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HL130M DRI-PUMP® PUMP OPERATING & MAINTENANCE MANUAL



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IMPORTANT SAFETY INFORMATION

READ THIS BEFORE INSTALLING OR OPERATING THIS EQUIPMENT

Because of the variety of conditions and environments in which this equipment can be used, the user and those responsible for this equipment must satisfy themselves as to the safety and acceptability of each application and operating conditions of this equipment.

IN NO EVENT will Godwin Pumps of America, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

Areas of this manual identifying important areas of concern appear as:

!!! IMPORTANT !!!

Alerts the reader where equipment can be damaged or economic loss can occur if procedures are not followed properly

!!! WARNING !!!

Alerts the reader where people may be hurt if procedures are not followed properly

California Proposition 65 Warning:

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

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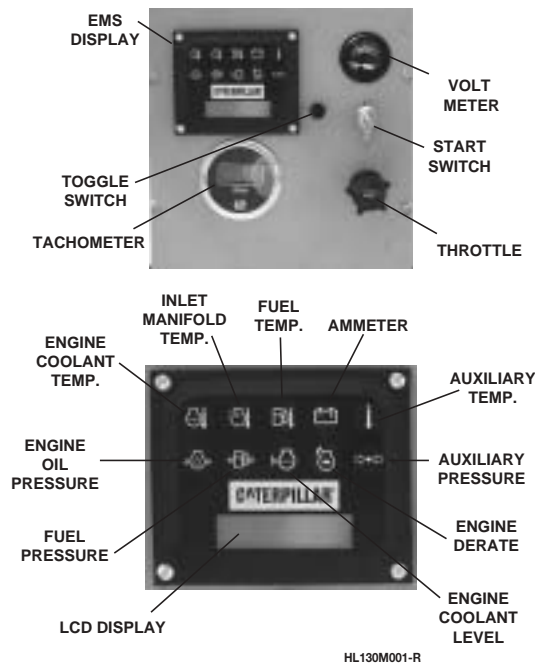


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HL130M Dri-Prime® Pump Quick Reference



Start Switch – Used to start engine. Switch must be depressed and turned to starting position.

Throttle – Varies engine speed for faster/slower operation.

Tachometer – Digital display indicating engine rpm.

Volt Meter – Gauge indicating voltage of the electrical system.

EMS Display and Toggle Switch – Displays engine information by means of LCD display and ten warning lamps. Engine information may be gathered by holding toggle switch up to choose specific diagnostic and down to retrieve data. Warning lamps light if system operation exceeds safe levels. Warning lamps include:

Coolant Temperature
Fuel Temperature
Auxiliary Temperature
Fuel Pressure
Engine Derate

Inlet Manifold Temperature
Ammeter / Battery Voltage
Engine Oil Pressure
Coolant Level
Auxiliary Pressure

Setup

1. Visually inspect pump and piping. Remove any extraneous equipment, debris, or dirt.
2. Check engine oil, mechanical seal oil, diesel fuel, and compressor oil levels. Replenish as necessary.
3. Check radiator coolant level. **WARNING!** Do not remove radiator cap if engine is running or warm. Serious burns or injury could result.
4. Close volute and non return drain valves.
5. Verify proper and secure connections of pump suction and discharge lines.

Operation

1. Turn ignition switch to "START." Let ignition switch return to "RUN" position.
2. Allow engine to momentarily warm-up. Use throttle to increase engine rpm to desired level.
3. Air will discharge from venturi outlet hose during priming and operation, this is normal.
4. Pump will prime and start to discharge product.
5. Use throttle to adjust engine speed for desired flow rate.

If Pump Will Not Prime

1. Remove suction piping at suction flange of pump.
2. Close drain valves on volute and discharge non return valves.
3. Start engine.
4. Let engine warm up while idling.
5. Position Vacuum Pad on pump suction flange. Make sure pad gasket seats firmly around edge.
6. Raise engine rpm to 1800.
7. Note reading on gauge of Vacuum Pad.
8. If gauge reads low (e.g., 5"-10" of mercury) or not at all, check the following:
 - Check that volute drain valve is closed
 - Check for obstructions in Non Return Valve at discharge
 - Check for airflow from venturi outlet hose
 - Check compressor operation
 - Check separation tank screen for obstruction.
 - Check venturi assembly
9. If gauge reads 20"-25" of mercury, check the following:
 - Restrictions in hose or screen
 - Air leak into suction hose, usually at fitting

Distance of vertical suction lift from source to pump impeller. Cannot be in excess of 27'

HOW TO USE THIS MANUAL

This manual describes the use, operation, and maintenance of the HL130M pump from Godwin Pumps of America, Inc. It consists of the following major sections:

INTRODUCTION	Contains descriptions of the various parts of the equipment, major specifications and performance data, required tools and supplies, and other related information. <i>Refer to this section first if you are new to Godwin Pumps and are generally unfamiliar with the equipment.</i>
INSTALLATION	Contains the requirements, recommendations, and procedures to install the equipment. <i>Use this section to initially install the pump before using.</i>
SETUP & OPERATION	Describes how to operate the equipment for pumping service. <i>Refer to this section before setting up or using the equipment.</i>
MAINTENANCE	Contains activities, recommendations, and procedures to keep the equipment in proper operating condition. <i>Use this section to learn how to maintain the equipment for continued operation.</i>
SERVICE	Containing instructions involved in using and maintaining the equipment. <i>Distribute this information to those responsible for maintaining and servicing the equipment.</i>
PARTS INFORMATION	Containing drawings used to locate and identify parts and components of the pump. <i>Refer to this information to specify and order spare and replacement parts.</i>

Additionally, an Appendix included with this manual contains supplementary information and materials that may be useful in operating and maintaining the equipment.

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INTRODUCTION This section contains general introductory information about the HL130M Dri-Prime Pump. It is intended to familiarize users with pump terminology, operation, and performance for successful and efficient use and operation of the equipment. Included are:

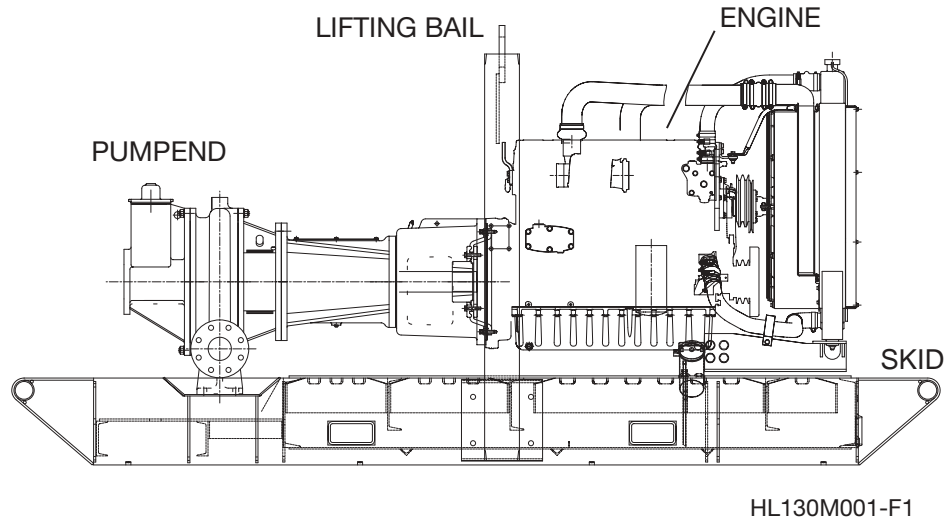
Model HL130M Dri-Prime Pump	Containing brief descriptions and illustrations of major components of the pump.
Typical Operation	Describing how the components operate for pumping service.
Performance	Listing the general operational capabilities and limits of the Godwin HL130M Pump.
Tools & Materials	Listing the items that should be available before using, maintaining, or servicing the Model HL130M Pump.
Serial Number Identification	Showing how to identify the serial numbers of the equipment when ordering replacement parts, spares, etc.
Warranty Information	Presenting the terms and conditions protecting your Godwin pump from defects and failures.
Safety Considerations	Describing the recommended procedures and practices for safe operation of the equipment.

If you are new to Godwin Pumps and generally unfamiliar with pumps, you can use this section to first learn about the equipment before attempting any installation, operation, or servicing.

Model HL130M Dri-Prime® Pump

The Model HL130M Dri-Prime pump from Godwin Pumps of America, Inc. is a heavy duty, solids handling, automatic self priming pump available for a variety of general purpose pumping and dewatering applications. Major components of the model HL130M are shown in Figure 1. Descriptions of these components are provided in the following.

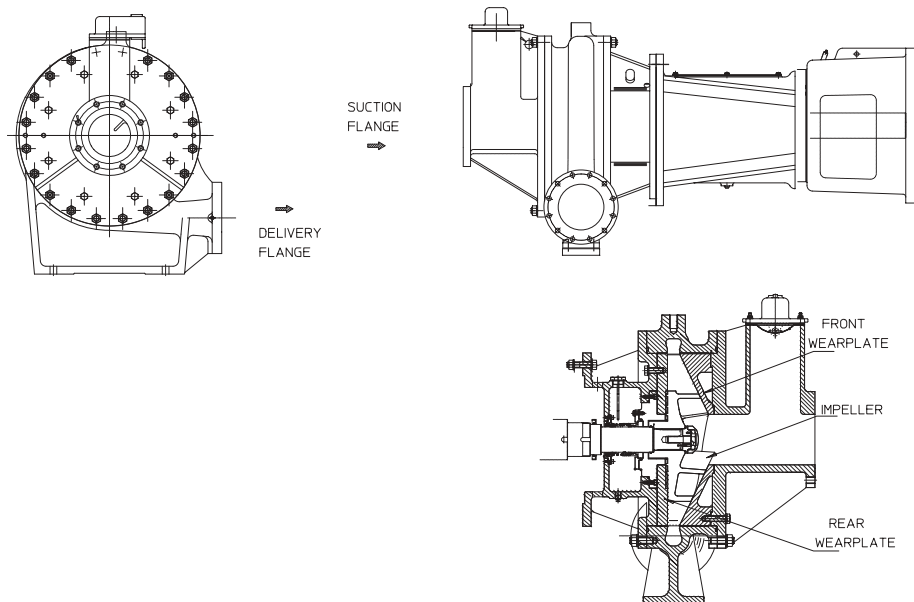
Figure 1
Model HL130M Components



Pumpend

Pumpend components comprise the front cover with suction flange, front wearplate, impeller, rear wearplate, pump casing (volute), and discharge flange. The suction flange provides the connection of external piping to the source to be pumped. The impeller provides the centrifugal energy to move the pumped product through the volute and out through the discharge flange. Configuration of these components is illustrated in Figure 2.

Figure 2
Pumpend Configuration



Priming System

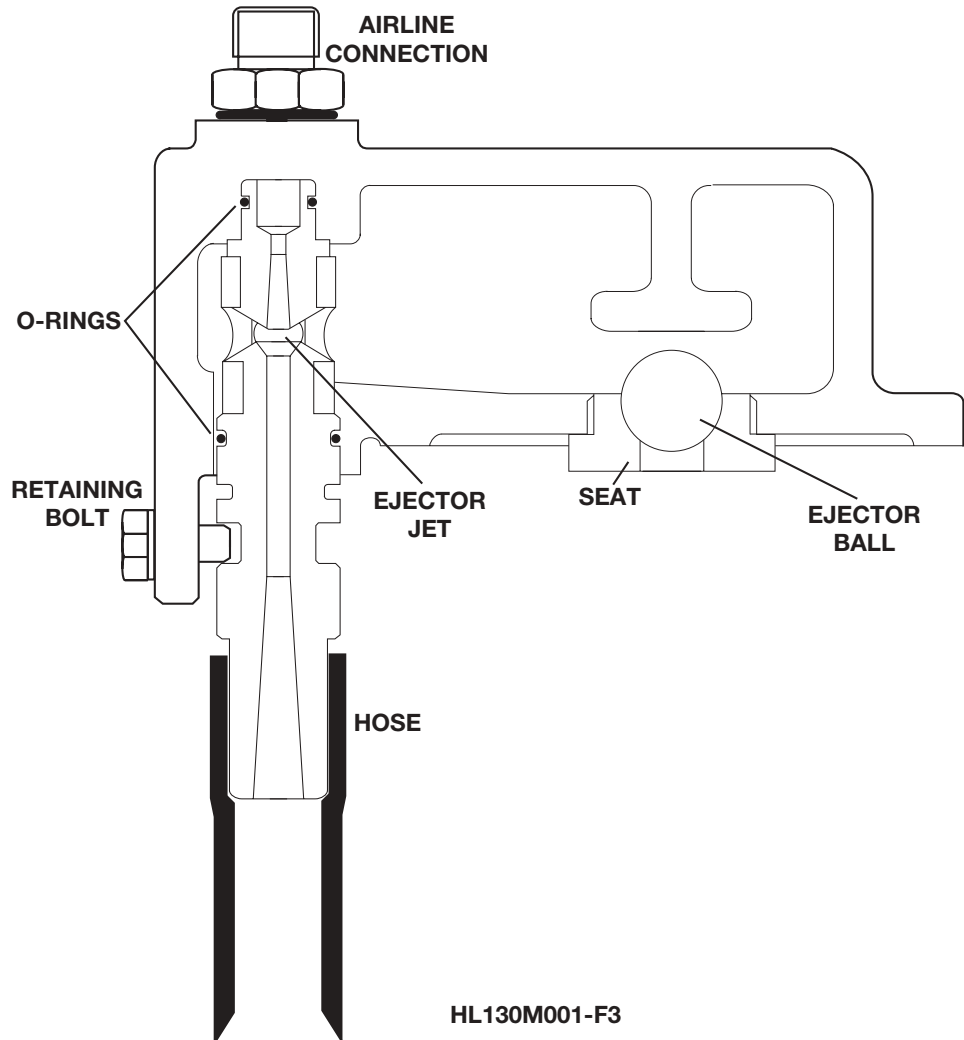
Priming system components create the suction required to draw product to the pump components. It consists of an ejector assembly, air separation tank, and an air compressor.

