RS-3
OWNER/OPERATOR MANUAL

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http://www.whitehydraulics.com/pdf/service/RE_service.pdf

Parker Model V20 Sectional Body Directional Control Valve – Go to following website:
http://www.parker.com/hydraulicvalve/serv/Bul%20HY14-2705-M3cvr.pdf

Chelsea P.T.O. – Go to following website:
http://www.parker.com/chelsea/cat/english/HY25-1380-M1_US.pdf

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.

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. The backup alarm should sound when backing up from either cab. 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. Keep tires at the maximum psi allowed by the tire manufacturer.

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, the bucket is securely racked, and the boom is in the correct horizontal position for travel. See Diagram 1 on the following page, which shows the correct position of the Main Boom for travel.

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.

Travel to Jobsite

Once the daily inspections have been completed, the operator will travel to the job site by driving the unit from the standard truck cab, referred to as the Lower Cab.

Do not use the Upper Cab for over-the-road travel purposes. The intended use for the Upper Cab is that of route travel only, and it is restricted to 16 mph.

During travel to the job site, be aware of and avoid colliding with low obstructions or structures over the roadway that may interfere with the Upper Cab and boom. The Rear Steer™ Loader is under legal height of 13'6" when the boom is properly stowed, as shown in *Diagram 1*, below.

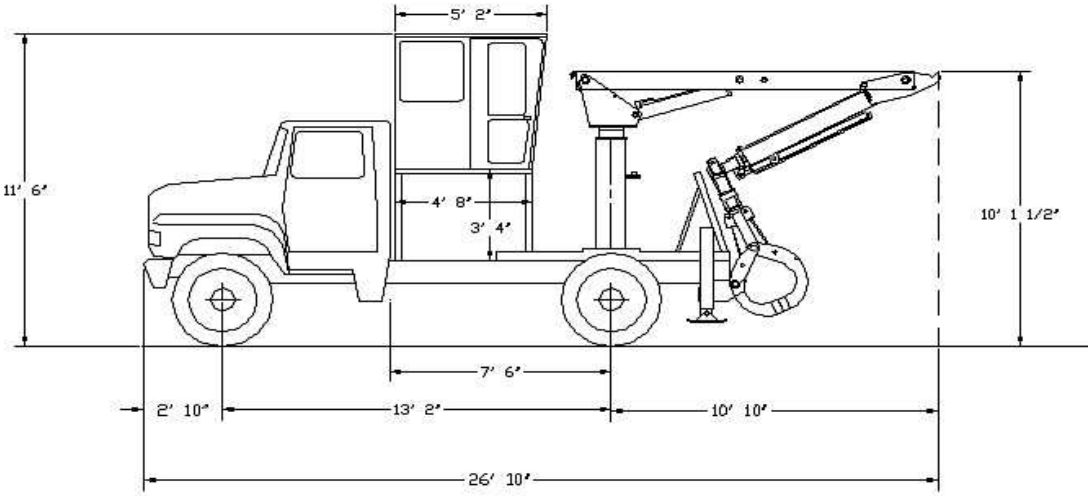


Diagram 1

When in the over the road travel mode, make sure that the boom is stowed in this proper position with the knuckle below the roofline of the upper cab. **Serious injury or death may occur if an improperly stowed boom contacts bridges, headache bars, or other overhead objects.**

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.

FLOW RESTRICTORS

Swing Actuator Restrictors: - The swing actuator flow restrictors control the swing speed of the loader boom. These restrictors are located on the swing drive motor, one on each port. These restrictors are factory preset and must not be removed or drilled out.

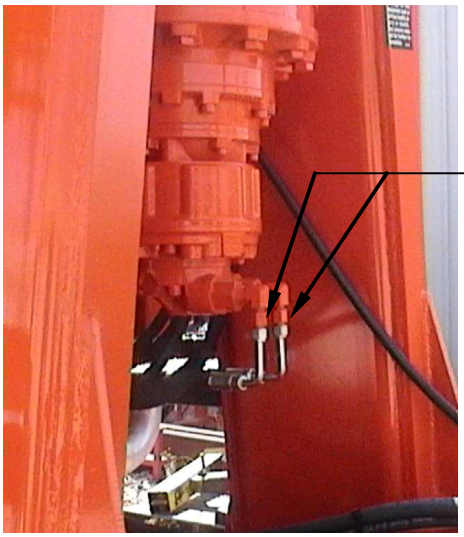
Rotary Actuator, Restrictor Size = .110

Some signs of restrictor removal or modification are:

1. Excessive boom swing speed. Full travel time should be 12 seconds, ±3 seconds, from pedestal stop block to stop block.

2. Broken or bent head (swing) stop. Catastrophic actuator damage will result if the head stop and/or stop blocks are damaged or missing.

3. Excessive swing speed causes excessive wear on the main boom/tip boom connecting bolt.



Swing Actuator Restrictors:

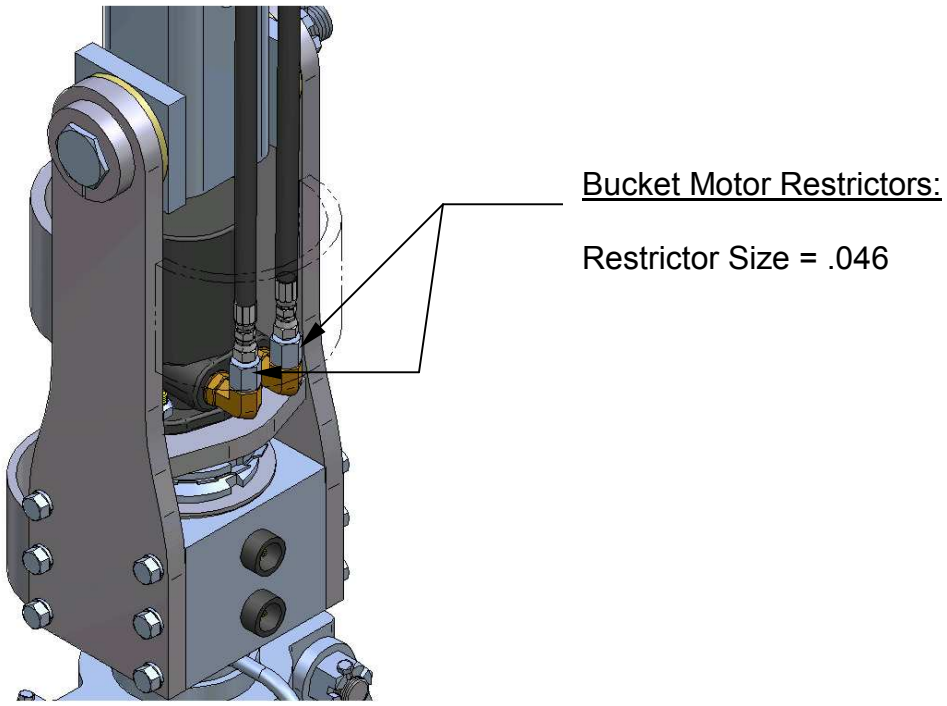
Actuator Restrictor Size = .110

Bucket Motor Restrictors: The bucket motor restrictors control the speed of the bucket rotation. These restrictors are located on the motor ports. These restrictors are factory preset and must not be removed or drilled out.

Restrictor Size: .046

Some signs of restrictor removal or modification are:

1. Excessive bucket rotation speed. Bucket rotation must not exceed 15 RPM.
2. Broken bucket rotator motor mounting bolts.
3. Broken bucket motor shaft and/or housing.



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 at the appropriate loader valve bank. Hydraulic pressure from the power source should go to the **"in"** at the loader valve bank, and return to the power source should come from the **"out"** at the loader valve bank. Using the auxiliary power source to run the hydraulics, replace all loader components to the travel position, and then return the loader to the shop for repair.

Outrigger Cylinders:

Pilot Operated Check Valve: - The vertical 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.

LOCK COLLAR

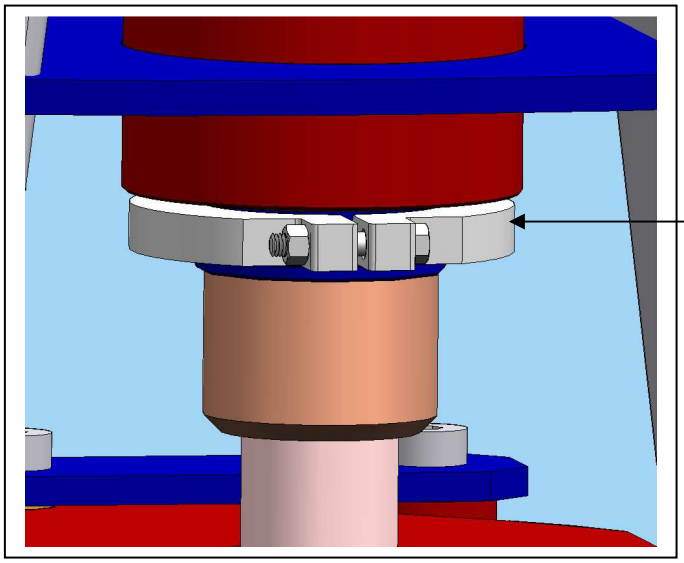
The lock collar is an integral part of the trash loader that holds the head and spindle assembly in the pedestal. The lock collar must be in place and the lock collar bolts properly torqued prior to use of the trash loader. The lock collar must be tight against the bottom of the spindle bearing housing with a maximum gap of one-quarter inch (1/4").

Under normal operating conditions, there is very little load applied to the lock collar. However, the following improper operating practice could put excess stress on the lock collar and therefore must be avoided.

- Excessively packing the load with the boom.

Improper lock collar installation and/or the improper operating practice listed above, could result in the head assembly being pulled up out of the pedestal assembly. The separation of these two loader components will result in equipment damage, and could result in serious personal injury or death.

Maintenance and shop personnel must continuously check for the above listed signs of abuse, and must report their observations to the person responsible for the operation practices of the trash loader operators. Corrective measures must be taken to stop abusive loading practices.



Lock Collar

(See Item No. 9 on the Head and Pedestal Assembly diagram in the “Dia. & Drawings” section of this manual.

BACK-UP ALARM

The back-up alarm must sound any time the gear shift selector is set to “R” in the Lower Cab. The back-up alarm on the front bumper must sound any time the gear shift selector is set to “D” in the Upper Cab. The back-up alarm is on the daily checklist of items to be checked prior to leaving the storage facility. If the either of the back-up alarms are not working, they must be repaired prior to putting the vehicle in service.

⚠WARNING

ALARM MUST SOUND WHEN BACKING UP. DO NOT BACK UP WITHOUT HAVING SOMEONE CLEAR BEHIND THIS VEHICLE.

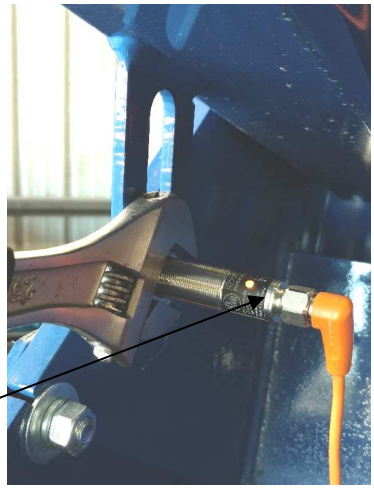
It is the operator’s responsibility to make sure that the area behind the loader is clear before backing up.

“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.

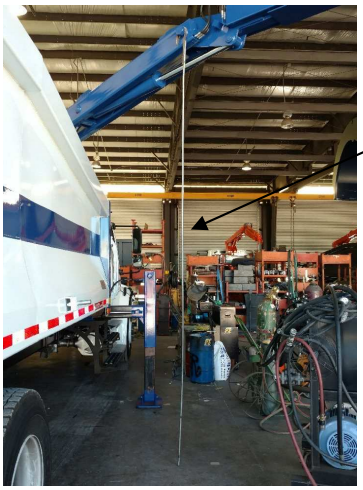
To adjust the boom sensor:

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.

"OUTRIGGER DOWN ALARM" (OPTIONAL)

This is a warning system that alerts the loader operator when the outriggers are not in the fully up stowed position. Two sensors are installed on the vertical outrigger legs to detect when the legs are not fully up. An audible alarm and light in the truck cab will alert the operator that the outriggers are not fully up. When the operator enters the truck cab after switching back to the lower cab, the warning light and audible alarm will alert him if the outriggers are not fully retracted up.

The truck chassis may be equipped with a factory red indicator and a gauge cluster mounted buzzer, if this is the case the outrigger alarm may use the factory red indicator and cluster buzzer instead of an aftermarket style light/buzzer.

As an added option the outrigger alarm may also be tied into transmission wiring lock the truck in neutral anytime the outriggers are not fully retracted up. This condition would be known as an auto neutral condition. If the outriggers are down and the transmission is attempted to be shifted the shifter display will flash RN or DN depending on the direction pressed. The flashing shifter indicates an auto neutral condition.

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.

REAR STEER™ TRASH LOADER - REQUIRED SAFETY DECALS

INSTALLED INSIDE UPPER CAB

⚠ WARNING

Do not drive loader with boom to side!
Keep extension boom retracted while driving!
Avoid sharp turns above 5 MPH!
Failure to follow these instructions could cause sudden and unpredictable boom movement, which could result in serious injury or death!

PETERSEN LOAD CHART FOR MODELS TL3, HL3, PL3 & BL3 -OUTRIGGERS EXTENDED-

RADIUS	TIP BOOM EXTENSION RETRACTED	TIP BOOM EXTENSION EXTENDED
10 ft	7100 lbs	7100 lbs
16 ft	3750 lbs	4400 lbs
20 ft		3200 lbs

WEIGHT OF ATTACHMENT TO BE SUBTRACTED FROM LIFT CAPACITIES. STANDARD TRASH BUCKET WEIGHS 1000 LBS.

RADII ARE MEASURED IN FEET FROM THE CENTER OF ROTATION TO THE CENTER OF THE BUCKET

LOADS FOR THE LOADER ON OUTRIGGERS REPRESENT 85% OF VEHICLE TIPPING MOMENT WHEN THE VEHICLE IS ON FIRM LEVEL GROUND.

BOOM EACH WITH TIP EXTENSION RETRACTED IS 16'6.5". BOOM LENGTH WITH TIP EXTENSION EXTENDED IS 20'0.5".

TIP BOOM EXTENSION FUNCTION IS NOT TO BE USED FOR LOAD LIFTING. THIS FUNCTION IS ONLY FOR LOAD REALIGNING OR TO IMPROVE LOAD LIFTING CAPACITY.

DO NOT USE THESE LOAD CHART VALUES TO PREDICT LOAD CAPACITIES AT OTHER RADII.

TIRE PRESSURES MUST BE IN ACCORDANCE TO THE TIRE MANUFACTURER'S RECOMMENDATIONS.

* See operational decal for joystick controls and outrigger controls on following page

⚠ WARNING

Heat treated materials
Do not weld

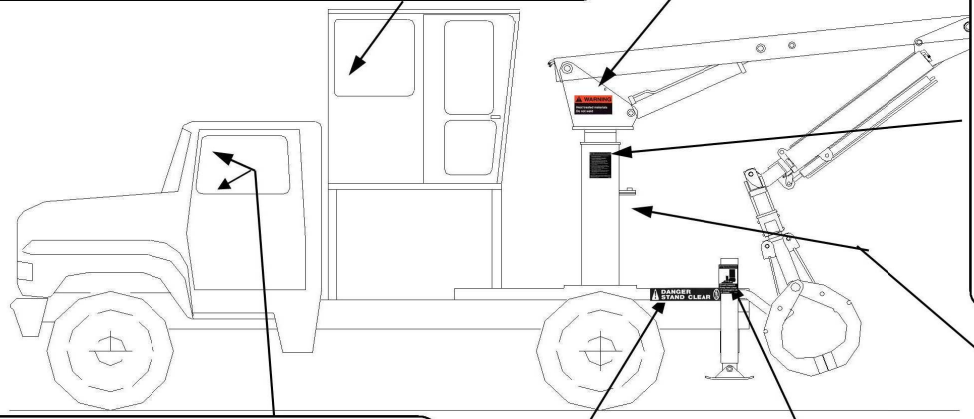
(A)

(A)

⚠ WARNING

1. Be sure you have read Owner's Manual prior to operating this equipment.
2. Do not operate the loader, dump body, or outriggers WHEN ANOTHER PERSON IS WITHIN 20' OF THE TRUCK.
3. A minimum distance of 10' FEET MUST BE MAINTAINED BETWEEN ANY PART OF THE LOADER AND ANY ELECTRICAL LINE.
4. Do not operate loader UNLESS OUTRIGGERS ARE EXTENDED.
5. Operate this unit ONLY ON LEVEL GROUND.
6. NEVER ALLOW ANYONE UNDER AN UPRAISED BODY OR AN EXTENDED LOADER.
7. Do not lift loads in excess of load capacities shown in Owner's Manual.
8. KEEP CONTROL VALVES IN NEUTRAL POSITION AND POWER-TAKEOFF DISENGAGED when unit is in transit.
9. Do not operate loader or body while vehicle is moving.

FAILURE TO COMPLY WITH ABOVE WARNINGS COULD RESULT IN DEATH, SERIOUS BODILY INJURY, AND OR EQUIPMENT DAMAGE. 02001



ON CAB SUN VISOR

⚠ WARNING

Before moving truck, boom must be stowed to lowest possible height; max. boom height not to exceed 13'6"

⚠ WARNING

Alarm must sound when backing up. Do not back up without having someone clear behind this vehicle.

ON DASH OF LOWER CAB

⚠ WARNING

Check boom height when lit

01010

⚠ DANGER STAND CLEAR (A)

⚠ WARNING

Crush hazard. Keep feet clear of outriggers at all times.

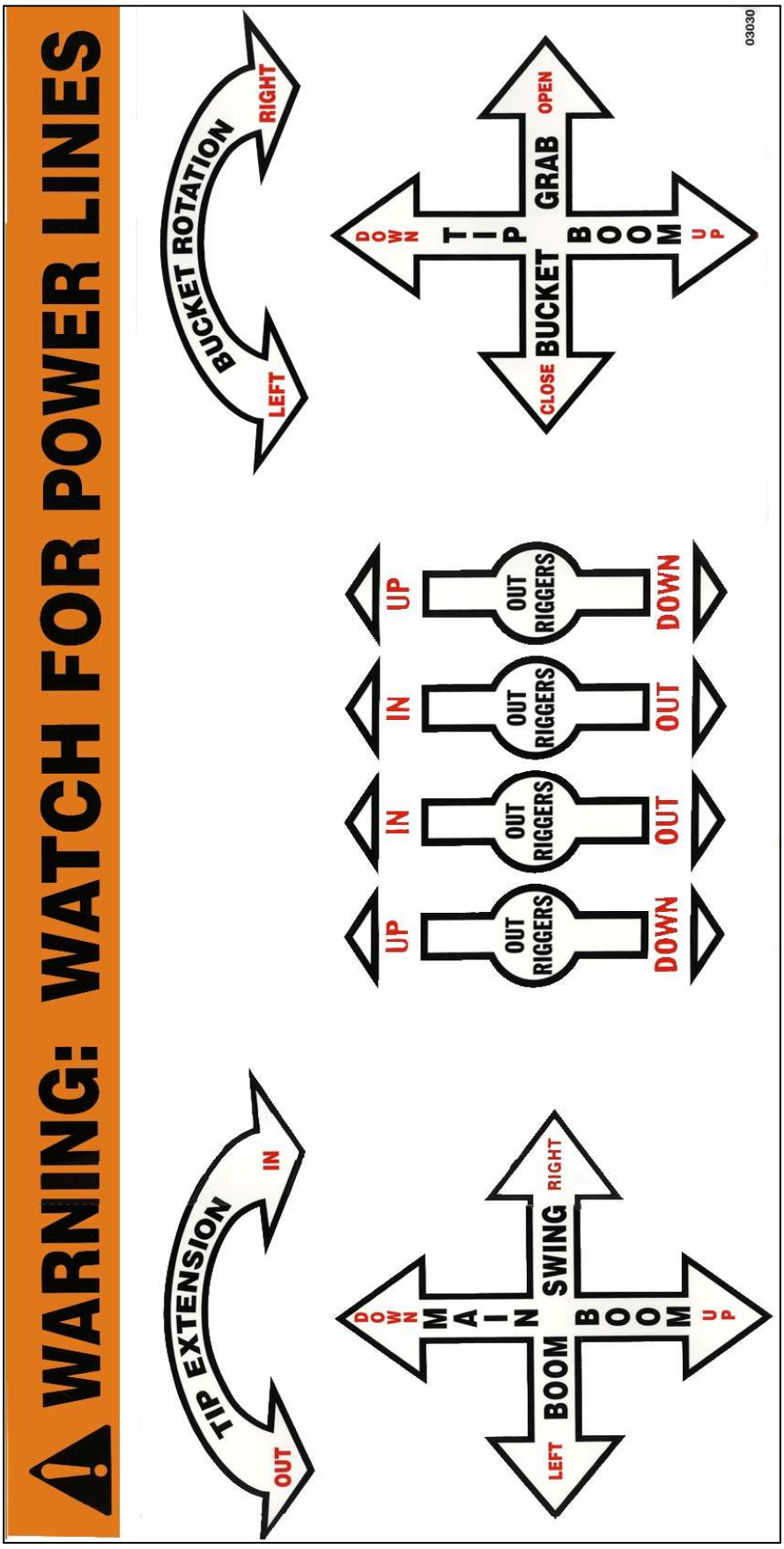
(A)

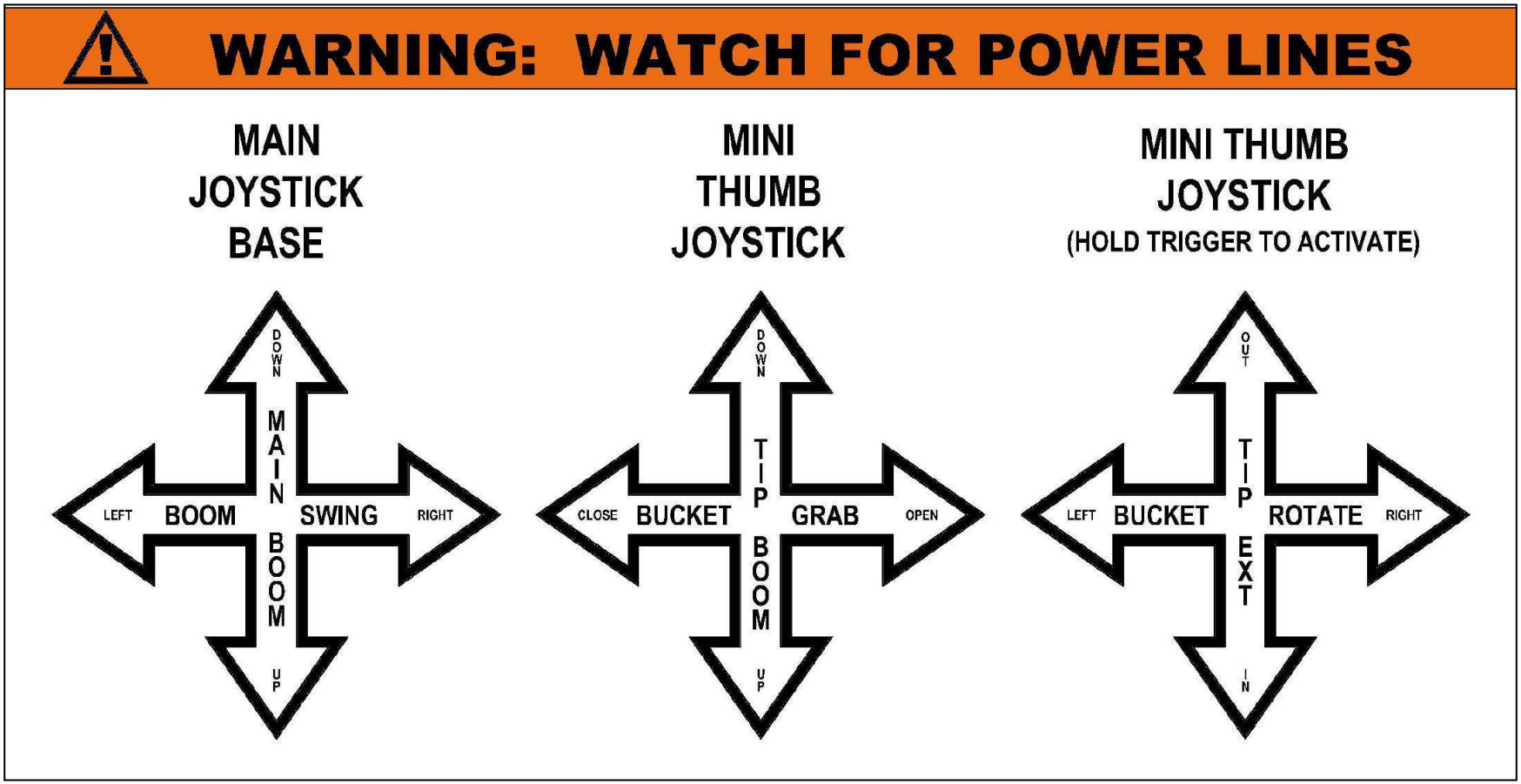
⚠ WARNING

You must not remove or tamper with the manufacturer's settings of oil flow restrictors. To do so could result in damage to the equipment and/or serious bodily injury or death. See Owner's Manual for further information. 02005

ONE ON EACH SIDE OF PEDESTAL A-FRAME FACING REAR OF TRUCK

(A) ONE DECAL ON EACH SIDE OF LOADER IN LOCATION SHOWN


WARNING: WATCH FOR POWER LINES
TIP EXTENSION
IN
OUT
BUCKET ROTATION
RIGHT
LEFT
MAIN BOOM
SWING
DOWN
UP
LEFT
RIGHT
TIP BUCKET BOOM GRAB
DOWN
UP
CLOSE
OPEN
OUT RIGGERS
UP
DOWN
IN
OUT
03030

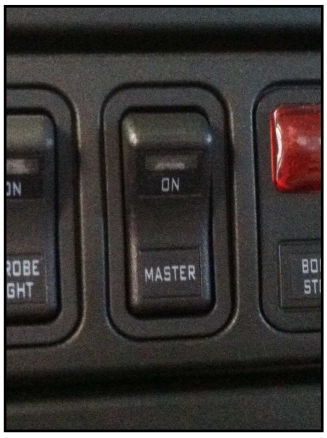

WARNING: WATCH FOR POWER LINES
MAIN JOYSTICK BASE
DOWN
MAIN BOOM
UP
LEFT BOOM
SWING RIGHT
MINI THUMB JOYSTICK
DOWN
TIP BOOM
UP
CLOSE BUCKET
GRAB OPEN
MINI THUMB JOYSTICK
(HOLD TRIGGER TO ACTIVATE)
OUT
TIP EXT
IN
LEFT BUCKET
ROTATE RIGHT

Part 4: Controls

We begin with the description that distinguishes the two cabs from one another. We refer to the standard truck chassis cab as the Lower Cab. We refer to the custom built loader operation cab as the Upper Cab.

Lower Cab Controls

In addition to the normal driving controls in the Lower Cab, there are transfer switches to transfer control of engine, transmission, and air conditioning to the Upper Cab. The operator will set the Engine Control Switch and the Air Conditioning Control Switch when entering and leaving the cab.



Master Control Switch Or Upper/Lower Switch:

This switch has two positions, on and off. When the switch is on the controls are switched to the upper cab and when the switch is off the controls are in the lower cab. This switch tells the truck's system from which cab to recognize the engine and transmission signals. The switch will be set to the Lower Cab position for over the road travel from the standard cab. The switch will be set to the Upper Cab for stop and go route loading.

AIR CONDITIONER:

The operation of the air conditioner in the lower cab requires no special conditions; it operates as specified in the truck manufacturer's manual. The upper cab air conditioning settings have no affect on the operation of the air conditioning in the lower cab.

The operation of the air conditioner in the upper cab requires the lower cab air conditioning unit to be set on MAX and its fan switch to be set on low. See Figure 1 below.

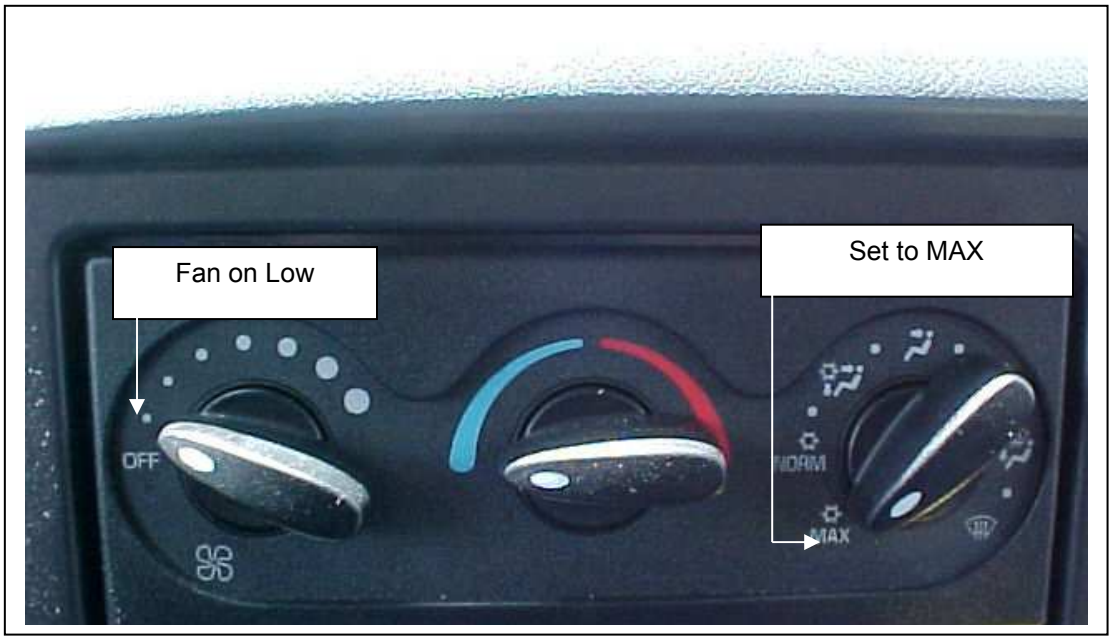


Figure 1 – Lower Cab Air Conditioner/Heater Control Panel

HEATER:

The operation of the heater in the lower cab requires the upper cab heater temperature control to be set on MAX. This will allow the heater in the lower cab to operate normally. See Figure 2 below.

Figure 2 – Upper Cab Air Conditioner/Heater Control Panel

The operation of the heater in the upper cab requires no special operating instructions. It operates as described in the heater's manual.

Strobe Light: The strobe light switch has on/off positions, and the strobe light should always be turned on when the operator is leaving the Lower Cab to enter the Upper Cab for loading purposes.

Emergency Flashers: The emergency flashers are normally located on the steering column, and should be used when operating the vehicle from the Upper Cab, and any other times the operator may deem necessary.

Parking Brake: The parking brake functions the same in the upper cab as it does in the lower cab. Pull the knob or switch out to set the brake, and push the knob or switch in to release the brake. For the parking brake to function from the Upper Cab, it is mandatory to apply the parking brake in the Lower Cab, before exiting, and vice versa. The parking brake must be set any time the operator leaves either cab.

Power Steering Diverter Valve: After exiting the Lower Cab, but prior to climbing the steps to the Upper Cab, the operator needs to set the Power Steering Diverter Valve. This valve diverts the fluid pressure from the OEM pump to the Upper Cab power steering motor. The valve is located to the left of the access steps to the Upper Cab, and should be set prior to ascending the steps, or after descending the steps. The control knob is a push/pull type knob. You pull the knob out to set the diverter valve to the Upper Cab position, and you push the knob in to set the diverter valve to the Lower Cab position.

Upper Cab Controls

Suspension Lock Valve: This valve is a spring set, pneumatic released mechanism to lock out the truck rear suspension in order to improve stability when operating on tires. It is important that the truck tires be maintained at the maximum air pressure allowed by the tire manufacturer. The suspension lock valve switch has on and off positions. The switch must be set to the “on” position prior to performing loader operations and to the “off” position when the operator exits the Upper Cab to return to the travel position in the Lower Cab.

Parking Brake Knob: The parking brake knob or switch has apply and release positions. Pull the knob or switch up to apply the parking brake and push the knob or switch down to release the parking brake. The parking brake is released when traveling from one stop to the next, and should be applied anytime the operator is loading

PTO Switch: The purpose of this device is to turn the PTO on/off. The truck transmission is programmed so that the PTO will disengage when the engine RPM exceeds 1750 or travel speed exceeds 10 mph. The switch is in the "on" position for loader and outrigger operations. The switch is in the "off" position anytime the operator exits the Upper Cab. There is also a PTO indicator light which is lit when the PTO is on.

Engine Stop Button: This button is a push down button that is used for emergency situations. Use of this button causes an immediate shutdown of the truck engine, and therefore power to loader functions also.

Start/Stop Button: (Optional) This button is a push button that is used to remotely start or stop the engine. The parking brake must be set for this button to function. Note that if the engine is killed with the engine stop button the remote start/stop button will need to be pushed twice to activate the remote start.

Transmission Selector Pad: The transmission selector pad has four positions: “D”, “N”, “R”, and “M”. Drive and Reverse are not assigned in relation to the direction that the operator faces, but in relation to the ordinary driving directions

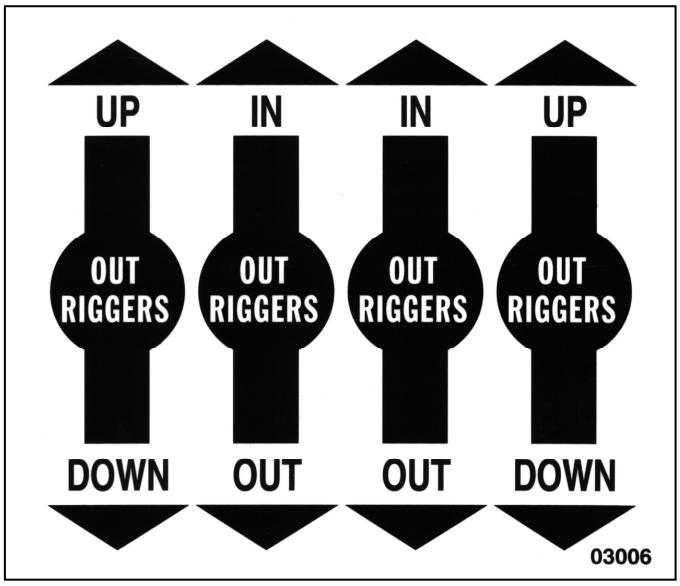
of the lower cab. The “D” key tells the truck to drive in the opposite direction of the loader. The “R” key tells the truck to drive in the direction of the loader. The “N” key puts the transmission into neutral gear and the “M” key is a mode key that should not be used or pressed by the operator. If the selector pad flashes DN or RD this means the transmission is in an auto neutral condition that may be caused from the parking brake.

Accelerator Pedal: The accelerator pedal is the pedal to the right of the steering column on the floor board. The pedal is used for acceleration in the drive and reverse modes. The pedal is preset to 1400 rpm when the transmission is in neutral. Depending on the engine type, when the truck is neutral it may only be necessary to slightly push on the pedal to activate the 1400 preset. Once the preset is activated the pedal can be fully pushed and the engine will hold at 1400 rpm. Some engine types require momentary push button that is at the tip of the pedal or internal to the pedal, once this switch is activated the engine will go into the preset 1400 RPM. To return the engine to idle release the pedal. When the truck is in drive in the upper cab this pedal will electronically disengage over 5 mph. It may be necessary to release the pedal and depress the pedal again if the travel speed goes over 5 mph to reengage the pedal in drive.

Brake Pedal: The brake pedal is the pedal to the left on the floor board. The pedal is used to operate the vehicle service brakes.

Rear Cab Gauge Display: This is a operator interface that provides a secondary gauge display in the rear operators cab. This interface displays road speed, engine rpm, oil pressure, water temp, transmission temp, charging voltage, fuel level, DEF level, air pressure (if available over J1939) and warning/indicator lights. The top right button will show all of the indicator lights and activate the audible alarm. This screen is also offered with a rear view camera which automatically displays the image over the gauges when the transmission is in drive from the upper cab. The camera can also be activated at anytime by pushing the top left button.

Outrigger Operational Control Handles:



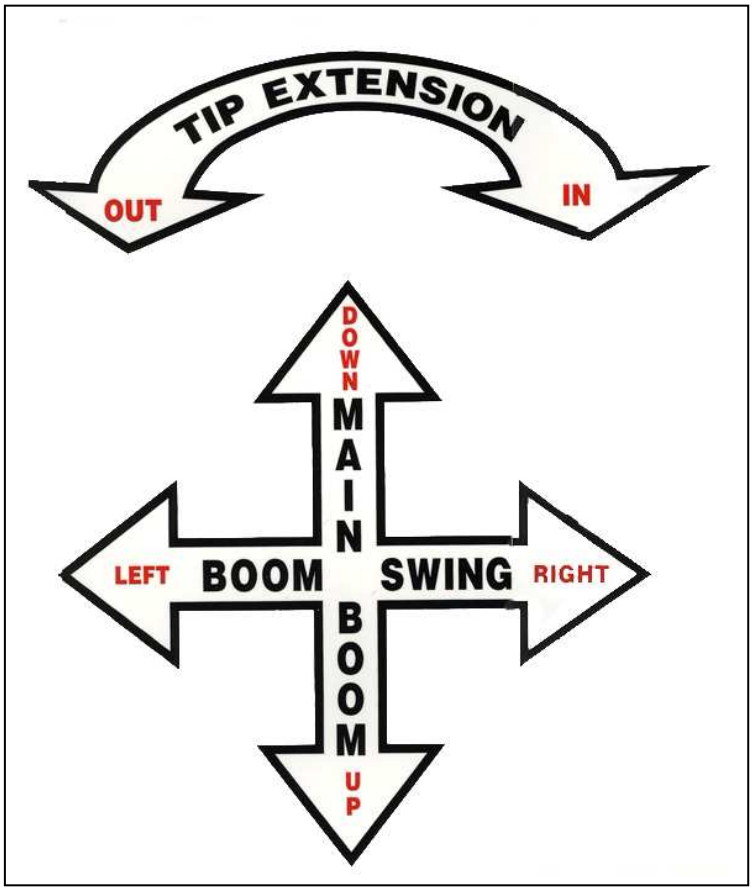
There are four handles. The two inside handles are for the outrigger in and out. The inside left is for the left outrigger, and the inside right is for the right outrigger. Pull the handle back to extend the outrigger horizontally and push the handle forward to retract the outrigger. The two outside handles are for the outrigger up and down functions. The outside left handle is for the left outrigger, and the outside right is for the right outrigger. Pull the handle back to extend the outrigger foot down and push the handle forward to retract the outrigger foot.

During normal trash loading operations, outriggers should not be required. Heavier loads at extended radii may require the use of outriggers. It is imperative for the operator to read, understand, and actively use the Load Capacity Chart. There is a Load Capacity Chart in the “Dia. & Drawings” section of this manual, and also one permanently installed inside the Upper Cab.

CAUTION: If you are in doubt of the weight of the load, use the outriggers. To achieve the full rated lifting capacity, the outriggers must be fully extended.

Mechanical Joystick Controls:

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.



