



OPERATION and MAINTENANCE

13822 Oaks Avenue
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INTRODUCTION	2
WARRANTY	3
WARRANTY CLAIM FORM	4
SAFETY	5
SAFETY ALERT SYMBOLS AND SIGNAL WORDS	5
LOCKOUT / TAGOUT	6
GENERAL SAFETY GUIDELINES	6
SAFETY DECALS	7
OPERATION	14
OPERATOR QUALIFICATIONS	14
PRODUCT DESCRIPTION	15
HYDRAULIC SYSTEM DESCRIPTION	16
CONTROLS	22
ERROR CODES	24
PRIMING	30
PUMPING	31
CLEANING	33
MAINTENANCE	34
RECOMMENDED MAINTENANCE PRACTICES	34
GENERAL MAINTENANCE AREAS	35
LUBRICATION	37
COMPONENT REPLACEMENT	45
S-TUBE, WEAR RING, AND WEAR PLATE	45
S-TUBE ADJUSTMENT	50
PISTON CUP AND GUIDE BAND REMOVAL/REPLACEMENT	51
ACCUMULATOR	54
PUMP MAINTENANCE SCHEDULE AND CHECKLISTS	55



INTRODUCTION

This manual introduces the warranty policy, safe operation, safe maintenance, parts, and other aspects of the concrete pump.

Reading and understanding this operation manual will help maximize performance and reliability, and help minimize dangers, improper operation, and repair costs. Contact REED Customer Service for additional replacement manuals.

All safety guidelines, product descriptions, illustrations, and specifications found throughout this manual were in effect at the time the manual was released for printing. It should be noted; REED RESERVES THE RIGHT TO MAKE CHANGES IN DESIGN OR TO MAKE ADDITIONS TO OR IMPROVEMENTS IN THE PRODUCT WITHOUT IMPOSING ANY OBLIGATIONS UPON ITSELF TO INSTALL THEM ON PRODUCTS PREVIOUSLY MANUFACTURED.

Everyone involved with the operation, maintenance, inspection, and repair of the concrete pump MUST READ and UNDERSTAND this manual and the accompanying Safety Manual.



WARRANTY

REED warrants each new A, B, and C Series Concrete Pump to be free of defects in material and workmanship under normal use and service for a period as follows:

A Series Pumps

- 1 year or 1200 pumping hours whichever occurs first

B and C Series Pumps

- "Hitch to Hopper" for 1 year or 1200 pumping hours, whichever occurs first
- All Structural Parts for 3 years

The warranty is issued **ONLY** to the **INITIAL USER**. The warranty period begins when the product is delivered to the initial user or when first put into service, whichever occurs first. Said warranty is void if the machine is subject to misuse, neglect, accident, and/or abuse.

REED's obligation under this warranty is limited to correcting without charge, at its factory, any parts or parts thereof which shall be returned to its factory, transportation prepaid and upon **REED's** examination proves to have been originally defective. Correction of such defects by repair or replacement shall constitute fulfillment of all obligations to the initial user. This warranty does not include labor or transportation charges unless specifically identified and authorized in writing by **REED**. Nor does the warranty apply to any unit upon which repairs or unauthorized alterations have been made.

This warranty does not apply to normal maintenance service or to normal replacement of certain machine parts which are subject to normal wear (such as concrete cylinders and wear components, valve mechanisms, delivery systems, hopper grate, etc.) **REED** makes no warranty in respect to trade accessories or outside vendor components, such being subject to the warranties of their respective manufacturers.

THIS IS A LIMITED WARRANTY AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE. In no event shall **REED** be made liable for incidental, general or consequential damage, loss or any expense directly or indirectly related and resulting from use or lack of use caused by delay in delivery, parts failure, or any other causes associated with the product use. No person, firm or corporation is authorized to assume for **REED** any other liability in connection with the sale of **REED** products.

Effective April 2010



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WARRANTY CLAIM FORM					
Claim Number:			Date:		
Distributor Account Number:			End User Account Number:		
Distributor:			End User:		
Address:			Address:		
City:		State:	City:		State:
Phone ()		Zip:	Phone ()		Zip:
Pump Model: _____			In Service Date: _____		
Pump Serial Number: _____			Hours of Operation: _____		
			Failure Date: _____		
			Repair Date: _____		
Do not send part(s) until requested by REED or until claim is approved. All parts requested to be returned must have a Return Authorization Number provided by REED and shipping freight prepaid. Parts must ship within 30 days from REED request. Return Authorization Number: _____ Ship Date: _____					
Part Number	Description	Qty	Unit Price	Total Price	Replacement Part Invoice No.
Failure Description and Cause: _____					
REED Comments: _____					
Claim Value Approved: \$ _____ Claim Value Denied: \$ _____					
REED Print Name, Sign, and Date: _____					
Dealer Print Name, Sign, and Date: _____					

SAFETY

Everyone involved with the operation, maintenance, inspection, and repair of the concrete pump **MUST READ** and **UNDERSTAND** this manual and the accompanying Safety Manual.

SAFETY ALERT SYMBOLS AND SIGNAL WORDS

The following safety alert symbols, signals, and explanations are intended to warn the operator of hazardous and potentially hazardous situations.

The triangle with the exclamation point inside is used to alert the operator to an important safety point, and is called a safety alert symbol. One of the following signal words will appear after the safety alert symbol:



If the safety alert symbol is followed by the signal word **DANGER**, the safety alert symbol indicates a hazardous situation which, if not avoided, **WILL** lead to death or serious injury.

If the safety alert symbol is followed by the signal word **WARNING**, the safety alert symbol indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.

If the safety alert symbol is followed by the signal word **CAUTION**, the safety alert symbol indicates a potentially hazardous situation which, if not avoided, **COULD** result in minor to moderate injury.

The signal word **CAUTION**, but without safety alert symbol means the safety symbol alert addresses a hazard which, if not avoided, **COULD** cause damage to equipment or property.



LOCKOUT / TAGOUT

The Lockout/Tagout procedure applies to all **REED** concrete placing equipment. Before performing any maintenance and/or repair on equipment;

1. Unit must be OFF and the ignition key must be removed from the control panel or dash.
2. Key must be securely stored in toolbox or with operator performing maintenance.
3. Signage must be posted to indicate machine is currently under Lockout/Tagout.

The following symbol is a reminder to Lock Out and Tag Out equipment before working on equipment.



GENERAL SAFETY GUIDELINES



Use Only Qualified, Experienced, and Trained Personnel
Wearing Protective Equipment At All Times



For Safe Use, Maintenance, Inspection, and Repair,
Only Operate, Maintain, Inspect, and Repair
In Accordance With This Operation Manual and the Safety Manual



Performance and Safety Features Must Never Be Altered, Disconnected, or Removed



Contact **REED** Technical Support and Service When Assistance Is Required



SAFETY DECALS

Decals and placement of decals are standardized by the Concrete Pump Manufacturers Association (CPMA) for your protection. They are placed at appropriate areas on the concrete pump to be constant warnings of dangers. Know and adhere to the information they provide. Contact **REED** Customer Service for complimentary replacements of safety decals, shipping charges may apply.

DECALS PLACED NEAR CONTROL BOX AREA



WARNING
Do not operate at pressures exceeding the rating of the entire material delivery system.
ADVERTENCIA
No operar a presiones que excedan la presión nominal de todo el material de la línea de entrega.

WARNING
Do not use the boom as a crane or hoist.
ADVERTENCIA
No usar la pluma como grúa o aparato de levante.

WARNING
Stay off hopper grates.
ADVERTENCIA
Manténgase alejado de la rejilla que cubren la tolva.

SAFETY MANUAL

⚠ WARNING

Do not operate this machine without training. Understand the warnings in safety manuals and on decals.

⚠ ADVERTENCIA

No use esta maquinaria sin estar capacitado. Entienda las advertencias de los manuales de seguridad y de las calcomanías.