During a priming sequence, compressed air flows through a venturi nozzle within the ejector that creates a vacuum in the separation tank, lifting the valve ball, evacuating the pump and suction piping to deliver product to the pump end. A screen beneath the valve ball prevents entry of solids or debris that may obstruct actuation of the valve ball during priming and operation. A zero ejector carry over option can be supplied where environmental issues predominate.

The priming system operates continuously while the pump is running whether or not product is available at the suction end – thus allowing continuous, unassisted operation. Pump will automatically re-prime when product becomes available.

Priming components are shown in Figure 3.

Figure 3
Priming Components



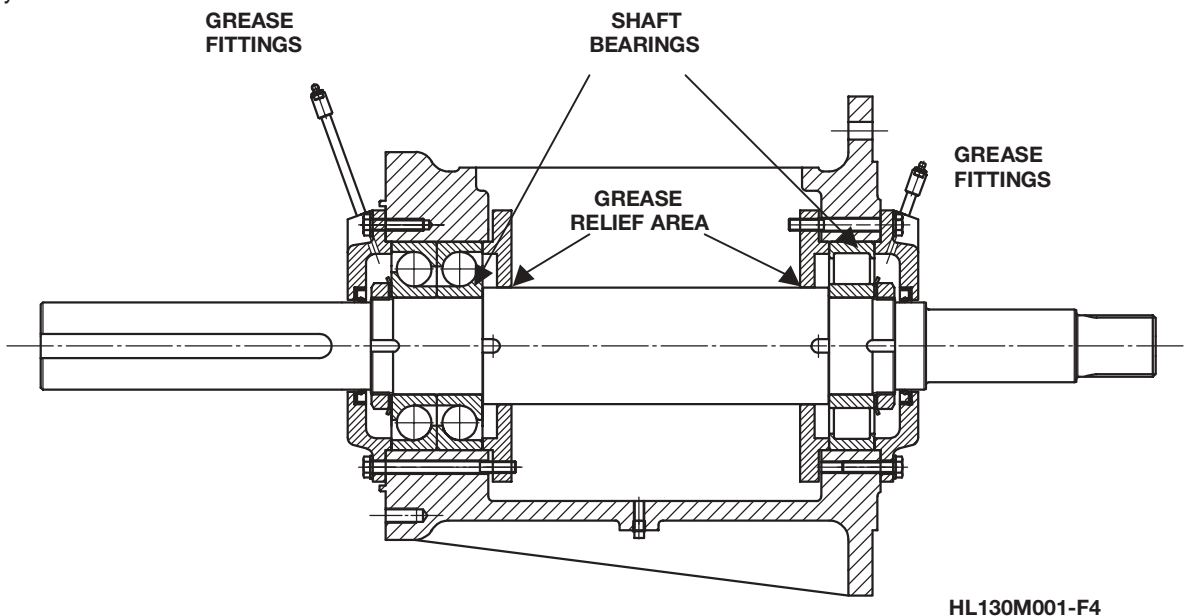
Engine

The Model HL130M uses a Caterpillar model C-9 diesel engine as the prime mover of the pump. The engine is supplied complete with radiator, alternator, fuel pump and air intake assemblies installed at the factory. A taperlock coupling mounted on the flywheel of the engine is connected to the pump shaft. A panel mounted on the engine contains the controls and gauges used in operation of the pump (see "Operating Controls" in the following). Diesel fuel is supplied to the fuel pump from an integral, double-walled fuel tank mounted in the skid.

Pump Shaft & Bearing Assembly

Power is transmitted from the engine to the impeller through a shaft, bearings, and mechanical seal housed in a bearing bracket mounted to the pumpend. The Model HL130M shaft is mounted on a back to back angular contact location bearing and a roller bearing at pump end. Both are grease lubricated. Configuration and components of this assembly are shown in Figure 4.

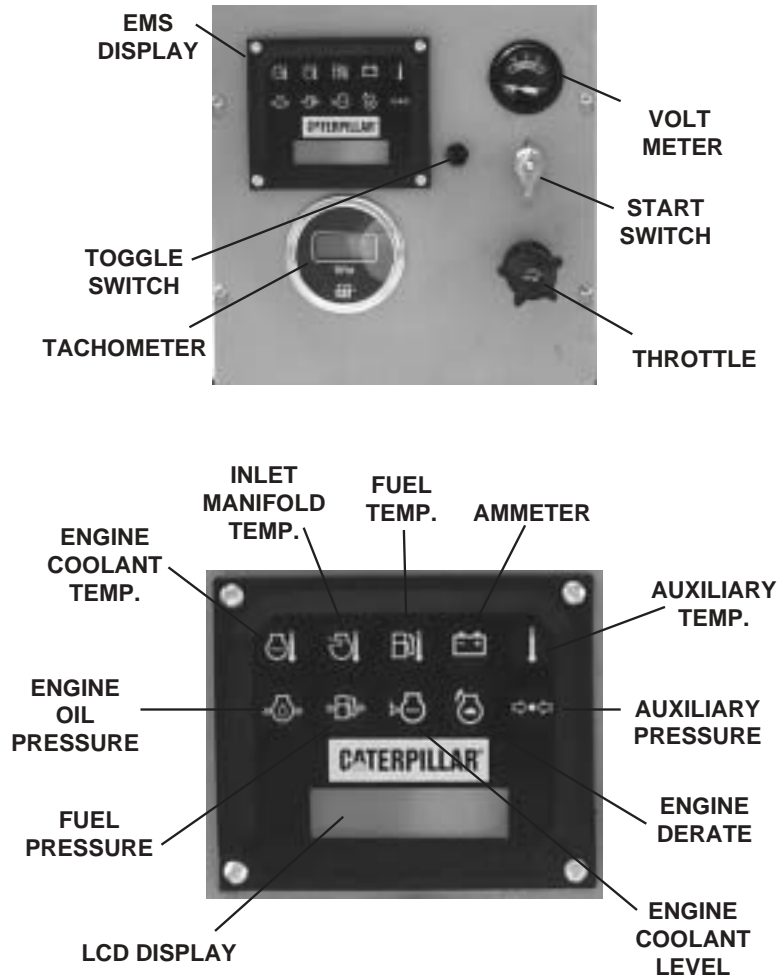
Figure 4
Bearing Assembly



Operating Controls

The Godwin Model HL130M Pump is operated from a Control Panel mounted on the engine drive unit. Controls and locations are shown in Figure 5. Descriptions of each control are provided in the following.

Figure 5
Model HL130M Controls



HL130M001-F5

Start Switch

Used to start engine. Switch must be depressed and turned to starting position.

Throttle

Varies engine speed for faster/slower operation.

Tachometer

Digital display indicating engine rpm.

Volt Meter

Gauge indicating voltage of the electrical system.

EMS Display and Toggle Switch

Displays engine information by means of LCD display and ten warning lamps. Engine information may be gathered by holding toggle switch up to choose specific diagnostic and down to retrieve data. Warning lamps light if system operation exceeds safe levels. Warning lamps include:

Coolant Temperature
Inlet Manifold Temperature
Fuel Temperature
Ammeter / Battery Voltage
Auxiliary Temperature
Engine Oil Pressure
Fuel Pressure
Coolant Level
Engine Derate
Auxiliary Pressure

Typical Operation The following describes the typical operation of the Godwin Model HL130M Pump. Actual operation, however, may differ according to specific applications, operating procedures, and other conditions in effect at a particular facility.

Prior to operation, the pump is connected to suction intake and discharge output lines at each corresponding flange of the pump end. The engine can then be started using the start switch. Upon starting, the compressor delivers air to the nozzle of the ejector assembly. High velocity air travels through the venturi to create a vacuum within the air separation tank of the priming system. Evacuation of the tank raises the ejector ball in the tank, further evacuating the pump casing and suction lines.

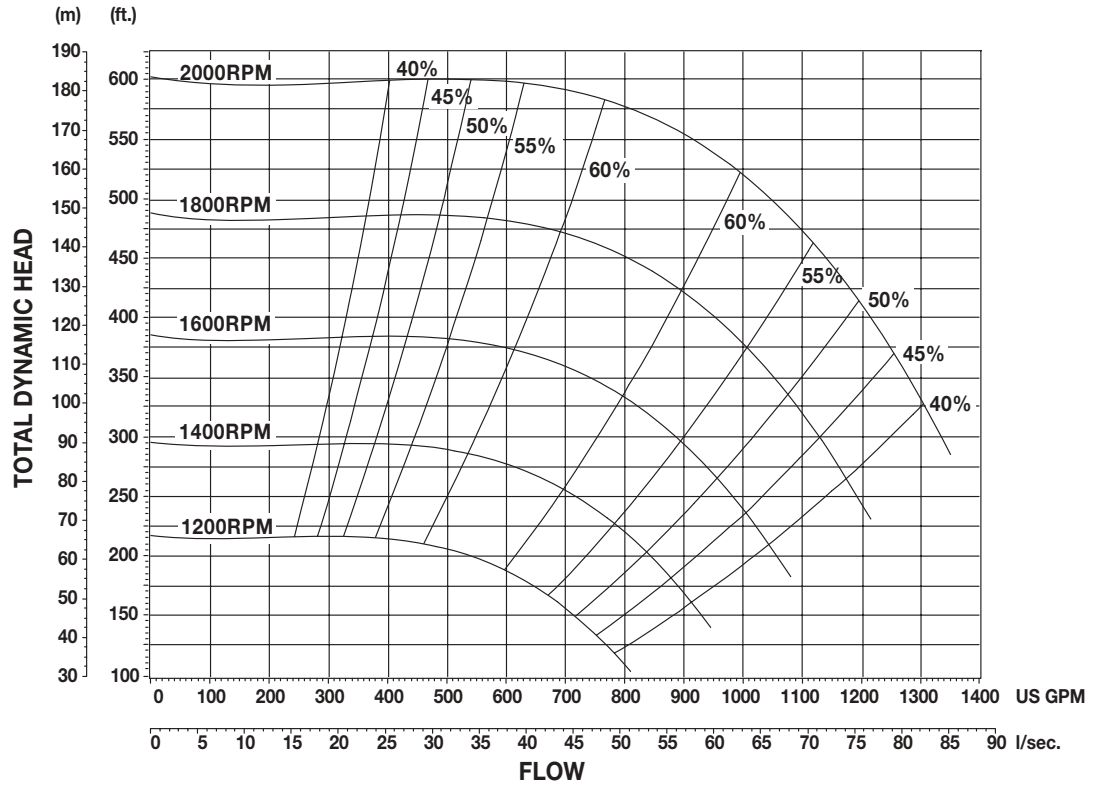
Atmospheric pressure causes liquid at suction inlet to rise through the suction lines to the pump. Rotation of the impeller within the pump propels liquid through the pump to the discharge. Pressure from the pumped liquid opens the check valve, allowing liquid to empty through discharge lines.

Pumping continues, unassisted and without operator intervention, until no more liquid is available at the suction inlet. If pump is left running, it will automatically re-prime when additional liquid becomes available at the suction inlet.

Performance

A pump performance curve for the Model HL130M is illustrated in Figure 6 and can be used to estimate overall performance. Figure 6 illustrates test conditions based on water testing at sea level and water temperature of 68° F (20° C).

