

Technical Manual

**Operator's, Organizational, Direct Support
and General Support Maintenance Manual
Including Repair Parts List**

For

**SAW, POWER HACK MODEL 1010
KASTO-RACINE INC.
(NSN 3405-00-812-1593)**

HEADQUARTERS DEPARTMENT OF THE ARMY

NOVEMBER 1981

Technical Manual
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DEPARTMENT OF THE ARMY
Washington, DC, 10 November 1981

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2, located in the back of this manual direct to: Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAS, Rock Island, IL 61299. A reply will be furnished direct to you.

NOTE

This manual is published for the purpose of identifying an authorized commercial manual for the use of the personnel to whom this equipment is issued.

Manufactured by: Kasto-Racine Inc.
100 McClure Road
Monroeville, PA 15146

Procured under Contract No. DAAA09-78-C-5108

This technical manual is an authentication of the manufacturers' commercial literature and does not conform with the format and content specified in AR 310-3, Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

INSTRUCTIONS FOR REQUISITIONING PARTS

NOT IDENTIFIED BY NSN

When requisitioning parts not identified by National Stock Number, it is mandatory that the following information be furnished the supply officer.

- 1 - Manufacturer's Federal Supply Code Number - 50471
- 2 - Manufacturer's Part Number exactly as listed herein.
- 3 - Nomenclature exactly as listed herein, including dimensions, if necessary.
- 4 - Manufacturer's Model Number - 1010
- 5 - Manufacturer's Serial Number (End Item)
- 6 - Any other information such as Type, Frame Number, and Electrical Characteristics, if applicable.
- 7 - If DD Form 1348 is used, fill in all blocks except 4, 5, 6, and Remarks field in accordance with AR 725-50.

Complete Form as Follows:

- (a) In blocks 4, 5, 6, list manufacturer's Federal Supply Code Number 5071 followed by a colon and manufacturer's Part Number for the repair part.
- (b) Complete Remarks field as follows:

Noun:	(nomenclature of repair part)
For:	NSN: 3405-00-812-1593
Manufacturer:	Kasto-Racine Inc. 100 McClure Road
Model:	1010
Serial:	(of end item)

Any other pertinent information such as Frame Number, Type, Dimensions, etc.

FLOOR PLAN

Hydraulic Saw
Model 1010, 1212, 1216 & 1415 Heavy Duty

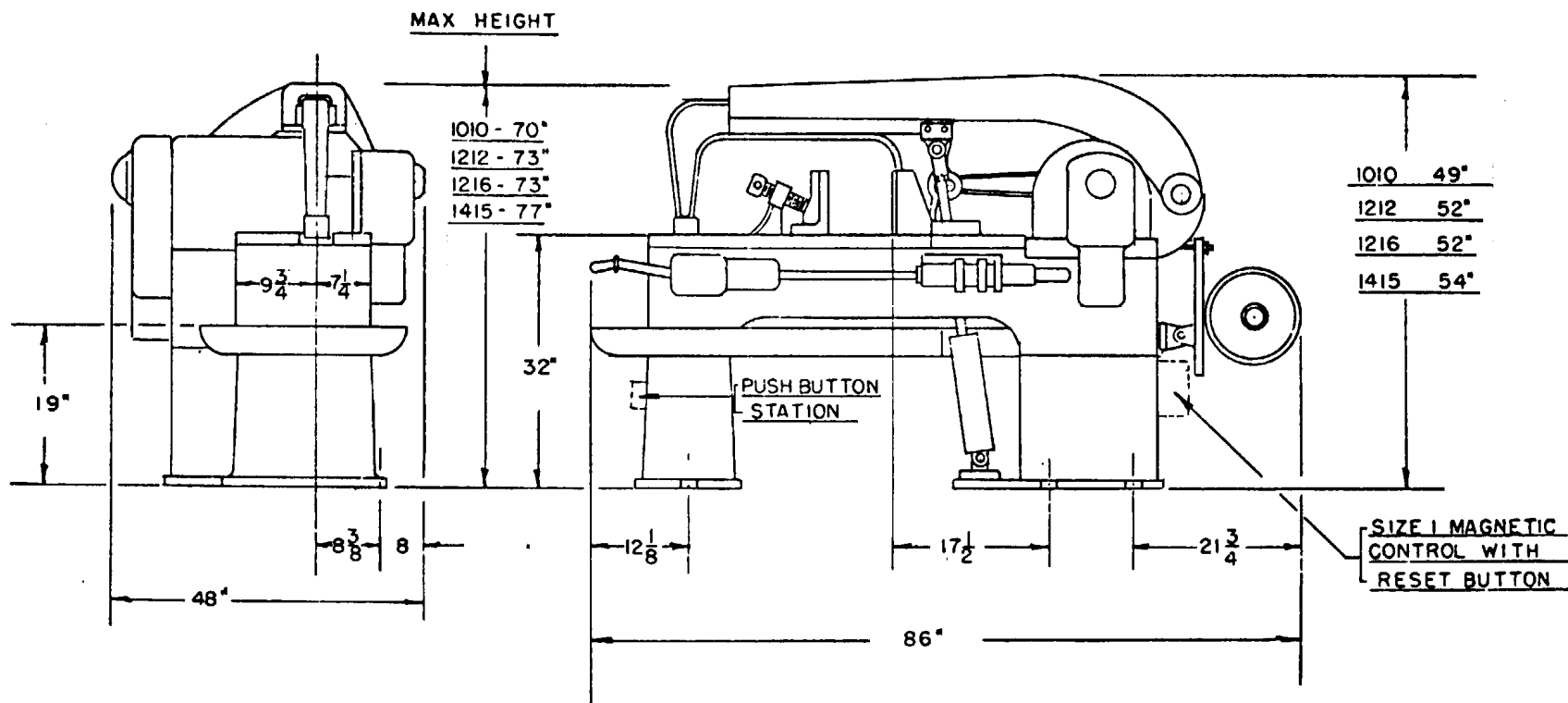
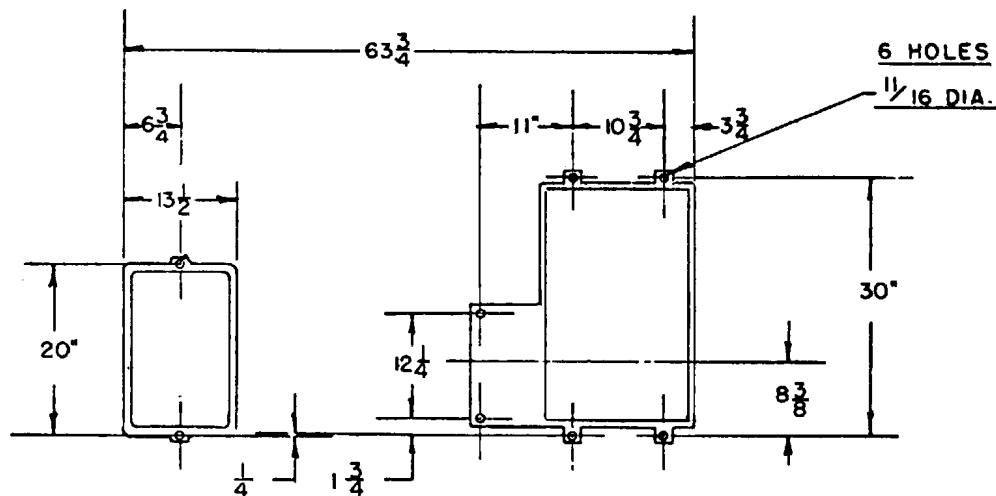


TABLE OF SPECIFICATIONS

Models 1010, 1212, 1216, 1415
Heavy Duty Hydraulic Saw

MACHINE MODEL NUMBER	1010	1212	1216	1415
Rated Capacity	10" x 10"	12" x 12"	12" x 16"	14" x 15"
Actual Capacity	10" x 10"	12" x 12"	12" x 16"	14" x 15"
Capacity with Swivel	10" x 6Y"	12" x 7"	12" x 9"	14" x 9"
Vise at 45x				
Blade Length	18"	21" & 18"	24" & 21"	24" & 21"
Length of Stroke	6"			
Strokes Per Minute	150-110-85-80-60 & 45			
Motor H P (Standard 1200 R P M)	5			
Height, Floor to Table Top	32"			
Floor Space	48" x 84"			
Shipping Weight	3600	3750	3800	3850

- BASE:** Heavy fabricated cabinet under rear of machine, fabricated base supporting front end.
- SAW GUIDE:** Rigid one-piece construction pivoted 10" back of crank shaft. Double slide bearings on top and on both sides of frame. Adjustable gib on one side, two adjustable bottom gibs.
- SAW FRAME:** Heavy cast iron construction. Side bearing plates 1-1/8" thick, 3" wide, are bolted through frame and accurately ground. Felt pad lubrication bearing plates cannot distort from heavy blade tension.
- GEARED HEAD:** Built in as integral part of the machine. Gears all steel and hardened. Cluster gears mounted on 6-spline shaft. Drive from 3-speed gears is through internal bull gear mounted on crank shaft. Six-speeds obtained by 2 step Poly Vee Belt Drive.
- FEED:** Two types of feed are available on all machines flexible (constant pressure feed) and positive feed. Low pressure hydraulic system pressure obtained through simple constant volume pump that applies pressure to top of main cylinder. Single plunger metering pump, with variable stroke and with graduated dial adjustment regulates exact amount of feed desired throughout each cutting stroke. Graduations from 0-22 permit sensitive and accurate control of feed.

SPECIFICATIONS - Continued

LIFT:	A positive lift of the blade on each non-cutting stroke is accomplished hydraulically.
SINGLE LEVER CONTROL:	Single lever controls all operating phases of machine. Governs rapid traverse of saw guide up and down, clutch engagement, and rest positions.
ADJUSTABLE AUTOMATIC KNOCKOUT:	At the finish of the cut a valve releases hydraulic pressure to move the control lever upward. Clutch is disengaged and saw frame rises to its highest position after each cut. Knockout may be adjusted to limit the cut to any desired depth and also to limit the height to which the saw guide will rise.
BLADE HOLDERS:	Of special design hold the blade rigidly in perfect alignment and proper tension for accurate cutting.
DOUBLE SWIVEL VISES:	Grip stock on both sides of blade. Rear vises bolted to table, front vises quick acting, engage slots in table plates. Rear vise jaws fitted with steel plates. Height of jaws 8". Table opening permits chips to fall into pan for easy removal. Vises that swivel for cutting angles up to 450 are furnished as standard equipment. Manual overhead clamp is furnished for clamping bundled material.
TABLE PLATES:	Two special cast nickel iron table plates on machine are replaceable in case of damage or wear.
COOLANT PUMP:	Simple constant pressure gear pump supplies coolant through two flexible steel hose connections to saw blade. Pump equipped with relief valve to control flow of coolant. Strainer in main chip pan and screened removable chip pan in coolant pump protect pump from floating chips.
LUBRICATION:	All gears run constantly in oil. - Hydraulic pumps self-oiling. Wick oilers provided on saw slide, connecting rod bearings and other bearing points.
CLUTCH:	Twin Disc; held in engagement by hydraulic pressure.
LENGTH GAUGE:	Adjustable to permit duplicating cuts of the same length, without resetting.
BEARINGS:	All main bearings and revolving bearings Bronze bushed.
MOTOR:	5 HP 1200R PM.
DRIVE:	Direct from motor to main drive pulley of machine through 2 step Poly Vee Belt Drive. Motor attached to heavy cast iron platform hinged to rear of machine base. Motor platform adjustable for belt take up. All belts completely guarded with safety guard easily removable.
DIRECTION PLATES:	Direction plates are attached to each machine which will assist the operator in selecting the correct cutting speed and feeds.

OPERATING INSTRUCTIONS

UNCRATING AND SETTING UP:

After removal from crate, machine should be located on solid foundation and securely fastened in place. Be sure all equipment belonging to machine is removed from crate. This should consist of:

- 1-Handle for tightening vise jaws
- 1-Wrench for tensioning blade
- 1-1/4 set screw wrench for blade holder
- 1-Length gage, assembled, for cutting multiple pieces of same length
This fits in bored hole on side of right rear vise jaw
- 2-Lengths flexible hose for coolant
- 1-Standard front blade holder with tightening nut and blade bolt
- 1-Spacer block used in front of blade holder. (1212 & 1216 & 1415)
- 2-Splash aprons for drip pan

SPEED AND ROTATION:

Motor rotation should be in accordance with direction of arrow on machine belt guard. The large pulley should run counterclockwise when facing the machine from the side on which the large pulley is located.

OILING AND FILLING:

Machine is shipped with hydraulic system filled. Make sure no oil has leaked out in-transit by checking oil level on gauge at the back of the machine. This gauge should always show about 1/4" to H" of oil. If more oil is needed, fill through screw plug on top of gear box cover. Any good grade of oil, as recommended by the manufacturers for hydraulic machine use, viscosity 200 S.S.U. at 100°F is suitable. Machine is shipped with hydraulic system filled with medium oil. If machine is located in cold place, use lighter grade oil. In running machine, always keep hydraulic system FILLED by adding a quart or more of oil as needed. Drain out old oil after about 600 hours of actual running time. If running time is intermittent, drain and refill every six months. System holds about seven gallons. Drain plug is located on side of base below drive pulley.

Other oil cups and holes for lubricating machine. (See Lubrication Chart.)

Remove control lever cover and oil all moving parts once a month.

STARTING MACHINE:

CONTROL LEVER (200287) which extends beyond front of machine, has four positions: Up Clutch, Rest and Down. Place this lever in Rest position and start motor. Raise lever to Up position by pushing it slightly to right and raising rapidly through Clutch position. This will cause saw frame to rise to highest point.

By RELEASING control lever before saw frame has reached highest point the automatic knockout device will trip the lever returning it to Rest position when the frame has reached its highest point. If the control lever is held continuously in Up position until the saw frame has reached its highest point, then knockout device will not operate, and it will be necessary to push lever to right and force downward to Rest position.

Move saw frame up and down several times to remove any air that may be trapped in the main cylinder. The lowering of frame is accomplished by pushing control lever downward to its lowest point or to Down position. It will be noted that when lever is released in Down position, it automatically returns to Rest position by spring pressure.

OPERATING INSTRUCTIONS - Continued

To engage CLUTCH, press lever to right and raise to Clutch position and hold until saw frame reciprocates, then lever may be released as it will automatically hold in this position.

Rest position is used to stop saw frame at any point and to hold saw frame just above work to measure desired length of piece to be cut.

No harm can come to pump or machine by operation of CONTROL LEVER or by shifting to any location. If CONTROL LEVER is in Up position and operator wishes to throw lever to Rest position independent of automatic knockout, push CONTROL LEVER to right and press downward to Rest

CAUTION

Do not start reciprocation with saw teeth resting on material to be cut. See instruction under Cutting Operation

AUTOMATIC KNOCKOUT:

KNOCKOUT ROD (300396) with adjusting nuts is located below feed unit. Adjustment of nut and locking nut on end of knockout rod determines point at which trip will operate to stop feed and reciprocation and return saw frame to Up position. If machine knocks out before blade cuts through stock, move adjusting nut farther from knockout lever (200278). If knockout works too late, move adjusting nut nearer to knockout lever.

An adjustable nut (300436) on knockout rod (300396) is also provided and may be set to determine the height to which frame will rise above work. This may be set to stop frame at about 1" above the table, or higher as desired. Blade should always be 1/4" above work before engaging clutch.