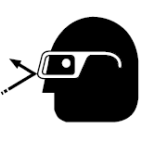
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IMPORTANT	IMPORTANTE
You can order additional operation manuals, spare parts books, safety manuals and decal sets by contacting us at: REED Manufacturing 1-(888)-779-7333 7:00 AM to 5:00 PM Pacific Time Monday through Friday	Usted puede solicitar manuales de operacion, catalogos de refacciones, manuales de seguridad y juegos de calcomanias adicionales contactando a: REED Manufacturing 1-(888)-779-7333 DE 7:00 AM a 5:00 PM Hora Pacifico LUNES A VIERNES

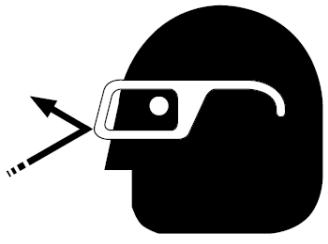
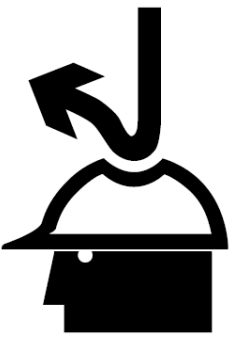
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⚠ WARNING			SAFETY INSTRUCTIONS
			1. Relieve system pressure before opening any system or coupling. 2. Regularly inspect system condition and wall thickness. 3. Wear reduces system burst pressure. 4. Use recommended clean out procedures - consult manufacturer. 5. Use retaining pins in delivery system snap couplings.
• Stay clear of pressurized concrete placing system. • Wear eye protection. • Do not operate at pressures exceeding the rating of any piece of the material delivery system.			INSTRUCCIONES DE SEGURIDAD 1. Alivie la presión del sistema ante de abrir un sistema o un acoplamiento. 2. Inspeccione periódicamente el estado del sistema y el espesor de las paredes. 3. El desgaste reduce la presión de rotura por estallido. 4. Use los procedimientos de limpieza recomendados, consulte con el fabricante. 5. Use los pasadores de retención en los acoplamientos de fijación a presión.
⚠ ADVERTENCIA • Permanezca alejado del sistema de distribución de concreto presurizado. • Use protección para los ojos. • No opere a presiones mayores que las de la capacidad de cualquier pieza del sistema de descarga.			

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ADVERTENCIA ⚠ WARNING

		
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INSTRUCCIONES DE SEGURIDAD				SAFETY INSTRUCTIONS		
 Recommended hand signals Señales de mano recomendadas						
 1. START PUMP SPEED UP	 2. SLOW PUMP DOWN	 3. STOP PUMP	 4. LITTLE BIT	 5. RELIEVE PRESSURE	 6. ADD WATER 4-GALLONS	 7. ALL DONE CLEAN UP
1. PRENDER LA BOMBA ACCELERAR	2. BAJAR VELOCIDAD A LA BOMBA	3. PARAR LA BOMBA	4. UN POCO	5. ALIVIAR LA PRESIÓN	6. AÑADIR AGUA 4-GALONES	7. TERMINADO LIMPIAR

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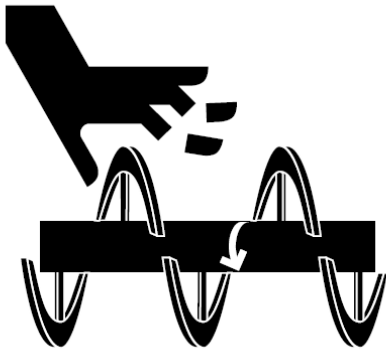


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DECALS PLACED NEAR HOPPER GRATE AREA

! WARNING



Do not paint over this label/No pintar encima de esta etiqueta

Keep hands out of hopper and valve assembly. See operation manual if access is required.

! ADVERTENCIA

No meta las manos a la tolva o válvula. Consulte el manual de operación si necesita tener acceso.

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! WARNING



Do not paint over this label/No pintar encima de esta etiqueta

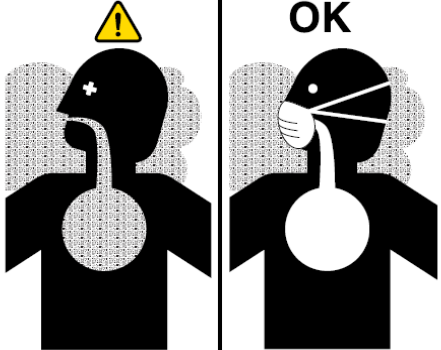
Stay off hopper grates.

! ADVERTENCIA

Manténgase alejado de la rejilla que cubren la tolva.

800918

! WARNING



Do not paint over this label/No pintar encima de esta etiqueta

Cement dust is toxic. Use lung protection when exposed.

! ADVERTENCIA

El polvo de cemento es tóxico. Use protección para los pulmones cuando se exponga.

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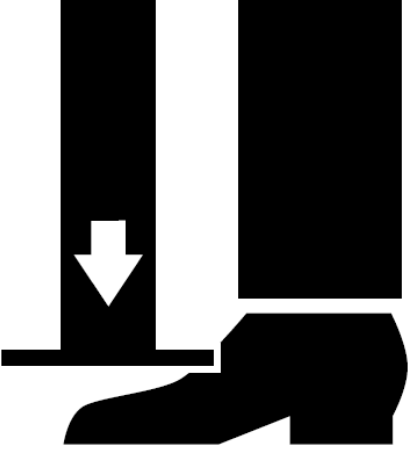
DECALS PLACED NEAR WATERBOX AREA

	 WARNING Keep hands out of waterbox. Stop motor if access is required. Keep guards in place.  ADVERTENCIA No meta las manos a la caja de agua. Pare el motor si necesita tener acceso. Mantenga las cubiertas cerradas.
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Do not paint over this label/No pintar encima de ésta etiqueta

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DECALS PLACED NEAR OUTRIGGER CONTROL AREA

	 WARNING Clear area before activating outriggers.  ADVERTENCIA Despeje el área antes de activar los estabilizadores.
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DECALS PLACED NEAR HOPPER OUTLET AREA



WARNING

Do not operate at pressures exceeding the rating of the entire material delivery system.

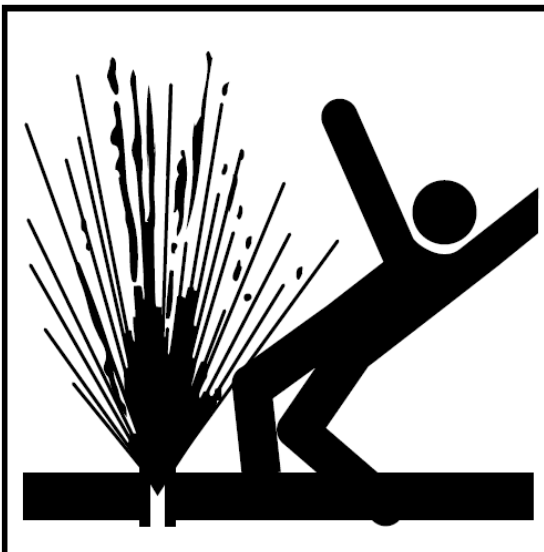


ADVERTENCIA

No utilizar a presiones que excedan la presión nominal de todo el material de la línea de entrega.

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WARNING

Before opening a blocked pipeline, relieve pressure by reversing pump. See manual.



ADVERTENCIA

Alivie la presión antes de destapar una tubería bloqueada, invirtiendo para ello la bomba. Vea el manual.

