



TABLE OF CONTENTS

SECTION	DESCRIPTION	PAGE
	TABLE OF CONTENTS	1-4
1.0	GENERAL INFORMATION	5
1.1	Warranty	5
1.2	Model 150 Vibratory Exciter w/ Power Unit	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
2.0	SAFETY INFORMATION	8
2.1	Important Safety Information	8
2.2	Standard Safety Procedures	9-10
3.0	INTRODUCTION	11
3.1	Specifications	11
3.2	General Overview	12
4.0	MAINTENANCE	13
4.1	Daily Maintenance	14
4.2	General Maintenance	15
4.2.1	Power Unit	16
4.2.2	Vibratory Exciter	16
4.3	Maintenance Schedule	17
4.4	Torque Specifications	18
4.5	Fluids and Filters Specifications	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
4.6	Disassembly of Exciter Case	21
4.6.1	Remove Clamp Housing	22
4.6.2	Remove Suspension Housing	22
4.6.3	Disassembly of Exciter	23-24
4.6.4	Removal of Eccentric Shafts	24
4.6.5	Removal and Replacement of Eccentric Bearing into Bearing Support Sleeves	25-26
4.6.6	Reassembly	27-30
4.7	Movable Jaw Replacement	31
4.7.1	Exploded View of Parts	31
4.7.2	Jaw Replacement	32
4.7.3	Rebuilding the Model 150 Clamp Cylinder	32-33
5.0	Operation	34
5.1	Connecting the Hydraulic Hoses	34
5.1.1	Connecting the Hydraulic Hoses between the Power Pack and the Exciter	34
5.2	Pre-Start	34
5.2.1	Power Unit	34-36
5.2.2	Vibratory Exciter	36-37
5.3	Starting Units	38
5.3.1	Power Unit	38
5.3.2	Vibratory Exciter	39-40
5.4	Stopping the Unit	40-41
5.5	Setting System Flows and Pressures	41
5.5.1	V-90 Drive Pressure Relief Setting	41-42
5.5.2	Clamp Pump Pressure	43
5.5.3	Setting Clamp Pump Flow	43-44



TABLE OF CONTENTS

SECTION	DESCRIPTION	PAGE
6.0	TROUBLESHOOTING	44
6.1	Power Unit	44
6.1.1	Engine Will Not Start	44-45
6.1.2	Throttle Will Not Operate	45
6.2	Vibratory Exciter	45
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	Excessive Driving Time/Temperature	49
7.0	DIAGRAM OF PARTS	51
7.1	Exciter Gear Case	52
7.1.1	Bill of Materials	52
7.1.2	Exploded View	53
7.2	Vibration Suppressor	54
7.2.1	Bill of Materials	54
7.2.2	Exploded View	55
7.3	Model 150 Universal Sheeting Clamp	56
7.3.1	Bill of Materials	56
7.3.2	Exploded View	57
7.4	Model 150-100 Ton Caisson Clamp	58
7.4.1	Bill of Materials	58
7.4.2	Exploded View	59
7.5	Model 150 Caisson Beam	60
7.5.1	Bill of Materials	60
7.5.2	Exploded View	61



TABLE OF CONTENTS

SECTION	DESCRIPTION	PAGE
7.6	Brake Manifold	62
7.6.1	Bill of Materials	62
7.6.2	Exploded View	63
7.7	Hydraulic Manifold	64
7.7.1	Bill of Materials	64
7.7.2	Exploded View	65
7.8	Power Unit Replacement Parts	66
7.8.1	Bill of Materials	66
7.8.2	Exploded View	67
7.9	Remote Control Pendant	68
7.9.1	Bill of Materials	66
7.9.2	Exploded View	69
7.10	Hydraulic Schematic	70
7.10.1	Bill of Materials	70
7.10.2	Exploded View	71
7.11	Air Schematic/Remote Control & Pendant	72
7.11.1	Bill of Materials	72
7.11.2	Hydraulic Schematic	73
8.0	Placard Section	75
8.1	Placards and Safety Sign	76-80



SECTION 1-GENERAL INFORMATION

1.1 Warranty

HYDRAULIC POWER SYSTEMS, INC. hereby warrants that the Model 500 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, N. 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 re-shipped 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 party 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 writing, signed by the parties to the 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

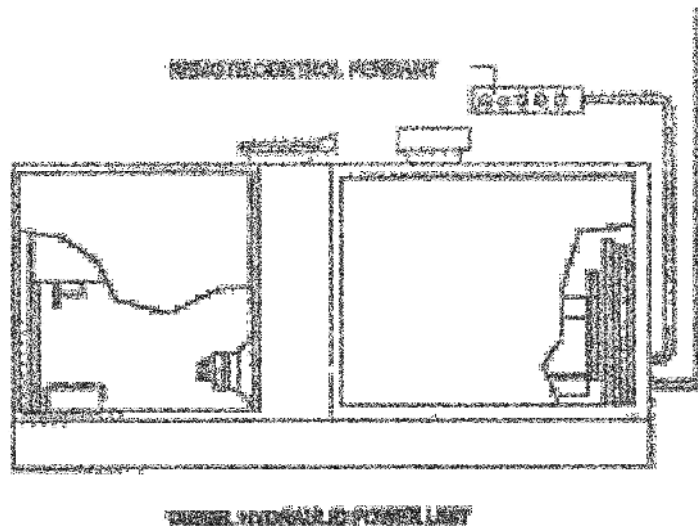
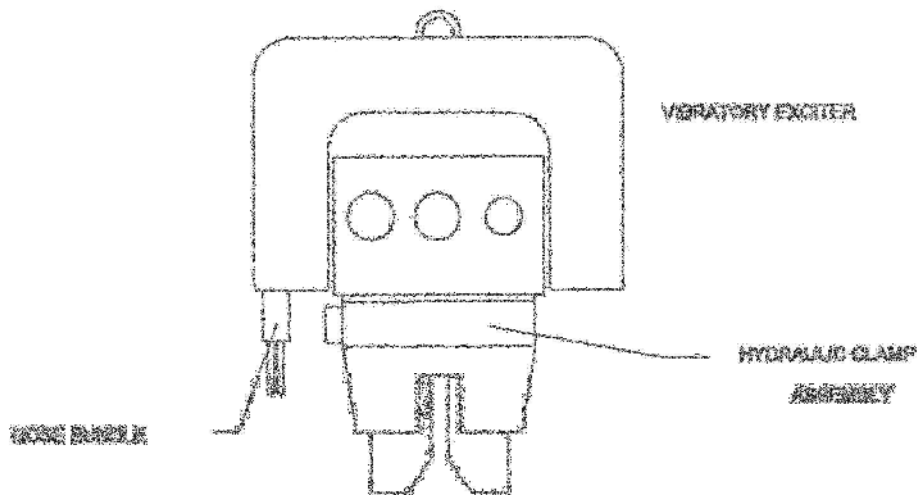


SECTION 1-GENERAL INFORMATION

1.2-Model 150 Vibratory Exciter with Power Unit

The **H.P.S.I. Model 150 Vibratory Pile Hammer** is designed for the installation and removal of a variety of types of piling. It utilizes high-speed directional vibration and customized hydraulic clamping accessories.

The Model 150 consists of five main parts: A **vibratory exciter**, A **hydraulic clamp** assembly suitable for driving or pulling a particular type of pile; A **hydraulic hose bundle** 100 feet in length; And is driven by a **diesel hydraulic power unit**, and **remote control pendant** that operates the hydraulic pumps and motors as well as providing pressure for the hydraulic clamp assembly.





SECTION 1-GENERAL INFORMATION-continued

1.2-Model 150 Vibratory Exciter with Power Unit

1.2.1-Vibratory Exciter

The vibratory exciter head consists of four gears turning four eccentric weights driven by a Volvo 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 8 rubber suppressors and provides for a maximum line pull of 30 tons of extracting force.

1.2.2-Diesel Hydraulic Power Unit

The 150 diesel hydraulic power unit is equipped with a Caterpillar Diesel Engine with a rated output of 210 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 150 and allows the operator to move around for the best view of the worksite.

1.2.3-Hydraulic Hose Bundle

The 150 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

2.1 Important Safety Information

Most accidents involving product operation, maintenance and repair are caused by a failure to observe basic safety rules and precautions. An accident can often be avoided by recognizing potentially hazardous situations before the situation occurs. A person must always be alert to potential hazards. This person should also have the necessary training, skills, and tools to perform these functions properly.

DANGER

WARNING: IMPROPER OPERATION AND/OR MAINTENANCE OF THIS PRODUCT CAN BE EXTREMELY DANGEROUS AND COULD RESULT IN SERIOUS INJURY OR DEATH.

DO NOT OPERATE, MAINTENANCE, OR PERFORM ANY REPAIRS ON THIS PRODUCT UNTIL YOU HAVE READ AND UNDERSTOOD THE OPERATION, MAINTENANCE AND REPAIR INFORMATION IN THIS MANUAL.

SAFETY PRECAUTIONS AND WARNINGS ARE ALSO PROVIDED ON THE PRODUCT. IF THESE HAZARD WARNINGS ARE NOT HEEDDED, SERIOUS BODILY INJURY OR DEATH COULD OCCUR TO YOU OR OTHER PERSONS.

HYDRAULIC POWER SYSTEMS, INC. cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the product are therefore not all inclusive. If a tool, procedure, work method or operation technique not specifically recommended by H.P.S.I. is used, you must first determine that it is in no way dangerous for you and others in the vicinity. Concern for the safety of the product should also be taken into consideration. You should ensure that the unit will not be damaged or made unsafe by the particular operation, maintenance, or repair procedures you choose.



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 2-SAFETY SECTION 2-SAFETY-continued

2.2-Standard Safety Procedures-continued

EXTINGUISH ALL OPEN FLAMES INCLUDING CIGARETTES OR OTHER BURNING SUBSTANCES WHILE CHECKING BATTERY ELECTROLYTE LEVEL. BATTERIES GIVE OFF FLAMMABLE FUMES.

ELECTROLYTE SOLUTION IS AN ACID. CONTACT WITH EXPOSED SKIN WILL CAUSE SERIOUS INJURY. ALWAYS WEAR PROTECTIVE GEAR WHEN REFILLING AND HANDLING ELECTROLYTE SOLUTION.

POWER UNIT MUST HAVE PROPER VENTILATION TO INSURE SAFE AND EFFICIENT OPERATION.

NEVER ATTEMPT REPAIRS YOU DO NOT UNDERSTAND. ALWAYS FOLLOW MANUAL INSTRUCTIONS.

ALWAYS REPAIR AND/OR REPLACE BROKEN OR DAMAGED PARTS BEFORE OPERATION. USE OF INCORRECT TOOLS IN OPERATION AND REPAIR SITUATIONS CAN FURTHER INCREASE RISKS TO MACHINERY AND OPERATORS.

REMOVE ALL TOOLS, ELECTRICAL CORDS, AND OTHER LOOSE ITEMS FROM THE POWER UNIT AND VIBRATORY EXCITER PRIOR TO USE.

DISPOSE OF WASTE OIL AND OTHER WASTE PRODUCTS SAFELY. ALWAYS WIPE UP SPILLED OIL, COOLANT, FUEL, ETC.

SAFELY DISPOSE OF CONTAMINATED RAGS AND CONTAINERS. NEVER LEAVE IN OR ON THE POWER UNIT CONTAINER. NEVER STORE FLAMMABLE LIQUIDS NEAR THE POWER UNIT OR EXCITER.

DANGER!

INSULATE ALL ELECTRICAL CONNECTIONS AND DISCONNECTED WIRES.

DISCONNECT AND TAPE THE BATTER GROUND LEAD BEFORE WORKING ON THE ENGINE TO PREVENT ACCIDENTAL IGNITION.

WHEN RIGGING THE VIBRATOR A STEEL WIRE ROPE SLING MUST BE CONNECTED TO THE LIFTING PIN OR SHACKLE OF THE VIBRATION SUPPRESSOR. THE REQUIRED STRENGTH OF THIS SLING DEPENDS ON THE CAPACITY OF THE CRANE AND THE WORK TO BE DONE. A SAFETY FACTOR OF 5 IS RECOMMENDED.



SECTION 3-INTRODUCTION

3.1-Specifications

H.P.S.I MODEL 150 VIBRATORY PILE HAMMER SPECIFICATIONS

EXCITER

ECCENTRIC MOMENT	1500 in./lbs.
FREQUENCY	1600 c.p.m.
DYNAMIC FORCE	55 tons
AMPLITUDE, INCHES	875 "
MAXIMUM LINE PULL	30 tons
PILE CLAMPING FORCE	50 tons
SUSPENDED WEIGHT	7050 lbs.
WIDTH	87"
THROAT WIDTH	14"
HEIGHT	78"

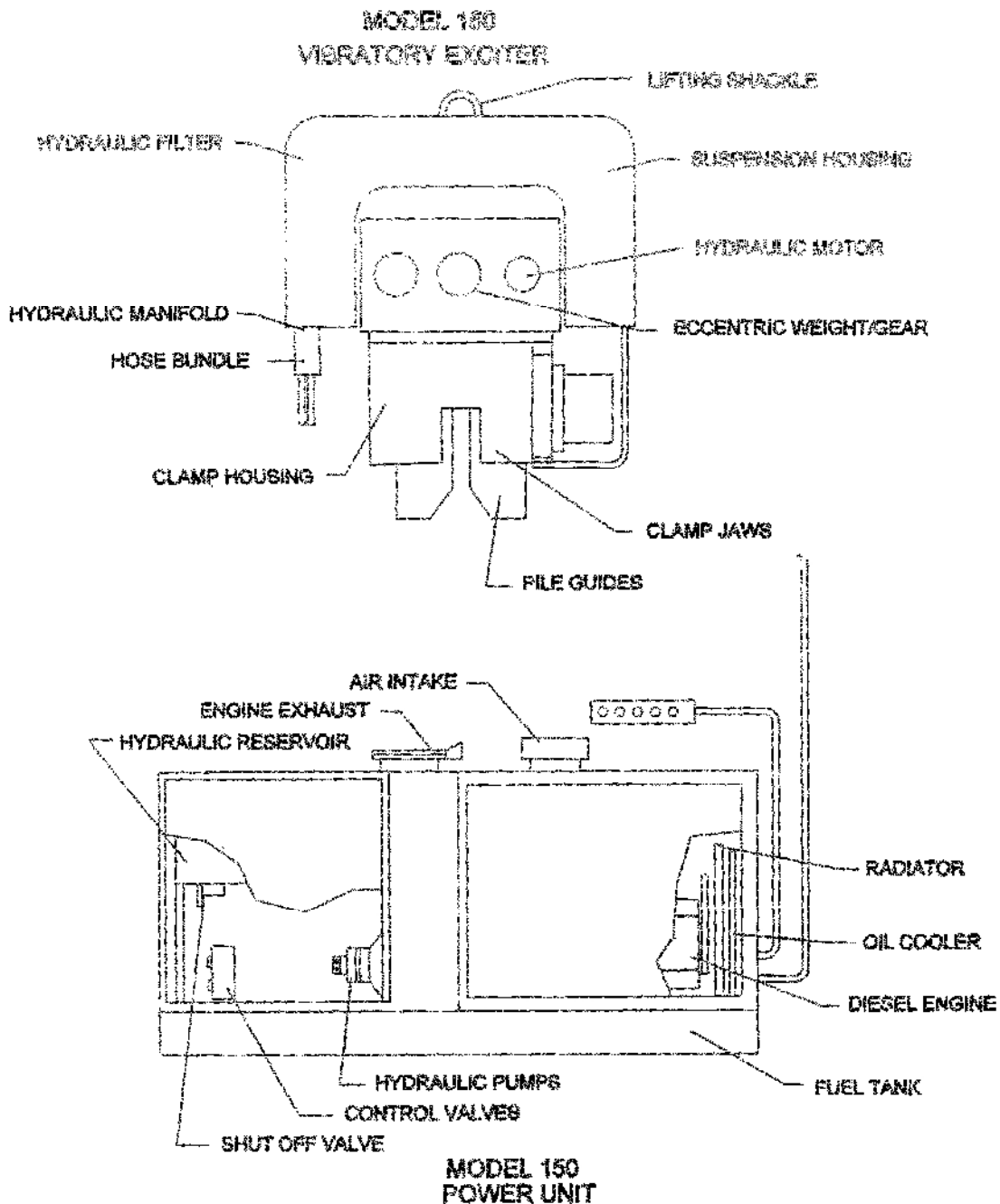
POWER PAC

DIESEL ENGINE	210 H.P.
HYDRAULIC FLOW	120 G.P.M.
MAXIMUM DRIVE PRESSURE	2500 p.s.i.
MAXIMUM CLAMP PRESSURE	2500 p.s.i.
WEIGHT	7800 lbs.
LENGTH	108"
WIDTH	48"
HEIGHT	78"
REMOTE PENDANT	AIR
SHEET METAL ENCLOSURE	STANDARD



SECTION 3-INTRODUCTION SECTION 2-SAFETY-continued

3.2-General Overview





Hydraulic Power Systems INC.