Figure 6
Model HL130M Pump
Performance Curve



HL130M001-F6

Tools & Materials

Although no special tools or materials (other than diesel fuel and lubrication oil) are required for operation of the pump, the following items should be available to those responsible for maintaining and servicing the equipment.

Tools

- Hand Tools (adjustable wrenches, socket sets, screwdrivers, etc.)
- Oil Filter Wrench
- Aligning/Pry Bar
- Dead Blow Hammer/Mallet
- Vacuum Pad
- Thickness/Feeler Gauge Set
- Gasket/Razor Blade Scraper
- Flashlight
- Dial Test Indicator (Dial Calipers)

Materials

- Seal Housing Oil (SAE 20/20)
- Bearing Grease
- Water Detecting Paste
- Cosmoline (Petrolatum) Corrosion Inhibitor
- Anti-Seize Lubricant
- Replacement Gaskets and O-Rings (factory supplied)

Hand tools, hammers, flashlight are used for disassembly of pump components during servicing. The vacuum pad is a gasket-covered plate fitted with a vacuum gauge used to test suction integrity. The thickness/feeler gauge set is used to measure and set clearances of impeller, wearplates, and shaft. The dial test indicator is used to measure shaft end-play. The water detecting paste is used to check for the presence of water in the diesel fuel system. Cosmoline is used to protect parts when the pump is not in use. Anti-seize lubricant is used when re-assembling parts after maintenance/service.

Engine Supplies

The Model C-9 diesel engine used on the HL130M Pump requires fuel, oil, coolant, grease lubricants, and filters during operation. Recommended sources for these items from the manufacturer (Caterpillar) are listed in the following.

Diesel Fuel	Diesel fuel identified as No. 1-D and No. 2-D in ASTM D975 will provide the rated engine performance and full component service life of the Model C-9. If unavailable, diesel fuel meeting the following specifications can be used.
<i>Specification (ASTM Test)</i>	<i>Requirements</i>
Aromatics (D1319)	35% max.
Ash (D482)	0.02% wt., max.
Carbon residue on 10% bottoms (D524)	0.35% wt., max.
Cetane Number (D613)	35-40 min.
Cloud Point	Maximum not above expected ambient temperature
Copper Strip Corrosion (D130)	No. 3 max.
Distillation (D86)	10% at 540° F (282° C) max. 90% at 680° F (360° C) max.
Flash Point (D93)	Legal limit
API Gravity (D287)	30 min., 45 max.
Pour Point (D97)	10° F (6° C) min. below ambient
Sulfur (D3605/D1552)	3% max.
Viscosity (D445)	1.4 cSt min., 20.0 cSt max. at 104° F (40° C)
Water & Sediment (D1796)	0.1% max.
Water (D1744)	0.1% max.
Sediment (D473)	0.05% wt., max.
Gums & Resins (D381)	10 mg/100 ml (5.8 gr/US gal), max.
Lubricity (D6078/D6079)	3100 g min., 0.018 inch (0.45mm) max. at 140° F (60° C), 0.015 inch (0.38mm) max. at 77° F (25° C)

Heavy Fuel Oil (HFO), Residual fuel, or blended fuel must NOT be used. Severe component wear and failures can result.

Engine Oil

The following Caterpillar multigrade Diesel Engine Oil (DEO) products are recommended:

- Caterpillar Diesel Engine Oil (DEO) 15w-40 or 10w-30

If these products are unavailable, the following commercial products may be used:

- EMA LRG-1 multigrade oil (preferred)
- API CH-4 multigrade oil (preferred)
- API CG-4 multigrade oil (preferred)
- API CF-4 multigrade oil (acceptable)

The manufacturer does not recommend the use of any after-market oil additives.

The Caterpillar model C-9 engine requires 8-1/4 gallons of oil.

Grease

The following Caterpillar products are recommended:

- Multipurpose Lithium Complex Grease (MPGL)
- Multipurpose Lithium Complex Grease with Molybdenum (MPGM)
- Bearing Lubricant (SPG)
- Water & Temperature Resistant Grease (WTR)
- Desert Gold Caterpillar Premium Grease (CPG)
- Artic Platinum Caterpillar Premium Grease (CPG)

Coolant

The primary coolant types recommended by the manufacturer include:

- Caterpillar Extended Life Coolant (ELC) (preferred)
- Caterpillar Diesel Engine Antifreeze/Coolant (DEAC) (acceptable)

A 50/50 mixture is suggested for optimum performance.

Filters

Specify the following Caterpillar products when replacing fuel and oil filters during regularly scheduled maintenance.

- Oil Filter: B-99
- Fuel Filter: BF-7632
- Air Filter: PA-2335 and RS3515

These products are available from the manufacturer (Caterpillar) or Godwin Pumps of America, Inc.

Serial Number Identification

Each pump assembly and engine are identified by a unique serial number that is referenced to records maintained by Godwin Pumps of America, Inc. These serial numbers **must** be used when ordering replacements, spares, or servicing the equipment. Serial numbers are engraved onto a plate attached to the pump and engine. The serial number plate of the Model 3406B engine is located either on the right-rear of the cylinder block or on the left-front of the cylinder block.

Upon receipt of the equipment, you should record each serial number for future reference. An Equipment Identification Log contained in the Appendix can be used to record each serial number. This information should be recorded upon initial use of the pump.

Warranty Information

Godwin Pumps of America, Inc. warrants its Dri-Prime equipment to be free from defects in workmanship and materials for a period of 12 months or the accumulation of 2000 hours of use from date of shipment.

The company's sole obligation under this warranty shall be to replace parts when necessary on products that have been returned to it or an authorized service center and found to be defective by the Company. This warranty covers the above described portable pumping equipment when used for pumping non-corrosive liquids containing limited quantities of abrasive particles in compliance with documentation furnished with the equipment and Company representations.

Godwin Pumps shall not be liable for any special, indirect, or consequential damages of any kind. Major components not manufactured by the Company are covered by the original manufacturer's warranty in lieu of this warranty. The Company will not be held responsible for travel expenses, rented equipment, outside contractor's fees, or unauthorized repair shop expenses. The Company neither assumes nor authorizes any person or other company to assume for it, any other obligation in connection with the sale of its equipment. Any enlargement or modification of this by a representative or other sales agent is their exclusive responsibility. Transportation charges shall be borne by the buyer. Returns must have prior written authorization from the Company.

This warranty shall extend only to the original owner and shall not apply to any products that have been repaired or altered without the Company's consent or have been subject to misuse, accident, or neglect, or have been used for uses other than the Company's intended purpose.

No other warranties, expressed or implied including implied warranties of merchantability and fitness for a particular purpose, will apply.

Safety Considerations

Use the following general guidelines and instructions with your Godwin Pump to lessen the chance of accidents, personal injury, and damage to the machine and equipment.

The Occupational Safety and Health Act (OSHA) places the burden of compliance of safe operation of equipment on the user of the equipment and the Act is generalized to the extent that determination of compliance is a judgment of the local inspector. Godwin Pumps of America, Inc. is not responsible for meeting the full requirements of OSHA in respect to the equipment supplied, or for any penalty assessed for failure to meet the requirements of the Occupational Safety and Health Act, as interpreted by an authorized inspector. Godwin Pumps of America, Inc. will use its best efforts to remedy any such violations at a reasonable cost to the buyer.

- This equipment generates diesel exhaust fumes that can cause injury or death. Use only in well ventilated areas to prevent dangerous buildup of exhaust fumes.
- Consider use of appropriate safety equipment and clothing before using the pump. These could include: hearing protection, safety glasses/goggles, air purifying respirators, safety shoes, etc.
- Use only towing/hoisting equipment suitable for the size and weight of the equipment.

- Rotating equipment presents a hazard that can cause injury or death. Alert surrounding personnel when pump is to be started and while in operation. Post appropriate notifications.
- All safety guards are to be in place and in position during operation.
- Keep suction areas free from debris. Although pump can handle solids, larger items may cause blockage and damage to pump components.
- Never reach into or over pump components while in operation.
- Pressure may be present even after shutdown of pump. Never open engine radiator cap while engine is running or warm. Allow to cool and pressure to escape.
- Practice safe maintenance procedures. Read manual and understand procedure before attempting any maintenance or servicing. Stop pump, disconnect battery ground (-) cable, and allow engine to cool before starting any work.

INSTALLATION

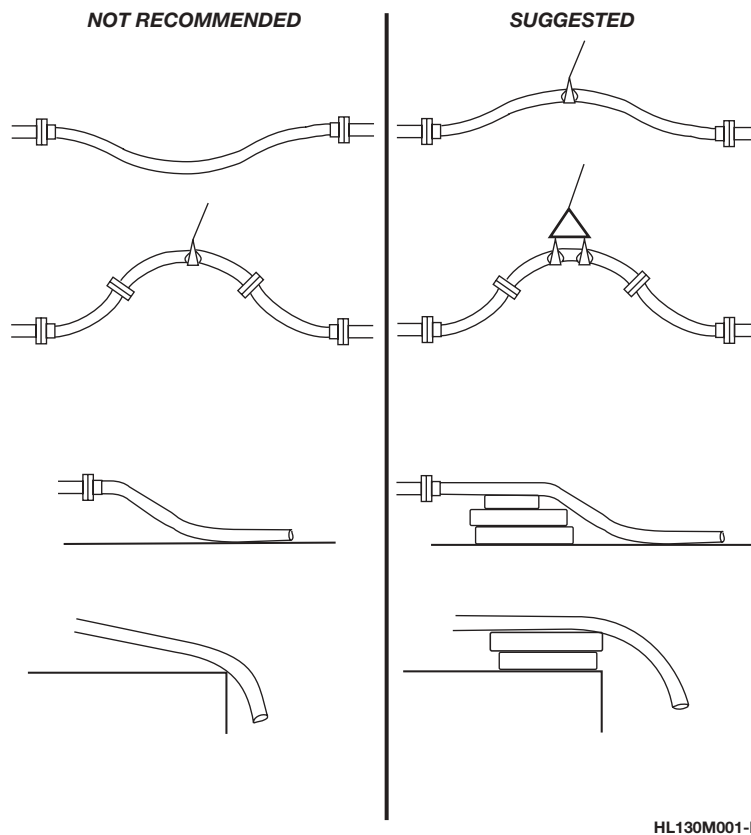
This section presents information about positioning and installing your Godwin Model HL130M Pump. Careful attention paid during the installation process will result in safer, more efficient, and more effective use of the equipment.

Site Requirements

Because of the variety of environments and circumstances in which the Godwin Model HL130M Pump can operate, only minimal site requirements are necessary for installing the pump. When selecting a site for the pump, the following should be considered:

- Select a site as close as possible to the source to be pumped with a relatively straight path between the source and suction inlet of the pump.
- Choose a site that is relatively flat and on firm ground.
- Be aware of re-fueling requirements of the pump when selecting a site.
- Consider the pump's total, loaded weight when selecting hoisting equipment to be used for final installation.
- Lay out piping runs before installation for unrestricted movement of product during pumping. Recommended piping connections are shown in Figure 7.
- This equipment creates diesel exhaust which may present a safety hazard. Consider appropriate forms of ventilation when selecting a site for installation.

Figure 7
Recommended Piping
Connections



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When a site is selected and prepared, refer to the following to install the pump.

Installation Procedures & Recommendations

Use the following general procedures and recommendations for installing the Model HL130M Pump.

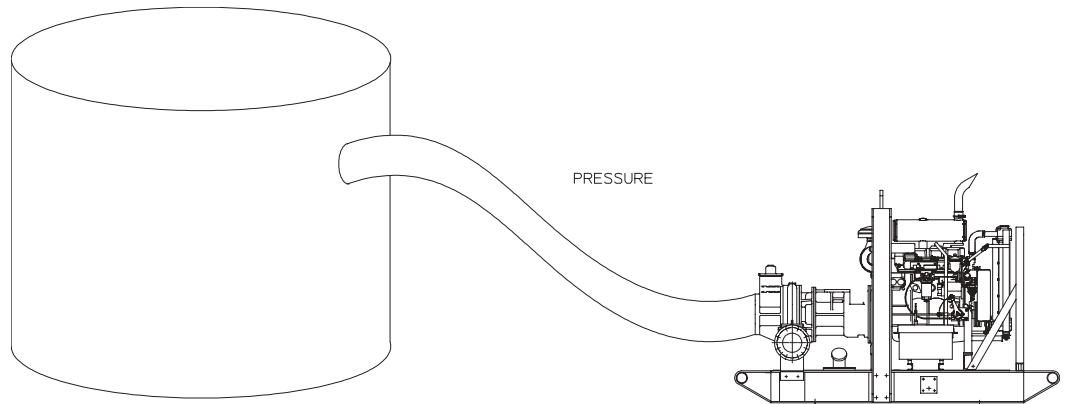
1. Position the pump at the selected site. Use jackstands/wheelchocks as necessary to prevent movement when in operation.
2. Install strainer onto suction intake piping. Strainer apertures should be no larger than the rated solids handling diameter for the pump.
3. Connect suction and discharge pipework to the pump. Be sure to support connections and pipework to minimize strain, leakage, and misalignment (refer to Figure 8).

