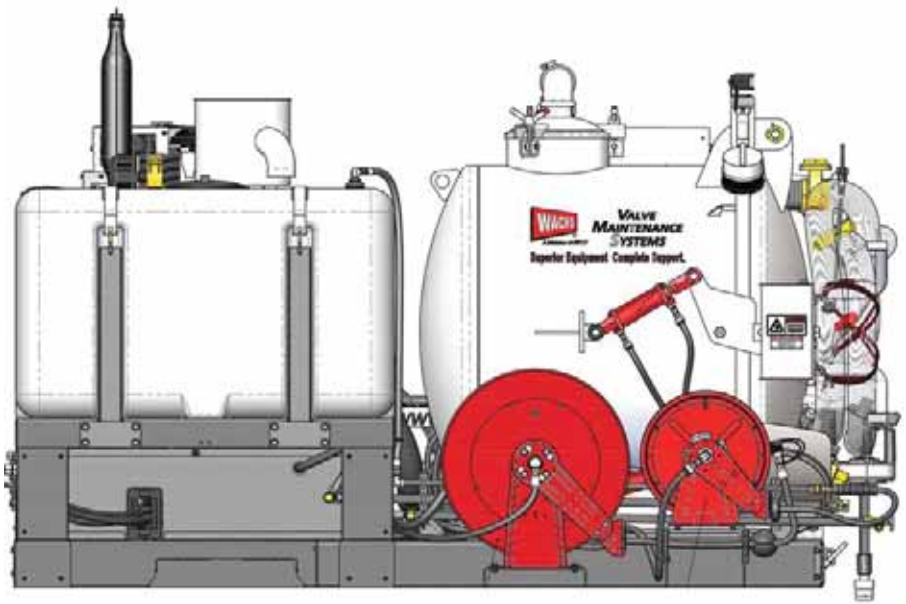




E.H. Wachs
600 Knightsbridge Parkway
Lincolnshire, IL 60069
www.ehwachs.com

Standard SB Valve Maintenance System User's Manual



E.H. Wachs Part No. 77-MAN-04
Rev. A, March 2020

Revision History:
Original March 2020

Copyright © 2019 E.H. Wachs. All rights reserved.
This manual may not be reproduced in whole or in part
without the written consent of E.H. Wachs.

Table of Contents

Chapter 1: About the Standard SB VMS	1
Purpose of This Manual	1
How to Use The Manual	1
Symbols and Warnings	2
Manual Updates and Revision Tracking	3
Equipment Description	3
Engine Specifications	8
Diesel Engine (Configuration 77-000-58)	8
Gas Engine (Configuration 77-000-59)	9
Hydraulic Power System	9
Vacuum System	9
Pressure Washer	10
Hydraulic Hose Reel	10
ERV-750 Extended Reach Valve Operator	10
2,400 W Power Inverter	11
TM-7 Automated Valve Exerciser (Optional)	11
Water Heater (Optional)	12
Dismantling and Disposal	13
Hydraulics and Lubricants	13
Machinery and Components	13
System Component Manuals	13
Chapter 2: Safety	15
Safe Operating Guidelines	15
Safe Operating Environment	16
Safety Alerts in This Manual	17
Protective Equipment Requirements	17
Protective Clothing	17
Eye Protection	18
Hearing Protection	18
Safe Operation of the SB VMS	18
Proper Use of the SB VMS	18
Hydraulic Powered Equipment	18
Misuse of Equipment	19
Potential Hazards	19
Residual Risks	20
Disconnecting Power	20

Chapter 3: Operating Instructions	21
Curbside Control Panel	21
Diesel Engine Configuration (77-000-58)	22
Gas Engine Configuration (77-000-59)	23
Engine Operation	24
Diesel Engine Starting and Operation	26
Gas Engine Starting and Operation	26
Hydraulic System Controls	27
ERV-750 Operation	27
Vacuum Operation	28
Selecting a Vacuum Wand	28
Setup and Operation	29
Emptying the Tank	35
Draining Liquid	36
Dumping Solids	37
Unclogging the Vacuum	41
Pressure Washer Operation	42
Filling the Water Tank	44
Filling the Antifreeze (Primer) Tank	44
Using the Pressure Washer	45
Priming the Washer Pump	50
Prime Using the Pump Pressure	50
Recirculation	53
Light Bar Operation	55
120 VAC Electrical Power Inverter	57
Auxiliary Hydraulic Circuit/Hose Reel Operation	59
TM-7 Operation (Optional)	59
Water Heater Operation (Optional)	60
Starting and Running the Water Heater	61
Spraying Hot Water	62
Chapter 4: Maintenance	63
Lubrication and Fluid Maintenance	63
Mechanical Grease Fittings	63
Pressure Washer Pump	64
Blower	65
Engine	65
Diesel Engine	65

Gas Engine	65
Replacing Fuses	66
Servicing the Drive Belts	67
Vacuum Blower Belts	67
Sprayer Pump Belts	69
Adjusting the Tank Latches	71
Valve Operators	75
ERV-750	75
TM-7	75
Cold Weather Preparation and Service	75
Chapter 5: Parts List and Ordering Information	77
Ordering Information	77
Ordering Replacement Parts	77
Repair Information	77
Warranty Information	78
Return Goods Address	78
Drawings and Parts Lists	78

Chapter 1

About the Standard SB VMS

PURPOSE OF THIS MANUAL

This manual explains how to operate and maintain the Standard SB Valve Maintenance System (SB VMS). It includes instructions for set-up, operation, and maintenance. It also contains parts lists, diagrams, and service information to help you order replacement parts and perform user-serviceable repairs.

Before operating the SB VMS, you should read through this manual and become familiar with all instructions.

HOW TO USE THE MANUAL

This manual is organized to help you quickly find the information you need. Each chapter describes a specific topic on using or maintaining your equipment.

Each page is designed with two columns. This large column on the inside of the page contains instructions and illustrations. Use these instructions to operate and maintain the equipment.

The narrower column on the outside contains additional information such as warnings, special notes, and definitions. Refer to it for safety notes and other information.

In This Chapter

PURPOSE OF THIS MANUAL
HOW TO USE THE MANUAL
SYMBOLS AND WARNINGS
MANUAL UPDATES AND REVISION TRACKING
EQUIPMENT DESCRIPTION

Throughout this manual, refer to this column for warnings, cautions, and notices with supplementary information.

SYMBOLS AND WARNINGS

The following symbols are used throughout this manual to indicate special notes and warnings. They appear in the outside column of the page, next to the section they refer to. Make sure you understand what each symbol means, and follow all instructions for cautions and warnings.



WARNING

A WARNING alert with the safety alert symbol indicates a potentially hazardous situation that **could** result in **serious injury or death**.



CAUTION

A CAUTION alert with the safety alert symbol indicates a potentially hazardous situation that **could** result in **minor or moderate injury**.



CAUTION

A CAUTION alert with the damage alert symbol indicates a situation that **will** result in **damage to the equipment**.



IMPORTANT

An IMPORTANT alert with the damage alert symbol indicates a situation that **may** result in **damage to the equipment**.



This is the **safety alert symbol**. It is used to alert you to **potential personal injury hazards**. Obey all safety messages that follow this symbol to avoid possible injury or death.



This is the **equipment damage alert symbol**. It is used to alert you to **potential equipment damage situations**. Obey all messages that follow this symbol to avoid damaging the equipment or workpiece on which it is operating.

NOTE

This symbol indicates a user note. **Notes** provide additional information to supplement the instructions, or tips for easier operation.



NOTE

A NOTE provides supplementary information or operating tips.

MANUAL UPDATES AND REVISION TRACKING

Occasionally, we will update manuals with improved operation or maintenance procedures, or with corrections if necessary. When a manual is revised, we will update the revision history on the title page.

You may have factory service or upgrades performed on the equipment. If this service changes any technical data or operation and maintenance procedures, we will include a revised manual when we return the equipment to you.

Current versions of E.H. Wachs Company manuals are also available in PDF format. You can request an electronic copy of this manual by emailing customer service at sales@ehwachs.com.

EQUIPMENT DESCRIPTION

The SB VMS is available with two engine options. The engine provides power for the hydraulic system and all equipment provided with the system.

- 25 HP Kubota diesel engine, SB VMS configuration 77-000-58.
- 27 HP Kohler gas engine, SB VMS configuration 77-000-59.

The SB VMS includes the following features and standard Wachs equipment for valve maintenance operations:

- Integrated hydraulic system with auxiliary HTMA class II circuit, 8 gpm @ 2,000 psi (30 l/m @ 138 bar).
- ERV-750 extended reach valve operator with telescoping valve key and ruggedized HC-100 controller/data logger.
- Vacuum system with 250 gallon (950 l) spoils tank and hydraulic dump.
- 2.6 gpm (9.5 lpm), 3,000 psi (210 bar) pressure washer.

- 100 gallon (379 l) water tank.
- Service light bar with arrow board.
- 50' (15 m) auxiliary hydraulic hose reel.
- Vehicle storage tray for hydraulic breaker or other tools.
- 2,400 W power inverter.
- 50' (15 m) electric cord reel.

The following optional equipment is also available:

- TM-7 HD Plus valve operator.
- Hot water heater.
- GNSS receiver for survey-grade GPS accuracy.

The following figures illustrate the components and features of the SB VMS.

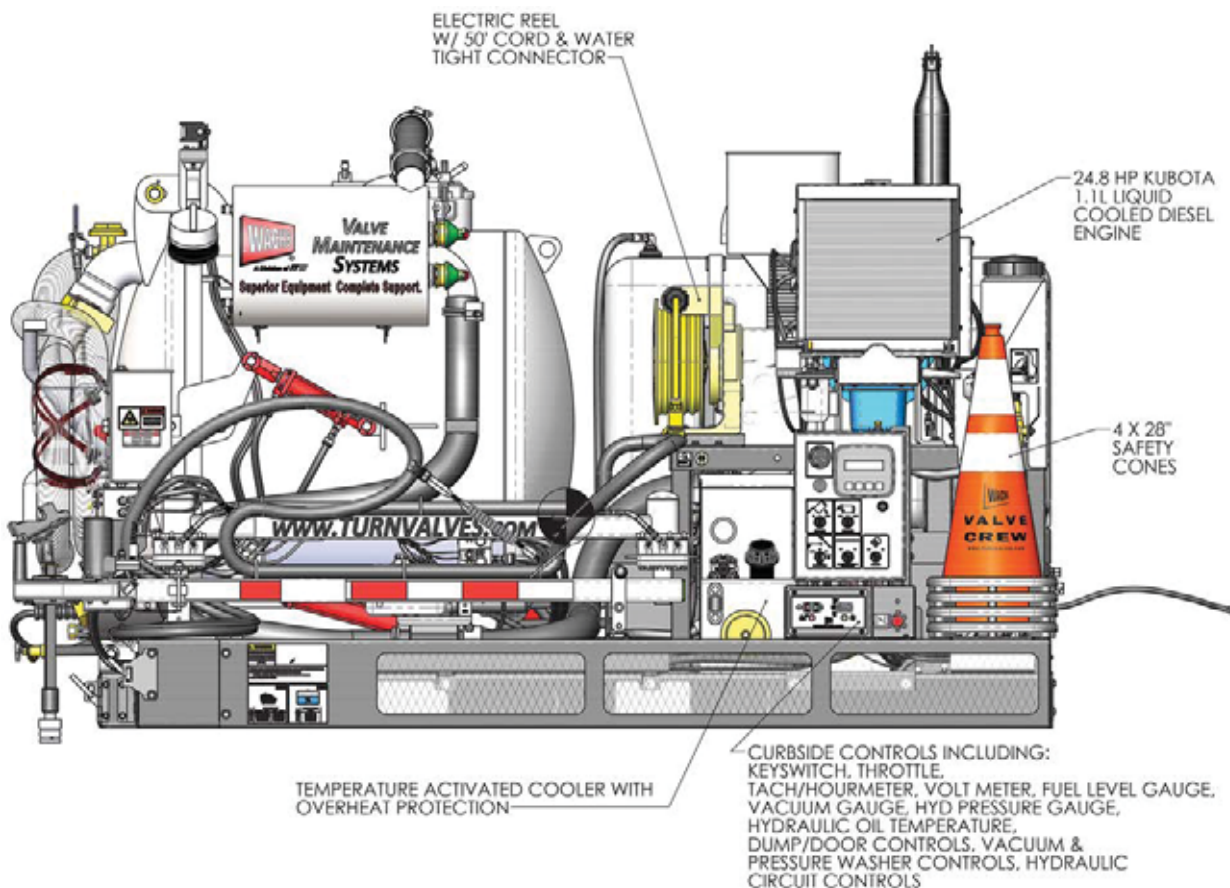


Figure 1-1. The drawing shows the controls-side view of the SB VMS diesel engine configuration, 77-000-58.

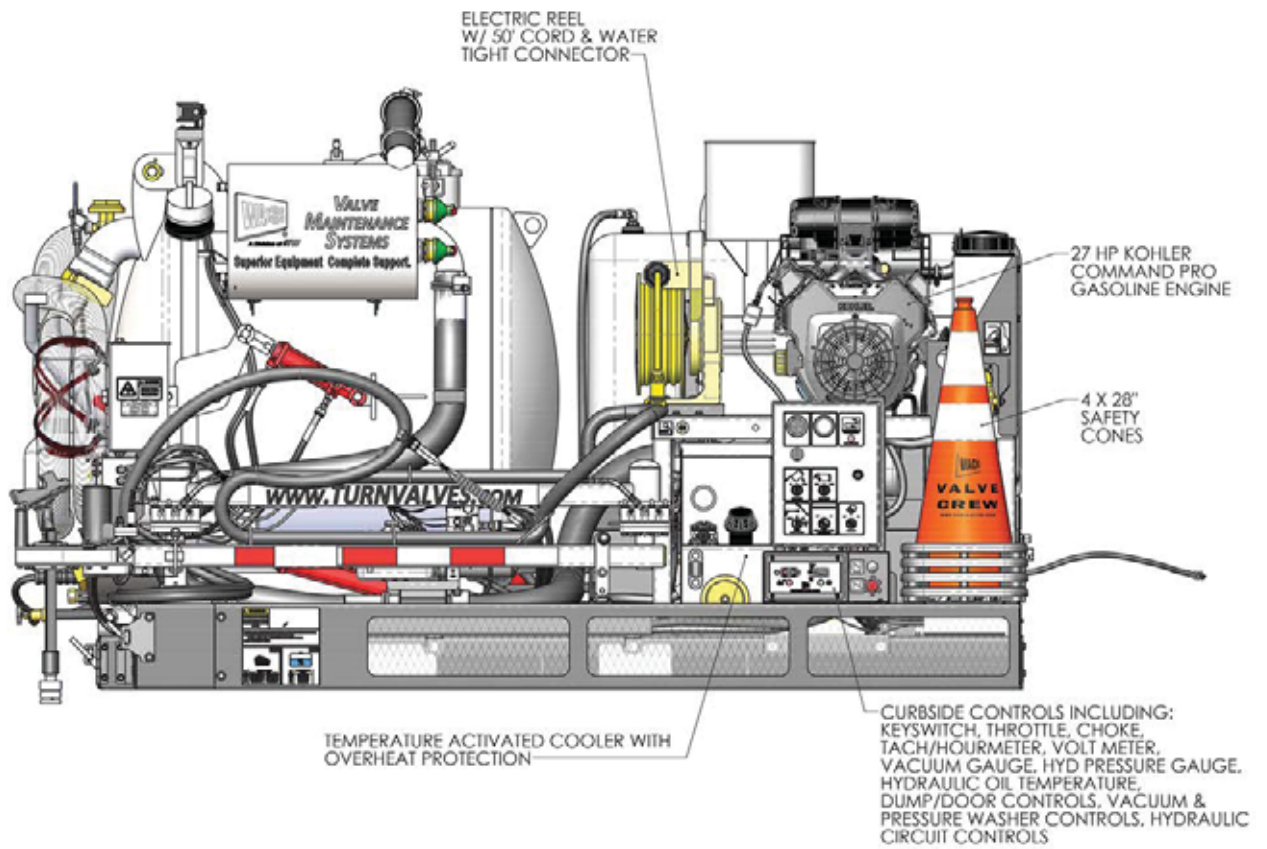


Figure 1-2. The drawing shows the controls-side view of the SB VMS gas engine configuration, 77-000-59.

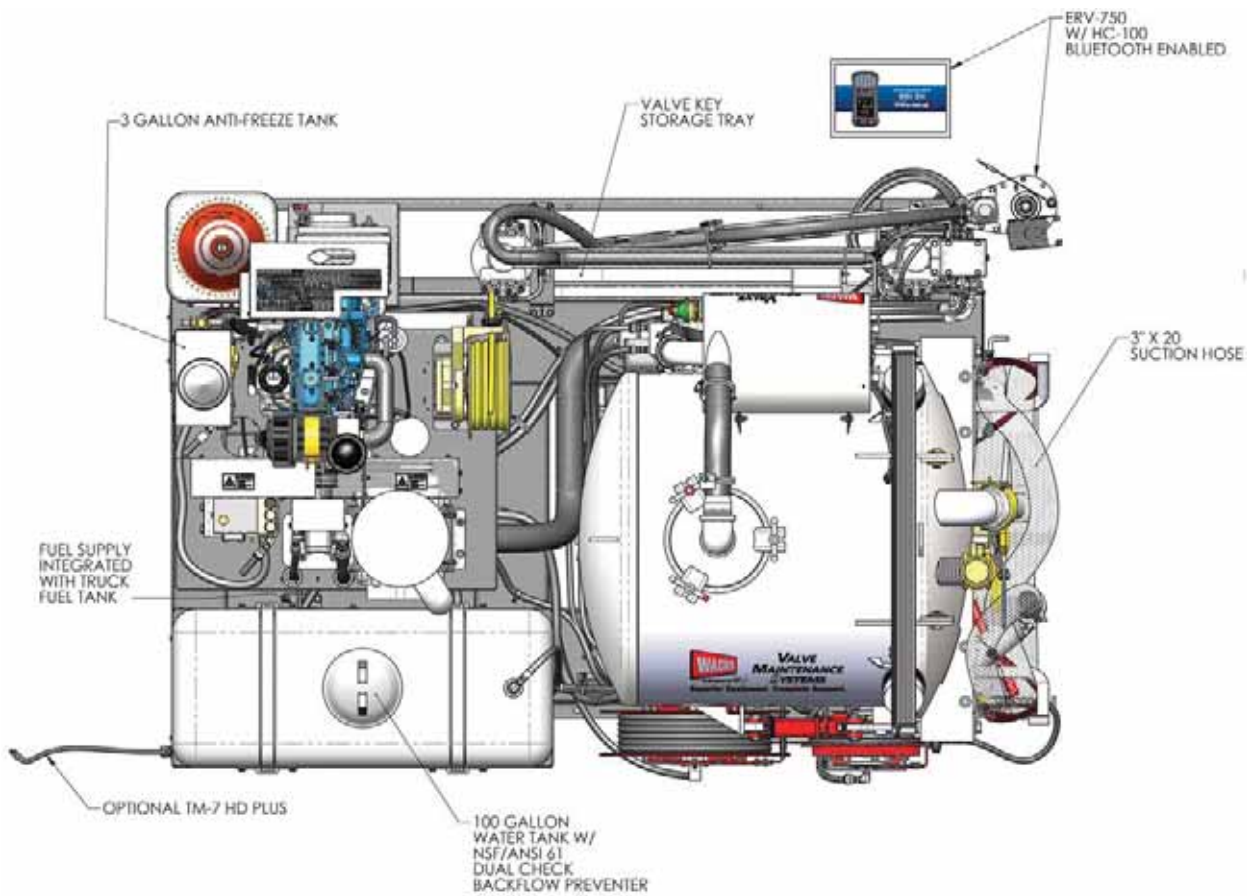


Figure 1-3. The drawing shows the top view of the SB VMS.

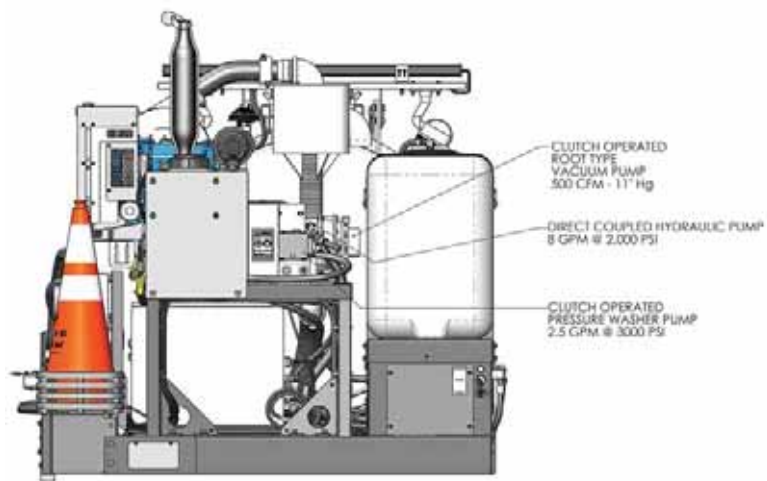


Figure 1-4. The drawing shows the front view of the SB VMS (both engine configurations).

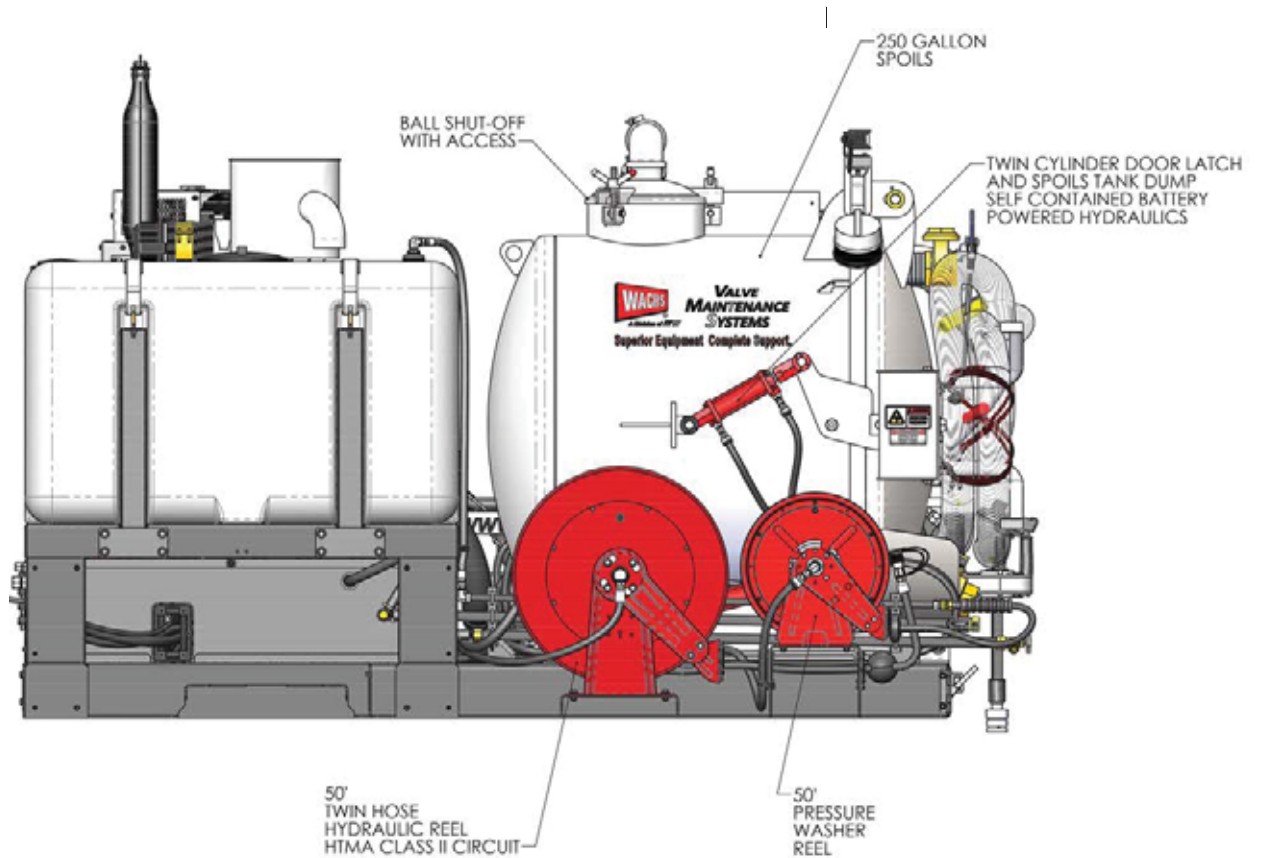


Figure 1-5. The drawing shows the tank-side view of the SB VMS (both engine configurations).

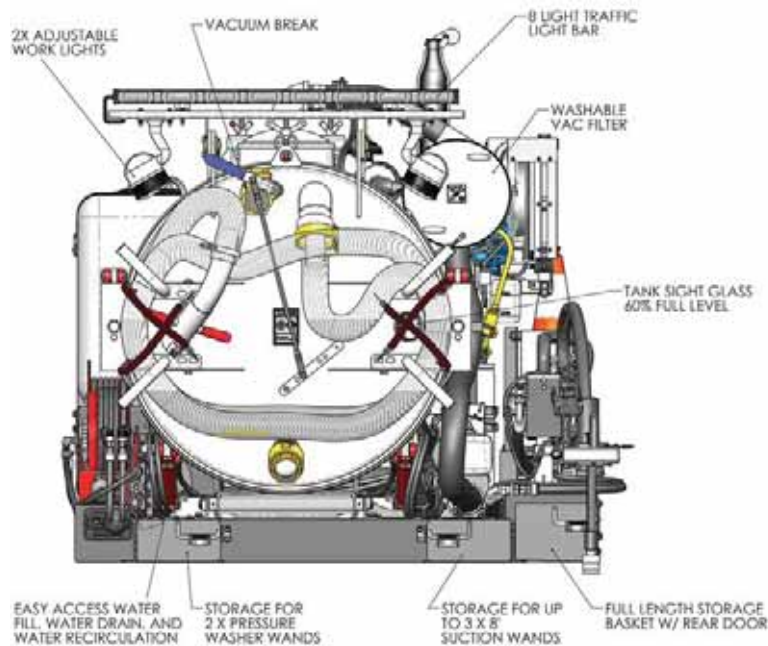


Figure 1-6. The drawing shows the rear view of the SB VMS (both engine configurations).

Engine Specifications

The integrated engine operates all of the SB VMS equipment, including the hydraulic system and auxiliary circuit. Controls for starting and operating the engine are on the system curbside control panel.

The engine uses fuel from the vehicle fuel tank, supplied by an electric pump attached to the frame. The fuel system has two filters, one at the pump and one in the fuel line at the engine. The fuel pump is fused. See Chapter 4 for maintenance instructions on replacing the fuse and filters.

Diesel Engine (Configuration 77-000-58)

The diesel engine configuration uses a 25 HP Kubota D1105-E4 Tier 4F engine.

The diesel engine is provided with an *Operator's Manual*. Refer to the Kubota manual for operating guidelines, maintenance, and service of the engine.

Gas Engine (Configuration 77-000-59)

The gas engine configuration uses a 27 HP Kohler Command Pro CH740 gasoline engine.

The engine operates on 87 octane unleaded gasoline or on 10% ethanol/90% gasoline “gasohol” blend. Use a winter blend fuel when running the engine in cold weather.

The Kohler engine is provided with an *Owner’s Manual* and a *Service Manual*. Refer to the Kohler manuals for operating guidelines, maintenance, and service of the engine.

Hydraulic Power System

The system hydraulic pump is directly coupled to the engine. It provides 8 gpm (30 l/m) hydraulic flow at 2,000 psi (138 bar). The hydraulic system includes a 10 gallon (38 l) fluid reservoir, fan-cooled heat exchanger, and an auxiliary HTMA Class II circuit.

Use a high-quality hydraulic oil with anti-wear properties and a viscosity index of 140 minimum (per ASTM D2270). ISO-32 oil is recommended; it provides a good balance for hydraulic systems in freezing cold and hot summer conditions. For environments not subject to freezing conditions, you can substitute ISO-46 oil.

Vacuum System

The utility vacuum system includes a 500 CFM, 11” Hg positive displacement blower, tach/hourmeter, silencer, and washable filter. The vacuum includes a 200 gallon holding tank with a hydraulic dump door operated by an electronic control panel.

The following vacuum attachments are provided:

- A 3” diameter x 20 ft flexible suction hose, with connection elbow and handles for operation.
- 7/8” diameter x 8 ft vacuum wand.
- 1-1/4” diameter x 8 ft vacuum wand.
- 2-1/2” diameter x 8 ft vacuum wand.

All wands have a standard connector for the 3” suction hose elbow.

Pressure Washer

The clutch-driven pressure washer outputs 2.6 gpm @ 3000 psi. It includes the following features:

- 5 gallon priming tank
- 100 gallon water tank
- sprayer wand
- 50 ft hose on a spring-rewind hose reel.

Hydraulic Hose Reel

The hose reel supplies 50 ft of 1/2" hydraulic hose (rated 2000 psi) for operating auxiliary equipment. It includes hose whips and connectors to connect to the auxiliary tools.

ERV-750 Extended Reach Valve Operator

The ERV-750 is an extended-reach hydraulic valve operator on a telescoping arm mounted to a swivel base. It can reach valves up to 11 ft from the curb side of the truck, and provides up to 750 lb-ft of torque.



Figure 1-7. The ERV-750 valve operator extends on a telescoping swivel arm.

The ERV-750 includes the HC-100 handheld controller/data logger for operating the machine and collecting valve exercising data. The controller is available with optional GPS capability (either standard or submeter resolution) for automated valve locating and logging.

The HC-100 is available separately (79-422-01, North American version) if a spare or replacement is needed.

The ERV-750 is supplied with its own manual, *ERV-750 Extended Reach Valve Operator User's Manual*, for operating instructions and parts/service information.

2,400 W Power Inverter

The power inverter supplies household 120 VAC electrical power. It features a low-frequency design and delivers up to 20 A continuously, with 6,480 W of peak power. The GFCI provides protection to the on-board outlet and the 50 ft electric cord reel. The cord reel is heavy-duty NEMA 4 rated with a water-tight plug.

The power inverter has its own power switch. There is an indicator light on the truck dashboard that turns on when the inverter is on.

- The inverter draws power from the truck's electrical system. Only turn on the inverter when you are using it.
- If operating the inverter for more than a few minutes, or when drawing more than 5 A through the inverter, run the truck engine to keep the truck battery charged.
- The inverter will draw power when it is on, even if you are not operating an electrical tool with it. Do not leave the inverter on when the truck is not running, to avoid running down the truck battery.

A manufacturer's manual, *Dimensions DC to AC Power Inverters Owner's Manual*, is supplied with the power inverter. Refer to the inverter manual for detailed operating and maintenance instructions.

TM-7 Automated Valve Exerciser (Optional)

The TM-7 HD Plus is a heavy-duty automated valve operator providing up to 2,500 lb-ft of torque. The power head is mounted on a rigid frame that slides out over the valve location and slides back onto the truck for storage.



Figure 1-8. The TM-7 is shown extended to its operating position.

The TM-7 HD Plus uses the HC-100 handheld control unit for operating the machine and collecting valve exercising data. The TM-7 operates in manual mode or in an exercising mode that automatically controls torque and direction to exercise valves safely and completely.

The TM-7 HD Plus is supplied with its own manual, *TM-7 Truck Mounted Valve Operator User's Manual*, for operating instructions and parts/service information.

Water Heater (Optional)

A water heater is available for heating sprayer water. When installed, the heater is integrated with the sprayer system, and water circulates through the heater. (You can bypass the heater, if desired, when not using it.)

The water heater operates on its own fuel source, with an attached fuel tank. **Use either kerosene or diesel fuel (#1 or #2). Do not use any other fuels.**

A separate manual is provided with the water heater: *Alkota Oil Water Heater Model 410 WH Operation & Service Manual*. Refer to this manual for detailed safety, service, and maintenance information.



WARNING

Do not use gasoline or any non-specified fuel in the water heater. Use of any other fuel could result in fire or explosion, causing serious injury or death.

DISMANTLING AND DISPOSAL

Hydraulics and Lubricants

- Whenever servicing or dismantling the equipment, always capture hydraulic fluid and lubricants. Recycle or dispose of fluids as required by local environmental law.
- Do not dispose of fluids by pouring down the drain.



Machinery and Components

- Recycle or dispose of metal and other equipment components as required by local environmental law.



SYSTEM COMPONENT MANUALS

The following separate manuals are provided for components of the SB VMS system. These manuals contain important safety, service, and maintenance information that may not be included in this manual.

- *Kubota Diesel Engine Operator's Manual* (for diesel engine configuration)
- *Kohler Command Pro Owner's Manual* (for gas engine configuration)
- *Roots Universal RAI, URAI-DSL, URAI-G & Metric Series Installation, Operation and Maintenance Manual*
- *Dimensions DC to AC Power Inverters Owner's Manual*
- *ERV-750 Extended Reach Valve Operator User's Manual*
- *TM-7 Truck Mounted Valve Operator User's Manual* (optional)
- *Alkota Oil Water Heater Model 410 WH Operation & Service Manual* (optional).



Chapter 2

Safety

E.H. Wachs takes great pride in designing and manufacturing safe, high-quality products. We make user safety a top priority in the design of all our products.

Read this chapter carefully before operating the SB VMS. It contains important safety instructions and recommendations. Tool operators and maintenance personnel must always comply with the safety precautions in this manual, and on the stickers and tags attached to the equipment.

SAFE OPERATING GUIDELINES

Follow these guidelines for safe operation of all E.H. Wachs equipment.

- **READ THE OPERATING MANUAL.** Make sure you understand all setup and operating instructions before you begin. Keep this manual with the machine.
- **INSPECT MACHINE AND ACCESSORIES BEFORE USE.** Before starting the machine, look for loose bolts or nuts, leaking lubricant, rusted components, worn or damaged fittings, and any other physical conditions that may affect operation. Properly maintaining the machine can greatly decrease the chances for injury.
- **ALWAYS READ STICKERS AND LABELS.** Make sure all labels and stickers are in place, clearly legible, and in good condition. Refer to “Safety Labels” later in this chapter for label locations on the machine. Replace any dam-

In This Chapter

SAFE OPERATING GUIDELINES

SAFE OPERATION OF THE SB VMS



Look for this symbol throughout the manual. It indicates a personal injury hazard.

aged or missing safety labels; see Chapter 5 for ordering information.

- **ESTABLISH A TRAINING PROGRAM.** Ensure that all operators know how to operate the machinery safely. Do not operate the machinery unless you have been trained, or are under the supervision of an instructor.
- **KEEP CLEAR OF MOVING PARTS.** Keep hands, arms, and fingers clear of all rotating or moving parts. Always turn the machine off and disconnect the power source before doing any adjustments or service.
- **SECURE LOOSE CLOTHING AND JEWELRY.** Secure or remove loose-fitting clothing and jewelry, and securely bind long hair, to prevent them from getting caught in moving parts of the machine.
- **FOLLOW SAFE PROCEDURES FOR HANDLING LUBRICANTS.** Refer to the manufacturer's instructions and the Material Safety Data Sheets.

Safe Operating Environment



- Do not use this equipment in a potentially explosive atmosphere. Fire or explosion could result, with the risk of serious injury or death.
- Provide adequate lighting to use the equipment, in accordance with worksite or local regulations.
- **KEEP WORK AREA CLEAR.** Keep all clutter and nonessential materials out of the work area. Only people directly involved with the work being performed should have access to the area.
- The end user is responsible for providing a safe hydraulic hose management procedure for the worksite. This should take into account mechanical protection of the hoses and trip hazards presented by the hoses. It is strongly recommended that the end user conduct a risk assessment to identify these risks and specify a suitable control action for hose management.
- Start in a work area without bystanders. The operator must be familiar with all prohibited work areas in the environment, and all worksite safety guidelines and procedures.

Safety Alerts in This Manual

The following alerts are used throughout this manual to indicate operator safety hazards. In all cases, these alerts include a notice describing the hazard and the means to avoid or reduce risk. Carefully read all safety alerts.



This icon is displayed with any safety alert that indicates a personal injury hazard.

WARNING

This safety alert, with the personal injury hazard symbol, indicates a potentially hazardous situation that, if not avoided, **could** result in **death or serious injury**.

CAUTION

This safety alert, with the personal injury hazard symbol, indicates a potentially hazardous situation that, if not avoided, **could** result in **minor or moderate injury**.

Protective Equipment Requirements

Protective Clothing

Wear safety shoes when operating or servicing the equipment. Serious injury could result from dropping the machine or its components.

Do not wear gloves while operating the valve operator(s). Gloves are an entanglement hazard with moving parts.



NOTE

Gloves can be worn to protect hands from the weather and hot machine surfaces. However, **do not wear gloves while operating the valve operator(s).**

Eye Protection



The Eye Protection hazard label is affixed to the machine. Always wear impact-resistant eye protection while operating or working near this equipment.

Hearing Protection



The Hearing Protection hazard label is affixed to the machine. The highest continuous noise levels recorded for this equipment exceed 80 dB(A). Equipment operators/maintainers must wear hearing protection.

SAFE OPERATION OF THE SB VMS

Proper Use of the SB VMS

- This equipment is to be operated, serviced, and maintained only by qualified, trained personnel.
- Make sure the vehicle is stable and level when parked at the work location.
- Keep personnel away from the rear of the truck when dumping the spoils tank.
- Dump the spoils tank only in authorized dumping areas.
- DO NOT wear gloves when operating the valve operator(s). Gloves can become entangled in rotating machinery, causing serious injury. (You can wear gloves when performing other tasks with the SB VMS machinery.)
- Before performing any service on the equipment, disconnect the power source(s). Follow all lock-out/tag-out procedures required at the worksite.

Hydraulic Powered Equipment

- Be sure all hoses are connected for correct flow to and from the equipment you are operating.
- Hydraulic components such as hoses, motors, and manifolds will get hot during operation and may cause burns. Do not touch hydraulic components, except for operator controls, during or after operating the machine.



WARNING

Exceeding the maximum hydraulic pressure or flow rate can result in equipment damage or operator harm.

- **Hydraulic injection injury**—A pinhole in a hydraulic hose or fitting can eject fluid with enough force to pierce skin. Check hoses and fittings regularly for leaks. **Do not use bare hands to check for leaks while the system is pressurized.** If you suspect a leak, move a piece of paper or cardboard at least 6 inches (15 cm) over the suspicious area and watch for fluid spraying on the surface.

Misuse of Equipment

- Do not use the machinery for any purpose other than the procedures described in this manual.
- Do not use the machinery in a potentially explosive environment.
- Do not operate the machinery without all covers in place.
- Do not climb or step on the machinery.
- Do not perform any set-up, maintenance, adjustments, service, or disassembly of the machinery without first disconnecting power sources and performing any site-required lock-out tag-out (LOTO) procedure.

Potential Hazards

Hot Surfaces. Hydraulic components become hot during operation. Do not touch any surface before making sure it is not hot enough to cause burns.

Noise Hazard. The highest continuous noise levels recorded for this equipment exceed 80 dB(A). Equipment operators/maintainers must wear hearing protection.

Flying Debris. The SB VMS pressure washer can create airborne debris during operation. Auxiliary tools connected to the hydraulic system or 120 VAC electrical supply may also create debris. Always wear impact-resistant eye protection while operating or working near this equipment.



WARNING

Injection of hydraulic fluid through the skin is a serious injury that can result in infection, tissue damage, and possible loss of limb. **Seek medical treatment immediately.** First aid is not sufficient treatment for injection injury.





High-Pressure Hydraulic Fluid. A pinhole in a hydraulic hose or fitting can eject fluid with enough force to pierce skin. Check hoses and fittings regularly for leaks. **Do not use bare hands to check for leaks while the system is pressurized.**

Outdoor Use. The SB VMS is designed for outdoor use. Do not operate the machine outdoors during or immediately after (30 minutes) an electrical storm

Residual Risks

- Hot surfaces on hydraulic components after operation.
- Noise hazard during operation of the machine.
- Entanglement hazards from moving parts of the machine.
- Handling of potentially hazardous materials, including fluids and lubricants used for operation and maintenance of the machine.
- Trip hazards from cords and hydraulic hoses.
- Slip and fall hazards from spilled hydraulic fluid or lubricants.

Disconnecting Power

Power is disconnected by turning off the engine and turning off the power inverter.

Before performing any service or storing the SB VMS, make sure to release any residual hydraulic pressure and water pressure.

Chapter 3

Operating Instructions

CURBSIDE CONTROL PANEL

The control panel on the SB VMS includes controls for engine and hydraulic system functions.



Figure 3-1. Curbside control panel (diesel version).

In This Chapter

- CURBSIDE CONTROL PANEL
- ENGINE OPERATION
- HYDRAULIC SYSTEM CONTROLS
- ERV-750 OPERATION
- VACUUM OPERATION
- PRESSURE WASHER OPERATION
- LIGHT BAR OPERATION
- 120 VAC ELECTRICAL POWER INVERTER
- AUXILIARY HYDRAULIC CIRCUIT/HOSE REEL OPERATION
- TM-7 OPERATION (OPTIONAL)
- WATER HEATER OPERATION (OPTIONAL)

Diesel Engine Configuration (77-000-58)

The following diagram illustrates the control panel for the SB VMS with diesel engine.

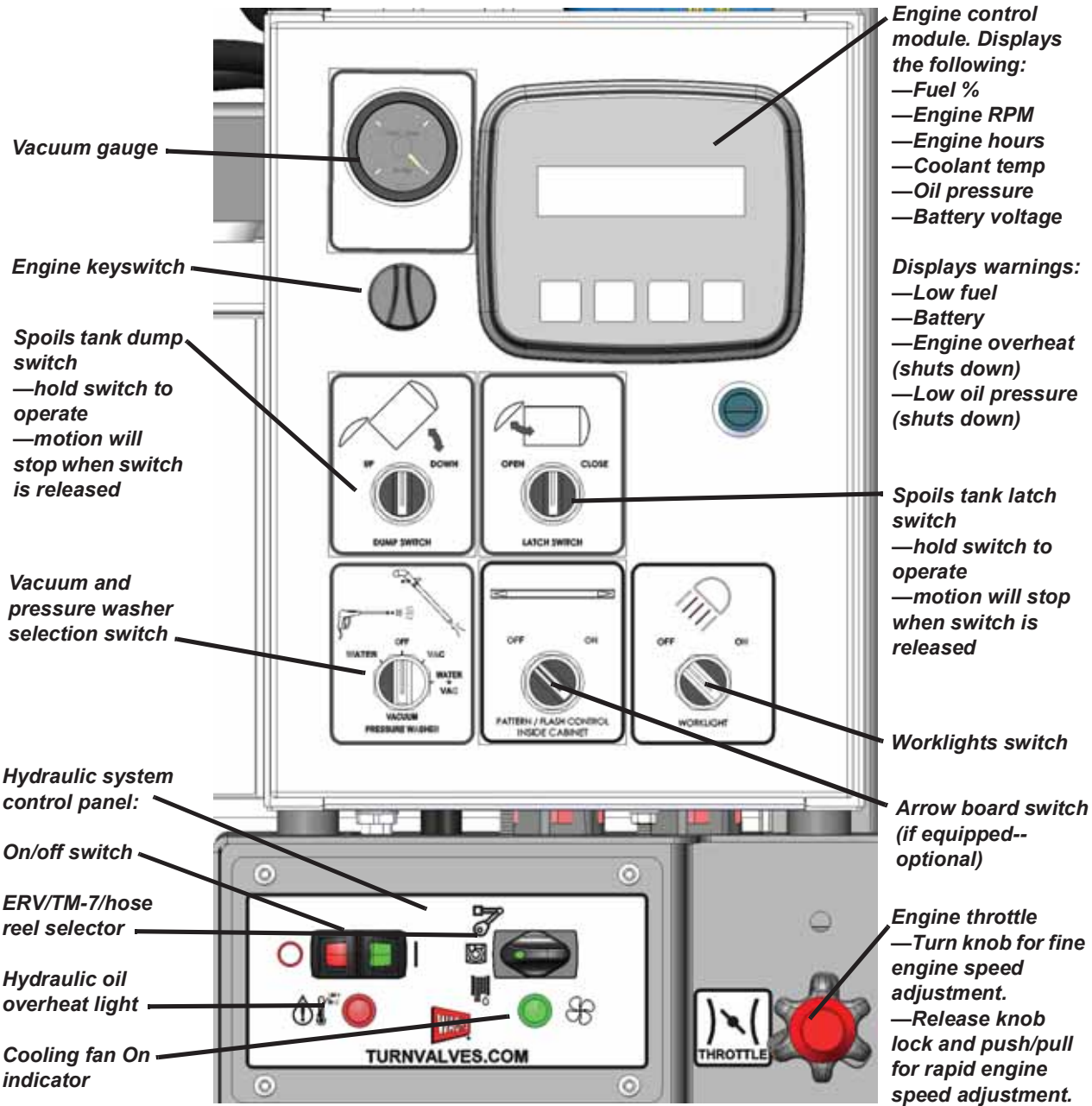


Figure 3-2. The drawing shows the operating features of the diesel configuration control panel.

Gas Engine Configuration (77-000-59)

The following diagram illustrates the control panel for the SB VMS with gas engine.

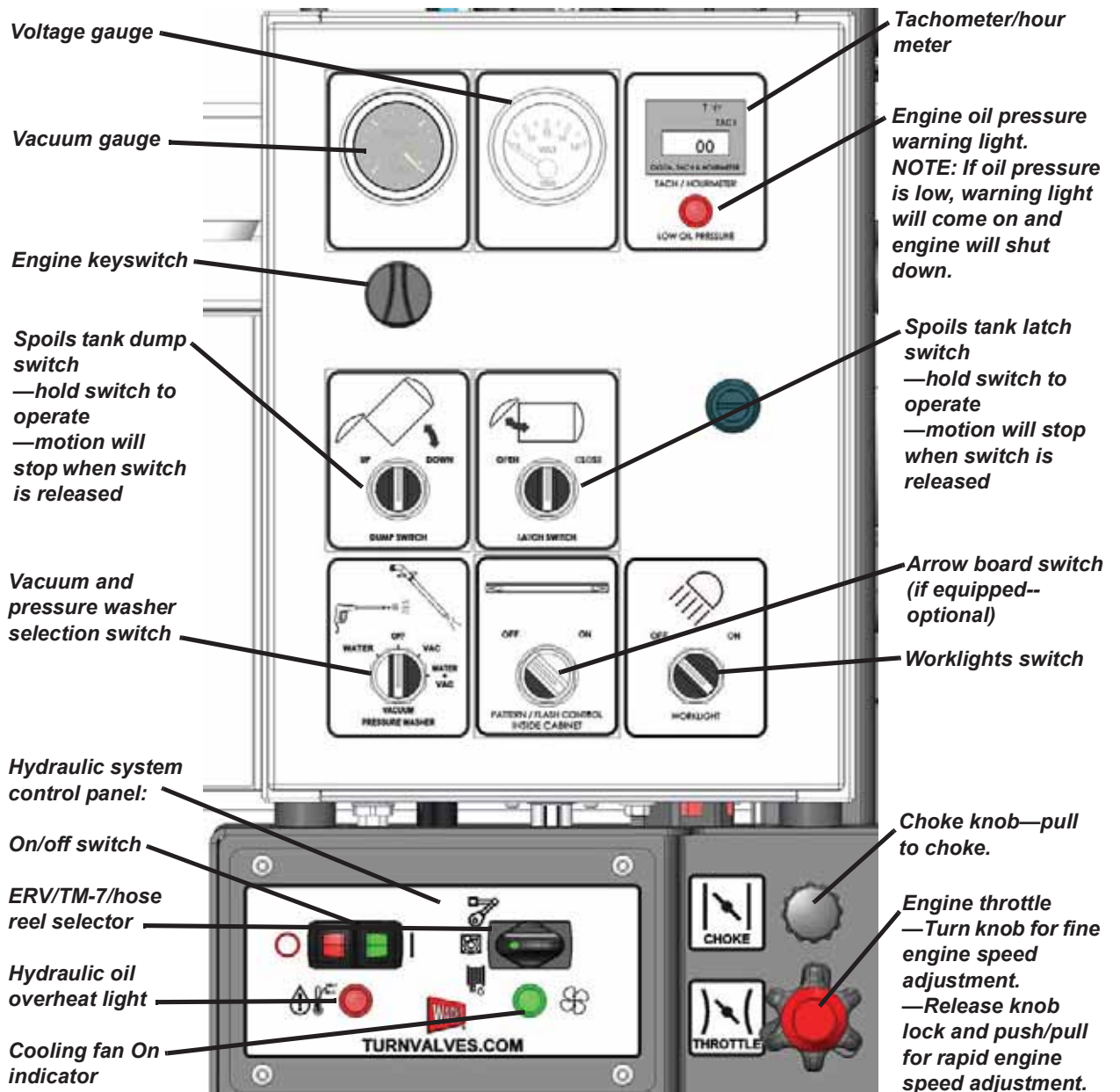


Figure 3-3. The drawing shows the operating features of the gas configuration control panel.

ENGINE OPERATION

The integrated gas or diesel engine provides power to the SB VMS. The engine must be running to operate the hydraulic-powered components of the system (valve operators, vacuum, pressure washer, hose reel).

You can operate the electrical components of the system without running the engine (spoils tank latch and dump, arrow board, work lights, power inverter). However, you should run the engine if you operate these components for more than a short time, to avoid draining the battery.

- 1.** Before starting the engine, make sure the following control switches are set to the OFF position:
 - Vacuum/pressure washer
 - Pattern/flash control
 - Worklights
 - Hydraulic system.
- 2.** Use the keyswitch to start the engine.
- 3.** Allow the engine to warm up before throttling it up to operating speed.
- 4.** Use the throttle knob to set the engine speed. The throttle knob has a lock to keep the engine speed constant during operation.
 - Loosen the lock to adjust the throttle.
 - Tighten the lock to fix the engine speed at the throttle setting.



NOTE

See specific starting notes for each engine, including cold-weather starting, in the following diesel and gas engine subsections.

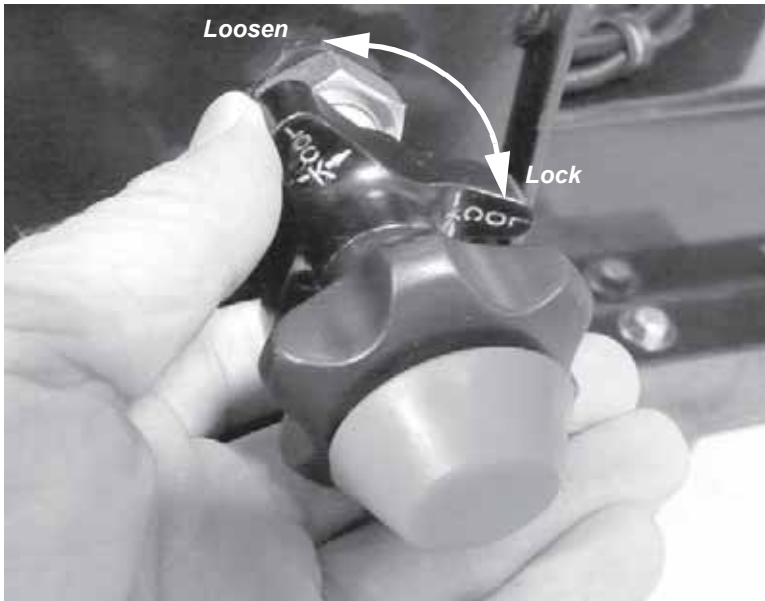


Figure 3-4. Loosen the throttle lock to adjust the throttle. Tighten the lock to keep the engine speed constant.

- 5.** For fine adjustment of the engine speed, turn the throttle knob:
- counter-clockwise to increase speed
 - clockwise to decrease speed.

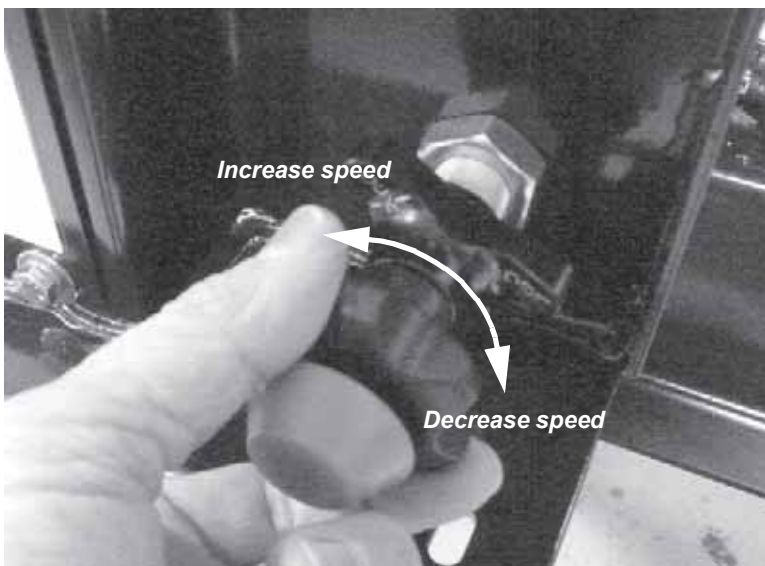


Figure 3-5. For fine engine speed adjustment, turn the throttle knob.

- 6.** For rapid adjustment of the engine speed, push the button on the throttle to push/pull it:
- pull the throttle out to increase engine speed
 - push the throttle in to decrease engine speed.

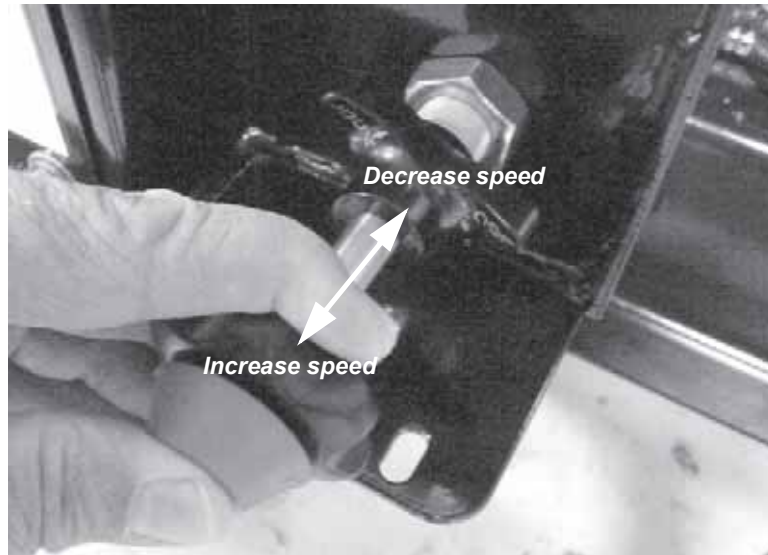


Figure 3-6. For rapid engine speed adjustment, hold the throttle button and push or pull the throttle.

Refer to specific operating notes in the following subsections for your engine configuration (diesel or gas).

Diesel Engine Starting and Operation

The diesel engine has a built-in block heater (110 V) to keep the engine warm in cold environments. Plug in the block heater to pre-warm the engine for easier starting in cold weather.

When you turn on the keyswitch, a countdown timer appears on the control panel display while the ignition plugs are pre-warmed. Wait until the timer counts down to start the engine.

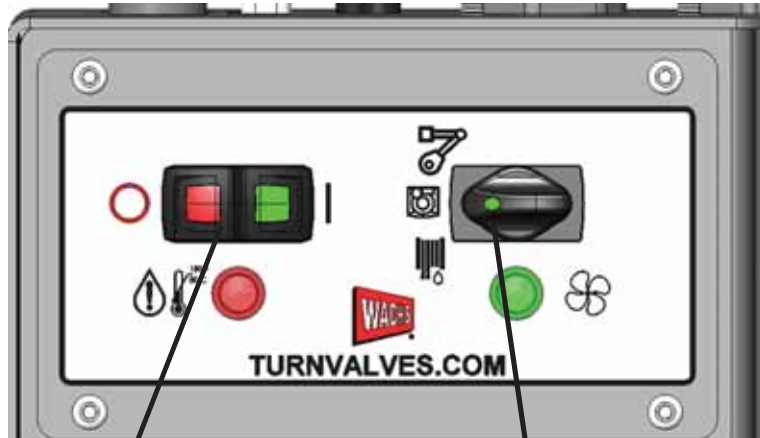
Gas Engine Starting and Operation

When starting the engine cold, pull out the choke knob before starting. Allow the engine to warm up, then push in the choke and set the throttle speed.

HYDRAULIC SYSTEM CONTROLS

Use the hydraulic system control panel to turn the hydraulics on and off, and to select the hydraulic tool.

- The engine must be running to operate the hydraulic system.
- For safety, the hydraulic system is off when the engine is first started.



On/off switch

- Engine must be on to operate hydraulic system.
- Push green to turn on.
- Push red to turn off.
- Hydraulic system is always OFF when engine is first started.

Hydraulic tool selector

- ERV 750
- TM-7 (if equipped)
- hydraulic hose reel.

Figure 3-7. Use the control panel to turn the hydraulic system ON/OFF, and to select the hydraulic tool.

ERV-750 OPERATION

This section describes how to set up the ERV-750 for use. Detailed instructions on operating the ERV-750 are in the *ERV-750 Extended Reach Valve Operator User's Manual*, which is provided with the ERV-750.

- 1.** Unfasten the latches that hold the ERV arm in place.



Figure 3-8. Release the two latches that secure the ERV-750 arm to the truck.

- 2.** Operate the ERV-750 according to the instructions in the *ERV-750 Extended Reach Valve Operator User's Manual*.
- 3.** When you are finished using the ERV-750, return the arm to its storage position and fasten it with both latches.

VACUUM OPERATION

Selecting a Vacuum Wand

Three vacuum wands of different diameters are provided with the SB VMS:

- 7/8" diameter x 8 ft vacuum wand.
- 1-1/4" diameter x 8 ft vacuum wand.
- 2-1/2" diameter x 8 ft vacuum wand.

In general, use the largest wand you can for the work environment. Larger wands pick up more debris faster and are less likely to clog. Use a smaller wand when you need to work in a tight area.

Setup and Operation

Before setting up the vacuum system, position the vehicle so that the suction hose reaches the work area.

- Make sure that the latch on the dump door of the holding tank is fully engaged.
 - Make sure the holding tank drain valve is closed.
 - Make sure that the vacuum break lever on the back of the truck is in the CLOSED position.
- 1.** Park the vehicle on level ground in a location close enough to the work site to reach it with the suction hose.
 - 2.** Remove the suction hose from its storage location on the back of the spoils tank and lay it out on the ground.
 - 3.** Release the locking collar holding the plug in the inlet port at the top of the spoils tank.



Figure 3-9. Pull the latch on the locking collar to release it and take it off the inlet port.

- 4.** Remove the plug from the inlet port. Put the plug in a secure location such as the truck storage box.



NOTE

The standard suction hose is 20 feet long (longer length hoses can be ordered).



Figure 3-10. Remove the plug from the inlet port.

- 5.** Insert the port fitting end of the suction hose into the inlet port. Put the locking collar over the fitting and close the latch to secure the hose.



Figure 3-11. Insert the hose fitting into the inlet port and attach it with the locking collar.

- 6.** Slide the elbow fitting (with handles) over the end of the vacuum wand.

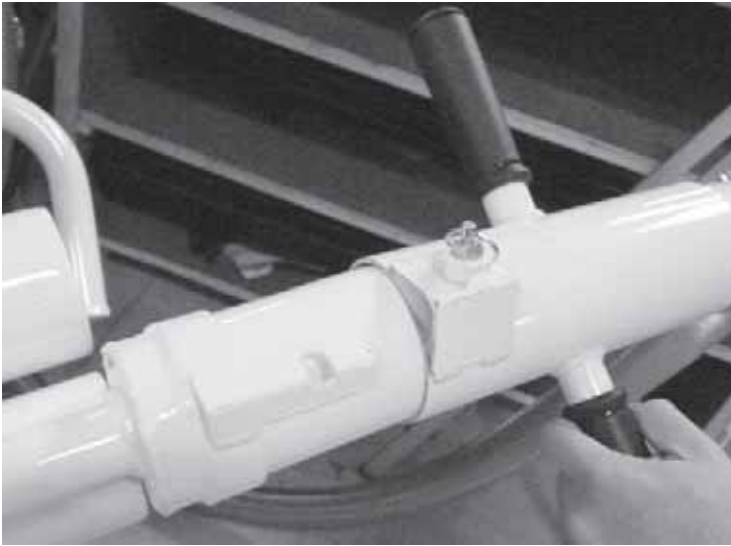


Figure 3-12. Slide the elbow onto the end of the wand. Align the locking pin in the elbow with the slot on the wand fitting.

- 7.** Insert the wand fully into the elbow until the lock pin engages.



Figure 3-13. Insert the elbow into the wand until the lock pin engages to secure the wand.

- 8.** Start the engine, following the instructions in “Starting and Running the Engine” earlier in this chapter.
- 9.** Before turning on the vacuum blower, make sure you are holding the wand off the ground and away from any objects.



NOTE

Set the engine throttle to low speed before turning on the pressure washer or vacuum blower.

- 10.** At the control panel, turn the Vacuum/Pressure Washer switch to the VAC position. The vacuum blower will engage.

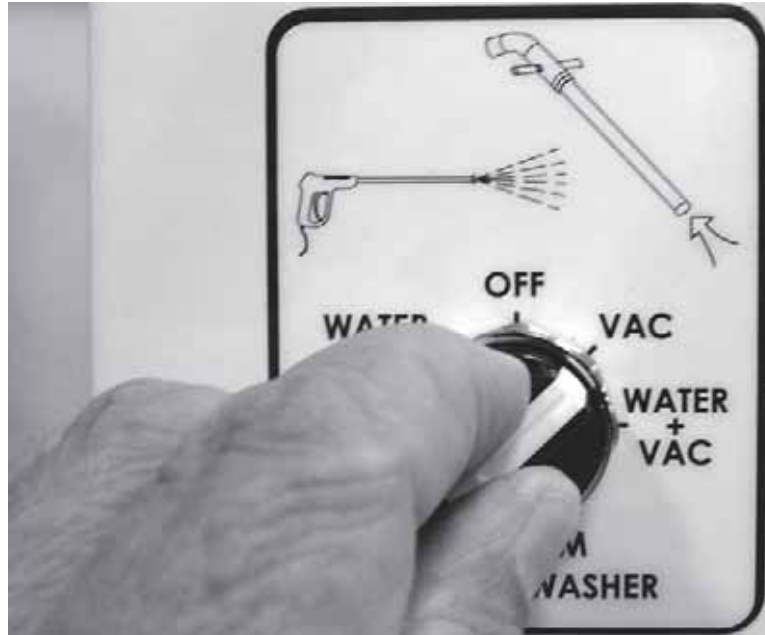


Figure 3-14. Turn the Vacuum/Pressure Washer switch to the VAC position.

- 11.** If you are using the pressure washer to aid in vacuuming, turn the Vacuum/Pressure Washer switch to the BOTH position.

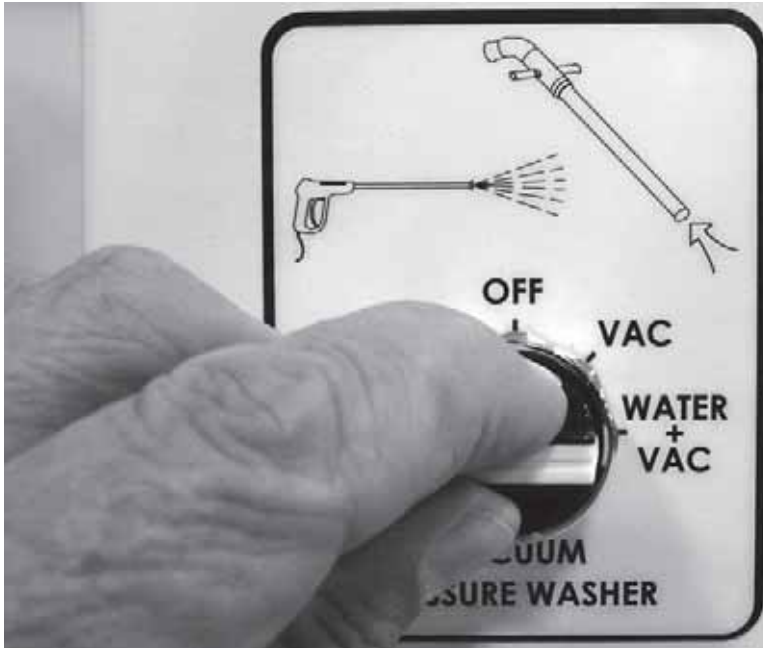


Figure 3-15. To use both the washer and vacuum, turn the Vacuum/Pressure Washer switch to the WATER + VAC position.

- 12.** Vacuum the work site to remove the water or debris. Note the following guidelines when operating the vacuum:
- When vacuuming water, do not submerge the tip of the wand. Skim the surface of the water with the wand to keep from opening the vacuum relief valves.
 - Monitor the vacuum pressure. Normal operation should have a vacuum level of about 5". If the filter or wand is clogged, the vacuum will rise to 11". Shut the vacuum off and check the filter and wand or hose.
 - Vacuuming dry debris may be easier if you use the pressure washer to wet the material into a slurry.
 - You can "dig" with the pressure washer to loosen and remove material around hydrants or other equipment.
 - **Follow all safe digging practices and guidelines required for the worksite.**



Monitor the pressure on the vacuum gauge while operating the vacuum.



CAUTION

Do not fill the spoils tank to a level that exceeds the maximum Gross Vehicle Weight Rating (GVWR) of the vehicle and skid. Check the label inside the driver's door for available vehicle payload. See the **SPOILS WEIGHT** sticker on the tank for estimating the weight of the spoils in the tank.



NOTE

A clogged wand or hose will also stop vacuum suction. If the suction stops and the tank is not full, see the instructions in the "Unclogging the Vacuum" section below.

- 13.** You can monitor the fill level of the spoils tank by checking the sight glass on the front of the tank. The sight glass is at the 60% fill level.

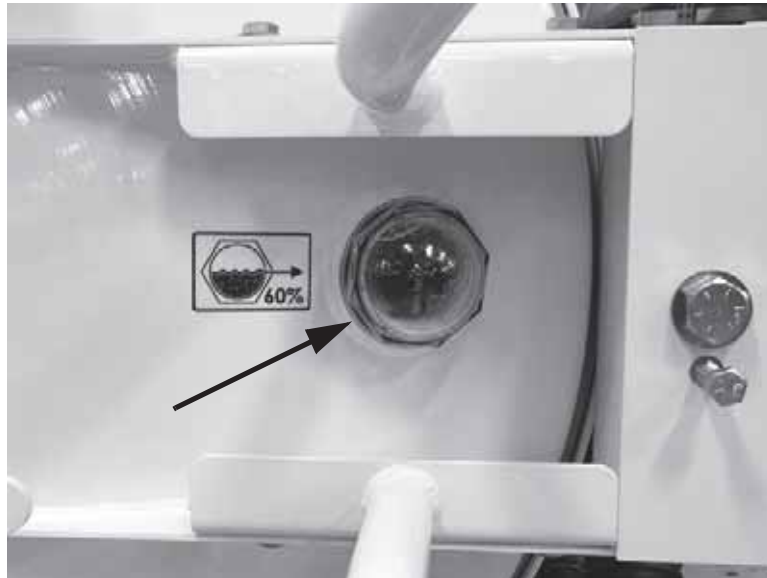


Figure 3-16. Monitor the fill level of the tank using the sight glass.

- 14.** When the tank fills with liquid, a ball valve in the top of the tank shuts off the vacuum pressure. (The relief valves in the filter canister will open.) See the instructions in the next section, "Emptying the Tank".
- 15.** When you are finished vacuuming or when the vacuum pressure stops, turn the Vacuum/Pressure Washer switch to the OFF position.

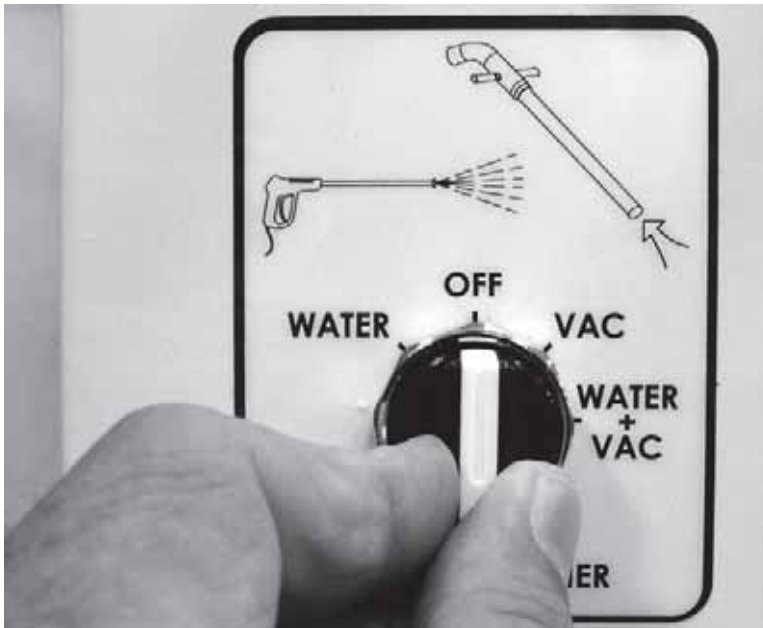


Figure 3-17. Turn the Vacuum/Pressure Washer switch OFF to turn off the vacuum.

