GP SERIES
OPERATION AND
MAINTENANCE MANUAL

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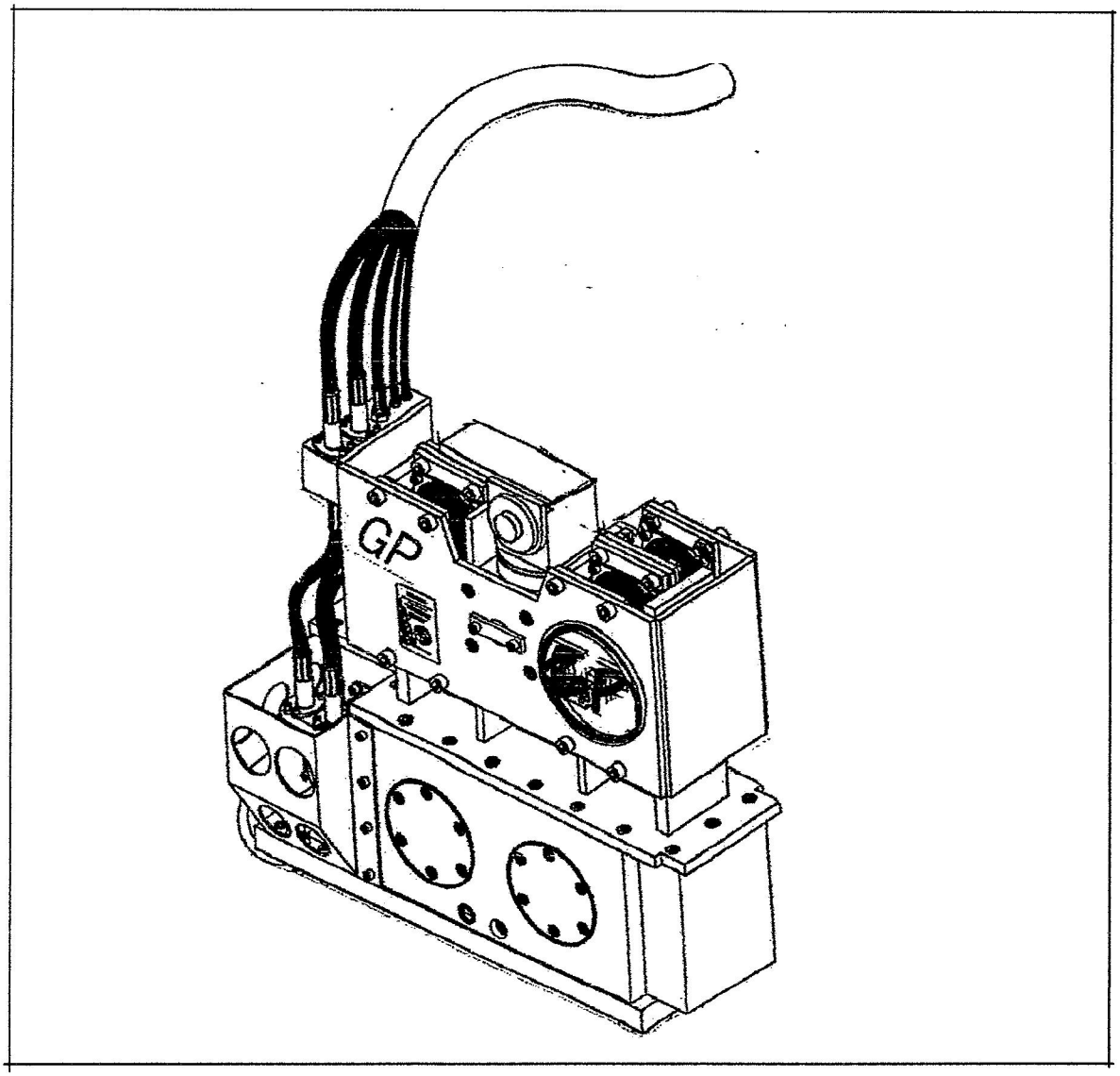
FOUNDATION EQUIPMENT.com, Seattle, Wa. 206-369-2999/ fx 815-717-9346



SERIAL NUMBER:

GP MODELS- 23.2wc / 23.2exwc / 33.2wc

Rev 8/14

OPERATION / MAINTENANCE MANUAL

GP MODEL VIBRATORY HAMMER

Safety Precautions

(This list of precautions must be followed at all times to ensure personal & equipment safety.)

1. Read this manual from beginning to end before operating or working on this machine.
2. When operating in a closed area, pipe exhaust fumes outside. (**WARNING:** Breathing exhaust fumes can cause serious injury and even death.
3. When servicing batteries, avoid any type of spark or open flame. Batteries generate explosive gases during charging. There must be proper ventilation when charging batteries.
4. Never adjust or repair the unit while it is in operation.
5. Make sure the Control Pendant is in the "**OFF**" position before starting the unit.
6. Remove all tools and electrical cords before starting the unit.
7. Keep oily rags away from the exhaust system.
8. Never store flammable liquids near the engine.
9. Never stand under vibro at any time and keep your eyes on the vibro when it is in operation. Keep a look out for loose bolts or leaking hydraulic lines.
10. Avoid pulling on hose quick dis-connect fittings. Move power unit closer to work if hoses cannot reach. Do not use hoses as a tow line to tug the power unit! If a hose fails at the hydraulic couplers then it is a result of "hose tugging by the pile crew".
11. Avoid kinks in the hoses. Kinks will cut the hose safety factor by 50 percent.
12. Always wear eye and ear protection.
13. Avoid standing downwind of vibrating piles. Dirt and other matter may become airborne and fall into the unprotected eye.
14. Always wear a hardhat, gloves, and safety shoes.
15. Always attach safety line to pile when extracting or hoisting into position.
16. **(WARNING)** Never clamp vibro to pile and dis-connect from crane line. Lay vibro down on ground when not in use.
17. Do not truck power unit with quick dis-connect caps and plugs screwed on to fittings unless the caps and plugs have wire rope safety line attached. Store in storage box under control panel.

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GP MODEL VIBRATORY HAMMER

PREPARATION AND OPERATION

Precautions and Rules for Operation

The following is a list of precautions, suggestions and rules that are intended to help promote the safe and productive use of the GP Model Vibratory Hammer.