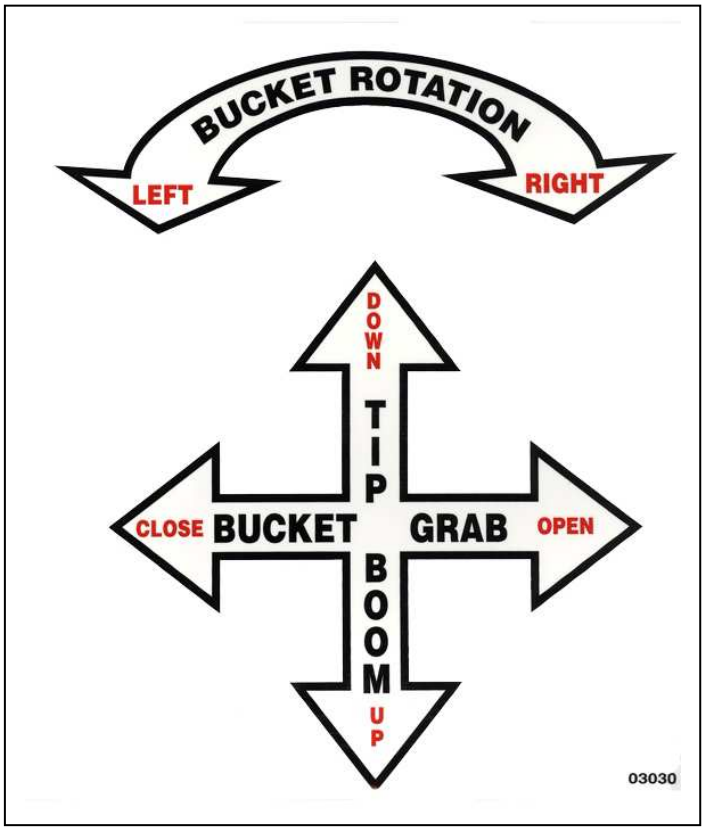
Left Joystick Control

Left Joystick Control:

Boom Swing – Move the handle left to make the boom swing to the left. Move the handle right to make the boom swing to the right.

Boom Elevation – Pull the handle back to make the main boom to up. Push the handle forward to make the main boom go down.

Tip Extension – Twist the handle counter-clockwise to extend the tip extension. Twist the handle clockwise to retract the tip extension.



Right Joystick Control

Right Joystick Control:

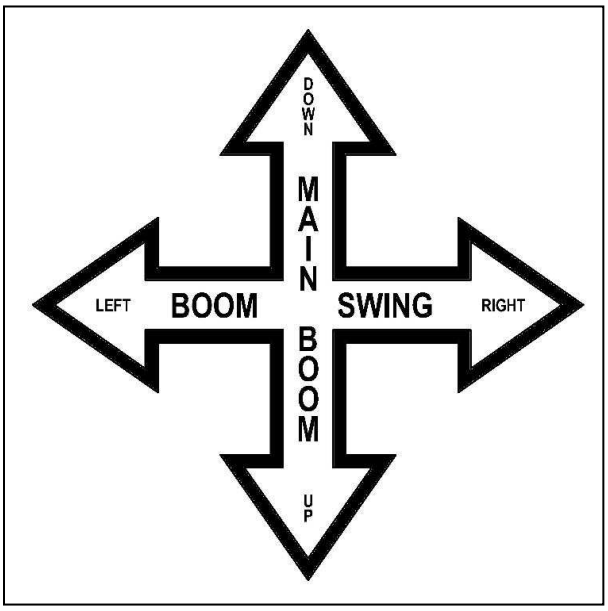
Bucket Grab – Move the handle to the right to open the bucket. Move the handle to the left to close the bucket.

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

Bucket Rotation – Twist the handle clockwise to rotate the bucket to the right. Twist the handle counter-clockwise to rotate the bucket to the left.

Electronic Single Joystick Control

The electronic control modules have acceleration and deceleration factors built into the controls to prevent sudden movements that would cause stress to structural components of the boom. All six axes of control are done with the single joystick. The outrigger controls are to the left of the operators seat.

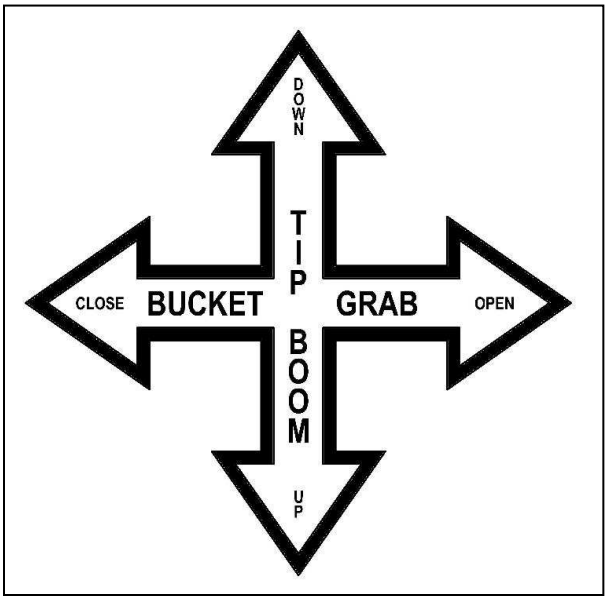


Joystick Base Control:

Boom Swing – Move the handle left to make the boom swing to the left. Move the handle right to make the boom swing to the right.

Boom Elevation – Pull the handle back to make the main boom to up. Push the handle forward to make the main boom go down.

Mini Joystick Primary Functions:

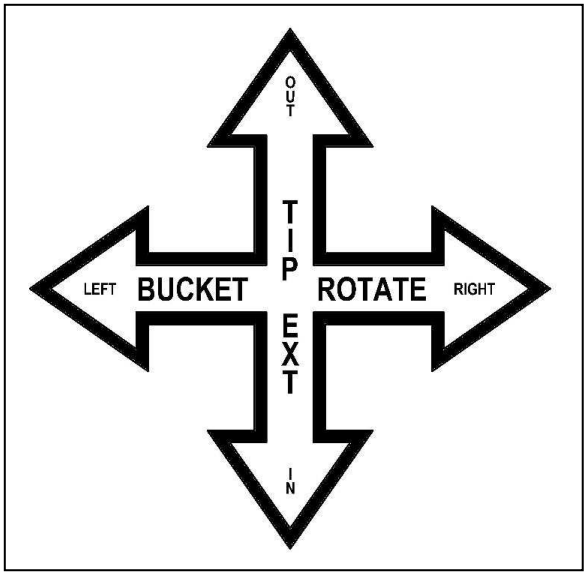


Bucket Grab – Move the mini joystick to the right to open the bucket. Move the mini joystick to the left to close the bucket.

Tip Boom Elevation – Move the mini joystick back to raise the tip boom. Move the mini joystick forward to lower the tip boom.

Mini Joystick Secondary Functions:

To activate these functions push and hold the trigger while activating the mini joystick. Releasing the trigger will allow the mini joystick to return back to primary functions.



Tip Extension – While holding the trigger move the mini joystick up to extend the tip extension or down to retract the tip extension.

Bucket Rotation – While holding the trigger move the mini joystick to the left to rotate the bucket to the left or to the right to rotate the bucket to the right.

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.

At the job site, position the loader so that the Upper Cab is facing the direction of your pickup route. The easiest way to do this is to approach the trash route from the opposite direction, which will place the Upper Cab in the correct direction for loading. This method allows you to drive to the first pickup site, change cabs, and already be in correct position. Because it's not always possible to approach the loading route in this manner, you must plan to stop at a safe location to change from the Lower Cab to the Upper Cab. The loader is positioned so that it is directly parallel to the beginning of the first pile of trash being loaded. Leave room for the trash truck to pull in front of the loader facing the same direction as the Upper Cab and loader.

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. The swing arc is controlled by positive stops. Damaged or missing head and pedestal stops poses an unsafe condition by allowing the boom to swing too far resulting in damage to the cab, possible loader damage, and potential injury to the operator in the cab. The swing arc diagram, which is depicted on the Load Capacity Chart in the Upper Cab, and also in this Owner’s Manual, illustrates not only the boom swing radius, but also lifting capacities in relation to the center of boom rotation. For loads closer to the pedestal, the safe working load for lifting is more, and for loads that are a farther reach from the pedestal, the safe working load for lifting is less.

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 an extended loader.

- When entering or exiting the Upper Cab, 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

1. Before leaving the Lower Cab, place the transmission in neutral (“N”) and set the parking brake. Engage the truck flashers and strobe lights. Set the master switch and air conditioning control switches to the Upper Cab position.

2. Shift the Power Steering Diverter Valve switch to the Upper Cab position, by pulling out the knob.

3. Seat yourself in the Upper Cab. Adjust the seat and rearview mirrors. Fasten your seatbelt.

4. Engage the power-take-off (PTO) switch.

   Note: For cold weather operation, allow the loader hydraulic system to reach operating temperature before commencing work.

5. Set the Suspension Lock Valve to the "On" position. Swing the boom from side to side to ensure that the suspension locks engage. When the suspension locks are engaged, the operator will still experience some machine movement due to tire compression. If the suspension locks do not engage, the loader will feel unstable and rock to the side when you swing the boom. If the suspension locks will not engage, you must return to the maintenance facility and have them repaired prior to performing any loading functions.

   Do not attempt to use the loader without first setting the suspension locks, and if necessary, the outriggers. Failure to set the suspension locks could result in the vehicle overturning when the boom is swung to the side causing vehicle damage, personal injury, or death.

6. Check that the air-conditioning is on and properly adjusted. The Upper Cab is also equipped with windshield wipers, two auxiliary DC plugs for accessories, and an air horn.

7. If in the operator's judgment, outriggers are required to make the lift, the outriggers must be set before making the lift.

   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. A “Load Capacity Chart” is also installed inside the Upper Cab for the operator’s use. Do not attempt to lift more than the capacities shown on the load chart for your model loader at the correct radius.

8. To make the lift:

    a) Raise boom from stowage rack and swing to trash pile. Use tip extension, if needed, and rotate bucket so that it is aligned with trash.

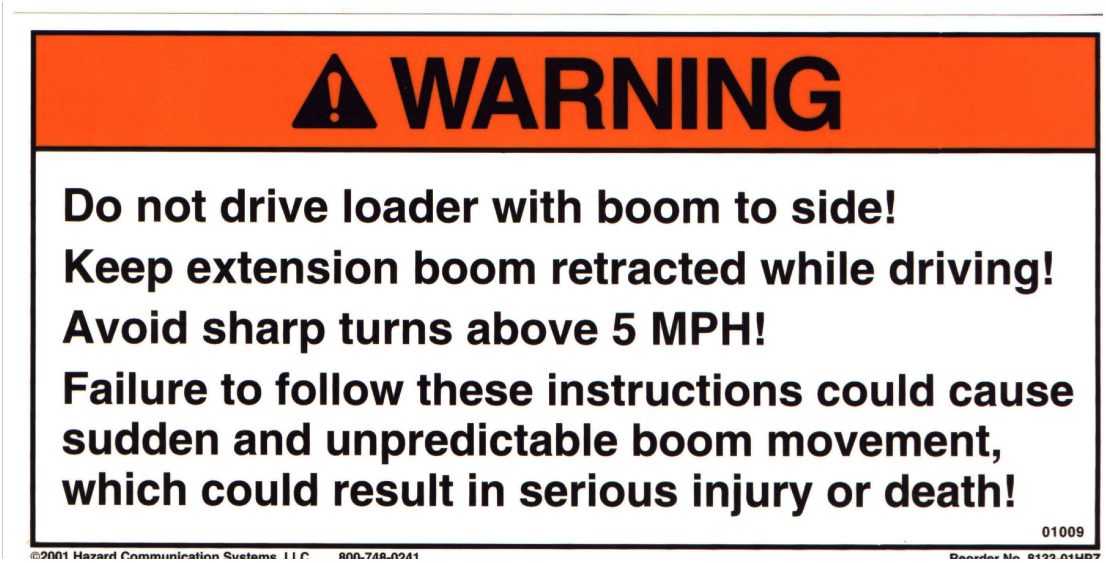
    b) Open the bucket, lower around trash, and close the bucket so that you have a firm grip on the trash. Raise the boom slightly and activate the bucket grab once again to make sure you have a firm grip on the trash.

    c) Lift and swing the load to the companion trash truck. 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.

Always load from the curbside of the lane you are traveling in. After completing the load, signal to the trash truck driver to pull forward to the next pile of trash. If outriggers were used to make the lift, make sure they are up and retracted prior to moving the vehicle. Apply the brake pedal with your right foot. Release the parking brake. Select "R", reverse, on the transmission range selector. You are now ready to drive the loader, from the Upper Cab, to the next trash pile.

Caution: When driving the truck from the Upper Cab in reverse, the steering axle is now behind the operator. It is extremely important for the operator to understand that the back of the unit (the truck front cab) will swing wide when making turns. Look for vehicles beside you or traveling towards you in all directions that may be affected by you actions, and proceed with caution.

The following warning decal is posted at the Upper Cab control station. You must observe these warnings when driving from the Upper Cab.



When approaching an intersection or stop signal, keep the end of the boom out of the intersection. Never enter into an intersection, road or other lanes with any part of the trash-loading unit without fully surveying your surroundings; then proceed with caution.

Exercise extreme care when passing through or turning at an intersection when driving from the Upper Cab with the boom extended. Depending on the lane width, traffic congestion, parked vehicles, visibility, and other factors, it may be necessary to knuckle the tip boom under the main boom, or to swing the boom while turning at an intersection in order to maintain a safe distance from other vehicles or obstacles. Excessive acceleration and rapid turns at speeds above 5 mph should be avoided when the boom is extended as they may result in unpredictable and uncontrolled boom movements.

NOTE: When operating loader functions and driving at the same time, the operator must remember that at engine speeds above 1750 RPM, the hot shift PTO disengages to protect the hydraulic pump and other system components. This means that it is not possible to operate loader functions while driving from the Upper Cab when engine speed is above 1750 RPM. Loader hydraulic functions will resume when engine RPM falls below 900 RPM, allowing the hot shift PTO to automatically re-engage.

At the next pile, set the parking brake, and switch the transmission back to "N", neutral, and begin the loading procedure again.

When loading, please follow these additional precautions:

- Do not leave a load suspended when the operator is away from the control station.
- Only operate the loader when seated at 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 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.
- Do not allow the bucket to swing beyond parallel to the tip boom. If the bucket flips up beyond parallel it can cause damage to loader components.

When Loading Is Complete:

1. Set the transmission range selector to the "N", neutral position, and apply the parking brake.
2. Stow the bucket in travel position, as shown in Diagram 1 in this manual. When the boom and bucket are properly racked, the boom should be resting completely against the support, and the main boom should be in horizontal position.
3. Move the PTO switch to the "Off" position.
4. Disengage the suspension locks by setting the suspension lock valve to "Off" position.
5. Turn off air-conditioning and all other accessories.
6. Exit the Upper Cab, making sure the door is latched properly. Descend the steps, making sure to use handholds and sure footing.
7. Push the diverter valve knob in to divert the power steering to the Lower Cab.
8. Upon entering the Lower Cab, set the Master switch to the Lower Cab position, and set the air-conditioning selector switch to the Lower Cab position.

The Lower Cab has a warning light and audible alarm that alerts the driver when the boom is not stowed at the proper height for travel. When the operator enters the truck cab after using the loader, the warning light and alarm will alert the driver if the boom height exceeds 13 feet. If the warning light and/or audible alarm is sounding, you must adjust your boom to the correct travel height, before moving the vehicle. The bucket must be properly racked and the boom in the correct horizontal position when driving from the Lower Cab.

You are now ready to resume standard driving procedures from the Lower Cab.

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 diagrams are included in the "Dia. & Drawings" section of 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. See lock-out/tag-out procedures on following page.
- Bucket and boom at rest on ground or floor of dump body. These components should be at rest at their lowest energy level.
- 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.

Lock-out/Tag-out Procedure (LOTO)

1. With the vehicle parked on level firm ground, set the parking brake and chock the wheels.

2. Place operating equipment at lowest potential energy level or position so as not to be subject to possible free fall, and/or install additional blocking device(s) to prevent this potential for any raised or elevated equipment such as bodies, tail or side gates, booms, bucket or other attachments.

3. If work on the bucket is required, un-rack the bucket by first setting the outriggers, second, positioning the bucket over the side of the truck and finally, lowering the boom until the bucket is on the ground.

4. If it is necessary to raise the body during LOTO, the body prop must be in place to secure the body from falling. (Note: The Model RS3 Loader is not equipped with a body.)

5. Disengage the PTO and shut down the truck engine.

6. Remove the key from the ignition.

7. Using a non-reusable fastener, secure a LOTO tag to the steering wheel indicating the vehicle is out of service.

8. Relieve stored energy from the hydraulic components by moving each control handle back and forth several times. Cylinders equipped with either pilot operated check or counterbalance valves will not function unless under hydraulic power.

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.

Part 2: Service:

EVERY 40 HOURS	
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.
Check power steering fluid in front steering assembly.	Fill if needed.
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. Planetary Gearbox Oil should be visible on site glass. Hydraulic Oil = AW32 Gear Oil = 80W Gearlube
Check engine and road speed overspeed control for proper setting.	Check by revving the engine to exceed 1750 RPM, at which point the PTO light should turn off if the engine overspeed is properly set. Reset if necessary. PTO light should turn off if road speed exceeds 10 mph.
Check lock collar for excess clearance.	Lock collar must be tight against bottom of spindle bearing housing with maximum gap of one-quarter inch (1/4").

Check back-up and boom-up alarms to make sure they are working properly.	Repair or replace if needed.

EVERY 80 HOURS *(These requirements are in addition to the 40 hour service requirements.)*	
Re-torque boom swing actuator bolts.	To 210 ft. lbs. - dry threads
Re-torque bucket rotator bolts.	To 110 ft. lbs. - dry threads

EVERY 160 HOURS *(These requirements are in addition to the 80 hour service requirements.)*	
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.
Check the front steering assembly (the steering hydraulic cylinders located behind the front axle.)	Check for leaking cylinders, cracks in weldments, and that bolts and nuts are secure. Repair and/or replace as needed.
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 made. The Petersen rotating head assembly has special high strength steel components that are welded together. After welding, the entire assembly receives post-weld heat treatment. **Do not** weld on the rotating head assembly. Welding on the rotating head could reduce its load bearing capacity and fatigue life.
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.
Re-torque loader tie-down bolts.	To 400 ft. lbs. - dry threads
Verify steering cylinder clamps are tight	If loose re-torque to 90 ft. lbs.
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.

EVERY 600 HOURS OR 6 MONTHS *(These requirements are in addition to the 160 hour service requirements.)*	
Clean hydraulic oil filter on suction line, replace return line filter cartridge, replace breather. Note that breather may be integral with the oil tank cap.	

EVERY 3000 HOURS *(These requirements are in addition to the 160 hour service requirements.)*	
Change oil in planetary gearbox	Drain existing oil from swing gearbox and replace with 1.75 quarts of 80W Gearlube

How to Find the Serial Number

The serial number for your unit can be found in two places. The number is stamped on the side of the base plate of the head assembly, and is also stamped on the base plate of the pedestal assembly. You will be asked to provide the serial number any time you order parts from our Parts Department.

The serial number listed below is a fictitious number for illustration purposes.

TL3-0199-344

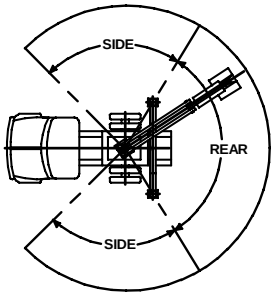
The serial number provides us with three types of information, as shown in the above example.

- **"TL3" indicates the model of your loader.**
- **"0199" indicates the date it was manufactured. This example indicates that the loader was manufactured in January, 1999.**
- **"0344" is a unit number that is specific to your loader only.**

  If your head and/or pedestal assembly is or has been changed to a current production model, this number will have an "R" added, which would become "0344R". When a major component such as the head or pedestal assembly receives a replacement, the date of manufacture also gets updated. For example, if the unit listed above were to get a new head assembly in May of 2004, the serial number stamped on the new head assembly would be TL3-0504-0344R.

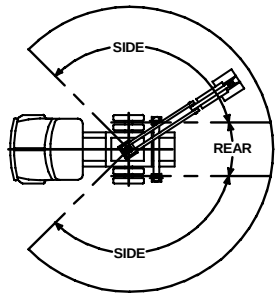
PETERSEN INDUSTRIES RS-3 LOAD CHART

LOADER ON OUTRIGGERS **				
RADIUS	SIDE		REAR	
	TIP EXTENSION RETRACTED	TIP EXTENSION EXTENDED	TIP EXTENSION RETRACTED	TIP EXTENSION EXTENDED
10 ft	6511 lb *	6834 lb *	7630 lb	8420 lb
13 ft	4820 lb *	5485 lb *	5611 lb	6477 lb
16 ft	3800 lb *	4242 lb *	4400 lb	5240 lb
20 ft	-	2737 lb *	-	3260 lb



LOADER ON OUTRIGGERS *

LOADER ON TIRES ***				
RADIUS	SIDE		REAR	
	TIP EXTENSION RETRACTED	TIP EXTENSION EXTENDED	TIP EXTENSION RETRACTED	TIP EXTENSION EXTENDED
10 ft	4220 lb *	4263 lb *	5505 lb *	5850 lb *
13 ft	2800 lb *	3000 lb *	4142 lb *	4838 lb *
16 ft	2100 lb *	2100 lb *	3307 lb *	3840 lb *
20 ft	-	1473 lb *	-	2530 lb *



LOADER ON TIRES **

WEIGHT OF ATTACHMENT TO BE SUBTRACTED FROM LIFT CAPACITIES. STANDARD TRASH BUCKET WEIGHS 1000 LBS.

RADII ARE MEASURED IN FEET FROM THE CENTER OF ROTATION TO THE CENTER OF THE BUCKET

LOADS MARKED WITH (*) ARE LIMITED BY THE STABILITY OF THE LOADER.

****LOADS FOR THE LOADER ON OUTRIGGERS REPRESENT 85% OF VEHICLE TIPPING MOMENT WHEN THE VEHICLE IS ON FIRM LEVEL GROUND.**

*****LOADS FOR THE LOADER ON TIRES (OUTRIGGERS FULLY RETRACTED) REPRESENT 75% OF VEHICLE TIPPING MOMENT WHEN THE VEHICLE IS ON FIRM LEVEL GROUND.**

BOOM LENGTH WITH TIP EXTENSION RETRACTED IS 16 FEET. BOOM LENGTH WITH TIP EXTENSION EXTENDED IS 20 FEET.

TIP BOOM EXTENSION FUNCTION IS NOT TO BE USED FOR LOAD LIFTING. THIS FUNCTION IS ONLY FOR LOAD REACHING OR TO IMPROVE LOAD-LIFTING CAPACITY.

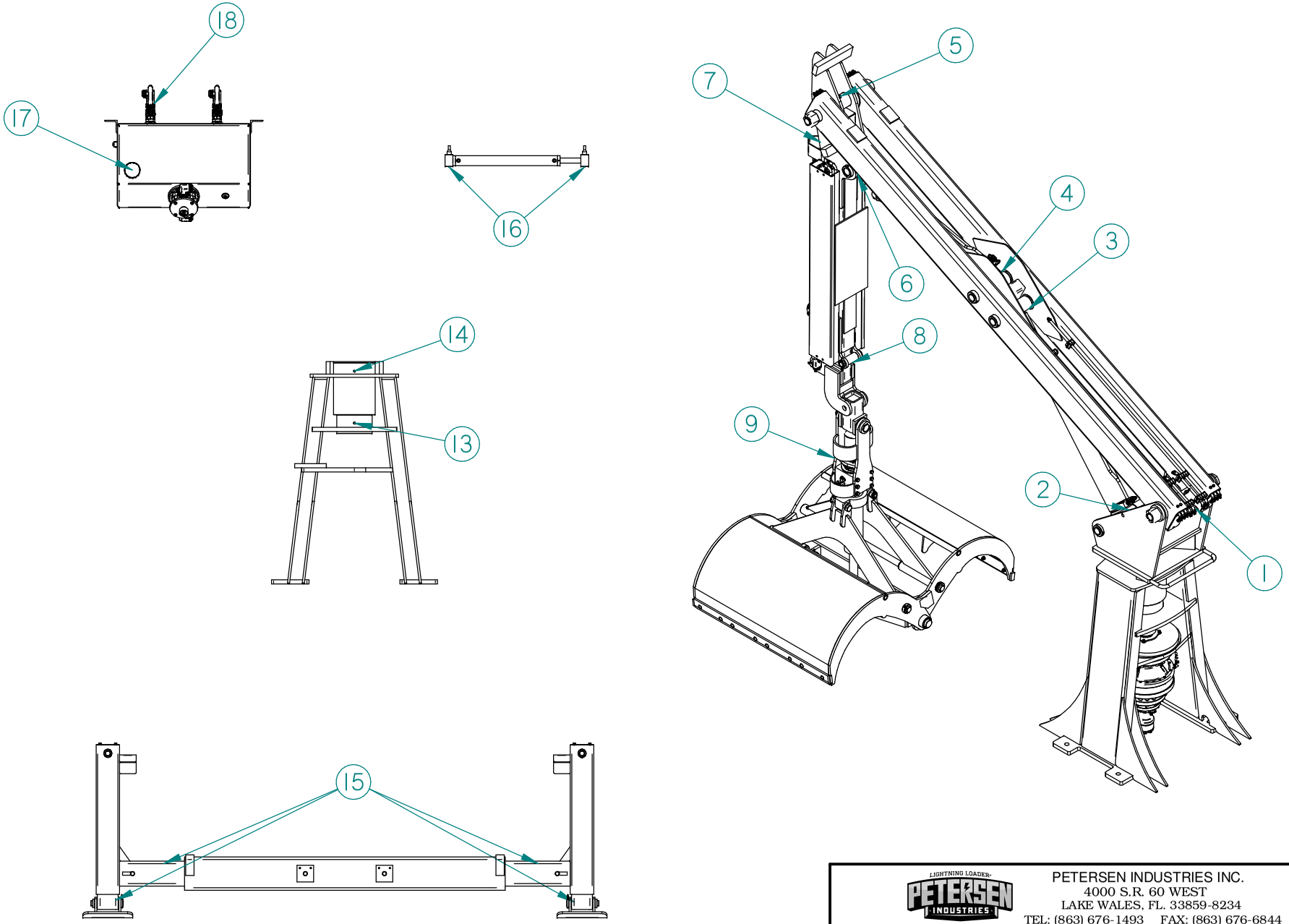
DO NOT USE THESE LOAD CHART VALUES TO PREDICT LOAD CAPACITIES AT OTHER RADII.

TIRE PRESSURES MUST BE IN ACCORDANCE TO THE TIRE MANUFACTURER'S RECOMMENDATIONS.

P/N: PDECAL06:001

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

TITLE: REAR STEER LOAD CHART			
CAD NO.: 01 00 00 002 5	PART NO.: PDECAL06:001		SCALE: N/A
DRAWN BY: E.J.B	APPROVED:	DATE: 8/31/99	SHEET: 1 OF 1



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

TITLE: RS3 MAINTENANCE POINTS

PART NUMBER:	SCALE:
01 00 00 008 2	NA

DRAWN BY:	APPROVED BY:	DATE:	SHEET:
BRB		8/24/2016	3 OF 4

RS3 LUBRICATION POINTS TABLE

Point Number	Grease Point	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 Main Pivot	1	Grease	Pressure	40 Hours
6	Tip Cylinder Rod End	1	Grease	Pressure	40 Hours
7	Tip Extension	1	Grease	Pressure	40 Hours
8	Tip Extension Roller	1	Grease	Pressure	40 Hours
9	Rotator Housing Manifold	2	Grease	Pressure	8 Hours
10	Bucket A Frame Spools	4	Grease	Pressure	8 Hours
11	Bucket Main Pivot	4	Grease	Pressure	8 Hours
12	Bucket A Frame Connect Pivot	2	Grease	Pressure	8 Hours
13	Spindle Bottom Bearing Housing	1	Grease	Pressure	40 Hours
14	Spindle Top Bearing Housing	1	Grease	Pressure	40 Hours
15	Outrigger Inner Tubes	4	Grease	Brush	160 Hours
16	Upper Cab Steering Cylinder	1	Grease	Pressure	40 Hours
17	Hydraulic Tank	1	Oil	Fill to Max Level	40 Hours
18	Hydraulic Filter	1	-	Replace	1000 Hours

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

TITLE: RS3 MAINTENANCE POINTS

PART NUMBER: 01 00 00 008 2

SCALE: NA

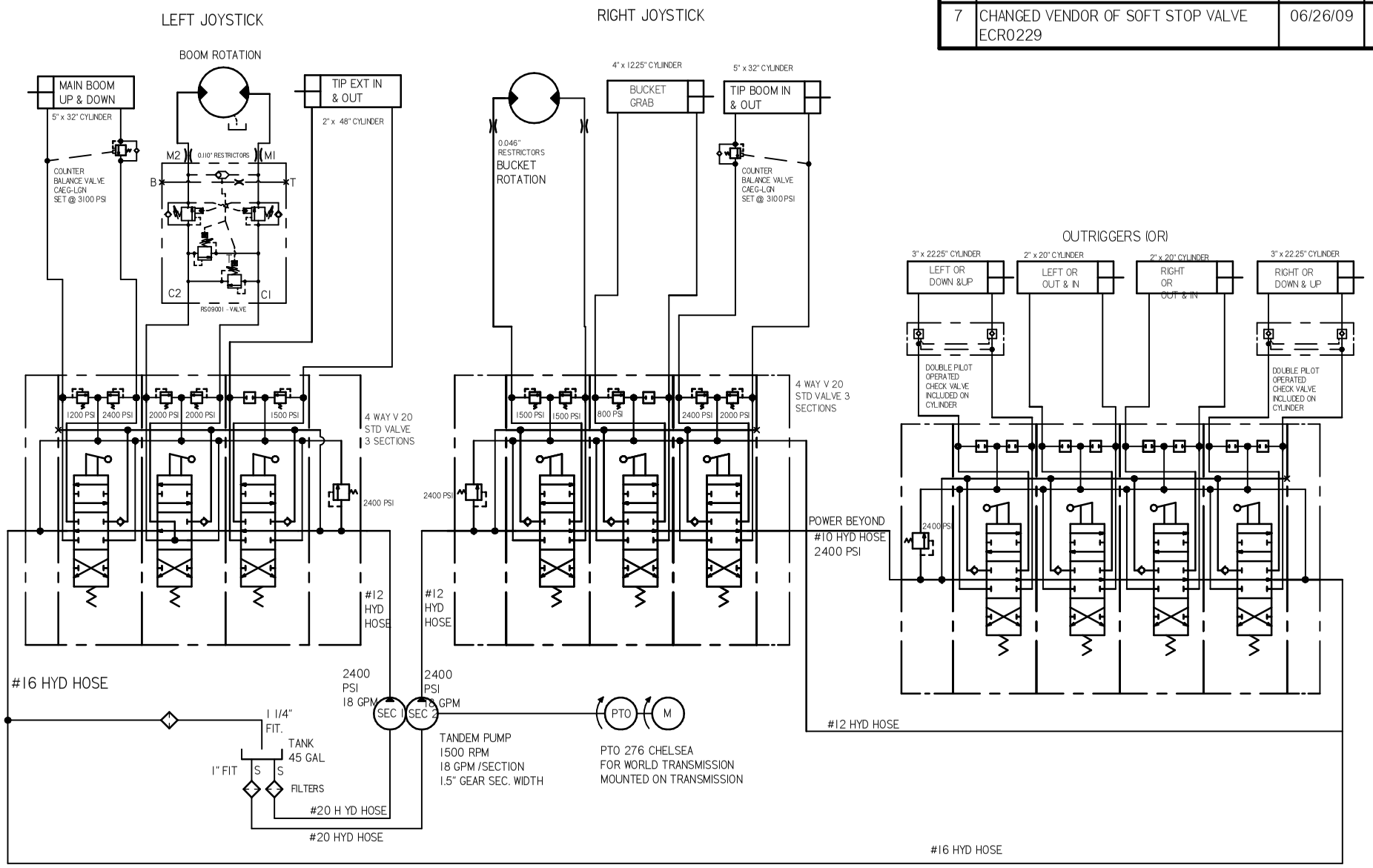
DRAWN BY: BRB

APPROVED BY:

DATE: 8/24/2016

SHEET: 4 OF 4

REV.	DESCRIPTION	DATE	BY
7	CHANGED VENDOR OF SOFT STOP VALVE ECR0229	06/26/09	RB



NOTE: ALL HOSES GOING TO CYLINDERS OR MOTORS ARE #6 HYD HOSES UNLESS OTHER ARE SPECIFIED.

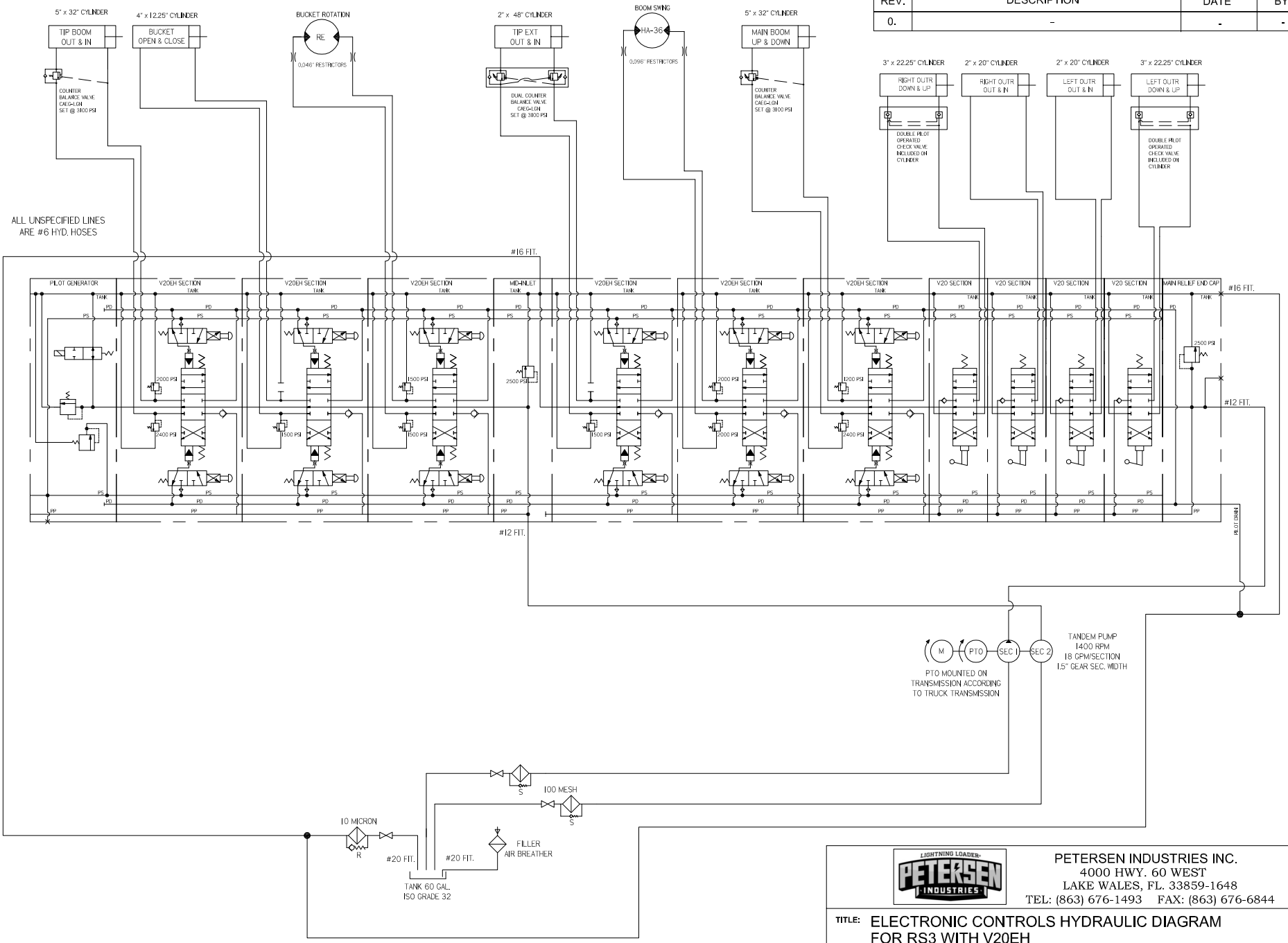
PETERSEN INDUSTRIES INC.
4000 S.R. 60 WEST
LAKE WALES, FL. 33859-8201
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: HYDRAULIC CIRCUIT FOR REAR STEER

PART NUMBER:	SCALE:
52 07 14 001 7	

DRAWN BY:	APPROVED BY:	DATE:	SHEET:
RB		06/26/09	1 OF 1

REV.	DESCRIPTION	DATE	BY
0.	-	-	-



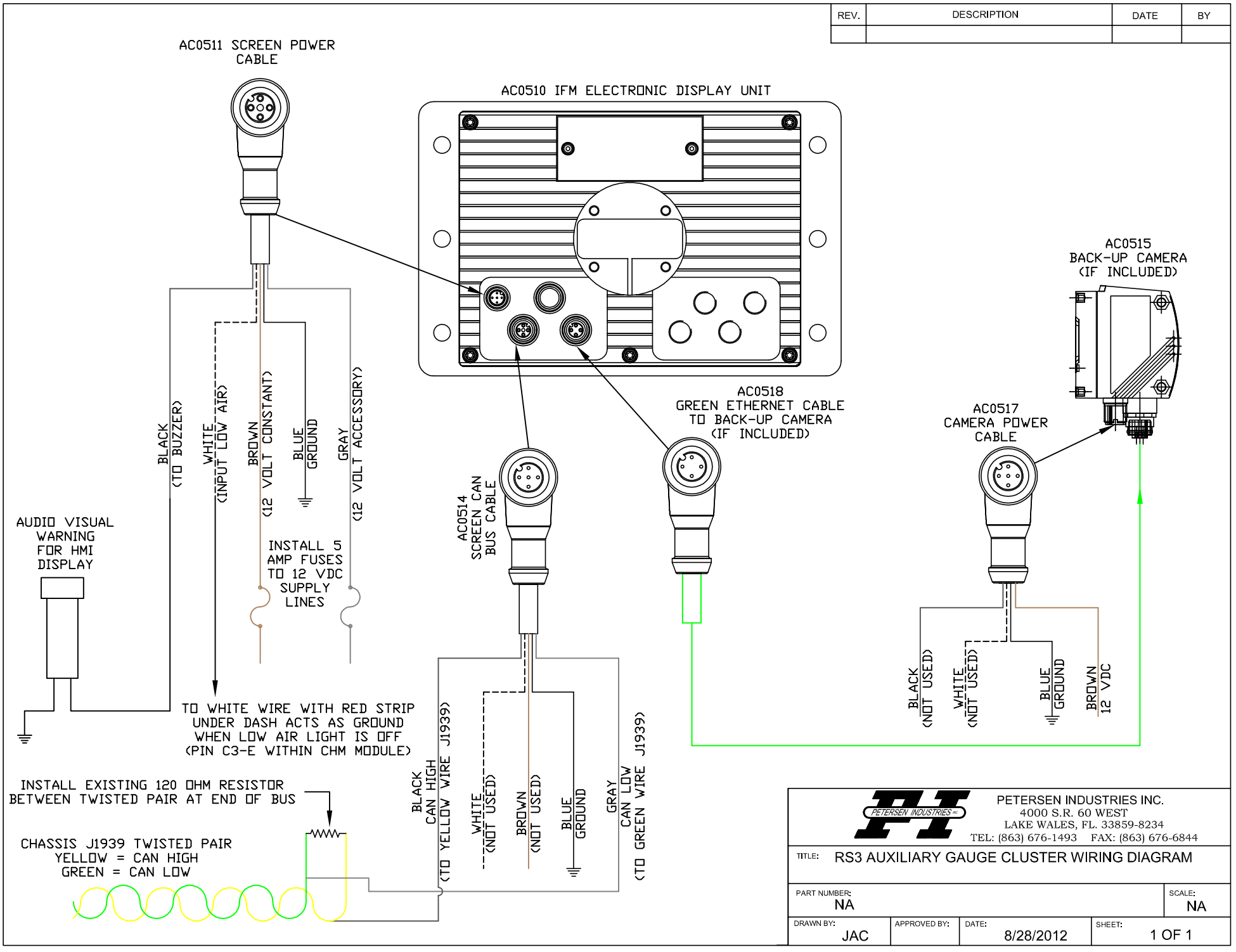
PETERSEN INDUSTRIES INC.
4000 HWY. 60 WEST
LAKE WALES, FL. 33859-1648
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: ELECTRONIC CONTROLS HYDRAULIC DIAGRAM FOR RS3 WITH V20EH