Once installed, you can proceed to the following section to start-up and operate the pump.

Flooded Suction Applications

If the pump is to be installed in a situation where positive pressure is present at the suction flange (i.e., “flooded suction”), the air ejector of the priming system should be disconnected and removed. A typical flooded suction application is shown in Figure 8.

Figure 8
Typical Flooded Suction
Application



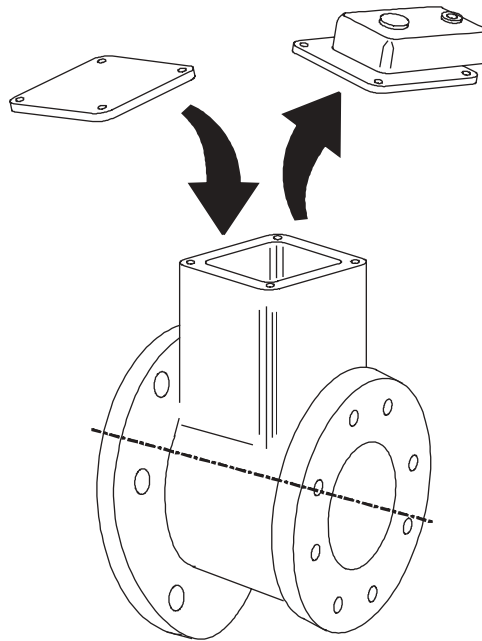
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!!! IMPORTANT !!!

Failure to disconnect and remove the ejector in flooded suction conditions can cause permanent damage to the compressor — disabling the pump.

If the pump is to be used in a flooded suction application, the priming system should be disabled and the housing replaced with a specially supplied blank plate. Installation of this plate is shown in Figure 9.

Figure 9
Blank Plate Installation



HL130M001-F9

Discharge Piping Installation

Considerable care and careful analysis should be taken when installing and connecting the HL130M pump with discharge piping. Because the HL130M pump is particularly suited for high lift and high discharge pressure applications, inadequate discharge piping design may result in unwanted hydraulic transients (i.e., “water hammer”) and surges that can damage and permanently disable the pump.

The following presents some of the major design elements that are typically included in the proper design of discharge piping to reduce or minimize the effect of water hammer.

Piping Supports — Discharge piping (and suction piping) must be externally supported. Pump flanges are for connection only and cannot be used to support hose. Refer to Figure 7 for recommended types and methods of support.

High Pressure Discharge Hose — Reinforced high pressure discharge hose rated for system pressures must be used at the discharge connection of the pump.

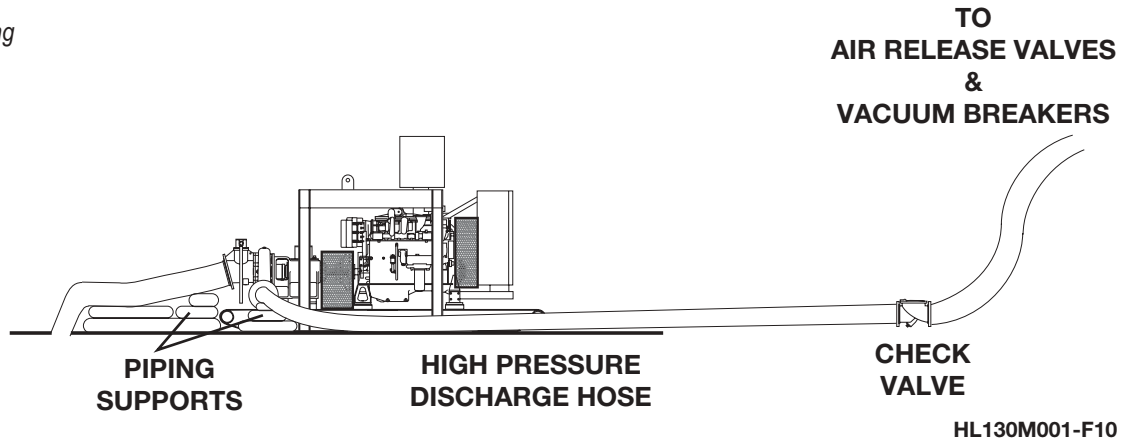
Check Valves — A check valve mounted in the discharge piping prevents any backflow of pumped product from returning to the pump. Generally, HL130M discharge piping should include a check valve installed at approximately the same elevation of the pump at 10-20 pipe diameters downstream.

Air Release Valves — Air release valves automatically vent small pockets of air that may accumulate at high points in the discharge piping. The accumulation of air in discharge piping can severely affect flow rates and can possibly impede flow entirely.

Vacuum Breakers — Allows air to re-enter discharge piping to prevent a vacuum from occurring.

Typical configuration of these elements is shown in Figure 10. The specific type, model, size, and selection of these elements is the responsibility of the discharge piping installer.

Figure 10
Typical Discharge Piping
Configuration



SETUP & OPERATION

This section provides information and instructions to setup and operate your Model HL130M Pump. Included are

- Setup Procedures
- Starting & Operating the Pump
- Shutdown Procedures
- Storage Recommendations

Users should be familiar with locations and functions of the control panel before proceeding. Refer to “Operating Controls” and Figure 5 before attempting any instructions contained in this section.

A Quick Reference Guide accompanying this manual contains summary information about operating the pump. It can be posted on or near the pump to assist personnel in correct setup, operation, and shutdown of the pump.

Setup Procedures

Perform the following before starting the pump.

1. Visually inspect pump and piping. Remove any extraneous equipment, debris, or dirt.
2. Check engine oil level, mechanical seal oil, and diesel fuel levels. Replenish as necessary.
3. Check radiator coolant level. Replenish as necessary.

!!! WARNING !!!

Do not remove radiator cap if engine is running or warm. Serious burns or injury could result.

4. Close volute drain valve.
5. Verify proper and secure connections of pump suction and discharge lines.

Starting & Operating the Pump

When properly setup (see previous), use the following to start pumping operation.

1. Press and turn start switch to “START” position and allow engine to momentarily warm-up.
2. Use throttle to increase engine rpm to desired level.
3. Air will discharge from venturi outlet hose during priming and operation, this is normal.
4. Pump will prime and start to discharge product.
5. Use throttle to adjust engine speed for desired flow rate.

After starting, no other operator intervention is required other than daily maintenance requirements. Pump will continue and may be left unattended.

If pump will not prime or operation is unsatisfactory, refer to the Troubleshooting Guide in the Maintenance section of this manual to identify cause and appropriate correction.

Shutdown Procedures

After pumping is completed, use the following to safely shutdown the equipment.

1. Use throttle to reduce engine speed to idle.
2. Turn start switch to "OFF" position.
3. Open drain valve on volute.

Refer to the following section if pump is to be stored and unused for a length of time (longer than 3 months).

Storage Recommendations

If the pump is to be unused and put into temporary storage (3-6 months), you should perform the following to prevent any damage or deterioration that might occur.

1. Empty pump of all product and clean surfaces of dirt, debris, oil, fuel, etc.
2. Remove front cover and coat front of wearplate and impeller with appropriate rust/corrosion inhibitor such as Cosmoline, petrolatum, etc. Additionally, coat any unpainted, machined surfaces that may be subject to rust and/or corrosion.
3. If storage period will exceed 6 months, prepare engine for long term storage according to manufacturer's information. Generally this preparation includes, but is not limited to:
 - Replacing oil and filter
 - Servicing air cleaner
 - Draining fuel tank and adding inhibitor
 - Adding inhibitor to crankcase
 - Disconnecting air intake
 - Disconnecting and removing battery
 - Removing belts
 - Coating machined surfaces with rust inhibitor (Cosmoline)
 - Sealing engine openings

Refer to engine manufacturer's data for long term storage preparation instructions and materials.

If to be stored outside and subject to weather, it is advisable to cover pump and engine with waterproof tarpaulin.

MAINTENANCE This section provides instructions, procedures, and recommendations to keep your Model HL130M Pump in proper operating condition. Included are:

- Preventative Maintenance
- Corrective Maintenance
- Troubleshooting Guide
- Maintenance Records

Implementing a regular, periodic schedule of maintenance is essential for continued, reliable operation of the pump. Although your Godwin pump requires only minimal maintenance, ignoring these requirements may lead to untimely failures and expensive repairs.

Preventative Maintenance

Preventative maintenance of the Model HL130M pump can be categorized according to Daily Maintenance and 250-Hour Maintenance intervals. The recommended maintenance activities at each of these intervals is described in the following.

Daily Preventative Maintenance

The following should be performed on a daily basis before starting or operating the pump. The Appendix of this manual contains a Daily Maintenance Checklist that can be used to document and record that pump maintenance was performed.

- Check engine oil level. Level on dipstick should be within crosshatch pattern or at "FULL" mark. If indicated, replenish with proper engine oil.
- Use water detecting paste and check diesel fuel for presence of water. If water is indicated, drain and clean tank. Otherwise, check fuel level and replenish as necessary.
- Check radiator coolant level.

!!! WARNING !!!

Do not remove radiator cap if engine is running/warm. Serious burns or injury could result.

- Check oil level in mechanical seal.
- Check for proper actuation of pressure relief valve of compressor. Valve should easily spring back into position when released.
- Check grease fitting of shaft bearings. Grease should be present at fitting. Add grease if necessary.
- Check position of volute drain valve. Valve should be closed prior to operation.

250-Hour Preventative Maintenance

The following should be performed on periodic, 250-Hour intervals for continued, reliable operation of the pump. Corresponding Service Procedures involved in this maintenance is included in the "Service Procedures" section of this manual.

The Appendix of this manual contains a 250-Hour Maintenance Checklist that can be used to document and record that pump maintenance was performed.

1. Refer to engine hour meter to determine if maintenance is required. If due for 250 hour servicing, turn pump off, remove pump from service, and disconnect all piping (where practicable).
2. Disconnect battery ground (-) cable before attempting any maintenance activities.

!!! WARNING !!!

This procedure involves access to operating parts of the pump. Accidental start-up may cause injury. Disconnecting battery will reduce the chance of accidental start-up.

3. Initially inspect pump and remove dirt, debris, tools, etc. Open volute valve to drain any product from pump. Visually inspect volute from suction flange for any obstructions and remove accordingly.
4. Check for proper front and rear clearances between impeller and wearplates. (See "Pump Servicing: Checking for Proper Impeller Clearance".)
5. Drain engine oil and remove old oil filter. (See "Engine Servicing: Checking/Replacing Oil & Filters".) Write current engine hour meter reading on new filter to serve as a record for next maintenance interval.
6. Check for proper coolant level and concentration. Refill as necessary. Brush away any accumulated dirt and debris from radiator coils.
7. Replace engine fuel filter by initially draining and removing existing filter, then installing replacement. Bleed fuel system of air and re-prime fuel pump when done. (See "Engine Servicing: Checking/Replacing Oil & Filters".)
8. Inspect engine air cleaner for excessive dirt. Replace as required.
9. Inspect all hoses, belts, wiring, and connections around engine. Correct as required.
10. Disconnect ejector assembly and inspect for wear and conditions of O-rings and nozzle. Remove housing and check condition of ball, seat, and screen. Clean screen of any dirt or debris. Refer to "Priming System Service: Ejector Assembly" for procedures to disassemble and service ejector.
11. Check condition of discharge check valve.
12. Drain oil from mechanical seal and replace with SAE 20/20 oil. (Refer to "Pump Servicing: Mechanical Seal Servicing".)
13. Check and replenish grease at bearing bracket.

14. Check compressor timing belt tension. Deflection should be approximately 1" - 1/2" at center. Belt tension can be changed by adding/removing shims between compressor and mounting bracket. (Refer to "Priming System: Compressor Service".) If tension cannot be corrected, replace belt with spare.
15. Inspect compressor oil and air lines and connections for leaks, damage, etc. Examine compressor air filter for excessive dirt. Replace as required.

When complete, record items serviced and engine hours on 250-Hour Maintenance Checklist.

When maintenance is completed, it is suggested that pump be started and vacuum test performed with engine running and after switched off. Record vacuum gauge readings on checklist as reference.

Corrective Maintenance

Repair of a non-functioning pump can, in most cases, be made by identifying the problem and possible cause and making the correction accordingly. The table appearing in the following lists some of the more common problems with the associated causes and solutions. Additional troubleshooting concerning why a pump will not prime is also provided in the following.

