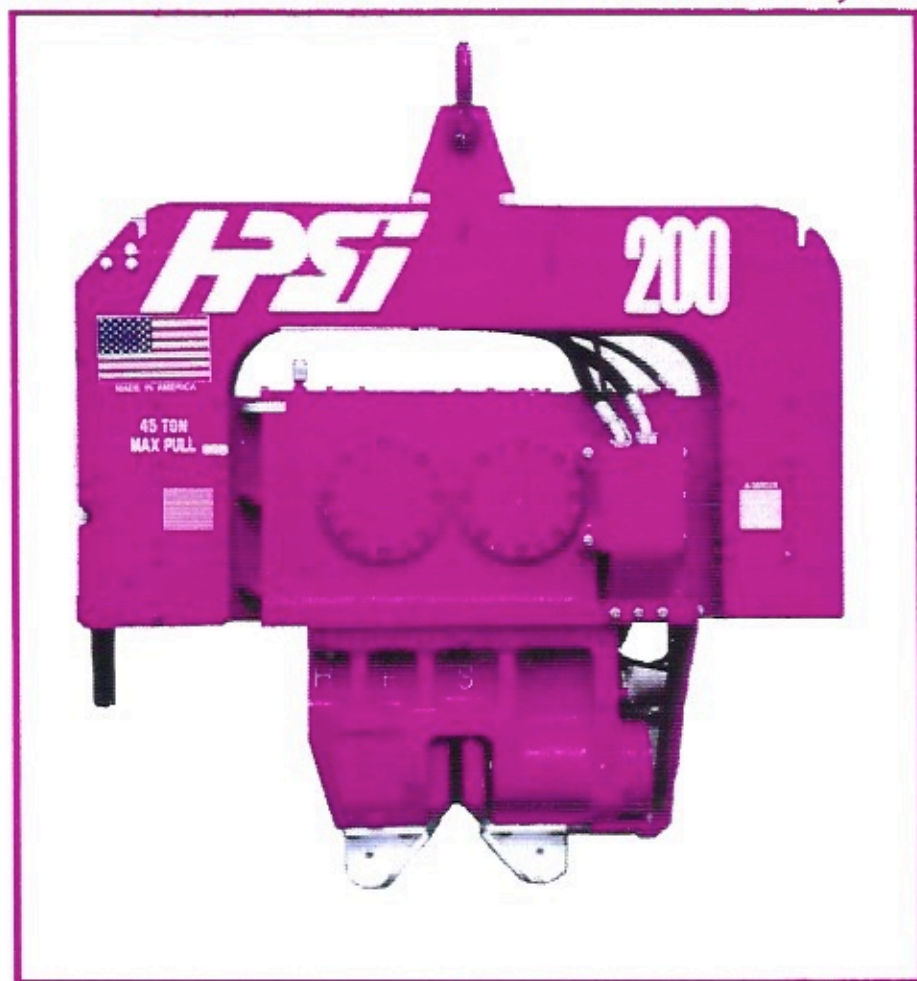




---

**HYDRAULIC POWER SYSTEMS, INC.**



**VIBRATORY PILE DRIVING EQUIPMENT**

**MODEL 200  
OPERATORS, MAINTENANCE  
AND PARTS MANUAL**



**TABLE OF CONTENTS**

SECTION	DESCRIPTION .....	PAGE
-	<b>TABLE OF CONTENTS .....</b>	<b>1-4</b>
<b>1.0</b>	<b>GENERAL INFORMATION .....</b>	<b>5</b>
1.1	<b>Warranty .....</b>	5
1.2	<b>Model 200 Vibratory Exciter with Power Unit .....</b>	6
1.2.1	Vibratory Exciter .....	7
1.2.2	Diesel Hydraulic Power Unit .....	7
1.2.3	Hydraulic Hose Bundle .....	7
1.2.4	Hydraulic Clamp Assembly .....	7
1.2.5	Remote Control Pendant .....	7
<b>2.0</b>	<b>SAFETY INFORMATION .....</b>	<b>8</b>
2.1	<b>Important Safety Information .....</b>	8
2.2	<b>Standard Safety Procedures .....</b>	9-10
<b>3.0</b>	<b>INTRODUCTION .....</b>	<b>11</b>
3.1	<b>Specifications .....</b>	11
3.2	<b>General Overview .....</b>	12
<b>4.0</b>	<b>MAINTENANCE .....</b>	<b>13</b>
4.1	<b>Daily Maintenance .....</b>	14
4.2	<b>General Maintenance .....</b>	15
4.2.1	Power Unit .....	16
4.2.2	Vibratory Exciter .....	16
4.3	<b>Maintenance Schedule .....</b>	17
4.4	<b>Torque Specifications .....</b>	18
4.5	<b>Fluids and Filters Specifications .....</b>	19
4.5.1	Lubricants .....	19
4.5.2	Fuels .....	19
4.5.3	Coolants .....	19
4.5.4	Filters .....	20



## TABLE OF CONTENTS

SECTION	DESCRIPTION .....	PAGE
<b>6.0</b>	<b>TROUBLE SHOOTING .....</b>	<b>44</b>
<b>6.1</b>	<b>Power Unit .....</b>	<b>44</b>
6.1.1	Engine Will Not Start .....	44-45
6.1.2	Throttle Will Not Operate .....	45
<b>6.2</b>	<b>Vibratory Exciter .....</b>	<b>45</b>
6.2.1	Remote Pendant Does Not Function Properly .....	45
6.2.2	Specific Functions of Remote Pendant Do Not Function .....	45-46
6.2.3	Hydraulic Clamp Will Not Close .....	46
6.2.4	Hydraulic Clamp Will Not Open .....	46-47
6.2.5	Hammer Will Not Vibrate .....	47
6.2.6	Hammer Runs At Slow Speed .....	48
6.2.7	Hammer Will Not Stop .....	48
6.2.8	Excessive Driving Time/Temperature .....	49
6.2.9	Driving Speed .....	49
	Notes .....	50
<b>7.0</b>	<b>DIAGRAM OF PARTS .....</b>	<b>51</b>
<b>7.1</b>	<b>Exciter Gear Case .....</b>	<b>52</b>
7.1.1	Bill Of Materials .....	52
7.1.2	Exploded View .....	53
<b>7.2</b>	<b>Vibration Suppressor .....</b>	<b>54</b>
7.2.1	Bill Of Materials .....	54
7.2.2	Exploded View .....	55
<b>7.3</b>	<b>Model 200 - 300 Universal Sheeting Clamp .....</b>	<b>56</b>
7.3.1	Bill Of Materials .....	56
7.3.2	Exploded View .....	57
<b>7.4</b>	<b>Model 200 - 100 Ton Caisson Clamp .....</b>	<b>58</b>
7.4.1	Bill Of Materials .....	58
7.4.2	Exploded View .....	59
<b>7.5</b>	<b>Model 200 Caisson Beam.....</b>	<b>60</b>
7.5.1	Bill Of Materials .....	60
7.5.2	Exploded View .....	61



## **SECTION 1- GENERAL INFORMATION**

### **1.1 Warranty**

**HYDRAULIC POWER SYSTEMS, INC.** hereby warrants that the is free from defects in material and workmanship attributable to **HYDRAULIC POWER SYSTEMS, INC.** under normal use and service for a period of ninety (90) days from date of delivery of such machine.

THE EXCLUSIVE REMEDY OF THE BUYER UNDER THIS WARRANTY is the repair or replacement, without charge, of any defective part or parts of this machine as long as buyer notifies **HYDRAULIC POWER SYSTEMS, INC.** by registered mail of such defect within seventy-five (75) days from the date of delivery of this machine.

Any part or parts claimed to be defective must be shipped to the **HYDRAULIC POWER SYSTEMS, INC.** factory at 1203 Ozark, North Kansas City, Missouri 64116, transportation prepaid. The **HYDRAULIC POWER SYSTEMS, INC.** acceptance of any part so shipped shall not be deemed an admission that the part is defective, and if **HYDRAULIC POWER SYSTEMS, INC.** finds that any part returned is not defective, such part shall be reshipped to the Buyer at Buyer's expense.

THE BUYER'S SOLE AND EXCLUSIVE REMEDY AGAINST **HYDRAULIC POWER SYSTEMS, INC.** UNDER THIS WARRANTY shall be for the REPAIR OR REPLACEMENT of defective parts as provided above. THE BUYER AGREES THAT NO OTHER REMEDY, INCLUDING, BUT NOT LIMITED TO, INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR LOST PROFITS, LOST SALES, INJURY TO PERSONS OR PROPERTY OR OTHER INCIDENTAL OR CONSEQUENTIAL LOSS SHALL BE AVAILABLE TO THE BUYER.

THE SOLE PURPOSE OF THE STIPULATED EXCLUSIVE REMEDY shall be to provide the Buyer with free repair or replacement of defective parts in the manner provided herein. This EXCLUSIVE REMEDY shall not be deemed to fail of its essential purpose so long as **HYDRAULIC POWER SYSTEMS, INC.** is willing and able to repair or replace defective parts in the prescribed manner.

THE BUYER SHALL NOT BE REQUIRED TO DELIVER A DEFECTIVE PART TO **HYDRAULIC POWER SYSTEMS, INC.** IF:

- (1) The part was destroyed as a result of its defect in any part covered in the warranty,

AND

- (2) **HYDRAULIC POWER SYSTEMS, INC.** is reasonably satisfied that the part was defective at the time of sale.

If both of these conditions are met, **HYDRAULIC POWER SYSTEMS, INC.** shall replace the part in the same manner provided herein as if the Buyer had delivered it to **HYDRAULIC POWER SYSTEMS INC.** at its factory.

THIS WARRANTY SHALL NOT APPLY to any machinery which has suffered abuse, misuse, neglect or accident or to any machinery which has been altered so as to affect its ability or reliability, (except where such alteration has been accomplished with the prior written consent of **HYDRAULIC POWER SYSTEMS, INC.**) or which has been repaired in any way by the Buyer without the prior written consent of **HYDRAULIC POWER SYSTEMS, INC.** or which has been negligently installed by the Buyer.

WARNING: THIS PRODUCT IS NOT TO BE USED IN ANY FASHION DIFFERENT FROM THAT WHICH BUYER HAS ADVISED SELLER SHALL BE ITS INTENDED USE. NO WARRANTY CONVEYED HEREIN SHALL APPLY TO A USE OTHER THAN THAT WHICH BUYER HAS INDICATED TO SELLER AT THE TIME OF PURCHASE.

SELLER DOES NOT WARRANT PRODUCTS MANUFACTURED BY OTHER MANUFACTURERS WHICH MAY BE USED IN THE ASSEMBLY OF THE TOTAL PRODUCT SOLD BY SELLER. BUYER'S SOLE REMEDY AS TO PRODUCTS MANUFACTURED BY OTHERS SHALL BE PURSUED WITH SUCH OTHER COMPONENT PRODUCT MANUFACTURERS.

THE BUYER EXPRESSLY UNDERSTANDS THAT **HYDRAULIC POWER SYSTEMS, INC.** HAS MADE NO EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, IMPLIED OR EXPRESSED WARRANTIES FOR MERCHANTABILITY OR FITNESS, OTHER THAN THE EXPRESSED WARRANTY SET FORTH ABOVE. THE SELLER, HEREBY, DISCLAIMS ALL OTHER EXPRESSED WARRANTIES, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND ALL OTHER IMPLIED WARRANTIES.

Any oral statements made by any person about the machine described in the Agreement DO NOT CONSTITUTE WARRANTIES and are not part of this Agreement. The entire Agreement between the parties hereto is embodied in this writing. This writing constitutes the final expression of the parties' Agreement, and it is a COMPLETE AND EXCLUSIVE STATEMENT of the terms of that Agreement. All oral or written agreements between the parties made prior to the execution of this Agreement are hereby merged herein. This Agreement SHALL NOT BE MODIFIED OR ALTERED in any way other than by a writing, signed by the parties to this Agreement, their successors or authorized agents, and this Agreement SHALL NOT BE VARIED, SUPPLEMENTED, QUALIFIED, EXPLAINED, OR INTERPRETED BY ANY PRIOR COURSE OR DEALING BETWEEN THE PARTIES OR BY ANY USAGE OF TRADE.

HYDRAULIC POWER SYSTEMS, INC.  
1203 Ozark  
North Kansas City, Missouri 64116



## **SECTION 1- GENERAL INFORMATION - continued**

### **1.2 - Model 200 Vibratory Exciter with Power Unit**

#### **1.2.1 - Vibratory Exciter**

The vibratory exciter head consists of two gears turning two eccentric weights driven by a Hydraulic Motor at a rate of 1600 vibrations per minute.

All eccentrics are timed to cancel the side forces and sum the up and down forces of the eccentric weights to create the amplitude necessary to drive or pull the pile.