PART NUMBER:	SCALE:
52 07 14 004 0	N/A

DRAWN BY:	APPROVED BY:	DATE:	SHEET:
JAC		4/19/2013	1 OF 1

REV.	DESCRIPTION	DATE	BY



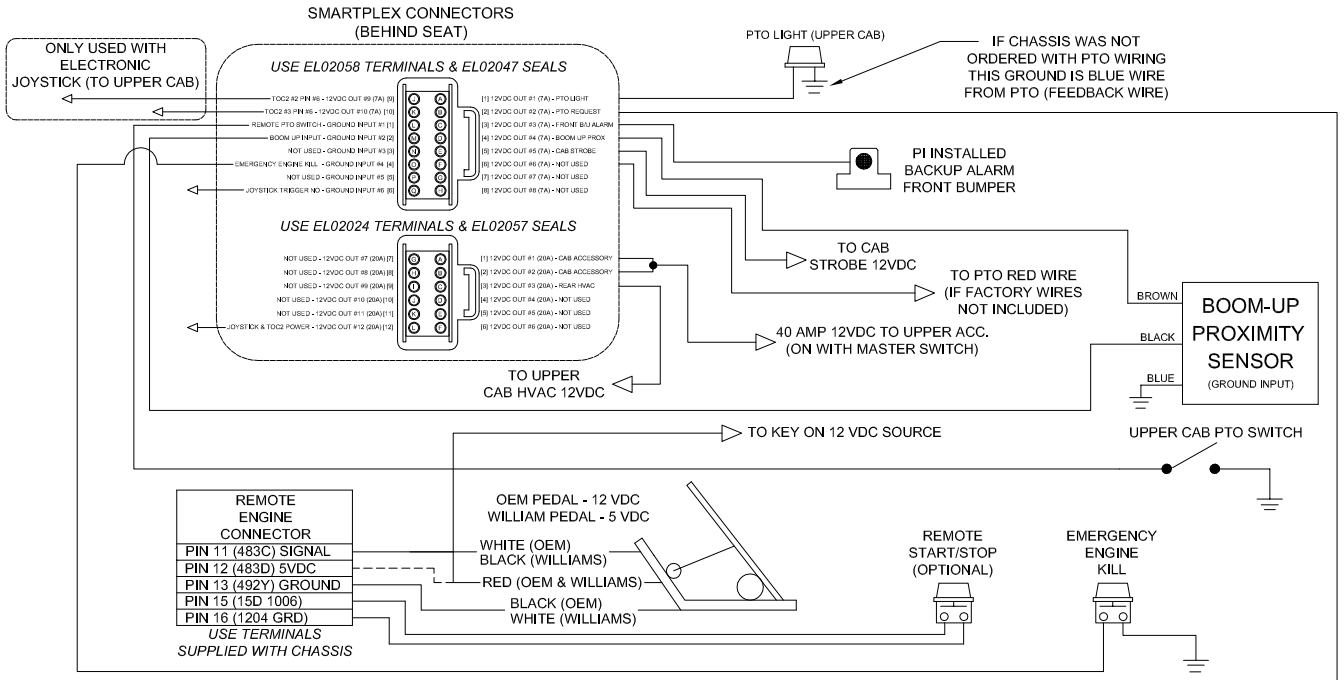
PETERSEN INDUSTRIES INC.
4000 S.R. 60 WEST
LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

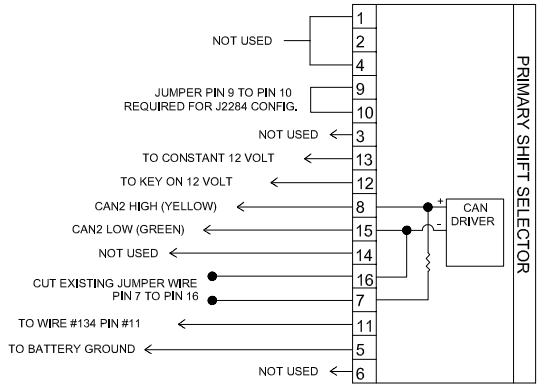
TITLE: RS3 AUXILIARY GAUGE CLUSTER WIRING DIAGRAM

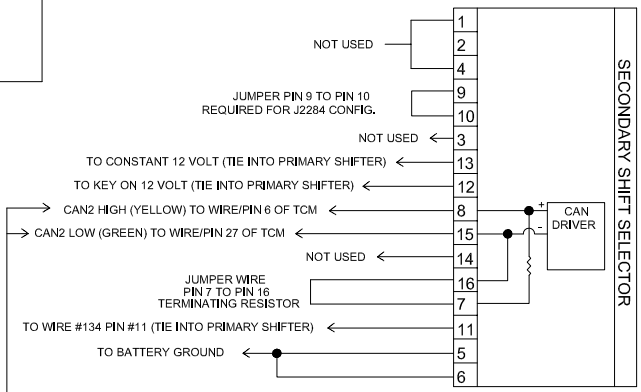
PART NUMBER:	SCALE:
NA	NA

DRAWN BY:	APPROVED BY:	DATE:	SHEET:
JAC		8/28/2012	1 OF 1

REV.	DESCRIPTION	DATE	BY
-	-	-	-







SPLICE THESE WIRES INTO THE PINS SHOWN ON THE TCM 1" TO 2" BEHIND THE TCM CONNECTOR. THE GREEN/YELLOW ADDED NODE SHOULD NOT EXCEED 16.5 FEET. RUN WIRE DOWN & OUT OF UPPER CAB THEN DOWN DRIVER SIDE FRAME RAIL & UP TO SECONDARY SHIFTER

REMOTE TRANSMISSION CONNECTOR
PIN 8 (497D3) TCM 143
PIN 10 (497D5) TCM 142
PIN 11 (497D6) TCM 101
PIN 12 (497D10) TCM 117
USE TERMINALS SUPPLIED WITH CHASSIS

CHASSIS MODULE (CHM)
CONNECTOR C2 - PIN A
USE EL02024 TERMINALS
USE EL2047 SEALS
USE EL02059 RETAINER

FREIGHTLINER PARAMETERS TO APPLY WITH SERVICE LINK

1. 26-20100-175 TO CONTROL UPPER/LOWER CAB TRANSFER **MUST PROGRAM ECU TO LISTEN FOR J1939 REMOTE ACCELERATOR FROM SA33* (CHASSIS MUST BE EQUIPPED WITH FACTORY PTO WIRING)
2. 26-20500-075 & 26-20708-005 BOOM OUT OF STOW
3. 26-20701-014 EMERGENCY ENGINE KILL *MUST PROGRAM ECU TO LISTEN FOR J1939 SHUTDOWN MESSAGE (ENGINE AUX SHUTDOWN SWITCH SA33)*
4. *26-20101-040 GENERAL PARAMETER TO CONTROL SMART SWITCH 2 AND 6.7 A OUTPUT 5 FOR CAB STROBE LIGHT*
5. *26-01032-127 REMOTE START/STOP (CHASSIS MUST BE EQUIPPED WITH REMOTE START/STOP)*

FREIGHTLINER OPTIONAL PARAMETER

1. 26-20100-173 TO CONTROL UPPER/LOWER CAB TRANSFER **MUST PROGRAM ECU TO LISTEN FOR J1939 REMOTE ACCELERATOR FROM SA33* (USE THIS IF CHASSIS IS NOT EQUIPPED WITH FACTORY PTO WIRING)
2. 26-20100-176 SAME AS 175 BUT HAS OUTPUT POWER FOR TOC2'S ON 12 PIN CONNECTOR PIN L.
3. 26-20718-027 FOR ELECTRONIC JOYSTICK TRIGGER
4. 26-20715-027 TO ACT AS AN AUTO NEUTRAL WITH SERVICE BRAKE OR PARKING BRAKE AND VEHICLE SPEED IS ZERO.
   - * INPUT 3 = REMOTE ON/OFF AUTO NEUTRAL SWITCH
   - * INPUT 4 = GROUND INPUT FROM REAR BRAKE PEDAL OR PARKING BRAKE
   - * OUTPUT IS 6.7A #4 MUST REWIRE SO CONNECT TCM 103 AND 117 TO ACTIVATE AUTO NEUTRAL
   - * MUST ENABLE 117 IN ALLISON DOC TO ENABLE AUTO NEUTRAL

CUMMINS ENGINE PARAMETERS TO MODIFY

1. PTO - ENABLE
   MAXIMUM SPEED - 1400 RPM
2. ACCELERATOR PEDAL OR LEVER OVERRIDE - ENABLE
   PARKING BRAKE INTERLOCK TYPE - NONE
3. REMOTE PTO - ENABLE
   NUMBER OF SPEEDS - 1
4. REMOTE ACCELERATOR PEDAL OR LEVER - ENABLE
   REMOTE ACCELERATOR PEDAL OR LEVER MODE - REMOTE ACCELERATOR PEDAL OR LEVER WITH TRANSITION VERIFICATION
5. SAE J1939 MULTIPLEXING
   AUXILIARY SHUTDOWN SWITCH - ENABLE
   SOURCE ADDRESS - 33 BODY CONTROLLER
   REMOTE ACCELERATOR PEDAL OR LEVER - ENABLE
   SOURCE ADDRESS - 33 BODY CONTROLLER

ALLISON TRANSMISSION PARAMETERS TO MODIFY

1. MUST ENABLE 101 FOR SHIFTER TRANSITION
2. MUST ENABLE 142 FOR AUXILIARY HOLD
3. MUST ENABLE SETTINGS FOR SECONDARY SHIFTER
4. DISABLE ANY SETTINGS THAT REQUIRE THE SERVICE BRAKE TO BE ACTIVE TO MAKE THE TRANS SHIFT INTO GEAR.

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

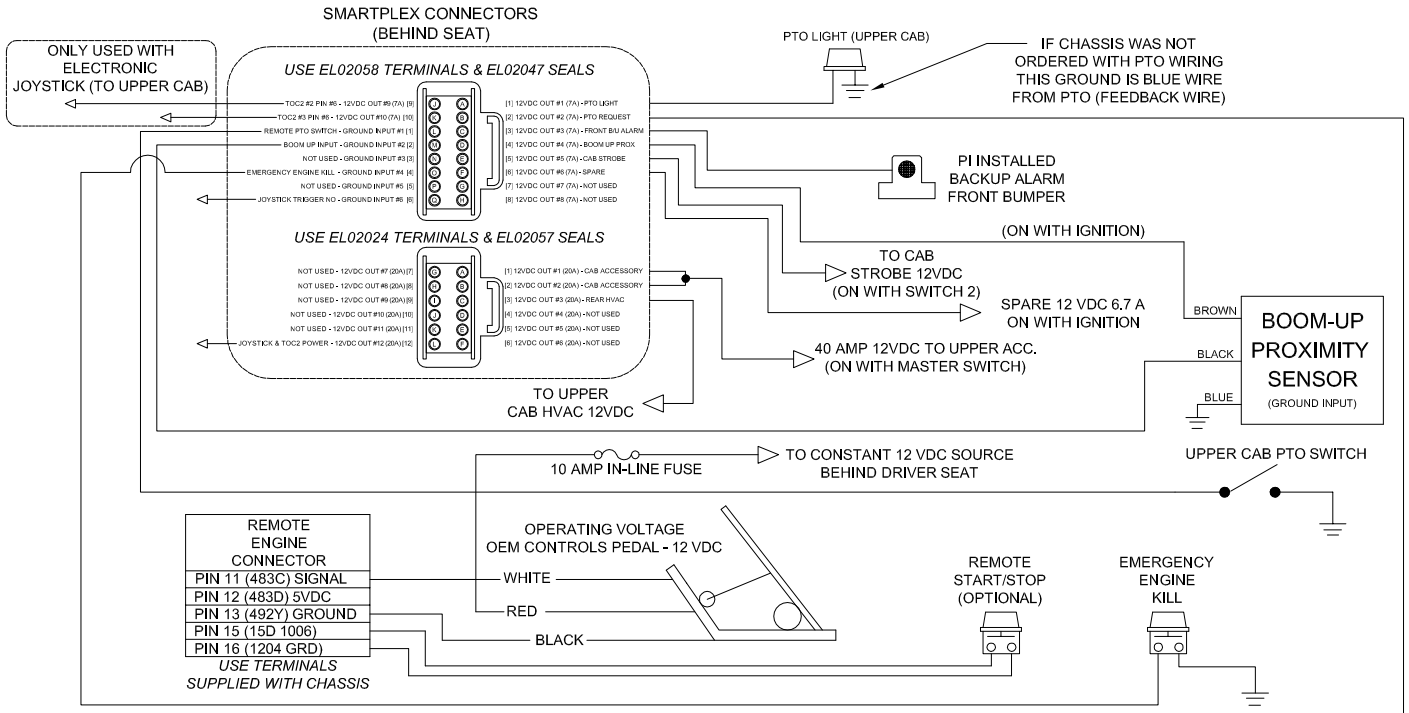
TITLE: RS3 FREIGHTLINER SMARTPLEX

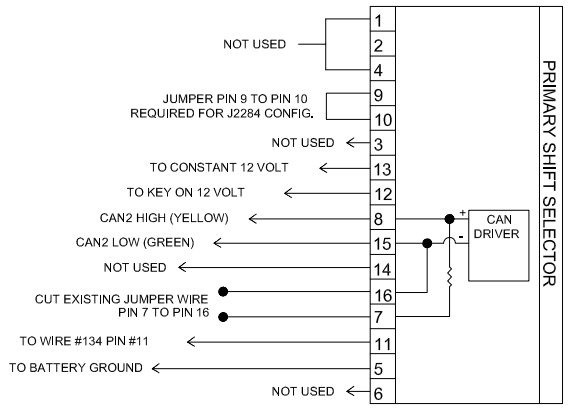
PART NUMBER:

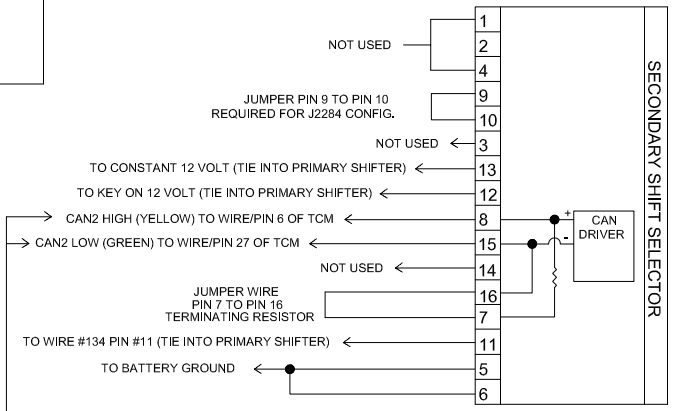
SCALE: NA

DRAWN BY:	APPROVED BY:	DATE:	SHEET:
JAC		10/1/2013	1 OF 1

REV.	DESCRIPTION	DATE	BY
-	-	-	-







SPLICE THESE WIRES INTO THE PINS SHOWN ON THE TCM 1" TO 2" BEHIND THE TCM CONNECTOR. THE GREEN/YELLOW ADDED NODE SHOULD NOT EXCEED 16.5 FEET. RUN WIRE DOWN & OUT OF UPPER CAB THEN DOWN DRIVER SIDE FRAME RAIL & UP TO SECONDARY SHIFTER

REMOTE TRANSMISSION CONNECTOR
PIN 8 (497D3) TCM 143
PIN 10 (497D5) TCM 142
PIN 11 (497D6) TCM 101
PIN 12 (497D10) TCM 117
USE TERMINALS SUPPLIED WITH CHASSIS

CHASSIS MODULE (CHM)
CONNECTOR C2 - PIN A
USE EL02024 TERMINALS
USE EL2047 SEALS
USE EL02059 RETAINER

FREIGHTLINER PARAMETERS TO APPLY WITH SERVICE LINK

1. 26-20100-222 TO CONTROL UPPER/LOWER CAB TRANSFER
   **MUST PROGRAM ECU TO LISTEN FOR J1939 REMOTE ACCELERATOR FROM SA33* (CHASSIS MUST BE EQUIPPED WITH FACTORY PTO WIRING)
2. 26-20500-075 & 26-20708-005 BOOM OUT OF STOW
3. 26-20701-014 EMERGENCY ENGINE KILL
   MUST PROGRAM ECU TO LISTEN FOR J1939 SHUTDOWN MESSAGE (ENGINE AUX SHUTDOWN SWITCH SA33)
4. *26-20101-040 GENERAL PARAMETER TO CONTROL SMART SWITCH 2 AND 6.7 A OUTPUT 5 FOR CAB STROBE LIGHT or 26-201-01-057 SWITCH 2 AND 20 A OUTPUT 7 (IF MORE THAN 6.7 A IS REQUIRED).*
5. *26-01089-000 REMOTE START/STOP (CHASSIS MUST BE EQUIPPED WITH REMOTE START/STOP)*

FREIGHTLINER OPTIONAL PARAMETER

1. 26-20100-224 SAME AS 222 BUT HAS OUTPUT POWER FOR TOC2'S ON 12 PIN CONNECTOR PIN L.
2. 26-20718-027 FOR ELECTRONIC JOYSTICK TRIGGER
3. 26-20715-027 TO ACT AS AN AUTO NEUTRAL WITH SERVICE BRAKE OR PARKING BRAKE AND VEHICLE SPEED IS ZERO.
   * INPUT 3 = REMOTE ON/OFF AUTO NEUTRAL SWITCH
   * INPUT 4 = GROUND INPUT FROM REAR BRAKE PEDAL OR PARKING BRAKE
   * OUTPUT IS 6.7A #4 MUST REWIRE SO CONNECT TCM 103 AND 117 TO ACTIVATE AUTO NEUTRAL
   * MUST ENABLE 117 IN ALLISON DOC TO ENABLE AUTO NEUTRAL

CUMMINS ENGINE PARAMETERS TO MODIFY

1. PTO - ENABLE
   MAXIMUM SPEED - 1400 RPM
2. ACCELERATOR PEDAL OR LEVER OVERRIDE - ENABLE
   PARKING BRAKE INTERLOCK TYPE - NONE
3. REMOTE PTO - ENABLE
   NUMBER OF SPEEDS - 1
4. REMOTE ACCELERATOR PEDAL OR LEVER - ENABLE
   REMOTE ACCELERATOR PEDAL OR LEVER MODE - REMOTE ACCELERATOR PEDAL OR LEVER WITH TRANSITION VERIFICATION
5. SAE J1939 MULTIPLEXING
   AUXILIARY SHUTDOWN SWITCH - ENABLE
   SOURCE ADDRESS - 33 BODY CONTROLLER
   REMOTE ACCELERATOR PEDAL OR LEVER - ENABLE
   SOURCE ADDRESS - 33 BODY CONTROLLER

ALLISON TRANSMISSION PARAMETERS TO MODIFY

1. MUST ENABLE 101 FOR SHIFTER TRANSITION
2. MUST ENABLE 142 FOR AUXILIARY HOLD
3. MUST ENABLE SETTINGS FOR SECONDARY SHIFTER
4. DISABLE ANY SETTINGS THAT REQUIRE THE SERVICE BRAKE TO BE ACTIVE TO MAKE THE TRANS SHIFT INTO GEAR.

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

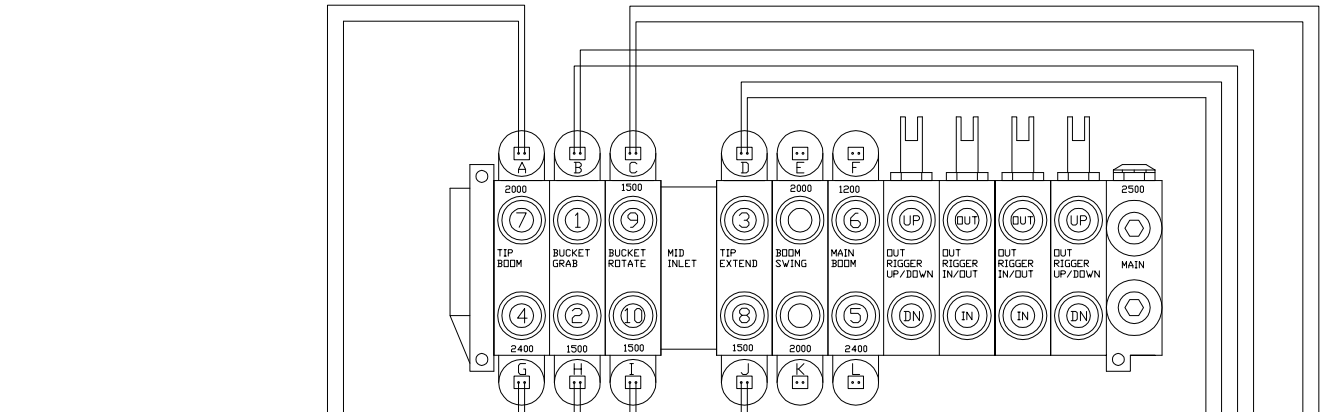
TITLE: RS3 FREIGHTLINER SMARTPLEX

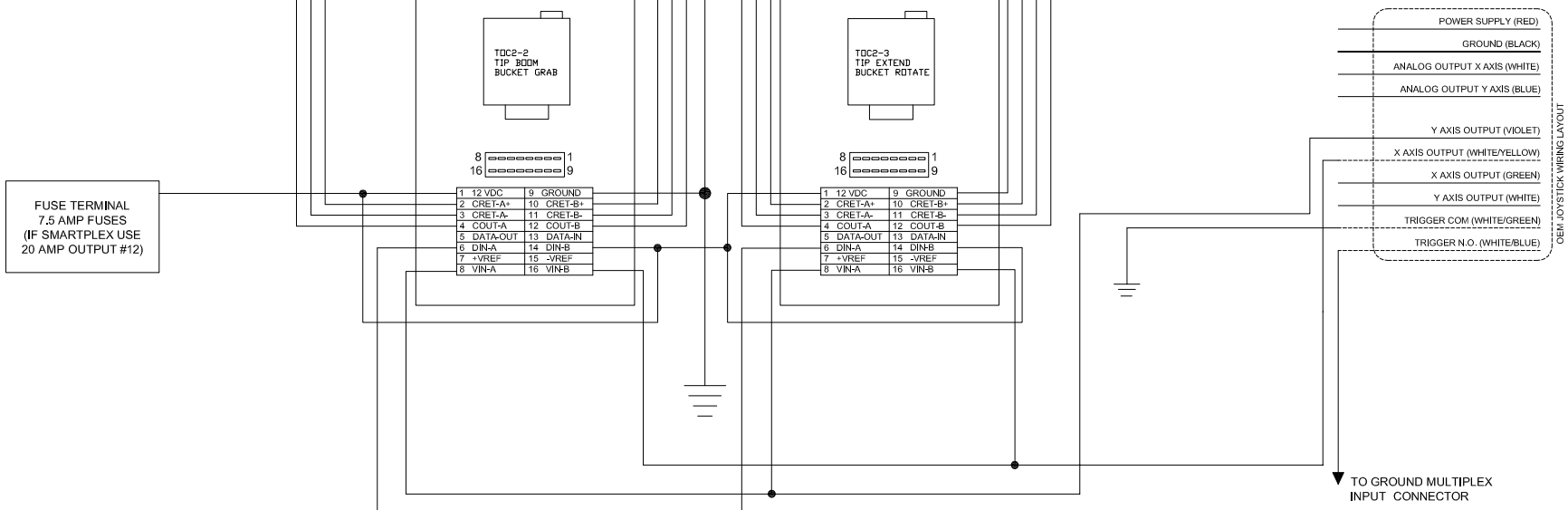
PART NUMBER:

SCALE: NA

DRAWN BY:	APPROVED BY:	DATE:	SHEET:
JAC		10/9/2017	1 OF 1

REV.	DESCRIPTION	DATE	BY





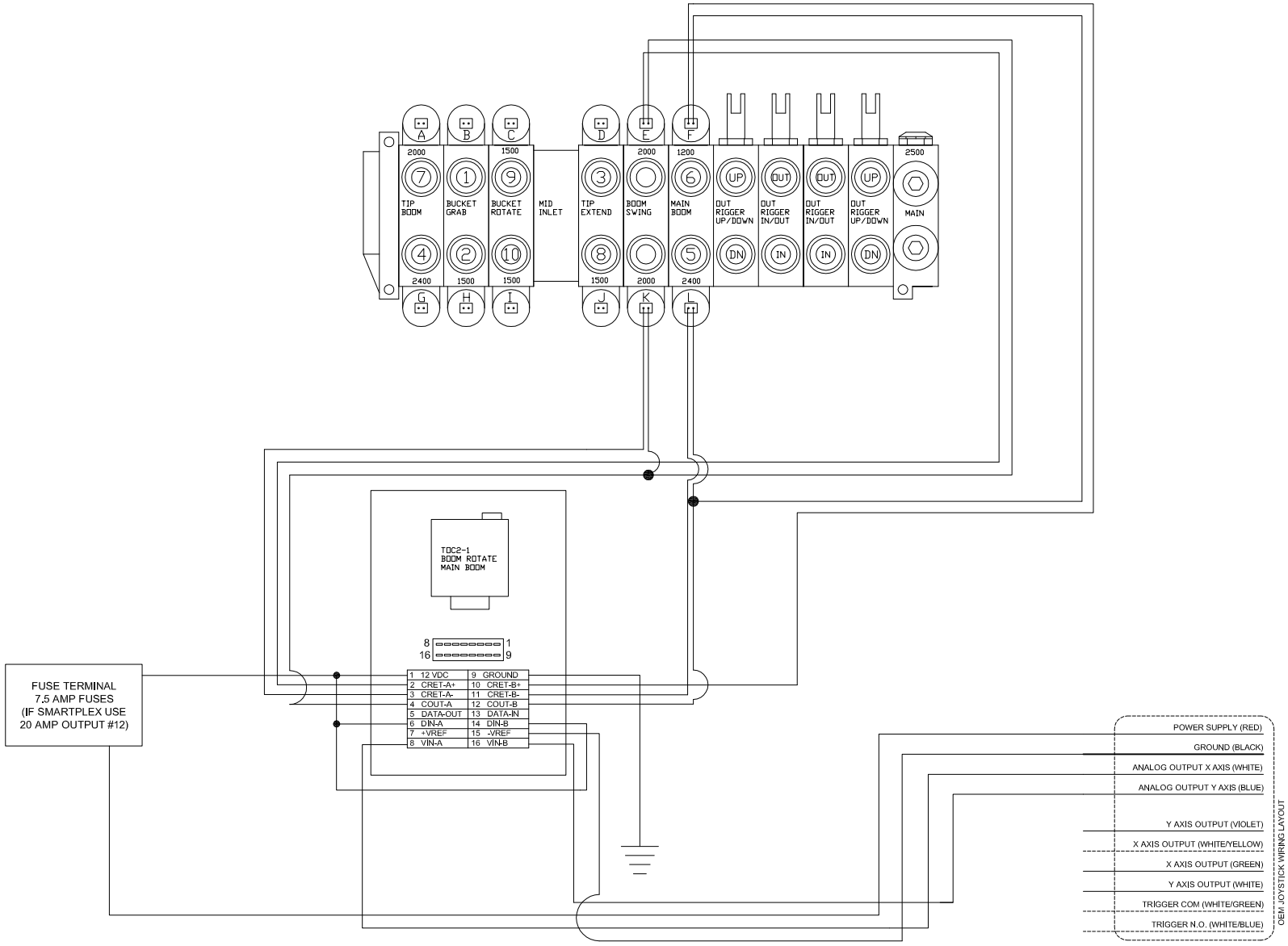
PETERSEN INDUSTRIES INC.
4000 S.R. 60 WEST
LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: RS ELECTRONIC OEM JOYSTICK SCHEMATIC TOC2 #1

PART NUMBER:	SCALE:
62 07 14 008 0	NA

DRAWN BY:	APPROVED BY:	DATE:	SHEET:
JAC		4/19/2013	1 OF 1

REV.	DESCRIPTION	DATE	BY

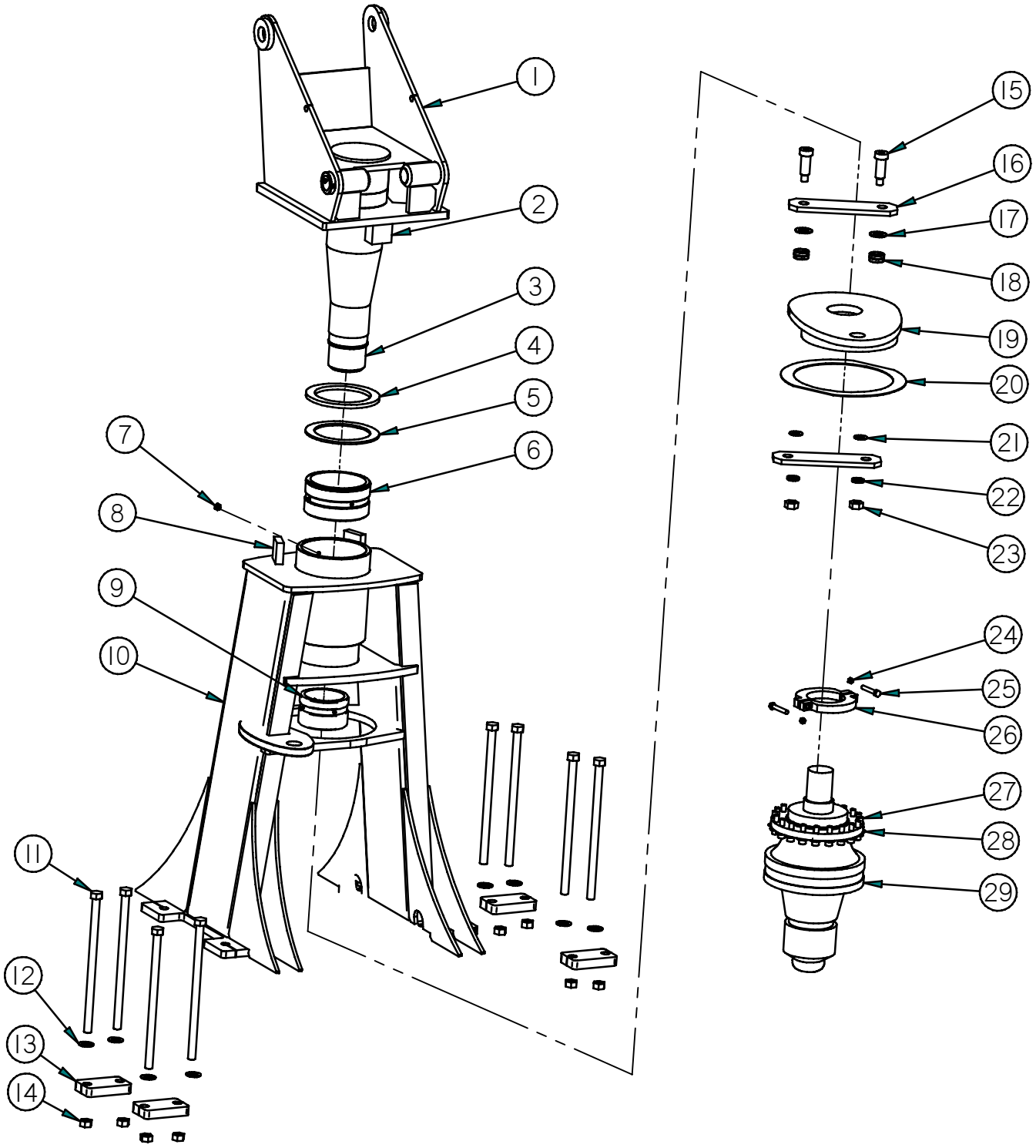


PETERSEN INDUSTRIES INC.
4000 S.R. 60 WEST
LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: RS ELECTRONIC OEM JOYSTICK SCHEMATIC TOC2 #1

PART NUMBER:	SCALE:
62 07 14 007 0	NA

DRAWN BY:	APPROVED BY:	DATE:	SHEET:
JAC		4/19/2013	1 OF 1



PART OF: REAR STEER ASSEMBLY,

PETERSEN INDUSTRIES INC.
20165 HWY. 27
LAKE WALES, FL. 33853-2426
(863) 676 1493 FX (863) 676 6844

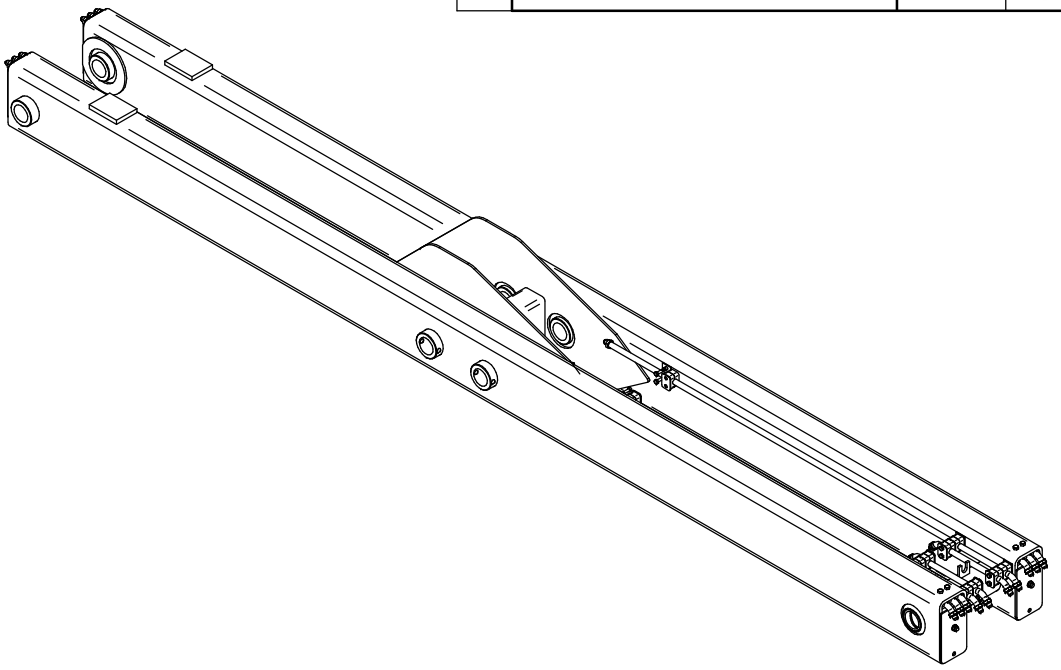
TITLE: REAR STEER TRASH PEDESTAL ASSEMBLY - EXPLODED			
CAD NO.: 02 02 07 001 0	PART NO.:		SCALE
DRAWN BY: WKB	APPROVED:	DATE: 08/05/03	SHEET: 1 OF 1

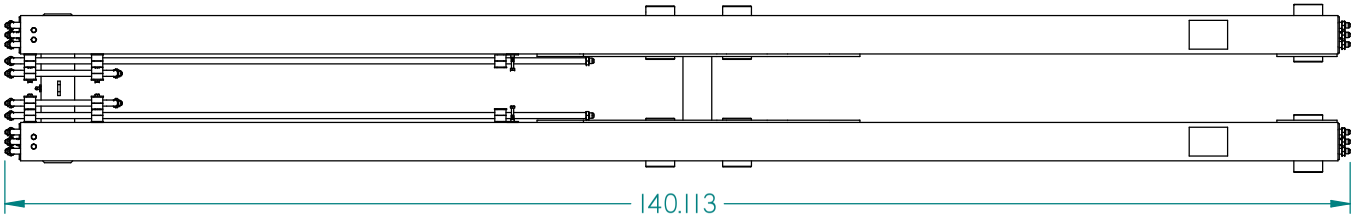
Dia. No.		Part Name	Order By This Part No.
RS3 HEAD AND PEDESTAL ASSEMBLY ROTARY ACTUATOR (DIAGRAM NO. 02 02 07 001 0)			
1		Head and Spindle Assembly	107105
2		Head Stop	107173
3		Spline, Spindle	HC99005
4	*	Nylatron Bushing-Thrust Bearing	BU510002
5		Thrust Spacer	106210
6		Nylatron Bushing-Upper Spindle	BU509002
7		Grease Fitting; 1/8" Straight	HF2002S
8		Pedestal Stop	106216
9		Nylatron Bushing, Lower Spindle	BU507005
10		Pedestal Weldment	106109
11		Bolt, Tie Down for Truck Frame	BL116288U88
12		Washer, 1" Flat	WAF16U5
13		Tie Down Block for Truck Frame	125203
14		Nut, 1" Nylon Lock	NUN16U
15	*	Bolt, Torque Link	BL120044U8
16	*	Torque Arm Link	114402
17	*	Flat Washer, Torque Link, 1 1/8"	WAF18S8
18	*	Torque Link Bearing	BE04N12SF20
19	*	Rotary Actuator Mt. Plate, Torque Arm Assy	114204
20		Torque Arm Wear Pad	BU317002
21		Spacer, Torque Arm	114453
22	*	Flat Washer, Torque Link, 7/8"	WAF14S8
23	*	Centerlock Nut, 7/8"	NUC14U
24		Lock Collar Nut, Stoverlock 1/2"	NUS08U
25		Bolt, Lock Collar	BL308048U513
26		Lock Collar (one side)	117103
27		Bolt, Rotary Actuator	SCA1032C
28		Lockwasher, Rotary Actuator	WAS105
29		Dinamic Rotary Actuator	HC01003

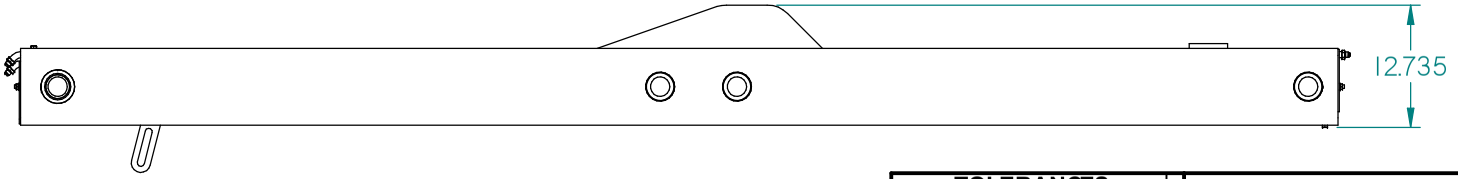
* NOTE: Item numbers with an asterisk (*) may have part numbers and prices different that what is shown on this pricelist. Please consult with the Petersen Parts Department to help correctly identify these parts for your loader. You may contact our Parts Department at 800/930-5623, ext. 229.

