



ANTAEUS HHP25 MANUAL

V10.12.25



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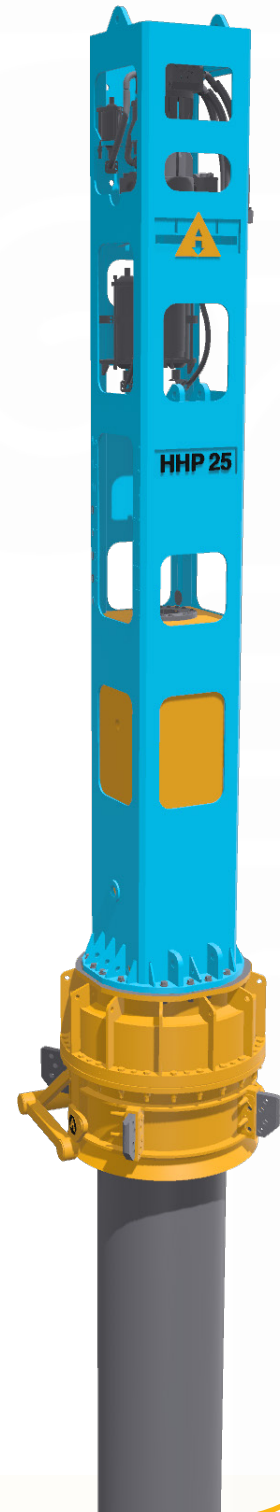
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ANTAEUS HHP25 MANUAL

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WARRANTY INFORMATION

Antaeus Foundation Equipment, Inc. (Antaeus) warrants that its new products are free from defects in materials and workmanship for a period of one (1) year from the date of delivery (unless a longer or shorter term warranty was agreed on as written in the purchase agreement) to the original purchaser, subject to the following terms:

Scope of Liability: Antaeus' responsibility under this warranty is strictly limited to, at Antaeus' discretion, the repair or replacement of any parts found to be defective in materials or workmanship after inspection. Such repairs or replacements will be provided at no cost to the user and will be carried out either at Antaeus' facility or by an authorized Antaeus distributor during normal business hours.

Exclusions: This warranty does not cover components or accessories not manufactured by Antaeus, as these items are subject to the warranty of their respective manufacturers. It also does not apply to routine maintenance items (such as engine tune-ups) or consumable parts (such as filters).

Replacement Parts: Any parts replaced or repaired under this warranty are covered only for the balance of the original warranty period, as if they were original components of the product.

Limitations: No other warranties, whether expressed or implied, are provided. Antaeus specifically disclaims any implied warranties of merchantability or fitness for a particular purpose.

Additional Exclusions: This warranty does not include transportation charges, installation costs, downtime, taxes, or any other incidental, indirect, or consequential damages or delays.

Return of Products: If requested by Antaeus, any products or parts covered by this warranty must be returned prepaid, with transportation arranged and paid for by the customer.

Hydraulic oil used in Antaeus equipment must meet the ISO 4406 Cleanliness Code 17/15/11.

Use of oil that does not meet this standard will void the warranty.

Improper use of the equipment—including but not limited to operating with known defective or worn parts, exceeding rated capacity, using unauthorized replacement parts, or performing repairs or modifications not approved by Antaeus—will result in the warranty being voided if such actions are determined by Antaeus to negatively impact the product.

Any welding performed on Antaeus equipment without prior written approval from Antaeus will void the warranty.

Only written authorization signed by an officer of Antaeus may modify or extend this warranty. No employee is permitted to alter the terms or grant additional warranties verbally or otherwise.



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Warnings and Safety



1. Authorized Personnel Only

Only individuals who are properly trained, experienced, and qualified should operate or maintain this equipment.

2. No Service During Operation

Never adjust, lubricate, or perform repairs while the unit is running or when it is suspended above the ground.

3. Maintain Safety Labels

Do not remove, obscure, or paint over safety or warning labels. Replace any label that is missing, damaged, or unreadable immediately.

4. Required Personal Protective Equipment (PPE)

All personnel working near this equipment must wear approved PPE, including:

- **Hard Hat**
- **Safety Footwear**
- **Safety Glasses**
- **Hearing Protection**

5. Maintain Safe Distance

Stay as far from the operating equipment as practical. Components can loosen and fall—never position yourself beneath equipment that is running or elevated.

6. Approved Replacement Parts Only

When repairing or maintaining the unit, use only parts supplied by, or approved in writing by, APE. Substitutions are not permitted.

NOTICE

No Welding or Flame Cutting

Do not weld, flame cut, or apply heat to this equipment.

7. Flammable Liquids Prohibited

Never store or use flammable liquids on or near the engine.

8. Properly Rated Lifting Gear

Ensure all lifting equipment—cranes, wire ropes, slings, hooks, shackles, etc.—is rated for the maximum anticipated loads.

9. Contact Before Operation if in Doubt

If unsure about the unit's weight, specifications, or performance, consult APE before lifting, handling, or operating the equipment.

10. Daily Wire Rope Inspection

Check all wire rope clips for tightness and inspect wire ropes for wear before each day's operation.

11. Control Ground Vibrations

Verify that vibrations from operation will not cause damage to or collapse nearby structures or excavations.

DANGER

DANGER



NOTICE



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Warnings and Safety



Operating & Maintenance Safety Guidelines

12. Ventilate Enclosed Areas

When operating in enclosed spaces, route exhaust fumes to the outside. Inhalation of exhaust gases can be fatal.

13. Clear the Work Area Before Start-Up

Remove all tools, parts, and electrical cords before starting the unit.

14. Battery Safety

Do not smoke or use open flames near batteries.

Batteries release explosive gases during charging—ensure adequate ventilation.

15. Fueling Precautions

Do not smoke or use open flames when filling the fuel tank.

16. Respond to Abnormal Operation Immediately

If the equipment operates abnormally, stop use at once and correct the problem before resuming.

17. Control Pendant Security

Never leave the control pendant (including radio control) unattended. (If your unit is equipped with a remote pendant)

18. Oily Rag Storage

Store oily rags only in approved containers, well away from the engine exhaust system.

19. Auger/Drill Start-Up

Before starting the Power Unit engine, ensure the auger rotation switch is in NEUTRAL. (if your unit has a pendant)

20. Hydraulic Pressure Settings

Do not adjust hydraulic pressures outside the specifications listed in this manual.

21. Hydraulic Hose Safety

Never operate with damaged or kinked hoses—replace immediately.

Do not lift or support hydraulic hoses using wire rope slings.

Quick Disconnect (QD) Connections

22. Never connect QDs while the Power Unit is running.

Moving Equipment

Do not pull or attempt to move equipment by the hydraulic hoses.

23. Hydraulic Leak Safety

Never use your hands to check for leaks—high-pressure fluid can penetrate the skin and cause severe injury, poisoning, or infection.

Do not attempt leak repairs while the equipment is operating.

Do not tighten or loosen fittings or hoses when the unit is running.

24. Equipment Stability

Always position the Power Unit on level, stable ground.

DANGER

DANGER

WARNING

CAUTION

CAUTION

NOTICE



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Warnings and Safety



GENERAL SAFETY WARNING

Read and understand the operator's manual before using this equipment. Failure to follow safety instructions may result in serious injury or death. Always wear appropriate personal protective equipment (PPE).



HYDRAULIC FLUID HAZARD

Hydraulic systems are under high pressure. Leaking fluid can penetrate the skin and cause serious injury, including blood poisoning or loss of limb. Seek immediate medical attention if fluid is injected into the skin. Do not inspect hydraulic leaks with your hands.



NOISE HAZARD

Equipment may produce noise levels that exceed permissible exposure limits. Prolonged exposure can cause hearing loss. Always wear hearing protection when operating or working near this equipment.



CRUSHING / PINCH HAZARD

Stay clear of moving parts, suspended loads, and pinch points. Contact with moving components may result in severe injury or death. Never position yourself under or near a raised load.



DIESEL EXHAUST WARNING

Diesel engine exhaust and many of its constituents are known to cause cancer, birth defects, and other reproductive harm. Avoid breathing exhaust fumes. Operate only in well-ventilated areas.



MODIFICATION WARNING

Unauthorized modifications, welding, or use of non-approved parts may compromise safety, cause equipment failure, and void the warranty. Only use Antaeus-approved components and follow factory guidelines.



WARNING

California Proposition 65

Warning: This product contains chemicals known to the State of California to cause cancer, and birth defects or other reproductive harm.

www.P65Warnings.ca.gov



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Units of Measurement and Notation:

Canadian Metric: In Canadian and U.S. notation, commas separate thousands and periods indicate decimal values. In contrast, we recognize that many European and French-language countries reverse this convention, using a comma for decimals and a space for thousands.

Example:

1,500 = one thousand five hundred

1.5 = one point five



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Hydraulic Impact Hammers

HHP-25

Specifications

Ram weight	25 tons (50,000 lbs)
Max Striking Energy	375 KN.m
Strike Frequency	60/28
Max Ram Stroke	59 in
Lifting Hydraulic Cylinder – Single Lift Hydraulic Cylinder	
Hammer Weight (w/o pile cap)	78,000 lbs
Ram Length	150 in
Hammer Height	29 ft 6 in
Center Distance from Leader to Hammer	47 in
Horizontal Width of Hammer (w/o pile cap)	61 in
Horizontal Width of Hammer	76 in
Cushion Material	Direct Drive (Steel on steel)

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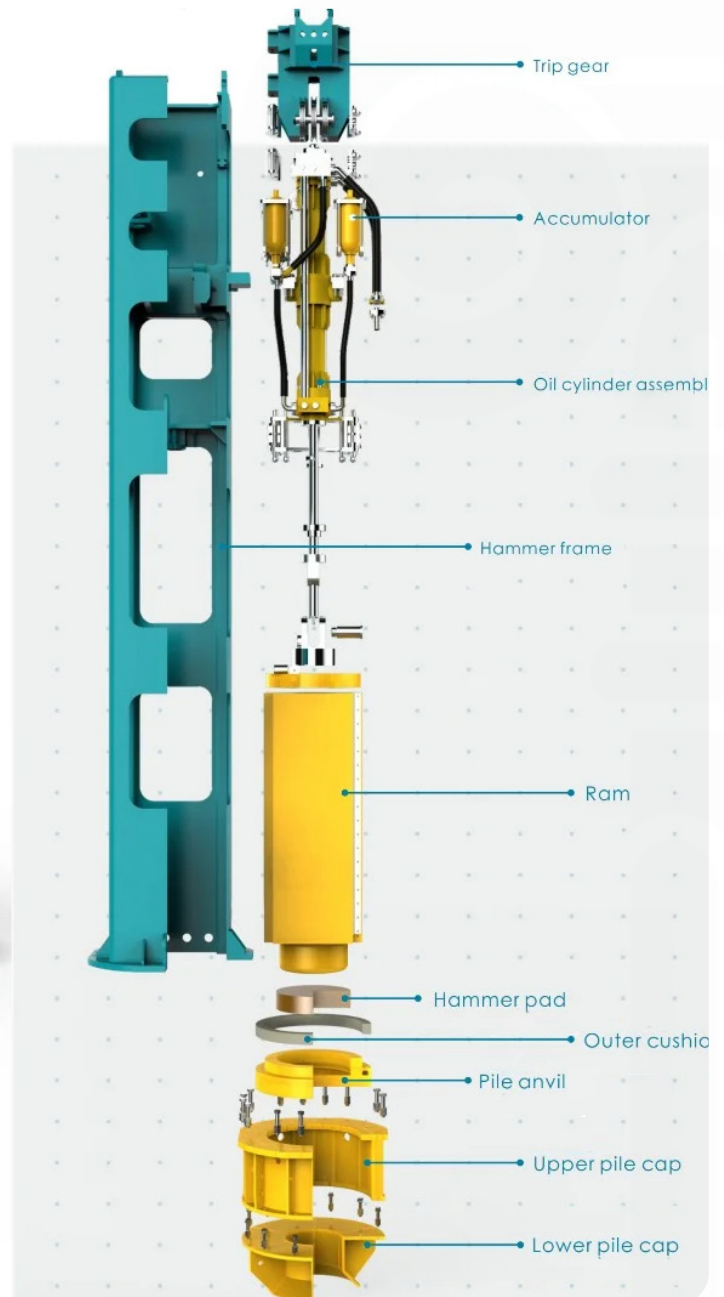
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Hydraulic Impact Hammer Series



INTELLIGENT MANUFACTURER
OF PILING EQUIPMENT



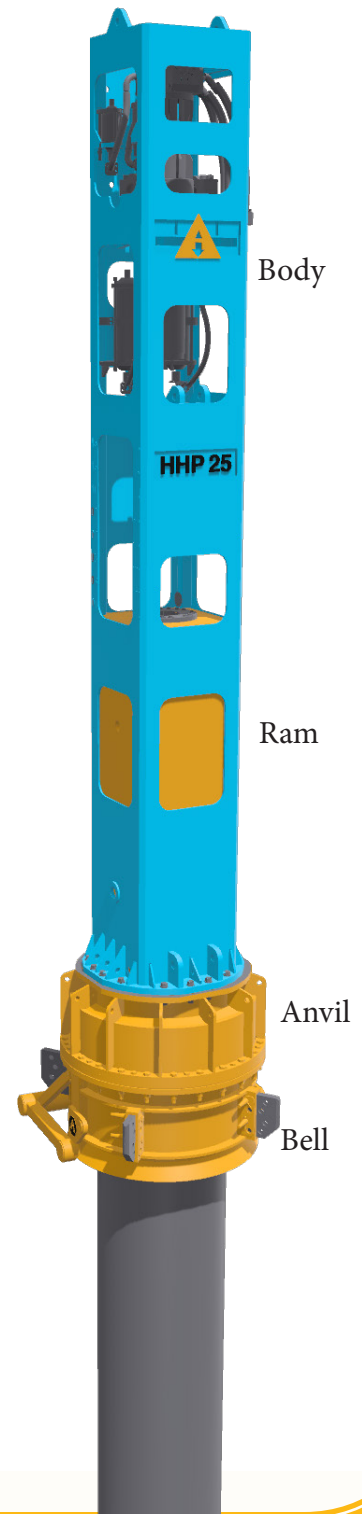


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Weights and Dimensions of Core Components

Part Name:	Dimensions (meters)	Weight (kg)
	Length x Width X Height	
Ram	3.8 x 1.3 x 1.3	25,000
Hammer Body	8.5 x 1.7 x 1.7	16,000
Oil hose Bracket	1.23 x 1 x .06	268
Lifting plate	1.55 x 0.6 x 0.1	545
Hydraulic hose	1.5 x 1.5 x 1m	~1,500
Bracket for Assembly	1.3 x 1.2 x 1.33 (Qty 2x)	1,300
Anvil	2.7 x 2.7 x 1	19,000
Bell (36") (no overturn)	3.3 x 1 x 2.25	6,000
Bell (36-60") + Overturn	3.6 x 3 x 2.5	9,800
Overturn Bracket	4.36 x 2.11 x 2	1,860

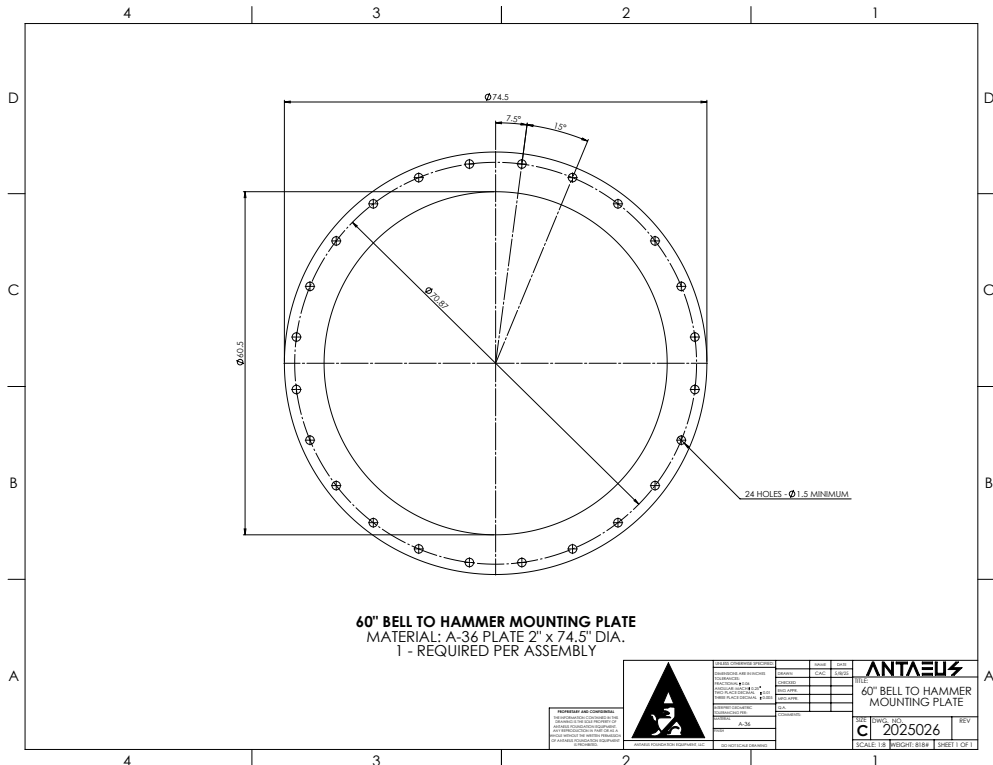
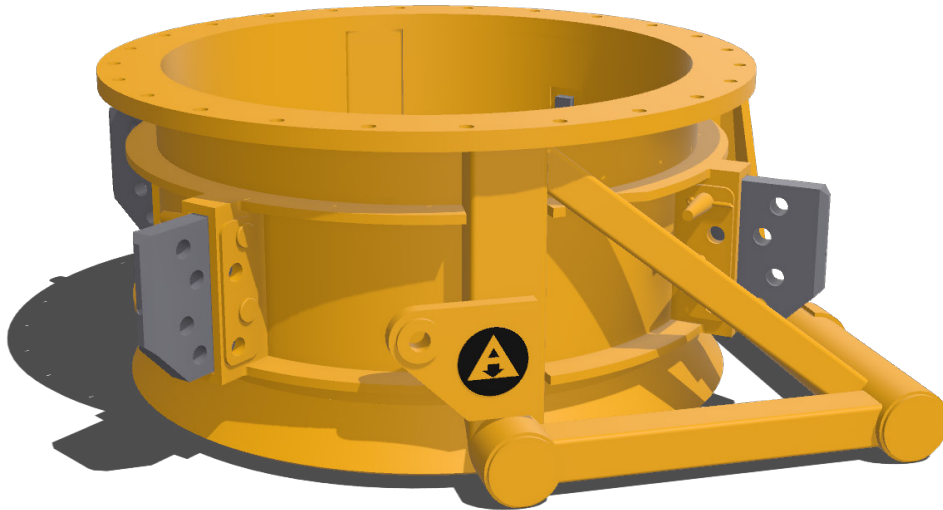
HHP25 Supplied to VanPile came with two bells. One bell can drive 36" (.91m) diameter piles only. The other can drive 36" (.91m) , 48" (1.22m) , and 60" (1.52m) diameter piles.