Release 01

Model 150 Operators , Maintenance, and Parts Manual

Effective Date 08/98

MAINTENANCE SECTION



SECTION 4-MAINTENANCE

4.1-Daily Maintenance

- 1) Make a “walk-around” inspection of the Power Unit and the Vibratory Exciter. Taking a few minutes to recognize and correct minor discrepancies can prevent major repairs at a later date.
- 2) Measure the crankcase oil level. The oil level must be between ADD and FULL marks on the dipstick. Refer to the Caterpillar Oil capacities and specifications located on the engine or in the manual for recommended oil types and capacities.
- 3) Inspect the coolant level. The level must be to the bottom of the radiator filler neck.
- 4) All guards must be in place. Repair or replace any guards that are missing or 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 specifications located in Section 4.5.1 of this manual.
- 6) Visually check all hydraulic hoses and fittings for any visible signs of oil leaks and correct if necessary.
- 7) 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.
- 8) Check all nuts, bolts, and visible fasteners for any necessary or required maintenance. Replace any missing or faulty nuts, bolts, fasteners or components as necessary.
- 9) Check the condition of the two Fixed Jaw bolts, P/N 33044, and replace if loose, cracked or broken prior to using the Exciter.
- 10) Check the condition of the Movable Jaw Pin, P/N 33040, and replace if loose, cracked or broken prior to using the Exciter.
- 11) Check the condition of the Movable Jaw, P/N 32082, for any possible cracks or damage and replace prior to using the Exciter.



SECTION 4-MAINTENANCE SECTION 2-continued

4.1-Daily Maintenance-continued

12) Upon lifting the 150 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 32285, 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 on top of the hydraulic tank. 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

4.2.2-Vibratory Exciter

- 1) Check the Exciter Case gear lube level for signs of moisture or extreme heat. Replace if either condition is evident.
- 2) Replace Gear Oil every 3 months or 100 hours, whichever comes first.
- 3) Run the Exciter at least once a month to maintain lubrication of pumps, Eccentric Bearings, and other vital parts.
- 4) Replace all missing or damaged bolts, nuts or fasteners immediately and prior to starting or using the Vibratory Exciter.
- 5) Replace any damaged hoses on the Exciter or the Hose Bundle when any evidence of potential failure exist.
- 6) Repair any oil leaks from the Exciter Case as soon as evidence exist of leaks to ensure that the Gear Case does not run low or without Gear Oil.
- 7) Replace gear oil immediately after any unauthorized use.
- 8) Turn exciter from stored side down to stored side up when exciter is stored for extended periods of time. It is not necessary to start unit with dry bearings in the exciter case.



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

4.4-Torque Specifications

1) Proper torque applied to all the fasteners and bolts on a Vibratory Exciter greatly reduces systematic problems and frequent repairs. It is therefore extremely important that the following chart be followed with as much precision as possible.

2) All torque specs are for lubricated threads. It is recommended that oil be used to lubricate threads on all fasteners to assure proper torque. **DO NOT USE “ANTI-SEIZE” IN ANY AREA OPEN TO THE GEAR BOX OF THE EXCITER.**

THE USE OF LOCTITE WILL ACHIEVE THE SAME LUBRICATION AS “LUBRICATED TORQUE VALVES”.

3) Listed below are the major fasteners used in the assembly of the **H.P.S.I. MODEL 150 VIBRATORY HAMMER**. For any information regarding the fasteners used on this product, please consult the factory.

SIZE	TYPE	REQUIRED TORQUE
3/8"	16 SOCKET-HEAD GRADE 8	59 FT./LBS.
1/2"	13 HEX-HEAD GRADE 8	107 FT./LBS.
1/2"	13 SOCKET-HEAD GRADE 8	144 FT./LBS.
5/8"	11 HEX-HEAD GRADE 8	212 FT./LBS.
3/4"	10 HEX-HEAD GRADE 8	376 FT./LBS.
3/4"	10 NUT GRADE 8	188 FT./LBS.
3/4"	10 SOCKET-HEAD GRADE 8	500 FT./LBS.
1"	8 HEX-HEAD GRADE 8	909 FT./LBS.
1"	8 SOCKET-HEAD GRADE 8	1044 FT./LBS.
1"	8 LOCK NUT	455 FT./LBS.
1 1/2"	6 HEX-HEAD GRADE 8	SEE #4 below

4) The achievement of the proper torque value on this bolt might exceed the average capacity of an ordinary torque wrench. Use the “turn of the nut” method to tighten bolt properly.

5) There are many fasteners available which are not suitable for use with HPSI products. Replace with only “American Manufactured” or factory replacement fasteners.



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

4.5-Fluids and Filters Specifications-continued

4.5.4-Filters

SERIAL # HPS

ENGINE MODEL

ENGINE SERIAL #

ENGINE ARRANGEMENT #

Engine Oil Filter

Engine Primary Fuel Filter

Engine Fuel Filter

Engine Air Filter

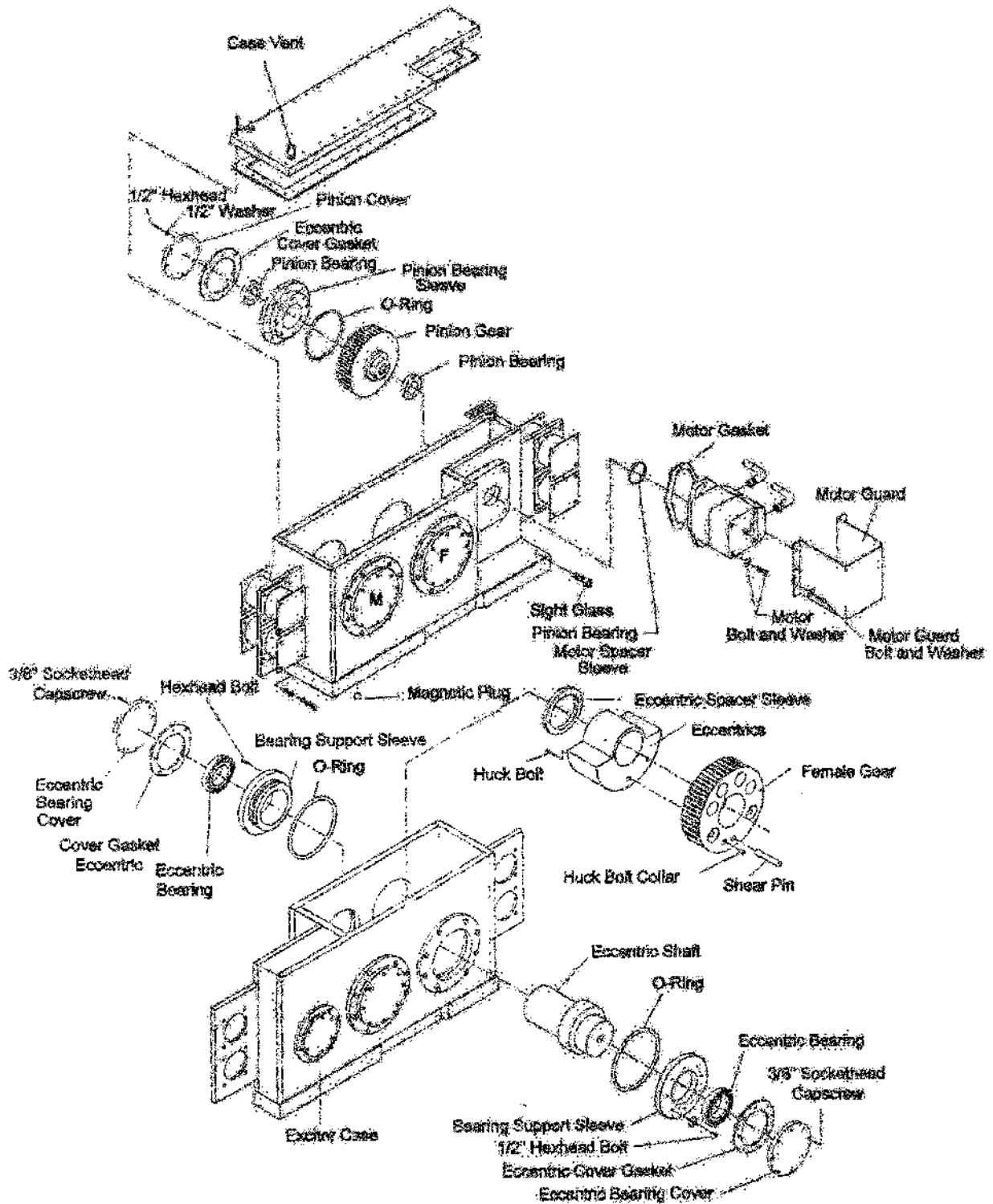
Hydraulic Return Tank Filters-Parker Element #932410,

HPSI P/N 00849

Spin On Hand Pump Filter-Gresen FSP-107, HPSI P/N 33184

SECTION 4-MAINTENANCE-continued

4.6-Disassembly of Exciter Case





SECTION 4-MAINTENANCE-continued

4.6-Disassembly of Exciter Unit

Thoroughly steam clean vibratory exciter. Disconnect hydraulic hose bundle from brake valve manifold and hose block.

4.6.1-REMOVE CLAMP HOUSING

- 1) Remove clamp guard.
- 2) Remove clamp hoses from case.
- 3) Remove the 6– 1 3/4” bolts on the clamp.

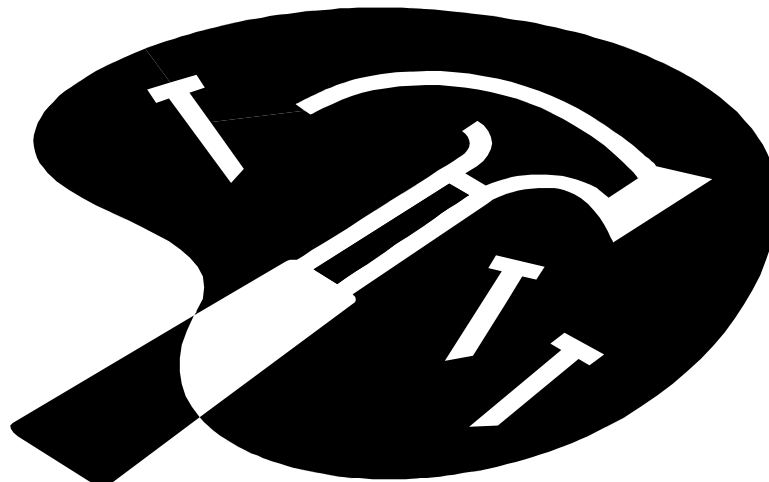
4.6.2-REMOVE SUSPENSION HOUSING

- 1) Remove suspension stop bolts and nuts. Lower suspension stop blocks from suspension housing.
- 2) Remove motor guard.
- 3) Remove the motor hose and clamp hoses from the motor and exciter case. Install plugs in the motor port to avoid contamination.
- 4) Remove the outer shear fender bolts and nuts from both sides of suspension.
- 5) Raise suspension from exciter case.

4.6-Disassembly of Exciter Unit-continued

4.6.3-DISASSEMBLY OF EXCITER CASE

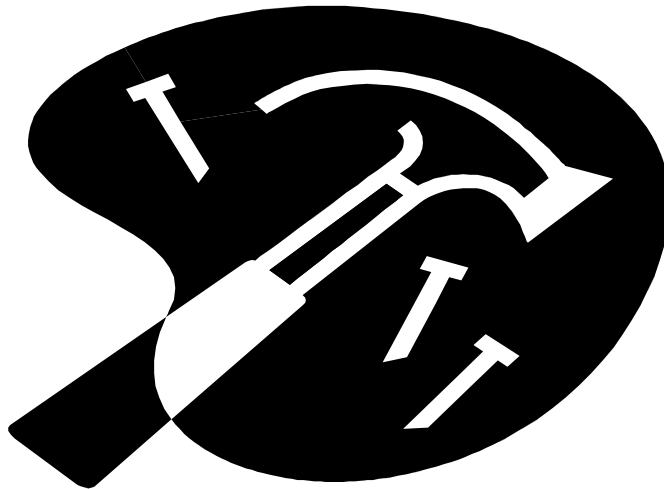
- 1) Thoroughly steam clean exciter case before any disassembly or removal of gear case cover or bearing covers.
- 2) Drain gear lube from exciter case into clean container by removing magnetic plug from bottom of exciter case (approximately 5 gallons). **DO NOT RE-USE GEAR OIL.** Clean container is 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

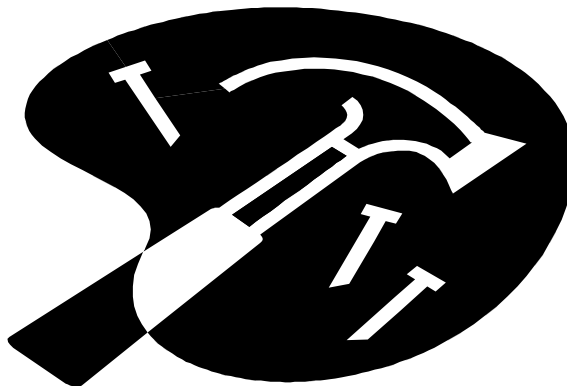
4.6.3-DISASSEMBLY OF EXCITER CASE-continued

8) To remove bearing support sleeves, use bearing sleeve/shaft removal puller (as shown below).



4.6.4-REMOVAL OF ECCENTRIC SHAFTS

1) Attach sleeve/shaft removal tool to threaded end of shaft. Shaft shoulder only allows removal from one side of case.



It is recommended that the shaft be supported during removal because of excessive weight. Retrieve shaft spacer and inner race as shaft is removed.

NOTE: ECCENTRIC ASSEMBLIES ARE FITTED WITH SHAFT SPACERS AT FACTORY FOR END PLAY TOLERANCES. It is necessary to retain the original eccentric shaft and spacer as a set to ease reassembly.

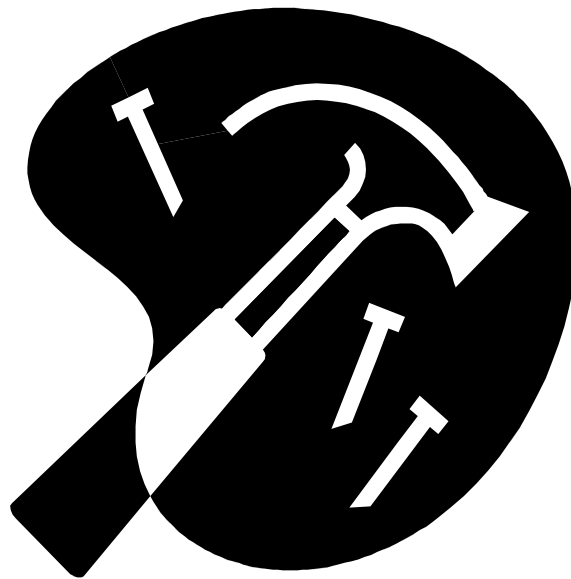
4.6-Disassembly of Exciter Unit-continued

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.