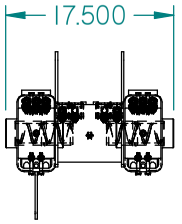
REV.	DESCRIPTION	DATE	BY
-	-	-	-

010 ASSEMBLY









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 PLACE(S)

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

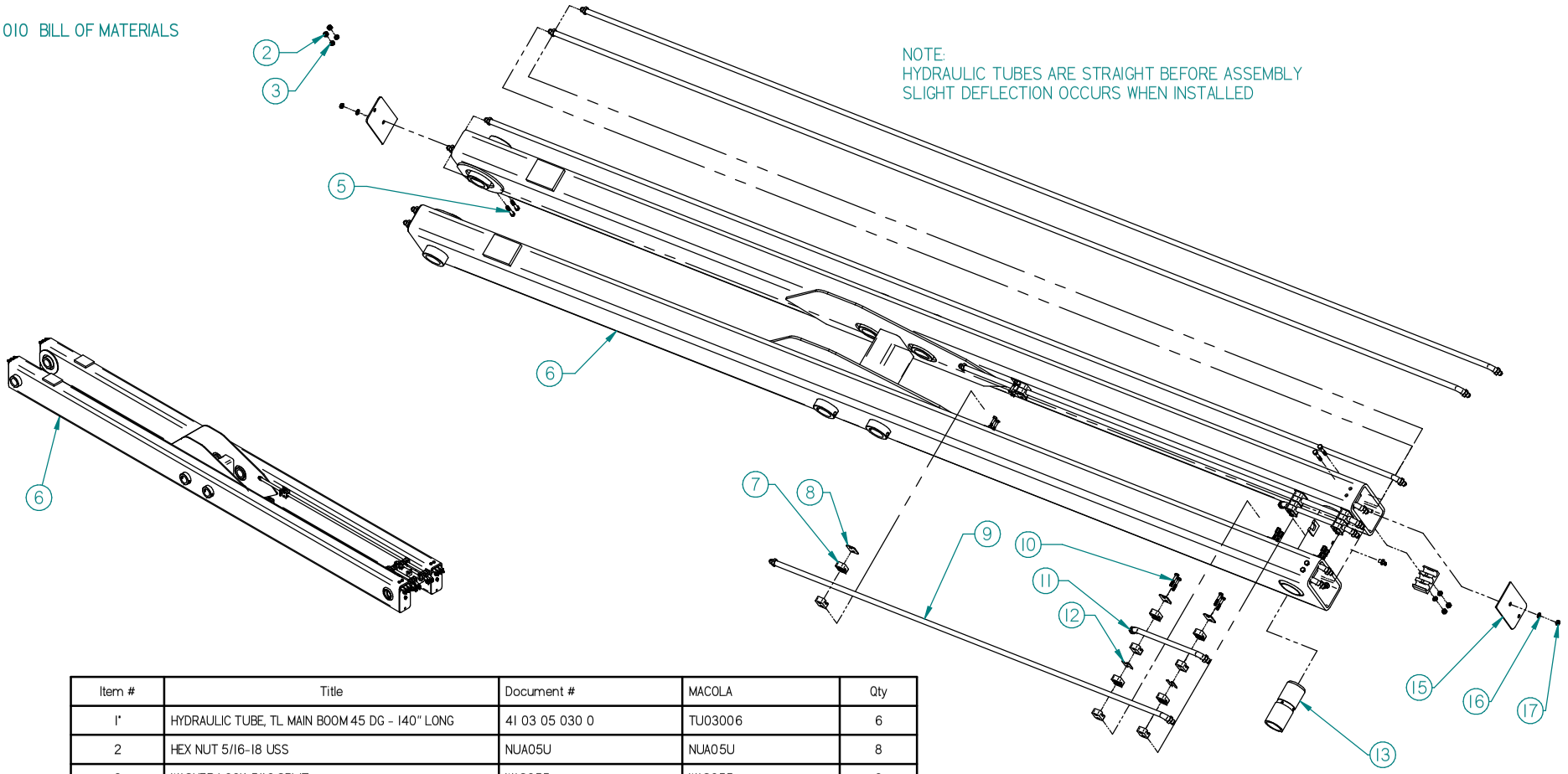
TITLE: MAIN BOOM TL3 ASSEMBLY

PART NUMBER:	SCALE:
12 03 04 001 0 / 108103	1:20

DRAWN BY:	APPROVED BY:	DATE:	SHEET:
OJ		08/04/2006	1 OF 2

010 BILL OF MATERIALS

NOTE:
HYDRAULIC TUBES ARE STRAIGHT BEFORE ASSEMBLY
SLIGHT DEFLECTION OCCURS WHEN INSTALLED



Item #	Title	Document #	MACOLA	Qty
1*	HYDRAULIC TUBE, TL MAIN BOOM 45 DG - 140" LONG	41 03 05 030 0	TU03006	6
2	HEX NUT 5/16-18 USS	NUA05U	NUA05U	8
3	WASHER LOCK 5/16 SPLIT	WAS055	WAS055	8
4*	3 HOLE CLAMP NYLATRON	40 00 00 066 0	CLT3N	4
5	HEX BOLT 5/16-18 X 2 UNC G5	BL305032U518	BL305032U518	8
6	TL MAIN BOOM WELDMENT	21 03 05 002 2	108152	1
7	CLAMP, PLASTIC (1-HOLE) (1 SET)	CLP210	CLP210	10
8	CLAMP, TOP PLATE ONLY (1-HOLE)	CL5G215	CL5G215	6
9	HYDRAULIC TUBE, TL MAIN BOOM 45 DG - 62" LONG	41 03 05 029 0	TU02002	2
10	BOLT HEX 1/4-20 X 1-1/2 UNC G5	BL304024U520	BL304024U520	8
11	HYDRAULIC TUBE, TL MAIN BOOM45 DG - 12" LONG	41 03 05 020 0	TU03002	2
12	CLAMP SAFETY PLATE	CL5G211	CL5G211	4
13	BUSHING, 2-1/2" X 2" X 6" NYLATRON	41 03 05 028 2	BU503004	2
14*	1/8" STRAIGHT GREASE FITTING	HF2002S	HF2002S	1
15	TL MAIN BOOM END CAP	41 03 05 007 2	108225	4
16	WASHER LOCK 3/8 SPLIT	WAS065	WAS065	4
17	HEX NUT 3/8 -16 USS	NUA06U	NUA06U	4

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

TITLE: MAIN BOOM TL3 ASSEMBLY

PART NUMBER: 12 03 04 001 0 / 108103

SCALE: 1:20

DRAWN BY: OJ

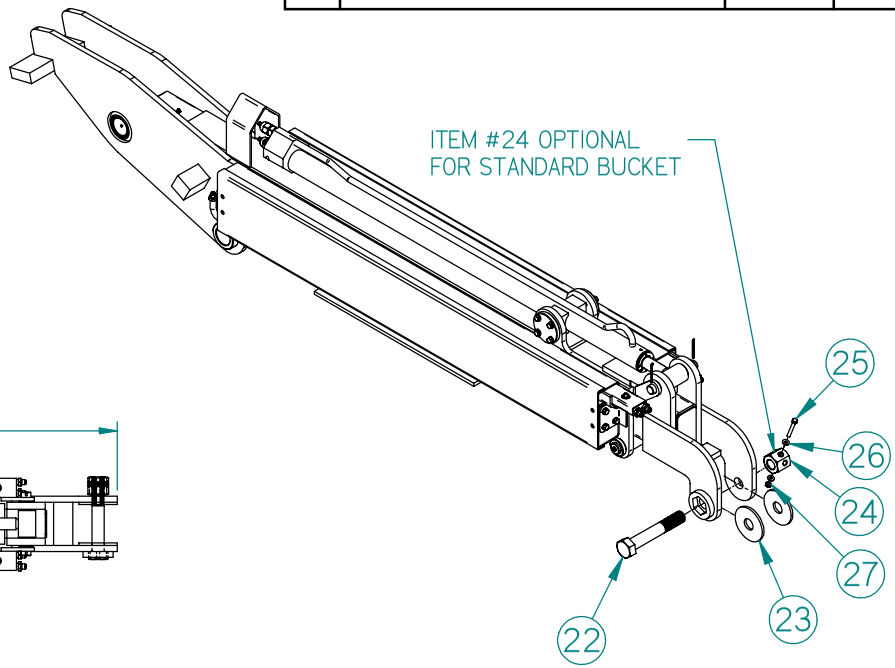
APPROVED BY:

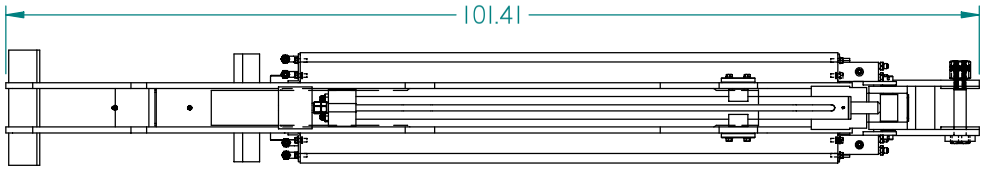
DATE: 08/04/2006

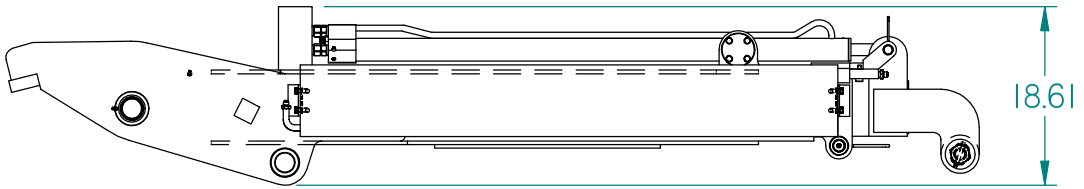
SHEET: 2 OF 2

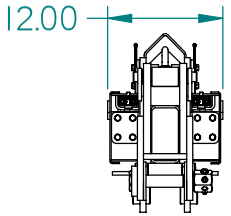
010 ASSEMBLY

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 PLACE(S)

PETERSEN INDUSTRIES INC.
4000 S.R. 60 WEST
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TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: TL3 TIP BOOM ASSEMBLY

PART NUMBER: 12 04 04 002 1 / 109103

SCALE: 1:20

DRAWN BY: BRB

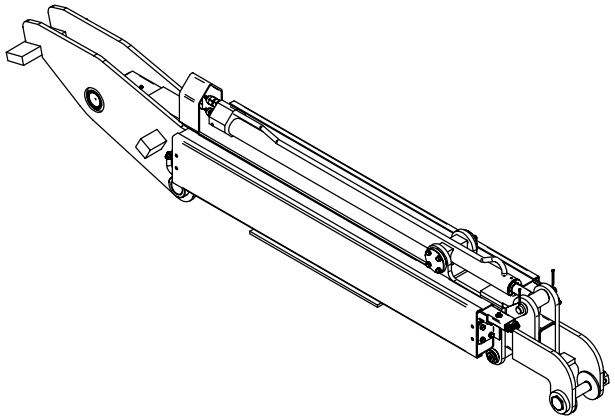
APPROVED BY:

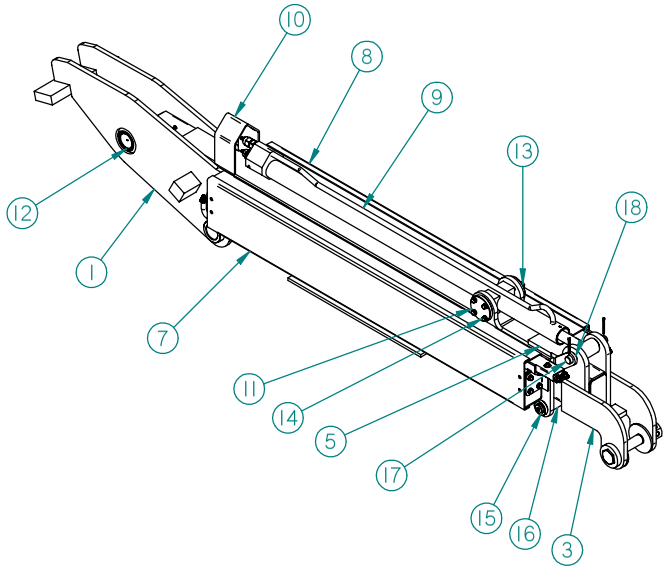
DATE: 10/26/2016

SHEET: 1 OF 2

010 BILL OF MATERIALS

Item #	Title	Document #	MACOLA	QTY
1	TL3 TIP BOOM OUTER WELDMENT	21 04 04 011 1	109152	1
2*	TL3 TIP BOOM SIDE WEAR PAD 2-7/8 X 5	41 04 04 041 0	BU303003	2
3	TL3 TIP EXTENSION INNER TUBE WELDMENT	21 04 04 010 3	109153	1
4*	TIP EXTENSION SQUARE WEAR PUCK	41 04 04 028 1	109210	10
5	TIP EXTENSION WEAR PLT RTNR / RTRCT STOP PLT ASSEMBLY	21 04 04 009 0	109154	1
6*	TL3 TIP BOOM TOP WEAR PAD 2-7/8 X 4	41 04 04 040 0	BU303002	1
7	HOSE RECOIL BOX ASSEMBLY - RIGHT	21 04 04 012 1	123122	1
8	HOSE RECOIL BOX ASSEMBLY - LEFT	21 04 04 013 1	123121	1
9	TIP EXTENSION CYLINDER SHAFT ASSEMBLY	22 14 01 010 2	121105	1
10	TIP BOOM TIP EXTENSION GUARD	41 04 04 027 1	109238	1
11	TRUNION TIP EXTENSION CYLINDER MOUNT	41 04 04 004 1	109205	2
12	BUSHING, 2 1/2 X 2 X 2 NYLATRON	41 11 09 022 5	BU502008	2
13	WASHER LOCK 3/8 SPLIT	WAS065	WAS065	8
14	HEX BOLT 3/8-16 X 1.00 USS G5	BL306016U516	BL306016U516	8
15	PIN, CONNECT	41 04 04 018 0	PI18105F	1
16	TIP BOOM, SUPPORT ROLLER WITH BUSHINGS	31 04 04 008 0	109235	1
17	PIN, CONNECT	41 04 04 012 0	PI16112F	1
18	WASHER, BUSHING 1.00 X 1.50	WAB1624	WAB1624	2
19*	PIN, COTTER .187 X 2	FA020332	FA020332	2
20*	COTTER PIN 5/16 X 3	FA020548	FA020548	1
21*	HYDRAULIC, .125 STRAIGHT GREASE FITTING	HF2002S	HF2002S	3
22	HEX BOLT 1-1/4-7 X 7-3/4 GR8	BL120124U87	BL120124U87	1
23	BUCKET BRAKE WASHER 4 X 1-5/16 X 1/4	WAF642004	WAF642004	2
24	BUCKET BOLT NUT	40 00 00 053 1	102454	1
25	HEX BOLT 5/16-18 X 2.50 USS G5	BL305040U518	BL305040U518	1
26	WASHER FLAT 5/16 USS	WAF05U5	WAF05U5	2
27	HEX NUT 5/16-24 SAE STOVERLOCK	NUS05S	NUS05S	1



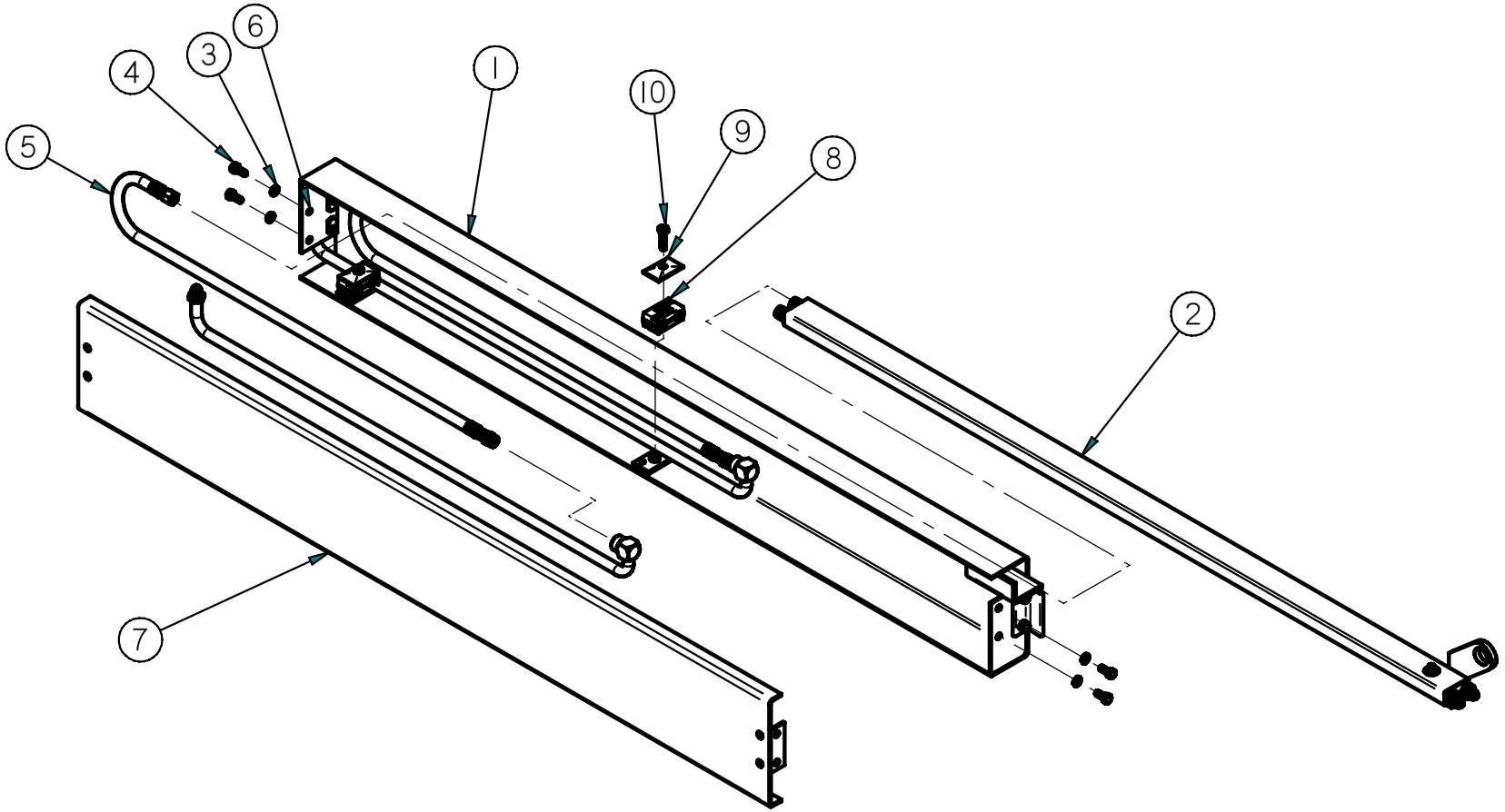


PETERSEN INDUSTRIES INC.
4000 S.R. 60 WEST
LAKE WALES, FL. 33859-8234
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: TL3 TIP BOOM ASSEMBLY

PART NUMBER:	SCALE:
12 04 04 002 1 / 109103	1:24

DRAWN BY:	APPROVED BY:	DATE:	SHEET:
BRB		10/26/2016	2 OF 2



Item Number	Title	Part Number	Quantity
1	HOSE RECOIL, HOUSING ASSEMBLY - RIGHT	123126	1
2	TIP BOOM, HOSE RECOIL SLIDE ASSY RH	123124	1
3	WASHER LOCK 5/16 SPLIT	WAS055	4
4	HEX BOLT 5/16-18 X 3/4 USS G5	BL305012U518	4
5	HOSE CUT 36" #6-S RECOIL BOX	HS10576FS	2
6	TUBE, TL3 HOSE RECOIL BOX - CURVED	TU04004	2
7	HOSE RECOIL, COVER ASSEMBLY	123127	1
8	CLAMP, PLASTIC ONLY (2-HOLE) (1 SET)	CLP220	2
9	CLAMP, TOP PLATE ONLY (2-HOLE)	CL5G225	2
10	HEX BOLT 5/16-18 X 1-1/4 UNC G5	BL305020U518	2

PETERSEN INDUSTRIES INC.
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TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: HOSE RECOIL BOX ASSEMBLY - RIGHT

PART NUMBER: 21 04 04 012 1 / 123122

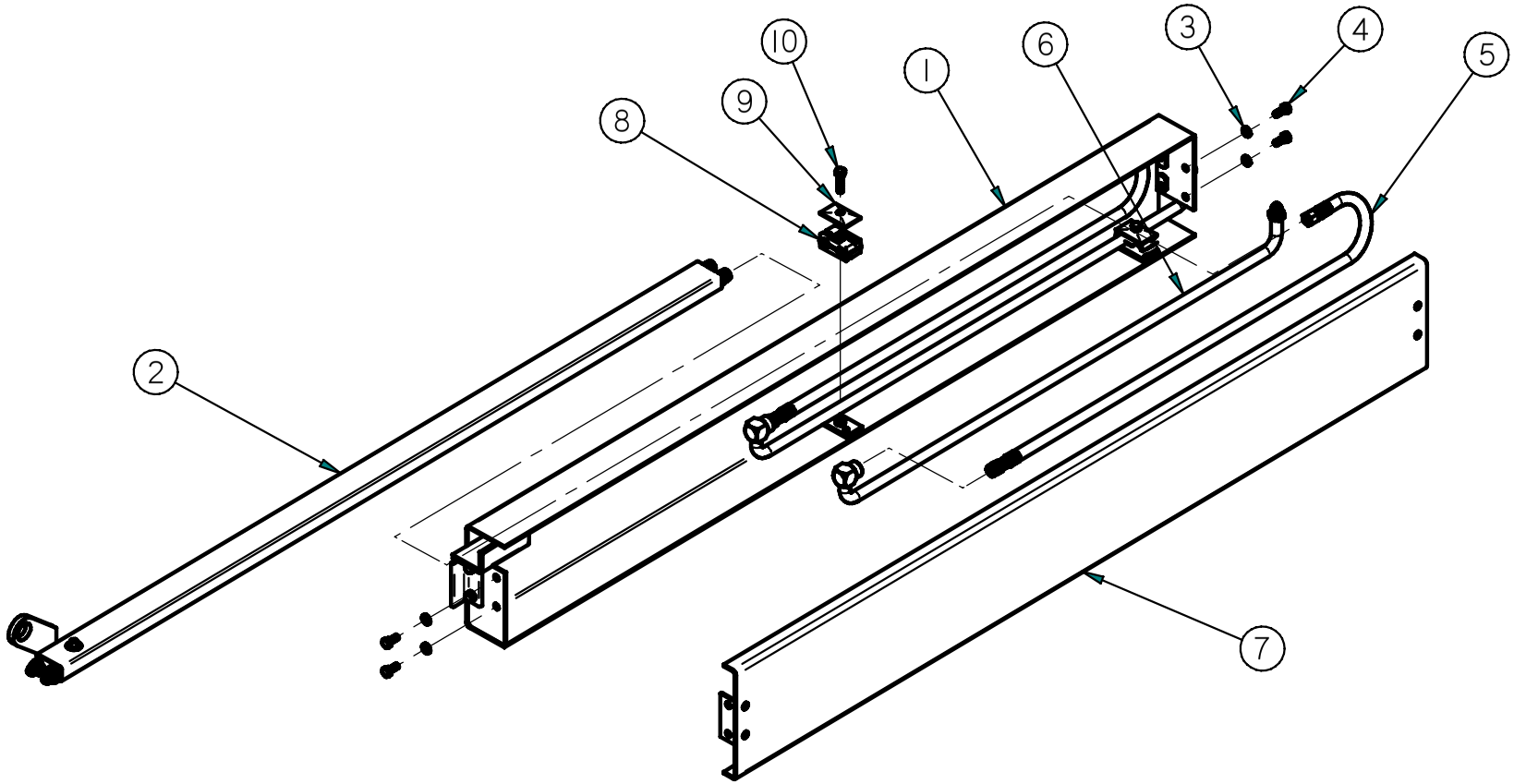
SCALE: NA

DRAWN BY: RB

APPROVED BY:

DATE: 08/05/08

SHEET: 1 OF 1



Item Number	Title	Part Number	Quantity
1	HOSE RECOIL, HOUSING ASSEMBLY - LEFT	123125	1
2	TIP BOOM, HOSE RECOIL SLIDE ASSY LH	123123	1
3	WASHER LOCK 5/16 SPLIT	WAS055	4
4	HEX BOLT 5/16-18 X 3/4 USS G5	BL305012U518	4
5	HOSE CUT 36" #6-S RECOIL BOX	HS10576FS	2
6	TUBE, TL3 HOSE RECOIL BOX - CURVED	TU04004	2
7	HOSE RECOIL, COVER ASSEMBLY	123127	1
8	CLAMP, PLASTIC ONLY (2-HOLE) (1 SET)	CLP220	2
9	CLAMP, TOP PLATE ONLY (2-HOLE)	CL5G225	2
10	HEX BOLT 5/16-18 X 1-1/4 UNC G5	BL305020U518	2

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

TITLE: HOSE RECOIL BOX ASSEMBLY - LEFT

PART NUMBER: 21 04 04 013 1 / 123121

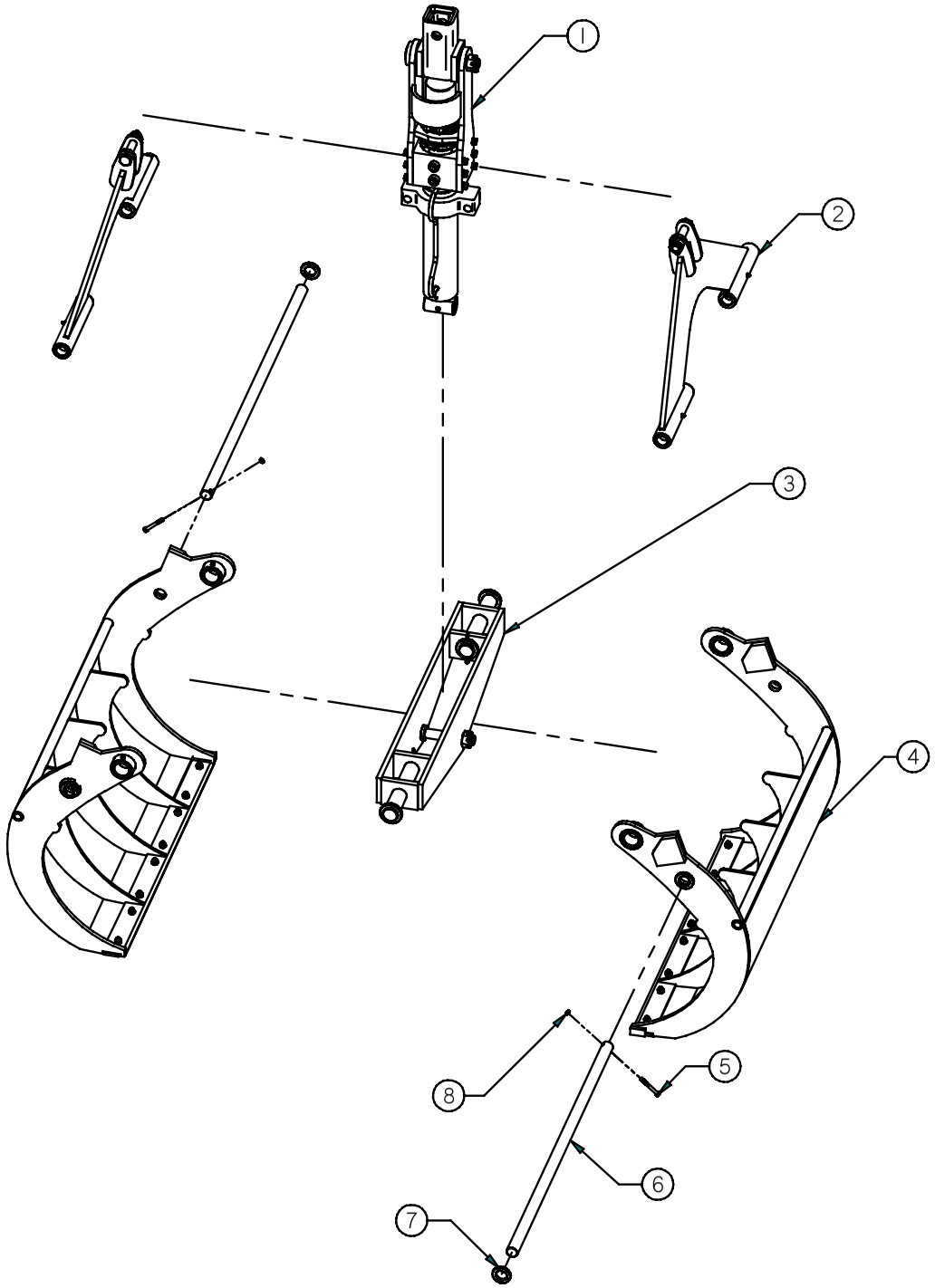
SCALE: NA

DRAWN BY: RB

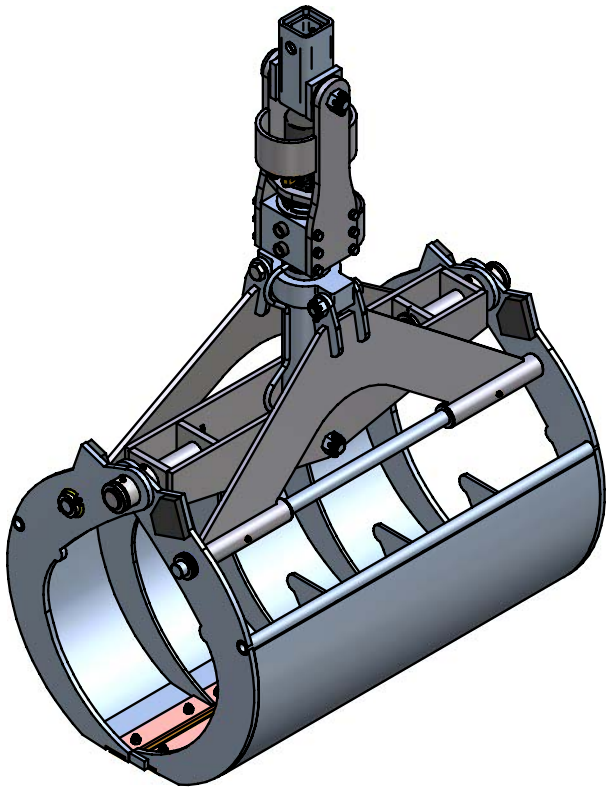
APPROVED BY:

DATE: 08/05/08

SHEET: 1 OF 1



Item Number	Title	Part Number	Quantity
1	BUCKET CYLINDER ROTATOR ASSEMBLY (RE MOTOR)	102124	1
2	STANDARD BUCKET A FRAME ASSEMBLY	102130	2
3	BUCKET SADDLE ASSEMBLY	102129	1
4	TRASH BUCKET JAW ASSEMBLY	102132	2
5	BOLT HEX 3/8-16 UNC X 3 G8	BL108048U816	2
6	STD BUCKET A FRAME SHAFT	102173	2
7	COLLAR SPACER 1 1/2 X 2 1/2 X 1/2_3/8	116106	2
8	NUT HEX 3/8 -16 UNC STOVERLOCK	NUS06U	2



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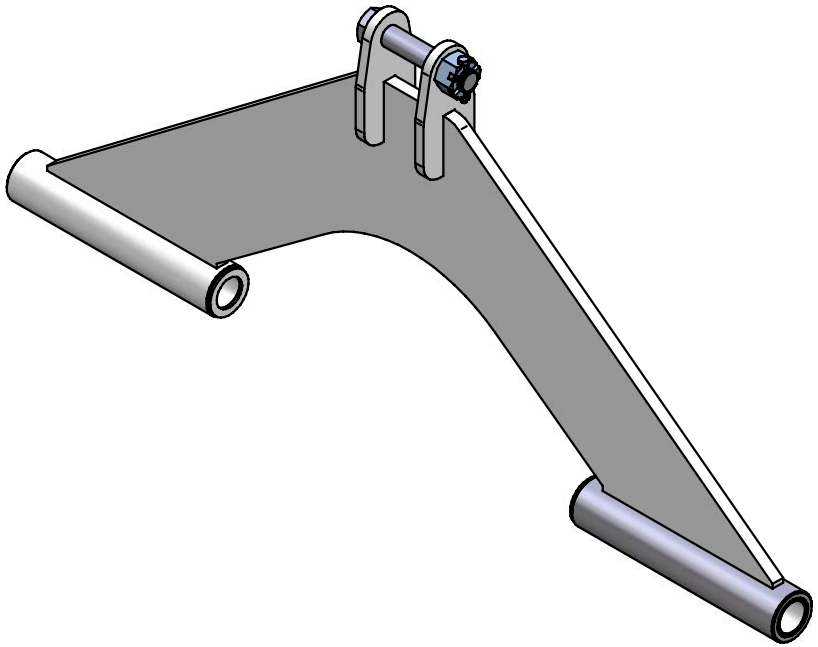
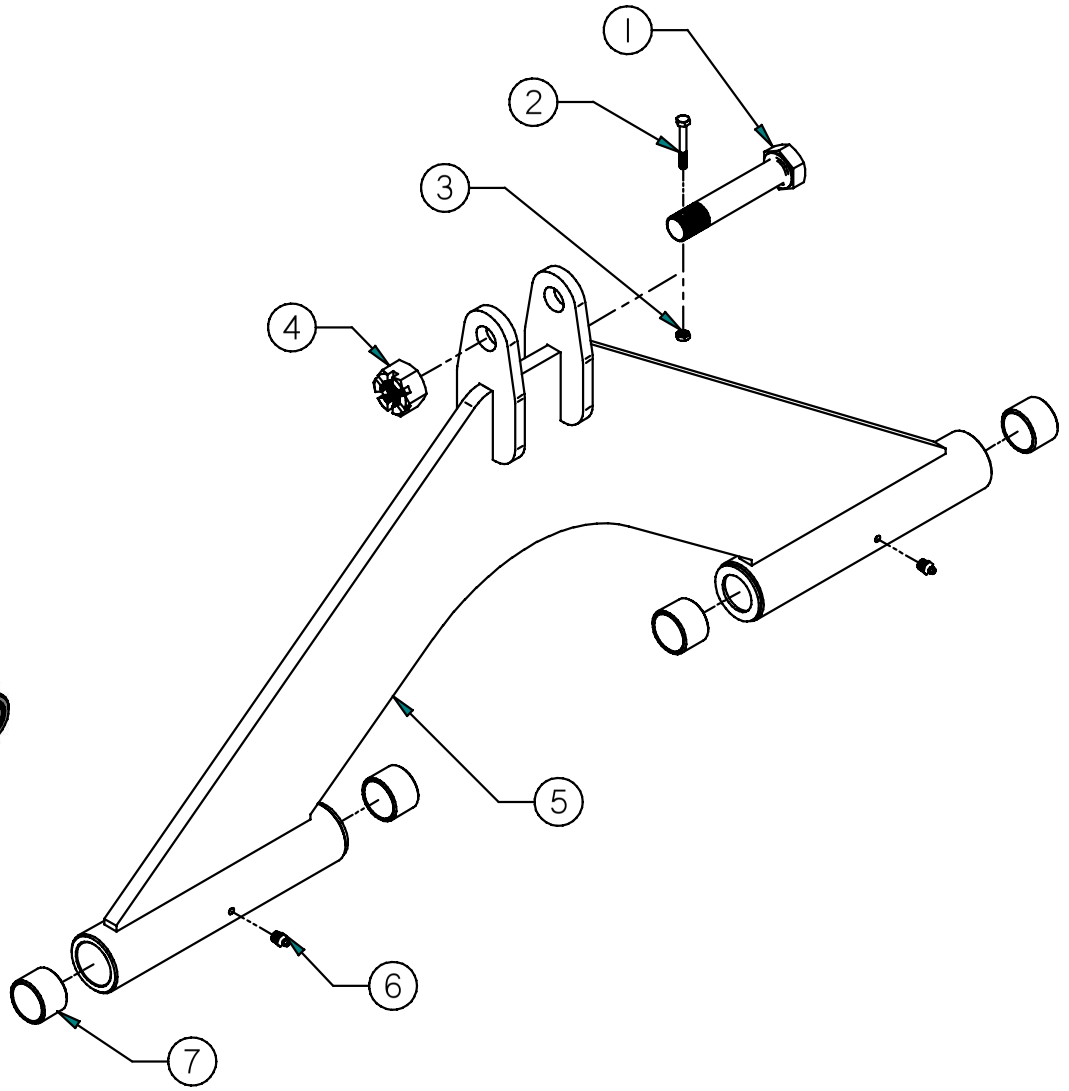
TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: STANDARD TRASH BUCKET ASSEMBLY

PART NUMBER:			SCALE:
11 11 01 0011 / 102101			N/A
DRAWN BY: E. B.	APPROVED BY:	DATE: 12/20/2000	SHEET: 1 OF 1





Item Number	Title	Part Number	Quantity
1	BOLT HEX 1-14 X 5 1/4 SAE HOLE	BL116084S8H1400	1
2	BOLT HEX 1/4-20 X 2 USS G5	BL304032U520	1
3	NUT STOVERLOCK 1/4 USS	NUS04U	1
4	NUT SLOTTED 1-14 SAE GR5	NUB16S5	1
5	STANDARD BUCKET A FRAME WELDMENT	102172	1
6	GREASE NIPPLE 1/8" STRAIGHT	HF2002S	2
7	A FRAME BUCKET SPOOL BUSHING	BU402012	4

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TITLE: STANDARD BUCKET A FRAME ASSEMBLY

PART NUMBER: 22 11 01 001 2 / 102130

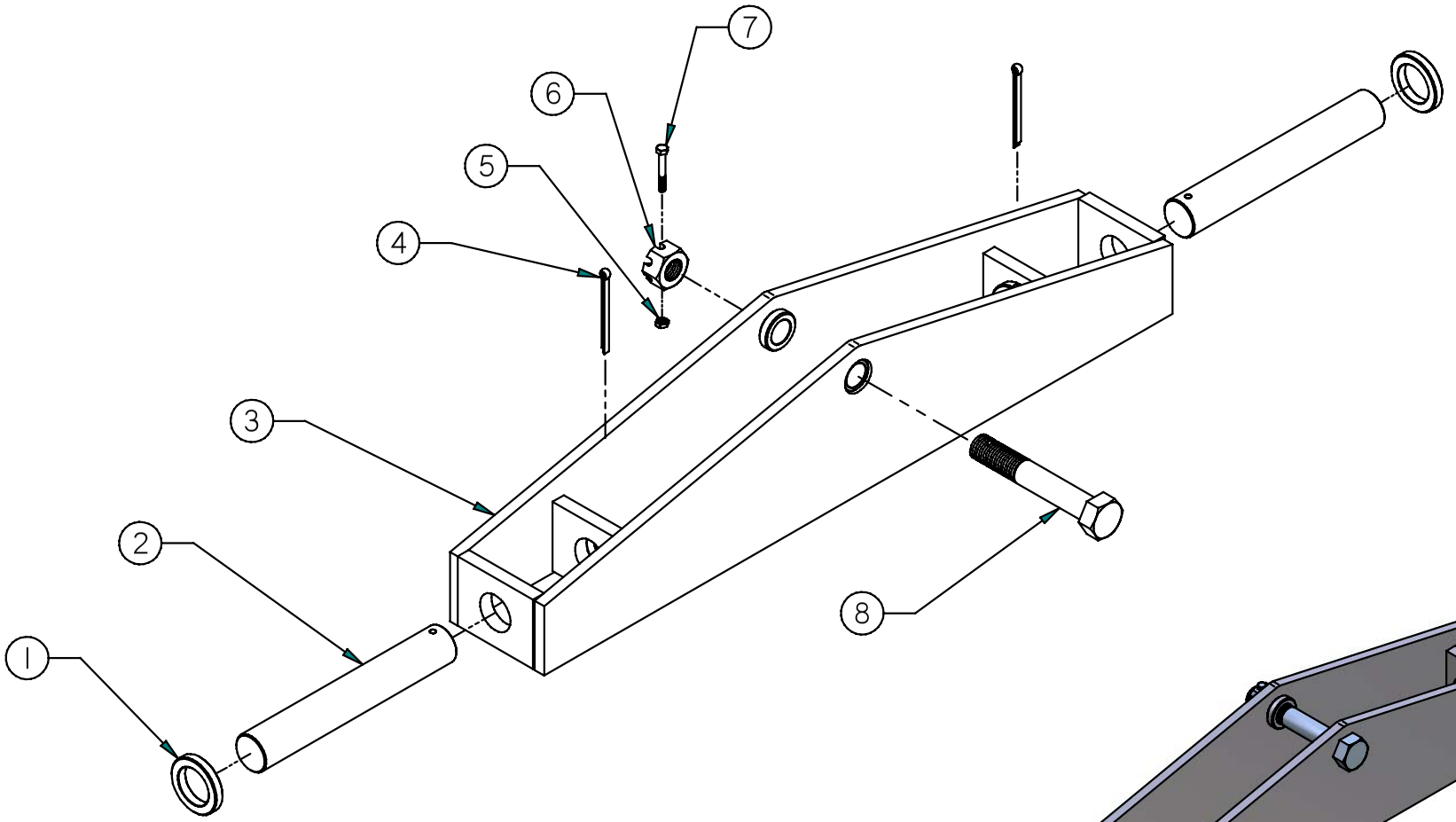
SCALE: N/A

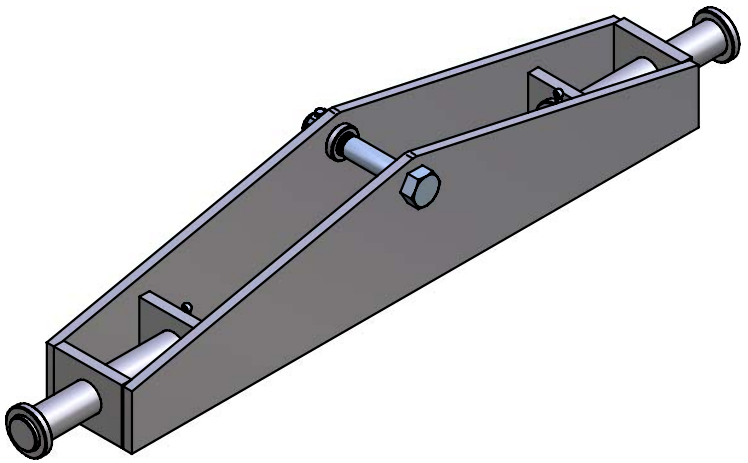
DRAWN BY: E.B.

