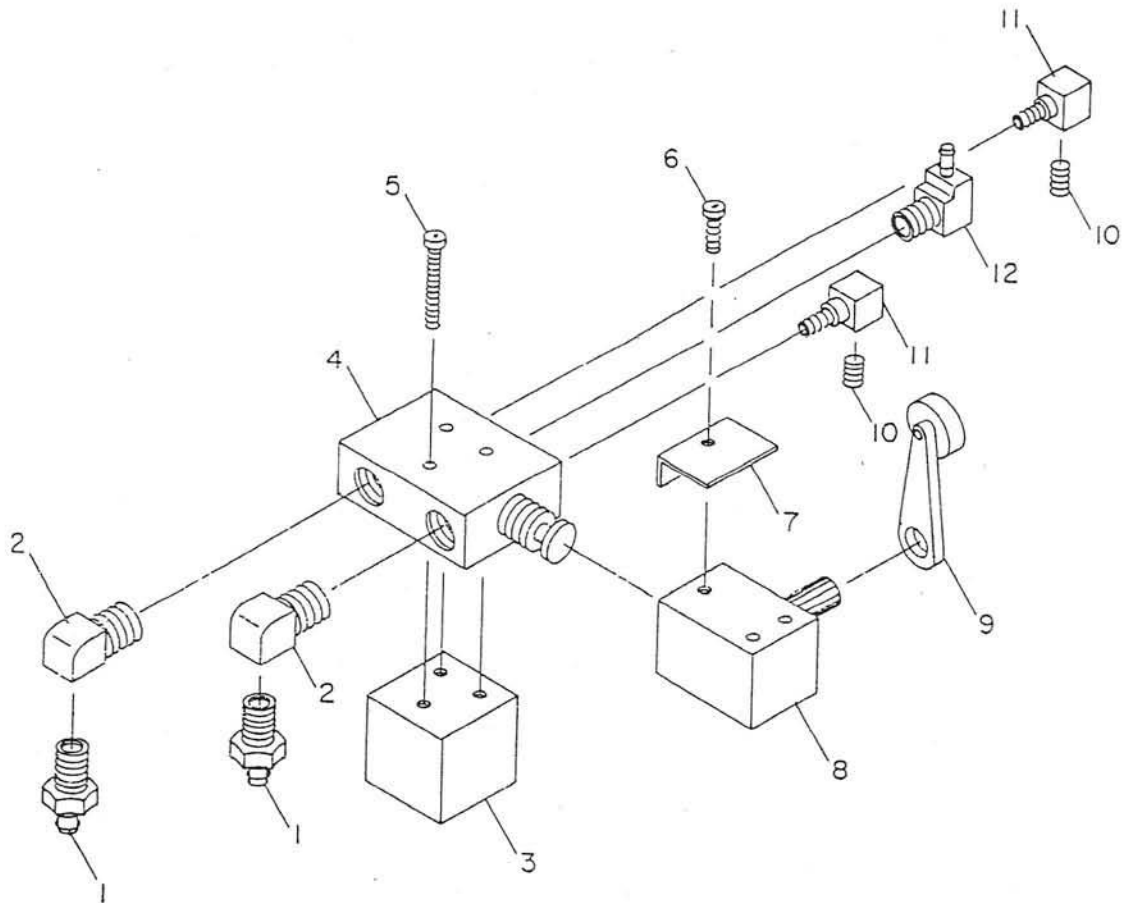


KEY	PART- NUMBER	DESCRITPION	QTY
1	PSC504-380/440	Circuit Breaker (380,440V)	1
2	---	Cover	1
3	---	Rubber Seal	1
4	---	Light (varies with voltage)	1
5	---	Clamping Mechanism	4
6	---	Ground Connecting Clamp	2
7	---	Ground Connecting Screw	2
8	---	Screw	4
9	---	Screw	4

Note: Items 2 through 9 are supplied with #1. When ordering replacement parts, please specify voltage.

