1203 Ozark
North Kansas City, Missouri 64116

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SECTION 1-GENERAL INFORMATION

1.1 Warranty

HYDRAULIC POWER SYSTEMS, INC. hereby warrants that the Model 40E 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 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 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.

SECTION 1-GENERAL INFORMATION

1.2-Model 40E Vibratory Exciter

The **H.P.S.I. Model 40E 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 40E consists of five main parts: A **vibratory exciter**, A **hydraulic clamp** assembly suitable for driving or pulling a particular type of pile; and is driven by a **diesel hydraulic power unit with a remote pendant** or **an excavator** that operates the hydraulic motor as well as providing pressure for the hydraulic clamp assembly.

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 2200 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 12 tons of extracting force.

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 HEEDED, 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.

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.

SECTION 2-SAFETY - continued

2.2-Standard Safety Procedures-continued

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 40E VIBRATORY PILE HAMMER SPECIFICATIONS

EXCITER

ECCENTRIC MOMENT…… 525 in./lbs.

FREQUENCY …… 2,200 c.p.m.

DYNAMIC FORCE …….. 28 tons

AMPLITUDE, INCHES …… 0.375 -0.5”

MAXIMUM LINE PULL …… 12 tons

PILE CLAMPING FORCE ……24 tons

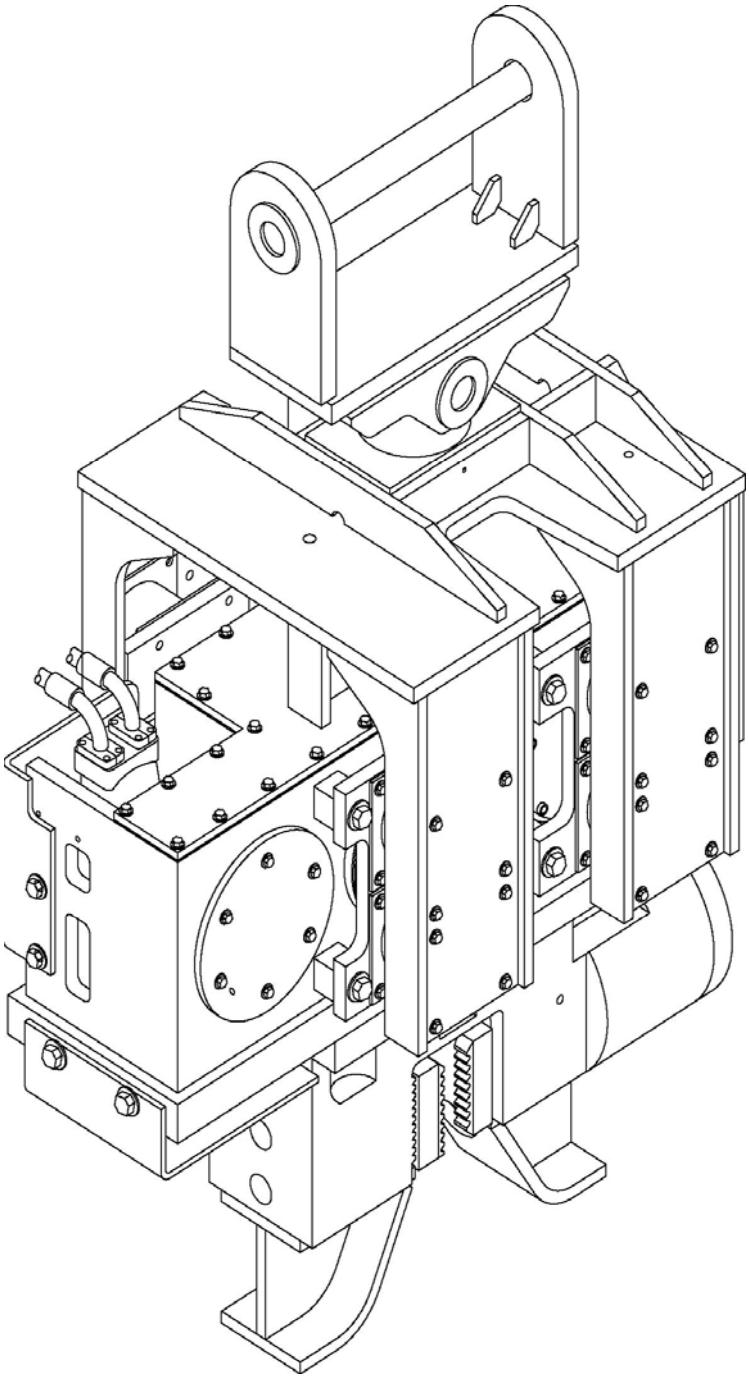
SUSPENDED WEIGHT ……4,350 lbs.
LENGTH …… 46”
THROAT WIDTH …….. 7”
HEIGHT ……..……67.56”

OPTIONAL: **POWER PACK**

DIESEL ENGINE ……..127 H.P.
HYDRAULIC FLOW ……37 G.P.M.
MAXIMUM DRIVE PRESSURE …… 4,500 p.s.i.
MAXIMUM CLAMP PRESSURE …… 2,500 p.s.i.
WEIGHT …… 4,800 lbs.
LENGTH ……108”
WIDTH ……48”
HEIGHT ……80”
REMOTE PENDANT ……OPTIONAL
SHEET METAL ENCLOSURE …… OPTIONAL

SECTION 3-INTRODUCTION

3.2-General Overview



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 that 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 490191, and replace if loose, cracked or broken prior to using the Exciter.

10) Check the condition of the Movable Jaw Pin, P/N CLP-33040, and replace if loose, cracked or broken prior to using the Exciter.

11) Check the condition of the Movable Jaw, P/N CLP-32210, for any possible cracks or damage and replace prior to using the Exciter.

SECTION 4-MAINTENANCE - continued

4.1-Daily Maintenance-continued

12) Upon lifting the 40E 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 33229, and replace should any damage or extensive wear be present before using the Exciter.

14) Grease the Clamp Piston Rod, P/N CLP-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-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 exists.

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 Desiccant				

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 760E 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 manufacturer's specs.

Power Pack 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.

