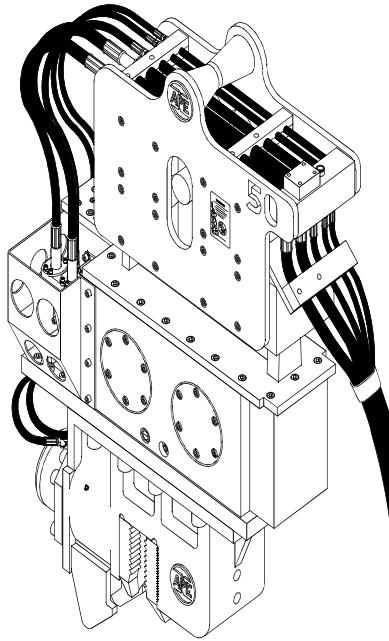
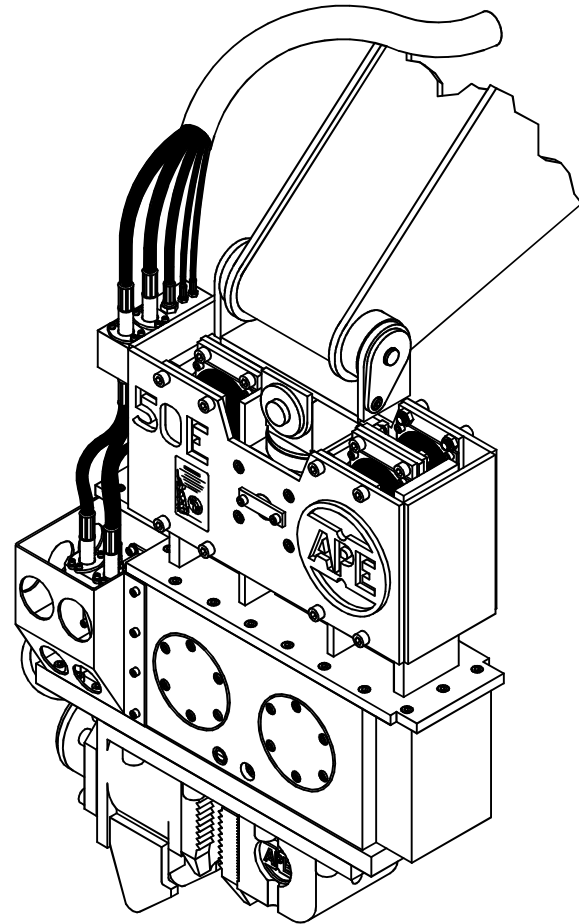




# OPERATION AND MAINTENANCE MANUAL



APE Model 50  
with standard suppressor



APE Model 20 & 50  
with excavator suppressor  
(see page 2-2AB for parts details)

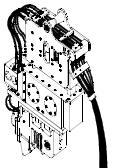
SERIAL NUMBER:

**MODEL 20 & 50 VIBRO WITH  
MODEL 260 POWER UNIT**



# OPERATION / MAINTENANCE MANUAL

MODEL 50 VIBRATORY HAMMER WITH MODEL 260 POWER UNIT



7032 SOUTH 196th - KENT, WA 98032 - (253) 872-0141 / FAX (253) 872-8710

## Revision Record

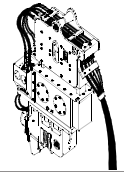
Change Number	Page Number	Date	Revision Description
01	--	5/25/94	Added new pendant & misc updates.
02	2 - 2	6/1/95	Change bolt part numbers
03	2-7,8	7/7/95	Added Caisson Clamp Identification
04	All	9/96	Revised to reflect engine changes in power unit.
05	1-4	9/99	Added Model 50 excavator suppressor housing
06	1-2	11/15	Updated weight for 260 power unit



# **OPERATION / MAINTENANCE MANUAL**

**MODEL 50 VIBRATORY HAMMER WITH MODEL 260 POWER UNIT**

7032 SOUTH 196th - KENT, WA 98032 - (253) 872-0141 / FAX (253) 872-8710



## **Preface**

### **General**

This manual covers the **Model 50 Vibratory Hammer and the Model 260 Power Unit**. The data provided in this manual gives the necessary information to operate and maintain APE equipment. The listed procedures are to be performed by qualified personnel who have an understanding of the equipment and who follow all safety precautions.

### **Guide to Using the Manual**

1. Refer to the Table of Contents for the page location of applicable sections.
2. All weights and measurements in this manual are in both English and Metric units.
3. The manual will be revised as necessary to reflect current information.

### **Abbreviations**

The following are abbreviations used within this manual.

**lbs.** = Pounds

**psi.** = Pounds per Square Inch

**hp.** = Horse Power

**gpm.** = Gallons Per Minute

**rpm.** = Revolutions Per Minute

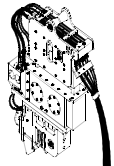
**hyd.** = Hydraulic

**NPT.** = National Pipe Thread



# OPERATION / MAINTENANCE MANUAL

MODEL 50 VIBRATORY HAMMER WITH MODEL 260 POWER UNIT



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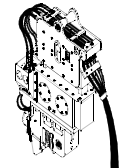
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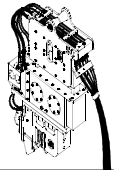
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MODEL 50 VIBRATORY HAMMER WITH MODEL 260 POWER UNIT



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## Safety Precautions

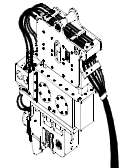
(This list of precautions must be followed at all times to ensure personal & equipment safety.)

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 disconnect caps and plugs screwed on to fittings unless the caps and plugs have wire rope safety lines attached. Store in storage box under control panel.



# OPERATION / MAINTENANCE MANUAL

MODEL 50 VIBRATORY HAMMER WITH MODEL 260 POWER UNIT



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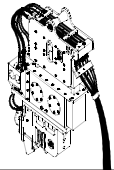
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MODEL 50 VIBRATORY HAMMER WITH MODEL 260 POWER UNIT



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## Warranty

American Piledriving Equipment, Inc.  
STANDARD WARRANTY

American Piledriving Equipment, Inc. (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 fittings 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.

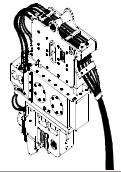
APE's obligation under this WARRANTY shall not include any transportation charges, costs of installation, duty, taxes or any other charges whatsoever, or any liability for direct, indirect, incidental or consequential damage or delay. If requested by APE/J&M, products or parts for which a warranty claim 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 this 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 (driving or pulling) 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 195 degrees F. Contact APE/J&M or your local APE/J&M distributor for special instructions when faced with refusal conditions.

**Refusal: Diesels:** Do not exceed 10 blows per inch or 120 blows per foot. In cases of setting of the pile it is permitted to increase the blow count to 250 blows per foot, but only for one foot of driving penetration. Pile inspectors should consult the APE factory for permission to exceed these limits. Failure to do so will void the warranty. This standard specification is accepted by the DFI (Deep Foundations Institute) and the PDCA (Pile Driving Contractors Association) and by all manufacturers of pile driving equipment.



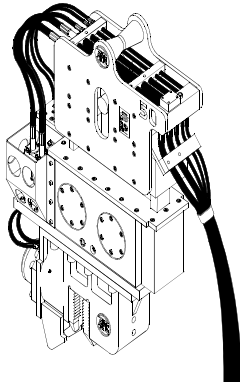


### I. GENERAL INFORMATION

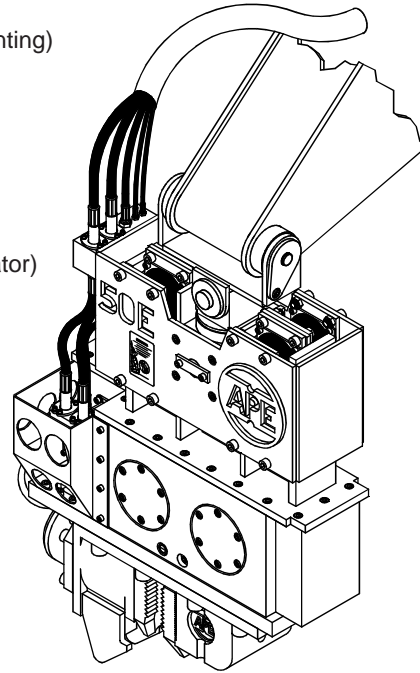
#### I-1. Machine Features

### APE MODEL 50 VIBRATORY DRIVER/EXTRACTOR

FOR ALL TYPES OF PILE DRIVING AND EXTRACTING

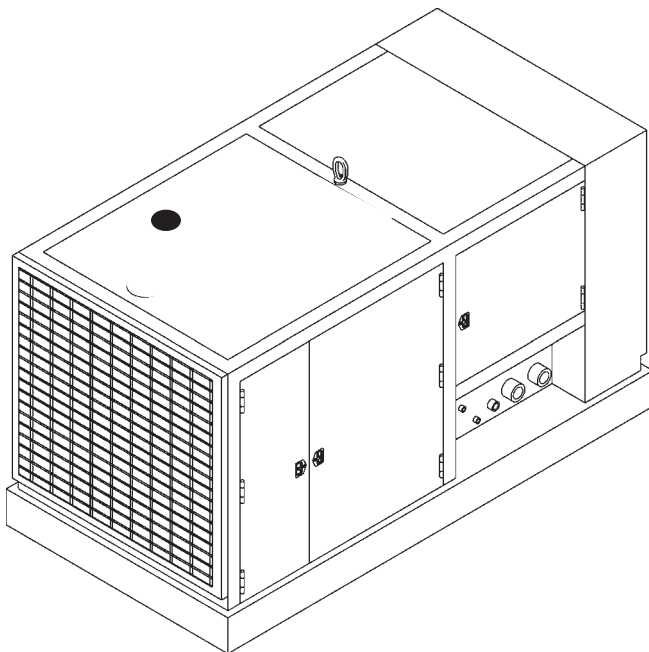


- Just 6900 pounds (4300 with excavator mounting)
- One piece gear/eccentric design
- No pins, splines or keyways
- Eccentrics enhanced with lead
- 1300 inch pounds - very powerful
- Visual indicator shows crane line pull
- 56 Ton line pull maximum (20 tons on excavator)
- Large rubber elastomers - smooth
- Can mount and operate off backhoe
- Can be used under water
- Drives double & single sheets
- 4 wire hoses prevent failures
- Clamp fits H-beams & plates
- 56 Tons of drive force
- Motor recessed - out of harm's way
- Attachments for wood & pipe piles



### APE MODEL 260 POWER UNIT

HYD POWER SOURCE FOR VIBROS, AUGERS, DECK WINCHES, HYD. IMPACT HAMMERS, ETC.



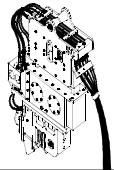
- Cummins engine
- 260 (179kW) horsepower
- Lockable sheet metal enclosure
- Hyd. flow from 0 to 80 gpm (328 lpm)
- 4,500 (310 bar) psi system
- Complete tool box provided
- Bi-directional flow for auger work
- 50 foot (15m) electric pendant
- Backup controls mounted on panel
- Engine safety shutdowns built in
- Sound reduction by design
- Easy to change hydraulic filters
- One loop hydraulic system
- Large cooler keeps oil temp down
- Enough power to run larger vibros



# OPERATION / MAINTENANCE MANUAL

MODEL 50 VIBRATORY HAMMER WITH MODEL 260 POWER UNIT

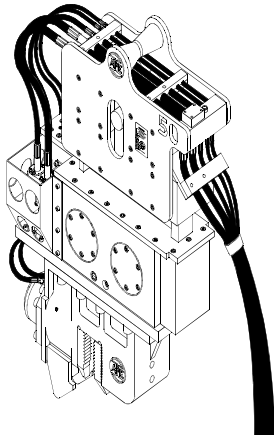
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## I. GENERAL INFORMATION (Continued...)

