



AL-1
OWNER/OPERATOR
MANUAL

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Parker P1 Variable Displacement Piston Pump


890 Chelsea PTO

Scott Hoist

Venco Hoist 6628



Part 1: A Word to Owner, Operator, and Service Personnel About Safety

 WARNING
FAILURE TO READ THIS BOOKLET IS A MISUSE OF THE EQUIPMENT. ANYONE WHO WILL OPERATE, SERVICE OR WORK AROUND THIS LOADER MUST FIRST READ THIS BOOKLET. DEATH OR SERIOUS INJURY MAY RESULT FROM IMPROPER USE OR MAINTENANCE OF THIS LOADER.

Introduction

Anyone who will operate, service or work around the loader should first read this manual. It is important that all workers understand the safety, operational, service, and repair requirements of the loader. Death or serious injury can result from improper use or maintenance of the loader.

As an owner or employer, it is your responsibility to know the specific requirements, governmental regulations, precautions, and work hazards that exist. You should make these known to all personnel working with the equipment or in the area. It is your responsibility to instruct the operator in the safe operation of the equipment and to provide the operator with properly maintained equipment.

It is the operator's responsibility to operate the loader with skill, good judgment and caution. Following recognized safety procedures helps to avoid accidents.

Do not allow untrained personnel, even on a temporary basis, to operate this equipment. Operators must be trained by an experienced trash loader operator who is familiar with all aspects of operation, safety, and maintenance of this equipment. Keep children, visitors and untrained personnel away from the equipment.

Modifications to any part of this loader can create a safety hazard and therefore shall not be made without the manufacturer's written approval. Use only factory approved parts to repair or maintain this equipment. If this equipment is rebuilt or remounted, mounting procedures and retesting is required in accordance with factory instructions.



WARNING

DO NOT OPERATE THE LOADER UNDER ANY CIRCUMSTANCE IF THERE IS REASON TO BELIEVE THE UNIT IS BROKEN OR MALFUNCTIONING. DO NOT ATTEMPT TO PLACE THE BOOM OF A BROKEN OR MALFUNCTIONING UNIT IN THE BODY OF THE LOADER UNIT WITHOUT ASSISTANCE FROM ANOTHER CRANE OR LIFTING DEVICE. ANY ATTEMPT TO USE OR MOVE THE BROKEN OR MALFUNCTIONING UNIT COULD RESULT IN SERIOUS BODILY INJURY OR DEATH.

The lighting and reflective devices on the unit is in compliance with FMVSS 108, however it is the responsibility of the end user to verify that the lighting specifically complies with any additional local requirements for the area that the truck is to be operated within.

The mud flaps installed on the unit are positioned based on the method of locating the mud flap a distance behind the rear tire in order for the bottom of the mud flap to be mounted low enough to be below the line formed from a 22.5 degree tangent angle out the rear tire. It is however the responsibility of the end user to verify that the mud flaps comply with requirements for the area that the truck is to be operated within.



Part 2: Daily Inspections - Before Leaving the Storage Facility

One of the most important factors in the prevention of accidents is a positive attitude towards safety. The habit of anticipating possible problems normally prevents many accidents from occurring.

Each morning, prior to leaving the storage facility or lot, the following inspections should be made:

1. Check oil level and battery.
2. Check the brakes and backup alarm. The backup alarm must always be sounding prior to backing up. Verify that the boom up alarm is functioning properly. If your unit is equipped with any additional alarms or warning lights, check these items also for proper operation.
3. Check rearview mirrors and adjust if necessary.
4. Check tires for proper inflation, cuts, and loose wheel nuts.
5. Check head and taillights, strobes, and flashers for proper operation.
6. Check the hydraulic system for any unusual conditions such as pools of hydraulic fluid or lubricating oil under the chassis, any outrigger which may have crept down, or any signs of damage or improper maintenance. The hydraulic hoses should be free from cuts and abrasions and there should be no evidence of binding or leakage.
7. Ensure that outriggers are fully retracted and the bucket is open and resting on the floor of the body. If the body contains debris, the bucket should be closed and at rest on the load. Ensure that most of the bucket and boom tip are below top of body.

Consult the truck manufacturer's manual for vehicle checks recommended by them.

Any insufficiencies found during this inspection must be corrected prior to use of the equipment.



Part 3: Safety Devices

We will now discuss some of the components designed into the loader system to ensure that safe loader control is maintained. There are hydraulic system flow devices designed into the loader system to control the flow of hydraulic fluid. Loader control and speed are essential to the safe operation of, and longevity of the loader.

To maintain safe loader control you must ensure that proper engine speed is observed, all oil flow restrictors are in place and have not been modified, and all valves are operating properly. You must not remove, or tamper with the manufacturer's recommended settings of oil flow devices.

Excessive operating speed causes erratic operation of the loader. Excessive operating speed decreases operator control and increases the stresses on the loader's supporting structures, which could cause unexpected component failure. The result of unexpected component failure could be damage to the equipment and/or serious bodily injury or death.

LOAD CONTROL VALVES

The load control valves are either a part of or plumbed directly onto load holding cylinders. These valves are found on the main boom lift cylinder, tip cylinder, tip extension, and the outrigger cylinders.

Main Boom Lift, Tip, and Tip Extension Cylinders:

Counter-balance Valves: - The counter-balance valve is a cartridge type valve, mounted directly into a housing that is welded to the lift, tip, and tip extension cylinders. These valves hold the load until hydraulic pressure is applied to it causing the valve to open. This ensures the load is held in case of hose rupture, or other hydraulic system failure.

Notice to Operators: If load control valve(s) malfunction, do not attempt to adjust valves, and/or continue to use the loader. Return to the maintenance facility for repair.

Counter-balance valve adjustment is not normally needed after initial installation. However, if adjustment is needed, first release load from valve and rest bucket on ground or floor of body. Turn valve screw far enough out so that valve will hold load when control valve is opened and truck PTO is off. The PTO should be off when adjusting the screw, back on to lift the boom, and off again to test load holding capability of the valve.

If the cartridge valve is replaced, you must first release the load from the valve. This means the boom must be at rest in the floor of the body or on the ground, prior to removing the cartridge valve.



WARNING

FAILURE TO FOLLOW THE PRECEDING INSTRUCTIONS REGARDING COUNTER-BALANCE VALVE ADJUSTMENT AND/OR REPLACEMENT, COULD RESULT IN THE BOOM FALLING ONCE THE CARTRIDGE VALVE IS REMOVED, WHICH COULD RESULT IN DAMAGE TO THE EQUIPMENT OR SERIOUS PERSONAL INJURY OR DEATH.

If the operator experiences hydraulic failure while on route, first try to get the hydraulic system working again. If you cannot get the hydraulic system working, we recommend that you call for the assistance of an auxiliary service vehicle that can provide a power source for the loader hydraulic system. The connections from the auxiliary power source should be made from the work ports of a valve on the auxiliary power source directly to the cylinder or motor that needs to be moved to get the loader back into a stowed position for travel.

Outrigger Cylinders:

Pilot Operated Check Valve: - The outrigger cylinders use pilot operated check valves which are part of the cylinders. In the event of hose failure, these valves hold the load until hydraulic pressure is applied, causing the valve to open.

These valves are factory preset and are not serviceable.

If you need to remove this valve, make sure the load is released from the cylinder prior to removing the valve.



BACK-UP ALARM

All truck mounted loaders have back-up alarms that must sound any time the gear shift selector is in reverse “R”. The back-up alarm is on the daily checklist of items to be checked prior to leaving the storage facility. If the back-up alarm is not working, it must be repaired prior to putting the vehicle in service.



It is the operator’s responsibility to make sure that the area behind the loader is clear before backing up.

“BOOM-UP” ALARM

A warning system that alerts the loader operator when the boom is not stowed properly for travel. A sensor is installed on the boom, and an audible alarm and red light in the truck cab. When the operator enters the truck cab after using the loader, the warning light and audible alarm will alert him if the boom travel height exceeds 13 feet.



The boom up alarm may have a round dial attached to the light that can be turned to adjust the volume of the audible alarm.

The boom up sensor will turn on a light once the sensor passes the head side plate.



Some trucks have a customizable red light and alarm already in the dash that can be used as a boom up alarm. If the truck is equipped with such a light and alarm, the boom up sensor will be wired into this light and alarm to function as a boom up alarm.

This system should be viewed as a tool to help operators measure the height of their boom, but more importantly, to warn the loader operators that their boom is above safe height for travel. It is not intended to replace an operator’s good judgment on safe travel height of their boom.

Operators should always be aware that some routes may have streets, roads, alleys, etc., that do not comply with the legal height requirement of 13'6", and should conduct their operations accordingly.

The PI factory boom sensors are set to 13'-0" so if you have a low height object you need to travel under you will need to set the sensor to the desired boom height. It therefore, may be necessary for the boom up sensor to be adjusted to a lower setting than the factory setting.

To adjust the boom sensor:

1. Park the truck on a smooth and level paved surface.
2. Set the outriggers out and down to stabilize the truck (Do not lift the truck). Swing the boom over to the side of the truck with the boom fully extended. Lift the main boom to desired height (typically the highest point is at the tip boom stop).
3. Loosen the sensor and slide it up or down as necessary so that the in dash alarm starts to go off at this boom height.
4. Tighten the sensor and put a visible mark at the center of the bracket so that a visual inspection can confirm that the sensor position has not changed. Note: This sensor must be within 1/8" of the head side plate to function properly.



When adjusting or checking boom sensor, use a set gage or measure to desired height (measure to from the ground to the upper most point of the tip boom stop).

Once sensor is set to required setting, mark with paint marker.



 WARNING
BEFORE MOVING TRUCK, BOOM MUST BE STOWED TO LOWEST POSSIBLE HEIGHT; MAX. BOOM HEIGHT NOT TO EXCEED 13'6".

This boom-up warning system became a standard feature of our loader in April, 2002. If you have an older model Lightning Loader® that does not have this boom-up warning system, you can contact our Parts Department and order a retro-fit kit to install this system.

SAFETY SYMBOLS

Your loader has required safety decals (see following pages) that alert those operating, working around, or performing maintenance on the loader of certain safety hazards. The safety decals are used to show the consequence of human interaction with a hazard in terms of:

1. The degree of severity.
(minor injury, severe injury, death)
2. The probability of severity.
(WILL result in, COULD result in)

The following definitions for identifying hazard levels are provided with their respective signal words.



DANGER Immediate hazards which WILL result in severe personal injury or death.



WARNING Hazards or unsafe practices which COULD result in severe personal injury or death.



CAUTION Hazards or unsafe practices which COULD result in minor personal injury or product or property damage.



Part 4: Controls

THROTTLE CONTROL

Throttle controls are installed for loaders mounted on a truck chassis. For loaders mounted on trucks with electronically controlled engines, a manual switch is used to advance the engine speed. The engine speed is advanced to the preset RPM, which increases the amount of engine power available. The hydraulic system is designed for a maximum oil flow of 42 GPM.

Preset RPM = Never to exceed 1400

The Atlas loader has a variable displacement hydraulic pump, therefore will operate at full speed at idle. Using the throttle advance may only be necessary if lifting heavy loads or performing multiple functions simultaneously. The spools inside the hydraulic valve are sized to only allow a set amount of flow out of the work ports for that valve, therefore increasing the engine rpms will not make any one function faster.

PTO OVER-SPEED CONTROL

The purpose of this control device is to prevent the pump from overspeeding. The pump is rated to a max rpm of 2700 rpm. This overspeed setting is based on the engine rpm and the ratio of the PTO.

The PTO used on an Allison 3000 RDS is 154% and on an Allison 4000 RDS it is 161%.

PRESET RPM = NOT TO EXCEED 1650

Power Take-Off Automatic Transmission:

Electrical Shift Control – The recommended procedure is to bring the vehicle to a full stop, place the truck gear shift lever in the neutral position, set the parking brake, and then engage the PTO. At the completion of loading operations, disengage the PTO, apply the service brakes, disengage the parking brake, and then select the appropriate transmission gear.

Power Take-Off Manual Transmission:

Manual Shift Control – The PTO is engaged when the knob on the dash or floor is pulled out and disengaged when the knob is pushed in. The truck gear shift lever must be in neutral and the clutch depressed whenever the knob is moved.

Air Shift Control – The PTO is engaged when the switch is moved to apply air to PTO, the “On” position. The PTO is disengaged when the switch is



in the “Off” position. The truck gear shift lever must be in neutral and the clutch depressed when the switch is moved.

PARK BRAKE

The truck brake must be set before leaving the cab for any reason.

BOOM SWING CIRCUIT

The boom swing circuit has an integral static brake that engages once the swing has stopped moving. The brake is spring applied and hydraulically released. Once the swing control is activated, hydraulic pressure is sent to the brake inside the gearbox releasing the brake. When the swing control is released the hydraulic pressure going to the brake slowly bleeds off to reengage the brake after the boom stops swinging.

The boom swing is continuous rotation in the top seat configuration and non-continuous if the controls are a dual walk thru configuration. Since you cannot see what is in front of the truck a continuous rotation is not very practical in a dual walk thru control configuration.

In the dual walk thru configuration the boom swing circuit is limited to swing using two proximity sensors in the inner ring of the slewing bearing. These sensors can be seen below the top plate of the pedestal. The sensors are activated by a plate that is mounted to the underside of the head weldment and swings with the head. The sensors close a valve that acts to stop the flow of hydraulic fluid to the swing motor in one direction which stops the boom from swinging in that direction. If for any reason there is an issue with these valves there are manual overrides on them to bypass the sensors and valves that act as swing stops. The overrides are located on top of the valves which are on the dual walk thru platform behind the main control valve. To put the valves into override mode twist the knurled knob and they pop up. If these valves are put into override mode, have your service department address this issue immediately, the overrides are intended for temporary use so the boom swing doesn't become stuck in the event of a hydraulic, electric or sensor issue.

MAIN BOOM LIMITING CIRCUIT

The main boom limiting circuit creates a lower main boom down port relief pressure when the tip boom is fully extended against the upper stop. This helps to prevent damage to the mechanical stop from packing. The solenoid valve in this circuit is normally open and is energized to become closed when the tip boom stop isn't in close proximity of the sensor. The sensor acts to open the solenoid valve when the upper tip boom stop approaches the main boom. The sensor is located at the main boom to tip boom connection point inside the main boom tube. For maximum packing force do not pack the load with the tip lift cylinder fully extended so that the tip boom stop is against the main boom. In a top seat configuration the two solenoid valves are located under



the top seat floor. In a dual walk thru configuration the two solenoid valves are located next to the swing limiting valves behind the passenger side control box.

TIP BOOM LIMITING CIRCUIT

The tip boom limiting circuit forces the tip boom up flow thru a restrictor fitting which acts to slow the tip boom up before hitting a mechanical stop. The solenoid valve is normally closed and is energized to become open when the tip boom upper stop isn't in close proximity of the sensor. The sensor acts to close the valve when the upper tip boom stop approaches the main boom. The sensor is located at the main boom to tip boom connection point inside the main boom tube. In a top seat configuration the two solenoid valves are located under the top seat floor. In a dual walk thru configuration the two solenoid valves are located next to the swing limiting valves behind the passenger side control box.

TOP SEAT HYDRAULIC PILOT LOADER CONTROLS

There are two (2) joystick handles to either side of the operator's seat. The operator seat is equipped with an operator present switch to enable the joysticks and the foot controller. In the event of a problem with the enable switch there is a manual override on the pilot control block to manually enable the controls, however this is only intended for temporary use to get the loader back into a stowed position so that repairs can be performed.

In front of the operator's seat there are four (4) toggle switches for controlling the outriggers. In between the outrigger controls are two (2) push buttons and a push/pull type switch. The push buttons are for activating the horn and emergency engine kill. The push/pull switch is to engage the high idle.

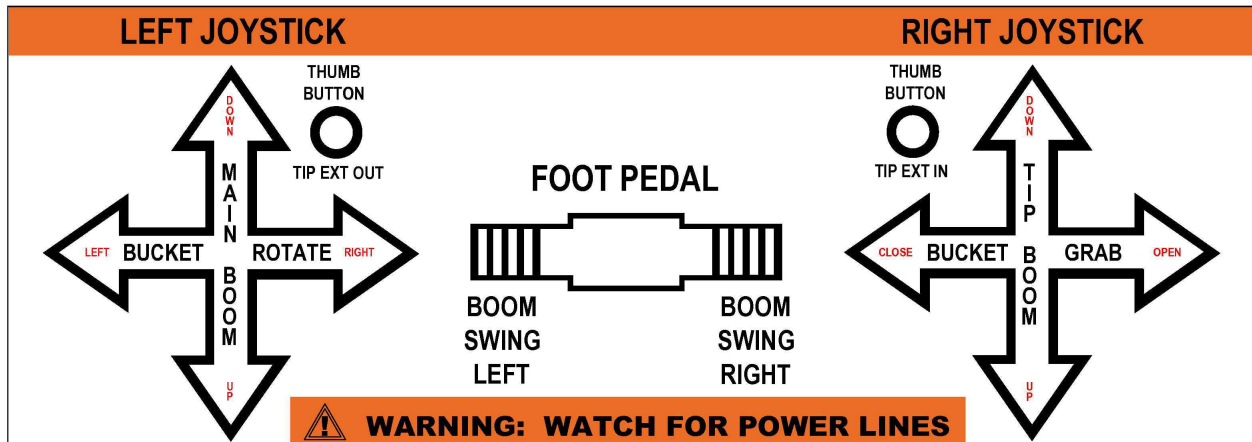
Body dump control is a momentary on/off/on toggle switch located inside the truck cab. This switch is located inside the cab to ensure operator safety when dumping. When the body is dumped no one should be seated at the top seat controls.

The optimum, safe method of operating the joystick and foot pedal controls is by feathering. Feather the controls by moving the joystick or foot pedal smoothly from the neutral position to start motion. After a slow, smooth start, move the joystick control to extreme for full speed. Just before stopping movement, move the joystick control smoothly back to the neutral position.

Do not store any collectibles on the operator's station, as they can create a tripping hazard or become lodged in the controls.



TOP SEAT HYDRAULIC PILOT LOADER CONTROLS



Left Joystick:

Bucket Rot.: Push handle to the left to rotate bucket left (counter-clockwise).
Push handle to the right to rotate bucket right (clockwise).

Main Boom: Pull handle back to raise boom.
Push handle forward to lower boom.

Tip Ext.: Push the thumb button to extend the tip extension.

Right Joystick:

Tip Boom: Pull the handle back to raise tip boom.
Push handle forward to lower tip boom.

Bucket Grab: Move handle right to open bucket.
Move handle left to close bucket.

Tip Ext.: Push the thumb button to retract the tip extension.

Foot Pedal Controller:

Boom Swing: Move handle right to make boom swing right.
Move handle left to make boom swing left.

DUAL WALK THRU HYDRAULIC PILOT LOADER CONTROLS

There are two (2) joystick handles on each side of the operator's platform. The operating functions of the two sides are identical, so the operator uses the same movements on either side to control the boom elevation, boom swing, tip boom extension, bucket grab, and bucket rotation.

At the center of the work platform are three (5) control handles. These handles are for the outriggers and the body dump.

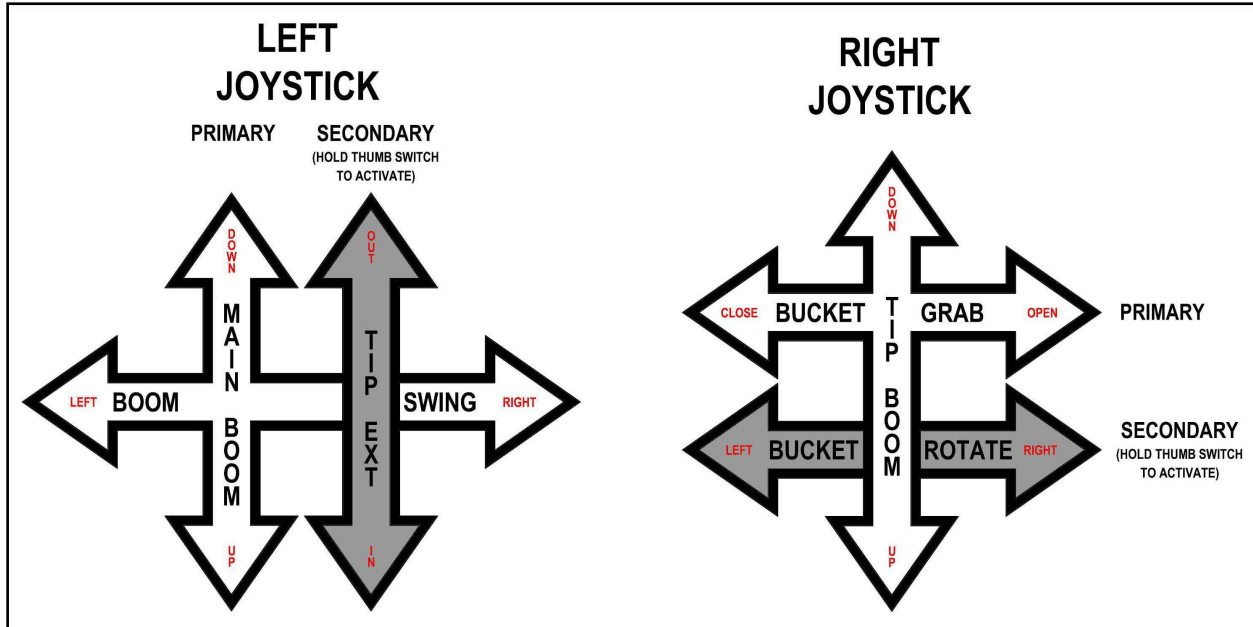
At the center of the work platform is a 3 position toggle switch. This switch is used to activate the left control station, the right control station or turn both control stations off.

The optimum, safe method of operating the controls is by feathering. **Do not jerk the control levers to full speed, or from one extreme to another.** Feather the controls by moving the joystick smoothly from the neutral position to start motion. After a slow, smooth start, move the joystick control to extreme for full speed. Just before stopping movement, move the joystick control smoothly back to the neutral position.

Always operate the loader on the side closest to the debris being loaded. Do not store any collectibles on the operator's platform, as they can create a tripping hazard or become lodged in the controls.



DUAL WALK THRU HYDRAULIC PILOT LOADER CONTROLS



Left Joystick:

Boom Swing: Move handle right to make boom swing right.
Move handle left to make boom swing left.

Main Boom: Pull handle back to raise boom.
Push handle forward to lower boom.

Tip Ext.: While holding the thumb switch push handle forward to extend tip or pull handle back to retract tip.

Right Joystick:

Tip Boom: Pull the handle back to raise tip boom.
Push handle forward to lower tip boom.

Bucket Grab: Move handle right to open bucket.
Move handle left to close bucket.

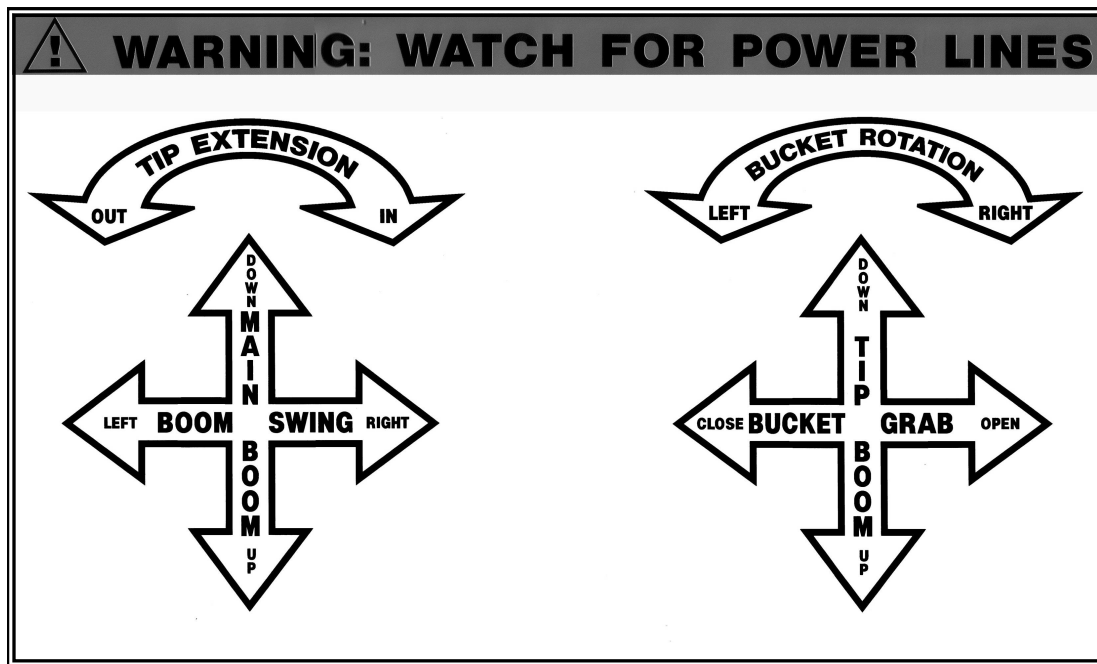
Bucket Rot.: While holding the thumb switch move handle right to rotate bucket right (clockwise) or move handle left to rotate bucket left (counter-clockwise).

DUAL WALK THRU QUADSTICK CONTROLS

There are two (2) joystick handles on each side of the operator's platform. The operating functions of the two sides are identical, so the operator uses the same movements on either side to control the boom elevation, boom swing, tip boom extension, bucket grab, and bucket rotation.

The optimum, safe method of operating the controls is by feathering. **Do not jerk the control levers to full speed, or from one extreme to another.** Feather the controls by moving the joystick smoothly from the neutral position to start motion. After a slow, smooth start, move the joystick control to extreme for full speed. Just before stopping movement, move the joystick control smoothly back to the neutral position.

On units equipped with dual controls, always operate the loader on the side closest to the debris being loaded. Do not store any collectibles on the operator's platform, as they can create a tripping hazard or become lodged in the controls.



Left Joystick:

Boom Swing: Move handle right to make boom swing right.
Move handle left to make boom swing left.

Main Boom: Pull handle back to raise boom.
Push handle forward to lower boom.

Tip Ext.: Twist handle counter-clockwise to extend tip extension out.
Twist handle clockwise to retract tip extension in.



Right Joystick:

Tip Boom: Pull the handle back to raise tip boom.
Push handle forward to lower tip boom.

Bucket Grab: Move handle right to open bucket.
Move handle left to close bucket.

Bucket Rot.: Twist handle clockwise to rotate bucket right (clockwise).
Twist handle counter-clockwise to rotate bucket left (counter-clockwise).



Part 5: Training

All members of the crew must become thoroughly familiar with the operation of controls, the correct operating procedures, maximum lifting capacities, and safety precautions before operating the loader. Operator training is essential. Always be prepared for an emergency. The following pages contain numerous safety precautions, information, and operating instructions that must be observed while performing work operations.

The health, safety and well-being of each member of the crew is of primary importance. Consequently, each member has an obligation to himself, and to his fellow workers, to make sure safe operating procedures are followed. All operating regulations recommended by the manufacturer, the employer and by municipal, state and federal agencies must be observed. The operating procedures set up in this manual are Petersen's recommendations and do not necessarily cover employer and governmental regulations. Each operator must know and observe those regulations.

Become familiar with all equipment checks. You should make daily equipment inspections and be able to spot any abnormality or malfunctions before beginning an assigned task, while working or after completing the task. There is a high degree of reliability built into your equipment, but there is always a possibility of mechanical failure or power failure due to incomplete service or abnormal wear. An operator should never take another's word. He should always thoroughly check the equipment himself.

Each crew member must receive thorough instructions on the care and maintenance of this machine, thus enabling him to identify and anticipate any problems that may occur. Knowing how the equipment operates will help you recognize when it is not operating properly and that repairs or adjustments are required.



Part 6: Setting Up at the Job Site

An important prerequisite to proper setting up at the job site is to thoroughly plan the lift before positioning the vehicle.

Always seek the best possible work site when parking the vehicle. An ideal parking location at a job site is firm, level dry ground or pavement, located in close proximity to the work station. Avoid uneven, rocky or muddy terrain, or steep grades. Location should be selected such that outriggers can be fully extended and the outrigger pad comes down on a firm, level surface. In the event that it is necessary to use the loader on an inclined surface, extreme care should be used. Loader slewing torque, stability, lifting capacity and other loader control functions may be affected adversely. Particular caution must be exercised with the swing function since a “downhill” inclined surface will increase the slewing speed and lengthen the time it takes to stop the motion. Your vehicle should be positioned in an area free from overhead obstructions and to allow performance of the entire task without repositioning, if possible. The operator must be familiar with the swing arc of the loader. You should position your vehicle so that the load is well within this arc. Once the vehicle is in position for loading, please follow these precautions and procedures for loading:

Precautions and Procedures for Loading:

- Before leaving the cab, engage all safety lights, place the transmission in neutral, and set the truck brake.
- Always be aware of traffic conditions. Extreme caution should be taken when operating extendible outriggers where there is traffic. The operator should consider the possible safety hazard and take necessary precautions, such as using safety cones to mark the outriggers. The operator should also consider using safety cones to mark the vehicle, if the loading position interferes with traffic flow, or other conditions make the vehicle not easily visible.
- Before commencing work, make sure the debris you are going to load does not conceal any fixed objects, such as fire hydrants, guy wires, etc.
- The vehicle should be positioned so that it is impossible for any portion of the equipment to come within the minimum required safe distance to any energized power line. Maintain a clearance of at least 10 feet between any part of the loader and any electrical line. Remember, power lines deflect in winds and additional clearances must be allowed. Death or serious injury may result from contact or arcing due to inadequate clearance to anyone working on or around the loader. All overhead wires should be considered energized until the electrical utility authorities verify that they are not and the wires are visibly grounded.



- Do not operate the loader during electrical storms, when high wind conditions exist, or in poorly lighted conditions.
- Your loading area must be clear of people. Do not operate the loader, outriggers, or dump body if another person is within twenty feet of the equipment.
- Do not allow any person under a raised body or extended loader.
- If your model loader uses a ladder for access to the loader station, use provided handholds and steps. Face the steps when getting on and off. Never use controls as handholds. Do not mount the machine if handholds or steps are broken or missing. Repair them first.

Failure to heed these instructions can result in serious personal injury or death.



Part 7: Loading Procedures

Engage the power-take-off. For cold weather operation, allow the loader hydraulic system to reach operating temperature before commencing work.

Before conducting any boom operations, extend all outriggers to level the loader side to side. When extending outriggers out and down, ensure that the vehicle is stabilized. To develop rated load capacity, the outriggers should be fully extended. Provide blocks, if necessary, to level the unit on sloping ground or bearing pads if the outriggers tend to sink into soft terrain. Some concrete surfaces are relatively thin and cannot withstand outrigger loading. Concrete can break through and cause instability.

Remember this safety information regarding the outriggers:

- Keep feet clear of outriggers at all times to avoid serious crushing injury.
- Failure to use the outriggers when loading may create an unstable condition, including the loader overturning that could result in serious personal injury or death.

Do you know the load capacity of the loader? Refer to the "Load Capacity Chart" in this manual for information regarding load capacities. The "Load Capacity Chart" is also riveted to the pedestal of the loader. Do not attempt to lift more than the capacities shown on the load chart for your model loader at the correct radius.

For loaders with manual throttle controls, set the throttle control to desired RPM, depending on loading conditions. Remember, DO NOT exceed the preset throttle control setting of 1400 revolutions per minute.

To make the lift:

1. Raise boom from inside of dump body and swing to trash pile. Use tip extension, if needed, and rotate bucket so that it is aligned with trash.
2. Open the bucket, lower around trash, and close the bucket so that you have a firm grip on the trash. Raise the boom slightly and activate the bucket grab once again to make sure you have a firm grip on the trash.
3. Lift and swing the load over the dump body. In order to minimize the height and stress on the boom, it is recommended that the tip extension be retracted prior to swinging the load. It is recommended to load the front of the body first.



When loading the dump body, please follow these precautions:

- **Do not** use the bucket to crowd the load to the front of the dump body as you can damage the bucket and other loader components.
- **Do not** overload the dump body. You must have room to stow the bucket within the body sides for travel.
- **Do not** allow limbs or other debris to protrude from the dump body.
- **Do not** excessively pack the load. Excess packing could result in dump body floor damage and loader damage.
- **Do not** allow the bucket to swing beyond parallel to the tip boom. If the bucket flips up beyond parallel to the tip boom the gimbal can damage the end of the tip boom.

Continue the loading procedure until all trash is loaded. If it is necessary for the operator to manually rake any remaining trash into a smaller pile, the boom must be stowed in the dump body or on the ground, and the PTO disengaged when the operator leaves the control station.

Please follow these additional loading precautions at all times:

- Do not leave a load suspended when the operator is away from the control station.
- Only operate the loader from the operator's station. Do not attempt to operate the loader from any position other than the operator's station.
- Never climb on operator controls or other loader components.
- Do not sit or stand at operator control station when truck is in motion. The control station is to be manned only when the vehicle has been parked and the procedures we previously discussed have been followed for setting up to load.
- Do not attempt to lift loads exceeding manufacturer's recommended safe working capacity.
- Do not impose lateral loads on the boom.
- Do not use stability to determine safe working load.



To cover the load:

When using a Petersen manufactured and installed load cover, please follow these procedures:

1. Knuckle the bucket to the front of the dump body.
2. Hook the tarp chain to the hook on the bucket.
3. Extend the boom to cover the debris, and rest the bucket on the load.

To stow the boom and bucket:

There are two proper ways to stow the bucket in the dump body. In each case the bucket sides should be parallel to sides of the dump body. The operator can either stow the bucket in the opened position on the body floor, or roll the closed bucket over on top of the load. In both cases it is necessary for the operator to leave room in the dump body to stow the boom and bucket. Always ensure that at least half of the bucket and tip of the boom are below the top of the body sides before travel.

Bucket Roll Method (with PI single cylinder bucket only):

The rear of the dump body must be at least half full in order to use the bucket roll method for stowing the boom and bucket.

1. Use the control handles on the curb side.
2. Close the bucket and rotate until bucket sides are parallel to body sides.
3. Move the bucket to the curb side rear inside corner of the dump body.
4. Rest the bucket on the load.
5. Simultaneously boom down and swing the boom to the street side until the boom tip and at least half of the bucket are below top of body sides. Ensure that no part of the loader or load is over legal height of 13 ft. 6 in.

Please see illustrations on the following page for examples of correct and incorrect ways to stow the bucket for travel.

WARNING! – Failure to stow the boom and bucket as instructed could allow the boom to slew (swing) and the bucket to fall outside of the body. Loss of boom control with the bucket outside of the dump body could result in damage to objects in the vicinity of the grapple truck, and/or serious injury or death to people in the vicinity of the grapple truck.



Once the bucket has been properly stowed for travel, retract all outriggers, disengage the PTO, and pickup any safety cones or markers that were used. Release the parking brake, and you're ready to travel to the dump site.



Part 8: Dumping the Load

As you prepare to dump the load, it is important that you choose a level, firm area. Each of the following steps must be followed precisely and in sequence. The procedure must not be done in a hurried manner.

1. Set the parking brake.
2. Open the rear dump body doors and latch them back. Use caution when opening doors, as items placed against doors could fall suddenly when doors are opened and cause injury.
3. Engage the power-take-off.
4. Extend the outrigger on both sides and lower to within six to eight inches of the ground. This allows for emergency stabilization, and movement of the truck.
5. If your load is covered with a tarp, as discussed in "Covering the Load", retract the tarp.
6. Raise the main boom to the maximum elevation and keep it centered over the dump body during the entire dumping procedure.
7. Place the tip boom in a position so that it will not contact the bulkhead of the dump body when the dump body is raised. Do not swing the boom to either side during the dumping procedure, as the outriggers are not fully lowered.
8. Activate the body dump handle or switch. Slowly raise the body to empty the load. Make sure you avoid contact between the main boom and tip boom, and the dump body.
9. If the emptied pile prevents complete dumping of body contents, disengage the PTO. SLOWLY move the truck forward to complete dumping of the body. Remember, the outriggers are partially down and the boom is raised. Extreme caution should be used during this procedure.

This is not a procedure to force debris out of the dump body. If there is debris stuck in the dump body, lower the dump body and dislodge the debris with the loader.

10. When you have finished dumping the load, lower the dump body. Stow the boom and bucket in the dump body with bucket open and resting on body floor.
11. Raise and retract the outriggers, and disengage the power-take-off.
12. Close and lock body rear doors.



Safety Precautions Regarding Dumping Procedure:

- Do not use the loader boom to force the dump body down when lowering the dump body.
- Do not dump the load until the rear body doors are latched open. The doors and body hinges can be damaged if doors are allowed to swing freely during the dumping procedure.
- Do not travel with rear body doors open. They must be closed and locked for travel.



Part 1: Safety Procedures and Precautions for Service and Repair

A regular schedule of maintenance is essential to keep your unit at peak operating efficiency. Operators or service personnel responsible for the care of the unit must be completely familiar with the type and frequency of inspections, maintenance, and lubrication operations to be performed.

Always keep the loader free from sand and other foreign particles to ensure trouble-free operation and to avoid excessive wear. Air entering the oil tank carries with it small quantities of impurities and moisture. The hydraulic oil should be drained at least once a year to rid the system of any contamination and condensation.

The hydraulic circuit diagram is included in this manual for service or maintenance information.

Make sure you observe the following procedures and precautions when performing maintenance and/or repairs on your equipment.



Safety Procedures and Precautions for Service and Repair

- Do not perform any work on the loader unless you are qualified and authorized to do so.
- Loader is placed where it will cause the least interference with other equipment or operations in the area.
- All controls at the off position and all operating features in neutral position.
- Do not attempt to clean, oil or service a loader when the power-take-off is engaged.
- Deactivate means for starting. Use lockout-tagout procedure.
- Bucket and boom at rest on ground or floor of dump body.
- Do not disconnect hydraulic connections under pressure. Hot hydraulic fluid can cause serious injury. Stay clear of hydraulic leaks as high pressure and hot hydraulic fluid can cause serious injury.
- Always use dump body prop(s) before servicing or repairing body or hoist. Never leave the body raised or partly raised while vehicle is unattended or while performing maintenance or service under the body, unless the body is braced to prevent accidental lowering.

Modification to any part of the loader can create a safety hazard and therefore shall not be made without the manufacturer's written approval. It is important that you use factory replacement parts to ensure that size and capacity are as the original parts.

It is important that hydraulic components be rated at proper flow and pressure. If your loader is rebuilt or remounted, mounting procedures and retesting is required in accordance with factory instructions.

Disconnecting, removing, or disabling any part or component which controls the speed of the loader is a misuse of the loader.

The following lists inspections and maintenance which are to be conducted on your unit to help assure it is operating properly and safely. These inspections are in addition to any inspections previously listed, such as daily inspections. Check all items at the frequency listed and make necessary repairs prior to operating.



The following are minimum service requirements. Hard use or dirty operating conditions dictate more frequent inspection and maintenance.

After service adjustment, and repairs, the loader shall not be returned to service until all guards have been reinstalled, trapped air removed from the hydraulic system if required, safety devices reactivated, and maintenance equipment removed.



Procedure to Set Backlash on Pinion and Ring Gear

The ring gear is not perfectly round and has a spot where its diameter is the largest. This spot is marked with paint and Petersen Industries always places this spot where the pinion meshes with the ring gear as if the boom was straight back in the body. If for some reason it isn't possible to position the ring gear in this location this spot will be stamped with a "BL" on the side of the upper plate of the pedestal.

It is recommended that this same practice be followed if the slewing bearing ever requires replacement.

To set backlash position the boom straight back in the body so the pinion is in contact with the largest diameter of the ring gear. One tooth of the pinion should be perfectly set into a gear opening on the ring gear.

Loosen the gearbox bolts and use a suitable tool to push the gearbox closer to the ring gear. Use a 0.007 inch feeler gauge and set into one side of the perfectly meshed tooth. With the feeler gauge placed on one side of this tooth, the other side of this tooth should be contacting the ring gear. The gearbox should now be pivoted in or out to make the feeler gauge snug. Once set, tighten all gearbox mounting bolts.

Remove the feeler gauge and rotate the boom to check that there isn't excessive play between the pinion and ring gear in any locations around the gear.



Procedure to check/set pressures on Atlas Hydraulic System

Note that this procedure should only be performed if major hydraulic work is performed. The pumps come preset from the factory so you should not have to set, however to be certain your system is working properly you should perform these steps to verify your hydraulic system is working properly.

Install a pressure gauge into the BG port on the pump, use a hydraulic hose that is long enough to reach to the valves on the loader and to the top seat so the controls can be activated while the gauge is monitored. Alternatively you can install a gauge into any port on either valve is labeled "P" in order to read pump pressure. Refers to the following pages for where these ports are located on the pump and inlet/outlet sections of the valve.

The factory setting of the pressure compensator on the pump is 3500 psi but the load sense reliefs on the valves are the pressure limiting devices which are set to 3000 psi on the valve in terms of the maximum system pressure. The pump is set higher than the valves so that the two pressure compensators do not interfere with each other.

Lower Valve:

While holding the dump body in the up position turn the load sense relief clockwise until the gauge pressure reaches 3000 psi. Note that the only function on the lower valve that needs 3000 psi is body dump up so you cannot use an outrigger to set this pressure. Once you get to the point where you see 3000 psi as described above you should increase the pump pressure compensator to ensure that the compensator on the valve is actually the one that is set lower and is controlling the pressure.

Upper Valve:

While holding the joystick to activate the tip boom up in a fully up (extended) out position turn the load sense relief clockwise until the gauge pressure reaches 3000 psi. Note that main boom up, tip boom up, and tip extension in can all be used to set this 3000 psi pressure setting. These functions also have port reliefs but these are only present in these functions for induced loads (if the boom is ran into something and experiences an external force not created by the hydraulic system.)

Once the 3000 psi pressure is set on both the lower and upper valves, check all the other functions for pressure settings as indicated on the owner's manual.

Remove the gauge and hose, then replace the BG plug and verify that all adjustment screws and lock nuts are tightened.



Once the pressure compensators have been set properly as described above. The loader should be operated and the controls should match the control decal for function and direction. The hydraulic functions should be bottomed out to verify port relief settings according to the owner's manual.

Note that the port reliefs start to relief at 4-5 GPM and some of the functions run on up to 18 GPM. Therefore if you bottom out a function the pressure reading could be as much as 400 psi higher than the port relief setting due to the pressure rise from the additional flow.

To test a cylinder bottom out the cylinder in the fully retracted position, hold the function and record the pressure reading. To test a motor position the motor so rotation will not be possible, hold the function and record the pressure reading.



Hydraulic System Settings and Specifications

Hydraulic Function	Pressure Setting	Maximum Flow
Main Boom Cylinder Up	3300 psi*	18 GPM
Main Boom Cylinder Down	1200 psi	18 GPM
Tip Boom Cylinder Up	3300 psi*	18 GPM
Tip Boom Cylinder Down	2000 psi	18 GPM
Boom Swing Left	2000 psi	14.5 GPM**
Boom Swing Right	2000 psi	14.5 GPM**
Bucket Open	2000 psi	18 GPM
Bucket Close	2500 psi	18 GPM
Bucket Rotate Clockwise	None	2 GPM**
Bucket Rotate Counter Clockwise	None	2 GPM**
Tip Extension Retract	3045 psi	13.2 GPM**
Tip Extension Extend	1450 psi	18 GPM**
Outrigger Slide Out	2500 psi	8 GPM
Outrigger Slide In	2500 psi	8 GPM
Outrigger Down	2500 psi	18 GPM
Outrigger Up	2500 psi	18 GPM
Body Dump Up	3000 psi	18 GPM
Body Dump Down	NA	NA
Pilot Generator	508 psi	4-6 GPM

* This function has a port relief only for induced loads and is actually limited to the 3000 psi which is controlled by the pressure compensator setting.

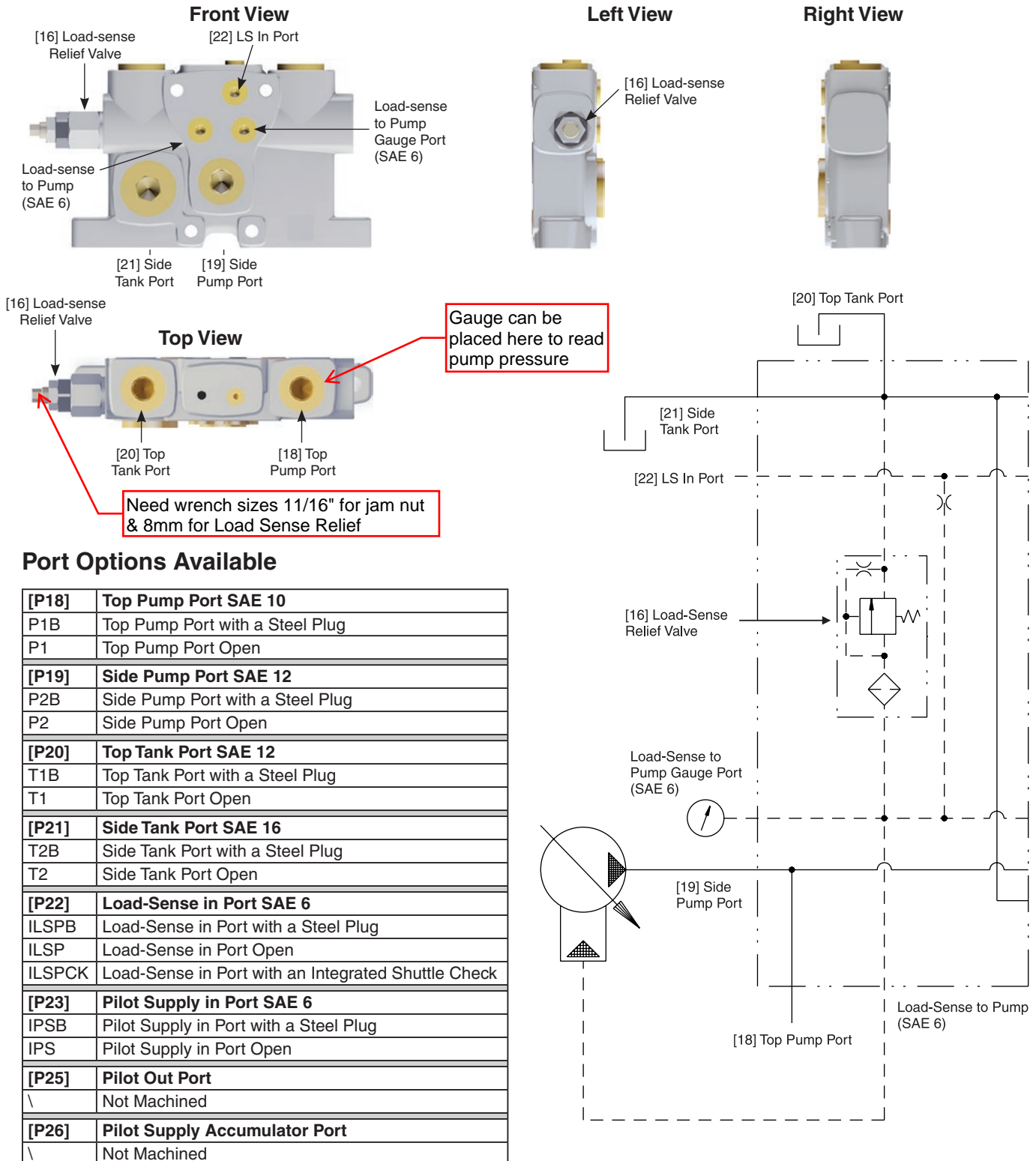
** This function has spool stops at the upper and lower of the work section valve. The spool stops can be used to limit the flow by limiting the stroke of the spool. The flow listed on the chart above is the maximum flow that can be theoretically achieved.



I – [P15] Inlet Section Type

Standard Inlet

The standard inlet can be used with manual, hydraulic pilot, and electrohydraulic configurations. The pilot in port allows for solenoid pilot generation flow to be brought into the VP120 valve assembly from an external source.



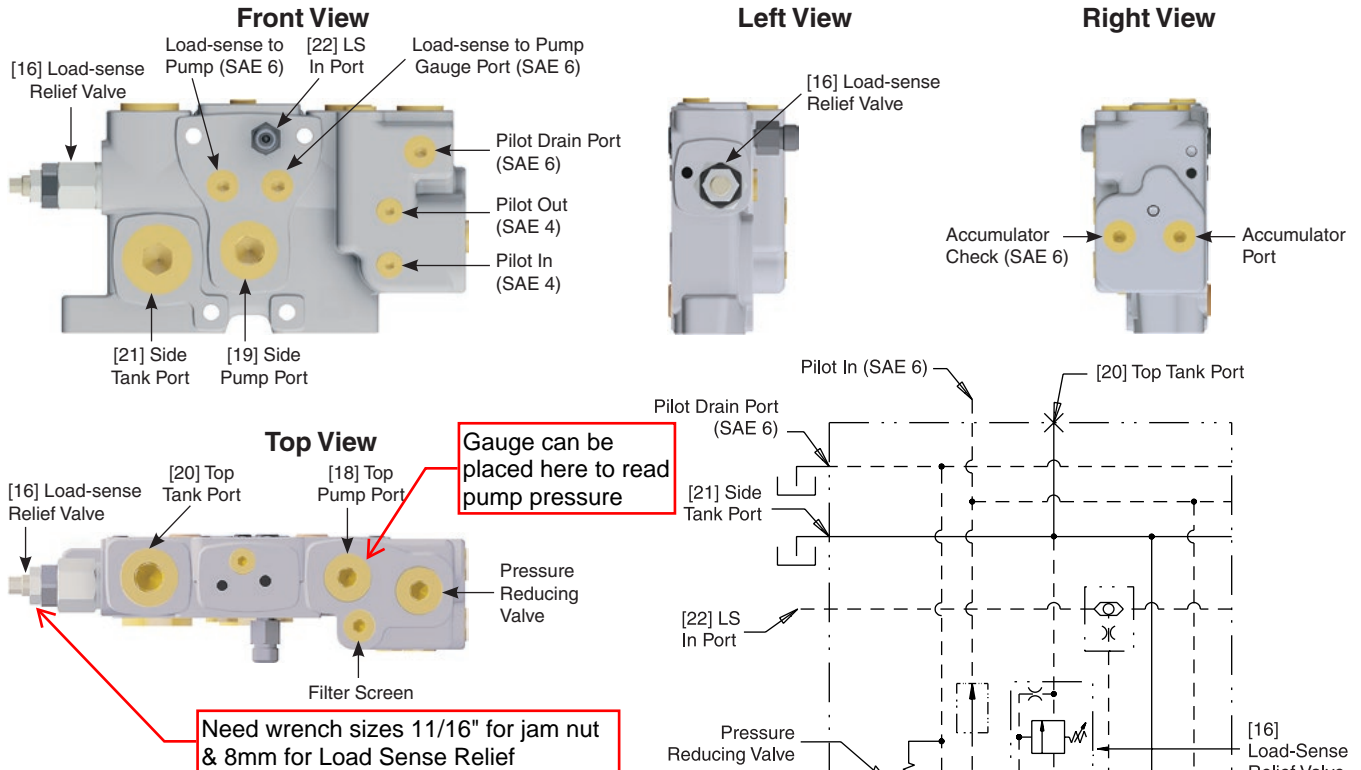
Port Options Available

[P18]	Top Pump Port SAE 10
P1B	Top Pump Port with a Steel Plug
P1	Top Pump Port Open
[P19]	Side Pump Port SAE 12
P2B	Side Pump Port with a Steel Plug
P2	Side Pump Port Open
[P20]	Top Tank Port SAE 12
T1B	Top Tank Port with a Steel Plug
T1	Top Tank Port Open
[P21]	Side Tank Port SAE 16
T2B	Side Tank Port with a Steel Plug
T2	Side Tank Port Open
[P22]	Load-Sense in Port SAE 6
ILSPB	Load-Sense in Port with a Steel Plug
ILSP	Load-Sense in Port Open
ILSPCK	Load-Sense in Port with an Integrated Shuttle Check
[P23]	Pilot Supply in Port SAE 6
IPSB	Pilot Supply in Port with a Steel Plug
IPS	Pilot Supply in Port Open
[P25]	Pilot Out Port
\	Not Machined
[P26]	Pilot Supply Accumulator Port
\	Not Machined

IEH – [P15] Inlet Section Type

Pilot Generating Inlet

The pilot generating inlet is mainly used when electrohydraulic sections are in use to provide pilot flow and pressure to the section solenoids. Other reasons for the inlet with internal pilot generation could be to generate pilot flow and pressure for external operations (i.e., hydraulic pilot controllers) or for kidney loop filtration. The inlet with internal pilot generation also contains an optional accumulator porting with check valve to provide a stand by flow and pressure for certain situations.



Port Options Available

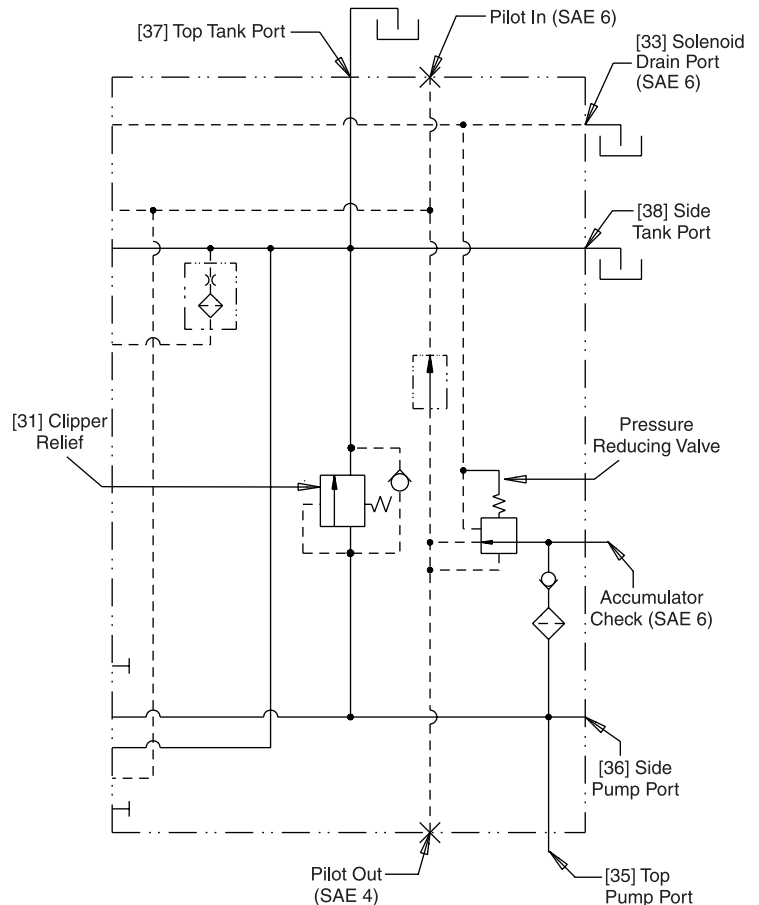
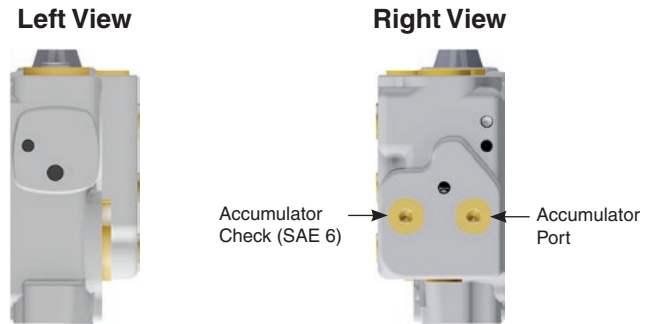
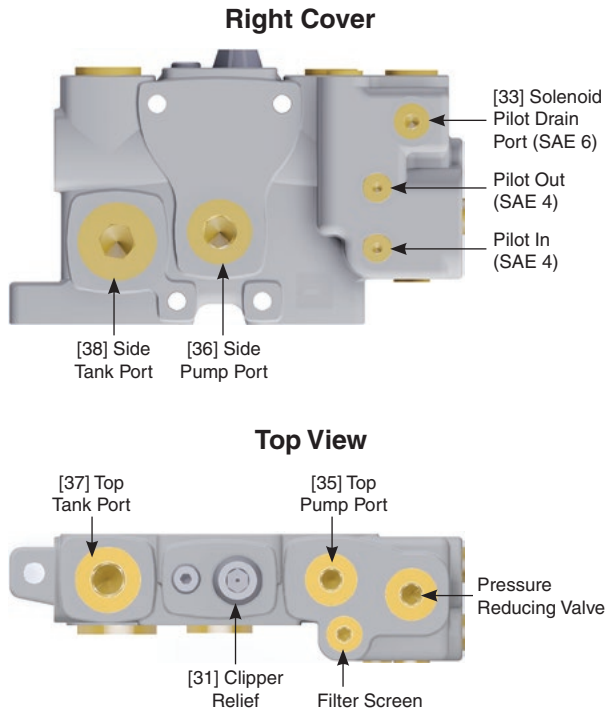
[P18]	Top Pump Port SAE 10
P1B	Top Pump Port with a Steel Plug
P1	Top Pump Port Open
[P19]	Side Pump Port SAE 12
P2B	Side Pump Port with a Steel Plug
P2	Side Pump Port Open
[P20]	Top Tank Port SAE 12
T1B	Top Tank Port with a Steel Plug
T1	Top Tank Port Open
[P21]	Side Tank Port SAE 16
T2B	Side Tank Port with a Steel Plug
T2	Side Tank Port Open
[P22]	Load-Sense in Port SAE 6
ILSPB	Load-Sense in Port with a Steel Plug
ILSP	Load-Sense in Port Open
ILSPCK	Load-Sense in Port with an Integrated Shuttle Check
[P23]	Pilot Supply in Port SAE 6
IPSB	Pilot Supply in Port with a Steel Plug
IPS	Pilot Supply in Port Open

[P25]	Pilot Out Port SAE 6
IPOB	Pilot Out Port with a Steel Plug
IPO	Pilot Out Port Open
[P26]	Pilot Supply Accumulator Port SAE 6
IACB	Pilot Supply Accumulator Port Plugged
IAC	Pilot Supply Accumulator Port Open
[P27]	Inlet Pilot Drain
ISDP	Inlet Pilot Drain Plugged
ISD	Inlet Pilot Drain Open

OEH – [P30] Outlet Section Type

Pilot Generating Outlet

The pilot generating outlet is mainly used when electrohydraulic sections are in use to provide pilot flow and pressure to the section solenoids. Please note only one pilot generating outlet should be used, if already used as an inlet then the outlet option is not available. Other reasons the outlet with internal pilot generation could be to generate pilot flow and pressure for external operations (i.e., hydraulic pilot controllers) or for kidney loop filtration. All pilot generating outlets contain a mandatory pilot drain port in the cover which can be plugged if pilot flow will be drained from an inlet cover.



Port Options Available

[P33]	Solenoid Drain SAE 6
SDB	Solenoid Drain with a Steel Plug
SD	Solenoid Drain Open
[P35]	Top Pump Port SAE 10
P3B	Top Pump Port with a Steel Plug
P3	Top Pump Port Open
[P36]	Side Pump Port SAE 12
P4B	Side Pump Port with a Steel Plug
P4	Side Pump Port Open
[P37]	Top Tank Port SAE 12
T3B	Top Tank Port with a Steel Plug
T3	Top Tank Port Open
[P38]	Side Tank Port SAE 16
T4B	Side Tank Port with a Steel Plug
T4	Side Tank Port Open
[P39]	Load-Sense in Port
\	Not Machined
[P40]	Pilot Supply in Port SAE 6
OPSB	Pilot Supply in Port with a Steel Plug
OPS	Pilot Supply in Port Open

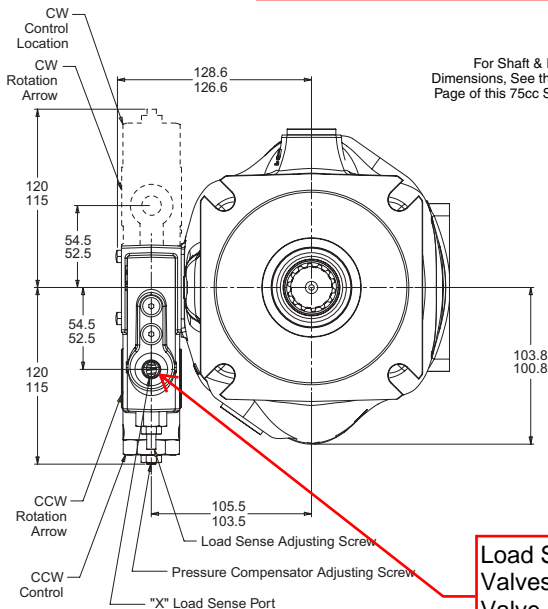
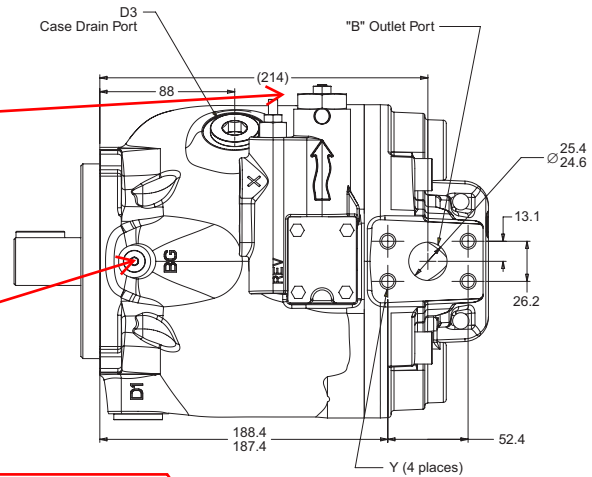
[P43]	Pilot Out Port SAE 6
OPOB	Pilot Out Port with a Steel Plug
OPO	Pilot Out Port Open
[P44]	Pilot Supply Accumulator Port SAE 6
OACB	Pilot Supply Accumulator Port Plugged
OAC	Pilot Supply Accumulator Port Open

**Pump Installation - P1/PD 075
Side Port
“L” Control Option**

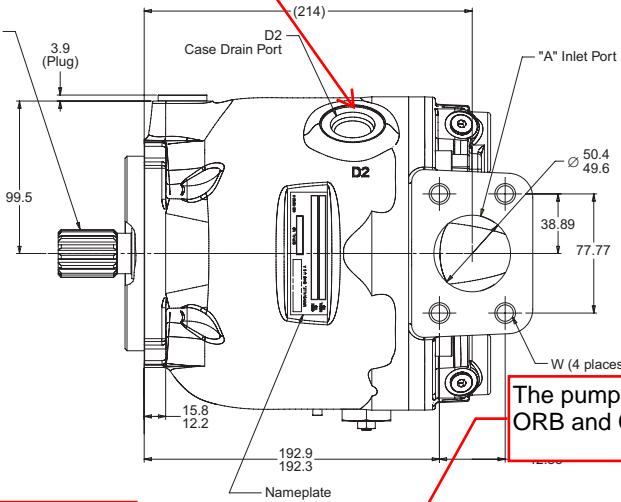
10 mm wrench for jam nuts and 2.5 mm allen wrench for adjuster screws

BG Port Used to Measure Pump Pressure

Highest Drain (D port) must be connected back to Tank. It allows the pump to have constant lubrication.

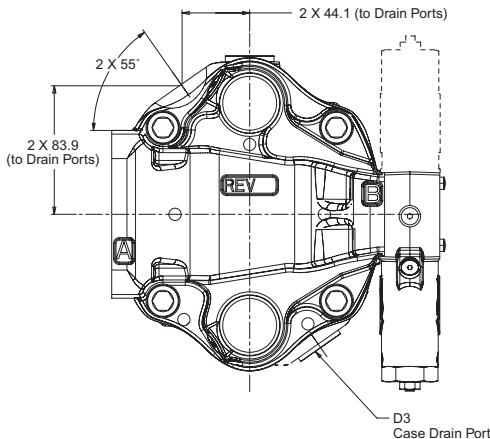


For Shaft & Flange Dimensions, See the First Page of this 75cc Section



The pump we use has ORB and Code 61 Ports

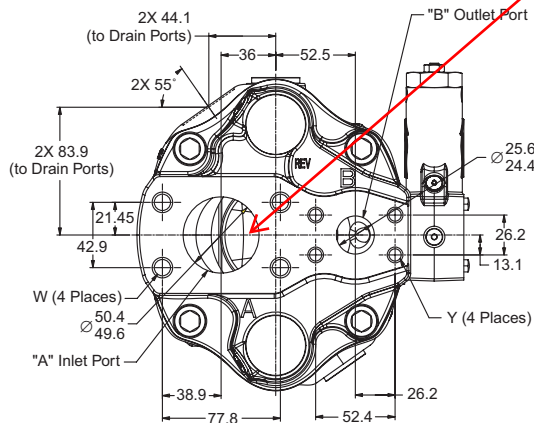
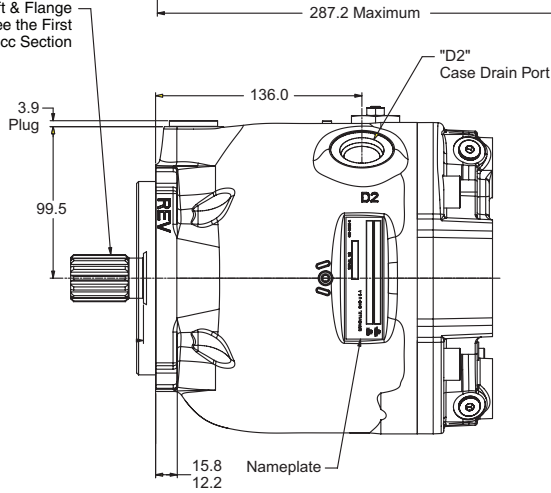
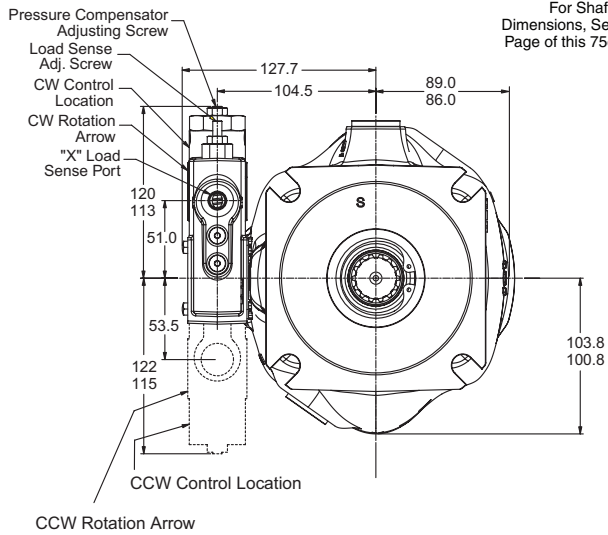
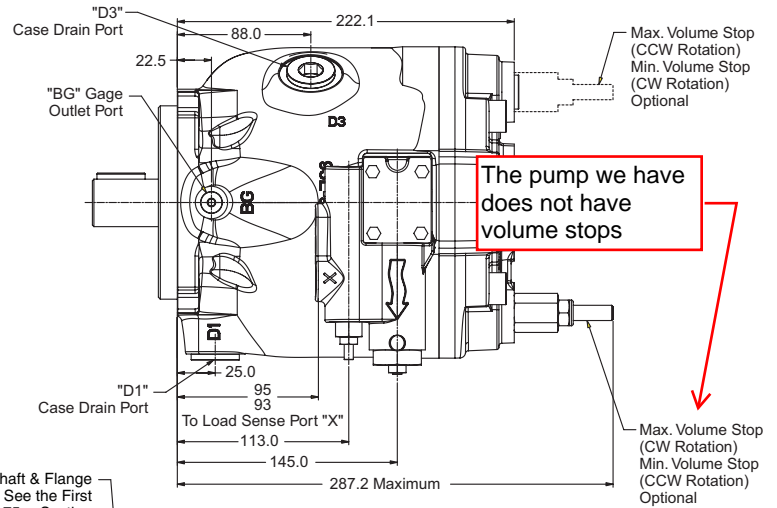
Load Sense Port to Valves or Shuttle Valve (Signals pump to increase stroke)



P1/PD 075 Port Sizes			
	SAE	ISO	BSP
A Inlet	50mm code 61 ^C	50mm DN 51 ^B	—
W Threads	½ - 13 UNC-2B ^C	M12 x 1.75 ^B	—
B Outlet	25mm code 61 ^C	25mm DN25 ^B	—
Y Threads	¾ - 16 UNC-2B ^C	M10 x 1.5 ^B	—
BG	SAE-4 ^D	M12x1.5 ^A	¼" ^E
D1 D2 D3	SAE-12 ^D	M27x2 ^A	¾" ^E
X	SAE-4 ^D	M12x1.5 ^A	¼" ^E

Note A: Metric o-ring boss port conform to ISO 6149-1
Note B: Metric 4-bolt flange port conforms to ISO 6162
Note C: Inch 4-bolt flange port conforms to SAE J518
Note D: Inch o-ring boss port conforms to SAE J514
Note E: BSP boss port conforms to ISO 228-1

**Pump Installation - P1/PD 075
End Port
"L" Control Option**



P1/PD 075 Port Sizes			
	SAE	ISO	BSP
∅A Inlet	50mm code 61 ^C	50mm DN 51 ^B	—
W Threads	½ - 13 UNC-2B ^C	M12 x 1.75 ^B	—
∅B Outlet	25mm code 61 ^C	25mm DN25 ^B	—
Y Threads	¾ - 16 UNC-2B ^C	M10 x 1.5 ^B	—
BG	SAE-4 ^D	M12x1.5 ^A	¼" ^E
D1 D2 D3	SAE-12 ^D	M27x2 ^A	¾" ^E
X	SAE-4 ^D	M12x1.5 ^A	¼" ^E

Note A: Metric o-ring boss port conform to ISO 6149-1
Note B: Metric 4-bolt flange port conforms to ISO 6162
Note C: Inch 4-bolt flange port conforms to SAE J518
Note D: Inch o-ring boss port conforms to SAE J514
Note E: BSP boss port conforms to ISO 228-1

Part 2: Service:

AFTER FIRST 40 HOURS OF OPERATION (BREAK IN SERVICE)	
Re-torque slewing bearing bolts.	280 ft. lbs.
Check torque of gearbox bolts	280 ft. lbs. (3/4" bolts) 680 ft. lbs. (1" bolts)
Replace return filter	
Change oil in planetary gearbox	Drain existing oil from swing gearbox and replace with 2.95 quarts of 80W gear lube.

EVERY 40 HOURS or WEEKLY	
Grease all fittings.	See Grease and Maintenance Diagram in the "Dia. & Drawings" section of this manual. Grease fittings that are worn and will not hold the grease gun, or those that have a stuck check ball, must be replaced. Grease = EP2 (Extreme Pressure)
Check hydraulic hoses for cuts or abrasions, or any evidence of binding or leakage.	Replace any damaged hoses.
Check all hydraulic fittings to make sure they are in place and do not show signs of leakage.	Replace any missing, damaged or modified fittings.
Tighten bucket brake pads.	If brake pads show excessive wear, replace. Tighten gimbal rotator bolt and tip boom gimbal bolt, if needed.
Check oil level.	All oil levels are to be checked with the loader parked on a level surface in transport position, and while the oil is cold, unless otherwise specified. Oil level should be two to three (2 to 3) inches from top of tank. Hydraulic Oil = AW32

EVERY 40 HOURS or WEEKLY	
Check engine over speed control for proper setting.	Check by revving the engine to exceed 1650 RPM, at which point the PTO light should turn off if the engine overspeed is properly set. The PTO should not reengage until engine RPM's drop below 900. Reset if necessary.
Check the engine throttle control for proper setting.	1400 RPM maximum.
Check back-up and boom-up alarms to make sure they are working properly.	Repair or replace if needed.

EVERY 80 HOURS or EVERY 2 WEEKS <i>(These requirements are in addition to the 40 hour service requirements.)</i>	
Check torque of slewing bearing bolts.	280 ft. lbs.
Check torque of bucket rotator bolts.	110 ft. lbs. (PI single cylinder bucket only)
Check torque of gearbox bolts	280 ft. lbs. (3/4" bolts) 680 ft. lbs. (1" bolts)
Check for play between the pinion and ring gear.	If there is visible play between the pinion and ring gear follow the procedure for setting pinion backlash.

EVERY 160 HOURS or MONTHLY <i>(These requirements are in addition to the 80 hour service requirements.)</i>	
Examine all loader pivot points (head and pedestal, main boom, tip boom, bucket and body) for visible play.	If visible play is observed at pivot points, bushings and/or pins must be replaced as needed.
Chassis - Check truck frame for cracks, loose or missing bolts, rivets, damaged springs or loose shackles.	See truck manufacturer's service manual for service and repair instructions.
Structural - Visually inspect complete loader for damage, especially cracks in weldments.	It is necessary for your loader to be clean of oil and grease for these inspections to be performed effectively.
Fasteners - Check all pins, sheaves, retainers, bolts and nuts.	Replace damaged or missing parts.
Retighten main boom and tip boom connecting bolts.	Replace if needed.
Check PTO and pump drive train.	Check for loose or missing bolts. Replace seals if needed.
Inspect loader tie-down bolts.	Tighten if loose



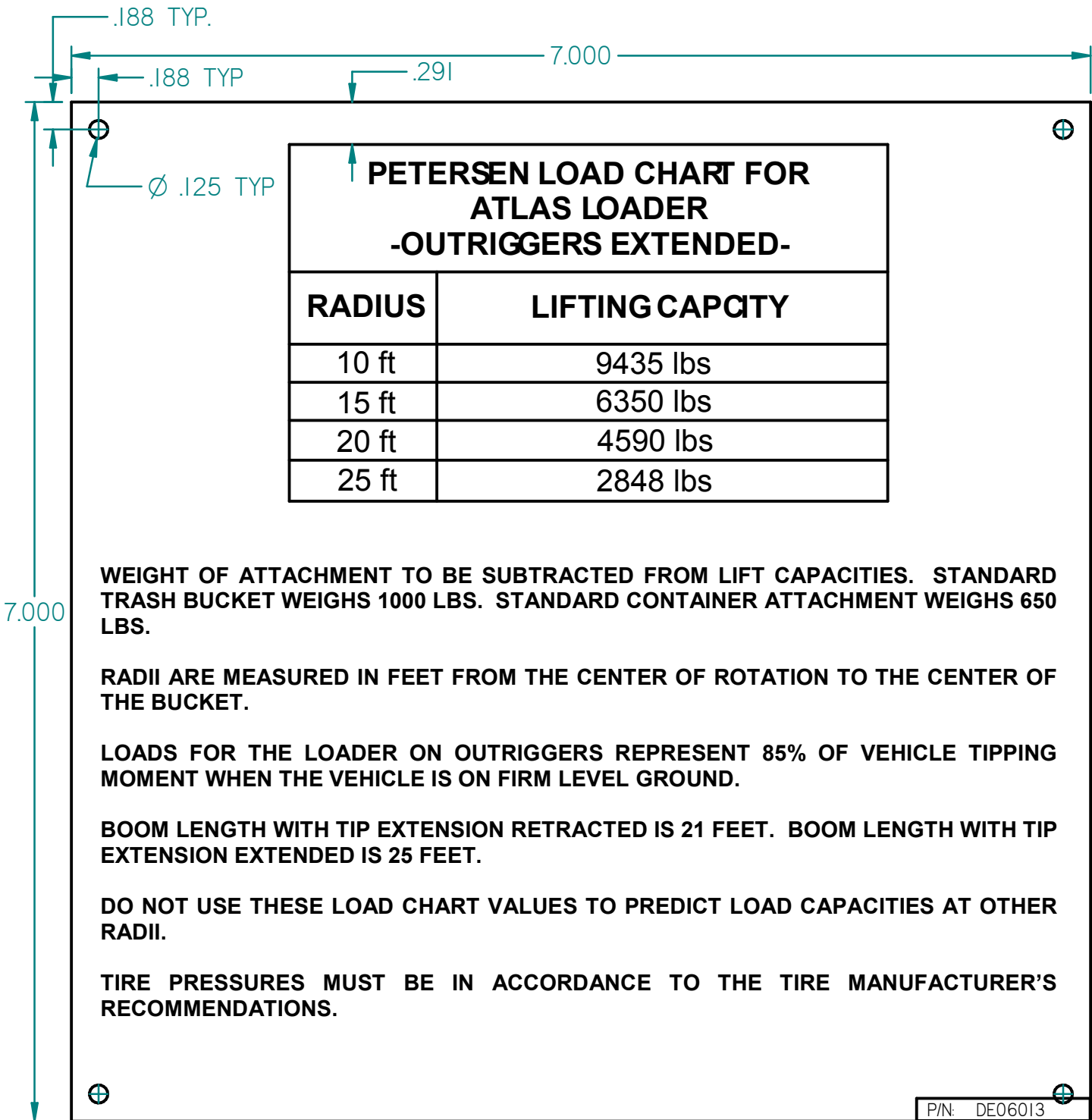
EVERY 160 HOURS or MONTHLY <i>(These requirements are in addition to the 80 hour service requirements.)</i>	
Decals - Check for presence and legibility.	Check decal listing in “Part 3: Safety Devices – Safety Symbols” of this manual for required operational and safety decals. Replace missing or illegible decals.
Re-torque the two Allen headed bolts at base of bucket rotator	442.5 ft. lbs.


EVERY 600 HOURS or 6 MONTHS	
Replace return line filter cartridge and breather filter.	

EVERY 3000 HOURS or 12 MONTHS <i>(These requirements are in addition to the 160 hour service requirements.)</i>	
Change oil in planetary gearbox	Drain existing oil from swing gearbox and replace with 2.95 quarts of 80W gear lube.
Inspect slewing bearing for lateral movement between the two rings with a dial indicator.	Amount of lateral movement in bearing loaded to unloaded shouldn't exceed 0.055”.

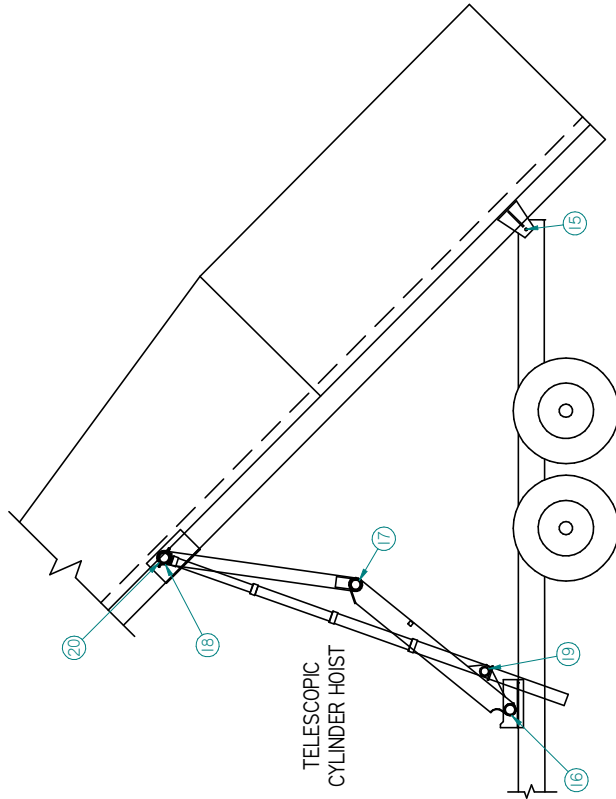


ZONE	REV.	DESCRIPTION	DATE	BY

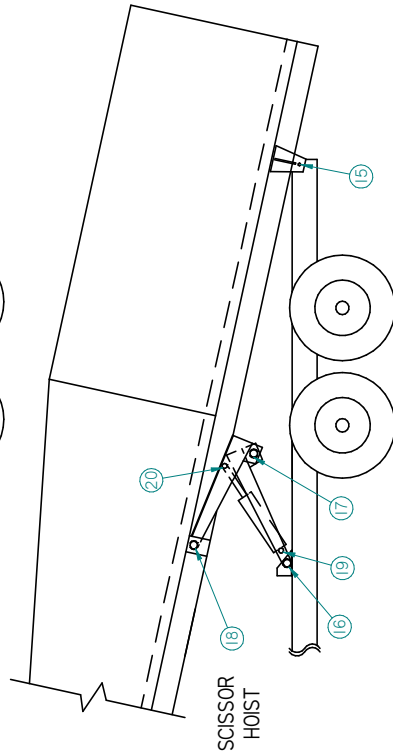


		PETERSEN INDUSTRIES INC. 446 US HWY. 27 N. LAKE WALES, FL 33853 (863) 676 1493 FX (863) 676 6844	
TITLE: LOAD CHART DECAL FOR ATLAS LOADER			
CAD NO.: TBD	PART NO.:		SCALE 1:1
DRAWN BY: JAC	APPROVED:	DATE: 11/17/2015	SHEET: 1 OF 1

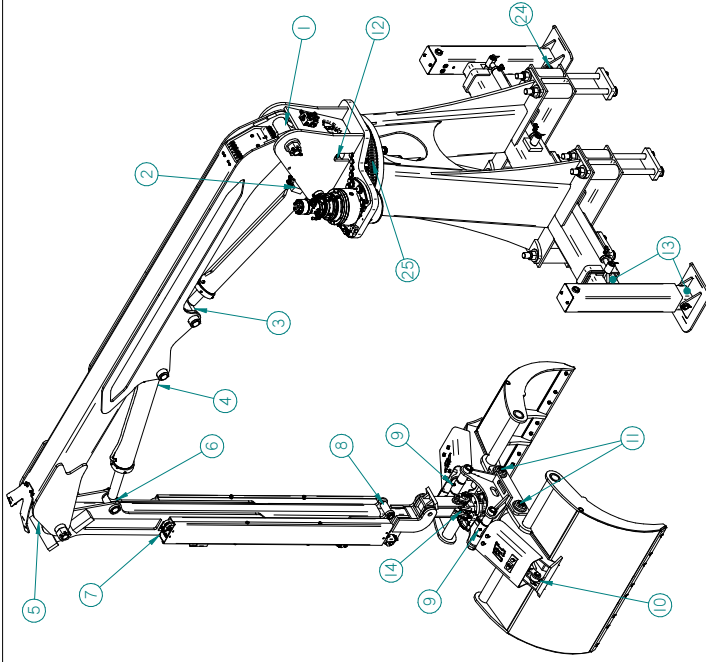
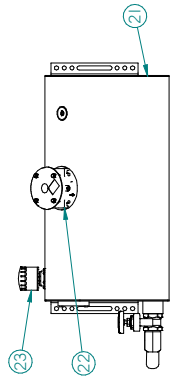
ATLAS LUBRICATION CHART



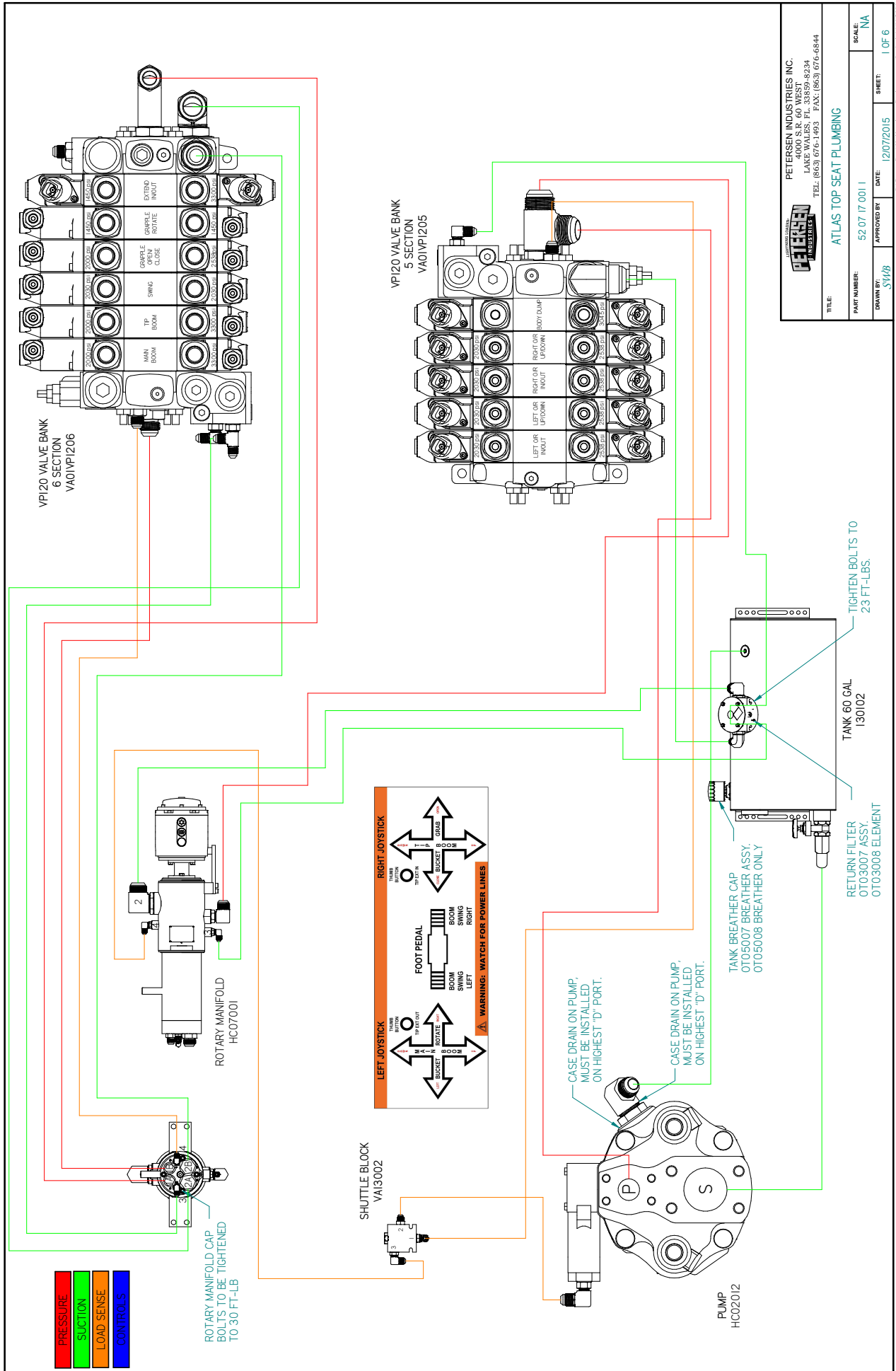
TELESCOPIC
CYLINDER HOIST



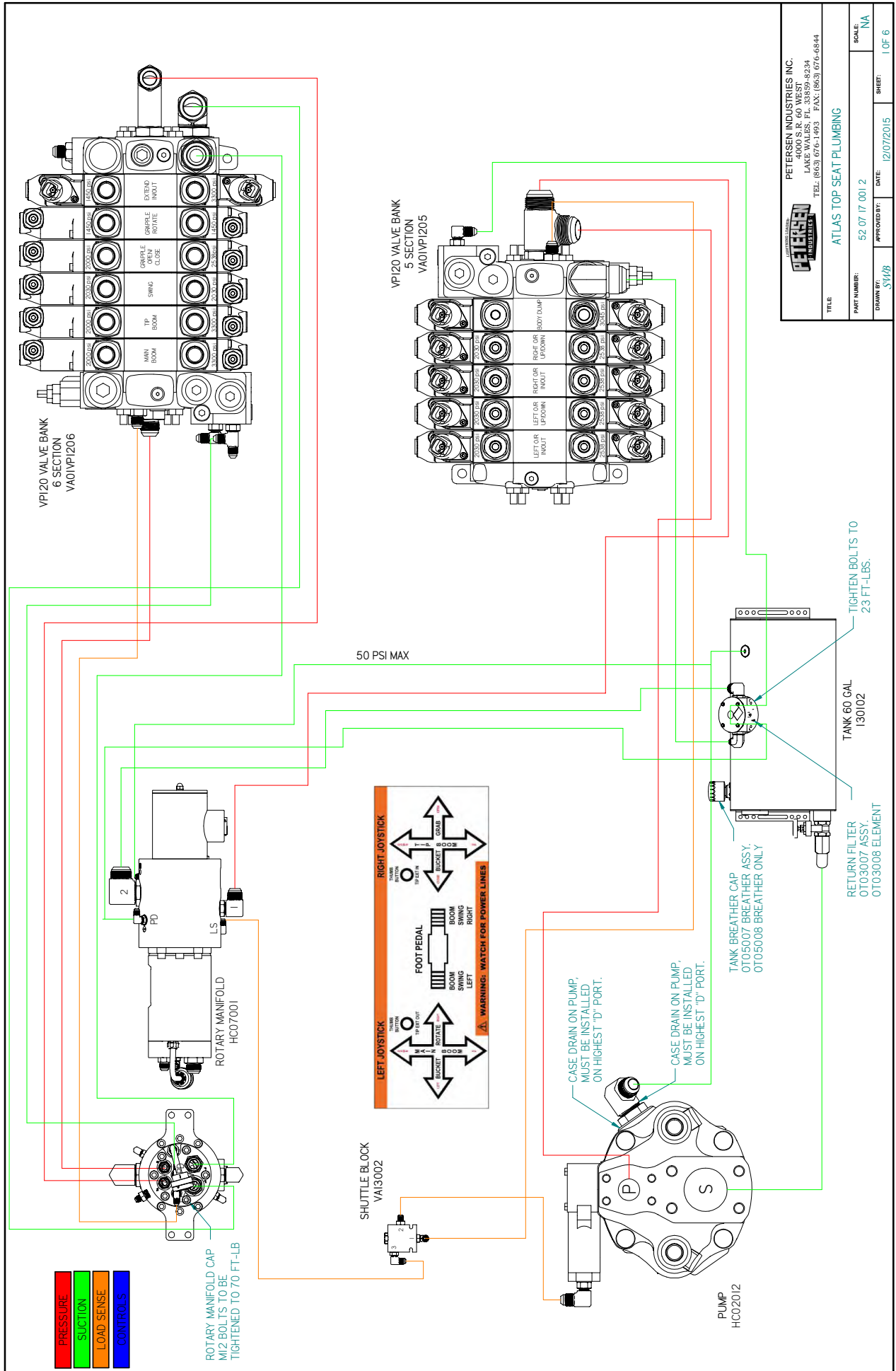
SCISSOR
HOIST



Point Number	Maintenance Description	Number of Points	Lubricant	Application Method	Frequency
1	Main Boom Pivot	1	Grease	Pressure	40-Hours
2	Main Boom Lift Cylinder Base End	1	Grease	Pressure	40-Hours
3	Main Boom Lift Cylinder Rod End	1	Grease	Pressure	40-Hours
4	Tip Cylinder Base End	1	Grease	Pressure	40-Hours
5	Tip Boom to Main Boom Pivot	1	Grease	Pressure	40-Hours
6	Tip Cylinder Rod End	1	Grease	Pressure	40-Hours
7	Tip Extension Tube	1	Grease	Pressure	40-Hours
8	Tip Extension Roller	1	Grease	Pressure	40-Hours
9	Bucket Cylinder Base End	2	Grease	Pressure	40-Hours
10	Bucket Cylinder Rod End	2	Grease	Pressure	40-Hours
11	Bucket Jaw Pivot	2	Grease	Pressure	40-Hours
12	Steering Bearing	1	Grease	Pressure	40-Hours
13	Outrigger Inner Tubes	4	Grease	Brush	80-Hours
14	Bucket Rotator Pin	1	Grease	Pressure	40-Hours
15	Body Chassis Pivot	2	Grease	Pressure	40-Hours
16	Hoist Lower Pivot	2	Grease	Pressure	40-Hours
17	Hoist Scissors Pivot	3	Grease	Pressure	40-Hours
18	Hoist Upper Pivot	2	Grease	Pressure	40-Hours
19	Hoist Cylinder Lower Pivot	2	Grease	Pressure	40-Hours
20	Hoist Cylinder Upper Pivot	2	Grease	Pressure	40-Hours
21	Hydraulic Tank	1	150-32 Hyd Oil	Fill to Max Level	40-Hours
22	Hydraulic Filter	1	OTQ3008	Replace	1000-Hours
23	Hydraulic Tank Breather	1	OTQ5008	Replace	1000-Hours
24	Outrigger Foot	2	Grease	Pressure	40-Hours
25	Ring Gear	1	Grease	Brush	40-Hours



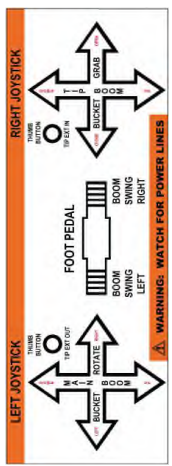
		PETERSEN INDUSTRIES INC. 4000 S.P. 60 WEST LAKE WALES, FL 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6644	
ATLAS TOP SEAT PLUMBING			
TITLE:	52 07 17 001 1	DATE:	12/07/2015
PART NUMBER:	APPROVED BY:	SHEET:	1 OF 6
DRAWN BY:	SYMB	SCALE:	NA



PRESSURE
SUCTION
LOAD SENSE
CONTROLS

ROTARY MANIFOLD CAP
 M12 BOLTS TO BE
 TIGHTENED TO 70 FT-LB

SHUTTLE BLOCK
VA13002



PUMP
HC02012

TANK 60 GAL
130102

RETURN FILTER
0T03007 ASSY.
0T03008 ELEMENT

TANK BREATHER CAP
0T05007 BREATHER ASSY.
0T05008 BREATHER ONLY

CASE DRAIN ON PUMP
MUST BE INSTALLED
ON HIGHEST 'D' PORT.

CASE DRAIN ON PUMP
MUST BE INSTALLED
ON HIGHEST 'D' PORT.

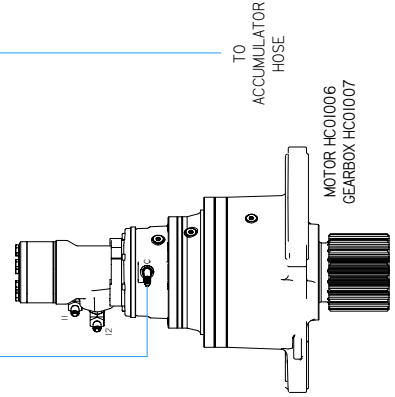
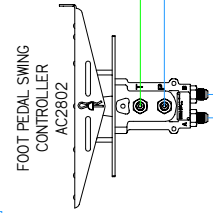
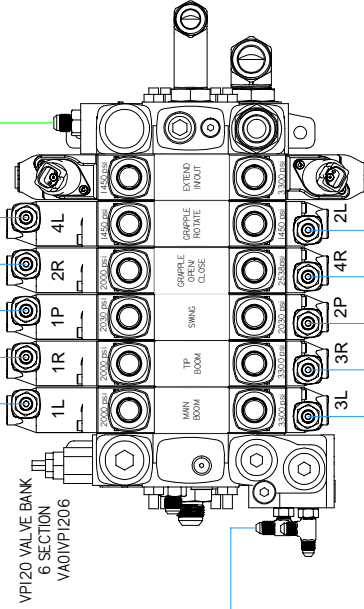
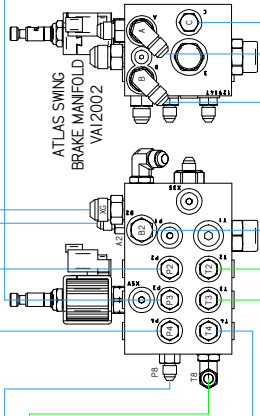
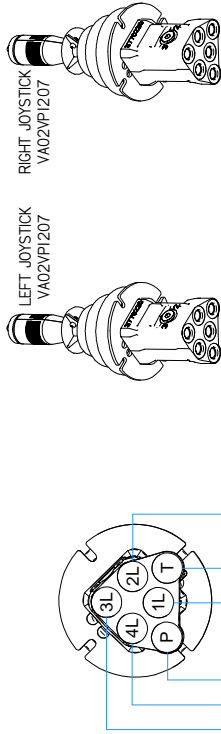
50 PSI MAX

VPI20 VALVE BANK
6 SECTION
VA01VP1206

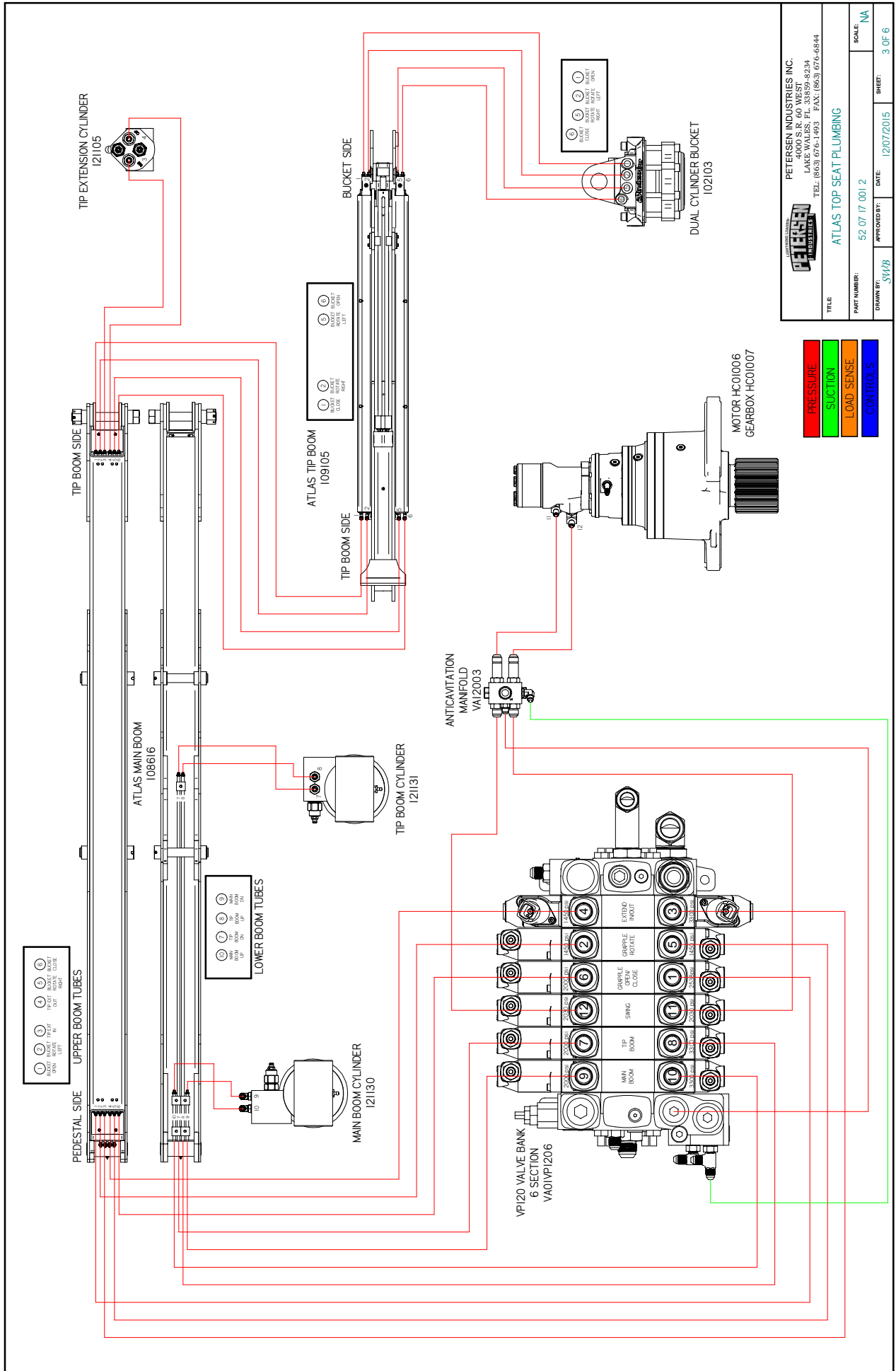
VPI20 VALVE BANK
5 SECTION
VA01VP1205

		PETERSEN INDUSTRIES INC. 4000 S. R. 60 WEST LAKE WALES, FL 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6644	
ATLAS TOP SEAT PLUMBING			
TITLE	52 07 17 001 2	DATE	12/07/2015
PART NUMBER	APPROVED BY:	SHEET:	1 OF 6
SCALE	NA	REVISED:	11/12/2004

NOTE: LEFT AND RIGHT ARE AS IF YOU ARE SITTING IN THE OPERATORS SEAT. IT IS IMPORTANT THAT JOYSTICKS ARE ORIENTED AS SHOWN IN THE DIAGRAM WITH THE PORT 3 FACING THE REAR OF THE SEAT.