APPROVED BY:

DATE: 2/23/99

SHEET: 1 OF 1





Item Number	Title	Part Number	Quantity
1	BUCKET SADDLE PIVOT COLLAR	116107	2
2	BUCKET SADDLE PIVOT PIN	PI30204FC	2
3	BUCKET SADDLE WELDMENT	102178	1
4	COTTER PIN 5/16 X 4	FA020564	2
5	HEX NUT 5/16-18 USS STOVERLOCK	NUS05U	1
6	SLOTTED NUT 1-1/4 UNC GR5	NUB20U	1
7	HEX BOLT 5/16-18 X 2-1/4 UNC GR5	BL305036U518	1
8	HEX BOLT 1-1/4-7 X 7-3/4 GR8	BLI20124U87	1

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TITLE: BUCKET SADDLE ASSEMBLY

PART NUMBER: 22 11 01 003 0 / 102129

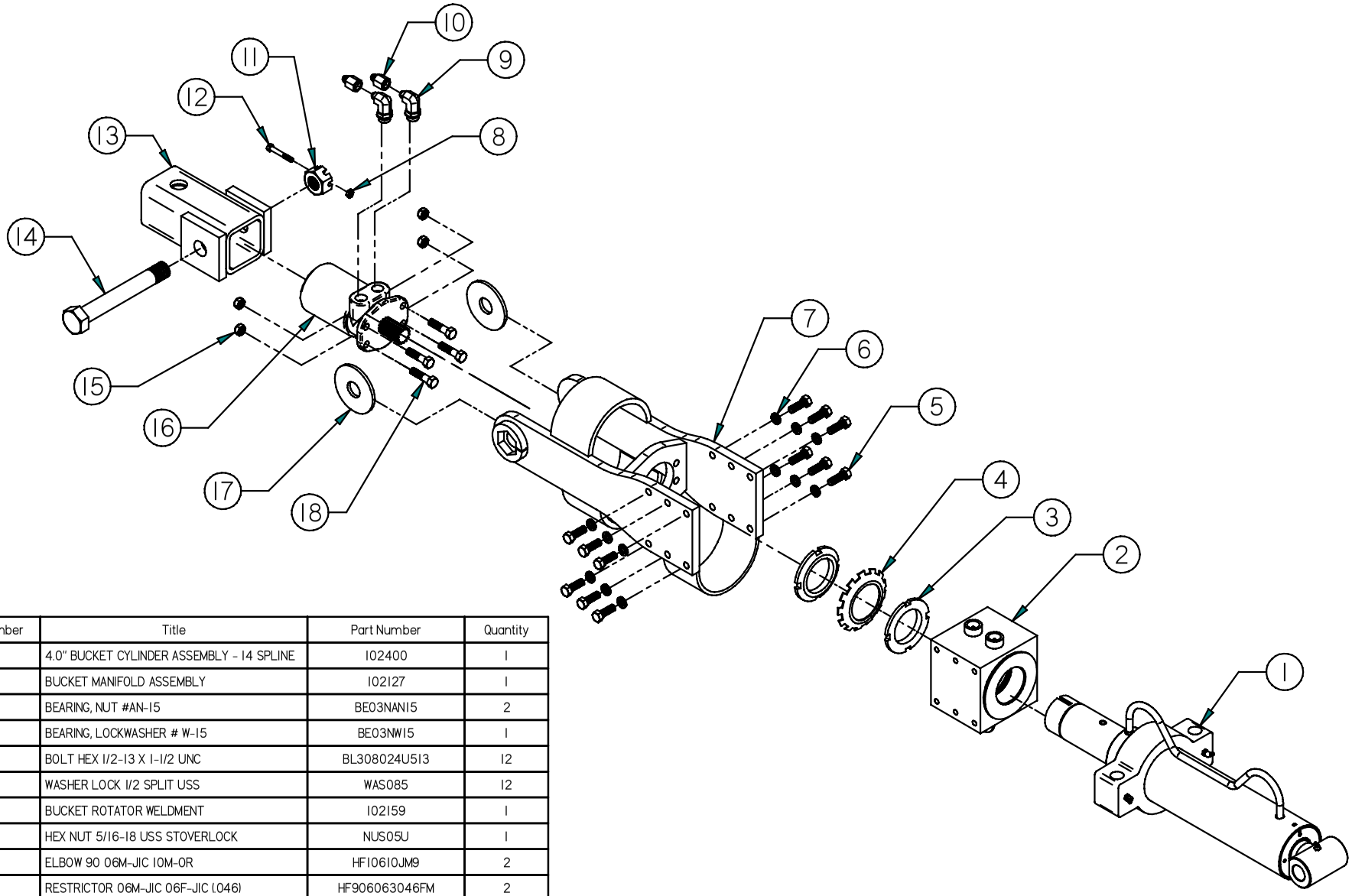
SCALE: N/A

DRAWN BY: E.B.

APPROVED BY:

DATE: 11/13/2000

SHEET: 1 OF 1



Item Number	Title	Part Number	Quantity
1	4.0" BUCKET CYLINDER ASSEMBLY - 14 SPLINE	102400	1
2	BUCKET MANIFOLD ASSEMBLY	102127	1
3	BEARING, NUT #AN-15	BE03NAN15	2
4	BEARING, LOCKWASHER # W-15	BE03NW15	1
5	BOLT HEX 1/2-13 X 1-1/2 UNC	BL308024U513	12
6	WASHER LOCK 1/2 SPLIT USS	WAS085	12
7	BUCKET ROTATOR WELDMENT	102159	1
8	HEX NUT 5/16-18 USS STOVERLOCK	NUS05U	1
9	ELBOW 90 06M-JIC 10M-OR	HF10610JM9	2
10	RESTRICTOR 06M-JIC 06F-JIC (.046)	HF906063046FM	2
11	SLOTTED NUT 1-1/4 UNC GR5	NUB20U	1
12	HEX BOLT 5/16-18 X 2-1/4 UNC GR5	BL305036U518	1
13	GIMBAL WELDMENT 4 X 5-1/2	102119	1
14	BOLT - ROTATOR GIMBAL, TRASH	102158	1
15	HEX NUT 1/2-13 STOVERLOCK	NUS08U	4
16	HYD MOTOR RE-32-08-05-0 (14 SPLINE)	HC03004	1
17	BUCKET BRAKE WASHER 4 X 1-5/16 X 1/4	WAF642004	2
18	BOLT HEX 1/2-13 X 2 UNC GR8	BL108032U813	4

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TITLE: BUCKET CYLINDER ROTATOR ASSEMBLY (RE MOTOR)

PART NUMBER:			SCALE:
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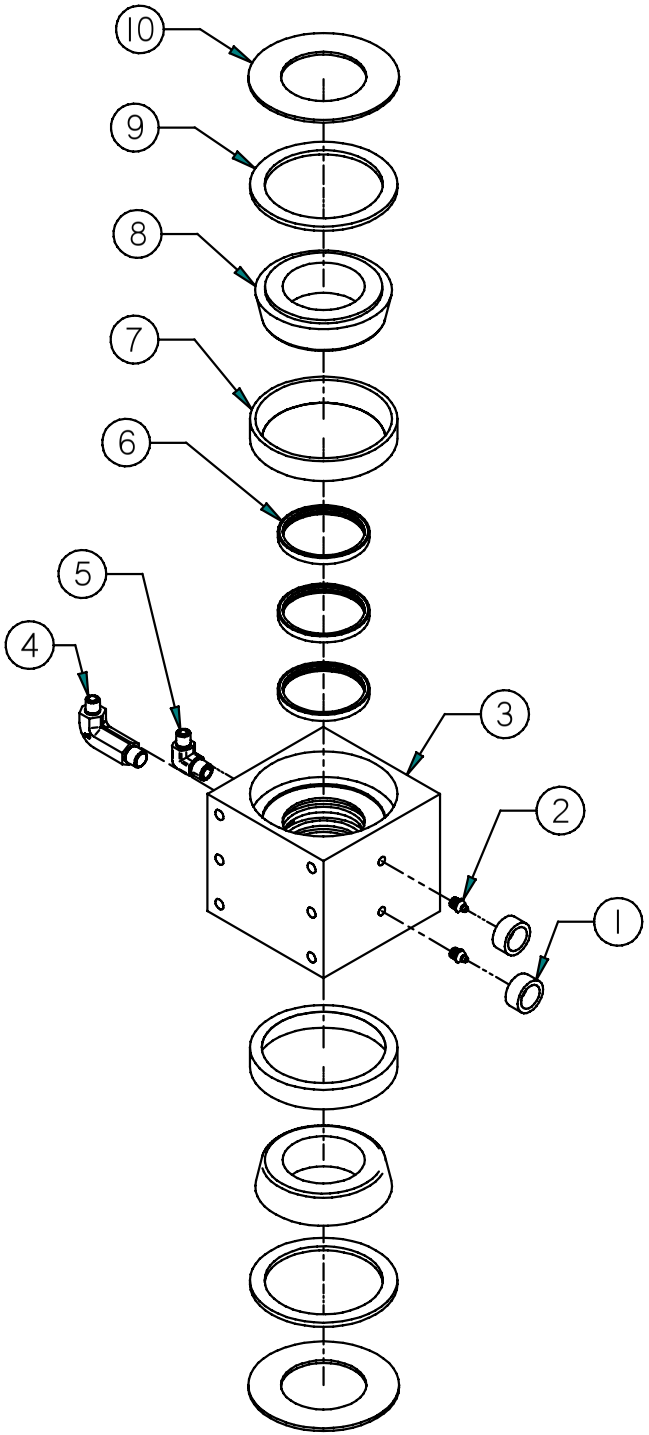
DRAWN BY:	APPROVED BY:	DATE:	SHEET:
Olvera, J.		11/9/2005	1 OF 1



Item Number	Title	Part Number	Quantity
1	BUCKET MANIFOLD GREASE FITTING COVER	102151	2
2	GREASE NIPPLE 1/8" STRAIGHT	HF2002S	2
3	BUCKET MANIFOLD HOUSING	102443	1
4	ELBOW 90 06M-JIC 06M-JIC LONG	HF806069ML	1
5	ELBOW 90 06M-JIC 06M-JIC	HF806069M	1
6	SEAL KIT TR-035	HPKTR035	3
7	BEARING RACE #493	BE03N493	2
8	TIMKEN ROLLER BEARING #495-A	BE03N495A	2
9	ROTATOR FELT WASHER	WAL866902	2
10	CONTINUOUS ROTATOR THRUST WASHER	WAF885002	2

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

TITLE: BUCKET MANIFOLD ASSEMBLY

PART NUMBER: 21 11 09 002 2 / 102127

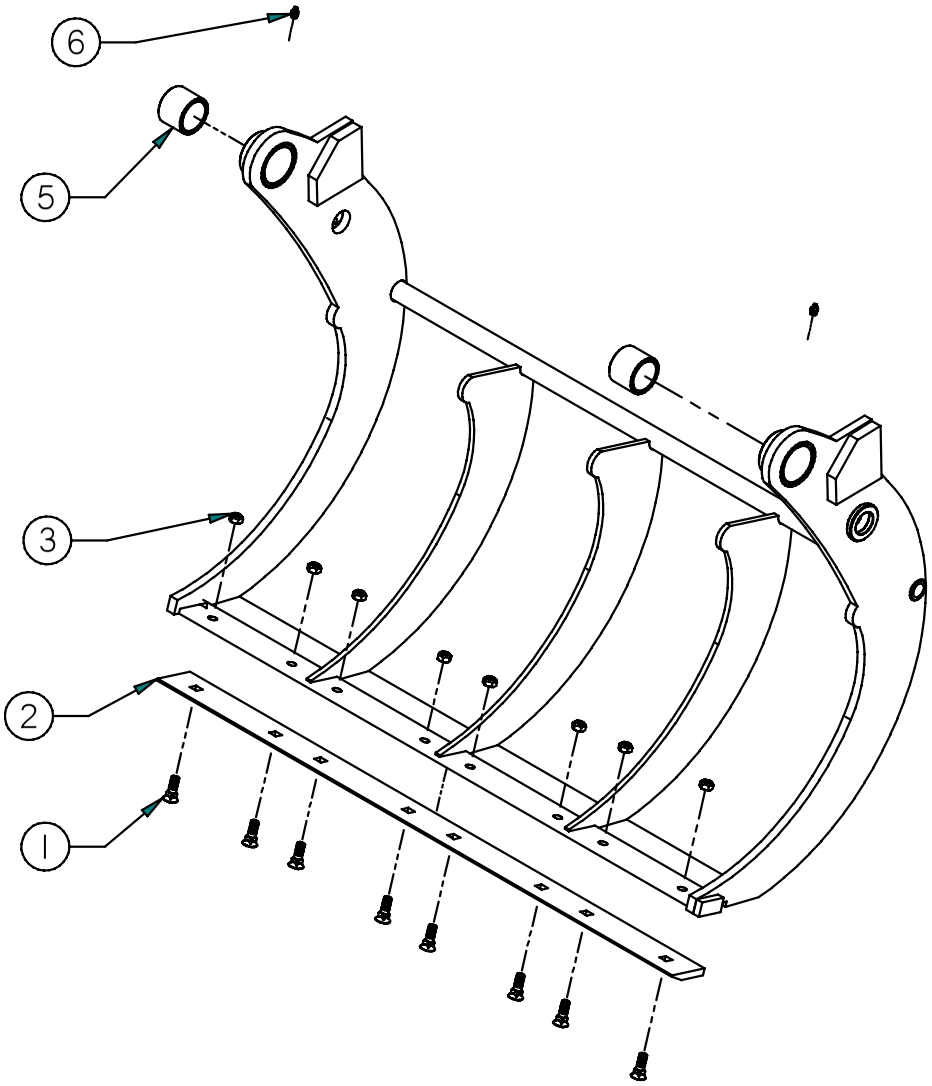
SCALE: N/A

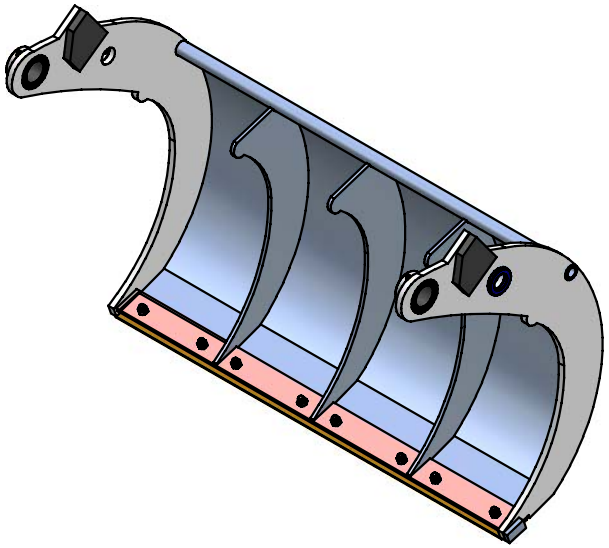
DRAWN BY: E. B.

APPROVED BY:

DATE: 12/14/2000

SHEET: 1 OF 1





Item Number	Title	Part Number	Quantity
1	FLAT HEAD PLOW BOLT 1/2-13 X 1-1/2 #3 G5	BL6080243513	8
2	BUCKET, TL JAW BLADE	102171	1
3	HEX NUT 1/2-13 STOVERLOCK	NUS08U	8
5	BUSHING, 2 1/2 X 2 X 2 NYLATRON	BU502008	2
6	GREASE NIPPLE 1/8" STRAIGHT	HF2002S	2

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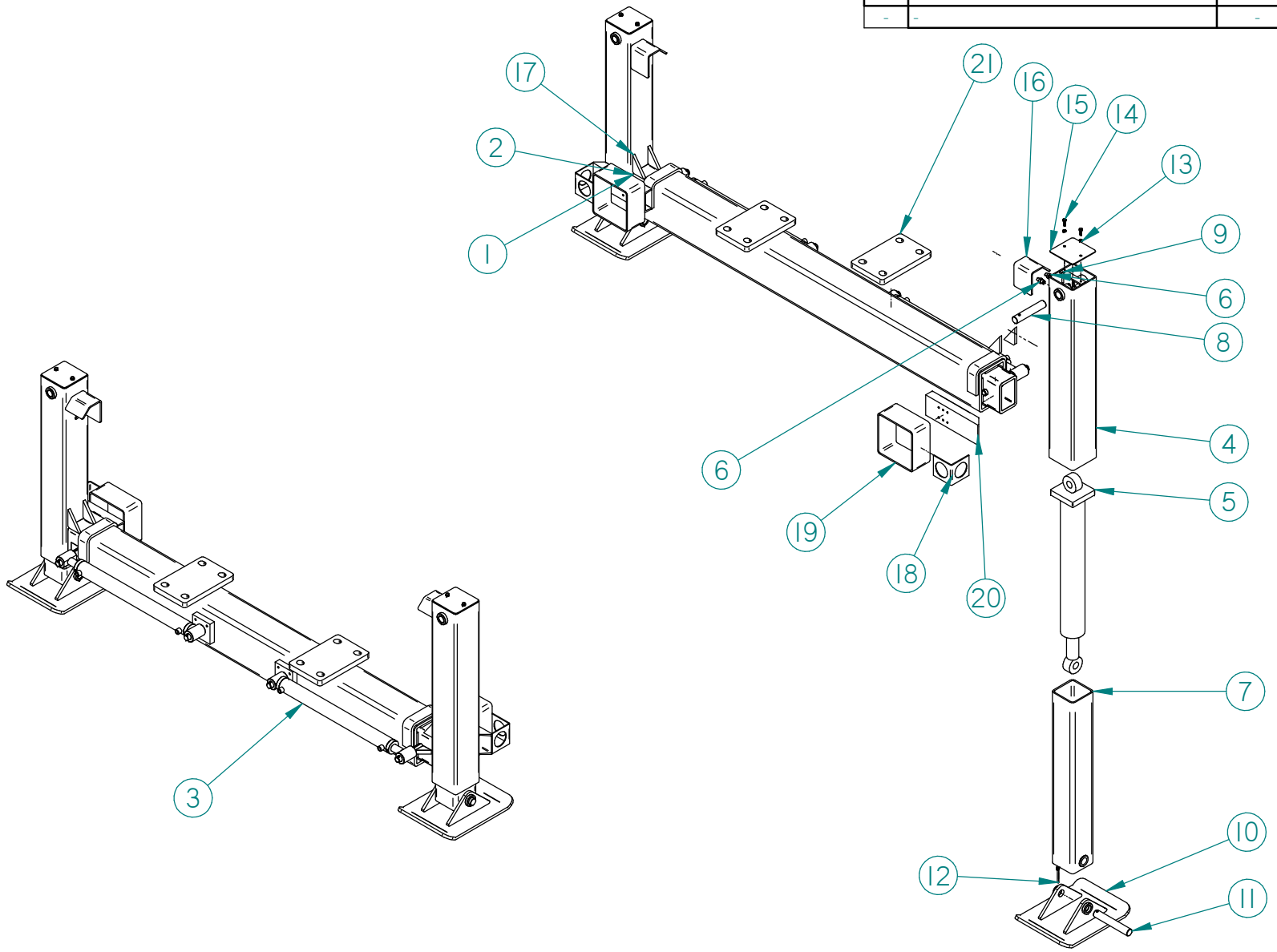
TITLE: TRASH BUCKET JAW ASSEMBLY			
PART NUMBER: 22 11 01 002 5 / 102132			SCALE: N/A
DRAWN BY: E.B.	APPROVED BY:	DATE: 8/28/00	SHEET: 1 OF 1

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 PLACE(S)

LIGHTNING LOADER PETERSEN INDUSTRIES

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

TITLE: RL AND RS OUTRIGGERS ASSEMBLY

PART NUMBER:	SCALE:
22 06 04 014 0	1:25

DRAWN BY:	APPROVED BY:	DATE:	SHEET:
SWB		06/27/2017	1 OF 2

Item #	Title	Document #	MACOLA	Qty
1	OUTRIGGER, #3A HORIZONTAL LEG ASSEMBLY	22 06 04 001 1	113102	1
2	OUTRIGGER, #3A INNER HORIZONTAL LEG WELDMENT	22 06 04 005 0	113114	2
3	OUTRIGGER IN/OUT CYLINDER	CY05001	CY05001	2
4	OUTRIGGER LEG OUTER TUB	22 06 04 007 1	113104	2
5	CYLINDER, OUTRIGGER, VERTICAL LEG EXTENSION RL AND RS	CY05006	CY05006	2
6	HYDRAULIC, FITTING #6-6 MALE CONNECTOR	HF060606	HF060606	4
7	OUTRIGGER, LEG INNER TUB	22 06 04 006 1	113105	2
8	PIN, VERTICAL CYLINDER, BASE END	42 06 04 021 1	PII8106F1	2
9	ROLL PIN, .3125 X 2	FA040532	FA040532	2
10	OUTRIGGER FOOT ASSEMBLY	22 06 04 008 1	113106	2
11	PIN - OUTRIGGER LEG CYLINDER LOWER	42 06 04 010 2	PII8122F	2
12	COTTER PIN, 5/16 X 3	FA020548	FA020548	2
13	WASHER LOCK 5/16 SPLIT	WAS055	WAS055	4
14	HEX BOLT 5/16-18 X 1 USS G5	BL305016U518	BL305016U518	4
15	OUTRIGGER VERTICAL LEG COVER PLATE	42 06 04 023 0	113107	2
16	RL, OUTRIGGER, HOSE GUARD	42 06 04 018 0	113178	2
17	OUTRIGGER, #3 TUBE GUSSET, VERTICAL TO HORIZONTAL	42 06 04 028 0	113124	4
18	RS, REAR RED MARKER LIGHT BRACKET	42 05 19 010 0	119337	2
19	TAIL LIGHT PROTECTOR	41 08 04 051 0	125379	2
20	BODY, RS REAR LIGHT SUPPORT	42 05 19 009 0	119264	2
21	RL, OUTRIGGER 3 MOUNTING PLATE	42 06 04 020 3	113179	2

PETERSEN INDUSTRIES INC.
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TEL: (863) 676-1493 FAX: (863) 676-6844

TITLE: RL AND RS OUTRIGGERS ASSEMBLY

PART NUMBER: 22 06 04 014 0

SCALE: NA

DRAWN BY: SWB

APPROVED BY:

DATE: 06/27/2017

SHEET: 2 OF 2

Dia. No.		Part Name	Order By This Part No.
MISCELLANEOUS PARTS - REAR STEER			
		Seal Kit - SS40 Hydraulic Actuator	HPK430308SI
		Seal Kit - SAI	N/A
		Pump, Tandem	HC02005
		3-Way Valve, 1/2" Port	VA0312160R
		4-Way Valve, 1/2" Port	VA0412160R
		Seal Kit, 5" Lift Cylinder	HPKTH10329B
		Seal Kit, 5" Tip Cylinder	HPKTH10329B
		Seal Kit, 3" Vertical Outrigger Cylinder, Round	HPK12044X
		Seal Kit, 3" Vertical Outrigger Cylinder, Square	HPKTH16195
		Seal Kit, 2" Horizontal Outrigger Cylinder	HPKTH10154
		Seal Kit, 4" Bucket Cylinder	HPKTH10140
		Suction Filter	OT01002
		Suction Filter Element	OT02003
		Return Filter	OT03004
		Return Filter Element	OT03005
		Seal Kit, 2" Tip Extension Cylinder	HPKTH12570

NOTIFICATION OF TRANSFER OF OWNERSHIP

TO: Petersen Industries, Inc.
4000 SR 60 West
Lake Wales, FL 33859
Telephone: 800/930-5623, Ext. 256

FROM: _____

_____

_____

This is to advise you that our organization is no longer the owner of the Petersen loader listed below. We have listed the name and address of the subsequent owner. Would you please change your records accordingly.

Petersen Loader Serial Number: _____

VIN: _____

Name and Address of New Owner:

_____

_____

_____

Phone:_____

Contact: _____

BY: _____
(Name)

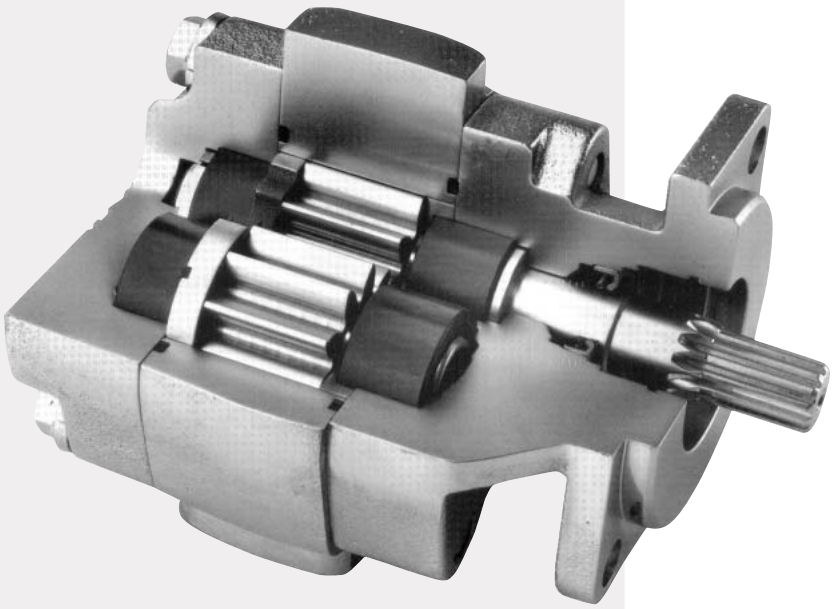
Date: _____

Service Manual HY09-SM020/US

Service Manual
PGP020™

Effective: July 1, 2006
Supersedes: All Others

PGP020 Series



The Parker Hannifin Gear Pump Division Assures:

- Consistent quality
- Technical innovation
- Premier customer service

Worldwide Sales and Service

Parker operates sales and service centers in major industrial areas worldwide. Call 1-800-C-PARKER for more information, or for a synopsis of the Gear Pump Division, contact a Parker representative.

The Gear Pump Division's ability to engineer specialty products for unique applications has kept us at the forefront of technology, and ensured our position as the industry leader. Our success has come from providing a quality product with excellent sales and service support.

We manufacture hydraulic components for a wide range of industries including:

- Construction
- Refuse/dump truck
- Material handling
- Forestry
- Agriculture
- Industrial

WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

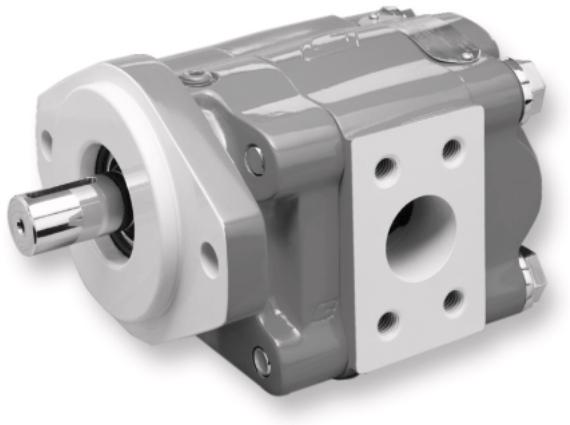
The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the "Offer of Sale".

Parker Hannifin Corporation
Gear Pump Division
Youngstown, Ohio USA

Index



Parker Hannifin Corporation
Gear Pump Division
Youngstown, Ohio USA

Pump Service Instructions

General Instructions

These service instructions will:

- familiarize you with the PGP020 series roller bearing pump, its component parts and their relative position;
- show the proper methods for disassembly and assembly;
- advise appropriate care and use of this hydraulic pump.

Following these instructions can prolong the life of your pump, and help achieve optimal performance.

We recommend you read this entire set of instructions before attempting any repair.

To ensure damage did not occur during shipment, check all replacement parts closely before installation.

Cleanliness

Dirt is the enemy of any hydraulic system, so keeping equipment clean is a crucial maintenance requirement.

MAKE SURE YOU DISASSEMBLE AND ASSEMBLE YOUR HYDRAULIC EQUIPMENT IN A CLEAN AREA.

TO PREVENT PERSONAL INJURY, SAFETY GLASSES AND STEEL TOE SHOES SHOULD BE WORN.

Cautions

1) Parker replacement parts are made to original equipment standards. For assured quality of material and workmanship and for compatibility in assembly, **USE ONLY GENUINE Parker REPLACEMENT PARTS**.

2) If it becomes necessary to pry apart castings, use extreme caution not to mar or damage the machined surfaces. Excessive force while prying can result in misalignment and seriously damage parts.

3) If component assembly is difficult, do not force items and never employ an iron hammer. For a complete list of recommended tools, see Page 11.

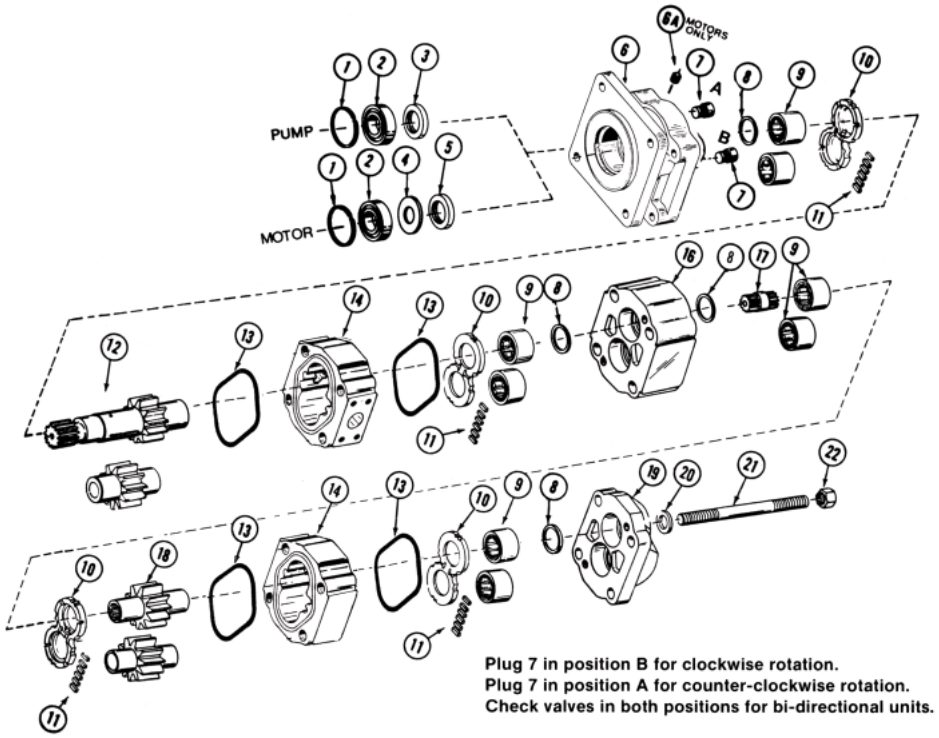
4) Gears are closely matched, therefore, they must be kept together as a set when removed from the unit. Handle with care to avoid damage to the journals, faces and teeth.

5) Never hammer roller bearings into bores. Use only an arbor press or other suitable tool.

6) It is important to airblast all parts and wipe them with a clean, lint-free cloth before assembly.

Exploded View and Parts List

Item No.	Description	Required	Ten Digit No. (TDN)
1	Snap Ring	1	391-2686-063
2	Outboard Bearing	1	391-0381-040
	Outboard Spacer	1	391-3383-069
3	Lip Seal (pump)	1	391-2883-058
4	Seal Retainer (motor)	1	391-3381-040
5	Lip Seal (motor)	1	391-2883-119
6	Shaft End Cover	1	308-50XX-XXX
6A	Drain Plug (motor)	1	391-2282-XXX
7	Check Assemblies for Motors & Bi-Rotational Pumps	2	391-3681-001
	Plugs (pumps only)	1	391-2286-004
8	Ring Seals (per gear section)	2	391-2585-006
9	Roller Bearings (per gear section)	4	391-0381-906
10	Thrust plates (motor) (per gear section)	2	391-2185-913
	Thrust plates (pump) (per gear section)	2	391-2185-913
11	Pocket Seals (per gear section)	1 strip	391-2882-022 (Viton) 391-2882-051 (Buna)
12	Drive Shaft Gear Set	1 Set	312-29XX-XXX
13	Gasket Seals (per gear section)	2	391-2884-019
14	Gear Housing	1	308-8XXX-XXX
16	Bearing Carrier	-	308-7XXX-XXX
17	Connecting Shaft	-	312-1133-001
18	Gear Set	set	312-28XX-XXX
19	Port End Cover	1	308-3XXX-XXX
20	Washers	4	391-3782-146
21	Cap Screws (single units)	4	391-1401-XXX
	Studs (multiple units)	4	391-1425-XXX
22	Nuts (multiple units)	4	391-1451-115



Plug 7 in position B for clockwise rotation.
Plug 7 in position A for counter-clockwise rotation.
Check valves in both positions for bi-directional units.

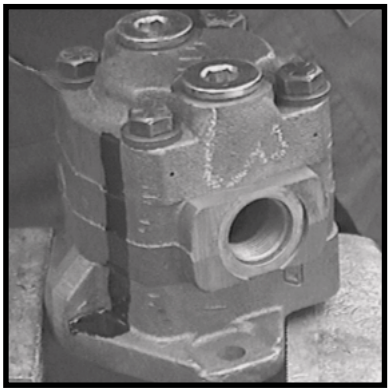
Parker Hannifin Corporation
Gear Pump Division
Youngstown, Ohio USA

PGP020™ Disassembly Instructions

STEP 1

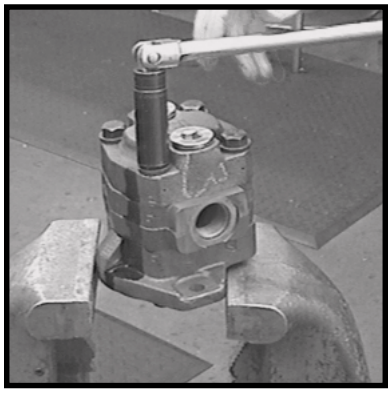
Place the pump in a vise with the drive shaft pointing down. Clamp unit on the sides of the mounting flange. Do not clamp on the pilot diameter as it may damage the sealing surface.

STEP 2



Mark each casting in the assembly with machinist ink or a prick punch to orient the castings, so that the unit can be reassembled later in the proper position.

STEP 3



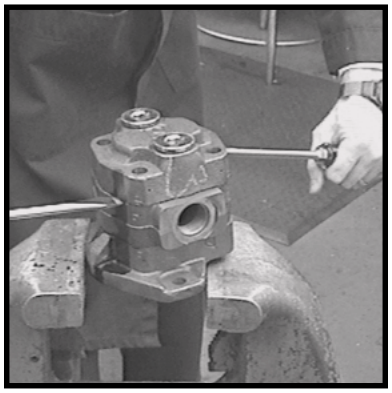
Loosen and remove the four, cap screws and washers with a 13/16” socket and wrench.

STEP 4.1

Remove the port end cover subassembly using steps 4.1 - 4.3:

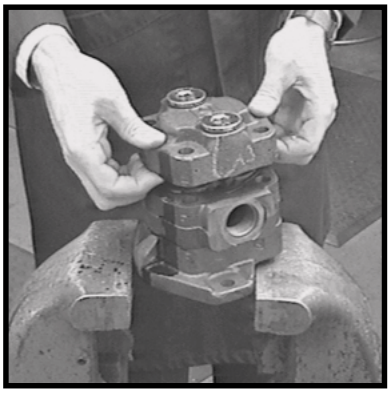
4.1 Place the point of a large, screwdriver or a chisel on the parting line between the port end cover casting and the gear housing casting. Gently tap until a slight separation between the castings is detected.

STEP 4.2



4.2 Place two, large, flat-bladed screwdrivers into the separation notches and pry up the port end cover until loose. BE CAREFUL not to nick, mar or scratch the machined casting faces.