BLADES:

Standard blades for this machine are indicated on the chart located on the machine beneath the Feed Control Dial (200286).

For general purpose cutting the 11" and 2" wide blades are recommended.

HOW TO INSTALL BLADES -- Proper Tension:

See that the blade is firmly held in the blade holders by the blade holder pins. Now tighten adjusting nut at the front end of the saw frame by hand BUT WITH SLIGHT TENSION. This removes slack from blade holes. Then turn adjusting nut with the wrench handle provided for this purpose until blade is taut (2Y2 turns). After a few cuts have been made, retighten the blade slightly as blades will stretch at ends. It is advisable to use standard torque wrench measured in inch rounds (13/4" and 2" wide blades 275 inch pounds).

SAW FRAME GIB ADJUSTMENT:

The saw frame is fully adjustable in the guide or slide by a heavy two-piece adjustable side gib and two lower gib plates adjustable by removing strips of laminated shim stock. After considerable running, these gibs may need take-up. Be sure, after adjustment, that frame is not binding either at front or rear, as this will cause pounding and clutch slippage.

CAUTION

FRAME SHOULD BE DISCONNECTED FROM CONNECTING ROD AND MOVED FORWARD AND BACK BY HAND TO INSURE AGAINST BINDING.

PUMP CHAIN DRIVE ADJUSTMENT:

An idler sprocket is located behind belt guard. For take-up of chain move idler arm enough to take up slack.

OPERATING INSTRUCTIONS - Continued**CUTTING OPERATION:**

The single lever control makes this machine very simple to operate with a few minutes of practice. Put stock to be cut in machine and tighten securely in vise with saw frame in Up position. Vise tightening wrench furnished is of sufficient length to exert adequate pressure without undue strain. Then open the feed dial, which is on the right hand side of the machine, to normal feed. See suggested feeds on chart located on machine beneath Feed Control Dial (200286). Now push the control lever down to the lowest position. This will give a rapid traverse of the saw frame downward. Raising or lowering slightly will control the rate of down travel. When the saw blade has approached to within 1/4" above the stock, bring the lever up to Clutch position.

CAUTION

NEVER PLACE LEVER IN CLUTCH POSITION TO START THE RECIPROICATION WHEN THE BLADE IS RESTING ON THE WORK. Always allow 1/4 for the blade to feed down to the work otherwise you are likely to break blades.

SIX SPEED:

Each range covers three speed: High 85, 110, 150; low 45, 60, 80. To go from high to low range, remove belt guard and shift Poly Vee belt on step pulleys.

Gear shift lever is located on top of gear case cover. HIGH SPEED should be used for cold rolled steel, pipe, structural shapes and easily machineable stock. The medium and low speeds are for harder stock. Shifting from one speed to another should be done with the clutch engaged: that is, with the saw frame reciprocating.

When machine is new, gear teeth may be a little hard to mesh. Shifting should be done quickly, especially when shifting from low to high gear. If shift lever stops in a neutral position, it is best to return to lower gear and then shift rapidly across to high gear. Shift lever should not be forced. It may be necessary, at first, to throw clutch out of engagement momentarily and shift the lever before gears have entirely stopped running.

FLEXIBLE AND POSITIVE FEED:

Two feeds are available -- positive and flexible. To put machine in flexible feed, turn petcock (400163) all the way out (counterclockwise). To put machine in positive feed, turn petcock all the way in (clockwise). (See cross section drawing No. 4.) With machine set on flexible feed the pressure is automatically regulated and feed is increased or decreased in accordance with resistance against the blade. This allows blade to advance more rapidly through a light section of metal and reduces feed during the cutting of a heavy section. Thus, in cutting round bar stock, feed will be greater at the beginning and end of cut than in the center. Conversely, in cutting tubing the feed will be less at the beginning and end of cut and will automatically increase through the center of the cut where the area of solid metal presented to the blade is smaller.

This flexible control should be used in conjunction with the graduated feed dial, and it will be found that feed setting can be increased over feed numbers used with the positive feed as suggested below. The closing of the pet cock as mentioned above immediately changes the feed to a positive feed, metering out on exact quantity of oil on each cutting stroke as determined by the setting of the feed dial.

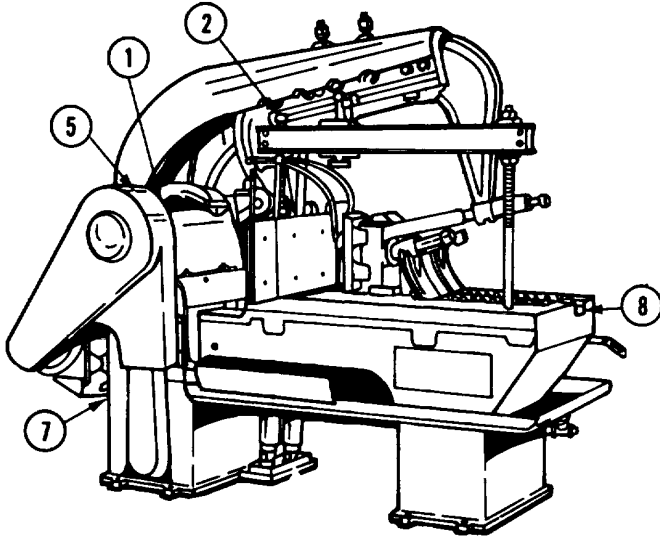
SUGGESTED FEEDS:

See feed chart located on machine beneath Feed Control Dial (200286) for recommended feeds on various sizes and kinds of material.

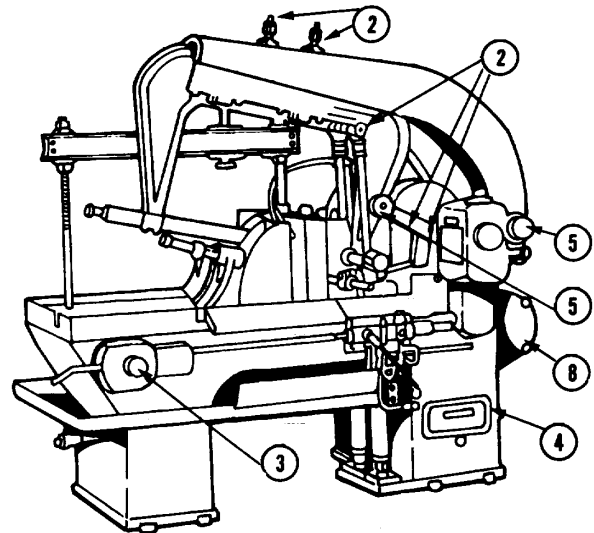
Operator will quickly become familiar with rates of feeds for fastest production consistent with accuracy and reasonable blade life.

**MAINTENANCE INSTRUCTIONS
LUBRICATION**

Models 1010, 1212, 1216 and 1415 Hydraulic Heavy Duty Saws



1. Main Hydraulic System Reservoir Fill Plug. Use medium weight hydraulic oil for 40° temperature and up. Use light weight hydraulic oil for temperature below 40°. Capacity 7 gallons. (Check weekly.)
2. Seven Oilers. Use medium machine oil. (Oil every 8 hours.)
3. Control Lever Assembly. Oil holes, remove guard. (Oil monthly.)
4. Coolant Reservoir. Soluble oil or light cutting oil. Capacity 10 gallons.
5. Three Zerk grease fittings.
6. Serial number location.
7. Reservoir Drain Plug.
8. Hydraulic Reservoir Oil Level Gage.



TROUBLE CHARTS

TROUBLE	CAUSE	REMEDY
<p>SAW WILL NOT OPERATE PROPERLY AFTER SETTING UP</p>	<p>1. Wrong voltage on Electrical Equipment. This causes loss of power and overheating of motor.</p>	<p>A. Check your order or requisition to be sure machine has been wired for voltage available.</p> <p>B. Check Thermal Overload Relays in Switch to be sure they are of sufficient capacity for maximum load of motor.</p>
	<p>2. WRONG ROTATION OF MOTOR. The hydraulic units will not operate if rotation is wrong.</p>	<p>A. Rotation of motor should be counterclockwise when facing shaft end of motor.</p>
	<p>3. INSUFFICIENT OIL IN RESERVOIR</p>	<p>A. Check oil level in sight gage.</p> <p>B. Oil capacity in reservoir is 7 gallons. Filler plug is located on top of gear case cover.</p>
	<p>4. WRONG VISCOSITY OF OIL IN RESERVOIR. Too heavy an oil may cause sluggish operation of saw, Too light an oil may cause excessive leaking that may affect operation of valves, etc.</p>	<p>A. Use medium hydraulic oil in temperatures of 40° and up. Use light hydraulic oil in temperatures below 400. In extremely low temperatures a very light oil similar to DTE light should be used.</p>
<p>CROOKED CUTTING AND BLADE BREAKAGE</p>	<p>1. WRONG BLADE. A dull blade or a blade with an uneven set will not Cut straight.</p>	<p>A. Use a six, four or three tooth blade.</p> <p>B. Blade should be 1¼" wide or more. For maximum production use the widest blade available in each length.</p> <p>C. Blade should be .088 thickness or greater.</p> <p>D. Blade should be of high speed or molybdenum high speed steel.</p>
	<p>2. WRONG TENSION ON BLADE Insufficient tension permits blade to twist or weave, causing crooked cutting. Excessive tension will pull the ends out of blades.</p>	<p>A. When placing blade in saw frame, take up slack by hand, turning 300314 saw tightened knob before tightening set screws. See Fig. 16.</p> <p>B. After tightening set screws, make 2/2 full turns with 300314 saw tightened knob using tightened handle.</p> <p>C. Look at under side of blade holder at joint of saw frame. It should be long enough to prevent blade holder coming through to strike the washer that lies against the thrust bearing. Otherwise, proper tension cannot be obtained. Also, check the condition of 400078 thrust bearing. See Fig. 16.</p> <p>D. If a torque wrench is use, apply tension as follows: 13/4" & 2" wide blade-250 to 275 inch lbs.</p>

TROUBLE CHARTS- Continued

TROUBLE	CAUSE	REMEDY
<p>CROOKED CUTTING AND BLADE BREAKAGE (Continued)</p>	<p>3. OVER FEED OF SAW BLADE. If blade is led too fast, teeth are quickly dulled because they are over-loaded Crooked cutting also Develops because the blade is deflected by excessive feeding.</p>	<p>A. Each machine includes a feed chart. This chart indicates recommended feeds and speeds for general metal cutting. Set the feed on your machine according to this chart. Then increase or decrease feed according to the stock you are cutting. Correct adjustment will increase blade life and production.</p> <p>B. Check for abnormal feed down of saw frame. Normal feed Down, while reciprocating at 150 strokes per minute with feed dial set at zero and 400163 flexible feed valve (Fig. 4) shut off, is Y2" to Y3" in ten minutes. Normal leak down, while machine is in Rest position, is full drop from upper most position in six or seven hours</p> <p>C. To correct this condition see Abnormal Feed Down of Saw Frame on Page 11.</p>
	<p>4. BLADE MAY NOT BE SQUARE WITH STOCK BEING CUT.</p>	<p>A. Check squareness of blade with table by placing a square on table bed. Raising and lowering the saw blade checks For straight travel. Placing square on face of rear vise jaw and against saw blade checks for blade alignment. Blade should be at 90° angle with the jaws. Jaws must be tight against aligning key at rear of vise jaw.</p> <p>B. After heavy or long service, it may be necessary to resurface the vise jaws to insure correct alignment.</p> <p>C. Check to make sure that stock stands are level with the machine.</p>
	<p>5. 200338 side gibs not adjusted properly. See Fig. 8. Gibs hold Frame in proper alignment. If too loose, they will permit blade to run. If too tight, they may score the bearing surface.</p>	<p>A. Tighten saw blade in place so that bearing surfaces on saw frame will be under normal working stress. See Item 2 on Page 9.</p> <p>B. Remove 300315 wrist pin when adjusting 200338 and 200257-200258 gibs. See Fig. 1 and 8.</p> <p>C. Adjust bottom gibs to obtain snug sliding fit by removing laminations on 401992 shim under 200257 & 200258. Each lamination is .002".</p> <p>D. Adjust side gib with Setscrews. Slide frame full strokes by hand after adjustment of each screw and before replacing 300315 wrist pin.</p>
	<p>6. Blade holders 300295 and 300302 out of alignment. See Fig. 16A.</p>	<p>A. Blade holders may be twisted or reversed causing misalignment. Make sure that the front blade holder is relatively in the same position as the rear blade Holder so that the blade clamping faces are in alignment.</p> <p>B. Blade holders 300295 and 300302 may be bent and require straightening or replacement. See Fig 16A.</p>

TROUBLE CHARTS - Continued

TROUBLE	CAUSE	REMEDY
	1. 200283 feed adjusting knob incorrectly positioned end feed cannot be controlled See Fig. 3	A. Feed control timing ring 200285 should be at bottom, that is, neutral position, when feed knob 200286 is turned to the left against stop pin, which is zero position. Fig. 3 shows feed control timing ring on center or in zero position. If 200285 ring is in uppermost position, when 200286 knob is in zero position, the feed is fully open and is uncontrollable. See Fig. 3. B. To set 200286 knob to correct position raise knob over stop pins and turn to the left as far as it will go. Then lower knob into place. Make sure knob remains in correct position when replacing 275026 guard. See Fig. 3.
ABNORMAL FEED DOWN OF SAW FRAME (While saw frame is reciprocating)	2. WORN 200283 FEED TIMING CASE COVER See: Fig. 7 If 200283 cover is worn, the feed down of saw frame cannot be controlled because of excessive Leakage	A. To check for oil leaks at this point, remove 275026 guard (Fig. 3) and 303019 tubing coil (Fig. 7). Remove a 1/8" fitting on 700057 lift cylinder (Fig. 3) and insert a 1/8" pipe plug in place of fitting. Shut off flexible feed valve 400163 (Fig. 4) and start saw reciprocating. B. If no more than normal feed down is evident (See Page 10 Item 3B for normal feed down), then leak must be in 200283 feed timing case cover, and this part must be replaced. See Fig. 7. C. 200283 feed timing case cover is always fitted with 200277 feed cylinder (Figs. 7 and 3) and shipped as complete assembly No. 700036.
	3. Worn 4 piston IN 200261 control valve causing excessive leak. See Fig. 4.	A. First check for abnormal feed down of saw frame due to leak in 200283 feed timing case cover (See Item 2A, Page 11). B. If abnormal feed down is still evident, the control valve piston 300354 is probably worn and the valve must be replaced. C. As the control valve piston 300354 is fitted to the Control valve 200261, these parts must be purchased as complete assembly No. 700015.
	4. Insufficient oil in reservoir	A. See Page 9 Items 3 and 4.
ABNORMAL FEED DOWN OF SAW FRAME (While Machine is idle or in Rest position)	1. Dirt under relief valve ball beneath 30043 cap on control valve 200261 causing oil leak, through ball check. See Fig 4.	A. Remove 300403 cap on top of 200261 control valve and clean ball and ball seat. See Fig. 4. B. Reseat by topping ball in place in seat with soft Steel rod before replacing 300403 cap. See Fig. 4
	2. Dirt in 300411 flexible feed valve body causing leak through ball check at all times, See Figs. 4.	A. Remove 300414 cap. Then measure adjusting screw projection (usually about 1/4") so that it can-be replaced in former position. Remove 300419 adjusting stud and 400157 spring. See Fig. 4.