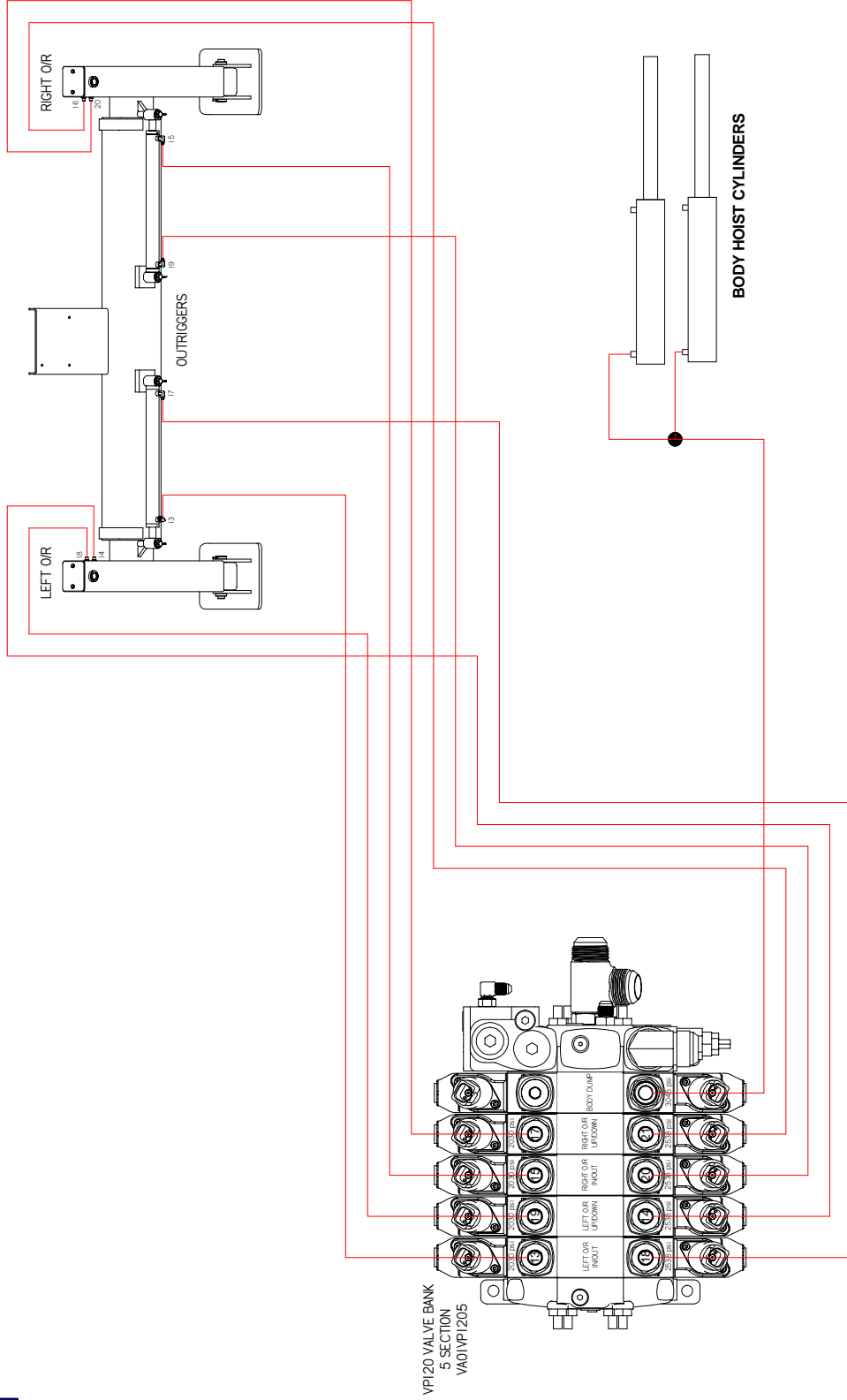
		PETERSEN INDUSTRIES INC. 4000 S. R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE	ATLAS TOP SEAT PLUMBING	DATE	12/07/2015
PART NUMBER	52 07 17 001 2	SCALE	NA
DRAWN BY	SVB/B	SHEET	2 OF 6



PETERSEN INDUSTRIES INC.
 4000 S. P. 60 WEST
 LAKE WALES, FL 33859-8234
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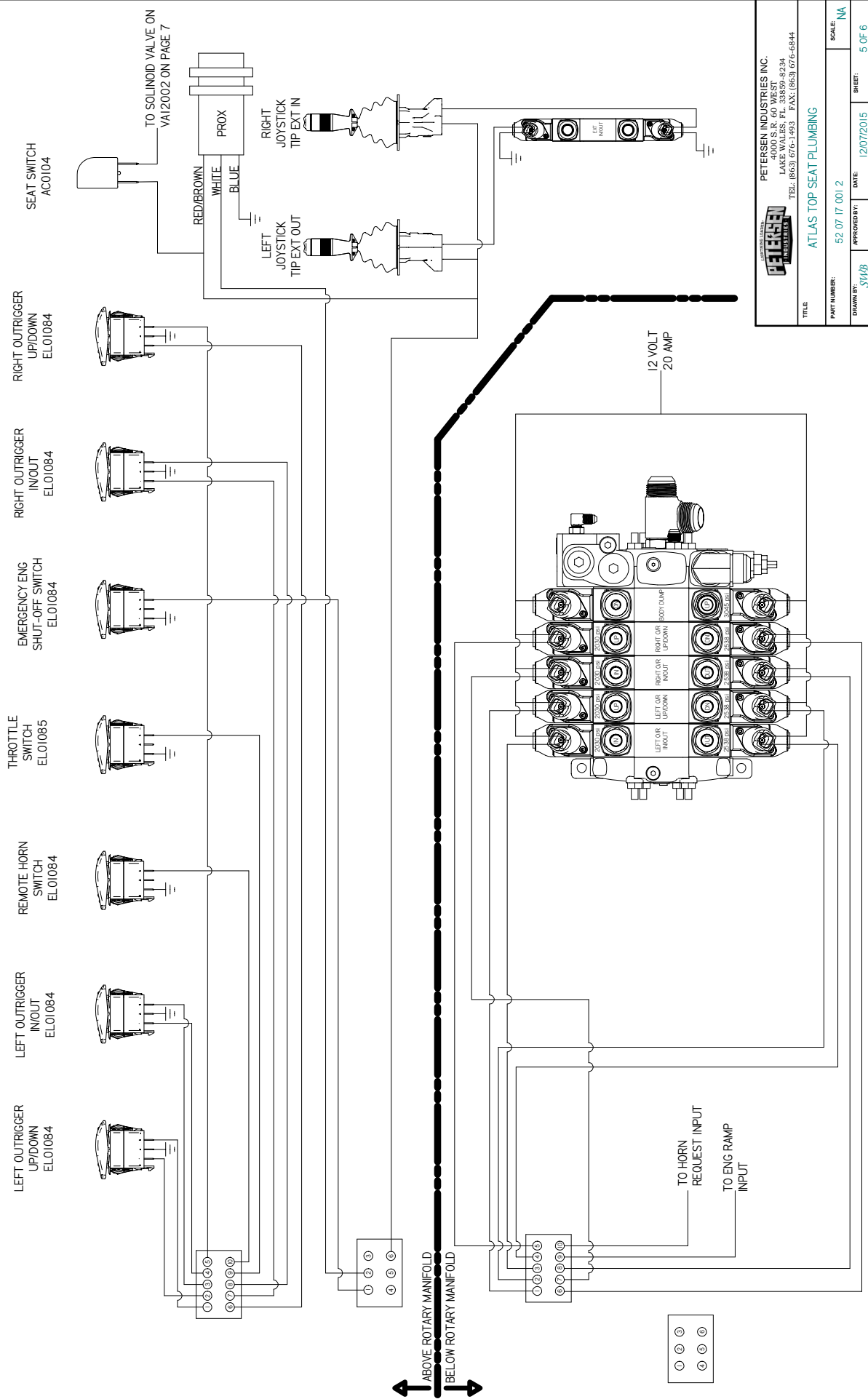
ATLAS TOP SEAT PLUMBING

TITLE: ATLAS TOP SEAT PLUMBING
 PART NUMBER: 52 07 17 001 2
 DRAWN BY: SYB
 DATE: 12/07/2015
 SHEET: 3 OF 6
 SCALE: NA



		PETERSEN INDUSTRIES INC. 4000 S. R. 60 WEST LAKE WALES, FL 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE	ATLAS TOP SEAT PLUMBING		
PART NUMBER	52 07 17 001 2	DATE	12/07/2015
APPROVED BY:	SYB	SCALE	NA
DRAWN BY:	SYB	SHEET:	4 OF 6

NOTE: LEFT AND RIGHT ARE AS IF YOU ARE SITTING IN THE OPERATORS SEAT



LEFT OUTRIGGER UP/DOWN ELO1084

LEFT OUTRIGGER IN/OUT ELO1084

REMOTE HORN SWITCH ELO1084

THROTTLE SWITCH ELO1085

EMERGENCY ENG SHUT-OFF SWITCH ELO1084

RIGHT OUTRIGGER IN/OUT ELO1084

RIGHT OUTRIGGER UP/DOWN ELO1084

SEAT SWITCH AC0104

TO SOLINOID VALVE ON VAI2002 ON PAGE 7

RED/BROWN WHITE BLUE

LEFT JOYSTICK TIP EXT OUT

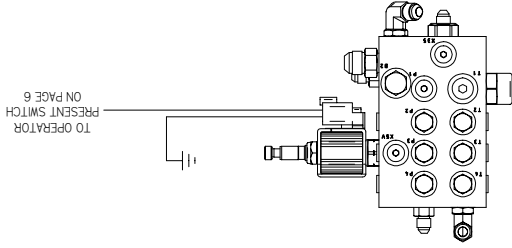
RIGHT JOYSTICK TIP EXT IN

↑ ABOVE ROTARY MANIFOLD
↓ BELOW ROTARY MANIFOLD


12 VOLT 20 AMP

TO HORN REQUEST INPUT
TO ENG RAMP INPUT

PETERSEN INDUSTRIES INC. 4000 S. R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE	ATLAS TOP SEAT PLUMBING
PART NUMBER	52 07 17 001 2
APPROVED BY:	SVB
DATE	12/07/2015
SCALE	NA
SHEET	5 OF 6



NO. OF CIRCUITS	WIRE SIZE, AWG	MAX LOAD (AMPS)	WIRE TYPE	WIRE COLOR	FUNCTION
1	16	5	GXL	YELLOW	LEFT OR UP
2	16	5	GXL	GREEN	LEFT OR DOWN
3	16	5	GXL	BLACK	LEFT OR IN
4	16	5	GXL	BLUE	LEFT OR OUT
5	16	5	GXL	PINK	RIGHT OR UP
6	16	5	GXL	VIOLET	RIGHT OR DOWN
7	16	5	GXL	BROWN	RIGHT OR IN
8	16	5	GXL	ORANGE	RIGHT OR OUT
9	16	5	GXL	LIGHT BLUE	BODY DUMP
10	16	5	GXL	TAN	RAMP UP
11	16	5	GXL	WHITE	HORN
12	16	10	GXL	GRAY	ENG KILL
13	16	10	GXL		SPARE
14	16	10	GXL		SPARE
15	16	10	GXL		SPARE
16	16	10	GXL		SPARE
17	16	10	GXL		SPARE
18	16	10	GXL		SPARE
19	16	10	GXL		SPARE
20	16	10	GXL		SPARE



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ATLAS TOP SEAT PLUMBING

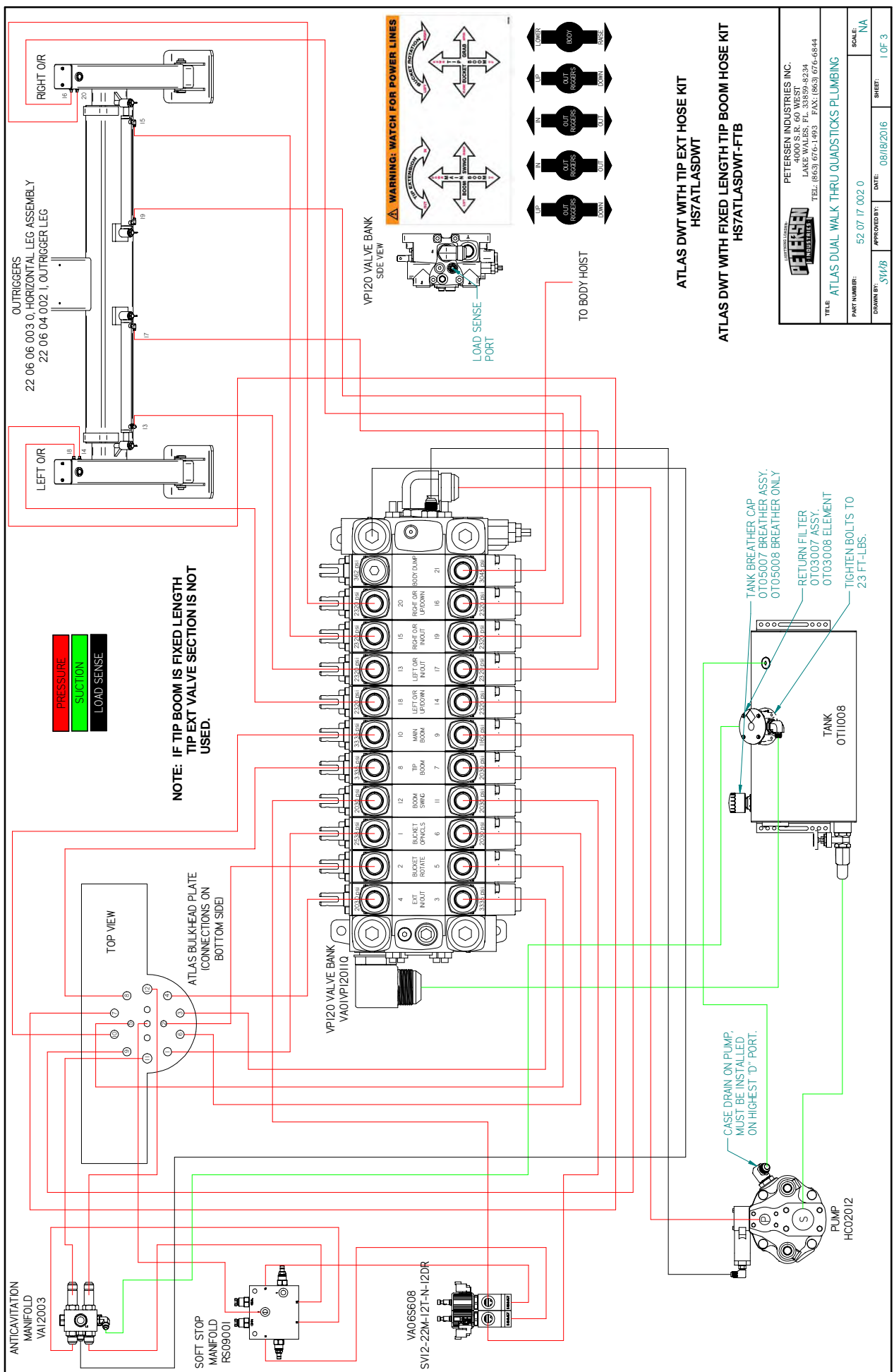
TITLE: _____

PART NUMBER: 52 07 17 001 2

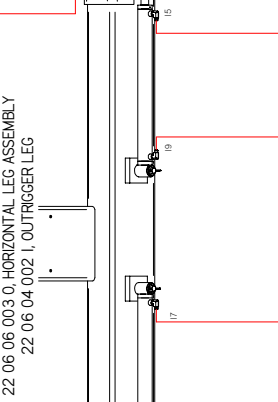
APPROVED BY: *SYMB* DATE: 12/07/2015

SCALE: NA

DRAWN BY: _____ SHEET: 6 OF 6

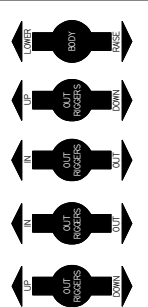
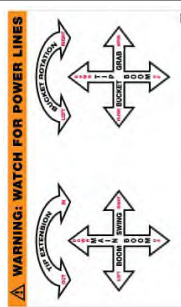
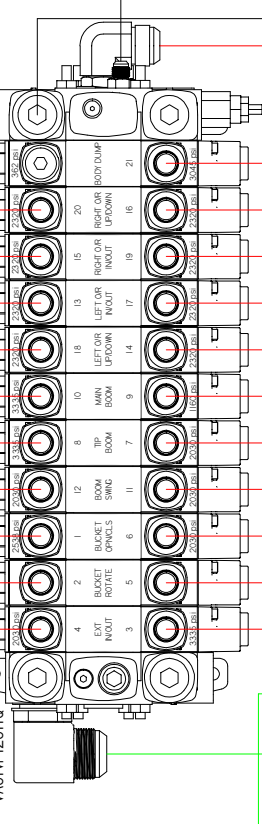
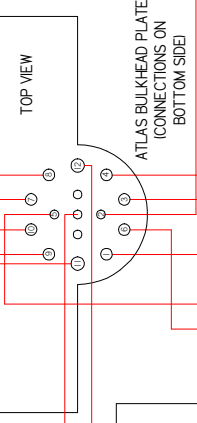


OUTRIGGERS
22 06 06 003 0 HORIZONTAL LEG ASSEMBLY
22 06 04 002 1 OUTRIGGER LEG



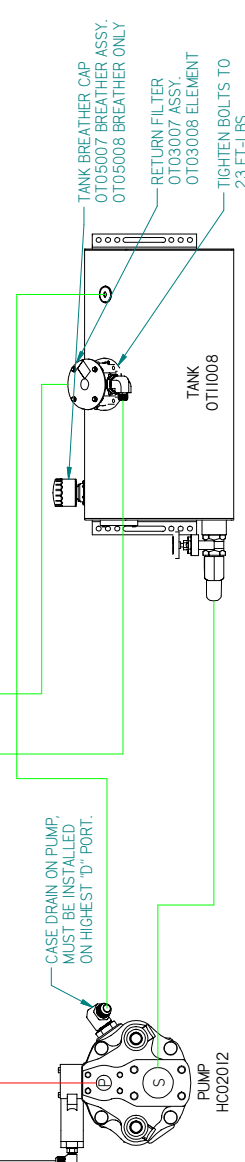
PRESSURE
SUCTION
LOAD SENSE

**NOTE: IF TIP BOOM IS FIXED LENGTH
TIP EXT VALVE SECTION IS NOT
USED.**



**ATLAS DWT WITH TIP EXT HOSE KIT
H57ATLASDWT**

**ATLAS DWT WITH FIXED LENGTH TIP BOOM HOSE KIT
H57ATLASDWT-FTB**



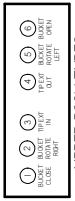
PETERSEN INDUSTRIES INC. 4000 S. R. 60 WEST LAKE WALES, FL 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6644	
TITLE	ATLAS DUAL WALK THRU QUADSTICKS PLUMBING
PART NUMBER	52 07 17 002 0
SCALE	NA
DRAWN BY	SYH/B
APPROVED BY	DATE 08/18/2016
SHEET	1 OF 3

NOTE: IF TIP BOOM IS FIXED LENGTH DO NOT INSTALL SMALL BULKHEAD PLATES (107371). RETURN PLATES TO STOCK.

BIG BULKHEAD 107370

SMALL BULKHEAD 107371

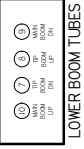
THESE BIG AND SMALL BULKHEAD PLATES ARE STANDING ON THE WALK THRU LOOKING AT BACK OF HEAD



BIG BULKHEAD 107370

SMALL BULKHEAD 107371

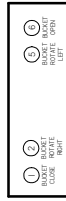
THESE BIG AND SMALL BULKHEAD PLATES ARE LOOKING INSIDE HEAD



ATLAS TIP BOOM 02 04 08 001 0

TIP BOOM SIDE

BUCKET SIDE



ATLAS MAIN BOOM 02 03 18 001 0

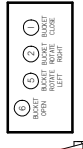
TIP BOOM SIDE

THIS IS THE BOTTOM OF THE MAIN BOOM LOOKING UP

TIP EXTENSION CYLINDER 121105



DUAL CYLINDER BUCKET 102103



NOTE: IF TIP BOOM IS FIXED LENGTH HOSES 3 AND 4 WILL NOT BE USED.

BIG BULKHEAD 107370

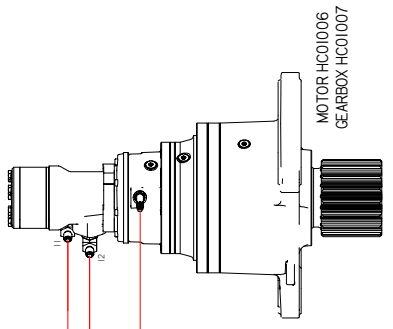
SMALL BULKHEAD 107371

THESE BIG AND SMALL BULKHEAD PLATES ARE LOOKING INSIDE HEAD



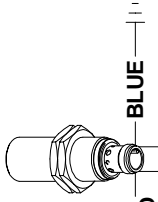
MAIN BOOM CYLINDER 121130

TIP BOOM CYLINDER 121131

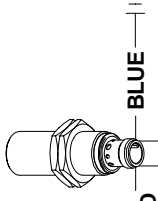


		PETERESEN INDUSTRIES INC. 4000 S. R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE	ATLAS DUAL WALK THRU QUADSTICKS PLUMBING	SCALE	NA
PART NUMBER	52 07 17 002 0	DATE	08/18/2016
DRAWN BY	SJH/B	APPROVED BY	
		SHEET	2 OF 3

EL01042
PROXIMITY SENSOR



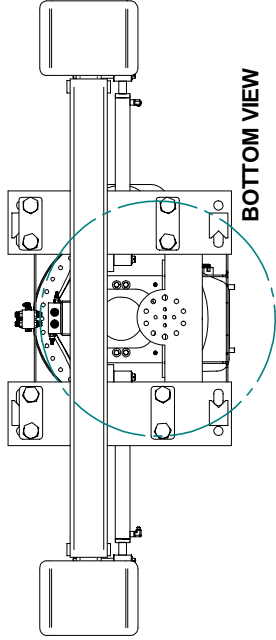
EL01042
PROXIMITY SENSOR



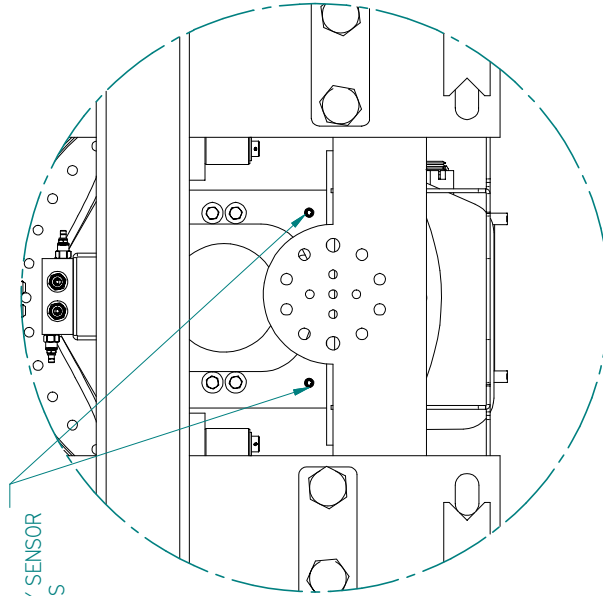
KEY ON POWER

12 VOLT
20 AMP
FUSE

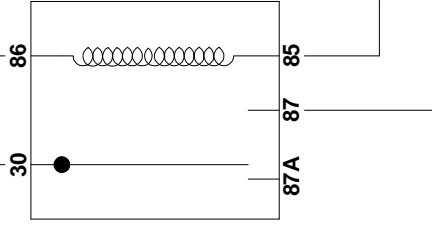
EL01064
PROXIMITY SENSOR
LOCATIONS



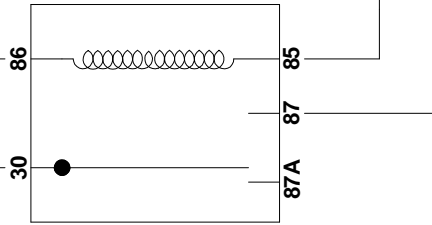
BOTTOM VIEW



DETAIL A



TO SOL
POWER



TO SOL
POWER



PETERESEN INDUSTRIES, INC.
4000 S. P. 60 WEST
LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE ATLAS DUAL WALK THRU QUADSTICKS PLUMBING

PART NUMBER:	52 07 17 002 0	DATE:	08/18/2016	SCALE:	NA
DRAWN BY:	S1168	APPROVED BY:		SHEET:	3 OF 3

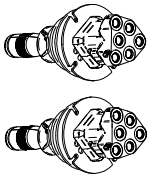
Revised: 11/1/2004
R: Custom Dwg/Dgt Landscape Boxer

**PILOT CONTROL
DIAGRAM**

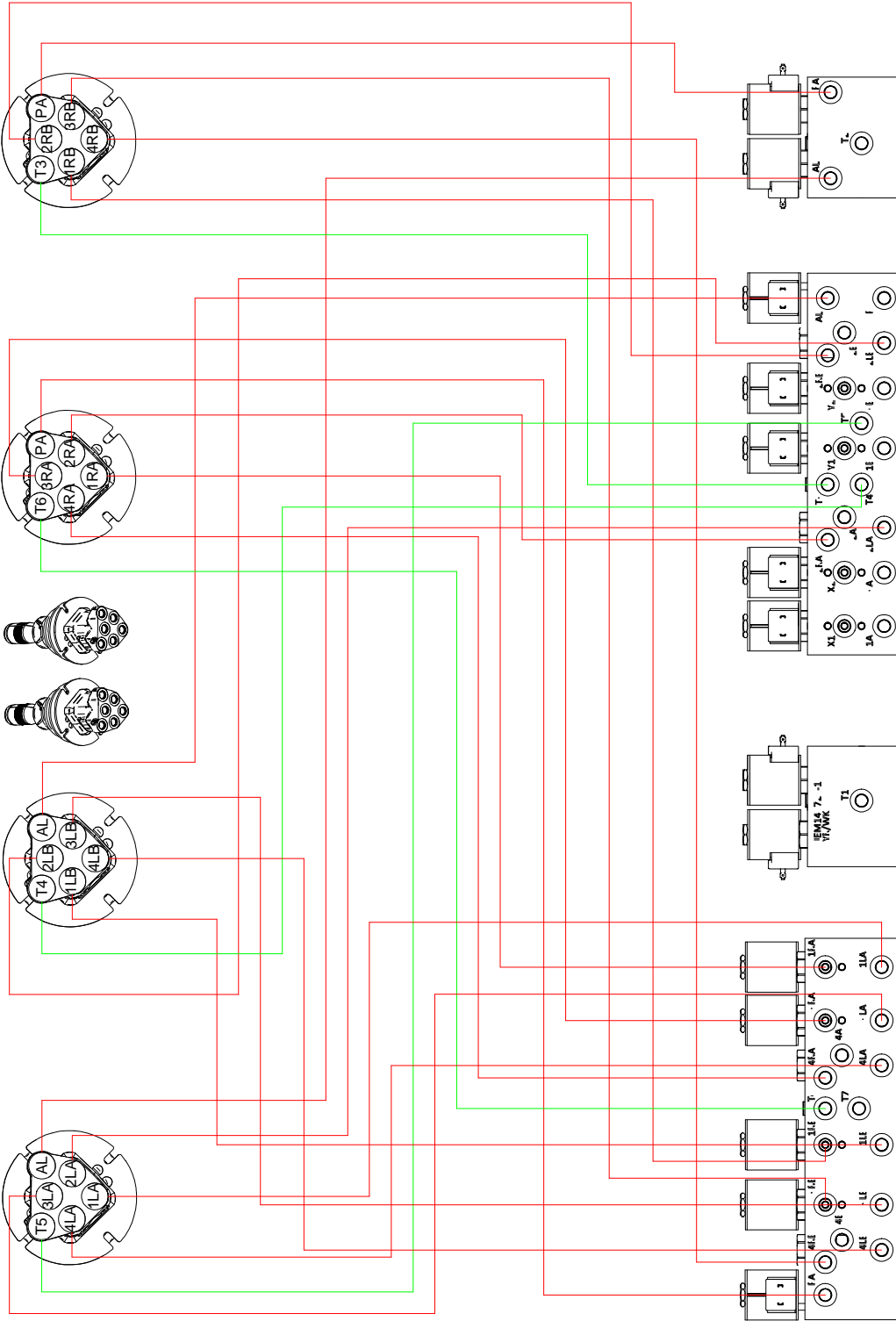
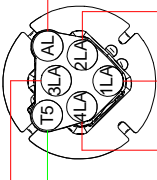
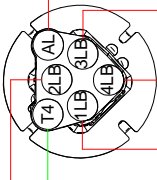
*** JOYSTICK PLUMBING IS
SHOWN LOOKING AT BOTTOM
OF JOYSTICK.**

*** JOYSTICK MUST BE
INSTALLED WITH FLAT SIDE
OF JOYSTICK FACING
OPERATOR ON DUAL WALK
THRU**

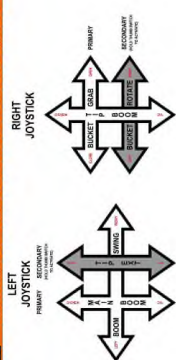
**RIGHT JOYSTICKS
VA02VP1207**



**LEFT JOYSTICKS
VA02VP1207**



WARNING: WATCH FOR POWER LINES



**PILOT HOSE KIT
HSTATLASDWT/PIL**
**ATLAS DWT WITH TIP EXT HOSE KIT
HSTATLASDWT**
**ATLAS DWT WITH FIXED LENGTH TIP BOOM HOSE KIT
HSTATLASDWT-FTB**

**SHUTTLE MANIFOLD
VA13001**

**T, X1, X2, Y1, Y2
CAN BE USED AS
TANK PORTS ON
SHUTTLE MANIFOLD.
ANY UNUSED PORTS
SHOULD BE PLUGGED.**

PETERSEN INDUSTRIES INC.
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LAKE WALES, FL 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

PETERSEN INDUSTRIES

ATLAS DUAL WALK THRU PILOT PLUMBING

PART NUMBER: **52 07 17 003 0** DATE: **01/30/2017** SCALE: **NA**

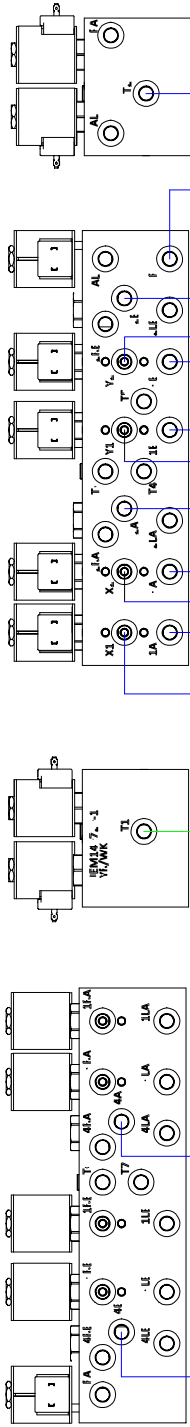
DRAWN BY: **SVB** APPROVED BY: **SVB** SHEET: **1 OF 8**

Revised: 11/12/2004
R: Current Dwg/001 Landscape Baster

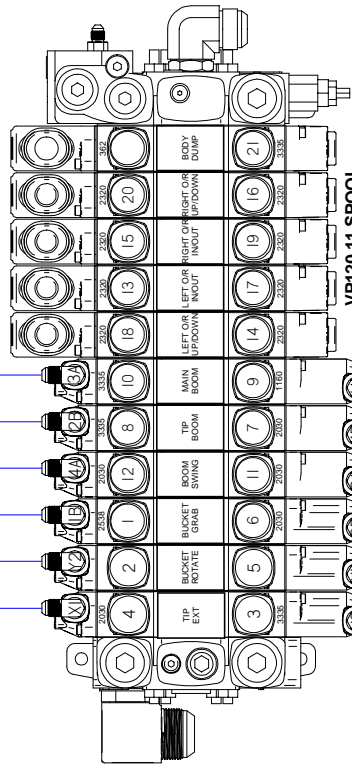
**PILOT CONTROL
DIAGRAM**



**SHUTTLE MANIFOLD
VA13001**



**PLUMB DIRECTLY TO
TANK. DO NOT ROUTE
THRU RETURN FILTER.**



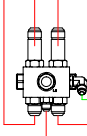
**NOTE: IF TIP BOOM IS FIXED LENGTH
TIP EXT VALVE SECTION IS NOT
USED.**

PETERSEN INDUSTRIES
PETERSEN INDUSTRIES INC.
4000 S. R. 60 WEST
LAKE WALES, FL 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6644

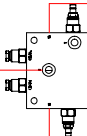
ATLAS DUAL WALK THRU PILOT PLUMBING

PART NUMBER: 52 07 17 003 0
DATE: 01/30/2017
APPROVED BY: SVB
SCALE: NA
DRAWN BY: SVB
SHEET: 2 OF 8
Revised: 11/1/2004

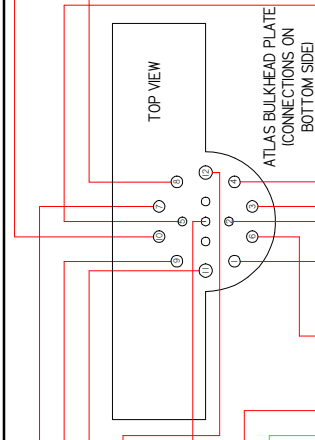
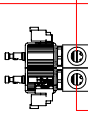
ANTICAVITATION
MANIFOLD
VA12003



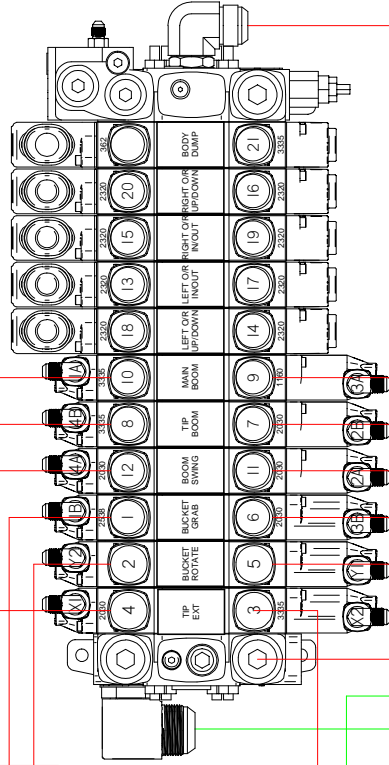
SOFT STOP
MANIFOLD
RS09001



SV12M-22-12T-
N12DL

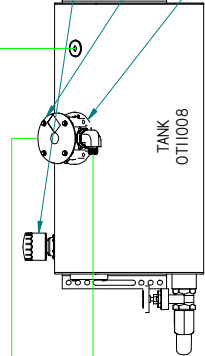
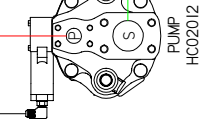


VP120 VALVE BANK
VA01VP120IIP
SEE 32.07.17.003.0 FOR
FITTING LOCATIONS

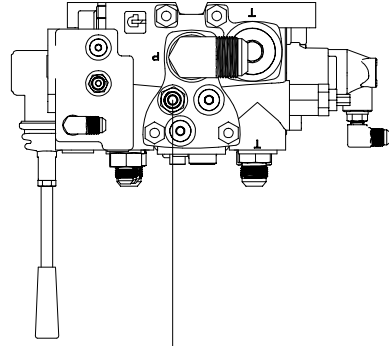


NOTE:
IF TIP BOOM IS FIXED LENGTH TIP EXT
VALVE SECTION IS NOT USED.

CASE DRAIN ON PUMP
MUST BE INSTALLED
ON HIGHEST "D" PORT.

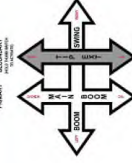


TANK BREATHER CAP
0105007 BREATHER ASSY.
0105008 BREATHER ONLY
RETURN FILTER
0103007 ASSY
0103008 ELEMENT
TIGHTEN BOLTS TO
23 FT.-LBS.

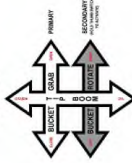


WARNING: WATCH FOR POWER LINES

LEFT
JOYSTICK

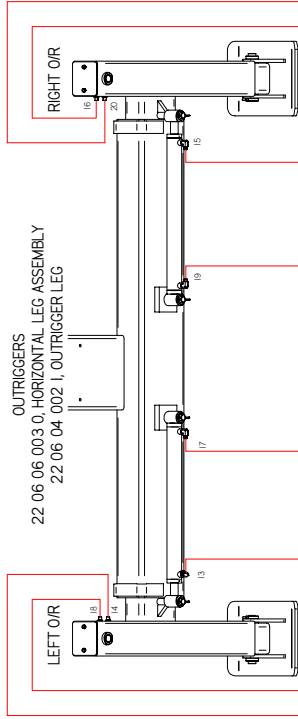


RIGHT
JOYSTICK

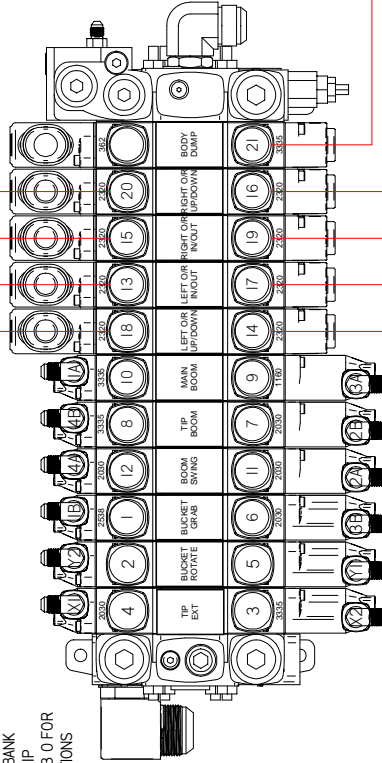


		PETERSEN INDUSTRIES INC. 4000 S. R. 60 WEST LAKE WALES, FL 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6644	
TITLE ATLAS DUAL WALK THRU PILOT PLUMBING		SCALE NA	
PART NUMBER 52.07.17.003.0		DATE 01/30/2017	
DRAWN BY SYB		SHEET 3 OF 8	

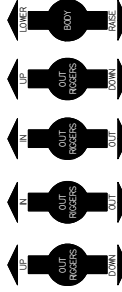
Approved By: R. Clumey Eng/00pt Landscape Bocker
Revised: 11/11/2004



VPI20 VALVE BANK
 VA01VPI201IP
 SEE 32.07.17.003.0 FOR
 FITTING LOCATIONS



**NOTE: IF TIP BOOM IS FIXED LENGTH
 TIP EXT VALVE SECTION IS NOT
 USED.**

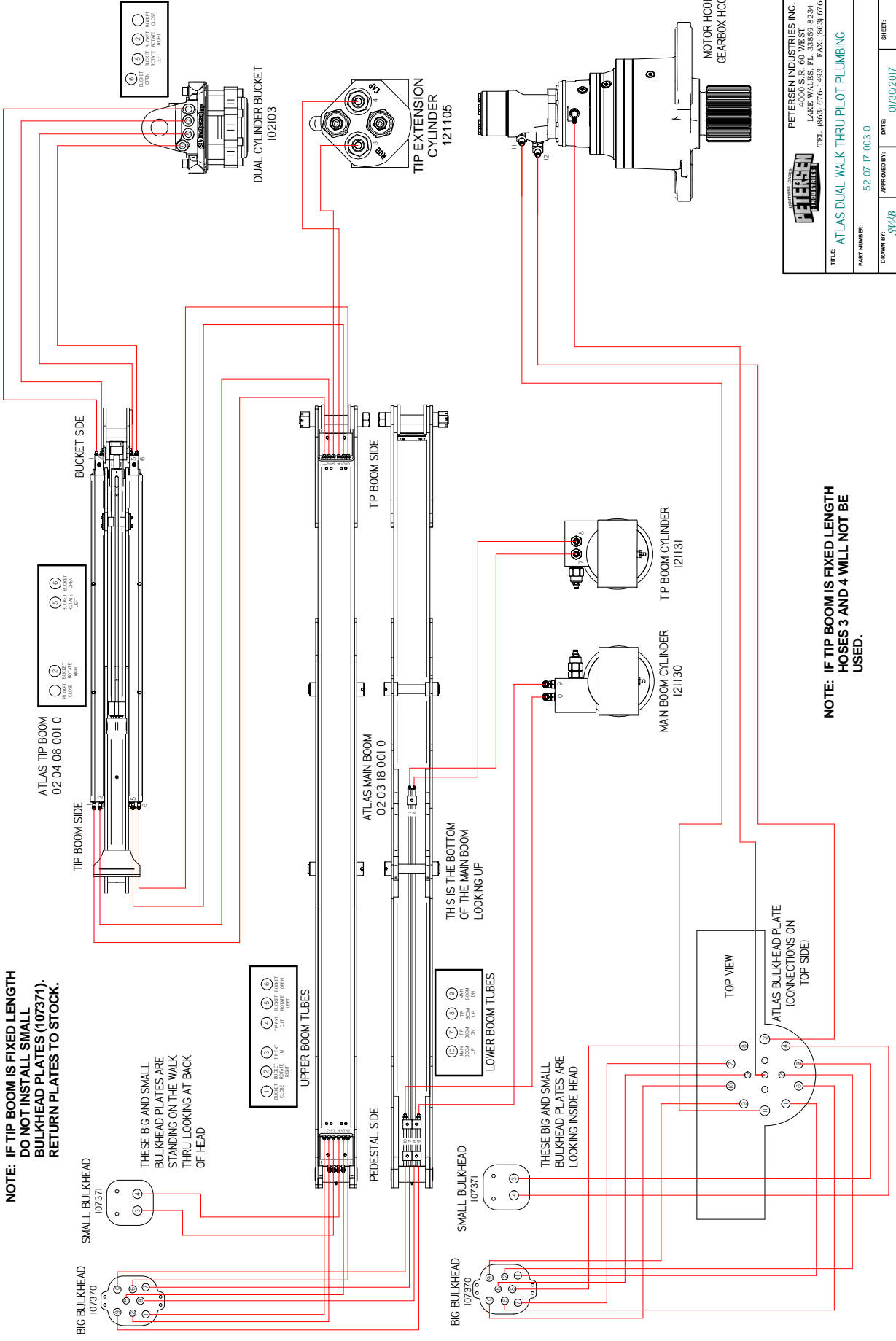


TO BODY HOIST

PETERSEN INDUSTRIES
 PETERSEN INDUSTRIES INC.
 4000 S. P. 60 WEST
 LAKE WALES, FL. 33859-8234
 TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: ATLAS DUAL WALK THRU PILOT PLUMBING
 PART NUMBER: 52.07.17.003.0
 DRAWN BY: SYB
 APPROVED BY: DATE: 01/30/2017
 SCALE: NA
 SHEET: 4 OF 8

NOTE: IF TIP BOOM IS FIXED LENGTH DO NOT INSTALL SMALL BULKHEAD PLATES (107371). RETURN PLATES TO STOCK.



BIG BULKHEAD 107370

SMALL BULKHEAD 107371

THESE BIG AND SMALL BULKHEAD PLATES ARE STANDING ON THE WALK THRU LOOKING AT BACK OF HEAD

UPPER BOOM TUBES
 1. BUCKET BUCKET IN, BUCKET BUCKET OUT, TIP TIP IN, TIP TIP OUT, TIP TIP IN, TIP TIP OUT

BIG BULKHEAD 107370

SMALL BULKHEAD 107371

THESE BIG AND SMALL BULKHEAD PLATES ARE LOOKING INSIDE HEAD

LOWER BOOM TUBES
 1. MAIN TIP IN, MAIN TIP OUT, TIP TIP IN, TIP TIP OUT

TOP VIEW

ATLAS BULK-HEAD PLATE (CONNECTIONS ON TOP SIDE)

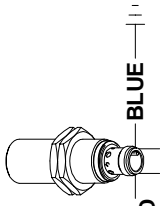
NOTE: IF TIP BOOM IS FIXED LENGTH HOSES 3 AND 4 WILL NOT BE USED.



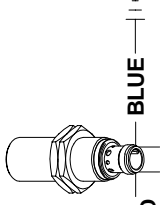
PETERESSEN INDUSTRIES INC.
 4000 S. R. 60 WEST
 LAKE WALES, FL. 33859-8234
 TEL: (863) 676-1493 FAX: (863) 676-6644

TITLE ATLAS DUAL WALK THRU PILOT PLUMBING		SCALE NA
PART NUMBER 52 07 17 003 0	DATE 01/30/2017	SHEET 5 OF 8
DRAWN BY SYM/B	APPROVED BY	

EL01042
PROXIMITY SENSOR

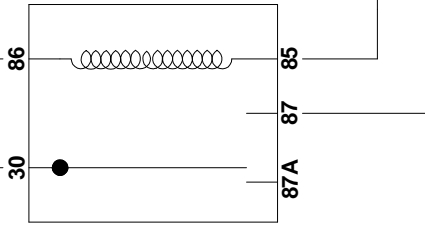
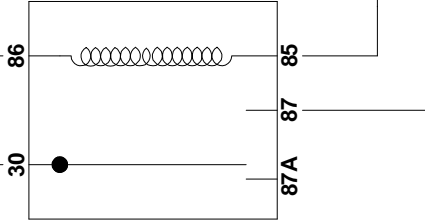


EL01042
PROXIMITY SENSOR



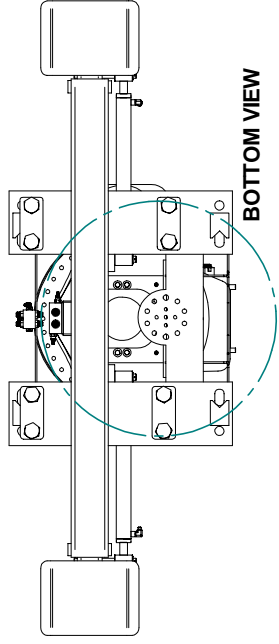
KEY ON POWER

12 VOLT
20 AMP
FUSE



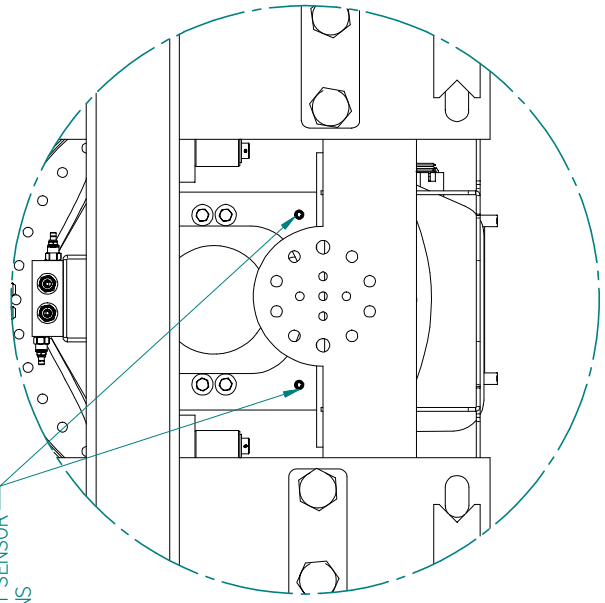
TO SOL
POWER

TO SOL
POWER



BOTTOM VIEW

PROXIMITY SENSOR
LOCATIONS



DETAIL A



PETERESEN INDUSTRIES, INC.
4000 S. P. 60 WEST
LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6644

TITLE ATLAS DUAL WALK THRU PILOT PLUMBING

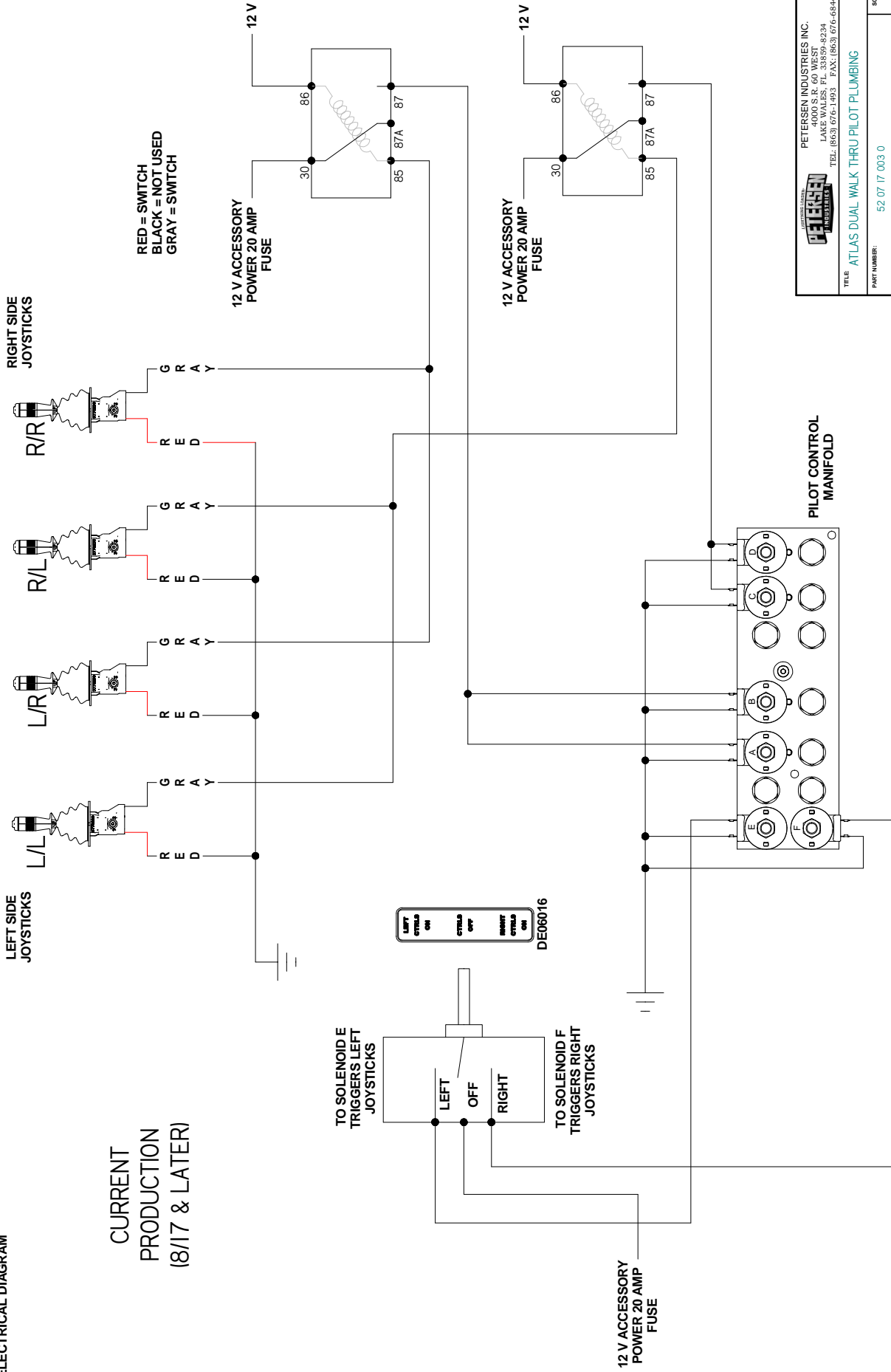
PART NUMBER:	52 07 17 003 0	SCALE:	NA
DRAWN BY:	SYMB	DATE:	01/30/2017
APPROVED BY:		SHEET:	6 OF 8

Revised: 11/1/2004

Last Printed: 8/17/2017 by: sarscheid

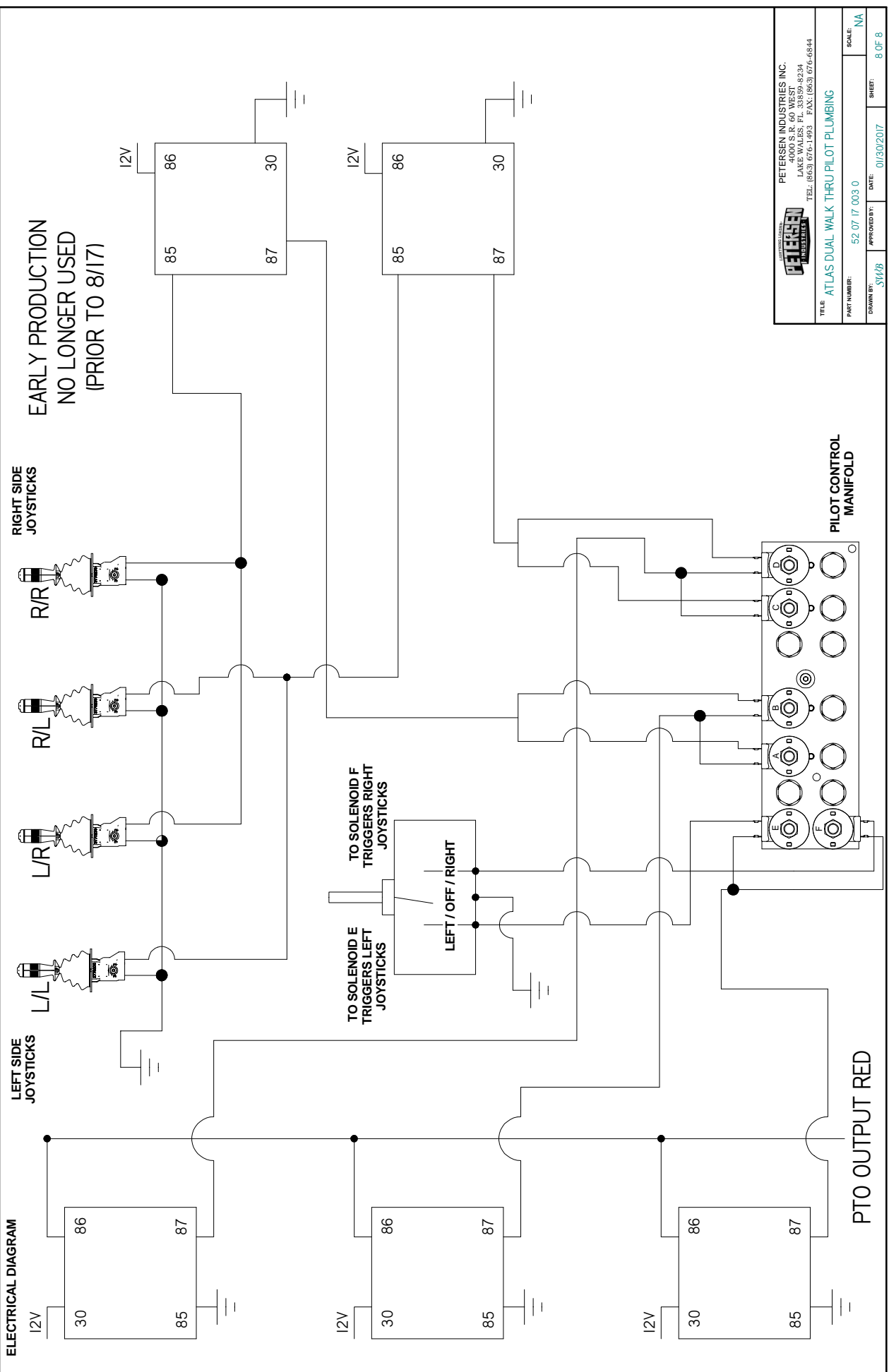
ELECTRICAL DIAGRAM

CURRENT PRODUCTION (8/17 & LATER)



PETERSEN INDUSTRIES INC. 4000 S. R. 60 WEST LAKE WALES, FL 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE: ATLAS DUAL WALK THRU PILOT PLUMBING	
PART NUMBER:	52 07 17 003 0
APPROVED BY:	DATE: 01/30/2017
DRAWN BY:	SVB
SCALE:	NA
SHEET:	7 OF 8

ELECTRICAL DIAGRAM



EARLY PRODUCTION
NO LONGER USED
(PRIOR TO 8/17)

RIGHT SIDE
JOYSTICKS

LEFT SIDE
JOYSTICKS

TO SOLENOID E
TRIGGERS LEFT
JOYSTICKS

TO SOLENOID F
TRIGGERS RIGHT
JOYSTICKS

LEFT / OFF / RIGHT

PILOT CONTROL
MANIFOLD

PTO OUTPUT RED

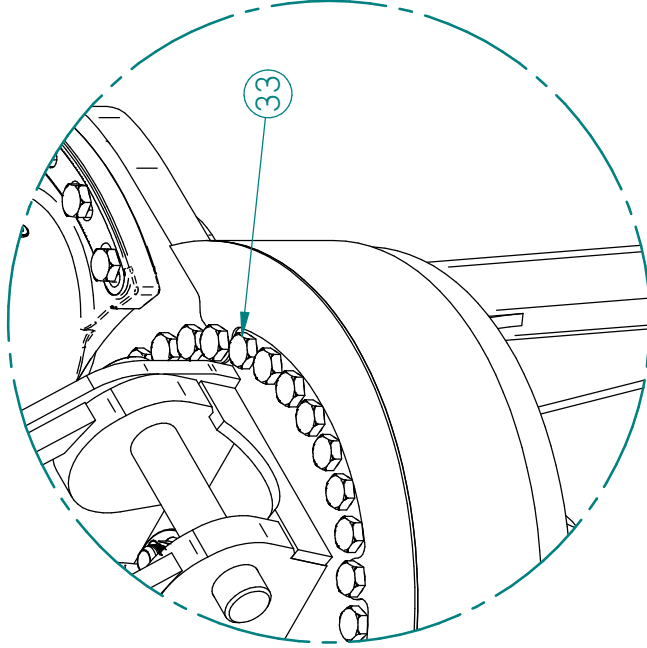
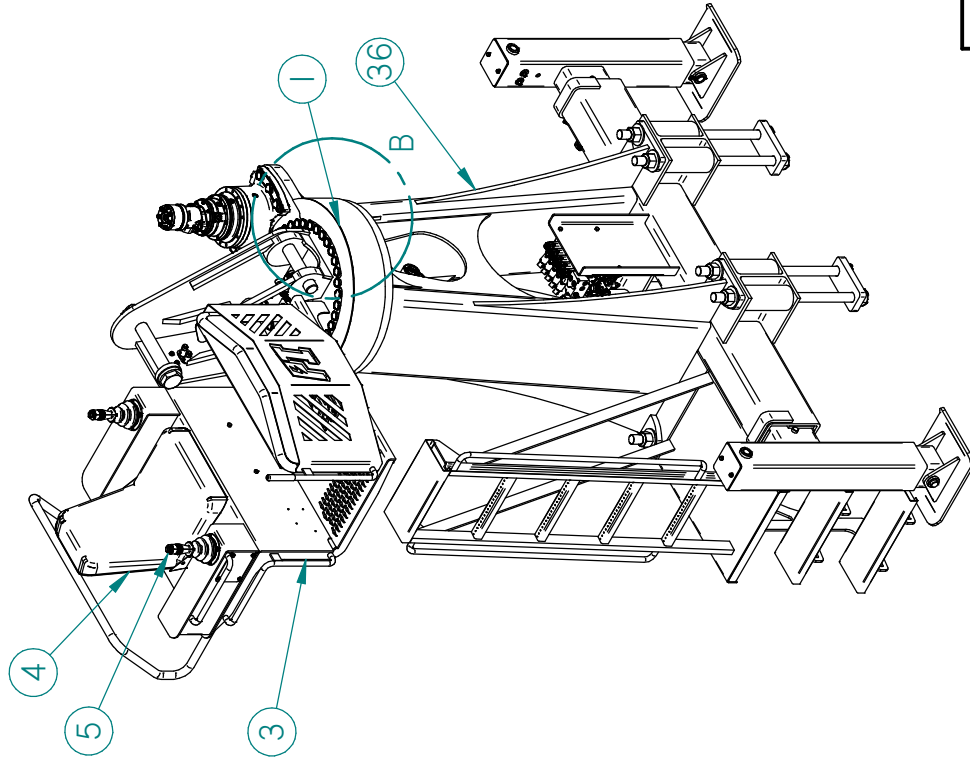


PETERESSEN INDUSTRIES INC.
4000 S. P. 60 WEST
LAKE WALES, FL 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE ATLAS DUAL WALK THRU PILOT PLUMBING		SCALE NA
PART NUMBER 52 07 17 003 0	DATE 01/30/2017	SHEET 8 OF 8
DRAWN BY SYM/B	APPROVED BY	REVISED 11/1/2004

010 ASSEMBLY

REV.	DESCRIPTION	DATE	BY
3	CUSTOMER REQUESTED CHANGES TO FLOOR, LADDER, ETC	04/07/17	SYKB



DETAIL B

*SLEWING BEARING BOLTS TO BE TORQUED TO 282 FT-LB

*GEARBOX BOLTS TO BE TORQUED TO:
1" BOLTS - 480 FT-LB
3/4" BOLTS - 282 FT-LB

TOLERANCES

1 DEC.	+ 0.100
2 DEC.	+ 0.050
3 DEC.	+ 0.010
ANGLE:	+ 1.000°
FRACTION:	+ 1/32"
DIM. UNITS:	INCHES
SURFACE FINISH:	125/32

UNLESS OTHERWISE SPECIFIED

DEC. = DECIMAL PLACES)

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TEL: (863) 676-1493 FAX: (863) 676-6844

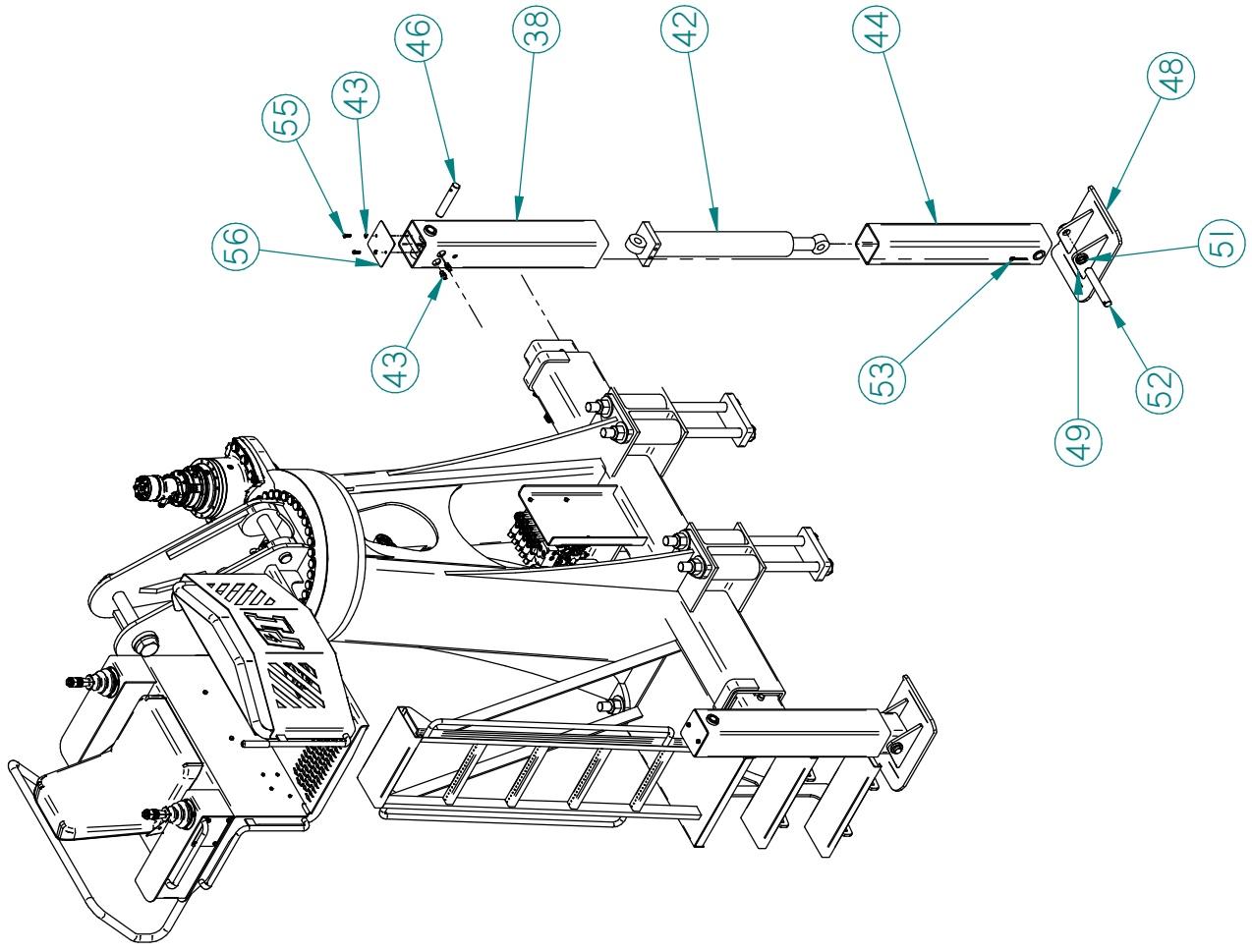


TITLE: **ATLAS HEAD AND PEDESTAL ASSEMBLY**

PART NUMBER: 02 02 18 001 3 / 106050

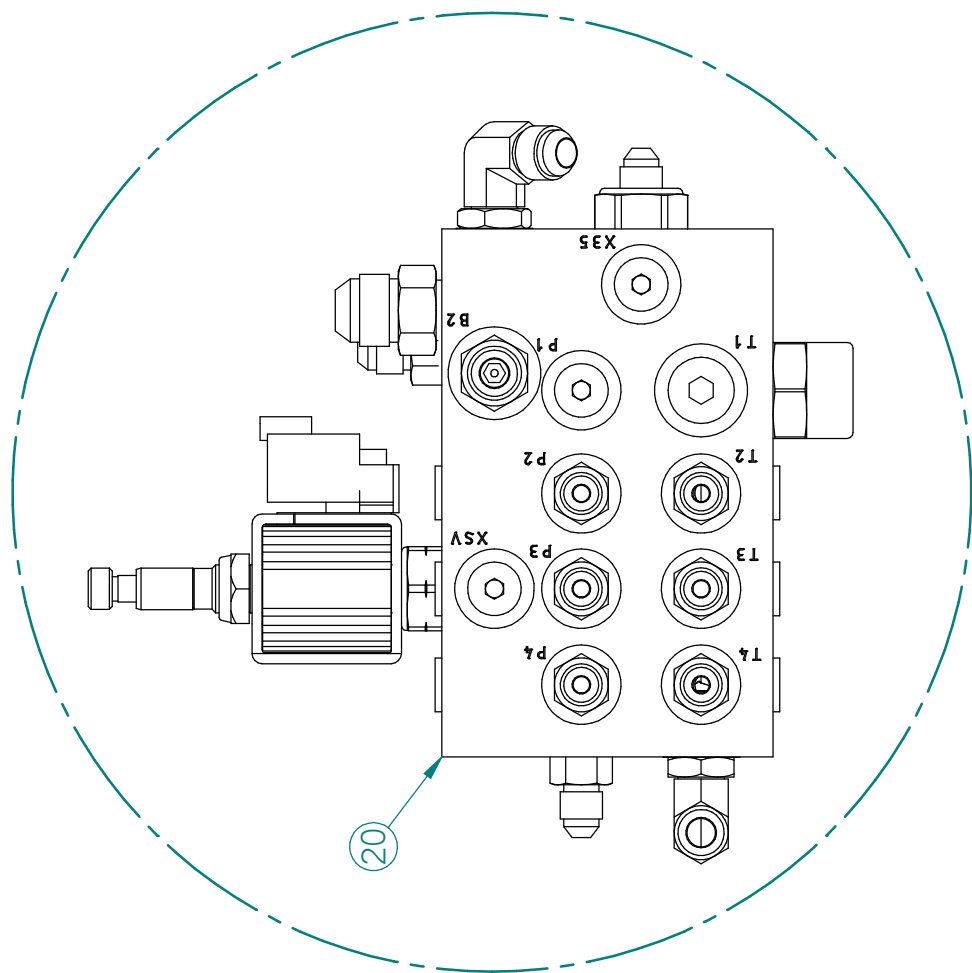
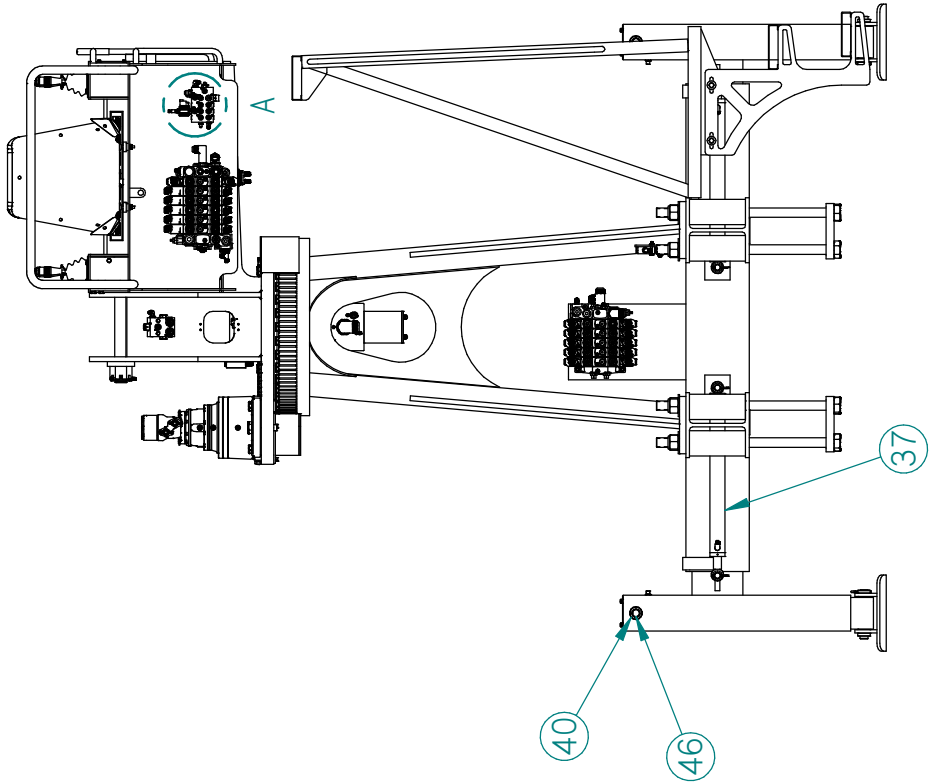
SCALE: 1:30

APPROVED BY: SYKB DATE: 1/19/2015 SHEET: 1 OF 7



PETERESEN INDUSTRIES INC.
 4000 S.R. 60 WEST
 LAKE WALES, FL. 33859-8234
 TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE ATLAS HEAD AND PEDESTAL ASSEMBLY		SCALE: 1:30
PART NUMBER: 02 02 18 001 3 / 106050	APPROVED BY: SYMB	SHEET: 2 OF 7
DRAWN BY: SYMB	DATE: 1/19/2015	Revised: 11/11/2004

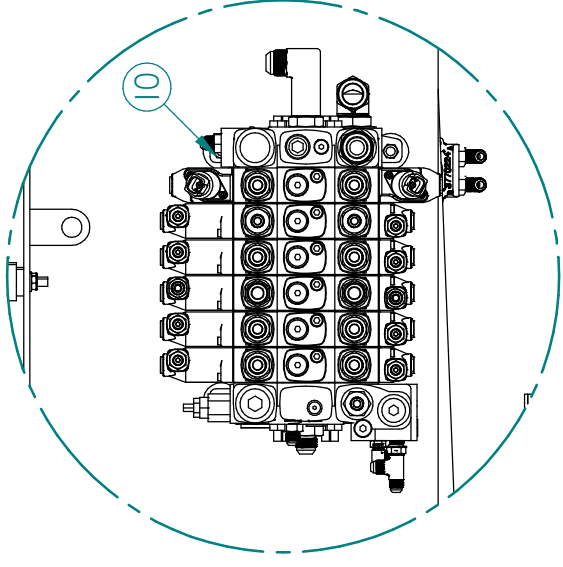
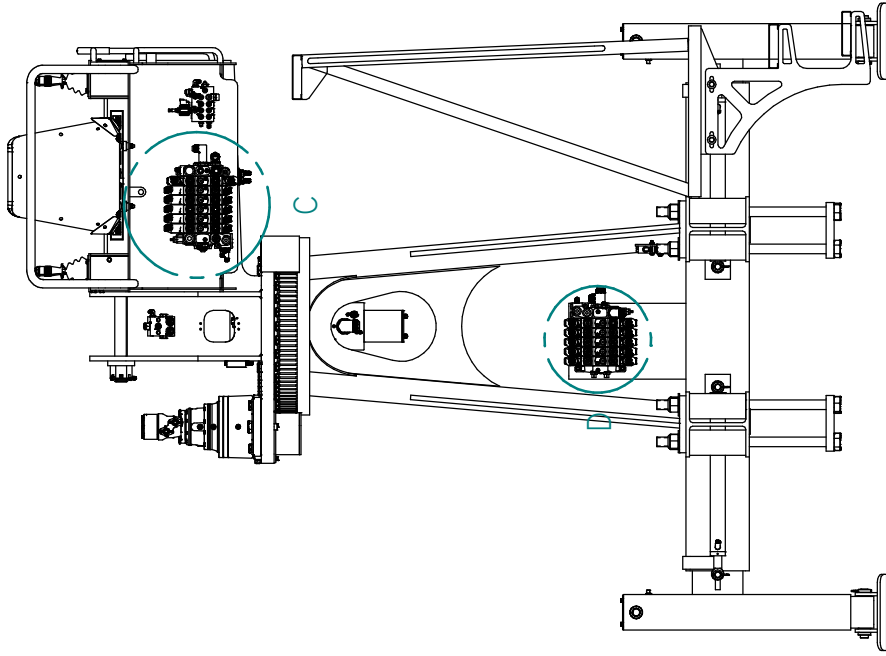


DETAIL A

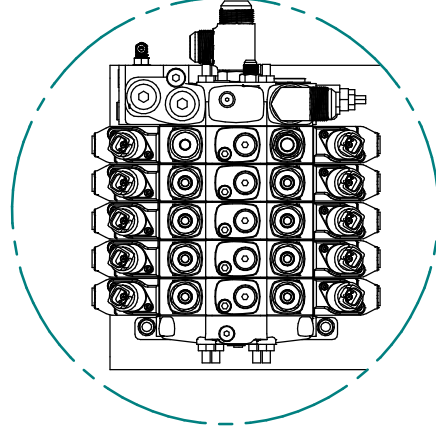


PETERSEN INDUSTRIES INC.
 4000 S.R. 60 WEST
 LAKE WALES, FL. 33859-8234
 TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE		ATLAS HEAD AND PEDESTAL ASSEMBLY	
PART NUMBER:	02 02 18 001 3 / 106050	SCALE:	1:30
DRAWN BY:	SYMB	APPROVED BY:	1/19/2015
		SHEET:	3 OF 7



DETAIL C



DETAIL D



PETERSEN INDUSTRIES INC.
 4000 S.R. 60 WEST
 LAKE WALES, FL. 33859-8234
 TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE

ATLAS HEAD AND PEDESTAL ASSEMBLY

PART NUMBER:

02 02 18 001 3 / 106050

SCALE:

1:30

DRAWN BY:

SY4/B

APPROVED BY:

1/19/2015

SHEET:

4 OF 7

Item #	Title	Document #	MACOLA	Qty
1	ATLAS RING GEAR GUARD WELDMENT	32 02 03 010 0	I07204	1
2	HYDRAULIC, #4 M.JIC-#6 MOR90	HF100406JM9	HF100406JM9	2
3	ATLAS HEAD WITH SIDE SEAT WELDMENT	32 02 03 006 3	I07200	1
4	ACCESSORY, UNIVERSAL SEAT ASSEMBLY	AC0104	AC0104	1
5	VALVE, JOYSTICK PILOT 2 AXIS WITH SWITCH FOR VPI20 ATLAS	VA02VPI207	VA02VPI207	2
6	2 AXIS PILOT FOOT CONTROLLER	AC2802	AC2802	1
7	WASHER LOCK 1/4 SPLIT USS	WAS045	WAS045	4
8	NUT HEX 1/4 USS	NUA04U	NUA04U	4
9	WASHER LOCK 3/8 SPLIT	WAS065	WAS065	14
10	HEX NUT 3/8 -16 USS	NUA06U	NUA06U	6
11	HYDRAULIC, FITTING #4 M.JIC-#6 MOR	HF100406JM	HF100406JM	12
13	WASHER FLAT .250 USS	WAF04U5	WAF04U5	20
14	NUT, NYLON LOCK, .250 USS	NUN04U	NUN04U	8
15	BOLT HEX 1/4-20 X 1 USS G5	BL304016U520	BL304016U520	8
16	WASHER FLAT 5/16 USS	WAF05U5	WAF05U5	6
17	HEX NUT 5/16-24 SAE STOVERLOCK	NUS05S	NUS05S	4
18	HEX BOLT 3/8-16 X .750 USS G5	BL306012U516	BL306012U516	7
19	VALVE, ANTI CAVITATION MANIFOLD	VAI2003	VAI2003	1
20	VALVE, PILOT BRAKE BLOCK	VAI2002	VAI2002	1
21	HYDRAULIC, FITTING WITH ORIFICE CHECKS	VA06C004	VA06C004	2
22	HEX NUT 5/16-18 USS	NUA05U	NUA05U	2
23	STANDOFF 1-1/2 X 21/64 - 1-5/8	41 07 02 001 0	I29433	3
24	ELECTRICAL, SPDT ROCKER SWITCH	EL01084	EL01084	7
25	ELECTRICAL, 10 TERMINAL CONNECTOR	EL01086	EL01086	7
26	ATLAS CONTROL BOX DECAL	01 00 00 033 0	DE06014	1
27	BOLT HEX 1/4-20 USS G5	BL304012U520	BL304012U520	4



PETERSEN INDUSTRIES INC.
4000 S.R. 60 WEST
LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE ATLAS HEAD AND PEDESTAL ASSEMBLY		SCALE: NA
PART NUMBER: 02 02 18 001 3 / 106050	APPROVED BY: <i>SMB</i>	SHEET: 5 OF 7
DRAWN BY: <i>SMB</i>	DATE: 1/19/2015	

Item #	Title	Document #	MACOLA	Qty
28'	HEX BOLT 5/16-18 X 3.50 USS 05	BL305056U518	BL305056U518	2
29'	HEAD, ATLAS JOYSTICK BOX COVER, LEFT SIDE	41 02 03 057 1	107358	1
30'	ATLAS, VP120 6 SECTION VALVE BANK WITH FITTINGS	32 07 17 001 0	129496	1
31'	HYDRAULIC, ACTUATOR RR GEARBOX	HC01007	HC01007	1
32'	BOLT, STRUCTURAL, HEAVY HEX, .75 - 10 UNC X 3 LG	BL112048U810	BL112048U810	5
33	BOLT, STRUCTURAL, HEAVY HEX, .75 - 10 UNC X 4 LG	BL112064U810	BL112064U810	72
34'	ATLAS ROTARY MANIFOLD	HC07001	HC07001	1
35'	ATLAS 28" SLEWING BEARING	BEW03132	BEW03132	1
36	ATLAS PEDESTAL WELDMENT	32 02 03 001 0	106000	1
37	OUTRIGGER INOUT CYLINDER	CY05001	CY05001	2
38	OUTRIGGER, #3A VERTICAL LEG OUTER TUBE	42 06 04 006 4	113111	2
39'	SPOOL, OUTRIGGER LEG CYLINDER UPPER WHOLE	42 06 04 008 2	115107	2
40	SPOOL, OUTRIGGER LEG CYLINDER UPPER	42 06 04 007 1	115106	2
41'	OUTRIGGER COVER PLATE BRACKET	42 06 04 017 1	113110	2
42	CYLINDER, OUTRIGGER VERTICAL LEG EXTENSION RL AND RS	CY05006	CY05006	2
43	HYDRAULIC, FITTING #6-6 MALE CONNECTOR	HF060606	HF060606	4
44	OUTRIGGER, #3 VERTICAL LEG INNER TUBE	42 06 04 005 1	113112	2
45'	SPOOL, OUTRIGGER LEG CYLINDER LOWER	42 06 04 012 1	115108	4
46	PIN VERTICAL CYLINDER, BASE END	42 06 04 021 1	PI18106FI	2
47'	ROLL PIN, .3125 X 2	FA040532	FA040532	2
48	OUTRIGGER FOOT PLATE	42 06 04 009 1	113109	2
49	OUTRIGGER FOOT MOUNTING EAR	42 06 04 013 1	113108	4
50'	COLLAR - 42	40 00 00 004 0	116102	2
51	COLLAR # 42 WITH HOLE	40 00 00 005 1	116103	2
52	PIN - OUTRIGGER LEG CYLINDER LOWER	42 06 04 010 2	PI18122F	2
53	COTTER PIN 5/16 X 3	FA020548	FA020548	2



PETERSEN INDUSTRIES INC.
4000 S.R. 60 WEST
LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE

ATLAS HEAD AND PEDESTAL ASSEMBLY

PART NUMBER:

02 02 18 001 3 / 106050

SCALE:

NA

DRAWN BY:

SWB

APPROVED BY:

DATE:

1/19/2015

SHEET:

6 OF 7

Item #	Title	Document #	MACOLA	Qty
54	WASHER LOCK 5/16 SPLIT	WAS055	WAS055	4
55	HEX BOLT 5/16-18 X 1 USS G5	BL306016U518	BL306016U518	4
56	OUTRIGGER VERTICAL LEG COVER PLATE	42 06 04 023 0	I13107	2
57	HYDRAULIC, #6 JIC X #6 PIPE 90	HF806069M	HF806069M	4
58	ATLAS LADDER ASSEMBLY	32 02 18 001 0	I06009	1
59	ATLAS PINION GUARD	32 02 03 011 1	I07205	1
60	ATLAS, VP 120 5 SECTION VALVE BANK WITH FITTINGS	32 07 17 002 0	I29497	1
61	HEX BOLT 3/8-16 X 1.50 USS G5	BL306024U516	BL306024U516	3
62	WASHER FLAT 1/2 USS	WAF08U5	WAF08U5	4
63	BOLT HEX 1/2-13 X 2.00 USS G5	BL308032U513	BL308032U513	4
64	PUMP SHUTTLE VALVE ASSEMBLY	VAI3002	VAI3002	1
65	BOLT HEX 1/4-20 X 2 USS G5	BL304032U520	BL304032U520	2
66	HEX NUT 1/4-20 STOVERLOCK USS	NU504UJ	NU504UJ	2
67	HYDRAULIC MOTOR	HC01006	HC01006	1
68	FITTING, HYDRAULIC, #4 MJIC X #4 MJIC X #2 M	HF41040402T	HF41040402T	4
69	MOTOR LOCKING BOLT	FAI112MM28	FAI112MM28	2
70	HYDRAULIC, #4 M JIC X #4 M BSPP	HF220404S	HF220404S	1
71	HYDRAULIC, #2 M PIPE X #4 F	HF10204FS	HF10204FS	1
72	HYDRAULIC, #2-2 COUPLING	HF520202000	HF520202000	1
73	HYDRAULIC, BREATHER VENT	HC06001	HC06001	1
74	ATLAS ROTARY MANIFOLD BRACKET HYDRA DYNE	41 02 03 063 0	I07364	1
75	BOLT, HEX, 437-14 X 1.25 USS G5	BL307020U514	BL307020U514	3
76	HYDRAULIC, FITTING #DM JIC X #10 M OR	HF11010JM	HF11010JM	2
77	ATLAS 5 SPOOL VALVE MOUNTING PLATE	41 02 03 053 0	I07324	1
78	ATLAS SHUTTLE BLOCK MOUNTING PLATE	42 02 18 001 0	I06413	1
79	HYDRAULIC, FITTING #4M JIC X #4M OR	HF10404JM	HF10404JM	2

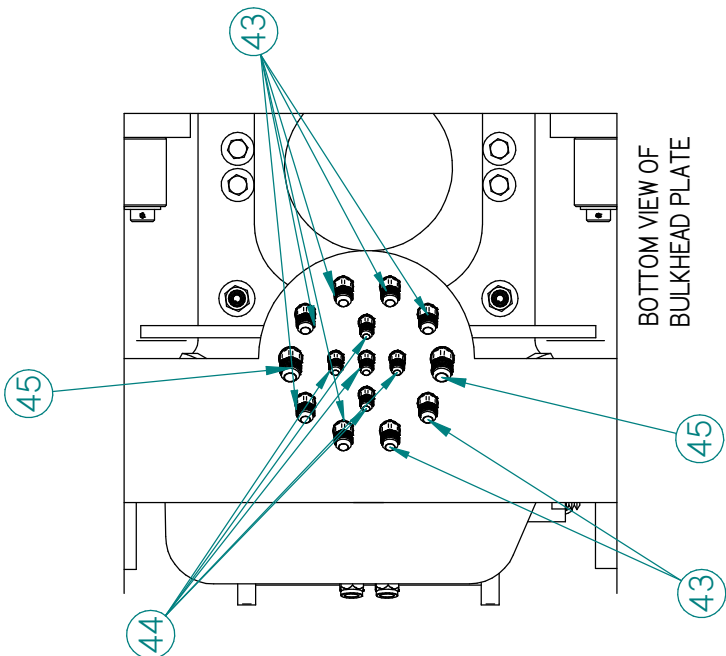
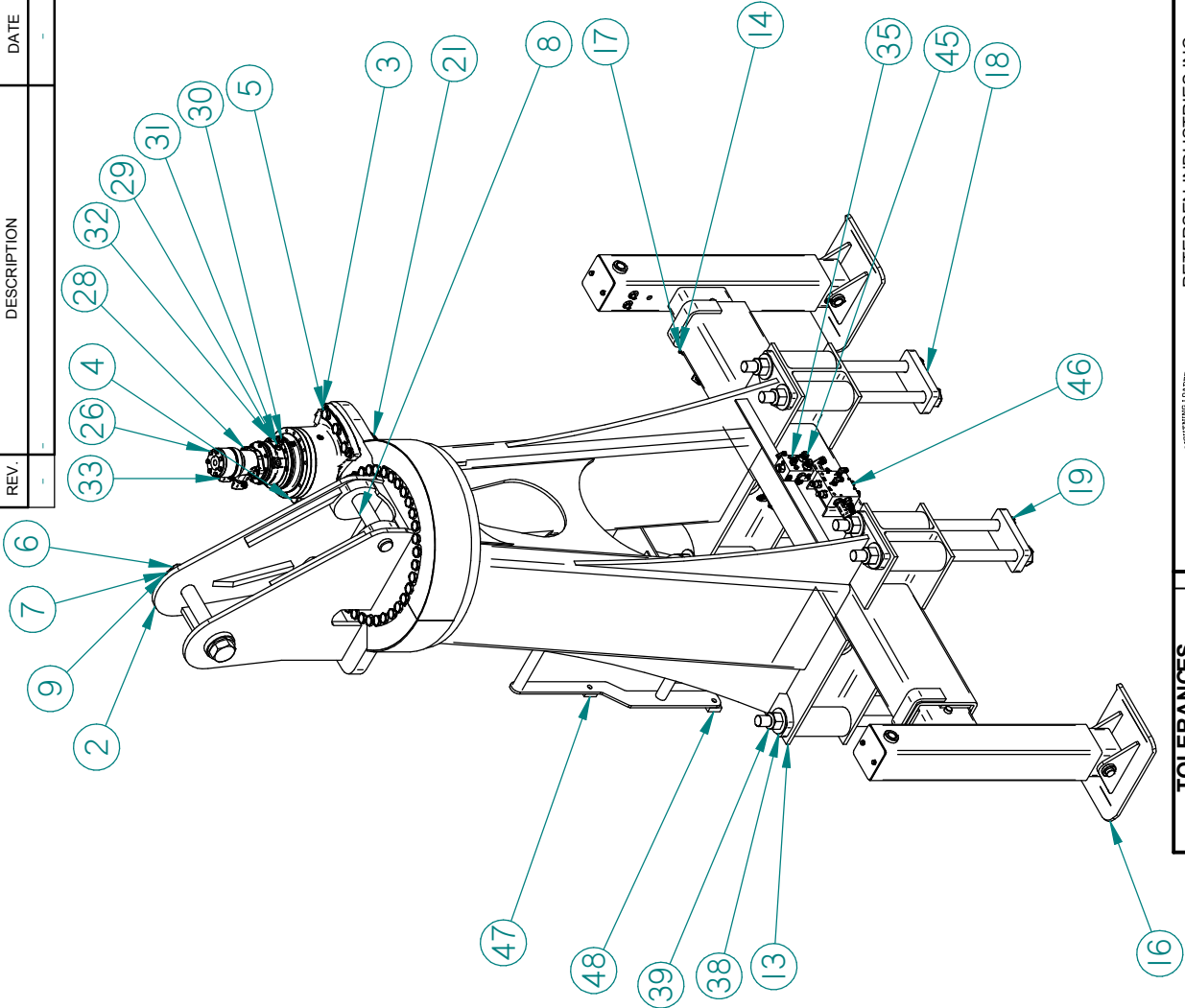


PETERSEN INDUSTRIES INC.
4000 S.R. 60 WEST
LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE ATLAS HEAD AND PEDESTAL ASSEMBLY		SCALE: NA
PART NUMBER: 02 02 18 001 3 / 106050	APPROVED BY: SYKB	SHEET: 7 OF 7
DRAWN BY: SYKB	DATE: 1/19/2015	Revised: 11/11/2004

010 ASSEMBLY

REV.	DESCRIPTION	DATE	BY



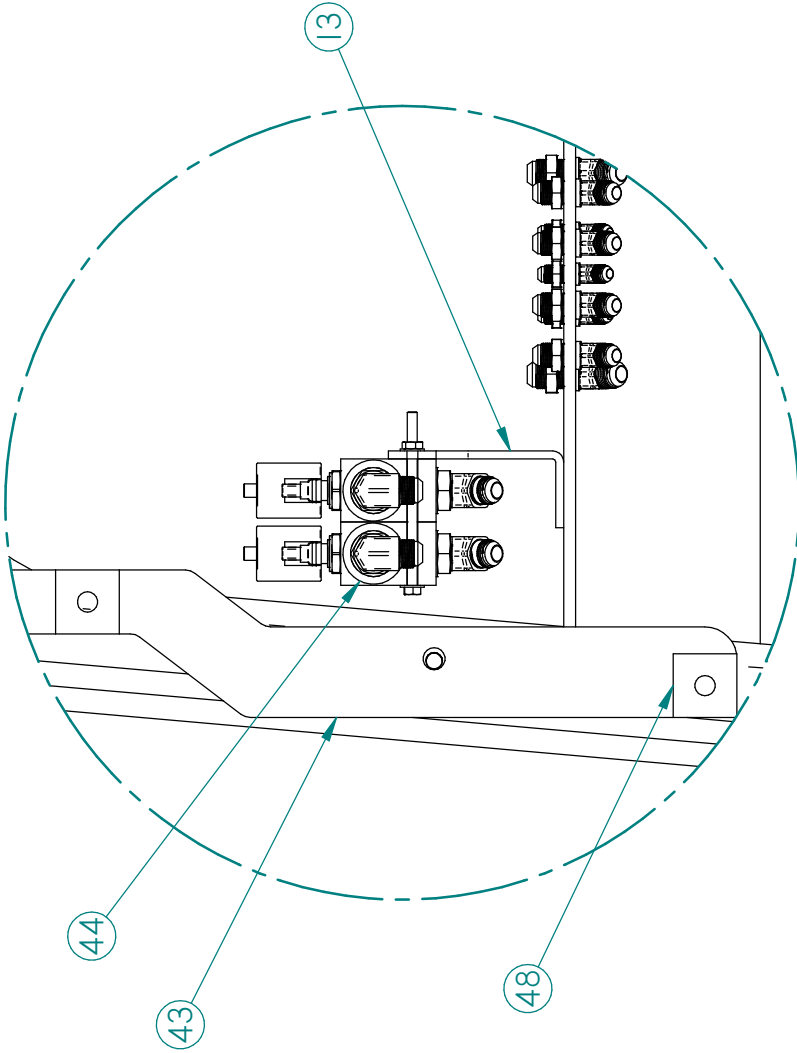
TOLERANCES

1 DEC.	+ 0.100
2 DEC.	+ 0.050
3 DEC.	+ 0.010
ANGLE:	+ 1.000°
FRACTION:	+ 1/32"
DIM. UNITS:	INCHES
SURFACE FINISH:	125/32

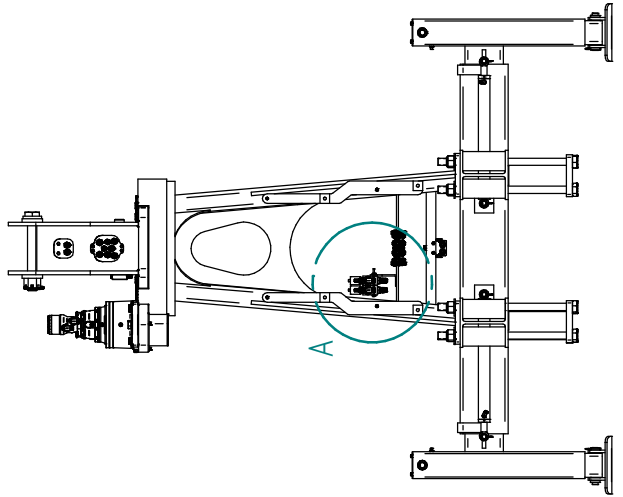
UNLESS OTHERWISE SPECIFIED


DEC. = DECIMAL PLACES)

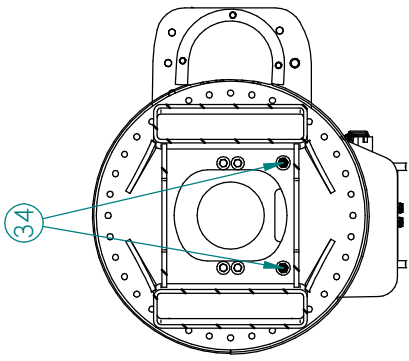
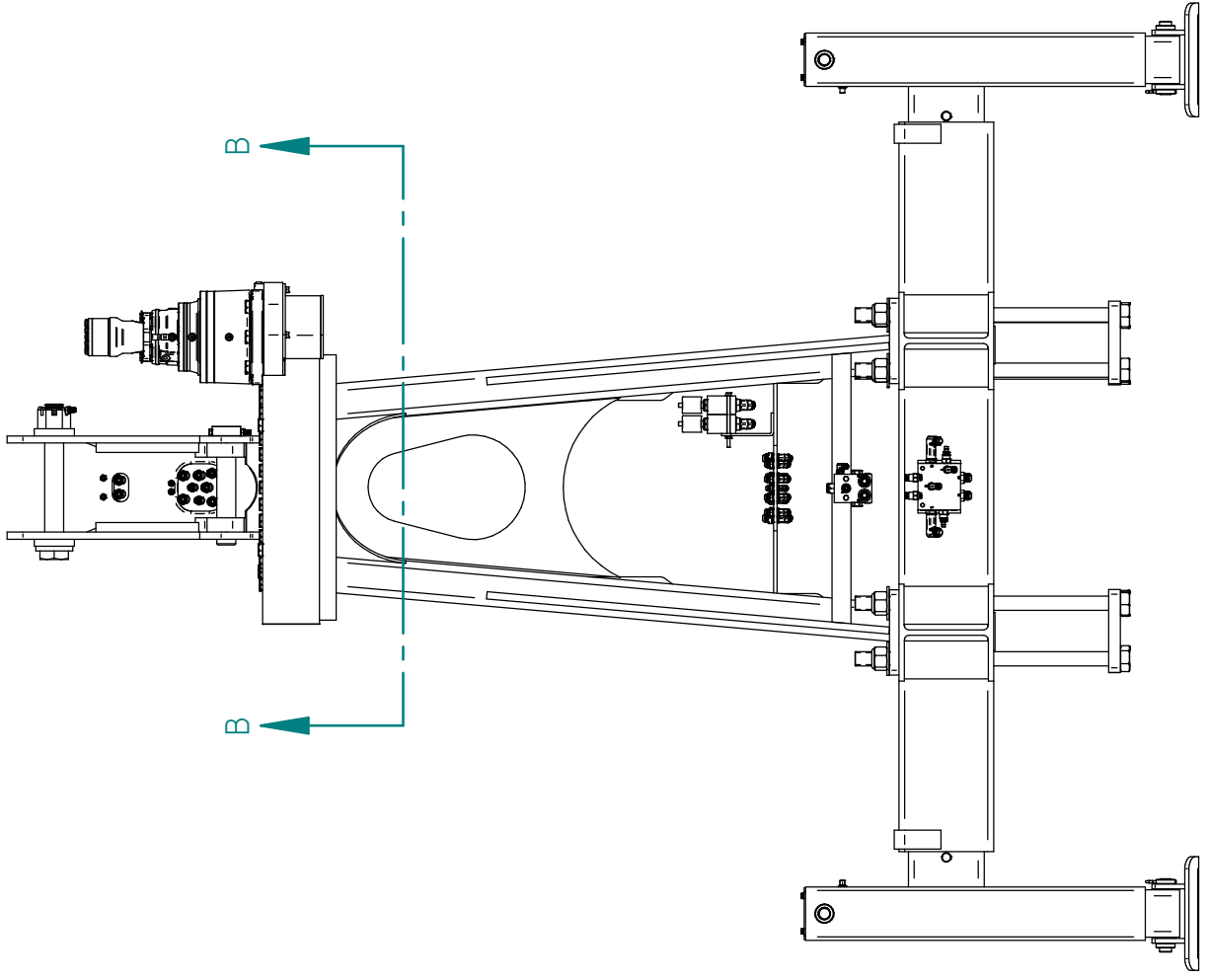
PETERSEN INDUSTRIES INC. 4000 S.R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE: ATLAS DWT HEAD AND PEDESTAL ASSEMBLY	
PART NUMBER: 02 02 18 002 1 / 106051	SCALE: 1:25
DRAWN BY: SYMB	SHEET: 1 OF 5
APPROVED BY:	DATE: 03/01/2017



DETAIL A



		PETERSEN INDUSTRIES INC. 4000 S.R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE ATLAS DWT HEAD AND PEDESTAL ASSEMBLY			
PART NUMBER: 02 02 18 002 1 / 106051		SCALE: 1:6	
DRAWN BY: SJK/B	APPROVED BY:	DATE: 03/01/2017	SHEET: 2 OF 5



SECTION B-B



PETERESEN INDUSTRIES INC.
 4000 S.R. 60 WEST
 LAKE WALES, FL. 33859-8234
 TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: ATLAS DWT HEAD AND PEDESTAL ASSEMBLY

PART NUMBER:	02 02 18 002 1 / 106051	SCALE:	1:20
DRAWN BY:	SYKB	DATE:	03/01/2017
APPROVED BY:		SHEET:	3 OF 5

010 ASSEMBLY

Item #	Title	Document #	MACOLA	Qty
1*	ATLAS RING GEAR GUARD WELDMENT - REAR	32 02 03 019 0	I07213	1
2	ATLAS HEAD ASSEMBLY	02 01 06 002 1	I07211	1
3	HYDRAULIC ACTUATOR RR GEARBOX	HC01007	HC01007	1
4	BOLT HEX 1-8 X 3 UNC G8	BL116048U88	BL116048U88	1
5	BOLT, STRUCTURAL, HEAVY HEX, .75 - 10 UNC X 3 LG	BL112048U810	BL112048U810	41
6	HEX BOLT 2-4.5 X 15 UNC G8	BL132240U845	BL132240U845	1
7	NUT, SLOTTED 2.00 HEAVY USS	NUB32HU	NUB32HU	1
8	PIN 2 X 1/2 1/45 CP ROD	41 01 06 031 0	P130303F	1
9	BOLT, 0.4375-1/4 X 4 USS G8	BL307064U814	BL307064U814	2
10*	NUT, STOVERLOCK 0.4375 USS	NUS07U	NUS07U	2
11*	BOLT, STRUCTURAL, HEAVY HEX, .75 - 10 UNC X 4 LG	BL112064U810	BL112064U810	36
12*	ATLAS 28" SLEWING BEARING	BEVM03132	BEVM03132	1
13	PEDESTAL- ATLAS DWT WELDMENT	32 02 03 014 0	I06011	1
14	OUTRIGGER IN/OUT CYLINDER	CY05001	CY05001	2
15*	1.5" OD x 1.032" ID x 0.125" FLAT WASHER	WAB1624	WAB1624	4
16	RL & RS MODEL 3 OUTRIGGER VERTICAL LEG ASSEMBLY	22 06 04 002 1	I13103	2
17	COTTER PIN 3/16 X 2	FA020332	FA020332	4
18	TIE DOWN BLOCK, 4.25 SPREAD, 1.5 BOLTS	41 02 15 068 1	I06414	4
19	BOLT, 1.500 - 6 UNC X 28 LG	41 02 15 075 0	BL124448U86	8
20*	HYDRAULIC, #6 JIC X #6 PIPE 90	HF806069M	HF806069M	4
21	ATLAS PINION GUARD	32 02 03 011 1	I07205	1
22*	WASHER LOCK 3/8 SPLIT	WAS065	WAS065	3
23*	HEX BOLT 3/8-16 X .750 USS G5	BL306012U516	BL306012U516	3
24*	WASHER FLAT 1/2 USS	WAF08U5	WAF08U5	4
25*	BOLT HEX 1/2-13 X 2.00 USS G5	BL308032U513	BL308032U513	4
26	HYDRAULIC MOTOR	HC01008	HC01008	1
27*	FITTING, HYDRAULIC, #4 MJIC X #4 MJIC X #2 M	HF41040402T	HF41040402T	4
28	MOTOR LOCKING BOLT	FA1112MM28	FA1112MM28	2



PETERSEN INDUSTRIES INC.
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TITLE: ATLAS DWT HEAD AND PEDESTAL ASSEMBLY

PART NUMBER: 02 02 18 002 1 / 106051

SCALE: NA
DRAWN BY: SVK/B APPROVED BY: DATE: 03/01/2017 SHEET: 4 OF 5

010 ASSEMBLY

Item #	Title	Document #	MACOLA	Qty
29	HYDRAULIC, #4 M JIC X #4 M BSPP	HF220404S	HF220404S	1
30	HYDRAULIC, #2 M PIPE X #4 F	HF10204FS	HF10204FS	1
31	HYDRAULIC, #2-2 COUPLING	HF520202000	HF520202000	1
32	HYDRAULIC, BREATHER VENT	HC06001	HC06001	1
33	HYDRAULIC, FITTING #10M JIC X 12M OR 90	HF11012JM9	HF11012JM9	2
34	PROXIMITY SENSOR	EL01064	EL01064	2
35	HEX BOLT 5/16-18 X 3 USS C5	BL305048U518	BL305048U518	2
36	WASHER LOCK 5/16 SPLIT	WAS055	WAS055	2
37	HEX NUT 5/16-24 SAE STOVERLOCK	NUS05S	NUS05S	2
38	WASHER FLAT 1.50 USS	WAF24U5	WAF24U5	8
39	NUT, NYLON LOCK 1-1/2"-6	NUN24U	NUN24U	8
43	HYDRAULIC, #8 JIC X #8 JIC BULKHEAD 45	HF708084	HF708084	8
43	DWT, CONTROLS ADJUSTMENT PLATE	42 07 01 086 0	129605	2
44	HYDRAULIC, #6 JIC X #6 JIC BULKHEAD 45	HF706064	HF706064	5
44	VALVE, ATLAS SWING LIMITING ASSEMBLY	21 07 13 002 0	129028	1
45	VALVE, ATLAS ANTI CAV FOR DWT WITH FITTINGS	32 07 17 014 0	129505	1
45	HYDRAULIC, #10 JIC X #10 JIC BULKHEAD 45	HF710104	HF710104	2
46	VALVE, ATLAS SOFT STOP MANIFOLD WITH FITTINGS	32 07 17 015 0	129506	1
47	DWT, CONTROL HANDLE SPACER	42 07 17 007 0	129606	2
48	DWT, CONTROL HANDLE SPACER 2	42 07 17 008 0	129608	2
49	ATLAS RING GUARD WILDMT - FRONT	32 02 03 015 0	107372	1

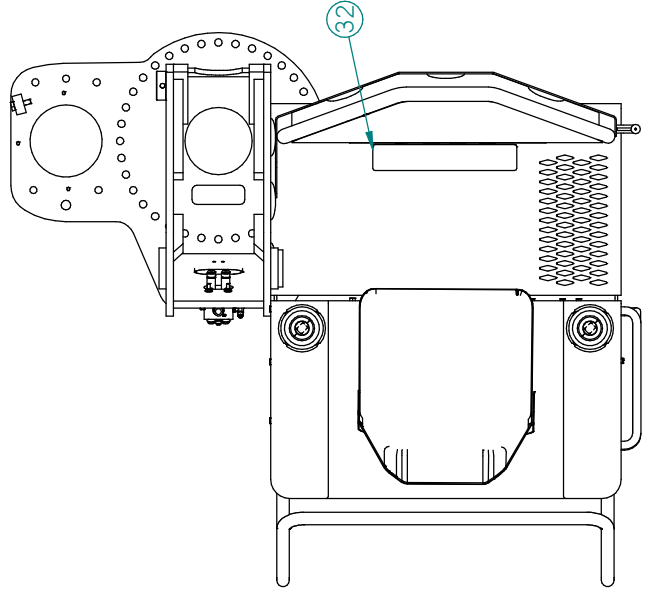
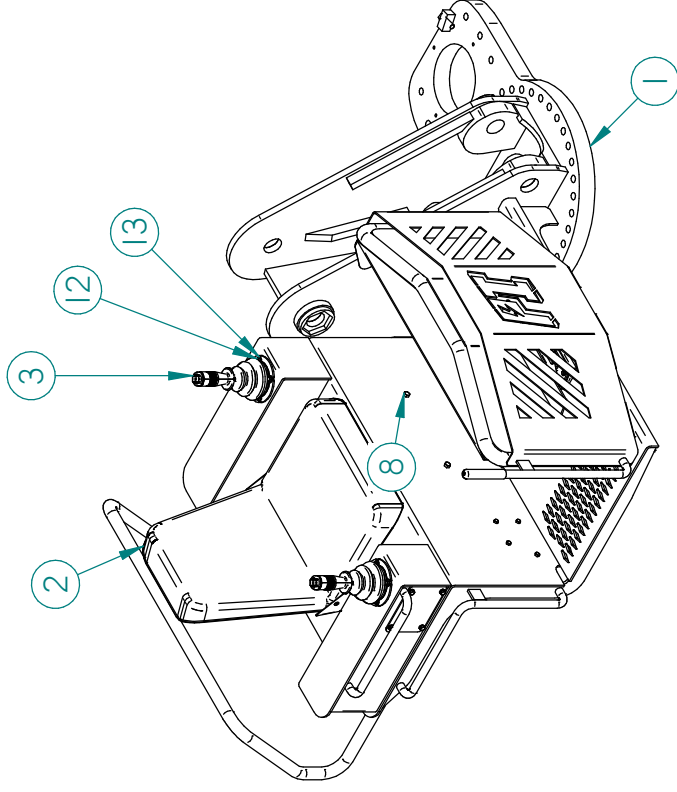
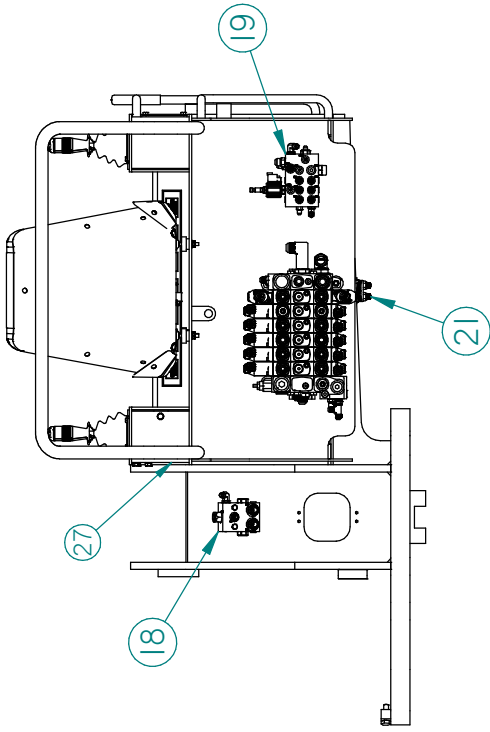


PETERSEN INDUSTRIES INC.
4000 S.R. 60 WEST
LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: ATLAS DWT HEAD AND PEDESTAL ASSEMBLY

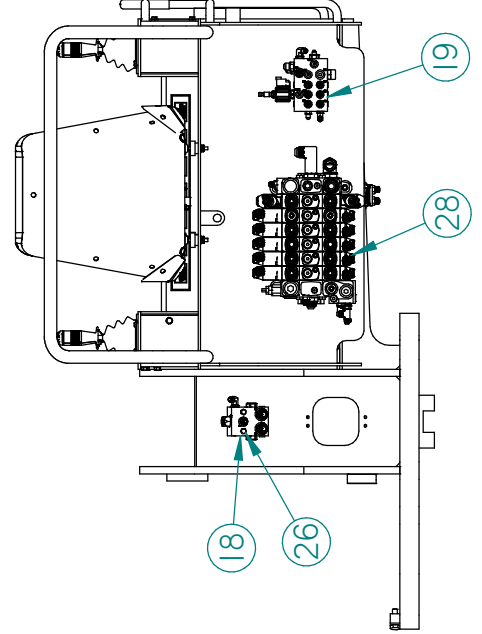
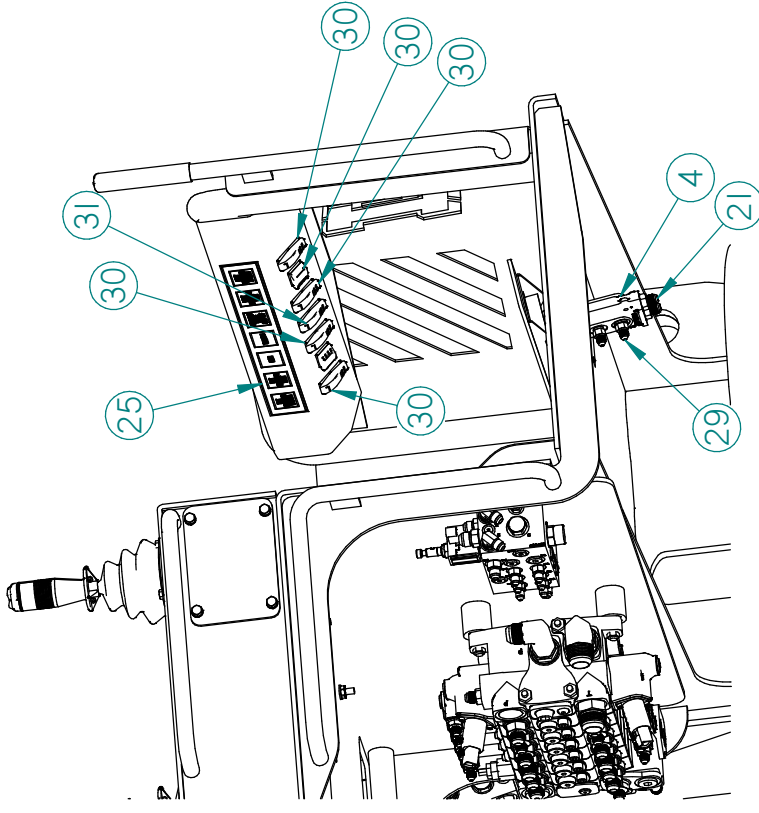
PART NUMBER:	02 02 18 002 1 / 106051	SCALE:	NA
DRAWN BY:	SM/B	DATE:	03/01/2017
APPROVED BY:		SHEET:	5 OF 5

NOTE: SEAT SHOWN IS REPRESENTATIVE ONLY



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TITLE ATLAS HEAD ASSEMBLY		SCALE: 1:20
PART NUMBER: 02 01 06 001 2 / 107210	DATE: 10/19/2015	SHEET: 1 OF 3
DRAWN BY: SYKB	APPROVED BY:	



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 LAKE WALES, FL. 33859-8234
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TITLE
ATLAS HEAD ASSEMBLY

PART NUMBER:	02 01 06 001 2 / 107210	SCALE:	
DRAWN BY:	APPROVED BY:	DATE:	SHEET: 2 OF 3

Item #	Title	Document #	MACOLA	Qty
29	HYDRAULIC, FITTING #4M JIC X #4M OR	HF10404JM	HF10404JM	2
30	ELECTRICAL, SPDT ROCKER SWITCH ON-OFF-ON MOMENTARY	ELO1084	ELO1084	6
31	ELECTRICAL, SPDT ROCKER SWITCH ON-OFF-ON LATCHING	ELO1084	ELO1085	1
32	CONTROLS, FOOT PEDAL EXTENDER PLATE	42.07.13.053.0	129495	1

Item #	Title	Document #	MACOLA	Qty
1	ATLAS HEAD WITH SIDE SEAT WELDMENT	32.02.03.006.3	I07200	1
2	ACCESSORY, UNIVERSAL SEAT ASSEMBLY	AC0104	AC0104	1
3	VALVE, JOYSTICK PILOT 2 AXIS WITH SWITCH FOR VP120 ATLAS	VA02VP1207	VA02VP1207	2
4	2 AXIS PILOT FOOT CONTROLLER	AC2802	AC2802	1
5	BOLT HEX 1/4"-20 USS G5	BL.304012U520	BL.304012U520	8
6	WASHER LOCK 1/4 SPLIT USS	WAS045	WAS045	4
7	NUT HEX 1/4 USS	NUA04U	NUA04U	4
8	HEX BOLT 3/8-16 X 3.00 USS G5	BL.306048U516	BL.306048U516	3
9	WASHER LOCK 3/8 SPLIT	WAS065	WAS065	9
10	HEX NUT 3/8 -16 USS	NUA06U	NUA06U	3
11	HYDRAULIC, FITTING #4 M.JIC-#6 MOR	HF100406JM	HF100406JM	12
12	BOLT HEX 1/4"-20 X 1 USS G5	BL.304016U520	BL.304016U520	8
13	WASHER FLAT .250 USS	WAF04U5	WAF04U5	16
14	NUT, NYLON LOCK, .250 USS	NUA04U	NUA04U	8
15	WASHER FLAT 5/16 USS	WAF05U5	WAF05U5	6
16	HEX NUT 5/16-24 SAE STOVERLOCK	NU5055	NU5055	4
17	HEX BOLT 3/8-16 X .750 USS G5	BL.306012U516	BL.306012U516	4
18	VALVE, ANTI CAVITATION MANIFOLD	VA12003	VA12003	1
19	VALVE, PILOT BRAKE BLOCK	VA12002	VA12002	1
20	ATLAS SEAT SWITCH	AC0113	AC0113	1
21	HYDRAULIC, FITTING WITH ORIFICE CHECKS	VA06C004	VA06C004	2
22	HEX NUT 5/16-18 USS	NUA05U	NUA05U	2
23	STANDOFF 1-1/2 X 21/64 - 1-5/8	41.07.02.001.0	I29433	3
24	ELECTRICAL, 10 TERMINAL CONNECTOR	ELO1086	ELO1086	7
25	ATLAS CONTROL BOX DECAL	01.00.00.033.0	DE06014	1
26	HEX BOLT 5/16-18 X 3.50 USS G5	BL.305056U518	BL.305056U518	2
27	HEAD, ATLAS JOYSTICK BOX COVER, LEFT SIDE	41.02.03.057.1	I07358	1
28	ATLAS, VP120 6 SECTION VALVE BANK WITH FITTINGS	32.07.17.001.0	I29496	1

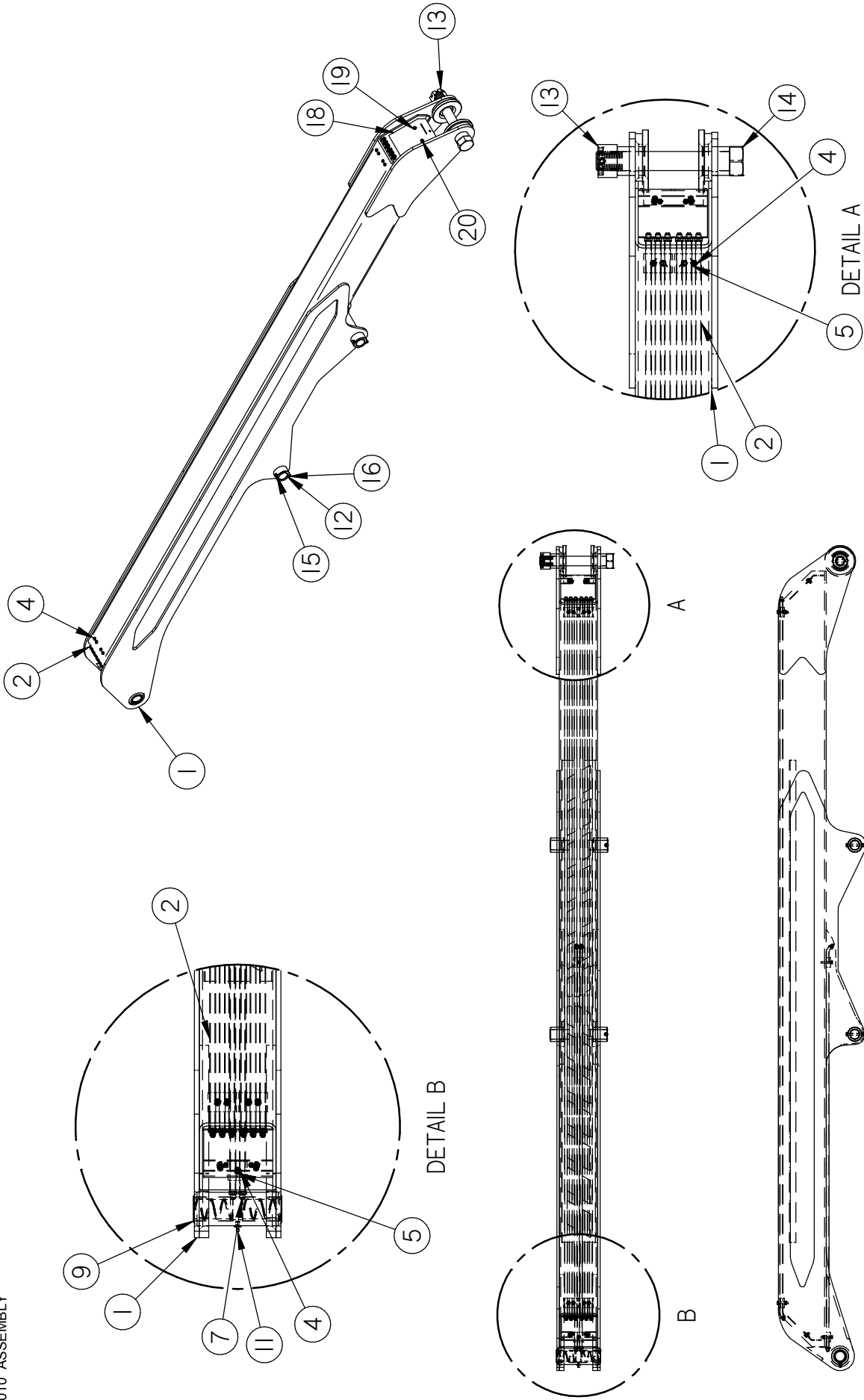
FASTENER TABLE	
LOCATION	FASTENER DESCRIPTION
OPERATOR SEAT	
6 SECTION VALVE BANK	3/8"-16 x 3" & STOVER NUT
ANTI-CAV BLOCK ON BACK OF HEAD	5/16"-18 X 3.5", FLAT WASHER & USS NUT
PILOT BRAKE BLOCK	1/4"-20 X 3/4"
PILOT JOYSTICKS	1/4"-20 x 1, FLAT WASHER, NYLON LOCK NUT
PILOT FOOT PEDAL	1/4"-20 x 3/4, LOCK WASHER & USS
JOYSTICK COVER BOXES	3/8"-16 x 3/4" & LOCK WASHERS
JOYSTICK RIGHT SIDE PLATE	5/16"-18 x 3/4" & LOCK WASHERS