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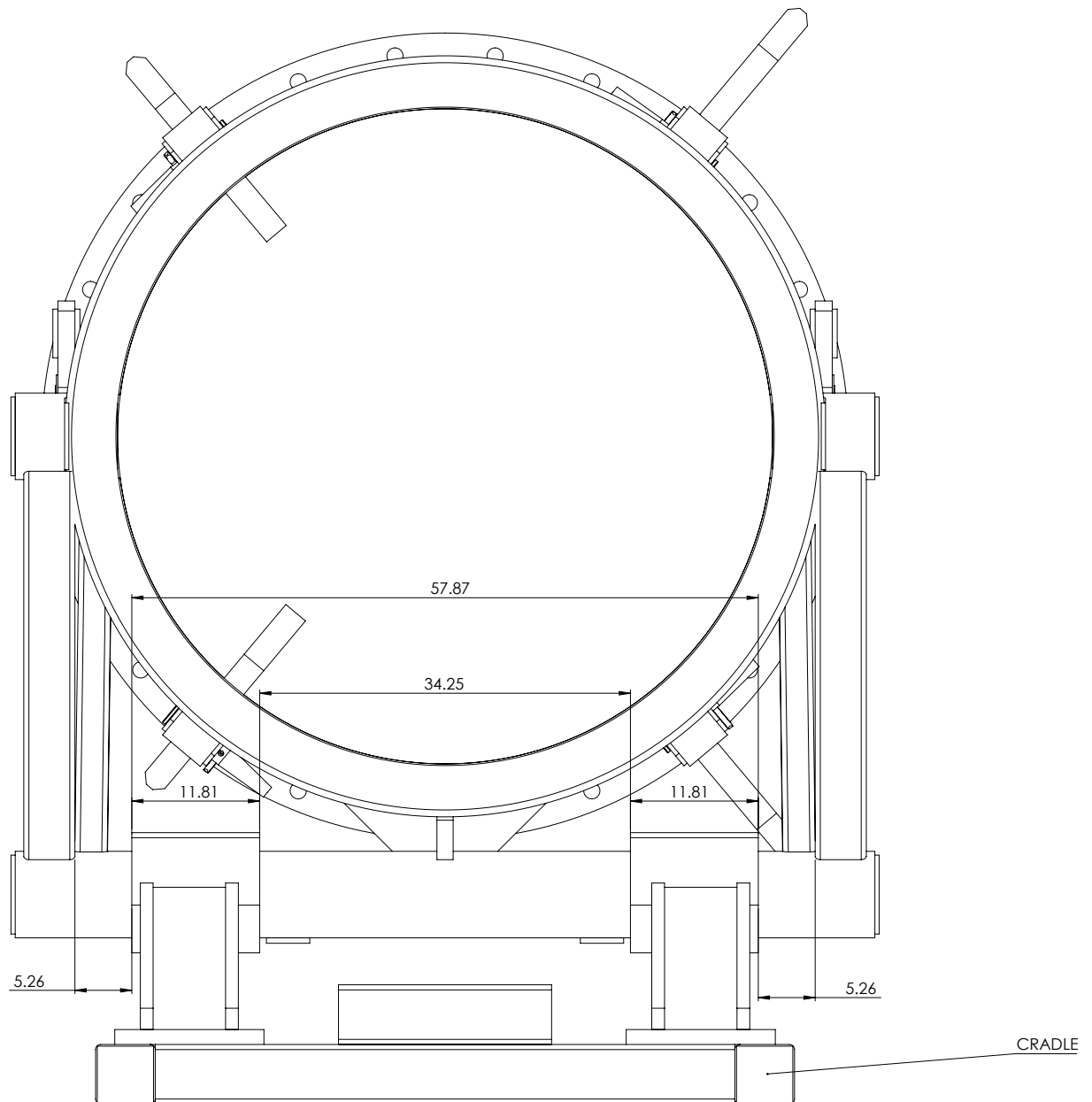
60" Bell with build in tipping bracket





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60" Bell with build in tipping bracket

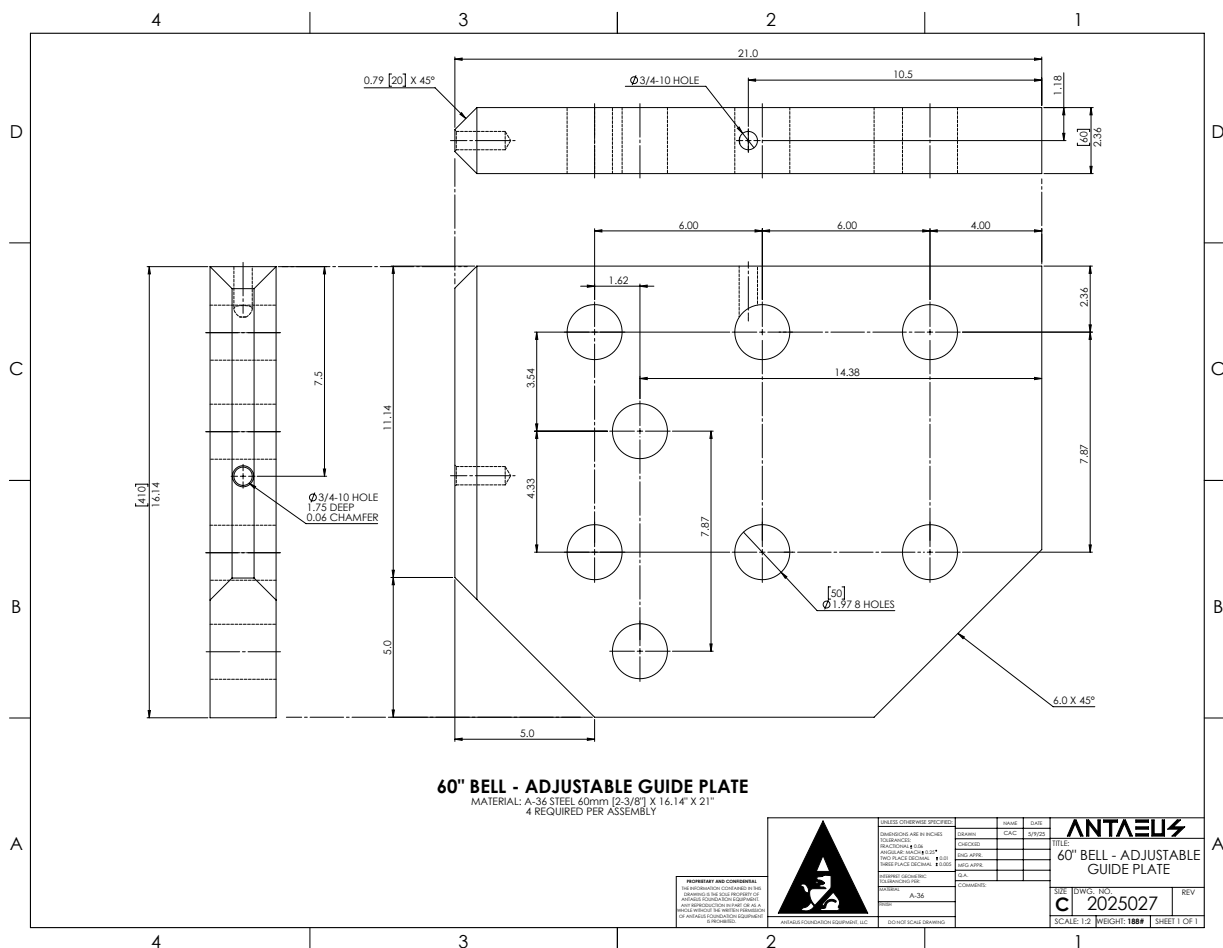




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60" Bell with build in tipping bracket

The adjustable guide plate can be modified in the future to drive many different diameter piles.





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HHP to Diesel Hammer Energy Comparison Chart

Important Information for HHP VS DIESEL:

A hydraulic hammer (HHP) delivers energy to the pile over approximately 60 to 80 milliseconds when the ram strikes, whereas a diesel hammer delivers energy in about 20 milliseconds. Although the maximum energy output may be similar, the hydraulic hammer's longer energy delivery time makes it more suitable for concrete piles and cohesive soils. In contrast, the diesel hammer's rapid energy delivery is more effective for piercing and cutting through non-cohesive soils. The extended energy delivery time of a hydraulic impact hammer can effectively shear cohesive soils like clay. In contrast, the rapid energy delivery of a diesel hammer tends to cause the energy to bounce off the clay rather than penetrate it.

GRL-WEAP analysis typically does not account for the energy delivery time, colloquially known as "peak force." Therefore, while we can compare the maximum energy, hydraulic and diesel hammers cannot be compared directly. Generally, when selecting a hydraulic impact hammer, it is advisable to choose one that is 20% larger than the diesel hammer equivalent to account for the slower energy delivery. In GRL-WEAP, the program assumes that a diesel hammer operates at 80% efficiency. This means that if the maximum energy is 100,000 ft-lbs, the actual delivered energy is only 80,000 ft-lbs. This energy loss is due to parasitic losses from friction and compression of the ram before impact. However, we believe that the 80% efficiency estimate is generous, and a more realistic figure might be closer to 50%.

Conversely, a hydraulic hammer typically has a much higher efficiency of around 95%, as the only parasitic loss is from moving the oil. Therefore, a 100,000 ft-lb hydraulic impact hammer could be considered to deliver 95,000 ft-lbs of energy, compared to the 50,000 ft-lbs a diesel hammer would likely deliver in a real-world scenario.

On the following page, you will find a comparison between 100% efficiency and real-world performance. We recommend considering the real-world performance when determining the appropriate size for a hammer.



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HHP to Diesel at 100% Efficiency (For Reference Only)
Not Reflective of Real-World Performance

HHP HAMMER	
Max Energy @ 100% (Max Stroke)	
Hammer	Energy
-	-
-	-
-	-
HHP 5	44,253.72 ft-lb (60 kN·m)
-	-
-	-
HHP 8	88,507 ft-lbs (120 kN·m)
-	-
HHP 12	132,761 ft-lbs (180 kN·m)
HHP 14	154,888 ft-lbs (210 kN·m)
HHP 16	177,014 ft-lbs (240 kN·m)
HHP 18	199,141 ft-lbs (270 kN·m)
HHP 20	221,268 ft-lbs (300 kN·m)
-	-
HHP 25	276,585 ft-lbs (375 kN·m)
-	-
-	-
HHP 30	331,902 ft-lbs (450 kN·m)
-	-
-	-
HHP 40	442,537 ft-lbs (600 kN·m)
HHP 50	553,171 ft-lbs (750 kN·m)
-	-
HHP 65	719,112 ft-lbs (975 kN·m)
HHP 1000	737,562 ft-lbs (1000 kN·m)
-	-

DIESEL HAMMER	
Max Energy @ 100% (Setting 4)	
Hammer	Energy
D 8	19,800 ft-lbs (26.94 kN·m)
D 12	29,768 ft-lbs (40.36 kN·m)
D 16	39,690 ft-lbs (53.81 kN·m)
D 19	47,126 ft-lbs (63.89 kN·m)
D 25	62,010 ft-lbs (84.07 kN·m)
D 30	74,419 ft-lbs (100.89 kN·m)
D 36	89,303 ft-lbs (121.07 kN·m)
D 46	114,109 ft-lbs (154.70 kN·m)
D 50	124,031 ft-lbs (168.16 kN·m)
D 62	153,799 ft-lbs (208.51 kN·m)
D 70	173,644 ft-lbs (235.43 kN·m)
D 80	198,450 ft-lbs (269.05 kN·m)
-	-
D 100	248,063 ft-lbs (336.31 kN·m)
-	-
D 125	310,028 ft-lbs (420.32 kN·m)
D 128	317,475 ft-lbs (430.43 kN·m)
-	-
D 138	342,326 ft-lbs (464.11 kN·m)
D 160	396,844 ft-lbs (538.02 kN·m)
D 180	446,445 ft-lbs (605.27 kN·m)
D 220	545,648 ft-lbs (739.76 kN·m)
D 260	664,850 ft-lbs (874.25 kN·m)
-	-
-	-
D 320	793,688 ft-lbs (1,076.04 kN·m)



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HHP 95% to Diesel at 80% Efficiency GRL-WEAP Comparison

HHP HAMMER	
Max Energy @ 95% (Max Stroke)	
Hammer	Energy
-	-
-	-
-	-
HHP 5	42,041 ft-lb (57 kN·m)
-	-
-	-
HHP 8	84,081 ft-lbs (114 kN·m)
-	-
-	-
HHP 12	126,123 ft-lbs (171 kN·m)
HHP 14	147,144 ft-lbs (200 kN·m)
-	-
HHP 16	168,163 ft-lbs (228 kN·m)
HHP 18	189,184 ft-lbs (257 KN·m)
-	-
HHP 20	210,205 ft-lbs (285 KN·m)
-	-
-	-
HHP 25	262,756 ft-lbs (356 KN·m)
-	-
-	-
HHP 30	315,307 ft-lbs (428 KN·m)
-	-
HHP 40	420,410 ft-lbs (570 KN·m)
HHP 50	525,512 ft-lbs (713 KN·m)
-	-
-	-
-	-
HHP 65	683,156 ft-lbs (926 KN·m)
HHP 1000	700,684 ft-lbs (950 KN·m)

DIESEL HAMMER	
Max Energy @ 80% (Setting 4)	
Hammer	Energy
D 8	15,840 ft-lbs (21.55 kN·m)
D 12	23,814 ft-lbs (32.29 kN·m)
D 16	31,752 ft-lbs (43.05 kN·m)
D 19	37,701 ft-lbs (51.11 kN·m)
D 25	49,608 ft-lbs (67.26 kN·m)
D 30	59,535 ft-lbs (80.71 kN·m)
D 36	71,442 ft-lbs (96.86 kN·m)
D 46	91,287 ft-lbs (123.76 kN·m)
D 50	99,225 ft-lbs (134.53 kN·m)
D 62	123,039 ft-lbs (166.81 kN·m)
D 70	138,915 ft-lbs (188.34 kN·m)
D 80	158,760 ft-lbs (215.24 kN·m)
-	-
-	-
D 100	198,450 ft-lbs (269.05 kN·m)
-	-
D 125	248,022 ft-lbs (336.26 kN·m)
D 128	253,980 ft-lbs (344.34 kN·m)
-	-
D 138	273,861 ft-lbs (371.29 kN·m)
-	-
D 160	317,475 ft-lbs (430.42 kN·m)
D 180	357,156 ft-lbs (484.22 kN·m)
D 220	436,518 ft-lbs (591.81 kN·m)
D 260	531,880 ft-lbs (699.40 kN·m)
-	-
-	-
-	-
D 320	634,950 ft-lbs (860.83 kN·m)
-	-
-	-



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HHP 95% to Diesel at 50% Efficiency

Real-World Performance Estimation / Older Diesel Hammer (not brand new)

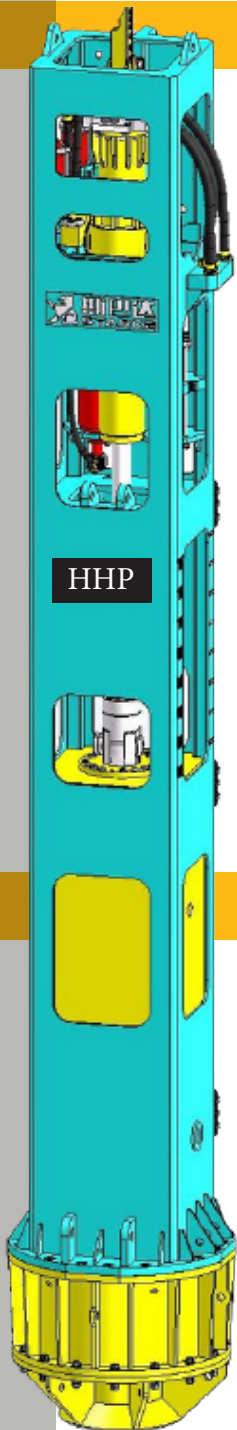
HHP HAMMER Max Energy @ 95% (Max Stroke)		DIESEL HAMMER Max Energy @ 50% (Setting 4)	
Hammer	Energy	Hammer	Energy
-	-	D 8	9,900 ft-lbs (13.47 kN·m)
-	-	D 12	14,884 ft-lbs (20.18 kN·m)
-	-	D 16	19,845 ft-lbs (26.91 kN·m)
		D 19	23,563 ft-lbs (31.95 kN·m)
		D 25	31,005 ft-lbs (42.04 kN·m)
		D 30	37,210 ft-lbs (50.45 kN·m)
HHP 5	42,041 ft-lb (57 kN·m)	D 36	44,652 ft-lbs (60.54 kN·m)
-	-	D 46	57,055 ft-lbs (77.35 kN·m)
-	-	D 50	62,016 ft-lbs (84.08 kN·m)
-	-	D 62	76,900 ft-lbs (104.26 kN·m)
-	-	D 70	86,822 ft-lbs (117.72 kN·m)
-	-	D 80	99,225 ft-lbs (134.53 kN·m)
HHP 8	84,081 ft-lbs (114 kN·m)	-	-
-	-	D 100	124,032 ft-lbs (168.16 kN·m)
HHP 12	126,123 ft-lbs (171 kN·m)	-	-
-	-	D 125	155,014 ft-lbs (210.16 kN·m)
HHP 14	147,144 ft-lbs (200 kN·m)	D 128	158,738 ft-lbs (215.22 kN·m)
-	-	-	-
HHP 16	168,163 ft-lbs (228 kN·m)	D 138	171,163 ft-lbs (232.06 kN·m)
HHP 18	189,184 ft-lbs (257 KN·m)	-	-
-	-	D 160	198,422ft-lbs (269.01 kN·m)
HHP 20	210,205 ft-lbs (285 KN·m)	-	-
-	-	D 180	223,223 ft-lbs (302.64 kN·m)
HHP 25	262,756 ft-lbs (356 KN·m)	D 220	272,824 ft-lbs (369.88 kN·m)
HHP 30	315,307 ft-lbs (428 KN·m)	-	-
-	-	D 260	332,425 ft-lbs (437.13 kN·m)
-	-	D 320	396,844 ft-lbs (538.02 kN·m)
HHP 40	420,410 ft-lbs (570 KN·m)	-	-
HHP 50	525,512 ft-lbs (713 KN·m)	-	-
HHP 65	683,156 ft-lbs (926 KN·m)	-	-
HHP 1000	700,684 ft-lbs (950 KN·m)	-	-



Antaeus Foundation Equipment
Rent / Sell / Service / Manufacture - A Pile Driving Innovation Company
250 S. Webster Street
Seattle WA 98108
www.AntaeusUSA.com

V3.18.24-1

(Daily / Per Pile) Checklist for Impact Hammer and Power



- ☐ Visually / Use hand wrench to inspect all main mounting bolts on lower bell an anvil, make sure no locking nuts have come loose or missing. Torque any suspect bolts back to spec (see chart). ONLY torque to 70% max torque according to the spec.
- ☐ Visually check all hydraulic hose and fittings for any signs of leaky oil. Verify any wear points that are causing premature damage.
- ☐ Visually inspect the white nylon wear pads and confirm no side looks more worn than the other. All inside pads should be equally worn and not worn more than 5mm or .2 inches. (Otherwise the hydraulic cylinder may begin to flex, which will eventually lead to leaky seals.
- ☐ Confirm all sensors on top of the hammer. Confirm that all electrical wires, DIN connectors, and connections are not showing signs of wear or abrasion.
- ☐ Visually inspect hose connectors at the hammer, confirm that no hydraulic hose is showing signs of wear down the steel braids. If steel braids are showing confirm that there are no broken brands. Replace if necessary.
- ☐ Visually inspect the eye connector where the hydraulic cylinder connects to the ram, confirm any cracks or premature wear.

