INSTRUCTION MANUAL
for
THOMSON
NATIONAL PRESS COMPANY

DUAL MICROMETER
CUTTERS AND CREASERS

General Offices and Factory
THOMSON NATIONAL PRESS COMPANY
FRANKLIN, MASSACHUSETTS

Sales Offices
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Prepared by
The Thomson National Press Company

Price Ten Dollars

FOREWORD

This Instruction Manual has been prepared to give you helpful information on the installation, operation, care and maintenance of Thomson National Cutting and Creasing Presses, so that you may operate them at maximum efficiency and with a minimum of maintenance.

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Your Thomson National Cutting and Creasing Press is skillfully designed and expertly constructed of high grade materials, and will easily meet all the service demands of normal use.

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To insure the successful operation of the machine, it must be operated within its load limitations, using proper dies and makeready procedure. The machine should be kept well lubricated, reasonably clean, and free from foreign matter.

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Operators are urged to read this manual thoroughly before operating the machine. Throughout the manual, warnings are included as a part of service and operating procedures. Warning signs are also placed on the machine to remind operators of hazards resulting from improper procedures. The purpose is to prevent accidents and establish safe operating practices.

THIS MANUAL IS SET UP FOR YOUR CONVENIENCE

This Instruction Manual is prepared in logical sections, or chapters, to make it easy for you to find specific information for reference after your first reading.

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On the next page you will find a Table of Contents. Section I gives a general description of the main parts of the Thomson Cutting and Creasing Press.

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Section II gives complete information on unpacking, and setting up the machine with relation to the drive, feed and delivery areas, the floor space required, and lubrication recommendations.

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Section III explains operation sequences relative to makeready, rate of operation, die construction, press loads, and safety.

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Section IV explains the care and maintenance of the press as well as operational difficulties.

TABLE OF CONTENTS

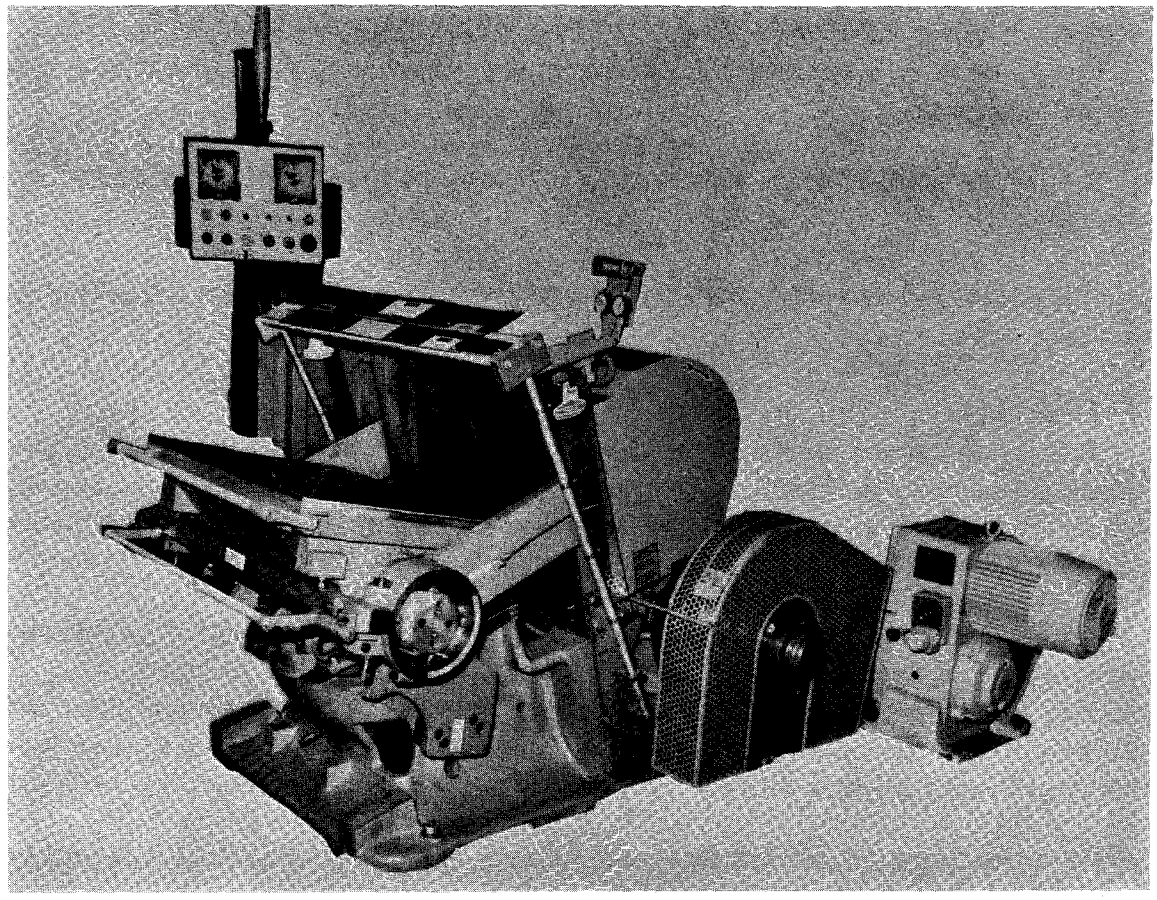
SECTION I — GENERAL DESCRIPTION

SECTION II — INSTALLATION

SECTION III — OPERATION

SECTION IV — CARE, MAINTENANCE AND OPERATIONAL DIFFICULTIES

— SEE MAKEREADY INSTRUCTION MANUAL FOR ADDITIONAL INFORMATION —



SECTION I
GENERAL DESCRIPTION

The Thomson Cutting and Creasing Press is a hand-fed Platen Press designed to be used with steel rule dies for the manufacture of paper, corrugated and fibre boxes, display cutouts, paper toys, gaskets, greeting cards, automobile door and body panels, decals, and many other products of the paper and plastic industries.

These machines are also used with electric die heaters for roll leafing, embossing and hot die cutting.

The words PLATEN or BRIDGE as used in this manual are synonymous, and refer to the same part.

The letters D.M. as used with this manual are abbreviations for the words Dual Micrometer.

The letters A.C. as used with this manual are abbreviations for the words Air Clutch.

STYLES

These popular machines have been constructed in many designs. Each style change exemplifies advancements made in machine design and construction, utilizing the best in materials and methods and resulting in improved machine productivity, safety, maintenance, and operation.

The Style 11-8-6 AC-DM machine is constructed with cast steel bridge and dual micrometer impression control, but has compound gearing. It is air clutch operated, having a live flywheel, and designed for continuous operation, manual start with automatic stop, automatic start and stop with adjustable dwell in the open position, and dwell in the closed position as an option. This machine is crank action in design.

The Style 11-8-7 AC-DM has the same features as the Style 11-8-6 AC-DM with the addition of a power operated adjuster bar.

The Style 10 machine is constructed with a steel frame, cast steel bridge, dual micrometer impression control and any style assembly and operating modes described above.

SPECIFICATIONS

Thomson AC-DM Crank Action presses are constructed in five basic sizes, 22 x 32, 28 x 41, 33 x 47, 38 x 54, and 44 x 66. All machine sizes indicated are inside chase dimensions.

MAIN PARTS

The main parts of the machine are the frame, bridge, connecting rods, flywheel, adjuster bar, pinion shaft, main shaft, bridge shaft, and gear wheels.

DISTINGUISHING OPERATING FEATURES

The bridge makes a direct, square, and theoretically perfect impact upon the form, sliding to the frame face, free and unrestrained with perfect parallelism.

Adjustable bridge lugs are provided for setting the face of the bridge parallel with the face of the frame. In an emergency where something falls into the press, the bridge lugs will slip on impression preventing unnecessary breakage and maintenance.

The face of the frame is inclined forward from the vertical, eliminating the need for frisket fingers, as the processed sheet lies naturally against the bridge on this inclined angle.

The adjuster bar should always be released when material is not being processed and the machine is in operation. This will eliminate dulling of the rule in the die and damaging of the cutting plate.

A hard steel cutting plate should always be used on the press with an impression, whereby the steel rule in the die only contacts the surface of the plate and does not cut into it.

THE MACHINE WILL BE ABUSED AND OVERLOADED IF SOFT BRASS OR STAINLESS STEEL PLATES ARE SUBSTITUTED, OR IF RUBBER MAKEREADY BLANKETS ARE USED UNDER THE HARD CUTTING PLATE.

All dies must be properly located so that the press load is balanced relative to the connecting rod pull. If this is impossible, then bearers must be used to balance the load and prevent tipping of the bridge, causing slippage of the bridge lugs. *(See Makeready Instruction Manual.)*

SECTION II
INSTALLATION

UNPACKING

The complete machine comes with grease on exposed surfaces to protect it from corrosion, and bolted to heavy skids to protect it from damage. The chase, drive, and compressor, complete with motor tank and bracket, are crated separately.

For export shipment the machine is boxed.

SELECTING LOCATION

Leave the press on skids until it is moved into its permanent position. See the floor plan for the area required and distribution of weight. A solid foundation is recommended for the machine and it should be located over building beam supports. Proper consideration of working space around the installation area and good lighting for the operator are important factors in selecting a location.

WARNING: Check the capacity of the lifting equipment in your plant before moving your new press.

LEVELING

Remove the skids, place level on pinion shaft, and drive wedges under the frame corners until a level position is obtained. *See Figure 1.* Shim, remove the wedges and secure the press to the floor.

CAUTION

THE PRESS MUST BE MAINTAINED IN A LEVEL POSITION SO THAT THE OIL IN THE MAIN SHAFT BEARING DOES NOT FLOW TO ONE SIDE, AND THE SIDES OF THE BRIDGE DO NOT BEAR ONLY ON ONE SIDE OF THE FRAME ROCKER SEATS.

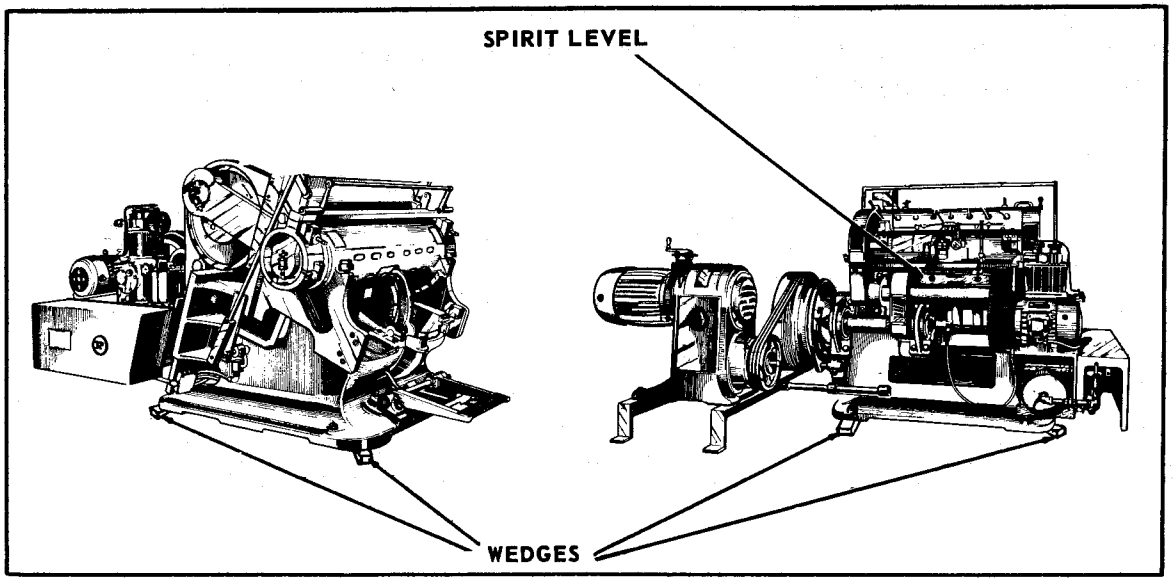


Figure 1

VIBRATION PADS

If vibration pads are to be used, insert them instead of the shims under each of the machine base areas at the time the wedges are removed.

CLEANING PARTS

Uncrate all parts and thoroughly clean with kerosene to remove all dirt, foreign matter and protective coatings. Check all parts of the machine to see that they are free from foreign matter such as wood, chips, and possibly nails that may have become lodged in holes, pockets, or gear teeth.

Check and clean out all oil holes to make sure they have not become obstructed with dirt, grease, or paint.

ASSEMBLY OF PARTS — STYLE 11-8-6 AIR CLUTCH MACHINES

Bolt air compressor bracket assembly to left-hand back of press. Connect air line pipe from press to air reservoir tank.

Assemble to back of frame; rails for variable speed drive. Mount drive, adjust belts for proper tension, and install belt guard.