Do not paint over this label/No pintar encima de ésta etiqueta

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OPERATION and MAINTENANCE

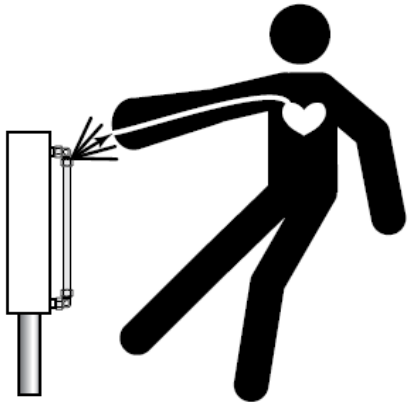
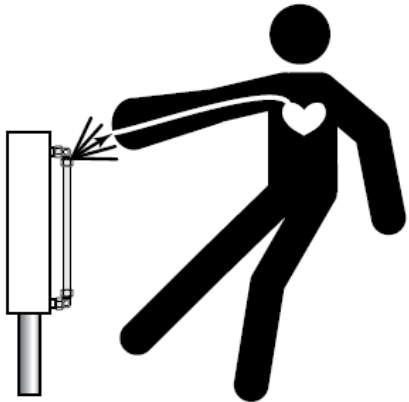
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DECALS PLACED ON SIDE PANEL AREA

	⚠ WARNING This machine is remote controlled and may start at any time. Stop engine before servicing unit.
	⚠ ADVERTENCIA Esta máquina funciona a control remoto y puede ponerse en marcha en cualquier momento. Apagar el motor antes de realizar el mantenimiento.

Do not paint over this label / No pintar encima de esta etiqueta

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	⚠ WARNING
	Do not touch hydraulic oil leaks. Get immediate medical attention if oil penetrates skin.
	⚠ ADVERTENCIA
	No toque las fugas de aceite hidráulico. Obtenga atención médica inmediata si el aceite penetra en la piel.

Do not paint over this label / No pintar encima de esta etiqueta

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OPERATION

OPERATOR QUALIFICATIONS

Everyone involved with the operation, maintenance, inspection, and repair of the concrete pump MUST READ and UNDERSTAND this operation manual and the accompanying Safety Manual.

The following are a few general warnings for operator qualifications outlined in the Safety Manual.



- Individuals who cannot read and understand this operation manual, Safety Manual, signs, warnings, notices, and operating instructions, in the language in which they are printed, must not be allowed to operate the concrete pump.
- Only qualified, experienced, and trained personnel may be allowed to operate the concrete pump.
- Operation, maintenance, inspections, and repair must only be made by qualified, experienced, and trained personnel.
- Obey all applicable local and government statutes and regulations applying to safe operation and towing of concrete pumps.

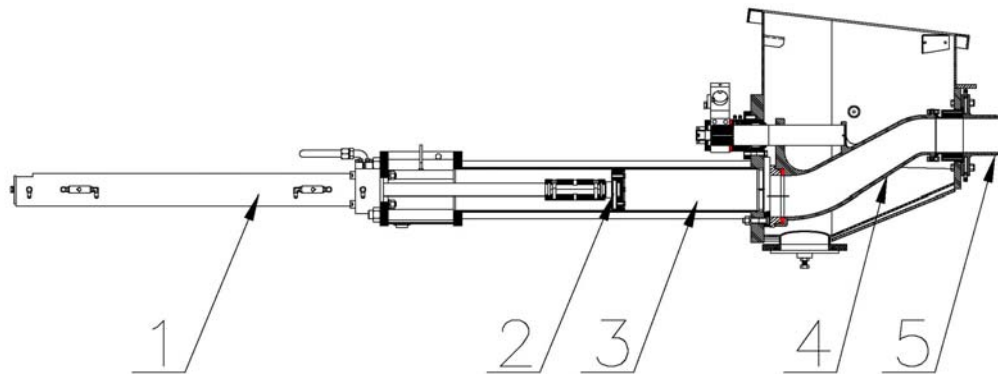


PRODUCT DESCRIPTION

The operation of the concrete pump encompasses the use of hydraulic and electrical systems. The concrete pump is designed to safely pump wet concrete through a delivery system of pipes and hoses within its published ratings and specifications.

Stability of the concrete pump during operation is provided by the outriggers and front jack. Controls for the outriggers are located on the sides of the concrete pump.

The pumping system employs a S-Tube design valve system. This system incorporates material cylinders linked to hydraulic cylinders that cycle alternately. With concrete material in the hopper and the pump operating, a material cylinder retracts, drawing material into the cylinder. At full retraction of the cylinder, a signal is sent to both the S-tube swing cylinder and the drive cylinder directional valves causing the s-tube to shift position to the fully loaded material cylinder and the drive cylinders to change direction. The concrete piston of the loaded cylinder then pushes the material through the s-tube and into the delivery lines. The shifting from one cylinder to the other cylinder takes place providing a continuous flow of material through the delivery piping system. The pump can be operated at the control panel or can be operated from the remote control.



The hydraulic oil flow created by the hydraulic pump pushes the drive cylinder pistons inside the drive cylinders (1) alternately back and forth. Because the drive cylinders and concrete pistons (2) inside the concrete cylinders (3) are linked together, the pistons move synchronously.

When a drive cylinder retracts along with the concrete piston, concrete will be sucked from the hopper into the concrete cylinder. Simultaneously, the other drive cylinder and concrete piston are extended toward the hopper. The concrete piston will push concrete from the concrete cylinders through the S-Tube (4) and out to delivery system (5).

Next, the pump switches at the end of the stroke, causing the s-tube valve to shift to the other concrete cylinder which has sucked and filled the cylinder with concrete, starting the next cycle.

Reverse pumping links the concrete piston in the suction stroke and S-Tube valve to suck concrete from the s-tube instead of the hopper. As a result, the concrete piston pumps concrete into the hopper.

The power for operation of the concrete pump is provided by the engine, which drives the



hydraulic pumps.

All functions for operation of the concrete pump can be accomplished from the local controls mounted on the side of the unit. Optional hand-held cable or radio remotes enable the pump to be operated away from a remote distance.

HYDRAULIC SYSTEM DESCRIPTION

The hydraulic system of the concrete pump consists of three separate circuits and although integrated, each is designed to perform a particular function within the operation of the concrete pump. The three circuits utilized are:

- **Main Pump Circuit**
Controls operation of the hydraulic drive cylinders.
- **S-Tube Shift Circuit**
Controls operation of shifting the s-tube from one material cylinder to the other.
- **Auxiliary Circuit**
Controls the operation of the agitator and other auxiliary equipment.

For the purpose of making the operation of each circuit easier to understand, they are being described separately.

MAIN PUMP CIRCUIT

The main hydraulic pump is a variable displacement axial piston pump of swashplate design. The pistons run along the swashplate which is capable of being tilted. This tilting changes the angle of the swashplate and thus the stroke length of the pistons, which in turn varies the displacement of fluid. The larger the angle of the swashplate, the greater the flow. The angle of the swashplate is varied by the volume control that works in conjunction with the load sense feature of this pump.

The main hydraulic pump is driven directly by the engine or electric motor. When the engine is running, PUMP switch in the OFF position and the VOLUME control minimized, there is no demand placed on the pump. This is referred to as the pump being de-stroked, meaning, it is only producing a minimal amount of flow to enable the lubrication of the pump. This lubrication exists regardless of whether the engine is at idle or maximum RPM.

The main pump circuit is equipped with a manifold that is drilled and ported to accommodate the relief valve, check valve, flow control and the pilot operated directional valve. The cycle valve is a directional spool valve with electro hydraulic solenoid operation. Its purpose is to direct the flow of oil from the main hydraulic pump to one or the other hydraulic drive cylinders.

To energize the pump circuit, use the adjustable throttle control to set the engine speed at maximum RPM. Open the VOLUME control to any range from 0 to FULL. In so doing, the load



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sense is alerted to the demand and places the pump on stroke. The pump will now produce the flow in proportion to the amount by which the volume control has been opened. Since the PUMP switch is OFF, the flow from the hydraulic pump is fed to the main directional valve, thru the valve, and then returns to the hydraulic tank.

