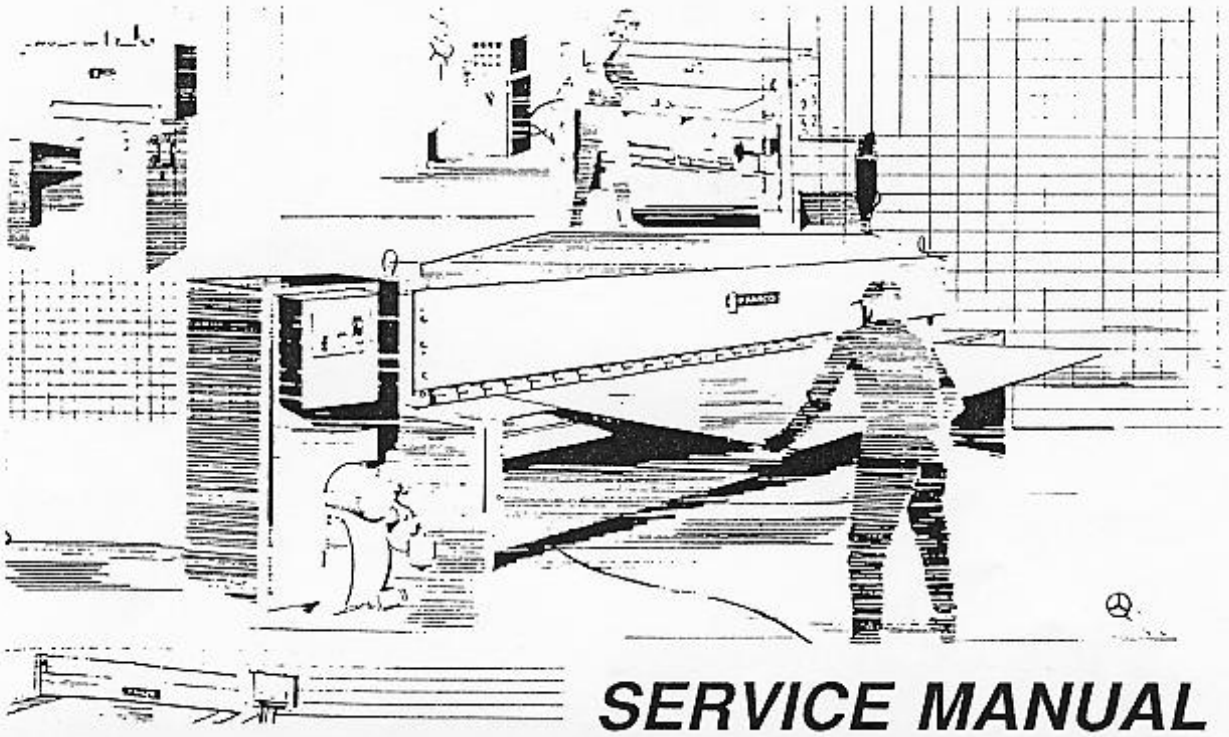
FAMCO MACHINE DIVISION

MODELS 'W' & 'P-W' SERIES
SQUARING AND PRODUCTION SHEARS
(Manual Wear Adjusting Pneumatic Clutch/Brake combination)



SERVICE MANUAL

WARRANTY

THE FAMCO MACHINE DIVISION warrants that the equipment which it supplies will fulfill the specifications contained in the contract of sale. If either the workmanship or material is not as agreed, such defect shall be remedied by FAMCO. No allowance will be made for any expenses incurred by the purchaser in repairing defective parts or in supplying any missing parts, except on FAMCO's written consent. The warranty on all components purchased by FAMCO from other vendors shall be in accordance with the warranty given by such vendor. FAMCO shall not be liable for any loss of profits or any other consequential damages whatsoever arising from any breach of warranty, delays in shipment, or from any other cause(s) whatsoever. No other warranty shall be implied, or attach by operation of law. This warranty is limited to one (1) year or 2000 hours of usage, whichever comes first, after date of shipment from FAMCO's plant (six (6) months if used on a two shift operation), and is void if the original equipment has been altered. This warranty is limited to the first purchaser and is not transferable.

FAMCO MACHINE DIVISION
BELCO INDUSTRIES, INC.

PRODUCT LITERATURE DISCLAIMER

SPECIFICATIONS AND/OR DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE. PLEASE CONSULT FACTORY

READ THIS MANUAL CAREFULLY

It is essential to give the Serial Number of your machine in any order of repair parts to assure prompt and accurate service.

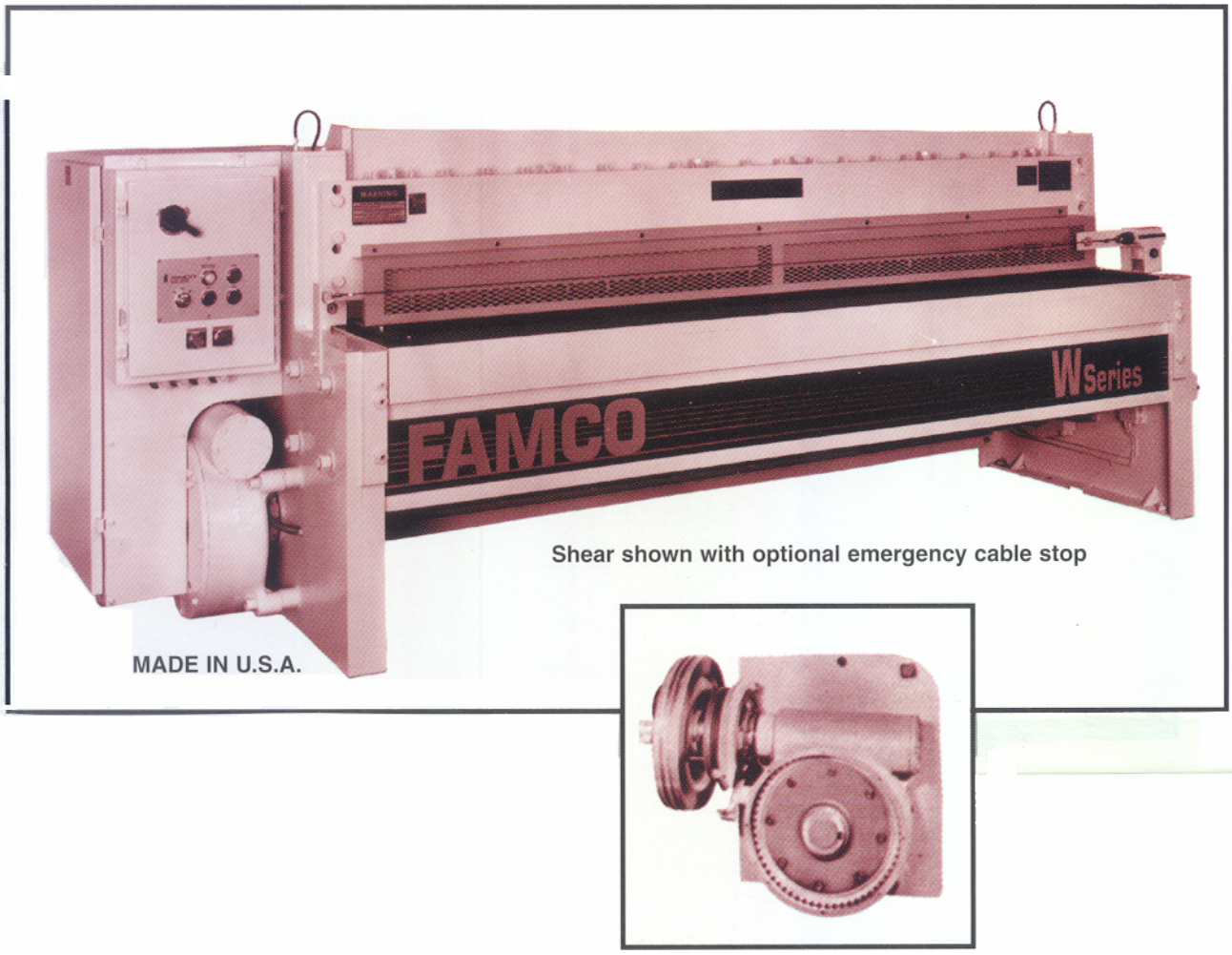
Order repair parts by part numbers, description and machine serial number.

W and P-W Series Shears

Production Shears	Squaring Shears	Description
P-724	724	7ga x 24"
P-736	736	7ga x 36"
P-748	748	7ga x 48"
P-752	752	7ga x 52"
P-760	760	7ga x 60"
P-772	772	7ga x 72"
P-796	796	7ga x 96"
P-1010	1010	10ga x 10'
P-1012	1012	10ga x 12'
P-1052	1052	10ga x 52"
P-1060	1060	10ga x 60"
P-1072	1072	10ga x 72"
P-1084	1084	10ga x 84"
P-1096	1096	10ga x 96"
P-2510	2510	1/4" x 10'
P-2512	2512	1/4" x 12'
P-2548	2548	1/4" x 48"
P-2552	2552	1/4" x 52"
P-2560	2560	1/4" x 60"
P-2572	2572	1/4" x 72"
P-2584	2584	1/4" x 84"
P-2596	2596	1/4" x 96"

This manual has been written to instruct the operator in the operation and maintenance of the FAMCO SHEAR. When written, it was completely up-to-date. Because of the later improvements in design, descriptions may vary slightly from the shear delivered to you**.**

Your FAMCO SHEAR is a precision-built, accurate, quality machine tool. Careful attention to the adjustment and maintenance of the shear should result in many years of trouble-free service. Although your machine has been carefully inspected and tested in our plant, some of the adjustments may have been disturbed in transit. Therefore, it is recommended that your millwrights, maintenance personnel and shear operators carefully read these instructions before the shear is installed or operated. Additional copies of this manual will be furnished on request at additional charge. We can assume no liability for unauthorized alterations or attachments to the shear.



Shear shown with optional emergency cable stop

FAMCO MACHINE DIVISION

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SPECIAL NOTE: The actual Bill-Of-Material that was used to build your FAMCO Shear is included in the back of this manual.

TABLE OF CONTENTS

(alphabetical order)

SPECIAL NOTE: The actual Bill-Of-Material that was used to build your FAMCO Shear is included in the back of this manual.

FAMCO MACHINE DIVISION

MACHINE TOOL SAFETY

The following listed steps are intended as a guide for employer-management. It is hoped that, by Pointing out definite areas of responsibility the entire program of shear safety will receive the leadership and full participation so necessary from the top down. A shear safety program works best when it has the vigorous backing of management – where program objectives are vividly spelled out and each employee's responsibilities are clearly defined. Management must spark such a program by keeping actively involved, by constantly promoting safety amongst its own personnel, and by exchanging ideas with others who have demonstrated interest in safety. All of this can be best accomplished by establishing a shop safety committee to review your plant's safety procedures, make recommendations to eliminate unsafe practices and work habits, and issue operating and safety instructions not only new employees but old-timers that need periodic refreshers.

1. Shear manufacturers cannot know what day-to-day use will be made of a shear. It is the employer who determines the type of material to be sheared, and the method of loading and unloading the work pieces. Logically then, it becomes the responsibility of the employer/management to make certain the guards and other necessary safety devices are used which will make it impossible for operators to place their hands or any part of their bodies near moving parts.
2. Before installing the shear, be sure to read and understand Famco Machine's Operating Instructions Manual.
3. Locate each shear to provide adequate floor space for workers in an area that will not be subject to interference or traffic by others.
4. Provide adequate clearance between shears and other equipment so that movement of one operator will not interfere with the work of another.
5. Make certain operators are fully trained.
6. Set up a program of daily, weekly, and monthly shear inspections. Make a check list and follow through to make certain the job is being done correctly. Keep a historical record of all shear maintenance work, repairs, and adjustments.
7. Make frequent evaluation checks of all shear safety guards and devices especially during actual production runs. Correct any unsafe practices or situations immediately.
8. Never allow minors to operate or assist in the operation of a shear.
9. Establish safe, convenient material handling systems. If conveyor equipment is installed, follow the manufacturer's recommendations and make sure it conforms to recommendations published in the "Safety Code for Conveyors, Cableways and Related Equipment" (B20.1-1957) available from the American National Standards Institute (ANSI).
10. Provide adequate illumination of the work area.
11. Make sure that the correct tools and equipment are provided for each job. This can be done by proper planning of scheduled work.
12. Provide a clean, safe work area around each shear.
13. Provide adequate fire protection equipment.
14. If the shear malfunction is reported, stop the shear immediately and correct the problem before resuming production.
15. Provide personal protection equipment, such as safety glasses with side shields, safety helmets, tongs, gloves, hand pads, spats, and protective sleeves, as required to suit the operation.

MACHINE TOOL SAFETY (Cont.)

16. Schedule periodic meetings of the company safety committee to review and update all safety regulations.
17. Establish a firm policy on shearing safety regulations. Publish your objectives and spell out each employee's responsibilities. Make certain all employees know, unmistakably, what is expected of them.
18. Thoroughly investigate all accidents and "close calls." Take immediate action to prevent a recurrence of the incident. Keep records of the investigation and of the corrective measures, which were taken.
19. Publish a list of names, addresses and phone numbers of physicians and members of the organization who are to be called upon in emergencies.
20. Make certain that all power shears and associated equipment are properly connected to earth ground. Grounding should be in accordance with the National Electrical Safety Code and consistent with sound local practices.
21. Never overload the shear attempting to cut material beyond the rated thickness capacity of the shear.
22. COOPERATE AND PARTICIPATE! Appoint a safety coordinator who will arrange discussion groups with key personnel in the plant. The group should fully analyze and review special guarding problems, accidents, and use of all company equipment. Then, step out and make a concerted effort to communicate with other companies and groups who have demonstrated interest in safety. Only by active cooperation can we learn, not only from our own experience, but the experiences of others as well.

Before operating the shear, make certain that you read and understand fully all recommended operating and safety instructions in your Famco Shear Operating Instructions Manual.

The following safety precautions must be observed and practiced at all times:

1. Never place any part of the body under the holddown feet or bar, between the blades, beyond guards and awareness barriers, under or against the edges of the material being sheared. Your hands and fingers could be maimed or even amputated by improper or careless placement.
2. Make sure that the metal or plastic being sheared is properly located under the holddown feet or holddown bar.
3. Never operate, service, repair, or adjust the shear without first obtaining proper instructions from your supervisor.
4. Never operate the shear without pinch points guarded and without point-of-operation guards or barriers installed.
5. Always be cautious when adjusting the back gage. Never have the main or back gage motors on, or flywheel in motion, when anyone is at the rear of the shear.
6. Never operate the shear without first making certain that no one is behind the shear.
7. Never store or leave, even momentarily, tools or scrap material on the shear bed.
8. Always use hand tools to position or remove small pieces of metal or plastic.
9. Always wear safety glasses to protect your eyes while operating the shear.
10. Always wear safety shoes.
11. Always keep the back of the shear clear of scrap and material. Use chutes, conveyors or ramps to collect material.
12. Always shut off the shear when unattended.
13. Always be alert to safe operating methods, procedures and maintenance.

MACHINE TOOL SAFETY (Cont.)

14. Always be sure that the blades are sharp and maintain proper blade clearance.
15. Never use bare hands to clean off the shear bed. Metal and plastic slivers can be painful and injurious. Use a brush instead.
16. Always wear snug-fitting hand and arm protection when handling rough or sharp edged stock or blades.
17. Check the lubrication of your shear daily. Make sure the lubricator is working properly.
18. Have your shear checked for level monthly.

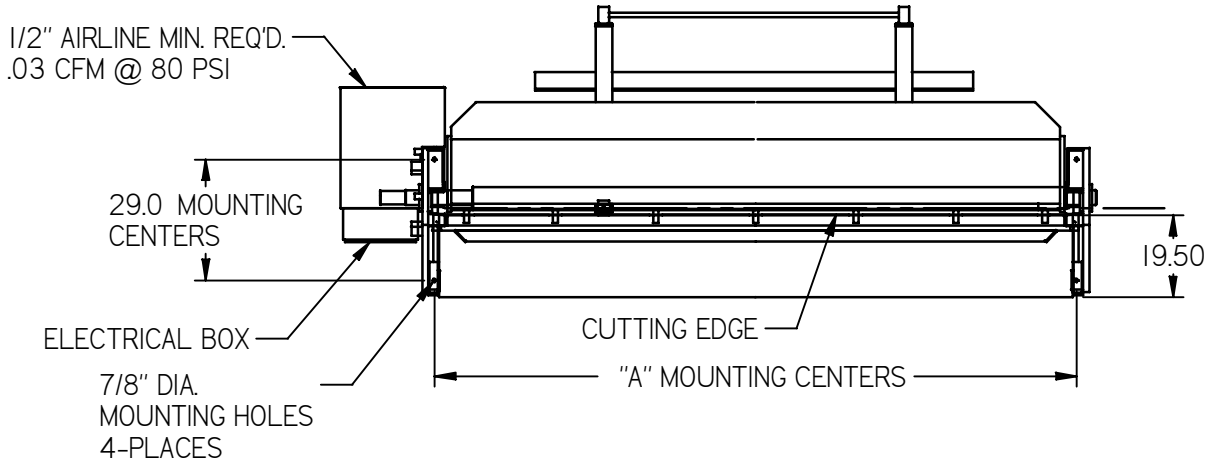
Should it become necessary to repair or replace any of the larger shear components, proper handling of equipment must be provided. Most shear parts are quite heavy by nature and, as such, must be considered potentially dangerous to handle. Only the best type of handling equipment should be used, but it should be checked first to make certain that the load to be applied will not exceed capacity of the equipment or cause it to become unstable. The condition of lifting cables, chains, ropes, slings and hooks should be carefully checked and tested to make sure that they will sustain the loads safely.

When it is not possible to perform maintenance or repair work on shears from floor level, a good solid work platform, portable scaffolding lashed to the shear, or hydraulic elevator platform should be used. The work platform should provide good footing for workers, plus adequate space for tools and parts. Avoid working from ladders or climbing on shears to perform maintenance work – this practice is NOT safe.

There is an increasing amount of electrical equipment used in the control and operation of shears. An important point to remember is that all non-current carrying parts of electrical apparatus, the enclosures for electrical components, and the SHEAR FRAME must be permanently grounded. Make certain that electrical panels and shear frame are properly connected to earth ground with an electrical conductor which is sized to comply with recognized codes. Installation should be in accordance with the National Electrical Code and/or local codes.

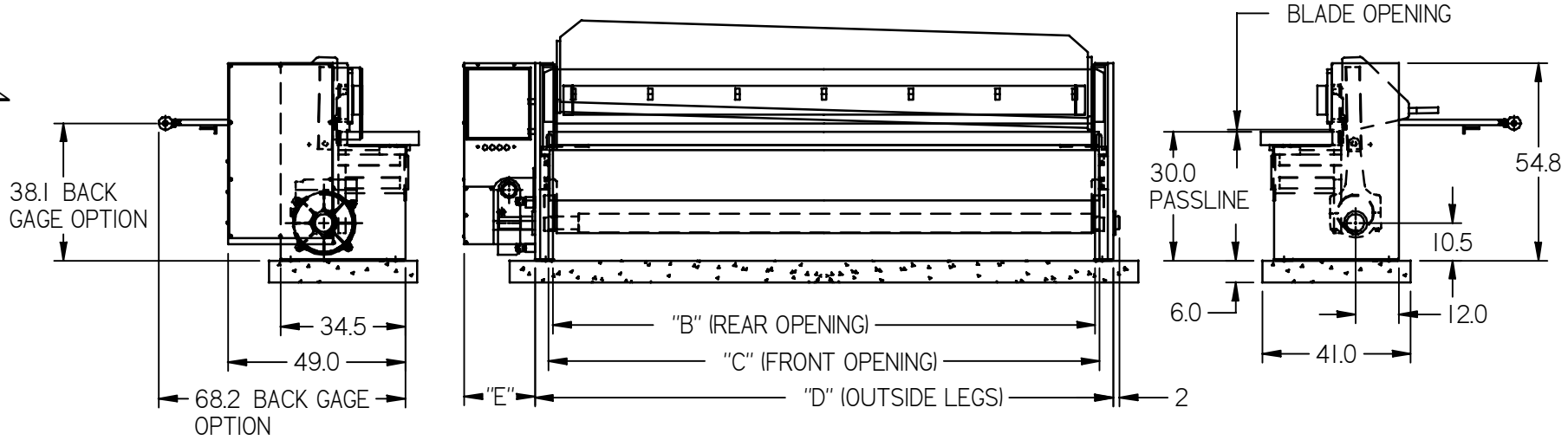
Any maintenance personnel engaged in the removal, replacement, or adjustment of parts on a shear should exercise due care to assure his own safety and that of other persons in the plant. Personnel should make certain that, before any parts are removed, all spring, air and hydraulic pressures (where applicable) have been turned off at the shear and that all pressures are bled from system components. Electrical power should also be disconnected, disconnect switch OFF, and WARNING tags attached to the shear disconnect switch and air shutoff valve (where applicable).

After all repairs and maintenance have been completed, the repair mechanic should check his work, remove tools, rigging and handling equipment. Power should be restored to the shear only after all personnel are clear of the shear. Then start the shear as noted in the manual and run it for an adequate length of time to determine that all parts especially the lubrication system and clutch controls, are functioning properly. All guards and applicable safety equipment must be installed before turning the shear over to production personnel.



	SHEAR MODEL:							
	2548 1048 748	2552 1052 752	2560 1060 760	2572 1072 772	2584 1084 784	2596 1096 796	2510 1010 710	2512 1012 712
LENGTH:	48	52	60	72	84	96	120	144
A	58	62	70	82	94	106	130	154
B	54	58	66	78	90	102	126	150
C	56.5	60.5	68.5	80.5	92.5	104.5	128.5	152.5
D	64	68	76	88	100	112	136	160
E	19.25	19.25	19.25	19.25	19.25	19.25	19.5	21.5

W-PW SERIES SHEAR MACHINE DIMENSIONS



FAMCO MACHINE DIVISION

INSTALLATION

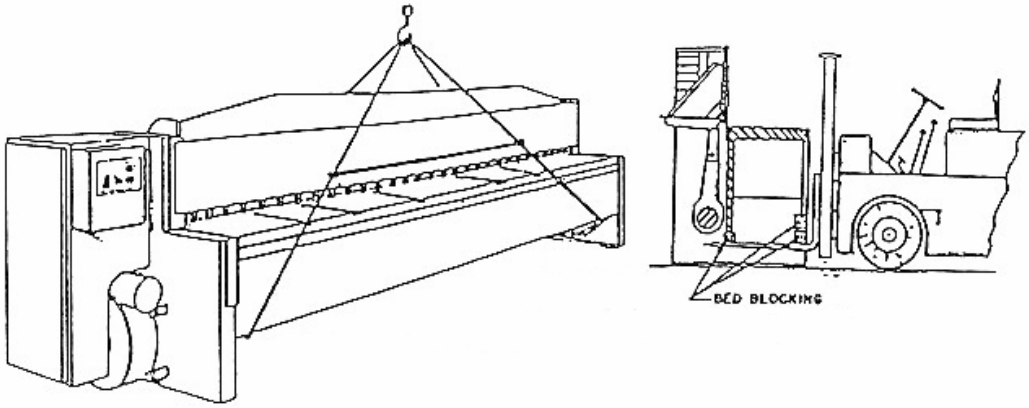
Receiving

Check the equipment immediately upon receipt for any loss of parts or damage incurred during shipment. All equipment is sold F.O.B. FAMCO Machine Div., Kenosha, WI. The manufacturer's responsibility for transit damage ends with the carrier's signature on the bill of lading attesting to the arrival in good condition. If you later discover any damage or loss that occurred in shipping, report it promptly to the transport company in order to expedite the necessary claims.