TROUBLE CHARTS - Continued

TROUBLE	CAUSE	REMEDY
ABNORMAL FEED DOWN OF SAW FRAME (while Machine is idle or in Rest position) (Continued)		B. Flush 300411 valve body and clean ball and seat. C. Reseat by tapping ball in place with a soft steel rod before replacing removed parts.
	3. 200287 valve control	A. Remove 200291 control handle guard to see if 200287 control handle is up against 300385 Rest position Detent. See Fig. 5. B. To adjust, turn lock nuts to put enough pressure against 401531 spring to hold 200287 control handle in-position. See Fig. 5.
	4. 300354 control piston out of adjustment, allowing oil to pass through. See Fig. 4 & 5.	A. To check adjustment remove 200291 control handle guard and raise 200287 control candle to uppermost position. In this position the correct adjustment is to have 300387 Detent in control handle within 1/32" of 300424 stop pin. See Fig. 5. B. To make correct adjustment of valve piston, loosen lock nut on 300354 piston and screw piston in or out of 200236 toggle, thus placing control handle 200287 in proper position. Then lock again with locknut. See Fig. 4.
	5. Insufficient or wrong viscosity oil in reservoir.	A. See Page 9, Items 3 and 4.
DOES NOT KNOCK OUT AT FINISH OF CUT	1. 300436 ADJUSTING NUTS OUT OF ADJUSTMENT. Adjust these nuts according to size of work and saw blade width.	A. The rear 300436 adjusting nuts at 200278 lever are for knockout at finish of cut. See Fig. 3. B. The front 300436 adjusting nuts at 200278 lever are for adjusting the height to which the saw frame will rise after the knockout at finish of cut. See Fig. 3.
	2. 300373 SWIVEL BOLT LOOSE ON 300396 KNOCKOUT ROD 300396 rod must be tight in 300373 bolt to operate knockout of 200287 control handle. See Fig. 5	A. 300373 swivel bolt is held in position on 300396 knockout rod with headless setscrew. See Fig. 5. B. If 300373 swivel bolt has loosened, make' the correct adjustment by lowering saw frame to its lowest position and put the control handle 200287 in Rest Position. See Fig. 5. C. Slide 300396 knockout rod through hole in head of 300373 bolt until 300396 rod extends 1" beyond 300374 bolt on 200278 knockout rod lever at rear of machine. See Fig. 3 and 5.
	3. OVERSTRESSED OR BROKEN 45318 SPRING CONTROL VALVE. This spring raises control handle 200287 to UP position at Finish of cut. If weak or broken, handle will not rise. See Fig. 4.	A. To check, remove 200281 knockout spring container cap by turning to left. Remove 400145 outer spring and lock nuts holding 453918 spring. See Fig. 4. B. 453918 spring should be 4-9/16" long free length. If 453918 spring has been overstressed or has taken a set , it should be replaced, or in an emergency a spacer can be put in to make the free length of 4-9/16".

TROUBLE CHARTS - Continued

TROUBLE	CAUSE	REMEDY
<p>DOES NOT KNOCK OUT AT FINISH OF CUT (Continued)</p>	<p>4. TOO MUCH TENSION ON 400145 SPRING When this is the trouble, the 200287 control handle will not raise all of the way to UP position after the knockout but will jerk up and down between Clutch and UP position</p>	<p>A. Remove 200281 cap by turning to left. Remove 400145 spring and cut one coil from the end.</p>
	<p>5. Low oil pressure on hydraulic system causing loss of power against 200309 knockout piston which puts pressure on 453918 spring to trip control handle 2C287 See Fig. 4.</p>	<p>A. To check pressure, stop motor and insert a 150 pound or over hydraulic pressure gage in place of the 1" pipe plug on outer side of 200261 control valve. See Fig. 4. B. Start motor and put 200287 control handle in Clutch position to obtain reading. Pressure should be 95 to 100 pounds. C. To adjust pressure, remove 300372 cap on top of control valve and lift out 400152 spring and 300429 seat disc. Then loosen lock nuts on seat disc 300429 and adjust to put more or less pressure against 400152 spring to obtain more or less oil pressure. See Fig. 4.</p>
	<p>6. 300354 CONTROL VALVE PISTON OUT OF ADJUSTMENT.</p>	<p>A. See Page 12, Items 4A and 4B for abnormal feed down of saw frame</p>
<p>OIL LEAKS</p>	<p>1. TOO THIN OR TOO HEAVY AN OIL IN RESERVOIR</p>	<p>A. See Page 9, Item 4A for oil specifications. B. This machine is not designed for extremely light oil except where used in cold temperatures. The use of exceptionally thin hydraulic oils may result in excessive leakage.</p>
	<p>2. 403539 GREENTWEED OIL SEAL ON 401979 PUMP SHAFT OR 450245 GASKET IS WORN. See Fig. 6</p>	<p>A. Replace 403529 Greentweed Seal. B. Replace 450245 Gasket.</p>
	<p>3. OIL SEAL 400173 IN 770046 PULLEY MAY LEAK. See Fig. 6.</p>	<p>A. Remove 770046 main pulley to replace oil seal 400173. B. Care must be taken when replacing pulley so that the sealing edge of 400173 oil seal is not marred. See Fig. 6.</p>
	<p>4. OIL SEAL 400140 in CONTROL VALVE 200261 MAY LEAK See Fig. 4.</p>	<p>A. To replace 400140 oil seal, remove 200236 pin and snap ring in front of seal. See Fig. 4. B. Then remove 200281 cap, 400145 spring, lock nuts and 453918 spring. See Fig. 4. C. Next, by using the 300354 piston as a ram, tap the 400140 oil seal out of the control valve.</p>

TROUBLE CHARTS - Continued

TROUBLE	CAUSE	REMEDY
<p>OIL LEAKS (Continued)</p>	<p>5. Overflow oil from 700273 feed timing case, due to heavy oil in cold temperature. See Fig 3.</p>	<p>A. A thinner oil must be used. If oil is too heavy, there may be a run over or leak out of 700273 timing case because the exhaust oil cannot be returned to the reservoir fast enough.</p>
	<p>6. PACK NO 400201 ON 300350 CLUTCH PISTON ROD MAY LEAK, See Fig. 6</p>	<p>A. 400201 is a leather washer--two are required. Must be replaced if leaking. B. To replace 400201 seal washers, remove 450398 guard and 300358 clutch cone and 400150 spring. See Fig. 6.</p>
	<p>1. WORN OR LOOSE V BELT See Fig. 6.</p>	<p>A. Remove main guard 450398 to check adjustment and See Fig. 6. condition of Poly Vee belt 450152. See Fig. 2. B. If V belt is oil soaked, check for oil leaks described on Page 13 and 14, Items 3 and 6. V belt can be tightened by adjusting pivoted motor plate 201076. See Fig. 1.</p>
	<p>2. CLUTCH 400174 OUT OF ADJUSTMENT.</p>	<p>A. To adjust clutch, remove 450398 guard, then pull spring pin to clutch plate and turn to right so that there is about 1/32" clearance between clutch plate and clutch facing. See Fig. 6A.</p>
<p>SLOWING UP OF SAW FRAME</p>	<p>1. IMPROPER ADJUSTMENT OF 300441 FLEXIBLE FEED VALVE. This valve is adjusted at factory for general cutting and in many cases must be readjusted to suit job If not adjusted properly by the saw blade may ride over the stack instead of feeding into it. See Fig. 4.</p>	<p>A. To adjust for heavier flexible feed, remove 300414 cap and turn 300419 adjusting screw about 1 or two turns to right. See Fig. 4.</p>
	<p>FEED DOWN</p>	<p>2. Check condition of Saw blade which may have become to dull to obtain maximum production and efficiency</p>
<p>3. Stock being cut may be too hard or tough for practical use of flexible feed.</p>		<p>A. Try making test cuts with positive feed by closing 400163 flexible feed shut off valve. See Fig. 4. B. Note from feed chart that less feed must be used with positive feed than with flexible feed.</p>
<p>4. Binding of 380183 saw guide pivot shaft from lack of proper lubrication. See Fig. 1 and 2.</p>		<p>A. Check for scoring 380183 saw guide pivot shaft by loosening 200222 and 200223 caps to drive 380183 shaft part way out of bearings. See Fig. 2.</p>

TROUBLE CHARTS - Continued

TROUBLE	CAUSE	REMEDY
SLOWING UP OF SAW FRAME FEED DOWN (Continued)	5. Binding in 450212 main cylinder packing gland. See Fig. 9.	A. To adjust revolve gland 450212 to the left 1/2 turn.
RECIPROCA-TION OF SAW FRAME WITH CONTROL HANDLE IN REST POSITION	1. BUSHING 400143 770046 MAIN PULLEY TOO TIGHT CAUSING DRAG ON DRIVE SHAFT. This may not show up until machine has been run for several weeks. See Fig. 6.	A. To eliminate drag of 400143 bushing on drive shaft, remove main pulley, 770046 and scrape high spots from bore of bushing. See Fig. 6.
	2. Improper release of 300358 clutch cone causing slight engagement of 400174 clutch. See Fig. 6.	A. 400150 spring may need replacing or a spacer put in between 400150 spring and 300358.
LOSS OF LIFT OF SAW BLADE ON RETURN STROKE	1. Excessive feed down of saw frame which causes bending of saw blade upward.	A. See both Abnormal feed down of saw frame paragraphs.
	2. LOW PRESSURE ON HYDRAULIC SYSTEM Lift piston 700057 (Fig. 3) will not flow 200296 cam (Fig. 7) if pressure is too low.	A. For checking pressure see Page 13, Item 5.
SAW FRAME DOES NOT RAISE WITH CONTROL LEVER IN UP POSITION	1. INSUFFICIENT OIL IN RESERVOIR	A. See Page 9, Item 3 for oil level instructions.
	2. LOW OIL PRESSURE ON HYDRAULIC SYSTEM	A. For checking pressure, see Page 13, Item 5.

PARTS LIST

Model 1010, 1212, 1215, 1415 Saw

<u>Part No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Description</u>
200201	Table	210033	Speed Indicator Plate
200206	Gear Case Order Assm. 790001	210054	Motor Pulley
200209	Saw Guide 1010 Order Assm. 700389	210058	Chip Plate
200212	Saw Guide 1212, 1216 Order Assm. 700390 (1415)	210063	Bracket for Twin Cylinder 1010
200214	Saw Frame 1010 Order Assm. 700080	210076	Stack Catcher
200217	Connecting Rod Order Assm. 700065	210077	Bracket for Twin Cylinder 1212 - 1216 -1415
200220	Rear Vise Jaw (Small)	210179	Chip Plate 1415
200222	Cap	210188	Saw Frame Order 700535 - 1415
200223	Cap	210189	Filler Black 1415
200224	Cap	220009	Pump Plate
200225	Cap	265015	Vise Nut
200226	Cap	265016	Shifter Arm Order 700079 Assm.
200227	Cap	265017	K.O. Rod Lever
200230	Door	265154	K.O. Rod Lever 1415
200231	Inner & Outer Brg. an Drive Shaft Order 790003 Assm.	275026	Lift and Feed Cylinder Guard
200232	Spline Shaft Bearing	275027	Feed Ring
200233	Crank Shaft Bearing Order 790004 Assm.	275031	Guard Cap
200235	Spacer	300294	Drive Shaft
200236	Toggle for Control Lever	300295	Blade Holder - Rear Order 793024
200237	Gib Plates 1010 See Also 200369	300298	Front Blade Holder 1010 Order 793026
200238	Gear Case Cover -	300301	Blade Holder - Front 1216 Order 793029
200240	Tension Rod Brackets -	300302	Blade Holder - Front 1212 Order 793030
200241	Upper Lift Rod Head	300305	Vise Plate (RH)
200245	Swivel Vise Jaw	300308	Vise Screw Order 793034
200247	Swivel Vise Jaw Carrier Order 793007	300309	Vise Screw Plug
200250	Pump Sprocket (24T)	300313	Blade Holder - Plate
200253	Idler Arm	300314	Saw Tightening Handwheel
200254	Spacer for Blade Holder 1010	300315	Connecting Rod Pin Order 793036 (Auto Oiler See 381108)
200255	Main Pulley Drive Shaft Order 770002 Assm.	300317	Saw Tightening Handle
200256	Flange for Drive Shaft Order 790005 Assm.	300318	Pin for Tension Rod Head
200257	L.H. Gib Plate 1010	300319	Connecting Pin for Control Valve Lever
200258	R.H. Gib Plate 1010	300320	Connecting Pin for Control Valve Lever
200259	Control Valve Sleeve Order 700015 Assm.	300321	Hand Nut a her
200261	Control Valve Body Order 700015 Assm.	300323	Thimbles
200267	Lift Roller Support Arm	300324	Nut
200268	Shifter Fork Order 790002 Assm.	300325	Stud
200269	Shifter Handle	300333	Spacing Collar
200274	Crank Shaft	333838	Idler Shaft
200276	Lift Piston Roller Link	300339	Shifter Rod
200277	Feed Cylinder Order 700036 Assm.	300340	Motor Plate Adj. Screw
200278	K.30 Rod Lover	300350	Piston Rod
200279	Timing Carrier Bracket Order 700306 Assm.	300351	in Shaft Order r 790005 Am.
200280	Knock Out Cylinder	300354	Piston for Control Valve Order 700015 Assm.
200281	Knock Out Spring Container	300358	Clutch Cone
200282	Feed Timing Case Order 793011	300361	Feed Piston Order 700036 Assm.
200283	Feed Timing Case Cover Order 700036 Assm.	300362	Feed Adj. Screw
200285	Timing Ring	300364	Feed Adj. Screw Bushing
200286	Feed Adj. Knob Order 700062 Assm Bs	300365	Feed Screw Thimble
200287	Valve Control Lever Order 700492	300366	Feed Timing Case Spring Plug
200288	Knock Out Lever	300367	Feed Roller Shoulder Screw
200289	Valve Control Lever Plate	300368	Timing Link Shoulder Screw
200290	Timing Link	300371	K.O. Lever Shoulder Screw
200291	Control Lever Guard	300372	Control Valve Relief Valve Cap
200294	R.H. Front Vise Jaw Order 79301 3	300373	Swivel Bolt for K.O. Lever
200296	Cam Order 793015	300374	Swivel Bolt
200300	Bracket for Motor Plate	300375	Lift Roller Arm Pivot Screw
200307	Bracket for Motor Plate Adj. Screw	300376	Lift Roller Order 793038
200309	Knock Out Piston	300377	Lift Piston Pin
200310	Piston	300381	K.O. Piston Spring Rod
200322	Length Gauge Stop Collar	300383	Control Lever Stud
200323	Length Gauge Support Bracket	300384	Washer for Control Lever Pivot Stud
200324	Length Gauge Head Order 770003 Assm.	300385	Neutral Detent
200330	End Flange Order 700282 Assm.	300386	Food Detent
200332	End Flange Order 700283 Assm.	300387	Control Lever Detent
200337	Gibs 1212, 1216, 1415	300388	Handle Detent
200338	Gibs 1010	300389	K.O. Lever Spring Rod
200339	Oil Plate	300392	Control Lever Rod
200341	Cabinet Log	500394	Shoulder Screw
200349	Spacer for Blade Holder - 3" - 1216	300396	K.O. Rod
200350	Spacer for Blade Holder -3-1/2" - 1212	300398	Shifter Fork Stud
200351	R.H. Gib	300399	Shifter Fork Ball Spring Stud
200352	L.H. Gib Plate	300400	Drain Fitting
200360	L.H. Table Plate	300402	Thrust Washer
200367	R.H. Table Plate	300403	Safety Volvo C
200369	Gib Plates, 1212, 1216, 1415	300404	Extension Stud for Control Lever Pivot Stud
200371	Rear Swivel Jaw	300405	Stud for K.O. Lever Spring
200377	Saw Frame 1216 Order 700086 Assm.	300408	Feed Timing Case. Lock Nut
200425	Overhead Clamp Nut	300409	Vise Jaw Button