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TITLE ATLAS HEAD ASSEMBLY		SCALE: 1:20
PART NUMBER: 02 01 06 001 2 / I07210	APPROVED BY: SWB	SHEET: 3 OF 3
DRAWN BY: SWB	DATE: 10/19/2015	

010 ASSEMBLY



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LAKE WALES, FL. 33859-8234
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TITLE ATLAS MAIN BOOM ASSEMBLY	
PART NUMBER: 02 03 18 001 0 108616	SCALE: 1:30
DRAWN BY: SYKB	APPROVED BY:
DATE: 10/19/2015	SHEET: 1 OF 2

Item #	Title	Document #	Macola	Quantity
1	ATLAS MAIN BOOM WELDMENT	32 03 04 001 0	I08025	1
2	HYDRAULIC TUBE, 45 DG - 150-1/2" LG ATLAS	41 03 05 033 0	TU03020	6
3	3 HOLE CLAMP NYLATRON	40 00 00 066 0	CLT3N	4
4	HEX BOLT 5/16-18 X 200 USS G5	BL305032U518	BL305032U518	10
5	HEX NUT 5/16-18 USS STOVERLOCK	NUS05U	NUS05U	9
6	WASHER FLAT 5/16 USS	WAF05U5	WAF05U5	9
7	HYDRAULIC TUBE, FIXED MAIN BOOM 45 DG - 84" LG	TU05003	TU05003	2
8	2 HOLE CLAMP NYLATRON	40 00 00 067 0	CLT2N	2
9	BUSHING, 2-1/2" X 2" X 4-1/8" NYLATRON ATLAS	41 03 05 034 0	BU503005	2
11	1/8" STRAIGHT GREASE FITTING	HF2002S	HF2002S	1
12	2" X 12" PIN	41 03 04 009 0	I08608	2
13	NUT, SLOTTED 200 HEAVY USS	NUB32HU	NUB32HU	1
14	HEX BOLT 2-4.5 X 14 UNC G8	BL132224U845	BL132224U845	1
15	HEX BOLT 3/8-16 X 3.50 USS G5	BL306056U516	BL306056U516	2
16	NUT HEX 3/8 -16 UNC STOVERLOCK	NUS06U	NUS06U	2
17	ATLAS MAIN BOOM END CAP MOUNTING PLATE WELDMENT	31 03 04 001 0	I08623	2
18	ATLAS MAIN BOOM END CAP	41 03 04 014 0	I08622	2
19	WASHER LOCK 5/16 SPLIT	WAS055	WAS055	4
20	HEX BOLT 5/16-18 X 3/4 USS G5	BL305012U518	BL305012U518	4
21	ATLAS MAIN BOOM TO TIP BOOM SPACER	41 03 04 016 0	I08625	2
22	MAIN BOOM BUSHING	42 03 04 004 0	BU507008	2



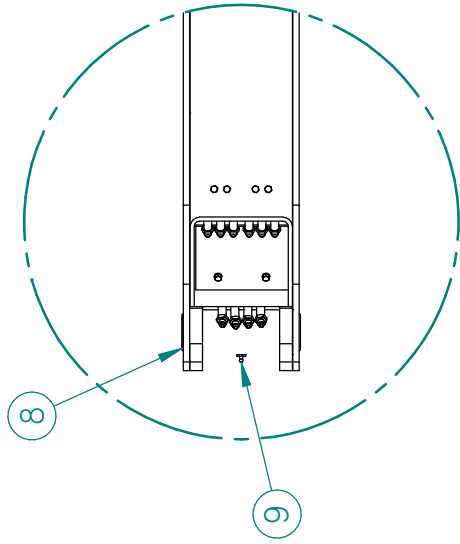
PETERSEN INDUSTRIES INC.
4000 S.R. 60 WEST
LAKE WALES, FL 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: ATLAS MAIN BOOM ASSEMBLY

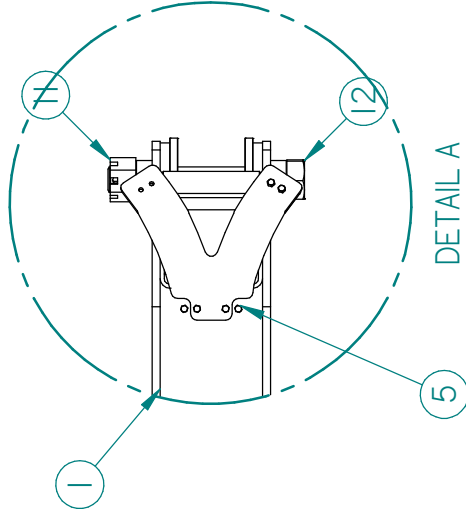
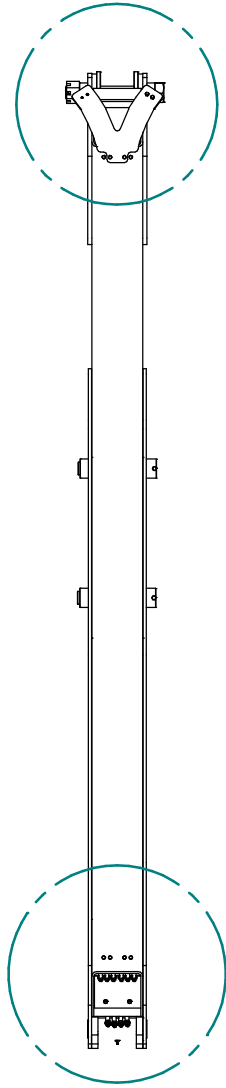
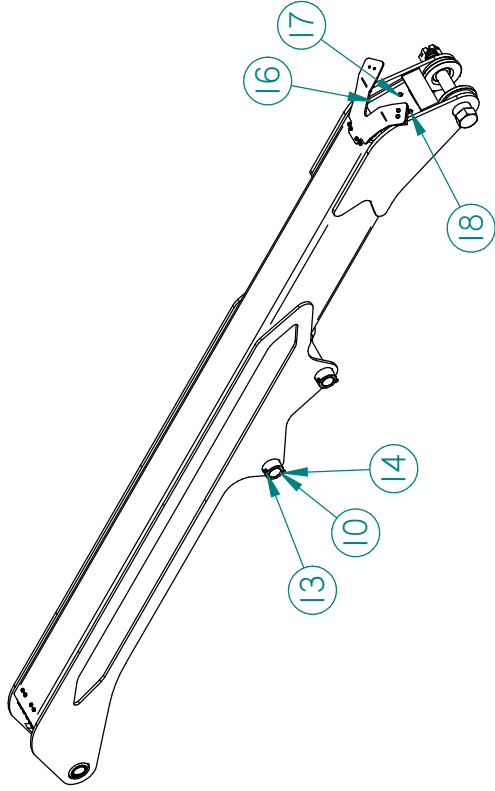
PART NUMBER: 02 03 18 001 0 / I08616 SCALE: 1:30
 APPROVED BY: DATE: 10/19/2015 SHEET: 2 OF 2
 DRAWN BY: SWB

REV.	DESCRIPTION	DATE	BY

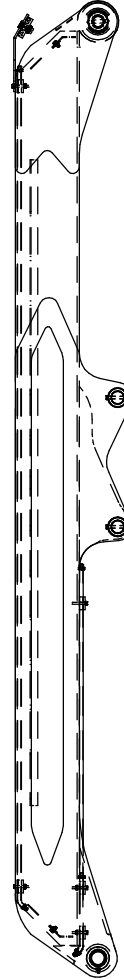
010 ASSEMBLY



DETAIL B



DETAIL A



TOLERANCES

- 1 DEC. ± 0.100
- 2 DEC. ± 0.050
- 3 DEC. ± 0.010
- ANGLE: ± 1.000°
- FRACTION: ± 1/32"
- DIM. UNITS: INCHES
- SURFACE FINISH: 125/32

UNLESS OTHERWISE SPECIFIED



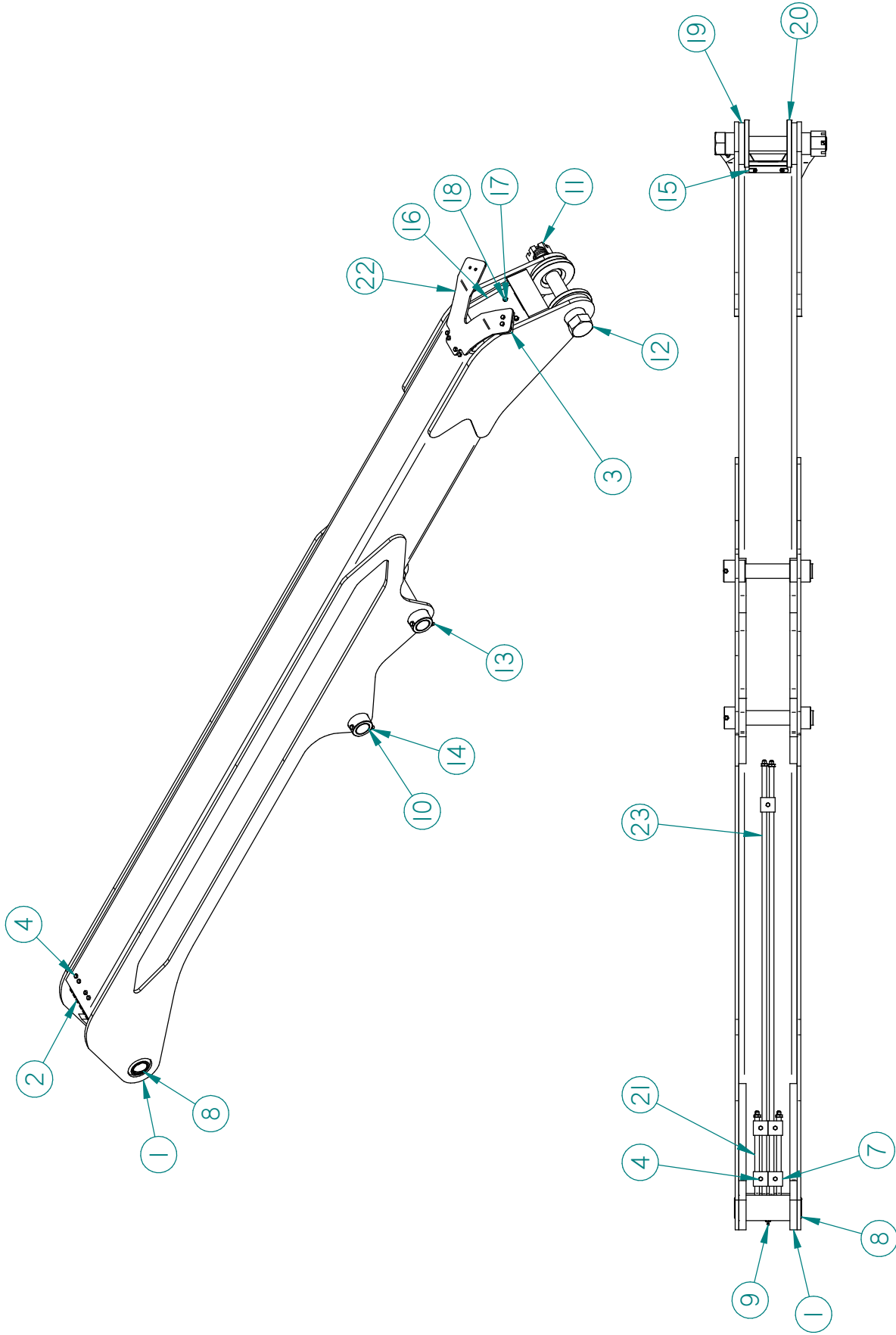
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LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: ATLAS MAIN BOOM 146.5 ASSEMBLY

PART NUMBER: 02 03 18 002 0 / 108628

SCALE: 1:30

APPROVED BY: *SYKB* DATE: 10/19/2015 SHEET: 1 OF 3



PETERSEN INDUSTRIES INC.
 LIGHTNING LOADERS
PETERSEN INDUSTRIES
 4000 S.R. 60 WEST
 LAKE WALES, FL. 33859-8234
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ATLAS MAIN BOOM 146.5 ASSEMBLY

TITLE	ATLAS MAIN BOOM 146.5 ASSEMBLY		
PART NUMBER:	02 03 18 002 0 / 108628	SCALE:	1:20
DRAWN BY:	SWB	APPROVED BY:	SWB
		DATE:	10/19/2015
		SHEET:	2 OF 3

Item #	Title	Document #	Macola	Quantity
1	ATLAS MAIN BOOM WELDMENT	32 03 04 004 0	I08026	1
2	HYDRAULIC TUBE, TL MAIN BOOM 45" - 132" LONG	41 03 05 037 0	TU03010	6
3	3 HOLE CLAMP NYLATRON	40 00 00 066 0	CLT3N	5
4	HEX BOLT 5/16-18 X 2.00 USS G5	BL305032U518	BL305032U518	15
5	HEX NUT 5/16-24 SAE STOVERLOCK	NUS05S	NUS05S	14
6	WASHER FLAT 5/16 USS	WAF05U5	WAF05U5	14
7	2 HOLE CLAMP NYLATRON	40 00 00 067 0	CLT2N	5
8	BUSHING, 2-1/2" X 2" X 4-1/8" NYLATRON ATLAS	41 03 05 034 0	BU503005	2
9	1/8" STRAIGHT GREASE FITTING	HF2002S	HF2002S	1
10	2" X 12" PIN	41 03 04 009 1	I08608	2
11	NUT, SLOTTED 2.00 HEAVY USS	NUB32HU	NUB32HU	1
12	HEX BOLT 2-4.5 X 14 UNC G8	BL132224U845	BL132224U845	1
13	HEX BOLT 3/8-16 X 3.50 USS G5	BL306056U516	BL306056U516	2
14	NUT HEX 3/8 -16 UNC STOVERLOCK	NUS06U	NUS06U	2
15	ATLAS MAIN BOOM END CAP MOUNTING PLATE WELDMENT	31 03 04 001 0	I08623	2
16	ATLAS MAIN BOOM END CAP	41 03 04 014 0	I08622	2
17	WASHER LOCK 5/16 SPLIT	WAS055	WAS055	4
18	HEX BOLT 5/16-18 X 3/4 USS G5	BL305012U518	BL305012U518	4
19	ATLAS MAIN BOOM TO TIP BOOM SPACER	41 03 04 016 0	I08625	2
20	TL MAIN BOOM TO TIP BOOM THRUST WASHER - STIFFENER	42 03 04 004 0	BU507008	2
21	HYD TUBE, 625 OD X .065 WALL X 45 DEG 12 LING ATLS	21 03 18 001 0	TBD	2
22	ATLAS MAIN BOOM TO TIP BOOM HOSE BRACKET	41 03 04 020 0	I08632	1
23	HYDRAULIC TUBE, TL MAIN BOOM 45 DG - 62" LONG	41 03 05 029 0	TU02002	2



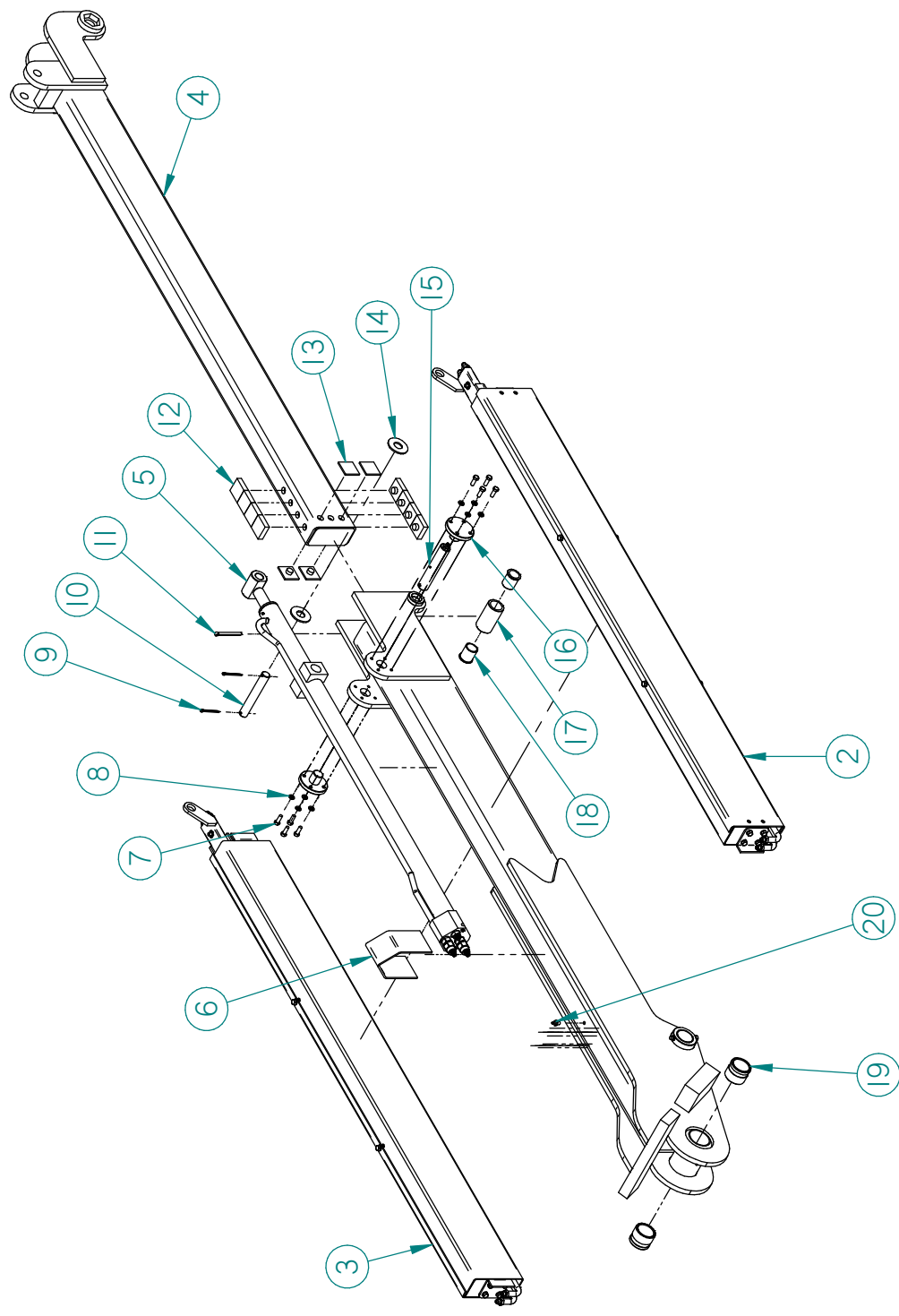
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ATLAS MAIN BOOM 146.5 ASSEMBLY

TITLE	ATLAS MAIN BOOM 146.5 ASSEMBLY		
PART NUMBER:	02 03 18 002 0 / I08628	SCALE:	1:20
DRAWN BY:	SWB	APPROVED BY:	
DATE:	10/19/2015	SHEET:	3 OF 3

010 ASSEMBLY


REV.	DESCRIPTION	DATE	BY
1	REVISED TIP BOOM STOPS	1/5/2017	JAC



DEC. = DECIMAL PLACES (S)

TOLERANCES	
1 DEC.	+ 0.100
2 DEC.	+ 0.050
3 DEC.	+ 0.010
ANGLE:	+ 1.000°
FRACTION:	+ 1/32"
DIM. UNITS:	INCHES
SURFACE FINISH:	125/32

UNLESS OTHERWISE SPECIFIED

 <p>PETERSEN INDUSTRIES INC. 4000 S.R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844</p>	
TITLE: ATLAS TIP BOOM ASSEMBLY	
PART NUMBER: 02 04 08 001 0 / 109105	SCALE: 1:20
DRAWN BY: SYKB	APPROVED BY: [Signature]
DATE: 03/03/2016	SHEET: 1 OF 2

Item #	Title	Document #	MACOLA	Qty
1	ATLAS TIP BOOM WELDMENT	32 04 04 001 I	I14010	1
2	ATLAS HOSE RECOIL BOX ASSEMBLY - RIGHT	21 04 04 025 0	I23132	1
3	ATLAS HOSE RECOIL BOX ASSEMBLY - LEFT	21 04 04 026 0	I23133	1
4	TL3 TIP EXTENSION INNER TUBE WELDMENT	21 04 04 010 3	I09153	1
5	20" TIP EXTENSION CYLINDER	22 14 01 010 I	I21105	1
6	TIP BOOM TIP EXTENSION GUARD	41 04 04 027 I	I09238	1
7	HEX BOLT 3/8-16 X 1.00 USS G5	BL306016U516	BL306016U516	8
8	WASHER LOCK 3/8 SPLIT	WAS065	WAS065	8
9	COTTER PIN 3/16 X 2	FA020332	FA020332	2
10	TIP EXT CYLINDER ROD END PIN	41 04 04 012 I	PII6112F	1
11	COTTER PIN 5/16 X 3	FA020548	FA020548	1
12	ATLAS TIP EXT NYLATRON PAD	41 04 04 054 0	I08612	8
13	TIP EXTENSION SQUARE WEAR PUCK	41 04 04 028 I	I09210	4
14	WASHER FLAT 1 USS	WAF16U5	WAF16U5	2
15	TIP EXT ROLLER PIN, OUTRIGGER LEG PIVOT, FOOT CONNECT	41 04 04 018 0	PII8105F	1
16	TRUNION TIP EXTENSION CYLINDER MOUNT	41 04 04 004 I	I09205	2
17	TIP EXTENSION SUPPORT ROLLER	41 04 04 001 0	I09162	1
18	BUSHING 1.2656" X 1.5" X 1.75"	40 00 00 062 0	BU402007	2
19	BUSHING, 2 1/2 X 2 X 2 NYLATRON	41 11 09 022 4	BU502008	2
20	1/8" STRAIGHT GREASE FITTING	HF2002S	HF2002S	2
21	2" X 6.625" PIN	41 04 04 070 0	I09262	1
22	HEX BOLT 3/8-16 X 3.50 USS G5	BL306056U516	BL306056U516	1
23	NUT HEX 3/8-16 UNC STOVERLOCK	NUS06U	NUS06U	1



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TITLE: ATLAS TIP BOOM ASSEMBLY

PART NUMBER: 02 04 08 001 0 / I09105

SCALE: NA

DRAWN BY: SYMB

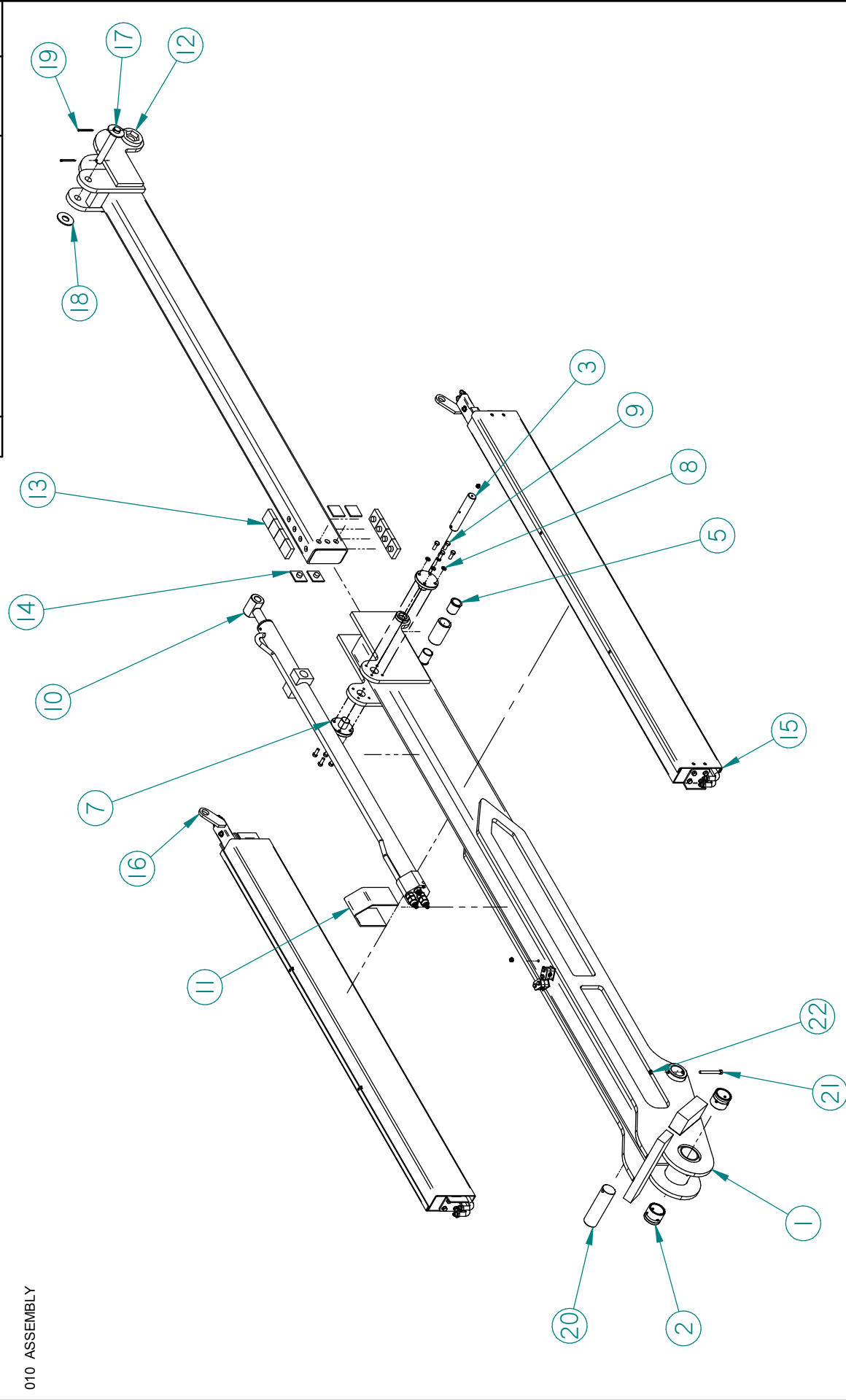
APPROVED BY:

SHEET: 2 OF 2

DATE: 03/03/2016

R:\Current Dwg\Wpi Landscape Border Revised: 11/11/2004

REV.	DESCRIPTION	DATE	BY



010 ASSEMBLY

		PETERSEN INDUSTRIES INC. 4000 S.R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE: ATLAS TIP BOOM ASSEMBLY			
PART NUMBER: 02 04 08 002 0 / 109106		SCALE: 1:20	
DRAWN BY: SYMB	APPROVED BY:	DATE: 03/31/2017	SHEET: 1 OF 2
DEC. = DECIMAL PLACES			
TOLERANCES 1 DEC. ± 0.100 2 DEC. ± 0.050 3 DEC. ± 0.010 ANGLE ± 1.000° FRACTION: ± 1/32" DIM. UNITS: INCHES SURFACE FINISH: 125/32			
UNLESS OTHERWISE SPECIFIED			

Item #	Title	Document #	MACOLA	Qty
1	ATLAS TIP BOOM WELDMENT	32 04 04 005 0	109267	1
2	BUSHING, 2 1/2 X 2 X 2 NYLATRON	41 11 09 022 5	BU502008	2
3	TIP EXT ROLLER PIN, OUTRIGGER LEG PIVOT, FOOT CONNECT	41 04 04 018 0	PI18105F	1
4	TIP EXTENSION SUPPORT ROLLER	41 04 04 001 0	115131	1
5	BUSHING 1.2656" X 1.5" X 1.75"	40 00 00 062 0	BU402007	2
6	HYDRAULIC, .125 STRAIGHT GREASE FITTING	HF2002S	HF2002S	2
7	TRUNION TIP EXTENSION CYLINDER MOUNT	41 04 04 004 1	109205	2
8	WASHER LOCK 3/8 SPLIT	WAS065	WAS065	8
9	HEX BOLT 3/8-16 X 1.00 USS G5	BL306016U516	BL306016U516	8
10	ATLAS TIP EXTENSION CYLINDER SHAFT ASSEMBLY	22 14 01 013 1	121106	1
11	TIP BOOM TIP EXTENSION GUARD	41 04 04 027 1	109238	1
12	TL3 TIP EXTENSION INNER TUBE WELDMENT	21 04 04 010 3	109153	1
13	ATLAS TIP EXT NYLATRON PAD	41 04 04 054 0	108612	8
14	TIP EXTENSION SQUARE WEAR PUCK	41 04 04 028 1	109210	4
15	ATLAS HOSE RECOIL BOX ASSEMBLY - RIGHT	21 04 04 025 0	123132	1
16	ATLAS HOSE RECOIL BOX ASSEMBLY - LEFT	21 04 04 026 0	123133	1
17	TIP EXT CYLINDER ROD END PIN	41 04 04 012 1	PI16112F	1
18	WASHER FLAT 1 USS	WAF16U5	WAF16U5	2
19	COTTER PIN 3/16 X 2	FA020332	FA020332	2
20	2" X 6.625" PIN	41 04 04 070 0	109262	1
21	HEX BOLT 3/8-16 X 3.50 USS G5	BL306056U516	BL306056U516	1
22	NUT HEX 3/8 -16 UNC STOVERLOCK	NUS06U	NUS06U	1



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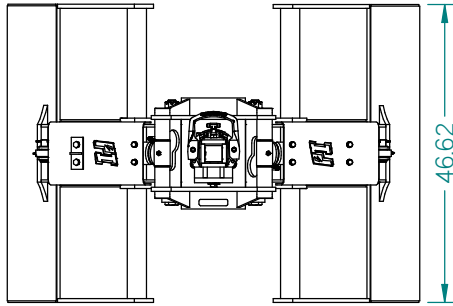
TITLE: ATLAS TIP BOOM ASSEMBLY

PART NUMBER: 02 04 08 002 0 / 109106

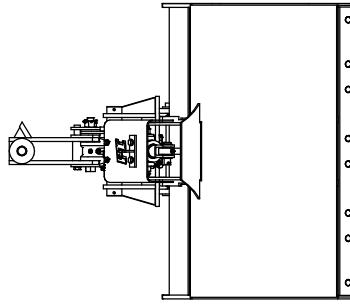
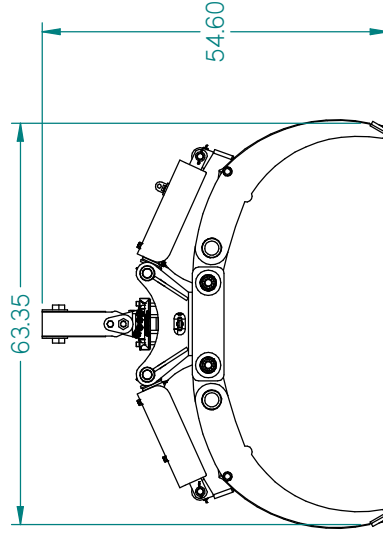
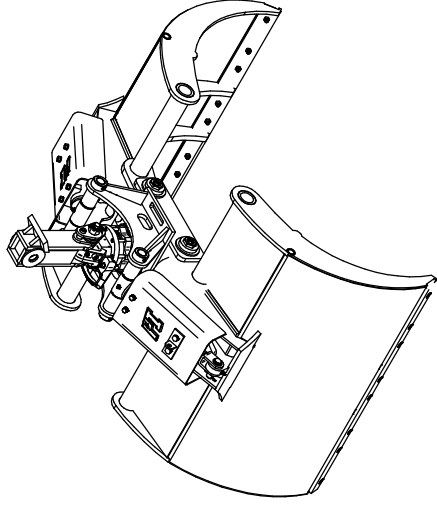
SCALE: NA

DRAWN BY: SYMB APPROVED BY: DATE: 03/31/2017 SHEET: 2 OF 2

010 ASSEMBLY



REV.	DESCRIPTION	DATE	BY
1	REVISED GMBAL MOUNTING PIN	09/30/2016	JYB
2	REVISED BUCKET SADDLE WELDMENT	10/04/2016	JYB



TOLERANCES
 1 DEC. ± 0.100
 2 DEC. ± 0.050
 3 DEC. ± 0.010
 ANGLE: ± 1.000°
 FRACTION: ± 1/32"
 DIM. UNITS: INCHES
 SURFACE FINISH: 125/32
 UNLESS OTHERWISE SPECIFIED

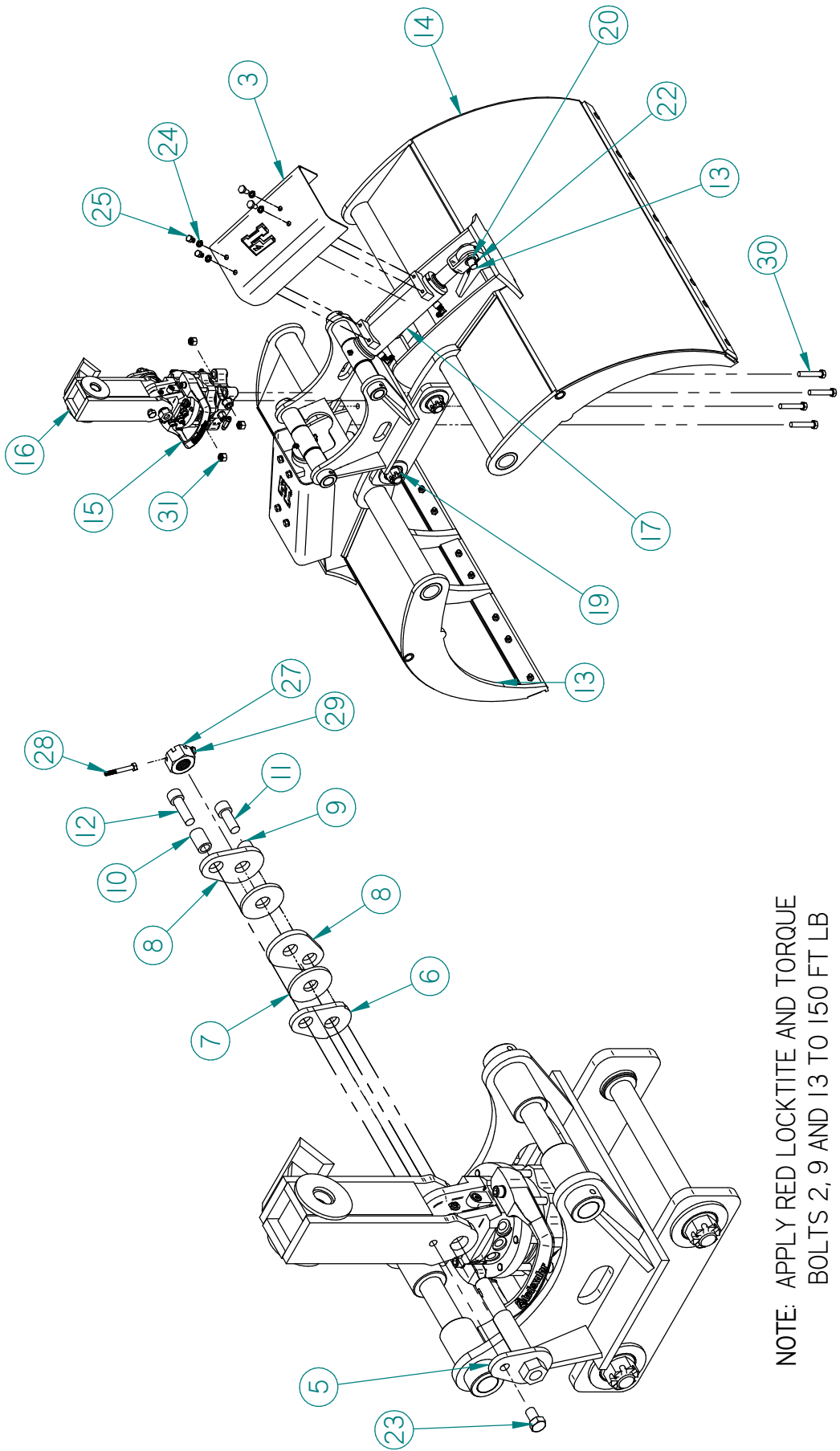


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NOTE: DUAL CYLINDER BUCKET WEIGHS 1040 LBS

TITLE: DUAL CYLINDER BUCKET ASSEMBLY

PART NUMBER: 111110012 / 102103	SCALE: 1:30
DRAWN BY: JYB	APPROVED BY: [Signature]
DATE: 03/03/2016	SHEET: 1 OF 3



NOTE: APPLY RED LOCKTITE AND TORQUE BOLTS 2, 9 AND 13 TO 150 FT LB

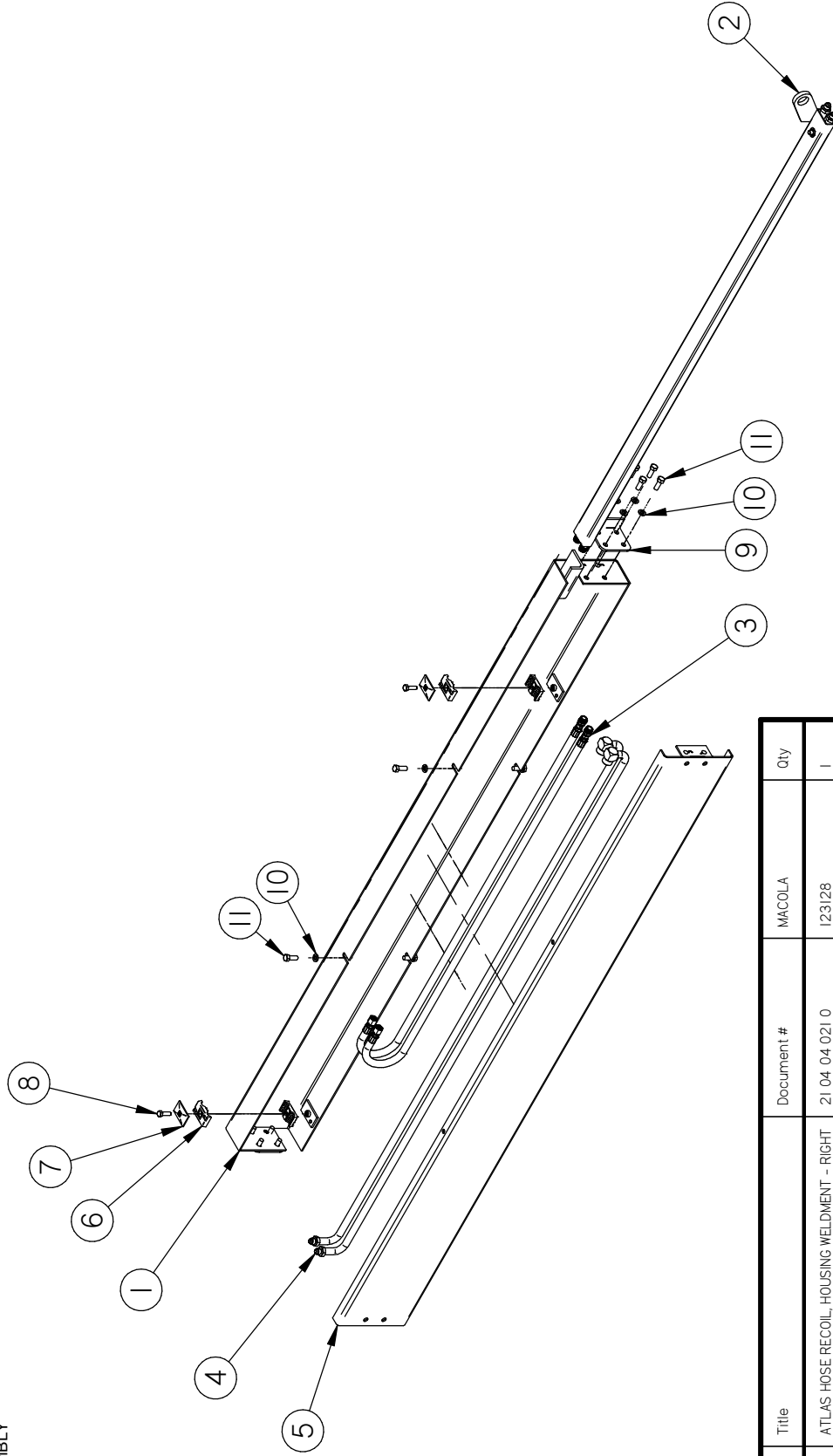
PETERSEN INDUSTRIES INC.
 4000 S.R. 60 WEST
 LAKE WALES, FL. 33859-8234
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TITLE: DUAL CYLINDER BUCKET ASSEMBLY

PART NUMBER: 111110012 / 102103	SCALE: 1:20
DRAWN BY: SYMB	APPROVED BY: 03/03/2016
SHEET: 2 OF 3	DATE: 03/03/2016

010 ASSEMBLY



Item #	Title	Document #	MACOLA	Qty
1	ATLAS HOSE RECOIL - HOUSING WELDMENT - RIGHT	21 04 04 021 0	I23128	1
2	TIP BOOM, HOSE RECOIL SLIDE ASSY RH	21 04 04 014 1	I23124	1
3	HOSE CUT 48" #6-S RECOIL BOX	51 04 07 001 0	HS10768FS	2
4	TUBE, ATLAS RECOIL BOX - CURVED	41 04 04 064 0	TU04008	2
5	ATLAS HOSE RECOIL, COVER WELDMENT	21 04 04 027 0	I23134	1
6	CLAMP, PLASTIC ONLY (2-HOLE) (I SET)	CLP220	CLP220	2
7	CLAMP, TOP PLATE ONLY (2-HOLE)	CL5C225	CL5C225	2
8	BOLT, HEX HD, 5/16 - 18 UNC 1.250 LG	BL305012U518	BL305012U518	2
9	HOSE RECOIL COVER BRACKET	41 04 04 068 0	I23153	2
10	WASHER LOCK 3/8 SPLIT	WAS065	WAS065	12
11	HEX BOLT 3/8-16 X 1.00 USS G5	BL306016U516	BL306016U516	12



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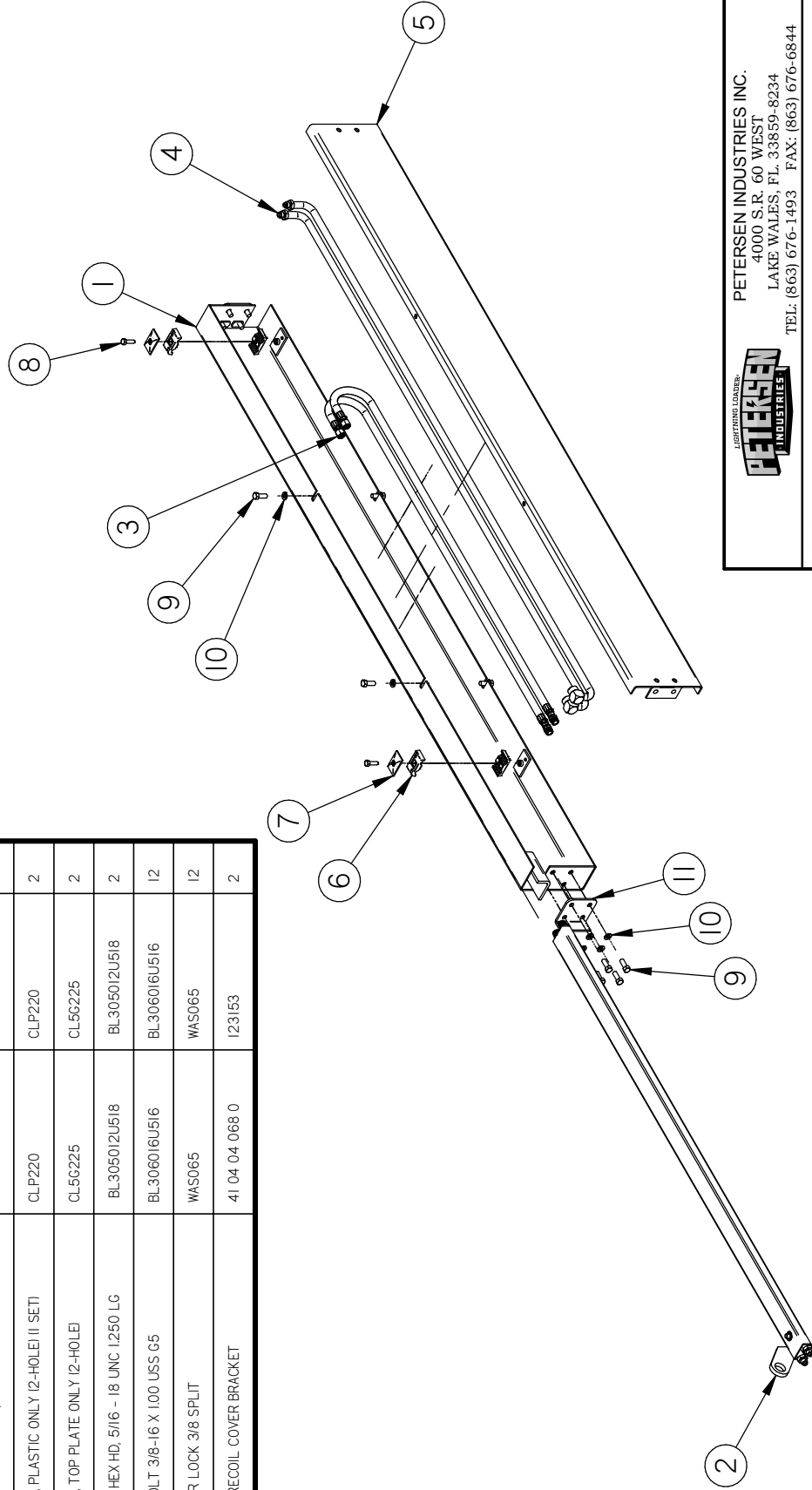
TITLE: ATLAS HOSE RECOIL BOX ASSEMBLY - RIGHT

PART NUMBER: 21 04 04 025 0 / I23132 SCALE: 1:15

DRAWN BY: SYKB APPROVED BY: DATE: 02/29/2016 SHEET: 1 OF 1

010 ASSEMBLY

Item #	Title	Document #	MACOLA	Qty
1	ATLAS HOSE RECOIL, HOUSING WELDMENT - LEFT	21 04 04 022 0	123129	1
2	TIP BOOM, HOSE RECOIL - SLIDE ASSY LH	21 04 04 015 1	123123	1
3	HOSE CUT 48" #6-S RECOIL BOX	51 04 07 001 0	HS10768FS	2
4	TUBE ATLAS RECOIL BOX - CURVED	41 04 04 064 0	TU04008	2
5	ATLAS HOSE RECOIL, COVER WELDMENT	21 04 04 027 0	123134	1
6	CLAMP, PLASTIC ONLY (2-HOLE/II SET)	CLP220	CLP220	2
7	CLAMP, TOP PLATE ONLY (2-HOLE)	CL5G225	CL5G225	2
8	BOLT, HEX HD, 5/16 - 18 UNC 1250 LG	BL305012U518	BL305012U518	2
9	HEX BOLT 3/8-16 X 100 USS C5	BL306016U516	BL306016U516	12
10	WASHER LOCK 3/8 SPLIT	WAS065	WAS065	12
11	HOSE RECOIL COVER BRACKET	41 04 04 068 0	123153	2



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TITLE ATLAS HOSE RECOIL BOX ASSEMBLY - LEFT	
PART NUMBER: 21 04 04 026 0 / 123133	SCALE: 1:15
DRAWN BY: SYMB	APPROVED BY: SYMB
DATE: 02/29/2016	SHEET: 1 OF 1

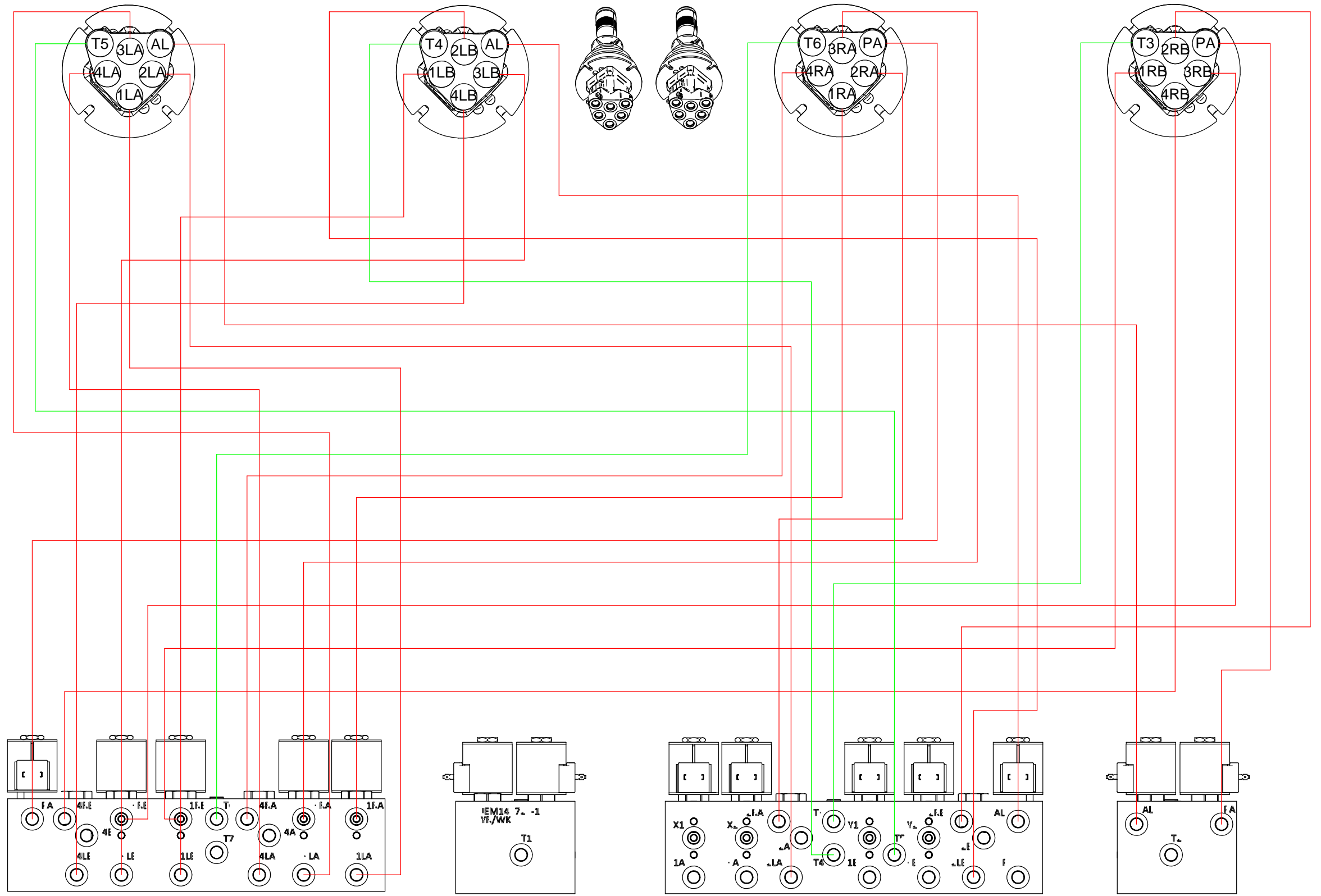
**PILOT CONTROL
DIAGRAM**

**LEFT JOYSTICKS
VA02VP1207**

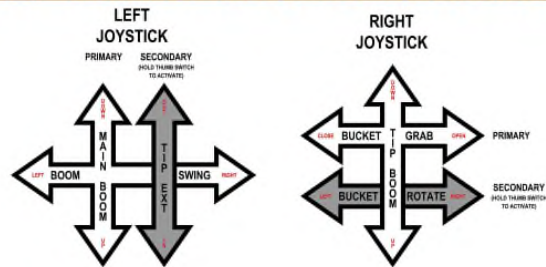
**RIGHT JOYSTICKS
VA02VP1207**

*** JOYSTICK PLUMBING IS
SHOWN LOOKING AT BOTTOM
OF JOYSTICK.**

*** JOYSTICK MUST BE
INSTALLED WITH FLAT SIDE
OF JOYSTICK FACING
OPERATOR ON DUAL WALK
THRU**



WARNING: WATCH FOR POWER LINES



**PILOT HOSE KIT
HS7ATLASDWT/PIL**

**ATLAS DWT WITH TIP EXT HOSE KIT
HS7ATLASDWT**

**ATLAS DWT WITH FIXED LENGTH TIP BOOM HOSE KIT
HS7ATLASDWT-FTB**

**SHUTTLE MANIFOLD
VA13001**

**T, X1, X2, Y1, Y2
CAN BE USED AS
TANK PORTS ON
SHUTTLE MANIFOLD.
ANY UNUSED PORTS
SHOULD BE PLUGGED.**



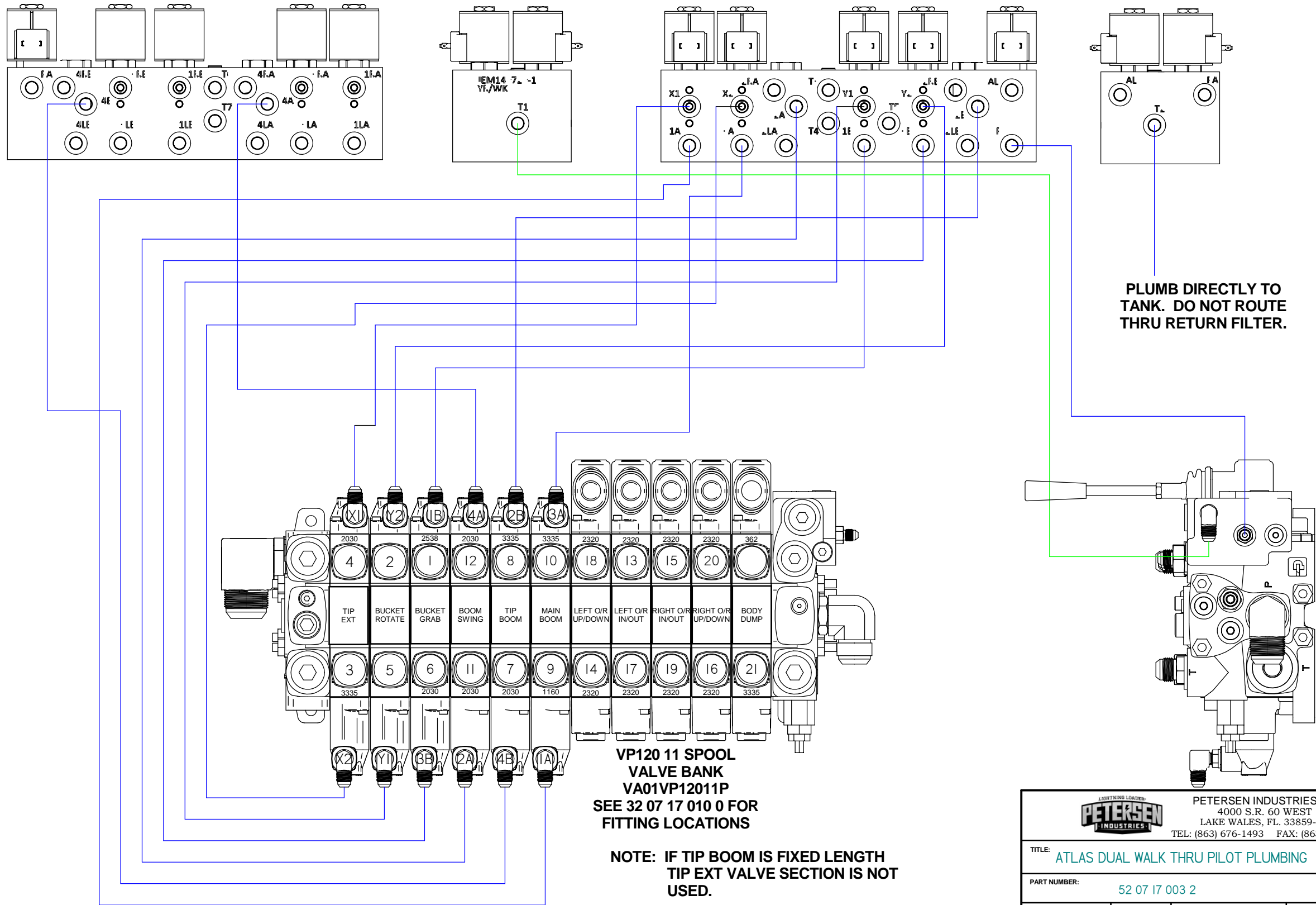
PETERSEN INDUSTRIES INC.
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LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: ATLAS DUAL WALK THRU PILOT PLUMBING			
PART NUMBER: 52 07 17 003 2			SCALE: NA
DRAWN BY: SWB	APPROVED BY:	DATE: 01/30/2017	SHEET: 1 OF 10

**PILOT CONTROL
DIAGRAM**

PRESSURE
SUCTION
LOAD SENSE
CONTROLS

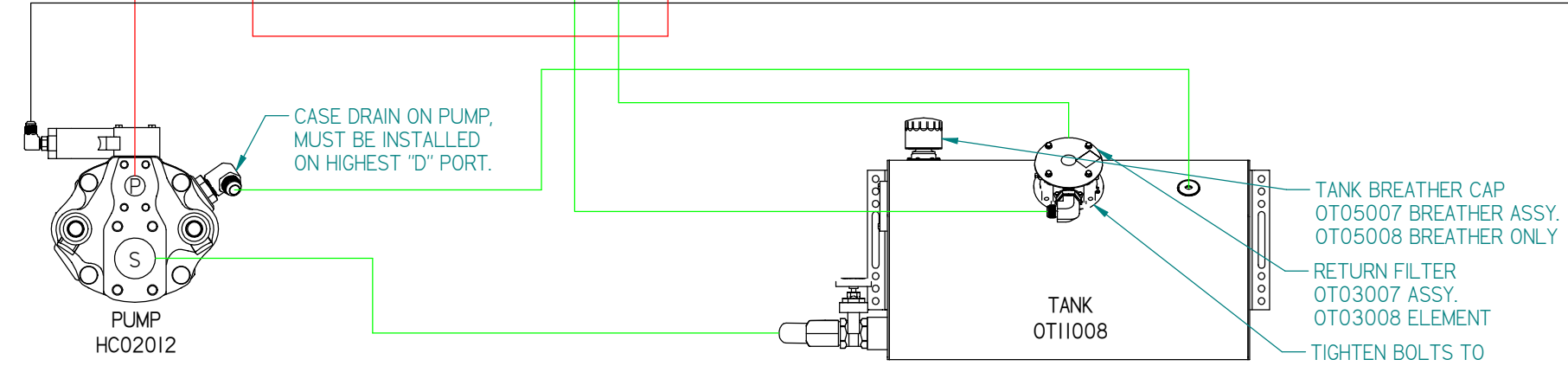
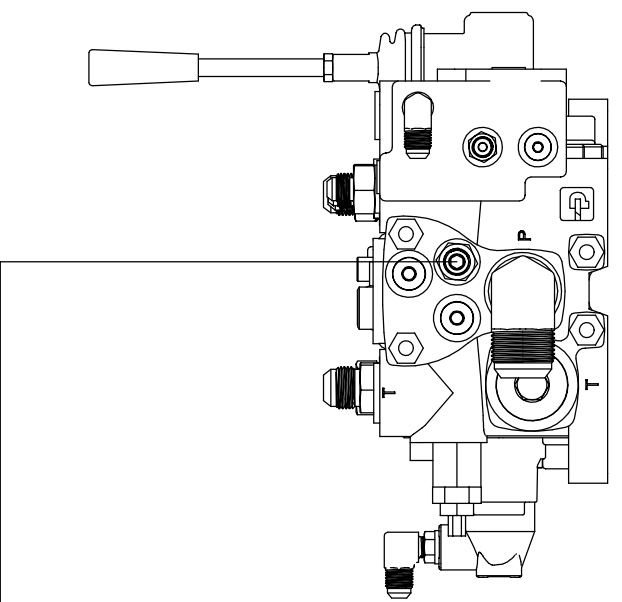
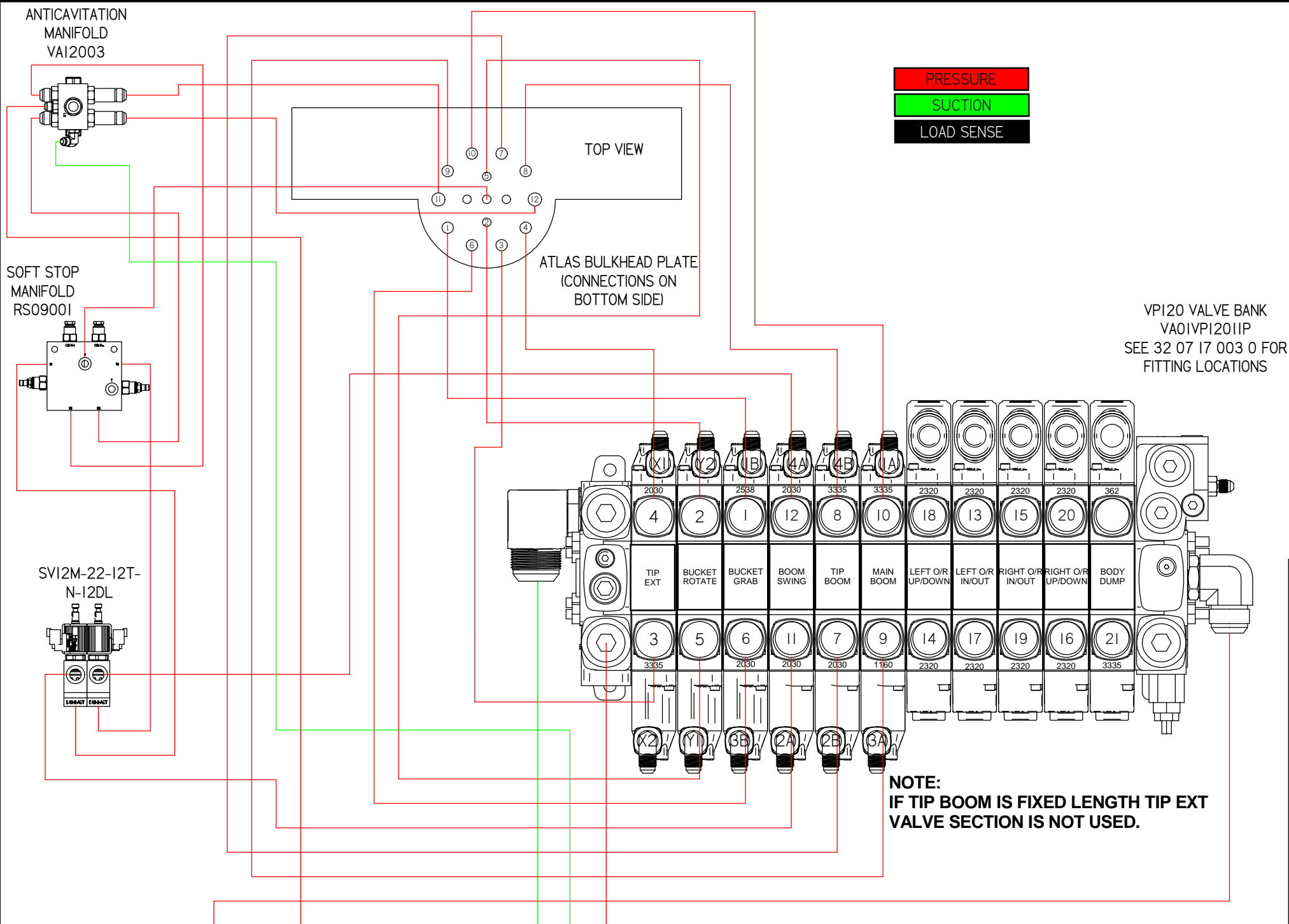
**SHUTTLE MANIFOLD
VA13001**



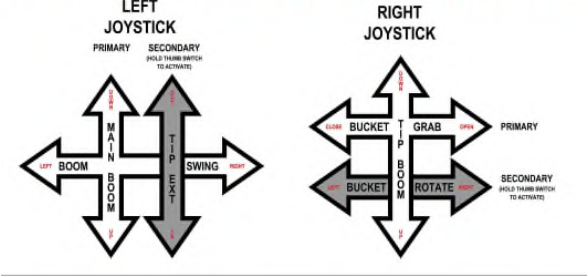
**VP120 11 SPOOL
VALVE BANK
VA01VP12011P
SEE 32 07 17 010 0 FOR
FITTING LOCATIONS**

**NOTE: IF TIP BOOM IS FIXED LENGTH
TIP EXT VALVE SECTION IS NOT
USED.**

		PETERSEN INDUSTRIES INC. 4000 S.R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE: ATLAS DUAL WALK THRU PILOT PLUMBING			
PART NUMBER: 52 07 17 003 2		SCALE: NA	
DRAWN BY: SWB	APPROVED BY:	DATE: 01/30/2017	SHEET: 2 OF 10



WARNING: WATCH FOR POWER LINES

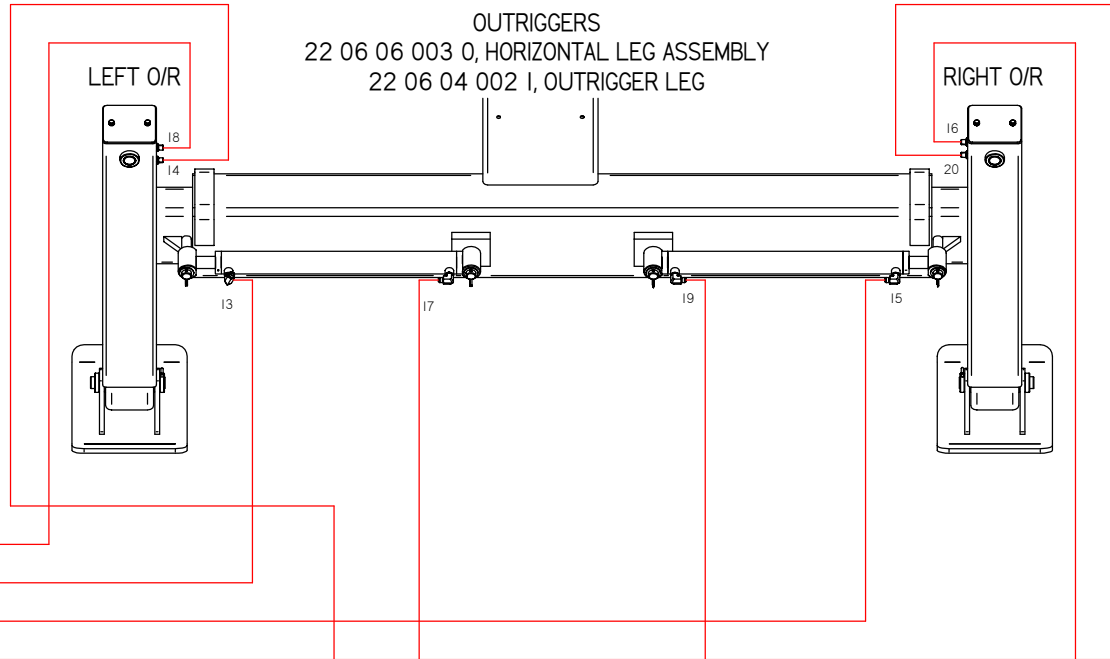
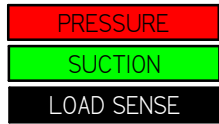


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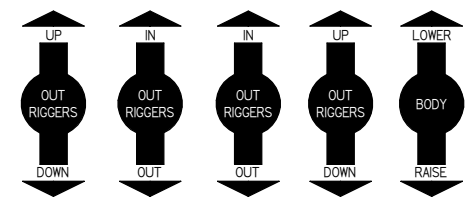
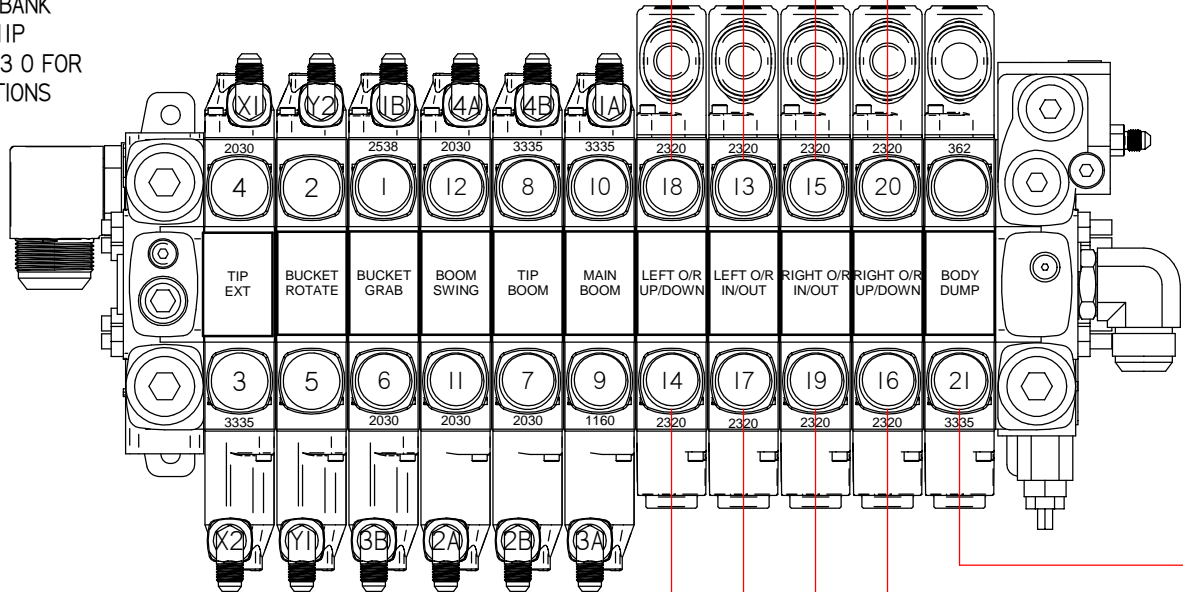
TITLE: ATLAS DUAL WALK THRU PILOT PLUMBING

PART NUMBER: 52 07 17 003 2 SCALE: NA

DRAWN BY: SWB APPROVED BY: DATE: 01/30/2017 SHEET: 3 OF 10



VP120 VALVE BANK
VA01VP1201IP
SEE 32 07 17 003 0 FOR
FITTING LOCATIONS



**NOTE: IF TIP BOOM IS FIXED LENGTH
TIP EXT VALVE SECTION IS NOT
USED.**

TO BODY HOIST

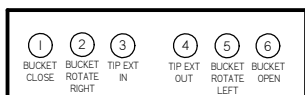
		PETERSEN INDUSTRIES INC. 4000 S.R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE: ATLAS DUAL WALK THRU PILOT PLUMBING			
PART NUMBER: 52 07 17 003 2			SCALE: NA
DRAWN BY: SWB	APPROVED BY:	DATE: 01/30/2017	SHEET: 4 OF 10

**NOTE: IF TIP BOOM IS FIXED LENGTH
DO NOT INSTALL SMALL
BULKHEAD PLATES (107371).
RETURN PLATES TO STOCK.**

BIG BULKHEAD
107370

SMALL BULKHEAD
107371

THESE BIG AND SMALL
BULKHEAD PLATES ARE
STANDING ON THE WALK
THRU LOOKING AT BACK
OF HEAD

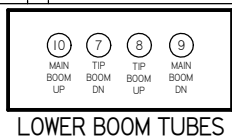


UPPER BOOM TUBES

PEDESTAL SIDE

ATLAS MAIN BOOM
02 03 18 001 0

TIP BOOM SIDE



LOWER BOOM TUBES

THIS IS THE BOTTOM
OF THE MAIN BOOM
LOOKING UP

BIG BULKHEAD
107370

SMALL BULKHEAD
107371

THESE BIG AND SMALL
BULKHEAD PLATES ARE
LOOKING INSIDE HEAD

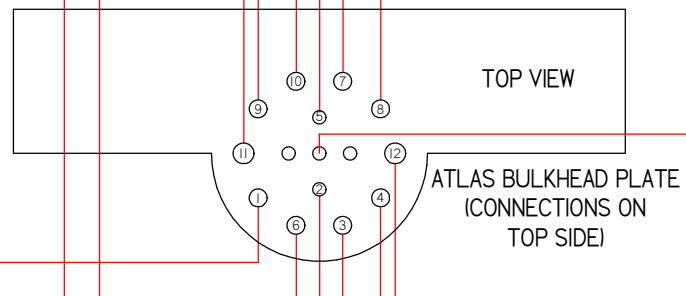
MAIN BOOM CYLINDER
121130

TIP BOOM CYLINDER
121131

DUAL CYLINDER BUCKET
102103

TIP EXTENSION
CYLINDER
121105

MOTOR HC01008
GEARBOX HC01007



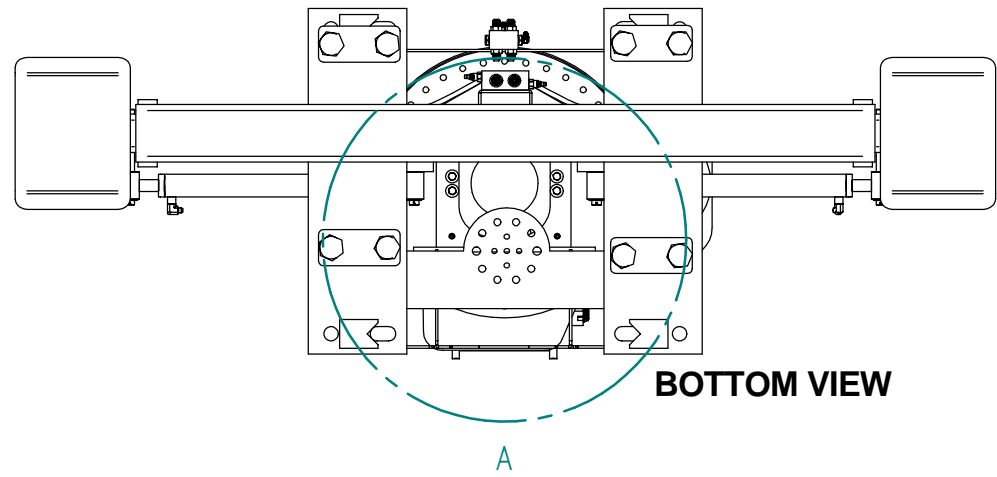
**NOTE: IF TIP BOOM IS FIXED LENGTH
HOSES 3 AND 4 WILL NOT BE
USED.**



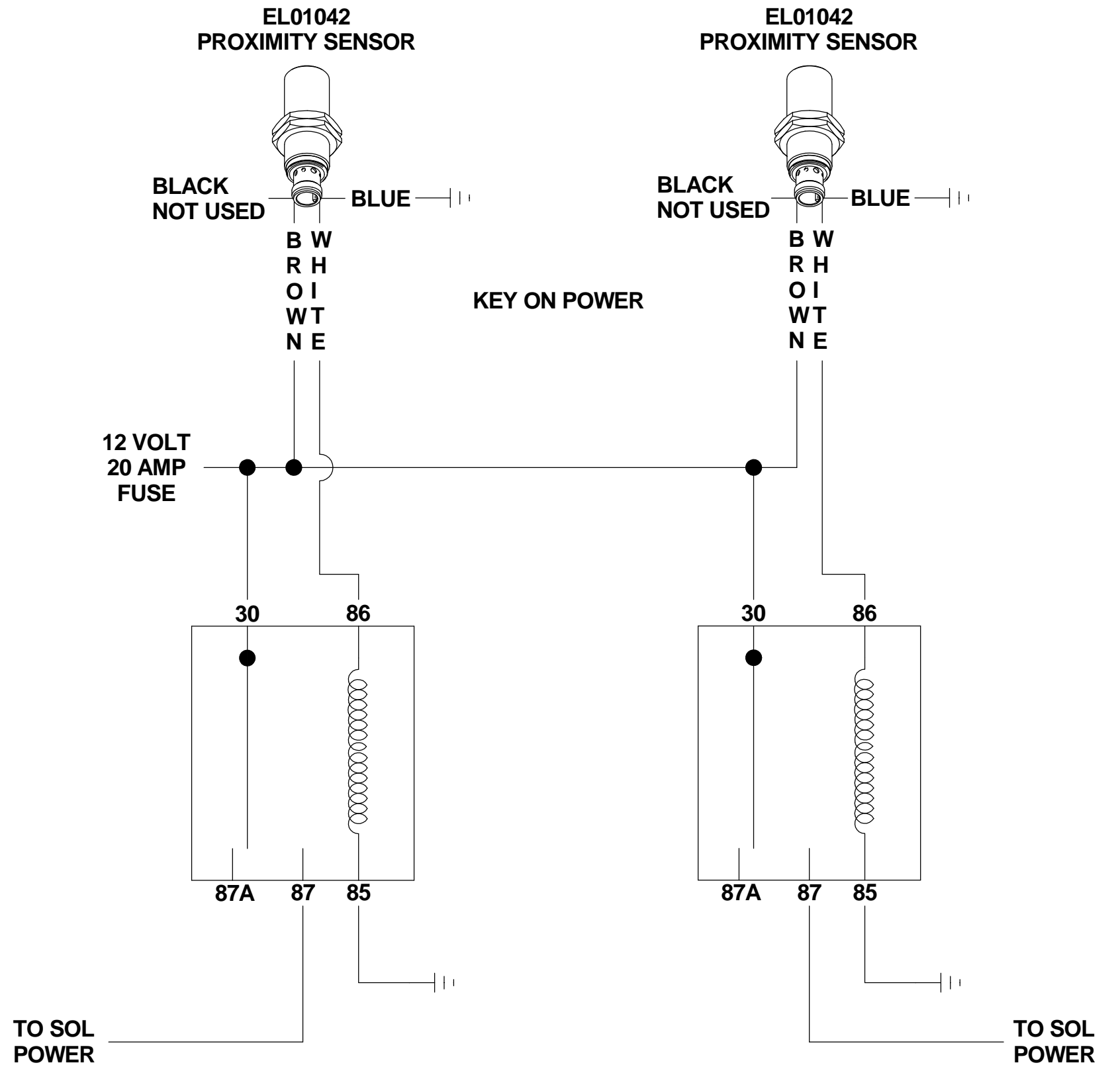
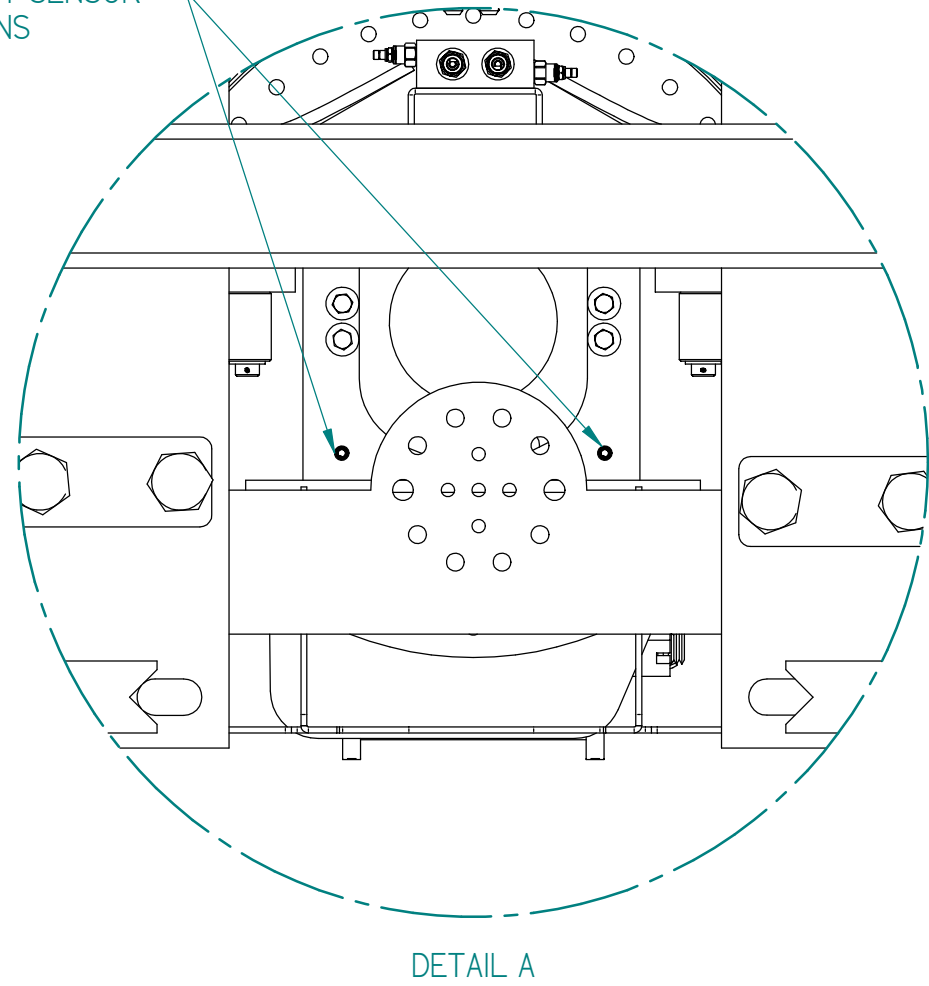
PETERSEN INDUSTRIES INC.
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LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844


TITLE: **ATLAS DUAL WALK THRU PILOT PLUMBING**

PART NUMBER: 52 07 17 003 2		SCALE: NA
DRAWN BY: SWB	APPROVED BY:	DATE: 01/30/2017
SHEET: 5 OF 10		



PROXIMITY SENSOR LOCATIONS



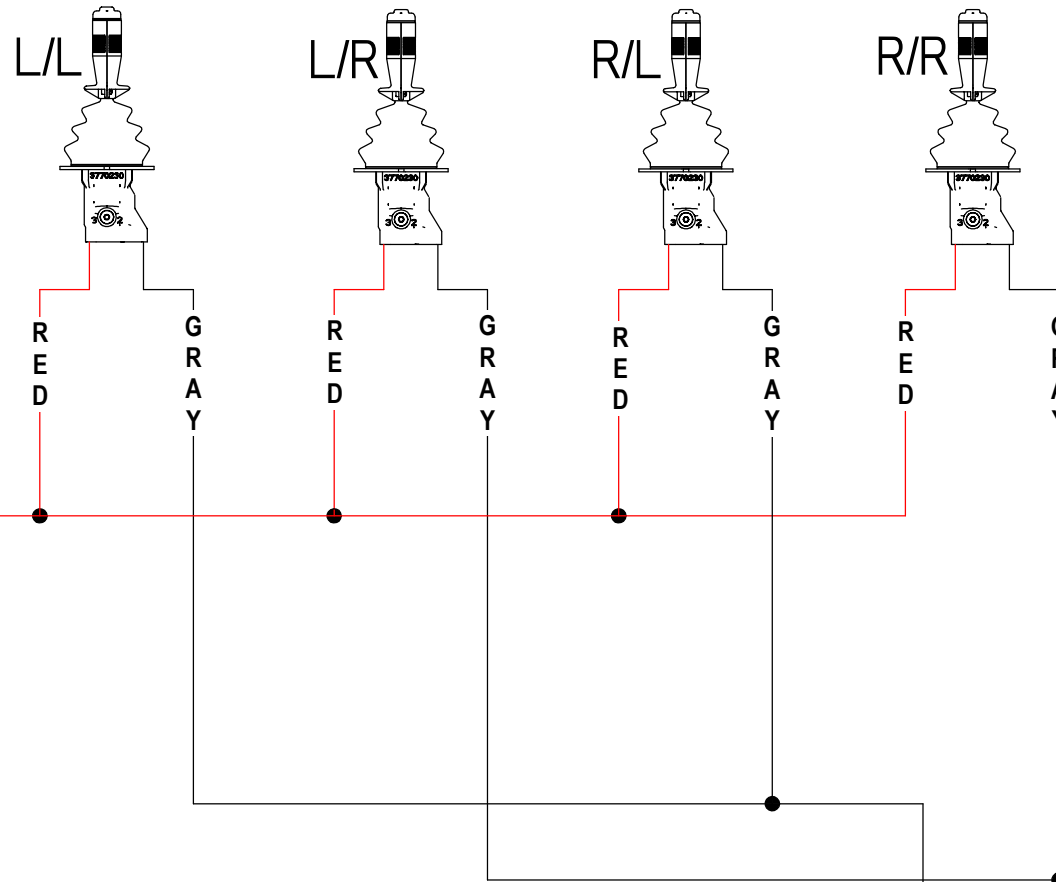
		PETERSEN INDUSTRIES INC. 4000 S.R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE: ATLAS DUAL WALK THRU PILOT PLUMBING			
PART NUMBER: 52 07 17 003 2			SCALE: NA
DRAWN BY: SWB	APPROVED BY:	DATE: 01/30/2017	SHEET: 6 OF 10

ELECTRICAL DIAGRAM

CURRENT PRODUCTION (8/17 & LATER)

LEFT SIDE JOYSTICKS

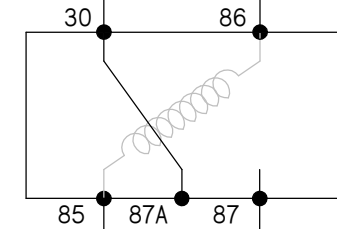
RIGHT SIDE JOYSTICKS



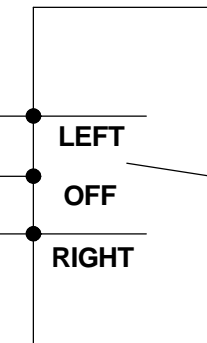
RED = SWITCH
BLACK = NOT USED
GRAY = SWITCH

12 V ACCESSORY POWER 20 AMP FUSE

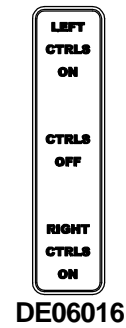
12 V



TO SOLENOID E TRIGGERS LEFT JOYSTICKS

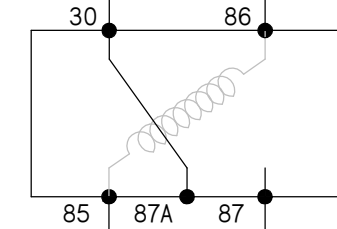


TO SOLENOID F TRIGGERS RIGHT JOYSTICKS

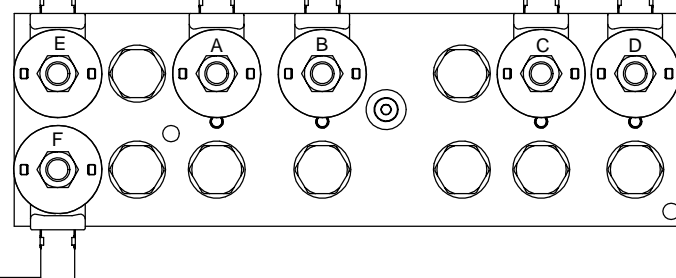


12 V ACCESSORY POWER 20 AMP FUSE

12 V



12 V ACCESSORY POWER 20 AMP FUSE



PILOT CONTROL MANIFOLD



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LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: ATLAS DUAL WALK THRU PILOT PLUMBING

PART NUMBER: 52 07 17 003 2		SCALE: NA
DRAWN BY: SWB	APPROVED BY:	DATE: 01/30/2017
SHEET: 7 OF 10		

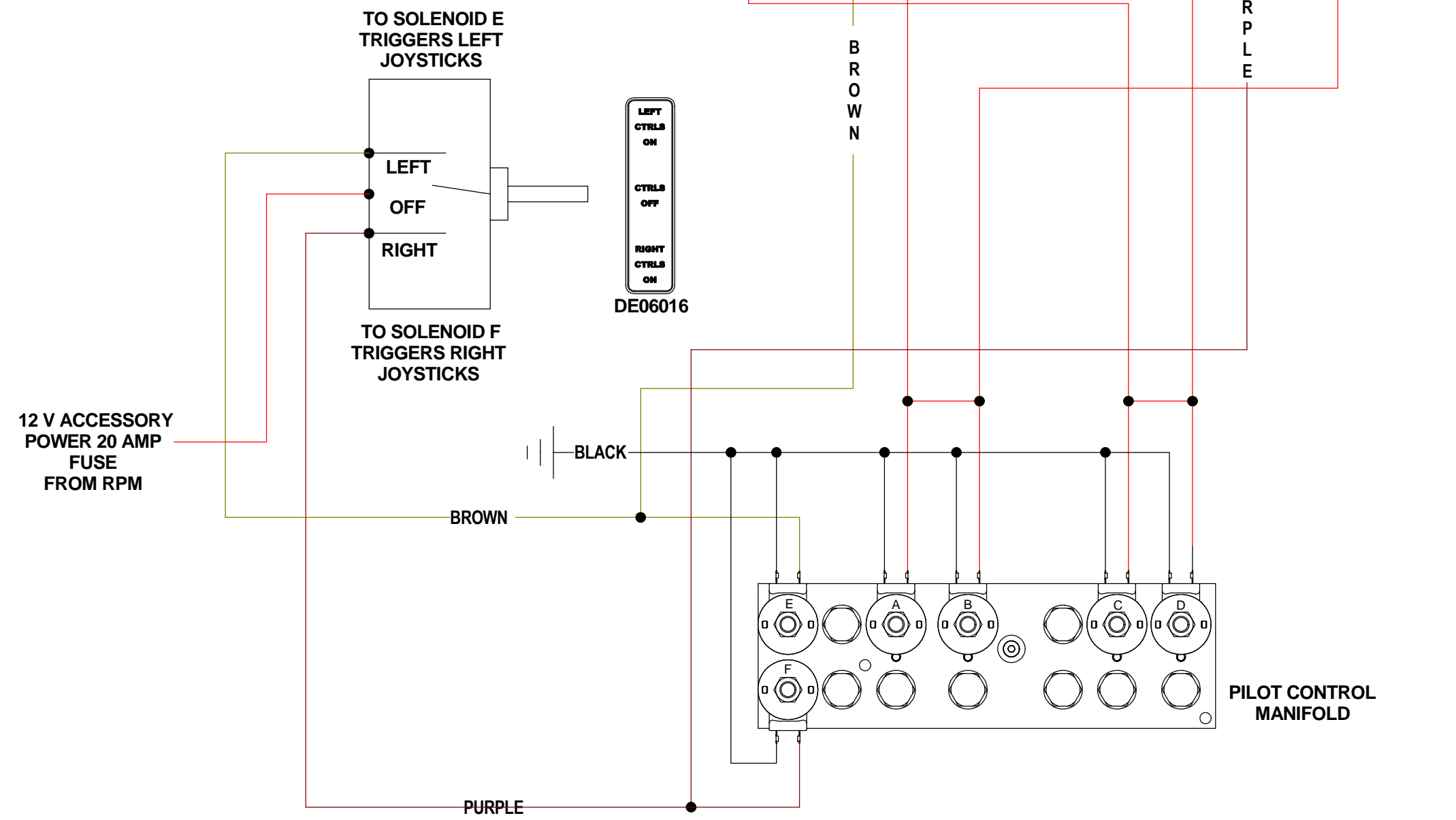
ELECTRICAL DIAGRAM

CURRENT PRODUCTION (8/17 & LATER)
INTERNATIONAL WITH DLB (NO RELAYS)

LEFT SIDE JOYSTICKS

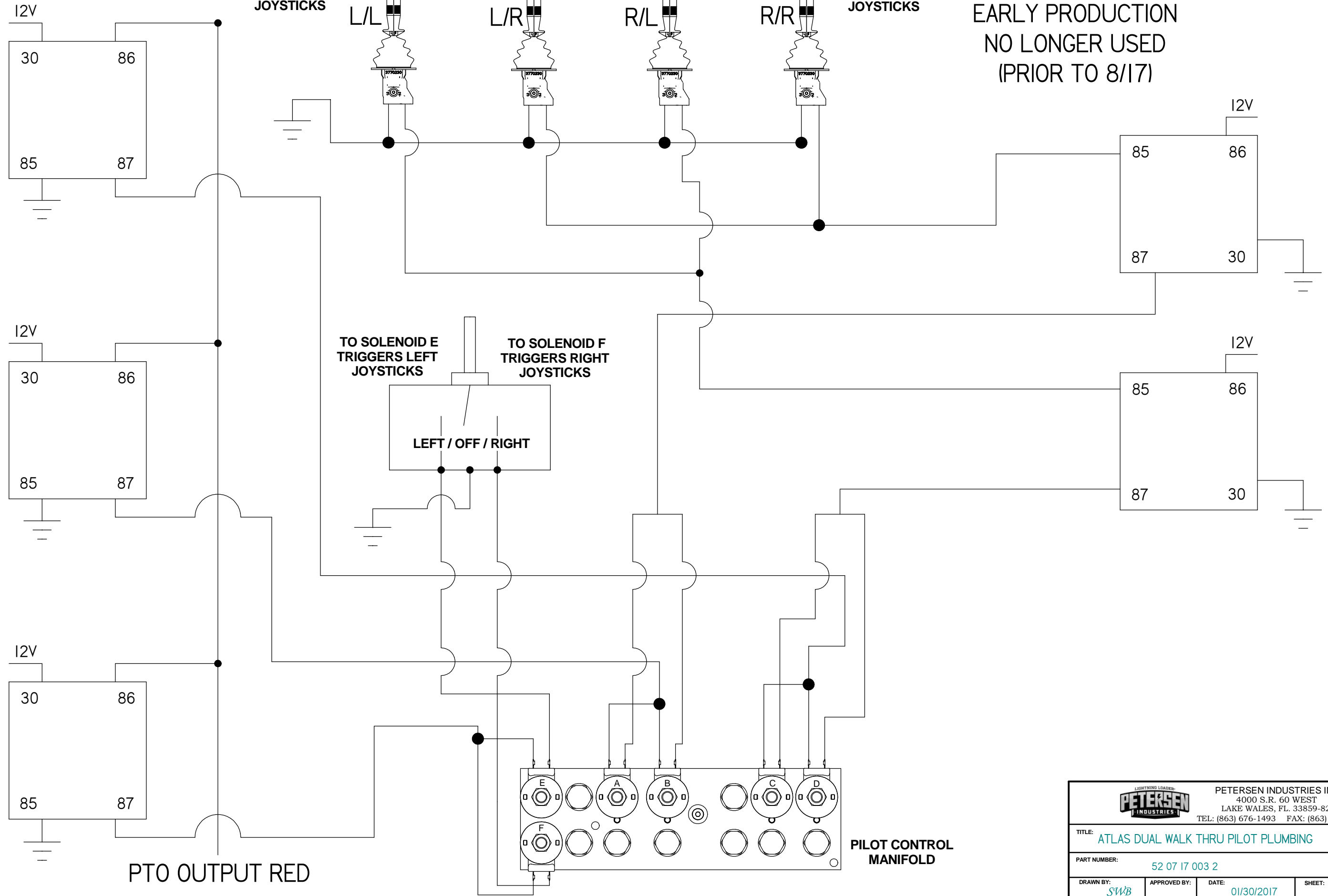
RIGHT SIDE JOYSTICKS

RED = SWITCH
BLACK = NOT USED
GRAY = SWITCH



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		TITLE: ATLAS DUAL WALK THRU PILOT PLUMBING	
PART NUMBER: 52 07 17 003 2		SCALE: NA	
DRAWN BY: SWB	APPROVED BY:	DATE: 01/30/2017	SHEET: 8 OF 10

ELECTRICAL DIAGRAM



		PETERSEN INDUSTRIES INC. 4000 S.R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE: ATLAS DUAL WALK THRU PILOT PLUMBING			
PART NUMBER: 52 07 17 003 2		SCALE: NA	
DRAWN BY: SWB	APPROVED BY:	DATE: 01/30/2017	SHEET: 9 OF 10

VP120 PILOT END CAP SPECIFICATIONS

- | | |
|--------------------------------------|--------------------|
| 1. PILOT PRESSURE | 508 psi, 4-6 GPM |
| 2. PILOT PRESSURE
(INITIATE FLOW) | 101 psi |
| 3. PILOT PRESSURE
(FULL STROKE) | 315 psi |
| 4. FLUID CLEANLINESS | 17/14 PER ISO 4406 |
| 5. AMBIENT TEMPERTURE | -22°F TO 176°F |
| 6. FLUID TEMPERATURE | -4°F TO 176°F |

GEARBOX BRAKE FUNCTIONAL DESCRIPTION

BRAKE IS SPRING APPLIED AND HYDRAULICALLY RELEASED. PRESSURE TO RELEASE THE BRAKE IS 145-159 PSI AND IT CAN HANDLE A MAX PRESSURE OF 4351 PSI.

JOYSTICK FUNCTIONAL DESCRIPTION

THE JOYSTICK IS SUPPLIED WITH PILOT PRESSURE FROM THE VP120 CONTROL VALVE. AS THE JOYSTICK IS SHIFTED THE OUTPUT PRESSURE FROM THE CORROSPONDING A OR B PORT RISES FROM 0 PSI TO 306 PSI.

PILOT FOOT PEDAL FUNCTIONAL DESCRIPTION

THE PEDAL IS SUPPLIED WITH PILOT PRESSURE FROM THE VP120 CONTROL VALVE. AS THE PEDAL IS SHIFTED THE OUTPUT PRESSURE FROM THE CORROSPONDING A OR B PORT RISES FROM 0 PSI TO 321 PSI.



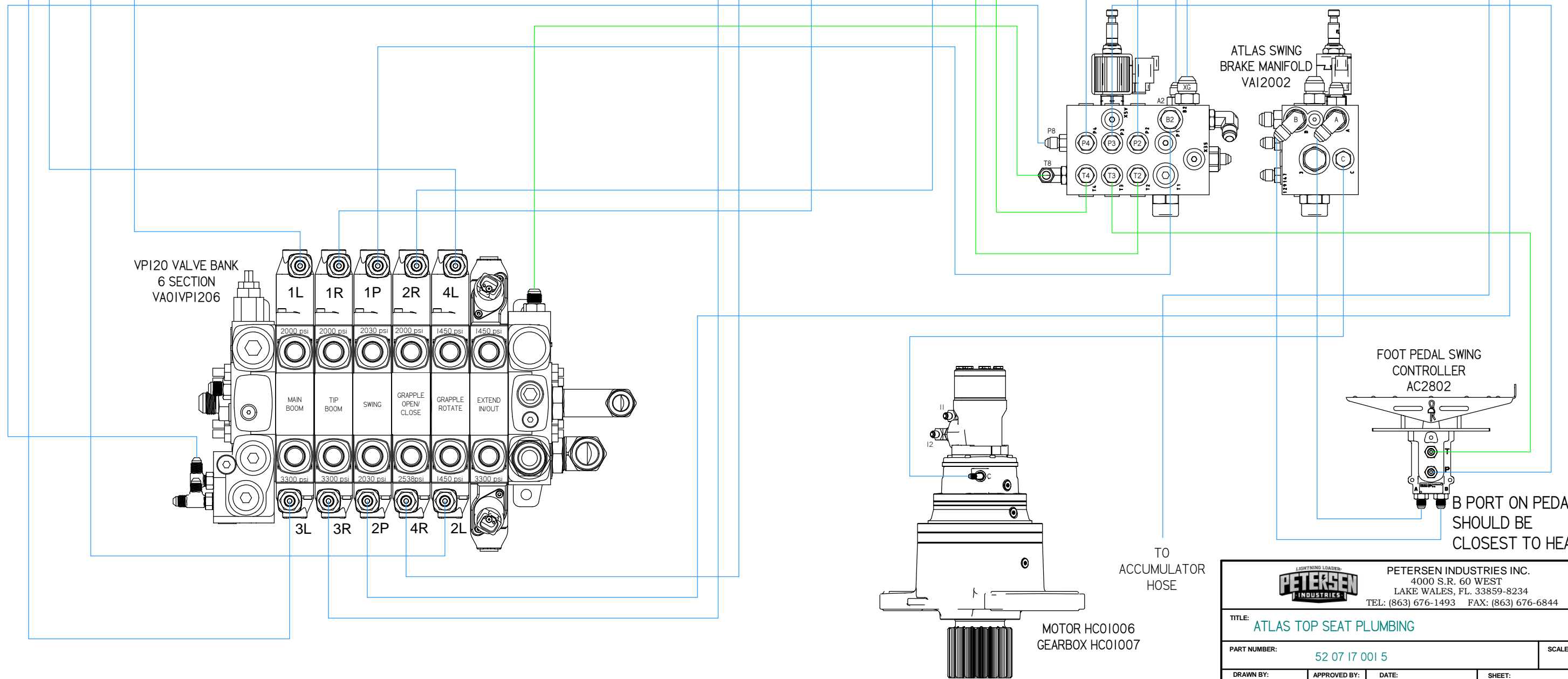
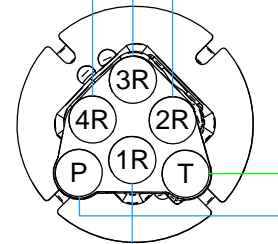
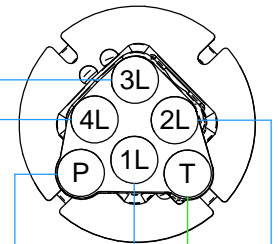
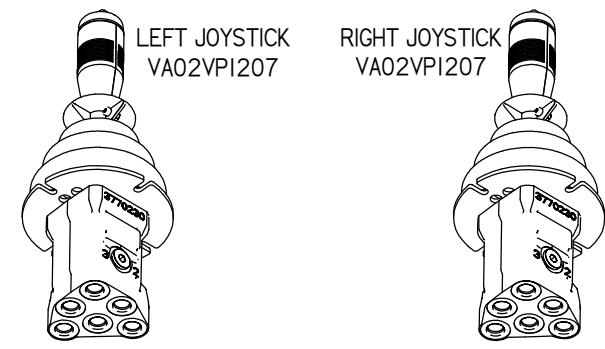
PETERSEN INDUSTRIES INC.
4000 S.R. 60 WEST
LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: ATLAS DUAL WALK THRU PILOT PLUMBING

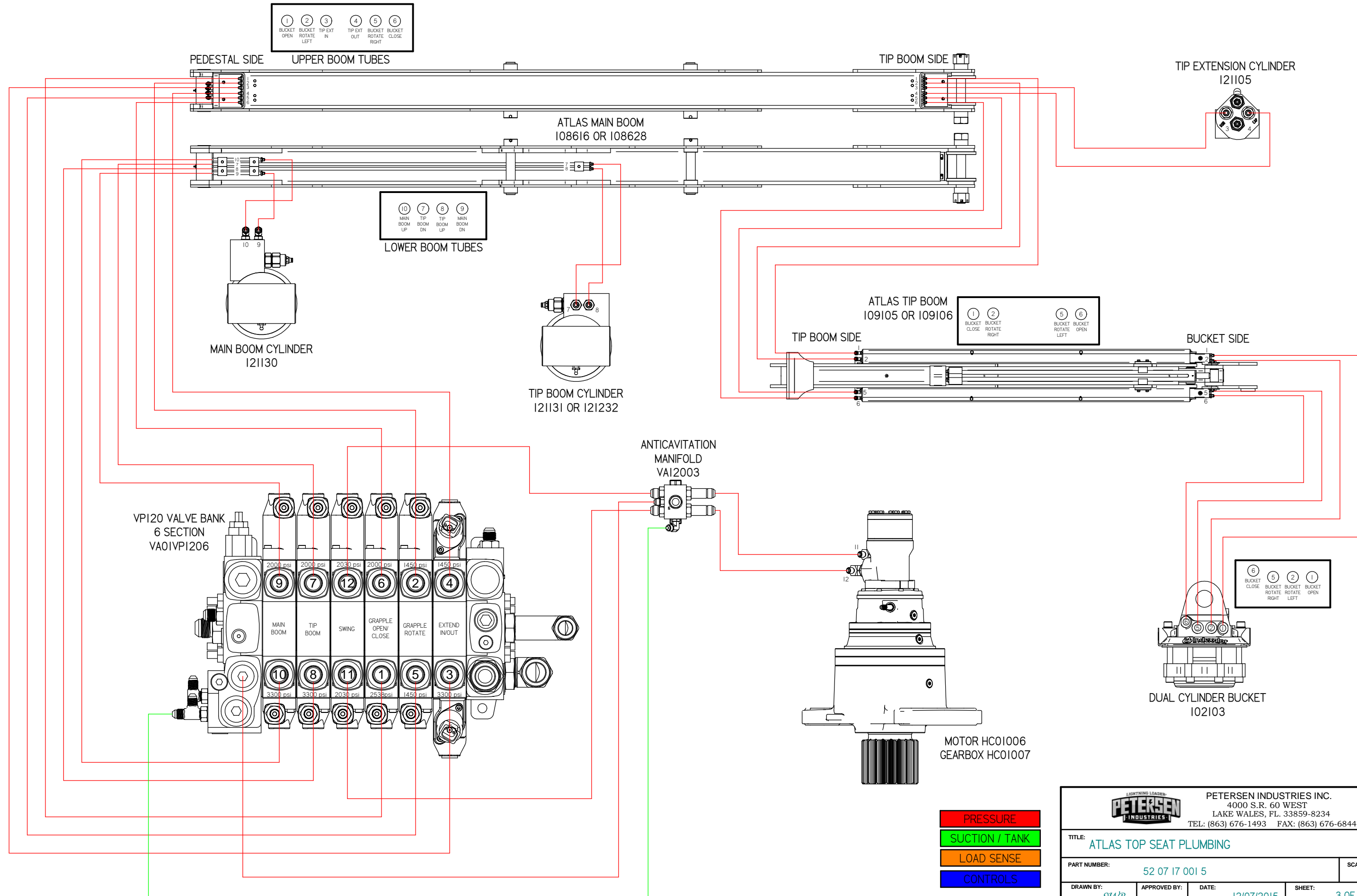
PART NUMBER: 52 07 17 003 2		SCALE: NA
DRAWN BY: SWB	APPROVED BY:	DATE: 01/30/2017 SHEET: 10 OF 10

NOTE: LEFT AND RIGHT ARE AS IF YOU ARE SITTING IN THE OPERATORS SEAT, IT IS IMPORTANT THAT JOYSTICKS ARE ORIENTED AS SHOWN IN THE DIAGRAM WITH THE PORT 3 FACING THE REAR OF THE SEAT.

