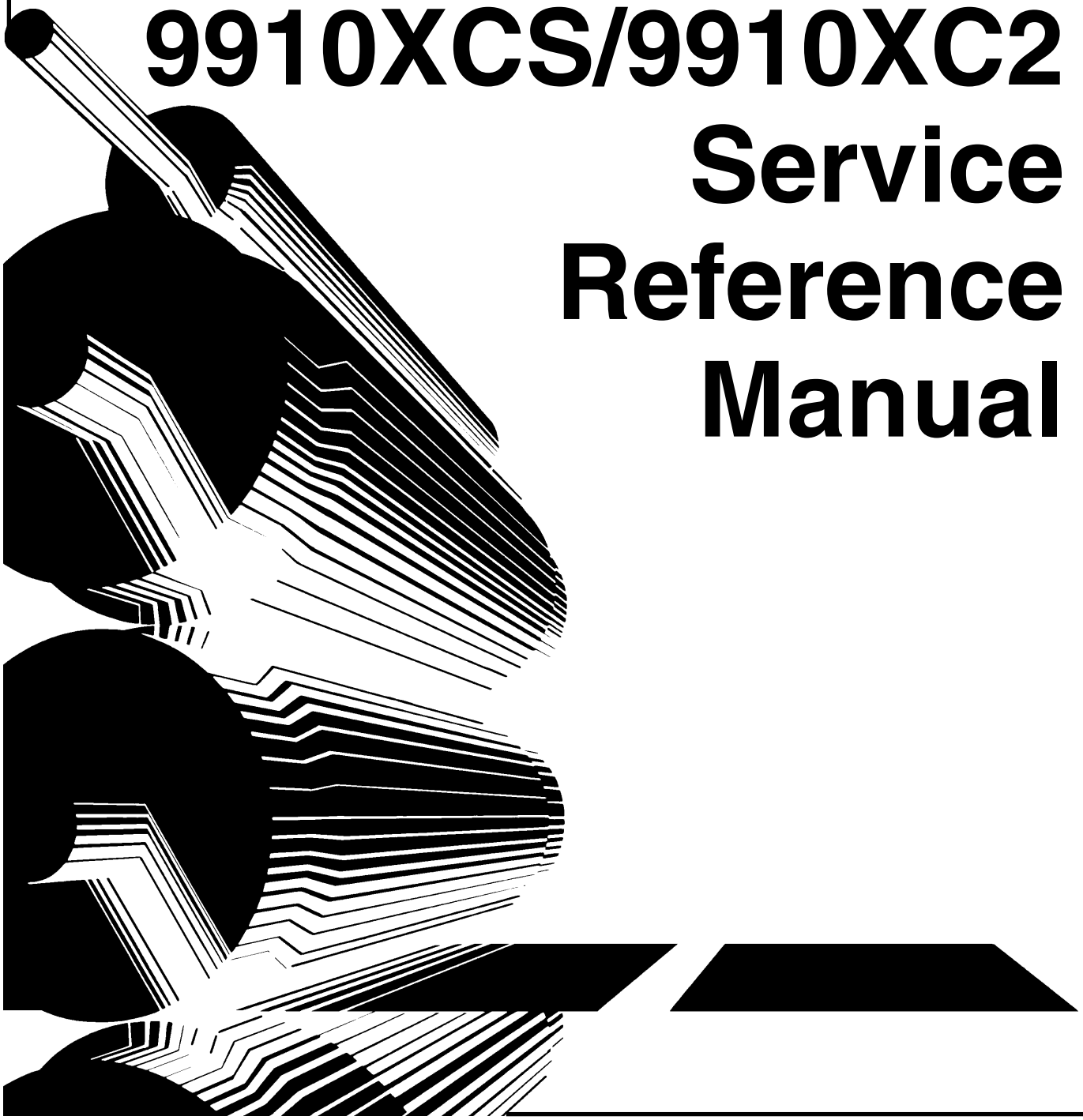
9905/9910/9910D/ 9910XCS/9910XC2 Service Reference Manual



P/N 177187 (REV. 0)

WARNING:

This equipment must be connected to a properly grounded three (3) wire outlet. Failure to do so creates a potential danger of electrical shock.

The circuit to which this equipment is connected must be current protected by a device with suitable current interruption capability as required by underwriters laboratories, Canadian standards association, N.E.M.A or local code (whichever is the most stringent).

When servicing this equipment with covers removed, exposed terminals are an electrical hazard. Caution must be exercised.

WARNING:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

NOTE:

Users of this equipment service document are warned that A.B.Dick service documents are designed to be used in conjunction with an A.B.Dick service training class. An untrained person using this document, without the benefit of the accompanying training, could inadvertently cause damage to the equipment and/or cause injury to himself/herself or others. Users of this document are advised that A.B.Dick Company shall not be liable for any personal injury or property damage arising out of the use of this document by untrained persons.

IMPORTANT NOTICE

Contents

SPECIFICATIONS

ABDICK®

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1. PAPER SIZE:

   3" x 5" to 13-1/2" x 17-3/4"

   (76 mm x 127 mm to 343 mm x 451 mm)

2. PAPER WEIGHT:

   12 lb. (5.4 kg) Bond to 135 lb. (203 gm^2) Index

3. PRINTING AREA:

   12-1/2" x 17-1/4" (318 mm x 438 mm)

4. METAL PLATE SIZE:

   13" x 19-3/8" (330 mm x 492 mm)

5. BLANKET SIZE:

   12-5/8" x 19-3/16" (321 mm x 487 mm)

6. MASTER CYLINDER DIAMETER:

   6.7560" ± .0007" (171.60 mm ± .0177 mm)

7. BLANKET CYLINDER DIAMETER:

   6.6010"/6.5995" (167.66 mm/167.62 mm)

8. IMPRESSION CYLINDER DIAMETER:
   6.7587"/6.7573" (171.67 mm/171.63 mm)

9. MACHINE FRAME SPACING:

   17" (432 mm)

10. VERTICAL REGISTRATION:

    ±.005" (.12 mm)

11. LATERAL REGISTRATION"

    ±.015" (.38 mm)

12. PRINT ADJUSTMENT RAISE:

    5-1/2" (139.7 mm)

13. PRINT ADJUSTMENT LOWER:

    6-1/2" (165.1 mm)

14. BLANKET THICKNESS:

    .068"/.066" (1.72 mm/1.67 mm)

15. FEED TABLE CAPACITY:

    140 lbs. (63.5 kg)

    Equivalent to 20" (50.8 cm) of 20 lb. (75.2 gm^2) paper at maximum size

16. CHAIN DELIVERY CAPACITY:
    147 lbs. (66.6 kg)

    Equivalent to 21" (50.8 cm) of 20 lb. (75.2 gm^2) paper at maximum paper size

17. PRESS SPEED:

    3,000 to 10,000 Copies Per Hour

18. GRIPPER MARGIN:

    1/4" (6.35 mm)

19. POWER SOURCES:

    220 VAC, 50 Hz, 10 A

    230 VAC, 60 Hz, 10 A

    240 VAC, 50 Hz, 10 A

20. SOUND LEVEL (MAXIMUM):

    85 dB/A

21. POWER CONSUMPTION (MAXIMUM):

    230 VAC, 10 A, 2,000 W

INTRODUCTION TO FUNCTIONAL OPERATION

The following discussion of the A.B.Dick 9910 Series Offset Duplicators explains the function of each part of the machine. Most of the machine functions are operated from the Operation Control Handle. These functions are explained in this section. The functions not directly involved with the Operation Control Handle will be discussed separately.

The explanations are made with the assumption that all parts are in perfect condition and adjusted.

CLUTCH AND VARIABLE SPEED PULLEY

PURPOSE: Controls drive and speed of drive shaft and cylinders.

FUNCTION:

1. Drive motor switch (1) turned "On" ·
2. Motor turns pulley (2) causing belt (3) to turn drive pulley (4).
3. Drive pulley (4) turns.
4. Pinion gear (5) will then turn blanket cylinder (6).
5. When speed control knob is turned to a higher number, higher voltage is applied to the DC drive motor, increasing the speed of the machine.

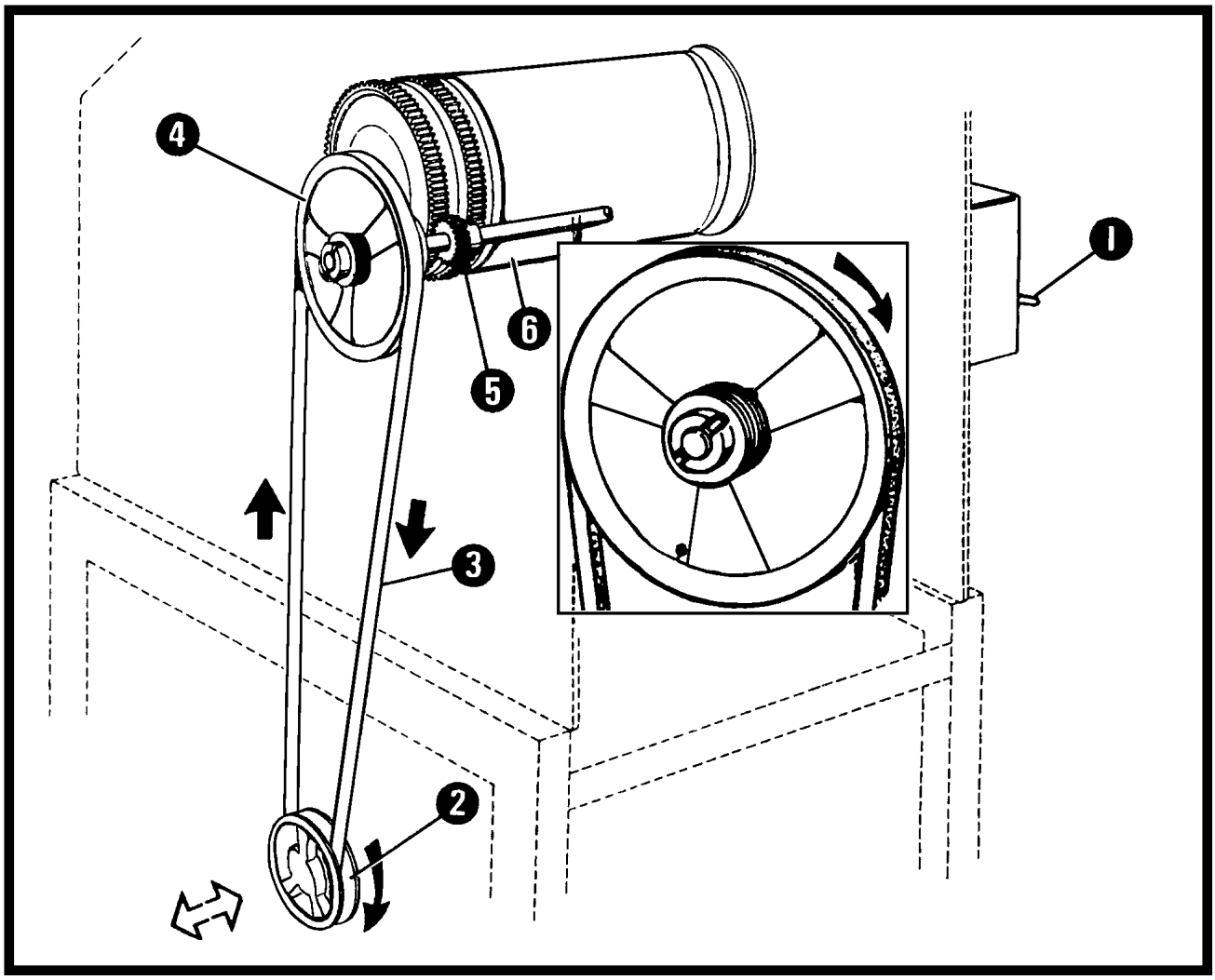


Figure 1 - Clutch and Variable Speed Pulley

INK ROLLER AND RATCHETING SYSTEMS

PURPOSE: Controls Ink transfer from the ink fountain to the master or plate.

FUNCTION:

1. Gear (1) moves link (2) and lever (3). With lever (4) lifted ["On"] lever (3) and pawl (5) will advance the teeth of ratchet (6).
2. Ratchet (6) will turn ink fountain roller (7) transferring ink from ink fountain (8) to ink fountain roller (7) and ductor roller (9).
3. Ink ductor roller (9) transfers ink to distributor roller (10) as cam (11) turns, moving levers (12 and 13) which move the ductor roller (9).
4. Ink is then transferred from the distributor roller (10) to:

the rider roller (14),

the oscillating roller (15),

the rider roller (16),

the form roll oscillator (17),

the upper form roller (18),

the lower form roller (19),

and the master or plate on the master cylinder (20).

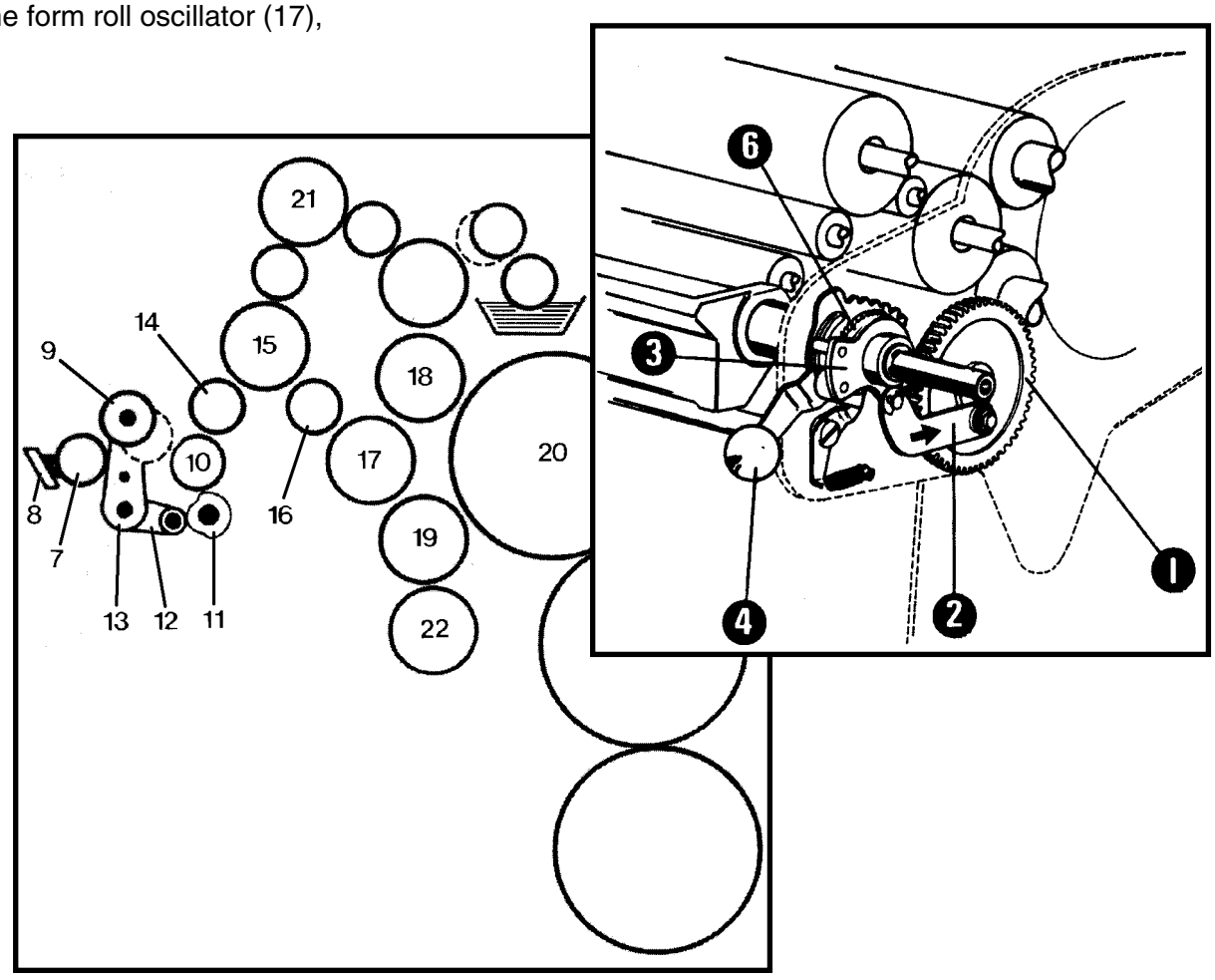


Figure 2 - Ink Roller and Racheting Systems

AQUAMATIC SYSTEM

PURPOSE: Controls transfer of fountain solution from the aquamatic fountain to the master or plate.

FUNCTION:

1. Fountain solution flows from the fountain solution bottle (1) into the aquamatic fountain (2). When the fluid reaches the bottle valve air cannot enter and a air tight seal prevents further flow of solution.
2. Cams (3) turn and move levers (4). Levers (4) move aquamatic ductor roller (5).
3. Aquamatic ductor roller (5) is moved in and out of contact with aquamatic oscillator roller (6). This action transfers fountain solution from the aquamatic fountain roller (7) to oscillator (6).
4. A supply of fountain solution is then transferred to upper form roller (8), form roller oscillator (9), lower from roller (10), and master or plate on master cylinder (11).

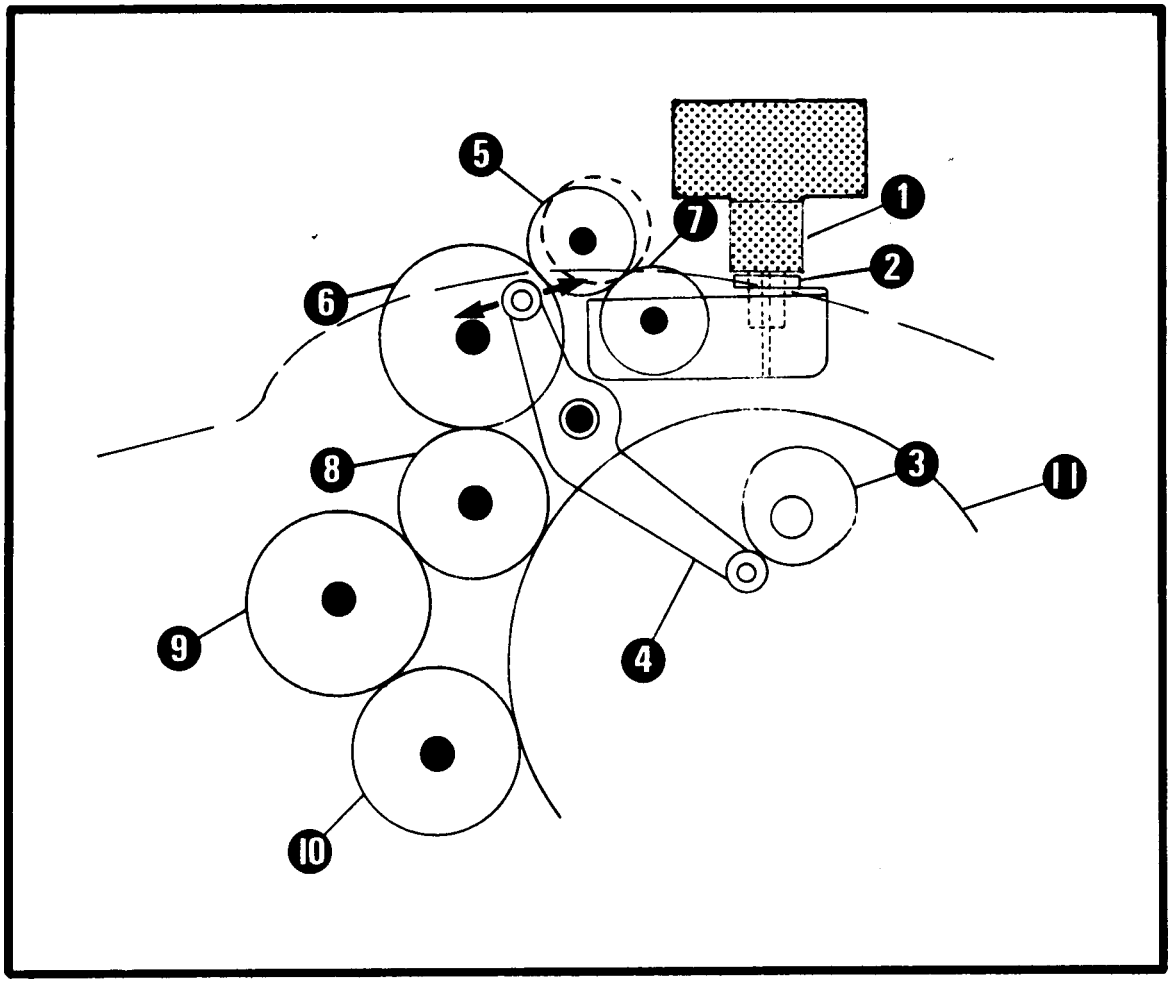


Figure 3 - Aquamatic System

9910XC2 MOTORIZED CONTINUOUS DAMPENER

PURPOSE: Controls the transfer of fountain solution from the dampener to the master or plate.

FUNCTION:

1. Fountain solution flows from the bottle to the fountain through the bottle holder and tube assembly. As the fluid level in the fountain rises, fluid begins to back up into the fill tube and bottle holder. The fluid in the holder seals the bottle valve so air cannot enter, preventing the further flow of solution.
2. As the operator control lever is moved, the dampener control shaft is rotated from "Night Latch" to "Neutral", and cam (1) rotates in a counterclockwise direction, allowing the metering roller bracket (2) and metering roller (4) to come into contact with the oscillator (5) and pan roller (6). The required tension for pressure and movement is provided by springs (3). Further movement of the control lever, from "Neutral" to "Ink", rotates cam (1) and allows the main bracket (7) and oscillator (5) to move into contact with the water form roller (9) which then makes contact with the plate.
3. The quantity of fountain solution applied is controlled by the speed of the dampener motor (11) through idler gear (12) to the pan roller (6).
4. The dampener motor speed control, located on the dampener control box, controls the voltage applied to the motor which in turn increases or decreases the motor RPM.

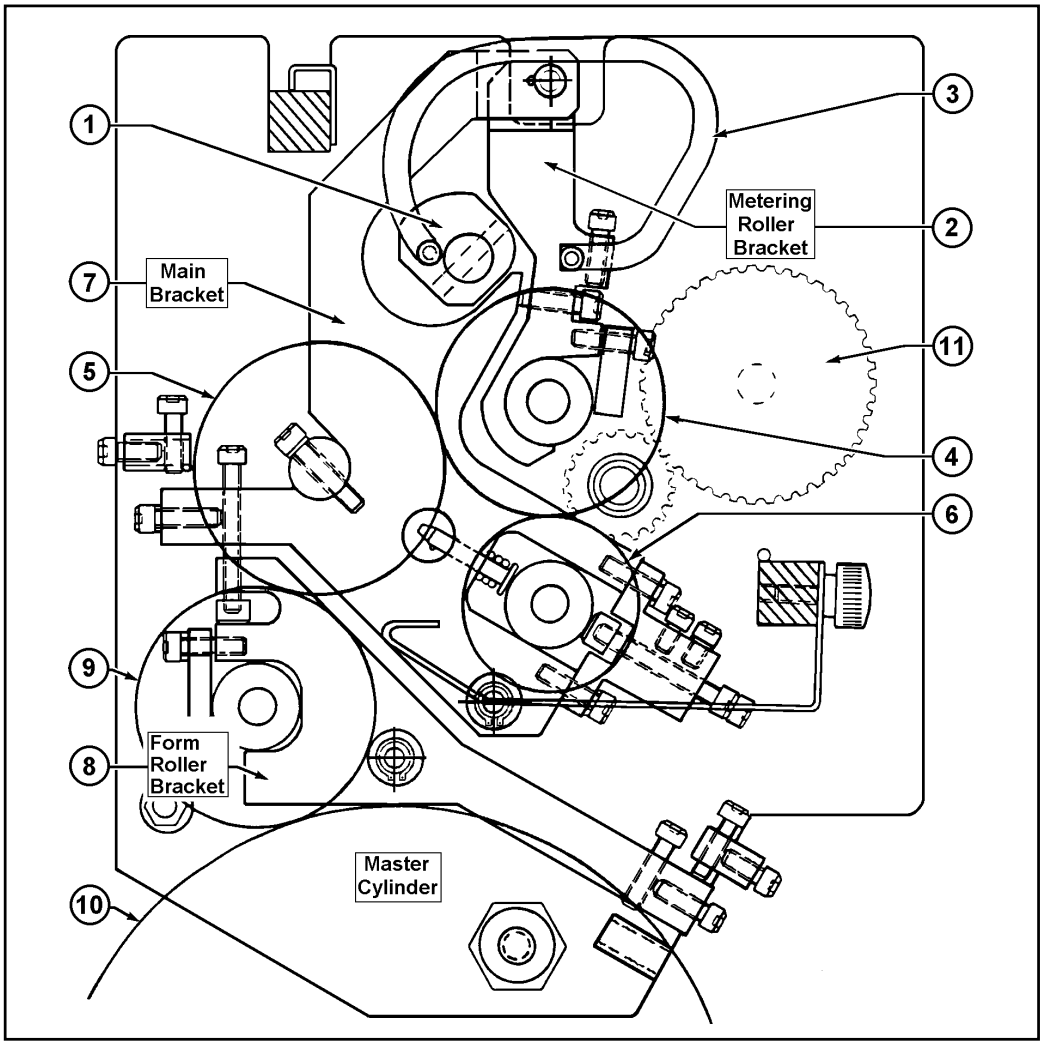


Figure 4- Motorized Continuous Dampener (Operator Side View)

9910D NON-MOTORIZED CONTINUOUS DAMPENER

PURPOSE: Controls the transfer of fountain solution from the dampener to the master or plate.

FUNCTION:

1. Fountain solution flows from the bottle through the tubing to the filler valve assembly (1) (see Figure 5). The solution fills the nip between the plate form roller and the metering roller when the fluid level reaches the bottom of the filler valve (1). Air flow is shut off and the further flow of solution is prevented.
2. The dampener is controlled through the operator control lever. Movement of the lever in a clockwise direction rotates the eccentric dampener shaft (2), lowering the assembly into contact with the plate. Water control is automatically increased with the speed of the press, since the dampener is driven by the master cylinder.

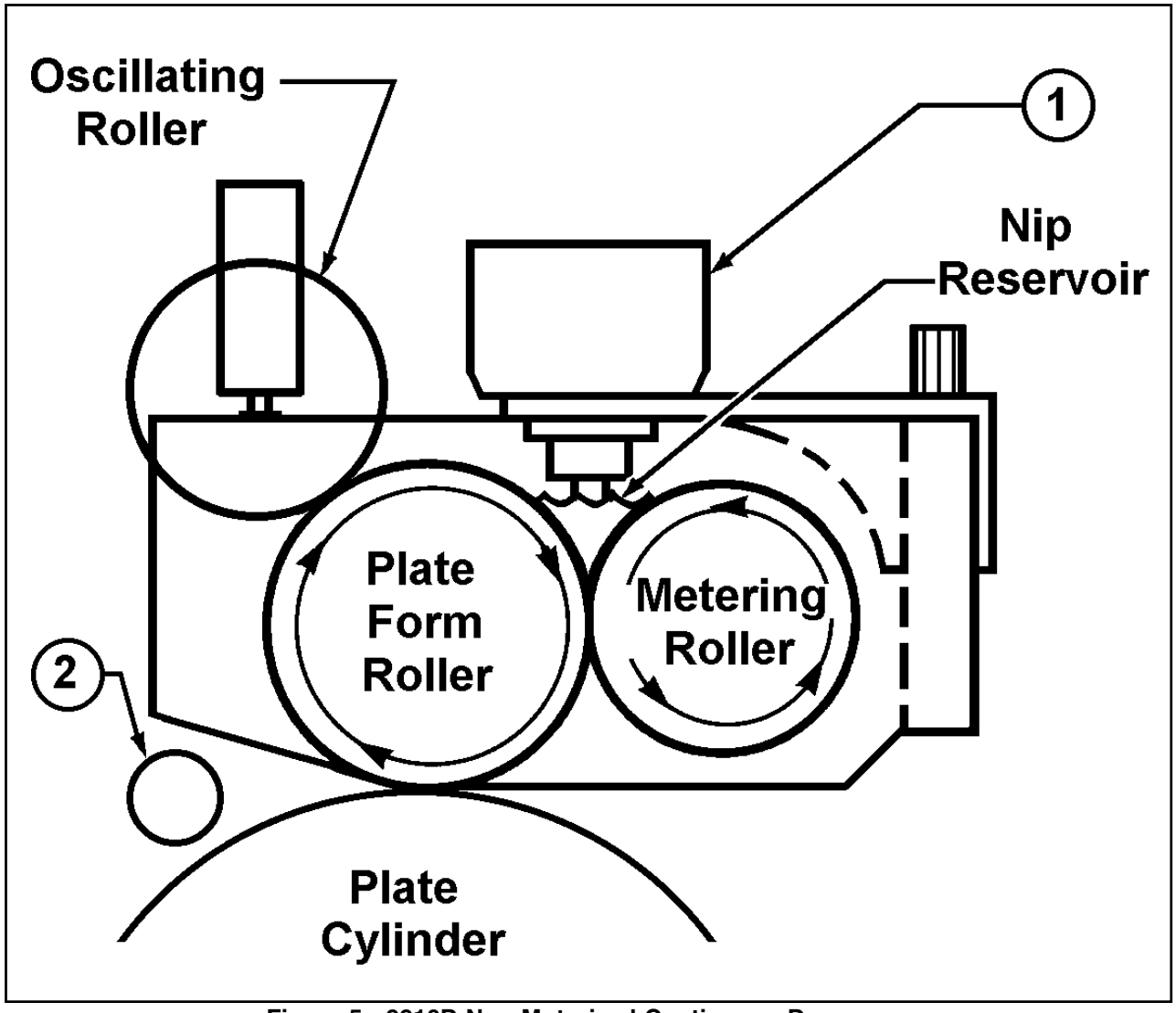


Figure 5 - 9910D Non-Motorized Continuous Dampener

OPERATION CONTROL HANDLE

"NIGHT LATCH"

PURPOSE: Keeps form rollers out of contact with form roller oscillator.

FUNCTION:

1. With Operation Control Handle (1) in “Night Latch”, cams (2) position levers (3).
2. Levers (3) prevent form rollers (4) from contacting form roller oscillator (5).

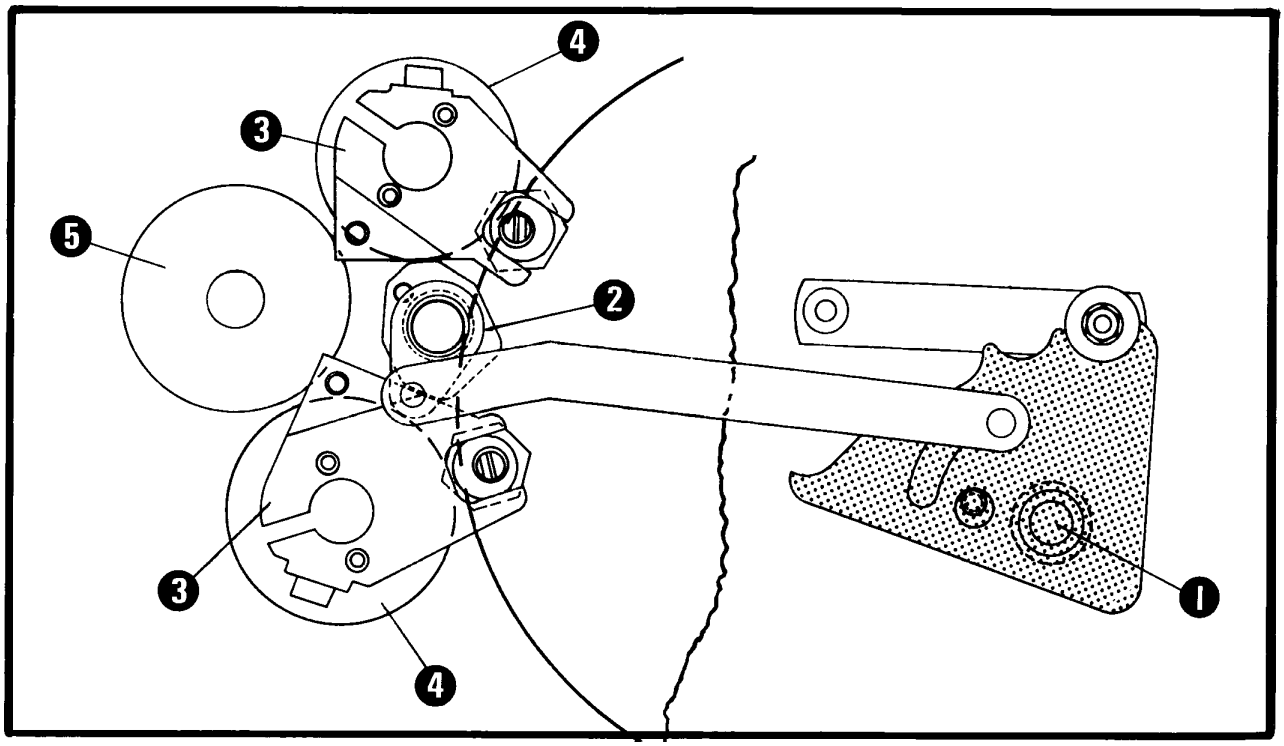


Figure 6 - Operation Control Handle

OPERATION CONTROL HANDLE

"NIGHT LATCH" TO "NEUTRAL"

PURPOSE: Places form rollers in contact with form roller oscillator.

FUNCTION:

1. When operation control handle (1) is moved from “Night Latch” to “Neutral” link (2) moves lever (3) and shaft (4). Shaft (4) turns cams (5).
2. Cams (5) permit form roller levers (6) to move form rollers (7) into contact with form roller oscillator (8).

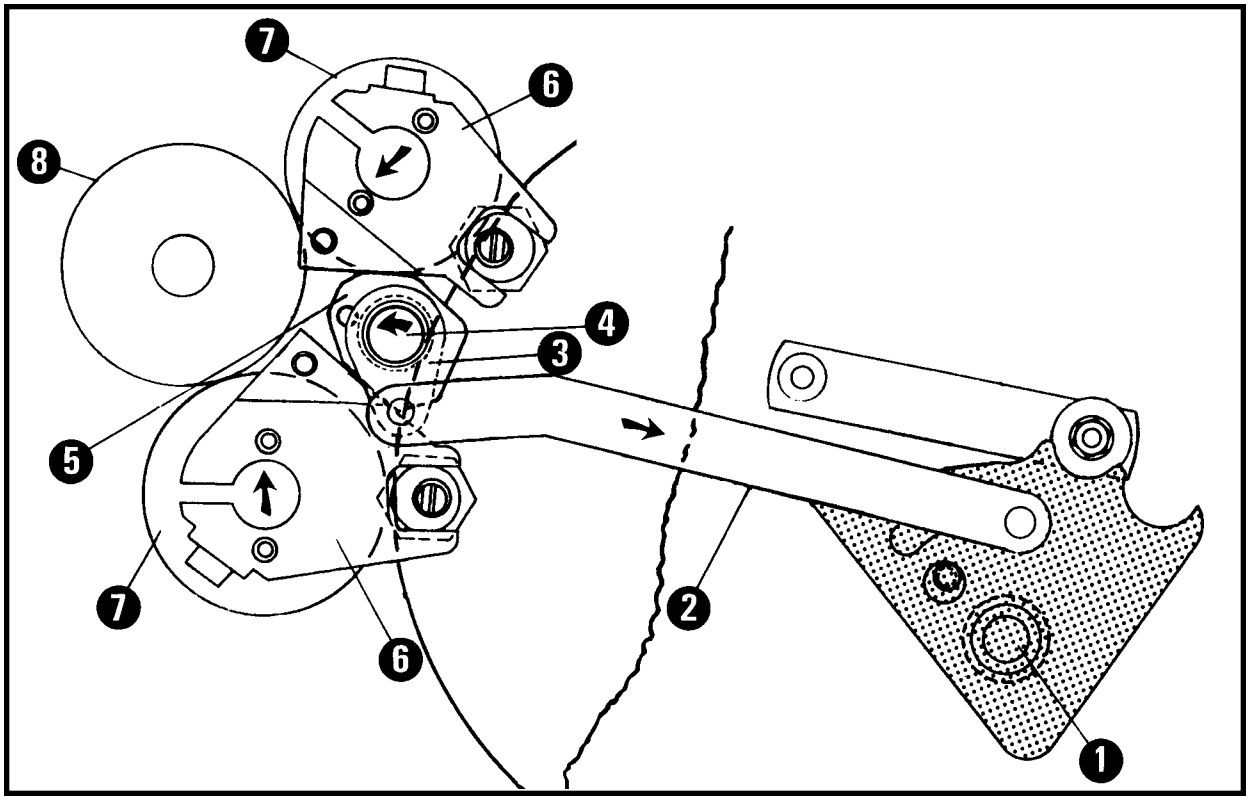


Figure 7- Operation Control Handle

***"NIGHT LATCH" TO "NEUTRAL"* (Continued)**

PURPOSE: 1. Places the form rollers in contact with master or plate.

2. Releases Automatic Aquamatic Lockout.

FUNCTION:

3. With lever (18) in “down (aquamatic)” position the Operation Control Handle will permit ductor roller to function as explained in Steps 4 through 7.
4. When shaft (4) is turned (in step 1) cam (11) will turn lever (12).
5. Lever (12) will move shaft (13) which will lift arms (14) above ears (15).
6. Aquamatic ductor roller (16) will now be permitted to contact oscillator roller (17).
7. With lever (18) in up ("manual") position ductor roller will always contact the oscillator roller while ducting.

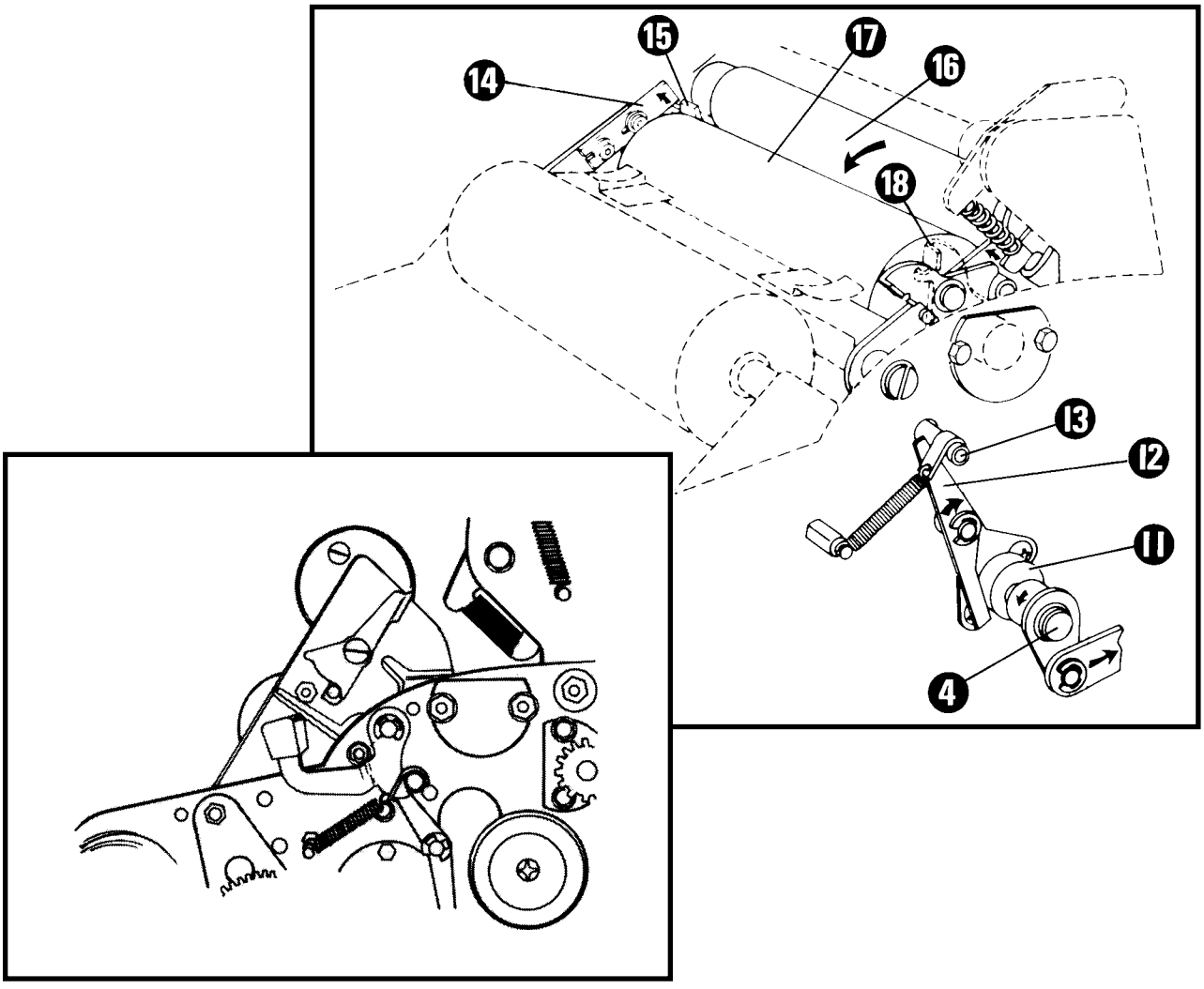


Figure 8 - Operation Control Handle

OPERATION CONTROL HANDLE

"NEUTRAL" TO "INK"

PURPOSE: 1. Places the form rollers in contact with master or plate.

2. Releases Automatic Aquamatic Lockout.

FUNCTION:

1. When Operation Control Handle (1) is moved to “Ink”, link (2) moves lever (3) and shaft (4). Shaft (4) turns cams (5).
2. Cams (5) and studs (6) permit slides (7) to move toward master cylinder.
3. Springs (8) cause pins (9) of form roller levers (10) to follow slides (7).
4. Form rollers (11) now contact the master cylinder.

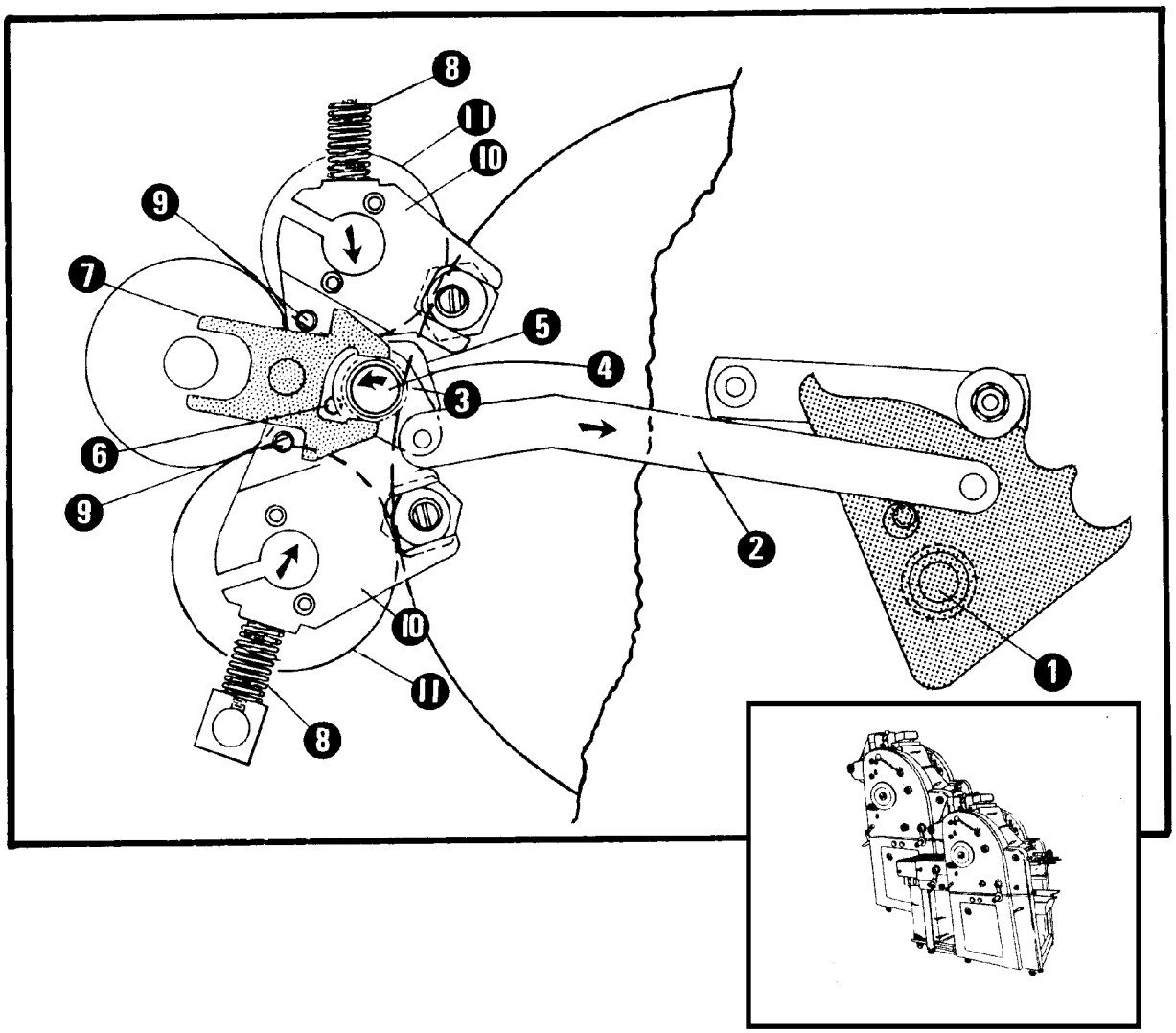


Figure 9 - Operation Control Handle

OPERATION CONTROL HANDLE

"INK" TO "IMAGE"

PURPOSE: Allows Master Cylinder to contact Blanket Cylinder.

FUNCTION:

1. When Operation Control Handle (1) is moved to “Image”, stud (2) lifts am assembly (3).
2. Master cylinder latch (4) will be lifted. As cylinders turn, master cylinder lever (5) will be engaged by latch (4).
3. Lever (5) is on master cylinder eccentric shaft, which will lower the master cylinder (6) into contact with the blanket cylinder (7).
4. Operation Control Handle will return to “Ink” when released. Cylinder contact will then depend on paper feed.
5. When detent cam (8) was moved to “Image” link (9) was moved up by screw and disc (10). Stud (11) was moved out of its notch, permitting cam (8) to move to “Image”.

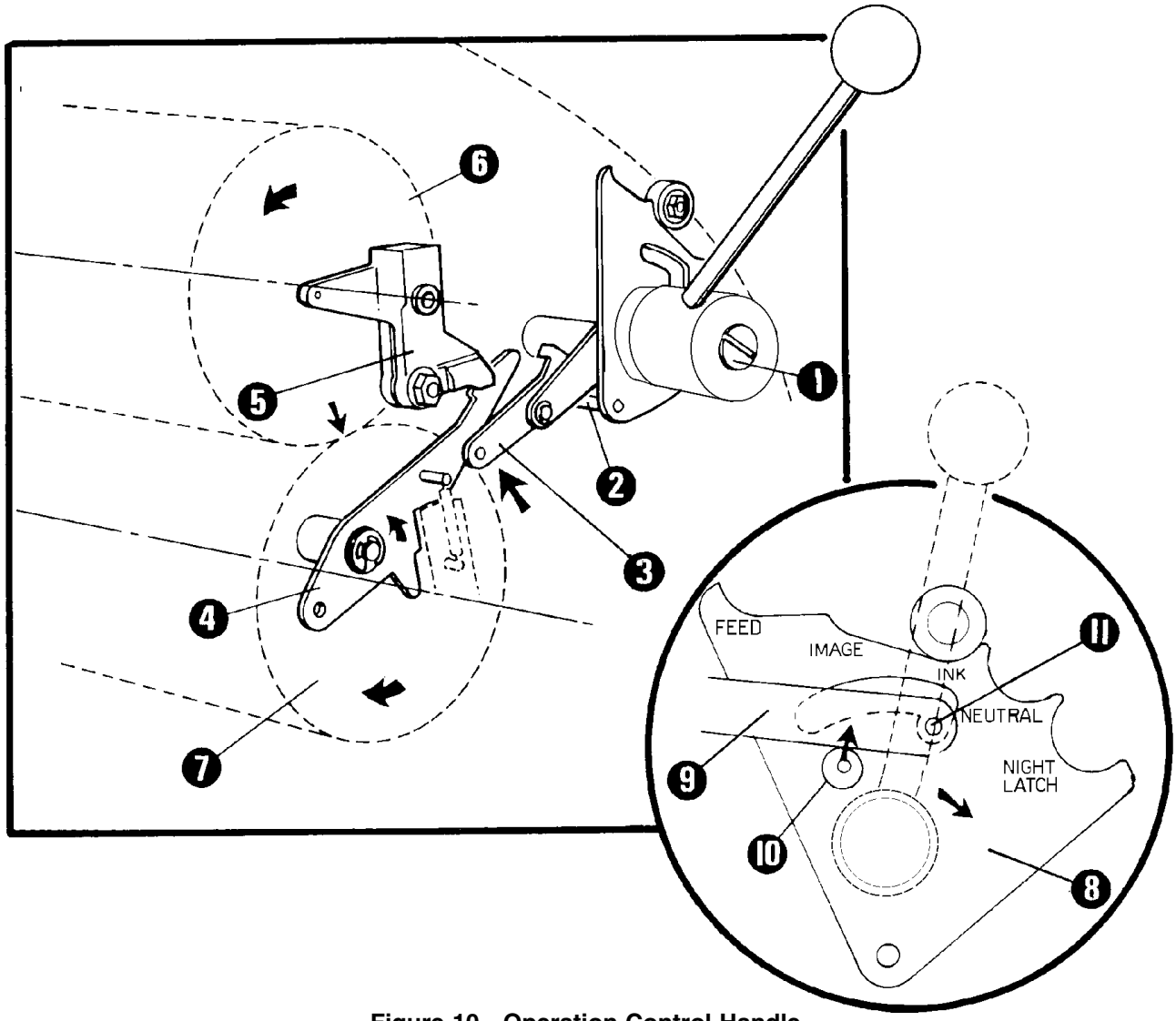


Figure 10 - Operation Control Handle

OPERATION CONTROL HANDLE

"IMAGE" TO "FEED"

PURPOSE: Turns Feed Control Lever on.

FUNCTION:

1. When Operation Control Handle (1) is moved to “Feed”, stud (2) pushes lever (3) which pulls bar (4).
2. Bar (4) pivots feed control lever (5).
3. Feed control lever (5) will release the feed latch (6) allowing the header tube assembly (7) to feed paper.
4. When the Operation Control Handle is released, spring action will move it back to the “Ink” position. The feed control lever (5) will remain on. Cylinder contact will now be controlled by paper feed.

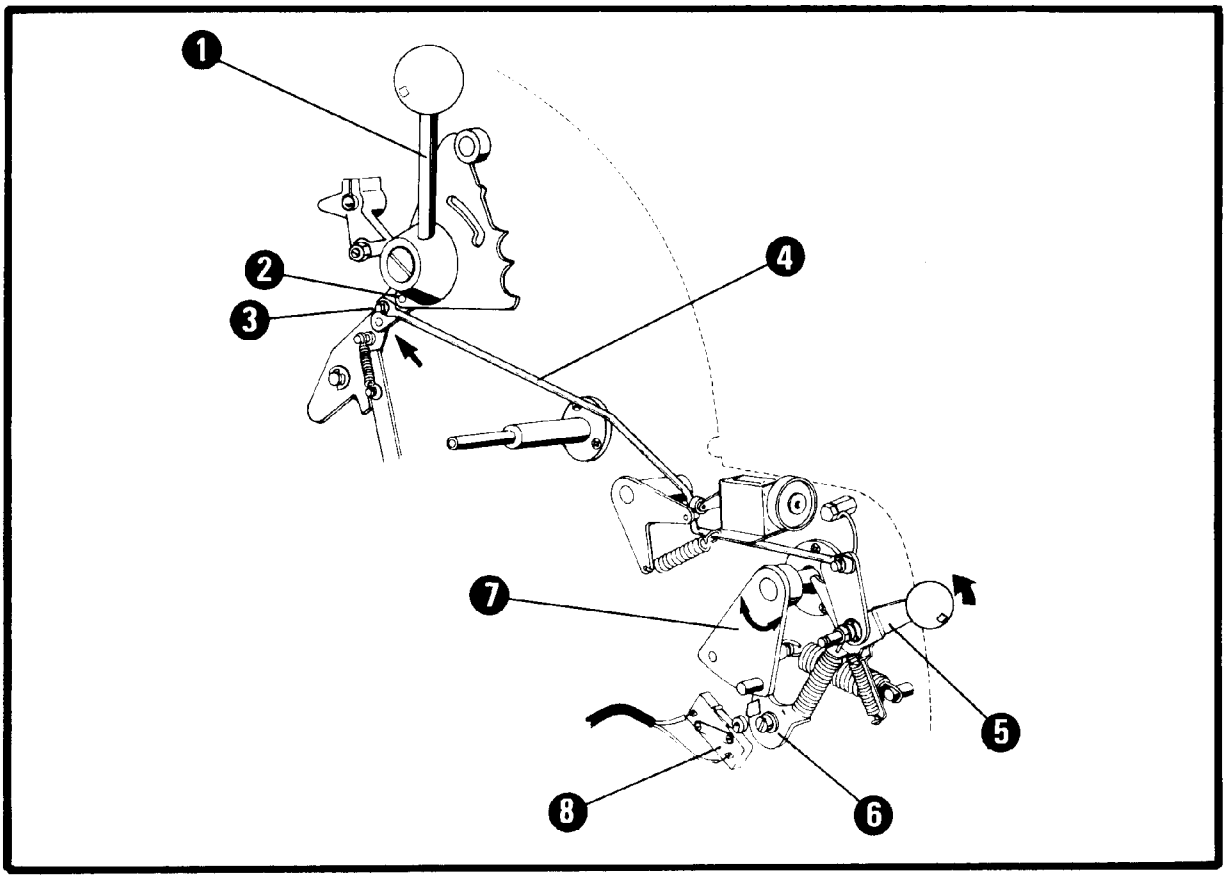


Figure 11 - Operation Control Handle

PAPER FEED

PURPOSE: Allows suction feet to have vertical and horizontal movement.

FUNCTION:

Horizontal Movement

1. Whenever machine is running, suction feet will move horizontally. Truck and lever (1) follow high of cam (2).
2. Link (3) moves levers (4). Levers (4) move truck (5) which pivots levers (6) and suction feet assembly (7).
3. Suction feet (8) then move forward.

Vertical Movement

1. When feed control lever is in “On” position, truck and lever (9) are permitted to follow cam (10).
2. Truck and lever (9) move link (11) which pivots lever (12).
3. Shaft (13) is turned by lever (12).
4. Shaft (13) will pivot link (14) which moves suction feet assembly (7) down.
5. Suction feet (8) will then lift up a sheet of paper and the horizontal movement will forward it to the crotch of the forwarding rollers.
6. The correct timing of vertical and horizontal movement is controlled by the positions of the cams (2 and 10).

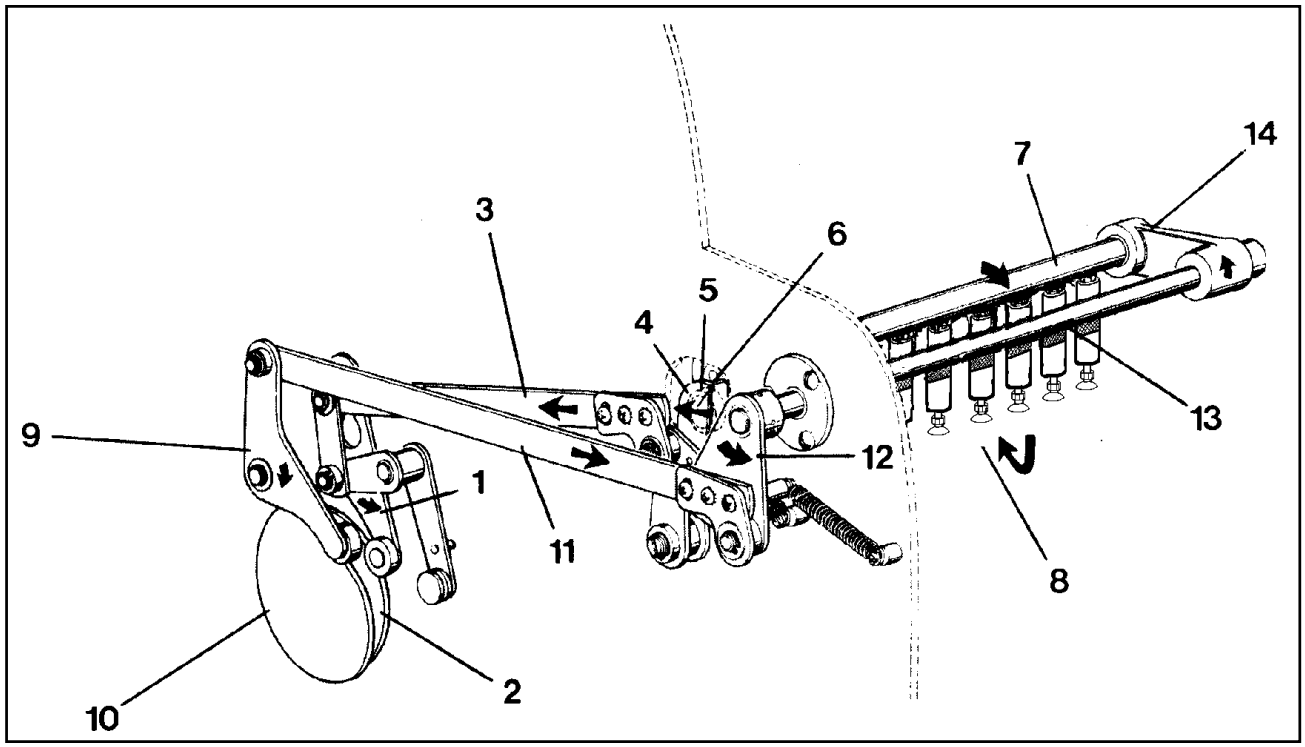


Figure 12 - Paper Feed Mechanism

PAPER BUCKLE CONTROL

PURPOSE: Ensures paper will be fed completely into impression cylinder grippers.

FUNCTION:

1. Buckle control (1) is turned, causing lever (2) to pivot, lifting links (3 and 4).
2. When link (4) is moved up in slot of lever (5) its stroke is increased.
3. Link (4) will increase the forward movement of levers (6).
4. The suction feet (7) will then deliver the paper sooner to the forwarding rollers (8).

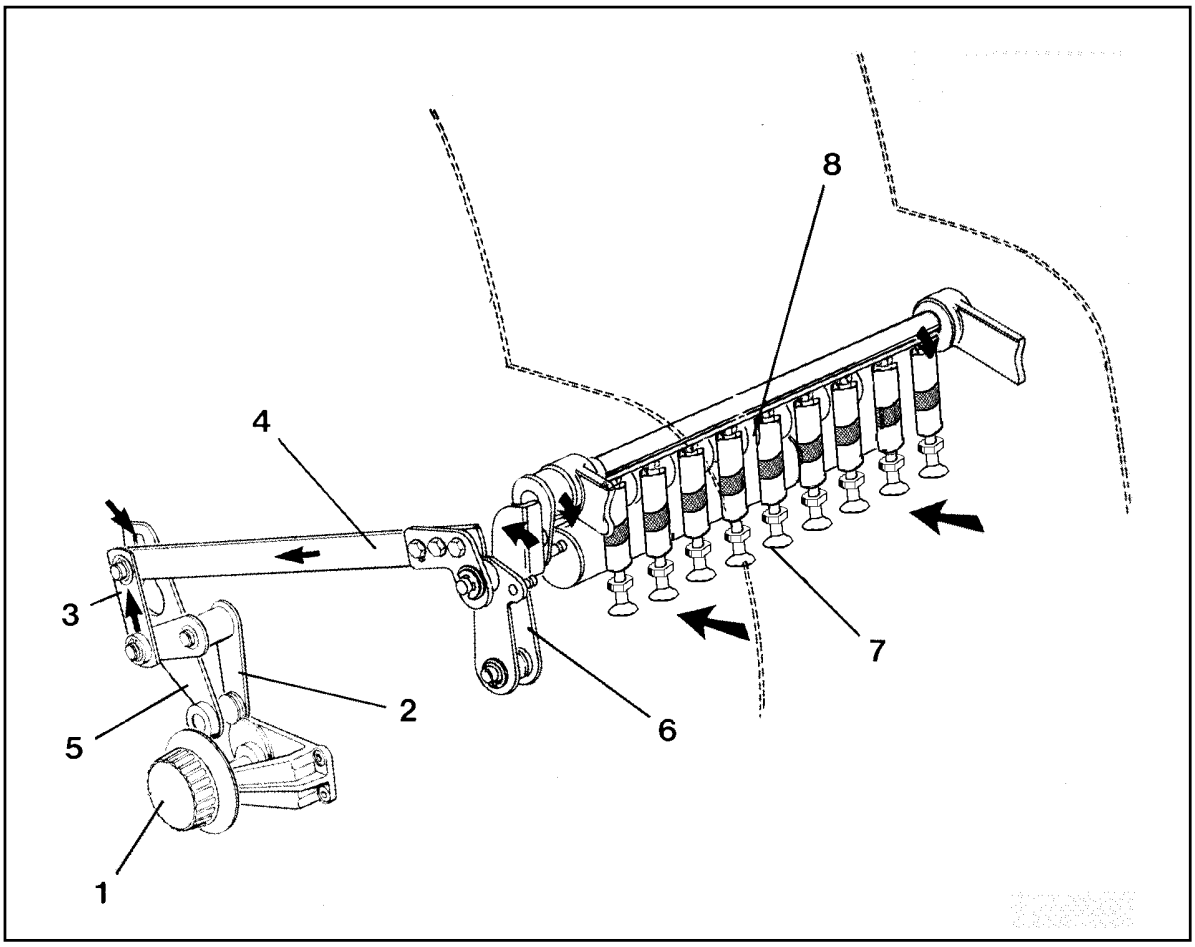


Figure 13 - Paper Buckle Control Mechanism

VACUUM MAKE AND BREAK VALVE

PURPOSE: To pick up and release paper.

FUNCTION:

1. As suction feet are lowered, truck and lever (1) move to low of cam (2).
2. Link (3) causes lever (4) to close valve (5) opening.
3. Suction is caused when valve (5) is closed and the top sheet of paper is then lifted.
4. When the sheet of paper has been forwarded to the forwarding rollers, valve (5) is opened.
5. Opening of valve (5) breaks vacuum, which causes the suction feet to release sheet.