To energize the cycling circuit, the PUMP switch must be ON. When this is done, an electrical signal is generated which in turn energizes the coils of the main directional pilot valve and also activates the S-Tube directional valve.

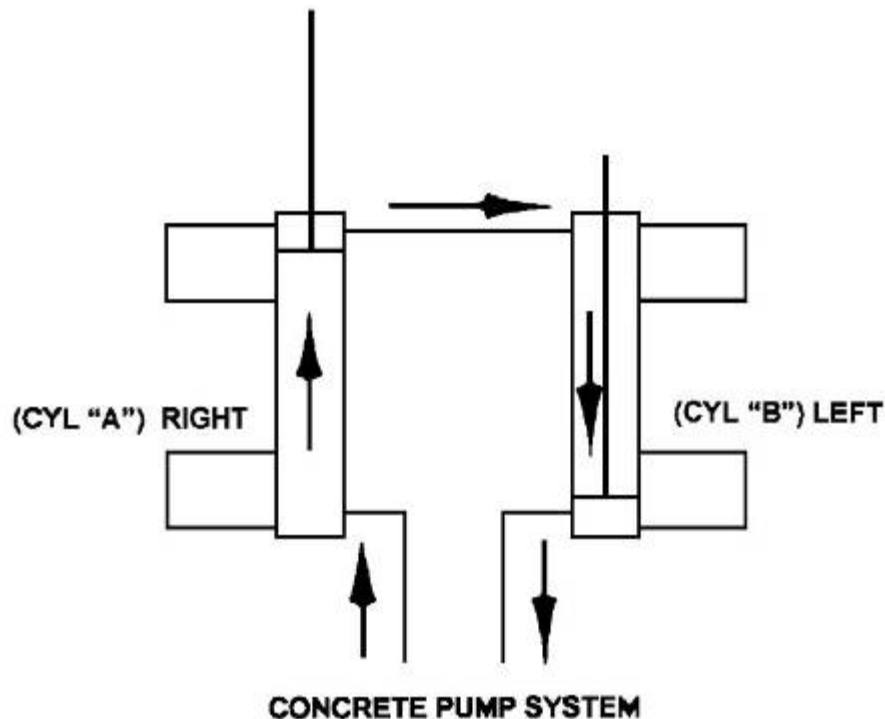
The material pumping action is the result of the two material cylinders cycling on an alternate basis. This alternating cycling is controlled by an electrical signal that is generated by the proximity sensors located in the flush box at the end of each material cylinder's suction or retraction stroke.

As the piston coupler passes under the proximity sensor, it generates an electrical input signal that is sent to the logic controller, designed to control the alternating action of the material cylinders and to synchronize the movement of the s-tube. The output signal from the logic controller is used to energize the coils of the main directional pilot valve as well as that of the s-tube directional valve.

As protection to the main pump circuit against excessive pressure, a relief valve has been installed and set. Thus when the system pressure reaches the maximum factory settings, the relief valve opens directing the oil back to the tank.

MAIN PUMP CIRCUIT OPERATIONAL SEQUENCE

It can be noted in the schematic and the diagram below that the main pressure and flow is only directed to one side of the hydraulic drive cylinder. In this instance, it is directed to the head side or piston side of the double acting drive cylinder.



The hydraulic drive cylinders are identical. Because only one cylinder is pressurized at a time, a means is required to assist in the retraction of the opposite cylinder. This is accomplished by connecting the rod sides of the cylinders together, forming a slave loop. In so doing, the hydraulic fluid that exists in the rod side of the extending cylinder (CYL "A") is transferred to the rod side of the other cylinder (CYL "B") causing it to retract simultaneously. The oil in the head side of CYL "B" is then forced out as it retracts and free flows through the directional valve back to the hydraulic tank or system.

With this arrangement of connecting the two cylinders together, it is possible for various reasons, such as leakage around the piston seals, that more oil exists on the rod side of the cylinder than is required. When this condition exists, some hydraulic oil remains at the rod end of the cylinder being extended while the other cylinder is fully retracted. As a result, the cylinder will not completely extend and thus short strokes, which will also happen to the other cylinder on the next cycle.

This condition can be corrected by actuating and holding the STROKE CHANGE switch on the electrical control box until extending cylinder is fully extended. Hydraulically, this is accomplished by use of the check valves installed on both cylinders. By holding the STROKE CHANGE switch, you have interrupted the cycle and are forcing more oil into the head side of the extending cylinder. Since that cavity is full, pressure is built up in the rod side of the fully



retracted cylinder, which unseats the head-side check valve and forces the excess oil out of the slave loop and back to the tank. Once the extending cylinder has reached its full stroke, regular operation can continue.

Short stroking can also occur from incorrect proximity sensor location or leaking check valves.

S-TUBE CIRCUIT

Since there is only one outlet for the pumping material, a means is required to transfer the material from the material cylinder to the outlet and into the delivery line. To accomplish this, an s-tube is installed in the hopper. Since there are two material cylinders and one s-tube, the s-tube must be shifted from one material cylinder to the other, whichever one is loaded with the pumping material.

The s-tube shift hydraulic circuit is of the open center type, meaning that when the control valves are in the neutral position, the internal passages of the valves are open, allowing the hydraulic fluid to return to the tank. With the engine running the hydraulic pump is operating, producing a flow of oil which, with no control energized, will pass through the shift circuit on its way back to tank.

To meet the flow and pressure requirements of the shift circuit, one section of a tandem pump is used. Note: a single pump may be used if unit is not required for auxiliary equipment. The tandem hydraulic pump is of the gear pump design with a fixed displacement, meaning it is designed to constantly produce the same displacement at a pre-set maximum, depending on engine rpm. The tandem gear pump is directly connected to and driven through the main hydraulic pump. In addition to the hydraulic pump, the s-tube shift circuit consists of a manifold, an accumulator, solenoid valve cartridges, a solenoid directional valve, and 1 or 2 hydraulic shift cylinders. The following is offered to describe the function of each in the system.

S-TUBE CIRCUIT MANIFOLD

Like the main hydraulic circuit, the shift circuit is also equipped with a manifold block. It contains an unloader cartridge, relief cartridge and solenoid valve cartridges. A solenoid operated directional valve is mounted on top of the block and a s-tube selector control valve is located on front of the block. Each of these components is designed to perform a particular function in the swing circuit as explained in the following descriptions:

- **RELIEF CARTRIDGE**

This cartridge is used to divert the pump flow from going to the accumulator once its capacity has been reached, directing it back to tank. It becomes operational when the unloader cartridge setting has been reached, acting as a dump valve.

- **UNLOADER CARTRIDGE**

This pressure sensitive cartridge is used to protect the system from excessive pressure and to limit the amount of pressure being applied to the accumulator by hydraulically signaling the relief cartridge to open once the unloader setting has been reached. The unloader will also redirect the oil back to the accumulator when it senses a drop in system pressure,



when the hydraulic cylinder shifts for example.

- **SOLENOID VALVE CARTRIDGE**

There are two (2) of these cartridges used in the circuit. Both, which may be referred to as a dump valve, are designed into the circuit as SAFETY VALVES. Their purpose is to automatically relieve pressure from the shift circuit as commanded by the emergency stop circuit. At start up, the normally open cartridges are open to tank so the shift circuit can not build any pressure. When the emergency stop circuit is reset, an electrical signal is generated which energizes the solenoids, closing the cartridges and allowing the shift circuit to pressurize. When the emergency stop function is activated or the key switch turned off, the power is taken away from solenoids, causing the cartridges to open and dump shift circuit pressure back to tank.

- **SOLENOID DIRECTIONAL VALVE**

This valve is a directional control valve that is shifted by electronically activated solenoids. Its purpose is to direct the flow of oil stored in the accumulator to one or the other end of the shift cylinder based on the signal received by the logic controller that was generated by the proximity sensor.