Missing items not noted on the bill of lading, or discrepancies between items ordered and those received, should be reported promptly to:

FAMCO MACHINE DIVISION
BELCO INDUSTRIES, INC.
1001-31st STREET
KENOSHA, WISCONSIN 53140
PHONE NO.: 1-262-654-3516
FAX NO.: 1-262-654-0803
e-mail: SALES@FAMCOMACHINE.COM

PRELIMINARY OPERATIONS



MODELS 'W' AND 'P-W' SERIES
ESTIMATED SHEAR WEIGHTS

SHEAR MODEL	WEIGHT (LBS.)	SHEAR MODEL	WEIGHT (LBS)
724	6,500	P-724	5,800
736	6,600	P-736	5,900
748	6,700	P-748	6,000
752	7,500	P-752	6,400
760	7,600	P-760	7,000
772	7,700	P-772	7,700
796	9,700	P-796	9,700
1010	11,000	P-1010	11,000
1012	14,700	P-1012	14,700
1052	7,500	P-1052	7,500
1060	7,400	P-1060	7,400
1072	7,500	P-1072	7,500
1084	7,900	P-1084	7,500
1096	9,300	P-1096	9,300
2510	12,000	P-2510	12,000
2512	13,500	P-2512	13,500
2548	7,500	P-2548	7,500
2552	8,000	P-2552	8,000
2560	9,000	P-2560	9,000
2572	10,000	P-2572	10,000
2584	11,000	P-2584	11,000
2596	11,300	P-2596	11,300

RECEIPT AND INSPECTION

Check the shear immediately when first received for obvious shipping damage or missing parts. If there is damage that needs attention, notify the delivering carrier and have their agent inspect the shear before proceeding with the installation.

RIGGING AND MOVING

Leave the shear on the shipping skids during all moving operations and until ready to position at the operating location. Crane or hoist rigging is permissible when the sling is rigged under the skids. If both the front and rear skirt of the shear are first removed, if any, it is also permissible to rig slings beneath the bed and crosshead only as shown above.

LIFTING EQUIPMENT

There are a variety of accessories that might be needed for a lifting or turning job:

1. Hooks – They are made in many shapes and sizes. The hook must not be loaded over its capacity and must be used properly.

2. Chains – Not recommended for heavy lifts because flaws are difficult to detect and they are too cumbersome to handle.

3. Manila Rope – Provides a good grip on the job and is light and flexible to handle. Must be protected against the weather and other destructive elements such as solvents, oil, and heat. Manila rope should be inspected frequently.

4. Nylon Rope – Gradually replacing manila rope. Basically the same strength and not affected by destructive elements.

5. Wire Rope – Most slings are made of wire rope. It is preferred because it is stronger than fabric ropes; it is flexible and can be shaped to most lifting requirements.

Remember, your first responsibility is to practice safety. Before you begin any lift, we suggest you go through a mental checklist. Ask yourself questions like the following:

1. What is the weight of this load?

2. What type of accessory, hitch or connection is required?

3. Will the lift be a straight lift or whether an angle rig is required? This determination will affect the lifting capability of the accessory.

4. Are the slings free of kinks, knots, or broken strands?

5. Is proper clearance available to make the lift safely?

LIFTING TIPS

1. NEVER lift more than the related capacity of the hoisting equipment.

2. If in doubt, have the hoisting equipment INSPECTED for safe operating conditions. INSPECT all slings. DON'T TAKE CHANCES, if in doubt, check with the proper authorities.

3. BALANCE LOAD in sling before LIFTING more than a few inches. Distribute load evenly.

4. Use a sling LARGE enough for the LOAD.

5. To PREVENT damage from the slings to the finished parts of the machine, be sure machine parts are properly PROTECTED by PADDING.

6. ALWAYS be sure your slings are free of knots and kinks. Also, SLACK must be taken out of the sling before lifting.

7. TO PREVENT a serious accident that may be caused by sharp corners and edges cutting the sling, use proper BLOCKING and PADDING.

8. CLARIFY HAND SIGNALS with co-workers. If signals are not understood, make no move until they are clarified.

9. DO NOT lift loads with extra slings or cables suspended from the hook.

10. ALL loads must be lifted gradually. Sudden jerks may DAMAGE cables or slings.

11. BEFORE lifting a machine or a component of a machine VERIFY that all interrelated connections are disconnected.

12. BEFORE you signal to have a load lifted, be sure that all tools, parts, chips, coolant, oil, etc. are REMOVED from the LOAD.

13. DO NOT carry loads over aisles unless absolutely necessary.

14. As the lift starts OBSERVE the slings or lifting devices to assure that they are FUNCTIONING PROPERLY.

15. BEFORE making the lift, ask all employees to STAND CLEAR. NEVER allow a person to work under the load while the load is suspended from the crane hook.

16. When setting loads down, prepare the landing area beforehand and DON'T create a condition of LEANING and UNSTABLE units.

17. When lowering the load on blocks, the blocks MUST be even in height for a LEVEL and STABLE load.

18. DON'T set your load down in aisles. It is your duty to keep AISLES CLEAR for other employees.

19. ALWAYS be suspicious of a heavy load which must be lifted by eye bolts and NEVER lift such loads at an angle unless the eye bolts are short shouldered.

20. Between lifts, DON'T leave slings or hooks or other equipment lying around on the floor.

21. ALWAYS use good horse sense and good judgment in handling all loads.

FOUNDATION – INSTALLATION - LEVELING

To maintain good blade life and accurate shearing, it is very important that the shear should be properly installed on an adequate foundation.

A concrete floor 6" thick, reinforced with 1/4" dia. steel mesh, on 6" centers should be adequate, and is recommended. The shear should not be placed over expansion joints or cracks in the concrete. Actual dimensions are dependent on local soil conditions. Consult a local registered civil engineer.

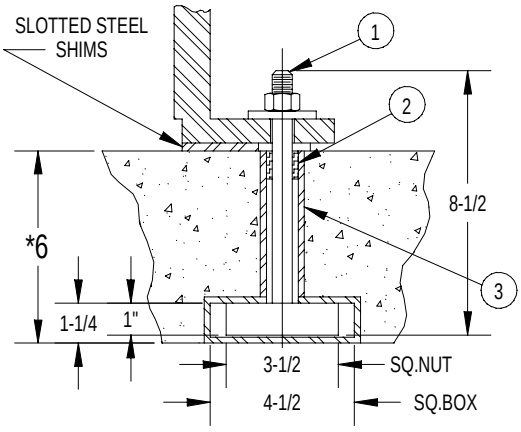
When leveling the shear, use a precision level (accurate to .001" per foot) on the shear bed top surface. Use only steel shims between the shear base and the floor. The bolts must fit freely thru the machine base holes to avoid side loading. Before tightening each bolt, recheck the floor shims to be sure they are snug. Great care must be taken while tightening the foundation bolts to avoid any twisting load on the shear.

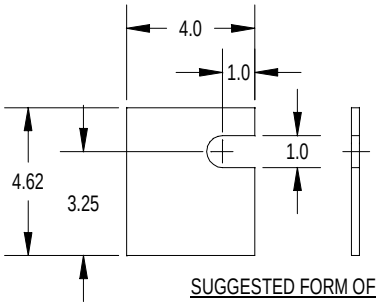
Make a final check with the precision level at <u>each end</u> of the shear. It should read perfectly level both lengthwise and across the table. Cement grouting is recommended to help maintain level accuracy.

Thoroughly clean and lubricate the shear when installation is complete.

Do not use any compressible material or shock absorbents, for they will allow the shear to twist and damage the ways and/or bearings.

A typical foundation and anchoring method is shown below.





SUGGESTED FORM OF SLOTTED SHIMS

1. 2" IRON PIPE; WELD TO 12 GA SHEET METAL BOX WITH NUT INSIDE. MAKE NUT FROM SQUARE STOCK TO PREVENT TURNING IN BOX. NOTE: HOLDDOWN BOLTS, NUTS, BOXES AND PIPES ARE NOT FURNISHED WITH MACHINE. USE WOODEN FRAMES TO SUSPEND HOLDDOWN BOLTS TO SECURE ACCURATE LOCATION.
2. 3/4" DIA. HOLDDOWN BOLT (8" THREADED STUD) MUST FLOAT INSIDE OF PIPE TO LINE UP WITH MOUNTING HOLE IN MACHINE.
3. CAUTION: INSERT WOOD PLUG BEFORE POURING CONCRETE. REMOVE PLUG AFTER POURING.

*6" MINIMUM THICKNESS IS REQUIRED.

ACTUAL DIMENSIONS ARE DEPENDANT ON LOCAL SOIL CONDITIONS. CONSULT A LOCAL REGISTERED CIVIL ENGINEER. CONCRETE TO BE REINFORCED WITH 1/4" DIA. STEEL MESH ON 6" CENTERS.

FAMCO MACHINE DIVISION

OPERATION

DO NOT OVERLOAD. Stay within the capacity rating of this shear.
This shear is built to provide years of satisfactory operation, PROVIDED it is kept well lubricated, properly adjusted and the material capacity is not exceeded. NEVER cut anything that exceeds the rated shear capacity, no matter how short it may be.

Unless otherwise specified, this shear is equipped with *either* a foot switch control or "cut" pushbutton control, and is wired for single cycle (one stroke) operation.

The foot switch or "cut" button must be held for the desired number of strokes and must be fully released at the completion of the cut to set the clutch circuit for another stroke.

OPERATIONAL SAFETY

NOTE: CAUTION SHOULD BE TAKEN WHEN ADJUSTING OR REPAIRING THE SHEAR THAT ALL ELECTRICAL POWER IS OFF TO PREVENT THE HOLDDOWN AND THE BLADES FROM ENGAGING ACCIDENTALLY.

Before operating the machine, obtain (and understand) operating and safety instructions from your employer.

Providing safe and proper working conditions and point of operation safety devices consistent with the use and operation of the machine are determinations to be made by, and the sole responsibility of, the user of the machine.

The user should familiarize himself with point of operation safety devices that are in common usage in the industry, and equip the machine with such devices as are consistent with the operations being performed.

All operating and maintenance personnel should be specifically instructed by the user on the proper operating and maintenance instructions contained in this manual.

The determination as to whether to use mechanical (or other) safety devices must be made by the user; the user alone, being most intimately familiar with the operation, must judge what is practical or impractical.

Due to various types of operations that may be encountered, and a variety of feeding and/or take-off devices with which to equip machines to accommodate such operations, the user must be responsible for furnishing as part of his day-to-day procedure those devices that best satisfy safe operation.

START UP PROCEDURE

1. CHECK BLADE CLEARANCE - Before the motor is started, turn the drive shaft over by hand to be sure that the blades have clearance. The blades were properly adjusted before shipment, but may have moved during shipment or rigging. Refer to the section on "Blade Adjustment and Clearance".
2. GREASE OR OIL THE HOLDDOWN FEET – Grease or oil the Holddown feet in the Top-Dead-Center position prior to start up. Refer to section on "Holddown Adjustment".
3. APPLY POWER – Turn on the Main Power.
4. CHECK FLYWHEEL ROTATION – Check the proper rotation of the flywheel, as indicated by the arrow on the flywheel.

LOCK OUT/TAG OUT PROCEDURE

For safety inspections, moving or long periods of machine downtime not requiring air or electrical power, the following procedure is suggested:

1. DEPRESS THE "STOP" PUSHBUTTON.
2. DISENGAGE POWER – Turn off Main Power and **Lock and Tag** Disconnect Switch Handle.
3. ALLOW FLYWHEEL TO STOP – Allow the flywheel to completely stop before attempting any inspection, adjustment, repair or replacement.
4. BLOCK UNDER THE CROSSHEAD – Use a piece of 2" x 4" wood.
5. TURN OFF AIR SUPPLY – Turn off air supply and bleed off stored air.

BLADE AND GIB ADJUSTMENT

When an objectionable burr appears on the material sheared edge, inspect the machine for proper blade sharpness, blade clearance, and crosshead gib adjustment. Inspection and adjustments should be made in the following sequence:

BLADE SHARPNESS

These shears are furnished with 4 edged blades. When the cutting edges in use become dull, the blades should be removed and turned to present a sharp edge to the work. Dull blades increase the shearing load and cause more twist and camber. Refer to the section entitled "Blade Changing and Replacement" for the correct procedure.

Resharpening is necessary after all 4 edges become dull. The factory recommendations for resharpening blades and grinding limits are outlined in the section on "Regrinding".

NOTE: KEEP BLADES SHARP. DULL BLADES CAN INCREASE THE SHEARING LOADS BY AS MUCH AS 50%.

CROSSHEAD GIB BEARING ADJUSTMENT

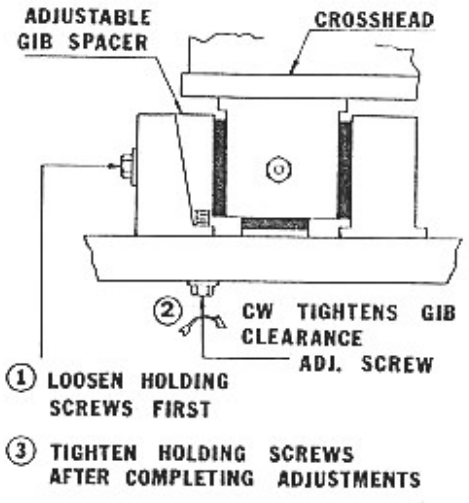
Non-metallic crosshead Gib Bearings on all FAMCO shears are made of Texolite, and are located on the front, back and ends of the crosshead. Non-metallic gibs permit setting a close clearance in the gib ways by means of the tapered Gib Spacer. This is particularly important on light gauge material where blade clearances are at a minimum and a burr-free cut is mandatory.

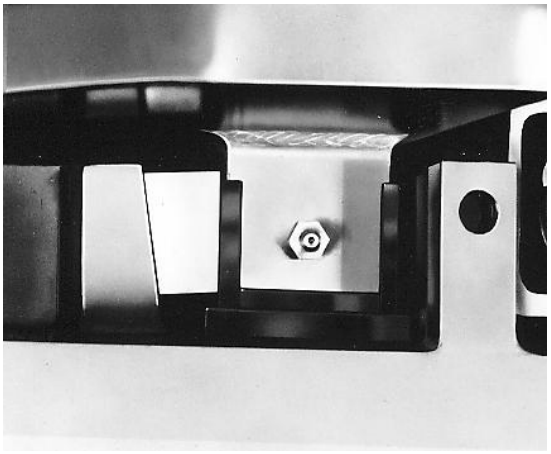
If gib clearances were excessive, the crosshead could move in the ways when material is contacted, thereby increasing the blade clearance and causing a poor sheared edge. The FAMCO crosshead remains truly aligned on even the most difficult cuts.

The gib bearing clearance has been properly adjusted at the factory and should not be changed except to compensate for gib bearing wear. When necessary, adjustment can be made by loosening the gib spacer holding screws on each leg (1), and tightening the adjusting screws on the outside of each leg (3), until all play has been eliminated between the gib bearing and the gib way. Be sure to retighten the holding screws.

When properly adjusted and well lubricated, the Gib Ways will run warm, but not hot, on continuous operation.

NOTE: Torque Adj. Screws to
"15 foot pounds"

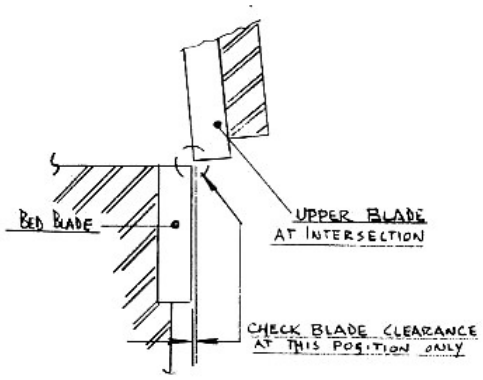




Refer to the "HOLDDOWN PARTS LIST" section for the proper location of the adjusting screws.

BLADE ADJUSTMENT AND CLEARANCE

Properly adjusted blades should not touch or rub together.
A blade clearance as noted below should be maintained.



Machine Capacity - Mild Steel	Blade Clearance
14 and 16 gage	.002" - .0025"
12 gage	.0025" - .0035"
10 gage	.004" - .005"
3/16 inch	.006" - .007"

NOTE: DISCONNECT ALL POWER TO THE MACHINE WHEN MANUALLY MOVING THE SHEAR! BE VERY CAREFUL TO AVOID PLACING YOUR FINGERS OR ANY PARTS OF YOUR BODY BETWEEN THE BLADES!

EXERCISE CAUTION DURING BLADE ADJUSTMENT WHEN FINGERS ARE NEAR SHARP BLADE EDGES.

To **ADJUST** the blades bring the blade to the Point of Intersection using the following steps:

1. Locate the "INCH" pushbutton switch.
2. "JOG" the Crosshead to the Point of Intersection by quickly depressing the "INCH" pushbutton.
3. Measure the blade clearance at this position.

For larger machines, you can bring the blade to the bottom of the stroke as follows:

1. Turn the selector switch to the "CONTINUOUS" mode position.
2. Step on the foot switch.
3. Quickly push the "START" and "STOP" pushbuttons alternately to start and stop the motor until the crosshead stops at the bottom of the stroke.
4. Measure the blade clearance at this position.

To **SET** the blade clearance (GAP), **move the bed using the following steps**:

(Refer to the "BED ADJUSTING BOLTS PARTS LIST" on page 61 for the proper location of the adjusting screws.)

1. Loosen the four BED END BOLTS on the side or face of each leg.
2. Loosen the two Jam Nuts on the BED PUSH BOLTS.
3. Adjustment is made by moving the BED PUSH BOLTS and BED PULL BOLTS, located on the front of each Leg member, in or out until the gap is obtained at both ends of the table.
4. Lock this setting by tightening the BED PUSH BOLT Jam Nuts and the four BED END BOLTS.

PARALLEL ADJUSTING BLADE BLOCKS

FAMCO Machine Div. uses the adjustment block design on all models and sizes similar to that used on heavy gauge and plate shears, to assure utmost dependability and rigidity. The individual blade seat adjustment blocks, shown here, are spaced six to eight inches apart and permit extremely accurate adjustment for uniform blade gap (parallelism) settings throughout the full length of the shear, without shimming or other compromising procedures. These adjustment blocks can be quickly set to an exact blade clearance for more accurate and burr-free shearing.

The purpose of the adjusting blocks is to get the crosshead blade parallel with the table blade thru the length of the shear.

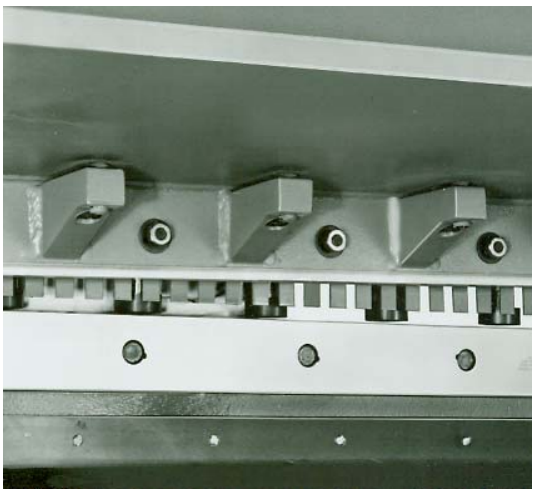
NOTE: ADJUST THE BLADE GAP BY MOVING THE SHEAR BED IN AND OUT WITH THE PUSH AND PULL SCREWS LOCATED AT THE FRONT OF THE SHEAR. Refer to the BLADE ADJUSTMENT AND CLEARANCE section on Page 12 to adjust the BLADE GAP and CLEARANCE.

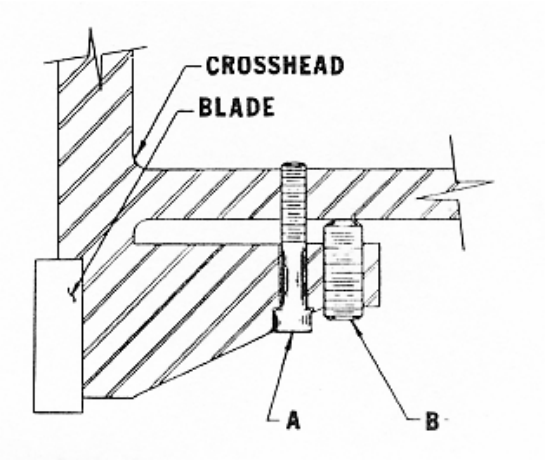
When adjusting the crosshead blade, adjust all the blocks a little at a time. Do not take up all the gap at any point at once. Work from both ends towards the middle of the crosshead. Once the blades are parallel, you can increase or decrease the blade clearance by moving the bed.

To move the crosshead blade towards the table blade, loosen PUSH screw “A” and tighten PULL screw “B” as shown below. To move the crosshead blade away from the table blade, the opposite applies.

NOTE: After adjusting the blade clearance, tighten all screws, and make a few full capacity cuts. You must now recheck the blade clearance, observing all SAFETY RULES.

If the blade clearance has not changed, you are ready for production. Occasionally the blade clearance will change after the first few cuts because the “PUSH-PULL” screws “A” and “B” “seat” themselves. However, once they are well seated, the blade clearance will not change!





BLADE CHANGING AND REPLACEMENTS

NOTE: REFER TO THE "SHUT DOWN PROCEDURE" FOR PRECAUTIONARY SAFETY PROCEDURES BEFORE CHANGING BLADES.

Block up the crosshead from the floor to one end only, leaving clearance for both blade and blade bolts to be removed.

The holddown has to be removed in order to remove the crosshead blade – see instructions on "Removing the Holddown". After the holddown is removed, insert (2) ½" diameter by approximately 1 foot long steel rods through 2 blade bolt holes after all but 2 of the blade bolts have been removed. Now using the two rods, the blade can be lifted from the crosshead after the last two blade bolts have been removed. Always handle blades with extreme care – protect yourself from the sharp edges and protect the sharp edges from accidental damage.

Place the blade on a rack and clean with solvent before replacing.

Remove the lower blade using the same procedure as outlined above.

Replace the crosshead blade by reversing the instructions given above, being careful to replace the blade shim on top of the blade; the shim is necessary to preserve the captive blade edge.

Replacing the lower blade is essentially the same procedure except the shim is under the blade. For blades that have been reground, additional shims will be necessary to bring the top of the blade flush with the table top.

Tighten all blade bolts to the following torque requirements:

Blade Bolt Diameter	Torque Setting
1/2 inch	22 FT. LBS.
3/8 inch	14 FT. LBS.

See "Blade Adjustment" for setting the proper clearance.

NOTE: If the shear is equipped with a Back Gage, reground blades also require adjustment of the back gage dials and scales in the table.

REGRINDING

Blades must be ground carefully to give you good results. We highly recommend that you send your blades to shear blade manufacturers for regrinding because they are experienced in the care of your blades and have the equipment to give you an accurate grind. When returning blades to be reground, specify the grinding limits given below.

GRINDING LIMITS

Width - Parallel within .005" from end to end
Thickness - Parallel within .003" from end to end.
No variation greater than .001" within any 12" of length.

SHEAR ADJUSTMENT AND HOLDDOWN INSTRUCTIONS

REMOVING THE HOLDDOWN

1. Insert the correct number of 1/2-13 UNC x 4" long square head, flat point, set screws in the tapped holes provided on the foot pickup bar.
2. Using these as "jack screws", tighten them down until there is tension against the holddown assembly.
3. Tighten each jack screw four (4) more times in order to release the holddown pickup bolts from the crosshead bosses.
4. The holddown mounting bolts can now be removed from each end permitting the removal of the holddown assembly.