PARTS LIST Continued

<u>Part No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Description</u>
200652	Saw Frame 2121 Order 700084 Assm.	300411	Yielding Feed Valve Body Order 700035 Am.
201037	Coolant Pump Bracket	300414	Cap for Yielding. Feed Valve
201076	Motor Plate	300416	Pivot Shaft for Motor Plate
210014	Motor Pulley	300417	Filler Plug for Gear Case
210015	Poly V belt Pulley Order 770046 Assm	300419	Stud for Yielding Feed Valve
210025	Retainer Seal	300420	Bushing Feed Screw
210032	Junction Block	300424	Control Lever Stop Pin
300425	Dowel Pin	400138	Splash Plate for Pan
300426	Feed Timing Ring Guide Stud	400139	Pelt for Saw Frame
300428	Bracing Stud for Guard	400140	Seal for Control Valve Piston
300429	Relief Valve Seat Stem	400141	Feed Piston Fibre
300430	Nut for Relief Valve Stem	400143	Bushing
300431	Blade Holder Stud	400144	Feed Timing Case Cover End Plate
300436	K.O. Adj. Nut	400145	Control Valve Piston Return Spring (large)
300437	Half Round Plug	400146	K.O. Lever Spring
300441	Washer	400147	Control Lever Friction Spring
300449	Bracing Bolt	400148	Neutral Extension Spring
300451	Sliding Block L.H.	400150	Clutch Spring
300452	Sliding Block R.H.	400151	Shifter Fork Ball Spring
300454	Plate for Sliding Block	400152	Control Valve Relief Valve Spring
300457	Pin for Shifter Arm Order 700079 Assm.	400153	Spring for Valve
300458	Vise Nut Tightening Handle	400154	Bushing for Main Drive Shaft
300459	3/8" x 57" Tube - Control Valve to Clutch	400155	Bushing for Timing Link
300461	5/8" x 9" Tube - Control Valve to Drain	400156	Piston Ring
300462	5/8" x 15-1/2" Tube - Lift Cyl. to Valve	400157	Yielding Valve Spring
300468	1/4" x 6" Tube - Yielding Feed to Control Valve	400158	Bushing for Lift Roller Support Arm
300469	3/8" 13" Tube - Coolant Pipe to Drain	400162	Shut off for Hose
300470	3/8" x 21" Tube - Coolant Pump to Drain	400163	Shut Off for Yielding Feed
300477	Removable Key	400164	Gasket for K.O. Spring Container
300480	Dowel Pin	400165	Gasket for Safety Valve Cap
300482	Rear Swivel Jaw Plate	400166	Gasket for Relief Valve Cap
300486	Slide Bar	400167	Connecting Rod Shims
300488	Block for Slide Bar	400168	Connecting Rod Shims
300489	Clamp Screw	400169	Coolant Hose
300491	Stud for Overhead Clamp	400171	Pump, Tuthill Order 793042 before M3148 Order 793104 after M3147
300496	Clamp Screw Washer	400172	Bearing
300499	Lower Slide Washer	400173	Seal for Pulley
300500	Stud	400174	Twin Disc Clutch
300507	Handle for Dowel Pin	400175	Oil Cup for Saw Guide
300589	Clamp Nut Plate	400180	Bushing for Timing Bracket
300956	Blade Pin	400183	Felt Oil Retainers 3/8" x 1/4"
302462	1" Ell	400184	Bearing
302463	Seal Washer for Cam	400186	Chip Pan
302467	Timing Case Drain Pipe	400189	Oiling Instructing Plate
302468	Stud for Control Lever Rod End	400190	Roller Bearing
302469	Length Gauge Support Bar	400191	Gasket for Pump
302472	Length Gauge Adz. Bar	400193	Gasket for Lift Cylinder
302473	Fee Dial Stop Stud	400194	Gasket for Timing Case Cover
302474	Coolant Pump Belt	400195	Gasket for K.O. Cylinder
302475	Clutch Key	400196	Gasket for End Plate
302477	Feed Ring Guide Screw	400198	Apron for Cylinder
302480	Lubricating Pin	400200	Gasket for Timing Case Cover Screw
302482	Coolant Drain Pipe -1" x 52-1/2"	400201	Packings
302484	Coolant Drain Pipe 1" x 10"	400203	Upper Slide Washer
302485	Drain Pipe	400274	Wrench
302493	Stud for Guard	400455	Washer
302501	Piston Fibre Pin	400501	Rubber Washer
302994	Door	400502	Washer
303017	Feed Coil Order 700484	400514	Brown & Sharpe Pump
303069	Pinion Gear	400541	Washer for Pan
304697	Bushing	400687	1/4" x 1-1/4" Hex Hd. Cap Screw
380001	Bushing for K.O. Spring Container	400692	Screw
380108	Base	400696	5/16" x 3/4" Hex Hd. Cap Screw
380131	Tube - From Pump to Control Valve	400697	5/16" x 2-1/4" Hex Hd. Cap Screw
380132	Tube - Pressure Line to Top Cylinder	400705	5/16" x 1/2" Hex Hd. Cap Screw
380133	Tube - Pressure Line to Bottom Cylinder	400706	5/16" x 1" Hex Hd Cap Screw
380183	Pivot Shaft	400713	3/8" x 1-1/4" Hex Hd. Cap Screw
380313	Door for Base	400716	3/8" x 2" Hex Hd Cap Screw
380799	Hose	400717	3/8" x 1" Hex Hd Cap Screw
380804	Tube - 1/2" OD x 14" - Steel	400729	3/8" x 2-1/4" Hex Hd. Cap Screw
381061	Key	400731	3/8" x 4-1/2" Hex Hd. Cap Screw
381108	Connecting Rod Pin Automatic Oiler	400737	7/16" x 1" Hex Hd. Cop Screw
381308	Hand Wheel for Door	400739	7/16" x 1-1/4" Hex Hd. Cap Screw
381440	K.O. Lever Button	400744	1/2" x 1-1/2" Hex Hd. Cap Screw
382002	Bracket - 1415	400745	1/2" x 2" Hex Hd. Cap Screw
382007	Spacer for Chip Plate 1415	400747	1/2" x 1-1/4" Hex Hd. Cap Screw
400005	Coolant Pump	400749	1/2" x 2-1/4" Hex Hd Cap Screw
400055	Splash Plate for Pan	400751	1/2" x 1" Hex Hd Cap Screw
400063	Caution Plate	400752	1/2" x 2-1/2" Hex Hd. Cap Screw
400065	Saw Frame Bushing	400760	5/8" x 1-3/4" Hex Hd Cap Screw
400073	Bushing		

PARTS LIST Continued

<u>Part No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Description</u>
400078	Thrust Bearing	400762	5/8" x 2-1/2" Hex Hd. Cap Screw
400085	Oiler	400798	5/16" x 3/4" Hollow Hd. Cap Screw
400087	Snap Ring	400800	5/16" x 7/8" Hollow Hd. Cap Screw
400125	Stationary Cluster Gear	400808	3/8" x 1" S Hd. Cap Screw
400126	Cluster Gear	400820	7/16" x 1-1/4" Allen Hd. Cap Screw
400129	Drip Pan	400826	1/2" x 1" Hollow Hd. Cap Screw
400132	Oil Gauge	400828	1/2" x 1-3/4" Allen Hd. Cap Screw
400133	Bushing for Main Shaft Order 790003 Assm.	400835	5/8" x 3-1/4" Socket Hd Cap Screw
400134	Bushing for Inner Crank Order 790004 Assm.	400858	1/4" x 5/16" Hollow Hd. SetScrew N.F.
400136	Strainer - Use 453380	400861	5/16" x 5/16" S. Hd SetScrew
400137	Vise Bolt Washer	400862	5/16" x 3/8" Hollow SetScrew
400864	5/16" x 1/2" S. Hd. SetScrew	401543	Control Valve Piston Return Spring (small) - Order 453918
400868	5/16" x 3/4" Dog. Pt. SetScrew (hollow)	401594	1/2" Pie Nut
400870	1/2" x 1/2" Hollow Hd. Cup Pt. SetScrew	401598	10/24" x 1/2" Rd. d. Machine Screw
400880	3/8" x 1/2" S. Hd. SetScrew	401606	1/4" x 3/8" Rd. Hd. Machine Screw
400897	3/32" x 3/4" Cotter Pin	401608	1/4" x 3/4" Rd. Hd. Machine Screw
400900	1/8" x 1" Cotter Key	401612	3/32" x 3/8" Rd. Hd. Machine Screw
400901	Cotter Pin for Cylinder Pin	401619	Washer
400908	Lockwasher 5/16"	401620	5/16" Washer
400909	1/2" Lockwasher	401622	1/2" Flat Washer
400910	5/8" Lockwasher	401623	5/8" Wrought Washer
400912	7/16" Lockwasher	401641	1/2" x 2-1/4" N.C. Stud
400922	1/8" Allen Hd. Pipe Plug	401642	1/2" x 2-1/2" USS Stud
400925	1/16" Allen Hd. Pipe Plug	401710	Roll Pin
400927	1/4" Pipe Plug	401722	3/16" x 1-1/4" Roll Pin
400931	1/2" Pipe Plug	401723	1/4" x 3/4" Roll Pin
400934	1" Plug	401725	1/4" x 1" Roll Pin
400936	3/4" Pipe Plug	401728	1/4" x 1-1/2" Roll Pin
401002	10/32" x 3/4" Fill. Hd. Machine Screw	401729	1/4" x 2" Roll Pin
401010	5/16" SAE Jam Nut	401730	1/4" x 2-1/2" Roll Pin
401011	3/8" SAE Jam Nut	400828	1/2" x 1-3/4" Allen Hd. Cap Screw
401012	7/16" SAE Jam Nut	401867	Rear Jaw Key (short)
401013	1/2" SAE Jam Nut	401883	5/8" x 2-3/4" Allen Hd. Cap Screw
401015	5/8" SAE Jam Nut	401951	Gasket between Gear Case
401016	3/4" SAE Jam Nut	401952	Gasket for Gear Case Cover (large)
401017	7/8" SAE Jam Nut	401953	Gasket for Gear Case Cover (small)
401020	1-1/2" RF NF Jam Nut	401954	Gasket for Cam Seal
401023	5/16" USS Jam Nut	401955	Aux. Drip Pan
401025	7/16" USS Jam Nut	401959	Pump Roller Chain
401026	1/2" USS Jam Nut	401967	Gasket
401027	5/8" USS Jam Nut	401973	Gasket for Speed Indicating Plate
401030	1" USS Jam Nut	401977	Coolant Intake Pipe
401034	3/8" SAE Full Nut	401984	Spring
401042	8/32" Nut	401987	1/8 Zerk Fin
401044	1/4" USS Full Nut	401989	Gasket for Oil Plate
401045	5/16" NC Full Nut	401991	Shim for Gib Plate 1212 - 1216 - 1415
401048	1/2" USS Full Nut	401992	Shim for Gib Plate 1010
401049	5/8" USS Full Nut	401993	Gasket for Gear Case Bearing Cop (short)
401052	1" USS Nut	401994	Gasket for Gear Case Bearing Cop (long)
401056	3/4" NC Full Nut	402366	Gasket for Timing Case Spring Plug
401067	3/8" Steel Ball	402370	Nipple 1/2" 6-1/2" - 1415
401068	7/16" Steel Ball	402374	8/32" Flat Hd. Machine Screw
401118	#9 Woodruff Key	402823	Reducer
401124	#E Woodruff Key	402894	5/16" x 2-1/8" NC Hex Hd. Cap Screw
401126	#15 Woodruff Key	402924	Pump Pulley
401133	1/4" P -3/8" T45 Ell	402987	3/8" NC Acorn Nut
401137	1/4" MP to 3/8" OD Tube Adaptor (brass)	403024	1/2" x 4-1/2" Allen Cap Screw
401139	1/8" MP to 1" To Adaptor	403183	Washer
401142	1/2" MP to 5/8" Tubing Adaptor	403237	1/2" x 2" Roll Pin
401144	1/2" FP to 5/8" T Straight Adaptor	403529	Seal, G.T.
401151	1/8" MP -1/4" T 90° Ell (Steel)	403945	12" Hose
401152	90° Ell (507-4 or 309) 1/8" MP to 1/4" OD T	403962	90° Union
401153	1/4" MP K 3/8" Tube 90° Ell	404037	1/2" N.F. Elastic Stop Nut
401154	1/2" FP to 5/8" T 90° Ell	404414	Clamp
401156	1/2" MP to 5/8" T 90° Ell	404725	Locking Screw
401159	3/8" Tube to 3/8" Tube to 1/4" FP Tee	404832	1/2" x 7-1/2" x 1/Nipple
401161	1/2" FP to 5/8" to 5/8" T	434892	3/8" x 1/4" x 1/4" Tee.
401163	lee (1875-46 or 44-6-L-30)	404895	1/2" x 3" N.F. Cop Screw
401174	3/4" x 3/8" Reducer	405628	1/2" x 3-1/2" Nipple
401188	1" Tee	406284	Nipple
401192	1/4" x 1/4" x 3/8" Tee	450003	Name Plate
401212	3/8" x 1-1/4" Flat Hd. Machine Screw	45004	Control Lever Indication Plate
401218	10/24" x 3/4" Flat Hd. Machine Screw	450152	Poly-V-Belt 72518
401219	1/4" x 1/2" Flat Hd. Machine Screw	450206	Cylinder Bott. Cap
401223	1/4" x 1-1/2" Flat Hd. Machine Screw	450207	Cylinder Pist. Ring
401224	5/16" x 1/2" Flat Hd. Machine Screw	450208	Cylinder Piston
401312	1/4" Street Ell	450209	Ring
401313	1/2" Street Ell	450210	Lock Washer
401314	Street Ell 3/4"	450211	Piston Rod Packing