CAUTION

TURN THE PRESS OVER VERY SLOWLY WITH THE FLYWHEEL RUNNING IN THE PROPER DIRECTION TO MAKE SURE EVERYTHING FUNCTIONS SATISFACTORILY BEFORE APPLYING FULL POWER. THE MAIN GEARS SHOULD REVOLVE AWAY FROM OPERATOR IN DIRECTIONS AS INDICATED BY ARROW ON THE SIDE OF THE GEAR.

WIRING — ALL MACHINES

The machine is equipped with a master control console and panel box completely wired at the factory. The plug from the control console need only be plugged into the receptacle on the panel box.

WARNING: This plug should never be engaged or disengaged with the power on.

Only qualified personnel should install and service electrical equipment.

WARNING: Never connect incoming electrical power to the fuse holders. This will prevent the disconnect switch from turning off the power when the switch is in the off position.

It is necessary, in the customer's plant, to have the power leads wired to the fusible disconnect switch in the control panel, and to reconnect the air compressor motor and drive motor to the press wiring.

A separate wall disconnect switch should be installed for each machine.

WARNING: Disconnect power and stop flywheels before applying any lubrication.

LUBRICATION

WARNING: Before placing the machine in operation, it should be thoroughly lubricated.

Make sure that oil holes are not clogged with dirt, paint, or any other foreign matter.

Thomson Cutting and Creasing Presses have bearings that work under relatively slow speeds and extreme pressures. Proper lubrication affects the life of a press, and is one of the most important items towards its proper operation. Better results will be obtained by applying a small quantity of lubricant frequently, rather than a large supply at long intervals. Recommended lubricants are shown on metal plates or decals attached to each machine.

Recommend SAE 30 oil in lubricating system.

Recommend SAE 30 oil in air compressors.

Recommend SAE 10 oil in air line lubricators.

Recommend EP 1 Grease in flywheel bearings on compound geared machines.

Recommend SAE 30 oil in Micro-Fog Lubricators.

AIR COMPRESSOR

Before starting compressor, check for full oil level in crank case. *(Maintain level between the two marks on the gauge.)* **NEVER** allow oil to fall below the lower mark.

Check Compressor for turning in right direction with power.

For temperatures of 32° to 80°F. at point of installation, a high quality turbine oil or compressor oil equal to a viscosity of SAE 30 is recommended. See lubrication guide plate on back of the press.

Change oil every 500 hours of operation. If oil becomes dirty or diluted before 500 hours, it should be changed. Crank case should be thoroughly cleaned every time the oil is changed.

ELECTRIC MOTOR OR VARIABLE SPEED DRIVE

All lubricating points must be checked and lubricated in accordance with manufacturer's recommendations furnished with motor or drive.

MAIN SHAFT BEARINGS

Maintain oil level to marking on eye level gauge by filling two main shaft bearing reservoirs as necessary. Drain and replace oil when it shows signs of dirt or discoloration.

CONNECTING ROD BUSHINGS IMPRESSION SLEEVE BEARINGS

These bearings are lubricated by hand. Alemite fittings should be fed grease four times for an eight hour shift.

GEARS

New Machine

Important: Before starting up a new machine, make sure all gear teeth are well lubricated. Lubricate manually if necessary. Never operate the machine with the gears dry.

Manual Lubrication

Apply recommended lubricants if manually lubricated. Check daily.

Brush Lubrication — Gears

Brushes are fed by the automatic lubricating system. Maintain oil level in oiling system and check occasionally oil film on gear teeth.

Micro-Fog Lubrication — Gears

Maintain oil level in reservoir using SAE 30 oil. Set air pressure between 10 and 20 pounds, depending on number on discharge points. Set flow to 30 drops per minute.

The bypass adjusting screw adjacent to the outlet should be set closed and the oil feed adjusting screw on the inlet set to give the desired lubrication. Approximately 10% of oil passing sight feed dome becomes available for lubrication.

Gear Thrust Pads

The small oil reservoirs that lubricate the inside thrust pads are fed by the oiling system and should have sufficient oil level at all times.

The outside pads are lubricated by the oiling system.

AIR LINE LUBRICATOR

Keep filled with SAE 10 oil. The purpose of this lubricator is to protect the walls and packings in the air system from rusting and drying out. Set for wide open.

ANTI-FRICTION PILLOW BLOCKS

Once every six months apply three-tenths ounce of high quality lithium base grease to bearings having model numbers 108 through 207 and PB900, and one-half ounce of grease to bearings having model numbers 208 through 307. CAUTION: EXCESS QUANTITY OF GREASE WILL CAUSE BEARINGS TO RUN WARM.

FLYWHEEL BEARINGS

The sealed bearing reservoir has been filled with 28 ounces of lubricant on the 26 inch air clutch and 14 ounces of lubricant on the 24 inch air clutch at the factory. At 1000 hour intervals, add not more than three-tenths ounce of EP 1 grease. For unusual idling, grease every 100 hours. Refer to chart attached to the press.

MOVING SURFACES THAT WORK FACE TO FACE

Apply oil or grease on all surfaces that have another surface working against them or bearings that cannot be lubricated by the automatic oiling system.

SHUTTING DOWN MACHINE

When shutting down a machine for a period of several weeks, oil all bearings to seal them and to shut out dirt.

— NOTES —

INSTRUCTIONS FOR LUBRICATOR TYPE "P" AND "R"

The bijur lubricating system consists of a pump unit which forces oil through a branched tubing line to Meter-Units, one of these being located at or near each bearing. The pump measures the total quantity of oil fed to the system and the Meter-Units proportion this quantity according to the individual requirements of the bearings.

OIL

Use only a clean mineral oil of SAE 30 viscosity, as recommended by the machine manufacturer. NEVER use so-called dripless oil or oil containing graphite, soap, or other foreign substance. Refill reservoir before oil level drops to the bottom of oil level gauge.

STARTING UP A NEW MACHINE

Fill oil reservoir. To fill lines and lubricate bearings before starting new machine, pull instant feed button to upper stop and release to allow pump to discharge. Repeat for 10 to 20 strokes or until oil is in evidence at all bearings.

PRESSURE

When machine is in operation, the lubricator pump forces a metered quantity of oil into the distributing system, building up pressure at predetermined intervals. Machines are equipped with either pressure gauges or oil flow indicators showing periodic pressure use and flow of oil.

LUBRICATOR

Suspended from the lubricator cover is a small piston pump operated from the machine through a rotating *(cyclic) (Type "P")* or oscillating *(Type "R")* shaft. *See Figure 2.* The lubricator pump is of the spring discharge type. Descent of piston will be slower with a cold machine and faster as the temperature rises. This variation in discharge time automatically compensates for changes in oil viscosity and temperature, assuring a constant volume of oil being fed to the bearings. The pump stroke is set by the machine manufacturer to suit each type of machine. No change should be made

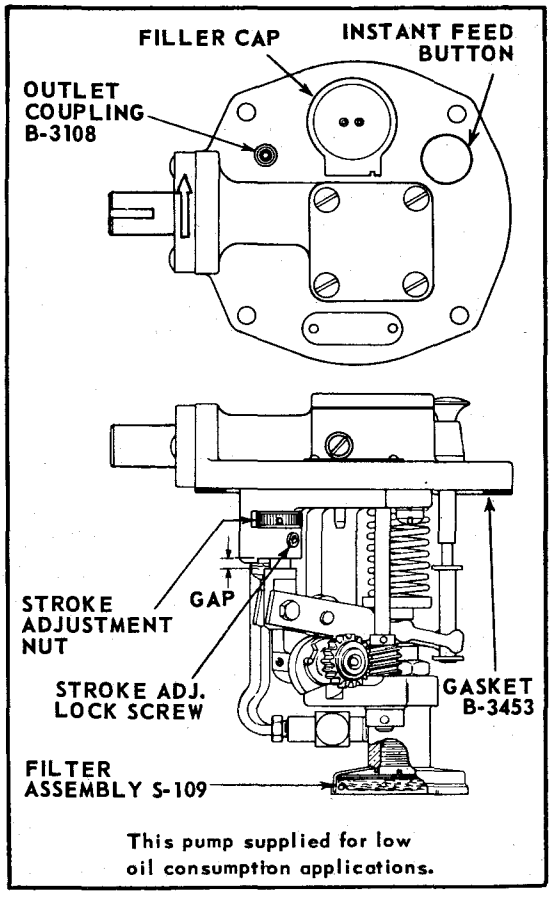


Figure 2

unless there is a definite necessity. Lubricator is arranged for 2 cu. cm. maximum to 1 cu. cm. minimum discharge per shot. To change setting, loosen lock screw. Reduce gap of pivot support to decrease discharge, and increase gap to increase discharge. Retighten the lock screw after desired change setting.

INSTRUCTIONS FOR LUBRICATOR TYPE "A-A"

The bijur lubricating system consists of a pump unit which forces oil through a branched tubing line to Meter-Units, one of these being located at or near each bearing. The pump measures the total quantity of oil fed to the system and the Meter-Units proportion this quantity according to the individual requirements of the bearings.

OIL

Use only a clean mineral oil of SAE 30 viscosity, as recommended by the machine manufacturer. **NEVER** use so-called dripless oil or oil containing graphite, soap, or other foreign substance. Refill reservoir before oil level drops to the bottom of oil level gauge.

STARTING UP A NEW MACHINE

Fill oil reservoir. To fill lines and lubricate bearings before starting new machine, push feed button *(Figure 3)* with press in operation and Cam Setting at #1 with Bypass valve open.

PRESSURE

When machine is in operation, the lubricator pump forces a metered quantity of oil into the distributing system, at 45 pounds pressure and at predetermined intervals. Machines are equipped with oil flow indicators *(or pressure gauges)* showing periodic pressure use and flow of oil.

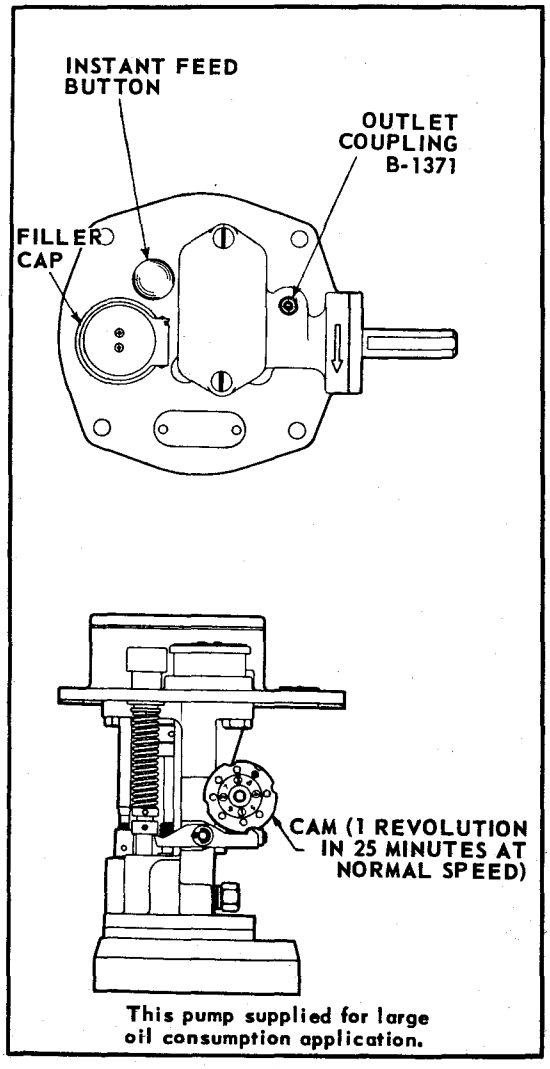


Figure 3

A filter disc at pump inlet protects the lubricating system from chips and dirt. It is recommended that the filter disc be inspected every six months. If it is not clean, replace it with a new one.

CAM SETTING, CYCLE TIME, AND DISCHARGE

Discharge per cycle is independent of lubricator drive speed.

Discharge per hour is proportional to lubricator drive speed.

Cycle time is inversely proportional to lubricator drive speed.

Discharge figures *(below)* are at normal drive speed and with By-Pass valve closed. This valve may be opened to reduce discharge to any desired amount down to 50% of figures shown.

Design	Cam Setting No.	Cycle Time	Discharge per Cycle	Discharge per Hour	Time for 1 Pint Discharge
TYPE "A-A"	8	6¼ Min.	32 CU CM	300 CU CM/HR	1½ Hrs.
	7	6¼ Min.	21 CU CM	200 CU CM/HR	2½ Hrs.
	6	6¼ Min.	14 CU CM	140 CU CM/HR	3½ Hrs.
	5	6¼ Min.	10 CU CM	90 CU CM/HR	5½ Hrs.
	4	25 Min.	21 CU CM	50 CU CM/HR	9½ Hrs.
	3	25 Min.	14 CU CM	35 CU CM/HR	14 Hrs.
	2	25 Min.	11 CU CM	25 CU CM/HR	19 Hrs.
	1	25 Min.	8 CU CM	20 CU CM/HR	24 Hrs.