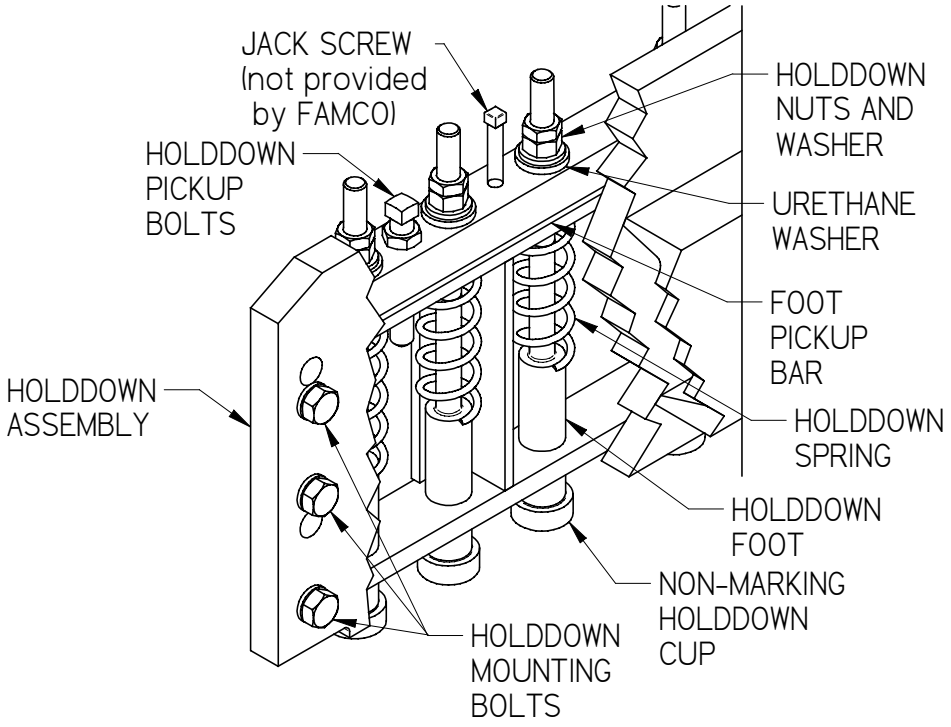
SPECIAL NOTE: Do not loosen the holddown nuts, which are securing the holddown feet. These have been adjusted and set at the factory.

INSTALLING AND ADJUSTING THE HOLDDOWN

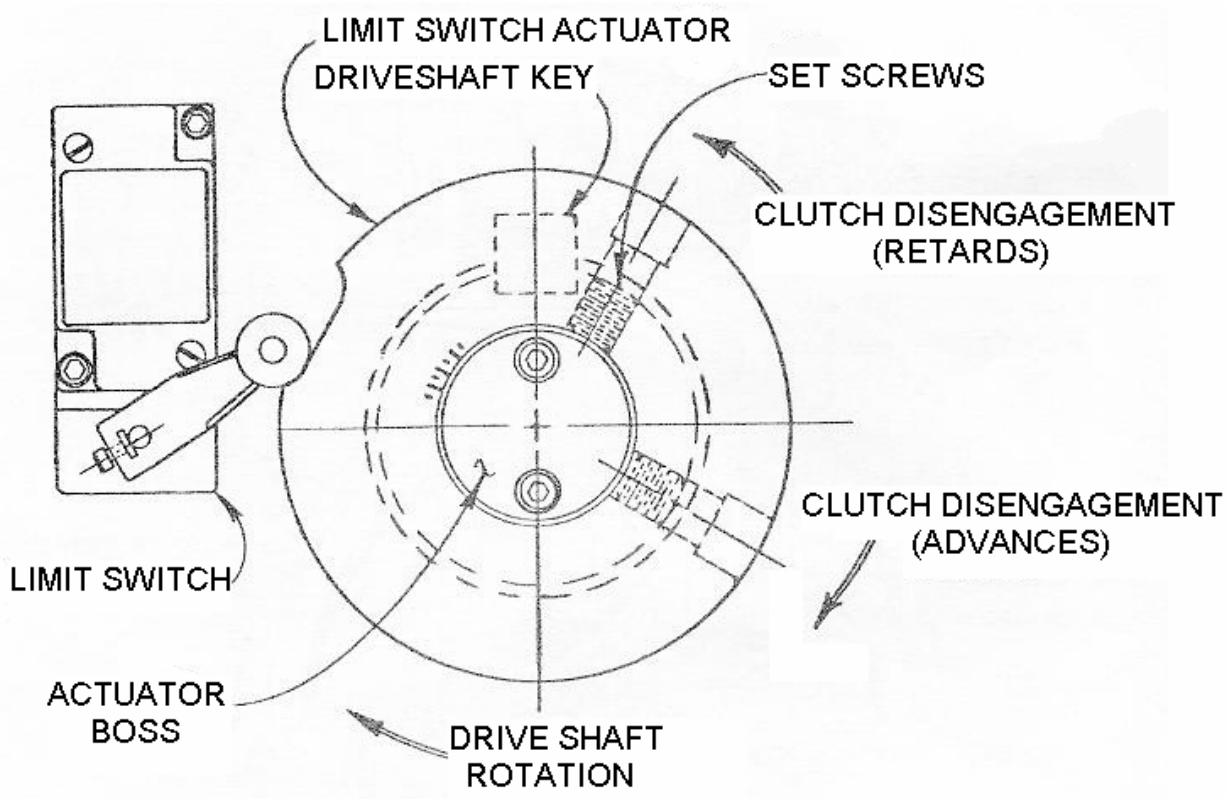
The holddown assembly of this series shear is stationary. Only the feet move, thus there are no holddown ways to maintain. Provided that the jack screws were not loosened after the holddown was removed, you are now ready to re-install it on the machine.

1. Secure the holddown assembly to the leg members with the holddown mounting bolts.
2. Loosen and remove the jack screws that were used to pull up the holddown feet. This will automatically give the right amount of clearance between the bed and the holddown feet; approximately 1/4" for all W Series shears.

If any final adjustment is required, it should be made ONLY thru the holddown pickup bolts, NOT thru the individual holddown feet. SPECIAL NOTE: Holddown feet ***must*** be lubricated manually once a year.



CROSSHEAD “TOP-DEAD-CENTER” ADJUSTMENT



If the Crosshead is over traveling the “Top-Dead-Center” (TDC) by an excessive amount, the limit switch should be adjusted. The Limit Switch, located at the opposite end of the Transmission inside the flywheel guard of the shear, controls the engaging and disengaging point of the air operated Clutch/Brake, and ultimately, the stopping position of the Crosshead. The Eccentric Limit Switch Actuator actuates the Limit Switch. The Crosshead is in its normal stopped position or TDC when the Driveshaft Key is perpendicular to the ground. The above sketch shows the Driveshaft Key, which is actually on the Transmission end of the shear.

The Clutch/Brake and Limit Switch were adjusted for stopping and holding the Crosshead at TDC using 80 PSI air pressure at the factory. The 80 PSI air pressure must be maintained otherwise the stopping point of the Crosshead will be affected.

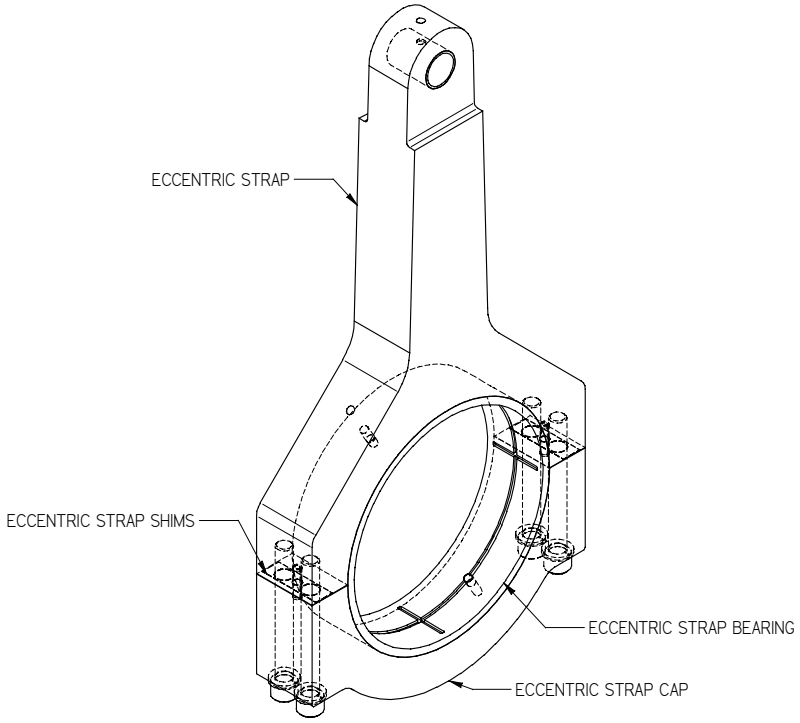
To adjust the Limit Switch, these steps should be followed:

1. Loosen the Set Screws on the Limit Switch Actuator.
2. Rotate the Actuator clockwise (CW) or counter-clockwise (CCW) in order to retard or advance the Clutch/Brake disengaging point.
3. Tighten the Limit Switch Actuator Set Screws.

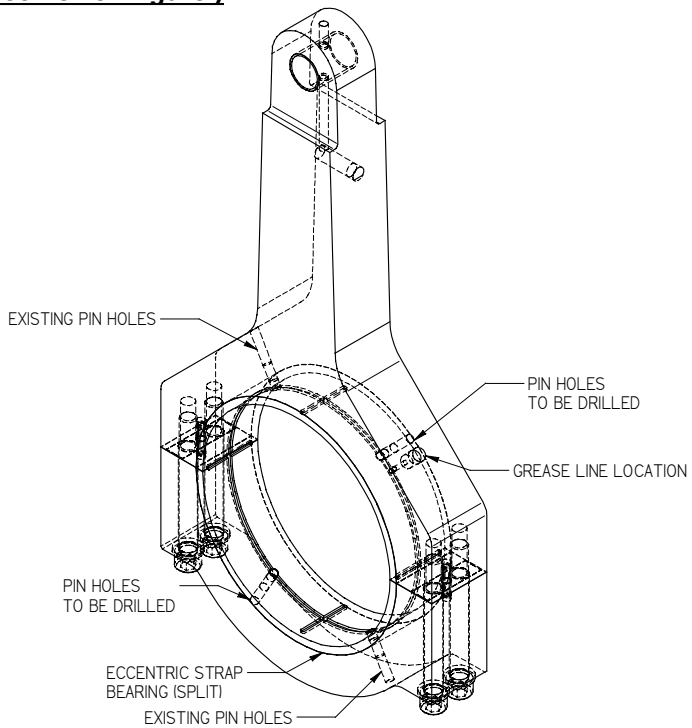
NOTE: Make sure both Set Screws are tightened after adjustments are made.

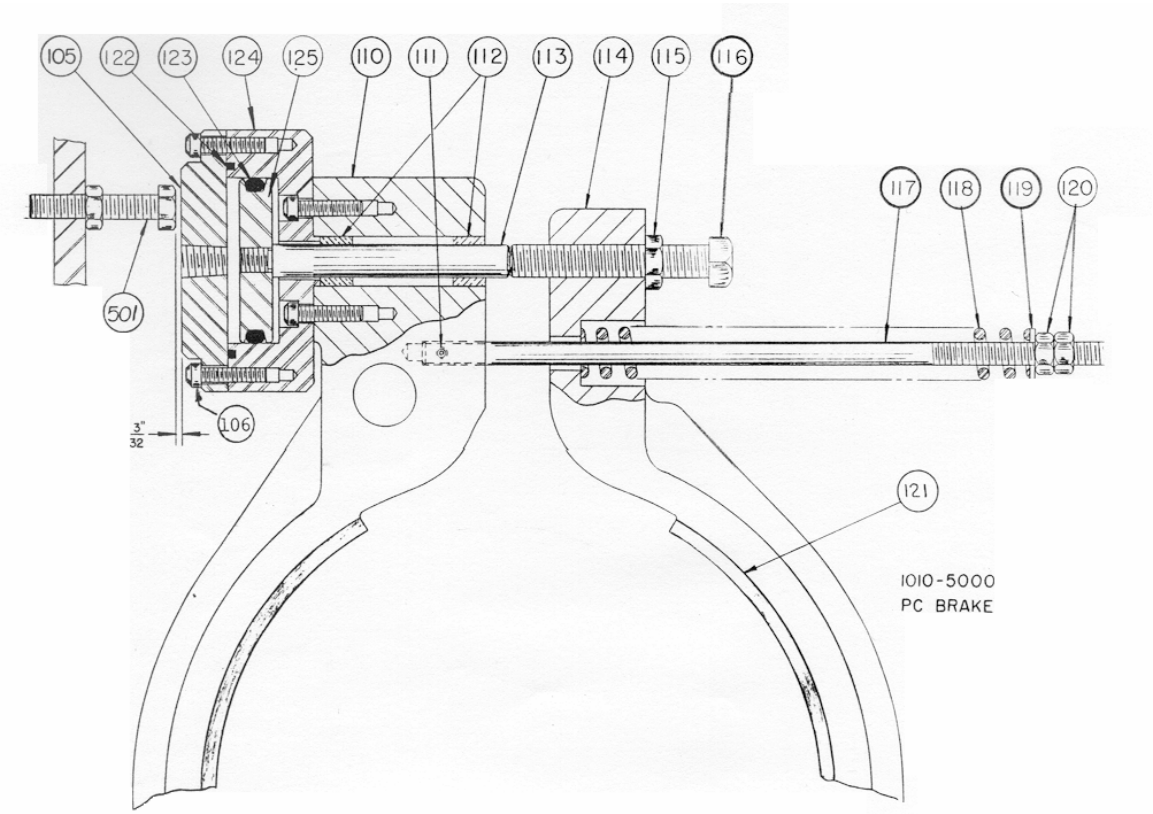
ECCENTRIC STRAP ADJUSTMENT

Normal running clearance between the bronze Strap Bearing and the Eccentric Cam is .003” to .005”. If the clearance is not within this range, shims should either be added or subtracted to the Eccentric Strap Assembly. Two .005” thick shims on each side of the assembly are included from the factory.



NOTE: If Eccentric Strap Bearing replacement is done without removing the driveshaft, split bearings are used. Each half of the split bearing requires two pins. Two pins will be using existing bearing pin holes in the Eccentric Strap. Two additional pin holes need to be drilled adjacent to the grease line. (See Lower Figure.)





PC BRAKE ADJUSTMENT

With the operating air pressure off, loosen locknut (Item 115) and tighten the adjusting screw (Item 116) until the piston (Item 125) is “bottomed” out against the cylinder cap (Item 105).

Back off the adjusting screw (Item 116) until a clearance of .030” to .060” is obtained between the adjusting screw and the piston rod (Item 113). Re-tighten locknut (Item 115) at this setting.

By always maintaining a .030” to .060” clearance between these two parts, it is always assured that the brake linings are in full contact with the brake drum, as they wear.

After adjusting the piston setting, actuate the brake with the manual override on the solenoid valve, and check the brake opening between the lining and the brake drum. Brake linings should be free of the drum with a clearance of .010” to .020” on each side.

NOTE: Avoid excessive brake clearance on brake linings.

SPRING ADJUSMENT

Spring setting is for the control of stopping time, as well as stopping position of the rotating shaft. The top stop limit switch cam must be adjusted along with the brake tension, for proper stopping position.

By loosening the outer locknut (Item 120) and tightening the inner adjustment nut (also Item 120 above), the spring tension on the brake drum can be increased.

DO NOT OVERTIGHTEN: After turning the adjustment nut a few turns (clockwise), actuate the shear and observe its stopping.

Make sure to tighten the outer locknut (Item 120) once the adjustments are complete.

INSPECTION

The brake should be inspected periodically to make sure it pivots freely at the reaction bushing (pin). If the brake does not pivot freely, remove it from the shear, clean and lubricate both the reaction bushing and the brake mounting hole.

BRAKE LININGS

When new, the brake linings are 3/16" thick. Should they wear below 3/32" thickness, obtain new linings (FAMCO Part No. 1010-121) from the factory.

The brake linings are installed with adhesive. To install new brake linings, first scrape off the old linings and THOROUGHLY clean the brake halves with a good solvent.

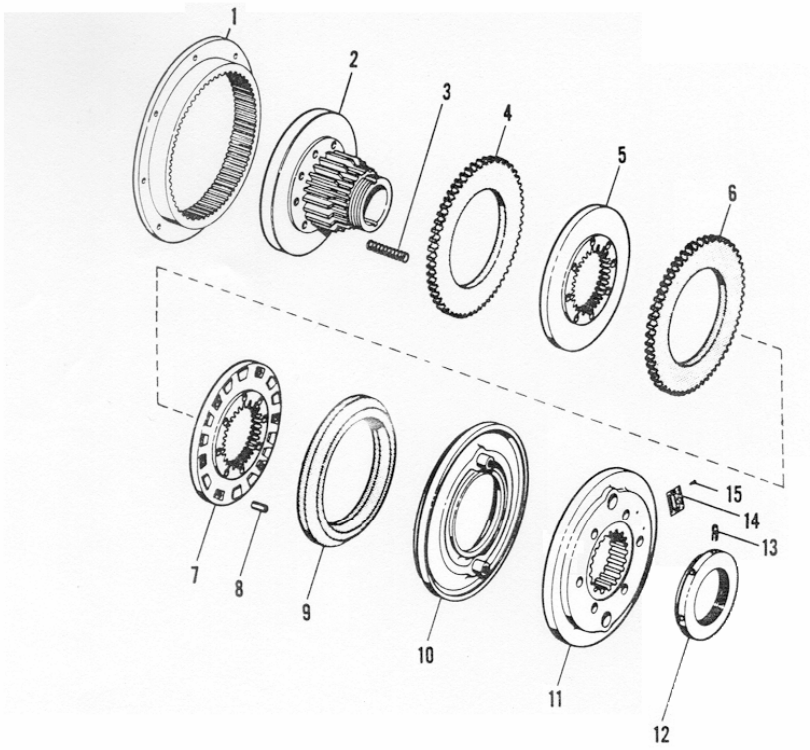
A good two-part epoxy cement can be used. FAMCO suggests the use of Rybestos-Manhattan RB6009). Follow the instructions of the epoxy manufacturer when installing the new linings. After the linings are cemented on, clamp the brake assembly to the brake drum. Let cement dry for approximately 8 hours.

To speed the drying process, the brake can be placed into an oven. After cementing the linings on the brake, clamp it around a 9-1/2" diameter drum and place it in an oven for 20 to 30 minutes at 300-350 degrees F.

LININGS SHOULD BE INSPECTED REGULARLY TO AVOID EXCESSIVE WEAR.

KEEP LUBRICANTS OFF AND AWAY FROM THE BRAKE LININGS

Adjust the Stop Cap Screw (Item 501) to always have a 3/32" clearance between its head and the cylinder cap (Item 105).



Item	Description	Quantity	Item	Description	Quantity
1	RING, driving		9	PLATE, insulator	1
2	PLATE, hub-and-back		10	DIAPHRAGM ASSEMBLY	1
3	SPRING, release		11	PLATE, front cover	1
4	PLATE, driving		12	NUT, special	1
5	PLATE, central		13	SCREW, cup point set (1/4 x 5/8)	1
6	PLATE, driving		14	PLATE, name	1
7	PLATE, pressure		15	SCREW, drive	2
8	ROLLPIN				

GENERAL OPERATION

A. Maximum Allowable Speed (Cast Iron Driving Ring):
   a. 4200 RPM with solid driving plates
   b. 3300 RPM with split driving plates
B. Maximum Allowable Speed (Steel or Nodular Iron):
   a. 4850 RPM with solid driving plates
C. Torque:
   a. Slipping 780 lbs. ft. *@ 130 psi.
   b. Working 390 lbs. ft. *@ 130 psi.

* - Can be increased 33% with heavy duty driving plates.

D. Horsepower Rating:
   a. Normal-Duty – 61 hp.
   b. Heavy-Duty – 39 hp.
E. Air Volume To Engage (Fully Worn):
   a. 11 cubic inches
F. Air Pressure: Consult original equipment manufacturer. Pressure should not exceed 130 psi.

Air Operated Clutch Operating and Maintenance Instructions

for use with manual wear adjusting clutch/brake assembly

INSTALLATION

A. Shaft Fits: Clutch hubs should be fitted to the shaft with a light press fit to eliminate the possibility of keys becoming hammered out due to shock loading.

B. Alignment: Proper alignment of the clutch with relation to the driving member (driving ring and driving spider) is of the utmost importance in order to obtain satisfactory clutch performance and minimum service requirements.

C. Noise: Excessive wear of the clutch driving plate and excessive heating is usually accompanied by a noisy operating condition. Therefore, it is suggested that a noisy clutch be checked for proper alignment.

NOTE

When a clutch is equipped with a solid driving plate, a certain amount of noise Is normal at various speeds due to the driving plate rattling in the driving ring.

IRREGULARITIES OF PERFORMANCE AND CORRECTIVE MEASURES

A. Clutch Slippage:
   a. Air pressure at the clutch must be as recommended by the original equipment manufacturer. Take this reading as close to the clutch as possible to eliminate any line pressure drop.
   b. Plate worn out. Maximum allowable standout with clutch engaged indicates clutch facing worn out.
   c. Inspect entire air line installation for any restrictions or leaks which could decrease the air supply to the clutch.
   d. Check operating valve for full opening.
   e. Carefully inspect clutch for possible air leakage at the diaphragm.
   f. If operating in cold weather, the air lines may be restricted due to freezing of the moisture in the air system. The addition of denatured alcohol or Ethylene Glycol in the air received will eliminate this problem.

B. Clutch Overheating:
   a. Check all points as listed under clutch slippage.
   b. Check alignment as described in paragraph ‘C’ under ‘Installation’. If misalignment exists, the clutch may not completely disengage.
   c. Be sure no dirt or foreign matter has collected in the driving ring or spider, which would prevent the driving plate from working freely.
   d. Check pressure plate and insulator plate for complete release travel.

DISASSEMBLY (refer to view of clutch on previous page)

A. Place the clutch on a working surface, hub-and-back plate (2) down.
B. Back the hex socket head setscrew (13) out until the special nut (12) is free.
C. Remove the special nut (12) with a spanner or chain wrench from the hub-and-back plate.
D. Lift the front plate (11) and the clutch diaphragm assembly (10) from the insulator plate (9).
E. Lift the insulator plate and the pressure plate (7) from the hub-and-back plate as an assembly. Pry the insulator plate from the pressure plate only if replacement of the parts is necessary. The plates are held together with six roll pins (8). Do not remove the roll pins unless replacement of the parts is necessary.
F. Remove the eight release springs (3) from the hub-and-back plate assembly.
G. Remove the driving plates (4 & 6) and center plate (5) from the hub-and-back plate (2).
H. Remove the name plate (14) only if replacement of the parts is necessary. The plate can be removed by prying out the mounting drive screws. The specification number of the clutch is stamped on this name plate.

Air Operated Clutch Operating and Maintenance Instructions

for use with manual wear adjusting clutch/brake assembly

ASSEMBLY

A. Place the hub-and-back plate (2) on a workbench with the hub side up.
B. Install the first driving plate (4) onto the hub-and-back plate.
C. Install the center plate (5) over the hub-and-back plate, aligning the release spring holes.
D. Place the eight springs (3) in position in the machined counterbored holes in the hub-and-back plate and holes in the center plate (5).
E. Install the second driving plate (6) on the hub-and-back plate against the center plate.
F. Insert six roll pins (8) in the pressure plate if they were removed during disassembly. Install the insulator plate (9) on the roll pins. Use a rubber mallet to firmly seat the insulator plate on the roll pins.
G. Install the pressure plate and insulator, making certain to align the bores in the pressure plate with the springs. After placing the pressure plate in position, center the springs by inserting a drift pin or other suitable tool through the holes in the pressure plate.
H. Install the diaphragm (10) over the pressure plate and insulator plate.
I. Install the front plate (11) making certain the hub side is down and proper alignment exists with the splines and the air hose connecting points.

NOTE

The air inlet holes must be assembled within 7-1/2 degrees of the keyway in the hub-and-back plate.