1.) Follow the Daily Maintenance Required Prior to Operation.
2.) Read and follow the Safety Precautions.
3.) Follow the start-up procedures listed in the manual.
4.) Keep mandrel plump at all times.
5.) Come up to speed before doing work.
6.) No dancing. Avoid de-intensification.
7.) Drive past obstacles and then go back.
8.) Backhoe on site to remove obstacles.
9.) Probe the pile if it appears stuck.
10.) Keep piles plumb or down the road you go.
11.) Never rush the foreman.
12.) Slow and plumb and the job will get done.
13.) Never stand under pile hammers.
14.) Wait for vibro to get to full speed, then pull.
15.) In sandy soils drive faster.
16.) In clay amplitude is everything.
17.) Low drive pressure means easy work.
18.) High pressure means friction on piles.
19.) Over 4500 psi means get a bigger hammer.
20.) No amplitude means get a bigger hammer.
21.) Check bolts each morning.
22.) Read the manual – know your machine.
23.) Attach whip line to pile when pulling.
24.) Extract straight – look at mast and cable.
25.) Stalled engine means dirty fuel filters.

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GP MODEL VIBRATORY HAMMER

Warranty

American Piledriving Equipment, Inc. J&M Foundation Equipment LLC
STANDARD WARRANTY

American Piledriving Equipment, Inc./J&M Foundation Equipment LLC (APE/J&M) warrants new products sold by it to be free from defects in material or workmanship for a period of one year after the date of delivery to the first user and subject to the following conditions:
APE/J&M's obligation and liability under this WARRANTY is expressly limited to repairing or replacing at APE/J&M's option, any parts which appear to APE/J&M upon inspection to have Been defective in material or workmanship. Such parts shall be provided at no cost to the user, at the business establishment of APE/J&M or the authorized APE/J&M distributor of the product during regular working hours. This WARRANTY, shall not apply to component parts or accessories of products not manufactured by APE/J&M and which carry the warranty of the manufacturer thereof, or to normal maintenance (scraped and skived lube and fuel lines, worn cushion material in the drive base) or normal maintenance parts (such as fouled injectors, weakened check valve springs, damaged grease zirts caused by use over time).
Replacement or repair parts installed in the product covered by this WARRANTY are warranted only for the remainder of the warranty as if such parts were original components of said product. APE/J&M makes no other warranty, expressed or implied and makes no warranty of merchantability of fitness for any particular purpose.

APE's obligation under this WARRANTY shall not include any transportation charges, costs of installation, duty, taxes or any other charges whatsoever, or any liability for direct, indirect, incidental or consequential damage or delay. If requested by APE/J&M, products or parts for which a warranty claim is made are to be returned transportation prepaid to APE/J&M. Any improper use, including operation after discovery of defective or worn parts, operation beyond rated capacity, substitution of any parts whatsoever, or parts not approved by APE/J&M or any alteration or repair by others in such manner as in APE/J&M's judgment affects the product materially and adversely, shall void the warranty.

ANY TYPE OF WELDING ON EQUIPMENT
WILL VOID THE WARRANTY

Refusal: Vibros: If the pile does not move one foot in 30 seconds of vibro operation at full speed. Resort to a larger vibro. APE/J&M equipment may exceed the refusal driving criteria for short periods of time as may be needed to penetrate hard soil layers or obstacles. In such cases, a heat gun is used to monitor the temperature of the bearings and related components to prevent use of the machine beyond 210 degrees. Contact APE/J&M.

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GP MODEL VIBRATORY HAMMER

The use of the APE Sequence Valve with any APE vibro, regardless of model or size, whether attached to an excavator or run from an APE power unit, must have in place safety chains and/or safety cables attached to any pile regardless of pile type. This is a mandatory safety device required to prevent injury and/or damage by possible failure of clamp close hydraulic pressure for any reason. Loss or reduction of hydraulic clamp pressure may result in dropping a pile unexpectedly.

Picking up piles of any type and moving them from location to location without this safety device is absolutely for bidden. Anytime an APE vibro is attached to a pile of any type, regardless of intended use of the vibro shall always have this safety device attached, no exceptions allowed.

Violation of this basic and standard safety procedure is the sole responsibility of the user and American Piledriving Equipment, Inc shall not be held liable, directly or indirectly for possible results that may occur due to the intentional or unintentional use of our product without this safety device installed.

GP SERIES VIBRO SPECIFICATIONS

GP13.2 WC

SPECIFICATIONS	DATA
Drive Force	62 tons (552 kN)
Frequency Maximum (VPM)	0 - 2,200 vpm
Max Line Pull/Crowd	25 tons (222 kN)
Bare Hammer Weight	3,850 lbs (1746 kg)
Width	14.75 in (37.47 cm)
Length	58.00 in (147.32 cm)
Height (pin to bottom plate)	54.00 in (137 cm)

GP23.2 WC

SPECIFICATIONS	DATA
Drive Force	88 tons (785 kN)
Frequency Maximum (VPM)	0 - 2,200 vpm
Max Line Pull/Crowd	25 tons (222 kN)
Bare Hammer Weight	4,950 lbs (2,245 kg)
Width	15.00 in (38 cm)
Length	58.00 in (147.32 cm)
Height (pin to bottom plate)	58.00 in (147.32 cm)

GP23.2 EX WC

SPECIFICATIONS	DATA
Drive Force	109 tons (972 kN)
Frequency Maximum (VPM)	0 - 2,200 vpm
Max Line Pull/Crowd	25 tons (222 kN)
Bare Hammer Weight	5,150 lbs (2336 kg)
Width	15.00 in (38 cm)
Length	58.00 in (147.32 cm)
Height (pin to bottom plate)	58.00 in (147.32 cm)

GP33.2 WC

SPECIFICATIONS	DATA
Drive Force	151 tons (1347 kN)
Frequency Maximum (VPM)	0 - 2,200 vpm
Max Line Pull/Crowd	25 tons (222 kN)
Bare Hammer Weight	5,400 lbs (2449 kg)
Width	15.00 in (38 cm)
Length	58.00 in (147.32 cm)
Height (pin to bottom plate)	58.00 in (147.32 cm)

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LOADING AND UNLOADING

GP Vibratory Hammer

The vibrator is normally shipped laying flat on the trailer deck. Lift the vibrator by rigging one line to the lifting pin and one line around the clamp attachment lifting the vibro. Avoid smashing hydraulic lines. Vibro should be loaded with hydraulic motor down facing the deck and breather valves facing the sky. Before the truck has left, carefully inspect the machine and hoses for any missing equipment or sign of damage that may have occurred during shipment or unloading.