1 CU INCH = 16.4 CU CM 1 CU CM = 30 Drops (Approx.)

METER UNITS

Meter-Units are self-contained, non-adjustable units. Letters stamped on them indicate the type and numbers the flow rate — the higher the number, the greater the flow. The Meter-Units offer such high resistance to oil flow that they are the controlling factor in oil distribution. Due to this, there is practically no variation in oil delivery, normally caused by flow resistance in the tubing, variation in bearing wear, or initial fit. Check Valves in the Meter-Units prevent reverse flow, and maintain the tubing full of oil at all times. A Meter-Unit may be mounted directly at a bearing, at an adjacent junction or a tee head.

Two types of metering units are used and they are not interchangeable. Use MJB metering units on the oscillating Type R pump and FJB on the cyclic Type P or Type A pumps.

INSPECTION AND SERVICING

With the pump feeding to the system, inspect for evidence of oil at the bearings; also, ascertain that there are no leaks at the tubes or connections.

INSPECTION AND SERVICING

With the pump feeding to the system, inspect for evidence of oil at the bearings; also, ascertain that there are no leaks at the tubes or connections.

IF CONDITIONS INDICATE THAT ALL BEARINGS ARE GETTING INSUFFICIENT OIL, INSPECT FOR:

1. Low oil level in reservoir. If the reservoir has a mercury switch, the press automatically stops or an indicator light shows a warning.
2. Broken or cracked tubes or loose connections. Wipe off tubes and connections, and watch for leaks. When replacing a tube, see that it is properly clipped to prevent vibration.
3. Flattened lubricator pump outlet tube.
4. Clogged lubricator pump filter. Remove filter disc and replace with a new one. Check every six months.
5. Dirt in reservoir.

IF ONE BEARING ONLY IS GETTING INSUFFICIENT OIL, INSPECT FOR:

1. Flattened oil tube or loose connection to the tail pipe feeding this bearing.
2. Slow feeding Meter-Unit. Make sure oil reaches inlet of Meter-Unit when pump is feeding; also, check rate of feed with Meter-Unit connected so as to drip free. Should there be any question as to the rate, compare it with a Meter-Unit of the same rate number on another part of the machine. If Meter-Unit is feeding a proper quantity in accordance with its rate number, and an increased feed is desired, use same type and next higher rate number. Tee Meter-Units are replaced complete with head. Never disassemble a Meter-Unit or drill it out, as this will ruin its operation. Do not try to test Meter-Units by blowing through them. REMEMBER oil flows through Meter-Units very slowly, and IN ONE DIRECTION ONLY, as indicated by arrow plainly stamped on each Meter-Unit.

Detailed service instruction will be found at the end of the parts catalogue for each machine.

SECTION III
OPERATION

DIE LOADS AND PRESS CAPACITY

Years of research and testing have been performed by Thomson National Engineers on forces required to die cut, crease, or emboss all types of sample material.

The maximum tonnage recommended by various manufacturers of cutting and creasing presses can become a confused and misunderstood statement when a comparison of machines is made unless the basis used by each company is defined and understood.

LOAD RECOMMENDATIONS

In order to eliminate unnecessary maintenance and breakage of presses, a free service of printed recommendations for your particular materials and machines is offered.

Please forward to our factory at Franklin, Massachusetts a 6" square sample of your material together with the size, style, and serial number of your machines, requesting our detailed recommendations as to die construction, maximum inches of rule in die, and machine recommendations.

DIE LOADS

Cutting and creasing loads can be determined by testing a sample board with a one-half inch square die composed of rule selected for the sample board. A special laboratory press gives a direct reading in pounds. This test takes into consideration board grain, displacement and sufficient stripping material load.

The resulting force figured for one inch of rule divided into the selected tonnage for the press is the recommended inches of rule in the die.

The recommended tonnage for each Thomson Press is the die load selected from years of field experience to give the minimum of maintenance.

PRESS LOADS

The total press load cannot be predetermined, but would have to be measured by a strain gauge attached to the machine. It is a summation of the following loads created by variable factors:

1. Load created by die imperfections such as:
   A. Dull cutting rule of unequal height.
   B. Poor die design, specifying cutting rule of incorrect height, bevel, or thickness, or incorrect height of creasing rule, lumber, or stripping material.

2. Load created by poor makeready that is paddy or has improper leveling or spotting up.
3. Load created by material variations caused by changes in moisture content, grain, or thickness.
4. Excess load created by careless micrometer setting of the cutting impression.
5. Load created by a worn machine condition and natural bending or elongation of highly stressed parts.
6. Load created during cutting and creasing of material. This is the selected load used as a basis for Thomson recommendations.

The total press load will vary with the above conditions and has been found to be 3 times the recommended die cutting load. A Thomson press with a die load recommendation of 100 ton could be equivalent to another manufacturer's press load recommendation of 300 ton.

PLATEN PRESS SAFETY

SAFE PLATEN PRESS OPERATION — THE USER'S RESPONSIBILITY

This section of the Instruction Manual is not intended as a Safety Code. Its purpose is to alert persons associated with platen presses of the importance of establishing safe operating and maintenance procedures.

Throughout this manual warnings have been inserted calling attention to safe practices and procedures. Day to day safety is a vital part of everyone's job. A press accident can result in loss of production, damage to the press, loss of a skilled operator and breakdown of shop morale.

Make every effort to keep your presses safe for production. Daily press inspections, over and above maintenance check, of all devices and brakes is a good way to start.

GUARDING THE "POINT OF OPERATION"

"Point of Operation" is that part of the platen press where stock is actually inserted and maintained during any process of cutting, creasing, embossing, or other necessary operation. The use of proper point of operation devices is considered to be the greatest single factor in the control of platen press accidents.

It must be the responsibility of the employer to provide and insure the usage of properly applied and adjusted devices on every operation performed on a platen press consistent with the dies being used, with the feeding methods being used, with the type of stroking being used, or other features unique to the operation, so as to provide maximum protection to the operator for that specific operation.

SAFETY DEVICES

The following Safety Devices are provided with your press, and are required for proper operation.

1. Wrap Around Auxiliary Safety Device

Prevents or stops normal stroking of the press, or both, if the operator's hands are placed in the point of operation as the platen closes. The chase or die should not be removed except when this device is placed in its back safety position, causing the platen to become inoperative. This device is equipped with redundant switching and failure indication lights for effective control reliability.

WARNING: This Auxiliary Safety Device must be set and maintained with its upper tube or bar not less than nine (9) inches from the true face of the press frame and with less than one-half inch movement to actuate the brake.

2. Platen Stop Bar

Prevents or stops normal stroking of the press, or both, when activated by the operator's hands, arms or body.

MANAGEMENT SAFETY TIPS

1. Make certain that press operators are trained and instructed in the safe method of working and insure adequate supervision for following correct operating procedures.

2. Set up a program of press inspection. Keep a record of braking distances of platen at maximum speed of 30 impressions a minute. Platen must stop four (4) inches from the face of the frame when the wrap around is actuated as the face of the platen passes under it.

3. Establish a preventive maintenance program.

4. Make frequent evaluation checks of all press safety devices during actual production runs. Correct any unsafe condition before resuming operation.

5. Provide a clean, safe, uncluttered area around each press.

6. Stop the press immediately when a malfunction is reported and correct before resuming operation.

7. Establish, publish and enforce a firm policy of safety regulations.

8. Take immediate action to prevent a recurrence of all "close calls" before they become accidents.

9. Never change wiring.

10. Never change air piping.

11. Never substitute component parts.

12. Dies and stripping material should be checked and maintained for ease of press operator.

PRESS OPERATOR'S SAFETY TIPS

1. Operator not to operate press with any malfunction.

2. Make a pre-operation check of all operating controls, safeguarding devices, bottom and side sheet or material guides, alert signals, die and material being worked.

3. Never attempt to correct or remove misfed sheets before stopping the platen in the fully open position. Report die trouble to Supervisor.

4. Never operate, service or adjust the press, or install dies without proper understanding of the instructions in the Instruction Manual.

5. Never sit on, stand on or bend over the platen with the flywheel turning.

6. Never make ready or set bottom guides before stopping the motion of the flywheel.

7. Whenever possible, use bottom and side guides that are held in position by bolts or screws, not glued on.

8. Obey alert or warning signals on the press.

9. Stop machine if it malfunctions. Report any questionable operation, unusual action, unsafe condition or improper maintenance to the proper persons.

10. Whenever possible, locate small size dies in the upper portion of the frame face and use bearers on each corner of the platen. This eliminates the need to feed into the center of the platen.

11. When changing setting of press controls for a different mode of operation, test the machine cycle to be sure it operates as expected. Locking type selector switches should be adjusted by an authorized person only and keys removed after setting to prevent unauthorized change.

12. Check the work area to be sure it is free of objects that could cause one to slip or trip.

13. Wear proper personal protective equipment specified by the employer.

14. Shut off power to the press when it is not in use.

15. Never talk to another person while feeding the press.

16. Never reach over, under or around press safety devices and never try to bend, check, modify or remove point of operation safety devices.

17. Develop a sense of personal safety awareness. Observe all safety regulations. Be on the lookout for hazardous conditions and discuss control of them with your supervisor.

18. Whenever possible, remove steel chase from the frame and use chaseless dies allowing clearance above the die between the face and platen on impression.

19. Remove rings from fingers and loose clothing that could get caught in moving parts of the machine.

CAUTION

AIR LINE FILTER

Drain water and residue whenever shown in the reservoir if not equipped with an automatic trap.

CAUTION

AIR TANK

The valve located on the bottom of the air tank should be opened about once a week to draw any water that has collected, if not equipped with an automatic drain valve.

AIR LINE LUBRICATOR

Keep filled with SAE 10 oil. The purpose of this lubrication is to protect the walls and packings in the air system from rusting and drying out. Adjustments on page 13. and 00.

CAUTION

BRIDGE CAM WELL

Automatically lubricated machines have the bridge cam lubricated by the oiling system. The bridge cam well should be kept drained at all times, allowing fresh, clean oil to be fed to the cam bearing. The bridge cam well should be kept clean preventing unnecessary damage and maintenance.

IMPRESSION ADJUSTMENTS — DUAL MICROMETER DESIGN

The impression is adjusted by the dual micrometer control whereby each side of the bridge is adjusted separately. This allows for a more accurate and faster makeready, reducing starting time to a bare minimum.

This is accomplished by first loosening the locking bolts on the impression sleeve housing. *(Fig. 4)* Then, loosen the impression worm shaft lock bolt. *(Fig. 5)* The impression can now be advanced by turning the wormshafts counterclockwise, or decreased by turning the wormshafts clockwise. *(Fig. 6)* Turn the wormshafts one division of the micrometer collar until the cutting rule cuts the sheet on a light impression. *(See makeready).*

WARNING: Never advance one side of the bridge ahead of the opposite side more than 0.015", or 1/64".

DO NOT PACK UNDER THE CUTTING PLATE IN PREFERENCE TO ADVANCING IMPRESSION BY MICROMETER ADJUSTMENTS.

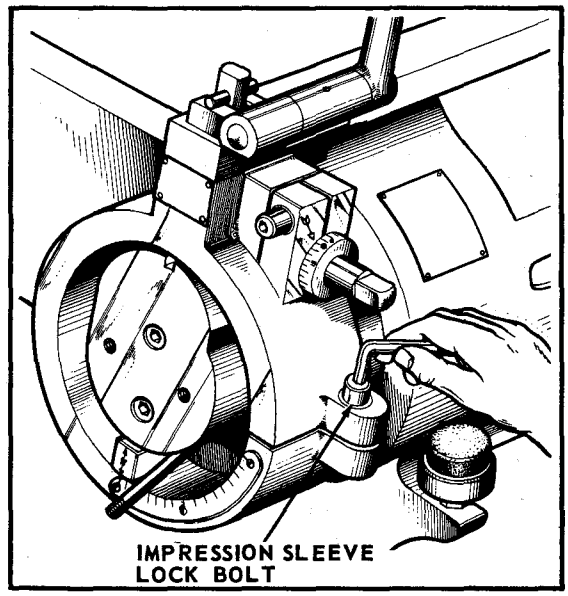


Figure 4

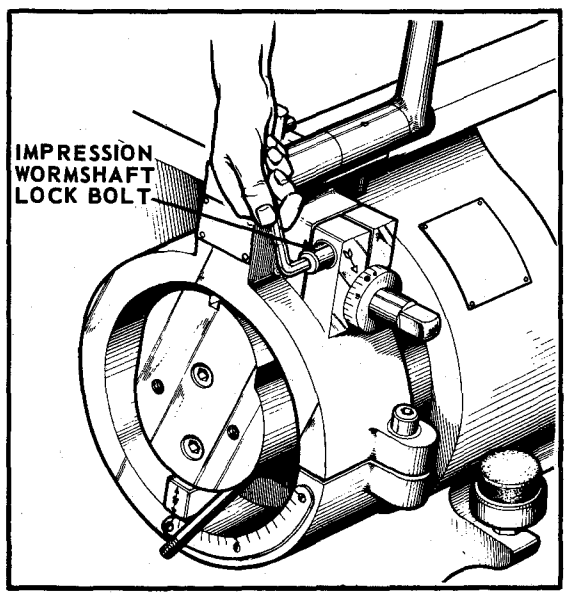


Figure 5

IMPRESSION MEASUREMENTS

Please refer to impression measurements sheets at the end of this book giving information on the amount of increment between each indicator marking, as well as the amount of impression throw-off.