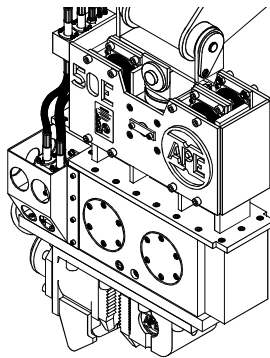
### I-2. Machine Specifications

#### I-2A. Model 50 Vibro - (Table 1-A.)



Eccentric Moment	1300
Drive Force	56 Tons (498 kN)
Frequency (cpm)	0 - 1800
Amplitude	7/8" (22mm)
Pile Clamp Force	100 Tons (890 kN)
Line Pull for Extraction	56 Tons (497 kN)
Hydraulic Hose Length	100' (30 m)
Suspended Weight	6900 lbs. (3136 kg)
Length	52" (1,320 mm)
Width	16" (406 mm)
Height	61" (1,549 mm)
Height with Clamp*	75" (1,905 mm)

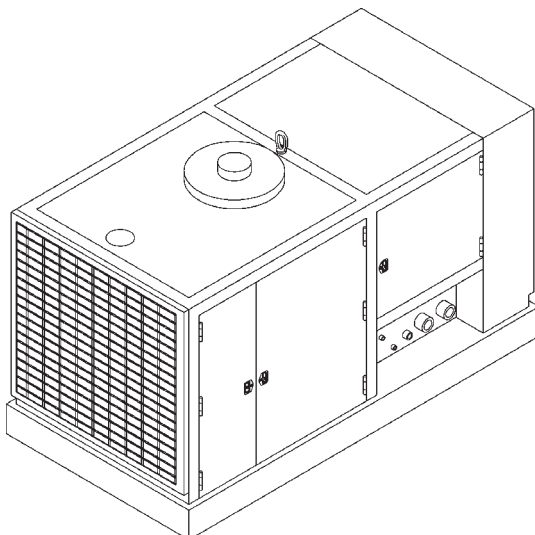
\* Weight and height includes sheeting clamp and 1/2 of hose bundle.



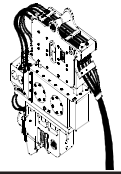
Eccentric Moment	1300
Drive Force	56 Tons (498 kN)
Frequency (cpm)	0 - 1800
Amplitude	7/8" (22mm)
Pile Clamp Force	100 Tons (890 kN)
Line Pull for Extraction	20 tons
Suspended Weight	4300 lbs.
Length	52" (1,320 mm)
Width	14 inches (355 mm)
Height	61" (1,549 mm)
Height with Clamp*	75" (1,905 mm)

\* Weight and height includes sheeting clamp and 1/2 of hose bundle.

#### I-2B. Model 260 Power Unit - (Table 1-B.)



Engine	260h.p.Cummins 6CT8.3
Maximum Power	260 (194 kW)
Operating Speed	2200 rpm
Maximum Drive Pressure	4,500 psi (310 bar)
Max.Hyd.Flow-Forward	80 gpm (303 lpm)
Max.Hyd.Flow-Reverse	80 gpm (303 lpm)
Clamp Pressure	4,500 psi (310 bar)
Clamp Pump Flow @ 2100 rpm	6.5 gpm (25 lpm)
Weight	11,000 lbs (4,990 kg)
Length	102" (260 cm)
Width	50" (127 cm)
Height	60" (152 cm)



### **I. GENERAL INFORMATION (Continued...)**

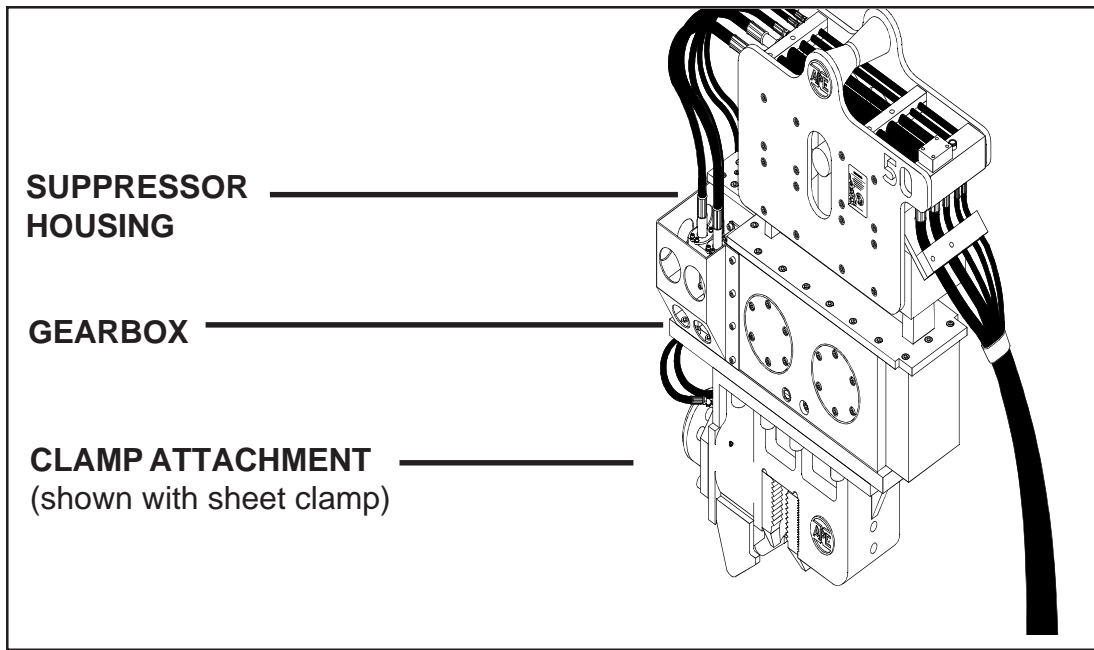
#### **I-3. General Description of Model 50 Vibro**

The **APE Model 50** is a variable frequency vibratory pile driver/extractor designed to drive and extract all types of piles including sheet, pipe, timber, concrete, H-beam, I-beam, and steel plates. In addition, the vibrator can be used for soil compaction, installing well casings, and installation of tie-backs and wick drains.

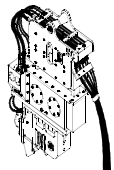
The Model 50 operates in a frequency range of 0 to 1800 cycles per minute depending on the hydraulic flow and on the hydraulic motors fitted to the gear train. The Model 50 is especially suited for driving or extracting piles that are near buildings or other structures. This is because the Model 50 vibrates at higher frequencies and thus is less damaging to surrounding soils.

The three major parts to the Model 50 are as follows:

- A.)** The Suppressor housing. (Excavator suppressor not shown on this page)
- B.)** The Gearbox.
- C.)** The Clamping Attachment.



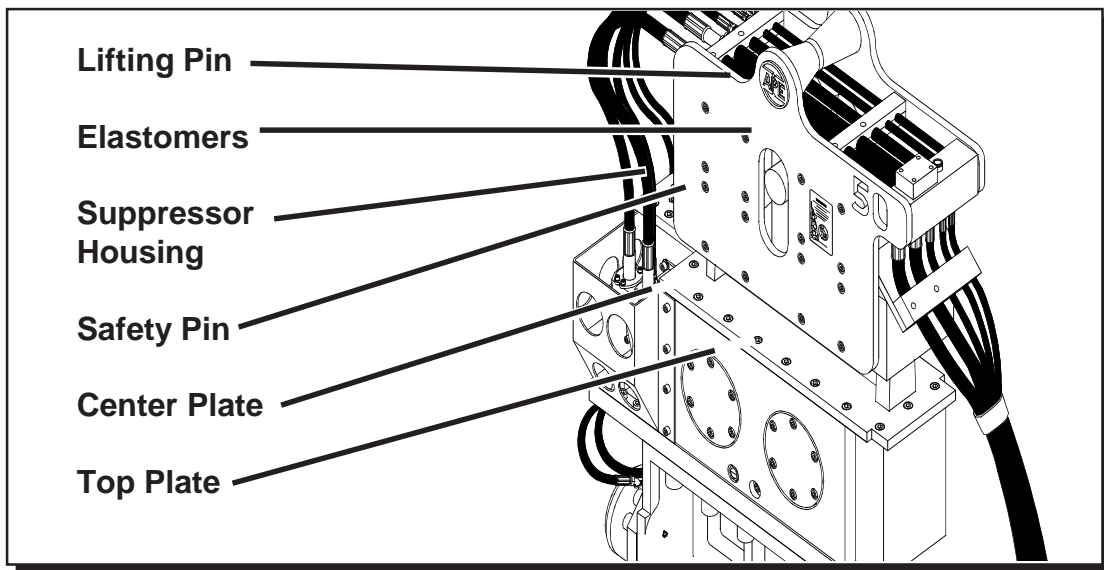
**Figure 1-B. General Description of 50 Vibro.**



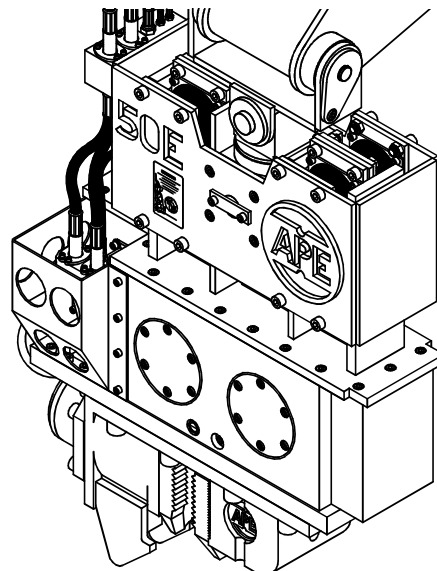
### I. GENERAL INFORMATION (Continued...)

#### I-3A. The Suppressor Housing

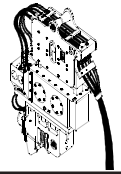
The suppressor housing of the **Model 50 APE Vibrator** is the top part of the vibro that attaches to the crane line. It is designed to absorb the vibration generated from the vibrator gearbox. Three different types of suppressors can be mounted to the APE Model 50 vibro. The standard suppressor is for light to medium work, the heavy duty suppressor is for hard extraction. A third type of suppressor is used when the unit is mounted to an excavator. In addition, many special suppressors have designed for unique jobs, such as inside buildings where headroom is a problem.