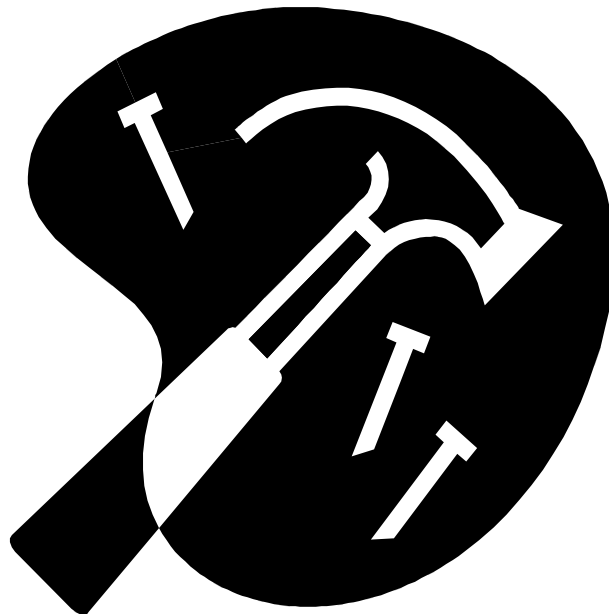


- 2) Thoroughly clean the bearing support sleeve and visually inspect for any damage.

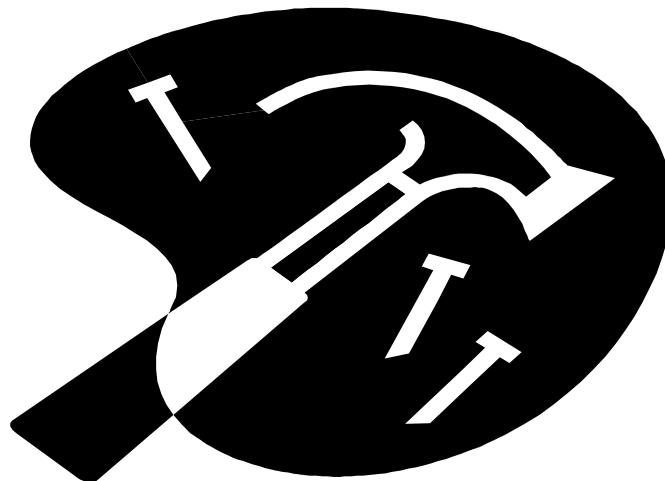
4.6-Disassembly of Exciter Unit-continued

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

3) Reinstall with new eccentric bearings per factory specification utilizing bearing press. **DO NOT INSTALL WITH HAMMER OR MALLET!**



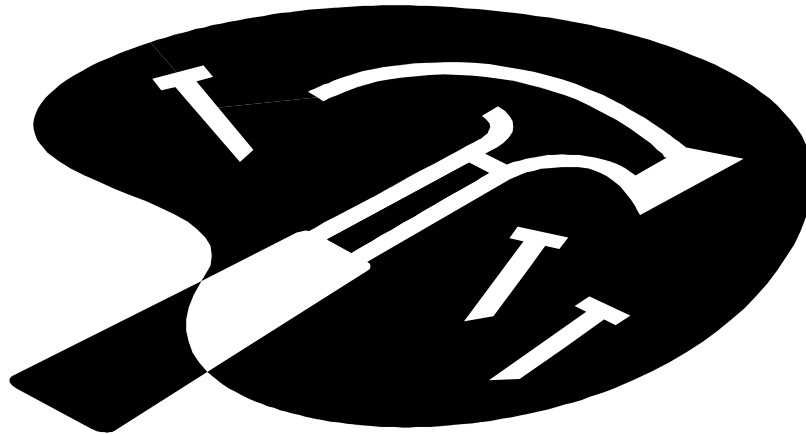
4) Visually inspect the gap between the bearing sleeve lip and the outer bearing race to verify bearing is seated properly.



4.6-Disassembly of Exciter Unit-continued

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

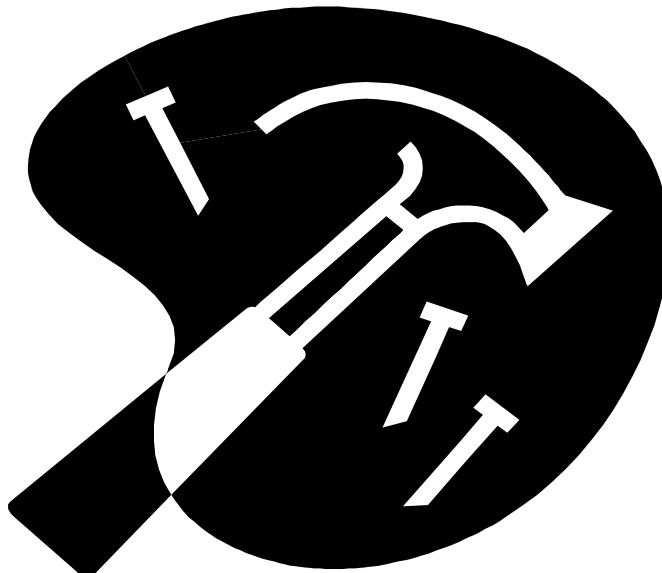
5) Replace bearing sleeve o-rings with factory type o-rings only (high temperature).



4.6.6-REASSEMBLY

1) Thoroughly steam clean inside of gear case. Inspect for any loose material inside the box.

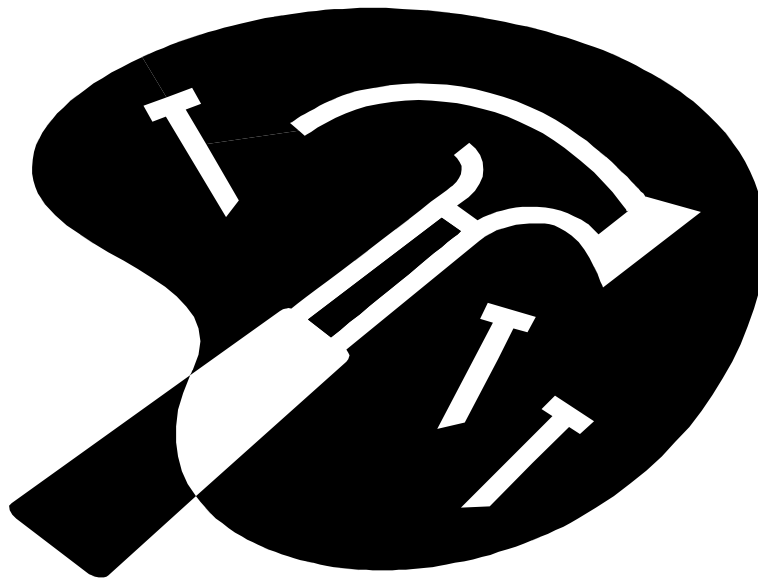
2) Lower eccentric/gear assembly into gear case to original location. Male and female gears must be positioned properly. See location on exploded view section 4.6.



4.6-Disassembly of Exciter Unit-continued

4.6.6-REASSEMBLY-continued

- 3) Reinstall eccentric shaft into original location.
- 4) Reinstall original shaft spacer sleeve while maintaining shoulder on opposite side tightly against gear/eccentric assembly.
- 5) Install inner races on shaft. Maintain tightness of shoulders on both ends to obtain proper end play on shaft assembly after final assembly.
- 6) Using a top and bottom dowel, install bearing support sleeve into case. Locate oil drain ports, top and bottom, to allow proper oil circulation.

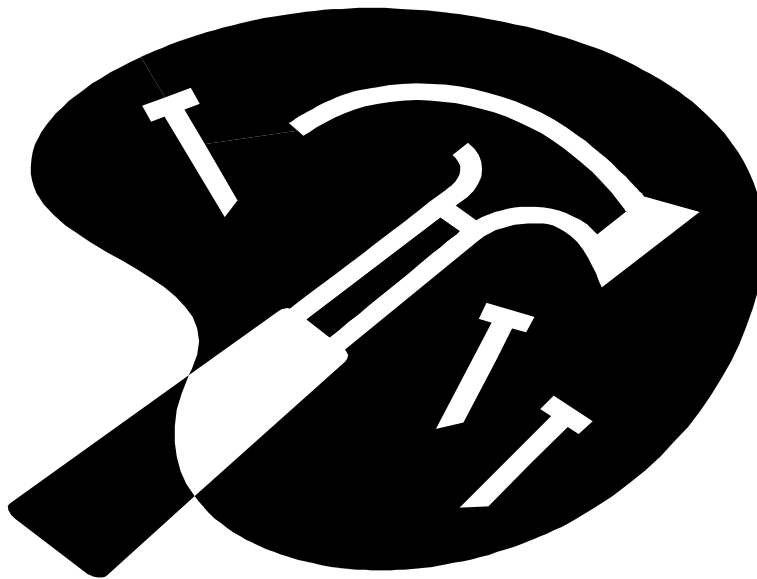


Pull bearing sleeve into case by tightening bolts in a star pattern, lightly, one at a time until the sleeve is fully pulled into the case. **DO NOT OVER-TIGHTEN AS DAMAGE TO THE CASE THREADS MAY OCCUR.** Properly torque all bolts per specifications. Improperly torque bolts or bolts installed without flat washers WILL break under vibration. Use Loctite on all fasteners.

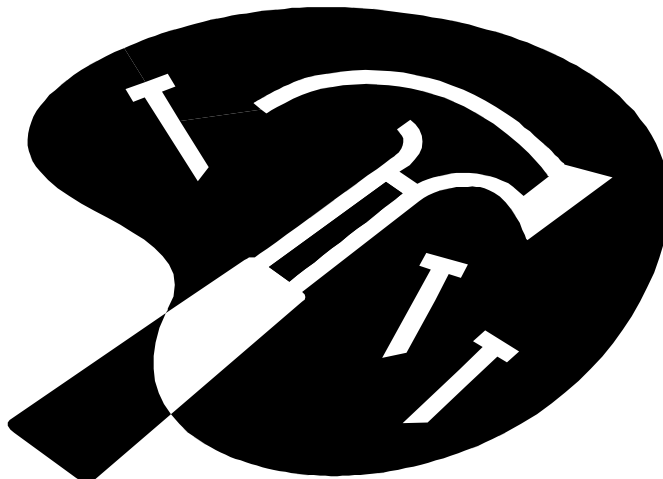
4.6-Disassembly of Exciter Unit-continued

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.



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.





4.6-Disassembly of Exciter Unit-continued

4.6.6-REASSEMBLY-continued

- 9) Install new pinion bearing into pinion bearing sleeve. Replace o-ring. Position pinion gear into case. Pull pinion bearing sleeve into case in same manner as eccentric bearing sleeves.
- 10) Replace pinion bearing cover without gasket to hold bearing in place.
- 11) Install motor side pinion bearing into case. Locate far enough into case to allow initial installation of motor spacer sleeve.
- 12) Locate dial indicator into pinion gear area and tighten spacer ring until .025" to .040" end play has been achieved.
- 13) Remove pinion cover and reinstall with proper gasket. Torque bolts to proper tightness.
- 14) Install all bearing covers with factory gaskets. Tighten bolts to proper torque.
- 15) Fill gear case to proper level (middle of sight-glass) with gear oil.
- 16) Install gear case cover with new gasket. Tighten to proper torque.

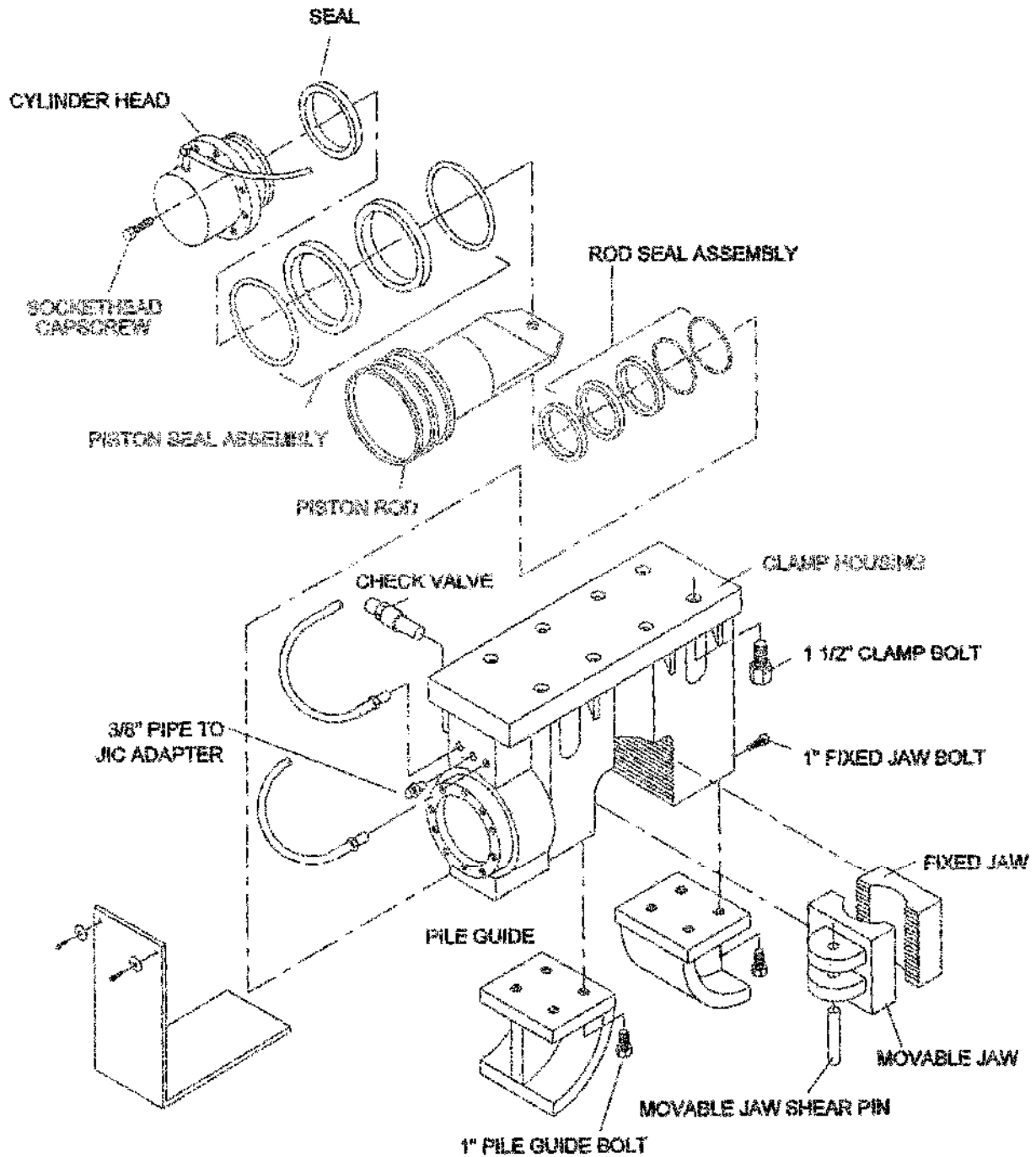
CAUTION!

NEVER ALLOW BOLTS OR TOOLS TO BE SET AROUND THE OPEN TOP OF THE GEAR BOX. TOTAL GEAR/BEARING FAILURE WILL OCCUR DUE TO FOREIGN OBJECTS FALLING IN THE OPEN GEARBOX!

