

FOG ENFORCER

GREASE ENFORCER

Operation & Maintenance Manual

Mohegan Sun Casino • Uncasville, CT • 8/17



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FOG ENFORCER	GREASE ENFORCER
	System Overview
<u>DESCRIPTION</u> The Grease Enforcer was designed for those facilities that want to take charge of their pretreatment system to meet wastewater discharge limits, solid waste disposal requirements and reduce their risk of exposure to escalating disposal costs. You can think of it as having a pumping truck permanently stationed on site providing daily disposal service, but with an environmentally “friendly” separation operation output of recyclable fats and oils utilizing the FOG Enforcer component of the Grease Enforcer system, and removal and collection of landfillable “dry” coarse solids utilizing the dual liquids/solids separators. Incidental solids from kitchen flows are trapped and transferred by the Automatic Solids Transfer System. In addition to incidental solids, heavy loadings of coarse solids are removed by the dual automatic liquids/solids separator in the Grease Enforcer system. The heart of the Grease Enforcer system is the automatic grease and oils separator. This unit removes grease and oils from wastewater streams. The efficient separation process removes 98% of free-floating grease and oils, and automatically places them in a container. The oil/grease recovered is virtually water free, and therefore ready to be sold to a rendering company. The Grease Enforcer utilizes low shear design diaphragm pumps to transport the grease, oils, and solids from the remote separator quickly and without emulsification of the grease and oils. The pumps also allow the specifying engineer to site the Grease Enforcer in the optimum location for convenience, traffic and site aesthetics, regardless of where the separation tank (or existing grease trap) is located. The Grease Enforcer has a brain, too, that ensures the operating cycle will perform without a hitch each time the system operates. The Grease Enforcer system is both environmentally friendly and operation friendly. <u>BENEFITS</u> • Automatically removes coarse solids • Automatically removes free-floating fats and oils • Helps reduce BOD levels and associated surcharges and fines • Reduces operation costs versus paying for pumping service • Removed dewatered coarse solids are landfill ready • Removed greases/oils are recycle ready for rendering • Removes up to 900 pounds of fats/oils and 2000 pounds of solids per day <u>FEATURES</u> • Rugged corrosion resistant construction • Easy-access solids removal units • Reliable automatic operation • Easy to service modular design <u>APPLICATIONS</u> • Restaurants • Casinos • Schools • Bakeries • Cafeterias • Hotels • Nursing Homes • Universities • Food Processing Plants • Shopping Centers/Malls • Manufacturing Plants • Commissaries • Airports • Resorts • Hospitals • Institutions • Correctional Facilities ©2017 FOG Enforcer All rights reserved • Patented/Patents Pending • Specifications subject to change without notice	
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System Specifications

Grease Enforcer

Services existing sump pit or grease trap daily. Automatically separates grease and oils into a collection container. Solids are placed in a separate container.

System Includes:

- FOG Enforcer 75 GPM Automatic Grease Removal Unit
- Two (2) Automatic Solids Separators
- System Control Panel*
- Back-wash Assembly
- Two 1/2 HP (2) diaphragm lift pumps
- Powder Coated Cold-Rolled Steel Support Frame

Electrical Requirements. 230VAC, 3 Phase, 30 Amp.

Eductor Pump Water Supply Requirements.** . 3/4" supply line, 12 GPM

Maximum Grease Removal. 1744 Pounds/Day

Skimming Rate. 136 Pounds/Hour

Solids Removal Capacity. > 2000 pounds/day

Suggested Containment Space. . . . 8' W x 10' L x 8' H

Diaphragm Pump Maximum Lift Capability. . . . 12 feet from static water level of separator tank to highest point of diaphragm pump inlet piping. Please contact factory for higher lift situations.

***Wiring Diagrams & Timing Charts are attached to Grease Enforcer system.**

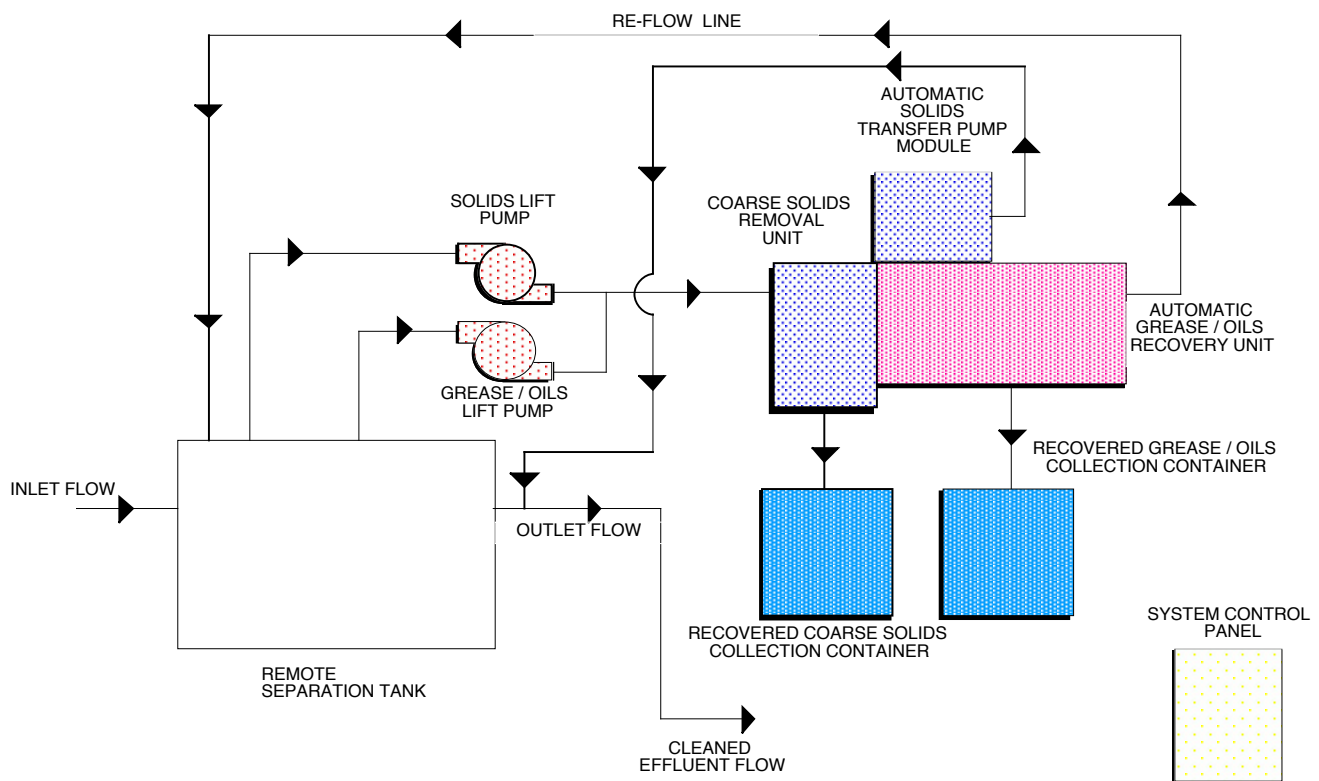
**** Facility is responsible for providing a minimum 3/4", 12 GPM water supply for eductor pump operation. FOG Enforcer supplies a 3/4" female connector to connect to this supply.**

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Operation Flowchart



1. Grease/Oil/Solids bearing flow enters the separator tank from the kitchen. Wastes immediately separate into floating & non-floating (heavier than water) components.
2. Time controller activates Grease Enforcer to begin automatic separation operation. **Solids Cycle**
3. Lift pump #2 activates and lifts heavier-than-water solids from the solids hopper installed in the separator tank. This flow passes through the dual solids removal units, where coarse solids are separated, dewatered, and emptied into the waste container.
4. The effluent passes through the solids removal units into the FOG Enforcer automatic grease & oil removal unit, where fine solids are trapped and automatically removed from the system.
5. The cleaned water passes through the FOG Enforcer and is returned to the separator tank. **Grease Cycle**
6. Lift pump #1 activates, lifting accumulated fats, oils and grease from the top 2 - 3" on the separator tank. Any coarse solids in this flow are separated through the solids removal component, and any fine solids are removed using the eductor pump on the FOG Enforcer.
7. The fats, oils and grease separate from the effluent in the FOG Enforcer. The "cleaned" effluent passes through the FOG Enforcer and is returned to the separator tank.
8. The motors & heaters in the FOG Enforcer activate, skimming the fats, oils & grease out and depositing them into a grease collection container.
9. The backwash lines activate periodically during the FOG Enforcer skimming cycle to maintain static liquid level in the Big Dipper unit for optimum skimming efficiency.

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System Control

Grease Enforcer System Control

The Grease Enforcer is designed with the flexibility to service a variety of situations. The system control panel may be easily programmed to provide up to six cleaning cycles per day (most applications require only one or two daily cycles). Setting the cleaning cycles is a simple process. Inside the system control panel are two 24-hour timers. Each timer controls a grease cycle and a solids cycle. The timers in turn are controlled by two selector switches. These selector switches determine how long each cycle will run for. The selector switches are labelled "Light", "Medium", and "Heavy". The operator determines the setting according to which setup works best with the installation/facility. Pushing in one (1) tab on the timer starts the Grease Enforcer cleaning cycle. Each cleaning cycle can take up to four (4) hours (when the "Heavy" cycle is selected for both the Grease & Solids cycle). Therefore, a maximum of one tab should be pushed in on either timer each four hour period.

When the system senses a tab in the "On" position, a pre-programmed logic controller (part #PLC-1) is activated. The PLC-1 automatically controls timing sequences that ensure the pumps, heaters, motors and other components needed to provide grease & solids removal operate in the proper sequence. The PLC-1's operating cycle is programmed and tested at FOG Enforcer, and cannot be altered by non-factory personnel. The operating cycle & timing sequences are displayed on an instruction sheet provided with the system.

The Grease Enforcer is designed to operate with 230 volt three phase power. The system requires 30 amp rated fuses on the supply input. The system has individual internal fusing for each major component group. Shutting off power to the Grease Enforcer will not harm the internal electronics or programming.

The system is supplied with a mechanic's cycle, which enables the Grease Enforcer to operate at 1/10 normal time. This allows the Grease Enforcer to operate each cycle ten times faster than normal, allowing the operator to check each cycle to ensure full operation. To operate the mechanic's cycle, simply press the button in the Control Panel labelled "Mechanic's Cycle".

There is also a feature that allows the grease removal unit to drain itself out. To utilize this feature, push the button labelled "Tank Drain" on the Control Panel when the Grease Enforcer is not actively engaged in either the Grease or Solids cycle. Pushing this button activates the eductor pump, emptying the grease removal unit. This feature allows for ease of periodic cleaning of the FOG Enforcer grease removal component included with the system.

Note: This equipment must be installed to comply with all national, state, and local electrical & plumbing codes for your area. Installation should only be performed by a qualified, licensed electrician & plumber.

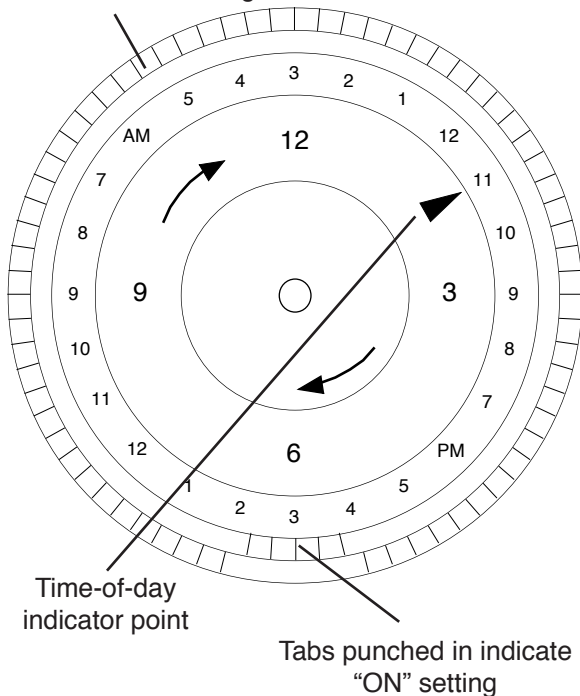
Note: Caution should be used when working with any electrical device. Shutting off power to the Grease Enforcer will not harm the internal electronics or programming.