STEP 4.3



4.3 Lift off the port end cover subassembly.

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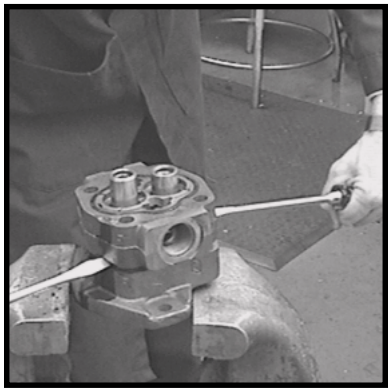
Youngstown, Ohio USA

PGP020™ Disassembly Instructions

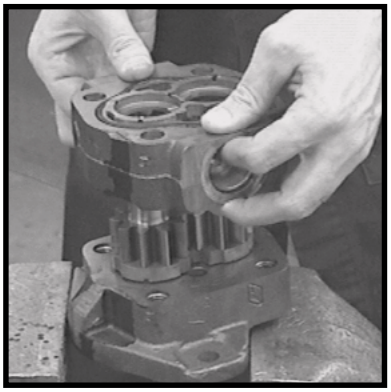
STEP 5.1



Remove the gear housing subassembly using steps 5.1 - 5.3:

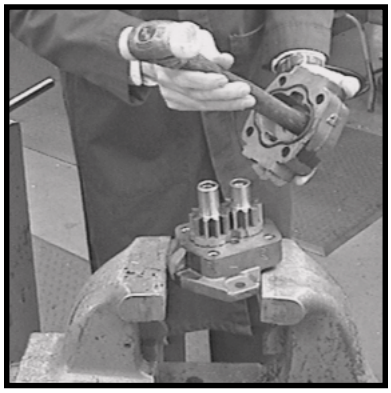
5.1 Place the two, large, flat-bladed screwdrivers into the separation notches and pry up the gear housing until loose. BE CAREFUL not to nick, mar or scratch the machined casting faces.

STEP 5.2



5.2 Lift off the gear housing subassembly.

STEP 5.3

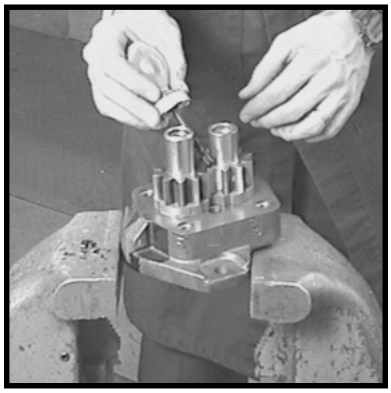


5.3 Remove the thrust plate from the housing. It may be necessary to gently tap the thrust plate with the handle of a hammer or screwdriver. Be careful not to bend or score the thrust plate. Remove and discard the six, small, rubber pocket seals from the thrust plate.

STEP 6

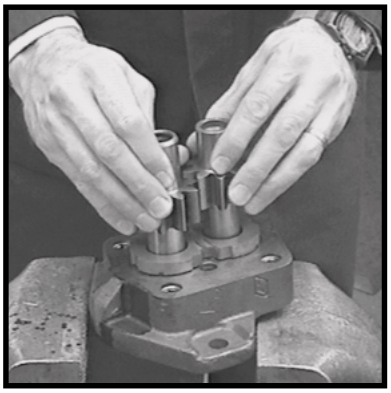
Remove and discard the rubber section seals from the top and bottom gear housing faces.

STEP 7



Wipe the gear face surface dry with a clean, lint-free cloth. Mark the teeth of the drive and driven gears (the gear set) at their mesh point with machinist ink or quick-dry marker. This is to index the gear set for proper orientation during reassembly.

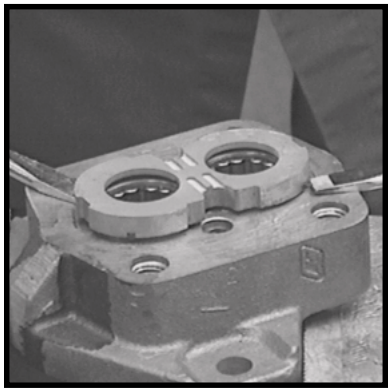
STEP 8



Remove the idler gear and the gear shaft. Keep them together as they are a matched set. Handle with care to avoid damage to the journals, faces and teeth.

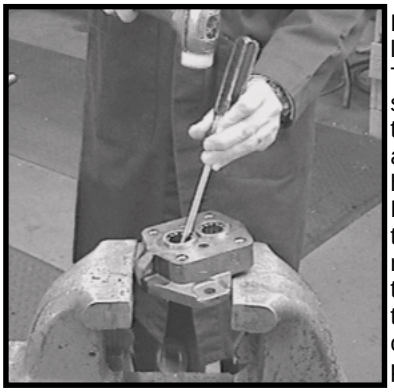
PGP020™ Disassembly Instructions

STEP 9



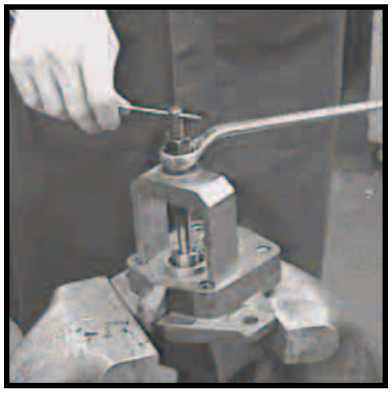
Gently lift off the thrust plate. Be careful not to bend or score the plate and mating surface of the casting. Remove and discard the six, rubber pocket seals from the back of the thrust plate.

STEP 10



Remove lip seal. Place a lip seal removal tool (see Tool List P11) or a screwdriver tip against the inside of the lip seal and tap the screwdriver handle with a hammer. Be careful not to damage the roller bearing or the ring seal with screwdriver tip. Note: If bearings are to be removed from the casting, then step can be performed after Step 12.

STEP 11

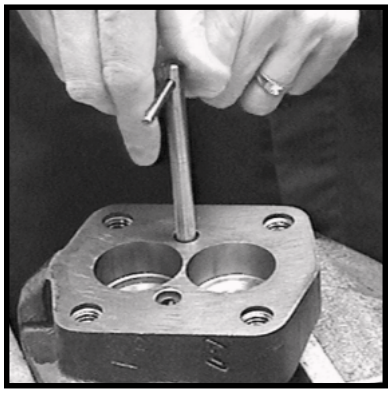


Use a bearing puller to remove the roller bearings. Note: This step is optional depending on the condition of the bearings.

STEP 12

Remove the bronze ring seal from the gear shaft bearing bore in the shaft end cover and the port end cover castings.

STEP 13



Remove the checks from the shaft end cover casting with the check tool (see Tool List on Page 11).

CAUTION: Failure to follow the recommended assembly instructions can result in poor performance or failure of the product. Product should be thoroughly tested to ensure proper operation before the unit is put back into service.

Parker Hannifin Corporation
Gear Pump Division
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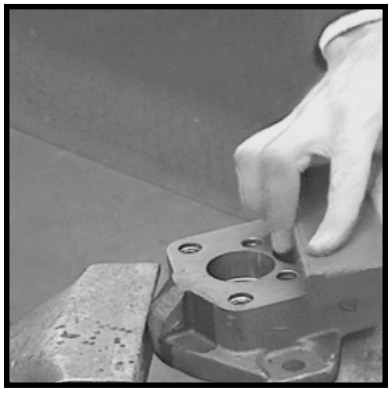
PGP020™ Assembly Instructions

STEP 1

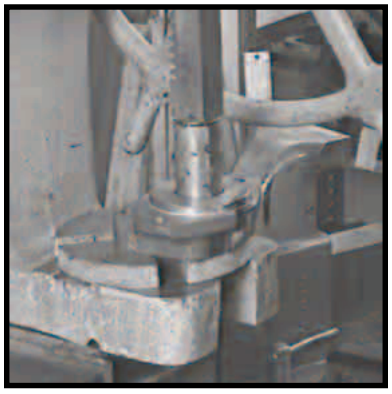


Stone all machined casting surfaces with a medium-grit carborundum stone. If the bearings were removed, deburr the bearing bore using a deburring tool. Rinse all parts in a solvent fluid. Air blast all parts and wipe them with a clean, lint-free cloth before starting the assembly.

STEP 2

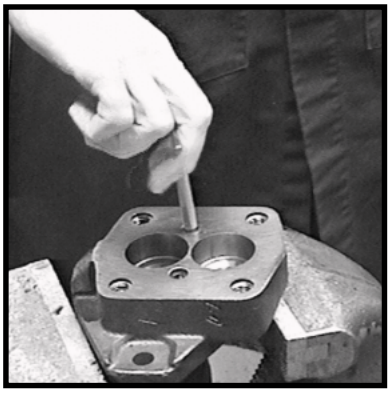
Coat the outside diameter of the lip seal with Permatex Aviation Form-A-Gasket No.3 Non-Hardening Sealant or equivalent. Be careful not to get Permatex on the inner lip of the seal as it will cause a lip seal leak.

STEP 3



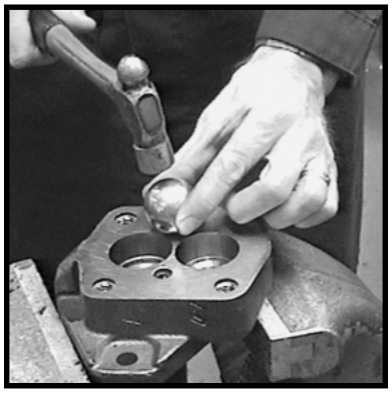
Place the shaft end cover on an arbor press with the pilot facing up. Place lip seal with the shoulder of the seal up, at the top of the seal bore. Press the lip seal into the shaft end cover with a lip seal installation bar (see Tool List on Page 11). The seal should be pressed in so it is flush with the recessed face in the shaft end cover casting.

STEP 4



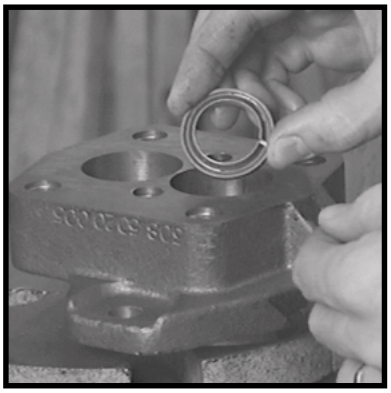
Apply Loctite® No.262 to the threaded check holes in the shaft end casting. Install the checks in the shaft end cover using the check tool (see Tool List on Page 11). The checks must bottom out in the casting.

STEP 5



Peen over the check holes in the shaft end cover with a 1½" steel ball and a hammer. This will insure the checks do not back out of the check holes during operation.

STEP 6



If the ring seals were removed from the shaft end cover or the port end cover, they should be replaced at this time. Place the ring seals in the bottom of the drive gear bearing bores. Be sure that the flat side of the ring seal is against the mating surface in the casting. Ring seals are placed behind the drive gear bearings only.

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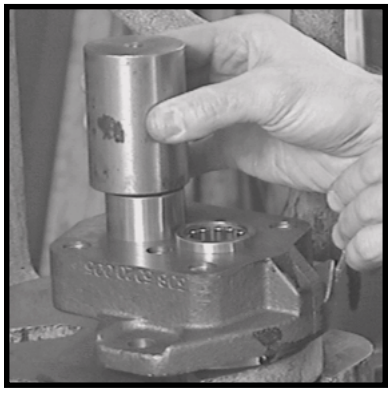
Youngstown, Ohio USA

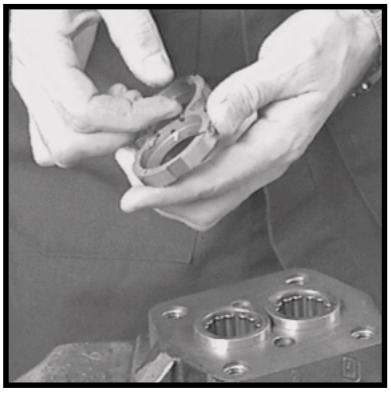
PGP020™ Assembly Instructions

STEP 7



Install the bearings in the shaft end cover and the port end cover. Use an arbor press to press the bearings into the bottom of the bearing bores. Check to make sure the ring seals move freely under the drive gear bearings.

STEP 8

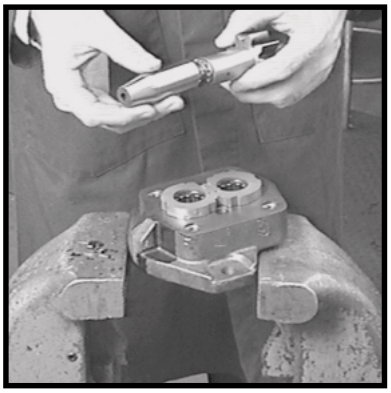


Grip the shaft end cover in a vise with the mounting face down. Cut two, pocket seals 7/32” long from the pocket seal strip. Grease the seals well and insert them into the center slots on the reverse side of the thrust plate.

STEP 9

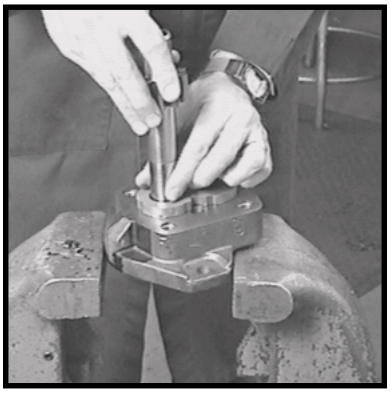
With the pocket seals facing down, place thrust plate over the bearings. Tap the thrust plate with a soft-faced hammer around the edge until the thrust plate is about 1/32” from the casting surface. Do not tap the center of the plate. Cut four pocket seals 1/4” long from the seal strip. Push a pocket seal into each of the remaining slots in the thrust plate until it touches the bearing wall. Use a razor blade to trim the exposed portion of the pocket seals. The pocket seals should be flush with the outside diameter of the plate.

STEP 10



Insert the external drive end of the gear shaft into the shaft installation sleeve (see Tool List on Page 11). Lightly grease the gear shaft and sleeve.

STEP 11



Insert the gear shaft with the shaft installation sleeve into the shaft end cover using a twisting motion. Be careful not to damage the lip seal. Push down carefully until the gear rests against the thrust plate face. Remove the shaft installation sleeve. Insert the idler gear into its bearing bore, matching the orientation marks on the teeth of the gear set as previously marked (see Step 7 on Page 5).

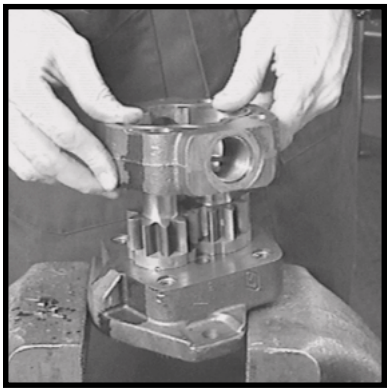
Parker Hannifin Corporation
Gear Pump Division
Youngstown, Ohio USA

PGP020™ Assembly Instructions

STEP 12

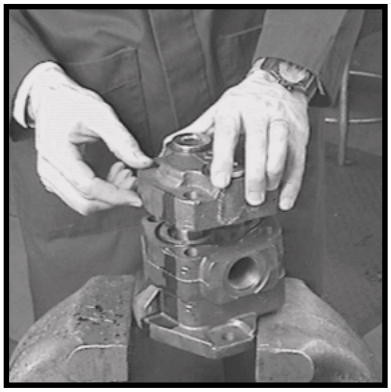
Apply a light coating of grease to the new section seals and place them into the machined grooves on both sides of the gear housing. Check the section seals for proper fit.

STEP 13



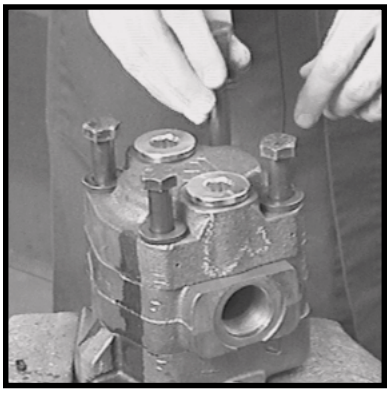
Locate the orientation mark on the gear housing and line it up with the mark on the shaft end cover. Slide the gear housing over gear set. Make sure the gear housing rests tightly against shaft end cover. Be careful not to pinch the section seal. Squirt clean, hydraulic oil over the gear shaft and the idler gear to provide initial lubrication when the pump is started.

STEP 14



Insert the pocket seals into the thrust plate and install onto the port end cover following the previous instructions in steps 8 & 9. Then place port end cover over the gear journals. The orientation mark on port end cover must line up with the mark on the gear housing. Also, be sure bearing bore holding the ring seal goes over the drive gear journal. Apply pressure to the casting with your hand or tap lightly with a soft-faced hammer until the port end cover rests tightly against the gear housing.

STEP 15

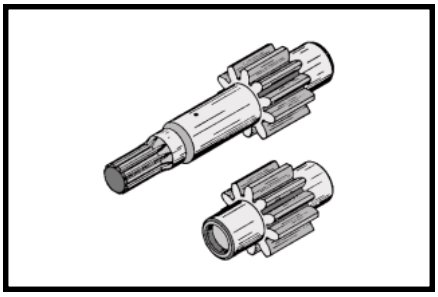


Thread the four, cap screws with the washers into the shaft end cover and tighten them in a cross-corner pattern. Rotate the gear shaft of the pump with a 6” wrench to make certain there is no binding in the pump.

STEP 16

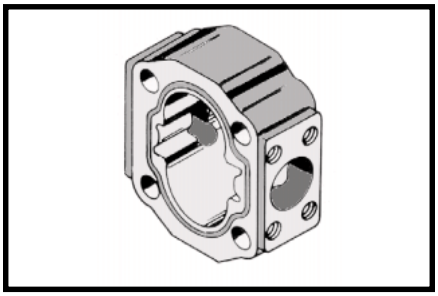
After the cap screws are tightened, make certain there is no internal binding of the gear set by rotating the gear shaft, then tighten the cap screws in a cross-corner pattern to a final torque of 2400 in. lbs. (200 ft. lbs.).

Part Replacement Guide



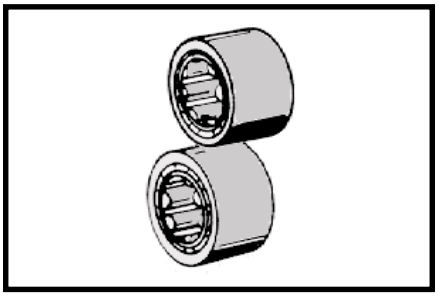
If the gear set contains any of the following defects, it should be replaced:

- Wear on the hubs or in the seal areas detectable by touch or in excess of .002”.
- Score marks, grooves or burrs on the outside diameter of the teeth.
- Nicks, grooves or fretting of the teeth surfaces.
- Wear or damage to the drive spline, key or keyway.

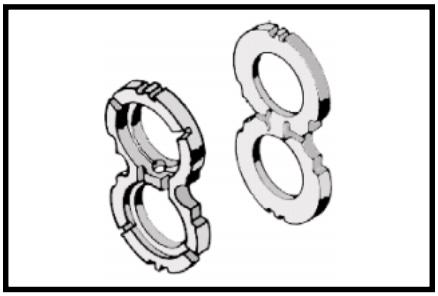


Wear in excess of .005” cut-out necessitates replacement of the gear housing. Place a straight-edge across the bore. If you can slip a .005” feeler gage in the cut-out area, replace the gear housing.

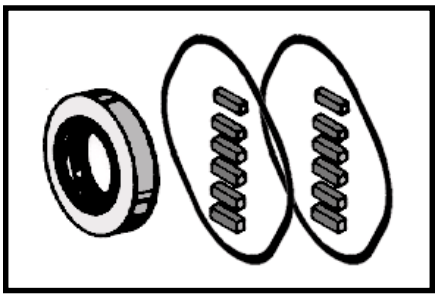
Where the cut-out is moderate, .005” or less, the gear housing is still in good condition. If the housing has equal size ports or no ports, the housing may be rotated 180°, exchanging ports, and reused.



If the gears are replaced, then the bearings must be replaced also. Bearings should fit into the bores with a light press fit.



Any scratches, grooves, erosion or pitting on the thrust plate face, which is the area that comes in contact with the gear faces, requires the replacement of the thrust plates.



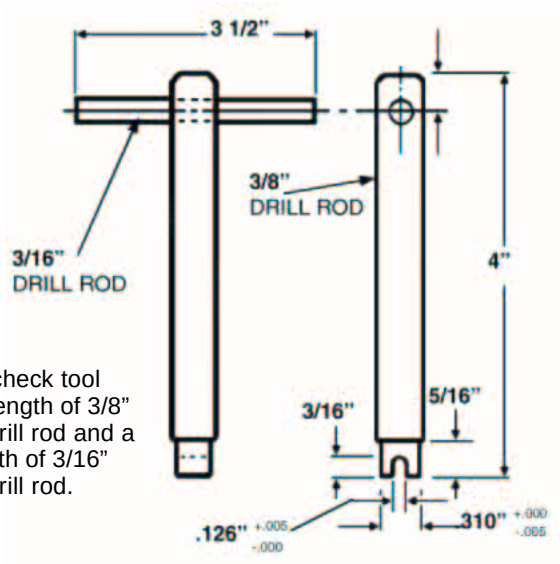
Replace all rubber and polymer seals whenever reassembling the pump. This includes lip seal, pocket seal strips and section seals.

Tool List

- Arbor press
- Permanent marker or an awl
- Bearing puller (Owatonna Tool Co. MD-956 or equivalent)
- Clean, lint-free cloths
- Deburring tool (a file with the cutting teeth ground off)
- Machinist hammer
- Soft-faced hammer
- Permatex Aviation Form-A-Gasket No.3 Non-hardening Sealant or equivalent
- Medium-grit carborundum stone
- Hydraulic oil and grease
- Prick punch or machinists ink
- Sharp, razor blade
- Scale (1/32” or 1/64” graduations)
- Feeler gauges
- Small, flat-head screwdriver
- Large, flat-headed screwdrivers
- Torque wrench
- 13/16” socket
- 1½” steel ball
- Loctite® No.262
- Vise with a 6” minimum open spread
- Lip seal installation bar (1 3/4” X 2”)
- Shaft installation sleeve (steel)
- Lip seal removal tool
- Check tool
- 6” wrench

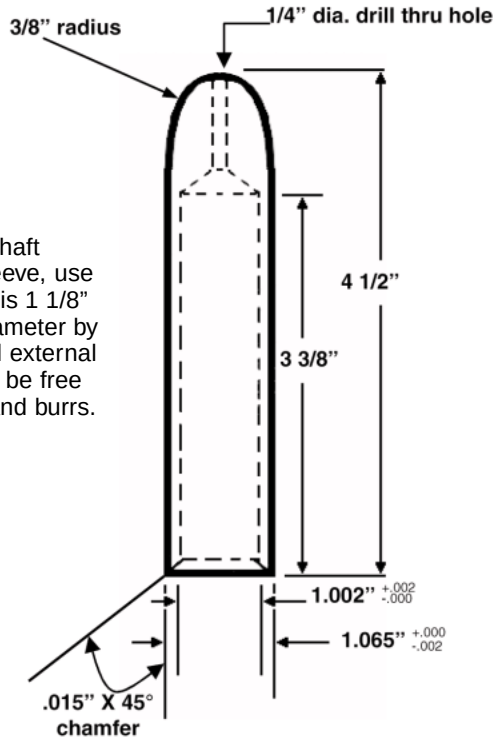
Check Tool

Make the check tool from a 4” length of 3/8” diameter drill rod and a 3 1/2” length of 3/16” diameter drill rod.



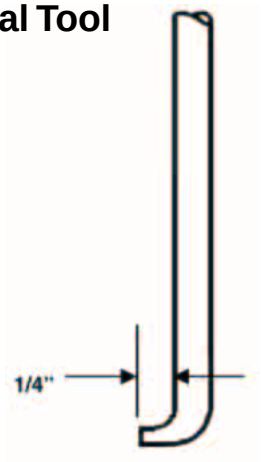
Shaft Installation Sleeve (Steel)

To make the shaft installation sleeve, use bar stock that is 1 1/8” or 1 1/4” in diameter by 4 5/8” long. All external surfaces must be free of scratches and burrs.



Lip Seal Removal Tool

A seal removal tool can be made easily from an old screwdriver. Heat the tip and bend as shown. Grind off the tip to fit the notch behind the lip seal.



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Youngstown, Ohio USA

Lubrication and Oil Recommendations

All parts, with the exception of the outboard bearing, are lubricated by the hydraulic oil in the circuit. Particular attention must be paid to keep the oil in the system clean. Whenever there is a pump or motor failure and there is reason to suspect that metal particles may be in the system, the oil must be drained, the entire system flushed clean and any filter screens thoroughly cleaned or replaced. New oil should be supplied for the entire system. Oil suitable and recommended for use in circuits involving Commercial Hydraulics' pumps and motors should meet the following specifications:

Viscosity:
- 50 SSU minimum @ operating temperature
  7500 SSU maximum @ starting temperature
- 150 to 225 SSU @ 100º F (37.8º C) (generally)
  44 to 48 SSU @ 210º F (98.9º C) (generally)

Approximate SSU at . . .		
Oil Grade	**100 F (37. 8° C)**	**210° F (98.9° C)**
SAE 10	150	43
SAE 20	330	51

Viscosity Index: 90 minimum

Aniline Point: 175 minimum

Recommended Additives: Foam Depressant
Rust and Oxidation Inhibitors

Other Desirable Characteristics:
- Stability of physical and chemical characteristics.
- High demulsibility (low emulsibility) for separation of water, air and contaminants.
- Resistant to the formation of gums, sludges, acids, tars and varnishes.
- High lubricity and film strength.

General Recommendations:

A good-quality, hydraulic oil conforming to the characteristics listed above is essential to the satisfactory performance and long life of any hydraulic system.

Oil should be changed on a regular schedule in accordance with the equipment manufacturer's recommendations, and the system should be periodically flushed.

Oil temperature in reservoir must not exceed 200º F (93.3º C) with a maximum temperature of 180º F (82.2º C) recommended. Higher temperatures will result in rapid oil deterioration.

Reservoir capacity should equal in gallons the pump output in gpm or the total gpm of all pumps where there is more than one in the system.

Normal Temperatures: 0º F (-18º C) to 100º F (37.8º C) Ambient
100º F (37.8º C) to 180º F (82.2º C) System
Be sure your oil is suitable for the temperatures you expect to encounter.

Cold Weather Operation:

Oils for use in cold weather should have a viscosity that does not exceed 7500 SSU at the minimum start-up temperature. A pour point of at least 20º F below start-up temperature is recommended. Start-up procedures should allow for a gradual warm-up until the oil reaches a reasonably fluid state.

Lubrication and Oil Recommendations

The Use of Other Oils:

- Diesel Fuel or Kerosene (Coal Oil): These are sometimes used as dilutants for cold weather operations but are not recommended as they are not sufficiently refined products.
- Fire-Resistant Fluids: Of the several different types, only the inverted emulsion types may be used without switching to a special seal, packing, gasket, hose, etc., compositions. Their use may substantially reduce pump life. Experience indicates that the use of fire-resistant fluids can be disastrous unless certain precautions are followed. **DO NOT USE ANY FIRE RESISTANT FLUIDS OR NON-PETROLEUM OILS WITHOUT CONSULTING OUR PRODUCT SUPPORT DEPARTMENT.**
- These suggestions are intended as a guide only. **OBTAIN YOUR FINAL OIL RECOMMENDATIONS FROM YOUR OIL SUPPLIER.**

Recommended Start-up Procedure for New or Rebuilt Pump or Motor

Before installing a new or a rebuilt pump or motor, back out the main relief valve until the spring tension on the adjusting screw is relaxed. This will avoid the possibility of immediate damage to the replacement unit in the event that the relief valve setting had been increased beyond the recommended operating pressure prior to removing the old unit.

Before connecting any lines to the pump or to the motor, fill all ports with clean oil to provide initial lubrication. This is particularly important when the unit is located above the oil reservoir.

After connecting the lines and mounting the replacement unit, operate the pump or the motor for at least two minutes at zero pressure at the lowest possible rpm. During this break-in period, the unit should run free and not develop an excessive amount of heat. If the unit operates properly, the speed and the pressure can then be increased to the normal operating settings.

Reset the main relief valve to its proper setting while the pump is running at the maximum operating engine (motor) speed for the vehicle.

ALWAYS USE AN ACCURATE GAGE WHEN ADJUSTING THE RELIEF VALVE PRESSURE SETTING.

Test Procedure Recommended

Be sure there is an adequate supply of oil for the pump; at least one gallon of oil for each gpm of pump capacity.

If one section of a tandem pump is being tested, make sure all other sections which are not being tested, are adequately supplied with oil. If any of the other sections run dry or if plugs are left in ports, serious and permanent damage will result.

The oil should be a good-quality, hydraulic oil rated at 150 SSU at 100º F with the oil temperature held at 120º F plus or minus 5º F. (Test procedures are described in detail in SAE handbooks; see Hydraulic Power Pump Test Procedure SAE J745c.)

The inlet line must be an adequate size with no more than 5" mercury vacuum adjacent to the pump inlet. As a rule, the inlet line must provide an inlet flow velocity that is not in excess of 8 feet per second.

Hot oil drawn into a cold pump could cause it to seize. Switching the pump on and off in short bursts could help prevent seizure.

Operate the pump at least two minutes at zero pressure and at moderate speed (not over 1500 rpm).

If pump becomes hot to touch, it is binding and could seize. This rarely occurs, but if it does, the pump will have to be disassembled and be rebuilt, taking extra care to remove burrs and to assure freedom from binding.

Gradually increase the pressure on a pump until the desired test pressure has been reached. This should take about five minutes.

Delivery should run close to the rated, catalog performance figures which are averaged from the testing of several pumps. A 5% lower reading may be used as a rated minimum, if new or relatively new parts have been used. When rebuilding the pump, reuse only those parts which appear to be in satisfactory condition. A 10% or 15% lower reading is permitted for the rebuilt pump, depending upon the performance expected from the equipment. Your individual experience is the best guide.

Many repairmen measure the output at the normal operating speed, at zero pressure, then at 1000 psi (or the operating pressure of the equipment), and allow a volume decrease approximating the listing below. The table listing shows the drop off in flow that can be expected at various operating pressures for a pump rebuilt with used parts.

PGP020 pumps are generally tested to 2000 psi.

GPM Delivery at 1800rpm	**GPM Drop Off At...**			
100 psi	**1000 psi/70 bar**	**1500 psi/105 bar**	**2000 psi/140 bar**	**2500 psi/175 bar**
5 - 14	2 to 3	21/2 - 31/2	3 to 4	31/2 - 41/2
15 - 25	21/2 to 31/2	3 - 4	31/2 to 5	4 - 51/2
26 - 50	3 to 4	4 - 5	4 to 6	41/2 - 61/2

At test speeds other than 1800 rpm, gpm delivery will vary almost proportionately, but the same (drop-off) figures should be used.

Be sure to run the pump in the direction for which it was designed and built. Driving the pump in the wrong direction will build up pressure behind the lip seal, causing damage to the pump and necessitating its replacement.

Since it is rarely feasible to test motors on dynamometers, the practical procedure is to test them as pumps, running complete testing procedures in each direction.

After completing the testing procedures, the pump is ready for installation and immediate duty operation on equipment. It must be reinforced that to prevent seizure, hot oil must not be drawn into a cold pump.

Instructions for Change of Rotation

The PGP020 series pump can be assembled for clockwise (CW), counterclockwise (CCW), or bi-rotational operation. The direction of rotation is determined by looking at the pump with the drive shaft facing you and the idler gear down. If the pump has unequal porting and the larger port is on the left side, then the pump is set up for CW operation. If the larger port is on the right side of the pump, then it is set up for CCW operation. Bi-rotational pumps that can be run in either direction, will have equal size ports.

DISASSEMBLY

1 If the unit has a keyed shaft, remove the key.

2) Clamp the unit in a vise on the outside diameter of the mounting flange with the drive shaft down.

3) Remove the cap screws on single units or hex nuts and studs on multiple units.

4) Remove the port (rear) end cover.

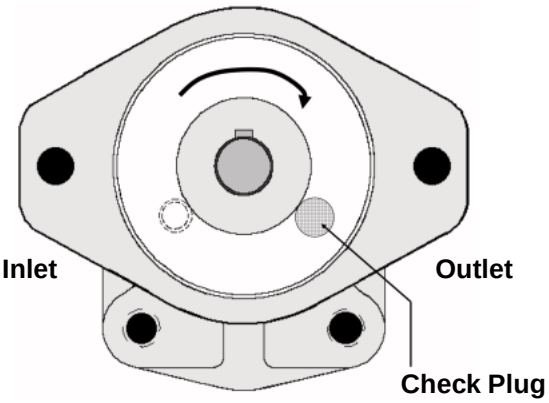
5) Remove the gear housing and the gear set. Keep the gears together because they are a matched set.

   For multiple units: Remove the bearing carrier and the next gear housing and gear set until all that remains is the shaft end cover.

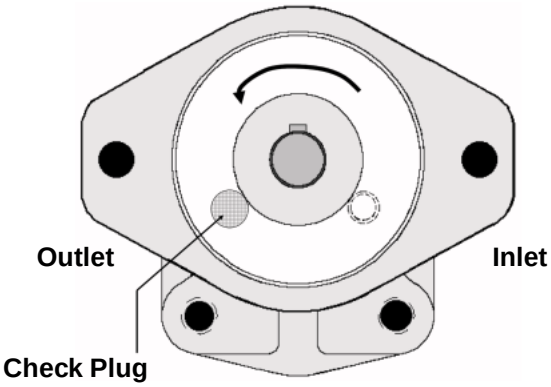
Note: Care should be taken to avoid losing the small, rubber pocket seals fitted in the thrust plate pocket seal grooves.

6) Lift the thrust plate off of the shaft end cover. Do not lose the pocket seals.

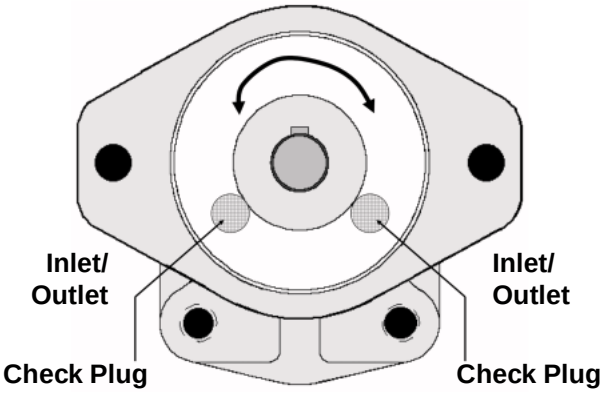
7) Remove the check plug in the shaft end cover with a screwdriver and then install it in the opposite drain hole. Screw in tightly and stake the check plug with a punch at both edges of the screwdriver slot. For a single-rotation pump, the check plug is always located on the high pressure (outlet) side of the pump. If the shaft end cover has two check plugs, the pump is already set-up for double rotation.



CW



CCW



Bi-rotational

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Gear Pump Division
Youngstown, Ohio USA

ASSEMBLY

1) Before assembling the unit, stone off the machined surfaces. This will remove any nicks or burrs that may have resulted from the disassembly.

2) Air blast all parts and wipe them with a clean, lint-free cloth before starting the assembly.

Note: PGP020 series thrust plates are designed for bi-rotational operation and do not have to be rotated.

3) Place one thrust plate with pocket seals over the shaft end cover bearings. Be sure the pocket seals are properly fitted in the thrust plate pocket seal grooves.

4) Insert the gear shaft with the shaft installation sleeve into the shaft end cover with a twisting motion. Insert the idler gear.

5) Rotate the gear housing 180° and carefully slide over the gear set. Make sure both section seals stay in the seal grooves during assembly. Keep the drive gear and idler gear in the same gear bore as previously marked.

6) For multiple units: Place the thrust plates with pocket seals over the bearings on both sides of the bearing carrier. Be sure the pocket seals are properly fitted in the thrust plate pocket seal grooves.

7) Rotate the bearing carrier 180° and install over the gear set and gear housing.

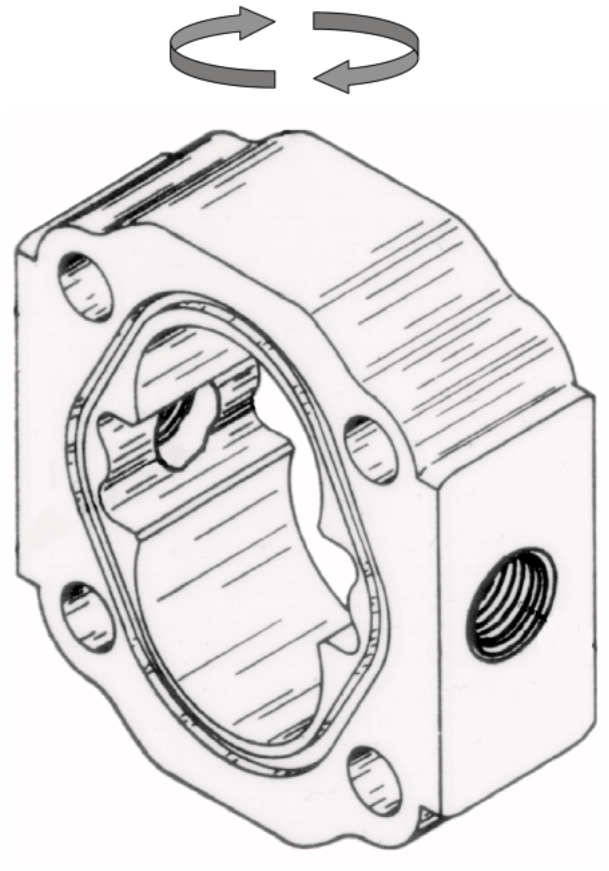
Note: If the bearing carrier has an L-shaped porting configuration, it cannot be used. A new bearing carrier will have to be machined with the proper configuration.

8) Insert the gears into the bearing carrier.

9) Rotate the gear housing 180° and carefully slide over the gear set. Make sure both section seals stay in the seal grooves during assembly.

10) Place the port end cover with the thrust plate over the gear set. If the port end cover is ported, it must be inverted.

11) Insert the cap screws or the studs into the unit and torque in a cross-corner pattern to 2400 in. lbs (200 ft. lbs).



Gear Housing

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Notes

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Notes

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2. Payment: Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

3. Delivery: Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. Warranty: Seller warrants that the item sold hereunder shall be free from defects in material or workmanship for a period of 547 days from the date of shipment to Buyer, or 3,000 hours of use, whichever expires first. **THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED.**

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6. Changes, Reschedules and Cancellations: Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. 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 items sold hereunder, 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.

8. 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, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are 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. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. 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 Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (hereinafter '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 an item sold pursuant to this contract 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 an item sold hereunder 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 said item, replace or modify said time so as to make it noninfringing, or offer to accept return of said item 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 items 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 item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of 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, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

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Parker Hannifin Corporation

About Parker Hannifin Corporation

Parker Hannifin is a leading global motion-control company dedicated to delivering premier customer service. A Fortune 500 corporation listed on the New York Stock Exchange (PH), our components and systems comprise over 1,400 product lines that control motion in some 1,000 industrial and aerospace markets. Parker is the only manufacturer to offer its customers a choice of hydraulic, pneumatic, and electromechanical motion-control solutions. Our Company has the largest distribution network in its field, with over 7,500 distributors serving more than 350,000 customers worldwide.

Parker's Charter

To be a leading worldwide manufacturer of components and systems for the builders and users of durable goods. More specifically, we will design, market and manufacture products controlling motion, flow and pressure. We will achieve profitable growth through premier customer service.

Product Information

North American customers seeking product information, the location of a nearby distributor, or repair services will receive prompt attention by calling the Parker Product Information Center at our toll-free number: 1-800-C-PARKER (1-800-272-7537). In the UK, a similar service is available by calling 0500-103-203.