Check rigging before each pile, check for pinch points, broken wire, excessive wear in any one location especially near shackles. Confirm all shackles are not missing any locking pins.

Checklist DURING Operation of Hammer

- ☐ Run the hammer for about 5 minutes at low blow count to warm up all the nylon pads that everything rides on. Those pads can become brittle if they are cold; The friction of the hammer running for 5 minutes softens them up.
- ☐ Do not allow the ram to bounce when it drops beyond what is necessary. If you see it bouncing then you should turn down the energy. Bouncing is typically due to hitting an obstruction or reaching refusal. If pile is not advancing consult factory for advise.
- ☐ If you see return oil lines jumping around each blow it means an accumulator is broken or the return QD is not all the way tight.
- ☐ Confirm system pressure is at 26 MPA (~3,770 PSI) when system pressure is enabled. During pile driving operation the max range the pressure should shift is ~500 PSI (40bar). If pressure is fluctuating 1,100 PSI to 1,500 PSI per blow it means that a low pressure accumulator is likely damaged, leaking, or low nitrogen. If the system pressure of 26MPA (3,770 PSI) is fluctuating down to as low as 0 PSI it means a high pressure accumulator is leaking or damaged.

INSPECTOR _____ DATE _____



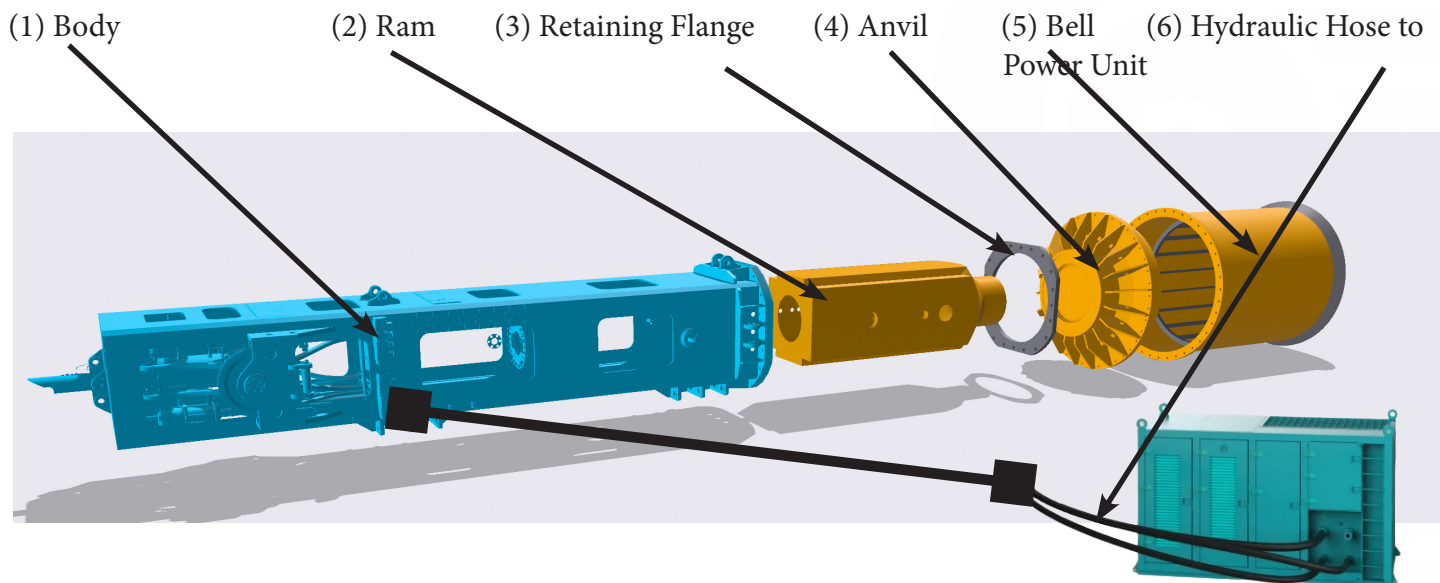
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HHP ASSEMBLY STEPS (ALL MODELS)

Hammer Assembly Overview

Assembly instructions and information:

There are 6 sections of the HHP Hammer that will require assembly:



All of the bolts, lock washers, and necessary mounting fasteners are already on the pieces and are ready for assembly. All of the necessary tools are provided.

Note: for the HHP12/14/20/25 the Anvil can be bolted directly to the hammer body in most cases. The “Retaining Flange” may not be on your HHP as it depends on what Anvil/Bell combination was purchased.



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HHP ASSEMBLY STEPS (ALL MODELS)

Body Assembly

Step 1

Create a level working area for the body of the HHP to lay flat on

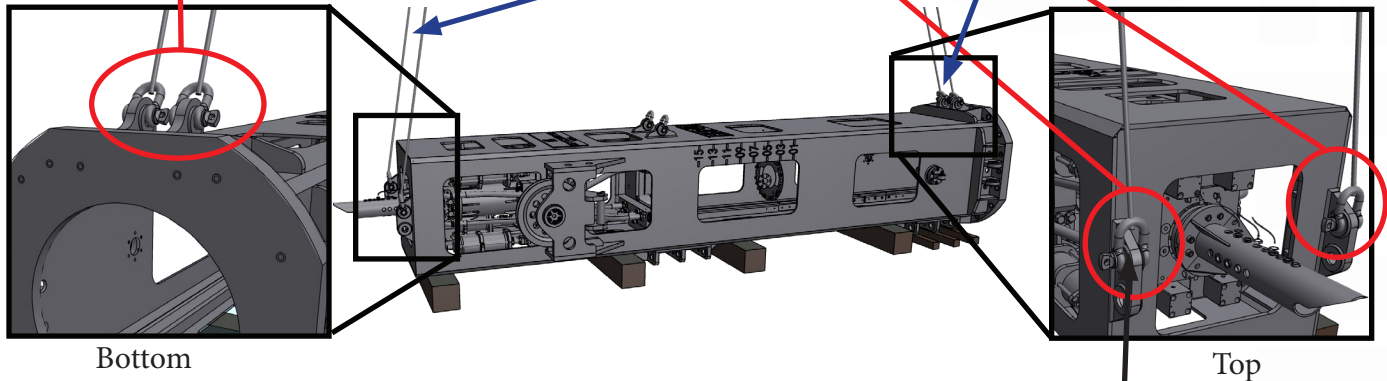
Lift Body onto level area using 4x 12"X12" pieces of cribbing and 3x 4X4" pieces of cribbing to level the body on XY Axis with carpenters level. (see pic below)

Check Body Weight and use appropriate size shackle and wire rigging based on your HHP size and weight to lift the entire assembled amount.

See "size and weights" page for your size HHP

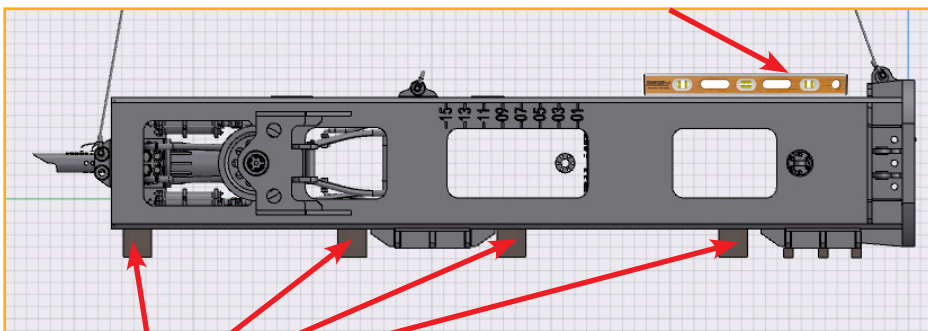
HHP25 fully assembled will be ~150,000 lbs (68,000kg)

Wire Rope Sling:
4 each ~25' (7.5m) sling length of appropriate capacity.



Hammer body must sit as level as possible

XY Level
Carpenters level



Example:
12x12" Cribbing
Quantity 4x

Hammer Body Shackle Hole Information:

Shackle Pin Max Diameter:
3.375 inches (85.7mm)

Anchor Shackle Min Length:
6 inches (152.4mm)

Jaw Opening:
2.5 inches (63.5 mm)

Largest Shackle that will fit the hole is a 85 ton shackle



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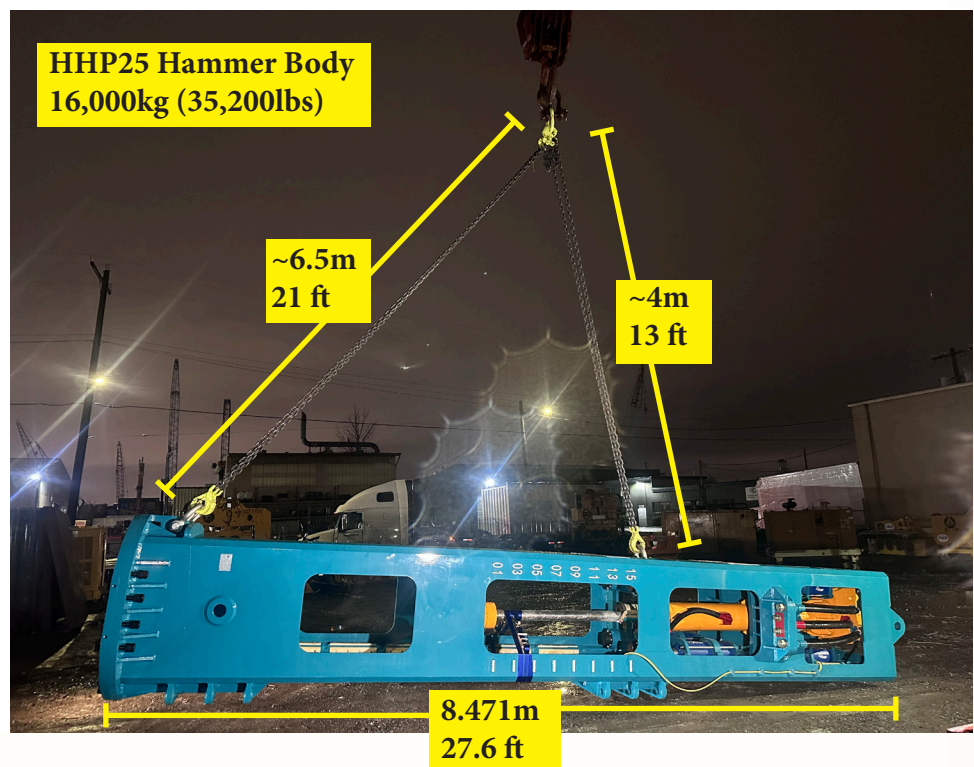
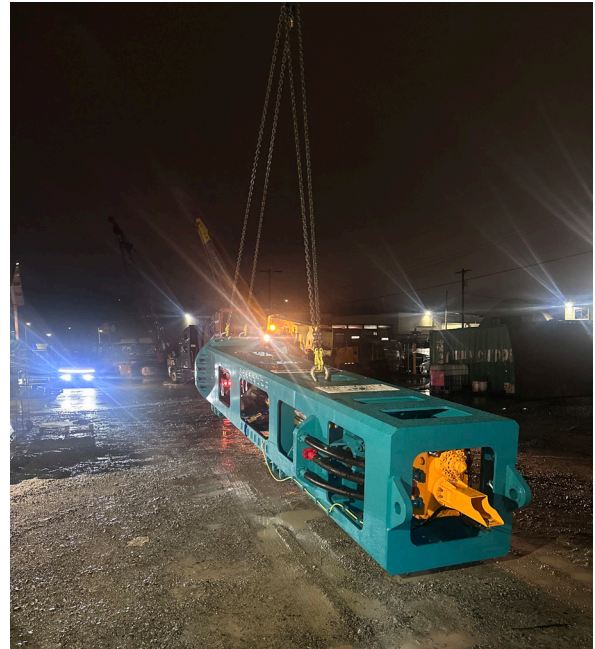
HHP ASSEMBLY STEPS (ALL MODELS)

Body Assembly

Step 1

Alternative pick option

For lifting the hammer body of an HHP25 or below an additional lifting option is to shackle to a point directly above the hydraulic cylinder. (See left and below photos). When the Ram is not installed the cylinder side will be 20% heavier and will require a slightly shorter sling length to hang flat. We recommend a 4 point adjustable chain sling to help accommodate various picking options and max flexibility during assembly or tear down. **Do NOT** use this lifting option after the ram is installed, this is only for lifting the body section only.



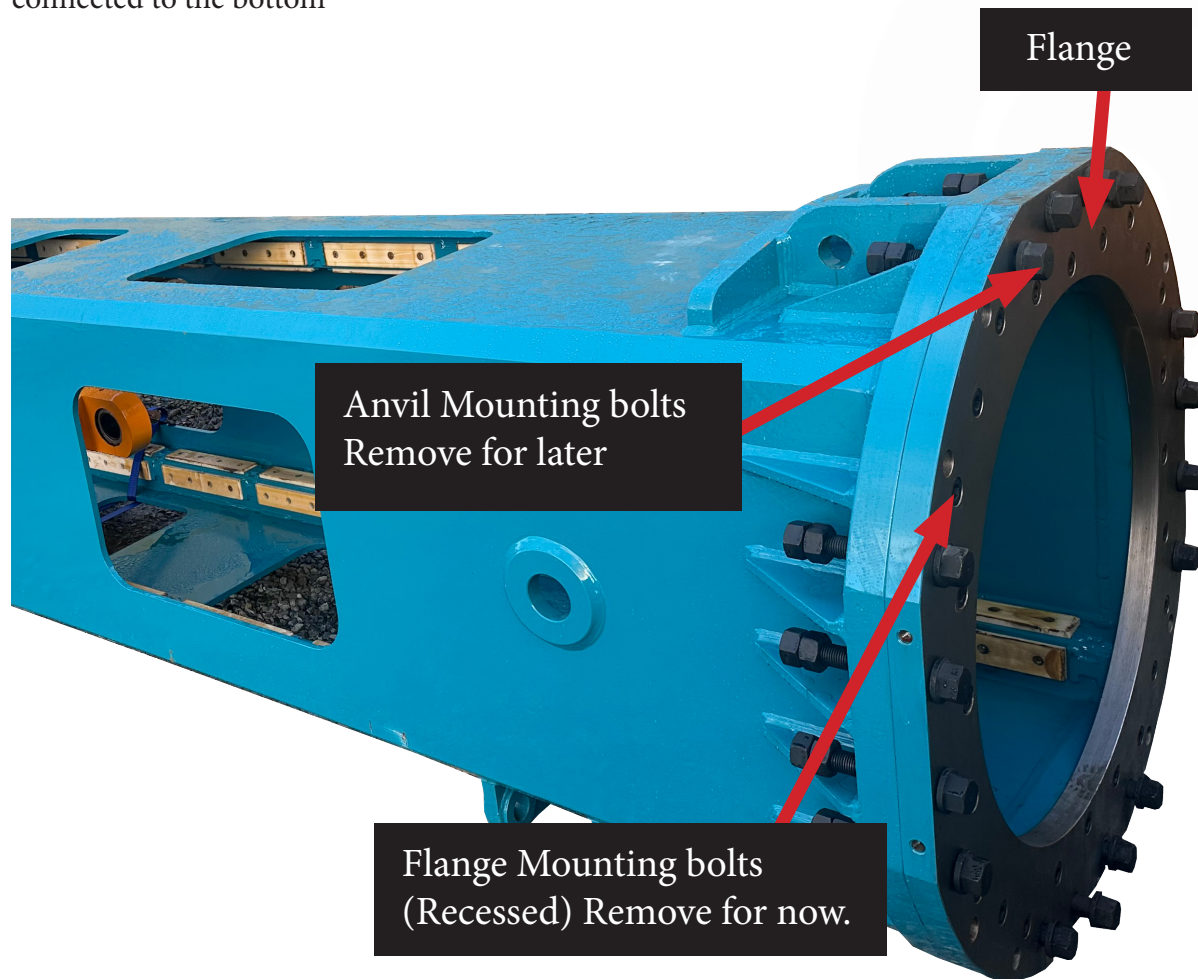


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HHP ASSEMBLY STEPS (ALL MODELS)

Body Assembly

Remove the bottom flange from the unit if it is connected to the hammer body. The flange is sometimes shipped separate for larger units. For HHP25 and below the flange will be shipped attached to the hammer body. The purpose of the flange is to hold the Ram inside the hammer when the anvil is not connected to the bottom



Remove all bolts from the bottom, place in a clean place. The bolts that hold the flange to the hammer body are recessed inside the flange. All the bolts should be removed on this step. **Tip:** Remember the orientation will make re-assembly be easier. You will re-assemble the flange after the Ram is put inside and attached to the main cylinder.