The vibration of the exciter case is isolated by the use of 12 rubber suppressors and provides for a maximum line pull of 45 tons of extracting force.

#### **1.2.2 - Diesel Hydraulic Power Unit**

The 200 diesel hydraulic power unit is equipped with a Caterpillar 3306 Diesel Engine with a rated output of 300 H. P. The power unit is mounted on a skid type fuel tank base and is equipped with full engine and hydraulic instrumentation inside the fully enclosed unit. A 30 foot remote control air operated pendant is standard on the Model 200 and allows the operator to move around for the best view of the worksite.

#### **1.2.3 - Hydraulic Hose Bundle**

The 200 unit is also equipped with a 100 foot hydraulic hose bundle, standard, consisting of two 50 foot sections.

#### **1.2.4 - Hydraulic Clamp Assembly**

Various hydraulic clamp types are available for various types of piling. Consult the factory or your nearest Factory Authorized Representative for the particular clamp assembly required for your application.

#### **1.2.5 - Remote Control Pendant**

The vibratory exciter is operated by a hand-held, remote control pendant. The pendant control buttons stop and start the vibration, closes and opens the hydraulic clamp.



## SECTION 2- SAFETY - continued

The information, specifications, and illustrations in this publication are on the basis of information available at the time it was written. The specifications, pressures, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service given to the product. Obtain the complete and most current information before starting any job. H.P.S.I. dealers have the most current information available. For the name of the nearest FACTORY AUTHORIZED REPRESENTATIVE contact HYDRAULIC POWER SYSTEMS INC. at (816) 221-4774.

### 2.2 - Standard Safety Procedures



**WARNING !!**

NEVER START ENGINE WITH THE GOVERNOR LINKAGE DISCONNECTED.

INSTALL GUARDS OVER ALL EXPOSED ROTATING PARTS.

ALWAYS STOP ENGINE BEFORE ADJUSTING OR REPAIRING ENGINE HYDRAULIC POWER UNIT.

DO NOT WEAR LOOSE CLOTHING WHEN WORKING NEAR ENGINE OR EXCITER.

ALWAYS WEAR PROTECTIVE GLASSES, CLOTHING, HEADGEAR, RESPIRATOR, ETC. WHEN CONDITIONS REQUIRE THEM.

NEVER INSPECT ENGINE COOLING SYSTEM WHILE UNIT IS RUNNING.

IF EQUIPPED WITH JACKET WATER COOLING SYSTEM, REMOVE COOLANT FILLER CAP SLOWLY TO RELIEVE PRESSURE THAT MAY HAVE BUILT UP DURING OPERATION. **NEVER REMOVE CAP WHILE ENGINE IS HOT OR OPERATING. STEAM FROM COOLING SYSTEM COULD CAUSE SERIOUS INJURY.**

EXTINGUISH ALL OPEN FLAMES INCLUDING CIGARETTES OR OTHER BURNING SUBSTANCES WHILE REFUELING UNIT AND WHEN SERVICING BATTERIES.



## SECTION 3 - INTRODUCTION

### 3.1 - Specifications

#### H.P.S.I MODEL 200 VIBRATORY PILE HAMMER SPECIFICATIONS

##### **EXCITER**

ECCENTRIC MOMENT .....	2000
FREQUENCY .....	1600
DYNAMIC FORCE .....	73
AMPLITUDE .....	.875
MAXIMUM LINE PULL .....	45
PILE CLAMPING FORCE .....	150
SUSPENDED WEIGHT .....	8600
WIDTH .....	95
THROAT WIDTH .....	14
OVERALL LENGTH .....	85

##### **POWER PACK**

DIESEL ENGINE .....	300
HYDRAULIC FLOW .....	70
MAXIMUM DRIVE PRESSURE .....	5000
MAXIMUM CLAMP PRESSURE .....	5000
WEIGHT .....	11000
LENGTH .....	144
WIDTH .....	60
HEIGHT .....	95
REMOTE PENDANT .....	AIR
SHEET METAL ENCLOSURE .....	STANDARD



**HYDRAULIC POWER SYSTEMS INC.**

Release 01

Model 200 Operators, Maintenance, and Parts Manual

Effective Date 06/97

# MAINTENANCE SECTION





## **SECTION 4 - MAINTENANCE SECTION 2 - continued**

### **4.1 - Daily Maintenance - continued**

12) Upon lifting the 200 Exciter to a free-hanging position, check the level of the gear oil in the sight glass located in the lower left hand corner of the case. Try to position the case as level as possible to achieve the most accurate measure possible.

13) Check the condition of all Vibration Dampeners, P/N 33036, and replace should any damage or extensive wear be present before using the Exciter.

14) Grease the Clamp Piston Rod, P/N 32042, by using a grease gun and applying grease to the two alimite fittings located on the sides of the Clamp Housing, This should be done at least two times a day.

### **4.2 - General Maintenance**



#### **4.2.1 - Power Unit**

1) Perform all Caterpillar maintenance requirements per the Operation and Maintenance Manual.

2) At 250 hours, replace the pre-charge filter elements, P/N 33119 located at the rear of the engine opposite the instrument panel side of the Power Unit. See the dirt indicator float levels on the side of the filter housing. Replace the elements before the dirt indicators are in the red area. Check the condition of the hydraulic elements with the engine running at maximum R.P.M. to obtain an accurate reading.

3) Replace the Hand Pump Filter located on the Hydraulic Reservoir next to the Hand Pump every 6 months or earlier if conditions exist.

4) Replace the Hydraulic Oil as necessary due to any contamination by foreign materials such as water, dirt, mixtures of incompatible Hydraulic Oils, or any other substance that cannot be removed by means of the Filter Elements.

5) Replace the Desigant Material located in the Midland Air Dryer once a year or every 500 hours of operation, whichever comes first.



## SECTION 4 - MAINTENANCE - continued

### 4.3 - Maintenance Schedule

#### 4.2.2 - Power Unit

ITEM	AS NEEDED	100 HOURS	250 HOURS	500 HOURS
Engine Oil				
Engine Oil Filter				
Engine Air Filter				
Engine Coolant				
Diesel Fuel				
Hydraulic Oil				
Hydraulic Filters				
Pump Drive				
Hand Pump Filter				
Air Dryer Desigant				

#### 4.2.3 - Vibratory Exciter Unit

ITEM	AS NEEDED	100 HOURS	250 HOURS	500 HOURS
Gear Lube				
Clamp Grease				
Motor Filter				
Fasteners				
Hoses				
Clamp Jaws				

\*1 - Service per Caterpillar Operations and Maintenance Manuals.



## **SECTION 4 - MAINTENANCE - continued**

### **4.5 - Fluids and Filters Specifications**

#### **4.5.1 - Lubricants**



**Power Unit Engine Oil** - Refer to Caterpillar Operation and Maintenance Manual or engine manufacturers specs.

**Power Pac Pump Drive Gear Oil** - Conoco SAE 85W-140

**Hydraulic Oil** - Units are shipped with Chevron Clarity AW46, unless otherwise designated by customer. Check for oil type "E" or label located on the hydraulic tank. Conventional hydraulic oils also acceptable but may not be EPA or coast guard approved for spillage. The following are approved substitutes to the hydraulic system:

- Texaco Rando HD-46
- Mobil DTE-15
- Exxon-Univis P-32
- Conoco 46

**Exciter Gear Case Oil** - Units are shipped with Texaco Meropa 220 Gear Oil. The following are approved substitutes:

- Mobil SCH-634 Gear Oil\*
- Shell Omala 75\*

\*NOTE: WHEN ADDING GEAR OILS IT IS ADVISABLE TO MAINTAIN THE SAME GEAR OILS RATHER THAN MIXING DIFFERENT TYPES OF OILS. SOME OILS, ALTHOUGH COMPATIBLE WITH THE DESIGN OF THIS MACHINE, MAY NOT BE COMPATIBLE WITH OTHER TYPES OF GEAR OIL.

**Hydraulic Clamp Grease** - NLGI No. 2 or equal

#### **4.5.2 - Fuels**

**Diesel Fuel** - See Caterpillar Operation and Maintenance Manual or engine manufacturer specifications.

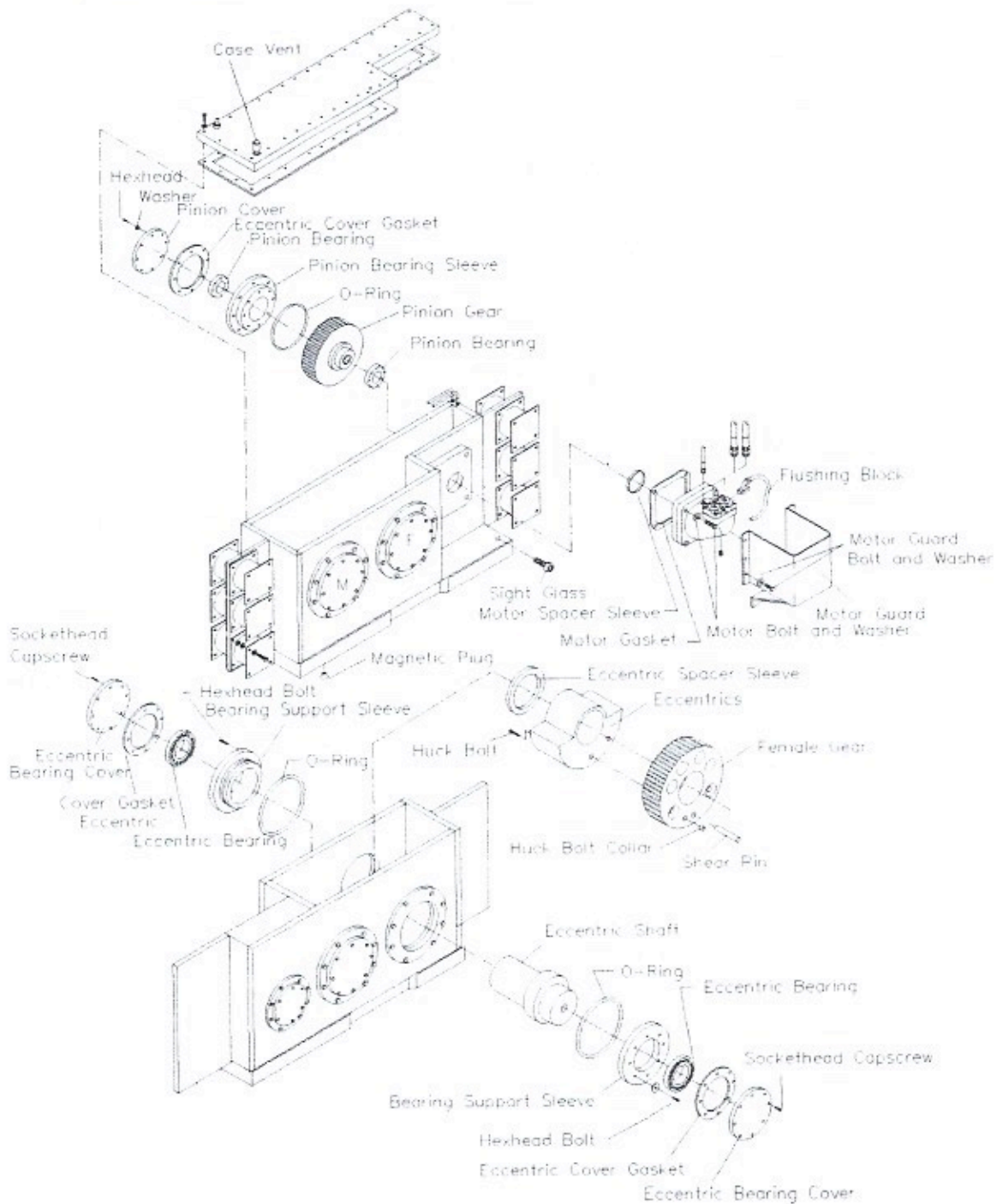
#### **4.5.3 - Coolants**

**Diesel Engine Radiator** - See Caterpillar Operation and Maintenance Manual or engine manufacturer specifications.



## SECTION 4 - MAINTENANCE - continued

### 4.6 - Disassembly of Exciter Case

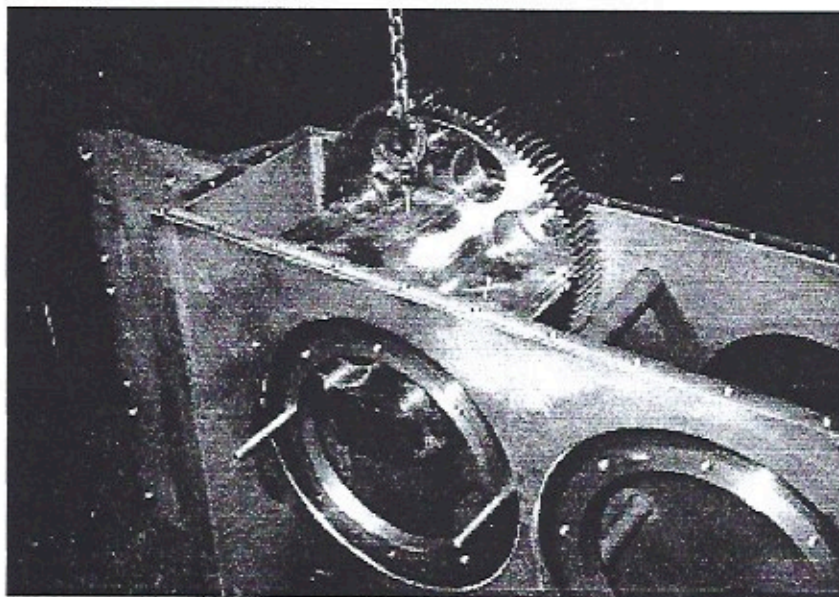




## 4.6 - Disassembly of Exciter Unit - continued

### 4.6.3 - DISASSEMBLY OF EXCITER CASE

- 1) Thoroughly steam clean exciter case before any disassembly or removal of gear case cover or bearing covers.
- 2) Drain gear lube from exciter case into clean container by removing magnetic plug from bottom of exciter case (approximately 6 gallons) DO NOT RE-USE GEAR OIL. Clean container is for oil sample testing only.
- 3) Remove gear case cover bolts and gear case cover to expose exciter gear case .
- 4) Remove motor from exciter case.
- 5) Remove eccentric bearing covers and pinion bearing cover.
- 6) To remove eccentric gear assemblies, remove bearing support sleeve bolts from bearing support sleeves.
- 7) Eccentric gear assembly to be removed must be supported by over head crane as bearing support sleeves are being removed.