The throw-off information is desirable when embossing or die cutting thick material. Maximum throw-off is necessary to prevent marking of the sheet.

RULE HEIGHT

Dual micrometer equipped presses are furnished with a 3/16" filler plate which must be used under the hard cutting plate for 0.937 inch high cutting rule. When using 1.125 inch high cutting rule, remove the 3/16" filler plate.

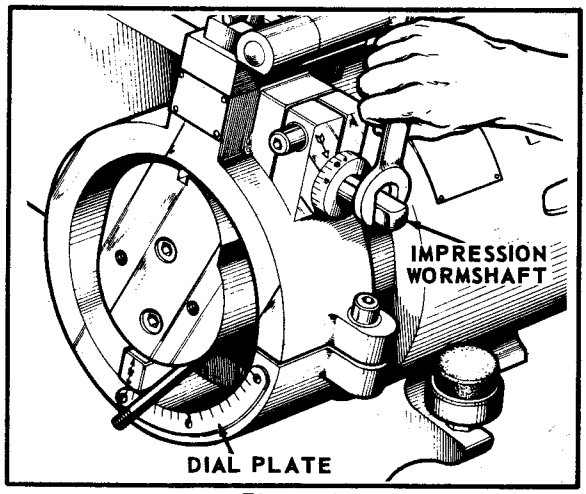


Figure 6

CAUTION

NEVER TAKE AN IMPRESSION WITHOUT FIRST HAVING TIGHTENED LOCKING BOLTS ON IMPRESSION SLEEVE HOUSING. ALWAYS RETURN IMPRESSION ADJUSTMENT TO EXTREME LOW POSITION WHEN STARTING A NEW JOB. SEE DIAL PLATE MARKINGS ON IMPRESSION SLEEVE HOUSING. *(See Figure 6)*

ADJUSTER BAR ADJUSTMENTS — STYLE 11-8-7 POWER OPERATED

1. Place adjuster bar in impression position with the adjuster latches in the adjuster slides.

2. Lock adjuster bar stop bolts in position having them just contact adjuster bar.

3. Loosen impression yoke lock screw and turn impression cylinder piston rods until there is about 1/8" clearance between end of the air cylinder and piston, preventing piston from grounding at end of stroke. Lock Impression yoke lock screw. *(See Figure 7.)*

4. Adjust the adjuster bar stop holders so that the adjuster bar in the out position will not cause the pistons to bottom at this end of the stroke. Have about 1/8" of clearance.

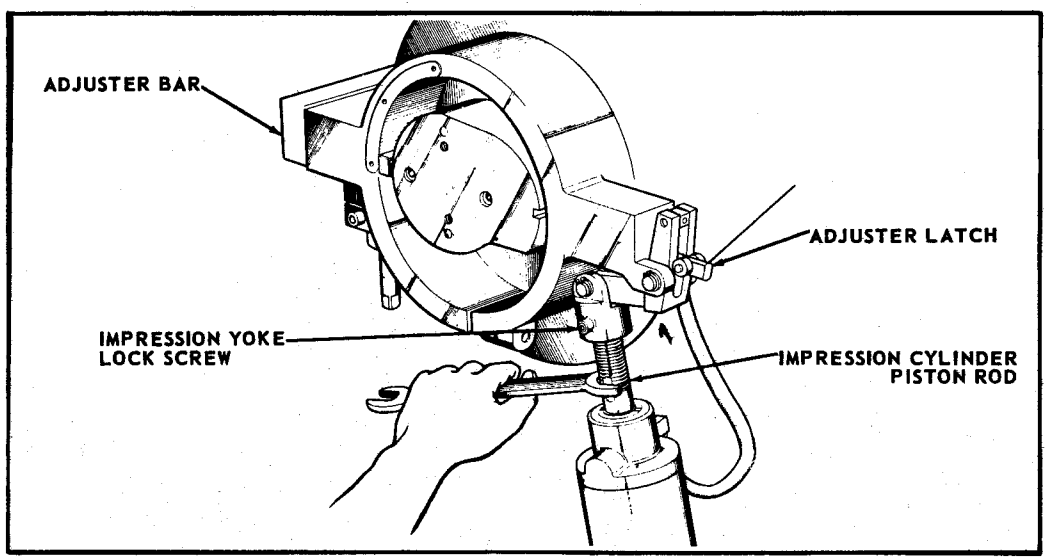


Figure 7

ADJUSTER BAR ADJUSTMENTS — STYLE 11-8-6 HAND OPERATED

1. Move stop bolts forward out of interference position.
2. Place adjuster bar in impression position with adjuster latches in adjuster slides.
3. Reset bolts until they contact adjuster bar. *(See Figure 8)*
4. Tighten Check Nut.

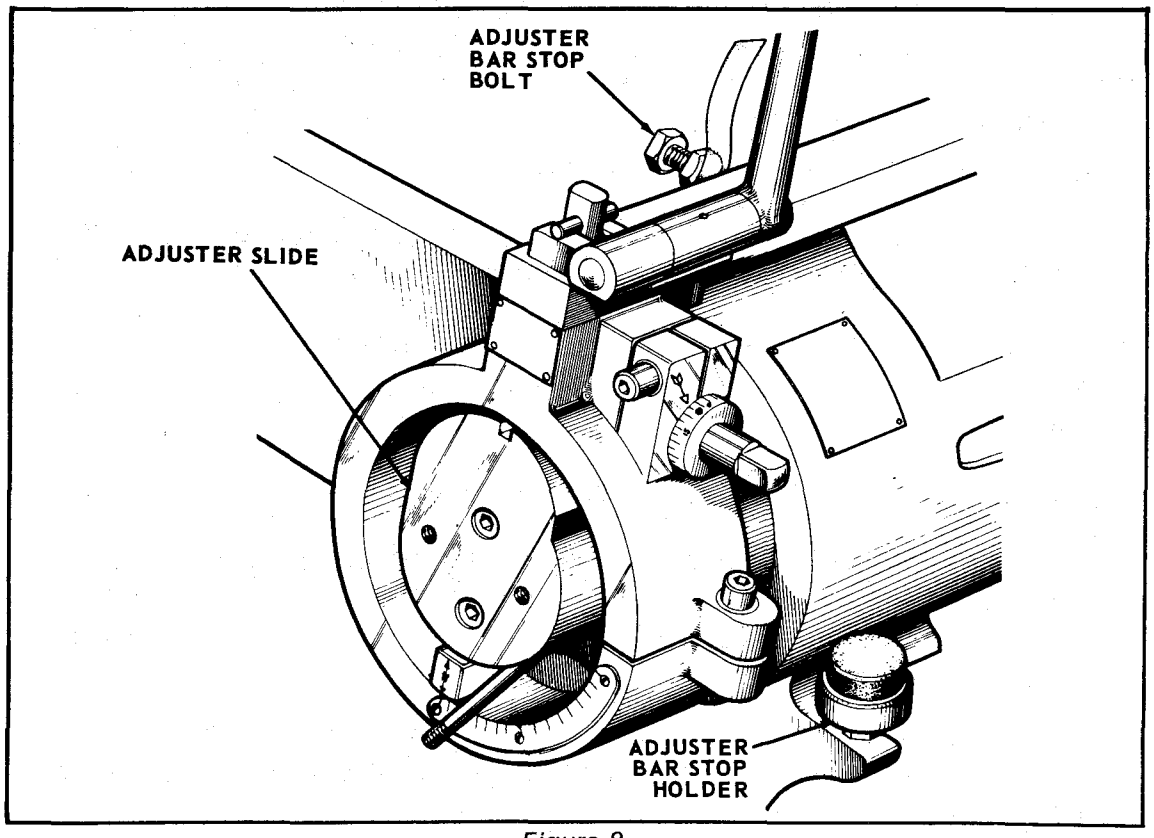


Figure 8

AIR COMPRESSOR UNLOADER

The air compressor unloader is preset to work at 90 pounds per square inch pressure. The unloading pressure is adjustable, and regulated by the pressure adjusting screw behind the wing nut.

CAUTION

The UNLOADER WILL NOT UNLOAD if the wing nut is tight against the pressure adjusting screw.

On presses equipped with the low pressure switch, it is set to start the press at 60 pounds air pressure and will stop the press when the pressure falls below 50 pounds.

The air system is also equipped with a safety valve that is set for 100 pounds maximum pressure.

PLACING CUTTING AND CREASING DIE IN PRESS

CENTRALIZING DIE

When possible, it is very important to have the center of force of the die located in line with the center line of connecting rod pull to prevent unnecessary tipping of the bridge and movement of the bridge lugs.

CAUTION

If it is necessary to have an unbalanced load, bearers should be inserted for balance. Please refer to Section "Makeready for Bearers".

SECTION IV
CARE, MAINTENANCE, AND OPERATIONAL DIFFICULTIES

GENERAL CARE

In order to get the most efficiency from your Thomson Cutting and Creasing Press, it should be given the good care due any precision machine. It should be kept reasonably clean and free from dirt, paper dust, and foreign matter. Do not allow waste material to collect in bridge cam well, on rocker seats, or in gear teeth. Wipe and clean all working areas at least once a week.

While the press is ruggedly built of high quality materials and relatively trouble free, you should carefully follow all operating instructions, and check the machine for proper adjustments and wear at the first indication of improper performance.

Keep the machine properly lubricated at all times and do not abuse it by overloading, either with too heavy a job, poor makeready, dull dies, or variations in material conditions such as thickness, moisture content, and grain.

RESETTING BRIDGE FACE PARALLEL WITH FRAME FACE

BRIDGE LUGS MOVED OUT OF CORRECT POSITION ALLOWING UPWARD MOTION OF BRIDGE TO BE ARRESTED BY CAM INSTEAD OF BOTTOM BRIDGE LUGS.

INSTRUCTIONS FOR ENGAGING AIR CLUTCH ON PAGE 34.

RECOMMENDATIONS: Reset the bridge lugs by placing in the press a cutting form composed of new cutting rule selected for uniform height, which has been spaced evenly divided in a chase. In place of the cutting form, two parallels 1" square, extending from the top to the bottom of the frame face, can be used. Have the adjuster bar thrown into cutting position, and adjust the impression for a tight squeeze against cutting form or parallel bars. Turn the flywheels by hand and bring the bridge up to impression point. Unloosen the bridge lug bolts so that the bridge lugs will not offer any resistance as the bridge surface aligns itself against the cutting form. Turn the flywheel slowly by hand and bring the bridge tightly against the form. The bridge lugs should be set hand tight against the top and bottom of the rocker seats. Tighten the bridge lug bolts with an extension handle on the wrench, to eliminate slippage. If it is necessary to tip the bridge top or bottom, after paralleling the faces of bridge and frame and resetting the the bridge lugs securely, proceed as follows:

TIPPING BRIDGE

To tip top of bridge away from face of frame, stop the bridge at impression point with the adjuster bar thrown out. Drive wedges between the bottom of the bridge and each side of the frame, holding the bridge against the bottom bridge lugs. Loosen the top bridge lug bolts, and place .001" to .003" tissue paper between the top lugs and rocker seats. Tighten the lug bolts, keeping the lugs hand tight against the tissue

paper. Remove the tissue paper and wedges, and drive the wedges between the top of the bridge and the frame, forcing the top lugs against the rocker seat plates. Loosen the bottom lug bolts; make the bottom lugs hand tight against the bottom rocker seat and tighten the bottom lug bolts in this position. Reverse process to tip bottom of the bridge away from the face of the frame. Reset the bridge cam roller, following instructions for installing new bridge cam and cam roller. *(See Figure 9.)*

ALTERNATE METHOD

Instead of driving wedges between the bottom sides of the frame and bridge, raise only one top bridge lug at a time and insert .001" to .003" tissue paper.

Tighten the lug bolts one side at a time, keeping the lugs hand tight against the tissue paper.