PRESSURE
SUCTION / TANK
LOAD SENSE
CONTROLS



		PETERSEN INDUSTRIES INC. 4000 S.R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE: ATLAS TOP SEAT PLUMBING			
PART NUMBER: 52 07 17 001 5		SCALE: NA	
DRAWN BY: SWB	APPROVED BY:	DATE: 12/07/2015	SHEET: 2 OF 9



1 BUCKET OPEN
2 BUCKET ROTATE LEFT
3 TIP EXT IN
4 TIP EXT OUT
5 BUCKET ROTATE RIGHT
6 BUCKET CLOSE

10 MAIN BOOM UP
7 TIP BOOM UP
8 TIP BOOM UP
9 MAIN BOOM DN

1 BUCKET CLOSE
2 BUCKET ROTATE RIGHT
5 BUCKET ROTATE LEFT
6 BUCKET OPEN

6 BUCKET CLOSE
5 BUCKET ROTATE RIGHT
2 BUCKET ROTATE LEFT
1 BUCKET OPEN

PRESSURE
SUCTION / TANK
LOAD SENSE
CONTROLS

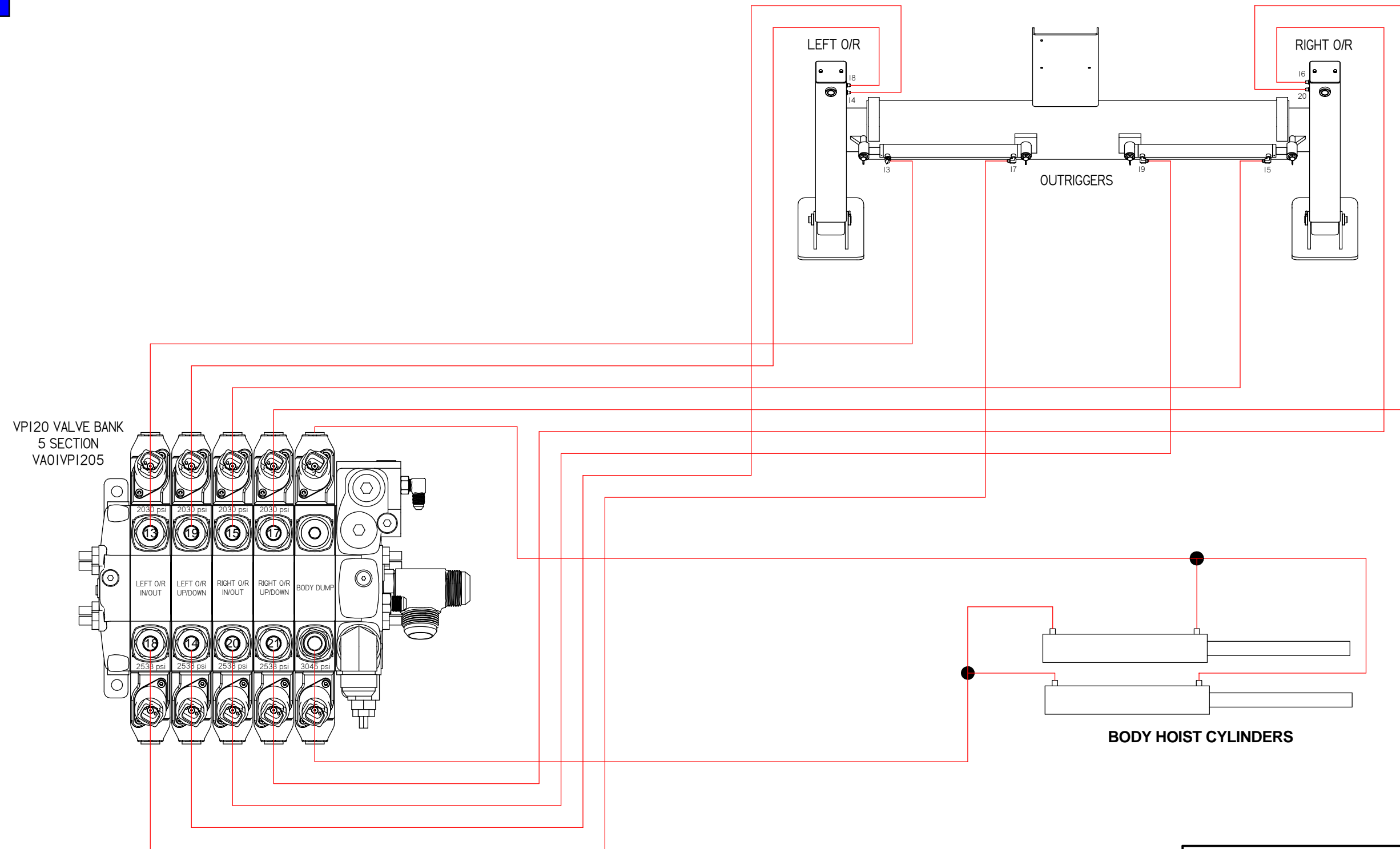
PETERSEN INDUSTRIES INC.
 4000 S.R. 60 WEST
 LAKE WALES, FL. 33859-8234
 TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: **ATLAS TOP SEAT PLUMBING**

PART NUMBER: 52 07 17 001 5 SCALE: NA

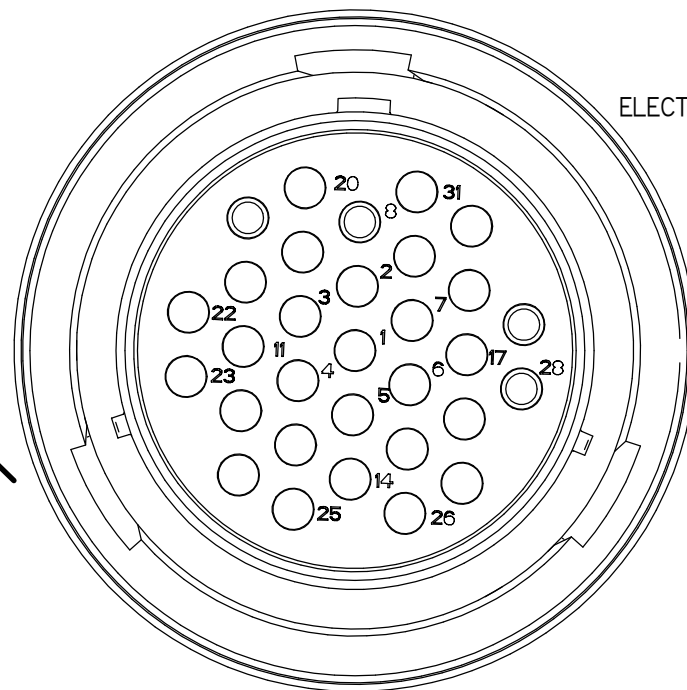
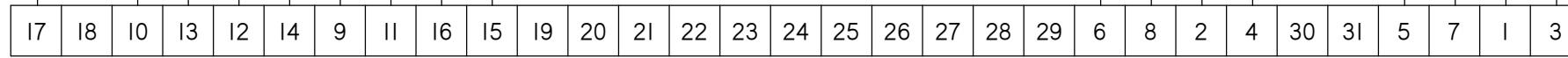
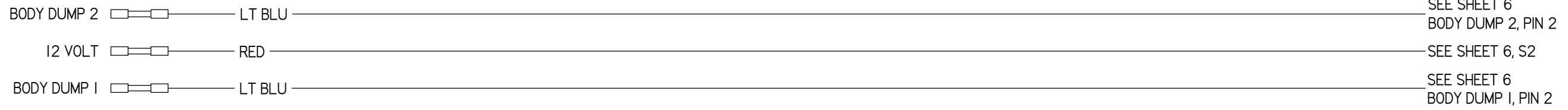
DRAWN BY: SWB APPROVED BY: DATE: 12/07/2015 SHEET: 3 OF 9

- PRESSURE
- SUCTION / TANK
- LOAD SENSE
- CONTROLS



		PETERSEN INDUSTRIES INC. 4000 S.R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE: ATLAS TOP SEAT PLUMBING			
PART NUMBER: 52 07 17 001 5		SCALE: NA	
DRAWN BY: SWB	APPROVED BY:	DATE: 12/07/2015	SHEET: 4 OF 9

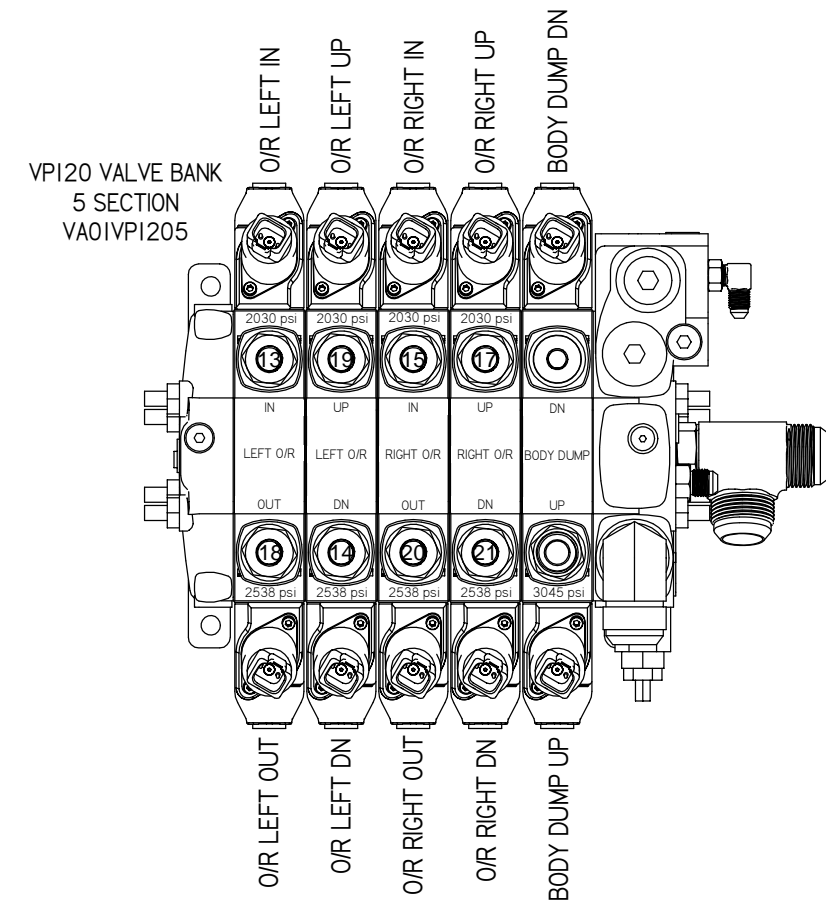
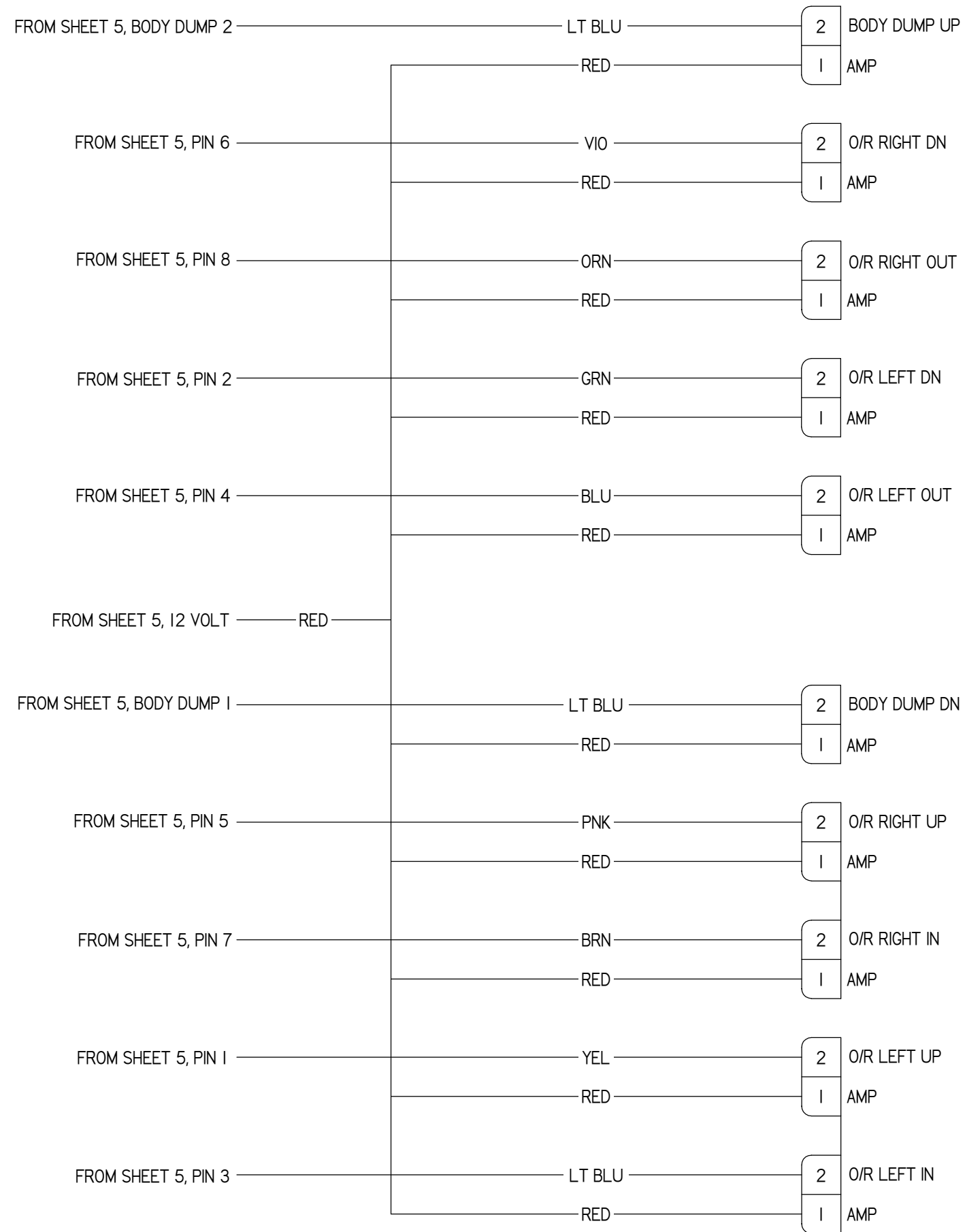
ROTARY MANIFOLD LOWER HARNESS




ELECTRICAL CONNECTOR

		PETERSEN INDUSTRIES INC. 4000 S.R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE: ATLAS TOP SEAT PLUMBING			
PART NUMBER: 52 07 17 001 5			SCALE: NA
DRAWN BY: SWB	APPROVED BY:	DATE: 12/07/2015	SHEET: 5 OF 9

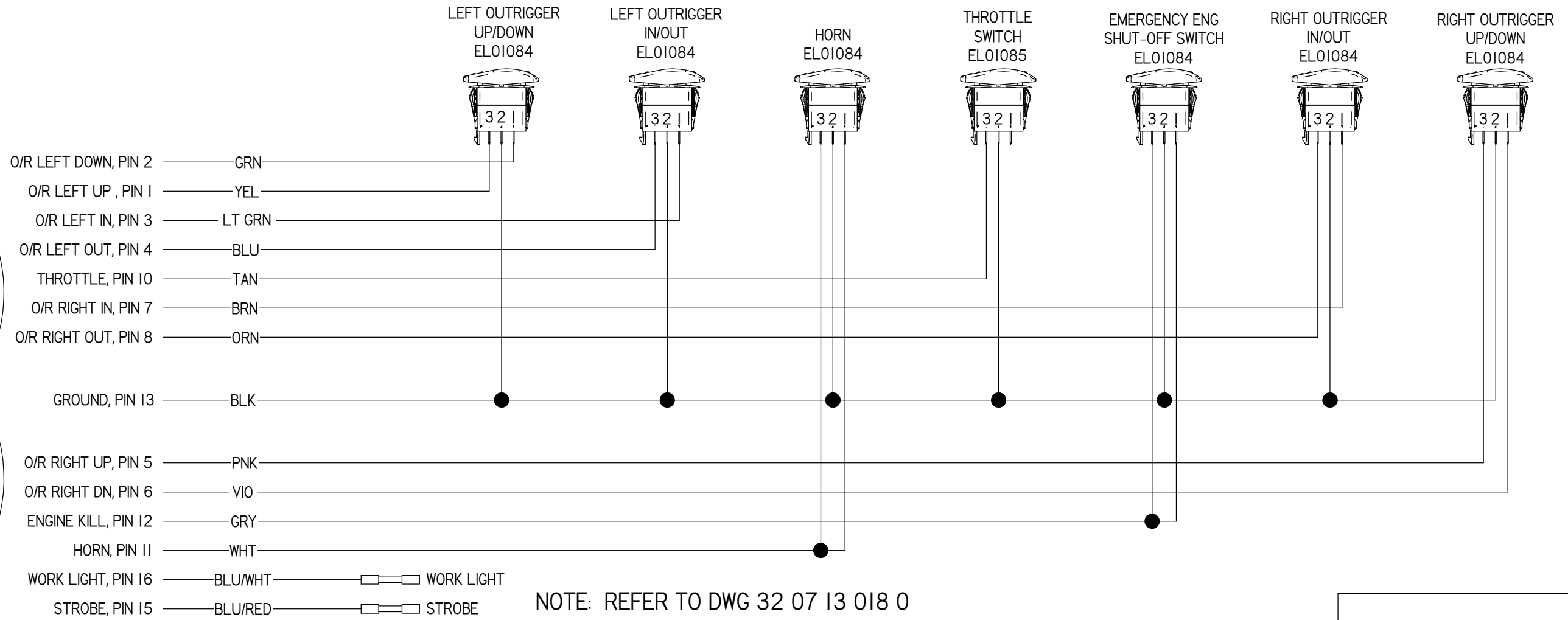
ROTARY MANIFOLD LOWER HARNESS



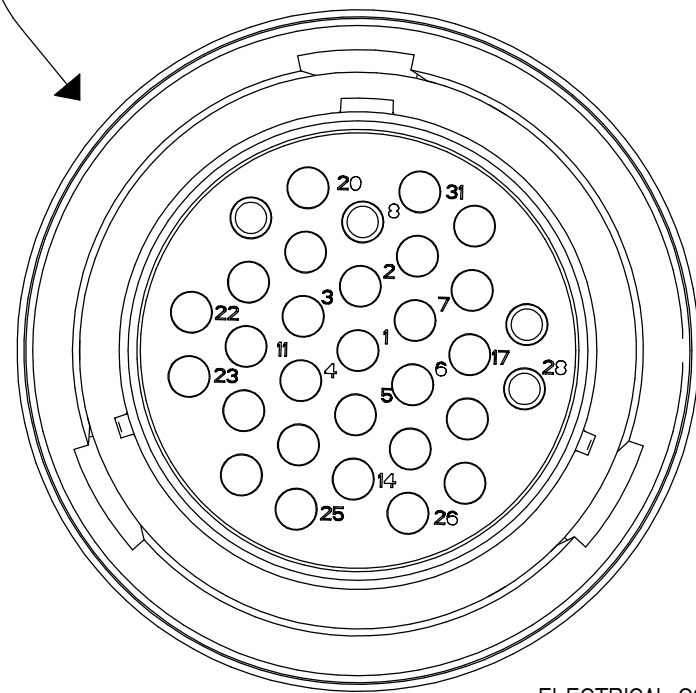
		PETERSEN INDUSTRIES INC. 4000 S.R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE: ATLAS TOP SEAT PLUMBING			
PART NUMBER: 52 07 17 001 5			SCALE: NA
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ROTARY MANIFOLD UPPER HARNESS

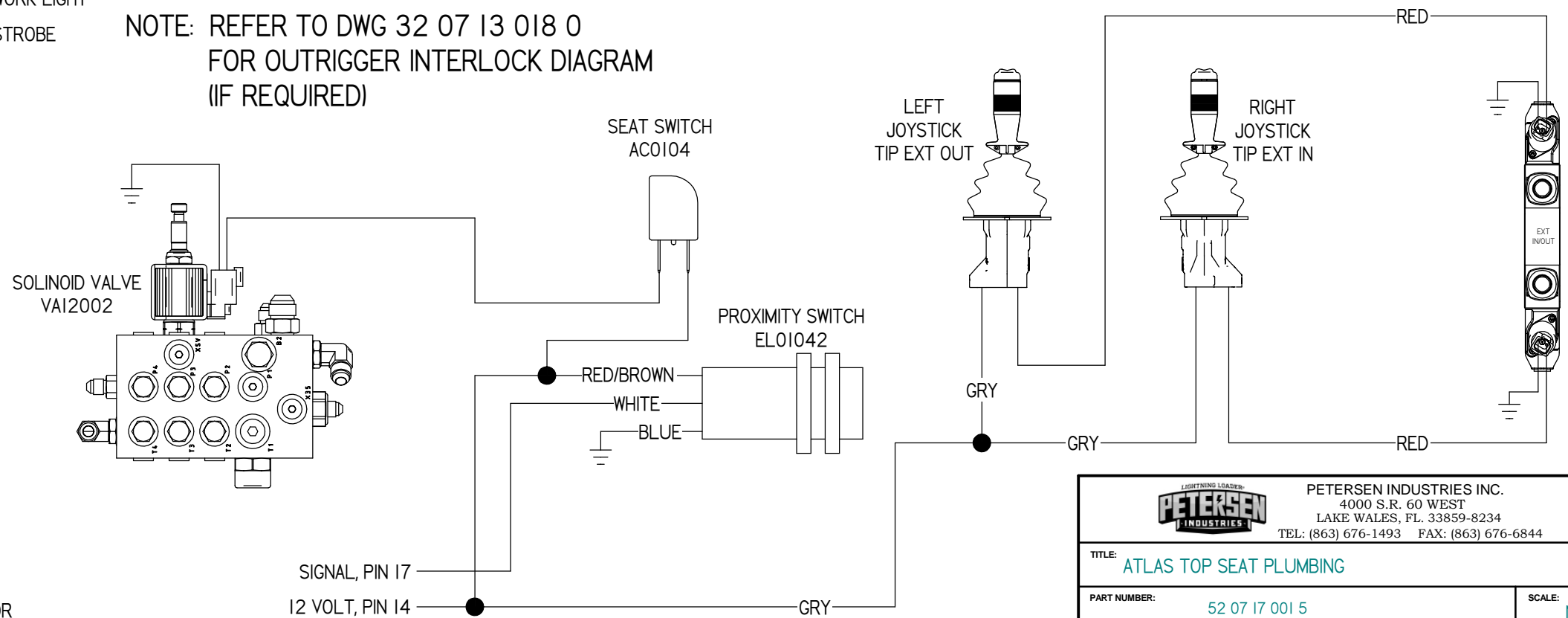
NOTE: LEFT AND RIGHT ARE AS IF YOU ARE SITTING IN THE OPERATORS SEAT



NOTE: REFER TO DWG 32 07 13 018 0 FOR OUTRIGGER INTERLOCK DIAGRAM (IF REQUIRED)




ELECTRICAL CONNECTOR



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TITLE: ATLAS TOP SEAT PLUMBING			
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PORT LABEL	FUNCTION	RATED PRESSURE	PORT ON TOP OF SPOOL	PORT ON SIDE OF BARREL	TEST
1	RETURN	500 PSI	2X SAE #16 ORB	SAE #24 ORB	*
2	PRESSURE	3500 PSI	2X SAE #10 ORB	SAE #16 ORB	*
LS	LOAD SENSE	3500 PSI	SAE #6 ORB	SAE #6 ORB	*
PD	PILOT DRAIN	50 PSI	SAE #6 ORB	SAE #6 ORB	*
E	ELECTRICAL	N/A	1/2 NPT	DIA .67"	
V	VENT	50 PSI MAX.	SAE #8 ORB PLUGGED	SAE #8 ORB PLUGGED	*

CIRCUIT #	CORE WIRE GAUGE/ TYPE	MAX AMPERAGE RATING	VOLTAGE RATING
1-11	16 / GXL	5	12 VDC
12-20	16 / GXL	10	12 VDC

		PETERSEN INDUSTRIES INC. 4000 S.R. 60 WEST LAKE WALES, FL. 33859-8234 TEL: (863) 676-1493 FAX: (863) 676-6844	
TITLE: ATLAS TOP SEAT PLUMBING			
PART NUMBER: 52 07 17 001 5			SCALE: NA
DRAWN BY: SWB	APPROVED BY:	DATE: 12/07/2015	SHEET: 8 OF 9

VP120 PILOT END CAP SPECIFICATIONS

- 1. PILOT PRESSURE 508 psi, 4-6 GPM
- 2. PILOT PRESSURE (INITIATE FLOW) 101 psi
- 3. PILOT PRESSURE (FULL STROKE) 315 psi
- 4. FLUID CLEANLINESS 17/14 PER ISO 4406
- 5. AMBIENT TEMPERTURE -22°F TO 176°F
- 6. FLUID TEMPERATURE -4°F TO 176°F

GEARBOX BRAKE FUNCTIONAL DESCRIPTION

BRAKE IS SPRING APPLIED AND HYDRAULICALLY RELEASED. PRESSURE TO RELEASE THE BRAKE IS 145-159 PSI AND IT CAN HANDLE A MAX PRESSURE OF 4351 PSI.

JOYSTICK FUNCTIONAL DESCRIPTION

THE JOYSTICK IS SUPPLIED WITH PILOT PRESSURE FROM THE VP120 CONTROL VALVE. AS THE JOYSTICK IS SHIFTED THE OUTPUT PRESSURE FROM THE CORROSPONDING A OR B PORT RISES FROM 0 PSI TO 306 PSI.

PILOT FOOT PEDAL FUNCTIONAL DESCRIPTION

THE PEDAL IS SUPPLIED WITH PILOT PRESSURE FROM THE VP120 CONTROL VALVE. AS THE PEDAL IS SHIFTED THE OUTPUT PRESSURE FROM THE CORROSPONDING A OR B PORT RISES FROM 0 PSI TO 321 PSI.

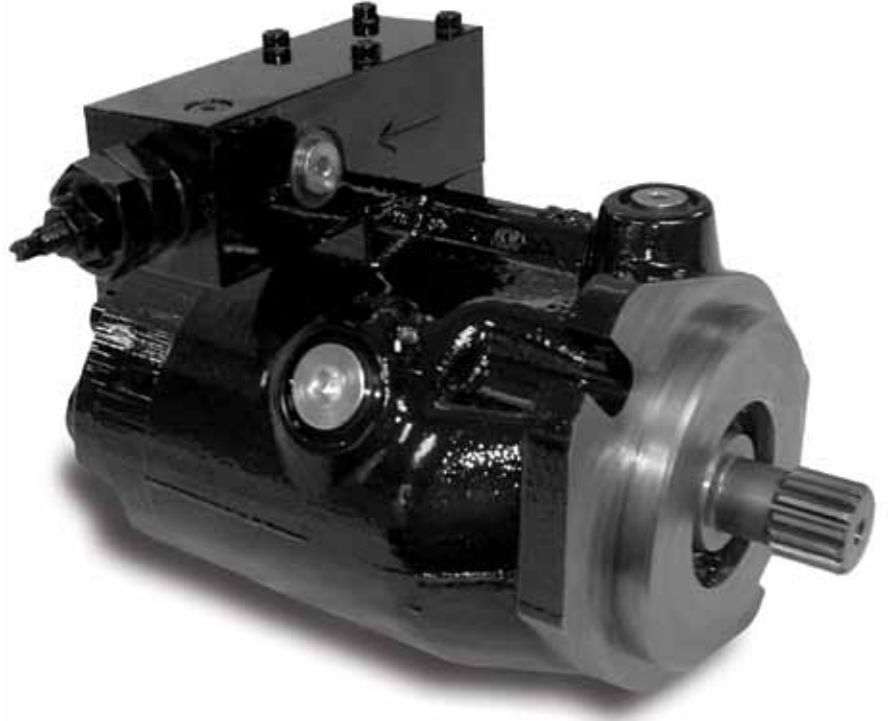


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LAKE WALES, FL. 33859-8234
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TITLE: ATLAS TOP SEAT PLUMBING			
PART NUMBER: 52 07 17 001 5			SCALE: NA
DRAWN BY: SWB	APPROVED BY:	DATE: 12/07/2015	SHEET: 9 OF 9



aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



P1/PD Series: 18cc to 140cc Medium Pressure Axial Piston Pumps

Variable Displacement – Service Information
Bulletin HY28-2665-02/SVC/EN
Effective: January 1, 2014



ENGINEERING YOUR SUCCESS.

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This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

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OFFER OF SALE

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MOUNTING

These pumps are designed to operate in any position. The pump shaft must be in alignment with the shaft of the source driver and should be checked with a dial indicator. The mating pilot bore and coupling must be concentric. This concentricity is particularly important if the shaft is rigidly connected to the driven load without a flexible coupling.

SHAFT INFORMATION

Splined: The shafts will accept a maximum misalignment of 0.15mm, 0.005 inch, total indicator reading. Angular misalignment at the external and internal spline axis must be less than ± 0.002 mm per mm of shaft radius, ± 0.002 inches per inch of shaft radius. The coupling interface must be lubricated. PARKER recommends lithium molydisulfide or similar grease. The internal coupling should be hardened to Rc 27-34 and must conform to SAE-J498c, class 5 flat root side fit.

Keyed: High strength heat treated keys must be used. Replacement keys must be hardened to 27-34 Rc. The key corners must be chamfered 0.81-1.0 mm, 0.032"-0.040", at 45° to clear radii that exist in the keyway.

SIDE LOAD CAPABILITY

The P1/PD series is designed for inline-drive. Side loading on the shaft is not recommended. If this is unavoidable consult your nearest PARKER representative.

FLUID CONNECTIONS

Connect inlet and outlet lines to the port block of the pump. The maximum case pressure is 2 bar (30 psi) continuous, 4 bar (60 psi) intermittent. The case pressure must never exceed inlet pressure by more than .5 bar (7 psi). When connecting case drain line make certain that drain plumbing passes above highest point of the pump before passing to the reservoir. The case leakage line must be of sufficient size to prevent back pressure in excess of 2 bar (30 psi) and returned to the reservoir below the surface of the oil as far from the supply inlet as possible. All fluid lines, whether pipe, tubing, or hose must be adequate size and strength to assure free flow through the pump. An undersize inlet line will prevent the pump from operating properly at full rated speed. An undersize outlet line will cause back pressure and cause heat generation and increased noise. Flexible hose lines are recommended. If rigid piping is used, the workmanship must be accurate to eliminate strain on the pump port block or to the fluid connections. Sharp bends in the lines must be eliminated wherever possible. All system piping must be cleaned and flushed before installing pump. Make sure the entire hydraulic system is free of dirt, lint, scale, or other foreign material.

Caution: Do not use galvanized pipe. Galvanized coating can flake off with continued use.

SYSTEM RELIEF VALVES

Although the P1/PD series pumps have very fast off-stroke compensator response, system relief valves are recommended in all cases for safety considerations.

RECOMMENDED FLUIDS

The fluid recommended for use in these pumps has a petroleum base and contains agents which provide oxidation inhibition and anti-rust, anti-foam and de-aerating properties as described in PARKER standard HF-1. Where anti-wear additive fluids are specified, see PARKER standard HF-0.

VISCOSITY INDEX

90 V. I. minimum. Higher values extend the range of operating temperature but may reduce the service life of the fluid.

TEMPERATURE

Determined by the viscosity characteristics of the fluid used. Because high temperatures degrade seals, reduce the service life of the fluid and create hazards, fluid temperature should not exceed 110°C (230°F) at the case drain.

MAINTENANCE

The pump is self-lubricating and preventative maintenance is limited to keeping system fluid clean by changing filters frequently. Keep all fittings and screws tight. Do not operate at pressures and speeds in excess of the recommended limit. If the pump does not operate properly, check the troubleshooting chart before attempting to overhaul the unit. Overhauling may be accomplished by referring to the disassembly, rework limits of wear parts, and assembly procedures as provided in this service manual.

FLUID CLEANLINESS

Fluid must be cleaned before and continuously during operation, by filters that maintain a cleanliness level of ISO 20/18/14. Better cleanliness levels will significantly extend the life of the components. As contaminant generation may vary with each application, each must be analyzed to determine proper filtration to maintain the required cleanliness level.

**STARTUP PROCEDURE FOR
NEW INSTALLATIONS**

- Read and understand the instruction manual.
- Identify components and their function.
- Visually inspect components and lines for possible damage.
- Insure that all necessary ports are properly connected.
- Check reservoir for cleanliness. Drain and clean as required.
- Check fluid level and fill as required with filtered fluid to a minimum ISO cleanliness level of 20/18/14.
- Fill pump case with clean oil prior to starting.
- If pump is mounted vertically with the shaft up, bleed the air out the D1 drain port located near the mounting flange.
- Check alignment of drive.
- Check oil cooler and activate it, if included in circuit. Check fluid temperature.
- Reduce pressure settings of compensator and relief valve. Make sure accurate pressure readings can be made at appropriate places.
- If solenoids in system, check for actuation.
- Jog the pump drive. Check for proper shaft rotation. Make sure pump fills properly.
- Start the pump drive.
- Bleed system of air. Recheck fluid level.
- Cycle unloaded machine at low pressure and observe actuation (at low speed, if possible).
- Increase pressure settings gradually in steps. Check for leaks in all lines especially in pump and motor inlet lines.
- Make correct pressure adjustments.
- Gradually increase speed. Be alert for trouble as indicated by changes in sounds, system shocks, and air in fluid.
- Equipment is operational.

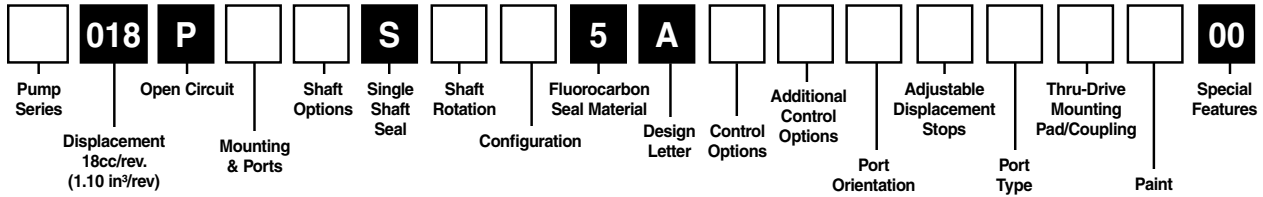
Typical Adjustment Ranges and Initial Settings (unless customer specified at time of order)

Function	Adjustment range	Adjustment value	Recommended or Initial Setting
Pressure compensators			
"C0"	80-280 bar (1160-4060 PSI)	40 bar/turn (580 PSI/turn)	Factory supplied at minimum
"C1"	20-80 bar (290-1160 PSI)	18.6 bar/turn (260PSI/turn)	Factory supplied at minimum
"AM"	80-280 bar (1160-4060 PSI)	40 bar/turn (580 PSI/turn)	Factory supplied at minimum
Load sense pressure			
"L0"	8-35 bar (116-500 PSI)	28 bar/turn (410 PSI/turn)	24 bar (350 PSI)
Differential pressure			
"AM"	37 bar (540 PSI)	Adjustment not recommended	Factory Set do not adjust
Maximum Volume stop			
018	100-40%	9% per turn (1.6 cc/turn)	100%
028	100-40%	8.2% per turn (2.3 cc/turn)	100%
045	100-20%	7.5% per turn (3.4 cc/turn)	100%
060	100-30%	6.8% per turn (4.1 cc/turn)	100%
075	100-35%	6.2% per turn (4.65 cc/turn)	100%
100	100-50%	5.5% per turn (5.5 cc/turn)	100%
140	100-50%	4.8% per turn (6.72 cc/turn)	100%
Minimum Volume stop			
018	0-68%	10% per turn (1.8 cc/turn)	0%
028	0-40%	9% per turn (2.6 cc/turn)	0%
045	0-40%	8.2% per turn (3.7 cc/turn)	0%
060	0-50%	4.6% per turn (2.76 cc/turn)	0%
075	0-45%	4.3% per turn (3.23 cc/turn)	0%
100	0-45%	3.9% per turn (3.9 cc/turn)	0%
140	0-25%	3.3% per turn (4.62 cc/turn)	0%

Component problems and circuit problems are often interrelated. An improper circuit may operate with apparent success but will cause failure of a particular component within it. The component failure can be the effect, not the cause of the problem. This general guide is offered to help in locating and eliminating the cause of problems by studying their effects.

Effect of Trouble	Possible Cause	Fault Which Needs Remedy
noisy pump	air in fluid	leak in inlet line
		low fluid level
		turbulent fluid
		return lines above fluid level
		gas leak from accumulator
		excessive pressure drop in the inlet line from a pressurized reservoir
		inlet line strainer acting as air trap
	cavitation in rotating group	fluid too cold
		fluid too viscous
		fluid too heavy
		shaft speed too high
		inlet line too small
		inlet strainer too small
		inlet strainer too dirty
		operating altitude too high
	misaligned shaft	inlet pressure too low
		faulty installation
		distortion in mounting
		axial interference
		faulty coupling
mechanical fault in pump	excessive overhung loads	
	piston and shoe looseness or failure	
	bearing failure	
	incorrect port plate rotation	
	eroded or worn parts in the displacement control	
erosion on barrel ports and port plate	air in fluid	see noisy pump above
	cavitation	see noisy pump above
pressure shocks	cogging load	mechanical considerations
	worn relief valve	needed repairs
	worn compensator	replace
	slow response in check valves	replace or relocate
	excessive decompression energy rates	improve decompression control
	barrel blow-off	rotating group worn, excessive case pressure
compensator instability	excessive line capacitance (line volume, line stretch, accumulator effects)	reduce line size or lengths
		eliminate hose

Effect of Trouble	Possible Cause	Fault Which Needs Remedy
high wear in pump	excessive loads	reduce pressure settings
		reduce speeds
	contaminant particles in fluid	improper filter maintenance
		filters too coarse
		introduction of dirty fluid to system
		reservoir openings
		improper reservoir breather
		improper line replacement
	improper fluid	fluid too thin or thick for operating temperature range
		breakdown of fluid with time/temperature/heating effects
		incorrect additives in new fluid
		destruction of additive effectiveness with chemical aging
	improper repair	incorrect parts
		incorrect procedures, dimensions, finishes
	unwanted water in fluid	condensation
		faulty breather/strainer
heat exchanger leakage		
faulty clean-up practice		
heating of fluid	excessive pump leakage	recheck case drain flow and repair as required
		fluid too thin
		improper assembly, port timing
	relief valve	set too low (compared to load or to compensator)
		instability caused by back pressure, worn parts
	compensator	set too high (compared to relief)
		worn parts
	pump too large for fluid needs	select smaller pump displacement
	heat exchanger	water turned off or too little flow
		water too hot
		fan clogged or restricted
		efficiency reduced by mud or scale deposits
		intermittent hydraulic fluid flow
	reservoir	too little fluid
		improper baffles
		insulating air blanket that prevents heat rejection
heat pickup from adjacent equipment		



Pump Series	
P1	Mobile
PD	Industrial

Mounting & Ports	
S	SAE A Pilot SAE Threaded Work Ports with SAE Aux Ports
A	SAE A Pilot Metric Work Ports with BSPP Aux Ports
M	ISO - 80mm Pilot Metric Work Ports with Metric Aux Ports
B	ISO - 80mm Pilot Metric Work Ports with BSPP Aux Ports

Shaft Options	
01	Splined shaft - SAE 19-4 11T
02	Keyed shaft - SAE 19-1 .75" Dia.
04	ISO keyed 20MM Dia.
06	Splined shaft - SAE A 9T*

Shaft Rotation	
R	Clockwise
L	Counterclockwise

Configuration	
M	Mobile (P1)
S	Industrial (PD)

Control Options	
C0	Pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
C1	Pressure limiter 290.08 - 1160.30 PSI (20 - 80 bar)
L0	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
L2	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with bleed & pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
AN*	Pilot operated pressure limiter with ISO4401 interface & SAE 4 Vent Port
AM	Pilot operated pressure limiter with mechanical adjustment and SAE 4 Vent Port
AE	Pilot operated pressure limiter with mechanical and electrical adjustment 12 VDC
AF	Pilot operated pressure limiter with mechanical and electrical adjustment 24 VDC
##	See chart below for electronic control options

*Not functional control as such

Additional Control Options	
0	No other options
2	Displacement sensor **

** mandatory with "W***", "X***", "Y***", "Z***" "D*" and "Y*"

Port Orientation	
E	End Ports
R	Side ported with ripple chamber
T	Side ported with Thru-Drive

Adjustable Displacement Stops	
0	None
1	Adjustable maximum displacement stop
2	Adjustable minimum displacement stop
3	Adjustable maximum and minimum displacement stop

Port Type	
0	Flange Ports*
2	Threaded Ports

*With Thru-Drive Only

Thru-Drive Mounting Pad/Coupling	
0	No Thru-Drive
A	SAE 82-2(A), 16(A), 9T coupling
H	SAE 82-2(A), 19(--), 11T coupling

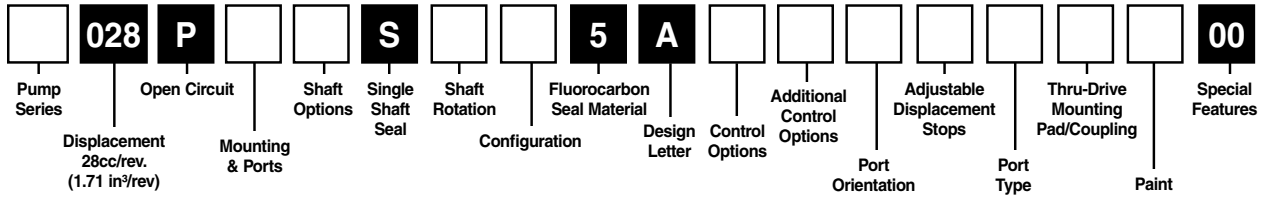
Paint	
00	No Paint
PB	Black Paint

Electronic Control Options	
#	#

0	No ECU
D	Proportional displacement control
Y	Proportional pressure and displacement control

P	Electronic valve with zero displacement default
T	Electronic valve with max displacement default
S	Electronic valve with zero displacement default and hydromechanical Pmax
U	Electronic valve with max displacement default and hydromechanical Pmax
W	Electronic valve with zero displacement default (CANBUS compatible)
X	Electronic valve with max displacement default (CANBUS compatible)
Y	Electronic valve with zero displacement default and hydromechanical Pmax (CANBUS compatible)
Z	Electronic valve with max displacement default and hydromechanical Pmax (CANBUS compatible)

*** W, X, Y and Z only available with "D*" and "Y*"



Pump Series	
P1	Mobile
PD	Industrial

Mounting & Ports	
S	SAE B Pilot SAE Work Ports with SAE Aux Ports
A	SAE B Pilot Metric Work Ports with BSPP Aux Ports
M	ISO - 100MM Pilot Metric Work Ports with Aux Ports
B	ISO - 100MM Pilot Metric Work Ports with BSPP Aux Ports

Shaft Options	
01	Splined shaft - SAE B-B 15T
02	Keyed shaft - SAE B-B 1" Dia.
04	ISO keyed 25MM Dia.
08	Splined shaft - SAE B 13T

Shaft Rotation	
R	Clockwise
L	Counterclockwise

Configuration	
M	Mobile (P1)
S	Industrial (PD)

Control Options	
C0	Pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
C1	Pressure limiter 290.08 - 1160.30 PSI (20 - 80 bar)
L0	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
L2	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with bleed & pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
AN*	Pilot operated pressure limiter with ISO4401 interface & SAE 4 Vent Port
AM	Pilot operated pressure limiter with mechanical adjustment and SAE 4 Vent Port
AE	Pilot operated pressure limiter with mechanical and electrical adjustment 12 VDC
AF	Pilot operated pressure limiter with mechanical and electrical adjustment 24 VDC
##	See chart below for electronic control options

*Not functional control as such

Additional Control Options	
0	No other options
2	Displacement sensor **

** mandatory with "W***", "X***", "Y***", "Z***" "D*" and "Y*"

Port Orientation	
E	End Ports
R	Side ported with ripple chamber
T	Side ported with through drive

Adjustable Displacement Stops* (For E & R Port Orientation Only)	
0	None
1	Adjustable maximum displacement stop
2	Adjustable minimum displacement stop
3	Adjustable maximum and minimum displacement stop

*Not available with Thru-Drive

Port Type	
0	Flange Ports
2	Threaded Ports

Thru-Drive Mounting Pad/Coupling	
0	No Thru-Drive
A	SAE 82-2 (A), 16 (A), 9T coupling
H	SAE 82-2 (A), 19 (-), 11T coupling
B	SAE 101-2 (B), 22 (B) , 13T coupling
Q	SAE 101-2 (B), 25 (B-B), 15T coupling

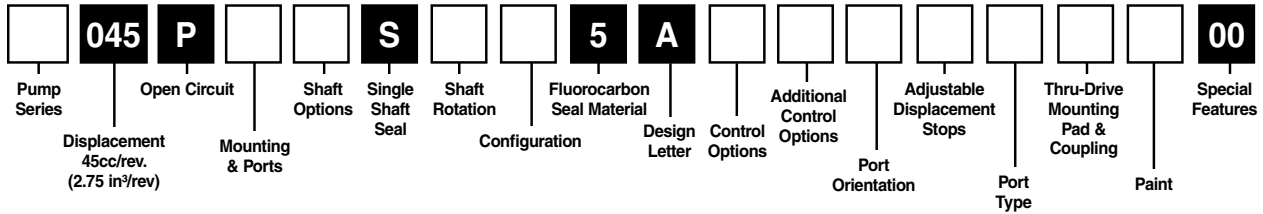
Paint	
00	No Paint
PB	Black Paint

Electronic Control Options	
#	#

0	No ECU
D	Proportional displacement control
Y	Proportional pressure and displacement control

P	Electronic valve with zero displacement default
T	Electronic valve with max displacement default
S	Electronic valve with zero displacement default and hydromechanical Pmax
U	Electronic valve with max displacement default and hydromechanical Pmax
W	Electronic valve with zero displacement default (CANBUS compatible)
X	Electronic valve with max displacement default (CANBUS compatible)
Y	Electronic valve with zero displacement default and hydromechanical Pmax (CANBUS compatible)
Z	Electronic valve with max displacement default and hydromechanical Pmax (CANBUS compatible)

*** W, X, Y and Z only available with "D*" and "Y*"



Pump Series	
P1	Mobile
PD	Industrial

Mounting & Ports	
S	SAE B Pilot with SAE Threaded or Flange Work Ports with SAE Aux Ports
A	SAE B Pilot with Metric Threaded or Metric Flange Work Ports with BSPP Aux Ports
M	ISO - 100MM Pilot Metric Threaded or Metric Flange Work Ports with Aux Ports
B	ISO - 100MM Pilot Metric Threaded or Metric Flange Work Ports with Aux Ports

Shaft Options	
01	Splined shaft - SAE B-B 15T
02	Keyed shaft - SAE B-B 1" Dia.
04	ISO keyed 25MM Dia.
08	Splined shaft - SAE B 13T

Shaft Rotation	
R	Clockwise
L	Counterclockwise

Configuration	
M	Mobile (P1)
S	Industrial (PD)
U	Universal (SAE Mounting Option, S, Only)

Control Options	
C0	Pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
C1	Pressure limiter 290.08 - 1160.30 PSI (20 - 80 bar)
L0	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
L2	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with bleed & pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
AN*	Pilot operated pressure limiter with ISO4401 interface & SAE 4 Vent Port
AL	Pilot operated pressure limiter with Load sensing (only available with "T" Torque Limiter option, i.e. "ALT ")
AM	Pilot operated pressure limiter with mechanical adjustment and SAE 4 Vent Port
AE	Pilot operated pressure limiter with mechanical and electrical adjustment 12 VDC
AF	Pilot operated pressure limiter with mechanical and electrical adjustment 24 VDC
##	See chart below for electronic control options

*Not functional control as such

Additional Control Options	
0	No other options
2	Displacement sensor **
T	Torque Limiter Control (Used with AM, AN or AL control options)

** mandatory with "W***", "X***", "Y***", "Z***" "D*" and "Y**"

Port Orientation	
E	End Ports
R	Side ported with ripple chamber
T	Side ported with through drive

Adjustable Displacement Stops* (For E & R Port Orientation Only)	
0	None
1	Adjustable maximum displacement stop
2	Adjustable minimum displacement stop
3	Adjustable maximum and minimum displacement stop

*Not available with Thru-Drive

Port Type	
0	Flange Ports
2	Threaded Ports

Thru-Drive Mounting Pad/Coupling	
0	No Thru-Drive
A	SAE 82-2 (A), 16 (A), 9T coupling
H	SAE 82-2 (A), 19 (-), 11T coupling
B	SAE 101-2 (B), 22 (B), 13T coupling
Q	SAE 101-2 (B), 25 (B-B), 15T coupling

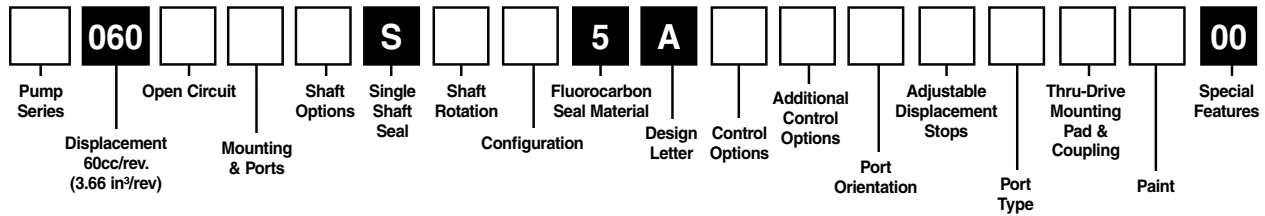
Paint	
00	No Paint
PB	Black Paint

Electronic Control Options	
#	#

0	No ECU
D	Proportional displacement control
Y	Proportional pressure and displacement control

P	Electronic valve with zero displacement default
T	Electronic valve with max displacement default
S	Electronic valve with zero displacement default and hydromechanical Pmax
U	Electronic valve with max displacement default and hydromechanical Pmax
W	Electronic valve with zero displacement default (CANBUS compatible)
Y	Electronic valve with max displacement default (CANBUS compatible)
X	Electronic valve with zero displacement default and hydromechanical Pmax (CANBUS compatible)
Z	Electronic valve with max displacement default and hydromechanical Pmax (CANBUS compatible)

*** W, X, Y and Z only available with "D*" and "Y**"



Pump Series	
P1	Mobile
PD	Industrial

Open Circuit	
P	Open Circuit (One Side of Center)
X	Open Circuit (100% over Center)

Mounting & Ports	
S	SAE C Pilot SAE Flange Connection Ports with SAE Aux Ports
A	SAE C Pilot Metric Flange Connection Ports with BSPP Aux Ports
M	ISO - 125MM Pilot Metric Flange Connection Ports with Metric Aux Ports
B	ISO - 125MM Pilot, Metric Flange Connection Ports with BSPP Aux Ports
C	SAE C 2-Bolt Pilot SAE Flange Connection Ports with SAE Aux Ports
D	SAE C 2-Bolt Pilot SAE Flange Connection Ports with BSPP Aux Ports

Shaft Options	
01	Splined shaft - SAE C 14T
02	Keyed shaft - SAE C 32-1 KEY
04	Keyed shaft - ISO / DIN KEY 32MM Dia.

Shaft Rotation	
R	Clockwise
L	Counterclockwise

Configuration	
M	Mobile (P1)
S	Industrial (PD)
U	Universal

Control Options	
C0	Pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
C1	Pressure limiter 290.08 - 1160.30 PSI (20 - 80 bar)
L0	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
L2	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with bleed & pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
AN*	Pilot operated pressure limiter with ISO4401 interface & SAE 4 Vent Port
AL	Pilot operated pressure limiter with Load sensing (only available with "T" Torque Limiter option, i.e. "ALT ")
AM	Pilot operated pressure limiter with mechanical adjustment and SAE 4 Vent Port
AE	Pilot operated pressure limiter with mechanical and electrical adjustment 12 VDC
AF	Pilot operated pressure limiter with mechanical and electrical adjustment 24 VDC
##	See chart below for electronic control options

*Not functional control as such

Additional Control Options	
0	No other options
2	Displacement sensor **
T	Torque Limiter Control (Used with AM, AN or AL control options)

** mandatory with "W***", "X***", "Y***", "Z***" "D" and "Y"

Port Orientation	
E	End Ports
S	Side Ports
T	Side Ports with Thru-Drive

Adjustable Displacement Stops* (For E & S Port Orientation Only)	
0	None
1	Adjustable maximum displacement stop
2	Adjustable minimum displacement stop
3	Adjustable maximum and minimum displacement stop

*Not available with Thru-Drive

Port Type	
0	Flange Ports
2	SAE Threaded Ports (Available only on "E" port and "S" or "C" mount)
4	BSPP Threaded Ports (Available only on "E" port and "D" mount)

Thru-Drive Mounting Pad/Coupling	
0	No Thru-Drive
A	SAE 82-2 (A), 16 (A), 9T coupling
H	SAE 82-2 (A), 19 (-), 11T coupling
B	SAE 101-2 (B), 22 (B), 13T coupling
Q	SAE 101-2 (B), 25 (B-B), 15T coupling
J	SAE 101-2 (B), rotated 45 degrees, 22 (B), 13T coupling
K	SAE 101-2 (B), rotated 45 degrees, 25 (B-B), 15T coupling
C	SAE 127-4 (C), 32 (C), 14T coupling

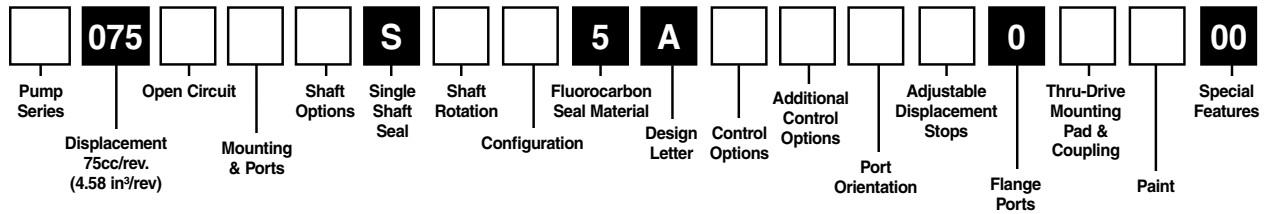
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PB	Black Paint

Electronic Control Options	
#	#

0	No ECU
D	Proportional displacement control
Y	Proportional pressure control

P	Electronic valve with zero displacement default
T	Electronic valve with max displacement default
S	Electronic valve with zero displacement default and hydromechanical Pmax
U	Electronic valve with max displacement default and hydromechanical Pmax
W	Electronic valve with zero displacement default (CANBUS compatible)
Y	Electronic valve with max displacement default (CANBUS compatible)
X	Electronic valve with zero displacement default and hydromechanical Pmax (CANBUS compatible)
Z	Electronic valve with max displacement default and hydromechanical Pmax (CANBUS compatible)

*** W, X, Y and Z only available with "D" and "Y"



Pump Series	
P1	Mobile
PD	Industrial

Open Circuit	
P	Open Circuit (One Side of Center)
X	Open Circuit (100% over Center)

Mounting & Ports	
S	SAE C Pilot SAE Flange Connection Ports with SAE Aux Ports
A	SAE C Pilot Metric Flange Connection Ports with BSPP Aux Ports
M	ISO - 125MM Pilot Metric Flange Connection Ports with Metric Aux Ports
B	ISO - 125MM Pilot, Metric Flange Connection Ports with BSPP Aux Ports
C	SAE C 2-Bolt Pilot SAE Flange Connection Ports with SAE Aux Ports
D	SAE C 2-Bolt Pilot SAE Flange Connection Ports with BSPP Aux Ports

Shaft Options	
01	Spined shaft - SAE C 14T
02	Keyed shaft - SAE C 32-1 KEY
04	Keyed shaft - ISO / DIN KEY 32MM Dia.

Shaft Rotation	
R	Clockwise
L	Counterclockwise

Configuration	
M	Mobile (P1)
S	Industrial (PD)
U	Universal

Control Options	
C0	Pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
C1	Pressure limiter 290.08 - 1160.30 PSI (20 - 80 bar)
L0	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
L2	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with bleed & pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
AN*	Pilot operated pressure limiter with ISO4401 interface & SAE 4 Vent Port
AM	Pilot operated pressure limiter with mechanical adjustment and SAE 4 Vent Port
AE	Pilot operated pressure limiter with mechanical and electrical adjustment 12 VDC
AF	Pilot operated pressure limiter with mechanical and electrical adjustment 24 VDC
##	See chart below for electronic control options

*Not functional control as such

Additional Control Options	
0	No other options
2	Displacement sensor **
T	Torque Limiter Control (Used with AM, AN or L0 control options)

** mandatory with "W***", "X***", "Y***", "Z***" "D*" and "Y"

Port Orientation	
E	End Ports
S	Side Ports
T	Side Ports with Thru-Drive

Adjustable Displacement Stops* (For E & S Port Orientation Only)	
0	None
1	Adjustable maximum displacement stop
2	Adjustable minimum displacement stop
3	Adjustable maximum and minimum displacement stop

*Not available with Thru-Drive

Thru-Drive Mounting Pad/Coupling	
0	No Thru-Drive
A	SAE 82-2 (A), 16 (A), 9T coupling
H	SAE 82-2 (A), 19 (--), 11T coupling
B	SAE 101-2 (B), 22 (B), 13T coupling
Q	SAE 101-2 (B), 25 (B-B), 15T coupling
J	SAE 101-2 (B), rotated 45 degrees, 22 (B), 13T coupling
K	SAE 101-2 (B), rotated 45 degrees, 25 (B-B), 15T coupling
C	SAE 127-4 (C), 32 (C), 14T coupling

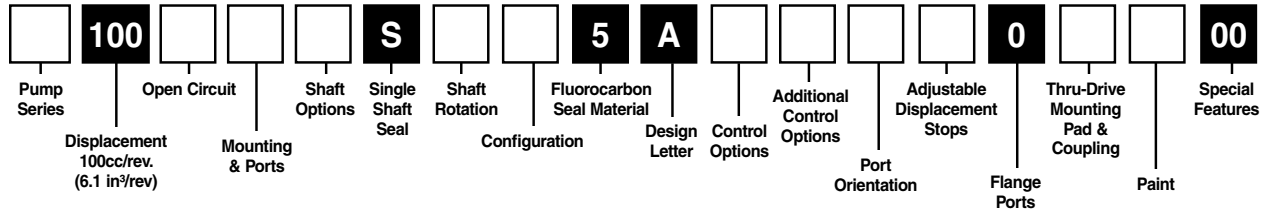
Paint	
00	No Paint
PB	Black Paint

Electronic Control Options	
#	#

0	No ECU
D	Proportional displacement control
Y	Proportional pressure control

P	Electronic valve with zero displacement default
T	Electronic valve with max displacement default
S	Electronic valve with zero displacement default and hydromechanical Pmax
U	Electronic valve with max displacement default and hydromechanical Pmax
W	Electronic valve with zero displacement default (CANBUS compatible)
Y	Electronic valve with max displacement default (CANBUS compatible)
X	Electronic valve with zero displacement default and hydromechanical Pmax (CANBUS compatible)
Z	Electronic valve with max displacement default and hydromechanical Pmax (CANBUS compatible)

*** W, X, Y and Z only available with "D*" and "Y"



Pump Series	
P1	Mobile
PD	Industrial

Open Circuit	
P	Open Circuit (One Side of Center)
X	Open Circuit (100% over Center)

Mounting & Ports	
S	SAE C Pilot SAE Flange Connection Ports with SAE Aux Ports
A	SAE C Pilot Metric Flange Connection Ports with BSPP Aux Ports
M	ISO - 125MM Pilot Metric Flange Connection Ports with Metric Aux Ports
B	ISO - 125MM Pilot, Metric Flange Connection Ports with BSPP Aux Ports

Shaft Options	
01	Splined shaft - SAE C-C 17T
02	Keyed shaft - SAE C-C 38-1
04	Keyed shaft - ISO / DIN 40MM Dia.
06	Splined shaft - SAE C 14T

Shaft Rotation	
R	Clockwise
L	Counterclockwise

Configuration	
M	Mobile (P1)
S	Industrial (PD)
U	Universal

Control Options	
C0	Pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
C1	Pressure limiter 290.08 - 1160.30 PSI (20 - 80 bar)
L0	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
L2	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with bleed & pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
AN*	Pilot operated pressure limiter with ISO4401 interface & SAE 4 Vent Port
AM	Pilot operated pressure limiter with mechanical adjustment and SAE 4 Vent Port
AE	Pilot operated pressure limiter with mechanical and electrical adjustment 12 VDC
AF	Pilot operated pressure limiter with mechanical and electrical adjustment 24 VDC
##	See chart below for electronic control options

*Not functional control as such

Additional Control Options	
0	No other options
2	Displacement sensor **
T	Torque Limiter Control (Used with AM, AN or L0 control options)

** mandatory with "W***", "X***", "Y***", "Z***" "D*" and "Y"

Port Orientation	
E	End Ports
S	Side Ports
T	Side Ports with Thru-Drive

Adjustable Displacement Stops* (For E & S Port Orientation Only)	
0	None
1	Adjustable maximum displacement stop
2	Adjustable minimum displacement stop
3	Adjustable maximum and minimum displacement stop

*Not available with Thru-Drive

Thru-Drive Mounting Pad/Coupling	
0	No Thru-Drive
A	SAE 82-2 (A), 16 (A), 9T coupling
H	SAE 82-2 (A), 19 (--), 11T coupling
B	SAE 101-2 (B), 22 (B), 13T coupling
Q	SAE 101-2 (B), 25 (B-B), 15T coupling
J	SAE 101-2 (B), rotated 45 degrees, 22 (B), 13T coupling
K	SAE 101-2 (B), rotated 45 degrees, 25 (B-B), 15T coupling
C	SAE 127-4 (C), 32 (C), 14T coupling
N	SAE 127-4 (C), 38 (C-C), 17T coupling

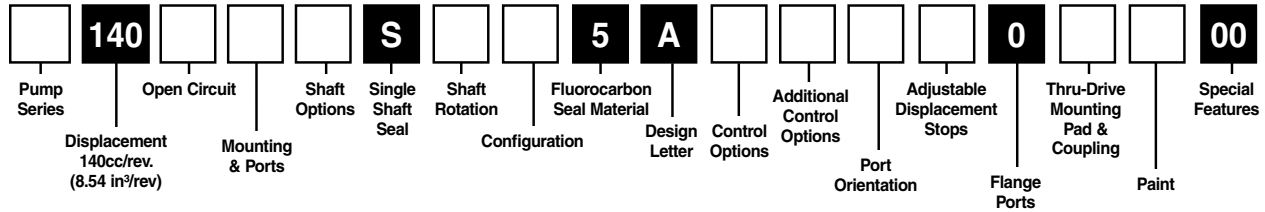
Paint	
00	No Paint
PB	Black Paint

Electronic Control Options	
#	#

0	No ECU
D	Proportional displacement control
Y	Proportional pressure control

P	Electronic valve with zero displacement default
T	Electronic valve with max displacement default
S	Electronic valve with zero displacement default and hydromechanical Pmax
U	Electronic valve with max displacement default and hydromechanical Pmax
W	Electronic valve with zero displacement default (CANBUS compatible)
Y	Electronic valve with max displacement default (CANBUS compatible)
X	Electronic valve with zero displacement default and hydromechanical Pmax (CANBUS compatible)
Z	Electronic valve with max displacement default and hydromechanical Pmax (CANBUS compatible)

*** W, X, Y and Z only available with "D*" and "Y"



Pump Series	
P1	Mobile
PD	Industrial

Open Circuit	
P	Open Circuit (One Side of Center)
X	Open Circuit (100% over Center)

Mounting & Ports	
S	SAE D Pilot SAE Flange Connection Ports with SAE Aux Ports
A	SAE D Pilot BSPP Flange Connection Ports with BSPP Aux Ports
M	ISO - 180MM Pilot Metric Flange Connection Ports with Metric Aux Ports
B	ISO - 180MM Pilot Metric Flange Connection Ports with BSPP Aux Ports

Shaft Options	
01	Splined shaft - SAE D 13T
02	Keyed shaft - SAE D 44-1
04	Keyed shaft - ISO / DIN 50MM Dia.

Shaft Rotation	
R	Clockwise
L	Counterclockwise

Configuration	
M	Mobile (P1)
S	Industrial (PD)
U	Universal

Control Options	
C0	Pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
C1	Pressure limiter 290.08 - 1160.30 PSI (20 - 80 bar)
L0	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
L2	Load sensing 145.04-435.11 PSI ΔP (10-30 bar ΔP) with bleed & pressure limiter 1160.30 - 4061.05 PSI (80 - 280 bar)
AN*	Pilot operated pressure limiter with ISO4401 interface & SAE 4 Vent Port
AM	Pilot operated pressure limiter with mechanical adjustment and SAE 4 Vent Port
AE	Pilot operated pressure limiter with mechanical and electrical adjustment 12 VDC
AF	Pilot operated pressure limiter with mechanical and electrical adjustment 24 VDC
##	See chart below for electronic control options

*Not functional control as such

Additional Control Options	
0	No other options
2	Displacement sensor **
T	Torque Limiter Control (Used with AM, AN or L0 control options)

** mandatory with "W***", "X***", "Y***", "Z***" "D*" and "Y"

Port Orientation	
E	End Ports
S	Side Ports
T	Side Ports with Thru-Drive

Adjustable Displacement Stops* (For E & S Port Orientation Only)	
0	None
1	Adjustable maximum displacement stop
2	Adjustable minimum displacement stop
3	Adjustable maximum and minimum displacement stop

*Not available with Thru-Drive

Thru-Drive Mounting Pad/Coupling	
0	No Thru-Drive
A	SAE 82-2 (A), 16 (A), 9T coupling
B	SAE 101-2 (B), 22 (B), 11T coupling
Q	SAE 101-2 (B), 25 (B-B), 13T coupling
J	SAE 101-2 (B), rotated 45 degrees, 22 (B), 15T coupling
K	SAE 101-2 (B), rotated 45 degrees, 25 (B-B), 13T coupling
C	SAE 127-4 (C), 32 (C), 14T coupling
N	SAE 127-4 (C), 38 (C-C), 17T coupling
D	SAE 152-4 (D), 44 (D), 13T coupling

Paint	
00	No Paint
PB	Black Paint

Electronic Control Options	
#	#

0	No ECU
D	Proportional displacement control
Y	Proportional pressure control

P	Electronic valve with zero displacement default
T	Electronic valve with max displacement default
S	Electronic valve with zero displacement default and hydromechanical Pmax
U	Electronic valve with max displacement default and hydromechanical Pmax
W	Electronic valve with zero displacement default (CANBUS compatible)
Y	Electronic valve with max displacement default (CANBUS compatible)
X	Electronic valve with zero displacement default and hydromechanical Pmax (CANBUS compatible)
Z	Electronic valve with max displacement default and hydromechanical Pmax (CANBUS compatible)

*** W, X, Y and Z only available with "D*" and "Y"

Technical Data

Model	P1/PD 018	P1/PD 028	P1/PD 045	P1/PD 060	P1/PD 075	P1/PD 100	P1/PD 140
Maximum Displacement, cm ³ /rev cu.in./rev	18 1.10	28 1.71	45 2.75	60 3.66	75 4.58	100 6.01	140 8.54
Outlet Pressure – Continuous, bar psi	280 4000						
Intermittent*, bar psi	320 4500						
Peak, bar psi	350 5000						
P1 Maximum Speed (1.3 bar abs inlet), rpm	3600	3400	3100	2800	2700	2500	2400
P1 (1.0 bar abs inlet), rpm	3300	3200	2800	2500	2400	2100	2100
P1 (0.8 bar abs inlet), rpm	2900	2900	2400	2200	2100	1900	1800
PD Maximum Speed (1.0 bar abs inlet), rpm	1800						
PD (0.8 bar abs inlet), rpm	1800						
Minimum Speed, rpm	600						
Inlet Pressure – Maximum, bar psi	10 (gage) 145						
Rated, bar psia	1.0 absolute (0.0 gage) 14.5						
Minimum, bar psia	0.8 absolute (-0.2 gage) 11.6						
Case Pressure – Peak, bar	4.0 absolute (3.0 gage) and less than 0.5 bar above inlet pressure						
Rated, bar	2.0 absolute (1.0 gage) and less than 0.5 bar above inlet pressure						
Fluid Temperature Range, °C °F	-40 to +95 -40 to +203						
Fluid Viscosity – Rated, cSt	6 to 160						
Max. Intermittent, cSt	5000 (for cold starting)						
Min. Intermittent, cSt	5						
Fluid Contamination – Rated, ISO	20/18/14						
Maximum, ISO	21/19/16						
SAE Mounting – Flange	82-2 (A)	101-2 (B)	101-2 (B)	127-2 (C) or 127-4 (C)	127-4 (C)	152-4 (D)	
ISO Mounting - Flange	80 mm	100 mm	100 mm	125 mm	125 mm	180 mm	
SAE Keyed Shafts	19-1, A	25-1, BB	25-1, BB	32-1, C	32-1, C	38-1, CC	44-1, D
ISO Keyed Shafts	20 mm	25 mm	25 mm	32 mm	32 mm	40 mm	50 mm
SAE Spline Shafts	9T, A 11T, A	13T, B 15T, BB	13T, B 15T, BB	14T, C	14T, C	17T, CC	13T, D
Weight – End Port, kg (lb)	13.4 (29.5)	17.7 (39.0)	23 (50)	29 (64)	30 (66)	51 (112)	66 (145)
Side Port, kg (lb)	14.2 (31.3)	18.1 (40.0)	24 (52)	30 (67)	31 (68)	53 (117)	67 (147)
Thru-Drive, kg (lb)	—	22 (48)	27 (59)	34 (75)	35 (77)	55 (121)	82 (180)
Moment of Inertia kg-mm ²	760	1555	3208	4548	5041	12027	21400
Moment of Inertia Thru-Drive kg-mm ²	NA	1618	3268	4687	5207	12402	22343

*Intermittent pressure is defined as less than 10% of operation time, not exceeding 6 successive seconds.

Typical Control Reponse Times*

Control Description	Pump Operating Condition	Typical Control Response Time (ms)						
		018	028	045	060	075	100	140
"C" Pressure Limiter	Maximum Displacement to Zero	25	25	25	37	21	26	30
	Zero Displacement to Maximum	80	80	106	119	89	108	125
"L" Load Sensing	Maximum Displacement to Zero	40	40	30	54	40	43	45
	Zero Displacement to Maximum	70	70	120	186	97	189	280
"A" Pilot Operated Control	Maximum Displacement to Zero	25	25	46	43	37	39	40
	Zero Displacement to Maximum	80	80	131	125	115	123	130

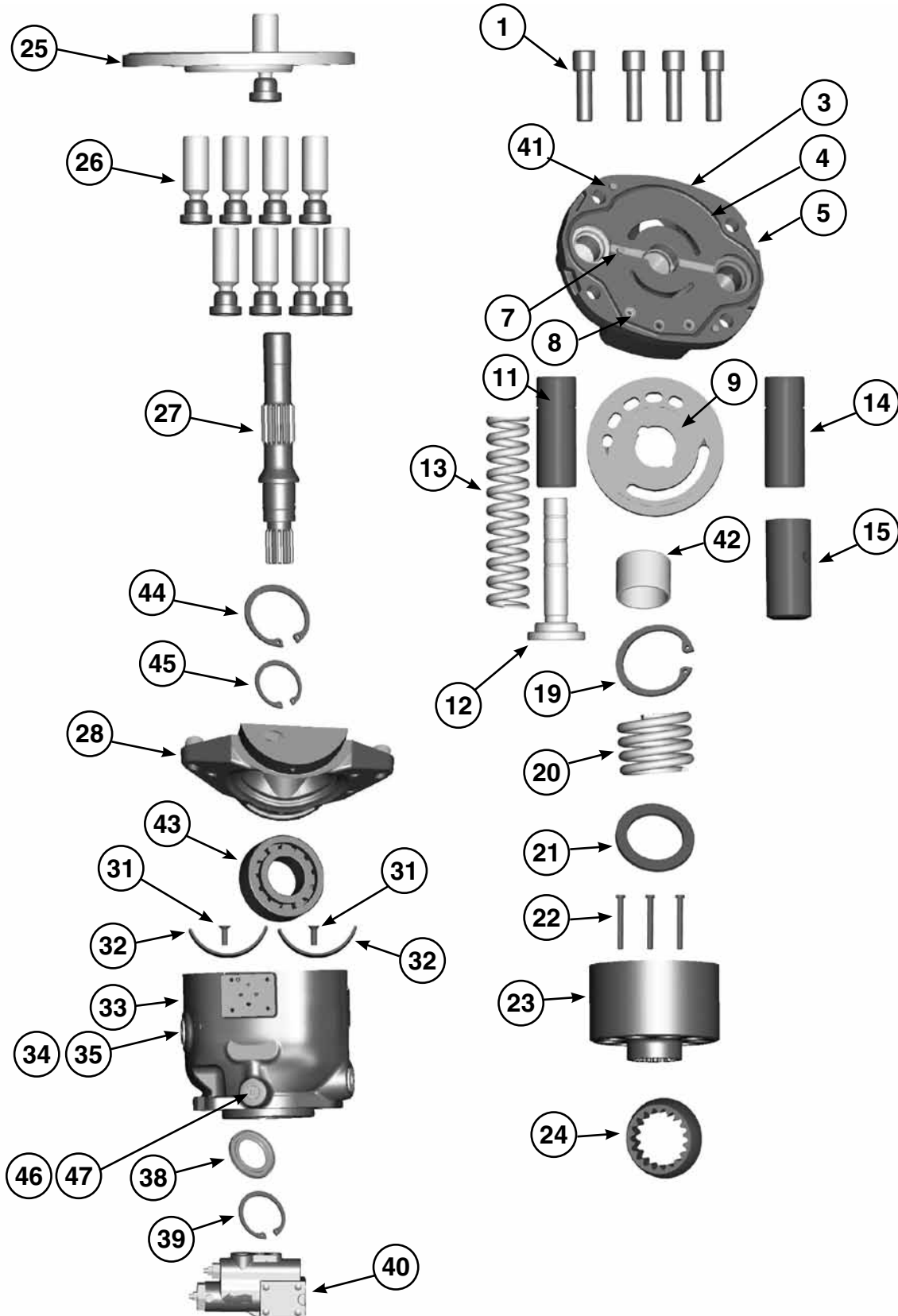
* Based on NFPA testing standards

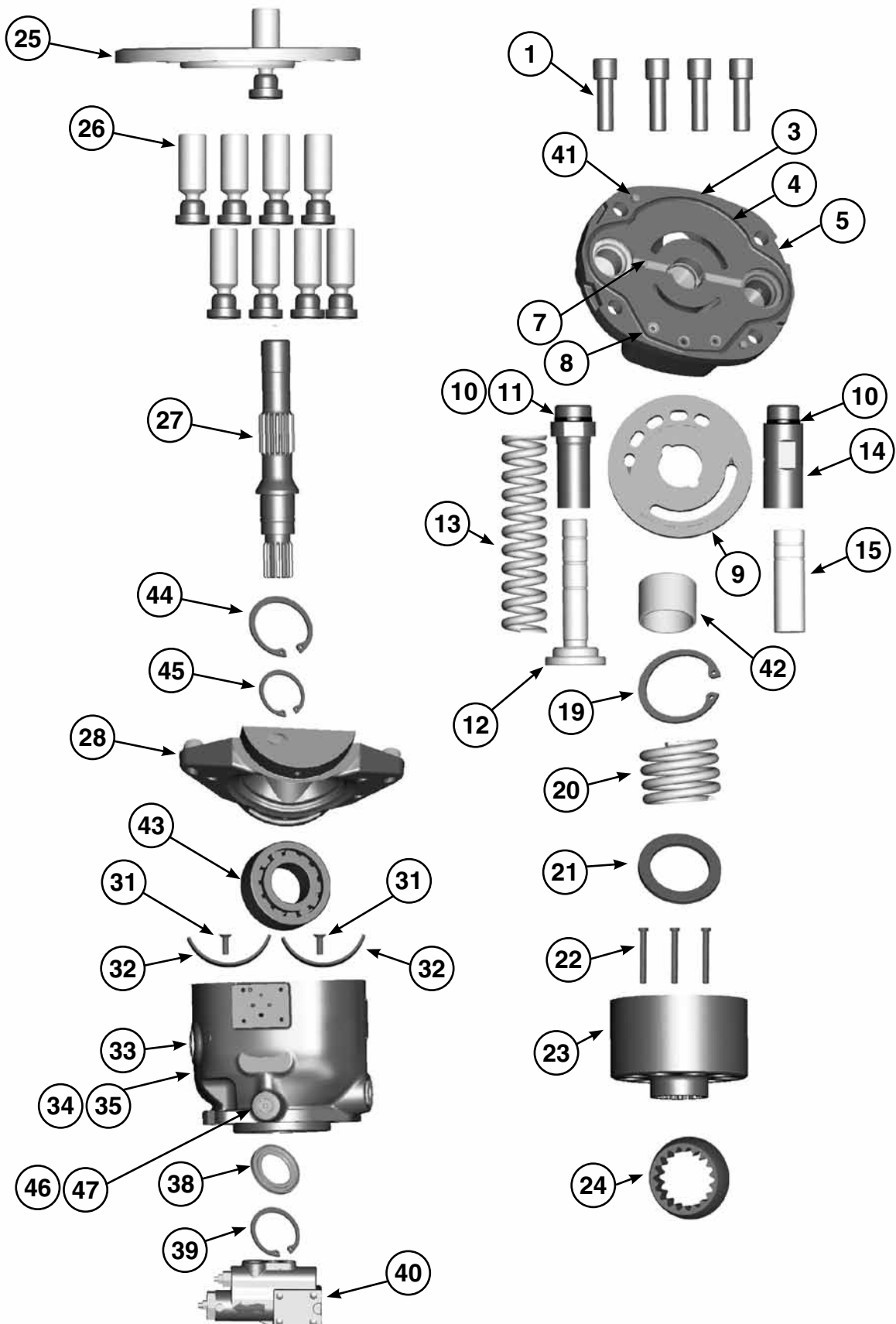
For max volume stops:

Pump Size	% Stroke reduction per turn
P*060	6.76
P*075	6.2
P*100	5.5
P*140	4.8
P*018	9
P*028	8.2
P*045	7.5

Control Adjustment Sensitivity:

- Load Sense 28 Bar/Turn
- Pressure Compensator 80 to 280 bar range (C0) = 40 Bar/Turn
- Pressure Compensator 20 to 80 bar range (C1) = 18.6 Bar/Turn
- Pressure compensator (AM) 10 to 40 bar range = 20 Bar/Turn

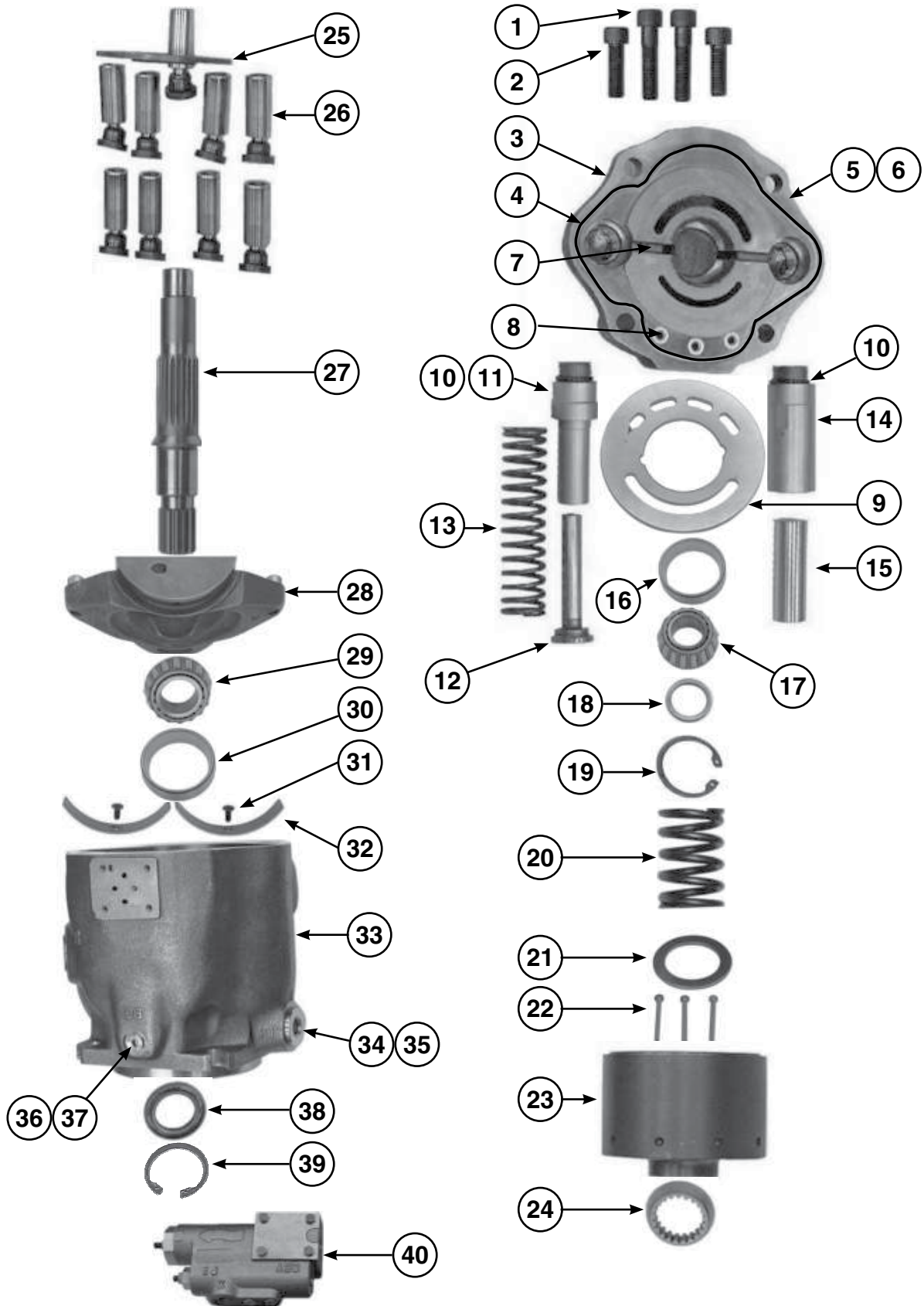




ITEM #	QTY	018 PART #	028 PART #	045 PART #	DESCRIPTION
1	4	210 x209	210 x 211	361-12229-0	Socket head cap screw
3	1	Contact Factory for port block ordering information			Port Block
4*	1	2050V-7	2160V-7	675-00162-0	Port block O-Ring
5	2	108X2V	108X2V	108X2V	Boss Plug (not shown)
7	1	299X67	324-30014-0	324-30014-0	Port Plate Pin
8*	3	605-10077-0	605-10077-0	605-10077-0	O-Ring
9	1	03E-94415-0	03E-94969-0	03E-94339-0	Port plate, clockwise, industrial (PD)
		03E-94414-0	03E-94970-0	03E-94340-0	Port plate, counter clockwise, industrial (PD)
		03E-94413-0	03E-94969-0	03E-94341-0	Port plate, clockwise, mobile (P1)
		03E-94416-0	03E-94970-0	03E-94342-0	Port plate, counter clockwise, mobile (P1)
		03E-94963-0	03E-94376-0	03E-95374-0	Port plate, CW, industrial (PD), ripple chamber
		03E-94964-0	03E-94377-0	03E-95080-0	Port plate, CCW, industrial (PD), ripple chamber
		03E-94965-0	03E-94378-0	03E-95374-0	Port plate, clockwise, mobile (P1), ripple chamber
10*	2	**	**	695-00912-0	Bias and control rod O-ring
11	1	03E-94427-0	03E-94390-0	03E-94355-0	Bias Guide
12	1	03E-94428-0	03E-94391-0	03E-94354-0	Bias Piston
13	1	03E-94430-0	03E-94393-0	03E-94356-0	Bias Spring
14	1	03E-94427-0	03E-94390-0	03E-94353-0	Control guide
15	1	03E-94426-0	03E-94389-0	03E-94352-0	Control piston
19	1	256X521	256X525	356-65144-0	Retaining ring, internal
20	1	787635	03E-94387-0	03E-94350-0	Barrel hold down spring
21	2	786996	03E-94388-0	03E-94351-0	Barrel hold down washer
22	3	787000	03E-94386-0	03E-95903-0	Barrel hold down pin
23	1	03E-94717-0	03E-94375-0	03E-94338-0	Barrel
24	1	787002	03E-94385-0	03E-94348-0	Spherical washer
25	1	786994	03E-94384-0	03E-94347-0	Retainer plate
26	9	789641	S2E-18415-0	S2E-18413-0	Piston and shoe assembly
27	1	03E-94409-0	03E-94372-0	03E-94335-0	01 shaft option, no thru drive
		03E-94411-0	03E-94374-0	03E-94337-0	01 shaft option with thru drive
		03E-94410-0	03E-94373-0	03E-94948-0	02 shaft option, no thru drive
		03E-94806-0	03E-94900-0	03E-94908-0	02 shaft option with thru drive
		03E-94800-0	03E-94903-0	03E-94923-0	04 shaft option, no thru drive
		03E-94801-0	03E-94904-0	03E-94922-0	04 shaft option with thru drive
		03E-94718-0	**	**	06 shaft option, no thru drive
		**	**	**	06 shaft option with thru drive
03E-94804-0	03E-95166-0	03E-94990-0	08 shaft option, no thru drive		
03E-94762-0	03E-95492-0	03E-95197-0	08 shaft option with thru drive		
28	1	S2E-19079-0	S2E-18414-0	S2E-18412-0	Cam
31	2	03E-94359-0	03E-94359-0	03E-94359-0	Bearing retainer Orifice
32	2	03E-94432-0	03E-94395-0	03E-94358-0	Cam bearing
33	1	**	**	**	Housing (not sold seperatley)
34	2	108X6	108X8	488-35055-0	Plug, SAE ORB
		Consult Parker Rep.			Plug, BSPP
		Consult Parker Rep.			Plug, ISO
35*	2	695-00908-0	695-00908-0	695-00910-0	SAE O-ring
38*	1	787140	P2-060-3304	620-82125-5	Shaft Seal
39	1	256X535	256X544	356-65158-0	Seal Retainer
40	1	see separate compensator ordering information			Compensator
41	2	324-30024-0	324-30024-0	324-30014-0	Cover dowel pin
42	1	216-10013-0	789814	230-82227-0	Port block bushing
43	1	230-82514-0	789815	230-82516-0	Cylindrical roller bearing
44	1	256X222	256X222	356-65159-0	External retaining ring (shaft)
45	1	256X544	256X544	356-65144-0	Internal retaining ring (housing)
46	1	108X4	108X4	108X4	Boss plug
47*	1	695-00904-0	695-00904-0	695-00904-0	O-ring

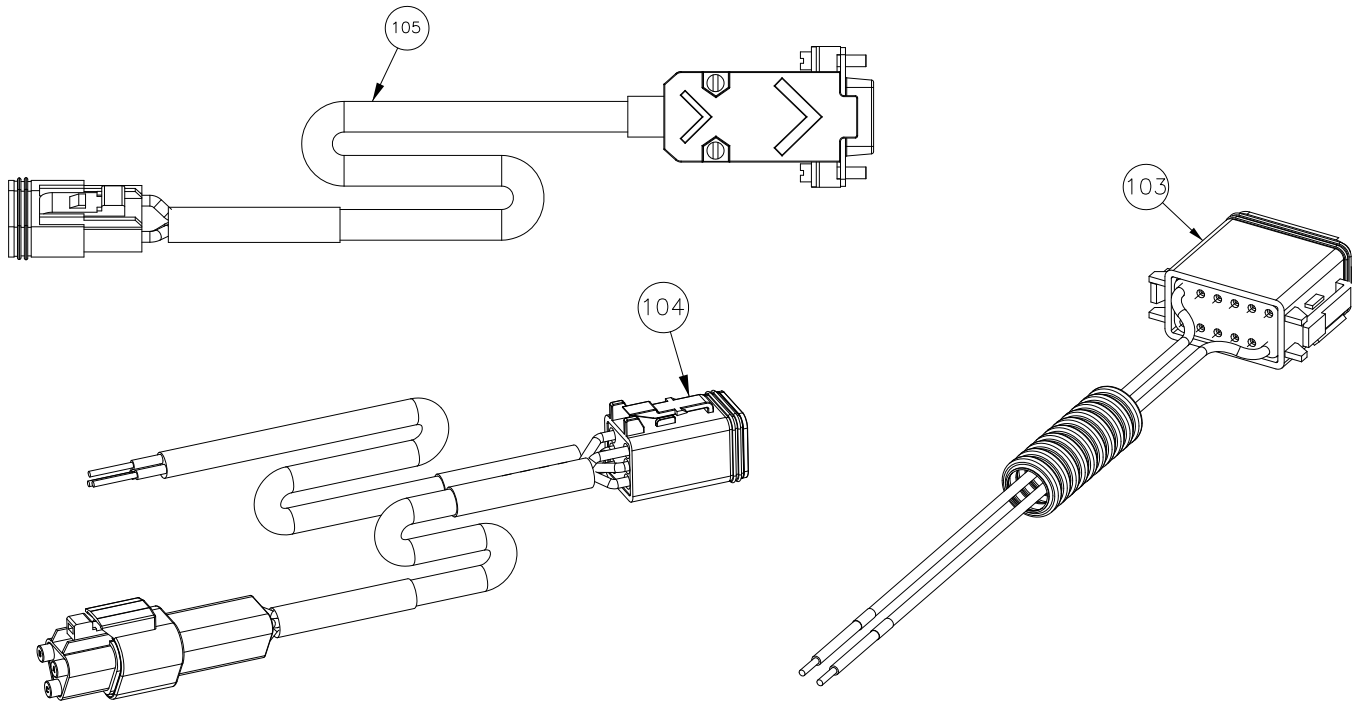
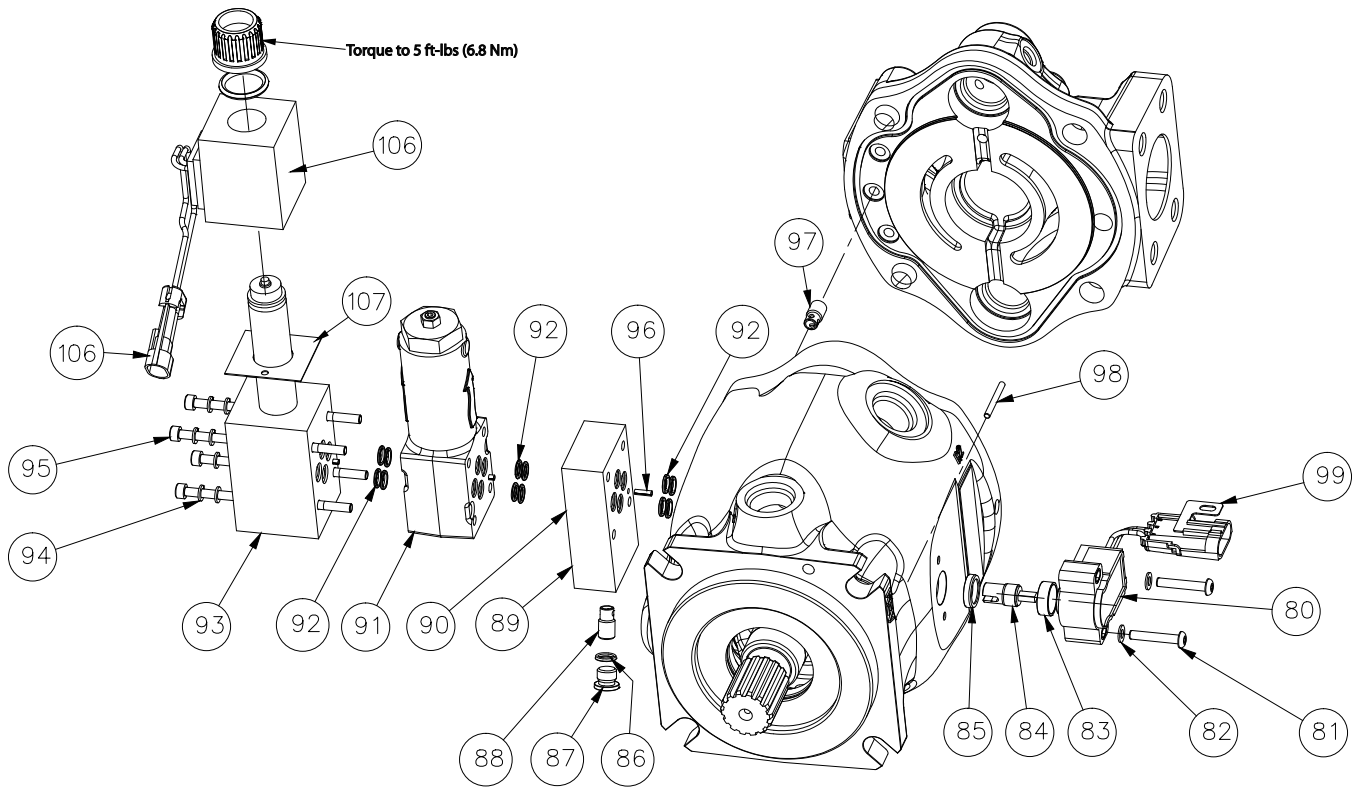
* denotes Item is included in the seal kit





ITEM #	QTY	060 PART #	075 PART #	100 PART #	140 PART #	DESCRIPTION
1	4 (2:075)	361-13250-0	361-13270-0	361-14290-0	361-15270-0	Socket head cap screw
2	0 (2:075)	**	361-13250-0	**	**	Socket head cap screw (075 only)
3	1	Contact factory for port block ordering information.				Port Block
4*	1	675-00164-0	675-00165-0	675-00169-0	675-00173-0	Port block O-Ring
5	2	488-35001-0	488-35001-0	488-35001-0	488-35001-0	Boss Plug (not shown)
6*	2	695-00904-0	695-00904-0	695-00904-0	695-00904-0	O-ring boss plug
7	1	324-30014-0	324-30014-0	324-30014-0	324-30014-0	Port Plate Pin
8*	3	605-10077-0	605-10077-0	605-10070-0	605-10070-0	O-Ring
9	1	03E-94038-0	03E-93169-0	03E-93785-0	03E-93252-0	Port plate, clockwise, industrial (PD)
		03E-94039-0	03E-93170-0	03E-93786-0	03E-93253-0	Port plate, counter clockwise, industrial (PD)
		03E-94040-0	03E-93171-0	03E-93787-0	03E-93254-0	Port plate, clockwise, mobile (P1)
		03E-94041-0	03E-93172-0	03E-93788-0	03E-93255-0	Port plate, counter clockwise, mobile (P1)
10*	2	695-00912-0	695-00912-0	695-00914-0	695-00916-0	Bias and control rod O-ring
11	1	03E-94054-0	03E-93150-0	03E-93800-0	03E-93248-0	Bias Guide
		**	03E-94498-0	03E-94827-0	03E-94743-0	Bias Guide, Overcenter Order Code Option "X"
12	1	03E-94053-0	03E-93149-0	03E-93799-0	03E-94658-0	Bias Piston
		**	**	**	—	—
		**	**	**	—	—
13	1	03E-94055-0	03E-93151-0	03E-93801-0	03E-93963-0	Bias Spring
		**	03E-94499-0	03E-94829-0	03E-94752-0	Bias Spring, Overcenter Order Code Option "X"
14	1	03E-94052-0	03E-93148-0	03E-93798-0	03E-93246-0	Control guide
		**	03E-94608-0	03E-94828-0	03E-93246-0	Control guide, Overcenter Order Code Option "X"
15	1	03E-94051-0	03E-93147-0	03E-93797-0	03E-94252-0	Control piston
		**	03E-93147-0	03E-93797-0	03E-94751-0	Control piston, Overcenter Order Code Option "X"
16	1	230-82237-0	230-82237-0	230-82244-0	230-82239-0	Tapered roller bearing cup
17	1	INCLUDED IN ITEM 16		230-82518-0	INCLUDED IN ITEM 16	Tapered roller bearing cone
18	1	S2E-18591-0K	S2E-18591-0K	S2E-18640-0K	S2E-18527-0K	Bearing Shim Kit (includes all standard shim sizes)
19	1	356-65152-0	356-65144-0	356-65146-0	356-65147-0	Retaining ring, internal
20	1	03E-94049-0	03E-93145-0	03E-93795-0	03E-93959-0	Barrel hold down spring
21	1	03E-94050-0	03E-93146-0	03E-93796-0	03E-93244-0	Barrel hold down washer
22	3	03E-95904-0	03E-95905-0	03E-95906-0	03E-95907-0	Barrel hold down pin
23	1	03E-94036-0	03E-93129-0	03E-93783-0	03E-93242-0	Barrel
24	1	03E-94047-0	03E-93142-0	03E-93794-0	03E-93241-0	Spherical washer
25	1	03E-94046-0	03E-93139-0	03E-93793-0	03E-93240-0	Retainer plate
26	9	S2E-18296-0	S2E-17003-0	S2E-17912-0	S2E-17323-0	Piston and shoe assembly
27	1	03E-94032-0	03E-93999-0	03E-93779-0	03E-93227-0	01 shaft option, no thru drive
		03E-94033-0	03E-94000-0	03E-93780-0	03E-93228-0	01 shaft option with thru drive
		03E-94034-0	03E-94001-0	03E-93781-0	03E-93231-0	02 shaft option, no thru drive
		03E-94035-0	03E-94002-0	03E-93782-0	03E-93232-0	02 shaft option with thru drive
		03E-94768-0	03E-94003-0	03E-94006-0	03E-93233-0	04 shaft option, no thru drive
		03E-94767-0	03E-93127-0	03E-94007-0	03E-93234-0	04 shaft option with thru drive
		**	**	03E-94500-0	03E-95070-0	06 shaft option, no thru drive
**	**	03E-94462-0	**	06 shaft option with thru drive		
28	1	S2E-18411-0	S2E-17443-0	S2E-17961-0	S2E-17957-0	Cam
29	1	230-82236-0	230-82236-0	230-82519-0	230-82241-0	Tapered roller bearing cone (and cup 140)
30	1	230-82235-0	230-82235-0	230-82245-0	**	Tapered roller bearing cup
31	2	03E-93763-0	03E-93763-0	03E-93763-0	03E-93763-0	Bearing retainer Orifice
32	2	03E-94057-0	03E-93950-0	03E-93952-0	03E-93953-0	Cam bearing
33	1	**	**	**	**	Housing (not sold separately)
34	2	488-35014-0	488-35014-0	488-35014-0	488-35024-0	Plug, SAE ORB
		447-01056-2	447-01056-2	447-01056-2	477-01068-2	Plug, BSPP
		447-01065-5	447-01065-5	447-01065-5	477-01066-5	Plug, ISO
35*	2	695-00910-0	695-00910-0	695-0912-0	695-0916-0	SAE O-ring
36	1	488-35061-0	488-35061-0	488-35061-0	488-35061-0	Plug, SAE ORB
		447-01053-2	447-01053-2	447-01053-2	447-01053-2	Plug, BSPP
		447-01061-5	447-01061-5	447-01061-5	447-01061-5	Plug, ISO
37*	1	695-00904-0	695-00904-0	695-00904-0	695-00904-0	SAE O-ring
		605-10064-5	605-10061-5	605-10061-5	605-10061-5	BSPP O-ring
38*	1	620-82118-5	620-82118-5	620-82121-5	620-82120-5	Shaft Seal
39	1	356-65146-0	356-65146-0	356-65147-0	356-65148-0	Seal Retainer
40	1	See separate compensator ordering information.				Compensator

* denotes Item is included in the seal kit



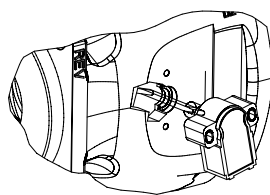
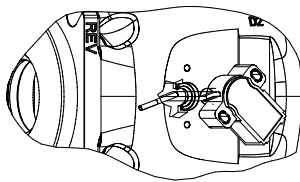
RDEC Parts list				
ITEM #	QTY	Part #	DESCRIPTION	
80	1	03E-95420-0	Rotary Position sensor	
81	2	210X73	Socket head cap screw	
82	2	234X7	Washer	
83	1	03E-95249-0	Position sensor spacer	
84	1	03E-95201-0	Shaft position connector 18 and 45 thru 75	
		03E-95545-0	Shaft position connector 28	
		03E-95205-0	Shaft position connector 100 and 140	
85	1	789764	Seal	
86	1	675-00904-0	O-Ring Seal	
87	1	108X4V	O-Ring boss plug	
88	1	S13-40266-0	Check Valve	
89	1	S2E-19182-5	External Servo Assembly*	
90	1	03E-95347-0	External servo manifold	
91	1	S2E-19174-5	Maximum pressure valve CCW	
		S2E-19173-5	Maximum pressure valve CW	
92	12	605-10069-0	O-Ring Seal	
93	1	517-00178-5	Proportional valve 0 disp default CW	
		517-00180-5	Proportional valve max disp default CW	
		517-00179-5	Proportional valve 0 disp default CCW	
		517-00181-5	Proportional valve max disp default CCW	
94	8	350-10167-0	Lock Washer	
95	4	361-07360-8	Socket head cap screw**	
		210x105	Socket head cap screw***	
		210x110	Socket head cap screw****	
96	1	325-36002-0	Roll Pin	
97	1	S13-40266-0	Check Valve	
98	1	03E-94859-0	Cam pin	
99	1	S2E-19190-0K	Position sensor mating connector	
100	1	S2E-19254-0	Electronic control unit (not shown)	
101	1	S2E-19192-5K	Pressure sensor kit UNC threads(not shown)	
		S2E-19523-5K	Pressure sensor kit BSPP threads (not shown)	
		S2E-19191-0K	Pressure sensor mating connector (not shown)	
102	1	S2E-19179-0	12 Pin cable assembly	
103	1	S2E-19259-0	CAN communication cable	
104	1	S2E-19180-0	Control communication cable	
106	1	1210694	Standard Coil	
107	1	121459	Gasket	

* Item 89 includes items 86, 87, 88, 90, 92 and 96
** Used on control options S/X/U/Z
*** Used on pumps without overcenter capability (P) and control options P/W/T/Y
**** Used on pumps with over center capability (X) and control options P/W/T/Y

Displacement Sensor Installation

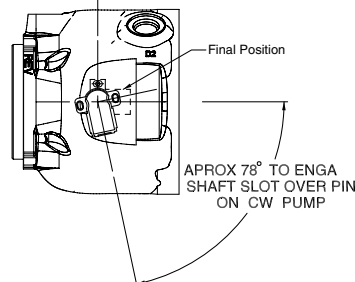
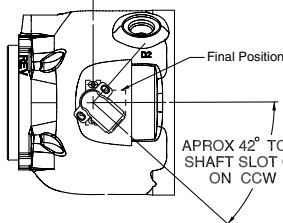
CCW PUMPS

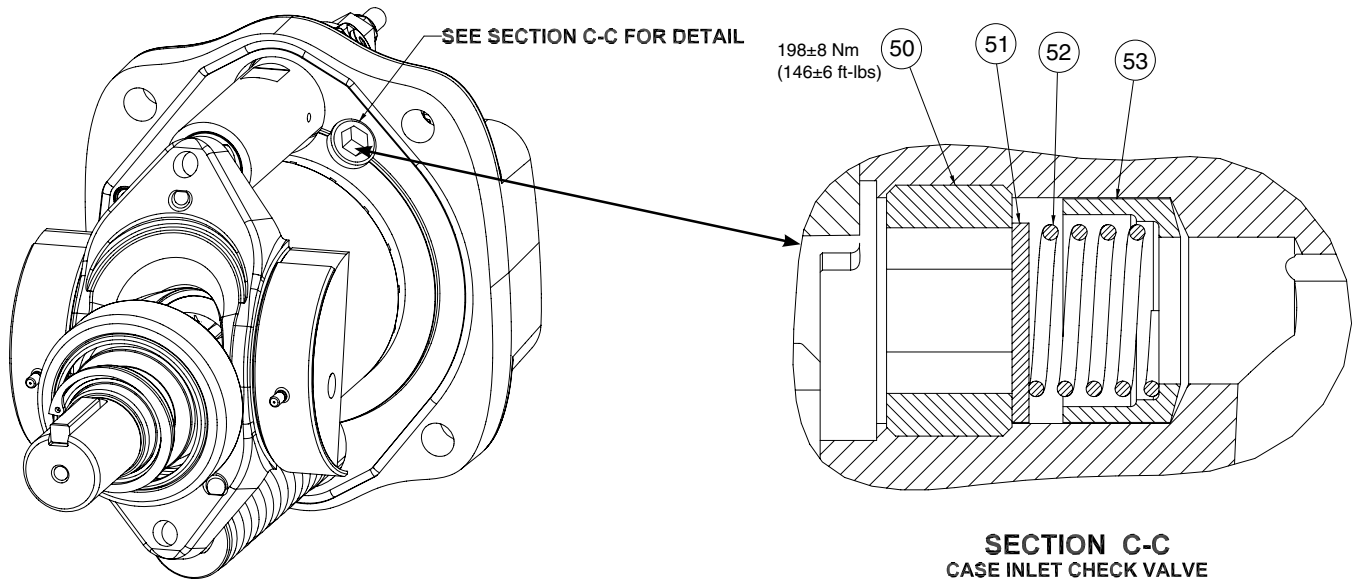
CW PUMPS



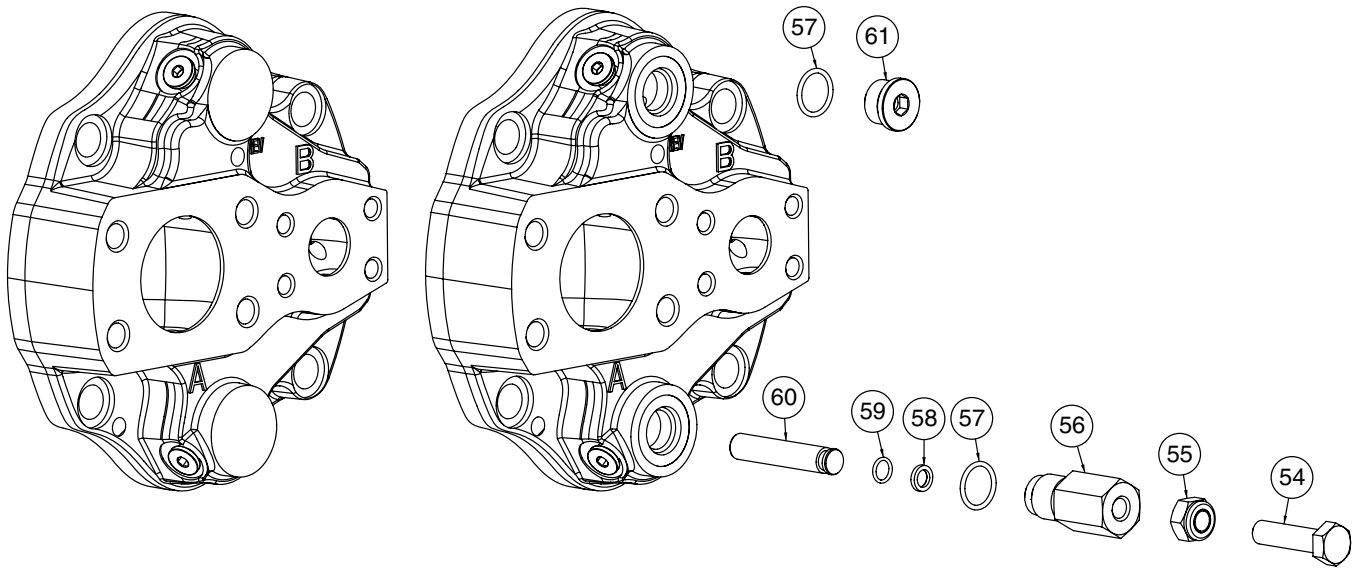
After engaging shaft slot to pin, hold sensor flush to pump pad and rotate to align screw slots to screw holes. Secure with screws & washers, 2 places.

After engaging shaft slot to pin, hold sensor flush to pump pad and rotate to align screw slots to screw holes. Secure with screws & washers, 2 places.



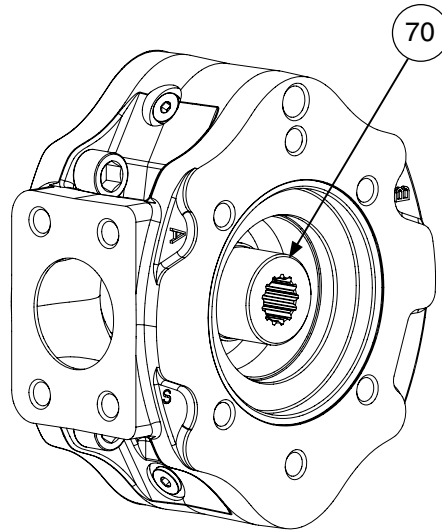


CASE TO INLET CHECK VALVE				
Item No	Qty	018, 028, 045	060, 075, 100, 140	Description
50	1	314-10002-0	314-10000-0	Hollow Set Screw
51	1	03E-94720-0	03E-93931-0	Check Valve Poppet
52	1	03E-94721-0	03E-93987-0	Spring
53	1	03E-94722-0	03E-93988-0	Check Valve Stop



Minimum and Maximum Volume Stop									
Item #	Qty	018	028	045	060	075	100	140	Description
54	1	362-11045-0							Adjusting Screw
55	1	334-00013-0			334-00011-0			Locknut, Adjusting Screw	
56	1	03E-93181-0			03E-93181-0			Volume Stop Plug	
57	1	695-00908-0			695-00908-0			O-ring, Volume Stop Plug	
58	1	618-15023-0			618-15023-0			Back Up Ring	
59	1	695-00011-0			695-00011-0			O-ring, Volume Stop Rod	
60	1	03E-94736-0	03E-95170-0	03E-93262-0			Volume Stop Rod		
61	1	488-35018-0			488-35018-0			Plug(No Volume Stop)	
Not Shown	1	03E-95217-0	03E-95358-0	03E-93262-0	**			Minimum Volume Stop Rod	
KIT		S2E-19203-5	S2E-19204-5	S2E-19114-5	S2E-18987-5K	S2E-18988-5K		Adjustable Volume Stop	
KIT		S2E-19608-5	S2E-19609-5	Use Above Kit			Adjustable Minimum Volume Stop		

Maximum and minimum volume stops use the same components except where noted.