**Figure 1-C. General Description of Suppressor Housing.**



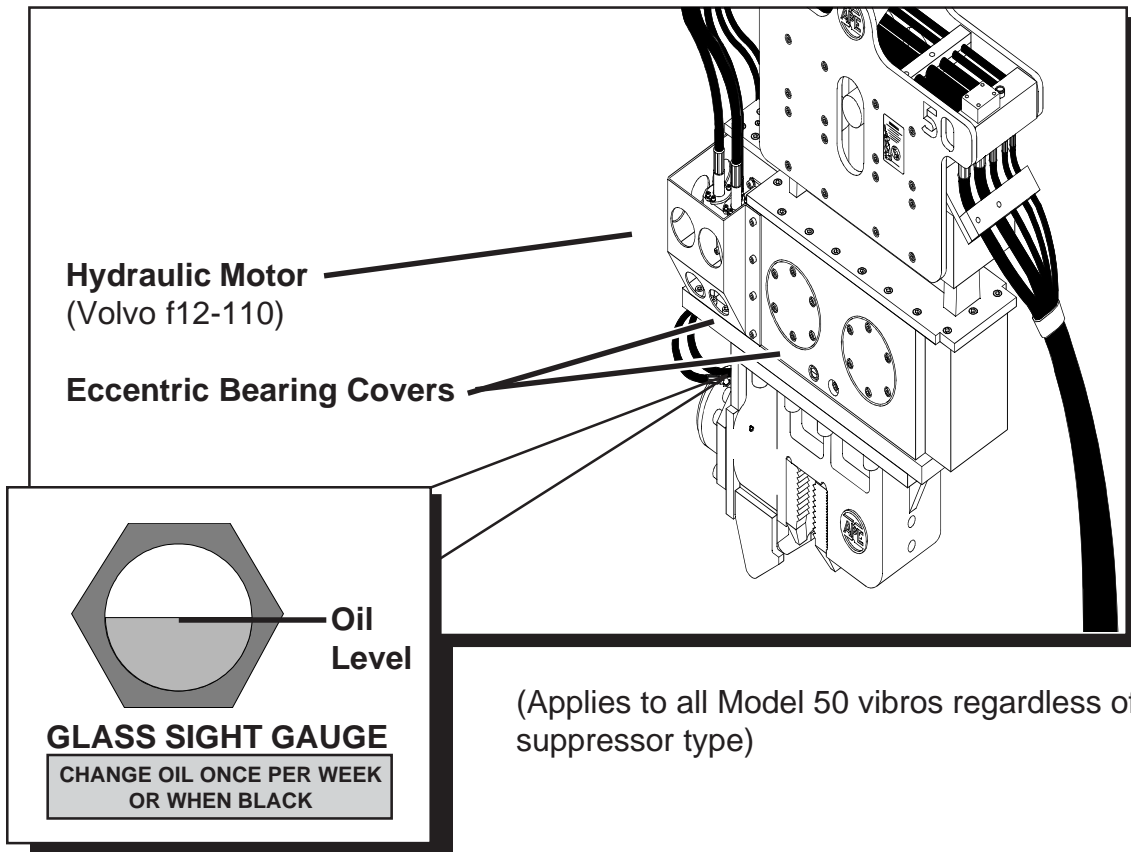
Excavator type suppressor shown with mounting pin.



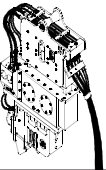
### I. GENERAL INFORMATION (Continued...)

#### I-3B. The Vibrator Gearbox

The vibrator gearbox contains two high amplitude eccentric weights cast in one piece with the gear. The counterweight is filled, and therefore, enhanced with lead to increase eccentric moment. This design is unique to the industry and was developed by the engineers of APE to solve a number of problems associated with other types of vibrator machines. Both the eccentric and the drive gear have been helically cut to provide high speed operation with reduced noise and wear. Vibration is caused by the vertical movement created when the eccentrics are rotated. The eccentric and drive gear are driven in line by one Volvo motor mounted on the outside face of the gearbox. The motor is recessed for maximum protection. The eccentrics rotate on two shafts housed by four giant spherical bearings. The gears and bearings receive lubrication as a result of the fluid splashing inside the gearbox when the gears are rotated. The oil level is quickly determined by looking at the site gauge. The Model 50 can be operated under water to a depth of 30 feet without modifications. (Consult factory for depths below 30 feet.)



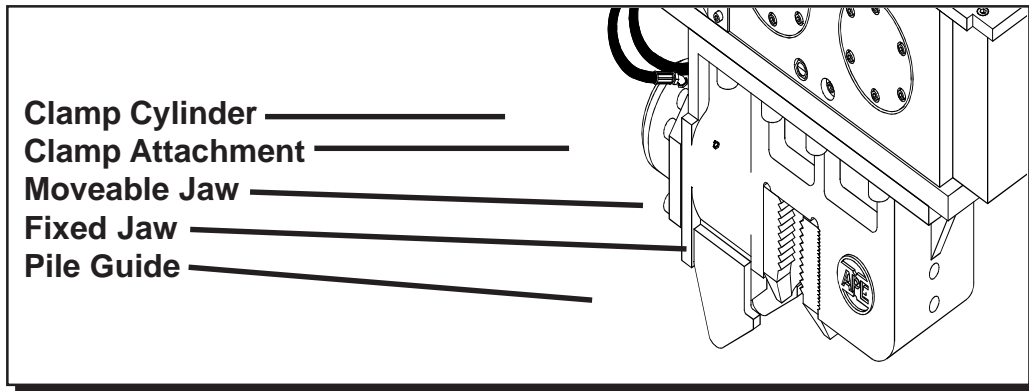
**Figure 1-D. General Description of Vibrator Gearbox.**



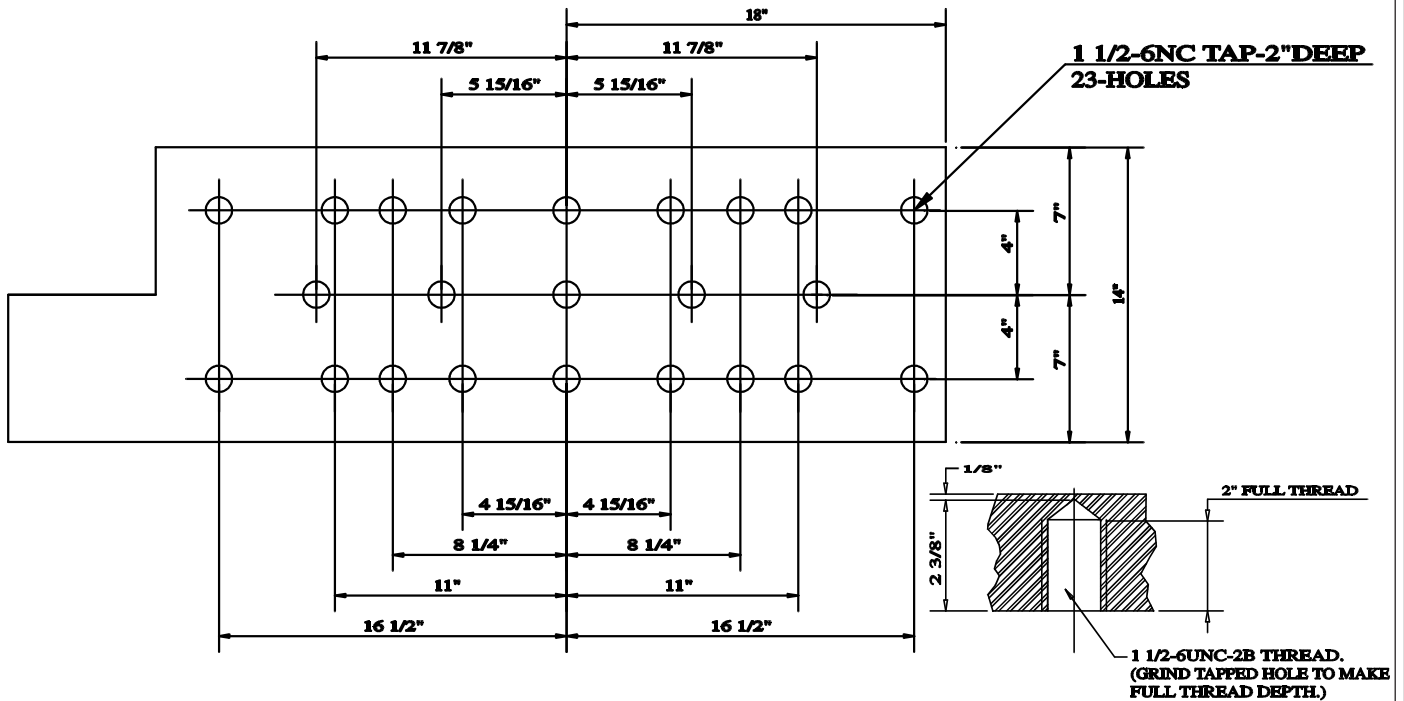
### I. GENERAL INFORMATION (Continued...)

#### I-3C. The Clamp Attachment

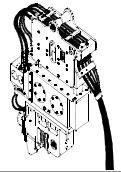
The APE 50 comes with a **standard sheet pile clamp attachment**. The clamp contains two gripping jaws. One is "fixed" and one is "moveable." A large hydraulic cylinder operates the moveable jaw with up to 250 tons of clamping force depending on clamp pump relief pressure. The jaws open and close by turning a switch on the remote control pendant or may be operated by turning the switch at the main control panel mounted behind one of the doors on the power unit. The valve can be manually operated with a screwdriver if all electrical fails. **The APE standard sheet pile clamp** can be fitted with jaws to fit many different types of piles including sheet piles, H-Beams, steel plates, steel rods, pipe piles, wood piles, and concrete piles. (Contact APE or your local APE distributor for more information on clamp attachments for special pile types.)



**Figure 1-E. General Description of Clamp Attachment.**



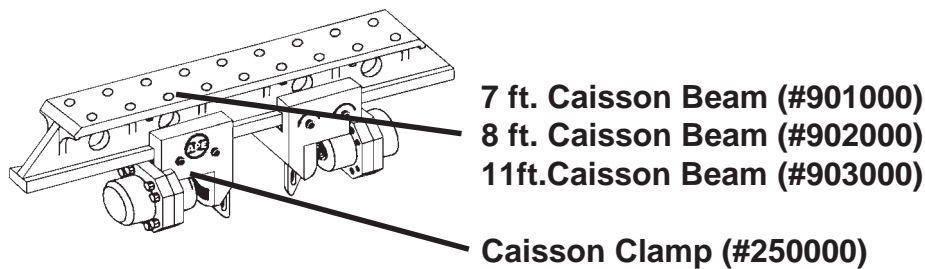
**Figure 1-F. Clamp Attachment Hole Configuration.**



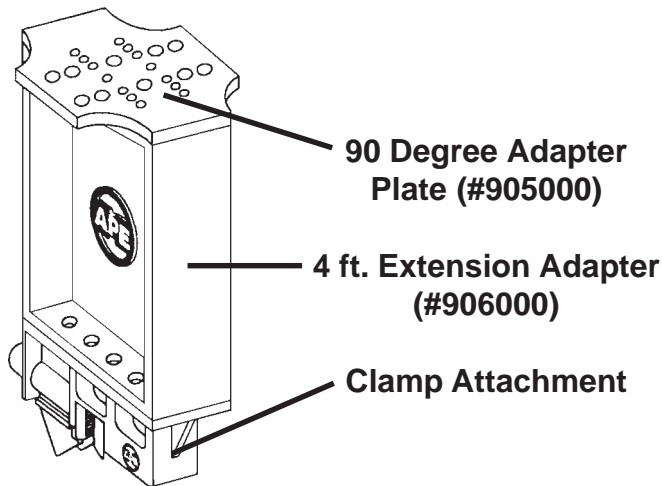
## I. GENERAL INFORMATION (Continued...)

### I-3D. Optional Attachments

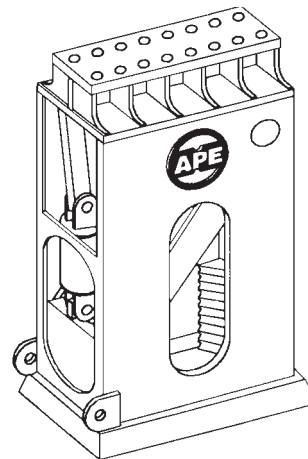
The following are some of the optional attachments for the APE Vibratory Hammers. (Contact APE or your local APE distributor for more information about these and other available equipment.)