Remove the tissue paper, and drive wedges between the top sides of the bridge and frame, forcing the top lugs against the rocker seat plates. Loosen the bottom bridge lug bolts; make the bottom lugs hand tight against the bottom rocker seats, and tighten the bottom lug bolts in this position. Reverse the process to tip the bottom of the bridge away from the frame. Reset the bridge cam roller. *(See Figure 9.)*

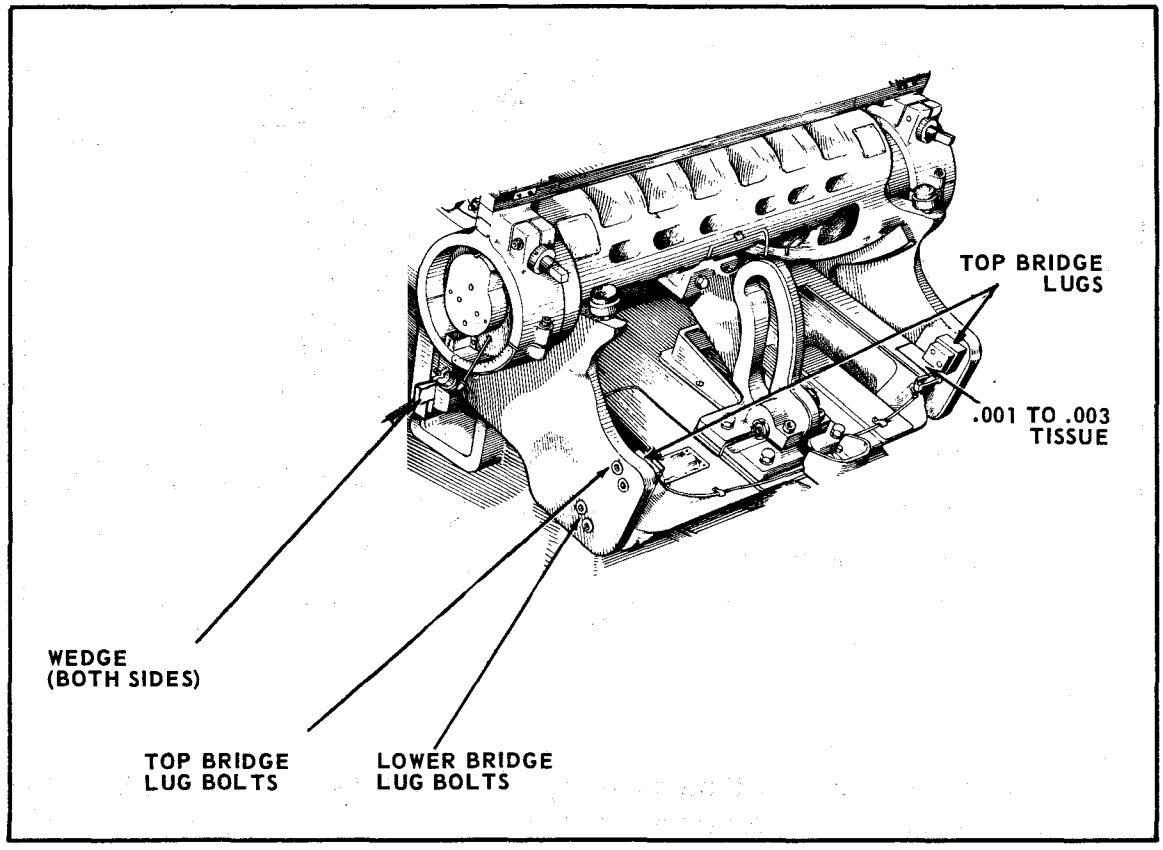


Figure 9

INSTALLING NEW BRIDGE CAM AND CAM ROLLER

BRIDGE CAM ROLLER SHAFT OUT OF ADJUSTMENT

RECOMMENDATIONS: Important — Always reset Bridge Face parallel with Frame Face and secure Bridge Lugs. Follow instruction on page 28. The proper method to set the bridge cam is to have the bridge cam roller bearing on the top of the straight-away of the bridge cam, having the bridge position away from the impression with only 1/4" at the top bridge lugs bearing on the ends of the rocker seats. Set *(with feelers),* the crown-shaped bridge cam rollers equidistant from each side of cam; adjust the rollers so that they bear in center area of cam only, by adjusting eccentric bridge cam roller stand bushings. The bridge cam roller stand assembly should snap back and forth with roller contacting top of the bridge cam if adjusted properly. With the bridge on impression, the bridge cam roller should be free to turn in the clearance section of the bridge cam. *(See Figure 10.)*

CAUTION:

IF THE BRIDGE CAM ROLLER STAND BUSHINGS MOVE FROM THEIR SELECTED SETTING, THEN WEAR AND CAM BREAKAGE WILL RESULT. CHECK LOCKING SCREWS OCCASIONALLY.

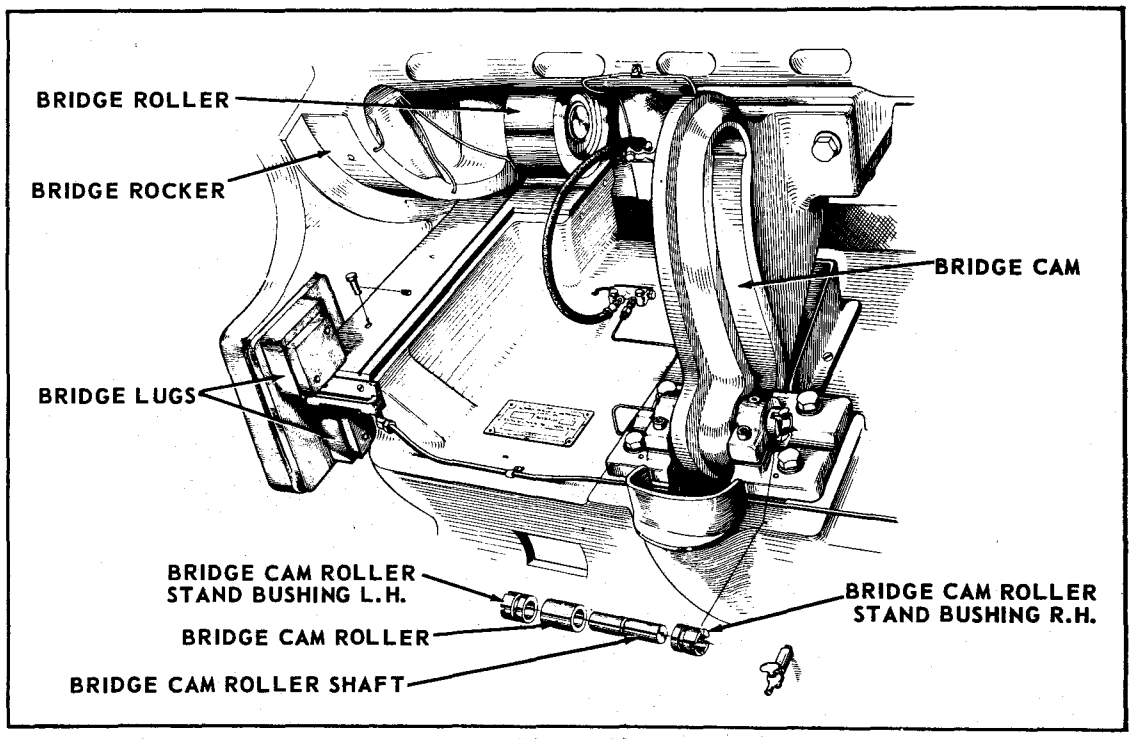


Figure 10

RESETTING BRIDGE LUGS

Follow instructions for resetting the bridge face parallel with the frame face. The bridge lugs should always be set hand tight against the top and the bottom of the rocker seats.

BRIDGE ROLLERS UNDERSIZE

Check monthly for wear and replace at first indication. As roller becomes worn undersize, it wears away the bridge rocker radius, which destroys the normal bridge cam motion, causing breakage of cam. *(See Bridge Rocker Radius)*

BRIDGE ROCKER RADIUS UNDERSIZE

Check monthly; at first indication of abnormal wear, replace with new rollers.

As the rollers become worn undersize, parts of the bridge rocker radius become worn out of shape destroying the normal motion of the bridge cam, resulting in unnecessary wear and breakage of the bridge cam.

BRIDGE STUCK ON CENTER

Recommended procedure for moving the bridge from dead center:

A. Determine if the bridge is stuck before center, over center, or on center. If before center, back off, and reverse wires to motor.

B. If necessary, increase air line pressure to clutch to 100 pounds by adjusting unloader on air compressor. Reset air pressure before continuing normal press operation.

C. Adjust the variable speed drive to maximum speed.

D. If the bridge refuses to move under clutch operation, heat up center section of each connecting rod until rods expand sufficiently to allow bridge to move from its stuck position.

REMOVING AND INSTALLING MAIN GEARS

Main gears can be removed and installed by using either the ram method or hydraulic jack method, or both. Never use hydraulic jacks to remove cast iron gears, as the gears will not withstand the pressure and are liable to crack.

One hundred ton Center Hole Jenny Pullers are manufactured by Templeton Kenly and Company, 1020 South Central Avenue, Chicago, IL; service stations are located in all the principal cities.

The following descriptive instructions are self-explanatory. *(See Figures 11 and 12)*

CLUTCH ADJUSTMENT (MINSTER)

As the clutch facings wear, the travel of the pressure plate becomes greater. This travel should be held to a minimum, allowing only freedom from drag on the clutch disc when the air is off.

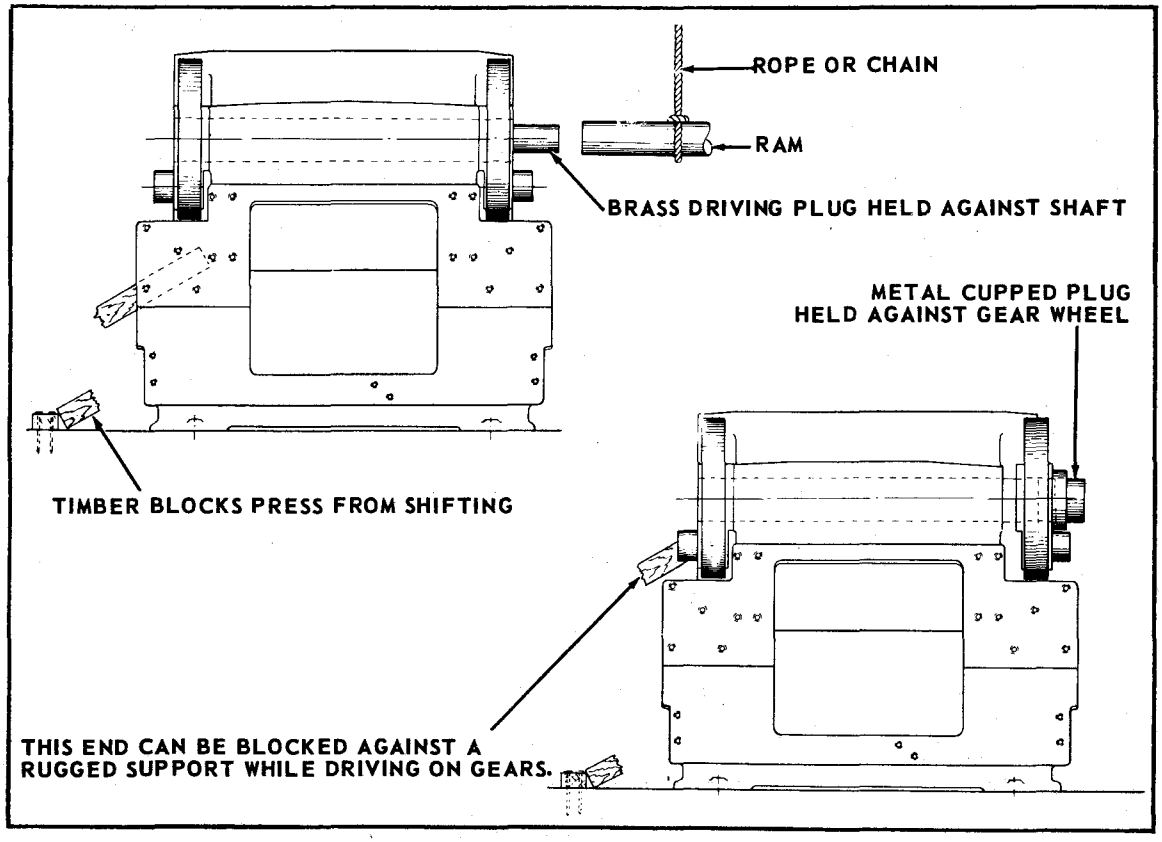
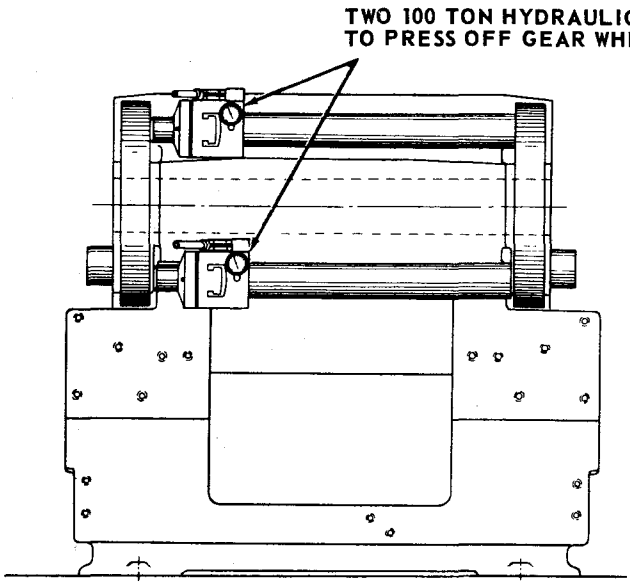

ROPE OR CHAIN
RAM
BRASS DRIVING PLUG HELD AGAINST SHAFT
METAL CUPPED PLUG
HELD AGAINST GEAR WHEEL
TIMBER BLOCKS PRESS FROM SHIFTING
THIS END CAN BE BLOCKED AGAINST A
RUGGED SUPPORT WHILE DRIVING ON GEARS.