- 16.** Turn off the gas engine using the keyswitch.
- 17.** Remove the wand from the suction hose and put it in the accessory storage box.
- 18.** Remove the hose from the tank inlet port and replace it on the back of the truck.
- 19.** Put the plug back in the inlet port and secure it with the locking collar.

Emptying the Tank

Follow the procedure below for draining liquid or dumping solids from the tank. If the tank contains both liquid and solids, first drain the liquid, then dump the solids.

Dump the spoils tank only in authorized dumping areas.



WARNING

Keep personnel away from the rear of the truck when dumping the spoils tank. Serious injury could result from contact with moving parts.



NOTE

The tank moves out 12" before it tips for dumping, and the door swings out when opened. Allow sufficient clearance behind the truck.



NOTE

If the valve is blocked with solids and the liquid won't drain, it is easiest to dump the tank to empty it. Stand clear of the tank when dumping liquids; the tank contents will splash out when the door is opened.

Draining Liquid

- 1.** Move the truck to the dumping location. If you will be dumping solids, make sure there is clearance for the tank to open and dump.
- 2.** Open the tank drain valve to allow the liquid to drain.

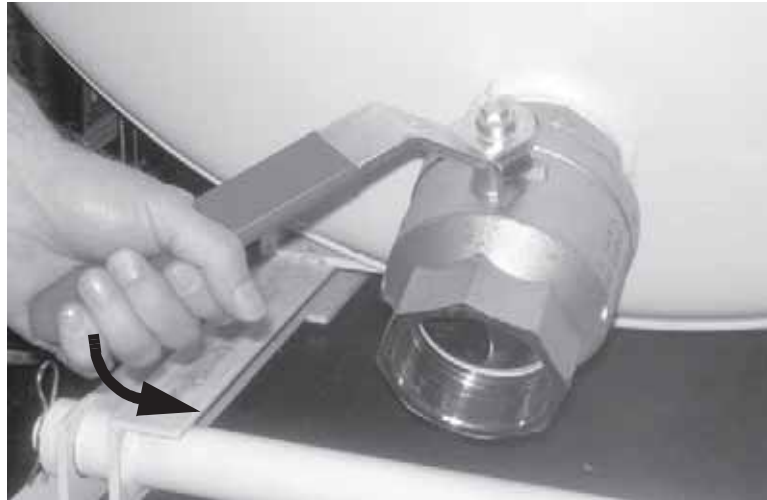


Figure 3-18. Open the tank drain valve to allow liquid to drain from the tank.

- 3.** When the liquid has finished draining, check the tank drain valve to make sure there are no obstructions blocking the tank drain.



Figure 3-19. Check the drain valve before closing it to make sure there are no obstructions.

- 4.** Close the tank drain valve.



Figure 3-20. Close the tank drain valve when the liquid has finished draining.

- 5.** If you are finished with the equipment, turn off the engine.

Dumping Solids

If there is liquid in the tank, drain it before dumping the solids.

- 1.** Move the truck to the dumping location. Make sure there is clearance for the tank to open and dump.
- 2.** Start the gas engine, following the instructions in “Starting and Running the Engine” earlier in this chapter.
- 3.** At the control panel, turn and hold the Dump Switch to the UP position. Hold the switch until the tank is fully tipped up, then release it to the center position.



CAUTION

Park the truck on level ground before dumping. You may not be able to close the door if the truck is not level.



WARNING

Make sure no one is in front of or near the tank when operating the Dump Switch. Contact with the tank while it is moving could cause serious injury.



Figure 3-21. Turn the Dump Switch to the UP position and hold it until the tank is completely tipped.



Figure 3-22. Tip the tank fully before opening the tank door.



WARNING

Make sure no one is in front of or near the tank when operating the Latch Switch. Contact with the tank door or contents when the door opens could cause serious injury.

4. At the control panel, turn the Latch Switch to the OPEN position and hold it until the door opens.



Figure 3-23. Turn the Latch Switch to the OPEN position and hold it until the door swings open.



Figure 3-24. The tank door will swing open when the latches are released.

5. After the tank contents have dumped and the door has stopped swinging, check the inside of the tank for remaining debris. Remove debris with the power washer, or use a shovel to scrape it out if necessary.
6. Use the power washer to clean the rim of the door and the tank where they contact each other. This will ensure the tank door will seal properly when you close it.



WARNING

Make sure no one is near the tank when operating the Dump and Latch Switches. Contact with the tank or door when they are moving could cause serious injury.

7. At the control panel, turn the Dump Switch to the DOWN position and hold it until the tank has lowered and moved back to its operating position. Release the Dump Switch.



Figure 3-25. After the tank is dumped, turn the Dump Switch to the DOWN position until the tank has moved back to its operating position.

8. Make sure the door is in contact with the tank before operating the Latch Switch.
9. At the control panel, turn the Latch Switch to the CLOSE position and hold it until the latches on the door completely engage.



CAUTION

Make sure the tank is lowered to its level position before closing the door. If you close the door latches before setting the tank down, you could damage the latch mechanisms.



Figure 3-26. When the tank is in the down position, turn the Latch Switch to the CLOSE position until the latches are fully engaged.

10. If you are finished with the equipment, turn off the engine.

Unclogging the Vacuum

If the system loses suction and the tank is not full, there is either a clog in the wand or hose, or the filter is plugged. If the suction stops suddenly, a clog is the most likely cause. A gradual decrease of suction is probably caused by a plugged filter.

Use the following procedure to clear the clog. Instructions for cleaning the filter are in Chapter 6.

1. With the vacuum still running, turn the Vacuum Break lever to the CLOSED position, then return it to the OPEN position. This may dislodge the clog.

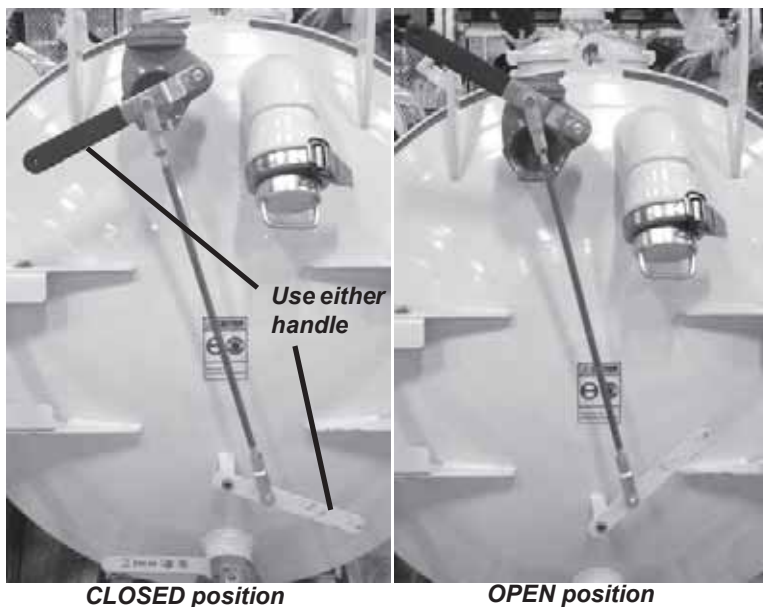


Figure 3-27. Turn the Vacuum Break lever to the CLOSED position.

2. Repeat opening and closing the Vacuum Break lever one or two times to see if the clog dislodges.
3. If using the Vacuum Break lever does not dislodge the clog, return the lever to the OPEN position. Turn the Vacuum/Pressure Washer switch to the OFF position to turn off the vacuum.



NOTE

Also check the filter whenever the vacuum system becomes clogged. Reduced suction caused by a partially clogged filter could cause the hose to clog. Clean the filter if necessary.

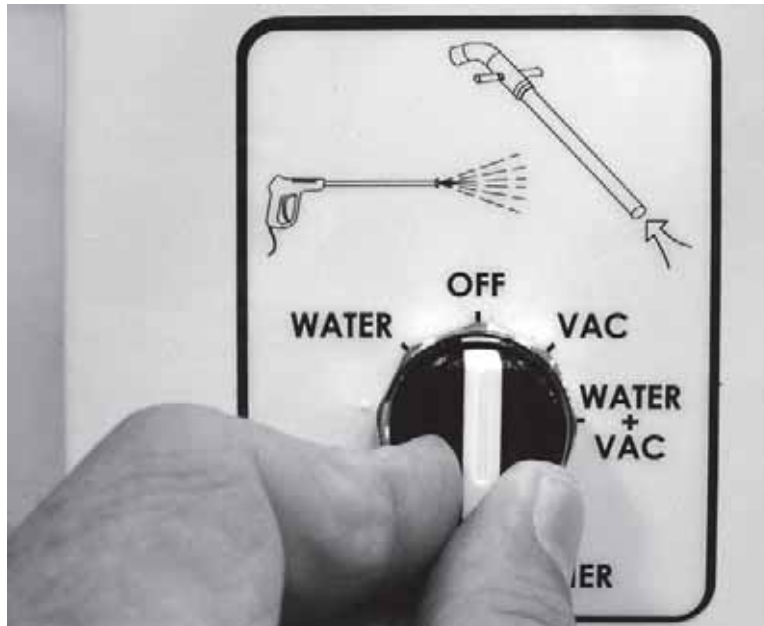


Figure 3-28. Turn the Vacuum/Pressure Washer switch OFF to turn off the vacuum.

4. Remove the wand from the hose and look through it to check for an obstruction. If it is blocked, use a rod or similar tool in the connector end of the wand to push the obstruction out.
5. If the wand is not clogged, remove the hose from the inlet port and check it. Try using the pressure washer from the tank end of the hose to spray out the clog, or use a long rod or similar tool to push the clog back out of the hose.
6. When you have removed the clog, reconnect the wand to the hose. Spray water into the tank end of the hose to make sure it comes out the wand.
7. Reconnect the hose to the inlet port on the tank.

PRESSURE WASHER OPERATION

Before operating the pressure washer, check the following:

- Make sure there is water in the washer reservoir.
- If the temperature will be below freezing, make sure there is antifreeze in the antifreeze reservoir.

- Make sure the Water Supply Valve lever is in the “Tanks” position.

The following photo illustrates the pressure washer fittings.

- Recirculation fitting—connect the sprayer hose to this fitting to recirculate water through the system (see “Recirculation” at the end of this section). Keep the sprayer hose “parked” here when not using the pressure washer.
- Tank fill inlet—connect a garden hose to this fitting to fill the pressure washer tank. (A backflow preventer keeps the tank from draining when you disconnect the hose.)
- Sprayer hose—connect the hose to a sprayer wand for operation. Keep it connected to the recirculation fitting when not using the pressure washer.
- Tank drain outlet—turn the faucet handle to open the outlet and drain the tank.

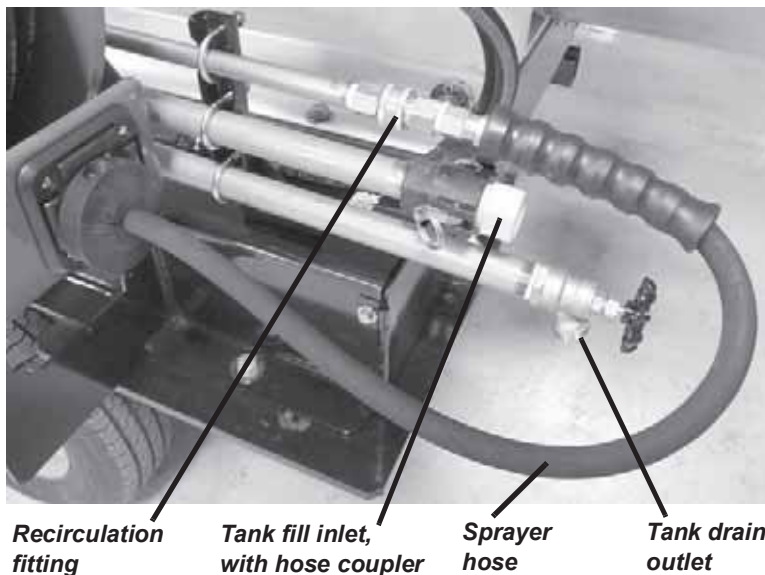


Figure 3-29. The photo shows the pressure washer and tank connections.

When you are using the system in low-temperature (freezing) conditions, you should operate the pressure washer pump with the sprayer hose connected to the recirculation fitting. See “Recirculation” on page 53.



NOTE

There is a NSF dual-check backflow preventer on the inlet line, beneath the water tank. This prevents the tank from draining through the inlet. When you disconnect the supply hose from the inlet, only water in the pipe will drain out.

See Chapter 4 for instructions on storing the pressure washer in sub-freezing weather.

Filling the Water Tank

To fill the water tank, connect a garden hose to the hose inlet connection at the back of the truck, by the hose reel. See Figure 3-29.

The inlet line has a NSF dual-check backflow preventer, beneath the water tank. This prevents the tank from draining through the inlet.

You can also fill the tank by removing the top cap.

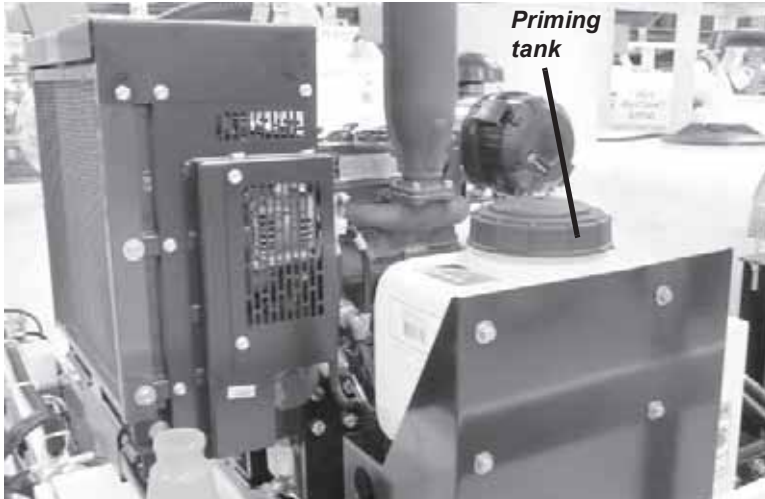


Figure 3-30. You can remove the lid from the top of the water tank to fill it.

Filling the Antifreeze (Primer) Tank

The priming tank is by the engine at the front of the truck bed. Unscrew the cap and fill the tank before using the sprayer.

- When operating the sprayer in below-freezing or near-freezing weather, keep the priming tank filled with an antifreeze mixture appropriate for the temperature.
- When there is no danger of freezing temperatures, you can keep plain water in the tank. You can use a water treatment solution to keep the sprayer system clean.



*Figure 3-31. In **freezing** weather, fill the priming tank with an antifreeze mixture. In **non-freezing** weather, use water treated with a purifying agent.*

Using the Pressure Washer

The short sprayer wand is recommended for washing down the truck or cleaning other equipment. The longer wand is useful for cleaning at the work site or scouring soil and debris while vacuuming.

- 1.** Pull enough sprayer hose from the hose reel to reach the work location.



NOTE

The sprayer hose is 50 feet long. The hose reel has a ratchet lock; when you have pulled out the desired length of hose, stop pulling when you hear the ratchet click.

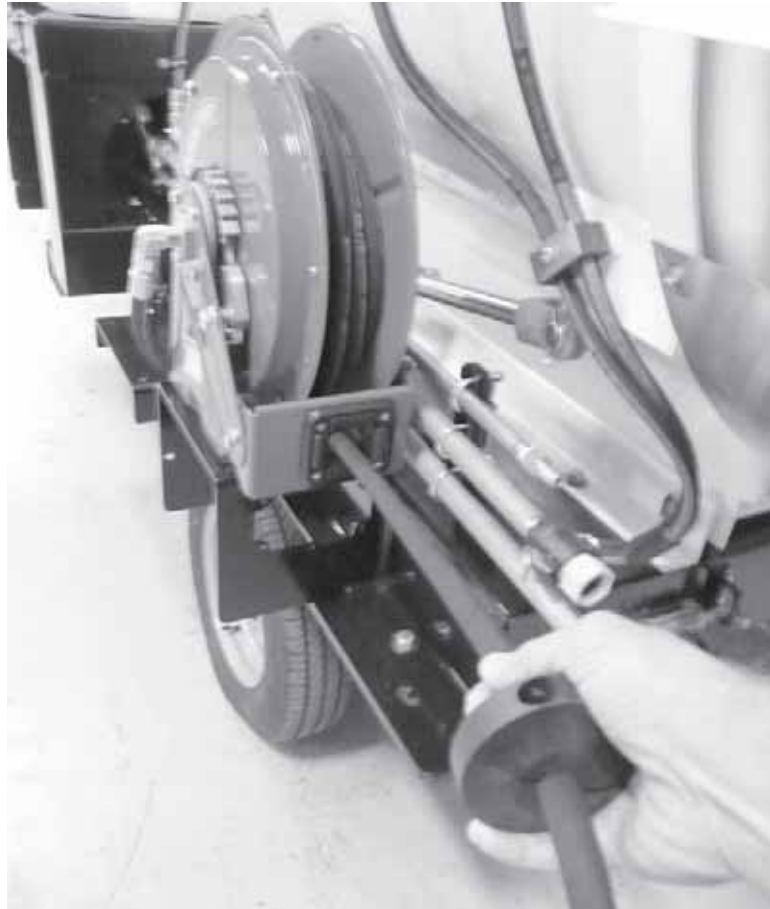


Figure 3-32. Pull the sprayer hose out of the hose reel until you can reach the work location.

- 2.** Select the sprayer wand you want to use. Attach the wand to the end of the sprayer hose. Two standard sprayer wands are provided:
 - The shorter wash-down wand (77-406-00) has a rotating nozzle for hydro-excavation and high-pressure cleaning.
 - The longer rotating-nozzle wand (77-408-01) has a 40° nozzle for easy cleaning of the spoils tank.

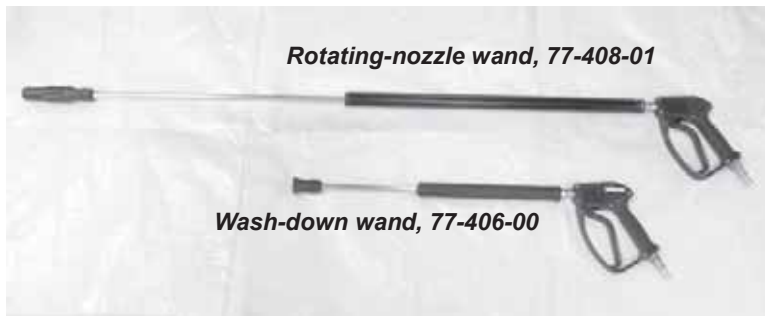


Figure 3-33. The photo shows the 2 sprayer wands.



Figure 3-34. Attach the spray wand to the sprayer hose.

3. Start the gas engine and run at low to medium throttle.
4. At the control panel, turn the Vacuum/Pressure Washer switch to the WATER position.



NOTE

Set the engine throttle to low speed before turning on the pressure washer or vacuum blower.

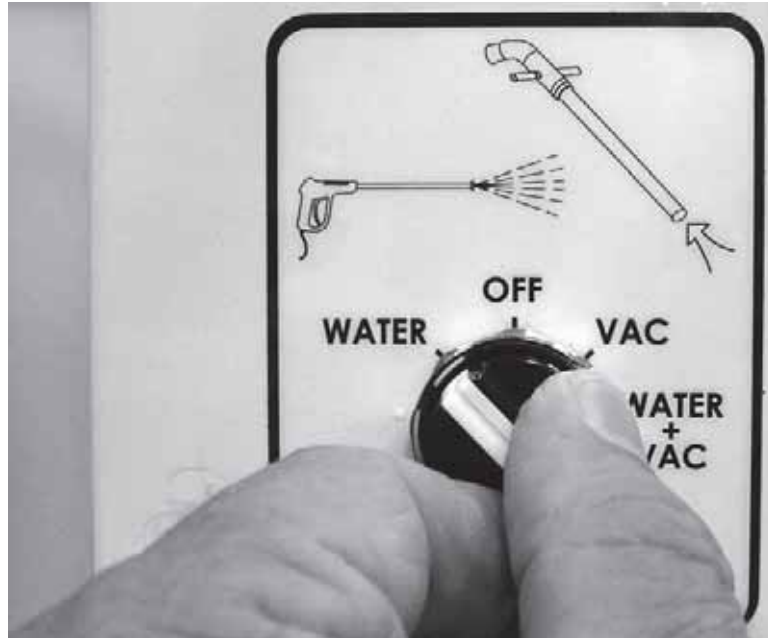


Figure 3-35. Turn the pressure washer switch to the WATER position.

5. If you will be using both the pressure washer and vacuum, turn the Vacuum/Pressure Washer switch to the WATER + VAC position.

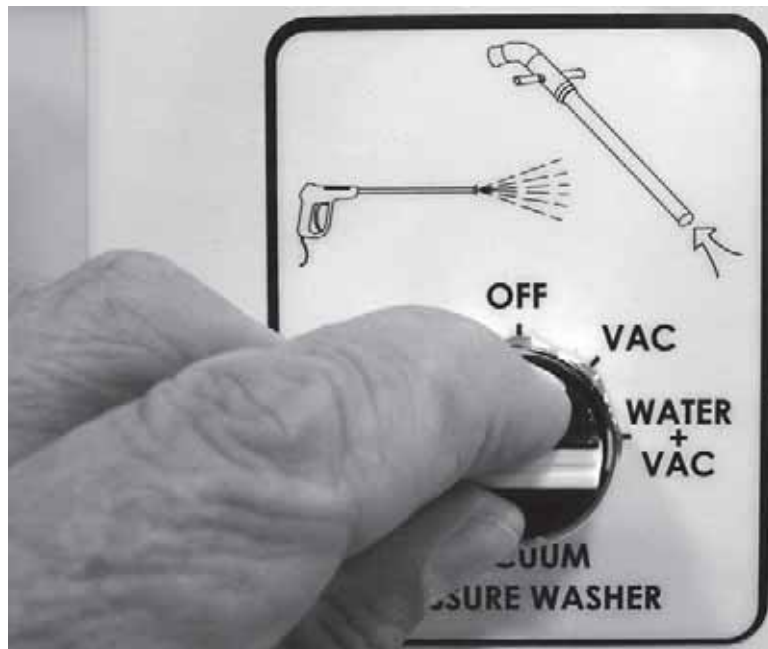


Figure 3-36. To use both the washer and vacuum, turn the Vacuum/Pressure Washer switch to the WATER + VAC position.

6. Squeeze the trigger on the spray wand to start spraying.
7. Adjust the sprayer pressure by turning the unloader knob on the sprayer pump.

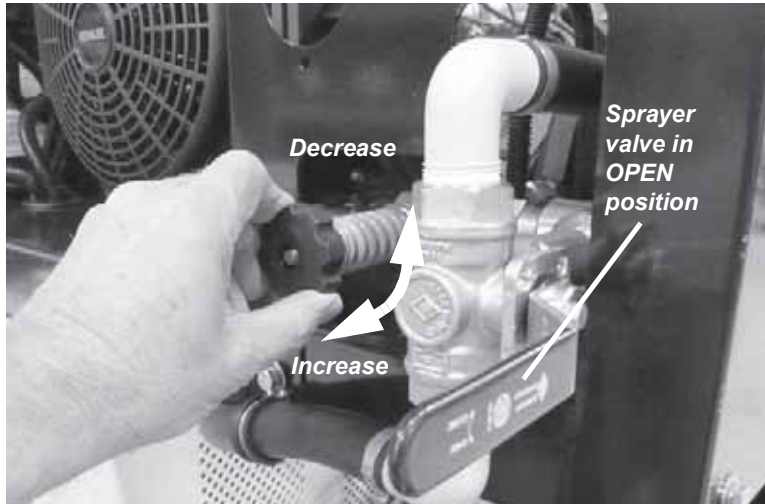


Figure 3-37. Turn the unloader knob clockwise to increase the water pressure, or counter-clockwise to decrease water pressure.

8. Monitor the water level in the water tank while using the sprayer. Refill the tank when necessary. If the tank runs dry and the pump loses its prime, follow the priming procedure in the next section.
9. When you are finished spraying, turn the Vacuum/Pressure Washer switch to the OFF position.



CAUTION

Never exceed 3,000 psi (206 bar) pressure.

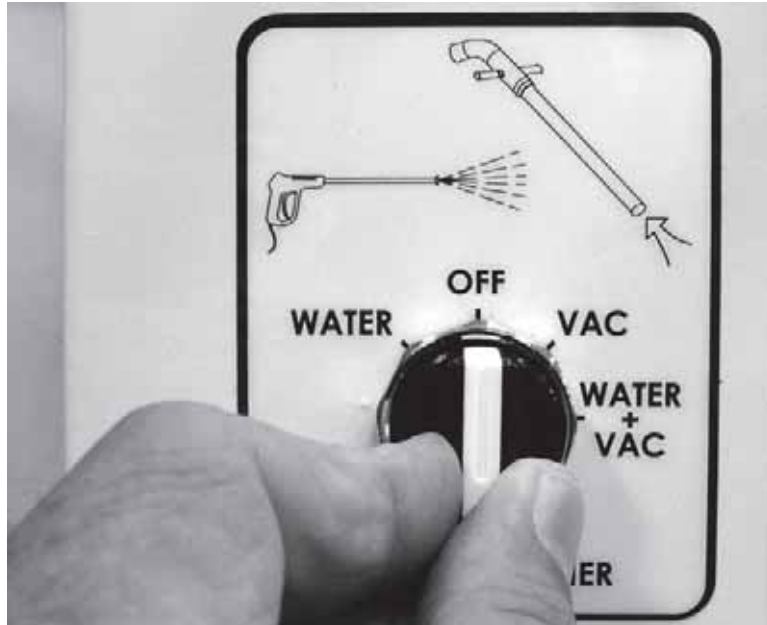


Figure 3-38. Turn the Vacuum/Pressure Washer switch OFF when you are done using the sprayer.



NOTE

Any loose or cracked fittings, or air trapped in the suction line, will prevent the water pump from operating correctly.

Priming the Washer Pump

You may need to prime the washer pump if the tank runs dry, or if the system is drained because of a leak or service. You can prime the pump using its own pressure or using an external pressurized water source.

Prime Using the Pump Pressure

1. Fill the main water tank with water.
2. Fill the priming tank with water.



Figure 3-39. Remove the lid to fill the priming tank.

3. Move the yellow Water Supply Valve lever (in front of the left fender) to the “Antifreeze/Charge Tank” position.
4. Pull enough hose from the sprayer hose reel to reach the priming tank. Put the end of the sprayer hose into the top of the tank to cycle the antifreeze as you prime the system.
5. Loosen the clear plastic water strainer until fluid fills the bowl, then re-tighten. (The suction supply line should now be primed from the priming tank to the strainer housing.)

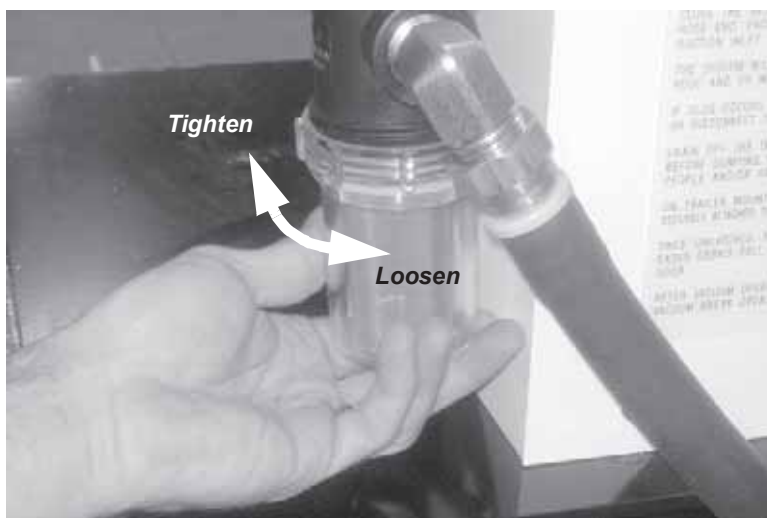


Figure 3-40. Loosen the strainer until water fills the bowl, then re-tighten it.



CAUTION

Do not move the Water Supply Valve lever when the pump is running. Damage to the pump could result.

6. Turn the unloader knob counter-clockwise to release all spring tension.

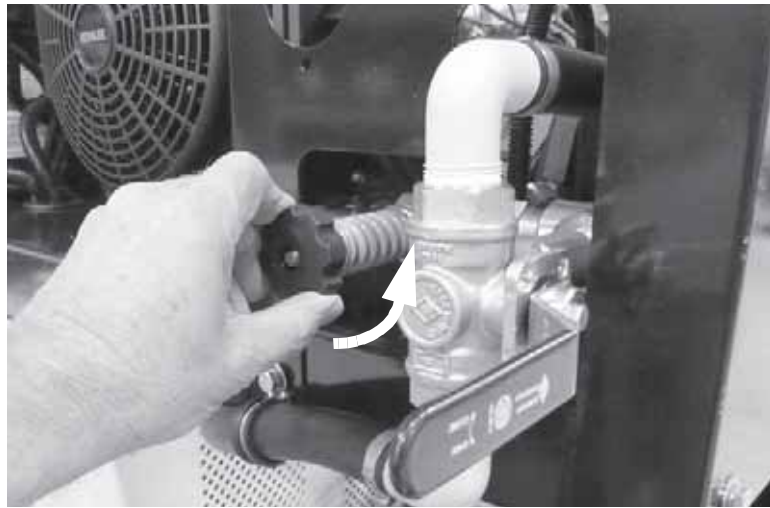


Figure 3-41. Turn the unloader knob counter-clockwise until the spring tension is released.

7. Start the engine and run at low to medium throttle.
8. At the control panel, turn the Vacuum/Pressure Washer switch to the WATER position. Water will begin to flow from the end of the sprayer hose.



NOTE

Set the engine throttle to low speed before turning on the pressure washer or vacuum blower.

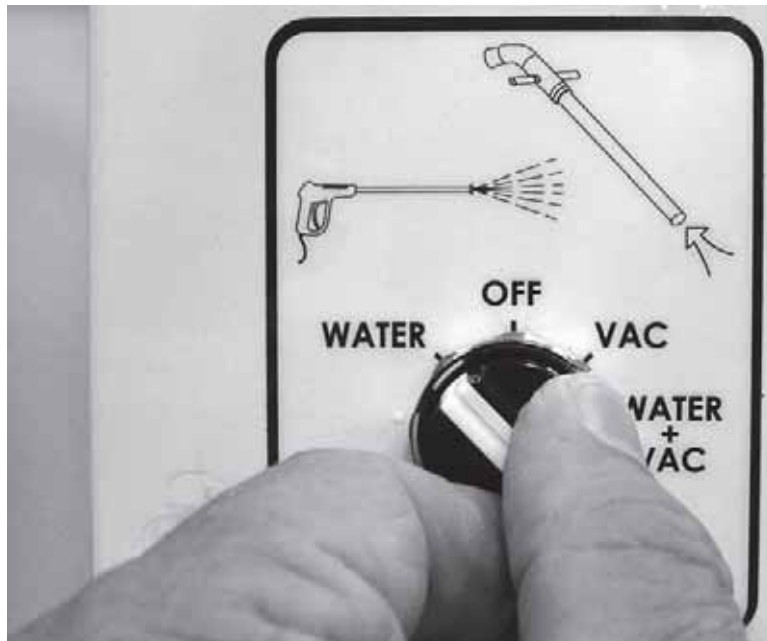


Figure 3-42. Turn the pressure washer switch to the "Water" position.

9. Let the water continue to flow until it is a steady flow, with no air bubbles. This could take up to 3-5 minutes.
10. Move the Water Supply Valve lever to the “Tanks” position. This will prime the main tank and allow continued operation.

Recirculation

In freezing conditions, use the pressure washer pump to recirculate water through the system, to help prevent freeze-up.

1. Turn the Vacuum/Pressure Washer switch to the OFF position.

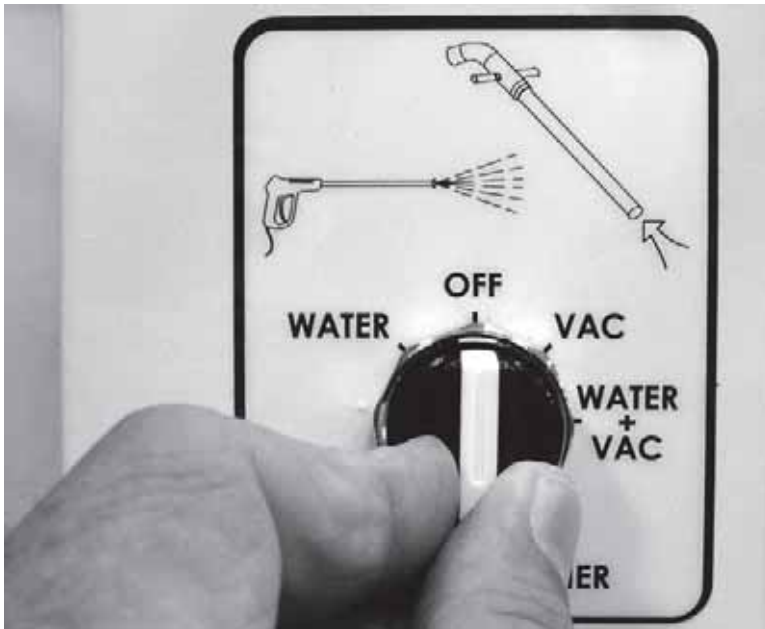


Figure 3-43. Turn the Vacuum/Pressure Washer switch OFF before you connect or disconnect the sprayer hose.

2. Connect the sprayer hose to the recirculation fitting.



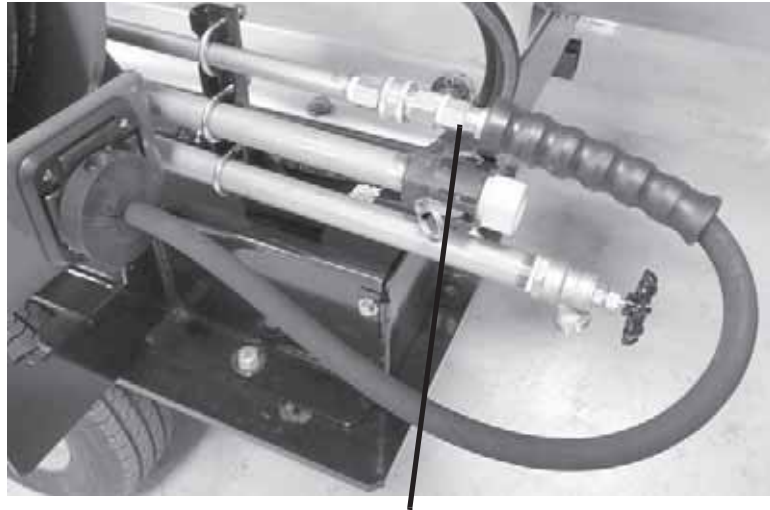
CAUTION

Do not move the Water Supply Valve lever when the pump is running. Damage to the pump could result.



CAUTION

Always turn the switch OFF when connecting or disconnecting the sprayer hose.



Sprayer hose connected for recirculation

Figure 3-44. Connect the sprayer hose to the recirculation fitting.

- 3.** Start the engine (if not already running).
- 4.** Turn the Vacuum/Pressure Washer switch to the WATER position.

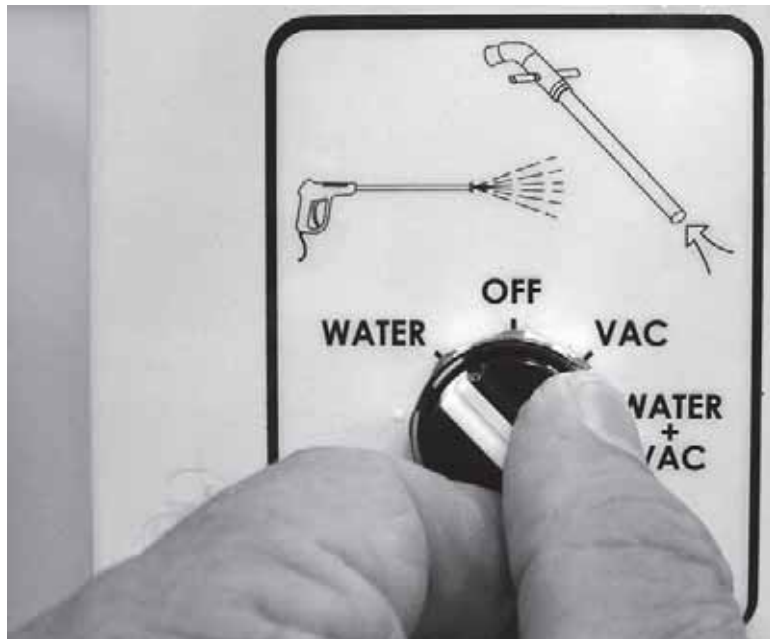


Figure 3-45. Turn the Vacuum/Pressure Washer switch to the “Water” position.

LIGHT BAR OPERATION

The light bar controller is mounted inside the control box to keep it from water damage.

1. Turn the PATTERN/FLASH CONTROL switch to the ON position.



Figure 3-46. Turn the PATTERN/FLASH CONTROL switch ON to power the light bar.

2. Use a large, flat-blade screwdriver to open the control box.



Figure 3-47. Use a screwdriver to open the control box and access the light bar control panel.

3. Access the light bar control panel inside the control box.

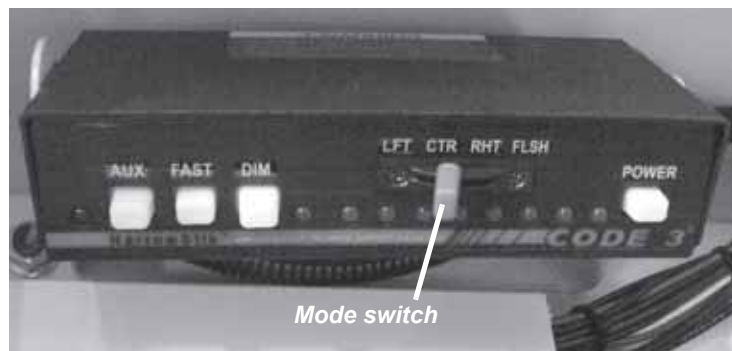


Figure 3-48. Open the control box to access the light bar control panel.

4. Press the POWER button to turn on power to the light bar.
5. If it is night, push in the DIM button for low-intensity light mode.
6. Push in the FAST button for faster flashing speed.
7. Set the mode switch to the change the light bar display, as illustrated below.

LFT	Flashing to the left
CTR	Flashing from the center out
RHT	Flashing to the right
FLSH	Flashing alternate inside/outside

8. To turn off the light bar, press the POWER button.
9. Turn the PATTERN/FLASH CONTROL switch to the OFF position.
10. Shut and secure the control box door when not operating the light bar.

120 VAC ELECTRICAL POWER INVERTER

The power inverter provides 120 VAC electrical power for operating auxiliary equipment. Power is supplied through the electric cord reel. The power inverter supplies up to 20 A of electrical power.

- The inverter draws power from the truck's electrical system. Only turn on the inverter when you are using it.
- If operating the inverter for more than a few minutes, or when drawing more than 5 A through the inverter, run the truck engine to keep the truck battery charged.
- The inverter will draw power when it is on, even if you are not operating an electrical tool with it. Do not leave the inverter on when the truck is not running, to avoid running down the truck battery.

The power inverter is inside a cabinet on the right side of the truck.



Figure 3-49. Open the cabinet door to access the power inverter.



NOTE

There is an indicator light on the truck dashboard that will light up when the power inverter is on.



CAUTION

Do not use a tool that draws more than 20 A of power.



CAUTION

Always turn off the power inverter when not using it. The inverter will draw power even if you are not operating an electrical tool, and will run down the truck battery.

1. Turn on the power inverter, using power switch on the front panel.



Figure 3-50. Press the switch to turn on the power inverter.

2. Pull enough electrical cord from the cord reel to reach the work location.
3. Plug the electrical tool you are using into the cord.
4. Running the truck engine is recommended when operating electrical tools. The power inverter draws power from the truck's electrical system, and will draw down the truck battery if the engine is not running.
5. When you are finished, rewind the electrical cord into the reel.
6. Turn off the power inverter switch.

AUXILIARY HYDRAULIC CIRCUIT/HOSE REEL OPERATION

1. Pull the hoses out of the hydraulic hose reel to the location of the tool you are operating.

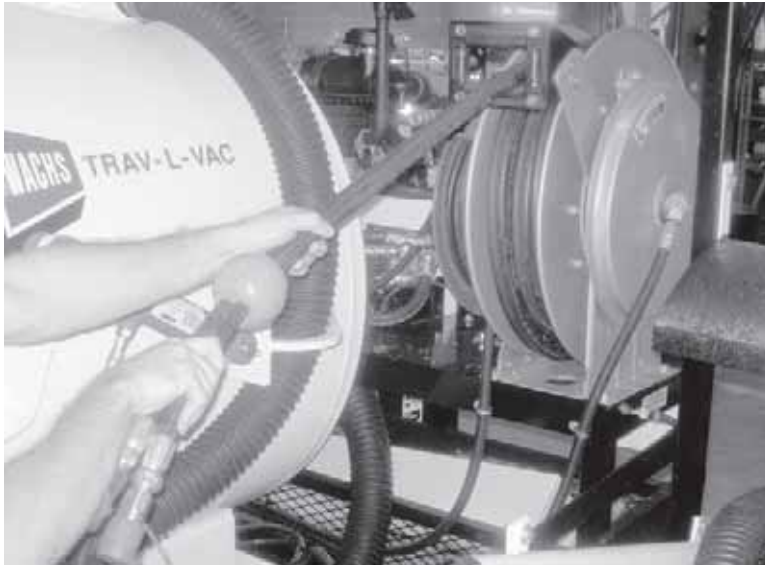


Figure 3-51. Pull the hydraulic hose pair off the hose reel to the work location.

2. Connect the hoses to the hydraulic tool. If the tool has flow controls, make sure it is turned off.
3. Start the engine. Set the throttle so that the system pressure gauge on the front of the hydraulic tank displays the pressure you need for the tool you are operating.

TM-7 OPERATION (OPTIONAL)

This section describes how to set up the TM-7 for use. Detailed instructions on operating the TM-7 are in the *TM-7 Truck Mounted Valve Operator User's Manual*, which is provided with the TM-7.

The TM-7's hydraulic system is plumbed directly to the hydraulic tank. You do not need to connect any hoses to use the TM-7.



NOTE

The hydraulic hoses are 45 feet long. The hose reel has a ratchet lock; when you have pulled out the desired length of hose, stop pulling when you hear the ratchet click.

1. Loosen the lock knob on the side of the TM-7 slide rail.
2. Pull the TM-7 out to the desired operating position. Tighten the lock knob securely.



Figure 3-52. Loosen the lock knob on the side of the TM-7 slide rail, and pull the TM-7 out to the operating position as shown. Tighten the lock knob.

3. Operate the TM-7 according to the instructions in the *Truck Mounted Valve Operator, Model TM-7* manual.
4. When finished with the TM-7, loosen the lock knob and return it to its “parked” position. Re-tighten the lock knob.

WATER HEATER OPERATION (OPTIONAL)

Follow the procedures below for operating the water heater, depending on how you want to circulate the hot water. There is a valve and a hose inlet on the water heater that allow you to operate it in three configurations:

- spraying hot water with the sprayer hose
- circulating water from the heater to the tank
- circulating water from the heater through the entire sprayer system.



WARNING

The water heater gets very hot. Stay away from the top vent of the heater unit when operating the heater. Contact with the heater may cause severe burns.

NOTE: With the water heater installed, water to the sprayer is always circulated through the water heater. The water will be heated only if you turn the heater on.

Starting and Running the Water Heater

1. Fill the heater's fuel tank. Use only kerosene or diesel (#1 or #2) fuel.
2. Start the gas engine and run at low to medium throttle.
3. At the control panel, turn the Vacuum/Pressure Washer switch to the WATER position.

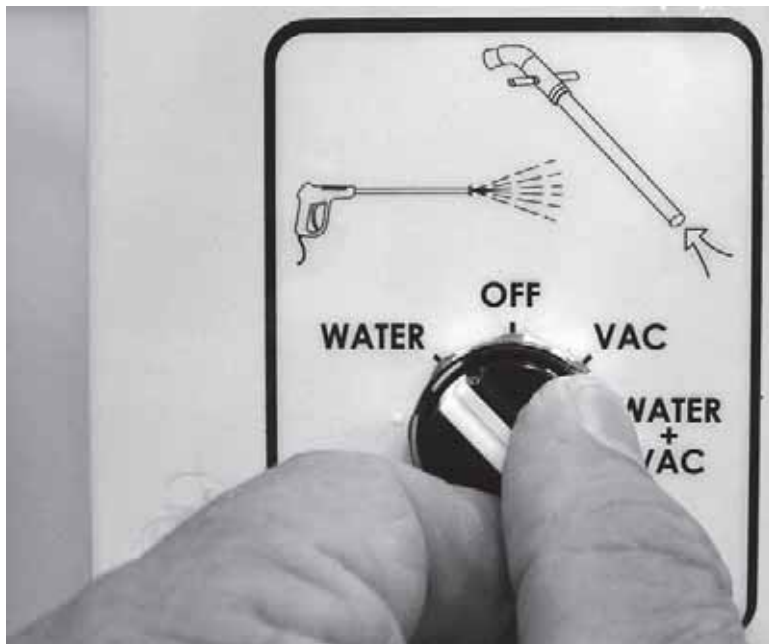


Figure 3-53. Turn the pressure washer switch to the WATER position.

4. On the water heater control box, set the desired temperature on the thermostat.
5. Turn the water heater switch to the ON position.
6. The heater will heat the water to the temperature on the thermostat. The burner will then cycle on and off as necessary to maintain that temperature.



WARNING

Do not use gasoline or any non-specified fuel in the water heater. Use of any other fuel could result in fire or explosion, causing serious injury or death.



NOTE

Set the engine throttle to low speed before turning on the pressure washer or vacuum blower.



NOTE

You must have the engine running and the Vacuum/Pressure Washer switch set to WATER.

- 7.** To turn the water heater off, turn the switch on the water heater control box OFF.

Spraying Hot Water

See “Pressure Washer Operation” in this chapter for instructions on operating the sprayer.

- 1.** Operate the sprayer as usual. It may take a few seconds for hot water to reach the spray wand.

When you are using the system in low-temperature (freezing) conditions, you should operated the pressure washer pump with the sprayer hose connected to the recirculation fitting. See “Recirculation” on page 53.

Chapter 4

Maintenance

LUBRICATION AND FLUID MAINTENANCE

Mechanical Grease Fittings

Lubricate the fittings on the following components:

- spoils tank dump pivot
- spoils tank dump slide
- spoils tank door.

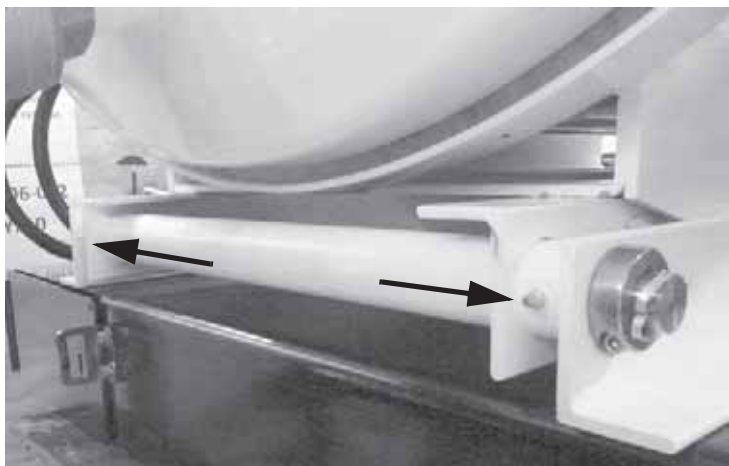


Figure 4-1. Apply grease to the dump pivot at the 2 fittings (one each side).

In This Chapter

LUBRICATION AND FLUID MAINTENANCE

REPLACING FUSES

SERVICING THE DRIVE BELTS

ADJUSTING THE TANK LATCHES

VALVE OPERATORS

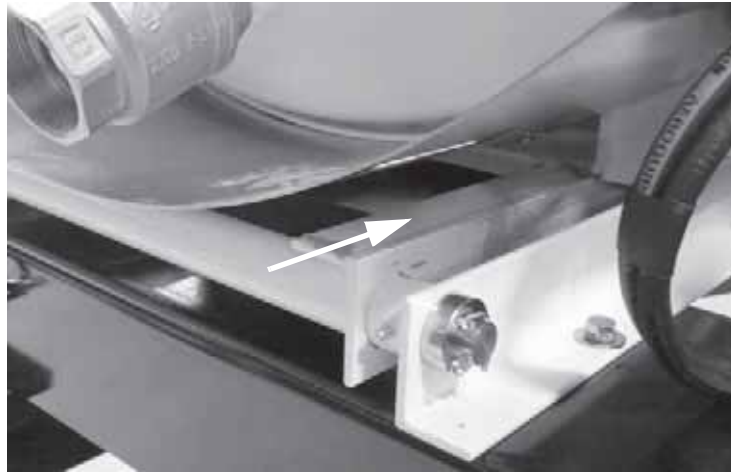


Figure 4-2. Apply grease directly onto the dump slide rails (both sides). Move the tank to the dump position to grease the full length of the slide rails.

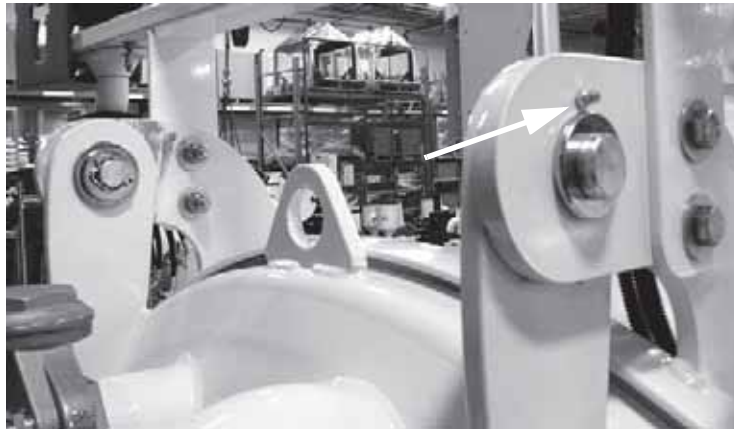


Figure 4-3. Apply grease to the tank door hinges at the 2 fittings (one each side).

Pressure Washer Pump

The pressure washer pump is a General Pump model TX1512S17.

- Change the pump crankcase oil after an initial 50-hour break-in period.
- After break-in period, change the oil every 3 months or 500 hours of operation.
- Use General Pump Series 100 oil (30 weight) in the pressure washer pump.

Blower

The vacuum blower is a Howden Roots Universal URAI blower. The Howden *Installation, Operation, and Maintenance Manual* supplied with the blower provides detailed lubrication guidelines. Read and refer to the blower manual for full maintenance instructions.

- Change the oil after an initial 100-hour break-in period.
- After break-in period, change the oil according to its life expectancy, based on operating temperature:
 - 6000 hours at less than 180° F.
 - For every 15° F above 180° F, oil life expectancy is reduced by half.
 - Assume oil operating temperature is 80% of discharge air temperature (Fahrenheit).
- Use Roots Synthetic Oil part no. 813-106-220 (ISO viscosity no. 220) for operation from 32°-90° F.
- **DO NOT** use Mobil SHC synthetic oils.

For full maintenance information, see the Howden manual.

Engine

Diesel Engine

- Change the engine oil after the initial 50 hours of operation, and every 200 hours of operation after that.
- Change the oil filter cartridge after the initial 50 hours of operation, and every 200 hours of operation after that.

Refer to the *Operator's Manual* provided with the Kubota engine for instructions on the oil changing procedure, and for full maintenance information.

Gas Engine

- Change the engine oil every 100 hours of operation, or annually.
- Change the oil filter every 200 hours of operation.

Refer to the *Service Manual* provided with the Kohler engine for instructions on the oil changing procedure, and for full maintenance information.

REPLACING FUSES

The fuse block is inside the curbside control panel.

1. Using a flat-blade screwdriver, open the control panel door.



Figure 4-4. To access the fuse block, open the front of the curbside control panel.

2. There is a fuse reference chart on the inside of the control panel door. Identify the blown fuse in the fuse block. Pull out the fuse and press in a new one. Make sure the new fuse is the correct amperage rating.

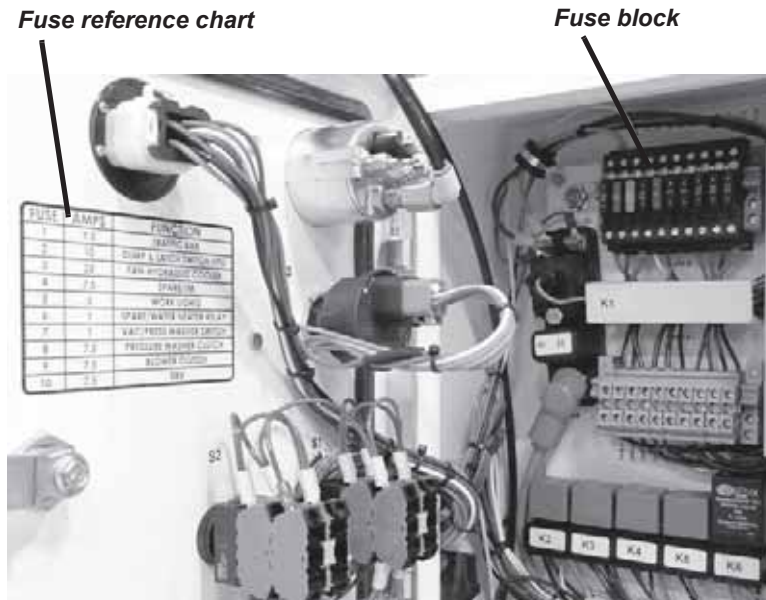


Figure 4-5. Identify the blown fuse in the fuse block. There is a fuse reference chart on the inside of the control panel door.

3. Close the control panel door and secure the latch with the screwdriver.

SERVICING THE DRIVE BELTS

This section describes how to check and replace the belts that drive the sprayer pump and vacuum blower. There are two belts driving each machine. The procedures include instructions on tightening the belts; if the belts are in good condition but are loose, tighten them rather than replacing them.

Check for cracks, tears, worn surfaces, or signs of overheating when you inspect the belts. Replace any belt that is damaged.

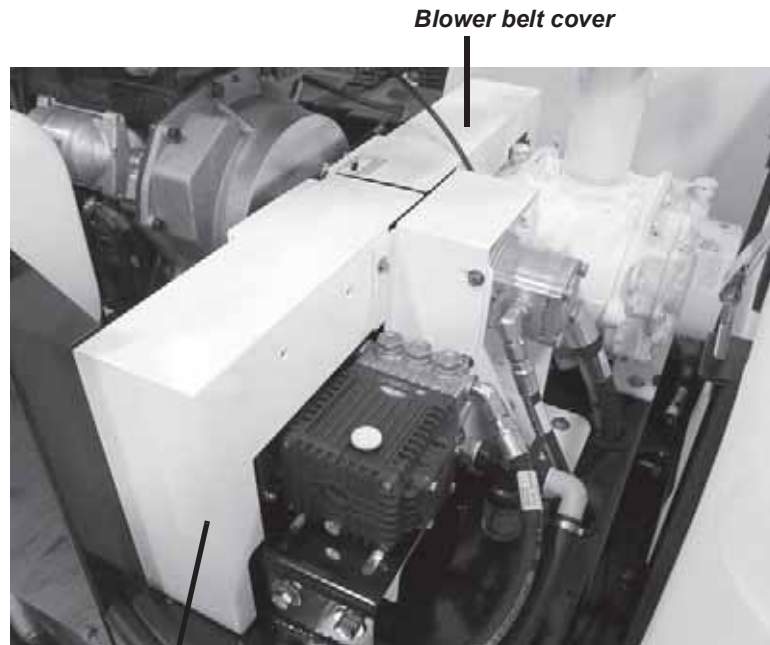
Vacuum Blower Belts

1. Remove the screws securing the blower belt cover. Remove the cover.



NOTE

It is easier to access the belts if you first move the spoils tank out to the dump position.



Pump belt cover

Figure 4-6. Remove the screws securing the blower belt cover to take the cover off and access the belts.

- 2.** Inspect the belts for any damage. Check the tension on the belts.

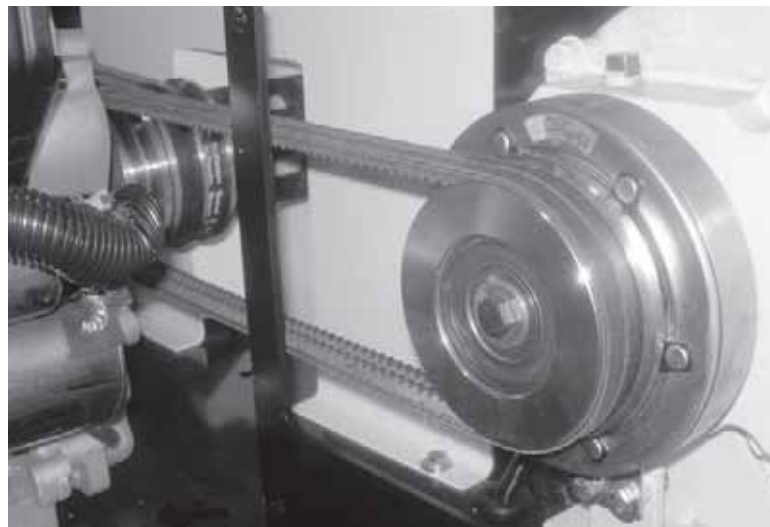


Figure 4-7. Inspect the blower belts for damage and correct tension.

- 3.** If you need to replace one or both belts, loosen the tension all the way using the tension screws:

- Loosen the 4 position locking screws on the blower mounting plate.
- Turn the tension screws counter-clockwise all the way to full loosen the belts.

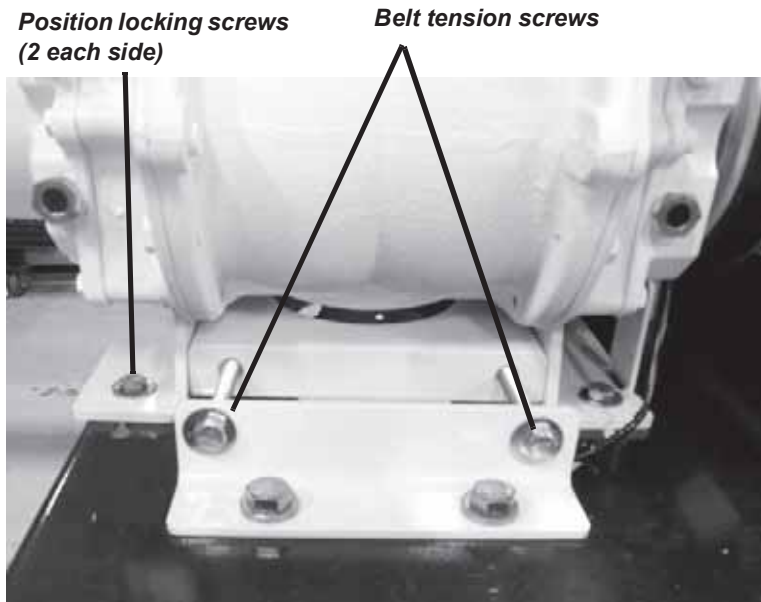


Figure 4-8. Use the tension screws on the blower mounting plate to loosen and tighten the blower belts.

4. Slip the belt you are replacing off the pulleys, and replace it with the new belt.
5. Tighten the blower belt tensioning screws until the belts are tight on the pulleys. You should be able to deflect the belts no more than 1/2" (13 mm) by pressing on them with your thumb halfway between the pulleys.
6. Replace the blower belt cover and secure it with the screws.

Sprayer Pump Belts

1. Remove the screws holding the sprayer pump belt cover. Remove the cover.



NOTE

Turn both tensioning screws the same number of turns to keep the blower square with the drive system.



NOTE

It is easier to access the belts if you first move the spoils tank out to the dump position.

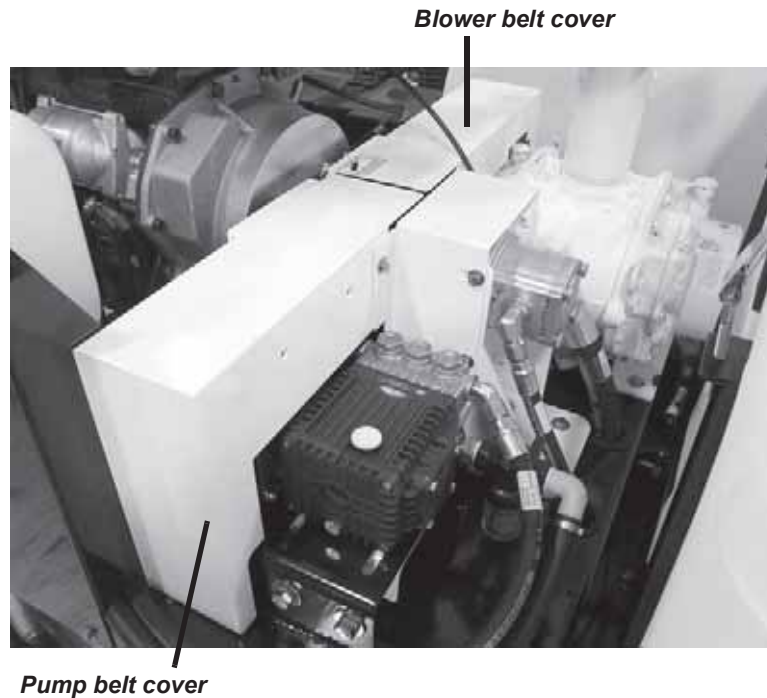


Figure 4-9. Remove the screws securing the pump belt cover to take the cover off and access the belts.

- 2.** Inspect the belts for any damage. Check the tension on the belts.



Figure 4-10. Inspect the sprayer pump belts for damage and correct tension.

- 3.** If you need to replace one or both belts, loosen the tension all the way using the tension screws:

- Loosen the 4 position locking screws beneath the pump mounting plate.
- Turn the tension screws counter-clockwise all the way to full loosen the belts.

Belt tension screws

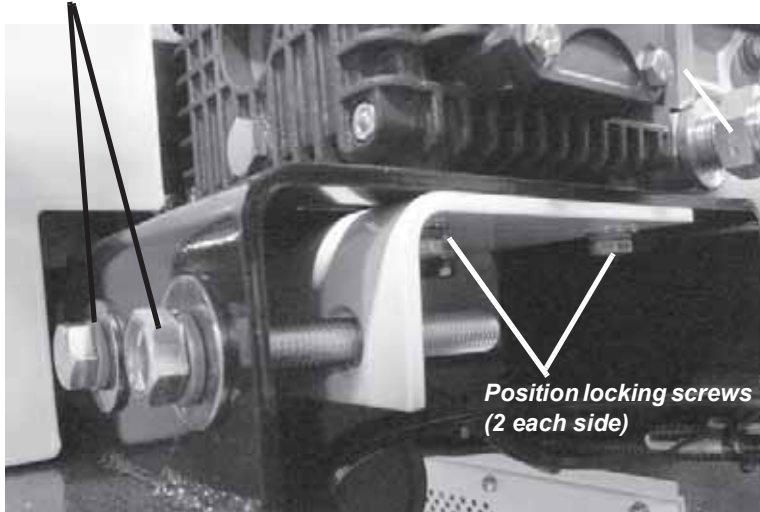


Figure 4-11. Use the tension screws on the pump mounting plate to loosen and tighten the blower belts.

4. Slip the belt you are replacing off the pulleys, and replace it with the new belt.
5. Tighten the sprayer pump belt tensioning screws until the belts are tight on the pulleys. You should be able to deflect the belts no more than 1/2" (13 mm) by pressing on them with your thumb halfway between the pulleys.
6. Re-tighten the position locking screws
7. Replace the sprayer pump belt cover. Insert and tighten the screws.



NOTE

Turn both tensioning screws the same number of turns to keep the sprayer pump square with the drive system.

ADJUSTING THE TANK LATCHES

You can adjust the clearance between the spoils tank door and the seal. If the door is leaking, you will need to tighten the latch pin adjustment. If the latch won't completely engage, you will need to loosen the latch pin adjustment.

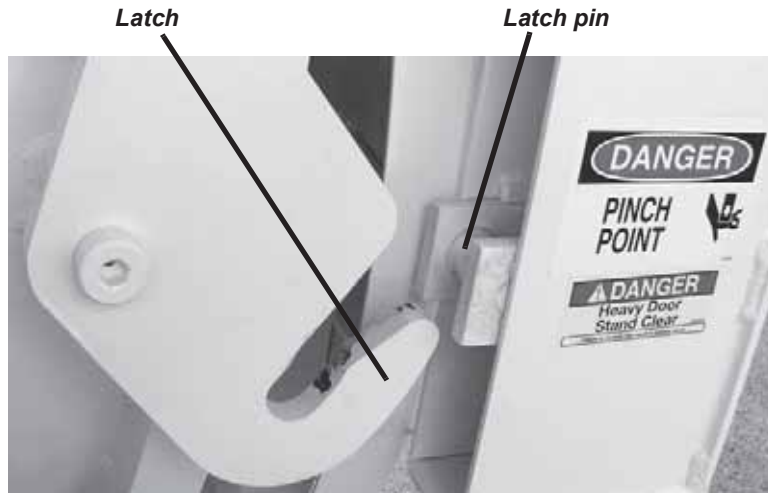


Figure 4-12. When you close the tank door, the latch engages behind the latch pin to clamp the door shut.



Figure 4-13. The front of the latch cover has screws for adjusting the latch.

Perform the following procedure for both sides of the tank door.



NOTE

The power switch on the engine must be in the ON position to operate the door latch.

1. At the control panel, turn the Latch Switch to the OPEN position and hold it until the latch is fully released.



Figure 4-14. Turn the Latch Switch to the OPEN position and hold it until the latch fully opens.

2. Turn the set screw on the front of the latch cover several turns counter-clockwise to loosen it.



Figure 4-15. Turn the set screw counter-clockwise to loosen it.

3. To **tighten** the latch, turn the adjustment screw **clockwise**.



NOTE

Adjust the screw no more than one turn at a time. Operate the latch to check it after each turn.



Figure 4-16. Turn the adjustment screw clockwise to tighten the latch.

- 4.** To **loosen** the latch, turn the adjustment screw **counter-clockwise**.



Figure 4-17. Turn the adjustment screw counter-clockwise to loosen the latch.

- 5.** Securely tighten the set screw when you have finished the adjustment.

VALVE OPERATORS

ERV-750

Refer to the maintenance instructions in the *ERV-750 Extended Reach Valve Operator User's Manual*, provided with the valve maintenance system.

TM-7

Refer to the maintenance instructions in the *TM-7 Truck Mounted Valve Operator User's Manual*, provided with the valve maintenance system (if equipped with the optional TM-7).

COLD WEATHER PREPARATION AND SERVICE

Use the following procedure to prepare the SB VMS pressure washer system for operation or storage in freezing weather.

If you use the pressure washer system in potentially freezing weather, drain it after operating and antifreeze the system again, using this procedure.

For operation of the pressure washer system in freezing temperatures, see “Recirculation” on page 53.

- 1.** Open the drain valve on the pressure washer water tank and allow the tank to empty.
- 2.** Set the water source selector valve set to Main Tank. Start the engine and run the water system at idle until water stops flowing back to the main tank through the recirculation circuit.
 - There is a flow switch which might shut the pump off before it's completely empty. Switch the pump off/on several times to make sure all water is removed.
- 3.** Fill the antifreeze/prime tank with RV antifreeze—approximately 3 gallons.
- 4.** Flip the water source valve to the antifreeze tank.

- 5.** Start the engine and run the water system at idle until you see antifreeze running at full concentration in the main water tank from the recirculation circuit.
- 6.** Shut off the engine
- 7.** Close main water tank drain valve.
 - If you close this too soon, you will trap fresh water in the low point drain.

Chapter 5

Parts List and Ordering Information

ORDERING INFORMATION

To place an order, request service, or get more detailed information on any E.H. Wachs Company products, call us at one of the following numbers:

U.S. 800-323-8185

International: 847-537-8800

You can also visit our Web site at:

www.ehwachs.com

Ordering Replacement Parts

When ordering parts, refer to the parts lists in this chapter. Please provide the part description and part number for all parts you are ordering.

Repair Information

Please call us for an authorization number before returning any equipment for repair or factory service. We will advise you of shipping and handling. When you send the equipment, please include the following information:

- Your name/company name
- Your address
- Your phone number

In This Chapter

ORDERING INFORMATION

DRAWINGS AND PARTS LISTS

- A description of the problem or the work to be done.

Before we perform any repair, we will estimate the work and inform you of the cost and the time to complete it.

Warranty Information

Enclosed with the manual is a warranty card. Please fill out the registration card and return to E.H. Wachs Company. Retain the owner's registration record and warranty card for your information.