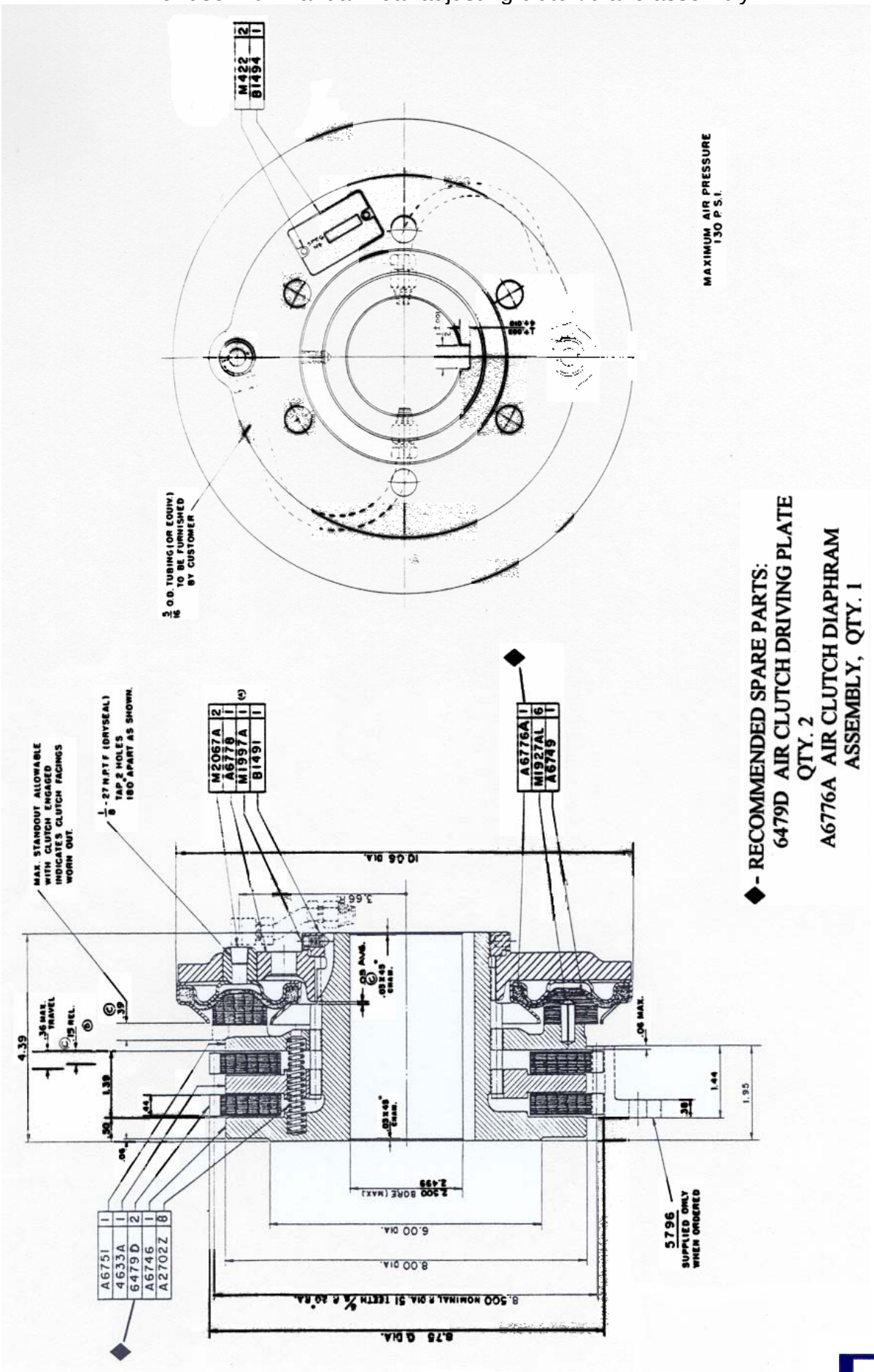
J. Clamp the front plate down, and secure the plate to the hub-and-back plate with the special nut (12). Tighten the special nut until it bottoms, then back-off the nut until the setscrew hole in the nut aligns with the slot in the hub-and-back plate. Secure the special nut to the hub-and-back plate with the setscrew (13).
K. If the nameplate (14) was removed during disassembly, replace it with the proper new one, and secure it to the front plate with two drive screws (15).

PREVENTATIVE MAINTENANCE

A. Routinely check the following:
   a. Be sure no dirt or foreign matter has collected in the driving plates from working freely.
   b. Check pressure plate and insulator plate for complete release travel.
   c. If operating in cold weather, the air lines may be restricted due to freezing of the moisture in the air lines or system. The addition of denatured alcohol or Ethylene Glycol in the air received will eliminate this problem.
   d. Avoid the use of rust inhibitors or commercial anti-freeze.

CLEANING AND INSPECTION

A. CLEANING – Thoroughly clean all parts with suitable cleaning agents. After cleaning, dry with compressed air. Lubricate all machined surfaces with clean oil. Examine each part after cleaning to make certain all foreign matter has been removed.
B. INSPECTION:
   a. Inspect castings for cracks. Replace cracked castings. Inspect tapped holes for damaged threads. Chase damaged threads with a standard tap of the correct size. Replace all castings that cannot be repaired properly.
   b. Inspect the teeth of the driving rings. Replace a damaged driving ring.
   c. Inspect all flexible hoses for cracks, sponginess, or other damage. Replace a damaged hose.
   d. Inspect the diaphragm for surface cracks and hardening. Replace a damaged or questionable diaphragm assembly.
   e. Inspect all gear teeth for cleanliness and damage. Foreign particles tend to collect in the root area of the gear teeth. Clean thoroughly and repair minor nicks with a fine file. Replace gear teeth that cannot be repaired.
   f. It is very important that all air hoses be clean and clear.
   g. Inspect the driving plates for cracks, nicks or chips. Replace damaged driving plates.
   h. Inspect for cracked or warped pressure plate. Replace the plate if it is damaged.
   i. Replace return springs as standard practice after any clutch failure.



FAMCO MACHINE DIVISION

WORM GEAR TRANSMISSION/REDUCER
LUBRICATION AND MAINTENANCE INSTRUCTIONS

WARNING!!
Read ALL instructions prior to operating reducer.
Injury to personnel or reducer failure may be caused by improper operation.
This reducer is not a fail-safe device.
Rotating equipment is potentially dangerous and should be guarded at all times.

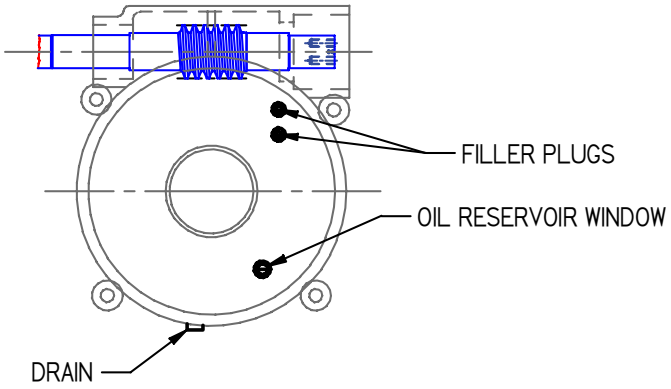
The "W" Series Shear features a silent worm gear design. The worm is part of the one-piece clutch shaft to insure true rigidity. Worm and gear rotate **only** during the cutting stroke – a fraction of the total operation time of the shear.

LUBRICATION
Your reducer was filled with lubricant to operate within a 30° to 100°F ambient temperature range. Prior to startup, verify that the oil is at the level shown in the window on the unit. If the ambient temperature will be outside the range for the lubricant installed at the factory, drain and fill the reducer with the proper viscosity lubricant prior to use. The precision-made gears and bearings in the reducer require high-grade lubricants of the proper viscosity to maintain trouble-free performance. For best results, use lubricants on the chart below for your reducer. Consult this chart or the factory for alternate lubricants.

CHANGE INTERVALS: Standard compounded lubricants should be changed every six months or 2500 operating hours, whichever comes first. Factory installed synthetic lubricants should be changed every two years or 6000 operating hours, whichever comes first.

Units shipped from the factory are assembled to properly lubricate all internal components based on a specific assumed mounting condition.

CAUTION!!
⇨ Oil should be changed more often if the reducer is used in a severe environment. ⇦
(that is, dusty, humid, etc.)



Manufacturer	30 to 100 deg. F Ambient Temperature AGMA Compounded No. 7	50 to 125 deg. F Ambient Temperature AGMA Compounded No. 8
Amoco Oil Co.	Worm Gear Oil	Cylinder Oil #680
Chevron USA, Inc.	Cylinder Oil #460X	Cylinder Oil #680X
Exxon Co. USA	Cylesstic TK-460	Cylesstic TK-680
Gulf Oil Co.	Senate 460	Senate 680D
Mobile Oil Corp.	600 W Super Cylinder	Extra Hecla Super
Shell Oil Co.	Valvata Oil J460	Valvata Oil J680
Sun Oil Co.	Gear Oil 7C	Gear Oil 8C
Texaco	Honor Cylinder Oil	650T Cylinder Oil
Union Oil Co. of CA	Steaval A	Worm Gear Lube 140

LUBRICATION (cont.)
Some gear lubricants contain E.P. additives that can be corrosive to gear bronze parts. Avoid lubricants that are compounded with sulfur and/or chlorine. For temperature ranges not shown, contact the factory.

Always check for proper oil level after filling. Capacities vary somewhat with model and mounting position. Oil should rise to the line on the Oil Reservoir Window. *Do not overfill*. The capacity for this transmission/worm gear reducer is 1-1/2 quarts.

SYNTHETIC LUBRICANTS
Synthetic lubricants provide the potential for numerous benefits including a wider operating temperature range and increased interval between changes. Use of synthetics can cause problems if they are not compatible with the seals of the conventional lubricants they replace. For normal ambient temperatures (-10° F to 105° F) we recommend the use of Mobil SHC 634 which is compatible with the standard compounded oil shipped in the reducer and the Viton® seal material used. For other temperatures, contact the factory for a recommendation.

MAINTENANCE
Your worm gear reducer has been tested and adjusted at the factory. Dismantling or replacement of the components must be done by factory service personnel to maintain the first years warranty. Frequently check the oil level of the reducer. If the oil is low, referring to the Oil Reservoir Window, add the proper lubrication. To add lubrication, follow these instructions:

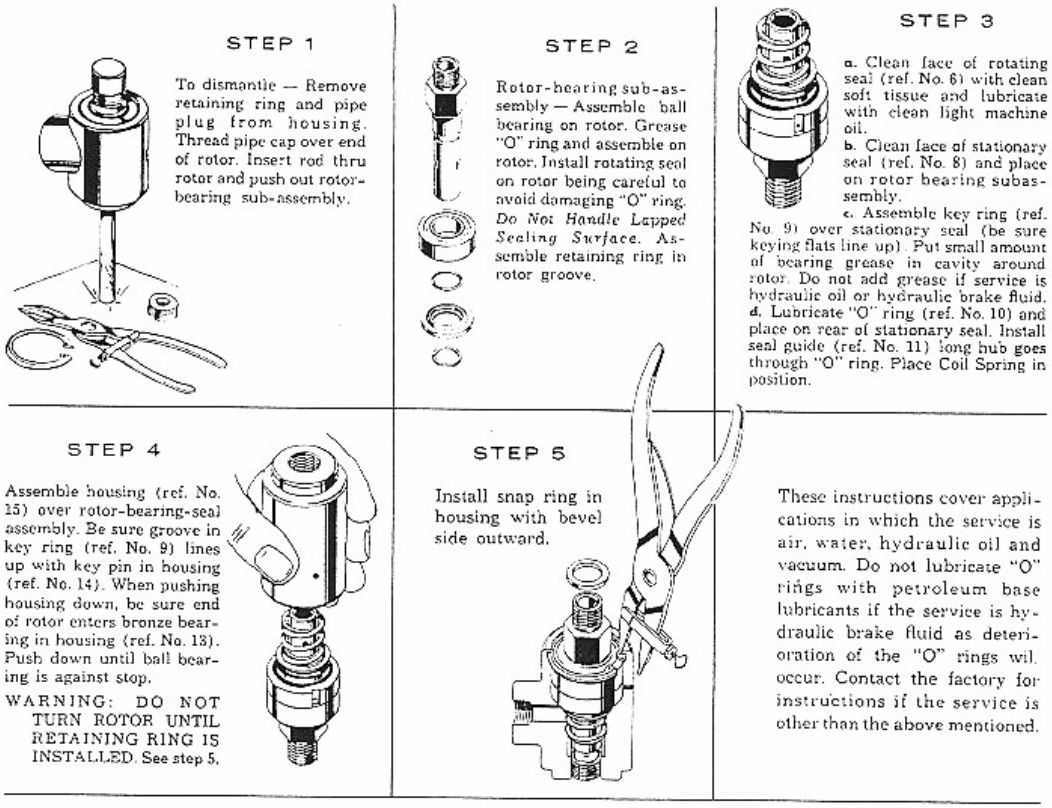
1. Remove the top and bottom Filler Plugs and add lubricant in *the bottom Filler Plug* until the oil level comes up to the sight line on the Oil Reservoir Window.
2. Replace the top and bottom Filler Plugs.

To replace the oil, follow these instructions:

1. Remove the top and bottom Filler Plugs.
2. Place a container large enough under the transmission.
3. Remove the Drain Plug underneath the transmission to let the oil out.
4. Replace the Drain Plug.
5. Add lubricant in *the bottom Filler Plug* until the oil level comes up to the sight line on the Oil Reservoir Window.
6. Replace the top and bottom Filler Plugs.

It is also recommended to dismantle and rotate the internal worm gear 180 degrees after 3 (three) years of shear operation.

ROTATING AIR UNION REPAIR AND ASSEMBLY INSTRUCTIONS



STEP 1

To dismantle — Remove retaining ring and pipe plug from housing. Thread pipe cap over end of rotor. Insert rod thru rotor and push out rotor-bearing sub-assembly.

STEP 2

Rotor-bearing sub-assembly — Assemble ball bearing on rotor. Grease "O" ring and assemble on rotor. Install rotating seal on rotor being careful to avoid damaging "O" ring. *Do Not Handle Lapped Sealing Surface.* Assemble retaining ring in rotor groove.

STEP 3

a. Clean face of rotating seal (ref. No. 6) with clean soft tissue and lubricate with clean light machine oil.

b. Clean face of stationary seal (ref. No. 8) and place on rotor bearing subassembly.

c. Assemble key ring (ref. No. 9) over stationary seal (be sure keying flats line up). Put small amount of bearing grease in cavity around rotor. Do not add grease if service is hydraulic oil or hydraulic brake fluid.

d. Lubricate "O" ring (ref. No. 10) and place on rear of stationary seal. Install seal guide (ref. No. 11) long hub goes through "O" ring. Place Coil Spring in position.

STEP 4

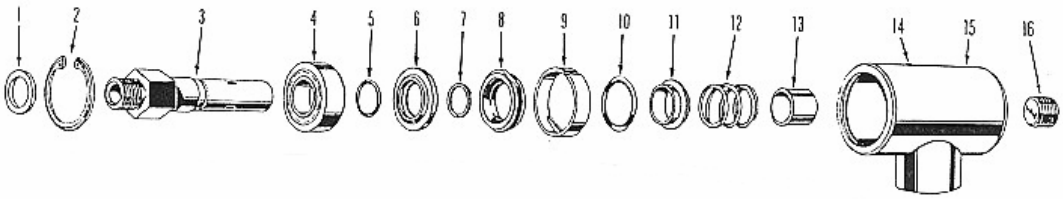
Assemble housing (ref. No. 15) over rotor-bearing-seal assembly. Be sure groove in key ring (ref. No. 9) lines up with key pin in housing (ref. No. 14). When pushing housing down, be sure end of rotor enters bronze bearing in housing (ref. No. 13). Push down until ball bearing is against stop.

WARNING: DO NOT TURN ROTOR UNTIL RETAINING RING IS INSTALLED. See step 5.

STEP 5

Install snap ring in housing with bevel side outward.

These instructions cover applications in which the service is air, water, hydraulic oil and vacuum. Do not lubricate "O" rings with petroleum base lubricants if the service is hydraulic brake fluid as deterioration of the "O" rings will occur. Contact the factory for instructions if the service is other than the above mentioned.



LUBRICATION

Lubrication of the ball bearings or seal faces is periodically required. The models which are not equipped with a grease fitting or oil cup are lubricated for life and require no maintenance other than periodic inspection to determine if normal wear has caused the union to leak. The unions equipped with oil cups should be lubricated periodically with four to five drops of high quality SAE #30 motor oil, approximately once a month or in extreme severe conditions where high rpm is encountered once a week. Rotating unions which are equipped with grease fittings should be lubricated with a good quality ball bearing grease. We recommend Kluber Lubrication's Petamo GHY 133N for temperatures to 300°F (150°C), Only enough grease should be applied to the ball bearings to replace that which has been dissipated. Overgreasing can be as damaging to the union as undergreasing. Particularly in high rpm applications, grease should be used sparingly. The chart below provides the approximate frequency of lubrication depending on temperature or as experience dictates.

OPERATING TEMPERATURE	FREQUENCY OF LUBRICATION
0°F (-18°C) to 250°F (121°C)	Once every three months
250°F (121°C) to 300°F (149°C)	Once monthly

TYPICAL ELECTRICAL CONTROL PANELS

Pedestal Type

Machine Mounted Type

CONTROL PANEL FUNCTION, when furnished:

1.) MAIN SHUT OFF (Red and Yellow Handle) – Disconnects all power to the Shear and the Electric Motor.

2.) POWER ON (White protruding Light/Cap) – Pilot light to indicate power is on.

3.) START (Green flush Pushbutton) – Starts the Electric Motor, which makes the Shear operational.

4.) STOP (Red flush Pushbutton) – Stops the Electric Motor; disables the Shear.

5.) INCH (Black flush Pushbutton) – "Jogs" the Crosshead/Blades to position desired; used for setup purposes.

6.) EMERGENCY STOP (Red mushroom-shaped Pushbutton) – Stops any Crosshead/Blade travel.

7.) CUT (Orange flush Pushbutton) – Allows cutting, as Shear runs through one complete cycle. (used on Production models; Foot Switch is used on non-Production models)

8.) INCH-OFF-SINGLE (Keyed Selector Switch) –
   a. "OFF" Position – Disallows any setup or cutting activity of the Shear.
   b. "INCH" Position – Allows the "jogging" of the Crosshead/Blades through the use of the "INCH" pushbutton (see number 5 above).
   c. "SINGLE" Position – Through the use of the "CUT" pushbutton or Foot Switch, allows cutting, as the Shear runs through one complete cycle.

ELECTRICAL CONNECTIONS

Unless otherwise specified, power connections are all for 230/460 volt, 3 phase, 60 hertz operation. (Dual voltage motors can be connected to run either 230 or 460.) All connections should be done by a qualified electrician. Power connections are made to the disconnect switch; Terminals L1, L2 and L3. The motor is protected by manual reset overload relays in the magnetic starter. The solenoid, limit switch and control relays operate at the step down voltage of 115 volts AC. Before making power connections, check to be sure that power characteristics match the electrical specifications of the machine. Observe all local electrical codes and provide adequate grounding. Check direction of rotation before cycling. Any voltage changes would also have to be made in fuse rating, overload heaters, and the connection to the primary side of the transformer.

FOR A COMPLETE ELECTRICAL SCHEMATIC OF THIS SHEAR,
SEE THE LAST PAGE IN THE BACK OF THIS MANUAL.

IF FOR ANY REASON THIS PAGE IS MISSING,
OR A COPY IS NEEDED, CONTACT:

FAMCO MACHINE DIVISION
BELCO INDUSTRIES, INC.
1001-31st STREET
KENOSHA, WISCONSIN 53140
PHONE NO.: 1-262-654-3516
FAX NO.: 1-262-654-0803
e-mail: SALES@FAMCOMACHINE.COM

REFER TO THE ELECTRICAL DIAGRAM NUMBER LISTED ON THE
ELECTRICAL SPECIFICATION PLATE
INSIDE THE ELECTRICAL CONTROL BOX DOOR.

LUBRICATION (standard)

Your FAMCO Shear must be properly lubricated during operation to insure a trouble-free machine. The Lubrication Schedule indicates when and what type of lubrication to use. Due to the advanced design, a minimum number of units on the shear require daily attention. However, adherence to the Lubrication Schedule is of major importance in obtaining maximum performance and long life of the machine.

For maximum efficiency and minimum downtime, always follow the directions as outlined. It is important to use fresh, clean lubricants at all times and to follow the specifications. Specific lubricants have been developed through extensive testing. Do not substitute unless an equivalent product is available.

One-Point Centralized Grease System – 4 Port

This is a progressive lubricating system. Measuring valve pistons are in each lube line. Each piston must operate positively forcing a full measured shot of grease into the bearing line, before the main flow operates the next piston in sequence. Since each piston must complete its stroke before grease can flow to the next piston, it is apparent that one should never block any lube points. Do not pinch any lube lines. Repair blockage immediately. Excessive pressure at the grease gun handle indicates a blocked condition. Trace and clear the blockage before operating the machine.

Manifold

Divider Valve

Use one shot of Mobil “Mobilux” Grease #1 or equivalent twice per 8 (eight) hour shift, for normal operations.

The lubrication lines are connected throughout the shear on both sides to the following 4 (four) lubrication points:

1) The Eccentric Strap – this lubricates the bronze eccentric bearing
2) The Drive Shaft – this lubricates the drive shaft leg bearings
3) The Crosshead Gib Slide – this lubricates the crosshead gib bearings
4) The Connecting Rod Pins – this lubricates the pins on the connecting rod and crosshead arm.

Refer to the “Lubrication Schedule” for frequency and lubrication type for all the above items.

LUBRICATION (optional)

Your FAMCO Shear must be properly lubricated during operation to insure a trouble-free machine. The Lubrication Schedule indicates when and what type of lubrication to use. Due to the advanced design, a minimum number of units on the shear require daily attention. However, adherence to the Lubrication Schedule is of major importance in obtaining maximum performance and long life of the machine.

For maximum efficiency and minimum downtime, always follow the directions as outlined. It is important to use fresh, clean lubricants at all times and to follow the specifications. Specific lubricants have been developed through extensive testing. Do not substitute unless an equivalent product is available.

"One-Shot" and "Automatic" Oiling Systems (3 Point) - Optional

The system consists of a lubricator which, when activated, forces a measured amount of oil into a single line of distribution tubing. The tubing is branched to supply oil to the bearing surfaces through meter units, which proportion the correct oil film to each point. Do not pinch any oil lines. Repair blockage immediately. Excessive pressure at the pump indicates a blocked condition. Trace and clear the blockage before operating the machine.

For the Manual Oil Pump, one pull of the handle lubricates the shear bearing areas. Lubricator includes a spring return piston pump in a plastic reservoir. Pulling up slowly on the lever handle to the stop fills the cylinder with a predetermined volume of oil. Upon release, spring pressure discharges the oil into the system and returns the handle to the original position.

For the Automatic Oil System (not shown), a motor driven piston pump of the spring-discharge type is used. The motor incorporates a gear reduction, which determines the operating cycle of the pump piston. The oil is then dispensed through meter units lubricating the shear bearing areas.

One-Shot

Automatic

Use Excel wayoil 68 or equivalent once daily, for normal operations.

The oil lines are connected throughout the shear on both sides to the following 3 (three) lubrication points:

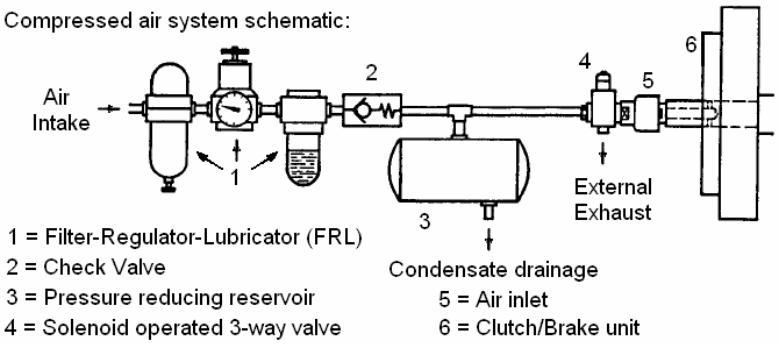
1) The Eccentric Strap – this lubricates the bronze eccentric bearing
2) The Drive Shaft – this lubricates the drive shaft leg bearings
3) The Crosshead Gib Slide – this lubricates the crosshead gib bearings

Refer to the "Lubrication Schedule" for frequency and lubrication type for all the above items.