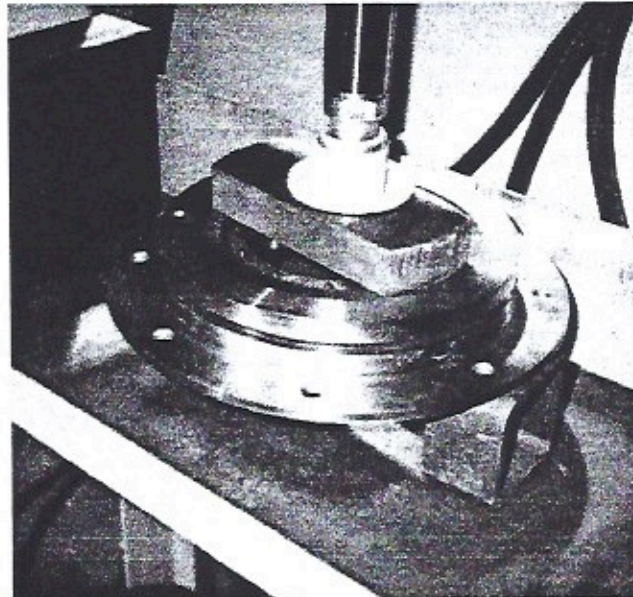
## 4.6 - Disassembly of Exciter Unit - continued

### 4.6.4 - REMOVAL OF ECCENTRIC SHAFTS - continued

- 2) Raise eccentric assembly out of case and store with original shaft and spacer.
- 3) Remove shaft inner race from shoulder side of shaft very lightly heating and tapping race. **DO NOT REUSE HEATED RACES OR BEARINGS.**
- 4) Remove pinion bearing support sleeve in same manner as eccentric sleeves, by using HPSI puller. Pinion gear must also be supported during removal of pinion bearing spacer sleeves and pinion bearings.
- 5) Remove pinion bearings and motor spacer sleeve by **LIGHTLY** tapping with small rubber mallet on the outer race only.

### 4.6.5 - REMOVAL AND REPLACEMENT OF ECCENTRIC BEARINGS INTO BEARING SUPPORT SLEEVES

- 1) Using HPSI bearing press pilot, press bearings out of support sleeves.

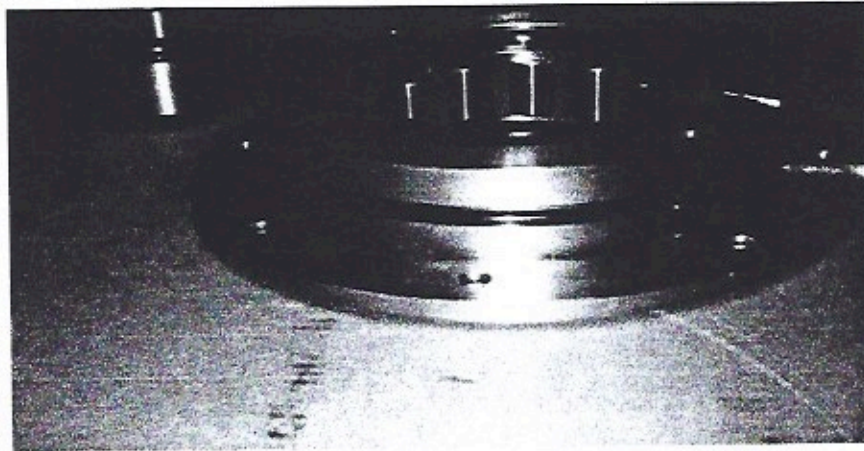


- 2) Thoroughly clean the bearing support sleeve and visually inspect for any damage.

## 4.6 - Disassembly of Exciter Unit - continued

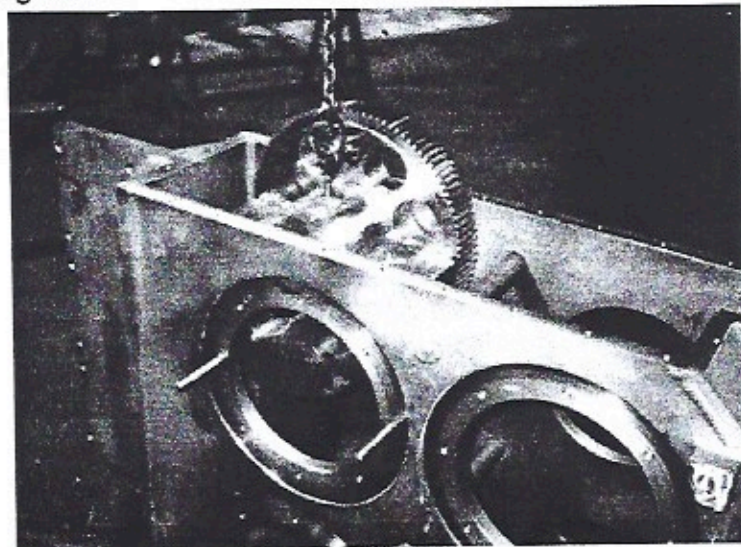
### 4.6.5 - REMOVAL AND REPLACEMENT OF ECCENTRIC BEARINGS INTO BEARING SUPPORT SLEEVES - continued

- 5) Replace bearing sleeve o-rings with factory type o-rings only (high temperature).



### 4.6.6 - REASSEMBLY

- 1) Thoroughly steam clean inside of gear case. Inspect for any loose material inside the box.
- 2) Lower eccentric/gear assembly into gear case to original location. Male and female gears must be positioned properly. See location on exploded view section 4.6 page 21.

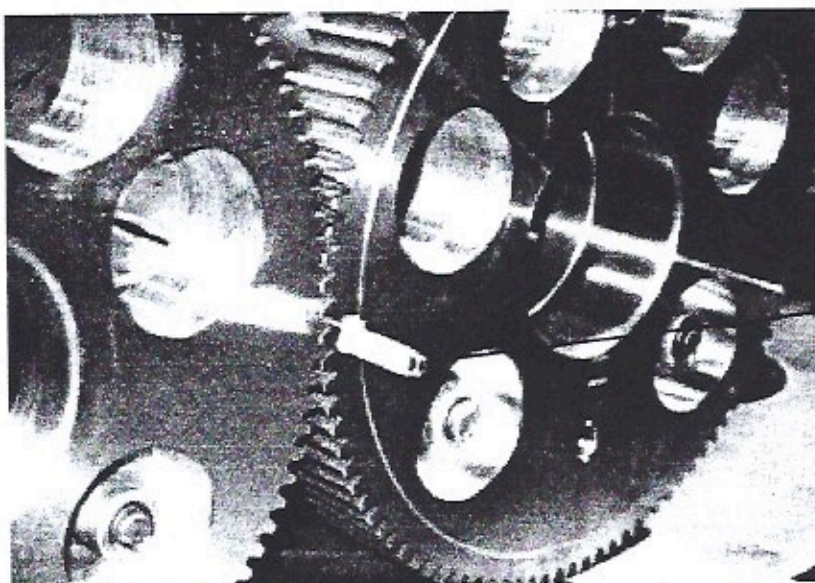




## 4.6 - Disassembly of Exciter Unit - continued

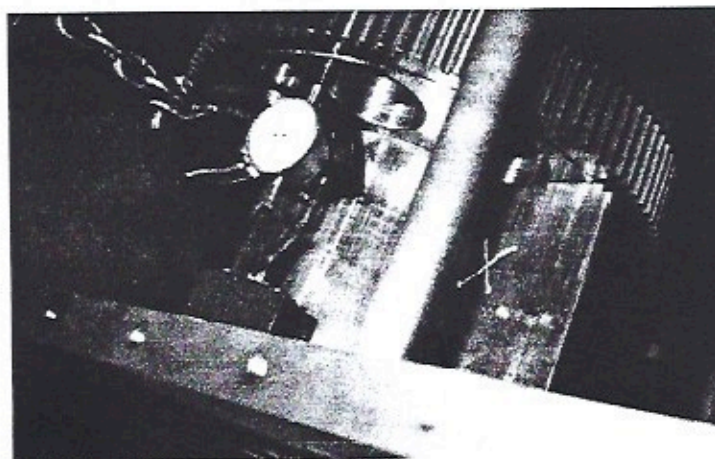
### 4.6.6 - REASSEMBLY - continued

7) Backlash between gears is recommended to be .016". Use of a feeler gauge on at least two sides showing equal backlash, will help verify that all components are round. Consult factory for backlash of less than .015" or greater than .018" for approval.



FEELER  
GAUGE

8) To verify end play on the shaft assembly, use a dial indicator to measure total travel from one side of the case to the other. Position indicator at zero with assembly pushed to one side. Move assembly firmly to the opposite side of the case. Should end play be below .025" or exceed .040", consult factory.