- **SHIFT BALL VALVE**

This is a manual ball valve and is used to control the speed of the s-tube shift. with valve fully opened, the flow is unrestricted, causing a fast hard shift of the s-tube. When the valve is closed, the shift is slower as the flow must now pass through an orifice.

- **ACCUMULATOR**

The accumulator is incorporated into the shift circuit to provide instant pressure and volume for the shifting of the s-tube, which cannot be obtained under normal circumstances. An accumulator is a hydraulic reservoir that retains the hydraulic fluid under high pressure. The accumulator contains a rubber bladder on the inside of the reservoir. The bladder is pre-charged with dry nitrogen. In the application of the shift circuit, the hydraulic fluid is pumped into the accumulator at a higher pressure than that inside the bladder. This compresses the bladder building up high pressure within the accumulator that is retained until released.



S-TUBE CIRCUIT OPERATIONAL SEQUENCE

In the operational sequence of the shift circuit with the engine at full RPM, the tandem pump is producing its rated displacement. The flow is going through the system and is being dumped or directed back to the tank thru the solenoid cartridges of the s-tube circuit manifold.

When the HORN/RESET switch is placed to RESET, an electrical signal closes the solenoid cartridges. When this occurs the hydraulic fluid is now directed to the accumulator where it starts compressing the bladder and building up pressure. When the pressure in the shift circuit reaches a setting of the unloader valve, the unloader valve activates causing the relief cartridge to open. The open relief valve now directs the oil flow from the pump back to the tank instead of continuing to pressurize the accumulator. A check valve retains the pressure in the swing circuit and prevents the fluid from going back into the pump line.

In the main pump circuit description it was described how an electrical signal was generated by the proximity sensor which was sent to the logic controller and used to control the alternating action of the hydraulic drive cylinders. This same signal is also used to shift the s-tube so that its movement is synchronized with that of the hydraulic drive cylinder, shifting the s-tube to the material cylinder which is ready to extend (normal forward operation).

The electrical signal activates the solenoid coil of the directional valve, shifting the spool to the appropriate side. The accumulator then releases, exhausting the fluid which flows through the directional valve and is directed to the appropriate side of the shift cylinder. As soon as the shift is made the accumulator is refilled immediately and the sequence starts all over again.

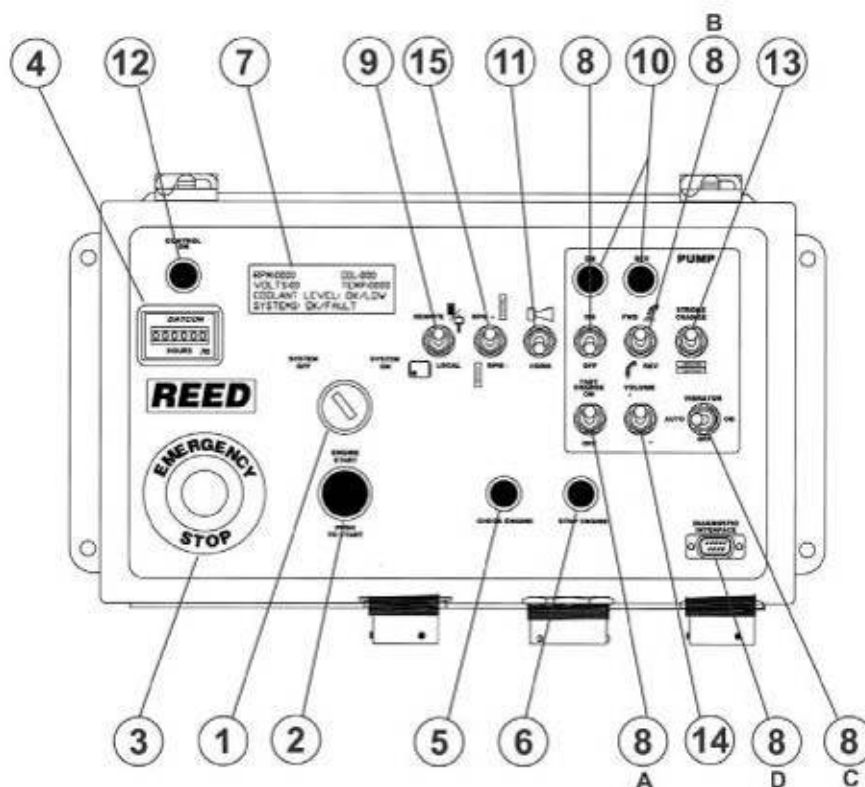
AUXILIARY CIRCUIT

The auxiliary circuit has been designed and installed for the purpose of operating the hydraulic function of the auxiliary equipment on the unit, primarily the agitator. This function is that of the agitator rotation for mixing the material in the hopper and feeding of the concrete cylinders.

The flow and pressure requirements for the auxiliary circuit are met by employing the second stage or section of the same tandem pump used on the s-tube shift circuit. With the engine running and throttle set to maximum RPM, the flow from the tandem pump is directed to a single spool directional control valve. This circuit also utilizes a solenoid valve cartridge or dump valve, designed as a safety valve with the purpose of preventing flow to the auxiliary circuit as commanded by the emergency stop circuit. At start up, the normally open cartridge directs the oil flow from the tandem pump to tank, prohibiting function of the auxiliary circuit. When the emergency stop circuit is reset, an electrical signal is generated to energize the solenoid, closing the cartridge and blocking flow directly back to tank, instead allowing the flow to the single spool directional control valve for operation. The directional control valve has relief cartridge to protect the system against excessive pressure

When the valve lever is activated the agitator will rotate in forward direction as hydraulic fluid is directed to that side of the motor. Rotation can be reversed by moving lever in other direction.

CONTROLS



1. SYSTEM POWER energizes the system enabling Engine Start Button.
2. ENGINE START starts the engine when the System Power Switch is ON.
3. **EMERGENCY STOP stops all functions of the concrete pump when pushed in. Pull the Emergency Stop Button out to enable system to reset; Horn/Reset must be pressed to reset pump operation.**
4. HOUR METER records the number of hours the electrical system has been activated when the ignition key is ON.
5. CHECK ENGINE is on when engine experiencing possible problems.
6. STOP ENGINE indicates operator to stop engine immediately.
7. DIGITAL DISPLAY displays engine RPM, oil pressure, volts, temperature, coolant level, strokes per minute, and status of systems.
8. PUMP ON controls concrete pump ON/OFF function.
- 8A.FAST CHANGE (if equipped) controls fast change feature for smoother operation under certain conditions.



- 8B. PUMP FORWARD REVERSE controls pump direction.
- 8C. VIBRATOR (HOPPER OPTION) controls vibrator activation.
- 8D. DIAGNOSTIC INTERFACE (accessible by **REED** and authorized **REED** dealers only)
Diagnostic Interface is a computer port for system settings and diagnostic testing.
- 9. CONTROL controls LOCAL or REMOTE operation.
- 10. PUMP ON and PUMP REVERSE lights indicate pump status.
- 11. HORN/RESET activates system for operation.
- 12. CONTROL ON indicates control circuit energized.
- 13. STROKE CHANGE changes stroke direction and eliminates proximity sensor signal while activated.
- 14. VOLUME CONTROL (if equipped) controls volume output of the concrete pump.
- 15. RPM +/- controls increase and decrease of engine RPM.