SECTION 4-MAINTENANCE-continued

4.6-Disassembly of Exciter Unit

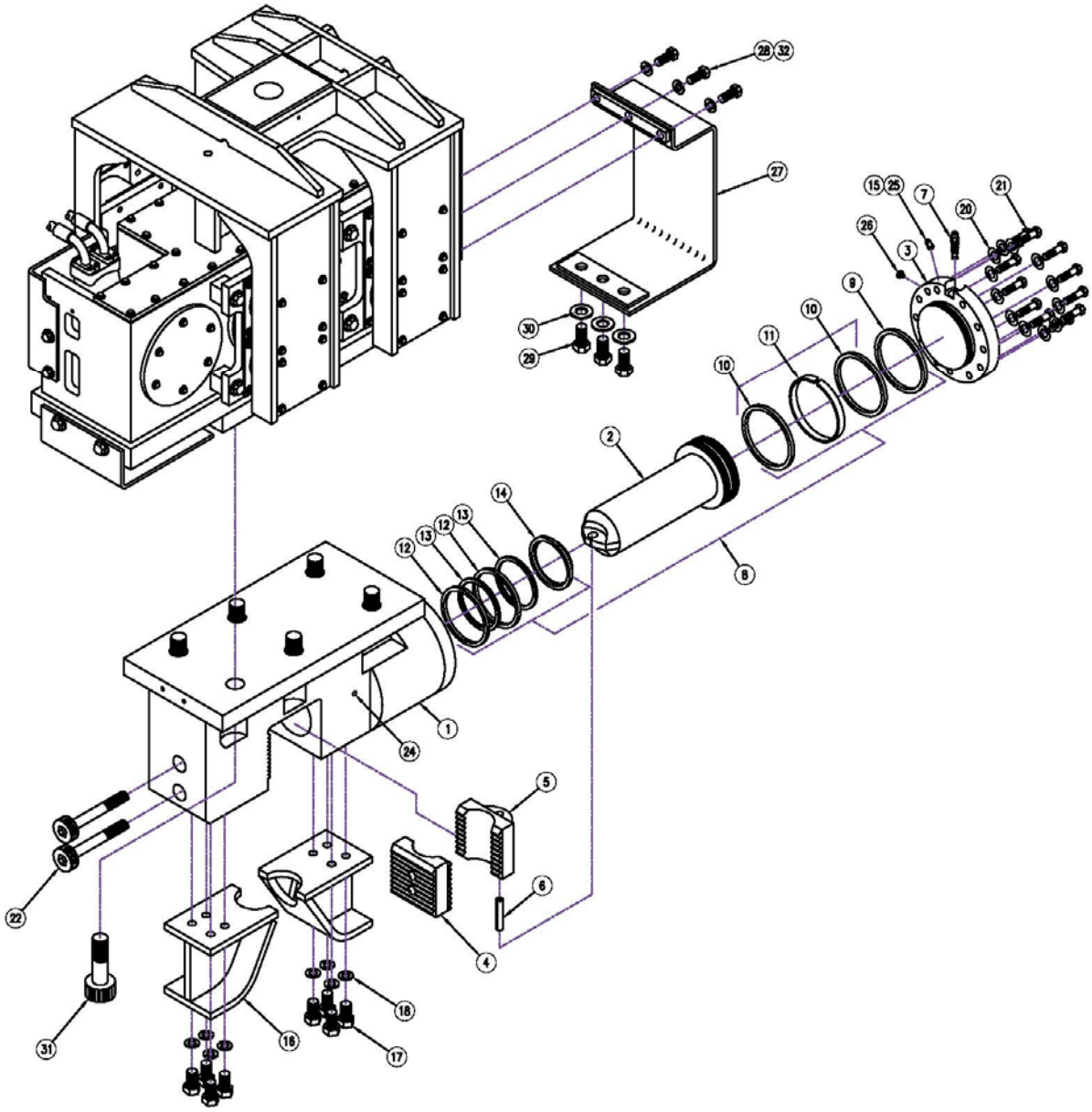
Thoroughly steam clean vibratory exciter. Disconnect hydraulic hose bundle from brake valve manifold and hose block.

4.6.1-REMOVE CLAMP HOUSING

1) Remove clamp guard.

2) Remove clamp hoses from case.

3) Remove the 6 – 1 1/2” bolts on the clamp.



4.6.2-REMOVE SUSPENSION HOUSING

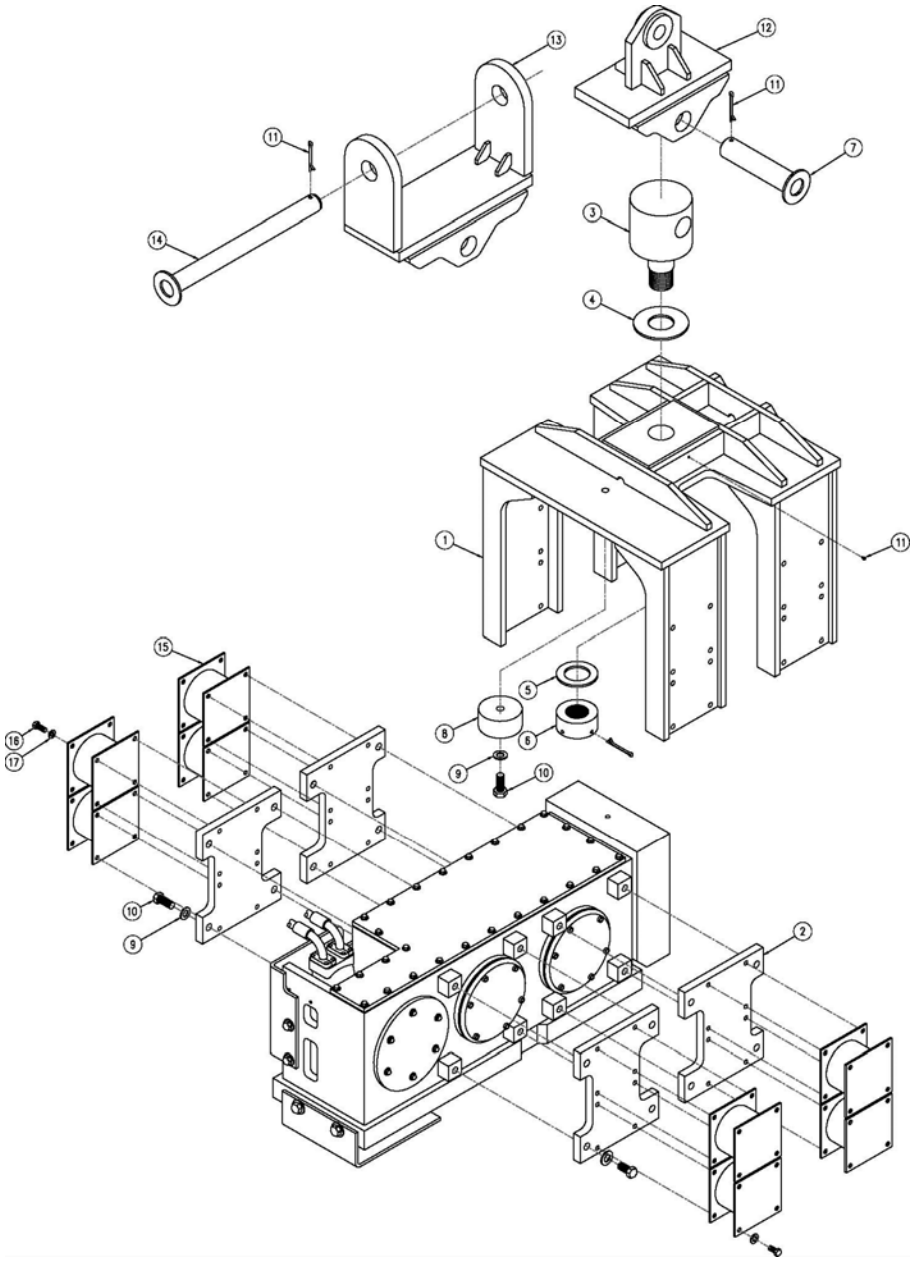
1) Remove suspension stop bolts and nuts. Lower suspension stop blocks from suspension housing.