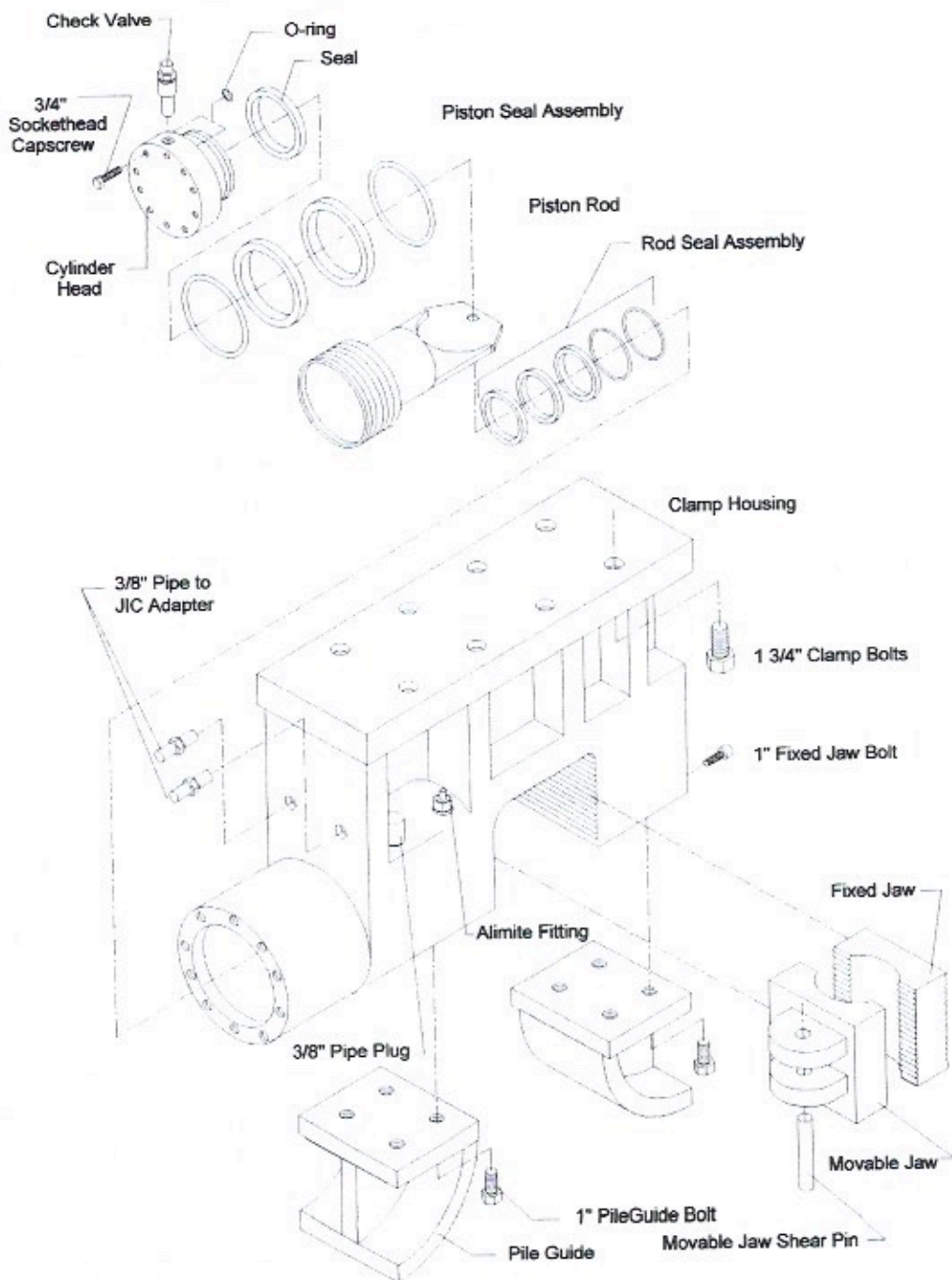




## SECTION 4 - MAINTENANCE CONTINUED

### 4.7 - Movable Jaw Replacement

#### 4.7.1 - Exploded View of Parts





## **SECTION 4 - MAINTENANCE CONTINUED**

### **4.7 - Movable Jaw Replacement**

#### **4.7.3 - Rebuilding the Model 300 Clamp Cylinder - continued**

- 6) Steam clean the clamp housing to remove all chance of contamination.
- 7) Inspect and remove any loose metal. Install new seals into the clamp housing.
- 8) Clean and replace piston head seals and wear rings.
- 9) Install piston into clamp housing while observing that seals are properly located as the piston goes into the housing.
- 10) The use of a rubber mallet may be necessary to locate the piston down into the cylinder. The top of the piston should be positioned approximately 2" down into the cylinder.
- 11) After replacing the cylinder head seal and o-rings, reinstall the cylinder head. Special notice should be given to the seal and o-ring to insure proper positioning as the head is being installed.
- 12) To tighten the cylinder head, install all the socket head cap screws and slowly pull down the head in a star fashion until the head is flush with the clamp housing. Proper torque should be used as well as loctite on the bolts to avoid the loosening of the bolts and damage to the two o-rings located on the face of the cylinder head.
- 13) Replace the cylinder check valve with a factory preset valve rated at 1000 psi.
- 14) Replace the jaws as described in 4.7.2

**WARNING !!**

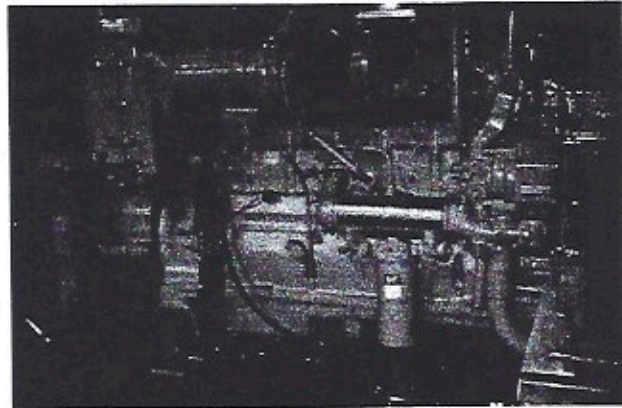
**WARNING! NEVER REMOVE THE 3/8" PIPE PLUG FROM THE CYLINDER AREA OF THE CLAMP HOUSING. 5000 PSI MAY BE ON THIS PLUG. NEVER REMOVE THE CYLINDER CHECK VALVE WITHOUT RELEASING CLAMP PRESSURE.**



## SECTION 5 - OPERATION

### 5.2 - Pre-Start of Power Pack

#### 5.2.1 - Power Unit



- 1) Perform required periodic maintenance before starting the engine. Make a "walk-around" inspection of the power unit. Often it can only take a few moments to correct minor discrepancies which can prevent major repairs at a later date.
- 2) Measure the crankcase oil level. The oil level must be between the ADD and FULL marks on the dipstick. Refer to the Caterpillar Oil capacities and specifications located on the engine for recommended oil types and capacities.
- 3) Inspect the air cleaner service indicator. If the red piston is locked in the raised position, service the air cleaner.
- 4) All guards must be in place. Repair or replace all guards that are damaged.
- 5) Check the level of the hydraulic oil in the hydraulic sight gauge located on the side of the hydraulic reservoir. Add as needed per the hydraulic oil specification located in Section 4.5 Fluids and Filter Specifications.
- 6) Visually check all hydraulic hoses and fittings for any visible signs of oil leaks.
- 7) Open faucet valves located on the top of the manifold to relieve any existing pressure on the Quick Disconnects prior to attaching the Hoses Bundle. See Section 5.1.1 Connecting the Hydraulic Hoses between the Power Pack and the Exciter.



## **SECTION 5 - OPERATION - continued**

### **5.2 - Pre-Start of Units - continued**

#### **5.2.2 - Vibratory Exciter - continued**

- 4) Check the condition of the two Fixed Jaw Bolts, P/N 33044 and replace if loose, cracked or broken prior to use.
  
- 5) Check the condition of the Movable Jaw Pin, P/N 33040 and replace if broken, damaged or missing prior to use.
  
- 6) Check the condition of the Movable Jaw, P/N 32040, for any possible cracks or damage and replace if necessary prior to use.
  
- 7) Upon lifting the 200 Vibratory Exciter to an upright and free-hanging position, check the oil level in the Exciter Gear Box by looking into the glass sight gauge located in the left hand corner of the exciter case. The oil level should be approximately on half the way up into the sight glass.

**WARNING !!**

**NOTE:** DO NOT OVERFILL EXCITER GEAR CASE. EXTREME HEAT IS PRODUCED AND DAMAGE TO THE EXCITER WILL OCCUR AS WELL AS LOSS OF PERFORMANCE OF THE EXCITER.

- 8) Add any necessary Gear Oil through the Filler Plug located in the Gear Case Cover, per the gear oil specification contained in Section 4.5, page 19 of this manual.
  
- 9) Check the Gear Case for any leaks of gear oil and correct any leaks prior to use as necessary.
  
- 10) Check the condition of all Vibration Dampeners, P/N 33036 and replace should any damage be present prior to use.
  
- 11) Grease the Alimite fitting located on the sides of the Clamp Housing before initial use and twice daily.
  
- 12) Visually inspect all bolts, pins and fasteners used in mounting the sheet metal enclosure, radiator brackets, oil coolers, hydraulic manifold, hydraulic reservoir and any other visible components.



## **SECTION 5 - OPERATION - continued**

### **5.3 - Starting Units - continued**

#### **5.3.1 - Power Unit - continued**



**CAUTION:** Close the Clamp Jaws with a steel plate between teeth before running the Exciter in the "Free hanging" position. See Section 5.2.2 for further instructions.

**CAUTION:** Do Not override the automatic shutdown safety features for Oil Pressure, Water Temperature, High Hydraulic Oil Temperature or any other Safety feature on this machine. To do so is to risk the components and void the warranty of the unit as well as the personal safety of yourself and others.

#### **5.3.2 - Vibratory Exciter**

1) The Vibratory Exciter functions are controlled by the use of the 30' Remote Pendant which is a standard feature on this model. Position the Power Unit in such a way as to enable the clearest visual contact for the Remote Pendant Operator between the Power Unit Instrument Panel and the location in which the Exciter is to be used.

2) After completing the necessary aspects of Sections 5.1 and 5.2, increase the throttle to the maximum R.P.M.

3) To clamp the pile, position the Exciter on the pile to be driven or extracted and push the Clamp Closed button on the Remote Control Pendant. Check the Clamp Pressure Gauge to assure that the pressure is being maintained on the pile.

**CAUTION:** DO NOT begin to pull until the clamp pressure has reached adequate pressure to hold the pile.



## **SECTION 5 - OPERATION - continued**

### **5.4 - Stopping Unit - continued**

**CAUTION:** Never leave the Vibratory Exciter clamped to a pile unattended by the operator and crew for any reason. Although the clamp is protected with a check valve to maintain pressure for short periods of interruptions, it is not designed to maintain pressure without the Power Unit providing pressure for any extended length of time.

- 5) Be certain that both the Key Switch and the toggle switch are in the off position at the end of any overnight or prolonged shutdown of the unit.

### **5.5 - Setting System Relief Valves and Pressures**

#### **5.5.1 - Charge Pump Relief**

The V-J5 Ful-Flow relief valve is mounted on the outlet side of the charge pump. The V-J5 relief valves have been set at 175 P.S.I. at the factory. If however, you need to set relief follow these steps:

- 1) Push the emergency stop button so that the engine will not start, which could cause personal injury.
- 2) Remove acorn nut on-relief valve. Loosen the lock nut on adjusting screw.
- 3) Crank the engine until at least 50 P.S.I. is showing on charge pressure gauge. Do not let the engine start until you have at least 50 P.S.I. reading on the charge pressure gauge.
- 4) Turn the adjusting screw IN to increase pressure and OUT to decrease the pressure. Pull emergency stop button OUT and let engine start. Screw IN adjusting screw until gauge reads 175 P.S.I. at idle and approximately 200 P.S.I. full throttle.
- 5) Tighten lock nut on adjusting screw, and put the acorn nut back on and tighten.

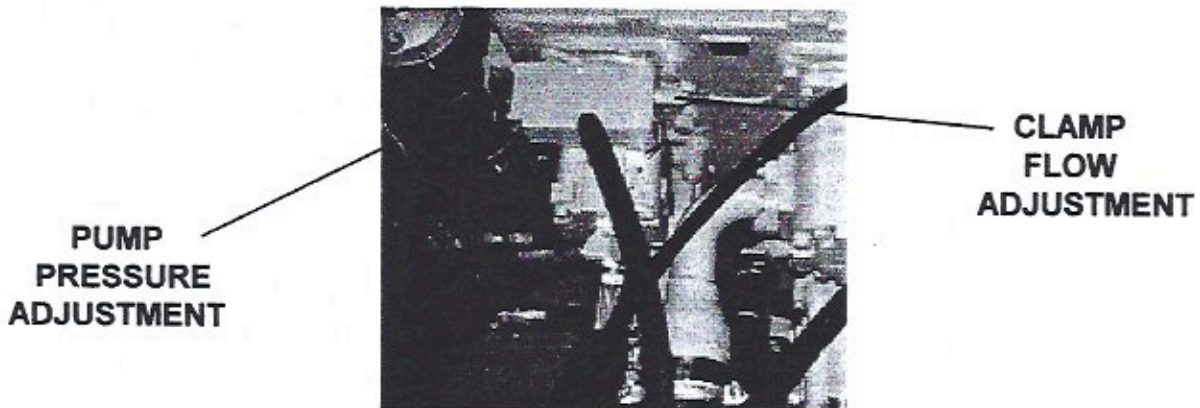
See Picture next page.



## SECTION 5 - OPERATION - continued

### 5.5 - Setting System Relief Valves and Pressures - continued

#### 5.5.2 - Drive Pressure Relief - continued



#### 5.5.3 - Clamp Pump Pressure

To make the compensator adjustment, it is necessary for the clamp pressure relief valve to be set first.

- 1) Shut down unit.
- 2) Turn adjustment knob of the clamp relief valve located on the hydraulic manifold out 3 times.
- 3) Raise the clamp pump pressure to maximum setting by returning the pressure adjustment all the way **IN**.
- 4) Start the unit.
- 5) Slowly turn the manifold relief valve in until the gauge pressure reads 5400 P.S.I.
- 6) Slowly **BACK OUT** the adjustment on the clamp pump until the gauge pressure approaches 5000 P.S.I.
- 7) Shut down unit and tighten locking nuts.
- 8) Restart the unit and reduce pressure to 5000 P.S.I.  
"Failure to set the relief valve pressure higher than the clamp pump pressure will result in clamp pump failure."



## **SECTION 6 - TROUBLESHOOTING - continued**

### **6.1 - Power Unit**

#### **6.1.1 - Engine Will Not Start - continued**

5) Oil pressure too low. → Check oil level.