AIR REQUIREMENTS, CONNECTIONS AND SERVICE

Your FAMCO Shear is furnished with a combination Filter, Pressure Regulator and Lubricator unit (F-R-L). Standard combination units include a 50-micron filter element, filter with manual drain, lubricator with manual drain, metal bowls with sight glass, relieving regulator with gauge, an outlet pressure range of 5 to 150 PSI and ½ PTF port size threads. Depending on the shear model, the F-R-L unit is located at the base of the Electrical Control Pedestal, inside the Flywheel Enclosure or under the Bed.

Air connections to the Clutch/Brake unit are made at the combination F-R-L unit. Pneumatic piping must be free of foreign material such as pipe sealants, metal chips, etc. **WARNING!!** All incoming air lines ***must be at least ½" I.D. inch size***. Undersize air lines will cause sluggish response as well as disengagement and may cause severe damage to machine parts. In addition, undersize lines contribute to clutch wear, since they cause initial clutch slippage by not providing adequate air flow. A ***minimum of 83-90 PSI line pressure*** is required for full shearing capacity. The ***maximum line pressure should not exceed 93 PSI*** for Clutch/Brake unit life. *The machine warranty will become null and void if the above items are not adhered to.*



FILTER

The filter can be disassembled for cleaning and servicing without removal from the air line. The screw-on type bowl can be removed and installed with only two full turns. After two full turns the sight glass on the metal bowl will be positioned at the starting point. The depth-type element, which can be cleaned, has an extra large surface area for extended life.

Servicing: 1.) Keep accumulated liquids below baffle.
2.) Replace filter element when dirty.

PRESSURE REGULATOR AND VALVE

The regulator can be disassembled for servicing without removal from the air line. The non rising pressure adjustment knob provides easy hand adjustment at any pressure range and is locked by merely pushing on the knob. The balanced valve provides regulation by reducing the effect of variations in inlet pressure on the outlet pressure.

Adjustment: Turn adjustment knob clockwise (CW) to increase and counter-clockwise (CCW) to decrease outlet pressure setting. To reduce pressure, first reduce to a pressure less than desired, then increase to the desired outlet pressure.

LUBRICATOR

The lubricator can be disassembled for servicing without removal from the air line. The screw-on type bowl can be removed and installed with only two full turns. Most working parts are contained in a single, removable capsule. The Pyrex sight glass is backed by diagonal stripes that optically change, clearly indicating oil level in the sight glass.

Servicing:

Recommended lubricants: Use a misting type oil rated at 50 to 200 SSU (ISO Grade 7 to 46) at 100°F (38°). The oils used must be compatible with materials of construction. Famco has filled the lubricator at the factory.

Adjustment: Turn adjustment on the sight feed dome to increase or decrease oil delivery. Monitor the device being lubricated and readjust if needed.

LUBRICATION SCHEDULE

LUBRICATION SCHEDULE	LUBRICANT	DAILY	WEEKLY	MONTHLY	SIX MONTHS	ANNUALLY
1. Check and lubricate eccentric strap bearings	Amoco Grease #2	X				
2. Lubricate crosshead gib bearings	Amoco Grease #2	X				
3. Lubricate driveshaft and leg bearings	Amoco Grease #2	X				
4. Lubricate connecting rod pins	Amoco Grease #2		X			
5. Lubricate holddown ways (except "W" series)	Amoco Grease #2	X				
6. Lubricate back gage ways and lead screw nut	Amoco Grease #2		X			
7. Lubricate flywheel bearings (W, PC, B, M series)	Amoco Grease #2			X		
8. Transmission - check oil level		X				
- empty clean and refill	Amoco perma gear EP 320 ("S" series)					X
	Amoco cylinder oil #460 ("W" series)					X
9. Empty, clean & refill power back gage gear motor	Transmission oil					X
10. Check air pressure, air line lubricator oil level		X				
- add if necessary		X				
- drain air line filter		X				
11. For one-point centralized grease system	Amoco Grease #2	2X				
- check for pinched or broken lines			X			
12. For one-shot and automatic oiling systems	Excel wayoil 68	X				
check oil reservoir - add oil if necessary		X				
check for broken or pinched lines			X			
check for broken oil meters		X				
check for broken linkage			X			
empty, clean, change filter and refill reservoir					X	

NOTE: Intervals are based on average use of one shift operation.

MAINTENANCE CHECK LIST

CHECK OR ADJUSTMENT	INTERVAL		
	DAILY	WEEKLY	MONTHLY
1. Check holddown for proper operation.	X		
2. Inspect blades for nicks or wear.	X		
3. Check for pinched or broken oil or grease lines.		X	
4. Check blade bolts (if they have not been turned) - tighten if necessary.			X
5. Check blade clearance - adjust if necessary.			X
6. Check gib adjustment - adjust if necessary.			X
7. Check machine and feed table level - relevel if necessary.			X
8. Check entire machine for loose fasteners - tighten if necessary.			X
9. Check air filter.	X		
10. Drain air line filter.	X		
11. Check tightness of main drive V-belt(s).			X
12. Check for clutch/brake lining ware.			X

NOTE: Intervals are based on average use of one 8-hour shift operation.

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
1. Crosshead stopping short of “top-dead-center”.	a. Not enough lubrication.	a. Follow “Lubrication Schedule”.
	b. Overloading conditions.	b. Stay within shear capacity.
	c. Crosshead limit switch actuation incorrect.	c. See section on “Crosshead Top-Dead-Center Adjustment”.
	d. Crosshead adjustable gib spacer to tight.	d. See section on “Crosshead Gib Bearing Adjustment”.
	e. Eccentric straps to tight.	e. See section on “Eccentric Strap Adjustment”.
	f. Holddown springs over tightened.	f. See section on “Holddown Adjustment”.
2. Crosshead overtraveling past “top-dead-center”.	a. Loose clutch/brake unit.	a. See section on “Clutch/Brake Maintenance”.
	b. Oil on clutch/brake lining.	b. Replace Clutch/Brake plates; See section on “Clutch/Brake Linings”.
	c. Loose crosshead gibs.	c. See section on “Crosshead Gib Adjustment”.
	d. Crosshead proximity switch actuation incorrect.	d. See section on “Crosshead Top-Dead-Center Adjustment”.
3. Crosshead stops at bottom of stroke.	a. Crosshead proximity switch actuation incorrect.	a. See section on “Crosshead Gib Bearing Adjustment”.
	b. Loose crosshead gibs.	b. See section on “Crosshead Gib Bearing Adjustment”.
	c. Clutch disengages prematurely – excessive gap.	c. See section on “Clutch/Brake Maintenance”.

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
4. Clutch and/or brake plate slips.	a. Friction linings worn down	a. Replace Clutch -and- Brake plates.
	b. Clutch plate moist or oily.	b. Replace Clutch -and- Brake plates. Eliminate source of moisture and/or oil.
	c. Air pressure too low.	c. Increase operating pressure to 80 PSI.
	d. “Valving” defective (check: connect the compressed air directly).	d. Replace bad component in air line.
5. Motor running – shear does not actuate.	a. Keyed selector switch in wrong position.	a. Check selector switch position.
	b. Loose or worn V-belt.	b. Tighten V-belt tension using adjustment bushings -or- replace V-belt.
	c. Defective foot switch.	c. Replace foot switch.
	d. No air pressure.	d. Check air lines and air line pressure.
6. Burr on sheared material edge.	a. Dull blades.	a. See section on “Regrinding” instructions.
	b. Improper blade clearance.	b. See section on “Blade Adjustment and Clearance”.
	c. Crosshead loose in gibways.	c. See section on “Gib Bearing Adjustment”.
7. Kick-back of material.	Dull blades.	See section on “Regrinding” instructions.

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
8. No lubrication or inadequate supply.	a. Pinched or broken oil or grease lines.	a. Repair or replace tubing.
	b. Oil or grease reservoir empty.	b. Fill reservoir. (See Lubrication Instructions and Schedule).
9. Crosshead binds.	a. Adjustable gib(s) to tight.	a. Adjust adjustable Gib Spacer
	b. Inadequate supply of lubricant.	b. Readjust lubrication device.
10. Main fuses blow -or- motor overload needs to be reset when trying to start shear.	a. Incorrect voltage supplied to shear.	a. Review electrical schematic.
	b. Incorrect overload heater selection.	b. Check heater requirements.
	c. Incorrect fuse selection.	c. Use only Time Delay fuses rated the same as original equipment.

How to Identify and Order Replacement Parts

1. Refer to the following pages of parts illustrations and identification. Locate the desired part and item number on each drawing or picture.
2. Refer to the corresponding item number in the parts list to determine the part number and name.
3. Send, FAX or e-mail a purchase order with the part number(s), name, quantity and the SERIAL NUMBER and MODEL NUMBER of the machine to:

Parts Division

FAMCO MACHINE DIVISION

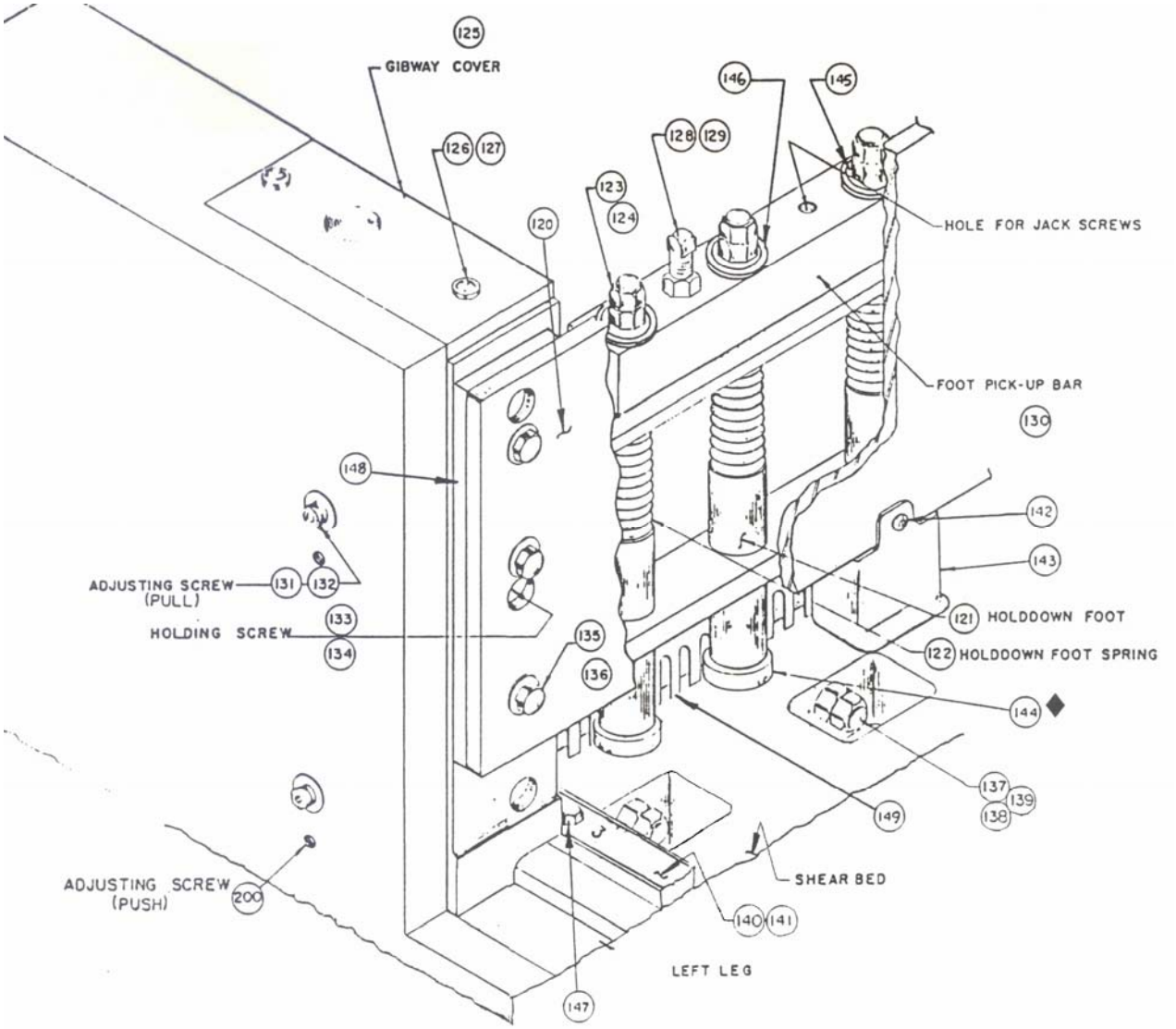
BELCO INDUSTRIES, INC.
1001-31st STREET
KENOSHA, WISCONSIN 53140
PHONE NO.: 1-262-654-3516
FAX NO.: 1-262-654-0803
e-mail: SALES@FAMCOMACHINE.COM

NOTE: USE ONLY FAMCO PART NUMBERS!

Do not use manufacturer's number. If part is not identified, sketch or photograph the part required and include it with the order.

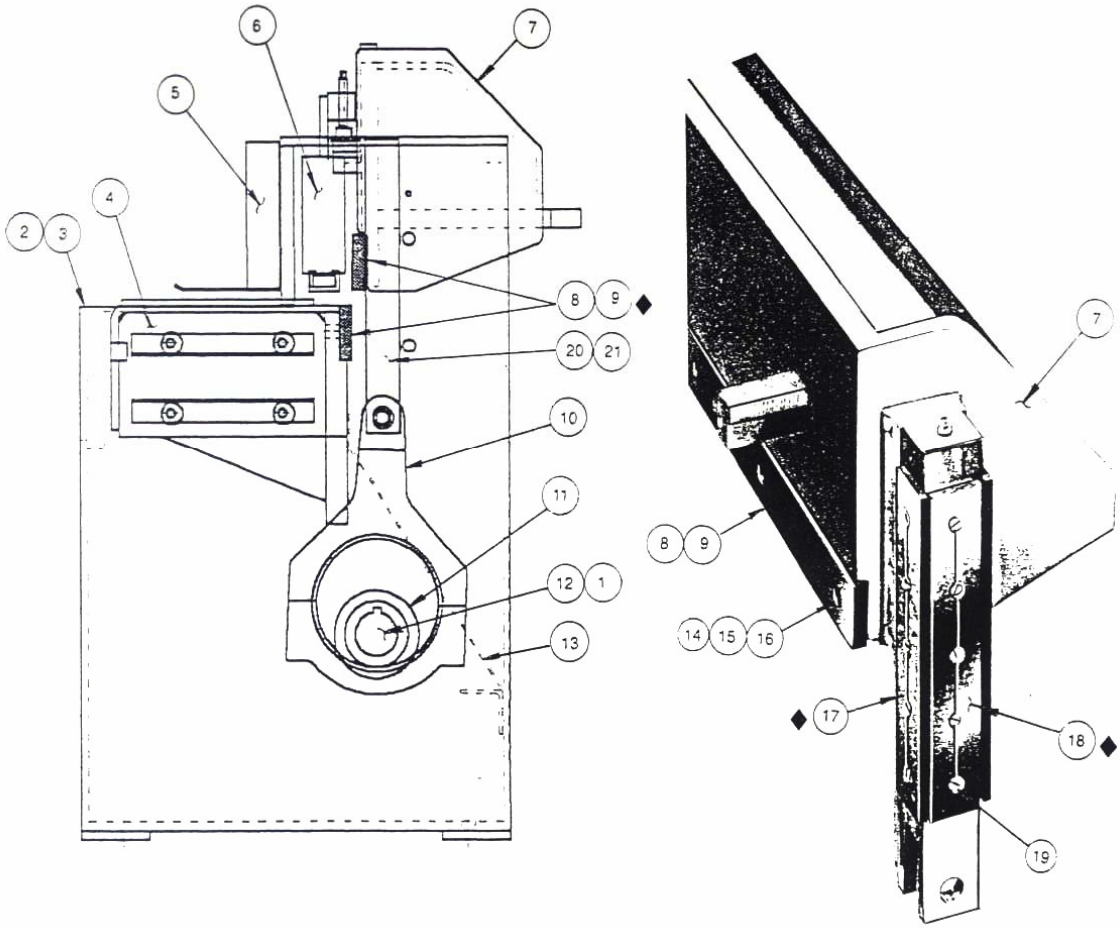
PARTS MARKED WITH A "♦" ARE RECOMMENDED SPARE PARTS.

SHEAR ADJUSTMENT - HOLDDOWN PARTS LIST



ITEM NO.	PART NO.	PART NAME	ITEM NO.	PART NO.	PART NAME
120	*SEE CHART	HOLDDOWN ASSEMBLY	136	9228-5230	3/4" Spring Lockwasher
121	*SEE CHART	Holddown Foot	137	9188-4030	Bed Blade Bolt
122	*SEE CHART	Holddown Foot Spring	138	9223-1210	Hex Full Nut, 1/2-13
123	9223-1230	Hex Full Nut, 3/4-10	139	9223-2210	Hex Jam Nut, 1/2-13
124	9223-2230	Hex Jam Nut, 3/4-10	140	*SEE CHART	Guide Bar
125	1010-024A	Gibway Cover	141	9615-4680	English/Metric Bed Scale ('W' Series only)
126	9136-3460	Button Head Cap Screw, 3/8-16 X 1-1/4	142	9136-3410	Button Head Cap Screw, 3/8-16 X 1/2
127	9228-5190	3/8" Spring Lockwasher	143	*SEE CHART	Holddown Foot Guard ('W' Series only)
128	9223-2230	Hex Jam Nut, 3/4-10	144	1010-118	Non-Marking Holddown Cup ('W' Series only)
129	9144-4440	Square Head Set Screw, 3/4-10 x 5	144	*SEE CHART	Solid Holddown Bar-not shown ('P-W' Series only)
130	*SEE CHART	Foot Pick Up Bar	145	9228-2230	1/2" Flat Washer
131	9132-4020	Adjusting Screw (PULL)	146	1473-012	Urethane Washer
132	9228-1210	1/2" Flat Washer	147	9126-4350	Hex Head Cap Screw, 3/8-16 x 1"
133	9132-3960	Socket Head Cap Screw, 1/2-13 X 2-1/2	148	1096-076	Holddown Spacer
134	9228-5210	1/2" Spring Lockwasher	149	*SEE CHART	Finger Guard
135	9126-4330	Hex Head Cap Screw, 3/4-10 x 1-3/4	200	9162-3940	Adjusting Screw (PUSH)

BED-CROSSHEAD-LEG PARTS LIST

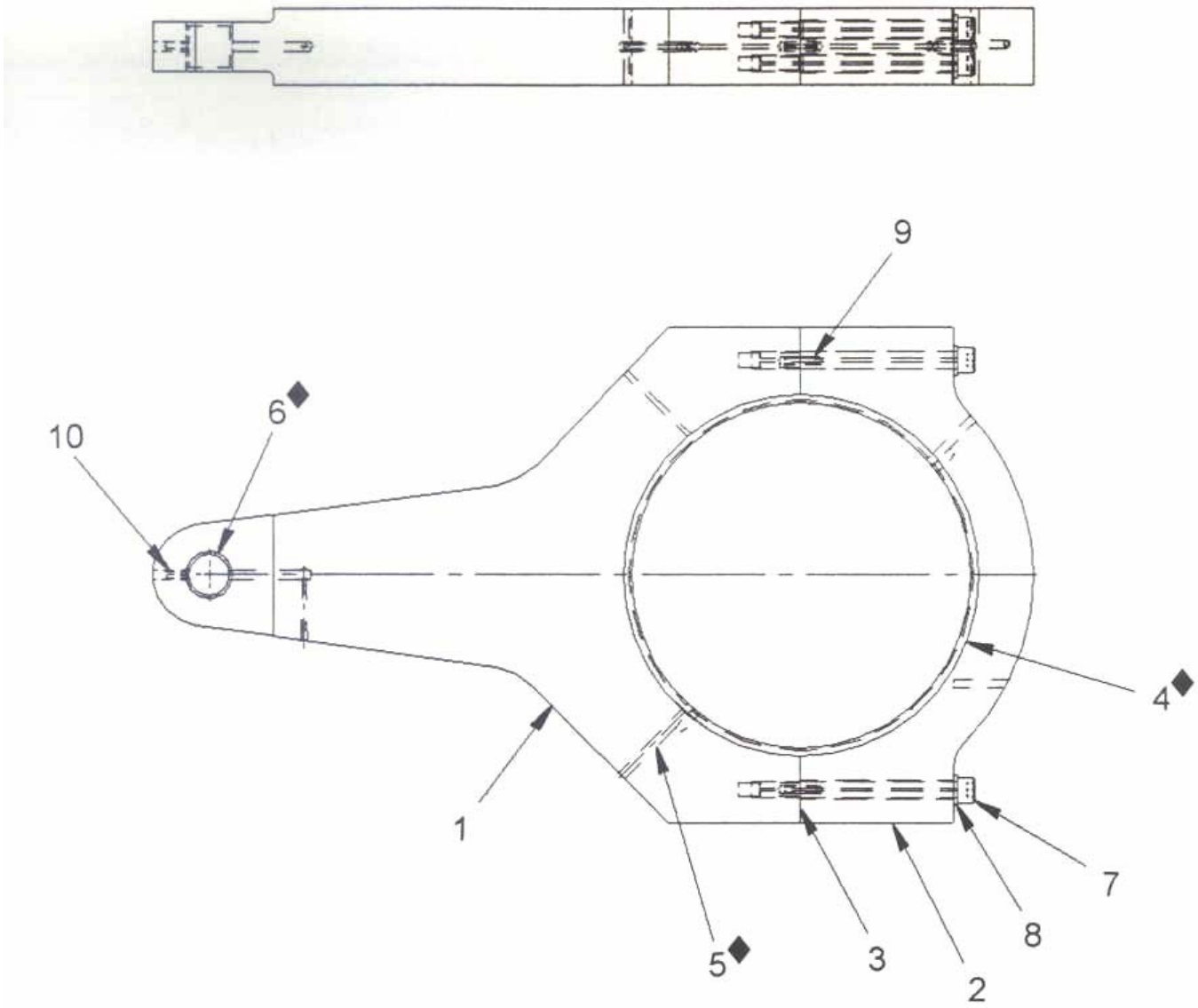


ITEM NO.	PART NO.	PART NAME
1	1010-043	Driveshaft Collar
2	*SEE CHART	RIGHT LEG ASSEMBLY
3	*SEE CHART	LEFT LEG ASSEMBLY
4	*SEE CHART	BED ASSEMBLY
5	*SEE CHART	Box finger guard
6	*SEE CHART	HOLDDOWN ASSEMBLY
7	*SEE CHART	CROSSHEAD ASSEMBLY
8	*SEE CHART	High carbon-high chrome blades
9	*SEE CHART	Blade shims
10	*SEE CHART	ECCENTRIC STRAP ASSEMBLY
11	*SEE CHART	Eccentric Step Cam
12	*SEE CHART	Drive shaft
13	*SEE CHART	STOCK CHUTE ASSEMBLY
14	9188-3470	Crosshead blade bolt
15	9228-1210	Flat washer, 1/2"
16	9228-5210	Spring lock washer, 1/2"
17	*SEE CHART	Crosshead gib bearing, side
18	*SEE CHART	Crosshead gib bearing, end
19	9215-1680	Self-tapping screw, #10

PARTS NOT SHOWN:	
1272-291	Eccentric strap guard, right
1272-292	Eccentric strap guard, left
9451-3500	Inner bearing
9451-9350	Outer bearing
*SEE CHART	Adjustable gib spacer, right
*SEE CHART	Adjustable gib spacer, left
*SEE CHART	Gib Spacer Shim

* See Chart Table Parts List
on Pages 47 thru 52

ECCENTRIC STRAP PARTS LIST



ITEM NO.	PART NO.	PART NAME
--	* SEE CHART	ECCENTRIC STRAP ASSEMBLY
1	* SEE CHART	ECCENTRIC STRAP
2	* SEE CHART	ECCENTRIC STRAP CAP
3	* SEE CHART	ECCENTRIC STRAP SHIM
4	* SEE CHART	ECCENTRIC STRAP BEARING
5	* SEE CHART	ECCENTRIC STRAP BEARING PIN
6	* SEE CHART	CONNECTING ROD BEARING
7	* SEE CHART	SOCKET HEAD CAP SCREW
8	* SEE CHART	SPRING LOCK WASHER
9	* SEE CHART	ROLL PIN
10	* SEE CHART	DRIVE PIN
11	* SEE CHART	GREASE FITTING-not shown