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 2 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.

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.

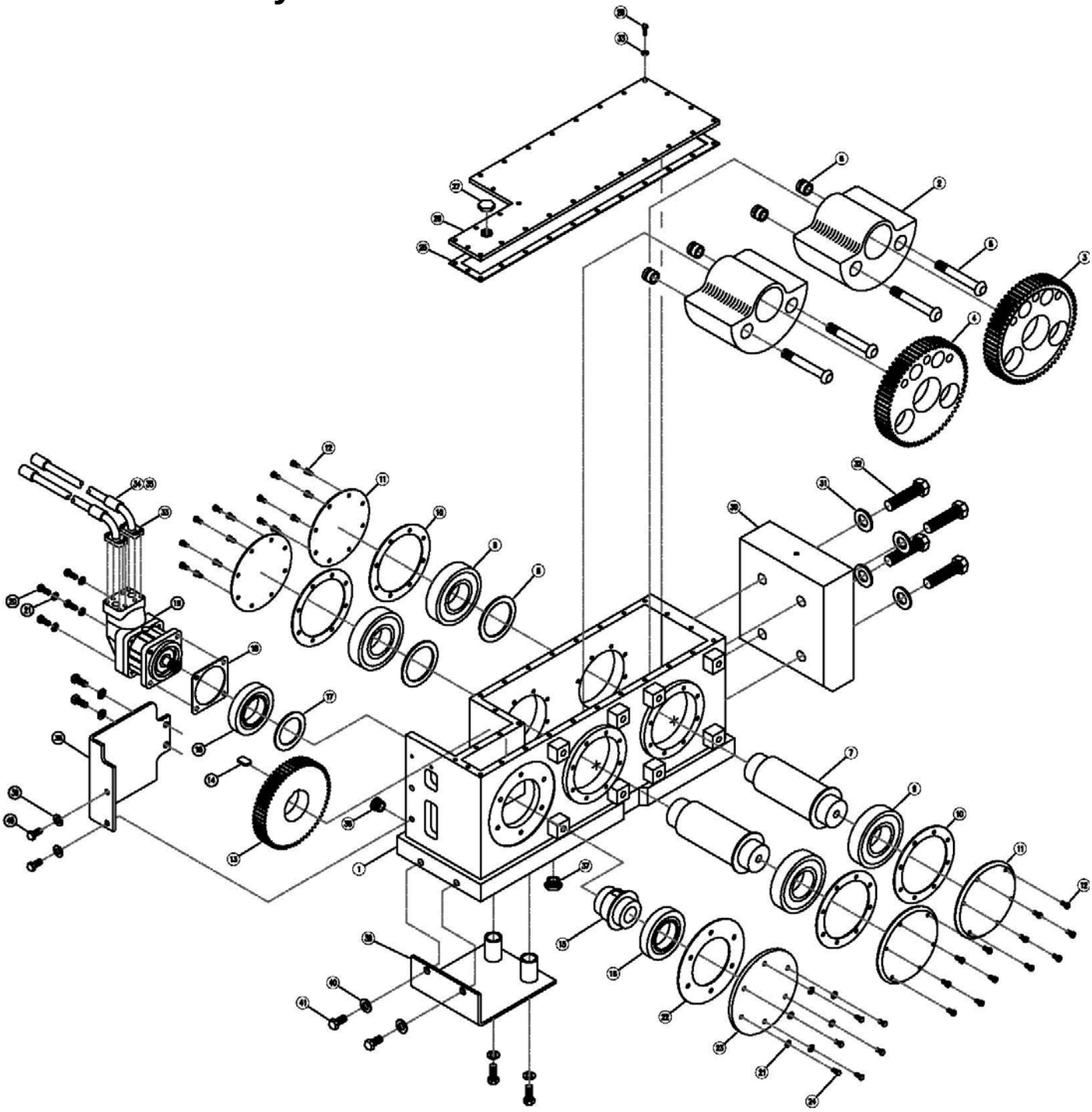
2) Thoroughly clean the bearing support sleeve and visually inspect for any damage.

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.

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

4.6-Disassembly of Exciter Unit - continued



4.6-Disassembly of Exciter Unit - continued

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.

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.

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.

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.

4.6-Disassembly of Exciter Unit - continued

4.6.6-REASSEMBLY - continued

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.