Return Goods Address

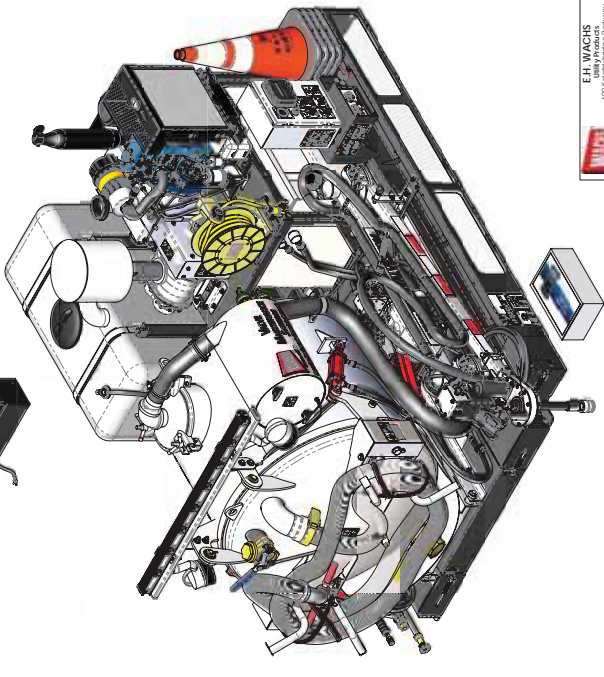
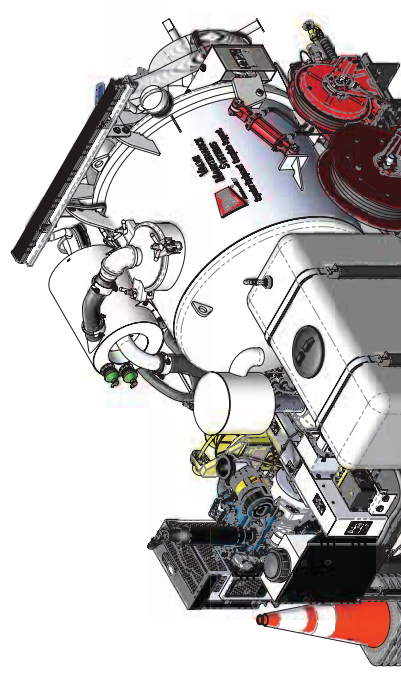
Return equipment for repair to the following address.

E.H. Wachs
600 Knightsbridge Parkway
Lincolnshire, Illinois 60069 USA

DRAWINGS AND PARTS LISTS

The drawings on the following pages illustrate the components of the SB VMS systems (both diesel and gas engine configurations), and include parts lists for ordering spare or replacement parts.

ITEM NO.	PART NUMBER	DESCRIPTION	ESTIMATE LENGTH	QTY.	ITEM NO.	PART NUMBER	DESCRIPTION	ESTIMATE LENGTH	QTY.	ITEM NO.	PART NUMBER	DESCRIPTION	ESTIMATE LENGTH	QTY.
1	68-153-11	HANDLE, CLEVIS ROD		1	60	77-292-12	151.5/16" HOSE ASSEMBLY, 08 FJ X .08 HOSE		1	61	77-292-13	43 13/16" HOSE ASSEMBLY, 08 FJ X .08 HOSE		1
2	68-158-16	HOSE CLAMP, CRIMP, 23.9 - 27.1 MM		5	62	77-292-14	45 3/4" HOSE ASSEMBLY, 12 FJ X 12 FJ 90 X 12 HOSE		1	63	77-292-15	45 7/8" HOSE ASSEMBLY, 08 FJ X 08 FJ 90X .08 HOSE		1
3	68-158-57	HOSE CLAMP, SERRAL, CIRCUMFERE		2	64	77-312-20	3' X 20' CLEAR SUCTION HOSE ASSEMBLY		1	65	77-406-00	WASH DOWN WAND		1
4	68-160-03	HOSE, 3" VACUUM, BLACK	(6.75)1	1	66	77-408-01	PRESSURE WASHER WAND, W/ROTATING NOZZLE		1	67	77-413-04	ROLLER ASSEMBLY		3
5	68-195-50	HOSE REEL, REELCRAFT, (3/8" X 50') BOTTOM WIND		1	68	77-413-06	HYDRAULIC HOSE REEL KIT, BOTTOM ROLLER		1	69	77-426-00	LIGHT BAR KIT		1
6	68-202-50	OD PLUG, 3/8" X 3/8" NPT F		1	70	77-500-03-29	ASSEMBLY, 250 GAL SPOILS TANK		1	71	77-500-03-29	WIRE HARNESS, SKID POWER PACK		1
7	68-233-00	HOSE, 3/4" LP, LOCK ON	(8.12) (10.12) (80)	3	72	79-404-00	ERV-750 FOR VMS KIT		1	73	79-422-01	HC-100, VITALS CONTROLLER KIT-IN AMER		1
8	68-236-00	STRIP, EPDM ADHESIVE BACKED FOAM RUBBER, 2" W X 1/4" THK	2X (9')	2	74	90-045-04	NUT, 10-24 NYLOCK		18	75	90-051-07	HHCS, 1/4-20 X 3/4, GRADE 5 ZN		12
9	68-236-00	STRIP, EPDM ADHESIVE BACKED FOAM RUBBER, 2" W X 1/4" THK	2X (20.1/2')	2	76	90-051-10	NUT, 5/16-18 HEX GRADE 8		12	77	90-055-10	NUT, 1/4-20 HEX		2
10	68-242-01	DRAIN VALVE, 3/4" NPT FEMALE INLET X 3/4" MIGHT OUTLET		1	78	90-055-18	NUT, 1/4-20 ACCORN		13	79	90-055-52	WASHER, 1/4 SPLIT RING		25
11	68-243-20	ADAPTER, 3/4" NPT M X 3/4" HOSE BARB - NYLON		3	80	90-055-53	WASHER, FLAT, 1/4"		25	81	90-061-07	HHCS, 5/16-18 X 3/4		6
12	68-243-30	ELBOW, 3/4" NPT M X 3/4" HOSE BARB - NYLON		3	82	90-065-01	NUT, 5/16-18 HEX GRADE 8		6	83	90-065-51	WASHER, 5/16 FLAT		6
13	68-243-70	HOSE TO CAM LEVER ADAPTER, 3/4" CAM M X GHT F		1	84	90-065-52	WASHER, 5/16 FLAT		6	85	90-071-10	HHCS, 3/8-16 X 1		47
14	68-243-71	CAM LEVER SOCKET, 3/4" X 3/4" NPT F		1	86	90-071-20	HHCS, 3/8-16 X 2 CR 5 ZN		4	87	90-075-01	NUT, 3/8-16 HEX GR 5 ZN		3
15	68-243-80	ADAPTER, 3/4" BARB X 3/4" NPT F		1	88	90-075-05	NUT, 3/8-16 NYLOCK GR 5 ZN		4	89	90-075-05	WASHER, 3/8 FLAT		51
16	68-247-01	SMAP BUSHINGS, 1.38 ID X 1.75 HOSE X 1.25 PANEL		1	90	90-075-53	WASHER, 3/8 FLAT		55	91	90-078-84	ADAPTER, 8 (3/4" - 16) NJ X 3/8" NPT F 90		1
17	68-250-02	WAND WELDMENT, 7/8" X 8", 3" HOSE		1	92	90-079-12	HHCS, 1/2-13 X 1-1/4 GRADE 8		14	93	90-095-15	NUT, 1/2-13 HEX GR 8 YELLOW ZINC		2
18	68-250-03	WAND WELDMENT, 1-1/4" X 8", 3" HOSE		1	94	90-095-52	WASHER, 1/2 FLAT		14	96	90-098-30	ADAPTER, 8 JC-M X 1/2 JC-M BULKHEAD		1
19	68-250-04	WAND WELDMENT, 2-1/2" X 8", 3" HOSE		1	97	90-098-31	NUT, 8 (3/4-16) BULKHEAD		1	98	90-098-77	8 (3/4-16) JIC CAP		1
20	71-162-63	100 GALLON WATER TANK ASSEMBLY		1	99	90-135-05	GROMMET, 7/8 ID X 1 1/4" HOLE X 3/16" THK		18	100	90-140-07	SHCS, 10-24 X 3/4 SS18-8		1
21	71-175-11	BUMPER, PUSH IN 1/4" HOLE		6	101	90-218-15	TEE, 3/4 NPT POLY SCH 80		1	102	90-218-18	NPT F, 3/4 NPT, 1 3/8 PVC SCH 80		1
22	71-209-02	CLAMP, 3.5" OD		1	103	90-218-40	-12 (1.1/16 - 12) JIC CAP		1	104	90-218-96	ADAPTER, 1/2 JC-M X 1/2 JC-M BULKHEAD		1
23	71-209-04	U-BOLT, ZINC-PLATED STEEL, 1/4"-20, 1-1/8" ID, 2" HEIGHT		6	105	90-218-96	NUT, 1/2 (1.1/16 - 12) JIC CAP		1	106	90-903-10	CUSHIONED LOOP CLAMP, 1"		5
24	71-235-94	LATCH CATCH		1	107	90-903-15	CUSHIONED LOOP CLAMP, 1 1/2"		3	108	90-903-20	CUSHIONED LOOP CLAMP, 2"		3
25	71-235-95	LATCH ASSY, RH		1	109	90-903-25	CUSHIONED LOOP CLAMP, 3/4"		3	110	90-903-75	CUSHIONED LOOP CLAMP, 3/4"		1
26	71-236-95	LATCH ASSY, LH		2	111	90-1066-58	HHCS, 1/4-20 X 5/8" GR 5 ZN		30	112	90-1883K610	CLEVIS ROD END, 1/2 X 1/2		2
27	71-260-14	KIT, DIESEL SB SKID POWER PACK		1	113	90-6516K96	THREADED ROD, 1/2-13" X 24"		1	114	90-91327A168	BOLT, SHOULDER, 1/2 X 5/16 X SS		1
28	71-267-07	LABEL, 1M PRESSURE, TANK, POWER		1	115	910-8-8-CTK-5	ELBOW, 1/2" M NPT X 9" M JIC (3/4"-16)		2					
29	71-276-11	DOUBLE CHECK VALVE, 3/4" NPT F X 3/4" NPT F		1										
30	71-277-50	PVC EDGE TRIM, 0.0907 TO 0.1907 EDGE THICKNESS (2.34')		1										
31	71-290-01	WATER TANK BASE WELDMENT		1										
32	71-290-02	WELDMENT, WATER TANK STAKE		4										
33	71-290-03	HOSE ROLLER GUIDE BRACKET		1										
34	71-290-04	WELDMENT, BASKET SOE		1										
35	71-290-05	WELDMENT, LATCH BRACKET		1										
36	71-290-06	WAND HOLDER WELDMENT		1										
37	71-290-07	PRESSURE WASHER WAND HOLDER WELDMENT		1										
38	71-290-08	WELDMENT, DOOR SKID		2										
39	71-290-09	WELDMENT, BASKET DOOR		1										
40	71-290-11	WELDMENT, SUPPORT BRACKET		1										
41	71-290-12	PIPE SUPPORT BRACKET		2										
42	71-290-13	PIPE SUPPORT		2										
43	71-290-15	BASKET, BACK PANEL		1										
44	71-290-16	COVER PLATE		2										
45	71-290-17	COVER PLATE		1										
46	71-290-18	COVER PLATE		1										
47	71-290-21	BACK COVER PANEL		1										
48	71-290-22	SIDE COVER PANEL		1										
49	71-290-24	WELDMENT, KEY BOX		2										
50	71-290-28	STRAP, WATER TANK		2										
51	71-290-29	STAINLESS STEEL PIPE, 3/4" SCH 40		2										
52	71-290-30	STAINLESS STEEL PIPE, 3/8" SCH 40		2										
53	71-290-31	LATCH CATCH		2										
54	71-290-44	LABEL, 100 GAL WATER TANK		1										
55	71-290-46	LABEL, GWR WARNING		1										
56	71-290-70	CONNECTION PLATE		1										
57	71-290-00	WELDMENT, VMS SKID/R CONTROLS		1										
58	71-291-01	WELDMENT, CONE HOLDER		1										
59	71-291-28	28" TRAFFIC CONE		4										

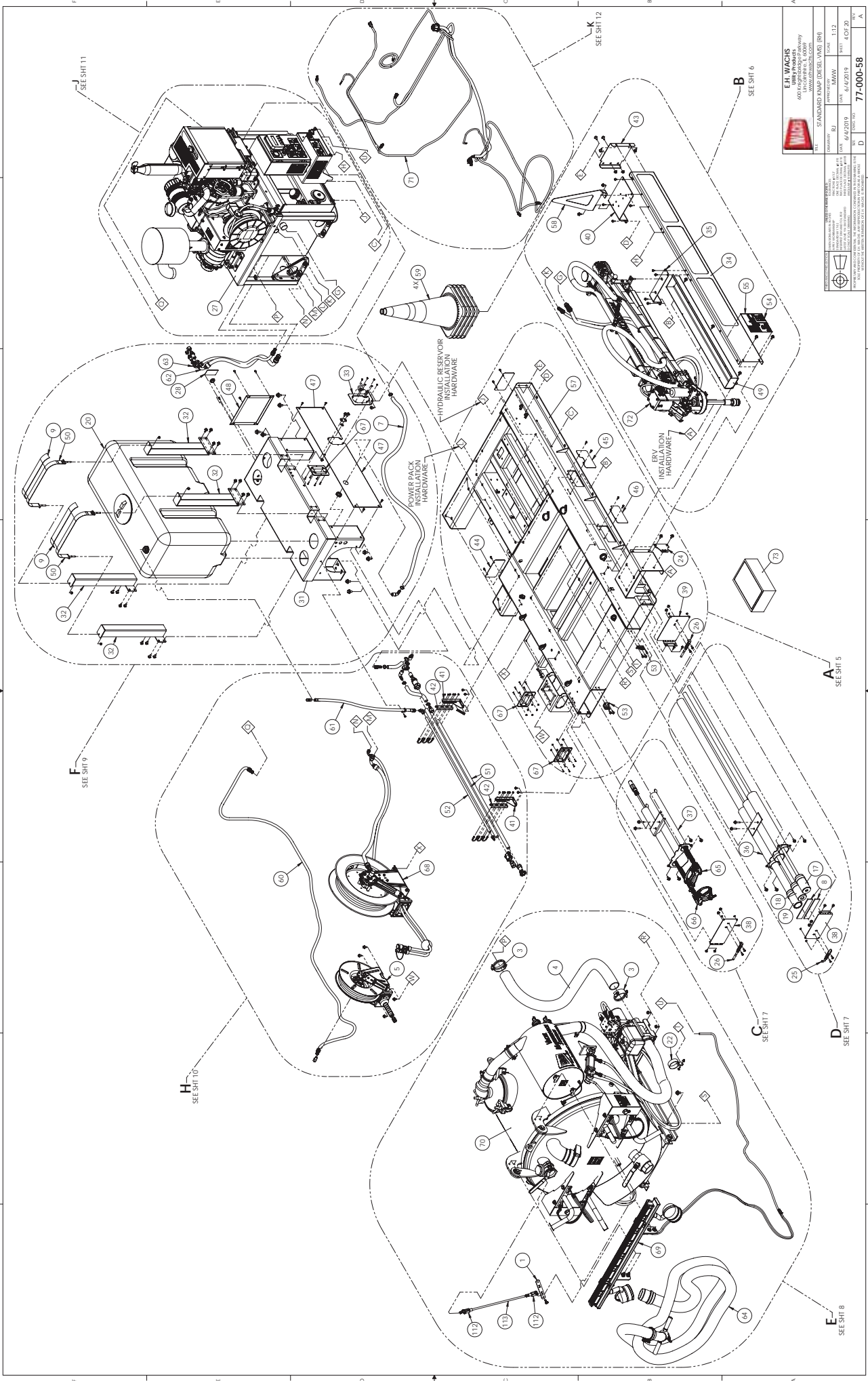


WACHS
E.H. WACHS
605 E. Highway 100
Waco, TX 76780
www.wachsmfg.com

STANDARD KAMP DIESEL VMS (RH)

REV	DATE	BY	APP'D	DESCRIPTION
1.12	06/20/19	BL	BL	REVISED FOR VMS
1.12	06/20/19	BL	BL	REVISED FOR VMS
2.02	06/20/19	BL	BL	REVISED FOR VMS

77-000-58



E.H. WACHS		STANDARD TANK DIESEL VANS (R8)	
600 N. HIGHLAND AVENUE ANN ARBOR, MICHIGAN 48106 TEL. (313) 761-1111 WWW.EHWACHS.COM		WWW.EHWACHS.COM	
REV.	DATE	BY	CHKD.
1	06/20/19	AW	AW
2	07/28	AW	AW
3	07/28	AW	AW
4	07/28	AW	AW
5	07/28	AW	AW
6	07/28	AW	AW
7	07/28	AW	AW
8	07/28	AW	AW
9	07/28	AW	AW
10	07/28	AW	AW
11	07/28	AW	AW
12	07/28	AW	AW
13	07/28	AW	AW
14	07/28	AW	AW
15	07/28	AW	AW
16	07/28	AW	AW
17	07/28	AW	AW
18	07/28	AW	AW
19	07/28	AW	AW
20	07/28	AW	AW
21	07/28	AW	AW
22	07/28	AW	AW
23	07/28	AW	AW
24	07/28	AW	AW
25	07/28	AW	AW
26	07/28	AW	AW
27	07/28	AW	AW
28	07/28	AW	AW
29	07/28	AW	AW
30	07/28	AW	AW
31	07/28	AW	AW
32	07/28	AW	AW
33	07/28	AW	AW
34	07/28	AW	AW
35	07/28	AW	AW
36	07/28	AW	AW
37	07/28	AW	AW
38	07/28	AW	AW
39	07/28	AW	AW
40	07/28	AW	AW
41	07/28	AW	AW
42	07/28	AW	AW
43	07/28	AW	AW
44	07/28	AW	AW
45	07/28	AW	AW
46	07/28	AW	AW
47	07/28	AW	AW
48	07/28	AW	AW
49	07/28	AW	AW
50	07/28	AW	AW
51	07/28	AW	AW
52	07/28	AW	AW
53	07/28	AW	AW
54	07/28	AW	AW
55	07/28	AW	AW
56	07/28	AW	AW
57	07/28	AW	AW
58	07/28	AW	AW
59	07/28	AW	AW
60	07/28	AW	AW
61	07/28	AW	AW
62	07/28	AW	AW
63	07/28	AW	AW
64	07/28	AW	AW
65	07/28	AW	AW
66	07/28	AW	AW
67	07/28	AW	AW
68	07/28	AW	AW
69	07/28	AW	AW
70	07/28	AW	AW
71	07/28	AW	AW
72	07/28	AW	AW
73	07/28	AW	AW
74	07/28	AW	AW
75	07/28	AW	AW
76	07/28	AW	AW
77	07/28	AW	AW
78	07/28	AW	AW

POWER PACK INSTALLATION HARDWARE
 HYDRAULIC RESERVOIR INSTALLATION HARDWARE
 ERY INSULATION HARDWARE

SEE SHT 11
 SEE SHT 12
 SEE SHT 6
 SEE SHT 5
 SEE SHT 7
 SEE SHT 8
 SEE SHT 9
 SEE SHT 10
 SEE SHT 12

E.H. WACHS
 600 N. HIGHLAND AVENUE
 ANN ARBOR, MICHIGAN 48106
 TEL. (313) 761-1111
 WWW.EHWACHS.COM

STANDARD TANK DIESEL VANS (R8)
 REV. DATE BY CHKD.
 1 06/20/19 AW AW
 2 07/28 AW AW
 3 07/28 AW AW
 4 07/28 AW AW
 5 07/28 AW AW
 6 07/28 AW AW
 7 07/28 AW AW
 8 07/28 AW AW
 9 07/28 AW AW
 10 07/28 AW AW
 11 07/28 AW AW
 12 07/28 AW AW
 13 07/28 AW AW
 14 07/28 AW AW
 15 07/28 AW AW
 16 07/28 AW AW
 17 07/28 AW AW
 18 07/28 AW AW
 19 07/28 AW AW
 20 07/28 AW AW
 21 07/28 AW AW
 22 07/28 AW AW
 23 07/28 AW AW
 24 07/28 AW AW
 25 07/28 AW AW
 26 07/28 AW AW
 27 07/28 AW AW
 28 07/28 AW AW
 29 07/28 AW AW
 30 07/28 AW AW
 31 07/28 AW AW
 32 07/28 AW AW
 33 07/28 AW AW
 34 07/28 AW AW
 35 07/28 AW AW
 36 07/28 AW AW
 37 07/28 AW AW
 38 07/28 AW AW
 39 07/28 AW AW
 40 07/28 AW AW
 41 07/28 AW AW
 42 07/28 AW AW
 43 07/28 AW AW
 44 07/28 AW AW
 45 07/28 AW AW
 46 07/28 AW AW
 47 07/28 AW AW
 48 07/28 AW AW
 49 07/28 AW AW
 50 07/28 AW AW
 51 07/28 AW AW
 52 07/28 AW AW
 53 07/28 AW AW
 54 07/28 AW AW
 55 07/28 AW AW
 56 07/28 AW AW
 57 07/28 AW AW
 58 07/28 AW AW
 59 07/28 AW AW
 60 07/28 AW AW
 61 07/28 AW AW
 62 07/28 AW AW
 63 07/28 AW AW
 64 07/28 AW AW
 65 07/28 AW AW
 66 07/28 AW AW
 67 07/28 AW AW
 68 07/28 AW AW
 69 07/28 AW AW
 70 07/28 AW AW
 71 07/28 AW AW
 72 07/28 AW AW
 73 07/28 AW AW
 74 07/28 AW AW
 75 07/28 AW AW
 76 07/28 AW AW
 77 07/28 AW AW
 78 07/28 AW AW

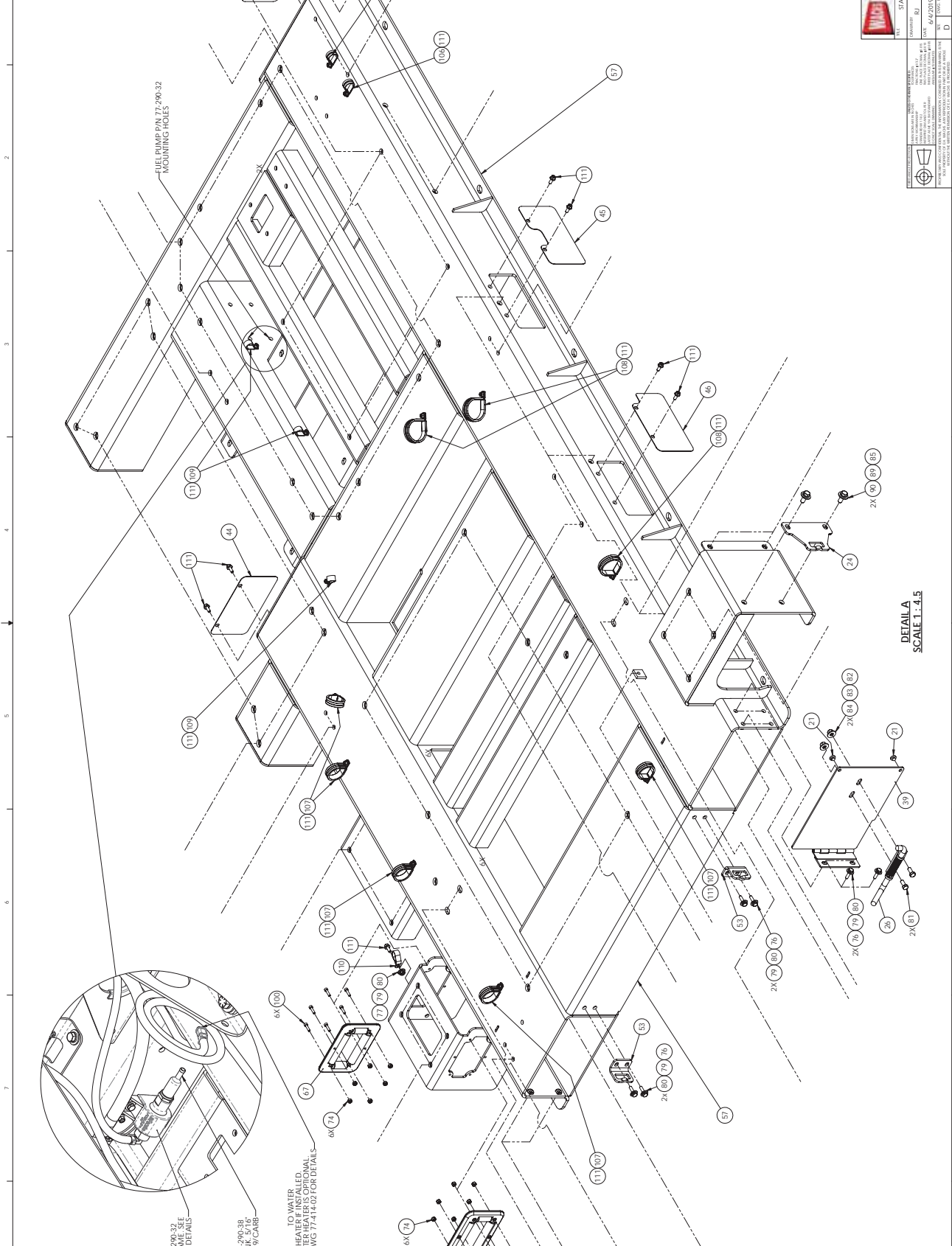
SEE SHT 11
 SEE SHT 12
 SEE SHT 6
 SEE SHT 5
 SEE SHT 7
 SEE SHT 8
 SEE SHT 9
 SEE SHT 10
 SEE SHT 12

E.H. WACHS
 600 N. HIGHLAND AVENUE
 ANN ARBOR, MICHIGAN 48106
 TEL. (313) 761-1111
 WWW.EHWACHS.COM

STANDARD TANK DIESEL VANS (R8)
 REV. DATE BY CHKD.
 1 06/20/19 AW AW
 2 07/28 AW AW
 3 07/28 AW AW
 4 07/28 AW AW
 5 07/28 AW AW
 6 07/28 AW AW
 7 07/28 AW AW
 8 07/28 AW AW
 9 07/28 AW AW
 10 07/28 AW AW
 11 07/28 AW AW
 12 07/28 AW AW
 13 07/28 AW AW
 14 07/28 AW AW
 15 07/28 AW AW
 16 07/28 AW AW
 17 07/28 AW AW
 18 07/28 AW AW
 19 07/28 AW AW
 20 07/28 AW AW
 21 07/28 AW AW
 22 07/28 AW AW
 23 07/28 AW AW
 24 07/28 AW AW
 25 07/28 AW AW
 26 07/28 AW AW
 27 07/28 AW AW
 28 07/28 AW AW
 29 07/28 AW AW
 30 07/28 AW AW
 31 07/28 AW AW
 32 07/28 AW AW
 33 07/28 AW AW
 34 07/28 AW AW
 35 07/28 AW AW
 36 07/28 AW AW
 37 07/28 AW AW
 38 07/28 AW AW
 39 07/28 AW AW
 40 07/28 AW AW
 41 07/28 AW AW
 42 07/28 AW AW
 43 07/28 AW AW
 44 07/28 AW AW
 45 07/28 AW AW
 46 07/28 AW AW
 47 07/28 AW AW
 48 07/28 AW AW
 49 07/28 AW AW
 50 07/28 AW AW
 51 07/28 AW AW
 52 07/28 AW AW
 53 07/28 AW AW
 54 07/28 AW AW
 55 07/28 AW AW
 56 07/28 AW AW
 57 07/28 AW AW
 58 07/28 AW AW
 59 07/28 AW AW
 60 07/28 AW AW
 61 07/28 AW AW
 62 07/28 AW AW
 63 07/28 AW AW
 64 07/28 AW AW
 65 07/28 AW AW
 66 07/28 AW AW
 67 07/28 AW AW
 68 07/28 AW AW
 69 07/28 AW AW
 70 07/28 AW AW
 71 07/28 AW AW
 72 07/28 AW AW
 73 07/28 AW AW
 74 07/28 AW AW
 75 07/28 AW AW
 76 07/28 AW AW
 77 07/28 AW AW
 78 07/28 AW AW

SEE SHT 11
 SEE SHT 12
 SEE SHT 6
 SEE SHT 5
 SEE SHT 7
 SEE SHT 8
 SEE SHT 9
 SEE SHT 10
 SEE SHT 12

E.H. WACHS
 600 N. HIGHLAND AVENUE
 ANN ARBOR, MICHIGAN 48106
 TEL. (313) 761-1111
 WWW.EHWACHS.COM



E.H. WACHS
 600 S. Highway 101, Suite 100
 Waco, TX 76798
 WWW.EHWACHS.COM

WACHS

STANDARD KAMF (DIESEL VANS) (R8)

DATE: 04/20/19
 REV: 002

77-000-58

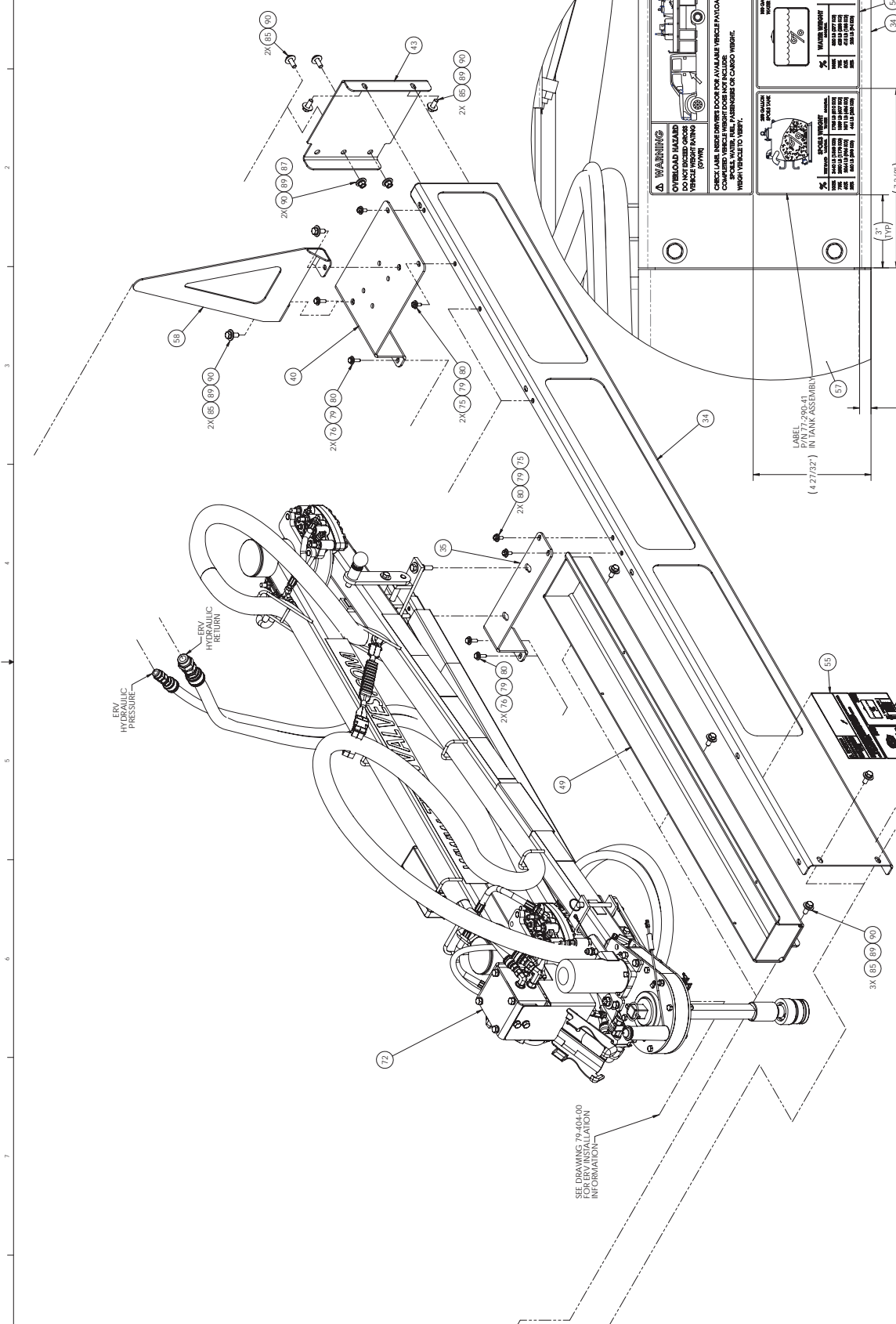
DETAIL A
 SCALE 1:4.5

FUEL PUMP PIN 77-290-32
 MOUNTING HOLES

FUEL PUMP PIN 77-290-32
 MOUNTS TO SKID FRAME. SEE
 DWG 77-266-14 FOR DETAILS

FUEL FILTER/PIN 77-290-38
 MOUNTS TO SKID FRAME. SEE
 DWG 77-266-14 FOR DETAILS

TO WATER
 HEATER IF INSTALLED.
 SEE DWG 77-414-02 FOR DETAILS.



HYDRAULIC PRESSURE
HYDRAULIC RETURN

SEE DRAWINGS 79-404-00
FOR
ADDITIONAL
INFORMATION

WARNING
CONTROL VALVES
DO NOT EXCEED OROCS
VEHICLE WEIGHT RATING
CAPACITY

CONTROL VALVE
DO NOT EXCEED OROCS
VEHICLE WEIGHT RATING
CAPACITY

CONTROL VALVE
DO NOT EXCEED OROCS
VEHICLE WEIGHT RATING
CAPACITY

WARNING
CONTROL VALVE
DO NOT EXCEED OROCS
VEHICLE WEIGHT RATING
CAPACITY

CONTROL VALVE
DO NOT EXCEED OROCS
VEHICLE WEIGHT RATING
CAPACITY

CONTROL VALVE
DO NOT EXCEED OROCS
VEHICLE WEIGHT RATING
CAPACITY

WARNING
CONTROL VALVE
DO NOT EXCEED OROCS
VEHICLE WEIGHT RATING
CAPACITY

CONTROL VALVE
DO NOT EXCEED OROCS
VEHICLE WEIGHT RATING
CAPACITY

CONTROL VALVE
DO NOT EXCEED OROCS
VEHICLE WEIGHT RATING
CAPACITY

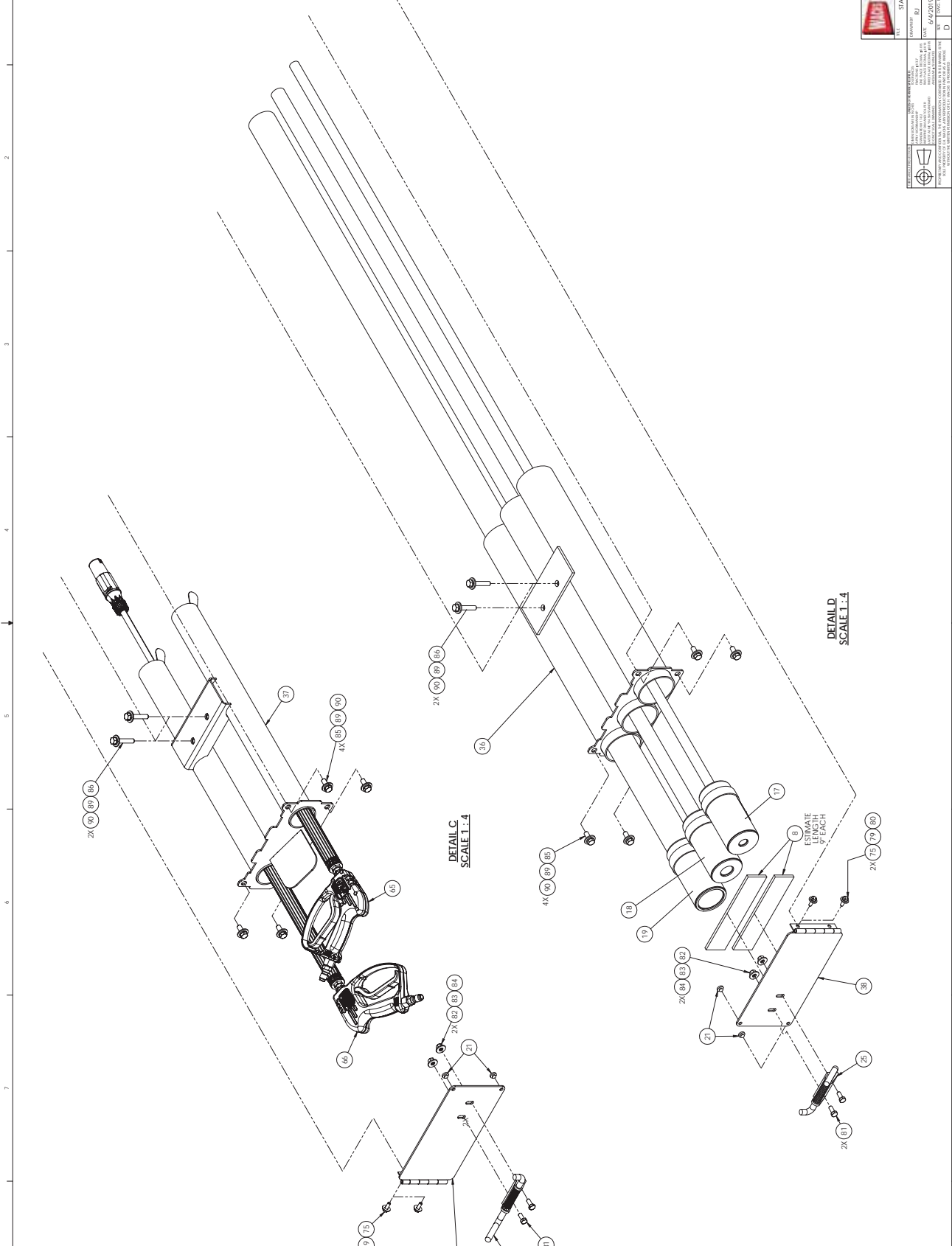
SCALE AND WEIGHTS OF LABEL
VALUES SHOWN ON DRAWING
MAY DIFFER FROM ACTUAL.
SEE NOTE FOR SHEET 1

SCALE 1:2

DETAIL B
SCALE 1:4.5

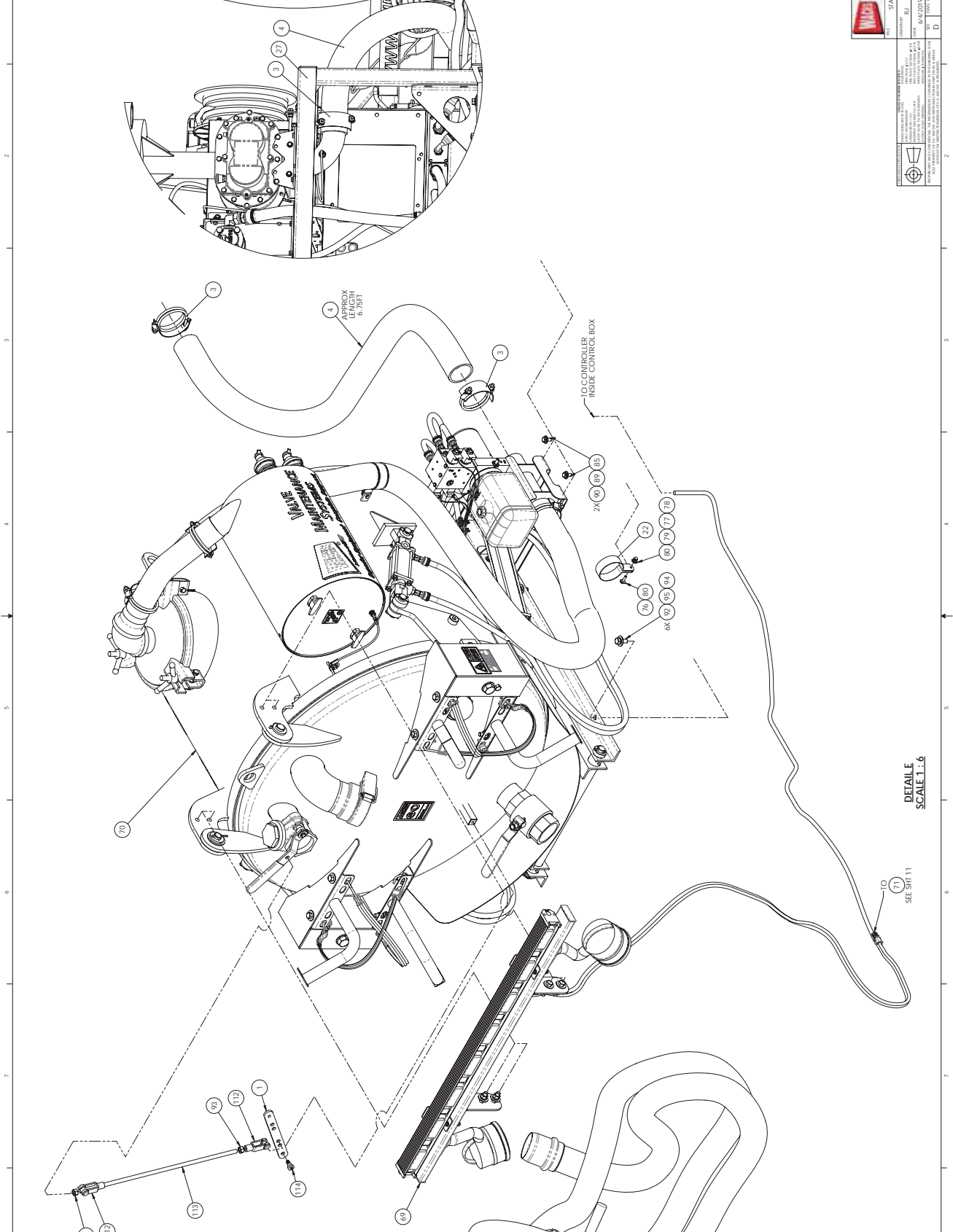
THIS LABEL
NOT IN THIS
ASSEMBLY
FROM

E.H. WACHS 600 E. HIGHWAY 101, SUITE 100 MOUNTAIN VIEW, CA 94039 WWW.EHWACHS.COM		STANDARD MAP (DESEL-VAS) (R)	SCALE	1:6
DATE	REV	REV	DATE	REV
04/2019	1	04/2019	04/2019	1
DRAWN BY: [Signature]		CHECKED BY: [Signature]		
DESIGNED BY: [Signature]		APPROVED BY: [Signature]		
PART NO. 79-404-00		PART NAME: STANDARD MAP (DESEL-VAS) (R)		
REV. 1		REV. 1		
REV. 2		REV. 2		
REV. 3		REV. 3		
REV. 4		REV. 4		
REV. 5		REV. 5		
REV. 6		REV. 6		
REV. 7		REV. 7		
REV. 8		REV. 8		
REV. 9		REV. 9		
REV. 10		REV. 10		
REV. 11		REV. 11		
REV. 12		REV. 12		
REV. 13		REV. 13		
REV. 14		REV. 14		
REV. 15		REV. 15		
REV. 16		REV. 16		
REV. 17		REV. 17		
REV. 18		REV. 18		
REV. 19		REV. 19		
REV. 20		REV. 20		
REV. 21		REV. 21		
REV. 22		REV. 22		
REV. 23		REV. 23		
REV. 24		REV. 24		
REV. 25		REV. 25		
REV. 26		REV. 26		
REV. 27		REV. 27		
REV. 28		REV. 28		
REV. 29		REV. 29		
REV. 30		REV. 30		
REV. 31		REV. 31		
REV. 32		REV. 32		
REV. 33		REV. 33		
REV. 34		REV. 34		
REV. 35		REV. 35		
REV. 36		REV. 36		
REV. 37		REV. 37		
REV. 38		REV. 38		
REV. 39		REV. 39		
REV. 40		REV. 40		
REV. 41		REV. 41		
REV. 42		REV. 42		
REV. 43		REV. 43		
REV. 44		REV. 44		
REV. 45		REV. 45		
REV. 46		REV. 46		
REV. 47		REV. 47		
REV. 48		REV. 48		
REV. 49		REV. 49		
REV. 50		REV. 50		
REV. 51		REV. 51		
REV. 52		REV. 52		
REV. 53		REV. 53		
REV. 54		REV. 54		
REV. 55		REV. 55		
REV. 56		REV. 56		
REV. 57		REV. 57		
REV. 58		REV. 58		
REV. 59		REV. 59		
REV. 60		REV. 60		
REV. 61		REV. 61		
REV. 62		REV. 62		
REV. 63		REV. 63		
REV. 64		REV. 64		
REV. 65		REV. 65		
REV. 66		REV. 66		
REV. 67		REV. 67		
REV. 68		REV. 68		
REV. 69		REV. 69		
REV. 70		REV. 70		
REV. 71		REV. 71		
REV. 72		REV. 72		
REV. 73		REV. 73		
REV. 74		REV. 74		
REV. 75		REV. 75		
REV. 76		REV. 76		
REV. 77		REV. 77		
REV. 78		REV. 78		
REV. 79		REV. 79		
REV. 80		REV. 80		
REV. 81		REV. 81		
REV. 82		REV. 82		
REV. 83		REV. 83		
REV. 84		REV. 84		
REV. 85		REV. 85		
REV. 86		REV. 86		
REV. 87		REV. 87		
REV. 88		REV. 88		
REV. 89		REV. 89		
REV. 90		REV. 90		
REV. 91		REV. 91		
REV. 92		REV. 92		
REV. 93		REV. 93		
REV. 94		REV. 94		
REV. 95		REV. 95		
REV. 96		REV. 96		
REV. 97		REV. 97		
REV. 98		REV. 98		
REV. 99		REV. 99		
REV. 100		REV. 100		



		E.H. WACHS 600 North Highway 100 Waco, Texas 76798 WWW.WACHS.COM	
TITLE: STANDARD MAP (DESEL-VAS) (R) DRAWING: RL DATE: 04/20/19 DES: EOOD-DAO	SCALE: 1:12 DATE: 04/20/19 DES: EOOD-DAO	SHEET: 7 OF 26 DES: EOOD-DAO	77-000-58 D

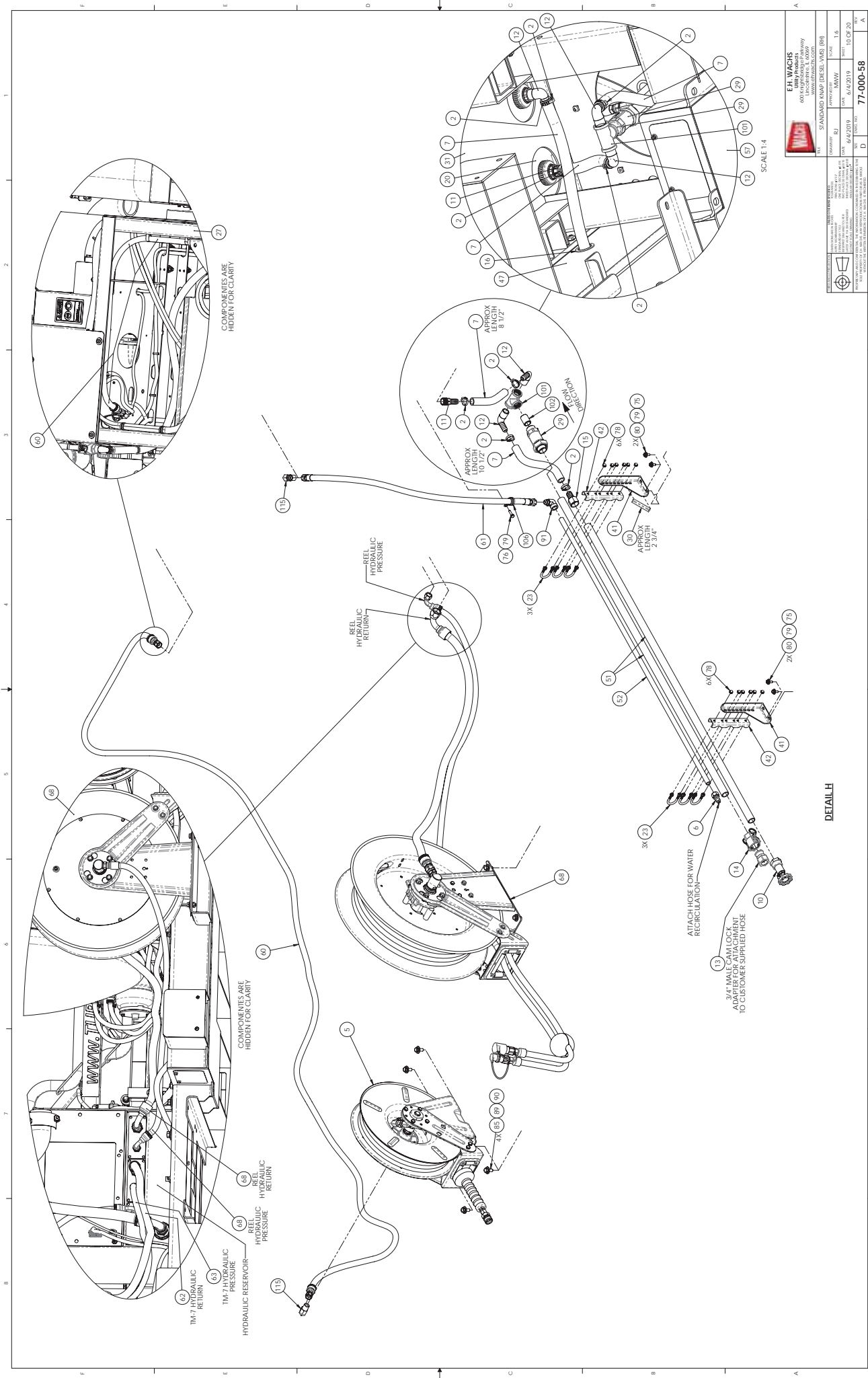
THIS DRAWING IS THE PROPERTY OF WACHS. IT IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN. IT IS NOT TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF WACHS. WACHS ASSUMES NO LIABILITY FOR DAMAGES OF ANY KIND, INCLUDING CONSEQUENTIAL DAMAGES, ARISING FROM THE USE OF THIS DRAWING.



DETAIL
SCALE 1:6

SEE SH111

E.H. WACHS		600 N. Highway 100, Suite 100 Waco, TX 76788 www.ehwachs.com	
REV	STANDARD MAP (DIESEL VANS) (R8)	SCALE	1:6
DATE	04/20/19	DATE	04/20/19
BY	00000	BY	00000
CHK	00000	CHK	00000
D		77-000-58	



		E.H. WACHS 6095 Northpark Drive Dallas, Texas 75246 Phone: 972-241-1100 Fax: 972-241-1101 www.wachsmachinery.com	
MODEL: STANDARD AMAP (DIESEL VANS) (R8) DRAWING: RL DATE: 04/20/19 DESIGNED BY: [blank] CHECKED BY: [blank] APPROVED BY: [blank]	SCALE: 1:4 SHEET: 01 OF 08 DRAWING NO.: 77-000-58	© 2019 WACHS MACHINERY, INC. ALL RIGHTS RESERVED. THIS DOCUMENT IS UNCLASSIFIED AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.	

DETAIL H

SCALE 1:4

COMPONENTS ARE HIDDEN FOR CLARITY

COMPONENTS ARE HIDDEN FOR CLARITY

REEL HYDRAULIC PRESSURE

REEL HYDRAULIC RETURN

ATTACH HOSE FOR WATER RECIRCULATION

3/4" MALLEABLE LOCK ADAPTER FOR ATTACHMENT TO CUSTOMER SUPPLIED HOSE

APPROX LENGTH 10' (4)

APPROX LENGTH 8 1/2' (2)

APPROX LENGTH 2 3/4' (30)

APPROX LENGTH 10' (4)

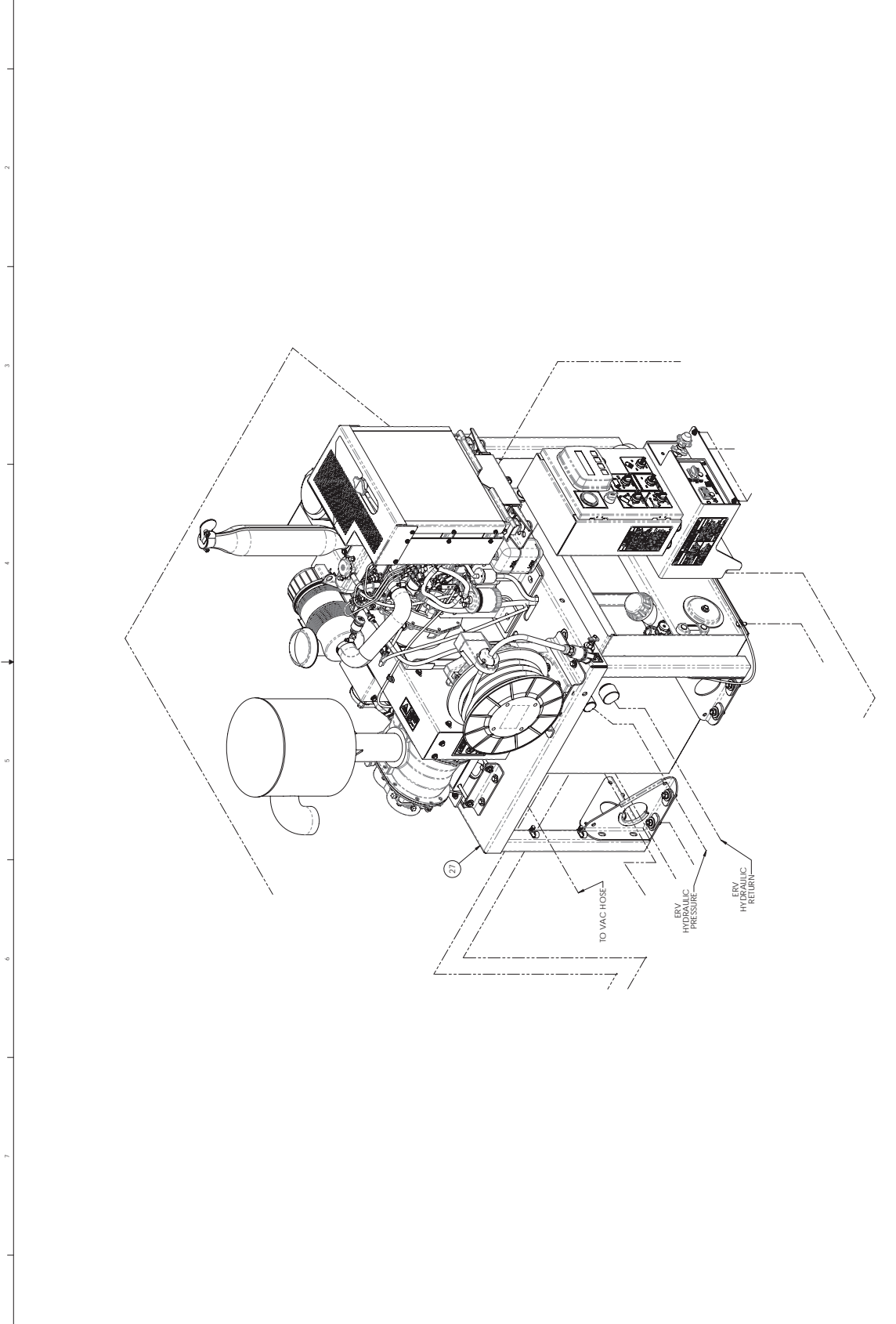
APPROX LENGTH 8 1/2' (2)

APPROX LENGTH 2 3/4' (30)

APPROX LENGTH 10' (4)

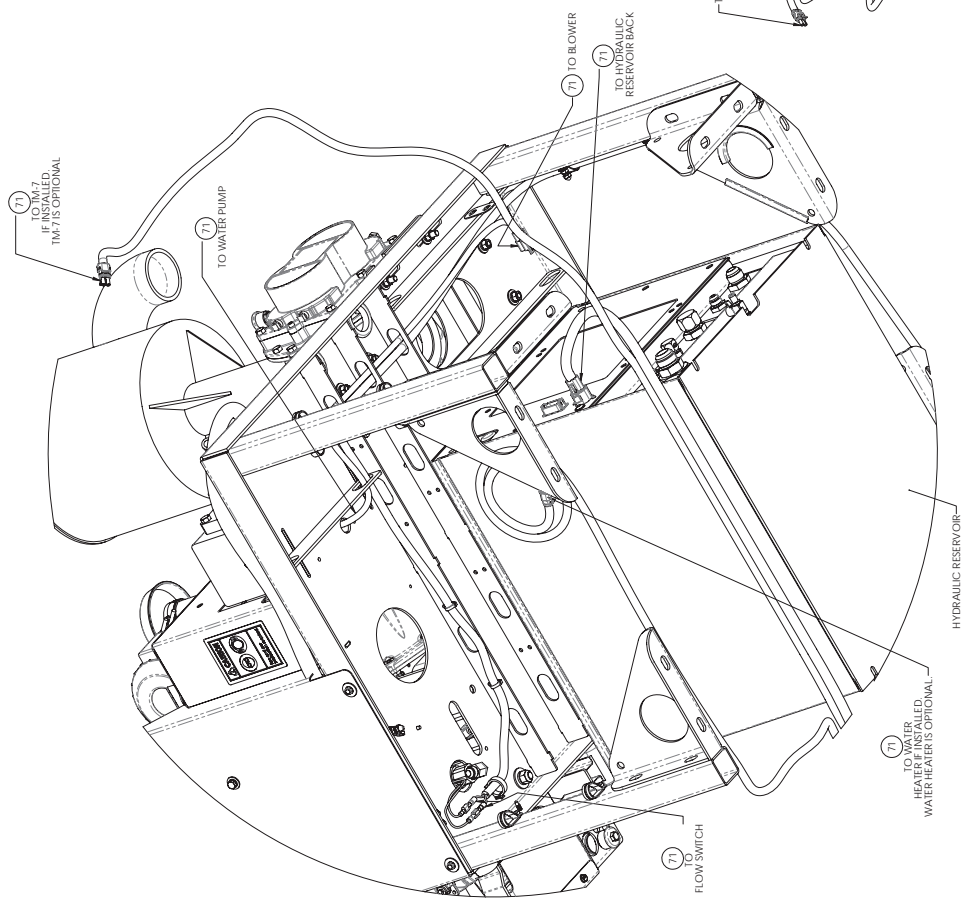
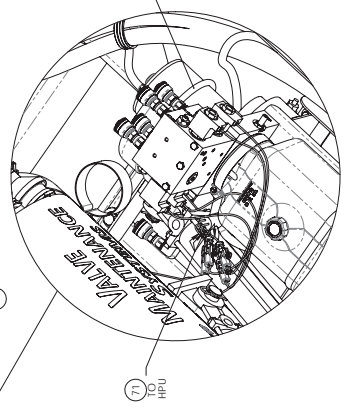
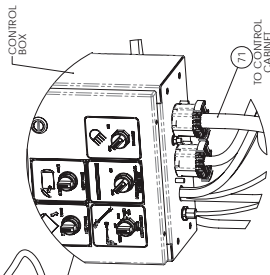
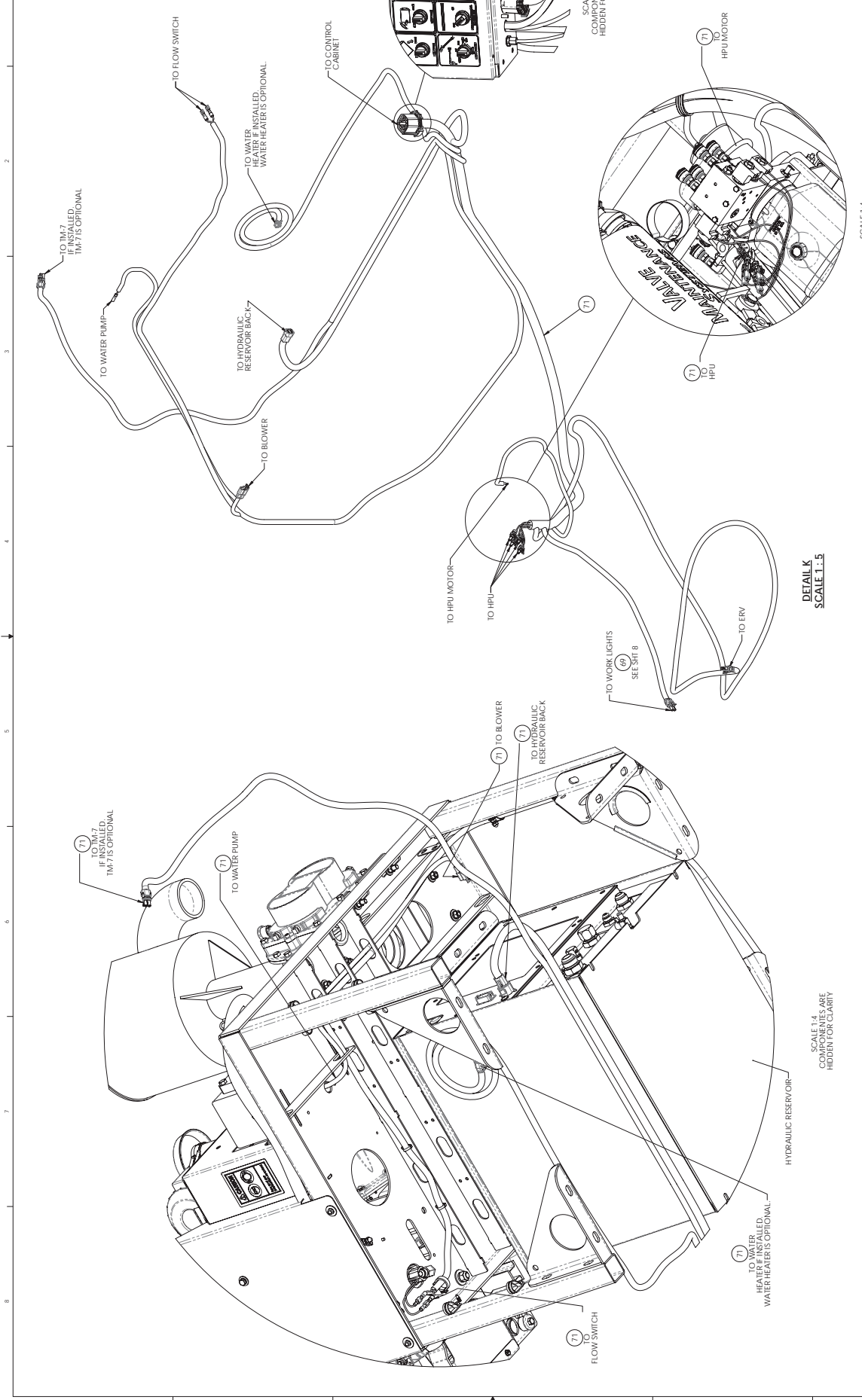
APPROX LENGTH 8 1/2' (2)

APPROX LENGTH 2 3/4' (30)



DETAIL

		E.H. WACHS 600 North Highway 100 P.O. Box 100 Waco, Texas 76788 WWW.WACHS.COM	
TITLE: STANDARD AMAP (DIESEL VANS) (RH)	SCALE: 1:1	DRAWING NO.: 77-000-58	SHEET: 1 OF 2
DATE: 04/20/19	DESIGNED BY:	CHECKED BY:	DATE:
DRAWN BY:	APPROVED BY:	DATE:	DATE:



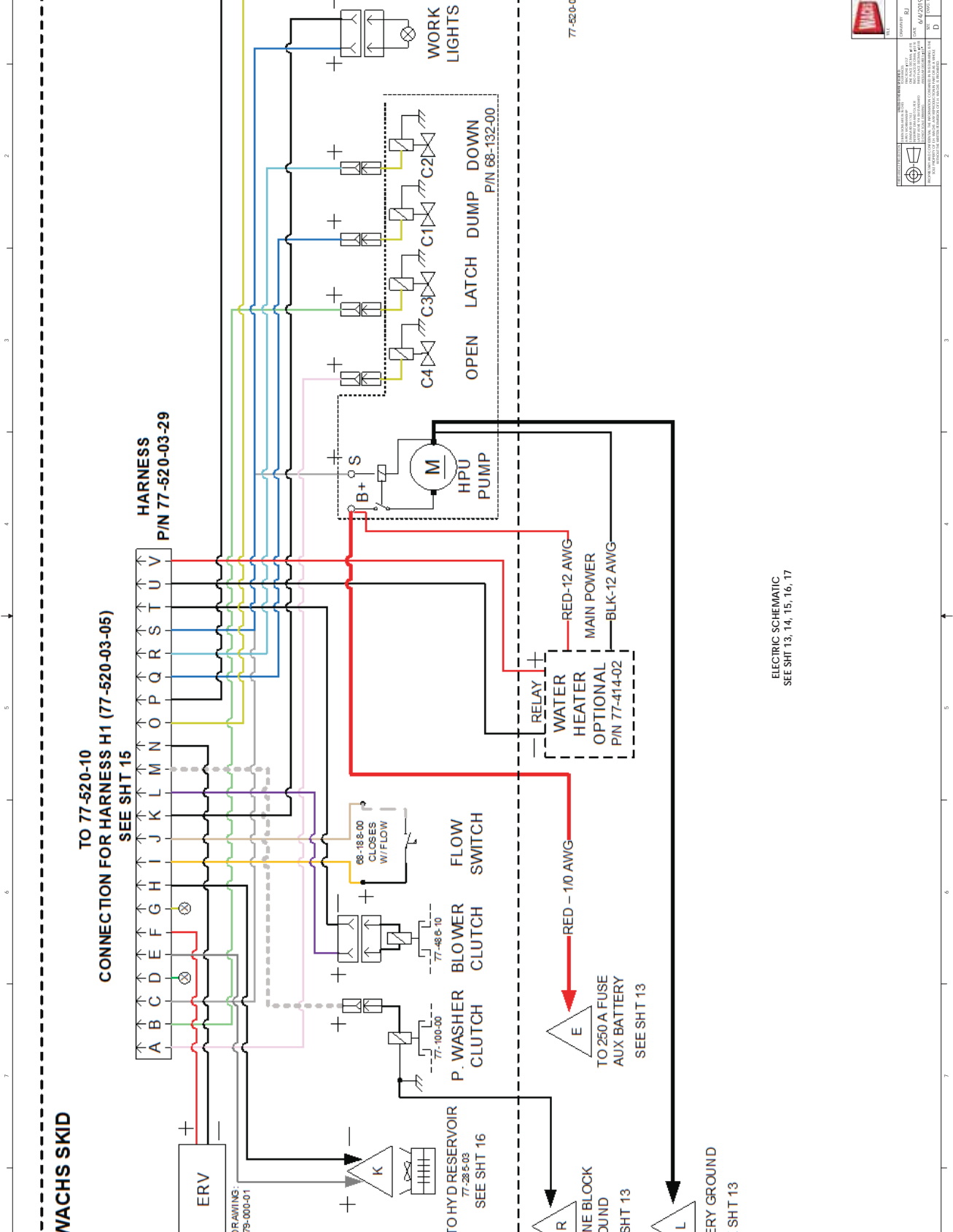
DETAIL K
SCALE 1:5

SCALE 1:4
COMPONENTS ARE
HIDDEN FOR CLARITY

SCALE 1:4
COMPONENTS ARE
HIDDEN FOR CLARITY

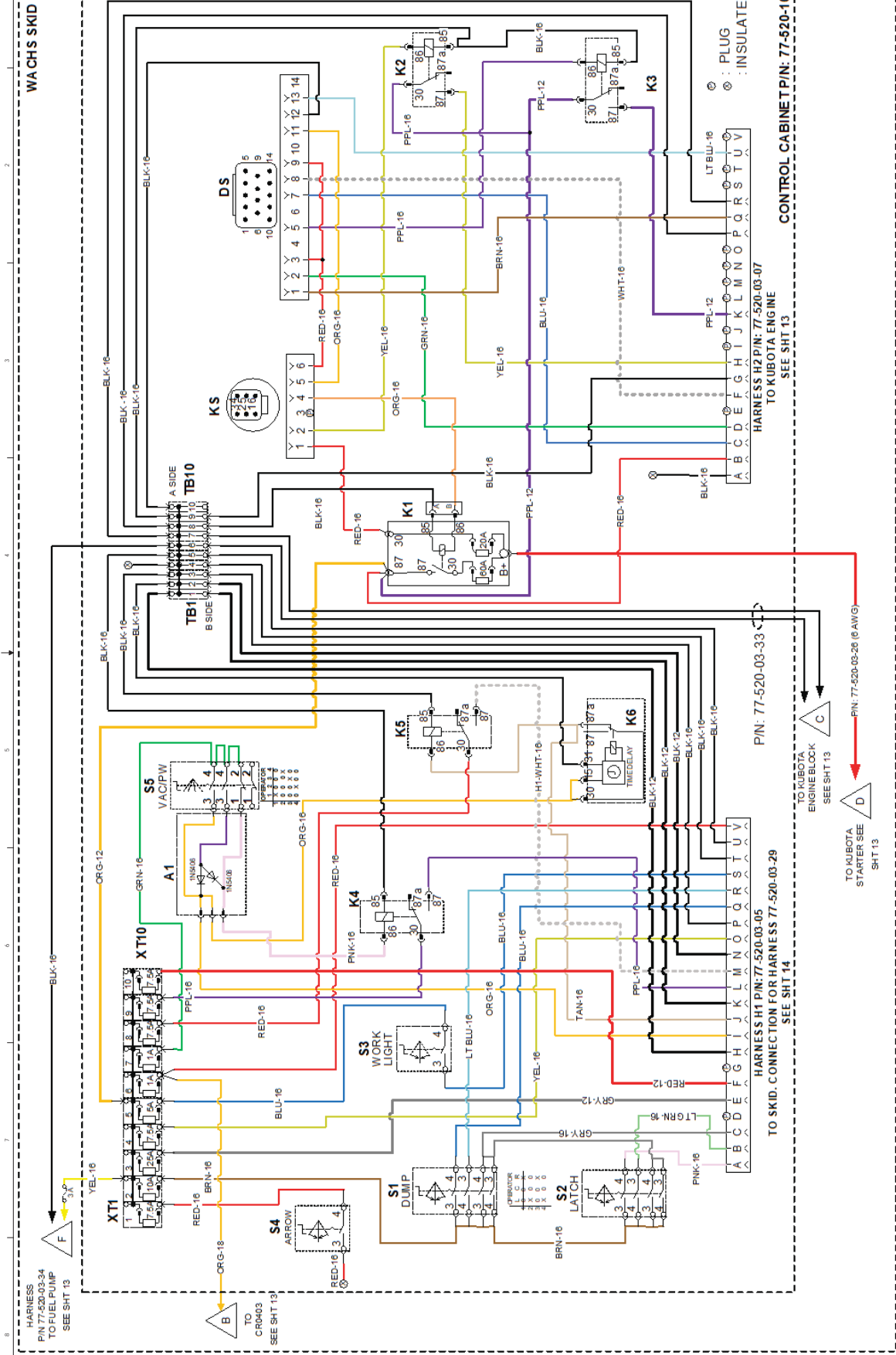
		E.H. WACHS 609 S. Highway 101, P.O. Box 100 Waco, TX 76787 www.walco.com	
REV.	STANDARD AMAP (DIESEL VANS) (RH)	SCALE	1:5
DRAWN BY	BL	DATE	6/22/2019
CHECKED BY	BL	DATE	6/22/2019
DESIGNED BY	BL	DATE	6/22/2019
APPROVED BY	BL	DATE	6/22/2019
PROJECT NO.	77-000-58	SHEET NO.	12 OF 26