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Timer Operation

Tabs **not** punched in indicate "OFF" setting



TO SET TIMER:

1. Push on/off tabs on the outer ring of timer inward into dial at desired "ON" times. Only one tab is needed to start the Grease Enforcer cycle.
2. Turn dial **CLOCKWISE** one or more complete revolutions until the present time is aligned with the time-of-day indicator point.
3. Always set one cycle timer to run at least 2 hours after the previous cycle. The "Heavy" setting for both the grease & solids cycle runs for 2 hours. The grease & solids cycles cannot run simultaneously.

The FOG Enforcer Grease/Solids Timer System offers a great deal of flexibility to match the needs of your kitchen. This improved version incorporates dual 24-Hour Timers coupled with dual selector switches (one each for solids removal cycle and grease removal cycle). The selector switch provides three settings (heavy, medium and light) in order to best handle the grease and solids loading from your kitchen operation. If you have high loadings of solids but a minimal loading of grease, simply set the Solids selector switch at "Heavy" and the Grease selector switch to "Light," or vice versa if it's the other way around.

Grease Cycle Operation:

Three different grease cycles are operator selectable for lift pump running duration of 30 minutes (light), 60 minutes (medium), and 120 minutes (heavy). Grease & oils skimming, solids removal, system flushing and AST timing reflect these settings.

The grease timer (clock) should be set to the desired running time for the grease lift cycles (presumably right after meals). The grease cycle is programmed to run one cycle and wait for the next "ON" occurrence on the 24-hour timer to run again. The grease cycle takes precedence over the solids cycle - if the solids cycle were running, it would pause in order to allow the grease cycle to be completed. The solids cycle begins again upon grease cycle completion.

Solids Cycle Operation:

The frequency of solids lift cycles is operator selectable. Solids lift cycles occur every 120 minutes (light), 60 minutes (medium), or 30 minutes (heavy) as determined by selector switch position. Solids removal, flushing, and AST operation match frequency with the solids cycle.

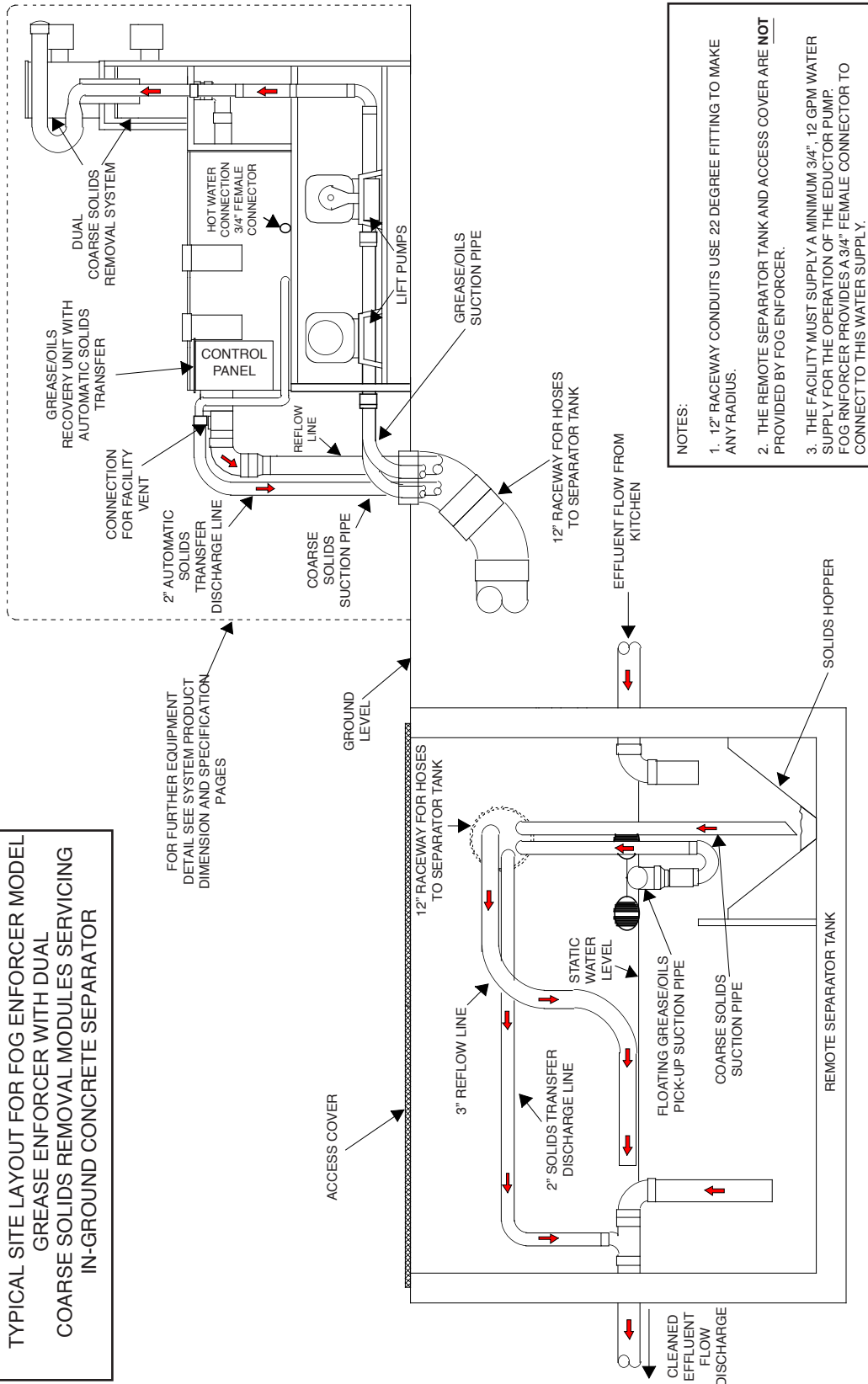
The solids timer (clock) should be set to the time when the solids removal process begins and the pins on the 24-hour solids timer are turned to their "ON" position. The solids operation ends when the "OFF" setting is reached. The solids program begins at the initial "ON" occurrence and repeats (loops) until the timer reaches the "OFF" settings.

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Grease Enforcer

TYPICAL SITE LAYOUT FOR FOG ENFORCER MODEL GREASE ENFORCER WITH DUAL COARSE SOLIDS REMOVAL MODULES SERVICING IN-GROUND CONCRETE SEPARATOR

FOR FURTHER EQUIPMENT
DETAIL SEE SYSTEM PRODUCT
DIMENSION AND SPECIFICATION
PAGES



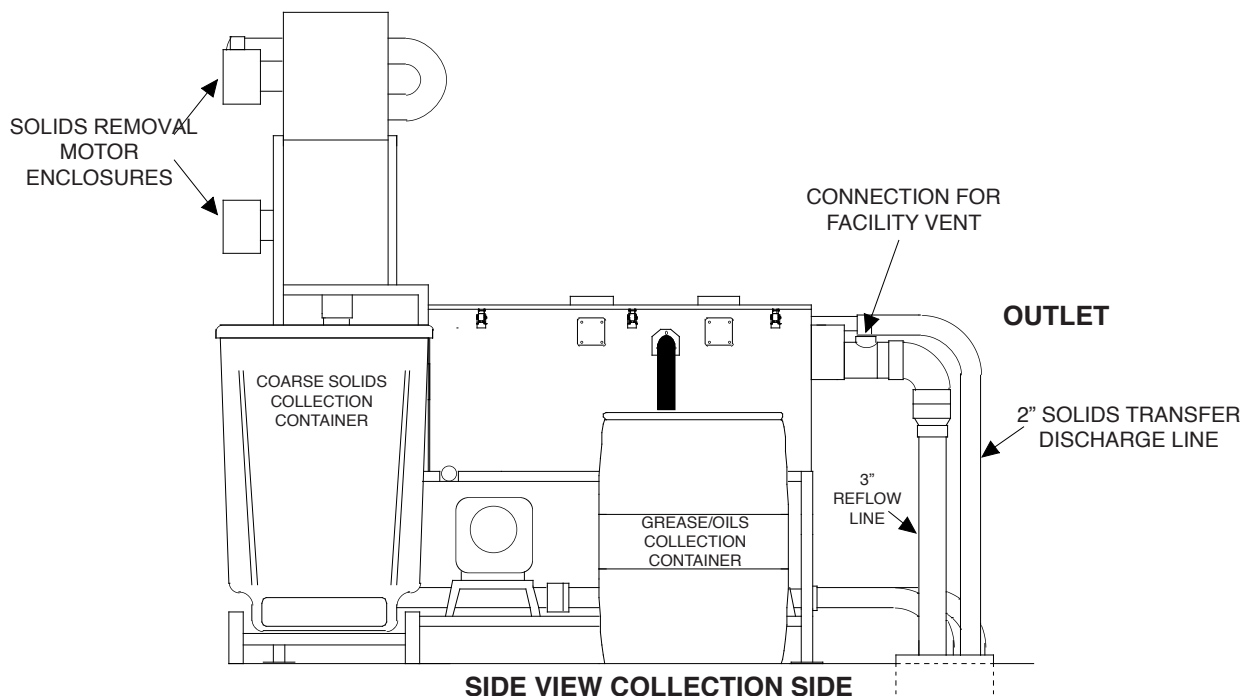
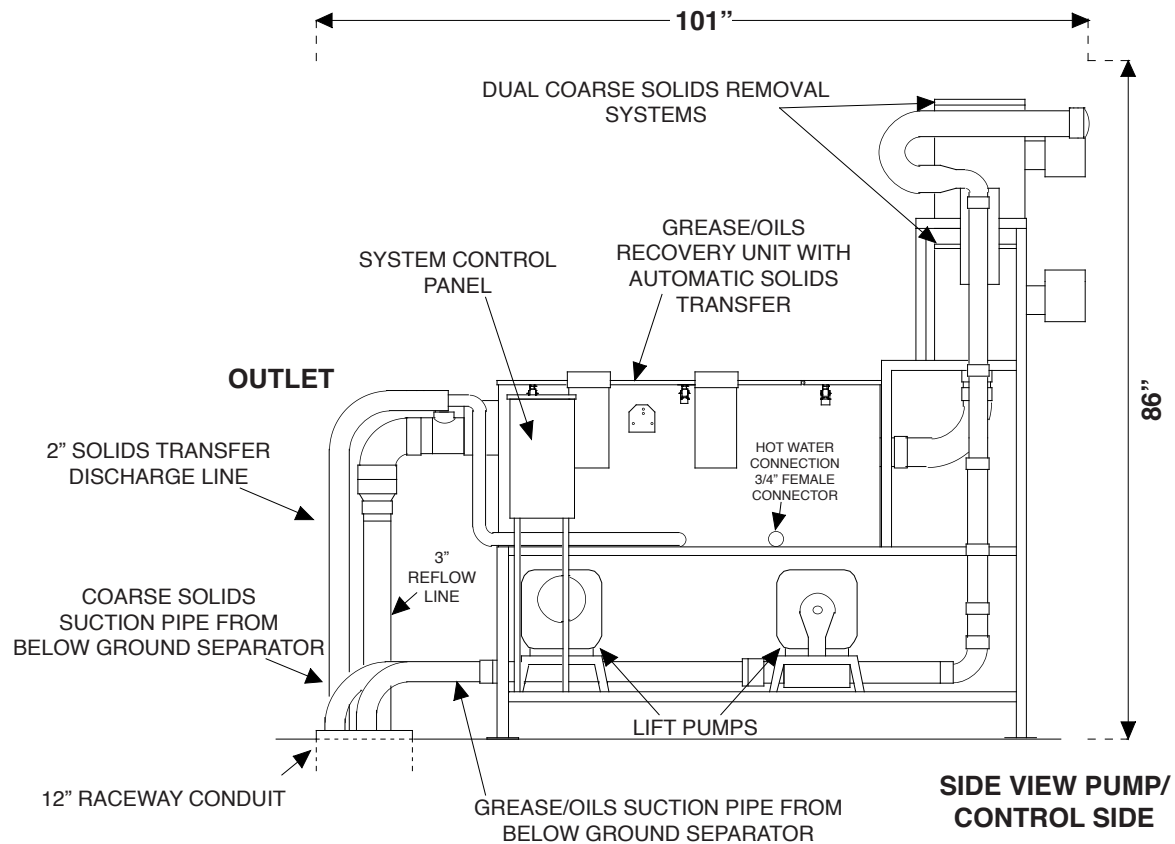
Note: The remote separator tank is not provided by FOG Enforcer.
The remote separator tank will be designed by the engineer to be a passive grease trap.