Troubleshooting Guide

<i>Problem</i>	<i>Possible Cause</i>	<i>Solution</i>
Pump does not prime	<ol style="list-style-type: none"> 1. Suction lift excessive 2. Insufficient product at inlet 3. Suction/Strainer blocked 4. Suction hose collapsed 5. Check valve not seating 6. Mechanical seal drawing air 7. Ejector jet/nozzle worn 8. Ejector ball stuck 9. Compressor leaking 10. Compressor air volume 11. Compressor drive belt 12. Ejector screen blocked 	<ol style="list-style-type: none"> 1. Reduce lift distance 2. Re-position inlet/piping 3. Remove obstruction, clean 4. Replace hose 5. Check valve damage 6. Replace/Rebuild 7. Replace 8. Disassemble, remove obstruction 9. Check connections, replace 10. Service/Replace compressor 11. Increase belt tension, replace 12. Remove and clean
Insufficient Product	<ol style="list-style-type: none"> 1. Discharge head excessive 2. Suction lift excessive 3. Suction/Strainer blocked 4. Suction line not airtight 5. Suction hose collapsed 6. Mechanical seal drawing air 7. Obstruction 8. Impeller worn 9. Delivery hose punctured 10. Incorrect speed 	<ol style="list-style-type: none"> 1. Reduce distance 2. Reduce distance 3. Remove obstruction, clean 4. Repair leaks 5. Replace hose 6. Replace/Rebuild 7. Check and remove 8. Replace 9. Replace/Repair 10. Check throttle/speed setting
Pump requires excessive power	<ol style="list-style-type: none"> 1. Obstruction 2. Viscosity 3. Speed set too high 4. Impeller rubbing 	<ol style="list-style-type: none"> 1. Check body/impeller 2. Inappropriate application 3. Check throttle setting 4. Check and reset clearance
Pump Vibrating/Overheating	<ol style="list-style-type: none"> 1. Obstruction 2. Screen blocked 3. Impeller damaged 4. Cavitation 5. Speed set too high 	<ol style="list-style-type: none"> 1. Check body/impeller 2. Check/clear screen 3. Replace 4. Excessive suction lift, reduce 5. Check throttle setting

Priming System Troubleshooting

Use the following additional information to troubleshoot problems with the priming system. These tests require the use of a vacuum pad test fixture (available from Godwin Pumps of America, Inc.) and access to pump piping.

Pump Vacuum Pad Test

1. Remove suction piping at suction flange of pump.
2. Close drain valves on volute and discharge valves
3. Start engine
4. Let engine warm up while idling.
5. Position vacuum pad on pump suction flange. Make sure pad gasket seats firmly around edge.
6. Raise engine speed through range recommended by Godwin Pumps.
7. Note reading on gauge of vacuum pad.
8. If gauge reads low (e.g., 5"-10" of mercury) or not at all, check the following:
 - Check that volute drain valve is closed
 - Check for obstructions in check valve at discharge
 - Check for airflow from venturi outlet hose
 - Check compressor operation
 - Check separation tank screen for obstruction
 - Check O-rings of ejector assembly
 - Check for leaks on mechanical seal
9. If gauge reads 20"-25" of mercury, check the following:
 - Restrictions in hose or screen
 - Air leak into suction hose, usually at fitting
 - Distance of vertical suction lift from source to pump impeller. Cannot be in excess of 27'

The following section ("Service") provides specific procedures to service the priming system.

Maintenance Records

It is recommended that all maintenance of the pump, engine, and trailer be recorded for future reference. Maintenance checklists contained in the Appendix are available to record and document any maintenance performed on the equipment. These sheets can be removed from this manual and reproduced to serve as a hard copy maintenance record.

SERVICE

This section contains the instructions and procedures to service your Godwin Model HL130M Pump. Included are:

- Pump Servicing
- Priming System Service
- Engine Servicing

Proper, periodic, preventative servicing of your Godwin Pump will result in longer, more reliable operation with less downtime due to emergency repairs. Servicing should be performed according to the recommendations described in the "Maintenance" section of this manual.

Before attempting any of these procedures, the recommended tools and supplies should be readily available and accessible. (See "Tools & Materials" in the Introduction of this manual.)

Servicing Procedures

For convenience, major servicing procedures for the Model HL130M pump are contained in the following pages. If desired, these pages can be copied and distributed to those responsible for servicing the equipment.

Pump Servicing

Major service areas of the pump include checking for proper clearances between pump impeller and wearplates, inspection and, if necessary, replacing/rebuilding the mechanical seal, and lubricating shaft end bearings.

Impeller Replacement

The Godwin HL130M impeller is mounted on the shaft via a multi-spline drive arrangement. Before undertaking the following procedure, you will require replacement tab washer and O-rings.

1. Disconnect battery cables from battery before starting this procedure.

!!! WARNING !!!

This procedure involves access to operating parts of the pump. Accidental start-up may cause injury. Disconnecting battery will reduce the chance of accidental start-up.

2. Drain any product from the pump casing and non-return valve.
3. Remove front cover from pump body. This will expose the impeller.

!!! IMPORTANT !!!

Front cover is heavy and may require two people or hoisting equipment to remove.

4. Remove the impeller washer cover. This will expose the shaft fixing bolt. Unscrew this item after releasing the tab washer. Remove impeller washer.
5. Slide impeller from shaft. If required, the impeller can be jacked forward by using the rear wearplate. Release the four wearplate setscrews and use jack screws provided to carry out the procedure.
6. With impeller removed, check visually on shaft and impeller splines for signs of wear or damage. Physically check for rocking between the impeller and shaft.
7. Check O-rings situated in impeller hub and impeller washer for damage. Replace as necessary.
8. Remove and check impeller shims for wear or damage.

Impeller Installation

!!! IMPORTANT !!!

Clean both impeller and shaft splines completely.

1. Ensure rear wearplate is tight and located correctly.
2. Smear anti-seize compound on both shaft and impeller splines.
3. Fit O-ring into impeller hub. Ensure this area is clean and apply lubrication to the O-ring.

!!! IMPORTANT !!!

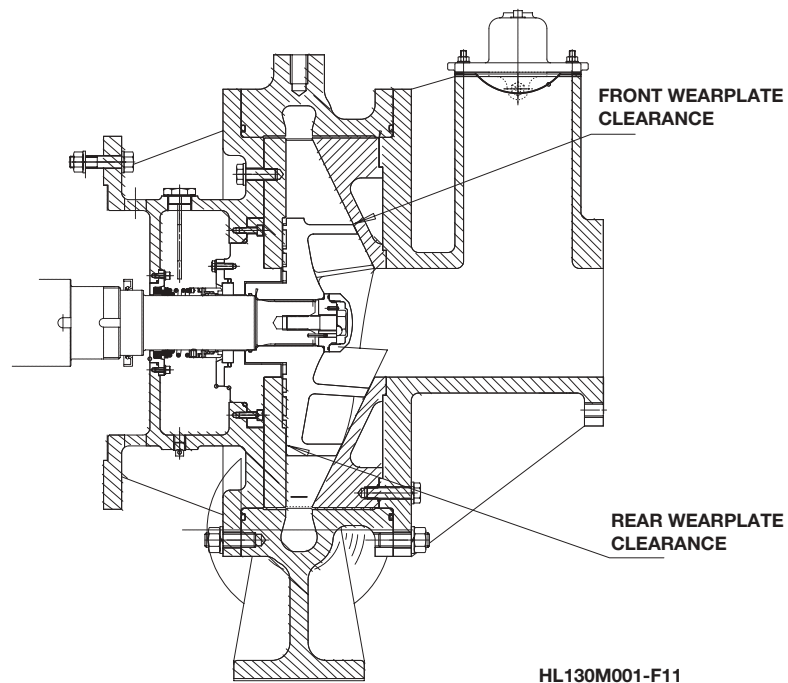
When carrying out installation of impeller shims, do not use the new stiff lock bolt. Use a standard bolt or the used stiff lock bolt.

4. Install impeller shims into hub of impeller, fit washer with O-ring and fully tighten impeller setscrew to correct torque of 240 Nm. Remove and add shims to obtain the correct clearance between impeller and rear wearplate – 0.020" - 0.025".
5. When the correct clearances have been achieved, bend tab washer to lock impeller screw, ensuring that roll pin locates in tab washer.
6. Replace impeller washer cover.
7. Replace front cover and check clearances between impeller and wearplates. See "Adjusting Impeller/Wearplate Clearance".

Checking Impeller & Wearplate Clearance

Clearance between the rotating impeller and front/rear wearplates can greatly affect the operating efficiency of the pump. Inadequate clearance will cause premature wear of pump components. Excessive clearance will decrease pumping volume and efficiency. The pump is factory adjusted for a clearance of 0.020" to 0.025" between the impeller and wearplates, but this clearance should be checked at indicated maintenance intervals. Use the following to check impeller/wearplates clearances. Figure 11 illustrates this procedure.

Figure 11
Impeller & Wearplate Clearance



1. Disconnect battery cables from battery before starting this procedure.

!!! WARNING !!!

This procedure involves access to operating parts of the pump. Accidental start-up may cause injury. Disconnecting battery will reduce the chance of accidental start-up.

2. Reach into suction flange with 0.025" blade of feeler gauge and insert it between impeller and front wearplate. Blade should pass around perimeter of impeller without either excessive "play" or excessive restriction. Be sure to check all the way around, especially at each of the vanes of the impeller.
3. If clearance needs to be increased (i.e., too tight) or reduced (too loose), refer to the following procedure to change (see "Adjusting Impeller/Wearplate Clearance").
4. Remove front cover housing of pump by removing the retaining bolts around outside edge of housing. Set front cover aside when done.

!!! IMPORTANT !!!

Front cover is heavy and may require two people or hoisting equipment to remove.

5. With front cover removed, check for clearance between impeller and rear wearplate. Be sure to check all the way around. If clearance needs to be changed, refer to the following procedure.

Adjusting Impeller/Wearplate Clearance

Adjusting impeller clearance between wearplates involves adding or removing shims between the front cover and pump body (front wearplate clearance), or adding/removing shims between the impeller and shaft (rear wearplate clearance). This procedure is described in the following.

1. Determine where clearance is to be adjusted.
2. If front wearplate clearance is too great, remove shims between front cover and pump housing. Remove only one shim at a time if more than one are present and re-check for proper clearance.
3. If front wearplate clearance is less than 0.020"-0.025", remove shim from between front wearplate and front cover. Remove only one shim at a time and re-check clearance.
4. If impeller/rear wearplate clearance is too great, remove shims between shaft and impeller.
5. If clearance is less than 0.020" to 0.025", install shims between shaft and impeller.
6. Re-check both front and rear clearance before re-assembling. Note details in service record.

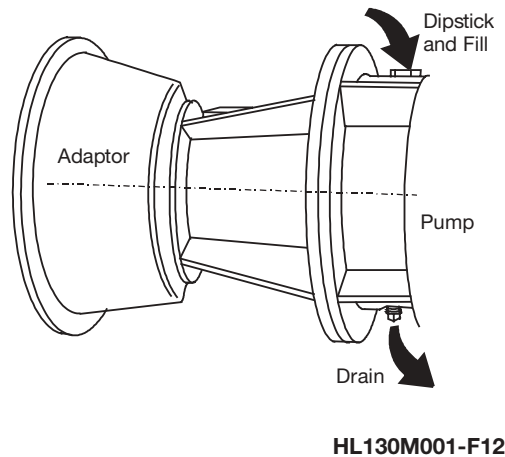
Mechanical Seal Servicing

The pump is fitted with the Godwin oil lubricated, dry running double mechanical seal comprised of silicon carbide interfaces on the pump end and silicon/carbon on the drive end. The only routine maintenance required for the seal is to regularly check that there is the correct level of oil in the rear gallery, by removing the oil filler/dipstick and checking the maximum/minimum levels. Any excess oil will be automatically vented from the top of the oil filler/dipstick plug.

Checking/Replacing Mechanical Seal Oil

Oil surrounding the mechanical seal should be checked daily and replaced during each designated maintenance interval. A supply of SAE 20/20 (engine) oil should be available before performing this procedure. Oil fill and drain locations of the mechanical seal of the Model HL130M pump are shown in Figure 12.

Figure 12
Mechanical Seal Oil Fill
and Drain Locations



1. Disconnect battery cables from battery before starting this procedure.

!!! WARNING !!!

This procedure involves access to operating parts of the pump. Accidental start-up may cause injury. Disconnecting battery will reduce the chance of accidental start-up.