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

4.7.2-Jaw Replacement

- 1) Remove the two fixed jaw bolts and fixed jaw.
- 2) Remove the movable Jaw pin by driving the pin down to expose the pin toward the top of the jaw. It may be necessary to remove the top half of the shear pin with a cutting torch to allow driving out the remaining portion of the shear pin.
- 3) Replace with new movable jaw and jaw pin. Start the movable jaw pin by partially driving the pin into the lower ear of the jaw. Then position the jaw on the end of the clamp piston rod. Complete driving the pin into the ear of the jaw and until the pin is driven 3/4" into the ear of the jaw.

NOTE: NEVER REUSE A MOVABLE JAW SHEAR PIN. REPLACE WITH A NEW PIN ANY TIME THE JAW IS REMOVED.

4.7.3-Rebuilding the Model 150 Clamp Cylinder.

- 1) Remove jaws as outlined in section 4.7.2.
- 2) Verify that there is NO PRESSURE on the clamp piston. To release the check valve located in the cylinder head of the clamp, loosen the lock nut and turn in the adjustment screw (clockwise) as far as possible.
- 3) Remove the socket head cap screws from the cylinder head of the clamp. Remove the cylinder head. Check by tightening these bolts, the head will pull away from the clamp allowing removal of the cylinder head.
- 4) Install a 3/4" lifting eye into the exposed end of the piston rod. It is much easier to raise the rod with the clamp positioned so that the rod is vertical and an overhead crane can be used to lift the rod from the clamp housing.
- 5) Remove all the seals from both the piston rod and the inside bore of the clamp.



SECTION 4-MAINTENANCE CONTINUED

4.7-Movable Jaw Replacement

4.7.3-Rebuilding the Model 150 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 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!!

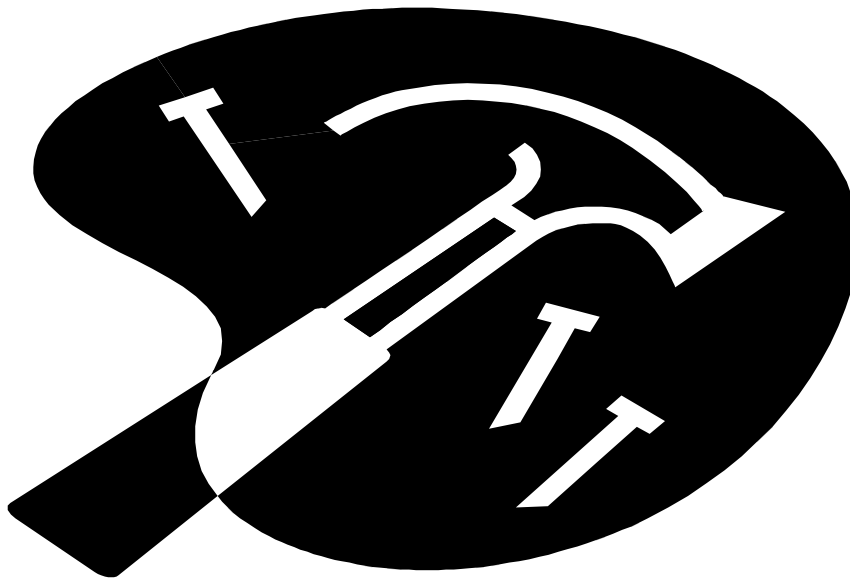
WARNING! NEVER REMOVE THE 3/8" PIPE PLUG FROM THE CYLINDER AREA OF THE CLAMP HOUSING. 5000 PSI MAY BE ON THIS PLUG. NEVER REMOVE THE CYLINDER CHECK VALVE WITHOUT RELEASING CLAMP PRESSURE.

SECTION 5-OPERATION

5.1-Connecting the Hydraulic Hoses

5.1.1-Connection of the Hydraulic Hoses between the Power Pack & Exciter

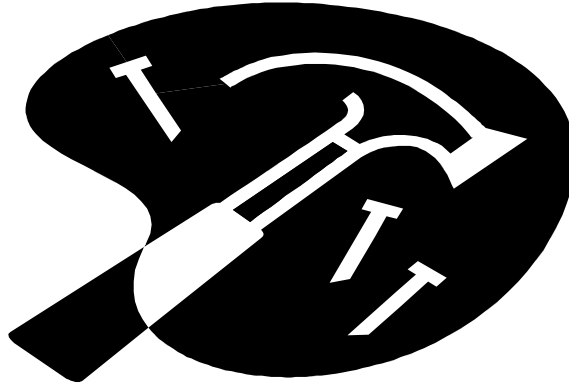
- 1) The Power Pack must be shut down during the connection of the hydraulic hoses.
- 2) The Vibrator Exciter and Power Pack are connected with quick-disconnect couplers.
- 3) Clean quick disconnects with a lint free cloth and cleaning fluid before making the connections.
- 4) Make sure the couplers are fully hand tight. Do not use wrenches or hammers to avoid damaged internal parts of the quick disconnects.



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.



SECTION 5-OPERATION-continued

5.2-Pre-Start of Units

5.2.1-Power Unit

- 8) Clean the Quick Disconnects both on the Hose Bundle and the Power Unit prior to connecting the fittings together.
- 9) Be certain that the main shut-off valve located on the bottom of the hydraulic reservoir is in the open position. Failure to open this valve prior to starting the engine will result in major and costly pump damage.
- 10) Connect all five of the Quick Disconnect fittings from the Hose Bundle to the matching Quick Disconnects on the Hydraulic Manifold located behind the rear door of the Power Unit. (See 5.1.1 Connecting the Hydraulic Hoses).
- 11) 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.
- 12) To start the power pack refer to the Section "Starting Unit" 5.3.1 Power Unit. Let the Power Unit run for at least 15 minutes prior to starting the exciter.

5.2.2-Vibratory Exciter

- 1) The Model 150 has been designed to utilize a McKissick P/N S-2140-30 ton lifting shackle for the lifting of the Exciter. It is important that this Shackle is properly installed per the manufacturer's specifications and instructions, and that all of their safety recommendations and warnings are carefully followed.
- 2) Check all nuts, bolts, and visible fasteners for any necessary or required maintenance. Replace any missing or damaged nuts, bolts, fasteners or components as necessary.
- 3) Check all hydraulic hoses and fittings for any visible leaks, cracks, loose fittings or bolts and repair or replace as necessary prior to use.



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 33082, for any possible cracks or damage and replace if necessary prior to use.
- 7) Upon lifting the 150 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 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

5.3.1-Power Unit

- 1) After performing inspections, read the Caterpillar Operation and Maintenance Manual available with your unit. Should this manual not be with the unit, contact your Authorized Factory Representative, H.P.S.I., or your nearest Caterpillar dealer.
- 2) Do not start the diesel engine if the temperature of the Hydraulic oil is below 0 degrees F. Refer to the combination Sight/Temp Gauge located on the side of the Hydraulic Reservoir tank.
- 3) Should the environment for your application be in subzero climates, consult the factory for the installation and availability of in-tank heaters which operate on 110 volt, 40 AMP service. These heaters provide 3KW of power for warming the hydraulic oil before use.
- 4) Position the throttle handle located on the 30' Remote Pendant to the approximate center position.
- 5) Start the Diesel Engine by turning the Start Switch located on the Instrument Panel to the Start position. Upon starting the diesel engine, release the switch and it will return to the run position.
- 6) As soon as the Diesel Engine has started, return the throttle on the Remote Pendant to the Idle position. Repeat this sequence should the engine die.
- 7) Allow for the Diesel Engine to idle for 5 to 10 minutes or until the water temperature begins to rise and the hydraulic oil temperature has come up to above 60 degrees F.
- 8) Do not operate the unit at full speed until the hydraulic oil exceeds 60 degrees F.
- 9) If the hydraulic oil temperature will not exceed 60 degrees, adjust the engine speed to 1600 R.P.M. and "Free Hang" run the exciter by pushing the Start button located on the Remote Control Pendant.



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

5.3-Starting Units-continued

5.3.2-Vibratory Exciter

4) Without pulling on the Exciter, push the Start button on the Remote Pendant and allow the Exciter to come up to speed. After a few seconds, if extracting, beginning to pull up on the Exciter slowly as the pile begins to extract from the ground.



CAUTION: It is recommended that a safety cable **always** be attached to both the pile and a non-vibrating portion of the hammer, in the event that the hydraulic clamp loses clamp pressure.

5) The 150 Exciter is equipped with a Load Indicator Placard that indicates the maximum allowable pull on the Exciter. The **maximum load should not be exceeded**; because failure of the shear fender may occur.

6) **Never** un-clamp the pile from the Exciter when the Exciter is vibrating.

5.4-Stopping Units

1) To stop the Vibratory Exciter, turn the switch located on the Remote Pendant to the OFF position. **DO NOT** reduce the engine speed while the Exciter is coming to a stop.

2) With the Diesel Engine R.P.M. still at **maximum**, un-clamp the pile as safely as allowable.

3) The Diesel Engine R.P.M. may now be reduced to a suitable speed to allow for proper systems cooling as necessary. **During extreme driving, it is necessary to leave engine at maximum available R.P.M. to allow the proper cooling between pile.**

4) After the Hydraulic Oil and Diesel Engine temperatures have been allowed to cool, reduce the Diesel Engine speed to idle and turn the Engine Start Switch to the OFF position.

NOTE: DURING OPERATION IN EXTREME HEAT OR HARD DRIVING IT IS NECESSARY TO LEAVE THE ENGINE AT HIGH IDLE AT ALL TIMES TO INSURE PROPER COOLING OR HYDRAULICS AND ENGINE SYSTEMS.



SECTION 5-OPERATION-continued

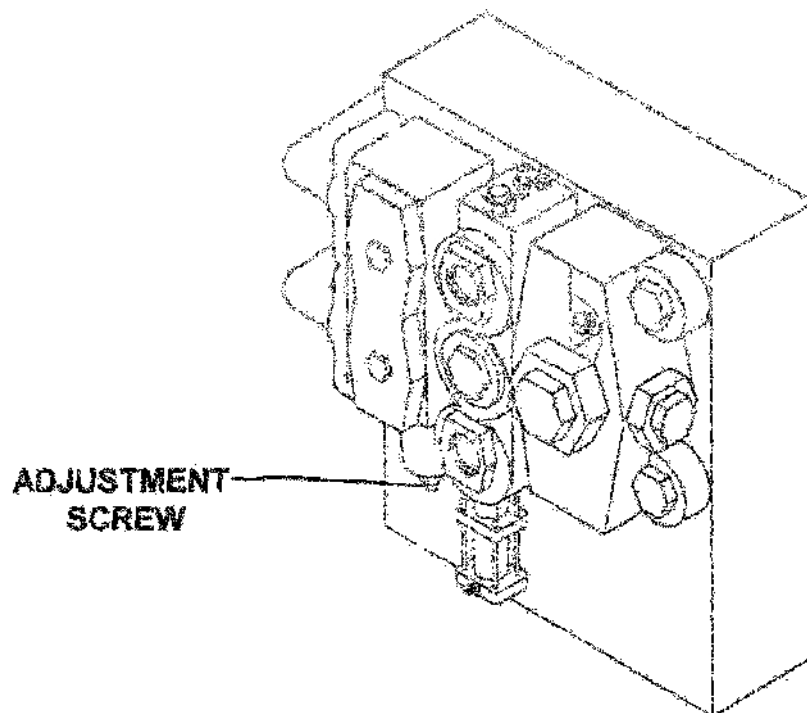
5.4-Stopping Unit-continued

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 the OFF/START switch is 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-V-90 Drive Pressure Relief Setting





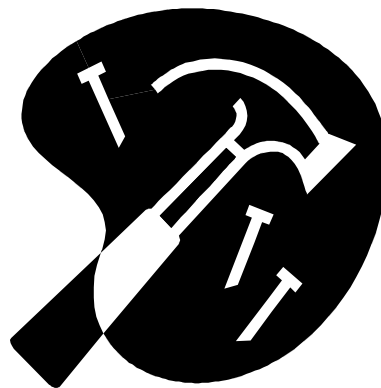
SECTION 5-OPERATION-continued

5.5-Setting System Relief Valves and Pressures-continued

5.5.1-V-90 Drive Pressure Relief Setting-continued

- 1) Shut off engine.
- 2) Loosen locking nut.
- 3) Back out adjusting screws.
- 4) Start engine.
- 5) Turn pendant switch to "VIBRO ON" position
- 6) Slowly screw in the adjustment screw until gauge pressure indicates 2500 PSI with oil at operating temperature.
- 7) Tighten lock nut.
- 8) Verify pressure after tightening lock nut.

**PUMP
PRESSURE
ADJUSTMENT**



**CLAMP
FLOW
ADJUSTMENT**



SECTION 5-OPERATION

5.5-Setting System Relief Valves and Pressures-continued

5.5.2-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 turns.
- 3) Raise the clamp pump pressure to maximum setting by turning 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 reaches 5000 P.S.I.
- 7) Shut down unit and tighten locking nuts.
- 8) Restart the unit and recheck pressure to 5000 P.S.I.

“FAILURE TO SET THE RELIEF VALVE PRESSURE HIGHER THAN THE CLAMP PRESSURE WILL RESULT IN CLAMP PUMP FAILURE.”

5.5.3-Setting Clamp Pump Flow

The best way to set the flow is with the aid of a flow meter. However, the flow can be set by turning the adjustment **IN** 3 to 3 1/2 turns after the adjusting screw comes in contact with spring. This will give about 11-12 G.P.M. The maximum volume stop when backed out all the way **OUT** will give about 17-19 G.P.M.



SECTION 5-OPERATION

5.5-Setting System Relief Valves and Pressures-continued

CAUTION: IT IS NECESSARY FOR ONLY TRAINED PERSONNEL TO PERFORM PRESSURE ADJUSTMENTS TO THE HYDRAULIC SYSTEM. CONSULT YOUR AUTHORIZED FACTORY REPRESENTATIVE FOR ASSISTANCE.

SECTION 6-TROUBLESHOOTING

NOTE: The following information may be useful in aiding qualified individuals in determining and correcting many common problems. However, not all circumstances can be foreseen nor all minor mistakes covered. Please consult your Factory Authorized Representative or H.P.S.I. for any detailed information not covered in this manual.

6.1-Power Unit

6.1.1-Engine Will Not Start

- 1) Faulty battery—Test, and recharge or replace if necessary
- 2) Master ON/OFF switch—Verify that it is in the ON position.
- 3) Master Circuit Breaker—Reset if necessary. Red button on electrical box-out to run.
- 4) Fuel pressure too low—Prime fuel pump.



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

6.2.2-Specific Functions of Remote Pendant Do Not Operate Properly

- 1) Check air supply to Remote Pendant—Verify that pressure is available to the air hose manifold in the Power Pac.
- 2) Verify that air pressure is present at the inlet port of the valve which is not functioning. If so, replace the push-button of the nonworking function to correct if air is determined to be going to the button and not being discharged from the button.

6.2.3-Hydraulic Clamp Will Not Close

- 1) Verify that clamp pressure is available. Push the Clamp Open button and observe the Clamp Pressure gauge located on the instrument panel in the Power Unit. If pressure is not indicated on the gauge, consult your Dealer or the Factory for repair or replacement of the Clamp Pump or Relief Valve.
- 2) Check quick disconnects to be sure that they are tightened properly. To verify this, simply remove and reconnect both.
- 3) Bleed air from the Clamp cylinder and lines. Slightly crack the JIC Swivel fittings located on the bottom of the Exciter Case.
- 4) Check Clamp Pressure Gauge and verify pressure is available at the manifold in the unit. This is accomplished by pushing the Clamp Closed button on the Remote Pendant. (Refer to Section 6.2.1 regarding Pendant operation prior to proceeding.) If pressure is not evident on the gauge, consult your dealer or H.P.S.I. for more information regarding the setting of the relief valve or the pressure of the Clamp Pump.