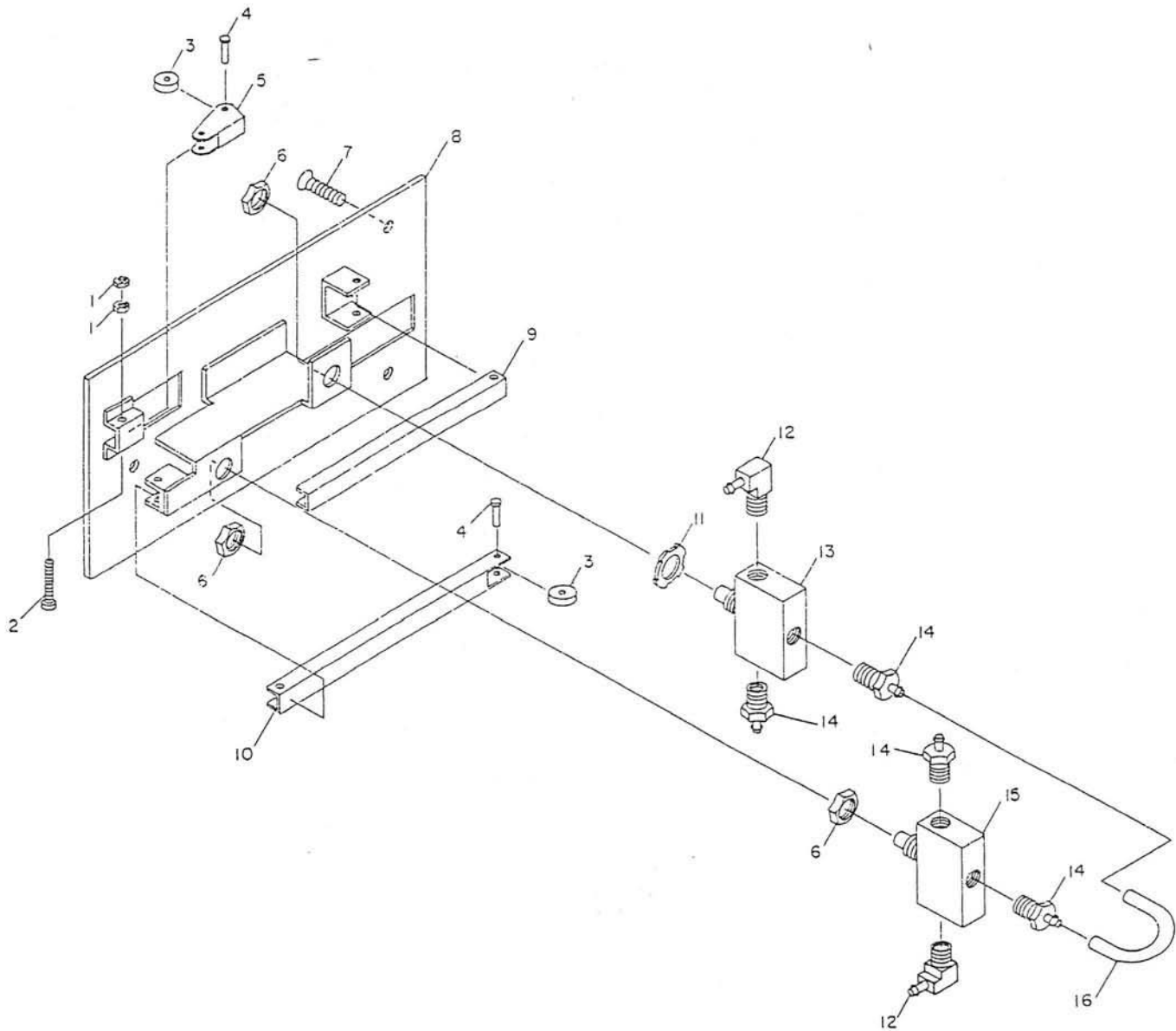
Item #1: Use Part Number: PSC504-220 for 220V,3Ph,50/60Cy

LV-4 ASSEMBLY



KEY	PART NUMBER	DESCRIPTION	QTY
1	PSR634	Barbed Fitting	2
2	H146	1/8NPT Elbow	2
3	PSR170-3	Valve Block	1
4	PSR653	Valve	1
5	MS1M3-20	Soc. Head Screw M3 x 20	3
6	MS1M4-6	Soc. Head Screw M4 x 6	1
7	PSR174-3	LV-4 Holder	1
8	PSR652	Valve Actuator	1
9	PSR651	Lever Arm	1
10	---	Set Screw (supplied w#4)	2
11	PSR656	Fitting	2
12	PSR636	Barbed Fitting	1