What to do if damaged during shipment

In the event of damage, notify the trucking agent at once. Note all damage on the bill of lading. Fax/Call/email the information as soon as possible, any delay may make it impossible to find the responsible party.

Filling Vibrator Pressure Hose

The vibrator is shipped with the hoses filled with oil. However, if the unit has been sitting for a long period of time or if a damaged hose has been replaced with a new one, then the hoses must be filled. Hook up all the hoses to the power. Start the excavator and let it run for ten minutes before running the vibro. The hoses will fill up by themselves in ten minutes even if the vibro is not in the vibrate mode. Follow all commonly accepted hydraulic procedures.

Gearcase Oil Capacity

The GP Vibrator requires 8 quarts of approved gearcase oil, which will bring the level up to the BOTTOM of the site glass with the vibrator sitting level.. It is recommended to change the gearcase oil on a weekly basis (50hrs) and if your vibrator is inactive for over a month, turn the vibrator over so the other bearings are laying in oil.

(See following 7 pages)

SINCE 1839
Schaeffer MANUFACTURING COMPANY

ISO 9001 CERTIFIED

TECHNICAL DATA

102 Barton Street, St. Louis, Missouri 63104
In-State (314) 865-4100/Out of State 800-325-9962/Fax (314) 865-4107 http://www.schaefferoil.com

#268 SUPREME GEAR LUBE
SAE 140, ISO 320,460, 680

Supreme Lube is a multi-purpose thermally stable and thermally durable para-synthetic gear lubricant that is recommended for use in all types of enclosed industrial and automotive gear drives where extreme pressure characteristics are needed.

Supreme Gear Lube is blended from the finest high quality severely hydrotreated polyalphaolefin (PAO) synthetic base fluids and severely solvent refined, severely hydro-finished high viscosity index 100% pure paraffin base oils available. This unique combination provides Supreme Gear Lube with the following advantages:

1. Excellent low temperature properties. This results in the bearings and gears being instantly lubricated at sub-zero temperatures the moment they start turning.
2. Superior oxidation and thermal stability.
3. Excellent resistance to thermal degradation
4. Excellent hydrolytic and demulsibility characteristics
5. A high viscosity index
6. Increased wear protection and longer gear life
7. Compatibility with all types of seals.

Blended into these para-synthetic base fluids is a highly specialized non-corrosive thermally stable and thermally durable multifunctional extreme pressure additive package that provides the Supreme Gear Lube with the following performance advantages:

1. Enhanced thermal and oxidative stability and durability to handle operating temperatures of 300°F to 350°F.
2. Excellent extreme pressure properties to protect the gears and bearings from excessive wear and fatigue.

Continued on Next Page

3. Prevention of the formation of sludge and carbon deposits that erode the seals.
4. Excellent seal compatibility
5. Enhanced protection of copper, brass and bronze components from corrosion.
6. Non-corrosivity to brass, bronze and other non-ferrous metal parts.
7. Excellent protection of components from rust and corrosion in dry conditions and in the presence of moisture.
8. Excellent resistance to water and moisture
9. Excellent water separability characteristics
10. Enhanced gear, bearing and seal cleanliness
11. Excellent resistance to foaming.

The trends among automotive and industrial gear drive manufacturers is to operate the equipment at higher speeds, loads, power densities and increased torque. These trends have resulted in automotive and industrial gear drives being subjected to higher operating temperatures. These higher operating temperatures have further resulted in today's gear lubricant's being subjected to extreme thermal stress.

Therefore, it is important that a gear lubricant possess thermal stability and durability characteristics. Gear lubricants that do not possess these properties rapidly oxidize and decompose when subjected to high temperatures, resulting in the formation of sludge, varnish, and carbon deposits on the gears, bearings and seals, abraded seals, premature seal hardening and brittleness, and a loss of the gear lubricant's extreme pressure additive chemistries ability to protect against excessive wear, spalling and overall distress to the gears and bearings.

Supreme Gear Lube's para-synthetic base fluids and the thermally stable and the thermally durable multifunctional extreme pressure additive package enable the Supreme Gear Lube to resist oxidation and thermal stress at operating temperatures 150°F to 175°F higher than conventional gear lubricants. This results in:

1. A vast reduction in the formation of deposits.
2. Better heat transfer
3. Excellent protection to the gears and bearings even under the most extreme thermally stressed operating conditions.
4. Less wear to gears, bearings and seals.
5. Increased oil seal life

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6. Lower operating temperatures
7. Less energy consumption
8. Longer lubricant life
9. Longer equipment life
10. Reduced maintenance costs

Most types of gearing are designed to operate under hydrodynamic lubrication conditions. That is a full fluid oil film must separate the metal surfaces of the gears and bearings during operation. However, during periods of cold start up, extremely high operating temperatures or high shock loading conditions this full fluid film can be destroyed. Unless a boundary lubricant is present in the gear lubricant when this full fluid film is destroyed, excessive wear can take place.

To prevent this wear, Molybdenum Disulfide is further blended into the Supreme Gear Lube. Molybdenum Disulfide provides the boundary lubrication that is needed by plating itself to the metal surfaces of the gears and bearings. Once plated, Molybdenum Disulfide forms an indestructible long lasting solid lubricant film that is capable of withstanding pressures up to 500,000 psi. This solid lubricant film once plated to the gears and bearings will reduce friction, vibration, and wear, thus extending equipment life.

The Moly film also provides a smooth finish surface on all of the moving surfaces of the gear drives. This smooth finish minimizes the action of cold welding and vibration, which can occur during start up after the gears have been standing idle and during periods of high shock loading. This in turn lessens starting loads and peak power demand, thus resulting in a realistic power cost savings.

Supreme Gear Lube contains an adhesive-cohesive additive that allows the product to tenaciously stick and cling to the gears and bearings. This ensures the Supreme Gear Lube to retain a fine film that "stays put" on the metal surface of the gears and bearings regardless of how thoroughly it is wiped away.

Supreme Gear Lube contains the proper additive system that allows the product to properly function and lubricate limited slip, positraction, and high offset gear rear ends and differentials.