SECTION 6-TROUBLESHOOTING-continued

6.2.4-Hydraulic Clamp Will Not Open

- 1) Check the Quick disconnects. Verify that they are properly tightened. Remove and retighten to insure proper alignment.
- 2) Check Remote Pendant and air connections as outlined in 6.2.1.

CAUTION: TO RELEASE THE PRESSURE CAPTURED INSIDE THE HYDRAULIC CYLINDER, CAREFULLY LOOSEN THE LOCK NUT ON THE RELIEF VALVE (PART #33047, ON THE MODEL 130 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 outline in the Remote Pendant Section 6.2.1.



SECTION 6-TROUBLESHOOTING-continued

6.2.6-Hammer Runs At Slow Speed

- 1) Check the security of the Quick Disconnects. Remove and reinstall to assure the proper alignment of the valves inside the quick disconnect.
- 2) Check the soft start accumulator precharge. This can be performed by observing the drive pressure gauge upon start up of exciter. The pressure should climb from 0 to 3000 very quickly and then gradually climb higher. The exciter will start slowly, sometimes violently shaking the crane boom should this precharge be below 3000 P.S.I.
- 3) Check the pre-charge pressure indicated on the Charge Pressure Gauge located in the Power Pac of the Hydraulic Filter Canister. This Pressure should indicate between 170 and 185 P.S.I. with the Engine R.P.M. at 1500. Consult your Dealer or H.P.S.I. for repairs if this pressure is not evident.
- 4) Check the drive pressure when the hammer is in the free hanging mode. If the pressure indicated on the Drive Pressure Gauge located in the Power Pac is above 2500 P.S.I. then check the Exciter Gear Box for excessive oil or oil which appears to be contaminated with Hydraulic Oil. This is an indication of a damaged shaft seal in the Hydraulic Motor on the Exciter. Replacement will be necessary before operation resumes.

6.2.7-Hammer Will Not Stop

- 1) Shut down Power Pac by turning off the Key Switch located on the Engine Unit.
- 2) Verify that air supply is working as outlined in the Remote Pendant Sections.



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 150 Operators , Maintenance, and Parts Manual

Effective Date 08/98

PARTS SECTION



SECTION 7-DIAGRAM OF PARTS

7.1-Exciter Gear Case

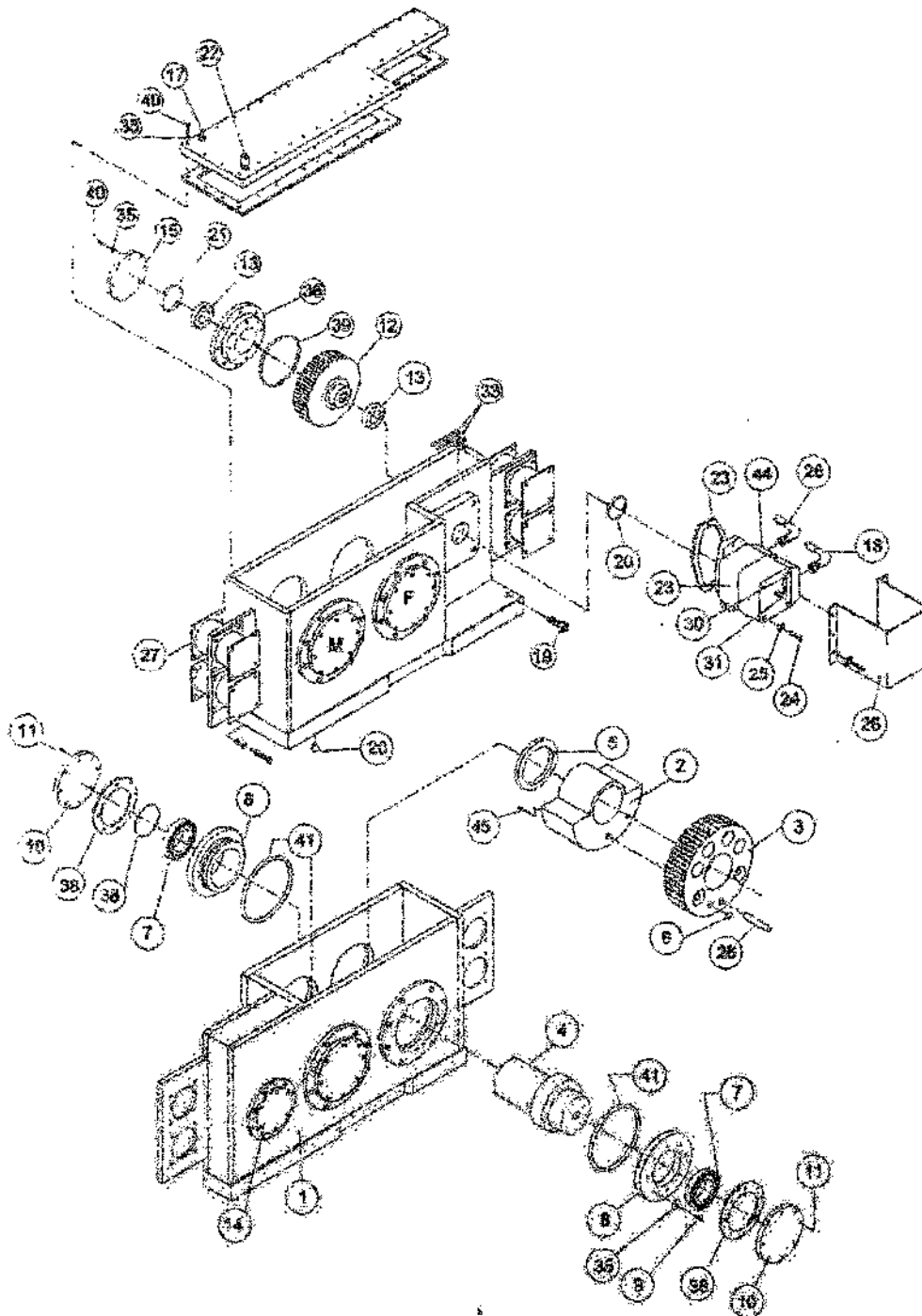
7.1.1-Bill of Materials

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	32313	Exciter Gear Case
2	2	32308	Eccentrics
3	1	32309	Eccentric Gears-Female
4	2	32018	Eccentric Shafts
5	2	32047	Eccentric Shaft Spacer
6	4	33002	Huck Bolt Collars
7	4	33096	Eccentric Bearings
8	4	32026	Bearing Support Sleeve
9	32	33068	Bolt 3/4"-10 x 1 1/2" Long
10	4	32007	Eccentric Cover
11	32	33003	Bolt 1/2"-13 x 1 1/4" Long
12	1	32317	Pinion Gear
13	2	33005	Pinion Bearing
14	1	32021	Pinion Bearing Cover
15	1	32346	Gear Case Cover Gasket
16	1	32315	Gear Case Cover
17	1	33074	Oil Fill Plug
18	1	33462	1 1/4" Pressure Motor Hose
19	1	33007	Sight Gauge
20	1	33008	Magnetic Plug
21	1	33099	Pinion Cover Gasket
22	1	33010	Case Vent
23	1	00151	Motor
24	2	33032	5/8" Bolt
25	2	33033	5/8" Flat Washers
26	1	32314	Motor Guard
27	8	33036	Shear Fender
28	1	33463	1 1/4" Return Motor Hose
29	2	00193	2" Flange Kit
30	1	33464	1/2" Case Drain Hose
31	1	33129	1/2" 90 Degree Fitting
32	1	33138	"C" Mount Motor Gasket
33	4	33269	3/8" Pipe/JIC Adapter
34		32016	Eccentric Gear-Male
35	32	33146	1/2" Flatwasher
36	1	32311	Pinion Bearing Sleeve
37	1	32062	Motor Spacer Sleeve
38	8	33097	Eccentric Cover Gasket
39	1	33319	Pinion Bearing Support Ring O-ring
40	22	33003	Gear Case Cover Bolt 1/2" x 1 1/4" Long
41	4	33402	Eccentric Bearing Support Sleeve O-ring
42	4	33040	Shear Pin
43	8	33001	Huck Bolt
44	1	32310	Male Eccentric Gear

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-Vibration Suppressor

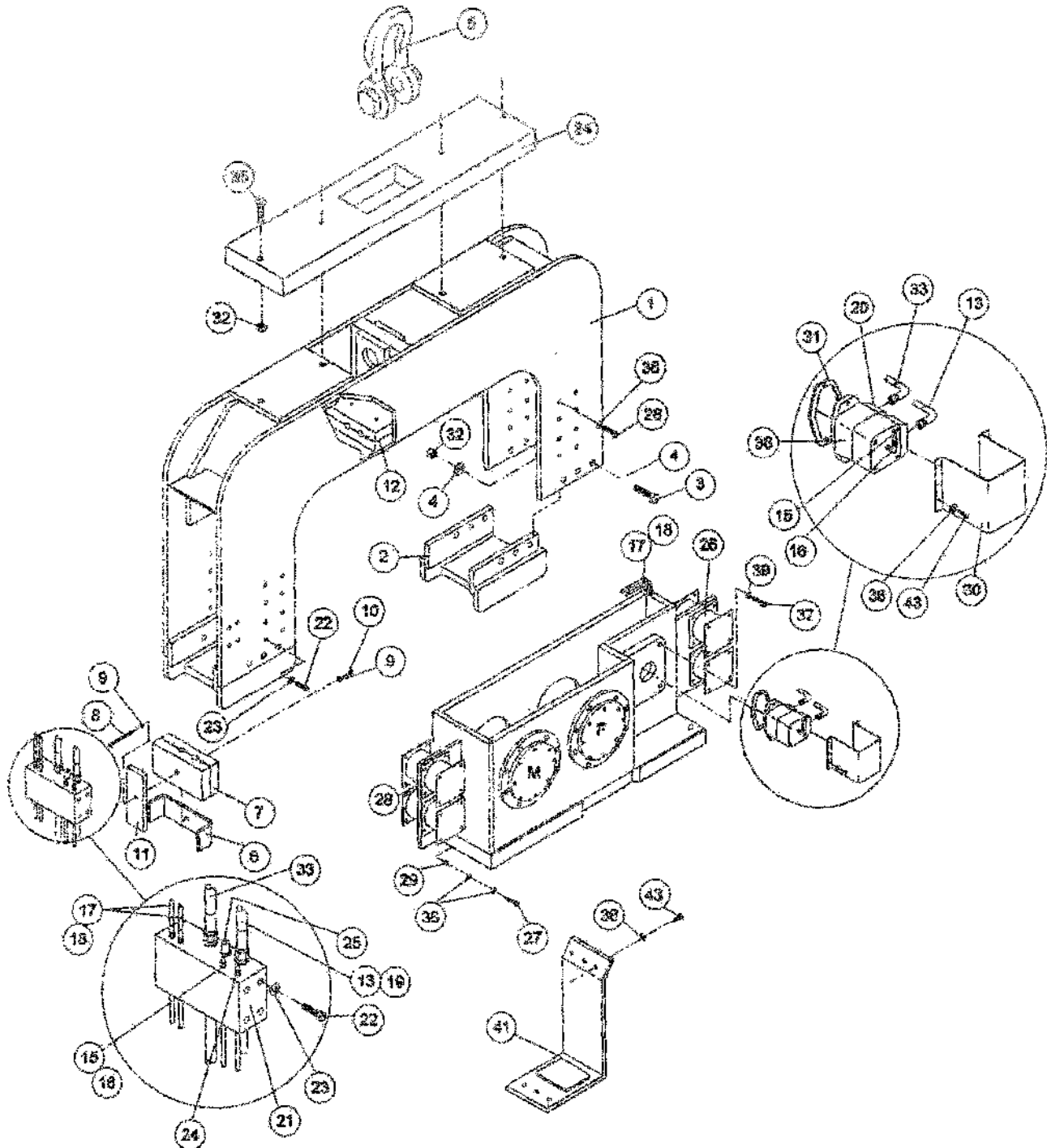
7.2.1-Bill of Materials

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	32013	Suppressor Housing
2	1	33022	Suppression Stop Plate
3	12	33006	1" Bolt
4	12	33137	1" Washer
5	1	33201	McKissick Shackle-30 Ton
6	1	32488	Hose Bracket
7	1	32180	Nylon Inserts-Set Only
8	1	33318	Bolt 1/2"-13 x 6" Long
9	1	33146	1/2" Flatwasher
10	1	33145	1/2" Hex Head Nut
11	1	32488-1	Retainer Plate
12	1	32380	Upper Hose Block
13	1	33462	1 1/4" Pressure Hose
14	1	33403	1 1/4" Pressure Hose
15	1	33464	1/2" Case Drain Hose
16	1	33129	1/2" 90 Degree Fitting
17	2	33024	3/8" Clamp Hose
18	4	33379	1/2" Pipe to 3/8" J.I.C. 2404-6-8
19	3	33030	1 1/4" Pipe/JIC Adapter 2404-20-20
20	2	00193	2" Flange Kit
21	1	32046	Brake/Relief Manifold
22	4	33032	Bolt 5/8"-11 x 1 3/4" Long
23	4	33033	5/8" Flat Washer
24	1	33034	Relief Valve-3/4" NPT
25	1	33035	Brake Valve
26	8	33036	Vibration Suppressor
27	32	33037	Bolt 3/4"-10 x 2 1/2" Long
28	16	33038	Bolt 3/4"-10 x 2 3/4" Long
29	72	33039	3/4" Hex-Head Nut
30	1	32314	Motor Guard
31	1	33138	"C" Flange Gasket
32	12	33075	1" Lock Nut
33	1	33463	1 1/4" Return Hose
34	1	32069	Bias Weights
35	4	33121	1" Bias Weight Bolt
36	54	33013	3/4" Flatwasher
37	2	33032	5/8" Bolt
38	1	33140	Motor
39	2	33033	5/8" Flatwasher
40	1	33296	150 Pigtail Set Complete include 13,15,17,24,33,39
41	1	32316	Clamp Guard
42	6	33012	3/4" Guard Bolt