ERROR CODES

- EC01** – No radio link (no signal from either radio or cable)
- EC02** – J1939 CAN link error
- EC03** – RPM Plus
- EC04** – RPM Minus
- EC05** – Volume Plus
- EC06** – Volume Minus
- EC07** – Horn
- EC08** – Vibrator
- EC09** – Safety Valve 1
- EC10** – Safety Valve 2
- EC11** – Pump Coil A
- EC12** – Pump Coil B
- EC13** – S Tube A
- EC14** – S Tube B
- EC15** – Reverse Coil Output – enabled when calibration checkbox for Reverse Logic Change is unchecked.
- EC16** – Fast Change – enabled when the calibration checkbox for Fast Change is checked.
- EC17** – Reverse Light Out Error
- EC18** – Pump Light Out Error
- EC19** – Check Engine Light
- EC20** – Stop Engine Light
- EC21** – Volume PWM Output Error
- EC22** – Prox A&B Error
- EC23** – Wrong ID
- EC24** – Engine RPM Overspeed
- EC25** – Oil Low Pressure
- EC26** – Coolant Over Temp.
- EC27** – Low Battery Voltage
- EC28** – High Battery Voltage
- EC29** – Denison Fast Change
- EC30** – Denison A (only on C series with Denison Hydraulic pumps)
- EC31** – Denison B (only on C series with Denison Hydraulic pumps)



VOLUME CONTROL KNOB adjusts volume output of the material.
COUNTERCLOCKWISE To INCREASE Volume
CLOCKWISE To DECREASE Volume

CAUTION

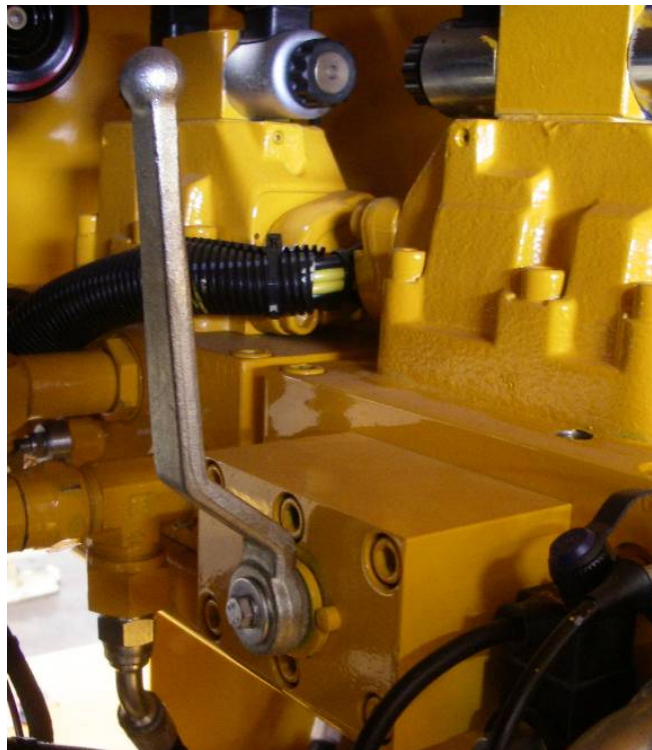
Do Not Adjust Volume Output by Adjusting RPM
Adjust Volume Output by Adjusting Volume Control Knob



AGITATOR CONTROL controls agitator ON/OFF and FORWARD REVERSE functions.



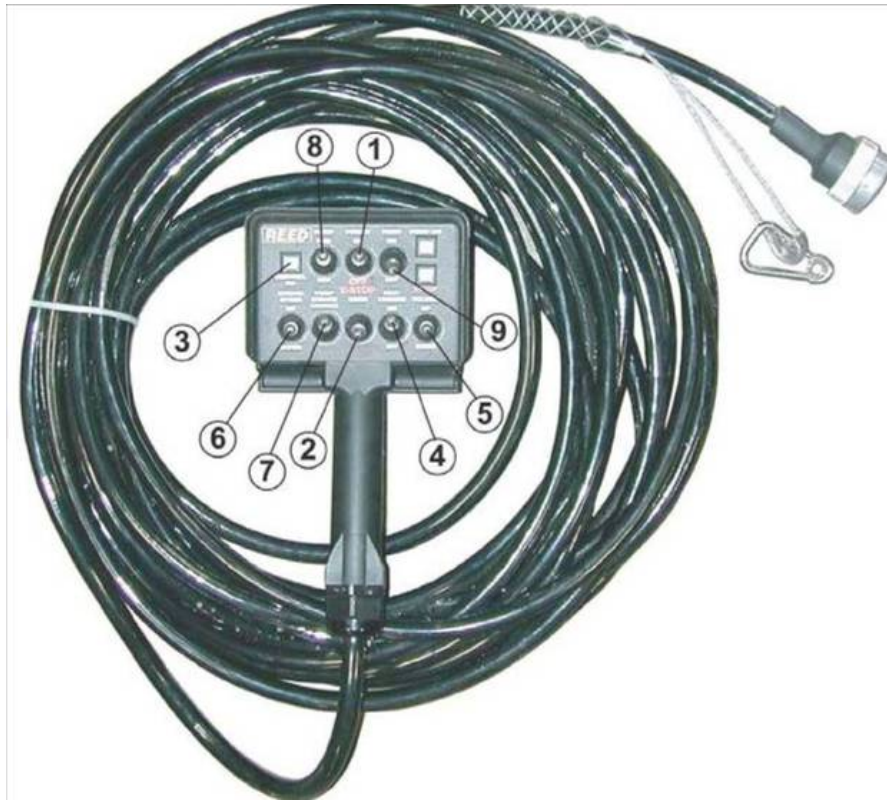
OUTRIGGER CONTROL raises and lifts outriggers to set machine stability.



SHIFT BALL VALVE controls the speed of the S-Tube shift.

Hard Shift - rotate ball valve lever counter clockwise to fully open the valve and allow the hydraulic flow to bypass a restrictive orifice.

Soft Shift - turn ball valve lever clockwise closing the ball valve and directing the hydraulic fluid through an orifice. This position may be used when a slurry is being pumped or when the machine is being cleaned out.



CABLE REMOTE (RADIO REMOTE OPTIONAL, CONTACT **REED** FOR INFORMATION)

1. POWER ON/EMERGENCY STOP switch stops all functions of the concrete pump in OFF position. Move the Emergency Stop switch to ON to enable system reset; Horn/Reset must be pressed to reset pump operation.
2. HORN/RESET activates system for operation.
3. CONTROL ON indicates control circuit energized.
4. FAST CHANGE (if equipped) controls the fast change feature for smoother operation under certain conditions
5. VOLUME CONTROL (if equipped) controls volume output of the concrete pump.
6. RPM +/- controls increase and decrease of engine RPM.
7. STROKE CHANGE changes stroke direction and eliminates proximity sensor signal while activated.
8. PUMP FORWARD/REVERSE controls pump direction.
9. PUMP ON/OFF controls concrete pump ON/OFF function.



TOWING

Refer to the Safety Manual for towing safety precautions not limited to the following guidelines:



Ensure Unit Is Securely Attached Before Driving
Refer To Tow Hitch Instruction Manual



Tow Slowly and Safely Depending On Road Conditions
Overturning May Occur At Unsafe Speeds



NEVER Exceed 55 MPH



Maintain a Sufficient Distance for Braking
Overturning May Occur At Unsafe Stopping Distances



SET-UP

Refer to the Safety Manual for set-up safety precautions not limited to the following guidelines:



Ensure Machine Can Be Safely Operated In Set-Up Location
Away From Hazards and Dangers
Away From Slopes and Excavations



Position Machine On As Solid and Level Ground As Possible



Place Outrigger Pads Below Outrigger Jacks If Necessary



Secure Jack Positions with Outrigger Pins and Locks



Not Using Outriggers Voids Warranty
Damage Will Occur If Outriggers Are Not Used



PRIMING

Priming consists of pumping a lubricant to coat the s-tube and delivery lines to assist the initial concrete material in getting through the delivery lines and avoid blockages. Once the delivery lines are full of concrete, that material will supply the lubrication necessary for the material to flow through the delivery lines. However, it is imperative that a primer be used ahead of the initial concrete material to pre-lubricate the lines in order to avoid blockages.

A suggested grout to use for priming and lubrication may consist of 2 parts sand and 1 part cement and mixed to a consistency of a thick cream.