6) Hot hydraulic oil shutdown. → If engine has shut down during hard driving, high hydraulic oil temperatures may have activated the safety shutdown of the Diesel Engine. Allow the unit to cool for several minutes before attempting to restart. Follow basic starting procedures once engine is again operating.

#### **6.1.2 - Throttle Will Not Operate**

1) Verify that air is being delivered to the diaphragm on the engine throttle. → Replace diaphragm if air is available at the valve.

2) Refer to Remote Pendant, Section 6.2.1.

### **6.2 - Vibratory Exciter**

#### **6.2.1 - Remote Pendant Does Not Function Properly**

1) Check air pressure at the receiver tank. → If no pressure exists, consult your Caterpillar Manual or Dealer for service on the compressor or regulator.

NOTE: One of the easiest and fastest ways to verify the air system of leaks is to start the engine and let it run for a few minutes to build up pressure, then completely shut down and listen for air leaks.

2) Check air pressure at the Remote Pendant Box. → If air pressure does not exist at this point, check for broken lines or faulty connections between the Receiver Tank and the Remote Pendant unit.





## **SECTION 6 - TROUBLESHOOTING - continued**

### **6.2.4 - Hydraulic Clamp Will Not Open - continued**

**CAUTION:** TO RELEASE THE PRESSURE CAPTURED INSIDE THE HYDRAULIC CYLINDER, CAREFULLY LOOSEN THE LOCK NUT ON THE RELIEF VALVE (PART #33047, ON THE MODEL 300 CLAMP CYLINDER, EXPLODED DIAGRAM PAGE). NEXT SCREW IN THE STEM WITH AN ALLEN WRENCH UNTIL IT IS AS TIGHT AS POSSIBLE. MAKE SURE THAT THE NUT DOES NOT RETIGHTEN AS YOU DO THIS, ALLOWING PRESSURE TO BE MAINTAINED IN THE CYLINDER. AFTER TURNING IN THE STEM, THE PRESSURE AND LOAD SHOULD BE RELEASED FROM THE CLAMP.

3) To adjust the pressure of the Clamp Cylinder Check Valve located on the Hydraulic Clamp Cylinder, turn the stem portion of the valve all the way in and turn outward two and one half turns. Tighten the lock nut securely in this position.

### **6.2.5 - Hammer Will Not Vibrate**

- 1) Check the Drive Pressure on the Instrument Panel of the Power Pac. → If the gauge does not indicate pressure, contact your Dealer or the H.P.S.I.
- 2) Check the Hydraulic Motor on the Exciter Case for any damage. → Replace if evidence of damage exists.
- 3) → Replace the Brake Valve located in the Exciter Manifold in the Suspension Housing.
- 4) → Inspect the Remote Pendant for air-related problems as outlined in the Remote Pendant Section **6.2.1**



## **SECTION 6 - TROUBLESHOOTING - continued**

### **6.2.8 - Excessive Driving Time/Temperature**

- 1) → There are two types of heat generated during pile driving /extracting with vibratory hammer. In very cohesive soil it is not uncommon to see the drive pressure or the machine raise to its relief valve setting during pulling or driving. As the relief valve is opened the speed of the gearbox is decreased over the reduction of hydraulic oil to the hydraulic motor. This in turn generates heat in the hydraulic system which can only be cooled by reducing the drive pressure below relief setting and allowing the oil cooler to perform. Normally this means that a larger unit is needed if this condition persists. In very soft driving conditions, it is not uncommon to see gearbox temperatures on the exciter elevate between 200 degrees F. and 250 degrees F.
- 2) → When sheets are being driven and very little time passes between driving sheets, maximum bearing load is seen during maximum amplitude and in turn generates heat into the gearbox.

### **6.2.9 - Driving Speed**

- 1) → As a general rule, the minimum penetration should be below 1" per minute for continuous driving.



**HYDRAULIC POWER SYSTEMS INC.**

Release 01

**Model 200 Operators, Maintenance, and Parts Manual**

**Effective Date 06/97**

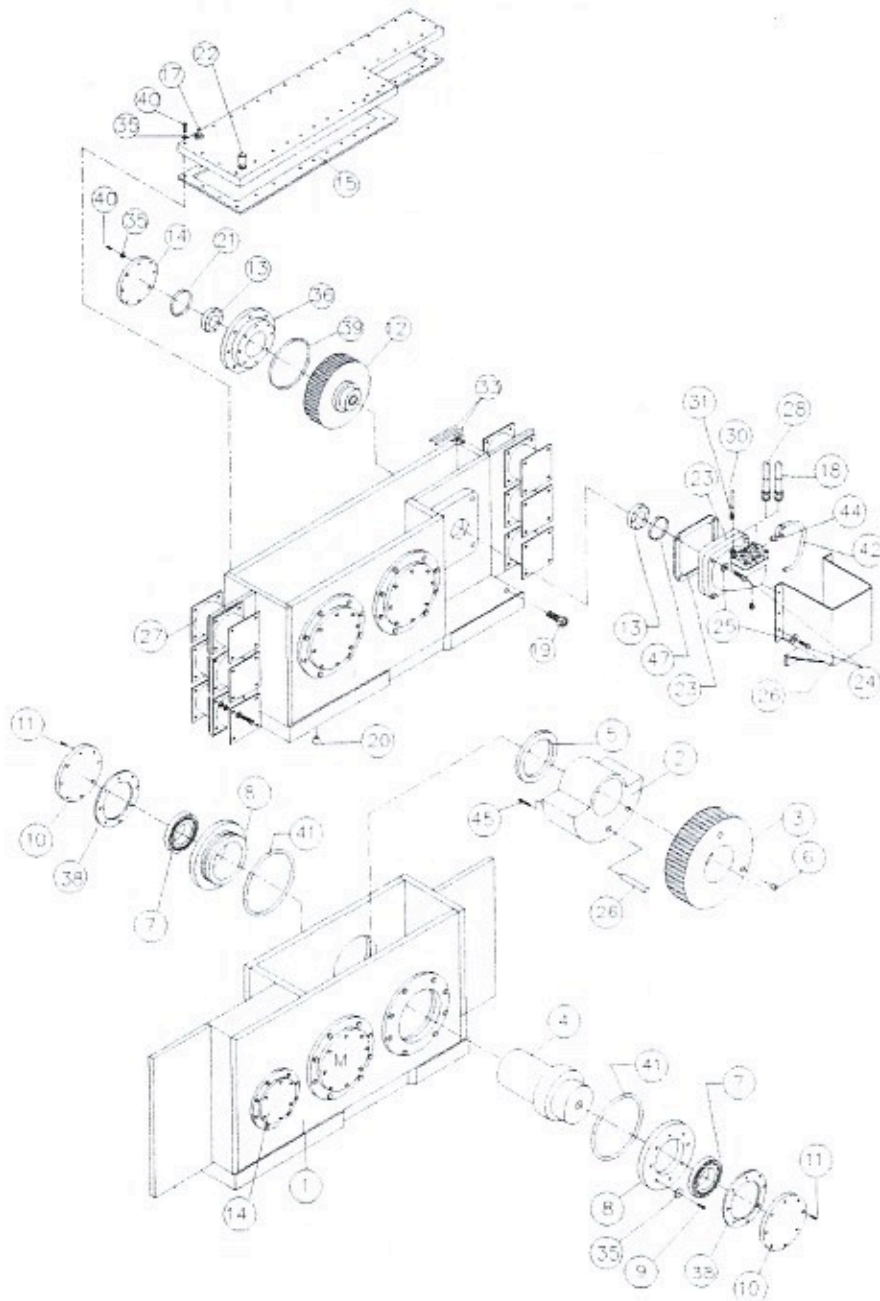
# PARTS SECTION



## SECTION 7 - DIAGRAM OF PARTS - CONTINUED

### 7.1 - Exciter Gear Case

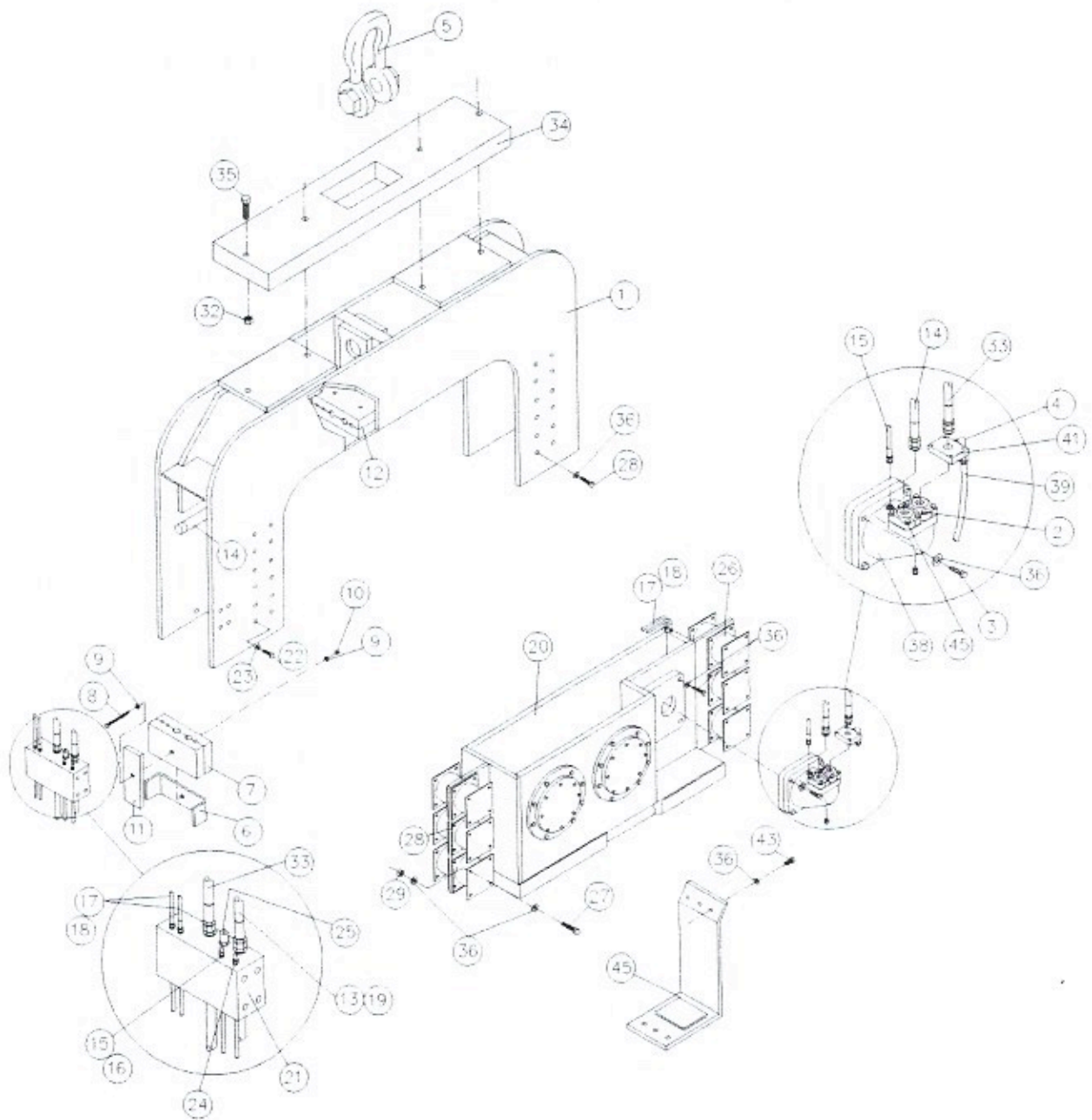
#### 7.1.2 - Exciter Gear Case - Exploded View