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Side Views

Grease Enforcer



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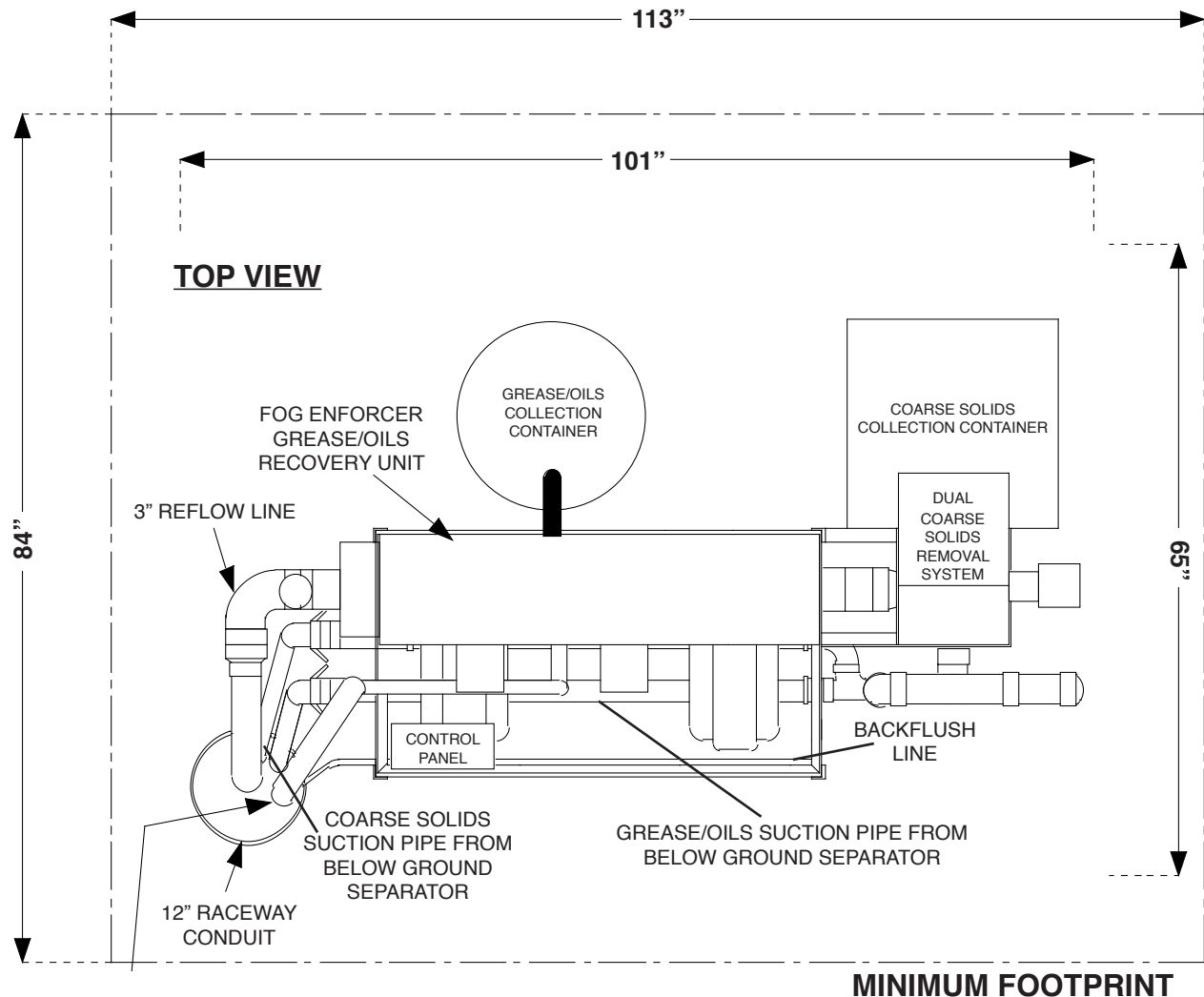
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Top View

Grease Enforcer



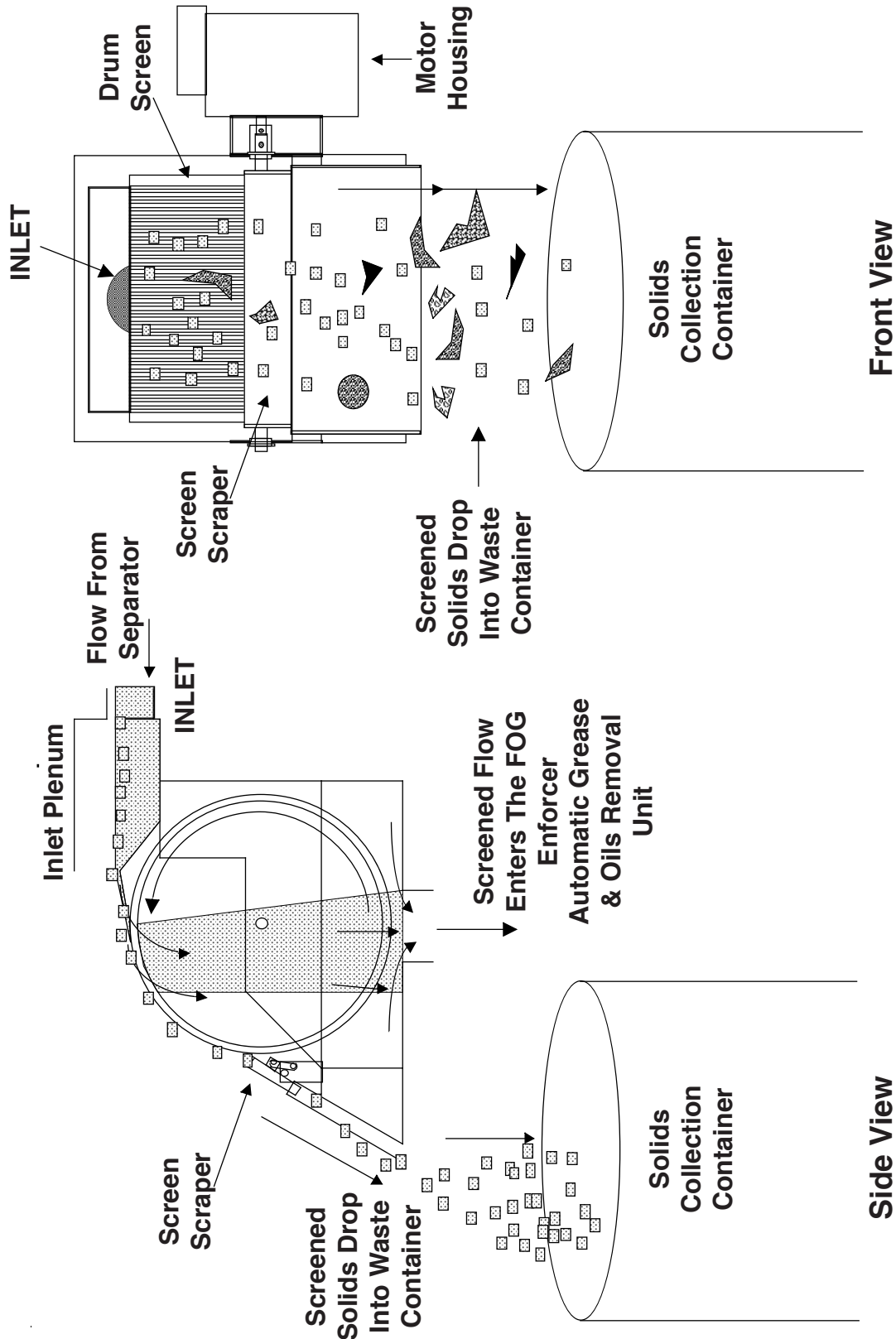
2" SOLIDS TRANSFER
RETURN LINE FROM
OUTLET OF REMOTE
SEPARATOR TANK

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Solids Removal Operation

Solids Removal Operation Schematic & Part Identification*



*These Systems WILL NOT OPERATE unless the cover is attached

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Maintenance Instructions

DAILY

Empty grease and solids collection containers. Wash containers if necessary.

WEEKLY

Check wheel wiper blades for build-up of fine solids. If build-up is present, wipe or spray clean.

Inspect the dual Big Flipper® coarse solids removal screen for fine solids buildup. It may easily be sprayed with hot water or wiped clean.

The bottom of the Big Dipper tank should be checked for fine solids accumulation. If build-up of fine solids has accumulated, solids should be removed by stirring the bottom with a long handled spatula or using a "wet vac" or by using the "Tank Drain" sequence.

Inspect the grease outlet sump for build-up of congealed fats or fine solids. Wipe off any accumulation.

QUARTERLY

Grease the drive cam on each of the Grease Enforcer's diaphragm lift pumps. There is a grease fitting on the drive cam's housing. (Please see Page 26 "Grease Enforcer Diaphragm Pump Identification")

Check hose connections (quick disconnect) for tight fit.

ANNUALLY

Replace FOG Enforcer's wiper blades (part # PB-3).

Inspect FOG Enforcer Wheel Drive Sprockets (part # WDS-1) for wear. Replace if necessary.

Check FOG Enforcer's motor-to-wheel drive shaft coupling (part # NSC-1) for slippage. Re-place if necessary.

Check lift pump diaphragms for wear or leaks.