PARTS LIST Continued

<u>Part No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Description</u>
401320	1/2" x 3/4" Elbow	450212	Piston Rod Wiper
401328	1/4" Pipe Coupling	450213	Cylinder Swivel Pin
401348	1/4" x 0 Coolant Pipe	450214	Ring
401357	3/8" Close Nipple	450215	Piston Lock Nut
401368	Coolant Pipe (3/8" K 17")	450216	Cylinder Lock Nut
401370	1/2" x 3/4" Elbow	450218	Packing Adaptor
401376	1/2" x 1-1/2" Nipple	450219	Cylinder Top Cap
401377	1/2" x 2" Nipple	450220	Packing Nut
401379	1/2" K 3" Nipple	450224	T.J. Cylinder - 1010 - 1212 - 1216
401380	1/2" x 3-1/2" Nipple	450245	Gasket
401385	1/2" x 6" Nipple	450334	Feed Timing Ring Spring
401401	1" Close Nipple	450350	Relief Valve - Order 793013
401429	1/2" x 1 1/2" Sq. Hd. Dog Pt. SetScrew	450398	Guard Back Plate
401440	5/16" x 1/2" Sq. Hd. SetScrew Cup Pt.	450399	Guard
401445	5/16" x 1" Sq. Hd. SetScrew	450559	Bushing
401455	1/2" x 1" sq. d. SetScrew	450572	Cylinder Body
401531	Neutral Compression Spring	450373	Piston Rod
450578	Nut	700282	End Flange Assembly
450582	Feed Chart	700283	End Flange Assembly
450801	Elbow	700306	Timing Carrier Bracket Assembly
450804	Bracket	700389	Saw Guide Assembly -1010 Machine
450806	Sprocket	700390	Saw Guide Assembly - 1212, 1216 Machines
450810	Nipple	700484	Food Coil - 1010 - 1212 - 1216
450811	Nipple	700492	Valve Control Lever
450813	Sprocket	700533	Table Assembly - 1415
450874	Bull Gear	700535	Saw Frame - 1415
450879	Pump Drive Sprocket (36T)	700536	Feed Coil Assembly - 1415
450916	G.T. Seal	770002	Main Pulley Drive Shaft Assembly
451639	Shim Front Blade Holder Plate	770003	Length Gauge Head Assembly
451852	Back Up Plate	770046	Poly-V-Belt Drive Assembly
453380	Strainer	770060	Idler Sprocket
453918	Control Valve Piston Return Spring (small)	770062	Pump Assembly - After M-3228
454285	T.J. Cylinder 1415	790001	Gear Case & Cap Assembly
454301	Hyd. Pump Chain 1415	790002	Shifter Fork Assembly
700006	Control Lever Assm. Complete	790003	Inner Bearing on Drive Shaft
700013	Feed Timing Case Assembly	790004	Crank Shaft Bearing
700015	Control Valve Assembly	790005	Spline Shaft & Flange
700025	Main Pump Assembly - Before M-3229	790007	Spline Shaft & Gear
700032	Length gage Assembly	793007	Swivel Jaw Carrier
700035	Yielding Feed Valve Assembly	793011	Feed Timing Case
700036	Feed Timing Case Cover Assembly	793013	Front Jaw
700056	Idler Sprocket Assembly	793015	Cam
700057	Lift Cylinder Assembly - 1010 - 1212 - 1216	793018	Relief Valve
700058	Lift Cylinder Assembly - 1415	793024	Rear Blade Holder
700062	Feed Knob Assembly	793026	Front Blade Holder - 1010
700065	Connecting Rod Assembly	793029	Front Blade Holder - 1216
700079	Shifter Arm Assembly	793030	Front Blade Holder - 1212
700080	Saw Frame -1010	793036	Connecting Rod
700084	Sow Frame Assembly - 1212	793038	Lift Roller & Bearing
70086	Saw Frame Assembly - 1216	793042	Tuthill Pump - Before M-3148
700091	Vise Nut & Screw Assembly	793098	Chuck Valve & Lever Assembly
700119	Roar Jaw Stud Assembly	793104	Tuthill Pump - After M-3147
700276	Vise Bolt Assembly - R.H. Rear Jaw		

**HYDRAULIC VISE PARTS
DRAWING 700514 AND 700003**

PARTS LIST Continued

<u>Part No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Description</u>
200236	Toggle	400187	Flexible Hose (1/2 x 1
200318	Cylinder Cap	400212	Flexible Hose 13/8 x 308)
200320	Bearing Bracket	400214	Valve Piston Ring
200321	Valve Control Lever Arm	400215	Large Gasket
200325	Cylinder	400216	Sill Gasket et
200433	Valve End Cap (large)	400483	Oil Cup
200434	Volvo End Cap (small)	400645	Knob for Valve Control Lever
210161	Piston for Chuck	400706	5/16 x 1" Hex Hd. Cap Screw
220014	Valve Body	400733	3/8 x 5/8" H Hex Hd. Cap Screw
265021	Chuck Body	400750	1/2 x 3/4" Hex Hd. Cop Screw
270011	Chuck Lover	400784	1/4 x 1/2" Hollow Hd. Cop Screw
290004	Chuck Sleeve	400807	3/8 x 2-1/2" Socket Hd. Cap Screw
290005	Volvo Control Lever	400853	1/4 x 1/2" Hollow Hd. SetScrew
300309	Plug for Piston Adj. Screw	400897	3/32" x 3/4 Cotter Pin
300319	Connecting Pin	400929	3/8" Pip Plug
300435	Piston Adj. Screw	401013	1/2" SAE Jam Nut
300438	Chuck Piston Button	401047	7/16" USS Nut
300439	Chuck Lover Pivot Pin	401117	#3 Woodruff Key
300440	Chuck Push Rod	401154	1/4" MP to 3/8" OD Tube 90e Ell
300445	Valve Control Lever Shaft	401157	3/8" MP to 1/2" Tube o90 Ell
300447	Toggle Hood	401309	3/8" 45e Ell
300448	Shoulder Screw	401357	3/8" Close Nipple
300474	5/8 OD x 20" lg. Steel Tubing	401372	3/8" 33-1/2" Pipe
300552	Valve Spool	401378	1/2" 2-1/2" Nipple
300553	Valve Stem	401517	p ring
301040	Washer	401547	Chuck Piston Return Spring
302443	Pull Rod	401608	1/4" x 3/4" RH Machine Screw
302464	Studs for Cylinder	401621	3/8" Wrought Washer
381131	Tube	401725	1/4" x 1" Roll Pin
381469	Spring Guide Stud	402454	1/8" x 1-1/2 Roll Pin
341741	5/8 x 14" Steel Tubing	402952	3/11 Pipe Strop
381742	1/2 OD x 10" Copper Tubing	403265	Gasket
400140	Oil Seal	453576	GT Seal
400149	Spring	700092	Chuck Volvo Lover
400178	u Sleeve Spring		