		E.H. WACHS 609 S. Highway 101, P.O. Box 100 Waco, TX 76787 www.walco.com	
REV.	STANDARD AMAP (DIESEL VANS) (RH)	SCALE	1:5
DRAWN BY	BL	DATE	6/22/2019
CHECKED BY	BL	DATE	6/22/2019
DESIGNED BY	BL	DATE	6/22/2019
APPROVED BY	BL	DATE	6/22/2019
PROJECT NO.	77-000-58	SHEET NO.	12 OF 26



ELECTRIC SCHEMATIC
SEE SHT 13, 14, 15, 16, 17

E.H. WACHS 600 N. Highway 100 Wachs Electric www.wachselectric.com		SCALE	1:1
DRAWING NO.	77-000-58	DATE	11/07/08
REV.		BY	
APPROVED BY		DATE	11/07/08
DESIGNED BY		DATE	11/07/08
CHECKED BY		DATE	11/07/08
ISSUED BY		DATE	11/07/08
ISSUED TO		DATE	11/07/08



WACHS SKID

CONTROL CABINET PIN: 77-520-101

PLUG : INSULATE

TO KUBOTA STARTER SEE SHT 13

TO KUBOTA ENGINE BLOCK SEE SHT 13

TO KUBOTA ENGINE SEE SHT 13

TO SKID. CONNECTION FOR HARNESS 77-520-03-29 SEE SHT 14

HARNES H1 PIN: 77-520-03-05

HARNES H2 PIN: 77-520-03-07

TO KUBOTA ENGINE SEE SHT 13

PIN: 77-520-03-33

PIN: 77-520-03-26 (6 AWG)

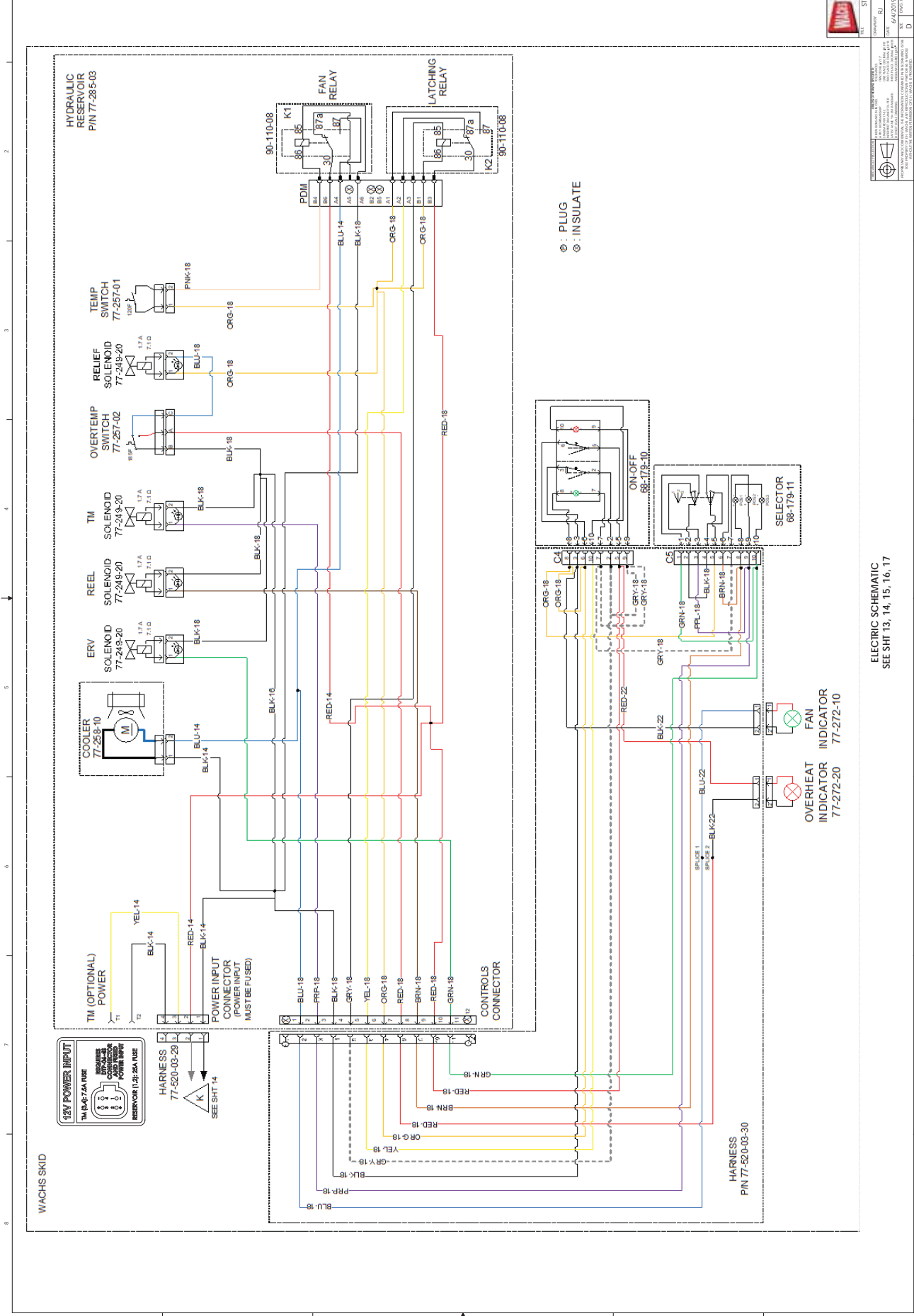
TO CR403 SEE SHT 13

TO FUEL PUMP SEE SHT 13

TO KUBOTA STARTER SEE SHT 13

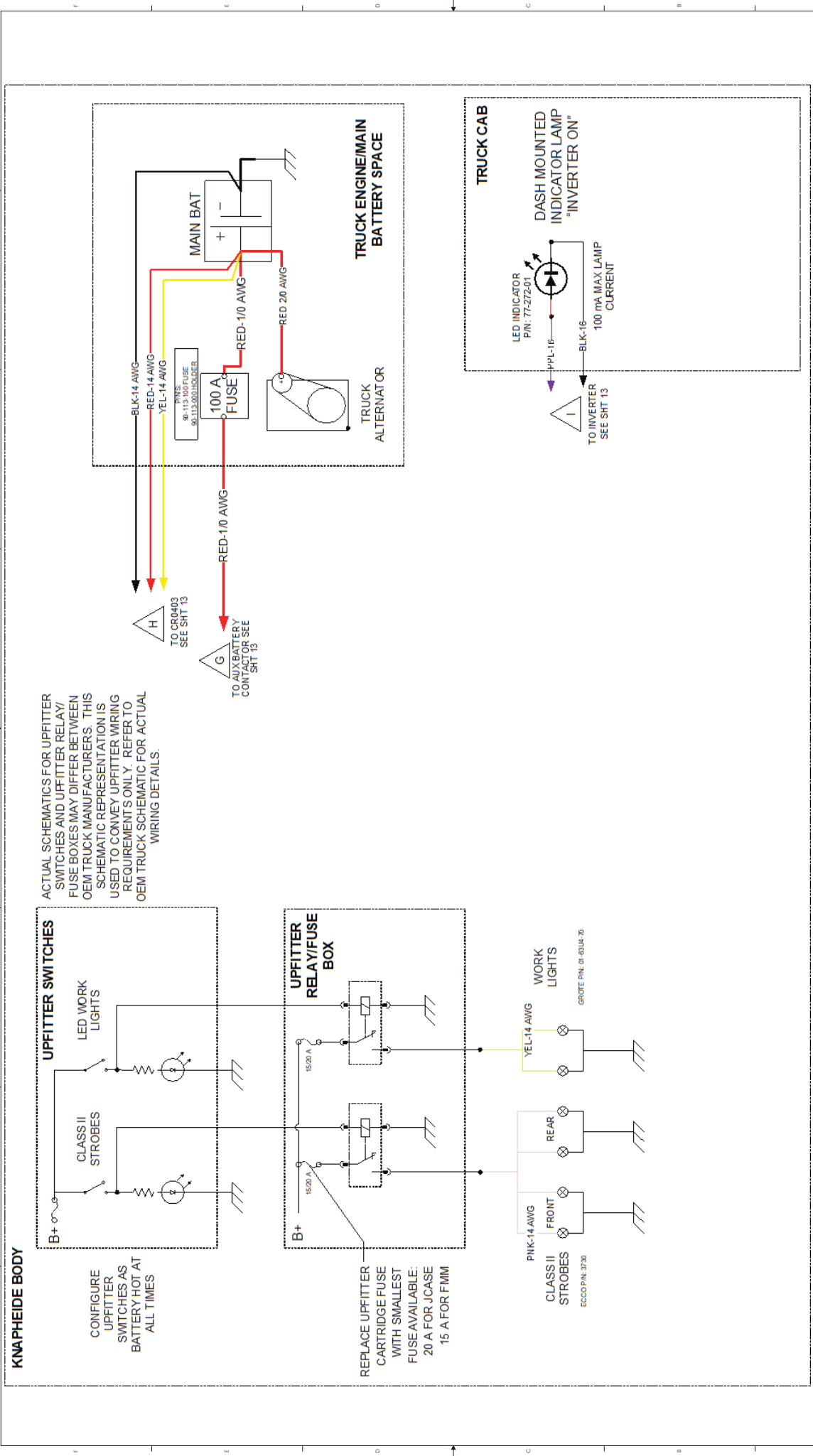
ELECTRIC SCHEMATIC
SEE SHT 13, 14, 15, 16, 17

E.H. WACHS 600 N. HARRIS BLVD. SUITE 100 MARIETTA, GA 30067 WWW.WACHS.COM		REV.	DATE	BY	CHKD.
1	STANDARD WMP (DIESEL WMS) RH	BL	06/20/19	BL	LS
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62					
63					
64					
65					
66					
67					
68					
69					
70					
71					
72					
73					
74					
75					
76					
77					
78					
79					
80					
81					
82					
83					
84					
85					
86					
87					
88					
89					
90					
91					
92					
93					
94					
95					
96					
97					
98					
99					
100					



E.H. WACHS 600 KENNEDY DRIVE MILWAUKEE, WISCONSIN 53212 WWW.WACHS.COM	
REV	STANDARD/KMP (GEISEL-VMS) (RH)
DATE	04/02/2019
BY	6/2/2019
CHK	6/2/2019
APP	6/2/2019
DES	6/2/2019
DWG NO	77-000-58
REV	15 OF 26
APP	15

ELECTRIC SCHEMATIC
 SEE SHT 13, 14, 15, 16, 17



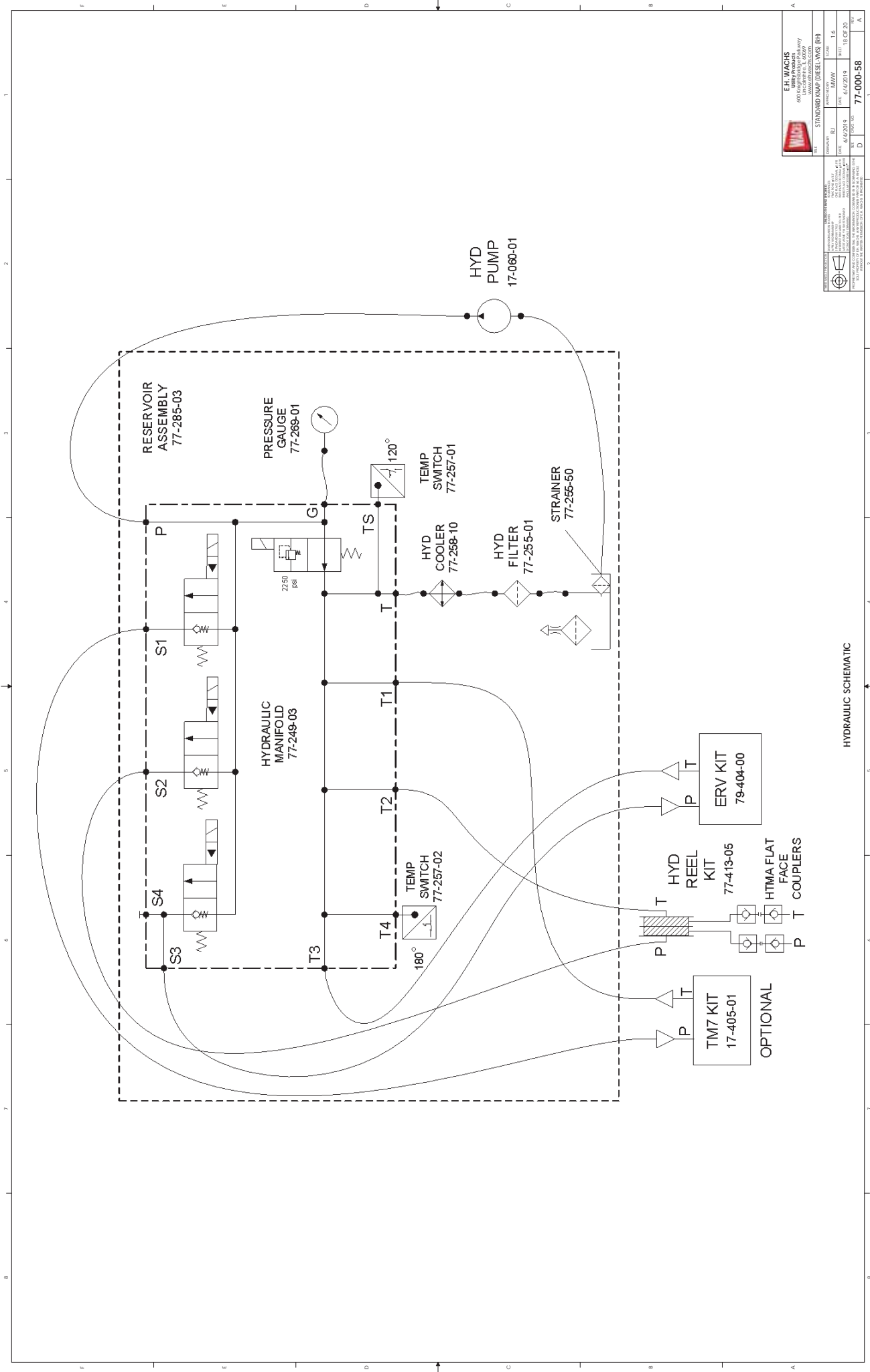
ACTUAL SCHEMATICS FOR UPFITTER SWITCHES AND UPFITTER RELAY/FUSE BOXES MAY DIFFER BETWEEN OEM TRUCK MANUFACTURERS. THIS SCHEMATIC REPRESENTATION IS USED TO CONVEY UPFITTER WIRING REQUIREMENTS ONLY. REFER TO OEM TRUCK SCHEMATIC FOR ACTUAL WIRING DETAILS.

E.H. WACHS
 600 N. Highway 100, Suite 100
 Houston, TX 77060
 www.ehwachs.com

REV	DESCRIPTION	DATE	BY
1.0	STANDARD KAMP (DIESEL/WAS) (RH)	06/20/19	EHW
1.1		04/20/19	EHW
1.2		07/02/19	EHW
1.3		07/02/19	EHW

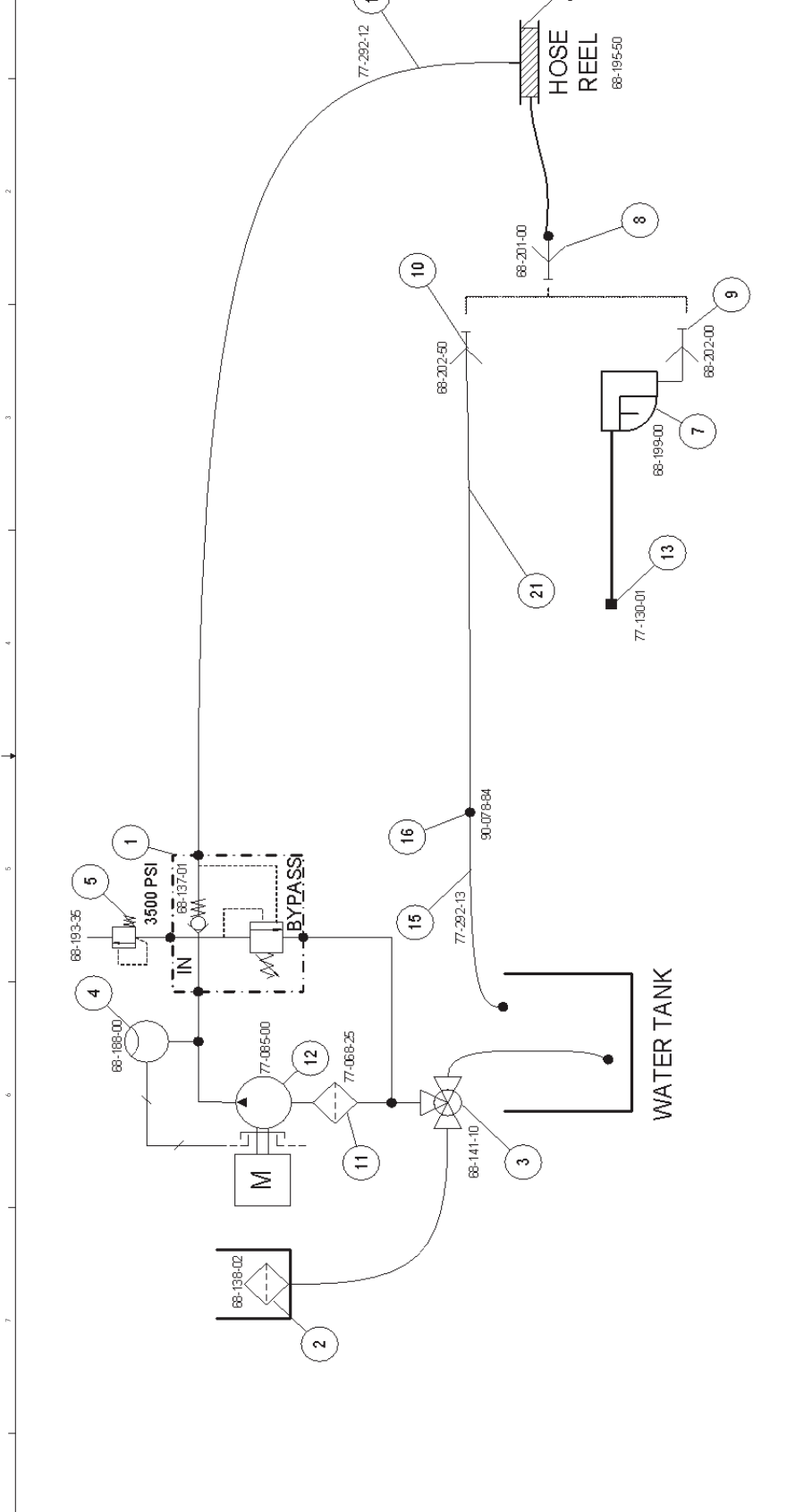
77-000-58

ELECTRIC SCHEMATIC
 SEE SHT 13, 14, 15, 16, 17



E.H. WACHS 600 E. Highway 100, Suite 100 Waco, TX 76780 www.ehwachs.com	
REV	STANDARD KAMP (DIESEL) VMS RH
DATE	06/20/19
BY	77-000-58
CHK	
APP'D	
SCALE	1:1
FIG NO	15 OF 26

HYDRAULIC SCHEMATIC



PARTS LIST FOR PRESSURE WASHER SYSTEM SCHEMATICS. REFERENCE ONLY. BALLOONS DO NOT CORRESPOND WITH ROW TABLE ON SHEET 3

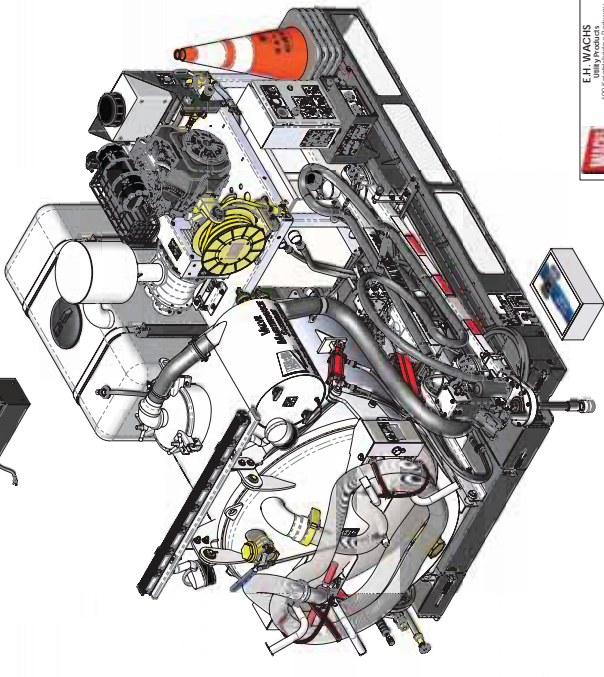
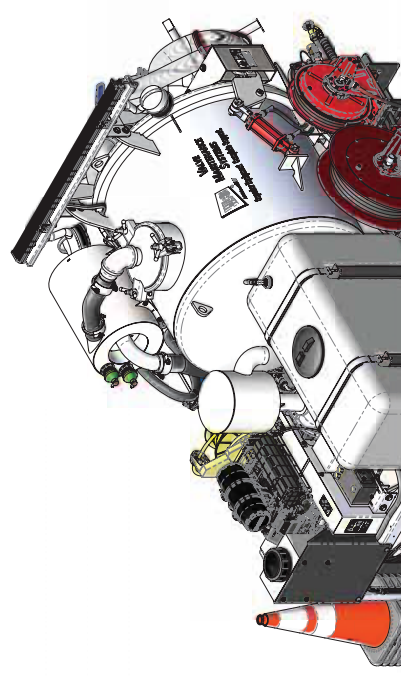
SCHEMATIC ITEM	PART NUMBER	DESCRIPTION
1	68-137-01	VALVE, TRAPPED PRESSURE UNLOADER
2	68-138-02	STRAINER
3	68-141-10	BALL VALVE, 3-WAY
4	68-188-00	FLOW SWITCH
5	68-192-35	SAFETY RELIEF, 3500 PSI
6	68-195-50	HOSE REEL
7	68-199-00	SPRAY GUN
8	68-201-00	OD COUPLER, 3/8" X 3/8" NPT-F
9	68-202-00	OD PLUG, 3/8" X 3/8" NPT-M
10	68-202-50	OD PLUG, 3/8" X 3/8" NPT-F
11	77-069-25	STRAINER
12	77-085-00	PUMP PRESSURE WASHER 2.6 GPM, 3000 PSI
13	77-130-01	NOZZLE, .030 X 15 DEGREE
14	77-292-12	151 5/16" HOSE ASSEMBLY, .08 E.I. X .08 F.I. X .08 HOSE
15	77-292-13	43 13/16" HOSE ASSEMBLY, .08 E.I. X .08 F.I. X .08 HOSE
16	90-076-84	ADAPTER, 8 1/4" - 1.6MM I.D. X 3/8" NPT-F 90

PRESSURE WASHER SYSTEM SCHEMATIC

E.H. WACHS
600 E. High Street, P.O. Box 100
Waco, TX 76788-0100
www.ehwachs.com

REV.	DESCRIPTION	DATE
1.12	STANDARD KAMP (DIESEL, WMS) (RH)	11/02/08
1.11	REVISED TO ADD HOSE ASSEMBLY	06/20/10
1.10	REVISED TO ADD HOSE ASSEMBLY	06/20/10
1.09	REVISED TO ADD HOSE ASSEMBLY	06/20/10
1.08	REVISED TO ADD HOSE ASSEMBLY	06/20/10
1.07	REVISED TO ADD HOSE ASSEMBLY	06/20/10
1.06	REVISED TO ADD HOSE ASSEMBLY	06/20/10
1.05	REVISED TO ADD HOSE ASSEMBLY	06/20/10
1.04	REVISED TO ADD HOSE ASSEMBLY	06/20/10
1.03	REVISED TO ADD HOSE ASSEMBLY	06/20/10
1.02	REVISED TO ADD HOSE ASSEMBLY	06/20/10
1.01	REVISED TO ADD HOSE ASSEMBLY	06/20/10

ITEM NO.	PART NUMBER	DESCRIPTION	ESTIMATE LENGTH	QTY	ITEM NO.	PART NUMBER	DESCRIPTION	ESTIMATE LENGTH	QTY
1	68-153-11	HANDLE, CLEVIS ROD		1	60	77-292-12	151.5/16" HOSE ASSEMBLY, 08 FJ X 08 FJ X 08 HOSE		1
2	68-158-16	HOSE CLAMP, CRIMP-23.9 - 271.1MM		5	61	77-292-13	43.13/16" HOSE ASSEMBLY, 08 FJ X 08 FJ X 08 FJ X 08 HOSE		1
3	68-158-57	HOSE CLAMP, 3" SPIRAL, C/CLOCKWISE		2	62	77-292-14	45.3/4" HOSE ASSEMBLY, 12 FJ X 12 FJ X 12 HOSE		1
4	68-160-03	HOSE, 3" VACUUM, BLACK	(6.75FT)	1	63	77-292-15	45.7/8" HOSE ASSEMBLY, 08 FJ X 08 FJ X 08 HOSE		1
5	68-195-50	HOSE REEL, REELDRIFT, (08" X 50') BOTTOM WIND		1	64	77-312-20	3" X 20' CLEAR SUCTION HOSE ASSEMBLY		1
6	68-202-50	OD PLUG, 3/8" X 3/8" NPT F		1	65	77-406-00	WASH DOWN WAND		1
7	68-203-00	HOSE, 3/4" LP LOCK ON	(8 1/2') (10 1/2') (80')	3	66	77-408-01	PRESSURE WASH WAND, W/ROTATING NOZZLE		1
8	68-226-00	STRIP, EPDM ADHESIVE BACKED FOAM RUBBER, 2" W X 1/4" THK	2X (9')	2	67	77-413-04	ROLLER ASSEMBLY		3
9	68-236-00	STRIP, EPDM ADHESIVE BACKED FOAM RUBBER, 2" W X 1/4" THK	2X (20 1/2')	2	68	77-413-05	HYDRAULIC HOSE REEL KIT, BOTTOM ROLLER		1
10	68-242-51	DRAIN VALVE, 3/4" NPT FEMALE INLET X 3/4" MIGHT OUTLET		1	69	77-420-00	LIGHT BAR KIT		1
11	68-243-20	ADAPTER, 3/4" NPT M X 3/4" HOSE BARB - NYLON		1	70	77-431-02-00	ASSEMBLY, 280 GAL SPOILS TANK		1
12	68-243-30	ELBOW, 3/4" NPT M X 3/4" HOSE BARB - NYLON		3	71	77-500-03-29	WIRE HARNESS, SKID POWER PACK		1
13	68-243-70	HOSE TO CAM LEVER ADAPTER, 3/4" CAM M X 3/4" GHT F		1	72	79-404-00	ERV-750 FOR VAS KIT		1
14	68-243-71	CAM LEVER SOCKET, 3/4" X 3/4" NPT F		1	73	79-422-01	HC-100 - VITALS CONTROLLER KIT - N AMER		1
15	68-243-80	ADAPTER, 3/4" BARB X 3/4" NPT F		1	74	90-051-04	NUT, 10.24 NYLOCK		18
16	68-247-01	SNAP BUSHING, 1.38 ID X 1.75 HOLE X .125 PANEL		1	75	90-051-07	HHCS, 1/4-20 X 3/4 GRADE 5, 2h		12
17	68-420-02	WAND WELDMENT, 7/8" X 8", 3" HOSE		1	76	90-051-10	HHCS, 1/4-20 X 1		12
18	68-420-03	WAND WELDMENT, 1-1/4" X 8", 3" HOSE		1	77	90-055-01	NUT, 1/4-20 HEX		2
19	68-420-04	WAND WELDMENT, 2-1/2" X 8", 3" HOSE		1	78	90-055-18	NUT, 1/4-20 ACORN		13
20	77-262-63	100 GALLON WATER TANK ASSEMBLY		1	79	90-055-52	WASHER, 1/4 SPIRIT RING		25
21	77-175-11	BUMPER, PUSH IN 1/4" HOLE		6	80	90-055-53	WASHER, FLAT, 1/4"		25
22	77-209-02	CLAMP, 3.5" OD		1	81	90-061-07	HHCS, 5/16-18 X 3/4		6
23	77-209-04	U-BOLT, ZINC-PLATED STEEL, 1/4"-20, 1-1/8" ID, 2" HEIGHT		6	82	90-065-01	NUT, 5/16-18 HEX GRADE 8		6
24	77-250-14	KIT, GAS SB SKID POWER PACK		1	83	90-065-51	WASHER, 5/16 SPIRIT RING		6
25	77-255-94	LATCH CATCH		1	84	90-065-52	WASHER, 5/16 X 1		6
26	77-255-95	LATCH ASSY, RH		2	85	90-071-10	HHCS, 3/8-16 X 1		47
27	77-267-95	LATCH ASSY, LH		2	86	90-071-20	HHCS, 3/8-16 X 2 GR 5 ZN		4
28	77-267-07	LABEL, IM/PRESSURE, TANK, POWER		1	87	90-075-01	NUT, 3/8-16 HEX GR 5 ZN		3
29	77-276-11	DOUBLE CHECK VALVE, 3/4" NPT F X 3/4" NPT F		1	88	90-075-05	NUT, 3/8-16 NYLOCK GR 5 ZN		4
30	77-277-50	PVC EDGE TRIM, 0.090" TO 0.100" EDGE THICKNESS	(2 3/4')	1	89	90-075-52	WASHER, 3/8 SPIRIT RING		51
31	77-290-01	WATER TANK BASE WELDMENT		1	90	90-075-53	WASHER, 3/8 FLAT		55
32	77-290-02	WELDMENT, WATER TANK STAKE		4	91	90-078-84	ADAPTER, 8 (3/4" - 16) WJ X 3/8" NPT F 90		1
33	77-290-03	HOSE ROLLER GUIDE BRACKET		1	92	90-091-12	HHCS, 1/2-13 X 1-1/4 GRADE 8		14
34	77-290-04	WELDMENT, BASKET SIDE		1	93	90-095-15	NUT, 1/2-13 HEX GR 5 YELLOW ZINC		2
35	77-290-05	WELDMENT, LATCH BRACKET		1	94	90-095-52	WASHER, 1/2 SPIRIT RING		14
36	77-290-06	WAND HOLDER WELDMENT		1	95	90-095-58	WASHER, 1/2 SPIRIT RING		14
37	77-290-07	PRESSURE WASH WAND HOLDER WELDMENT		1	96	90-098-20	ADAPTER, 8 JIC-M (3/4-16) X 8 JIC-M BULKHEAD		1
38	77-290-08	WELDMENT, DOOR SKID		2	97	90-098-31	NUT, 8 (3/4-16) BULKHEAD		1
39	77-290-09	WELDMENT, BASKET DOOR		1	98	90-098-77	8 (3/4-16) JIC CAP		1
40	77-290-11	WELDMENT, SUPPORT BRACKET		1	99	90-135-06	GROMMET, 7/8" ID X 1 1/4" HOLE X 3/16" THK		1
41	77-290-12	PIPE SUPPORT BRACKET		2	100	90-140-07	SHCS, 10-24 X 3/4 S518-B		18
42	77-290-13	PIPE SUPPORT		2	101	90-218-15	TEE, 3/4 NPT POLY SCH 80		1
43	77-290-15	BASKET BACK PANEL		1	102	90-218-18	NPTFE, 3/4 NPT, 1.318 PVC SCH 80		1
44	77-290-16	COVER PLATE		2	103	90-218-40	-12 (1-1/16 - 1/2) JIC CAP		1
45	77-290-17	COVER PLATE		2	104	90-218-96	ADAPTER, 12 JIC-M X 12 JIC-M BULKHEAD		1
46	77-290-18	COVER PLATE		1	105	90-218-98	NUT, 12 (1-1/16 - 1/2) BULKHEAD		1
47	77-290-21	BACK COVER PANEL		1	106	90-903-10	CUSHIONED LOOP CLAMP, 1"		3
48	77-290-22	SIDE COVER PANEL		1	107	90-903-15	CUSHIONED LOOP CLAMP, 1 1/2"		5
49	77-290-24	WELDMENT, KEY BOX		1	108	90-903-20	CUSHIONED LOOP CLAMP, 2"		3
50	77-290-28	STRAP, WATER TANK		2	109	90-903-75	CUSHIONED LOOP CLAMP, 3/4"		3
51	77-290-29	STAINLESS STEEL PIPE, 3/4" SCH 40		2	110	90-903-75	CUSHIONED LOOP CLAMP, 3/4"		3
52	77-290-30	STAINLESS STEEL PIPE, 3/8" SCH 40		1	111	90-1060-58	HHCS, 1/4-20 X 5.98" GR 5 ZN		30
53	77-290-31	LATCH CATCH		2	112	90-18836-10	CLEVIS ROD END, 1/2-13"		2
54	77-290-44	LABEL, 100 GAL WATER TANK		1	113	90-45164-96	THREADED ROD, 1/2-13 X 24"		1
55	77-290-46	LABEL, GYWR WARNING		1	114	90-91327A1488	BOLT, SHOULDER, 1/2 X 5/16 X SS		1
56	77-290-00	CONNECTION PLATE		1	115	910-88-C1K-S	ELBOW, 1/2" M NPT X 8" M JIC (3/4"-16)		2
57	77-290-00	WELDMENT, VAS SMD RH CONTROLS		1					
58	77-291-01	WELDMENT, CONE HOLDER		1					
59	77-291-28	28" TRAFFIC CONE		4					

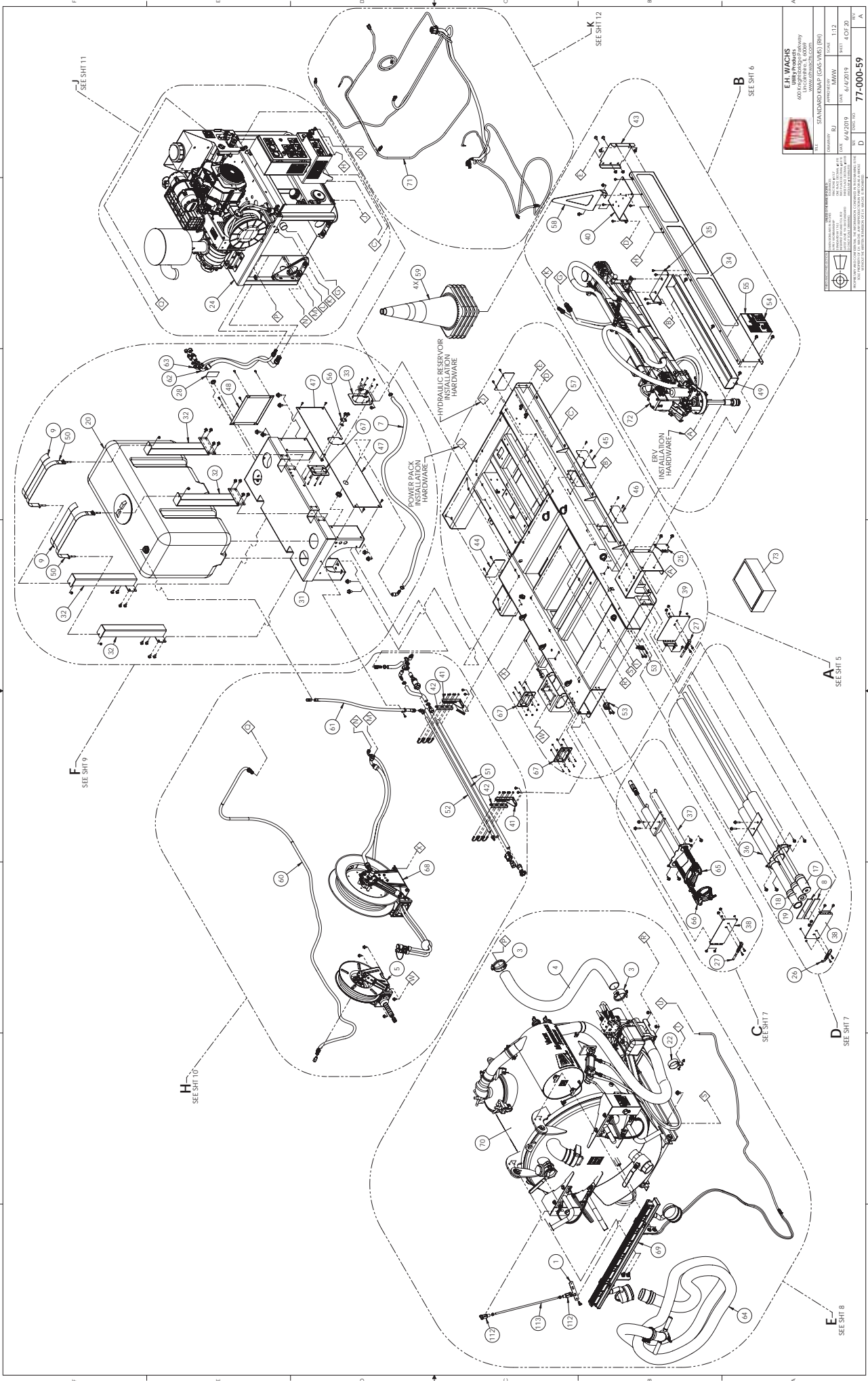


E.H. WACHS
 605 E. Highway 100
 Waco, TX 76780
 WWW.EHWACHS.COM

WACHS

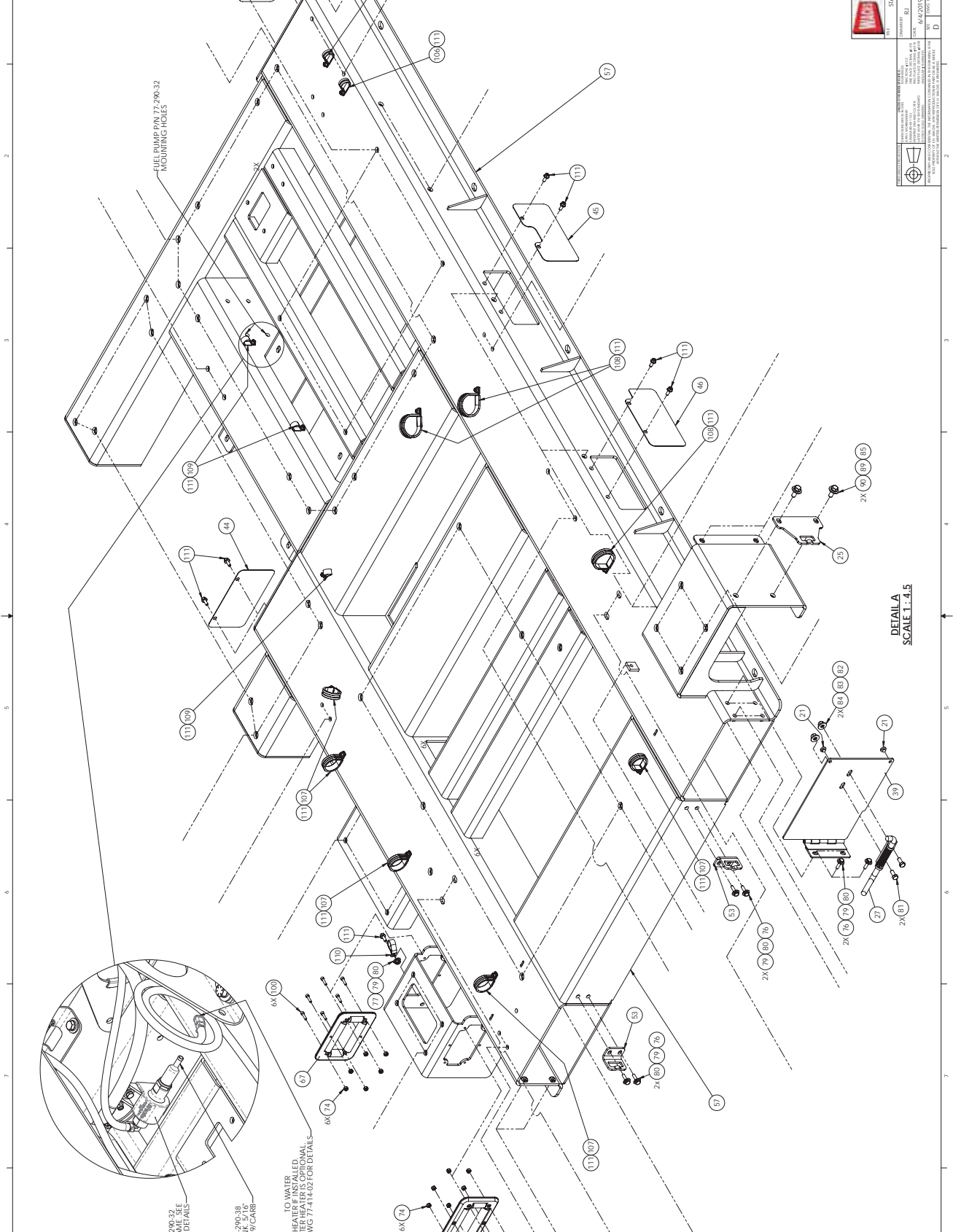
STANDARD KAMP (GAS W/S) (RH)

DATE: 04/28/19
 REV: 04/28/19
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]
 EST: 2107-28
 77-000-59



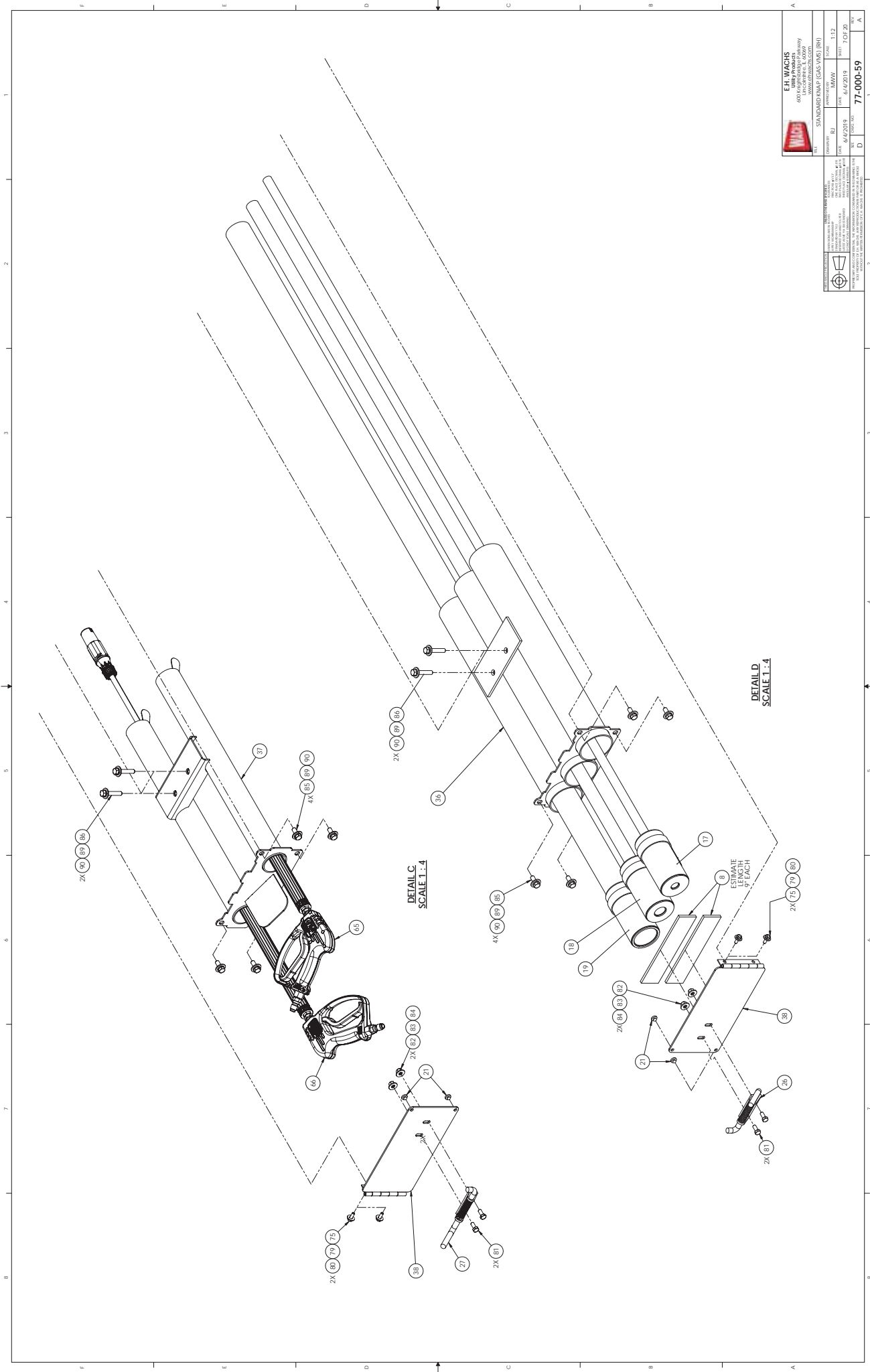
E.H. WACHS		600 S. HIGHTOWER DRIVE		MILWAUKEE, WISCONSIN 53212	
STANDARD MAP (GAS VARD) (R8)		REV. 04/2019		SHEET 4 OF 26	
DRAWN BY: [Signature]		DATE: 04/2019		REV. 04/2019	
PROJECT NO. 77-000-59		REV. 04/2019		REV. 04/2019	

WACHS
 STANDARD MAP (GAS VARD) (R8)
 REV. 04/2019
 SHEET 4 OF 26
 PROJECT NO. 77-000-59
 REV. 04/2019



		E.H. WACHS 600 N. Highway 101 Waco, TX 76798 www.ehwachs.com	
REV	DATE	BY	CHK
1	06/28/19	RL	RL
2	07/29/19	RL	RL
3	08/29/19	RL	RL
4	09/29/19	RL	RL
5	10/29/19	RL	RL
6	11/29/19	RL	RL
7	12/29/19	RL	RL
8	01/29/20	RL	RL
9	02/29/20	RL	RL
10	03/29/20	RL	RL
11	04/29/20	RL	RL
12	05/29/20	RL	RL
13	06/29/20	RL	RL
14	07/29/20	RL	RL
15	08/29/20	RL	RL
16	09/29/20	RL	RL
17	10/29/20	RL	RL
18	11/29/20	RL	RL
19	12/29/20	RL	RL
20	01/29/21	RL	RL
21	02/29/21	RL	RL
22	03/29/21	RL	RL
23	04/29/21	RL	RL
24	05/29/21	RL	RL
25	06/29/21	RL	RL
26	07/29/21	RL	RL
27	08/29/21	RL	RL
28	09/29/21	RL	RL
29	10/29/21	RL	RL
30	11/29/21	RL	RL
31	12/29/21	RL	RL
32	01/29/22	RL	RL
33	02/29/22	RL	RL
34	03/29/22	RL	RL
35	04/29/22	RL	RL
36	05/29/22	RL	RL
37	06/29/22	RL	RL
38	07/29/22	RL	RL
39	08/29/22	RL	RL
40	09/29/22	RL	RL
41	10/29/22	RL	RL
42	11/29/22	RL	RL
43	12/29/22	RL	RL
44	01/29/23	RL	RL
45	02/29/23	RL	RL
46	03/29/23	RL	RL
47	04/29/23	RL	RL
48	05/29/23	RL	RL
49	06/29/23	RL	RL
50	07/29/23	RL	RL
51	08/29/23	RL	RL
52	09/29/23	RL	RL
53	10/29/23	RL	RL
54	11/29/23	RL	RL
55	12/29/23	RL	RL
56	01/29/24	RL	RL
57	02/29/24	RL	RL
58	03/29/24	RL	RL
59	04/29/24	RL	RL
60	05/29/24	RL	RL
61	06/29/24	RL	RL
62	07/29/24	RL	RL
63	08/29/24	RL	RL
64	09/29/24	RL	RL
65	10/29/24	RL	RL
66	11/29/24	RL	RL
67	12/29/24	RL	RL
68	01/29/25	RL	RL
69	02/29/25	RL	RL
70	03/29/25	RL	RL
71	04/29/25	RL	RL
72	05/29/25	RL	RL
73	06/29/25	RL	RL
74	07/29/25	RL	RL
75	08/29/25	RL	RL
76	09/29/25	RL	RL
77	10/29/25	RL	RL
78	11/29/25	RL	RL
79	12/29/25	RL	RL
80	01/29/26	RL	RL
81	02/29/26	RL	RL
82	03/29/26	RL	RL
83	04/29/26	RL	RL
84	05/29/26	RL	RL
85	06/29/26	RL	RL
86	07/29/26	RL	RL
87	08/29/26	RL	RL
88	09/29/26	RL	RL
89	10/29/26	RL	RL
90	11/29/26	RL	RL
91	12/29/26	RL	RL
92	01/29/27	RL	RL
93	02/29/27	RL	RL
94	03/29/27	RL	RL
95	04/29/27	RL	RL
96	05/29/27	RL	RL
97	06/29/27	RL	RL
98	07/29/27	RL	RL
99	08/29/27	RL	RL
100	09/29/27	RL	RL

DETAIL A
SCALE 1:4.5



E.H. WACHS
 600 K Street, Suite 100
 Westborough, MA 01581
 www.ehwachs.com

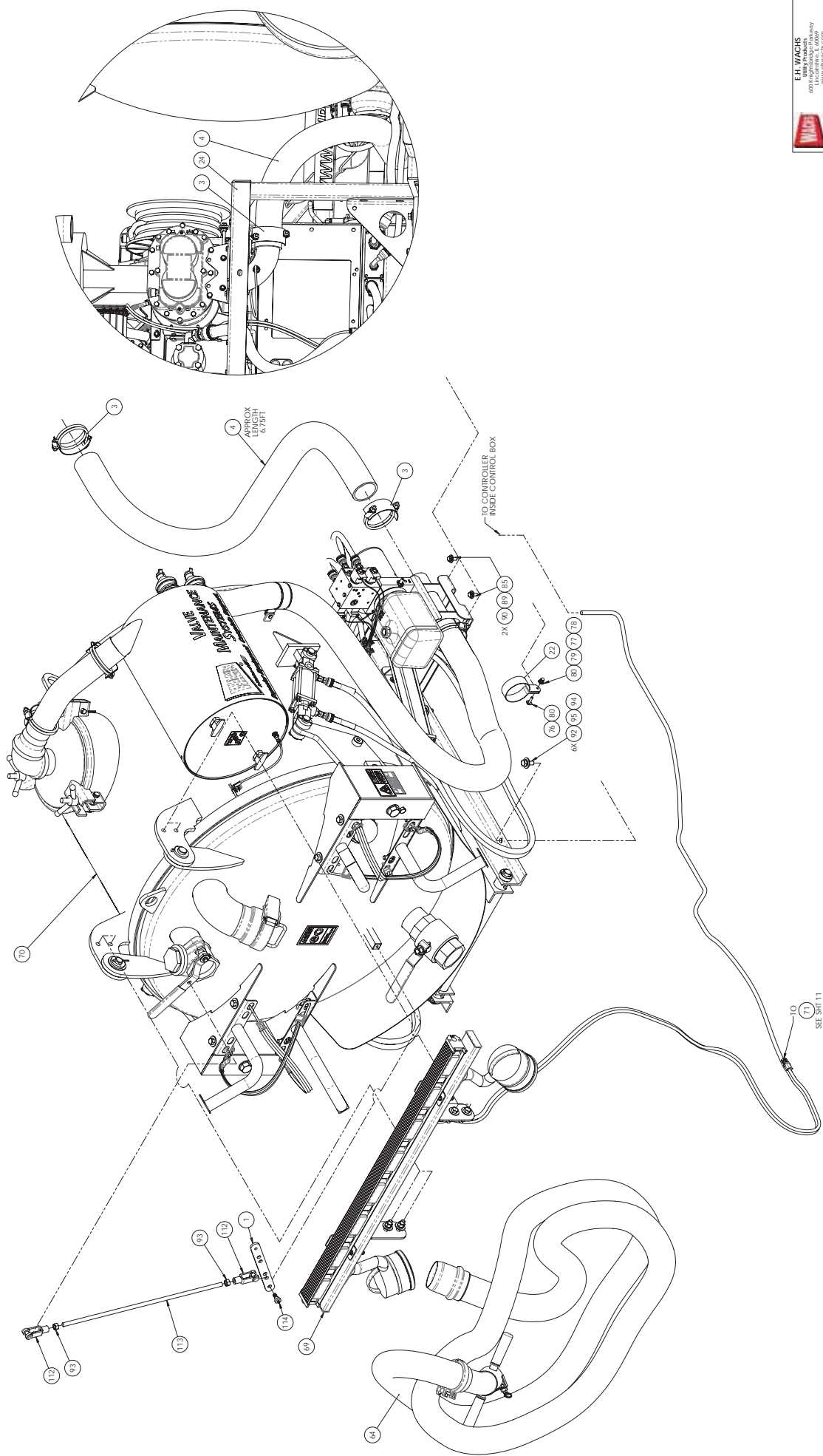
WACHS

STANDARD MAP (GAS VALVE) (RH)

DATE: 04/20/19
 DESIGNED BY: [Redacted]
 CHECKED BY: [Redacted]
 SCALE: 1:12
 SHEET: 7 OF 26
 DWG NO: 77-000-59

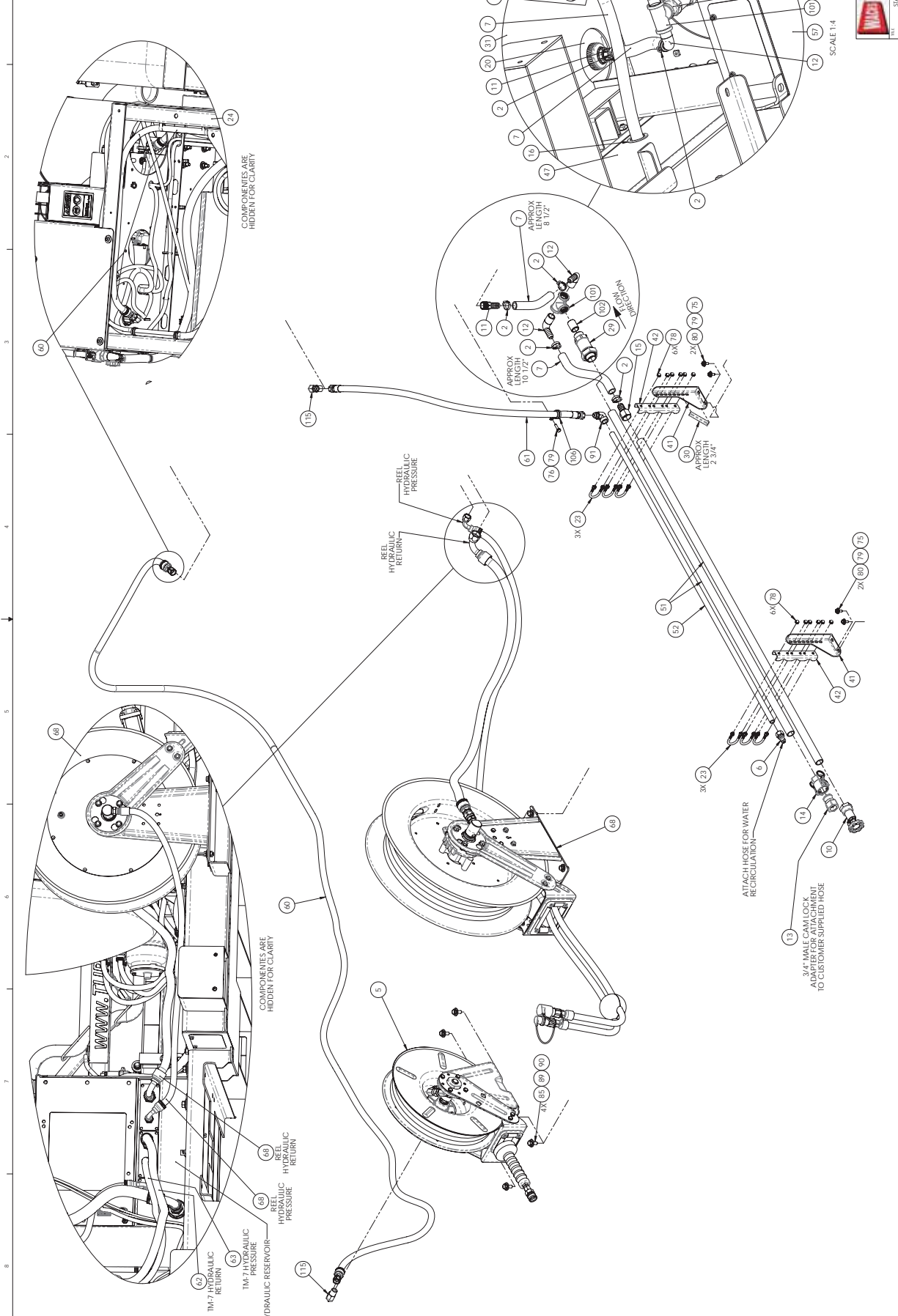
ESTIMATE LENGTH 1 INCH

DETAIL D
 SCALE 1 : 4



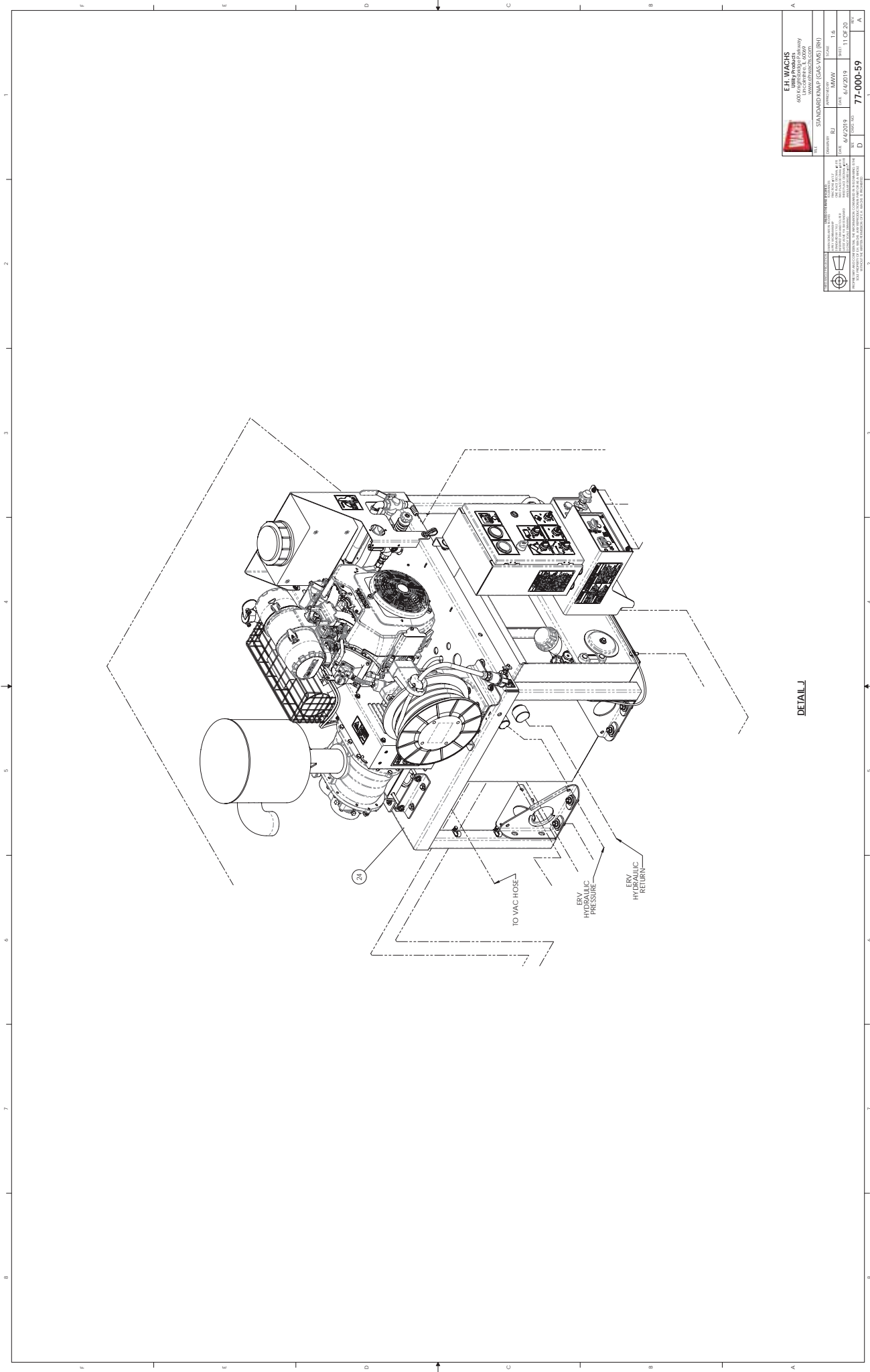
DETAIL
SCALE 1:6

E.H. WACHS		STANDARD MAP (GAS/WAD) (RH)	
400 S. HIGHLAND AVENUE MILWAUKEE, WI 53205 WWW.MARESSCIUBA.COM		WWW.MARESSCIUBA.COM	
REV.	DATE	BY	CHK
1	01/2019	EW	EW
2	04/2019	EW	EW
3	02/2020	EW	EW
4	02/2020	EW	EW
5	02/2020	EW	EW
6	02/2020	EW	EW
7	02/2020	EW	EW
8	02/2020	EW	EW
9	02/2020	EW	EW
10	02/2020	EW	EW
11	02/2020	EW	EW
12	02/2020	EW	EW
13	02/2020	EW	EW
14	02/2020	EW	EW
15	02/2020	EW	EW
16	02/2020	EW	EW
17	02/2020	EW	EW
18	02/2020	EW	EW
19	02/2020	EW	EW
20	02/2020	EW	EW
21	02/2020	EW	EW
22	02/2020	EW	EW
23	02/2020	EW	EW
24	02/2020	EW	EW
25	02/2020	EW	EW
26	02/2020	EW	EW
27	02/2020	EW	EW
28	02/2020	EW	EW
29	02/2020	EW	EW
30	02/2020	EW	EW
31	02/2020	EW	EW
32	02/2020	EW	EW
33	02/2020	EW	EW
34	02/2020	EW	EW
35	02/2020	EW	EW
36	02/2020	EW	EW
37	02/2020	EW	EW
38	02/2020	EW	EW
39	02/2020	EW	EW
40	02/2020	EW	EW
41	02/2020	EW	EW
42	02/2020	EW	EW
43	02/2020	EW	EW
44	02/2020	EW	EW
45	02/2020	EW	EW
46	02/2020	EW	EW
47	02/2020	EW	EW
48	02/2020	EW	EW
49	02/2020	EW	EW
50	02/2020	EW	EW
51	02/2020	EW	EW
52	02/2020	EW	EW
53	02/2020	EW	EW
54	02/2020	EW	EW
55	02/2020	EW	EW
56	02/2020	EW	EW
57	02/2020	EW	EW
58	02/2020	EW	EW
59	02/2020	EW	EW
60	02/2020	EW	EW
61	02/2020	EW	EW
62	02/2020	EW	EW
63	02/2020	EW	EW
64	02/2020	EW	EW
65	02/2020	EW	EW
66	02/2020	EW	EW
67	02/2020	EW	EW
68	02/2020	EW	EW
69	02/2020	EW	EW
70	02/2020	EW	EW
71	02/2020	EW	EW
72	02/2020	EW	EW
73	02/2020	EW	EW
74	02/2020	EW	EW
75	02/2020	EW	EW
76	02/2020	EW	EW
77	02/2020	EW	EW
78	02/2020	EW	EW
79	02/2020	EW	EW
80	02/2020	EW	EW
81	02/2020	EW	EW
82	02/2020	EW	EW
83	02/2020	EW	EW
84	02/2020	EW	EW



E.H. WACHS 609 S. HIGHLAND AVE. SUITE 100 MILWAUKEE, WI 53212 WWW.EHWACHS.COM		STANDARD MAP (GAS/WATER) (RH)	
REV	DATE	BY	CHKD
1	06/20/19	AW	EW
2	08/07/20	AW	EW
3	08/07/20	AW	EW
4	08/07/20	AW	EW
5	08/07/20	AW	EW
6	08/07/20	AW	EW
7	08/07/20	AW	EW
8	08/07/20	AW	EW
9	08/07/20	AW	EW
10	08/07/20	AW	EW
11	08/07/20	AW	EW
12	08/07/20	AW	EW
13	08/07/20	AW	EW
14	08/07/20	AW	EW
15	08/07/20	AW	EW
16	08/07/20	AW	EW
17	08/07/20	AW	EW
18	08/07/20	AW	EW
19	08/07/20	AW	EW
20	08/07/20	AW	EW
21	08/07/20	AW	EW
22	08/07/20	AW	EW
23	08/07/20	AW	EW
24	08/07/20	AW	EW
25	08/07/20	AW	EW
26	08/07/20	AW	EW
27	08/07/20	AW	EW
28	08/07/20	AW	EW
29	08/07/20	AW	EW
30	08/07/20	AW	EW
31	08/07/20	AW	EW
32	08/07/20	AW	EW
33	08/07/20	AW	EW
34	08/07/20	AW	EW
35	08/07/20	AW	EW
36	08/07/20	AW	EW
37	08/07/20	AW	EW
38	08/07/20	AW	EW
39	08/07/20	AW	EW
40	08/07/20	AW	EW
41	08/07/20	AW	EW
42	08/07/20	AW	EW
43	08/07/20	AW	EW
44	08/07/20	AW	EW
45	08/07/20	AW	EW
46	08/07/20	AW	EW
47	08/07/20	AW	EW
48	08/07/20	AW	EW
49	08/07/20	AW	EW
50	08/07/20	AW	EW
51	08/07/20	AW	EW
52	08/07/20	AW	EW
53	08/07/20	AW	EW
54	08/07/20	AW	EW
55	08/07/20	AW	EW
56	08/07/20	AW	EW
57	08/07/20	AW	EW
58	08/07/20	AW	EW
59	08/07/20	AW	EW
60	08/07/20	AW	EW
61	08/07/20	AW	EW
62	08/07/20	AW	EW
63	08/07/20	AW	EW
64	08/07/20	AW	EW
65	08/07/20	AW	EW
66	08/07/20	AW	EW
67	08/07/20	AW	EW
68	08/07/20	AW	EW
69	08/07/20	AW	EW
70	08/07/20	AW	EW
71	08/07/20	AW	EW
72	08/07/20	AW	EW
73	08/07/20	AW	EW
74	08/07/20	AW	EW
75	08/07/20	AW	EW
76	08/07/20	AW	EW
77	08/07/20	AW	EW
78	08/07/20	AW	EW
79	08/07/20	AW	EW
80	08/07/20	AW	EW
81	08/07/20	AW	EW
82	08/07/20	AW	EW
83	08/07/20	AW	EW
84	08/07/20	AW	EW
85	08/07/20	AW	EW
86	08/07/20	AW	EW
87	08/07/20	AW	EW
88	08/07/20	AW	EW
89	08/07/20	AW	EW
90	08/07/20	AW	EW
91	08/07/20	AW	EW
92	08/07/20	AW	EW
93	08/07/20	AW	EW
94	08/07/20	AW	EW
95	08/07/20	AW	EW
96	08/07/20	AW	EW
97	08/07/20	AW	EW
98	08/07/20	AW	EW
99	08/07/20	AW	EW
100	08/07/20	AW	EW

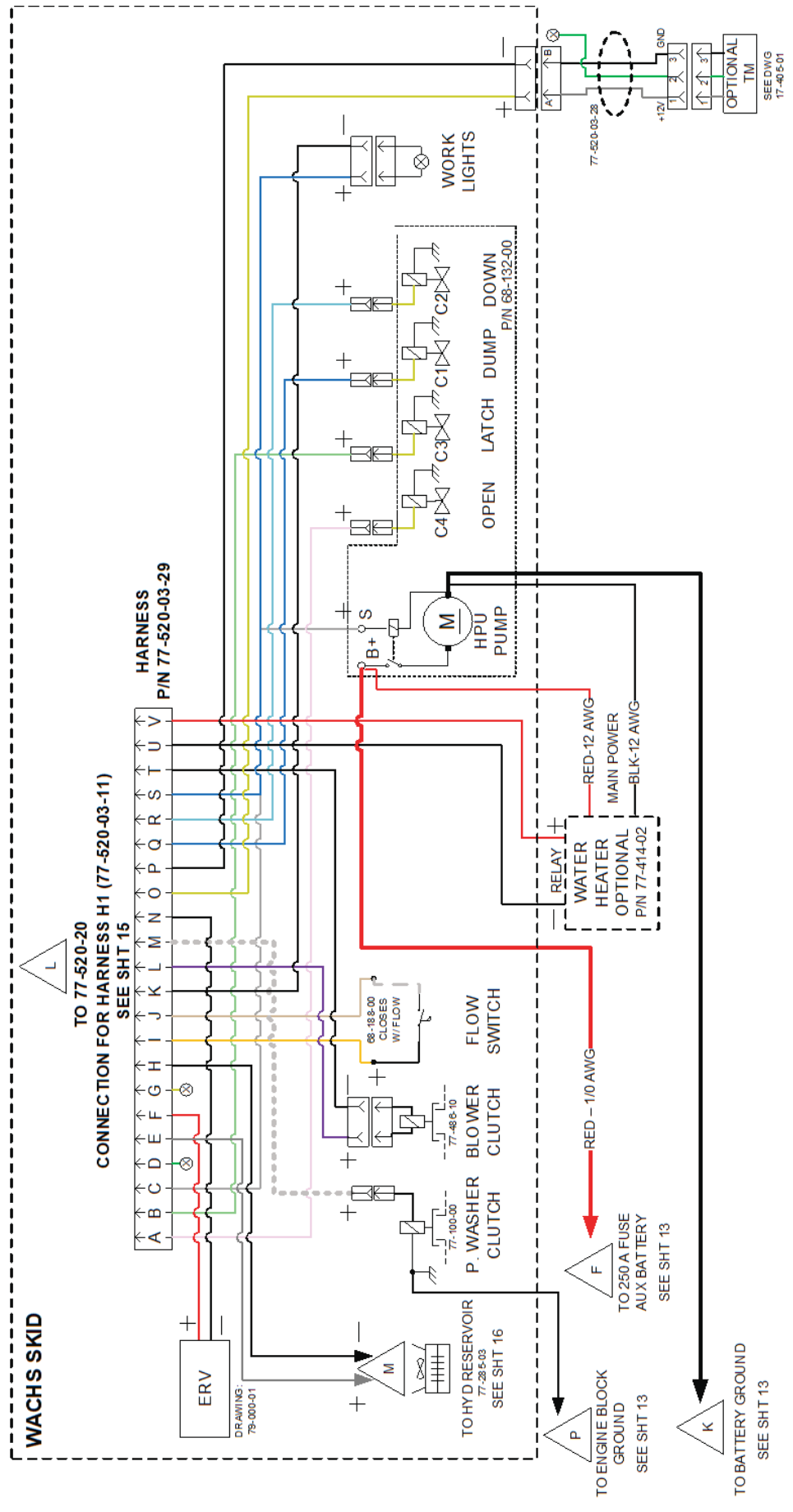
DETAIL H



DETAIL

		E.H. WACHS 600 North Highway 100 P.O. Box 100 Wachs, MO 64688-0100 www.wachsmfg.com	
REV	STANDARD MAP (GAS VARD) (RH)	SCALE	1:1
DATE	04/28/19	DATE	11/07/16
BY	ECG/MSD	BY	ECG/MSD
CHKD	ECG/MSD	CHKD	ECG/MSD
D		77-000-59	

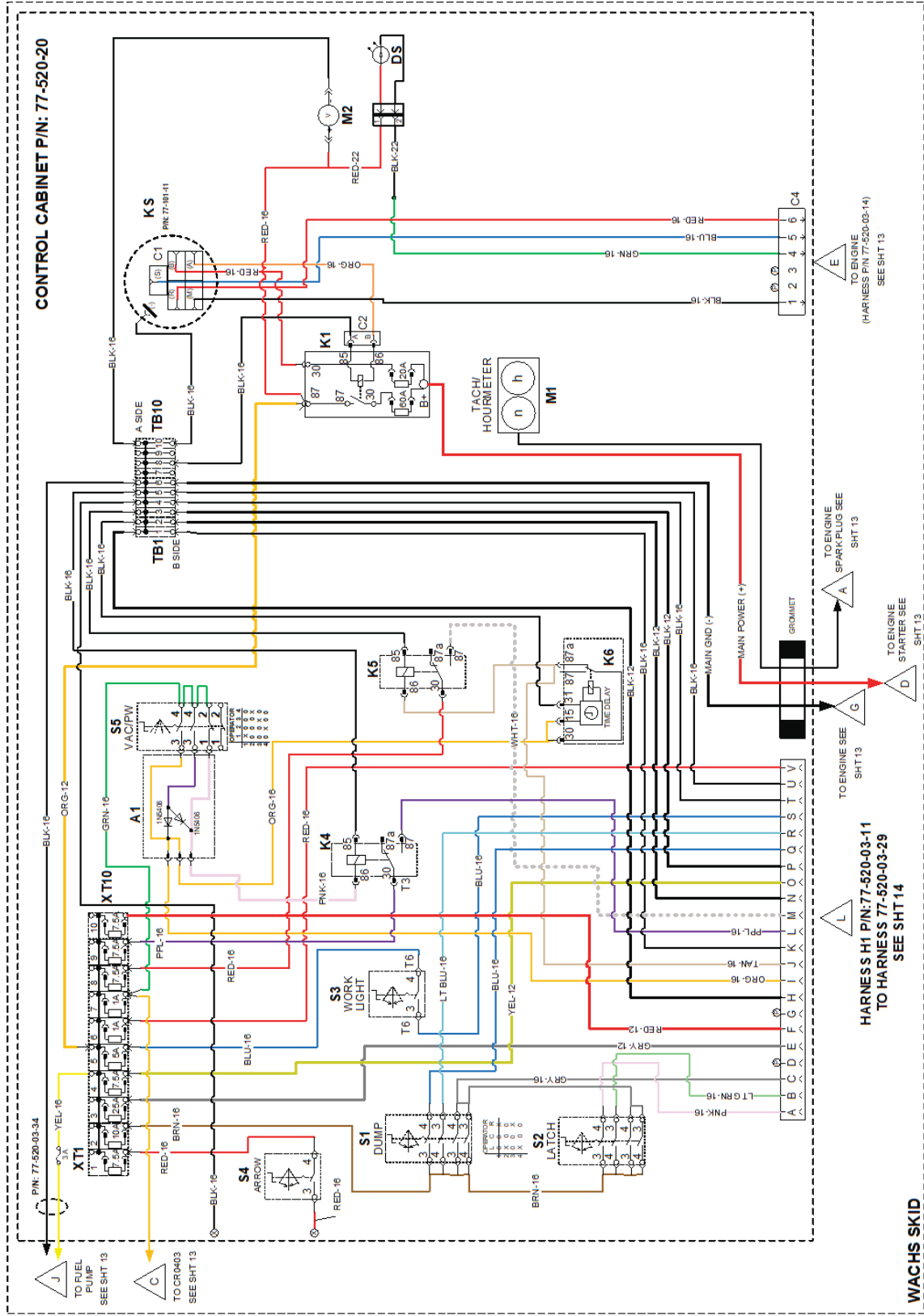
THIS DRAWING IS THE PROPERTY OF WACHS MANUFACTURING COMPANY. IT IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN. IT IS NOT TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM. WACHS MANUFACTURING COMPANY ASSUMES NO LIABILITY FOR ANY DAMAGE OR LOSS OF PROFITS, BUSINESS, OR REPUTATION, OR FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER IN A CONTRACT OR OTHERWISE, ARISING OUT OF OR FROM THIS DRAWING.