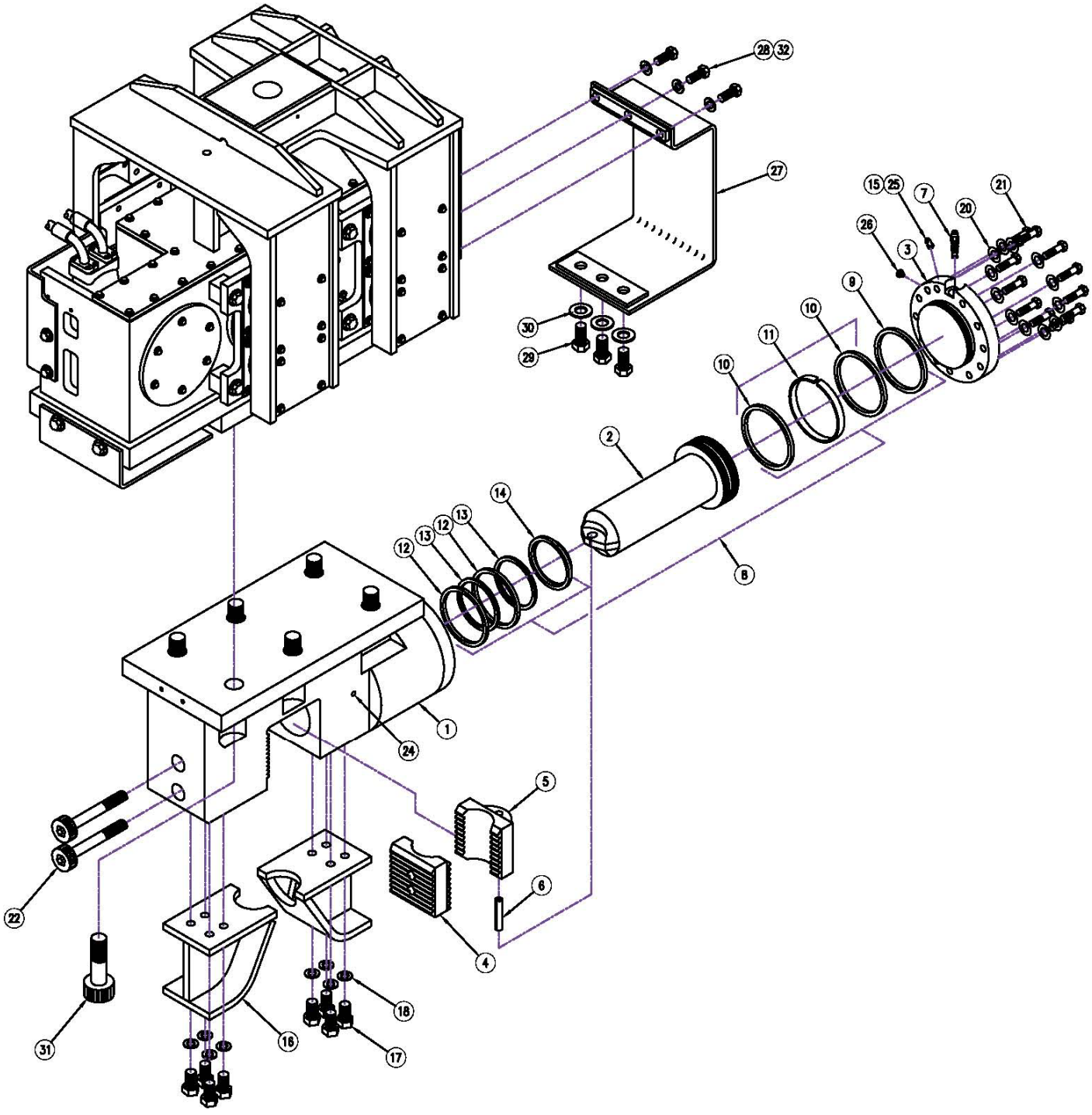
CAUTION!

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

4.7.2-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 24 ton 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

4.7.3-Rebuilding the 24 ton 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.

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-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.

5.2.4-Hydraulic Clamp Will Not Open

1) Check the Quick disconnects. Verify that they are properly tightened. Remove and retighten to insure proper alignment.

5.2.5-Hammer Will Not Vibrate

1) Check the Drive Pressure on the Instrument Panel of the Power Pack or Excavator. If the gauge does not indicate pressure, contact your Dealer or 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.

5.2.6-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.

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.

5.2.7-Hammer Will Not Stop

1) Shut down Power Pac by turning off the Key Switch located on the Engine Unit.

SECTION 5-TROUBLESHOOTING - continued

5.2.8-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.