The Aerospace Group is a leader in the development, design, manufacture and servicing of control systems and components for aerospace and related high-technology markets, while achieving growth through premier customer service.

The Climate & Industrial Controls Group designs, manufactures and markets system-control and fluid-handling components and systems to refrigeration, air-conditioning and industrial customers worldwide.

The Fluid Connectors Group designs, manufactures and markets rigid and flexible connectors, and associated products used in pneumatic and fluid systems.

The Seal Group designs, manufactures and distributes industrial and commercial sealing devices and related products by providing superior quality and total customer satisfaction.

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Service Manual
HY09-SM020/US
2.5M, 07/06, T&M

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WHITE HYDRAULICS

PI444002
9/01

Service Instructions For The
RE (500/501) Series

For Use With
Seal Kit 500444002

*****USE EXPLODED VIEW ON BACK FOR REFERENCE*****

A) Remove all shaft related components from shaft (27) (i.e. keys, wire rings, nuts). To aid in reassembly of the motor, make a "V" shaped set of lines from the endcover (24) to the housing using either paint or a marker. With shaft facing down, secure motor in vise by clamping on to housing (15).

B) Loosen and remove seven bolts (26) holding motor assembly together. Remove endcover (24) and endcover seal (10). Discard seal. Remove balance plate (22) taking care not to drop the three steel balls (23) located in the three holes in the balance plate (22). Remove rotor assembly (21), manifold (19), drive link spacer (20) (NOTE: Some motors do not use spacer), drive link (18) and thrust bearing (17). Remove body seals (9) from rotor assembly (21) and housing seal (8) from housing (15) and discard seals. (NOTE: Compare old housing seal (8) to the two housing seals included in kit to determine which one to use.)

C) Gently tap shaft (27) upward from housing (15) and remove through rear of housing and lay aside. Remove housing (15) from vise and turn over. Pry dust seal (1) from housing. Push the seal carrier (11), thrust washer (12) and thrust bearing (13) down until they make contact with the roller bearing (14) located in the housing bore.

D) Remove wire ring (2), steel backup shim (3) and high pressure seal (4) from inner bore groove with a small screwdriver Lift our seal carrier (11), thrust washer (12) and thrust bearing (13) from the housing bore. Using a small screwdriver, carefully pry shaft seal (7), backup seal (6), and metal backup shim (5) from seal carrier (11) and discard. Lay seal carrier (11), thrust washer (12) and thrust bearing (13) aside. (NOTE: If a new thrust washer (12) and seal carrier (11) is included in kit, old items may be discarded).

E) At this point, all parts should be cleaned in an oil-base solvent and dried using compressed air (For safety, observe all OSHA safety guidelines). All new seals should be lightly coated in clean oil prior to installation.

F) Place shaft (27) on a clean flat surface with output end facing up. Place thrust bearing (13) (NOTE: If thrust bearing has integral washer, make sure washer surface faces down.) Then thrust washer (12) on shaft (See Technical Bulletin PI444004 to determine correct thrust washer to use). Lightly coat seal area of shaft with clean oil and place plactic installation sleeve with shaft seal (7) down onto shaft covering all splines, keyways and wire ring grooves. Slide shaft seal (7) down onto shaft (27) making sure that lip on seal faces down (See Figure 1 for correct seal orientation) until it contacts thrust washer (12). Remove plastic installation sleeve. Carefully install the backup seal (6) onto the shaft (27) with the flat side up and the seal lip facing the shaft seal (7). Place the metal backup shim (5) onto the shaft and against the backup seal (6). Place the seal carrier (11) onto the shaft (large end down) and carefully press the seal carrier (11) down onto the seal assembly using an arbor press and sleeve to compress the seal into the carrier.

G) With pilot side facing up, place housing (15) on spacers to raise housing approximately .250 above work surface (NOTE: Spacers should allow shaft to contact work surface). Place shaft/seal carrier assembly into housing (15). Install high pressure seal (4) into groove in housing. Install metal backup shim (3) against high pressure seal (4) in groove in housing bore by squeezing the shim (3) between thumb and forefinger to bow shim. While maintaining bow in shim, start the shim into the groove and use a small screwdriver to push the shim into groove. Install wire ring (2) into the groove making sure that the ends are butted.

H) While holding shaft into housing, place housing/shaft assembly in vise with shaft end down. Making sure that end of drive link (18) with crowned splines goes into shaft end, install drive link (18) into shaft and tap lightly to seat the seal carrier against the wire ring (2). Place thrust bearing (17) over drive link (18). If seal carrier (11) is properly seated against wire ring (2), thrust bearing (17) will be flush with rear surface of housing.

I) Install housing seal (8) into groove in housing (15). Place manifold (19) onto housing, (15) side with only seven holes facing housing (15). Place body seals (9) in grooves in both sides of rotor (21). Place rotor (21) onto manifold (19) with side of rotor with chamfer in splines facing manifold (19).

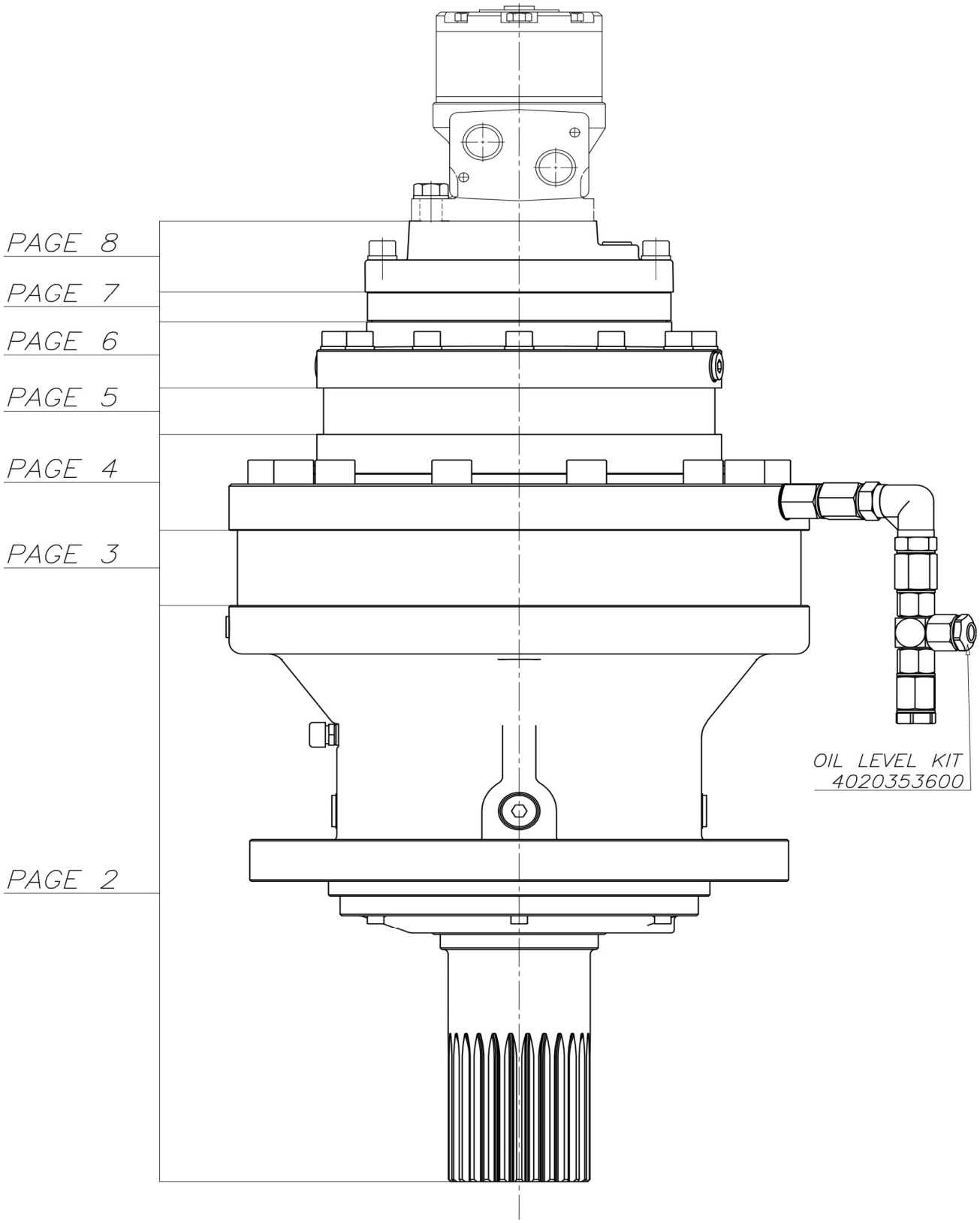
J) Install balance plate (22) onto rotor (21) making sure holes for steel balls (23) faces up. Install three steel balls (23) in holes in balance plate (22). Install endcover seal (10) into groove in endcover (24) and place endcover onto balance plate (22). Install seven assembly bolts (26) and pre-torque to 10 ft. lbs. Using the bolt torque sequence shown in Figure 2, final torque all bolts to 50 ft. lbs.

K) Remove motor from vise and place on work surface with shaft (27) facing up. Making sure that lip on seal (1) faces up, place dust seal (1) over shaft (27). Using a sleeve and a hammer, carefully drive dust seal (1) into place.

LISTA RICAMBI N°**2712-02**	N°PAGINE **08**
DATA DI COMPILAZIONE **04/02/2013**	
FIRMA : **Grosso.G**	N° RICHIESTA:**CI_0116**

GEARBOX DESCRIPTION **RE 1523 TS SP.8/16 Z26 60.5 MR**

GEARBOX CODE **91V2HS300600**



T0 ALL PETERSEN IND. INC. CUSTOMERS:

YOU HAVE PURCHASED ONE OF THE FINEST, MOST TECHNICALLY ADVANCED MACHINES IN THE INDUSTRY. YOUR MACHINE COMES EQUIPPED WITH A RED DOT A/C SYSTEM PROVIDED BY OUR PARTNERS IN BUSINESS,
" CTK CLIMATE CONTROL CORP."

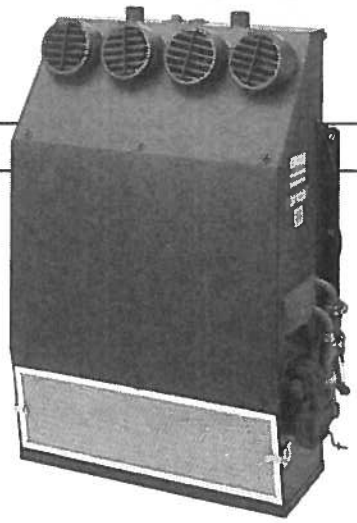
RED DOT WARRANTY WILL APPLY TO THIS A/C SYSTEM. PLEASE CONTACT
" CTK CLIMATE CONTROL CORP."
FOR ALL WARRANTY CLAIMS AT 1-407-926-8877 IN ORLANDO, FL. FOR THE LOCATION OF THE CLOSEST AUTHORIZED DEALER.

OFF ROAD

R-5075 BACKWALL

Heater/Air Conditioner Unit

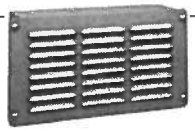
CONSTRUCTION • MINING • AGRICULTURE



Using the proven performance characteristics of the R-5045 Series, Red Dot has beefed up this unit with a heavy duty metal housing for off road applications. The R-5075 was specifically designed for application where high capacity is required. This unit offers fresh air intake and can be pressurized.

OPTIONS:

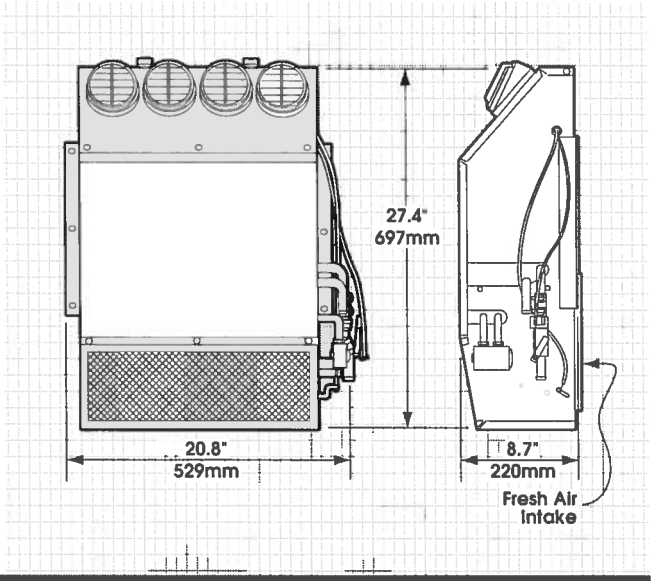
Inline Booster Pressurizers:
see Filters & Pressurizers section



Panel Filter:
78R5150
Replacement Filter:
78R5320

R-5075 SPECIFICATIONS

BTU'S	Heating – 46,000 BTU/Hr @ 150°F (13.5 kW @ 66°C) water to air differential Cooling – 33,000 BTU/Hr with 36°F (9.7 kW w/ 2.2°C) refrigerant temp. and 80°F (26.7°C) wet bulb entering air
AIR FLOW	430 CFM (730 m3/h)
WEIGHT	47 lbs. (21 kg)
MOTOR	One three-speed
CURRENT DRAW	21.8 amps @ 13.6 VDC (includes 4 amps for A/C clutch) 10.9 amps @ 27.2 VDC (includes 2 amps for A/C clutch)
MODELS	R-5075-0P (12 VDC) R-5075-0-24P (24 VDC)

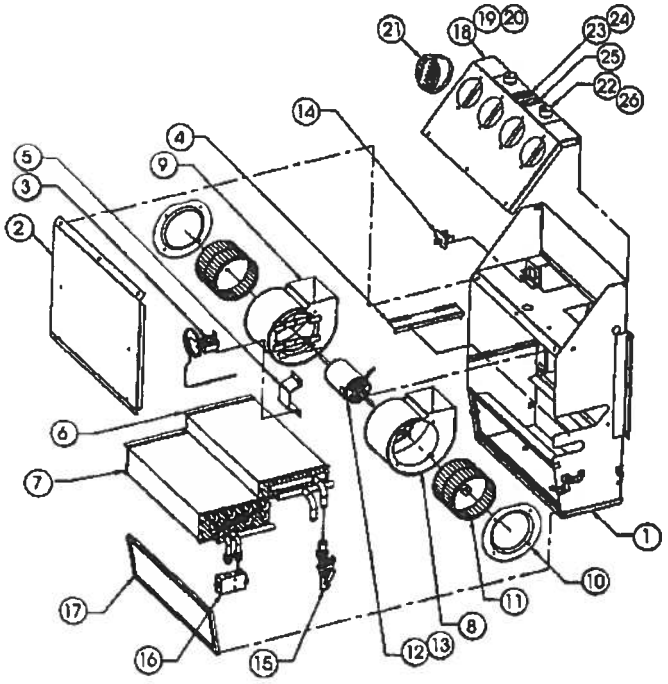


R-5075 SYSTEM ORDERING GUIDE

	R12/R-134a	NOTES
UNIT	R-5075-0P R-5075-0-24P	12 VDC 24 VDC
CONDENSER	77R0700 - Radiator Mount R-9730 - Remote Mount	See 77 Series Condensers section See Units Condensers section
INSTALLATION KITS	78R1025 78R1070	Front Mount Condenser Remote Mount Condenser
COMPRESSOR	See 75 Series Compressor section	
R12 SERVICE VALVES	75R5611 & 75R5618	Required with CCI and TECUMSEH applications.
R134A CHARGE FITTING	75R5681 & 75R5688	Required with CCI and TECUMSEH applications.
CLUTCH TECUMSEH/CCI	See 75 Series Clutch section	
COMPRESSOR MOUNT KIT	See Compressor Mount Applications section	
OPTIONS	Replacement Recirc Filter Replacement Fresh Air Intake Filter Fresh Air Intake	78R5360 78R5320 78R5150

Heater-
Air Conditioner
Model R-5075

SERVICE PARTS LIST



ITEM	NOTE	PART NO.	DESCRIPTION	CAT. NO	ITEM	NOTE	PART NO.	DESCRIPTION	CAT. NO
1		RD-3-7243-0	HOUSING ASSY.		14		RD-5-3647-0	RESISTOR-SPEED CONTROL	71R1450
2		RD-3-7244-0	COVER ASSY-CORE		15		RD-5-7760-0	VALVE-WATER CABLE OPER.	
3		RD-4427-24	THERMOSTAT	71R3100	16		RD-5-6868-0	VALVE-R-134a/R12 CMPTBL71R8300	
4		RD-3-7252-13	RETAINER-CORE		17		RD-5-8076-0	FILTER-AIR 17.5x5.5x.34 THK	
5		RD-3-3174-13	RETAINER-MOTOR		18		RD-3-7254-0	PLENUM ASSY CNTRL PNL, 12 V	
6		RD-1-0325-13	HEATER CORE ASSY	76R3500	19		RD-3-7254-1	PLENUM ASSY-CNTRL PNL, 24 V	
7		RD-2-1370-0	EVAPORATOR CORE ASSY	76R7070	20		RD-3-7255-0	WRAP ASSY-PLENUM	
8		RD-3-2547-0	BLOWER ASSY		21		RD-5-5223-2	AIR DIFFUSER ASSY	
9		RD-3-2547-1	BLOWER ASSY		22		RD-5-8152-27.8	ROTARY ACTUATOR ASSY	
10		RD-3-2592-0	ENTRY RING		23		RD-5-7183-1	SWITCH-MODE OFF-ON-ON 12V	
11		RD-3-2557-0	BLOWER WHEEL	73R7150	24		RD-5-7183-0	SWITCH-MODE OFF-ON-ON 24 V	
12		RD-5-5049-0	MOTOR-12 VOLT	73R4322	25		RD-5-7181-0	SWITCH-RCKR FAN ON-ON-ON	
13		RD-5-5049-24	MOTOR-24 VOLT	73R4324	26		RD-5-8075-0	KNOB-CNTRL DEEP RECES	

A. NOT SHOWN B. HTR-A/C ONLY C. HEATER ONLY

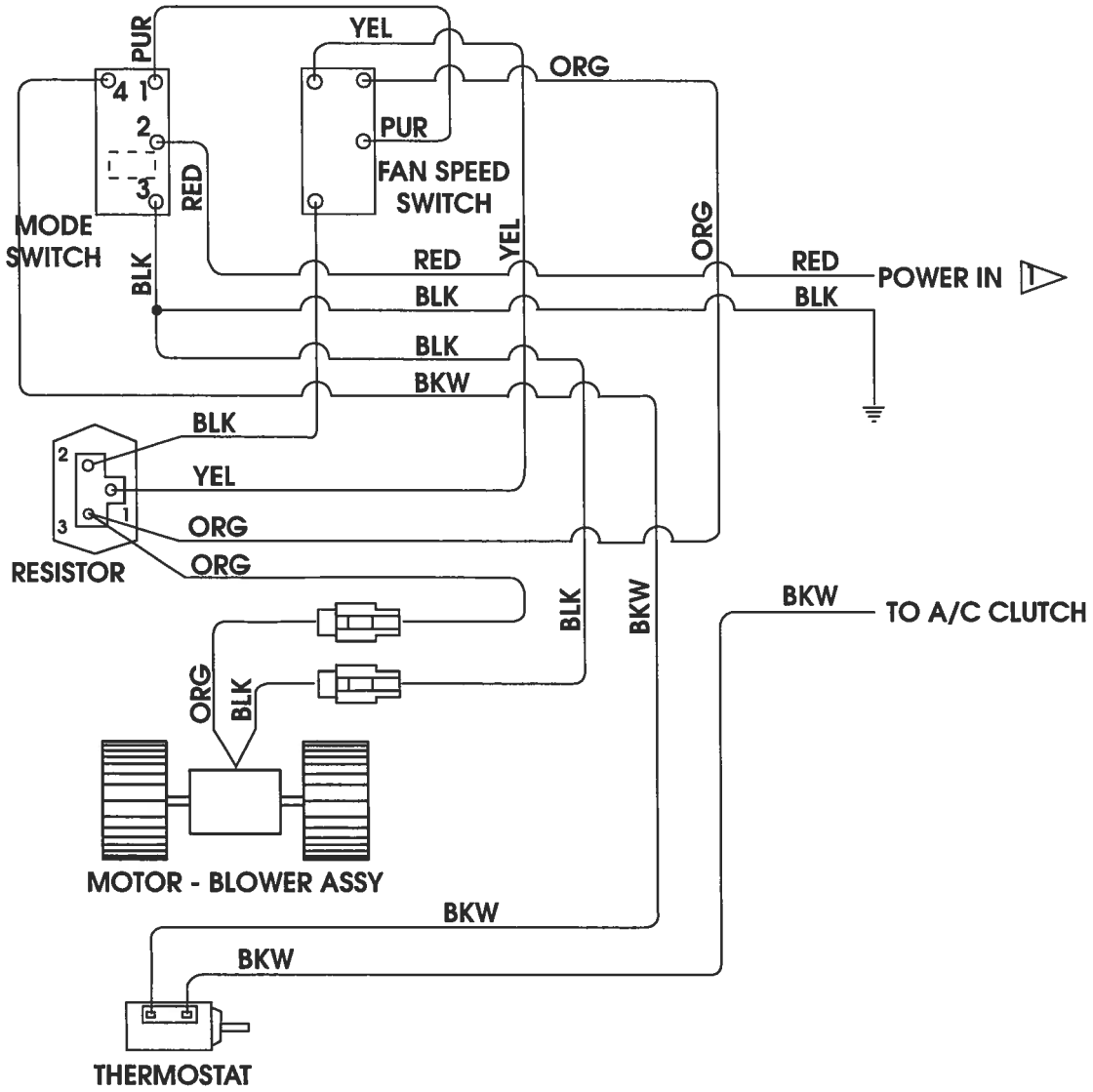
Red Dot Corporation PO Box 88790, Seattle, WA 98138 (425) 251-6897 Fax (425) 251-3934

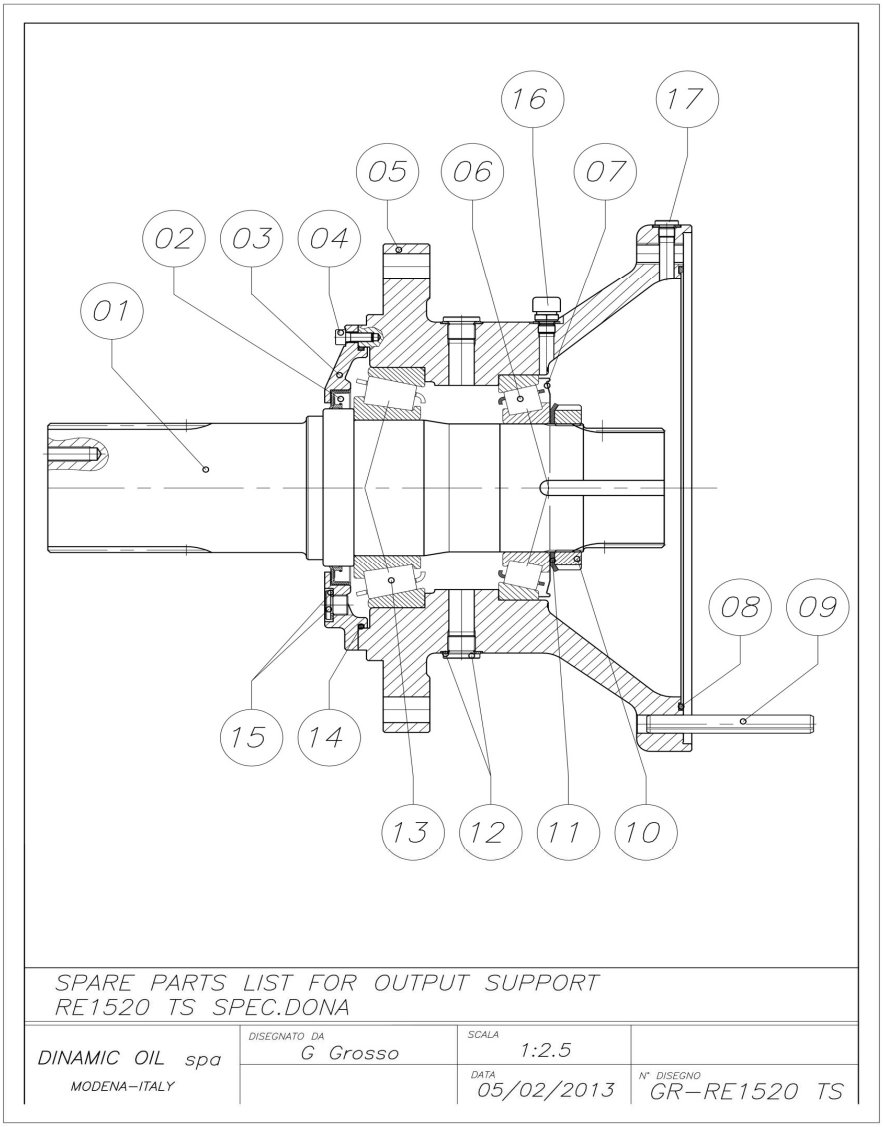
RED DOT Custom HEATERS AND AIR CONDITIONERS

R-134a Compatible

Heater-Air Conditioner
Model R-5075

ELECTRICAL SCHEMATIC



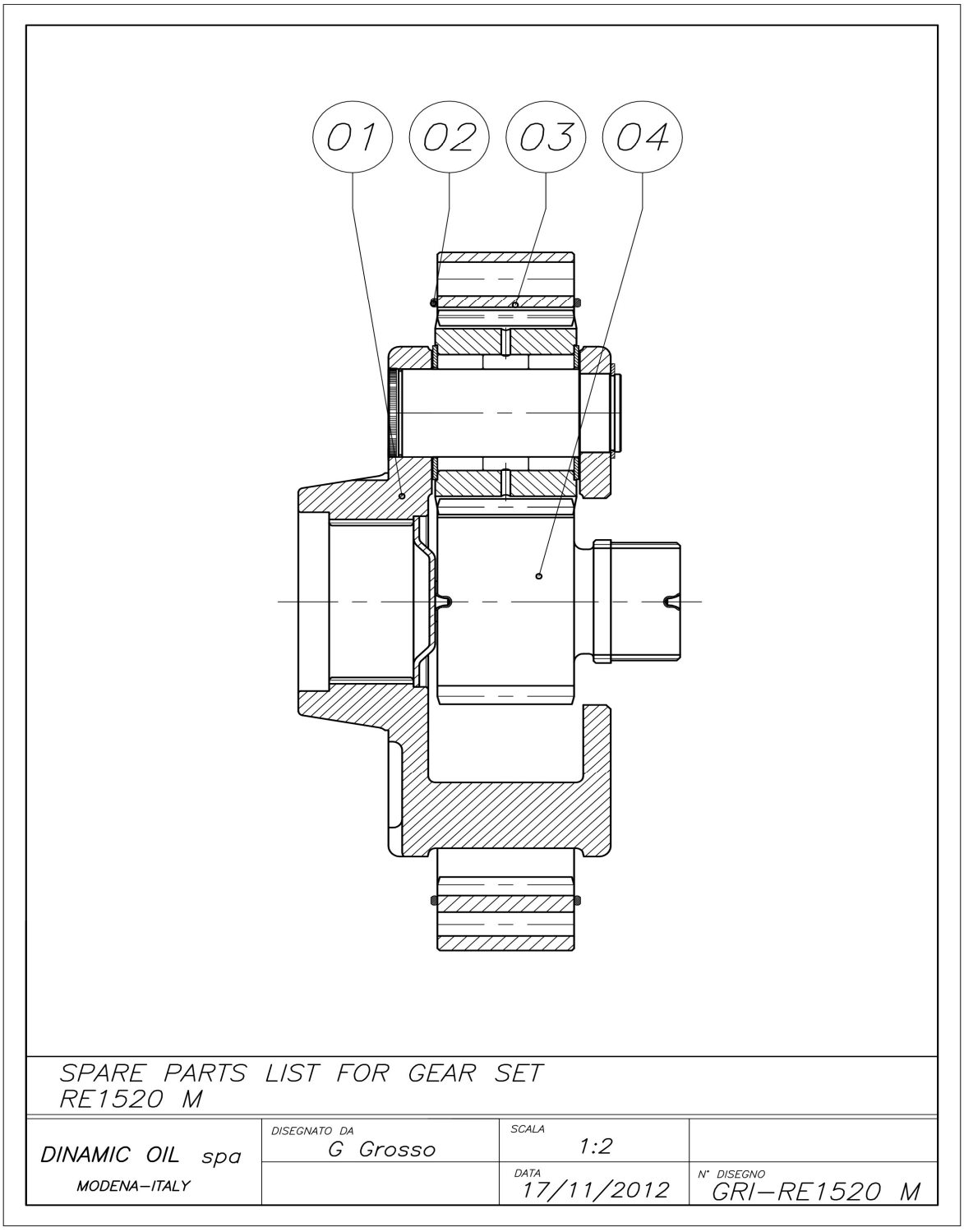


SPARE PARTS LIST FOR OUTPUT SUPPORT RE1520 TS SPEC.DONA	**GRU-1520 TS**

POS.	DESCRIZIONE	ITEM	Q.TA'	CODICE
1	ALBERO SCANALATO SPEC. 8/16 DP Z26 RE1520	SHAFT	1	02261309
2	ANELLO DI TENUTA 105x130x12	RING SEAL	1	415003300
3	COPERCHIETTO PORTATEN.RE1020/1520	COVER	1	02251012
4	VITE TCEI M6x16 12,9	SCREW	6	410409400
5	CORPO T RE 1520 SPEC.FORI RADDOPPIA	OUTPUT SUPPORT	1	022010139
6	CUSCINETTO CR 30217 TIPO A	BEARING	1	401021200
7	ANELLO NILOS 32217 AV	NILOS	1	415052600
10	GHIERA M85x2	LOCKNUT	1	430000900
11	ROSETTA DI SIC. MBS17 X RE1020/1520	TAB WASHER	1	423205300
12	TAPPO TCEI 3/8"GAS	PLUG	4	419000700
	RONDELLA RAME 3/8"GAS	WASHER	4	423000600
13	CUSCINETTO CR 32218 TIPO A	BEARING	1	401018100
14	GUARNIZIONE O-RING 2-167	O-RING SEAL	1	406013100
15	RONDELLA RAME 1/4"RICOTTO	WASHER	1	423000300
	TAPPO TCEI 1/4"GAS DIN 908	PLUG	1	419000600
16	TAPPO SFIATO 1/8"GAS CON VALVOLA	BREATHER PLUG	1	419021900
	RONDELLA RAME 1/8"GAS	WASHER	1	423001700
17	TAPPO TCEI 1/8"GAS	PLUG	1	419020900
	RONDELLA RAME 1/8"GAS	WASHER	1	423001700

SUB ASSEMBLY CODE: 99371400

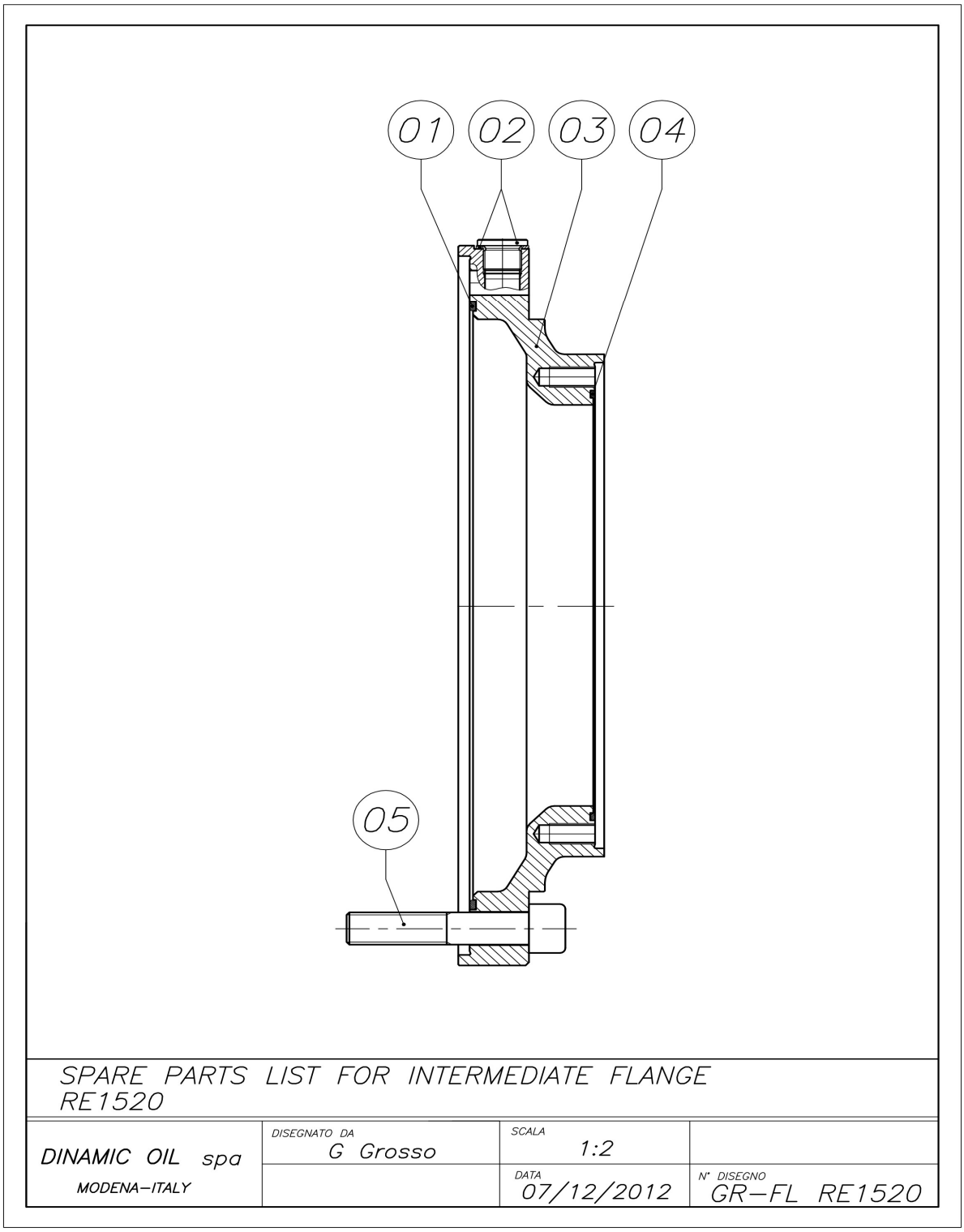
8	OR 2-277	O RING SEAL	1	406023400
9	SPINA ELASTICA Ø12X100 UNI6873	ELASTIC PINS	3	434010700



SPARE PARTS LIST FOR GEAR SET RE1520 M R=4.09	**GRI-RE1520 M**

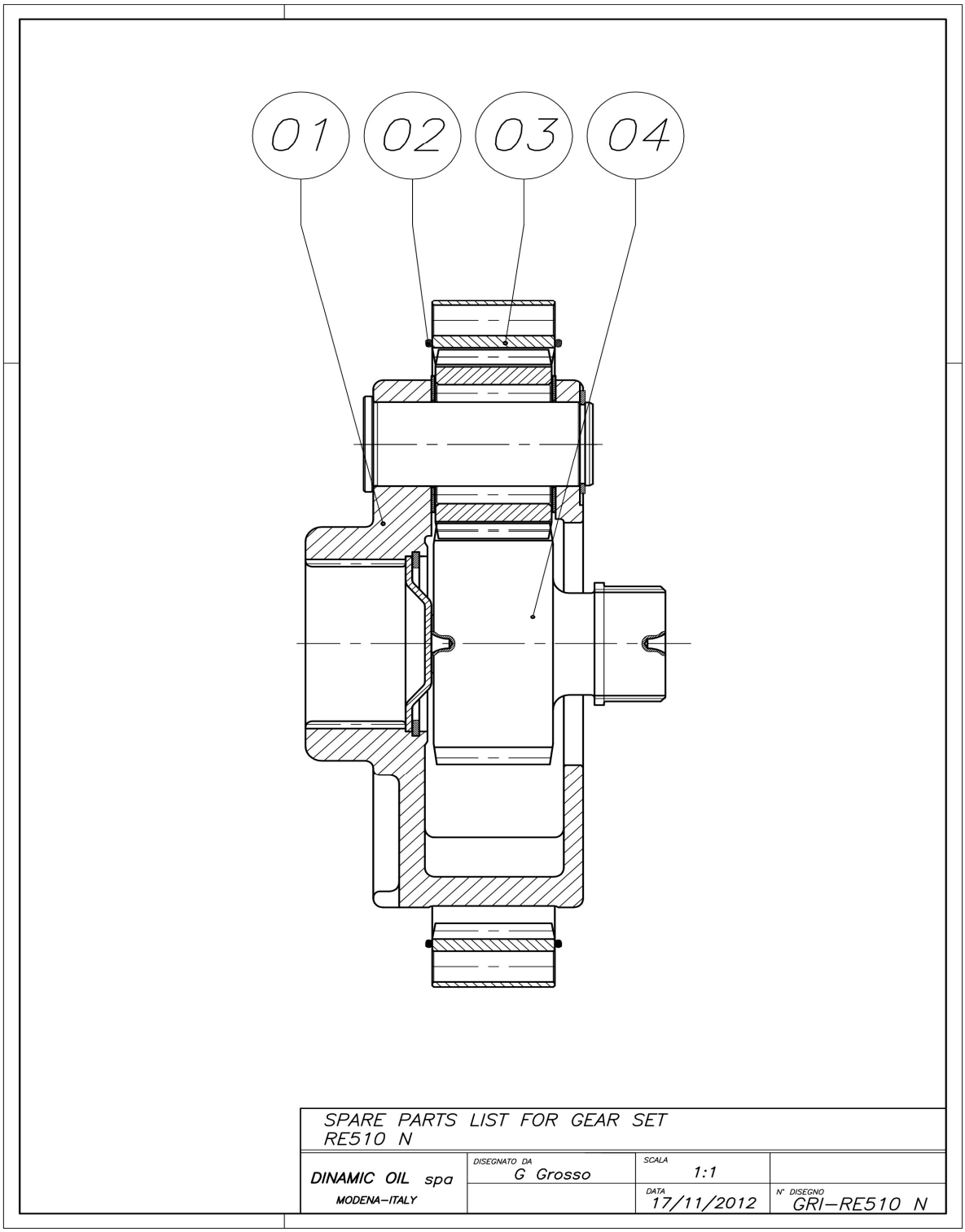
POS.	DESCRIZIONE	ITEM	Q.TA'	CODICE
1	RAGG.INGRANAGGERIA RE1520 R1:4.09	GEAR SET	1	99130400
2	OR 2-277	O RING SEAL	2	406023400
3	CORONA RE1520/2000	RING GEAR	1	02231027
4	SOLARE R=1:4.09 RE 1520	SUN GEAR	1	02611116