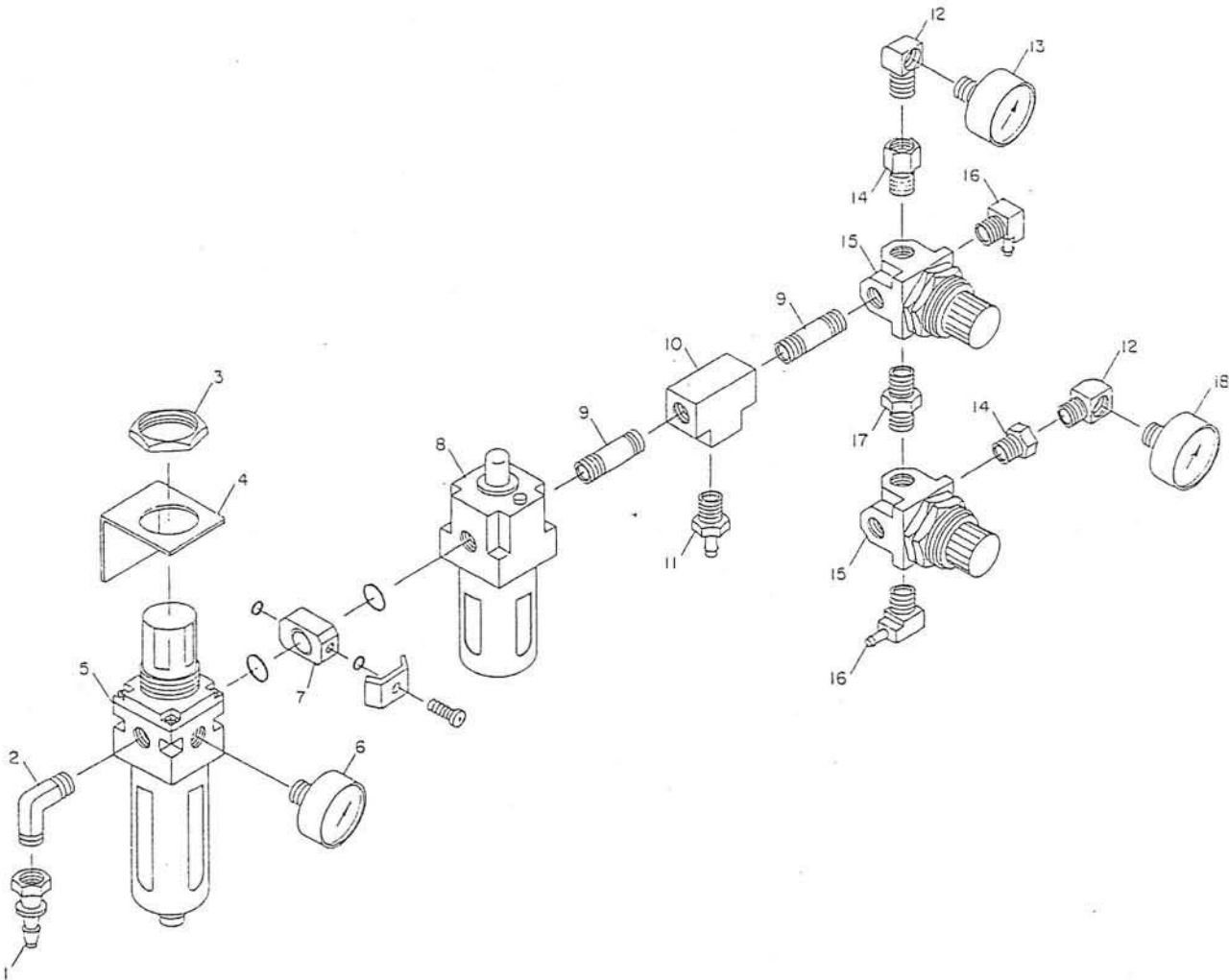
OPERATOR PLATE ASSEMBLY LV-2 and LV-3



LOVESHAW

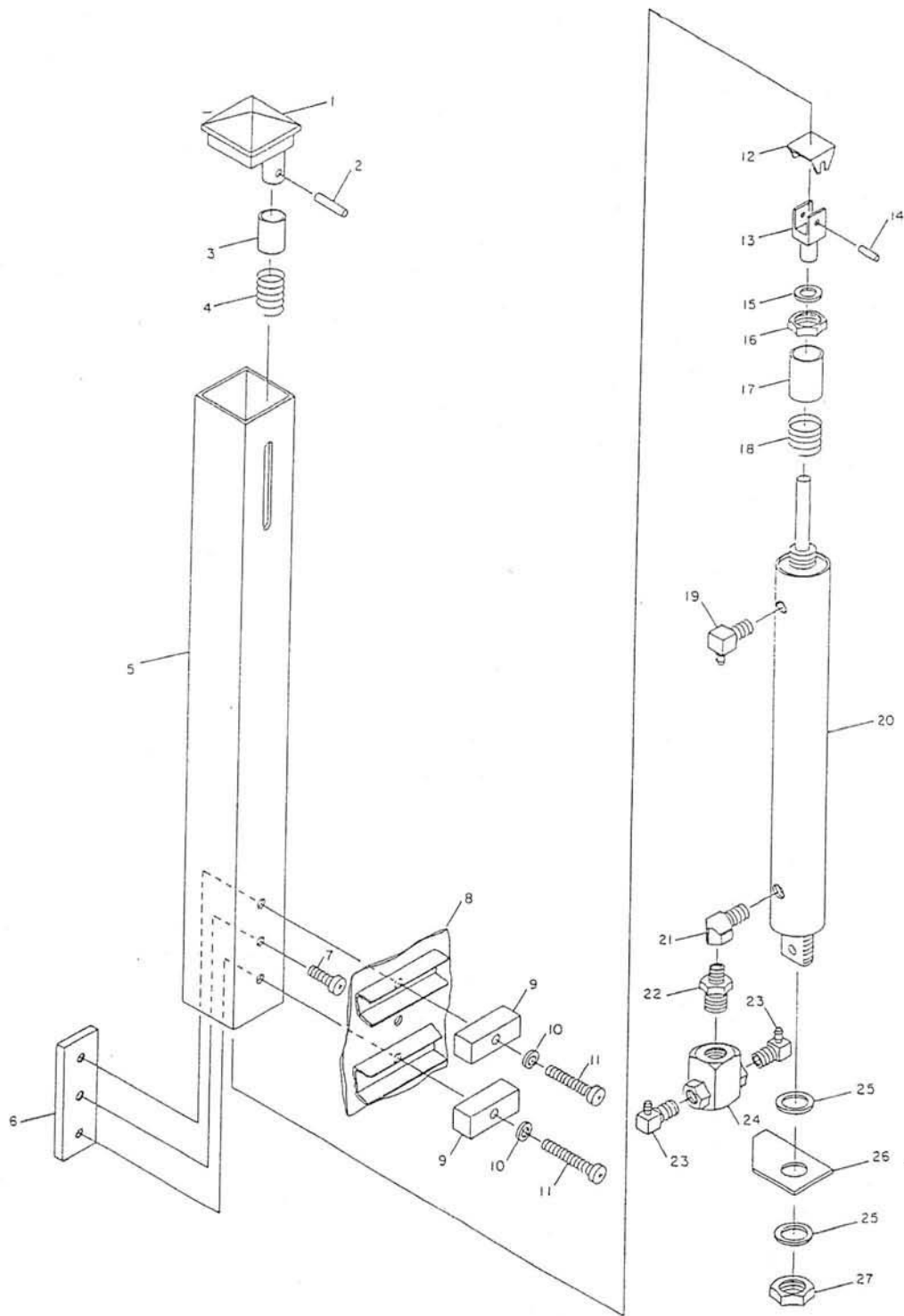
KEY	PART NUMBER	DESCRIPTION	QTY
1	MN1-3	M5 Hex Nut	6
2	MS1M3-20	Soc. Head Screw M3 x 20	3
3	PSR151-3	Roller	2
4	PSR608	Rivet	2
5	PSR150-3	Small Arm	1
6	---	Hex Nut (Supplied with #13 & 15)	2
7	MS2M5-10	Csk. Screw M5 x 10	3
8	PSR177-4	Operator Plate Weld.	1
9	PSR179-3	Arm (LV-2)	1
10	PSR178-3	Arm (LV-3)	1
11	---	Star Washer M12	1
12	PSR636	Barbed Fitting	2
13	PSR631	LV-2 Valve	1
14	PSR634	Barbed Straight Fitting	4
15	PSR631	LV-3 Valve	1
16	PSR700	Tubing	1