ELECTRIC SCHEMATIC
SEE SHT 13, 14, 15, 16, 17

E.H. WACHS 600 N. Highway 100 Wachs Electric Inc. www.wachselectric.com		SCALE	1:1
DRAWING NO.	77-000-59	REV.	1.0
DATE	06/20/19	BY	11/07/18
DESIGNED BY		CHECKED BY	
APPROVED BY		DATE	

CONTROL CABINET P/N: 77-520-20



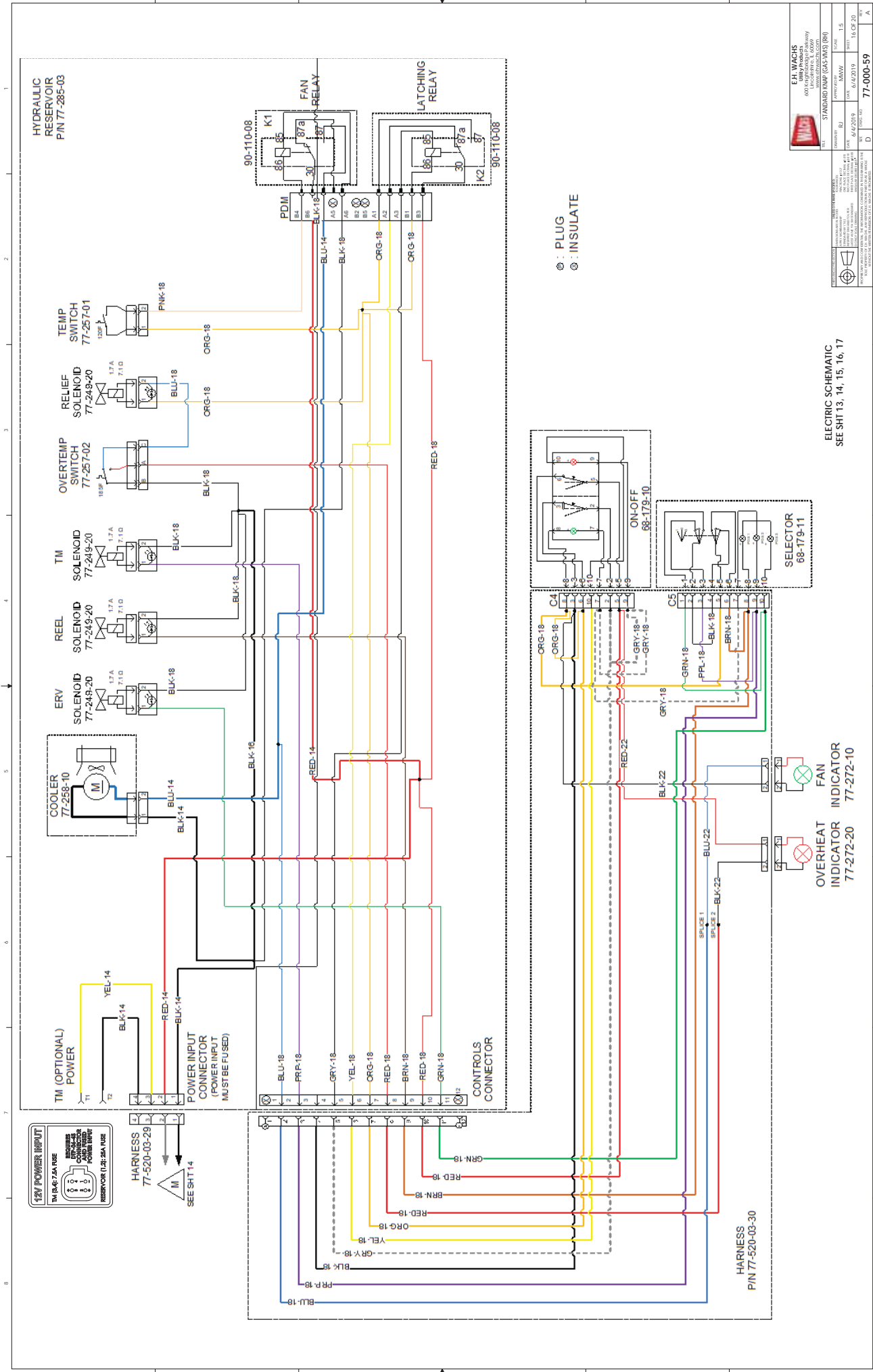
P/N: 77-520-03-34
 TO FUEL PUMP SEE SHT 13
 TO CR0403 SEE SHT 13

HARNES H1 P/N: 77-520-03-11
TO HARNES 77-520-03-29
SEE SHT 14

WACHS SKID

E.H. WACHS 600 S. Highway 100 Wachs Skid Co.	
REV.	STANDARD KMP (GAS/WMS) (R9)
DATE	06/20/19
BY	4/22/2019
CHK	02/02/20
APP	02/02/20
DES	02/02/20
DRW	02/02/20
SCALE	1:1
HEET	15 OF 26
77-000-59	

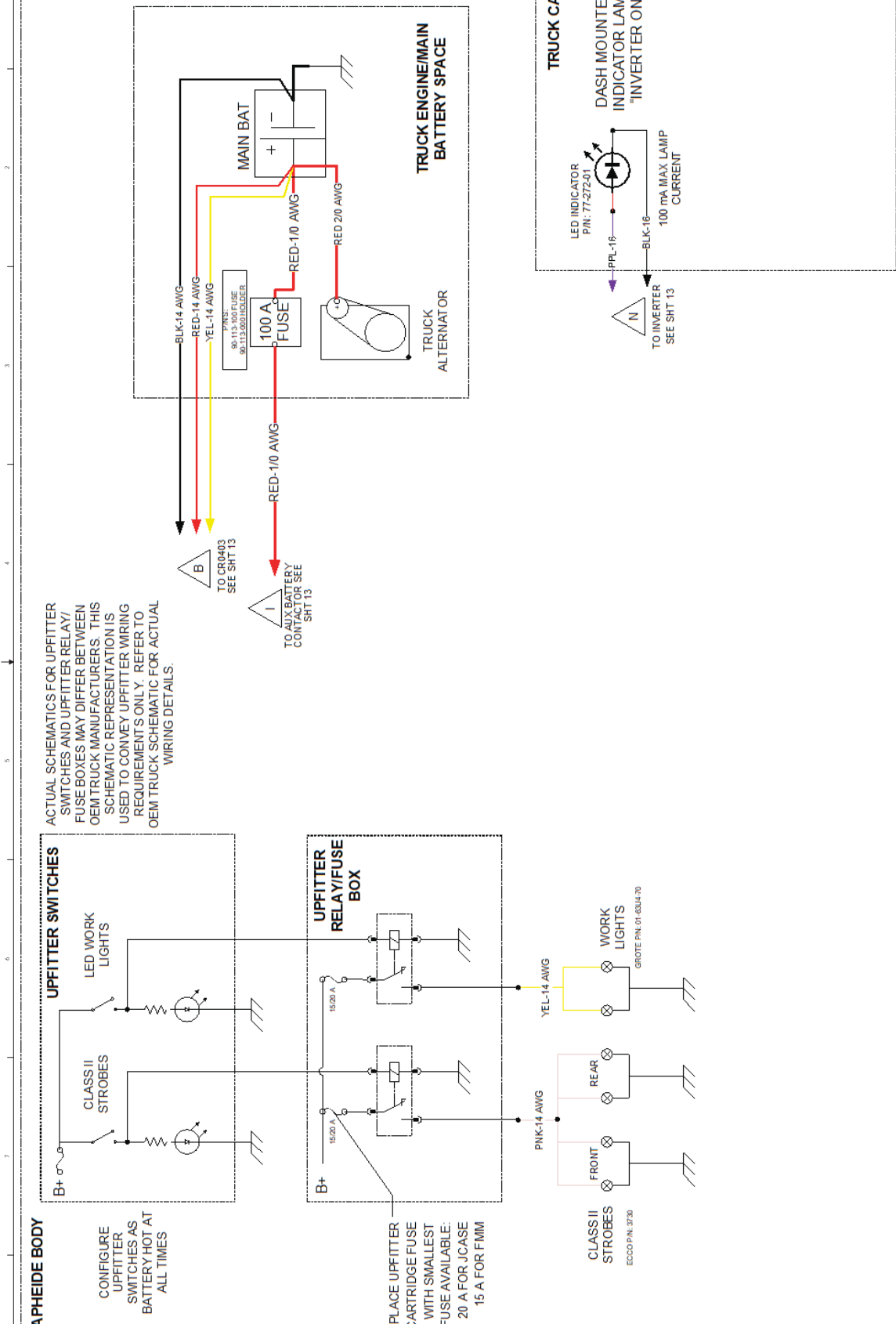
ELECTRIC SCHEMATIC
 SEE SHT 13, 14, 15, 16, 17



E.H. WACHS 600 North Highway 100 P.O. Box 100 Waco, TX 76788		STANDARD KMP (GAS-MS) (R)	
REV.	DATE	BY	CHK
1	06/20/19		I.S.
2	07/20/19		I.S.
3	08/01/19		I.S.
4	08/01/19		I.S.
5	08/01/19		I.S.
6	08/01/19		I.S.
7	08/01/19		I.S.
8	08/01/19		I.S.
9	08/01/19		I.S.
10	08/01/19		I.S.
11	08/01/19		I.S.
12	08/01/19		I.S.
13	08/01/19		I.S.
14	08/01/19		I.S.
15	08/01/19		I.S.
16	08/01/19		I.S.
17	08/01/19		I.S.
18	08/01/19		I.S.
19	08/01/19		I.S.
20	08/01/19		I.S.
21	08/01/19		I.S.
22	08/01/19		I.S.
23	08/01/19		I.S.
24	08/01/19		I.S.
25	08/01/19		I.S.
26	08/01/19		I.S.
27	08/01/19		I.S.
28	08/01/19		I.S.
29	08/01/19		I.S.
30	08/01/19		I.S.
31	08/01/19		I.S.
32	08/01/19		I.S.
33	08/01/19		I.S.
34	08/01/19		I.S.
35	08/01/19		I.S.
36	08/01/19		I.S.
37	08/01/19		I.S.
38	08/01/19		I.S.
39	08/01/19		I.S.
40	08/01/19		I.S.
41	08/01/19		I.S.
42	08/01/19		I.S.
43	08/01/19		I.S.
44	08/01/19		I.S.
45	08/01/19		I.S.
46	08/01/19		I.S.
47	08/01/19		I.S.
48	08/01/19		I.S.
49	08/01/19		I.S.
50	08/01/19		I.S.
51	08/01/19		I.S.
52	08/01/19		I.S.
53	08/01/19		I.S.
54	08/01/19		I.S.
55	08/01/19		I.S.
56	08/01/19		I.S.
57	08/01/19		I.S.
58	08/01/19		I.S.
59	08/01/19		I.S.
60	08/01/19		I.S.
61	08/01/19		I.S.
62	08/01/19		I.S.
63	08/01/19		I.S.
64	08/01/19		I.S.
65	08/01/19		I.S.
66	08/01/19		I.S.
67	08/01/19		I.S.
68	08/01/19		I.S.
69	08/01/19		I.S.
70	08/01/19		I.S.
71	08/01/19		I.S.
72	08/01/19		I.S.
73	08/01/19		I.S.
74	08/01/19		I.S.
75	08/01/19		I.S.
76	08/01/19		I.S.
77	08/01/19		I.S.
78	08/01/19		I.S.
79	08/01/19		I.S.
80	08/01/19		I.S.
81	08/01/19		I.S.
82	08/01/19		I.S.
83	08/01/19		I.S.
84	08/01/19		I.S.
85	08/01/19		I.S.
86	08/01/19		I.S.
87	08/01/19		I.S.
88	08/01/19		I.S.
89	08/01/19		I.S.
90	08/01/19		I.S.
91	08/01/19		I.S.
92	08/01/19		I.S.
93	08/01/19		I.S.
94	08/01/19		I.S.
95	08/01/19		I.S.
96	08/01/19		I.S.
97	08/01/19		I.S.
98	08/01/19		I.S.
99	08/01/19		I.S.
100	08/01/19		I.S.

ELECTRIC SCHEMATIC
SEE SHT 13, 14, 15, 16, 17

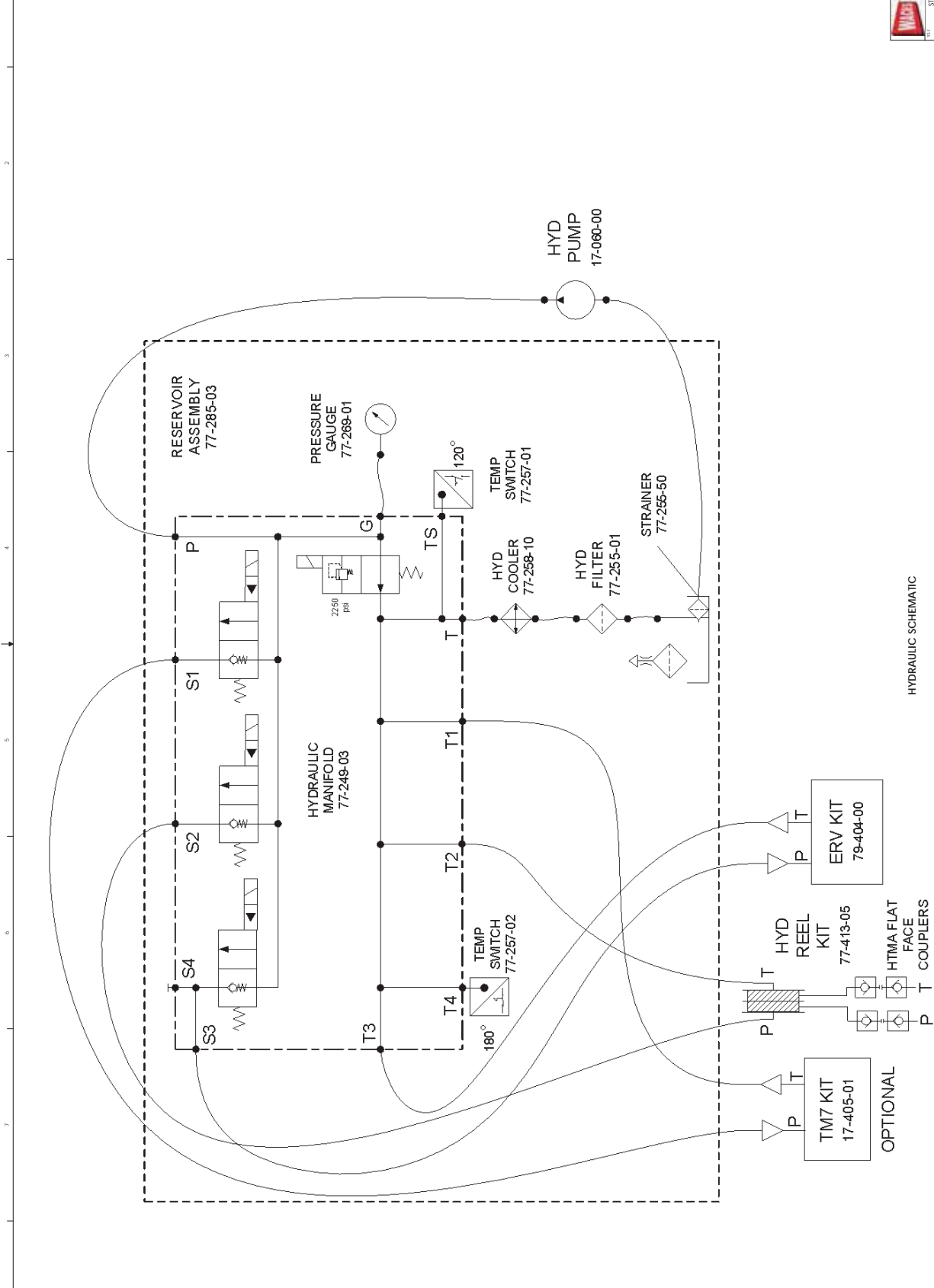
HARNESS
P/N 77-520-03-30



ACTUAL SCHEMATICS FOR UPFITTER SWITCHES AND UPFITTER RELAY/FUSE BOXES MAY DIFFER BETWEEN OEM TRUCK MANUFACTURERS. THIS SCHEMATIC REPRESENTATION IS USED TO CONVEY UPFITTER WIRING REQUIREMENTS ONLY. REFER TO OEM TRUCK SCHEMATIC FOR ACTUAL WIRING DETAILS.

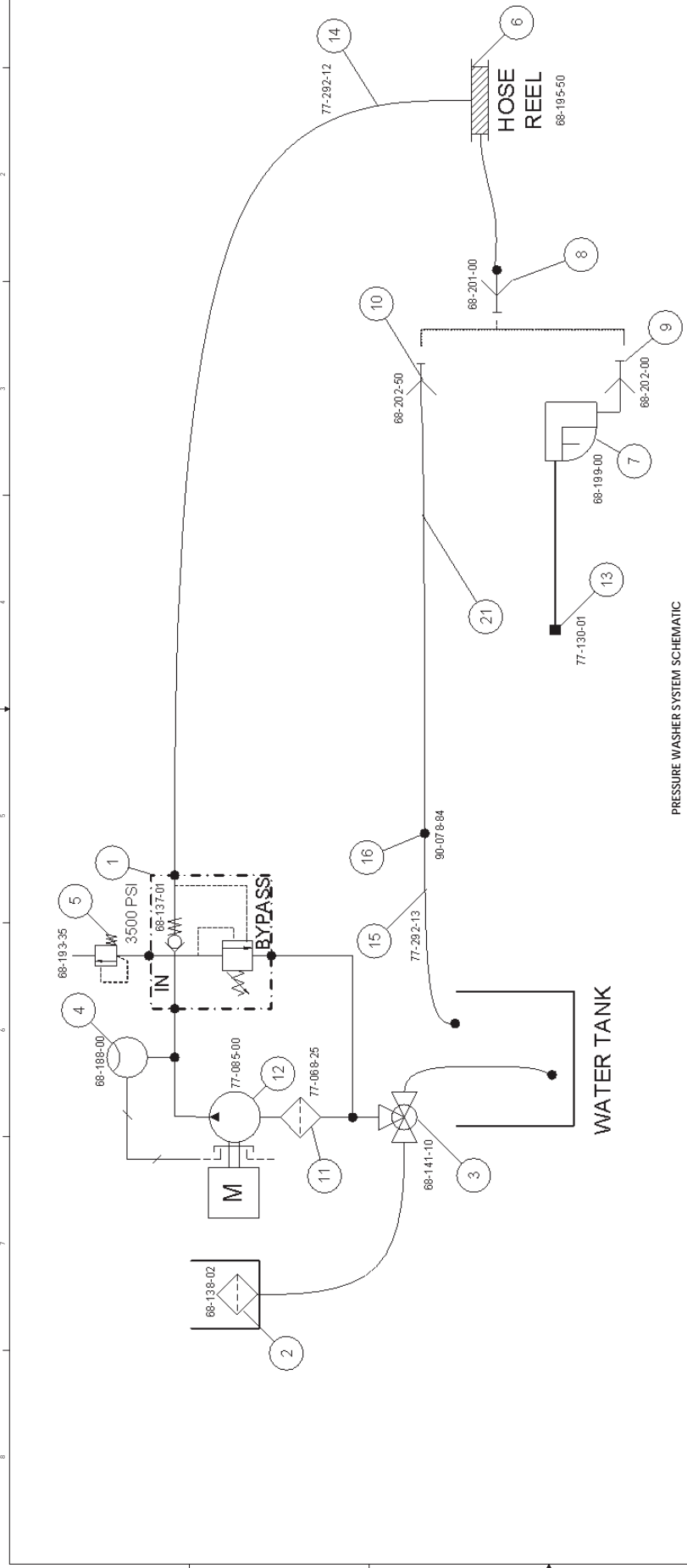
E.H. WACHS		STANDARD KAMP (GAS VANS) (RH)	
DATE	REV	BY	CHK
06/20/19	1.0		
77-000-59			

ELECTRIC SCHEMATIC
SEE SHT 13, 14, 15, 16, 17



HYDRAULIC SCHEMATIC

		E.H. WACHS 600 North Highway 100 Houston, Texas 77060 www.wachsmfg.com	
DRAWING NO. 77-000-59	REV. D	DATE 04/20/19	SCALE 1:1
PROJECT NO. 77-000-59	SHEET NO. 15	TOTAL SHEETS 26	DRAWN BY RL



PRESSURE WASHER SYSTEM SCHEMATIC

PARTS LIST FOR PRESSURE WASHER SYSTEM SCHEMATICS. REFERENCE ONLY. BALLOONS DO NOT CORRESPOND WITH ROW TABLE ON SHEET 3

SCHEMATIC ITEM	PART NUMBER	DESCRIPTION
1	68-137-01	VALVE, TRAPPED PRESSURE UNLOADER
2	68-138-02	STRAINER
3	68-141-10	BALL VALVE, 3-WAY
4	68-188-00	FLOW SWITCH
5	68-193-35	SAFETY RELIEF, 3500 PSI
6	68-195-50	HOSE REEL
7	68-199-00	SPRAY GUN
8	68-201-00	OD COUPLER, 3/8" X 3/8" NPT-F
9	68-202-00	OD PLUG, 3/8" X 3/8" NPT-M
10	68-202-50	OD PLUG, 3/8" X 3/8" NPT-F
11	77-069-25	STRAINER
12	77-085-00	PUMP PRESSURE WASHER 2.6 GPM, 3000 PSI
13	77-130-01	NOZZLE, .030 X 15 DEGREE
14	77-292-12	151 5/16" HOSE ASSEMBLY, .08 E.I. X .08 F.I. X .08 HOSE
15	77-292-13	43 13/16" HOSE ASSEMBLY, .08 E.I. X .08 F.I. X .08 HOSE
16	90-076-84	ADAPTER, 8 13/16" - 1.6MM I.D. X 3/8" NPT-F 90

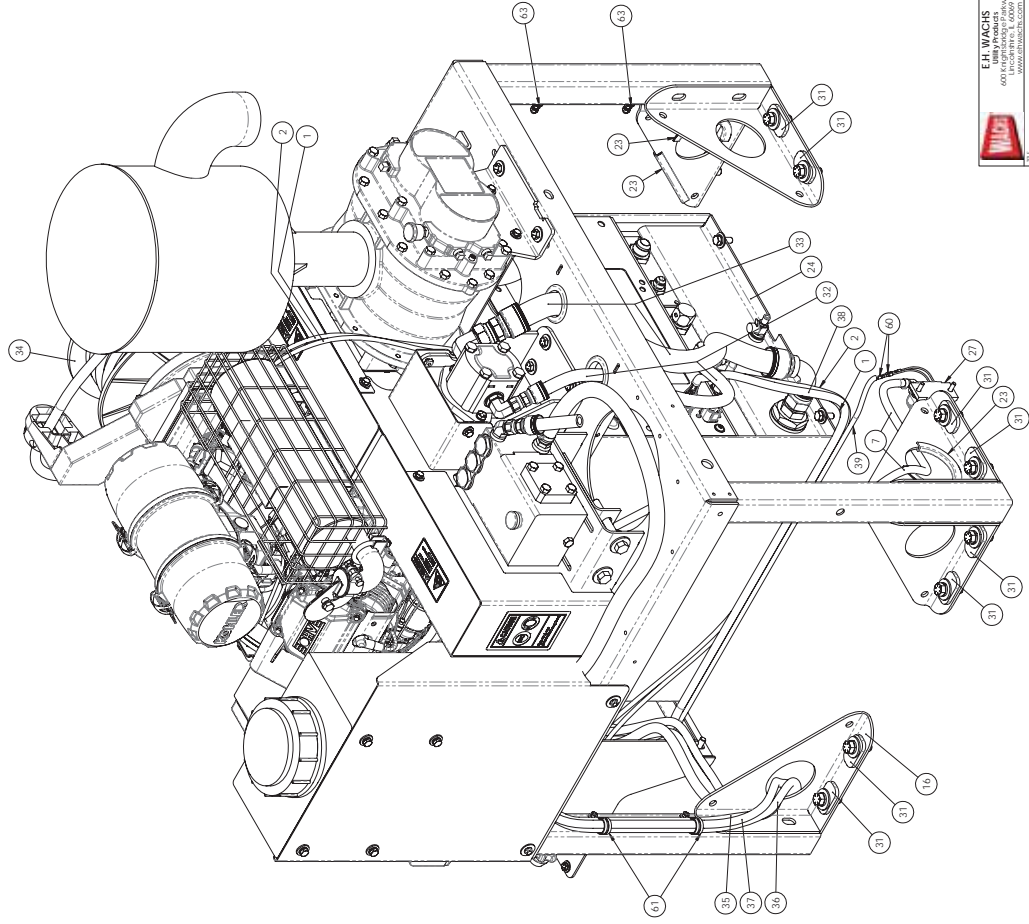
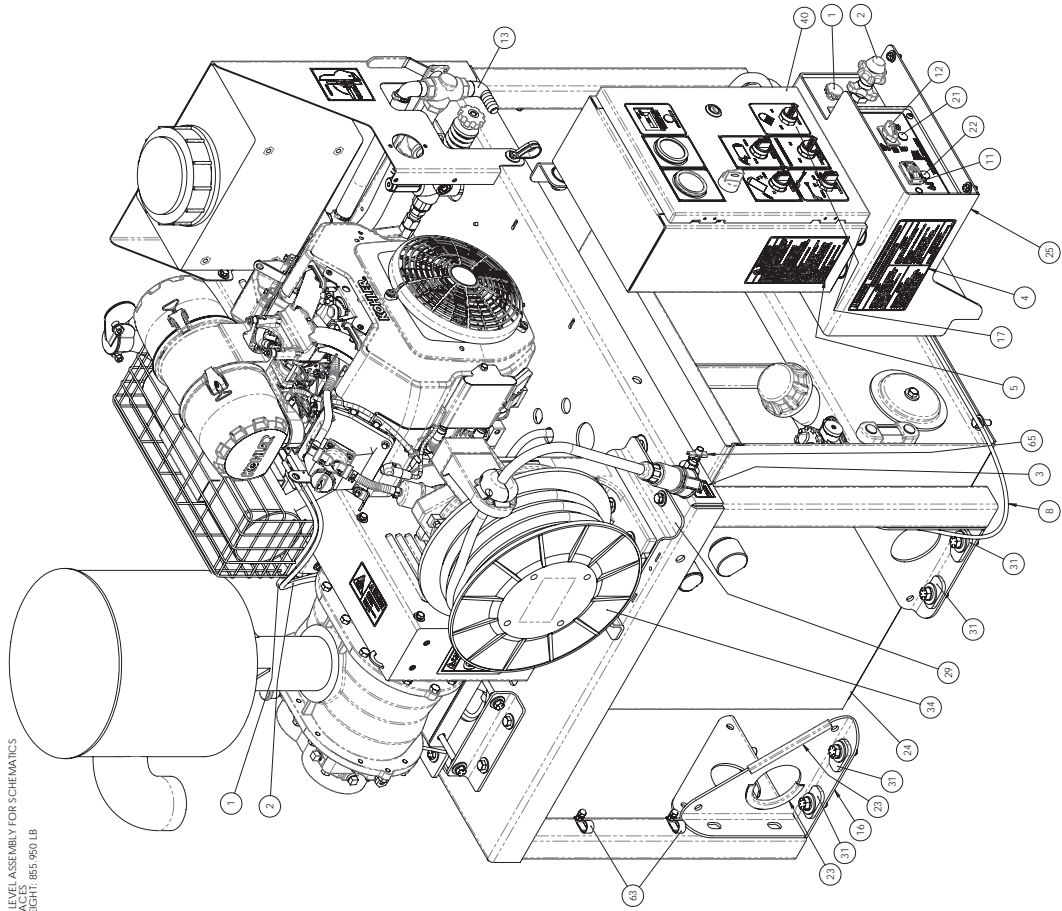
E.H. WACHS
 600 N. RICHMOND STREET
 WACO, TEXAS 76706
 WWW.EHWACHS.COM

DATE	REV	BY	APP'D	SCALE
04/20/19	1	MMW		1:1
06/20/19	2	MMW		1:1
07/25/19	3	MMW		1:1
08/02/19	4	MMW		1:1
08/02/19	5	MMW		1:1
08/02/19	6	MMW		1:1
08/02/19	7	MMW		1:1
08/02/19	8	MMW		1:1
08/02/19	9	MMW		1:1
08/02/19	10	MMW		1:1
08/02/19	11	MMW		1:1
08/02/19	12	MMW		1:1
08/02/19	13	MMW		1:1
08/02/19	14	MMW		1:1
08/02/19	15	MMW		1:1
08/02/19	16	MMW		1:1

77-000-59

REV.	DESCRIPTION	DATE	APP'D.
A	NEW RELEASE ECO 1754	30/03/2015	MMW

- NOTES:**
1. MATERIAL PER COMPONENT
 2. KIT REQUIRES OTHER COMPONENTS / SYSTEMS
 3. FOR INFORMATION ON THE LOCATION OF THE KIT, REFER TO THE TRANSPORTING PACKAGE AND SECURE LOOSE COMPONENTS AND
 4. FOR INFORMATION ON THE LOCATION OF THE KIT, REFER TO THE TRANSPORTING PACKAGE AND SECURE LOOSE COMPONENTS AND
 5. SEE HIGHER LEVEL ASSEMBLY FOR SCHEMATICS AND INTERFACES
 6. APPROX WEIGHT: 885 950 LB



E.H. WACHS
 6095 Northpark Drive
 Dallas, TX 75248
 WWW.EHWACHS.COM

WACHS

KT: GAS SKID POWER PACK

REV: 1.0
 DATE: 02/20/2015
 SHEET: 1 OF 7

77-230-14

REV.	DESCRIPTION	DATE	APP'D.
A	NEW RELEASE ECO 1754	30/03/2015	MMW

REV.	DESCRIPTION	DATE	APP'D.
A	NEW RELEASE ECO 1754	30/03/2015	MMW

REV.	DESCRIPTION	DATE	APP'D.
A	NEW RELEASE ECO 1754	30/03/2015	MMW

REV.	DESCRIPTION	DATE	APP'D.
A	NEW RELEASE ECO 1754	30/03/2015	MMW

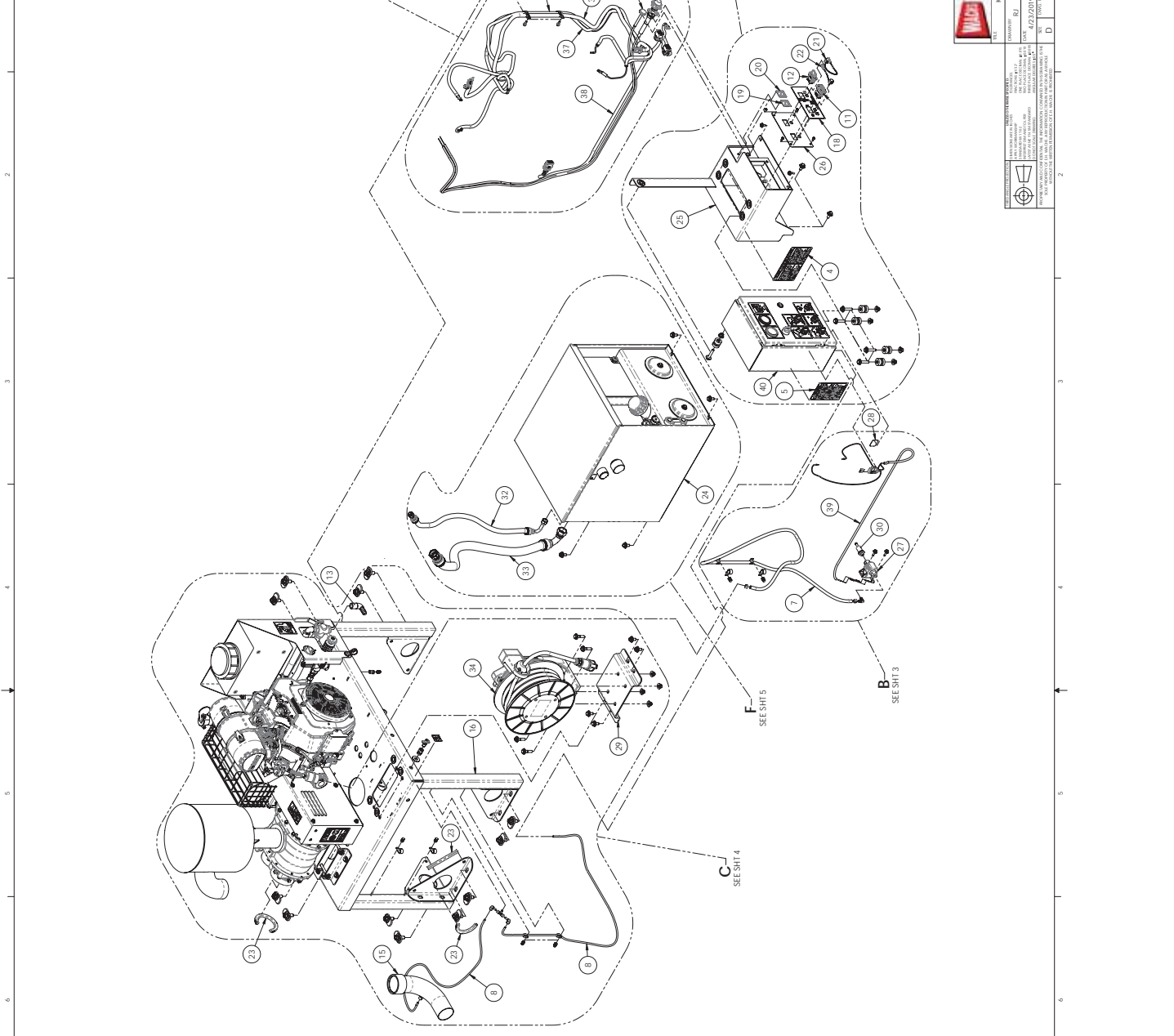
REV.	DESCRIPTION	DATE	APP'D.
A	NEW RELEASE ECO 1754	30/03/2015	MMW

REV.	DESCRIPTION	DATE	APP'D.
A	NEW RELEASE ECO 1754	30/03/2015	MMW

REV.	DESCRIPTION	DATE	APP'D.
A	NEW RELEASE ECO 1754	30/03/2015	MMW

REV.	DESCRIPTION	DATE	APP'D.
A	NEW RELEASE ECO 1754	30/03/2015	MMW

REV.	DESCRIPTION	DATE	APP'D.
A	NEW RELEASE ECO 1754	30/03/2015	MMW



ITEM NO.	PART NUMBER	DESCRIPTION	QTY	ESTIMATE LENGTH
1	17-064-01	CABLE, 9' CHOKE	1	
2	17-065-01	THROTTLE CABLE X 10'	1	
3	59-131-00	LABEL, CORROSION PROTECTION	1	
4	67-112-00	LABEL, MAINTENANCE SCHEDULE	1	
5	67-117-00	LABEL, SAFETY PRECAUTIONS	1	
6	68-158-04	HOSE CLAMP, CRMP 11.5-14.0MM	2	
7	68-159-25	HOSE, 1/4" FUEL, SAE 30R9/CARB	1	(87')
8	68-171-01	TUBING, 1/4" VACUUM RATED NYLON	2	(67'), (57')
9	68-172-13	ADAPTER, 1/4" PLUG-IN X 1/4" PTC 90	2	
10	68-175-03	ATO FUSE, 3 AMP	1	
11	68-179-10	SEALED ROCKERS SWITCH, 3 POSITION 2 LAMP	1	
12	68-179-11	SELECTOR SWITCH, 3 POSITION	1	
13	68-243-30	ELBOW, 3/4" NPTM X 3/4" HOSE BARB - NYLON	1	
14	68-243-90	ADAPTER, 1/8" NPTM X 1/4" HOSE BARB 90 BRASS	1	
15	71-064-01	ASSEMBLY, INLET ELBOW	1	
16	71-200-03	POWERPACK, 27 HP GAS, NO CIRTS	1	
17	71-242-01	ISOLATION MOUNT, 38 LB	5	
18	71-267-02	LABEL, HYDRAULIC CONTROLS 3 POSITION	1	
19	71-267-05	LABEL, THROTTLE	1	
20	71-267-06	LABEL, CHOKE	1	
21	71-272-10	INDICATOR, GREEN LED JWPF CONNECTOR	1	
22	71-272-20	INDICATOR, RED LED JWPF CONNECTOR	1	
23	71-277-50	PVC EDGE TRIM, 0.090" TO 0.190" EDGE THICKNESS	3	(6'), (7'), (10 1/4')
24	71-285-03	RESERVOIR ASSEMBLY, 3 CIRCUIT SKIDS	1	
25	71-290-10	WELDMENT, CONTROL MOUNT	1	
26	71-290-19	CONTROL PANEL	1	
27	71-290-32	FUEL PUMP	1	
28	71-290-34	LABEL, FUEL PUMP FUSE	1	
29	71-290-35	REEL INSTALLATION BRACKET	1	
30	71-290-38	FUEL FILTER	1	
31	71-290-40	CLAMPING WASHER	12	
32	71-292-02	32 1/8" HOSE ASSEMBLY, 08 FT X 08 FT 90 X, 08 HOSE	1	
33	71-292-03	33 1/8" HOSE ASSEMBLY, 16 FT X 16 FT 90 X, 16 HOSE	1	
34	71-292-00	ELECTRIC REEL ASSEMBLY	1	
35	71-520-03-14	WIRE HARNESS, GAS ENGINE GRND WMT	1	
36	71-520-03-26	WIRE HARNESS, POWER TO CTL BOX	1	
37	71-520-03-27	WIRE HARNESS, GND TO CTL BOX - GAS	1	
38	71-520-03-30	WIRE HARNESS, RESERVOIR CONTROLS	1	
39	71-520-03-34	WIRE HARNESS, FUEL PUMP FUSE	1	
40	71-520-20	CONTROL CABINET, WMT GAS	1	
41	90-051-07	HHCS, 1/4-20 X 3/4 GRADE 5 ZN	2	
42	90-051-10	HHCS, 1/4-20 X 1	2	
43	90-052-05	BHCS, 1/4-20 X 1/2	4	
44	90-055-18	NUT, 1/4-20 HEX	7	
45	90-055-01	NUT, 1/4-20 ACCORN	1	
46	90-055-52	WASHER, 1/4 SPLIT RING	11	
47	90-055-53	WASHER, FLAT 1/4	4	
48	90-061-07	HHCS, 5/16-18 X 3/4	1	
49	90-065-51	WASHER, 5/16 SPLIT RING	1	
50	90-065-52	WASHER, 5/16 FLAT	1	
51	90-071-10	HHCS, 3/8-16 X 1	10	
52	90-071-17	HHCS, 3/8-16 X 1.3/4	4	
53	90-071-20	HHCS, 3/8-16 X 2 GR 5 ZN	5	
54	90-075-01	NUT, 3/8-16 HEX GR 5 ZN	9	
55	90-075-52	WASHER, 3/8 SPLIT RING	19	
56	90-075-53	WASHER, 3/8 FLAT	28	
57	90-091-15	HHCS, 1/2-13 X 1-1/2 GRADE 5 ZN	12	
58	90-095-52	WASHER, 1/2 FLAT	13	
59	90-095-58	WASHER, 1/2 SPLIT RING	12	
60	90-101-28	TERMINAL, 22 AWG 150 MILS W/INS BUTTSPLICE	2	
61	90-003-10	CUSHIONED LOOP CLAMP, 1"	2	
62	90-003-50	CUSHIONED LOOP CLAMP, 1/2"	5	
63	90-003-75	CUSHIONED LOOP CLAMP, 3/4"	4	
64	90-1062-58	HHFS, 1/4-20 X 5/8" GR 5 ZN	2	
65	90-4921K44	FITTING, DRAIN, 1/4" NPT	1	
66	90-5111K204	BULKHEAD FITTING, 1/4" PTC X 1/4" NPTF	1	
67	90-5179K493	FITTING, 1/4" TUBE STEEL TEE	1	

E.H. WACHS
 600 N. HARRIS BLVD
 WACO, TEXAS 76706
 WWW.EHWACHS.COM

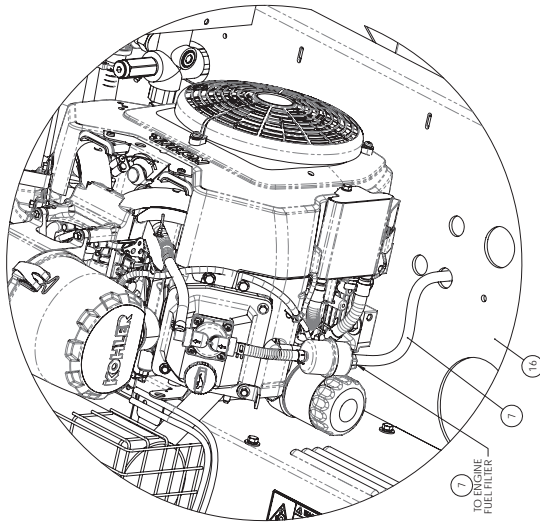
KT, GAS SE SKID POWER PACK

DATE: 09/20/2019
 DRAWING NO: 77-230-14
 SHEET: 2 OF 7

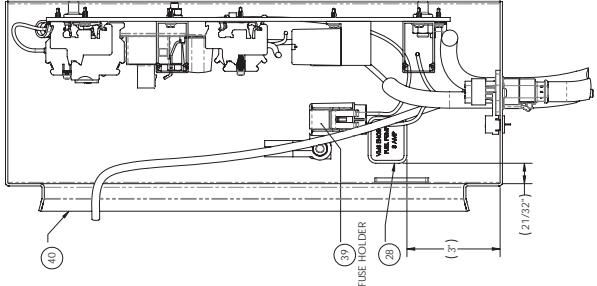
REVISIONS:
 1. 09/20/2019
 2. 07/17/2019

DESIGNED BY: [Blank]
 CHECKED BY: [Blank]
 APPROVED BY: [Blank]

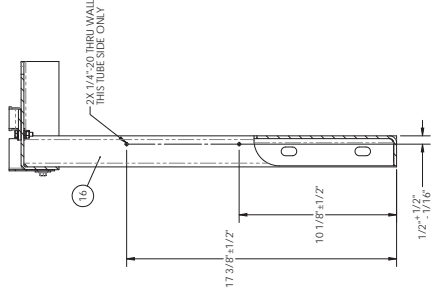
SCALE: 1:1



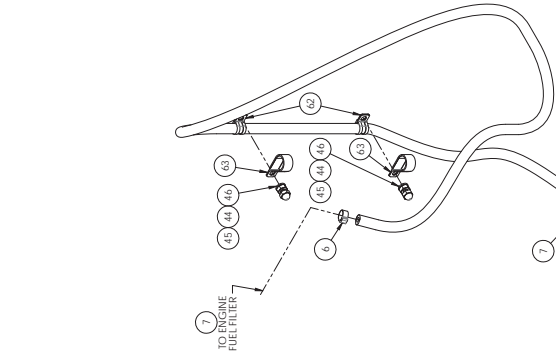
SCALE 1:3
ITEMS REMOVED FOR CLARITY



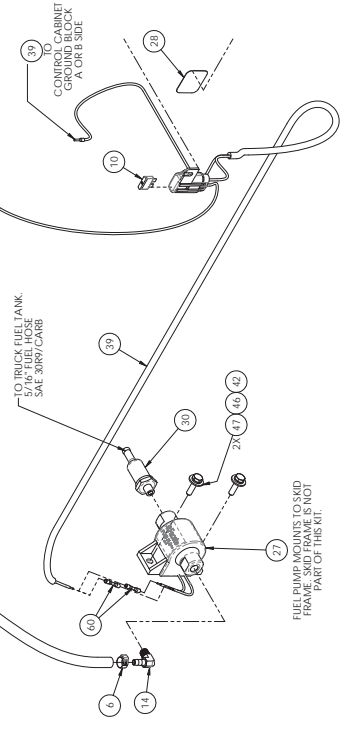
SCALE 1:2



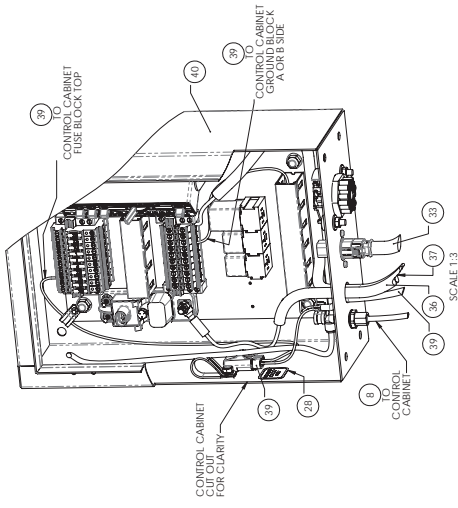
SECTION K-K
CLAMPS & HARNESS
HIDDEN FOR CLARITY



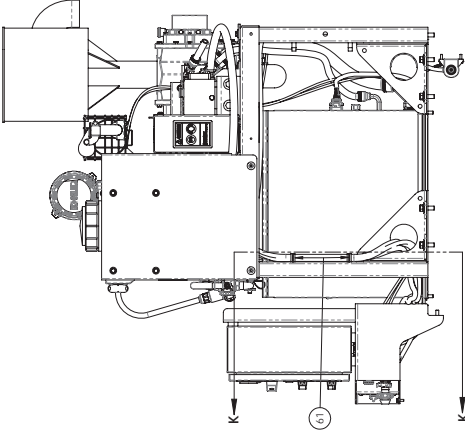
DETAIL B
SCALE 1:3



FUEL PUMP MOUNTS TO SKID
FRAME. SKID FRAME IS NOT
PART OF THIS KIT.

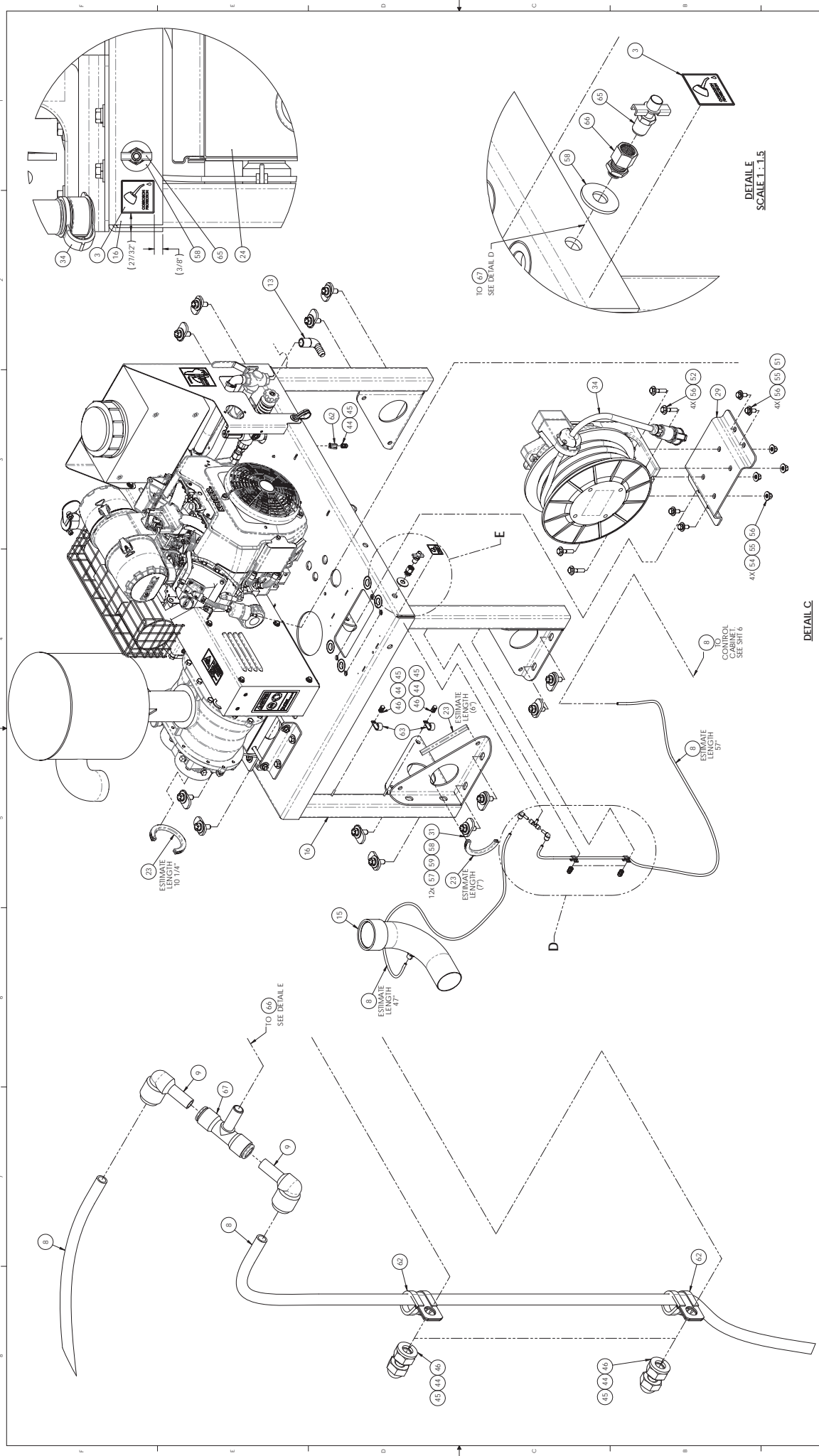


SCALE 1:3



SCALE 1:8

E.H. WACHS 600 N. HIGHLAND AVENUE MILWAUKEE, WI 53212 WWW.EHWACHS.COM		KIT: GAS SKID POWER PACK	
REV.	DATE	BY	CHK.
01	09/20/2019	RL	MLW
02	07/20/2018	RL	MLW
03	07/20/2018	RL	MLW
04	07/20/2018	RL	MLW
05	07/20/2018	RL	MLW
06	07/20/2018	RL	MLW
07	07/20/2018	RL	MLW
08	07/20/2018	RL	MLW
09	07/20/2018	RL	MLW
10	07/20/2018	RL	MLW
11	07/20/2018	RL	MLW
12	07/20/2018	RL	MLW
13	07/20/2018	RL	MLW
14	07/20/2018	RL	MLW
15	07/20/2018	RL	MLW
16	07/20/2018	RL	MLW
17	07/20/2018	RL	MLW
18	07/20/2018	RL	MLW
19	07/20/2018	RL	MLW
20	07/20/2018	RL	MLW
21	07/20/2018	RL	MLW
22	07/20/2018	RL	MLW
23	07/20/2018	RL	MLW
24	07/20/2018	RL	MLW
25	07/20/2018	RL	MLW
26	07/20/2018	RL	MLW
27	07/20/2018	RL	MLW
28	07/20/2018	RL	MLW
29	07/20/2018	RL	MLW
30	07/20/2018	RL	MLW
31	07/20/2018	RL	MLW
32	07/20/2018	RL	MLW
33	07/20/2018	RL	MLW
34	07/20/2018	RL	MLW
35	07/20/2018	RL	MLW
36	07/20/2018	RL	MLW
37	07/20/2018	RL	MLW
38	07/20/2018	RL	MLW
39	07/20/2018	RL	MLW
40	07/20/2018	RL	MLW
41	07/20/2018	RL	MLW
42	07/20/2018	RL	MLW
43	07/20/2018	RL	MLW
44	07/20/2018	RL	MLW
45	07/20/2018	RL	MLW
46	07/20/2018	RL	MLW
47	07/20/2018	RL	MLW
48	07/20/2018	RL	MLW
49	07/20/2018	RL	MLW
50	07/20/2018	RL	MLW
51	07/20/2018	RL	MLW
52	07/20/2018	RL	MLW
53	07/20/2018	RL	MLW
54	07/20/2018	RL	MLW
55	07/20/2018	RL	MLW
56	07/20/2018	RL	MLW
57	07/20/2018	RL	MLW
58	07/20/2018	RL	MLW
59	07/20/2018	RL	MLW
60	07/20/2018	RL	MLW
61	07/20/2018	RL	MLW
62	07/20/2018	RL	MLW
63	07/20/2018	RL	MLW
64	07/20/2018	RL	MLW
65	07/20/2018	RL	MLW
66	07/20/2018	RL	MLW
67	07/20/2018	RL	MLW
68	07/20/2018	RL	MLW
69	07/20/2018	RL	MLW
70	07/20/2018	RL	MLW
71	07/20/2018	RL	MLW
72	07/20/2018	RL	MLW
73	07/20/2018	RL	MLW
74	07/20/2018	RL	MLW
75	07/20/2018	RL	MLW
76	07/20/2018	RL	MLW
77	07/20/2018	RL	MLW
78	07/20/2018	RL	MLW
79	07/20/2018	RL	MLW
80	07/20/2018	RL	MLW
81	07/20/2018	RL	MLW
82	07/20/2018	RL	MLW
83	07/20/2018	RL	MLW
84	07/20/2018	RL	MLW
85	07/20/2018	RL	MLW
86	07/20/2018	RL	MLW
87	07/20/2018	RL	MLW
88	07/20/2018	RL	MLW
89	07/20/2018	RL	MLW
90	07/20/2018	RL	MLW
91	07/20/2018	RL	MLW
92	07/20/2018	RL	MLW
93	07/20/2018	RL	MLW
94	07/20/2018	RL	MLW
95	07/20/2018	RL	MLW
96	07/20/2018	RL	MLW
97	07/20/2018	RL	MLW
98	07/20/2018	RL	MLW
99	07/20/2018	RL	MLW
100	07/20/2018	RL	MLW



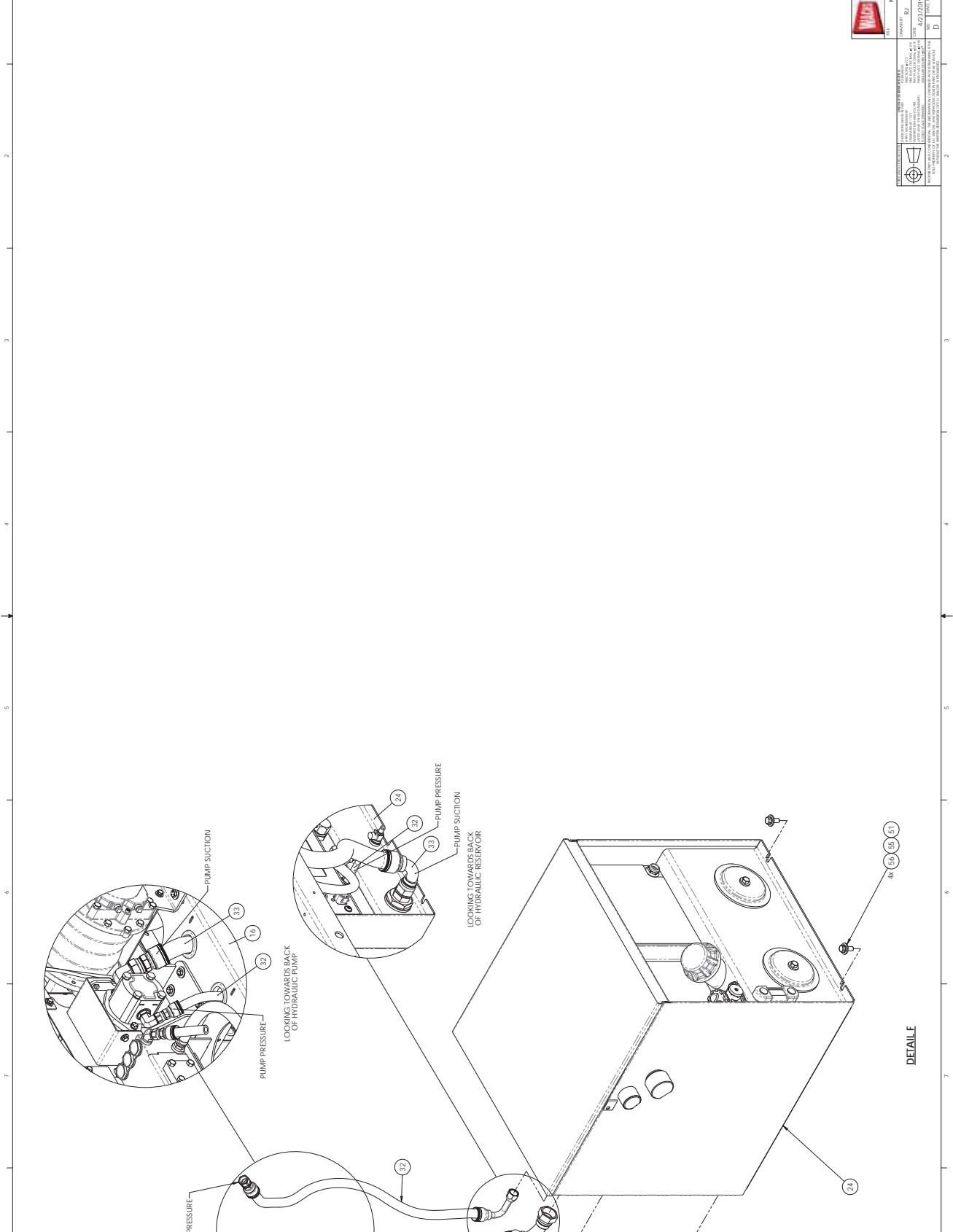
DETAIL E
SCALE 1:1.5

DETAIL C

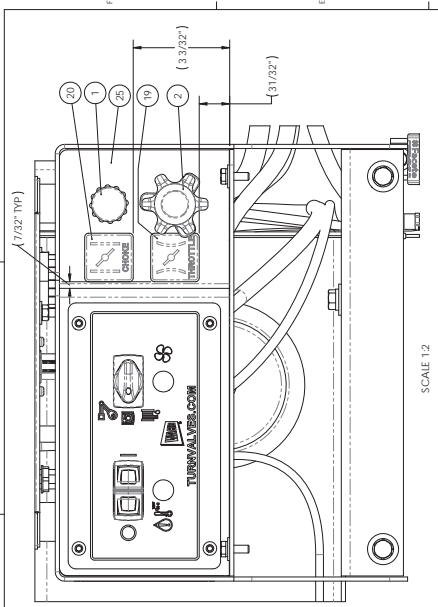
DETAIL D
SCALE 1:1

		E.H. WACHS 600 N. Highway 100, Suite 100 Westborough, MA 01581 www.walchusa.com	
KIT: GAS SKID POWER PACK DATE: 07/20/19 DESIGNED BY: E.H. WACHS DRAWN BY: E.H. WACHS CHECKED BY: E.H. WACHS SCALE: 1:1	SHEET: 4 OF 7 DRAWING NO.: 77-230-14		

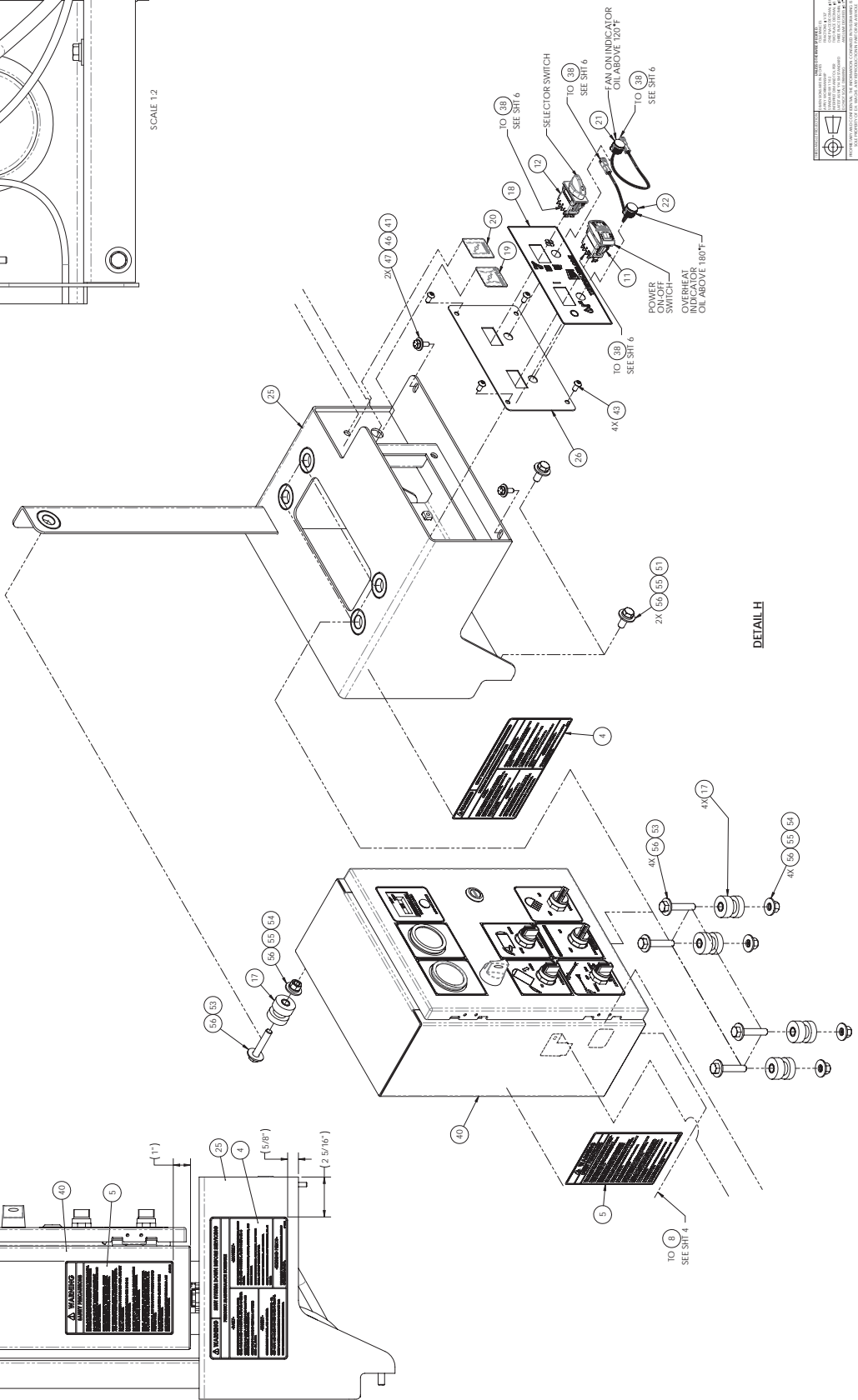
THIS DRAWING IS THE PROPERTY OF WALCH USA, INC. IT IS TO BE USED ONLY FOR THE PROJECT AND QUANTITY SPECIFIED HEREON. IT IS NOT TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.			
PROJECT NO.: 77-230-14 DRAWING NO.: 77-230-14 SHEET NO.: 4 OF 7 SCALE: 1:1			