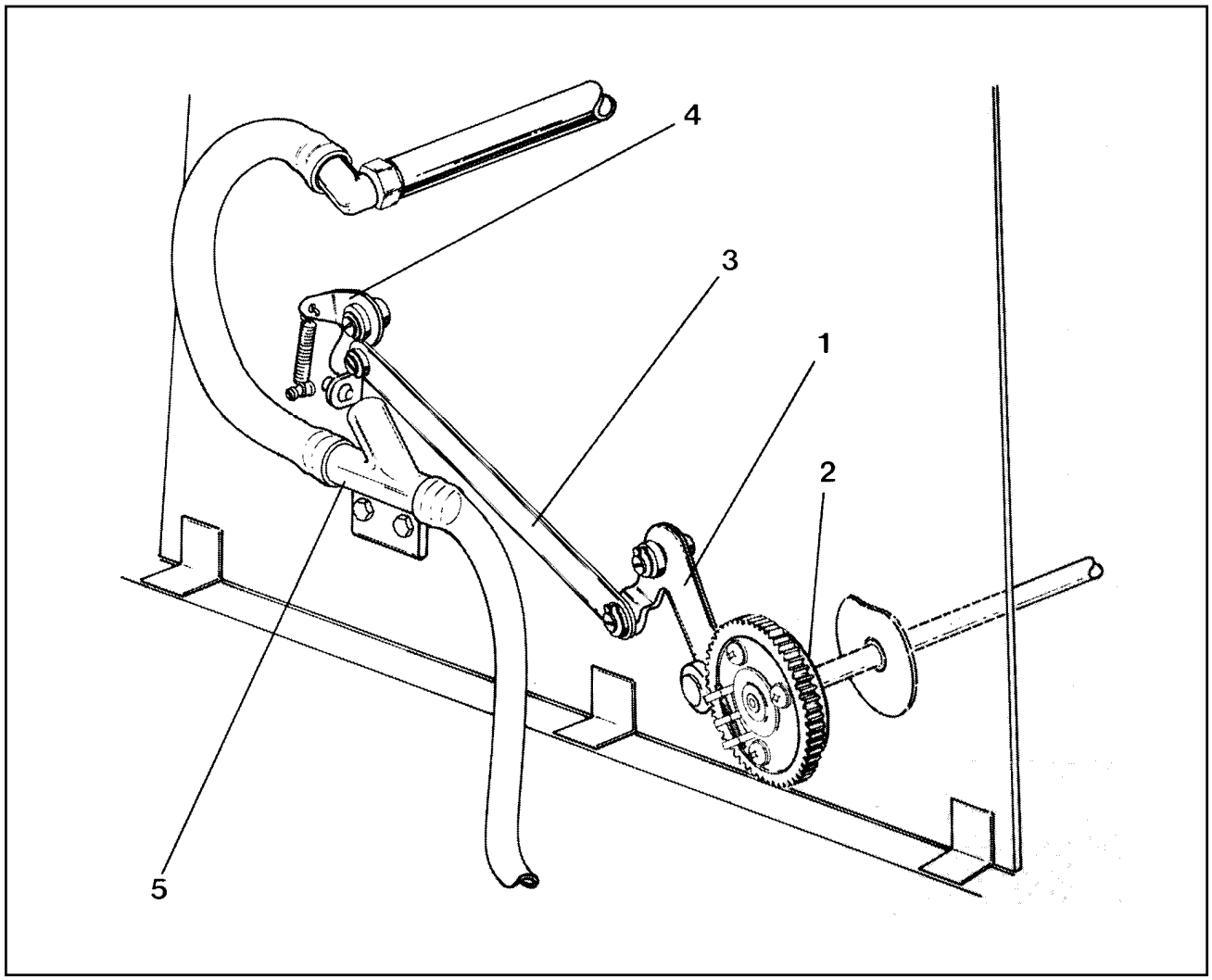


Figure 14 - Vacuum Make and Break Valve

PAPER FORWARDING

PURPOSE: Forwards paper to the grippers.

FUNCTION:

1. Suction feet (1) deliver a sheet of paper to the crotch of the forwarding rollers (2 and 3).
2. Spring tension holds forwarding rollers together when lever (4) follows low of cam (5).
3. Forwarding rollers (2 and 3) deliver paper to grippers. Rollers are held together and the forwarding action continues until after the grippers are closed.
4. Upper forwarding rollers (2) are lifted out of contact with lower forwarding rollers (3), when truck and lever (4) are on the high of the cam (5).

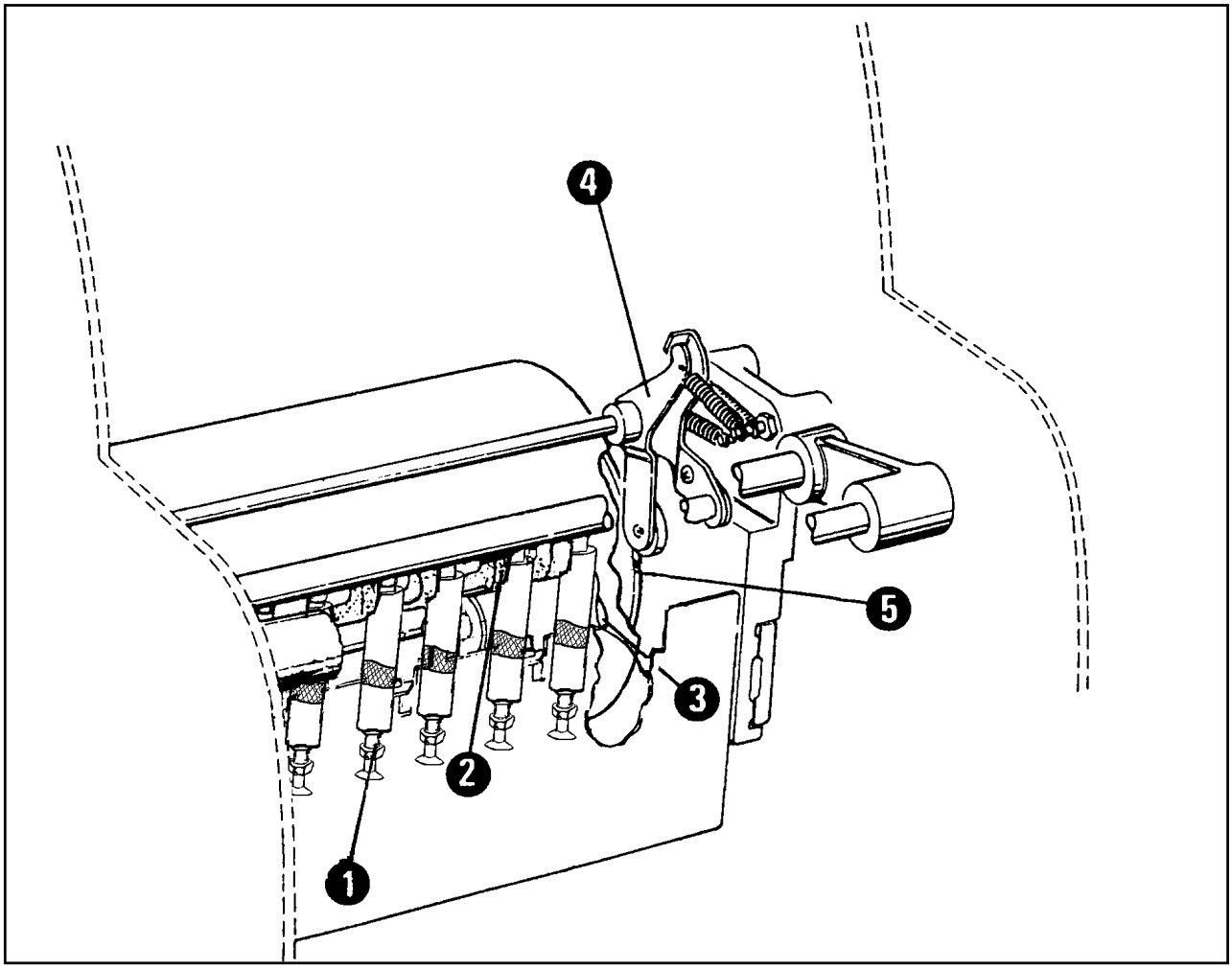


Figure 15 - Paper Forwarding Mechanism

PAPER GRIPPERS

PURPOSE: To grip and feed paper to strippers.

FUNCTION:

1. Paper is fed by forwarding rollers into the grippers (1) and against paper stops (2).
2. Impression cylinder turns and truck (3) moves to the high of gripper cam (4).
3. Truck (3) moves lever assembly (5). Lever (6) is turned, closing grippers (1) on lead edge of paper.
4. As the impression cylinder turns, truck (3) moves lever assembly (5). Lever (6) is turned, opening grippers (1), releasing lead edge of paper into the path of the chain delivery gripper bar.

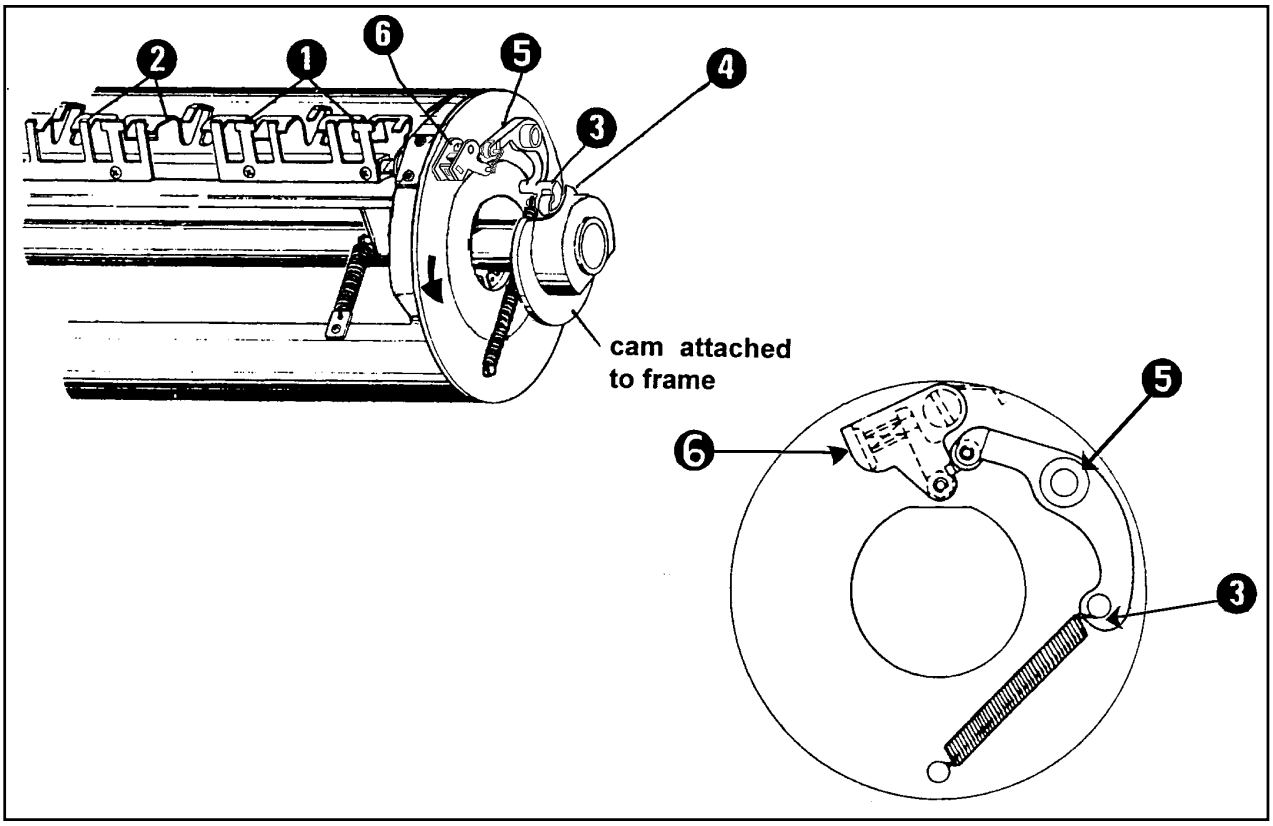


Figure 16 - Paper Gripper

IMPRESSION CYLINDER LATCHING

PURPOSE: Lifts and holds the impression cylinder in the duplicating position.

FUNCTION:

1. When a sheet of paper is fed under the feeler pins (1), their downward movement is prevented.
2. The ear (2) of feeler pin assembly will engage lower end of double lever (3) when truck (4) starts to move to low of cam (5).
3. Ear (2) will not permit truck (4) to follow low of cam (5). Impression cylinder latch (6) will then be permitted to lower and engage impression cylinder lever (7).
4. Impression cylinder lever (7) is engaged when power lever (8) moves to high of cam (9), turning lever (7).
5. Lever (7) on eccentric shaft (10) lifts the impression cylinder into contact with blanket cylinder. Impression cylinder will remain lifted as long as lever (7) is engaged by latch (6).
6. When no paper is fed feeler pin (1) lowers, ear (2) will not engage double-lever (3), truck (4) will move to low of cam (5), and double-lever (3) will not permit latch (6) to engage lever (7).

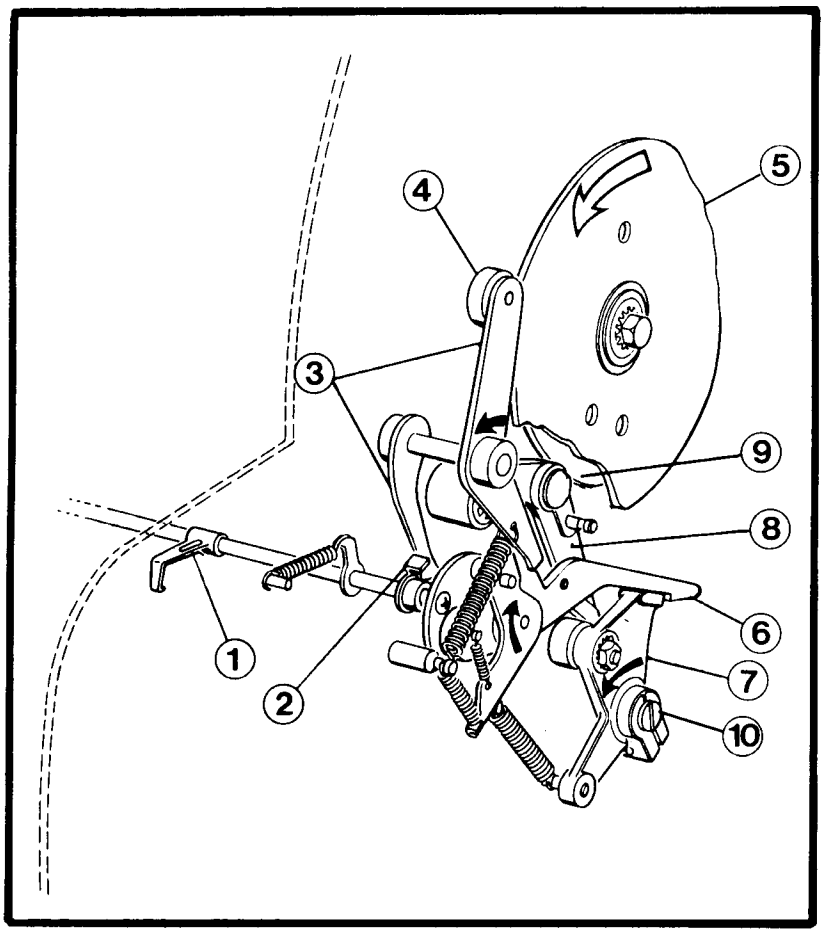


Figure 17 - Impression Cylinder Latching Mechanism

MASTER CYLINDER LATCHING

PURPOSE: Lowers and holds the master cylinder in the duplicating position.

FUNCTION:

1. When impression cylinder latches master cylinder is automatically latched on the next revolution of the cylinders.
2. Counter operating lever (1) on operator end of impression cylinder shaft turns when impression cylinder latches.
3. Lever (1) with spring attached lifts master cylinder link (2) up, master cylinder latch (3) is pushed up to engage master cylinder lever (4).
4. Lever (4) is engaged when power lever (5) moves to high of cam (6), turning lever (4).
5. Lever (4) on eccentric shaft (7) lowers master cylinder (8) into contact with blanket cylinder (9). Master cylinder (8) will be kept lowered as long as lever (4) is engaged by latch (3).
6. When no paper is fed, impression cylinder will not latch, lever (1) will not turn, link (2) and latch (3) will not engage lever (4).

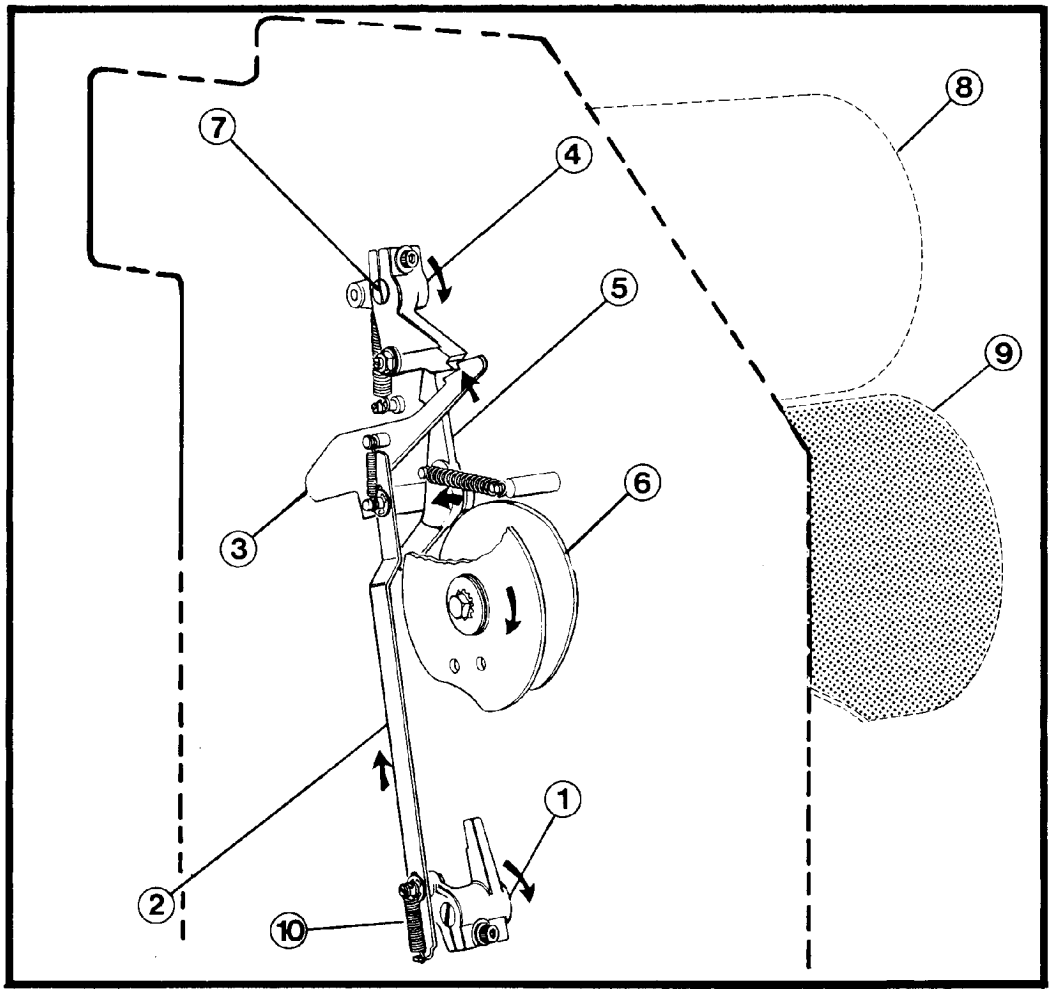


Figure 18 - Master Cylinder Latching Assembly

TABLE RAISE

PURPOSE: Raises and maintains the feed table at the proper feeding level.

FUNCTION:

Manual

1. Paper crank (1) is turned clockwise turning gear (12).
2. Gear (12) will turn: gear (15), bevel gear (16), worm gear (17), gear (18), and shaft (2).
3. Shaft (2) turns sprockets (3) and chains (4) (operator's and non-operator sides).
4. Chains (4) connected to feed table (5), lift the table.

Automatic (Table Release Lever (6) Up)

1. The paper height regulators (7) move up and down sensing for paper.
2. When the feeding level of the paper stack is lowered the paper height regulators (7) move down.
3. When the paper height regulators (7) move down, sliding link (23) moves to the right.
4. Pin (24) attached to the back side of link (23) contacts linkage plate (8) which causes latch (9) to release lever (10).
5. Pawl (11) connected to lever (10) will turn gear (12) by means of a ratchet located behind gear (12). Lever (10) is moved by power lever (22). The power lever (22) is driven by crank arm (13) and link (14).
6. The ratcheting of gear (12) will turn: gear (15), bevel gear (16), worm gear (17), gear (18), and shaft (2).
7. Shaft (2) turns sprockets (3) and chains (4) (operator and non-operator sides).
8. Chains (4) connected to feed table (5), lift the table.
9. Table (5) will then be lifted until the downward action of the paper height regulators (7) is restricted.
10. When regulators (7) are restricted link (23) is not allowed to travel fully to the right. Pin (24) attached to link (23) does not contact linkage plate (8).
11. The linkage plate (8) allows latch (9) to hold lever (10), stopping the ratcheting of gear (12).
12. Feed level of table (5) may be changed by moving table raise lever (19). Lever (19) will change the stroke of the paper height regulators (7). This will control when lever (10) is permitted to turn gear (12).
13. Trip bracket (20) restricts table (5) from raising too high and damaging the machine. Trip bracket (20) lifts lever (21) preventing paper height regulators (7) downward movement. This action will not allow lever (10) to turn gear (12).

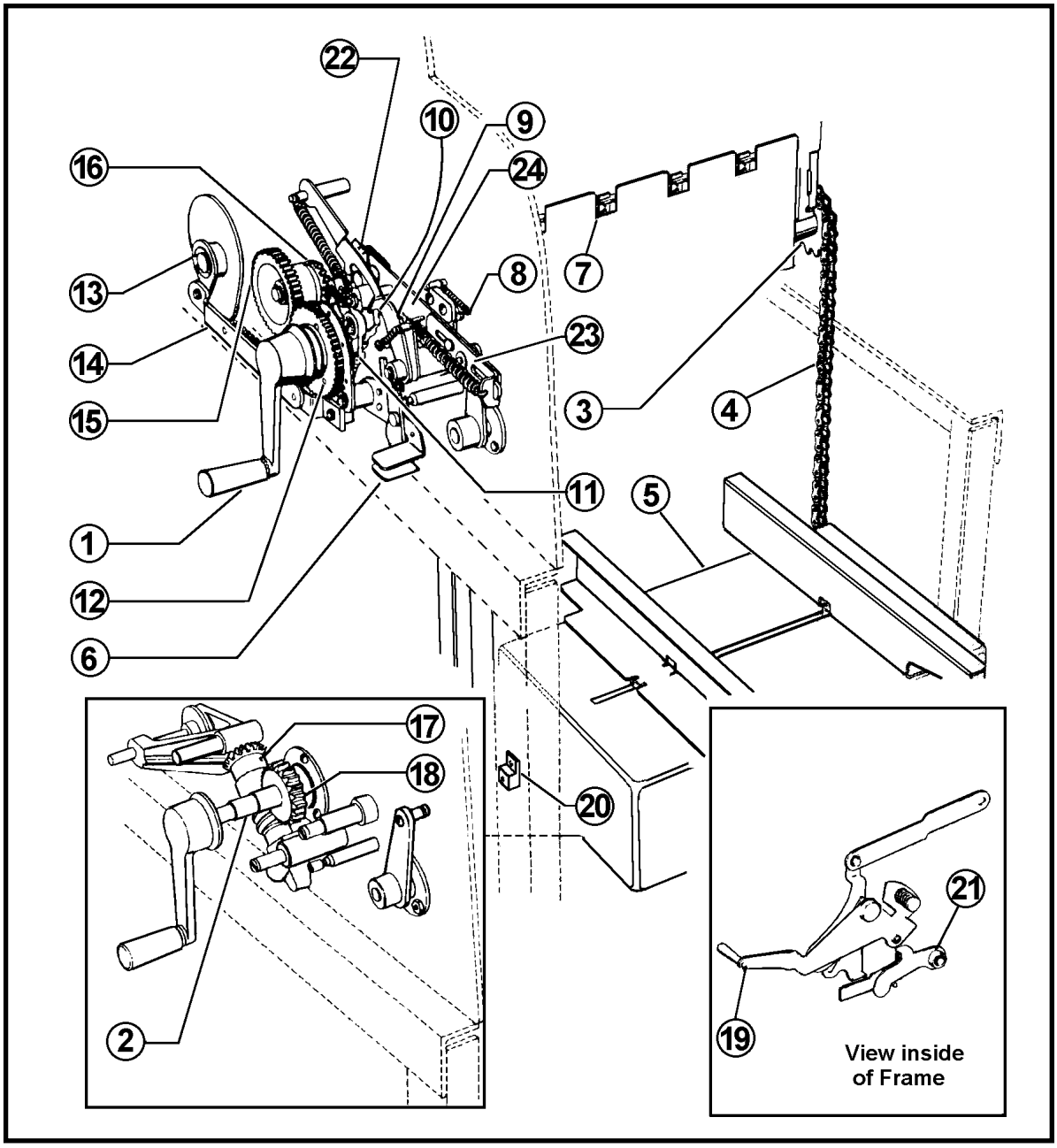


Figure 19 - Table Raise Mechanism

COUNTER

PURPOSE: Counts each duplicated copy.

FUNCTION:

1. Counter operating lever (1) is turned when impression cylinder latches.
2. Counter cam Lever (2) is permitted to follow low of cam (3).
3. As link (4) moves, switch (5) is actuated causing a pulse to the digital counter assembly and advancing (or decrementing) the counter one digit, depending upon the counter mode programmed.

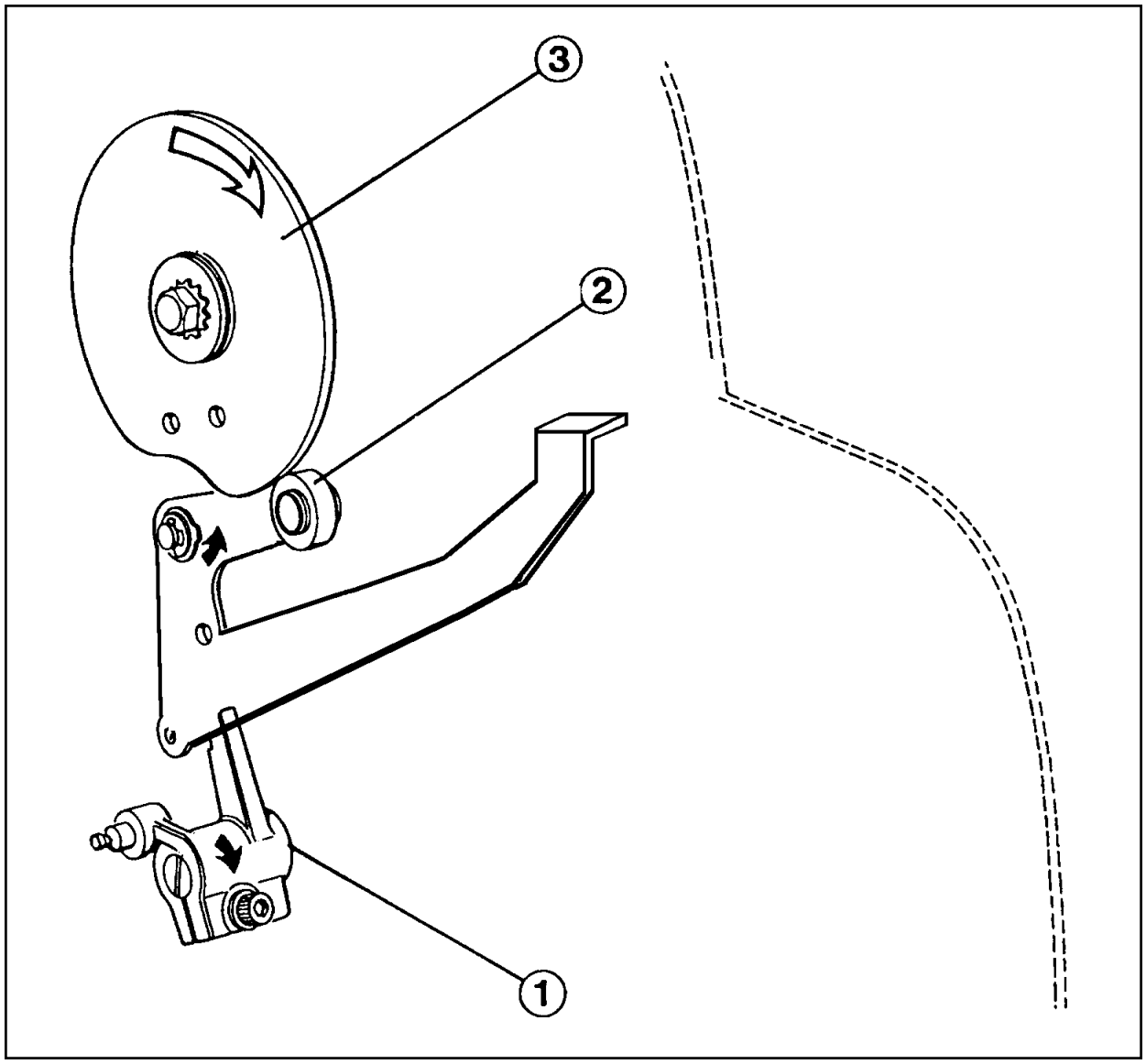


Figure 20 - Counter Assembly

AIR AND VACUUM SYSTEM

PURPOSE: Controls air and vacuum for use in machine.

FUNCTION:

1. Air is pulled into compressor through suction feet, make and break valve and the vacuum adjustment valve.
2. Compressor pushes air through blower tube and out through holes in paper height regulators. Air is also pushed out through air adjustment valve.

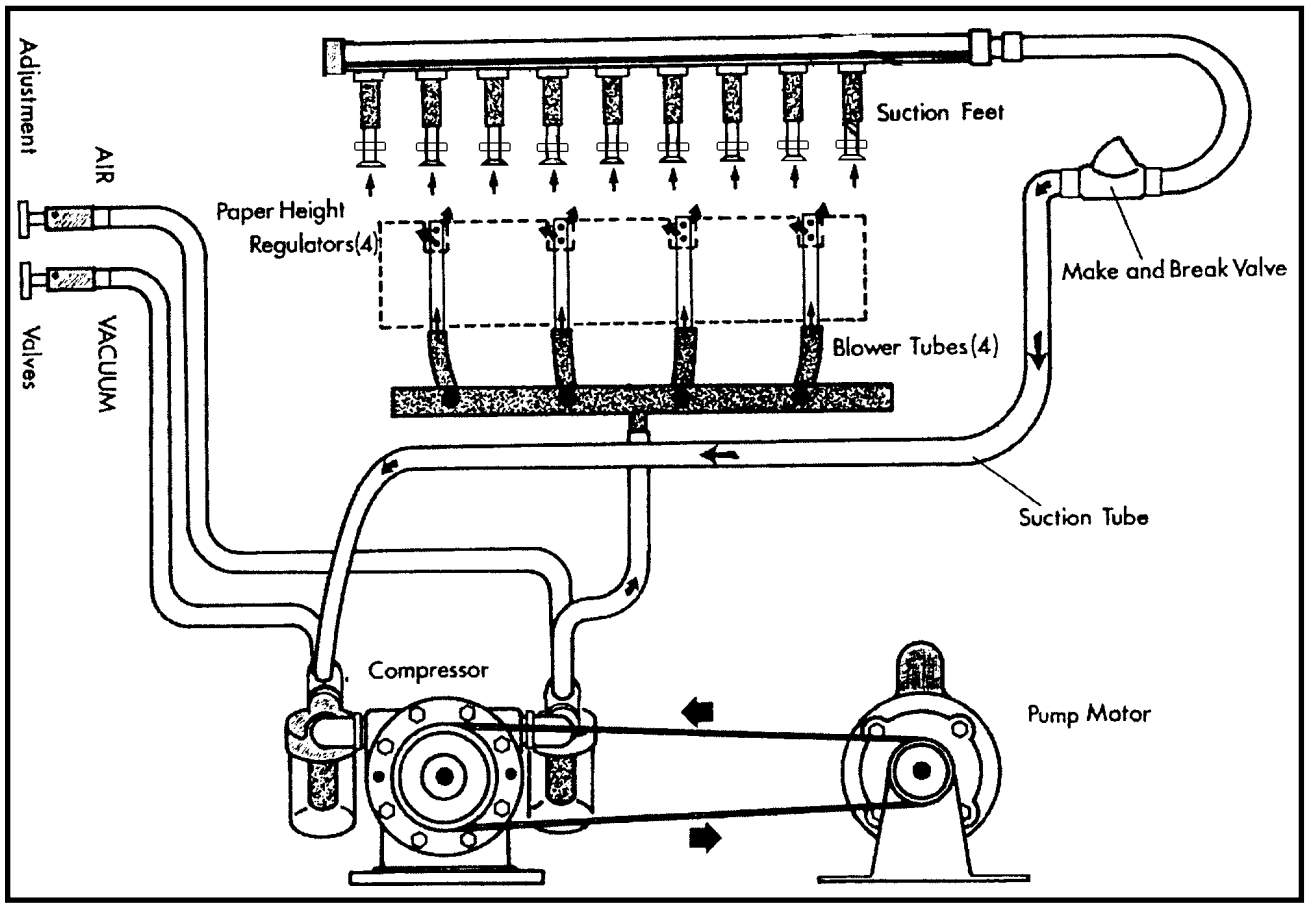


Figure 21 - Air and Vacuum Diagram

ADJUSTMENTS

ABDICK®

INTRODUCTION TO ADJUSTMENTS

NOTE:

Adjustment information for the 9905 Offset Duplicator tray delivery is provided in the 350/360/375/9800 Series/9810 Series Service Reference Manual (p/n 177187).

WARNING

THE MACHINE MUST BE UNPLUGGED FROM ITS RECEPTACLE WHEN MAKING ADJUSTMENTS. IF AN ADJUSTMENT REQUIRES THE MACHINE TO BE TURNED ON, PLUG IT IN AND IMMEDIATELY UNPLUG IT WHEN THE ADJUSTMENT IS COMPLETED.

Operating adjustments are discussed in this manual. The following adjustments should be made by a technical representative. To make the best use of this section of the manual, you should proceed as follows:

1. Read the requirement to find out what is expected of the adjustment.
2. Read the adjustment procedure.
3. After reading the procedure, if the requirement is met, go no further.
4. If the requirement is not met, make the adjustment.

NOTE:

Before making any adjustments, position the following:

Buckle Control at “0” Raise-Lower at “0” Gap Control at “1” (3:00 position)

In addition to the basic hand tools, the following gauges are required to calibrate a 9910 Series machine:

QUANTITY	PART NUMBER	DESCRIPTION
1 each	191541	Suction Foot Adjusting Gauge
2 each	191544	.0615 Feeler Gauge (Curved)
1 each	191545	.0606 Feeler Gauge (Flat)
1 each	191546	Feeler Gauge Set
1 each	191548	Impression Cylinder Support Arm Gauge
1 each	191549	Master Cylinder Support Arm Gauge
1 each	191551	Cylinder Adjusting Tool
1 each	191552	1/4" X 11/32" Gripper Gauge
1 each	191555	Chain Gripper Bar Gauge
1 each	191556	Impression Cylinder Gripper Gauge (Chain Delivery)
1 each	191573	Cylinder Adjusting Tool - Puller

ADJUSTMENT INSTRUCTIONS

The following materials should be used while calibrating and testing the machine:

Paper:	A.B.Dick Offset 43-2120 Sub. 20 8-1/2" X 11"
Ink:	A.B.Dick 3-1012 Black
Fountain Solution:	A.B.Dick 4-1115 Fountain Concentrate - dilute 15 parts distilled water with 1 part concentrate
Etch:	A.B.Dick 4-1015 Blue Etch A.B.Dick 4-4315 Blanket Wash A.B.Dick 4-4965 Chrome Cleaner
Ink Roller Conditioner:	A.B.Dick 4-4976
Master:	A.B.Dick 4000 Series Short Run Master A.B.Dick 7000 Series Metal Plate A.B.Dick 8000 Series Metal Plate
Blanket:	A.B.Dick 4-5200

CONTROL BOX - LINE VOLTAGE INPUT CHANGES

The 9900 series machines are factory wired for 230vac, 60Hz. power input. All control boxes are equipped with a domestic 230vac-15A power service cord with black, white, green insulated conductors.

If changes are required for other than above, ex. 200vac, 220vac, or 240vac and 50 cycle operation, please see Fig. 22A below or sheet 1 of 8 of the schematics included in this manual. Note: These wiring detail's are called out on the decal located on the inside of the control box cover assembly.

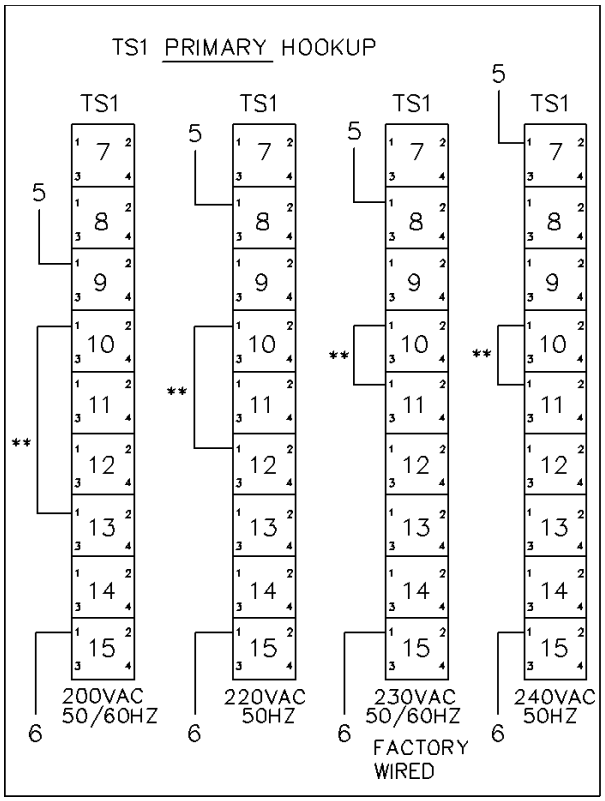


Figure 22A - TS1 Primary Hookup

NOTE:

If the machine/control box assembly is to be used on a 50Hz. power system (International units only), then the Domestic power service cord need's to be replaced with the International power service cord which is packed in the "packed unit", supplied with each machine. This cord complies with the International color code system, (brown, blue, green/yellow). A suitable hand-attached power plug will have to be purchased separately and applied to the end of the service cord. When changing this cord please note that the color code below:

FUNCTION	DOMESTIC	INTERNATIONAL
L1	BLACK	ROWN
L2	WHITE	BLUE
GROUND	GREEN	GREEN/YELLOW

Work-lamp power requirements:

The work-lamp receptacle is wired for 115vac operation at the factory. If 230vac operation is required (220-240v lamps) the following changes should be made to the power transformer assembly's terminal strip (TS1), located in the control box assembly. See Fig. 22B below and sheet 1 of 8 for the schematics located in this manual, for proper wiring details.

NOTE:

These wiring detail's are also called out on the decal located on the inside of the control box cover assembly.

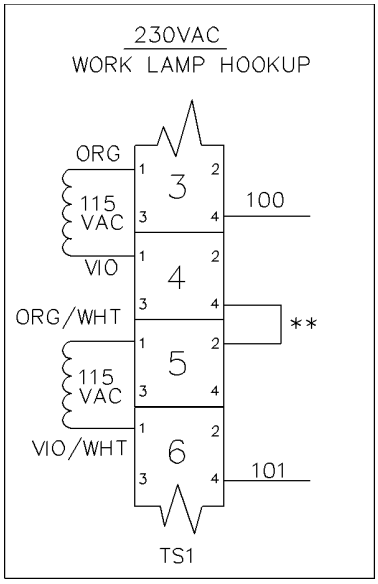


Figure 22B - 230VAC Work-lamp Hookup

PUMP MOTOR PULLEY CHANGE

The pump motor and pump located in the base of each machine is factory assembled for 60Hz. operation. For 50Hz. operation, (International units), the pump motor belt must be shifted to the inside pulley sheeves- no further adjustment is normally required.

MACHINE INSTALLATION

1. Remove all tape from the machine. The tape will be visible throughout the machine; however, a complete check will ensure that all of it has been removed.

NOTE:

Care should be taken when removing tape from the plastic guards. Use A.B.Dick Blanket Wash (P/N 4-4315) to remove all excess adhesive from the guards, covers and frames.

2. Remove the four (4) screws that secure the plywood shelf to the machine.

   After the screws are removed from the plywood shelf, move the shelf to the center of the machine and slide it out.

3. Level the machine:
   a. With the machine standing in its three-point position, adjust the three (3) foot pads to 1" to 1-1/16".
   b. Level the machine from side-to-side using the footing screws at the RECEIVING-END of the machine.
   c. Level the machine, front-to-rear, using the center footing screw.
   d. When the machine is level, set the outrigger screws to within 1/32" of the floor.

NOTE:

The outrigger screws should never be used to level the machine.

4. From the inside of the machine, remove the two (2) chipboard tubes that harness the feed table counterweights.
5. Remove the four (4) chipboard pieces (two in each side frame) inserted between the machine side frame and each ink head side frame.
6. Reposition the paper support rails and the back stop guides.

CAUTION:

The paper support rails must be rotated 180° so that both rails clear the front apron; also, the paper side and back guides must be positioned to clear the paper support board when the table is raised.

7. Assemble the following items onto the machine:
   a. Paper feed table handle, locating the screw in the groove of the shaft.
   b. Ink fountain, properly seated in place.
   c. Receding stacker handle.
   d. Receiving tray and tray Bail.
   e. Flexible work light.

8. Condition the aquamatic fountain roller:
   a. Move the aquamatic ductor roller to the NIGHT LATCH position.
   b. Scrub the aquamatic fountain roller with a cotton pad, saturated with water, to remove the protective gum coating. Wipe the roller dry.
   c. Thoroughly clean the copper roller using A.B.Dick Chrome Cylinder Cleaner (4-4965); clean the copper roller with water.
   d. Condition the surface of the fountain roller with Ink Roller Conditioner (P/N 4-4976).

      The entire roller surface should be covered and wiped several times.
   e. Dry the roller completely using a clean, dry cotton pad.
9. Clean the Blanket:
   a. Wash the blanket thoroughly with clear tap water to remove the protective powder.
   b. Wipe dry, and clean thoroughly with Roller Cleaner and Blanket Wash (P/N 4-4315).
10. Clean the master and impression cylinders:
   a. Wipe the entire surface of the cylinders with a clean cloth moistened with Blanket Wash.

      Allow to dry.
   b. Apply Chrome Cylinder Cleaner (P/N 4-4965) to the entire surface of the cylinders and rub vigorously.

      Three coats of chrome cleaner should be applied, and each one rubbed vigorously.
   c. Wash off the chrome cleaner with water and wipe the cylinders dry.
   d. Wipe the entire surface with a clean cotton pad saturated with Etch (#4-1015).

      Remove the excess Etch with a clean, dry, cotton pad.
11. Rotate the handwheel and check that all the chain delivery gripper bars clear the impression cylinder and its grippers.

    If there is an interference, refer to the adjustment sections of this manual entitled "Chain Delivery Adjustment and Timing Check" and "Gripper Bar and Timing Adjustments".
12. Load paper in the machine and check the following:
   a. Paper forwarding roller parallelism
   b. Grippers
   c. Buckle
13. Ink the machine and check the following:
   a. Master cylinder parallelism
   b. Oscillating rollers centering
   c. Form roller bead line
   d. Aquamatic ductor parallelism
   e. Aquamatic ductor lockout
   f. All safety cover interlocks

ADJUSTMENTS

MACHINE TIMING SPECIFICATIONS

NOTE:

Print Raise/Lower must be set at "0" when timing machine.

1. Face the open area of all cylinders toward the receiving end of the machine.
2. Refer to diagram below and check that the machine is properly in time. Timing marks of all gears come into time every seventh revolution. Cylinders come into time every revolution.

Machine Timing (Chain Delivery)

1. Face the open area of all cylinders toward the receiving end of the machine.
2. Refer to diagram below and check that the machine is properly in time. The timing marks of all gears come into time every fifth revolution. Cylinders come into time every revolution.

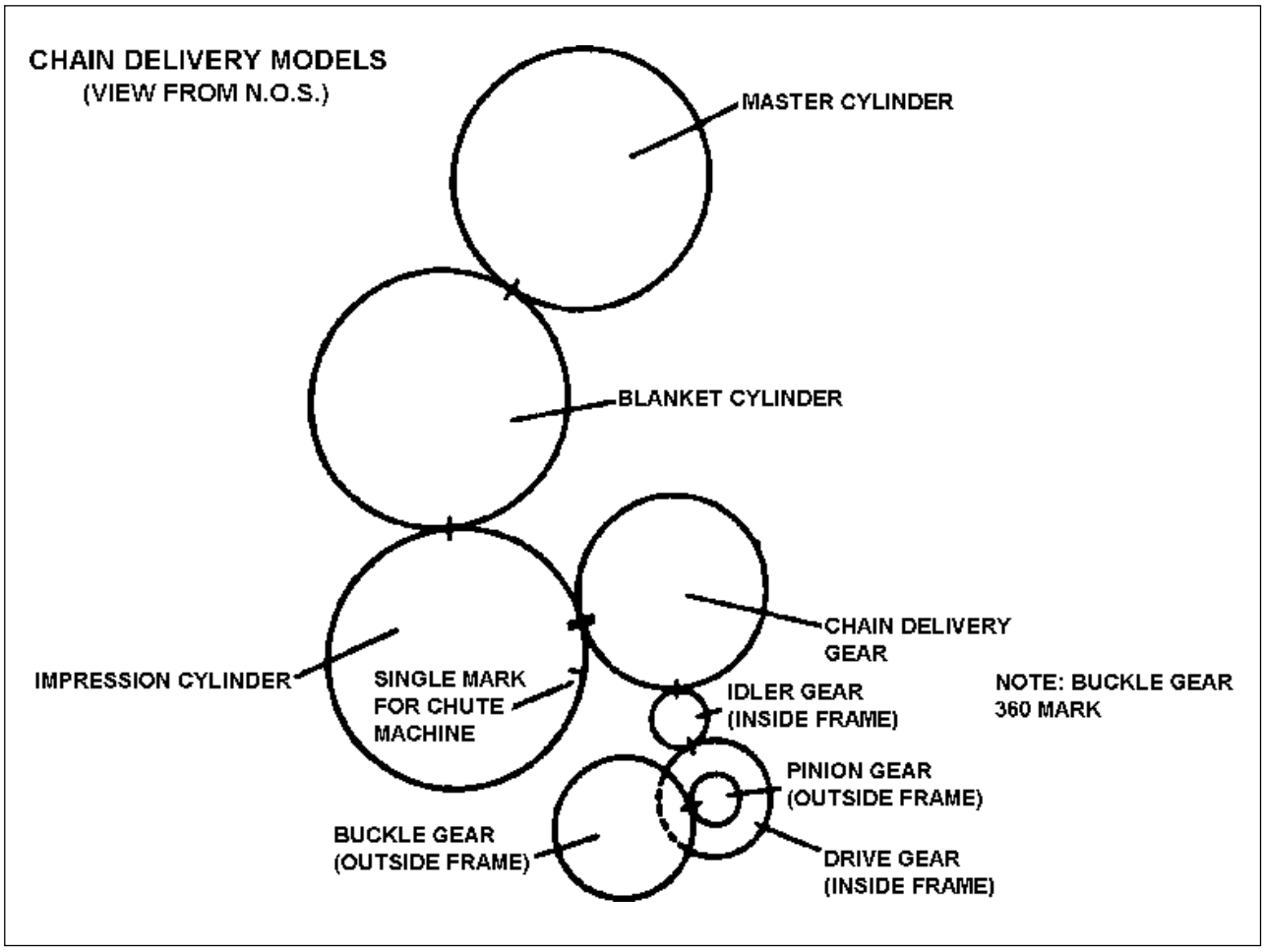


Figure 23 - Machine Timing Diagram

OPERATION CONTROL LEVEL DETENT

REQUIREMENT: The detent truck must properly locate in the sequence cam detents for correct form roller action.

When the operation control lever is moved from “Ink” to “Image”, the control ink must be lifted into the over-travel slot.

ADJUSTMENT:

1. Position operation control lever in “Ink” and turn “on” form rollers.
2. Loosen nut on detent lever truck (1).
3. Move operation control lever until form roller separator cams (2) are free of, and the cam (2) flats are parallel to, the form roller levers (3).
4. Hold the control lever and move truck (1) to fit properly into the “Ink” position of sequence cam (4).
5. Move control lever to the “Night Latch” position and check form rollers for proper release. Re-adjust slightly, if necessary.
6. Adjust eccentric disc (5) for smooth release of control link (6) when control lever is moved from “Ink” to “Image” to “Feed”.

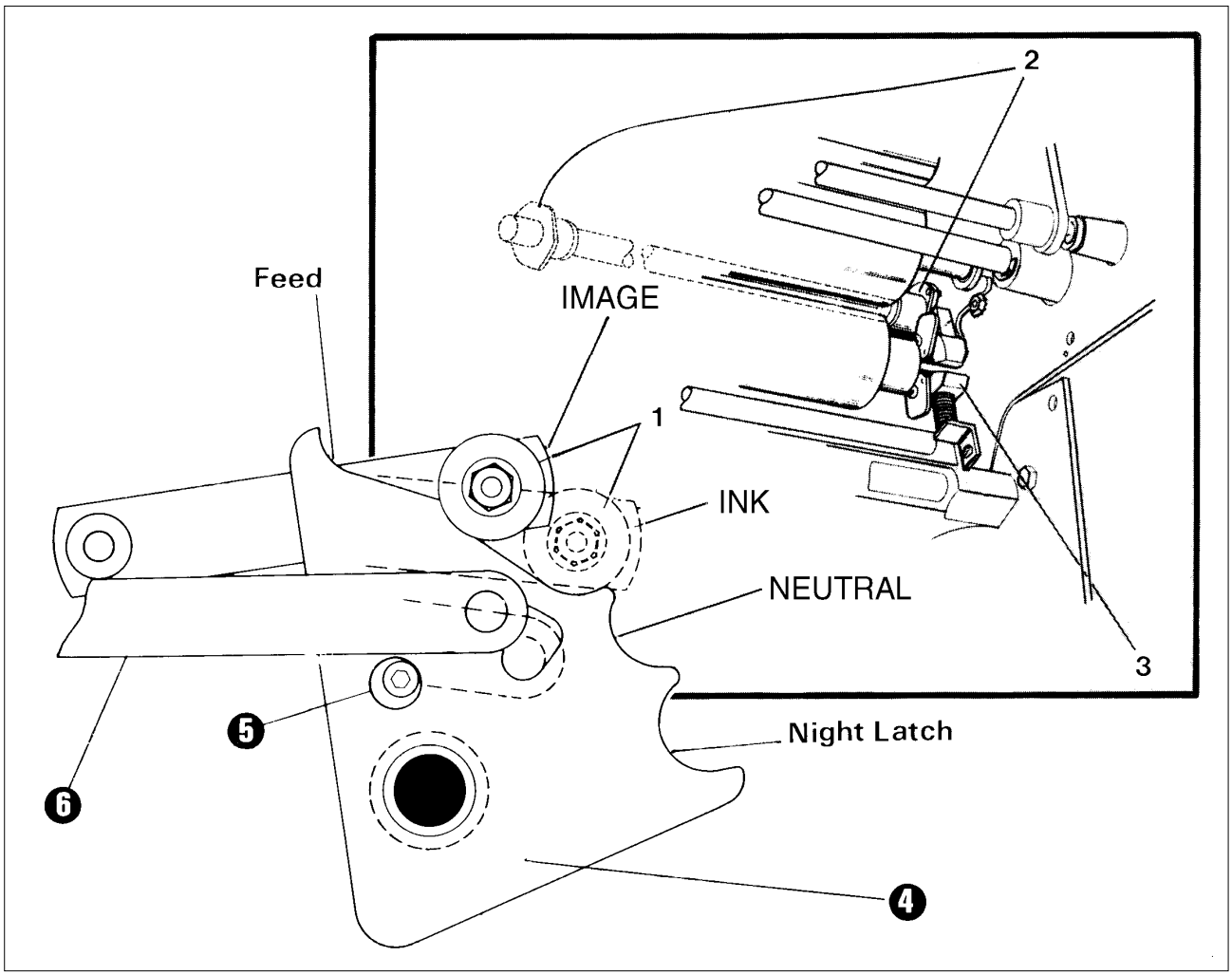


Figure 24 - Operation Control Lever

IMPRESSION CYLINDER SUPPORT ARM AND LATCH LEVER ADJUSTMENTS

(Steps 1-5 are for Operator Side of Machine)

The impression cylinder must be lifted and locked in the duplicating position under proper spring tension.

NOTE:

The machine must be level before doing this adjustment.

Set the gap control to the number 1 position.

Verify that the separator pins on both support arms are parallel to the gap control cams.

1. Remove the blanket from the blanket cylinder.
2. Turn the handwheel to a position where the blanket and impression cylinder surfaces are facing one another.
3. Loosen screw (1) (see Figure 25).
4. Remove springs (2) and master cylinder latch link (3).
5. Install tool (P/N 191551) on the impression cylinder shaft (4) and using the locking knob, draw the impression cylinder to the operator-side of the machine. Loosen locking knob on P/N 191551 tool.

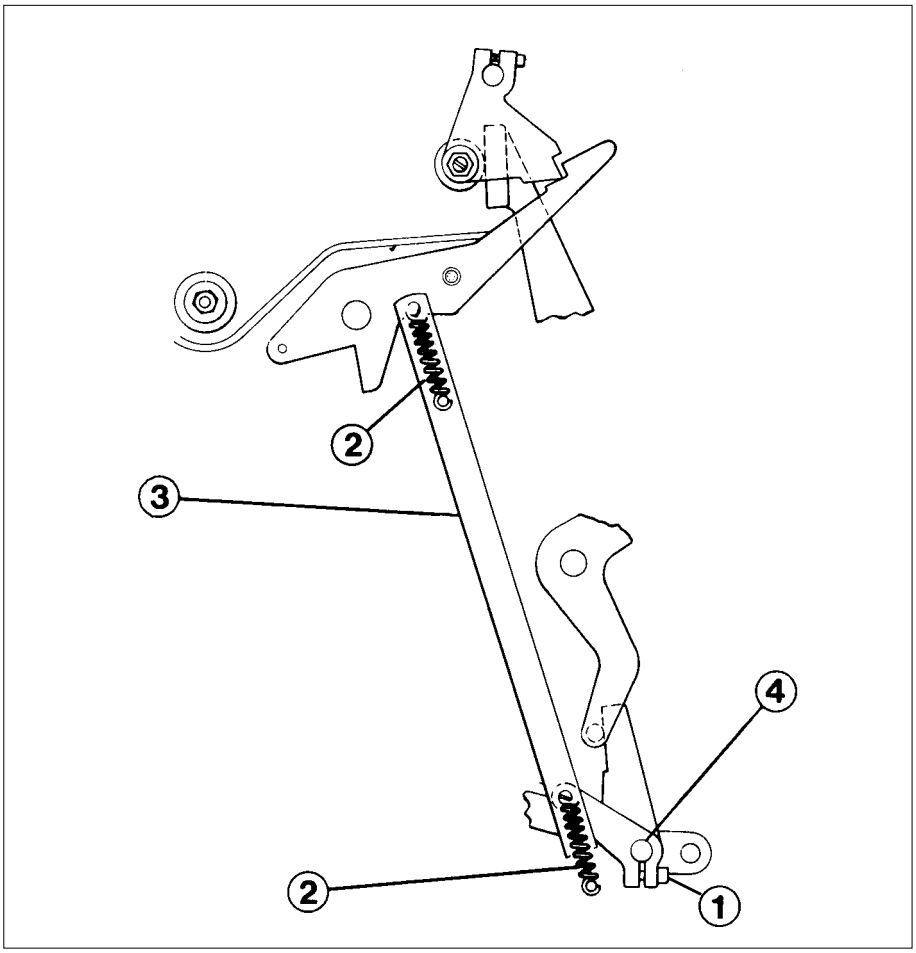


Figure 25 - Impression Cylinder Support Arm and Latch Lever

6. Loosen locknuts (5) on both support arms and turn screws (6) to preset the support arms (7) to a distance of 25/32"+ 1/64" between the underside of the stop blocks (8) and the machined side of the support arms (see Figure 26).
7. Finger tighten locknuts (5).
8. Adjust the cylinder support arm springs (9) to a length (10) of 1-31/64".

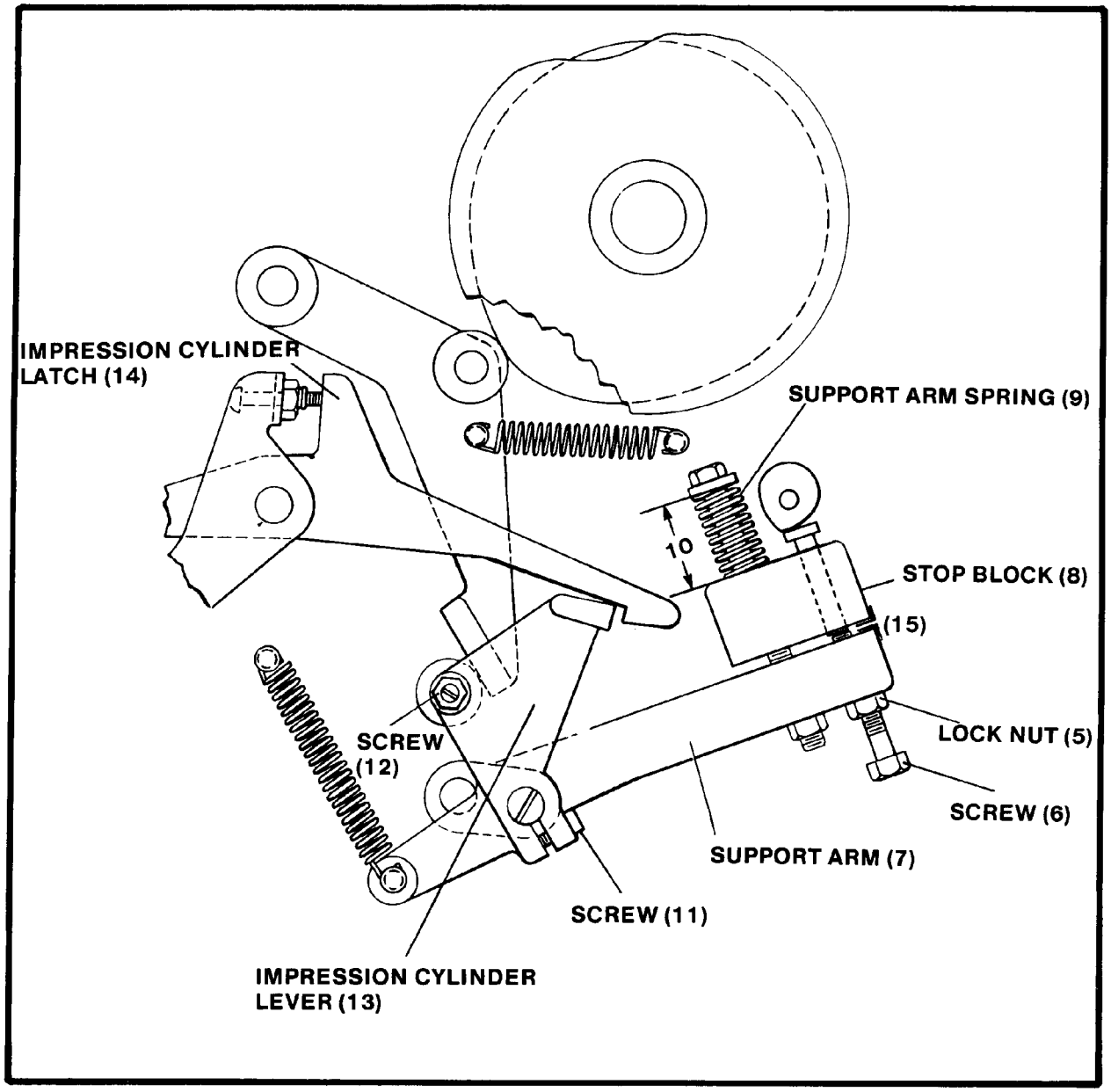


Figure 26 - Impression Cylinder and Latch Assembly

NOTE:

The truck of the forwarding roller lifting shaft must remain on the impression cylinder cam. Verify and reposition, if necessary. See Figures 26 and 27 for referenced parts.

9. Loosen screws (11 and 12) on the impression cylinder lever (13).
10. Insert a .0615" curved feeler gauge (P/N 191544) into the crotch of the impression and blanket cylinders at both ends of the machined surface (approximately 1/2" from either end).
11. Turn adjusting tool (P/N 191551) clockwise until both support arms (7) just move. Tighten lock knob on tool to hold the cylinder shaft in this position.
12. Using the adjusting tool, push the cylinder shaft to the non-operator side of the machine. Shoulder the support arm against the frame, and the impression cylinder lever (13) against the support arm and rotate the cylinder lever clockwise, latching it with the latch lever (14).
13. Tighten screw (11).
14. Loosen locknuts (5) and adjust screws (6) for a gap (15) of .005" between screw and tappet of the stop block (8).