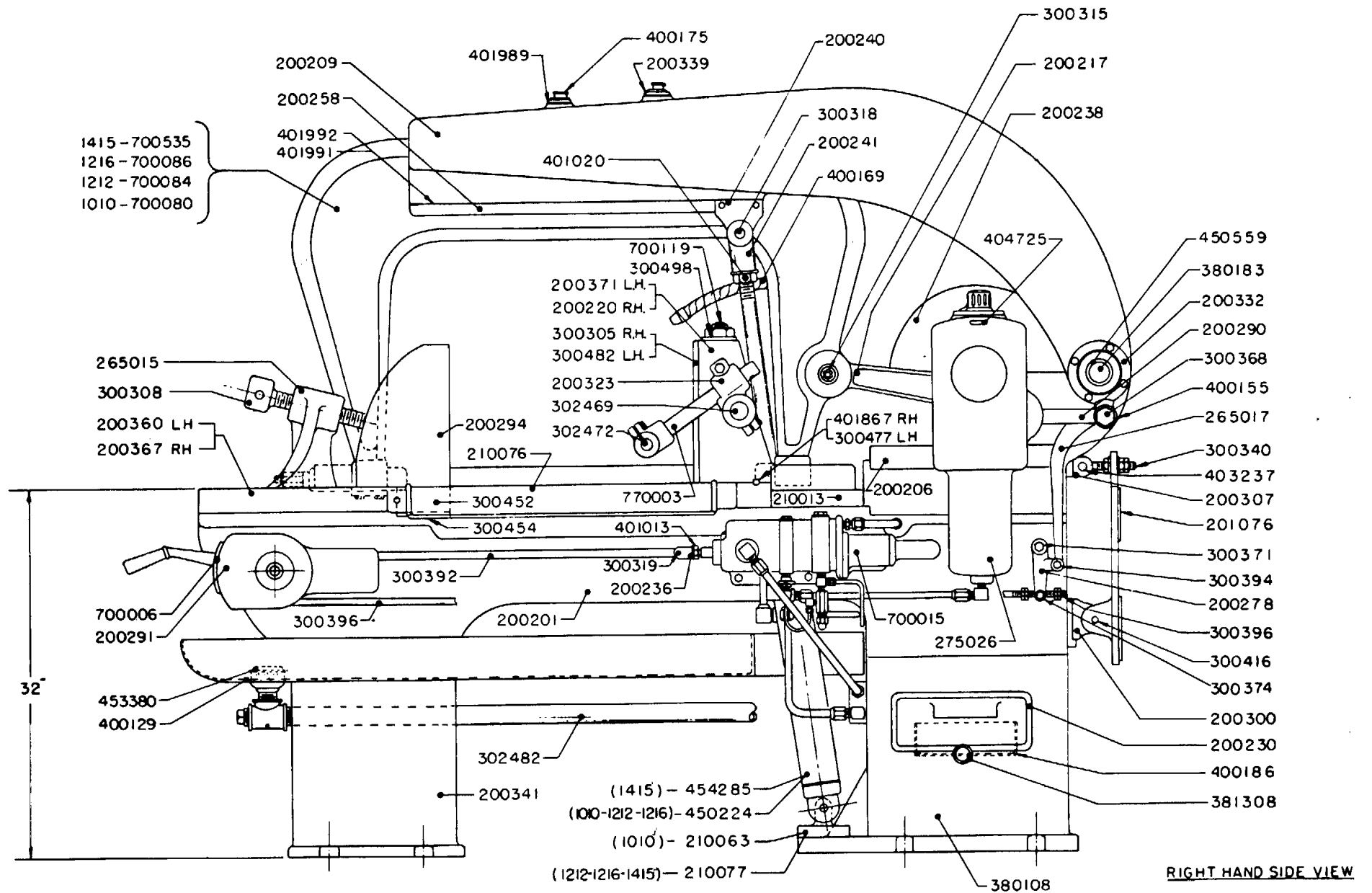


FIG. 1

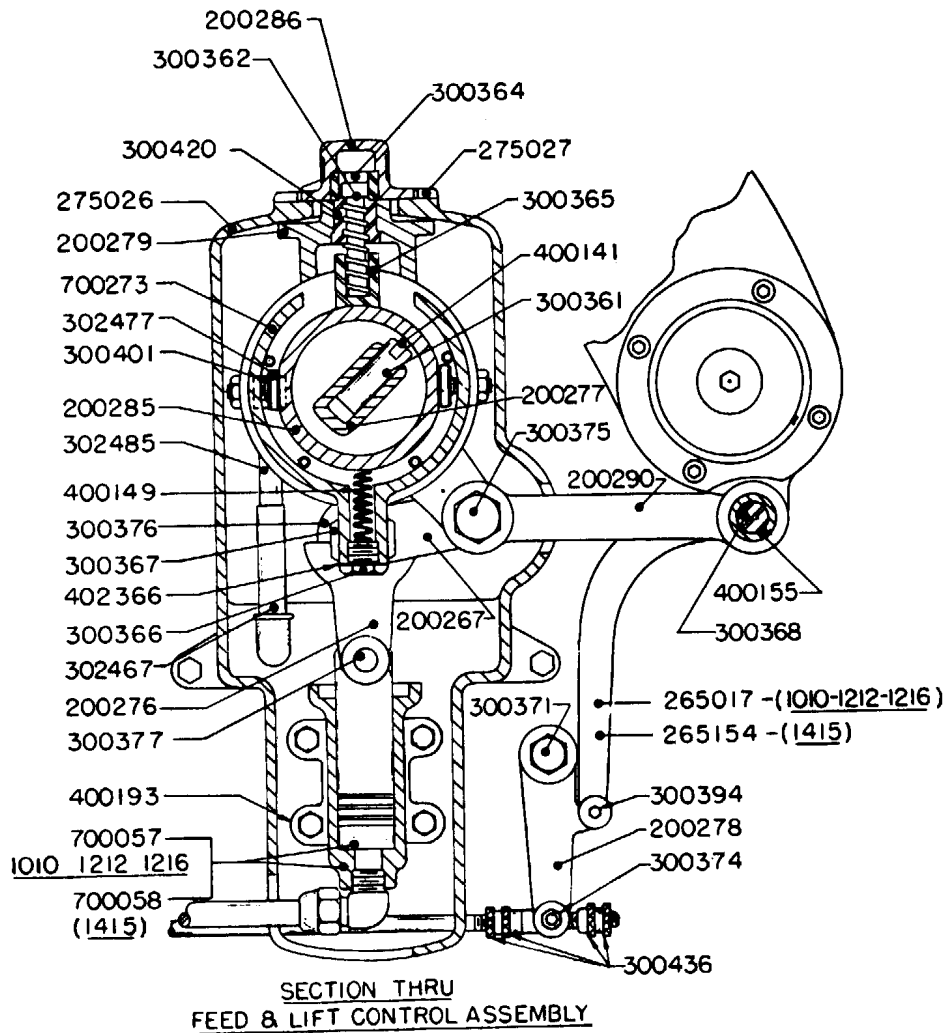


FIG. 3

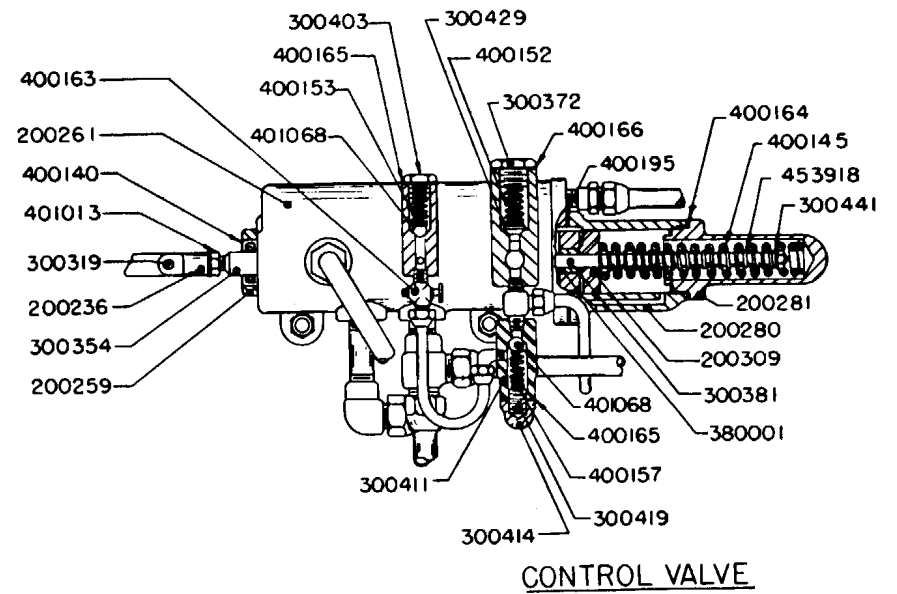


FIG. 4

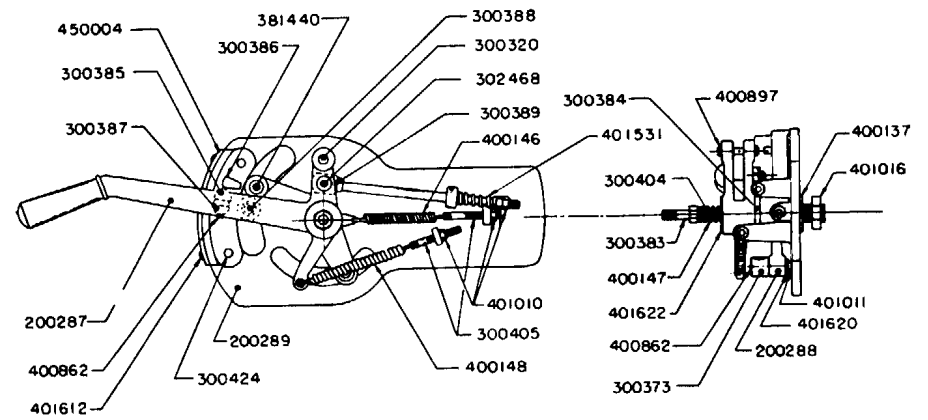
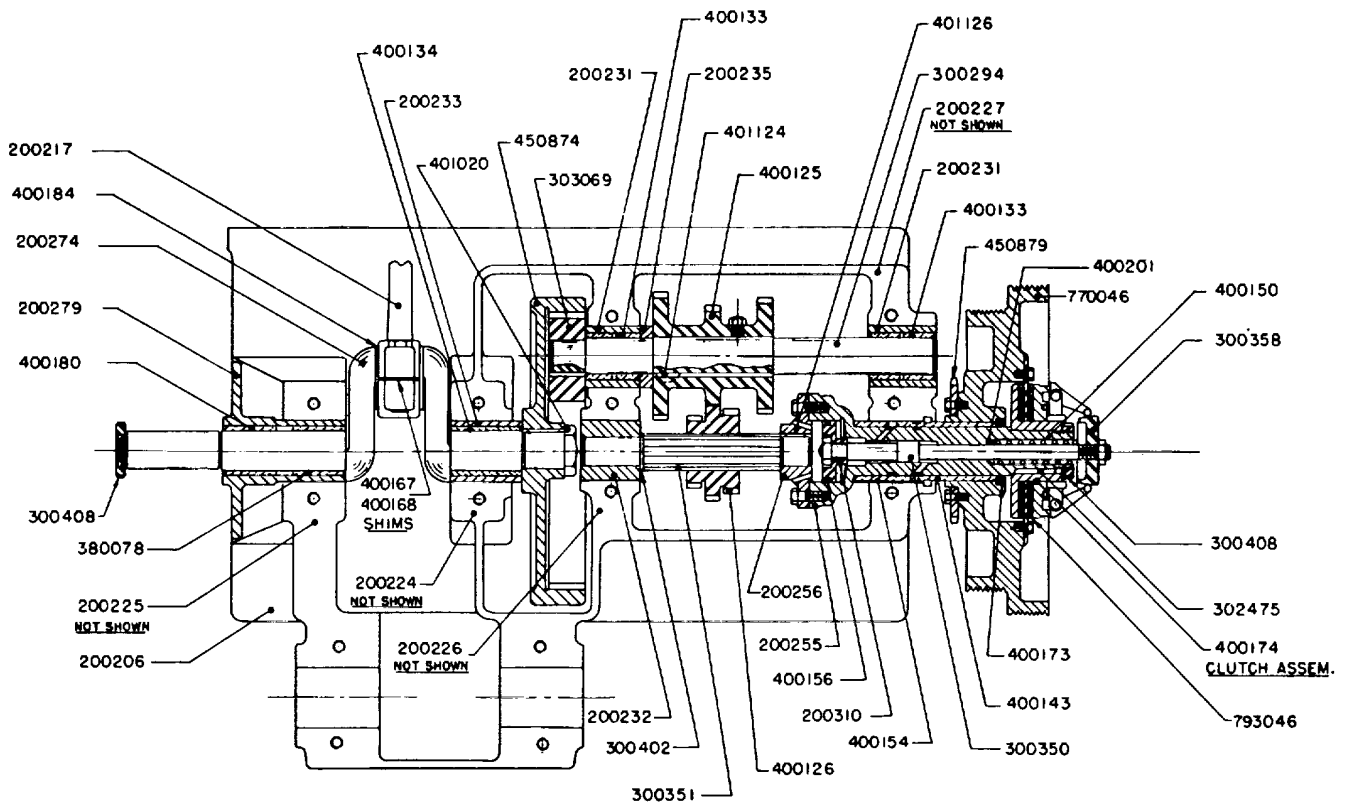
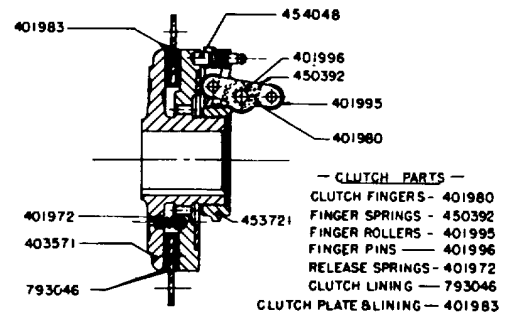


FIG. 5



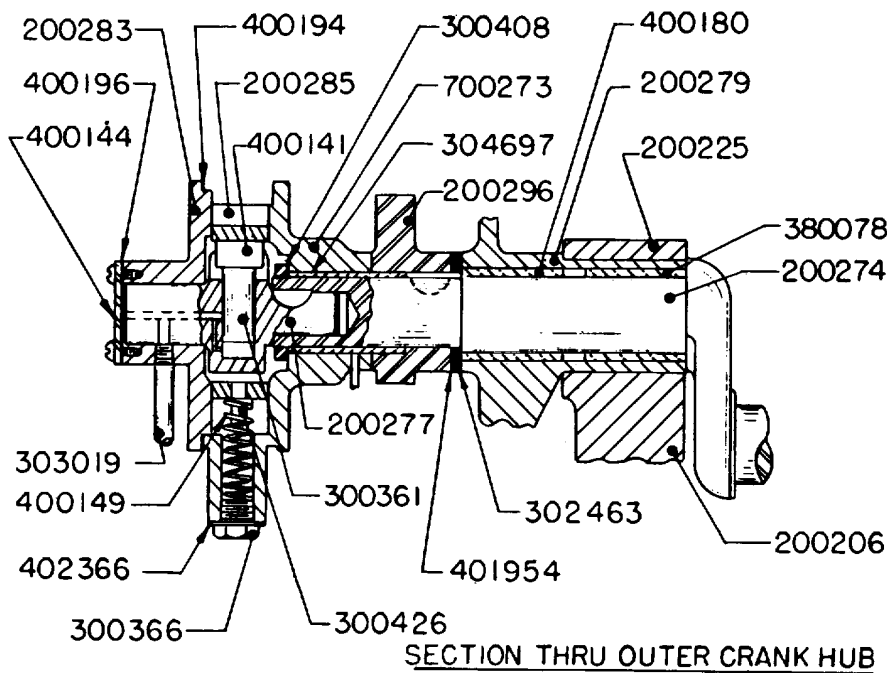
GEAR CASE & CLUTCH ASSEMBLY

FIG. 6



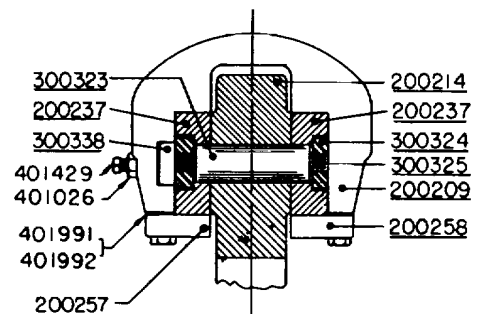
CLUTCH ASSEM.

FIG. 6A



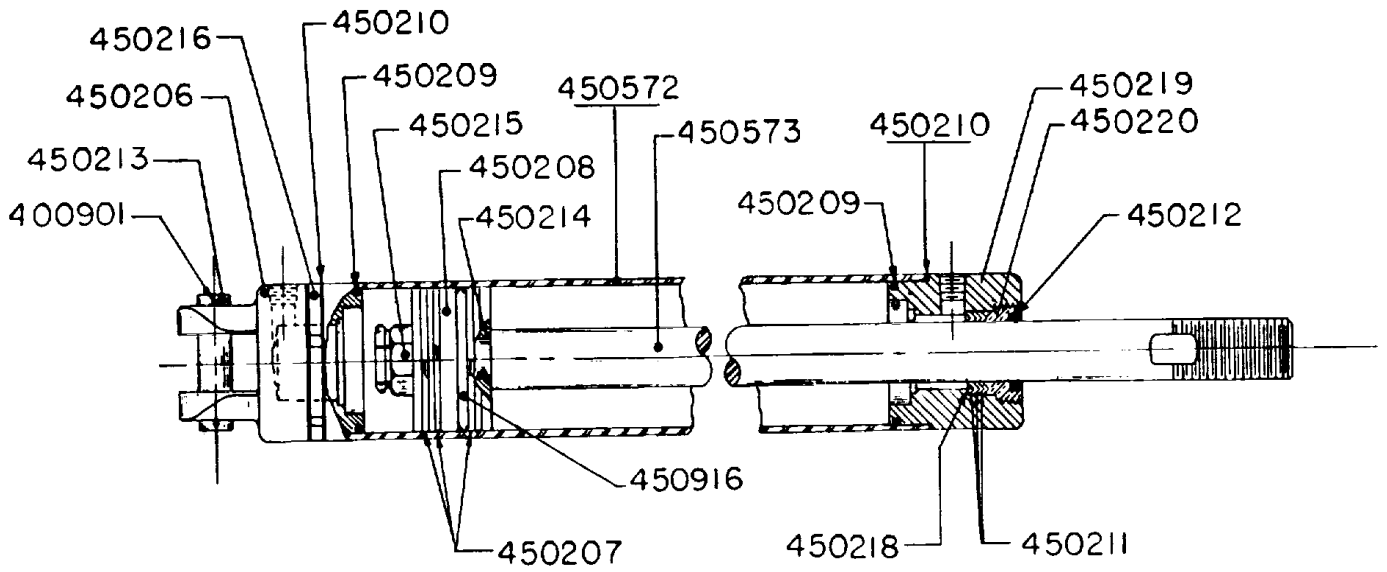
SECTION THRU OUTER CRANK HUB

FIG. 7



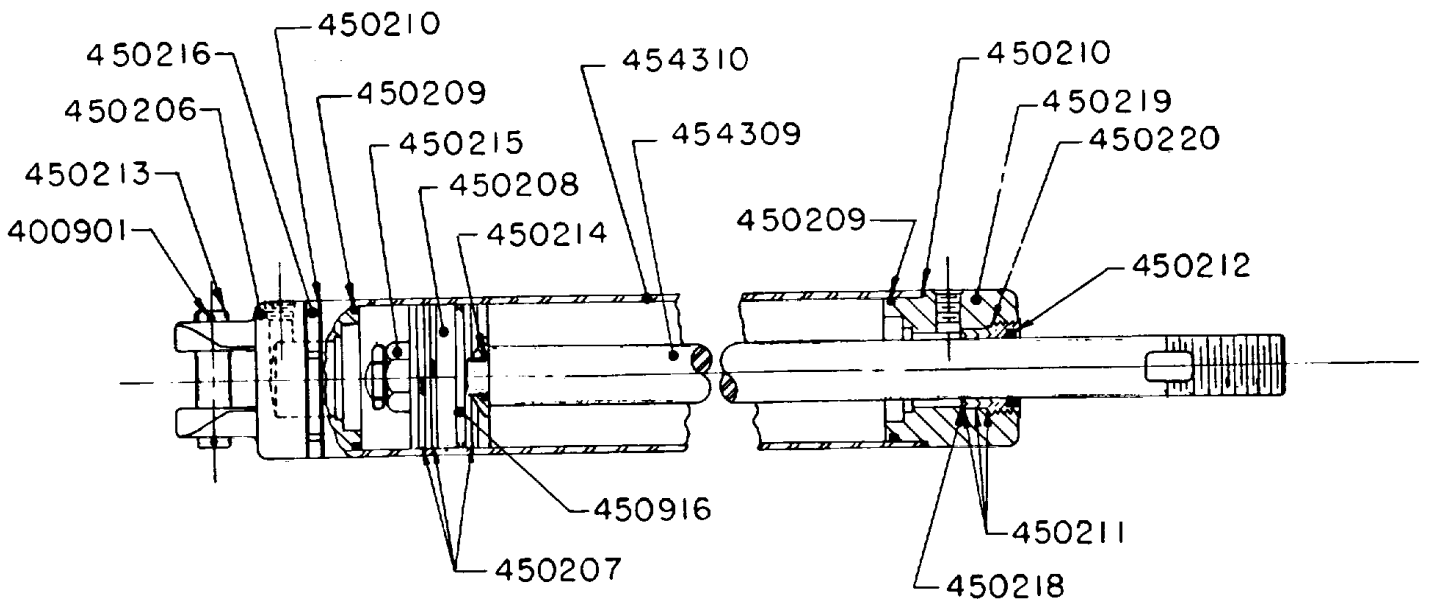
SECTION OF GIB ASSEMBLY

FIG. 8



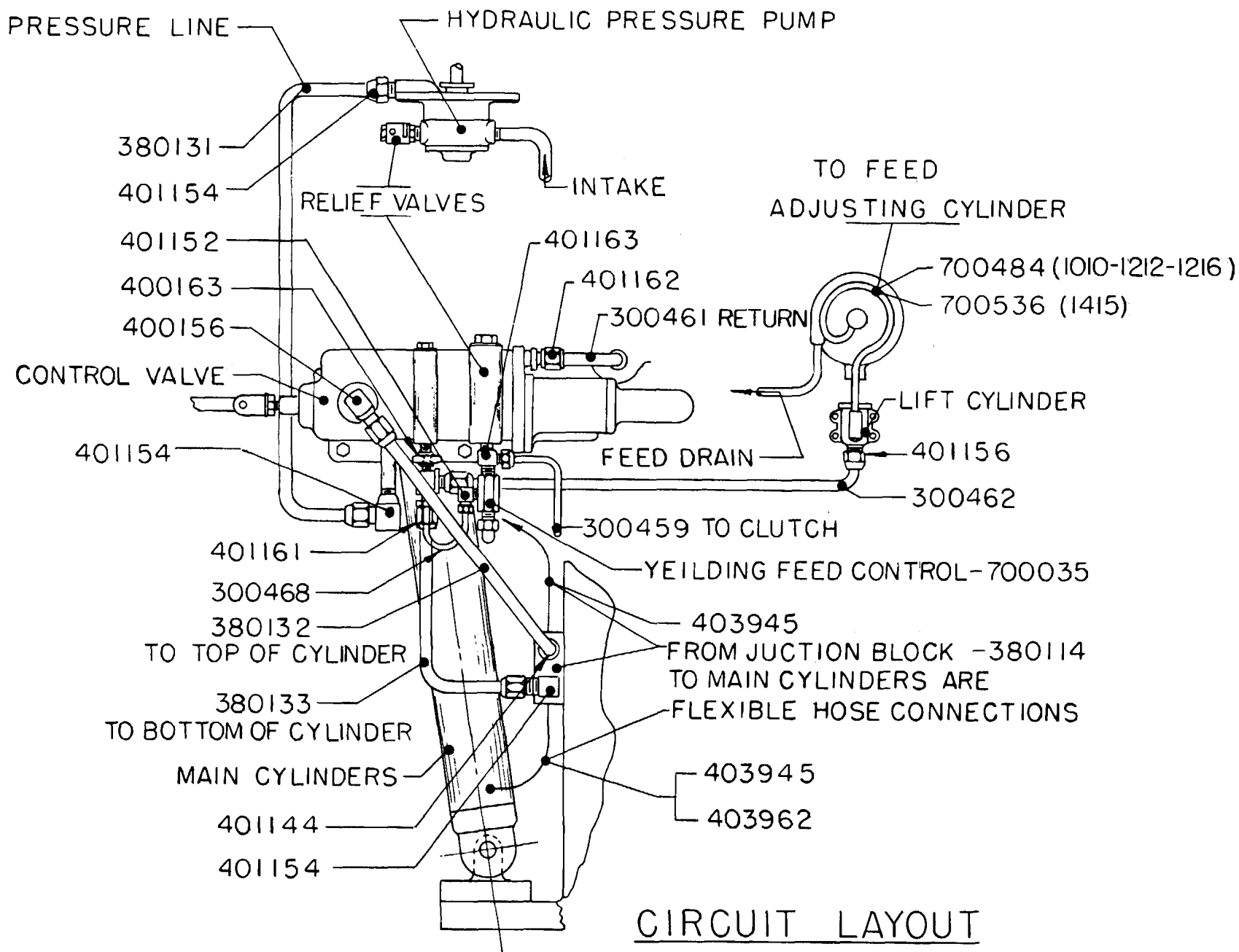
SECTION THRU
MAIN CYLINDER
1010-1212-1216