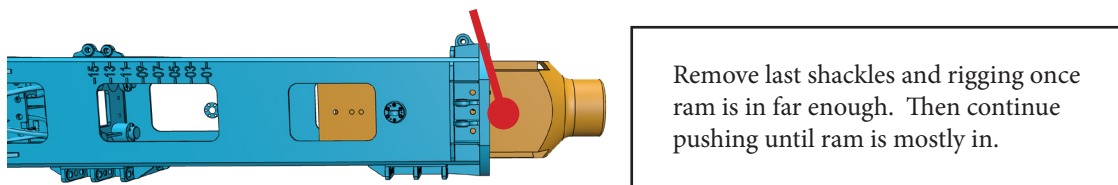
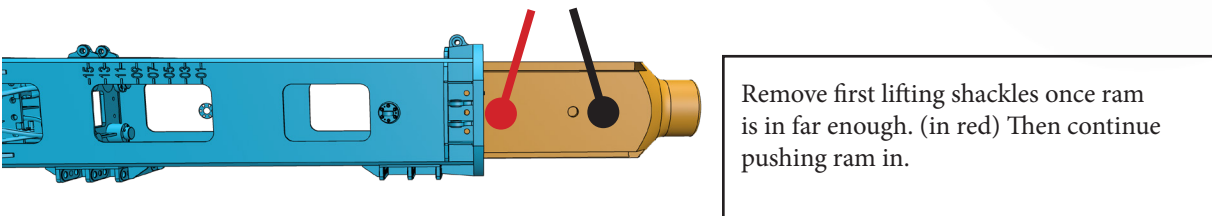
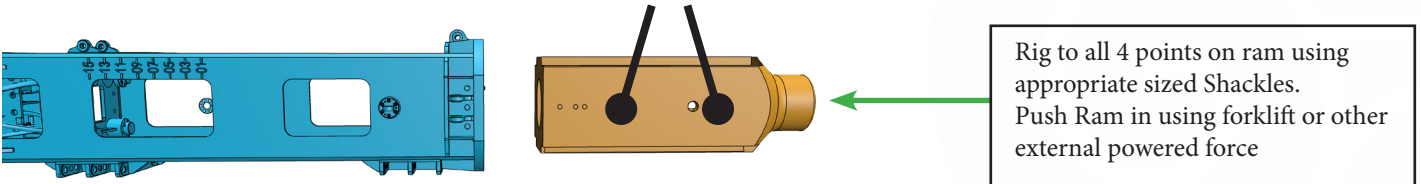
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HHP ASSEMBLY STEPS (ALL MODELS)

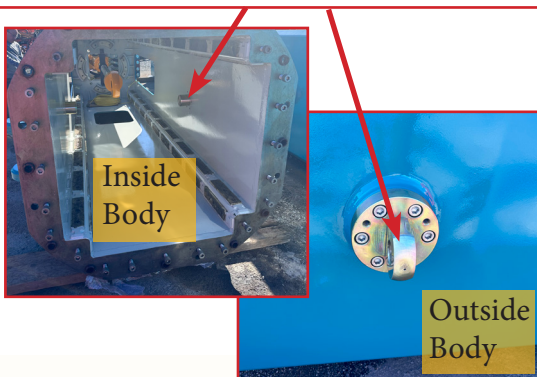
Step 2

Ram Assembly

Install 4 Shackles on Ram lifting eyes. The ram includes 4 special lifting eyes that screw into the side of the ram to provide an easy place to rig to. Make sure to keep track of these special lifting eyes for future transport or service work. Lift up ram and hang it in position to be inserted into the bottom of the hammer. Carefully insert the ram by pushing it in until the first shackles block progress. Many micro adjustments are going to be needed to get the ram to slide in just right. Use an approved bio grease to help slip the ram on the nylon pads.



NOTE: There is a travel pin that prevents the ram from sliding out that will need to be removed on the hammer body itself. These pins are for transporting the hammer while fully assembled.





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HHP ASSEMBLY STEPS (ALL MODELS)

Step 3

Ram Assembly

Overview: Once the ram is pushed in far enough the next step is to pin it to the hydraulic cylinder. The ram pin for the cylinder is already on the ram so you will need to remove the ram pin before the ram can be fully pushed in. The ram pin can be removed at this step, or it can be removed before you push the ram in, your choice.

Ram and Weight Chart

HHP35 - 35,000kg (88,000 lbs)

HHP25 - 25,000kg (55,100 lbs)

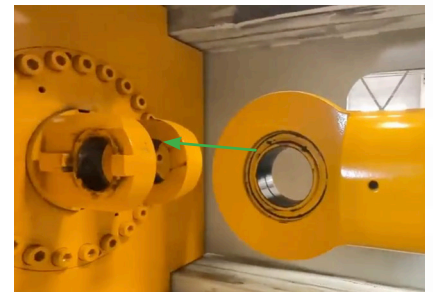
Bottom of cylinder



Top of Ram:
Ram Pin

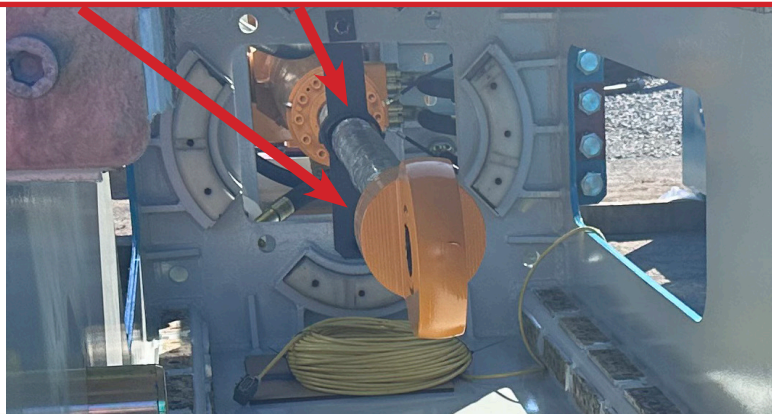


Side Angle Picture



Picture of cylinder and ram
after connected

Important Step: Make sure to remove the cylinder support bars (only there to protect the cylinder during transport with a ram.)





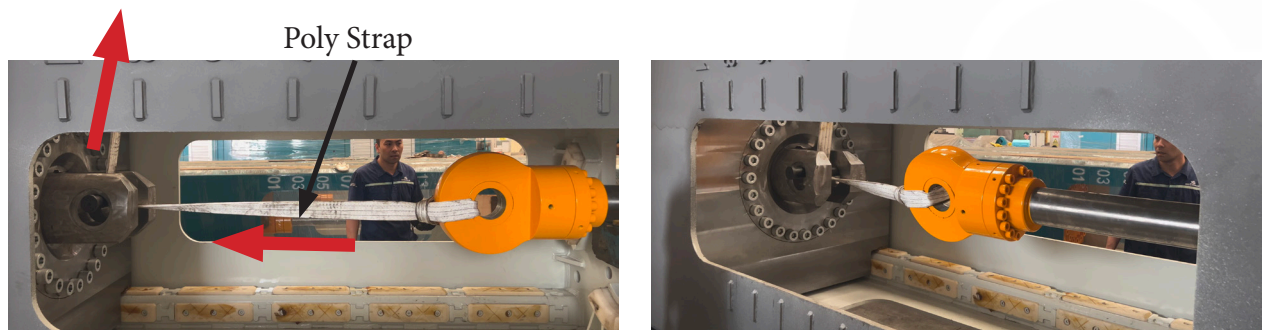
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HHP ASSEMBLY STEPS (ALL MODELS)

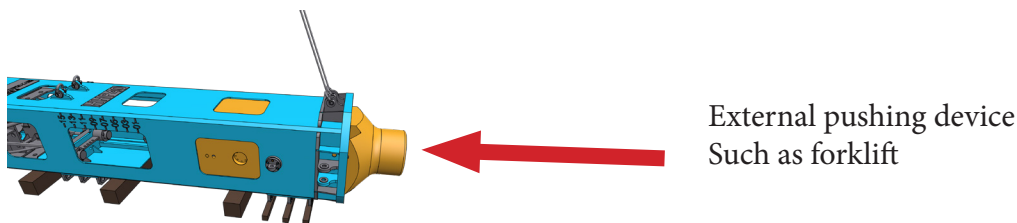
Step 4

Ram Assembly

When connecting the cylinder to the ram it is very important to not bend the cylinder arm or to put any pull pressure on it that is not in line with the ram. Best practice is to push the ram in to meet the cylinder however the cylinder can be pulled to meet the ram using the below technique:



Do not try to pull the ram using the above technique, only pull the cylinder. The cylinder is designed to move without hoses attached however it's important to go slow or air could be sucked into the manifold. The system can purge air from the system when it runs however it's best to take all precautions to go slow and steady on this step to minimize any possibility of air entering the system.



Push the cylinder in as far as you can until the cylinder is about 6" away from the ram pin connector. **Pro tip:** try and make the connection near a side window where you can have easier access for tools to make sliding the pin in easier. You can use some grease to help slide the pin in.



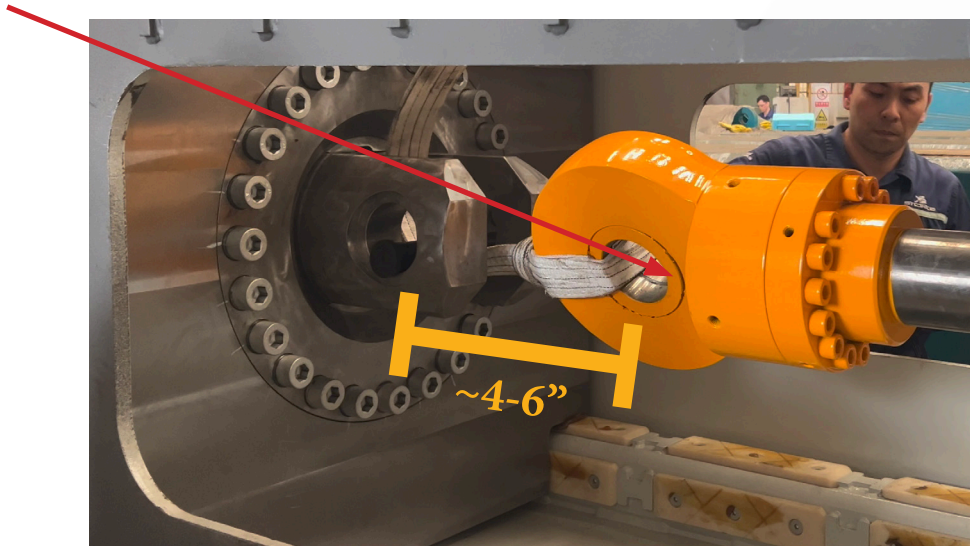
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HHP ASSEMBLY STEPS (ALL MODELS)

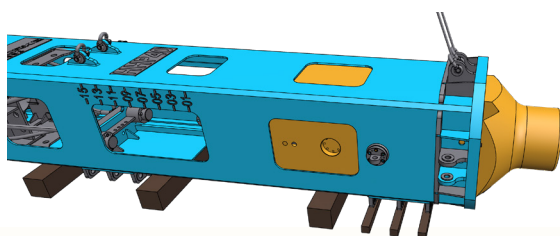
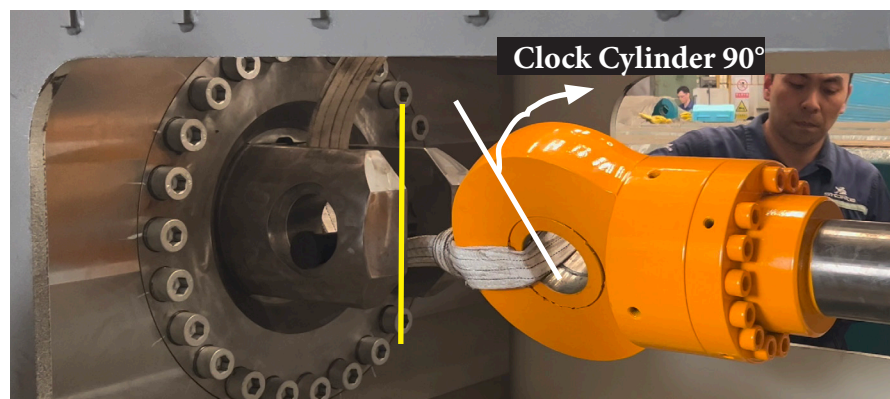
Step 5

Ram Assembly

From the pic you can see that the cylinder is about 4-6" away from where it needs to go to pin inside the ram.



Carefully clock the cylinder side so it is vertical. It should move with a small bar, do not use a chain wrench or anything on any part of the machined surface of the piston:



Continue pushing the ram in until the ram pin can be installed. Once the cylinder and ram are connected you will continue to slowly push the ram inside the hammer until there is enough room to install the flange or anvil on the hammer body base.



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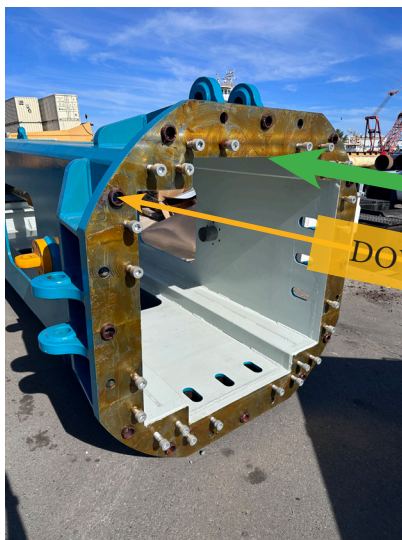
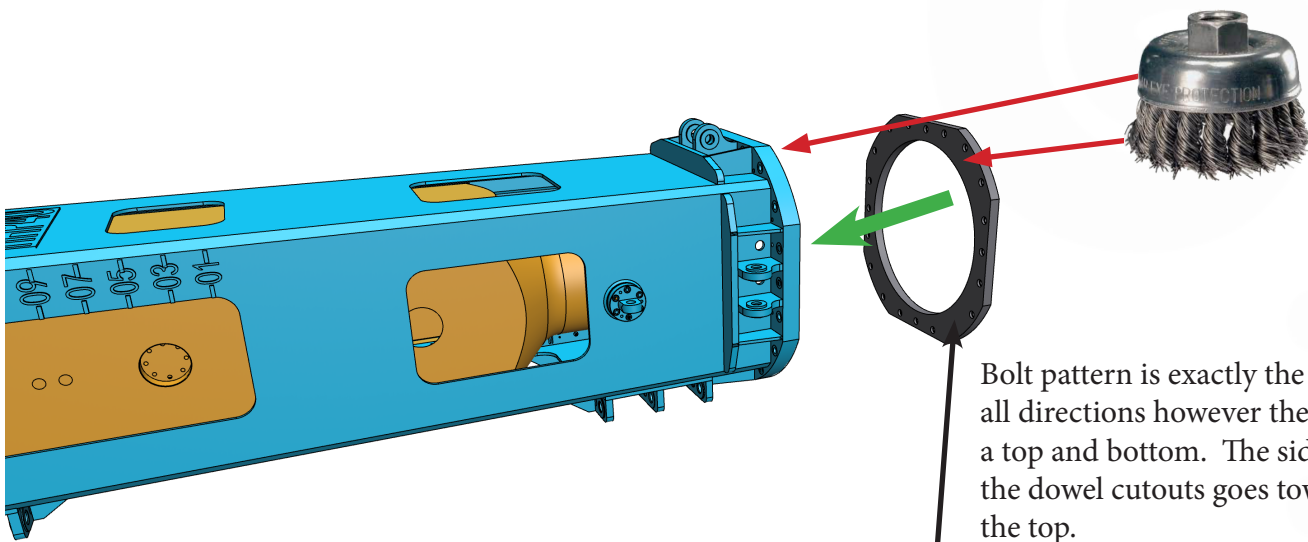
HHP ASSEMBLY STEPS (ALL MODELS)

Flange Assembly

Step 5

After the ram is connected to the hydraulic cylinder you can now install the bottom flange. You may need to push the ram in further in. Use a wire brush and make sure all the surfaces are as clean as possible before assembly.

The flange can be lifted using forklift through the center. There are drilled and tapped holes specifically for a lifting eye if desired.





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HHP ASSEMBLY STEPS (ALL MODELS)

Assemble Hydraulic Hose lines

Step 6

The hydraulic hose bundle will typically arrive assembled and pre-attached to the unit. In some cases due to the complexity of transport the hoses may come separate. For HHP25 and below there is one 2" pressure line and one 2" return. Some unique circumstances will have a single pressure and two return lines.

Hammer Side

Pressure = Red

Return = Blue/Body Color



Power Unit Side

Pressure = Red

Return = Blue/Body Color



SAFETY CHECK:

If the Red paint is every painted over, removed, or not visible then hoses could possibility connected backwards. A sure way to know which lines are pressure or return can be seen by looking at the hose fittings behind the manifold and inside the machine. Code 61 fittings will be for the return line (low pressure), larger Code 62 fittings will be for the pressure (high pressure). If hoses are connected backwards the seals will blow and create a safety problem as well as an oil spill. The hammer cannot run in reverse.

Note: The smaller 1.5" lines can be ignored when using HHP mode. The smaller lines are for running a vibratory hammer.

IMPORTANT: NEVER CONNECT THE VIBRO AND HHP AT THE SAME TIME OTHERWISE BOTH WILL TURN ON AT THE SAME TIME. IT IS ONLY AN EITHER/OR CIRCUIT.

IF YOU HAVE ANY REASON TO BELIEVE THE HOSES ARE NOT CONNECTED CORRECTLY DUE TO RECENT HOSE REPLACEMENT, SERVICE, OR TRANSPORT PLEASE CONTACT ANTAEUS TO VERIFY YOUR SYSTEM IS CORRECT AND SAFE.



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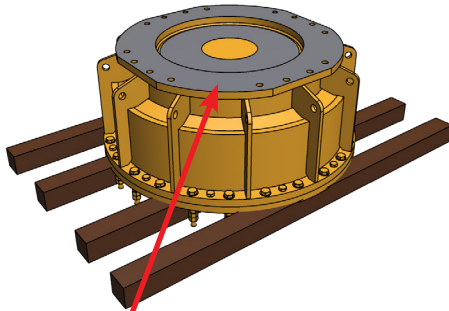
HHP ASSEMBLY STEPS (ALL MODELS)

Anvil Assembly

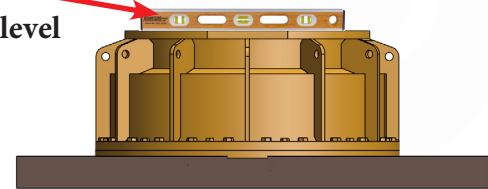
Step 7

The Anvil housing contains the main striker plate and cushion material. Some units are direct drive and may not contain any cushion material or may only contain side cushion material for sound dampening. The Anvil will determine what size pile can be driven and most times anvils are custom made for each unit. Your Anvil may look different than show in these illustrations however the assembly steps will be the same.

Place the anvil flat on top of cribbing material. (Example: Solid wood 4x4's)
Use a level and confirm the anvil is as flat as possible.