SECTION 7-DIAGRAM OF PARTS-continued

7.2.2-Vibration Suppressor-Exploded View





SECTION 7-DIAGRAM OF PARTS-continued

7.3-Model 150-Universal Sheeting Clamp

7.3.1-Bill of Materials

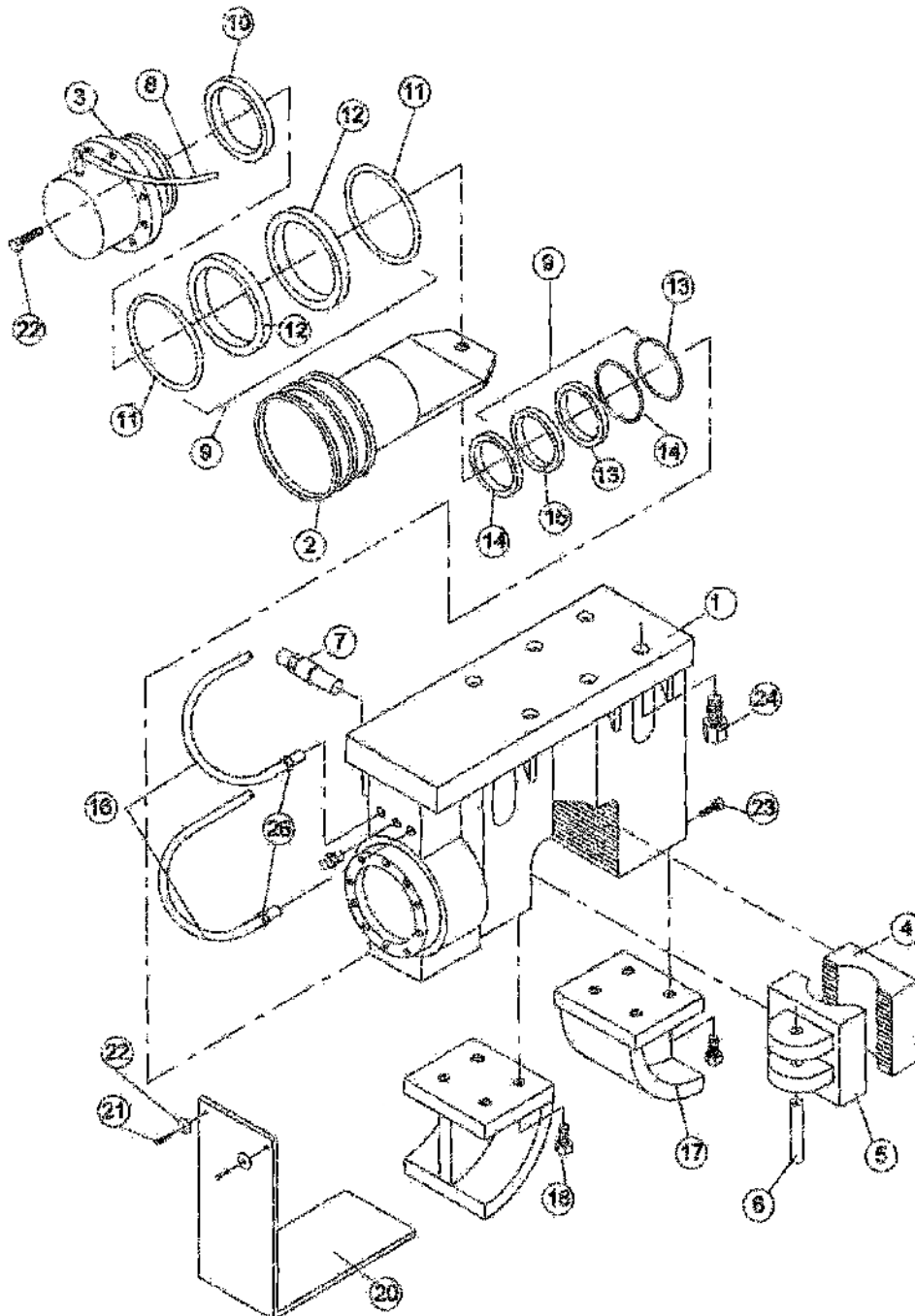
ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	32528	Clamp Housing-200 ton
2	1	32529	Piston Rod
3	1	32530	Cylinder Head
4	1	32494	Fixed Jaw
5	1	32495	Movable Jaw
6	1	33040	Movable Jaw Pin
7	1	33041	Check Valve
The following 7 part numbers are included in Seal Kit #33416:			
8	2	33216	O-Ring Seals
9	2	33079	2-207 O-rings
10	1	33426	Cylinder Head Seal
11	2	33427	Piston Seal
12	2	33428	Piston Wear Rings
13	2	33081	Piston Rod Dirt Wiper
14	2	33124	Piston Rod Wear Rings
15	1	33123	Rod Seal
16	2	33048	3/8" Clamp Hose
17	2	32055	Pile Guide
18	8	33084	1 x 1 3/4" Long, Hex-Head
19	6	33013	3/4" Washers
20	1	32446	Clamp Guard
21	6	33012	3/4" x 2" Clamp Guard Bolts
22	10	33043	3/4"-10 x 3" Long Socket Head Cap Screw
23	2	33044	1"-9x5" Long, Fixed Jaw Bolt
24	8	33009	1 3/4" x 5" Clamp Bolt
25	2	33047	Alimite Grease Fitting
26	2	33269	3/8" NPT/JIC Adapter
27	1	33268	3/8" NPT High Pressure Plug



SECTION 7-DIAGRAM OF PARTS-continued

7.3-Model 150-50 Universal Sheeting Clamp

7.3.2-Model 150-50 Universal Sheeting Clamp-Exploded View





SECTION 7-DIAGRAM OF PARTS-continued

7.4-Model 150-100 Ton Caisson Clamp

7.4.1-Bill of Materials

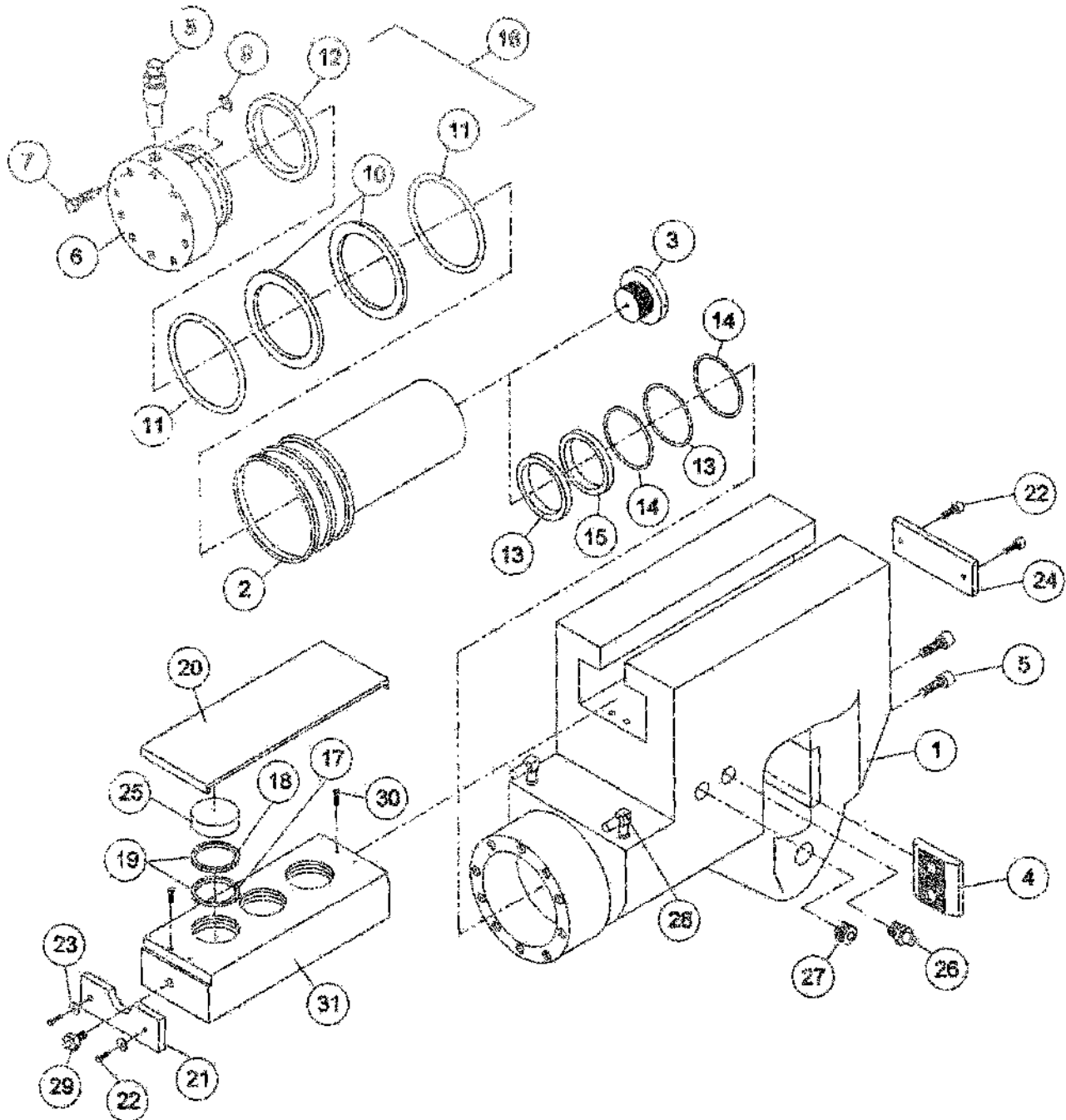
ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	32097	Caisson Clamp Housing only
2	1	32379	100 Ton Clamp Piston
3	1	32110	Movable Jaw
4	1	32101	Fixed Jaw
5	2	33044	1" x 5" Sockethead Capscrew
6	1	32041	Clamp Cylinder Head
7	10	33043	3/4" x 3" Sockethead Capscrew
8	1	33041	Cylinder Check Valve
9	2	33079	2-207 O-ring
10	2	33331	Piston Wear Rings
11	2	33330	Piston Seals
12	1	33078	Cylinder Head Seal
13	2	33329	Rod Bearing
14	2	33283	Rod Dirt Wiper
15	1	33328	Rod Pressure Seal
16	1	33219	Cylinder Seal Kit Complete Including 9,10,11,12,13,14,15,16
17	3	33212	Piston Pressure Seal
18	3	33213	Piston Dirt Wiper
19	1	33218	Seal Kit Including 17 and 18
20	1	32107	Pressure Plate
21	1	32435	Keeper Plate
22	4	33012	3/4" x 2" Hexhead Bolt
23	4	33013	3/4" Flatwasher
24	1	32436	Keeper Plate
25	3	32106	Hydraulic Lock Piston
26	1	33047	Alimite Fitting
27	1	33268	3/8" HDT High Pressure Plug
28	1	33334	3/8"-90 Degree SAE to JIC Adapter
29	1	33333	3/8"-SAE to JIC Adapter
30	4	33214	3/4" x 2" Sockethead Capscrew
31	1	32108	Caisson Lock Piston Block



SECTION 7-DIAGRAM OF PARTS-continued

7.4-Model 150-100 Ton Caisson Clamp

7.4.2-Model 150-100 Ton Caisson Clamp-Exploded View





SECTION 7-DIAGRAM OF PARTS-continued

7.5-Model 500 Caisson Beam

7.5.1-Bill of Materials

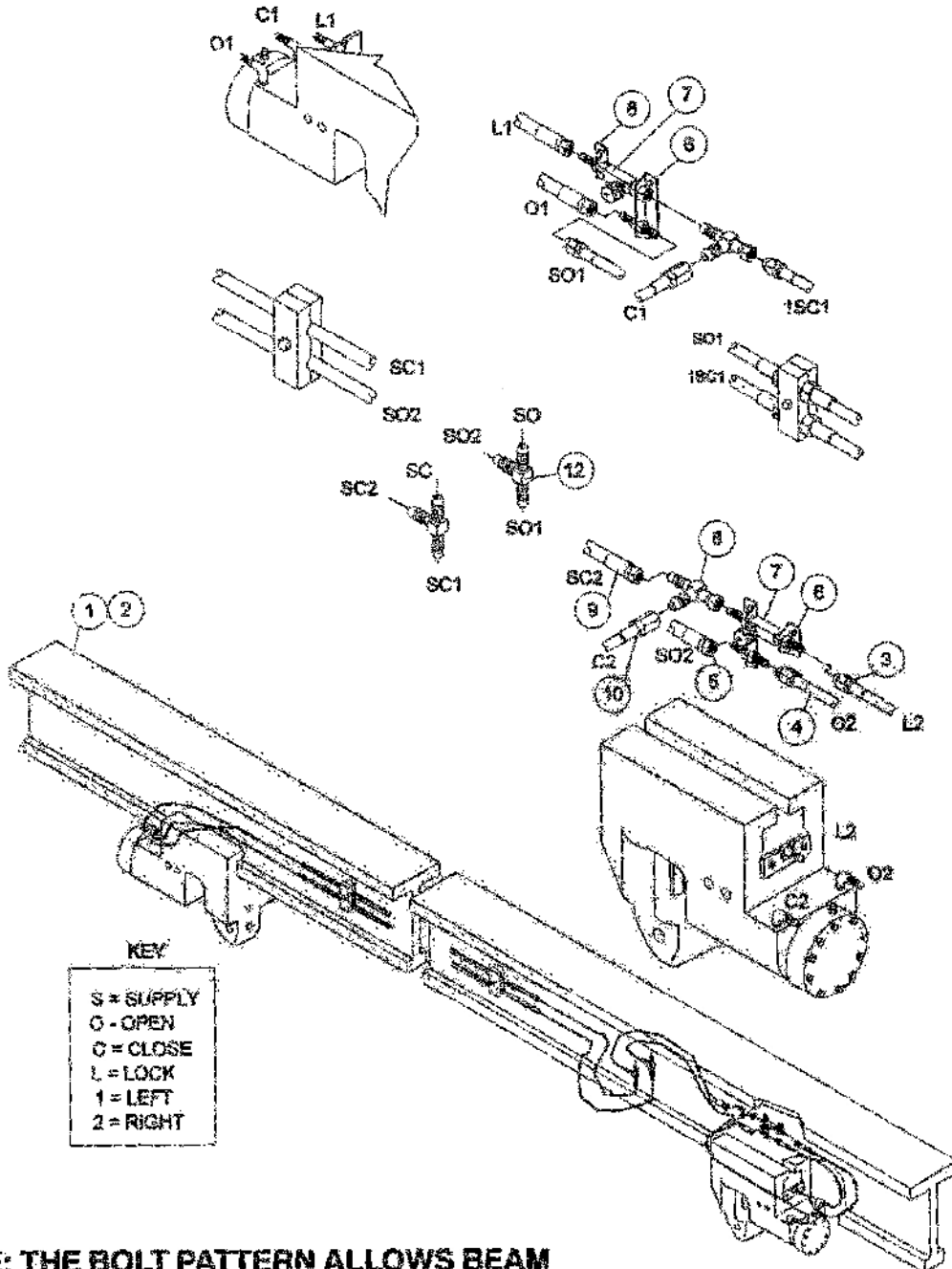
ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1		4' Caisson Beam
2	1	32189	7" Caisson Beam
3	2	33380	3/8" Hose-Right & Left Hydraulic Lock
4	1	33381	3/8" Hose-Right & Left Clamp Open
5	1	33382	3/8" Hose-Supply Open Right
6	2	32196	Check Valve Mounting Bracket
7	2	33221	3/8" Check Valve for Hydraulic Lock
8	2	33383	3/8" Tee Adapter
9	1	33384	3/8" Hose-Supply Closed
10	2	33385	3/8" Hose-Right & Left Clamp Closed
11	3	33386	3/8" Hose Clamp Kits
12	2	33387	3/8" Tee Adapter