FIG. 9



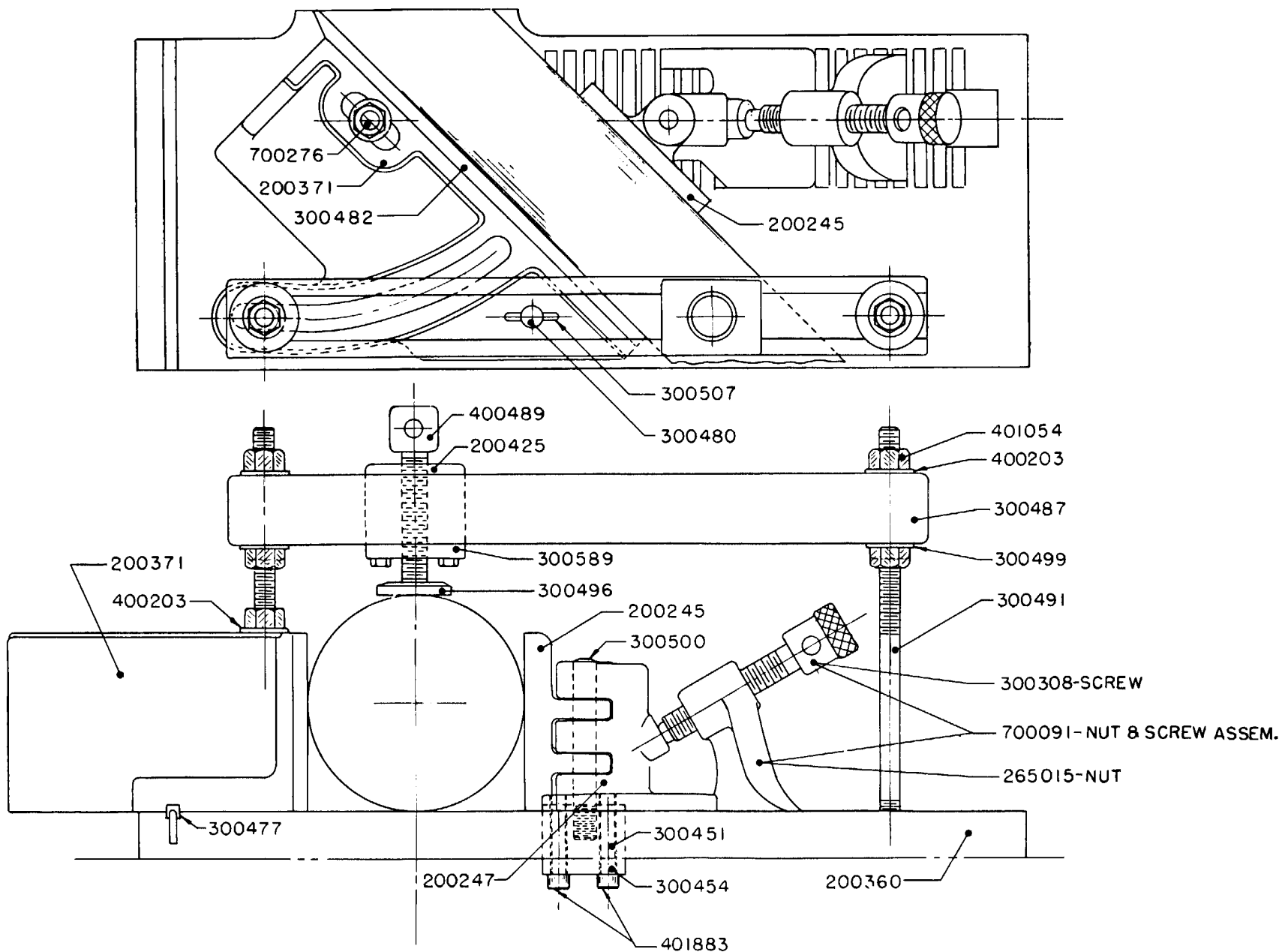
SECTION THRU
MAIN CYLINDER-1415

FIG. 10



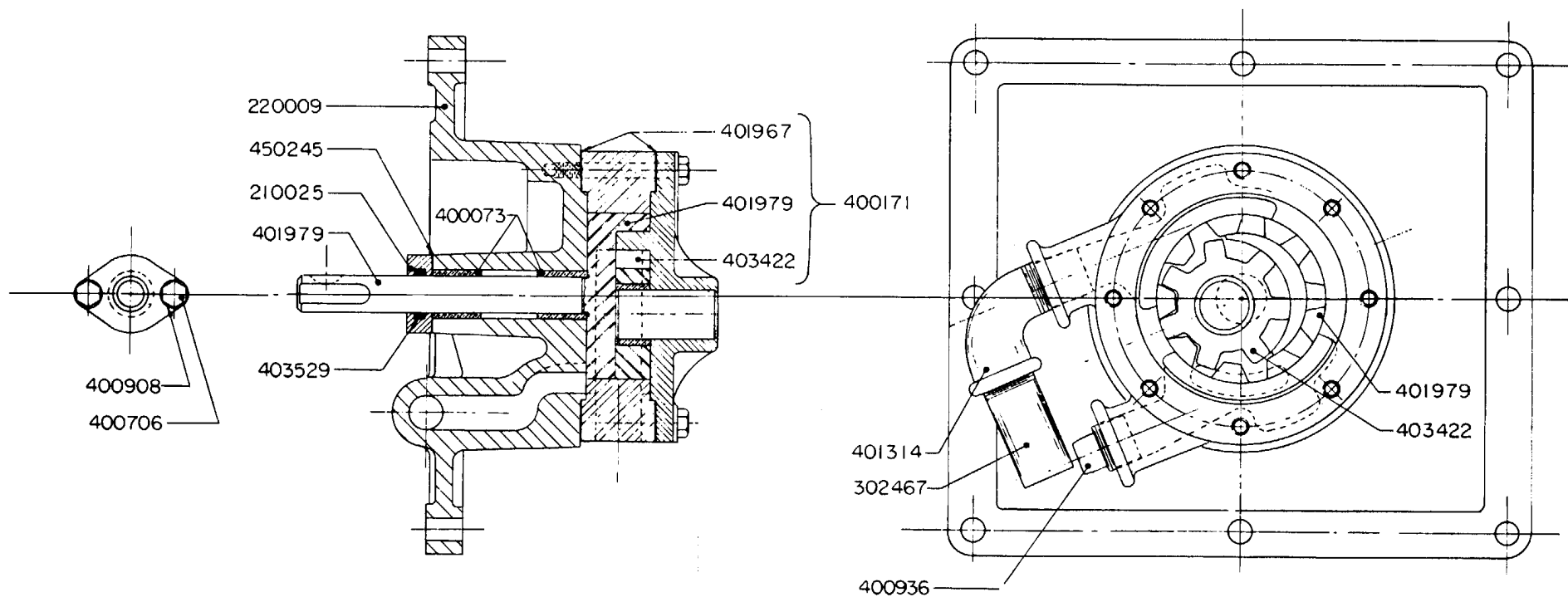
CIRCUIT LAYOUT

FIG. 10



SWIVEL VISE ARRANGEMENT WITH OVERHEAD CLAMP

FIG. 11



PUMP ASSEMBLY
FIG. 12

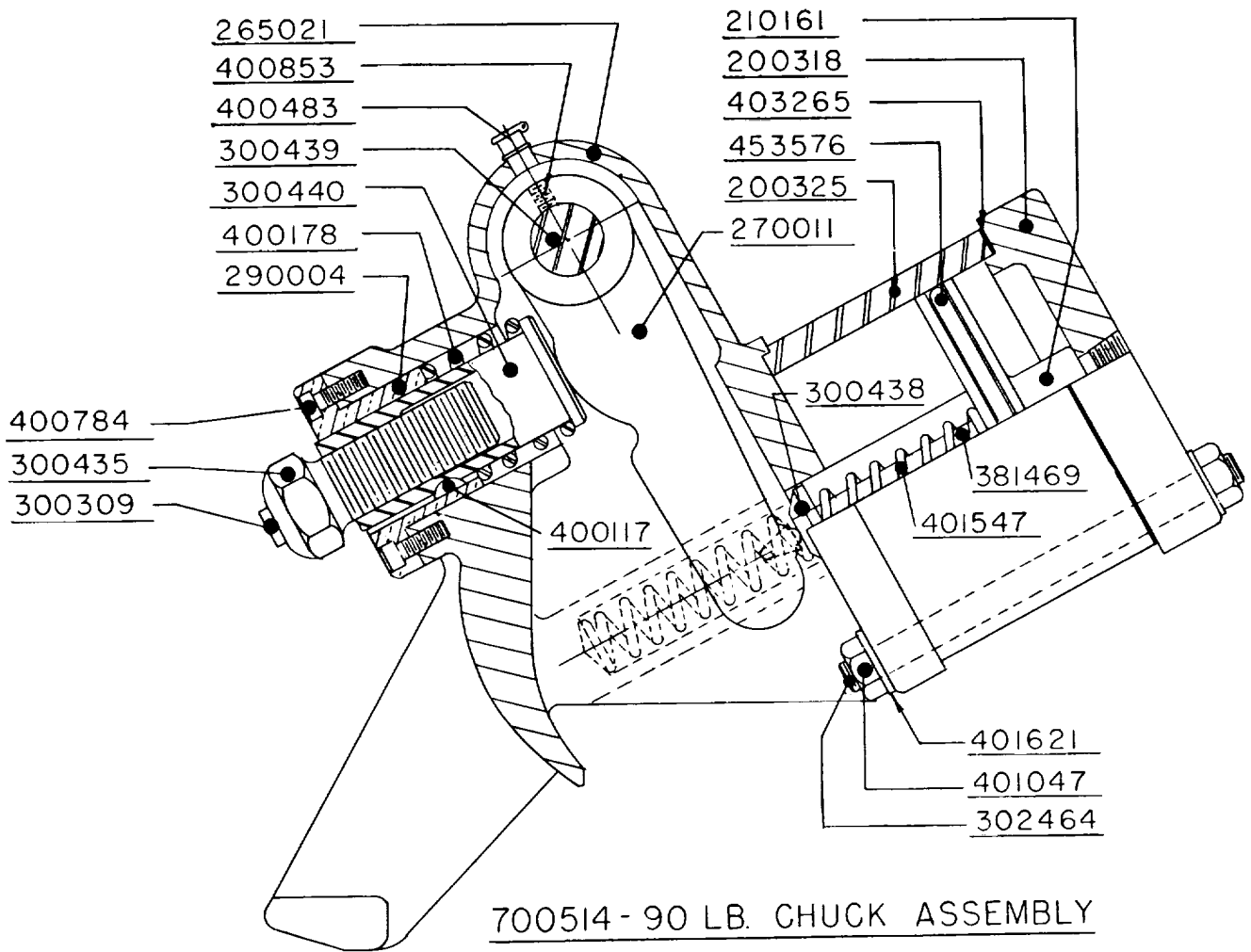


FIG. 13

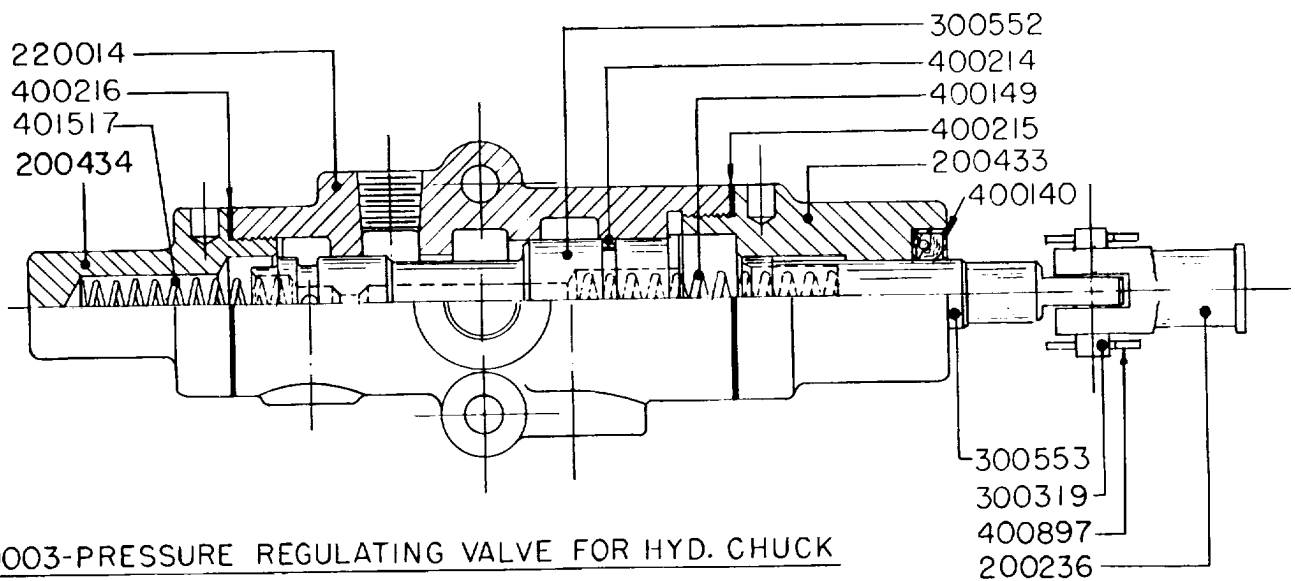
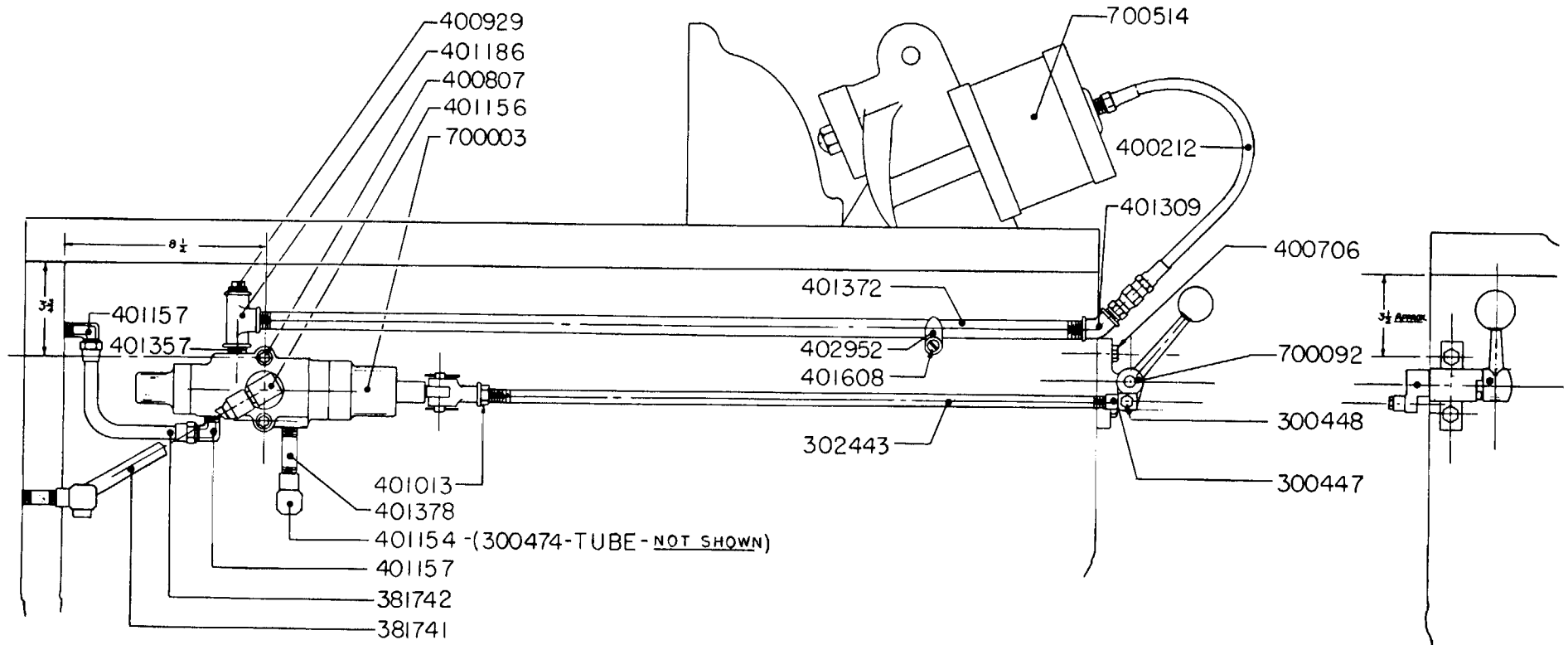