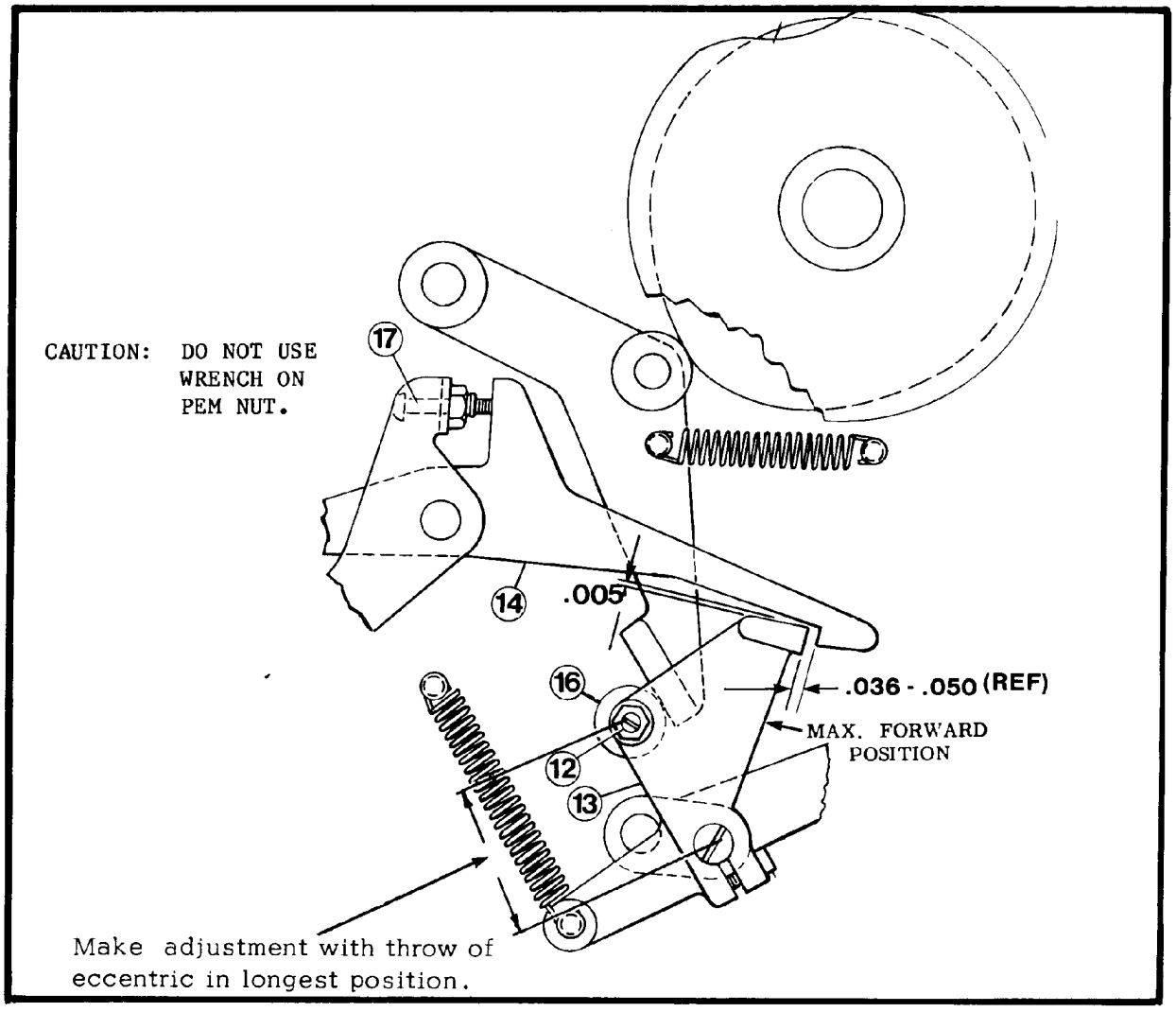


Figure 27 - Impression Cylinder and Latch Lever

15. Tighten locknuts and verify 1-31/64" setting in step 8. Loosen locking knob on cylinder adjusting tool.
16. Unlatch cylinder and remove curved feeler gauges.
17. Turn the handwheel until the impression cylinder Lever (13) is at its maximum forward position toward the feed end of the machine.
18. Bring the latch lever (14) down in contact with the impression cylinder Lever (13) and adjust the screw (12) to obtain a clearance of .036" to .050" between the Impression cylinder lever and latch lever.
19. Tighten nut (12).

NOTE:

The throw of the eccentric (16) must be placed in the longest position from the center of the actuating lever (13) as shown (see Figure 27).

20. Lift feeler pins above paper chute and turn handwheel until the impression cylinder lever (13) is again at its maximum forward position. Adjust screw (17) for .005" clearance between the top of the lever (13) and the latch lever (14).
21. Release feeler pins, turn handwheel and check that the latch lever (14) releases properly.

NOTE:

All of the above are preliminary adjustments and may have to be refined after taking a bead line between the known good inked blanket and impression cylinder. This check is made at the end of the form roller adjustment when the machine is inked.

COUNTER OPERATING LEVER AND ARM ADJUSTMENT

The counter operating Lever must maintain the location of the impression cylinder at the operator's side and allow for proper operation of the counter.

1. Turn handwheel until truck (1) is in the pocket (2) of cam (3) (see Figure 28).
2. Assure that the impression cylinder is unlatched and the lever screw (4) is loose.
3. Loosen knob on cylinder adjusting tool, seat counter operating lever (5) against support arm (6) and pin (7).
4. Tighten screw (4).

NOTE:

The counter operating lever maintains the location of the impression cylinder at the operator side. End play of .001" to .004" is permissible. The lever must be positioned so there is no binding at either extreme of travel.

5. Remove the cylinder adjusting tool and replace the master cylinder latch link and springs.
6. Adjust counter switch (8) for free movement at each end of its operating stroke. (Counting may be simulated by lifting feelers above chute and turning handwheel.) Verify that the counter switch is not forced to the body of the switch.

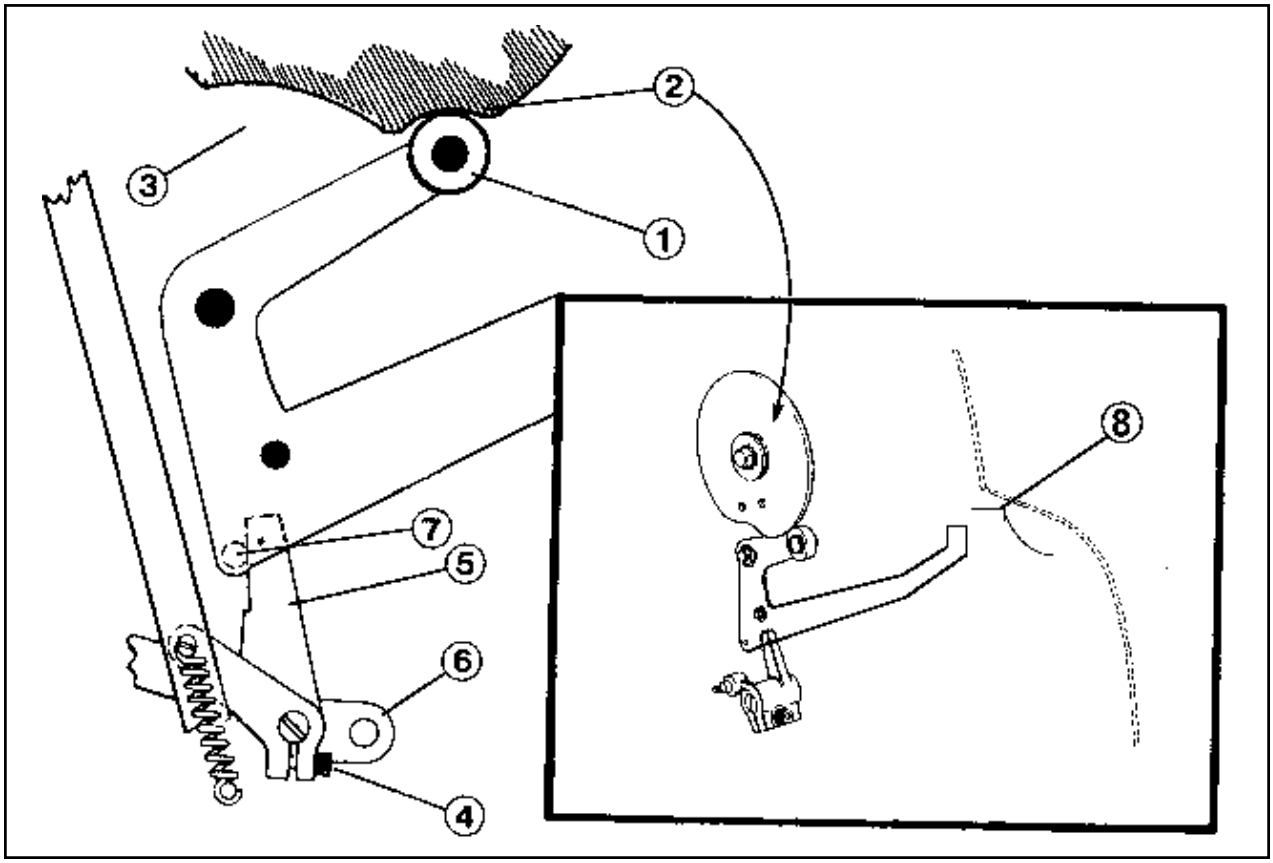


Figure 28 - Counter Operating Lever

MASTER CYLINDER LATCH LEVER ADJUSTMENT

The master cylinder must be lowered into contact with the blanket cylinder and locked in position under proper spring pressure. The machine must be level before you perform this adjustment.

1. Loosen locknuts (1) on both sides of the machine (See Figure 29).
2. Preset screws (2) to position master cylinder support arms (3) for 3/4" between the underside of the stop blocks (4) to the machined side of support arms (3).
3. Finger tighten locknuts.
4. Adjust master cylinder support arm springs (5) to 1-39/64" using tool (P/N 191549).
5. Loosen set screws in collar on non-operator end of master cylinder shaft (6) and screw (7) and nut (8) on master cylinder lever (9) (See Figure 30).
6. Insert cylinder adjusting tool into operator end of master cylinder shaft (6). Draw cylinder toward the operator side by tightening knob on tool. Push the shaft to the non-operator side to eliminate end play. Hold shaft (6) in this position and locate collar and support arm link on non-operator side against side frame. Tighten collar set screws.
7. Loosen knob on cylinder adjusting tool (P/N 191551) enough to free the master cylinder lever.
8. Turn handwheel until the solid areas of the master and blanket cylinders face each other.
9. Insert .0615" curved feeler gauges into the crotch of the master and blanket cylinders at both ends of the machined surfaces of the cylinders.
l0. Turn the adjusting tool (P/N 191551) clockwise until both support arms barely move. Keeping the support arms separated, position the master cylinder lever so it will be latched by the latch lever. Tighten screw (7).

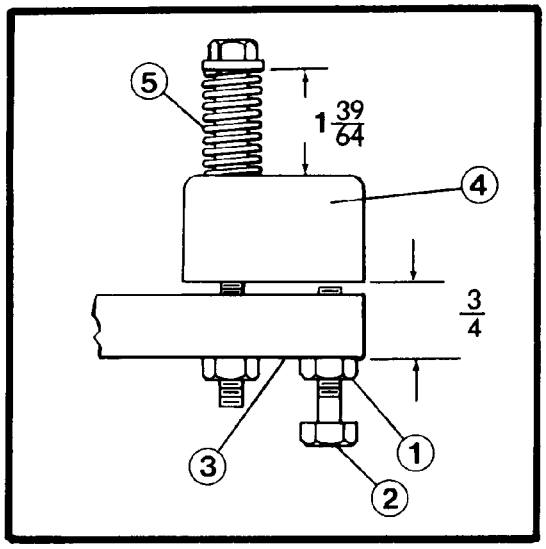


Figure 29 - Master Cylinder and Latch Lever

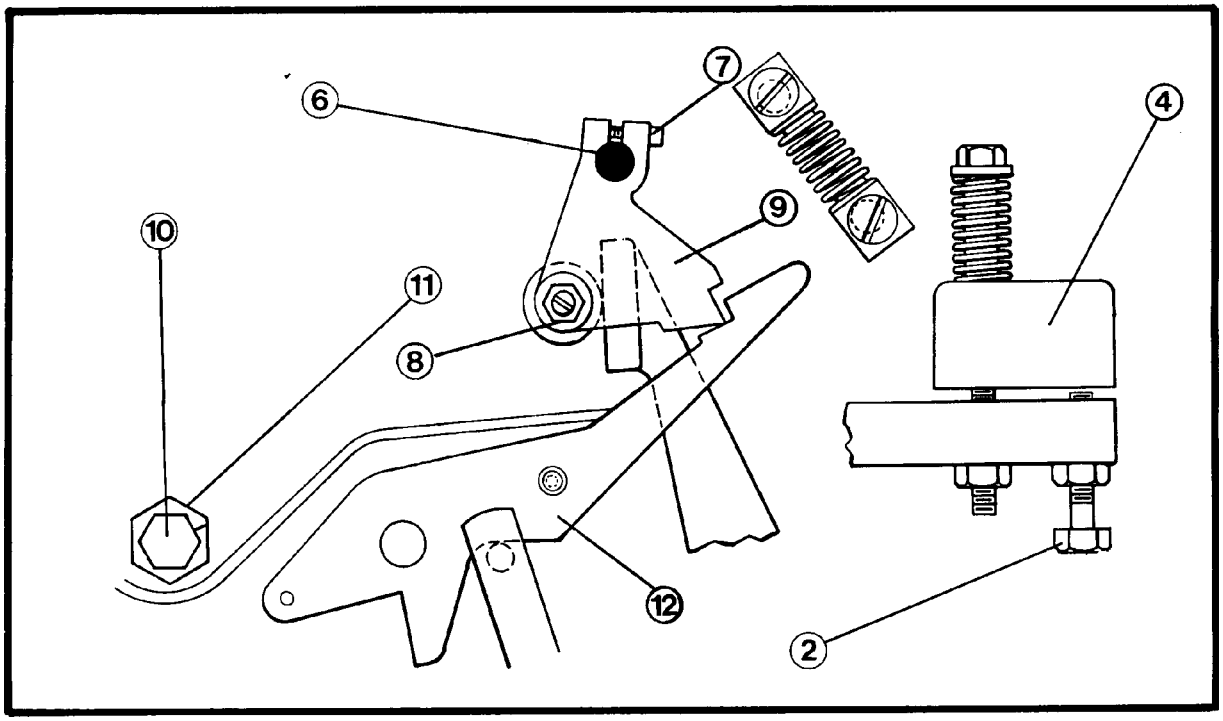


Figure 30 - Master Cylinder and Latch Lever

NOTE:

The master cylinder lever maintains the location of the master cylinder at the operator-side frame. The master cylinder end-play must not exceed .003". There must be no binding of the lever at either extreme of travel. Unlatch the lever, remove the gauges and check.

11. With the .0615" curved feeler gauges in place and the master cylinder latched, adjust both support arm springs (5) to 1-39/64" (see Figure 31).
12. Adjust screws (2) (both sides) for .000" between screws (2) and the stop blocks. Do not exceed the .000" tolerance.
13. Unlatch the cylinder. With the .0615" curved feeler gauges in place, turn the adjusting tool (P/N 191551) clockwise until the master cylinder lightly contacts the curved feeler gauges.
14. Loosen nut (10) and adjust eccentric (11) for equal contact on both curved feeler gauges (see Figure 6-8).

NOTE:

After each adjustment on eccentric (11), relatch the cylinder and ensure the .000" tolerance between the stop blocks and screws (2). Adjust screws (2) as necessary.

The indication mark on eccentric (11) must be between the twelve o'clock (12:00) and four o'clock (4:00) positions.

15. Tighten nut (10).
16. Latch the cylinder.
17. Loosen nuts (1) and adjust screws (2) for .000" gap between the screws and stop blocks (4).
18. Tighten nuts (1) and check springs (5) for 1-39/64" length.
19. Loosen lock nuts and adjust eccentric screws (15) for a length of 15/16" between blocks. Assure that blocks are in line.
20. Unlatch cylinder, remove curved feelers and adjusting tool.
21. Turn handwheel until lever (9) is at its maximum back position.

    Adjust screw (8) for a .036" to .050" clearance between lever and latch lever (12) (see Figure 32). Tighten nut.
22. Turn handwheel until counter operating lever (13) is at its maximum forward position. Rotate lever (9) and adjust screw (14) for latch lever (12) to fully engage the master cylinder lever.

    Tighten nut.
23. Replace blanket on blanket cylinder.

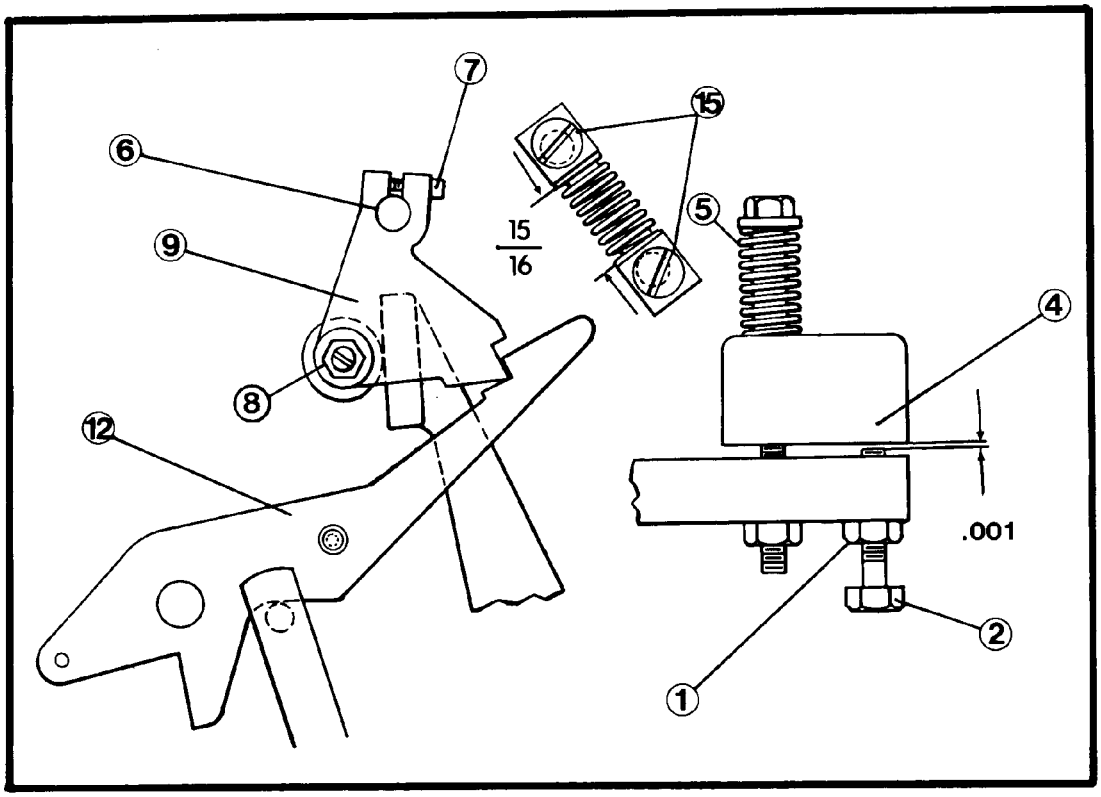


Figure 31 - Master Cylinder and Latch Lever

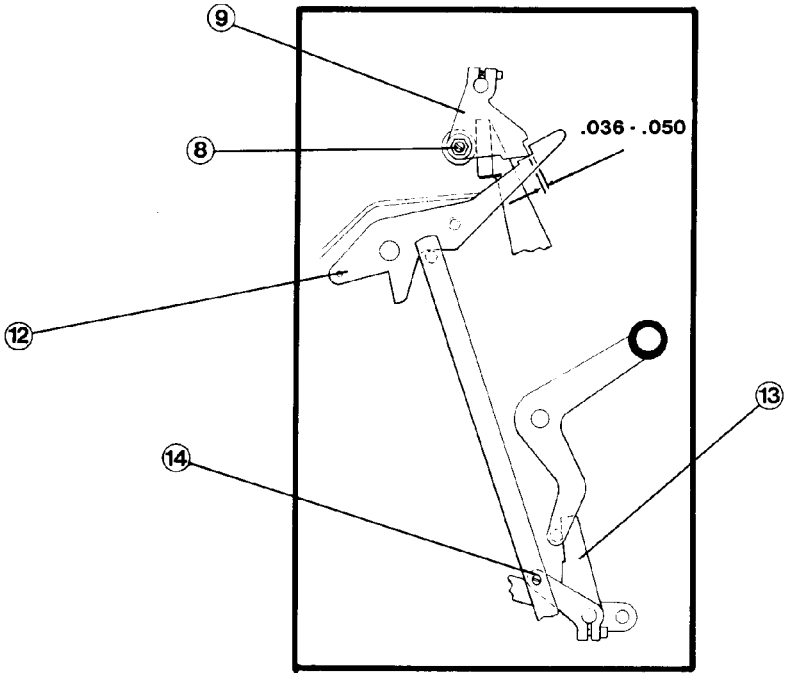


Figure 32- Master Cylinder and Latch Lever

MASTER CYLINDER CLAMP

The clamp must open flush to 1/8" below the top surface of the guard to properly load straight edge masters.

1. Set the head clamp lateral and angular adjusting knobs to midpoint on their adjustments.
2. Disengage locking lever (1) (see Figure 33).
3. Loosen hex screw (2) and allen screw (3).
4. Position collar (4) to provide 1/8" clearance (5) between the collar and the clamp hook (6).
5. Rotate the master cylinder one complete revolution counterclockwise.
6. Rotate the master cylinder clockwise until the clamp opens. Slowly continue turning until the clamp reaches its maximum “open” position. At this point, the lead edge of the cylinder should be flush to 1/8" below the top surface of the safety guard in master loading position (7).
7. If the above requirement is not met:
   a. Rotate collar (4) counterclockwise to raise cylinder up to the specified loading position.
   b. Rotate collar (4) clockwise to lower cylinder down to the specified loading position.
8. Tighten hex Screw (2) and allen screw (3).
9. Engage locking lever (1).

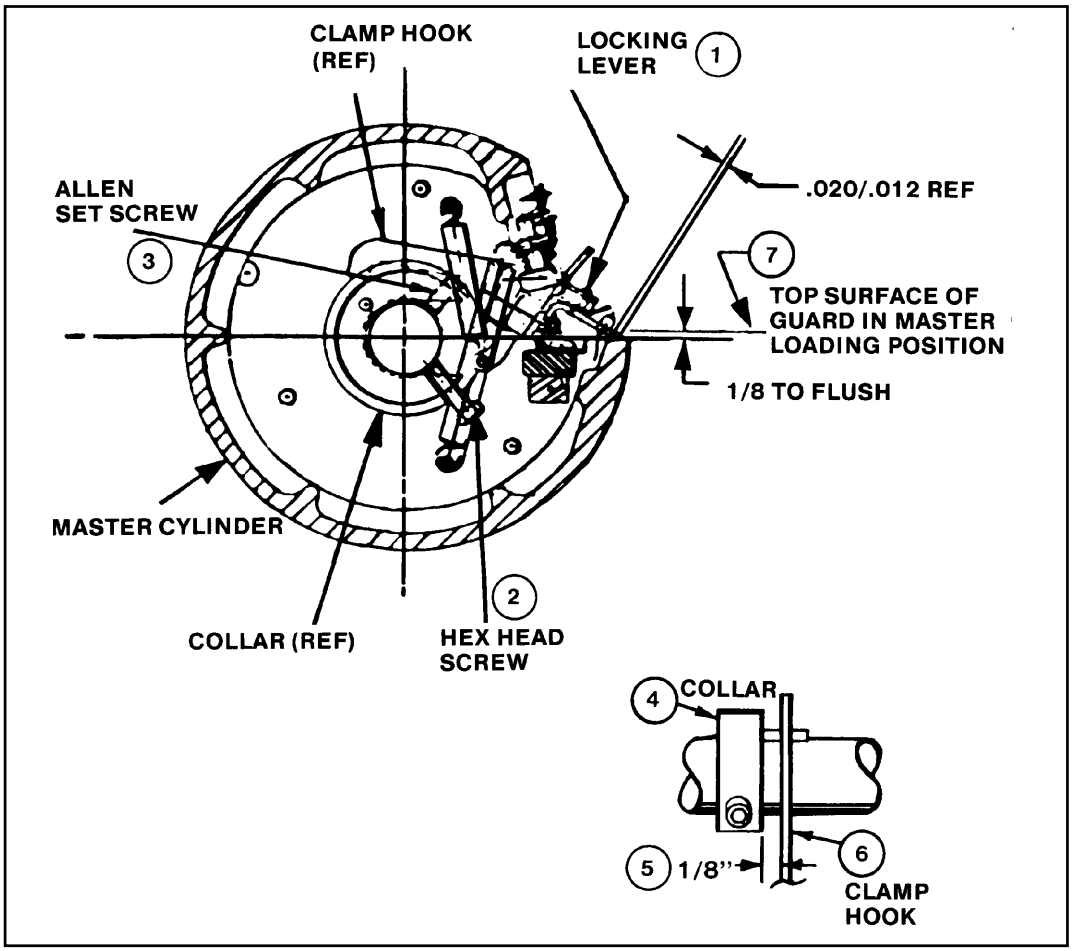


Figure 33 - Master Cylinder Clamp

CLAMP SUB-ASSEMBLY TO MASTER CYLINDER

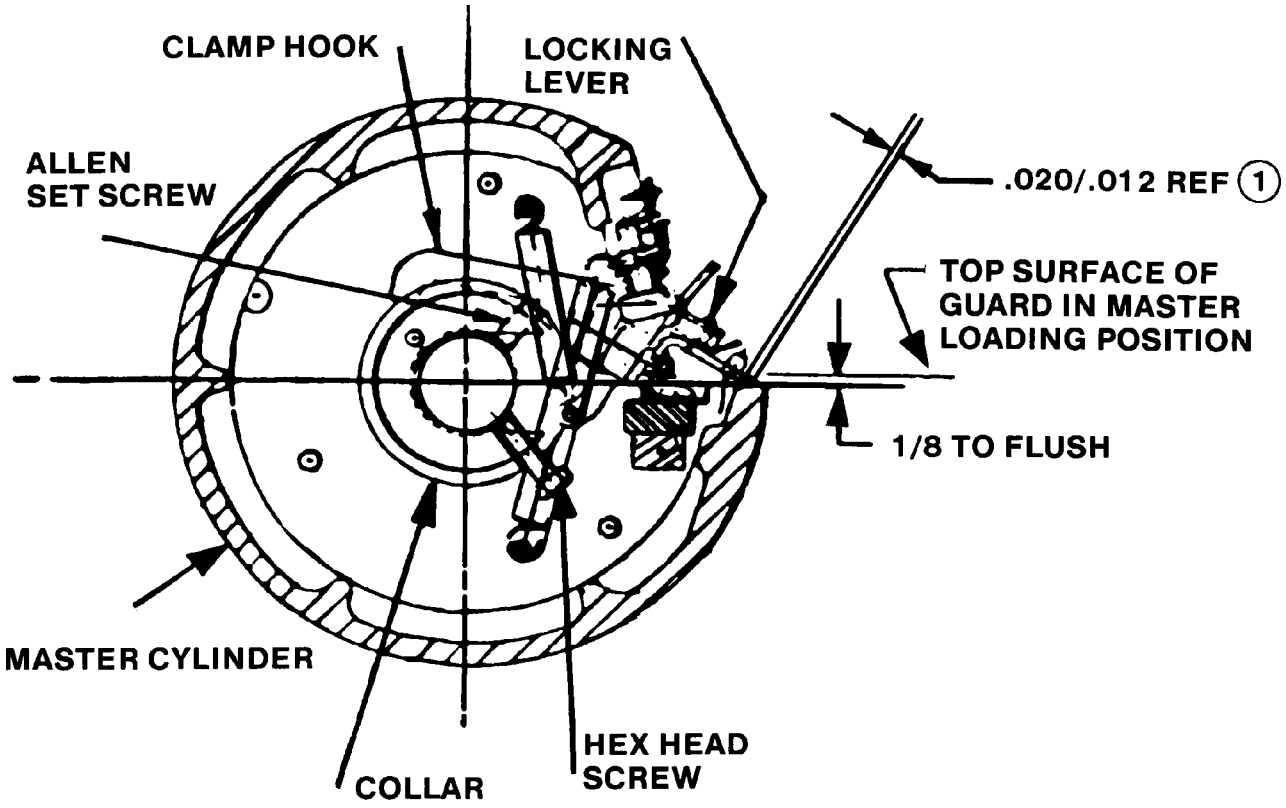
The straight-edge clamp must be adjusted so that there is a .012" (minimum) to .020" (maximum) clearance (1) between the universal clamp assembly (2) and the clamp plate (3) when the clamp is in the closed position (see Figure 34).

1. Loosen the screws (4) that mount the universal clamp assembly (2) to the hinge.
2. Adjust the universal clamp (2) to attain the .012" (minimum) to .020" (maximum) dimension (1); then tighten the screws.

NOTE:

The .012" (minimum) to .020" (maximum) dimension is to be set on both ends of the clamp assembly between the first two pinbar studs in the universal clamp. The two .012" to .020" settings must be within .003" of each other.

3. Leave the operator- and non-operator-side clamp mounting brackets loose.
4. By moving the brackets, adjust them so surface ”A” is level with surface ”B”, and surface ”C” contacts surface ”D” at point ”E” at both ends of the cylinder when the universal clamp is closed (see Figure 35).
5. Tighten the operator- and non-operator-side Mounting Bracket screws and check that the adjustment did not change and that the lateral and angular adjustments move freely.



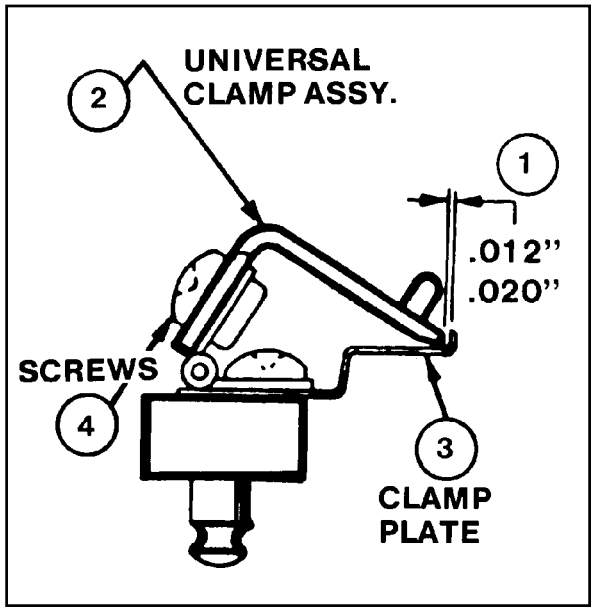


Figure 34

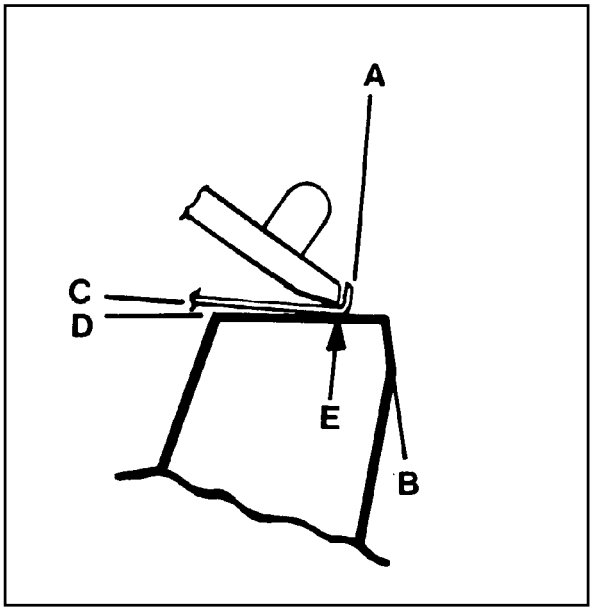


Figure 35

Master Cylinder Self-opening Clamp

FEELER PINS

REQUIREMENT: Feeler pins must control automatic impression cylinder latching. Feeler pins must not be malformed or come into contact with either set of forwarding rollers.

ADJUSTMENT:

1. Lift feeler pins, turn handwheel until impression cylinder latch lever (item 14, Figure 26) is at its maximum forward position. Gently depress feeler pins. Align as shown in Example #1 (see Figure 36).
2. Turn handwheel until upper (1) and lower (2) forwarding rollers are in contact. Check that feeler pins (3) do not come in contact with upper forwarding roller (1) shaft. Form pins (3) with finger and thumb pressure, if necessary. To avoid marring pins (3), do not use tools.
3. Lift feeler pins and rotate handwheel until impression cylinder latch lever (item 14, Figure 26) is at its maximum forward position. Release feeler pins. Pins should be positioned evenly at the bottom. Form pins up or down as required to make even.
4. Unlatch impression cylinder by rotating the handwheel until the impression cylinder latch lever (item 14, Fugure 26) is at its maximum forward position.
5. Locate screw (4) at the non-operator end of forwarding rollers (1 and 2). Loosen screw (4) and adjust stop lever (5) to contact feeler stop lever (6). Obtain 1/16" to 3/32" clearance between feeler pins (3) and lower forwarding roller shaft (2).

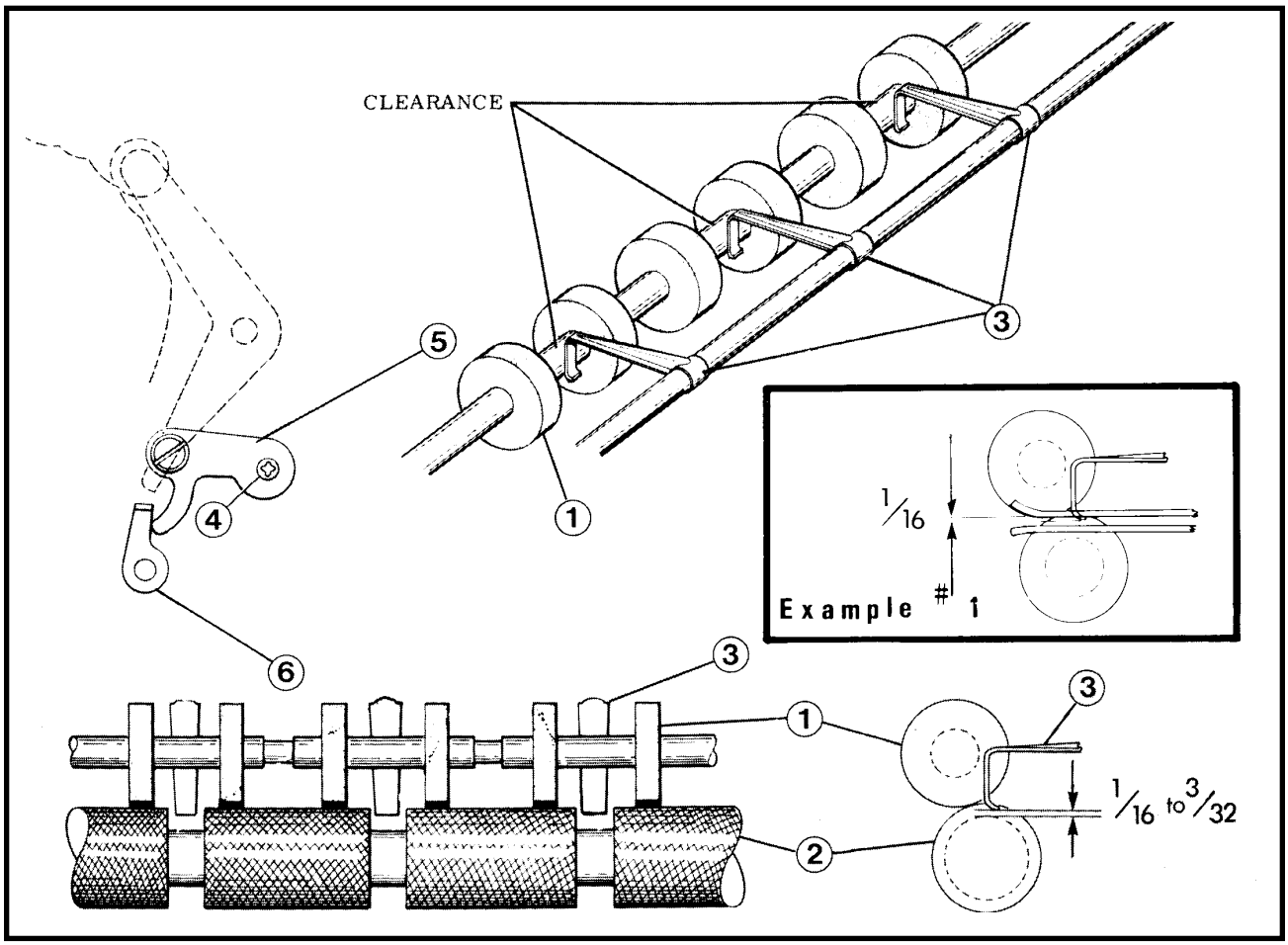


Figure 36 - Feeler Pin Adjustment

TABLE RAISING LATCH

REQUIREMENT: For proper feeding level of impression paper, the table raising latch lever must engage and disengage the table raising pawl lever.

ADJUSTMENT:

1. Locate power lever (l) outside operator side frame behind table raise gear (2).
2. Turn handwheel until power lever (1) is set at its maximum forward position.
3. Loosen screws (3) and adjust regulator plate (4) for latch lever (5) to clear lever (7) by 1/16". Use .0606" flat feeler gauge (6) held flat against lever (7).
4. Tighten screws (3).

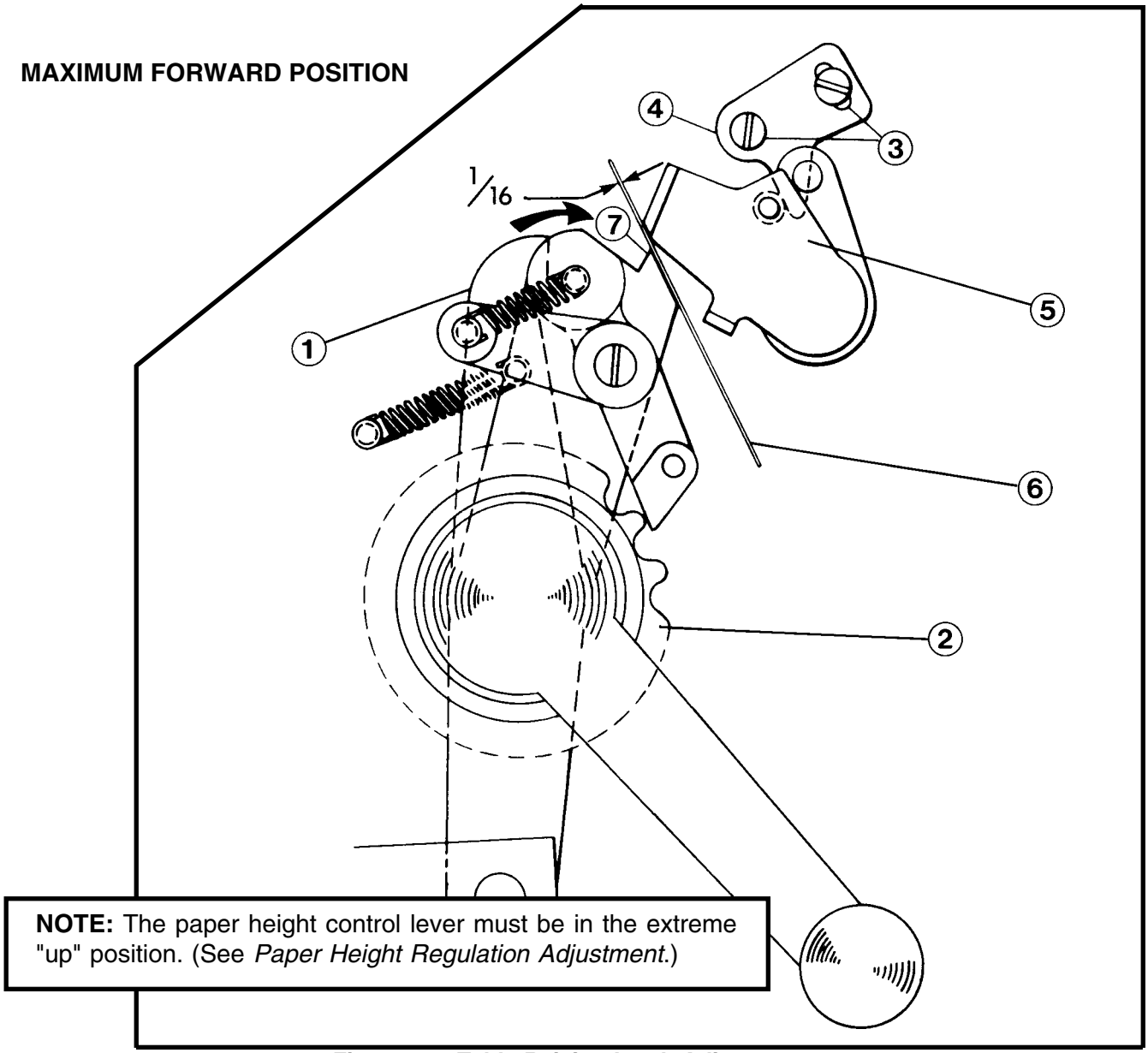


Figure 37 - Table Raising Latch Adjustment

FEED TABLE REGULATION

REQUIREMENT: The feed table must stop elevating when the surface of the feed table is 7/32" from the bottom edge of the operator side guide.

ADJUSTMENT:

1. Turn the handwheel to raise the feed table (1) and check that feed table (1) stops elevating when the top of the table is 7/32" below the paper side guide (2).
2. Adjust the trip bracket (3): Adjust down to allow table to elevate higher; adjust up if the table is elevated too high.

NOTE:

Start the adjustment with the trip bracket (3) at the highest point.

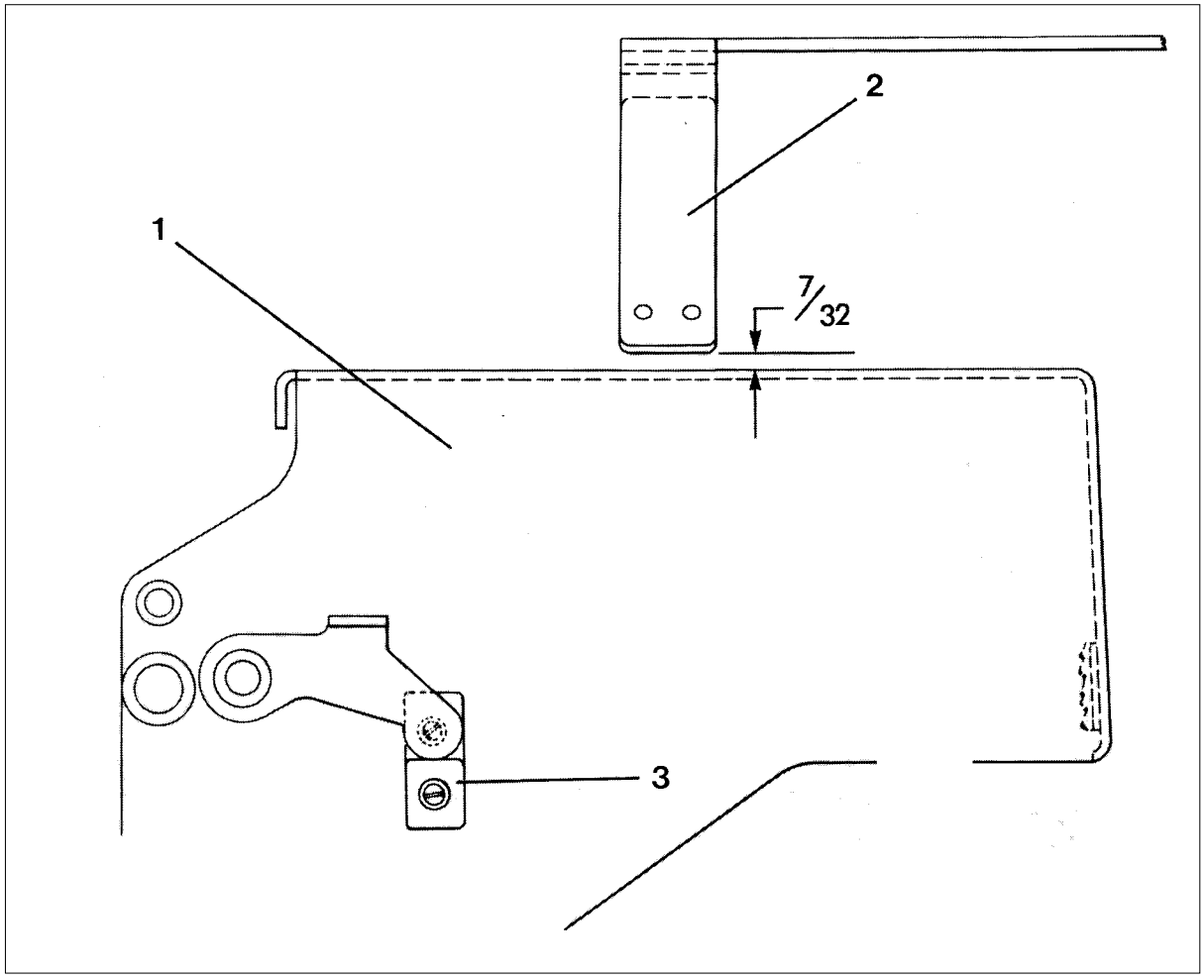


Figure 38 - Feed Table Regulation

PAPER HEIGHT REGULATION

NOTE:

If your machine is not equipped with eccentric stud (4) located above the paper height control lever (2), and a excess of 13/16" is measured, install eccentric screw (P/N 190116) and nut (P/N 150085).

REQUIREMENT: Paper height regulators must raise and lower to their proper levels.

ADJUSTMENT:

1. Turn handwheel until the paper height regulators (1) are at their low position.
2. Move paper height control lever (2) unti regulators (1) are 3/8" from bottom of slot in apron (3).
3. Turn handwheel until paper height regulators (1) are at their high position.
4. Adjust eccentric stud (4) until regulators (1) are 13/16" from bottom of slot in apron (3). Tighten eccentric stud (4).

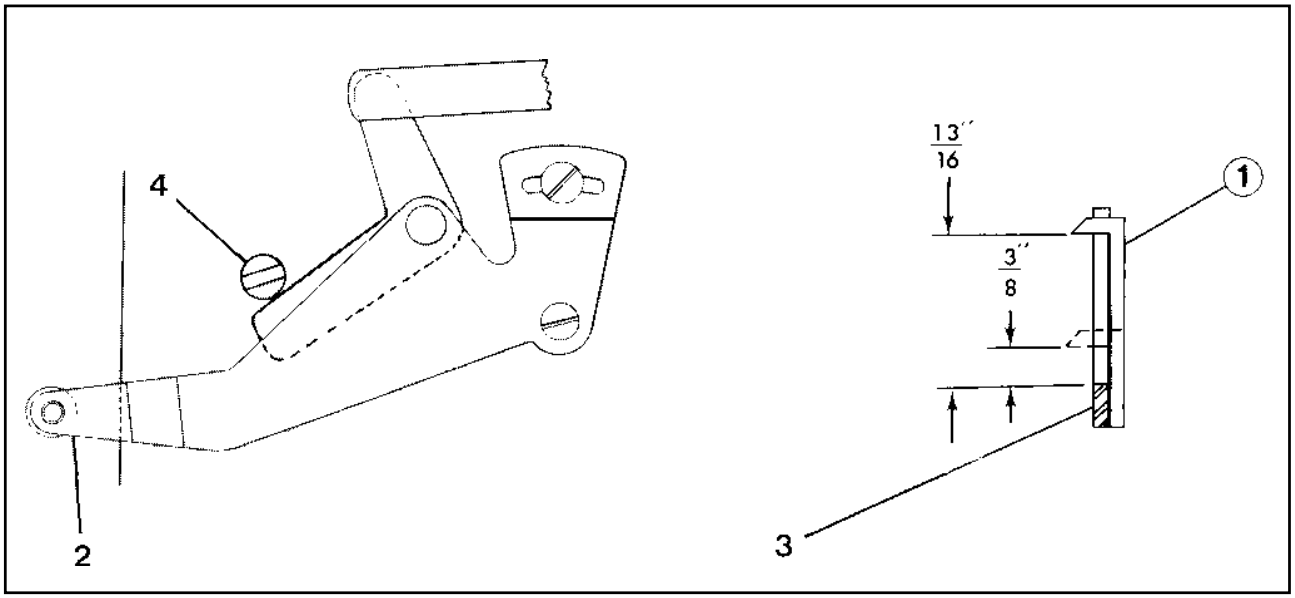


Figure 39 - Paper Height Regulation

SUCTION FEET AND BLOWER TUBES

REQUIREMENT: To assure proper feeding and accurate registration the impression paper must be maintained at the proper feeding height.

ADJUSTMENT:

1. Check that buckle control is set at “0”.
2. Locate the four blower hoses (1) behind the front apron. Position the blower hoses (1) on the blower tubes (2) 3/8" from the end of the shoulder on each tube.
3. Lift the feed control lever to the “ON” position.
4. Turn the handwheel until the suction tubes (3) are in their maximum down position. Remove one rubber suction cup.
5. Loosen screws (4) in feed horizontal link (5).
6. Adjust plate (6) so front edge of suction tubes (3) are 15/16" from apron (7). Use gauge (P/N 191541) as shown in Figure “A”.
7. Tighten screws (4).
8. Loosen screws (8) in the feed vertical link (9).
9. Adjust plate (10) so bottom of suction tubes (3) are 11/16" from bottom of slot in front apron. Use gauge (P/N 191541) as shown in Figure “B” with bottom of tool at bottom of slot. Hold level.
10. Tighten screws (8).

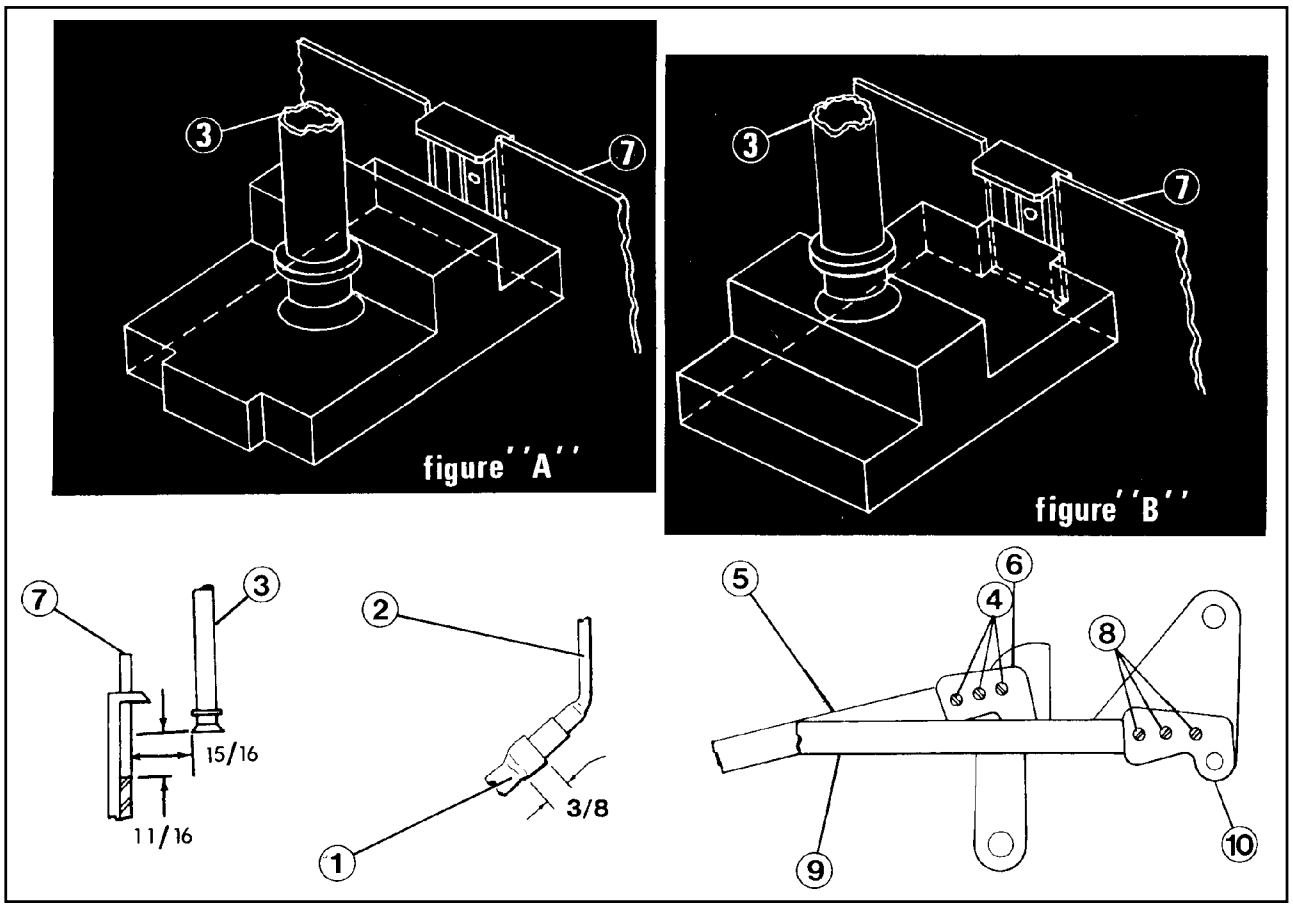


Figure 40 - Suction Feet and Blower Tubes

FEED RAISING AND SUCTION FOOT SHAFTS

REQUIREMENT: The feed raising and suction foot shafts must operate freely without end play.

ADJUSTMENT:

1. Locate the feed raising shaft (1) to non-operator side of machine.
2. Loosen screws (2) and adjust collar to eliminate shaft end play (1). Tighten screws (2).
3. Check that the shaft (1) does not bind.
4. Locate the header tube shaft (3) on the non-operator side of machine.
5. Loosen screws (4) and adjust collar to eliminate shaft end play (3). Tighten screws (4).
6. Check that the shaft (3) does not bind.

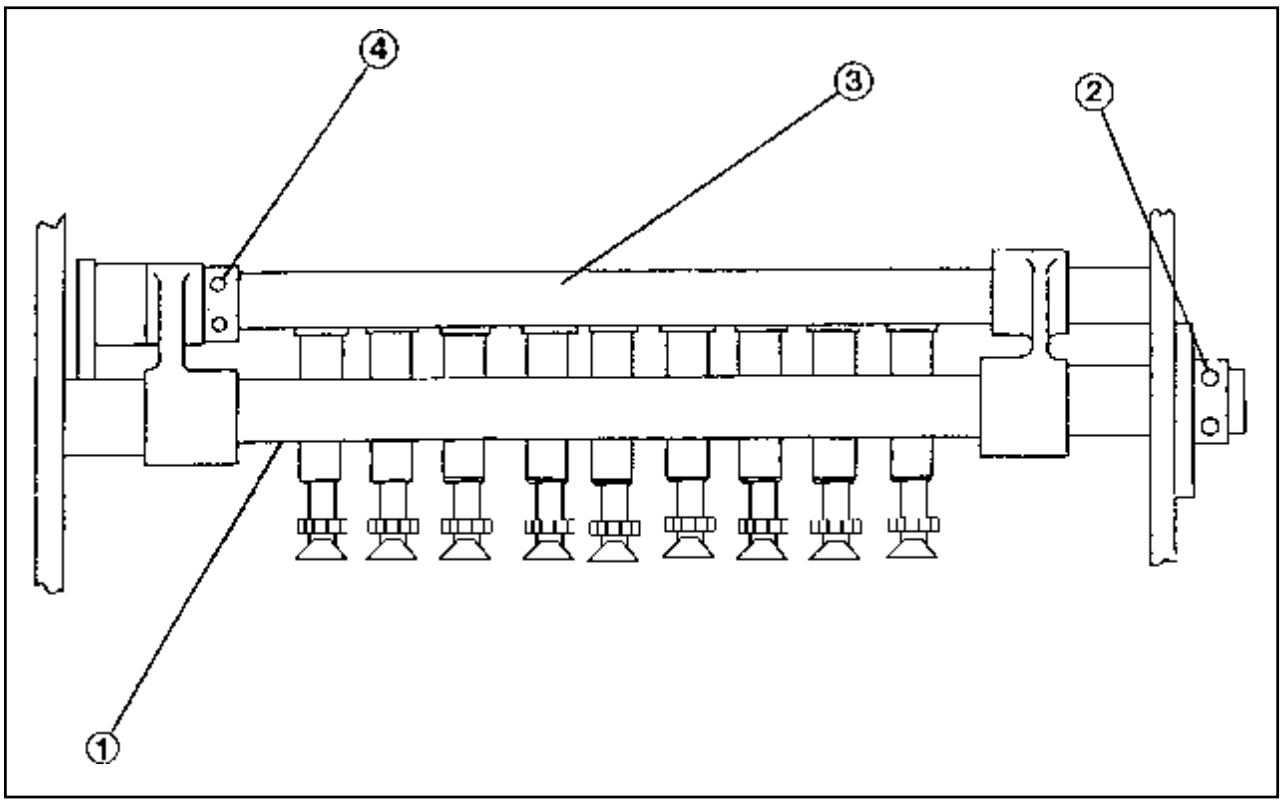


Figure 41 - Feed Raising and Suction Foot Shafts

UPPER FORWARDING ROLLER (9910XCS/9910XC2 ONLY)

REQUIREMENT: The forwarding roller must forward the paper to the grippers with the proper buckle, then lift to free the paper.

ADJUSTMENT:

1. Check that the forwarding roller (A) revolves freely with a minimum of end-play (see Figure 42).
2. Turn the handwheel until the forwarding roller (A) is lifted.
3. Check that the tips of the adjustment screws (B) (on both the operator and non-operator sides) are flush with the underside of the lower ears on the levers (C). If not, adjust them.
4. Turn the handwheel until the forwarding roller (A) is fully down in contact with the metal forwarding roller (D), and there is a maximum clearance between the bottom of the adjustment screws (B) and the lower ears of the forwarding roller carrier levers (C).
5. Adjust the screw (B) on the non-operator side carrier lever to obtain a .046" (3/64") clearance from the lower ear (C) of the operating lever.
6. Insert two 1" wide strips of 20# paper (one on each end) between the second rubber forwarding roller from the end and the metal forwarding roller. Turn the handwheel to find the point at which the rollers release the non-operator side strip of paper.
7. Adjust the operator side adjustment screw so both strips of paper release at the same time as the handwheel is turned. Do not readjust the non-operator side adjustment screw.

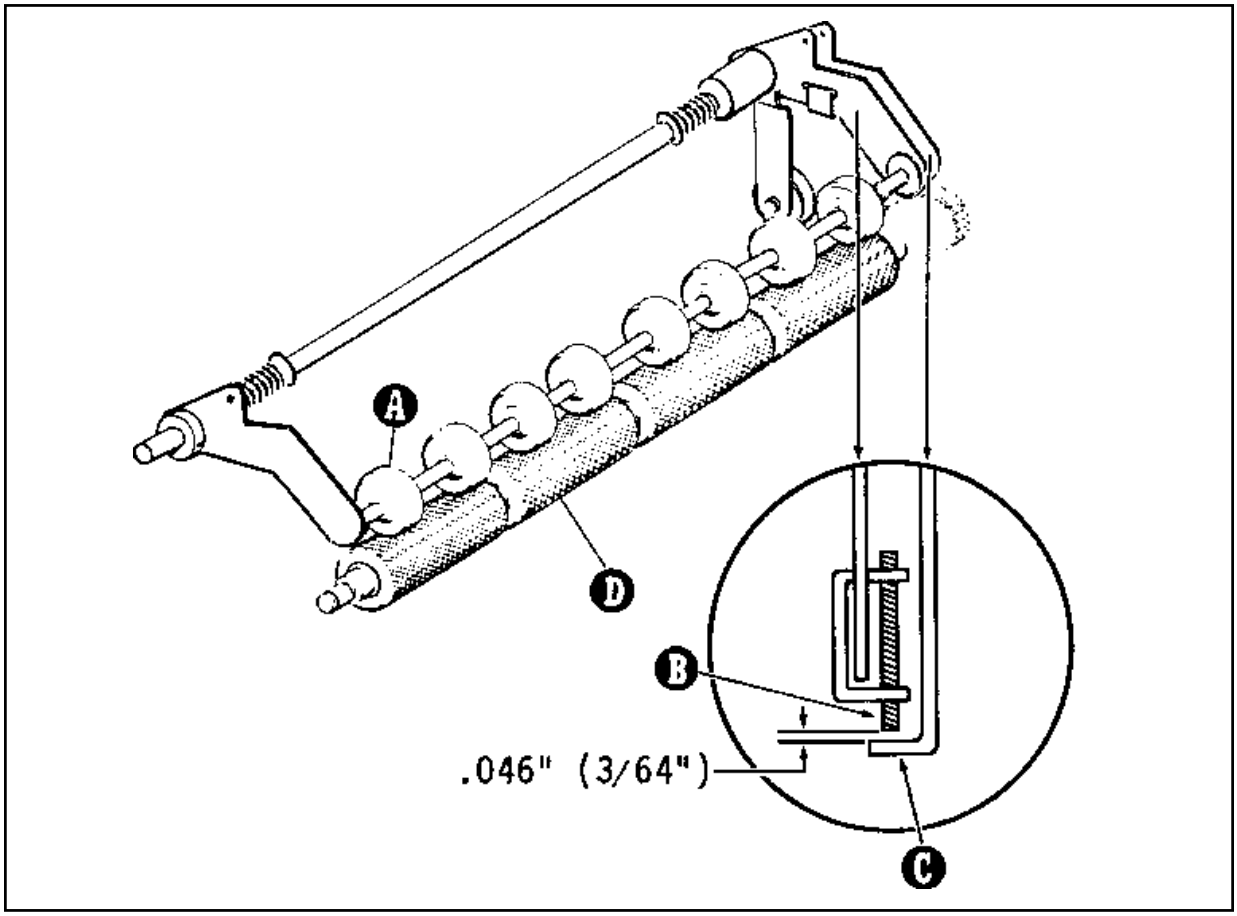


Figure 42 - Upper Forwarding Roller - 9910XCS/9910XC2

UPPER FORWARDING ROLLER (9910/9910D 0NLY)

REQUIREMENT: The forwarding roller must forward the impression paper to the grippers with the proper buckle, then lift to free the paper.

ADJUSTMENT:

1. Check that forwarding roller (1) revolves freely with a minimum of end play. Form forwarding roller levers (2) to remove end play.
2. Turn handwheel until forwarding roller (1) is fully down in contact with metal forwarding roller (3), and there is maximum clearance between operating lever (4) and ears of forwarding roller levers (2).
3. The clearance between operating lever (4) and the ears of forwarding roller levers (2) must be 1/16".
4. Form ears to secure this clearance. (Use forming tool P/N 191569).
5. Check that forwarding roller (1) raises at the same time on both sides. Re-adjust operator side, if necessary.