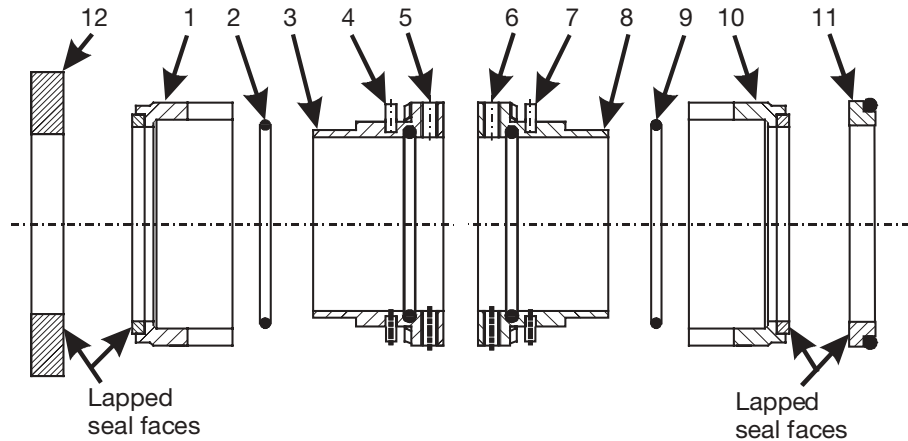
2. Remove the mechanical seal oil filler dipstick and check oil level. Oil should be within the level indicated on the dipstick (approx. top of housing). Replenish as necessary during daily maintenance.
3. If replacing oil (i.e., during 250-Hour Maintenance), position a suitable container at the drain plug location and remove drain plug. Allow oil to drain completely. Replace drain plug and refill with SAE 20/20 oil through vent plug. Replace vent plug and note oil change date/details in service log.
4. Dispose of used seal oil according to local environmental regulations.

Mechanical Seal Replacement

If, during troubleshooting, a failure of the mechanical seal is indicated, use the following to remove an existing seal. A subsequent procedure describes how to install and rebuild seal components

READ ALL FITTING INSTRUCTIONS BEFORE INSTALLATION OF THE SEAL
Refer to Figure 13 for corresponding components and locations

Figure 13
 Mechanical Seal
 Components



HL130M001-F13

!!! IMPORTANT !!!

Mechanical seals are precision engineered devices and extreme care must be taken to ensure that no damage occurs to lapped faces. Ensure that the lapped faces are absolutely clean throughout the entire installation. Soiled faces must be cleaned with appropriate degreasing cleaner and soft tissue.

1. Disconnect battery cables from battery before starting this procedure.

!!! WARNING !!!

This procedure involves access to operating parts of the pump. Accidental start-up may cause injury. Disconnecting battery will reduce the chance of accidental start-up.

2. Remove all burrs and sharp edges from where the seal must pass and clean the shaft.

!!! IMPORTANT !!!

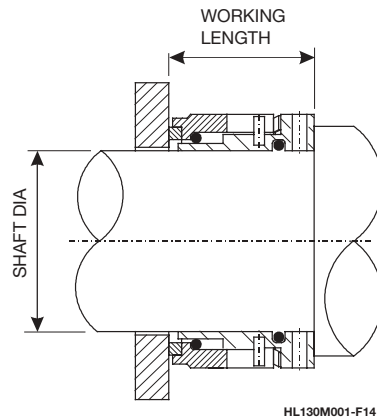
The two seal assemblies have different materials on their rotary heads – silicon carbide on the outboard seal and carbon on the inboard. Extreme care must be exercised in ensuring that the correct rotary head is used in each location. Failure to do so will lead to premature seal failure.

To help ensure that the parts are fitted in the correct order, you should identify each seal assembly before any item is removed. The boxes containing each are marked “Outboard” or “Inboard” as appropriate.

3. Clean the shaft thoroughly and lubricate with clean water or a diluted soft soap solution. Do not use heavy grease, silicone or PTFE based lubricants, as these can prevent the seal bellows from gripping the shaft.
4. Take the seal seat (Item 11) from the inboard assembly and carefully push into the adaptor seating.
5. Carefully clean the lapped seal face with a suitable degreasing agent and soft tissue.
6. Carefully remove the rotary head (Item 10) and O-ring (Item 9) from the assembly. Do not place rotary head face down as this may cause damage to the lapped seal face.
7. Take the sleeve assembly (Item 8) and ensure that the drive screws (Item 6) are fully retracted to prevent scratching of the shaft during assembly.
8. Lightly smear the O-ring (Item 9) with a silicon based grease lubricant. Place the O-ring inside the rotary head (Item 10). Avoid getting any grease onto the lapped seal face.
9. Gently push the rotary head (Item 10) onto the sleeve assembly (Item 8) ensuring that the drive pins (Item 7) are engaged in the slots of the rotary head.
10. Carefully slide the sleeve assembly along the shaft until the seal faces butt together.
11. Set the first seal working length and lightly tighten the drive screws to centralize and secure the sleeve on the shaft. Ensure that the seal faces are still abutted and the working length is correct, then tighten the drive screws fully.
12. Carefully remove the rotary head (Item 1) and O-ring (Item 2) from the outboard assembly. Do not place rotary head face down as this may cause damage to the lapped seal face.
13. Take the sleeve assembly (Item 3) and ensure that the drive screws (item 5) are fully retracted to prevent scratching the shaft. Slide the sleeve assembly along the shaft until it abuts the sleeve assembly (Item 6) previously fitted. Secure in place by fully tightening the drive screws.
14. Lightly smear the O-ring (Item 2) with a silicon based grease lubricant. Place the O-ring inside the rotary head (Item 1). Avoid getting any grease onto the lapped seal face.
15. Gently push the rotary head (Item 1) along the shaft and onto the sleeve assembly (Item 3) ensuring that the drive pins (Item 5) are engaged in the slots of the rotary head.
16. Fit the seal seat (Item 12) to the wearplate and retain with the retaining clamp. Be sure to use a new O-ring.
17. Fit the wearplates, smearing the outside diameter and O-ring with oil to aid assembly. This will also help to prevent the wearplates rusting into the adaptor and ease later strip-downs.

The second mechanical seal compression (working length) is automatically obtained and shims are not required. Figure 14 illustrates this.

Figure 14
Assembled Mechanical Seal



17. Fit the impeller to the shaft. Hold the impeller clamping washer in place and secure with an ordinary sacrificial bolt (not the one used on final assembly). Measure the clearance between impeller and the rear wearplate, adding or removing shims from between the impeller and shaft until the correct clearance is achieved.

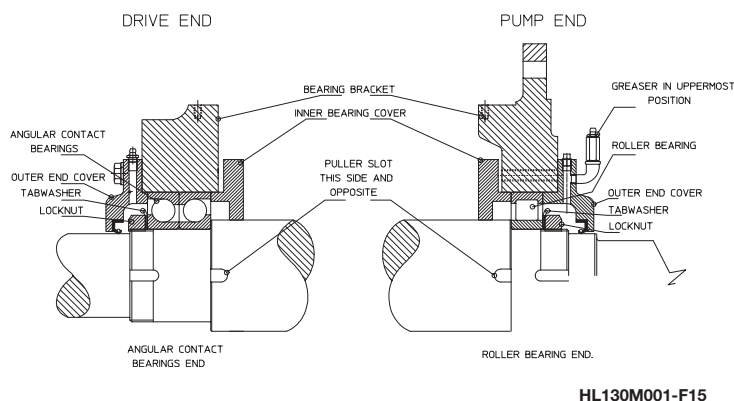
To ensure that the maximum impeller clearances are not exceeded, ensure that shaft end float is taken up at drive end for setting rear impeller clearance and at pump end for setting front impeller clearance.

18. Once the correct clearance has been obtained, fit a new impeller retaining bolt and locking washer. Under no circumstances should the old retaining bolt and washer be reused. Knock up the tabs on the locking washer and refit the locking bolt cover.
19. Refit the front cover, wearplate and ejector package complete. Check the front impeller clearance. Adjust if necessary by inserting or removing shims between the wearplate and front cover.
20. Reconnect the airline from the air compressor to the ejector.
21. Fill the seal chamber with SAE 20/20 oil.

Bearing Bracket Assembly and Greasing Procedure

Following is a procedure for assembly and greasing of the bearing bracket. Refer to Figure 15 for corresponding components and locations.

Figure 15
Bearing Bracket
Servicing Locations



1. Disconnect battery cables from battery before starting this procedure.

!!! WARNING !!!

This procedure involves access to operating parts of the pump. Accidental start-up may cause injury. Disconnecting battery will reduce the chance of accidental start-up.

2. Remove the pump hydraulic end assembly and mechanical seal.
3. Undo and remove the nuts and washers from the studs holding the adaptor to the pump body. Remove the pump body.

!!! IMPORTANT !!!

Pump body is heavy and requires hoisting equipment to remove.

4. Remove the grease nipple and extension pipe where they protrude through the mechanical seal adaptor.
5. Release the nuts on the bolts holding the adaptor to the bearing bracket and remove the fasteners. Remove the adaptor.
6. Remove the grease nipple and extension pipe where they protrude through the close coupling adaptor. Remove the adaptor.
7. Unscrew the drive end bearing cover fasteners and remove the bearing cover complete with lip seal. Note that the inner bearing cover will now be loose on the shaft.
8. Release the tab washer and remove the bearing locknut.
9. Extract the shaft and bearing assembly by pressing from the pump end. Take care that the loose inner bearing cover does not catch on or damage any part of the shaft assembly during this process. Remove the inner bearing cover.
10. Unscrew the pump end bearing cover fastenings. Note that three of these hold the inner bearing cover in place. Remove the inner bearing cover and pump end bearing cover.
11. If necessary, remove the angular contact bearings and the roller bearing inner race from the shaft and press out the roller bearing outer race from the bearing bracket.
12. Inspect all parts for damage or wear and replace as necessary. All lip seals and O-rings must be replaced.

Assembly

1. Ensure all parts are clean and free from burrs.
2. Heat the single roller bearing inner race and the two angular contact bearings with a bearing heater.

3. Once up to temperature, take the two angular contact bearings and slide them up hard against the shaft shoulder at the drive end. The bearing orientation is in "O" arrangement (i.e. with the two outer races "trapped" between the balls). Hold them there for a minimum of 30 seconds. This allows the races to grip the shaft and prevents them from creeping away from the shoulders during cooling. Let the assembly cool completely.
4. Take the single roller bearing inner race and slide it up hard against the shaft shoulder, holding it there for a minimum of 30 seconds to allow the race to grip the shaft and prevent it creeping away from the shoulder during cooling. Let the assembly cool completely.
5. Fit the drive end tab washer and locknut. Lift up at least two tabs to lock the nut in position.
6. Take the single roller bearing outer race and press it into the bearing bracket at the pump end. Use the pump end bearing cover, without the lip seal fitted, to press it into its final position.
7. Pack the two angular contact bearings with grease. Allow sufficient excess to fill the cavities at either side one-third full.
8. Lightly grease the bearing rollers and the raceway of the outer race of the single roller bearing.
9. Position the bearing bracket with the shaft axis vertical (pump end down) and the inner bearing covers loose in the line of the shaft internally. Press the shaft/bearing assembly into position.
10. Fit the drive end bearing cover (without lip seal) and tighten the retaining screws by hand. Rotate the shaft assembly by hand about a dozen times to ensure free movement.
11. Remove the drive end bearing cover. Grease the drive end lip seal and press it into the drive end bearing cover (lip seal facing in). Add a small amount of grease to the internal cavity of the cover and refit.
12. Fit the pump end tab washer and locknut. Lift up at least two tabs to lock the nut in position.
13. Fit the bearing cover pump end cover to the bearing bracket.
14. Check that the assembly rotates freely.
15. Grease the bearing cover pump end lip seal and press it into the pump end bearing cover (seal lip facing in).
16. After fitting the mechanical seal adaptor and close coupling adaptor, fit the bearing cover extension pipes and grease nipples. Charge the bearings with grease until it just emerges from the inner bearing covers.

Priming System Servicing

Servicing of the priming system consists of removing and inspecting the ejector assembly and the compressor air filter.

Ejector Servicing

Servicing of the ejector involves removing the assembly from the air separation enclosure, examining it, and, if necessary, replacing the gasket. Additionally, the non return valve ball, seat, and screen should be inspected and cleaned of any dirt, debris, or accumulated product buildup.

Use the following to service the ejector of the priming system. Refer to Figure 3 for corresponding locations.

1. Disconnect battery cables from battery before starting this procedure.

!!! WARNING !!!

This procedure involves access to operating parts of the pump. Accidental start-up may cause injury. Disconnecting battery will reduce the chance of accidental start-up.