The amount of grout required depends on the length of the delivery line as well as the material being pumped. Operator experience will eventually indicate the amount to be required.

In addition to grout, there is a wide variety of priming products available on the market.



PUMPING

Everyone involved with the operation, maintenance, inspection, and repair of the concrete pump MUST READ and UNDERSTAND this manual and the Safety Manual.

Refer to the Safety Manual for pumping and blockages safety precautions not limited to the following guidelines:



Perform Required Inspection, Lubrication, and Maintenance
Before, During, and After Pumping Operations



Do Not Remove Hopper Grate
Or Other Safety Components



Do Not Insert Body Parts into Hopper, S-Tube, or Waterbox
Or Other Moving Components



Turn Pump ON Only When Hopper Is Full Of Concrete



Ensure the following conditions are met before activating pump:

- o PUMP Switch Is OFF
- o VOLUME CONTROL Is Set To MINIMUM
- o AGITATOR Control Is In OFF Position
- o EMERGENCY STOPS Are Not Activated
- o Controls On LOCAL Position



PUMPING Continued

1. Turn KEY operated SYSTEM POWER Switch to ON
2. Press ENGINE START Button to start engine
3. Activate the HORN/RESET to prepare the concrete pump for operation
4. After engine warms up, increase RPM to desired engine RPM by adjusting THROTTLE CONTROL
5. Adjust VOLUME CONTROL to low output when starting pumping operations
6. Switch PUMP Switch to ON to pump concrete when hopper is full, maintain full level
7. Turn PUMP Switch to REVERSE to reverse the pumping action if necessary.
REVERSE function is typically used to relieve pressure in the delivery in the event of a blockage
8. Turn PUMP Switch OFF to stop cycling and stop pumping concrete
9. In the event of an emergency, push the EMERGENCY STOP Button IN to stop all functions of the concrete pump. Pull the EMERGENCY STOP Button OUT to enable system to reset; Horn/Reset function must be activated to reset pump operation.



CLEANING



Do Not Remove Hopper Grate
Or Other Safety Components



Do Not Insert Body Parts into Hopper, S-Tube, or Waterbox
Or Other Moving Components

1. Set VOLUME CONTROL to LOW
2. Pump as much material as possible out of the delivery system
3. Turn PUMP Switch OFF
4. Disconnect delivery system. Disconnect the line right after the reducer if a reducer is used
5. Open hopper door and empty hopper
6. Flush out hopper, S-Tube, and cylinders with water
7. Place DIRECTION Switch in REVERSE. Place no more than two feet of the water hose into the pump discharge outlet then turn the PUMP switch ON Water will drain into the material cylinders and as pump cycles, any sand and rocks will be forced out through the open clean out door.
8. Stroke the pump to make sure all sand and other material has been cleaned out, and then turn the pump off.
9. Close the hopper clean out door.
10. Place a clean out sponge into the disconnected delivery line. Reconnect the line to the hopper outlet or reducer with the sponge inserted as close to the hopper outlet as possible.
11. Fill the hopper with water. Place the DIRECTION Switch to the FORWARD position and check that VOLUME control is set at low speed. Turn PUMP Switch ON and cycle the pump until the sponge passes through the entire delivery system into a sponge catcher
12. Turn off the pump and allow the water to drain from the system
13. Clean up the remaining areas of the machine as needed
14. After clean up is complete lubricate all grease points to expel any grout before it cures



MAINTENANCE

RECOMMENDED MAINTENANCE PRACTICES

MAINTENANCE MANAGEMENT

Schedule lubrication and maintenance inspections to anticipate maintenance issues. Maintenance management requires the assignment of responsibilities to individual personnel, training of personnel, keeping of records, and the exercise of judgment.

INSPECTION AND LUBRICATION CHECKLISTS AND OPERATOR REPORTS

Utilize checklists for scheduled inspection and lubrication and maintain a written record regarding observations and actions performed. Maintain all scheduled maintenance reports by the operator listing any malfunctions and observations.

PUMP HISTORY FILE NOTING PUMP SERIAL NUMBER

File the operator reports, inspection and lubrication checklists, shop repair, work orders and tickets, parts replacement and pump usage records. This file should also include the parts book for the specific serial number and engine.

ANNUAL REVIEW

Review the history records of each unit once every year to find evidence of repetitive failures, adjustments, problems, or excessive wear so that action can be taken to minimize breakdowns and reduce excessive maintenance costs. A review of the machine history will help in the stocking of spare parts and assemblies in advance of a possible need.



Engine Manufacturer Maintenance Schedule Must Be Followed
Read Engine Manufacturer Manual

REED has provided only general guidelines regarding engine maintenance, and will not cover engine warranty claims.



Accumulator Pressure Must Be ZERO
Before And During Any Maintenance Procedures



Engine Must Be Turned OFF and Lockout / Tagout Procedures Must Be Followed
Before And During Any Maintenance Procedures



GENERAL MAINTENANCE AREAS

Perform scheduled inspections to identify and detect any potential problems. The list presented should be inspected and checked on a regular basis and is a recommended minimum.

TRAILER

- Frame integrity, visually check welds, cracks
- Torsion axle secure
- Wheels and tires, lug nuts tight, tire pressure
- Electric brakes, breakaway switch connected
- Front jack stand handle turns easily, smoothly
- Manual jacks slide freely, lock pins in place
- Lighting good condition, operational

ENGINE (refer to engine manufacturer manual)

- Inspect mounts, bolts, brackets and belts
- Oil and coolant fluids at proper level, check for leaks
- Fuel system, tank mounting, filter condition, leaks, damaged lines
- Battery hold down, condition, tightness of cables
- Key switch, indicator lights
- Throttle control functional
- Air cleaner and muffler securely mounted

PUMP CELL

- Visually check for structural damage, cracked welds
- Hydraulic drive cylinders in good condition, secure, check for leaks
- Material cylinders secure, tie rods tight
- Water box structurally sound, clean, cover in place
- S-Tube shift mechanism structurally sound, all pins and retainers in place
- Hydraulic shift cylinder(s) in good condition
- Bearing housing, seals etc. in good condition
- Hydraulic hoses secure no leaks

HOPPER ASSEMBLY

- Visually check for structural damage, cracked welds
- S-Tube secure, in good condition
- Check condition of wear plate, wear ring, seals
- Check connection of s-tube to outlet, seals, bearing
- Hopper drain is functional
- Cleaning hopper
- Zerk fittings accept grease



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MAIN CONTROLS

- Control box in good condition, sealed, not damaged
- All toggles in good condition, stay in position or momentarily return to center
- Control identification in good condition, legible
- Gauges in good condition

REMOTE CONTROLS

- Control console in good condition, not damaged
- Switch in good condition
- Cord in good condition, no cuts, securely mounted to box

HYDRAULIC SYSTEM

- Hydraulic tank securely mounted, covers tight
- Breather, filler cap and strainer in place, level sight gauge in proper condition
- Check filter condition indicators
- Hydraulic oil cooler securely mounted, connections tight
- Check accumulator condition, mounting brackets & clamps
- Hydraulic fluid to proper level and clean
- All hoses and tubing secure, check for leaks



LUBRICATION

The **REED** concrete pump is equipped with several components that require frequent lubrication. These areas involve the s-tube shifting mechanism, swing components, the shift and outlet bearings and agitator. To insure the economical service and the long life of these components, grease fittings are installed at each point.

Rapid wear and possible shutdown will result if the unit is operated with inadequate lubrication. Follow the recommendations stated herein, and if needed increase the application of lubricants above these recommendations when the equipment is subject to heavy usage.

MINIMUM LUBRICATING INTERVALS

Recommended lubrication intervals are based on normal use under normal conditions. The lubrication interval must be increased to meet more challenging uses and uses which subject the equipment to high and/or unusual concentration of forces. The lubrication interval must be increased if the pump has been exposed to environmental conditions such as low humidity, high humidity, excessive dust, high temperatures, low temperatures, heavy rainfall, long term storage, ocean air, etc...