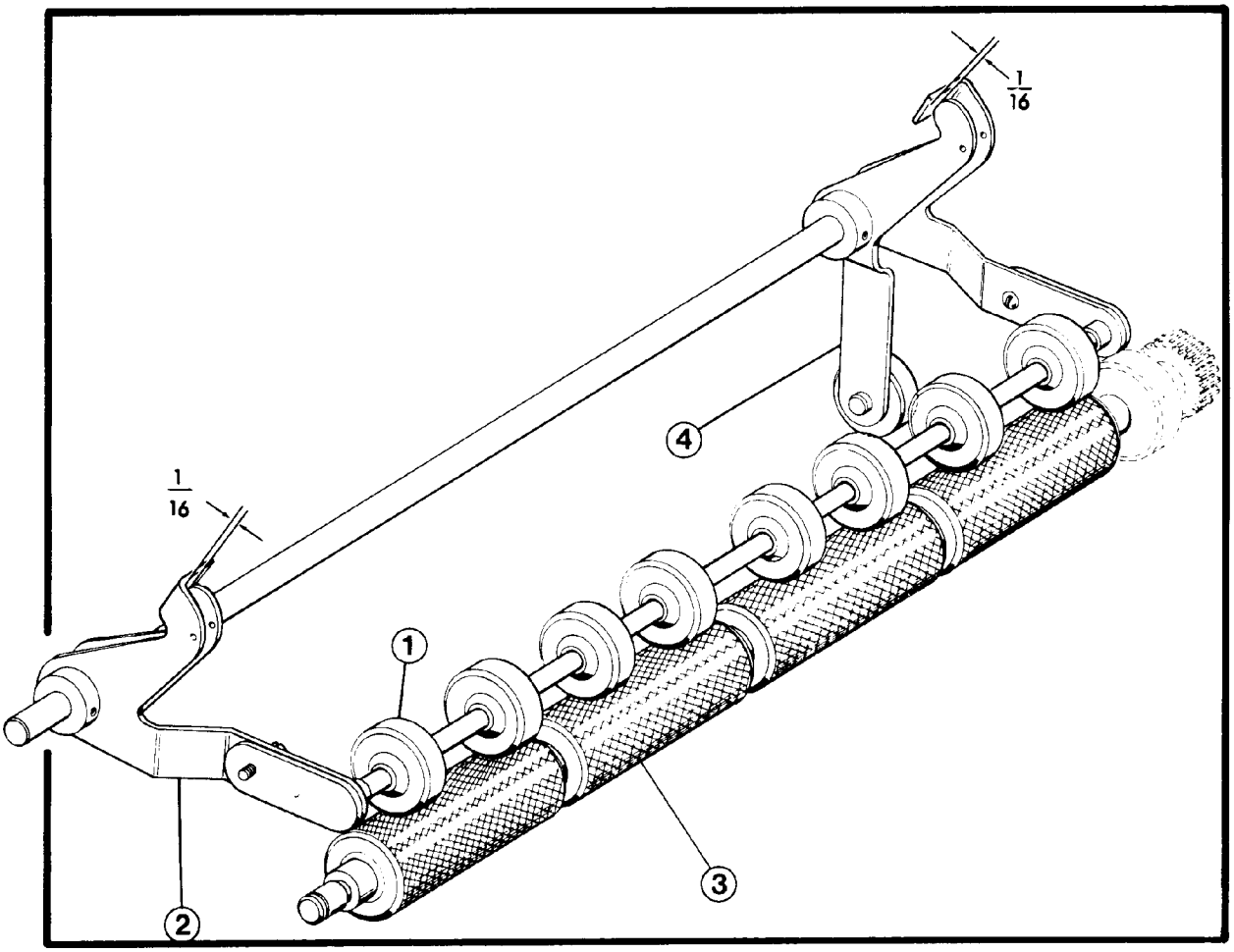


Figure 43 - Upper Forwarding Roller - 9910/9910D

FEED CONTROL LATCH LEVER

REQUIREMENT: The feed control latch must freely engage and disengage with its stop pin.

ADJUSTMENT:

1. Place feed on-off lever in its “OFF” (down) position.
2. Turn handwheel until sucker feet are in extreme up position.
3. Adjust eccentric stud (1) so latch lever (2) (located on operator side of machine) clears stop pin (3) by 3/64" (.046").
4. Hold stop bracket (4) in contact with mounting bar (5) at point (6) and tighten lock nut on eccentric stud (1).

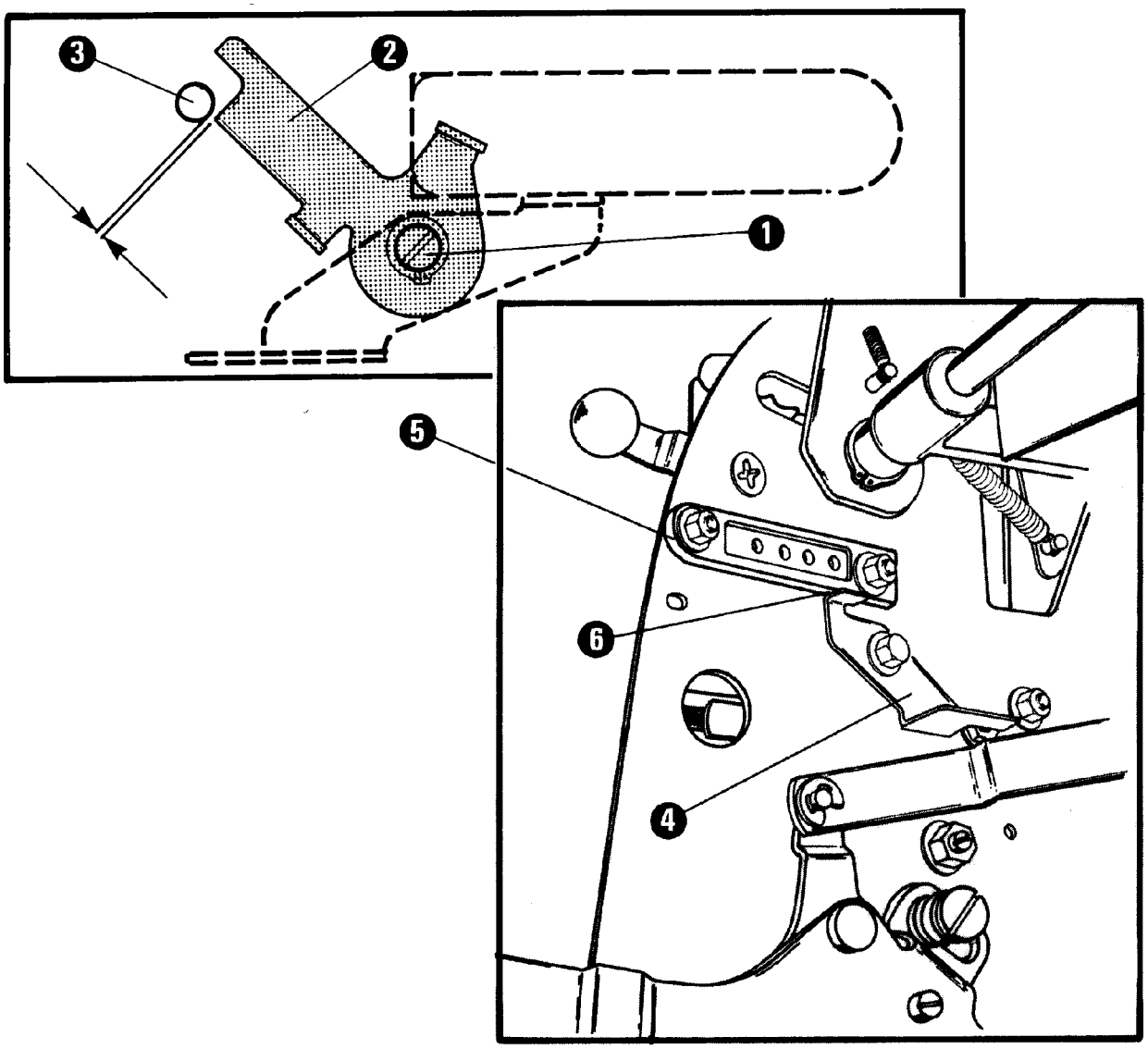


Figure 44 - Feed Control Latch Lever

VACUUM MAKE AND BREAK LINK

REQUIREMENT: The vacuum make and break link must be properly adjusted to assure proper feeding.

ADJUSTMENT:

1. Turn the handwheel until vacuum make and break cam (1) is in the low position as shown.
2. Loosen nut of eccentric pin (2). Adjust eccentric pin (2) until truck (3) clears low of cam by .015".
3. Tighten nut on eccentric pin (2).

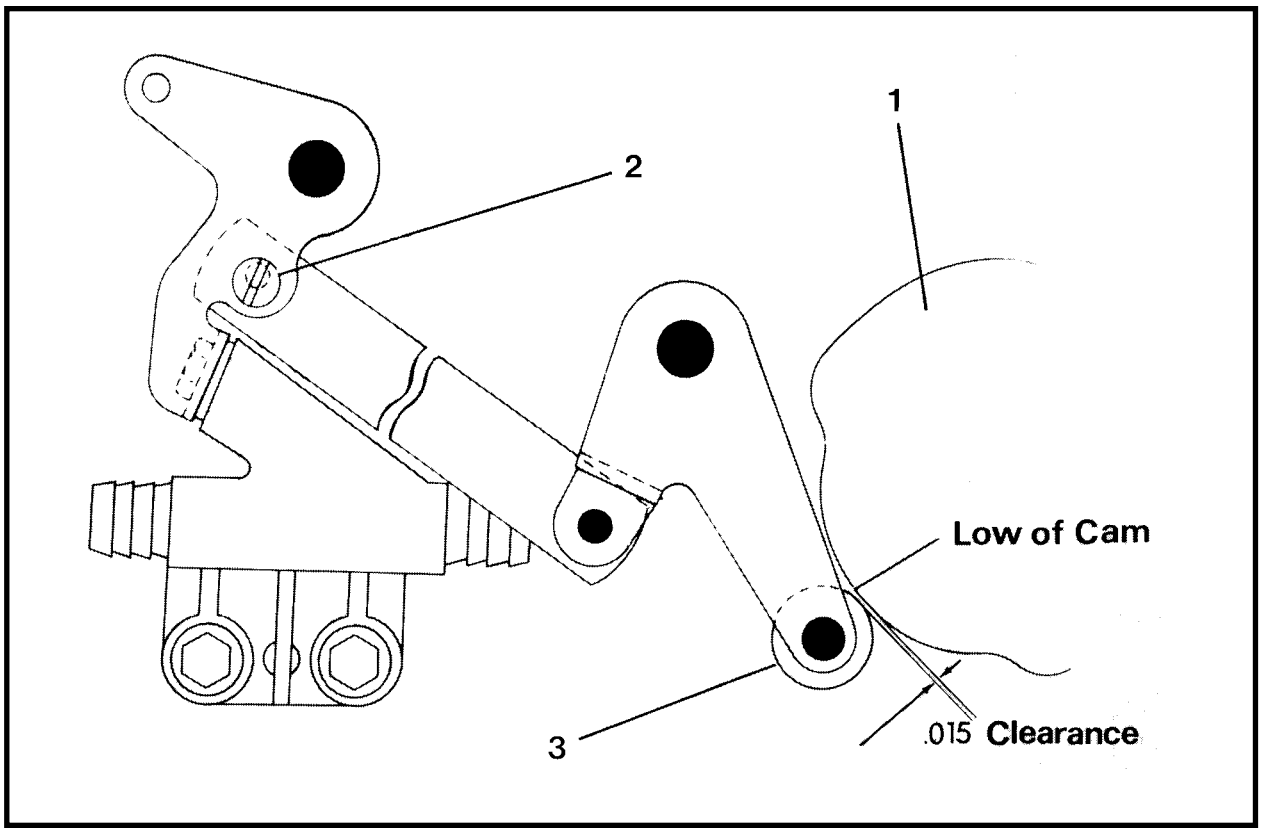


Figure 45 - Vacuum Make and Break Link

IMPRESSION CYLINDER PAPER GRIPPERS

REQUIREMENT: The impression cylinder paper grippers must be properly adjusted for accurate registration. There must be no binding, backlash, or malformation of parts of the gripper assembly.

ADJUSTMENT:

1. Check gripper fingers (1), stop assembly (2), and eject fingers (3) for malformation. Correct if necessary.
2. Set the impression cylinder gap control at "1".
3. Check for worn or malformed gripper fingers, stop asembly parts, and ejector fingers.
4. Check for a .010" to .013" clearance between the paper stops and the cylinder anvil in the closed position (see Figure 46).

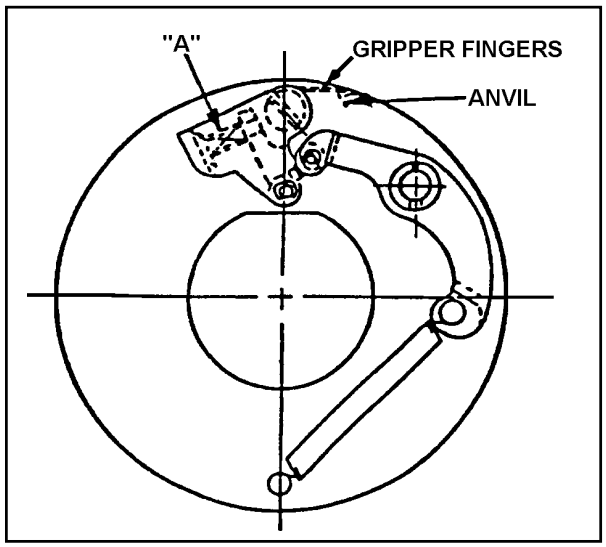


Figure 46 - Impression Cylinder Paper Grippers

5. Seat impression cylinder latch manually and turn handwheel until the impression cylinder latches.
6. Turn handwheel until the grippers are open to receive paper.
7. Manually insert a sheet of 20 lb. paper over the upper forwarding roller to the stops between the grippers and the cylinder anvil.
8. Turn the handwheel until the grippers are in the normally closed position, making sure the paper is up against the paper stop.
9. Turn adjustment screw "A" counterclockwise until very light contact is made with the grippers on the sheet.
10. Turn adjustment screw "A" 1-1/2 turns counterclockwise.
11. Insert a 4" wide sheet of 20 lb. paper under each gripper segment and check for 2-1/2 lb. to 4 lb. pull underneath each of the segments.
12. Adjust 3/32" Allen screw as necessary to obtain correct pull on both sides; repeat steps 8 to 11.

CAUTION:

EXCESSIVE TENSION WILL CAUSE PREMATURE WEAR AND OVERLOADING WHEN FEEDING CARD STOCK.

PAPER BUCKLE (9910/9910D ONLY)

REQUIREMENT: For good registration and to prevent misfeeding, the paper buckle gear must be adjusted for proper forwarding of paper to the impression cylinder grippers.

ADJUSTMENT:

1. Set buckle control at “0”.
2. Check that the 360 timing mark on buckle gear (1) and dot on pinion gear (2) are aligned.
3. Loosen locking screws (3).
4. Preset screws (4 and 5) for 3/16" between cam plate (6) and boss (7) of gear (1).
5. Turn “on” vacuum switch and feed control lever.
6. Manually feed a sheet of paper into the grippers until levers (8) just contact ears (9). Segment roller (10) must remain in contact with sheet of paper.
7. Mark trail edge of sheet being fed into grippers, on sheet below it on feed table.
8. Lift segment roller (10), then stretch out and release sheet. Do not pull sheet out of grippers.
9. Mark trail edge of sheet again. The distance between the two marks should be 3/16". To increase buckle adjust screws (4 and 5) to increase the 3/16" dimension between the cam plate (6) and boss (7) of gear (1).
10. Tighten locking screws (3).

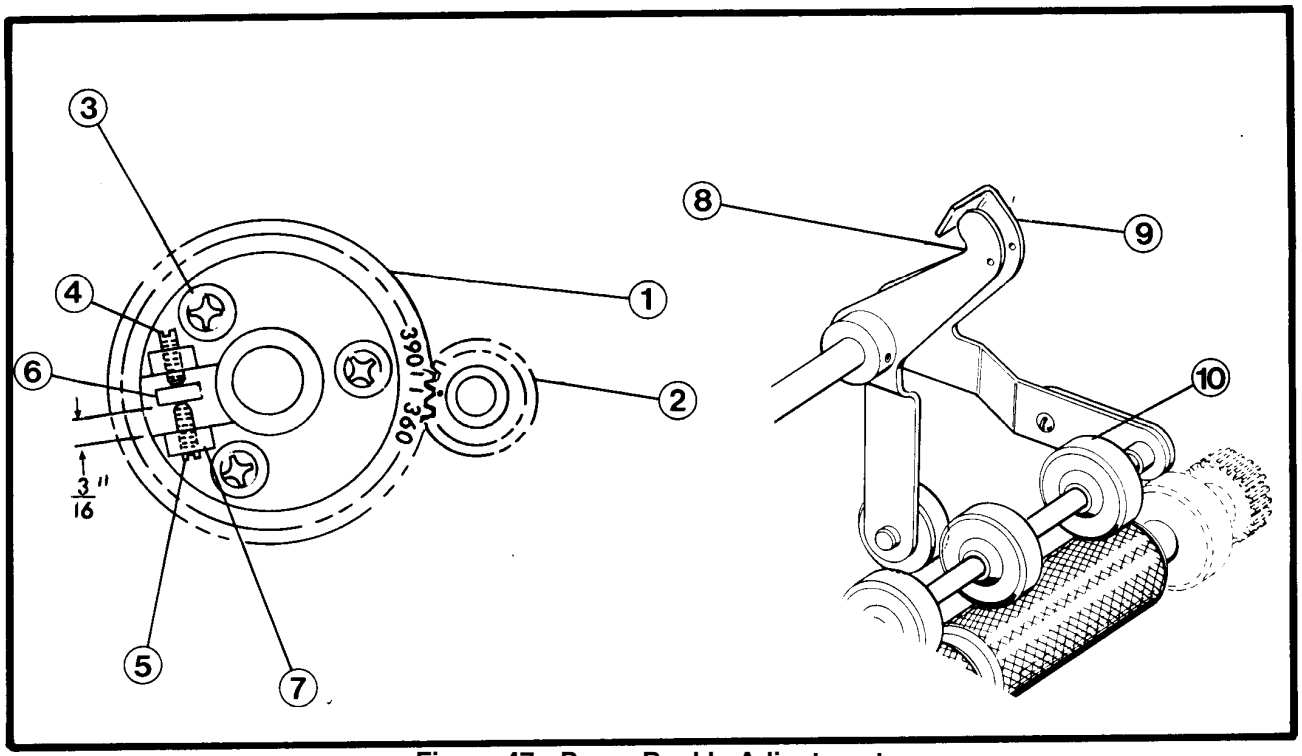


Figure 47 - Paper Buckle Adjustment

PAPER BUCKLE (9910XCS/9910XC2 ONLY)

REQUIREMENT: For good registration and to prevent misfeeding, the paper buckle gear must properly forward paper to the impression cylinder grippers.

ADJUSTMENT:

1. Set buckle control at “0”.
2. Check that the 360 timing mark on buckle gear (1) and dot on pinion gear (2) are aligned (see Figure 48).
3. Loosen locking screws (3).
4. Preset screws (4 and 5) for 3/16" between cam plate (6) and boss (7) of gear (1).
5. Check that the control switch, located in the rear of the control box, is in the "ON" position and that the service bypass switches are activated.
6. Momentarily depress the "FEED" and "PUMP" switch on the control panel. This automatically energizes the pump motor and feed control solenoid.
7. Manually feed a sheet of paper into the grippers until lever (8) just contacts (but does not lift) the adjustment screw (9) on lever (10). The upper forwarding roller (11) must remain in contact with the sheet of paper (see Figure 48).
8. Mark the trail edge of the sheet being fed into the grippers on the sheet below it on the feed table.
9. Lift the upper forwarding roller (11), stretch out and release the sheet. Do not pull the sheet out of the grippers.
10. Mark the trail edge of the sheet again. The distance between the two marks should be 3/16". To increase the buckle, adjust the screws (4 and 5) to increase the 3/16" dimension between the cam plate (6) and boss (7) of gear (1). Do the opposite to decrease the buckle.
11. Tighten the screws (3).

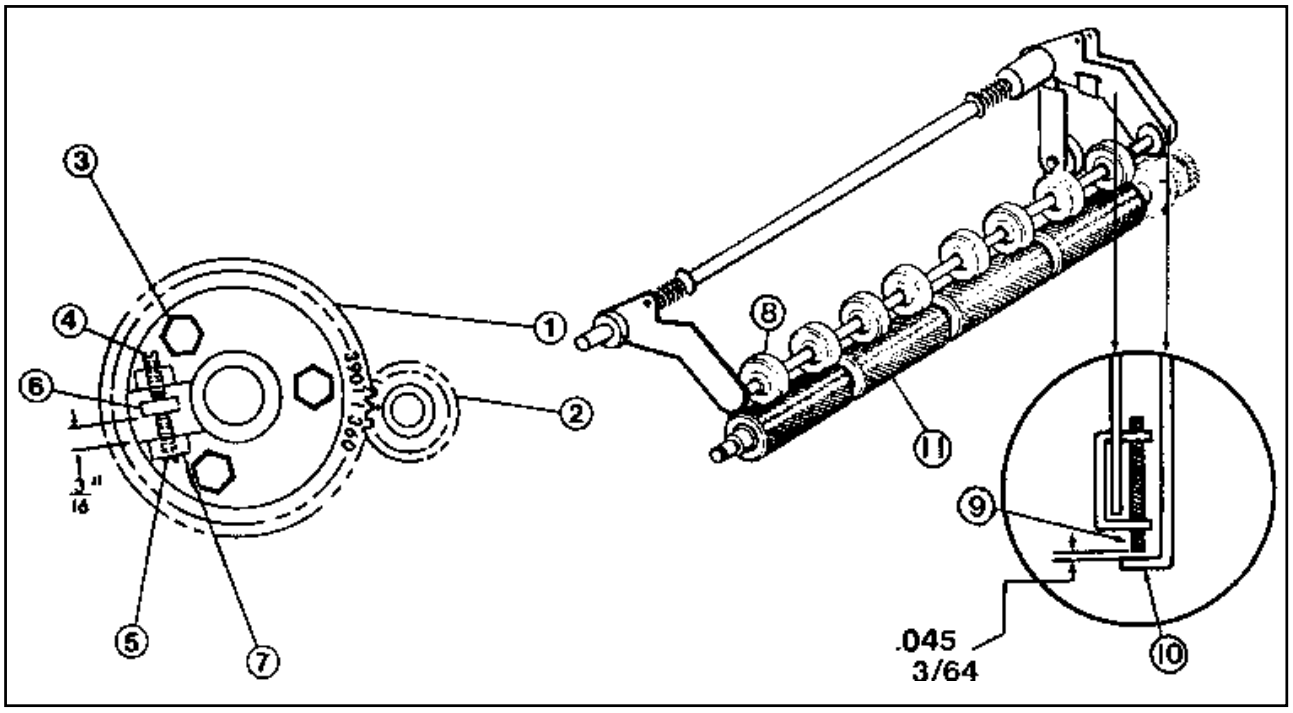


Figure 48 - Paper Buckle Adjustment

FRONT PAPER GUIDES

REQUIREMENT: Front Paper Guides must be properly aligned for good registration and proper alignment of paper pile.

ADJUSTMENT:

1. Remove chains (1) on both sides.
2. Turn sprockets (2) on both sides until paper guides (3) are at 90° angle with paper supports (4). Dimension between paper guides (3) at the top may be no more than, but may be 1/16" less than dimension between guides at bottom.
3. Replace chains (1) on both sides.
4. Loosen two screws (5) on both sides in sprocket bracket (6). Adjust brackets (6) for 3/4" slack at center of chains. Tighten screws (5) on both sides.

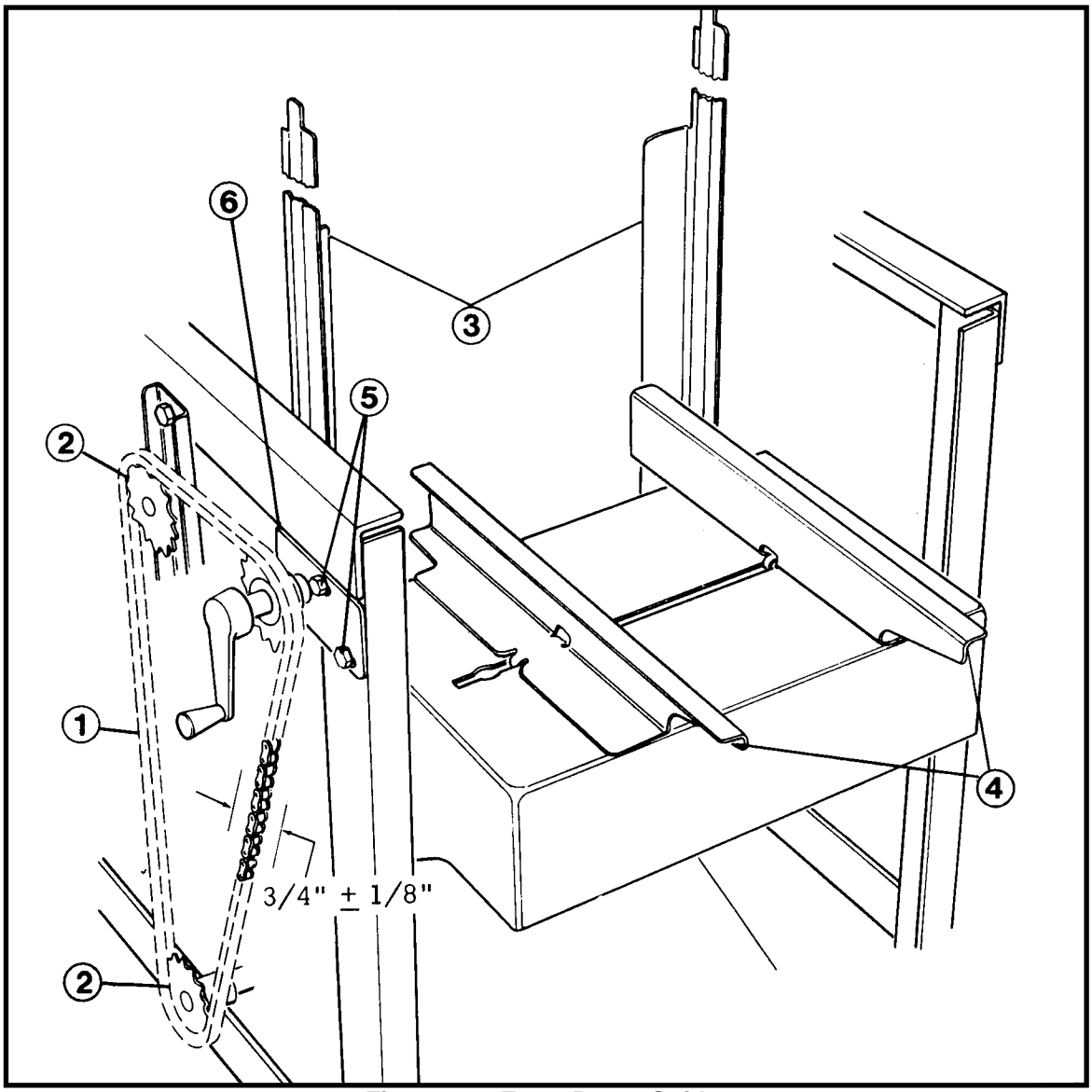


Figure 49 - Front Paper Guides

RIDER ROLLER END PLAY

REQUIREMENT: Rider Rollers must revolve freely with minimum end play.

ADJUSTMENT:

1. Loosen the nuts (4) holding the rider roller brackets; then position bracket as close as possible to ink fountain.
2. Loosen the set screws (1) in rider roller collars (2).
3. Position thr collars (2) outward against bearings for the rollers (3) to turn freely with minimum end play.
4. Tighten set screws (1).

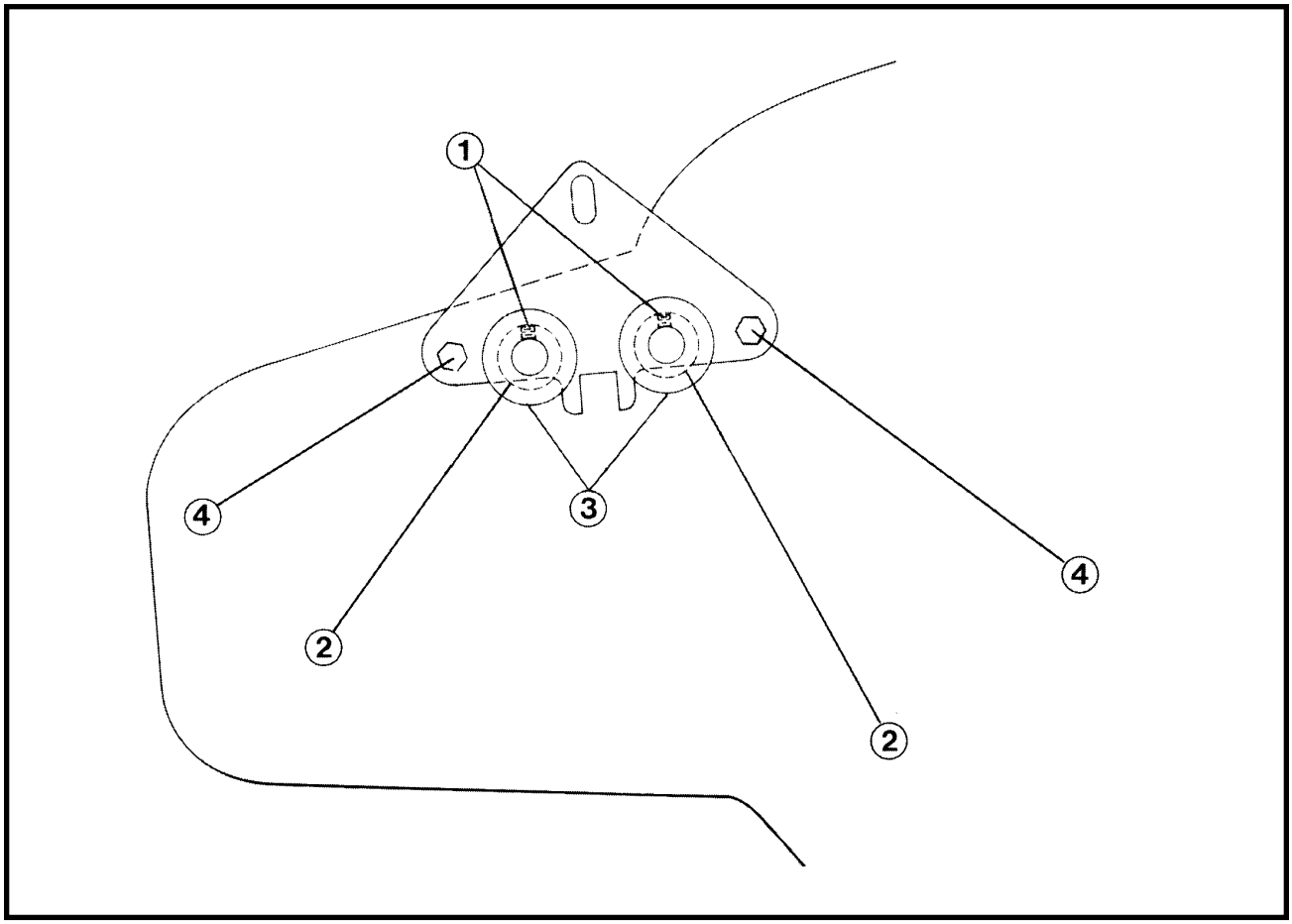


Figure 50 - Rider Roller Adjustment

FORM ROLLER END PLAY

REQUIREMENT: Form rollers must revolve freely with .005 - .010 end play.

ADJUSTMENT:

1. Turn the aquamatic night latch lever to "night latch" and remove the aquamatic oscillating roller.
2. Position the
   operation control lever in night latch. Ensure the upper form roller lever is “off” and the lower form roller lever is “on”.

NOTE:

If the machine has no operation control lever, turn the night latch lever to “night” and form roller levers “off”.

3. Loosen set screws (1) in the non-operator roller levers (2).
4. Adjust sleeve bearings (3) on non-operator side for .005" - .010" end play.
5. Tighten set screws (1). Check that form rollers revolve freely.

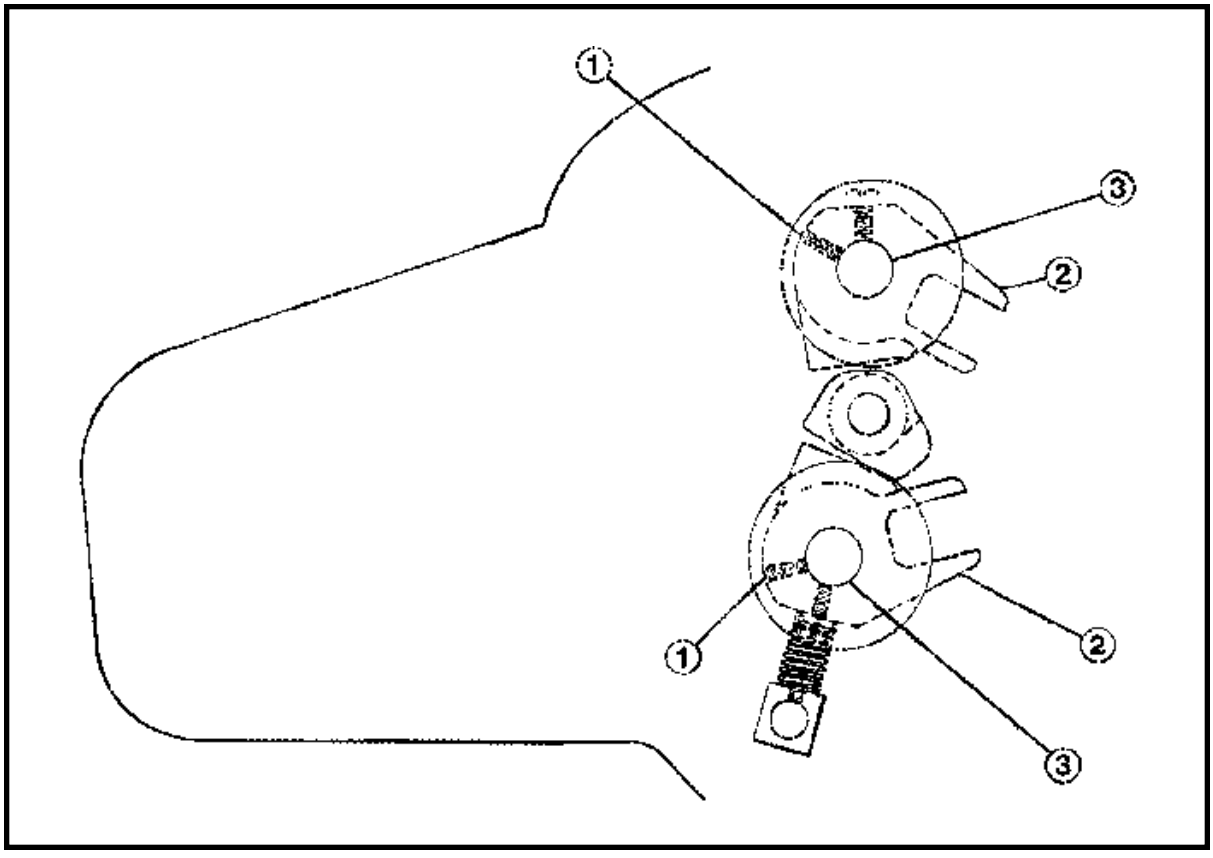


Figure 51 - Form Roller End Play

AQUAMATIC OSCILLATING ROLLER,

INK REPELLENT WAVE ROLLER AND INK DUCTOR CAM

REQUIREMENT: To secure uniform ink coverage:

A. The aquamatic oscillator and form oscillator must change direction when both form rollers are in the open area of the master cylinder.

B. The ink ductor roller must first contact the distributor roller when both form rollers are in the open area of the master cylinder.

C. The aquamatic oscillator roller must be centered within approximately .020" at either extreme of travel with the ductor roller, and must not travel past the edge of the ductor roller at either end (see Figure 52).

ADJUSTMENT:

NOTE:

The machine should be in "0" print adjustment.

1. Place the operation control lever in the "NIGHT LATCH" position.
2. Place the bottom form roller in the “ON” position.
3. Remove the taper pin (1) from the cam shaft gear (2).
4. Turn the handwheel until the largest hole in the impression cylinder separating cam (14) is in direct line from the center of the cam to the center of the Master Cylinder Support Arm pivot stud (15) (see Figure 52).
5. Remove the retainers (3), washer (5), and operating lever link (4).
6. While holding cam shaft gear (2), disengage the drive gear (13) from the waver cam and gear (12) by pulling gear and shaft outward.
7. Turn the waver cam and gear (12) in a clockwise direction from the non-operator side until the oscillator rollers have traveled to the extreme non-operator-side of the machine.
8. Slowly continue to turn the waver cam and gear (12) clockwise until the waver cam surface contacts the roller (9) and removes the slack from the waver operating lever (8).

   The hole in the waver cam and gear should be at approximately twelve o’clock (12:00). (As a result, the time lag in the waver arm for changing direction of the oscillator rollers is removed).
9. Turn the drive gear (13) in a clockwise direction to position the ink ductor cam (10), so the ductor lever truck (11) will be located at a point just preceding the high of the cam. At this point, the hole in the cam will be at nine o’clock (9:00) when viewed from the non-operator side.
10. Engage the drive gear and the waver cam and gear, rechecking the relation of the ductor truck (11) and cam (10). Relocate, if necessary ·
11. Holding the drive gear (13) in place, replace the cam shaft gear (2) and taper pin (1).

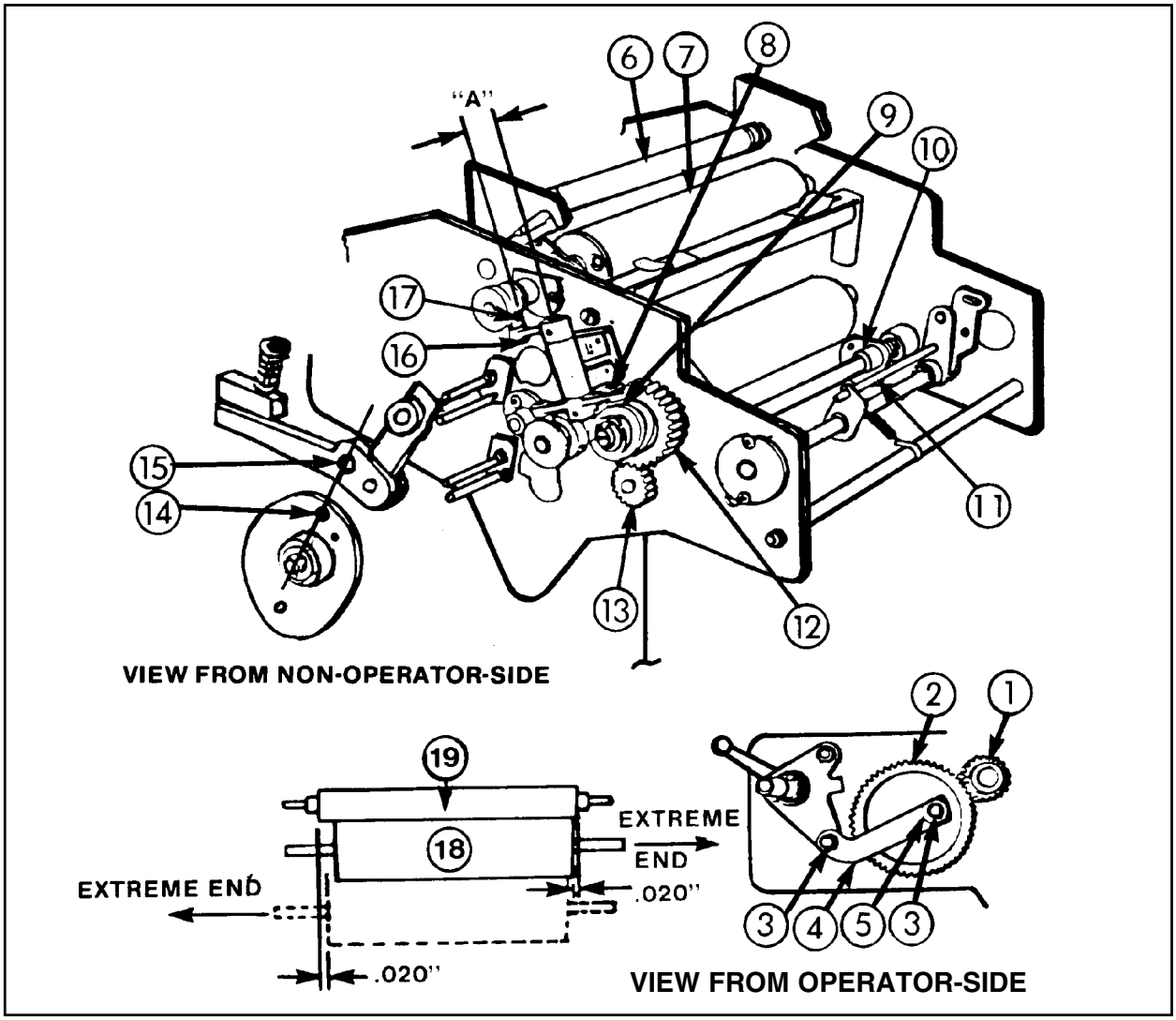


Figure 52 - Aquamatic Oscillator and Ductor Roller

1. TAPER PIN
2. CAMSHAFT GEAR
3. RETAINERS
4. OPERATING LEVER LINK
5. WASHER
6. DUCTOR ROLLER
7. OSCILLATING ROLLER
8. WAVER OPERATING LEVER
9. ROLLER
10. INK DUCTOR CAM
11. DUCTOR LEVER TRUCK
12. WAVER CAM AND GEAR
13. DRIVE GEAR
14. IMPRESSION CYLINDER SEPARATING CAM
15. MASTER CYLINDER SUPPORT ARM PIVOT STUD
16. LOCKNUT
17. ECCENTRIC SCREW
18. AQUAMATIC OSCILLATING ROLLER
19. DUCTOR ROLLER

NOTE:

If the taper pin hole in the gear and shaft is not easily accessible, insert an Allen wrench (or some substitute) in the gear and shaft holes to maintain relation; then turn the handwheel until the holes line up in a position where the taper pin can be driven home.

12. Replace the operating link (4), washer (5), and retainers (3).
13. Check to ensure that the following requirements are met:
    A. The aquamatic oscillator and the lower form oscillator roller must change direction when the lower form roller is in the open area of the master cylinder.
    B. The ink ductor roller must first contact the distributor roller when the lower form roller is in the open area of the master cylinder.
14. Loosen nut (16) and turn eccentric screw (17) until distance ”A” at minimum. Adjust screw (17) to center the aquamatic oscillator roller (18) with the ductor roller (19). Tighten lock nut (16).

NOTE:

The distance from the end of the aquamatic oscillator roller to the end of the ductor roller must be approximately .020" when the roller is on the extreme ends of each oscillation. At no time should the oscillator roller pass the edge of the ductor roller at either end of the oscillator travel.

DUCTOR LEVER TRUCK TO CAM AND INK DUCTOR LATCHOUT

To assure proper ink ducting, the actuating shaft truck must be adjusted.

The ink ductor lockout lever must be adjusted to lock out the ductor roller when in the “OFF” position.

1. Rotate the cam to the center point of the “low” (1) in relation to the truck (2) (see Figure 53).
2. Loosen the nut (3) on the truck and stud assembly (2).
3. Rotate the stud on the truck assembly until a clearance of .051" is achieved between the truck (2) and the center of the “low” on the cam (1).
4. Tighten the nut and stud, being sure that the stud does not rotate while the nut is being tightened.
5. When the ink ductor latchout lever is in the “OFF” position (4), the ink ductor roller should remain in full contact with the distributor roller at all times.
6. To adjust, turn the handwheel until the ductor Cam is at its “high” point (5) holding the ink ductor roller against the distributor roller.

   Loosen the screw (6) and move the top spring mounting stud (7) toward the ink fountain until the excess movement on the latchout lever (8) is removed.
7. Tighten the screw (6).

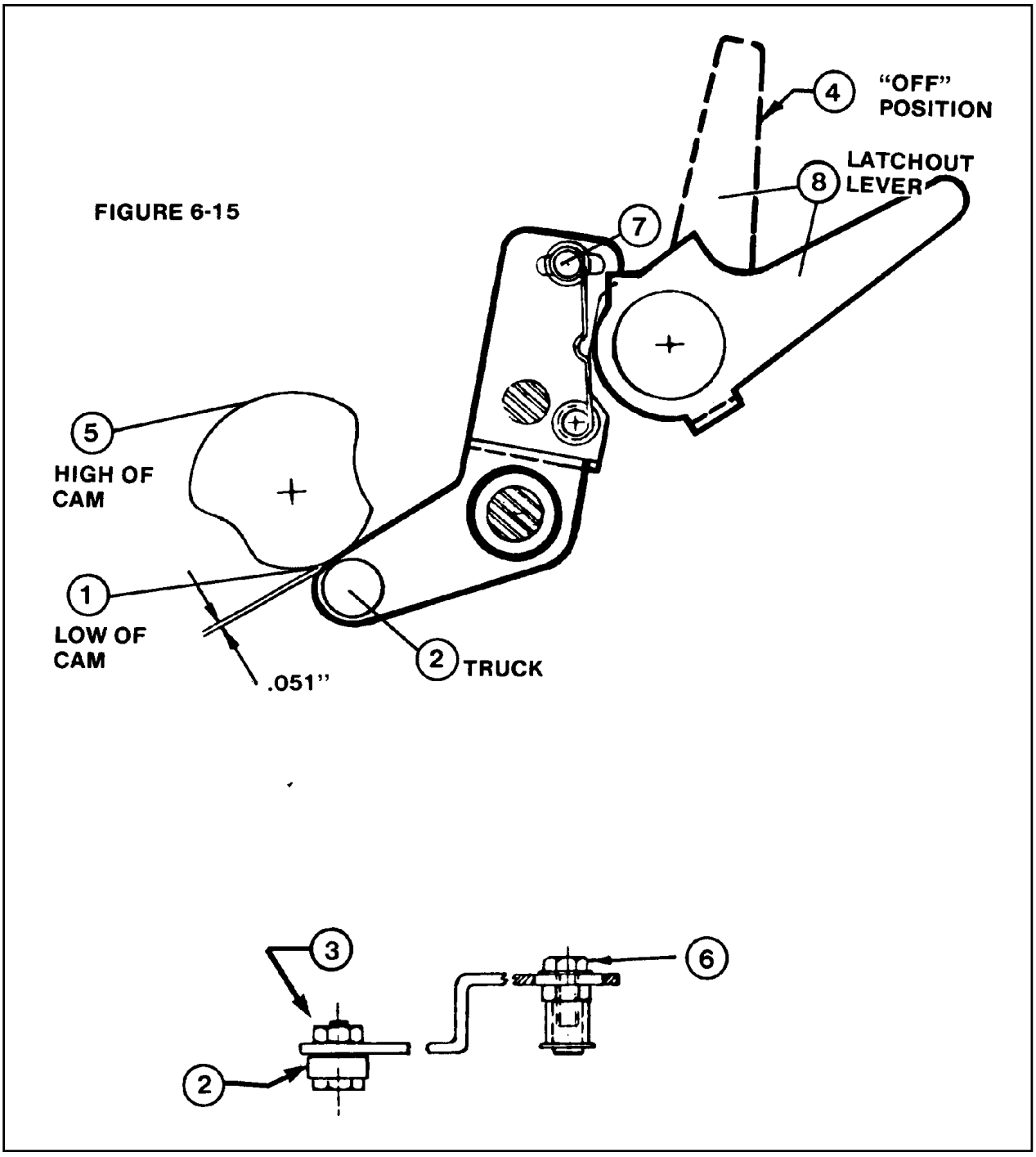


Figure 53 - Ductor Lever Truck to Cam and Ink Ductor Latchout

INK FORM ROLLER PRESSURE

REQUIREMENT: To assure copy quality, form rollers must contact master or plate under proper pressure.

NOTE:
Form roller end play adjustment must be made before making this adjustment.

ADJUSTMENT:

1. Position the following: Operation control lever to “Ink"
   Form roller levers to “Off”
   Aquamatic lockout to “Manual” (up)
   Machines without Operation control lever: Turn night latch to “Operate”
   Aquamatic night latch to “Operate”
   Aquamatic control to “45”
2. Apply ink to ink fountain and adjust fountain screws for even distribution of ink. Ink the roller system.
3. After inking all rollers, turn off machine and attach a 4000 Series master to the master cylinder.
4. Turn handwheel until both form rollers are in a position where they can contact the master.
5. Adjust four locking nuts (1) on four adjusting screws (2) on both sides. With plates (3) flat against frame, draw locking nuts (1) up snug (not tight) to plates (3). Check that adjusting screws (2) can be rotated.
6. Re-adjust, if necessary.

CAUTION:
If plates (3) are not adjusted properly, adjusting screws (2) will bind and form roller levers will bind.

6. Turn four adjusting screws (2) to position form rollers to their maximum distance from the master cylinder. Tighten lock screws (4).
7. Gently turn two form roller levers to “On” and then to “Off”.
8. Check ink bead lines on the master for the following widths, with a uniform measure within 1/64" across the length:
   Upper form roller - 1/8" to 5/32"
   Lower form roller - 5/32" to 3/16"
9. Loosen lock screws (4) as necessary and turn adjusting screws (2) in the direction shown in chart on the following page to INCREASE bead line.

NOTE:
When bead line is to be INCREASED (form roller moving toward master cylinder) the adjusting screws (2) must be turned in the direction listed on the chart. If not, the form rollers will be askew in the machine. It is possible to get a proper bead line dimension but it will run at an angle. Tighten screws (4).

10. Re-check adjustment page.

NOTE:
When the upper form roller is adjusted the aquamatic ductor roller must also be adjusted.

NOTE:

Screws (2) with a milled slot  or milled flat  indicate high point of eccentric. Opposing eccentric screws (2) must be approximately in the same position on both sides of the machine to assure that the rollers are not skewed.

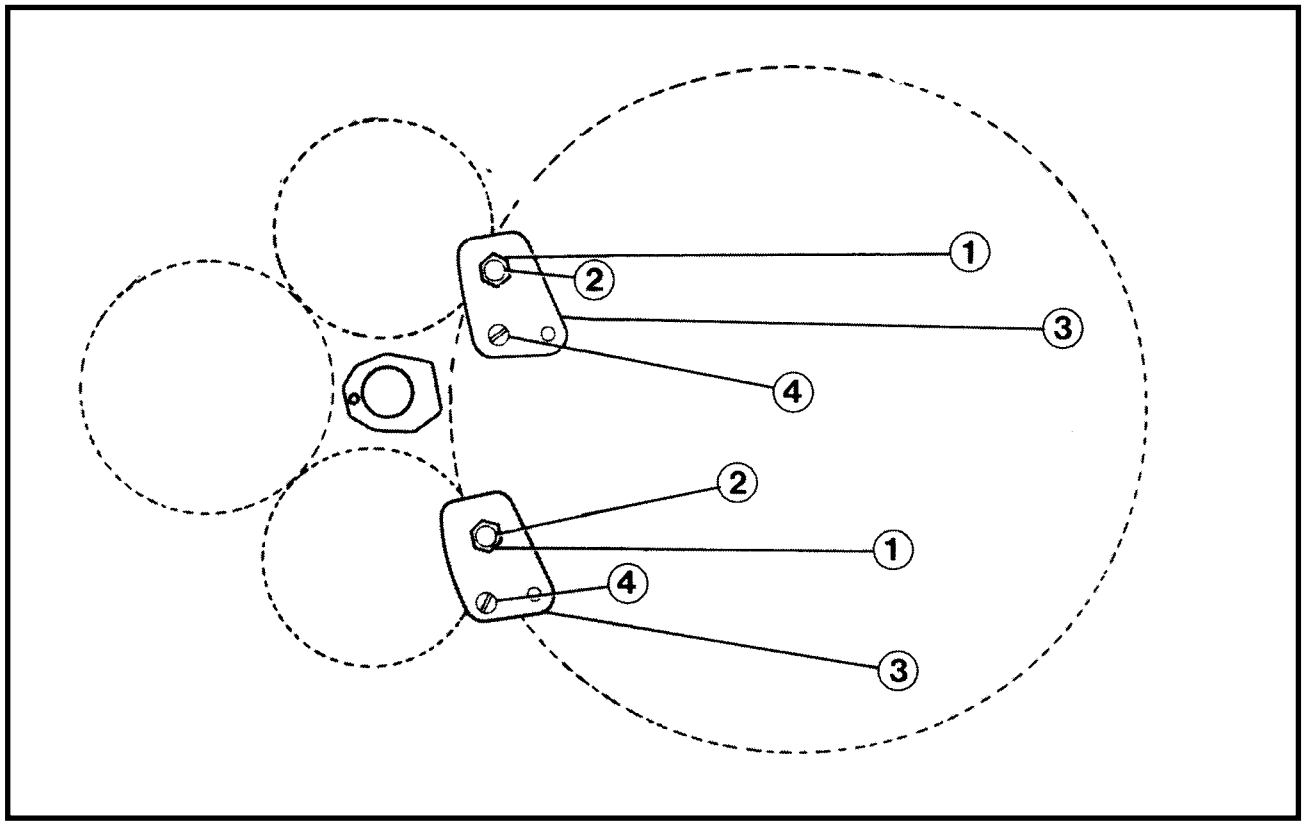


Figure 54 - Ink Form Roller Pressure Illustration

Turn the adjusting screws in the following direction to INCREASE the bead line to the correct dimension:

	NON-OPERATOR'S SIDE	OPERATOR'S SIDE
Upper Form Roller	Counterclockwise	Clockwise
Small Lower Form Roller	Counterclockwise	Clockwise
Large Lower Form Roller	Clockwise	Counterclockwise

AQUAMATIC DUCTOR ROLLER

REQUIREMENT: To assure uniform distribution of fountain solution and copy quality, the aquamatic unit must be properly adjusted.

NOTE:
Form rollers must be adjusted before you perform this adjustment.

ADJUSTMENT:

1. Position the following: Operation control lever in “Neutral”
   Aquamatic lockout lever in “Manual” (up)
   Form roller levers “On”
   Aquamatic night latch “Operate”
   Aquamatic control at “0” (Off)
   Machines without operation control handle: Turn night latch lever to “Operate”
2. Turn handwheel until ductor operating levers (1) (Figure 55) have moved as far as possible toward the receiving end of the machine. Adjust eccentric screws (3) and trucks up on both sides for 1/64" (.015") gap between aquamatic ductor (4) and oscillator (2) across the entire length.
3. Place a 4000 series master on master cylinder and move aquamatic control to "20".
4. Move operation control lever to “Ink”.

NOTE:
When performing step 5, the upper form roller must be on the solid area of the master cylinder.

5. Turn handwheel counterclockwise until aquamatic ductor (4) just separates from aquamatic oscillator (2). Adjust eccentrics (3) for both ends to separate at the same times.
6. Check that the aquamatic ductor roller (4) and oscillator (2) have a 1/64" gap when the aquamatic control is “Off”.

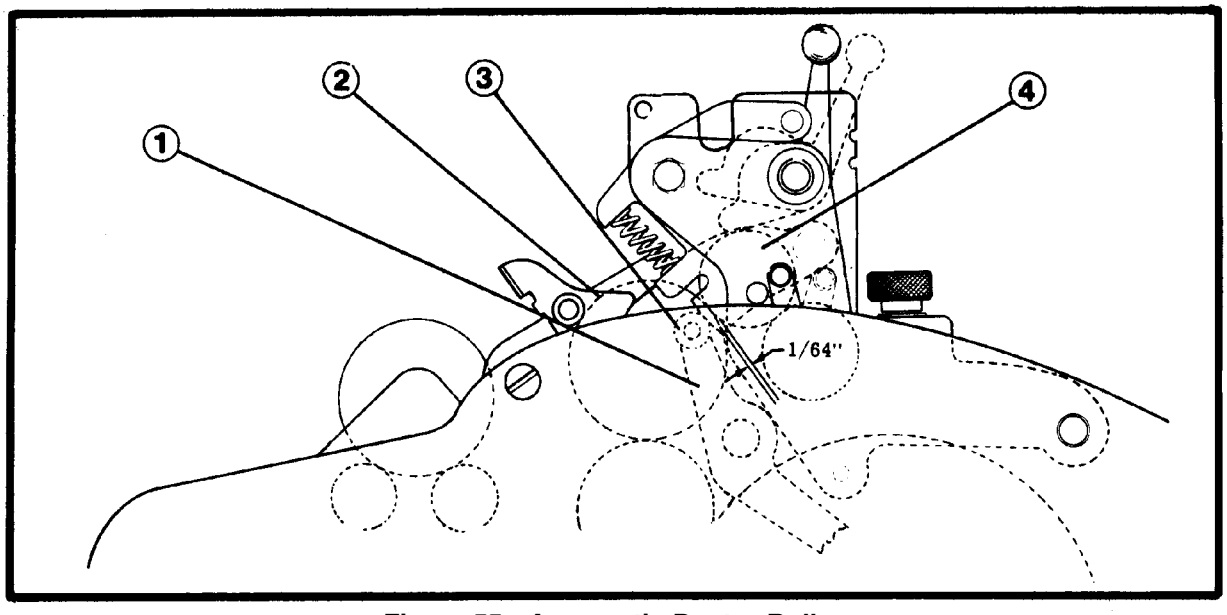


Figure 55 - Aquamatic Ductor Roller

AUTOMATIC AQUAMATIC LOCKOUT

REQUIREMENT: A. When operation control lever is in “Neutral”, the aquamatic ductor roller must not be allowed to contact the oscillator.

B. The aquamatic lockout system must lockout the ductor in “Neutral” and release the ductor in “Ink”.

ADJUSTMENT:

1. Position the following: Operation control lever in “Neutral”
   Form roller levers in “On”
   Aquamatic night latch lever in “Operate”
   Aquamatic control lever at “45”
   Aquamatic lockout lever in “Automatic” (down)
2. Loosen two locking screws (1) on both sides of the machine.
3. Move aquamatic control to obtain a gap of 1/16" between the aquamatic ductor roller (2) and oscillator (3). The handwheel may also have to be turned to obtain 1/16" gap.
4. Adjust arms (4) to butt against ears (5) of ductor roller levers.
5. Tighten screws (1) on both sides.
6. Loosen set screw in eccentric collar (6). Set high of eccentric in the upper range. Tighten the set screw (6).
7. Move operation control lever from “Neutral” to “Ink” and back several times while turning handwheel. Observe the release and lockout action of arms (4). Test machine under power also.
8. Rotate collar (6) as necessary for proper lockout and release. Refine arm (4) adjustment, if necessary.

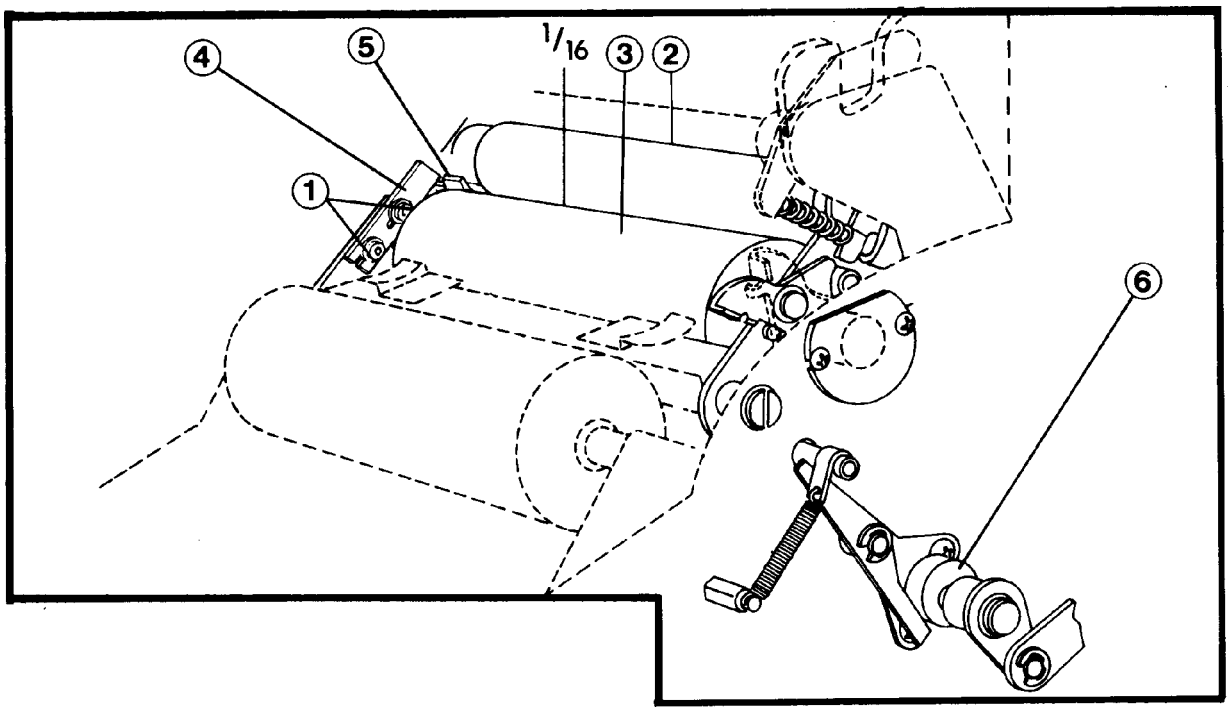


Figure 56 - Automatic Aquamatic Lockout

INK DUCTOR ROLLER

REQUIREMENT: For proper pressure of the ink ductor roller against the distributor roller, the actuating shaft truck must be adjusted.

ADJUSTMENT:

NOTE:
The ink ductor roller must be in the machine before adjustment.

1. Turn the handwheel until the ink ductor truck (item 1, Figure 57) is at the low of cam (2).
2. Loosen locking nut (4) and adjust eccentric screw (3) to obtain a .051" clearance between the truck (1) and cam (2).
3. Tighten nut (4).