Thru Drive Pad Coupling #70	Thru Drive Couplings							O-ring
	018	028	045	060	075	100	140	
SAE A, 9 Tooth	S2E-19538-0	S2E-19364-0	03E-94942-0	03E-93278-0	03E-93278-0	03E-94274-0	03E-93947-0	695-00237-0
SAE A, 11 Tooth	S2E-19726-0	S2E-19391-0	03E-94943-0	03E-94724-0	03E-94724-0	03E-94657-0	**	695-00237-0
SAE B, 13 Tooth	**	S2E-19365-0	03E-94945-0	03E-93277-0	03E-93277-0	03E-94273-0	03E-93946-0	695-00243-0
SAE BB, 15 Tooth	**	S2E-19409-0	03E-94361-0	03E-93279-0	03E-93279-0	03E-94272-0	03E-93945-0	695-00243-0
SAE C, 14 Tooth	**	**	**	03E-93276-0	03E-93276-0	03E-94271-0	03E-93944-0	695-00251-0
SAE CC, 17 Tooth	**	**	**	**	**	03E-94270-0	03E-93943-0	695-00251-0
SAE D&E, 13 Tooth	**	**	**	**	**	**	03E-93942-0	695-00259-0

Seal Kits	018	028	045	060	075	100	140
		S2E-18709-5K	S2E-19118-5K	S2E-19066-5K	S2E-18697-5K	S2E-18004-5K	S2E-18460-5K

Note: Seal kits contain all the seals required for any pump configuration.

Rotating Group Kits	018	028	045	060	075	100	140
CW Mobile P1	S2E-18710-0K	S2E-19119-0K	S2E-19067-0K	S2E-18698-0K	S2E-18032-0K	S2E-18485-0K	S2E-18489-0K
CW Mobile P1 with Ripple Chamber	S2E-19205-0K	S2E-19209-0K	S2E-19235-0K	**	**	**	**
CCW Mobile P1	S2E-18711-0K	S2E-19120-0K	S2E-19068-0K	S2E-18699-0K	S2E-18033-0K	S2E-18486-0K	S2E-18490-0K
CCW Mobile P1 w/ Ripple Chamber	S2E-19206-0K	S2E-19210-0K	S2E-19236-0K	**	**	**	**
CW Industrial PD	S2E-18712-0K	S2E-19121-0K	S2E-19069-0K	S2E-18700-0K	S2E-18483-0K	S2E-18487-0K	S2E-18491-0K
CW Industrial PD w/ Ripple Chamber	S2E-19207-0K	S2E-19211-0K	S2E-19126-0K	**	**	**	**
CCW Industrial PD	S2E-18713-0K	S2E-19122-0K	S2E-19070-0K	S2E-18701-0K	S2E-18484-0K	S2E-18488-0K	S2E-18492-0K
CCW Industrial PD w/ Ripple Chamber	S2E-19208-0K	S2E-19212-0K	S2E-19127-0K	**	**	**	**

Rotating Group Kit includes barrel s/a, pistons, retainer, washer, pins, port plate

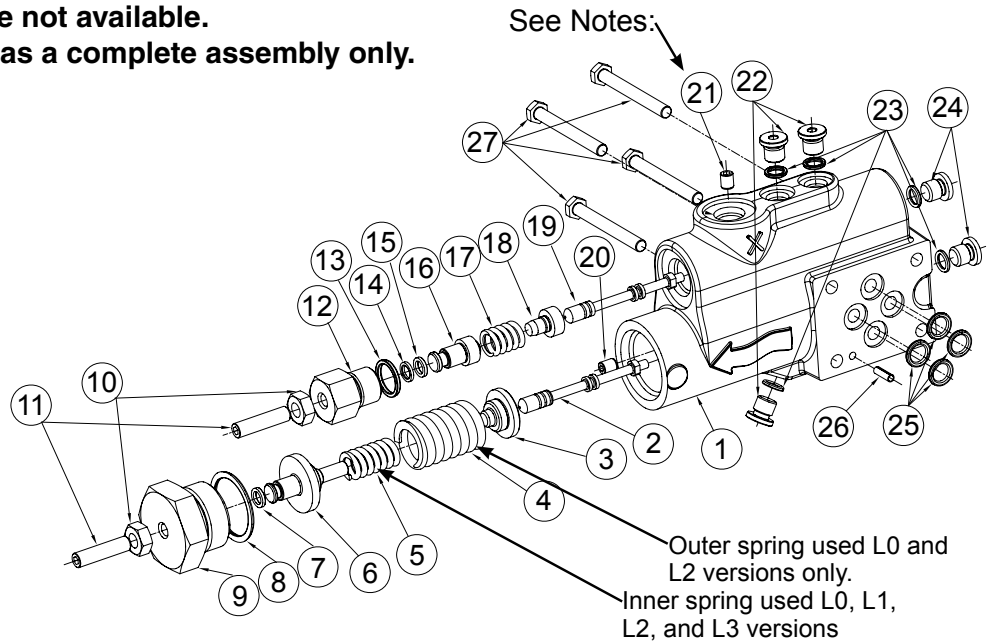
Torque Limiter Control Kits	045	060	075	100	140
Torque Limiter Kit for AMT Control	S2E-19102-5	S2E-19033-5	S2E-18720-5	S2E-18888-5	S2E-18963-5
Torque Limiter Kit for ALT Control	See Note		**	**	**
Torque Limiter Kit for LOT	**	**	S2E-18721-5	S2E-18759-5	S2E-18739-5

Torque Limiter Kits includes cartridge assembly, tubing and fittings.

Note: AM control can be converted to an AL control with conversion kit S2E-19117-0.

European customers will receive a solid spool in this kit. US customer will receive a set screw to plug orifice in spool.

**NOTE: Individual parts are not available.
 The compensator is sold as a complete assembly only.**

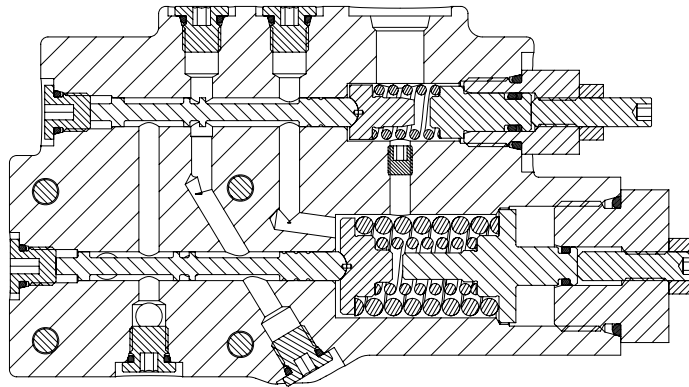


Compensator Part Number

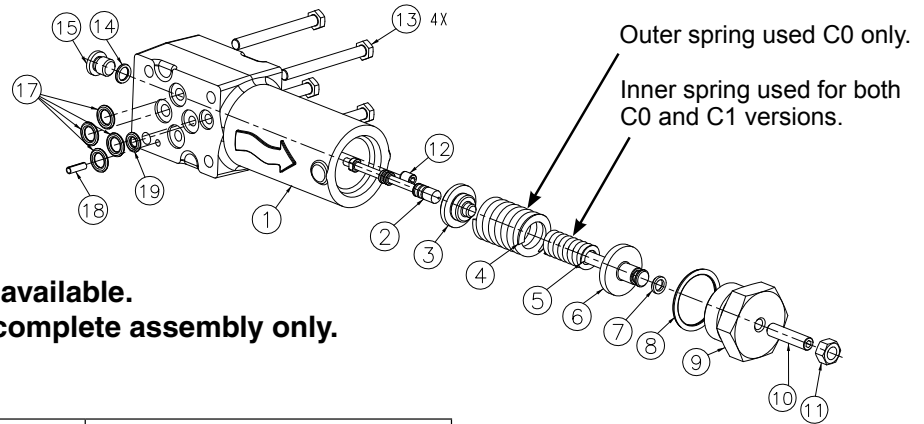
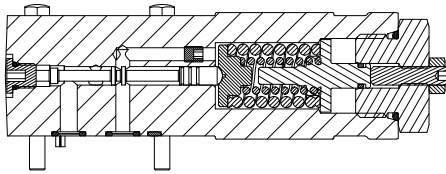
Port	Rotation	L0 80 - 280bar (1150 - 4000 psi)	L1 20-80 bar (300-1150 psi)	L2 80 - 280bar (1150 - 4000 psi)	L3 20-80 bar (300-1150 psi)
SAE	CW	S2E-17823-5T	S2E-18245-5T	S2E-18584-5 T	N/A
	CCW	S2E-17824-5T	S2E-18244-5T	S2E-18586-5 T	N/A
ISO	CW	S2E-17939-5T	N/A	N/A	N/A
	CCW	S2E-17938-5T	N/A	N/A	N/A
BSPP	CW	S2E-17937-5T	N/A	N/A	N/A
	CCW	S2E-17936-5T	N/A	N/A	N/A

Item No.	Qty	Description	NOTES / Tightening Torque
1	1	Compensator Body	
2	1	Main Compensator Spool	
3	1	Main Compensator Spring Seat	
4	1	Main Compensator Outer Spring	L0 & L2 versions only
5	1	Main Compensator Inner Spring	
6	1	Main Compensator Spring Seat & Piston	
7	2	Compensator Seal Piston O-ring	

Table CONTINUED on next page.



Item No.	Qty	Description	NOTES / Tightening Torque
8	1	Main Compensator Spring cap O-ring	
9	1	Main Compensator Spring cap	115 ± 7 N-m (85 ± 5 ft-lbs)
10	2	Adjusting screw locknut	7.9 ± 0.8 N-m (70 ± 7 in-lbs)
11	2	Adjusting screw	
12	1	Load Sense Compensator Spring cap	36.5 ± 1.5 N-m (27 ± 1 ft-lbs)
13	1	Load Sense Compensator Spring cap O-ring	
14	1	Load Sense Compensator Piston backup ring	
15	1	Load Sense Compensator Piston O-ring	
16	1	Load Sense Compensator Seal Piston	
17	1	Load sense compensator spring	
18	1	Load sense compensator spring seat	
19	1	Load sense compensator spool	
20	1	Socket set screw	(Loctite 242) 3.4 ± 0.4 N-m (30 ± 3 in-lbs)
21	1	Socket set screw	L0 & L1 versions (Loctite 242) 3.4 ± 0.4 N-m (30 ± 3 in-lbs)
		Orifice	L2 & L3 versions
22	3	SAE #2 O-ring boss plug	4.0 ± 0.6 N-m (35 ± 5 in-lbs)
23	5	SAE #2 O-ring	
24	2	Hardened SAE #2 O-ring boss plug	4.0 ± 0.6 N-m (35 ± 5 in-lbs)
25	4	Teflon O-ring	
26	1	Roll pin	
27	4	Hex mounting screw	5.0 ± 0.3 N-m (45 ± 3 in-lbs)



**NOTE: Individual parts are not available.
The compensator is sold as a complete assembly only.**

Compensator Part Number

Rotation	C0 80 - 280 bar (1150 - 4000 psi)	C1 20 - 80 bar (300 - 1150 psi)
CW	S2E-17904-5 T	S2E-18285-5 T
CCW	S2E-17905-5 T	S2E-18286-5 T

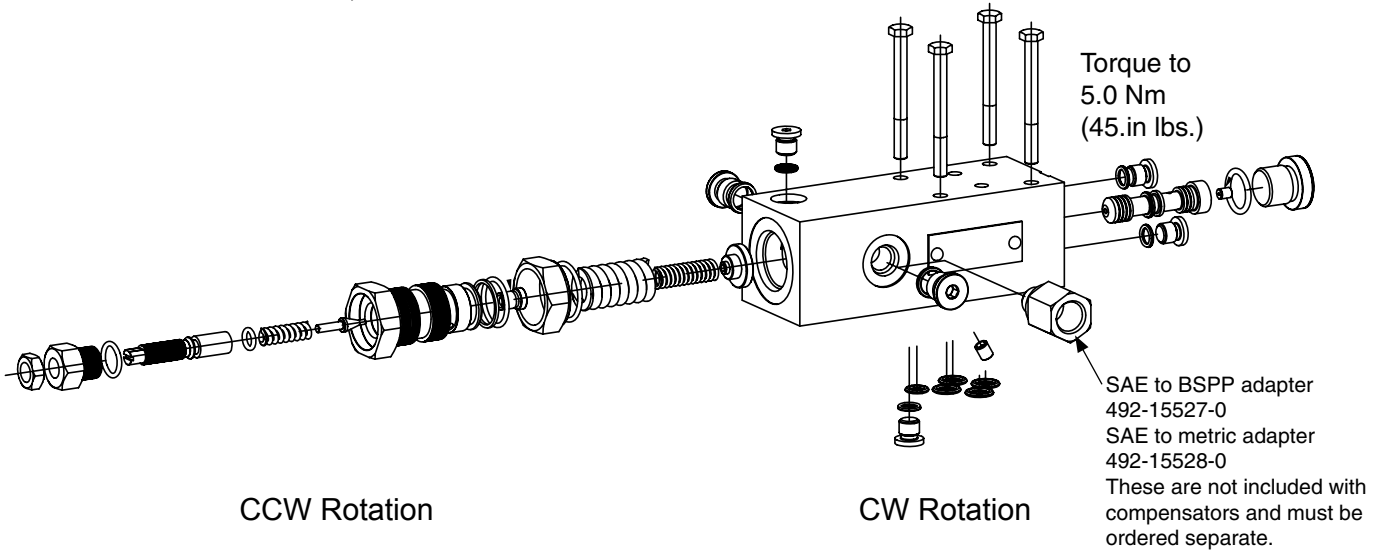
Item no.	Quantity	Description	NOTES / Tightening Torque
1	1	Compensator body CW rotation	
		Compensator body CCW rotation	
2	1	Spool	
3	1	Spring seat	
4	1	Outer spring	C0 versions only
5	1	Inner spring	
6	1	Spring seat & piston	
7	1	Seal piston o-ring	
8	1	Spring cap o-ring	
9	1	Spring cap	115 ± 7 N-m (85 ± 5 ft-lbs)
10	1	Adjusting screw	
11	1	Adjusting screw locknut	7.9 ± 0.8 N-m (70 ± 7 in-lbs)
12	1	Socket set screw	(Loctite 242) 3.4 ± 0.4 N-m (30 ± 3 in-lbs)
13	4	Hex mounting screw	5.0 ± 0.3 N-m (45 ± 3 in-lbs)
14	1	SAE #2 o-ring	
15	1	Hardened SAE #2 o-ring boss plug	4.0 ± 0.6 N-m (35 ± 5 in-lbs)
17	4	Teflon O-ring	
18	1	Roll pin	
19	1	Teflon O-ring	

**NOTE: Individual parts are not available.
The compensator is sold as a complete assembly only.**

Compensator Part Number

Rotation	AM*	AN*	AL*	AE*	AF*
CW	S2E-18745-5T	S2E-18743-5T	S2E-19107-5T	S2E-18747-5T	S2E-18749-5T
CCW	S2E-18746-5T	S2E-18744-5T	S2E-19106-5T	S2E-18748-5T	S2E-18750-5T

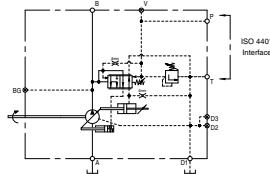
Note: To convert “AM*” to “AL*”, use conversion kit S2E-19117-0



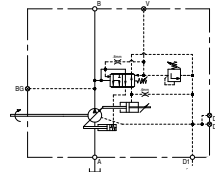
CCW Rotation

CW Rotation

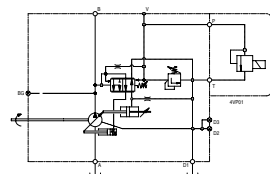
AN Control



AM Control



AE & AF Control



COMPENSATOR DISASSEMBLY

NOTES:

Access plugs on end of compensator spool bores are hardened plugs. Do not interchange with other plugs in the control.

For rotation change, the complete compensator assembly will need to be replaced.

Compensator Disassembly:

1. Measure and record the extension of the two pressure adjusting screws.
2. Carefully remove the main compensator spring cap. Remove the two springs. Remove the seal piston and spring seat. Remove the o-ring boss access plug on the opposite side of the compensator. Remove the compensator spool. NOTE: the compensator spool and inner spring are not interchangeable with the load sense compensator spool and spring.
3. For "L" series compensators: Carefully remove the load sense compensator spring cap with spring seat/seal piston. Remove the spring. Remove the spring seat. Remove the o-ring boss access plug on the opposite side of the compensator. Remove the load sense compensator spool. NOTE: the load sense compensator spool and spring are not interchangeable with the main compensator spool and inner spring of the main compensator.
4. Remove all SAE o-ring boss access plugs.

COMPENSATOR INSPECTION

NOTE: The compensator is supplied as an assembly. Individual parts are not available. If there is significant damage to any of the parts, the complete compensator will need to be replaced.

1. Inspect the main compensator spool and the load sense spool for scratches or other damage.
2. Inspect the springs for proper free extension length (see chart below).
3. Inspect the spool bores for damage. Apply a light oil film on the appropriate spool and check its fit in the bore. The spool should fit snugly in housing and not have any radial play.

COMPENSATOR SPRING FREE LENGTH			
Type	Item Number	Component	Tolerances
C*/L*	5	Main compensator spring - inner	Free height: 25.9±0.5mm (1.020±0.020 in.)
C0/L0/L2	4	Main compensator spring - outer	Free height: 39±0.7mm (1.535±0.028 in.)
L*	17	Load Sense spring	Free height: 14±0.4mm (0.551±0.016 in.)
R*	6	Bias spring	

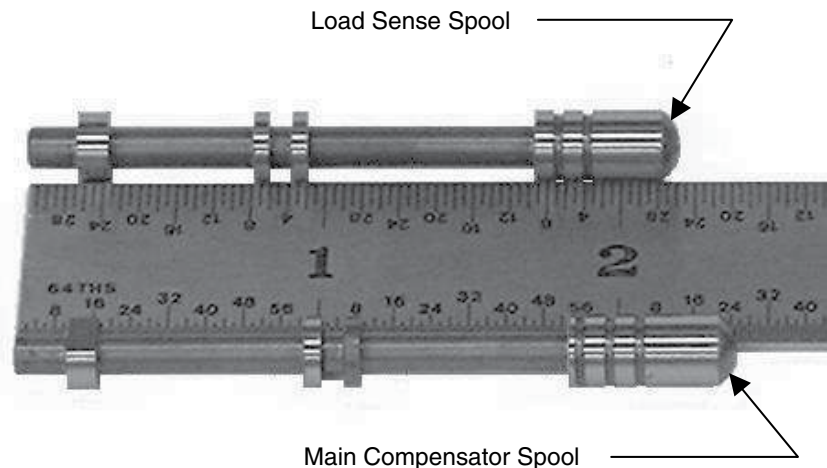
Reference item numbers on page 26.

COMPENSATOR ASSEMBLY

NOTE: instructions are for load sense compensator. For other compensator types disregard steps related to extra spool assembly.

Carefully clean and dry all parts prior to assembly. Use caution to insure that spools and other parts are not damaged during cleaning process. Use clean oil to lubricate seals and spools for easier assembly.

1. Remove and discard all o-rings. Install new o-rings on SAE boss plugs and seal pistons.
2. Apply a light film of oil to the o-ring on the main compensator seal piston. Install the main compensator seal piston in the main compensator spring cap.
3. Place inner compensator spring on seal piston. Install the outer compensator spring over the inner spring on the seal piston. Position the spring seat over the springs. Insert this assembly into the main compensator housing bore. Torque the main compensator spring cap to 169-183 Nm (125-135 ft.-lb.).
4. Apply a light film of oil on the main compensator spool (the longer of the 2 spools). Insert the spool into the spool bore opposite the main compensator spring assembly in the compensator body. The rounded end of the spool should be installed first so it will contact the spring seat. Install a new o-ring on the hardened SAE boss fitting and place it into the port. Torque fitting to 4 ± 0.5 Nm (37 ± 5 in-lb.).
5. Apply a light film of oil to the o-ring on the load sense seal piston. Install the load sense compensator seal piston seat in the load sense spring cap. Install the load sense spring over the seal piston. Position the spring seat over the spring. Install this assembly into the load sense bore of the compensator housing. Torque the load sense spring cap to 35-38 Nm (26-28 ft. lb.).
6. Apply a light film of oil to the load sense compensator spool (the shorter of the 2 spools). Insert the spool into the spool bore opposite the load sense spring assembly. The spool should be installed with the rounded end in first so it will contact the load sense spring seat. Install a new o-ring on the hardened SAE boss fitting and place it into the port. Torque fitting to 4 ± 0.5 Nm (37 ± 5 in-lb.).
7. Install o-rings on remaining SAE boss fittings and install into housing. Torque SAE-2 fittings to 4 ± 0.5 Nm (37 ± 5 in-lb.).



PUMP DISASSEMBLY

Pump disassembly for inspection should be limited to the following cases:
a) Malfunction or oil leakage resulting from damage or wear and tear.
b) Trouble-shooting procedures previously listed do not solve the problem.

For rotation change or shaft conversion, disassembly should be done only as far as necessary to complete conversion.

Disassembly and reassembly should be performed in a clean environment.

Caution: Spring assemblies in the pump are normally set under high compression and bodily injury may occur if caution is not taken during disassembly.

It is usually not necessary to replace spring (20) fitted in cylinder barrel. Do not replace the spring unless absolutely necessary.

After disassembly, the internal parts should be coated with a film of clean oil and protected from dirt and moisture.

It is recommended that the length of the protruding portion of the compensator adjusting screws, on the control 40 be measured and noted as this information will prove useful during assembly.

Care must be taken to avoid dropping, damaging or contaminating the machined parts and the control valve.

For complete overhaul, all o-rings and seals should be discarded and replaced.

1. Identify the pump from information on the data tag. Figure 1



Figure 1

PUMP DISASSEMBLY
Continued

2. Drain fluid from housing. Fluid drained from pump should be disposed of properly.
3. Mount pump in fixture to prevent movement while removing main housing bolts
4. Remove bolts holding the compensator assembly on the pump housing. Additional fluid may drain out of the passages when the compensator is removed. Set compensator aside for later disassembly and inspection
5. Remove the bolts attaching the port block to the main housing.
6. Carefully remove the port block. Use caution to avoid dropping the port plate. Note the location of the bias spring - piston assembly and the control piston assembly. The control piston, bias piston and bias spring may remain in pump when port block is removed. Remove and discard the three white Teflon seals on the port block. These seals should be replaced each time the pump is disassembled.
7. Remove the control piston and the bias piston - spring assembly.
NOTE: For rotation change only, do not disassemble further, proceed to step 14.
8. Position the pump horizontally and remove the rotating group. Avoid separating the pistons from the barrel if possible. This will assist in identifying damage between an individual piston and bore during component inspection.
- 8a. If completing a seal change or complete overhaul on a 045 pump turn housing over and remove the snap ring and shaft seal from the housing before moving on to step 9.
9. Remove cam from housing. See Figure 2

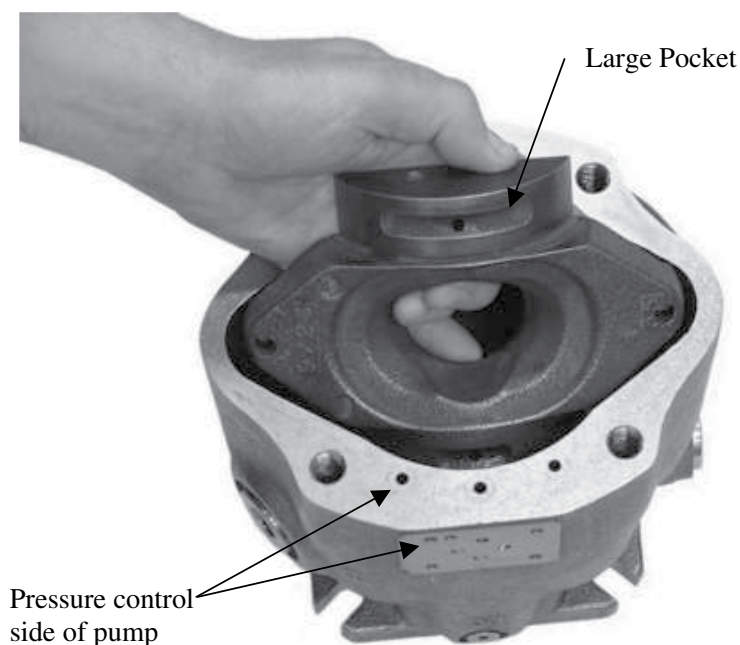


Figure 2

PUMP DISASSEMBLY
Continued

10. Remove cam bushing screws and cam bushings from pump.
11. Remove snap ring in housing and shaft bearing assembly.
12. If completing a seal change or a complete overhaul turn the housing over and remove the snap ring and shaft seal from the housing.
 - 12a. If you are working on an 045 pump please omit this step as this has already been completed in step 8a.
 - 12b. Always use a new shaft seal. Do not reuse old shaft seal.
13. If there is excessive wear on the port block bushing; remove the bushing from the port block.
14. If complete overhaul or rotation change, remove control piston and bias piston guides. The Control piston and bias piston guides are installed with Anaerobic thread lock. Place the port block in an oven at 163°C (325°F).
NOTE: to prevent annealing of heat treated surfaces DO NOT USE A TORCH TO HEAT PISTON GUIDES. (45 Size only)

COMPENSATOR DISASSEMBLY

NOTES: Access plugs on end of compensator spool bores are hardened plugs. Do not interchange with other plugs in the control. For rotation change, the complete compensator assembly will need to be replaced.

1. Measure and record the extension of the two pressure adjusting screws.
2. Carefully remove the main compensator spring cap. Remove the two springs. Remove the seal piston and spring seat. Remove the o-ring boss access plug on the opposite side of the compensator. Remove the compensator spool. NOTE: the compensator spool and inner spring are not interchangeable with the load sense compensator spool and spring.
3. Load sense compensator: Carefully remove the load sense compensator spring cap with spring seat/seal piston. Remove the spring. Remove the spring seat. Remove the o-ring boss access plug on the opposite side of the compensator. Remove the load sense compensator spool. NOTE: the load sense compensator spool and spring are not interchangeable with the main compensator spool and inner spring of the main compensator.
4. Remove all SAE o-ring boss access plugs.

Proceed to inspection section of this manual.

PUMP INSPECTION PROCEDURES

Carefully clean and dry all parts prior to inspection. Refer to chart 1 for dimensional information regarding allowable tolerances.

1. Examine piston diameters for scratches or gouges. If any piston is severely-damaged, note which piston bore it came out of. Extra attention should be given to that bore in step 2. Check end play of piston shoe assembly. Check the bottom surface of the shoes for damage. The shoe surface should be square and flat. Measure the depth of the pocket of the shoe. Shoes may be lapped as a set if the pocket depth is within allowable limits. Confirm pocket depth after lapping to insure it is still within limits.
2. Examine bores in cylinder for scratches. Check diameter of bores in 4 different locations, including near the bottom of the barrel where the piston does not travel. If the dimensions vary by more than 0.0102 mm (0.0004 in.) or any dimension exceeds the allowable limit, the barrel needs to be replaced. Examine the barrel face for scratches and gouges. The barrel can be reworked if dimensions are within specifications listed in chart 1.
3. The port plate can be lapped lightly if the face is only lightly scratched, otherwise it should be replaced.
4. Examine the retainer plate in the area of contact with the piston shoes. Any marks beyond light polishing indicate that replacement is necessary. Check the surface of the spherical area of the retainer plate and the spherical guide ball. Inspect the back surface of the spherical guide ball where the load pins make contact. If indentations are present replace the guide ball.
5. Examine cam on top and bottom surface. If scratches or gouges appear to penetrate the surface treatment, the cam must be replaced.
6. The cam bearings cannot be reworked and should be replaced if worn through the Teflon surface.
7. Both the bias piston and the compensator piston should move freely in their respective bores. The pistons and bores should be free of scratches or gouges.
8. The seal area of the drive shaft should be smooth and not have marks due to seal wear. Keyed shafts should be inspected for signs of brinelling and damage to the key area. Splined shafts may have a contact wear pattern but should not show excessive wear on the spline area.

NOTE: Spinning on shaft for P1/PD-018, 028 and 045 the cylindrical bearing should not have any signs of roller spalling, brinelling or discoloration. The bearing should be free to rotate without bind or rough feel.

COMPENSATOR INSPECTION

NOTE: The compensator is supplied as an assembly. Individual parts are not available. If there is significant damage to any of the parts, the complete compensator will need to be replaced.

1. Inspect the main compensator spool and the load sense spool for scratches or other damage.
2. Inspect the springs for proper free extension length (see chart on page 30).
3. Inspect the spool bores for damage. Apply a light oil film on the appropriate spool and check its fit in the bore. The spool should fit snugly in housing and not have any radial play.

**Chart 1
Rework Limits**

Item Number	Component	018 Part No	028 Part No	045 Part No	Tolerances
13 <i>Page 16 & 17</i>	Bias Spring	03E-94430-0 78.3 mm	03E-94393-0 87.5 mm	03E-94356-0 116.4 mm	Free Height +/- 0.2mm
20 <i>Page 16 & 17</i>	Barrel Spring	787635 41.4 mm	03E-94387-0 39.5 mm	03E-94350-0 48.3 mm	Free Height +/- 0.2mm
26 <i>Page 16 & 17</i>	Piston	789519 Max End Play 0.10 mm Min Shoe Flange Thickness 2.97 mm	S2E-18415-0 Max End Play 0.07 mm Min Shoe Flange Thickness 3.98 mm	S2E-184130-0 Max End Play 0.10 mm Min Shoe Flange Thickness 4.98 mm	Measure OD in 3 places, top, middle and bottom. Measurement should not vary by more than 0.01 mm End Play between piston and shoe should not exceed value shown
23 <i>Page 16 & 17</i>	Barrel	03E-94717-0	03E-94375-0	03E-94338-0	Measure piston bore ID in 3 places , top, middle, bottom. Measurement should not vary by more than 0.01 mm. Max material to be removed by lapping is .0051 mm
4 <i>Page 28 & 30</i>	P Max Compensator Spring-Outer	03E-93158-0 39 mm			Free Height : +/- 0.7mm
5 <i>Page 28 & 30</i>	P Max Compensator Spring- Inner	03E-93159-0 26 mm			Free Height : +/- 0.5mm
17 <i>Page 28</i>	Load Sense Spring	03E-93825-0 14 mm			Free Height : +/- 0.4mm

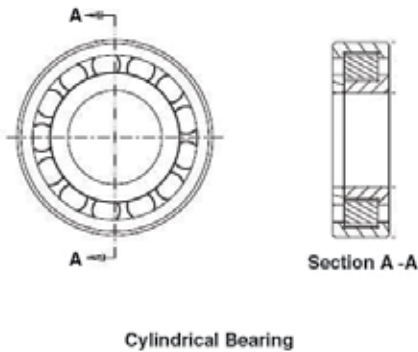
PUMP ASSEMBLY PROCEDURES

For major overhauls, all plugs should be removed, and the seals replaced. Prior to assembly, all parts should be thoroughly cleaned. Assembly should be performed in a clean work environment.

Do not use bearing grease during installation. Grease does not dissolve in hydraulic oil and may plug orifices or filters in the system. Clean petroleum jelly is preferred to lubricate o-rings and seals, and to adhere parts for assembly.

NOTE: For fluids other than petroleum based hydraulic oil, insure that petroleum jelly is compatible with the fluid. If not compatible, another product should be used instead.

Inspect all bearing surfaces and seal areas to insure that they are free from nicks, dings, scratches, and rust.



1. Turn housing over. Using installation tool T1, press the shaft seal in the seal bore. Install the snap ring into the groove in the seal housing bore.
NOTE: Install shaft and bearing on 45 unit before installing shaft seal. T1 tool not used on 45 unit, use T3 tool to insert shaft seal over input shaft.
2. Install cylindrical bearing on pump shaft (slip fit). Install external retaining ring to hold bearing in place on the shaft. Insert shaft assembly into the pump housing with the bearing sliding into the bearing diameter in the housing. Install internal retaining ring into the housing. (See drawing)
3. If barrel hold down spring was removed during disassembly process, install three pins to slots in barrel spline (45 Size only). Petroleum jelly can be used to hold pins in place while installing remaining parts. (Figure 4) Place barrel on fixture with pin side down. Install backup washer and hold down spring and second back up washer. Compress spring in press and install snap ring. Caution: Make sure snap ring is properly seated in groove prior to removing barrel from press.



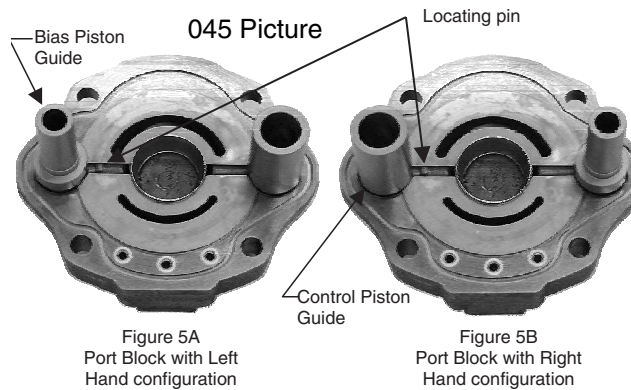
Figure 4

4. Apply a light film of oil into the piston bores. Lightly lubricate the spherical surface of the guide ball. Install the nine pistons into the bores in the hold down plate. Install the spherical guide ball into the hold down plate. While holding the guide ball against the hold down plate, install the pistons into the barrel.

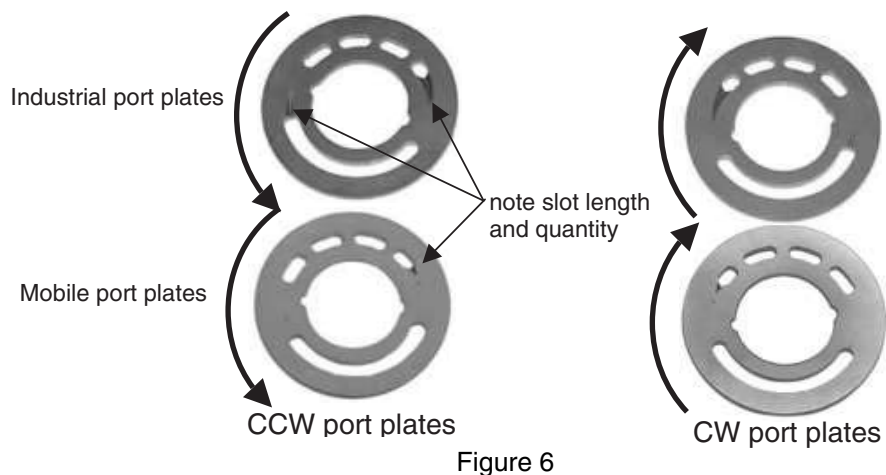
**PUMP ASSEMBLY PROCEDURES
Continued**

Chart 2	
Pump	Control and bias guide torque
018	Press Fit
028	Press Fit
045	142 Nm (105 ft lbs)

5. Install the locating pin on the port block face.
6. For 045: Apply Loctite Primer Grade T to guide threads and allow to dry. Install unlubricated o-rings on the control guide and bias guide. Apply Loctite 271 to guide threads. For left hand rotation the bias guide is installed nearest to the dowel pin (figure 5A.) For right hand rotation the control guide is installed nearest to the dowel pin (figure 5B.) Torque the control and bias guides as specified in Chart 2. For 018, 028: The guides are identical and press fit into the holes. (Not shown in picture below)



7. Apply light oil film to control piston and install it in the control guide bore.
8. Apply light oil film to the bias piston. Install the bias spring and the bias piston in the bias piston guide bore.
9. Apply a light layer of petroleum jelly to the back surface of the port plate. Install the port plate on the port block, lining up the slot on the port plate with the locating pin. (Refer to Figure 6)

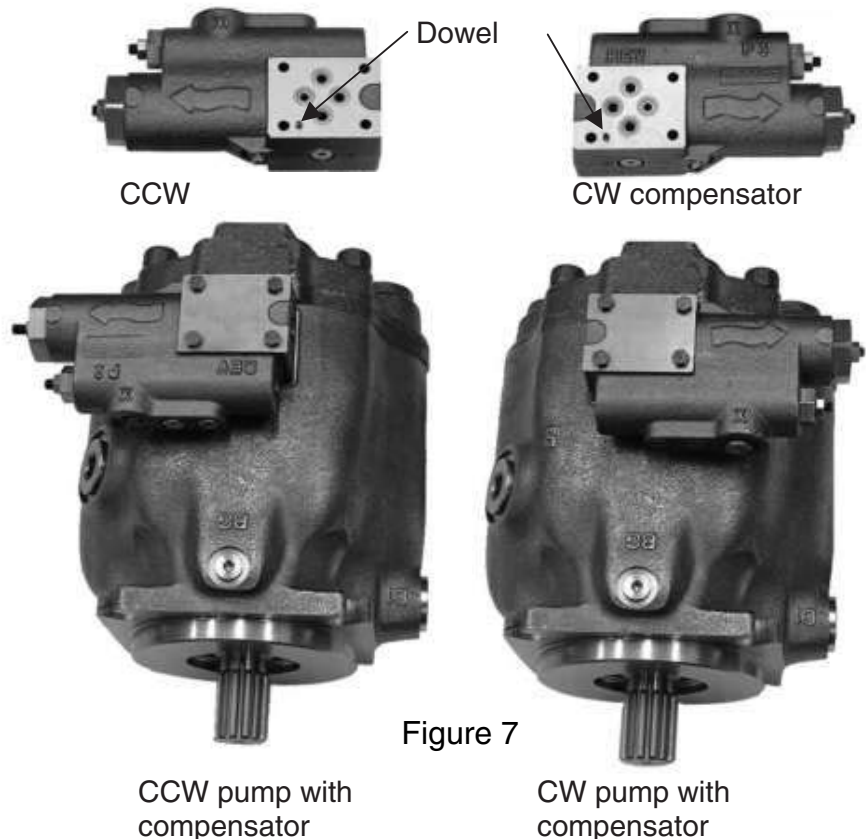


10. Install the large o-ring in the groove on the port block. Install the three teflon o-rings on the pressure communication ports of the port block.

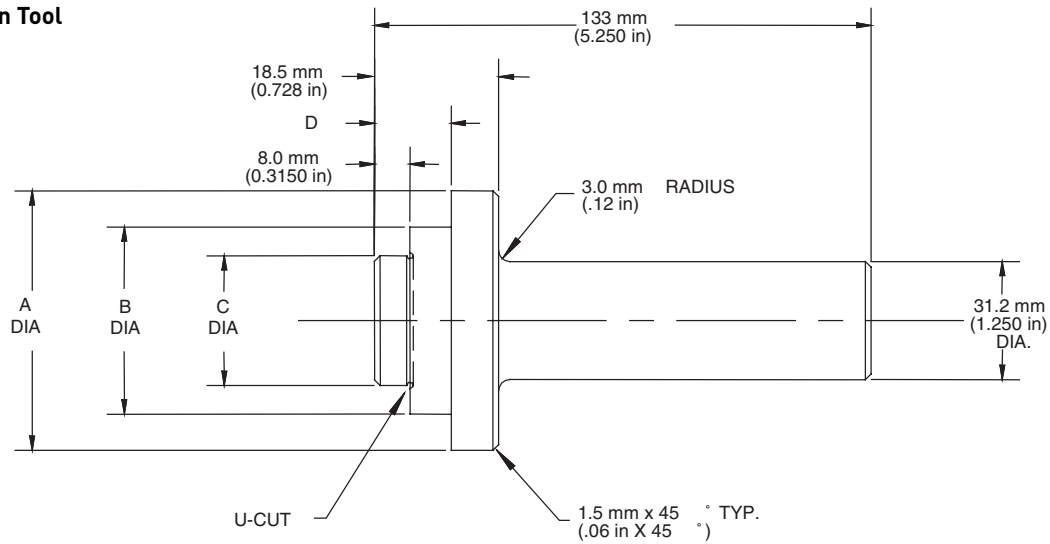
PUMP ASSEMBLY PROCEDURES
Continued

11. Install the cam bearings in the cradle area of the housing. The chamfer on the back of the bearing must face the outer wall of the housing. Use Loctite Primer Grade "T" or other suitable primer on screws and mating threads in housing. Apply Loctite #242 (use sparingly) to screw threads and install orifice screws to hold bearings in place. Torque screws to 3.4 ± 0.25 Nm (33 ± 3 in-lb).
12. Place thin film of clean oil on cam bearing surfaces. Install cam in housing. For 045, the cam must be tilted to permit entry into the housing. (Figure 2)
NOTE: The large pocket on the bottom surface of the cam must be on the same side as the three pressure communication holes on the main housing. Pump rotation does not affect the assembly of the cam.
13. Install the drive shaft into the pump housing. Position pump horizontally. Install the rotating group over the pump shaft. Rotate the barrel to insure that it is seated against the cam. Insure that the pump shaft is seated properly in the front bearing.
14. Confirm that compensator rotation, port plate rotation, control and bias piston location indicate same direction of rotation.
15. Carefully install the assembled port block on the pump housing. Press the port block to compress the bias spring and install housing bolts. Tighten the bolts in a cross pattern to insure the port block does not get cocked on the housing. When port block is seated on the housing, torque bolts in a cross pattern as specified in chart 3.
16. Install o-ring seals and assembled compensator on side of pump housing. Pump rotation is indicated by arrow on compensator housing. Torque bolts to 5 ± 0.25 Nm (45 ± 3 in-lb). (See Figure 7)

Chart 3	
Pump	Housing bolt torque
018	51 Nm (38 ft lbs)
028	70 Nm (52 ft lbs)
045	85 Nm (63 ft lbs)

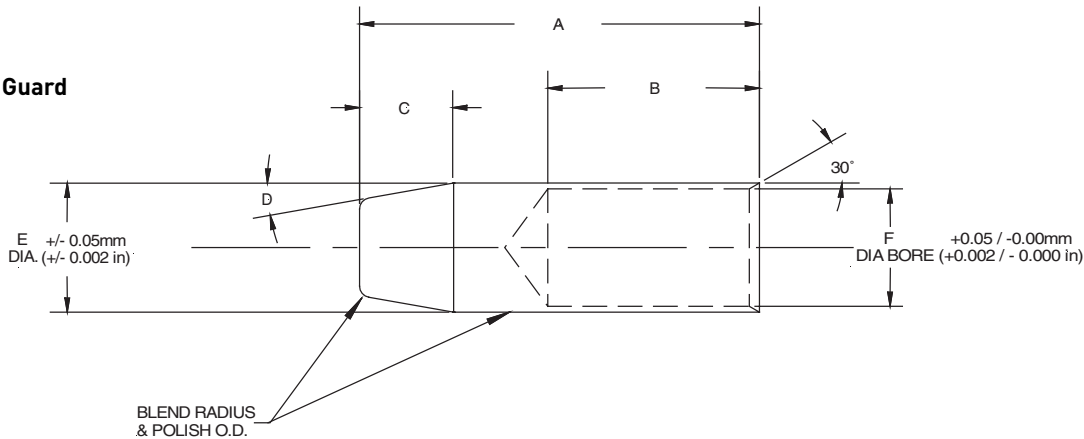


T1 Seal Installation Tool



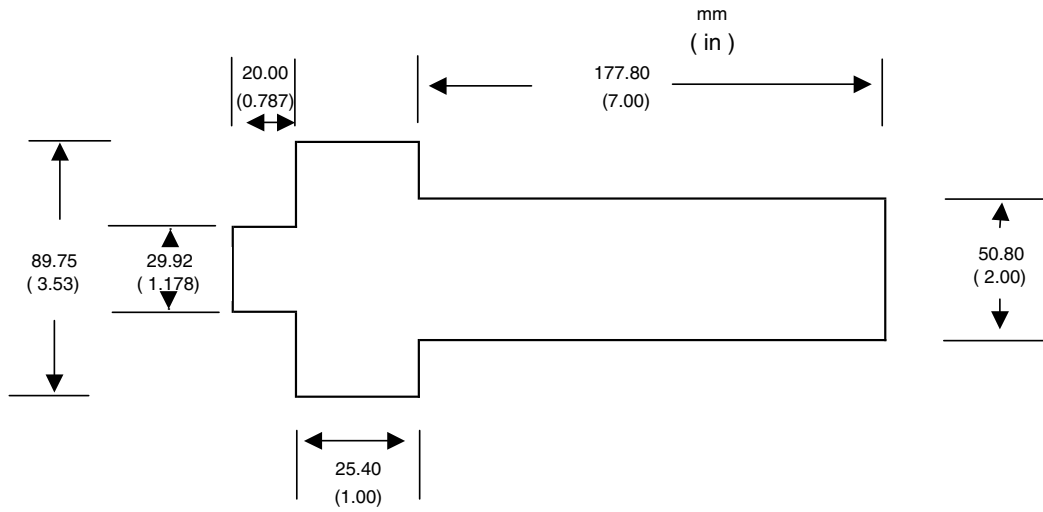
T1 Seal installation tool	A	B	C	D
(018)	2.250	1.62	1.18	0.406
(028)	2.250	2.00	1.378	0.447

T3 Seal Guard

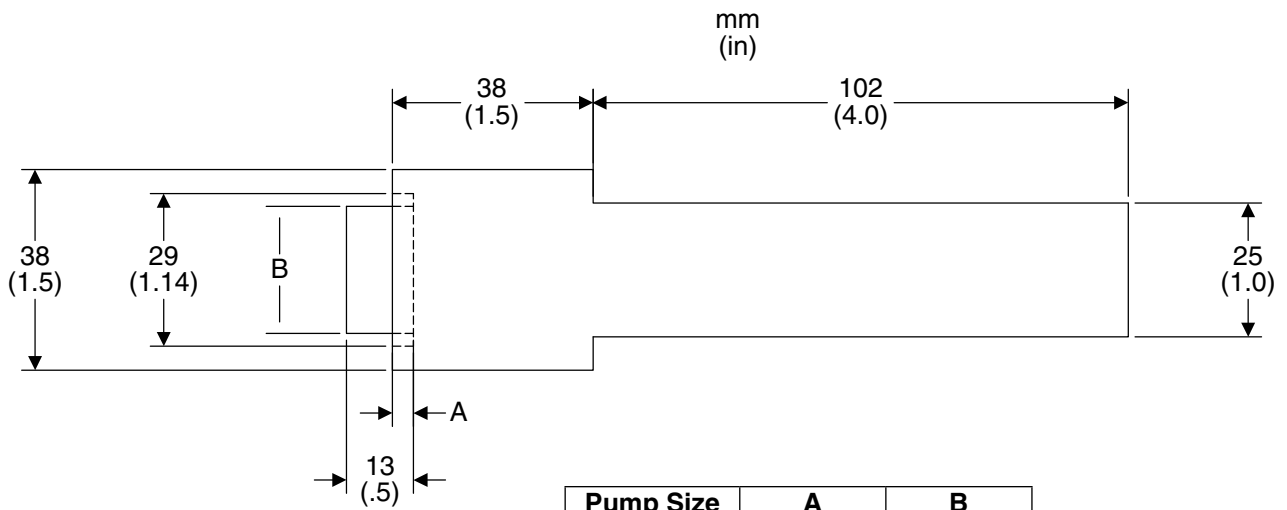


Pump Model	A	B	C	D	E	F
018 "01", "02", "04" Shafts	76.20 mm 3.00 in.	50.80 mm 2.00 in.	19.05 mm 0.75 in.	15°	28.82 mm 1.135 in.	20.45 mm 0.805 in.
018 "06" Shaft	76.20 mm 3.00 in.	50.80 mm 2.00 in.	19.05 mm 0.75 in.	15°	28.82 mm 1.135 in.	16.76 mm 0.66 in.
028 / 045 "01", "02", "04" Shafts	76.20 mm 3.00 in.	50.80 mm 2.00 in.	19.05 mm 0.75 in.	15°	38.10 mm 1.50 in.	26.00 mm 1.024 in.
018/028/045 "08" Shaft	76.20 mm 3.00 in.	50.80 mm 2.00 in.	19.05 mm 0.75 in.	15°	28.82 mm 1.135 in.	22.50 mm 0.885 in.

T2 Front Bearing P1/PD045 Installation Tool



T5 Rear Bushing Installation Tool



Pump Size	A	B
018	3.71 mm 0.146 in.	19.9 mm 0.772 in.
028	4.00 mm 0.157 in.	21.6 mm 0.85 in.
045	4.00 mm 0.157 in.	24.1 mm 0.95 in.

PUMP TEST PROCEDURE

Test criteria based on hydraulic oil ISO 32 per Parker HF-0 specifications.
Oil temperature: 50°C ± 2°C (120°F ± 10°F). **NOTE:** insure that the hydraulic system does not overheat during this test procedure.

Operating speed: 0 - 2300 rpm ± 30 rpm.
Case pressure: Maximum 14.5 psi (1 bar)

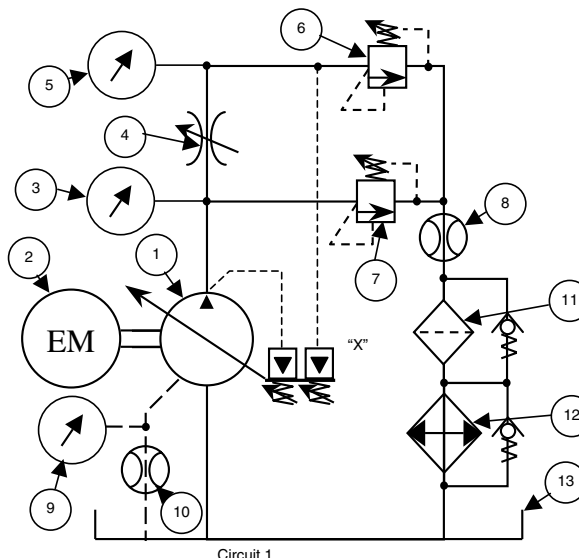
1. Mount pump on test fixture. Insure that shaft alignment is within specified tolerances.
2. Fill case with clean oil. Connect upper drain port to reservoir with no restrictions. Insure other drain ports are properly plugged.
3. Connect inlet and pressure lines. Insure that lines are filled with oil. Refer to circuit below. For units with "L" compensators, connect a suitable pilot line from port "X" to the pump discharge pressure line, down stream of the non-compensating flow valve.
4. Confirm direction of rotation for pump and drive are correct.
5. Reduce the main compensator setting to minimum. For units with "L" compensators, advance the load sense compensator adjustment until it bottoms out, and lock into position.
6. Set maximum volume stop (if included) to full displacement. If minimum volume stop is included, back adjustment all of the way out.
7. If possible, gradually increase pump speed to 1800 ± 30 rpm with no load.
8. Screw in compensator adjusting screw until it bottoms out, with no pressure on system load-relief valve.
9. Break-in pump at times and pressures listed below. Adjust the load-relief valve to the pressure listed for the times indicated. After break-in, reduce compensator setting to 280 bar (4060 psi), and adjust system load relief to cause pump to compensate three times to verify that pump compensates on and off stroke properly.

Time	30 seconds	30 seconds	30 seconds
Pressure	62-69 Bar 900-1000 psi	200-207 Bar 2900-3000 psi	269-276 Bar. 3900-4000 psi

TEST CIRCUIT

1. Test pump
2. Test stand prime mover
3. Pump pressure gauge
4. Non-compensating flow control
5. Load pressure gauge
6. Load relief valve
7. Safety bypass relief valve
8. Main flow meter
9. Case drain pressure gauge
10. Case drain flow meter
11. Filter assembly with bypass
12. Cooler assembly with bypass
13. Reservoir

NOTE: Items 4 and 5 are required for load sense pump test.



PERFORMANCE SPECIFICATIONS PUMP WITH PRESSURE COMPENSATOR				
STEP REFERENCE	CONDITION	018	028	045
1	Rated Speed	1800	1800	1800
4	Output Flow at minimum pressure	32 lpm minimum	49 lpm minimum	80 lpm minimum
5	Output Flow at rated pressure of 280 bar	30 lpm minimum	47 lpm minimum	77 lpm minimum
6	Case leakage at rated pressure of 280 bar	1.6 lpm	2.3 lpm	5.3 lpm
9*	Case leakage when compensated at 280 bar	5.7 lpm	5.7 lpm	9.5 lpm
10	Input Torque when compensated at 280 bar	17.5 Nm	21.2 Nm	42 Nm
11	Output Flow when pressure reduced to 273 bar with compensator set at 280 bar	30 lpm minimum	47 lpm minimum	77 lpm minimum

* When using the A series compensators increase compensated case leakage by 2.3 lpm

TEST PROCEDURE PUMP WITH PRESSURE COMPENSATOR			
STEP REFERENCE	CONDITION	REQUIRED VALUE	MEASURED VALUE
1	Set the pump speed to 1800 RPM	1800 rpm	
2	Increase pump pressure compensator adjustment to maximum.	n/a	
3	Record input oil temperature	43-54 ° C (110 – 130 ° F)	
4	Set output load pressure to minimum. Record output flow	see performance chart	
5	Set output load pressure to 280 ± 2 bar (4060 ± 30 psi). Record output flow	see performance chart	
6	Record case leakage	see performance chart	
7	Set output pressure to 290 ± 2 bar (4200 ± 30 psi)	n/a	
8	Set pressure compensator to 280 ± 2 bar (4060 ± 30 psi)	n/a	
9	Record case leakage	see performance chart	
10	Record input torque	see performance chart	
11	Reduce output pressure to 273 ± 2 bar (3960 ± 30 psi). Record output flow	see performance chart	
12	Verify no external leaks	No leakage permitted	

PUMP DISASSEMBLY NOTES

- A. Pump disassembly for inspection should be limited to the following cases:
 - a) Malfunction or oil leakage resulting from damage or wear and tear.
 - b) Trouble-shooting procedures previously listed do not solve the problem.

Caution: Spring assemblies in the pump are normally set under high compression and bodily injury may occur if caution is not taken during disassembly.

- B. For rotation change or shaft conversion, disassembly should be done only as far as necessary to complete conversion.
- C. Disassembly and reassembly should be performed in a clean environment.
- D. It is usually not necessary to replace spring (20) fitted in cylinder barrel. Do not replace the spring unless absolutely necessary.
- E. After disassembly, the internal parts should be coated with a film of clean oil and protected from dirt and moisture.
- F. It is recommended that the length of the protruding portion of the compensator adjusting screws, be measured and noted, as this information will prove useful during assembly.
- G. Care must be taken to avoid dropping, damaging or contaminating the machined parts and the control valve.
- H. For complete overhaul, all o-rings and seals should be discarded and replaced.

PUMP DISASSEMBLY PROCEDURE

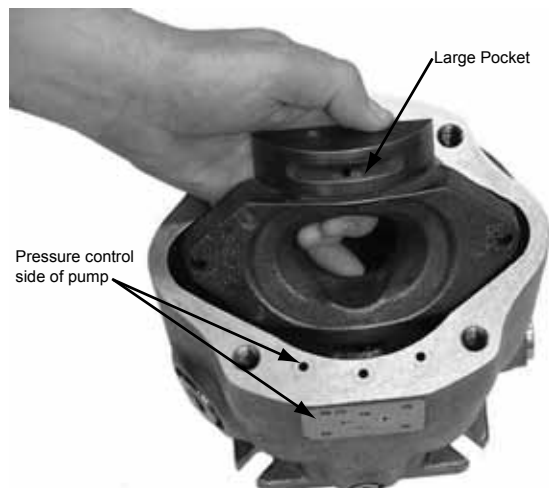
1. Identify the pump from information on the data tag. Figure 1
2. Drain fluid from housing. Fluid drained from pump should be disposed of properly.
3. Mount pump in fixture to prevent movement while removing main housing bolts
4. Remove bolts holding the compensator assembly on the pump housing. Additional fluid may drain out of the passages when the compensator is removed. Set compensator aside for later disassembly and inspection
5. Remove the bolts attaching the port block to the main housing.



Figure 1 Pump Data Tag

PUMP DISASSEMBLY PROCEDURE
(continued)

6. Carefully remove the port block. Use caution to avoid dropping the port plate. Note the location of the bias spring - piston assembly and the control piston assembly. The control piston, bias piston and bias spring may remain in pump when port block is removed. Remove and discard the three white Teflon seals on the port block. These seals should be replaced each time the pump is disassembled.
7. Remove the control piston and the bias piston - spring assembly.
NOTE:
For rotation change only do not disassemble further, proceed to step 16.
8. Remove the tapered roller bearing cone and shim from the end of the shaft.
9. Position the pump horizontally and remove the rotating group. Avoid separating the pistons from the barrel if possible. This will assist in identifying damage between an individual piston and bore during component inspection.
10. Remove the drive shaft.
NOTE : For shaft change only, no further disassembly is required. Proceed to assembly procedure step 5.
11. Remove the cam by rotating it 90 degrees and carefully extracting it from the pump housing. Note the large pocket under the cam fits on the pressure control side of the pump housing (same side as the three seals on the housing flange). Figure 2
12. Remove the front tapered roller bearing cone.
13. If there is excessive wear or damage, remove the tapered roller bearing cup from the bottom of the housing.
14. If completing a seal change or complete overhaul, turn the housing over and remove the snap ring and shaft seal from the housing. Note: do not reuse the shaft seal.
15. If there is excessive wear on the port block bearing cup, cone, or both; remove the tapered roller bearing cup from the port block.
16. If complete overhaul or rotation change, remove control piston and bias piston guides. The control piston and bias piston guides are installed with anerobic thread lock. Place the port block with piston guides in oven at 163° C (325° F)
NOTE: To prevent annealing of heat treated surfaces: DO NOT USE A TORCH TO HEAT PISTON GUIDES.



PUMP INSPECTION PROCEDURE

Carefully clean and dry all parts prior to inspection.

Refer to chart 1 for dimensional information regarding allowable tolerances.

1. Examine piston diameters for scratches or gouges. If any piston is severely damaged, note which piston bore it came out of. Extra attention should be given to that bore in step 2. Check end play of piston shoe assembly. Check the bottom surface of the shoes for damage. The shoe surface should be square and flat. Measure the thickness of the shoe. Shoes may be lapped as a set if the thickness is within allowable limits. Confirm shoe thickness after lapping to insure it is still within limits.
2. Examine bores in cylinder for scratches. Check diameter of bores in 4 different locations, including near the bottom of the barrel where the piston does not travel. If the dimensions vary by more than 0.0102 mm (0.0004 in.) or any dimension exceeds the allowable limit, the barrel needs to be replaced. Examine the barrel face for scratches and gouges. The barrel can be reworked if dimensions are within specifications listed in chart 1.
3. The port plate can be lapped lightly if the face is only lightly scratched, otherwise it should be replaced.
4. Examine the retainer plate in the area of contact with the piston shoes. Any marks beyond light polishing indicate that replacement is necessary. Check the surface of the spherical area of the retainer plate and the spherical guide ball. Inspect the back surface of the spherical guide ball where the load pins make contact. If indentations are present replace the guide ball.
5. Examine cam on top and bottom surface. If scratches or gouges appear to penetrate the surface treatment, the cam must be replaced.
6. The cam bearings cannot be reworked and should be replaced if worn through the Teflon surface.
7. Both the bias piston and the compensator piston should move freely in their respective bores. The pistons and bores should be free of scratches or gouges.
8. The seal area of the drive shaft should be smooth and not have marks due to seal wear. The bearing surfaces should not have any indication of the bearing cone spinning on the shaft. Keyed shafts should be inspected for signs of brinelling and damage to the key area. Splined shafts may have a contact wear pattern but should not show excessive wear on the spline area.

CHART 1 REWORK LIMITS						
Item Number	Component	Part number				Tolerances
		060	075	100	140	
13 <i>Page 20</i>	Bias spring	03E-94055-0	03E-93151-0 141.5 mm (5.57 in.)	03E-93801-0 174.6 mm (6.87 in.)	03E-93963-0 212.3 mm (8.36 in.)	Free height: ± 0.51mm (± 0.020 in.)
20 <i>Page 20</i>	Barrel hold down spring	03E-94049-0	03E-93145-0 63.7 mm (2.50 in.)	03E-93795-0 72.2 mm (2.84 in.)	03E-93959-0 68.6 mm (2.70 in.)	Free height: ± 0.51 mm (± 0.020 in.)
23 <i>Page 20</i>	Barrel	03E-94036-0	03E-93129-0	03E-93783-0	03E-93242-0	Measure piston bore diameters in 3 places at the top, middle, and bottom. The measurements should not vary by not more than 0.010 mm (0.0004 in.) Maximum material to be removed when lapping is 0.0051 mm (0.0002 in.)
26 <i>Page 20</i>	Piston and shoe assembly Sold in sets only	03E-94036-0 Maximum end play 0.10 mm (0.004 in.) Minimum shoe flange thickness 5.91 mm (0.233 in.)	S2E-17003-0 Maximum end play 0.10 mm (0.004 in.) Minimum shoe flange thickness 5.91 mm (0.233 in.)	S2E-17912-0 Maximum end play 0.13 mm (0.005 in.) Minimum shoe flange thickness 6.41 mm (0.252 in.)	S2E-17323-0 Maximum end play 0.13 mm (0.005 in.) Minimum shoe flange thickness 6.41 mm (0.252 in.)	Measure piston outside diameter in 3 places at the top, middle, and bottom. The measurements should not vary by more than 0.0102 mm (0.0004 in) End play between piston and shoe should not exceed values shown. Total material allowed to be removed from shoe face when lapping is 0.076mm (0.003 in)

PUMP ASSEMBLY PROCEDURE

For major overhauls, all plugs should be removed, and the seals replaced. Prior to assembly, all parts should be thoroughly cleaned. Assembly should be performed in a clean work environment.

Do not use bearing grease during installation. Grease does not dissolve in hydraulic oil and may plug orifices or filters in the system. Clean petroleum jelly is preferred to lubricate o-rings and seals, and to adhere parts for assembly.

NOTE: For fluids other than petroleum based hydraulic oil, insure that petroleum jelly is compatible with the fluid. If not compatible, another product should be used instead.

Inspect all bearing surfaces and seal areas to insure that they are free from nicks, dings, scratches, and rust.

1. Using installation tool T2, press the front bearing cup into the bottom of the housing. Make sure the cup is seated firmly against the bottom of the housing.
2. Turn housing over. Using installation tool T1, press the shaft seal in the seal bore. Install the snap ring into the groove in the seal housing bore.
3. Using installation tool T5, press the rear bearing cup into the port block. Insure that the cup is seated firmly against the bottom of the housing.
4. Install the front bearing cone and shaft into the housing.
5. Install the rear bearing cone on the shaft.
6. Install the port block onto the housing using housing bolts and tighten to 27 ± 1.3 Nm (20 ± 1 ft. lb.).
7. Position the pump so shaft end is up.
8. Lay a parallel bar on the pump pilot.
9. Press down on the shaft and rotate it 3-5 times then measure the height of the shaft end to the parallel bar using dial calipers or a dial indicator.
10. Grasp the shaft and pull it up and rotate it 3-5 times. Measure the height of the shaft end to the parallel bar. Note: if the shaft slips or falls, the steps must be repeated to get an accurate measurement. Figure 3
11. Subtract the larger from the smaller to get the differential gap.
12. Repeat the procedure three times. Once recorded, take the average of the three measurements.
13. With the average, use chart 2 to determine the correct shim to install in the pump.
14. Rebuild the pump with the shaft bearings, and selected shim. Check end play, then disassemble port block and continue with pump assembly.
15. If barrel hold down spring was removed during disassembly process, install three pins to slots in barrel spline. Petroleum jelly can be used to hold pins in place while installing remaining parts. Place barrel on fixture with pin side down. Install backup washer and hold down spring. Compress spring in press and install snap ring.

Caution: Make sure snap ring is properly seated in the groove prior to removing the barrel from the press.

**PUMP ASSEMBLY PROCEDURE
Continued**

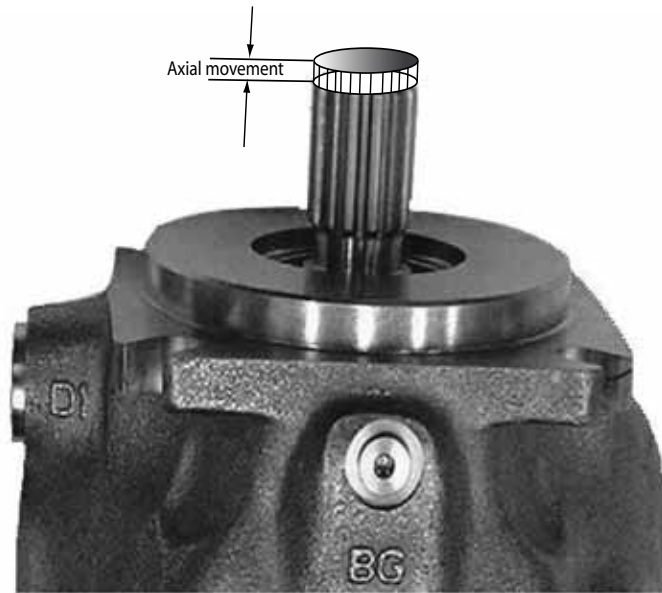


Figure 3

Chart 2: Shim Thickness Selection					
Measured Differential		Shim Thickness	Displacement		
Minimum	Maximum		060/075	100	140
3.07 mm (.121 in)	3.12 mm (.123 in)	3.04 mm (.1196 in)	03E-95262-0	03E-95268-0	03E-95265-0
3.15 mm (.124 in)	3.22 mm (.126 in)	3.12 mm (.1228 in)	03E-95263-0	03E-95269-0	03E-95266-0
3.23 mm (.127 in)	3.29 mm (.129 in)	3.20 mm (.1259 in)	03E-95264-0	03E-95270-0	03E-95267-0
3.30 mm (.130 in)	3.36 mm (.132in)	3.28 mm (.1291 in)	03E-93180-0	03E-94148-0	03E-93260-0
3.37 mm (.133 in)	3.44 mm (.135 in)	3.36 mm (.1323 in)	03E-93566-0	03E-94149-0	03E-93970-0
3.45 mm (.136 in)	3.51mm (.138 in)	3.44 mm (.1354in)	03E-93567-0	03E-94150-0	03E-93971-0
3.52 mm (.139in)	3.62 mm (.142 in)	3.52 mm (.1386 in)	03E-93568-0	03E-94151-0	03E-93972-0
3.63 mm (.143 in)	3.70 mm (.145 in)	3.60 mm (.1417 in)	03E-93569-0	03E-94152-0	03E-93973-0
3.71 mm (.146 in)	3.77 mm (.148 in)	3.68 mm (.1449 in)	03E-93570-0	03E-94153-0	03E-93974-0
3.78 mm (.149 in)	3.85 mm (.151 in)	3.76 mm (.1480 in)	03E-93571-0	03E-94154-0	03E-93975-0
3.86 mm (.152 in)	3.92 mm (.154 in)	3.84 mm (.1512 in)	03E-93572-0	03E-94155-0	03E-93976-0
3.93 mm (.155 in)	4.00 mm (.157 in)	3.92 mm (.1539 in)	03E-93573-0	03E-94156-0	03E-93977-0
4.01 mm (.158 in)	4.10 mm (.161 in)	4.00 mm (.1575 in)	03E-93574-0	03E-94157-0	03E-93978-0
4.11 mm (.162 in)	4.18 mm (.164 in)	4.08 mm (.1606 in)	03E-93575-0	03E-94158-0	03E-93979-0
4.19 mm (.165 in)	4.25 mm (.167 in)	4.16 mm (.1638 in)	03E-93576-0	03E-93864-0	03E-93980-0
Shim Kits:			S2E-18591-0K	S2E-18640-0K	S2E-18527-0K

**PUMP ASSEMBLY PROCEDURE
Continued**

Chart 3	
Pump	Control and Bias Guide Torque
060	142 ± 6.5 Nm (105 ± 5 ft-lbs)
075	142 ± 6.5 Nm (105 ± 5 ft-lbs)
100	184 ± 8 Nm (136 ± 6 ft-lbs)
140	203 ± 8 Nm (170 ± 6 ft-lbs)

16. Apply a light film of oil into the piston bores. Lightly lubricate the spherical surface of the guide ball. Install the nine pistons into the bores in the hold down plate. Install the spherical guide ball into the hold down plate. While holding the guide ball against the hold down plate, install the pistons into the barrel.
17. Install the locating pin on the port block face.
18. Apply Loctite Primer 7469 to the guide threads and allow to dry. Install unlubricated o-rings on the control guide and bias guide. Apply Loctite 272 to the guide threads. For right hand rotation the control guide is installed nearest to the dowel pin (figure 4A). For left hand rotation the bias guide is installed nearest to the dowel pin (figure 4B). Torque the control and bias guides as specified in Chart 3

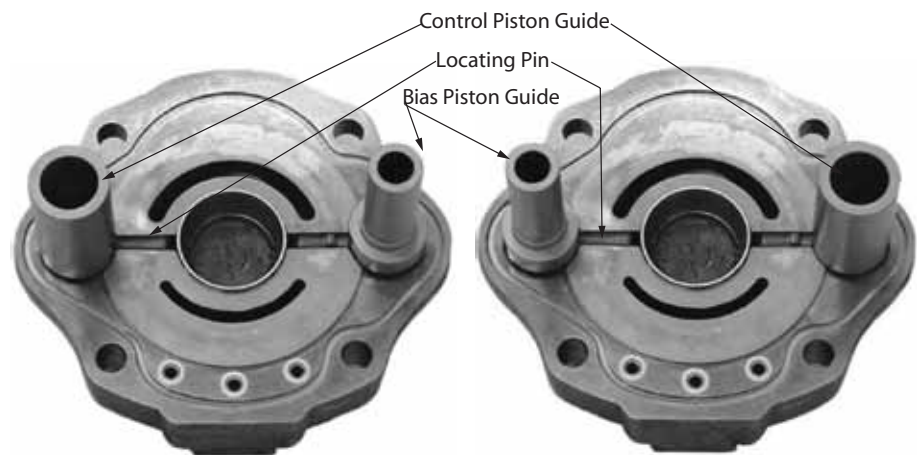


Figure 4A
Port block with
Right Hand configuration

Figure 4B
Port Block with
Left Hand configuration

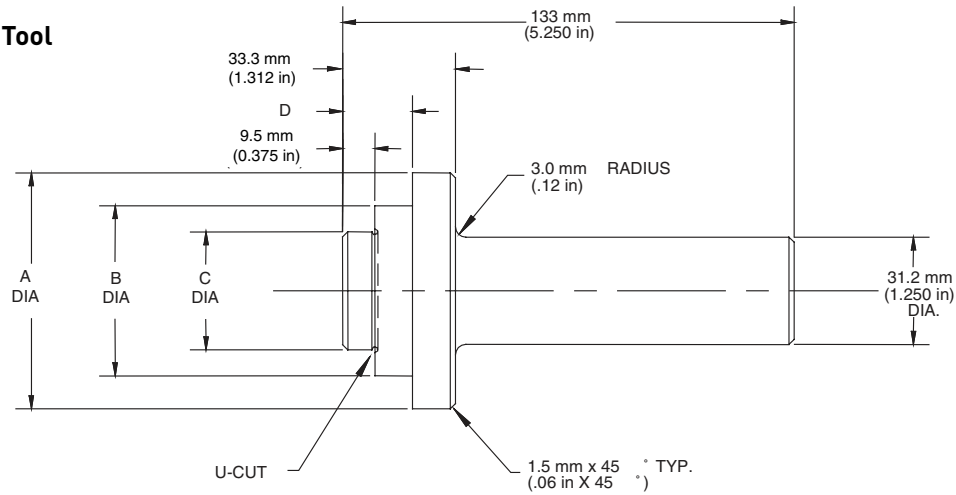
19. Apply light oil film to control piston and install it in the control guide bore.
NOTE: The 140 size has a lubrication hole in the piston. Confirm that the hole is facing the port block. The control piston has nonsymmetrical lubrication grooves. The end with the closest grooves must be installed towards the port block.
20. Apply light oil film to the bias piston. Install the bias spring and the bias piston in the bias piston guide bore.
21. Apply a light layer of petroleum jelly to the back surface of the port plate. Install the port plate on the port block, lining up the slot on the port plate with the locating pin.

**PUMP ASSEMBLY PROCEDURE
Continued**

Chart 4	
Pump	Housing Bolt Torque
060	135.6 ± 5 Nm (100 ± 4 ft-lbs)
075	135.6 ± 5 Nm (100 ± 4 ft-lbs)
100	229 ± 7 Nm (170 ± 5 ft-lbs)
140	278 ± 7 Nm (205 ± 5 ft-lbs)

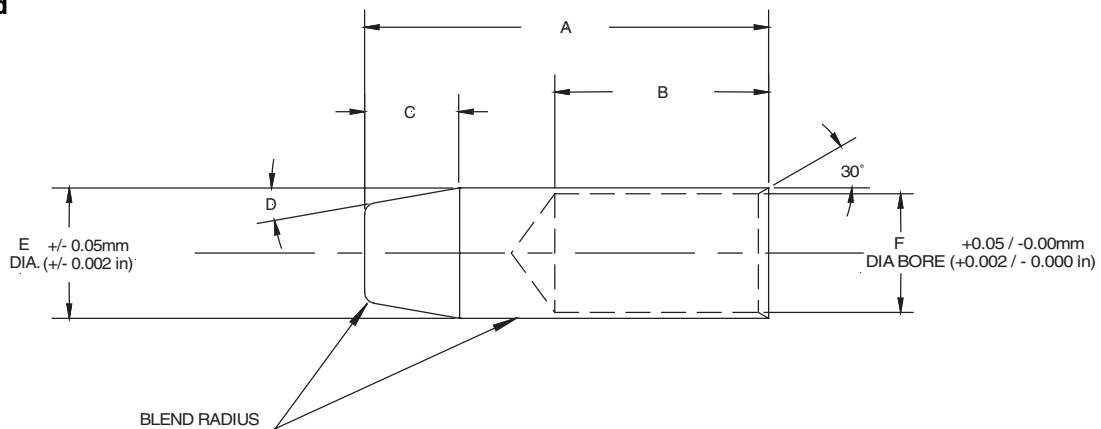
22. Install the large o-ring in the groove on the pump port block. Install the three white Teflon o-rings in the pressure communication ports on the pump housing.
23. Install the cam bearings in the cradle area of the housing. The chamfer on the back of the bearing must face the outer wall of the housing. Use Loctite Primer Grade "T" or other suitable primer on screws and mating threads in housing. Apply Loctite #242 (use sparingly) to screw threads and install orifice screws to hold bearings in place. Torque screws to 3.4 ± 0.25 Nm (33 ± 3 in-lb).
24. Place thin film of clean oil on cam bearing surfaces. Install cam in housing. The cam must be tilted to permit entry into the housing. (Figure 2) NOTE: The large pocket on the bottom surface of the cam must be on the same side as the three pressure communication holes on the main housing. Pump rotation does not affect the assembly of the cam.
25. Install the drive shaft into the pump housing. Position pump horizontally. Install the rotating group over the pump shaft. Rotate the barrel to insure that it is seated against the cam. Insure that the pump shaft is seated properly in the front bearing.
26. Install bearing spacer as determined from the chart (see step 11.) Install the rear bearing on the drive shaft.
27. Confirm that compensator rotation, port plate rotation, control and bias piston location indicate same direction of rotation.
28. Carefully install the assembled port block on the pump housing. Press the port block to compress the bias spring and install housing bolts. Tighten the bolts in a cross pattern to insure the port block does not get cocked on the housing. When port block is seated on the housing, torque bolts in a cross pattern as specified in chart 4.
29. Install o-ring seals and assembled compensator on side of pump housing. Pump rotation is indicated by arrow on compensator housing. Torque bolts to 5 ± 0.25 Nm (45 ± 3 in-lb).

T1 Seal Installation Tool



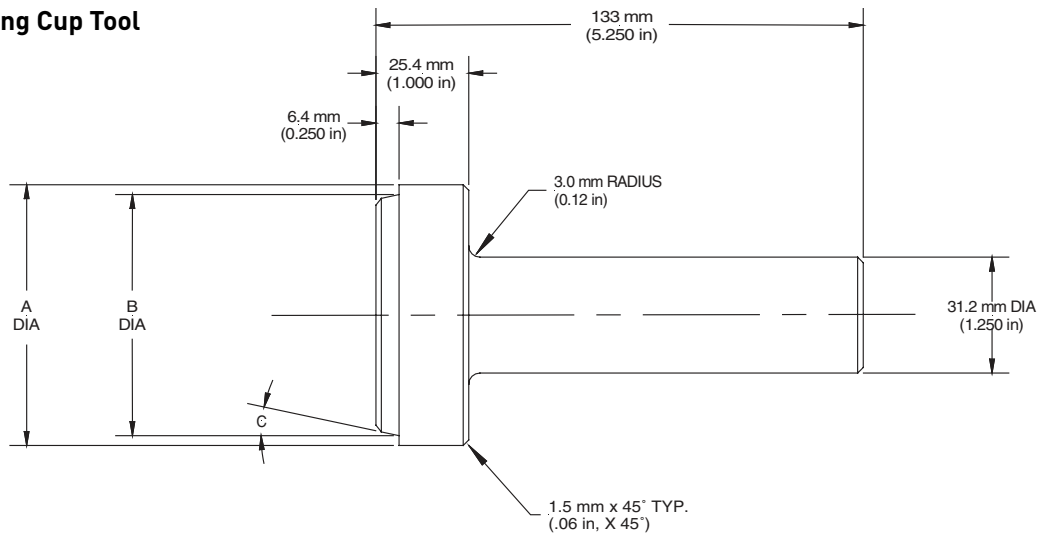
Pump Model	Part Number	A	B	C	D
060 & 075	213-0-004194	69.9 mm (2.750 in)	50.3 mm (1.980 in)	34.9 mm (1.375 in)	20.3 mm (0.800 in)
100	213-0-004208	63.5 mm (2.50 in)	56.6 mm (2.230 in)	43.3 mm (1.703 in)	14.0 mm (0.550 in)
140	213-0-004199	85.7 mm (3.375 in)	70.6 mm (2.780 in)	53.4 mm (2.10 in)	19.1 mm (0.750 in)

T3 Seal Guard



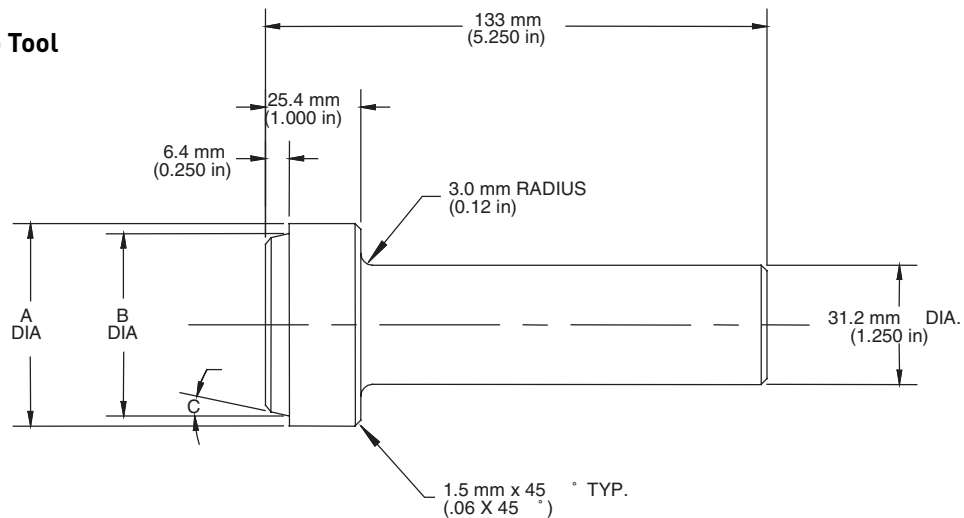
Pump Model	Part Number	A	B	C	D	E	F
060 & 075	213-0-004195	108 mm (4.25 in)	57.1 mm (2.25 in)	25.4 mm (1.00 in)	10°	34.90 mm (1.373 in)	31.75 mm (1.250 in)
100 SAE	213-0-004206	108 mm (4.25 in)	70.6 mm (2.78 in)	25.4 mm (1.00 in)	10°	43.26 mm (1.703 in)	38.1 mm (1.500 in)
100 ISO	213-0-004207	114 mm (4.50 in)	76.2 mm (3.00 in)	22.4 mm (0.88 in)	15°	43.26 mm (1.703 in)	40.06 mm (1.577 in)
140 SAE	213-0-004200	108 mm (4.25 in)	70.6 mm (2.78 in)	25.4 mm (1.00 in)	10°	53.04 mm (2.088 in)	44.48 mm (1.751 in)
140 ISO	213-0-004201	114 mm (4.50 in)	76.2 mm (3.00 in)	22.4 mm (0.88 in)	15°	53.04 mm (2.088 in)	50.04 mm (1.970 in)

T2 Front Bearing Cup Tool



Pump Model	Part Number	A	B	C
060 & 075	213-0-004192	71.4 mm (2.812 in)	66.0 mm (2.60 in)	12°
100	213-0-004204	92.1 mm (3.623 in)	86.1 mm (3.390 in)	15°
140	213-0-004197	93.7 mm (3.687 in)	89.3 mm (3.515 in)	15°

T5 Rear Bearing Cup Tool



Pump Model	Part Number	A	B	C
060 & 075	213-0-004193	53.8 mm (2.120 in)	48.7 mm (1.918 in)	12°
100	213-0-004205	65.1 mm (2.562 in)	59.3 mm (2.335 in)	15°
140	213-0-004198	71.1 mm (2.80 in)	65.1 mm (2.562 in)	15°

PUMP TEST PROCEDURE

Test criteria based on hydraulic oil ISO 32 per Parker HF-0 specifications.
Oil temperature: 50°C ± 2°C (120°F ± 10°F). **NOTE:** insure that the hydraulic system does not overheat during this test procedure.

Operating speed: 0 - 2300 rpm ± 30 rpm.

Case pressure: Maximum 14.5 psi (1 bar)

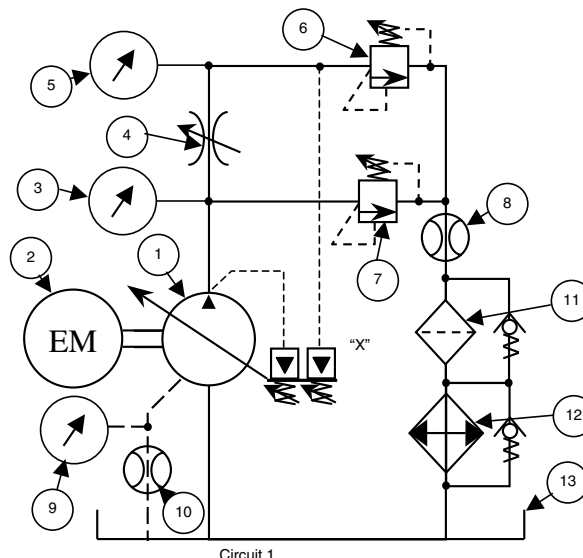
1. Mount pump on test fixture. Insure that shaft alignment is within specified tolerances.
2. Fill case with clean oil. Connect upper drain port to reservoir with no restrictions. Insure other drain ports are properly plugged.
3. Connect inlet and pressure lines. Insure that lines are filled with oil. Refer to circuit below. For units with "L" compensators, connect a suitable pilot line from port "X" to the pump discharge pressure line, down stream of the non-compensating flow valve.
4. Confirm direction of rotation for pump and drive are correct.
5. Reduce the main compensator setting to minimum. For units with "L" compensators, advance the load sense compensator adjustment until it bottoms out, and lock into position.
6. Set maximum volume stop (if included) to full displacement. If minimum volume stop is included, back adjustment all of the way out.
7. If possible, gradually increase pump speed to 1800 ± 30 rpm with no load.
8. Screw in compensator adjusting screw until it bottoms out, with no pressure on system load-relief valve.
9. Break-in pump at times and pressures listed below. Adjust the load-relief valve to the pressure listed for the times indicated. After break-in, reduce compensator setting to 280 bar (4060 psi), and adjust system load relief to cause pump to compensate three times to verify that pump compensates on and off stroke properly.

Time	30 seconds	30 seconds	30 seconds
Pressure	62-69 Bar 900-1000 psi	200-207 Bar 2900-3000 psi	269-276 Bar 3900-4000 psi

TEST CIRCUIT

1. Test pump
2. Test stand prime mover
3. Pump pressure gauge
4. Non-compensating flow control
5. Load pressure gauge
6. Load relief valve
7. Safety bypass relief valve
8. Main flow meter
9. Case drain pressure gauge
10. Case drain flow meter
11. Filter assembly with bypass
12. Cooler assembly with bypass
13. Reservoir

NOTE: Items 4 and 5 are required for load sense pump test.



PERFORMANCE SPECIFICATIONS PUMP WITH PRESSURE COMPENSATOR					
STEP REFERENCE	CONDITION	060	075	100	140
1	Rated Speed (RPMK)	1800	1800	1800	1800
4	Output Flow at minimum pressure	102 - 108 lpm	132 - 135 lpm	174 - 182 lpm	243 - 257 lpm
5	Output Flow at rated pressure of 280 bar	95 lpm min.	126 lpm min.	165 lpm min.	233 lpm min.
6	Case leakage at rated pressure of 280 bar	4.5 lpm min.	7.5 lpm min.	9 lpm min.	14 lpm min.
9*	Case leakage when compensated at 280 bar	11 lpm max.	15.1 lpm max.	15.9 lpm max.	16.7 lpm max.
10	Input Torque when compensated at 280 bar	38.9 Nm max.	49.6 Nm max.	67 Nm max.	96.6 Nm max.
11	Output Flow when pressure reduced to 273 bar with compensator set at 280 bar	99 lpm min.	126 lpm min.	165 lpm min.	233 lpm min.

* When using the A series compensators increase compensated case leakage by 2.3 lpm

TEST PROCEDURE PUMP WITH PRESSURE COMPENSATOR			
STEP REFERENCE	CONDITION	REQUIRED VALUE	MEASURED VALUE
1	Set the pump speed to 1800 RPM	1800 rpm	
2	Increase pump pressure compensator adjustment to maximum.	n/a	
3	Record input oil temperature	43-54 ° C (110 – 130 °F)	
4	Set output load pressure to minimum. Record output flow	see performance chart	
5	Set output load pressure to 280 ± 2 bar (4060 ± 30 psi). Record output flow	see performance chart	
6	Record case leakage	see performance chart	
7	Set output pressure to 290 ± 2 bar (4200 ± 30 psi)	n/a	
8	Set pressure compensator to 280 ± 2 bar (4060 ± 30 psi)	n/a	
9	Record case leakage	see performance chart	
10	Record input torque	see performance chart	
11	Reduce output pressure to 273 ± 2 bar (3960 ± 30 psi). Record output flow	see performance chart	
12	Verify no external leaks	No leakage permitted	

PERFORMANCE SPECIFICATIONS PUMP WITH LOAD SENSE COMPENSATOR					
STEP REFERENCE	CONDITION	060	075	100	140
1	Rated Speed (RPM)	1800	1800	1800	1800
4	Load sense output flow setting at 50 ± 2 bar (725 ± 30 psi)	60-63 lpm	77-79 lpm	103 - 105 lpm	145-147 lpm
5	Allowable flow variation from 50 to 260 ± 2 bar (725 to 3770 ± 30 psi)	56-66 lpm	73-83 lpm	99-109 lpm	136-156 lpm

TEST PROCEDURE PUMP WITH LOAD SENSE COMPENSATOR			
STEP REFERENCE	CONDITION	REQUIRED VALUE	MEASURED VALUE
1	Set the pump speed to 1800 RPM	1800 rpm	
2	Record input oil temperature	$43-54$ ° C ($110 - 130$ °F)	
3A	Set output load pressure to 50 ± 2 bar (725 ± 30 psi)	n/a	n/a
3B	Adjust throttle valve and adjust differential setting until pressure at pump outlet is 20 ± 2 bar (290 ± 30 psi) higher than the load pressure gage	n/a	n/a
4	Adjust throttle valve to required flow rate. Adjust output load pressure valve if necessary to maintain 50 ± 2 bar (725 ± 30 psi)	See performance chart	
5	Increase the output pressure to 260 ± 2 bar (3770 ± 30 psi). Verify that the flow remains within specified limits.	See performance chart	
6	Lock the load sense adjustment screw. Confirm differential pressure at 20 ± 2 bar (290 ± 30 psi).	n/a	n/a
7	Verify no external leaks	No leakage permitted	

CONVERSION FACTORS

DEFINITION & UNIT

displacement	$\text{in}^3/\text{rev} \times 16.387 = \text{cm}^3/\text{rev}$	$\text{cm}^3/\text{rev} \times 0.06102 = \text{in}^3/\text{rev}$
flow	$\text{gpm} \times 3.78 = \text{L}/\text{min}$	$\text{L}/\text{min} \times 0.2642 = \text{gpm}$
power	$\text{hp} \times 0.7457 = \text{kW}$	$\text{kW} \times 1.341 = \text{hp}$
torque	$\text{lb-ft} \times 1.3567 = \text{Nm}$	$\text{Nm} \times 0.7376 = \text{lb-ft}$
pressure	$\text{lbs}/\text{in}^2 \text{ (psi)} \times 0.06895 = \text{bar}$ $\text{lbs}/\text{in}^2 \text{ (psi)} \times 6.895 = \text{kPa}$	$\text{bar} \times 14.50 = \text{lbs}/\text{in}^2 \text{ (psi)}$ $\text{kPa} \times 0.1450 = \text{lbs}/\text{in}^2 \text{ (psi)}$
weight	$\text{lb} \times 0.4536 = \text{kg}$	$\text{kg} \times 2.205 = \text{lbs}$
force	$\text{lb} \times 4.448 = \text{N}$	$\text{N} \times 0.2248 = \text{lbs}$
volume	$\text{in}^3 \times 16.387 = \text{cm}^3$	$\text{cm}^3 \times 0.06102 = \text{in}^3$
area	$\text{in}^2 \times 6.452 = \text{cm}^2$	$\text{cm}^2 \times 0.1550 = \text{in}^2$
length	$\text{in} \times 25.4 = \text{mm}$	$\text{mm} \times 0.03937 = \text{in}$
temperature	$\frac{\text{degree F}-32}{1.8} = \text{°C}$	$1.8 \times \text{C}+32 = \text{°F}$
viscosity	$\text{cSt} \times 1.0 = \text{mm}^2/\text{sec}$ $\text{SSU} = \text{cSt} \times 4.25 + 14$	$\text{mm}^2/\text{sec} \times 1.0 = \text{cSt}$ $20 \text{ cSt} = 99 \text{ SSU}$

FLUID POWER FORMULAS

Pump input torque	lbs. in.	$\frac{\text{pressure}(\text{psi}) \times \text{displacement} (\text{in}^3/\text{rev})}{2\pi \times \text{mech. eff.}}$
Pump input power	hp	$\frac{\text{rpm} \times (\text{in}^3/\text{rev}) \times (\text{psi})}{395934 \times \text{overall eff.}}$
Pump output flow	U.S. gpm	$\frac{\text{rpm} \times (\text{in}^3/\text{rev}) \times \text{volumetric eff.}}{231}$
Fluid motor speed	rpm	$\frac{231 \times \text{flow rate}(\text{U.S. gpm}) \times \text{volumetric eff.}}{\text{displacement} (\text{in}^3/\text{rev})}$
Fluid motor torque	lbs. in.	$\frac{\text{pressure}(\text{psi}) \times \text{displacement} (\text{in}^3/\text{rev}) \times \text{mech. eff.}}{2\pi}$
Fluid motor power	hp	$\frac{\text{rpm} \times (\text{in}^3/\text{rev}) \times (\text{psi}) \times \text{overall eff.}}{395934}$
(metric)		
Pump input torque	Nm	$\frac{\text{pressure}(\text{bar}) \times \text{displacement} (\text{cm}^3/\text{rev})}{20\pi \times \text{mech. eff.}}$
Pump input power	kW	$\frac{\text{rpm} \times (\text{cm}^3/\text{rev}) \times (\text{bar})}{600000 \times \text{overall eff.}}$
Pump output flow	Lpm	$\frac{\text{rpm} \times (\text{cm}^3/\text{rev}) \times \text{volumetric eff.}}{1000}$
Fluid motor speed	rpm(min ⁻¹) (tr/mn)	$\frac{1000 \times \text{flow rate} (\text{Lpm}) \times \text{volumetric eff.}}{\text{displacement} (\text{cm}^3/\text{rev})}$
Fluid motor torque	Nm	$\frac{\text{pressure}(\text{bar}) \times \text{displacement} (\text{cm}^3/\text{rev}) \times \text{mech. eff.}}{20\pi}$
Fluid motor power	kW	$\frac{\text{rpm} \times (\text{cm}^3/\text{rev}) \times (\text{bar}) \times \text{overall eff.}}{600000}$

Jan 1st, 2014 - October 2013 service manual update log:

- Update item #9 and 44 on 028 parts list
- Updated item #22 on 045 parts list
- Update item #22, 35 and 37 on 060,075,100,140 parts list
- Added part # 106 and 107 to RDEC parts list
- Added 018 through drive couplings
- Added 028 BB through drive coupling
- For L0, L1, L2 and L3 compensator moved note from item number 6 to item number 4
- Updated exploded view on C0 and C1 compensator
- Updated part number on CCW AL control
- Added additional information to port adapters on A series compensators
- Updated case flow readings when compensated on all pumps.
- Added note on case flow readings when using A series compensators.

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14. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

15. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

16. Waiver and Severability. Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

17. Termination. This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (c) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (d) an assignment for the benefit of creditors, or (e) the dissolution or liquidation of the Buyer.

18. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.

19. Indemnity for Infringement of Intellectual Property Rights. Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

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Chelsea® Power Take-Off

890 Series Service Manual

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SECTION 1

Disassembly/Assembly Instructions

NOTES

- 1 Visually inspect parts before assembly for flaws.
- 2 The item numbers identifying parts are the same item numbers used on the engineering drawings.
- 3 Ensure tools and fixtures are current and have the required inspection and calibration labels and/or tags.
- 4 The terms **OUTPUT** and **DRIVE** are used interchangeably.
- 5 Lubricate most bearings before assembly. Use MELCOMOL "Y", EP-2 or equal.
- 6 When assembling bearings, always place the bearings rounded end into the part.
- 7 Use Parker O-Lube or equal to lubricate O-Rings and seals before assembly.
- 8 When assembling O-Rings, do not roll it into their grooves. Use a O-Ring tool for assembly. O-Rings are not to be twisted or damaged.
- 9 Always reference the current Chelsea Parts List for part numbers and assemblies. 890 Series is HY25-2890-M1/US

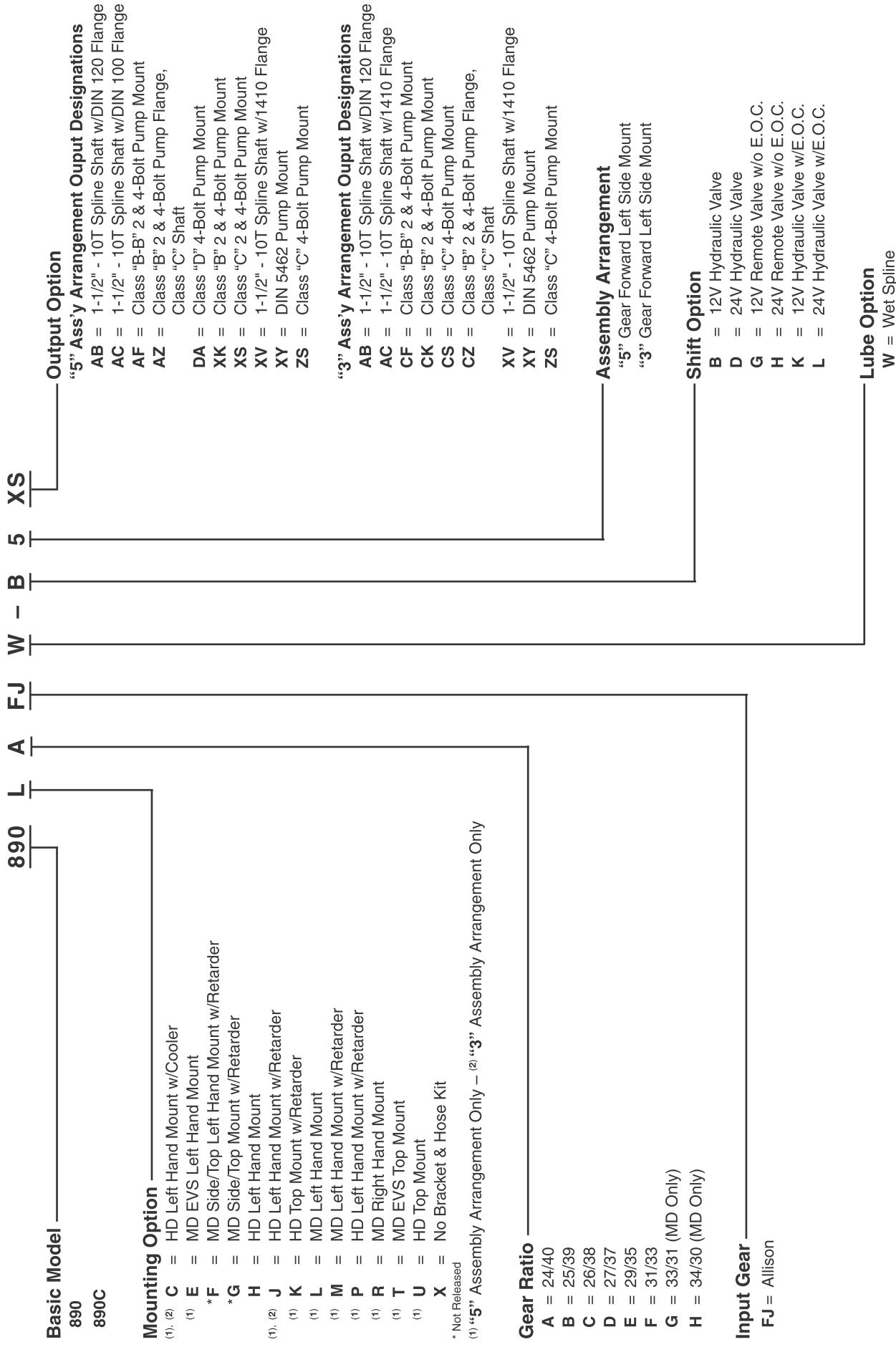


Suggested Tools

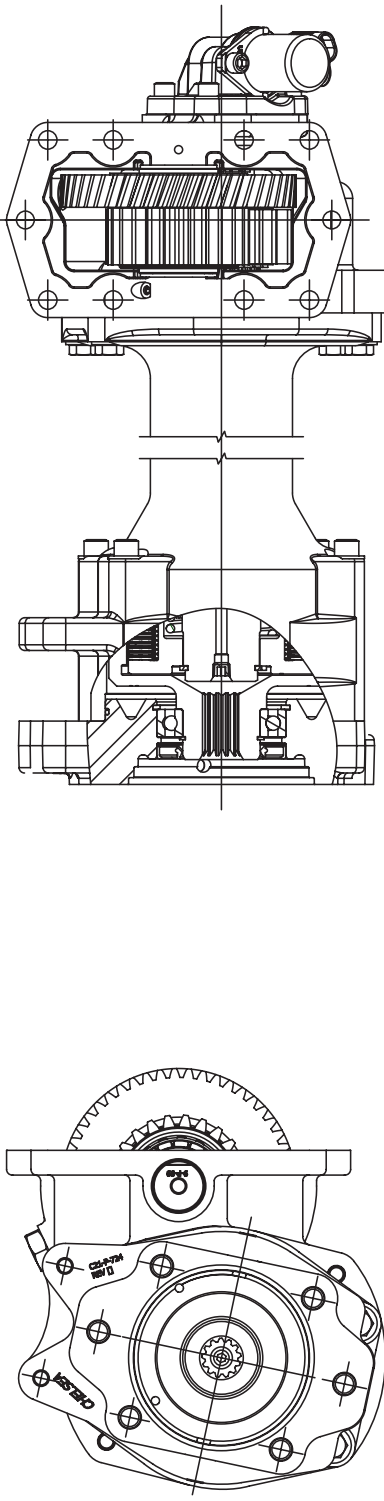
Safety Glasses	Shop Press	Pliers	Gasket Scraper Tool
3/4" Socket	5/32" Hex Bit Driver	Hammer/Mallet	

Suggested Service Kits

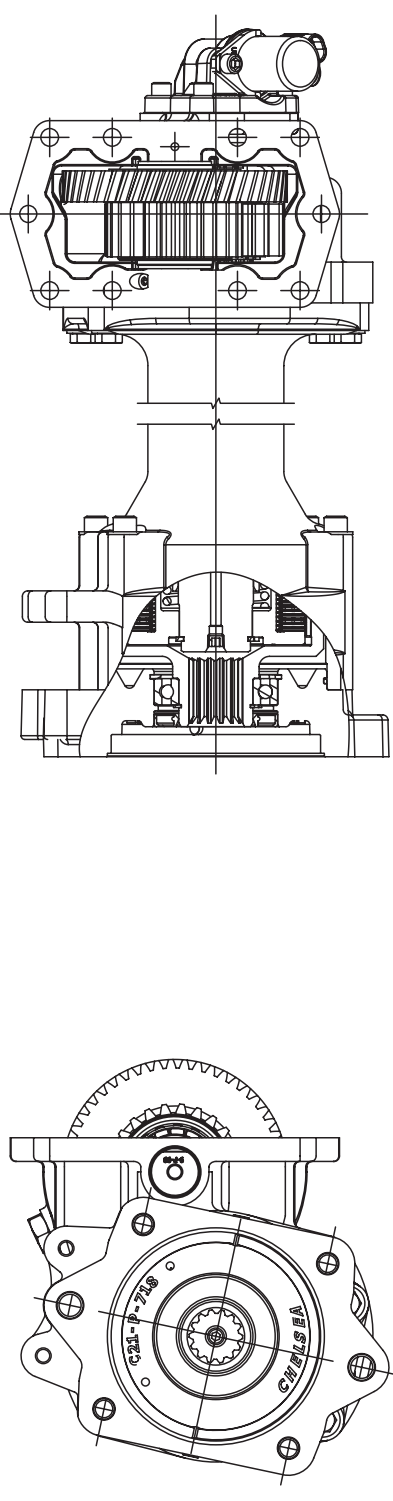
Part Number	Description
328948-36X	Kit Gasket & Installation
7170-86X	Kit Mounting
329644-1X	Kit Mounting & Installation ("XS")
329644-2X	Kit Mounting & Installation ("AF")



“AF” Output – Assembly 5



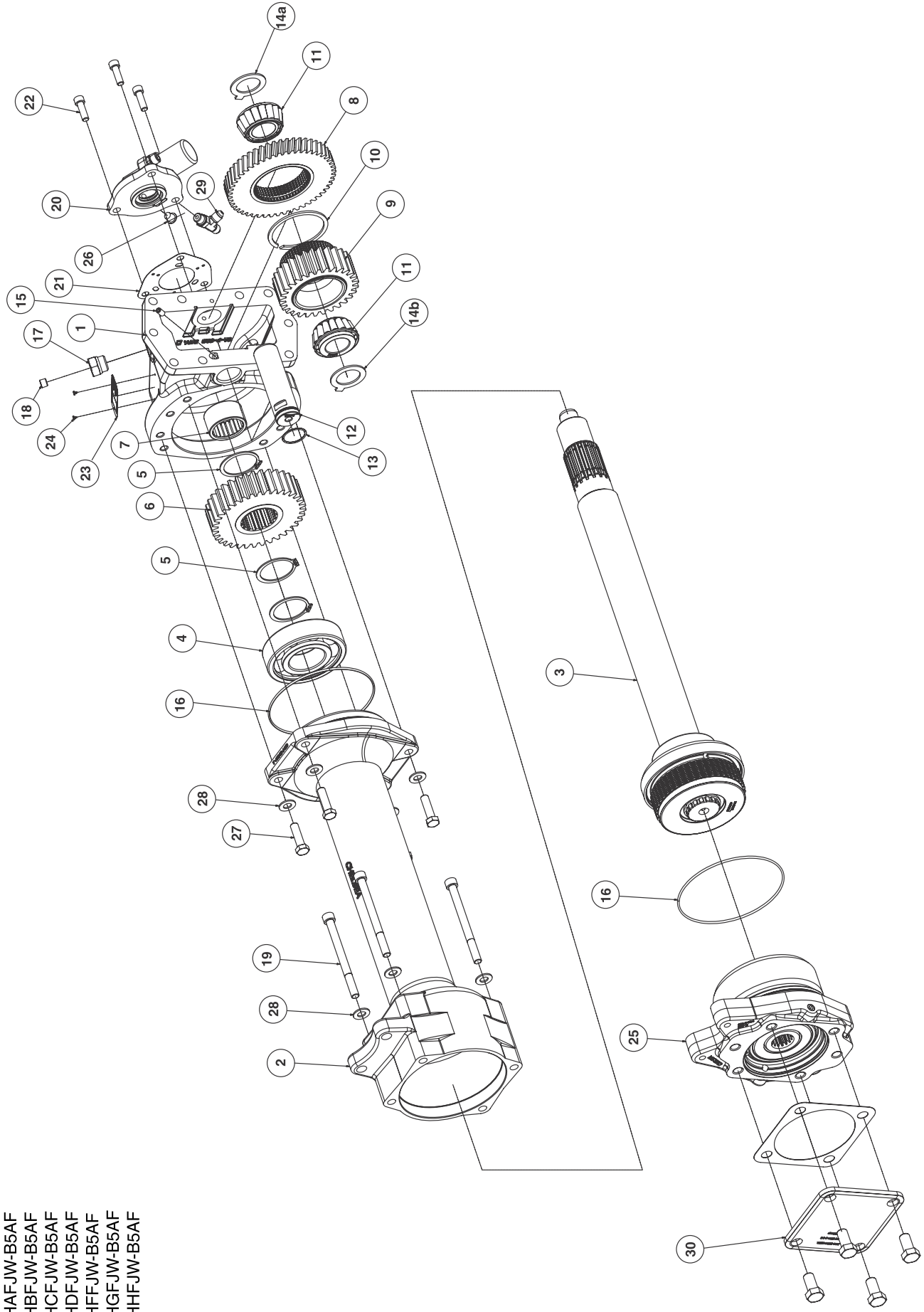
“XS” Output – Assembly 5



Service Manual
890 Series

Bulletin HY25-6890-M1/US
Exploded View – 890HEFJW-B5AF

- 890HAFJW-B5AF
- 890HBFJW-B5AF
- 890HCFJW-B5AF
- 890HDFJW-B5AF
- 890HFFJW-B5AF
- 890HGFJW-B5AF
- 890HFFJW-B5AF



**Service Manual
890 Series**

Bill of Materials

890HEFJW-B5AF

Item	Part Number	Description	Qty.
1	1-P-629	Housing.....	1
2	54-P-22	Bearing Retainer.....	1
3	329607X	Drive Shaft & Clutch Assembly.....	1
4	550026	Ball Bearing 1.7717" x 3.937 x .9843".....	1
5	379668	Lockring.....	3
6	2-P-865 (1)	Output Gear 35T.....	1
7	560972	Bearing Needle Roller Assembly 1.500" x 1.875 x 1.000".....	1
8	5-P-1428 (1)	Input Gear 50T.....	1
9	5-P-1432 (1)	Gear Ratio 29T.....	1
10	380064	Lockring.....	1
11	561026	Bearing Cone Tapered 1.181" x .9843".....	2
12	9-P-99	Idle Shaft 1.18".....	1
13	28-P-42	O-Ring 1.051" x .070".....	1
14a	14-P-82-1	Spacer 1.191" x 1.75 x .080".....	1
14b	14-P-82-1	Spacer 1.191" x 1.75 x .080".....	A.R.
	14-P-82-2	Spacer 1.191" x 1.75 x .085".....	A.R.
	14-P-82-3	Spacer 1.191" x 1.75 x .090".....	A.R.
	14-P-82-4	Spacer 1.191" x 1.75 x .094".....	A.R.