## SECTION 7 - DIAGRAM OF PARTS - CONTINUED

### 7.2.2 - Vibration Suppressor - Exploded View

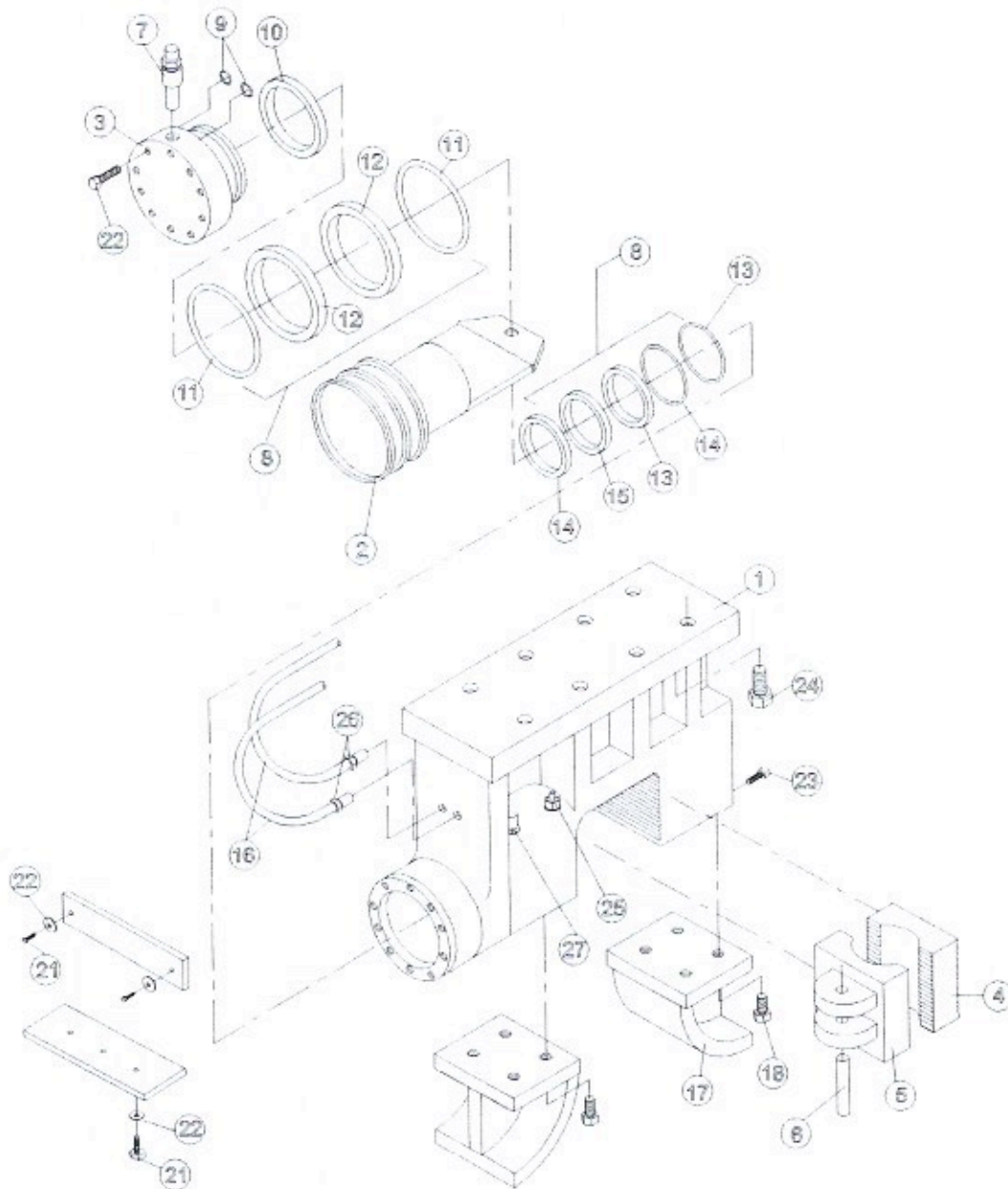




## SECTION 7 - DIAGRAM OF PARTS - CONTINUED

### 7.3 - Model 200 - 300 Universal Sheeting Clamp

#### 7.3.2 - Model 200 - 300 Universal Sheeting Clamp - Exploded View

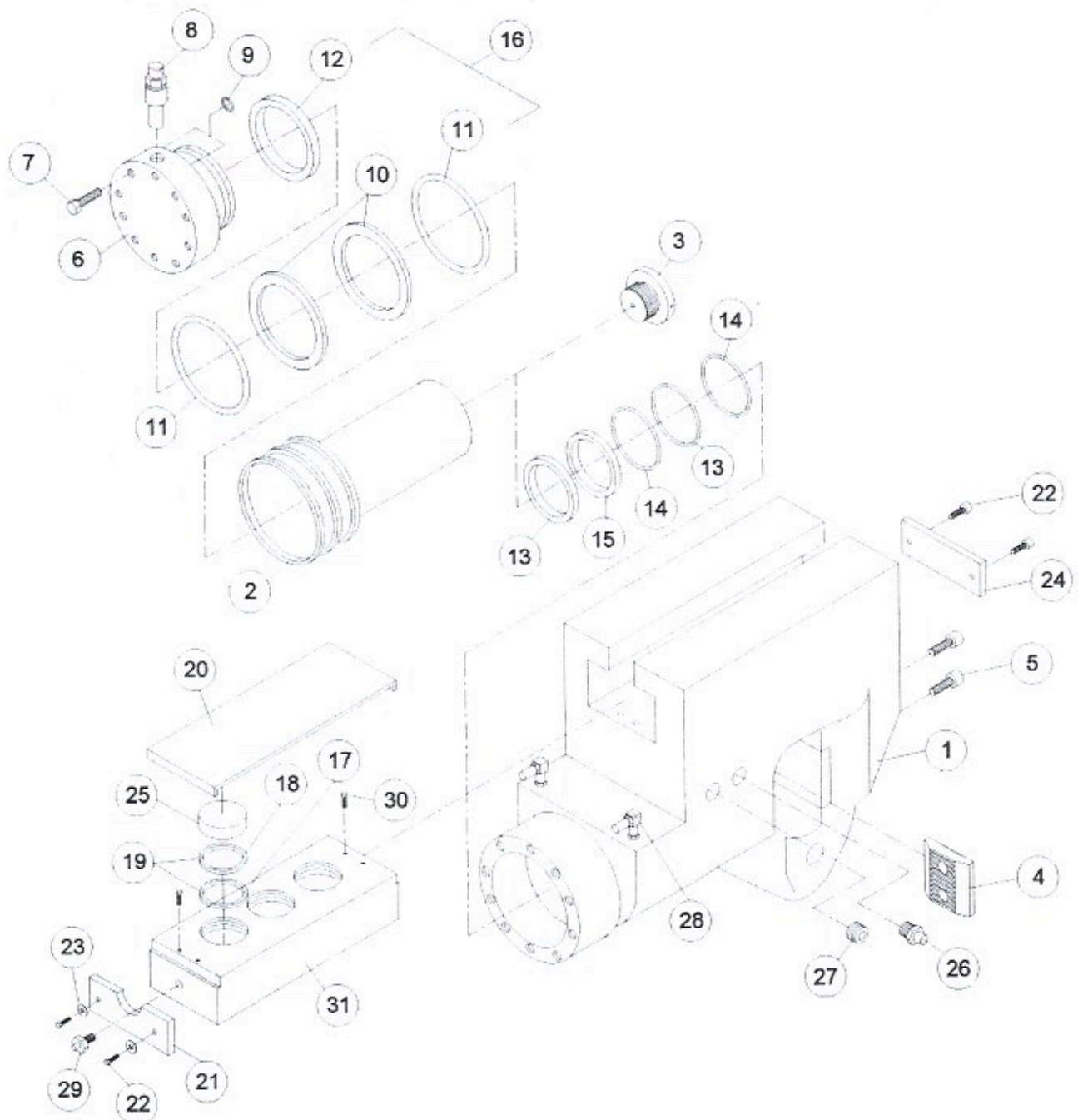




## SECTION 7 - DIAGRAM OF PARTS - CONTINUED

### 7.4 - Model 200 - 100 Ton Caisson Clamp

#### 7.4.2 - Model 200 - 100 Ton Caisson Clamp - Exploded View





**HYDRAULIC POWER SYSTEMS INC.**

Release 01

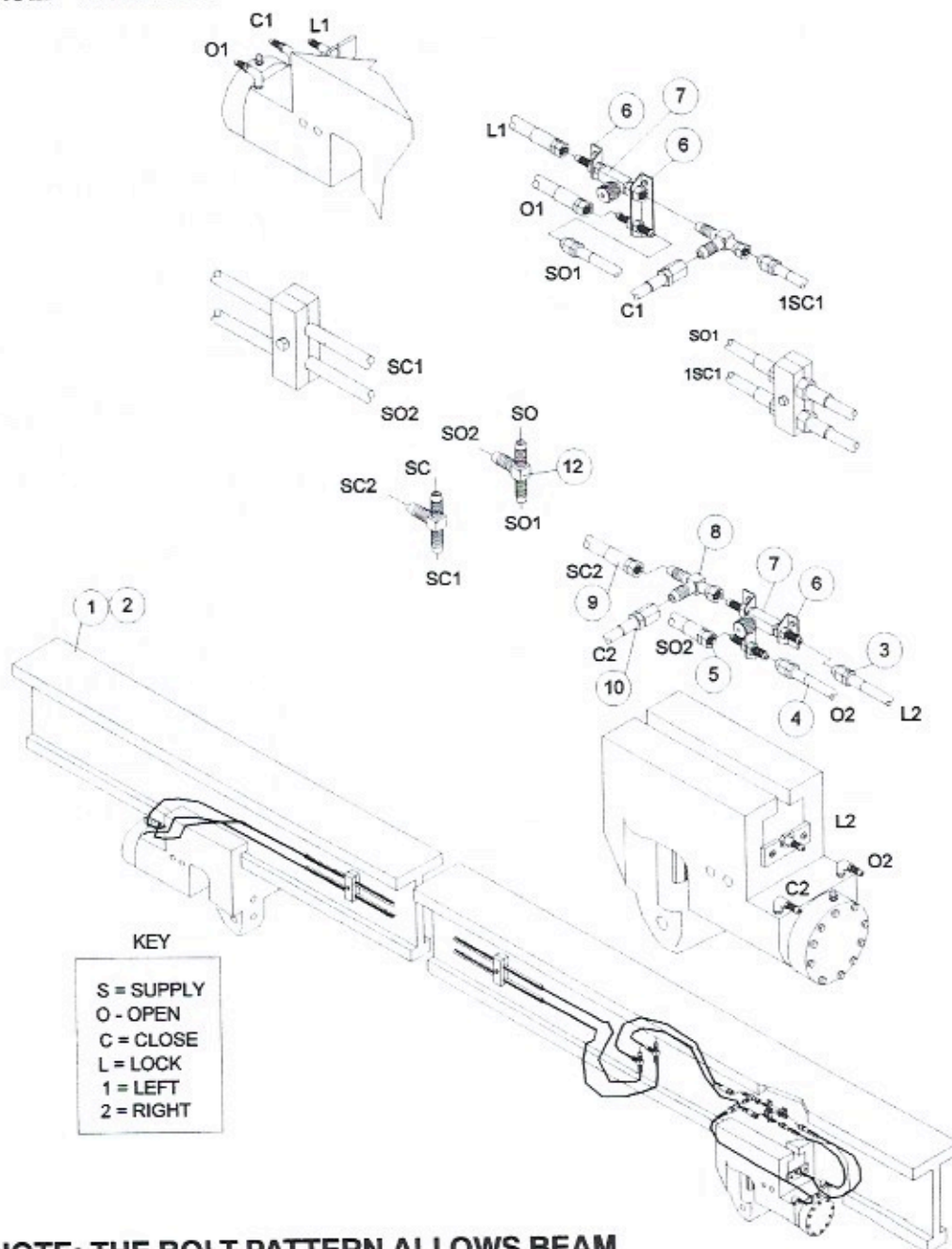
Model 200 Operators, Maintenance, and Parts Manual