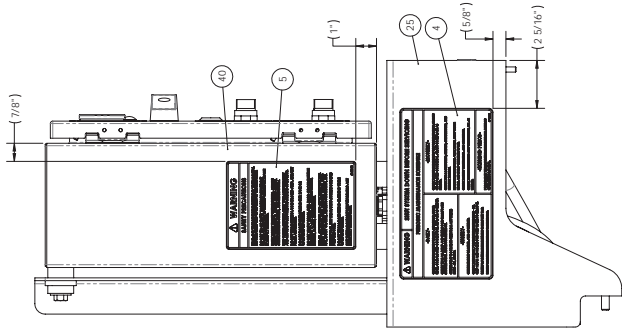
		E.H. WACHS 600 Kempterstraße 41074 Solingen www.walch.com	
REF.	KIT GAS SEAL POWER PACK	SCALE	1:1
DRAWING NO.	77-230-14	DATE	02/09/19
DESIGNER	RL	DATE	03/09/19
REV.	0001	DATE	03/09/19
D		5 OF 7	
D		A	



SCALE 1:2



DETAIL H



E.H. WACHS
 600 North Highway 100
 P.O. Box 100
 Waco, TX 76788-0100
 WWW.EHWACHS.COM

WACHS

KIT: GAS SE MID POWER PACK

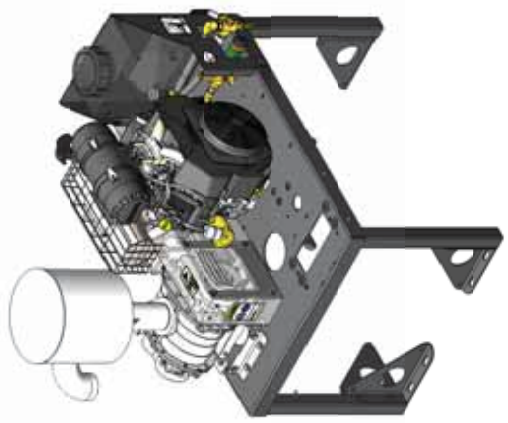
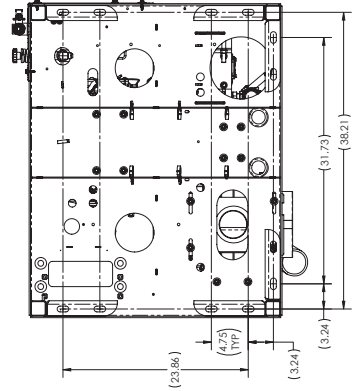
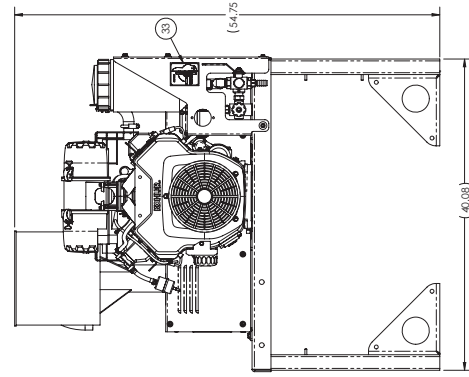
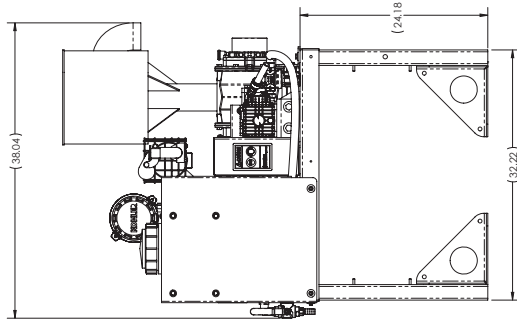
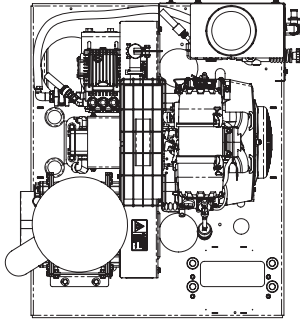
DATE	REV	BY	APP'D	SCALE
07/20/19	1	WACHS	WACHS	1:3
07/20/19	2	WACHS	WACHS	1:3
07/20/19	3	WACHS	WACHS	1:3
07/20/19	4	WACHS	WACHS	1:3
07/20/19	5	WACHS	WACHS	1:3
07/20/19	6	WACHS	WACHS	1:3
07/20/19	7	WACHS	WACHS	1:3
07/20/19	8	WACHS	WACHS	1:3
07/20/19	9	WACHS	WACHS	1:3
07/20/19	10	WACHS	WACHS	1:3
07/20/19	11	WACHS	WACHS	1:3
07/20/19	12	WACHS	WACHS	1:3
07/20/19	13	WACHS	WACHS	1:3
07/20/19	14	WACHS	WACHS	1:3
07/20/19	15	WACHS	WACHS	1:3
07/20/19	16	WACHS	WACHS	1:3
07/20/19	17	WACHS	WACHS	1:3
07/20/19	18	WACHS	WACHS	1:3
07/20/19	19	WACHS	WACHS	1:3
07/20/19	20	WACHS	WACHS	1:3
07/20/19	21	WACHS	WACHS	1:3
07/20/19	22	WACHS	WACHS	1:3
07/20/19	23	WACHS	WACHS	1:3
07/20/19	24	WACHS	WACHS	1:3
07/20/19	25	WACHS	WACHS	1:3
07/20/19	26	WACHS	WACHS	1:3
07/20/19	27	WACHS	WACHS	1:3
07/20/19	28	WACHS	WACHS	1:3
07/20/19	29	WACHS	WACHS	1:3
07/20/19	30	WACHS	WACHS	1:3
07/20/19	31	WACHS	WACHS	1:3
07/20/19	32	WACHS	WACHS	1:3
07/20/19	33	WACHS	WACHS	1:3
07/20/19	34	WACHS	WACHS	1:3
07/20/19	35	WACHS	WACHS	1:3
07/20/19	36	WACHS	WACHS	1:3
07/20/19	37	WACHS	WACHS	1:3
07/20/19	38	WACHS	WACHS	1:3
07/20/19	39	WACHS	WACHS	1:3
07/20/19	40	WACHS	WACHS	1:3
07/20/19	41	WACHS	WACHS	1:3
07/20/19	42	WACHS	WACHS	1:3
07/20/19	43	WACHS	WACHS	1:3
07/20/19	44	WACHS	WACHS	1:3
07/20/19	45	WACHS	WACHS	1:3
07/20/19	46	WACHS	WACHS	1:3
07/20/19	47	WACHS	WACHS	1:3
07/20/19	48	WACHS	WACHS	1:3
07/20/19	49	WACHS	WACHS	1:3
07/20/19	50	WACHS	WACHS	1:3
07/20/19	51	WACHS	WACHS	1:3
07/20/19	52	WACHS	WACHS	1:3
07/20/19	53	WACHS	WACHS	1:3
07/20/19	54	WACHS	WACHS	1:3
07/20/19	55	WACHS	WACHS	1:3
07/20/19	56	WACHS	WACHS	1:3
07/20/19	57	WACHS	WACHS	1:3
07/20/19	58	WACHS	WACHS	1:3
07/20/19	59	WACHS	WACHS	1:3
07/20/19	60	WACHS	WACHS	1:3
07/20/19	61	WACHS	WACHS	1:3
07/20/19	62	WACHS	WACHS	1:3
07/20/19	63	WACHS	WACHS	1:3
07/20/19	64	WACHS	WACHS	1:3
07/20/19	65	WACHS	WACHS	1:3
07/20/19	66	WACHS	WACHS	1:3
07/20/19	67	WACHS	WACHS	1:3
07/20/19	68	WACHS	WACHS	1:3
07/20/19	69	WACHS	WACHS	1:3
07/20/19	70	WACHS	WACHS	1:3
07/20/19	71	WACHS	WACHS	1:3
07/20/19	72	WACHS	WACHS	1:3
07/20/19	73	WACHS	WACHS	1:3
07/20/19	74	WACHS	WACHS	1:3
07/20/19	75	WACHS	WACHS	1:3
07/20/19	76	WACHS	WACHS	1:3
07/20/19	77	WACHS	WACHS	1:3
07/20/19	78	WACHS	WACHS	1:3
07/20/19	79	WACHS	WACHS	1:3
07/20/19	80	WACHS	WACHS	1:3
07/20/19	81	WACHS	WACHS	1:3
07/20/19	82	WACHS	WACHS	1:3
07/20/19	83	WACHS	WACHS	1:3
07/20/19	84	WACHS	WACHS	1:3
07/20/19	85	WACHS	WACHS	1:3
07/20/19	86	WACHS	WACHS	1:3
07/20/19	87	WACHS	WACHS	1:3
07/20/19	88	WACHS	WACHS	1:3
07/20/19	89	WACHS	WACHS	1:3
07/20/19	90	WACHS	WACHS	1:3
07/20/19	91	WACHS	WACHS	1:3
07/20/19	92	WACHS	WACHS	1:3
07/20/19	93	WACHS	WACHS	1:3
07/20/19	94	WACHS	WACHS	1:3
07/20/19	95	WACHS	WACHS	1:3
07/20/19	96	WACHS	WACHS	1:3
07/20/19	97	WACHS	WACHS	1:3
07/20/19	98	WACHS	WACHS	1:3
07/20/19	99	WACHS	WACHS	1:3
07/20/19	100	WACHS	WACHS	1:3

77-230-14

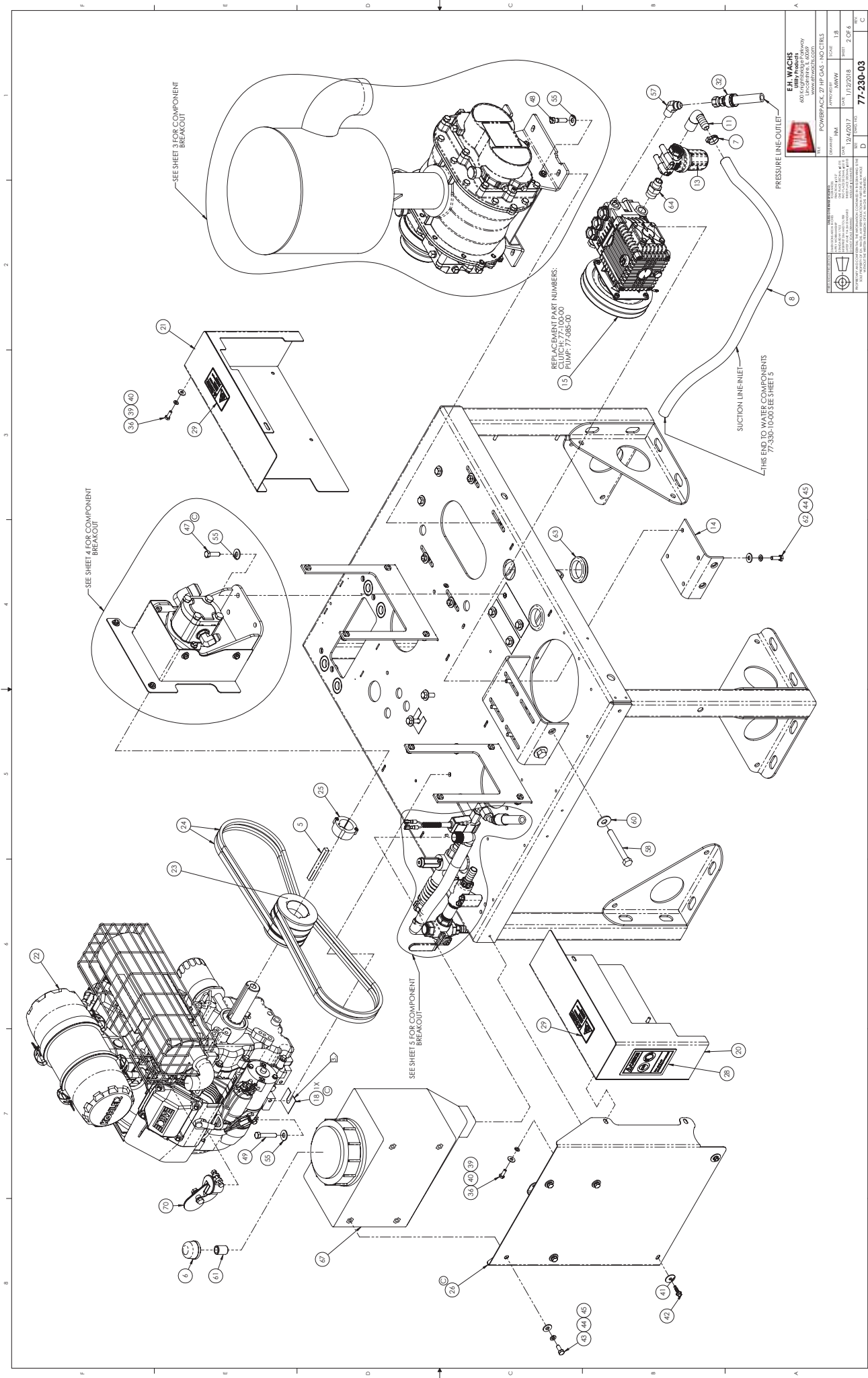
7 OF 7

NOTES:
 1. MATERIAL PER COMPONENT
 2. SEE PARTS LIST FOR PARTS
 3. SEE DIMS AS NEEDED FOR ENGINE AND HYDRAULIC PUMP ALIGNMENT ©
 4. APPROX. WEIGHT, 535.469 LBS.

REVISION HISTORY			
REV.	DESCRIPTION	DATE	APR
A	NEW RELEASE PER ECO-345 MM	5/23/2018	MM
B	REVISED PER ECO-345 W/77.000.0000.0000 W/77.000.0000.0000	9/17/2018	BC
C	ADD INSTRUCTIONS FOR SHIMS AND SHIMS AS NEEDED FOR ENGINE AND HYDRAULIC PUMP ALIGNMENT. SEE PARTS LIST FOR DIMENSIONS AND PARTS LIST FOR SHIMS AND HYDRAULIC PUMP. AND COUNTERBORE PER ECO-345	10/22/2018	MM



		E.H. WACHS 401 N. W. 10th Street Miami, FL 33136 www.walco.com	
REV.	77-230-03	DATE	11/12/2018
DESCRIPTION	POWERPACK, 27 HP GAS - NOCTES	SCALE	1:1
DESIGNED BY	MM	APPROVED BY	MM
DRAWN BY	MM	DATE	11/12/2018
REV.	77-230-03	REV.	1 OF 6
REV.	77-230-03	REV.	1 OF 6



SEE SHEET 3 FOR COMPONENT BREAKOUT

SEE SHEET 4 FOR COMPONENT BREAKOUT

SEE SHEET 5 FOR COMPONENT BREAKOUT

REPLACEMENT PART NUMBERS:
CLUTCH: 77300-00
PUMP: 77485-00

SUCTION LINE INLET
THIS DUES TO WATER COMPONENTS
77330-1000 SEE SHEET 3

PRESSURE LINE OUTLET

E.H. WACHS	
400 N. HILL STREET MILWAUKEE, WISCONSIN 53204 WWW.EHWACHS.COM	
SEE	POWERPACK, 27 HP GAS - NO CTBS
DESCRIPTION	HW
DATE	1/12/2018
BY	2746207
REV	2 OF 6
FIGURE NO.	77-230-03

DATE	1/12/2018
BY	2746207
REV	2 OF 6
FIGURE NO.	77-230-03

DATE	1/12/2018
BY	2746207
REV	2 OF 6
FIGURE NO.	77-230-03

DATE	1/12/2018
BY	2746207
REV	2 OF 6
FIGURE NO.	77-230-03

DATE	1/12/2018
BY	2746207
REV	2 OF 6
FIGURE NO.	77-230-03

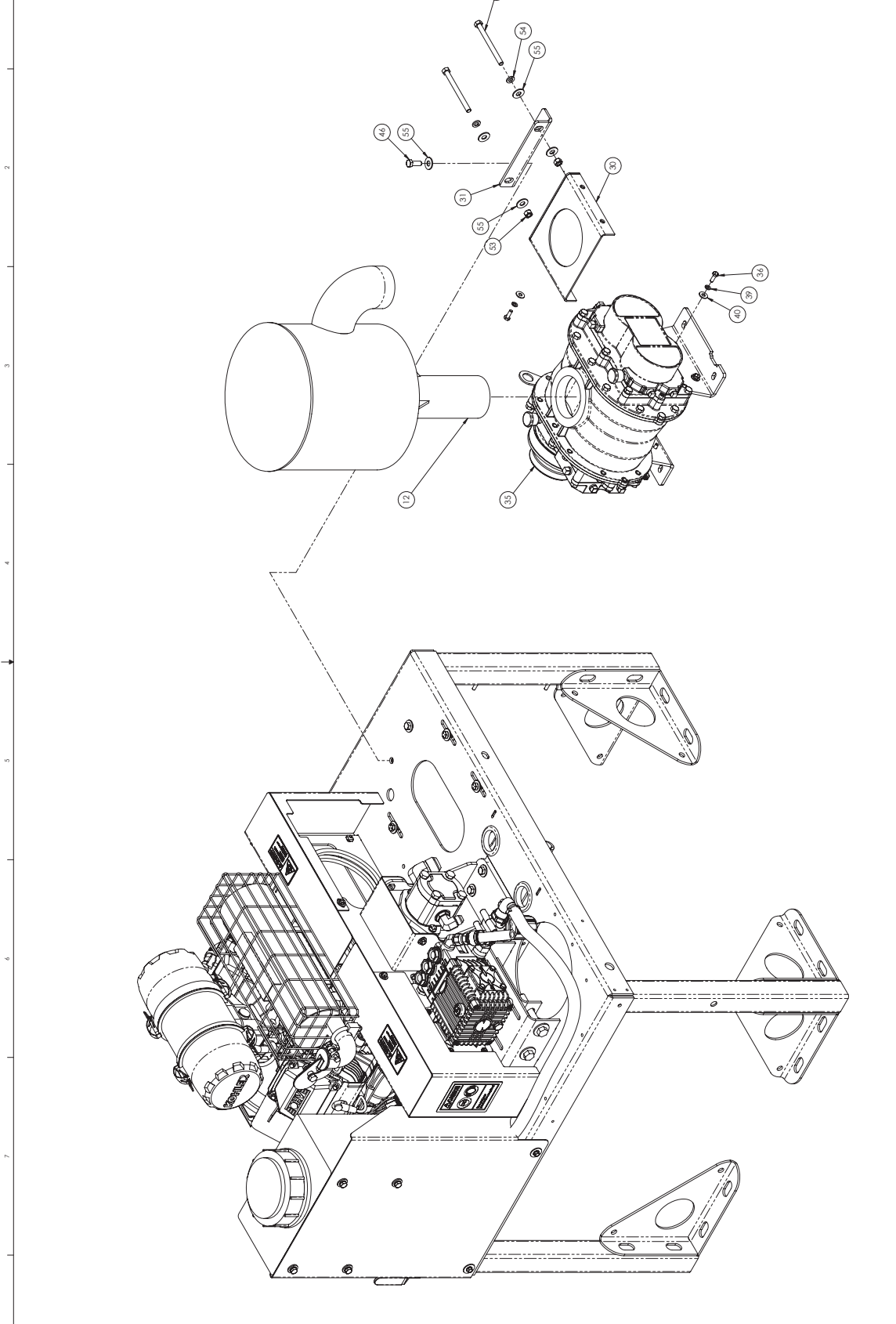
DATE	1/12/2018
BY	2746207
REV	2 OF 6
FIGURE NO.	77-230-03

DATE	1/12/2018
BY	2746207
REV	2 OF 6
FIGURE NO.	77-230-03

DATE	1/12/2018
BY	2746207
REV	2 OF 6
FIGURE NO.	77-230-03

DATE	1/12/2018
BY	2746207
REV	2 OF 6
FIGURE NO.	77-230-03

DATE	1/12/2018
BY	2746207
REV	2 OF 6
FIGURE NO.	77-230-03





E.H. WACHS
 400 N. High Street
 P.O. Box 100
 Waukesha, WI 53186
 www.walch.com

SITE	POWERPACK, 27 HP GAS - NO CTBLS	EQUIP	1/B
DESIGNER	HM	DATE	1/12/2018
DRAWN	2/4/2017	REV	3 OF 6
DATE	1/12/2018	BY	EC
REV	EC	BY	EC

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN INCHES. DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY.
 DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY. DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY.
 DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY. DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY.
 DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY. DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY.
 DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY. DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY.

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

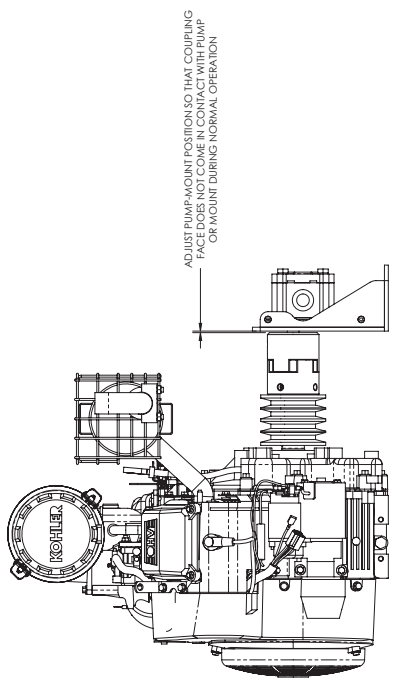
96

97

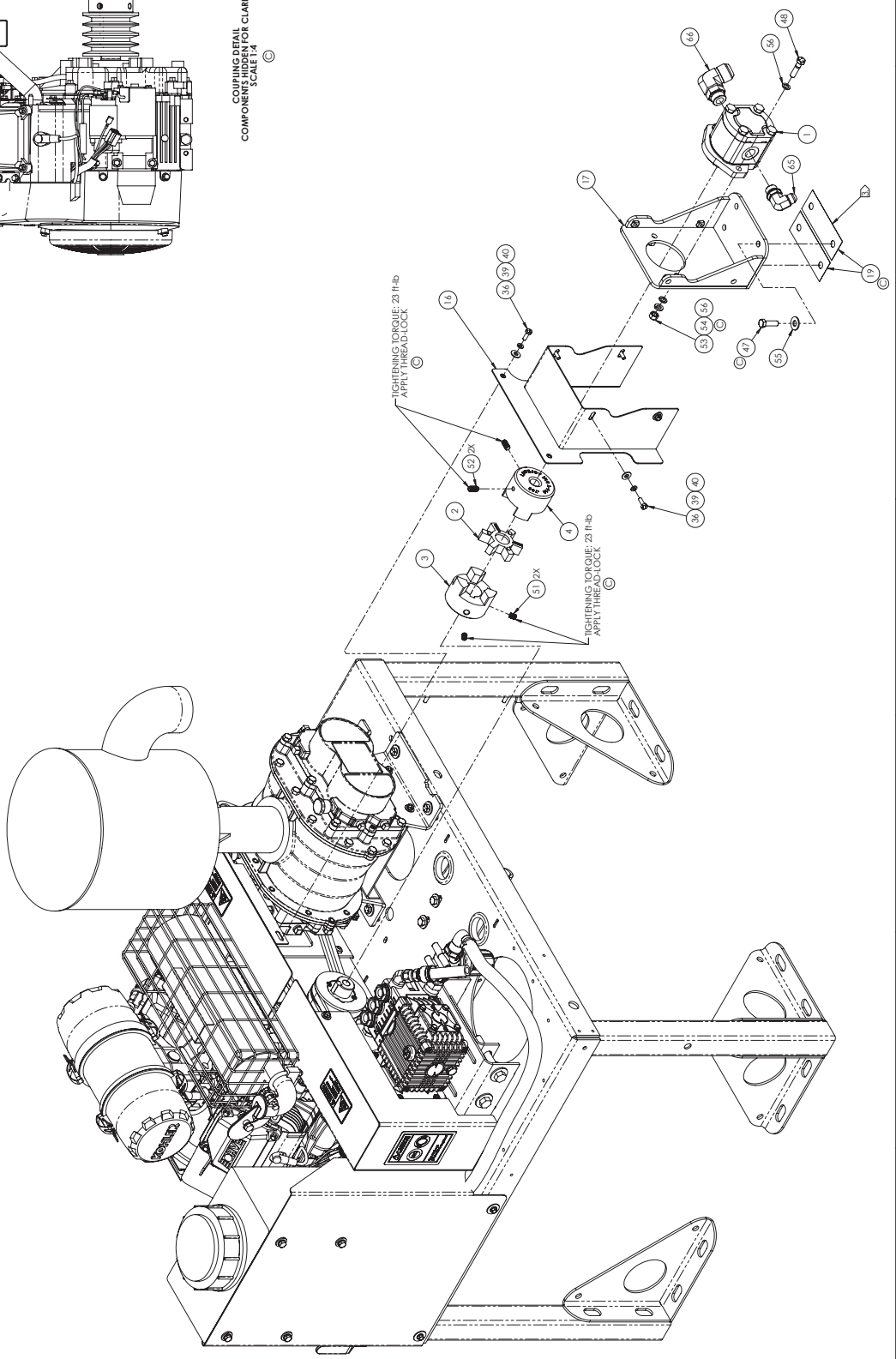
98

99

100



COUPLING DETAIL
COMPONENTS HIDDEN FOR CLARITY
SCALE: 1:1



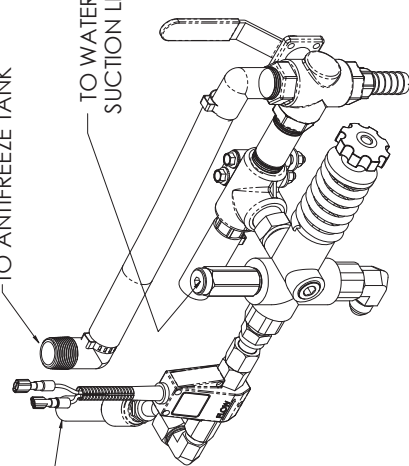
E.H. WACHS		EQUIPMENT	
400 E. HILL STREET, SUITE 100 MILWAUKEE, WI 53212 WWW.EHWACHS.COM		EQUIPMENT	
DATE	REV	DESCRIPTION	BY
07/26/2017	1	POWERPACK, 27 HP GAS - NO CTBS	IB
01/22/2018	2		IB
07/26/2017	3		IB
07/26/2017	4		IB
07/26/2017	5		IB
07/26/2017	6		IB
07/26/2017	7		IB
07/26/2017	8		IB
07/26/2017	9		IB
07/26/2017	10		IB
07/26/2017	11		IB
07/26/2017	12		IB
07/26/2017	13		IB
07/26/2017	14		IB
07/26/2017	15		IB
07/26/2017	16		IB
07/26/2017	17		IB
07/26/2017	18		IB
07/26/2017	19		IB
07/26/2017	20		IB
07/26/2017	21		IB
07/26/2017	22		IB
07/26/2017	23		IB
07/26/2017	24		IB
07/26/2017	25		IB
07/26/2017	26		IB
07/26/2017	27		IB
07/26/2017	28		IB
07/26/2017	29		IB
07/26/2017	30		IB
07/26/2017	31		IB
07/26/2017	32		IB
07/26/2017	33		IB
07/26/2017	34		IB
07/26/2017	35		IB
07/26/2017	36		IB
07/26/2017	37		IB
07/26/2017	38		IB
07/26/2017	39		IB
07/26/2017	40		IB
07/26/2017	41		IB
07/26/2017	42		IB
07/26/2017	43		IB
07/26/2017	44		IB
07/26/2017	45		IB
07/26/2017	46		IB
07/26/2017	47		IB
07/26/2017	48		IB
07/26/2017	49		IB
07/26/2017	50		IB
07/26/2017	51		IB
07/26/2017	52		IB
07/26/2017	53		IB
07/26/2017	54		IB
07/26/2017	55		IB
07/26/2017	56		IB
07/26/2017	57		IB
07/26/2017	58		IB
07/26/2017	59		IB
07/26/2017	60		IB
07/26/2017	61		IB
07/26/2017	62		IB
07/26/2017	63		IB
07/26/2017	64		IB
07/26/2017	65		IB
07/26/2017	66		IB

2 3 4 5 6 7 8

TO WATER PUMP
PRESSURE LINE-OUTLET

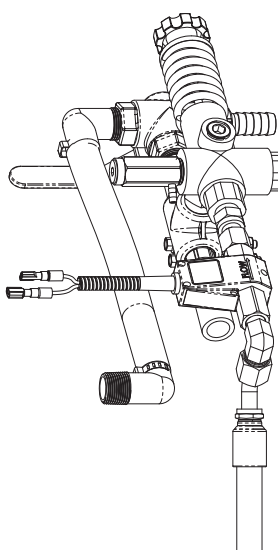
TO ANTIFREEZE TANK

TO WATER PUMP
SUCTION LINE-INLET



SCALE 1:2

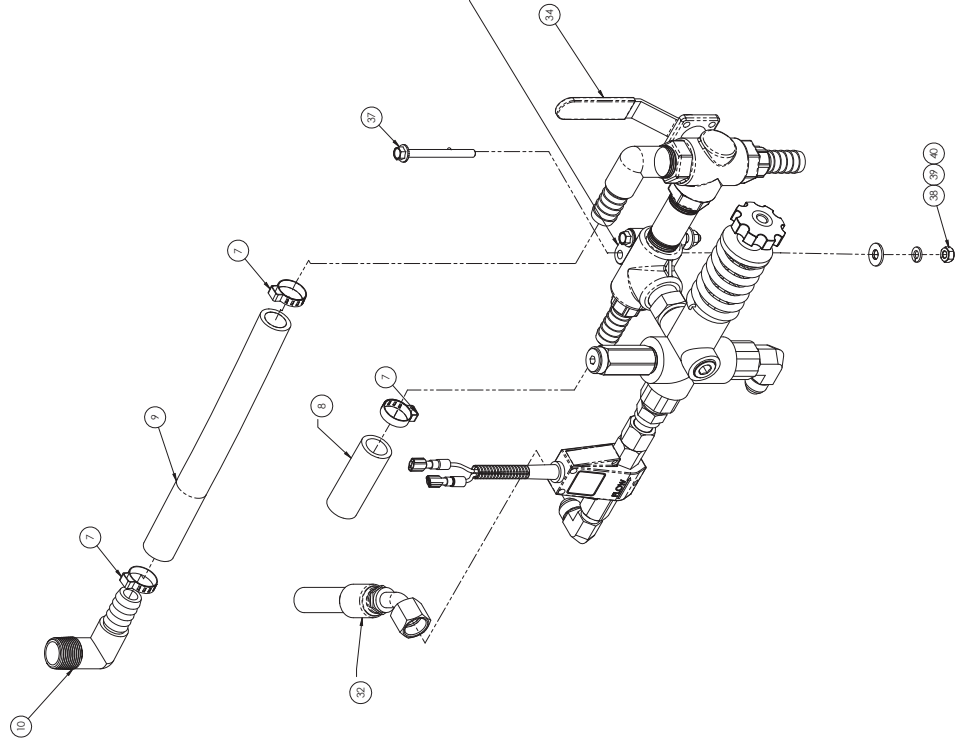
TO MAIN WATER TANK



SCALE 1:2

TO HOSE REEL
PRESSURE LINE

77-163-46 CAN BE SUBSTITUTED
WITH 77-163-49; REQUIRES
90-051-10 & 90-055-53 FASTENERS

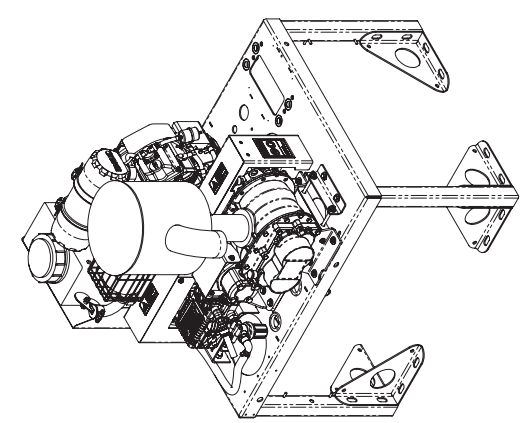



E.H. WACHS 400 N. HIGHLAND AVENUE MILWAUKEE, WISCONSIN 53212 WWW.EHWACHS.COM		WALCO	
ITEM	POWERPACK, 27 HP GAS - NO CTBS	SCALE	1:2
DESCRIPTION	IML	DATE	1/12/2018
DATE	2/4/2017	REV	5 OF 6
REV	02/01/18	REV	77-230-03
D		C	

THIS DRAWING IS THE PROPERTY OF E.H. WACHS. IT IS TO BE USED ONLY FOR THE PROJECT AND QUANTITY SPECIFIED. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM. WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS, ANY REPRODUCTION OR TRANSMISSION OF THIS DRAWING IS STRICTLY PROHIBITED.

ITEM	PART NUMBER	QTY	DESCRIPTION	LENGTH
1	17-060-00	1	PUMP, HYDRAULIC GEAR	
2	17-061-30	1	SPIDER, L110 HYDREL - CLOSED CENTER	
3	17-061-40	1	HUB, AL110 1/2" BORE (3/16" X 3/8" KEY)	
4	17-061-50	1	HUB, AL110 3/4" BORE (3/32" X 3/16" KEY)	
5	67-294-00	1	KEYS LOCK, 3/8" X 3/8" (INCH)	4"
6	68-138-02	1	Stator, Antifreeze Tank	
7	68-158-16	4	HOSE CLAMP, CRIMP-239 - 27.1 MM	
8	68-233-00	1	HOSE 3/4" I.P. LOCK ON	38"
9	68-233-00	1	HOSE 3/4" I.P. LOCK ON	10"
10	68-243-30	1	ELBOW, 3/4" NPT-M X 3/4" HOSE BARB - NYLON	
11	68-243-30	1	ELBOW, 3/4" NPT-M X 3/4" HOSE BARB - NYLON	
12	77-014-01	1	SILENCER	
13	77-068-25	1	STRAINER	
14	77-082-02	1	WELDMENT, PRESSURE WASHER TENSION	
15	77-085-10	1	PUMP & CLUTCH ASSEMBLY, PRESSURE WASHER	
16	77-087-19	1	WELDMENT, HYD PUMP GUARD	
17	77-087-20	1	WELDMENT, HYD PUMP MOUNT	
18	77-087-27	1	ENGINE SHIM KIT	
19	77-087-28	2	PUMP MOUNT SHIM KIT	
20	77-088-20	1	WELDMENT, WATER PUMP, BELT GUARD	
21	77-089-20	1	WELDMENT, BLOWER BELT GUARD	
22	77-101-02	1	ENGINE, 27 HP KOHLER GAS WITH MUFFLER	
23	77-110-30	1	SHEAVE, QUAD GROOVE	
24	77-111-52	4	BELT, AX35	
25	77-112-00	1	BUSHING, 1.610 X 1.2716"	
26	77-151-01-06	1	PANEL, ANTIFREEZE SUPPORT	
27	77-151-30	1	WELDMENT, GASOLINE POWERPACK	
28	77-160-05	2	LABEL, EYE AND EAR PROTECTION	
29	77-160-13	2	LABEL, MOVING PARTS PRESENT	
30	77-228-01	1	WELDMENT, BLOWER TENSION	
31	77-229-01	1	ANGLE BRACKET	
32	77-330-01-01	1	HOSE ASSEMBLY	

ITEM	PART NUMBER	QTY	DESCRIPTION	LENGTH
33	77-330-02-01	1	LABEL, TANK SELECT VALVE	
34	77-330-10-00	1	ASSEMBLY, WATER CONROIS POWERPACK VMT2	
35	77-484-00	1	BLOWER ASSEMBLY	
36	90-051-07	18	HHCS, 1/4-20 X 3/4 GRADE 5 ZN	
37	90-051-27	2	HHCS, 1/4-20 X 2-3/4 SERRATED GRADE 5	
38	90-055-01	2	NUT, 1/4-20 HEX	
39	90-055-52	20	WASHER, 1/4 SPLIT RING	
40	90-055-53	20	WASHER, FLAT, 1/4	
41	90-055-57	3	WASHER, 1/4 X 1 ODD FENDER 18-8SS	
42	90-059-03	3	HHSD, 1/4 X 1 HBPT SS	
43	90-061-07	4	HHCS, 5/16-18 X 3/4	
44	90-065-51	8	WASHER, 5/16 SPLIT RING	
45	90-065-52	8	WASHER, 5/16 FLAT	
46	90-071-10	2	HHCS, 3/8-16 X 1	
47	90-071-12	4	HHCS, 3/8-16 X 1-1/4 GRADE 5	
48	90-071-14	6	HHCS, 3/8-16 X 1-1/2 GR5 ZN	
49	90-071-20	4	HHCS, 3/8-16 X 2 GR 5 ZN	
50	90-071-45	2	HHCS, 3/8-16 X 4 1/2 FLT GR5 ZN	
51	90-074-05	2	SSS, 3/8-16 X 1/2 CUP PT. BLACK OXIDE	
52	90-074-07	2	SSS, 3/8-16 X 3/4 CUP PT	
53	90-075-01	18	NUT, 3/8-16 HEX GR 5 ZN	
54	90-075-52	18	WASHER, 3/8 SPLIT RING	
55	90-075-53	32	WASHER, 3/8 FLAT	
56	90-075-54	4	WASHER, 3/8 AN	
57	90-078-40	1	ADAPTER, 3/8 NPT-M X 8, JIC-M - 45 DEG	
58	90-091-41	2	HHCS, 1/2-13 X 4 FULL THD GRADE 8	
59	90-095-01	2	NUT, 1/2-13 HEX GRADE 8	
60	90-095-52	2	WASHER, 1/2 FLAT	
61	90-098-14	1	Nipple, 1/2" Copg. PVC.	
62	90-108-25	4	HHCS, M8-1.25 X 25MM DN 933 GR8.8 ZN	
63	90-135-03	2	GROMMET, 1 3/4" ID X 2" HOLE X 1/4" THK	
64	910-3/4-1/2-FFS	1	ADAPTER, 3/4" NPT-M X 1/2" NPT-M	
65	910-8-10-C50X-3	1	ELBOW, -8 M. JIC (9/4"-16) X -10M ODR (7/8"-14)	
66	910-16-12-C50X-3	1	ADAPTER, -12 MOREX -16 MJC 90 DEGREE ELBOW	
67	921-SP0003-RT	1	TANK, 3 GALLON	
68	931-561-CB025	7	CLIP, PLASTIC LOOM TO FRAME 1/2"	
69	931-561-CB100	7	CLIP, PLASTIC LOOM TO FRAME 1"	
70	940-35608	1	RAIN CAP, 1-1/4" EXHAUST	

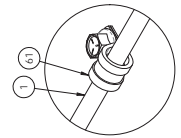
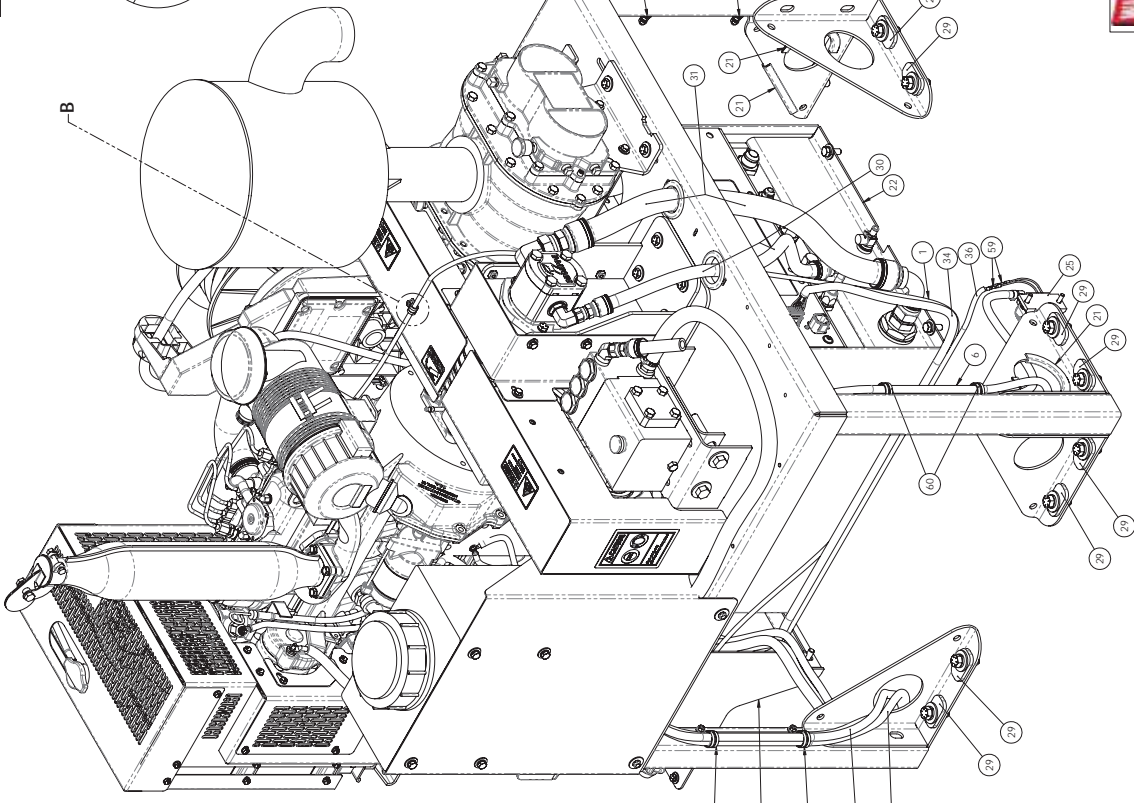
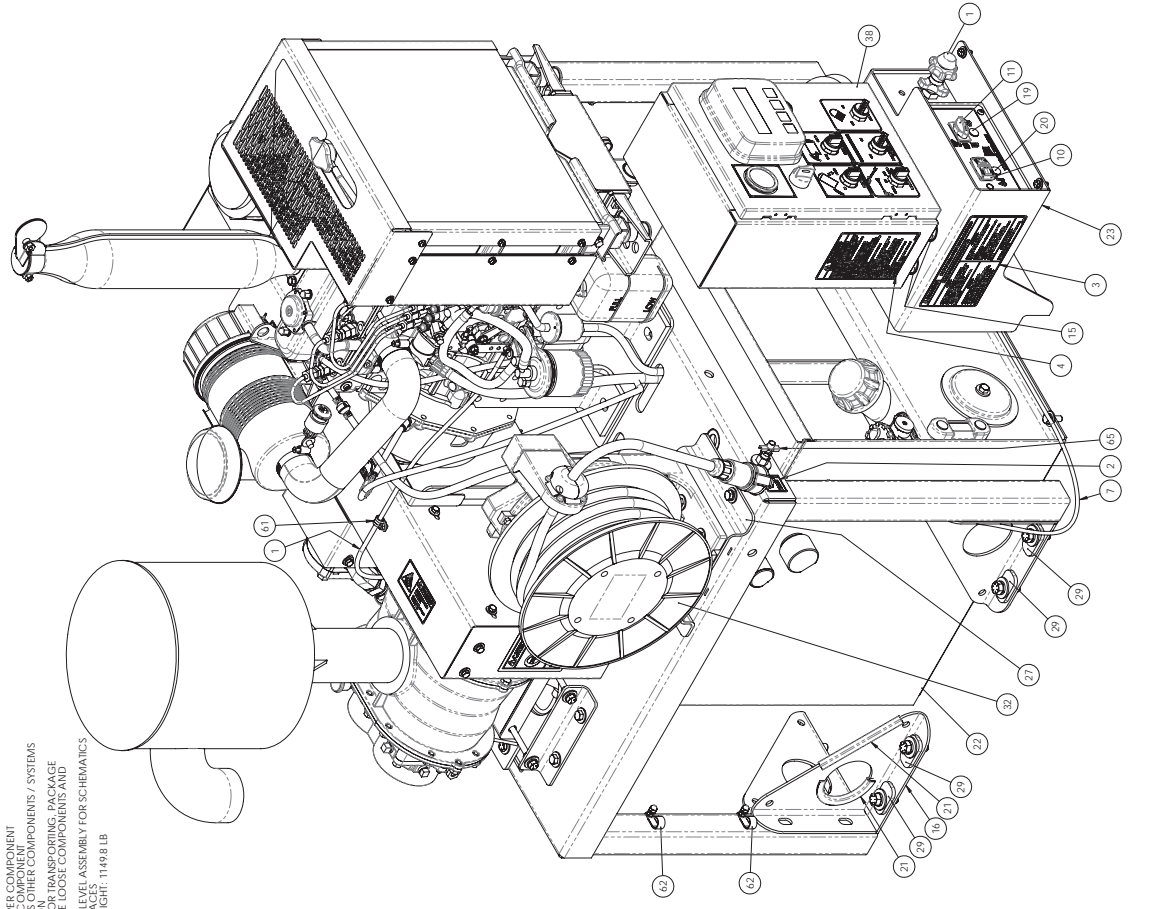




E.H. WACHS
400 N. W. Highway 100
P.O. Box 100
Wichita, KS 67207
www.ehwachs.com

DRAWING NO.	POWERPACK, 27 HP GAS - NO CTBS
DATE	1/12/2018
REV	1
BY	1/12/2018
CHKD	1/12/2018
APP'D	1/12/2018
SCALE	1:1
SHEET	1 OF 6
FIGURE NO.	77-230-03

- NOTES:**
1. MATERIALS PER COMPONENT
 2. KIT INCLUDES ALL PARTS AND SUBASSEMBLIES
 3. KIT REQUIRES OTHER COMPONENTS / SYSTEMS
 4. KIT REQUIRES OTHER COMPONENTS / SYSTEMS FOR WELDING OR TRANSPORTING, PACKAGING AND SECURE LOOSE COMPONENTS AND
 5. SEE HIGHER LEVEL ASSEMBLY FOR SCHEMATICS AND INTERFACES
 6. APPROX WEIGHT: 1149.8 LB



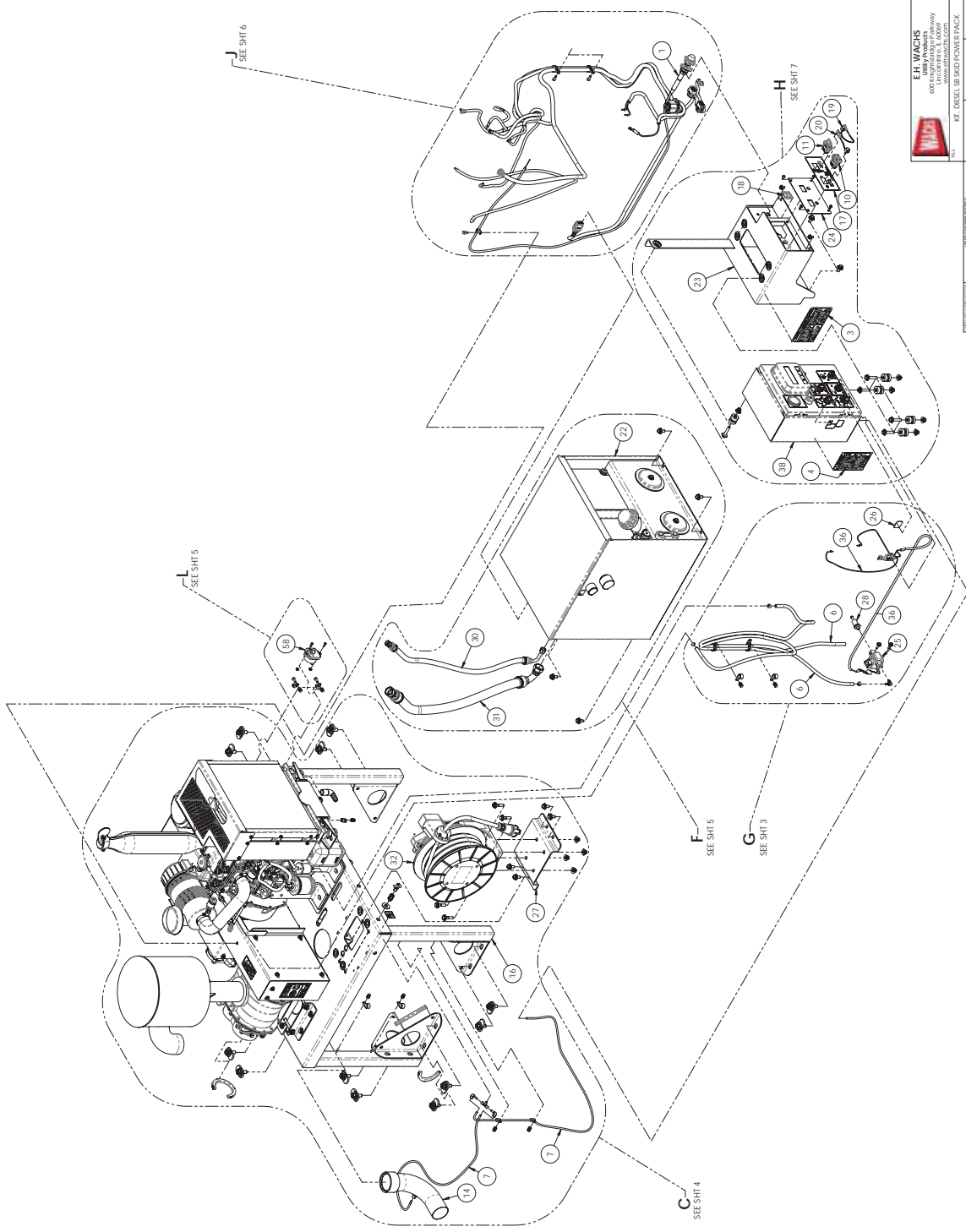
DETAIL B
SCALE: 1:1

REV.	DESCRIPTION	DATE	APP'D.
A	NEW RELEASE ECO 1754	03/02/01	MMW

E.H. WACHS		4000 Series Diesel Engine	
www.ehwachs.com		www.ehwachs.com	
KIT DIESEL 58 MID-POWER PACK		ITEM	14
REV.	03/02/01	DATE	14
APP'D.	MMW	BY	MMW
DATE	03/02/01	REV.	1 OF 7
FIG. NO.	77-260-14	REV.	1 OF 7

WACHS		E.H. WACHS	
www.ehwachs.com		www.ehwachs.com	
KIT DIESEL 58 MID-POWER PACK		ITEM	14
REV.	03/02/01	DATE	14
APP'D.	MMW	BY	MMW
DATE	03/02/01	REV.	1 OF 7
FIG. NO.	77-260-14	REV.	1 OF 7

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	ESTIMATE LENGTH
1	17-265-01	THRUSTLE CABLE X 10'	1	
2	59-131-00	LABEL, CORROSION PROTECTION	1	
3	67-112-00	LABEL, MAINTENANCE SCHEDULE	1	
4	67-117-00	LABEL, SAFETY PRECAUTIONS	1	
5	68-158-04	HOSE CLAMP, CRIMP 1 1/4" X 1.4" OMM	3	(84") (87")
6	68-159-25	HOSE, 1/4" FUEL - SAE 3090/CARB.	2	(84") (87")
7	68-171-01	TUBING, 1/4" VACUUM RATED NYLON	2	(87") (87")
8	68-172-13	ADAPTER, 1/4" PLUG-IN X 1/4" PTC 90	2	
9	68-175-03	ATO FUSE, 3AMP	1	
10	68-179-10	SEALED ROCKER SWITCH, 3 POSITION 2 LAMP	1	
11	68-179-11	SELECTOR SWITCH, 3 POSITION	1	
12	68-243-30	ELBOW, 3/4" NPT-M X 3/4" HOSE BARB - NYLON	1	
13	68-243-90	ADAPTER, 1/8" NPT-M X 1/4" HOSE BARB 90 BRASS	1	
14	77-064-01	ASSEMBLY INLET ELBOW	1	
15	77-242-01	ISOLATION MOUNT, 35 LB	5	
16	77-260-03	POWERPACK, KUBOTA DT105 DIESEL - NO CIRL	1	
17	77-267-02	LABEL, HYDRAULIC CONTROLS 3 POSITION	1	
18	77-267-05	LABEL, THROTTLE	1	
19	77-272-10	INDICATOR, GREEN LED JWPFC CONNECTOR	1	
20	77-272-20	INDICATOR, RED LED JWPFC CONNECTOR	1	
21	77-277-50	PVC EDGE RING, 0.090" TO 0.199" EDGE THICKNESS	3	(6") (7") (10 1/4")
22	77-285-03	RESERVOIR ASSEMBLY, 3 CIRCUIT SKIDS	1	
23	77-290-10	WELDMENT, CONTROL MOUNT	1	
24	77-290-19	CONTROL PANEL	1	
25	77-290-32	FUEL PUMP	1	
26	77-290-34	LABEL, FUEL PUMP FUSE	1	
27	77-290-35	REEL INSTALLATION BRACKET	1	
28	77-290-38	FUEL FILTER	1	
29	77-290-40	CLAMPING WASHER	12	
30	77-292-02	32 1/8" HOSE ASSEMBLY, 08 FJ X 08 FJ 90 X 08 HOSE	1	
31	77-292-03	33 1/8" HOSE ASSEMBLY, JIC X 16 FJIC 90 X 16 HOSE	1	
32	77-293-00	ELECTRIC REEL ASSEMBLY	1	
33	77-520-09-26	WIRE HARNESS, POWER TO CIL BOX	1	
34	77-520-09-30	WIRE HARNESS, RESERVOIR CONTROLS	1	
35	77-520-09-33	WIRE HARNESS, GND TO CIL BOX - DIESEL	1	
36	77-520-09-34	WIRE HARNESS, FUEL PUMP FUSE	1	
37	77-520-09-35	WIRE HARNESS, KUBOTA DT105 DIESEL ENGINE	1	
38	77-520-10	CONTROL CABINET, VMT DIESEL	1	
39	90-045-03	NUT, 10-24 HEX	2	
40	90-045-51	WASHER #10 FLAT	2	
41	90-045-52	WASHER #10 SPRING	2	
42	90-051-07	HHCS, 1/4" X 3/4" GRADE 5 ZN	2	
43	90-051-10	HHCS, 1/4" X 1"	2	
44	90-052-05	HHCS, 1/4" X 1/2"	4	
45	90-055-01	NUT, 1/4" X 20 HEX	9	
46	90-055-18	WASHER, 1/4" ACORN	9	
47	90-055-52	WASHER, 1/4" SPRING	13	
48	90-055-53	WASHER, FLAT, 1/4"	4	
49	90-071-10	HHCS, 3/8" X 1 1/4"	10	
50	90-071-17	HHCS, 3/8" X 1 3/4"	4	
51	90-071-20	HHCS, 3/8" X 2 GR 5 ZN	5	
52	90-075-01	NUT, 3/8" X 16 HEX GR 5 ZN	19	
53	90-075-52	WASHER, 3/8" SPRING	9	
54	90-075-53	WASHER, 3/8" FLAT	28	
55	90-091-15	HHCS, 1/2" X 1 1/2" GRADE 8 ZN	12	
56	90-095-52	WASHER, 1/2" FLAT	13	
57	90-095-58	WASHER, 1/2" SPRING	12	
58	90-111-40	HI AMP CIRCUIT BREAKER, 60AMPS	1	
59	90-191-28	TERMINAL, 23 19 TO 65 14 AVG BUTTSPLICE	2	
60	90-303-10	CUSHIONED LOOP CLAMP, 1"	4	
61	90-303-50	CUSHIONED LOOP CLAMP, 1/2"	6	
62	90-303-75	CUSHIONED LOOP CLAMP, 3/4"	4	
63	90-303-95	SHCS, 10-24 X 1/2" ZINC	2	
64	90-1062-58	HHCS, 1/4" X 2.5" GR 5 ZN	5	
65	90-4927K48	FITTING, DRAIN 1/4" NPT	1	
66	90-5111K204	BULKHEAD FITTING, 1/4" PTC X 1/4" NPT	1	
67	90-5779K693	FITTING, 1/4" TUBE STEM TEE	1	



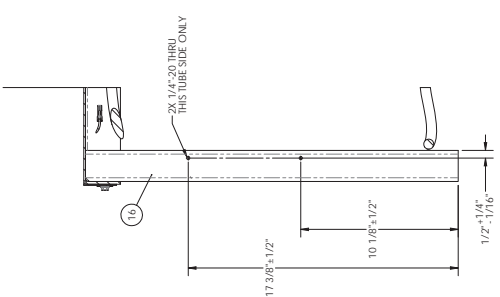
E.H. WACHS
 600 E. Highway 100, Waco, TX 76780
 WWW.EHWACHS.COM

WACHS

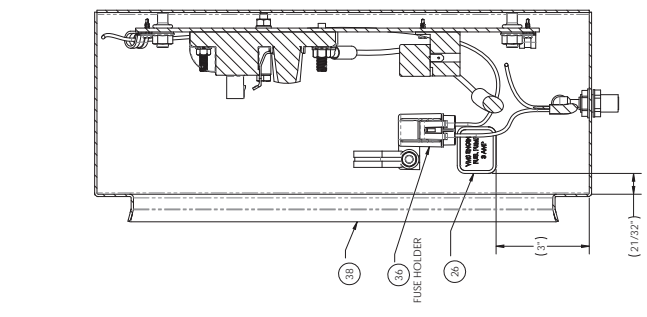
KT DIESEL 38 MID-POWER PACK

DATE: 09/29/2019
 SHEET: 2 OF 7
 PART NO: 77-260-14

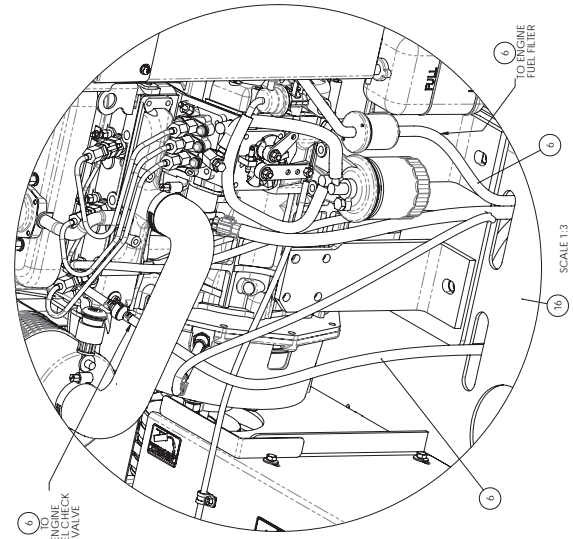
REV	DESCRIPTION	DATE
1	ISSUED FOR MANUFACTURE	09/29/2019
2	REVISED TO ADD PART 67	09/29/2019
3	REVISED TO ADD PART 66	09/29/2019
4	REVISED TO ADD PART 65	09/29/2019
5	REVISED TO ADD PART 64	09/29/2019
6	REVISED TO ADD PART 63	09/29/2019
7	REVISED TO ADD PART 62	09/29/2019
8	REVISED TO ADD PART 61	09/29/2019
9	REVISED TO ADD PART 60	09/29/2019
10	REVISED TO ADD PART 59	09/29/2019
11	REVISED TO ADD PART 58	09/29/2019
12	REVISED TO ADD PART 57	09/29/2019
13	REVISED TO ADD PART 56	09/29/2019
14	REVISED TO ADD PART 55	09/29/2019
15	REVISED TO ADD PART 54	09/29/2019
16	REVISED TO ADD PART 53	09/29/2019
17	REVISED TO ADD PART 52	09/29/2019
18	REVISED TO ADD PART 51	09/29/2019
19	REVISED TO ADD PART 50	09/29/2019
20	REVISED TO ADD PART 49	09/29/2019
21	REVISED TO ADD PART 48	09/29/2019
22	REVISED TO ADD PART 47	09/29/2019
23	REVISED TO ADD PART 46	09/29/2019
24	REVISED TO ADD PART 45	09/29/2019
25	REVISED TO ADD PART 44	09/29/2019
26	REVISED TO ADD PART 43	09/29/2019
27	REVISED TO ADD PART 42	09/29/2019
28	REVISED TO ADD PART 41	09/29/2019
29	REVISED TO ADD PART 40	09/29/2019
30	REVISED TO ADD PART 39	09/29/2019
31	REVISED TO ADD PART 38	09/29/2019
32	REVISED TO ADD PART 37	09/29/2019
33	REVISED TO ADD PART 36	09/29/2019
34	REVISED TO ADD PART 35	09/29/2019
35	REVISED TO ADD PART 34	09/29/2019
36	REVISED TO ADD PART 33	09/29/2019
37	REVISED TO ADD PART 32	09/29/2019
38	REVISED TO ADD PART 31	09/29/2019
39	REVISED TO ADD PART 30	09/29/2019
40	REVISED TO ADD PART 29	09/29/2019
41	REVISED TO ADD PART 28	09/29/2019
42	REVISED TO ADD PART 27	09/29/2019
43	REVISED TO ADD PART 26	09/29/2019
44	REVISED TO ADD PART 25	09/29/2019
45	REVISED TO ADD PART 24	09/29/2019
46	REVISED TO ADD PART 23	09/29/2019
47	REVISED TO ADD PART 22	09/29/2019
48	REVISED TO ADD PART 21	09/29/2019
49	REVISED TO ADD PART 20	09/29/2019
50	REVISED TO ADD PART 19	09/29/2019
51	REVISED TO ADD PART 18	09/29/2019
52	REVISED TO ADD PART 17	09/29/2019
53	REVISED TO ADD PART 16	09/29/2019
54	REVISED TO ADD PART 15	09/29/2019
55	REVISED TO ADD PART 14	09/29/2019
56	REVISED TO ADD PART 13	09/29/2019
57	REVISED TO ADD PART 12	09/29/2019
58	REVISED TO ADD PART 11	09/29/2019
59	REVISED TO ADD PART 10	09/29/2019
60	REVISED TO ADD PART 9	09/29/2019
61	REVISED TO ADD PART 8	09/29/2019
62	REVISED TO ADD PART 7	09/29/2019
63	REVISED TO ADD PART 6	09/29/2019
64	REVISED TO ADD PART 5	09/29/2019
65	REVISED TO ADD PART 4	09/29/2019
66	REVISED TO ADD PART 3	09/29/2019
67	REVISED TO ADD PART 2	09/29/2019



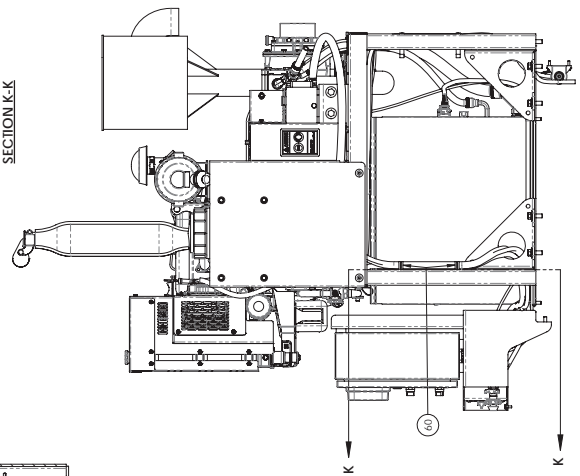
SECTION K-K



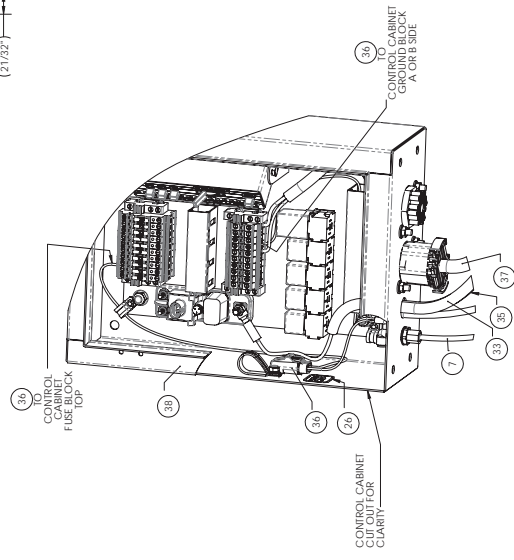
SCALE 12



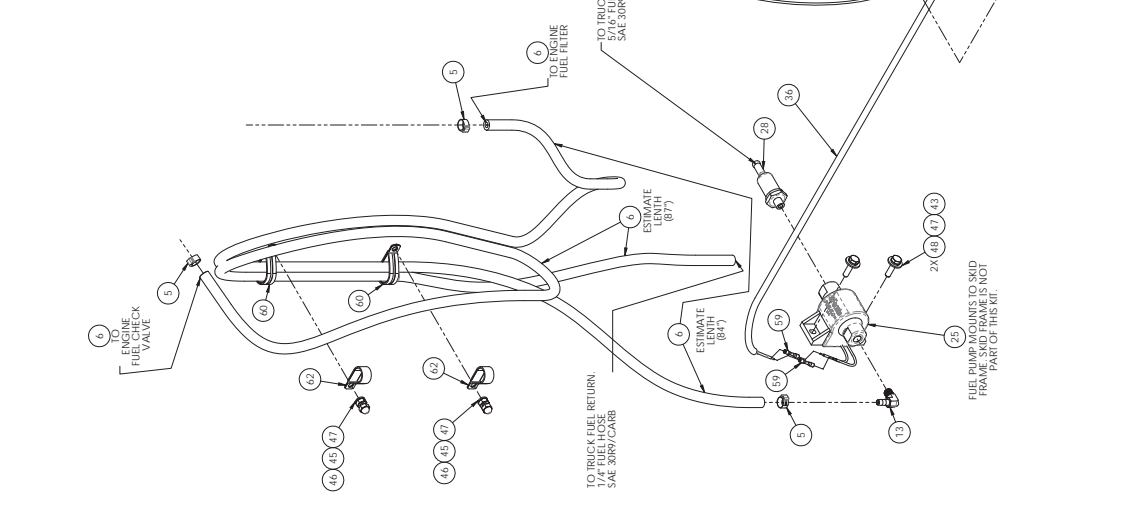
SCALE 13



SCALE 18

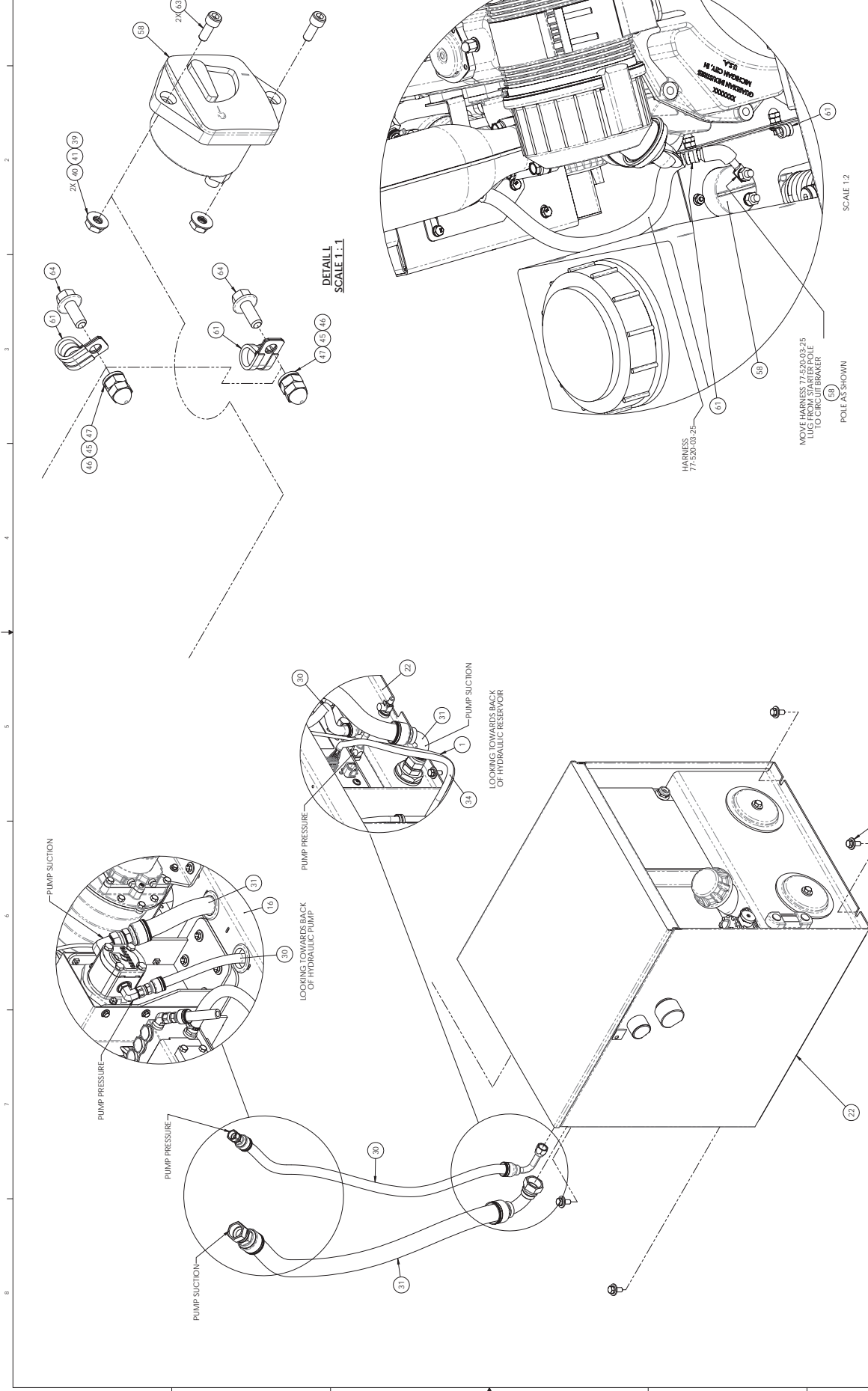


SCALE 13



SCALE 1.3

E.H. WACHS 600 N. HIGHLAND AVENUE MILWAUKEE, WISCONSIN 53212 WWW.EHWACHS.COM	
ITEM NO.	KT DEISE 38 SKID POWER PACK
REV.	1.4
DATE	9/22/2019
DESIGNED BY	3 OF 7
DRAWN BY	77-260-14
DATE	3/27/16
SCALE	A