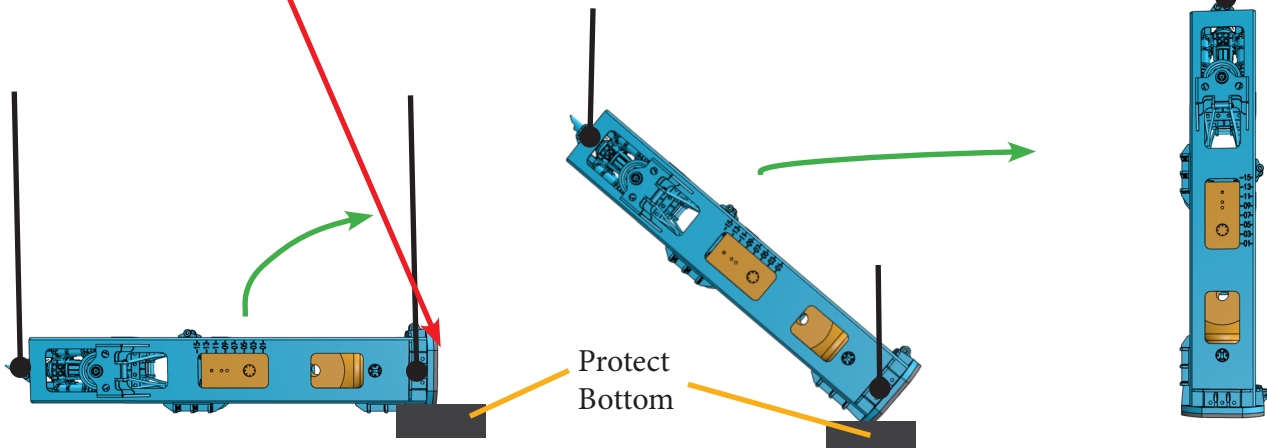


XY Level
Carpenters level



While both the anvil and the HHP Body are on the ground take an electric wire brush tool and clean completely the surface of the Anvil and the bottom of the HHP. Both surfaces should be entirely free of any rust, grease, or debris. Remove any bolts that may be stored.

Lift the hammer body up and hang it vertical from the crane. Make sure to protect the bottom while lifting using a large piece of wood or multiple pieces of wood.





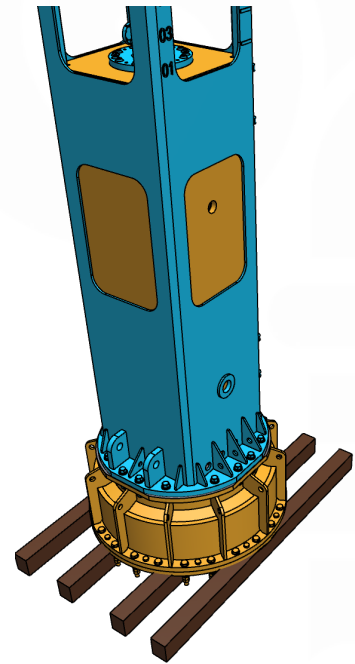
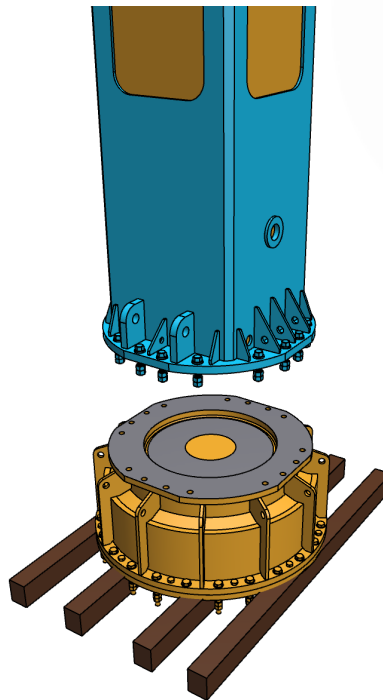
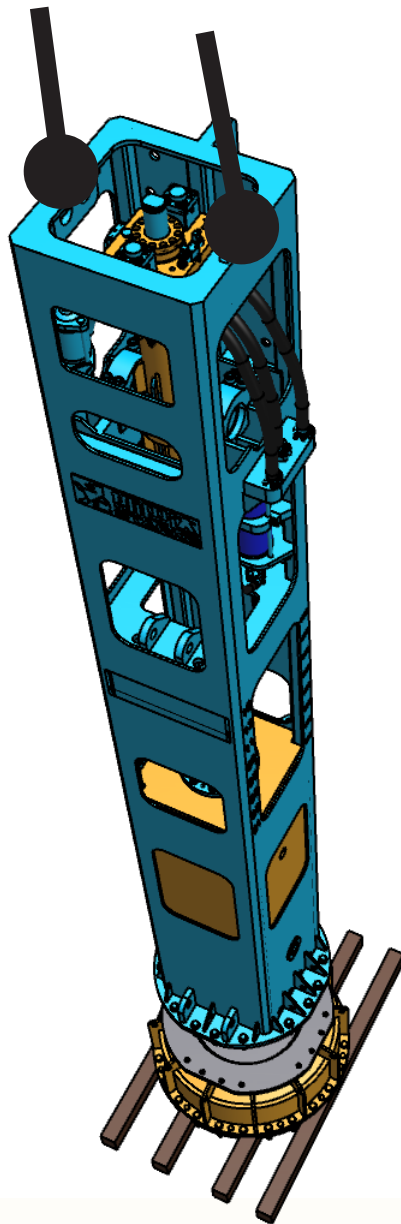
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HHP ASSEMBLY STEPS (ALL MODELS)

Anvil Assembly

IMPORTANT: When you lift the hammer upright the ram is going to slide to the very bottom. It is important to raise very slowly so the ram can slide to the bottom and not slam against the flange. If the ram drops too violently it could bend the flange. Go slow and let the ram slide in a controlled way to the bottom. and engage the flange.

Place hammer carefully on the Anvil and tighten all the bolts down.



Warning!

T

Torque bolts to 80% of yield strength using Anti-seize. **Do not** exceed 80% of the yield strength of the bolts.

All bolts should be as equally tight as possible.



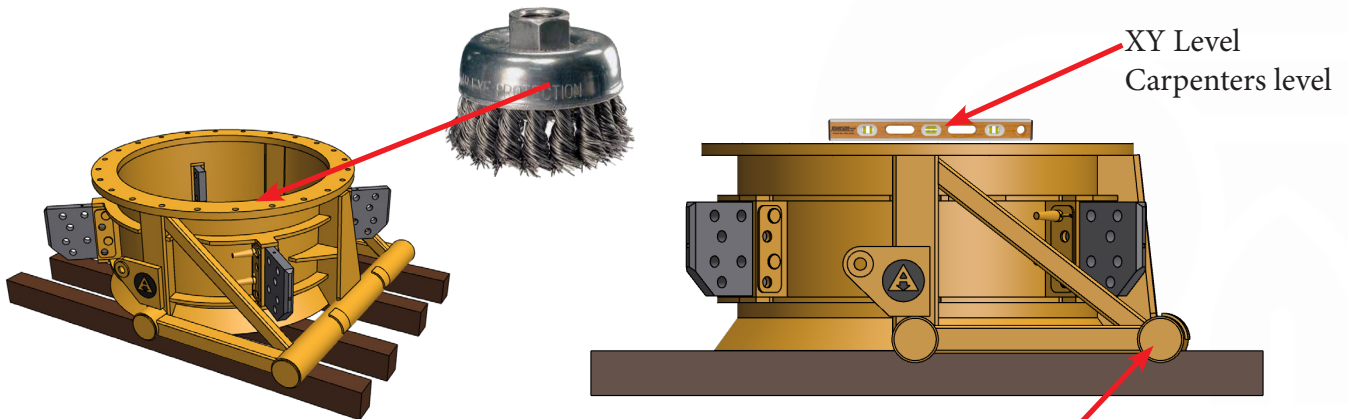
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HHP ASSEMBLY STEPS (ALL MODELS)

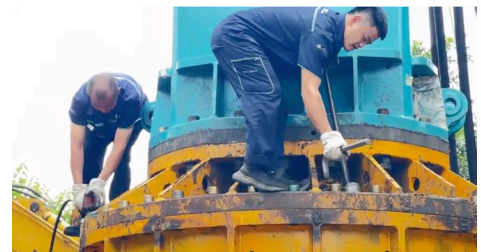
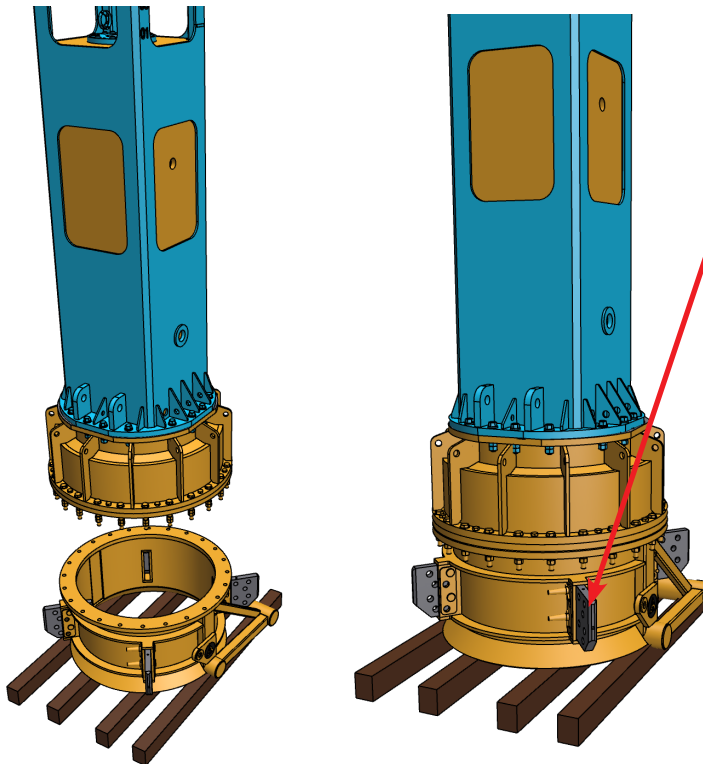
Step 8

Bell Assembly

Place the bell on a flat surface as shown below. This next step will be similar to the steps to install the Anvil. Make sure all the surfaces are clean. Once you have the bell flat on some cribbing material you can lift the HHP and Anvil on top of the bell and bolt it together.



Make sure the tipping bar is angled exactly along the flat side of the back of the hammer. This will allow the hammer to come down flat without twisting. The Bell can drive from 36" to 60" diameter piles. To set the pile diameter make sure the adjustment bars are in the correct position.





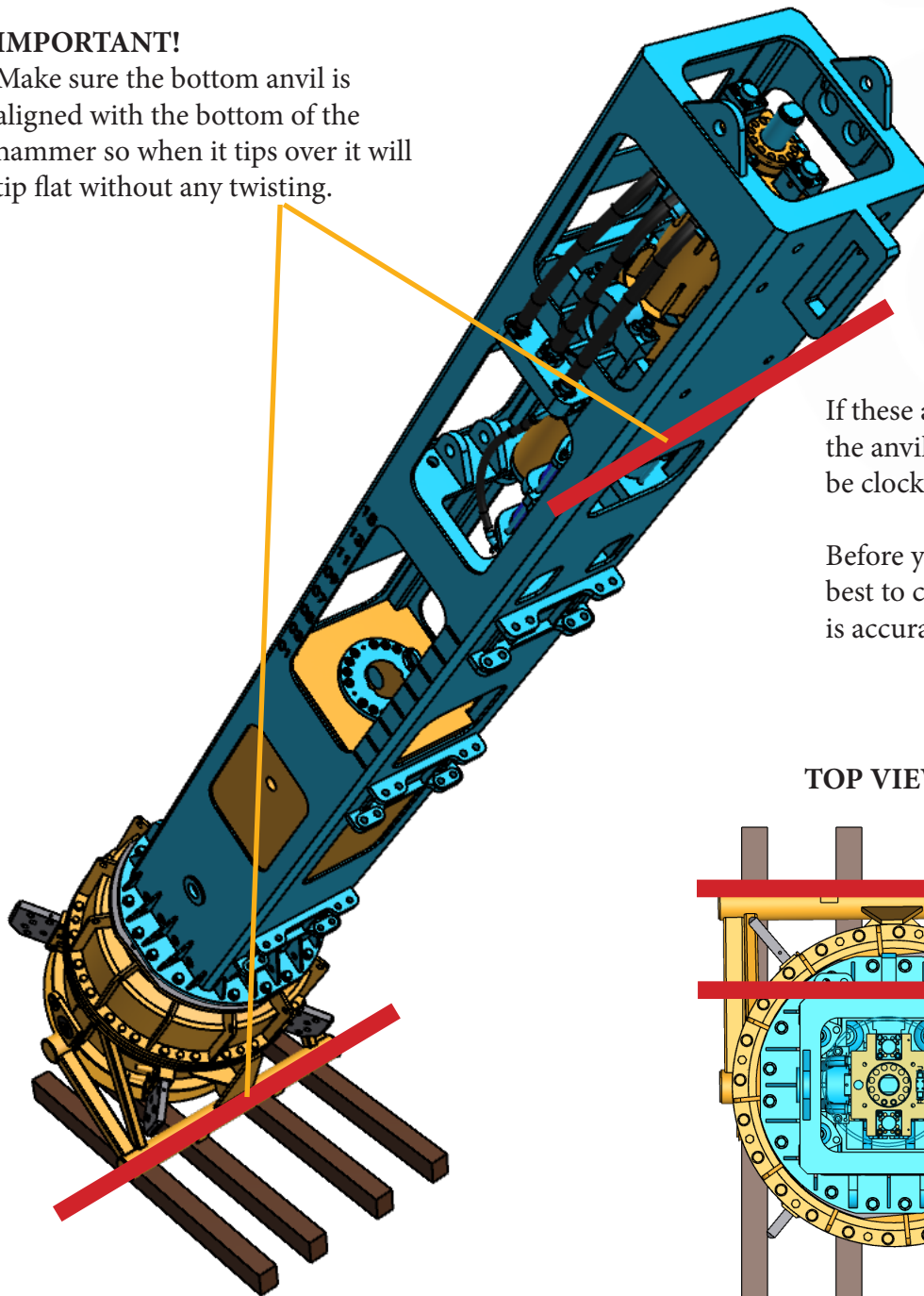
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HHP ASSEMBLY STEPS (ALL MODELS)

Bell Assembly

IMPORTANT!

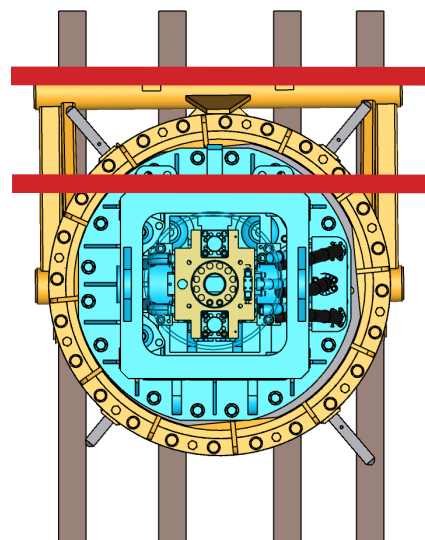
Make sure the bottom anvil is aligned with the bottom of the hammer so when it tips over it will tip flat without any twisting.



If these are not the same angle the anvil or bell may need to be clocked over one bolt hole.

Before you torque all bolts it's best to confirm the bell angle is accurate.

TOP VIEW





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IMPACT HAMMERS - SOUND DATA



Sound level at Max Stroke:

Distance:	dBA
<10 ft	140 dBA
50 ft	134 dBA
100 ft	128 dBA
150 + ft	~120 dBA

Sound levels are measured in open air with anvil striking directly on a steel pile without any sound barriers or sound dampening material.

Noise will drop about 6 dBA as the distance doubles. Noise from line source (the pile) will drop 3 dBA as distance doubles.

Sound Barriers can drop dBA rating by about 20 dBA in a single direction when used in open spaces. See Echo Barrier.

As the pile drives further into the ground the overall noise will reduce as line source noise fades.



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HHP SOUND DATA

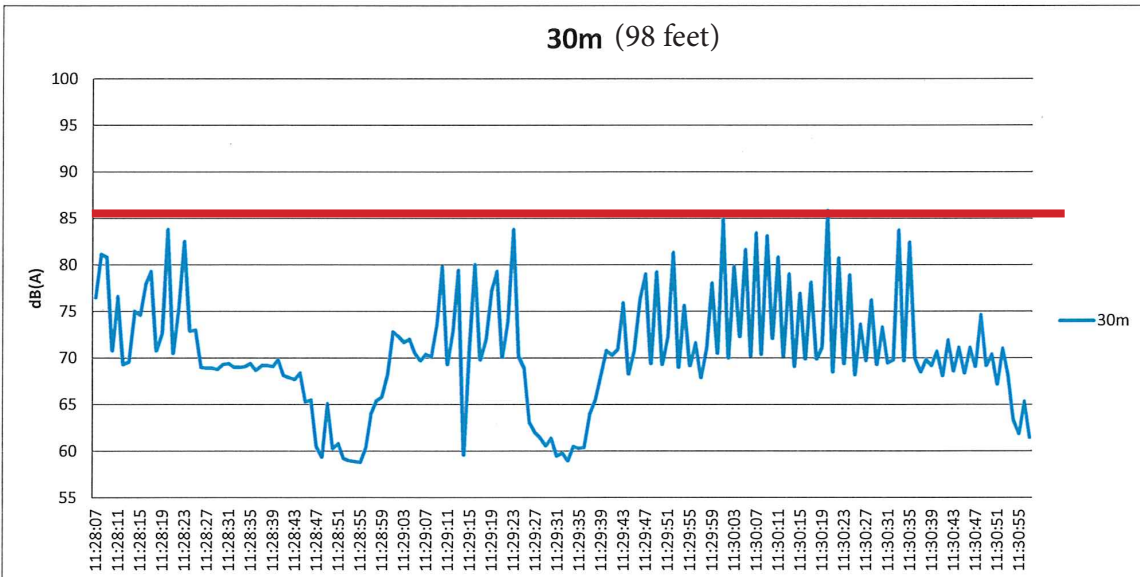
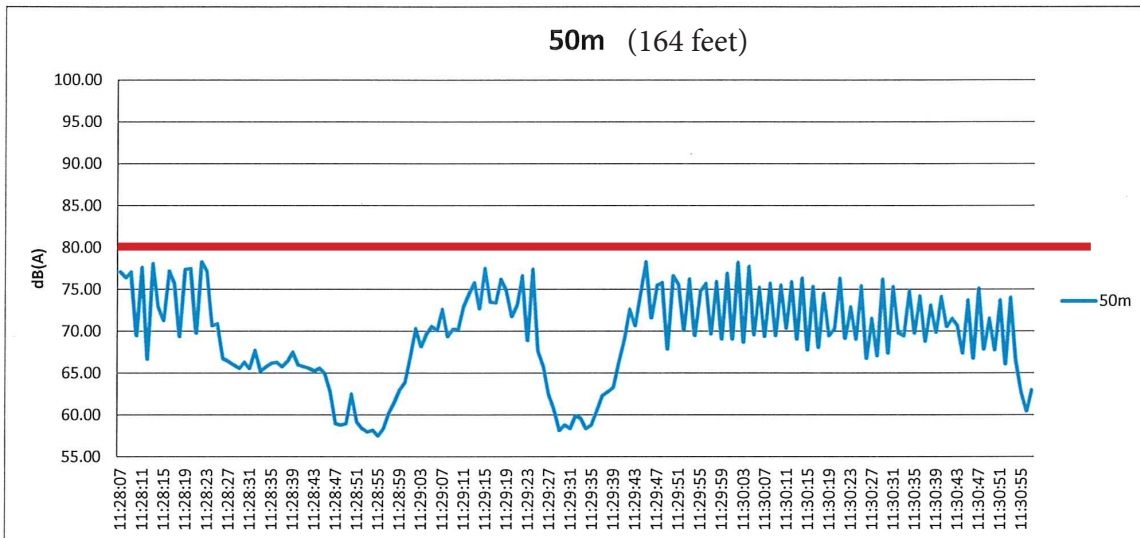
Measurement Details

Date and Time: 9/10/2017
 Sound Level Meter: Pulsar PM:81A A21637 (50m)
 Rion NL-52 (30m)
 Situation: Noise Barrier + U-shape Enclosure

Data	dB(A)		dB(A)
Leq (50m)	72.3	Leq (30m)	75.1

Result: Sound test results show that with a Noise Barrier the sound level was able to be reduced to under 86 dBA 30m (98 feet) and 80 dBA at 50m (164 feet).