5.2.9-Driving Speed

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

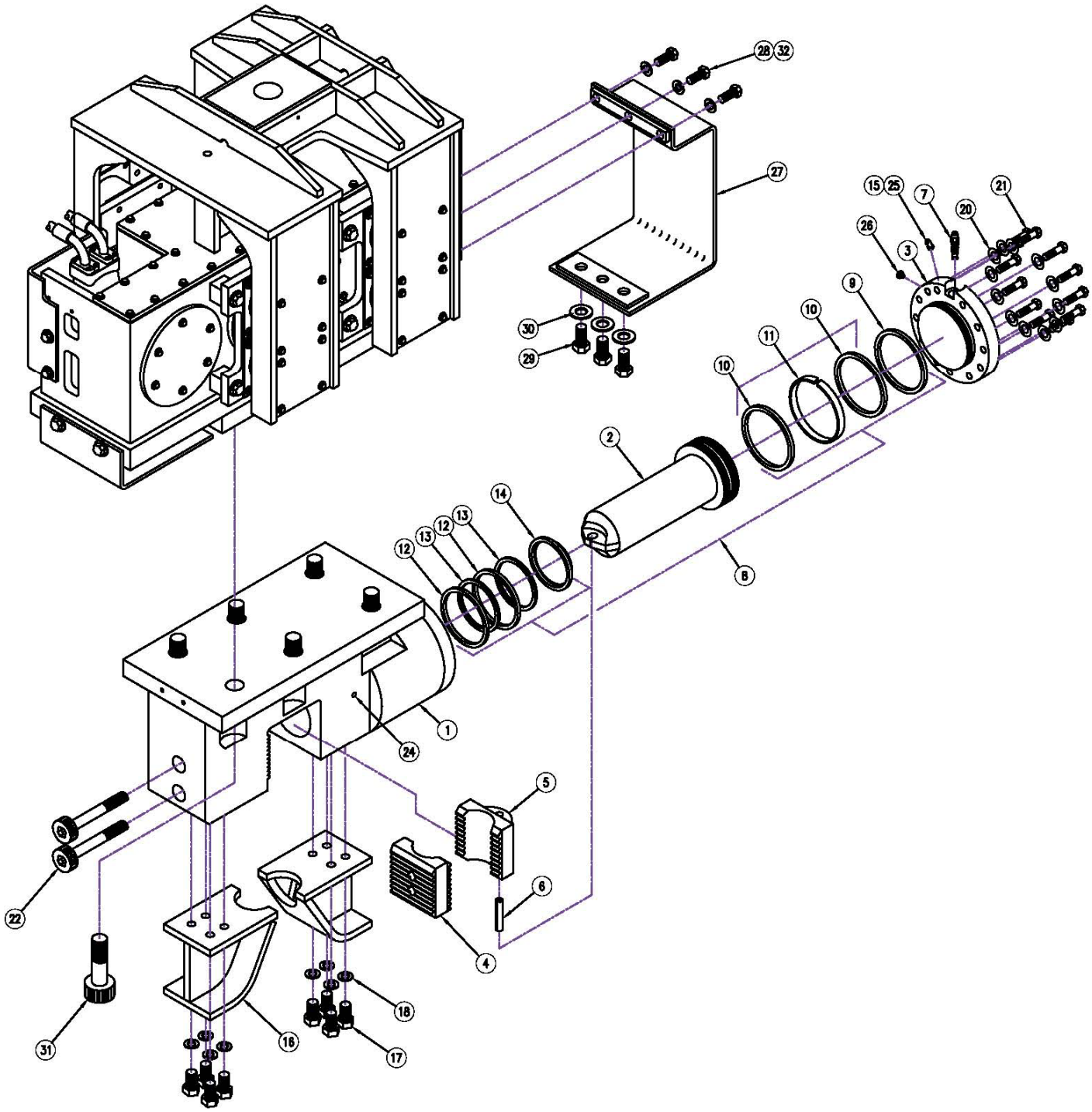
PARTS SECTION

SECTION 6-DIAGRAM OF PARTS

6.1 - Model 40E Universal 24T Sheeting Clamp

	Qty	Part Number	Name/Description
1	1		Clamp Housing
2	1		Piston Rod
3	1		Cylinder Head
4	1		Fixed Jaw
5	1		Movable Jaw
6	1		Movable Jaw Pin
7	1		Check Valve
8	1		Clamp Seal Kit Complete includes lines 9, 10, 11, 12, 13, and 14
9	1		Cylinder Head Seal 4615-2500-6500 included on line 8
10	2		Piston Seal included on line 8
11	1		Piston Wear Ring included on line 8
12	2		Piston Rod Dirt Wiper included on line 8
13	2		Piston Rod Wear Ring included on line 8
14	1		Rod Seal included on line 8
15	2		3/8" Clamp Hose
16	2		Pile Guide
17	8		¾" x 2 long Hex-head
18	8		¾" Washer
20	12		5/8 Flat Washer
21	12		Cylinder Head Cover Bolt 5/8 x 2½
22	2		1" - 9 x 5" long Fixed Jaw Bolt
24	1		Alimite Grease Fitting
25	2		3/8" NPT/JIC Adapter
26	1		3/8" NPT High Pressure Plug
27	1		Clamp Guard
28	2		1 x 1-1/2 Bolt
29	3		1 x 2 Bolt
30	5		1" Flat Washer
31	6		1-1/2 x 4 Socket Head Bolt

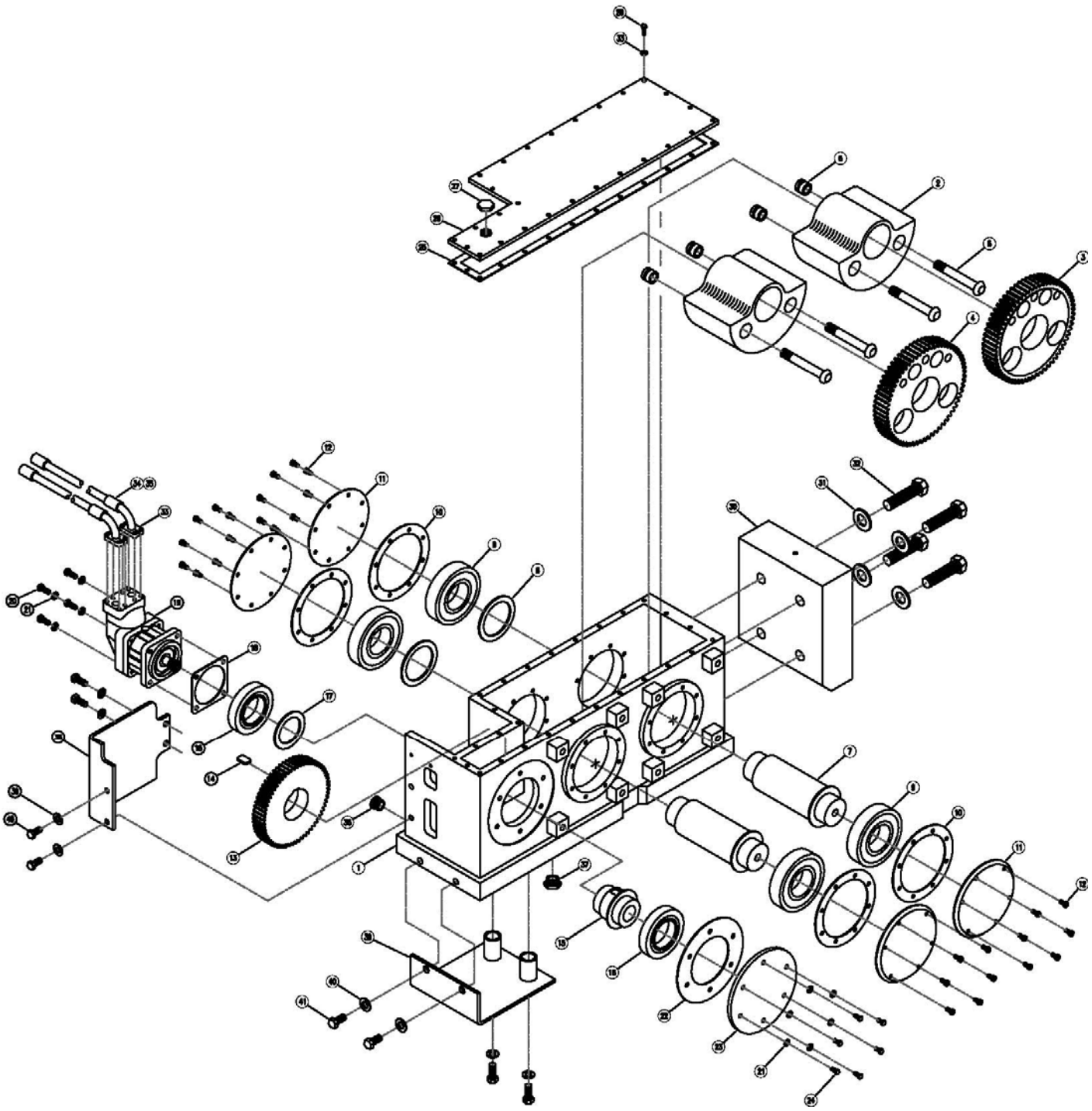
6.1.1 – Model 40E Universal 24T Sheeting Clamp - Exploded View