PNEUMATIC MANIFOLD ASSEMBLY



KEY	PART NUMBER	DESCRIPTION	QTY
1	PSR596	Fitting	1
2	PSR595	Elbow Fitting	1
3	---	Nut (Supplied with 5)	1
4	PSR176-4	Mounting Bracket	1
5	PSR701	Filter/Regulator	1
6	PSR610	Gage	1
7	PSR703	Adapter	1
8	PSR702	Lubricator	1
9	PSR589	Nipple	2
10	H104	Pipe Tee	1
11	H114A	Straight Connector	1
12	H146	Elbow	2
13	PSR611	Gage	1
14	PSR622	Fitting	2
15	LD4R1017	Regulator	2
16	PSR575	Fitting	2
17	PSR704	Reducer Bushing	1
18	PSR612	Gage	1

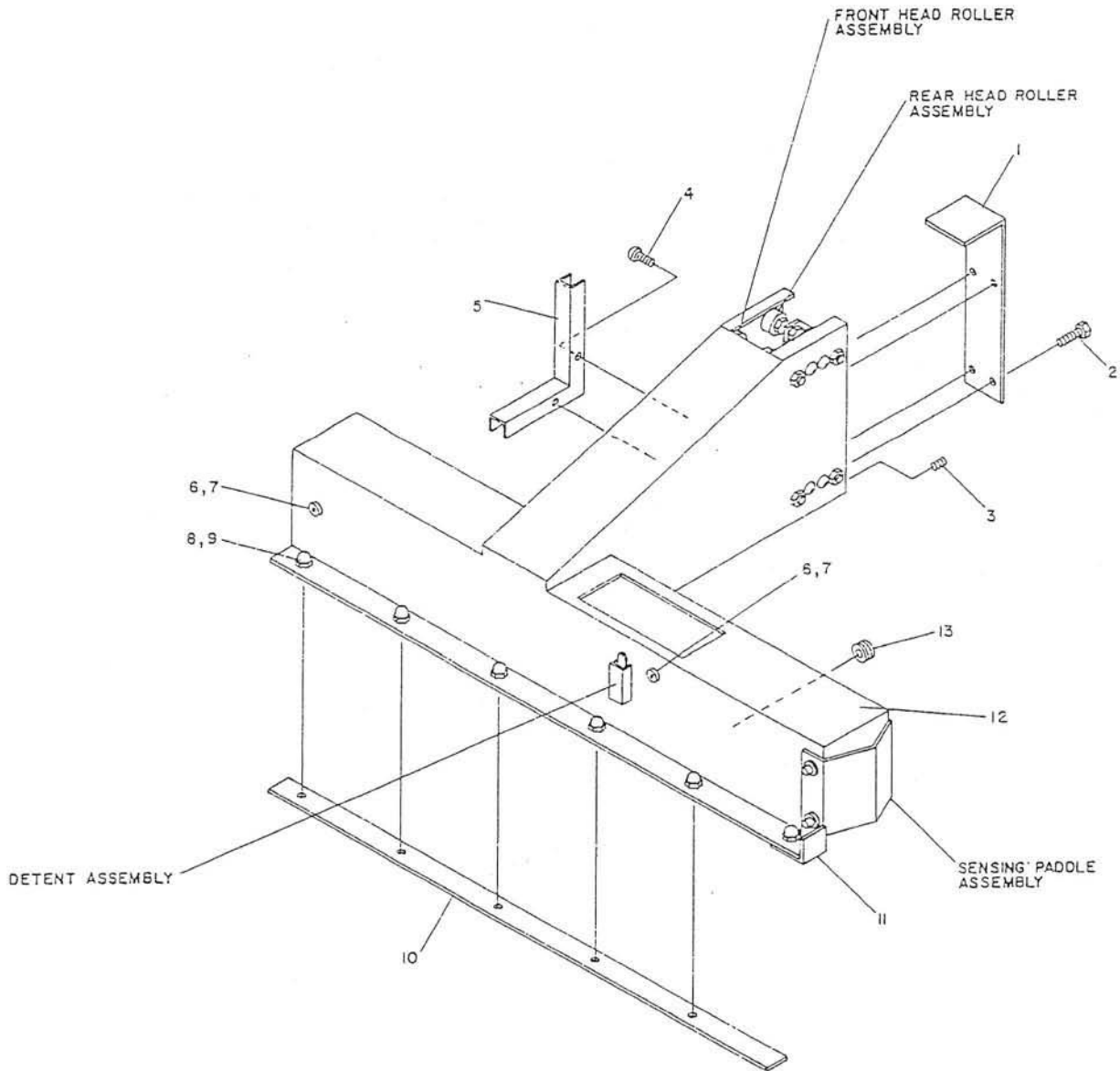
MAST ASSEMBLY



LOVESHAW

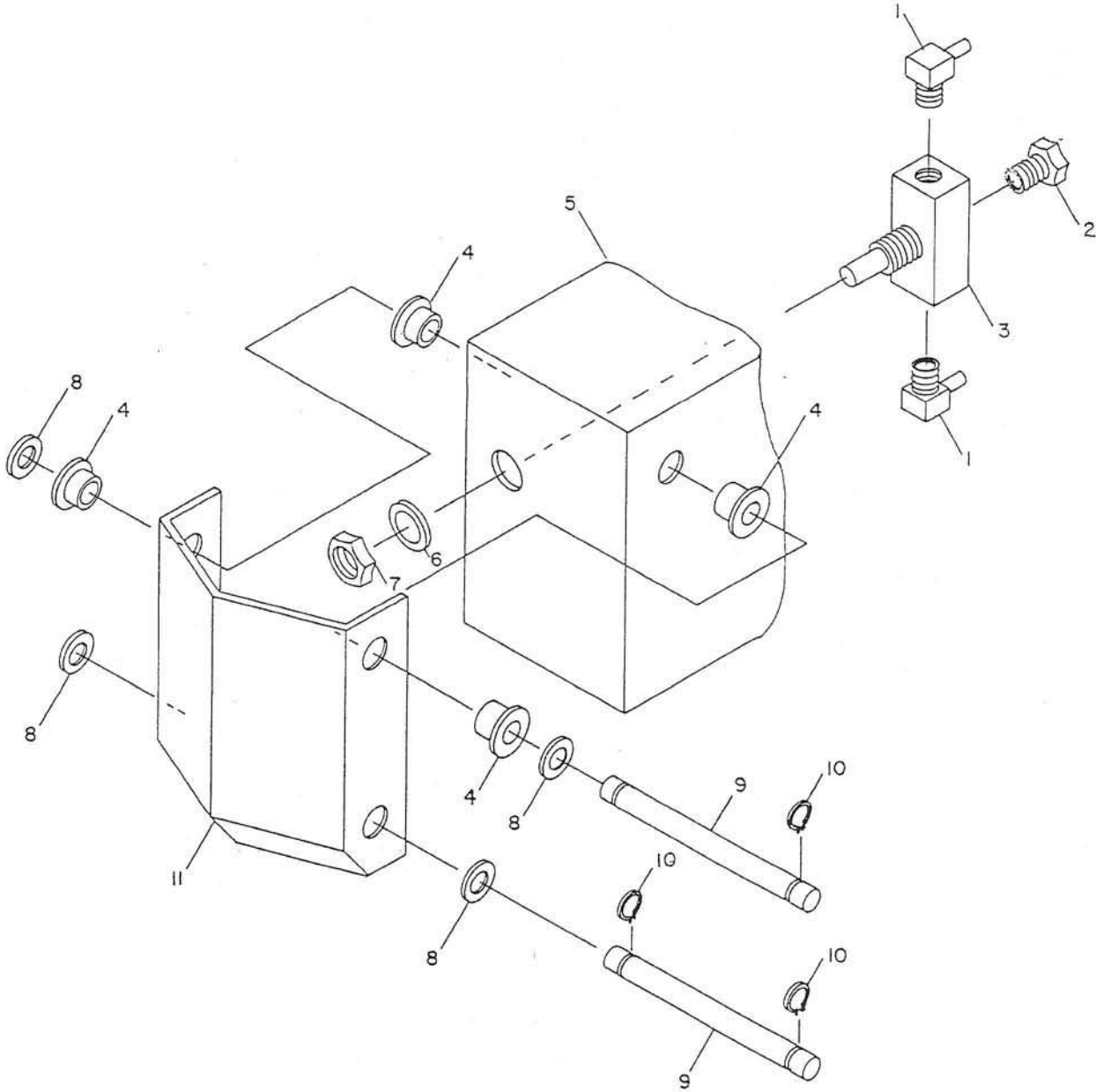
KEY	PART NUMBER	DESCRIPTION	QTY
1	PSR511B-4	Mast Cap	1
2	PSR609	Roll Pin	1
3	PSR102T-4	Rubber Bumper	1
4	PSR511C	Bumper Spring	1
5	PSR48-6	Mast	1
6	PSR50-4	Mast Mounting Plate	1
7	MS1M5-10	Soc. Head Screw M5 x 10	1
8	PSR35-7	P/O Main Frame	1
9	PSU101-4	Main Frame Strap	2
10	MW2-6	M10 Washer	2
11	MS1M10-30	Soc. Head Screw M10 x 30	2
12	PSR145-3	Spring Clip	1
13	PSR100CLA	Clevis	1
14	PSR144-3	Clevis Pin	1
15	IW1-8	1/2 Flat Washer	1
16	IN2-15	1/2-13 Jam Nut - Plated	1
17	PSR102B-4	Bumper	1
18	PSR511D	Cylinder Spring	1
19	PSR575	Elbow Fitting	1
20	PSR100A	Cylinder	1
21	PSR657-3	Elbow Fitting	1
22	PSR704	Fitting	1
23	PSR636	Elbow Fitting	2
24	LD4C1304	Shuttle Valve	1
25	PSR137-3	Washer	2
26	PSR116-4	Cylinder Mount	1
27	IN10-1-3	Cylinder Nut	1