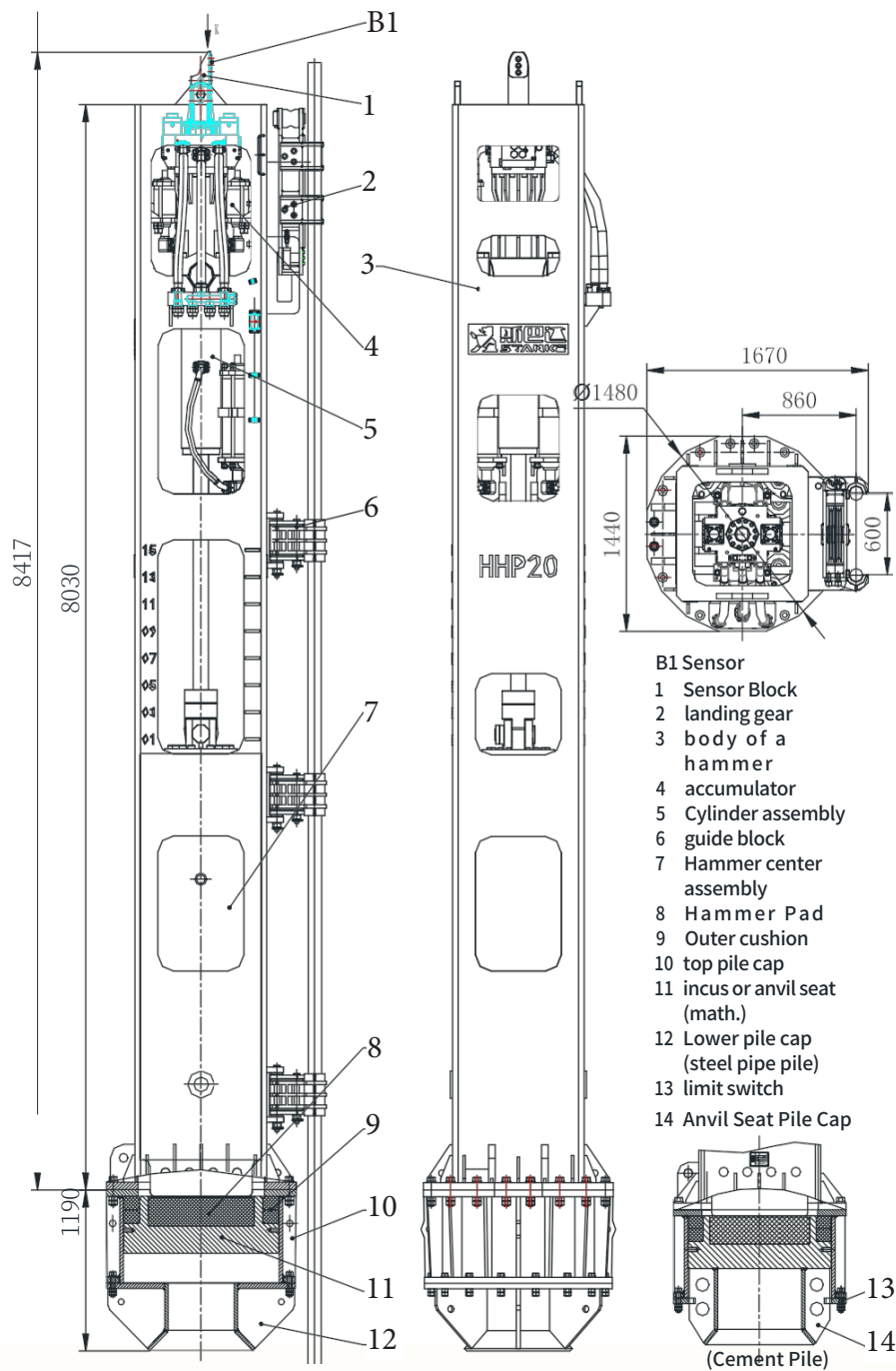
Hong Kong has strict sound requirements due to at risk bird populations.





ANTAEUS HHP25 MANUAL

HHP 25 Components List
Dimensions in metric (mm)





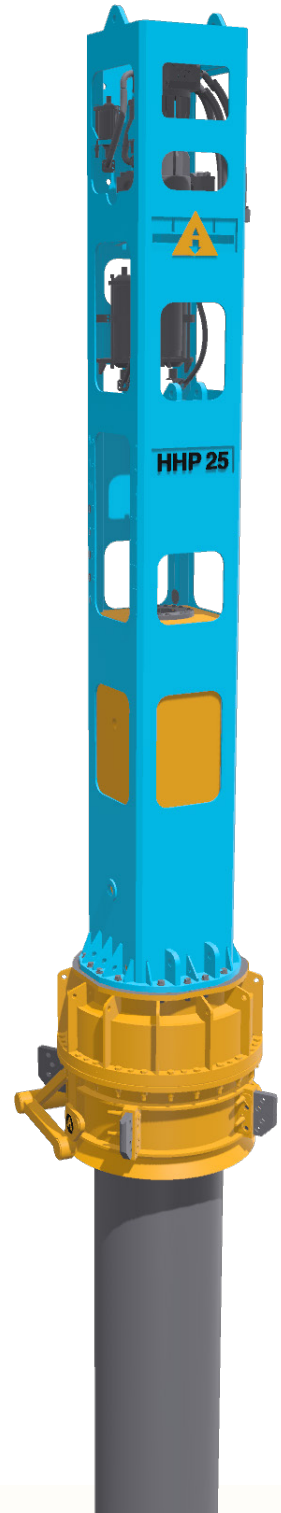
ANTAEUS HHP25 MANUAL

Principle: The pile hammer is a single-acting hydraulic hammer: using pressurized hydraulic fluid, the impact energy is obtained through the free fall of the hammer core.

- The core moves inside the hammer and is raised or lowered by a centrally located piston rod.
- A bearing housing and cushioning seat between the hammer core and piston rod protects the cylinder assembly and its seals from excessive shock loads and wear.
- The upper pile cap is coupled with the hammer body, the hammer pad is set in the anvil seat, and the hammer core strikes the hammer pad to realize the transfer of energy.
- The landing gear and pulley assembly is used to drive the hammer body up and down.

Accumulators:

- 2 high-pressure accumulators prevent pressure peaks and ensure that the oil volume is sufficient and that the pressure drop in the down stroke of the hammer core is limited.
- The 2 low-pressure accumulators reduce the large pressure fluctuations and pressure peaks generated by the pulsed oil flow on that side of the system.
- Energy Control: The pile hammer's strike energy can be adjusted between its minimum and maximum values. This strike energy is achieved by controlling the height of the hammer core by the control system.
- A proximity sensor in the sensor block provides data to the control system to determine the hammer height and speed of the core lift.





ANTAEUS HHP25 MANUAL

Operating Conditions

The following operating conditions need to be observed. Operating the pile hammer outside of the listed operating conditions will void the Antaeus warranty.

Limitations on the number of strikes

The conditions at the time of piling depend on different parameters:

- Actual pile hammer energy used
- Maximum energy (size) of the pile hammer
- Pile pier design (diameter, wall thickness) soil condition
- Plan of operation (continuous piling or intermittent piling) under optimal experimental

performance conditions, the number of strikes for piling is: 30-100 impacts/0.25m

REFUSAL CRITERIA:

REFUSAL CRITERIA FOR ANTAEUS DIESEL AND HYDRAULIC IMPACT HAMMERS

- When operating the hammer, do not exceed 10 blows per inch or 120 blows per foot
- In cases of setting the pile it is permitted to increase the blow count to 250 blows per foot. but for no more than one foot of driving penetration and no more than 1/4" of rebound per blow.
- Pile inspectors should consult the Antaeus factory for permission (Approval Letter) to exceed these limits.

Failure to do so will void your warranty





ANTAEUS HHP25 MANUAL

External Conditions and Hydraulic Fluid Limitations

Limitations that must be further complied:

Maximum ambient temperature	+45°C +113°F
minimum ambient temperature	-20°C -4°F
Maximum hydraulic oil temperature	+60°C -140°F

Hydraulic Oil

- Hydraulic fluid not only transmits force to moving elements, it also prevents corrosion of metal surfaces
- Keeping all parts and components clean is one of the most important factors to consider for trouble-free operation of hydraulic equipment.

Therefore, great care must be taken when performing all maintenance and repair work.

Determining Viscosity Grade

Oil Warning

Unsuitable hydraulic fluid

- Improper use of oil may damage the equipment. Do not use salts
- Polyethylene glycol (HPG)

Use of unapproved oil types or mixing of different oil types will void ANTAEUS' warranty on the equipment.



ANTAEUS HHP25 MANUAL

The recommended viscosity grades are as follows:

viscosity grade H(V)LP	environmental temperature	Minimum oil temperature	Ideal oil temperature	Max oil Temperature
ISO VG 22	max.10°C	-20°C	30-40°C	60°C
ISO VG 32	-10-15°C	-15°C	37-50°C	70°C
ISO VG 46	-5-40°C	-10°C	45-50°C	75°C
ISO VG 68	5-45°C	0°C	50-55°C	75°C

- the ambient temperature determines the viscosity grade of the hydraulic fluid.
- high-quality multigrade oils must be used when the ambient temperature changes drastically.

Accumulator filling pressure

High pressure accumulators: 20 L

Charge pressure 150 bar Low

Pressure accumulator: 6 L Charge
pressure 4 bar

Nitrogen must be of the following quality: industrially clean and 99.8% pure.

Gas Warning

Wrong gas

Filling with gas containing oxygen may cause the accumulator to explode.

- Only fill the accumulator with nitrogen.



ANTAEUS HHP25 MANUAL

Recommended torque comparison table for bolts

strength class		4.8		6.8		8.8		10.9		12.9	
Minimum breaking strength		3.92Mpa		588Mpa		784 Mpa		941 Mpa		941 Mpa	
material (that sth is made of)		Steel for general construction (Q235 or A3)		Steel for mechanical construction (35#)		Chromium-molybdenum alloy steel (35GrMoA)		Nickel-chromium-molybdenum alloy steel (40GrNiMoA)		Nickel-chromium alloy steel	
bolt (male component of nut and bolt) M	nut (female component of nut and bolt) mm	torque value		torque value		torque value		torque value		torque value	
		KGM	NM	KGM	NM	KGM	NM	KGM	NM	KGM	NM
14	22	7	69	10	98	14	137	17	165	23	225
16	24	10	98	14	137	21	206	25	247	36	363
18	27	14	137	21	206	29	284	35	341	49	480
20	30	18	176	28	296	41	402	58	569	69	480
22	32	23	225	34	333	55	539	78	765	93	911
24	36	32	314	48	470	70	686	100	981	120	1176
27	41	45	441	65	637	105	1029	150	1472	180	1764
30	46	60	588	90	882	125	1225	200	1962	240	2352
33	50	75	735	115	1127	150	1470	210	2060	250	2450
36	55	100	980	150	1470	180	1764	250	2453	300	2940
39	60	120	1176	180	1764	220	2156	300	2943	370	3626
42	65	155	1519	240	2352	280	2744	390	3826	470	4606
45	70	180	1764	280	2744	320	3136	450	4415	550	5390
48	75	230	2254	350	3430	400	3920	570	5592	680	6664
52	80	280	2744	420	4116	480	4704	670	6573	850	8330
56	85	360	3528	530	5149	610	5978	860	8437	1050	10290
60	90	410	4018	610	5978	790	7742	1100	10791	1350	13230
64	95	510	4998	760	7448	900	8820				
68	100	580	5684	870	8526	1100	10780				
72	105	660	6468	1000	9800	1290	12642				
76	110	750	7350	1100	10780	1500	1470				
80	115	830	8143	1250	12250	1850	18130				
85	120	900	8820	1400	13720	2250	22050				
90	130	1080	10584	1650	16170	2500	24500				
100	145	1400	13720	2050	20090						
110	155	1670	16366	2550	24990						
120	175	2030	19894	3050	29890						

- These are German industry standards and the torque values in the table are measured when the bolt reaches 70% of its yield limit. **Never exceed 80% of yield limit of a bolt on a pile driver.**



ANTAEUS HHP25 MANUAL

Bolt Torque values information and warnings:

- Suggested locking torque is: the value in the table $\times (70-80)\%$. For example: M52, 8.8 grade bolts, then the locking torque is $4704 \times 80\% = 3763\text{NM}$
- The loosening torque is 1.5 to 2 times the locking torque. For example, if the locking torque in the above example is 3763NM, then the loosening torque is about $3763\text{NM} \times (1.5-2) = 5644-7526\text{NM}$
- Metric and imperial torque conversion: $1\text{FT-LB} = 1.36\text{N-M}$
- Torque Calculation Formula $T = S \times 0.8 \times 70\% \times 0.2 \times 3.14 \times d \times D / 2$: Tensile Strength (MPa)
0.8: Yield Strength 70%:
General bolts are used up to 70% of the yield limit 0.2: Friction coefficient d : bolt diameter (mm) D : nut diameter (mm)

ATTENTION: Pay close attention to the crew that is installing the bolts and how they are measuring the torque values. Do not assume they know how to properly measure torque without verification. Dry bolts and bolts covered with anti-seize are torqued to different values, it is important to take bolt torquing very seriously. Mark every bolt when it is torqued so that you know for certain it is tight. If a bolt is not marked assume it has not been torqued.

MAJOR SAFETY HAZARD WARNING: Bolts can break under the massive energy impact of the ram, NEVER stand under the pile driver when it is running. Assume at any time a bolt could snap and fall. Properly torqued bolts can GREATLY reduce the chance of a broken bolt. Please take this step very serious.



ANTAEUS HHP25 MANUAL

Transportation and storage

This chapter describes the work involved in transporting and storing pile hammers.

Preparation of pile hammers for transportation

This chapter describes the preparations required to safely transport a pile hammer.

Shipping Warnings

Transportation support shifted

When transporting or erecting pile hammers, transport supports (frames or single supports) may shift and tipping of the pile hammer may injure persons standing around or damage other equipment.

- Transportation supports must always be securely fastened (e.g. by means of welded plug plates).

Uncontrolled core movement

When transporting or lifting pile hammers horizontally, the unsecured core may slide back and forth. This could cause the hammer to move and could result in personal injury or equipment damage.

When Transporting:

- The pile hammer and its core must be securely fastened.
- Be sure to install a transportation fixture for the hammer core.
- If the pile hammer is transported at speeds greater than 6 km/h the base of the hammer must be secured to the front of the transport vehicle.



ANTAEUS HHP25 MANUAL

Pressurized systems

Serious personal injury or even death can result from the pressure pushing parts out

- Transportation and storage safety, to avoid the accumulator and its mounting accessories to external impact.

WARNING:

The accumulators in the system are design to self bleed pressure within a few minutes of using the impact hammer. Make sure to check the gauges for any pressure before any transport or storage of any duration. After each pile driving day make sure the pressure has completely gone to zero PSI on all gauges.

It is best to keep the hoses attached so that pressure can properly make its way back to the tank.

When hoses are not connected the thermal expansion of the oil inside the hoses can cause pressure in the system. Be aware that hoses that have sat in the sun will likely have pressure inside of them and could leak over time. For long term storage some oil should be removed from the impact hammer hoses and system to allow room for thermal expansion. If the hoses are connected to the power unit the unit will self bleed into the hydraulic tank and no such worry is needed.



ANTAEUS HHP25 MANUAL

Environmental damage from oil spills

Oil leaks from pile hammers can lead to oil spills and environmental damage.

- It is important to avoid oil dripping into the soil.
- When storing pile hammers, seal or repair leaks first.
- If you can't seal it, drain the oil.

Preparation of pile hammers for transportation:

1. Check the pile hammer for oil leaks. If necessary, seal or repair leaks.
2. Fix hammer core to prevent back and forth movement.
3. Secure the pile hammer to a suitable frame/bracket.

- For transportation by sea: complete fixation of the frame/bracket by means of welding

Fixed core for easy transportation

During transportation, the hammer core must be secured to prevent movement.

Fixed hammer core:

1. Move the hammer core to its lower position with the core stop screw hole aligned with the hammer body stop through hole.
2. Limit pins are used to secure the hammer core for installation and transportation.

Corrosion of piston rods

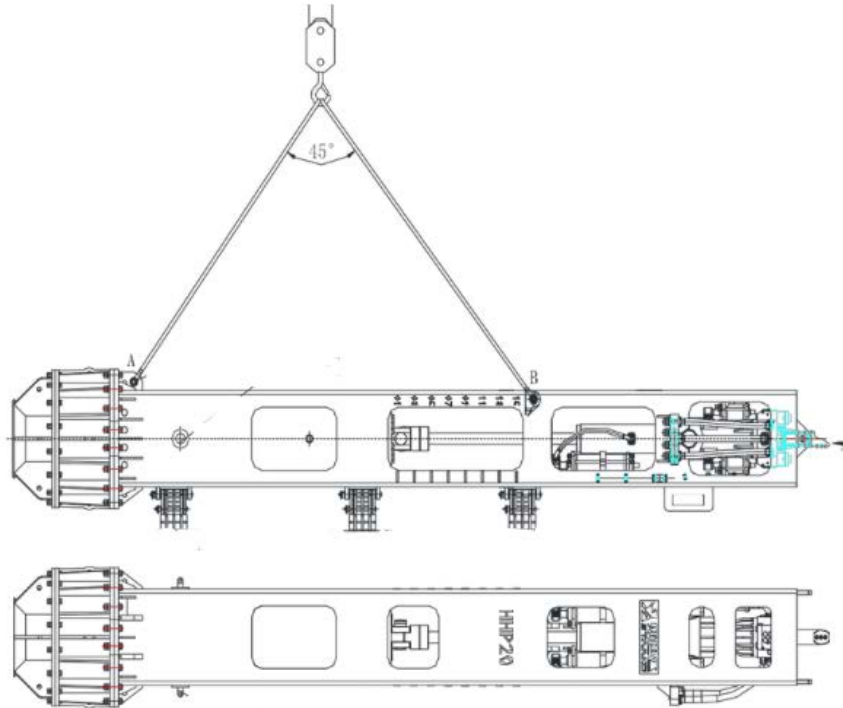
With the hammer core in a lower position, the piston rod is exposed and subject to the weather.