Effective Date 06/97

## SECTION 7 - DIAGRAM OF PARTS - CONTINUED

### 7.5- Model 200 - Caisson Beam

#### 7.5.2 - Model 200



**KEY**

- S = SUPPLY
- O = OPEN
- C = CLOSE
- L = LOCK
- 1 = LEFT
- 2 = RIGHT

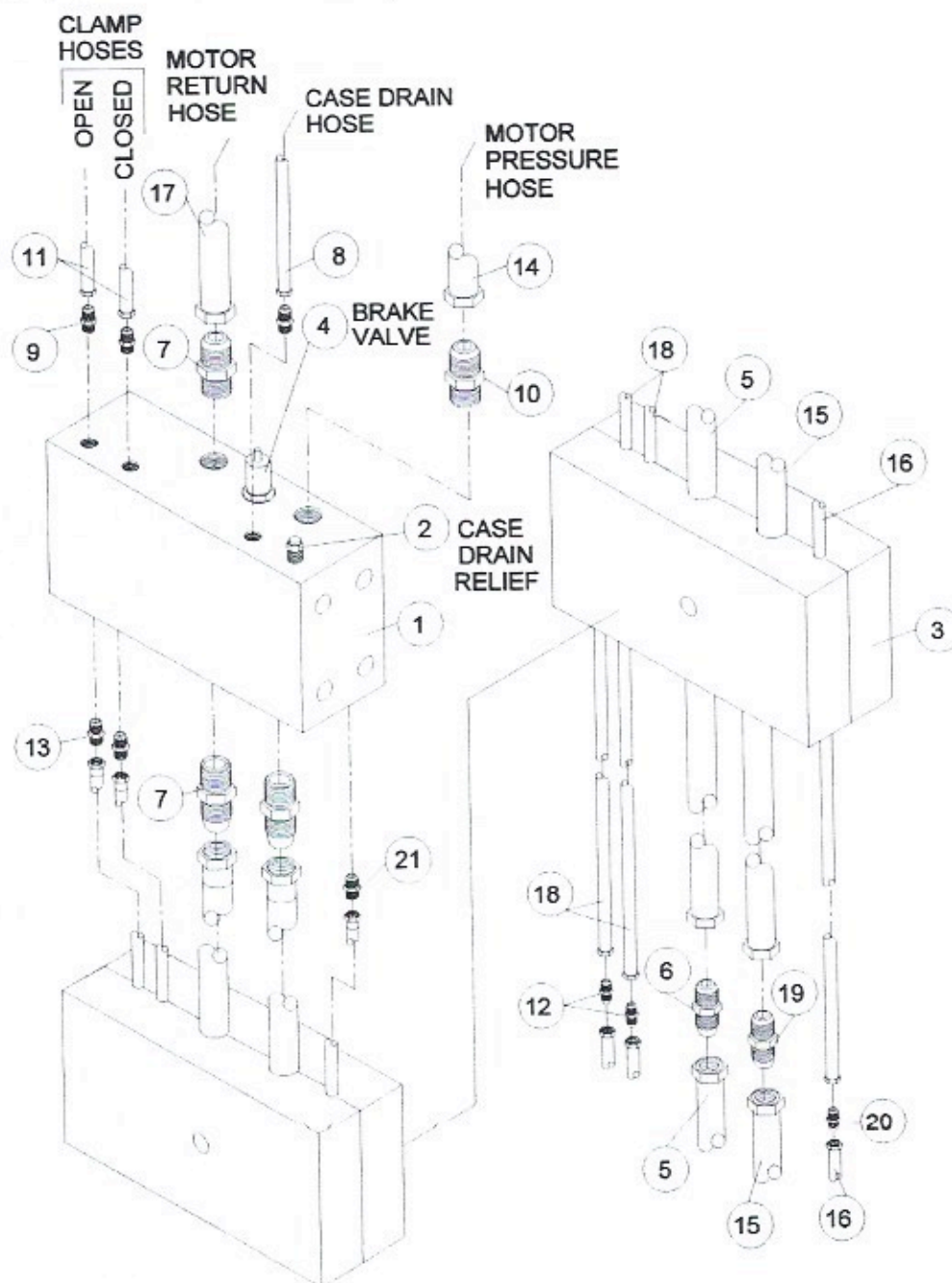
**NOTE: THE BOLT PATTERN ALLOWS BEAM TO BE INSTALLED IN ONE POSITION ONLY.**



## SECTION 7 - DIAGRAM OF PARTS - CONTINUED

### 7.6 - Brake Valve Manifold

#### 7.6.2 - Brake Valve Manifold - Exploded View

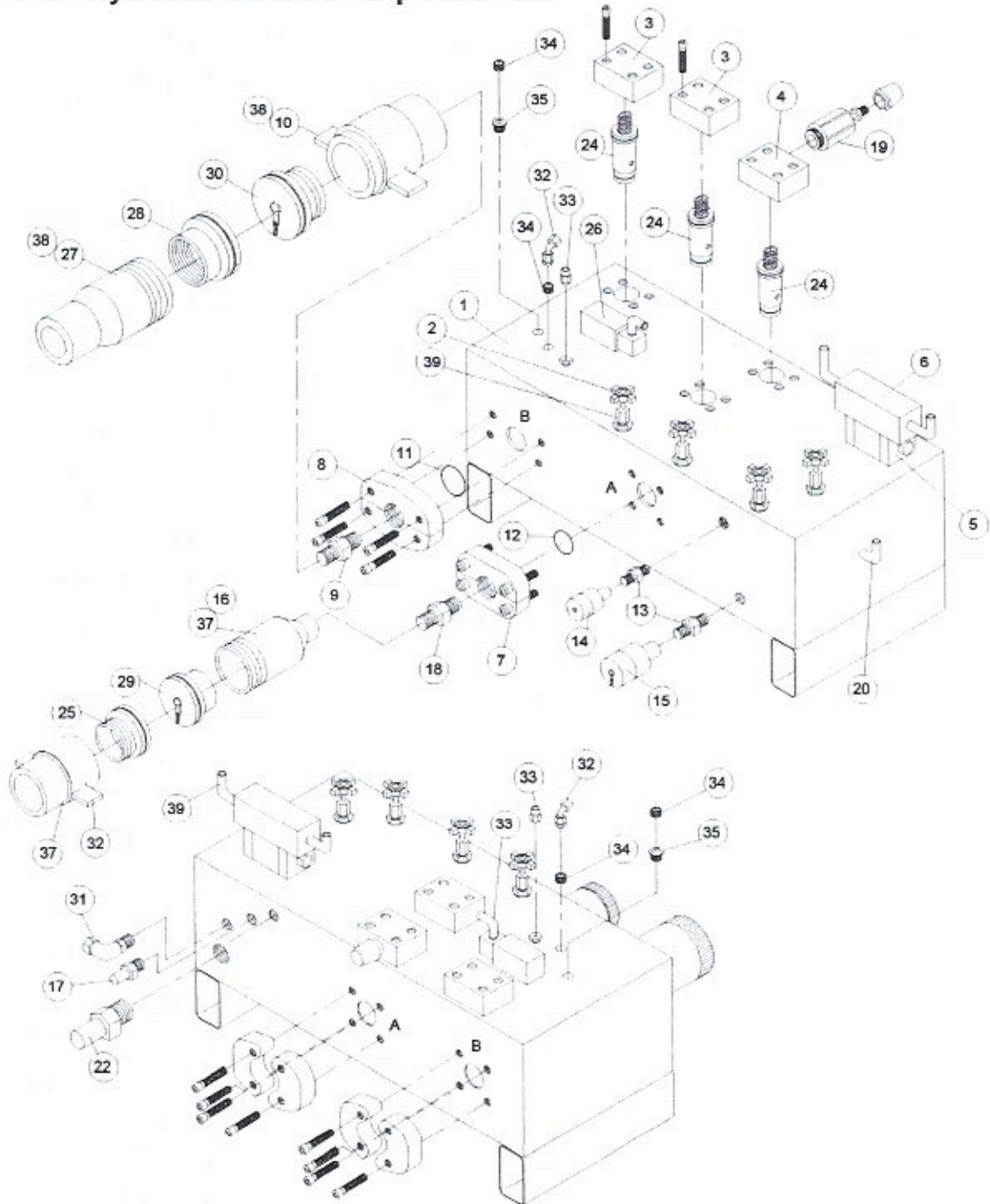




## SECTION 7 - DIAGRAM OF PARTS - CONTINUED

### 7.7 - Hydraulic Manifold

#### 7.7.2 - Hydraulic Manifold - Exploded View

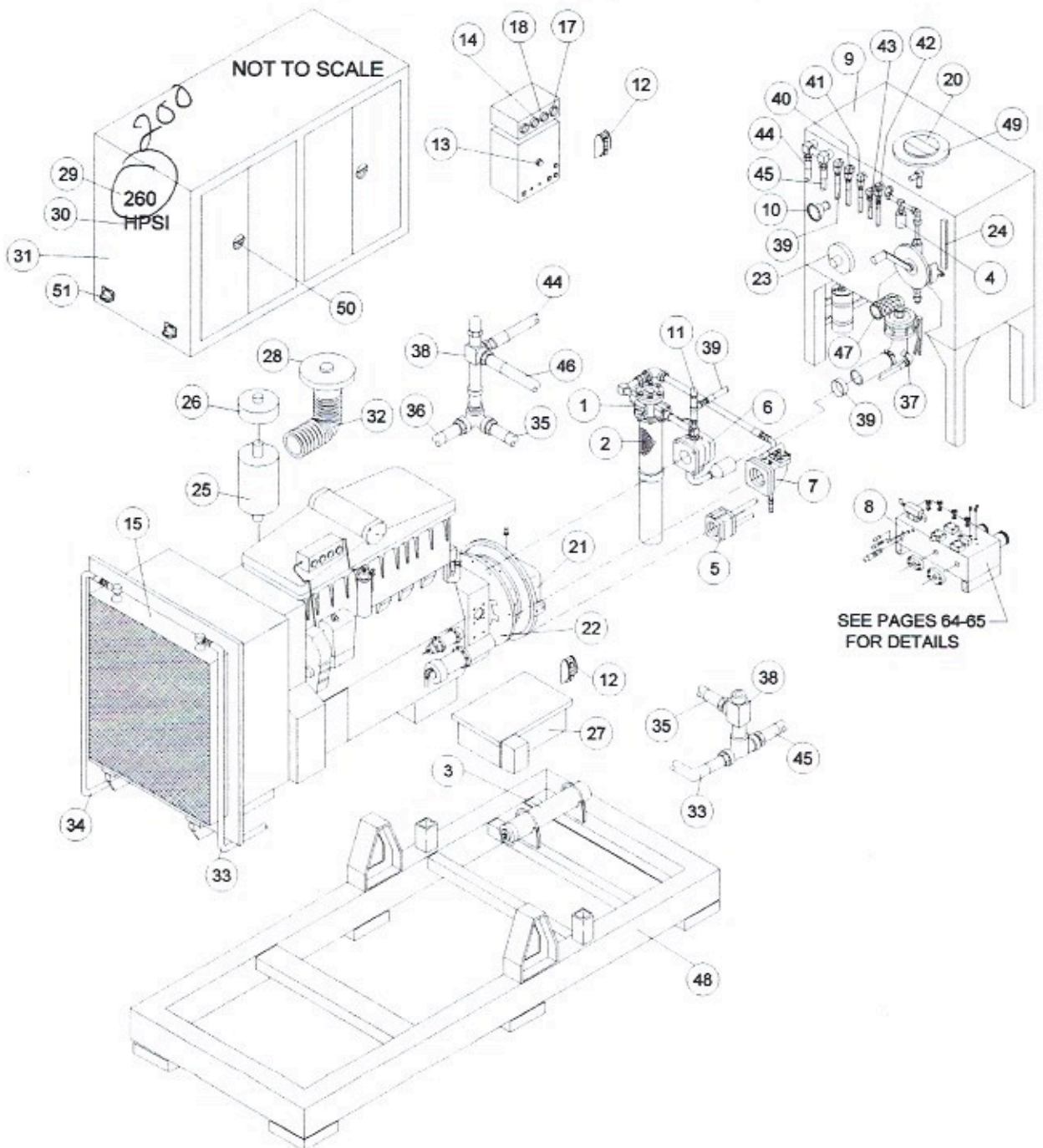




## SECTION 7 - DIAGRAM OF PARTS - CONTINUED

### 7.8- Power Unit Replacements Parts

#### 7.8.2 - Power Unit Replacement Parts - Exploded View

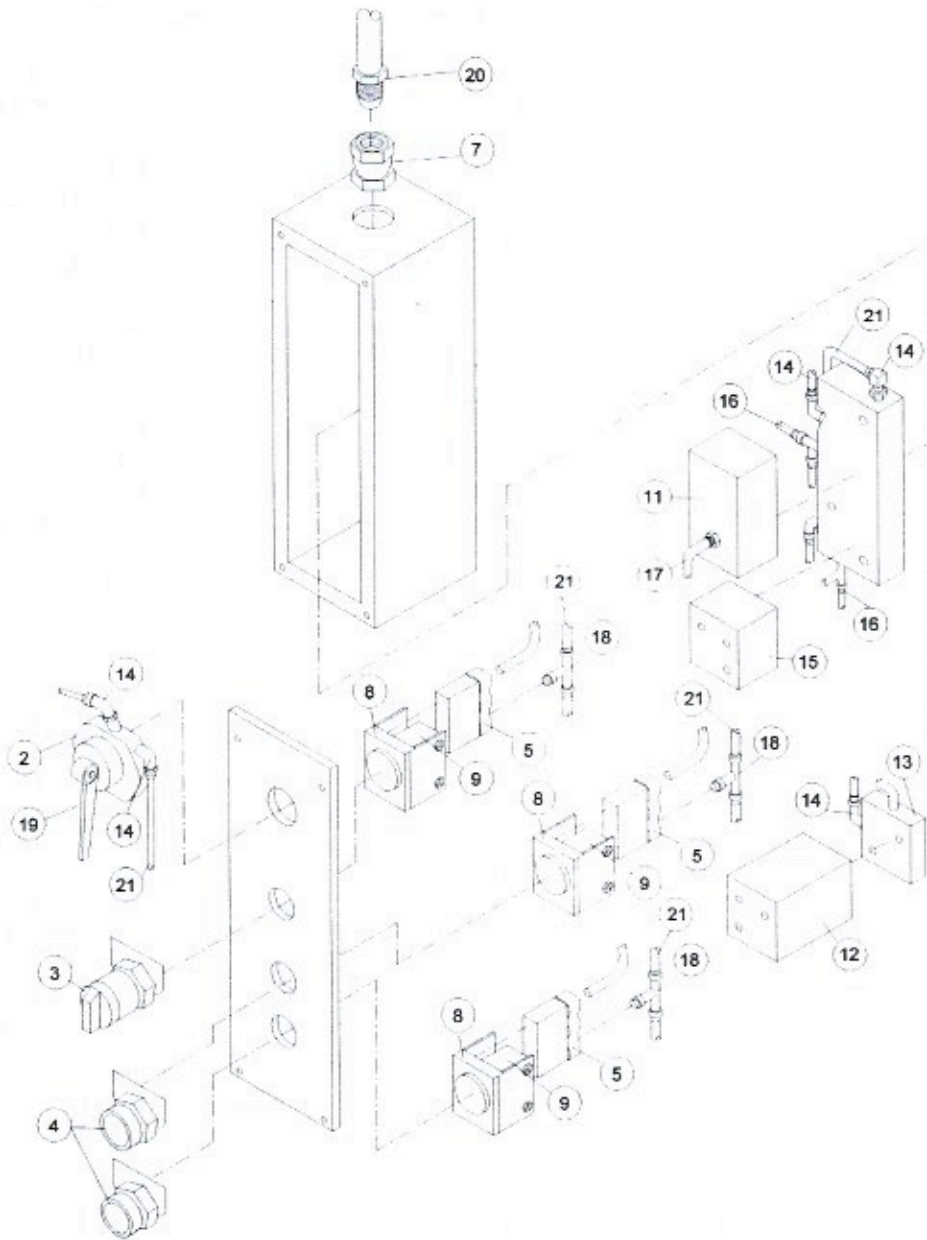




## SECTION 7 - DIAGRAM OF PARTS - CONTINUED

### 7.9- 200 Remote Control Pendant

#### 7.9.2 - 200 Remote Control Pendant - Exploded View

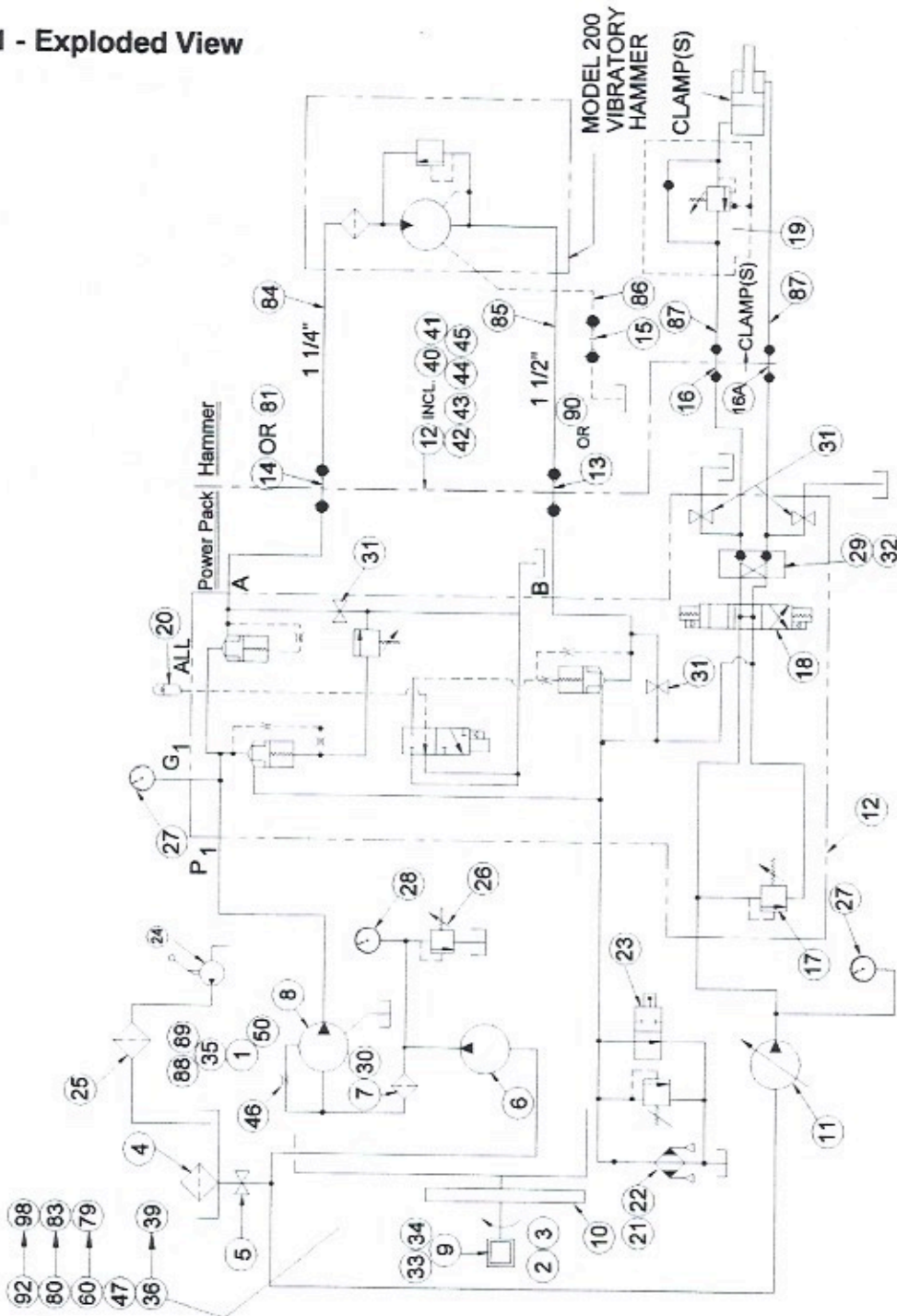