HEAD ASSEMBLY



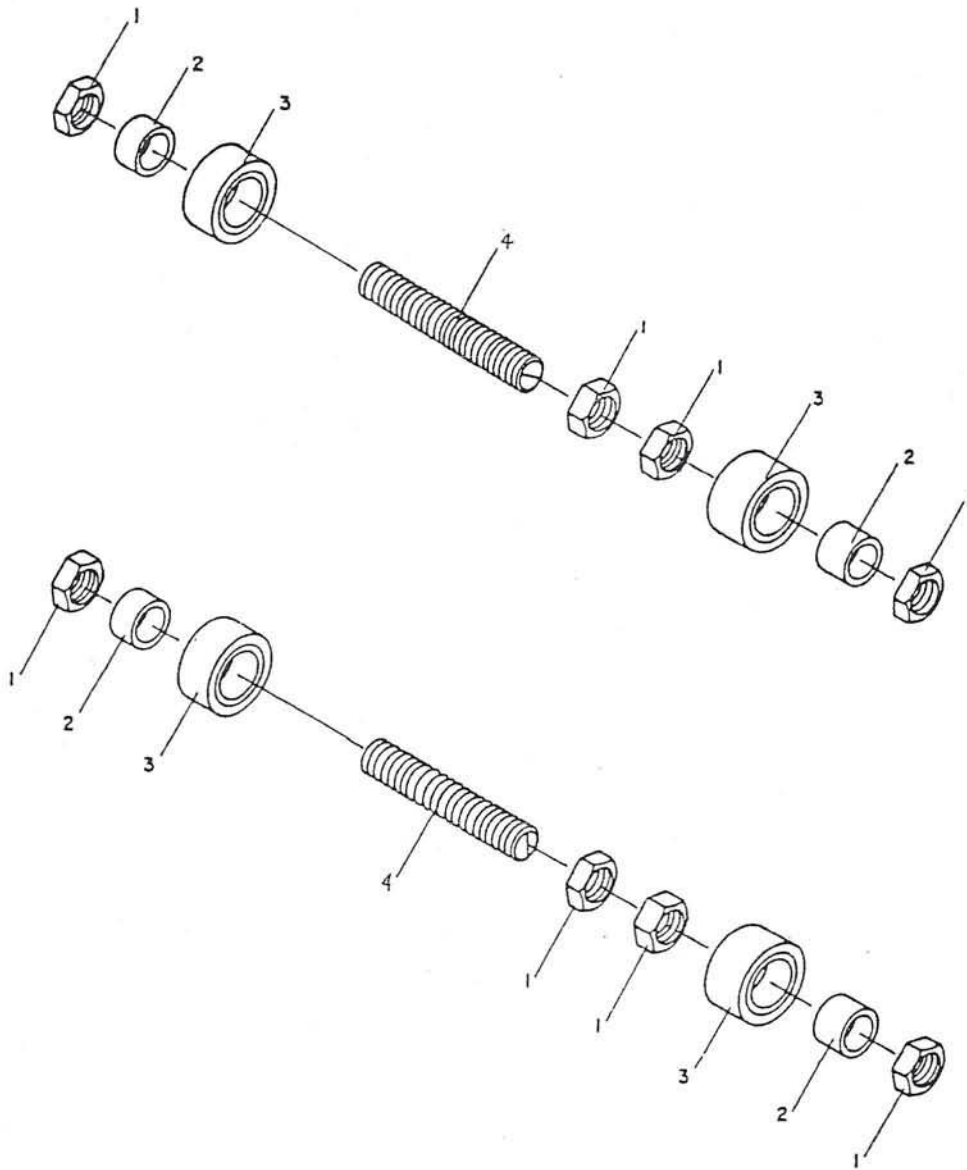
KEY	PART NUMBER	DESCRIPTION	QTY
1	PSR77-5	Cover	1
2	MS7M4-6	Phil. Head Screw M4 x 6	4
3	MS9M4-12	Set Screw M4 x 12	4
4	MS3M5-12	Button Head Screw M5 x 12	2
5	PSR119-5	Hose Guard	1
6	MS1M6-10	Soc. Head Screw M6 x 10	5
7	MN3-4	Dome Nut M6	7
8	MS2M5-10	Csk. Screw M5 x 10	11
9	MN3-3	Dome Nut M5	12
10	PSR73-5	Hold Down Rail	2
11	PSR163L-4	Flap Guide Angle - Left	1
--	PSR163R-4	Flap Guide Angle - Right	1
12	PSR76-7	Head Weld.	1
13	PSR604	Grommet	1
--	PSR606	Tube Holder (mounted on rear of Head)	3
--	MN1-3	Hex Nut M5 (for PSR606)	3
--	MS2M5-12	Csk. Screw M5 x 12 (for PSR606)	3