- Fully lubricate the piston rod.



ANTAEUS HHP25 MANUAL

Rigging information:



Important Rigging Information

Sling Selection

Steel wire rope adopts steel wire rope specification: GB8918; 6×36SW+IWR; outer diameter $\phi 50$; its inspection and scrapping standards are in line with the relevant provisions of GB5972-2016.

Buckle Selection

marine shackle G2130;2;35T (x2)



ANTAEUS HHP25 MANUAL

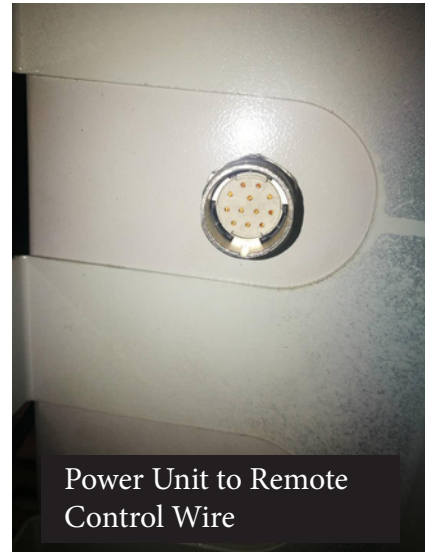
Keep clean all connection points. Marine environments are hard on electrical connections, make sure these connections do not get left out in the rain or elements.



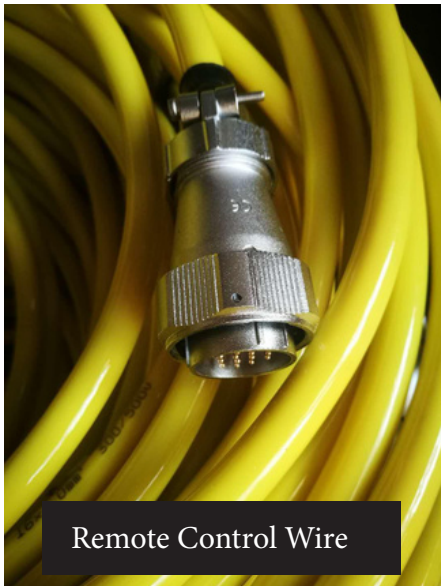
Hammer to Power Unit



Power Unit to Hammer



Power Unit to Remote Control Wire



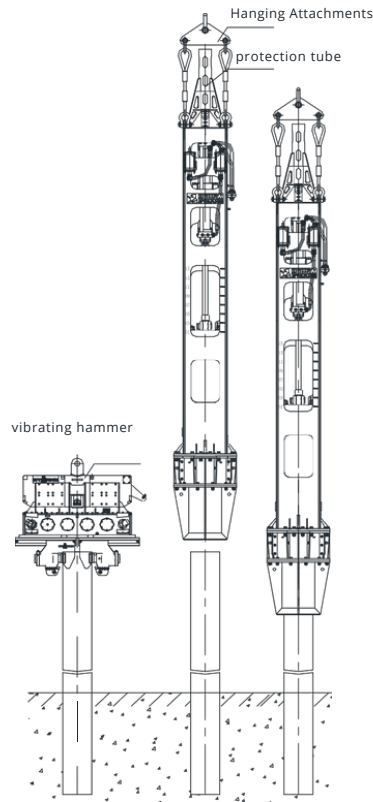
Remote Control Wire



Remote Control Panel



ANTAEUS HHP25 MANUAL



Pile Up Step (Vibratory Hammer Pre-sinking Pile):

1. Pre-sunk piles are completed first with a vibratory hammer, after the piers have been fully stabilized in the ground.
2. Connect the main winch rope of the crane to the lifting attachment.
3. Slowly raise the pile hammer to above the top of the pile pier using the wire rope stowage.
4. Move the pile hammer slowly to just above the pile pier.
5. Slowly place the pile hammer on the pile pier, which self-sinks the pile due to the weight of the hammer.
6. Loosen the hoist main winch wire rope and do not hang the pile hammer from the wire rope
7. Completion of the pile-up operation



ANTAEUS HHP25 MANUAL

IMPORTANT SAFETY INFORMATION REGARDING A “PILE RUN SITUATION.”

It always very important to use the lowest energy setting when striking a new pile. If the soil conditions near the top of the pile are soft the pile can shoot down into the ground and put enormous stress on the crane as it is shocked from the sudden load of the hammer. Take every precaution to avoid a pile run situation by knowing the soil conditions you are driving into and striking the pile using the smallest amount of energy needed to advance the pile at a constant rate.

Trial piling on new piers

Sudden drop of piers at start of pile driving

A sudden fall of a pile pier (a sudden drop of a few meters) can result in serious personal injury or even death, and can seriously damage equipment.

- Begin with a single blow at the lowest energy. If the penetration distance of the pile pier decreases after each blow, slowly increase the energy of the blow.
- Always keep an eye on the piles: if the piles continue to fall after the blow, stop immediately and wait until the piles stop sinking.
- Always observe changes in piling parameters. If pile pier penetration distance increases with each blow when the same energy is used: decrease the blow energy.
- The main winch wire rope of the crane must be loosened when hoisting, and the pile hammer must not be hung on the wire rope.



ANTAEUS HHP25 MANUAL

Basic Operating Instructions

For a detailed description of the control system, see the appropriate control manual. **To avoid a sudden drop in the piles, a single manual mode can be used to start piling on a new pile pier:**

1. Select manual mode in the control system.
2. Set the strike energy to the lowest value.
3. Execute a single strike.
4. Sustained single strikes.
5. Check oil pressure and other parameters.
6. Always check pile pier penetration.
7. If necessary, repeat steps 2 through 6 with adjustable parameters to change the strike energy. If you are confident that the piles will not drop any further, you can begin continuous automatic pile driving.

Continuous automatic piling

For a detailed description of the control system, see the appropriate control manual.

New Hammer Pad continues to wear out

New hammer pads are brittle and can break if hit consistently hard.

- You must start with small strokes and small energy blows for about 5 minutes before you can slowly start with high hammer blows.
- In the future, before each use of the current small stroke to play 3-5 minutes, to be softened by the heat of the hammer pad before the high hammer large energy strike.



ANTAEUS HHP25 MANUAL

Basic Operating Instructions

If you are sure that the piling pier will not drop suddenly again, you can start continuous automatic piling:

1. Change to automatic piling mode in the control system.
2. Start piling.
3. Monitoring of strike parameters.
4. If the pile pier has reached the required penetration distance, stop pile driving.

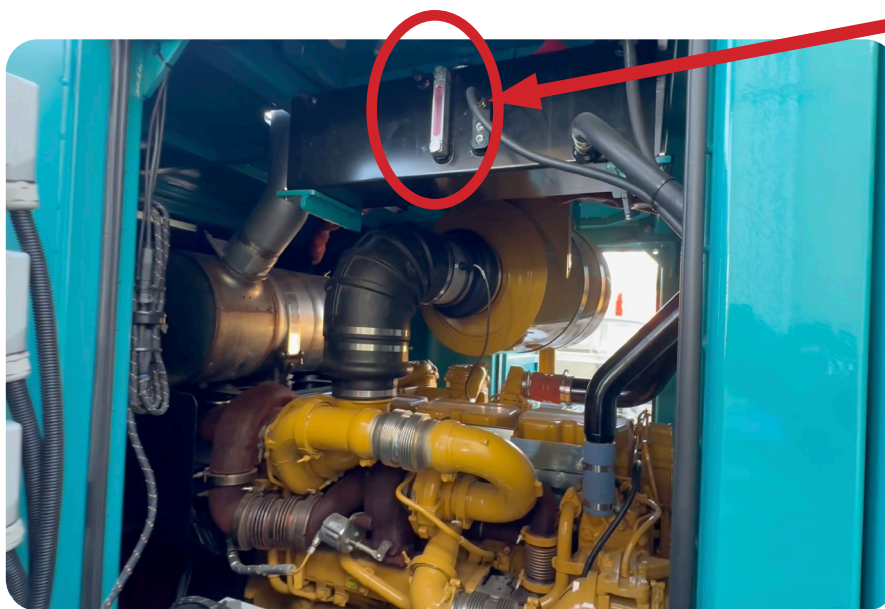


ANTAEUS HHP25 MANUAL

OPERATIONS GUIDE (STEP-BY-STEP)

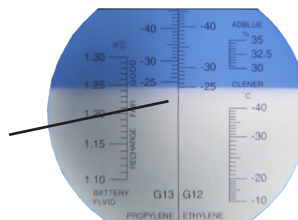
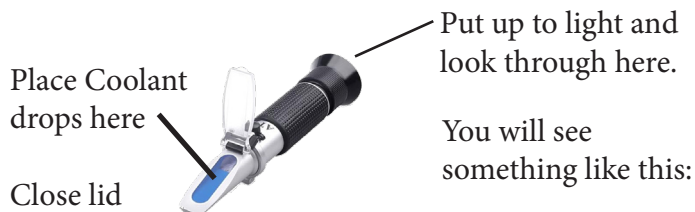
Prior to starting the unit check the following items:

Check coolant is correct level and is clear. There should be no thick oil in the coolant. Behind the door of the control panel you will find the coolant level sight glass indicator.



Check Anti-freeze level (inside of the coolant)

Take a few drops of coolant from the fill port and use a manual refractometer to verify the coolant temp of the anti-freeze temperature. Other testing equipment exists including digital versions of these tools. However a manual refractometer is inexpensive and durable. How to use it:



This shows the anti-freeze is -25C

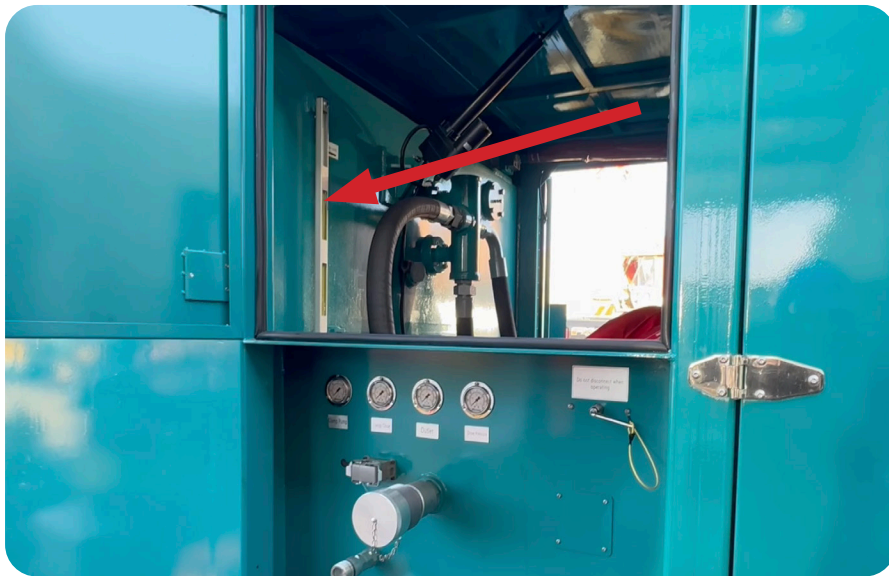
Note: Even if you don't know if you have Propylene Glycol or Ethylene the scale is pretty similar.



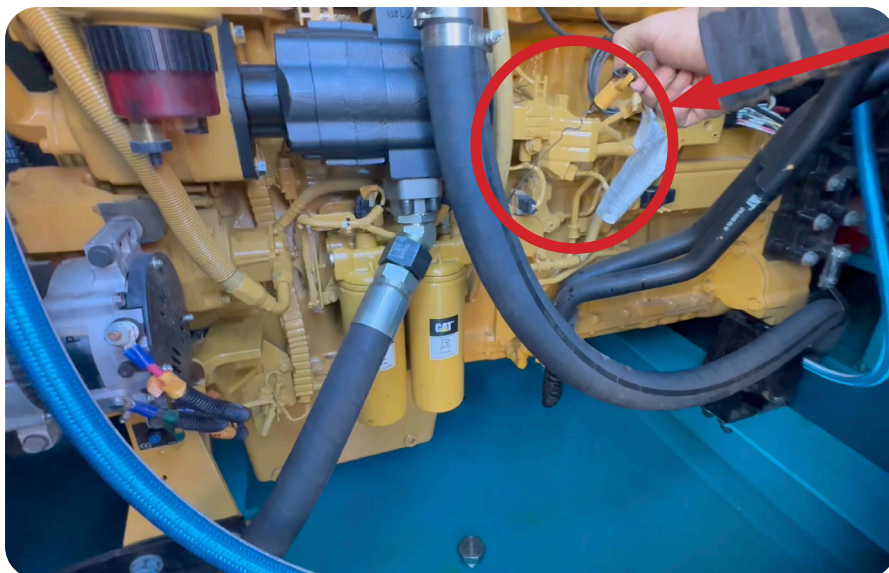
ANTAEUS HHP25 MANUAL

OPERATIONS GUIDE (STEP-BY-STEP)

Check hydraulic oil level: Make sure the oil is not too full or too empty. There should be some air on top of the sight glass to make room for oil as it expands. The oil should not be near the bottom of the sight glass. It should be about 75% of the way up from the bottom.



Check Engine Oil Level. On opposite side of the power unit you will find a dipstick. Make sure the oil level is correct level.

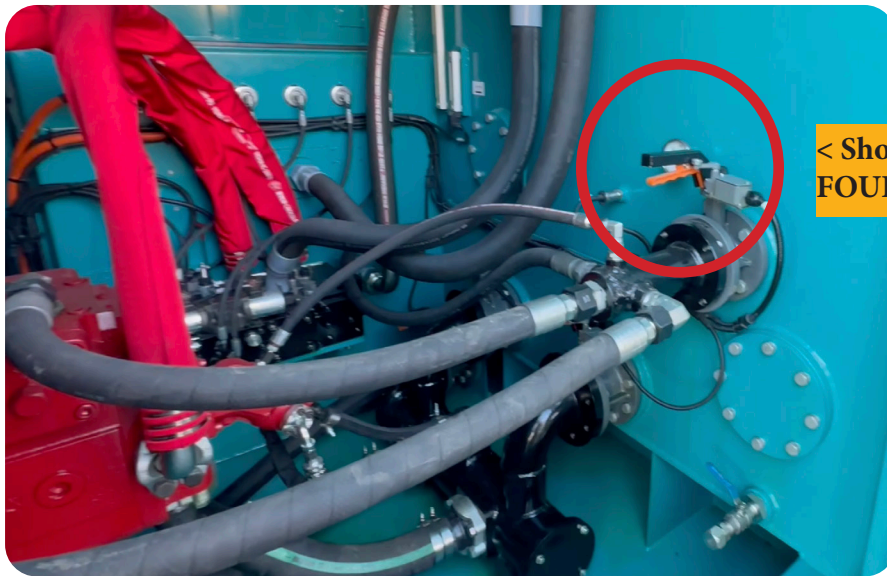




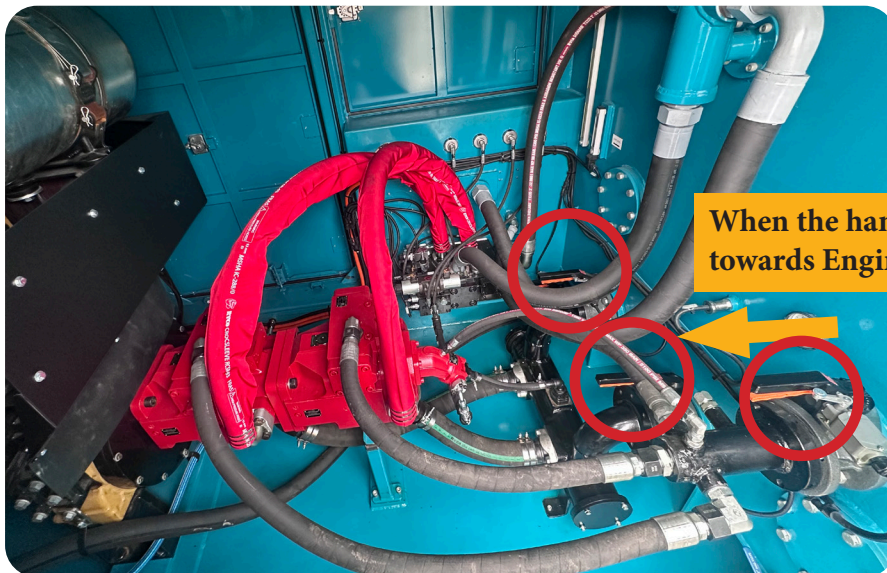
ANTAEUS HHP25 MANUAL

OPERATIONS GUIDE (STEP-BY-STEP)

Make sure that **ALL** hand controlled ball valves are **OPEN**. There are four total ball valves that can be closed to ease with service or transport. Make sure they are **ON** before you start the engine or rapid destruction of the pumps will occur. These are all located inside the power unit next to the main tank.



< Shown here **ONE** of **FOUR** total valves



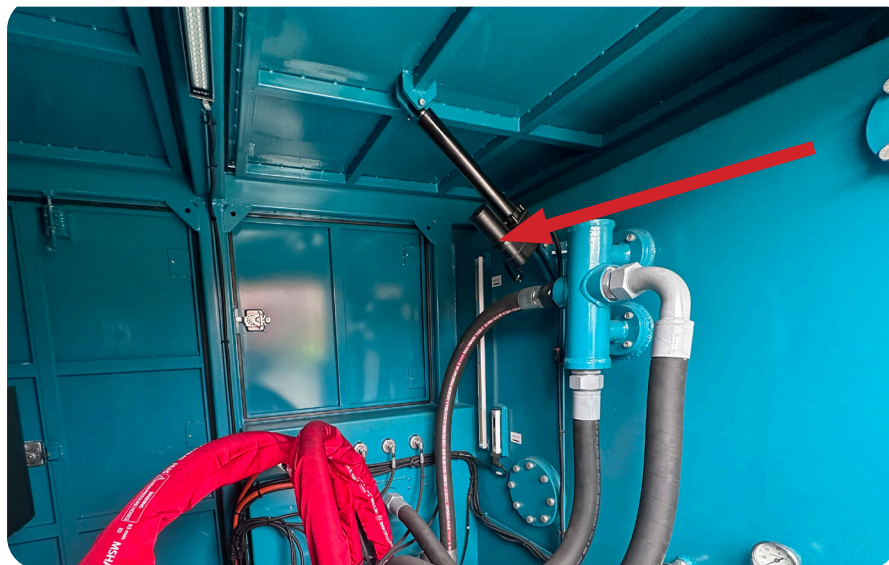
When the handle is facing towards Engine = **VALVE OPEN**



ANTAEUS HHP25 MANUAL

OPERATIONS GUIDE (STEP-BY-STEP)

Turn on Main Power: Located near the main quick disconnects is the main power control. Use the small “L shaped tool” to turn the power on. When the power is turned on the upper door will open up automatically with an electronic actuator (shown on bottom photo)





ANTAEUS HHP25 MANUAL

OPERATIONS GUIDE (STEP-BY-STEP)

Check battery cables are tight. Many strange problems can occur when battery cables are not tight.