6.2 - Model 40E Gearbox - Exploded View

	Qty	Part Number	Name/Description
1	1		525E GEARBOX
2	2		ECCENTRIC WEIGHT
3	1		FEMALE ECCENTRIC GEAR
4	1		MALE ECCENTRIC GEAR
5	4		HUCK BOLTS
6	4		HUCK BOLT COLLARS
7	2		ECCENTRIC SHAFT
8	2		ECCENTRIC SPACER RING
9	4		ECCENTRIC BEARING
10	4		ECCENTRIC BEARING COVER GASKET
11	4		ECCENTRIC BEARING COVER
12	24		ECCENTRIC COVER BOLTS
13	1		PINION GEAR
14	1		PINION SHAFT KEY
15	1		PINION SHAFT
16	2		PINION BEARING
17	1		PINION SHAFT SPACER
18	1		MOTOR GASKET
19	1		HYDRAULIC MOTOR
20	4		MOTOR BOLTS
21	10		MOTOR BOLT FLAT WASHER
22	1		PINION GASKET
23	1		PINION BEARING COVER
24	6		PINION COVER BOLTS
25	1		TOP COVER GASKET
26	1		TOP COVER
27	1		FILL PLUG
28	27		TOP COVER BOLTS
29	27		TOP COVER FLAT WASHERS
30	1		BIAS WEIGHT
31	4		BIAS WEIGHT FLAT WASHERS
32	4		BIAS WEIGHT BOLTS
33	2		MOTOR SPLIT FLANGE KIT
34	1		MOTOR HOSES - SUPPLY AND RETURN
35	1		RETURN CHECK VALVE
36	1		SIGHT GLASS
37	1		MAGNETIC PLUG
38	1		MOTOR GUARD
39	1		HOSE GUARD
40	4		MOTOR GUARD BOLTS
41	4		MOTOR GUARD FLAT WASHER
42	2		HOSE GUARD BOLTS / UPPER
43	4		HOSE GUARD FLAT WASHER
44	2		HOSE GUARD BOLTS / LOWER
45	4		SUPPLY HOSE SPLIT FLANGE BOLTS
46	4		RETURN HOSE SPLIT FLANGE BOLTS
47	8		LOCK WASHER

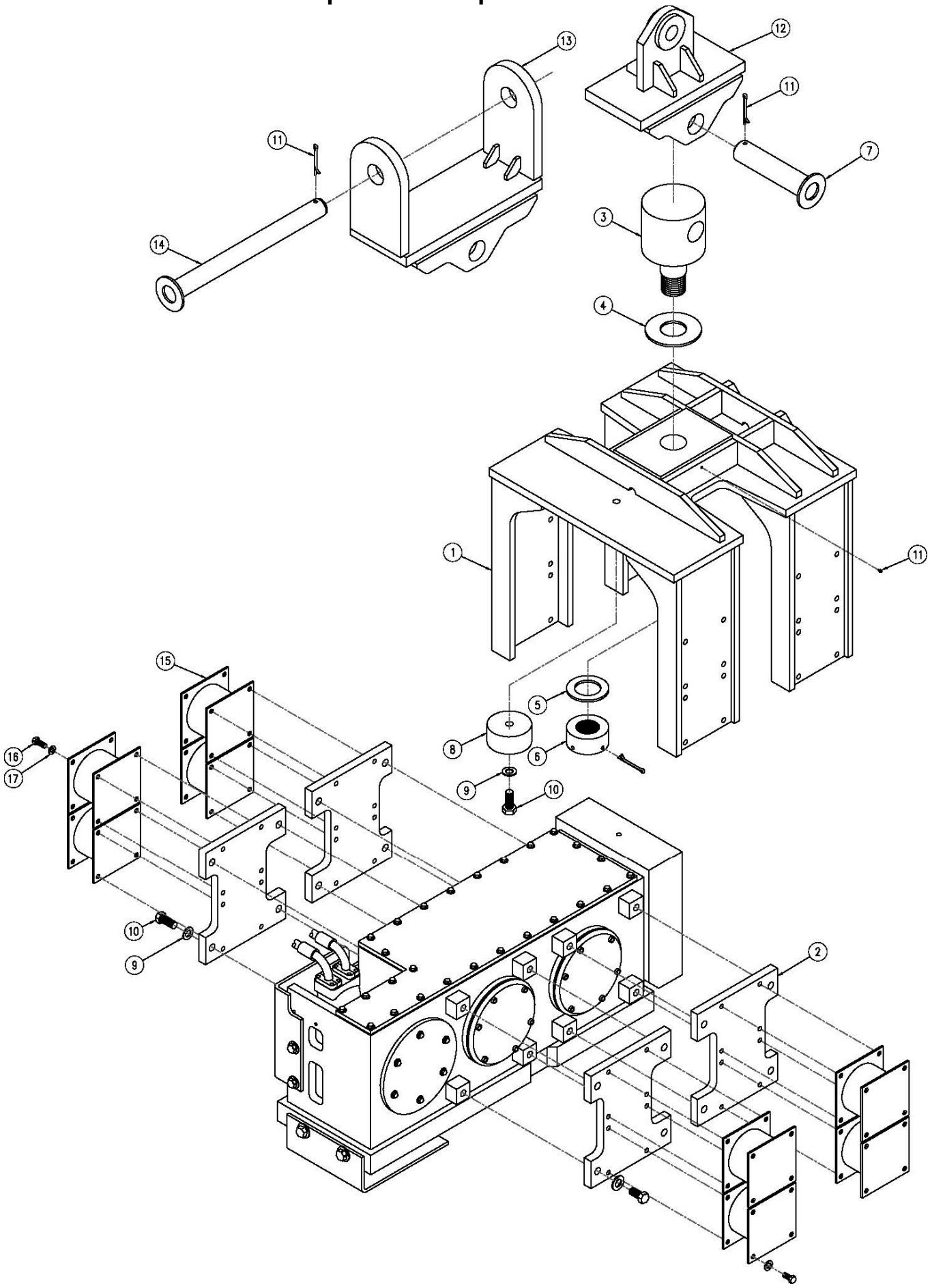
6.2.1- Model 40E Gearbox - Exploded View