SENSING PADDLE ASSEMBLY



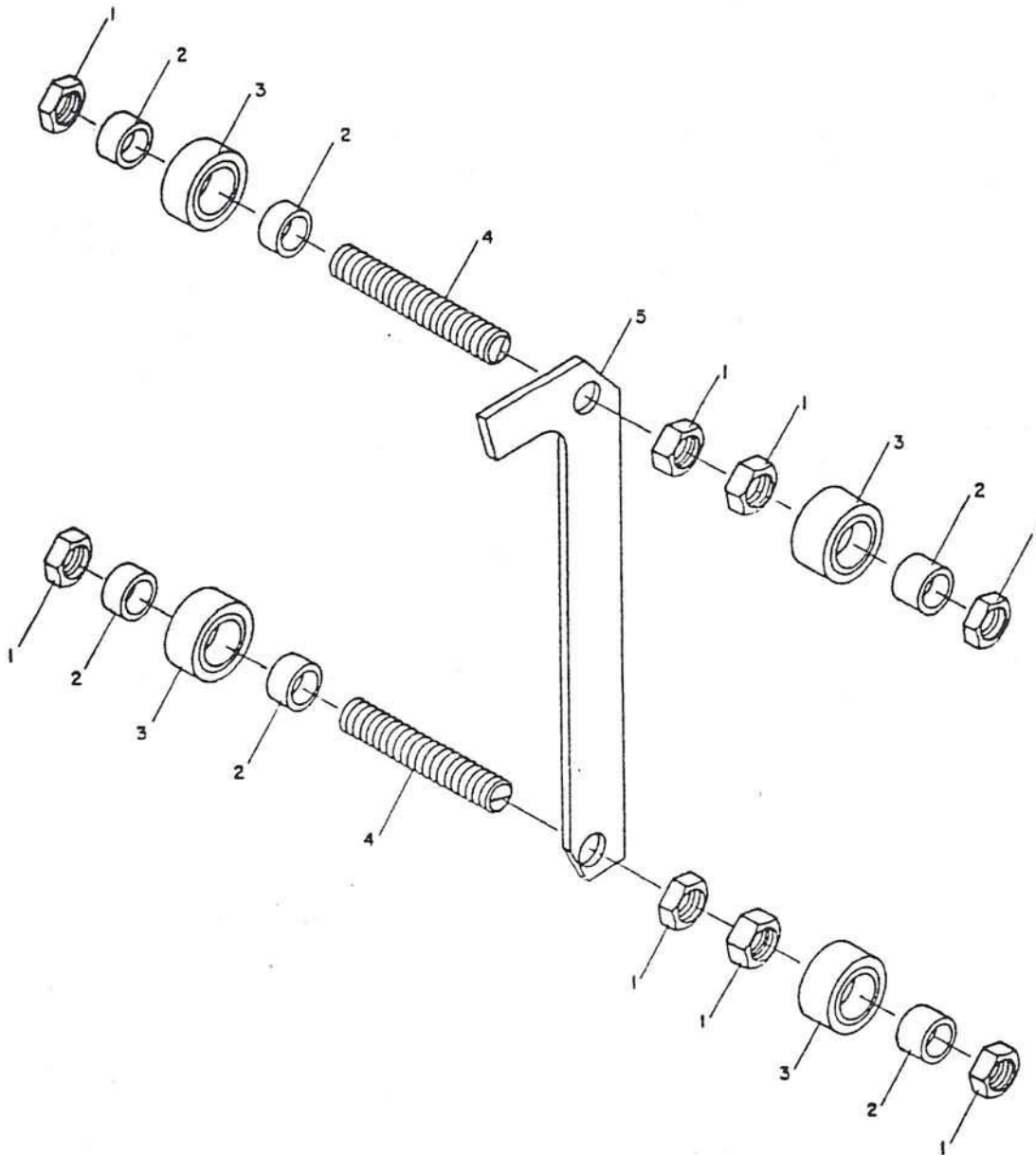
KEY	PART NUMBER	DESCRIPTION	QTY
1	PSR636	Elbow	2
2	PSR659	Breather	1
3	PSR631	LV-1 Valve	1
4	PSC21-4	Bushing	4
5	PSR76-7	Part Of Head Weld.	1
6	IW1-8	Washer	1
7	PSR631N	Nut (Supplied with #3)	1
8	IW2-7	3/8 Flat Washer	4
9	PSR166-3	Shaft	2
10	PSC641	Retaining Ring	4
11	PSR165-5	Sensing Paddle	1