2. Loosen compressor line connection to remove ejector from housing. Ensure that retaining bolt is completely backed-out to eliminate damage to ejector or housing during removal. There is no need to remove hose at this time. However, it may be more convenient to remove hose from ejector for inspection and cleaning.
3. Note condition of nozzle and O-rings. If nozzle is worn or damaged, it may require replacement. O-rings should not be worn, abraded, or crushed. If so, replace with spares after cleaning. (See step 4.)
4. Use high pressure hose or equivalent to clean ejector and nozzle from any accumulated dirt, debris, or product. Check hose for any obstructions. Replace O-rings if indicated.
5. Detach airline from compressor and remove the four bolts securing the air separation tank housing. Inspect for proper operation of non return valve ball into seating. If valve seat damaged, worn, etc., replace with spare. Inspect screen and clean as necessary.
6. Re-assemble ejector nozzle and air separation housing when done. It is advised to coat fastenings with anti-seize compound to assist in later disassembly/servicing. Record details of priming system servicing on service record.

Compressor Servicing

The Model HL130M is supplied with an engine mounted air compressor. Servicing procedures include checking the air filter during routine service intervals.

Engine Servicing

Servicing procedures for the engine of the HL130M pump include changing the engine oil and filter, changing the fuel filter, and flushing/replacing coolant. Procedures and recommendations for performing these activities are found in the documentation for the engine from the manufacturer (Caterpillar). This information is supplied in the package accompanying this manual.

PARTS INFORMATION

The following pages contain drawings used to locate and identify parts of the HL130M pump. It is intended to assist in specifying replacement, spare and repair items of the pump.

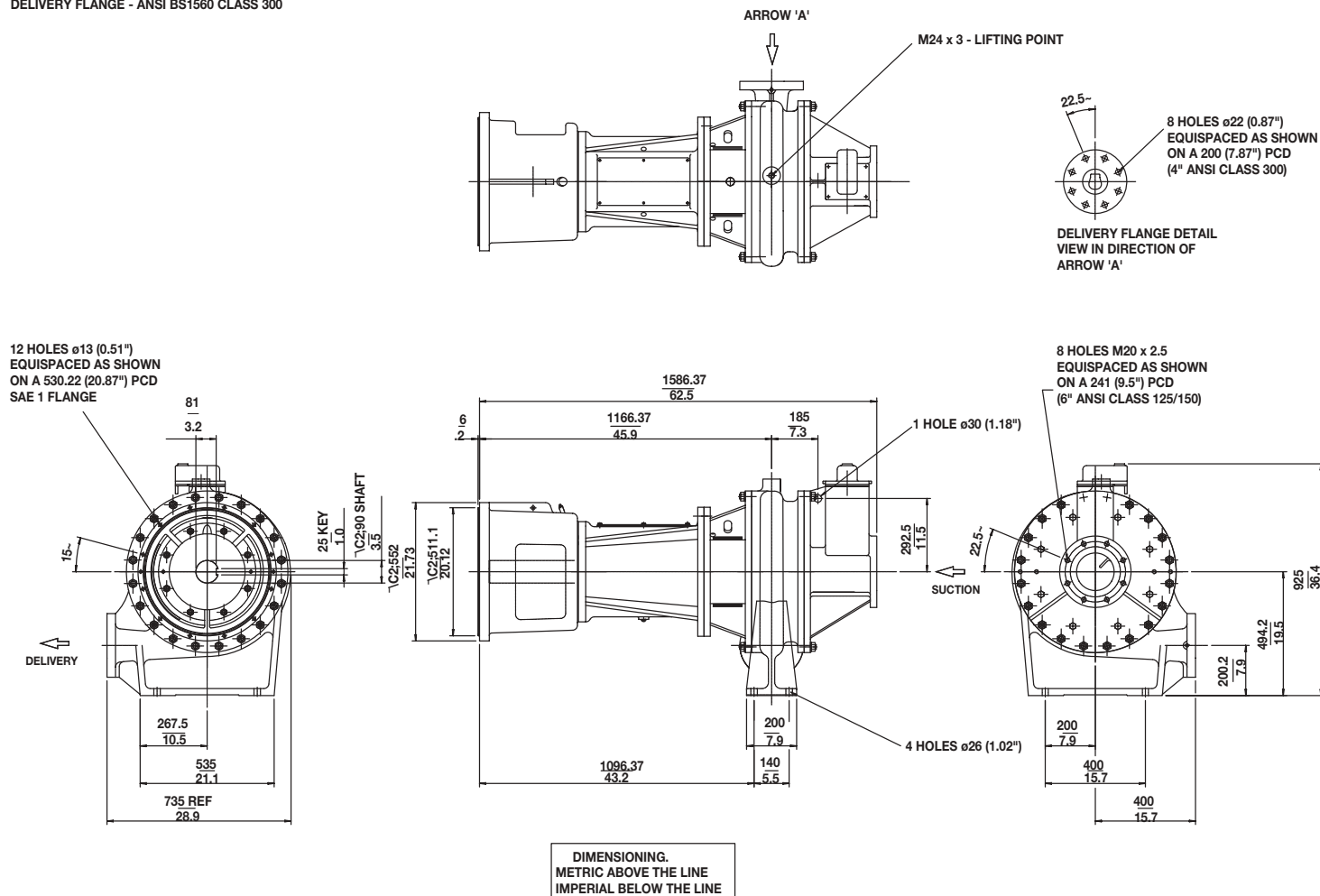
The following drawings are included:

- HL130M-BSGA-001, HL130M Outline Drawing
- HL130M-CI-ACW-01, Hydraulic End
- BB31-01, Bearing Bracket
- MA1213, Motor Adaptor
- EP41-15, Ejector Package

When specifying parts, refer to the Drawing Number, Reference Number from drawing, and, if possible, the serial number of the pump when contacting Godwin Pumps of America, Inc. (see “Serial Number Identification” in the Introduction of this manual).

	Size	P.C.D.	Hole Dia.	No. Holes
SUCTION	6"	241mm	M20 x 2.5	8
DELIVERY	4"	200mm	ø22	8

SUCTION FLANGE - ANSI BS1560 CLASS 125/150
DELIVERY FLANGE - ANSI BS1560 CLASS 300

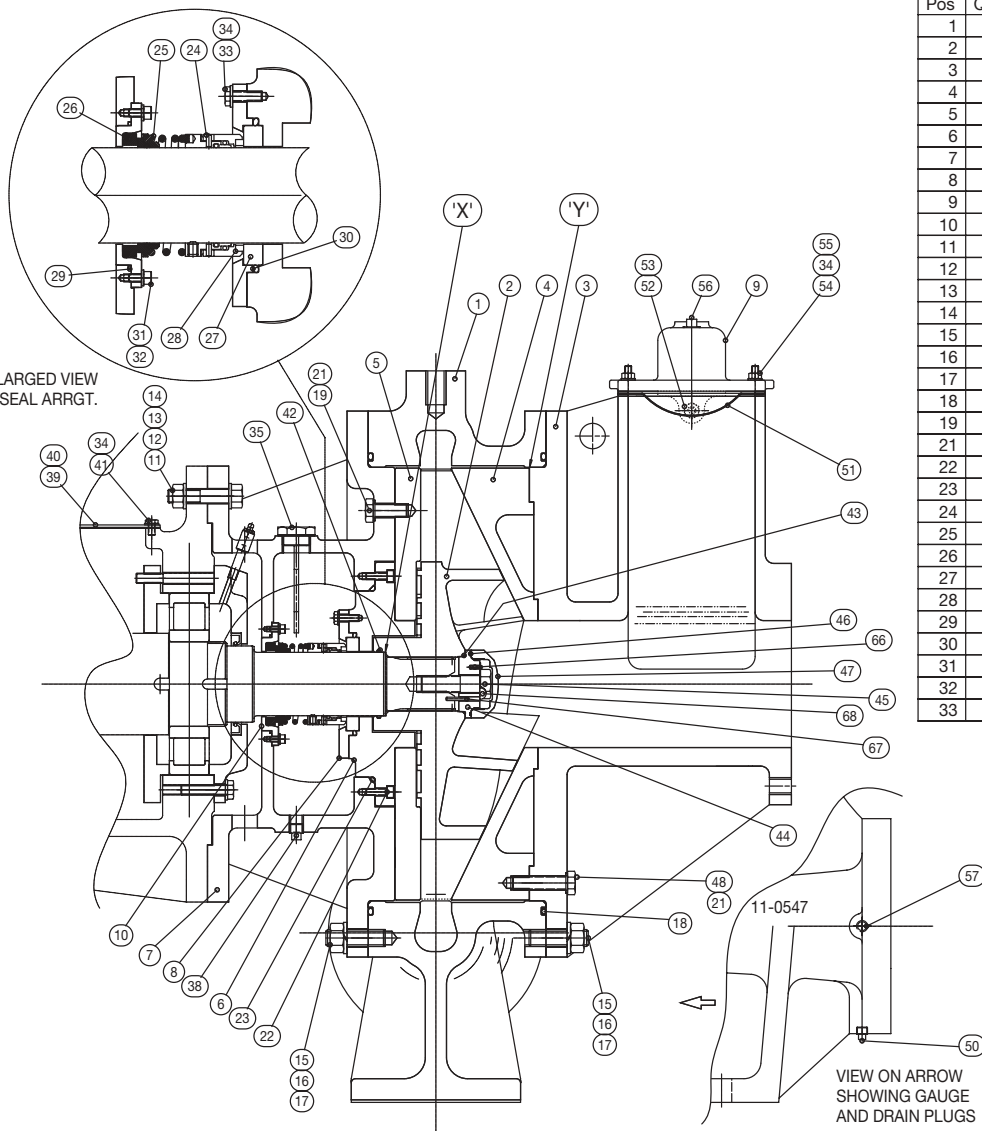


godwin
pumps

Godwin Pumps of America, Inc.
One Floodgate Road
Bridgeport, NJ 08014

Drawing Number:
HL130M-BSGA-001

Title:
**HL130M
OUTLINE DRAWING**



Pos	Qty	Description
1	1	BODY PUMP
2	1	IMPELLER
3	1	COVER FRONT
4	1	WEARPLATE FRONT
5	1	WEARPLATE REAR
6	1	WEARPLATE REAR
7	1	ADAPTOR
8	1	PLATE SEAL CLAMP
9	1	TANK SEPARATION
10	1	CARRIER
11	8	BOLT HEX HEAD
12	8	WASHER PLAIN
13	8	WASHER SPRING
14	8	NUT HEX FULL
15	40	STUD
16	40	WASHER SPRING
17	40	NUT HEX FULL
18	2	O RING
19	8	SCREW HEX HEAD
21	20	SEAL BONDED RUBBER
22	4	SCREW CAP HEAD SOCKET
23	1	O RING
24	1	SEAL MECHANICAL
25	1	FACE SEAL
26	1	SEAT SEAL
27	1	SEAT SEAL
28	1	FACE SEAL
29	1	O RING
30	1	O RING
31	4	SCREW CAP SOCKET
32	4	WASHER SPRING
33	4	SCREW HEX HEAD

Pos	Qty	Description
34	14	WASHER SPRING
35	1	PLUG OIL FILLER
38	1	PLUG
39	1	PLATE
40	1	GASKET
41	6	SCREW HEX HEAD
42	1	O RING
43	1	O RING
44	1	WASHER IMPELLER
45	1	BOLT HEX HEAD
46	1	O RING
47	1	COVER IMPELLER WASHER
48	8	SCREW HEX HEAD
50	1	PLUG
51	1	FILTER
52	1	SCREW HEX HEAD
53	1	WASHER SPRING
54	4	STUD
55	4	NUT HEX FULL
56	1	PLUG
57	1	PLUG
58	1	SHIM IMPELLER
59	1	SHIM IMPELLER
60	1	SHIM IMPELLER
62	1	SHIM WEARPLATE
63	1	SHIM WEARPLATE
64	1	SHIM WEARPLATE
65	1	SHIM WEARPLATE
66	1	PIN ROLL
67	1	PIN ROLL
68	1	WASHER TAB