PUMP SUCTION

PUMP PRESSURE

PUMP SUCTION

LOOKING TOWARDS BACK OF HYDRAULIC PUMP

PUMP PRESSURE

PUMP SUCTION

LOOKING TOWARDS BACK OF HYDRAULIC RESERVOIR

DETAIL SCALE 1:1

SCALE 1:2

HARNESSES 77-520 (3) 3/4"

MOVE HARNESSES 77-520 (3) 3/4" LUGS FROM STARTER POLE TO CIRCUIT BREAKER

POLE AS SHOWN

E.H. WACHS
 600 N. Highway 100, Suite 100
 Waco, TX 76798
 WWW.EHWACHS.COM

WACHS

KT DIESEL SB MID POWER PACK

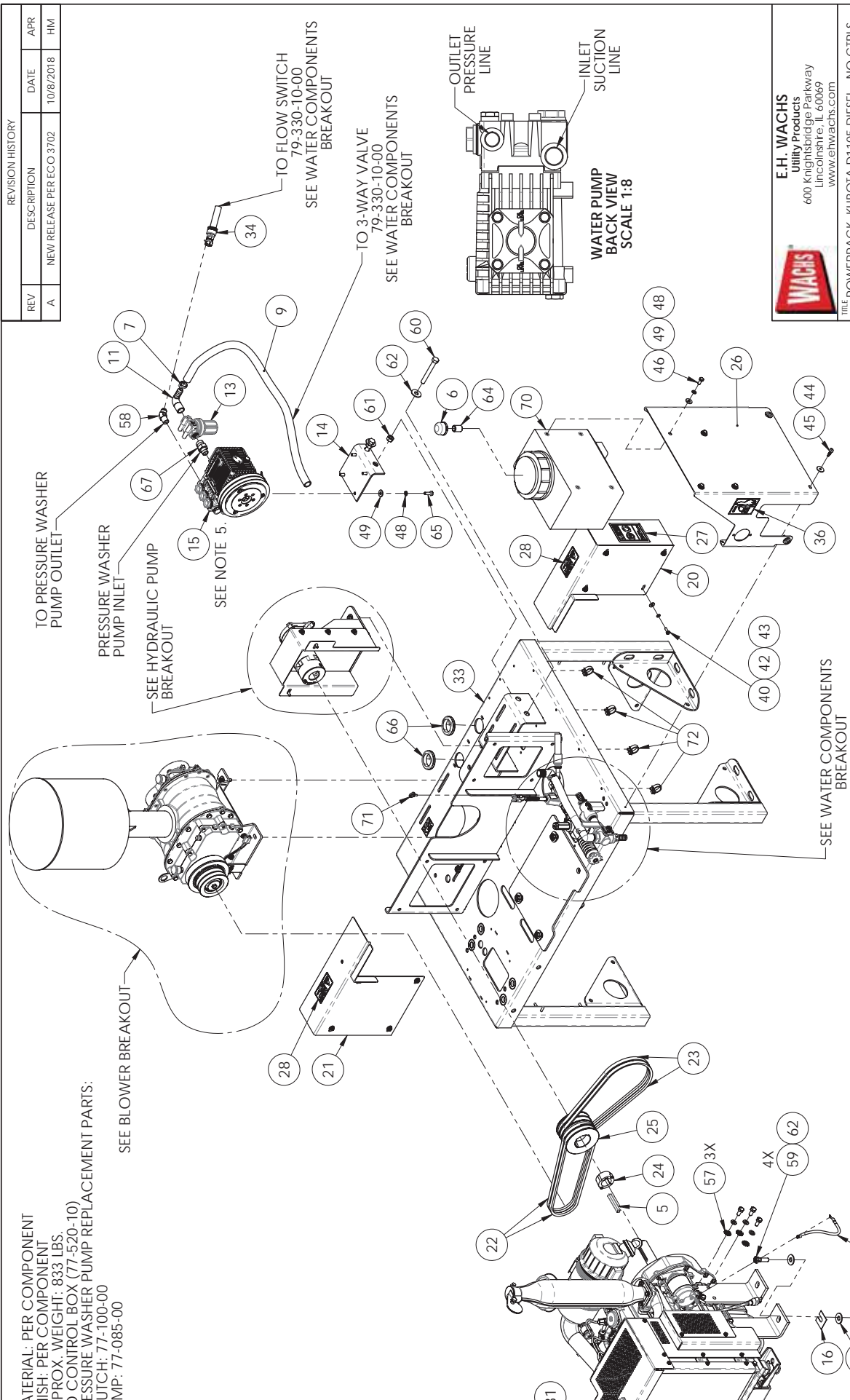
REV	DATE	BY	CHKD
1.0	09/22/2019	WACHS	WACHS
2.0	09/22/2019	WACHS	WACHS
3.0	09/22/2019	WACHS	WACHS
4.0	09/22/2019	WACHS	WACHS
5.0	09/22/2019	WACHS	WACHS

77-260-14

DETAIL

NOTES:

1. MATERIAL: PER COMPONENT
2. FINISH: PER COMPONENT
3. APPROX. WEIGHT: 833 LBS.
4. NO CONTROL BOX (77-520-10)
5. PRESSURE WASHER PUMP REPLACEMENT PARTS:
CLUTCH: 77-100-00
PUMP: 77-085-00



REVISION HISTORY			
REV	DESCRIPTION	DATE	APR
A	NEW RELEASE PER ECO 3702	10/8/2018	HM

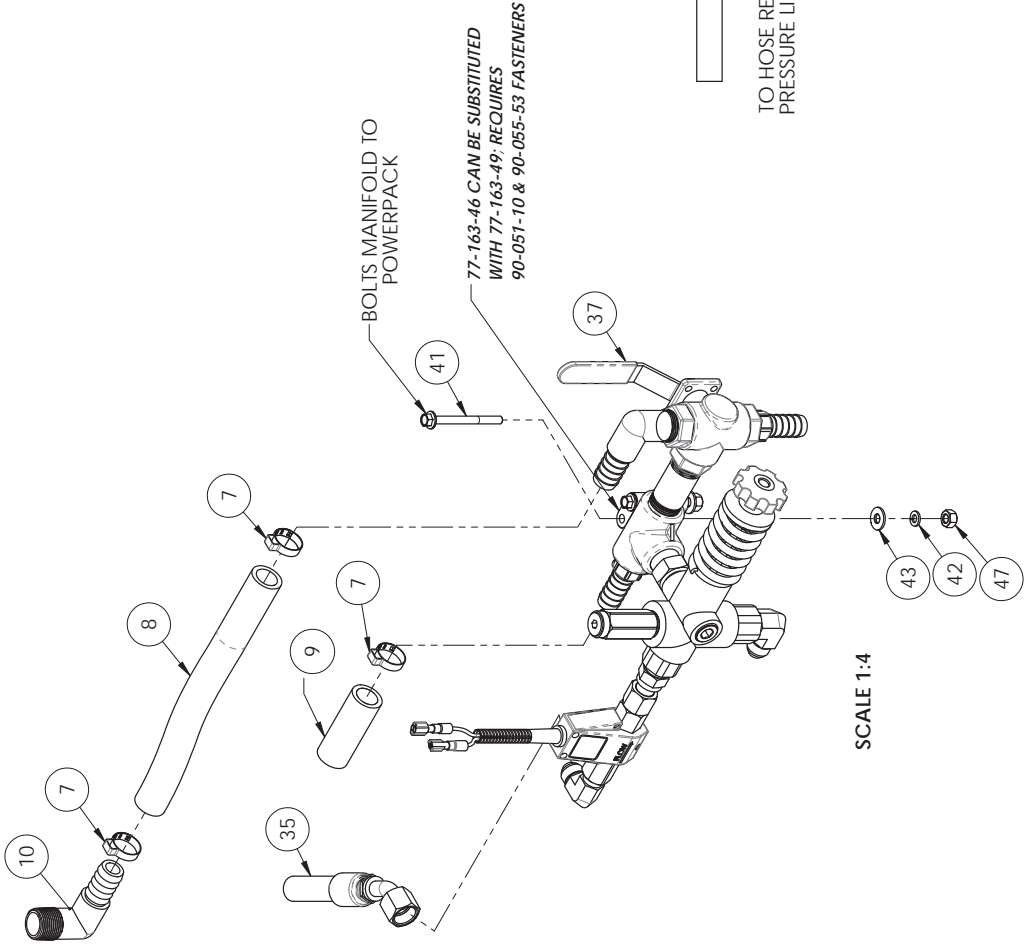
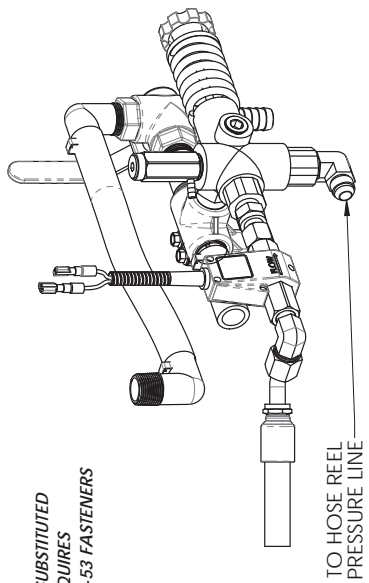
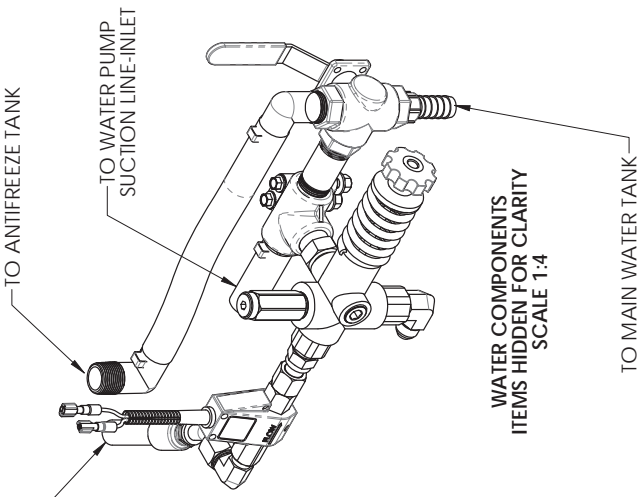
E.H. WACHS
Utility Products
600 Knightsbridge Parkway
Lincolnshire, IL 60069
www.ehwachs.com

TITLE POWERPACK, KUBOTA D1105 DIESEL - NO CTRLS			
DRAWN BY	APPROVED BY	SCALE	
HM	MWW	1:12	
DATE	DATE	SHEET	
10/4/2018	10/8/2018	1 OF 7	
SIZE	DWG. NO.	REV.	
B	77-260-03	A	

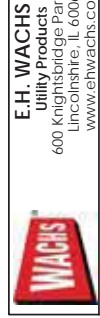
THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
FRACTIONS $\frac{1}{32}$
DECIMALS ± 0.005
DIMENSIONS IN PARENTHESES ARE
REFERENCE DIMENSIONS
DIMENSIONS IN PARENTHESES ARE
REFERENCE DIMENSIONS
DIMENSIONS IN PARENTHESES ARE
REFERENCE DIMENSIONS
DIMENSIONS IN PARENTHESES ARE
REFERENCE DIMENSIONS


PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE
SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE
WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.

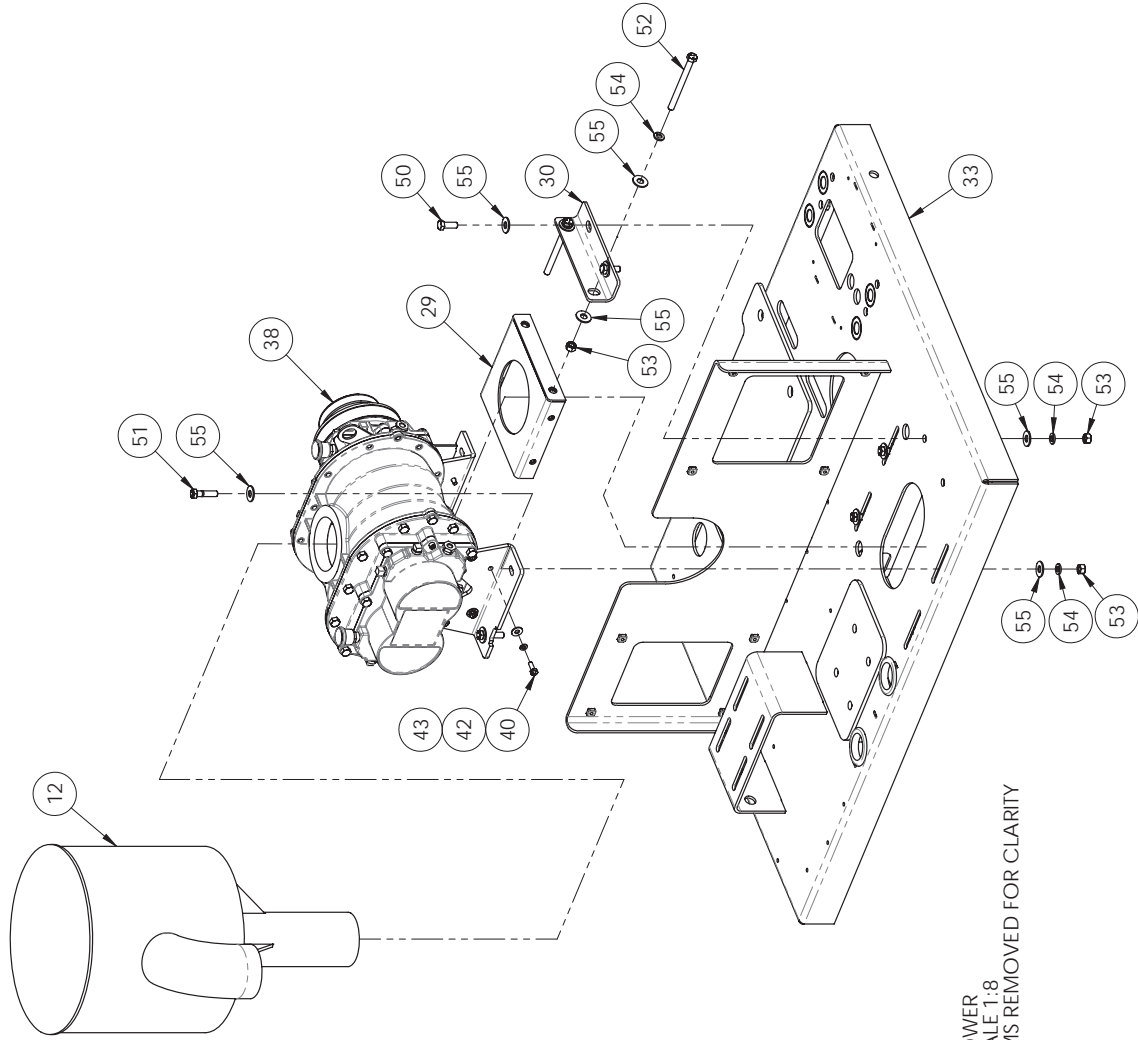


**WATER COMPONENTS
ITEMS HIDDEN FOR CLARITY
SCALE 1:4**

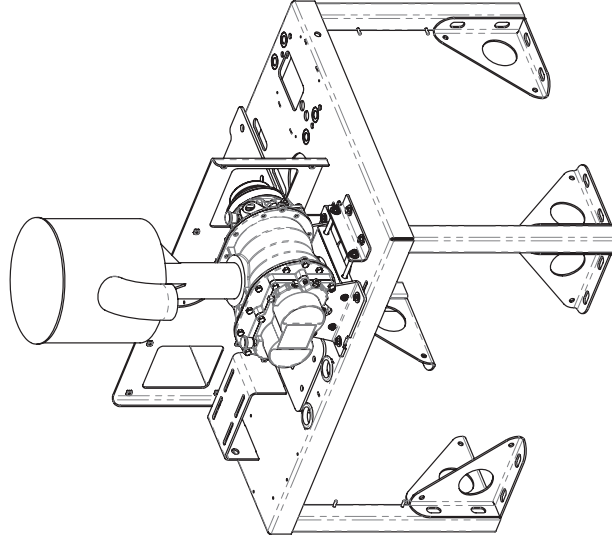


TITLE		POWERPACK, KUBOTA D1105 DIESEL - NO CTRLS	
DRAWN BY	APPROVED BY	SCALE	1:12
HM	MWW	SHEET	2 OF 7
DATE	DATE	DATE	10/8/2018
10/4/2018	10/8/2018	DATE	10/8/2018
SIZE	DWG. NO.	REV.	A
B	77-260-03		

THIRD ANGLE PROJECTION

 UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES
 APPLY UNLESS OTHERWISE SPECIFIED
 FRACTIONS 1/32"
 ONE PLACE DECIMAL .1
 TWO PLACE DECIMAL .0100
 INTERPRET DIM AND CLEARANCE DIMENSIONS AS SHOWN
 DIMENSIONS ARE TO BE SHOWN UNLESS OTHERWISE SPECIFIED
 DO NOT SCALE DRAWING
 ANGULAR ± 15 MINUTES
 PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.



BLOWER
SCALE 1:8
ITEMS REMOVED FOR CLARITY



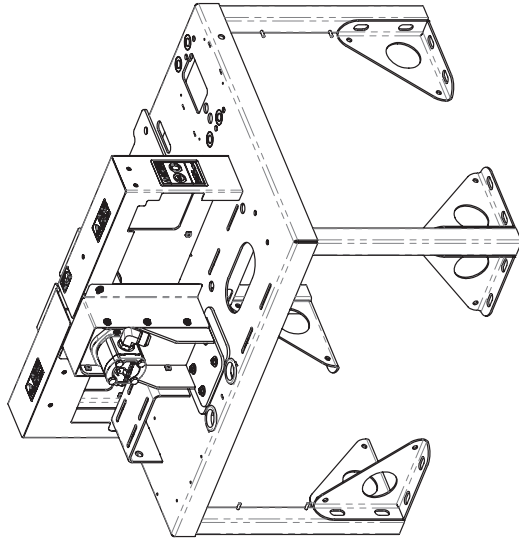
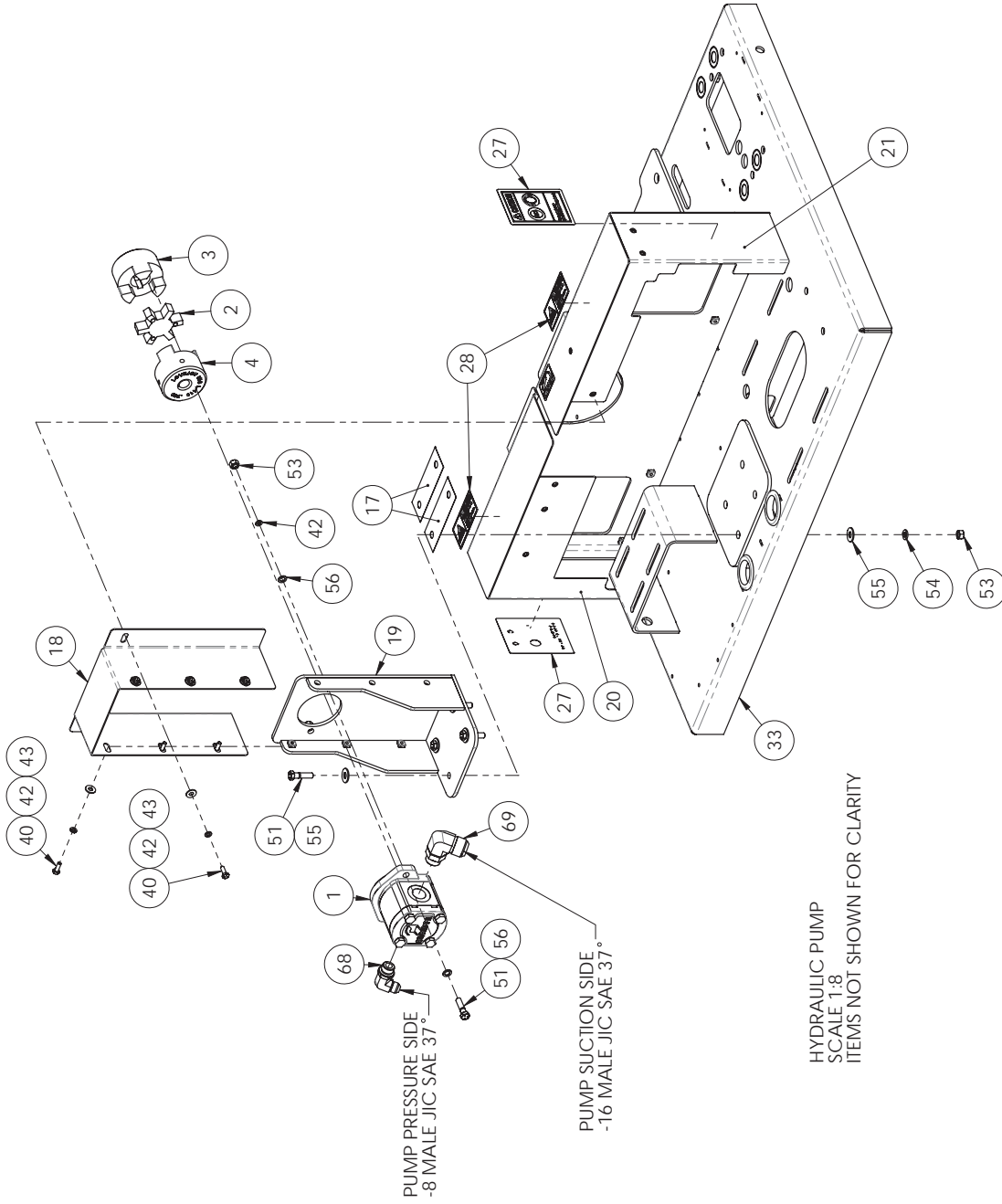
E.H. WACHS
Utility Products
600 Knightsbridge Parkway
Lincolnshire, IL 60069
www.ehwachs.com

TITLE POWERPACK, KUBOTA DT1105 DIESEL - NO CTRLS	
DRAWN BY HM	APPROVED BY MWW
DATE 10/4/2018	DATE 10/8/2018
SIZE B	DWG. NO. 77-260-03
SCALE 1:12	SHEET 3 OF 7
REV. A	

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
APPLY UNLESS NOTED
FRACTIONS 1/32"
ONE PLACE DECIMAL .1"
TWO PLACE DECIMAL .0100"
THREE PLACE DECIMAL .0010"
INTERPRET DIM AND CLEARANCE DIMS AS SHOWN
DO NOT SCALE DRAWING
ANGULAR ± 15 MINUTES

PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.



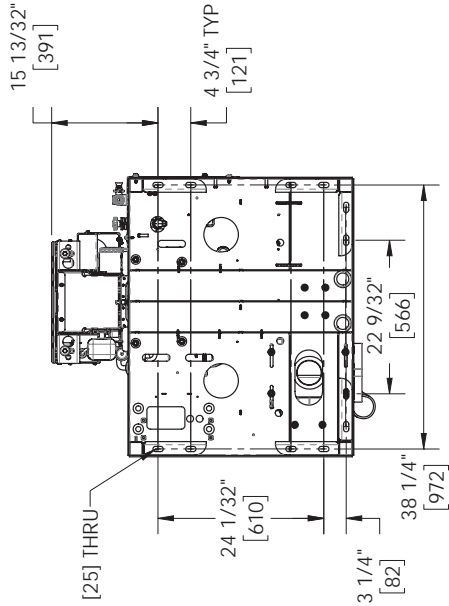
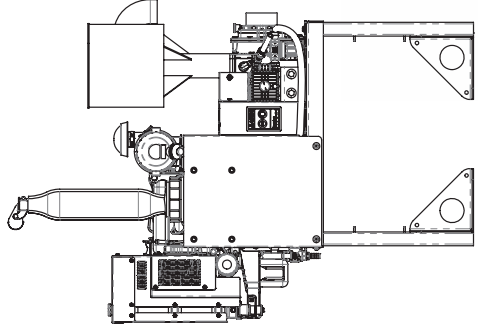
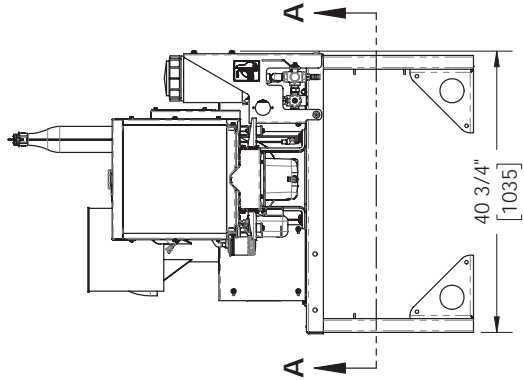
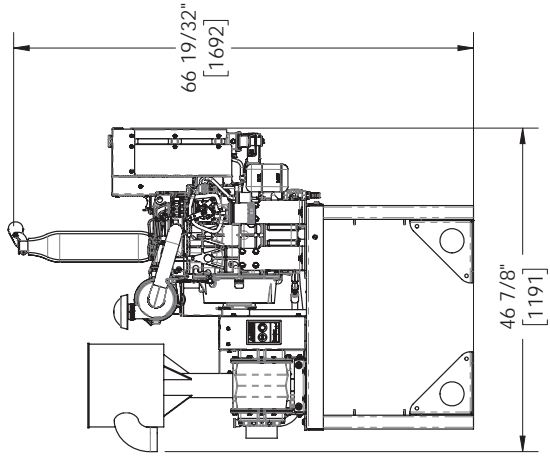
E.H. WACHS
Utility Products
600 Knightsbridge Parkway
Lincolnshire, IL 60069
www.ehwachs.com

TITLE POWERPACK, KUBOTA DT1105 DIESEL - NO CTRLS		SCALE 1:12	REV. A
DRAWN BY HM	APPROVED BY MMW	SHEET 4 OF 7	
DATE 10/4/2018	DATE 10/8/2018	SIZE B	
DWG. NO. 77-260-03			

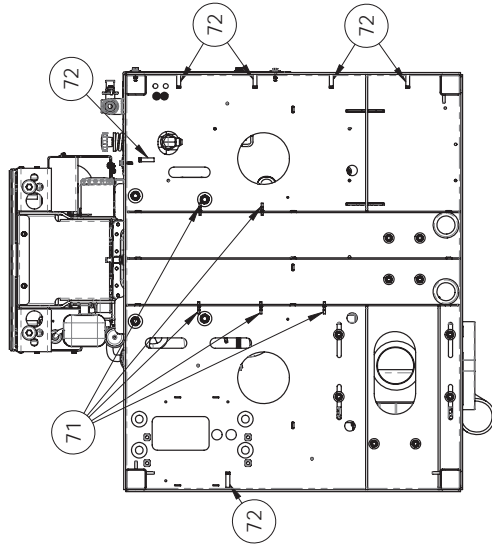
THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
APPLY UNLESS NOTED
FRACTIONS 1/32"
ONE PLACE DECIMAL .1"
TWO PLACE DECIMAL .0100"
THREE PLACE DECIMAL .0010"
HOLE DIMENSIONS .0015"
ANGULAR ± 15 MINUTES

PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.



MOUNTING HOLES
12X 9/16" [14] X 1" [25] THRU



SECTION A-A
SCALE 1 : 12



E.H. WACHS
Utility Products
600 Knightsbridge Parkway
Lincolnshire, IL 60069
www.ehwachs.com

TITLE POWERPACK, KUBOTA DT1105 DIESEL - NO CTRLS

APPROVED BY	DATE	SCALE	REV.
HM	10/4/2018	1:18	A
APPROVED BY	DATE	SHEET	
MWW	10/8/2018	5 OF 7	
SIZE	DWG. NO.		
B	77-260-03		

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
APPLY UNLESS NOTED
FRACTIONS 1/32
ONE PLACE DECIMAL 1/10
TWO PLACE DECIMAL 1/100
THREE PLACE DECIMAL 1/1000
ANGULAR DIMENSIONS
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.

ITEM NO.	PART NUMBER	QTY	DESCRIPTION	LENGTH	ITEM NO.	PART NUMBER	QTY	DESCRIPTION	LENGTH
1	17-060-01	1	PUMP, HYDRAULIC GEAR		31	77-240-05	1	ENGINE ASSEMBLY, KUBOTA DT1105	
2	17-061-30	1	SPIDER, L110 HYTREL - CLOSED CENTER		32	77-240-24	1	LABEL, GREASE FITTING	
3	17-061-40	1	HUB, AL110 1-7/16" BORE (3/16" X 3/8" KEY)		33	77-253-00	1	WELDMNT, DIESEL POWERPACK	
4	17-061-50	1	HUB, AL110 3/4" BORE (3/32" X 3/16" KEY)		34	77-330-01-01	1	HOSE ASSEMBLY	
5	67-294-00	1	KEYSTOCK, 3/8" X 3/8" (INCH)	3"	35	77-330-01-01	1	HOSE ASSEMBLY	
6	68-138-02	1	Strainer, Antifreeze Tank		36	77-330-03-01	1	LABEL, TANK SELECT VALVE	
7	68-158-16	4	HOSE CLAMP, CRIMP-23.9 - 27.1 MM		37	77-330-10-00	1	ASSEMBLY, WATER CONTROLS POWERPACK VMT-2	
8	68-233-00	1	HOSE, 3/4" LP LOCK ON	10"	38	77-486-00	1	BLOWER ASSEMBLY	
9	68-233-00	1	HOSE, 3/4" LP LOCK ON	38"	39	77-520-03-25	1	WIRE HARNESS, ALT TO STARTER	
10	68-243-30	1	ELBOW, 3/4" NPT-M X 3/4" HOSE BARB - NYLON		40	90-051-07	20	HHCS, 1/4-20 X 3/4 GRADE 5 Zn	
11	68-243-30	1	ELBOW, 3/4" NPT-M X 3/4" HOSE BARB - NYLON		41	90-051-27	2	HHCS, 1/4-20 X 2-3/4 SERRATED GRADE 5	
12	77-014-01	1	SILENCER		42	90-055-52	24	WASHER, 1/4 SPLIT RING	
13	77-068-25	1	STRAINER		43	90-055-53	22	WASHER, FLAT, 1/4	
14	77-082-02	1	WELDMNT, PRESSURE WASHER TENSION		44	90-055-57	3	WASHER, 1/4 x 1 OD FENDER 18-8SS	
15	77-085-10	1	PUMP & CLUTCH ASSEMBLY, PRESSURE WASHER		45	90-059-03	3	HHSD, 1/4 X 1 #3PT SS	
16	77-087-27	2	ENGINE SHIM KIT		46	90-061-07	4	HHCS, 5/16-18 x 3/4	
17	77-087-28	2	PUMP MOUNT SHIM KIT		47	90-065-01	2	NUT, 5/16-18 HEX GRADE 8	
18	77-087-35	1	COUPLING GUARD		48	90-065-51	8	WASHER, 5/16 SPLIT RING	
19	77-087-36	1	WELDMNT, PUMP MOUNT		49	90-065-52	8	WASHER, 5/16 FLAT	
20	77-088-21	1	WELDMNT, PRESSURE WASHER GUARD		50	90-071-10	2	HHCS, 3/8-16 X 1	
21	77-089-21	1	WELDMNT, BLOWER BELT GUARD		51	90-071-14	10	HHCS, 3/8-16 X 1-1/2 GR5 ZN	
22	77-111-50	2	V-BELT, AX 37		52	90-071-45	2	HHCS, 3/8-16 X 4-1/2 FLT GR5 ZN	
23	77-111-50	2	V-BELT, AX 37		53	90-075-01	14	NUT, 3/8-16 HEX GR 5 ZN	
24	77-112-00	1	BUSHING, 1.610 X 1-7/16"		54	90-075-52	12	WASHER, 3/8 SPLIT RING	
25	77-126-01	1	SHEAVE, 4AB 44 TB 1610		55	90-075-53	24	WASHER, 3/8 FLAT	
26	77-151-01-06	1	PANEL, ANTIFREEZE SUPPORT		56	90-075-54	4	WASHER, 3/8 AN	
27	77-160-05	2	LABEL, EYE AND EAR PROTECTION		57	90-075-62	3	WASHER, 3/8 INTERNAL/EXTERNAL TOOTH LOCK	
28	77-160-13	2	LABEL, MOVING PARTS PRESENT		58	90-078-60	1	ADAPTER, 3/8 NPT-M X -8 JIC-M - 45 DEG	
29	77-228-01	1	WELDMNT, BLOWER TENSION		59	90-091-18	4	HHCS, 1/2-13 X 1-3/4 GR8 ZN	
30	77-229-01	1	ANGLE BRACKET		60	90-091-41	2	HHCS, 1/2-13 X 4 FULL TRD GRADE 8	



E.H. WACHS
Utility Products
600 Knightsbridge Parkway
Lincolnshire, IL 60069
www.ehwachs.com

TITLE POWERPACK, KUBOTA DT1105 DIESEL - NO CTRLS
DRAWN BY HM
APPROVED BY MWW
DATE 10/4/2018
SCALE 1:18
SHEET 6 OF 7

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN DECIMALS
FRACTIONS 1/32
STANDARD W 1/32
TWO PLACE DECIMAL - F1010
THREE PLACE DECIMAL - F1010
ANGULAR DIMENSIONS - F1010
DO NOT SCALE DRAWING
ANGULAR ± 5 MINUTES
PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE
SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE
WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.

SIZE B
DWG. NO. 77-260-03
REV. A

ITEM NO.	PART NUMBER	QTY	DESCRIPTION	LENGTH
61	90-095-01	6	NUT, 1/2"-13 HEX GRADE 8	
62	90-095-52	10	WASHER, 1/2 FLAT	
63	90-095-58	4	WASHER, 1/2 SPLIT RING	
64	90-098-14	1	Nipple, 1/2" Close, PVC,	
65	90-108-25	4	HHCS, M8-1.25 X 25MM DIN 933 GR8.8 ZN	
66	90-135-03	2	GROMMET, 1 3/4" ID X 2" HOLE X 1/4" THK	
67	910-3/4-1/2-FF-S	1	ADAPTER, 3/4" NPT-M X 1/2" NPT-M	
68	910-8-10-C5OX-S	1	ELBOW, -8 M JIC (3/4"-16) X -10 M ORB (7/8"-14)	
69	910-16-12-C5OX-S	1	ADAPTER, -12 MORB X -16 MJIC 90 DEGREE ELBOW	
70	921-SP0003-RT	1	TANK, 3 GALLON	
71	931-561CB025	6	CLIP, PLASTIC LOOM TO FRAME 1/2"	
72	931-561CB100	6	CLIP, PLASTIC LOOM TO FRAME 1"	



E.H. WACHS
Utility Products
600 Knightsbridge Parkway
Lincolnshire, IL 60069
www.ehwachs.com

TITLE POWERPACK, KUBOTA DT1105 DIESEL - NO CTRLS

DRAWN BY HM APPROVED BY MWW SCALE 1:18

DATE 10/4/2018 DATE 10/8/2018 SHEET 7 OF 7

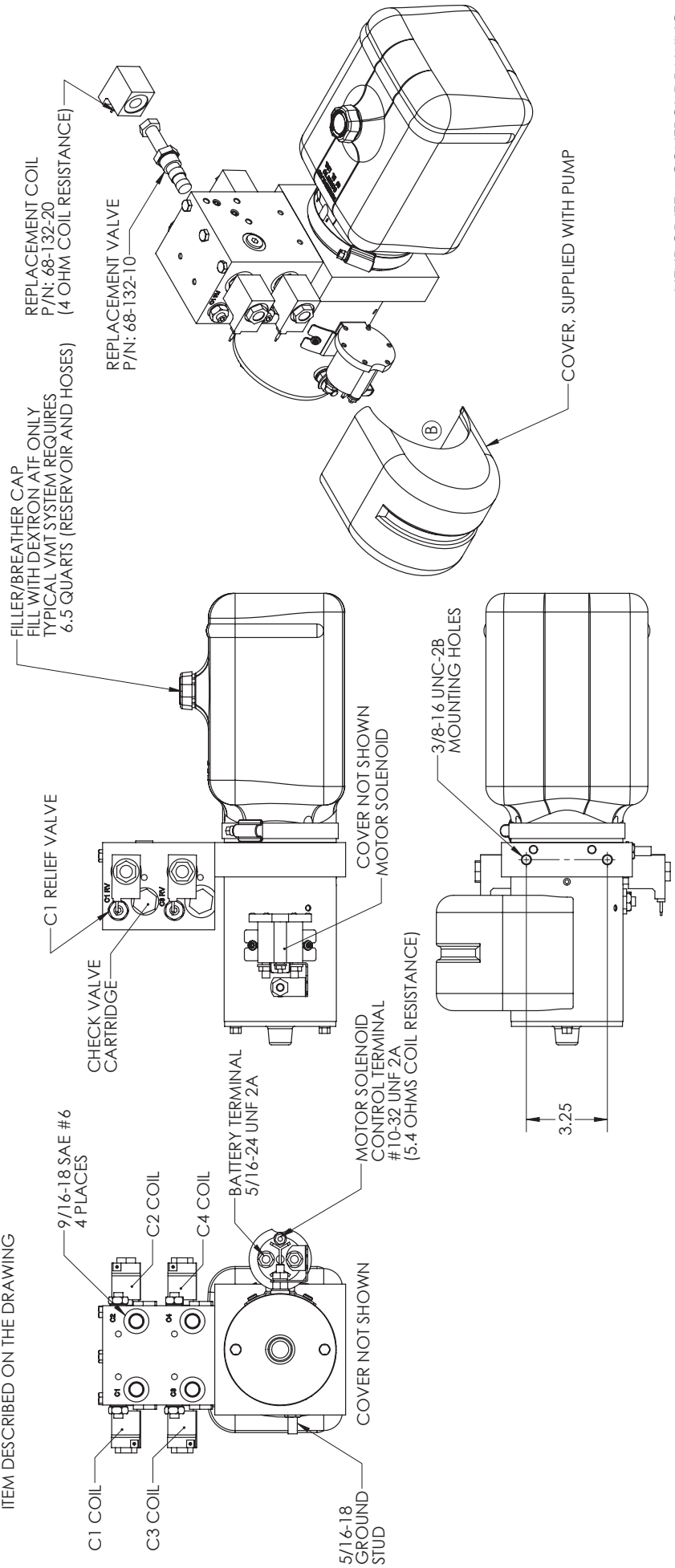
SIZE B DWG. NO. 77-260-03 REV. A

THIRD ANGLE PROJECTION
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN DECIMALS
APPLY UNLESS OTHERWISE SPECIFIED
FRACTIONS 1/32
ONE PLACE DECIMAL 1/16
TWO PLACE DECIMAL 1/32
THREE PLACE DECIMAL 1/64
ANGULAR 1/4 DEGREE
DO NOT SCALE DRAWING
PROPRIARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE
SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE
WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.

REVISION HISTORY

REV.	DESCRIPTION	DATE	APR.
A	NEW DRAWING - ECO 2498	9/15/2014	MWW
B	CHANGE RELIEF SET POINTS, ADD COVER, ECO 3127	3/25/2016	JMB

NOTES:
 1. HYDRAULIC POWER UNIT
 2. APPROX WEIGHT: 34 LB (NO FLUID)
 3. MOTOR SOLENOID: TROMBETTA 634-1261-212 OR EQUIV
 4. IDENTIFICATION OF THE APPROVED SOURCES OF SUPPLY HEREON IS NOT TO BE CONSTRUED AS A GUARANTEE OF PRESENT OR CONTINUED AVAILABILITY AS A SOURCE OF SUPPLY FOR THE ITEM DESCRIBED ON THE DRAWING



VENDOR ITEM CONTROL DRAWING



E.H. WACHS
 Utility Products
 455 Comanche Circle
 Harvard, IL 60033
 www.ehwachs.com

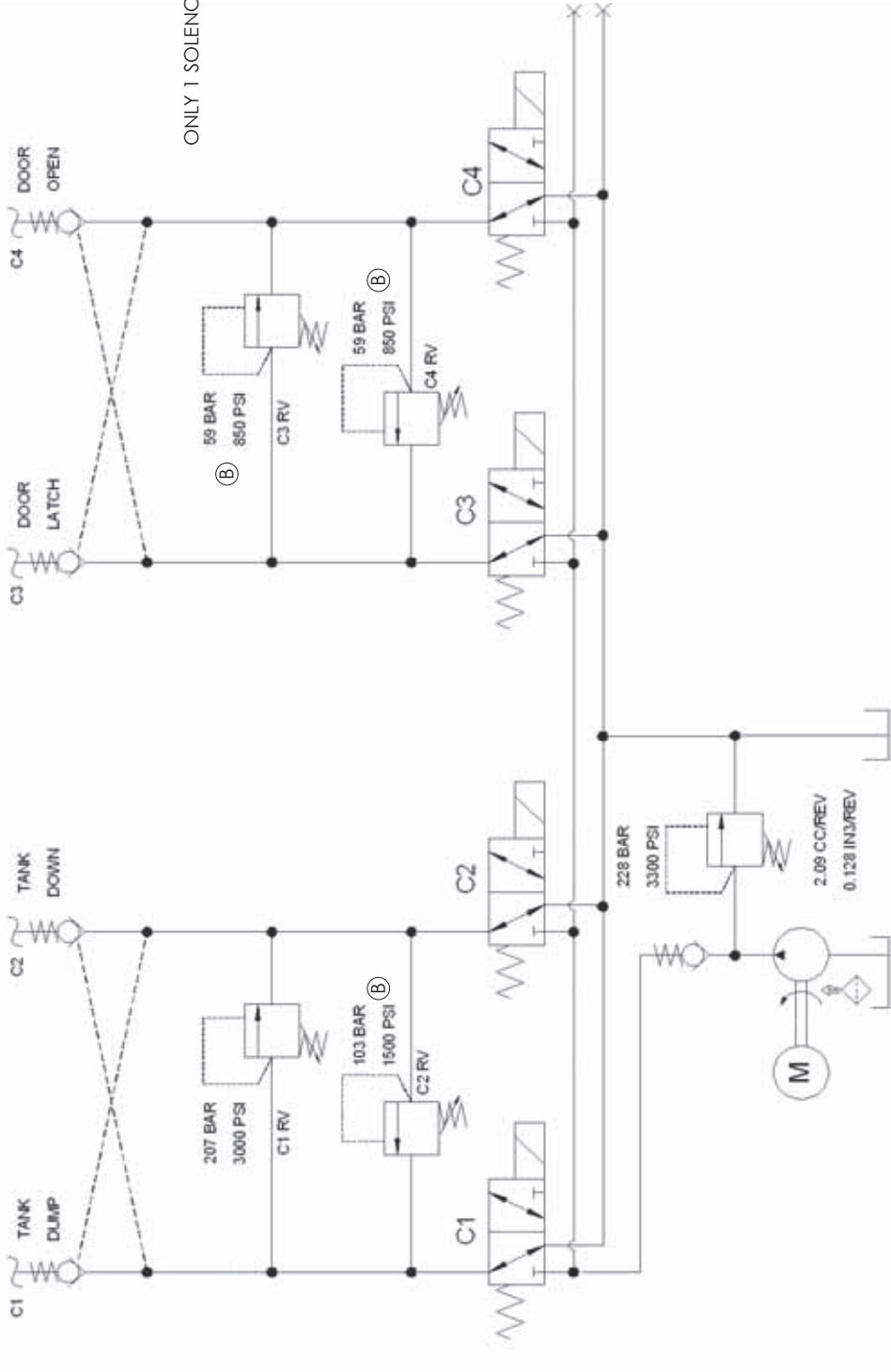
TITLE	HYDRAULIC POWER UNIT - 12 VDC
-------	-------------------------------

DRAWN BY	MWW	APPROVED BY	MWW	SCALE	1:4
DATE	09-15-2014	DATE	09-15-2014	SHEET	1 OF 2
SIZE	B	DWG. NO.	68-132-00	REV.	B

THIRD ANGLE PROJECTION

 UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES
 FRACTIONS 1/32"
 STANDARD W/ 1/32"
 INTERPRET DIM AND TOLERANCE AS SHOWN
 DO NOT SCALE DRAWING
 PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.

RATINGS (PSI)	3000	750	50
CURRENT DRAW (AMP)	260	128	82
FLOW RATE (GPM)	0.88	2.1	3.31
RUN TIME FROM COLD START W/O COOLING (MIN)	2.4	6.6	11.9
DUTY CYCLE (% OF 10 MIN PERIOD)	9	21	27



ONLY 1 SOLENOID COIL SHOULD BE ACTIVE AT A TIME



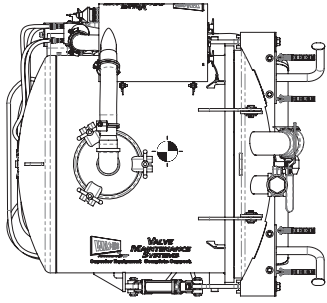
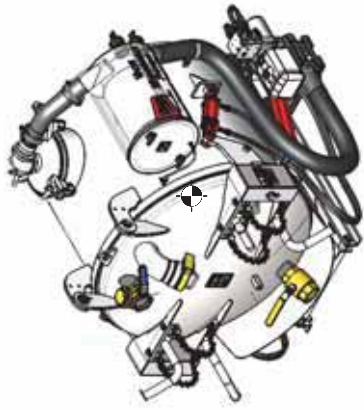
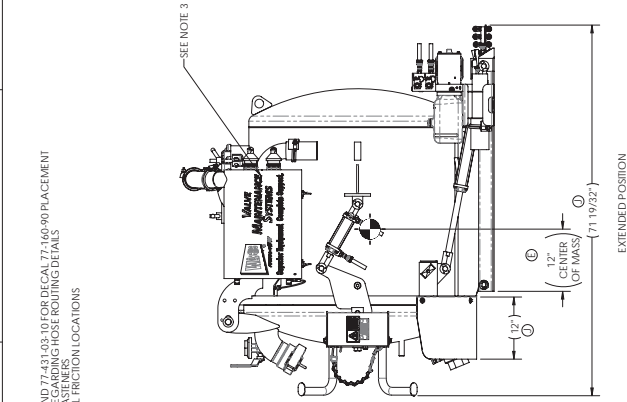
E.H. WACHS
Utility Products
455 Comanche Circle
Harvard, IL 60033
www.ehwachs.com

TITLE	HYDRAULIC POWER UNIT - 12 VDC		
DRAWN BY	MWW	APPROVED BY	MWW
DATE	09-15-2014	DATE	09-15-2014
SIZE	B	DWG. NO.	68-132-00
SCALE	1:4	SHEET	2 OF 2
REV.	B		

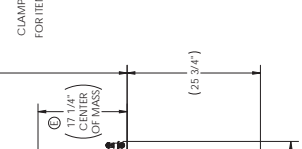
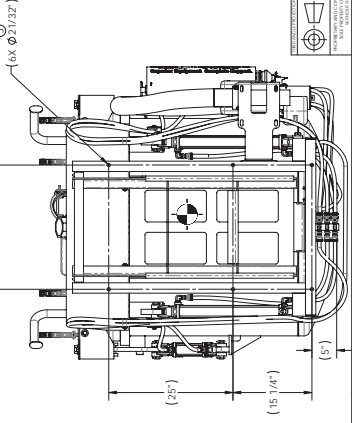
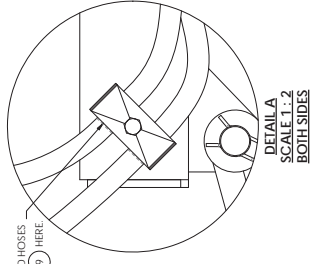
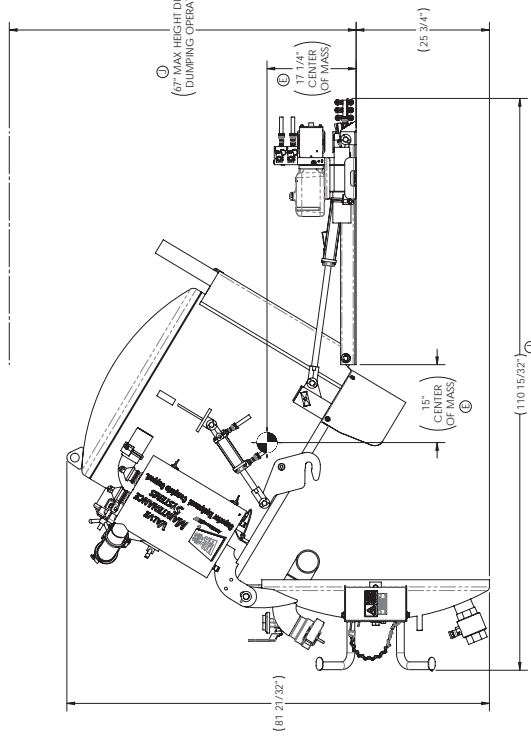
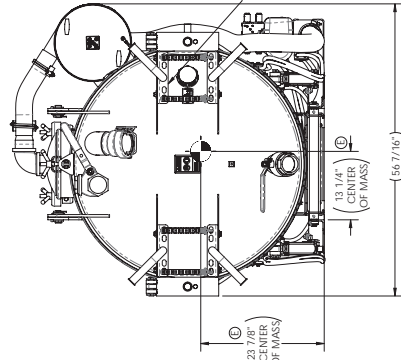
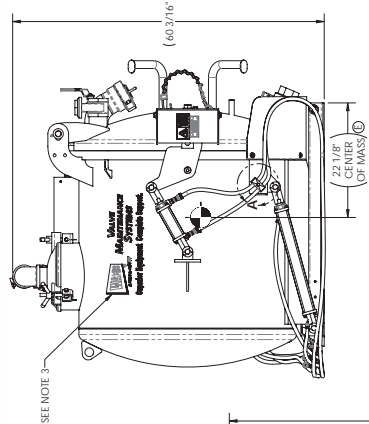
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
FRACTIONS $\frac{1}{32}$
DECIMALS 0.005
TOLERANCES UNLESS OTHERWISE SPECIFIED:
HOLE DIMENSIONS ±0.010
SHAFT DIMENSIONS ±0.005
FIT AND FINISH UNLESS OTHERWISE SPECIFIED:
HOLE AND SHAFT SURFACES UNLESS OTHERWISE SPECIFIED:
HOLE SURFACES: 32 RMS
SHAFT SURFACES: 63 RMS
ANGULAR ±1.5 MINUTES
PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.

- NOTES:
1. MATERIAL PER COMPONENT
 2. SEE WELDING PROCEDURES
 3. SEE WELDING PROCEDURES
 4. REFER TO SCHEMATIC SHEET # REGARDING HOSE ROUTING DETAILS
 5. REFER TO SCHEMATIC SHEET # REGARDING HOSE ROUTING DETAILS
 6. LIBERALLY APPLY GREASE TO ALL FRICTION LOCATIONS
 7. APPROX WEIGHT: 1100 LB

SEE NOTE 3

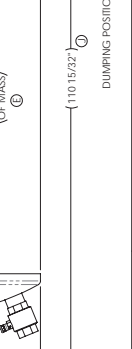
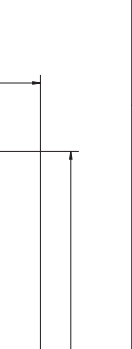
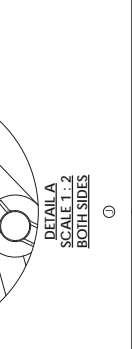
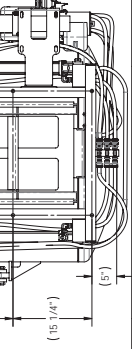


REV.	DESCRIPTION	DATE	APP.
A	CHANGING LETTER	8/24/2011	GLD
B	UPDATE ASSEMBLY AND HYDRAULIC SYSTEMS	5/20/2014	ABB
C	ECO 2000	1/17/2015	ABB
D	MAXX M2000 (2.0) 1932.2"	10/27/2015	ABB
E	ADD CENTER OF MASS AND FUL CRUISE HEIGHT	10/20/16	ABB
F	UPDATE 7.0 (1.0) ECO	1/27/2016	ABB
G	ADD LUGS AND FUL CRUISE HEIGHT	1/20/2017	MM
H	MAXX M2000 (2.0) 1932.2"	2/29/2018	EC
I	ADD CENTER OF MASS AND FUL CRUISE HEIGHT	4/19/2019	MM
J	CHANGING LETTERS	4/19/2019	MM

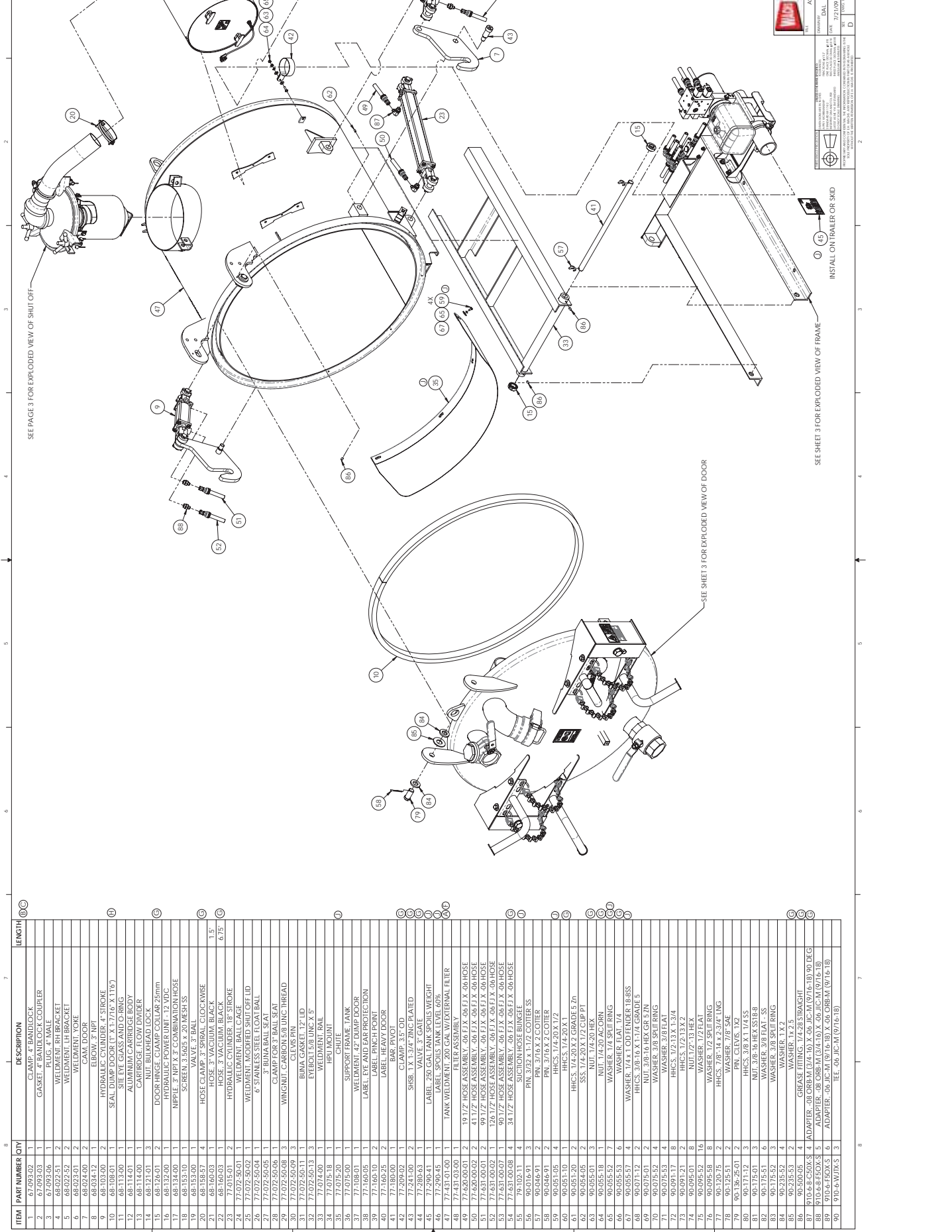


E.H. WACHS 600 KENTWOOD DRIVE WILSON, NC 27157 WWW.EHWACHS.COM	
SHEET 77-431-02-00	TOTAL SHEETS 1 OF 4
DATE 8/21/09	DRAWN BY DAL
CHECKED BY JMW	SCALE 1:12

ASSEMBLY 250 GAL SPOULSTANK



SHEET 77-431-02-00	TOTAL SHEETS 1 OF 4
DATE 8/21/09	DRAWN BY DAL
CHECKED BY JMW	SCALE 1:12



E.H. WACHS
 600 E. Highway 100, P.O. Box 100
 Wausau, WI 54981
 WWW.EHWACHS.COM

ASSEMBLY 250 GAL SPOIL TANK

DATE: 08/21/09
 DRAWN BY: DAL
 CHECKED BY: JAW
 SCALE: 1:16

REV: 2 OF 4
 77-431-02-00

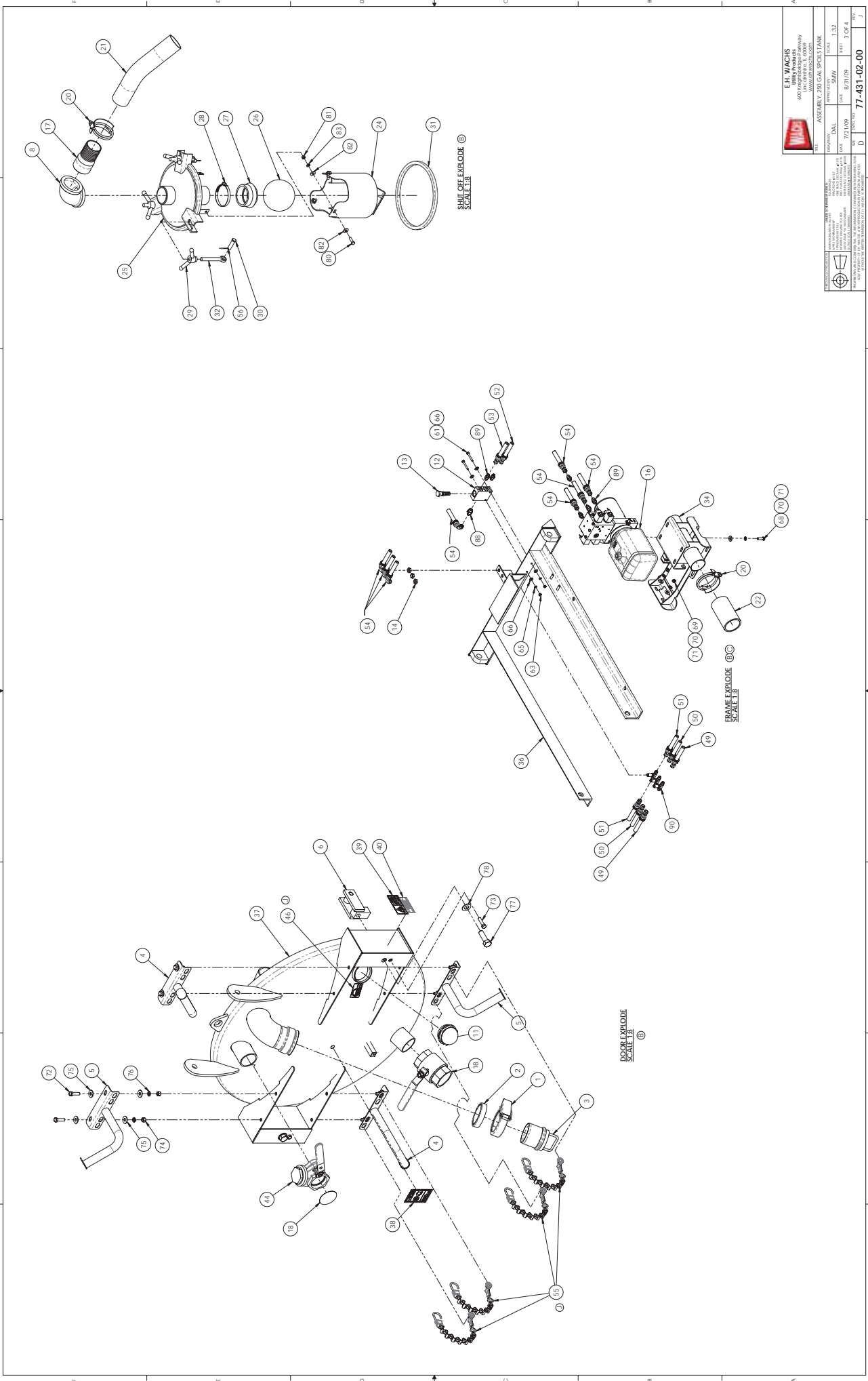
ITEM	PART NUMBER	QTY	DESCRIPTION	LENGTH
1	67-692-03	1	CLAMP, 1/2" BUNGEE	
2	67-293-03	1	GASKET, 2" BUNGEE LOCK	
3	67-093-06	1	PLUG, 4" MALE	
4	68-022-51	2	WELDMENT, RH BRACKET	
5	68-022-52	2	WELDMENT, LH BRACKET	
6	68-023-01	2	WELDMENT, YOKE	
7	68-024-03	2	CLAMP, DOOR	
8	68-103-00	2	HYDRAULIC CYLINDER, 4" STROKE	
9	68-108-01	1	SEAL, DUMP DOOR (17 X 17/16 X 11/16)	
10	68-113-00	1	SITE EYE GLASS AND O-RING	
11	68-114-01	1	ALUMINUM CARTRIDGE BODY	
12	68-114-01	1	CARTRIDGE, FLOW DIVIDER	
13	68-114-00	1	DOOR HINGE, BUTTERFLY (18" x 25" x 1/2")	
14	68-121-01	2	HYDRAULIC POWER UNIT, 12 VDC	
15	68-132-00	1	NIPPLE, 3" NPT X 3" COMBINATION HOSE	
16	68-134-00	1	SCREEN, 3.5625 X .20 MESH SS	
17	68-153-10	1	VALVE, 3" BALL	
18	68-153-00	1	HOSE CLAMP, 3" SPIRAL, CLOCKWISE	
19	68-158-57	4	HOSE, 3" VCLCUM, BLACK	1.5'
20	68-160-03	1	HOSE, 3" VCLCUM, BLACK	6.75'
21	68-160-03	1	HYDRAULIC CYLINDER, 18" STROKE	
22	68-160-03	1	WELDMENT, BALL CAGE	
23	68-160-03	1	WELDMENT, MODIFIED SHUT OFF, LID	
24	68-160-03	1	6" STAINLESS STEEL FLOAT BALL	
25	68-160-03	1	3" BUNA BALL SEAT	
26	68-160-03	1	CLAMP, BALL SEAT	
27	68-160-03	1	WINGNUT, CARBON, 5/8" UNC, THREAD	
28	68-160-03	1	CLEVIS PIN	
29	68-160-03	1	BUNA GASKET, 12" LID	
30	68-160-03	1	EYEBOLT, 5/8" UNC, X 5"	
31	68-160-03	1	WELDMENT, RAIL	
32	68-160-03	1	HPD MOUNT	
33	68-160-03	1	SUPPORT FRAME, TANK	
34	68-160-03	1	WELDMENT, 42" DUMP DOOR	
35	68-160-03	1	LABEL, EYE AND EAR PROTECTION	
36	68-160-03	1	LABEL, PINCH POINT	
37	68-160-03	1	LABEL, HEAVY DOOR	
38	68-160-03	1	BARK PIVOT	
39	68-160-03	1	BAR, PIVOT	
40	68-160-03	1	SHS, 1 X 1.34" GALV. PLATED	
41	68-160-03	1	VALVE, 3" GATE	
42	68-160-03	1	LABEL, 250 GAL TANK SPOILS WEIGHT	
43	68-160-03	1	LABEL, SPOILS TANK LEVEL 60%	
44	68-160-03	1	TANK WELDMENT, 200 GAL, W/EXTERNAL FILTER	
45	68-160-03	1	TELE-ASSEMBLY, 06 FJ X 06 HOSE	
46	68-160-03	1	41 1/2" HOSE ASSEMBLY, 06 FJ X 06 HOSE	
47	68-160-03	1	99 1/2" HOSE ASSEMBLY, 06 FJ X 06 HOSE	
48	68-160-03	1	126 1/2" HOSE ASSEMBLY, 06 FJ X 06 HOSE	
49	68-160-03	1	90 1/2" HOSE ASSEMBLY, 06 FJ X 06 HOSE	
50	68-160-03	1	34 1/2" HOSE ASSEMBLY, 06 FJ X 06 HOSE	
51	68-160-03	1	SUCTION HOSE BUNGEE	
52	68-160-03	1	PNL, 3/16 X 2 COTTER	
53	68-160-03	1	PNL, 3/16 X 2 COTTER	
54	68-160-03	1	HHCS, 1/4-20 X 1/2	
55	68-160-03	1	HHCS, 1/4-20 X 2 GRADE 5-7Z	
56	68-160-03	1	SSS, 20 X 1/2 (10) PPI	
57	68-160-03	1	NUT, 1/4-20 ACORN	
58	68-160-03	1	WASHER, 1/4 SPLIT RING	
59	68-160-03	1	WASHER, FLAT, 1/4	
60	68-160-03	1	WASHER, 1/4 X 1 O.D FENDER 18-8SS	
61	68-160-03	1	HHCS, 3/8-16 X 1 1/2 GRADE 5	
62	68-160-03	1	WASHER, 3/8 FLAT	
63	68-160-03	1	WASHER, 3/8 SPLIT RING	
64	68-160-03	1	WASHER, 3/8 FLAT	
65	68-160-03	1	HHCS, 1/2-13 X 1.3/4	
66	68-160-03	1	HHCS, 1/2-13 X 2	
67	68-160-03	1	NUT, 1/2-13 HEX	
68	68-160-03	1	WASHER, 1/2 FLAT	
69	68-160-03	1	WASHER, 1/2 SPLIT RING	
70	68-160-03	1	HHCS, 7/8" X 2 1/4" LONG	
71	68-160-03	1	WASHER, 7/8" SAE	
72	68-160-03	1	PNL, CLEVIS, X2	
73	68-160-03	1	PNL, CLEVIS, X2	
74	68-160-03	1	HHCS, 3/8 X 1 1/4 SS	
75	68-160-03	1	NUT, 3/8-16 HEX SS18-8	
76	68-160-03	1	WASHER, 3/8 FLAT, SS	
77	68-160-03	1	WASHER, 3/8 SPLIT RING	
78	68-160-03	1	WASHER, 1 X 2 1/2	
79	68-160-03	1	WASHER, 1 X 2 1/2	
80	68-160-03	1	GREASE FITTING, 1/4-28 S STRAIGHT	
81	68-160-03	1	ADAPTER, -08 ORB-M (3/4-10) X -06 JIC-M (9/16-18) 90 DEG	
82	68-160-03	1	ADAPTER, -08 ORB-M (3/4-10) X -06 JIC-M (9/16-18)	
83	68-160-03	1	ADAPTER, -06 JIC-M (9/16-18) X -06 ORB-M (9/16-18)	
84	68-160-03	1	TEL, -06 JIC-M (9/16-18)	