A.R. — As Required

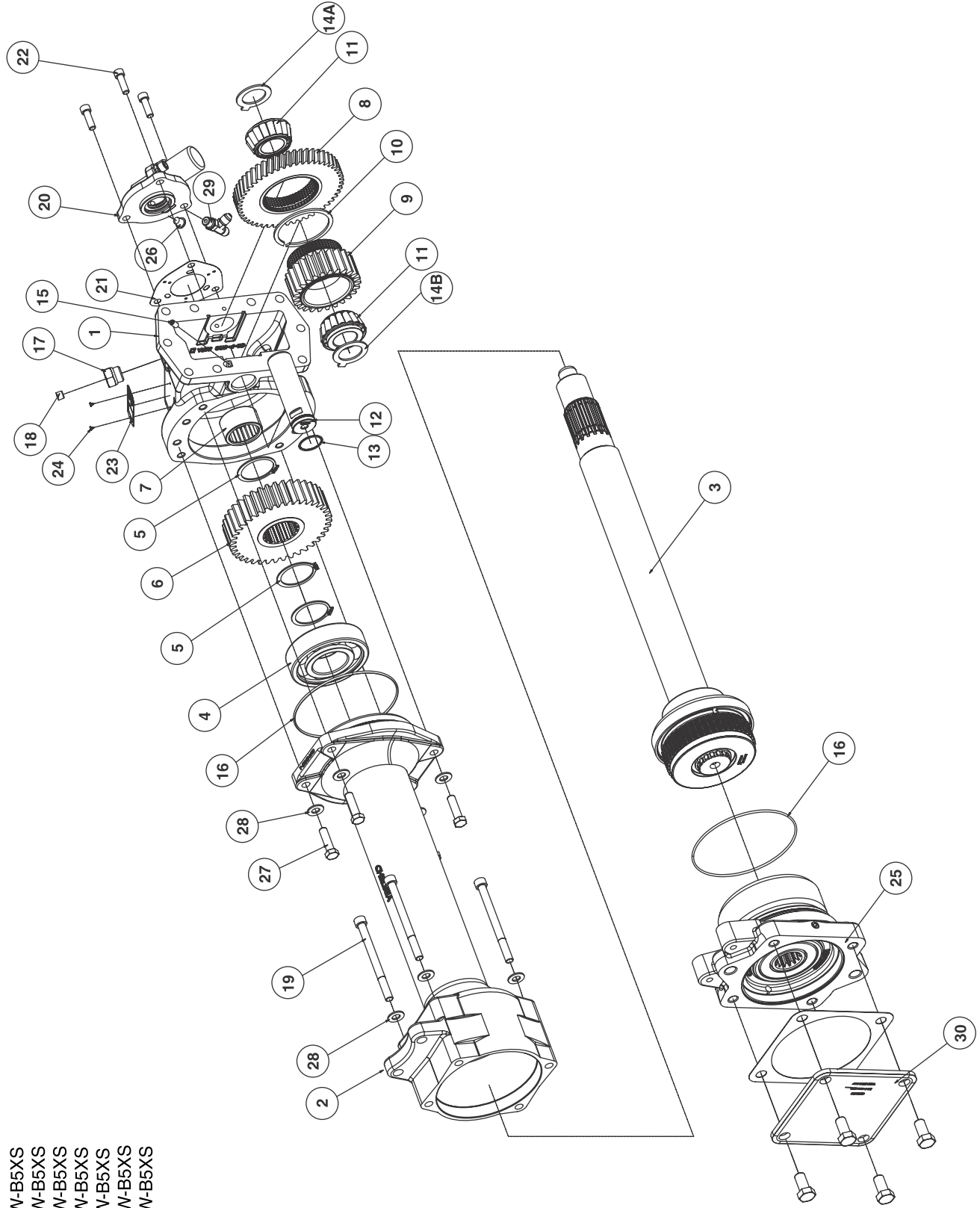
(1) See Page 24 for other Gear Options

Item	Part Number	Description	Qty.
15	378452-7	Set Screw SH .250" - 20 x .500".....	1
16	28-P-245	O-Ring 5.017" x .103".....	2
17	379242	Adapter Straight .125" - 27 x .750" - 16.....	1
18	379231	Pipe Plug .125" - 27.....	1
19	379433-18	Capscrew SH .375" - 16 x 4.500".....	4
20	329463-12X	12V Valve Cap Assembly.....	1
21	22-P-112	Gasket.....	1
22	378447-6	Capscrew SH .312" - 18 x 1.000".....	3
23	68-P-51	Name Plate.....	1
24	378422	Drive Screw.....	2
25	329609-3X	Output Assembly "AF".....	1
26	500897-5	Shipping Plug.....	2
27	378431-13	Capscrew HH .375" - 16 x 1.375".....	4
28	380076-07	Flat Hardened Washer .410" x .816 x .066".....	8
29	379659	Tee .438" - 20.....	2
30	329658X	Cover Kit "XK", "AF", "AZ".....	1

Service Manual
890 Series

Bulletin HY25-6890-M1/US
Exploded View – 890HBFJW-B5XS

- 890HAFJW-B5XS
- 890HCFJW-B5XS
- 890HDFJW-B5XS
- 890HEFJW-B5XS
- 890HFFJW-B5XS
- 890HGFJW-B5XS
- 890HFFJW-B5XS



Service Manual
890 Series

Bill of Materials

890HBFJW-B5XS

Item	Part Number	Description	Qty.
1	1-P-629	Housing.....	1
2	54-P-22	Bearing Retainer.....	1
3	329607X	Drive Shaft & Clutch Assembly.....	1
4	550026	Ball Bearing 1.7717" x 3.937 x .9843".....	1
5	379668	Lockring.....	3
6	2-P-872 (1)	Output Gear 39T.....	1
7	560972	Bearing Needle Roller Assembly 1.500" x 1.875" x 1.000".....	1
8	5-P-1428 (1)	Input Gear 50T.....	1
9	5-P-1438 (1)	Gear Ratio 25T.....	1
10	380064	Lockring.....	1
11	561026	Bearing Cone Tapered 1.181" x .9843".....	2
12	9-P-99	Idler Shaft 1.18".....	1
13	28-P-42	O-Ring.....	1
14A	14-P-82-1	Spacer 1.191" x 1.75 x .080".....	1
14B	14-P-82-1	Spacer 1.191" x 1.75 x .080".....	A.R.
	14-P-82-2	Spacer 1.191" x 1.75 x .085".....	A.R.
	14-P-82-3	Spacer 1.191" x 1.75 x .090".....	A.R.
	14-P-82-4	Spacer 1.191" x 1.75 x .094".....	A.R.

A.R. — As Required

(1) See Page 24 for other Gear Options

Item	Part Number	Description	Qty.
15	378452-7	Screw Set SH .250" - 20 x .500".....	1
16	28-P-245	O-Ring 5.017" x .103".....	2
17	379242	Adapter Straight .125" - 27 x .750" - 16.....	1
18	379231	Pipe Plug .125" - 27.....	1
19	379433-18	Capscrew SH .375" - 16 x 4.500".....	4
20	329463-12X	12V Valve Cap Assembly.....	1
21	22-P-112	Gasket.....	1
22	378447-6	Capscrew SH .312" - 18 x 1.000".....	3
23	68-P-51	Name Plate.....	1
24	378422	Drive Screw.....	2
25	329609-1X	Output Assembly "XS".....	1
26	500897-5	Shipping Plug.....	2
27	378431-13	Capscrew HH .375" - 16 x 1.375".....	4
28	380076-07	Flat Hardened Washer .410" x .816 x .066".....	8
29	379659	Tee .438" - 20.....	2
30	329654X	Cover Kit "XS".....	1

Service Manual
890 Series

Bill of Materials

890ECFJW-B5AF

Item	Part Number	Description	Qty.
1	1-P-629	Housing.....	1
2	54-P-22	Bearing Retainer.....	1
3	329607X	Drive Shaft & Clutch Assembly.....	1
4	550026	Ball Bearing 1.7717" x 3.937 x .9843".....	1
5	379668	Lockring.....	3
6	2-P-873 (1)	Output Gear 38T.....	1
7	560972	Bearing Needle Roller Assembly 1.500" x 1.875" x 1.000".....	1
8	5-P-1428 (1)	Input Gear 50T.....	1
9	5-P-1439 (1)	Gear Ratio 26T.....	1
10	380064	Lockring.....	1
11	561026	Bearing Cone Tapered 1.181" x .9843".....	2
12	9-P-99	Idle Shaft 1.18".....	1
13	28-P-42	O-Ring 1.05" x .070".....	1
14A	14-P-82-1	Spacer 1.191" x 1.75 x .080".....	1
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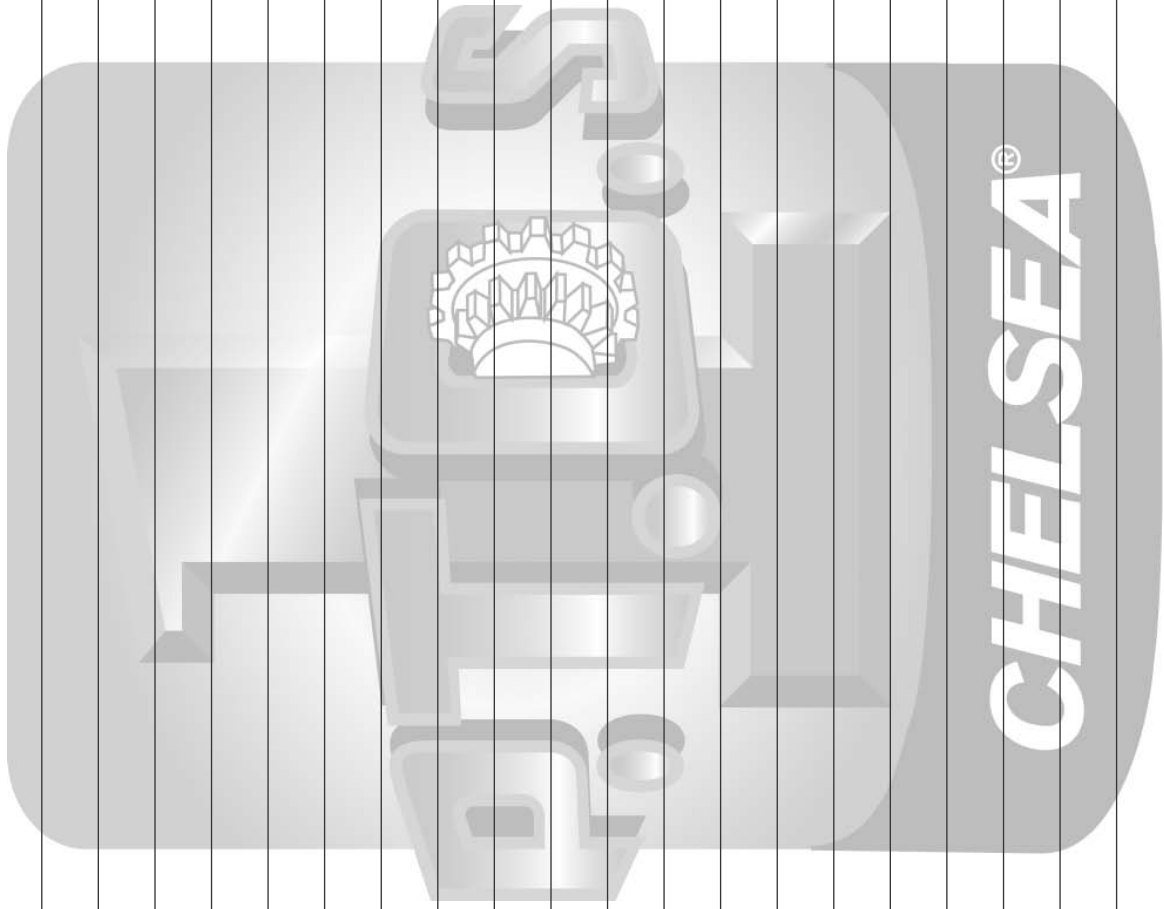
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18	379231	Pipe Plug .125" - 27.....	1
19	379433-18	Capscrew SH .375" - 16 x 4.500".....	4
20	329463-12X	12V Valve Cap Assembly.....	1
21	22-P-112	Gasket.....	1
22	378447-6	Capscrew SH .312" - 18 x 1.000".....	3
23	68-P-51	Name Plate.....	1
24	378422	Drive Screw.....	2
25	329609-3X	Output Assembly "AF".....	1
26	378431-13	Capscrew HH .375" - 16 x 1.375".....	4
27	380076-07	Flat Hardened Washer .410" x .816 x .066".....	8
28	379659	Tee .438" - 20.....	2
29	379564-2	Cap Thread .438".....	1

SECTION 2

Notes



When removing the 890 Series from the transmission and after pump and all the connections have been removed, it is recommended that the P.T.O. be removed in the following sequence.

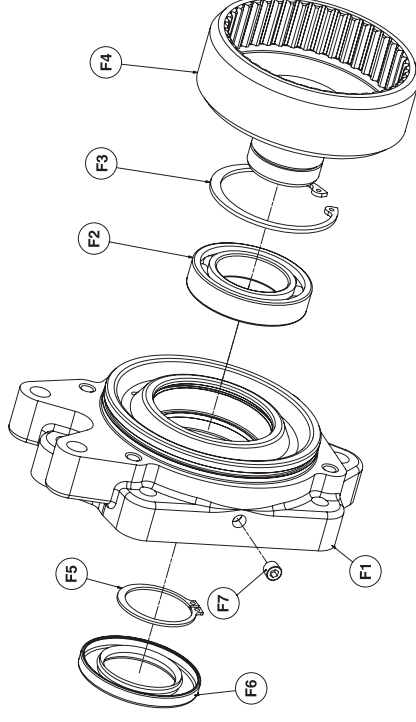
- The Tube section (2) may need some support to remove weight from the rear Bracket to ease the removal of the two Hex Capscrews
- Loosen the two Hex Capscrews that hold the Output Flange section of the P.T.O. (1) to the transmission Bracket. Do not completely remove at this time.
- Start to remove the Tube Assembly of the P.T.O. by removing the four Capscrews (27) and Washers (28) that mate the Tube to the P.T.O. Housing (1)
- Slowly slide the Tube towards the back of the transmission.
- While securely holding the Tube section remove the two Hex Capscrews from the rear Mounting Bracket while sliding the Tube back and down from the P.T.O. Housing.
- Remove the main P.T.O. Housing (1) from the transmission by removing the seven Capscrews.

Disassembly

- Housing Assembly
 - Remove T-Fitting 379659 from the Valve Cap Sub Assembly. Remove the Solenoid Valve Cap Assembly (20) from the P.T.O. housing (1) using a 1/4" Hex Bit to remove three Cap Screws (22).
 - Remove Gasket (21) from the Pilot of Solenoid Valve Cap Assembly (20). See page 21 for break down of the Valve Cap Assembly.
 - Remove Set Screw (15) to allow the Idle Shaft (12) to be removed.
 - Press Idle Shaft (12) thru the aligned Washers (14A & 14B), Bearings (11) & Input/Ratio Gear (8 & 9) until it is fully unseated.
 - Remove Tapered Roller Bearings (11) on both sides of the Input Gear Sub Assembly.
 - NOTE:** The Input Gear (8) and Ration Gear (9) cannot be separated due to the internal Snap Ring (10). If the Gear(s) need to be replaced, contact Chelsea Customer Service.
- Tube Assembly Section
 - Start by removing the O-Ring (16) from the end of the Tube (2) that mates to the main P.T.O. Housing (1).
 - Next remove the Snap Ring (5) that retains the Output Gear (6) on the Shaft Assembly (3).
 - Slide the Output Gear (6) off the Shaft Assembly (3).
 - Remove the next two Snap Rings (5).
 - At the Flange/Output end of the Tube Assembly (2) unscrew and remove the four Cap Screws (19) and Washers (28) from the Tube Assembly (2).
 - Remove the Output Assembly (25) and O-Ring (16) from the Tube Assembly (2).
 - Slide the Shaft Assembly (3) by pressing on the Shaft from the P.T.O. Housing (1) mating side of the Tube Assembly (2) towards the Flange/Output side of the Tube Assembly.
 - After Output Shaft (3) has been removed from the Tube (2), remove Roller Bearing (4) from Tube (2).

3. Flange Assembly

- Remove the Oil Seal (F6) from the Flange Housing (F1).
- Next remove the Snap Ring (F5) from the Flange Housing (F1).
- The Output/Clutch Bell Gear (F4) can be removed at this time.
- Remove Snap Ring (F3) to press out Bearing (F2).
- Pipe Plug (F7) can be removed if required.



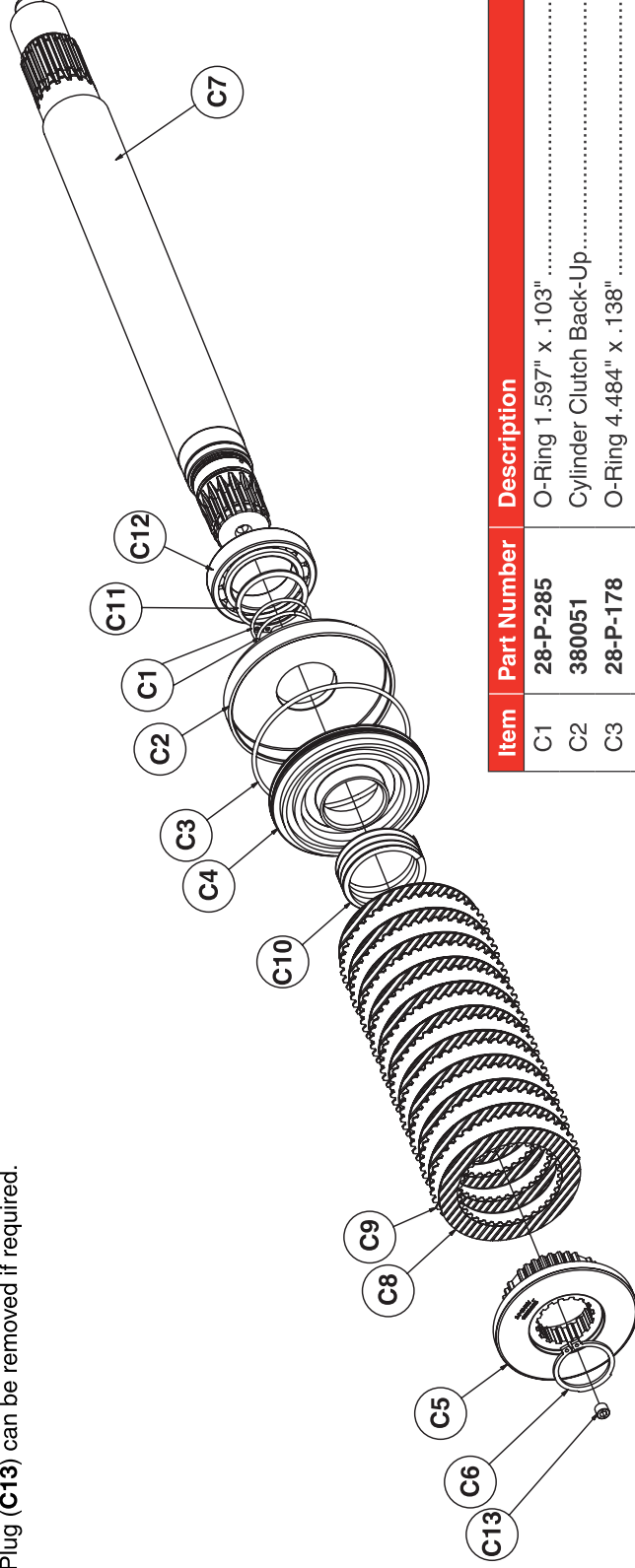
Item	Part Number	Description	Qty.
F1	21-P-717	Flange Pump "XS" S.A.E. "C" 2 or 4-Bolt	1
F2	561018	Bearing Ball 1.772" x 2.953" x .630"	1
F3	379919	Lockring	1
F4	2-P-867	Gear Output 1.250" - 14T Spline ("XS" Output)	1 or
F4	2-P-875	Gear Output 1.000" - 15T Spline ("AF" Output)	1
F5	379668	Lockring	1
F6	28-P-278	Oil Seal 2.953" x 1.772" x .315"	1
F7	379231	Plug Pipe .125" - 27	2
N.S.	28-P-259X	O-Ring 3.984" x .139" (Wet Spline Pump Mounting)	1

N.S. — Not Shown

Disassembly

Disassembly

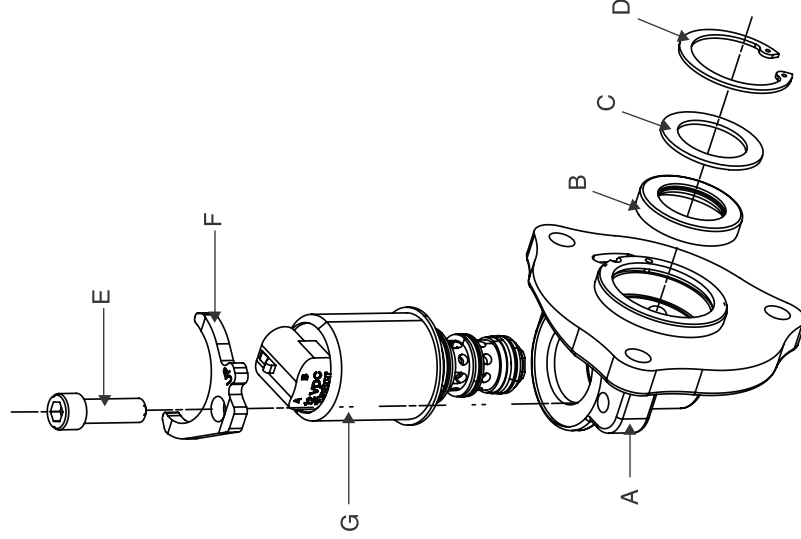
4. Driveshaft & Clutch Assembly
 - 4.1 Warning the Clutch Assembly is under spring tension.
 - 4.2. To remove the Clutch Pack from the Output Shaft (C7) start by compressing the Inner Clutch Gear (C5) and removing the Snap Ring (C6).
 - 4.3. Next remove the Clutch Gear (C5), Clutch Friction Discs (C8) and Clutch Plates (C9).
 - 4.4. Remove the Spring (C10), Clutch Piston (C4), and Back-Up Clutch Cylinder (C2).
 - 4.5. Remove the O-Ring (C3) from the Clutch Piston (C4).
 - 4.6. Remove the two O-Rings (C1) on the Output Shaft (C7).
 - 4.7. Remove the Bearing Retaining Lockring (C11) and then slide the Bearing (C12) off the Output Shaft Bearing (C7).
 - 4.8. Pipe Plug (C13) can be removed if required.



Item	Part Number	Description	Qty.
C1	28-P-285	O-Ring 1.597" x .103"	2
C2	380051	Cylinder Clutch Back-Up	1
C3	28-P-178	O-Ring 4.484" x .138"	1
C4	380110X	Piston Clutch	1
C5	2-P-858	Gear Output 36 Tooth	1
C6	380069	Lockring	1
C7	3-P-1007	Shaft Output	1
C8	379485	Disc Friction	11
C9	380065	Plate Clutch	10
C10	37-P-62	Spring 2.140" x 1.729"	1
C11	380070	Lockring	1
C12	561028	Bearing Ball 1.969" x 3.150" x .630"	1
C13	379231	Plug Pipe .125" - 27	1

Disassembly

5. Valve & Cap Assembly
 - 5.1. Carefully remove the Retaining Ring (D) and Washer (C). Visually inspect the Oil Seal (B) now. If you see signs of wear or leakage, remove the Oil Seal (B).
Important: Do not nick the Seal Bore. This could result in leakage or further damage to the P.T.O.
 - 5.2. Remove the Solenoid Valve Socket Capscrew (E).
 - 5.3. Remove the Solenoid Valve (G) from the Cap. Be careful not to damage the Seal. Check the O-Rings for damage. If they are damaged, replace the O-Rings.



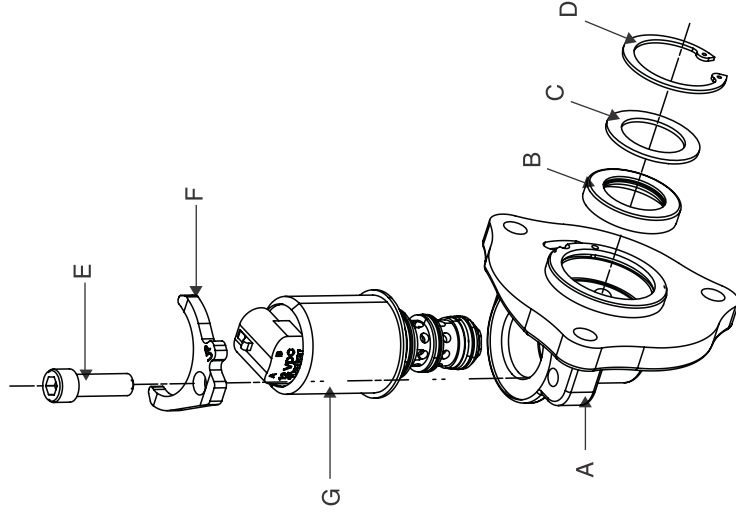
Item	Part Number	Description	Qty.
39	329442-12X	Valve & Cap Assembly (12V) ("KV" Pitch Only)	1 or
	329442-24X	Valve & Cap Assembly (24V) ("KV" Pitch Only)	1
	329463-12X	Valve & Cap Assembly (12V) ("FJ" Pitch Only)	1 or
	329463-24X	Valve & Cap Assembly (24V) ("FJ" Pitch Only)	1
A	34-P-143	Valve Cap	1
B	28-P-119	Oil Seal (Hi Pressure)	1
C	378811	Washer	1
D	378849	Retaining Ring	1
E	378447-6	Sockethead Capscrew .312" - 18 x 1.00"	1
F	379995	Clamp ("KV") Included with 379993 Valve	1 or
	380012	Clamp ("FJ") used with 380011 Valve	1
	380124	Clamp ("FJ") used with 380123 Valve	1
G	379993-12	Hydraulic Valve (12V) ("KV") (White Connector)	1 or
	379993-24	Hydraulic Valve (24V) ("KV") (Black Connector)	1
	380011-12	Hydraulic Valve (12V) ("FJ") (White Side Connector)	1 or
	380011-24	Hydraulic Valve (24V) ("FJ") (Black Side Connector)	1
	380123-12	Hydraulic Valve (12V) ("FJ") (White Connector Top) (New Style)	1 or
	380123-24	Hydraulic Valve (24V) ("FJ") (Black Connector Top) (New Style)	1

Assembly

1. Be sure selected parts are those called out on the Pick List.
2. Visually inspect parts before assembly for flaws.
3. The terms OUTPUT and DRIVE are used interchangeably.
4. Lubricate most bearings before assembly. Use MELCOMOL “Y”, EP-2 or equal.
5. When assembling bearings, always place the bearings rounded end into the part.
6. Use Parker O-Lube or equal to lubricate O-Rings and seals before assembly.
7. When assembling O-Rings, do not roll it into their grooves. Use an O-Ring tool for assembly. O-Rings are not to be twisted or damaged.
8. When assembling seals, the seal side is opposite the flat side which is identified by a stamped part number. The seal side must be in the direction of the oil/air pressure.

Assembly

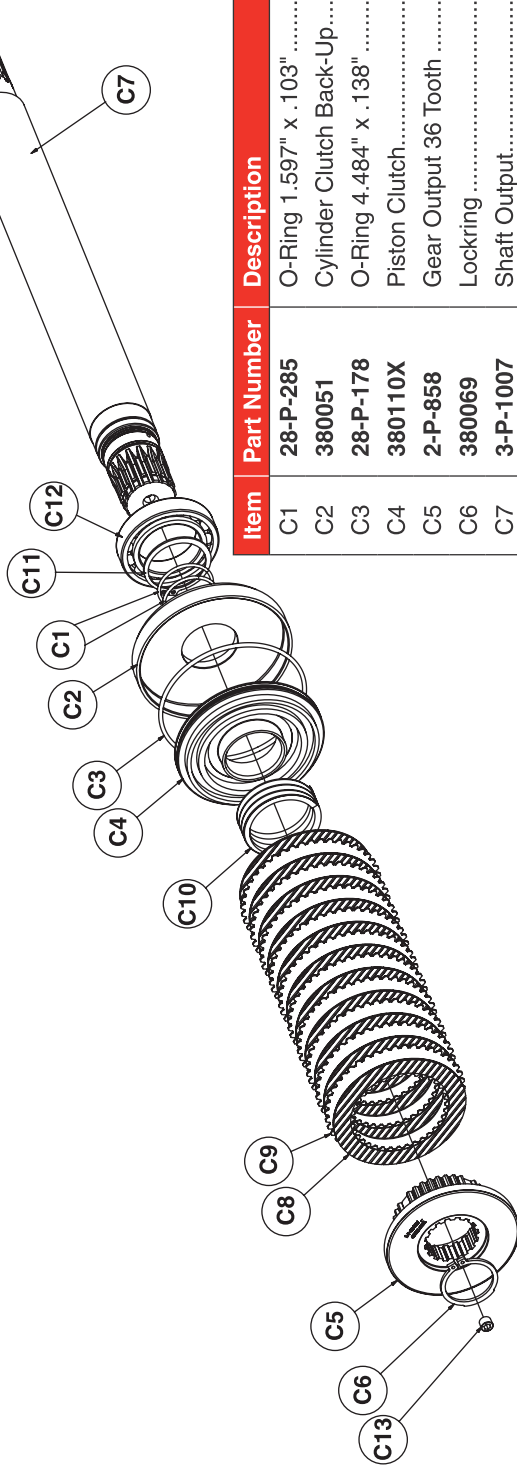
1. Valve & Cap Assembly
 - 1.1. If the Valve Assembly Oil Seal (B) was worn or damaged, replace it now. Lubricate a new Seal (B). Install it carefully with the proper driver. Next install the Washer (C) and Retaining Ring (D). **Important:** Avoid nicking the PTO Housing (1). This could cause leakage or other PTO damage.
 - 1.2. Lubricate and attach the Solenoid Valve (G) to the Cap.
 - 1.3. Next install the Clamp (F) and Sockethead Capscrew (E). Secure the Solenoid to the Valve Cap (A) with Hex Capscrew (E). Torque it to 96 – 120 in-lbs (11 – 14 Nm).
 - 1.4. Place a new Valve Cap Gasket (21) on the Valve Assembly. Make sure the holes are aligned. **Caution:** Do not use Sealing Compounds. It could affect the correct operation of the transmission.
 - 1.5. Attach the Valve Assembly (20) to the PTO Housing (1). Tighten the three Capscrews (22) and torque them to 192 – 240 in-lbs (22 – 27 Nm or 2.2 – 2.8 Kgm).



Item	Part Number	Description	Qty.
39	329442-12X	Valve & Cap Assembly (12V) (“KV” Pitch Only)	1 or
	329442-24X	Valve & Cap Assembly (24V) (“KV” Pitch Only)	1
	329463-12X	Valve & Cap Assembly (12V) (“FJ” Pitch Only)	1 or
	329463-24X	Valve & Cap Assembly (24V) (“FJ” Pitch Only)	1
A	34-P-143	Valve Cap	1
B	28-P-119	Oil Seal (Hi Pressure)	1
C	378811	Washer	1
D	378849	Retaining Ring	1
E	378447-6	Sockethead Capscrew .312” - 18 x 1.00”	1
F	379995	Clamp (“KV”) included with 379993 Valve	1 or
	380012	Clamp (“FJ”) used with 380011 Valve	1
	380124	Clamp (“FJ”) used with 380123 Valve	1
G	379993-12	Hydraulic Valve (12V) (“KV”) (White Connector)	1 or
	379993-24	Hydraulic Valve (24V) (“KV”) (Black Connector)	1
	380011-12	Hydraulic Valve (12V) (“FJ”) (White Side Connector)	1 or
	380011-24	Hydraulic Valve (24V) (“FJ”) (Black Side Connector)	1
	380123-12	Hydraulic Valve (12V) (“FJ”) (White Connector Top) (New Style)	1 or
	380123-24	Hydraulic Valve (24V) (“FJ”) (Black Connector Top) (New Style)	1

Assembly

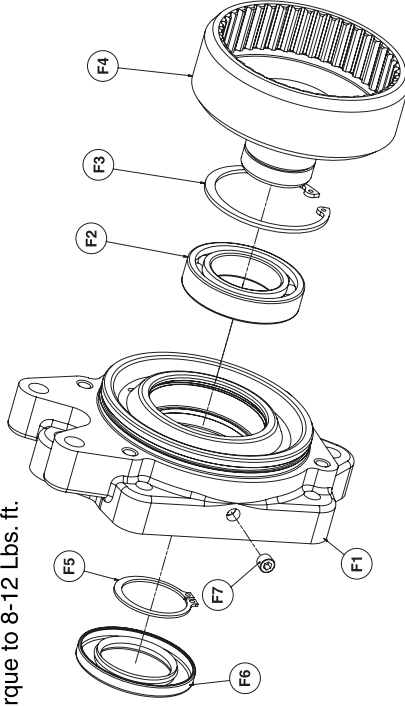
2. Drive Shaft Clutch Assembly
 - 2.1 Place Bearing (C12) onto Shaft (C7). Using a Press Tool, press the Bearing (C12) onto the Shaft (C7) allowing the Press Tool to fully seat against the end of the Shaft (C7).
 - 2.1.1. This will position the bearing properly for Snap-Ring installation.
 - 2.2. Place Snap-Ring (C11) over the end of Shaft (C7). Using Snap-Ring Pliers spread the legs of Snap-Ring over the Shaft and into the groove. Visually check to assure Snap-Ring is fully seated.
 - 2.3. Place O-Ring Sleeve over the end of Shaft (C7) allowing it to seat on the end of the Shaft beyond the lube hole. Lubricate O-Ring (C1) and slide over the O-Ring sleeve down to install into the groove in the Shaft (C7). Lubricate and place a second O-Ring (C1) onto the sleeve. Pull O-Ring Sleeve up in front of the lube hole. Proceed to slide the O-Ring (C1) down to install into the groove in the Shaft (C7).
 - 2.4. Lubricate O-Ring (C3) and install into the groove on the outer diameter of Clutch Piston (C4). Install Clutch Piston into the Back-Up Cylinder (C2). Place the Sub-Assembly onto the Shaft (C7) seating the Back-Up Cylinder (C2) against the shoulder of Shaft (C7).
 - 2.5. Install Clutch Pack onto Clutch Gear
 - 2.6. Alternately place ELEVEN Friction Discs (C8) and TEN Clutch Plates (C9) onto Inner Clutch Gear (C5) beginning and ending with a Friction Disc (C8).
 - 2.7. Slide the spring (C10) over the end of Shaft (C7) and Pilot onto the Clutch Piston 380053.
 - 2.8. Hold the completed Friction Disc / Clutch Plate Pack onto the Inner Clutch Gear (C5) and slide the Sub-Assembly onto the spline portion of Shaft (C7). Press the Sub-Assembly down to compress spring (C10).
 - 2.9. Install Snap-Ring (C6) into the groove of Shaft (C7) to retain the Clutch Pack Sub-Assembly.
 - 2.10. Install Plug (C13) (0.125"-27 NPT) into the end of Shaft (C7) to 8-12 Lbs. ft. (10.8-16.3 N.m.) torque.



Item	Part Number	Description	Qty.
C1	28-P-285	O-Ring 1.597" x .103"	2
C2	380051	Cylinder Clutch Back-Up	1
C3	28-P-178	O-Ring 4.484" x .138"	1
C4	380110X	Piston Clutch	1
C5	2-P-858	Gear Output 36 Tooth	1
C6	380069	Lockring	1
C7	3-P-1007	Shaft Output	1
C8	379485	Disc Friction	11
C9	380065	Plate Clutch	10
C10	37-P-62	Spring 2.140" x 1.729"	1
C11	380070	Lockring	1
C12	561028	Bearing Ball 1.969" x 3.150" x .630"	1
C13	379231	Plug Pipe .125" - 27	1

Assembly

3. Flange Assembly
 - 3.1. Place Bearing (F2) into the Pump Flange (F1). Using a Press Tool, press the Bearing (F2) into the Pump Flange (F1) until fully seated. Using Snap-Ring Pliers compress the legs of Snap-Ring (F3) and install into the Pump Flange (F1) to secure the Bearing. Lubricate and install O-Ring 28-P-245 into the groove located on the Male Pilot Diameter of the Pump Flange (F1).
 - 3.2. Install outer Clutch Gear (F4) into Bearing (F2) (slip fit) in the Pump Flange (F1). Rotate the Cap & Gear Assembly with Snap-Ring groove exposed. Using Snap-Ring Pliers spread the legs of Snap-Ring (F5) over the outer Clutch Gear Hub and into the groove. Visually check to assure Snap-Ring is fully seated.
 - 3.3. Place the proper Oil Seal Slide Tool into the Spline end of the outer Clutch Gear. Slide the Oil Seal (F6) over the Slide Tool. Pilot Seal Driver over the Seal Slide. Press the Oil Seal (F6) into Pump Flange Seal Bore flush with cast surface.
 - 3.4. Install Plug (F7) (0.125-27 NPT) into both sides of the Pump Flange (F1), torque to 8-12 Lbs. ft.



4. Shaft & Tube Assembly
 - 4.1. Position Bearing (4) onto the Bearing Bore of tube (2). Using a Bearing Driver, press Bearing (4) until it is fully seated against the Bearing Backing Shoulder within Tube (2).
 - 4.2. Insert the Output Shaft/Clutch Pack Sub-Assembly (3) into the outer Clutch Gear of the Pump Flange Output Sub-Assembly. **NOTE:** The Clutch Pack Plates & Discs may require alignment for ease of assembly with outer Clutch Gear.
 - 4.3. Slip the Tube (2) over the Output Shaft/Pump Flange Output Sub-Assemblies aligning with Bearing 550026. Rotate Tube (2) to align Thru Holes to Threaded Holes in the Pump Flange. Use caution when assembling Tube onto the Pump Flange Pilot to prevent O-Ring damage. Insert Alignment Tool through the Bracket Mounting Holes in Tube (2) and into the C'bores Threaded Holes in the Pump Flange.
 - 4.4. Place four Washers (28) onto four Cap Screws (27). Secure Tube (2) to the Pump Flange Output Sub-Assembly by installing FOUR Cap Screws with Washers, torque the screws to 30-35 Lbs. ft.
 - 4.5. Using Snap-Ring Pliers expand the legs of Snap-Ring (5) over Shaft (2) and install into groove securing the Tube/Bearing Sub-Assembly to the Shaft. Using Snap-Ring Pliers expand the legs of Snap-Ring (5) over Shaft (2) and install into groove. Visually check to assure the Snap-Ring (5) is fully seated.
 - 4.6. Lubricate and install O-Ring (16) into the groove located on the Male Pilot Diameter of Tube (2).
 - 4.7. Place the Output Gear (6) over the end of the Shaft (3), align Spline and slide the Gear into place shouldering the Gear on the Snap-Ring.
 - 4.8. Using Snap-Ring Pliers expand the legs of Snap-Ring (5) over Shaft (3) and install into groove. Visually check to assure the Snap-Ring (5) is fully seated.

Item	Part Number	Description	Qty.
F1	21-P-717	Flange Pump "XS" S.A.E. "C" 2 or 4-Bolt	1
F2	561018	Bearing Ball 1.772" x 2.953" x .630"	1
F3	379919	Lockring	1
F4	2-P-867	Gear Output 1.250" - 14T Spline ("XS" Output)	1 or
F4	2-P-875	Gear Output 1.000" - 15T Spline ("AF" Output)	1
F5	379668	Lockring	1
F6	28-P-278	Oil Seal 2.953" x 1.772" x .315"	1
F7	379231	Plug Pipe .125" - 27	2
N.S.	28-P-259X	O-Ring 3.984" x .139" (Wet Spline Pump Mounting)	1

N.S. — Not Shown

Assembly

5. Housing Assembly
 - 5.1. Using a Bearing Drive Tool install Caged Needle Roller Bearing (7) into P.T.O. Housing (1).
 - 5.2. Install Adapter Plug (17) into P.T.O. Housing (1) using a 7/8" Socket and torque to 25-30 Lbs. ft.
 - 5.3. Install Pipe Plug (18) into Adapter (17) Plug using a 3/16" Hex Bit and torque to 8-12 Lbs. ft.
 - 5.4. Place a Tapered Roller Bearing Cone (11) into both side bores of the Input Gear Sub-Assembly (8, 9 & 10).
 - 5.5. Place Tabbed Thrust Washer (14A) into the closed end of Housing (1) at the Idler Shaft Hole making sure the tab is located in the slot. Place the Input Gear Sub-Assembly & Bearings into the opening of the Housing (Input Gear towards the closed end of the Housing). Select and place a single Tabbed Washer (14B) to give proper Tapered Bearing endplay and insert the Washer making sure the tab is fully seated into the slot.
 - 5.6. Place Alignment Bar thru the Idler Shaft Hole in Housing 1-P-629 (1) to align the Washers (14A & B), Bearings (11) and Input Gear (8, 9 & 10).
 - 5.7. Lube O-Ring (13) and install into the groove on the Idler Shaft (12). Locate alignment line on the threaded end of the Shaft. Place the Idler Shaft into the Housing Idler Hole so the alignment line is parallel and closest to the Housing mounting surface. Press Idler Shaft (12) thru the aligned Washers, Bearings and Input Gear until it is fully seated.
 - 5.8. Install Set-Screw (15) to 30 in-lbs max torque to lock the Idler Shaft (12) in place.
 - 5.9. Place the Gasket (21) onto the Pilot of Solenoid Valve Cap Sub-Assembly (21).
 - 5.10. Install the Solenoid Valve Cap Sub-Assembly (21) with the Solenoid oriented downward and to the right (threaded hole upward to the right) onto the P.T.O. Housing (1) using a 1/4" Hex Bit to secure THREE Cap Screws (22) and torque to 24-28 Lbs. ft.
 - 5.11. Install and secure T-fitting (29) into the Valve Cap Sub-Assembly (21).

6

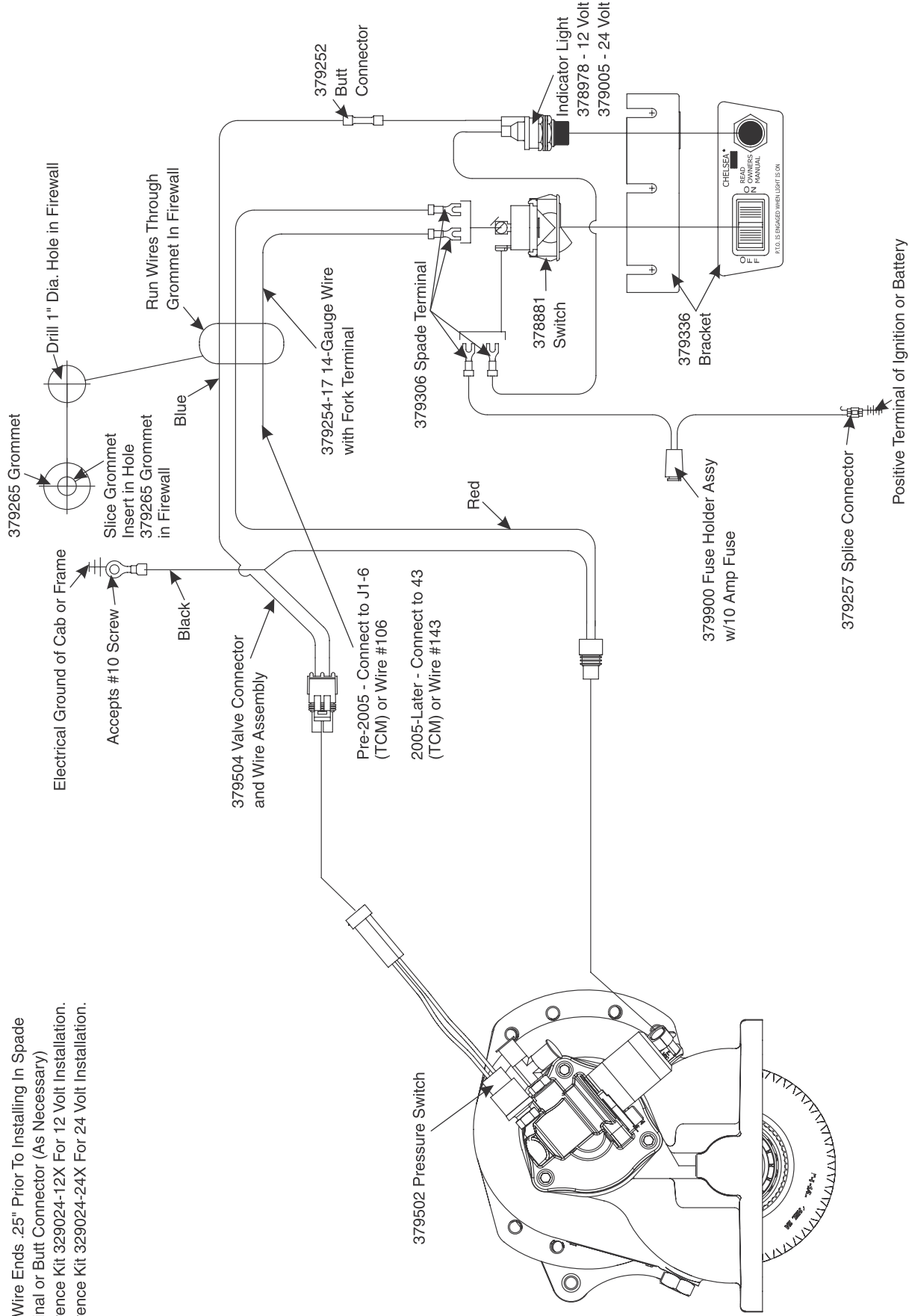
Mating P.T.O. Housing and Tube Assembly

- 6.1. Mate the Housing/Input Gear Sub-Assembly into the Tube/Output Gear Sub-Assembly. Use caution when assembling the Tube pilot into the P.T.O. Housing to prevent O-Ring damage.
- 6.2. There are two possible orientations of the P.T.O. Housing Sub-Assembly to the Tube. Use the one noted when Assembly was first Disassembled
- 6.3. Place Washer (28) onto Hex Head Screws (27). Fasten the Tube to the P.T.O. Housing using a 9/16" Hex Socket to secure the FOUR Hex Head Screws (27) with Washers and torque to 30-35 Lbs. ft.

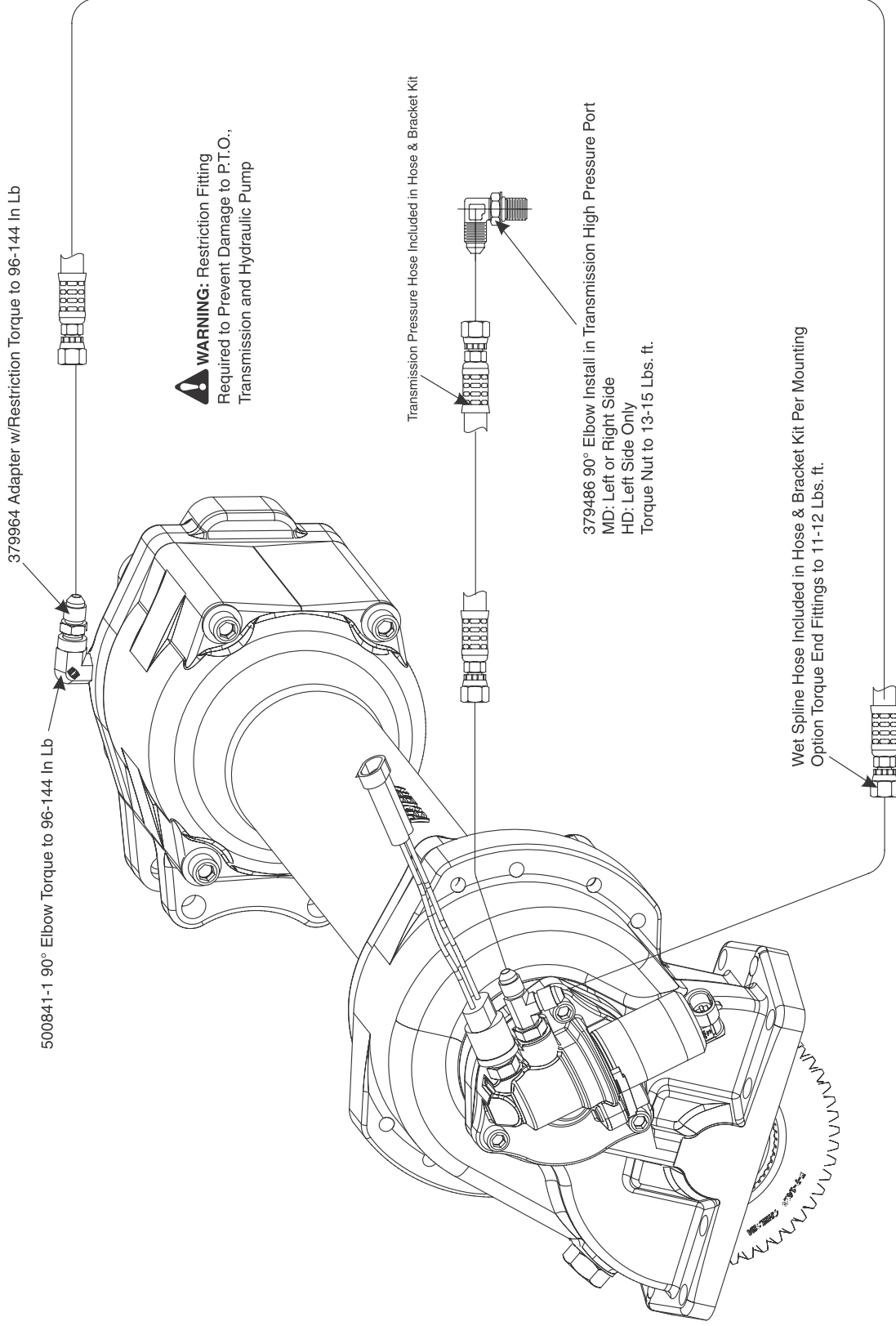
SECTION 3

Electrical Installation Sketch without E.O.C. for 890/892 Series (SK-459 Rev C)

Strip Wire Ends .25" Prior To Installing In Spade Terminal or Butt Connector (As Necessary)
Reference Kit 329024-12X For 12 Volt Installation.
Reference Kit 329024-24X For 24 Volt Installation.



Hose Installation Sketch for 890/892 Series (SK-504)



Torque Chart

Location	Torque (English)	Torque (Metric)
Idle Pin Set Screw	20 - 30 In. Lbs.	2 - 3 N.m.
Tube Assembly Cap Screws	30 - 35 Lbs. ft.	41 - 48 N.m.
Driveshaft Pipe Plug	8 - 12 Lbs. ft.	11 - 16 N.m.
Speed Sensor Port		
With E.O.C. (379243)	25 - 30 Lbs. ft.	34 - 41 N.m.
Without E.O.C.		
O-Ring Boss Plug (379242)	25 - 30 Lbs. ft.	34 - 41 N.m.
Pipe Plug (379231)	8 - 12 Lbs. ft.	11 - 16 N.m.
Valve Cap Assembly	24 - 28 Lbs. ft.	33 - 38 N.m.
Hydraulic Valve Clamp	96 - 120 In. Lbs.	11 - 13 N.m.
Shaft Nut "AB", "AC", "XV" (380486)	80 Lbs. ft.	109 N.m.

Service Manual 890 Series

Gear Chart

GEAR DESIGNATOR	INPUT GEAR	NO. TEETH A	RATIO GEAR	NO. TEETH B	OUTPUT GEAR	NO. TEETH C
890*AFJ	5-P-1428	50	5-P-1429	24	2-P-862	40
890*BFJ	5-P-1428	50	5-P-1438	25	2-P-872	39
890*CFJ	5-P-1428	50	5-P-1439	26	2-P-873	38
890*DFJ	5-P-1428	50	5-P-1440	27	2-P-874	37
890*EFJ	5-P-1428	50	5-P-1432	29	2-P-865	35
890*FFJ	5-P-1428	50	5-P-1433	31	2-P-866	33
890*GFJ	5-P-1428	50	5-P-1457	33	2-P-888	31
890*HFJ	5-P-1428	50	5-P-1455	34	2-P-8881	30

SECTION 4

Installation Instructions

Mounting the P.T.O. on the Transmission

Refer to HY25-1890-M1/US for Complete Installation Information

1. Begin by draining the oil from the transmission. Use caution, since the oil may be hot (**Fig. 1**).
2. Remove the P.T.O. aperture plate with a 15mm socket (**Fig. 2**).
3. Remove the gasket and clean the aperture surface (**Fig. 3**).

NOTE: Do not reuse the gasket that comes with the transmission.

4. Using a screwdriver, install the dowel pins until they bottom out (**Fig. 4**)

NOTE: Do not use sealing compounds because they are generally incompatible with automatic transmission fluid.

5. Install the special gasket over the guide pins. The ribbed surface should face outward, toward the installer (**Fig. 5**).

NOTE: To ensure proper backlash and sealing of P.T.O. to transmission, only use gasket furnished with the P.T.O.

6. Install the remaining capscrews. Torque all to 40 - 50 Lbs. ft. (54 - 68 N.m. or 5.5 - 6.9 Kg.m) (**Fig. 6**).
7. Securely attach the high pressure line to the P.T.O. valve "T" fitting (1), torque to 11-12 Lbs. ft. [15-16 N.m.] (**Fig. 7**) (**Fig. 7a**).

NOTE: For 890 Series see SK-504 [page 21](#) for complete plumbing installation of the transmission pressure hose and the wet spline hose.

8. Install elbow fitting supplied with P.T.O. into transmission main pressure port and torque nut to 13 - 15 Lbs. ft. or 156-180 pds-in.

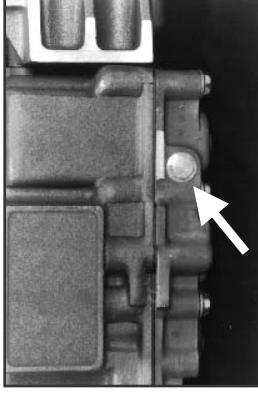


Fig. 1



Fig. 2

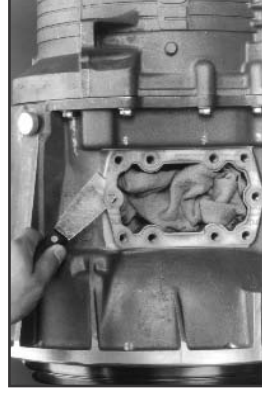


Fig. 3

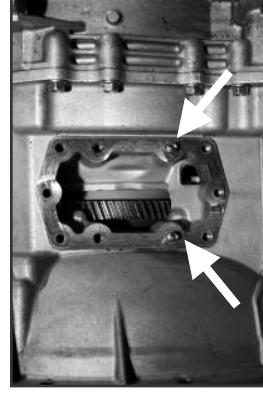


Fig. 4



Fig. 5



Fig. 6

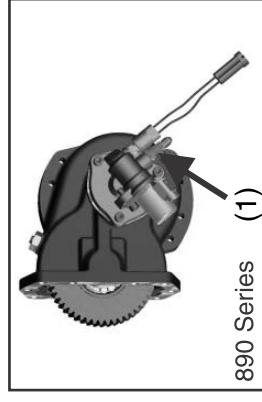


Fig. 7

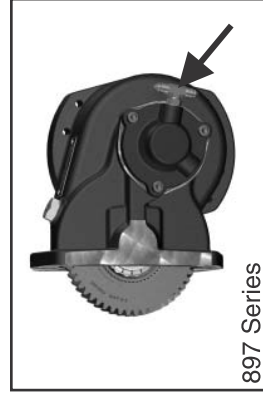


Fig. 7a

Installation Instructions

- Securely attach the high pressure line to the elbow fitting at the transmission high pressure port and torque to 11-12 Lbs. ft. [15-16 N.m.]. This fitting is included with the P.T.O. (**Fig. 8**).

NOTE: See SK-504 [page 21](#) for complete plumbing installation of the transmission hose and the wet spline hose.

- The 3 bolts on the transmission that will line up with the bracket must be removed. New longer Bolts (380075 M12-1.75" x 55mm) will be used for mounting the bracket to the transmission for all transmissions except 3000 Series w/Retarders. For 3000 Series w/Retarder use bolt 380364 (M12-1.75" x 140mm) (**Fig. 9 & 9a**).

NOTE: See Bracket Installation Chart on page 19 of HY25-1890-M1/US Manual

- The tube assembly is lined up and inserted into the Input Housing. As this is done, the bolts for the bracket should be started into the rear of the transmission (**Fig. 10**).
- As soon as at least 1 bolt is started, the tube assembly cannot fall. The unit can be aligned and slipped together with the transmission taking the weight (**Fig. 11**).

NOTE: When attaching the tube to the input housing use 4 NEW cap screws supplied with the P.T.O.

- The 4 Hex Head Cap Screws (378431-13, 3/8"-16 x 1.375") and flatwashers 380076-07 make the final attachment between the input housing and the tube assembly. Torque the Cap Screws to 30-35 Lbs. ft. [41-47 N.m.] (**Fig. 12**).
- The 3 longer bolts in the transmission should be Torqued as Follows:
3000 Family - 66-81 Lbs. ft. [90-110 N.m.]
4000 Family - 74-89 Lbs. ft. [100-120 N.m.] (**Fig. 13**).
- To complete installation of the P.T.O. see SK drawings on pages 15-17 for wiring and plumbing installation.

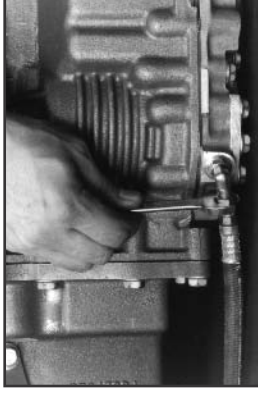


Fig. 8



Fig. 12

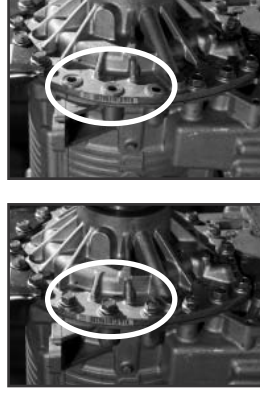


Fig. 9

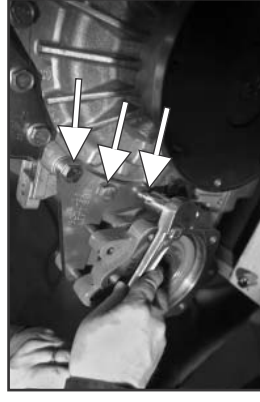


Fig. 13

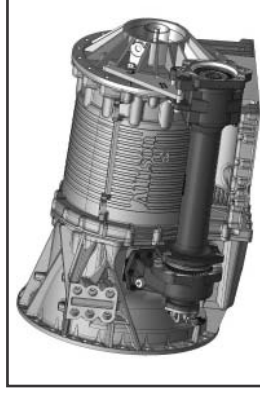


Fig. 10



Fig. 11

16. When installing pumps use O-Ring supplied with P.T.O. between pump and P.T.O. output. Torque pump bolts to proper torque specifications. Refer to page 3 of HY25-1890-M1/US manual for proper pump bracket support requirements.

NOTE: Do not use gasket with O-Ring

As with all auxiliary power systems, there are different concerns and needs with varying applications, duty cycles, and driven equipment Chelsea endeavors to provide options that will ensure trouble free use of our products and system solutions.

For customers that would like an extra level of protection from pump seal leaks, there are double sealed pumps available from Parker to satisfy your needs. Please verify your requirements with your Parker/Chelsea P.T.O. and Pump experts.

WARNING: Do not run P.T.O. w/wet spline output option if pump is not installed and connected to hydraulic system. Failure to do so may damage P.T.O./Transmission.

SECTION 5



Improper Installation and Operator Abuse are the Leading Causes of P.T.O. Failure

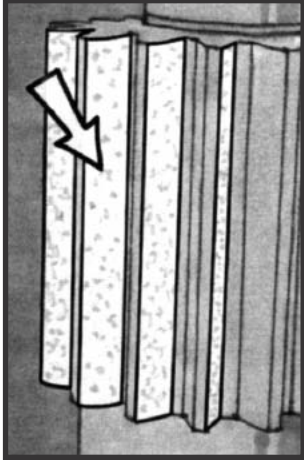
The Chelsea P.T.O. is designed and built to meet the rugged demands of the Mobile Equipment Industry. With proper use and maintenance, the Chelsea P.T.O. will provide a long service life, both on-highway and off. Yet, if a problem does arise, it is important to diagnose its causes and correct it at once.

The first place to look when troubleshooting a P.T.O. failure is in the application itself. Repeated or premature failure may be a sign of an incorrect application. This can be discovered by using the Chelsea HY25-3001/US General Information Catalog or HY25-3000/US Applications Catalog. Check to see if the proper P.T.O. was specified for the transmission, then find out if the torque handling capabilities of the P.T.O. are satisfactory for the job being done. A P.T.O. works best when it is properly specified for the transmission and job requirement.

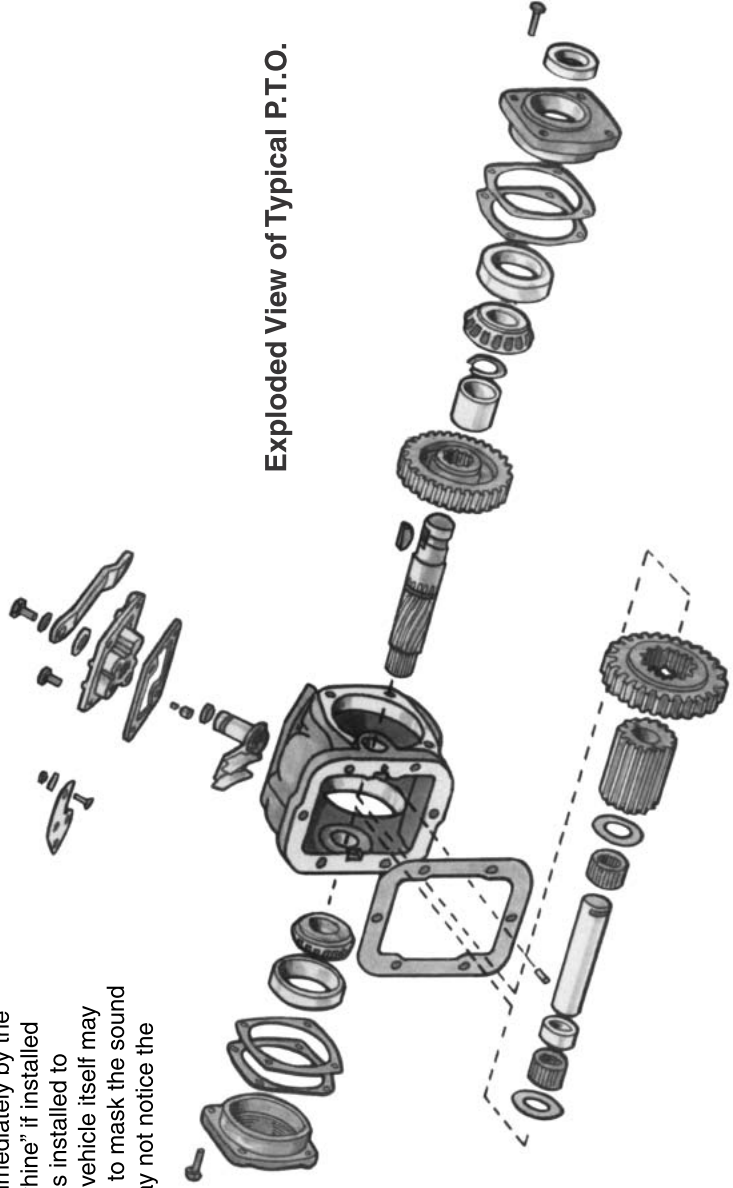
If the P.T.O. was correctly specified and then failed prematurely, there are two likely causes: improper installation and/or operator misuse. These are tough problems because they involve people as well as product. An improperly installed P.T.O. can normally be identified immediately by the sound it makes. It will "whine" if installed too tightly, or "clatter" if it is installed too loosely. Sometimes, the vehicle itself may contribute enough noise to mask the sound of the P.T.O. and one may not notice the problem.

If a problem is allowed to continue, then damage to the P.T.O. will result. A unit that has been mounted to loosely could result in broken gear teeth. A unit that is mounted too tightly could result in premature wear to the gear teeth. Also, when a P.T.O. is installed without enough filler blocks, spacers, or gaskets between it and the transmission, a deep wear pattern will occur on the gear teeth. These patterns will lead to fatigue and early tooth failure. To help prevent this from occurring, always test the P.T.O. for noise just after it is installed.

Whatever the reason for a P.T.O. failure, there will be confusion over who, or what, is at fault. More than likely the product will be blamed. Although the P.T.O. cannot defend itself, its failed parts will tell a story.



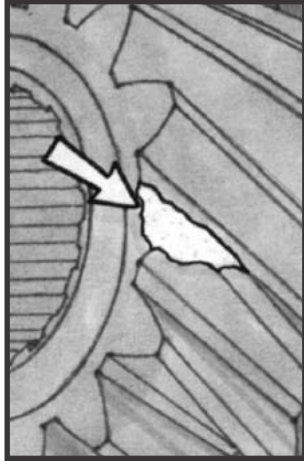
The first parts to inspect should be the gears. Check the surface of the gear teeth for signs of pitting . . . pitting is a normal wear pattern in most cases. However, contaminants in the oil or an installation that is too tight will cause severe pitting.



Exploded View of Typical P.T.O.

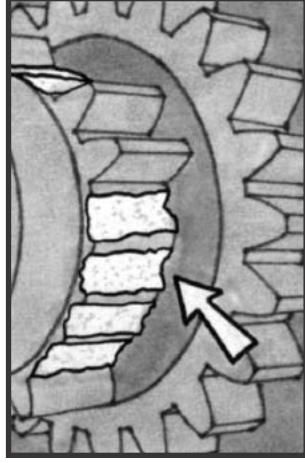
Troubleshooting

Once pitting of the gear surfaces has begun, there is nothing that can stop it. Severe pitting will eventually lead to gear tooth failure, therefore the damaged gear should be replaced when a P.T.O. is repaired or rebuilt.

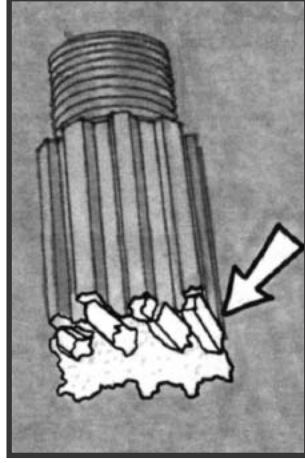


Sometimes a gear will chip a tooth because of mishandling or improper shifting. Even though a P.T.O. may continue to run with a chipped tooth, the damaged gear should be replaced immediately. It will damage the other teeth it comes in contact with during operation, not to mention the possible damage which could result from the loose chip. If the problem is allowed to continue, then failure to other parts in the P.T.O. or transmission could result.

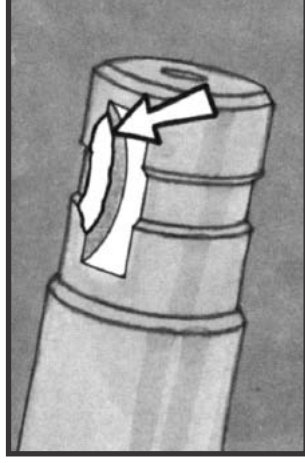
Another possible problem during vehicle operation is "shock load." This occurs when the torque demands on a P.T.O. are suddenly greater than it was designed to take. "Shock load" could be caused by torque overloads, improper shifting, equipment failure, or excessive loads over a short period of time. If this happens, the P.T.O. is likely to fail immediately. The vehicle operator may not even be aware of the reason for the P.T.O. failure.



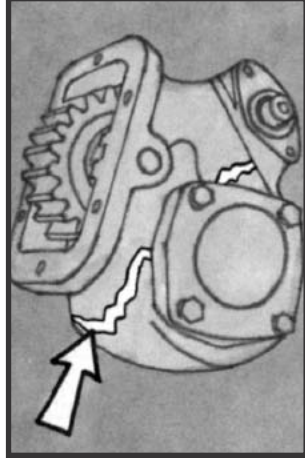
Worn gears can easily be affected by "shock load." If the worn gears are not replaced, they can eventually lead to broken gear teeth. This is the most severe form of P.T.O. failure. Worn or damaged gears are likely to break because of their reduced load carrying capacity. To prevent the possibility of broken gear teeth, always inspect auxiliary equipment for possible freeze-up. Also, recheck P.T.O. application, operating conditions and P.T.O. installation.



P.T.O. shafts are also vulnerable to operating abuse. If the shaft break is irregular, this usually indicates a torsional overload. Bending fatigue failure usually shows up as a smooth, flat break. To correct a P.T.O. shaft problem replace the failed shaft and check the speed and operating angle of the universal joint. Also, make sure the P.T.O. driveshaft is properly phased, (yokes in-line with each other). If a driveline is improperly installed it will cause vibration, which may lead to P.T.O. driveshaft or driven equipment problems.

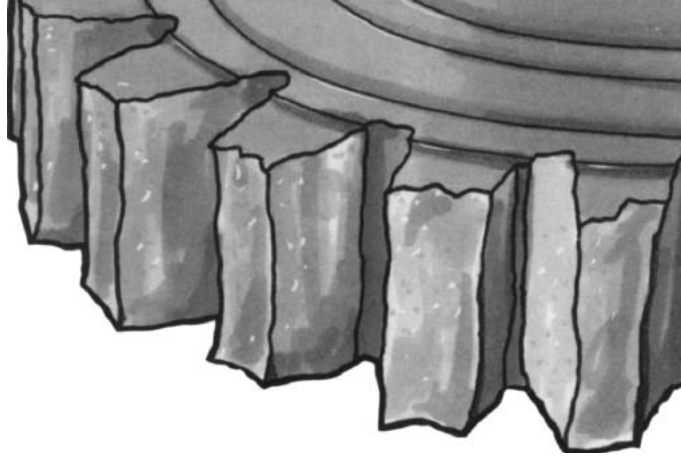


When inspecting a P.T.O. output shaft, always inspect the keyway. Sometimes a P.T.O. will fail because of a displaced keyway on the shaft caused by a loose fitting yoke or equipment freeze-up. Proper maintenance on auxiliary equipment and replacing a worn yoke and/or P.T.O. driven shaft will prevent this problem.

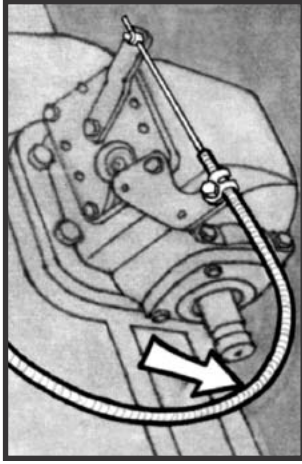


One of the most serious problems a P.T.O. can suffer is a cracked case. This condition can lead to oil loss and eventual transmission failure. Improper installation, poorly torqued bolts, or an unsupported direct mount pump can cause such a problem. A P.T.O. case can also be damaged by foreign objects meshing between the gear teeth, severe shock load, or even hitting an obstacle in the road.

Prevention is the best cure for P.T.O. case damage. Therefore, always torque the P.T.O. flange bolts in sequence and the proper specifications. Also, be sure to check the weight of the direct mount pump and, if it is over forty pounds, make a support bracket for it.

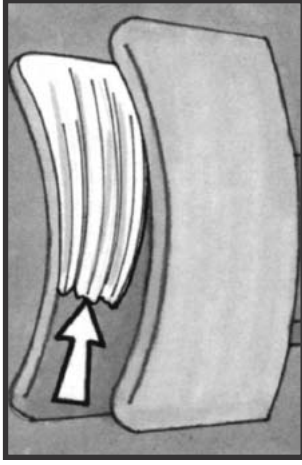


Deep Mesh Pattern Caused by Improper Backlash Adjustment

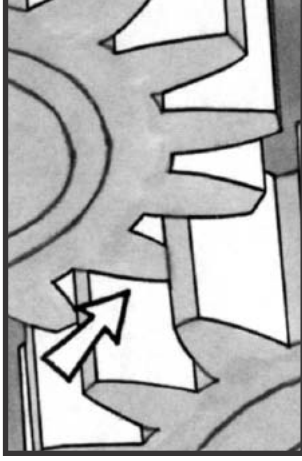


Shifting problems are sometimes a complaint an operator will have about his P.T.O. A P.T.O. that is hard to shift may be caused by a tight bend in the shifter cable, poor leverage, a gear that is installed backwards, or too tight of an installation. Many of these problems can be solved by inspecting the P.T.O. installation and making the proper adjustments regarding cable length, gear position, or shift lever.

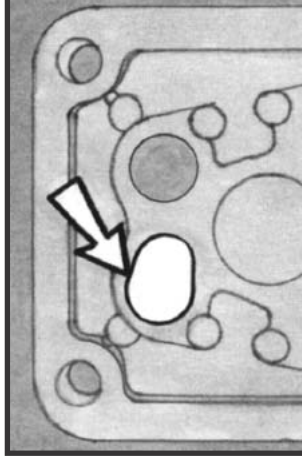
Remember, a lever-operated shift linkage should not be connected to a wire shift cover. The mechanical advantage of the lever is often too great for the wire shift cover and could severely damage it. Also inversely, don't use a cable with a lever shift cover. The cable isn't capable of transmitting the force necessary to shift a lever mechanism.



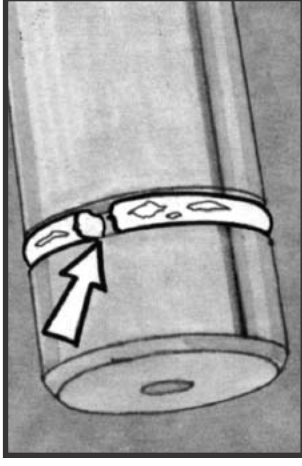
Most shifting complaints are caused by improper shifting procedure or incorrect linkage installation. Both of these situations will cause premature wear on the shift pad or fork and the shift rod or rail. To prevent this premature wear, avoid overshifting or undershifting the P.T.O. Overshifting causes the shifter fork to press against a P.T.O. gear during operation. This results in unnecessary friction and wear.



Undershifting allows incomplete gear tooth contact with the driver gear. This means only part of the tooth width is transmitting the torque and R.P.M. during P.T.O. operation. This situation can lead to gear failure or it could cause the P.T.O. to jump out of gear. These two problems can be overcome by checking linkage adjustments and proper operator training.



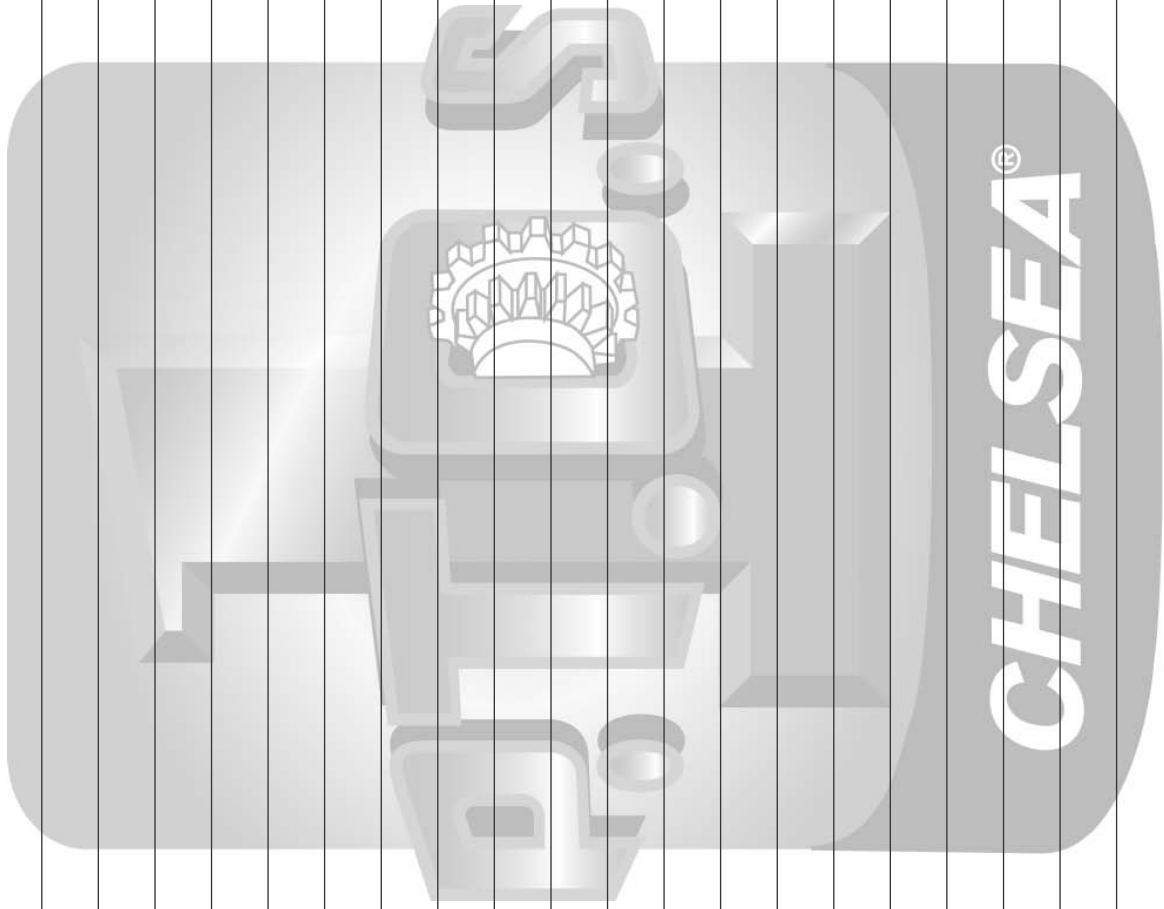
Shifting problems can also be caused by a worn or elongated shifter poppet hole. This causes the P.T.O. to jump out of gear and the parts in the shifter assembly to break or become loose. If this happens, replace those parts that are worn.



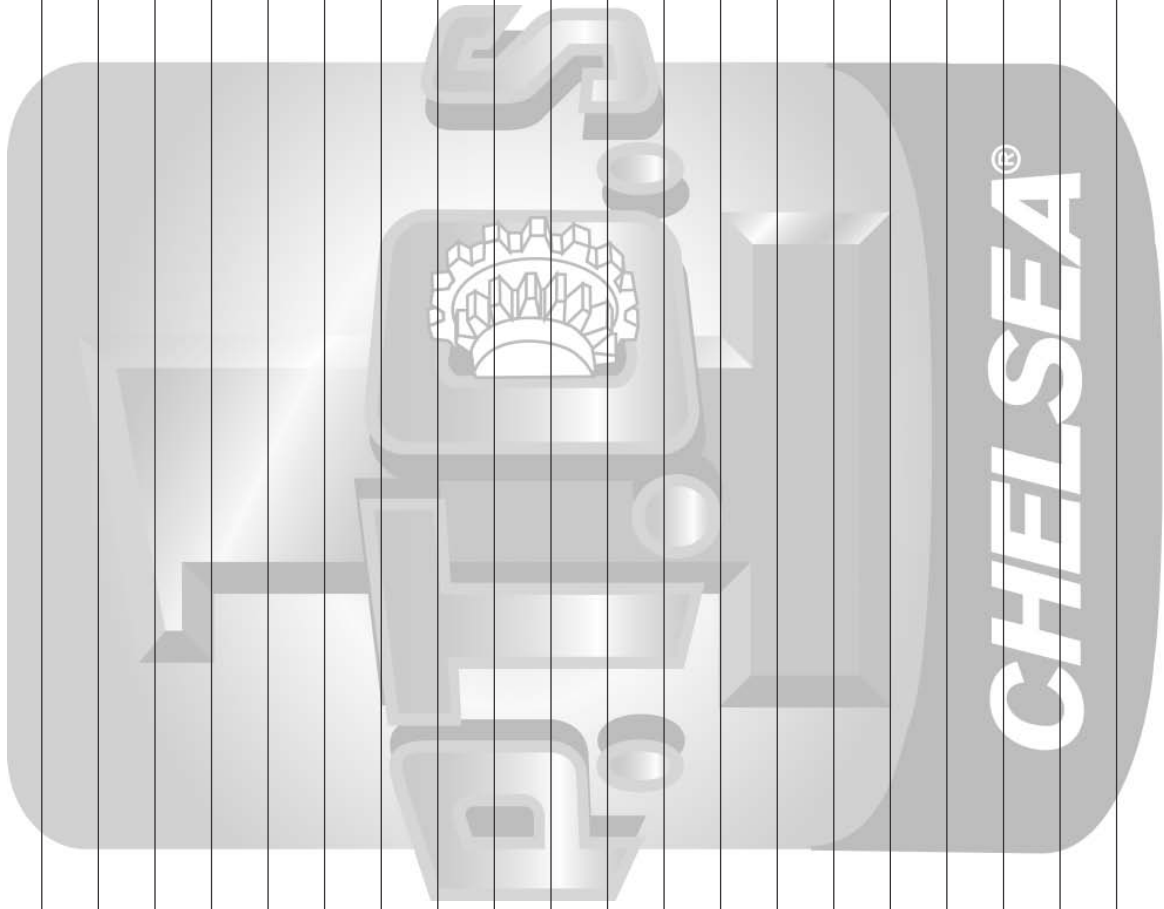
Seals and O-Rings may cause special problems in P.T.O. operations. Improper installation or heat build-up can cause O-Rings and seals to fail prematurely. Once seals or O-Rings fail, they should be replaced. The proper procedure for installing these parts is to lubricate them first so they will easily slide on the shaft.

329644-1X	Kit Mounting & Installation ("XS")	
379556	Tee .438" - 20	1
3 AOE5-5	Elbow 90°	1
379964	Adapter Restriction .438" - 20 x .125" - 27	1
500841-1	Elbow .127" - 27 Pipe	1
380071	Capscrew SH Shoulder .375" - 16 x 3.375"	2
380075	Capscrew HH M12 x 1.750" x 2.170"	3
28-P-245X	O-Ring 5.017" x .103"	2
378431-13	Capscrew HH .375" - 16 x 1.375"	4
SK-461	Fitting Instructions	1
329644-2X	Kit Mounting & Installation ("AF")	
379556	Tee .438" - 20	1
3 AOE5-5	Elbow 90°	1
379964	Adapter Restriction .438" - 20 x .125" - 27	1
500841-1	Elbow .127" - 27 Pipe	1
380071	Capscrew SH Shoulder .375" - 16 x 3.375"	2
380075	Capscrew HH M12 x 1.750" x 2.170"	3
28-P-245X	O-Ring 5.017" x .103"	1
378431-13	Capscrew HH .375" - 16 x 1.375"	4
SK-461	Fitting Instructions	1
28-P-259X	O-Ring 3.984" x .139"	1
328948-36X	Kit Gasket & Installation	
328946X	Caution Label Kit	1
35-P-74	Gasket Shim	1
379085-2	Instructions Label	1
379624	Product Warranty Card	1
HY25-1892-M1/US	Owners Manual	1
HY25-1002-M1/US	Safety Guide	1
7170-86X	Kit Mounting / Stud Kit	
379451	Screw Pilot	2
379453-10	Capscrew M10 - 1.5" x 1.378"	8
379486	90° Elbow	1
SK-355	Installation	1

Notes



Notes



Parker Hannifin Corporation – Chelsea Division Offer of Sale

The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods, services or work described will be referred to as "Products".

- 1. Terms and Conditions.** Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is subject to these terms and conditions or any newer version of the terms and conditions found on-line at www.parker.com/sale/terms/. Seller objects to any contrary or additional terms or conditions of Buyer's order or any other document issued by Buyer.
 - 2. Price Adjustments; Payments.** Prices stated on Seller's quote or other documentation offered by Seller are valid for 30 days, and do not include any sales, use, or other taxes unless specifically stated. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility. (INCOTERMS 2010). Payment is subject to credit approval and is due 30 days from the date of invoice or such other term as required by Seller's Credit Department, after which Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.
 - 3. Delivery Dates; Title and Risk; Shipment.** All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon placement of the products with the shipment carrier at Seller's facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferral of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions.
 - 4. Warranty.** Seller warrants that all products sold, other than the 590 Series, conform to the applicable Parker Chelsea standard specification for the lesser period of 2 years (24 Months) from date of service or 2-1/2 years (30 Months) from date of build (as marked on the product name plate). Seller warrants that the 590 Series will conform to the applicable Seller standard specification for the lesser period of 2 years (24 Months) from date of service or 2000 hours of usage. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**
 - 5. Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 30 days after delivery. Buyer shall notify Seller of any alleged breach of warranty within 30 days after the date the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for an amount due on any invoice) must be commenced within 12 months from the date of the breach without regard to the date breach is discovered.
 - 6. LIMITATION OF LIABILITY, UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT; OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT. EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.**
 - 7. User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.
 - 8. Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, will be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer ordering the items manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.
 - 9. Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.
 - 10. Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest.
 - 11. Improper use and indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.
 - 12. Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.
 - 13. Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.
 - 14. Force Majeure.** Seller does not assume the risk and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.
 - 15. Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.
 - 16. Termination.** Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days written notice of termination. Seller may immediately terminate this agreement, in writing, if Buyer: (a) commits a breach of any provision of this agreement (b) appointments a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or by a third party (d) makes an assignment for the benefit of creditors, or (e) dissolves or liquidates all or a majority of its assets.
- 17. Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement.
- 18. Indemnity for Infringement of Intellectual Property Rights.** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.
- 19. Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.
- 20. Compliance with Law, U. K. Bribery Act and U.S. Foreign Corrupt Practices Act.** Buyer agrees to comply with all applicable laws and regulations, including both those of the United Kingdom and the United States of America, and of the country or countries of the Territory in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA") and the U.S. Anti-Kickback Act (the "Anti-Kickback Act"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that they are familiar with the provisions of the U. K. Bribery Act, the FCPA and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer shall not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase products or otherwise benefit the business of Seller.

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MY – Malaysia, Shah Alam

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NZ – New Zealand, Mt Wellington

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SG – Singapore

Tel: +65 6887 6300

TH – Thailand, Bangkok

Tel: +662 717 8140

TW – Taiwan, New Taipei City

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BR – Brazil, Cachoeirinha RS

Tel: +55 51 3470 9144

CL – Chile, Santiago

Tel: +56 2 623 1216

Pan Am, Miami

Tel: +1 305-470-8800

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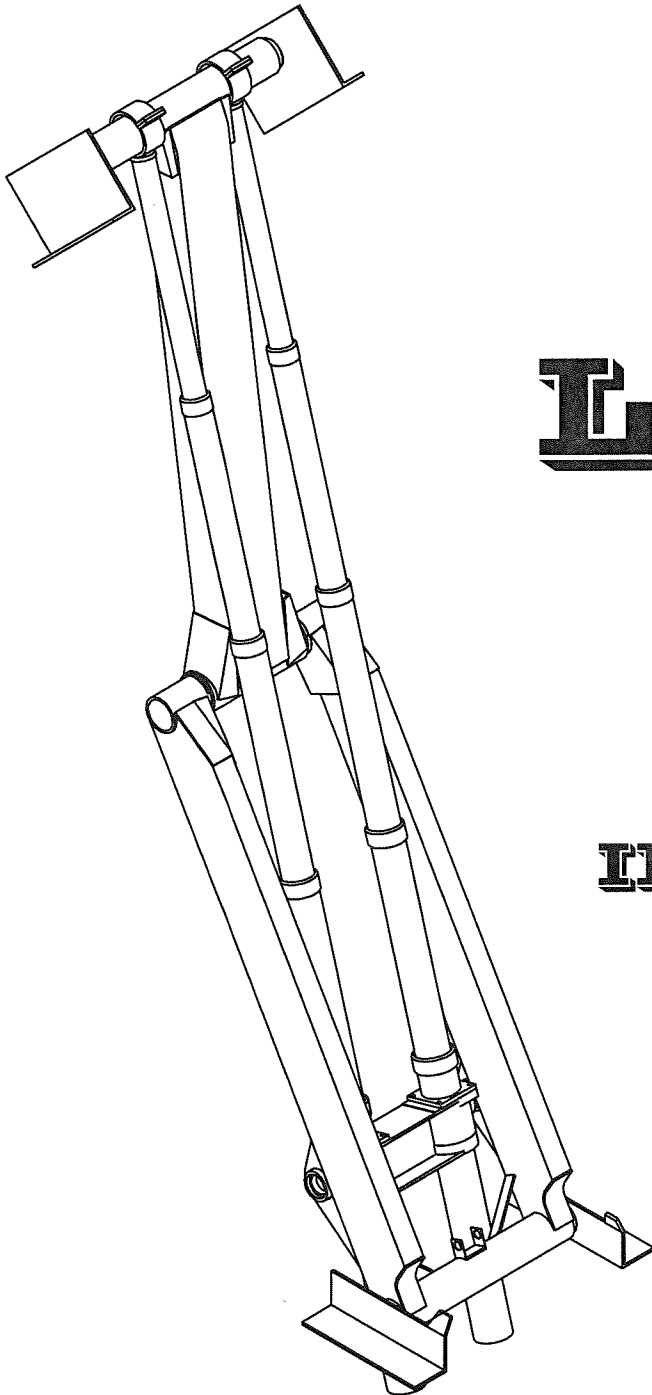
Fax: (662) 895-1069

www.parker.com/chelsea



Scott™

LEVEL LIFT



LL-3000

INSTALLATION

AND

OPERATION

SPECIFICATIONS

CYLINDER STAGES.....	3 7/8", 3 3/8", 2 7/8", 2 3/8"
STROKE.....	110 3/4"
PUMPS SET AT.....	3500 PSI

IMPORTANT INFORMATION

Congratulations on your recent purchase of a Scott Hoist! This manual is only a small part of Tafco's continuing effort to serve our customers and bring the best products possible to you the customer. If you have any questions or experience any problems, contact your local Scott Hoist distributor.

This manual has been prepared to provide the owner and operator with the information required to properly install and operate the Scott Hoist and pump unit. It is important that you, the owner or operator, read this manual prior to installing, operating or performing any maintenance work on the unit.

For your convenience, we have provided this space for you to record your hoist and pump model and serial numbers and date of purchase as well as your dealership name and address.

Some of the information below is needed for ordering parts. Please fill in the information for faster service when ordering.

NOTE: Hoist serial number is located in the scissor hinge tube.

OWNERS NAME: _____

OWNERS ADDRESS: _____

HOIST MODEL NUMBER: _____

HOIST SERIAL NUMBER: _____

PUMP MODEL NUMBER: _____

PUMP SERIAL NUMBER: _____

PURCHASE DATE: _____

DEALER NAME: _____

DEALER ADDRESS: _____

DEALER TELEPHONE NUMBER: _____

CAPACITY CHART (TONS)

LL3000 HOIST

(SCISSOR HINGE BACK)

BOX LENGTH (FEET)	CAB TO TRUNNION (INCHES)	OVER-HANG (INCHES)	DUMP ANGLE				
			35°	40°	45°	50°	55°
			230"	202.25"	181"	164"	150.4"
18	151	12	45.31	39.93	35.76	32.45	29.77
18	139	24	51.78	45.63	40.87	37.08	34.02
18	127	36	60.41	53.24	47.68	43.26	39.96
20	175	12	40.28	35.49	31.79	28.84	26.46
20	163	24	45.31	39.93	35.76	32.45	29.77
20	151	36	51.78	45.63	40.87	37.08	34.02
22	191	12	36.25	31.94	28.61	25.96	23.81
22	187	24	40.28	35.49	31.79	28.84	26.46
22	175	36	45.31	39.93	35.76	32.45	29.77
24	223	12	32.95	29.04	26.01	23.60	21.65
24	211	24	36.25	31.94	28.61	25.96	23.81
24	199	36	40.28	35.49	31.79	28.84	26.46
26	247	12	30.21	26.62	23.84	21.63	19.85
26	235	24	32.95	29.04	26.01	23.60	21.65
26	223	36	36.25	31.94	28.61	25.96	23.81

NOTE: CAPACITY IN TONS AT 3500 PSI.

NOTE: ① OVERHANG BASED ON 55" FROM CENTER LINE OF TAIL HINGE PIN TO CENTER LINE OF TRUCK TRUNNION, WITH A 2" CLEARANCE BETWEEN CAB AND BODY.

NOTE: ② CAPACITIES GIVEN INCLUDE BODY WEIGHT PLUS PAYLOAD WEIGHT, AND ASSUME PAYLOAD TO BE CENTERED IN BODY FRONT TO BACK.

MAXIMUM DUMP ANGLE CHART	
DUMP ANGLE	MAXIMUM OVERHANG*
35 degrees	59 inches (62 1/2 inches)
40 degrees	52 1/2 inches (56 inches)
45 degrees	48 inches (50 1/2 inches)
50 degrees	44 inches (46 1/2 inches)
55 degrees	41 1/2" (43 1/2 inches)

*Overhang is based upon 34 inches loaded frame height.
(36 inch loaded frame height shown in parenthesis.)

INSTALLATION TIPS

1. The hoist can be mounted with the Scissor Hinge either fore or aft for mounting versatility.
2. Plan how the hoist, safety prop, and pump will fit on the truck. The mounting area of the hoist must allow for proper movement of the hoist/ pump without interfering with truck cross members, fuel or air tanks etc.
3. The hoist upper mounts are positioned up between the bed cross sills. It may be necessary to shift the hoist slightly to avoid cutting or moving the bed cross sills. Keep in mind that this will slightly effect the hoist dump angle and capacity.
4. Determine where the PTO and pump can be located. The pump/ reservoir position will determine how the hoist will be plumbed. Keep the cylinder, pump and reservoir away from heat sources such as exhaust pipes.
5. Tilt cabs may require greater cab to bed clearance. This is necessary to allow the truck cab (when tilted) to clear the bed. Also any other obstruction (air cleaner stack, exhaust pipes, etc.) must be 2 inches or more from the bed being installed.
6. Take time to become familiar with all hoist parts and how they are to be mounted.
7. All work should be performed by qualified personnel.
8. Insure that this manual along with the pump installation manual are forwarded to the end user.
9. Never modify the hoist in any way. Install the hoist according to the installation manual.
10. These instructions are for typical installations. If your requirements are different due to body and truck configuration, it is the responsibility of the installer to insure the installation is completed correctly.

**READ ALL PROVIDED MATERIAL AND SAFETY
INSTRUCTIONS BEFORE INSTALLING HOIST!**

LL-3000 HOIST INSTALLATION INSTRUCTIONS

1. Mount the tail hinge assembly. For a tandem axle truck the tail hinge is mounted as follows: The distance from the center of the pivot pin of the hinge assembly to the rear edge of the rear tire should be 0 to 2 inches. (see page 10) This placement will give a distance of approximately 44 inches from the center of the trunnion to the center of the tail hinge pin. (For single axle trucks, the distance from the front of the tail hinge to the rear spring hanger should be 1 to 6 inches). The tail hinge is placed close to the axle to avoid frame damage and to prevent severe weight transfer from the front of the rear wheels when dumping. After placement of the tail hinge is determined, cut out the top rear section of the frame, in which the tail hinge will set (see page 9). The hinge should be mounted flush with the top and end of the frame. It may be necessary to cut off the excess length of the truck frame. After the hinge assembly is in place, insure that the tail hinge is square with the truck frame. Weld the assembly securely to the frame.
2. Insert lower frame mounts and top hoist mounts into the hoist frame. Make sure the lower mount guide tabs are facing away from the scissor hinge. Insert cylinders into hoist saddle and bolt securely. Bolt cylinder top mounts to upper hoist tube. Note the proper orientation of the cylinder top mount ears as shown on page 10. After doing so, place the hoist on the truck frame in the position it is to be mounted. Refer to the mounting chart on page 3 for the mounting length (ML) at which the hoist is to be positioned. The mounting length is the distance from the center of the tail hinge hinge pin to the center of the hoist lower mount tube. The hoist can be mounted in the standard or reverse installation (shown on page 10) to allow for cylinder swing clearances.

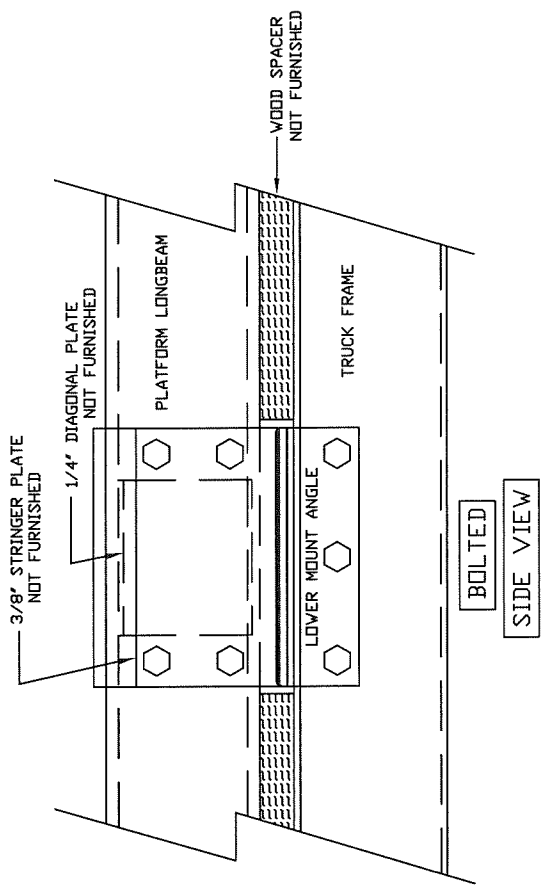
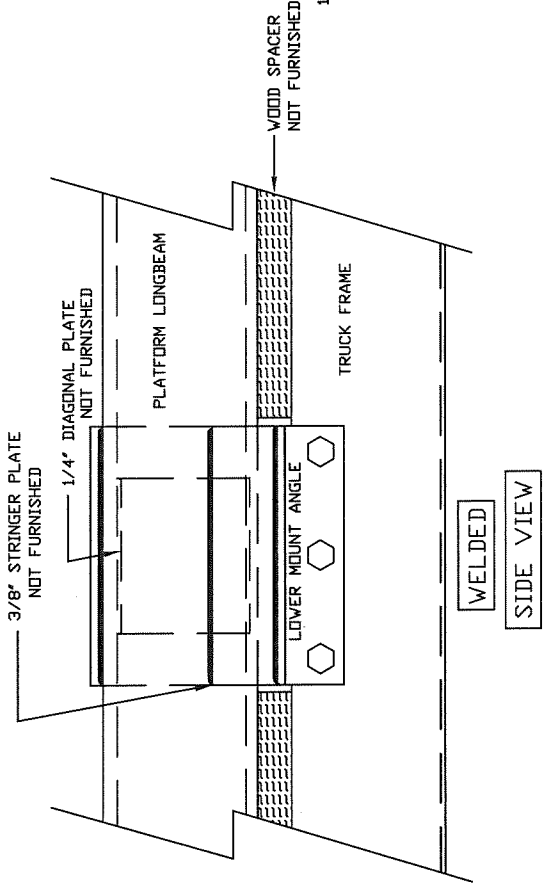
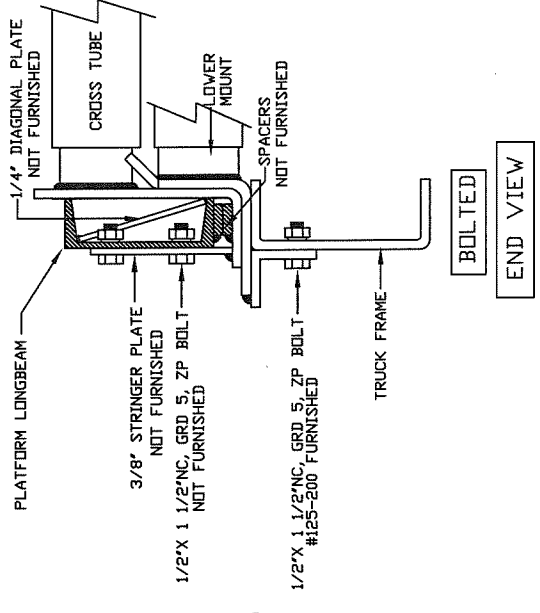
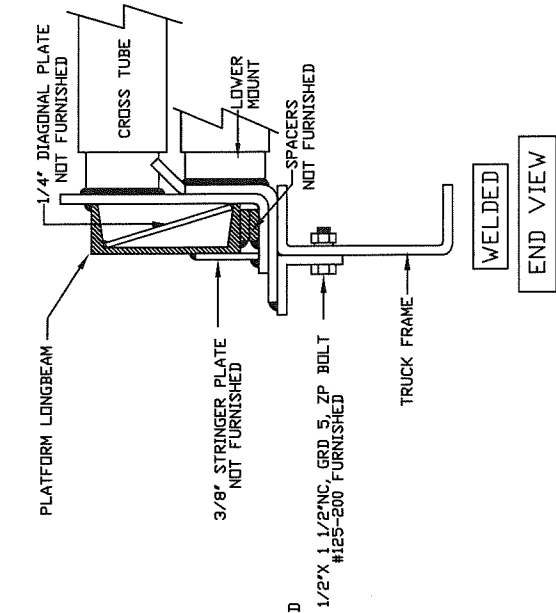
IMPORTANT: SO NOT WELD OR FASTEN LOWER MOUNTS TO TRUCK FRAME AT THIS TIME !
3. Determine if the Bed cross members will interfere with hoist upper mount plates when the bed is positioned on the truck frame with 2-3 inch of clearance between the cab and bed. If necessary, slide the hoist either fore or aft to allow hoist upper mount plates fall between bed cross members. (Note that moving the hoist towards the truck cab will increase capacity but decrease the dump angle and opposite results occur when moving the hoist away from the truck cab.

IN THE EVENT THAT A CROSS MEMBER MUST BE NOTCHED TO ALLOW FOR THE PROPER POSITIONING OF THE HOIST, IT IS ADVISABLE TO INSERT A CROSS CHANNEL BETWEEN THE LONG BEAMS MUST TO THE FORE AND AFT OF THE HOIST. THE CROSS CHANNEL WILL BE 1" SMALLER THAN THE SIZE OF THE LONG BEAM. See page 9.

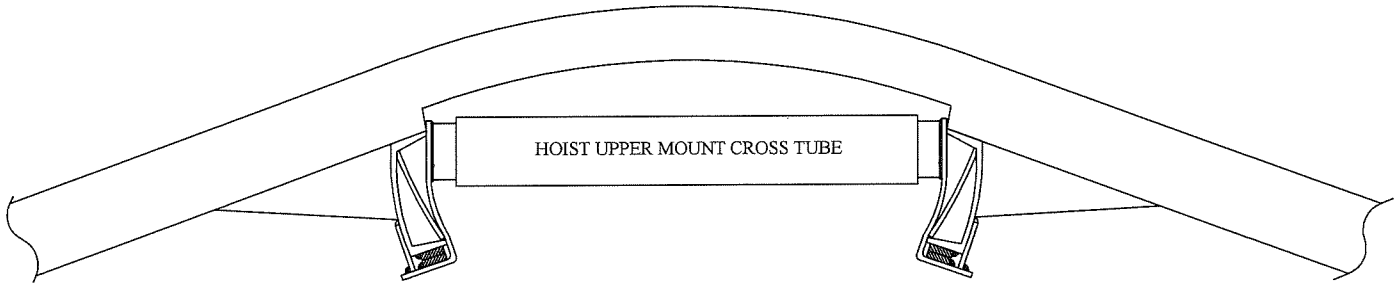
4. If the hoist hinging end is not supported by a truck frame cross member, install a support channel near the hinging end of the hoist frame. Hoist frame should run level along length of the truck frame. (see page 10).
5. Make sure that the hoist is square with the truck frame. Before attaching the lower mount angles, recheck for any possible interference (cylinder swing, etc.). Clamp the lower mount angles to the lower hoist mounts and weld the full length of the lower mount. Drill and bolt the lower mount angles to the side of the truck frame. **DO NOT WELD THE LOWER MOUNTS TO THE TRUCK FRAME.**
6. Mount the pump and reservoir at this time. Refer to the pump installation instructions in this manual (pages 15 & 17) and supplied with your pump and reservoir. Insure that proper clearance is provided with all hose, cable and PTO mounting.
7. Lower the truck bed onto the truck frame, positioning it exactly as it will be mounted when lowered. Recheck cab to bed clearance, bed cross member positioning and rear hinge positioning to insure proper location. Weld the vertical plate assembly of the tail hinge to the long beam of the bed. Refer to diagram on page 9 for proper mounting. Diagram also shows proper mounting on beds with aluminum long beams.
8. There are two methods to attach the upper hoist mounts to the bed long beams, shown on page 8. One method is to bolt the upper mount to the long beam and the other is to weld the upper mount to the long beam.
Both methods require a ¼ inch diagonal plate to be installed to the long beam, centered on the upper mount location. This will prevent the upper mount from rolling under. This plate is furnished by the installer due to the variety of long beam sizes.
 - A. For bolt-on applications, a stringer plate must be welded to the upper mount. This allows for the upper mount to be bolted to the long beam. See page 8. Drill and bolt the stringer attachment plate to the long beam. It may be necessary to raise the bed to complete bolting of the upper mount. Be sure to properly block the bed when doing so.
 - B. For applications in which the upper mount is welded, it can be welded in place as shown on page 8.
9. Connect the hydraulic hoses and fittings supplied with your hoist and pump. Use Loctite Hydraulic Sealant on all threaded NPT pipe joints. Fill the reservoir with a recommended fluid, as listed in the maintenance portion of this manual.
10. Grease all hoist, tail hinge and drive line grease fittings. This will prevent damage and insure smooth operation.

11. Slowly raise the bed in steps, checking for clearance of all hoist and drive line components. Raising the hoist and stopping it in several positions to check for clearance will help prevent damage to the truck and hoist.
12. If the hoist is operation with no clearance problems, then raise the hoist to half the dump angle. **SUPPORT THE BED WITH A SUITABLE OVERHEAD HOIST TO PREVENT LOWERING OT THE TRUCK BED.** Fill the reservoir tank $\frac{3}{4}$ full of the recommended fluid. Continue to raise the hoist fully. Unhook the overhead hoist and lower the truck bed.
13. Raise and lower the hoist several times. Check the fluid in the reservoir according to the pump installation instructions.
14. **ALL INSTALLATIONS MUST INCLUDE A SAFETY PROP. THE SAFETY PROP IS ONLY INTENDED TO SUPPORT AN EMPTY BODY AND IS NOT INTENDED TO BE USED WITH A LOADED BODY.** Refer to page 14 in this manual for the safety prop mounting instructions.

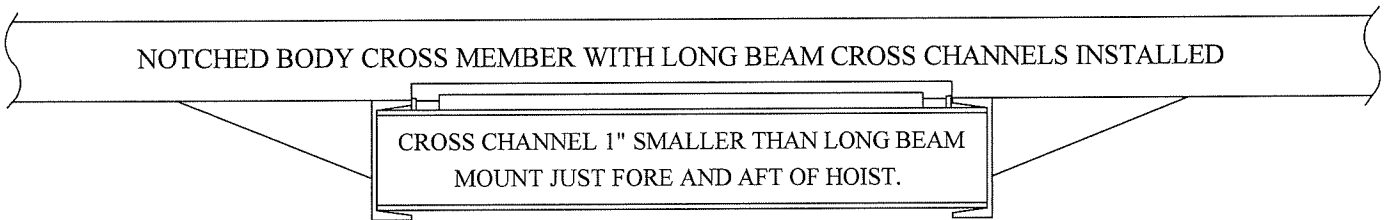
NOTE: INSTALL AND OBSERVE ALL SAFETY AND WARNING DECALS SHOWN ON PAGE 11.



ON GRAIN BODIES, IT IS RECOMMENDED THAT CROSS CHANNELS BE INSTALLED BETWEEN THE BODY LONG BEAMS. MOUNT ONE CROSS CHANNEL DIRECTLY IN FRONT OF HOIST UPPER MOUNT PLATES AND ONE DIRECTLY BEHIND HOIST AS SHOWN BELOW. WELD CROSS CHANNELS SECURELY TO BODY LONG BEAMS.