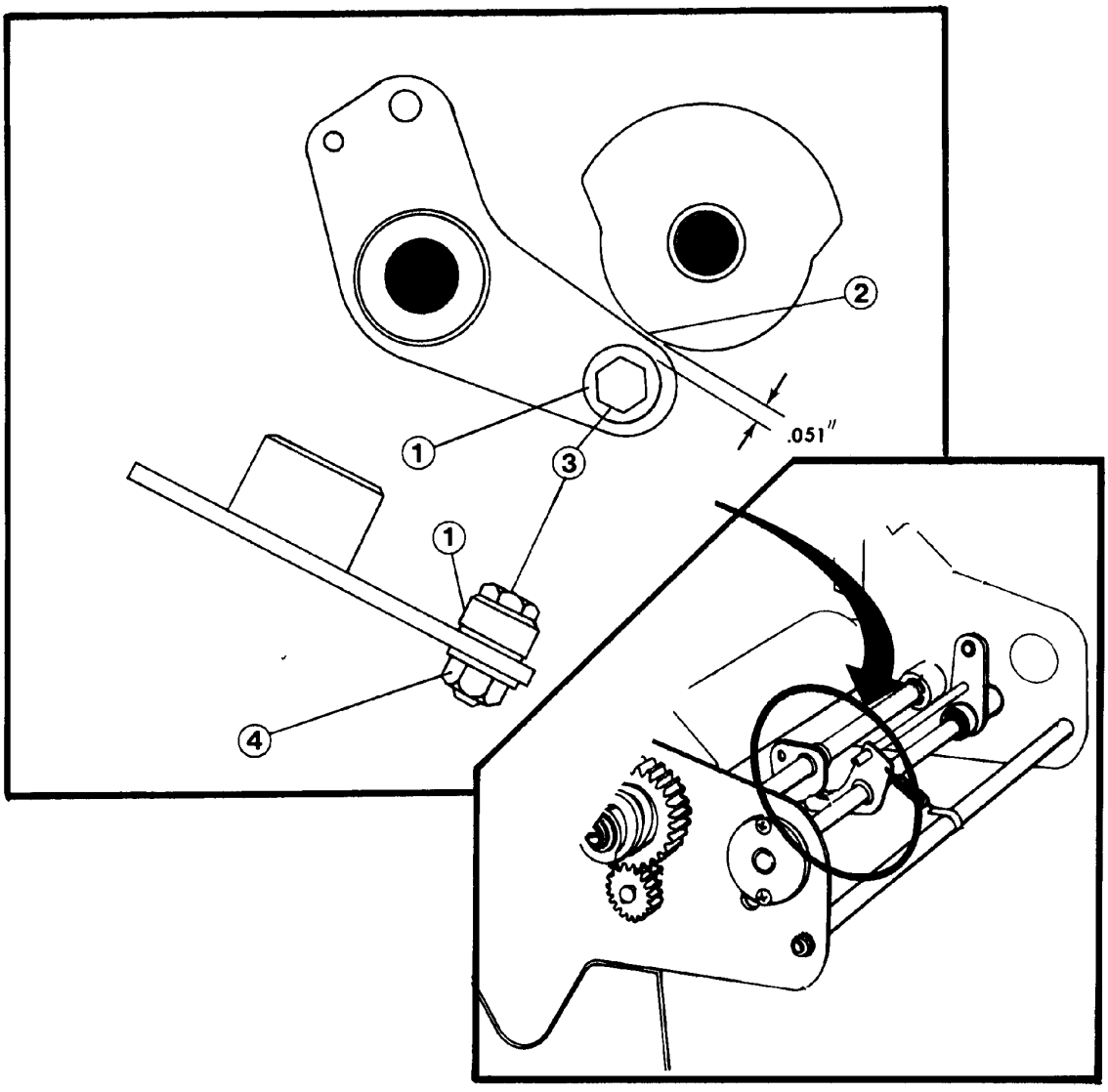


Figure 57 - Ink Ductor Roller

PRINT RAISE - LOWER STRIP

REQUIREMENT: When the raise-lower mark is at "0", copy 49/64" below the top of the holes on the pinbar plate should print 1/2" from the lead edge of the paper.

ADJUSTMENT:

1. On pinbar metal plates, expose a line exactly 49/64" below the top holes in the plate.
2. Attach the metal plate and make copies. Then measure the line of copy from thre lead edge of the sheet. This line should be 1/2" from the lead edge.
3. Move the print raise-lower adjustment to obtain 1/2".
4. Set the raise-lower plastic strip with its center graduation line on the "0" mark of the ring gear strip.
5. Drive the two rivets home.

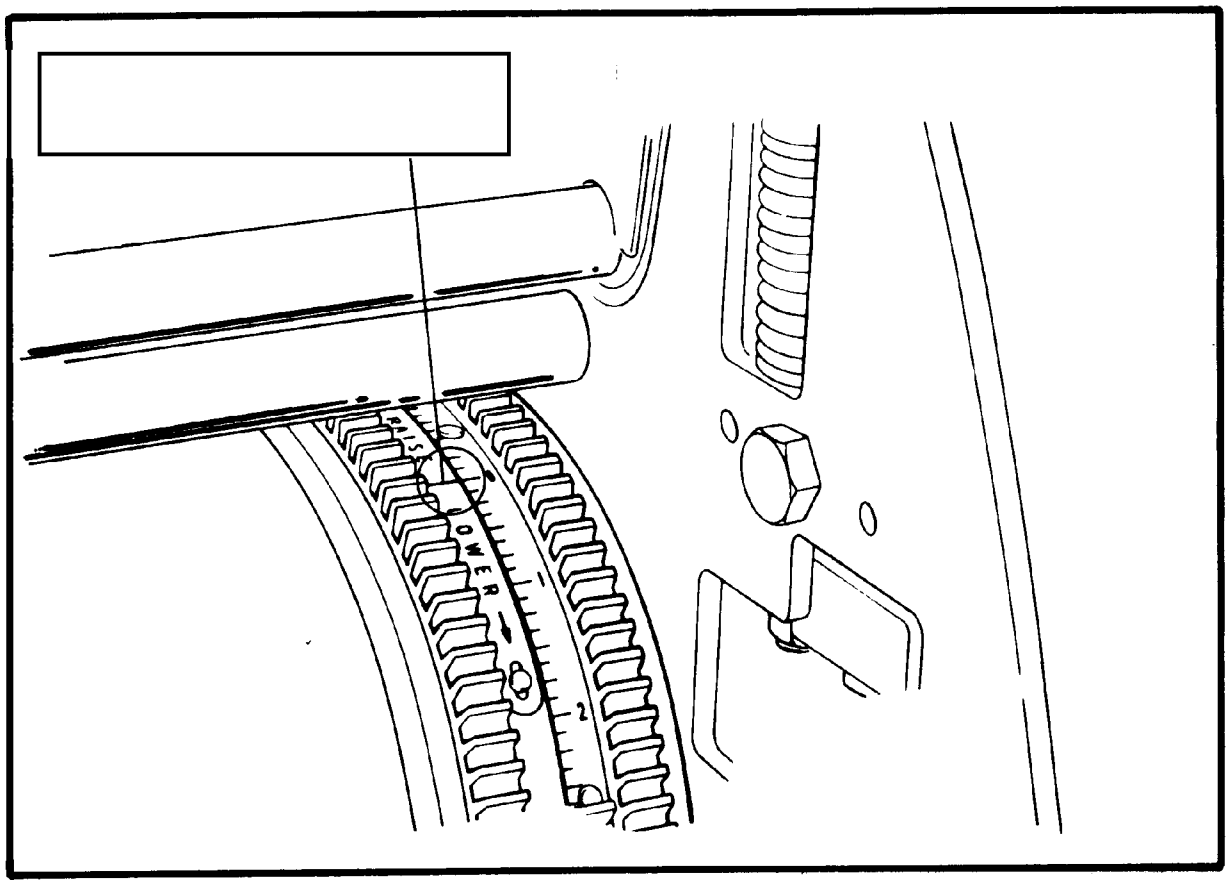


Figure 58 - Print Raise-Lower Strip

VACUUM PUMP PULLEY ALIGNMENT AND BELT TENSION ADJUSTMENT

Pulleys must be aligned and the belt properly tensioned to promote belt life and provide adequate clearance for the belt guard.

1. Remove Belt Guard.
2. Loosen set screws (item 1, Figure 59) in motor and pump pulleys.
3. Align pulleys to a dimension (2) of 2-3/4"+ 1/16" between the front cover panel (3) and the inside face of the pulley. Tighten the set screws (1).
4. Loosen motor mounting bolts (4) and adjust pump motor (5) to allow 1/2"+ 1/8" deflection of the belt when approximately one pound of force is applied to the belt midway between the two pulleys. Tighten the motor mounting bolts (4).
5. Replace the belt guard.

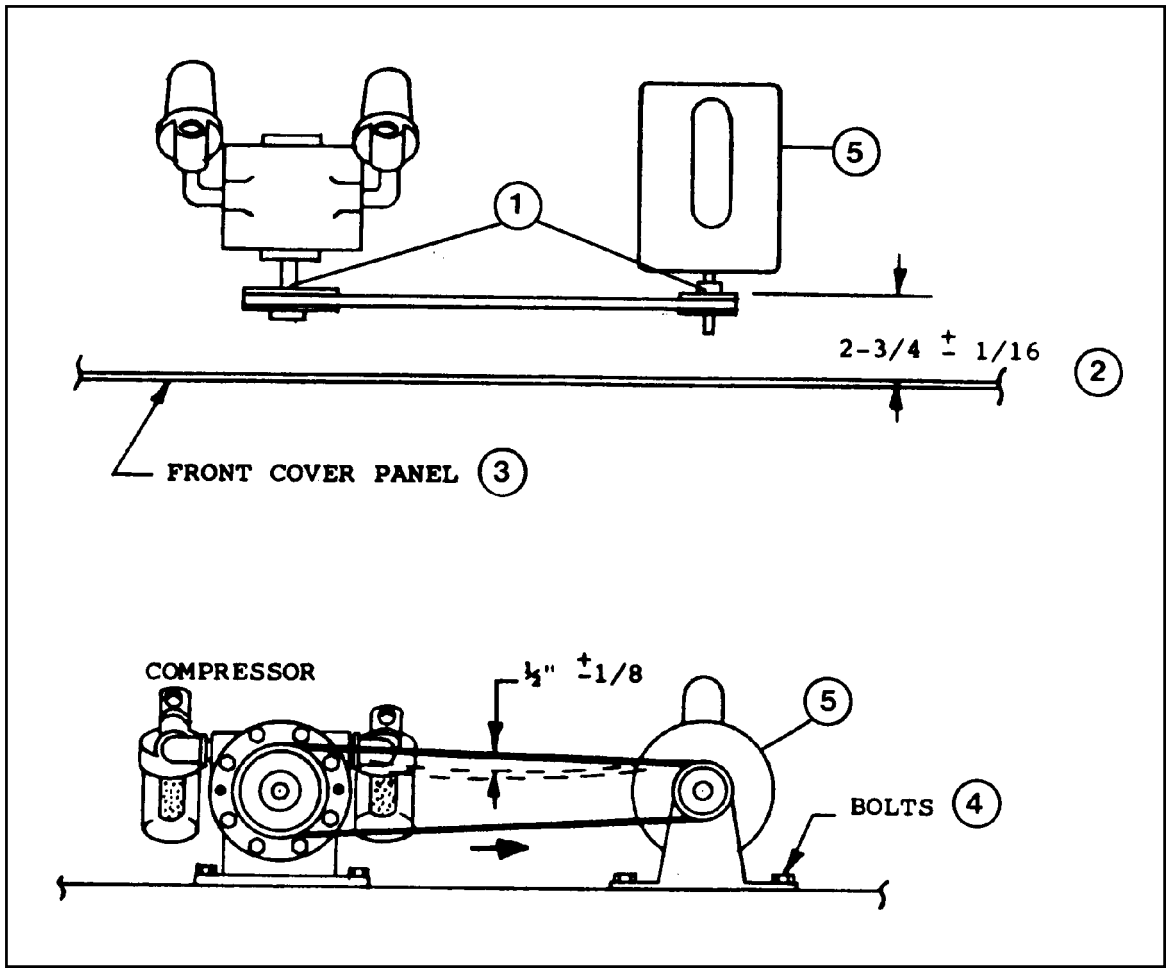


Figure 59 - Vacuum Pump Pulley Alignment and Belt Tension

FINAL MASTER AND IMPRESSION CYLINDER SUPPORT ARM ADJUSTMENT

The cylinder support arms must be fine-tuned for even pressure and even gapping.

1. Install a clean master (7000 Series).
2. Turn “ON” the machine.
3. Move the operation control lever to the INK position and ink the entire master.
4. Move the operation control lever to the NEUTRAL position.
5. Turn “OFF” the machine.
6. Gently turn the Master cylinder lever in a clockwise direction to make contact with the blanket.

   Once contact is made, release the master cylinder lever and turn the handwheel until the bead line is visible. The bead line must be equal across the entire length of the cylinder.
7. If the bead line is uneven, loosen the locknut (1) of the support arm screw (2) on the side which has the thinner width and adjust this screw until the bead line is even (See Figure 31).
8. After adjusting the bead line on the master cylinder (and checking the bead line in several locations around the circumference of the cylinder for uniformity), ink-up the entire blanket on the blanket cylinder.
9. Insert a sheet of paper 13" x 17-3/4" over the forwarding rollers into the grippers.
10. Turn the handwheel until the paper is between the blanket and impression cylinders.
11. Turn the impression cylinder lever on the non-operator-side In a counterclockwise direction bringing the cylinders lightly into contact.

    Turn the handwheel until the bead line is visible. The bead must be equal across the entire length of the cylinder.
12. If the bead line is uneven, loosen the locknut (5) of the support arm screw (6) on the side which has the thinner width and adjust this screw until the bead line is even (See Figure 31).

IMPRESSION CYLINDER GRIPPER

Paper grippers must be properly adjusted for accurate registration. There must be no binding, backlash, or malformation of parts of the gripper assembly.

1. Remove one (1) chain delivery gripper bar assembly.
2. Set the impression cylinder gap control at “1”.
3. Check for worn or malformed gripper fingers, stop assembly parts, and ejector fingers.
4. Check for a .010"- .013" clearance between the paper stops and the cylinder anvil **in the closed position.**
5. Latch-up the impression cylinder.
6. Turn the handwheel until the grippers are open to receive paper.
   Insert a 4" wide sheet of paper under the operator-side gripper.
   Turn the handwheel until the grippers are closed and check for a 2-1/2 to 4 lb. pull.
   Adjust the 3/32" allen screw (a) as necessary to obtain the correct pull (see Figure 60).
   Repeat step 6 for the non-operator-side gripper.
7. If you are unable to obtain a 2-1/2 to 4 lb. pull on both sides, repeat steps 3 - 6.

CAUTION:
EXCESSIVE TENSION WILL CAUSE PREMATURE WEAR AND OVERLOADING WHEN FEEDING CARD STOCK.

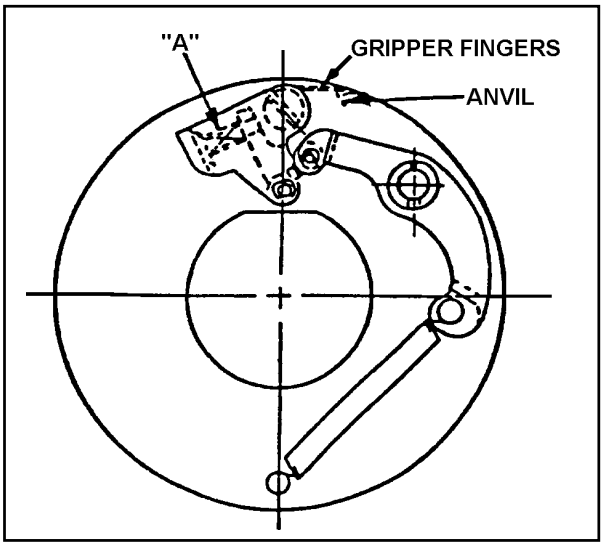


Figure 60 - Impression Cylinder Grippers (Chain Delivery)

CHAIN DELIVERY ADJUSTMENTS AND TIMING CHECK

The springs must be adjusted to properly tension the drive chains. The Joggers must be properly timed to prevent trapping the sheet before the sheet is released by the chain grippers.

NOTE:

Do not operate the chain delivery under power until the following steps have been checked and, if necessary, the adjustments are made.

1. Check the tension of the compression spring (operator-side and non-operator-side). The tension is correct if the dimension is 1-1/4" (see Figure 61). If necessary, adjust by performing the following steps.
   a. Loosen nut (1).
   b. Set adjusting screw (2) so that the compression springs are compressed to 1-1/4" long.
   c. Tighten nut (1) against block (3).
2. Check the timing by performing the following steps.
   a. Turn the handwheel until all timing marks on the machine are aligned.
   b. Ensure that the timing holes in the sprocket and gear are approximately in the position shown (4) and are in-line with each other within one gear tooth space (see Figure 62).

      If the Timing does not meet the above requirements, adjust by performing the following steps.

      - Remove the gripper bars and the operator-side chain.
      - With all timing marks aligned, the gripper bar attachment links on the chains must be on the teeth in the main drive sprockets that have timing marks.
      - Set the idler sprocket (5) so that the timing hole in the sprocket is in position within one sprocket tooth space.
      - Remove the cam assembly (6) and reinstall it so that the timing holes in the sprocket and gear (4) line-up within one gear tooth space.
      - Reinstall the chain and the gripper bars.

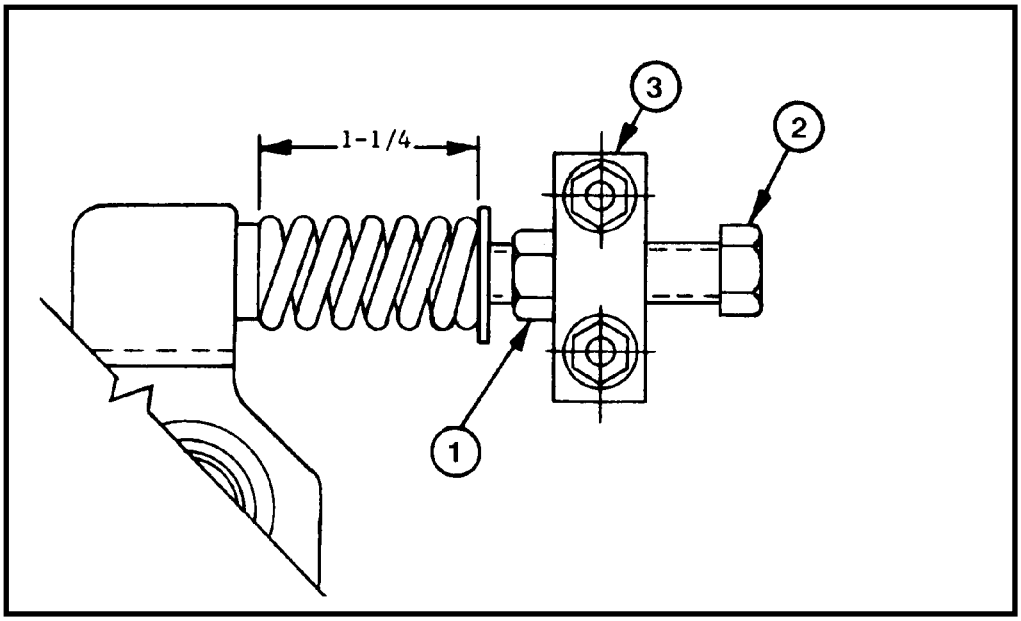


Figure 61 - Chain Delivery Adjustment

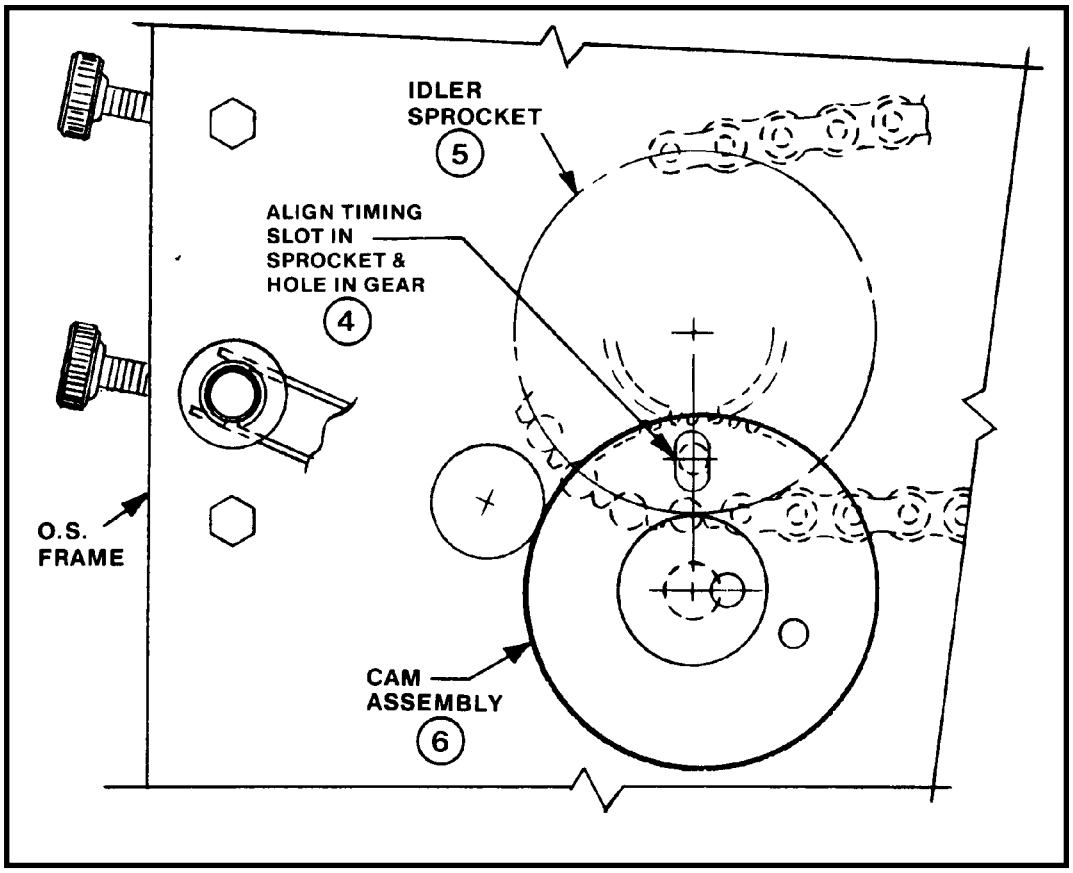


Figure 62 - Chain Delivery Timing

GRIPPER BAR AND TIMING ADJUSTMENTS

The grippers must operate freely and the gripper bars must be properly timed to transfer paper from the impression cylinder grippers to the chain grippers without nicking or dropping the paper.

NOTE:
Do not operate the chain delivery under power until the gripper bar calibrations and the clearance between the gripper bars and the impression cylinder had been checked.

1. While manually turning the machine, check to ensure that all the chain delivery gripper bars clear the impression cylinder and its grippers.
2. Check to ensure that all gripper bars open and close freely.
3. Check to ensure that all cam followers are adjusted to 1.125" using the chain gripper bar gauge (1) (P/N 191555) (see Figure 63).
4. It may be necessary to adjust the timing of the chain delivery gripper to the impression cylinder gripper. If required, adjust by performing the following steps:

CAUTION:
Extreme caution must be exercised when making this adjustment.

   a. Loosen the three sprocket mounting screws (2) (see Figure 64).
   b. To advance the chain gripper, turn the sprocket clockwise; to retard the chain gripper, turn the sprocket counterclockwise.

NOTE:
Use extreme caution, and make very small movements of the sprockets.

   d. Tighten the three sprocket mounting screws (2).
   e. Test all three gripper bars after each adjustment.

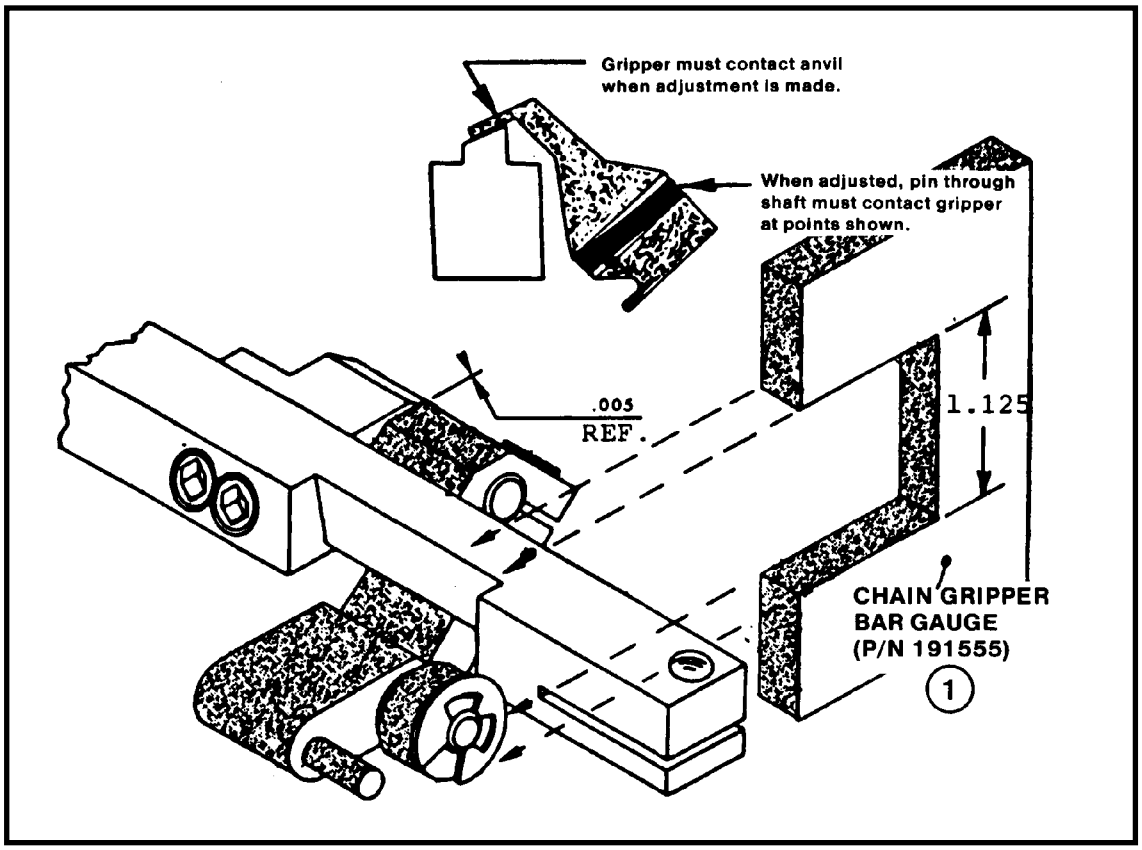


Figure 63 - Cam Follower Adjustment

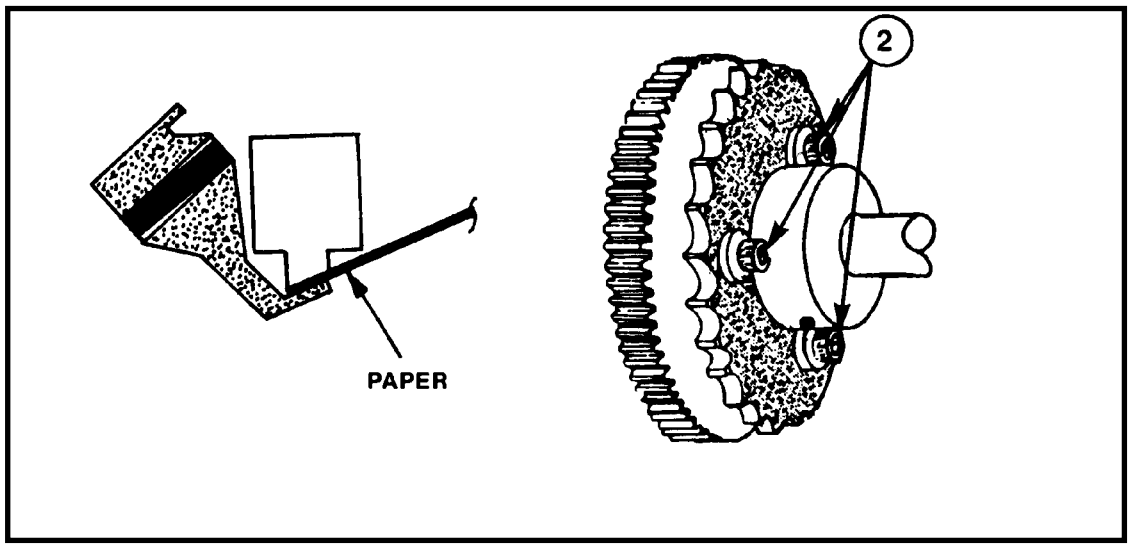


Figure 64 - Chain Delivery Gripper to Impression Cylinder Gripper Timing Adjustment

CONTROL LEVER ADJUSTMENTS

The receding stacker must start descending with the control lever in position “C” (see Figure 65).

1. Move the control lever (1) to position “A”.
2. Turn the handwheel until the pawl (2) is in its highest position (Position “B”).
3. Move the control lever (1) until the edge (3) passes through the base point (4) of the first ratchet tooth behind the pawl (2) (position “C”).
4. Loosen the two nuts (7).

   While holding the control lever (1) in this position, adjust the control ratchet (5) for the pin (6) to fit into the second tooth.
5. Tighten both nuts (7).

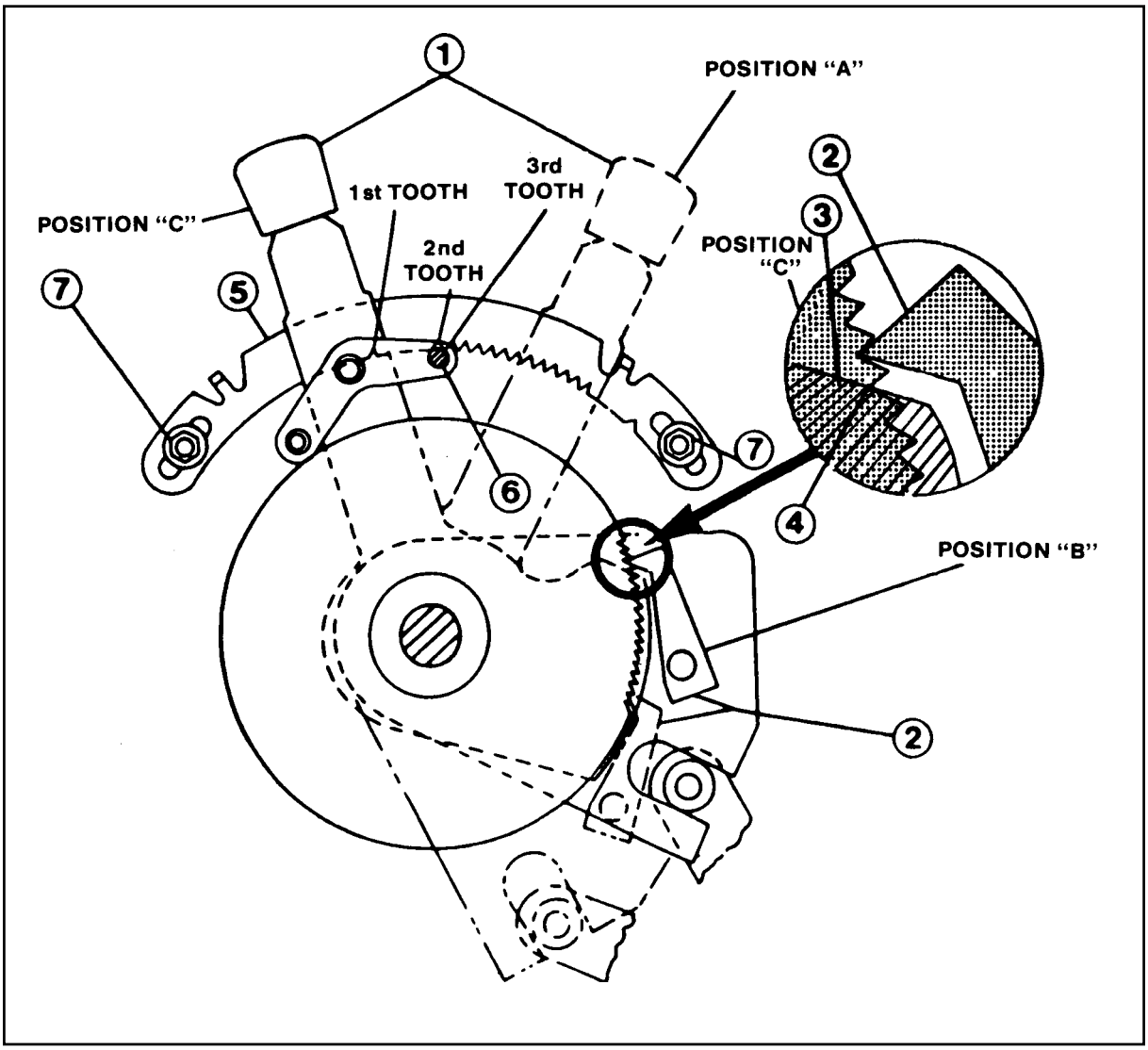


Figure 65 - Control Lever Adjustment

CHAIN DELIVERY PAPER STOP ADJUSTMENT

The paper stop assembly must be at 90° to the horizontal surface of the dolly with the paper stop locking knob tightened (see Figure 66).

1. With the dolly in the raised position and the paper stop assembly in close proximity to the dolly, place a square on the horizontal surface of the dolly (1) and check to ensure that the stop assembly is at 90° to the dolly.

   If necessary, adjust by performing the following step:

   a. Loosen the nuts (2) that mount the door stops (3) and position the door stops so that the paper stop assembly (4) is at 90° to the dolly (see Figure 66).

   b. Tighten the nuts (2).

NOTE:

The door assembly should contact both the operator-side and the non-operator side stops at the same time.

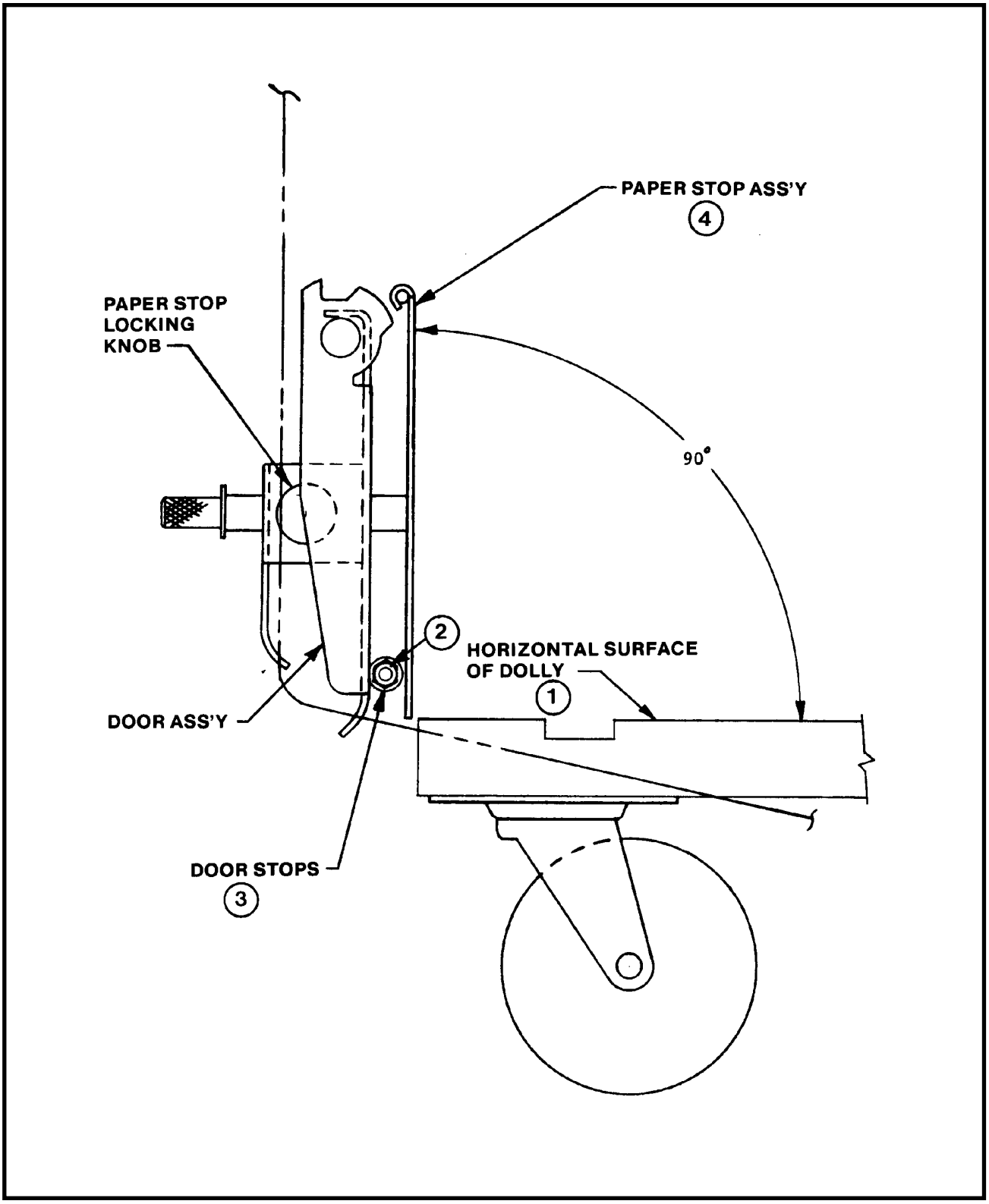


Figure 66 - Chain Delivery Paper Stop

SIDE JOGGER CHECK

If all parts are to specifications and have not been abused, the operator-side and non-operator side side joggers should be parallel to the chain delivery side frames and each other within 1/32".

Using a 6" scale and checking from the machine surfaces on the joggers, check that the side joggers meet these parallel specifications.

CHAIN DELIVERY GUARD MICROSWITCH ADJUSTMENT

With Guards (1), (2) and (3) in the closed position as shown, Switches (4), (5) and (6) must not be actuated by the Cams. Immediatelly after the Guards are lifted, the Switches must be actuated by the Cams (see Figure 67).

If the Switches do not meet the above specifications, adjust by performing the following steps:

1. Loosen the two mounting screws for either or both switches.
2. Adjust the switch(es) to specifications.
3. Tighten the mounting screws for the switch(es).

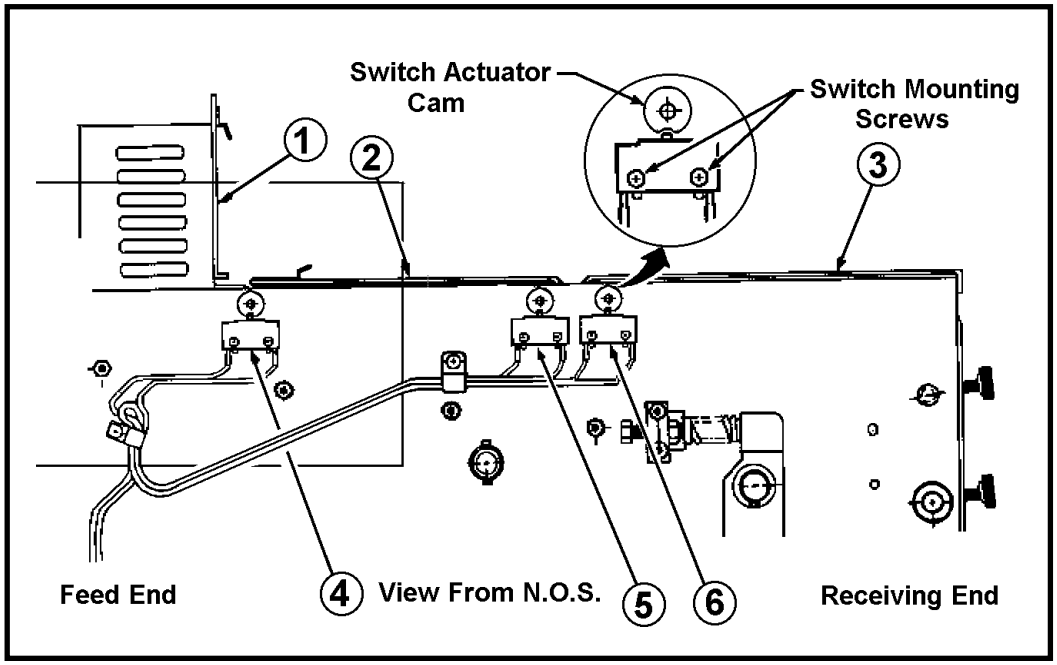


Figure 67 - Chain Delivery Guard Microswitch Adjustment

NOTE:

All retaining screws used to hold the safety switches in place are pre-coated with a thread-locking material to prevent slippage once the switches are properly adjusted. This is a regulatory agency requirement. If these screws are removed for switch replacement, newly-coated screws must be installed to maintain the integrity of the locking material.

DISASSEMBLY/ASSEMBLY

ABDICK®

MASTER CYLINDER REMOVAL

NOTE:
The master cylinder should be protected with a clean-up mat.

1. Remove the aquamatic trough (1).
2. Remove the master cylinder gear guard (2).

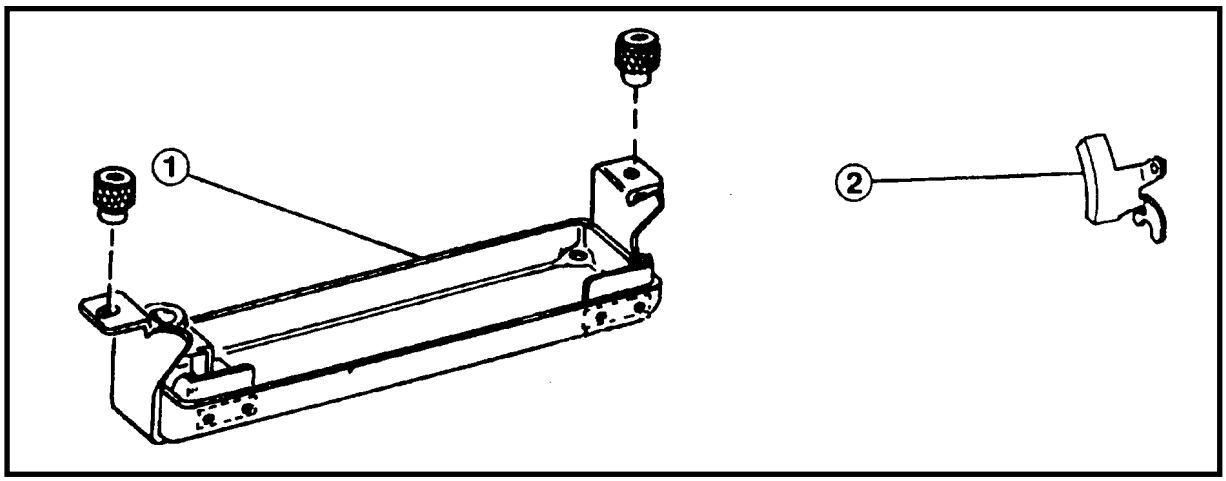


Figure 68 - Aquamatic Trough and Guard Removal

3. Remove the screws and nuts. There are two nuts on the non-operator side and one nut on the operator side.
4. Remove the nut. (Loosen on both sides of machine.)
5. Remove the aquamatic control handle. Remove the screw and stud.
6. The aquamatic unit should now be tilted up.

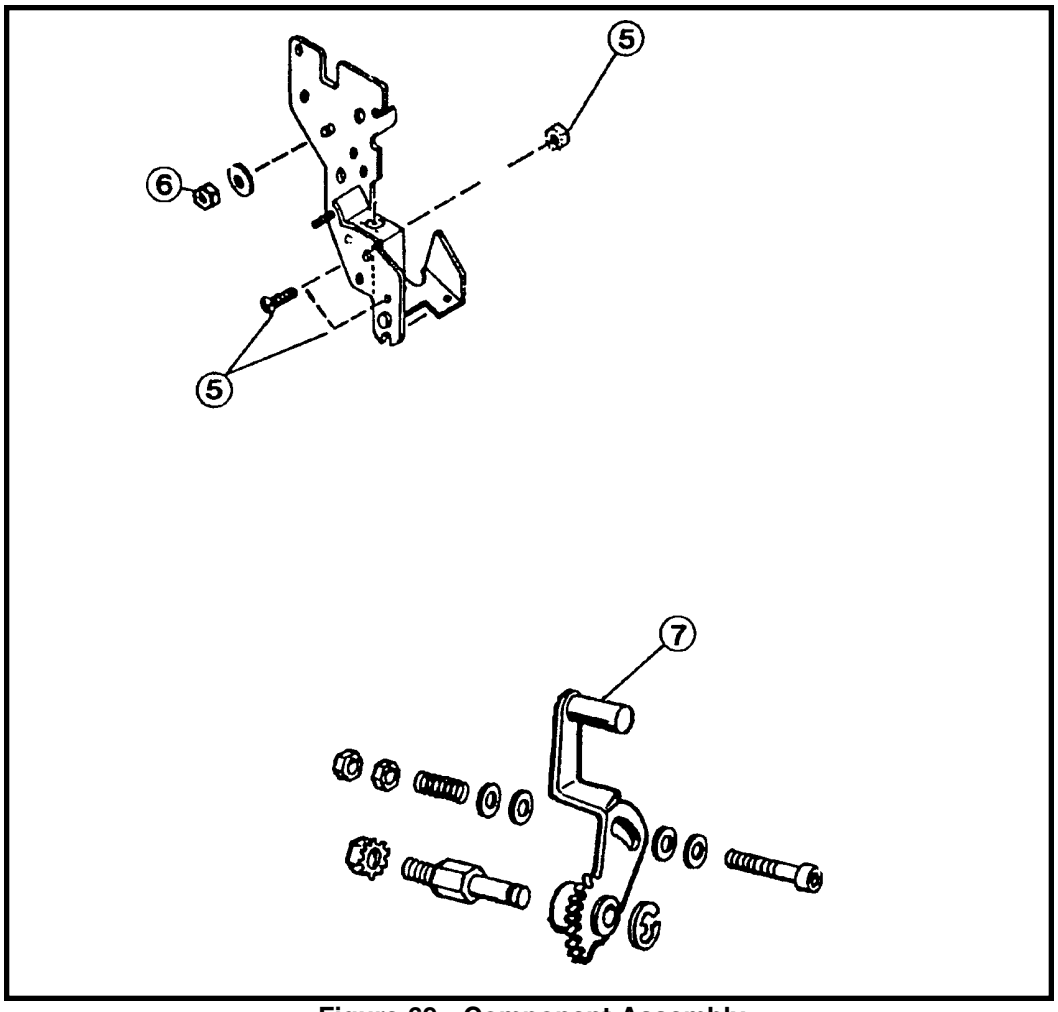


Figure 69 - Component Assembly

7. Remove the upper tie bar.
8. Remove the aquamatic gear (operator side)
9. Remove the master cylinder link.

NOTE:

The springs are not interchangeable. Do not change the location of the springs.

10. Remove the master cylinder latch.
11. Remove the master cylinder lever.

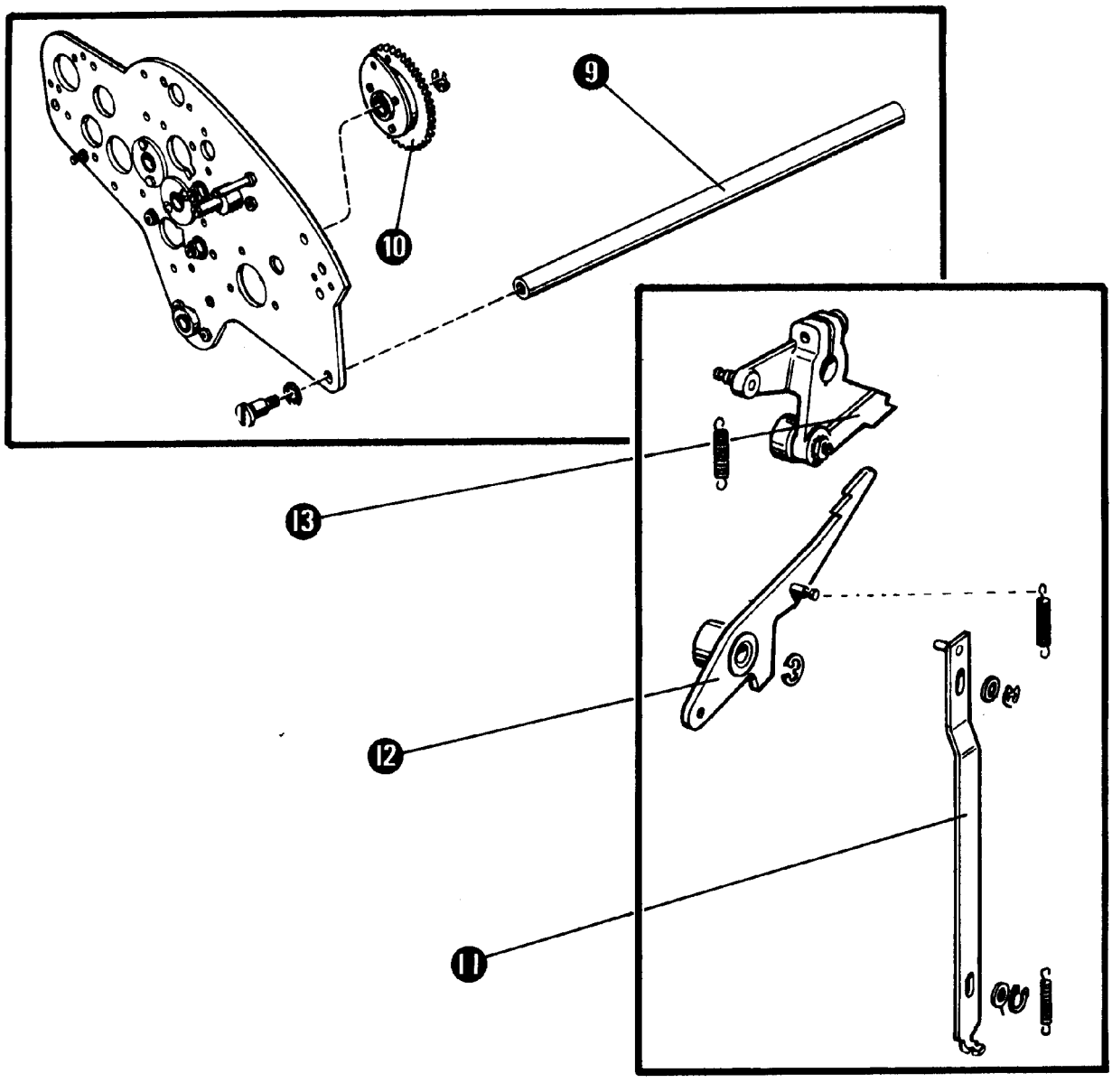


Figure 70 - Component Removal

12. Remove the non-operator side support arm.
13. Remove the operator side support arm.
14. Remove master cylinder shaft bearings (operator and non-operator sides).
15. Install the cylinder adjusting tool (P/N 191551).
16. Remove the collar located inside the cylinder. Remove the two setscrews completely. When re-assembling the cylinder, the beveled end of collar must be positioned towards the operator side, and the setscrews must bottom in holes in shaft.
17. Remove the master cylinder shaft from the operator side.

NOTE:

Be careful of the tru-arc on the shaft; replace, if loose.

18. Remove the master cylinder.

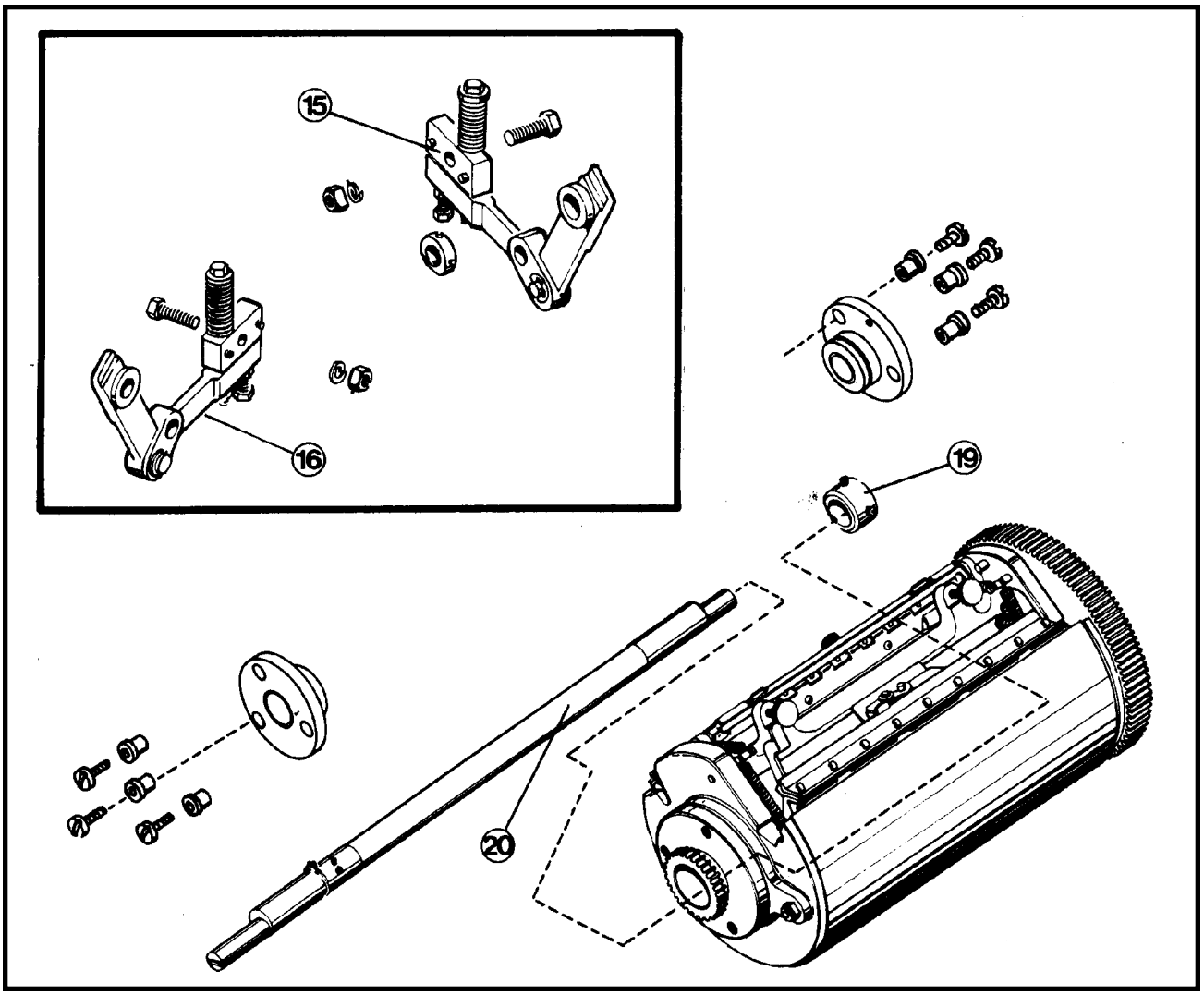


Figure 71 - Master Cylinder Removal

RE-INSTALLATION OF MASTER CYLINDER

NOTES:

Install the master cylinder in the reverse order of removal. The following should be noted when re-installing the master cylinder:

1. When re-installing the aquamatic gears, the gears must be timed to each other.
2. Turn the handwheel until the hole in the non-operator side gear aligns with the hole in the side frame.
3. Insert pin punch into holes.
4. With operator side gear out of mesh with the master cylinder, turn the gear until the holes align and then insert the punch. Install the “E” ring.
5. Refer to the timing section to time master cylinder.

BLANKET CYLINDER REMOVAL

NOTE:

The old blanket should be used when disassembling and assembling the cylinder.

1. Remove the safety cover and shaft assembly.

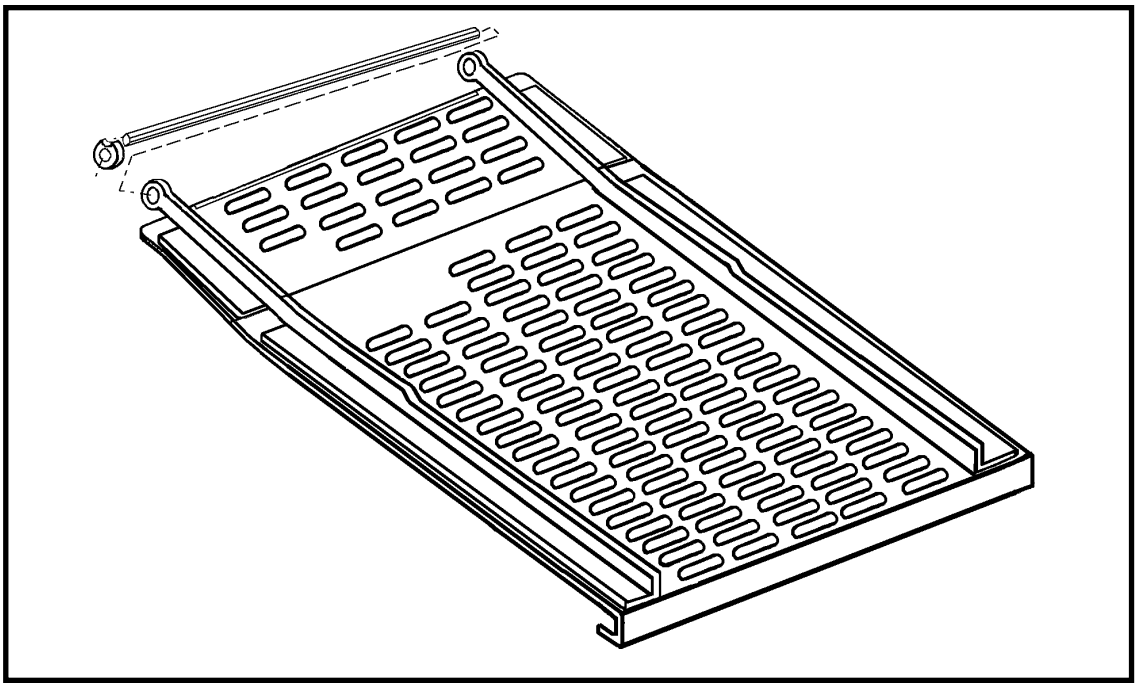


Figure 72 - Safety Cover and Shaft Asssembly

3. Remove the double lever assembly by removing the pin as shown.

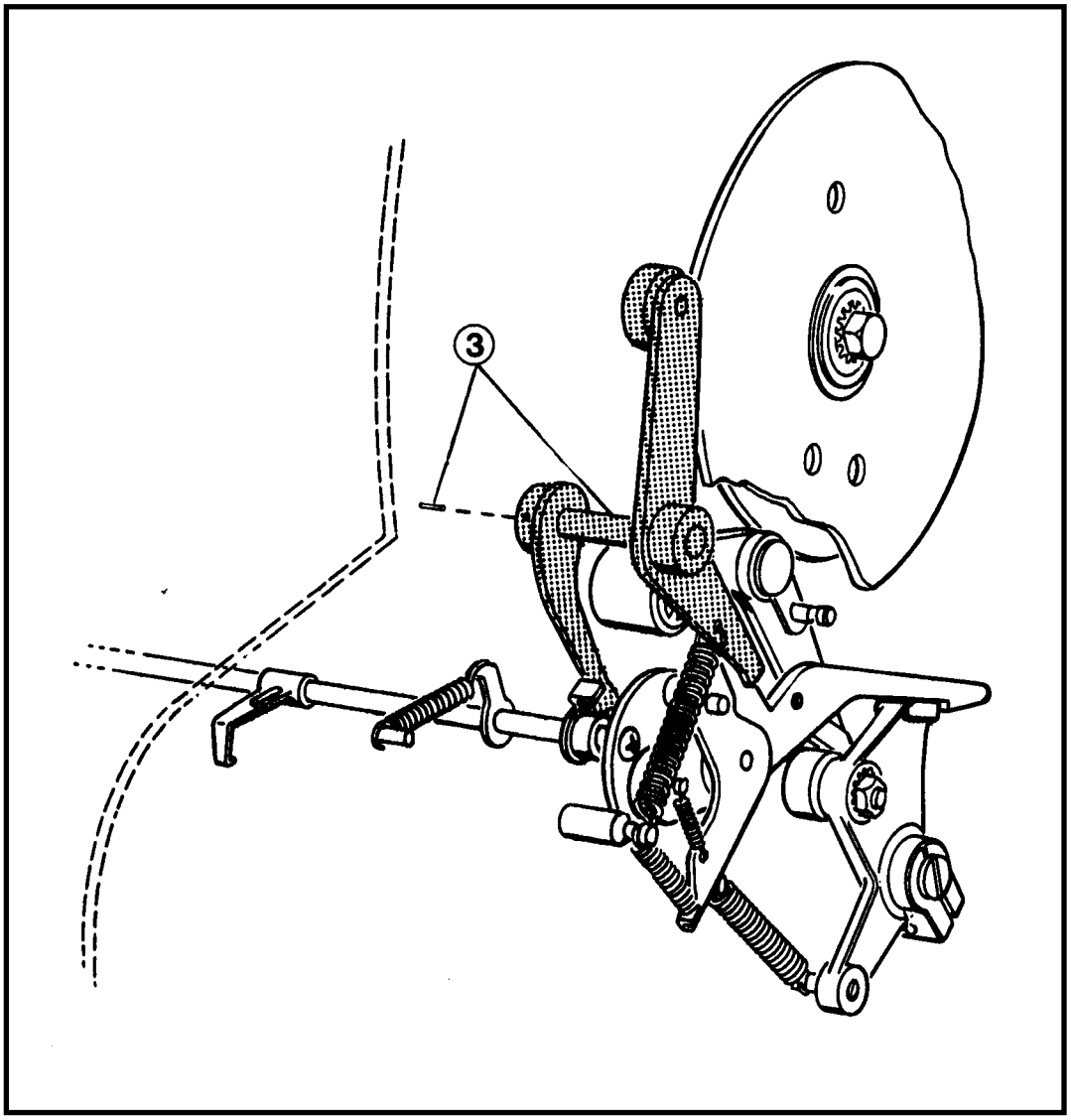


Figure 73 - Double Lever Assembly

4. Remove operator side cam, key and collar.
5. Remove the blanket cylinder pilot screw.
6. Remove the raise-lower plunger by removing the screws and nuts shown in Figure 74.