SECTION 7-DIAGRAM OF PARTS-continued

7.5-Model 150-Caisson Beam

7.5.2-Model 150



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



SECTION 7-DIAGRAM OF PARTS-continued

7.6-Brake Valve Manifold

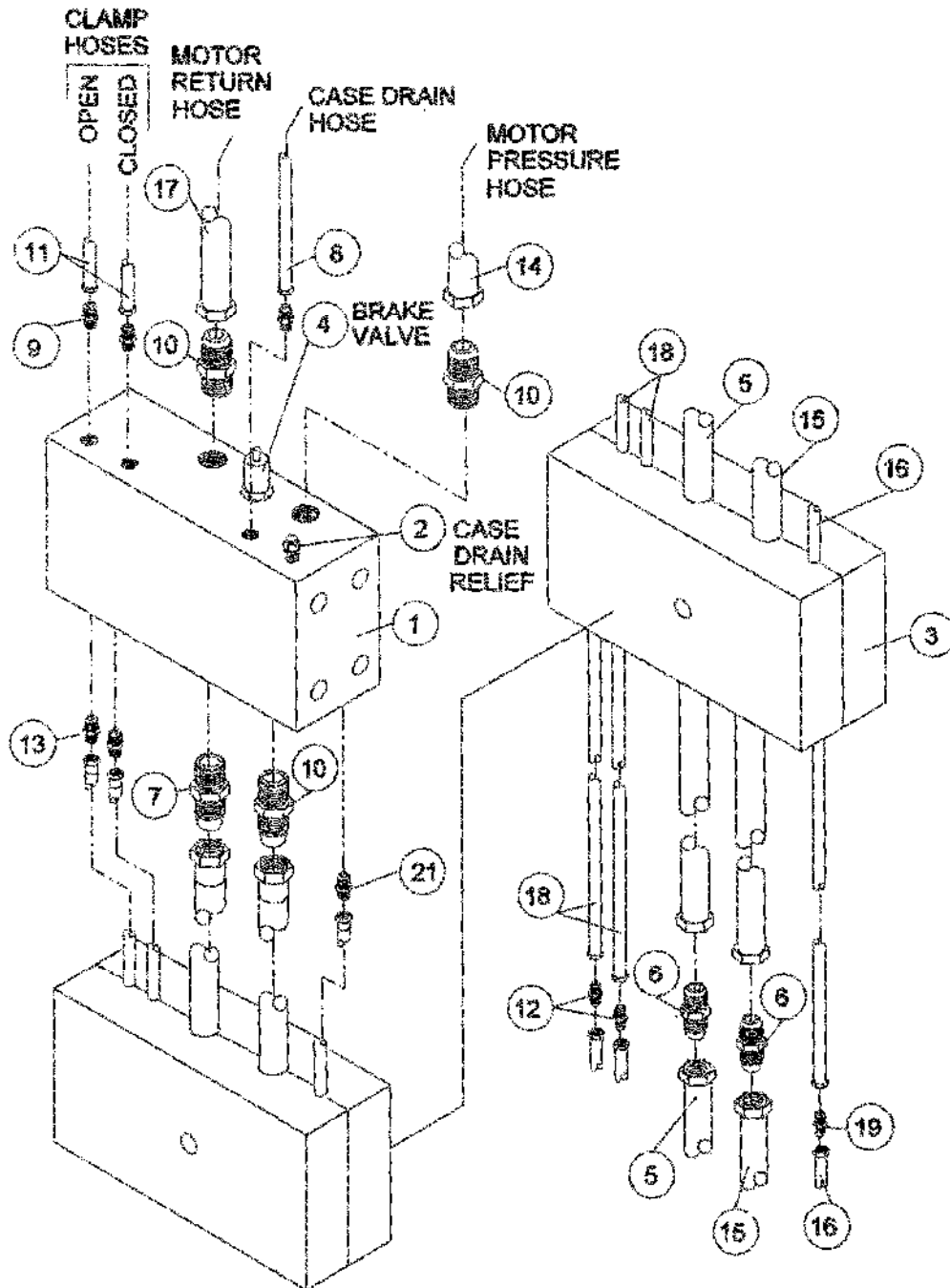
7.6.1-Bill of Materials

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	32046	Brake Valve Manifold
2	1	33034	Case Drain Relief Valve
3	1	32180	Nylon Inserts
4	1	33035	Brake Valve
5	2	33051	1 1/2" Return x 50'
6	1	33052	1 1/2" Male JIC Adapter
7	2	33031	1 1/2" Pipe/JIC Adapter
8	1	33316	1/2" Case Drain
9	2	33379	1/2" Pipe to 3/8" JIC Adapter
10	2	33030	1 1/4" Pipe to JIC Adapter
11	2	33029	3/8" Clamp Hose
12	4	33056	1/2" JIC Adapter
13	2	33020	1/2" Pipe/JIC
14	1	33025	1 1/4" Pressure Hose
15	2	33051	1 1/2" x 50' Pressure Hose
16	2	33053	3/4" x 50' Case Drain Hose
17	1	33026	1 1/4" Motor Return Hose
18	4	33151	1/2" x 50' Clamp Hose
19	2	33050	1 1/4" Male JIC Adapter
20	1	33054	3/4" Male JIC Adapter

SECTION 7-DIAGRAM OF PARTS-continued

7.6-Model 150-Brake Valve Manifold

7.6.2-Brake Valve Manifold-Exploded View





SECTION 7-DIAGRAM OF PARTS-continued

7.7-Hydraulic Manifold

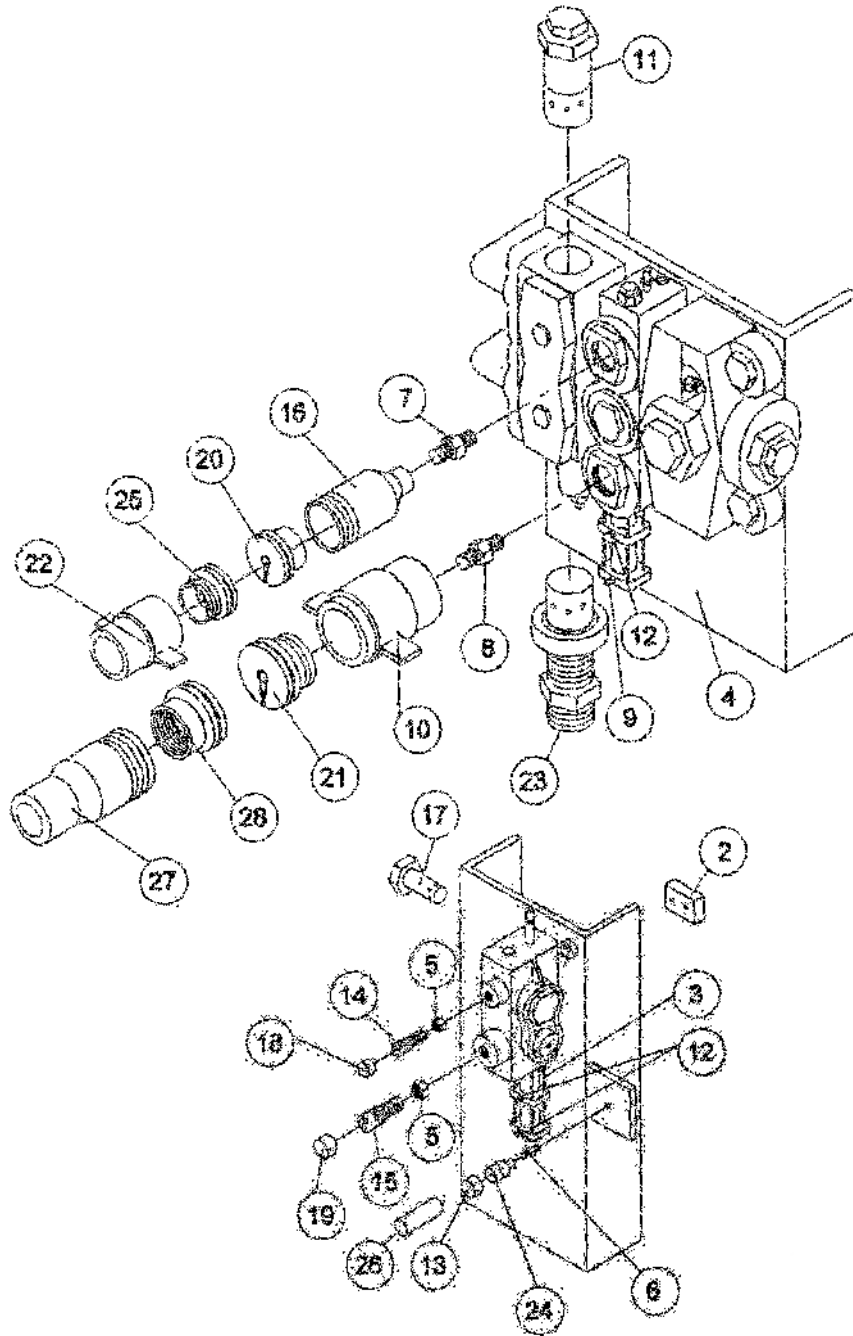
7.7.1-Bill of Materials

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	00985	Main Drive Valve
2	1	00813	Main Clamp Valve
3	1	33189	Clamp Air Shift Cylinder
4	1	33190	Air Shift Cylinders
5	1	33465	5/8" O-Ring to 1/2" NPT
6	1	33466	3/4" Pipe to Male JIC Bulkhead
7	1	33347	1 1/4" O-Ring to 1 1/4" NPT
8	1	33335	1 1/2" NPT to 1 1/4" O-Ring
9	1	33188	Air Exhaust Muffler
10	1	33063	1 1/2" Female Quick Disconnect
11	1	33469	Anti-Cavitation Check
12	1	33470	Check Air Fitting
13	1	33091	3/4" Dust Cover
14	1	00402	1/2" Male Quick Disconnect
15	1	00401	1/2" Female Quick Disconnect
16	1	33062	1 1/2" Male Quick Disconnect
17	1	33467	Clamp Pressure Main Relief Valve
18	1	33090	1 1/2" Dust Cap for Male Quick Disconnect
19	1	00441	1/2" Dust Plug
20	1	33090	Dust Cover for 1 1/2" Male Quick Disconnect
21	1	33338	Dust Cover for 1 1/2" Female Quick Disconnect
22	1	33340	3/4" SAE to JIC 90 Degree Adapter
23	1	33468	Drive Pressure Relief Valve
24	1	33066	Male 3/4" O.D.
25	1	33336	Dust Cover for 1 1/2" Female
26	1	33067	Female 3/4" O.D.
27	1	33062	1 1/2" Male Quick Disconnect

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 Replacement Parts

7.8.1-Bill of Materials

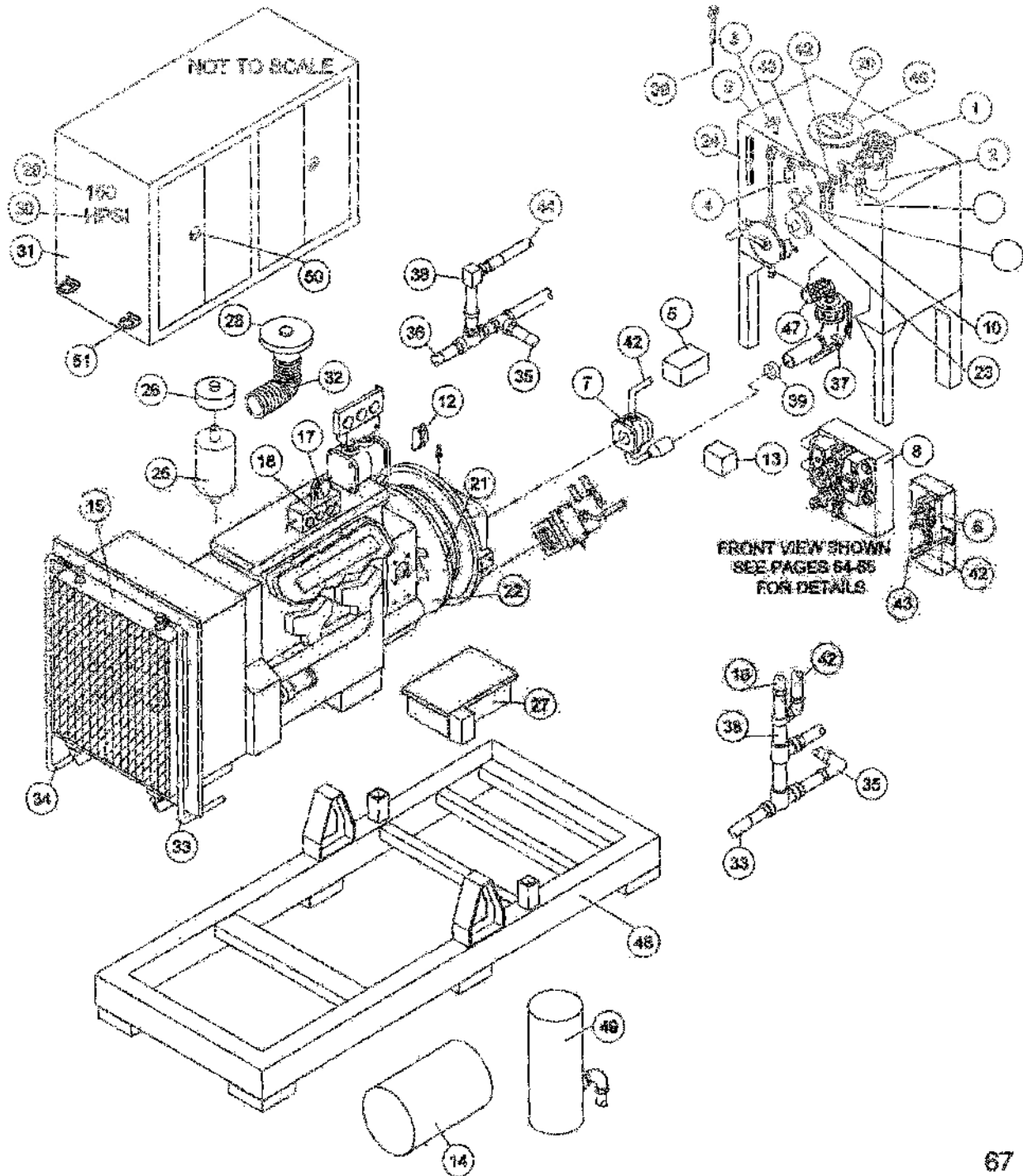
ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	00412	Filter Housing W/ Bypass
2	2	33119	Parker Filter Element
3	1	33471	Hot/Low Oil Sending Unit
4	1	33184	Spin-on Oil Filter Element
5	1	00416	Clamp Pump
6	1	00813	Main Clamp Valve Assembly
7	1	00346	Main Drive Pump
8	1	00737	Main Drive Valve Assembly
9	1	00379	Hydraulic Reservoir
10	1	00523	Temperature Gauge
11	1	00450	Hand Pump
12	1	33242	Off/Start/Run Switch
13	1	33187	Alpha Air Valve
14	1	00522	Air Receiver Tank
15	1	00337	150 Oil Cooler
16	1	33235	Fulflow Cooler Relief Valve
17	1	33182	0-3000 Clamp Pressure Gauge
18	1	33182	0-3000 Clamp Pressure Gauge
19	1	00770	Air Pressure Gauge
20	1	33109	16" Tank Cover
21	1	00507	Pump Drive Housing
22	1	33472	Flywheel Drive Plate
23	1	33354	110V. 3000 W Tank Heater (optional)
24	1	33240	Oil Level Site Gauge
25	2	00454	3" Exhaust Muffler
26	2	00124	3" Rain Cap
27	1	33361	8D-12V Battery
28	1	00549	Air Intake Hood
29	1	33299	"150" Logo
30	1	33178	"HPSI" Logo
31	1	33413	150 Enclosure
32	1	33414	Air Intake Flexible Hose
33	1	33473	Lower Cooler Supply Hose
34	1	33474	Lower Cooler Return Hose
35	1	33357	4" Shut Off Valve
36	1	33475	Cooler Relief to Tank
37	1	33476	Clamp Suction
38	1	00423	Thermostat Control Valve
39	1	33477	Main Suction Hose
40	1	33478	Tank to Exciter Case Drain
41	1	33486	Ladder Step Kit
42	1	33479	Tank to Clamp Pump
43	1	33480	Tank to Drain on Manifold Pump
44	1	33481	Tank to Cooler Bypass
45	1	33482	Return to Tank
46	1	33244	Air Dryer
47	1	33377	Suction Strainer
48	1	33483	Skid Fuel Tank
49	1	33484	Tank Cover Gasket
50	1	33485	Door Latch Kit



SECTION 7-DIAGRAM OF PARTS-continued

7.8-Power Unit Replacement Parts

7.8.2-Power Unit Replacement Parts-Exploded View





SECTION 7-DIAGRAM OF PARTS-continued

7.9-150 Remote Control Pendant

7.9.1-Bill of Materials

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	33286	Remote Pendant Complete
2	1	33228	Throttle Control Assembly
3	1	33230	On/Off Switch Only
4	2	33222	Clamp Button Kit
5	1	33231	Air Valve Body
6	1	33390	Remote Box Only
7	1	33226	Swivel Nut
8	3	33232	Mounting Bracket
9	3	33233	Spacer
10	1	33378	Faceplate
11	5	33393	Pipe to Snap Lock 90 Degree Fitting
12	3	33396	Snap Lock Tee
13	1	33397	Throttle Handle Kit
14	1	33398	30' Air Hose Cover
15	1	33399	5/16" Air Tubing