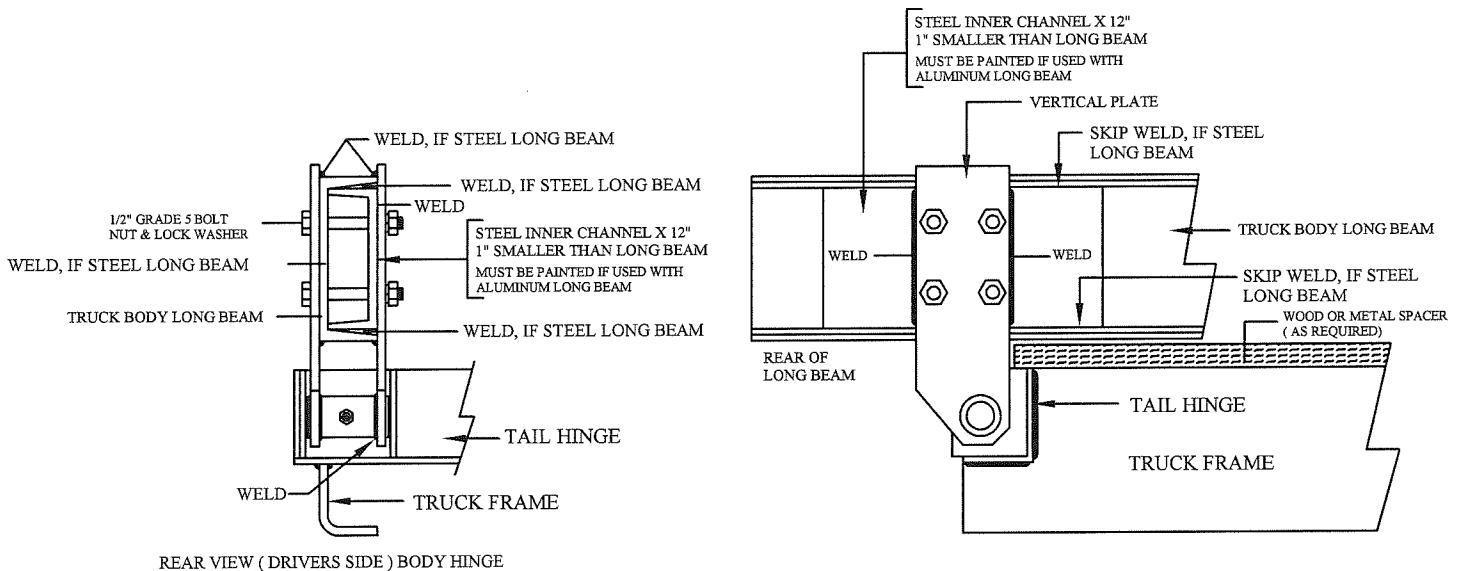


NOTCHED BODY CROSS MEMBER WITHOUT LONG BEAM CROSS CHANNELS INSTALLED
END VIEW

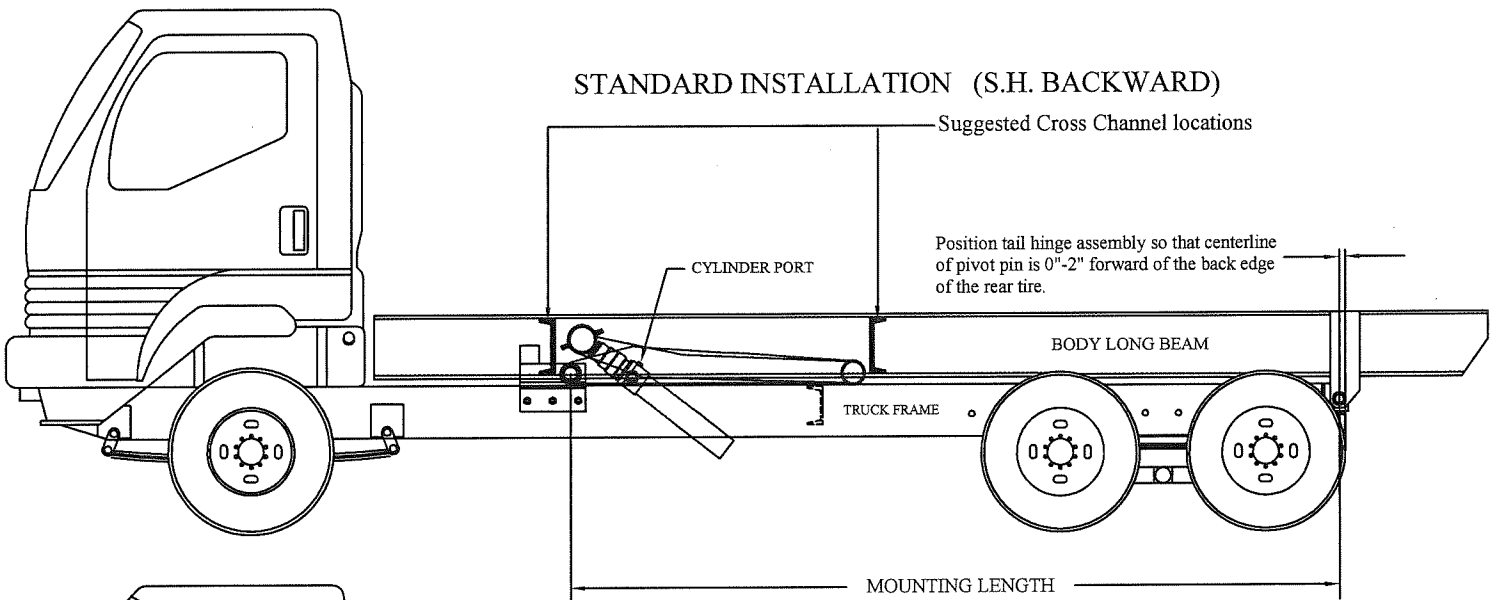


CROSS CHANNELS NOT FURNISHED

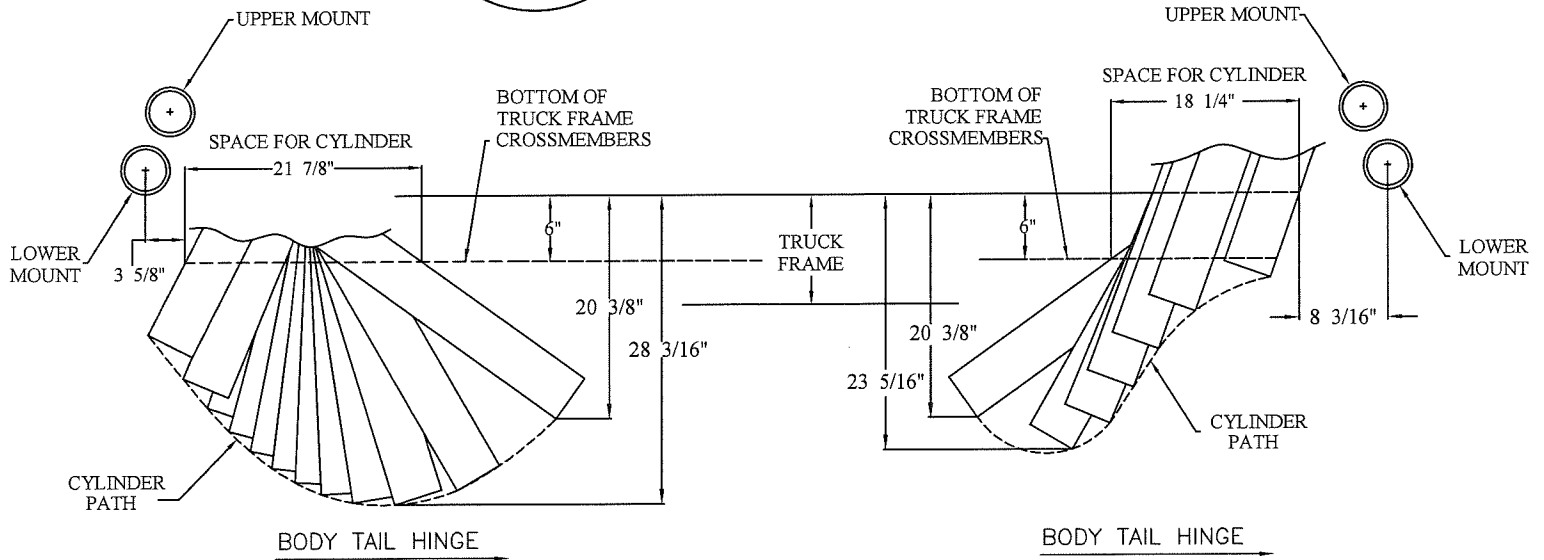
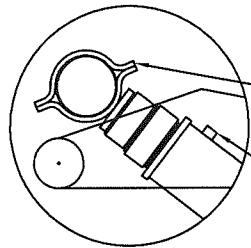
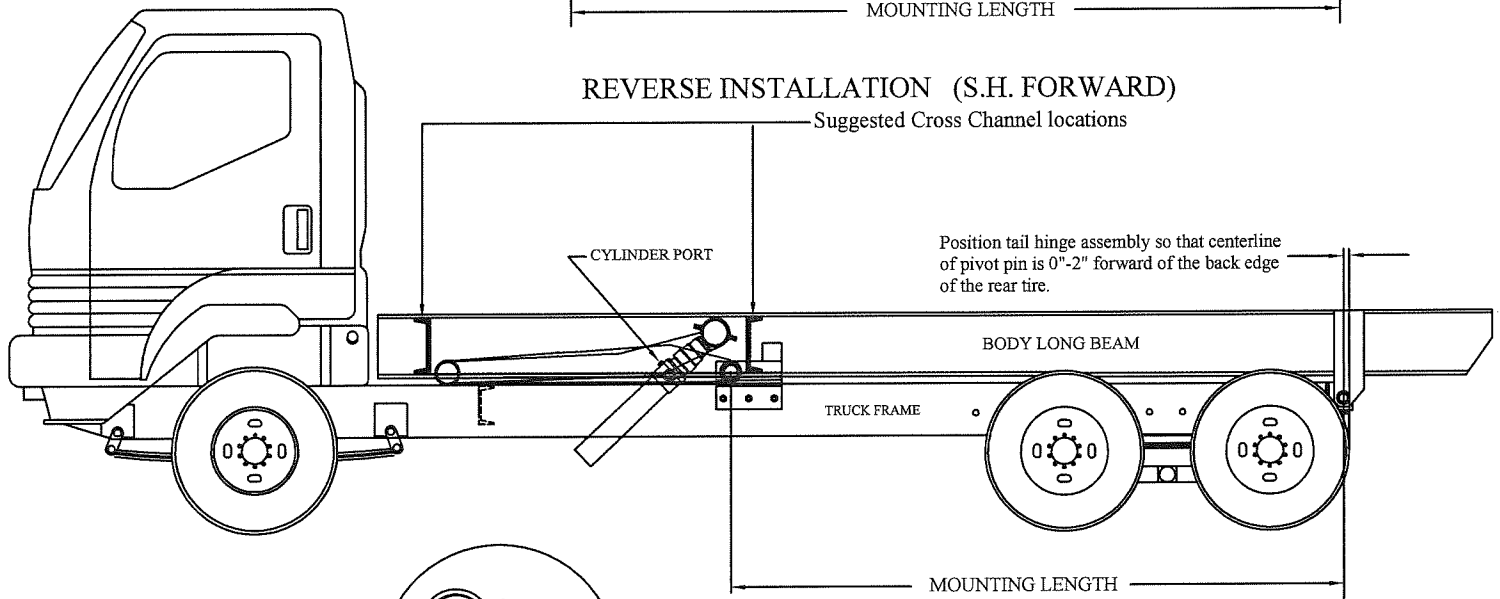
FAILURE TO PROPERLY MOUNT AND REINFORCE THE TRUCK BODY AND HOIST COULD VOID THE BODY AND HOIST WARRANTY!!



STANDARD INSTALLATION (S.H. BACKWARD)

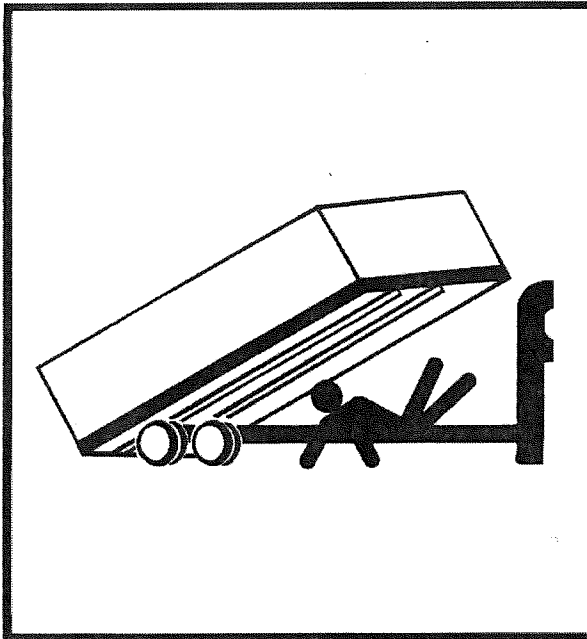


REVERSE INSTALLATION (S.H. FORWARD)



LL3000 HOIST- STANDARD INSTALLATION

LL3000 HOIST- REVERSE INSTALLATION



DANGER

Support box with safety prop before working under box.

Failure to heed may cause serious injury or death.

125-143

WARNING

MOVING THE TRUCK WHILE THE BODY AND HOIST ARE IN THE AIR COULD CAUSE A ROLL-OVER RESULTING IN INJURY OR DEATH.

HOIST OPERATION INSTRUCTIONS

1. TO ENGAGE THE P.T.O. - With the truck engine at idle, transmission in neutral, and emergency brake set; push clutch in - engage P.T.O. - release clutch.
2. TO RAISE THE HOIST - Pull pump control knob out rapidly.
3. TO HOLD THE HOIST IN ANY POSITION - Move pump control knob to center position.
4. TO LOWER THE HOIST - Push the pump control knob all the way in and hold the knob in until the box is down. For 2-way cylinders, hold the knob in until the box is pulled down.
5. DRIVING TRUCK - DISENGAGE P.T.O. WHILE DRIVING TRUCK.
6. SUPPORT BOX WITH SAFETY PROP - Then and only then work under box.

TAFCO EQUIPMENT CO.

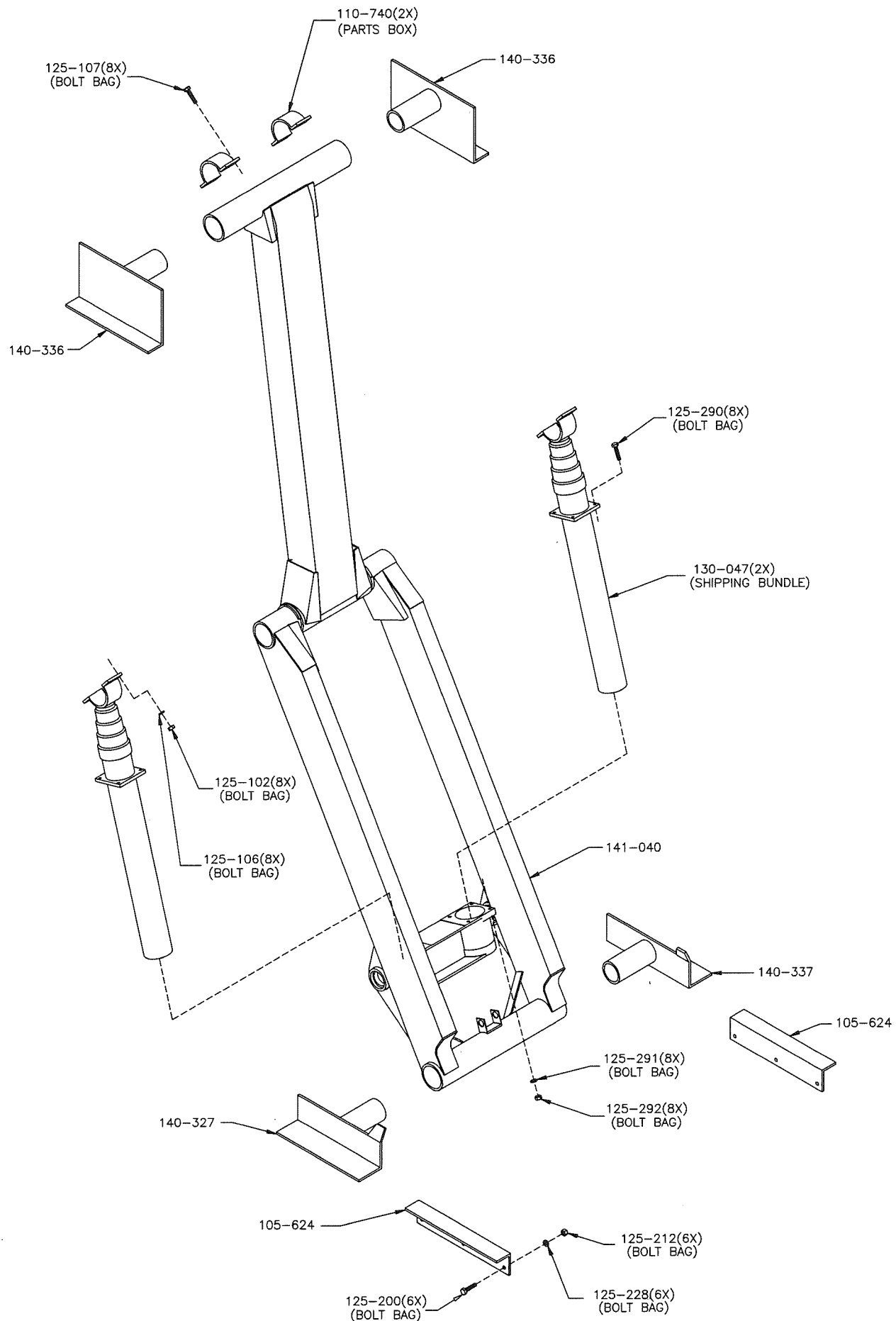
125-144

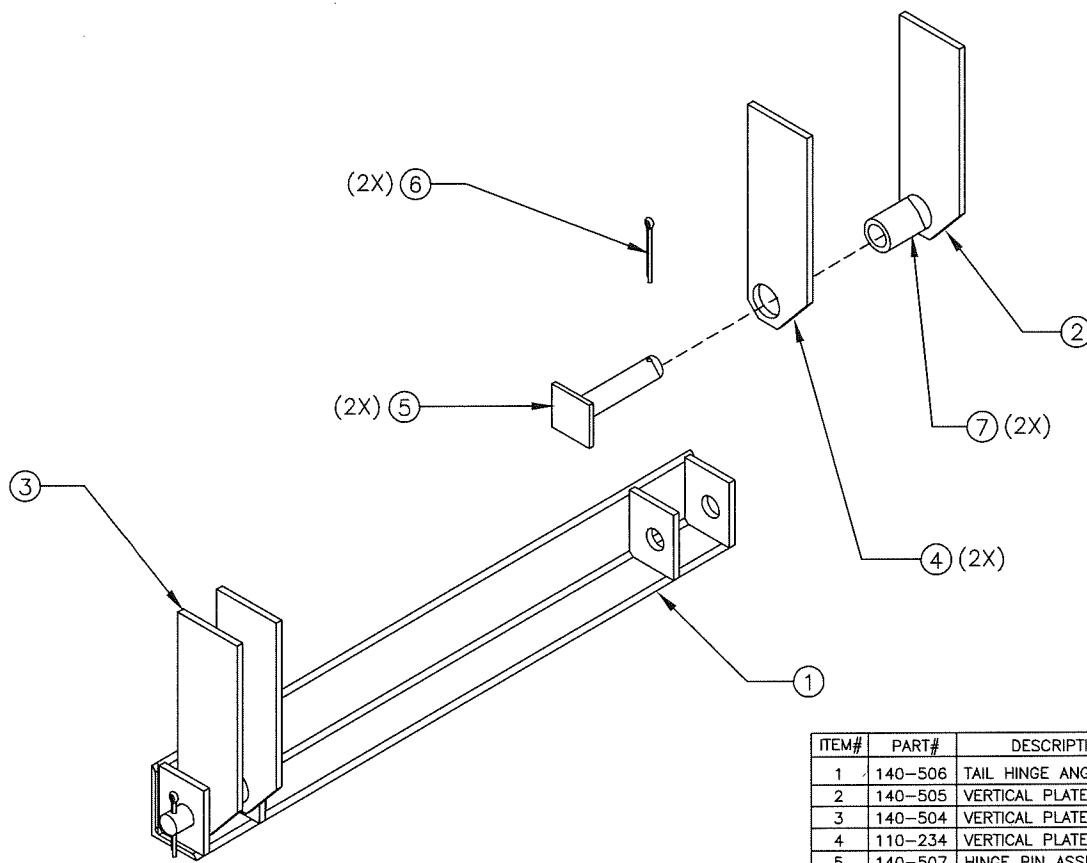
Apply on dashboard as near as possible to Hoist controls.

CAUTION:

Improper positioning of hoist could cause damage to cylinders and truck chassis cross-members. See mounting instructions for cylinder motion.

130-334





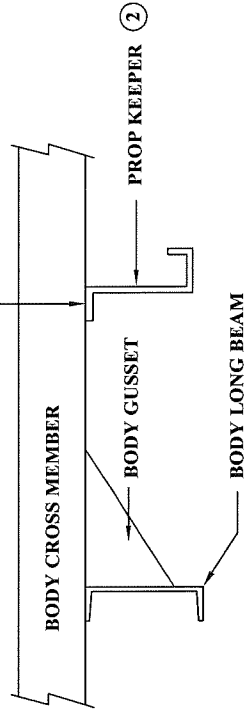
LL-3000 TAIL HINGE ASSEMBLY
PART# 140-525

ITEM#	PART#	DESCRIPTION	QTY
1	140-506	TAIL HINGE ANGLE ASSEMBLY	1
2	140-505	VERTICAL PLATE/BUSHING ASSEMBLY(R.H)	1
3	140-504	VERTICAL PLATE/BUSHING ASSEMBLY(L.H)	1
4	110-234	VERTICAL PLATE	2
5	140-507	HINGE PIN ASSEMBLY	2
6	125-318	3/8" X 2 1/2" COTTER PIN	2
7	125-285	1/4" DRIVE ZERKS	2

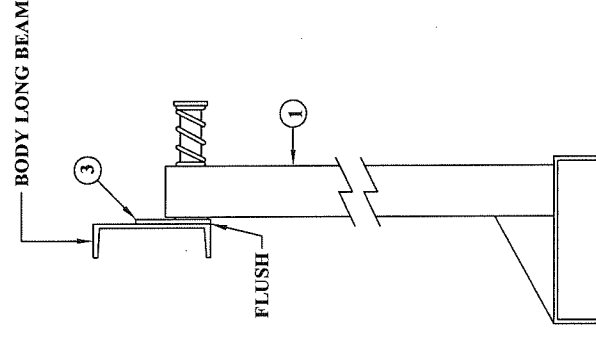
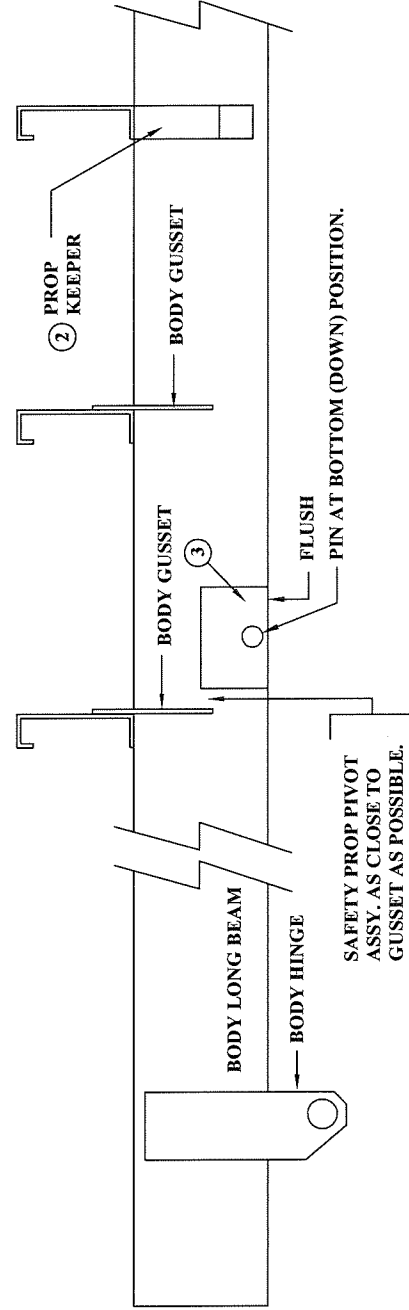
NOTES:

SAFETY PROP MOUNTING INSTRUCTIONS

WELD OR BOLT TO CROSS MEMBER HERE.



ITEM#	PART#	DESCRIPTION	QTY
1	140-416	SAFETY PROP LEG & PIVOT ASSY	1
2	110-953	SAFETY PROP KEEPER	1



1. Raise & brace up the empty body.
2. Locate leg/pivot assembly (plate ③), an appropriate distance forward of body hinge and as close to body gusset as possible. Pivot assembly mounting plate should be flush at the bottom with the bottom of the long beam, with the pin in the down position as shown.
NOTE: To protect the compression spring from weld splatter, wrap with a wet paper towel.
3. Clamp the pivot plate to the long beam and weld all around with a 3/8" fillet weld.
NOTE: To protect the compression spring from weld splatter, wrap with a wet paper towel.
4. Swing base of leg assembly forward into storage position. Slip prop keeper onto leg assembly and locate keeper to the most suitable crossmember. Clamp keeper to crossmember and weld or bolt permanently. On shorter truck bodies it may be necessary to store safety prop backward. If this is the case- then the pivot assembly should be welded directly behind body gusset.
5. Apply "DANGER" safety prop decals to outside surface of both bed long beams.

CAUTION: THE SAFETY PROP IS NOT DESIGNED TO SUPPORT LOADED BODY!

TAFCO DIRECT MOUNT PUMP INSTALLATION

The direct mount pump that Tafco supplies is a BI-ROTATIONAL pump with a 7/8" diameter-13 tooth splined shaft and a 2 bolt SAE "B" flange. The pump mounts directly to the PTO and should be positioned so you can use the side and / or end ports. It is recommended that you use the Tafco supplied tank and valve option with this pump. If you are not using the Tafco tank and valve, then you must insure the system you use meets all the requirements of the Scott Hoist you are installing.

The direct mount pump is BI-ROTATIONAL* and will rotate either direction. You must insure that you have the inlet hose (from the front of the tank to the pump) in the correct pump port that will allow oil to enter the pump and flow around the gear teeth. The oil does NOT flow between the teeth. The inlet line should be as close to the size of the inlet fitting as possible and should be a suction hose with crimp fittings. The pump hoses are supplied by the INSTALLER. The pressure hose from the pump to the control valve must have a working pressure rating equal to or exceeding the hoist maximum pressure setting.

NOTE: ALWAYS DOUBLE CHECK THE PTO ROTATION AND PUMP ROTATION TO INSURE YOU HAVE THE INLET AND OUTLET PROPERLY PLUMBED. SEE PAGE 16 FOR MORE INFORMATION.

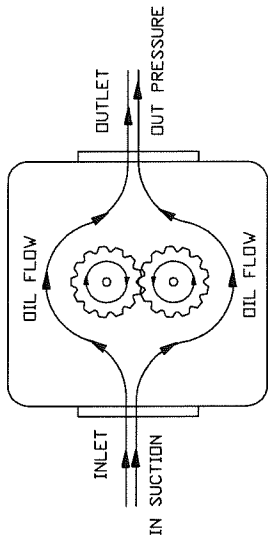
*BI-ROTATIONAL means that you do not need to take the pump apart to reverse the rotation. You simply need to insure that the hose from your oil supply tank attaches to the port that allows the oil to flow around the two gears when the PTO is operating.

1. Measure and determine the location and desired height of the valve/ reservoir. The valve/ reservoir should be mounted to insure the valve to cylinder hoses will reach.
2. Bolt the mounting brackets to the valve/ reservoir and clamp the brackets to the truck frame in the desired location. Remove the valve/reservoir.
3. Drill and bolt the brackets to the frame and remount the valve/reservoir. Be careful of brake lines, fuel tank, fuel lines and wiring located inside the truck frame when drilling through the frame.
4. Refer to the CONTROL CABLE INSTALLATION INSTRUCTIONS (page 20). This will give you detailed instructions on the installation and adjustments of the control cable.
5. See page 16 for the proper plumbing of the direct mount pump and valve/reservoir assembly. Note the valve lifting port (labeled 1 or B) is connected to the bottom of the cylinder to raise the hoist. The other port is the lowering port. For power up and power down hoists, this valve port is connected to the rod end of the hoist cylinder. For power up only hoists, this valve port is plugged off.

**WARNING: HOISTS WHICH ARE POWER UP AND POWER DOWN
MUST NOT BE MADE INTO POWER UP ONLY HOISTS !!**

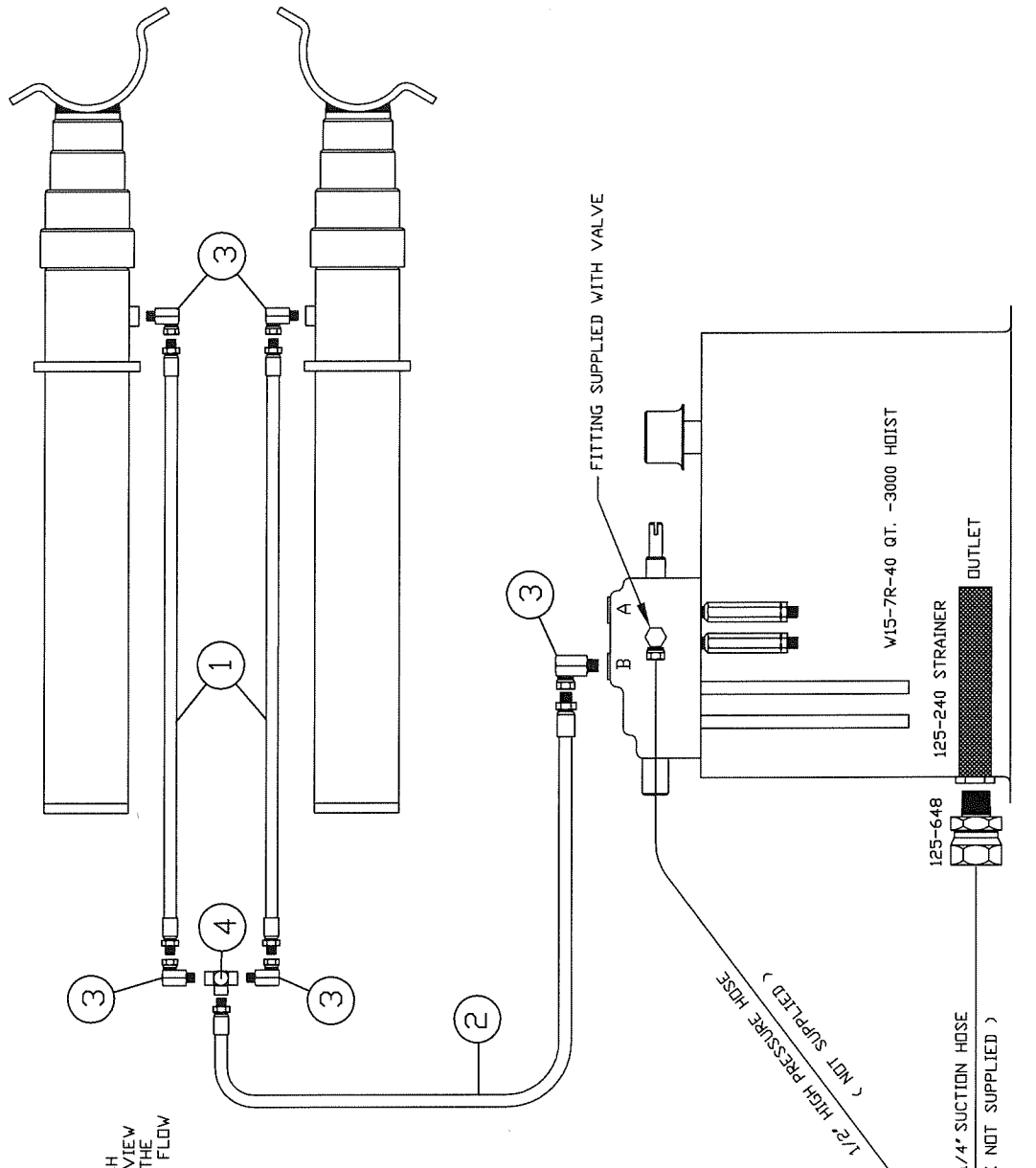
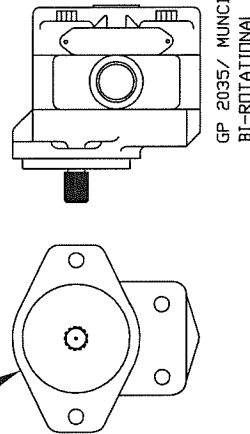
Always insure the proper routing of the cable so you pull the cable knob out to raise and push the cable knob in to lower.

1	125-247	40" x 1/2" HP HOSE
2	130-333	84" x 1/2" HP HOSE
3	125-141	90 DEG. MALE-FEMALE PIPE SWIVEL 1/2"
4	125-139	FEMALE 1/2" PIPE TEE.

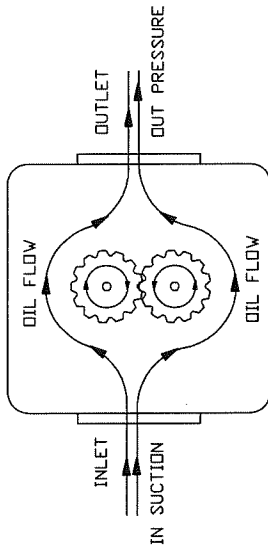


CHECK THE PTO AND PUMP ROTATION. THE GEARS MUST PULL THE OIL IN THROUGH THE INLET PORT, AROUND THE OUTSIDE OF THE GEARS, AND PUSH IT OUT THE PRESSURE PORT. IF YOUR ROTATION IS OPPOSITE THE ABOVE VIEW THEN THE GEARS WILL TURN THE OTHER DIRECTION AND THE INLET AND THE OUTLET PORTS WILL BE REVERSED KEEPING IN MIND THAT THE OIL MUST FLOW AROUND THE GEARS AND NOT BETWEEN THEM.

SAE 'B' 2 BOLT MOUNTING FLANGE
SAE 'B' 13 TOOTH SPLINED SHAFT - 7/8" DIAMETER

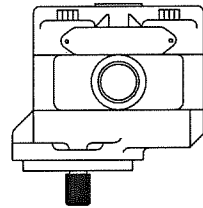


1	125-247	40" x 1/2" HP HOSE
2	125-770	84" X 3/4" HP HOSE
3	125-141	90 DEG. MALE-FEMALE PIPE SWIVEL 1/2"
4	125-773	FEMALE 3/4" PIPE TEE.
5	126-621	6901-12-12 90 DEG FITTING.
6	126-622	6901-10-12 90 DEG FITTING.
7	125-771	90 DEGREE MALE-FEMALE SWIVEL.

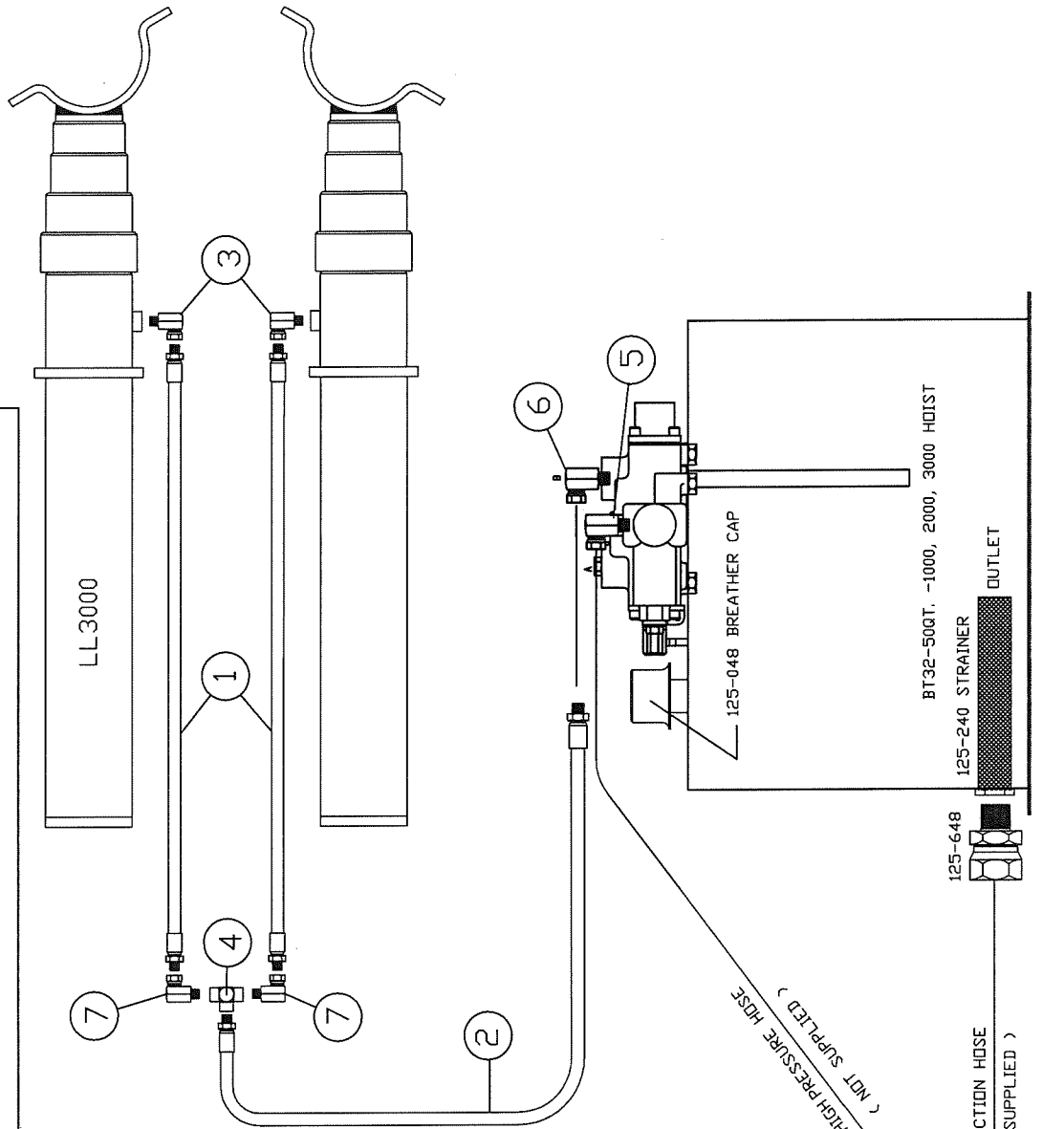
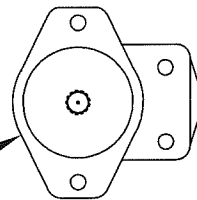


CHECK THE PTO AND PUMP ROTATION. THE GEARS MUST PULL THE OIL IN THROUGH THE INLET PORT, AROUND THE OUTSIDE OF THE GEARS, AND PUSH IT OUT THE PRESSURE PORT. IF YOUR ROTATION IS OPPOSITE THE ABOVE VIEW THEN THE GEARS WILL TURN THE OTHER DIRECTION AND THE INLET AND THE OUTLET PORTS WILL BE REVERSED KEEPING IN MIND THAT THE OIL MUST FLOW AROUND THE GEARS AND NOT BETWEEN THEM.

SAE 'B' 2 BOLT MOUNTING FLANGE
SAE 'B' 13 TOOTH SPLINED SHAFT - 7/8" DIAMETER



GP 2035/DAK PUMP
BI-ROTATIONAL



PTO DRIVE-LINE PUMP / RESERVOIR INSTALLATION

1. Measure and determine the location and desired height of the pump/ reservoir.
2. Bolt the pump brackets to the pump/ reservoir and clamp the brackets to the truck frame in the desired location.
3. **FOR STEP 3, REFER TO PAGE 19.**

Check the pump shaft to insure it is parallel to the PTO output shaft and also with the truck frame rail. Determine the drive line angle. The ideal drive line angle is 1 to 7 degrees. If this angle is greater than 15 degrees, relocate the pump/ reservoir to achieve a drive line angle less than 15 degrees. Determine the exact length of hex shaft "B".

It is of great importance that dimension "A" (of drive shaft illustration on page 19) of 1/8" is maintained on the drive shaft when installing to slip joint. This will prevent the fall out of drive line due to loosening of set-screws and will prevent the shaft from slipping out of the PTO joint.

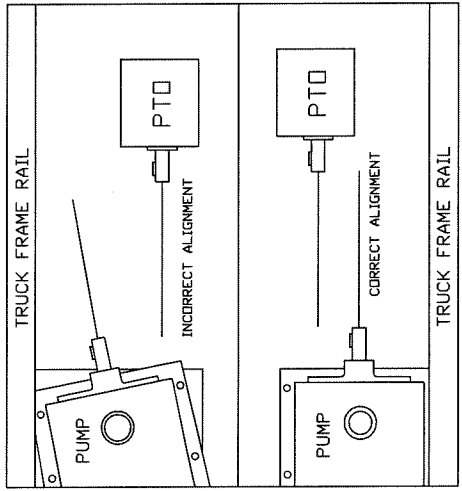
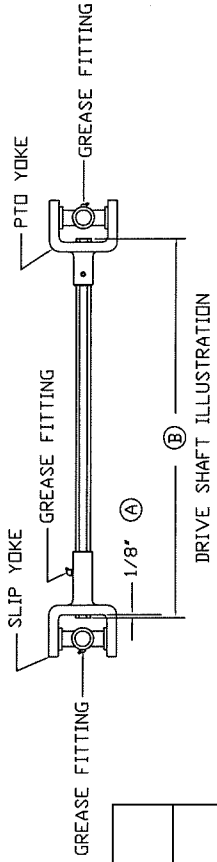
NOTE: An improperly installed drive line will cause excessive noise and vibration and may result in pump and/or PTO failure.
4. Remove the pump/ Reservoir.
Drill and bolt the brackets to the frame and remount the pump/reservoir. Be careful of brake lines, fuel tank, fuel lines and wiring inside the truck frame when drilling through the frame. Install the drive shaft insuring that the drive line yokes are in line. (see page 19).
5. Refer to the control cable installation instructions (page 20). This will give you detailed instructions on the installation and adjustments of the control cable.
6. See page 19 for the proper plumbing of the PTO pump to the hoist cylinder. Note the valve lifting port (labeled 1 or B) is connected to the bottom of the cylinder to raise the hoist. The other port is the lowering port. For power up and power down hoists, this valve port is connected to the rod end of the hoist cylinder. For power up only hoists, this valve port is plugged off.
WARNING: HOISTS WHICH ARE POWER UP AND POWER DOWN MUST NOT BE MADE INTO POWER UP ONLY HOISTS !!
Always insure the proper routing of the cable so you pull the cable knob out to raise and push the cable knob in to lower.

CAUTION: Read all safety and operation information provided by the PTO manufacturer. Observe these and all safety instructions.

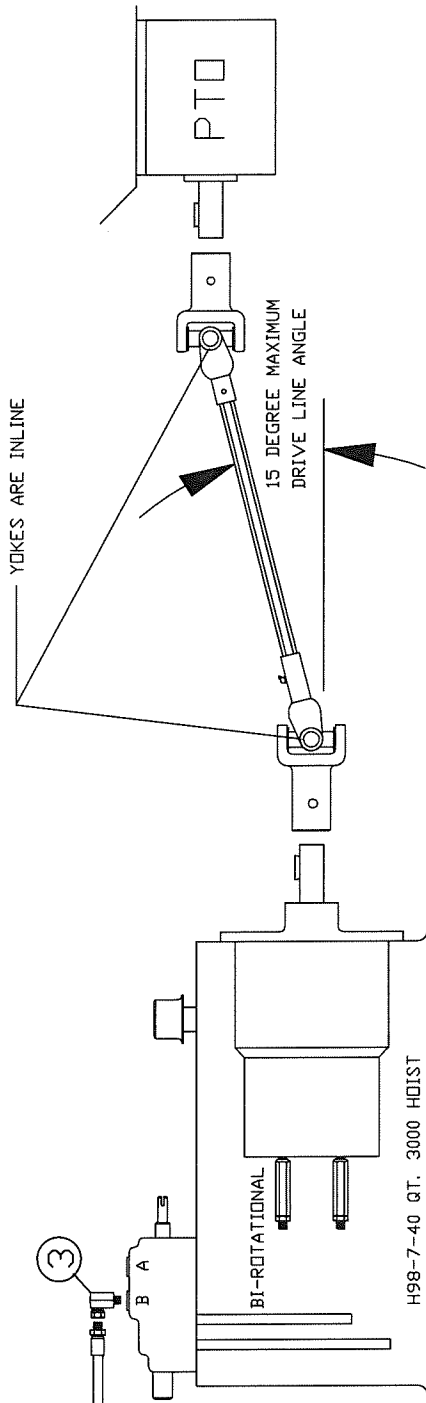
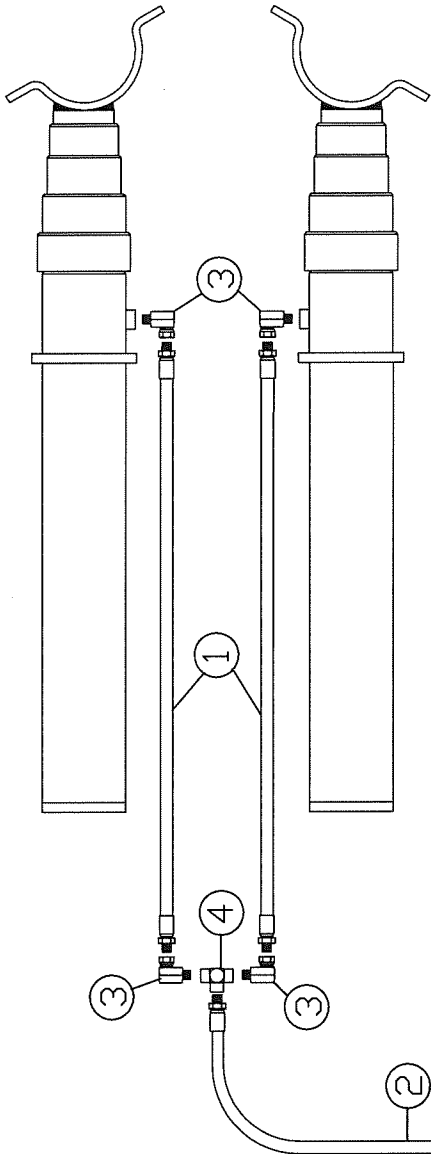
CAUTION !!

1. **DO NOT go under vehicle when the engine is running.**
2. **DO NOT work on a PTO or shaft while engine is running.**
3. **DO NOT engage or disengage the PTO or driven equipment by hand from under the vehicle when the engine is running.**
4. **ALWAYS shut the engine off before working on or near the PTO system.**

1	125-247	40" x 1/2" HP HOSE
2	130-333	84" x 1/2" HP HOSE
3	125-141	90 DEG. MALE-FEMALE PIPE SWIVEL 1/2"
4	125-139	FEMALE 1/2" PIPE TEE.




PTO-PUMP SHAFT ALIGNMENT
PUMP SHAFT AND PTO SHAFT MUST BE PARALLEL WITH EACH OTHER AND WITH THE TRUCK FRAME RAIL.



WILLIAMS MACHINE & TOOL CO.

MANUFACTURERS OF HYDRAULIC PISTON PUMPS

NEUTRAL LOCK-CONTROL CABLE INSTALLATION INSTRUCTIONS



DANGER

DO NOT ALLOW ANY PART OF YOUR BODY UNDER THE TRUCK BOX UNTIL THE TRUCK BOX IS PROPERLY BLOCKED. SERIOUS INJURY OR DEATH WILL RESULT FROM TRUCK BOX FALLING IN 1 SECOND OR LESS.

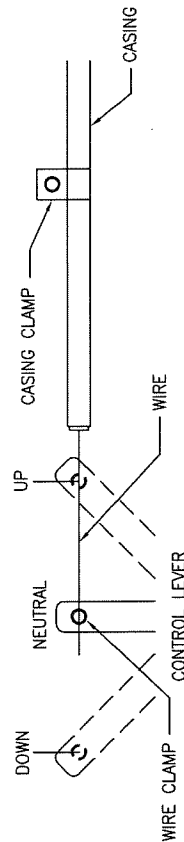
BEFORE BEGINNING ANY CONTROL CABLE INSTALLATION, PERFORM THE 3 STEPS BELOW:

1. MAKE SURE THE TRUCK BOX IS EMPTY - EMPTY THE LOAD.
2. THE TRUCK BOX MUST BE PROPERLY BLOCKED BY USING THE BODY PROPS ON THE TRUCK HOIST AND BY USING BLOCKS UNDER THE HOIST FRAME.
3. READ AND UNDERSTAND THESE INSTRUCTIONS SO PROPER INSTALLATION OF THE CABLE CAN BE ACCOMPLISHED.

INSTALLATION INSTRUCTIONS

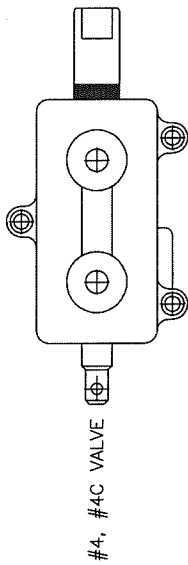
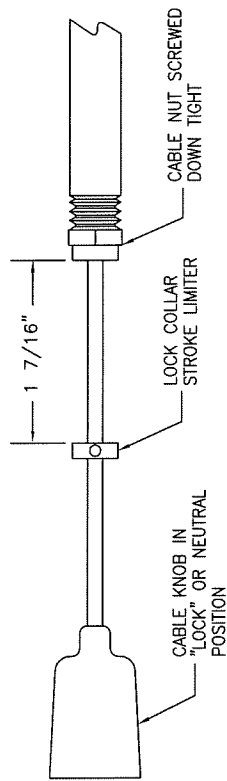
1. MOUNT THE CONTROL CABLE TO THE VEHICLE WITH SPECIAL ATTENTION THAT NO BENDS ARE SHARPER THAN A 10" RADIUS.
2. ROUTE THE CONTROL CABLE CASING AWAY FROM ALL HAZARDS WHICH MAY DAMAGE THE CABLE. KEEP THE CONTROL CABLE AWAY FROM CATALYTIC CONVERTERS, TAIL PIPES, EXHAUST PIPES, ETC. MAKE CERTAIN THE CONTROL CABLE IS NOT CRUSHED OR ROUTED WHERE MOVING PARTS MAY CRUSH IT.
3. A STROKE LIMITER(LOCK COLLAR) HAS BEEN INSTALLED ON THE CABLE HEAD. THIS LIMITER IS NECESSARY TO PREVENT OVER TRAVEL OF THE CABLE WHEN THE CABLE IS PUSHED IN, CAUSING THE CABLE WIRE TO KINK.
4. INSTALL CABLE TO THE CONTROL VALVE AND TIGHTEN THE CLAMPS PER DRAWING INSTRUCTIONS BELOW. SEE INSTRUCTION SHEET INCLUDED INSIDE THE CABLE CLAMP KIT FOR FURTHER DETAILS.

NOTE: WHEN INSTALLING CABLE ON AN EXISTING UNIT WITH HYDRAULIC LINES ALREADY CONNECTED, THE TRUCK BOX MUST BE PROPERLY BLOCKED TO PREVENT THE TRUCK BOX FROM FALLING. MOVING THE LEVER ON THE VALVE CAN CAUSE THE TRUCK BOX TO FALL IN ONE SECOND OR LESS. DEATH OR SERIOUS INJURY WILL RESULT IF THE LEVER IS MOVED WHILE SOMEONE IS UNDER THE TRUCK BOX.

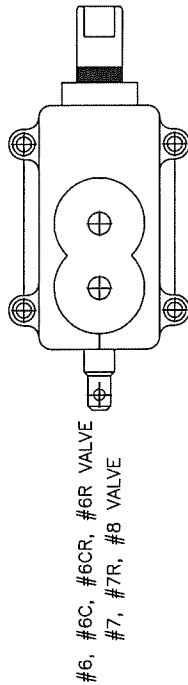


FORM# 125-932

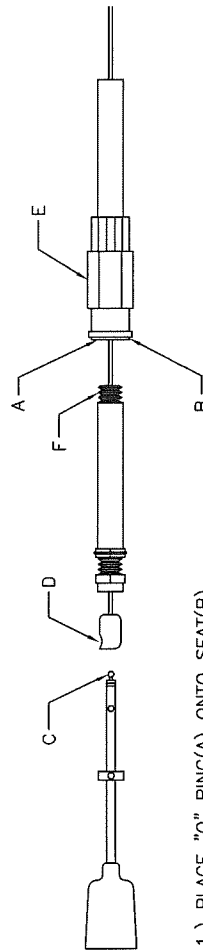
TO PREVENT CABLE WIRE FROM BEING OVER COMPRESSED IN CABLE PUSHED IN POSITION.



WILLIAMS



ASSEMBLY INSTRUCTIONS FOR CABLE AND CABLE HEAD

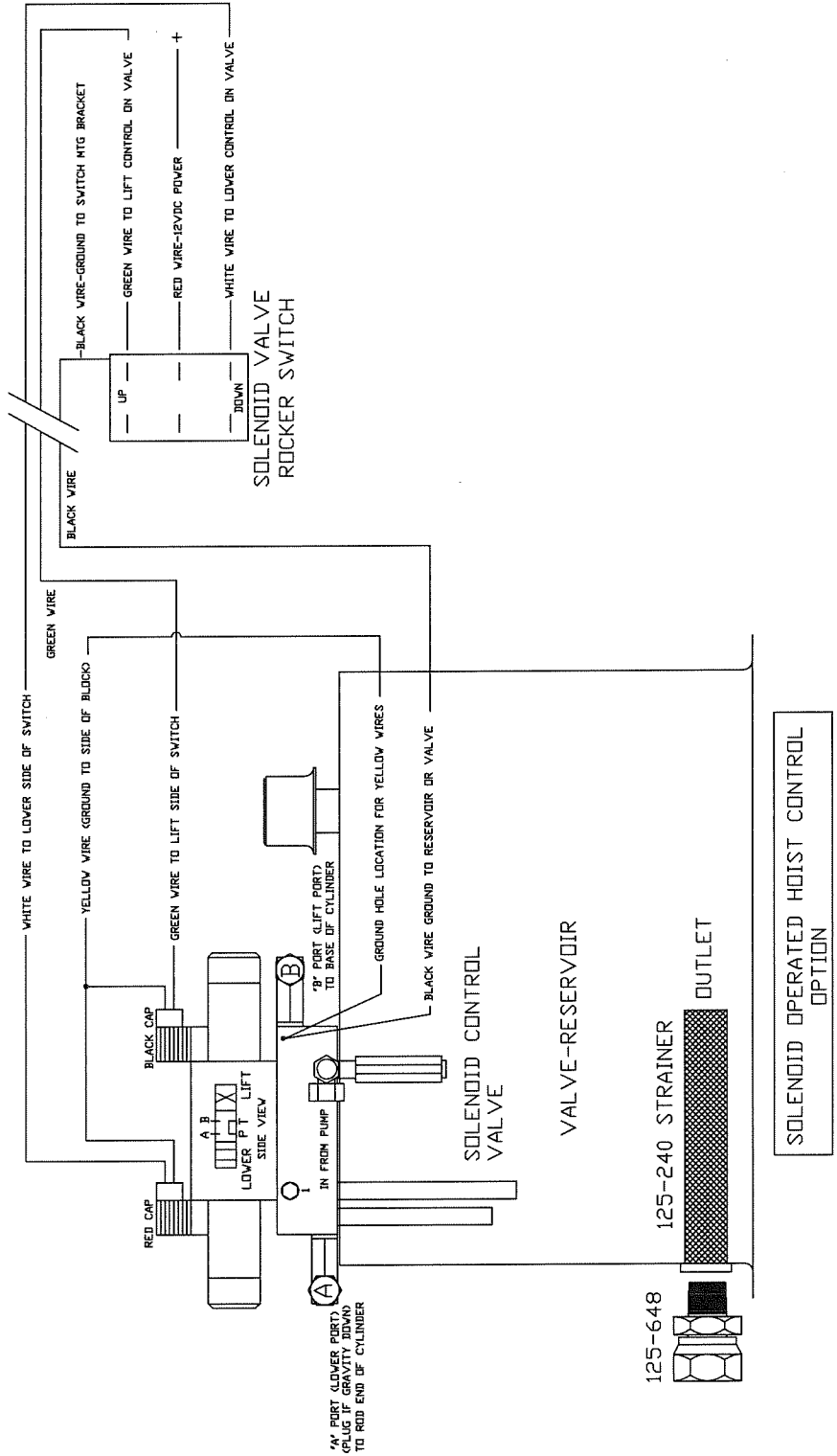
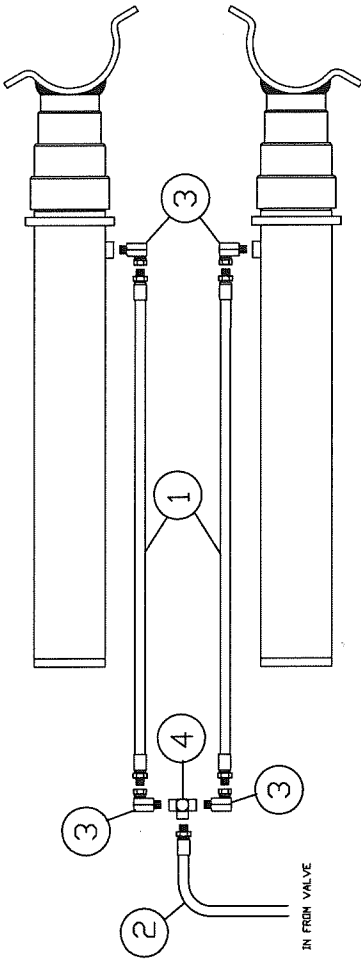


- 1.) PLACE "O" RING(A) ONTO SEAT(B)
- 2.) SLIDE BALL(C) INTO SLOT(D)
- 3.) PUSH NUT(E) ONTO THREADS(F) AND TIGHTEN SECURELY.

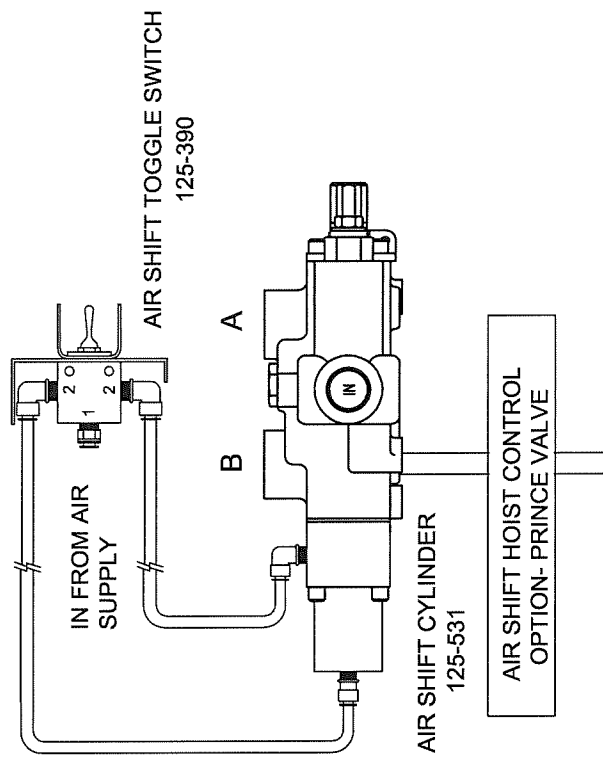
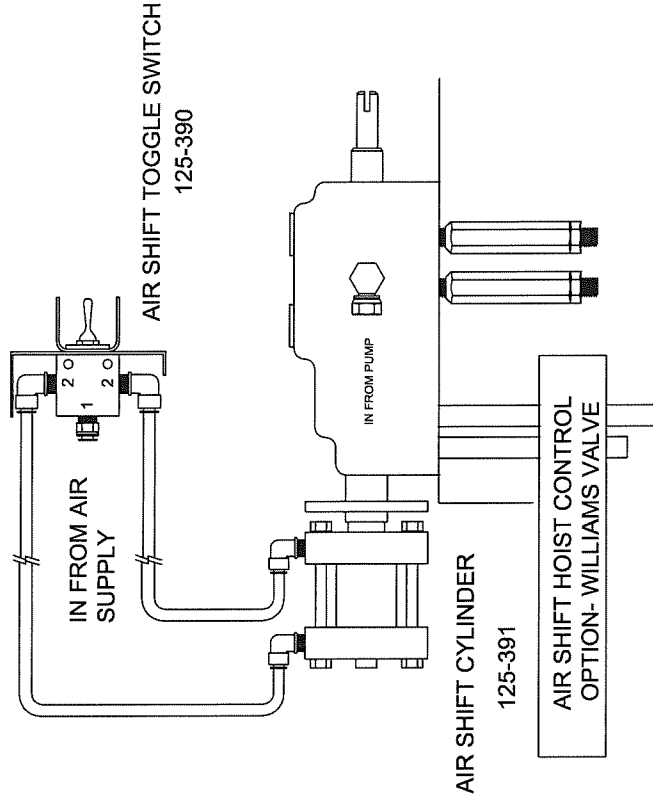
FORM# 125-932

ELECTRIC SHIFT HOIST CONTROL OPTION - WILLIAMS VALVE ONLY

1	125-247	40" x 1/2" HP HOSE
2	130-333	84" x 1/2" HP HOSE
3	125-141	90 DEG. MALE-FEMALE PIPE SWIVEL 1/2"
4	125-139	FEMALE 1/2" PIPE TEE.



AIR SHIFT HOIST CONTROL OPTION



SAFETY INSTRUCTIONS

1. Always insure the Hoist Control in the cab works freely and is in good operating order. The controls must be clearly marked for function and operation.
2. Always check for overhead wires, obstructions, and people before raising the hoist.
3. Dump with the truck at rest, on level ground and with a balanced load. The hoist design gives added stability in normal dumping operations. The hoist is not designed to operate in extreme conditions.
4. The operator must stay in the cab, at the controls during the duration of the dumping cycle. If there are bystanders around the dumping area, the operator must have an outside observer present to insure that all bystanders are a safe distance away.
5. Never permit anyone under a loaded dump bed.
6. Bring a loaded dump body down slowly by easing the control knob inward. On double acting cylinders, make sure the pump is running when doing so or the reservoir may over flow, resulting in the loss of fluid and allowing air into the system.
7. Always use the safety prop to secure a raised dump bed before any maintenance or inspection is performed under the empty dump body as specified by the safety decals provided by Tafco Equipment Co. The safety prop is not designed or intended to support a loaded body. If repairs or maintenance is needed, you must unload the body before attempting any repairs.
8. Observe all PTO safety instructions provided by the PTO manufacturer as well as those listed in the hoist information.
 - A. Do not go under the vehicle when the engine is running.
 - B. Do not work on PTO or shaft when the engine is running.
 - C. Do not engage or disengage the PTO or driven equipment by hand from under the vehicle when the engine is running.

OPERATION INSTRUCTIONS

OPERATION WARNINGS !

- A. Do not operate hoist while truck is moving.
- B. Make sure all loads are level in the truck bed.
- C. Do not dump loads while on uneven or unstable ground.
- D. Never operate PTO pump over the rated speed. (check with pump manufacturer for maximum speeds).
- E. Disengage PTO while driving truck to prevent damage.
- F. Do not increase pump pressure. Serious damage could occur if increased above the rated setting.
- G. If the hoist is a power down hoist (double acting cylinders) do not continue to send power to lower the hoist after the body is fully lowered. Damage to the truck and the hoist could occur.
- H. Never allow the hoist to bounce or jerk when stopping the hoist movement.

1. TO RAISE OR LOWER A CONTROL CABLE HOIST.

- A. Set the emergency / parking brake.
- B. Put the truck in neutral. Check area around truck for clearance.
- C. Push the clutch in. Engage the PTO while the truck is at idle. Release the clutch.
- D. To raise the hoist- depress the RED neutral release button on the end of the control knob. Pull control knob out rapidly.
- E. To hold the hoist in any position- move control knob to center (neutral) position.
- F. Stopping the hoist just before the cylinder(s) are fully extended will help increase the life of the hoist and pump.
- G. To lower the hoist- depress the RED neutral release button. Push the pump control knob all the way in and hold the knob in until the box is down.
- H. To stop the hoist from lowering, slowly return the control to the center position.
- I. Disengage the PTO while driving truck.
- J. Always make sure that the cable is centered when the box is fully lowered.
- K. Never allow the hoist to bounce or jerk when stopping hoist movement. This could cause serious damage to the truck frame and the hoist. This could also void the warranty due to misuse of the hoist.

SAFETY PROP OPERATION

WARNING!!

USE THE SAFETY PROP ONLY WITH AN EMPTY BOX. THE SAFETY PROP IS NOT DESIGNED TO SUPPORT A LOADED BOX. IF IT IS NECESSARY TO WORK ON A BOX OR HOIST, THE BOX MUST BE UNLOADED FIRST.

- A. Slowly raise the truck body until the base of the Safety Prop will clear the truck frame.**
- B. The Safety Prop should be unlatched from the prop keeper. Once unlatched, The Safety Prop will hang down.**
- C. Slowly lower the body back down until the Safety Prop base rests firmly on the truck frame. DO NOT POWER HOIST DOWN !**
- D. To release the Safety Prop, raise the body until the base of the prop clears the truck frame. Swing the Safety Prop up and latch into the prop keeper. The body can then be lowered completely down to the truck frame.**

MAINTENANCE INSTRUCTIONS

1. Periodic maintenance and inspection will increase hoist life. Check all bolts, cotter pins, hydraulic lines, hydraulic reservoir levels, scissor assembly, universal joints, and drive line components every 50 cycles or weekly, whichever comes first.
2. Lubricate all grease fittings before using the hoist the first time and every 50 hoist cycles there after. Greasing the hoist will prevent hoist damage and help to maintain lifting capacity. Severe conditions may require more frequent servicing.

The grease fittings on the LL3000 hoist are in the following locations:

- A. UPPER CROSS TUBE.....2 FITTINGS
- B. LOWER CROSS TUBE.....2 FITTINGS
- C. CENTER HINGE.....3 FITTINGS
- D. UPPER CYLINDER PIVOT.....1 FITTING PER CYL.
- E. LOWER CYLINDER PIVOT.....1 FITTING PER CYL.
- F. TAIL HINGE.....2 FITTINGS

IF EQUIPED WITH A RESERVOIR MOUNTED PTO PUMP, THERE WILL BE 3 FITTINGS ON THE PTO DRIVE SHAFT. ONE ON THE SLIP YOKE AND 1 ON EACH UNIVERSAL JOINT.

3. Under normal use and working conditions, the hydraulic oil should be changed annually. The breather cap should be cleaned regularly. With heavy use or very dusty conditions, the hydraulic oil should be changed more often. **KEEP THE OIL CLEAN. USE CLEAN CONTAINERS, FUNNELS AND AVOID ADDING IN DUSTY CONDITIONS!**

Use a quality hydraulic fluid SAE 10W or equivalent in normal conditions. Use Type A (Dextron) automatic transmission fluid in cold weather conditions.

4. Field repair of hydraulic components should not be attempted. This would include hydraulic cylinders, valves and pumps. These should be sent to a Tafco dealer/ distributor. Seals and o-rings on hydraulic cylinders should only be installed by a qualified hydraulic specialist. New parts can be obtained from your Tafco dealer/ distributor. Insure that the complete hydraulic system is flushed after any component failure.

TROUBLESHOOTING GUIDE

1. **THE HOIST WILL NOT RAISE SMOOTHLY:**
 - A: Air in the cylinder. (Refer to installation instructions-pages 5-7).
 - B: Lubricate hoist and tail hinge.
 - C: Check cylinder top cap orientation. (Refer to page 10).

2. **THE HOIST RAISES VERY SLOW:**
 - A: The oil is too thick for cold weather.
 - B: A hydraulic line is partially blocked or pinched.
 - C: The filter screen is dirty.
 - D: The pump is worn or defective.
 - E: The control valve is not moving the full stroke.

3. **FAILURE TO RAISE THE HOIST FULLY:**
 - A: Check the hydraulic oil level in the reservoir.
 - B: Air in the cylinder. (Refer to installation instructions-pages 5-7).
 - C: Lubricate the hoist components.

4. **FAILURE TO RAISE LOAD:**
 - A: Release bed tie downs.
 - B: Hoist capacity has been exceeded.
 - C: Check for blocked or pinched hydraulic line.
 - D: Control valve not moving the full stroke- check cable adjustment.
 - E: The pump intake is blocked from dirty oil or the oil is too thick from cold weather.
 - F: Check pump for proper operation.

5. **FAILURE TO LOWER HOIST:**
 - A: Control valve is not moving the full stroke. Check cable adjustment.
 - B: Check for blocked or pinched lines.

6. **OIL SPILLAGE OUT OF RESERVOIR:**
 - A: Too much oil in reservoir.
 - B: Too thick of oil causing oil to foam or air in the hydraulic lines. Cycle the hoist several times to bleed system.
 - C: Pump not engaged during lowering.
 - D: The body weight is too great, causing the hoist to lower too rapidly. A flow control valve must be installed in this situation.

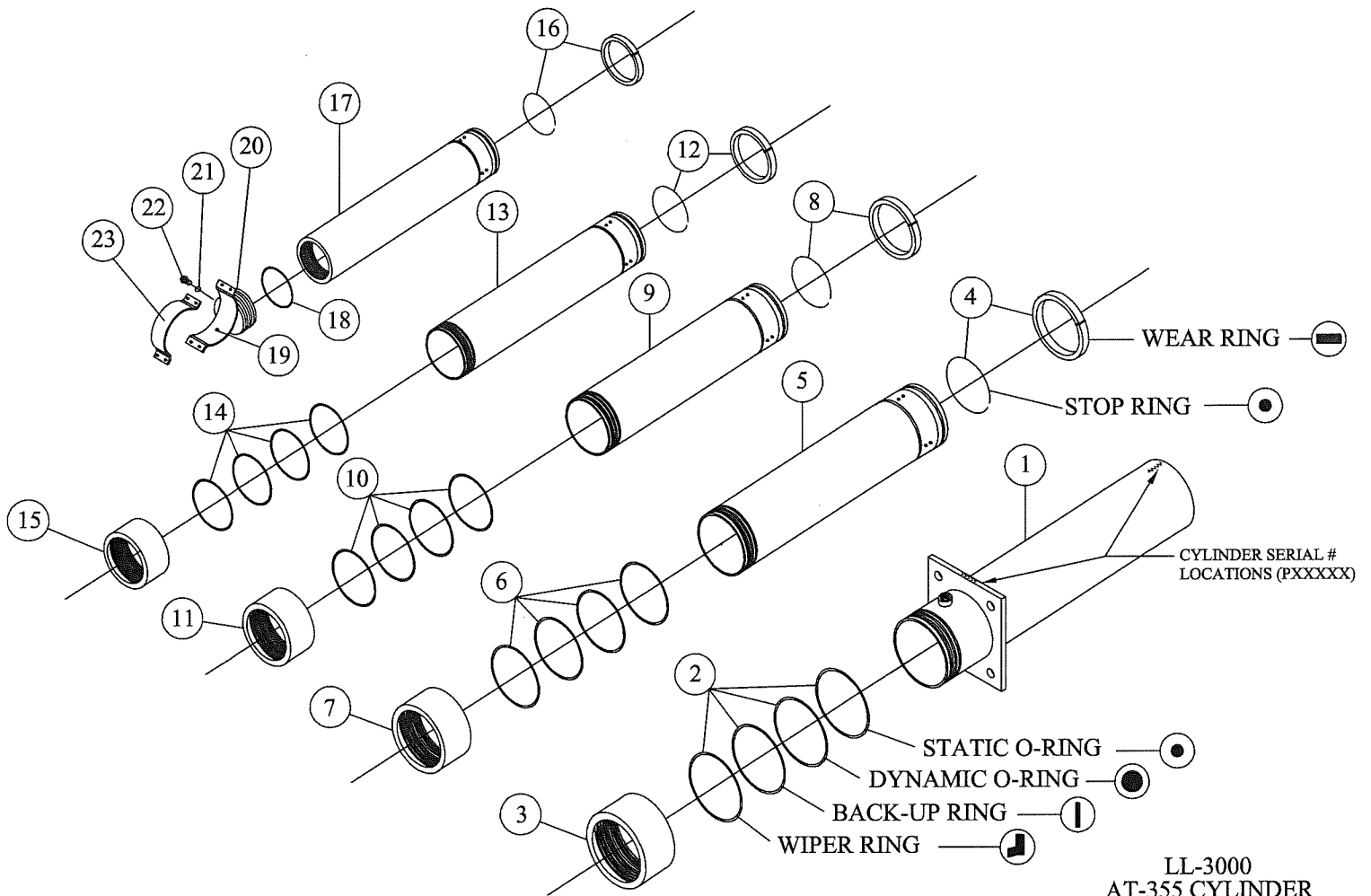
7. **OIL LEAKAGE:**
 - A: Make sure all fittings are properly sealed and tight.
 - B: Check all hoses. Use only fittings and hoses supplied by Tafco.
 - C: Gland nut leaking , may require cylinder repair. Contact your local Tafco dealer.

CYLINDER REWORK INSTRUCTIONS

1. **SPECIAL EQUIPMENT REQUIRED:**
 - A. Bronze coated or brass vise inserts.
 - B. Hydraulic pressure available.
 - C. Gland nut and piston spanner wrenches.

2. **GENERAL:**
 - A. Whenever clamping on a surface that moves past an o-ring or seal, extra care must be taken to prevent nicks, scratches, and deformation.
 - B. All parts that have scores or nicks on moving surfaces should be replaced with new parts.
 - C. Keep the cylinder parts very clean when reassembling.

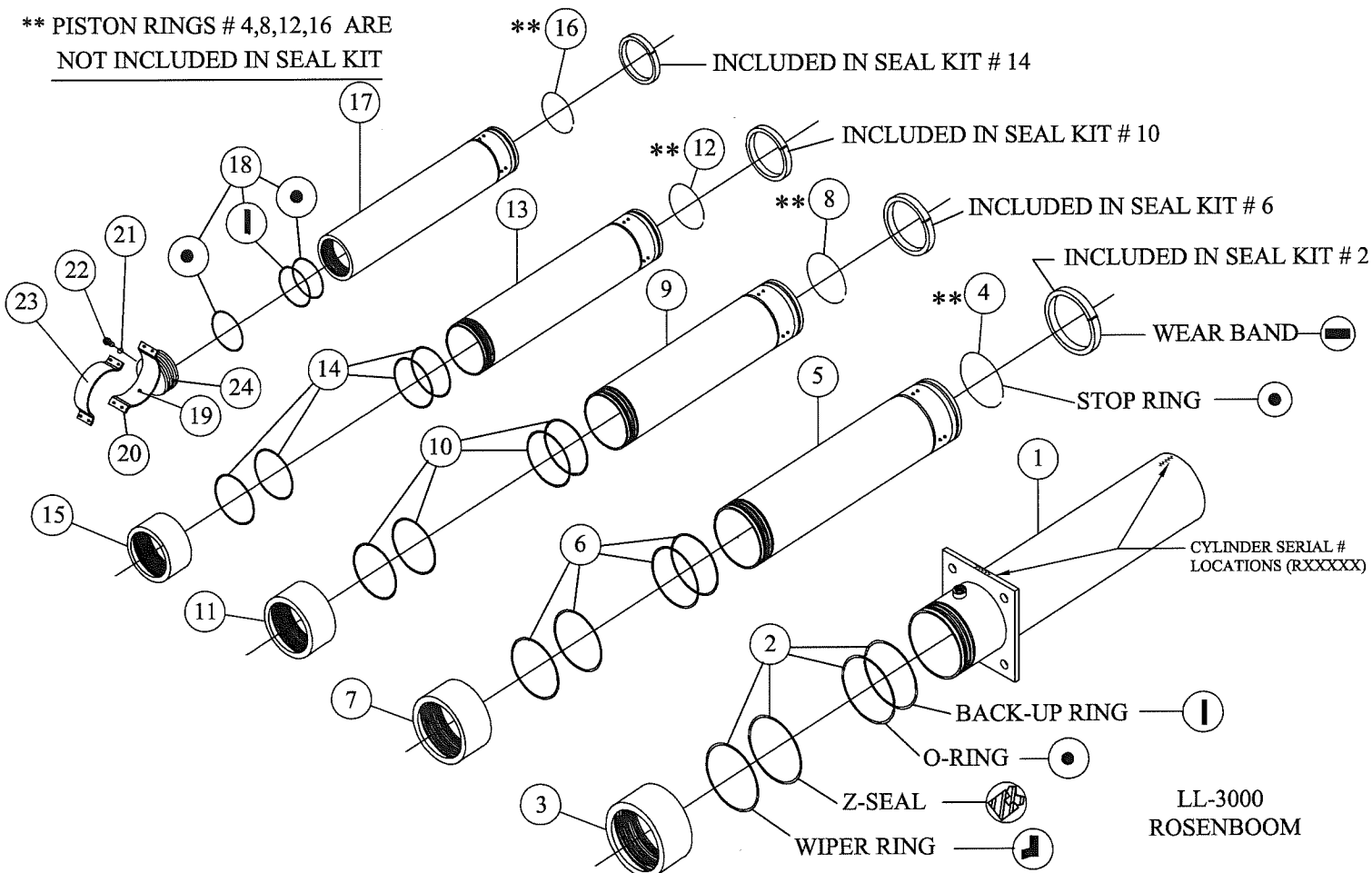
3. **DISASSEMBLY:**
 - A. Extend cylinder stages either manually or with hydraulic pressure.
WARNING: NEVER USE AIR PRESSURE TO EXTEND STAGES OR CYLINDERS.
 - B. Clamp on the cylinder body with a vise and unscrew the gland nut on the cylinder body.
 - C. Remove the gland nut with the cylinder rod or tube.
 - D. For telescopic or multiple stage cylinders, continue loosening gland nuts and removing smaller stages one at a time.
WARNING: DO NOT USE PIPE WRENCHES OR OTHER TOOLS THAT WILL DAMAGE OR SCRATCH CYLINDER RODS AND TUBES.
 - E. Remove the gland nut(s) from the cylinder rod or tubes.
 - F. Remove all o-rings, backup rings, stop rings, and wear rings. **HINT:** Keeping all parts to a gland nut, piston, or cylinder tube together will help to identify parts. This will make the re-assembly of the cylinder easier.
 - G. Clean all the metal parts and dry them thoroughly.
 - H. Install all o-rings, backup rings, stop rings, and wear rings using clean grease to hold parts in place if necessary. Grease all o-rings before installing them. Be sure to have all parts fully seated in their respective grooves before attempting final assembly.
 - I. Oil all moving parts: piston, cylinder rod, cylinder tubes, etc.
 - J. Assemble all gland nuts on their respective cylinder tubes.
 - K. Reassemble cylinder in the reverse order that it was disassembled. Tighten and Loctite all gland nuts as you go. When reassembling the cylinder top mount to the cylinder rod, use Loctite 222.
CAUTION: MAKE SURE NOT TO DAMAGE O-RINGS, SEALS, ETC. WHEN ASSEMBLING CYLINDER.
 - L. The cylinder is now ready to install in the hoist assembly.



LL-3000
AT-355 CYLINDER

ITEM	PART NUMBER	DESCRIPTION	NO. REQ'D.
1	130-243	Cylinder Body Assembly	1
2	130-154	Seal Kit	1
3	130-248	Gland Nut	1
4	130-155	Repair Kit	1
5	130.244	Cylinder Tube (first moving stage)	1
6	130-153	Seal Kit	1
7	130-249	Gland Nut	1
8	130-156	Repair Kit	1
9	130-245	Cylinder Tube (second moving stage)	1
10	130-152	Seal Kit	1
11	130-284	Gland Nut	1
12	130-157	Repair Kit	1
13	130-246	Cylinder Tube (third moving stage)	1
14	125-333	Seal Kit	1
15	130-285	Gland Nut	1
16	130-179	Repair Kit	1
17	130-247	Cylinder Tube (forth moving stage)	1
18	125-334	Static O-ring	1
19	125-286	Grease Zerk	1
20	130-286	Top Mount & Stem Assembly	1
21	126-026	Nylon Seal	1
22	126-025	Bleeder Screw	1
23	110-740	Cylinder Top Cap	1
Not shown	130-047	LL-3000 Cylinder (AT-355) - Complete (less top cap)	2 per hoist

**** PISTON RINGS # 4,8,12,16 ARE NOT INCLUDED IN SEAL KIT**



**LL-3000
ROSENBOOM**

ITEM	PART NUMBER	DESCRIPTION	NO. REQ'D.
1	130-181	Cylinder Body Assembly (015JB0078)	1
2	130-188	Seal Kit (093JA0011)	1
3	126-370	Gland Nut (060JW0011)	1
4	126-342	Stop ring (116AH0003)	1
5	126-338	Cylinder Tube (first moving stage) (071HB0005)	1
6	130-187	Seal Kit (093HA0007)	1
7	126-371	Gland Nut (060HV0013)	1
8	126-341	Stop ring (116AG0005)	1
9	126-337	Cylinder Tube (second moving stage) (071GB0004)	1
10	130-186	Seal Kit (093GA0007)	1
11	126-372	Gland Nut (060GT0017)	1
12	126-340	Stop ring (116AF0005)	1
13	126-336	Cylinder Tube (third moving stage) (071FB0006)	1
14	130-185	Seal Kit (093FA0002)	1
15	126-374	Gland Nut (060FS0017)	1
16	126-339	Stop ring (116AE0007)	1
17	126-335	Cylinder Tube (forth moving stage) (071ED0004)	1
18	126-157	Stem Seal Kit	1
19	125-286	Grease Zerk	1
20	130-122	Top Mount & Stem Assembly (013ZZ0055)	1
21	126-088	Bonded seal (108CE0002)	1
22	126-373	Bleeder Screw (016ZZ0863)	1
23	110-740	Cylinder Top Cap	1
24	126-343	Locking insert (174CZ0002)	1
Not shown	130-071	COMPLETE SEAL KIT (093JD0001)	2 per hoist
Not shown	130-047	LL-3000 Cylinder - Complete (less top cap)	2 per hoist

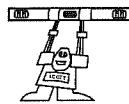


HOIST WARRANTY

Tafco Equipment Co. warrants each new SCOTT Hydraulic Hoist frame to be free from defects in material and workmanship for a period of three years from the date of installation. This warranty does not extend to any hoist unit, or part thereof, which has been subjected to misuse, neglect, accident, improper installation, unequal-loading or loading over and above the recommended weight range. This warranty does not extend to such hoist units or parts which have been repaired or altered outside of our factory or to which any accessories other than SCOTT have been affixed, or to any hoist not installed by an authorized SCOTT dealer or distributor. Tafco's obligation under this warranty is limited to replacement or repair of any part or parts thereof, which within the warranty period shall be returned to our factory, Blue Earth, Minnesota, transportation charges prepaid, for inspection. If such inspection reveals that a defect in the material or manufacturing actually exists, then TAFCO, at its' option, may repair or replace the defective part. All purchase assemblies (such as the hydraulic pump) will be warranted as per original manufacturer's policy. Pumps and cylinders carry a one year warranty as authorized by the manufacturer.

This warranty will not take effect until the application and registration form, which is provided at the time of the purchase and installation, is completed by the purchaser and returned to TAFCO. TAFCO does not assign to any of its' dealers, distributors or agents the right of warranty on its' behalf. If said dealer or distributor in performing a service or repair, returns to our factory on behalf of the purchaser such parts or hoist, the existence, validity or applicability of this warranty regarding such part or hoist remains solely the prerogative of TAFCO and not its' aforementioned agents.

All warranties must have a transaction number and approval prior to work being performed. TAFCO's policy is that a profit should not be made on warranty work, since this is part of a distributor or dealer function. Repair parts will be provided or replaced at TAFCO's discretion.



TAFCO

EQUIPMENT COMPANY

Highway 16 West- P.O. Box 339

Blue Earth, Mn. 56013

Phone (507) 526-3247

WARRANTY VALIDATION CERTIFICATE

No. _____

TO VALIDATE YOUR WARRANTY:

Complete this form and return it to the factory.

Note: Failure to complete and return this form as prescribed invalidates any warranty obligation by Tafco Equipment Co.

Your name or business name

Dealers name

Your address

Dealer's address

Hoist model _____

Serial number _____

Date installed _____

Installed by _____

I have read and fully understand the provisions and limitations of the warranty.

Customer's signature Date _____

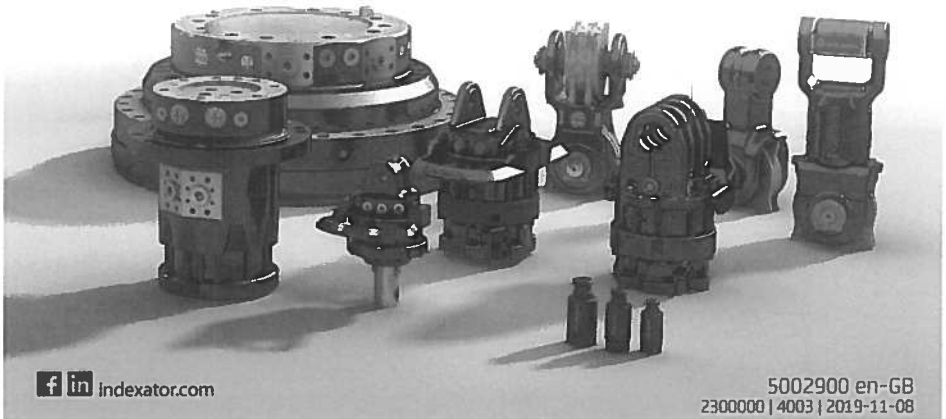
Assembly instructions



5006285 GV 6
5006286 GV 6 Y
5006384 GV 6-0
5060000 GV 6 M16
5112189 GV 12 R8
5120000 GV 12 Y HD
5120001 GV 125 Y HD
5120003 GV 12 Y XL
5120004 GV 125 LS Y XL
5212049 GV 12
5212052 GV 12 Y
5212055 GV 12-0
5212275 GV 12S
5212277 GV 12S Y
5212293 GV 12S M16
5212349 GV 12 LS
5212475 GV 12S LS



5140000 GV 14S Y
5214275 GV 14S
5170000 GV 17S 203 LS
5217275 GV 17S
5217277 GV 17S 203



Introduction

These assembly instructions must accompany the rotator until it has been fully installed. The instructions must be added to the technical documentation for the complete machine.

Designated use

- The rotator may only be used by trained personnel.
- The rotator must be manoeuvred from outside the risk area.
- The rotator is designed for positioning vertically-hanging loads.
- GV rotators are usually used on log grapples and on piece goods handling tools.

Note:

Note that the rotator needs a short braking distance before it stops fully.

Certain undemanded rotational movement may occur when holding loads due to the vane motor's construction.

Unauthorised use

- It is forbidden to mount/use a rotator on a machine where the risk area is not sufficient.
- The rotator is not designed for pulling the base machine.
- The rotator is not designed to be permanently fixed mounted on the crane.
- No manoeuvring may take place if there are any personnel in the risk area.
- Continuous rotation may only take place when the rotator has achieved normal operating temperature.

Installation requirements

- The linking device must be jointed in two directions, right-angled to each other, on a horizontal plane, and have sufficient work area to be able to freely handle vertically hanging loads.
- Maximum hydraulic pressure: **see technical data**.
- Maximum permitted revolution speed: 20 rpm This is controlled by oil flow from the base machine to the rotator. Rotators not marked LS on the tag

Introduction

contain flow limiters (not applicable to GV 3 which never have inbuilt flow limiters).

- For max. axial load: **see technical data**.
- The base machine valve that controls rotator rotation must have a closed neutral position in order to avoid uncontrolled movement.
- Install a pressure limiter in the base machine's hydraulic system if the pressure cannot be controlled sufficiently.

Maintenance

In the case of leakage, abnormal play, cracks or other operational disruptions, the rotator must immediately be serviced by authorised personnel. Additional damage can occur.

Maintenance that requires the rotator to be dismantled may only be performed by trained personnel. The rotator must be dismantled in the right way to prevent personal injury.

Defective parts shall be replaced only with original spare parts from Indexator Rotator Systems AB.

Other information

The information in this manual was correct at the time of going to print. No liability is accepted for any errors or omissions in this manual. Every effort has been made to ensure that the content is accurate and complete.

Indexator Rotator Systems AB reserves the right, with the aim of further development, to introduce improvements at any given time without altering the fundamental function of the product. These improvements and modifications do not necessarily mean that the manual will need updating. Contact your local dealer for information about any changes.

It is forbidden to copy all or parts of the manual's contents without the written consent of Indexator Rotator Systems AB. The restriction applies to all forms of copying, including printing, digitising, etc.

Used products are recycled in an environmentally friendly manner according to the laws and regulations of each country.

Indexator Rotator Systems AB provides dimensional drawings for detailed installation information.

Safety

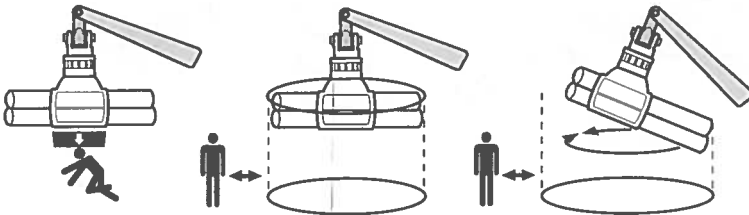
Risk area

The size of the risk area depends on the application and is determined by the application manufacturer. The risk area must be at least as big as the largest load, or as the width of the tool on a horizontal plane. The manufacturer must provide clear warnings about this.



DANGER

No personnel are permitted in the area under hanging loads/tools. It is a strictly prohibited area.

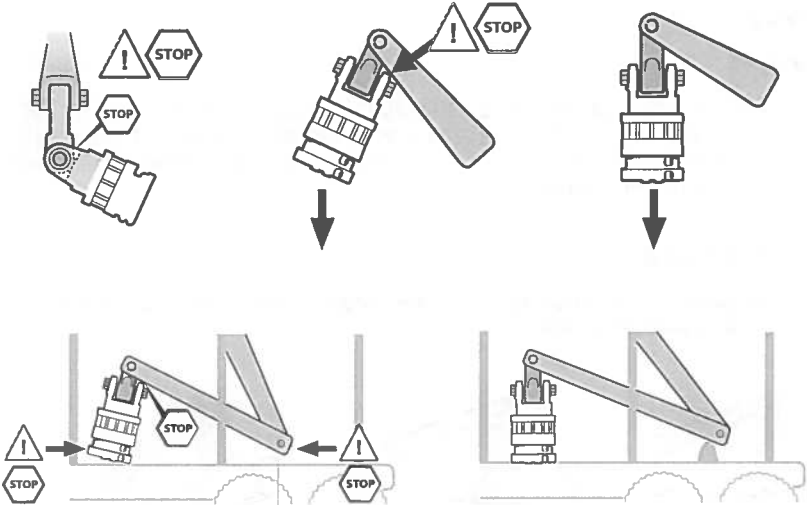


Caution

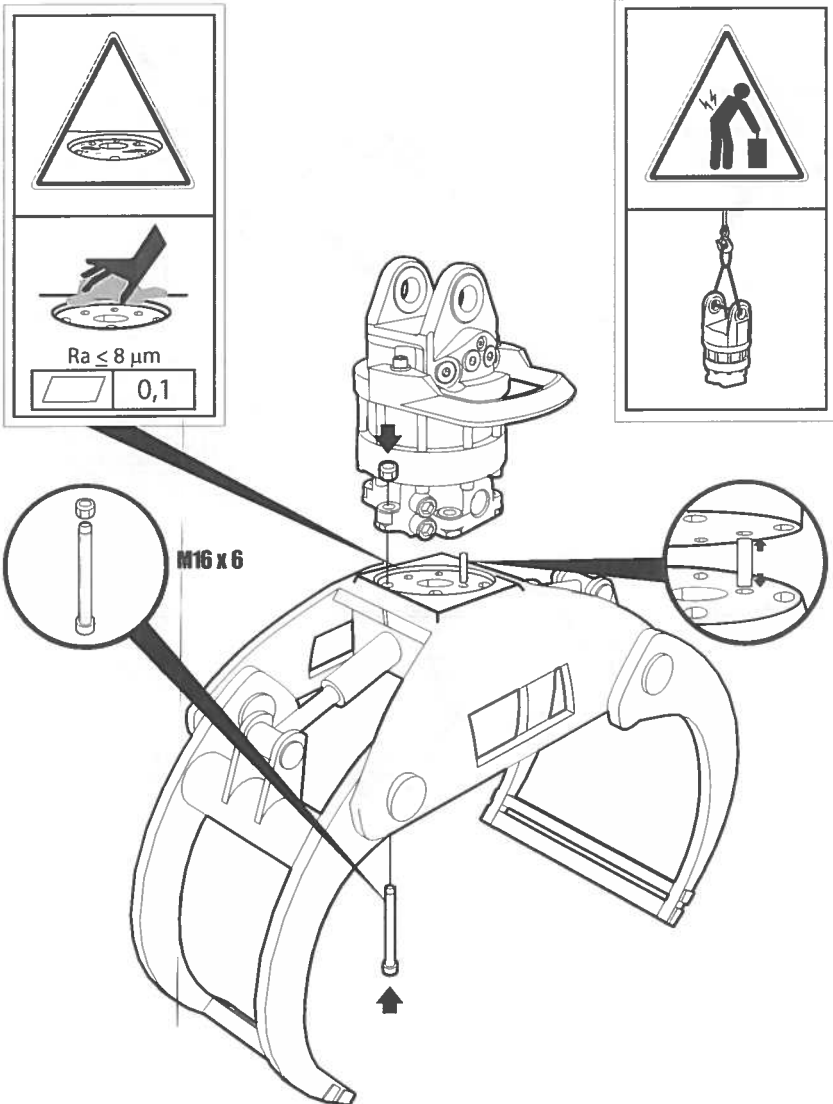
Risk of skin irritation/allergic reactions. There can be a number of chemical preparations on the rotator. Use protective gloves when handling.

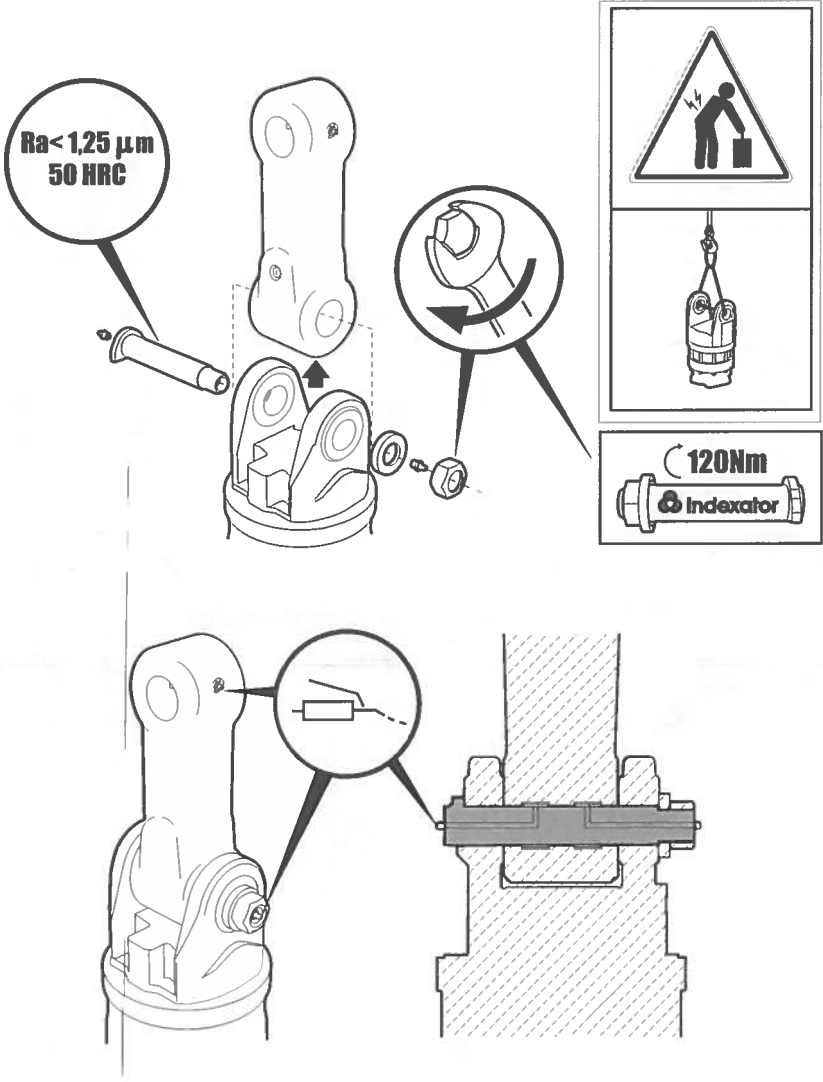


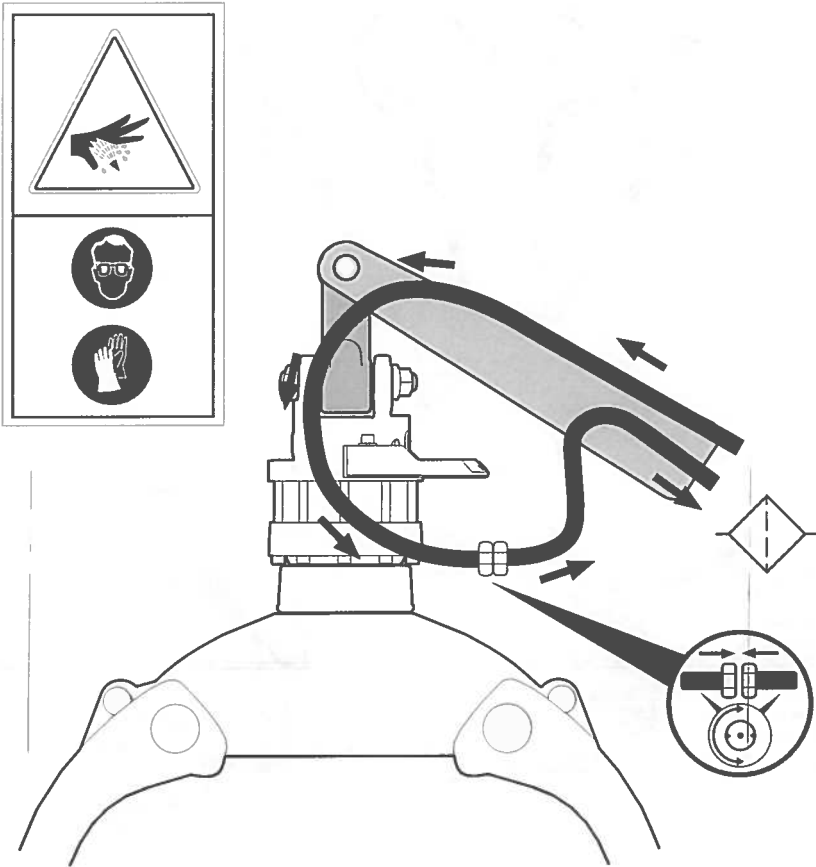
Safety




Assembly

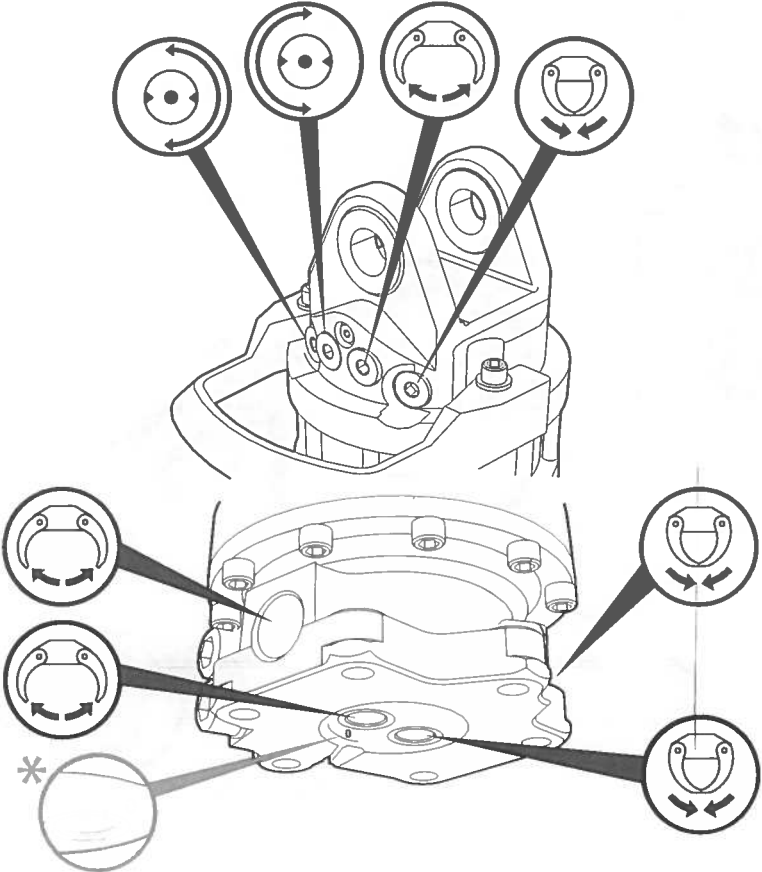




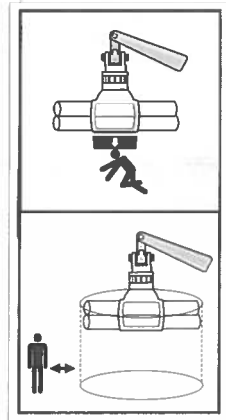
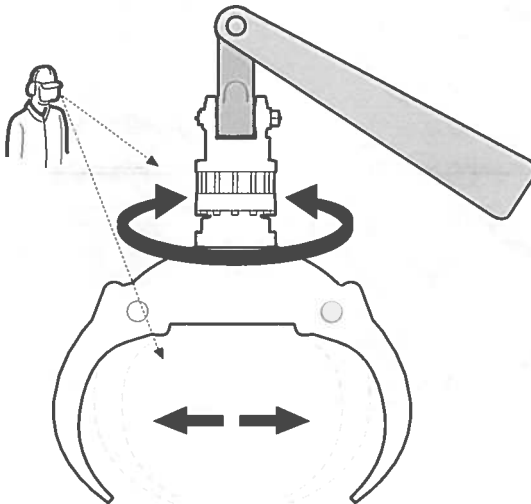
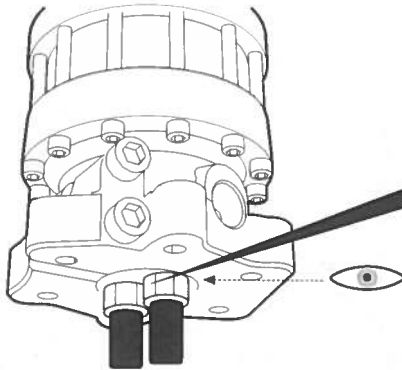


	ISO 4406 : 1999	NAS 1638
	18 / 16 / 13	7

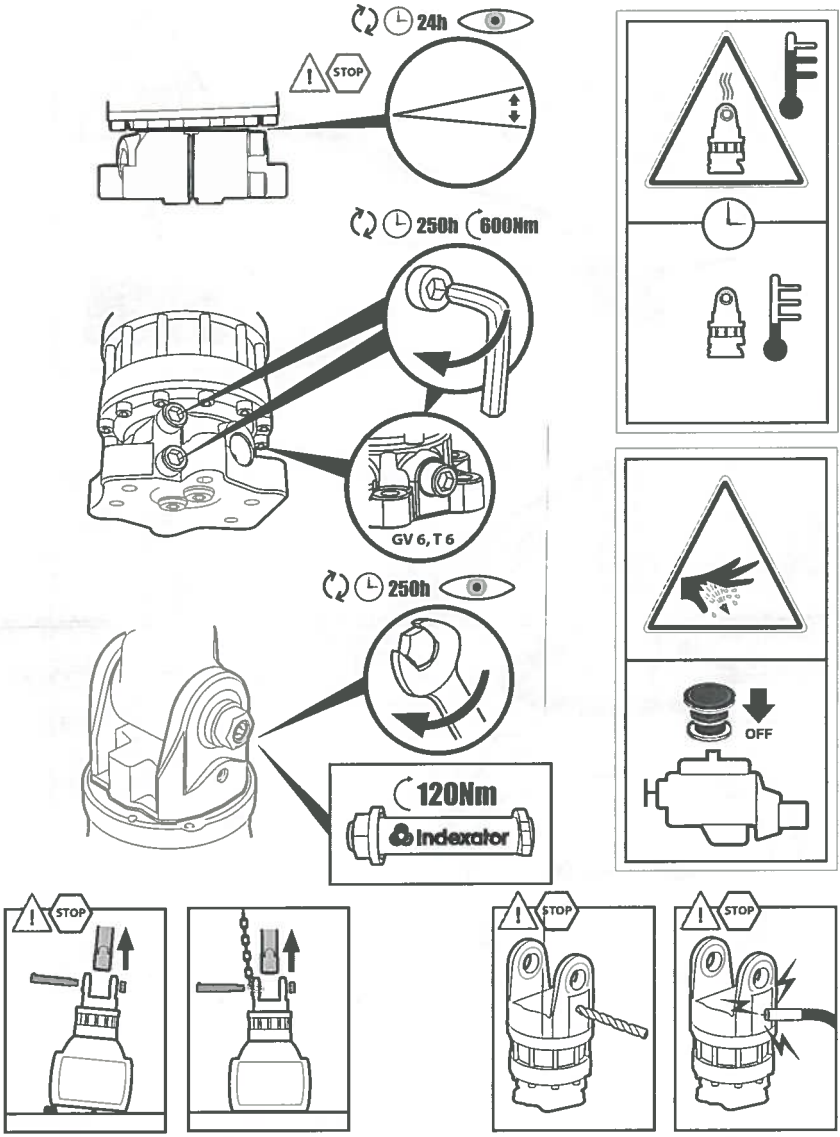
Assembly

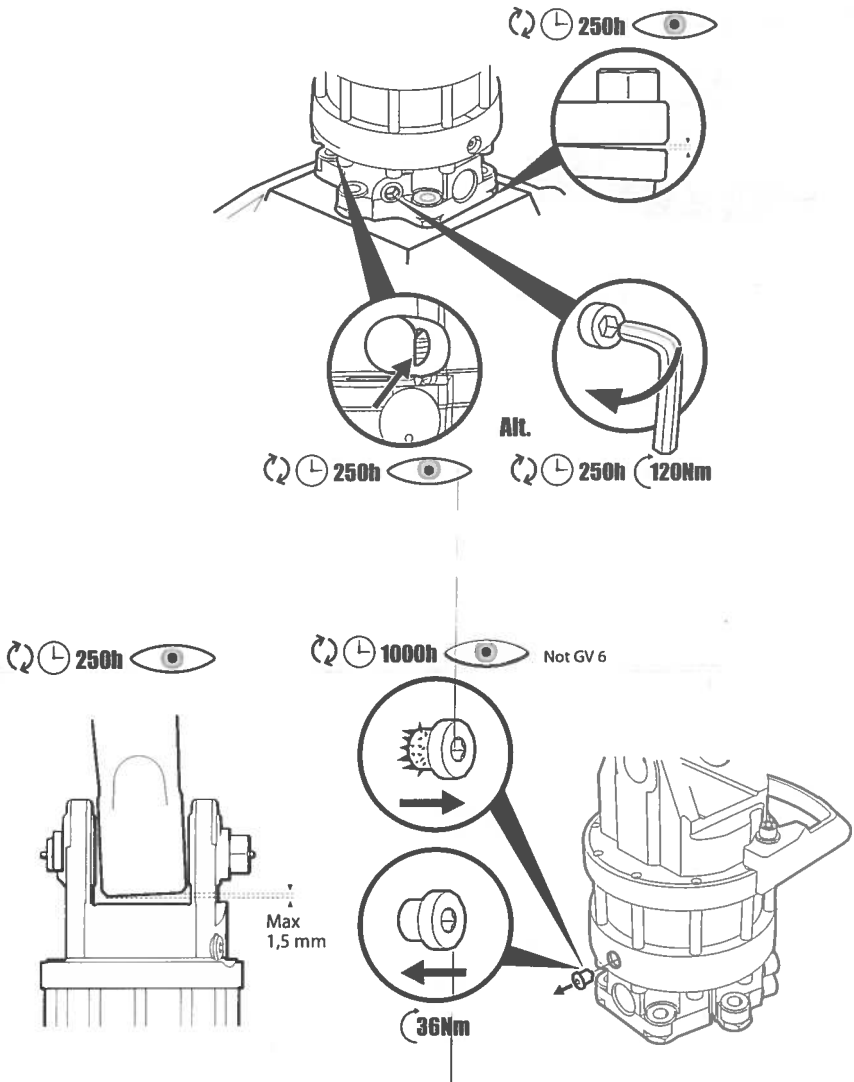


* GV 6, GV 6 Y, GV 6 M16, GV 6-0



Maintenance





↻ ⊕ 40h ⊖ x 10







Technical data

	Weight (kg)	Max. axial static load (kN)	Max. axial dynamic load (kN)	Torque at 20 MPa (Nm)	Torque at 25 MPa (Nm)
GV 6	44,9	60	25	1400	-
GV 6 M16	44,9	60	25	1400	-
GV 6 Y	46	60	25	1400	-
GV 6-0	42,8	60	25	1400	-
GV 12	54,2	100	50	-	2200
GV 12	54,2	100	50	-	2200
GV 12	54,2	100	50	-	2200
GV 12	54,2	100	50	-	2200
GV 12-0	54,2	100	50	-	2200
GV 12 LS	54,2	100	50	-	2200
GV 12 RB	60,5	100	50	-	2200
GV 12 Y	55,7	100	50	-	2200
GV 12 Y XL	55,9	100	50	-	2200
GV 12 Y HD	59,5	100	50	-	2200
GV 12S	57,7	100	50	-	2200
GV 12S LS	57,7	100	50	-	2200
GV 12S M16	57,7	100	50	-	2200
GV 12S Y	59,2	100	50	-	2200
GV 12S LS Y XL	58,5	100	50	-	2200
GV 12S Y HD	63	100	50	-	2200
GV 14S	58,9	100	50	-	3300
GV 14S Y	59	100	50	-	3300
GV 17S	63,6	160	50	-	3300
GV 17S 203	63,8	160	50	-	3300
GV 17S 203 LS	63,8	160	50	-	3300





All rotators have unlimited rotation.