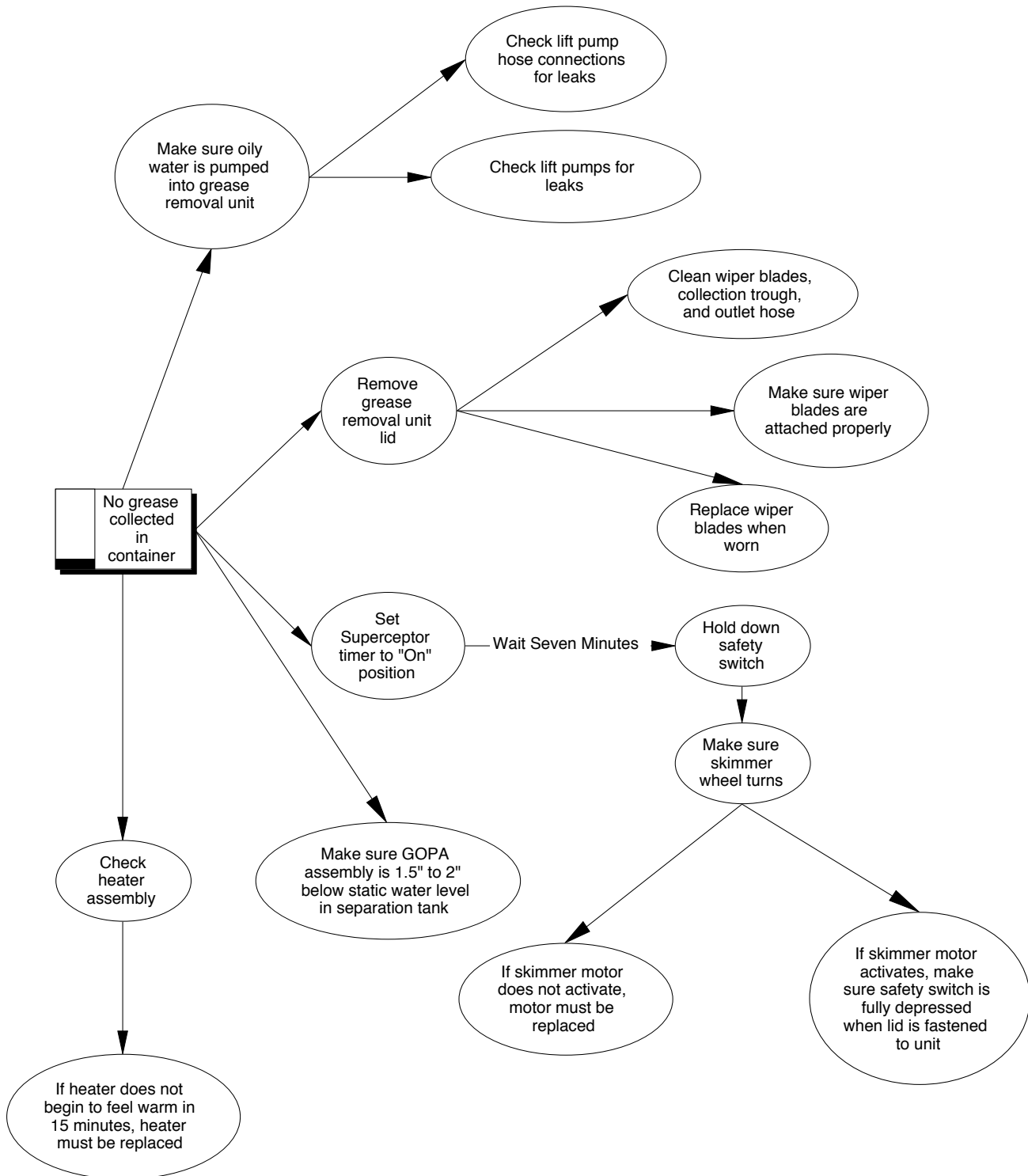
Make sure GOPA assembly is secure and in place. (Please see Page 10 "Grease/Oils Pickup Assembly")

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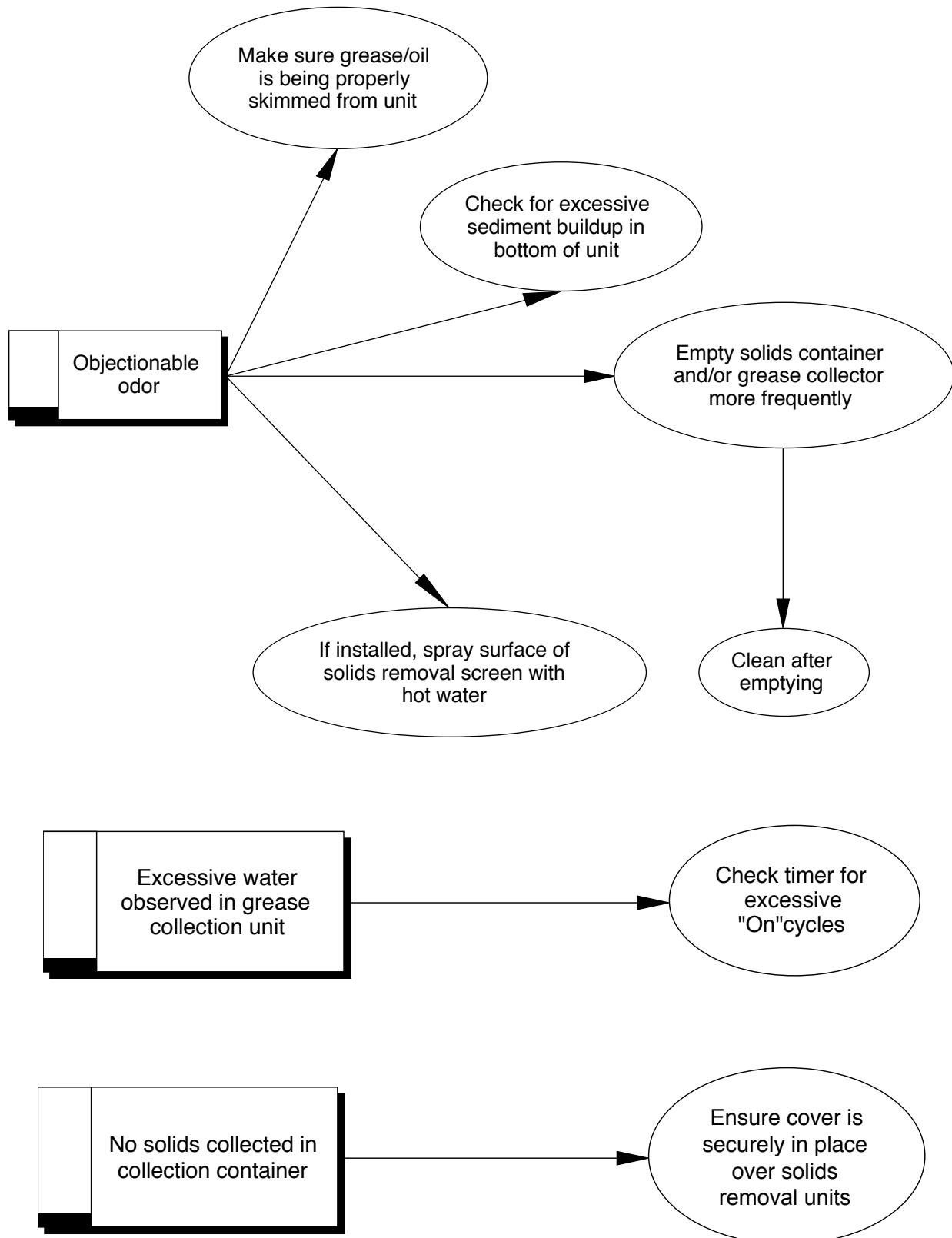
Grease Enforcer Troubleshooting



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Grease Enforcer Troubleshooting



Control Panel Wiring Diagram

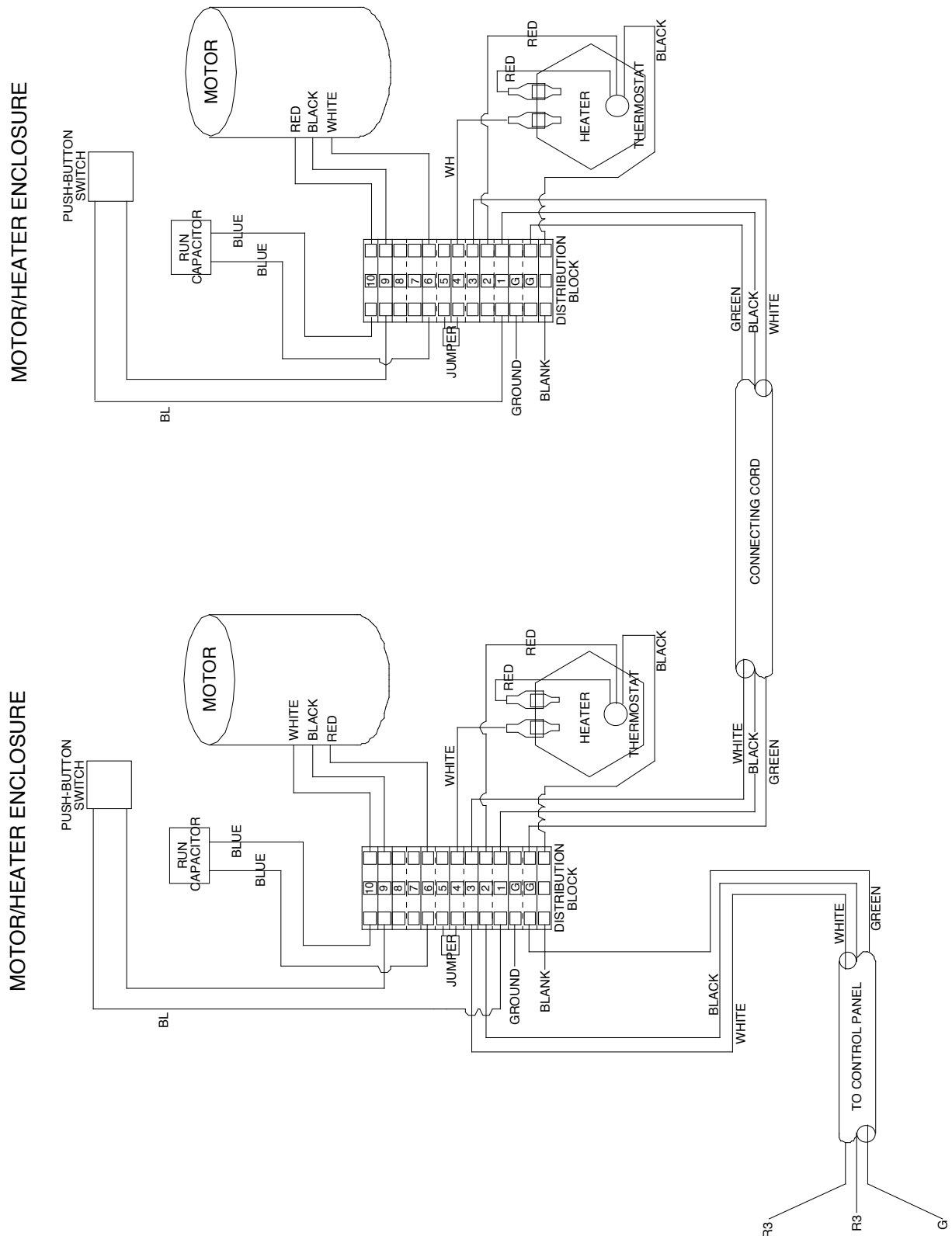
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Grease Removal Component Wiring Diagram

Wiring Diagram For FOG Enforcer Grease & Oils Removal Unit



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Coarse Solids Removal Wiring Diagram