**APE CAISSON CLAMP**

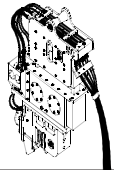


**APE 90 DEGREE ADAPTER WITH EXTENSION**



**APE DELUXE CONCRETE / WOOD CLAMP (#907000)**

**Figure 1-G. Optional Attachments**

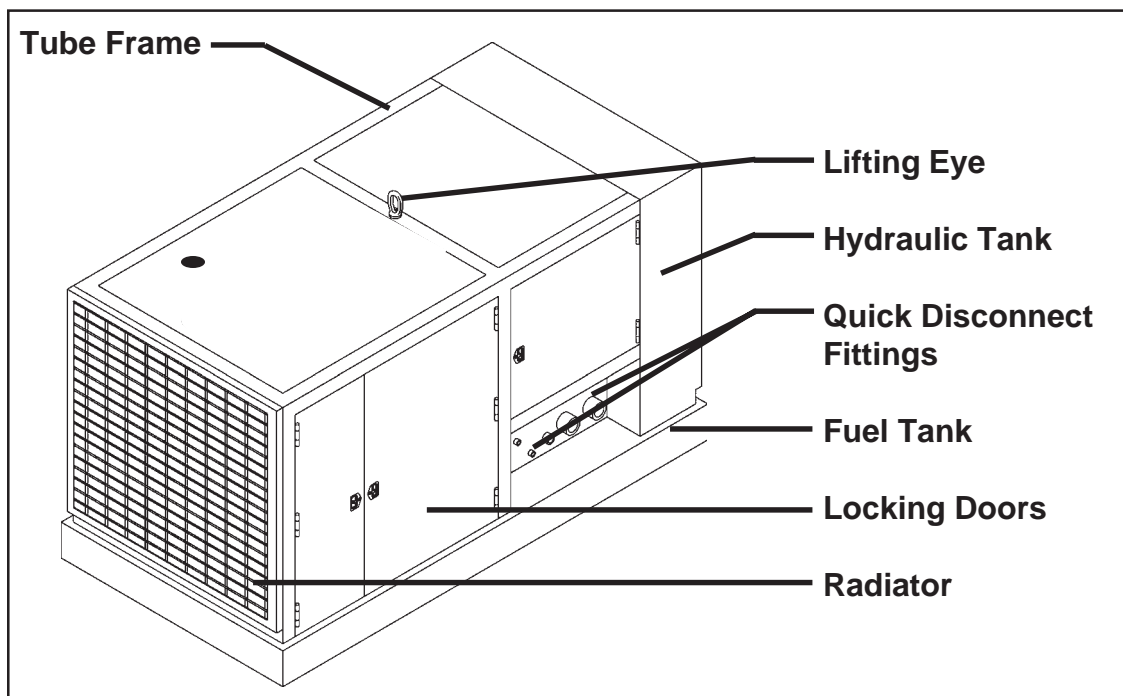


### I. GENERAL INFORMATION (Continued...)

#### I-4. General Description of Model 260 Power Unit

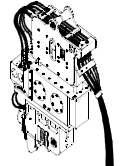
The Model 50 vibrator runs off the APE 260 power unit. The APE 260 has a 260 horsepower CUMMINS 6CT8.3 engine. The engine is mounted to a tubular frame that also serves as a diesel fuel tank. A sheet metal and tube frame covers the engine and is equipped with locking doors for protection from the environment. A control panel is located behind one of the doors and comes complete with a 50 foot control pendant. There are two hydraulic tanks on the power unit. One is the main tank and the other is a storage tank for extra oil in case the main tank becomes depleted. A hydraulic tank supplies oil to four pumps. One pump feeds the vibrator motor. A small pump feeds the clamp attachment. The Vibrator is connected to the power unit via five hydraulic hoses. The two large 1" hoses are the pressure and return lines for the vibrator motor. The two small 3/8" hoses are for the clamp system and the one middle sized 3/4" hose is for the vibrator motor case drain line. The hoses are attached to the power unit by connecting the "quick disconnect fittings" on the end of the hoses leading from the vibrator. The fittings go on only one way so there is no chance of hooking up the hoses improperly.

**WARNING:** Clean with ether or a clean rag before installing quick disconnects. Make sure you seat the quick disconnect fittings all the way tight. Failure to tighten the quick disconnects will stop the flow of oil and will prevent the vibro from operating. Failure to tighten the clamp fittings completely tight will cause the jaws to either not open or not close. If this happens you may have to crack the fitting and bleed off the pressure to release the quick dis-connects.



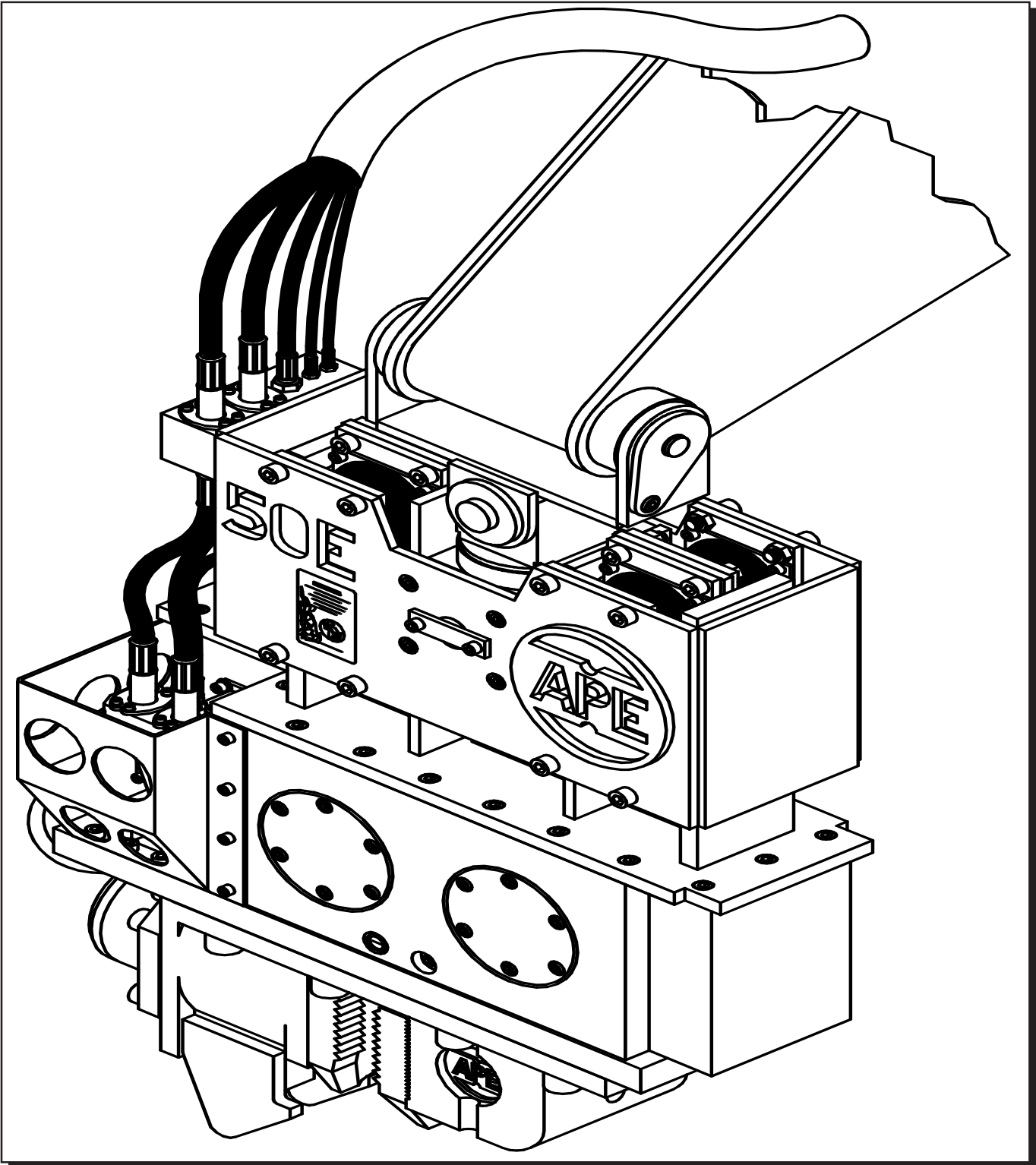
**Figure 1-H. General Description of Model 260 Power Unit**





### II. COMPONENT DEFINITION

#### II-1. Component Identification - Model 50 Vibratory Hammer



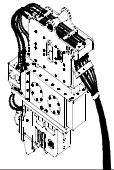
**Figure 2-A. Component Identification.**



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## II. COMPONENT DEFINITION (Continued...)

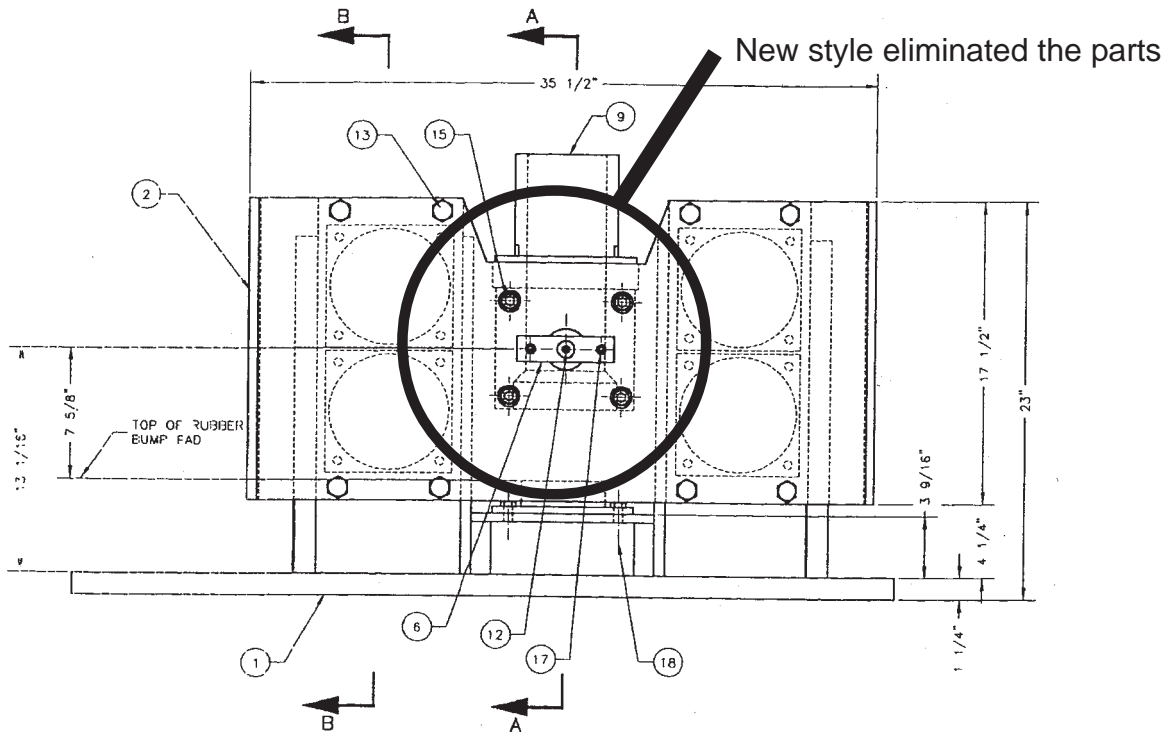
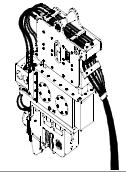
### II-1. Component Identification

The following is a general listing of the APE 50 major components and part numbers. (Please see Figure 2-A. for component location.)