FIG. 14



90° CHUCK ARRANGEMENT
FIG. 15

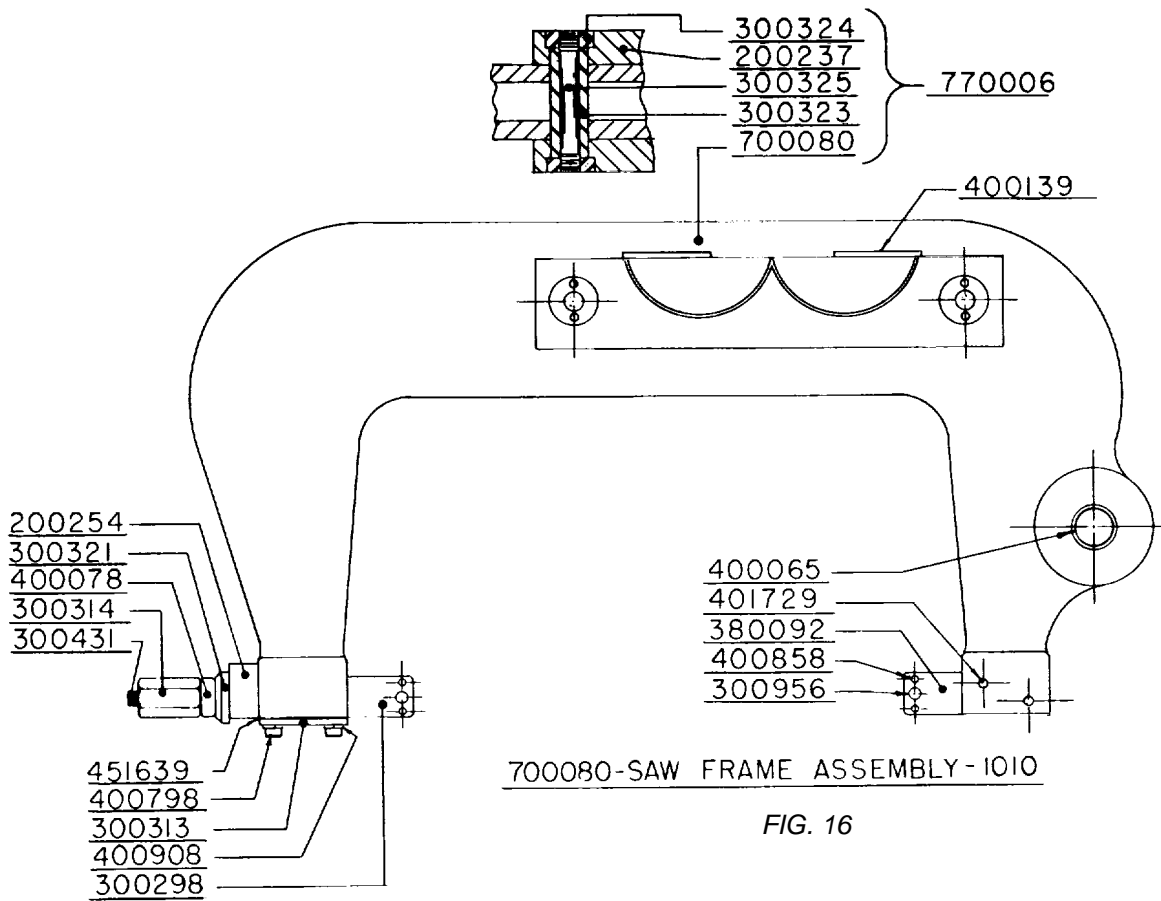


FIG. 16

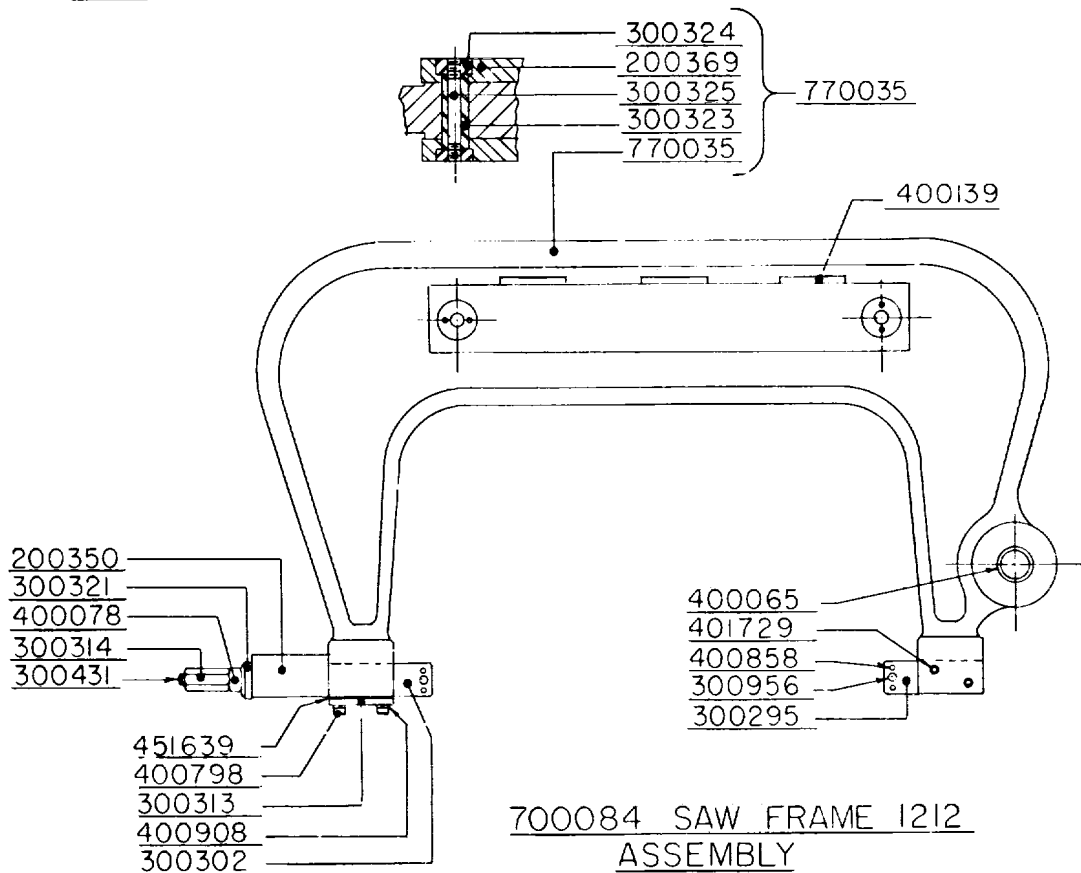


FIG. 16A

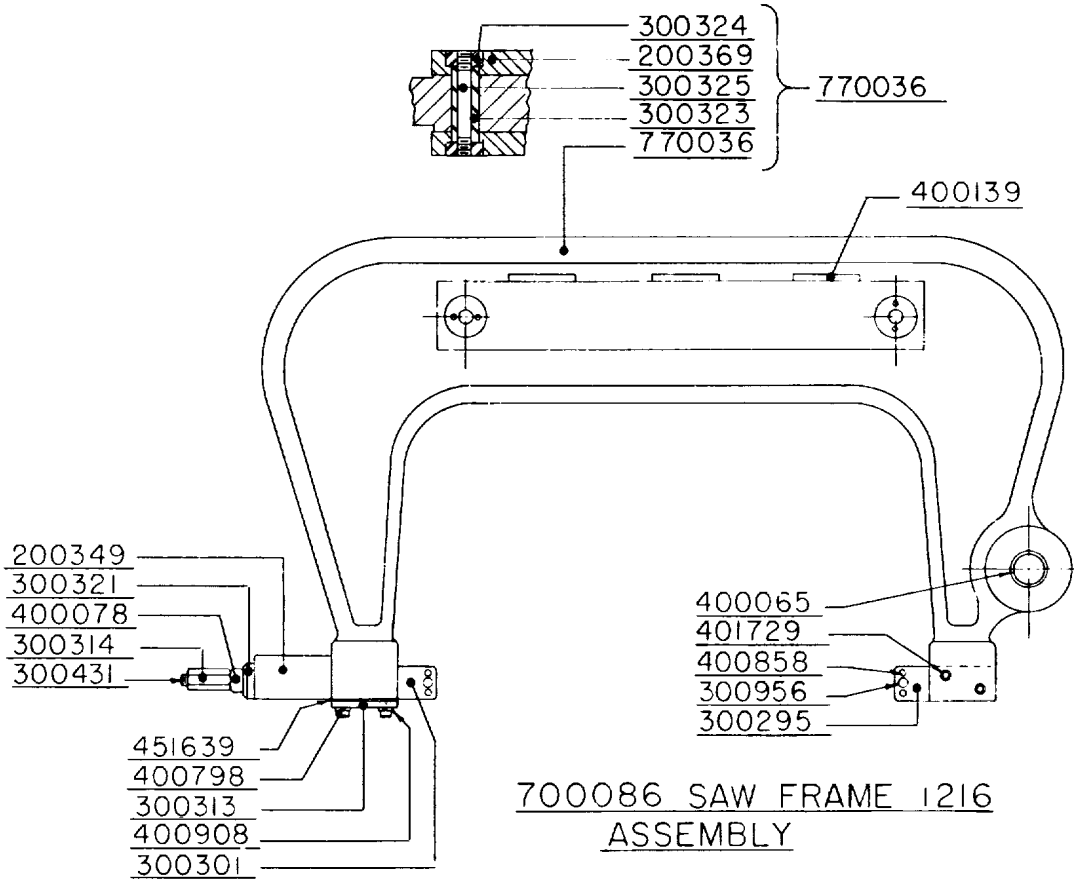


FIG. 16B

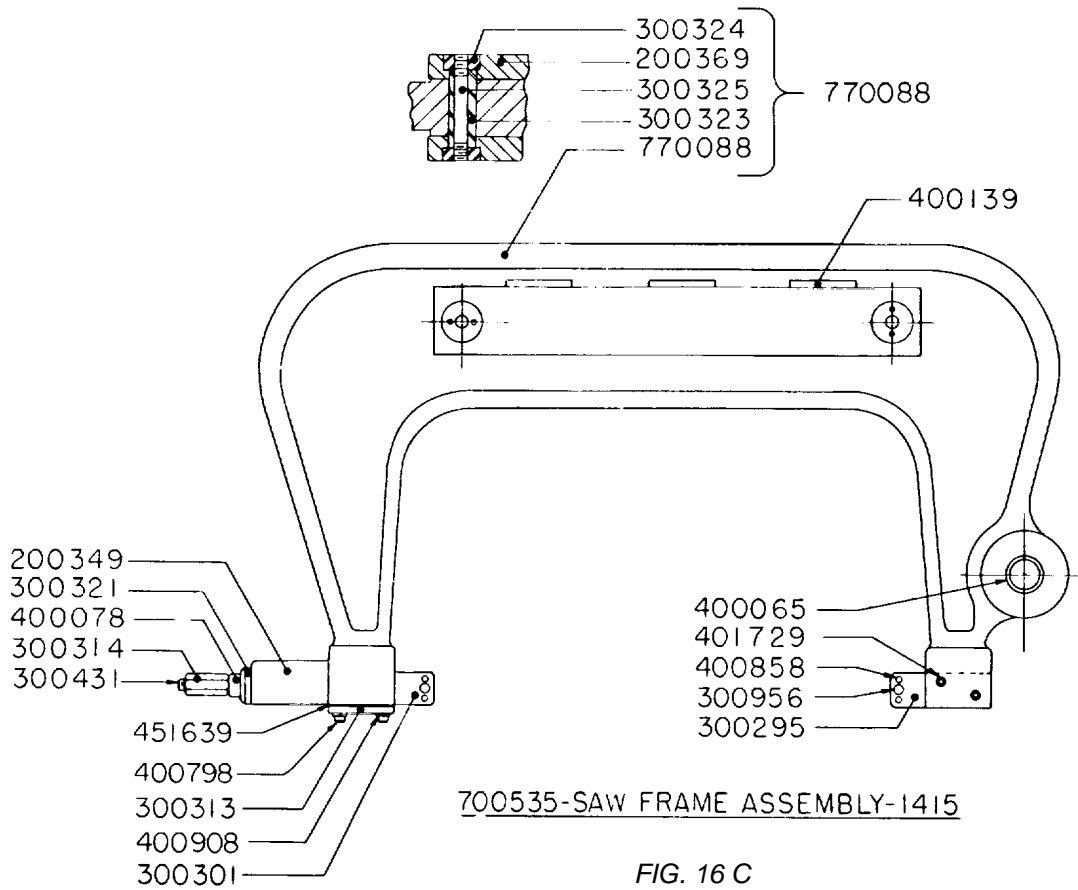


FIG. 16 C

By Order of the Secretary of the Army:

Official:

ROBERT M. JOYCE
Brigadier General, United States Army
The Adjutant General

E.C. MEYER
General, United States Army
Chief of Staff

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