LOWER UNIT

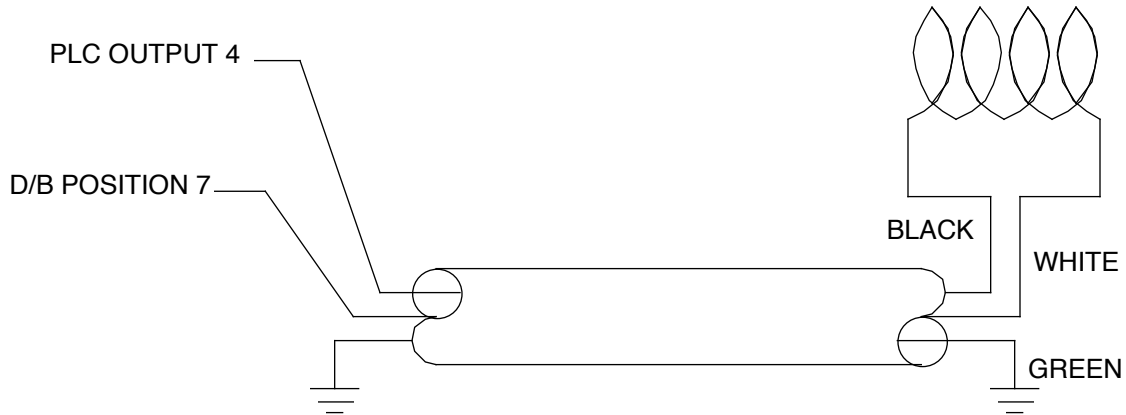


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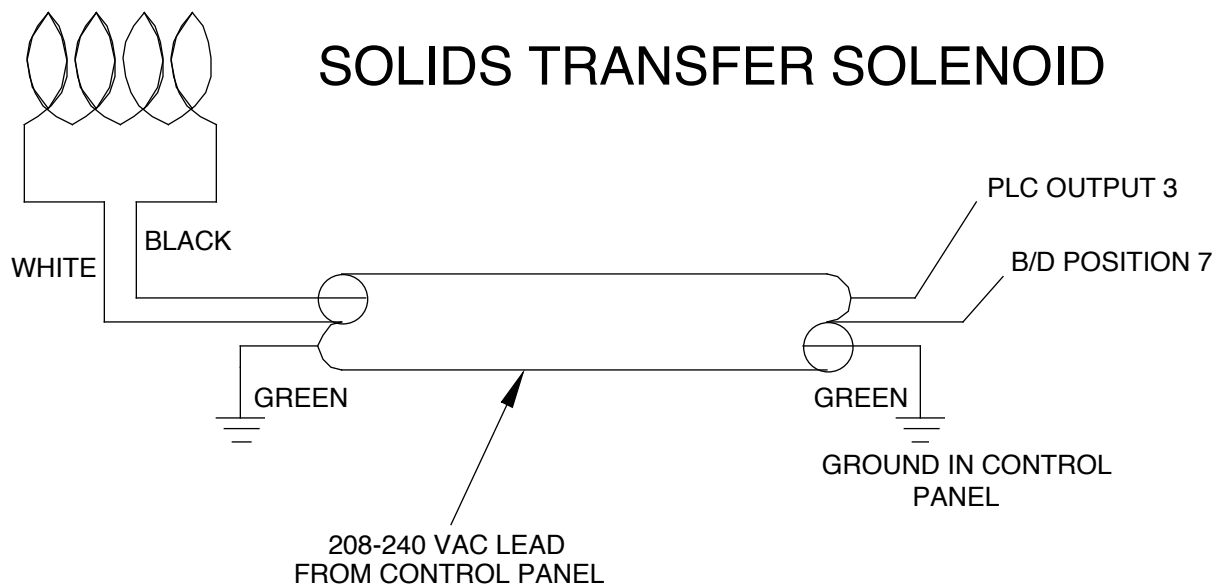
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Miscellaneous Component Wiring Diagrams

BACKWASH SOLENOID



SOLIDS TRANSFER SOLENOID



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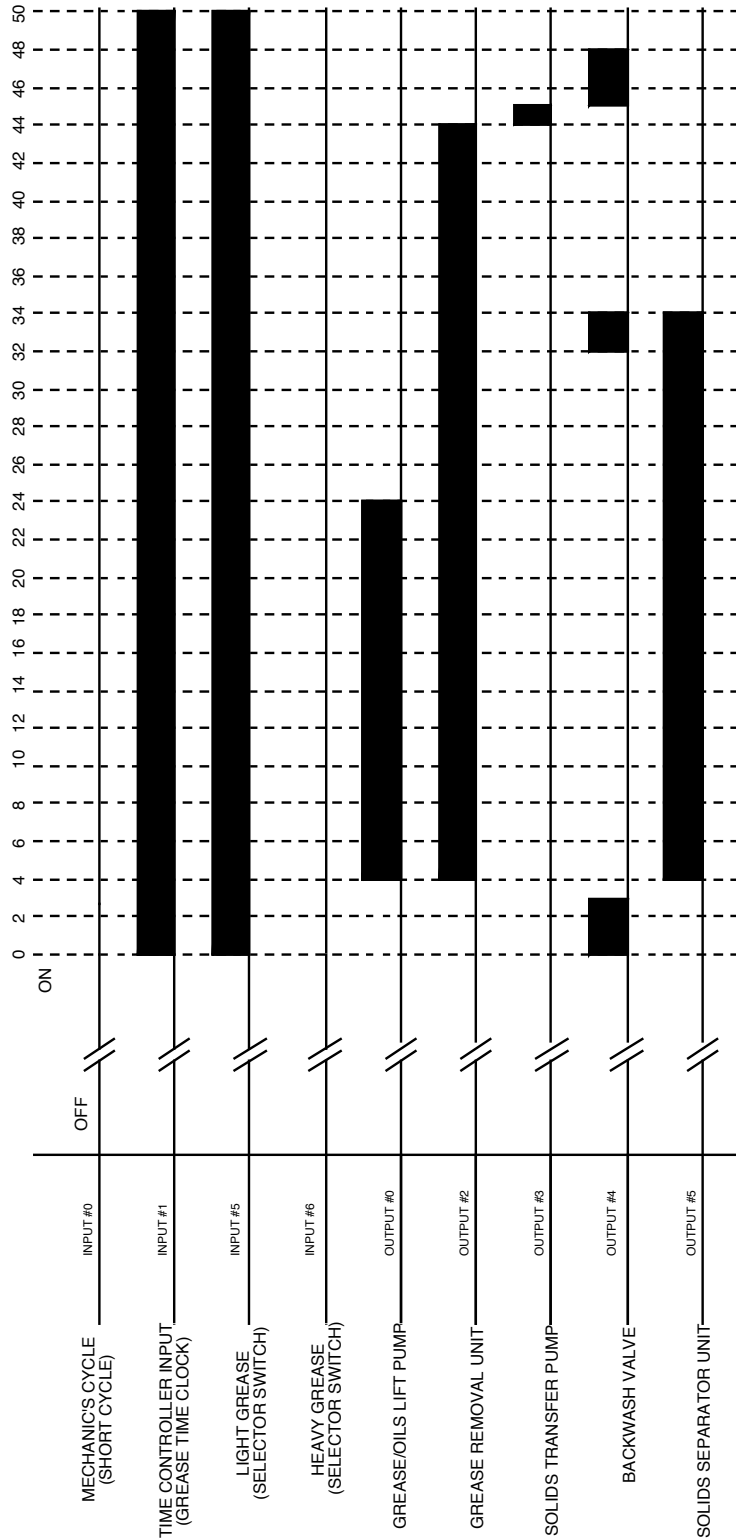
Grease Timing Chart

GREASE ENFORCER GREASE TIMING CHART

Not To Be Altered By Non-Factory Personnel

PRE-PROGRAMMED OPERATION SEQUENCE STEPS. EACH STEP IS EQUAL TO 2 MINUTES. SEQUENCE BEGINS WHEN 24-HOUR TIME CONTROLLER OUTPUT SWITCHES FROM OFF TO ON (INPUT #1) AND STOPS WHEN THE CYCLE IS COMPLETE. POSITION OF THE GREASE SELECTOR SWITCH DE-TERMINES THE LENGTH OF TIME THAT GREASE IS REMOVED FROM THE TRAP.

"LIGHT" GREASE SELECTOR SWITCH POSITIONS SHOWN



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GREASE ENFORCER

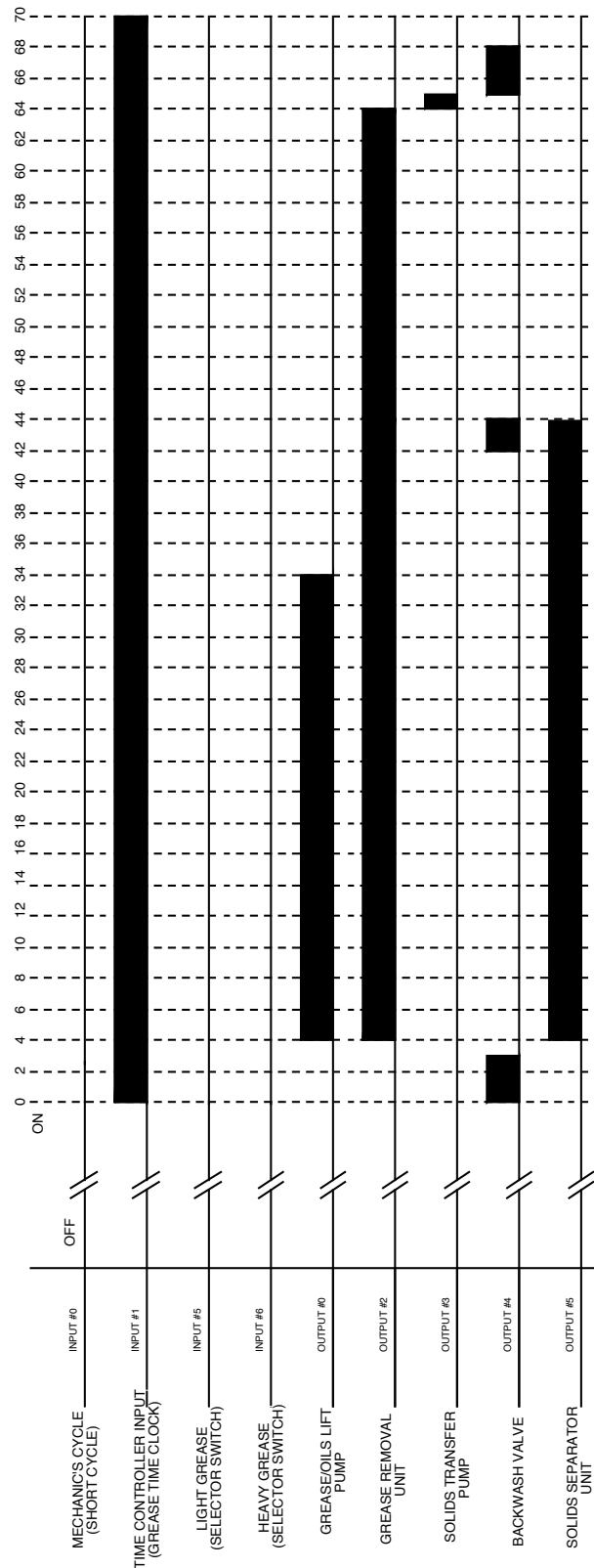
Grease Timing Chart

GREASE ENFORCER GREASE TIMING CHART

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SWITCH DETERMINES THE LENGTH OF TIME THAT GREASE IS REMOVED FROM THE TRAP.