* See Chart Table Parts List
on Pages 42 thru 47

CHART TABLE PARTS LIST
FOR 'W' SERIES SHEAR MODELS

PAGE	ITEM	DESCRIPTION	'W' SHEAR MODELS AND PART NUMBERS				
			748	752	760	772	796
44	120	HOLDDOWN ASSEMBLY	748-006	752-006	1060-006	1072-006	1096-006
44	121	Holddown Foot	1010-032B	1010-032B	1010-032B	1010-032B	1010-032B
44	122	Holddown Foot Spring	1010-031	1010-031	1010-031	1010-031	1010-031
44	130	Foot Pickup Bar	748-025	752-025	1060-025	1072-025	1096-025
44	140	Guide Bar	1010-033	1010-033	1010-033	1010-033	1010-033
44	143	Holddown Foot Guard	1010-060A	1010-060A	1010-060A	1010-060A	1010-060A
44	144	Solid Holddown Bar	n/a	n/a	n/a	n/a	n/a
44	149	Finger Guard	1010-026A	752-026	1060-026A	1072-026A	1096-026A
45	2	RIGHT LEG ASSEMBLY	1010-003	1010-003	1010-003	1010-003	1010-003
45	3	LEFT LEG ASSEMBLY	1010-004	1010-004	1010-004	1010-004	1010-004
45	4	BED ASSEMBLY	748-001	752-001A	1060-001	1072-001	796-001
45	5	Finger Guard	1010-026A	752-026	1060-026A	1072-026A	1096-026A
45	6	HOLDDOWN ASSEMBLY	748-006	752-006	1060-006	1072-006	1096-006
45	7	CROSSHEAD ASSEMBLY	748-002	752-002	1060-002	772-002	796-002
45	8	HC-HC Blades	1048-029	2552-029	1060-029	1672-029	1096-029
45	9	Blade Shim	1048-035	752-035	1060-035	1672-035	1096-035
45	10	ECCENTRIC STRAP ASSY.	1010-047A	1010-047A	1010-047A	1010-047A	1012-047
45	11	Eccentric Cam	1096-046	1096-046	1072-046	1010-046A	1012-046
45	12	Drive Shaft	748-044	752-044	1060-044	1072-044	1096-044
45	13	STOCK CHUTE ASSY.	748-112	752-112	1060-112	1072-112	1096-112
45	17	Crosshead Gib Bearing, side	1010-036A	1010-036A	1010-036A	1010-036A	1010-036A
45	18	Crosshead Gib Bearing, end	1272-036	1272-036	1272-036	1272-036	n/a
45		Adjustable Gib Spacer, Right	1010-037A	1010-037A	1010-037A	1010-037A	1010-037A
45		Adjustable Gib Spacer, Left	1010-038A	1010-038A	1010-038A	1010-038A	1010-038A
45		Gib Spacer Shim	1010-039A	1010-039A	1010-039A	1010-039A	1010-039A
46		ECCENTRIC STRAP ASSY.	1010-047A	1010-047A	1010-047A	1010-047A	1012-047
46	1	Eccentric Strap	1010-047A-01	1010-047A-01	1010-047A-01	1010-047A-04	1012-047-01
46	2	Eccentric Strap Cap	1010-047A-02	1010-047A-03	1010-047A-03	1010-047A-05	1012-047-02
46	3	Eccentric Strap Shim	1010-047-03	1010-047-04	1010-047-04	1010-047-06	1010-047-03
46	4	Eccentric Strap Bearing	1010-047A-04	1010-047A-05	1010-047A-05	1010-047A-07	1012-047-04
46	5	Eccentric Strap Bearing Pin	1010-047-05	1010-047-05	1010-047-05	1010-047-05	1010-047-05
46	6	Connecting Rod Bearing	9454-5560	9454-5560	9454-5560	9454-5560	9454-5560
46	7	Socket Head Cap Screw	9132-4030	9132-4030	9132-4030	9132-4030	9132-4030
46	8	Spring Lock Washer	9228-5210	9228-5210	9228-5210	9228-5210	9228-5210
46	9	Roll Pin	n/a	n/a	n/a	n/a	9238-2450
46	10	Drive Pin	9239-1510	9239-1510	9239-1510	9239-1510	9239-1510
46	11	Grease Fitting	n/a	n/a	n/a	n/a	9270-1010

CHART TABLE PARTS LIST (cont.)
FOR 'W' SERIES SHEAR MODELS

PAGE	ITEM	DESCRIPTION	'W' SHEAR MODELS AND PART NUMBERS						
			1010	1012	1052	1060	1072	1084	1096
44	120	HOLDDOWN ASSEMBLY	1010-006	1212-006	752-006	1060-006	1072-006	1084-006	1096-006
44	121	Holddown Foot	1010-032B	1010-032B	1010-032B	1010-032B	1010-032B	1010-032B	1010-032B
44	122	Holddown Foot Spring	1010-031	1010-031	1010-031	1010-031	1010-031	1010-031	1010-031
44	130	Foot Pickup Bar	1010-025	1212-025	752-025	1060-025	1072-025	1084-025	1096-025
44	140	Guide Bar	1010-033	1010-033	1010-033	1010-033	1010-033	1010-033	1010-033
44	143	Holddown Foot Guard	1010-060A	1010-060A	1010-060A	1010-060A	1010-060A	1010-060A	1010-060A
44	144	Solid Holddown Bar	n/a	n/a	n/a	n/a	n/a	n/a	n/a
44	149	Finger Guard	1010-026A	1212-026A	752-026	1060-026A	1072-026A	1084-026A	1096-026A
45	2	RIGHT LEG ASSEMBLY	1010-003	1010-003	1010-003	1010-003	1010-003	1010-003	1010-003
45	3	LEFT LEG ASSEMBLY	1010-004	1010-004	1010-004	1010-004	1010-004	1010-004	1010-004
45	4	BED ASSEMBLY	1010-001	1012-001	752-001A	1060-001	1072-001	1084-001	1096-001
45	5	Finger Guard	1010-026A	1212-026A	752-026	1060-026A	1072-026A	1084-026A	1096-026A
45	6	HOLDDOWN ASSEMBLY	1010-006	1212-006	752-006	1060-006	1072-006	1084-006	1096-006
45	7	CROSSHEAD ASSEMBLY	1010-002	1012-002	1052-002	1060-002	1072-002	1084-002	1096-002
45	8	HC-HC Blades	1010-029A	1212-028	2552-029	1070-029	1672-029	1084-029	1096-029
45	9	Blade Shim	1010-035A	1212-035	752-035	1070-035	1672-035	call factory	1096-035
45	10	ECCENTRIC STRAP ASSY.	1010-047A	1012-047	1010-047A	1010-047A	1010-047A	call factory	1010-047A
45	11	Eccentric Cam	1010-046A	1012-046	1072-046	1072-046	1072-046	1072-046	1096-046
45	12	Drive Shaft	1010-044A	1212-044	752-044	1060-044	1072-044	1084-044	1096-044
45	13	STOCK CHUTE ASSY.	1010-112	1212-112	752-112	1060-112	1072-112	1084-112	1096-112
45	17	Crosshead Gib Bearing, side	1010-036A	1010-036A	1010-036A	1010-036A	1010-036A	call factory	1010-036A
45	18	Crosshead Gib Bearing, end	1272-036	n/a	1272-036	1272-036	1272-036	call factory	1272-036
45		Adjustable Gib Spacer, Right	1010-037A	1010-037A	1010-037A	1010-037A	1010-037A	call factory	1010-037A
45		Adjustable Gib Spacer, Left	1010-038A	1010-038A	1010-038A	1010-038A	1010-038A	call factory	1010-038A
45		Gib Spacer Shim	1010-039A	1010-039A	1010-039A	1010-039A	1010-039A	call factory	1010-039A
46		ECCENTRIC STRAP ASSY.	1010-047A	1012-047	1010-047A	1010-047A	1010-047A	call factory	1010-047A
46	1	Eccentric Strap	1010-047A-04	1012-047-01	1010-047A-04	1010-047A-04	1010-047A-04	call factory	1010-047A-04
46	2	Eccentric Strap Cap	1010-047A-05	1012-047-02	1010-047A-05	1010-047A-05	1010-047A-05	call factory	1010-047A-05
46	3	Eccentric Strap Shim	1010-047-06	1010-047-03	1010-047-06	1010-047-06	1010-047-06	call factory	1010-047-06
46	4	Eccentric Strap Bearing	1010-047A-07	1012-047-04	1010-047A-07	1010-047A-07	1010-047A-07	call factory	1010-047A-07
46	5	Eccentric Strap Bearing Pin	1010-047-05	1010-047-05	1010-047-05	1010-047-05	1010-047-05	call factory	1010-047-05
46	6	Connecting Rod Bearing	9454-5560	9454-5560	9454-5560	9454-5560	9454-5560	call factory	9454-5560
46	7	Socket Head Cap Screw	9132-4030	9132-4030	9132-4030	9132-4030	9132-4030	call factory	9132-4030
46	8	Spring Lock Washer	9228-5210	9228-5210	9228-5210	9228-5210	9228-5210	call factory	9228-5210
46	9	Roll Pin	n/a	9238-2450	n/a	n/a	n/a	call factory	n/a
46	10	Drive Pin	9239-1510	9239-1510	9239-1510	9239-1510	9239-1510	call factory	9239-1510
46	11	Grease Fitting	n/a	9270-1010	n/a	n/a	n/a	call factory	n/a

CHART TABLE PARTS LIST (cont.)
FOR 'W' SERIES SHEAR MODELS

PAGE	ITEM	DESCRIPTION	'W' SHEAR MODELS AND PART NUMBERS							
			2510	2512	2548	2552	2560	2572	2584	2596
44	120	HOLDDOWN ASSEMBLY	call factory	2512-006	748-006	752-006	call factory	1072-006	call factory	2596A-006
44	121	Holddown Foot	call factory	2512-032	1010-032B	2572-032	call factory	2572-032	call factory	2512-032
44	122	Holddown Foot Spring	call factory	2596-031	1010-031	1010-031	call factory	1010-031	call factory	2596-031
44	130	Foot Pickup Bar	call factory	1212-025	748-025	752-025	call factory	1072-025	call factory	1096-025
44	140	Guide Bar	call factory	2512-033	1010-033	1010-033	call factory	1010-033	call factory	1010-033
44	143	Holddown Foot Guard	call factory	2512-060	1010-060A	1010-060A	call factory	1010-060A	call factory	1010-060A
44	144	Solid Holddown Bar	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
44	149	Finger Guard	call factory	1212-026A	1010-026A	752-026	call factory	1072-026A	call factory	2596-026
45	2	RIGHT LEG ASSEMBLY	call factory	2512-003	1010-003	1010-003	call factory	1010-003	call factory	2510-003
45	3	LEFT LEG ASSEMBLY	call factory	2512-004	1010-004	1010-004	call factory	1010-004	call factory	2510-004
45	4	BED ASSEMBLY	call factory	2512-001	748-001	752-001A	call factory	1072-001	call factory	2596A-001
45	5	Finger Guard	call factory	1212-026A	1010-026A	752-026	call factory	1072-026A	call factory	2596-026
45	6	HOLDDOWN ASSEMBLY	call factory	2512-006	748-006	752-006	call factory	1072-006	call factory	2596A-006
45	7	CROSSHEAD ASSEMBLY	call factory	2512-002	2548-002	2552-002	call factory	2572-002	call factory	2596A-002
45	8	HC-HC Blades	call factory	25H12-029	1048-029	2552-029	call factory	1672-029	call factory	2596-029
45	9	Blade Shim	call factory	1212-035	1048-035	1010-035A/752-035	call factory	1672-035	call factory	1096-035
45	10	ECCENTRIC STRAP ASSY.	call factory	2512-047GA	1010-047A	1010-047A	call factory	2572-047	call factory	2510-047
45	11	Eccentric Cam	call factory	2512-046	1010-046A	1010-046A	call factory	1012-046	call factory	2596A-056
45	12	Drive Shaft	call factory	2512-044	748-044	752-044	call factory	2572-044	call factory	2596A-044
45	13	STOCK CHUTE ASSY.	call factory	1212-112	748-112	752-112	call factory	1072-112	call factory	1096-112
45	17	Crosshead Gib Bearing, side	call factory	1010-036A	1010-036A	1010-036A	call factory	1010-036A	call factory	1010-036A
45	18	Crosshead Gib Bearing, end	call factory	1272-036	1272-036	1272-036	call factory	1272-036	call factory	1272-036
45		Adjustable Gib Spacer, Right	call factory	2512-037	1010-037A	1010-037A	call factory	1010-037A	call factory	1010-037A
45		Adjustable Gib Spacer, Left	call factory	2512-038	1010-038A	1010-038A	call factory	1010-038A	call factory	1010-038A
45		Gib Spacer Shim	call factory	1010-039A	1010-039A	1010-039A	call factory	1010-039A	call factory	1010-039A
46		ECCENTRIC STRAP ASSY.	call factory	2512-047GA	1010-047A	1010-047A	call factory	2572-047	call factory	2510-047
46	1	Eccentric Strap	call factory	2512-047GA-01	1010-047A-04	1010-047A-04	call factory	2572-047-01	call factory	2510-047-01
46	2	Eccentric Strap Cap	call factory	2512-047-02	1010-047A-05	1010-047A-05	call factory	1012-047-02	call factory	2510-047-02
46	3	Eccentric Strap Shim	call factory	1010-047-03	1010-047-06	1010-047-06	call factory	1010-047-03	call factory	1010-047-03
46	4	Eccentric Strap Bearing	call factory	2512-047-04	1010-047A-07	1010-047A-07	call factory	1012-047-04	call factory	2510-047-04
46	5	Eccentric Strap Bearing Pin	call factory	1010-047-05	1010-047-05	1010-047-05	call factory	1010-047-05	call factory	1010-047-05
46	6	Connecting Rod Bearing	call factory	2596A-047-06	9454-5560	9454-5560	call factory	9454-5570	call factory	2596A-047-06
46	7	Socket Head Cap Screw	call factory	9132-4050	9132-4030	9132-4030	call factory	9132-4030	call factory	9132-4050
46	8	Spring Lock Washer	call factory	9228-5210	9228-5210	9228-5210	call factory	9228-5210	call factory	9228-5210
46	9	Roll Pin	call factory	9238-2450	n/a	n/a	call factory	9238-2450	call factory	9238-2450
46	10	Drive Pin	call factory	n/a	9239-1510	9239-1510	call factory	9239-1510	call factory	n/a
46	11	Grease Fitting	call factory	n/a	n/a	n/a	call factory	9270-1010	call factory	n/a

CHART TABLE PARTS LIST
FOR 'P-W' SERIES SHEAR MODELS

PAGE	ITEM	DESCRIPTION	'P-W' SHEAR MODELS AND PART NUMBERS				
			P-748	P-752	P-760	P-772	P-796
44	120	HOLDDOWN ASSEMBLY	748-006	752-006	call factory	1072-006	call factory
44	121	Holddown Foot	1010-101A	1010-101A	call factory	1010-101E	call factory
44	122	Holddown Foot Spring	1010-031	1010-031	call factory	1010-031	call factory
44	130	Foot Pickup Bar	748-025	752-025	call factory	1072-025	1096-025
44	140	Guide Bar	1010-033	1010-033	call factory	1010-033	call factory
44	143	Holddown Foot Guard	n/a	n/a	n/a	n/a	n/a
44	144	Solid Holddown Bar	748-100	752-100	call factory	1072-100A	1096-100A
44	149	Finger Guard	748-026	752-026	call factory	1072-026A	call factory
45	2	RIGHT LEG ASSEMBLY	1010-003	1010-003	1010-003	1010-003	1010-003
45	3	LEFT LEG ASSEMBLY	1010-004	1010-004	1010-004	1010-004	1010-004
45	4	BED ASSEMBLY	748-011	752-011A	call factory	1072-011	796-011
45	5	Finger Guard	748-026	752-026	call factory	1072-026A	1096-026A
45	6	HOLDDOWN ASSEMBLY	748-006	752-006	call factory	1072-006	call factory
45	7	CROSSHEAD ASSEMBLY	748-002	752-002	call factory	772-002	796-002
45	8	HC-HC Blades	1048-029	2552-029	call factory	1672-029	1096-029
45	9	Blade Shim	752-035	752-035	call factory	1672-035	1096-035
45	10	ECCENTRIC STRAP ASSY.	1010-047A	1010-047A	call factory	1010-047A	call factory
45	11	Eccentric Cam	1096-046	1096-046	call factory	1010-046A	1012-056
45	12	Drive Shaft	748-044	752-044	call factory	1072-044	1096-044
45	13	STOCK CHUTE ASSY.	748-112	752-112	call factory	1072-112	1096-112
45	17	Crosshead Gib Bearing, side	1010-036A	1010-036A	call factory	1010-036A	1010-036A
45	18	Crosshead Gib Bearing, end	1272-036	1272-036	call factory	1272-036	1272-036
45		Adjustable Gib Spacer, Right	1010-037A	1010-037A	call factory	1010-037A	1010-037A
45		Adjustable Gib Spacer, Left	1010-038A	1010-038A	call factory	1010-038A	1010-038A
45		Gib Spacer Shim	1010-039A	1010-039A	1010-039A	1010-039A	1010-039A
46		ECCENTRIC STRAP ASSY.	1010-047A	1010-047A	call factory	1010-047A	call factory
46	1	Eccentric Strap	1010-047A-01	1010-047A-01	call factory	1010-047A-04	call factory
46	2	Eccentric Strap Cap	1010-047A-02	1010-047A-03	call factory	1010-047A-05	call factory
46	3	Eccentric Strap Shim	1010-047-03	1010-047-04	call factory	1010-047-06	call factory
46	4	Eccentric Strap Bearing	1010-047A-04	1010-047A-05	call factory	1010-047A-07	call factory
46	5	Eccentric Strap Bearing Pin	1010-047-05	1010-047-05	call factory	1010-047-05	call factory
46	6	Connecting Rod Bearing	9454-5560	9454-5560	call factory	9454-5560	call factory
46	7	Socket Head Cap Screw	9132-4030	9132-4030	call factory	9132-4030	call factory
46	8	Spring Lock Washer	9228-5210	9228-5210	call factory	9228-5210	call factory
46	9	Roll Pin	n/a	n/a	call factory	n/a	call factory
46	10	Drive Pin	9239-1510	9239-1510	call factory	9239-1510	call factory
46	11	Grease Fitting	n/a	n/a	call factory	n/a	call factory

CHART TABLE PARTS LIST (cont.)
FOR 'P-W' SERIES SHEAR MODELS

PAGE	ITEM	DESCRIPTION	'P-W' SHEAR MODELS AND PART NUMBERS					
			P-1010	P-1012	P-1052	P-1060	P-1072	P-1084	P-1096
44	120	HOLDDOWN ASSEMBLY	1010-006	1212-006	call factory	1060-006	1072-006	1084-006	1096-006
44	121	Holddown Foot	1010-101	1010-101A	call factory	1010-101E	1010-101E	1010-101E	1010-101E
44	122	Holddown Foot Spring	1010-031	1010-031	call factory	1010-031	1010-031	1010-031	1010-031
44	130	Foot Pickup Bar	1010-025	1212-025	call factory	1060-025	1072-025	1084-025	1096-025
44	140	Guide Bar	1010-033	1010-033	call factory	1010-033	1010-033	1010-033	1010-033
44	143	Holddown Foot Guard	n/a	n/a	n/a	n/a	n/a	n/a	n/a
44	144	Solid Holddown Bar	1010-100A	1212-100A	call factory	1060-100	1072-100A	1084-150	1096-101E
44	149	Finger Guard	1010-030	1212-026A	call factory	1060-027	1072-027	1084-027	1096-026A
45	2	RIGHT LEG ASSEMBLY	1010-003	1010-003	1010-003	1010-003	1010-003	1010-003	1010-003
45	3	LEFT LEG ASSEMBLY	1010-004	1010-004	1010-004	1010-004	1010-004	1010-004	1010-004
45	4	BED ASSEMBLY	1010-011	1012-011	call factory	1060-011	1072-011	1084-011	1096-011
45	5	Finger Guard	1010-030	1212-026A	call factory	1060-027	1072-027	1084-027	1096-026A
45	6	HOLDDOWN ASSEMBLY	1010-006	1212-006	call factory	1060-006	1072-006	1084-006	1096-006
45	7	CROSSHEAD ASSEMBLY	1010-002	1012-002	call factory	1060-002	1072-002	1084-002	1096-002
45	8	HC-HC Blades	1010-029A	1212-029	call factory	1672-029	1672-029	1084-029	1096-029
45	9	Blade Shim	1672-035	1212-035	call factory	1672-035	1672-035	1084-035	1096-035
45	10	ECCENTRIC STRAP ASSY.	1012-047	1012-047	call factory	1010-047A	1010-047A	1010-047A	1010-047A
45	11	Eccentric Cam	1012-046	1012-056	call factory	1096-046	1096-046	1096-046	1010-046A
45	12	Drive Shaft	1010-044A	1212-044	call factory	1060-044	1072-044	1084-044	1096-044
45	13	STOCK CHUTE ASSY.	1010-112	1212-112	call factory	1060-112	1072-112	1084-112	1096-112
45	17	Crosshead Gib Bearing, side	1010-036A	1010-036A	1010-036A	1010-036A	1010-036A	1010-036A	1010-036A
45	18	Crosshead Gib Bearing, end	1272-036	1272-036	1272-037	1272-036	1272-037	1272-036	1272-036
45		Adjustable Gib Spacer, Right	1010-037A	1010-037A	1010-037A	1010-037A	1010-037A	1010-037A	1010-037A
45		Adjustable Gib Spacer, Left	1010-038A	1010-038A	1010-038A	1010-038A	1010-038A	1010-038A	1010-038A
45		Gib Spacer Shim	1010-039A	1010-039A	1010-039A	1010-039A	1010-039A	1010-039A	1010-039A
46		ECCENTRIC STRAP ASSY.	1012-047	1012-047	call factory	1010-047A	1010-047A	1010-047A	1010-047A
46	1	Eccentric Strap	1012-047-01	1012-047-01	call factory	1010-047A-04	1010-047A-04	1010-047A-04	1010-047A-04
46	2	Eccentric Strap Cap	1012-047-02	1012-047-02	call factory	1010-047A-05	1010-047A-05	1010-047A-05	1010-047A-05
46	3	Eccentric Strap Shim	1010-047-03	1010-047-03	call factory	1010-047-06	1010-047-06	1010-047-06	1010-047-06
46	4	Eccentric Strap Bearing	1012-047-04	1012-047-04	call factory	1010-047A-07	1010-047A-07	1010-047A-07	1010-047A-07
46	5	Eccentric Strap Bearing Pin	1010-047-05	1010-047-05	call factory	1010-047-05	1010-047-05	1010-047-05	1010-047-05
46	6	Connecting Rod Bearing	9454-5560	9454-5560	call factory	9454-5560	9454-5560	9454-5560	9454-5560
46	7	Socket Head Cap Screw	9132-4030	9132-4030	call factory	9132-4030	9132-4030	9132-4030	9132-4030
46	8	Spring Lock Washer	9228-5210	9228-5210	call factory	9228-5210	9228-5210	9228-5210	9228-5210
46	9	Roll Pin	9238-2450	9238-2450	call factory	n/a	n/a	n/a	n/a
46	10	Drive Pin	9239-1510	9239-1510	call factory	9239-1510	9239-1510	9239-1510	9239-1510
46	11	Grease Fitting	9270-1010	9270-1010	call factory	n/a	n/a	n/a	n/a