**Table 2-A. Component Identification**

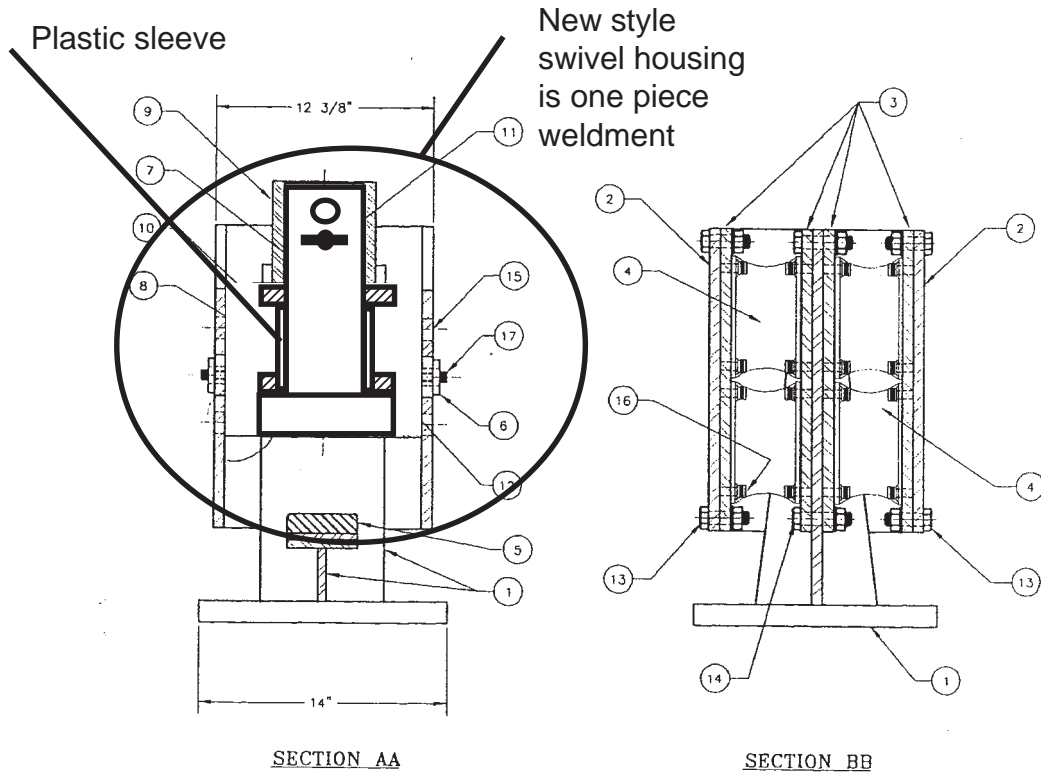
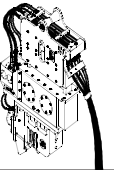
Item	Qty	Description	Part #
1	4	Model 50 Eccentric Bearing	#111001
2	2	Eccentric Shaft	#111003
3	4	Eccentric Bearing Cover	#111004
4	4	Eccentric Shaft Spacer	#111002
5	2	Eccentric Weight	#111007
6	1	Vibratory Motor	#112001
7	2	Motor Bearing	#122002
8	1	Fitting#F40X-S-8-12MJICxMBSPP	#112003
9	1	Motor Bearing Cover	#112005
10	1	Drive Gear	#112006
11	1	Bearing Spacer	#122008
12	1	Gear Spacer	#122009
13	1	Gear Carrier	#122010
14	1	#10 SAE Breather Plug	#122014
15	1	Breather Valve	#112015
16	1	Motor Guard	#112013
17	1	Motor Cover O-Ring Parker#2-258	#112019
18	2	Motor O-Ring Parker #2-163	#112020
19	1	Vibratory Gearbox	#113001
20	1	Bearing Spacer, narrowed	#122011
21	1	O-Ring .070 C/S BUNA 70 Cord	#113003
22	1	Magnetic Drain Plug	#123004
23	1	Sight Gauge	#123005
24	1	Gearbox Oil Level Plug	#123006
25	1	Oil Fill Plug	#123012
26	1	Center Bracket	#123015
27	1	Outer Suppressor Housing	#310101
28	4	#16 PIPE x 16 JIC	#411018
29	2	Code 62 Split Flange	#113010
30	6	Flange O-Ring #2-225	#113020
31	1	Bearing Cover O-Ring #2-276	#113101
32	1	Bolt Kit	#114000
33	1	1/8" Grease Zert	#211001
34	1	Jaw Pin	#211002
35	1	Movable Jaw	#211005
36	1	Fixed Jaw	#211011
37	1	Sheet Pile Guide Assy.	#211017
38	1	Clamp Body	#211019
39	1	Clamp Cylinder - Model 150	#212001
40	2	#6 SAE / #6 JIC 45Deg. Fitting	#212002
41	1	Plunger	#212301
42	1	Cylinder End Cap	#212302
43	1	Cylinder Piston	#212303
44	--	Bolt-SHCS 5/8"NF x 1" (Machined)	#114209
45	1	6" Rod Wiper #959-53	#212015
46	1	Type B Polypak #25006000-3758	#212016
47	1	Back-Up Ring #8-367 N300-90	#212017

Item	Qty	Description	Part #
48	2	O-Ring 70 Duro #2-367	#212018
49	1	Wear Ring #W125-6250-750	#212014
50	1	Piston Ring #TFE-R-30008 Bronze	#212011
51	1	Parker O-Ring #2-356	#212013
52	1	Square Ring #4426	#212012
53	1	Wear Ring #W125-8000-750	#212020
54	--	-----	-----
55	8	Small Elastomers	#311004
56	--	-----	-----
57	1	Center Pin	#311006
58	--	-----	-----
59	6	Bolt-SHCS 7/8"NC x 2"	#114218
60	1	Pop-Off Valve	#311009
61	1	Check Valve	#311015
62	2	#12 PIPE #12 JIC Fitting	#421016
63	6	#6 PIPE #6 JIC Fitting	#421017
64	2	Danger Sticker - Small	#000109
65	2	CAP #6 JIC	#123011
66	1	Hose, Suppressor, Case Drain	#411003
67	2	Hose, Suppressor, Clamp	#411004
68	2	Hose, Suppressor, Motor Feed	#411032
69	--	-----	-----
70	2	Hose, Pigtail, Motor Feed	#411010
71	1	Hose, Pigtail, Case Drain	#421009
72	2	Hose, Pigtail, Clamp Line	#421010
73	--	-----	-----
74	11	Bolt-SHCS 1/2" x 1 1/2" w/LW/FW	#114307
75	--	Bolt-SHCS 3/4"NC x 6"	#114104
76	--	Bolt-SHCS 3/4"NC x 1 3/4"	#124101
77	--	Bolt M14 x 30	#124112
78	--	Bolt-SHCS 3/4"NC x 1 3/4"	#124101
79	--	Bolt-SHCS 5/8"NC x 2"	#114114
80	--	Lockwasher 5/8" High Collar	#114115
81	--	Bolt-SHCS 1/2"NC x 1"	#114107
82	--	SAE 3/4" Flatwasher	#114305
83	--	Bolt-SHCS 3/4"NC x 1 3/4"	#124101
84	--	Bolt-SHCS 3/4"NC x 2 1/2"	#114301
85	--	Lockwasher 3/4" High Collar	#114105
86	--	Bolt-SHCS 1"NC x 9"	#114206
87	--	1" Lockwasher - High Collar	#114207
88	--	Bolt-SHCS 1 1/2" x 3 1/2"	#114201
89	--	1 1/2" Lockwasher - High Collar	#114202
90	--	Bolt-SHCS 1"NC x 3"	#114208
91	--	Bolt 1 1/4"NF x 3 1/2" GR.8 Hex	#114204
92	--	1 1/4" Lockwasher - High Collar	#114205



MODEL 50 SWIVEL-KEY ASSEMBLY

Item	Description	part number	Qty
1	Inner suppressor	312103	1
2	Outer suppressor	312102	1
3	Elastomer plate	311003	8
4	Elastomer	311004	8
5	Rubber bump pad w/bushings	312109 & 312110	1
6	Shear pin (discontinued)		1
7	Center swivel pin	312106	1
8	Swivel mount block (now part of the suppressor weldment)		1
9	Shackle mount	312107	1
10	Plastic swivel bushing	312108	1
11	Spring pin 1 1/4" x 5 3/4"	114500 (note: This part is sold as part of the bolt kit)	
12	Grease fitting	221001	2
13	Hex head cap screw 3/4" x 2 1/4" with lock washers		16
14	Hex head cap screw 3/4" x 3 3/4" with lock washers		8
15	Socket head cap screw 5/8" x 3 1/2" with lock washers		8
16	Socket head cap screw 1/2" x 7/8" with lock washers		32
17	Socket head cap screw 3/8" x 1 1/2" with lock washers		4
18	Hex head cap screw 1/2" x 3/4" with lock washers		4

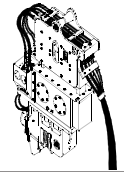




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## II. COMPONENT DEFINITION (Continued...)

### II-2. Hose Identification

The following is a general listing of the standard hoses that are shipped with the Model 50 Vibratory Hammer. (Please see Figure 2-B. for component location.)

Table 2-B. Hose Identification

Item	Qty	Description	Part #
1	2	1" Grey hose x 50' 1" Hose #100R12	#411010
2	2	1" Grey Hose x 50' 1" Hose #100R12	#411010
3	2	3/4" Two Wire Hose x 50' 3/4" 100R2AT w/ #HU1212NJ	#421009 Ea. End
4	4	3/8" Gates Hose x 50' w/ #HU66NJ Ea. End	#421010
5	1	Fitting #6 JIC Male/#6 Female	#421011
6	4	Fitting #24 Male JIC Union	#421012
7	2	Fitting #12 Male JIC Union	#421013
8	6	Fitting #6 Male JIC Union	#421014
9	2	Fitting #16 JIC x #16 Pipe	#421018

Item	Qty	Description	Part #
10	1	Fitting#12 JIC/#12 Pipe	#421016
11	1	Fitting #6 JIC/#6 Pipe	#421017
12	1	Aeroquip Male Q.D. #5100S112B	#421020
13	1	Aeroquip Dust Cap #5100S712B	#421021
14	2	Safeway Female Q.D. #S35-3	#421024
15	2	Safeway Male Q.D. #S31-3	#421025
16	2	Safeway Cap #S39-3	#421026
17	2	Safeway Plug #S34-3	#421027
18	2	Q.D. Hydraulic Female Coupling	#400301
19	2	Q.D. Hydraulic Male Coupling	#400303
20	1	APE Dust Plug	#400704
21	1	APE Dust Cap	#400703
22	2	Reducer #24 Pipe/#16 Pipe	#411045