"MEDIUM" GREASE SELECTOR SWITCH POSITIONS SHOWN



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GREASE ENFORCER

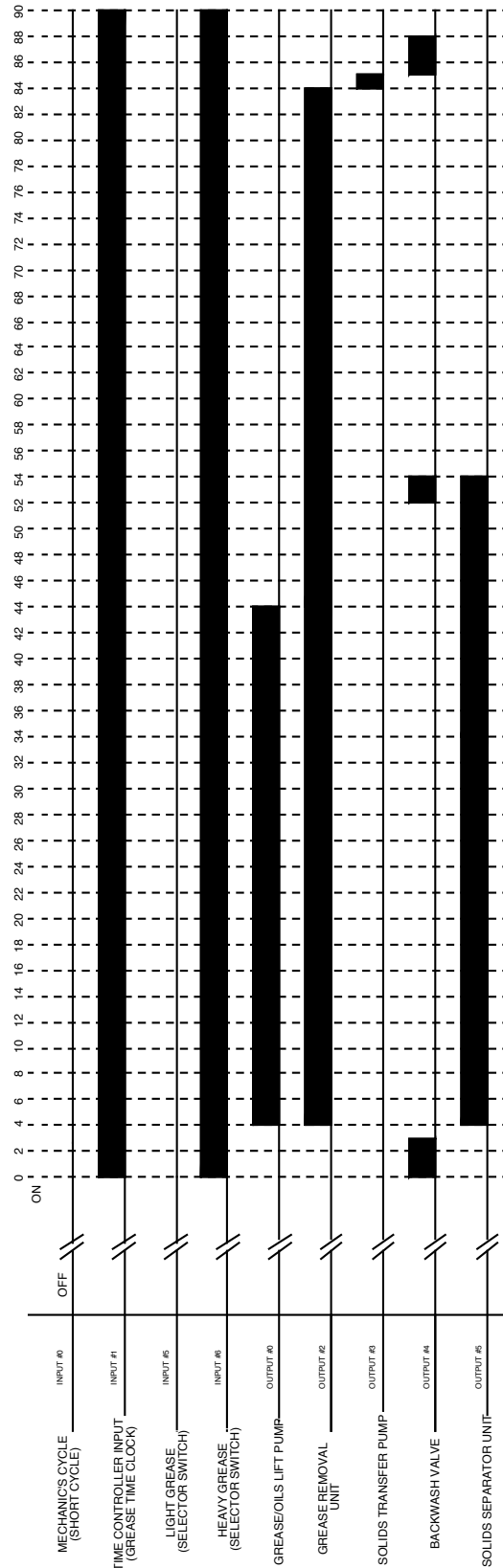
Grease Timing Chart

GREASE ENFORCER GREASE TIMING CHART

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"HEAVY" GREASE SELECTOR SWITCH POSITIONS SHOWN



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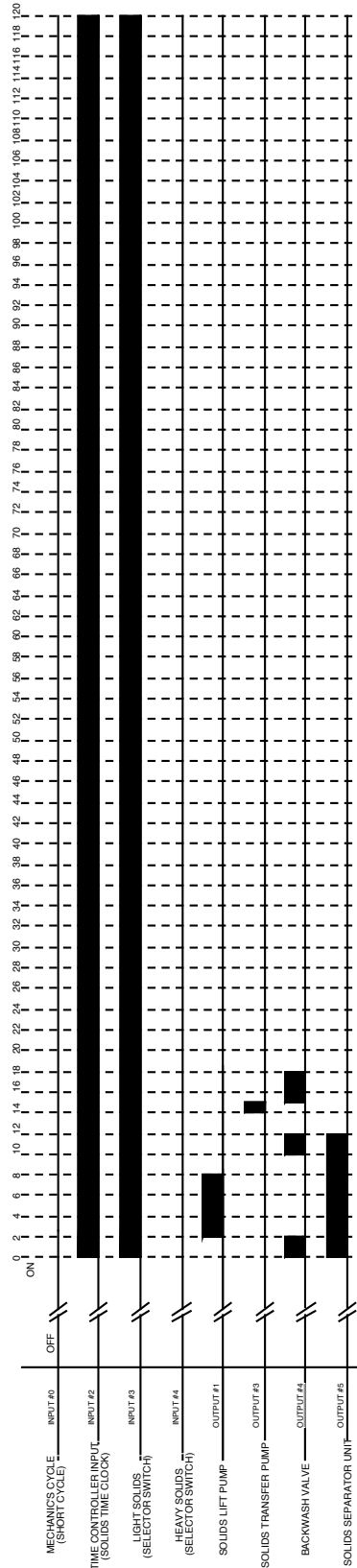
Solids Timing Chart

GREASE ENFORCER SOLIDS TIMING CHART

Not To Be Altered By Non-Factory Personnel

PRE-PROGRAMMED OPERATION SEQUENCE STEPS. EACH STEP IS EQUAL TO 2 MINUTES. SEQUENCE BEGINS WHEN 24-HOUR TIME CONTROLLER OUTPUT SWITCHES FROM OFF TO ON (INPUT #2) AND CONTINUES REPEATING THE CYCLE UNTIL THE TIMER CONTROLLER SWITCHES FROM ON TO OFF. POSITION OF THE SOLIDS SELECTOR SWITCH DETERMINES THE FREQUENCY OF SOLIDS REMOVAL FROM THE TRAP.

"LIGHT" SOLIDS SELECTOR SWITCH POSITION SHOWN



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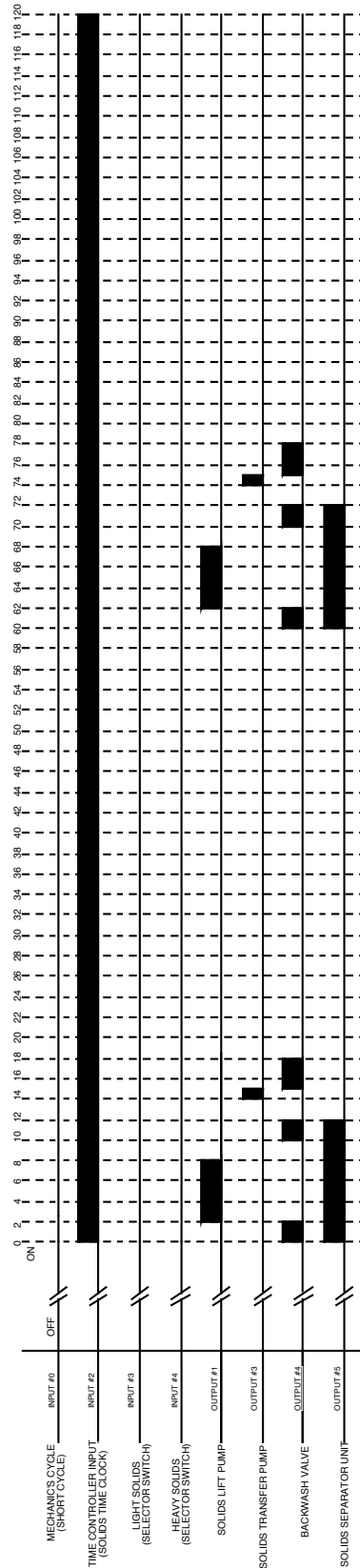
Solids Timing Chart

GREASE ENFORCER SOLIDS TIMING CHART

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"MEDIUM" SOLIDS SELECTOR SWITCH POSITION SHOWN



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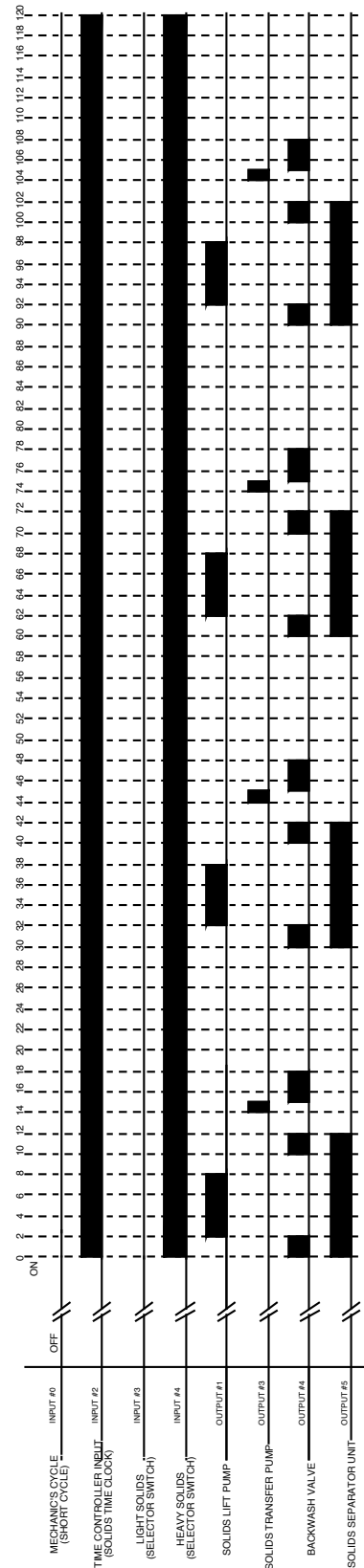
Solids Timing Chart

GREASE ENFORCER SOLIDS TIMING CHART

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"HEAVY" SOLIDS SELECTOR SWITCH POSITION SHOWN

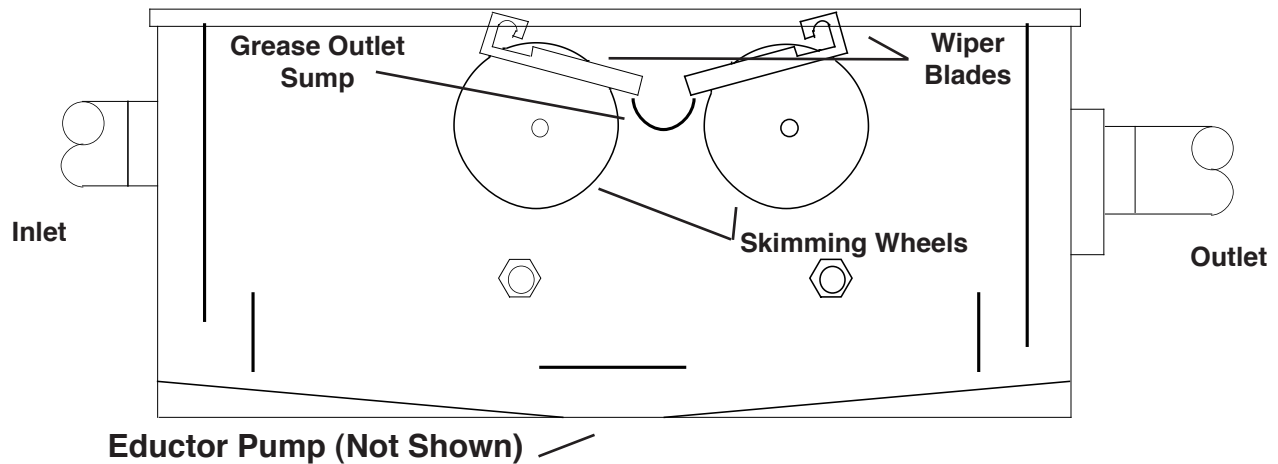


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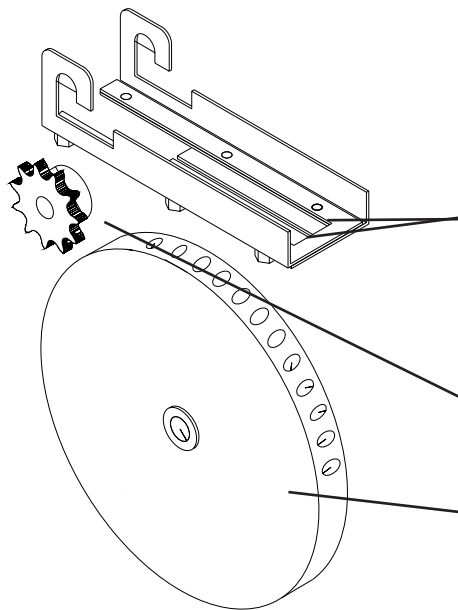
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Part Identification

FOG Enforcer Grease Removal Unit



Wheel Wiper Assembly



Part #PB-3 (Wiper Blades)