FRONT HEAD ROLLER ASSEMBLY



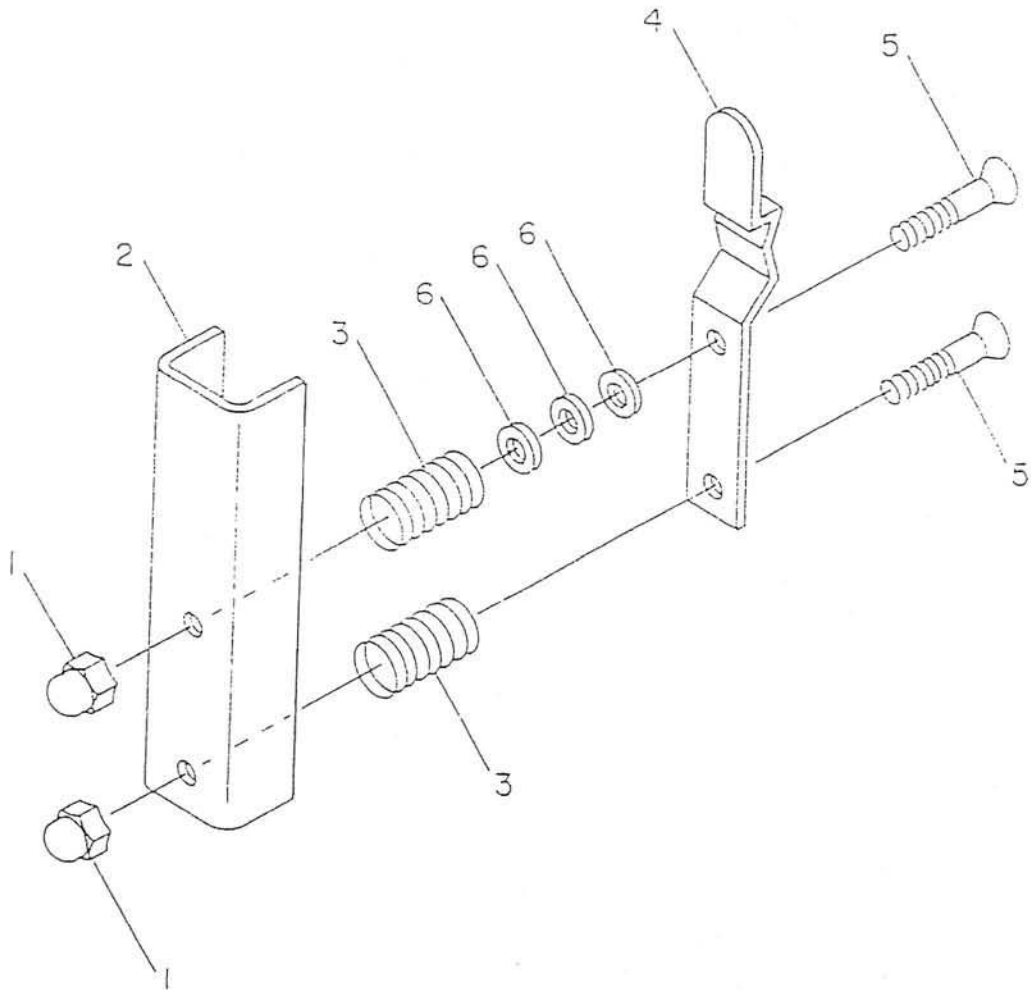
KEY	PART NUMBER	DESCRIPTION	QTY
1	MN2-7	M12 Hex Jam Nut	8
2	PSC138-3	Spacer	6
3	PSC501	Ball Bearing	4
4	PSR117-5	L-Plate - Head Cylinder	1

REAR HEAD ROLLER ASSEMBLY



KEY	PART NUMBER	DESCRIPTION	QTY
1	MN2-7	M12 Hex Jam Nut	8
2	PSC138-3	Spacer	6
3	PSC501	Ball Bearing	4
4	PSC52A-4	M12 Shaft	2
5	PSR117-5	L-Plate - Head Cylinder	1

DETENT ASSEMBLY



KEY	PART NUMBER	DESCRIPTION	QTY
1	MN3-4	Hex Dome Nut M6	2
2	PSC127A-4	Cover	1
3	PSC583	Compression Spring	2
4	PSC127B-4	Detent	1
5	MS2M6-35	Csk. Screw M6 x 35	2
6	MW1-4	M6 Flat Washer	3