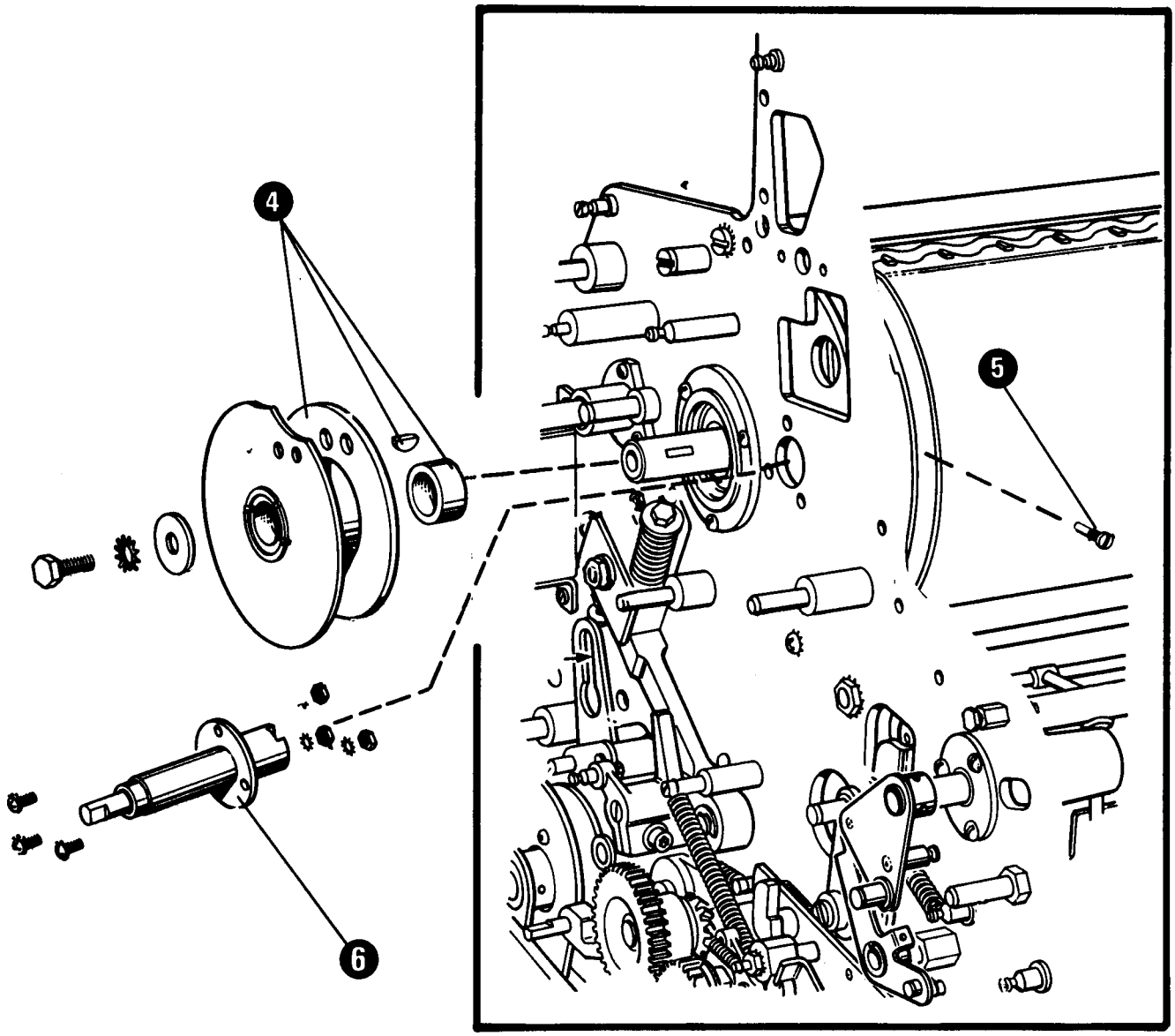


Figure 74 - Operator Side Cam, Key and Collar

7. Remove the blanket cylinder operator side bearing and housing. Remove the three screws and nuts (7) as shown in Figure 75. Do not remove the bearing from the housing.
8. Remove the lower tie bar on the blanket cylinder.
9. Remove the master cylinder support arm bolts.
10. Move the stop blocks so that the pins are out of the side frame. Push the support arms down.

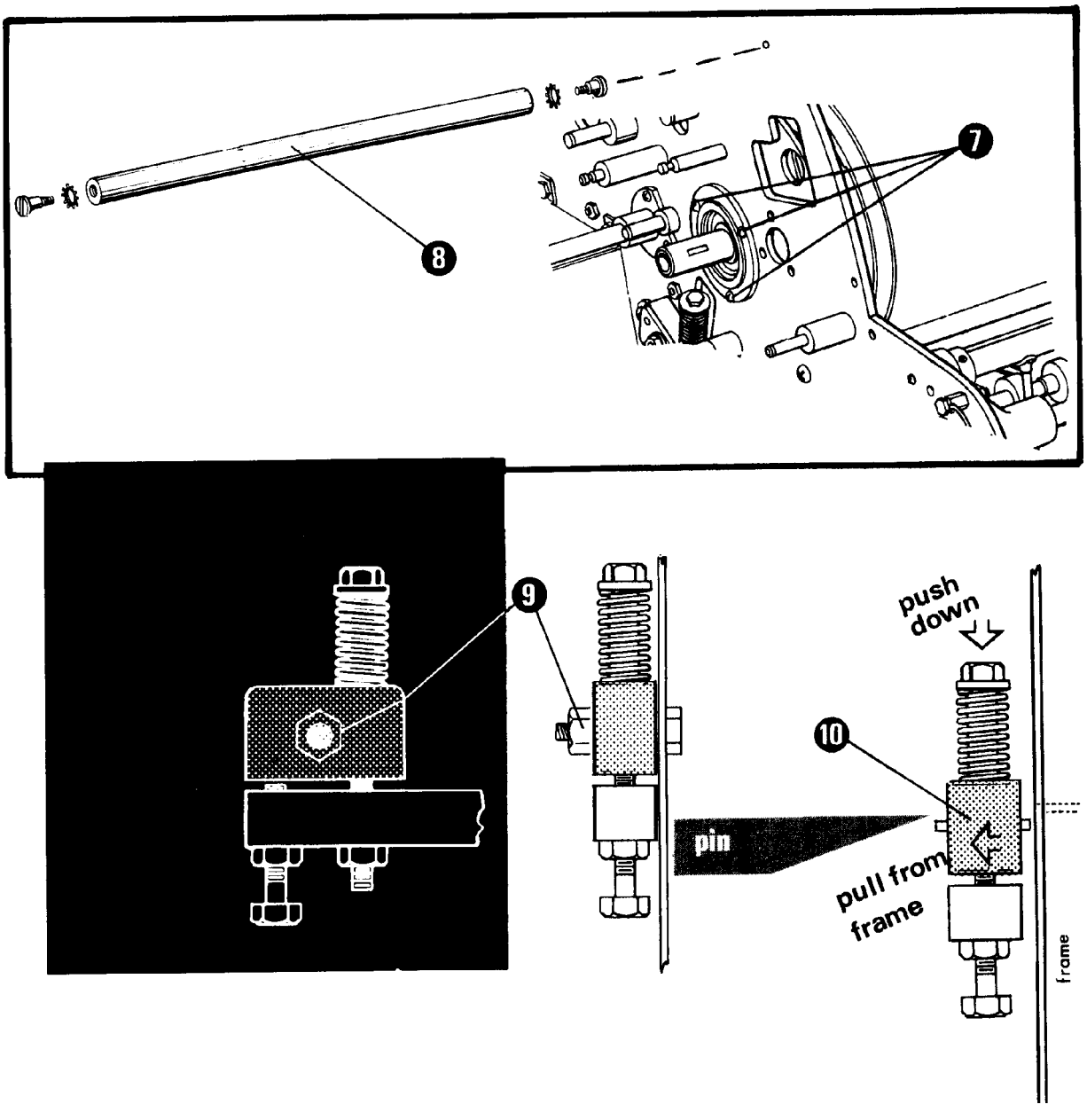


Figure 75 - Component Removal

11. Remove the blanket cylinder shaft from the operator side of the machine. Install the shaft pulling tool (P/N 191573) on the operator end of the shaft as shown in Figure 76.
12. Remove the blanket cylinder from the machine.

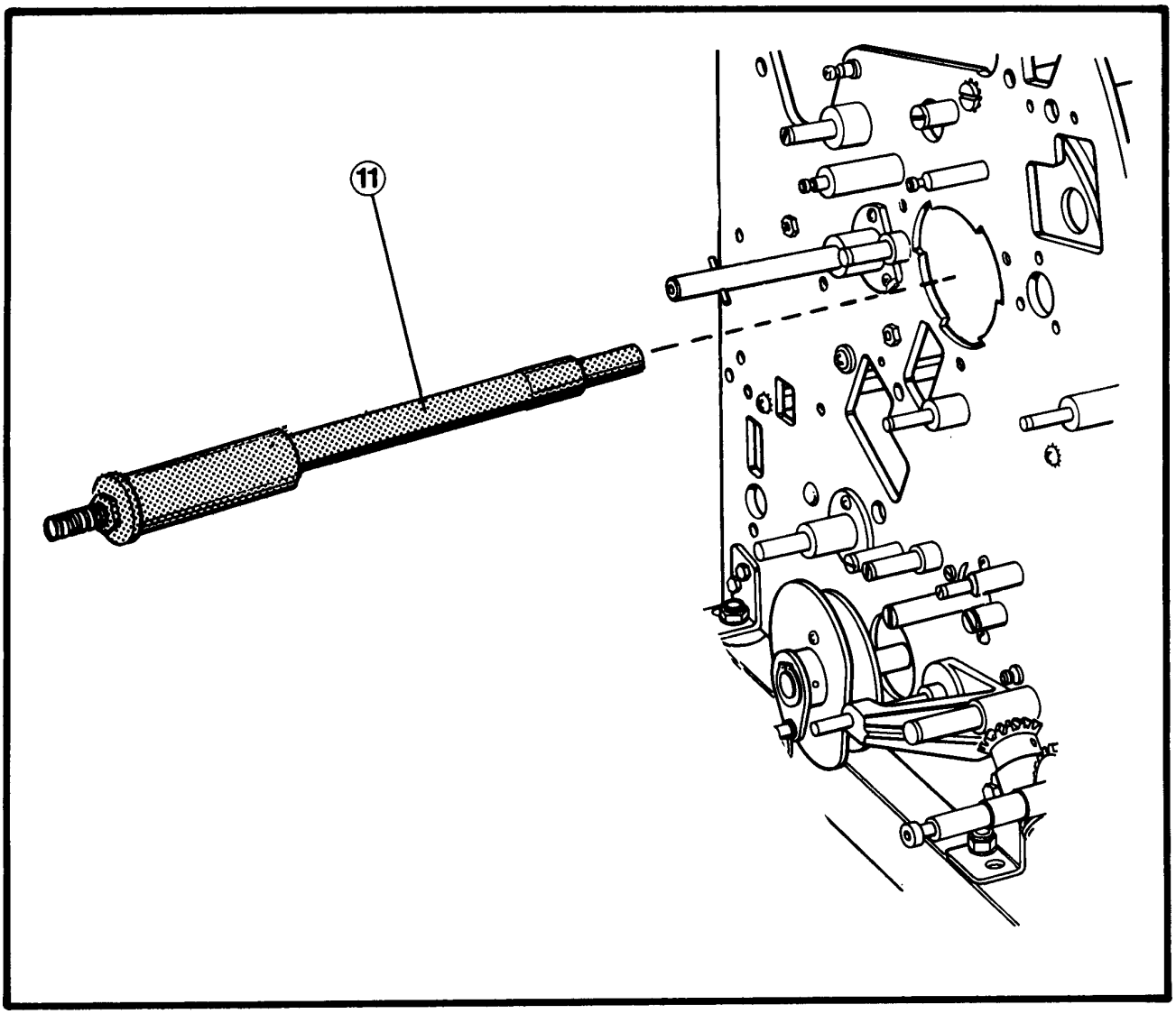
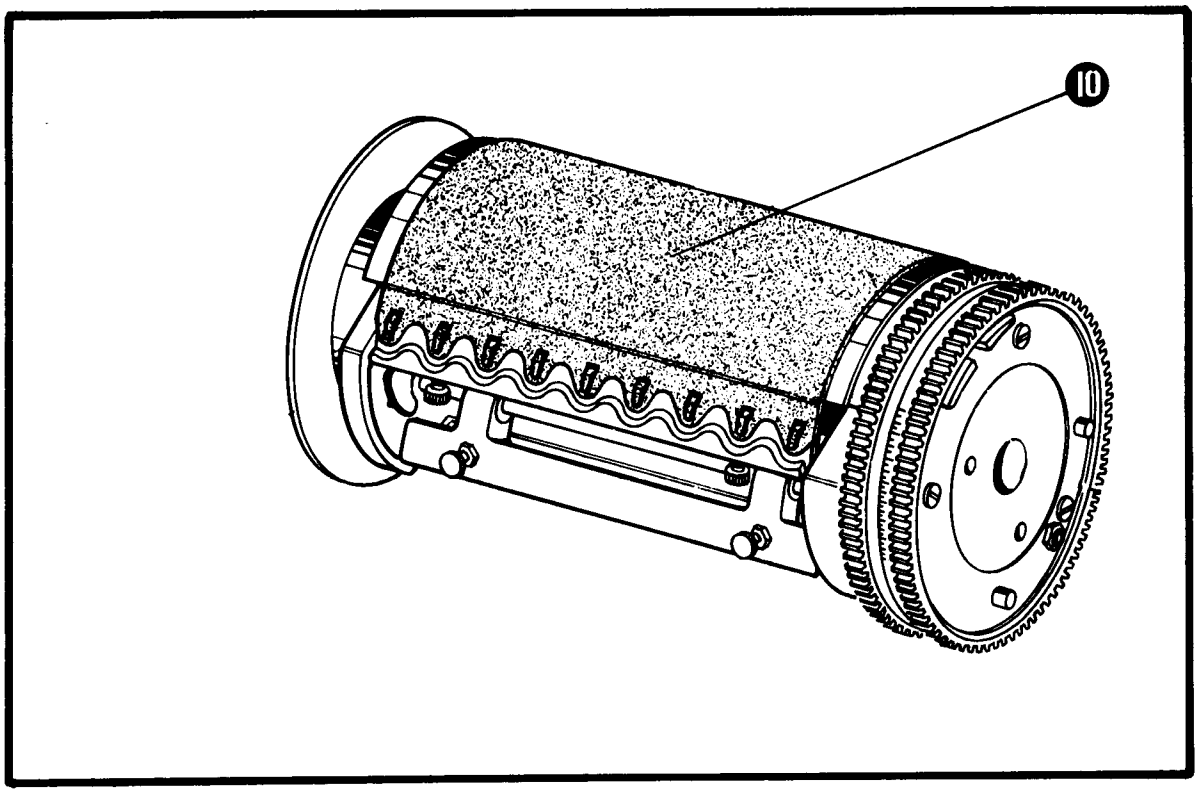


Figure 76 - Shaft Pulling Tool Insertion

BLANKET CYLINDER INSTALLATION

Install the blanket cylinder in the reverse order of removal. The following should be noted when re-installing the blanket cylinder.

1. Set the raise-lower at “0”.
2. When re-installing the cam the double holes in the operator and non-operator side cams should line up. The pilot screw should be installed when the holes are aligned.
3. Refer to the timing section to time the blanket cylinder.



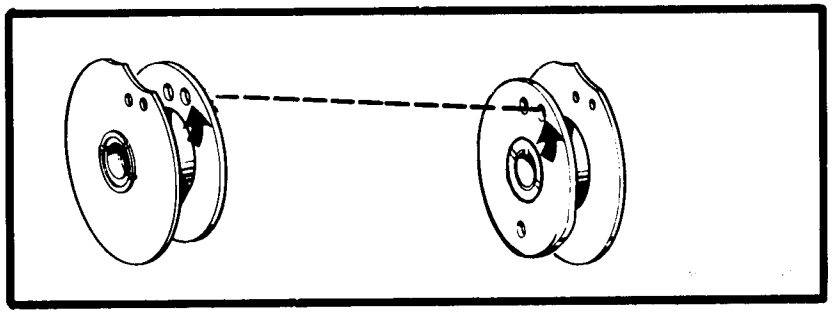


Figure 77 - Cam Alignment

IMPRESSION CYLINDER REMOVAL

CAUTION:

To avoid accidental damage, the impression cylinder should be protected with a cleanup mat.

1. Remove the auxiliary form roll assembly, keyboard and side covers. For 9905 machines, remove the receiving tray guards (see Figure 78).

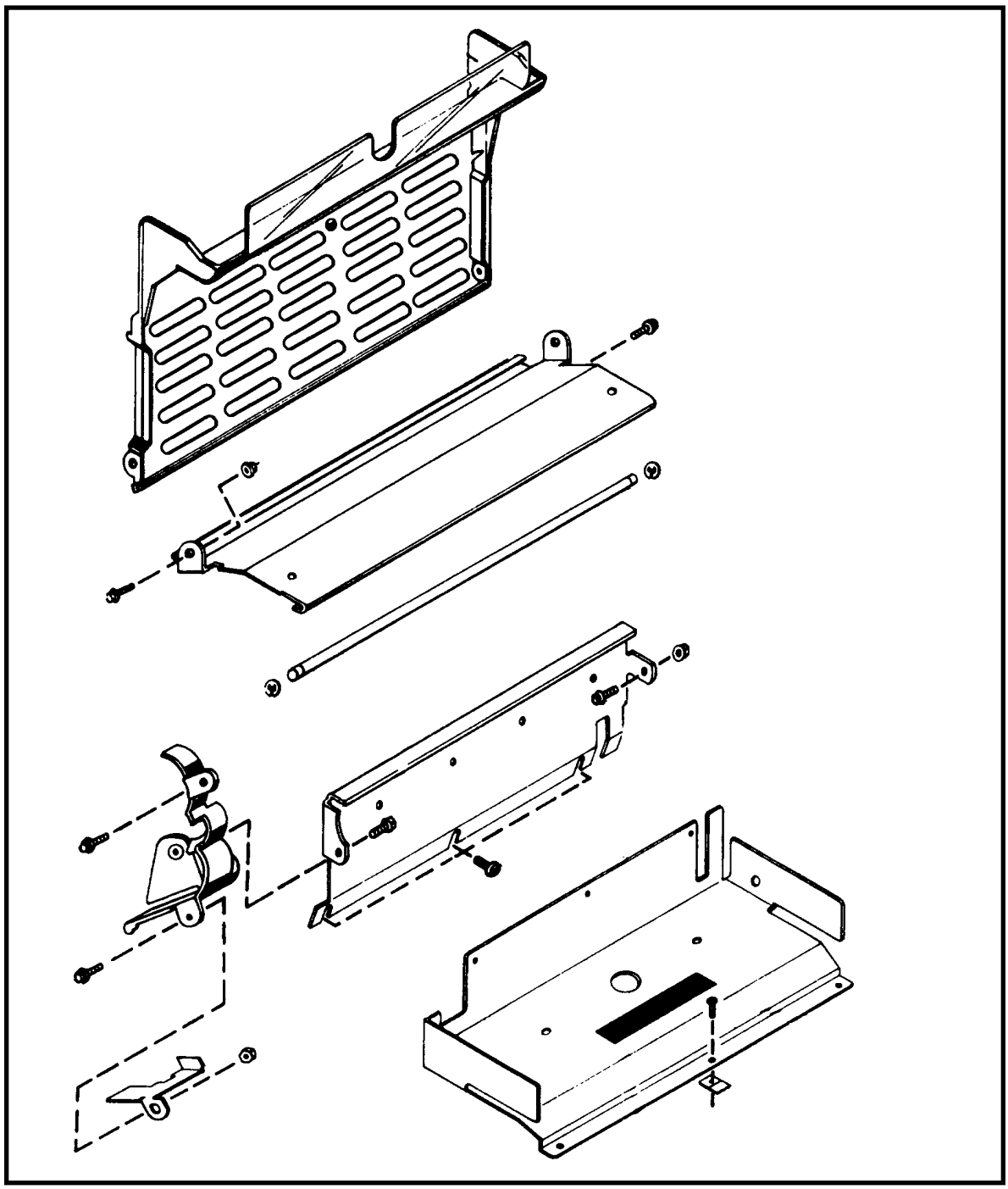


Figure 78 - 9905 Receiving Tray Guards

2. Remove the chain delivery unit as described in the section entitled *Chain Delivery Removal*.
3. Remove the gear (A) and stud (see Figure 79).
4. Remove the compound gear (B). Do not remove both pins; remove only the pin (C) shown in Figure 79.

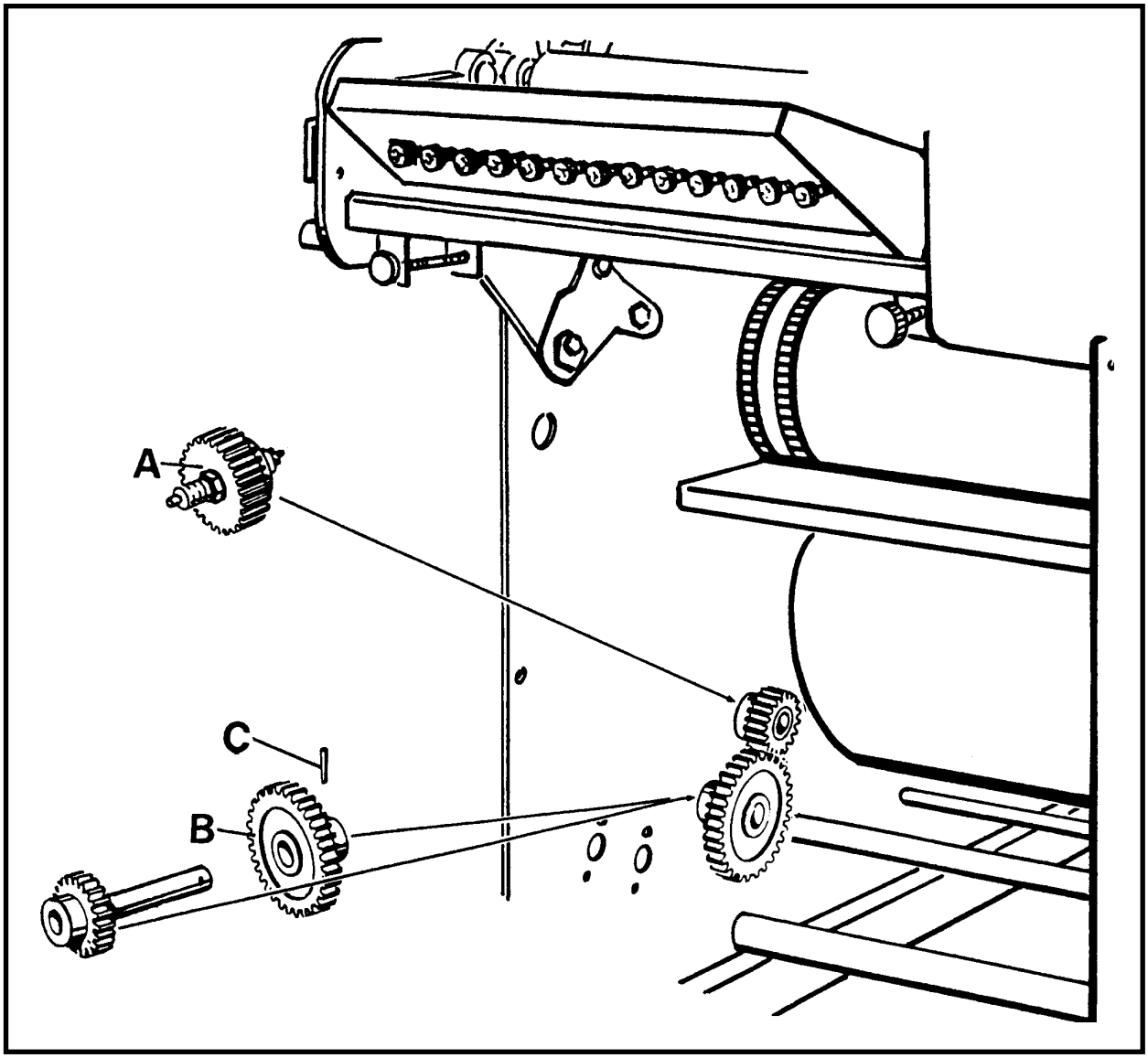


Figure 79 - Gear Removal

5. Remove the master cylinder link (D) (see Figure 80).
6. Remove the counter operation lever.

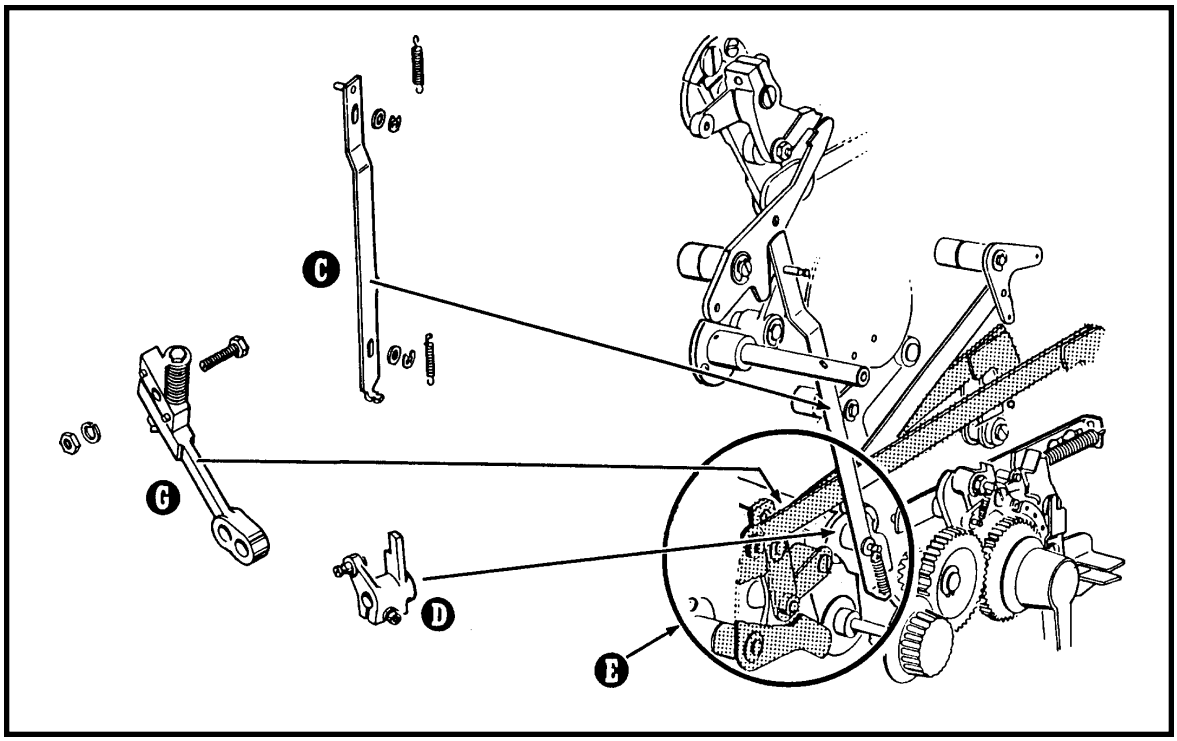


Figure 80 - Impression Cylinder Linkage

7. Remove the necessary linkage (F) to gain access to the (see Figure 81) impression cylinder support arm.

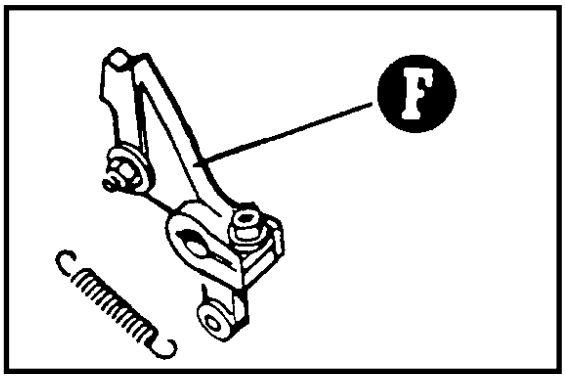


Figure 81 - Impression Cylinder Linkage

8. Remove the impression cylinder lever (G) which is located on the non-operator side of the press (see Figure 79).
9. Remove the operator and non-operator side support arms (H) (see Figure 80).

10. Install the cylinder adjusting tool (p/n 191551).
11. Completely remove the two setscrews (I) from the collar (J) located inside the impression cylinder (K). Remove the "C" ring (L) located on the impression cylinder shaft (M) (see Figure 82).
12. Remove the impression cylinder shaft (M) from the operator side.

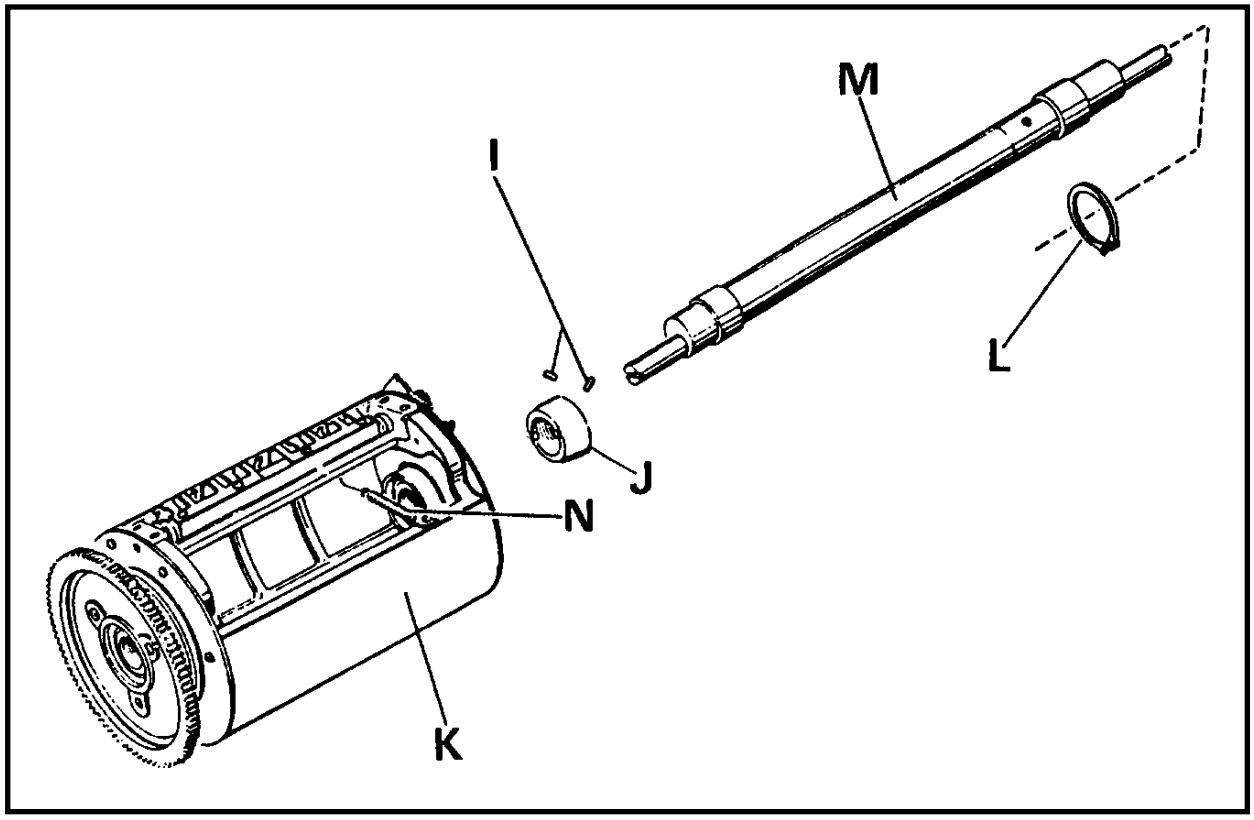


Figure 82 - Impression Cylinder & Impression Cylinder Shaft

IMPRESSION CYLINDER INSTALLATION

Install the impression cylinder in the reverse order of removal. Note the following when reinstalling the impression cylinder:

1. Install the collar (J) inside the impression cylinder with the beveled end facing the operator side (see Figure 82).
2. Install the heavier of the two springs on the bottom of the master cylinder link (see Figure 80, callout D).
3. Align the timing marks on the gripper pinion and segment gears. Hold the gears in position by tying the gripper fingers to the eject fingers.
4. Disconnect the forwarding roller springs and place a cotton pad (1) between the forwarding rollers (2) (see Figure 83). Place another cotton pad between lever (3) and arm (4) which will move the truck (5) away from the impression cylinder.

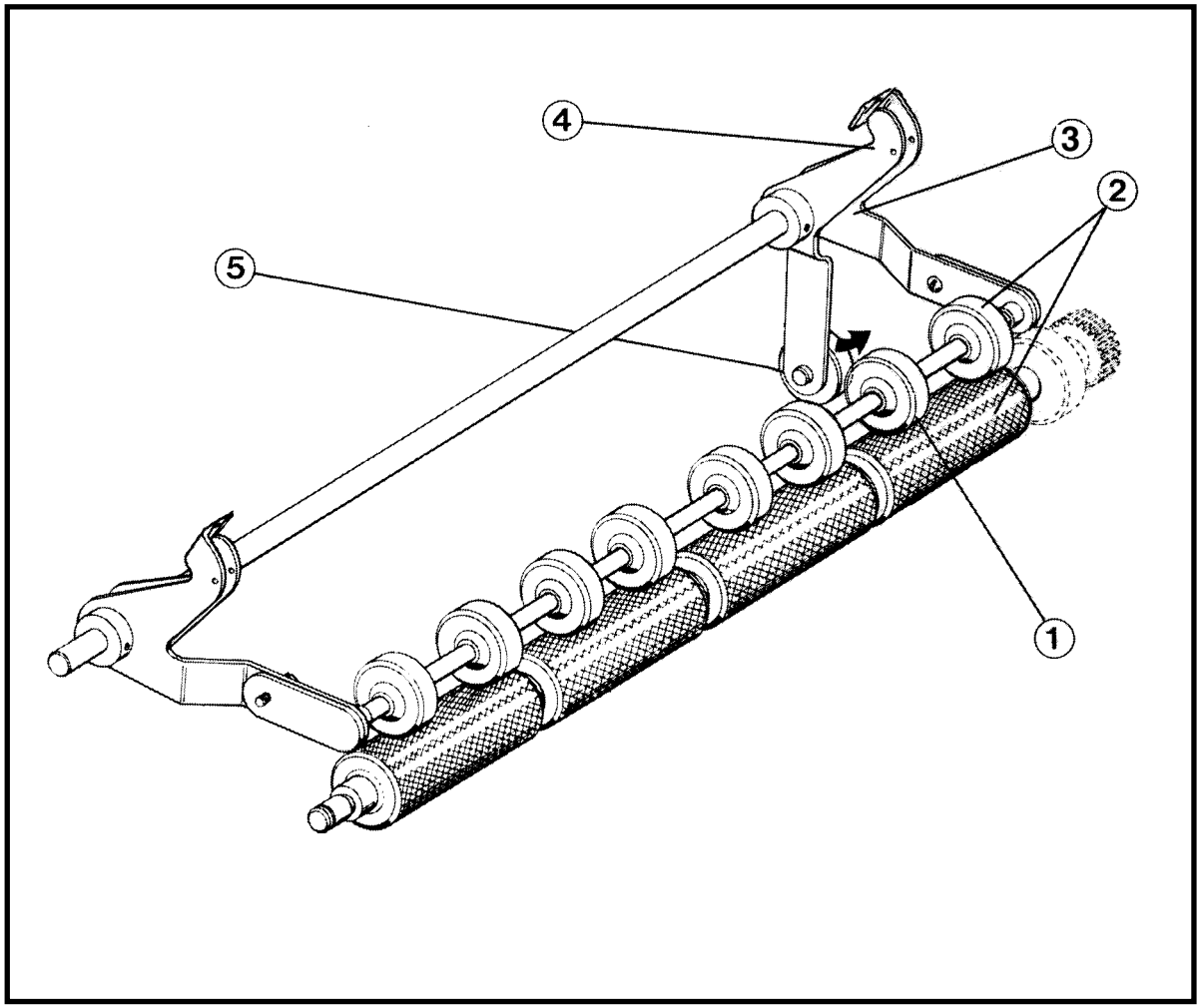


Figure 83 - Forwarding Rollers

CHAIN DELIVERY REMOVAL

1. Remove the following:
   a. Upper operator side cover
   b. Lower operator side cover
   c. Upper non-operator side cover
   d. Chain delivery covers
   e. Dolley
2. Position the paper stop all the way back towards the receiving end of the press.
3. Remove the paper guides (see Figure 84).

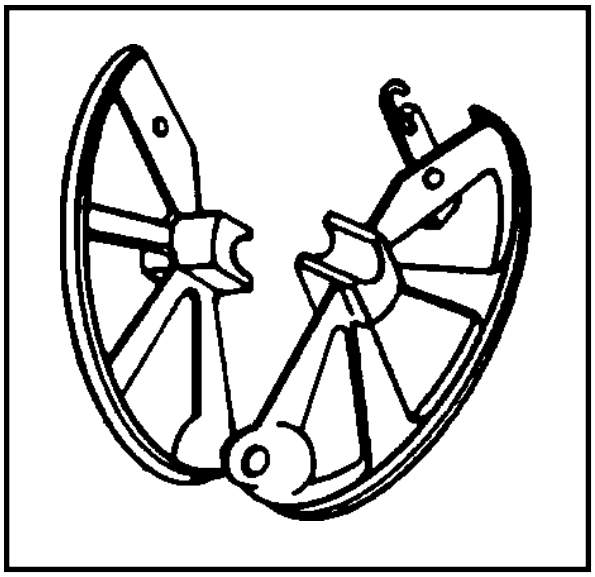


Figure 84 - Paper Guides

NOTE:
Position one of the gripper bars near the impression cylinder to facilitate removal of the paper guides.

4. Remove the three gripper bars.
5. Release the pressure on both chains.
6. Remove the master link on one of the chains. While firmly grasping the chain with your left hand and using your right hand to slowly rotate the handwheel in the clockwise direction, carefully remove the chain.
7. Repeat step 6 for the remaining chain.
8. Cut the wire ties on the non-operator side wiring harness.
9. Remove the chain delivery interlock wiring from the in-line splices.
10. Remove the four strain reliefs that secure the wire going to the chain delivery interlock.

11. Cut the two tie wraps on the machine tie bar.
12. Remove the strain reliefs (A) that secure the auxiliary feed, proof switch, and safety switch wires (see Figure 85). Remove the wires from both sides of the chain delivery by routing them through the side of the machine; then position the wires to the side and let them hang.

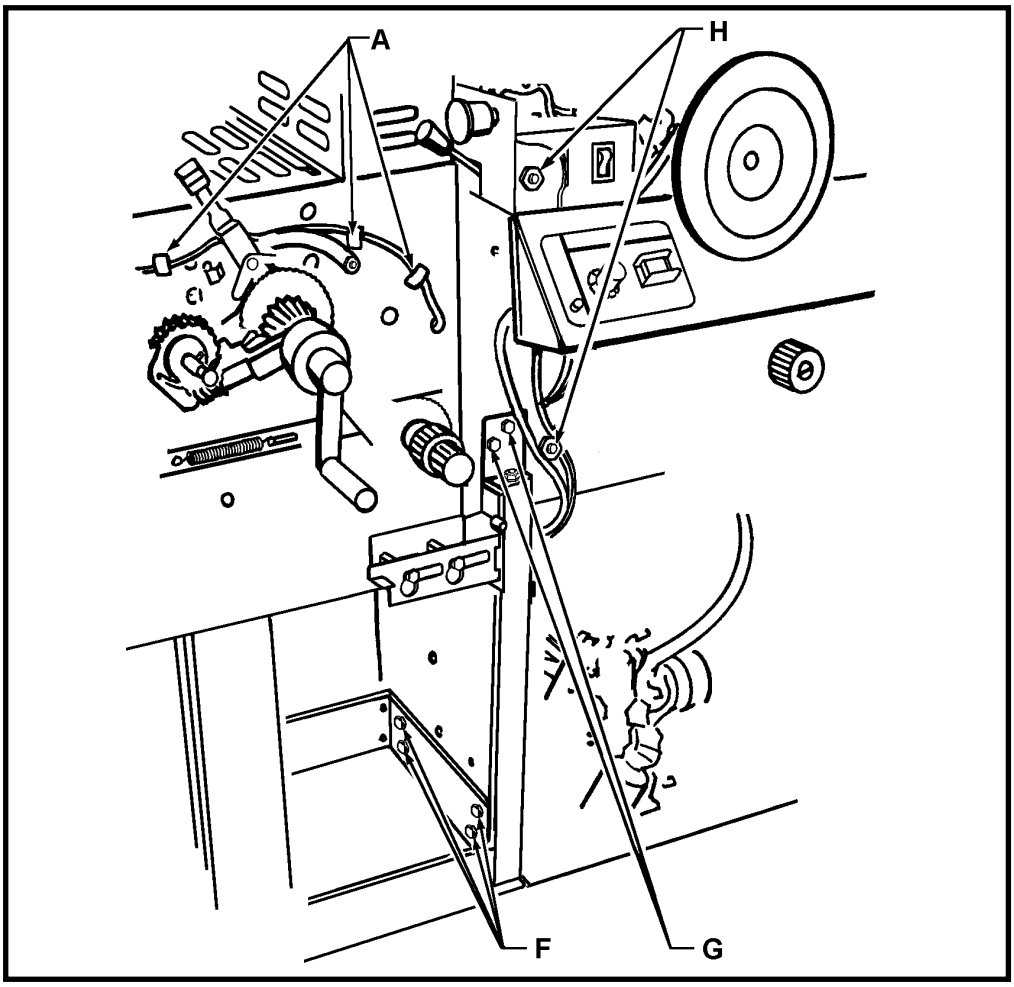


Figure 85 - Wire Routing

13. Remove the Tru-Arc ring (B) from the stud (C); then remove the stud (see Figure 86).
14. Loosen the Allen screw on the collar, shift the collar toward the non-operator side, remove the rear Tru-Arc ring (D) on the sprocket bar shaft, and slide the cam (E) towards the non-operator side of the press (see Figure 86).

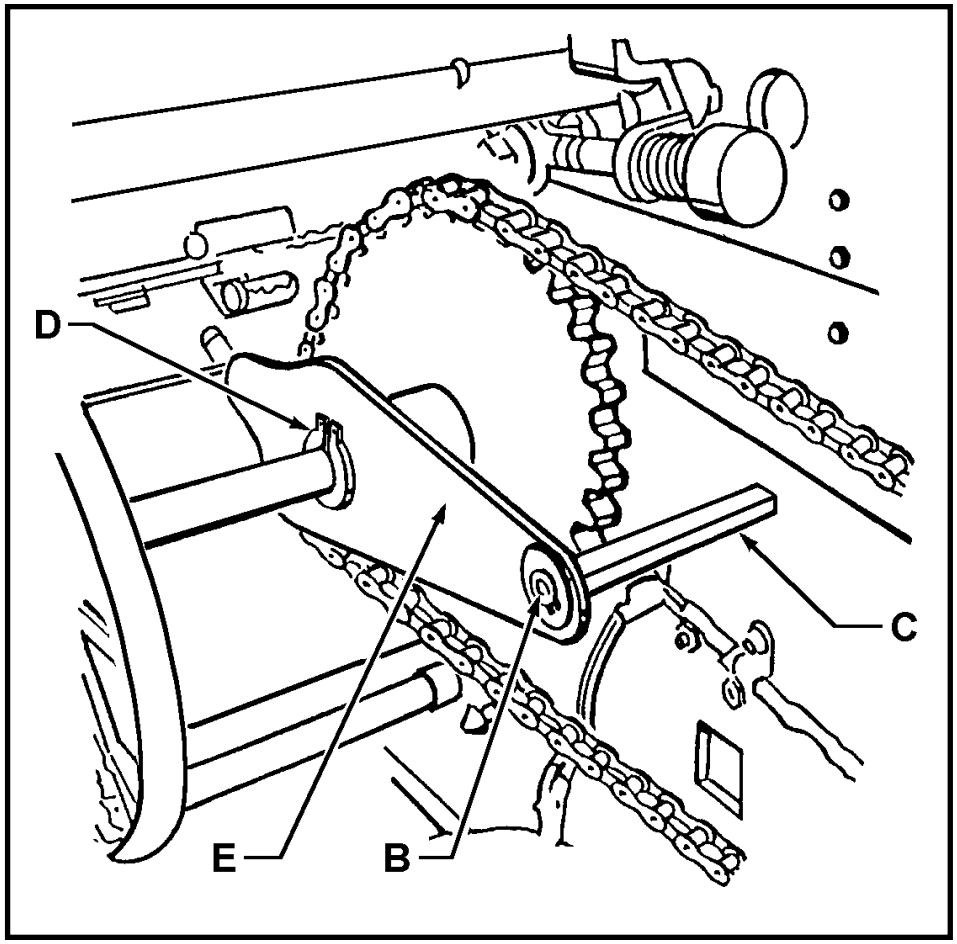


Figure 86 - Cam Removal

15. Remove the Tru-Arc ring that secures the speed control arm.
16. Remove the two bolts that secure the speed control assembly; then remove the speed control assembly.
17. Remove the lower four bolts (F) (see Figure 85).
18. Remove the four bolts (G) (two on each side) on the mid section support ("L" shaped brackets) (see Figure 85).
19. Remove the switch box; then remove the upper and lower bolts (H) on each side of the press, and remove the chain delivery (see Figure 85).

NOTE:

The sprocket shaft assembly remains in the machine.

20. Remove the 1/2" bolt from the end of the sprocket shaft on the non-operator side of the press.
21. Remove the taper pin on the sprocket gear and carefully slide the gear toward the non-operator side of the press.

CAUTION:
Be careful to avoid damaging the impression cylinder during this step.

22. Remove the three nuts and bolts that secure the sprocket shaft bearing housing; then remove the housing.
23. Move the sprocket shaft towards the non-operator side until the shaft clears the operator side; then remove the sprocket shaft assembly from between the machine frames.

CHAIN DELIVERY INSTALLATION

Remove the removal procedure to reinstall the chain delivery. Note the following during installation:

1. The machine must be correctly timed during the assembly procedure. The timing marks come into time every fifth revolution (see Figure 87).

With the vertical image position set at zero (neutral):

(A) Master Cylinder*
(B) Blanket Cylinder*
(C) Impression Cylinder*
(D) C.D. Drive Gear
(E) Intermediate Gear
(F) Large Pinion Gear
(G) Small Pinion Gear**
(H) Buckle Cam Shaft Gear**

*Dots align every rotation.

** Located on right side frame, outer side.

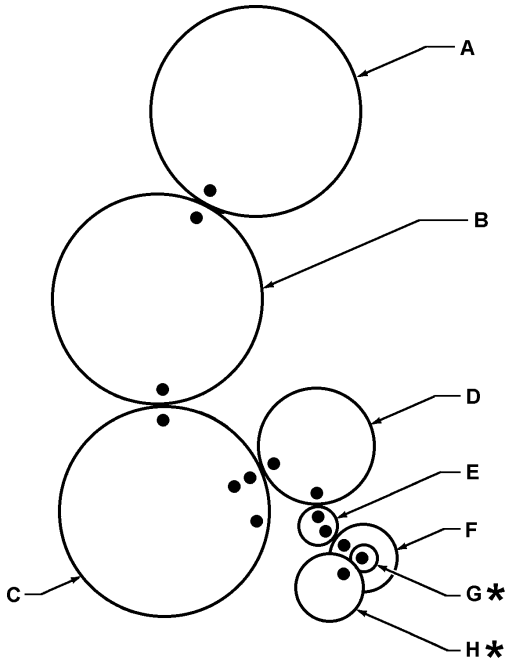


Figure 87 - Machine Timing Sequence

2. Ensure that the taper pin on the operator side sprocket gear is seated securely.
3. The back stop assembly has cutouts (A) which must be positioned over the machine tie bar (see Figure 88).

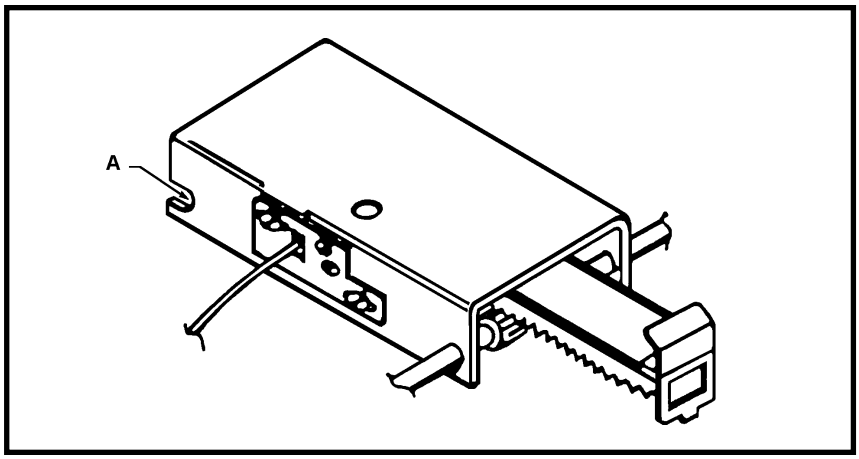


Figure 88 - Back Stop Assembly

ELECTRICAL

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COUNTER CALIBRATION

The following calibration procedure applies to all models except the 9905.

MACHINE SETUP

1. Disconnect the power cord from the receptacle.
2. Place the feed lever in the OFF position.
3. Place the single lever control in the NEUTRAL position.

POWER-UP CHECK

1. Connect the power cord to the power source.
2. The counter display will show "8 8 8 8 8" for approximately three seconds.
3. The display will then go blank for approximately three seconds and then show the number that was present before the power was removed.

D.C. VOLTAGE VERIFICATION

1. Remove the lower panel operation side and front cover of the 12 volt D.C. power supply.
2. At J1/P1 on the counter board, located behind the control panel, the D.C. voltage should measure 12.2 to 12.3 volts. Adjust this voltage on the power supply using the V adjust pot located at the lower left hand corner. Do not adjust R3.
3. Reinstall the items removed.

REMOTE FEED ON/OFF CHECK

1. Depress the remote feed ON/OFF switch. The feed lever should move to the ON position.
2. Depress the remote feed ON/OFF switch. The feed lever should move to the OFF position.

DOUBLES DETECT STATIC CHECK

1. Place the feed lever in the ON position.
2. Slowly rotate the doubles detect adjustment knob counterclockwise until the feed lever is automatically moved to the OFF position.
3. Rotate the doubles detect adjustment knob clockwise two full turns.

DRIVE MOTOR SPEED CONTROL ADJUSTMENT

Tools and Instruments Required

- 1/16" Wide Blade Screwdriver, 4" to 6" Long
- 0-250 VAC Voltmeter or VOM
- 0-4000 RPM Tachometer

NOTE:

The calibrations are to be made with the following:

- Plate: 150 line, 30% Tint Screen
- Ink: 3-1012 Black
- Line Voltage: 230 VAC - Use a variac to ensure proper input
- Water in the system: Performance Fountain Solution

CAUTION:

Under no circumstances are the "Torque Trim Pot" and the "IR Compensation Trim Pot" on the speed control (253726) to be adjusted from the factory setting. See Figure 88a for location of trim pots.

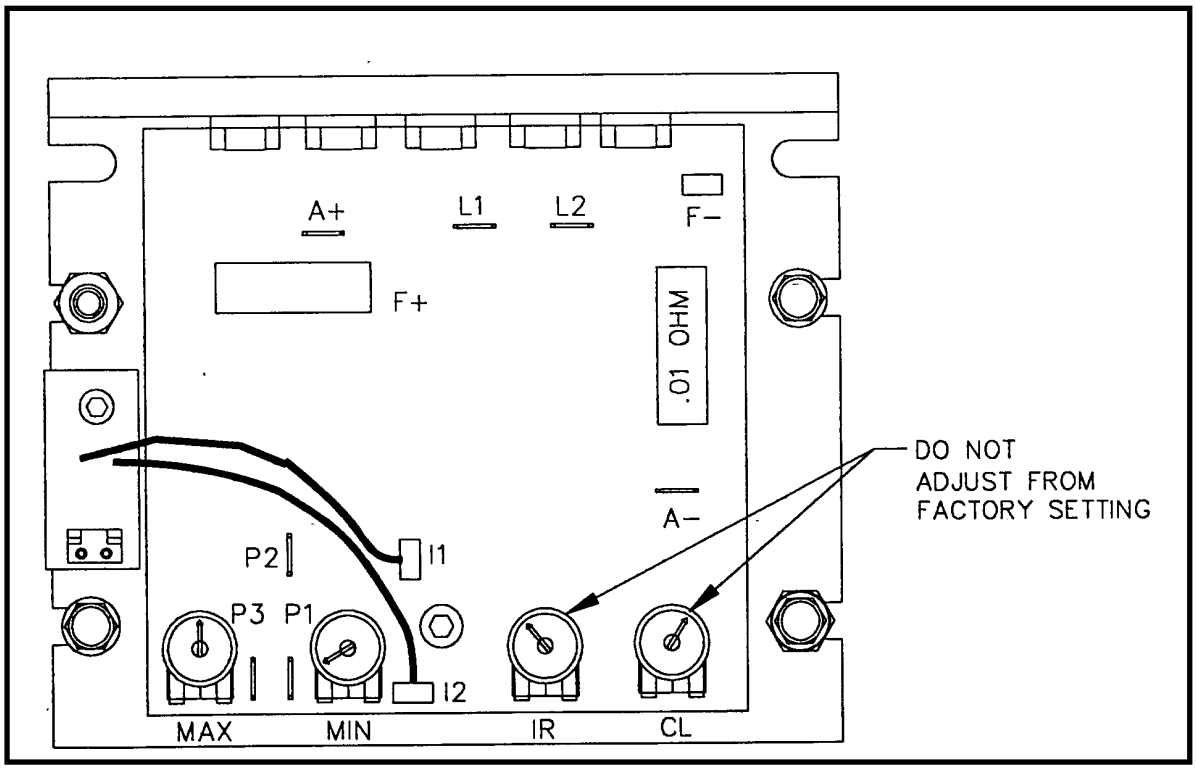


Figure 88a - Trim Pot Location

CAUTION:

Do not force the trim pots past their end stops or permanent damage may occur.

The following settings should be checked prior to start of calibration.

1. In the control box, check the following on speed control 253726:
   a. "Max" trimpot set to the 12:00 o'clock position
   b. "Min" trimpot set to the 7:00 o'clock position
2. At the operator's control panel, check PCB assembly 25525. Refer to Figure 88b for the following steps:
   a. "R4" adjusted for 1,100 ohms, as measured between TP1 and TP2. This trimpot is used to set the low end of the drive motor range.
   b. "R3" adjusted for 3,000 ohms, as measured between TP2 and TP3. This trimpot is used to set the high end of the drive motor range.

NOTE:

The above two adjustments are for approximate settings. They may have to be adjusted later.

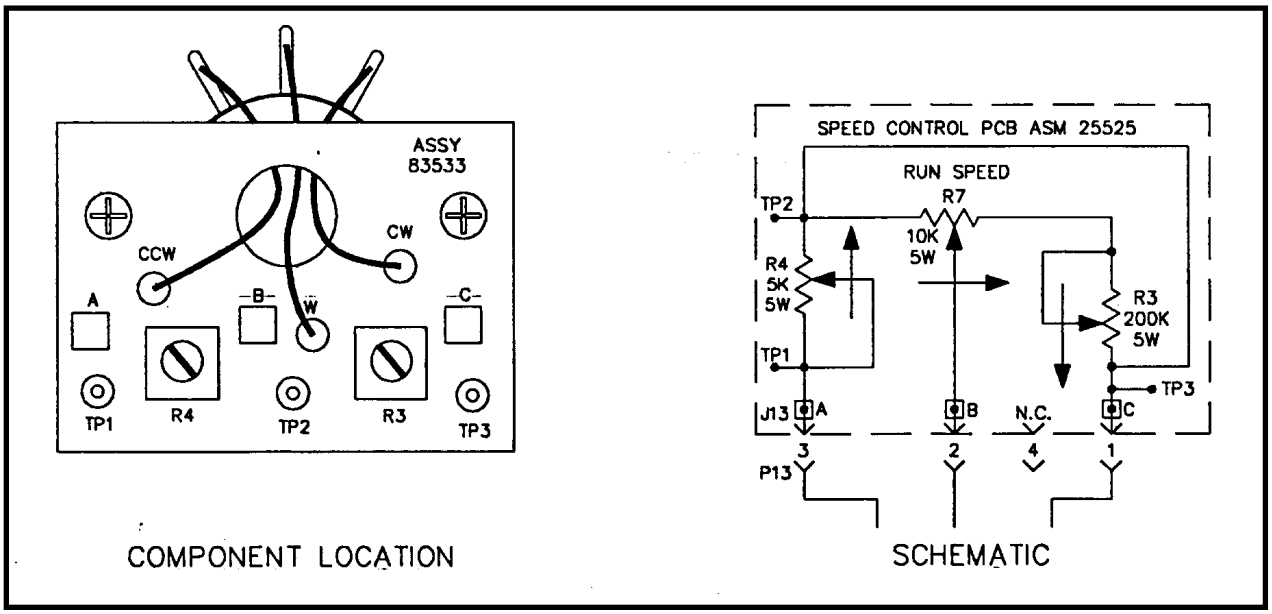


Figure 88b - Component Location and Schematic Diagram

DRIVE MOTOR SPEED CALIBRATION

Refer to figures 88a, 88b and 88c for the following steps.

1. Set the drive motor switch (S2) to the "On" position.

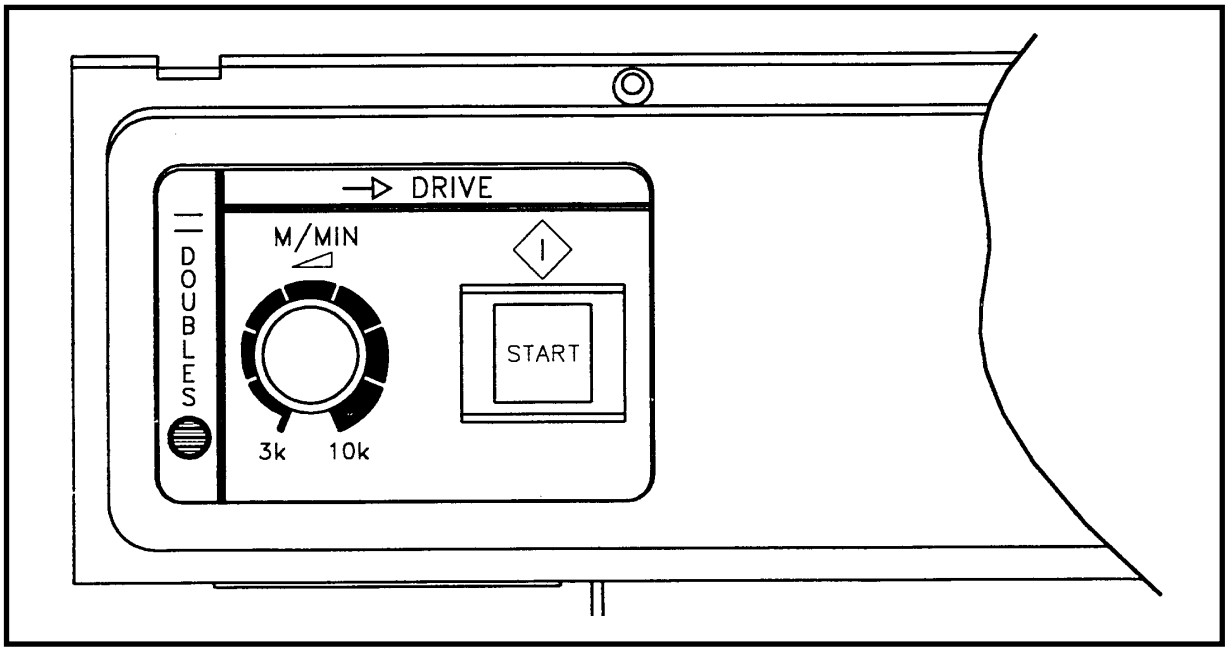


Figure 88c - Drive Motor Speed Control

NOTE:

In the following steps all guard covers must be in the closed position.

2. With the machine power "on", check to see that the start switch (S3) is lit and that the operator's speed control (R7) on the control panel is set for "3k" (3000 CPH).

NOTE:

The following two readings are best measured in RPM at the handwheel shaft on the non-operator side of the press.

3. Press the start switch (S3) and check that the operator's speed control (R7) to 3k. Also check the handwheel pulley shaft for 3000 RPM (approximately 552 RPM at the drive motor pulley). If the RPM is incorrect, adjust trimpot R3 on assembly 25525.
4. Set the operator's speed control (R7) to 10k, and check the handwheel pulley shaft for 1000 RPM (approximately 1841 RPM at the drive motor pulley). If the RPM is incorrect, adjust trimpot R4 on assembly 25525.

NOTE:

If you are unable to set the speeds at 3000 to 10,000 CPH, it may be necessary to adjust the "Max" trimpot on the speed control (253726) (see Figure 88a).

Only the 3000 CPH (low) and 10,000 CPH (high) settings should be checked.

When making any adjustments to the "Max" or "Min" trimpots on the speed control (253726), the machine speed range must be rechecked due to the interaction of the controls.

Use the following table for reference only.

MACHINE SPEED		DRIVE MOTOR SHAFT PULLEY RPM	HANDWHEEL SHAFT PULLEY RPM
CPH	CPM		
3000	50.0	552	300
4000	66.6	737	400
5000	83.3	921	500
6000	100.0	1106	600
7000	116.7	1290	700
8000	133.3	1474	800
9000	150.0	1658	900
10000	166.7	1842	1000

NOTE:

The drive motor pulley shaft (RPM) ratio to the handwheel pulley shaft (RPM) is approximately 1.843:1 (Measured from the non-operators side of the machine).

COUNTER KEYBOARD AND DISPLAY CHECK

1. Depress keys 1 through 9 in numerical order. The display should show "1 2 3 4 5". The counter accepts only five digits.
2. Depress the clear keypad key "C".
3. The display should show "0".
4. Depress keypads 6 through 0 in numerical sequence. The display should show "6 7 8 9 0".
5. Depress the "C" key to clear the display.
6. The display should show "0".

COUNT DOWN MODE CHECK

1. Depress keys "1" and "0".
2. The display should show "10".
3. Depress the enter "E" key.
4. The display should continue to show "10".
5. Remove all sheets of paper from the chain delivery.
6. Start the drive motor and pump motor.
7. Adjust the machine speed to 10,000 copies per hour.
8. Place the feed lever in the ON position. As each sheet of paper passes through the machine, the counter is incremented one count.
9. After the count has been satisfied, the feed lever will automatically be moved to thge OFF position. The counter display will show "0 0 0 0 0" for approximately five seconds and automatically re-enter the previously set number, "10".
10. Place the drive motor and pump motor switches in the OFF position.
11. Remove the sheets from the chain delivery and count them. There should be only 10 sheets.
12. Repeat steps 6 through 11. This will verify that the counter is automatically resetting the count properly.

COUNTER CHECK COUNT UP MODE

1. Depress the "C" key to clear the display.
2. The display should show "0".
3. Depress the enter ("E") key.
4. The display will show "0".
5. Start the drive motor and the pump motor.
6. Adjust the machine speed to 5,000 to 6,000 copies per hour.
7. Place the feed lever in the ON position. As each sheet of paper passes through the machine, the counter is incremented one count.
8. After 20 sheets have been counted, turn the feed off.
9. Restart the feed. The counter should continue to count up. After a few sheets have been fed, turn the feed OFF.
10. Place the drive motor and pump motor switches in the OFF position.
11. Remove the sheets of paper from the chain delivery and count them. The sheet count should be the same as the display shows. This presumes there were no jams.