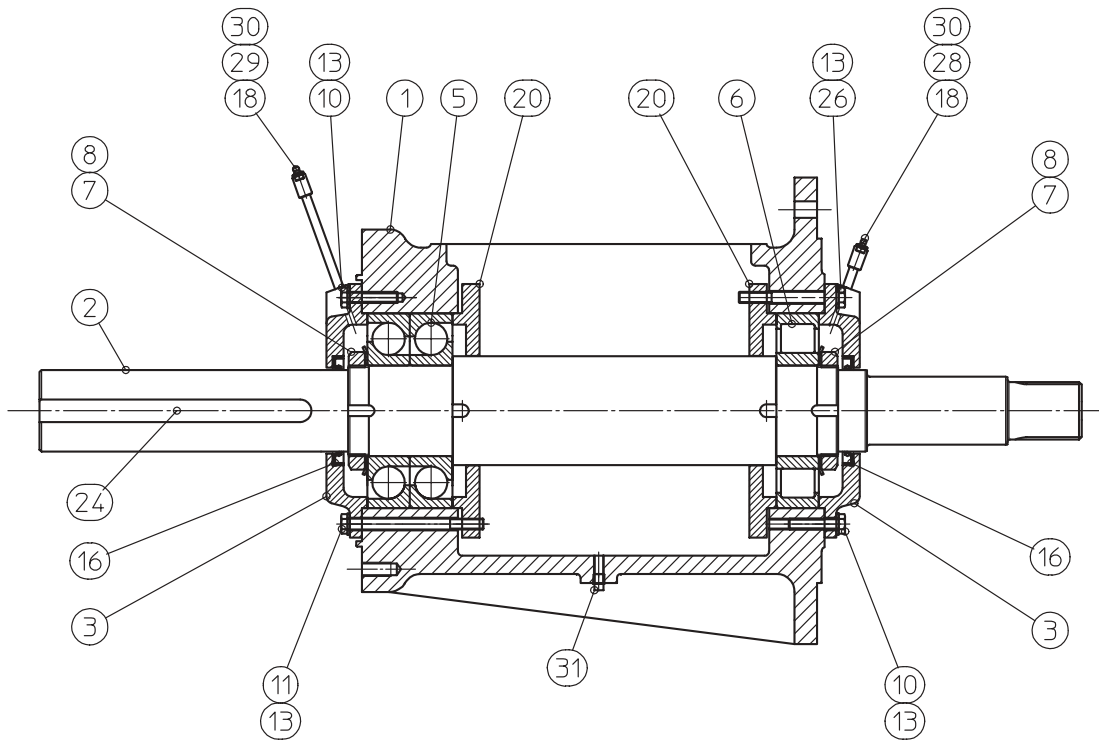
godwin
pumps

Godwin Pumps of America, Inc.
One Floodgate Road
Bridgeport, NJ 08014

Drawing Number:
HL130M-CI-ACW-01

Title:
HL130M
HYDRAULIC END

31	1	PLUG
30	2	SOCKET EQUAL
29	1	PIPE
28	1	PIPE
26	3	BOLT HEX HEAD
24	1	KEYSTEEL
20	2	COVER BEARING
18	2	NIPPLE GREASE
16	2	SEAL LIP
13	12	WASHER SPRING
11	3	BOLT HEX HEAD
10	6	SCREW HEX HEAD
8	2	WASHER TAB
7	2	LOCKNUT BEARING
6	1	BEARING ROLLER
5	2	BEARING ANGULAR CONTACT
3	2	COVER BEARING
2	1	SHAFT
1	1	BRACKET BEARING
Pos	Qty	Description



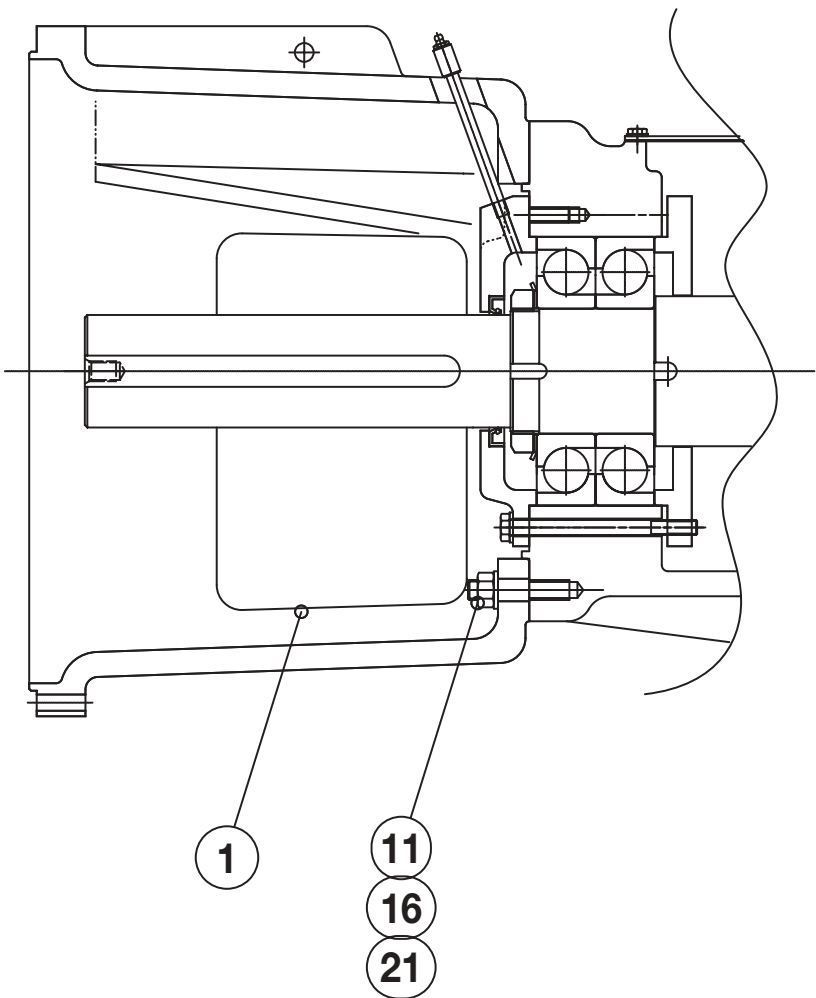
godwin
pumps

Godwin Pumps of America, Inc.
One Floodgate Road
Bridgeport, NJ 08014

Drawing Number:
BB31-01

Title:
HL130M
BEARING BRACKET

21	8	WASHER SPRING
16	8	NUT HEX FULL
11	8	STUD
1	1	ADAPTOR ENGINE
Pos	Qty	Description



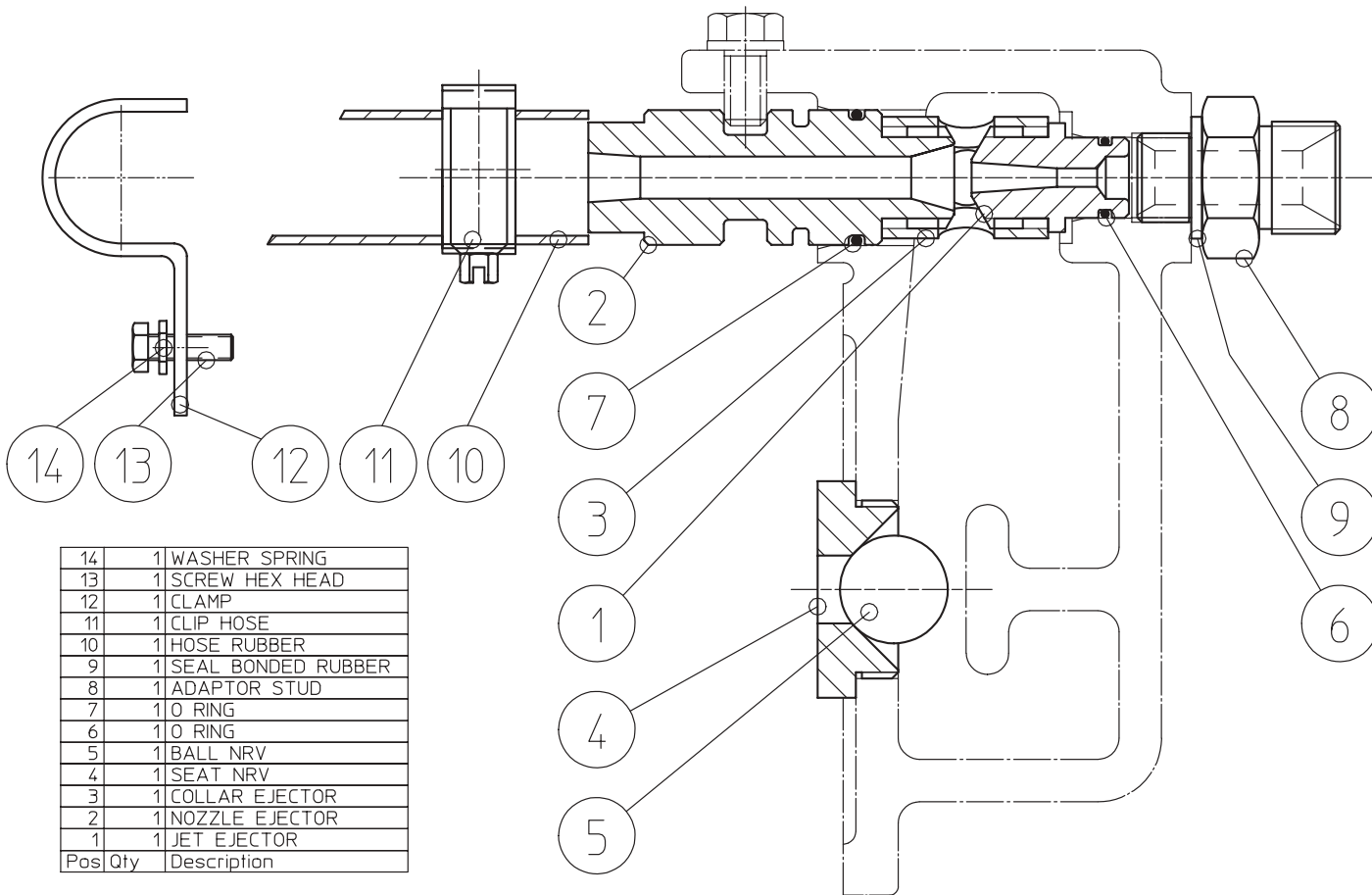
godwin
pumps



Godwin Pumps of America, Inc.
One Floodgate Road
Bridgeport, NJ 08014

Drawing Number:
MA1213

Title:
HL130M
MOTOR ADAPTOR



14	1	WASHER SPRING
13	1	SCREW HEX HEAD
12	1	CLAMP
11	1	CLIP HOSE
10	1	HOSE RUBBER
9	1	SEAL BONDED RUBBER
8	1	ADAPTOR STUD
7	1	O RING
6	1	O RING
5	1	BALL NRV
4	1	SEAT NRV
3	1	COLLAR EJECTOR
2	1	NOZZLE EJECTOR
1	1	JET EJECTOR
Pos	Qty	Description

**godwin
pumps**

Godwin Pumps of America, Inc.
One Floodgate Road
Bridgeport, NJ 08014

Drawing Number:
EP41-15

Title:
HL130M
Ejector Package

APPENDIX

- Equipment Identification Log
- Maintenance Checklists

**Equipment
Identification Log**

Designation: _____

Location: _____

Pump Serial Number: _____

Engine Serial Number: _____

Other: _____

Daily Maintenance Checklist

Pump: _____

Location: _____

Checked By: _____ Date: __ / __ / __

Engine Hour Meter: _____

	<i>Checked</i>	<i>Action Performed</i>
Engine Oil	<input type="checkbox"/>	_____
Diesel Fuel	<input type="checkbox"/>	_____
Radiator Coolant	<input type="checkbox"/>	_____
Mechanical Seal Coolant Level	<input type="checkbox"/>	_____
Shaft Bearings Lubrication	<input type="checkbox"/>	_____
Volute Drain Valve	<input type="checkbox"/>	_____
Discharge Check Valve	<input type="checkbox"/>	_____

250-Hour Maintenance Checklist

Pump: _____

Location: _____

Checked By: _____ Date: __ / __ / __

Engine Hour Meter: _____

	Checked	Action Performed
Pump Condition	<input type="checkbox"/>	_____
Impeller Clearance	<input type="checkbox"/>	_____
Front Wearplate	<input type="checkbox"/>	_____
Rear Wearplate	<input type="checkbox"/>	_____
Engine	<input type="checkbox"/>	_____
Oil & Oil Filter	<input type="checkbox"/>	_____
Coolant	<input type="checkbox"/>	_____
Radiator Coils	<input type="checkbox"/>	_____
Fuel Filter	<input type="checkbox"/>	_____
Air Cleaner	<input type="checkbox"/>	_____
Hoses	<input type="checkbox"/>	_____
Belts	<input type="checkbox"/>	_____
Wiring	<input type="checkbox"/>	_____
Ejector	<input type="checkbox"/>	_____
O-Rings	<input type="checkbox"/>	_____
Nozzle	<input type="checkbox"/>	_____
Ball & Seat	<input type="checkbox"/>	_____
Screen	<input type="checkbox"/>	_____
Mechanical Seal Oil	<input type="checkbox"/>	_____
Motor Adaptor Grease	<input type="checkbox"/>	_____
Vacuum Test		
Engine Running	__ "	
Engine Off	__ "	