Figure 11



ON LATER MODEL PRESSES WITH 1½" - 12 TAPPED HOLE IN CENTER OF MAIN SHAFT, A CENTER HOLE HYDRAULIC JACK OF 100 TON RATING CAN BE USED TO PRESS ON GEAR WHEELS.

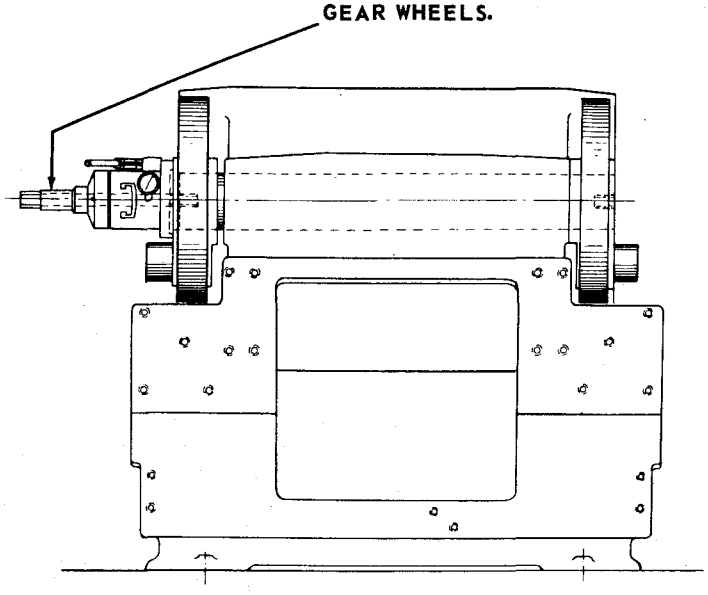


Figure 12

To make the proper adjustment on the Minster combination air clutch and brake, the clutch should be stopped so that the adjusting nut locking key is visible in its top position through one of the round cored holes in the flywheel. Using a long Allen head wrench, remove the Allen head screw from the adjusting nut locking key. Be careful not to drop screw. Insert a long screw into threaded hole in locking key and remove key. *(See Figure 13)*

If the adjusting nut is not split, place bar through flywheel hole and against rib on adjusting nut. Turn flywheel 1/8 of a turn clockwise to tighten clutch and counterclockwise to loosen clutch. The brake disc should have 0.105 inch total plate clearance *(in open position when cold)* on the 26 inch clutches, and 0.080 inch on the 24 inch clutches. If the adjusting nut is split, unlock clamp and turn adjusting nut by hand clockwise to tighten.

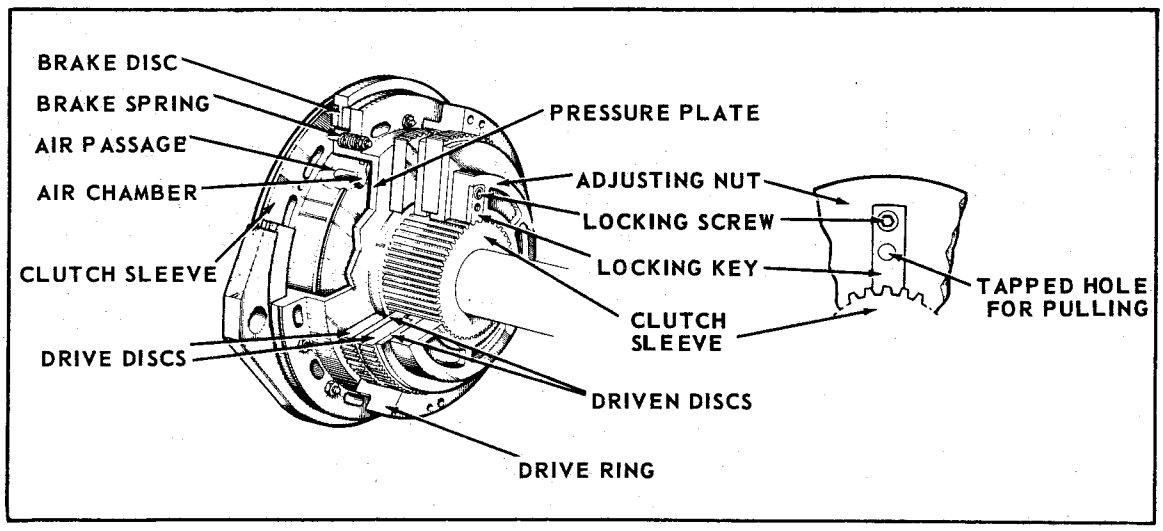


Figure 13

The clutch can be engaged and disengaged by air for adjustment purposes as follows:

1. Start air compressor and leave running.
2. Main motor must be off. Do not start.
3. Place switch to Run.
4. Place selector switch on Auto-Time.
5. Push Start and Stop button to operate air clutch.

DO NOT USE MOTOR DRIVE UNTIL LOCKING NUT KEY IS IN PLACE. CHECK FREEDOM OF FLYWHEEL MOVEMENT TO BE SURE THAT NO DRAG EXISTS.

INSTRUCTIONS FOR REMOVING CLUTCH AND REPLACING "O" RINGS WILL BE FOUND ON PAGES 35 AND 38.

CLUTCH DRAINAGE

A small drain plug is provided in the clutch air chamber for draining accumulated water or excess oil. The draining frequency will be controlled by the condition of the air supply.

Never allow plug to come loose, as air leakage affects clutch operation. *(26" clutch only)*

REMOVING MINSTER AIR CLUTCH AND REPLACING "O" RINGS (38 x 54 — 44 x 66 presses)

It may be necessary at some time to replace the clutch packing "O" rings. The need for replacement will be recognized by failure of the clutch to work properly and a noticeable leakage of air around the pressure plate. The procedure is as follows:

A. Remove flywheel clutch assembly shaft from the press.

B. Remove drive ring bolts from flywheel. Clutch can now be removed from shaft. *(See Figure 14 for suggested method)*

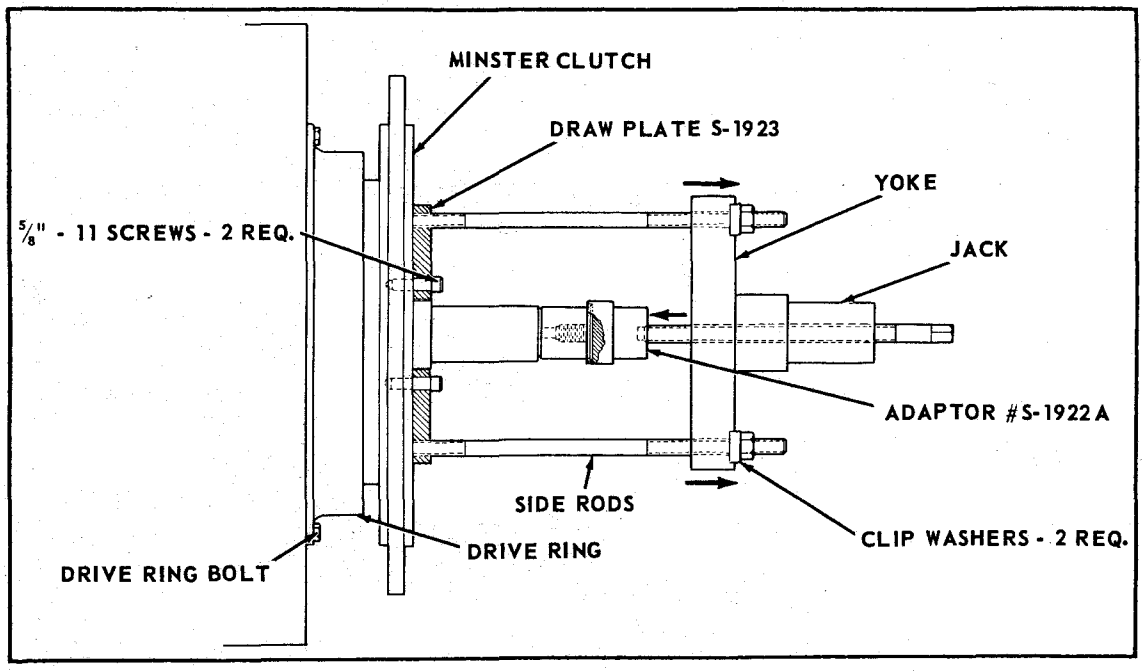


Figure 14

C. Remove roto-seal, pinion gear, and pillow block bearing, adjacent to clutch.

D. Remove locking key.

E. Remove clutch adjusting nut by turning counterclockwise.

F. Remove driving and driven discs. Place on top of each other in exact order of removal, and replace exactly as disassembled.

G. Remove the brake spring nuts and springs. Check the setting of brake spring nuts by counting the number of turns required for removal. It is very important that the nuts be replaced exactly as originally set.

H. Remove the pressure plate.

I. Remove "O" rings from packing plate.

J. Replace new "O" rings and lubricate thoroughly with light grease or oil.

K. Coat inside of clutch with grease to prevent rusting such as Molykote G.

L. Reassemble the pressure plate making sure the "O" rings are not pinched or damaged by the clutch sleeve.

M. Reassemble in the reverse order. *(G through A)*

N. Reset to maximum travel, or plate clearance of 0.078 inch *(on open position when cold)* on 26 inch clutches, and 0.078 inch on the 24 inch clutches. Refer to Clutch Adjustment.