6.3 - Model 40E Suspension

	Qty	Part Number	Name/Description
1	1		525 E SUPPRESOR HOUSING
2	4		SUPPRESOR MOUNTING PLATE
3	1		SWIVEL BOLT
4	1		UPPER SWIVEL SPACER
5	1		LOWER SWIVEL SPACER
6	1		SWIVEL NUT
7	1		SWIVEL BRACKET PIN
8	2		BUFFER
9	18		3/4" FLAT WASHER
10	17		3/4" x 2" HHCS
11	1		GREASE FITTING
12	1		CRANE ADAPTER
13	1		EXCAVATOR ADAPTER
14	1		EXCAVATOR PIN
15	8		SHEAR FENDER
16	32		1/2" x 1-1/4" HHCS
17	96		1/2" FLAT WASHER
18	32		1/2" NUT

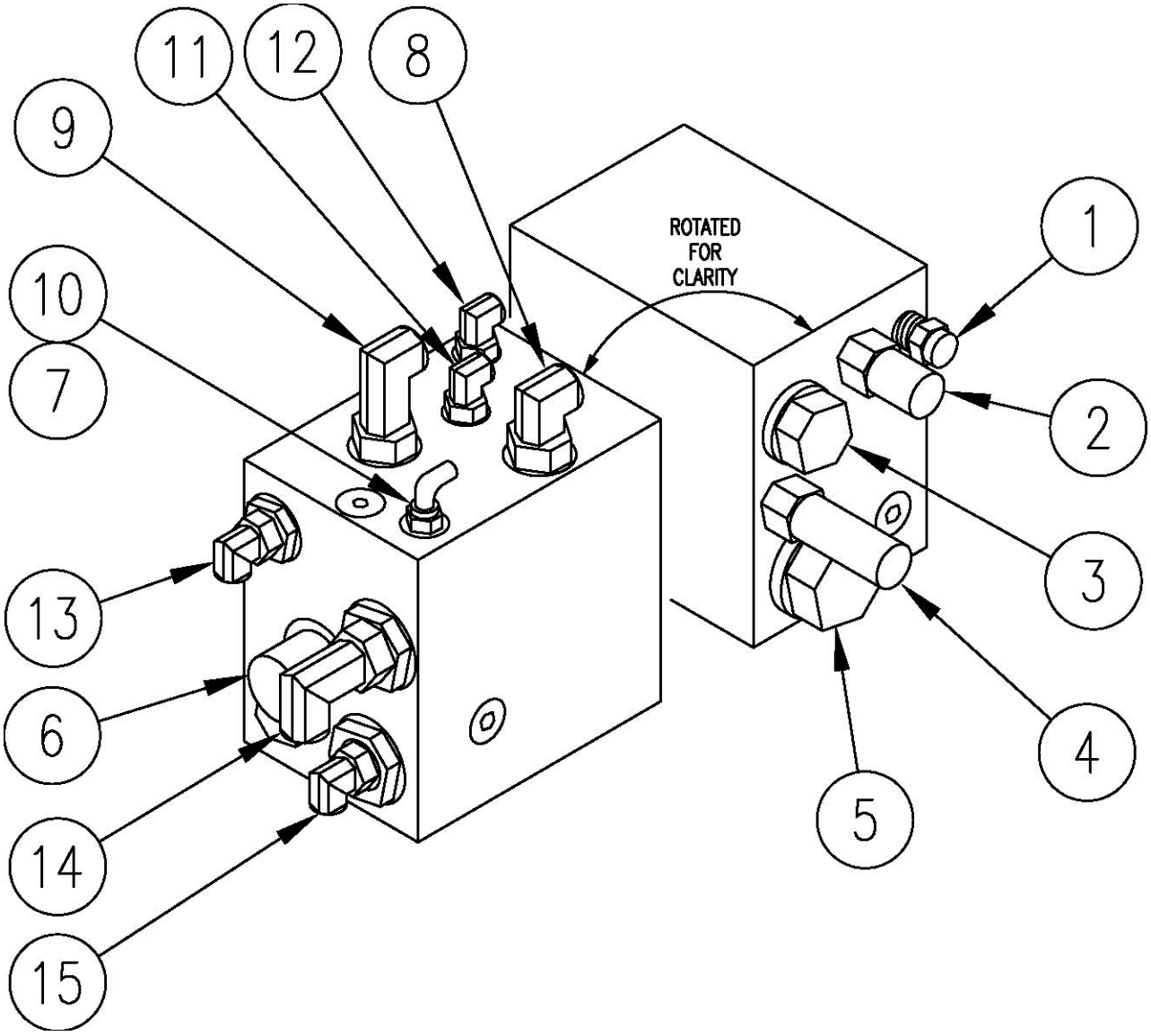
6.3.1 - Model 40E Suspension - Exploded View



6.4 - Model 40E Hydraulic Manifold

	Qty	Part Number	Name/Description
1	1	VLV-33034	120 psi Case Vent
2	1	VLV-01485	Pressure Reducing Valve
3	1	VLV-01484	Logic Element
4	1	VLV-01481	Relief Valve
5	1	VLV-01483	Flow Control Valve
6	1	VLV-01480	Counter Balance Valve
7	1	VLV-01512	Flow Control Valve
8	1		-12 Elbow
9	1		-12 Elbow Long
10	1		-6 Hose
11	1		-6 Elbow
12	1		-8 Elbow
13	1		-8 Elbow
14	1		-16 Elbow Long
15	1		-16 Elbow