Technical data





Hydraulics

		GV 6	GV 6 M16	GV 6 Y	GV 6-0	GV 12 LS
Max. pressure (MPa)		20	20	20	20	25
		20	20	20	20	25
		30	30	30	30	25
Max oil flow (l/min)		25	25	25	25	25
Upper hydraulic connection		G 1/2	G 1/2	G 1/2	G 1/2	G 1/2
Lower hydraulic connection		G 1/2	G 1/2	G 1/2	G 1/2	G 1/2





Technical data

		GV 12S	GV 12S LS	GV 12S M16	GV 12S Y
Max. pres- sure (MPa)		25	25	25	25
		25	25	25	25
		25	25	25	25
Max oil flow (l/min)		25	25	25	25
Upper hydraulic connection		G 1/2	G 1/2	G 1/2	G 1/2
Lower hydraulic connection		G 1/2	G 1/2	G 1/2	G 1/2





Technical data

		GV 12S LS Y XL	GV 12S Y HD	GV 12 Y	GV 12	GV 12-0
Max. pres- sure (MPa)		25	25	25	25	25
		25	25	25	25	25
		25	25	25	25	25
Max oil flow (l/min)		25	25	25	25	25
Upper hydraulic connection		G 1/2	G 1/2	G 1/2	G 1/2	G 1/2
Lower hydraulic connection		G 1/2	G 1/2	G 1/2	G 1/2	G 1/2

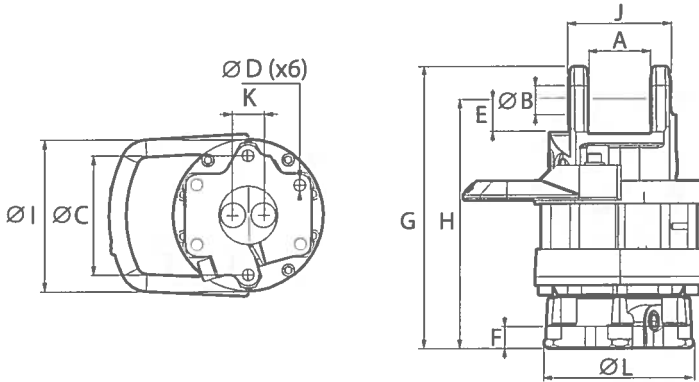
Technical data

		GV 12 Y XL	GV 12 Y HD	GV 12 R8	GV 14S
Max. pres- sure (MPa)		25	25	25	25
		25	25	25	25
		25	25	25	25
Max oil flow (l/min)		25	25	25	35
Upper hydraulic connection		G 1/2	G 1/2	7/8-14 UNF	G 1/2
Lower hydraulic connection		G 1/2	G 1/2	G 1/2	G 1/2

Technical data

		GV 145 Y	GV 175	GV 175 203	GV 175 203 LS
Max. pressure (MPa)		25	25	25	25
		25	25	25	25
		25	25	25	25
Max oil flow (l/min)		35	35	35	35
Upper hydraulic connection		G 1/2	G 1/2	G 1/2	G 1/2
Lower hydraulic connection		G 1/2	G 1/2	G 1/2	G 1/2

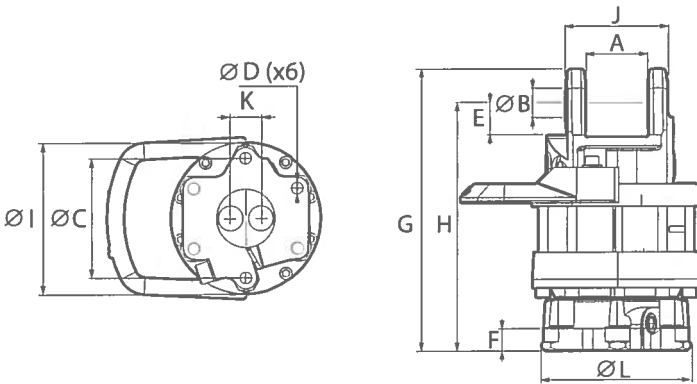
Measurements



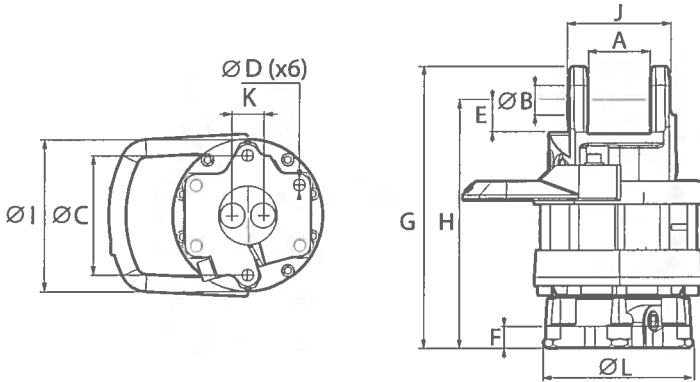
(mm)

	GV 6	GV 6 M16	GV 6 Y	GV 6-0	GV 12	GV 12-0
A	80,5	80,5	80,5	80,5	80,5	80,5
ØB	35	35	35	35	35	35
ØC	173	173	173	173	173	173
ØD	17	M16	17	17	17	17
E	42	42	42	42	42	42
F	30	30	30	30	30	30
G	346	346	346	346	362	362
H	300	300	300	300	317	317
ØI	205	205	205	205	218	218
J	131	131	131	131	131	131
K	36	36	36	36	38,5	38,5
ØL	211	211	211	211	209	209

Technical data

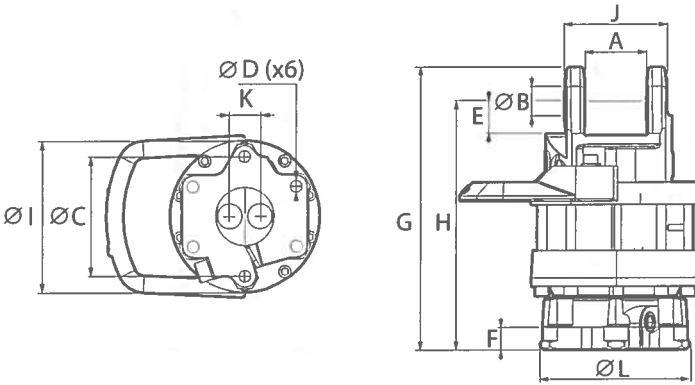


	GV 12 R8	GV 12 Y	GV 12 LS	GV 12 Y XL
A	103,2	80,5	80,5	80,5
ØB	50,8	35	35	35
ØC	204	173	173	173
ØD	17	17	17	17
E	58	42	42	42
F	30	30	30	30
G	388	362	362	362
H	333	317	317	317
ØI	218	218	218	218
J	170	131	131	131
K	38,5	38,5	38,5	38,5
ØL	209	209	209	209

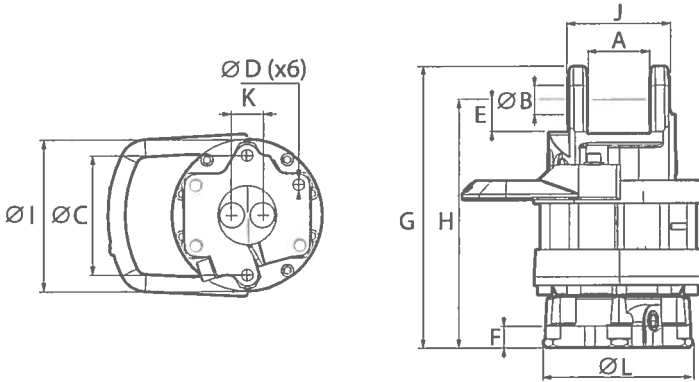


	GV 12 Y HD	GV 12S LS	GV 12S	GV 12S M16
A	80,5	101	101	101
ØB	35	45	45	45
ØC	173	173	173	173
ØD	17	17	17	M16
E	42	58	58	58
F	30	30	30	30
G	362	388	388	388
H	317	333	333	333
ØI	218	218	218	218
J	131	170	170	170
K	38,5	38,5	38,5	38,5
ØL	209	209	209	209

Technical data



	GV 12S Y	GV 12S LS Y XL	GV 12S Y HD	GV 14S
A	101	101	101	101
ØB	45	45	45	45
ØC	173	173	173	173
ØD	17	17	17	17
E	58	58	58	58
F	30	30	30	30
G	388	388	388	388
H	333	333	333	333
ØI	218	218	218	218
J	170	170	170	170
K	38,5	38,5	38,5	38,5
ØL	209	209	209	209



	GV 145 Y	GV 175	GV 175 203	GV 175 203 LS
A	101	101	101	101
ØB	45	45	45	45
ØC	173	173	203	203
ØD	17	17	21	21
E	58	58	58	58
F	30	40	40	40
G	388	408	408	408
H	333	353	353	353
ØI	218	218	218	218
J	170	170	170	170
K	38,5	40	40	40
ØL	209	243	243	243



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VENCO®

HOISTS

VC6628

INSTALLATION & OWNER'S MANUAL

Sold and Serviced by:

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 WARRANTY POLICY



VENCO VENTURO INDUSTRIES LLC
 CINCINNATI, OHIO

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SECTION 200

INSTALLATION



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

READ THIS FIRST

INSTALLATION WARNINGS

- ▶ Read and fully understand entire owner's manual prior to installation.
- ▶ Refer to Body Builder's Guide BEFORE welding or drilling on chassis as not to void the chassis warranty.
- ▶ When drilling the chassis make sure all brake lines, wire harnesses, and hoses are protected so as not to cause damage to these items resulting in failure. All fasteners must be installed so they do not interfere with these items as well.
- ▶ Cover all fuel related items (hoses, brake lines, wiring, etc.) so as not to cause fire or explosions that will result in serious injury or death.
- ▶ Route all wiring and hoses away from exhaust systems. Heat from exhaust systems can cause melting of wiring and hoses, resulting in fire and/or explosions that could result in serious injury or death.
- ▶ Only use body prop when vehicle is on firm level ground, and with an UNLOADED body only!
- ▶ NEVER work under a raised body without the use of the body prop. Failure to do so can cause serious injury or death.
- ▶ Hydraulic system must be designed to work within the manufacturer's specifications. Systems with more flow or PSI can cause hoist to fail during the dumping of a load; which could cause damage, serious injury or death.
- ▶ NEVER adjust factory relief valve settings without consulting with the factory.
- ▶ Fluid under pressure can pierce the skin and enter the bloodstream, causing serious injury or death. Always wear eye protection and protective clothing when working around hydraulic systems.
- ▶ NEVER operate hoist from outside the cab. Doing so can cause serious injury or death.
- ▶ NEVER perform maintenance on a Hoist without applying the following:
 - ▶▶ Chassis brake set and engine turned off
 - ▶▶ Removing battery cable, if necessary
 - ▶▶ Properly deploying the Hoist body prop
- ▲ ▶ Venco hoists are designed for and intended to be used on stationary trucks dumping on firm and level ground. Spreading applications and/or shock unloading are strictly prohibited and will void this warranty.



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE	DATE	SECTION
INSTALLATION WARNING	12-02-15A	-
HOISTS	SUPERSEDES 09-03-15	520951

!! READ THIS FIRST !!

BE SURE TO DO THE FOLLOWING, AND YOU WILL AVOID THE MOST COMMON INSTALLATION MISTAKES.

▲ 1. HOIST MUST BE LEVEL

1.1. SEE APPLICABLE PAGE : 416086

2. MUST HAVE 2" SPACE

2.1. SEE APPLICABLE PAGE : 416086

▲ 3. SUFFICIENT OVERHANG

3.1. SEE APPLICABLE PAGE :

VC416 :	416266
VC516 :	516203
VC520 NON SUB-FRAME :	520601
VC520 W/ SUB-FRAME :	520602
VC620 NON SUB-FRAME :	620103
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VC6620 :	662052
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4. USE PUMP WHICH MEETS VENCO SPECIFICATION(S)

4.1. SEE APPLICABLE PAGE : 416763



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE

CAUTIONARY NOTICE

DATE

12-07-15D

SECTION

-

HOISTS

SUPERSEDES

11-04-15C

416733

VENCO HOIST MODEL VC6628

CAPACITIES ARE BASED ON WATER LEVELS AND NON-DIMINISHING LOADS. DUE TO THE VARIATIONS IN TRUCK EQUIPMENT AND CAB-AXLE LENGTHS (CA), *THE DATA PROVIDED ON THIS PAGE IS TO BE USED AS A GUIDELINE ONLY.*

DUMP CLASS: 90

CONVERSION CLASS: J

WEIGHT: 1200 LBS.

POWER SOURCE:

ES - ELECTRIC SINGLE CTING

ED - ELECTRIC DOUBLE ACTING

PD - POWER TAKE OFF DOUBLE ACTING

ADDITIONAL DATA:

DUAL CYLINDERS, 6" BORE x 28" STROKE

CA: 138"-252"

CT: 126"-240"

DUMP ANGLE: 40° - 50°

MOUNTING HEIGHT REQ'D: 10-1/2"

C O N V E R S I O N A P P L I C A T I O N S V C 6 6 2 8					
B O D Y	C A	C T	O . H .	4 5 ° (T O N)	5 0 ° (T O N)
18'	138"	126"	48"	35.7	32.4
18'	144"	132"	42"	32.4	29.4
18'	150"	138"	36"	29.7	27.0
18'	156"	144"	30"	27.4	24.9
18'	162"	150"	24"	25.5	23.1
18'	168"	156"	18"	23.8	21.6
18'	174"	162"	12"	22.3	20.2
18'	180"	168"	6"	21.0	19.0
20'	162"	150"	48"	29.7	27.0
20'	168"	156"	42"	27.4	24.9
20'	174"	162"	36"	25.5	23.1
20'	180"	168"	30"	23.8	21.6
20'	186"	174"	24"	22.3	20.2
20'	192"	180"	18"	21.0	19.0
20'	198"	186"	12"	19.8	18.0
20'	204"	192"	6"	18.8	17.0
22'	186"	174"	48"	25.5	23.1
22'	192"	180"	42"	23.8	21.6
22'	198"	186"	36"	22.3	20.2
22'	204"	192"	30"	21.0	19.0
22'	210"	198"	24"	19.8	18.0
22'	216"	204"	18"	18.8	17.0
22'	222"	210"	12"	17.8	16.2
22'	228"	216"	6"	17.0	15.4
24'	210"	198"	48"	22.3	20.2
24'	216"	204"	42"	21.0	19.0
24'	222"	210"	36"	19.8	18.0
24'	228"	216"	30"	18.8	17.0
24'	234"	222"	24"	17.8	16.2
24'	240"	228"	18"	17.0	15.4
24'	246"	234"	12"	16.2	14.7
24'	252"	240"	6"	15.5	14.1

D U M P B O D Y A P P L I C A T I O N S V C 6 6 2 8 *					
B O D Y	C A	C T	O . H .	4 5 ° (T O N)	5 0 ° (T O N)
12'	102"	90"	12"	35.7	32.4
13'	114"	102"	12"	32.4	29.4
14'	126"	114"	12"	29.7	27.0
15'	138"	126"	12"	27.4	24.9
16'	150"	138"	12"	25.5	23.1
18'	174"	162"	12"	22.3	20.2

* VENCO hoists are designed for and intended to be used on stationary trucks dumping on firm and level ground. Spreading applications and/or shock unloading are strictly prohibited and will void this warranty.



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE
CAPACITY CHART

VC 6628 HOIST

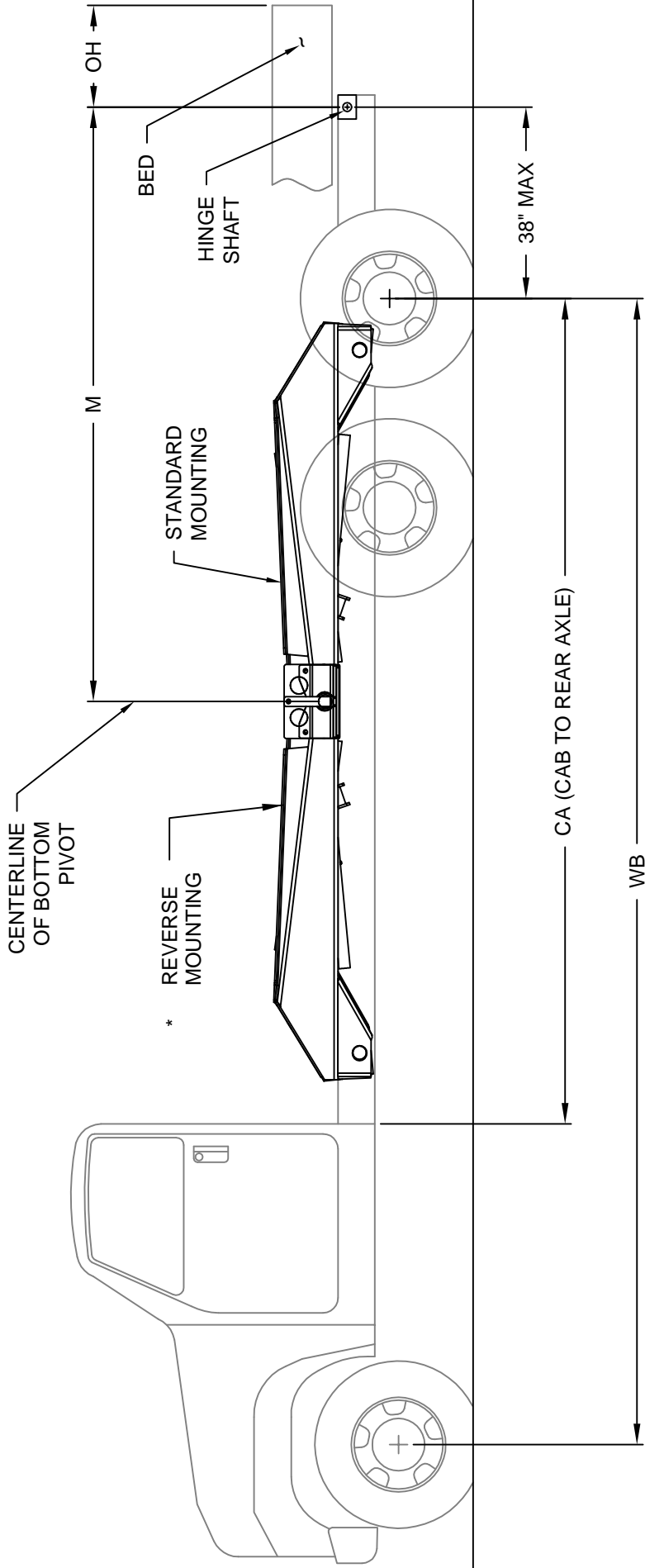
DATE
01-23-15D

SUPERSEDES
03-10-05C

SECTION
H100

662851

VC6628 HOIST MOUNTING DIMENSIONS



STANDARD MOUNTING

DUMP ANGLE	M
40°	146"
45°	130-1/2"
50°	118-1/4"

*REVERSE MOUNTING

DUMP ANGLE	M
40°	140"
45°	129"
50°	115"

FIGURE 1.C



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE

VC6628
MOUNTING DIMENSIONS

DATE

10-05-16A

SECTION

H200

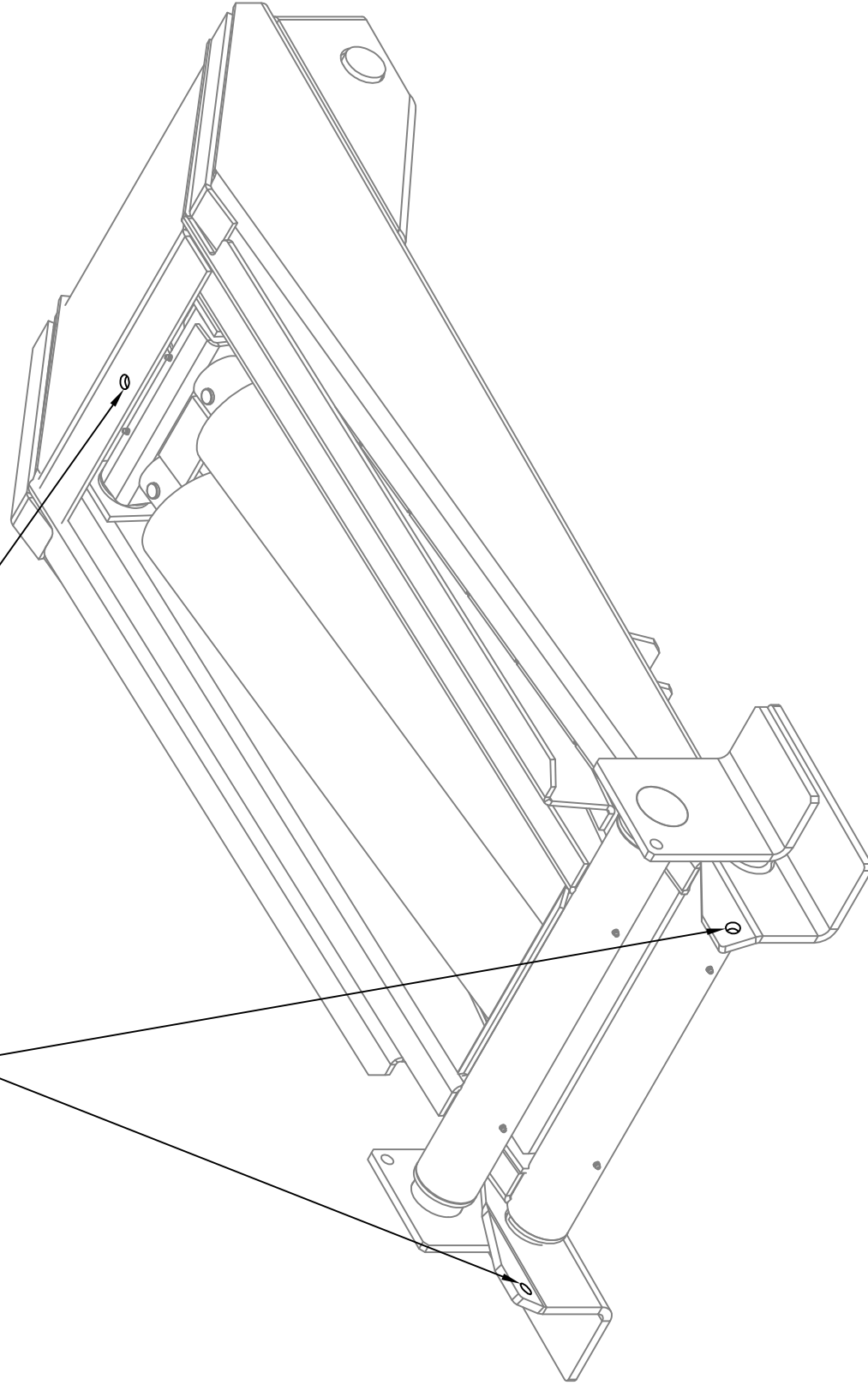
SUPERSEDES


12-16-15

VC6628

662867

LIFTING HOLE LOCATIONS



 Venco Venturo Industries LLC
Cincinnati, Ohio

TITLE
HOIST LIFTING HOLE LOCATIONS

VC6628

DATE
12-17-15B

SUPERSEDES
03-11-05A

SECTION
-

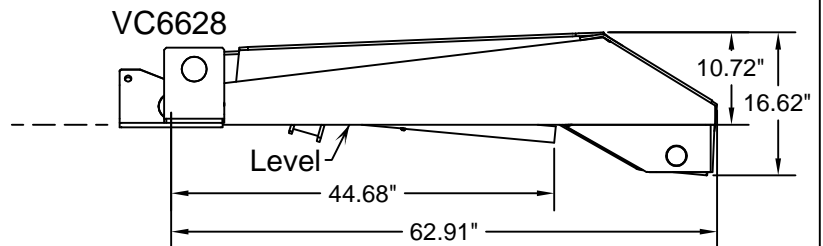
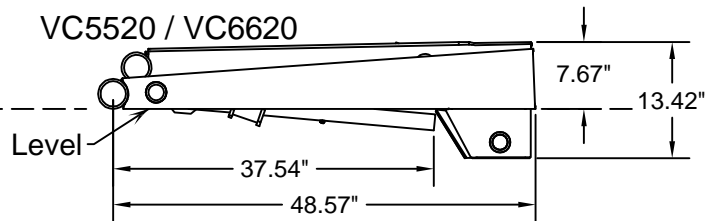
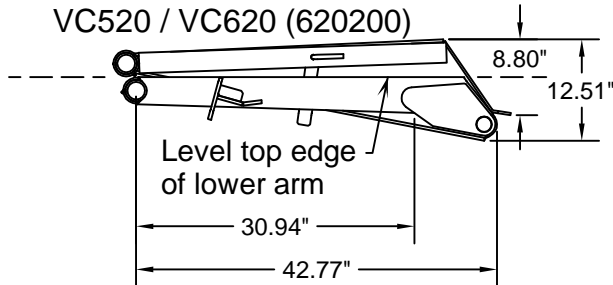
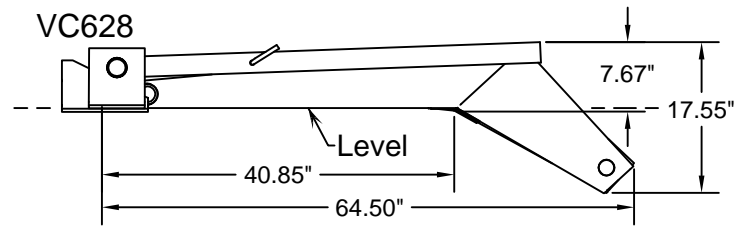
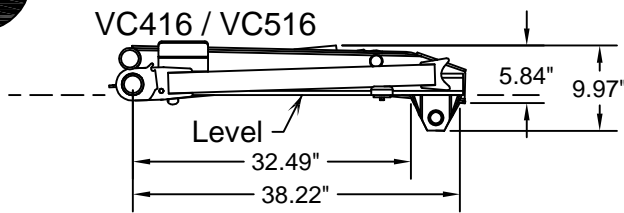
662864

!! IMPORTANT WARNING !!

* ALL VENCO CONVERSION HOISTS → VC416 THRU VC6628 *

1

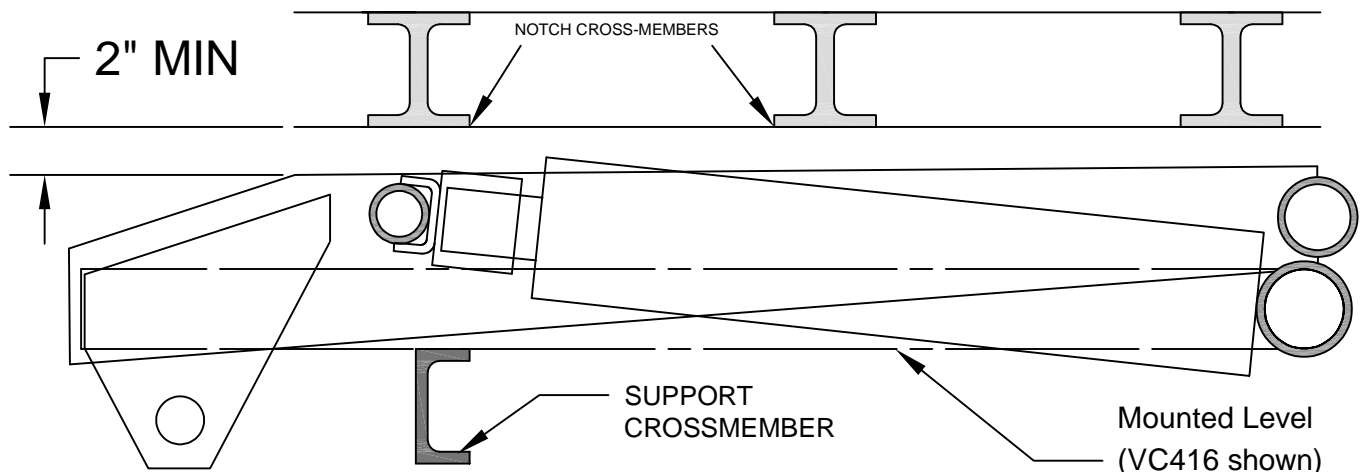
When installing the hoist, be sure to keep the hoist on a horizontal plane - LEVEL - with the truck frame.



2

!! IMPORTANT !!

A minimum clearance of 2" is required between the hoist (upper arm) and the body cross-members in order to prevent a mechanical lockout. If clearance is less than 2", then cross-members must be notched above arms.



!! IMPORTANT !!

THE HOIST SCISSOR MUST BE SUPPORTED WITH A CHASSIS-MOUNTED SUPPORT CROSSMEMBER. IF THE TRUCK CHASSIS DOES NOT HAVE A CROSSMEMBER TO SUPPORT THE HOIST IN A 'LEVEL' POSITION, THE INSTALLER 'MUST' INSTALL A SUPPORT CROSSMEMBER AS SHOWN ABOVE.



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE
IMPORTANT WARNING
VENCO HOISTS

DATE
11-05-15N
SUPERSEDES
08-10-15M

SECTION
H200
416086

HOIST MOUNTING INST. - VC6628

Refer to Capacity Chart drawing 662851.

CAUTION

- If the distance between the center of the rear axle and the rear hinge assembly exceeds 38", additional reinforcement of the truck frame is necessary

- Mark the location for the rear hinge. Ideally, this location will be immediately behind a truck cross member, approximately 38" behind the center of the rear axle on a single axle truck (see drawing 662867).
- Cut a 90° slot in each side of the frame as shown in Figure 2 below.
- Position the angle iron frame of the rear hinge assembly in the truck frame cut-outs. Make sure the rear hinge assembly is properly positioned on the truck frame. Weld all around truck frame rear hinge assembly joint (both sides). See DWG 628861 for information regarding the mounting of the Rear Hinge Brackets to the body.

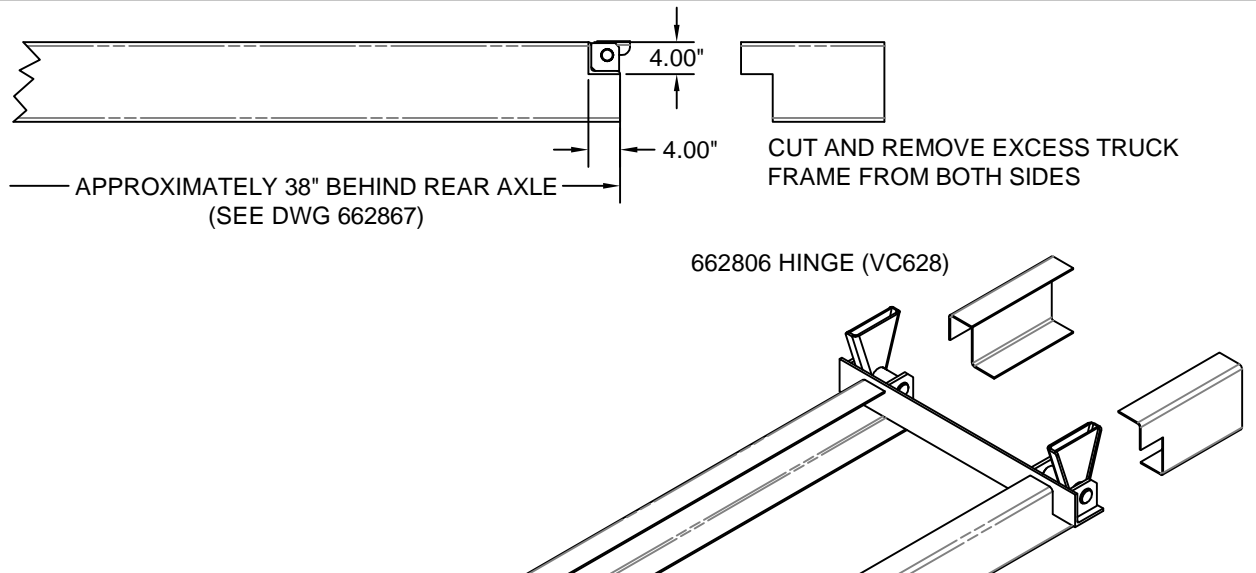


Figure 2 - Frame Modification and Rear Hinge Attachment

- Locate the hoist on the truck frame, making sure to center and square the hoist to the truck frame. The VC hoist is designed to rest on the truck frame. A section of the hoist extends below the truck frame level. Therefore, the hoist may have to be moved slightly forward or backwards to avoid frame crossmembers. The distance between the rear hinge assembly center and the center of the lower pivot is referred to as the "M Dimension". The table on Mounting Dimensions drawing 662867 provide the dump angles associated with the "M Dimensions".

Note: Moving the hoist along the truck frame will affect the hoist's performance. A forward movement (towards the cab) decreases dump angle and increases capacity. A backwards movement increases dump angle and decreases capacity. Reference Capacity Chart drawings 662851.



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE	MOUNTING INSTRCTNS
VC6628	

DATE	12-17-15
SUPERSEDES	-

SECTION	H200
	662871

HOIST MOUNTING INST. - VC6628

- E. After the hoist is positioned, place the mounting angles (Figure 3) under the lower pivot angles and against the truck frame. Clamp securely in place. Drill through the frame and install the mounting angle with two [2] 1/2-13 x 1-1/2" Grade 8 hex head cap screws, lock washers, hex nuts, and four [4] flat washers (both sides).



C A U T I O N

- The hoist lower pivot assembly must sit flush on the truck frame. If rivet head interference is encountered, use a filler block or countersink clearance holes in the bottom of the pivot assembly. **DO NOT** weld hoist mounting angle to truck frames - this may void the truck warranty.
- F. Weld each end of the lower pivot angle to its mounting angle as shown in Figure 3. Note the welding symbols. Do not weld to the truck frame.

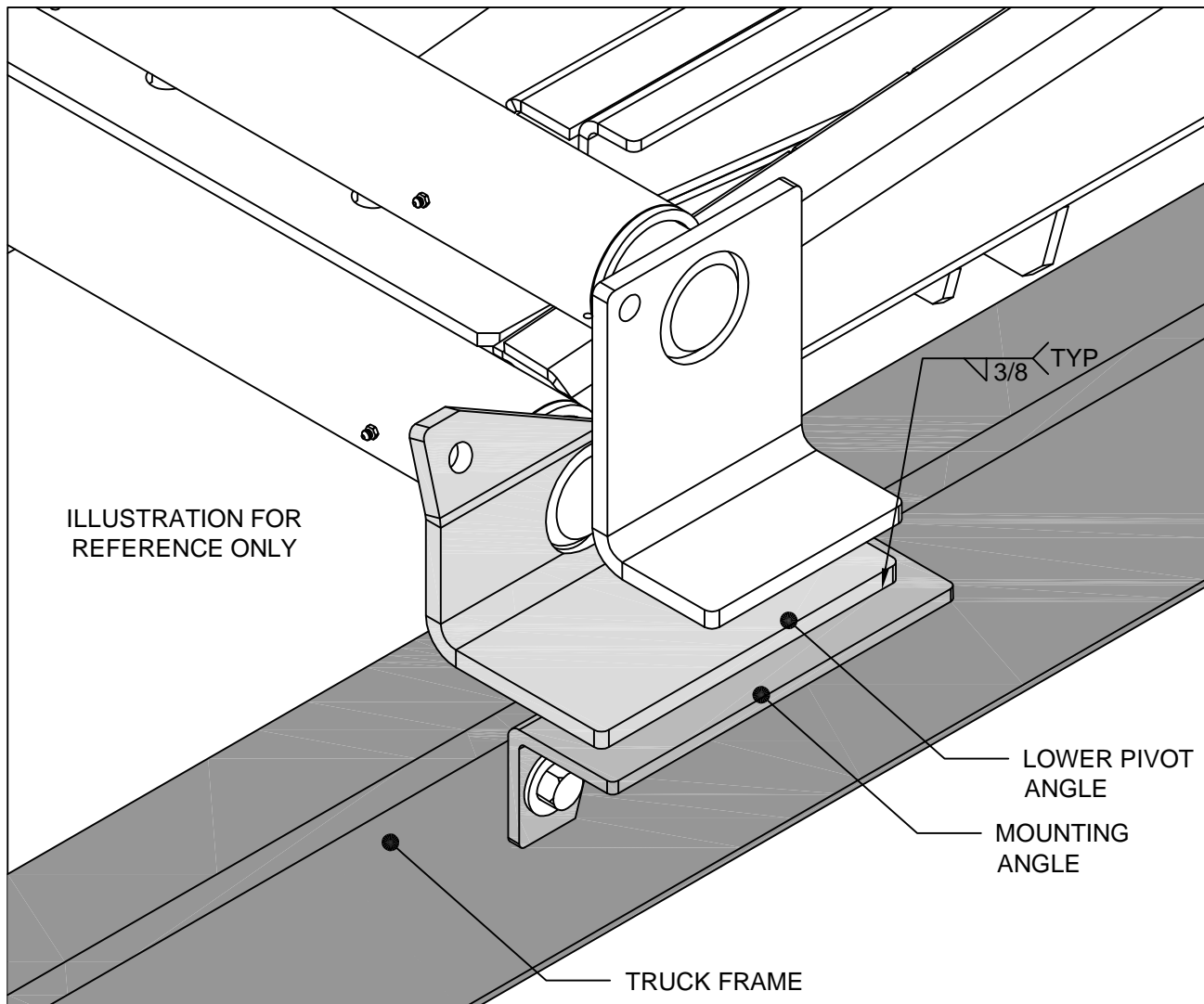


Figure 3. Mounting angle assembly.



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE
MOUNTING INSTRCTNS
VC6628

DATE
12-17-15
SUPERSEDES
-

SECTION
H200
662872

HOIST MOUNTING INSTRUCTIONS (CONT.)

G. Install hydraulic hoses per the following instructions:

1. 7' (or 7'-10") hose(s) installation - Connect one end of the hose to the front pump port (low pressure). Connect the other end of the hose to the rod end of the hoist cylinder (Figure 5).
2. 5' hose(s) installation - Connect one end of the hose to the rear pump port (high pressure). Connect the other end of the hose to the base end of the hoist cylinder (Figure 5).

H. Position and secure the filler strips (liner or sleeper) to the truck frame.

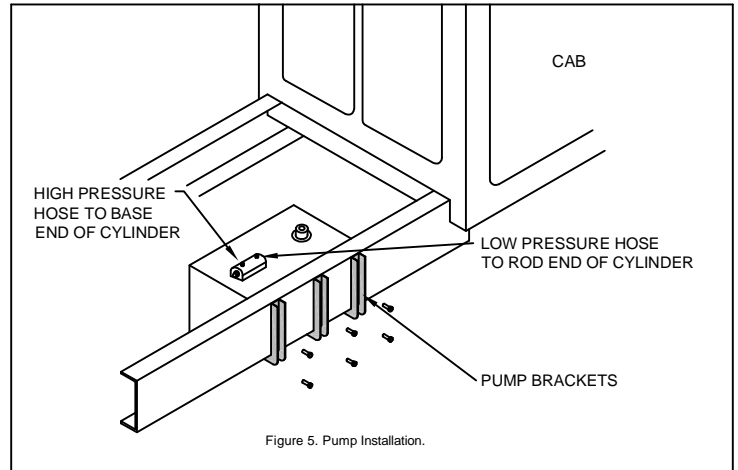
The VC6628 requires a minimum of 10-1/2" clearance above the truck frame.

NOTE: If the hoist needs to be mounted higher due to interference between the hoist knuckle and the truck frame, additional clearance above the truck frame will be required.

EXAMPLE:

Assuming that an 10-1/2" clearance is required and 6" long beams are on the truck body, a liner of at least 4 1/2" net will be required to obtain the minimum clearance required to mount the hoist.

$$6" + 4\ 1/2" = 10\text{-}1/2" \text{ minimum}$$



I. Position the body longitudinals (long beams) onto the truck frame / sub-frame.

NOTE: At least 2" clearance between the cab and closest point on the truck body is required.

J.

a. STANDARD HINGE (662806)

With the body aligned with the truck frame, push the hinge rockers outward as far as possible. Ensure that the longitudinal rails are sitting flat on the rockers, weld the body longitudinals to rockers (DWG 662871 Figure 2). See installation DWG 628861 for more information regarding the mounting of the rear hinge rockers to the body.

K. **Refer to DWG 520093 on the following page.** Make sure that the dump body longitudinals are resting flush on the top of the lifting angles. Weld the top of both lifting angles (the vertical 'leg') to the top flanges of the body longitudinals - a reinforcement plate may be required to fill the space between the lifting angles and body longitudinals. Weld all around the lifting angles, body longitudinals, and reinforcement plates (if applicable). **Be sure that your installation follows the method shown on the following page (DWG 520093).**



CAUTION



- Step "K" (above) is a critical installation procedure that must be carefully followed to ensure a successful hoist installation. Deviation from the suggested installation method may result in damage to the hoist.



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE
MOUNTING INSTRUCTNS
VC6628

DATE
12-17-15
SUPERSEDES
-

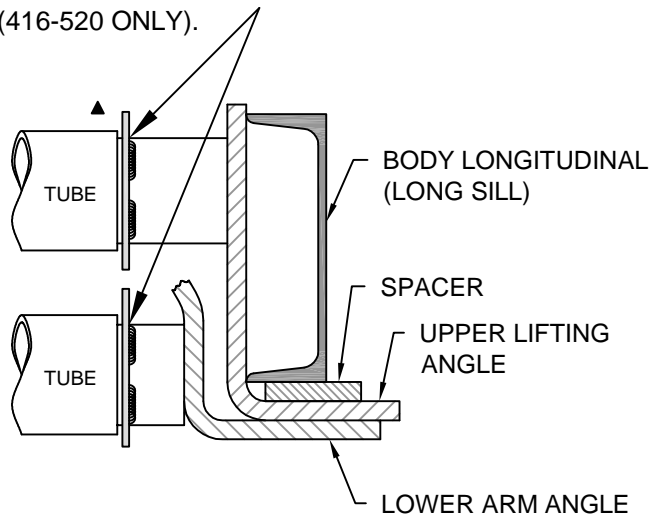
SECTION
H200
662873

IMPORTANT!

WHEN INSTALLING THE UPPER LIFTING ANGLES, THE GOAL IS TO COMPLETELY "BOX IN" THE LIFTING ANGLE, BODY LONG SILL SPACER, AND REINFORCEMENT PLATE - 100% WELD.

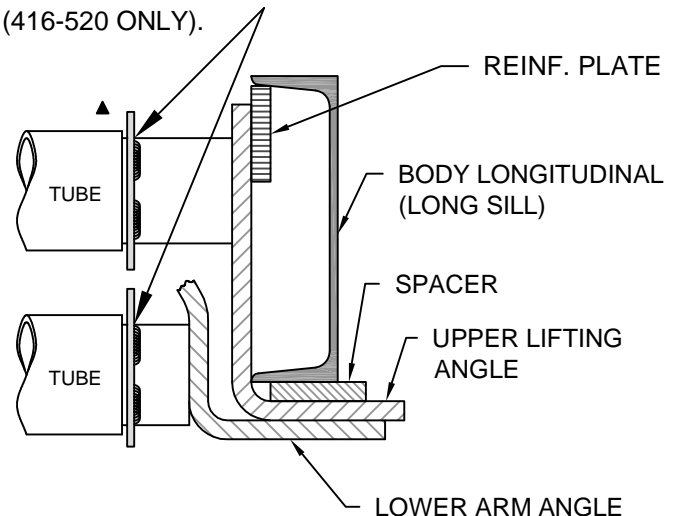
**SITUATION A:
LIFTING ANGLE FULLY
ENVELOPS BODY LONG SILL.**

▲ COLLAR SHOULD BE PROPERLY LOCATED AND STITCH WELDED TO PIVOT ROD TO LIMIT SIDE-TO-SIDE MOVEMENT OF SCISSORS (416-520 ONLY).

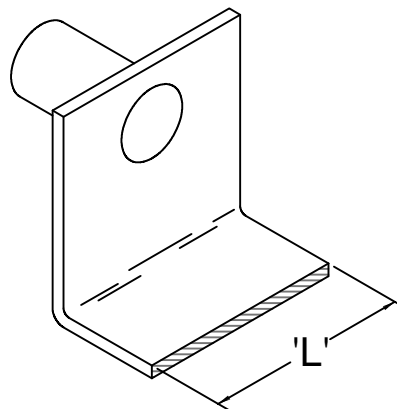


**SITUATION B:
LIFTING ANGLE DOES NOT
ENVELOP BODY LONG SILL AND
A REINFORCEMENT PLATE
IS REQUIRED.**

▲ COLLAR SHOULD BE PROPERLY LOCATED AND STITCH WELDED TO PIVOT ROD TO LIMIT SIDE-TO-SIDE MOVEMENT OF SCISSORS (416-520 ONLY).



NOTE: THE SPACER AND REINFORCEMENT PLATE SHOULD BE THE SAME LENGTH AS THE LIFTING ARM. SEE 'L' DIMENSION BELOW.



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE
INSTLL. INSTRUCTIONS

DATE
08-20-14E

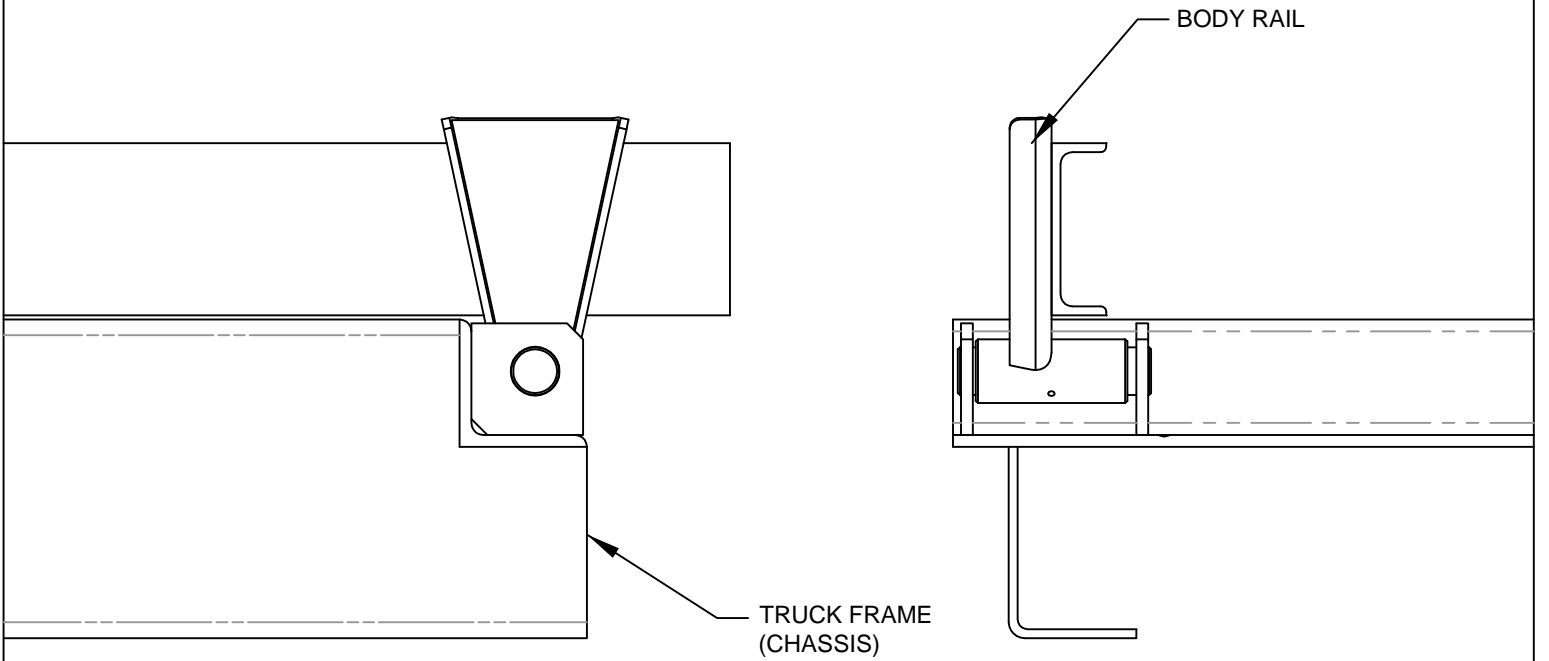
SECTION
H200

VC416-6628, TRLR313-6628

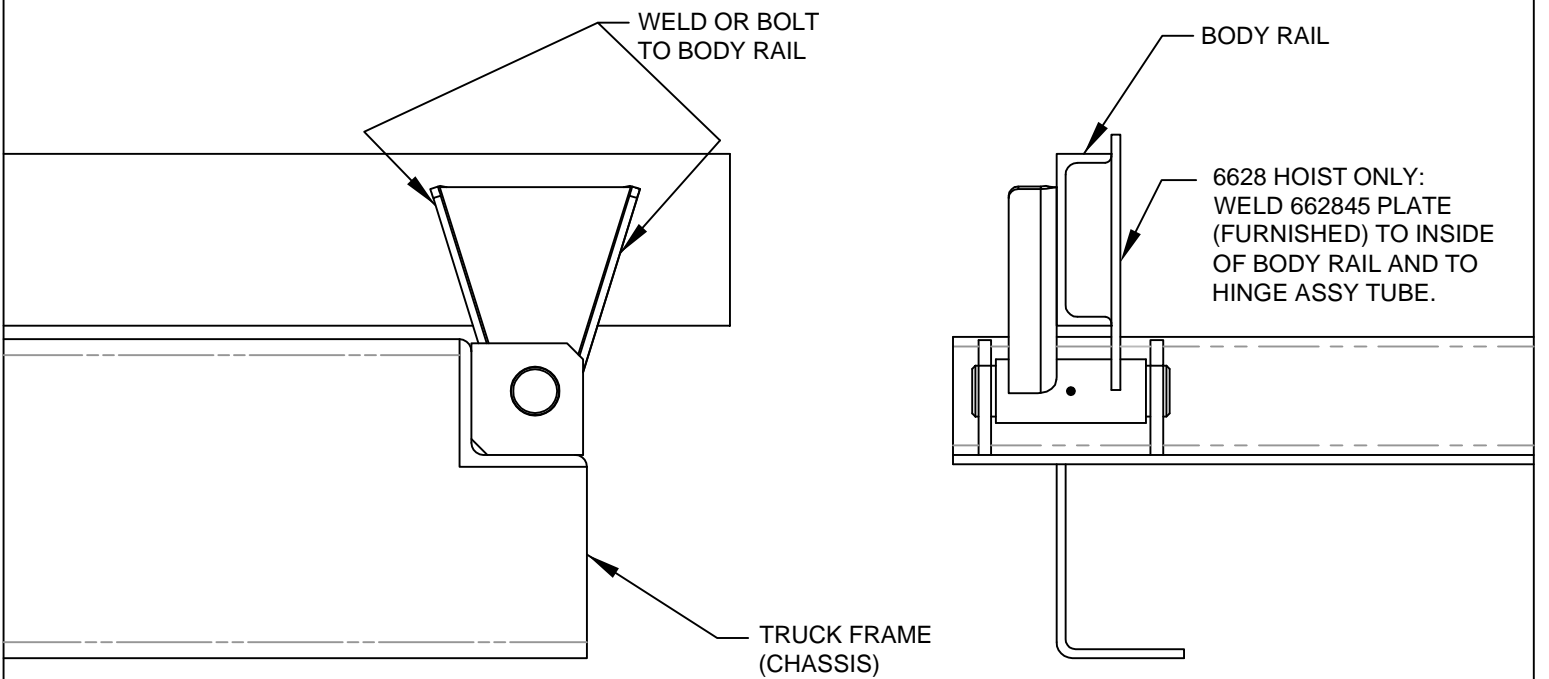
SUPERSEDES
01-14-13D

520093

HINGE MOUNTING INST. VC628 - 6628



662057-1 HINGE
VC628-6620



662806 HINGE
VC6628 ONLY



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE
HINGE TO BED MNTG

VC628-6628

DATE
12-08-15

SUPERSEDES

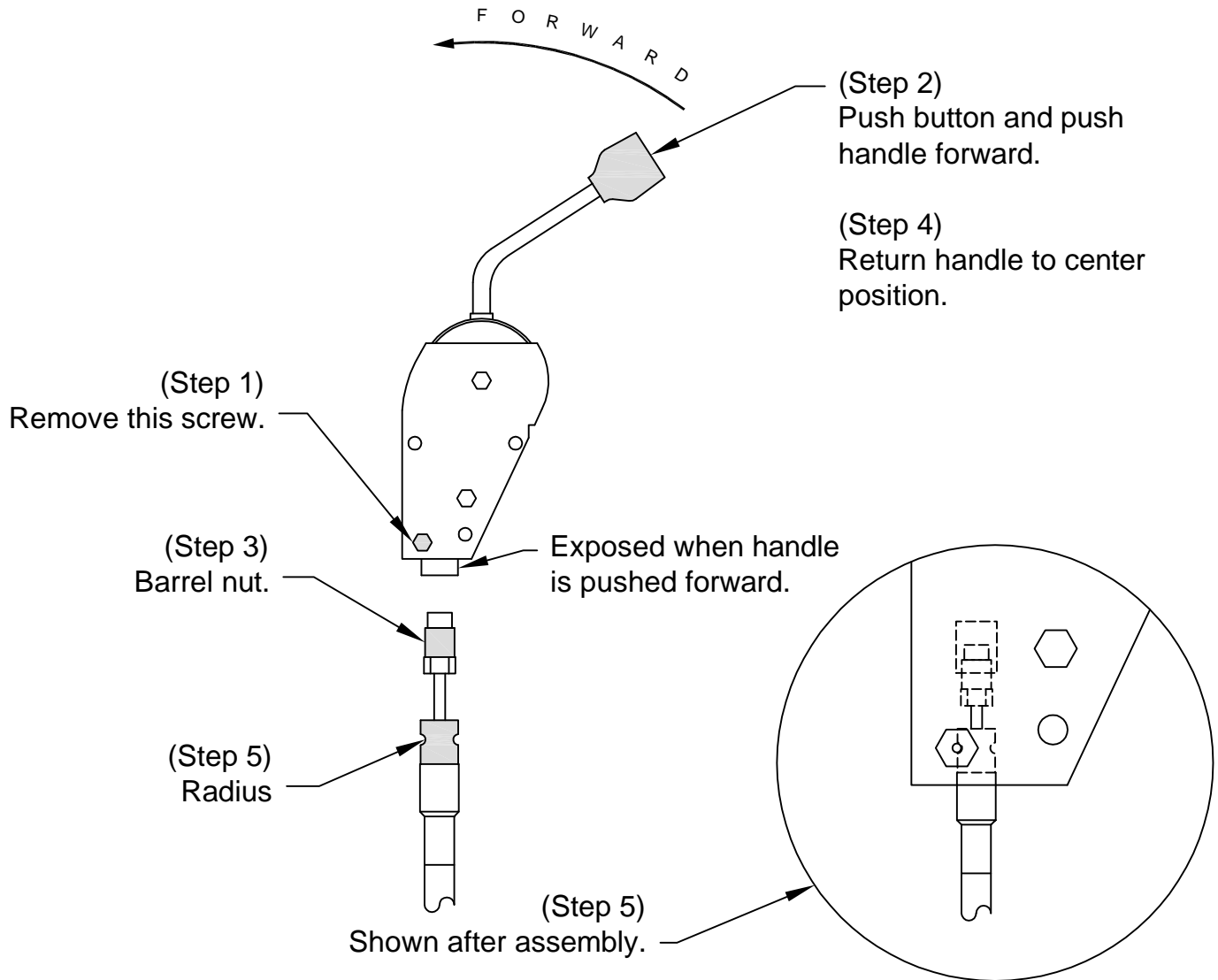
-

SECTION
H200

628861

ATTACHING 620129 CABLE TO 620131 / 132 HANDLE

- Step 1. Remove lowest screw & nut.
- Step 2. Depress red button on top of handle. Push handle forward and hold.
- Step 3. While holding handle, thread "barrel nut" into threaded hole in bottom and tighten.
- Step 4. Release handle. Handle should return to center position.
- Step 5. Replace screw & nut, making sure that radius on cable end is aligned with screw hole. After tightening screw, move handle forward and backward to make sure cable end is secure in console.



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE
CABLE / HANDLE ASSY
PTO PUMP CABLE

DATE
11-05-15B
SUPERSEDES
03-17-14A

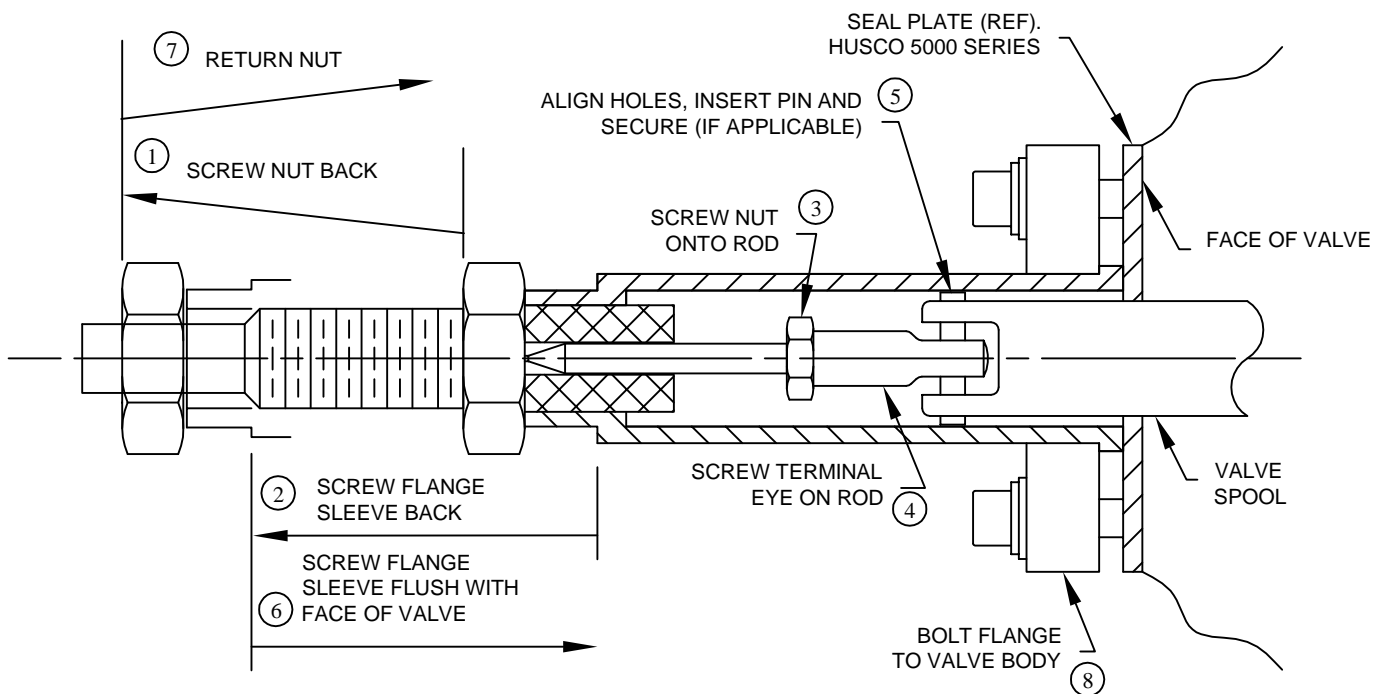
SECTION
-
620246

PTO PUMP CABLE INSTALLATION

1. Thread 0.750-16 UNF jam nut entire length of threaded hub and onto cable.
2. Place flange on sleeve and turn flange / sleeve assembly entire length of threaded hub and onto cable.
3. Threade 0.250-28 UNF jam nut onto threaded rod until it bottoms.
4. Thread terminal eye onto threaded rod and bottom against jam nut, turn to align with spool slot and secure jam nut against terminal eye.
5. Slide terminal eye into slot in spool and align holes. Insert connecting pin and secure with cotter pin (if applicable).
6. With cable attached to valve and input device, thread the flange / sleeve assembly onto the threaded hub until it is flush with the valve face. When turning the flange / sleeve assembly, make sure the input device remains in the neutral position.
7. Tighten the 0.750-16 UNF jam nut against the sleeve to lock in position.
8. Bring flange into position and bolt assembly to valve housing using two [2] socket head cap screws and two [2] split lock washers under head and two [2] flat washers under lockwashers. Tighten screws sufficiently to flatten lock washers or secure flange (see CAUTION).

CAUTION

- Excessive torque or over-tightening will distort flange.



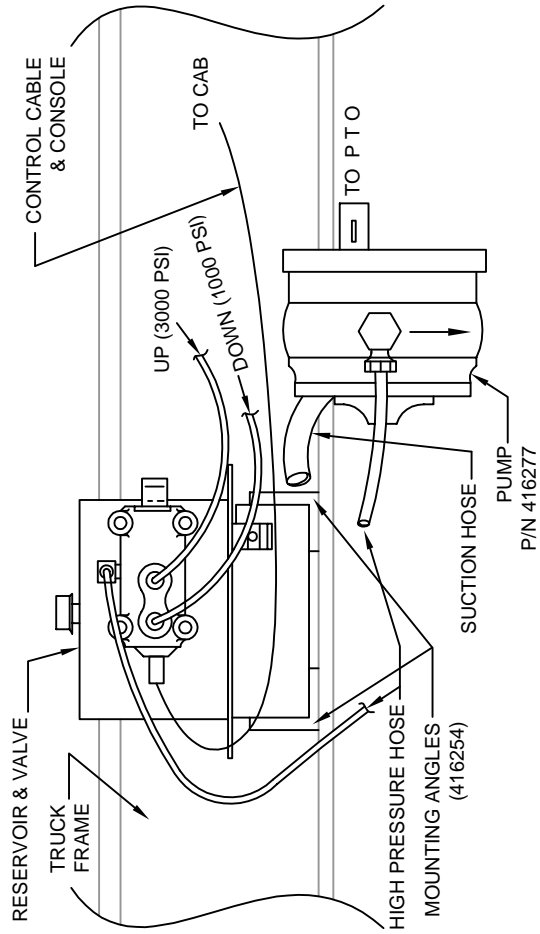
VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE
PTO PUMP CABLE INSTL
VC416-6628

DATE
11-05-15B
SUPERSEDES
03-17-14A

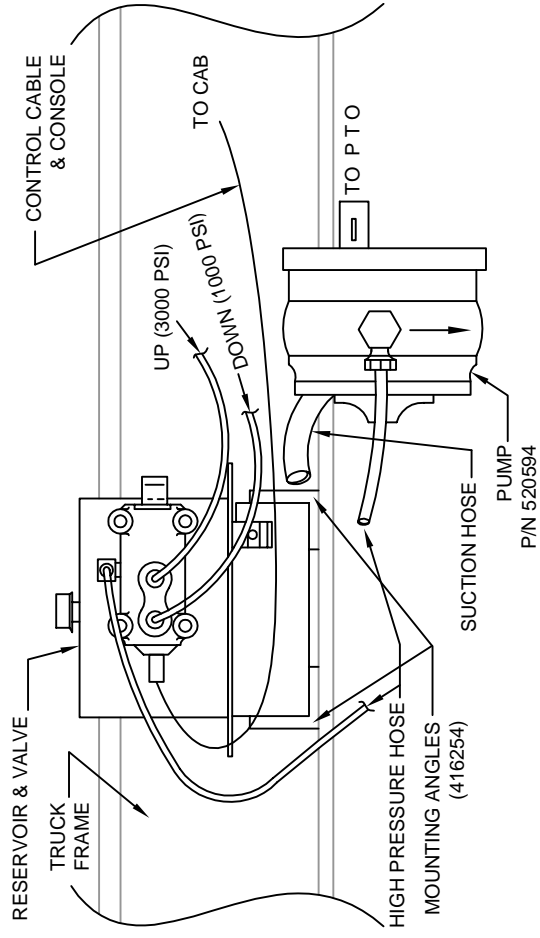
SECTION
-
416755

DIRECTIONAL PUMP CONFIGURATION FOR VC416-620



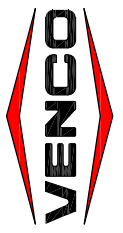
NOTE: ARROW ON PUMP HOUSING INDICATED ROTATION DIRECTION. FAILURE TO MATCH PTO ROTATION WITH PUMP ROTATION **WILL RESULT IN PUMP FAILURE.**

BI-DIRECTIONAL PUMP CONFIGURATION FOR VC628 & UP



NOTE: FOR BI-ROTATIONAL PUMP MOUNTING AND HOSE CONNECTION INFORMATION, SEE DWG 416812 (IF APPLICABLE).

Model	VC416	VC516	VC520	VC620	VC628	VC5520	VC6620	VC6628
Control Cable & Console	620125 - Curved 620124 - Straight							
Cylinder Up Hose	416044	520574						
Cylinder Down Hose	416045							
High Pressure Hose (pump to valve)	416045 (7' LG, 3/8 HOSE)	416045		628041		(2) 520574 (2) 416045 (2) 628041		
Suction Hose (reservoir to pump)	416079 (7' LG, 1.00" I.D.)	416079 (7' LG, 1.00" I.D.) FOR VC620 NON-SF		620910 (10' LG, 3/8 HOSE) FOR VC620 NON-SF		620909 (10' LG, 3/8 HOSE)		
Pump/Valve/Tank Pump (Only)	620011 (9 QUART) 416277		620077 (21 QUART) 520594					



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

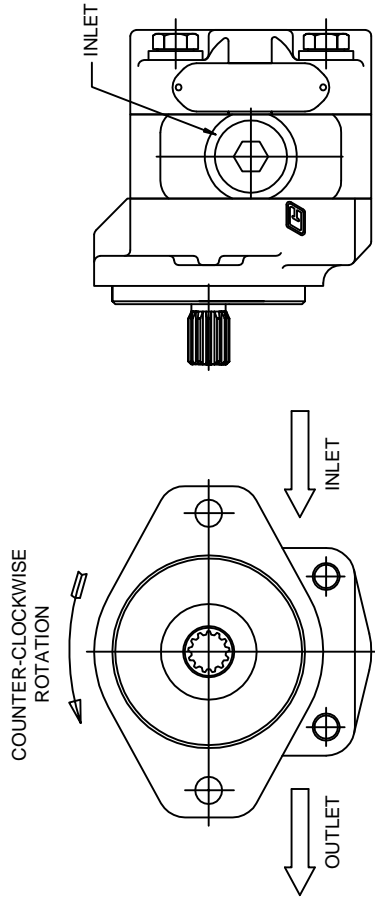
TITLE
SPLIT PUMP
VC416-6628

DATE
07-05-16C
SUPERSEDES
11-05-15B

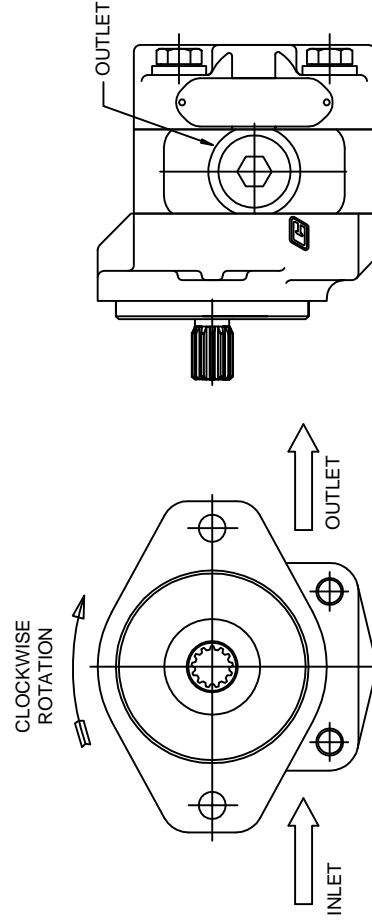
SECTION
H200
416763

BI-ROTATIONAL PUMP INSTALLATION

CLOCKWISE ROTATION PTO REQUIRES
COUNTER-CLOCKWISE ROTATION PUMP



COUNTER-CLOCKWISE ROTATION PTO
REQUIRES CLOCKWISE ROTATION PUMP



TO VERIFY THE INLET PORT ON A BI-ROTATIONAL PUMP,
DETERMINE WHICH WAY THE SHAFT OF THE PUMP IS GOING
TO TURN FROM THESE TWO SAMPLE DIAGRAMS AND PLUMB
ACCORDINGLY.

NOTE: DO NOT OPERATE THE PUMP WITHOUT OIL.



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE
BI-ROTATIONAL PUMP INSTALLATION

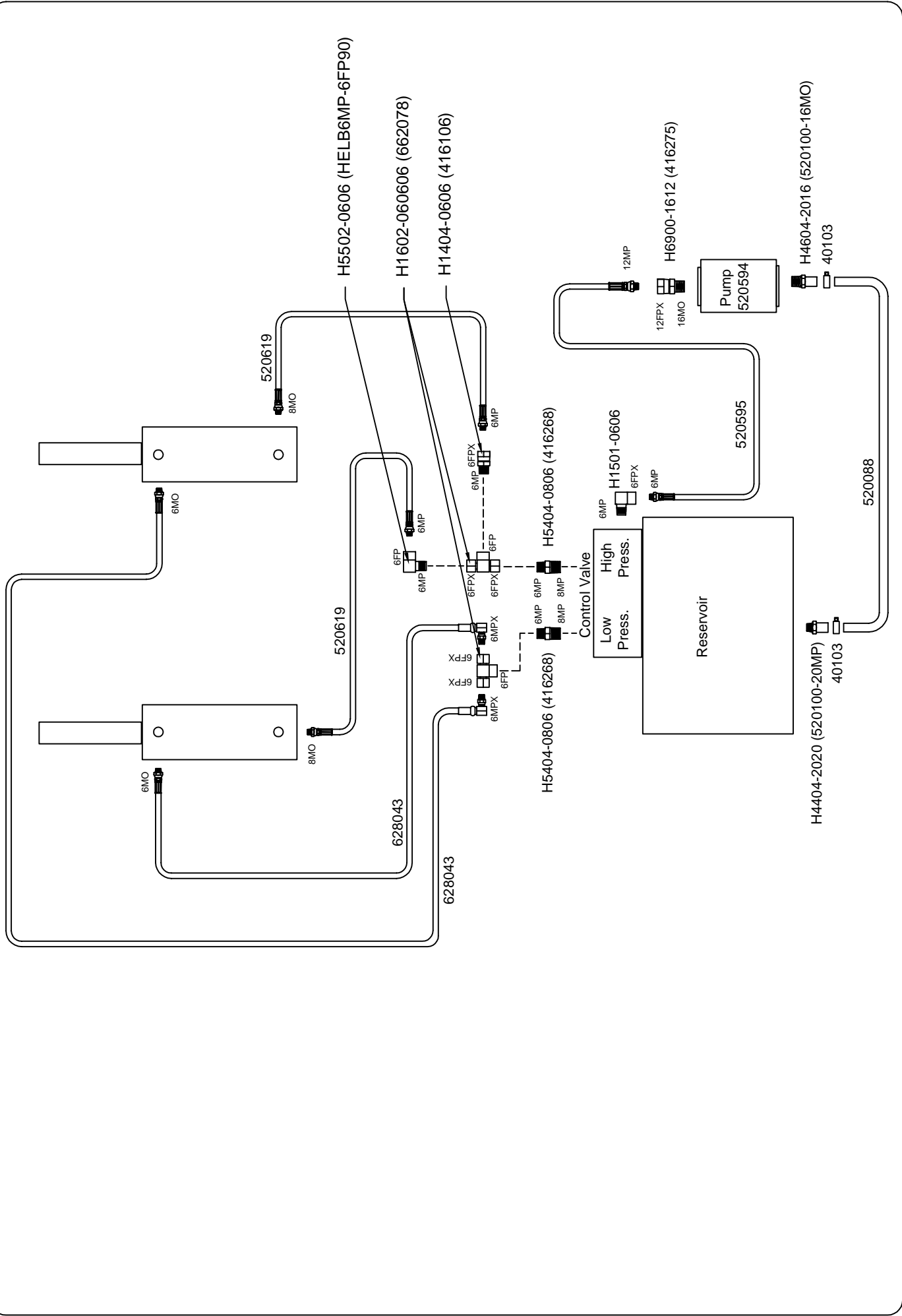
DATE
12-09-15A

SECTION
-

SUPERSEDES
06-02-05

416812

VC628-6628



VENCO VENCO VENTURO INDUSTRIES LLC CINCINNATI, OHIO	TITLE SPDG HOSE CONNECTION DIAGRAM		DATE 09-09-16C	SECTION -
	VC6620/6628		SUPERSEDES 07-20-16B	552004

Williams[®] Machine & Tool Co.

MANUFACTURERS OF HYDRAULIC PISTON PUMPS



CAUTION



- The gear pump you have purchased is a single rotation Gear Pump. Installation of this Gear Pump into a system that does not match the rotation of the Gear Pump may result in personal injury and/or property damage.

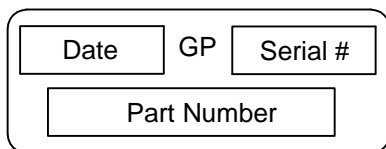
The Gear Pump you have purchased is a single rotation Gear Pump. The direction of rotation can be found by using the Williams Machine and Tool Co.'s Model Number. Directly following the Model Number are the letters CCW or CW. These letters indicate the direction of rotation for the Gear Pump. CCW indicates a counter-clockwise rotation. CW indicates a clockwise rotation. Pump shaft rotation is determined by viewing pump from the shaft end.

Example: GP1538 CCW. The CCW indicates a counter-clockwise rotation.

To verify the direction of rotation of your Gear Pump, perform the following steps:

- 1.) Locate the Part Number on the Gear Pump. The Part Number, Serial Number, and date code are located on the rear of the Gear Pump.
- 2.) Part Numbers ending in an even number are clockwise rotation (CW). Part Numbers ending in an odd number are counter-clockwise rotation (CCW).

Example: 1830201. The last number is 1 (an odd number). This indicates a counter-clockwise rotation (CCW).



The following chart specifies torque requirements for the SAE O' ring plugs installed into the side or rear ports of the Gear Pump. Any combination of inlet and outlet ports may be used, ie., inlet large rear port. outlet small side port; inlet large side and outlet small rear ports; or both side ports or both rear ports. One inlet and one outlet part must be plugged for proper Gear Pump operation.

PORT SIZE (SAE)	TORQUE (FT. LBS)
3/4 - 16	15 - 20
7/8 - 14	20 - 25
1 - 1/16 - 12	30 - 35
1 - 5/16 - 12	45 - 50
1 - 5/8 - 12	65 - 70



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE

WILLIAMS PTO WARNING

DATE

11-05-15D

SECTION

H200

SUPERSEDES

03-17-14C

416287

Included with your Venco hoist are various danger, warning, and caution decals. These decals must be placed in prominent locations so they are easily seen and readily identifiable. This illustration provides the recommended decal locations.

PD MODEL ONLY
 VENCO #416624 → 1 REQ'D
 AFFIX TO TRUCK DASHBOARD



VENCO #416052
 2 REQ'D (1 EACH SIDE)



VENCO #416084
 1 REQ'D FOR EACH SIDE
 SAFETY PROP
 (SWING-DOWN)



VENCO #416626
 1 REQ'D FOR EACH SIDE
 SAFETY PROP
 (INDEXING)



VENCO #416624
 1 REQ'D FOR EACH SIDE
 SAFETY PROP
 (LINKAGE)



VENCO #15254
 2 REQ'D (1 EACH SIDE)

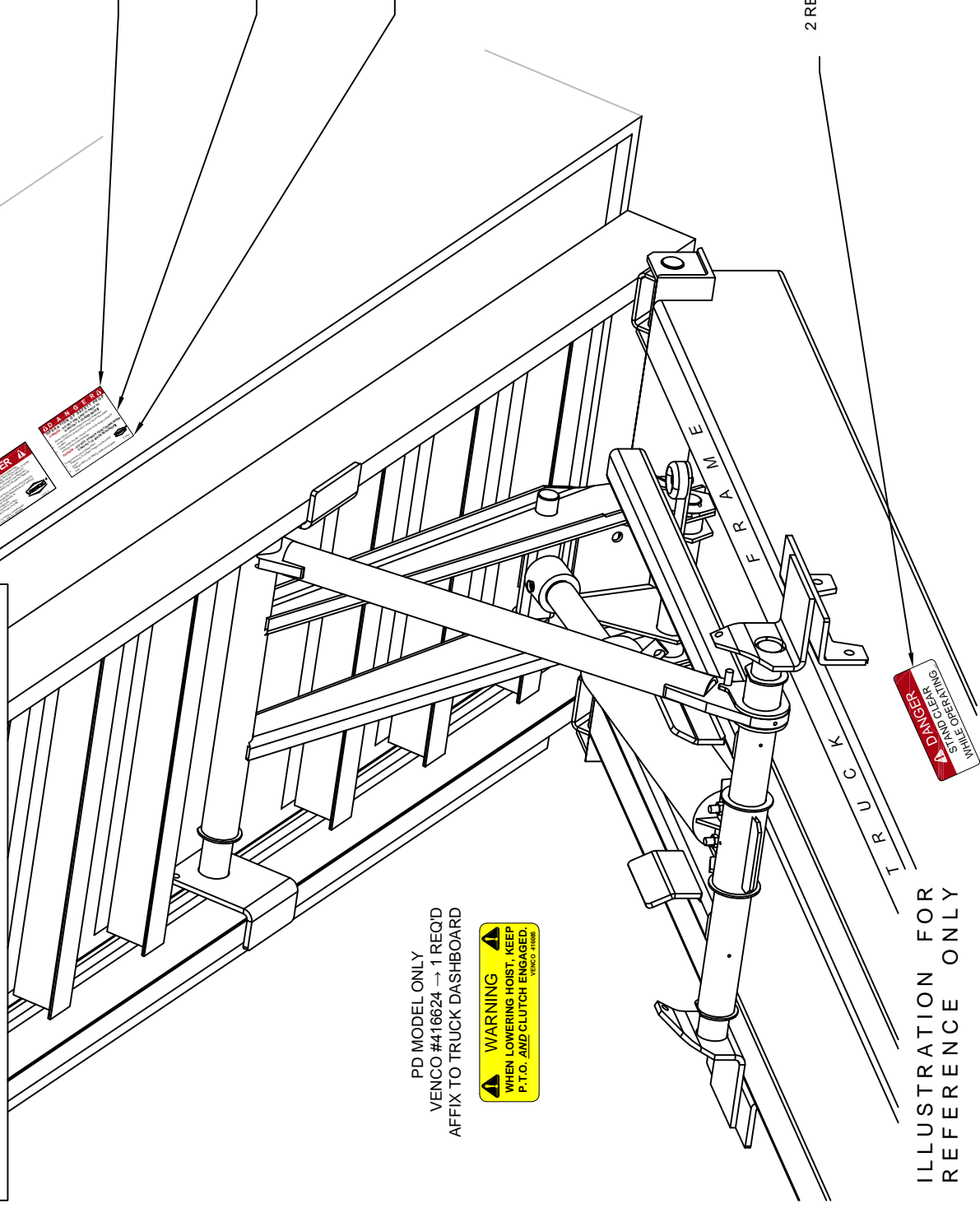


ILLUSTRATION FOR
 REFERENCE ONLY

	VENCO VENTURO INDUSTRIES LLC CINCINNATI, OHIO		TITLE	DECAL LOCATIONS VC416-6628, TRLR416-6628	
	DATE	SECTION			
	10-27-15F	H200			
	SUPERSEDES				
	10-31-14E				

416128

SECTION 250

OPERATION



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

READ THIS FIRST

OPERATOR - WARNINGS

- ▶ Read and fully understand entire owner's manual prior to operating this equipment.
- ▶ Do not dump while on uneven ground or if vehicle is uneven side to side. Dumping while uneven can cause vehicle to overturn and cause property damage, equipment damage, serious injury or death.
- ▶ Stay clear of dump body when dumping. Moving vehicle parts or the moving load could cause serious injury or death.
- ▶ NEVER be under a raised body, and keep all others clear when raising body. Body could inadvertently fall causing serious injury or death. Reference operator section for proper body prop use.
- ▶ Only allow qualified personnel to work on this equipment that understands its functions.
- ▶ Overloading Hoist can cause equipment malfunction, serious injury or death.
- ▶ NEVER operate this Hoist from outside the cab. This could cause serious injury or death.
- ▶ Make sure all warning and caution labels are legible and properly placed. Refer to the installation section for placement and the replacement parts section for replacement decals.
- ▶ When performing maintenance, truck should be turned off and emergency brake set along with body prop set under an UNLOADED body. NEVER prop a loaded body. Body could inadvertently fall, causing serious equipment damage, personal injury or death.
- ▶ We strongly recommend you contact your truck equipment distributor to perform any type of repair or maintenance on your equipment. If you do not have a local distributor, call VENCO VENTURO INDUSTRIES LLC for the closest authorized distributor.



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE	DATE	SECTION
OPERATOR - WARNINGS	09-03-15	-
HOISTS	SUPERSEDES	520952
	-	

HOIST MAINTENANCE AND OPERATION INSTRUCTIONS

- A. Hoist unit lubrication
1. Lubricate all grease fittings on the hoist unit.
 2. Lubricate the rear hinge assembly.
 3. The hoist system should be serviced at the same time the truck is serviced, and sooner if the hoist unit is performing heavy duty service.
 4. Pump Reservoir → Shall be filled with the recommended oil per the manufacturer's instructions. Periodically check the hydraulic fluid and change when the truck engine oil is changed.
- B. PTO Pump Operation
- With the hoist and body completely installed, cycle the hoist several times to purge the hydraulic system of air. Operate the hoist system per the instructions in this manual and per the PTO manufacturer's instructions.



C A U T I O N



- Do not operate the pump at more than 1000 RPM. Severe hoist system damage could result. The PTO speed to engine speed is governed by the gear ratio of the PTO drive installed in the truck transmission.
- For long service and safety from VC hoists, it is important that the following procedure be followed each time the hoist is operated:

1. Engage the PTO from the truck cab and adjust the engine speed to obtain the correct PTO and lift speed desired.
2. Pull the pump stick out. This will cause the hoist to raise.
3. When the pump has reached its maximum capacity, the pump will bypass through the relief valve. To prevent the pump from bypassing, push the pump knob to the center / middle position. Whenever the pump knob is centered, the hoist will stop moving and hold its position.



C A U T I O N



- Do not allow the pump to bypass for long periods of time, as this will put stress on the hydraulic and electrical systems of the hoist.

4. To lower the hoist, push the pump stick in.
NOTE: The Venco hoist powered by PTO drive pumps must be 'powered down'. Failure to 'power down' will cause the reservoir to overflow.
5. To lock the hoist against the truck frame when it is in the down position, push the pump knob in. When the pump bypasses, place the knob in the center 'hold' position.
6. Disengage PTO from transmission per the manufacturer's instructions.



C A U T I O N



- Do not drive the truck without first disengaging the PTO. Failure to disengage the PTO may result in severe damage to the pump and pump drive unit.



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE

MAINT. & OPER. INSTRC.

DATE

11-05-15D

SECTION

H250 ▲

VC 520-6628

SUPERSEDES

08-12-15C

520079

BODY PROP OPERATION GUIDE - GENERAL INFORMATION

D. Body prop(s): Federal Regulation 1926.601, Paragraph 10, requires the use of a body prop. Accordingly, all Venco hoist units will have included as a standard item a body prop (safety strut). See Paragraphs D.1. & D.2. below.

1. The body prop is designed for use only when the truck body is **empty**. The purpose of the body prop is to provide a safety strut for use when maintenance or inspections are performed on an **unloaded** truck body in the raised position.
2. One [1] body prop shall be furnished for truck bodies up to and including 15 feet. For bodies longer than 15 feet in length, two [2] body props should be used.
3. Venco hoists are equipped with one of three types of body props: **Indexing**, **Swing-down** or **Linkage**. The chart below shows the hoist model number and the corresponding body prop types available.



HOIST BODY PROP CONFIGURATION CHART				
HOIST MODEL	STD. BODY PROP TYPE	OPTIONAL LINKAGE BODY PROP	DUAL BODY PROP	OPERATIONAL DECAL PART NUMBER
VC416/516	INDEXING	OPTIONAL	NOT AVAILABLE	INDEX= 416626, LINKAGE= 416624
VC520	INDEXING	OPTIONAL	NOT AVAILABLE	INDEX= 416626, LINKAGE= 416624
VC620	SWING-DOWN	OPTIONAL	NOT AVAILABLE	SWING-DOWN=416084, LINKAGE=416624
VC628	SWING-DOWN	NOT AVAILABLE	OPTIONAL	SWING-DOWN=416084
VC6620	SWING-DOWN	NOT AVAILABLE	OPTIONAL	SWING-DOWN=416084
VC6628	SWING-DOWN	NOT AVAILABLE	STANDARD	SWING-DOWN=416084

NOTE: For an illustration and operating instructions for each body prop type, see page 416645 in this manual.

4. Special Precautions for Swing-down Body Props -

- Make sure the truck is parked on a **flat level surface**.
- Use a suitable tool to pull out the Spring-loaded release pin (stowage device) to release the body prop from the hoist frame. This will release the body prop allowing it to swing downward to a vertical position.
- Make sure that the body prop is aligned with the body prop foot rest (the body prop will be in a vertical position), then allow the truck body to move downward until the body prop is seated in the foot rest.
NOTE: DO NOT POWER DOWN AFTER MAKING CONTACT WITH BODY PROP FOOT REST
- To disengage the body prop, raise the truck body until the body prop swings freely away from the foot pad. Using a suitable tool, place the tool in a leverage position on the body prop and propel sharply to the left and upward (or to the right and upward) so that the locking pin can be compressed and seated in the locking pin hole. Make certain the body prop is latched securely before the hoist is operated.

WARNING

- Do not place arms, hands, or any part of the body between the truck longitudinals (long beams) or moving parts to pull the body prop release / locking pin.

WARNING

- Do not use the body prop(s) to support a loaded truck body.
- Body prop(s) should be free swinging to a vertical position after the locking pin is released

WARNING

- Read operation of safety strut and caution labels **before** operating the hoist.

WARNING

- Use care when reseating the body prop(s) in the locked position.



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE
BODY PROP OP. GUIDE
VC416 - VC6628 HOISTS

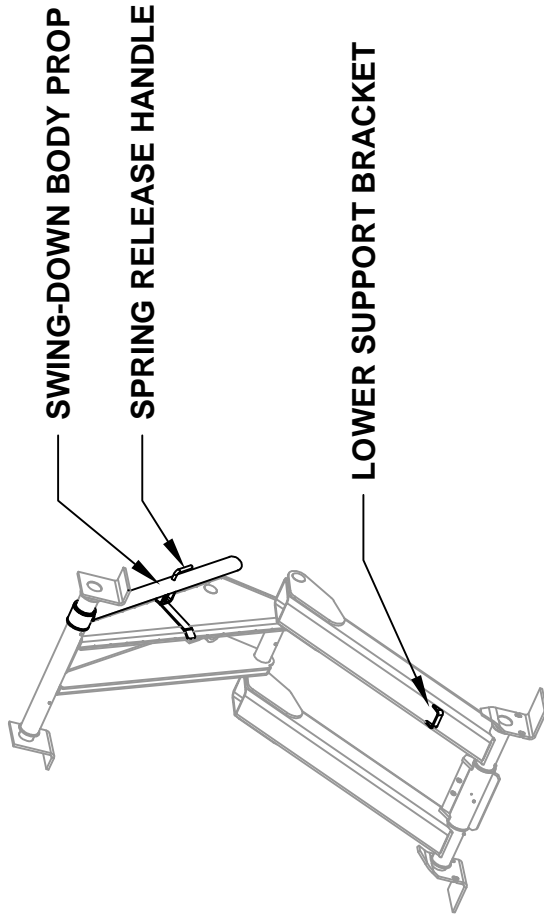
DATE
11-05-15A
SUPERSEDES
5-28-14

SECTION
H250 ▲
416644



BODY PROP OPERATION GUIDE - ILLUSTRATIONS & INSTRUCTIONS

VC628 - VC6628 (STANDARD) SWING-DOWN BODY PROP



NOTE: DUAL BODY PROPS ARE STANDARD ON HOIST MODEL VC6628. REFER TO THE HOIST BODY PROP CONFIGURATION CHART ON DRAWING 416644 TO DETERMINE THE AVAILABILITY OF DUAL BODY PROPS FOR OTHER HOIST MODELS.

⚠ D A N G E R ⚠

OPERATION OF SAFETY PROP

DANGER: DO NOT USE SAFETY PROP TO SUPPORT A LOADED BODY!

1. Raise body to sufficient height and shut off all power.
2. Unlock PROP(S) and permit to swing freely to the vertical position.
3. Using inside-the-cab controls, lower body slowly until PROP contacts lower support bracket.

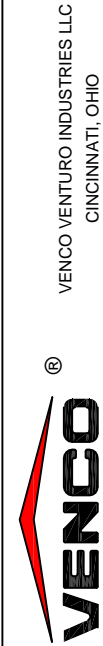
DANGER: DO NOT POWER HOIST DOWN AFTER CONTACT IS MADE WITH PROP!

To discontinue use of safety PROP:

1. Raise body to sufficient height and shut off all power.
2. Swing PROP to STORED position and engage lock.



416084-A



TITLE
BODY PROP OPERATIONS

VC628-6628

DATE
12-09-15
SUPERSEDES
-

SECTION
H250

628645

SECTION 300

MAINTENANCE

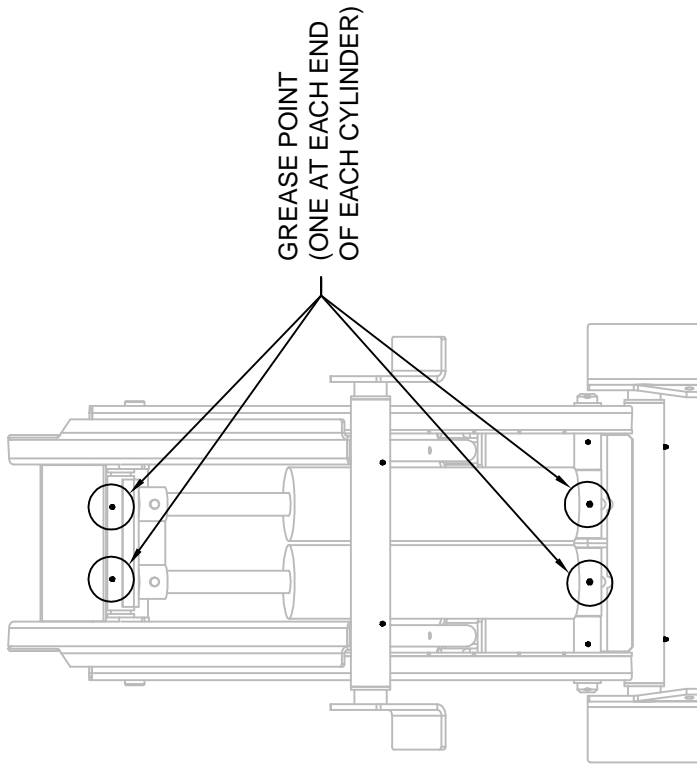
&

SERVICE

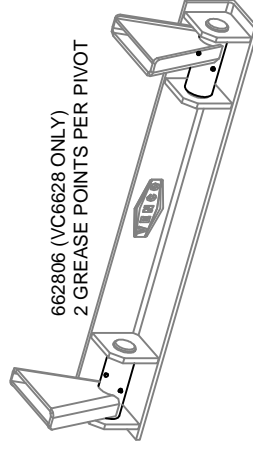
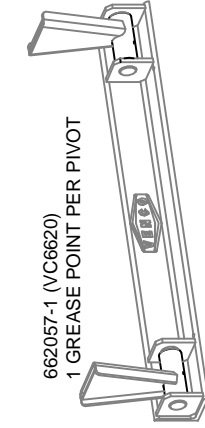
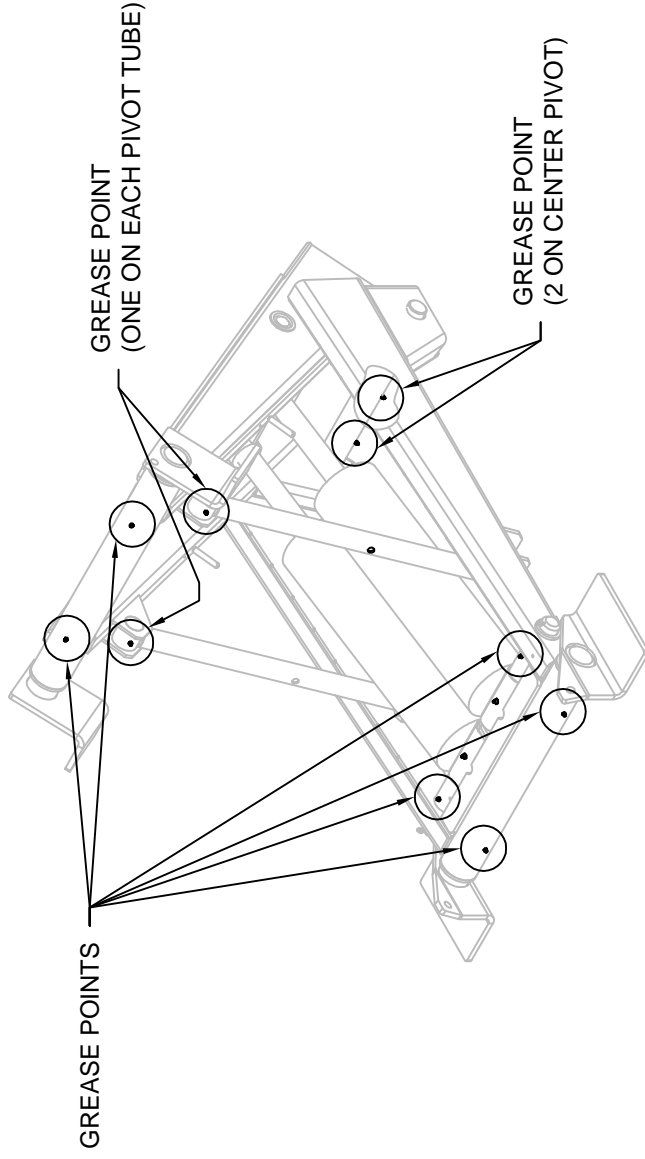


VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

HOIST GREASE POINTS



TOP VIEW



TO ENSURE THE RELIABLE PERFORMANCE OF YOUR VENCO HOIST, IT IS NECESSARY THAT YOU GREASE THE HOIST AT THE TIME OF TRUCK SERVICE WITH CHASSIS GREASE. THE GREASE POINTS FOR THE HOIST SCISSORS AND REAR HINGES ARE SHOWN ABOVE. ADDITIONAL FITTINGS FOR TWIN CYLINDER HOISTS AND ADDITIONAL BODY PROPS ARE ALSO NOTED.



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE
GREASE POINTS FOR HOISTS

VC6620/6628

DATE
12-14-15

SUPERSEDES
-

SECTION

-

662124

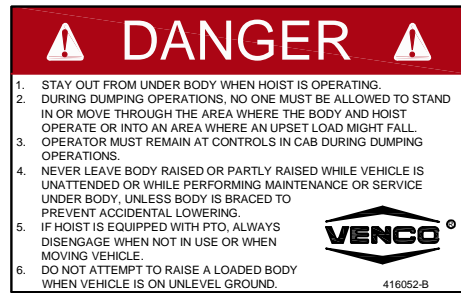
SECTION 400

REPLACEMENT PARTS

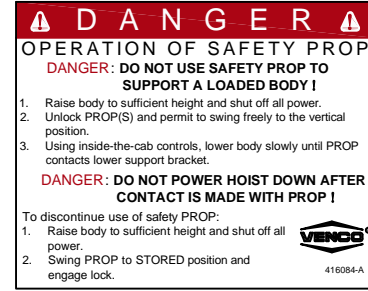


VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

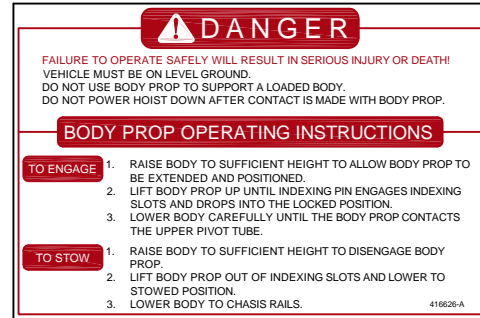
PART NO.: 416052
 DECAL: DANGER STAY CLEAR
 FUNCTION: To provide operator with a summary of key hoist operating procedures.
 QUANTITY: 2
 PLACEMENT: One on each side of body.



▲
 PART NO.: 416084 (VC620-VC6628 MODELS ONLY)
 DECAL: SAFETY PROP OPERATION
 FUNCTION: To inform the operator of proper operation of safety prop.
 QUANTITY: 1 For each safety prop.
 PLACEMENT: On side of body closest to safety prop(s).



▲
 PART NO.: 416626 (VC416,516 & 520 MODELS ONLY)
 DECAL: SAFETY PROP OPERATION, 'INDEXING' ONLY
 FUNCTION: To inform the operator of proper operation of safety prop.
 QUANTITY: 1 For each safety prop.
 PLACEMENT: On side of body closest to safety prop(s).




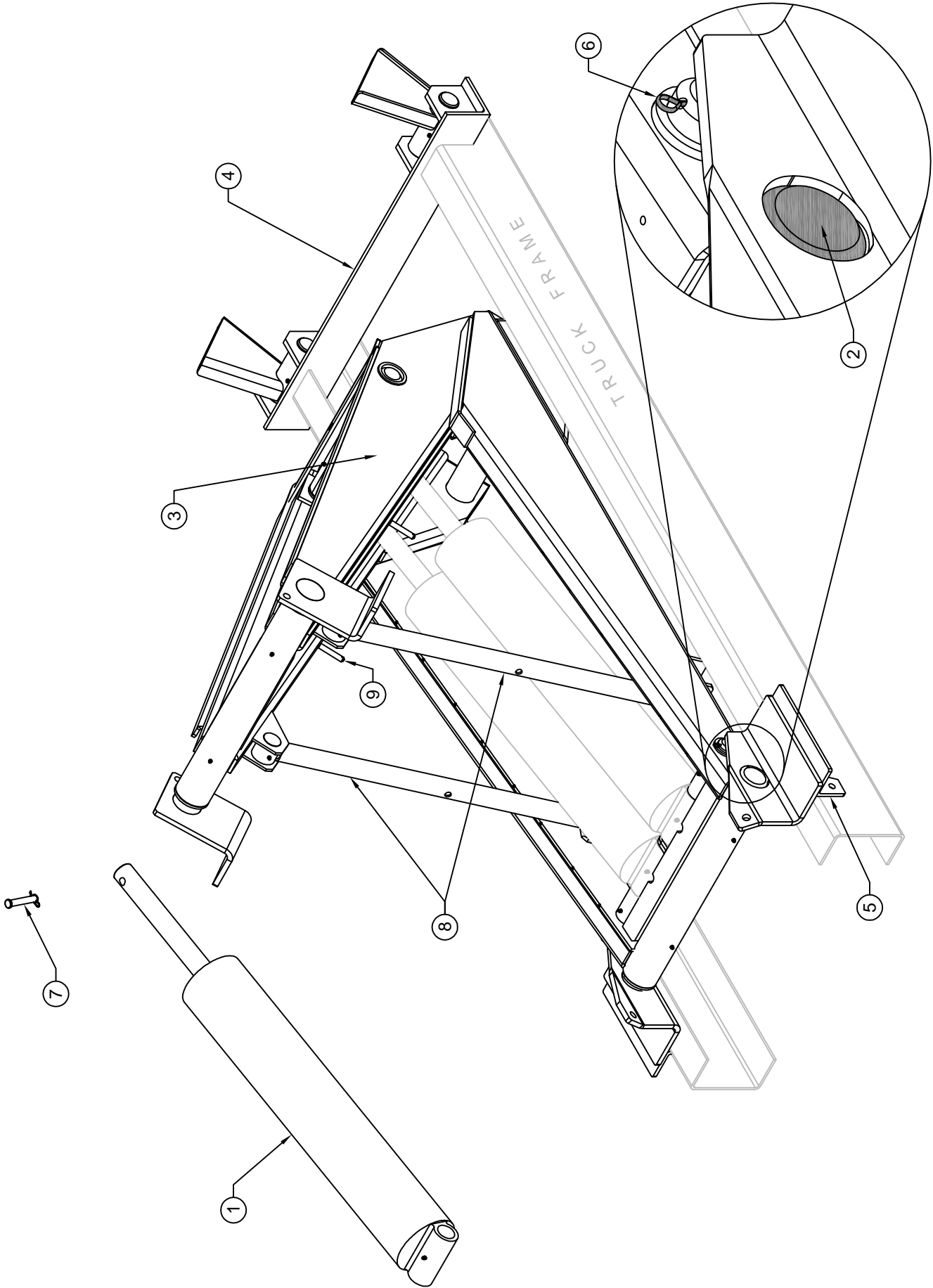
PART NO.: 15254
 DECAL: CAUTION STAND CLEAR
 FUNCTION: To inform the operator to stay clear of body / hoist.
 QUANTITY: 2
 PLACEMENT: One on each side of truck frame.



PART NO.: 416085
 DECAL: WARNING WHEN LOWERING
 FUNCTION: To inform the operator to keep P.T.O. and clutch engaged when lowering the hoist.
 QUANTITY: 1
 PLACEMENT: Affixed to truck dashboard.



	Venco VENTURO INDUSTRIES LLC CINCINNATI, OHIO	TITLE	DATE	SECTION
		DECAL LIST	11-05-15E	-
		VC/TRLR 416-6628	SUPERSEDES 03-26-14D	628820



 Venco VENTURO INDUSTRIES LLC CINCINNATI, OHIO	TITLE	REPLACEMENT PARTS DRAWING
	VC6628	
DATE	12-17-15D	SECTION
SUPERSEDES	08-07-00C	H400
		662853

662853 REPLACEMENT PARTS LIST

ITEM	PART NUMBER	QTY.	DESCRIPTION
1	628900	2	CYLINDER; 6" BORE X 20" STROKE
2	662808	1	LOWER CYLINDER PIVOT SHAFT
3	662809	1	SCISSORS ASSEMBLY
4	662806	1	REAR HINGE ASSEMBLY
5	520920	2	MOUNTING ANGLE
6	41610	2	COTTER PIN; 1/4" X 3"
7	416545	2	5/8 X 3 1/2" CLEVIS PIN W/ RUE RING ASSEMBLY
8	662836	2	BODY PROP (STANDARD)
9	662860	2	PIN; BODY PROP KEEPER
10	-	-	-
11	-	-	-
12	-	-	-
13	-	-	-
14	-	-	-
15	-	-	-
16	-	-	-
17	-	-	-
18	-	-	-
19	-	-	-
20	-	-	-
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30	-	-	-
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33	-	-	-
34	-	-	-
35	-	-	-

REPLACEMENT PARTS DWG REF 662853



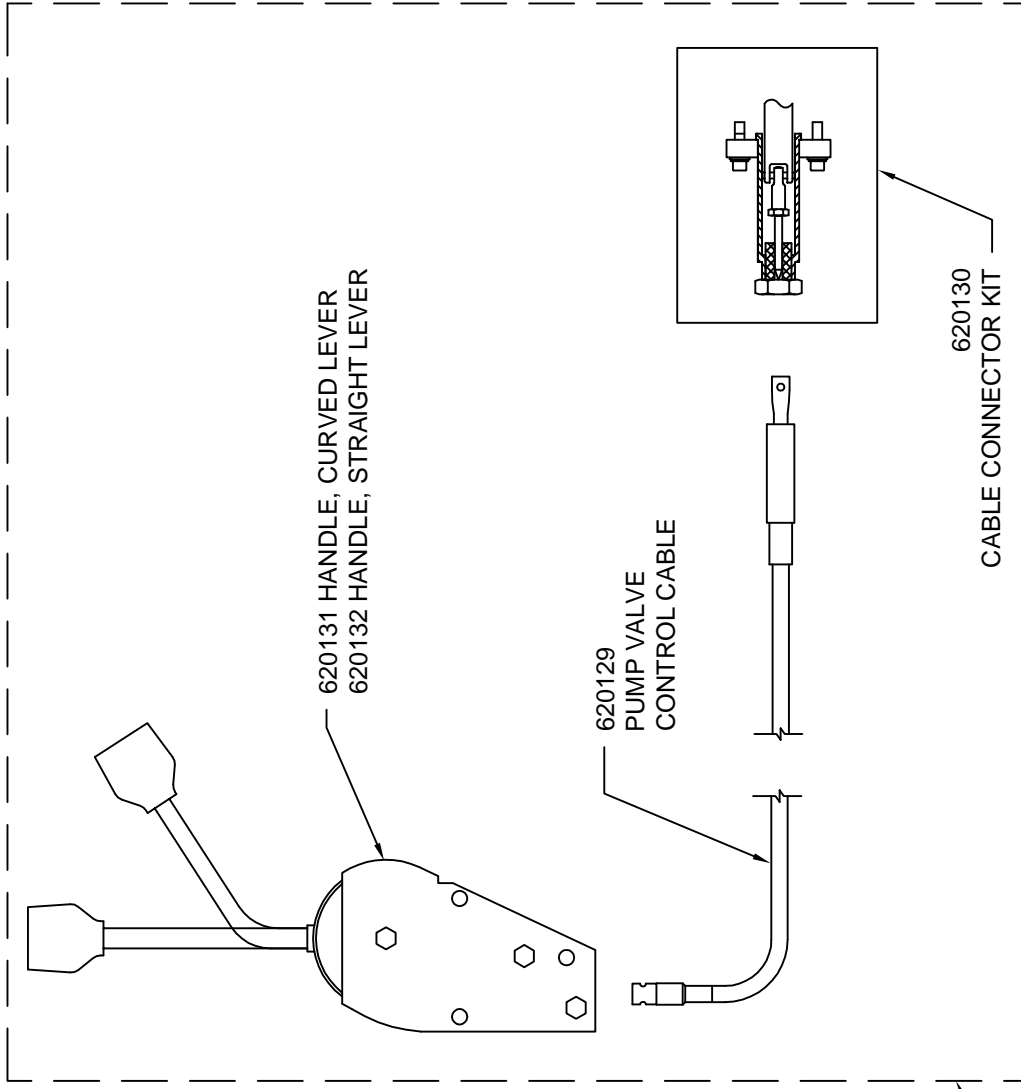
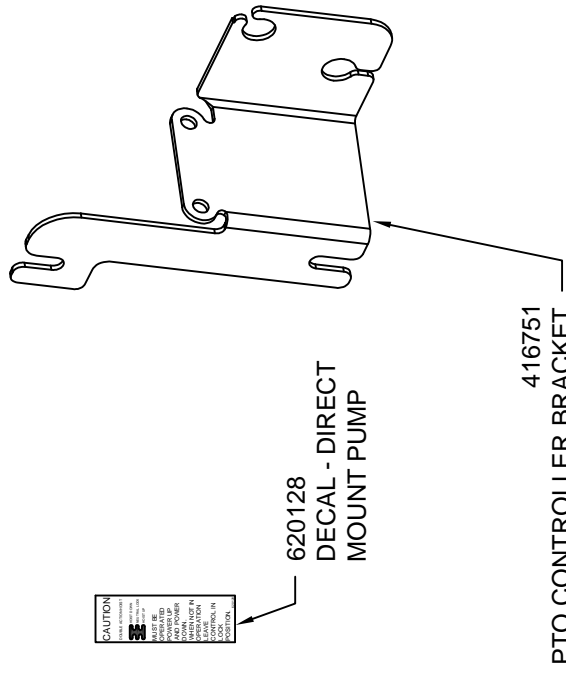
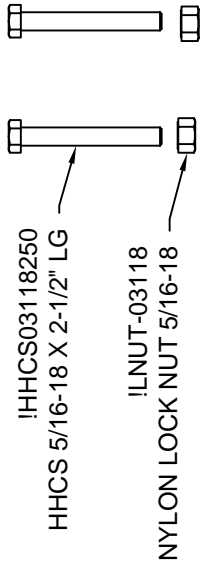
VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE
RPLCMNT PARTS LIST
VC6628

DATE
12-17-15F
SUPERSEDES
05-23-06E

SECTION
H400
662854

CABLE & CONSOLE KITS; 620125 (CURVED) & 620124 (STRAIGHT)



620126 CURVED HANDLE CABLE ASSEMBLY
620127 STRAIGHT HANDLE CABLE ASSEMBLY



VENCO VENTURO INDUSTRIES LLC
CINCINNATI, OHIO

TITLE
REPLACEMENT PARTS DWG & LIST

DATE
10-29-15B

SUPERSEDES
03-17-14A

SECTION
H400

620245



VENCO HOISTS LIMITED WARRANTY POLICY

Venco products are built to last...we guarantee them.

As a purchaser of any new Venco product covered by warranty, you will receive 3 years of the most complete coverage available...and, at no added cost to you.

3-Year Limited Warranty Policy

This limited policy warrants new products of Venco to be free from defects in material and workmanship for a period of three (3) years from date of original installation. OEM products or accessories purchased by Venco as part of or offered with our product will carry the OEM manufacturer's respective warranty. Our warranty covers:

- ***Repair or replacement of product***
- ***Labor to repair or replace product***
- ***Freight to return and/or replace product***

We shall not be liable for any contingent liabilities arising out of the improper function of any products. Warranty shall become void if the product is improperly installed, modified, damaged, abused or used for application other than intended use. Venco hoists are designed for and intended to be used on stationary trucks dumping on firm and level ground. Spreading applications and/or shock unloading are strictly prohibited and will void this warranty. There is no warranty of merchantability, fitness for a particular purpose, warranty arising from course of dealing or usage of trade, or any other implied or expressed warranty, except as made specifically herein. This warranty supersedes all previous warranties, written or implied.

Warranty Claims

Venco Venturo Industries LLC will make a good faith effort for prompt correction or other adjustment with respect to any product, which proves to be defective after our inspection and within the warranty period. Before any repairs are attempted or before returning any product, your Venco Distributor is required to obtain a warranty claim number. This number is necessary for any claim to be considered. To obtain a warranty claim number, Venco requires the model and serial number. Only authorized Venco Distributors can perform warranty. For the name and address of your local Venco Distributor call the **Warranty Claim Department - 513-772-8448**.

WARNING - It is the responsibility of the installer to ensure the installation is completed according to the manufacturer's recommendations, ensure the ultimate user understands how to operate product in a safe manner, and understands the need for regular service and maintenance by an authorized Venco Distributor. No modifications or alterations may be made to any Venco product without the expressed written consent of Venco Venturo Industries LLC. Installation of any Venco product must be done by an authorized Venco Distributor, to the standards of the industry; including maintenance, service and affixing of all instruction, safety and warning decals. Users should be instructed as to the safe operation at time of delivery. Maintenance, service, operation and safety warning decals are available on request from Venco Venturo Industries LLC.

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