Two (2) per assembly

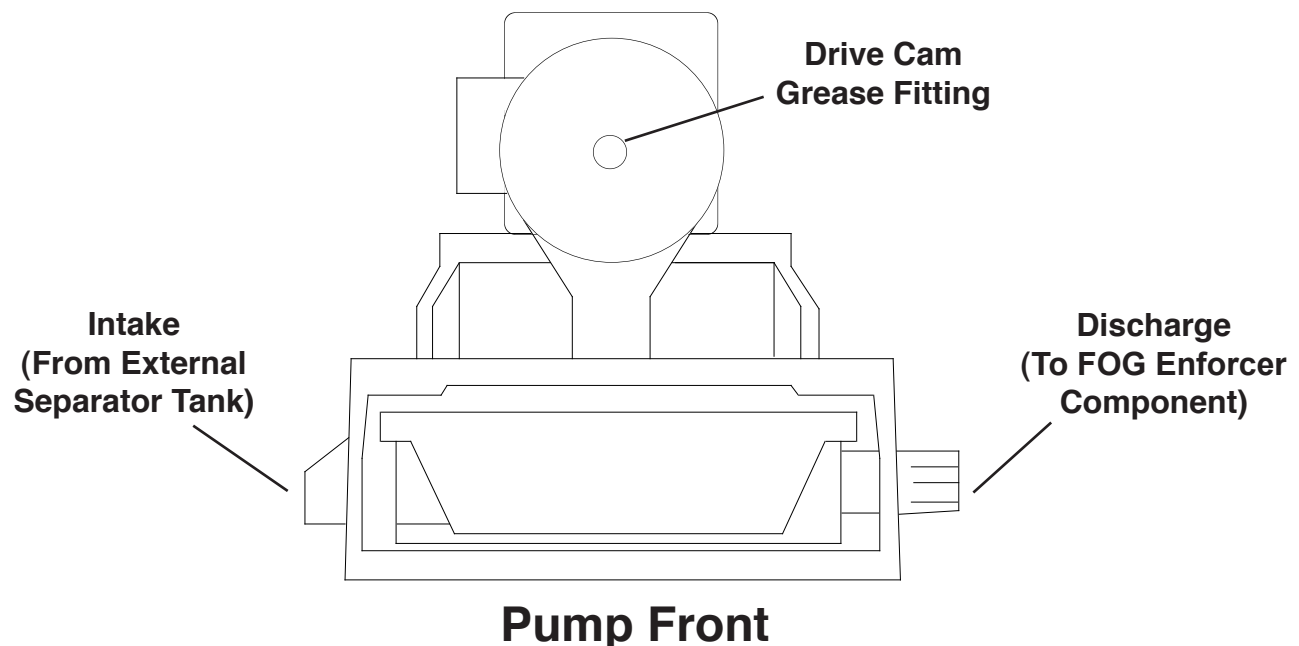
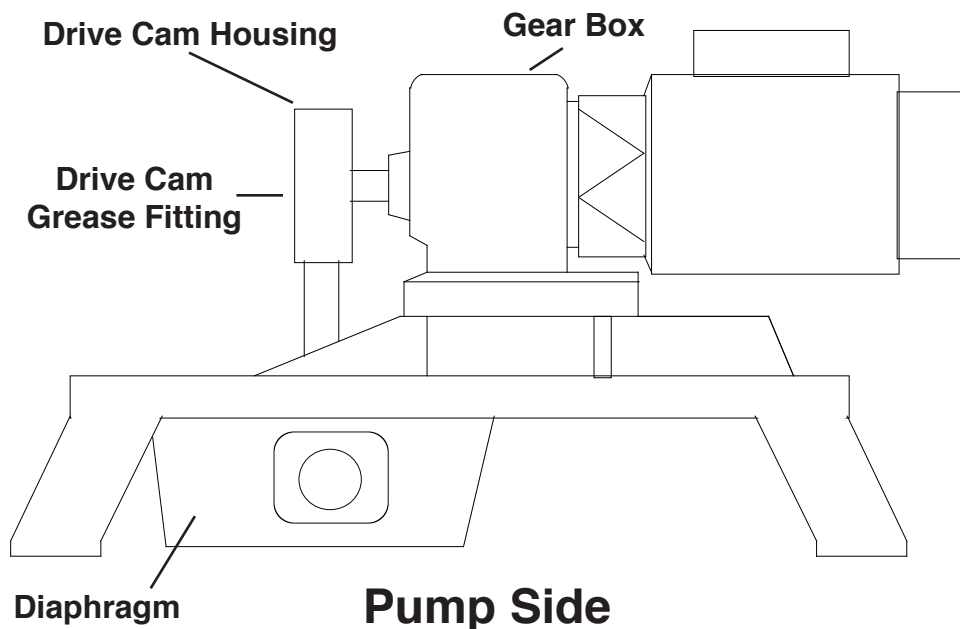
To remove use 7/16" wrench to remove nuts on underside

Part #WDS-1 (Wheel Sprocket)

Part #PDA-1 (Skimming Wheel)

Diaphragm Pump (Part # DP-1)

*The Diaphragm Lift Pump can lift a maximum of twelve (12) feet from the static water level of the remote separator tank to the highest point on the Diaphragm Lift Pump inlet piping. Please contact the factory for higher lift situations.



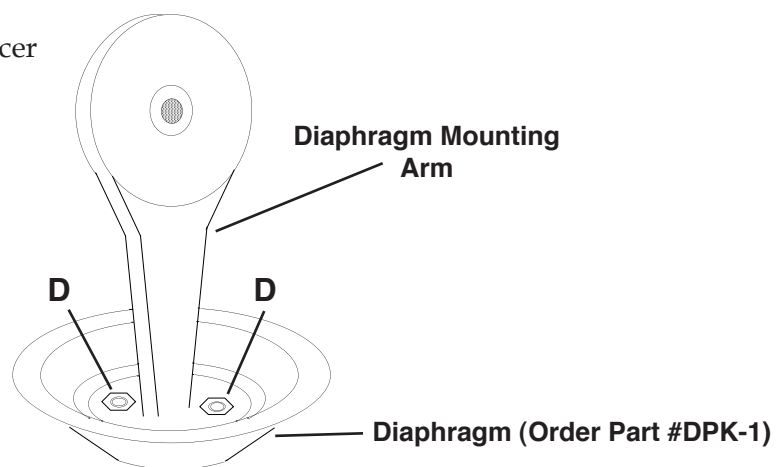
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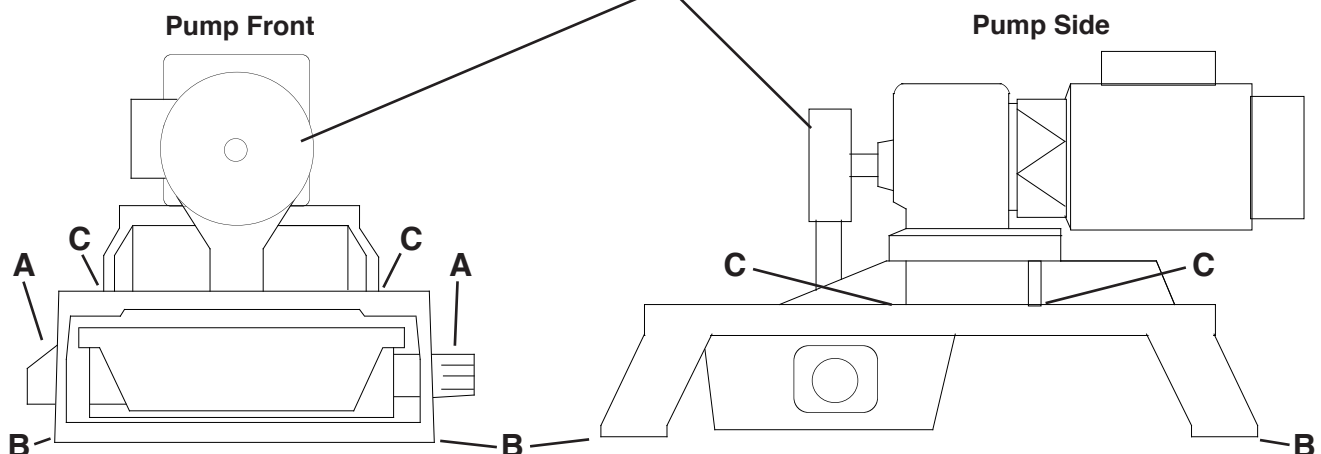
Replacing Pump Diaphragm

Replacing The Diaphragm In The Diaphragm Pump

- 1 - Disconnect power from the Grease Enforcer
- 2 - Disconnect hoses from both sides of pump (A)
- 3 - Remove the four pump mounting bolts (B)
- 4 - Slide the pump forward for access to pump base
- 5 - Remove four (4) bolts at the aluminum pump base (C). Pump base will detach from pump mounting assembly.
- 6 - Remove two (2) diaphragm attachment screws (D) and remove old diaphragm
- 7 - Attach new diaphragm attachment screws (D)
- 8 - Follow steps in reverse to reinstall diaphragm to lift pump, then to the SuperCeptor
- 9 - Reconnect power to Grease Enforcer



Diaphragm Assembly



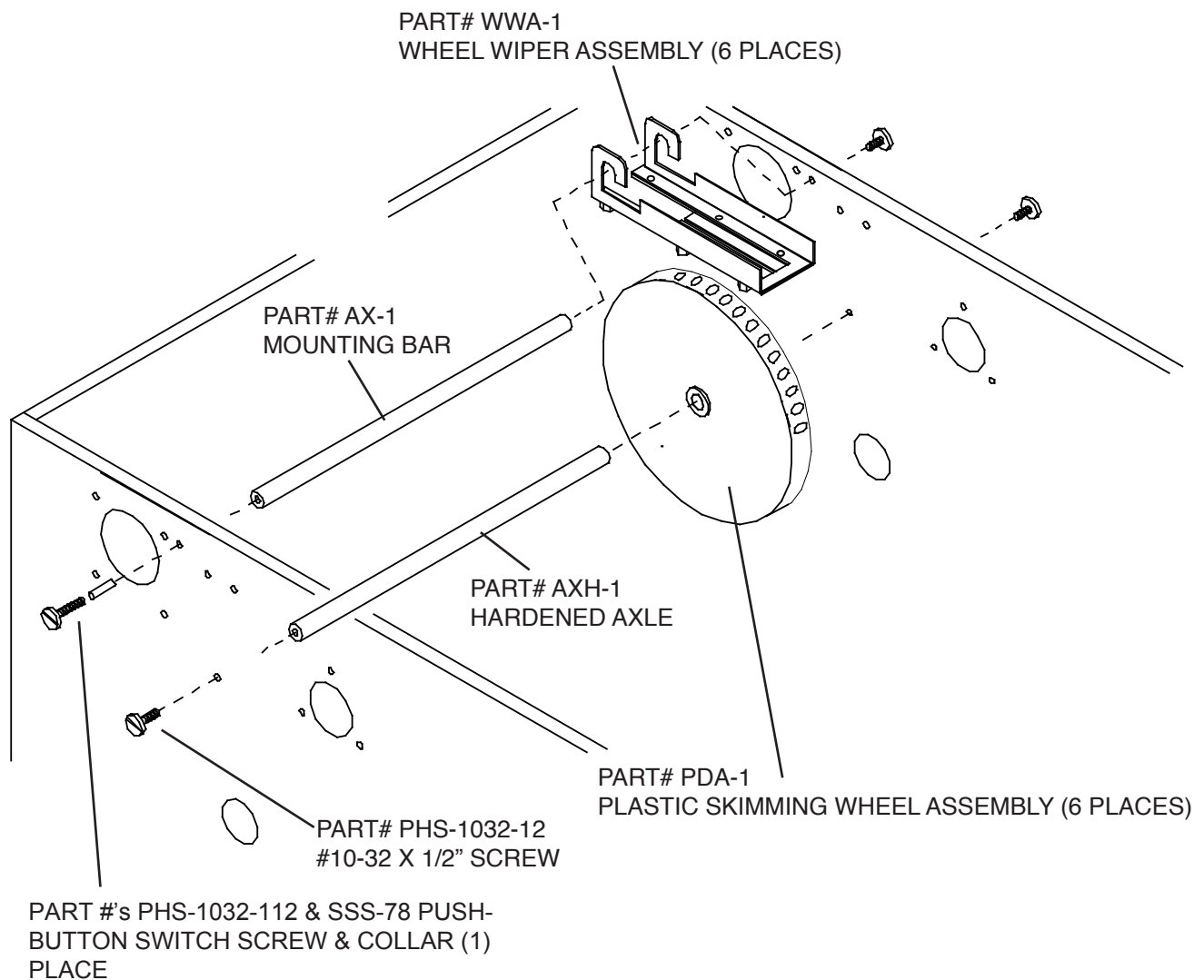
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Skimmer Assembly Parts

The Grease/Oils Skimmer Assembly performs the skimming process for the Grease Removal component of the Grease Enforcer. The Wheel Wiper Assembly (Part# WWA-1) slides down over the Plastic Skimming Wheel Assembly (Part# PDA-1). The lower half of the skimming wheel is submerged in the collected grease/oils layer within the tank. Small rubber Scraper Blades (Part#PB-3) within the Wheel Wiper Assembly contact the sides of the Plastic Skimming Wheel scraping off the grease and oils that have adhered to the sides of the skimming wheel and routing it to an outlet sump.