## SECTION 7 - DIAGRAM OF PARTS - CONTINUED

### 7.10 - Hydraulic Schematic - Model 200 Vibro Hammer & Power Pack

#### 7.10.1 - Exploded View

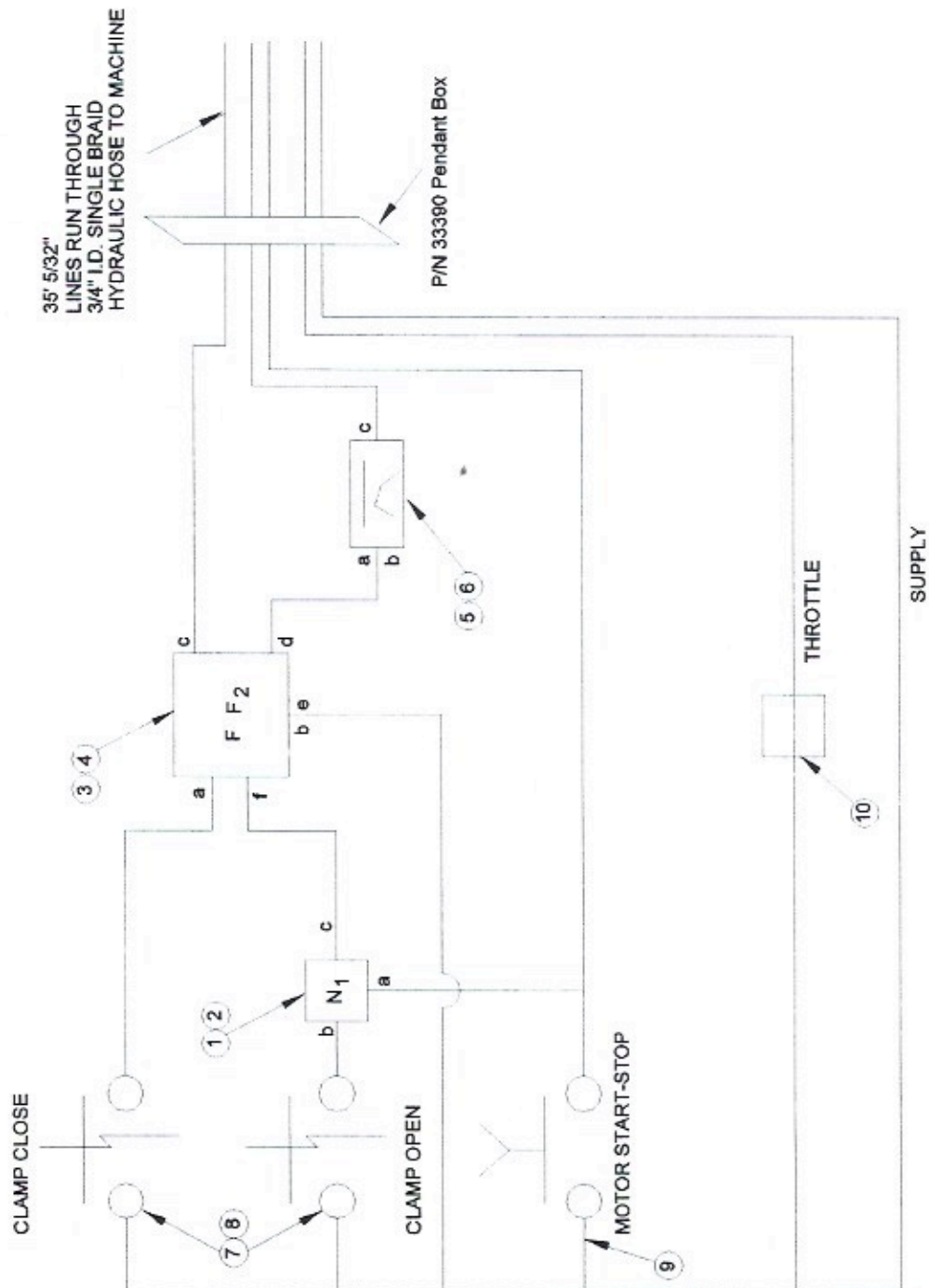




## SECTION 7 - DIAGRAM OF PARTS - CONTINUED

### 7.11- Air Schematic - Remote Control & Pendant - Vibro Power Pack

#### 7.11.1 - Exploded View





**HYDRAULIC POWER SYSTEMS INC.**

Release 01

Model 200 Operators, Maintenance, and Parts Manual

Effective Date 06/97

# PLACARD SECTION



**HYDRAULIC POWER SYSTEMS INC.**

Model 200 Operators, Maintenance, and Parts Manual

Release 01

Effective Date 06/97

**SECTION 8 - PLACARDS AND SAFETY  
SIGNS - CONTINUED**

**FUEL TANK  
DO NOT WELD**

**MAX PULL 45 TON**





**HYDRAULIC POWER SYSTEMS INC.**

Model 200 Operators, Maintenance, and Parts Manual

Release 01

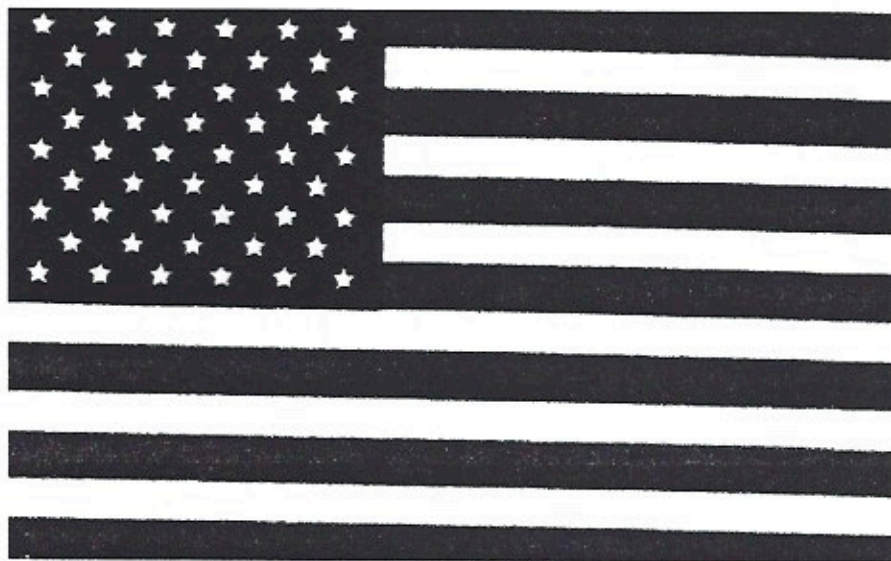
Effective Date 06/97

## **SECTION 8 - PLACARDS AND SAFETY SIGNS - CONTINUED**

### **CALIFORNIA**

#### **Proposition 65 Warning**

**Diesel engine exhaust and some of its  
constituents are known to the State of  
California to cause cancer, birth  
defects, and other reproductive harm.**



# **MADE IN AMERICA**