Supreme Gear Lube meets and exceeds the following specifications and manufacturer's requirements: API Service classifications GL-5, MT-1 and PG-2, United States Military Specifications MIL-PRF-2105E, SAE J2360, Mack GO-J, Clark MS-8 Rev 1, Ford, General Motors, Daimler-Chrysler, John Deere J11D, Komatsu-Dresser B22-003, Rockwell Standard O-76A and O-76B, Eaton's Final Drive Lubricant Specifications, Terex EEMS19003, VME American's Specifications EEMS19003F, EMS1901, White Motors MS0016, Volvo,

Volkswagen, US Steel 224, David Brown S1.53101 Type E, AGMA 9005 D-94, AGMA 90005 E-02 AGMA 250.04, AGMA 251.02, DIN 51517 Part 3 (CLP), and Cincinnati Milicron P-59.

TYPICAL PROPERTIES

SAE Grade	**140**	**-----**	**-----**	**-----**
ISO Grade		**320**	**460**	**680**
AGMA Grade	----	6EP	7EP	8EP
Specific Gravity @ 60°F/15°C	.8724	.871	.8708	.8722
Viscosity SUS @ 100°F/38°C (ASTM D-445)	1578-2551	1568-1849	2146-2753	3313-3749
Viscosity cSt @ 40°C (ASTM D-445)	290-325	299-353	403-520	616-745
Viscosity cSt @ 100°C (ASTM D-445)	25.00-32.00	27.94-33.34	29.50-40.50	34.50-51.50
Viscosity Index (ASTM D-2270)	125	150	120	110
Flash Point °F/°C (ASTM D-92)	490°/254°	490°/254°	510°/260°	490°/254°
Fire Point °F/°C (ASTM D-92)	540°/282°	540°/228°	550°/288°	540°/282°
Pour Point °F/°C (ASTM D-97)	-25°/-32° to -33°/-36°	-15°/-26° to -20°/-29°	-10°/-23 to -15°/-26°	-10°/-23° to-15/-26°
Rust Test (ASTM D-665)				
Procedure A (Distilled Water)	Pass	Pass	Pass	Pass
Procedure B (Salt Water)	Pass	Pass	Pass	Pass
Copper Strip Corrosion Test (ASTM D-130)	1a	1a	1a	1a
Four Ball EP Test (ASTM D-2783)				
Weld Point, kgs.	400	400	400	400
Load Wear Index	67.91	69.50	67.91	67.91
Four Ball Wear Test (ASTM D-4172)				
Scar Diameter, mm	0.28	0.28	0.28	.28
Coefficient of Friction	0.1	0.1	0.1	.1

SAE Grade	**140**	**---**	**----**	**----**
ISO Grade	**---**	**320**	**460**	**680**
Timken EP Test (ASTM D-2782)				
OK Load, lbs.	70	70	70	70
Failure Load, lbs.	75	75	75	75
Falex EP Continuous Load (ASTM D-3233)				
Procedure A				
Failure Load, lbs.	2500	2500	2500	3,000
FZG A/8.3/90 (ASTM D-5182)				
Failure Load	13th Stage	13th Stage	13th Stage	13th Stage
Oxidation Test (ASTM D-2893)				
312 hours @ 203°F/95°C				
% Viscosity Increase	3	3	3	5%
L-60-1 Thermal Oxidation Test (ASTM D-5704)				
% Viscosity Increase	22	22	22	22
Demulsibility Test (ASTM D-2711)				
Free Water, ml	83	83	83	83
% Water in Oil	0.65	0.65	0.65	0.65
Emulsion, ml.	Trace	Trace	Trace	Trace
Foam Tendency Test (ASTM D-892)				
Sequence I	0/0	0/0	0/0	0/0
Sequence II	0/0	0/0	0/0	0/0
Sequence III	0/0	0/0	0/0	0/0

Packaging: #268 Supreme Gear Lube is available in 420lb drums, 225 lb drums, 120 lb. kegs and 40 lb pails.

MATERIAL SAFETY DATA SHEET

Manufacturer:	Schaeffer Mfg. Company	**Emergency Response Number:**
Address:	102 Barton Street	**314-865-4105 (24-hour emergency number)or**
Address	St. Louis, MO 63104	**800-325-9962**

SECTION 1 – PRODUCT INFORMATION

Chemical Family: Petroleum Hydrocarbons and Additives | **Trade Name: #268 Supreme Gear Lube SAE 140**

Formula: Proprietary Mixture

SECTION 2 – HAZARDOUS INGREDIENTS

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES	CAS Number	%	Exposure Limits TVL ppm	Exposure Limits TVL mg/m^3	Exposure Limits PEL ppm	Exposure Limits PEL mg/m^3
Mixture of Paraffin Base Oils	64742-01-4, 64742-62-7 64742-52-5 64741-95-3			5		5
Olefin Sulfide	68937-96-2	3-4		NE		NE
Molybdenum Disulfide	1317-33-5	1-3		10		15
Polyalphaolefin Synthetic Base Fluids	68037-01-4	6-20		5		5

Section 3 – PHYSICAL DATA

Boiling Point:	>600°F/315.5°C	**Specific Gravity:**	.8724
Vapor Pressure (mm, Hg):	Not Determined	**% Volatile:**	Nil
Vapor Density (Air = 1):	Not Determined	**Evaporation Rate: (=1)**	Not Determined
Solubility in Water:	Insoluble	**pH:**	Not Applicable

Appearance and Odor: Gray black color, strong odor.

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method) °F/°C: 425°-430°F/218.33-221.11°C C.O.C. (ASTM D-92) | **Flammability Limits UEL & LEL** ----Not Determined

Extinguishing Media: Carbon dioxide foam, dry chemical foam, sand, earth

Special Fire Fighting Procedures: For fires involving this material, do not enter any enclosed or confined space without protective equipment including self-contained breathing apparatus.

Unusual Fire & Explosion Hazards: Dense black smoke

SECTION 5 - REACTIVITY HAZARD DATA

STABILITY [X] STABLE [ ]UNSTABLE | **Hazardous Decomposition** [ ] WILL [X] WILL NOT OCCUR

Conditions to Avoid: High heat, high energy ignition sources

Incompatibility (Mat. to avoid): Strong oxidizers and reducers

Hazardous Decomposition Products: Oxides of carbon, sulfur and by products of incomplete combustion

Conditions to Avoid: None

SECTION 6 - HEALTH HAZARD DATA

Threshold Limit Value and Sources: 5.0/mg/m^3 for oil mist. OSHA & ACGIH.