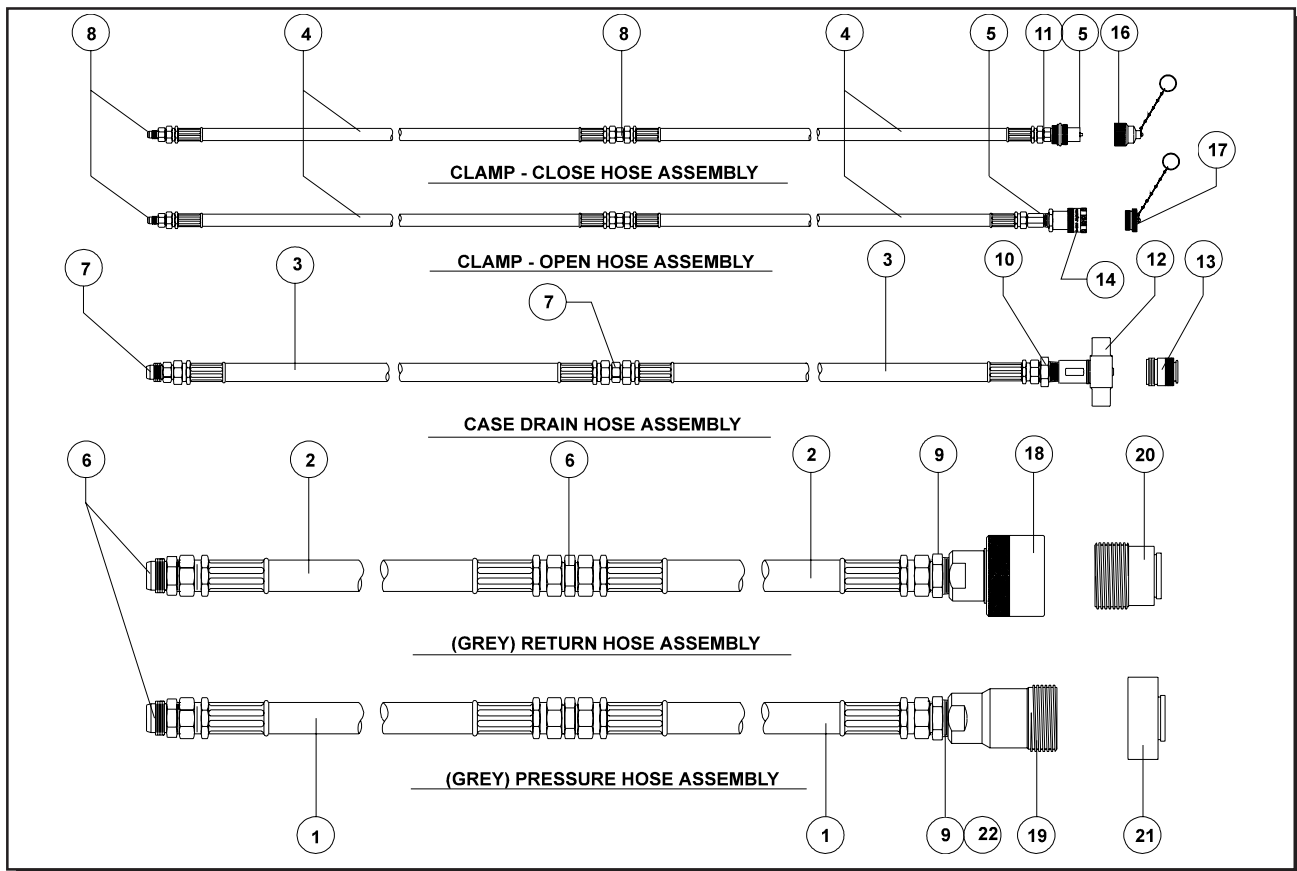
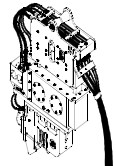
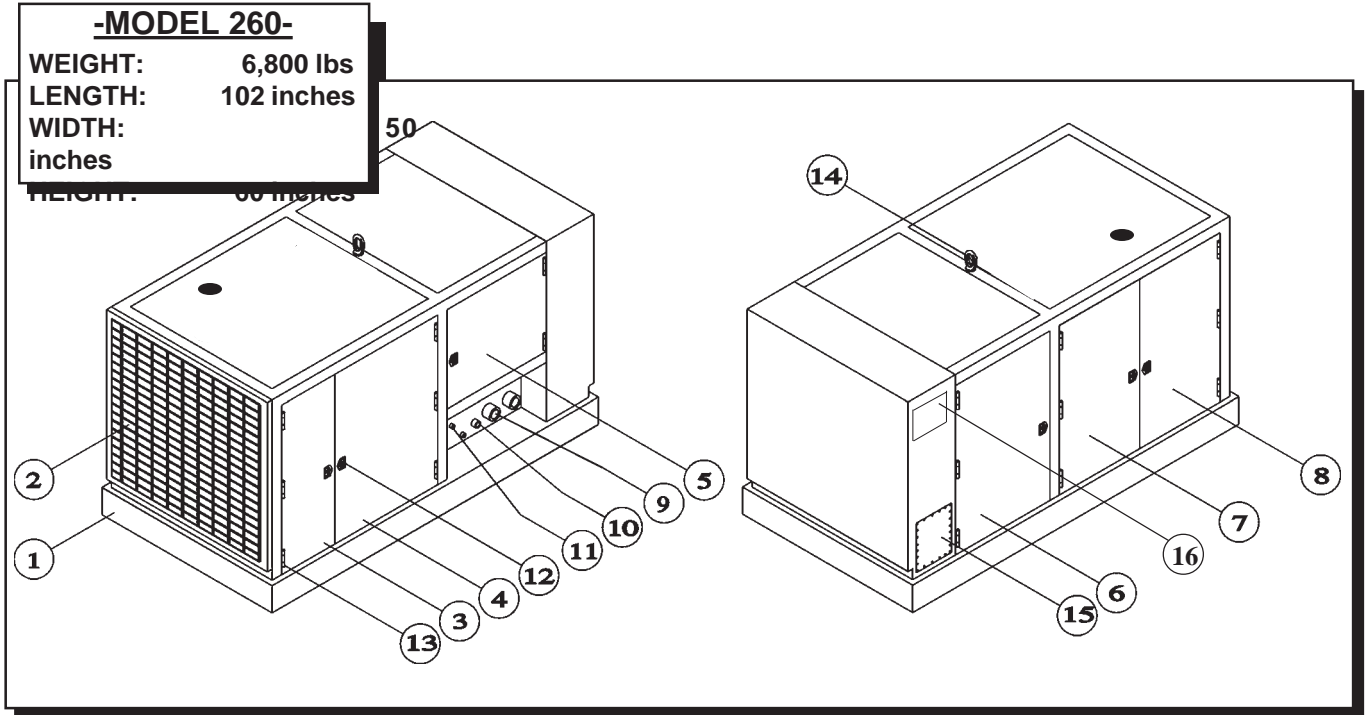


Figure 2-B. Hose Bundle Identification



### II. COMPONENT DEFINITION (Continued...)

#### II-3. Model 260 Power Unit Skid Identification

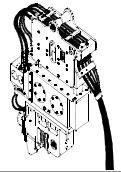


**Figure 2-C. Model 260 Power Unit Skid Identification**

**Table 2-C. Model Power Unit Skid Identification**

#### Model 260 Power Unit

Item	Qty	Description
1	1	Model 260 Power Unit Skid
2	1	Radiator Grill
3	1	Door 21 1/2" x 51 1/2"
4	1	Door 45 3/4" x 51 1/2"
5	1	Door 21 1/2" x 20"
6	1	Door 21 1/2" x 51 1/2"
7	1	Door 33 5/8" x 51 1/2"
8	1	Door 33 5/8" x 51 1/2"
9	2	1 1/2" Hydraulic Coupling
10	1	3/4" Hydraulic Coupling
11	2	3/8" Hydraulic Coupling
12	6	Door Handle / Lock
		Lock-#EMC 56462W Two Point Lock
		Handle-#EMC 48742W Locking Handle
13	17	Hinges #R140-150 Weld On Hinge
14	1	Lifting Eye Nuts - Crosby Laughlin #6-400 #10
15	1	Access Cover Plate 15" x 18"
16	1	Access Cover Plate 12" x 15"



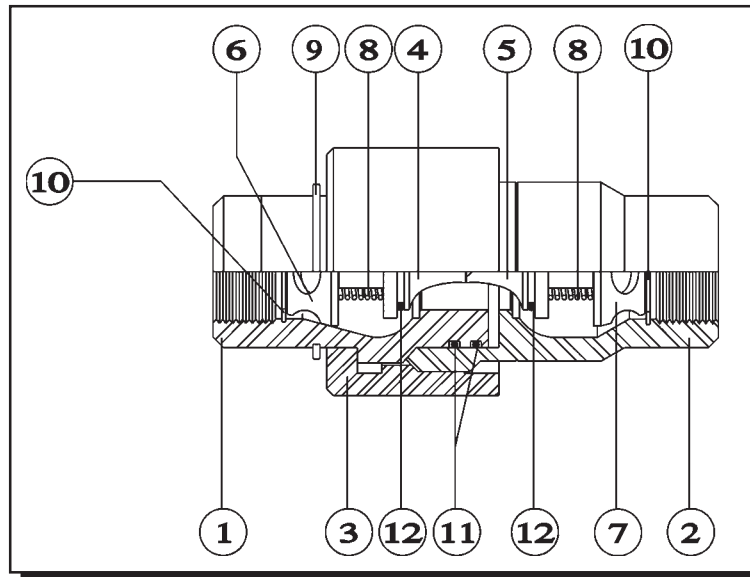
### II. MAJOR COMPONENT DEFINITION (Continued...)

#### II-4. Quick Disconnect Couplings

The APE Quick Disconnect Couplings are high pressure hydraulic couplings designed for rugged applications. Service in many such applications has proven the design compatible to extreme pressures, structural and system induced shock loads. The construction of the coupling assembly promotes ease of use and maintenance.

#### Design Features:

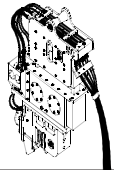
- Excellent flow characteristics for continuous duty applications.
- High strength design endures high surge and shock conditions.
- Flat crested stub-ACME threads and all steel construction withstand storage and rig-up damage.
- Structurally compatible with weight of 5,000 P.S.I. flex-hose and system induced shock loads.



**Figure 2-D. Quick Disconnect Coupling Identification**

**Table 2-D. Quick Disconnect Coupling Identification**

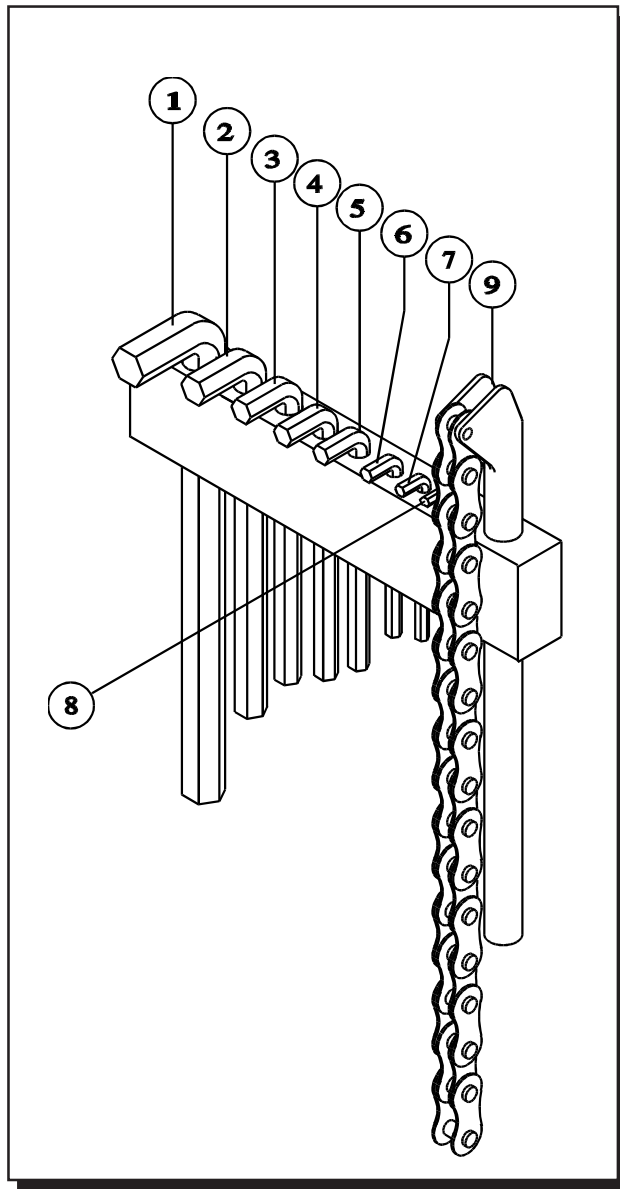
Item	Qty	Description
1	1	Q.D. Hydraulic Female Coupling #400301
2	1	Q.D. Hydraulic Male Coupling #400303
3	1	Q.D. Hydraulic Coupling Sleeve #400302
4	1	Q.D. O-Ring Carrier "A" #400202
5	1	Q.D. O-Ring Carrier "B" #400201
6	1	Q.D. Plunger #400101
7	1	Q.D. Plunger #400101
8	1	Q.D. Plunger Spring #400701
9	1	Retaining Ring - "Inverted External" #1-275
10	2	Retaining Ring - "Truarc Internal" #N5000-168
11	2	Parker O-Ring #2-230 & One Parback
12	2	Parker O-Ring #2-216



### II. MAJOR COMPONENT DEFINITION (Continued...)

#### II-5. Tool Set Identification

Mounted inside the **Model 260 Power Unit** is a set of tools frequently used for the maintenance of the **APE Model 50 Vibratory Hammer**. The following figure and table shows the location and the use for each tool.