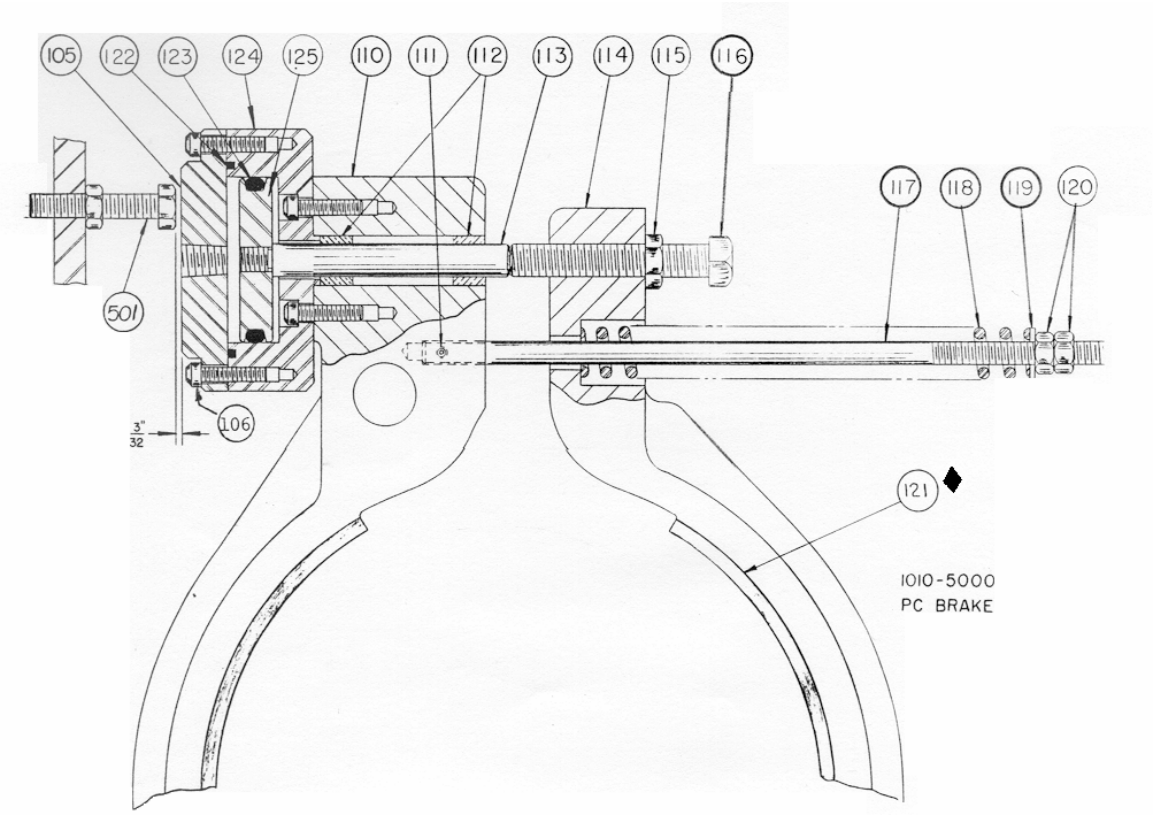
CHART TABLE PARTS LIST (cont.)
FOR 'P-W' SERIES SHEAR MODELS

PAGE	ITEM	DESCRIPTION	"P-W" SHEAR MODELS AND PART NUMBERS							
			P-2510	P-2512	P-2548	P-2552	P-2560	P-2572	P-2584P*	P-2596
44	120	HOLDDOWN ASSEMBLY	call factory	call factory	call factory	call factory	call factory	call factory	2584-600	call factory
44	121	Holddown Foot	call factory	call factory	call factory	call factory	call factory	call factory	2596A-032	call factory
44	122	Holddown Foot Spring	call factory	call factory	call factory	call factory	call factory	call factory	2596-630	call factory
44	130	Foot Pickup Bar	call factory	call factory	call factory	call factory	call factory	call factory	2584-625	call factory
44	140	Guide Bar	1010-130	call factory	call factory	call factory	call factory	call factory	1010-130	call factory
44	143	Holddown Foot Guard	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
44	144	Solid Holddown Bar	call factory	call factory	call factory	call factory	call factory	call factory	2584-150	call factory
44	149	Finger Guard	call factory	call factory	call factory	call factory	call factory	call factory	2584-027	call factory
45	2	RIGHT LEG ASSEMBLY	1010-003	1010-003	1010-003	1010-003	1010-003	1010-003	1010-003	1010-003
45	3	LEFT LEG ASSEMBLY	1010-004	1010-004	1010-004	1010-004	1010-004	1010-004	1010-004	1010-004
45	4	BED ASSEMBLY	call factory	call factory	call factory	call factory	call factory	call factory	2584-011	call factory
45	5	Finger Guard	call factory	call factory	call factory	call factory	call factory	call factory	2584-027	call factory
45	6	HOLDDOWN ASSEMBLY	call factory	call factory	call factory	call factory	call factory	call factory	2584-600	call factory
45	7	CROSSHEAD ASSEMBLY	call factory	call factory	call factory	call factory	call factory	call factory	2584-002P	call factory
45	8	HC-HC Blades	call factory	call factory	call factory	call factory	call factory	call factory	1084-029	call factory
45	9	Blade Shim	call factory	call factory	call factory	call factory	call factory	call factory	1084-035	call factory
45	10	ECCENTRIC STRAP ASSY.	call factory	call factory	call factory	call factory	call factory	call factory	2510-047	call factory
45	11	Eccentric Cam	call factory	call factory	call factory	call factory	call factory	call factory	2596A-056	call factory
45	12	Drive Shaft	call factory	call factory	call factory	call factory	call factory	call factory	2584-044	call factory
45	13	STOCK CHUTE ASSY.	call factory	call factory	call factory	call factory	call factory	call factory	1084-112	call factory
45	17	Crosshead Gib Bearing, side	1010-036A	1010-036A	1010-036A	1010-036A	1010-036A	1010-036A	1010-036A	1010-036A
45	18	Crosshead Gib Bearing, end	1272-036	1272-036	1272-036	1272-036	1272-036	1272-036	1272-036	1272-036
45		Adjustable Gib Spacer, Right	1010-037A	1010-037A	1010-037A	1010-037A	1010-037A	1010-037A	1010-037A	1010-037A
45		Adjustable Gib Spacer, Left	1010-038A	1010-038A	1010-038A	1010-038A	1010-038A	1010-038A	1010-038A	1010-038A
45		Gib Spacer Shim	1010-039A	1010-039A	1010-039A	1010-039A	1010-039A	1010-039A	1010-039A	1010-039A
46		ECCENTRIC STRAP ASSY.	call factory	call factory	call factory	call factory	call factory	call factory	2510-047	call factory
46	1	Eccentric Strap	call factory	call factory	call factory	call factory	call factory	call factory	2510-047-01	call factory
46	2	Eccentric Strap Cap	call factory	call factory	call factory	call factory	call factory	call factory	2510-047-02	call factory
46	3	Eccentric Strap Shim	call factory	call factory	call factory	call factory	call factory	call factory	1010-047-03	call factory
46	4	Eccentric Strap Bearing	call factory	call factory	call factory	call factory	call factory	call factory	2510-047-04	call factory
46	5	Eccentric Strap Bearing Pin	call factory	call factory	call factory	call factory	call factory	call factory	1010-047-05	call factory
46	6	Connecting Rod Bearing	call factory	call factory	call factory	call factory	call factory	call factory	2596a-047-06	call factory
46	7	Socket Head Cap Screw	call factory	call factory	call factory	call factory	call factory	call factory	9132-4050	call factory
46	8	Spring Lock Washer	call factory	call factory	call factory	call factory	call factory	call factory	9228-5210	call factory
46	9	Roll Pin	call factory	call factory	call factory	call factory	call factory	call factory	9238-2450	call factory
46	10	Drive Pin	call factory	call factory	call factory	call factory	call factory	call factory	n/a	call factory
46	11	Grease Fitting	call factory	call factory	call factory	call factory	call factory	call factory	n/a	call factory

* P2584P designates for shearing plastic material.

AIR OPERATED BRAKE PARTS LIST

for use with manual wear adjusting clutch/brake assembly



ITEM NO.	PART NO.	PART NAME
105	1010-125	Cylinder Cap
106	9132-2430	Socket Head Cap Screw, 1/4-20 x 3/4
110	1010-120-01	Brake Housing Cylinder Half *
111	9162-1660	Socket Head Set Screw, 10-24 x 1/2
112	9454-0110	Bronze Bearing
113	1010-127	Piston Rod
114	1010-120-02	Brake Housing Spring Half *
115	9223-2210	Jam Nut, 1/2-13
116	9144-3980	Square Head Set Screw, 1/2-13 x 3
117	1010-128	Spring Rod
118	1612-031	Spring
119	9228-1180	Flat Washer, 5/16
120	9223-1190	Hex Full Nut, 3/8-16
121	1010-121	Brake Lining
122	9455-2530	'O'-ring
123	9455-2545	Quad 'O'-ring
124	1010-124A	Cylinder
125	1010-126B	Piston (Quad Ring)
501	9126-4380	Hex Head Cap Screw, 3/4-10 x 3

PARTS NOT SHOWN:

PART NO.	PART NAME
1010-123	Mounting Bolt Sleeve
9162-2410	Socket Head Set Screw, 1/4-20 x 1/2
9228-1230	Flat Washer, 3/4
9274-1420	90 Degree Street Elbow

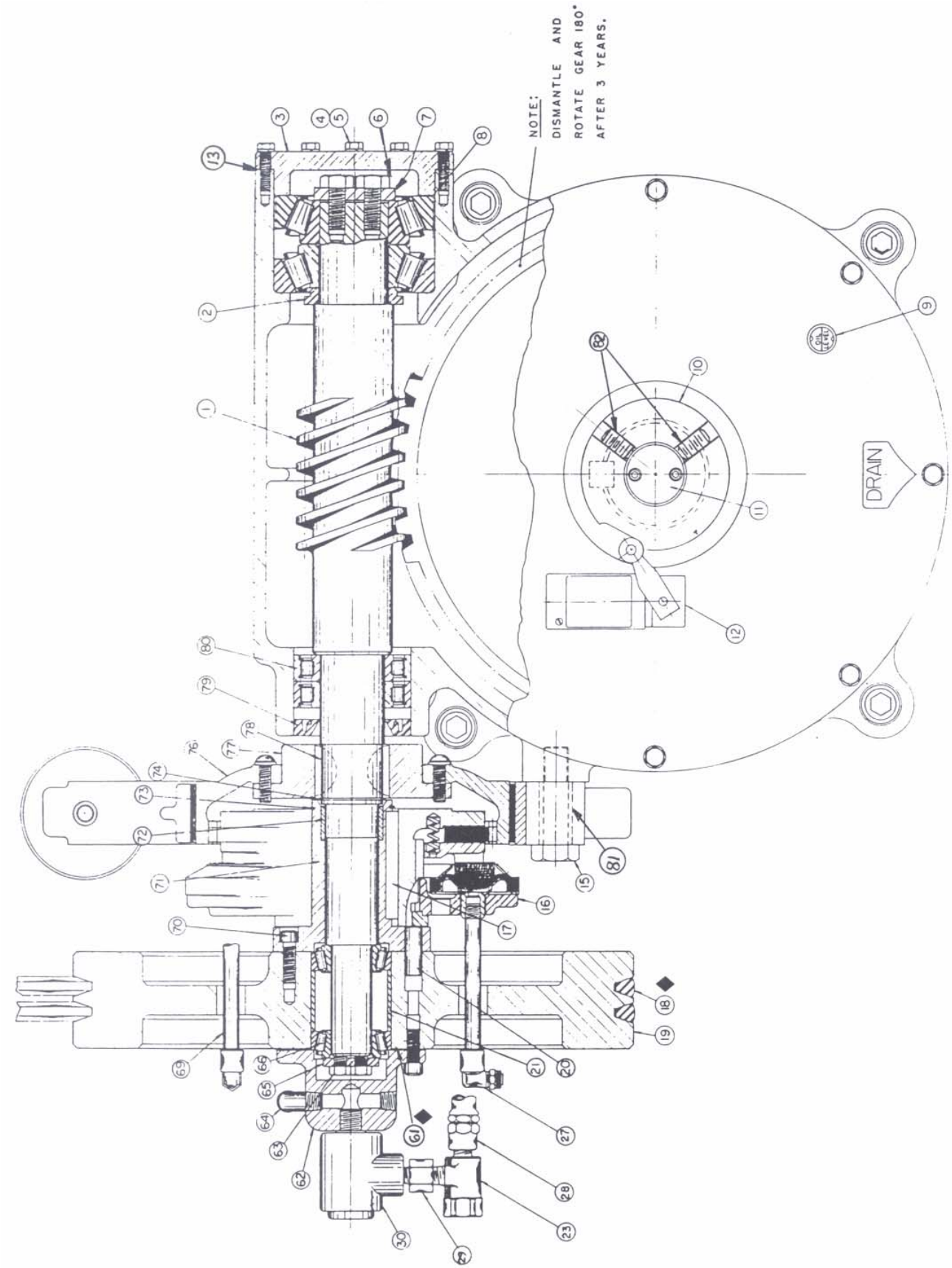
* NOTE: Brake Housing Set, 1010-120, includes the following parts:

1010-120-01	Brake Housing Cylinder Half
1010-120-02	Brake Housing Spring Half
1010-122	Hinge Pin
9245-6260	Retaining Ring
1010-121	Brake Lining

Quad 'O'-ring Kit, SK1010-9701, includes items 122 thru 125 above.

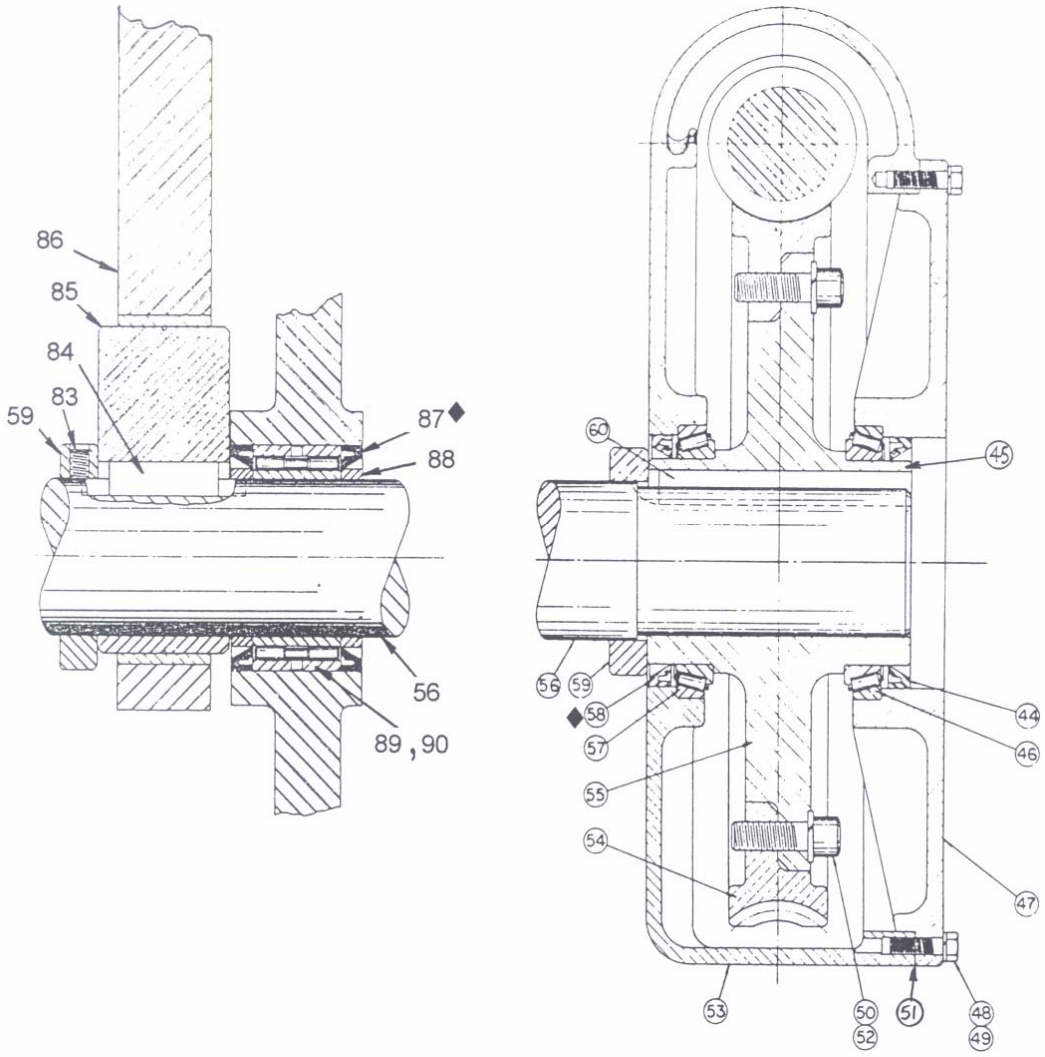
TRANSMISSION PARTS LIST

for use with manual wear adjusting clutch/brake assembly



TRANSMISSION PARTS LIST (cont.)

for use with manual wear adjusting clutch/brake assembly



TRANSMISSION CHARTED PARTS

ITEM	DESCRIPTION	PART NUMBER	SHEAR MODEL NUMBER
18	"V"-Belt	9400-5840	748, 752, 760, 772, 1010, 1052, 1060, 1072, 1096, P-752, P-772, P-1010, P-1012, P-1052, P-1060, P-1072, P-1084, P-1096
		9400-5870	796, 1012, 2548, 2552, 2572, P-796
		9400-5995	2512, 2596
		call factory	1084, 2510, 2560, 2584, P-748, P-760, P-2510, P-2512, P-2548, P-2552, P-2560, P-2572, P-2584, P-2596

ITEM	DESCRIPTION	PART NUMBER	SHEAR MODEL NUMBER
19	Flywheel	1010-069	748, 752, 760, 772, 1010, 1052, 1060, 1072, 1096, P-752, P-772, P-1010, P-1052, P-1060, P-1072, P-1084, P-1096
		1012-069A	796, 1012, 2548, 2552, 2572, P-796, P-1012
		call factory	1084, 2510, 2512, 2560, 2584, 2596, P-748, P-760, P-2510, P-2512, P-2548, P-2552, P-2560, P-2572, P-2584, P-2596

TRANSMISSION PARTS LIST (cont.)

for use with manual wear adjusting clutch/brake assembly

ITEM NO.	PART NO.	PART NAME
1	796-084-01	WORM SHAFT
2	1010-085	WORM BEARING SPACER
3	1010-092	GEAR CASE BEARING COVER
4	9126-3210	HEX HEAD CAP SCREW, 5/16-18 x 1-1/4
5	9228-5180	5/16" SPRING LOCK WASHER
6	1010-084-03	RETAINING SCREW
7	1010-084-02	SPACER
8	9452-2120	TAPER ROLLER BEARING - CONE
8	9452-9480	TAPER ROLLER BEARING - CUP
9	9350-6410	OIL RESERVOIR WINDOW
10	1010-064B	LIMIT SWITCH ACTUATOR
11	1010-66	ACTUATOR BOSS
12	9503-4100	LIMIT SWITCH
13	1010-089-01	BEARING CAP GASKET, CORAL
13	1010-089-02	BEARING CAP GASKET, BROWN
13	1010-089-03	BEARING CAP GASKET, BLUE
15	9126-4380	HEX HEAD CAP SCREW, 3/4-10 x 3
16	9285-0090	AIR CLUTCH
17	59-122	CLUTCH HUB KEY
18	SEE CHART	"V"-BELT
19	SEE CHART	FLYWHEEL
20	9237-3920	DOWEL PIN, 1/2 x 1-1/2
21	PC55-108	FLYWHEEL BEARING SPACER
23	9302-5050	QUICK RELEASE VALVE, 3/8
27	9276-1050	FEMALE ELBOW TUBE FITTING
28	1010-072	AIR HOSE ASSEMBLY
29	9275-0550	ADAPTER, 3/8 x 1/4
30	9285-1080	ROTATING AIR UNION
44	9455-0910	WORM GEAR OIL SEAL
45	1010-059	WORM GEAR ASSEMBLY
46	9452-4500	WORM GEAR BEARING - CONE
46	9452-9600	WORM GEAR BEARING - CUP
47	1010-091	GEAR CASE COVER
48	9126-3460	HEX HEAD CAP SCREW, 3/8-16 x 1-1/4
49	9228-5190	3/8" SPRING LOCK WASHER
50	9132-4130	SOCKET HEAD CAP SCREW, 5/8-11 x 1-3/4
51	1010-093-01	GEAR CASE GASKET, CORAL
51	1010-093-02	GEAR CASE GASKET, BROWN
51	1010-093-03	GEAR CASE GASKET, BLUE
52	9228-5220	5/8" SPRING LOCK WASHER
53	1010-090	GEAR CASE
54	1010-059-02	WORM GEAR RIM
55	1010-059-01	WORM GEAR HUB
56	* SEE CHART	DRIVESHAFT
57	9452-4500	WORM GEAR BEARING - CONE
57	9452-9600	WORM GEAR BEARING - CUP
58	9455-0910	WORM GEAR OIL SEAL
59	1010-043	DRIVE SHAFT COLLAR
60	9001-3280	WORM GEAR DRIVE KEY
61	55-114	BEARING CAP GASKET
62	1673-051	FLYWHEEL BEARING CAP
63	9175-3450	HEX HEAD CAP SCREW, 3/8-16 x 1
64	9276-0950	ELBOW TUBE FITTING
65	55-112	FLYWHEEL BEARING ADJUSTMENT PLATE
66	9452-1250	TAPER ROLLER BEARING - CONE
66	9452-9240	TAPER ROLLER BEARING - CUP
69	9274-0890	PIPE NIPPLE
70	9132-3460	SOCKET HEAD CAP SCREW, 3/8-16 x 1-1/4
71	PC55-092A	CLUTCH HUB
72	9454-0200	CLUTCH HUB BEARING
73	9245-6600	RETAINING RING
74	9245-6480	RETAINING RING
76	9285-2090	SPIDER FLANGE
77	1673-060	SPIDER FLANGE HUB
78	9240-3470	CLUTCH DRIVING JAW KEY
79	9455-0520	WORM SHAFT OIL SEAL
80	9450-3198	WORM SHAFT ROLLER BEARING
81	1010-123	MOUNTING BOLT SLEEVE
82	9162-3790	SOCKET HEAD SET SCREW, 1/2-13 x 1/2
83	9162-3700	SOCKET HEAD SET SCREW, 7/16-14 x 1
84	9001-3220	ECCENTRIC CAM KEY
85	* SEE CHART	ECCENTRIC CAM
86	* SEE CHART	ECCENTRIC STRAP ASSEMBLY
87	9455-0880	DRIVE SHAFT OIL SEAL
88	1010-048A	INNER SPACER
89	9451-3500	DRIVE SHAFT BEARING, INNER
90	9451-9500	DRIVE SHAFT BEARING, OUTER

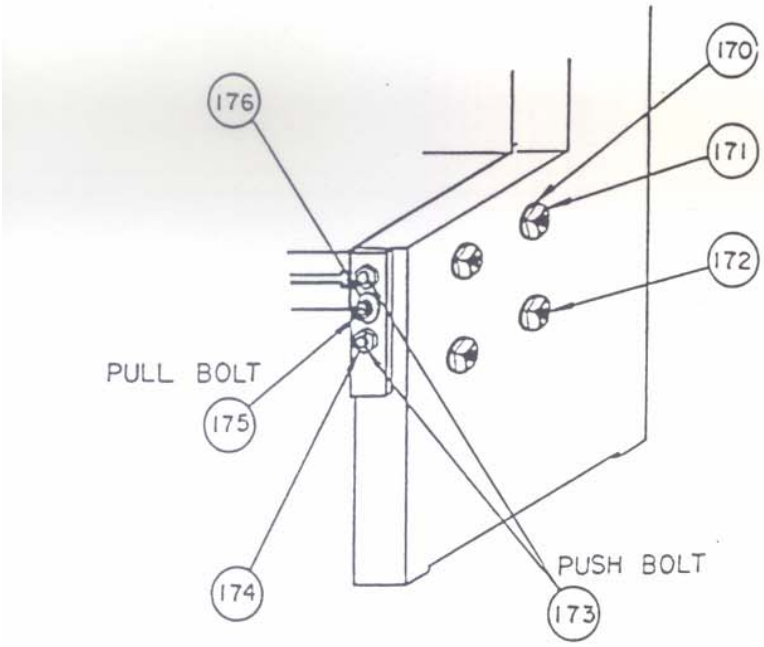
* See Chart Table Parts List
on Pages 42 thru 47