Acute Effects of Overexposure:

Ingestion:	Nausea and Diarrhea. Tackiness agents in this product may possibly be coagulated by stomach acids
Eye Contact:	Irritation and redness to eyes
Skin Contact:	Prolonged and repeated contact with the skin can cause irritation and redness to skin.
Inhalation:	Vapors can be given off under high heat conditions excessive breathing of vapors can cause irritation of the respiratory tract.

CHRONIC EFFECTS OF OVEREXPOSURE: None currently known

Emergency and First Aid Procedures:

Swallowing:	If conscious give 2 glasses of water to drink. Do not induce vomiting. Seek medical attention immediately.
Skin:	Wash skin thoroughly with soap and water. Launder contaminated clothing.
Inhalation:	Remove victim to fresh air. If breathing is labored administer oxygen. If breathing has stopped start artificial respiration immediately.
Eyes:	Flush eyes with clear, cool, clean water for 15 minutes. Seek medical attention immediately

SECTION 7 – SPILL OR LEAK PROCEDURES

Environmental Impact: This material is not expected to present any environmental problems other than those associated with oil spills. If spilled into a watercourse, call the Coast Guard Toll Free No. 800-424-8802.

Procedures To Be Taken If Material Is Released or Spilled: Immediately absorb spilled material with absorbent clay, diatomaceous earth or other suitable material. Keep out of sewers and waterways. Shovel up and dispose of in approved waste containers.

Waste Disposal Method: Dispose of at an approved waste or disposal site facility in accordance with all applicable federal, state and local laws and regulations. This product is not considered to be an RCRA hazardous waste.

SECTION 8 – SPECIAL PROTECTION INFORMATION

Respiratory Protection:	None required under ordinary conditions of use.
Ventilation:	No special requirement under ordinary conditions of use and with adequate ventilation.
Eye Protection:	Chemical resistant goggles or face shield.
Protective Clothing:	Oil resistant gloves.

Date Prepared: 05/13/2009

OF-1049 Rev. (1999)

SECTION 9 – SPECIAL PRECAUTIONS

Precautions To Be Taken In Handling and Storage: Do not store near heat, spark, flame or strong oxidizers. Keep containers closed when not in use.

Special Comments: Remove oil soaked clothing, launder before reuse. Wash skin thoroughly with soap and water after handling. Keep away from food and feed products

SECTION 10 – ADDITIONAL HEALTH AND TOXICOLOGICAL DATA

HMIS & NFPA Ratings: Health = 1 Fire = 1 Reactivity = 0

This product does not contain any of the chemicals listed on the National Toxicology Program Annual Reports on Carcinogens, The International Agency for Cancer Research Monographs and OSHA's 1910.10 Subpart Z List.

This product does not contain any chemicals that are found on the State of California's Proposition 65 List for chemicals classified as potential reproductive or cancer causing agent.

This product does not contain any greater than 1% of any of the chemicals listed on the EPA's SARA Title III Section 302/304 and 313 List and CERCLA 102(a).

All of the components in this material are on the US TSCA Inventory List. All of the components of this material are in compliance with the Canadian Environmental Protection Act, the EC Seventh Amendment Directive 921321EEC ..

Transport Information:

US DOT: Not regulated. Not dangerous for transport under the US DOT Regulations
IATA: Not Regulated. Not dangerous for transport under the IATA Regulations
IMDG: Not Regulated Not dangerous for transport under the IMO Regulations

EC Symbols: None
EC Risk Phrase: None
EC Safety Phrase: Not Classified

OPERATION / MAINTENANCE MANUAL

GP MODEL VIBRATORY HAMMER

Start Up & Shut Down Prodedures

The following procedures explain what to do to correctly start up & shut down the GP Vibratory Hammer.

Starting the GP Vibrator:

1. Put the mandrel on location.
2. Push or "crowd" down, with the Rodrill Mast until the mast lifts off the ground 3" (150mm).
3. Start the vibrator while concurrently pushing (crowding) the mandrel into the ground. Never lift the mast off the ground more than 10" (250mm).

Stopping the GP Vibrator: when pier is complete

1. Push down with the mandrel/vibrator.
2. Turn off the vibrator, while simultaneously pushing down into ground.
3. Move to next location and repeat "Starting the GP Vibrator".

NOTE: Pushing or crowding the vibrator / mandrel into the ground increases the vibrating mass, which lowers the amplitude or up/down motion of the vibrator. In this manner the operator can better control the gyrations/bouncing effect experienced when stopping and starting the vibrator.

Turning the vibrator OFF whenever the mandrel is OUT of the ground -increases bearing life and keeps the vibrator cool. The water cooled vibrator is still circulating coolant even while the vibrator is off . .

Turning the vibrator ON, or Vibrating when the mandrel is OUT of the ground (in "free hanging condition")- decreases bearing life, and may cause overheating/damage to the vibrator.

Monitor your vibrator temperature constantly,, do not exceed 200 degrees F.

OPERATION / MAINTENANCE MANUAL

GP MODEL VIBRATORY HAMMER

ORDERING PARTS

GP Series Vibrators are manufactured by American Piledriving Equipment

exclusively for FoundationEquipment.com

To order parts from the following pages Contact :