SUB ASSEMBLY CODE: K0500H1A01



SPARE PARTS LIST FOR INTERMEDIATE FLANGE RE1520 x SUPPORT "T"	GR-FL RE1520

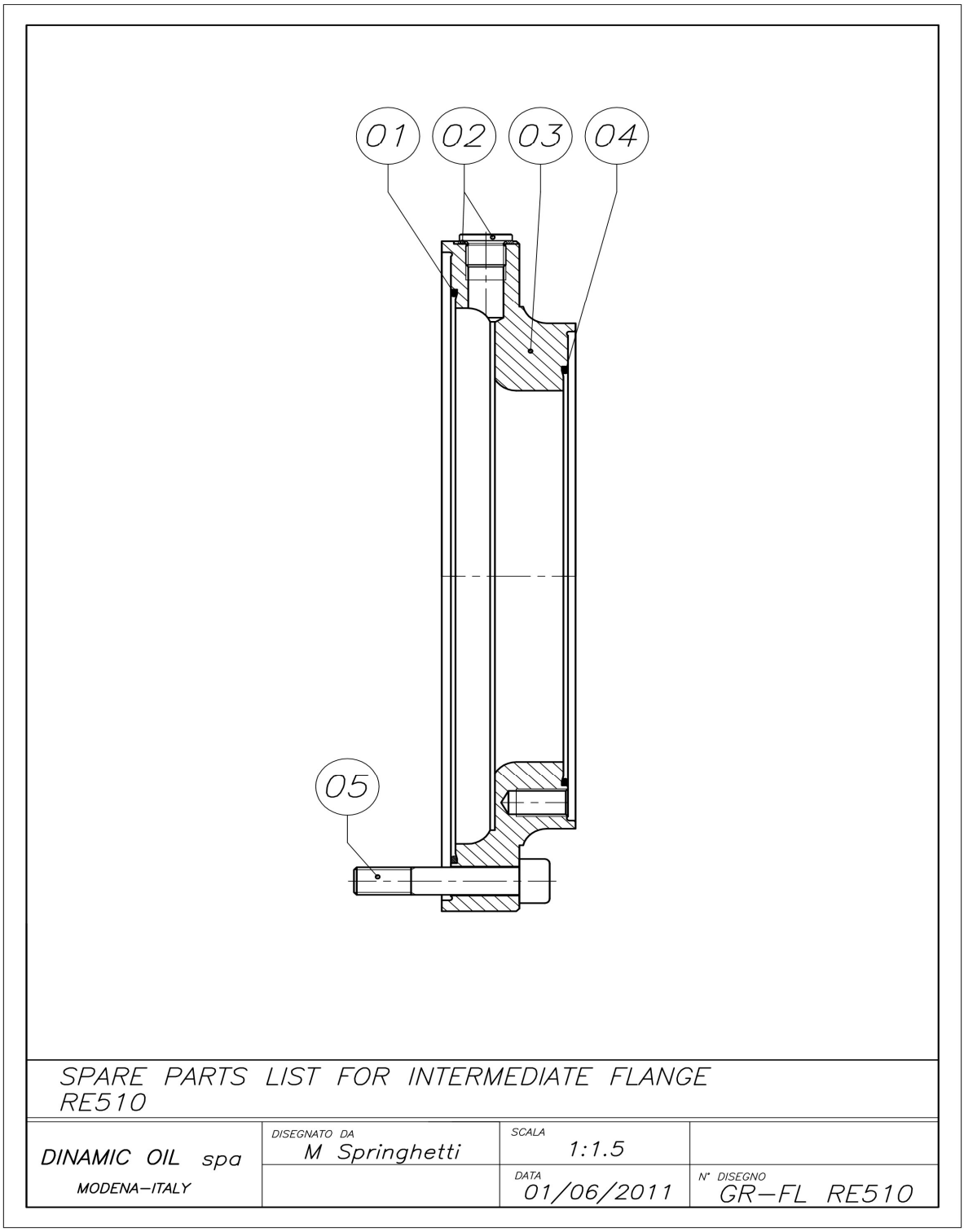
POS.	DESCRIZIONE	ITEM	Q.TA'	CODICE
1	GUARNIZIONE OR 2-277	OR-RING SEAL	1	406023400
2	TAPPO TCEI DIN 908 R 3/8"GAS	PLUG	2	419000700
	RONDELLA 3/8" RAME RICOTTO UNI 6953	WASHER	2	423000600
3	FLANG.INTERM.RE1520 PER RE510	INTERMEDIATE FLANGE	1	02731044
4	GUARNIZIONE OR 2-171	OR-RING SEAL	1	406015000
5	VITE TCEI M16X110 12.9 UNI5931	SCREW	16	410408400



SPARE PARTS LIST FOR GEAR SET RE510 N R=4.25	GRI-RE510 N

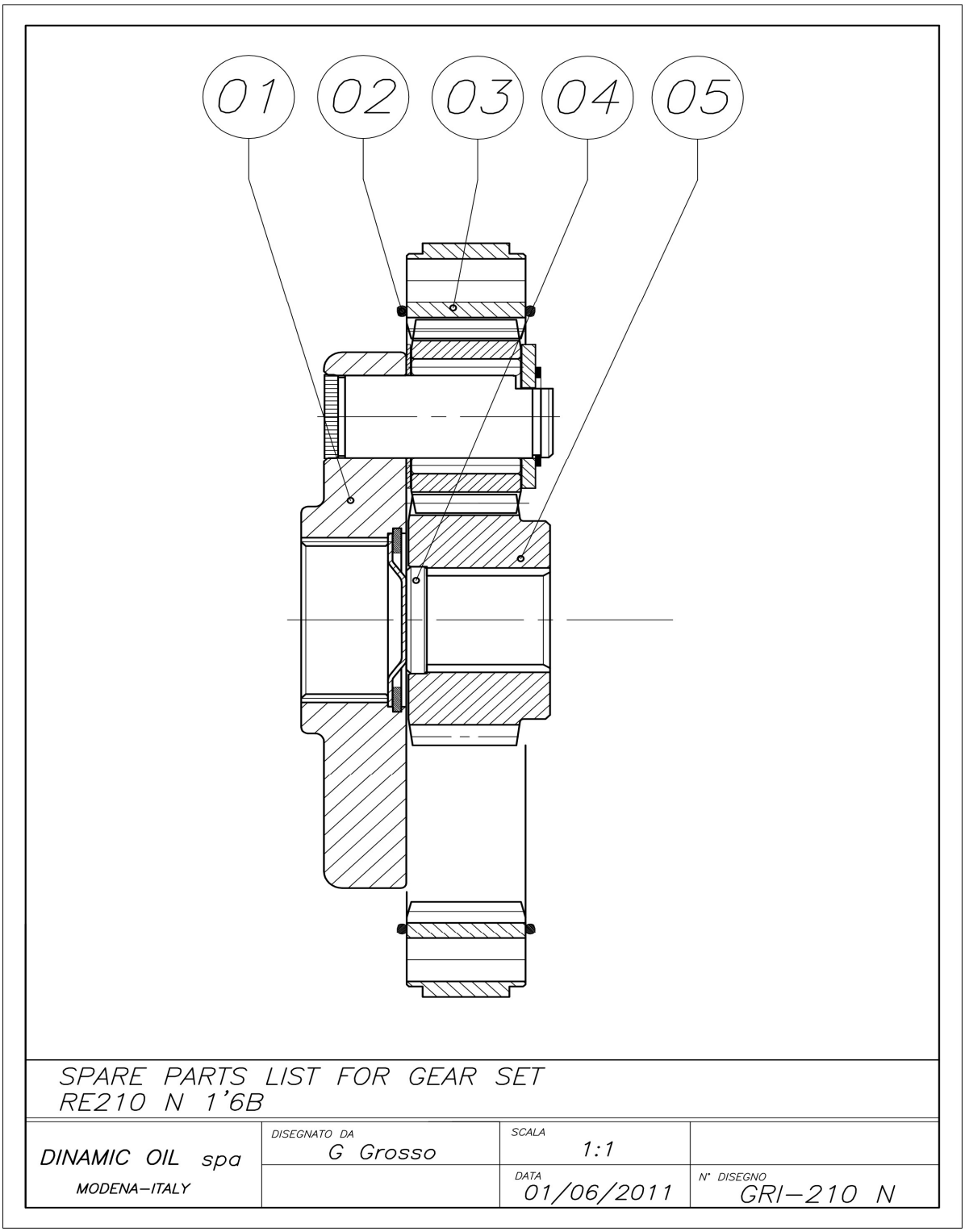
POS.	DESCRIZIONE	ITEM	Q.TA'	CODICE
1	RAGG.INGRANAGGERIA RE 510 4,25	GEAR SET	1	99121600
2	GUARNIZIONE OR 2-171	O RING SEAL	2	406015000
3	CORONA RE500	RING GEAR	1	2030030600
4	SOLARE 2ST R 4,25 RE 510	SUN GEAR	1	2030031900

SUB ASSEMBLY CODE: K0500E1B01



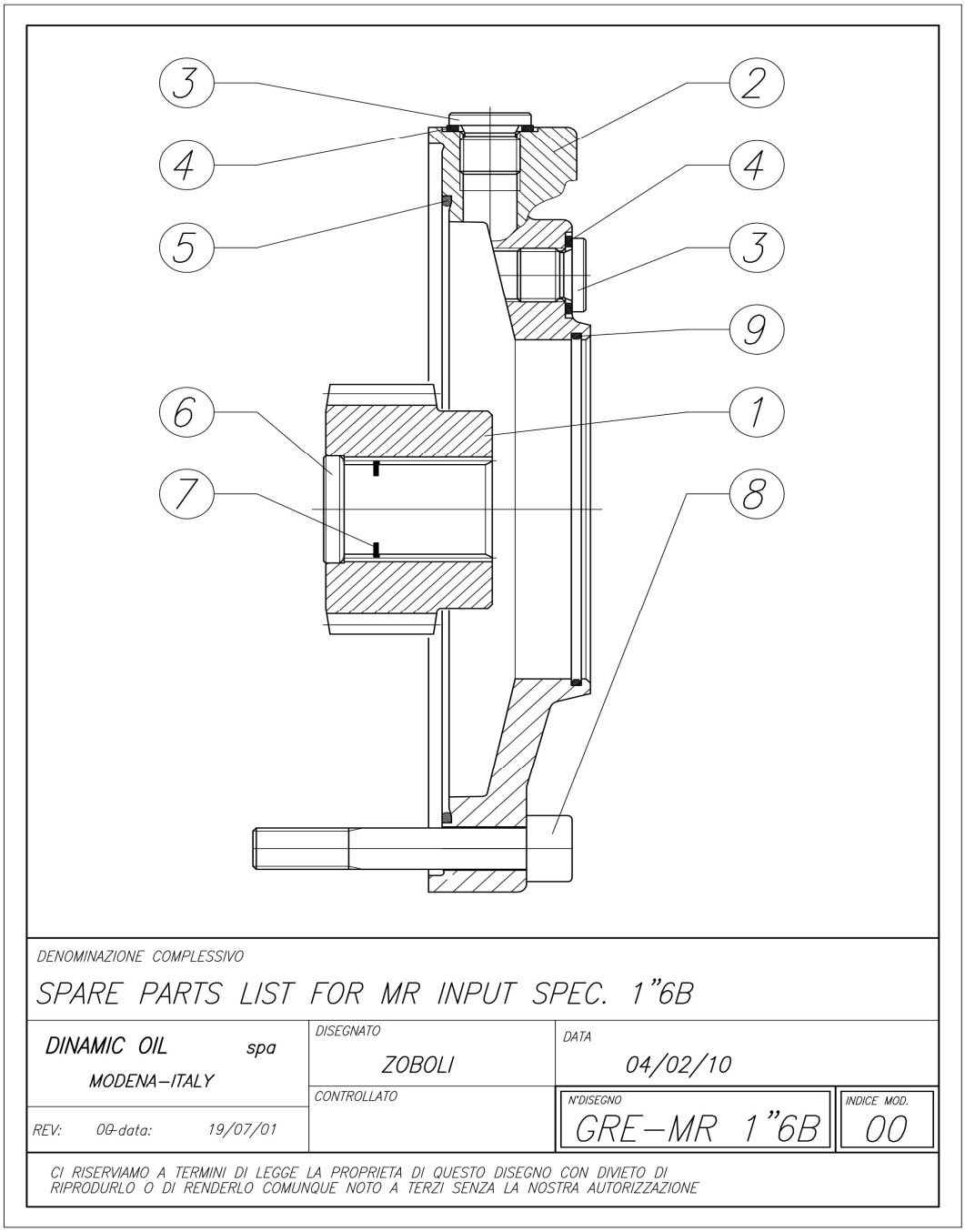
SPARE PARTS LIST FOR INTERMEDIATE FLANGE RE510 x RE1520	GR-FL RE510

POS.	DESCRIZIONE	ITEM	Q.TA'	CODICE
1	GUARNIZIONE OR 2-171	OR-RING SEAL	1	406015000
2	TAPPO TCEI 1/4"GAS DIN 90	PLUG	1	419000600
	RONDELLA RAME 1/4" RAME RICOTTO	WASHER	1	423000300
3	FLANGIA INTERMEDIA RE300-500	INTERMEDIATE FLANGE	1	2030022400
4	GUARNIZIONE OR 147X2,62 N70-N003	OR-RING SEAL	1	406018200
5	VITE TCEI M10X80 12.9 UNI 5931	SCREW	12	410407800



SPARE PARTS LIST FOR GEAR SET RE 210 N 1"6B i=3.48	GRI-210 N

POS.	DESCRIZIONE	ITEM	Q.TA'	CODICE
1	RAGG.INGRANAGGERIA RE 210 N 3,48	GEAR SET	1	99103600
2	OR 147X2,62 N70-N003	O-RING SEAL	2	406018200
3	CORONA RE210/240 1 ST	RING GEAR	1	02231009
4	PASTIGLIA MR 110-210 R.3,48-4,26	PAD	1	02741011
5	SOLARE R.3.48 MOT.ORB.1"6B	SUN GEAR	1	026110274



SPARE PARTS LIST FOR MR INPUT	**GRE-MR 1"6B**

POS.	DESCRIZIONE	ITEM	Q.TA'	CODICE
2	FLANGIA MR 110-240	INPUT MOTOR FLANGE	1	2000080100
3	TAPPO TCEI 1/4"GAS DIN 908	PLUG	2	419000600
4	RONDELLA RAME 1/4"RICOTTO 13X19X1.5	WASHER	2	423000300

SUB ASSEMBLY CODE: K0700AV01

1	SOLARE R.3.48 MOT.ORB.1"6B	SUN GEAR	1	026110274
5	GUARNIZIONE OR 147x2,62	O-RING SEAL	1	406018200
6	PASTIGLIA MR 110-210	PAD	1	02741011
7	SEEGER FORO Ø22	INT. SNAP RING	***	*********
8	VITE TCEI M10X60 12.9	SCREW	8	410410300
9	OR 2-042	O-RING SEAL	8	406002300

7 LUBRICATION

All DINAMIC OIL S.p.A. gearboxes are supplied without lubricating oil.
The user is required to ensure the units are filled with the correct lubricants before putting the machine to use.

7.1 TYPE OF LUBRICATION

Gearboxes are oil bath lubricated. Before putting the gearbox to use, fill it with oil, looking through the level cap to see if it is at the correct level. This operation requires special attention, and the level must be checked again after a few minutes of operation.

7.2 SELECTING AN OIL

Any mechanical transmission oil with EP additives in viscosity classes ISO VG220 to ISO VG320 under ISO 3448 can be used. In special cases oils with different viscosities may be used. In this case, contact the DINAMIC OIL S.p.A. technical assistance service. The oil viscosity must be chosen to suit the room temperature and the gearbox's real operating temperature. If the gearboxes must operate at very high ambient temperatures or with very large temperature excursions, synthetic oil is recommended. In gearboxes with vertical fitting and continuous operation, oil may suddenly overheat. In these cases it is necessary to provide an external tank (which DINAMIC OIL S.p.A. can supply) to allow the oil to expand as it heats up.

If the delivered gearbox is already filled with oil, the lock cap used for delivery needs to be replaced with the vent cap supplied.

Lubricants are potentially harmful/toxic substances to health: always refer to the manufacturer's safety data sheets.

Do not release used oil into the environment. Collect it and send it to authorised bodies for disposal in accordance with legislative provisions in force.

Recommended viscosity

ISO VG 3448	OPERATING TEMPERATURE [C°] / AMBIENT TEMPERATURE [C°]												
	-20°	-10°	0	10°	20°	30°	40°	50°	60°	70°	80°	90	100°
220													
320													

Lubricants for general use:

Manufacturer	Mineral oil	Synthetic oil	
		Polyalphaolefins (PAO)	Polyglycols (PG)
AGIP	Blasia	Blasia SX	Blasia S
ARAL	Degol BG		Degol GS
BP	Energol GR-XP	Enersyn EPX	Enersyn HTX
CASTROL	Alpha SP	Alphasyn EP	Alphasyn PG
CHEVRON	Ultra Gear	Tegra Synthetic	HiPerSYN
DEA	Falcon CLP		
ELF	Reductelf	Elf Syntherma	Elf Syntherma
ESSO	Spartan EP	Spartan S EP	Glycolube
FINA	Giran		
IP	Mellana		Telesia Oil
KLÜBER	Kluberoil GEM 1	Klubersynt EG4	Klubersynt GH6
MOBIL	Mobilgear XMP	Mobilgear SHC	Glygoile
OPTIMOL	Ultra		
Q8	Goya	El Greco	El Greco
SHELL	Omala S2 G	Omala S4 GX	Omala S4 WE
TOTAL	Carter EP	Carter SH	Carter SY

Lubricants for the food industry:

Manufacturer	Gear oil
AGIP	Rocol Foodlube Hi-Torque
ESSO	Gear Oil FM
KLÜBER	Klüberoil 4 HU1 N
MOBIL	DTE FM
SHELL	Cassida Fluid GL

7.3 BRAKE LUBRICATION

Negative hydraulic brakes with multiple discs and a lubrication chamber are already lubricated.

7.4 OIL FILLING AND LEVEL CHECKING

Every gearbox is equipped with level, vent, filling and draining caps for oil in a configuration that varies depending on the structural form (see point 3).

7.4.1. Horizontal fitting

For horizontal fitting, the lubricating oil level is located on the middle section of the gearbox.

7.4.2 Vertical fitting

For vertical fitting (both linear and at right angle), the lubricating oil level is located on the “top” section of the gearbox, to ensure the upper bearing is lubricated.

7.5 FILLING PROCEDURE

When being filled, the gearbox must be in the exact position that it will be in when operating.

Ensure the power supply is disconnected when filling.

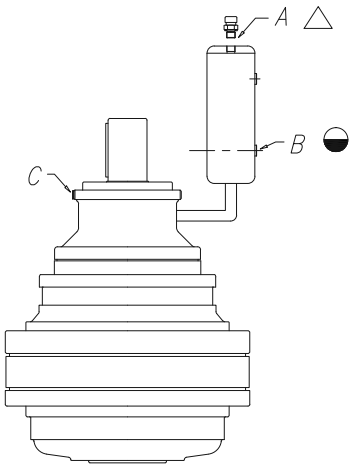
- Unscrew and remove the loading and level caps (see point 3.5).
- Feed the oil through the loading hole until it flows out of the level hole.
- Refit the caps using the appropriate tightening torques (see Annex 2).

7.5.1 Filling procedure with expansion chamber

In vertical fitting and cases where the gearbox needs to be completely filled, use of an expansion chamber is recommended.
This accessory ensures that all the gearbox’s components are lubricated, as well as serving as a reservoir for the oil, which increases in volume as the temperature rises.

- Unscrew cap “C”, located on the upper part of the gearbox, to prevent an air bubble from forming at the upper rotary seal.
- Unscrew loading cap “A” and start filling. When the oil flows out of the hole in cap “C”, close it using the appropriate tightening torques (see Annex 2) and fill up to level “B”.

- Refit cap “A” using the appropriate tightening torques (see Annex 2).



7.6 AMOUNT OF OIL

Indicative oil amounts are given in Annex 1 of this manual. These values are only indicative, and the level cap on the middle section of the gearbox itself must therefore be referred to.

8 SUPPORT AND SERVICING

Servicing must be performed by expert, authorised personnel adhering to the work and environmental safety standards in force.

Servicing on the gearbox must be performed with the power supply disconnected and the gearbox taken “out of service” to prevent it from being switched on accidentally. The oil temperature must be at a safe level so as not to burn the operators.

The instructions given in this paragraph must be followed, ensuring the gearbox is operational and that required levels of safety are met:

- Only use original spare parts. (Refer to the Spare Parts List for the gearbox in question).
- Use lubricants that are recommended by the manufacturer.
- After any servicing work, always replace the seal washers and any lubricating oil.
- Carry out the routine servicing work as set out by the manufacturer.
- Use additional lighting if carrying out servicing work in dimly lit areas, to ensure that it is performed safely.
- Take relevant precautions if carrying out servicing work in enclosed spaces, to ensure that it is performed safely.

DINAMIC OIL S.p.A. will not be held liable for damage caused to persons, animals or objects if non-original spare parts are used.

8.1 ROUTINE SERVICING

Scheduled routine servicing work is carried out on DINAMIC OIL S.p.A. gearboxes by the operator:

Proper servicing improves performance, longevity and safety.

After the first 150 hours of operation:

- Check there are no metal residues of abnormal size in the magnetic caps on the gearboxes.
- Clean the surfaces of the gearbox body and the air ventilation pathways to ensure correct

heat dispersal.
- Change the lubricating oil (see point 8.3).
- Check the screws are all tight, and tighten them where required.

After every 500 hours of operation:

- Check the oil levels with the relevant caps.
- Check for any leaks in the seals.
- Check the screws are all tight, and tighten them where required.

After every 2000 hours of operation or at least every 12 months:

- Clean the surfaces of the gearbox body and the air ventilation pathways to ensure correct heat dispersal.
- Check the screws are all tight, and tighten them where required.

It is worth checking for the vibration, noise and temperature of the gearbox while it is in operation.
When repaired, the right amount of oil must be restored.

8.2 SUPPLEMENTARY SERVICING

If agreed with the customer, DINAMIC OIL S.p.A. can supply suitable servicing procedures on a case by case basis.

DINAMIC OIL S.p.A. prohibits the gearbox from being opened for any operations which are not defined as “routine” servicing.

DINAMIC OIL S.p.A. will accept no liability for harm to objects or persons caused by operations carried out which do not fall within routine servicing and have not been agreed with the customer.

If in need of assistance, contact the DINAMIC OIL S.p.A. technical sales office.

8.3 OIL REPLACEMENT

Replace the lubricating oil according to the schedule set out in the following table, or at least every 2 years.

Average operating duration according to oil type:

Operating temperture	Oil type		
	Mineral oil	Synthetic oil	
		Polyalphaolefins (PAO)	Polyglycols (PG)
70° C	7000 hours	15000 hours	16000 hours
80° C	5000 hours	10000 hours	12000 hours
90° C	3000 hours	7500 hours	9000 hours

To make it easier to empty the gearbox, it is recommended that oil be changed when the gearbox is warm. Internal parts must be washed with a suitable liquid before filling with new oil. Oils with different viscosity or different brands of oil should not be mixed. In particular, synthetic and mineral oils must never be mixed together.
Once the machine is in operation, periodically check lubricant level and top up if necessary.

Do not release used oil into the environment. Collect it and send it to authorised bodies for disposal in accordance with legislative provisions in force.

Empty the oil when the gearbox is warm, but at a temperature not exceeding 40-45 °C to prevent the risk of burns.

8.3.1 Oil replacement procedure

- Place a receptacle of sufficient size underneath the draining cap.
- Unscrew the gearbox's loading and draining caps and allow the oil to completely drain.
- Wash internal parts with a suitable liquid.
- Refill the gearbox with oil (see point 7.5).

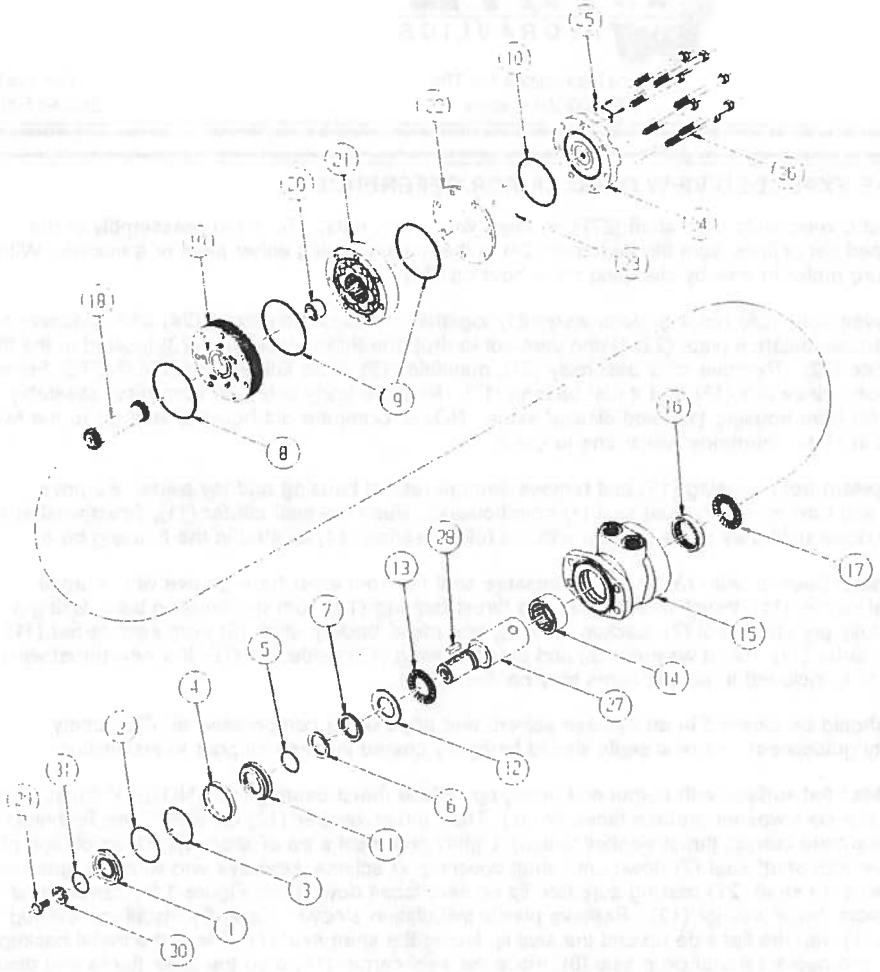
8.4 GREASE REPLACEMENT

The bearings of some gearboxes are lubricated with grease (performed in the factory). Replace the lubricating grease according to the schedule set out in the following table:

Average operating duration according to grease type:

Grease type	
Mineral	Synthetic
5000 hours	10000 hours

DINAMIC OIL S.p.A. recommends replacement at every oil change.
For the type and quantity, refer to the gearbox data sheet.



RE (500/501) Series Motor Components

1. Dust Seal
2. Split Wire Ring
3. Metal Backup Shim
4. High Pressure Seal
5. Metal Backup Shim
6. Backup Seal
7. Shaft Seal
8. Housing Seal
9. Body Seals (2)
10. Endcover Seal
11. Seal Carrier
12. Thrust Washer
13. Front Thrust Bearing
14. Front Housing Bearing
15. Housing
16. Rear Housing Bearing
17. Rear Thrust Bearing
18. Drive Link
19. Manifold
20. Drive Link Spacer
21. Rotor Assembly
22. Balance Plate
23. Steel Balls (3)
24. Endcover
25. I.D. Tag Assembly
26. Assembly Bolts (7)
27. Shaft
28. Shaft Key
29. Shaft Bolt
30. Lock Washer
31. Wire Ring

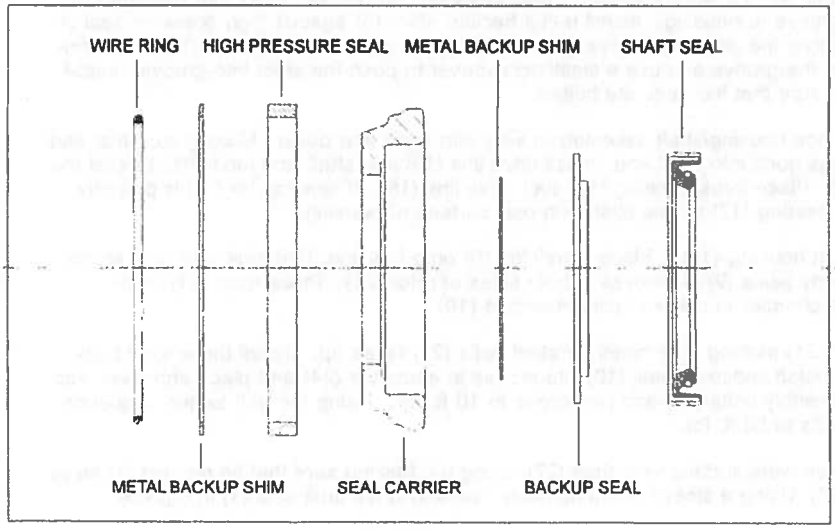


FIGURE 1

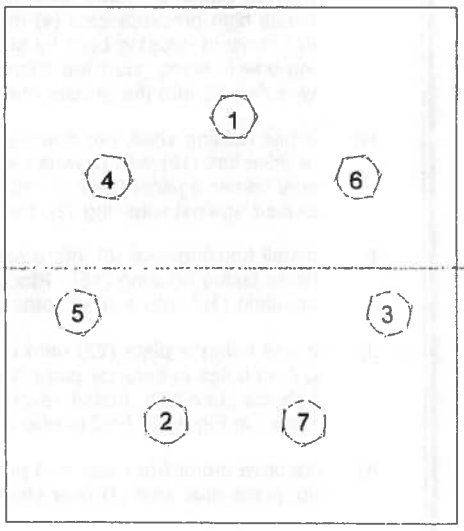
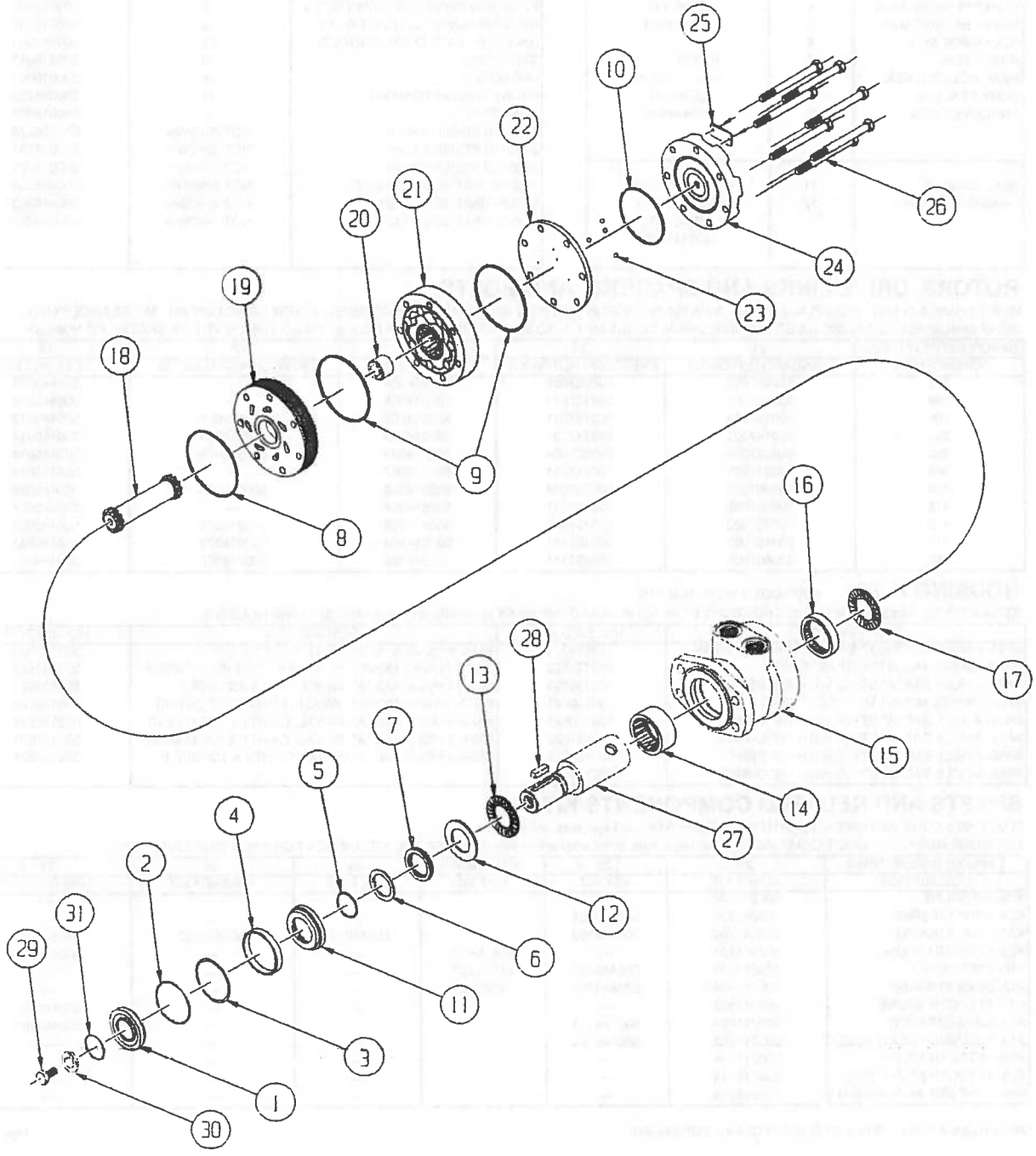


FIGURE 2

RE (500) Series



RE (500) SERIES MOTOR COMPONENTS

SEAL KIT 500444001

DESCRIPTION	EXP VIEW ITEM #	KIT #
DUST SEAL	1	
HOUSING SEAL	2	ITEMS # 1-12
METAL BACKUP SHIM	3	INCLUDED IN
HIGH PRESSURE SEAL	4	SEAL KIT
METAL BACKUP SHIM	5	500444001
POLYAMIDE SEAL	6	
SHAFT SEAL	7	ITEMS # 1-10
REAR HOUSING SEAL	8	INCLUDED IN
BODY SEALS (2)	9	SEAL KIT
ENDCOVER SEAL	10	500444002
SEAL CARRIER	11	ITEMS #11-12
THRUST WASHER	12	INCLUDED IN SEAL KIT 500444003

MISCELLANEOUS KITS

DESCRIPTION	EXPLODED VIEW ITEM #	KIT
REAR THRUST BEARING	17	500018059
FRONT HOUSING BEARING (1" WIDE)	14	500018003
REAR HOUSING BEARING (.5" WIDE)	16	500018002
FORWARD MANIFOLD (CCW OR "0")	19	500015006
REVERSE MANIFOLD (CW OR "1")	19	500015007
BALANCE PLATE (3 BALLS INCLD)	22	500012001
STEEL BALL	23	500018048
ENDCOVER	24	500016001
FRONT THRUST BEARING	13	500018252
DUST SEAL	1	500018006
1000 PSI RELIEF VALVE	NOT SHOWN	500018228
2000 PSI RELIEF VALVE	NOT SHOWN	500018231
3000 PSI RELIEF VALVE	NOT SHOWN	500018221
1.00-20 UNEF SLOTTED NUT	NOT SHOWN	500449304
1.00-20 UNEF SOLID NUT	NOT SHOWN	500449303
1.00-20 UNEF LOCK NUT	NOT SHOWN	300339303P

ROTORS, DRIVE LINKS AND SPACERS, AND BOLTS

WHEN CHANGING MOTOR DISPLACEMENTS, A MATCHING ROTOR AND BOLT SET KIT MUST BE ORDERED. A NEW DRIVE LINK KIT MAY BE NECESSARY. DRIVE LINK SPACERS ARE INCLUDED IN DRIVE LINK KITS, BUT MAY ALSO BE ORDERED SEPERATELY BY USING THE DRIVE LINK SPACER KIT NUMBER.

EXPLODED VIEW ITEM #	21	21	18	20	26
DISPLACEMENT	STANDARD ROTOR KIT	FREETURN ROTOR KIT	DRIVE LINK KIT	DRIVE LINK SPACER KIT	BOLT SET KIT
120	500087005	500087008	500014009	—	500445006
160	500137005	500137011	500014009	—	500445006
200	500167004	500167011	500014009	500018075	500445012
230	500147002	500147004	500014009	500018185	500445014
260	500227000	500227004	500014009	500018076	500445014
300	500247005	500247011	500014007	—	500445018
350	500207000	500207004	500014008	500018076	500445026
375	500307005	500307011	500014008	—	500445024
470	500357003	500357005	500014008	500018076	500445026
540	500407005	500407011	500014008	500018077	500445032
750	500607005	500607011	500014008	500018078	500445045

HOUSING KITS (EXPLODED VIEW ITEM #15)

STANDARD HOUSING KITS INCLUDE THE FRONT BEARING (#14) AND THE REAR BEARING (#16) INSTALLED IN THE HOUSING.

DESCRIPTION	HOUSING KIT	DESCRIPTION	HOUSING KIT
#F31- 4-HOLE W/O PILOT & RS 4-HOLE BOLT PTRN.	500130223	#A58- 6-HOLE SAE "A" STYLE WITH 1/2" BSP.F	500131923
#W38- WHEEL MOUNT WITH 1/2" BSP.F	500130523	#W38- WHEEL MOUNT W/ RELIEF PORT W/ 1/2" BSP.F	500133523
#A38- 4-HOLE SAE "A" STYLE WITH 1/2" BSP.F	500130623	#A38- 4-HOLE SAE "A" W/ RLF. PRT & 1/2" BSP.F	500133623
#W31- WHEEL MOUNT WITH 7/8" O-RING	500130723	#W31- WHEEL MOUNT W/ RLF. PORT & 7/8" O-RING	500133723
#A31- 4-HOLE SAE "A" STYLE WITH 7/8" O-RING	500130823	#A31- 4-HOLE SAE "A" W/ VAL. CAVITY & 7/8" O-RING	500133823
#A11- 2-HOLE SAE "A" STYLE WITH 7/8" O-RING	500131623	#A51- 6-HOLE SAE "A" W/ VAL. CAVITY & 7/8" O-RING	500134823
#A18- 2-HOLE SAE "A" STYLE WITH 1/2" BSP.F	500131723	#A58- 6-HOLE SAE "A" W/ VAL. CAVITY & 1/2" BSP.F	500134923
#A51- 6-HOLE SAE "A" STYLE WITH 7/8" O-RING	500131823		

SHAFTS AND RELATED COMPONENTS KITS

SHAFT KITS COME WITH RELATED SHAFT COMPONENTS (i.e. keys, nuts, etc.)
TO ORDER INDIVIDUAL SHAFT COMPONENTS (i.e. keys, nuts, bolts, washers or wire rings) USE THE KIT NUMBER FOR EACH INDIVIDUAL PART.

EXPLODED VIEW ITEM #	27	28	NOT SHOWN	29	30	31
DESCRIPTION	SHAFT KIT	KEY KIT	NUT KIT	BOLT KIT	WASHER KIT	WIRE RING KIT
#02- 6-B SPLINE	500011600	—		—	—	—
#22- 1-1/4" TAPERED	500011300	500449101		—	—	—
#20- 1-1/4" STRAIGHT	500011200	500449102		500449301	500449302	500449201
#23- 14 TOOTH SPLINE	500011101	—	SEE MISC.	—	—	500449201
#10- 1" STRAIGHT	500011201	500449100	KITS LIST	—	—	—
#12- 25MM STRAIGHT	500011109	500449104	ABOVE	—	—	—
#24- 19 TOOTH SPLINE	500011102	—		—	—	500449201
#21- 32MM STRAIGHT	500011203	500449103		—	—	500449201
#19- 1" STRAIGHT EXTENDED	500011202	500449100		—	—	—
#01- 13 TOOTH SPLINE	500011114	—		—	—	—
#29- 12 TOOTH SPLINE (BK)	500011116	—		—	—	—
#26- 1-1/4" STR. NON-ANNEALE	500011214	—		—	—	—