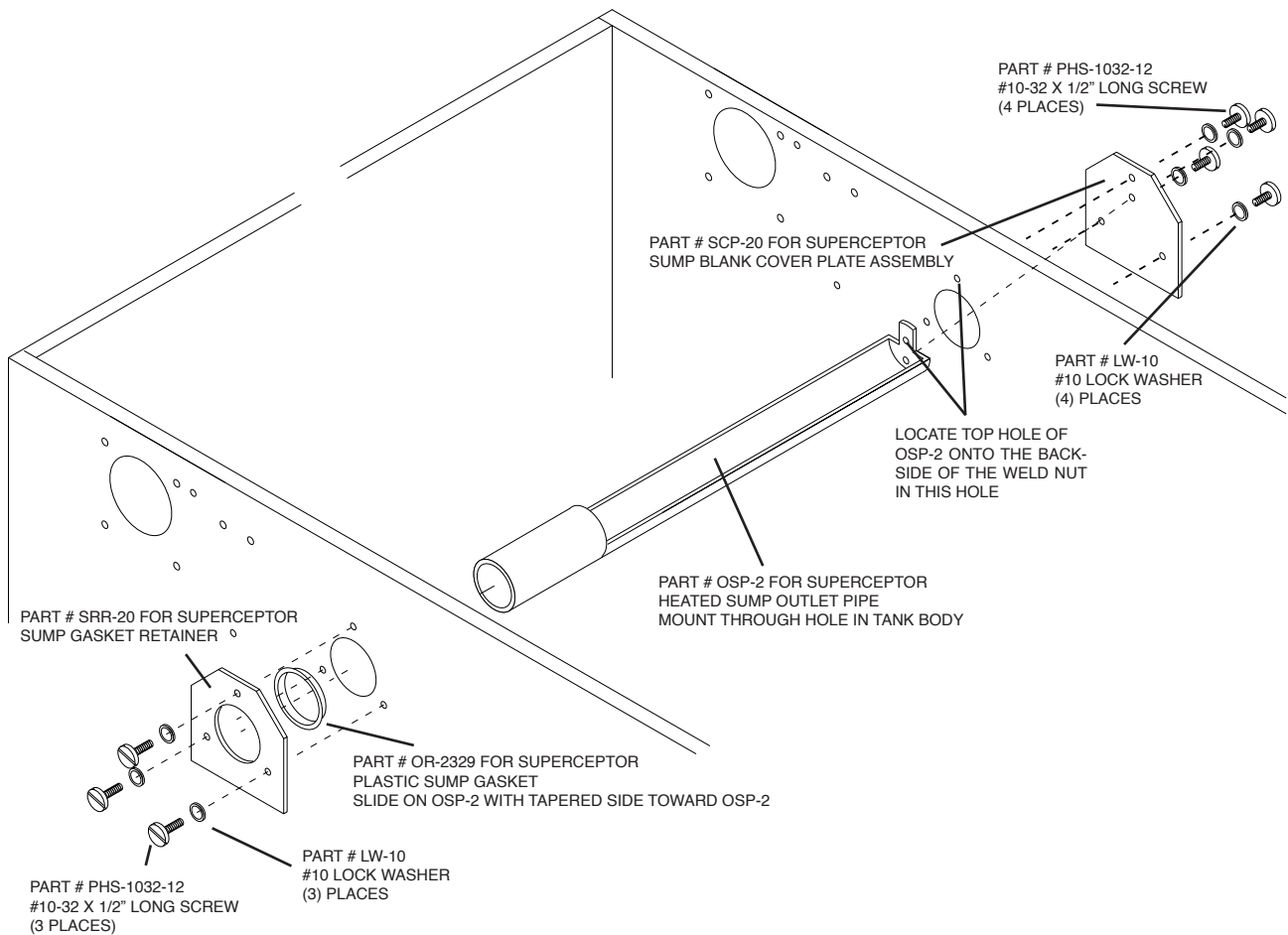
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Grease Outlet Sump

The Outlet Sump Pipe Assembly (Part # OSP-2) transfers the skimmed grease/oils from inside the system's tank to a collection container located outside of the tank.

The diagram below shows the location of the sump in its normal position as shipped from the factory.

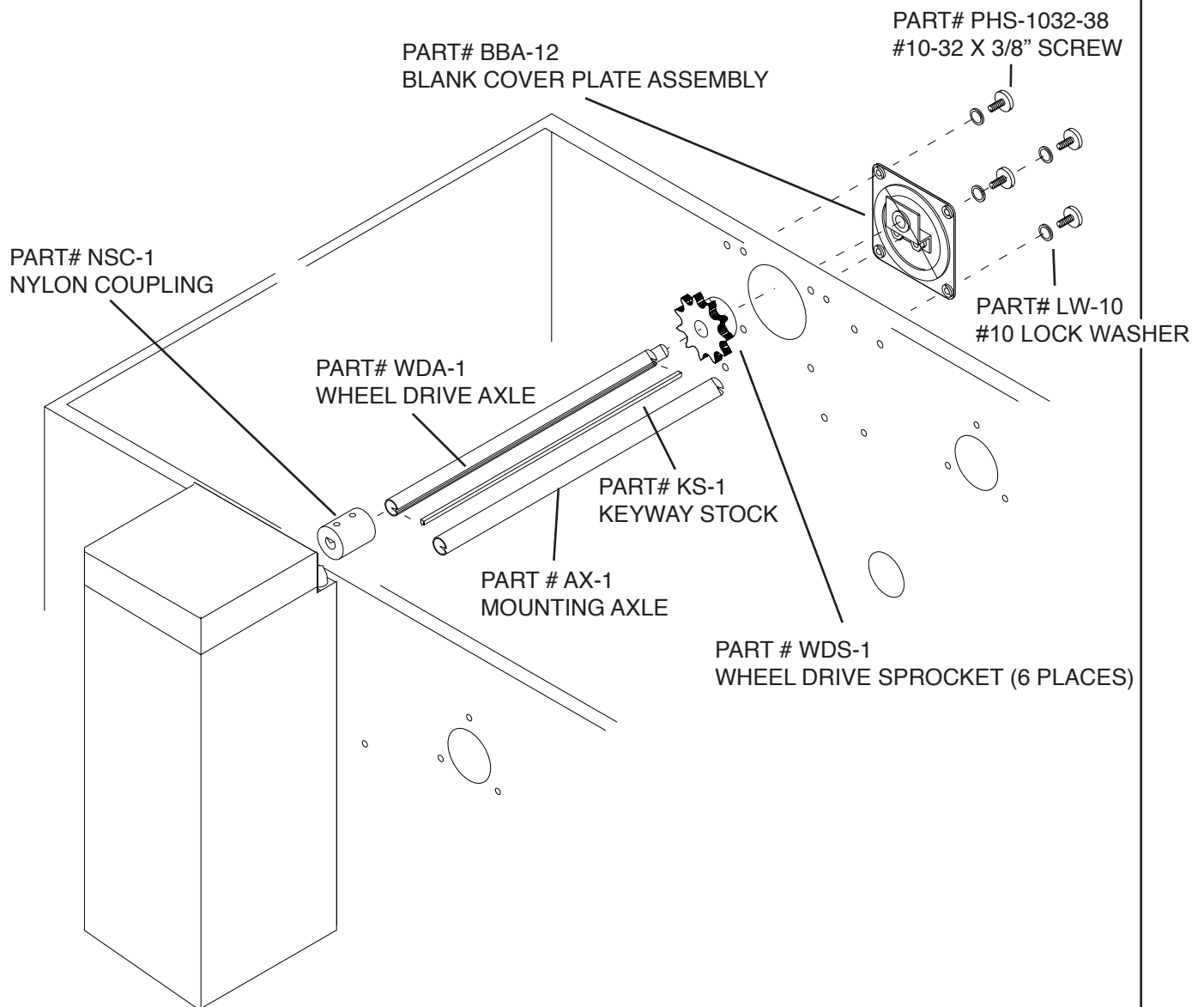


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Motor/Drive Assembly

The Motor/Drive Assembly provides the power for the system.
The Grease Enforcer has two Motor Assemblies and six (6)
Wheel Drive Sprockets (Part # WDS-1).

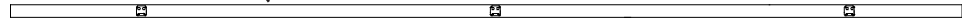


FOG ENFORCER

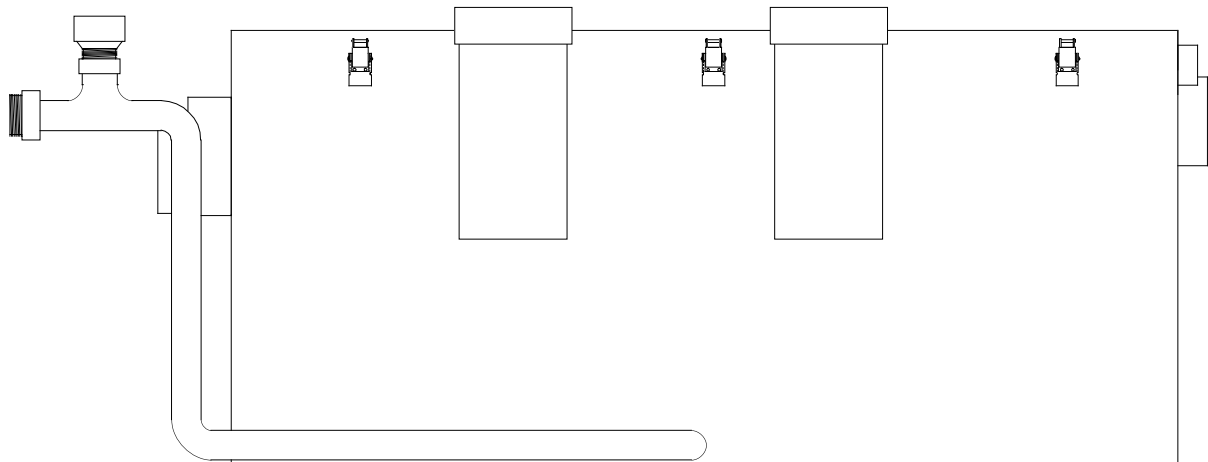
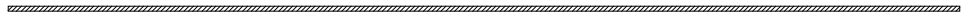
GREASE ENFORCER

Assorted Replacement Parts

Top Lid:
Part # WL-2750



Lid Gasket:
Part # RG-7



Eductor Pump Solenoid:
Part # SCOIL-240 (Coil)
SOL-34 (Valve)

NOT SHOWN

Diaphragm Pump: Part # DP-1

Diaphragm Replacement Kit (Includes Diaphragm & Flapper Valves): Part # DPK-1