RoDrill.com

11670 IH 10 East
Converse, TX USA 78109

Phone: 001-210.667.2130
Fax: 001-210.667.1352

Or

Foundation Equipment.com

Seattle, Wa

Phone 001-206 369 2999

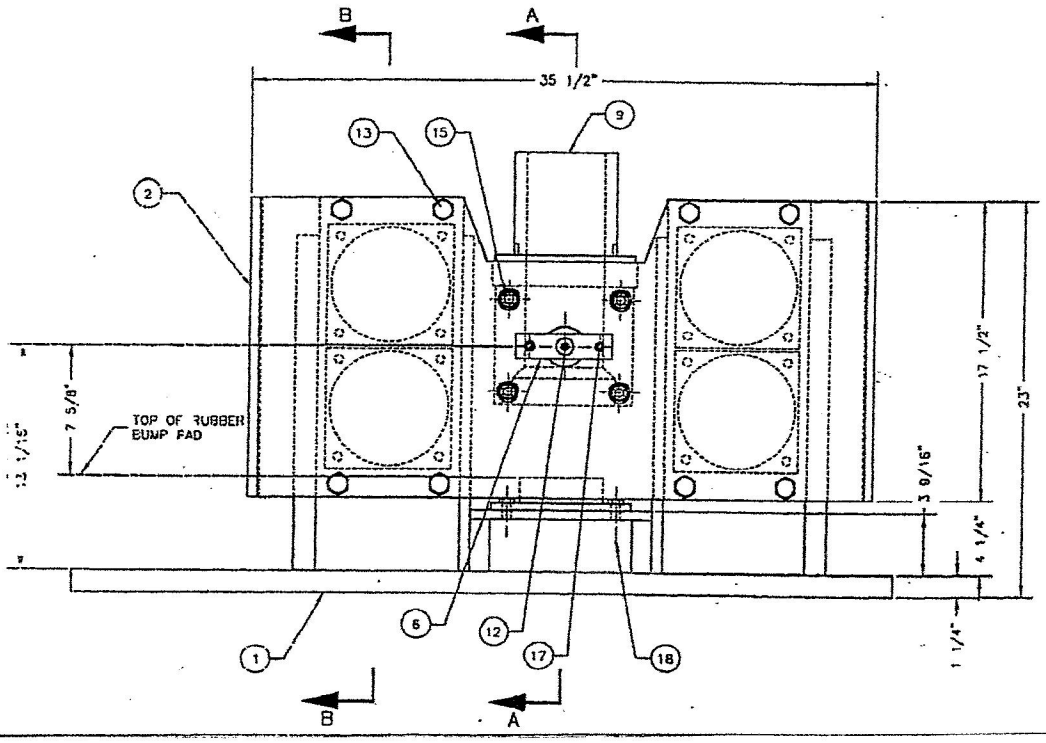
Fax 001-815 717 9346

customerservice@foundationequipment.com

Always specify your GP model number (-ie..GP23.2wc, GP 23.2exwc or GP 33.2wc) and serial number from the ID plate on your vibrator when ordering parts.

OPERATION / MAINTENANCE MANUAL

GP MODEL VIBRATORY HAMMER SUPPRESSOR



SUPPRESSOR HOUSING – ILLUSTRATION ONLY

Item	Description	part number	Qty
1	Inner suppressor	GP23.2	1
2	Outer suppressor	GP23.2	1
3	Elastomer plate	GP23.2	8
4	Elastomer	GP23.2-422114	8
5	Rubber bump pad w/bushings	GP23.2	1
6	Center swivel pin	GP23.2 -423217	1
7	Swivel mount block	GP23.2	1
8	Shackle mount	GP23.2	1
9	Plastic swivel bushing	GP23.2	1
10	Spring pin 1 1/4" x 5 3/4"	GP23.2	1
11	Grease fitting	GP23.2	2
00	Anti-Cav hyd manifold	GP23.2-serial#	
12	Hex head cap screw 3/4" x 2 1/4" with lock washers		16
13	Hex head cap screw 3/4" x 3 3/4" with lock washers		8
14	Socket head cap screw 5/8" x 3 1/2" with lock washers		8
15	Socket head cap screw 1/2" x 7/8" with lock washers		32
16	Socket head cap screw 3/8" x 1 1/2" with lock washers		4
17	Hex head cap screw 1/2" x 3/4" with lock washers		4

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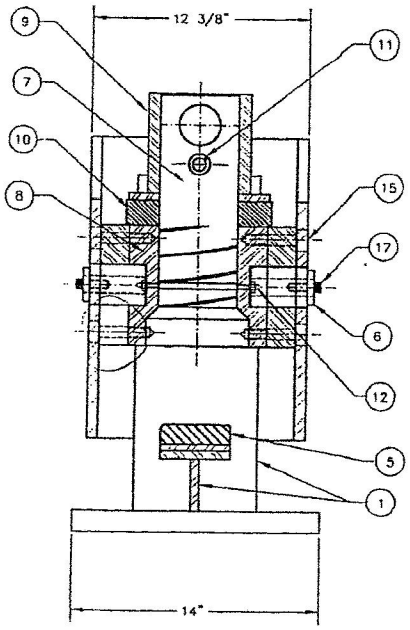
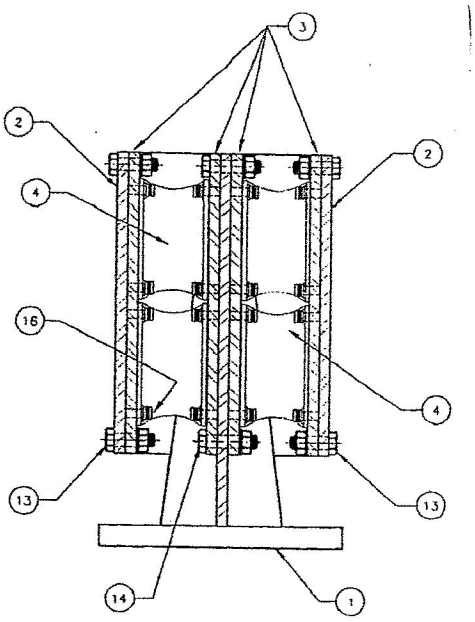