Occasional you will want to check the following if battery signal seems unpredictable:

Check Battery water level: The batteries do have distilled water inside that needs to be checked regularly (best practice is monthly but at least per job or rental minimum).



Step 1

Pop open the top of the battery cover



Step 2

Use a flashlight to look and make sure all the holes are filled to full the marking.



Step 3

Add ONLY distilled water. NEVER use tap water, tap water has minerals that can damage the battery.

Note: Low water will allow components to oxidize which leads to power loss and irreversible damage to the battery plates and separators. It exposes the battery terminals to more oxygen. The water is a consumable used in a reaction when charging and discharging, therefore it water needs to periodically be added.

Check Battery terminals:

The ECM on the engine requires a constant 24 volts to run. If the terminals are dirty or loose the voltage will be interrupted and cause the engine to stop. A loose wire during times of vibration can kill the engine and result in a service call. It may not be obvious at the time the engine stopping is caused by loose battery connections or dirty terminals.



Dirty

Clean

Tools List

- 1/2" wrench
- wire brush
- battery terminal contact cleaner (WD40 Contact Cleaner, CRC Battery cleaner, Sprayway Electrical Contact Cleaner, ect.)



ANTAEUS HHP25 MANUAL

OPERATIONS GUIDE (STEP-BY-STEP)

Connect the remote control pendant. The remote pendant is connected by a single yellow cable that powers the remote controls and communicates to the power unit. The connection point to the remote pendant is under the control panel.



Both Power Unit and Control panel uses a twist-lock style connector. It must be aligned, pushed in, and twisted to lock in.



Connection point UP inside the door



It is best to have the remote pendant connected prior to turning the power unit on. This is only to prevent and accidentally pressing of a control button while the unit is placed in a place on the job site for operations. **Turn the key IN to power up the control panel when ready.** If the connection is done correctly you will start to see engine data on the screen. **Make sure the follow switches are in this position BEFORE POWER ON:**



Power = ACC
PRESSURE START = OFF
MANUAL = STOP



ANTAEUS HHP25 MANUAL

OPERATIONS GUIDE (STEP-BY-STEP)

SAFETY NOTE: There is a sensor on top of the hammer called the “Pile Guard” sensor that will detect if the hammer is sitting on a pile or not. If the sensor does not detect the hammer is on a pile, for example if the pile is hanging from the crane and is not yet in position, then the “Pile Guard” light will appear on which will disable the hydraulic system as a safety precaution against stroking the ram while being held by the crane.



Note: This sensor can be bypassed which will be explained later for testing system pressures.



ANTAEUS HHP25 MANUAL

OPERATIONS GUIDE (STEP-BY-STEP)

Make sure all the E-Stop switches are not pushed. There are two total, one on the Pendant and one of the main control panel. They can best twisted to the right slightly and will pop out and reset.

Start Engine by using the key. Turn to the right until engine starts and let go.

NOTE: Current VanPile Unit has a small key issue where the key does not spring back to center. You may need to turn the key and manually twist it back slightly into the run position to disengage the starter. This is a known issue that is schedule to be fixed in the future when operations start. It will not affect operation.



Make sure tool select switch is in
"HYDRAULIC HAMMER MODE"

The Panel Control / STOP / Remote control switch can be in any position for initial startup. The P800a power unit can only control the HHP by using the remote pendant and not directly on the main panel. You can keep this switch in **REMOTE CONTROL** mode.

The main panel is mostly for turning on and off the engine.

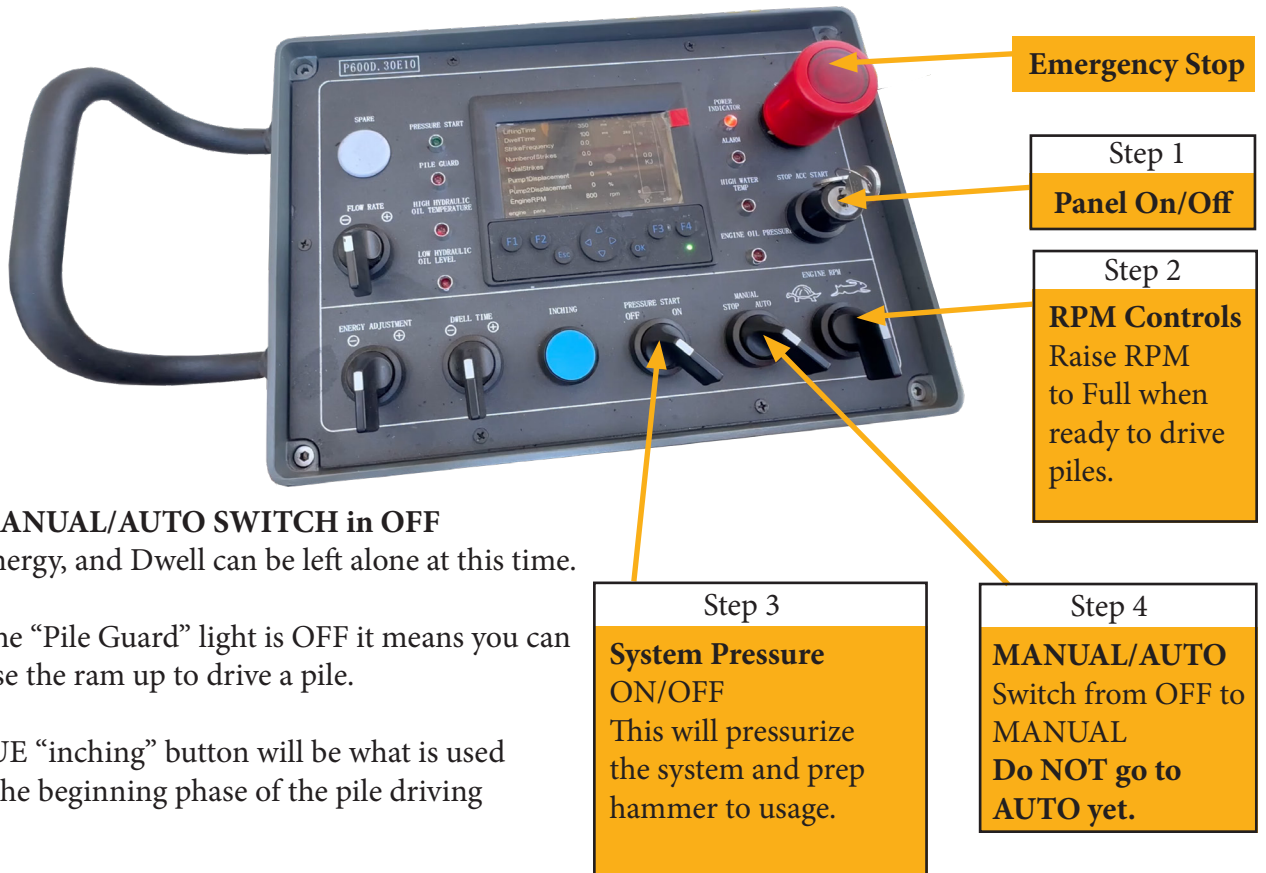


ANTAEUS HHP25 MANUAL

OPERATIONS GUIDE (STEP-BY-STEP)

Once the engine is on **let the hydraulic system warm up for at least 10 minutes** before either using the hammer or setting pressures.

Set the hammer on top of the desired pile. When ready to drive pile **turn the RPM of the engine to full** which will be 1800 RPM. Use the Tortoise and Hair switch to raise and lower the RPM on the remote controls.



Keep MANUAL/AUTO SWITCH in OFF
Flow, Energy, and Dwell can be left alone at this time.

When the “Pile Guard” light is OFF it means you can now raise the ram up to drive a pile.

The BLUE “inching” button will be what is used during the beginning phase of the pile driving process.

HOW TO DRIVE:

PUSH and HOLD “INCHING” = Ram goes up
LET GO of button = Ram drops

PUSH IN for just a half second and the ram will raise up less than an inch. For the first part of the pile you just want to gently tap on the pile. This is accomplished by simply tapping the blue inching button. **THE LONGER YOU HOLD THE BUTTON THE HIGHER THE RAM WILL RISE.** This feature will give the operator maximum control over the initial driving to confirm all systems are functioning as expected.



ANTAEUS HHP25 MANUAL

OPERATIONS GUIDE (STEP-BY-STEP)

After some time, which could be a few minutes or longer, the operator is going to get tired of pushing the blue button over and over again for each strike. When the operator is confident the pile can sustain consistent blows the operator can switch the **controls from MANUAL to AUTOMATIC**.

As soon as you switch from MANUAL mode to AUTO mode the blue “inching” button no longer functions. Instead the way to control the timing of the hammer will be done using the three switches on the left of the control panel (shown below with yellow border).



Step 5
Switch from Manual to AUTO.

Keep on
System Pressure ON/OFF



FLOW RATE SWITCH = Can increase the speed of the flow of the oil which will result in raising the ram faster. This will result in more strikes per minute.

ENERGY ADJUSTMENT = How long “in milliseconds” to hold the “inching button” is an easy way to think of this feature. It will determine how high the ram goes before it drops. It will default to a low setting.

DWELL TIME = Dwell is the length of time the system will wait before allowing the next strike. If your ram is bouncing (rebounding) on a pile you should set the dwell time higher to allow for the bouncing to stop before asking the system to raise the ram for another strike.



ANTAEUS HHP25 MANUAL

HIGHEST PRIORITY SAFETY NOTICE! READ AND UNDERSTAND

When you are done driving your pile you can switch the AUTO back to OFF. Turn System pressure OFF, turn RPM Down to idle, let the power unit run for about 5-10 minutes to allow hydraulic oil to cool and engine turbos to spin down. Then you can power off the machine.

VERY IMPORTANT SAFETY WARNING WHEN OPERATING THE HAMMER FOR THE VERY FIRST TIME AFTER A PURCHASE OR TRANSPORT. READ THIS AND UNDERSTAND IT:

IT IS POSSIBLE THAT DURING ASSEMBLY OR TRANSPORT **THE WIRES THAT CONTROL THE HHP UNIT MAY HAVE BEEN CONNECTED BACKWARDS.** IF THIS IS THE CASE THEN WHEN SYSTEM PRESSURE IS TURNED ON THE RAM WILL START TO RISE. IF THE WIRES ARE BACKWARDS THE INCHING LOGIC IS BACKWARDS. INSTEAD OF PRESSING THE INCHING BUTTON TO RISE THE LOGIC WILL BE BACKWARDS; WHERE NOT PUSHING THE BUTTON WILL BE RISE.

KNOWING THIS MAY BE POSSIBLE IT IS VERY IMPORTANT THAT **THE VERY FIRST TIME YOU PUSH THE SYSTEM PRESSURE ON BUTTON YOU LOOK CAREFULLY AT THE RAM AND SEE IF IT IS RISING.** IF IT IS RISING YOU KNOW THE WIRES ARE BACKWARDS.

TURN THE SYSTEM OFF AND THE RAM WILL SLOWLY FALL BACK TO THE BOTTOM.

THE SAFEST WAY TO MAKE SURE ALL THE SYSTEM IS FUNCTIONING CORRECTLY IS TO WAIT FOR THE HAMMER TO ALREADY BE ON A PILE BEFORE PUSHING THE SYSTEM PRESSURE ON BUTTON FOR THE FIRST TIME. IF THE RAM DOES NOT GO UP YOU KNOW IT'S CONNECTED CORRECTLY. DO ALL YOU CAN TO LABEL AND MAKE SURE THE WIRES ALWAYS STAY CORRECT FROM THAT POINT ON.



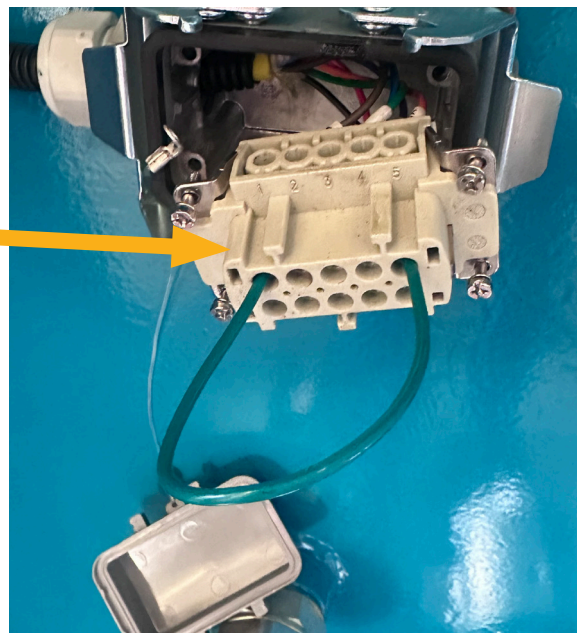
ANTAEUS HHP25 MANUAL

SETTING SYSTEM PRESSURES

To test system pressure you must make sure all hydraulic lines from the impact hammer to the power unit are disconnected. Make sure all electrical wires from the impact hammer to the power unit are also disconnected.

To test pressures we must bypass the pile guard logic, this will allow us to pressurize the system and bypass the logic that would prevent us from building pressure. To do this go to the connector where the impact hammer connects. Inside of the control panel is a wire used for bypassing. If the wire is not there you can use any wire that can safely handle 24V.

CONNECT TOP LEFT AND TOP RIGHT WITH A WIRE.



Connect a wire from the top left and top right connection pins on the plug. This will create a close circuit for the pile guard that the system is looking for. Normally this circuit would be completed when the proximity sensor on top of the impact hammer had detected that the hammer is against a pile. The system now believes the impact hammer is on a pile and ready to drive. We can now test system pressure.



ANTAEUS HHP25 MANUAL

SETTING SYSTEM PRESSURES

When the bypass wire is in place the control panel “pile guard” light will turn off. The system successfully thinks the pile guard circuit is complete.



Turn ON

**System Pressure
ON/OFF**

This will pressurize
the system and prep
hammer to usage.

Confirm: Pile Guard Light is OFF (due to bypass wire installed)

TURN ON: Push System Pressure. The pressure will rise on the “Drive Pressure” gauge.



The desired pressure is between 3,600 PSI and 4,000 PSI. This will be the pressure required to lift the ram up. If the system pressure is too low it won't have enough power to lift the ram.

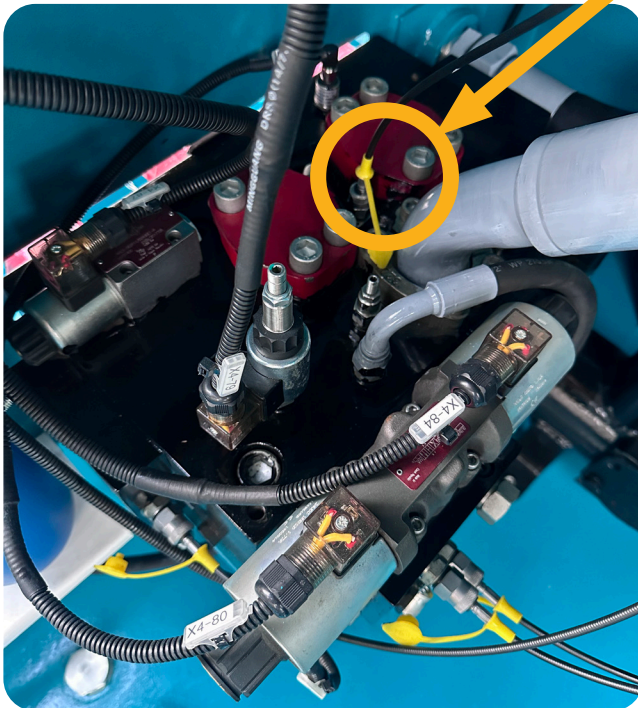
See next page on how to adjust the pressure higher or lower.



ANTAEUS HHP25 MANUAL

SETTING SYSTEM PRESSURES

The below relief valve will set the MAX pressure. Loosen the locking nut, adjust the pressure by turning in the adjustment screw (pressure will go up) or loosening the adjustment screw (system pressure will go down). Turn off the system pressure in-between each adjustment. The relief valve is sensitive, it's best to only turn 1/4" turn in or out and re-check pressure.



"Drive Pressure"

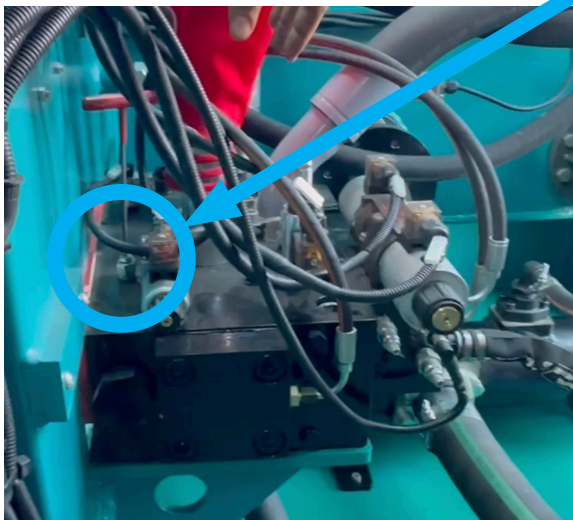




ANTAEUS HHP25 MANUAL

SETTING SYSTEM PRESSURES

When system pressure is turned off the “OUTLET” pressure gauge should stay pressurized for about 30 seconds and bleed back to zero.



“outlet pressure”

The outlet pressure is the pressure that is past the hydraulic manifold and is powering the impact hammer. It is very important for the outlet pressure to slowly drop in pressure after the system pressure is turned off. This will ensure the ram does not have any ability to rise on it's own after the system is turned off. It is also an OSHA regulation that all pressurized vessels including accumulators and hoses depressurize on their own and do not remain pressurized. The valve shown in this pictures is a needle valve, it must be 1/4” turn open always. The proper way to set it is to turn the needle valve all the way closed, then turn it back 1/4” of a turn. To make sure it is working you can pressurize the system, then turn the system off and the outlet pressure should slowly bleed to zero over about 30 seconds. If is it taking longer then you can open the valve a little more.

If the valve is open too far then the system will not be able to build enough pressure to rise the ram, if you turn this valve too far OUT then the ram will not rise. Simply turn it back in.

This valve is also a SAFETY valve. IF the ram is ever stuck at full stroke due to a sensor malfunction or hydraulic problem you can slowly spin this valve open and the ram will slowly drop.



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V10.12.25



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