COUNTER CHECK COUNT DOWN MODE WITH DOUBLES DETECT

1. Depress the "C" key to clear the display.
2. The display should show "0".
3. Depress key "2" and then "5".
4. The display should show "2 5".
5. Depress the "E" key.
6. Place the feed lever in the ON position.
7. Hand feed a single sheet of 20 lb. paper into the machine until it is approximately half way through the unit. Slowly rotate the doubles detect adjustment knob counterclockwise until the feed lever is automatically moved to the OFF position. The counter display should still show "2 5".
8. Slowly rotate the doubles detect adjustment knob clockwise one half turn.
9. Hand feed the sheet of paper all the way through the machine. Remove all sheets from the chain delivery.
10. Place a double sheet of 20 lb. paper under the second sheet of paper in the paper stack.
11. Start the drive motor and pump motor.
12. Place the feed lever in the ON position.
13. The counter should decrement one count for each sheet of paper fed through the press. When the double is detected, the feed lever should be automatically moved to the OFF position. The counter display should show "2 3". The first sheet through decrements the counter to "2 4". The second sheet decrements the counter to "2 3". The third sheet (the double) decrements the counter to "2 2". However, the double detected increments the counter to "2 3".
14. Check that the display shows "2 3".
15. Place the drive motor and pump motor switches in the OFF position.
16. Remove all sheets from the chain delivery.

COUNTER CHECK COUNT UP MODE WITH DOUBLES DETECT

1. Depress the "C" key to clear the display.
2. Depress the "0" key.
3. Depress the "E" key.
4. The display should show "0".
5. Place a double sheet of 20 lb. paper under the second sheet of paper in the paper stack.
6. Start the drive motor and pump motor.
7. Place the feed lever in the ON position.
8. The counter should increment one count for each of paper fed through the machine. When the double is detected, the feed lever should be automatically moved to the OFF position. The counter display should show "2". The first sheet through increments the counter to "1". The second sheet increments the counter to "2". The third sheet (the double) increments the counter to "3". However, the double detected decrements the counter to "2".
9. Verify that the display shows "2".
10. Place the drive motor and pump motor switches in the OFF position.
11. Remove all sheets from the chain delivery.

SHEET COUNT TOTALIZER CHECK

1. Depress the "C" key to clear the display.
2. The display should show "0".
3. Enter the code "9 9 9 9 9" by depressing the "9" key five times.
4. The display should show "9 9 9 9 9".
5. Depress the "E" key.
6. The display will show in hundreds the total number of sheets of paper that have been fed through the machine.
7. Depress the "C" key.
8. Depress the "0" key
9. Depress the "E" key.
10. The display should show "0".
11. Start the drive and pump motors.
12. Place the feed lever in the ON position.
13. After 201 sheets of paper have been fed, place the feed lever in the OFF position.
14. Place the drive and pump motor switches in the OFF position.
15. Enter the code "9 9 9 9 9" by depressing the number "9" key five times.
16. The display should show "9 9 9 9 9".
17. Depress the "E" key.
18. The display should show "2" more than the count in step 6. This is the number of sheets in hundreds that have been fed through the press.

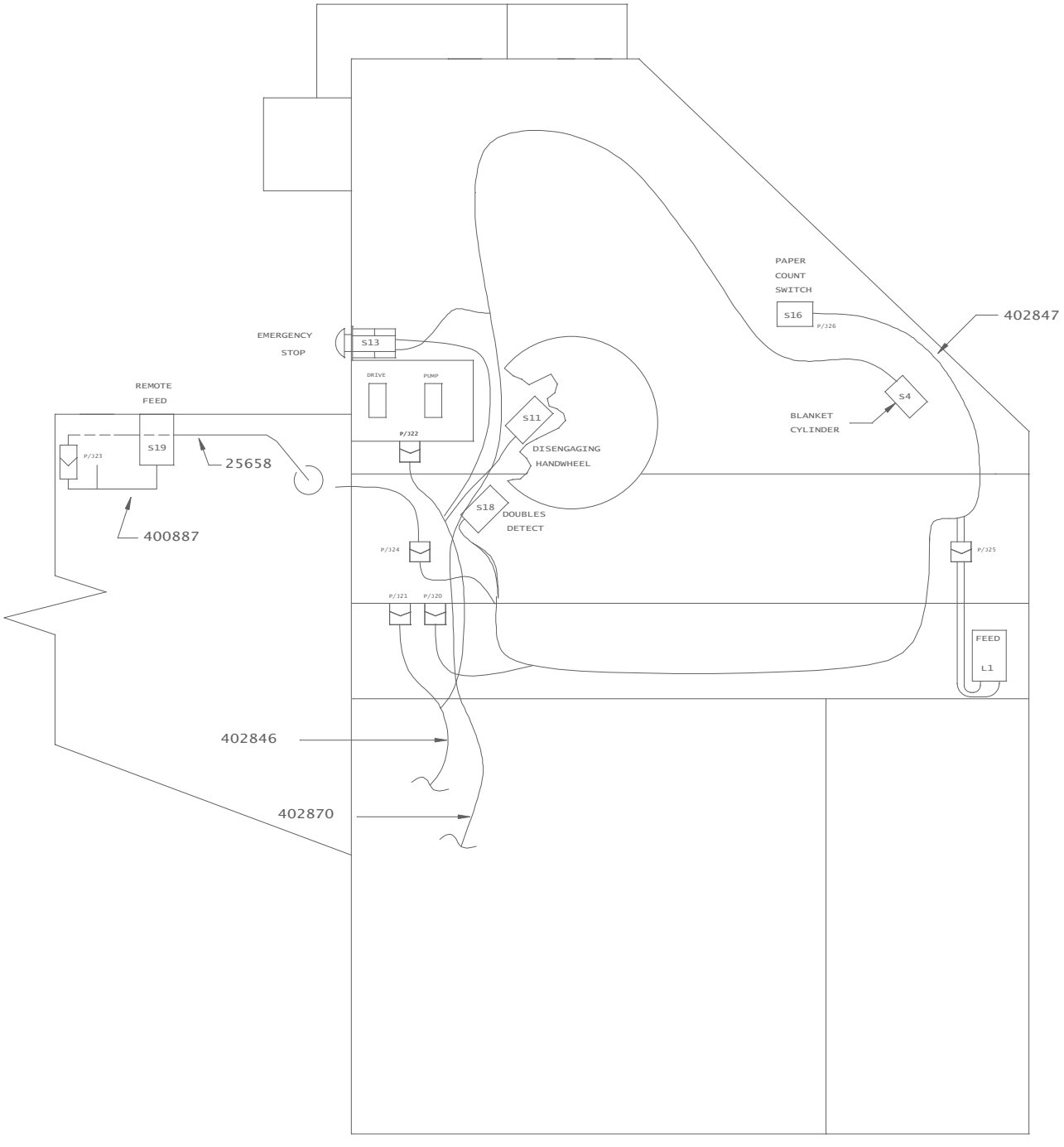
DOUBLES DETECT TOTALIZER CHECK

1. Depress the "C" key to clear the display.
2. The display should show "0".
3. Enter the code "9 9 9 9 8" by depressing the number "9" key four times and the number "8" key once.
4. The display should show "9 9 9 9 8".
5. Depress the "E" key.
6. The display will show the number of doubles detected to date.
7. Depress the "C" key.
8. The display will show "0".
9. Depress the number "1" and "0".
10. The display will show "1 0".
11. Depress the "E" key.
12. Slowly rotate the doubles detect adjustment knob counterclockwise until the feed lever is automatically moved to the opposite direction.
13. Slowly rotate the doubles detect adjustment knob clockwise two full turns.
14. Repeat steps 12 and 13 four more times.
15. Depress the "C" key.
16. The display shows "0".
17. Enter the code "9 9 9 9 8" by depressing the number "9" key four times and the number "8" key once.
18. The display should show "9 9 9 9 8".
19. Depress the "E" key.
20. The display will show the number in step 6 above plus the number of double detect signals created by steps 12 and 13.
21. Depress the "C" key.
22. The display will show "0".
23. Depress the "5" key twice.
24. The display will show "55".
25. Depress the "E" key.

ELECTRICAL COMPONENT LOCATION (OS)

CAUTION:

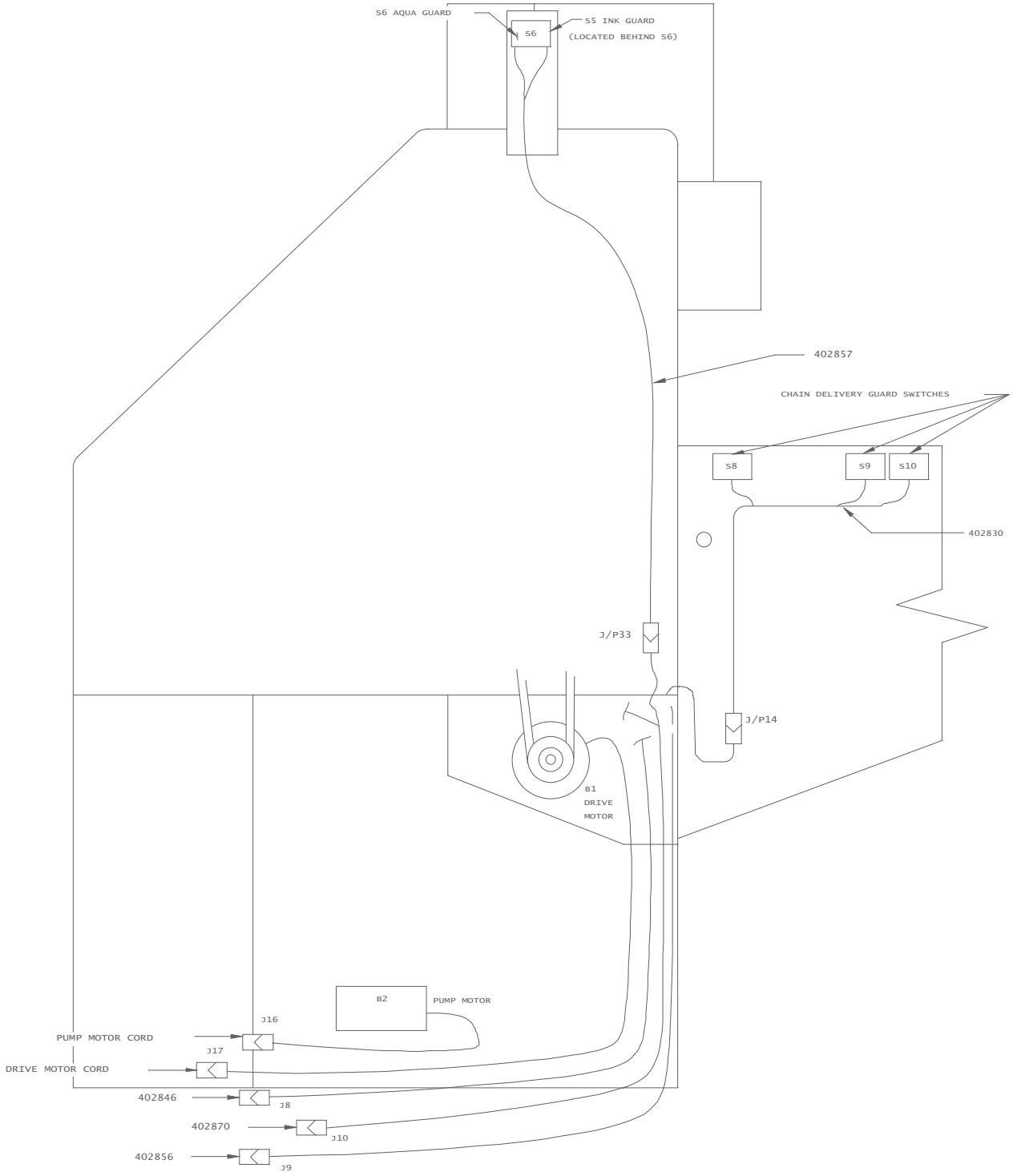
This machine must not be operated with the safety covers and/or electrical system bypassed or made inoperative.



ELECTRICAL COMPONENT LOCATION (NOS)

NOTE:

All retaining screws used to hold the safety switches in place are pre-coated with a thread-locking material to prevent slippage once the switches are properly adjusted. This is a regulatory agency requirement. If these screws are removed for switch replacement, newly-coated screws must be installed to maintain the integrity of the locking material.



Service Reference Manual

CONTINUOUS DAMPENER
(9910XC2)

ABDICK®

ROLLER IDENTIFICATION

The dampener rollers referenced in this section are identified by name in Figure 89.

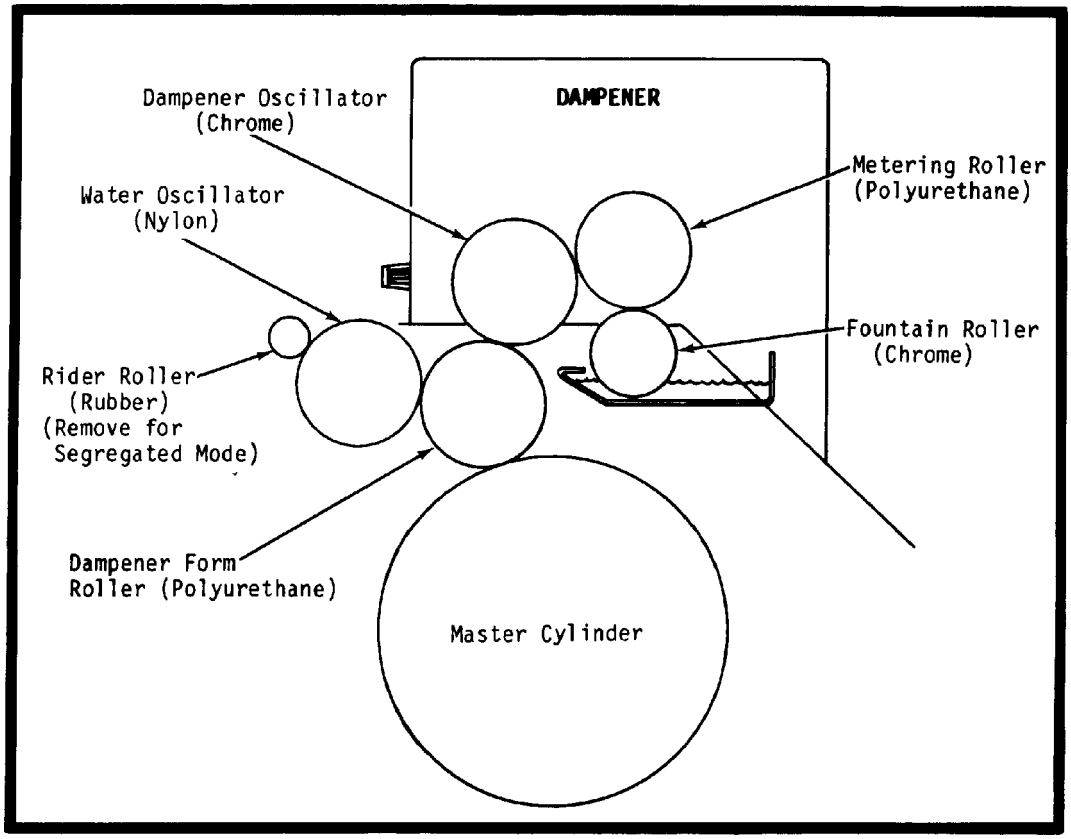


Figure 89 - Dampener Roller Identification

INITIAL ROLLER CLEANING

The three water-receptive rollers--the chrome fountain roller, the polyurethane metering roller, and the chrome dampener oscillator--must be thoroughly cleaned before fountain solution is added. The dampener oscillator can be removed from the delivery end for easier cleaning.

1. Remove the gum from the (2) chrome rollers with a water-wet cotton pad.

   When cleaning the fountain roller, you can rotate it by momentarily moving the dampener auto/manual switch to MANUAL.

WARNING:
KEEP YOUR FINGERS CLEAR OF THE ROLLERS WHEN ROTATING THE ROLLERS IN THE MANUAL MODE.

2. Remove any oxidation from the chrome rollers.

   If the chrome Oscillator is still in the press, back it away from the metering roller before cleaning the metering roller. To do this, move the dampener control knob to NIGHTLATCH.

3. Scrub all three rollers thoroughly with A.B.Dick Plate Cleaner 4-8014. Remove the cleaner with water.

CAUTION:
Never clean water-receptive rollers with roller deglazer or blanket wash.

4. Apply blue etch liberally to the chrome rollers.

5. Reapply blue etch when you are ready to run the dampener.

ADJUSTMENTS

DAMPENER CALIBRATION

Overview:

Figure 90 illustrates how the rollers are repositioned as the dampener control handle (A) is moved through the *Start*, *Neutral* and *Run* positions.

To control roller pressures, adjust the form roller bracket (A), main bracket (B) and metering roller bracket (C) (see Figure 91). These brackets are located inside the dampener side frames. Spring (D) provides the force for pressure between the rollers. Cam (E) is connected to the dampener operating shaft and regulates the sequence of pressure applied to the rollers.

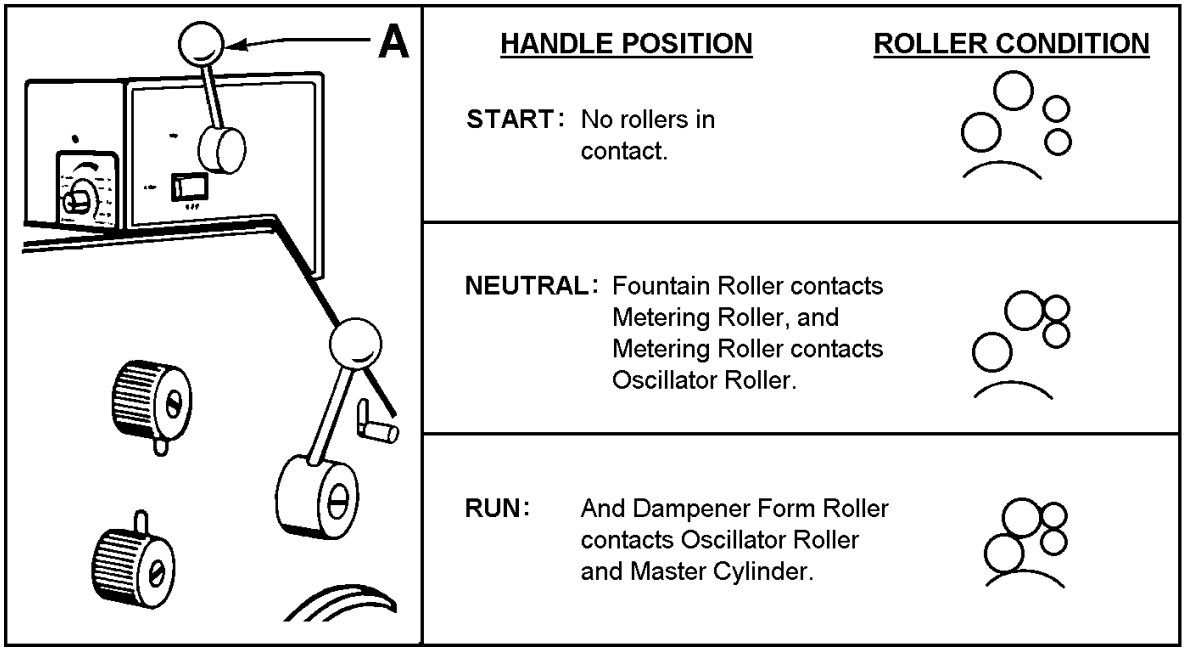


Figure 90 - Dampener Roller Positons

NOTE:

Throughout these calibrations it is essential that the roller pressures are even across all of the rollers.

Be sure to set each pressure correctly, and lock each adjustment before moving to the next adjustment.

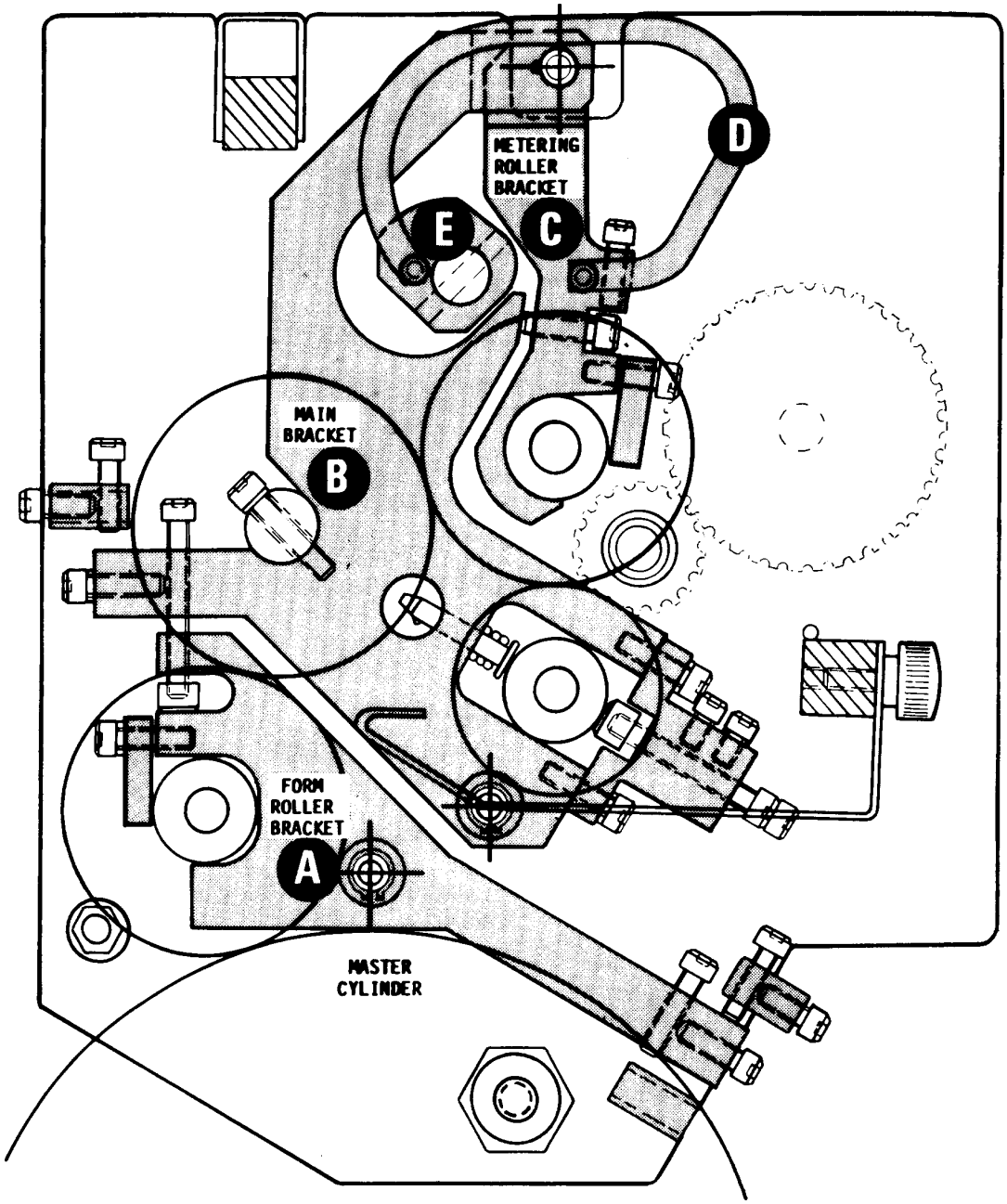


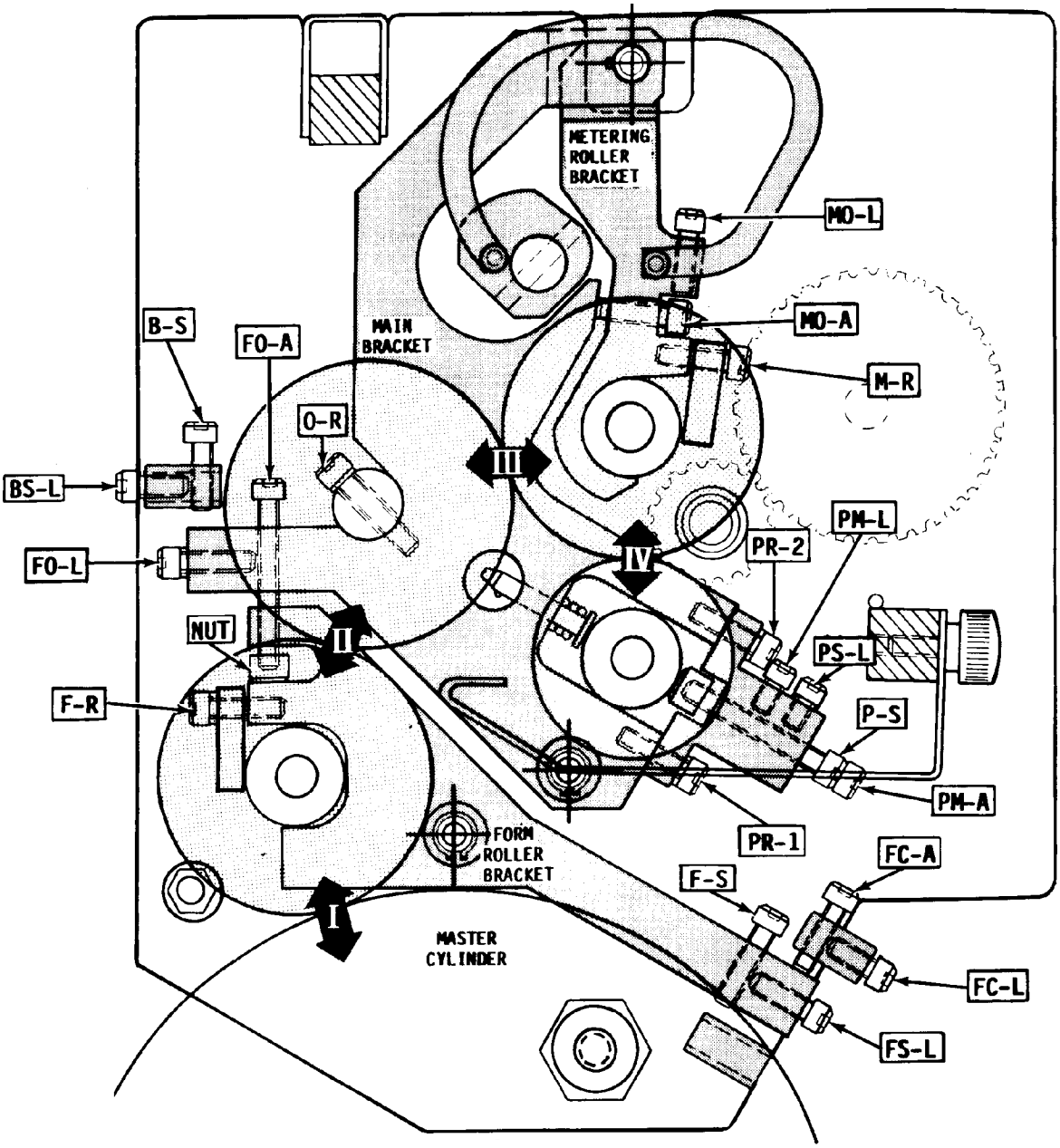
Figure 91 - Roller Brackets

CALIBRATION PREPARATION

Before starting, move the dampener control handle to NIGHTLATCH. Make sure no adjustments are applying pressure anywhere along the rollers. (There should be gaps between the rollers.) Check the following areas of the dampener. See Figure 92 for the location of the adjusting screws referenced in the procedure.

1. Dampener form roller to master cylinder:
   a. Loosen locking screws FC-L
   b. Remove pressure by turning adjusting screws FC-A outward.
   c. Loosen locking screws FS-L.
   d. Move stop screws F-S to make sure the stop blocks are not touching.
2. Form roller to oscillator:
   a. Loosen locking screws FO-L.
   b. Turn adjusting screws FO-A, so nuts (N) are centered in the gaps (about .035" on each side of the nuts).
   c. Turn stop screws B-S to make sure they do not touch the main brackets.
3. Metering roller to oscillator roller:
   a. Loosen locking screws MO-L.
   b. Turn back adjusting screws MO-A, so they do not contact the main brackets.
4. Metering roller to pan (fountain) roller:
   a. Loosen locking screws PM-L.
   b. Loosen locking screws PS-L.
   c. Turn stop screws P-S inward to move the heads away from the heads of screws PM-A.
   d. Turn adjusting screws PM-A outward to relieve pressure.

Figure 92 - Roller Adjusting Screws



ITEM BEING ADJUSTED:
(Letter(s) before hyphen)

B = Bracket (Main Dampener)
C = Cylinder (Master)
F = Form Roller
M = Metering Roller
O = Oscillator Roller
P = Pan Roller

FUNCTION OF SCREW:
(Letter after hyphen)

A = Adjusting
L = Locking
R = Retaining
S = Stop

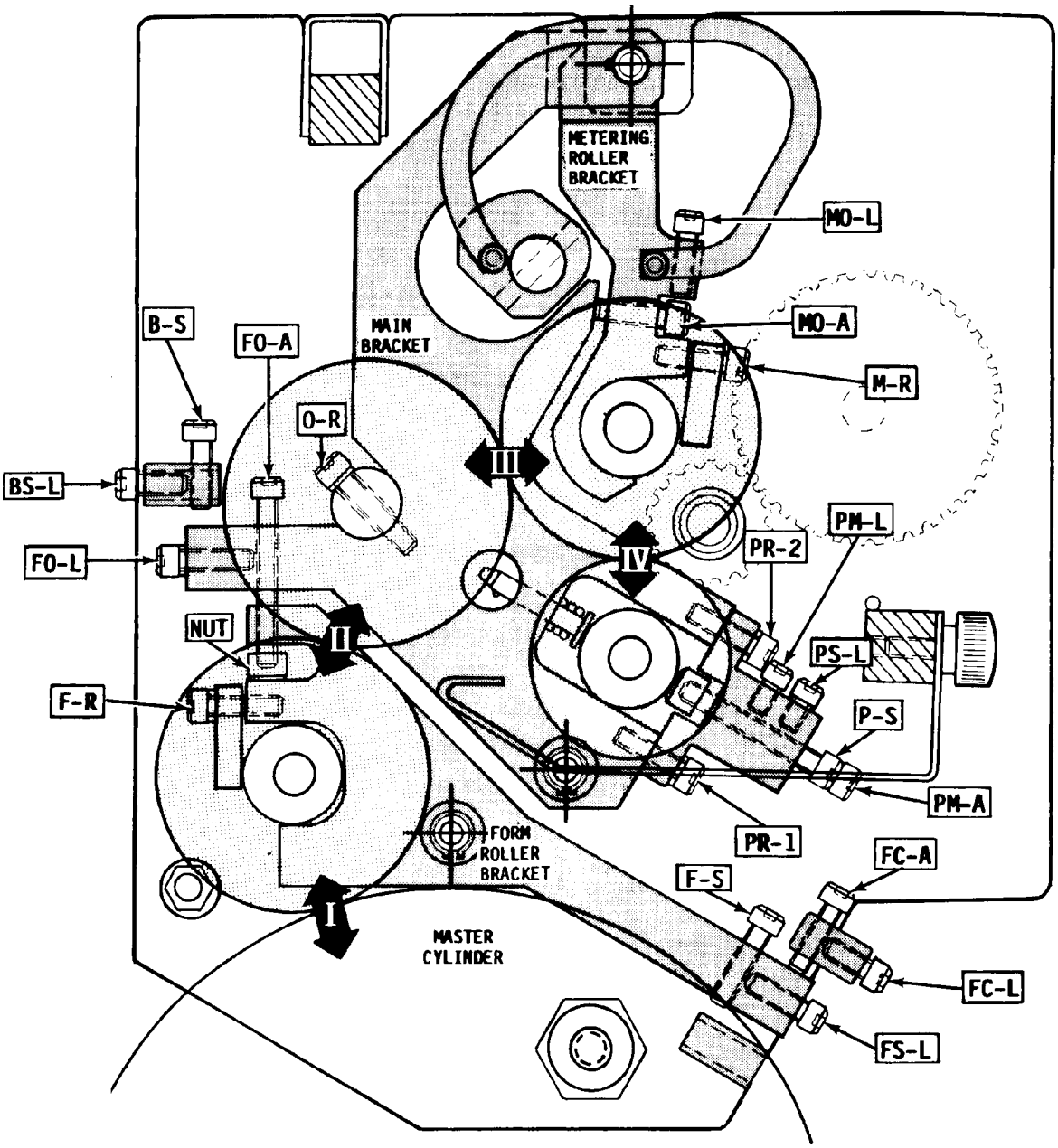
Example: FC-A is the **F**orm **R**oller to **C**ylinder - **A**djusting Screw

CALIBRATION STEPS FOR SETTING ROLLER PRESSURES

Before starting, move the machine control handle to NIGHTLATCH. Make sure there are no adjustments applying pressure anywhere along the rollers. (There should be no gaps between the rollers.) Check the following areas of the dampener. See Figure 93 for the location of the adjusting screws referenced in the procedure.

1. Dampener form roller to master cylinder (see Figure 93):
   a. Install a metal plate.
   b. Make a bead line by moving the machine control handle to INK & WATER, then back to NIGHTLATCH.
   c. Be sure lock screws FC-L are loose, and adjust screws FC-A to obtain a 1/8" to 5/32" bead line the same width all along the roller. (Keep rotating the roller, making bead lines and adjusting screws FC-A until a proper bead line is obtained.)
   d. Tighten locking screws FC-L.
   e. Be sure the machine control handle is in the NEUTRAL position. Set stop screws F-S against the stop blocks. Turning the screws clockwise will decrease the bead lines, and turning them counterclockwise will increase the bead lines. Do not leave a gap between the screws and the stop blocks. Tighten with screws FS-L.
   f. Recheck the form-to-cylinder bead line.
2. Form roller to oscillator (See Figure 92):
   a. Wipe the dampener oscillator to remove any excess moisture.
   b. With the control handle in the NEUTRAL position, carefully place a sheet of 20 lb. bond paper between the oscillator and the form roller.
   c. Move the control handle to INK & WATER, and make a bead line on the paper. Move the control handle to the NEUTRAL position.
   d. Verify that locking screws FO-E are loose, and adjust screws FO-A to get a 3/16"-1/4" bead line the same width all along the paper. (Keep rotating the roller, making bead lines on the paper and adjusting screws FO-A until the proper bead line is obtained. Move screws FO-A clockwise to decrease the bead lines and counterclockwise to increase the bead lines.
   e. Tighten locking screws FO-L.
   f. With the dampener control handle in the NEUTRAL position, set stop screws BS against the main bracket. Do not leave a gap between the screws and main bracket. Tighten with screws B-S.
   g. Recheck the form-to-oscillator bead line.
   h. Recheck the form-to-cylinder bead line.

Figure 93 - Adjusting Screws



ITEM BEING ADJUSTED:
(Letter(s) before hyphen)

B = Bracket (Main Dampener)
C = Cylinder (Master)
F = Form Roller
M = Metering Roller
O = Oscillator Roller
P = Pan Roller

FUNCTION OF SCREW:
(Letter after hyphen)

A = Adjusting
L = Locking
R = Retaining
S = Stop

Example: FC-A is the **F**orm **R**oller to **C**ylinder - **A**djusting Screw

3. Oscillator to metering roller (see Figure 93):
   a. Prepare a paper ink transfer sheet by rolling about 2 inches of a 20 lb. sheet of paper between any two rollers in the ink train.
   b. Move the dampener control handle to the NIGHTLATCH position.
   c. Put the ink transfer sheet between the metering roller and oscillator.
   d. Move the control handle to INK & WATER, then to NIGHTLATCH. Pull out the ink transfer sheet and check the bead line on the metering roller.
   e. Verify that locking screws MO-L are loose, and adjust screws MO-A to obtain a 1/8" to 3/16" bead line the same width all along the roller. (Keep rotating the roller, making bead lines and adjusting screws MO-A until this happens.)
   f. Tighten locking screws MO-L.

4. Pan (fountain) roller to metering roller (see Figure 94):
   a. Prepare a paper ink transfer sheet by rolling about 2 inches of a 20 lb. sheet of paper between any two rollers in the ink train.
   b. Back off pan stop locking screw PS-L and pan-to-metering lock screw PML. Then back off pan-to-metering adjusting screw PM-A until the pan and metering rollers are separated.
   c. With the dampener control handle in the NIGHTLATCH position, insert an ink transfer sheet between the pan and metering Rollers. Then move the dampener control handle to the NEUTRAL position.

NOTE:

Pan stop screw P-S limits the pressure between the pan and metering rollers by limiting the inward movement clockwise of the pan-to-metering adjusting screw PM-A. Therefore, when making this adjustment, P-S must be turned clockwise enough to allow PM-A to obtain the correct pressure. Once the correct pressure is achieved, P-S becomes a stop so that PM-A can always be returned to the proper pressure position, even after it is turned out to relieve pressure.

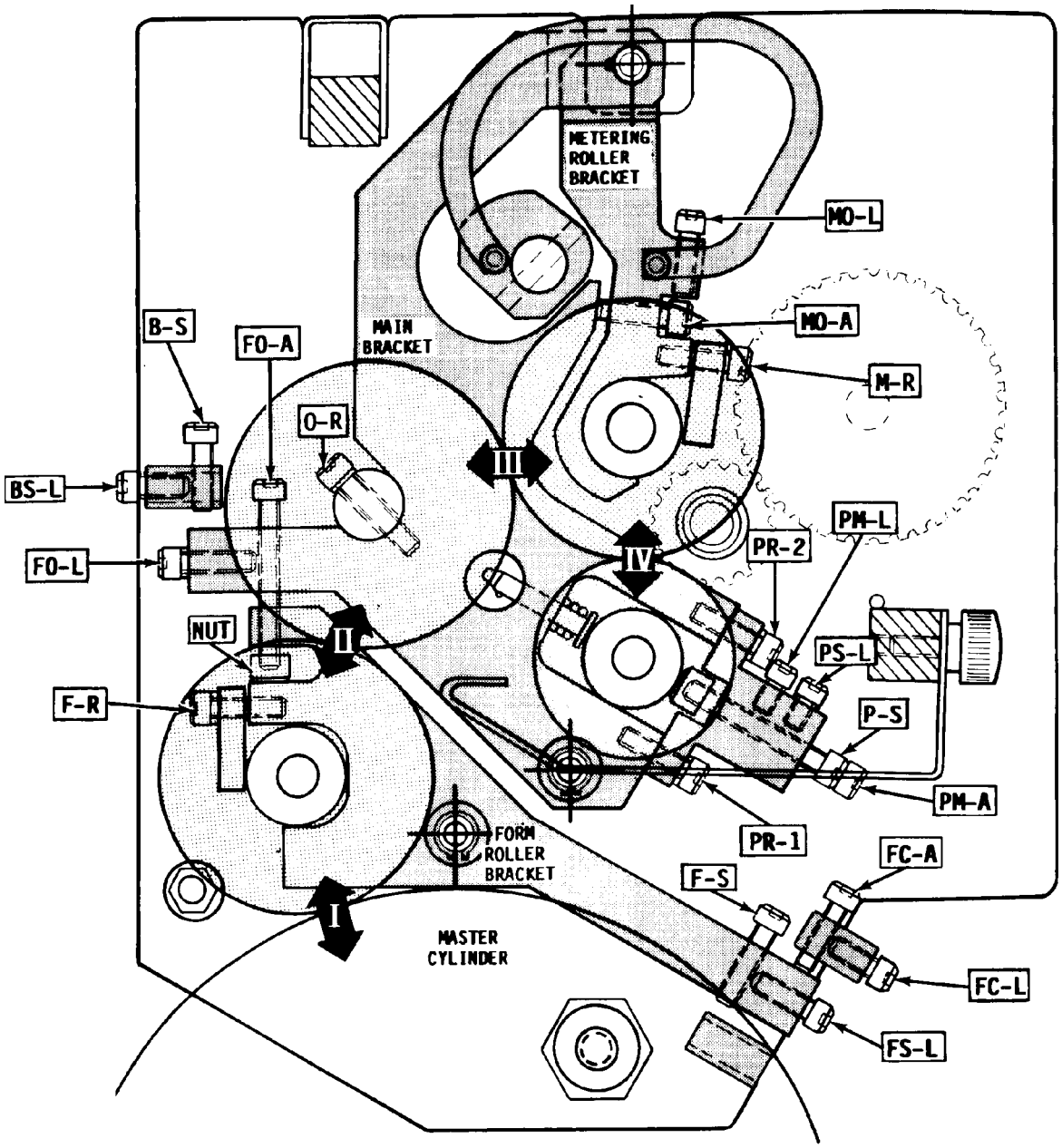
   e. Move pan stop screw P-S in so as not to restrict PM-A movement.
   f. Move pan-to-metering adjusting screw PM-A to obtain a bead line that is a uniform 1/8" to 3/16" wide. Adjust PM-A on each end so that the bead is the same width all across the roller.

NOTE:

To see the bead line: Remove the paper, put the dampener in the MANUAL mode and rotate the roller until the bead line shows on the metering roller.

   g. When the proper bead line is obtained, tighten pan-to-metering roller lock screw PM-L.
   h. Turn the pan stop screw P-S counterclockwise until its head just touches PM-A and acts as a stop to the inward movement of PM-A.
   i. Tighten the pan stop lock screw PS-L.
   j. Recheck the bead line.

Figure 94 - Roller Adjusting Screws



ITEM BEING ADJUSTED:
(Letter(s) before hyphen)

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C = Cylinder (Master)
F = Form Roller
M = Metering Roller
O = Oscillator Roller
P = Pan Roller

FUNCTION OF SCREW:
(Letter after hyphen)

A = Adjusting
L = Locking
R = Retaining
S = Stop

Example: FC-A is the **F**orm **R**oller to **C**ylinder - **A**djusting Screw

WATER LEVEL ADJUSTMENT

1. Loosen the two screws (A) holding the solution bottle in place (see Figure 95).
2. Raise the bottle enough to be sure the entire bottom of the pan roller is covered with solution.
3. The solution level should reach about half way up the side of the pan (see Figure 95).

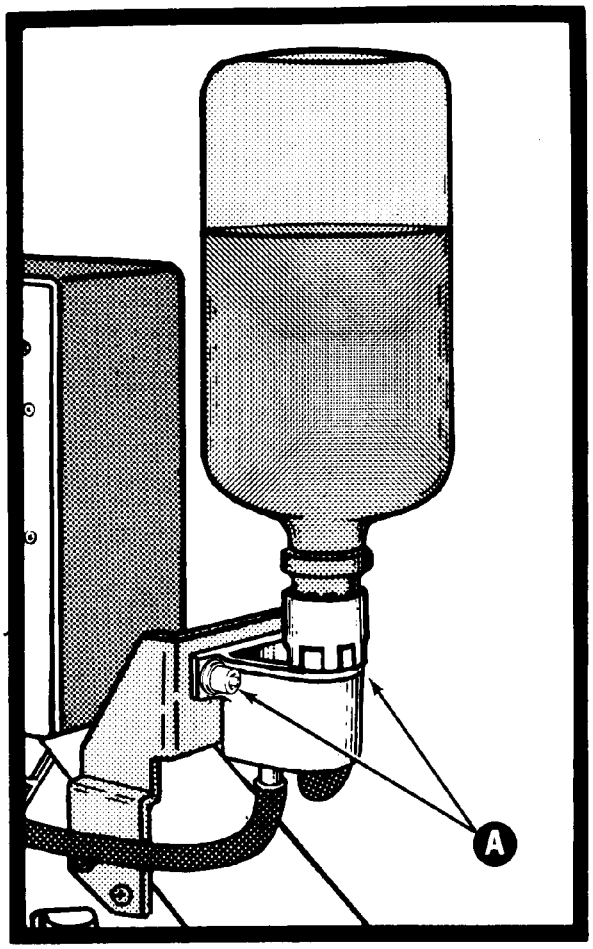

Figure 95 - Solution Bottle

DAMPENER SPEED ADJUSTMENTS

Auto Mode Speed

1. Remove the dampener motor cover.
2. Locate the drive gear (A) (Figure 96) and mark a tooth with bright chalk (for checking RPM).
3. Set the dampener auto/manual switch to AUTO.
4. Turn on the press drive motor. The dampener motor will also come on and turn drive gear (A) clockwise (as viewed from the non-operator side) (see Figure 96).
5. Set the press speed to 3500 IPH.
6. Vary the dampener speed control from "0" (min.) to "100" (max.) on the dial setting.
   a. At position "0" the dampener motor should run drive gear (A) at 20 to 25 RPM. Check the RPM by counting the RPM of the bright chalk mark on the drive gear tooth mentioned above (see Figure 96).

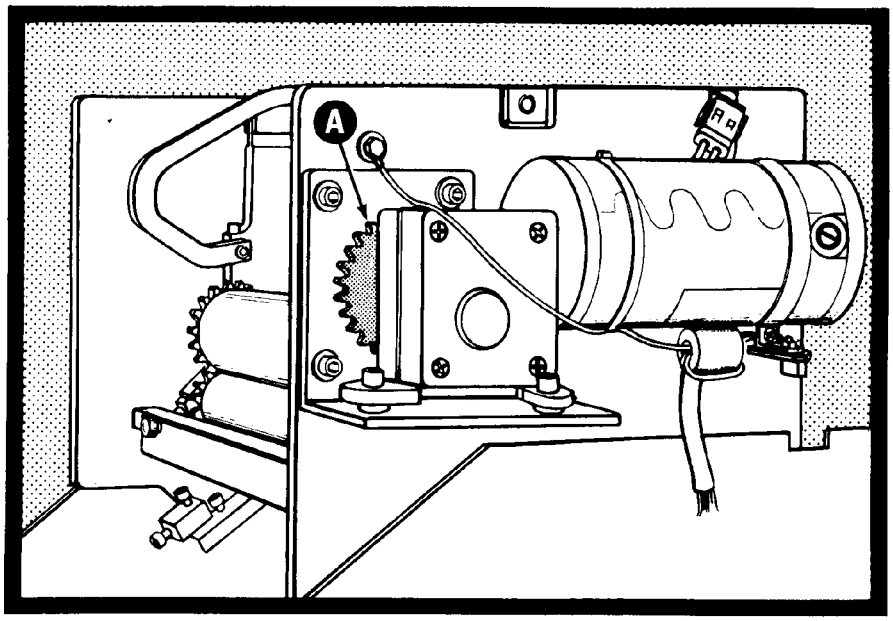

Figure 96 - Dampener Motor

If necessary, adjust MIN. Trim Pot (B) on the speed control board (see Figure 97). Turn the pot counterclockwise to slow the speed, or clockwise to raise speed.

b. At position “100” the dampener motor should run the drive gear at 190 to 200 RPM. Adjust the MAX. trim pot (C) (Figure 97) if necessary.

7. Turn off the press.

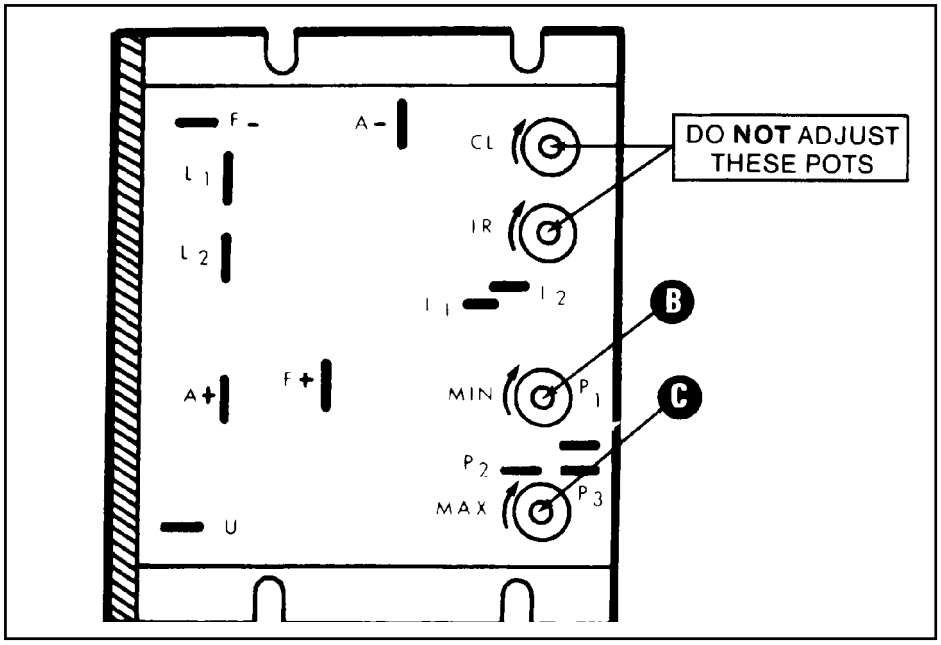

Figure 97 - Speed Control Board

Manual Mode Speed

8. With the power on, the machine control handle in the NEUTRAL position, and the auto/manual switch set to MANUAL, adjust manual speed control (D) (Figure 98) so the dampener motor runs the drive gear at 30 to 35 RPM.
9. Return the dampener auto/manual switch to AUTO.

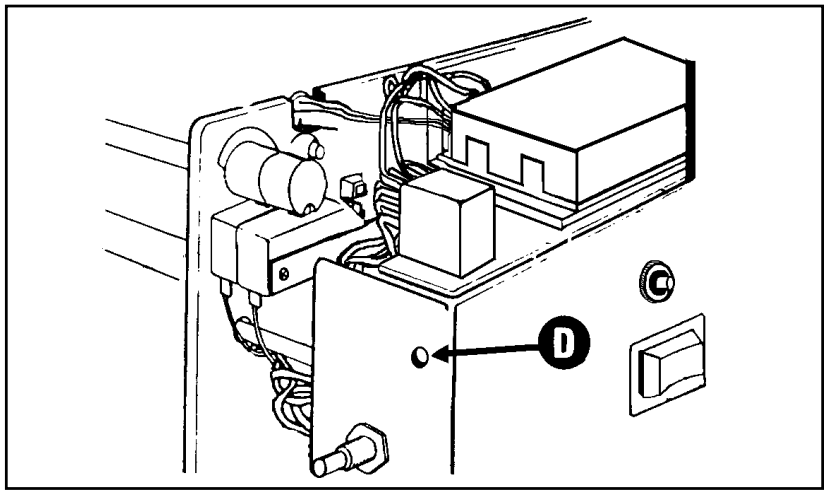

Figure 98 - Manual Speed Control

ELECTRICAL
SCHEMATIC DIAGRAMS

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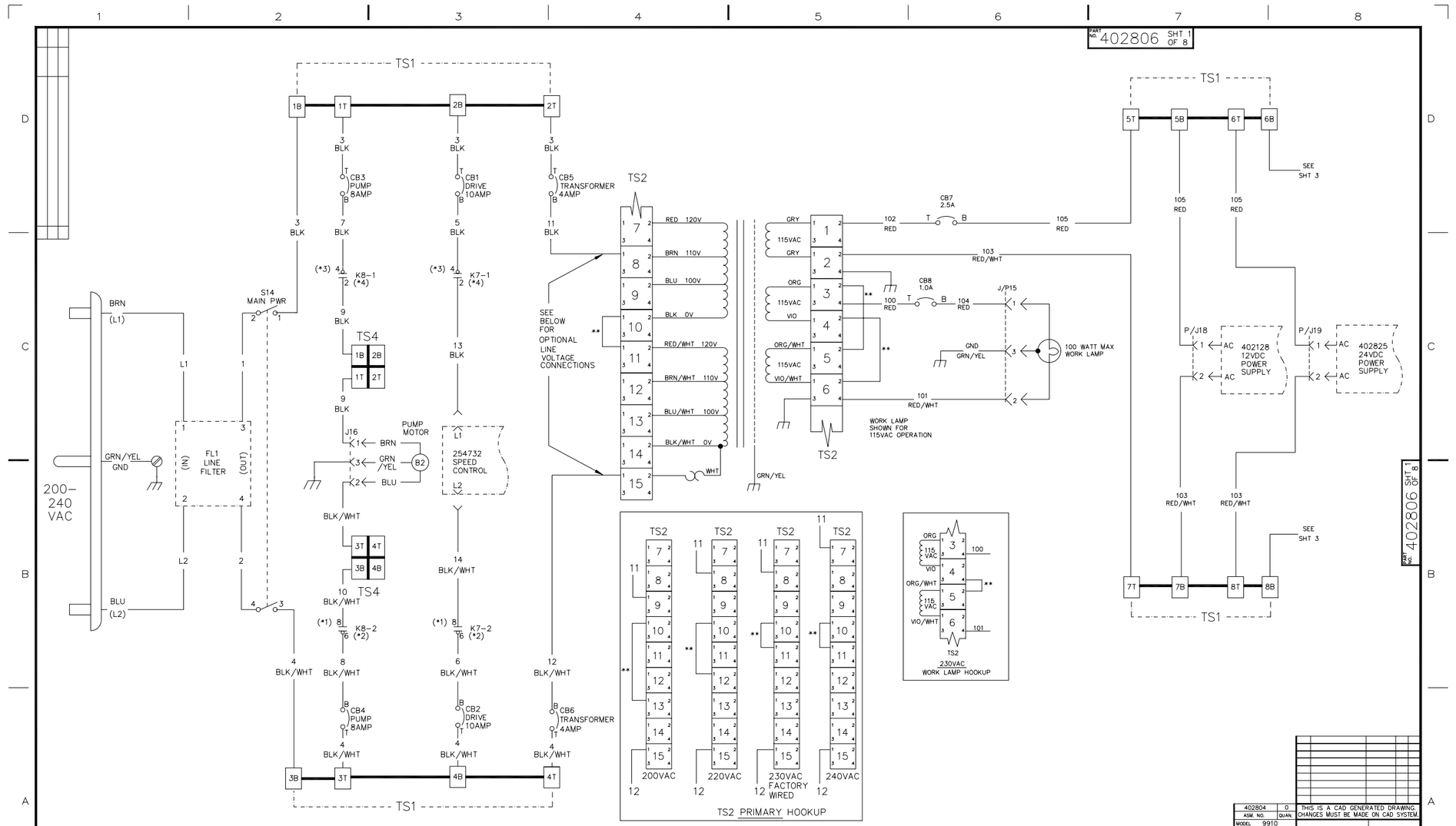
PART No. 402806 SHT 1 OF 8



NOTES: *ALTERNATE RELAY
** JUMPER WIRE

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MODEL 9910			
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MATERIAL | FINISH / HT. TREAT

NAME 9910/D SCHEMATIC ELECTRICAL CONTROL

ABDICK® 5700 W. TOUHY AVE., NILES, ILLINOIS 60714

PART NO. 402806 SHT 1 OF 8 REV. 3

CADFORM DFORM-5-90

PART No. 402806 SHT 1 OF 8

PART NO. 402806 SHT 2 OF 8

SWITCH BOX ASM. 402822
S2 DRIVE SW
S1 PUMP SW
ON
OFF
200 BLU/ORG
300 BLU/WHT
GND GRN/YEL
213 BLU/ORG
212 BLU/ORG
J22
P22
NC
SPARES
J8
P8
P33
K8 PUMP MOTOR
24V DC
(*5) 0
(*6) 1

CONTROL PANEL ASM. 402821
S3 START SW
219 BLU/ORG
211 BLU/ORG
J21
P21
EMERGENCY STOP
S13A
217 BLU/ORG
218 BLU/ORG
SEE SHT.4
TO SHT. 3
P3
P2
P1

SPEED CONTROL PCB ASM 25525
RUN SPEED
R7 10K 5W
R4 5K 5W
R3 200K 5W
TP1
TP2
TP3
J13
N.C.
P13
BLU 214
BLU 215
BLU 216

CHAIN DEL (9910'S ONLY)
S10
S9
S8
209 ORG
208 ORG
207 ORG
206 ORG
J14
P14

IMPRESSION GUARD (9905 ONLY)
S8
207 ORG
206 ORG
J14
P14

GUARDS NON-OPERATOR SIDE
P33 J33
S6 AQUA
S5 PINK
205 ORG
202 ORG
J/P37
95°C DRIVE MOT. CUTOUT SW. (INTERNAL TO MOT.)
206 ORG

GUARDS OPERATOR SIDE
204 ORG
S4 BLANKET CYL
203 ORG
S11 DISENGAGING HANDWHEEL
201 ORG
EMERGENCY STOP
S13B
22
200 ORG

K7 DRIVE MOTOR (AC)
K10 DRIVE MOTOR (DC)
K11 DRIVE MOTOR (DC)
218 BLU/ORG JUMPER
221 BLU/ORG
J1
J9
J10
P9
P10

CONTROL PCB (402843 ASM.)
J2
J4
P4
K1-1 (START)
K1-2 (START)
K2-1 (RUN)
K2-2 (RUN)
K2 RUN
K1 START
D1 1N4004
D2 1N4004
F1 1A SLO-BLO
GND
+24VDC

24VDC POWER SUPPLY (402825 ASM.)
PS2
24VDC 1.2 AMP.
P3
J3
300 BLU/WHT
299 BLU/ORG

NOTES:
1. ALL GUARDS SHOWN IN THE CLOSED POSITION – GUARD SWITCHES N.C.
2. * ALTERNATE RELAY

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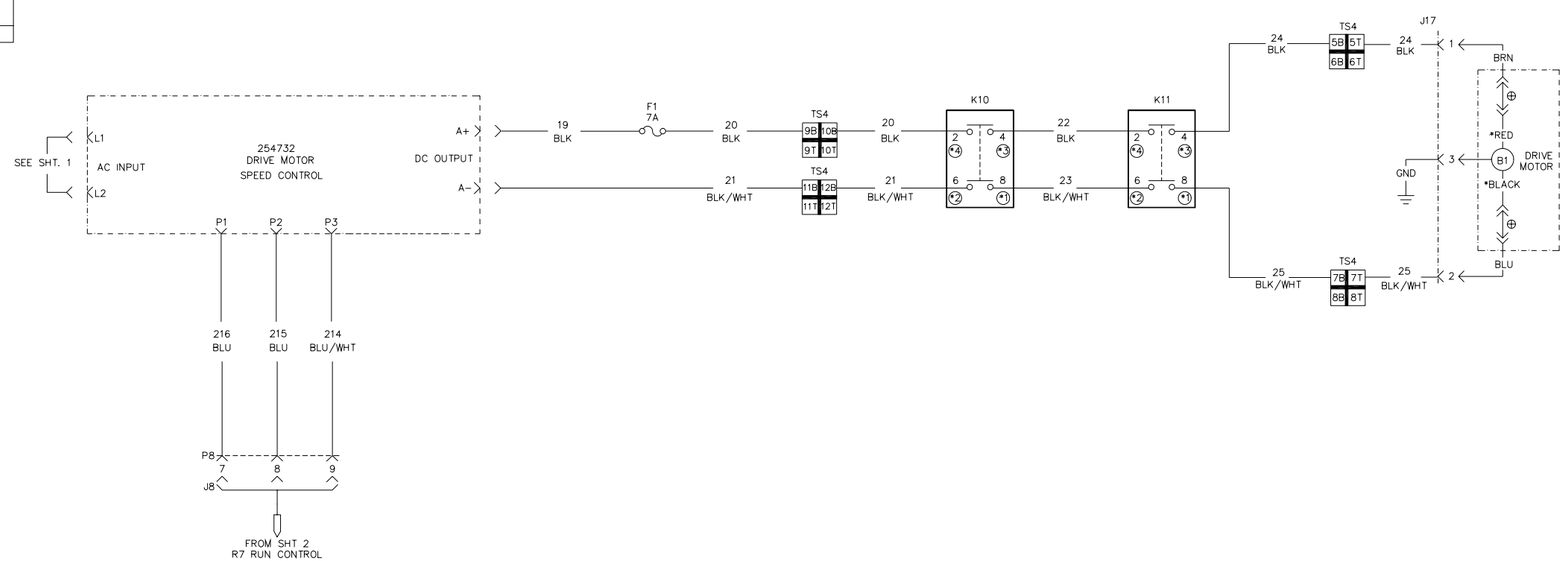
NAME 9910/D SCHEMATIC ELECTRICAL CONTROL

A. B. DICK COMPANY
5700 W. TOUHY AVE.
NILES, ILLINOIS 60714

PART NO. 402806 SHT 2 OF 8 ISSUE 2

CADFORM DSIZE–7–88

PART NO. 402806 SHT 3 OF 8



PART NO. 402806 SHT 3 OF 8

3. ⊖ ALTERNATE RELAY PIN NO.S
2. ⊕ DENOTES IN-LINE SPLICE.
NOTES: 1. * COLORS SHOWN ARE FOR LEESON 1 H.P. MOTOR.

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S17
KEYBOARD
401951

MICROPROCESSOR ASS'Y.
401955
PCB 1

LCD DISPLAY
401953
PCB 2

P6 P7 P1 P4 P2 P5 P3

DOUBLES LAMP

231 BLUE
DS1
233 BLUE
5V DC

J21 P21 J20 P20

NC NC NC

GND GRN/YEL
250 BLU/RED
300 BLU/WHT
232 BLU/WHT
233 BLU
234 BLU
235 BLU
236 BLU/RED
237 BLU/WHT
238 BLU/WHT
239 BLU
240 BLU

J8 P8

GND GRN/YEL
P.E.