SECTION AA



SECTION BB

SUPPRESSOR HOUSING – ILLUSTRATION ONLY

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MAJOR COMPONENT DEFINITION

Gearbox Identification

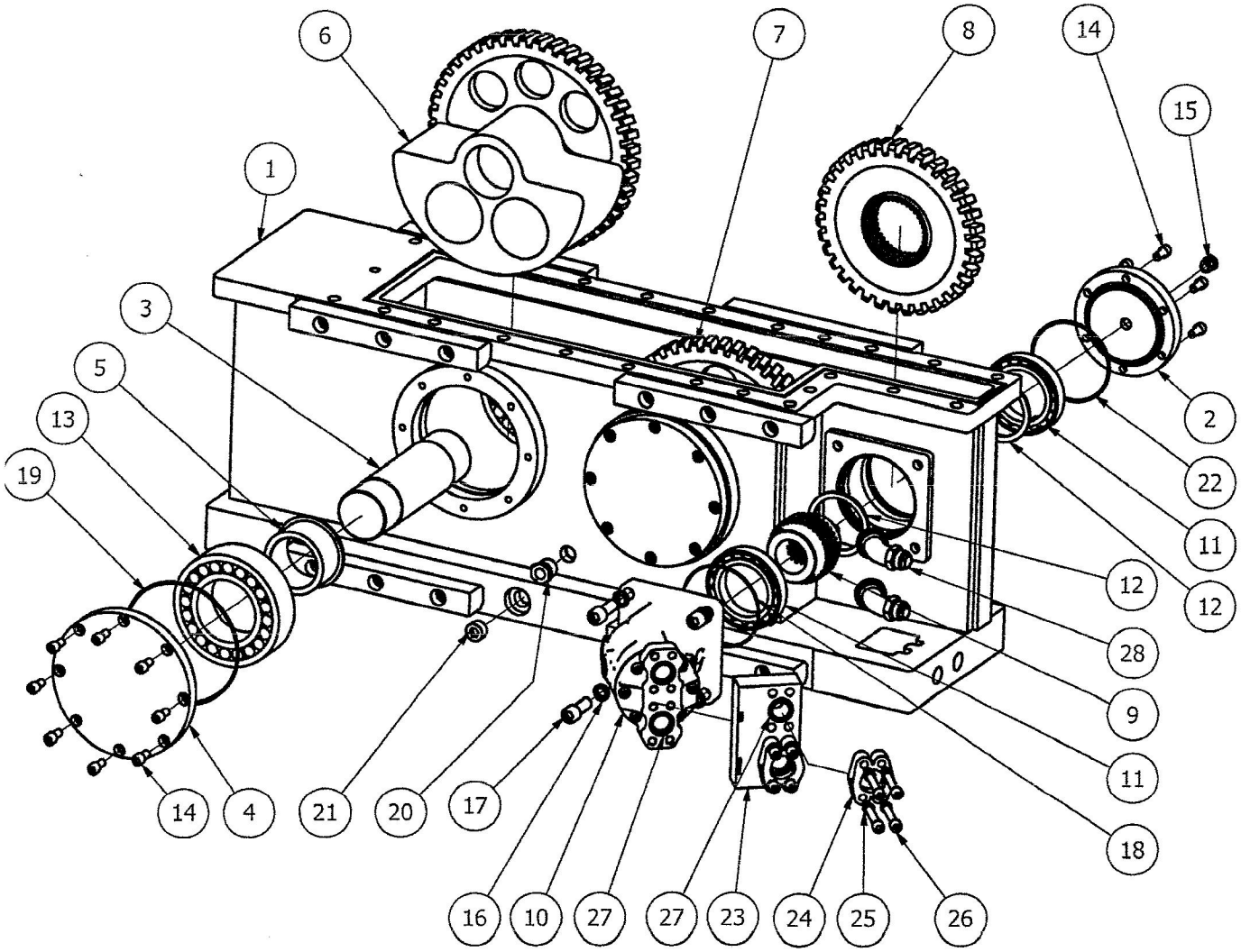

Figure 2-D. Gearbox Assembly

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GEARBOX IDENTIFICATION

PARTS LIST

ITEM	QTY	STOCK NUMBER	DESCRIPTION
1	1	GP23.2	GEAR BOX FRAME
2	1	233126	BEARING COVER w/BREATHER PORT
3	2	232114	ECCENTRIC SHAFT
4	4	232115wc	BEARING COVER ASSY-GP23.2
5	4	232116	BEARING SLEEVE
6	1	232117	ECCENTRIC LEFT HAND
7	1	242118	ECCENTRIC LEFT HAND
8	1	233117	DRIVE GEAR (specify Left or Right)
9	1	233121	GEAR CARRIER
10	1	233112A	AF MOTOR GP series
11	2	233113	MOTOR BEARING
12	2	233122	GEAR SPACER
13	4	232112	ECCENTRIC BEARING
14	38	100445	0.50-13UNC X 1.00 SHCS
15	1	233126	GEAR BOX BREATHER
16	4	140223	0.75 HI COLLAR LOCK WASHER
17	4	400069	0.75-10UNC X 2.00 SHCS
18	1	233131	2-163 O-RING
19	4	234112	2-248 O-RING
20	1	123005	SIGHT GLASS
21	1	123004	1" MAG PIPE PLUG
22	1	233120	2-258 O-RING
23	1	352103	CHECK VALVE MANIF ASM
24	2		20 SPLIT FLANGE CODE 62
25	8		0.50 HI COLLAR LOCK WASHER
26	8	100025	0.50-13UNC X 4.00 SHCS
27	4	100037	2-222 O-RING
28	2		FITT2V-20H16M
29	1	294114	GEAR BOX TOP PLATE O-RING

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Check Valve Manifold Identification 352103

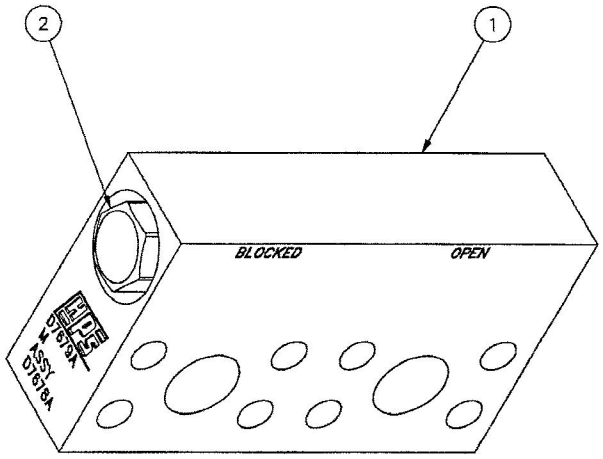

Figure 2-F. Check Valve Manifold Assembly

Parts List			
ITEM	QTY	STOCK NUMBER	DESCRIPTION
1	1	325105	CHECK VALVE MANIFOLD
2	1	352107	CHECK VALVE

Table 2-E. Check Valve Manifold Assembly

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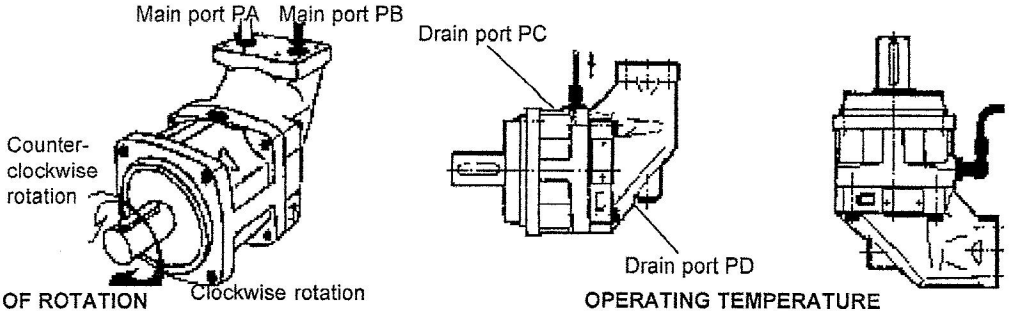
V-8. Hydraulic Motor - Installation and Start-Up. - Figure 5A.