**Figure 2-E. Tool Set Identification**

**Table 2-E. Tool Set Identification**

ITEM	QTY	DESCRIPTION	PART#
1	1	1" Allen Wrench	#50004
For use with the clamp attachment bolts			
2	1	3/4" Allen Wrench	#50006
For use with clamp fixed jaw, sheet guide			
3	1	5/8" Allen Wrench	#95007
For hydraulic motor, drain plug, top plate			
4	1	9/16" Allen Wrench	#50013
For use with the hose bracket bolts			
5	1	1/2" Allen Wrench	#50008
6	1	3/8" Allen Wrench	#50009
For use with bearing cover bolts			
7	1	5/16" Allen Wrench	#50014
For use with the hose bracket bolts			
8	1	1/4" Allen Wrench	#50015
For use with the vibro oil level check			
9	1	Chain Wrench	#50011
Used to tighten the quick disconnects			

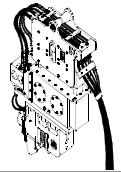




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## II. MAJOR COMPONENT DEFINITION (Continued...)

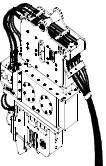
### II-6. Caisson Clamp Identification.

The following is a general listing of the parts for the APE Caisson Clamp and Beams. (Please see Figure 2-F. for component location.)

**Table 2-F. Caisson Clamp Identification**

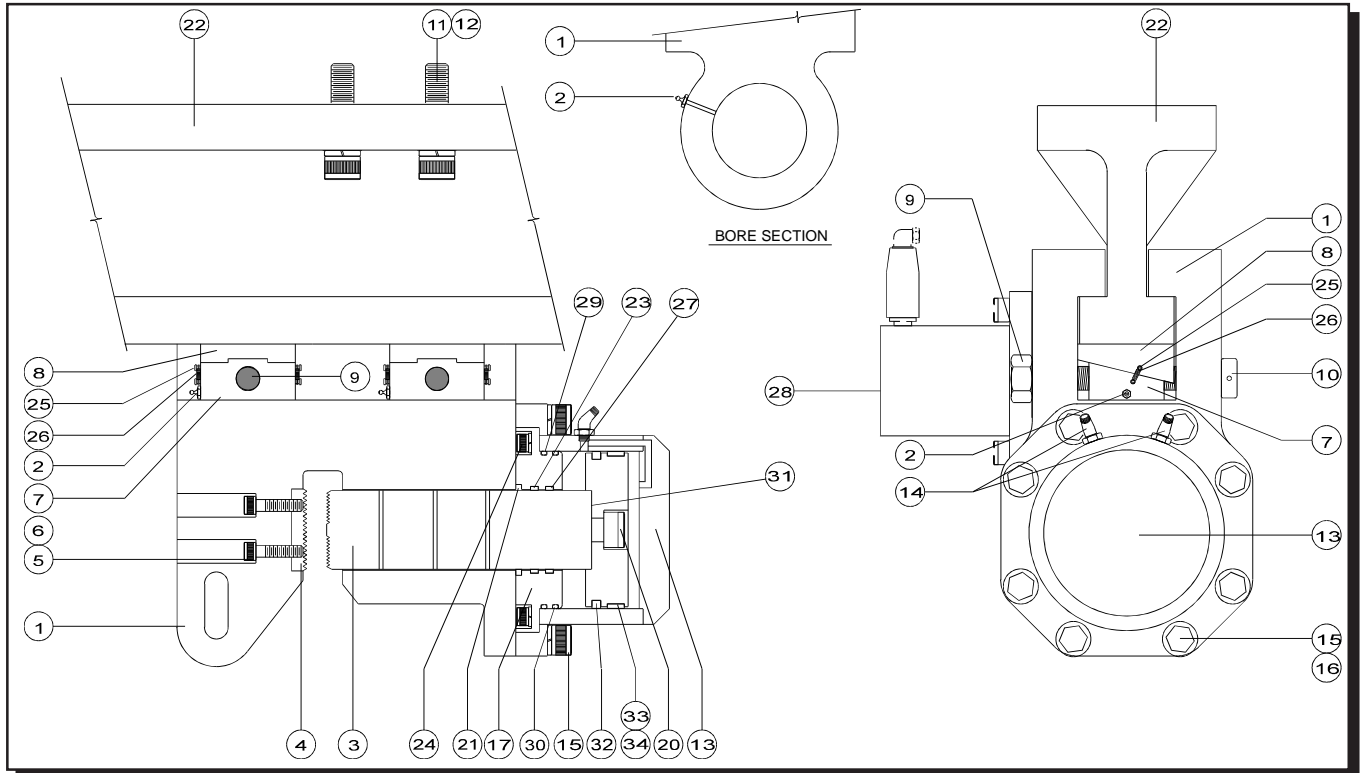
Item	Qty	Description	Part #
1	1	Caisson Clamp Body	#250101
2	6	Grease Zert	#221001
3	1	Caisson Clamp Plunger/Jaw	#250301
4	1	Caisson Clamp Fixed Jaw	#250202
5	2	Bolt - SHCS 5/8" x 4"	#124214
6	2	Lock Washer 5/8" High Collar	#124115
7	2	Male Wedge Half	#243102
8	2	Female Wedge Half	#243105
9	2	Wedge Bolt w/Washer	#124211
10	2	Wedge Nut w/Washer	#124212
11	17	Bolt - SHCS 1 1/2" x 3 1/2"	#124201
12	17	Lock Wa. - 1 1/2" High Collar	#124202
13	1	Clamp Cylinder	#250001
14	2	#6 SAE/#6 JIC 45 Deg. Fitting	#222002
15	8	Bolt - SHCS 1 1/4"NFx3 1/2"GR.8	#124204
16	8	Lock Wa. - 1 1/4"High Collar	#124205
17	1	Cylinder End Cap	#250302

Item	Qty	Description	Part #
18	1	Cylinder Piston	#250303
19	1	Plunger	#250301
20	1	Bolt -SHCS 1 1/2-8 x 3"	#250304
21	1	Wiper - #959-41	#
22	1	Caisson Beam 11ft.	#903000
23	1	Poly Seal - #2500-4500-375B	#
24	12	Bolt - SHCS 5/8-18 x 1"	#
25	8	Spring Pin	#250103
26	4	Wedge Spring	#250104
27	1	Wear Ring - #W2-4750-750	#
28	1	Hydraulic Wedge Activator Kit	#243100
29	1	Parker O-Ring #8-367	#
30	1	Parker O-Ring #2-367	#
31	1	Piston O-Ring #2-338	#
32	1	Piston Wear Ring #W2-8000-750	#
33	1	TFER8000 Bronze w/Loader Ring	#
34	1	Square Ring - #4426	#



### II. MAJOR COMPONENT DEFINITION (Continued...)

#### II-6. Caisson Clamp Identification. (Continued...)



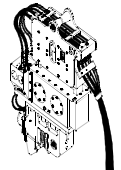
**Figure 2-F. Caisson Clamp Identification.**



# **OPERATION / MAINTENANCE MANUAL**

MODEL 50 VIBRATORY HAMMER WITH MODEL 260 POWER UNIT

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## **III. LOADING AND UNLOADING**

### **III-1. Model 50 Vibratory Hammer**

The APE 50 vibrator is normally shipped laying flat on the trailer deck and the hose bundle is coiled on top. Lift the vibrator by rigging one line to the lifting pin and one line around the clamp attachment lifting the vibro and hose bundle as one load. 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.

### **III-2. Model 260 Power Unit**

The Power Unit is always loaded with the oil cooler facing to the rear of the truck to prevent damage to the cooler and the radiator from flying objects. The Power Unit is usually held to the truck by wrapping a chain around both ends of the fuel tank base and the truck bed. After loading the Power Unit, tape the exhaust rain cap shut to prevent rain water from getting inside. If quick disconnects do not have safety cables then store them under the panel in the storage box rather than risk the possibility of the caps and plugs coming loose and falling off into traffic. Make sure all doors are fully closed. Tighten fuel cap to prevent diesel fuel from washing out the fill spout.

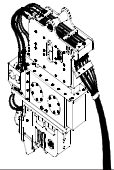
### **III-3. What to do if damaged during shipment**

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



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## IV. PREPARATION AND OPERATION

### IV-1. Rigging of Vibratory Hammer

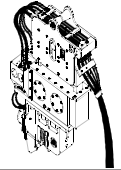
A steel wire rope sling must be connected to the lifting bail located on top of the vibro. The required strength of this sling depends on the capacity of the crane and the work to be carried out. A safety factor of six is recommended. Several turns of a smaller diameter cable will result in a longer lasting sling than one larger diameter cable. When making a sling, avoid using cheap cable clamps. Check the clamps daily.

### IV-2. Installing the Clamp Attachment

The Vibro is fitted with a standard sheet clamp at the factory. However, several types of clamps are used on APE vibros to fit many different types of piles. A step by step procedure is provided as follows:

- 1.) Clean all drilled and tapped threads on the bottom surface of the gearbox. Use a 1 1/2"UNC tap to clean any rusted threads and blow out any remaining fragments with compressed air. If there is a cutting torch on the jobsite then use the oxygen setting to blast the threads clean. Hold a rag over the tapped hole to prevent flying dirt from blasting into your eyes.
- 2.) Clean the machined bottom surface of the gearbox and prepare to mount the clamp. If the clamp bolts should ever break, check the machined surface with a straight edge to make sure it is true and flat.
- 3.) Clean the machined surface of clamp. Eye-ball the entire surface for damage. Make sure the surface is flat and void of all dirt.
- 4.) Start by getting the center bolt in first and work outwards. Do not tighten bolts until you have all of the bolts started.
- 5.) Tighten bolts using a six-foot cheater pipe. If you do not have a cheater pipe then use a sledge hammer.
- 6.) Go around all bolts at least three times making sure they are tight.
- 7.) After vibrating the first pile, check the bolts again.
- 8.) If one bolt breaks, replace them all since they may be weak or cracked.
- 9.) Never operate the vibro with missing clamp bolts.

**WARNING:** Do not use grade five bolts. All bolts should be allen head cap screw bolts. If one bolt breaks then the others are damaged and must be replaced. Never drive piles if one bolt is broken. Bolts break only because they were not tight and the crew neglected to check them. A good operator insists that every bolt is checked twice daily.