FILTER-REGULATOR-LUBRICATOR PARTS LIST

ITEM NO.	PART NO.	PART NAME
1	9303-8400	MODULAR MOUNTED FRL UNIT
2	9304-1501	HOSE (NOT SHOWN)
3	9304-2383	HOSE CLAMP (NOT SHOWN)
4	9301-3420	SOLENOID VALVE (NOT SHOWN)
5	9303-2040	MUFFLER (NOT SHOWN)
6	9303-8401	REPLACEMENT FILTER (NOT SHOWN)

TYPICAL ELECTRICAL PARTS LIST

PART NO.	PART NAME
9301-3420	SOLENOID VALVE
9501-4020	FOOT SWITCH ('W' SERIES ONLY)
9501-5010	DISCONNECT SWITCH ASSEMBLY
9502-1040	MOTOR STARTER
9502-2030	CONTROL RELAY
9503-2530	PILOT LIGHT - WHITE
9503-3220	PUSH BUTTON CONTROL - BLACK
9503-3280	PUSH BUTTON CONTROL - RED
9503-3285	STOP PUSH-TO-LOCK BUTTON CONTROL - RED
9503-3290	PUSH BUTTON CONTROL - GREEN
9503-3325	KEY SELECTOR SWITCH
9503-4100	LIMIT SWITCH
9503-6051	TRANSFORMER
9504-7010	TERMINAL BLOCK
9504-7013	END BARRIER
9504-7014	RETAINING CLIP
9504-8412	MDA 1.6 AMP FUSE
9506-3200	CONTROL BOX
9506-3210	PANEL

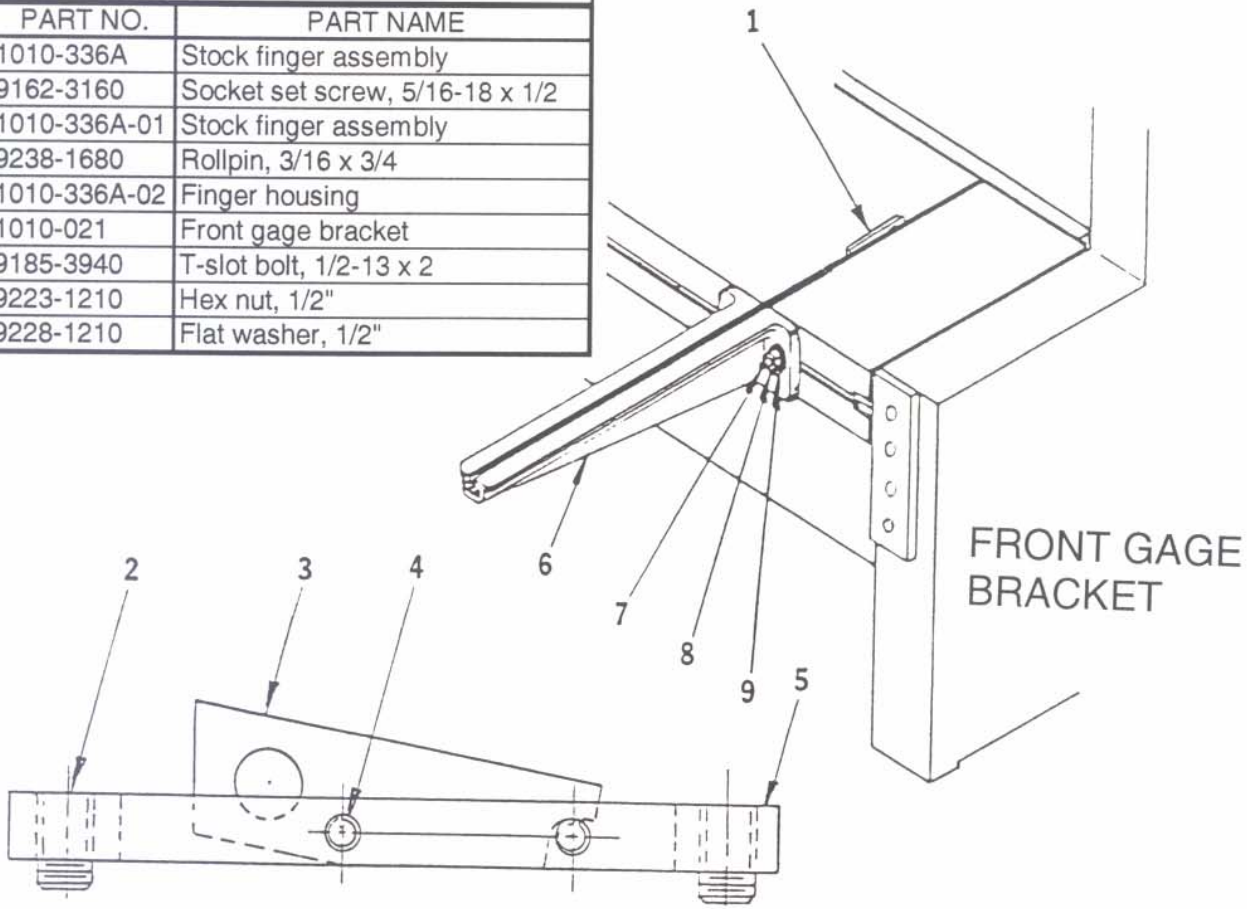


BED ADJUSTING BOLTS

ITEM NO.	PART NO.	PART NAME
170	9228-1250	Flat Washer, 1"
171	9223-1250	Hex Nut, 1"-8
172	9182-8090	Bed End Bolt, 1"-8 x 7
173	1010-132	Bed Push Bolt
174	9223-2230	Jam Nut, 3/4-10
175	9126-3980	Bed Pull Bolt, 1/2-13 x 3
176	9132-3980	Flat Washer, 1/2

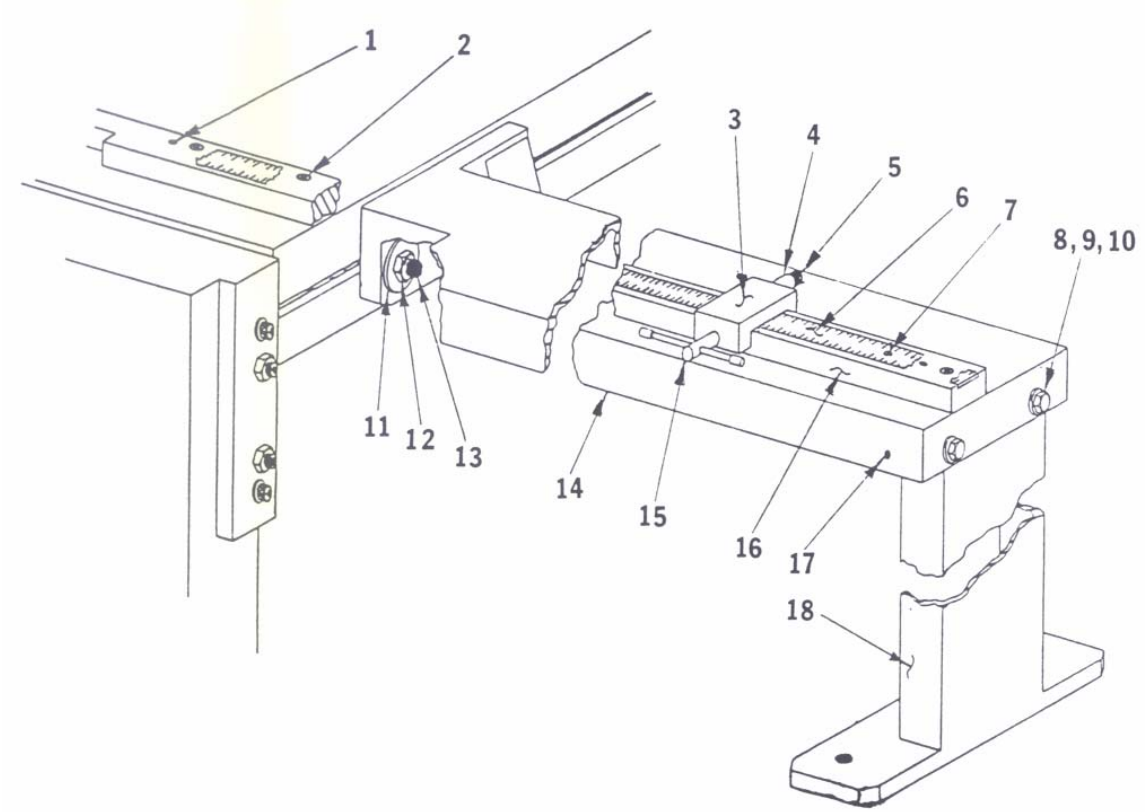
ACCESSORY PARTS LIST

ITEM NO.	PART NO.	PART NAME
1	1010-336A	Stock finger assembly
2	9162-3160	Socket set screw, 5/16-18 x 1/2
3	1010-336A-01	Stock finger assembly
4	9238-1680	Rollpin, 3/16 x 3/4
5	1010-336A-02	Finger housing
6	1010-021	Front gage bracket
7	9185-3940	T-slot bolt, 1/2-13 x 2
8	9223-1210	Hex nut, 1/2"
9	9228-1210	Flat washer, 1/2"



DISAPPEARING STOCK STOPS
Assembly #16-4205

FRONT SQUARING GAGE PARTS LIST (optional)



FRONT SQUARING GAGE ASSEMBLIES

4 FOOT FRONT SQUARING GAGE - Assembly #16-4052
6 FOOT FRONT SQUARING GAGE - Assembly #16-4062
8 FOOT FRONT SQUARING GAGE - Assembly #16-4081
10 FOOT FRONT SQUARING GAGE - Assembly #16-4093

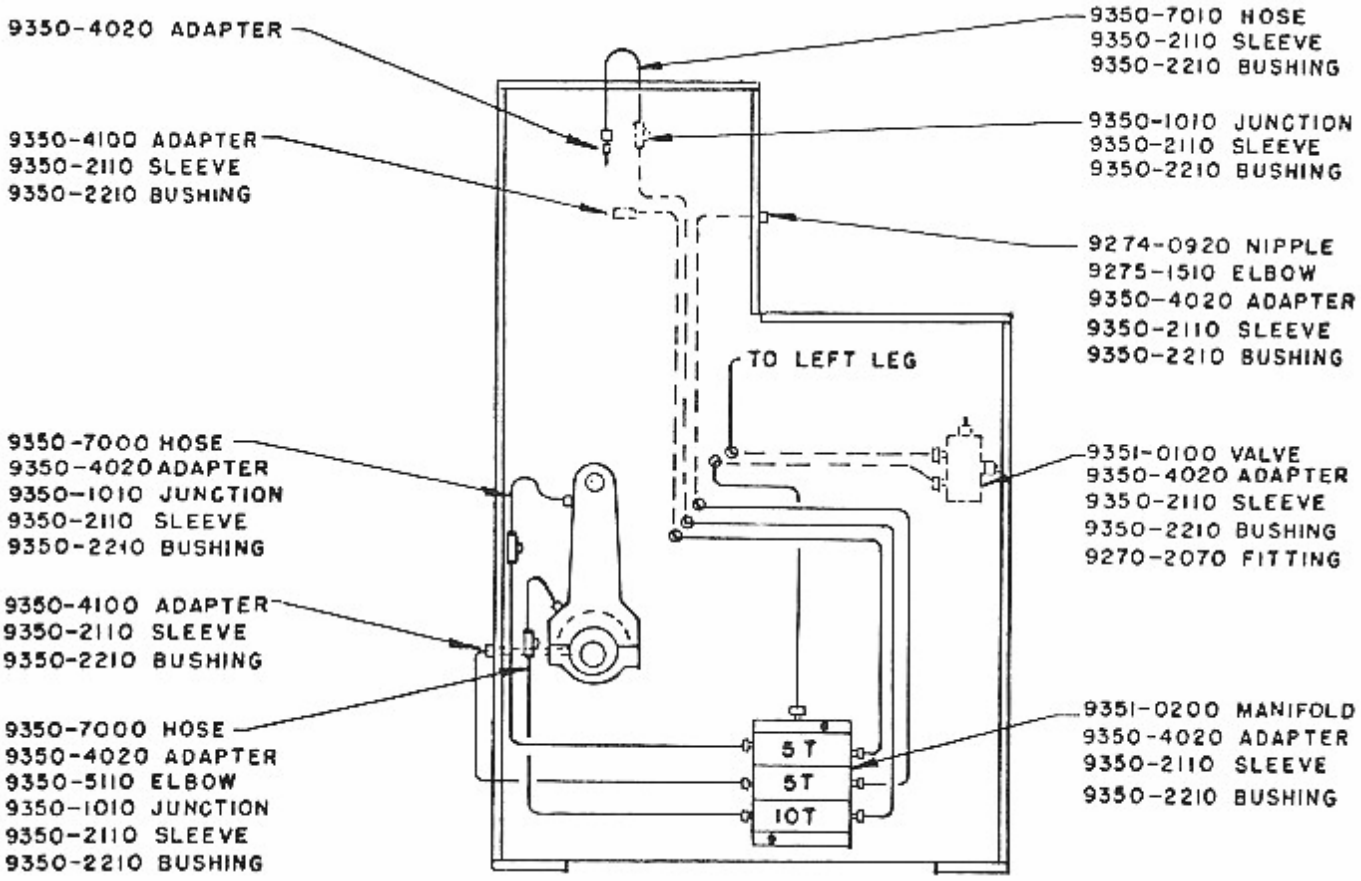
ITEM NO.	PART NO.	PART NAME	ITEM NO.	PART NO.	PART NAME
1	9238-3220	Roll pin, 5/16 x 1-1/2	12	9223-1210	Hex nut, 1/2"
2	9132-3450	Socket Head Cap Screw, 3/8-16 x 1"	13	9185-3940	T-slot bolt, 1/2-13 x 2"
3	1272-146A	Gage block	14	1010-139	Gage bed assembly (for 16-4052)
4	1272-147	Latch		1010-138A	Gage bed assembly (for 16-4062)
5	9174-3900	Stripper bolt, 1/2 x 1"		1010-168	Gage bed assembly (for 16-4081)
6	9615-4660	Scale - 6 foot (for 16-4062)		1010-134	Gage bed assembly (for 16-4093)
	9615-4665	Scale - 8 foot (for 16-4081)	15	1272-149	Lock handle
	9615-4685	Scale - 10 foot (for 16-4093)	16	1010-142	Front guide (for 16-4052)
7	9102-1240	Machine Screw, #8 x 3/8		1010-140A	Front guide (for 16-4062)
8	9126-3450	Hex Head Cap Screw, 3/8-16 x 1 **		1010-256	Front guide (for 16-4081)
9	9228-5190	Lockwasher, 3/8" **		1010-140A	Front guide (for 16-4093) *
10	9223-1190	Hex nut, 3/8" **	17	9162-3800	Socket set screw, 1/2-13 X 5/8
11	9228-1210	Washer, 1/2"	18	1272-148A	Leg assembly **

* also use 1010-255 Short guide with 16-4093

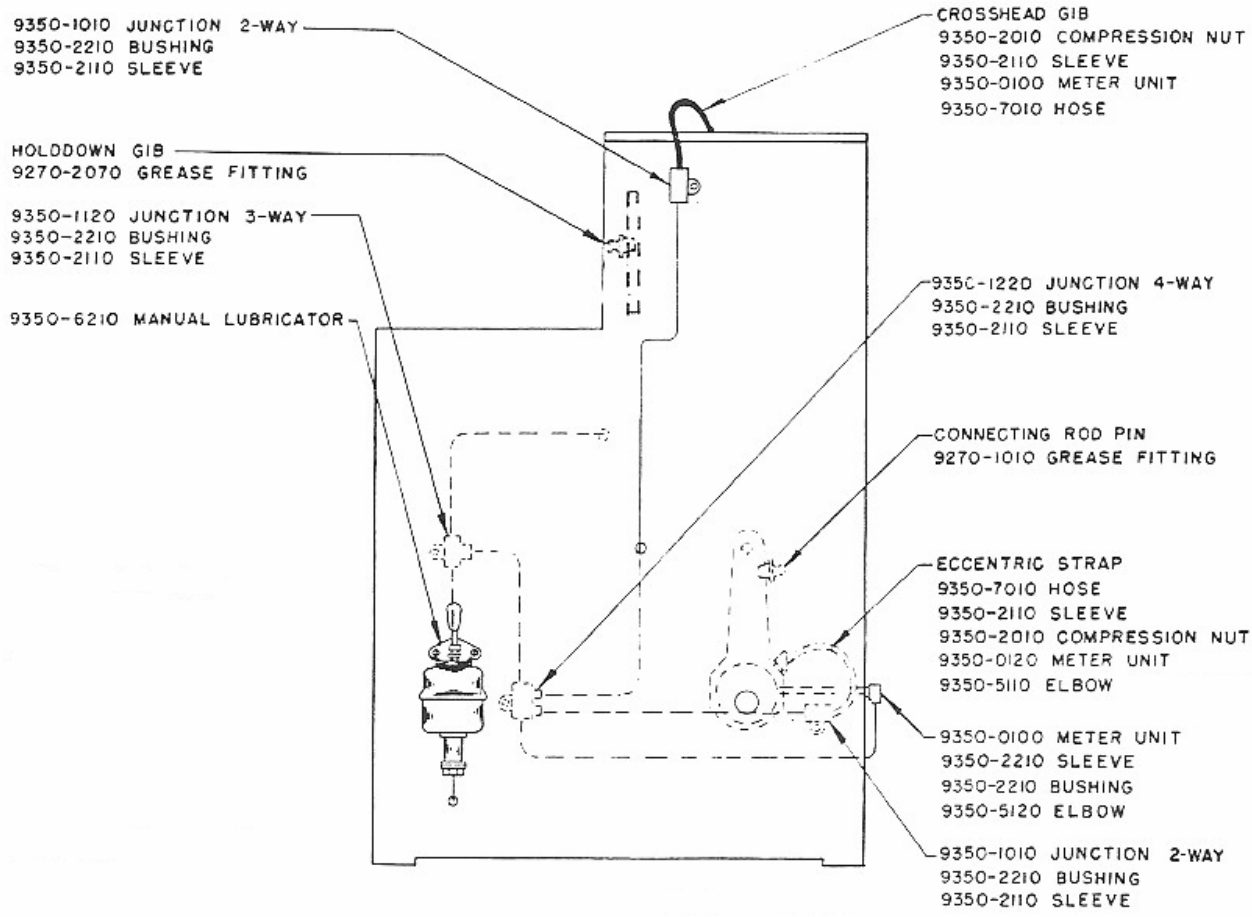
** for all except 16-4052

NOTE: When using a Front Squaring Gage, it is extremely important to secure the shear and Gage firmly to the foundation. Any movement of either the shear or the Gage will cause misalignment.

ONE-POINT CENTRALIZED GREASE PARTS LIST
ASSEMBLY PART #16-6215 (STD.)



ONE-SHOT OILING SYSTEM PARTS LIST (OPT.)
ASSEMBLY PART #16-6000 (STD.)



RECORDS

EDGE	DATE	BY WHOM
#1		
#2		
#3		
#4		
Sharpened or Replaced		
#1		
#2		
#3		
#4		
Sharpened or Replaced		
#1		
#2		
#3		
#4		

Oil & Filter Change

Parts Replaced

Material comparison

Equivalent capacity of FAMCO shears for material other than mild steel.

Mild Steel Gauge 50,000 PSI Shear Strength	3/8	1/4	3/16	10 .135	12 .105	14 .075	16 .060	18 .048	20 .036
Plastics – ABS Compounds	1.00	.875	.560	.500	.375	.250	.200	.150	.120
Stainless Steel									
Type 302 Annealed	.312	.200	.141	.109	.078	.063	.050	.038	.031
Type 302 Cold Worked	.250	.187	.109	.078	.063	.044	.038	.025	.018
Silicon Steel	.350	.210	.166	.105	.075	.060	.048	.036	.030
SAE 1050 Cold Rolled	.350	.210	.135	.105	.075	.060	.048	.036	.030
Aluminum									
1100-0	.500	.375	.313	.250	.190	.125	.100	.090	.063
1100-H14	.500	.375	.250	.190	.160	.125	.100	.090	.063
1100-H18	.625	.500	.250	.190	.160	.100	.090	.080	.063
3003-0	.750	.375	.313	.190	.160	.125	.100	.080	.063
3003-H14	.625	.500	.250	.190	.160	.100	.090	.080	.063
3003-H18	.625	.500	.250	.190	.160	.100	.090	.080	.063
5005-H14	.625	.500	.250	.190	.160	.100	.090	.080	.063
5052-0	.625	.500	.250	.190	.125	.100	.080	.063	.050
5052-H34	.625	.500	.250	.160	.125	.100	.080	.063	.050
5052-H38	.625	.450	.190	.160	.125	.100	.080	.063	.050
2024-0	.625	.500	.250	.190	.125	.100	.080	.063	.050
2024-T3	.625	.450	.190	.160	.125	.090	.071	.063	.050
6061-0	.625	.500	.250	.190	.160	.125	.100	.090	.063
6061-T4	.625	.450	.190	.160	.125	.100	.080	.063	.050
6061-T6	.625	.450	.190	.160	.125	.100	.080	.063	.050
7075-0	.625	.500	.250	.160	.125	.100	.080	.063	.050
7075-T6	.625	.450	.190	.125	.100	.080	.063	.050	.040
Brass-Yellow 65%-35%									
Soft	.450	.290	.229	.169	.129	.091	.072	.064	.051
1/2 Hard	.375	.250	.187	.144	.114	.081	.064	.051	.036
Hard	.375	.250	.187	.129	.102	.072	.064	.051	.036
Bronze, Phosphor									
Annealed	.375	.250	.204	.144	.114	.081	.064	.051	.040
Spring Temper	.312	.210	.162	.114	.091	.064	.051	.041	.032
Copper									
Soft	.450	.290	.229	.162	.129	.091	.072	.064	.051
Hard	.375	.250	.204	.144	.114	.081	.064	.051	.040
Gold–Soft 14 Carat	–	–	.200	.140	.110	.080	.60	.050	.040
Silver – 1/2 Hard Sterling	–	–	.200	.140	.110	.080	.060	.050	.040

CORPORATE HISTORY

In 1927, Mr. Herman Noll purchased the then Freeze and Miller Company, forming his new corporation Famco Machine Company. Since then Famco has continued as an American machine tool manufacturer of arbor, air and foot presses as well as power squaring shears.

In 1975, the company was sold to Belco Industries, Inc. and continued in the manufacture of former products under the Famco Machine Division banner.

In 1987, Famco acquired the Gorton Machine Tool products along with the Lars Corporation products and moved same to its newly expanded Kenosha facility. These products include the Gorton pantograph (engraving) line as well as the Lars tool and cutter grinders.

In 1994, William Blasi purchased 100% of the assets of Famco Gorton/Lars.

In 1996, Famco Machine Division, Belco Industries Incorporated acquired the assets of Milwaukee Slide and Spindle Company.

Famco is located on approximately 12 acres in Kenosha, Wisconsin. The current building is 55,000 square feet and is home for corporate offices, engineering, sales, manufacturing and purchasing.

The average length of service of Famco's manufacturing personnel is approximately 16 years.

FAMCO MACHINE DIVISION

GORTON GORTON

MILWAUKEE SLIDE AND SPINDLE

– MANUFACTURERS OF FAMCO/GORTON-LARS PRODUCTS/ MILWAUKEE SLIDE AND SPINDLE PRODUCTS –

Four Easy Ways to Reach Us!

Phone:
1-800-465-2233 (Toll Free)
262-654-3516 (Local)

Fax:
262-654-0803 (Local)

Mail to:
FAMCO MACHINE DIVISION
BELCO INDUSTRIES, INC.
1001 – 31st Street
Kenosha, WI 53140-1926

Internet:
http://www.famcomachine.com