SEE PAGE 3 FOR EXPLODED VIEW OF SHUT OFF

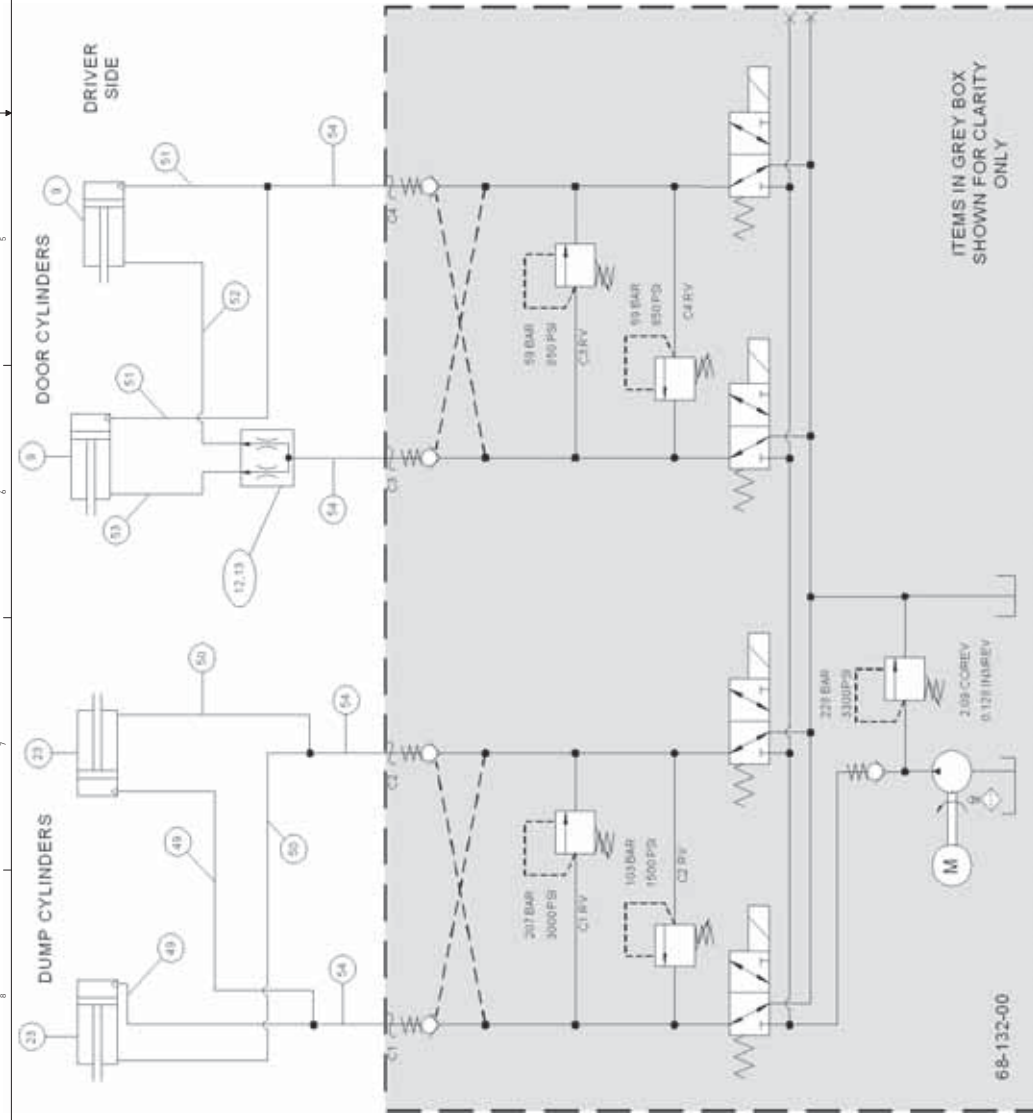
SEE SHEET 3 FOR EXPLODED VIEW OF FRAME

SEE SHEET 3 FOR EXPLODED VIEW OF DOOR

INSTALL ON TRAILER OR SKID



ITEM	DESCRIPTION	QTY	SCALE
ASSEMBLY	250 GAL. SPILL TANK	1	1:32
DATE	REVISED	BY	DATE
7/11/09	8/21/09		
DRAWN BY		CHECKED BY	
7/11/09		8/21/09	
DESIGNED BY		APPROVED BY	
7/11/09		8/21/09	
PARTS LISTED ARE SUBJECT TO CHANGE WITHOUT NOTICE			
THIS DRAWING IS THE PROPERTY OF E.H. WACHS. IT IS TO BE USED ONLY FOR THE PROJECT AND QUANTITY SPECIFIED THEREON.			
ALL DIMENSIONS ARE UNLESS OTHERWISE SPECIFIED			
TOLERANCES UNLESS OTHERWISE SPECIFIED:			
FRACTIONS DECIMALS			
1/16 0.0625			
1/8 0.125			
3/16 0.1875			
1/4 0.25			
3/8 0.375			
1/2 0.5			
5/8 0.625			
3/4 0.75			
7/8 0.875			
1 1.0			
1 1/8 1.125			
1 1/4 1.25			
1 3/8 1.375			
1 1/2 1.5			
1 5/8 1.625			
1 3/4 1.75			
1 7/8 1.875			
2 2.0			
2 1/8 2.125			
2 1/4 2.25			
2 3/8 2.375			
2 1/2 2.5			
2 5/8 2.625			
2 3/4 2.75			
2 7/8 2.875			
3 3.0			
3 1/8 3.125			
3 1/4 3.25			
3 3/8 3.375			
3 1/2 3.5			
3 5/8 3.625			
3 3/4 3.75			
3 7/8 3.875			
4 4.0			
4 1/8 4.125			
4 1/4 4.25			
4 3/8 4.375			
4 1/2 4.5			
4 5/8 4.625			
4 3/4 4.75			
4 7/8 4.875			
5 5.0			
5 1/8 5.125			
5 1/4 5.25			
5 3/8 5.375			
5 1/2 5.5			
5 5/8 5.625			
5 3/4 5.75			
5 7/8 5.875			
6 6.0			
6 1/8 6.125			
6 1/4 6.25			
6 3/8 6.375			
6 1/2 6.5			
6 5/8 6.625			
6 3/4 6.75			
6 7/8 6.875			
7 7.0			
7 1/8 7.125			
7 1/4 7.25			
7 3/8 7.375			
7 1/2 7.5			
7 5/8 7.625			
7 3/4 7.75			
7 7/8 7.875			
8 8.0			
8 1/8 8.125			
8 1/4 8.25			
8 3/8 8.375			
8 1/2 8.5			
8 5/8 8.625			
8 3/4 8.75			
8 7/8 8.875			
9 9.0			
9 1/8 9.125			
9 1/4 9.25			
9 3/8 9.375			
9 1/2 9.5			
9 5/8 9.625			
9 3/4 9.75			
9 7/8 9.875			
10 10.0			



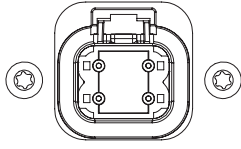
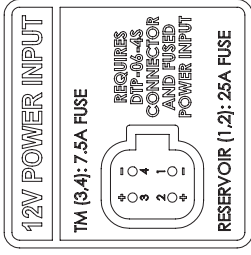
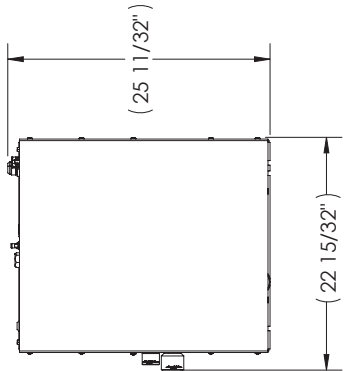
HYDRAULIC SCHEMATIC

E.H. WACHS 600 N. HARRIS BLVD. SUITE 100 MARIETTA, GA 30067 WWW.EHWACHS.COM		ASSEMBLY 250 GAL SPOIL TANK	
DATE	2/11/09	SCALE	1:1
DRAWN BY	DAL	APPROVED BY	SAW
REV	1	DATE	8/21/09
REV	2	DATE	10/07/09
REV	3	DATE	10/07/09
REV	4	DATE	10/07/09
REV	5	DATE	10/07/09
REV	6	DATE	10/07/09
REV	7	DATE	10/07/09
REV	8	DATE	10/07/09
REV	9	DATE	10/07/09
REV	10	DATE	10/07/09
REV	11	DATE	10/07/09
REV	12	DATE	10/07/09
REV	13	DATE	10/07/09
REV	14	DATE	10/07/09
REV	15	DATE	10/07/09
REV	16	DATE	10/07/09
REV	17	DATE	10/07/09
REV	18	DATE	10/07/09
REV	19	DATE	10/07/09
REV	20	DATE	10/07/09
REV	21	DATE	10/07/09
REV	22	DATE	10/07/09
REV	23	DATE	10/07/09
REV	24	DATE	10/07/09
REV	25	DATE	10/07/09
REV	26	DATE	10/07/09
REV	27	DATE	10/07/09
REV	28	DATE	10/07/09
REV	29	DATE	10/07/09
REV	30	DATE	10/07/09
REV	31	DATE	10/07/09
REV	32	DATE	10/07/09
REV	33	DATE	10/07/09
REV	34	DATE	10/07/09
REV	35	DATE	10/07/09
REV	36	DATE	10/07/09
REV	37	DATE	10/07/09
REV	38	DATE	10/07/09
REV	39	DATE	10/07/09
REV	40	DATE	10/07/09
REV	41	DATE	10/07/09
REV	42	DATE	10/07/09
REV	43	DATE	10/07/09
REV	44	DATE	10/07/09
REV	45	DATE	10/07/09
REV	46	DATE	10/07/09
REV	47	DATE	10/07/09
REV	48	DATE	10/07/09
REV	49	DATE	10/07/09
REV	50	DATE	10/07/09
REV	51	DATE	10/07/09
REV	52	DATE	10/07/09
REV	53	DATE	10/07/09
REV	54	DATE	10/07/09
REV	55	DATE	10/07/09
REV	56	DATE	10/07/09
REV	57	DATE	10/07/09
REV	58	DATE	10/07/09
REV	59	DATE	10/07/09
REV	60	DATE	10/07/09
REV	61	DATE	10/07/09
REV	62	DATE	10/07/09
REV	63	DATE	10/07/09
REV	64	DATE	10/07/09
REV	65	DATE	10/07/09
REV	66	DATE	10/07/09
REV	67	DATE	10/07/09
REV	68	DATE	10/07/09
REV	69	DATE	10/07/09
REV	70	DATE	10/07/09
REV	71	DATE	10/07/09
REV	72	DATE	10/07/09
REV	73	DATE	10/07/09
REV	74	DATE	10/07/09
REV	75	DATE	10/07/09
REV	76	DATE	10/07/09
REV	77	DATE	10/07/09
REV	78	DATE	10/07/09
REV	79	DATE	10/07/09
REV	80	DATE	10/07/09
REV	81	DATE	10/07/09
REV	82	DATE	10/07/09
REV	83	DATE	10/07/09
REV	84	DATE	10/07/09
REV	85	DATE	10/07/09
REV	86	DATE	10/07/09
REV	87	DATE	10/07/09
REV	88	DATE	10/07/09
REV	89	DATE	10/07/09
REV	90	DATE	10/07/09
REV	91	DATE	10/07/09
REV	92	DATE	10/07/09
REV	93	DATE	10/07/09
REV	94	DATE	10/07/09
REV	95	DATE	10/07/09
REV	96	DATE	10/07/09
REV	97	DATE	10/07/09
REV	98	DATE	10/07/09
REV	99	DATE	10/07/09
REV	100	DATE	10/07/09

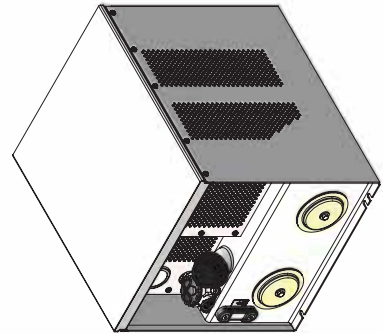
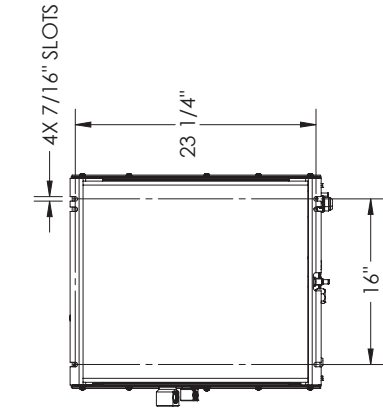
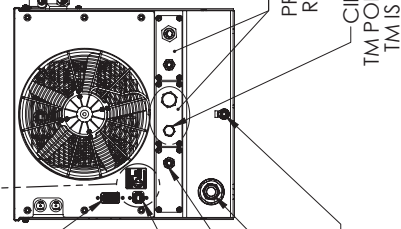
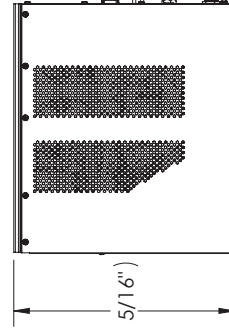
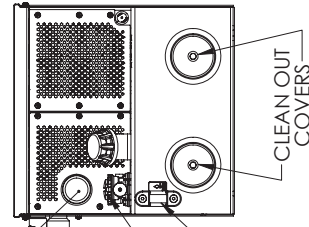
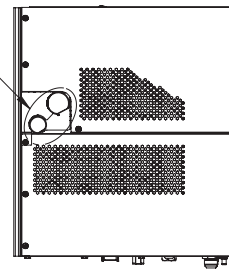
68-132-00

NOTES:

1. MATERIAL - PER COMPONENT
2. HYDRAULIC OIL:
 1. FACTORY SUPPLIED WITH PREMIUM GRADE ANTI-WEAR ISO-32
 2. ISO-46 RECOMMENDED FOR HIGH TEMP ENVIRONMENTS
 3. RECOMMENDED OPERATING OIL VISCOSITY: 100 - 450 SSV [20 - 85 cSt]
3. RESERVOIR CAPACITY: 10 GALLONS
4. FAN TURN-ON OIL TEMP: 120° F
5. OVER-HEAT OIL TEMP: 185° F (CIRCUITS WILL BYPASS)
6. OPERATING TEMPERATURE: -10° TO 120° F [-23° TO 49° C]
7. COLD WEATHER START-UP:
 1. HYDRAULIC FLUID BECOMES THICK IN COLD WEATHER
 2. RUN AT LOW FLOW WITH MINIMAL LOAD
 3. ALLOW HYDRAULIC OIL TO WARM UP TO 50° F [10° C] BEFORE OPERATING UNDER LOAD
8. APPROX WEIGHT: 265 LB FULL WITH HYDRAULIC OIL
 192 LB DRY



**DETAIL A
SCALE 1:1**



E.H. WACHS
 Utility Products
 600 Knightsbridge Parkway
 Lincolnshire, IL 60069
 www.ehwachs.com

REVISION HISTORY	
REV	DESCRIPTION
A	NEW RELEASE - ECO 3443
DATE	APR
6/25/2019	MWW

TITLE		RESERVOIR ASSEMBLY, 3 CIRCUIT SKIDS	
DRAWN BY	APPROVED BY	SCALE	1:12
MWW	MWW	SHEET	1 OF 5
DATE	DATE	REV.	A
08/01/2018	10/10/2018	SIZE	B
DWG. NO.			

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES
 FRACTIONS 1/32"
 DECIMALS 0.0005
 ONE PLACE DECIMAL 0.010
 TWO PLACE DECIMAL 0.0010
 ANGLES 1/4° AND 1/2°
 DO NOT SCALE DRAWING

PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.

ITEM	PART NUMBER	QTY	DESCRIPTION
1	77-185-55	1	OIL DRAIN VALVE, 1/2-20 X 3/8" HOSE
2	77-243-01	1	27-3/16" HOSE ASSEMBLY, -12FJ X -12FJ X -12 HOSE
3	77-243-02	1	30" HOSE ASSEMBLY, -12 FJ X -12 FJ X -12 HOSE
4	77-243-03	2	19-3/16" HOSE ASSEMBLY, -12 FJ X -12 FJ X -12 HOSE
5	77-243-00	3	19-7/8" HOSE ASSEMBLY, -08 FJ X -08 FJ 90 X -08 HOSE
6	77-246-15	1	WELDMENT, RESERVOIR TOP COVER
7	77-246-20	1	SIDE PANEL, RIGHT FULL
8	77-246-22	1	SWIVEL COVER PANEL
9	77-246-23	1	SIDE PANEL, BACK LEFT
10	77-246-24	1	SIDE PANEL, FRONT LEFT
11	77-246-25	1	GAUGE COVER PLATE
12	77-246-60	2	RESERVOIR ACCESS COVER, 6"
13	77-246-70	1	STRAINER BASKET WITH CHAIN
14	77-246-75	1	FILLER CAP WITH BREATHER
15	77-246-00	1	WELDMENT, RESERVOIR
16	77-249-03	1	MANIFOLD ASSEMBLY 3 CIRCUIT SELECTOR
17	77-255-01	1	HYDRAULIC OIL FILTER, IN-TANK RETURN
18	77-255-10	1	FILTER ELEMENT, 10 MICRON
19	77-255-50	1	SUCTION STRAINER, 149 MICRON W/ 5 PSI BYPASS
20	77-256-01	1	RESERVOIR SIGHT LEVEL/THERMOMETER 3" CENTER
21	77-257-01	1	TEMP SWITCH, 120F NO SPST-6 SAE ORB
22	77-257-02	1	TEMP SWITCH, 180F SPDT-8 SAE ORB
23	77-258-10	1	HYDRAULIC COOLER, 12 VDC
24	77-258-12	1	FAN SHROUD
25	77-258-14	1	LOWER COOLER SUPPORT
26	77-259-02	2	BULKHEAD PLATE, -8 + -12
27	77-259-03	1	BULKHEAD PLATE, -8
28	77-264-02	1	FRONT PANEL, NO CONTROLS
29	77-267-03	1	LABEL, OIL LEVEL
30	77-267-04	1	LABEL, 12V POWER INPUT-RESERVOIR
31	77-269-01	1	PRESSURE GAUGE, 0-3000 PSI
32	77-273-07	2	HOLE PLUG, 3/4"
33	77-273-08	1	HOLE PLUG, 7/8"
34	77-274-02	1	WIRE HARNESS, RESERVOIR NO CONTROLS
35	77-277-01	2X 18"	EDGE TRIM, 1/16" EDGE X 5/16" NEOPRENE (INCH)

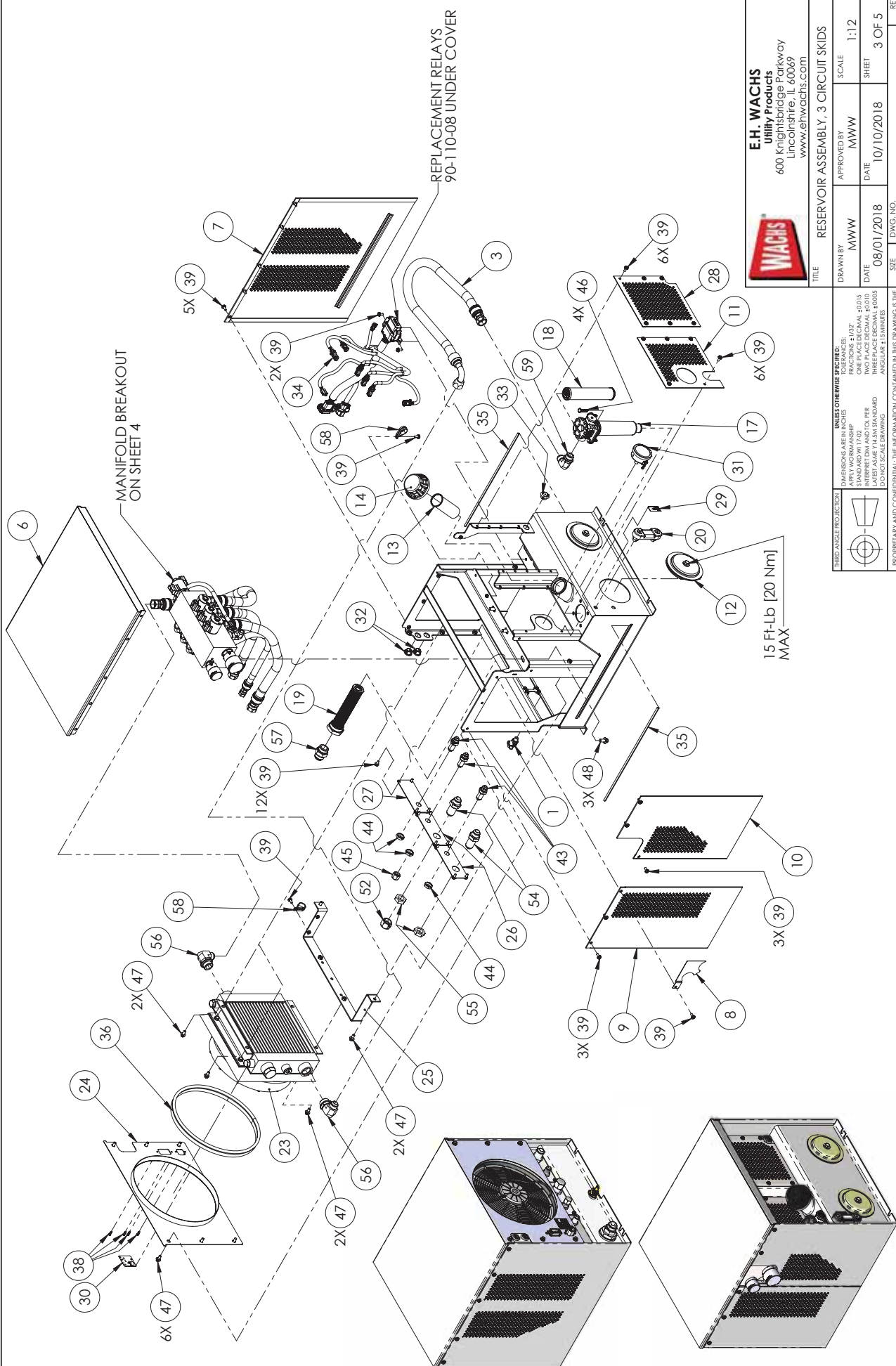
ITEM	PART NUMBER	QTY	DESCRIPTION
36	77-288-01	41"	PUSH-ON BULB SEAL, 1/16" EDGE X 3/8" BULB
37	79-102-06	1	HOSE ASSEMBLY, 1/4" HYDRAULIC 16-1/2" LONG
38	90-030-00	4	TPHST, M4.5 X 14mm
39	90-055-12	38	PHMS, M6 X 16 DOUBLE SEMS
40	90-058-13	1	ELBOW, 1/4 NPT-F X -04 JIC-M (7/16-20)
41	90-078-19	1	ADAPTER, -6 ORB-M (9/16-18) X -4 JIC-M (7/16-20)
42	90-088-90	1	PLUG, SAE -10 ORB (7/8-14)
43	90-098-30	3	ADAPTER, -8 JIC-M (3/4-16) X -8 JIC-M BULKHEAD
44	90-098-31	3	NUT, -8 (3/4-16) BULKHEAD
45	90-098-77	1	-8 (3/4-16) JIC CAP
46	90-1002-30	4	HHCS, M8 X 1.25MM X 30MM
47	90-1055-16	12	HHFS, M8-1.25 X 16 mm ISO 4162 8.8 ZN
48	90-1056-20	3	HHFS, M10-1.5 X 20 mm ISO 4162 8.8 ZN
49	90-200-10	1	SWIVEL, -10 ORB M X -8 ORB F 90
50	90-200-12	1	SWIVEL, -12 ORB M X -12 ORB F 90
51	90-208-10	3	ADAPTER, -10 ORB M (7/8"-14) X -8 JIC M (3/4"-16)
52	90-218-40	1	-12 (1 1/16 - 12) JIC CAP
53	90-218-81	1	ADAPTER, -12 ORB-M (1-1/16" - 12) X -8 ORB-F (3/4"-16)
54	90-218-96	2	ADAPTER, -12 JIC-M X -12 JIC-M BULKHEAD
55	90-218-98	2	NUT, -12 (1-1/16" - 12) BULKHEAD
56	90-238-66	2	ELBOW, -16 ORB M X -12 JIC M
57	90-238-67	1	ADAPTER, -16 ORB-M (1-5/16"-12) X -16 JIC-M
58	90-903-10	2	CUSHIONED LOOP CLAMP, 1"
59	910-12-C50X-S	1	ELBOW, -12 M JIC (1-1/16"-12) X -12 M ORB (1-1/16"-12) 90
60	910-12-F50X-S	3	ADAPTER, -12 JIC-M (1 1/16-12) X -12 ORB-M (1 1/16-12)



E.H. WACHS
Utility Products
600 Knightsbridge Parkway
Lincolnshire, IL 60069
www.ehwachs.com

		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES FRACTIONS 1/32" ONE PLACE DECIMAL .0100 TWO PLACE DECIMAL .0010 THREE PLACE DECIMAL .0005 ANGULAR ± 15 MINUTES DO NOT SCALE DRAWING	
TITLE RESERVOIR ASSEMBLY, 3 CIRCUIT SKIDS		DRAWN BY MWW	APPROVED BY MWW
DATE 08/01/2018	DATE 10/10/2018	SCALE 1:12	SHEET 2 OF 5
SIZE B	DWG. NO. 77-285-03	REV. A	

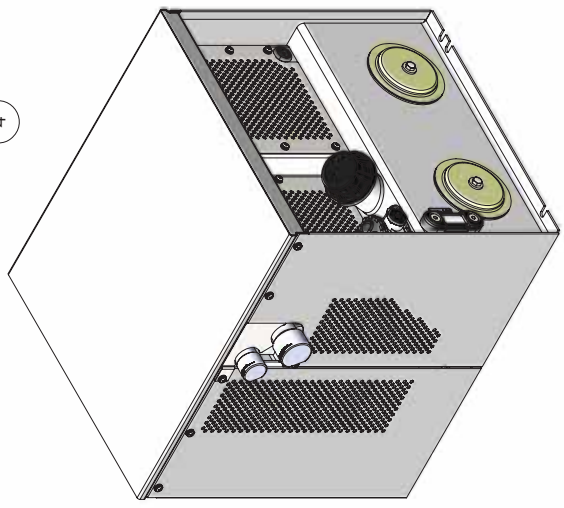
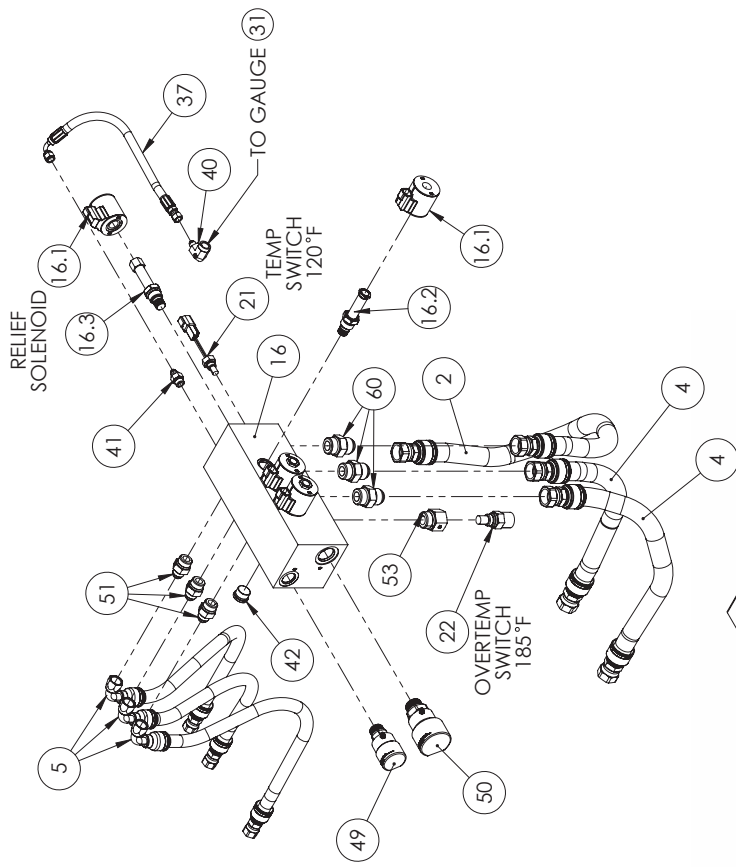
PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.



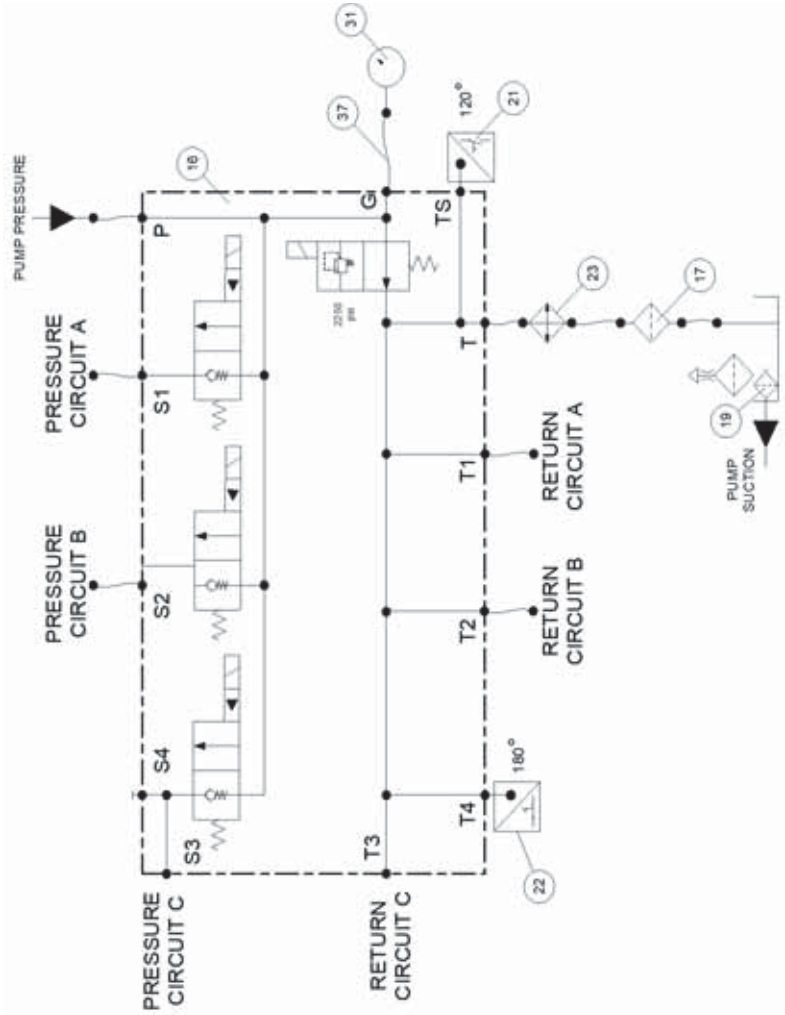
E.H. WACHS
Utility Products
600 Knightsbridge Parkway
Lincolnshire, IL 60069
www.ehwachs.com

TITLE		RESERVOIR ASSEMBLY, 3 CIRCUIT SKIDS	
DRAWN BY	APPROVED BY	SCALE	REV.
MWW	MWW	1:12	A
DATE	DATE	SHEET	
08/01/2018	10/10/2018	3 OF 5	
SIZE	DWG. NO.		
B	77-285-03		

THIRD ANGLE PROJECTION
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
FRACTIONS 1/32"
ONE PLACE DECIMAL 0.1000
TWO PLACE DECIMAL 0.0100
THREE PLACE DECIMAL 0.0010
ANGULAR 1/4 DEGREE
DO NOT SCALE DRAWING
PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE
SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE
WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.



REPLACEMENT PARTS FOR MANIFOLD ITEM (16)			
ITEM	PART NUMBER	QTY	DESCRIPTION
16.1	77-249-20	4	COIL, #10 12 VDC
16.2	77-249-30	3	SV10-20, 2-WAY CARTRIDGE
16.3	77-249-40	1	SVRV10-26F RELIEF CARTRIDGE



HYDRAULIC SCHEMATIC



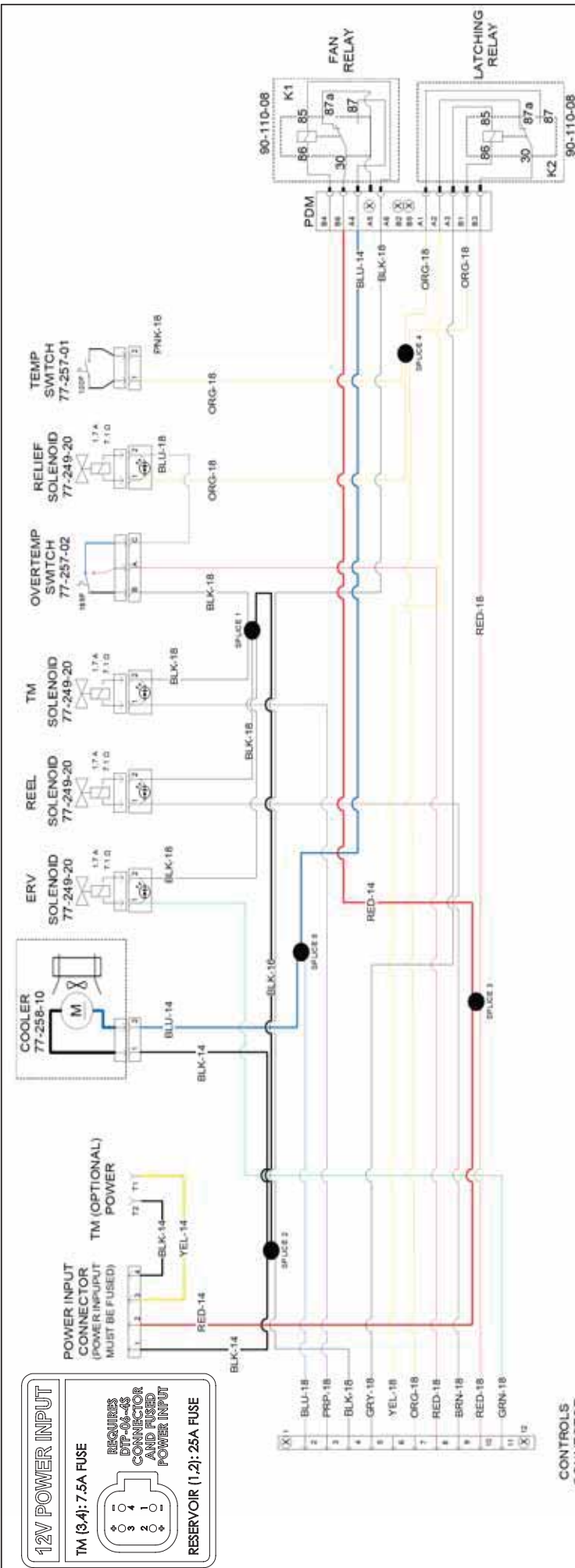
E.H. WACHS
Utility Products
600 Knightsbridge Parkway
Lincolnshire, IL 60069
www.ehwachs.com

TITLE		RESERVOIR ASSEMBLY, 3 CIRCUIT SKIDS	
DRAWN BY	APPROVED BY	SCALE	1:8
MMW	MMW	SHEET	4 OF 5
DATE	DATE	REV.	A
08/01/2018	10/10/2018	SIZE	B
		DWG. NO.	77-285-03

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
APPLY WORKMANSHIP
STANDARD W/1702
INTERPRET DIM AND TOLER
TWO PLACE DECIMAL #0.00
ONE PLACE DECIMAL #0.0
ANGULAR ± 15 MINUTES
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.



12V POWER INPUT

TM (3-4): 7.5A FUSE

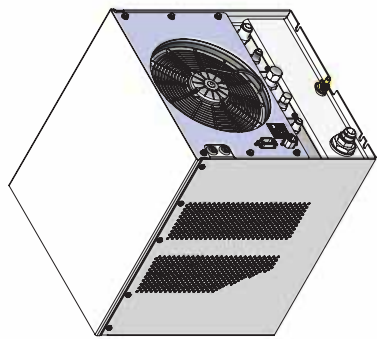
REQUIRES DTP-06-48 CONNECTOR AND FUSED POWER INPUT

RESERVOIR (1-2): 25A FUSE

CONTROLS CONNECTOR

CAVITY	WIRE COLOR	FUNCTION
1	N/A	PLUGGED
2	BLUE	FAN ON INDICATOR +12V (FAN POWER)
3	PURPLE	TM SOLENOID +12V
4	BLACK	CONTROLS GROUND
5	GRAY	LATCHING RELAY GROUND
6	YELLOW	OFF LED POWER (LATCHING RELAY OFF)
7	ORANGE	SWITCH POWER (LATCHING RELAY ON; RELIEF SOL ON)
8	RED	OVERTEMP INDICATOR RETURN TO GROUND
9	BROWN	REEL SOLENOID +12V
10	RED	CONTROLS +12V POWER (POWER INPUT CONNECTOR)
11	GREEN	ERV SOLENOID +12V
12	N/A	PLUGGED

ELECTRICAL SCHEMATIC



E.H. WACHS
Utility Products
600 Knightsbridge Parkway
Lincolnshire, IL 60069
www.ehwachs.com

TITLE		RESERVOIR ASSEMBLY, 3 CIRCUIT SKIDS	
DRAWN BY	MWW	APPROVED BY	MWW
DATE	08/01/2018	DATE	10/10/2018
SIZE	B	DWG. NO.	77-285-03
SCALE		1:12	
SHEET		5 OF 5	
REV.		A	

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
FRACTIONS 1/32"
DECIMALS 0.005"
DIMENSIONS IN PARENTHESES ARE
REFERENCE DIMENSIONS
DIMENSIONS IN BRACKETS ARE
FOR INFORMATION ONLY
DIMENSIONS ARE TO FACE UNLESS
OTHERWISE SPECIFIED
ANGULAR DIMENSIONS ARE TO CENTER UNLESS
OTHERWISE SPECIFIED
DO NOT SCALE DRAWING

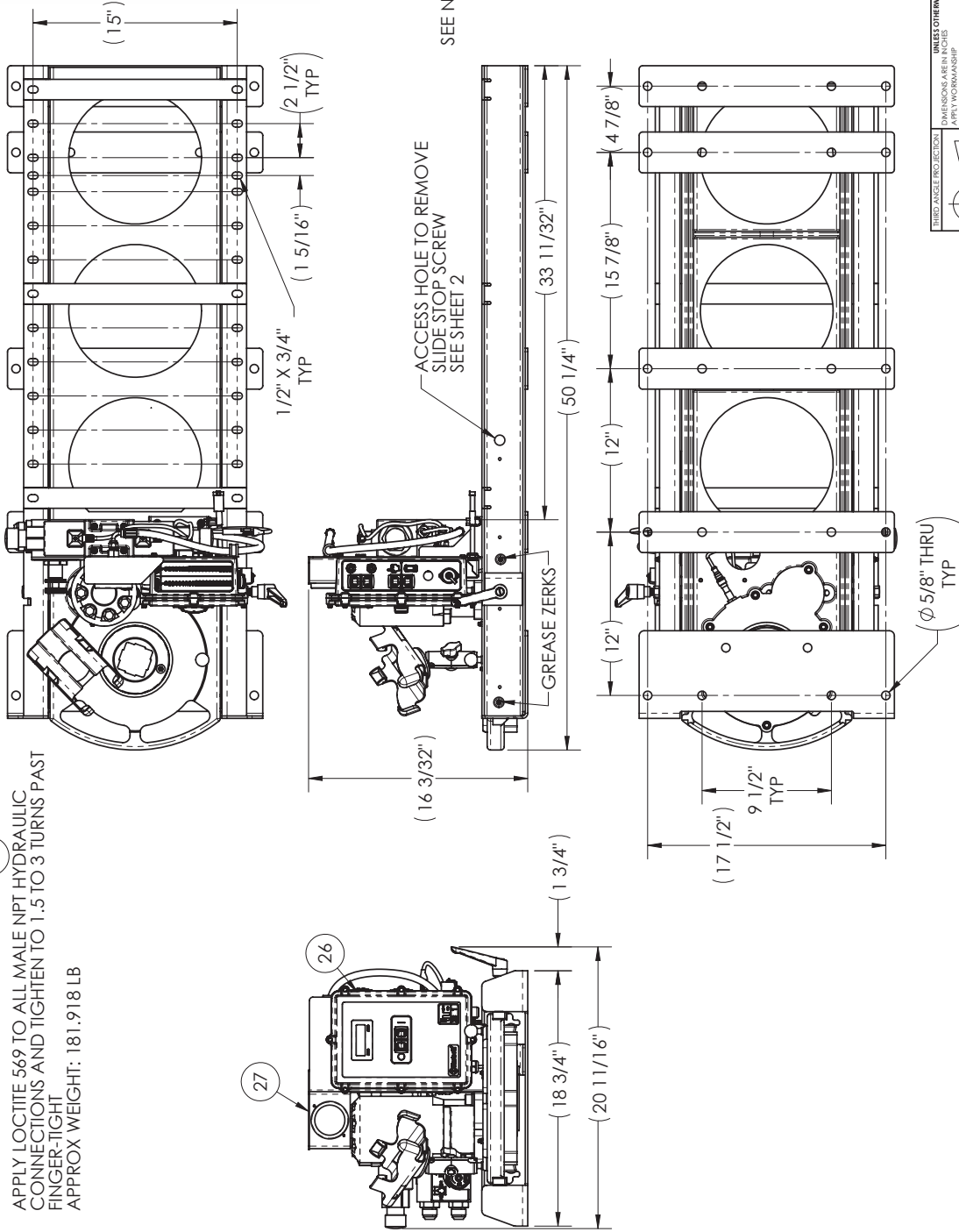
THIRD ANGLE PROJECTION

PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.

NOTES:

1. MATERIAL: PER COMPONENT
2. SEE SHEET 4 FOR ELECTRICAL SCHEMATIC
3. SEE SHEET 2 FOR EXPLODED VIEW
4. PASS HARNESS THROUGH OPENING IN (27)
5. APPLY LOCTITE 569 TO ALL MALE NPT HYDRAULIC CONNECTIONS AND TIGHTEN TO 1.5 TO 3 TURNS PAST FINGER-TIGHT
6. APPROX WEIGHT: 181.918 LB

REVISION HISTORY			
REV	DESCRIPTION	DATE	APR
A	NEW RELEASE PER ECO 3787	4/20/2020	HM

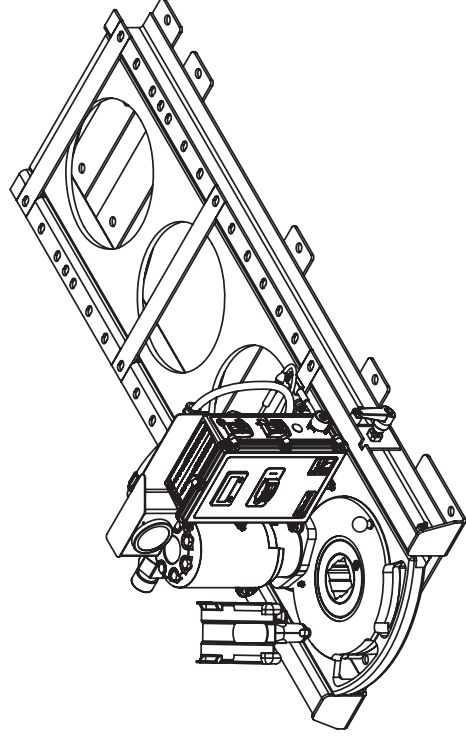


E.H. WACHS
 Utility Products
 600 Knightsbridge Parkway
 Lincolnshire, IL 60069
 www.ehwachs.com

TITLE	TM-7 HD PLUS		
DRAWN BY	HM	APPROVED BY	MWW
DATE	12/20/2019	DATE	01/30/2020
SIZE	B	DWG. NO.	17-000-30
SCALE	1:8	SHEET	1 OF 4
REV.	A		

UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES
 FRACTIONS SHALL BE IN 16ths
 ONE PLACE DECIMAL ±0.015
 TWO PLACE DECIMAL ±0.005
 ANGULAR DIMENSIONS ±0.5°
 TOLERANCES ARE PER ASME Y14.5
 STANDARD W/1702
 INTERPRET DIM AND TOL PER
 ASME Y14.5
 DO NOT SCALE DRAWING
 THIRD ANGLE PROJECTION
 PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.

ITEM	PART NUMBER	QTY	DESCRIPTION
1	17-013-01	1	ADJUSTABLE HANDLE, 1/2-13 X 2-1/2"
2	17-013-02	1	SWIVEL PAD, 1/2-13 DELRIN
3	17-139-00	1	TM7 HYD. MOTOR & MANIFOLD ASSEMBLY, HEAVY DUTY
4	17-156-02	1	LABEL, PRESSURE ADJUST
5	17-159-01	1	26 5/8" HOSE ASSEMBLY, -04 FJ 90 X -04 FJ 90 X -04 HOSE
6	17-317-10	1	QUADRATURE SENSOR
7	17-329-00	1	TM7 HEAD ASSEMBLY
8	17-333-00	1	TM7 FRAME ASSEMBLY
9	17-MAN-00	1	MANUAL, TM-7
10	77-269-01	1	PRESSURE GAUGE, 0-3000 PSI
11	79-039-02	2	1" BALL MOUNT X M10X1.5 EXT THREAD
12	79-202-00	1	CRADLE, VEHICLE MOUNT
13	90-051-05	1	HHCS, 1/4-20 X 1/2
14	90-055-01	1	NUT, 1/4-20 HEX
15	90-055-49	1	WASHER, 1/4 FLAT
16	90-055-52	1	WASHER, 1/4 SPLIT RING
17	90-058-07	1	STREET TEE, 1/4" NPT-M X 1/4" NPT-F X 1/4" NPT-F
18	90-058-08	1	ADAPTER, 1/4" NPT-M X 7/16-20 (-04) JIC-M
19	90-058-14	1	ADAPTER, 1/4" (-04) NPT-F X 7/16-20 (-04) JIC-M
20	90-500-05	4	GREASE FITTING, 1/4-28 STRAIGHT
21	90-903-50	1	CUSHIONED LOOP CLAMP, 1/2"
22	90-903-63	1	MOUNTING CABLE CLAMP, 5/8"
23	90-1062-58	4	HHFS, 1/4-20 x 5/8" GR5 ZN
24	90-1074-10	4	PHSD, M5 x 0.8 X 10 mm ZN
25	910-12-F5OX-S	2	ADAPTER, -12 JIC-M (1 1/16-12) X -12 ORB-M (1 1/16-12)
26	U16-005-010	1	ENCLOSURE ASSEMBLY
27	U16-005-015	1	WELDMENT, ENCLOSURE MOUNT
28	U16-005-020	1	WIRE HARNESS, HYD VALVE TO CONTROLS



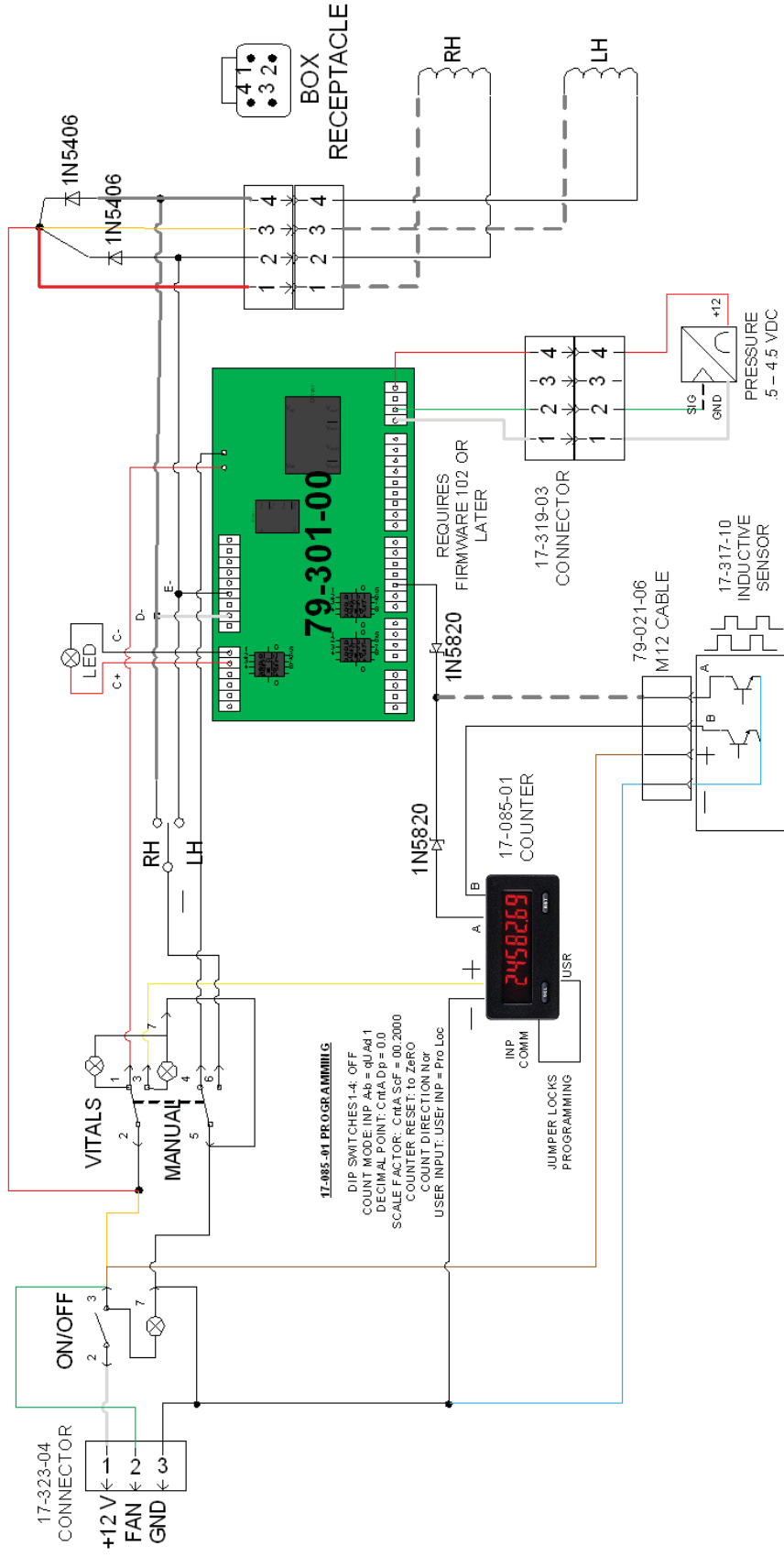
E.H. WACHS
Utility Products
600 Knightsbridge Parkway
Lincolnshire, IL 60069
www.ehwachs.com

TITLE	TM-7 HD PLUS		
DRAWN BY	HM	APPROVED BY	MWW
DATE	12/20/2019	DATE	01/30/2020
SIZE	B	DWG. NO.	17-000-30
SCALE	1:8	SHEET	3 OF 4
REV.	A		

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN DECIMALS
FRACTIONS 1/32"
STANDARD W/ 1/32"
INTERPRET DIM AND TOLER
DO NOT SCALE DRAWING

PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.



E.H. WACHS
 Utility Products
 600 Knightsbridge Parkway
 Lincolnshire, IL 60069
 www.ehwachs.com

TITLE		DRAWN BY		APPROVED BY		SCALE	
		HM		MMW		1:8	
DATE		DATE		DATE		SHEET	
12/20/2019		01/30/2020		01/30/2020		4 OF 4	
SIZE		DWG. NO.		REV.			
B		17-000-30		A			

THIRD ANGLE PROJECTION

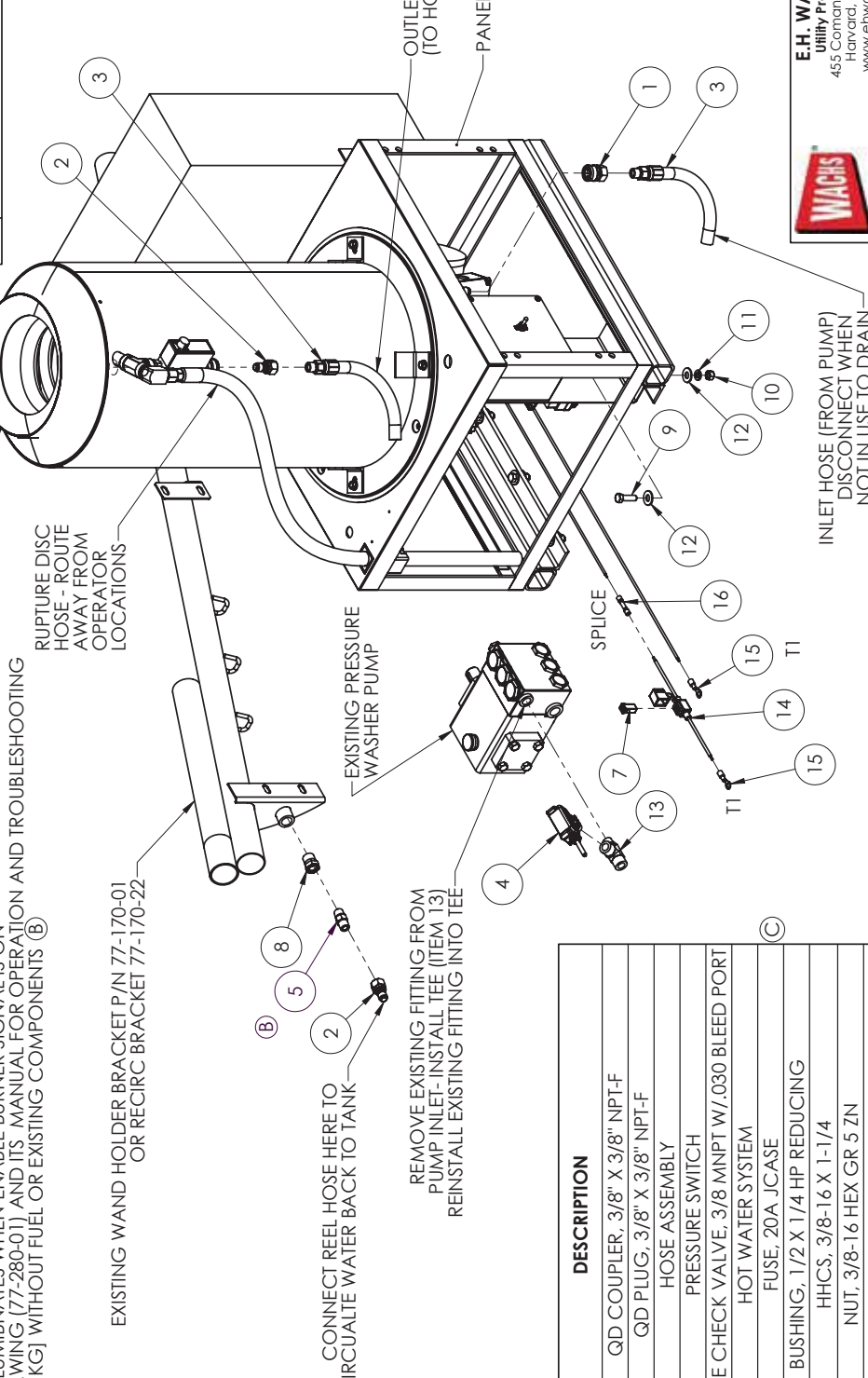
UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES
 ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE
 STANDARD UNITS: INCHES
 ONE PLACE DECIMAL: 0.1000
 TWO PLACE DECIMAL: 0.0100
 THREE PLACE DECIMAL: 0.0010
 ANGULAR DIMENSIONS: DEGREES
 DO NOT SCALE DRAWING

PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.

NOTES:

1. MATERIAL: PER COMPONENT
2. CHECK VALVE (ITEM 5) SET TO 600 PSI WHILE PUMP AT IDLE FLOW CONDITION
3. CHECK VALVE BUILDS PRESSURE TO ACTUATE PRESSURE SWITCH (ITEM 4)
4. WHEN NOT IN USE DISCONNECT WATER HEATER [COUPLE INLET AND OUTLET HOSES TOGETHER]
5. WATER HEATER REQUIRES THREE CONDITIONS TO ENABLE BURNER:
 1. PRESSURE SWITCH (ITEM 4) SWITCHED ON WITH PRESSURE
 2. FLOW SWITCH (P/N: 77-280-13) SWITCHED ON WITH FLOW AT THE HEATER INLET
 3. TEMPERATURE CONTROL SWITCH (P/N: 77-280-12) CALLS FOR HEAT
6. GREEN ENABLE PILOT LIGHT ILLUMINATES WHEN ENABLE BURNER SIGNAL IS ON
7. REFER TO WATER HEATER DRAWING (77-280-01) AND ITS MANUAL FOR OPERATION AND TROUBLESHOOTING
8. APPROX WEIGHT: 300 LB [136 KG] WITHOUT FUEL OR EXISTING COMPONENTS (B)

REVISION HISTORY			
REV	DESCRIPTION	DATE	APR
A	NEW RELEASE 0 ECO 2651	12/13/2014	MWW
B	NEW WATER HEATER HEIGHT PER MFG. ITEM 5, 77-276-10 WAS 77-276-01 REMOVED ITEM 13, 90-078-51	6/9/2015	MWW
C	ADDED FUSE; DIRECT CONNECTO TO BATTERY; ADDED SHEET 3 SCHEMATIC - ECO 312	10/13/2016	MWW



ITEM	PART NUMBER	QTY	DESCRIPTION
1	68-201-00	1	QD COUPLER, 3/8" X 3/8" NPT-F
2	68-202-50	2	QD PLUG, 3/8" X 3/8" NPT-F
3	77-263-01	2	HOSE ASSEMBLY
4	77-265-00	1	PRESSURE SWITCH
5	77-276-10	1	ADJUSTABLE CHECK VALVE, 3/8 MNPT W/.030 BLEED PORT
6	77-280-01	1	HOT WATER SYSTEM
7	77-381-20	1	FUSE, 20A, J-CASE
8	90-058-57	1	BUSHING, 1/2 X 1/4 HP REDUCING
9	90-071-12	8	HHCS, 3/8-16 X 1-1/4
10	90-075-01	8	NUT, 3/8-16 HEX GR 5 ZN
11	90-075-52	8	WASHER, 3/8 SPLIT RING
12	90-075-53	16	WASHER, 3/8 FLAT
13	90-078-15	1	TEE, 3/8 NPT-M X 3/8 NPT-F X 3/8 NPT-F STREET
14	90-110-04	1	FUSE HOLDER, J-CASE WEATHER PROOF
15	90-501-14	2	TERMINAL, 12-10 AWG 5/16" RING HT SHRINK
16	90-501-34	1	TERMINAL, 12-10 AWG BUTTSPlice ADHESIVE SHRINK



E.H. WACHS
Utility Products
455 Comanche Circle
Harvard, IL 60033
www.ehwachs.com

TITLE			
DRAWN BY	APPROVED BY	SCALE	
MWW	MWW	1:8	
DATE	DATE	SHEET	
12/13/2014	12/13/2014	1 OF 3	
SIZE	DWG. NO.		
B	77-414-01		

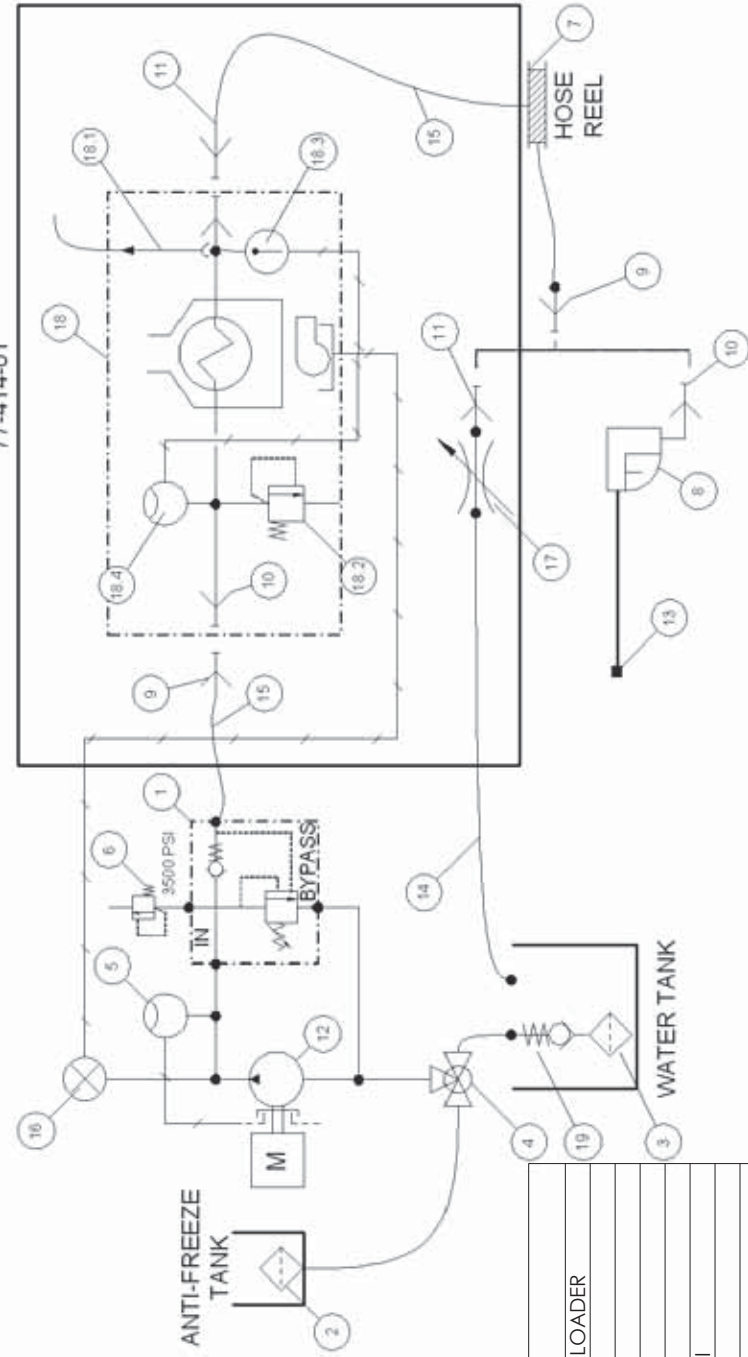
THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
FRACTIONS 1/32"
DECIMALS 0.0005
HOLE DIMENSIONS ARE TO BE INTERPRETED AND TOLERANCES TO NOT SCALE DRAWING

PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.

SYSTEM LEVEL PRESSURE WASHER SCHEMATIC

77-414-01



ITEMS SHOWN IN TABLE FOR REFERENCE ONLY
BOM TABLE FOR 77-414-01 ON SHEET 1

ITEM	PART NUMBER	DESCRIPTION
1	68-137-01	VALVE, TRAPPED PRESSURE UNLOADER
2	68-138-02	STRAINER
3	68-138-03	STRAINER
4	68-141-10	BALL VALVE, 3-WAY
5	68-188-00	FLOW SWITCH
6	68-193-35	SAFETY RELIEF- 3500 PSI
7	68-195-50	HOSE REEL
8	68-199-00	SPRAY GUN
9	68-201-00	QD COUPLER, 3/8" X 3/8" NPT-F
10	68-202-00	QD PLUG, 3/8" x 3/8" NPT-M
11	68-202-50	QD PLUG, 3/8" x 3/8" NPT-F
12	77-085-00	PUMP PRESSURE WASHER 2.6 GPM, 3000 PSI
13	77-130-01	NOZZLE, .030 X 15 DEGREE
14	77-263-00	HOSE ASSEMBLY
15	77-263-01	HOSE ASSEMBLY
16	77-265-00	PRESSURE SWITCH
17	77-276-10	ADJUSTABLE CHECK VALVE, 3/8 MNPT W/.030 BLEED PORT
18	77-280-01	WATER HEATER
18.1	77-280-10	RUPTURE DISC ASSEMBLY, 7000 PSI
18.2	77-280-11	RELIEF VALVE
18.3	77-280-12	TEMPERATURE CONTROL SWITCH
18.4	77-280-13	FLOW SWITCH
19	90-218-21	CHECK VALVE

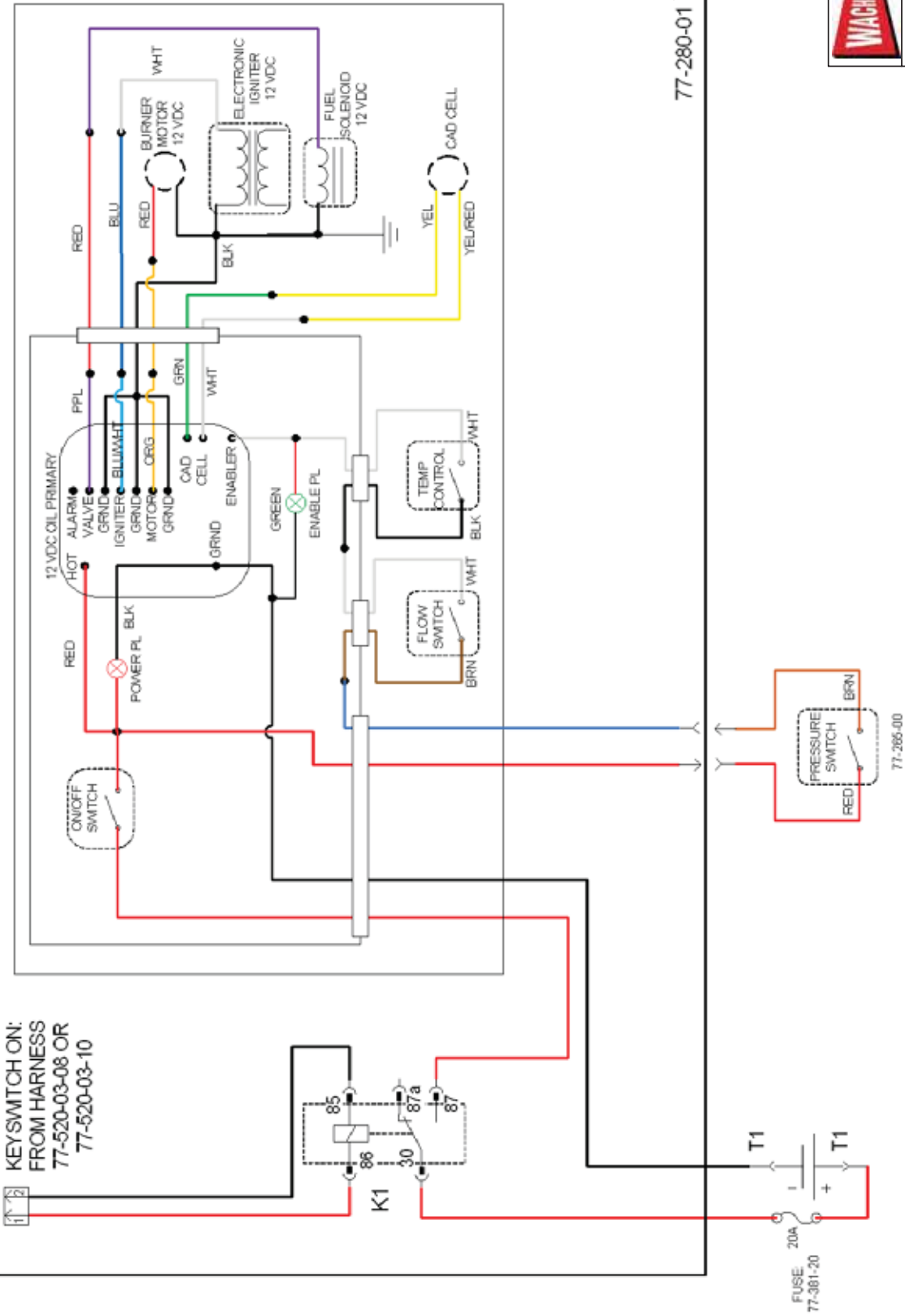


E.H. WACHS
Utility Products
455 Comanche Circle
Harvard, IL 60033
www.ehwachs.com

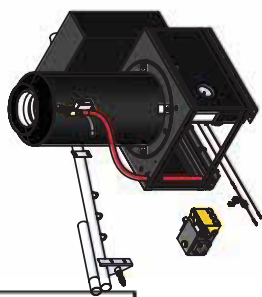
TITLE HOT WATER KIT			
DRAWN BY MWW	APPROVED BY MWW	SCALE 1:8	
DATE 12/13/2014	DATE 12/13/2014	SHEET 2 OF 3	
SIZE B	DWG. NO. 77-414-01	REV. C	

THIRD ANGLE PROJECTION
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
APPLY WORKMANSHIP
STANDARD W/1/32"
INTERPRET DIM AND COLOR
BY THE DRAWING
DO NOT SCALE DRAWING
PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE
SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE
WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.

KEYSWITCH ON:
FROM HARNESS
77-520-03-08 OR
77-520-03-10



77-280-01



E.H. WACHS
Utility Products
455 Comanche Circle
Harvard, IL 60033
www.ehwachs.com

TITLE		HOT WATER KIT	
DRAWN BY	MWW	APPROVED BY	MWW
DATE	12/13/2014	DATE	12/13/2014
SCALE	1:8	SHEET	3 OF 3
SIZE	B	DWG. NO.	77-414-01
REV.	C		

THIRD ANGLE PROJECTION
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
FRACTIONS 1/32"
STANDARD 1/16"
INTERPOL AND OLE PER
DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWING
ANGULAR 1/4 DEGREES
PROPRIARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE
SOLE PROPERTY OF E.H. WACHS. ANY REPRODUCTION IN PART OR AS A WHOLE
WITHOUT THE WRITTEN PERMISSION OF E.H. WACHS IS PROHIBITED.



600 Knightsbridge Parkway • Lincolnshire, IL 60069
847-537-8800 • www.ehwachs.com