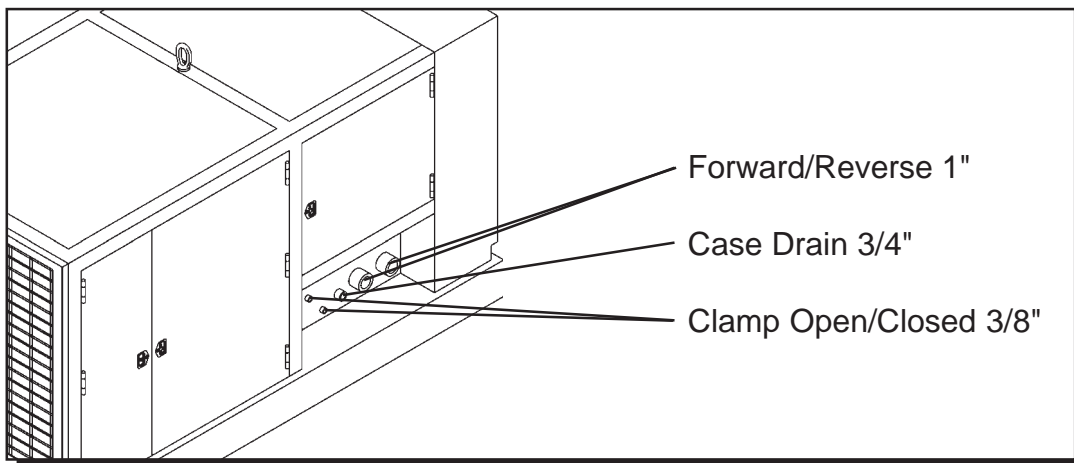
## IV. PREPARATION AND OPERATION (Continued...)

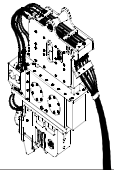
### IV-3. Plumbing the Vibro Hoses to the Power Unit

There are five hoses leading from the vibro that must be connected to the power unit to begin operation (Please see section III-2. Hose Identification on [page 2-3]). There are two big hoses, two little hoses and one middle sized hose. The hoses attach to the power unit by screwing the quick disconnect couplers onto the proper couplers of the power unit. The couplers on the power unit are mated with the couplers on the vibro so there is no chance of putting them on backwards. Please take the following steps when installing the couplers:

**WARNING: TURN THE POWER UNIT OFF BEFORE INSTALLING COUPLERS**

- 1.) Turn the power unit OFF.
- 2.) Clean all couplers with a can of ether if available. A clean dry cloth will also work but will require extreme care. Fittings must be spotless clean.
- 3.) Install couplers by screwing them onto their respective counterparts. Try to avoid cross-threading and maintain a straight line. Jerk the hose back and forth while turning coupler to aid installation effort. **Push hard to get the big coupler threads started.**
- 4.) Make sure fittings are tight. If they are properly cleaned they should run up tight with just a firm hand grip. However, they should be double checked with a chain wrench.
- 5.) Avoid over-tightening.
- 6.) If near salt water, spray with a light oil to prevent oxidation.
- 7.) Position the Power Unit so that vibrator has enough hose to reach the work. Avoid pulling too hard on hoses. Most hose failures are caused by pulling hoses off couplers.





### IV. PREPARATION AND OPERATION (Continued...)

#### IV-4. Filling Vibrator Pressure Hose

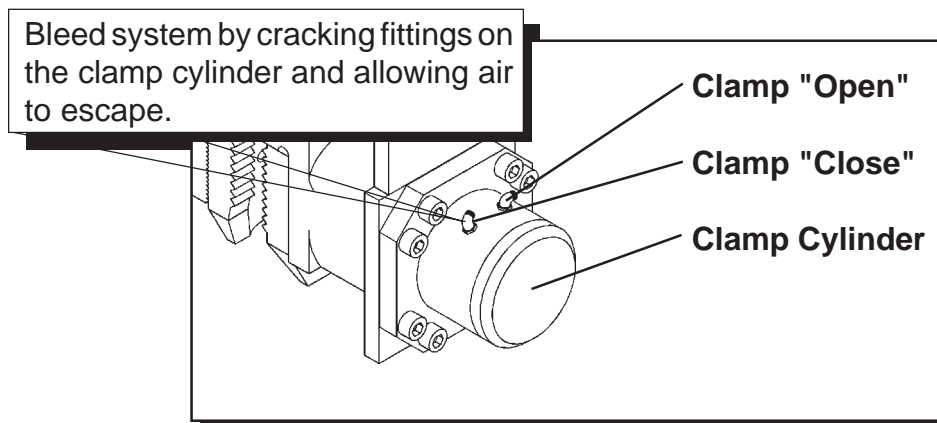
The vibrator is shipped with the hoses filled with oil. However, if the unit has been sitting for a long period of time or if a damaged hose has been replaced with a new one, then the hoses must be filled. Hook up all the hoses to the power unit (see Section IV-3 on [page 4-2] and Figure 4-A.). Start the power unit 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.

#### IV-5. Bleeding the Clamp Attachment Hydraulic Hoses

If the opening and closing of the jaws seems spongy or slow, it may be a result of air in the clamp hoses. Normally there is no need to worry about bleeding the clamp lines because the unit is shipped fully tested. However, should the vibro sit for a long period of time, if a new attachment is being installed or if a damaged clamp hose has been replaced, then the system may require bleeding to remove unwanted air in the system. To bleed the clamp system, follow these steps:

- 1.) Shut Power Unit OFF.
- 2.) Make sure the clamp line quick dis-connects are coupled to the power unit.
- 3.) Start the power unit engine and run at 1500 rpm. Give the engine time to warm up.
- 4.) Loosen the clamp lines at the hydraulic cylinder by backing the fittings off just a little.
- 5.) Turn the clamp switch on the power unit control pendant to "CLOSE" and wait for oil to flow from the fittings. WATCH FOR AIR BUBBLES. When air bubbles have stopped then quickly re-tighten the fittings.
- 6.) Repeat the same procedure for "OPEN" side.
- 7.) Operate the jaws. If they are still a bit spongy then repeat bleeding steps once more.

**WARNING: DO NOT BLEED SYSTEM AT FULL ENGINE THROTTLE BECAUSE TOO MUCH OIL WILL FLOW FROM THE HOSES AND COULD CAUSE INJURY.**

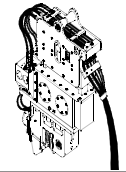


**Figure 4-B. Bleeding Clamp Attachment**



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## IV. PREPARATION AND OPERATION (Continued...)

### IV-6. Precautions and Rules for Operation

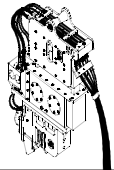
The following is a list of precautions, suggestions and rules that are intended to help promote the safe and productive use of the APE Model 50 Vibratory Hammer.

- 1.) Follow the Daily Maintenance Required Prior to Operation, [Section V-1.] [page 5-1].
- 2.) Read and follow the Safety Precautions, [page v].
- 3.) Follow the start-up procedures listed in the manual for the power unit being used.
- 4.) Start with piles in good condition.
- 5.) Put all teeth in pile.
- 6.) Drive in steps eight feet or less.
- 7.) Keep sheets plumb.
- 8.) Come up to speed before doing work.
- 9.) No dancing. Avoid de-intensification.
- 10.) Drive past obstacles and then go back.
- 11.) Backhoe on site to remove obstacles.
- 12.) Lead with the ball.
- 13.) Probe the pile if it appears stuck.
- 14.) Keep piles plumb or down the road you go.
- 15.) Never rush the sheet pile foreman.
- 16.) Slow and plumb and the job will get done.
- 17.) Melted inner locks - piles out of plumb.
- 18.) Never stand under pile hammers.
- 19.) Low clamp pressure means jaw failures.
- 20.) Wait for vibro to get to full speed then pull.
- 21.) Don't over excavate - lower the ring.
- 22.) Look at the jaws during driving.
- 23.) Beware of cracked or broken sheets.
- 24.) In sandy soils drive faster.
- 25.) In clay amplitude is everything.
- 26.) Low drive pressure means easy work.
- 27.) High pressure means friction on piles.
- 28.) Over 4500 psi means get a bigger hammer.
- 29.) No amplitude means get a bigger hammer.
- 30.) Caissons need heavy wall to avoid flex.
- 31.) Check clamp bolts each morning.
- 32.) Read the manual - know your machine.
- 33.) Attach whip line to pile when pulling.
- 34.) Know your line pull.
- 35.) Extract straight - look at boom and cable.
- 36.) Give boom stops some room.
- 37.) Stalled engine means dirty fuel filters.



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## IV. PREPARATION AND OPERATION (Continued...)

### IV-7. Relief Valve Settings Prior to Operation - Model 260

1. Do not hook up quick disconnects. Start engine and bring to full rpm.
2. Check Clamp relief valve setting by turning clamp switch to "open" and holding it there while you read the clamp "open" gauge on the panel. The gauge should read 3300 psi. If it is not coming up to pressure then set the relief valve (FACTORY AUTHORIZED PERSONNEL ONLY) by loosening the lock nut and turning the knob in slowly until the proper pressure is reached. Turn in to increase pressure and out to decrease pressure. Lock the locknut and re-check the pressure to make sure that you did not move the setting while you were tightening the lock nut. When you turn the clamp switch to "open" and hold it, a small light on the solenoid comes on to show that there is power to the solenoid. The solenoid light should go off when you turn it to the "Off" position.

3. Check the clamp pressure switch setting. Turn the clamp to "close" and see if the green light comes on indicating proper clamp pressure. If it does then everything is fine. Clamp pressure should read 3000 psi and light on pendant or panel should be lit. To set the pressure switch, turn the set screw out using a screwdriver. Turn it out a few turns counter clockwise. Turn clamp switch to "open" for a second. Make sure the clamp open gauge reads 3300 psi. If it does not, then go back to step 2 and set the clamp relief valve first. Knowing that your clamp relief valve is set to 3300 psi, turn the clamp switch to "closed." Green light should be on and clamp pressure should be very low or notreading at all. If green light is on then slowly turn the pressure switch screw clockwise with a screw driver until the pressure is 3000 psi or 300 psi below the clamp relief valve setting. Always set the clamp pressure switch 300 psi below the clamp relief valve setting or the light will never come on. We do not want the clamp pump to pump oil over therelief valve because this will cause heat and take away 25 horsepower from the engine. Call the factory if you have any questions. (800) 248-8498

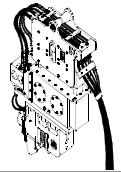
### IV-8. Shut-down Procedures

The following procedures explain what to do with the power unit to correctly shut down the APE Model 50 Vibratory Hammer.

- 1.) Stop the vibrator. (Refer to the power unit operating manual .)
- 2.) Allow the diesel engine to run for five minutes at 1000 engine rpms.
- 3.) Reduce engine speed to low idle for about 60 seconds.
- 4.) Shut engine off by turning off the main power switch.

**WARNING: Do not shut the power unit engine down while the vibrator is clamped onto a pile. The clamp check valve will slowly bleed off if there is any leakage in the hose lines or worn clamp seals in the cylinder that moves the jaw open or closed.**





### IV. PREPARATION AND OPERATION (Continued...)

#### IV-9. Operation of the Remote Control Pendant

1. All functions of the vibro can be controlled by the hand held pendant. It is the choice of the crew as to where best to locate the pendant. Some prefer to give it to the crane operator so he can control all functions. Others prefer to give it to one of the ground crew so that he can position himself close to the work at hand. A 50 foot cord is provided as standard equipment. If this is not long enough, additional 50 foot sections can be added. Should the pendant become damaged, all functions can be manually operated. See Section VII-3, Page 7-8 in this manual for more details on operation. See Section VII-3A, Page 7-9 of this manual for wiring diagram and pendant components.

#### IV-10. Normal steps to operate vibrator:

1. Position vibro on pile.
2. Turn clamp switch to Close and wait for light to come on pendant.
3. Turn to Forward to begin vibrating pile.
4. To drive, lower crane line as vibro vibrates pile.
5. To extract, pull up on vibro while vibrating.
6. See "Precautions and Rules for Operation" in this manual for more detailed operations on driving and extracting piles.
7. To stop the vibro turn the Forward switch to off.
8. To release clamp, press clamp switch clamp light will turn off.