O. Refer to Figure 15 for suggested method of assembling clutch to flywheel shaft and flywheel.

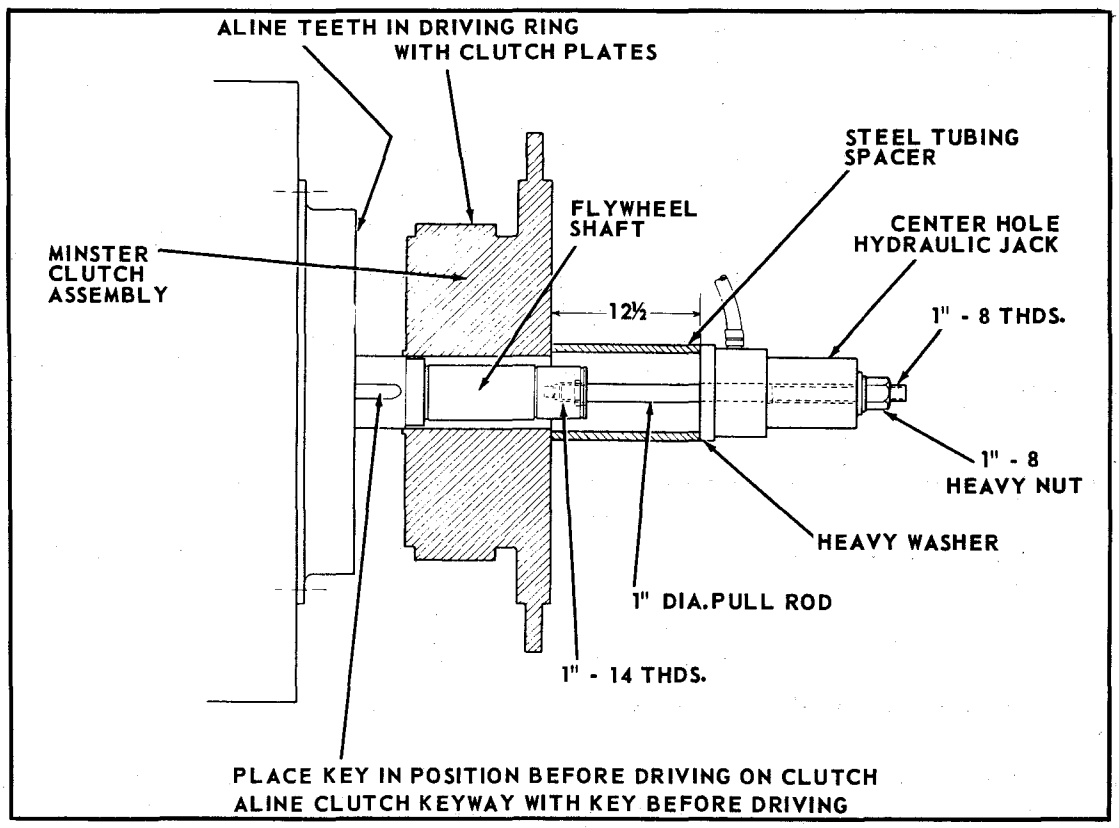


Figure 15

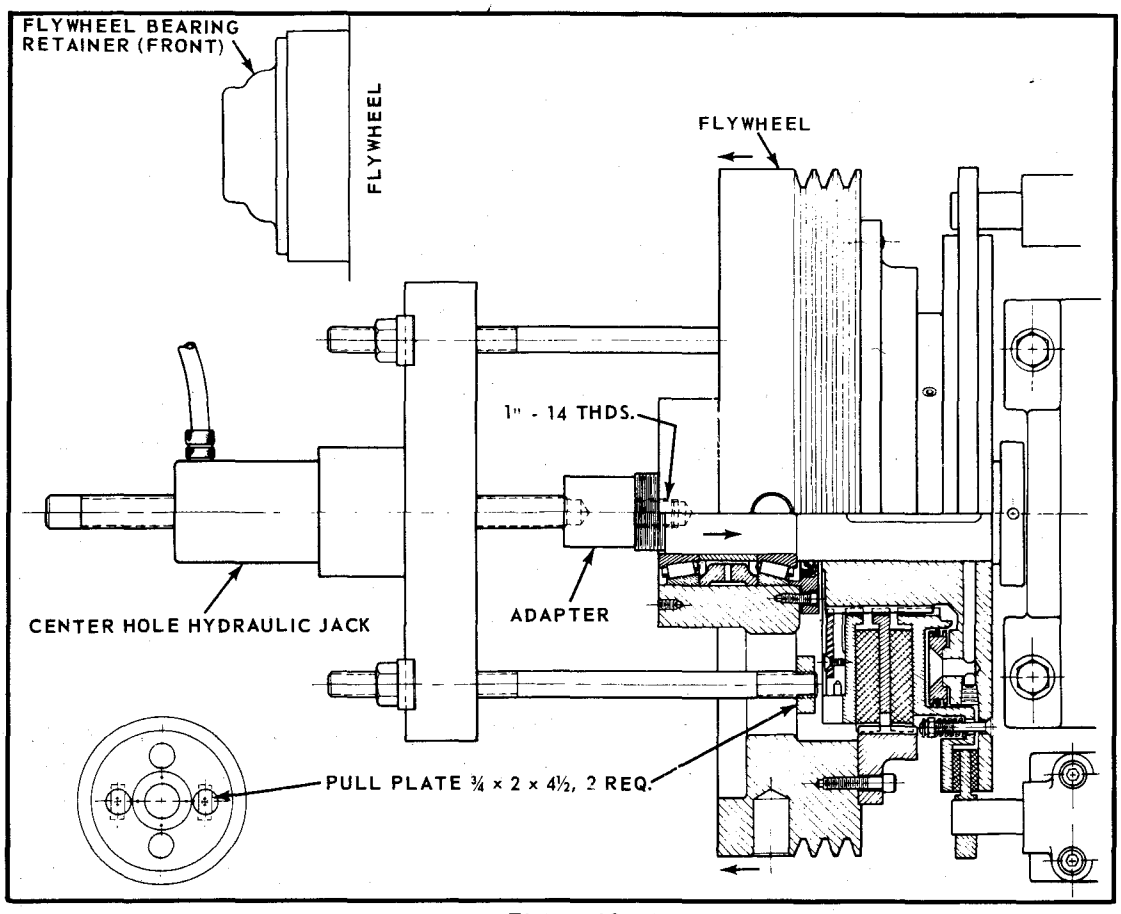


Figure 16

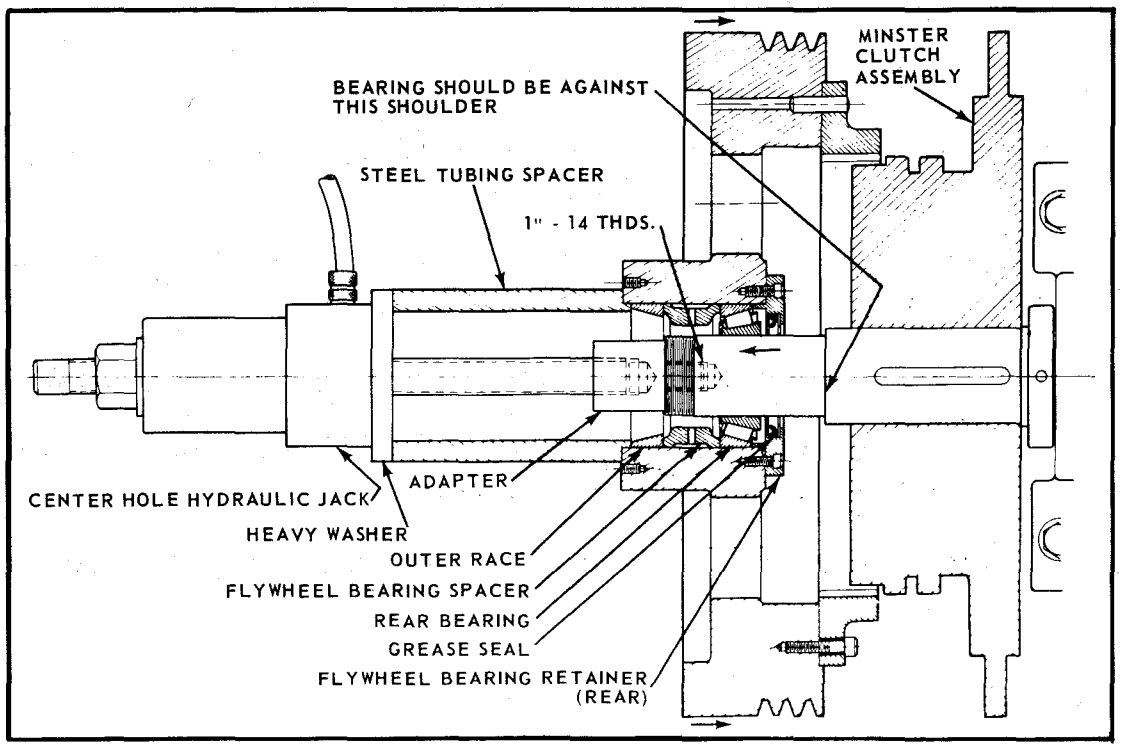


Figure 17

(22 x 32 AC DM, 28 x 41 AC DM, 33 x 47 OBF PRESSES)

Step 1. Remove flywheel bearing retainer.

Step 2. Remove flywheel bearing nut.

Step 3. Remove flywheel *(Suggested method in Figure 16)*

Step 4. Follow instructions "A" to "N" on page 35.

Step 5. Refer to Figure 17 for suggested method of replacing flywheel.

Step 6. Wash clean bearings and relubricate with BB1 high temperature grease before reassembling.

Step 7. Insert rear bearing into flywheel and move into exact position with rear flywheel bearing retainer, using longer screws than furnished at the beginning.

Step 8. When almost in position, revert to original screws for bringing into final position and securing retainer. Be sure to insert new grease seal before securing retainer.

Step 9. Place flywheel bearing spacer into position followed by outer race of front bearing. Use front flywheel bearing retainer to bring outer race into position, using two lengths of screws.

Step 10. Remove retainer to push on flywheel.

Step 11. Push on flywheel assembly using steel tubing spacer and center hole hydraulic jack as shown in Figure 17.

Step 12. When rear bearing is against shoulder of shaft as shown in Figure 16, remove jack and insert rollers and inner race.

Step 13. Tighten flywheel bearing nut and then back off approximately one quarter of a turn.
(Place 2 ounces of BB1 high temperature grease into flywheel bearing retainer. Replace flywheel bearing retainer.)

Step 14. Pump 12 ounces of BB1 high temperature grease through zerk fittings into flywheel.

CAUSES OF BRIDGE CAM FAILURE:

1. Worn Bridge Cam and Bridge Cam Roller.
2. Bridge Cam Roller Shaft out of Adjustment.
3. Bridge Face not parallel with frame face, causing it to rise on impression.
4. Bridge Lugs adjusted improperly, causing straining action with motion of bridge cam.
5. Bottom Bridge Lugs moved out of position, allowing upward motion of the bridge to be arrested by the cam.
6. Bridge Rollers worn undersize.
7. Bridge Rocker radius worn undersize.
8. Machine operating backwards.
9. Machine operating at excessive speeds.
10. Bridge Cam Roller Stand Bolts loose.

CAUSES OF BRIDGE LUGS SLIPPING:

1. Center of force of the die not centralized with connecting rod pull, and bearers not locked up in the side of the chase.
2. Cutting rule in die becomes dull, causing unbalanced load.
3. Extra stock feeds into, or falls into press.
4. Parts of die, such as rule or quoins, fall into the press.
5. Screwdriver left under corner of steel cutting plate.
6. Lug bolts loose.
7. Bridge Cam Roller out of adjustment.

BRIDGE FACE NOT PARALLEL WITH FRAME FACE — RESULTING TROUBLES

1. Bridge lifts on impression.
2. Cutting rules are abused and become dull.
3. Slur on impression.

4. Overload of press.

5. Unnecessary makeready.

6. Steel cutting plate cut into and damaged.

7. Slippage of bridge lugs.

8. Bridge cam Failure.

9. Unsatisfactory die cutting.

DISTURBING FACTORS THAT AFFECT THE CUTTING OF CARDBOARD

DIE

Stripping rubber or cork being compressed too solid.

Creasing rule too high, bearing off cutting.

Cutting rule not of identical even height.

Cutting rule dull, due to long usage or abuse or loose screws holding hard plate.

Rolled over edges from dies used on cylinder presses.

MAKEREADY

If the makeready is paddy due to special low rule, or for other reasons, the job will continually fade away and will also tend to dull the cutting rule more than necessary.

Never use more than .003" gummed paper for spotting up. Gummed paper .006" in thickness will constantly bear the form off and cause overloading of the press.

If a soft steel plate or brass plate is substituted for hard cutting plates, it is very likely that a main shaft, bridge shaft, or crank pin, or even connecting rods will become broken. The soft plates allow the rule to cut into them and eliminate the response of makeready; this overloads machine, causing failure of some part.

PRESS

a. Impression sleeve housing lock bolt loose.

b. Crank pins loosened or broken.

c. Main shaft broken or holes egg-shaped.

d. Bridge shaft broken or holes egg-shaped.

e. Connecting rods broken, worn or stretched.

f. Insufficient impression to take up machine clearance or bridge crown.

g. Eccentric bronze bushings in connecting rods becoming loose and revolving.

h. Ends of main frame bearing cracked.

i. Ends of bridge bearing cracked.

j. Bridge Lugs slipped. Bridge flutters.

k. Impression sleeves badly worn.

l. Fatiguing of parts.

m. Adjuster Bar Latches not engaging in slides.

BOARD

Fibre boards that have been bonded together with silica, and also metal lined boards which have uneven perforations and are used for blow out proof gaskets, cause considerable trouble in fading out of work.

Variation in moisture content of board and change in direction of grain will affect die cutting results.

DISTURBING FACTORS THAT AFFECT THE CREASING OF CARDBOARD

GRAIN DIRECTION

A crease will crack more with the grain than against it. The direction of the sheet grain has a direct bearing on the strength of the box as well as the quality of important creases.

ANGLE OF BREAK

The angle of break is the angle at which the board is creased, depending upon the width of the female die channel and the height of the counter.

The greater the angle of break, the less inherent bending ability is required of the board to prevent cracked creases. This can be accomplished by increasing the height of the counter and maintaining a minimum width female channel, which must be at least equal to the width of the creasing rule plus twice the caliper of the board. *(See Figure A)*

Cracked creases will result if the female channel is cut too narrow for the thickness of the rule and caliper of board.

The board must have inherent ability to stretch, or a point will be reached when torn creases will occur because of the draw.

DRAW

If the actual board stretch is insufficient, trouble from torn creases on the press will occur. The lower the height of the counter and the wider the female channel, the less draw on the sheet. *(See Figure B)*

The board must have inherent ability to bend or a point will be reached when cracked creases will be encountered.

MOISTURE CONTENT

Higher humidities (70% to 80%) favor board properties such as flexibility and toughness.

Tensile strength of fibre and corrugated board decrease with increase in humidity or moisture.