DIRECTION OF ROTATION

The F12 motor is bi-directional. The picture shows direction of flow vs. shaft rotation. When fluid enters port **PB** (black arrow) the motor turns counter clockwise, and when port **PA** is pressurized (open arrow) the shaft turns counter clockwise.

The F12 pump rotates clockwise or counter clockwise. The ordering code shows the direction of rotation.

FILTRATION

To obtain maximum motor service life, the fluid cleanliness should be checked to meet ISO code 18/13 or better (ISO 4406). A10 um (absolute) filter is recommended.

REQUIRED INLET PRESSURE

The motor sometimes operates as a pump (e.g. when it is used in a propel transmission and the vehicle is going downhill). The motor inlet port must then be supplied with sufficient fluid pressure, or increased noise and deteriorating performance may otherwise be experienced.

CASE PRESSURE

The table shows the highest recommended case pressure (F12 shaft seal type **H**) as a function of shaft speed.To obtain the longest seal life, the case pressure should be limited to 50% or less of the figures shown.

NOTE: Contact VOAC Hydraulics for information on other shaft seals.

Motor case pressure [bar] vs. shaft speed [rpm]					
designation	1500	3000	4000	5000	6000
F12-30	14.0	7.0	5.5	4.5	3.5
F12-40	12.0	6.0	4.5	3.5	
F12-60	12.0	6.0	4.5	3.5	
F12-80	10.0	5.0	4.0		
F12-110					

CASE DRAIN CONNECTIONS

There are two drain ports (**PC** and **PD**). The uppermost drain port should be utilized. In mounting positions such as 'shaft up', a drain line loop can be formed to provide bearing lubrication and cooling. Preferably, the drain line should be connected directly to the tank to avoid excessively high case pressure.

NOTE: When the motor is operating, the case must be filled with fluid to at least 50%.

OPERATING TEMPERATURE

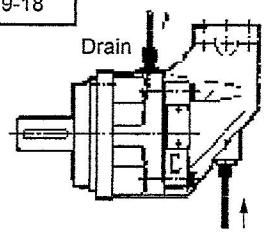
The following temperatures should not exceed (type H seal):

System fluid: 80deg. C
Drain fluid: 100deg. C

Type V ('Viton') shaft seals can be used to 115deg. C.

Continuous operation may require case flushing in order to meet the above viscosity and temperature limitations. The table shows operating speeds, above which flushing is usually required, as well as suggested flow through the case.

Motor designation	Speed [rpm]	Flow [l/min]
F12-30	3500	4-8
F12-40	3000	5-10
F12-60	3000	7-14
F12-80	2500	8-16
F12-110	2300	9-18



BEFORE START-UP

Make sure the motor case as well as the entire hydraulic system is filled with a recommended fluid. The internal leakage, especially at low operating pressures, is not sufficient to provide lubrication at start-up.

HYDRAULIC FLUIDS

Ratings and performance data for series F12 are based on operating with good quality, contamination-free petroleum-based fluids, Hydraulic fluids type HLP (DIN 51524), automatic transmission fluids type A, or API CD engine oils can be used.

At operating temperature, the viscosity (of the drain fluid) should normally be kept above 8 mm2/s (cSt). At start-up, the viscosity should not exceed 1000 mm2/s.

Fire resistant fluids, when used under modified operating conditions, and synthetic fluids are also suitable. Contact VOAC Hydraulics for further information.

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VIBRO TROUBLE-SHOOTING

The following table lists some possible problems, causes and solutions. If a serious problem should occur, contact the factory for additional service information.

Table 6-A. Vibro Trouble-Shooting Index

ITEM	PROBLEM	ITEM	PROBLEM
1.	Oil Blowing Out Between Gear box and Hydraulic Motor	6.	Vibrator Won't Start When Start Button is Engaged
2.	Vibro Gearbox is Too Hot	7.	Clamp Won't Open When Clamp Open Switch is Engaged
3.	Excess Oil in the Gearbox	8.	Vibro Won't Come Up to Normal Operating Speed
4.	Oil Blowing Out From Pop-Off Valve	9.	Vibro Won't Stop When Stop Button is Engaged
5.	Opening and Closing Clamp Jaws Seems Spongy or Slow		

Possible Cause	Remedy
1. Oil Blowing Out Between Gearbox and Hydraulic Motor	
The breather may be plugged or damaged.	Remove the breather and clean it. If the breather is damaged replace it.
O-rings may not be sealing properly	Check the o-rings between the gearbox top plate and the motor. Clean the seal areas and replace the o-rings if needed.
2. Vibro Gearbox is Too Hot	
Oil level may be too high.	Make sure the gearbox is level. Remove the oil over fill plug (located on the gearbox next to the sight gage). If oil flows out, the oil level is too high and must be lowered.
Oil may be too dirty.	Look at oil in the sight gage. If the oil is black or milky it must be replaced. If you are still not sure, remove the case drain plug and check the oil.
3. Excess Oil in the Gearbox	
The seal between the gearbox and the hydraulic motor may be bad and is allowing oil to flow directly into the gearbox.	Remove the motor from the face of the gearbox. Check and clean the seal area, replace the seal if it looks bad.
4. Oil Blowing out Pop-Off Valve	
Blocked flow in case drain line.	Check case drain line to see if it is pinched.
	Check case drain line for proper connection tightness.
Valve may be bad.	Remove and check the valve. Replace the valve if needed.
One or both motors may be damaged.	Remove the motors and have them checked for damage. Replace if needed.