12VDC POWER SUPPLY
PS1
250 BLU/RED
300 BLU/WHT
NC
P7 J7

253025 DOUBLE DETECT SWITCH
S18

J/P26
+5V
S16
COUNT SWITCH (HALL EFFECT)
253218

253002 REMOTE FEED SWITCH
S19
J/P23
J/P24
NC

J/P25
L1
FEED SOLENOID
401969

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PART NO. 402806 SHT 4 OF 8 REV. 1

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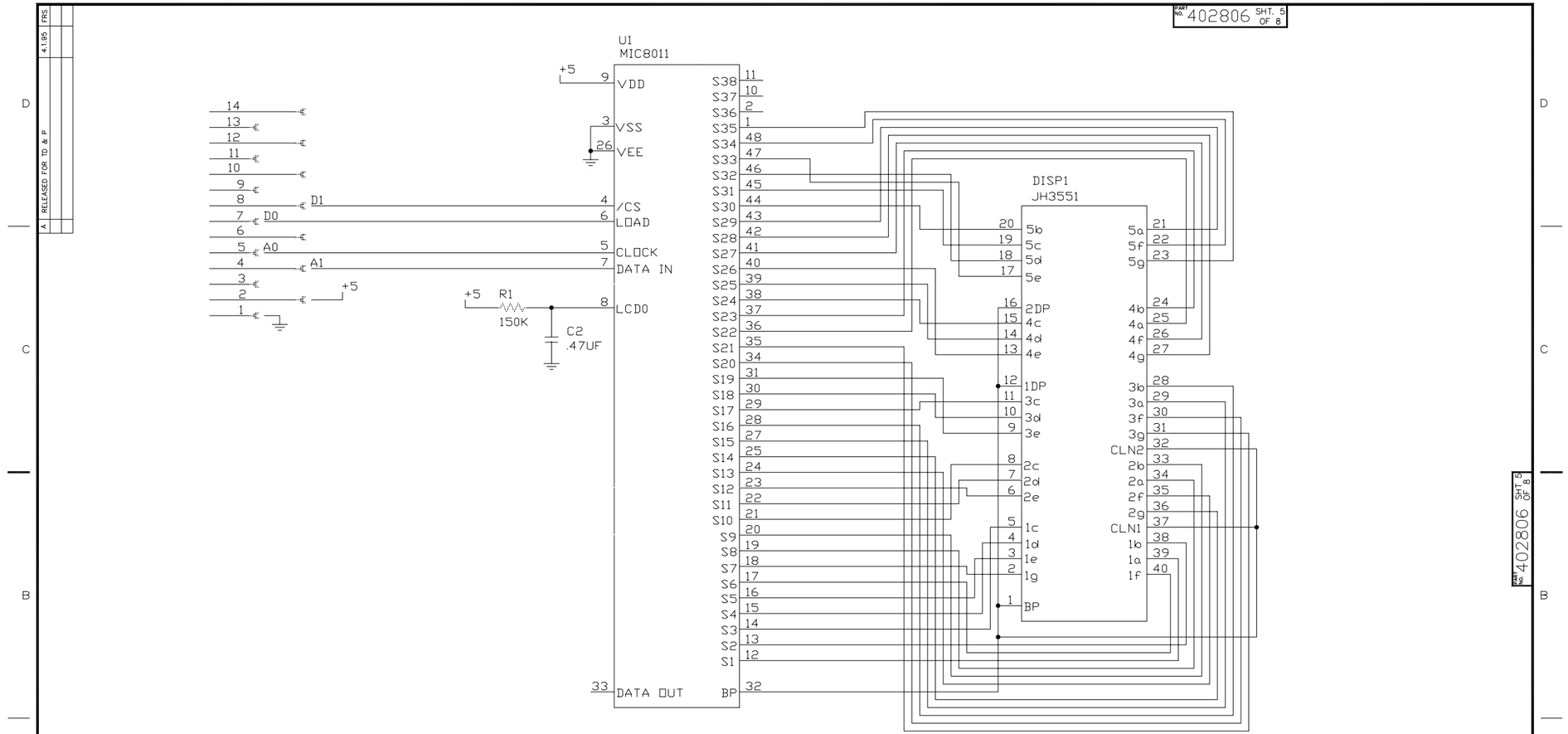

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MATERIAL | FINISH / HT. TREAT

NAME DISPLAY SCHEMATIC

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PART NO. 402806 SHT 5 OF 8 REV. 1

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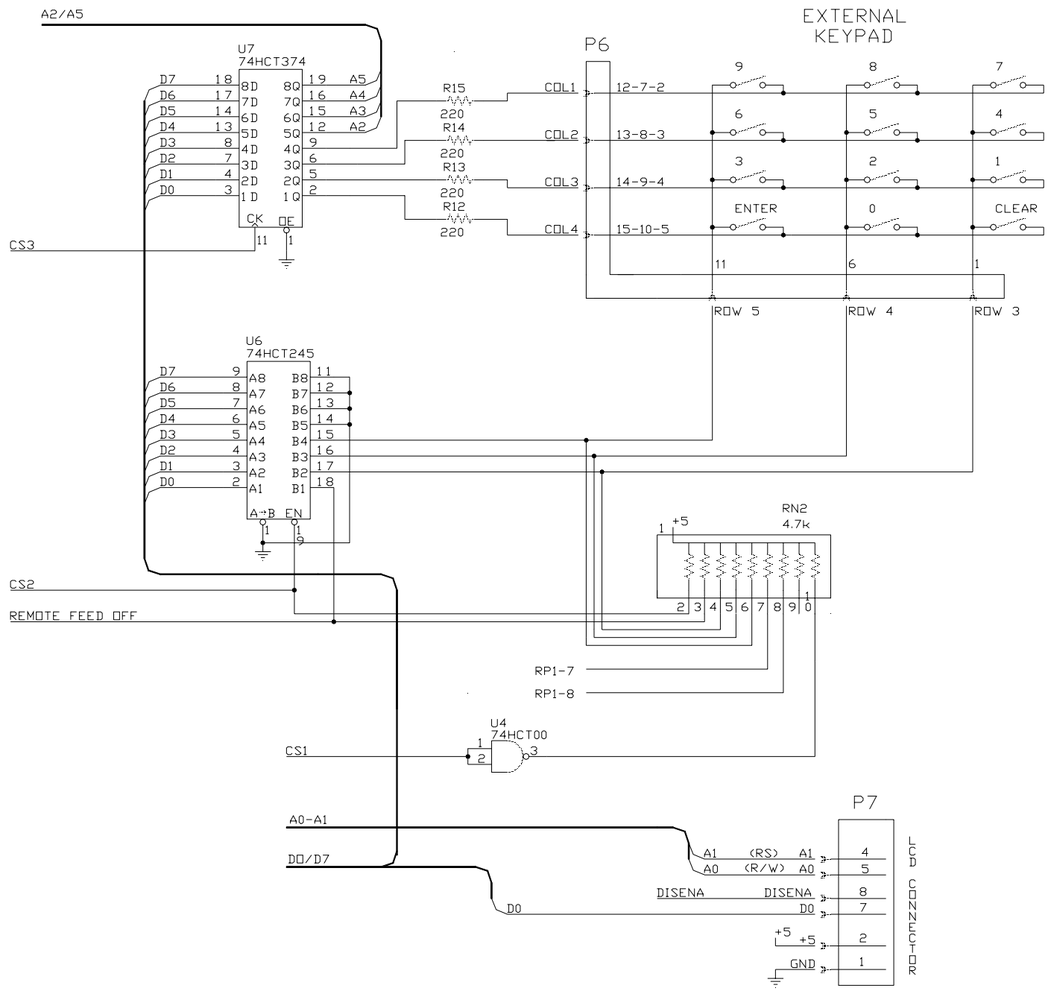

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		PART NO. 402806 SHT 6 OF 8	REV. 1

CADFORM DFORM-5-90

PART No. 402806 SHT 6 OF 8

PART No. 402806 SHT 7 OF 8

12VDC POWER SUPPLY

PS1

P.E.

BLUE/RED

BLUE/WHITE

P1

+12

GND

NC

D2 1N4004

D3 1N4004

7805 DREG

C14 3300UF

C1 0.1 MFD 1KV

REMOTE FEED OFF SHT.2 U6-18

P2

REMOTE FEED OFF

+5

GND

REMOTE FEED OFF SIGNAL

R1 1k

R2 1k

R3 220

R4 4.7k

R6 2.2k

R7 680

R8

R9

R17 4.7K

Q1 2N4403

Q2 2N4401

U4 74HCT00

D1 MR852

P5

12V

FEED 'OFF' SOLENOID

N-CHANNEL FET

R18 1k

C15 10UF

Z2 9.1V

R20 220

Q4 2N4401

R19 2.2k

R21 1k

R22 1k

Q3 2N4403

R23 1k

J1

A B C

JUMPER AB FOR COUNTER

JUMPER BC FOR DOUBLES DETECT

U1 TL7705A

SENSE IN

/RESIN

REF RESET

CT /RESET

R11 1K

C9 1 uf

C10 10uf

R10 680

C11 33pF

C12 33pF

XTAL 12MHZ

C13 1uf

U2 S87C751

X1

X2

RST

P0.2/VPP

P0.1/SDA/DE-PGM

P0.0/SCL/ASEL

P1.7/T0

P1.6/INT1

P1.5/INT0

P1.4/ADC4

P1.3/ADC3

P1.2/ADC2

P1.1/ADC1

P1.0/ADC0

P3.7 D7

P3.6 D6

P3.5 D5

P3.4 D4

P3.3 D3

P3.2 D2

P3.1 D1

P3.0 D0

RP1-7

U5 X2210

/WE

RECALL

/STORE

/CS

A5 A4 A3 A2 A5 A4 A3 A2

I/O4 I/O3 I/O2 I/O1

D3 D2 D1 D0

D0/D7

A2/A5

A0

A1

RP2 4.7K

DISENA /CS3

CNT1 RP1-8

P3

CNT 1

+5

CNT 2A

GND

CNT 2B

GND

COUNTERS INPUTS

U3 74HCT11

P4

GND

DDS

+5

DOUBLES DETECT SIGNAL

U9 74HCT138

G1

G2A

G2B

C

B

A

Y7 Y6 Y5 Y4 Y3 Y2 Y1 Y0

CS4 CS3 CS2 CS1

U1 U2 U3 U4 U5 U6 U7 U8

C1 .1uf C2 .1uf C3 .1uf C4 .1uf C5 .1uf C6 .1uf C7 .1uf C8 .1uf

U3 74HCT11

U4 74HCT00

U4 74HCT00

* NOTE1 CRYSTAL BODY SHOULD BE SOLDERED TO GROUND

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TOL. NOT SPEC'D: .XXX ±.005 .XX ±.010 .X ±.015 ANGLES ±2° SCALE NONE

MATERIAL

FINISH/HT. TREAT

NAME CPU SCHEMATIC

ABDICK® 5700 W. TOUHY AVE. NILES, ILLINOIS 60714

PART No. 402806 SHT 7 OF 8 REV. 1

CADFORM DFORM-5-90

DESIGNATION	DESCRIPTION	PART NO.	LOCATION
B1	DRIVE MOTOR	402844	3C7
B2	PUMP MOTOR	402145	1B3
CB1	DRIVE MOTOR	250051	1D3
CB2	DRIVE MOTOR	250051	1B3
CB3	PUMP MOTOR	252537	1D3
CB4	PUMP MOTOR	252537	1B3
CB5	POWER TRANSFORMER	253543	1D4
CB6	POWER TRANSFORMER	253543	1B4
CB7	POWER SUPPLY'S	253542	1D6
CB8	WORK LAMP	254726	1C6
F1	FUSE–DRIVE MOTOR	254730	3C4
FL1	LINE FILTER	253619	1B2
K7	DRV. MTR.–AC INPUT	253857	1B3,1D3,2B5
K8	PUMP MTR. RELAY	253857	1B2,1D2,2B3
K10	DRIVE MTR. RELAY	253857	2B6,3C6
K11	DRIVE MTR. RELAY	253857	2B6,3C6

DESIGNATION	DESCRIPTION	PART NO.	LOCATION
L1	FEED SOLENOID	401969	4A5
L2	RESERVED	———	———
PS1	CNTR. PWR SPLY 12V	402828	4B1
PS2	CONT. PWR SPLY 24V	402825	2A1
S1	PUMP MOTOR	253953	2D3
S2	DRIVE MOTOR	253953	2D2
S3	DRIVE MOT. START	253365	2D4
S4	GUARD BLKT CYL	253211	2D8
S5	GUARD INK	253211	2D7
S6	GUARD AQUA	253211	2C7
S7	RESERVED	———	———
S8	CD–GUARD	253211	2C7
S9	CD–GUARD	253211	2C7
S10	CD–GUARD	253211	2D8
S11	DISENG. HANDWHEEL	253211	2C8
S12	RESERVED	———	———
S13	EMERGENCY STOP	253475	2C8
S14	MAIN POWER	253952	1C2,1B2
S15	RESERVED	———	———
S16	PAPER COUNT	253218	4B7
S17	KEYBOARD	401951	4D2
S18	DOUBLES DETECT	253025	4B3
S19	REMOTE FEED	253002	4A3
S20	RESERVED	———	———
S21	RESERVED	———	———

DESIGNATION	DESCRIPTION	PART NO.	LOCATION
SC1	SPD. CONT.–DRV.MOT.	254732	3C3
T1	POWER TRANSFORMER	401678	1C5
TS1	115/230V TERM.STRIP	254500	1D3,1D7
TS2	TRANS. TERM. STRIP	401678	1C4
TS4	MOTOR TERM. STRIP	254728	1B4,3D4,3D6

CABLE ASM'S./HARNESSES–MACHINE	
LOW VOLTAGE DC CIRCUITS	402846
CONT. BOX TO CHAIN DELIVERY	402856
CONTROL PANEL TO SENSORS	402847
CHAIN DELIVERY	402830
GUARD, NON–OPERATOR–SIDE	402857
GUARD, OPERATOR SIDE	402870
CABLE ASM. REMOTE FEED	25658
HARNESS – REMOTE FEED	400887
HARNESS – IMPRES. GUARD (9905)	402880

CABLE ASM'S./HARNESSES–CONT. BOX ASM.	
HARNESS – 230 VAC	402858
HARNESS – 115 VAC	402859
HARNESS – LOW VOLTAGE	402879
CORD ASM. – POWER	402866
DRIVE MOTOR RECPT.	402864
PUMP MOTOR RECPT.	402865

PRINTED CIRCUIT BOARDS		
PCB1	* COUNTER BOARD	401955
PCB2	* LCD DISPLAY	401953
PCB3	OPER. SPEED CONT.	25525
PCB4	SNUBBER BOARD	402873
PCB5	CONTROL BOARD	402843

* PART OF 401959 COUNTER ASM.

PART NO. 402806 SHT 8 OF 8

ACAD R12

REFERENCE 0
ASM. NO. QUAN.
MODEL 9910
INITIAL USAGE

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MATERIAL

FINISH / HT. TREAT

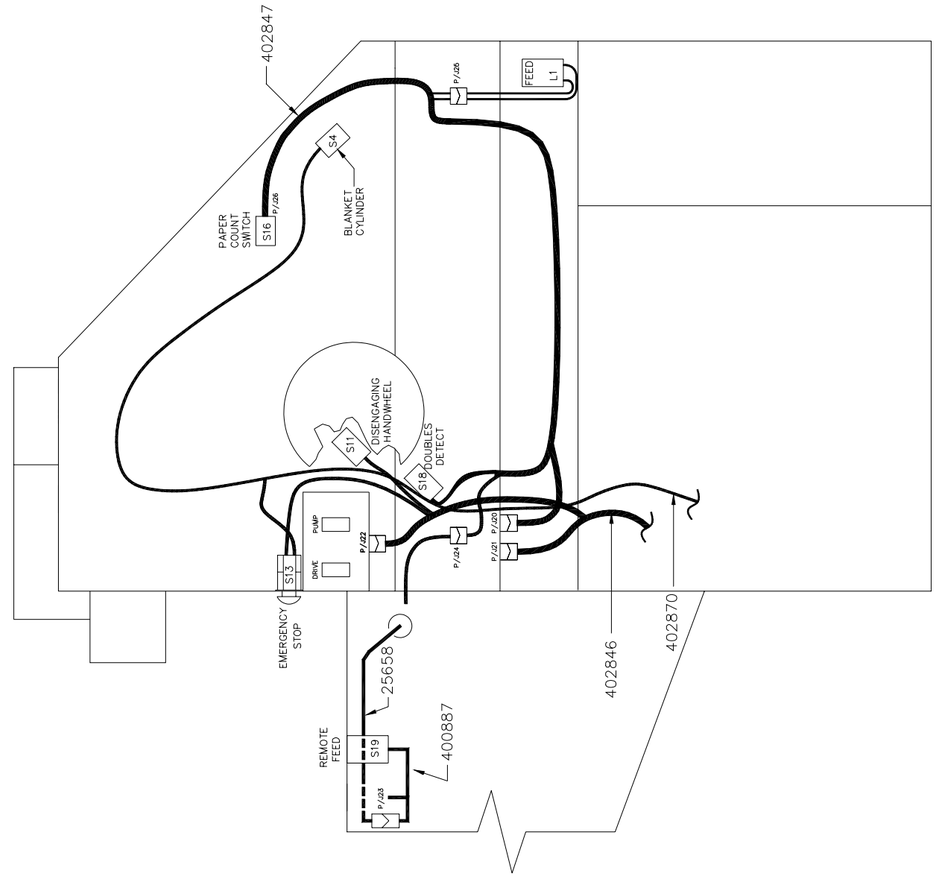
NAME COMPONENT DESCRIPTION

ABDICK®
5700 W. TOUHY AVE., NILES, ILLINOIS 60714

PART NO. 402806 SHT 8 OF 8 REV. 3

CADFORM DFORM–5–90

PART NO. 402807 SHT 1 OF 3



ACAD R12

402804	0	THIS IS A CAD GENERATED DRAWING. CHANGES MUST BE MADE ON CAD SYSTEM.			
ASM. NO.	QUAN.				
MODEL 9910/D/XCS					
INITIAL USAGE					

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TOL. NOT SPEC'D: .XXX ±.005 .XX ±.010 .X ±.015 ANGLES ±2° SCALE NONE

MATERIAL

FINISH/HT. TREAT

NAME HARNESS MAP OPERATOR SIDE

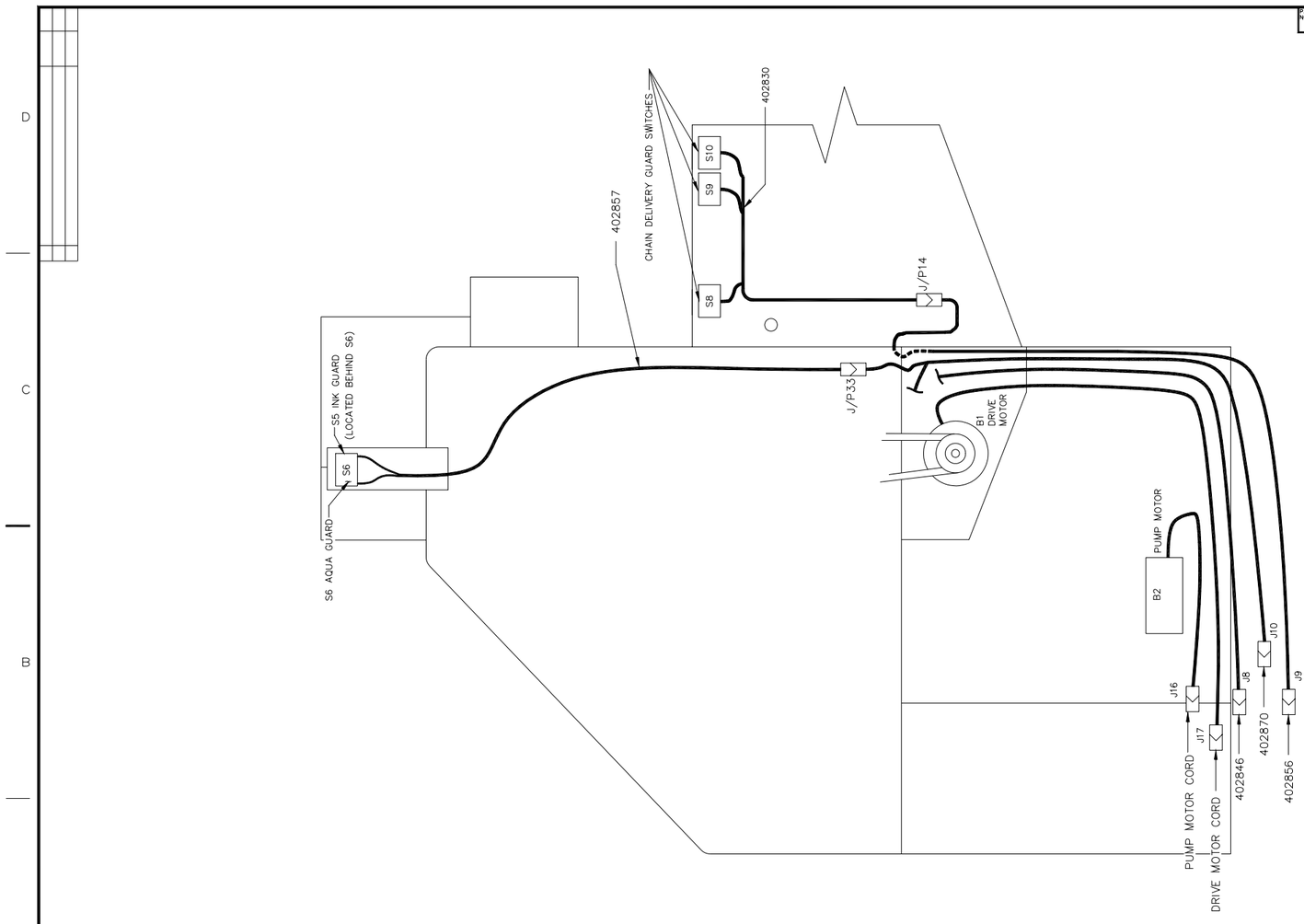
ABDICK®
5700 W. TOUHY AVE., NILES, ILLINOIS 60714

PART NO. 402807 SHT 1 OF 3 REV.

CADFORM DFORM-5-90

PART NO. 402807 SHT 1 OF 3

PART NO. 402807 SHT 2 OF 3



PART NO. 402807 SHT 2 OF 3

402804 ASM. NO.	0 QUAN.	THIS IS A CAD GENERATED DRAWING. CHANGES MUST BE MADE ON CAD SYSTEM
MODEL 9910/D/XCS		
INITIAL USAGE		

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TOL. NOT SPEC'D: .XXX ±.005 .XX ±.010 .X ±.015 ANGLES ±2° SCALE NONE

MATERIAL

FINISH / HT. TREAT

NAME HARNESS MAP NONOP SIDE

ABDICK®
5700 W. TOUHY AVE., NILES, ILLINOIS 60714

PART NO. 402807 SHT 2 OF 3 REV.

ACAD R12

CADFORM DFORM-5-90

PART NO. 402807 SHT 3 OF 3

DRIVE/PUMP MOTOR SWITCH BOX ASM.
P/J22
6 CIR. MRII
5
EMER.STOP SW. OP SIDE
2
CONTROL PANEL ASM.
P/J21
9 CIR. MRII
8
P/J20
12 CIR. MRII
9
DBLS. DET. SW. OP SIDE
2
COUNT SW. OP SIDE
3
3
FEED SOL. OP SIDE
2
2
REMOTE FEED SW. OP SIDE
2
2
2

24 CKT MR11
P/J8
15
2 CKT MR11
P/J9
GUARD SWITCHES CHAIN DELIVERY
2
2
3 CKT MR11
P/J10
GUARD SWITCHES NON-OP SIDE
2
2
GUARD SWITCHES OP SIDE
2
3 CKT CPC
P/J17
DRIVE MOTOR
3
3 CKT CPC
P/J16
PUMP MOTOR
3

CONTROL BOX ASM.

NOTES: 1. ☒ = DENOTES IN-LINE CONNECTOR

PART NO. 402807 SHT 3 OF 3

402804	0	THIS IS A CAD GENERATED DRAWING. CHANGES MUST BE MADE ON CAD SYSTEM	
ASM. NO.	DASH.		
MODEL 9910/D/XCS			
INITIAL USAGE			

SIGNED CAD-DRAWING APPROVALS WILL APPEAR ONLY ON ORIGINAL ISSUE.

TOL. NOT SPEC'D: .XXX ±.005 .XX ±.010 .X ±.015 ANGLES ±2° SCALE NONE

MATERIAL | FINISH / HT. TREAT | NAME HARNESS - MAP

ACAD R12

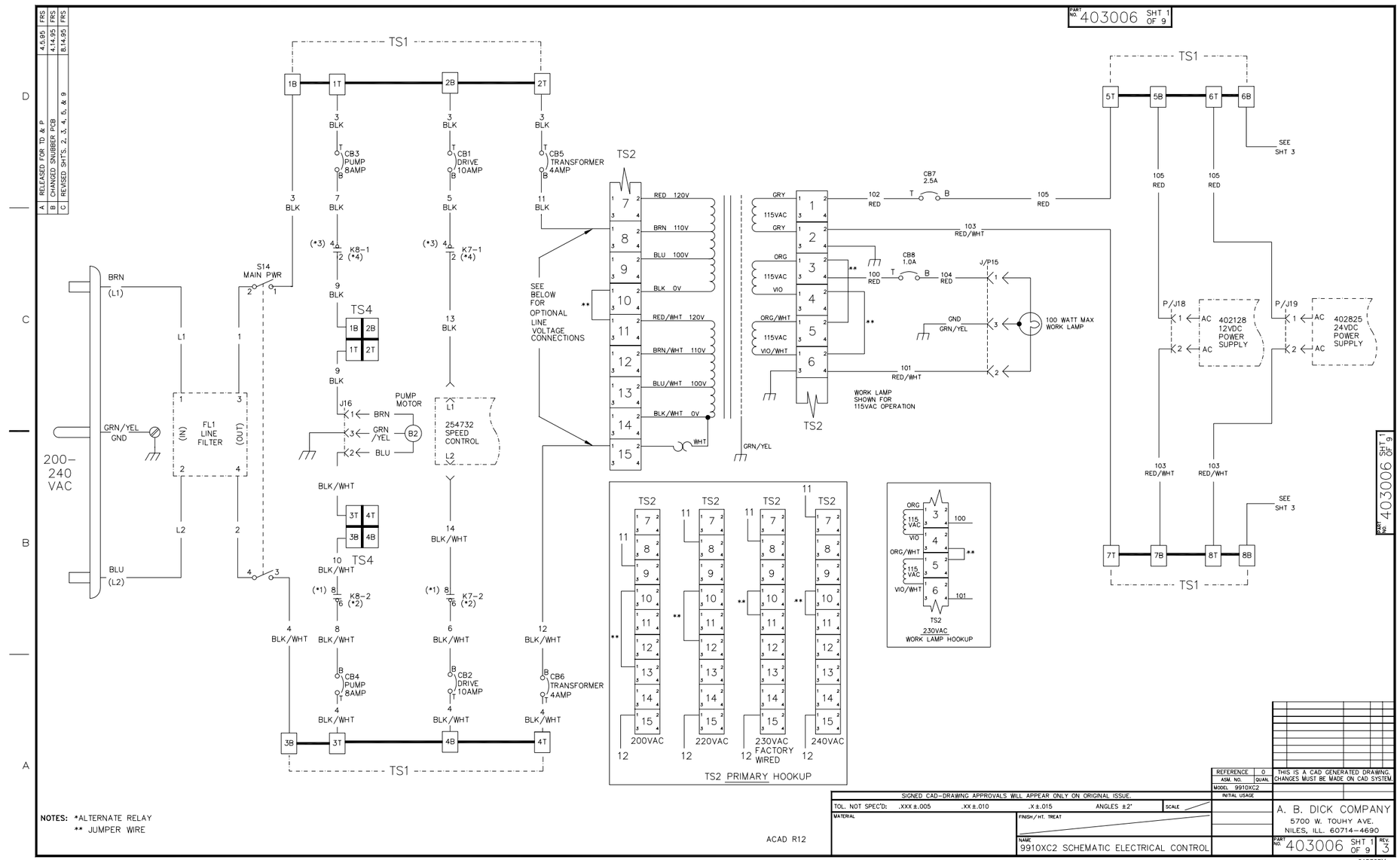
AB DICK®
5700 W. TOUHY AVE., CHICAGO, ILLINOIS 60648

PART NO. 402807 SHT 3 OF 3 REV.

CADFORM DFORM-5-90

A	RELEASED FOR TD & P	4.5.95 FRS
B	CHANGED SNUBBER PCB	4.14.95 FRS
C	REVISED SHTS. 2, 3, 4, 5, & 9	8.14.95 FRS

PART NO. 403006 SHT 1 OF 9



NOTES: *ALTERNATE RELAY
** JUMPER WIRE

ACAD R12

SIGNED CAD-DRAWING APPROVALS WILL APPEAR ONLY ON ORIGINAL ISSUE.

TOL. NOT SPEC'D: .XXX ±.005 .XX ±.010 .X ±.015 ANGLES ±2°

SCALE

MATERIAL

FINISH / HT. TREAT

NAME 9910XC2 SCHEMATIC ELECTRICAL CONTROL

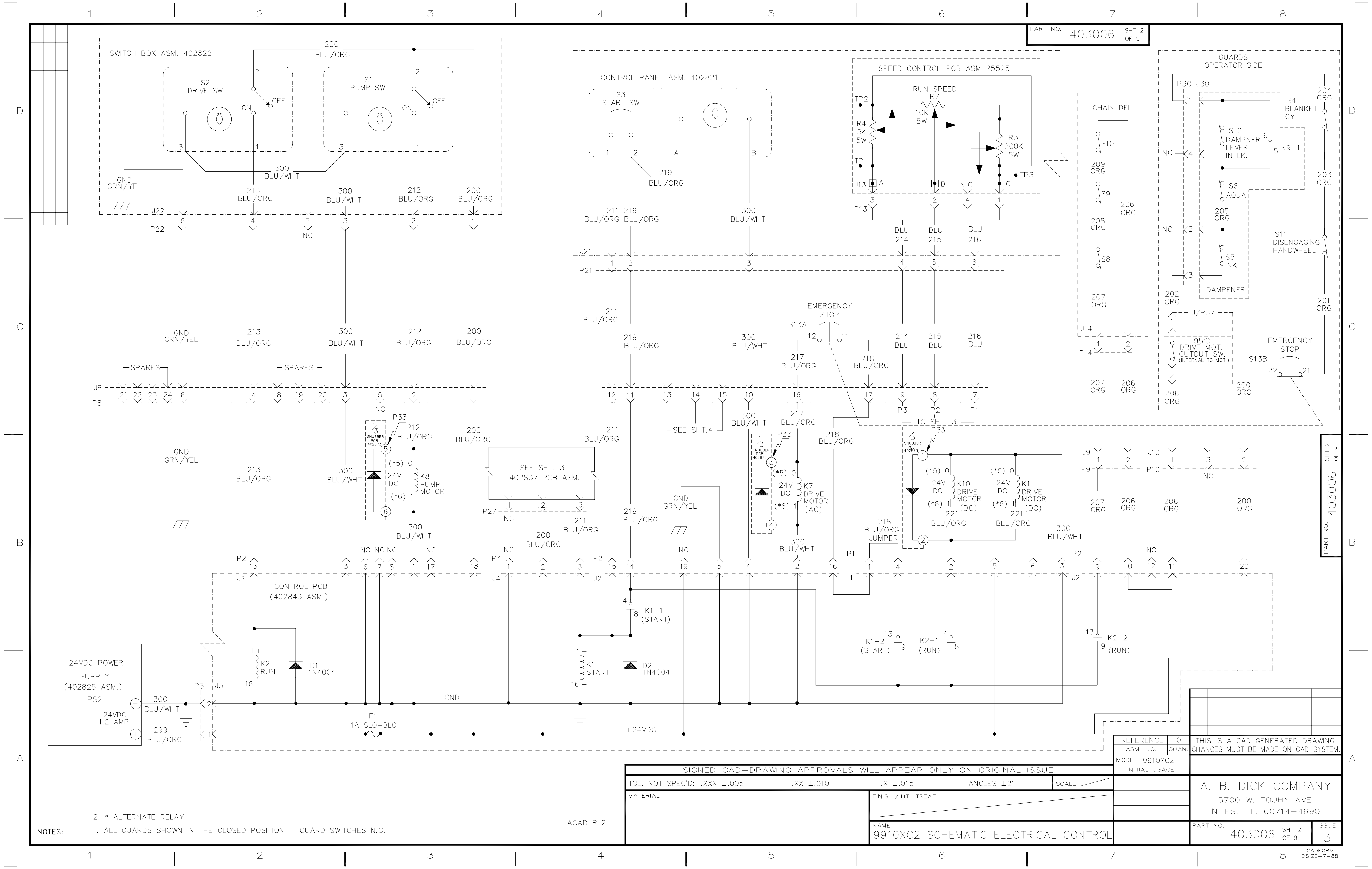
REFERENCE 0
ASM. NO. QUAN.
MODEL 9910XC2
INITIAL USAGE

THIS IS A CAD GENERATED DRAWING. CHANGES MUST BE MADE ON CAD SYSTEM.

A. B. DICK COMPANY
5700 W. TOUHY AVE.
NILES, ILL. 60714–4690

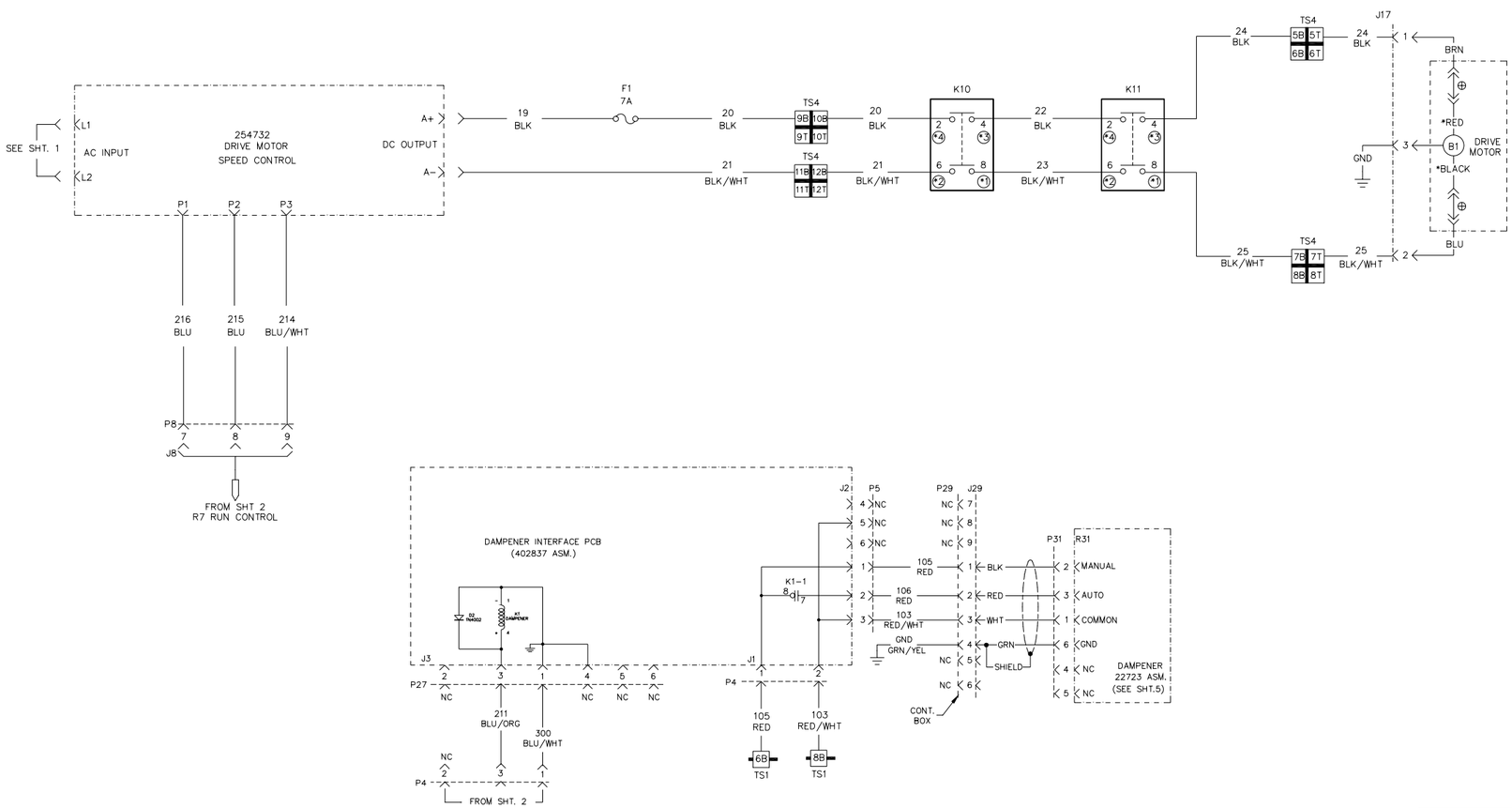
PART NO. 403006 SHT 1 OF 9 REV. C

CADFORM DFORM-5-90



PART NO. 403006 SHT 2 OF 9
SWITCH BOX ASM. 402822
S2 DRIVE SW
S1 PUMP SW
CONTROL PANEL ASM. 402821
S3 START SW
SPEED CONTROL PCB ASM 25525
RUN SPEED R7 10K 5W
R4 5K 5W
R3 200K 5W
GUARDS OPERATOR SIDE
S4 BLANKET CYL
S12 DAMPNER LEVER INTLK.
S6 AQUA
S5 INK
DAMPENER
S11 DISENGAGING HANDWHEEL
CHAIN DEL
EMERGENCY STOP
95°C DRIVE MOT. CUTOUT SW. (INTERNAL TO MOT.)
SEE SHT. 3 402837 PCB ASM.
SEE SHT.4
TO SHT. 3
K8 PUMP MOTOR
K7 DRIVE MOTOR (AC)
K10 DRIVE MOTOR (DC)
K11 DRIVE MOTOR (DC)
CONTROL PCB (402843 ASM.)
K2 RUN
D1 1N4004
K1 START
D2 1N4004
K1-1 (START)
K1-2 (START)
K2-1 (RUN)
K2-2 (RUN)
24VDC POWER SUPPLY (402825 ASM.) PS2 24VDC 1.2 AMP.
F1 1A SLO-BLO
GND
+24VDC
NOTES:
1. ALL GUARDS SHOWN IN THE CLOSED POSITION – GUARD SWITCHES N.C.
2. * ALTERNATE RELAY
ACAD R12
SIGNED CAD-DRAWING APPROVALS WILL APPEAR ONLY ON ORIGINAL ISSUE.
TOL. NOT SPEC'D: .XXX ±.005 .XX ±.010 .X ±.015 ANGLES ±2°
SCALE
MATERIAL
FINISH / HT. TREAT
NAME
9910XC2 SCHEMATIC ELECTRICAL CONTROL
REFERENCE 0
ASM. NO. QUAN.
MODEL 9910XC2
INITIAL USAGE
THIS IS A CAD GENERATED DRAWING. CHANGES MUST BE MADE ON CAD SYSTEM.
A. B. DICK COMPANY
5700 W. TOUHY AVE.
NILES, ILL. 60714-4690
PART NO. 403006 SHT 2 OF 9
ISSUE 3
CADFORM DSIZE-7-88

PART NO. 403006 SHT 3 OF 9



3. ⊕ ALTERNATE RELAY PIN NO.S
2. ⊕ DENOTES IN–LINE SPLICE.
NOTES: 1. * COLORS SHOWN ARE FOR LEESON 1 H.P. MOTOR.

ACAD R12

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TOL. NOT SPEC'D: .XXX ±.005 .XX ±.010 .X ±.015 ANGLES ±2° SCALE

MATERIAL

FINISH / HT. TREAT

NAME 9910XC2 SCHEMATIC ELECTRICAL CONTROL

REFERENCE	0
ASM. NO.	QUAN.
MODEL 9910XC2	
INITIAL USAGE	

THIS IS A CAD GENERATED DRAWING.
CHANGES MUST BE MADE ON CAD SYSTEM.

A. B. DICK COMPANY
5700 W. TOUHY AVE.
NILES, ILL. 60714–4690

PART NO. 403006 SHT 3 OF 9 ISSUE 3

CADFORM DSIZE–7–88

PART NO. 403006 SHT 3 OF 9

PART NO. 403006 SHT 4 OF 9

S17
KEYBOARD
401951

MICROPROCESSOR ASS'Y.
401955
PCB 1

LCD DISPLAY
401953
PCB 2

P6 P7 P1 P4 P2 P5 P3

DOUBLES LAMP
DS1
231 BLUE
233 BLUE
5V DC

J21 P21 J20 P20

NC NC NC

GND GRN/YEL
250 BLU/RED
300 BLU/WHT
232 BLU/WHT
233 BLU
234 BLU
235 BLU
236 BLU/RED
237 BLU/WHT
238 BLU/WHT
239 BLU
240 BLU

J8 P8

12VDC POWER SUPPLY
PS1
P7 J7

253025 DOUBLE DETECT SWITCH
S18

253002 REMOTE FEED SWITCH
S19
J/P23 J/P24

J/P26
+5V
S16
COUNT SWITCH (HALL EFFECT)
253218

J/P25
L1
FEED SOLENOID
401969

ACADR12

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TOL. NOT SPEC'D:	.XXX ±.005	.XX ±.010	.X ±.015	ANGLES ±2°
SCALE NONE				

MATERIAL
FINISH/HT. TREAT
NAME SCHEMATIC, COUNTER

REFERENCE	0
ASM. NO.	QUAN.
MODEL 9910XC2	
INITIAL USAGE	

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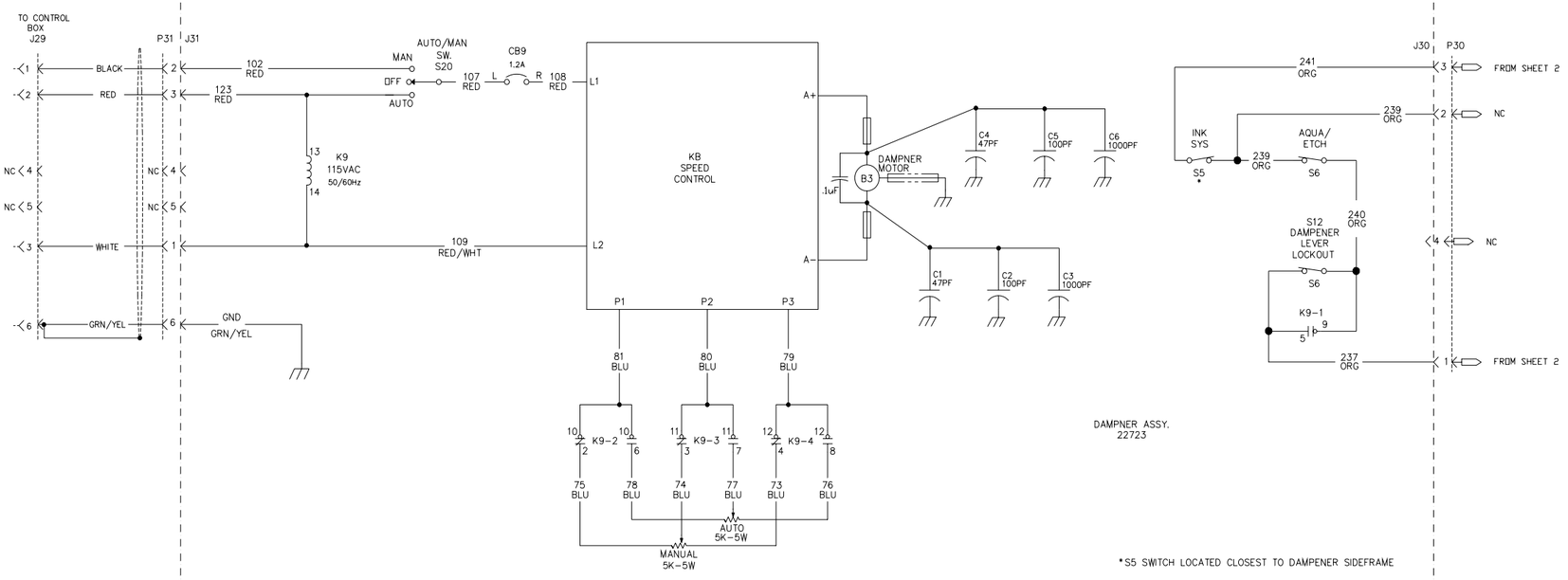
A. B. DICK COMPANY
5700 W. TOUHY AVE.
NILES, ILL. 60714-4690

PART NO. 403006 SHT 4 OF 9 REV.

CADFORM DFORM-5-90

PART NO. 403006 SHT 5 OF 9



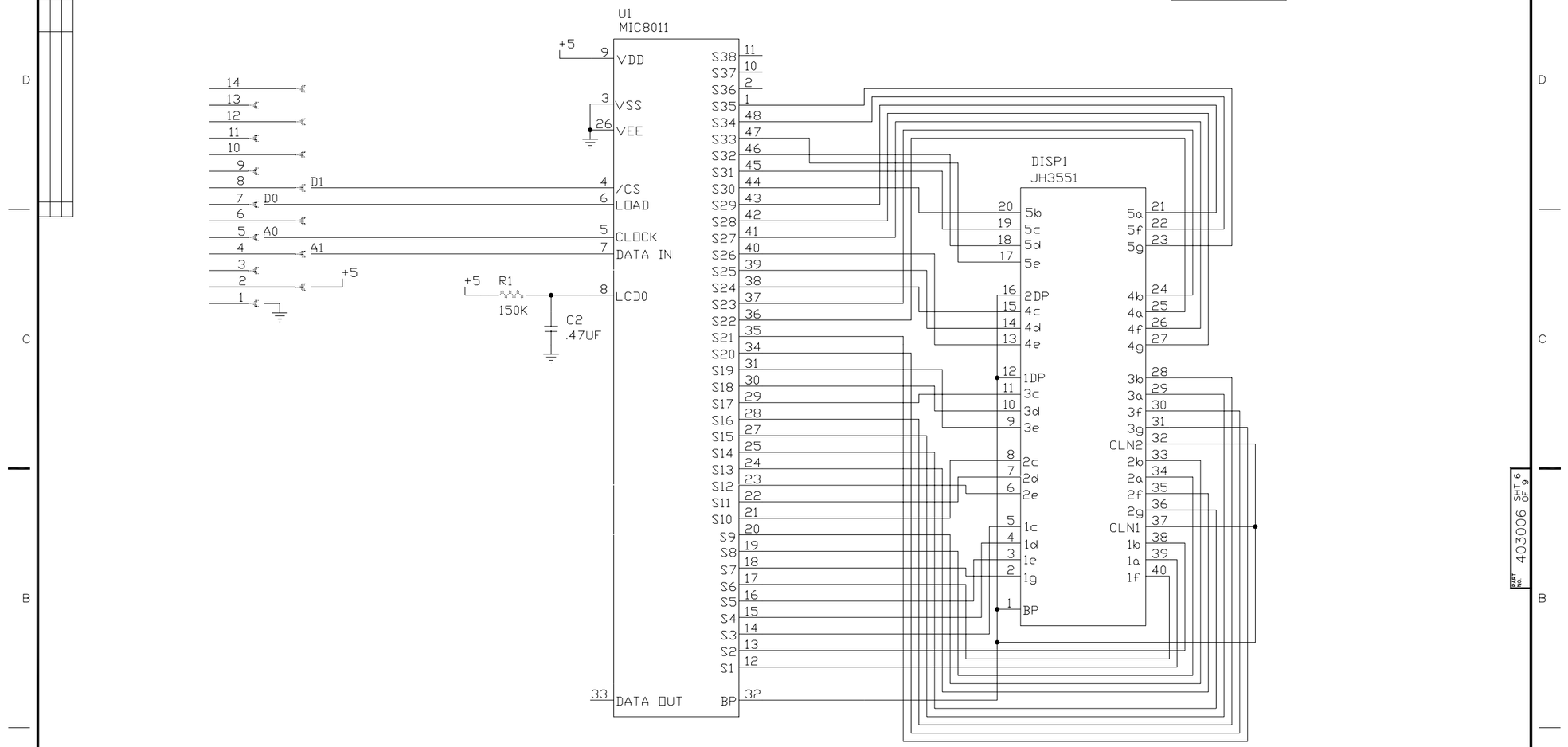
PART NO. 403006 SHT 5 OF 9

ACAD R12

SIGNED CAD-DRAWING APPROVALS WILL APPEAR ONLY ON ORIGINAL ISSUE.			REFERENCE 0 / ASM. NO. / QUAN. / THIS IS A CAD GENERATED DRAWING. CHANGES MUST BE MADE ON CAD SYSTEM.
TOL. NOT SPEC'D: .XXX ±.005 .XX ±.010 .X ±.015 ANGLES ±2°	SCALE NONE		MODEL 9910XC2 / INITIAL USAGE
MATERIAL / FINISH/HT. TREAT			A. B. DICK COMPANY 5700 W. TOUHY AVE. NILES, ILL. 60714-4690
NAME SCHEMATIC, DAMPENER			PART NO. 403006 SHT 5 OF 9 REV. 1

CADFORM DFORM-5-90

PART NO. 403006 SHT. 6 OF 9



1 Most significant digit

PART NO. 403006 SHT 6 OF 9

REFERENCE	0	THIS IS A CAD GENERATED DRAWING. CHANGES MUST BE MADE ON CAD SYSTEM.	
ASM. NO.	QUAN.		
MODEL 9910XC2			
INITIAL USAGE			

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MATERIAL

FINISH/HT. TREAT

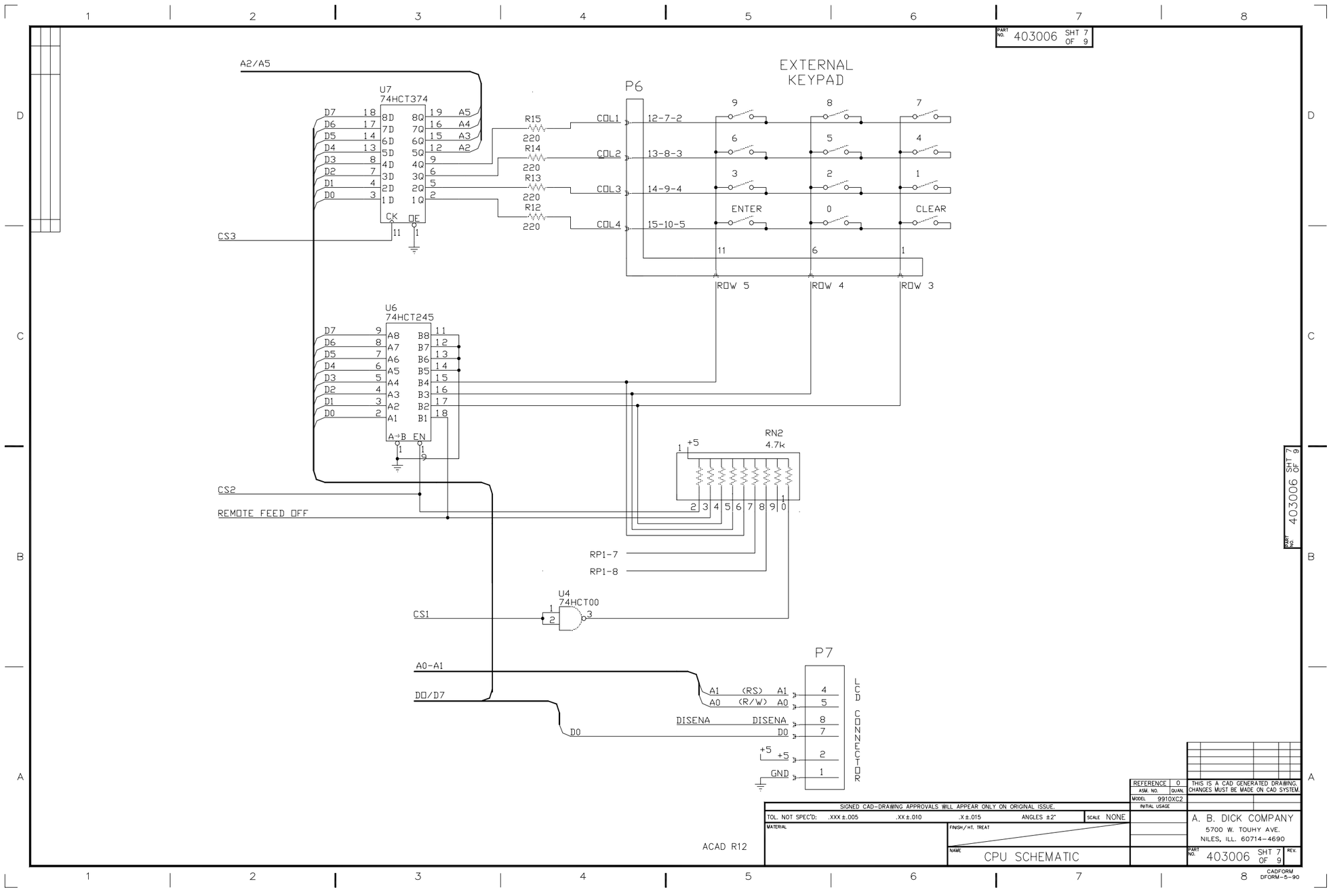
NAME DISPLAY SCHEMATIC

A. B. DICK COMPANY
5700 W. TOUHY AVE.
NILES, ILL. 60714-4690

PART NO. 403006 SHT 6 OF 9 REV.

ACAD R12

CADFORM DFORM-5-90


PART NO. 403006 SHT 7 OF 9
A2/A5
U7
74HCT374
D7 18 8D 8Q 19 A5
D6 17 7D 7Q 16 A4
D5 14 6D 6Q 15 A3
D4 13 5D 5Q 12 A2
D3 8 4D 4Q 9
D2 7 3D 3Q 6
D1 4 2D 2Q 5
D0 3 1D 1Q 2
CK OE
11 1
CS3
EXTERNAL KEYPAD
P6
R15 220
R14 220
R13 220
R12 220
COL1 12-7-2
COL2 13-8-3
COL3 14-9-4
COL4 15-10-5
9 8 7
6 5 4
3 2 1
ENTER 0 CLEAR
11 6 1
ROW 5
ROW 4
ROW 3
U6
74HCT245
D7 9 A8 B8 11
D6 8 A7 B7 12
D5 7 A6 B6 13
D4 6 A5 B5 14
D3 5 A4 B4 15
D2 4 A3 B3 16
D1 3 A2 B2 17
D0 2 A1 B1 18
A→B EN
1 19
RN2
4.7k
1 +5
2 3 4 5 6 7 8 9 10
CS2
REMOTE FEED OFF
RP1-7
RP1-8
U4
74HCT00
1 2 3
CS1
A0-A1
D0/D7
P7
A1 (RS) A1 4
A0 (R/W) A0 5
DISENA DISENA 8
D0 7
+5 +5 2
GND 1
CONNECTOR
ACAD R12
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TOL. NOT SPEC'D: .XXX ±.005 .XX ±.010 .X ±.015 ANGLES ±2°
SCALE NONE
MATERIAL
FINISH/HT. TREAT
NAME CPU SCHEMATIC
REFERENCE 0
ASM. NO. QUAN.
MODEL 9910XC2
INITIAL USAGE
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A. B. DICK COMPANY
5700 W. TOUHY AVE.
NILES, ILL. 60714-4690
PART NO. 403006 SHT 7 OF 9 REV.
CADFORM DFORM-5-90
PART NO. 403006 SHT 7 OF 9

PART NO. 403006 SHT 8 OF 9

12VDC POWER SUPPLY

PS1

BLUE/RED

BLUE/WHITE

P.E.

P1

BLUE/RED

BLUE/WHITE

+12

GND

NC

D2 1N4004

D3 1N4004

7805 DREG

C14 3300UF

C1 0.1 MFD 1KV

+5

REMOTE FEED OFF SHT.2 U6-18

R9

R17 4.7K

R8

U4 74HCT00

R7 680

Q2 2N4401

R1 1k

Q1 2N4403

R2 1k

R3 220

R6 2.2k

R4 4.7k

D1 MR852

P5

12V

FEED 'OFF' SOLENOID

N-CHANNEL FET

P2

REMOTE FEED OFF

REMOTE FEED OFF SIGNAL

+5

GND

R18 1k

C15 10UF

Z2 9.1V

R20 220

Q4 2N4401

R19 2.2k

+5V

R22 1k

Q3 2N4403

R21 1k

R23 1k

J1

A B C

J1

JUMPER AB FOR COUNTER

JUMPER BC FOR DOUBLES DETECT

U1 TL7705A

SENSE IN

/RESIN

REF RESET

CT /RESET

R11 1K

C9 .1 uf

C10 10uf

R10 680

C11 33pf

C12 33pf

XTAL 12MHZ

C13 .1uf

U2 S87C751

X1

X2

RST

P0.2/VPP

P0.1/SDA/OE-PGM

P0.0/SCL/ASEL

P1.7/T0

P1.6/INT1

P1.5/INT0

P1.4/ADC4

P1.3/ADC3

P1.2/ADC2

P1.1/ADC1

P1.0/ADC0

P3.7

P3.6

P3.5

P3.4

P3.3

P3.2

P3.1

P3.0

D7

D6

D5

D4

D3

D2

D1

D0

RP1-7

U5 X2210

/WE

RECALL

/STORE

/CS

A5

A4

A3

A2

A1

A0

I/O4

I/O3

I/O2

I/O1

D3

D2

D1

D0

D0/D7

A2/A5

A0

A1

RP2 4.7K

DISENA /CS3

CNT1 RP1-8

U1 U2 U3 U4 U5 U6 U7 U8

+5 8 24 14 14 18 20 20 8

C1 .1uf

C2 .1uf

C3 .1uf

C4 .1uf

C5 .1uf

C6 .1uf

C7 .1uf

C8 .1uf

4 12 7 7 8 10 10 3

U3 74HCT11

U4 74HCT00

U4 74HCT00

P3

COUNTERS INPUTS

CNT 1

+5

CNT 2A

GND

CNT 2B

GND

U3 74HCT11

P4

DOUBLES DETECT SIGNAL

GND

DDS

+5

U3 74HCT11

U9 74HCT138

G1

G2A

G2B

C

B

A

Y7

Y6

Y5

Y4

Y3

Y2

Y1

Y0

CS4

CS3

CS2

CS1

* NOTE1 CRYSTAL BODY SHOULD BE SOLDERED TO GROUND

ACAD R12

REFERENCE	0	THIS IS A CAD GENERATED DRAWING. CHANGES MUST BE MADE ON CAD SYSTEM.	
ASM. NO.	QUAN.		
MODEL 9910XC2			
INITIAL USAGE			

SIGNED CAD-DRAWING APPROVALS WILL APPEAR ONLY ON ORIGINAL ISSUE.

TOL. NOT SPEC'D: .XXX ±.005 .XX ±.010 .X ±.015 ANGLES ±2° SCALE NONE

MATERIAL

FINISH/HT. TREAT

NAME CPU SCHEMATIC

A. B. DICK COMPANY
5700 W. TOUHY AVE.
NILES, ILL. 60714-4690

PART NO. 403006 SHT 8 OF 9 REV.

CADFORM DFORM-5-90

PART NO. 403006 SHT 8 OF 9

DESIGNATION	DESCRIPTION	PART NO.	LOCATION
B1	DRIVE MOTOR	402844	3C7
B2	PUMP MOTOR	402145	1B3
B3	DAMPENER MOTOR	174093	5C4
CB1	DRIVE MOTOR	250051	1D3
CB2	DRIVE MOTOR	250051	1B3
CB3	PUMP MOTOR	252537	1D3
CB4	PUMP MOTOR	252537	1B3
CB5	POWER TRANSFORMER	254543	1D4
CB6	POWER TRANSFORMER	254543	1B4
CB7	POWER SUPPLY'S	254542	1D6
CB8	WORK LAMP	254726	1C6
CB9	DAMPENER	253618	5C3
F1	FUSE-DRIVE MOTOR	254730	3C4
FL1	LINE FILTER	253619	1B2
K7	DRV. MTR.-AC INPUT	253857	1B3,1D3,2B5
K8	PUMP MTR. RELAY	253857	1B2,1D2,2B3
K9	DAMPENER RELAY	253467	5C2,5B4
K10	DRIVE MTR. RELAY	253857	2B6,3C6
K11	DRIVE MTR. RELAY	253857	2B6,3C6

DESIGNATION	DESCRIPTION	PART NO.	LOCATION
SC1	SPD.CONT.-DRV.MOT.	254732	3C3
SC2	SPD.CONT.-DAMPENER	83706	5C4
T1	POWER TRANSFORMER	401678	1C5
TS1	115/230V TERM.STRIP	254500	1D3,1D7
TS2	TRANS. TERM. STRIP	401678	1C4
TS4	MOTOR TERM. STRIP	254728	1B4,3D4,3D6

DESIGNATION	DESCRIPTION	PART NO.	LOCATION
L1	FEED SOLENOID	401969	4A5
PS1	CNTR. PWR SPLY 12V	402828	4B1
PS2	CONT. PWR SPLY 24V	402825	2A1
S1	PUMP MOTOR	253953	2D3
S2	DRIVE MOTOR	253953	2D2
S3	DRIVE MOT. START	253365	2D4
S4	GUARD BLKT CYL	253211	2D8
S5	GUARD INK	253211	2D7
S6	GUARD AQUA	253211	2C7
S7	RESERVED	———	———
S8	CD-GUARD	253211	2C7
S9	CD-GUARD	253211	2C7
S10	CD-GUARD	253211	2D8
S11	DISENG. HANDWHEEL	253211	2C8
S12	DAMP. LEVER INTLK.	253211	2C8
S13	EMERGENCY STOP	253475	2C8
S14	MAIN POWER	253952	1C2,1B2
S15	RESERVED	———	———
S16	PAPER COUNT	253218	4B7
S17	KEYBOARD	401951	4D2
S18	DOUBLES DETECT	253025	4B3
S19	REMOTE FEED	253002	4A3
S20	DAMPENER POWER	254508	5C3

CABLE ASM'S./HARNESSES-MACHINE	
CABLE ASM. REMOTE FEED	25658
HARNESS - REMOTE FEED	400887
CHAIN DELIVERY	402830
GUARD, OPERATOR SIDE	402831
LOW VOLTAGE DC CIRCUITS	402846
CONTROL PANEL TO SENSORS	402847
CABLE ASM. DAMPENER POWER	402848
CONT. BOX TO CHAIN DELIVERY	402856

CABLE ASM'S./HARNESSES-CONT. BOX ASM.	
HARNESS - 230 VAC	402858
HARNESS - 115 VAC	402859
HARNESS - LOW VOLTAGE	402879
HARNESS - P4 TO P27	402863
DRIVE MOTOR RECPT.	402864
PUMP MOTOR RECPT.	402865
CORD ASM. - POWER	402866
HARNESS - P5 TO P29	402868

PRINTED CIRCUIT BOARDS		
PCB1	* COUNTER BOARD	401955
PCB2	* LCD DISPLAY	401953
PCB3	OPER. SPEED CONT.	25525
PCB4	SNUBBER BOARD	402873
PCB5	CONTROL BOARD	402843
PCB6	DAMPENER CONTROL	402837
* PART OF 401959 COUNTER ASM.		

PART NO. 403006 SHT 9 OF 9

ACAD R12

SIGNED CAD-DRAWING APPROVALS WILL APPEAR ONLY ON ORIGINAL ISSUE.

TOL. NOT SPEC'D: .XXX ±.005 .XX ±.010 .X ±.015 ANGLES ±2° SCALE NONE

MATERIAL

FINISH/HT. TREAT

NAME COMPONENT DESCRIPTION

REFERENCE 0 ASM. NO. QUAN.

MODEL 9910XC2

INITIAL USAGE

THIS IS A CAD GENERATED DRAWING. CHANGES MUST BE MADE ON CAD SYSTEM.

08.15.95

04.05.95

A. B. DICK COMPANY
5700 W. TOUHY AVE.
NILES, ILL. 60714-4690

PART NO. 403006 SHT 9 OF 9 REV. 3

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Service Reference Manual Revision Log

Date	Description
January, 1996	Manual revised with addition of Motor Control Speed Adjustment procedure, and precautionary note for Chain Delivery Guard Microswitch Adjustment procedure.
June, 1997	Manual revised by renumbering of pages based on chapters. Also added Control Box - Line Voltage Input Changes, and Pump Motor Pulley Change.

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