6.4.1 - Model 40E Hydraulic Manifold - Assembly View

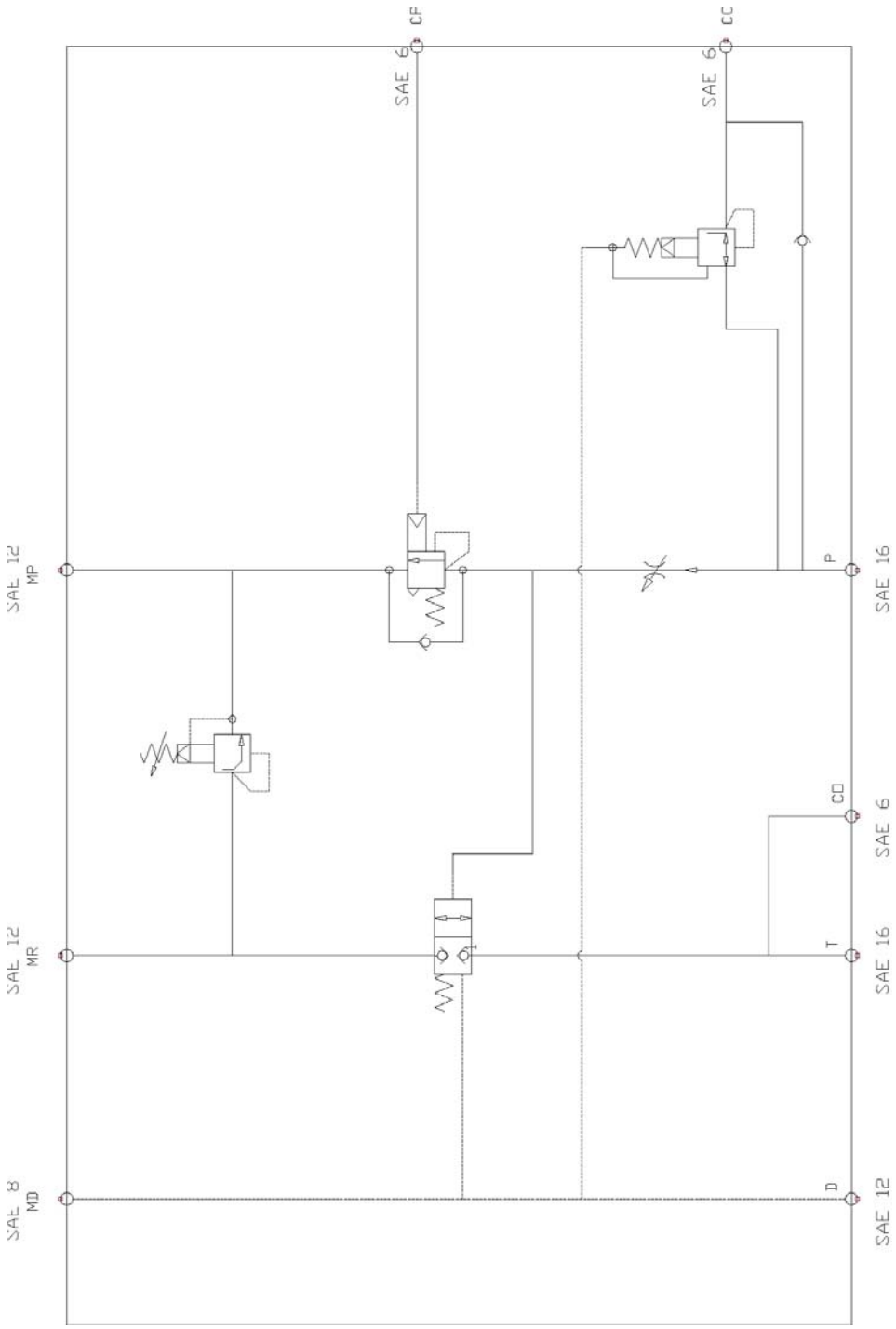


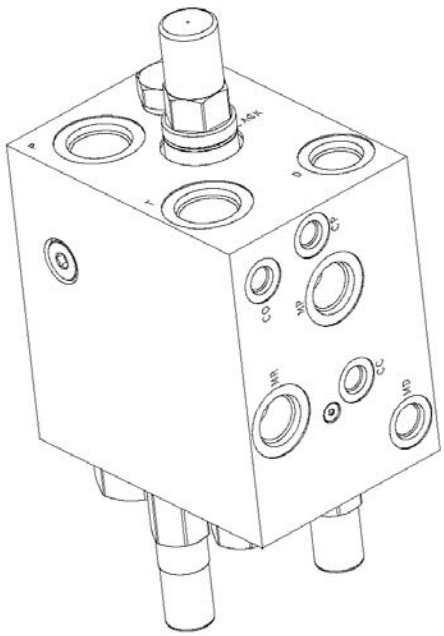
HYDRAULIC

SECTION 7 - Hydraulic Circuit

Input flow will automatically adjust through the sequence manifold to utilize the required and proper flow to operate the unit, eliminating the need for adjustments to the load sense **Power Pack** or **Excavator** hydraulic circuit. The sequence manifold will also limit the pressure to the clamp. This allows the vibratory hammer to utilize all the pressure of the **Power Pack** or **Excavator** up to **5000 psi** for driving.

7.1 - Model 40E Hydraulic Circuit





PLACARD SECTION

SECTION 8 - PLACARDS AND SAFETY SIGNS

MADE IN AMERICA

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.

FUEL TANK
DO NOT WELD

MAX PULL 12 TON

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.

CHARGE

MOBIL AW 46

NO. 2 DIESEL FUEL
CLAMP

**DO NOT STAND UNDER-
NEATH OR WITHIN 20 FEET
OF OPERATING EQUIPMENT
UNLESS MACHINERY IS
TURNED OFF AND SECURED.
FAILURE TO OBEY WARNING
COULD RESULT IN SERIOUS
PERSONAL INJURY OR
DEATH.**