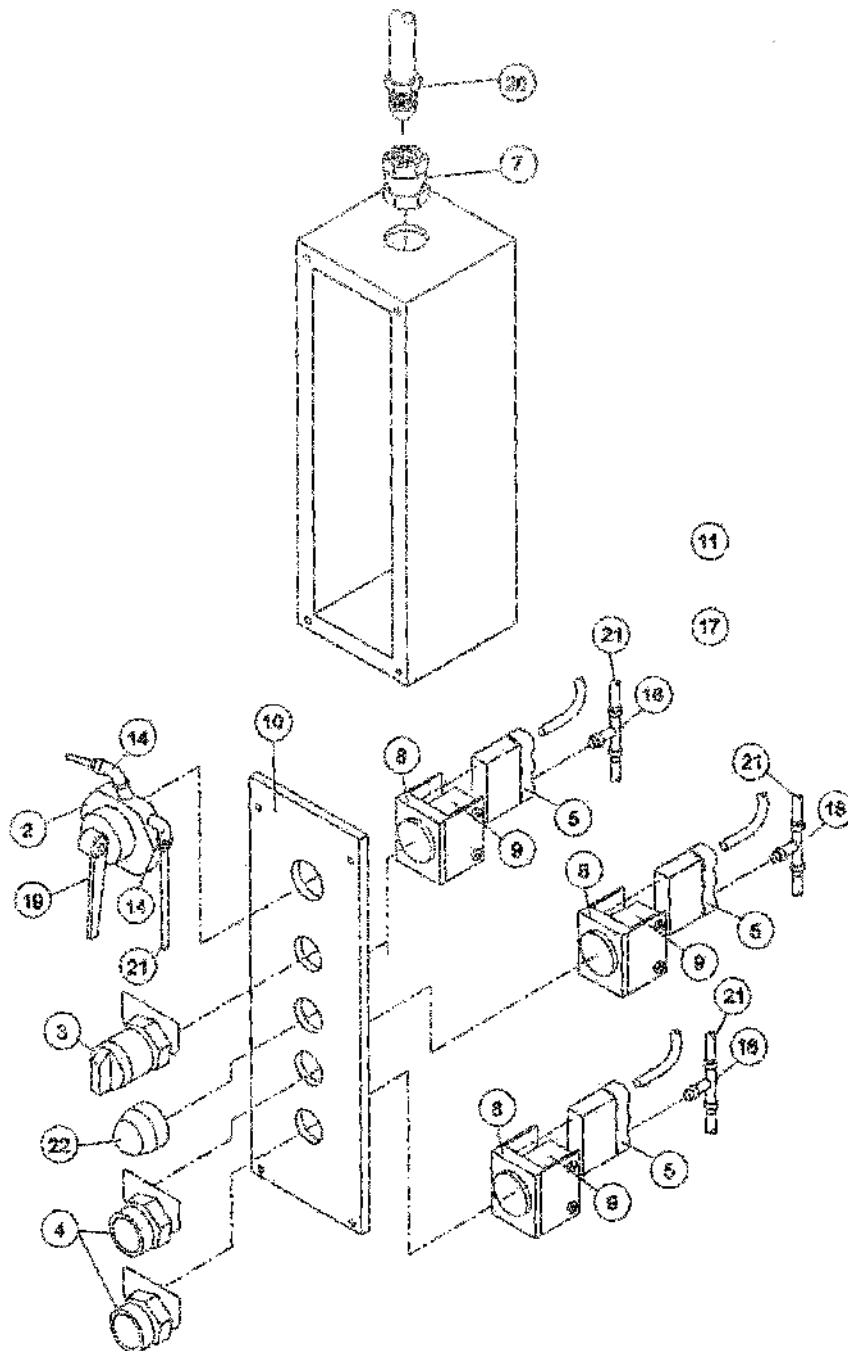
NOTE: See Section 7.11 for Airline Schematic



SECTION 7-DIAGRAM OF PARTS-continued

7.9-150 Remote Control Pendant

7.9.2-150 Remote Control Pendant-Exploded View





SECTION 7-DIAGRAM OF PARTS-continued

7.11-Hydraulic Schematic-Model 150 Vibro Hammer & Power Pack

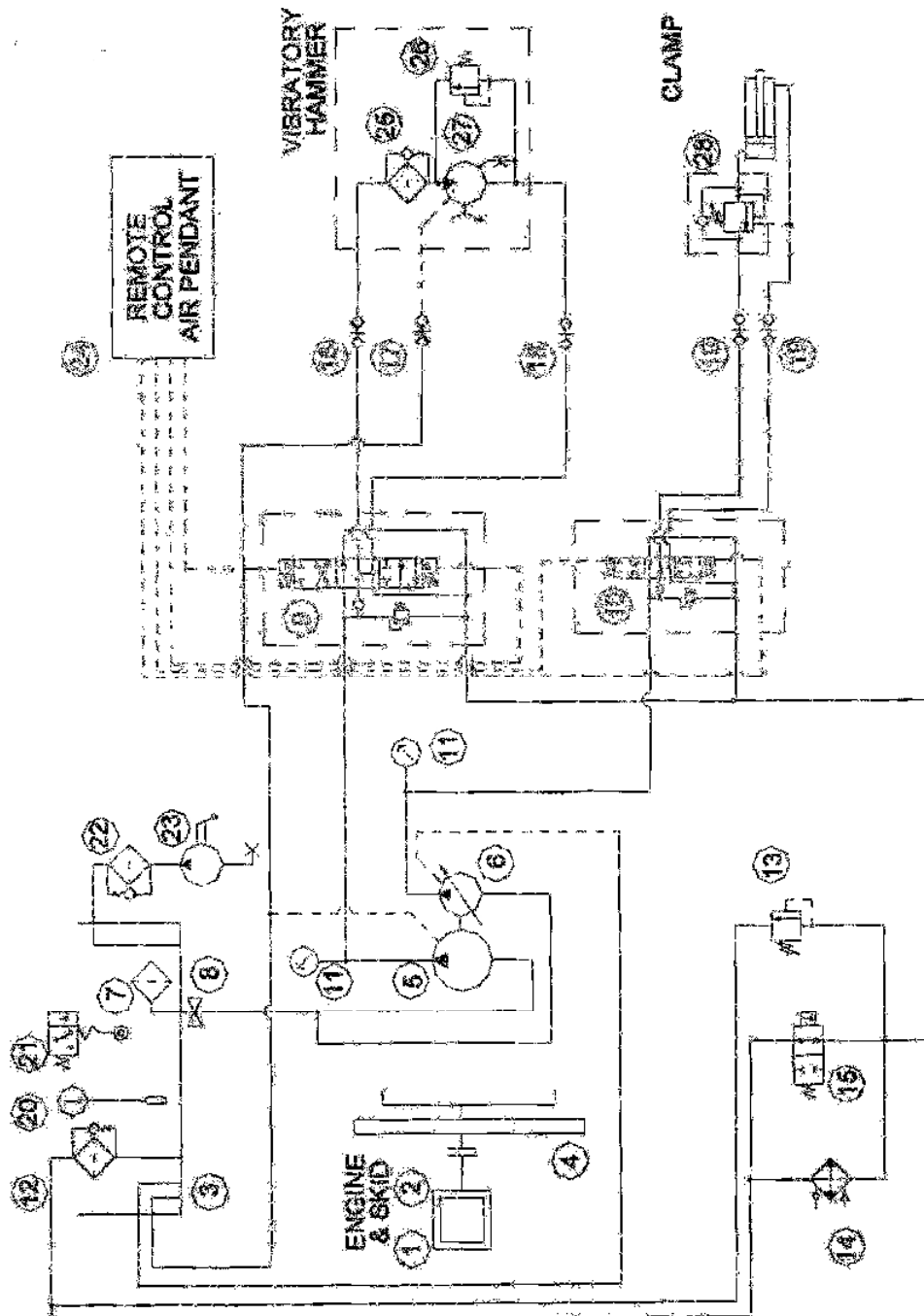
7.11.1-Bill of Materials

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	00379	Hydraulic Reservoir
2	1	33483	Tubing Skid/60 Gallon Tank
3	1	33413	Enclosure
4	1	33377	4" Suction Strainer
5	1	33357	4" Shut-Off Valve
6	1		
7	1		
8	1	00346	Main Drive Pump
9	1	3208	Caterpillar Diesel Engine
10	1	00507	Pump Drive
11	1	00416	Clamp Pump
12	1		
13	1	33062	Return Quick Disconnect
14	1	33059	Supply Quick Disconnect
15	1	33065	Case Drain Quick Disconnect
16	2	33069	Clamp Quick Disconnect
17	1	33487	Clamp Relief Valve
18	1	00446	Clamp Control Valve
19	1	33041	Clamp Check Valve
20	1		
21	1	00337	Cooler w/ Mounting Kit
22			
23	1	00423	Thermal Valve
24	1	00450	Hand Pump
25	1	33184	Hand Pump Filter
26	1	33235	Ful Flow Relief 60 psi
27	2	33182	Nosohok 0-3000 Gauge

SECTION 7-DIAGRAM OF PARTS-continued

7.10-Hydraulic Schematic-Model 150 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-Bill of Materials

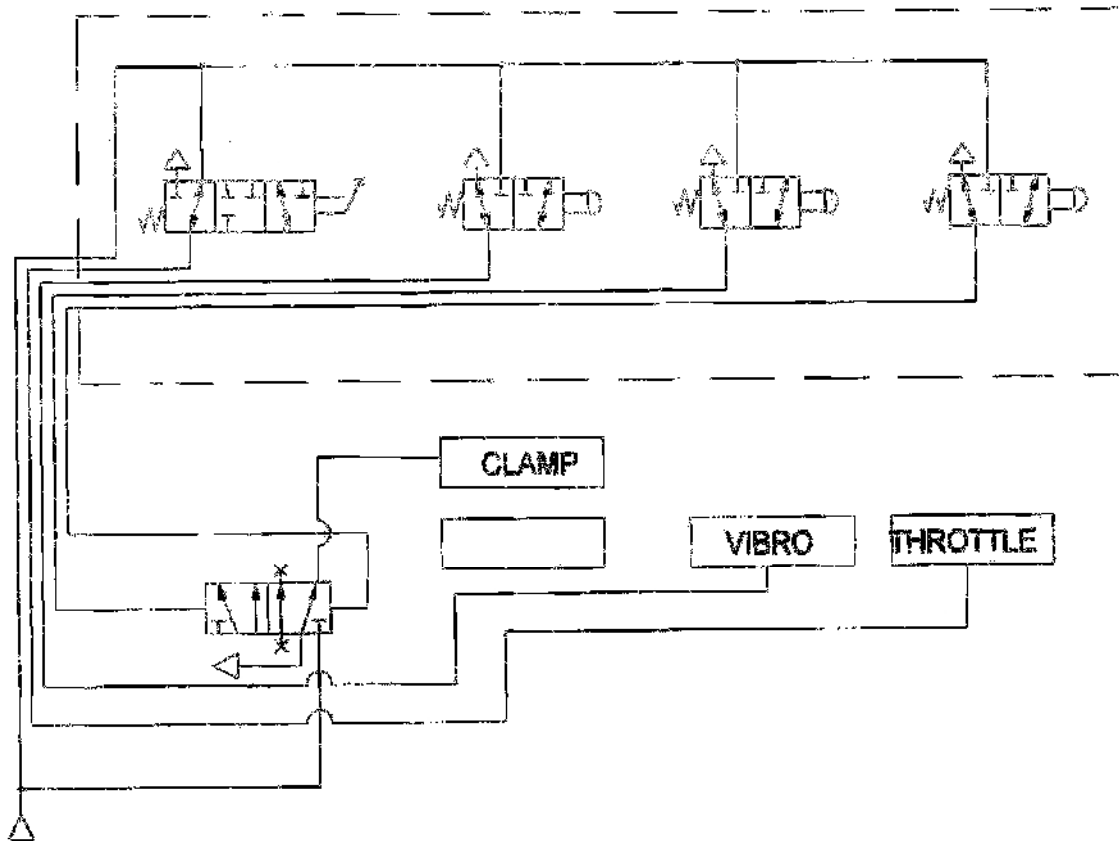
ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	33223	Aro Not Element
2	1	59387	Aro Base
3	1	33224	Aro Flip Flop Element
4	1	33391	Aro Base
5	1	33225	Aro Adjustment Pulse Element
6	1	33391	Aro Base
7	1	33222	Aro Push Button
8	1	33231	Aro Valve Kit
9	1	33230	On/Off Switch Only
10	1	33185	Williams Air Throttle Valve



SECTION 7-DIAGRAM OF PARTS-continued

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

7.11.2-Exploded View





Hydraulic Power Systems INC.

Release 01

Model 150 Operators , Maintenance, and Parts Manual

Effective Date 08/98

PLACARD SECTION



SECTION 8-PLACARDS AND SAFETY SIGNS

CLAMP

NO. 2 DIESEL FUEL

MOBIL AW 46

CHARGE



Hydraulic Power Systems INC.

Release 01

Model 150 Operators , Maintenance, and Parts Manual

Effective Date 08/98

SECTION 8-PLACARDS AND SAFETY SIGNS-CONTINUED

**FUEL TANK
DO NOT WELD**

MAX PULL 30 TON



SECTION 8-PLACARDS AND SAFETY SIGNS-CONTINUED



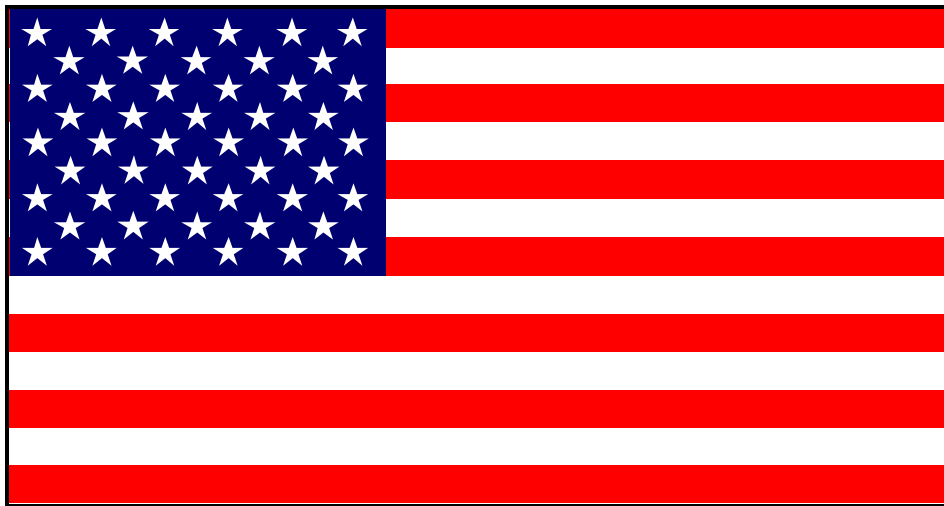


SECTION 8-PLACARDS AND SAFETY SIGNS CONTINUED

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



SECTION 8-PLACARDS AND SAFETY SIGNS-CONTINUED

BEFORE STARTING

1. CHECK TO MAKE SURE MAIN HYDRAULIC RESERVOIR VALVE IS IN THE "ON" POSITION OR "DOWN" POSITION. PUMP DAMAGE WILL RESULT IF ENGINE IS STARTED WHEN CLOSED.
2. CLOSE "PRESSURE BLEED-OFF" FAUCET VALVES, (4) LOCATED ON TOP OF HYDRAULIC MANIFOLD. DAMAGE TO CLAMP JAWS WILL RESULT IF NOT IN THE CLOSED POSITION DURING OPERATION OF EXCITER.
3. TO AVOID NEEDLESS FIELD SERVICE CHARGES, **MAKE SURE YOUR QUICK DISCONNECTS ARE PROPERLY SEALED AND FULLY ENGAGED.** MOST MALFUNCTIONS OF HYDRAULICS ARE DUE TO IMPROPERLY CONNECTED QUICK DISCONNECTS.