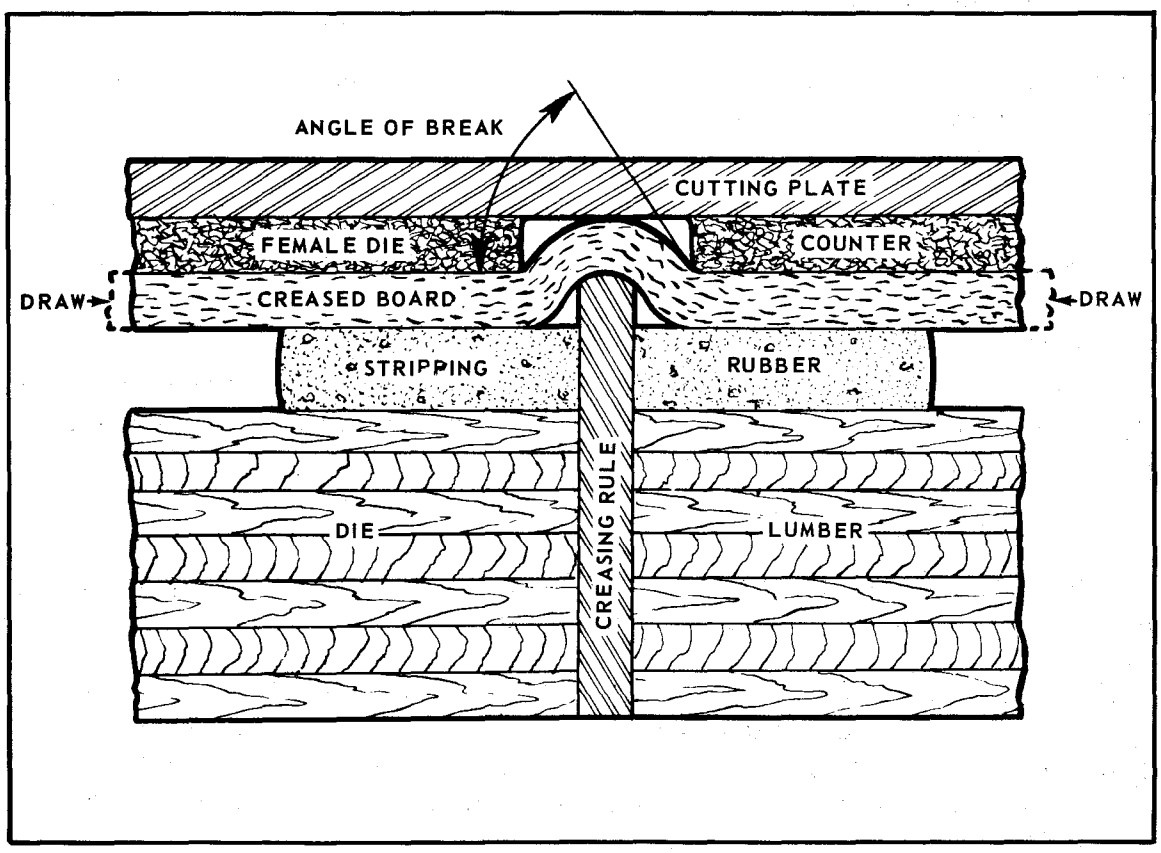


Figure A

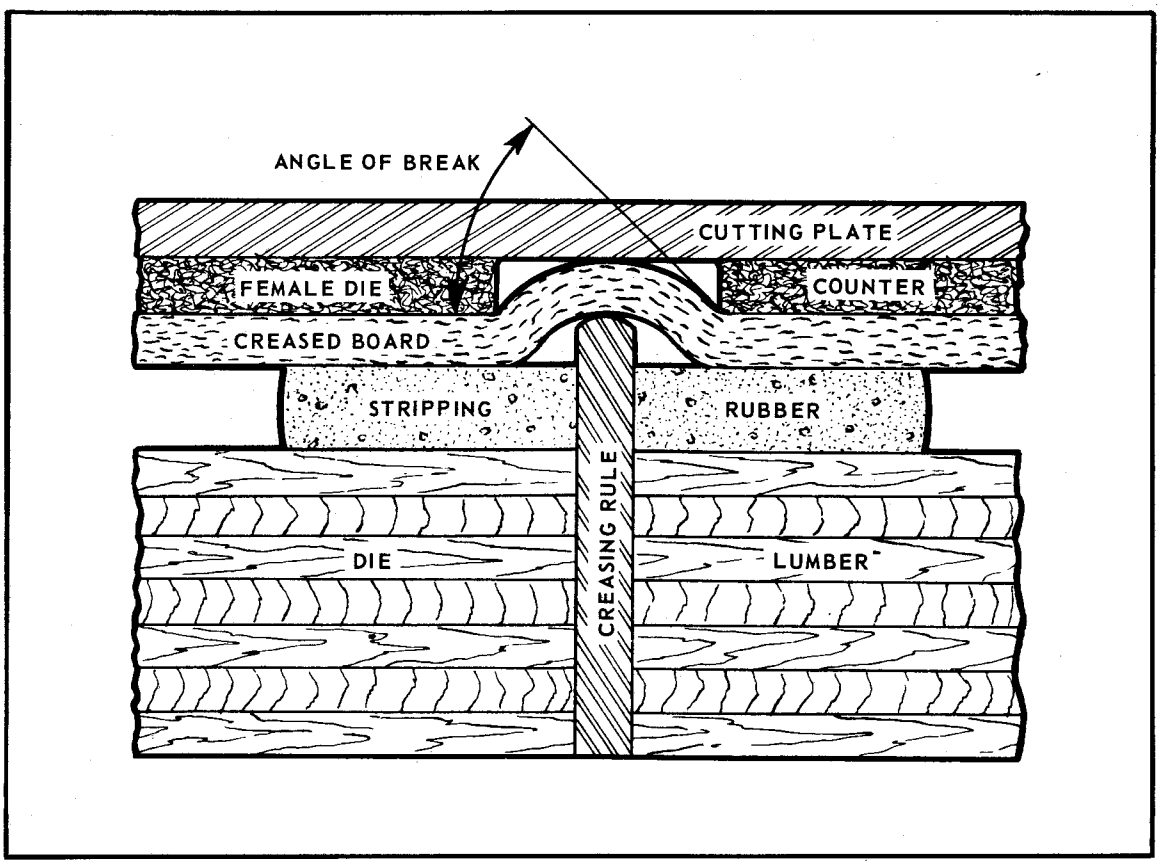

ANGLE OF BREAK
CUTTING PLATE
FEMALE DIE
COUNTER
CREASED BOARD
STRIPPING
RUBBER
CREASING RULE
DIE
LUMBER

Figure B

THICKNESS OF THE CREASING RULE

PAPERBOARD STOCK

Caliper in Inches		Rule Thickness (1 pt. equals 0.014")
.016" - .025"		2 pt.
.025" - .035"		3 pt.
.035" - .045"		4 pt.
.045" - .055"		6 pt.
.050" - Up	(Unusual Stock)	8 pt. to 12 pt.

★ ★ ★ ★ ★

FIBREBOARD STOCK

Caliper in Inches	Rule Thickness (1 pt. equals 0.014")
.032" - .060"	1/8"
.080"	3/16"
.100"	3/16"
.120"	1/4"

★ ★ ★ ★ ★

CORRUGATED BOARD

Single Wall	4 pts.
Double Wall	6 pts. to 8 pts.

BRIDGE STOPS, IGNORING OPERATION OF CONTROLS

A. Insufficient quantity of oil in the reservoir allows low level electric float switch to either stop the press or to signal by a light a low level warning.

B. Low air pressure cut-off switch equipped presses stop when the air pressure falls below 50 pounds. IF POWER THROWOFF BAR OPERATED ON SHORT TIME CYCLE, AIR PRESSURE DROP ACTUATES LOW PRESSURE SWITCH STOPPING BRIDGE. Thumbscrew on unloader must be in an unrestrained position. If low pressure switch spring slips out of position from pocket under cap, the press will stop due to vibration closing the contacts. Take apart and reset spring. Pressure too low to operate pilot section of dual valve.

C. Auxiliary wrap-around safety device Micro-Switches set too critically and actuated by vibration. WARNING: Micro-Switch must be set for less than 1/2" movement of auxiliary safety device to stop press.

D. Air Pressure Drops — Loss of Air

(1) If drop in air pressure occurs only when start button is pressed, check for "O" ring damage in clutch.

(2) Make sure that small screw in clutch and brake pressure plate has not worked out or is loose.

(3) Check Roto Seal for any air leakage.

(4) Check Wichita brake tire for air leakage.

(5) Check for loose connections or broken hose or kinked hose.

(6) Unloader thumbscrew must be set in an unrestrained position.

(7) Check all air valves.

E. Flywheel Stops

(1) If the air clutch is set with less than .090" plate clearance on the 26 inch clutch and .080" clearance on the 24 inch clutch, a drag can develop between the clutch and brake, resulting in heating and expansion in the unit. This causes the brake to eventually overload the motor and blow fuses.

F. Heat (Flywheel Bearings)

(1) Under certain operating conditions heat will develop in the flywheel bearings. This heat is a normal condition and should not be the cause of alarm. 150° — 175° is normal.

(2) The sealed bearing reservoir is filled with 28 ounces of EP 1 lubricant on the 26 inch air clutch and 14 ounces of EPI lubricant on the 24 inch air clutch at the factory. At 1000 hour intervals, check for addition of lubricant. For unusual idling, check every 100 hours. See Flywheel Bearings on page 14.

G. Heat (Clutches)

(1) The air clutches normally develop heat under constant start and stop operation, and should not be the cause of alarm.

(2) Excessive heat can be caused by the friction discs not separating, due to the drive disc teeth hanging up in the drive ring teeth, causing bridge to stop slowly.

(3) The 26 inch Minster Air Clutch must be set with .090" plate clearance and the 24 inch clutch, with .080" clearance between the clutch and brake; this allows heat expansion, and eliminates drag and excessive heat. Please read paragraph "E" (Flywheel Stops). Clearance is set when clutches are cold.

H. Bridge Slow to Stop

(1) Teeth hanging up in brake discs.

MINSTER CLUTCH AIR LEAK

This is caused by an "O" ring failure. Clutch must be disassembled and faulty "O" ring replaced.

ELECTRICAL SYSTEM FAILURE

1. Check all connections in panel box and floor console for loose wires which cause faulty operation of relays. Excessive vibration or shock affect relays.

2. Auxiliary safety device (wrap-around) limit switch, if set too fine, will cause erratic operation on single stroke, auto start-stop and continuous positions due to vibration. *(Setting - Must stop press with less than 1/2" movement of upper tube.)*

3. Low voltage under 10% drop prevents relays from dropping in or holding.

4. Limit switch, if faulty, causes unsteady operation on Auto start-stop or single stroke and must be replaced. Check distance from mag. -3/16" max.

5. Low oil level electric float switch, if installed to stop the platen, will prevent engaging of the clutch with the start button until the oil reservoir is refilled.

TIMER

CAUTION!!!!

Never have timer set at zero marking. An alarm will sound approximately two seconds before initiation of operation. This alarm is meant to alert the operator that the press is about to cycle, and that he should be clear of the point of operation to avoid injury. **NEVER** set the timer at such a point that the alarm does not sound before the initiation of each cycle.

INCREMENT MEASUREMENTS*

Housing Indicator Marking	14 x 22 BD DM		22 x 32 Style 6 DM 28 x 41 Style 6 DM 28 x 41 Style 9 DM		33 x 47 #6 DM		C54 #8-7 DM		44 x 66 #10-8-7	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
0	.000	.097	.000	.104	.000	.102	.000	.097	.000	.090
1	.013	.099	.013	.115	.013	.104	.011	.100	.013	.091
2	.013	.105	.013	.123	.012	.108	.011	.104	.011	.095
3	.012	.109	.012	.132	.011	.109	.010	.108	.010	.099
4	.012	.114	.012	.140	.011	.110	.010	.109	.010	.105
5	.011	.115	.011	.145	.011	.110	.010	.109	.010	.108
6	.011	.118	.011	.149	.009	.108	.010	.109	.009	.111
7	.009	.119	.011	.152	.009	.108	.010	.111	.009	.111
8	.009	.117	.010	.153	.009	.104	.009	.110	.009	.112
9	.009	.115	.009	.153	.008	.101	.008	.107	.009	.111
10	.008	.112	.009	.152	.007	.098	.008	.104	.008	.109
11	.007	.107	.008	.148	.007	.091	.008	.101	.008	.106
12	.006	.101	.007	.144	.005	.086	.006	.096	.008	.104
13	.005	.095	.006	.137	.004	.077	.006	.091	.007	.100
14	—	—	.004	.130	.003	.070	.005	.086	.006	.095
15	—	—	.004	.122	.002	.060	.004	.078	.005	.089
16	—	—	.003	.112	—	—	.003	.072	.004	.082
17	—	—	—	—	—	—	.002	.065	.004	.076
18	—	—	—	—	—	—	.001	.057	.003	.068

***IN = Adjuster Bar Thrown In - figure indicates increments between each indicator marking in inches.**
OUT = Adjuster Bar Thrown Out - figure indicates throwoff for each indicator marking in inches.