1) every hour of operation

2) after completion of every job

All lubrication points must be greased on each and every interval as recommended.

TYPE OF LUBRICANT

- Use EP grease, extreme pressure grease available for wheel bearings, general purpose grease, Shell Alvania EP (LFH2), or equivalent if this lubricant is unavailable in your area
- Do NOT use Moly grease, grease with Moly additives

LUBRICATION POINTS

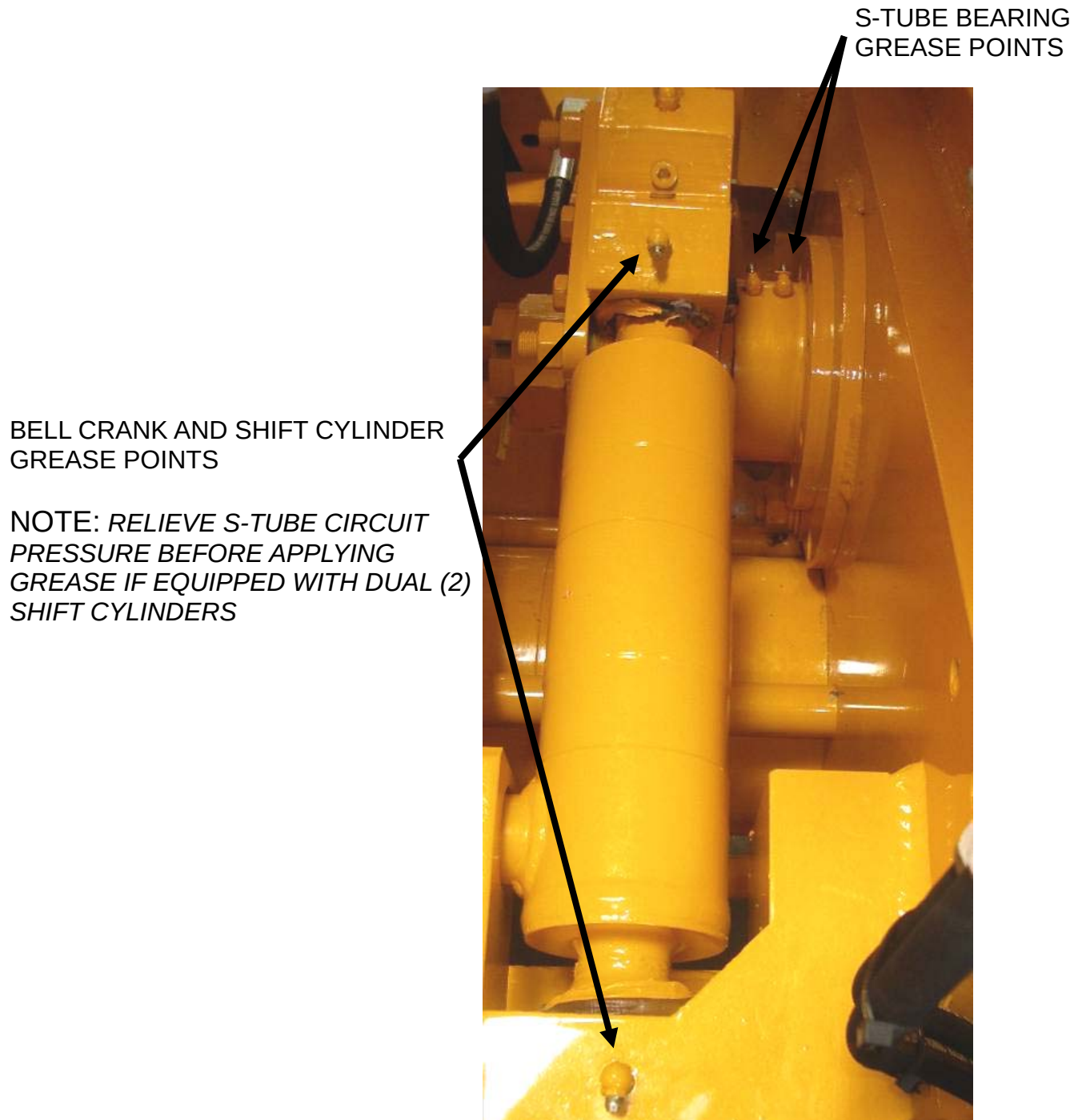
The following graphics are for REFERENCE ONLY.



S-TUBE SHIFT LUBRICATION

CAUTION

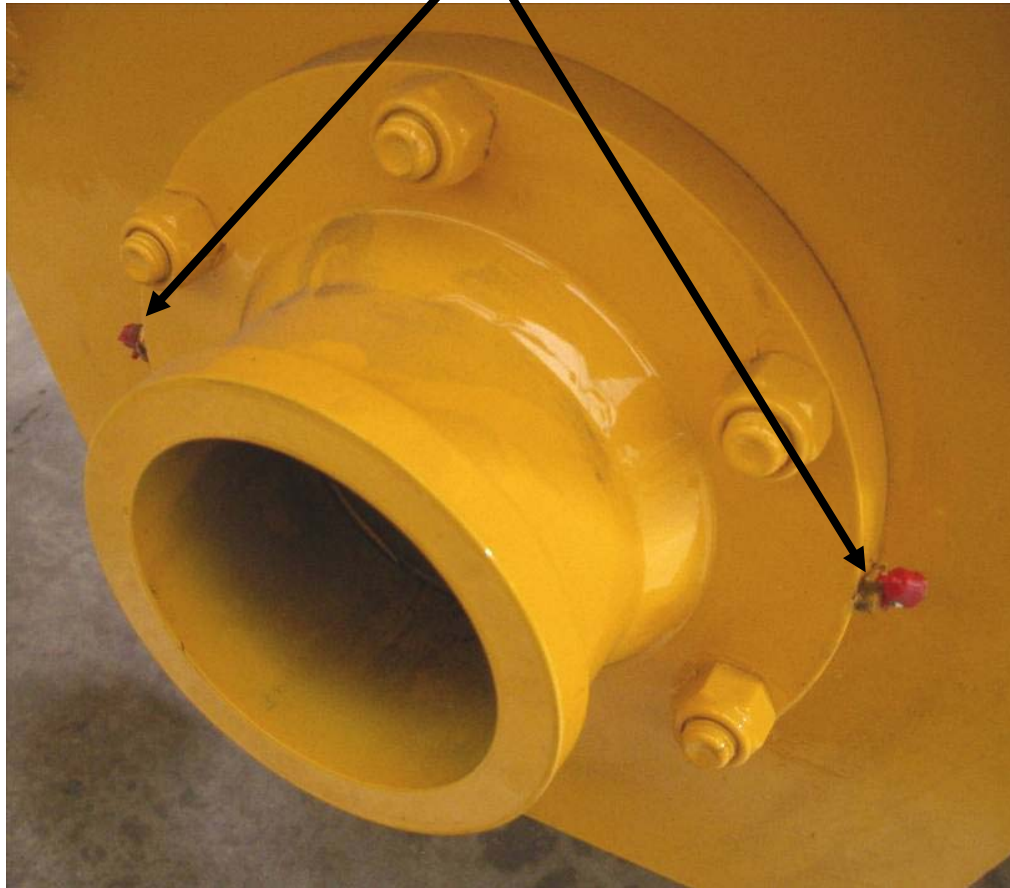
IF EQUIPPED WITH DUAL (2) HYDRAULIC SHIFT CYLINDERS,
RELIEVE SHIFT CIRCUIT HYDRAULIC PRESSURE TO PROPERLY GREASE
HYDRAULIC SHIFT CYLINDERS AND BELL CRANK





S-TUBE OUTLET LUBRICATION

S-TUBE OUTLET GREASE POINTS



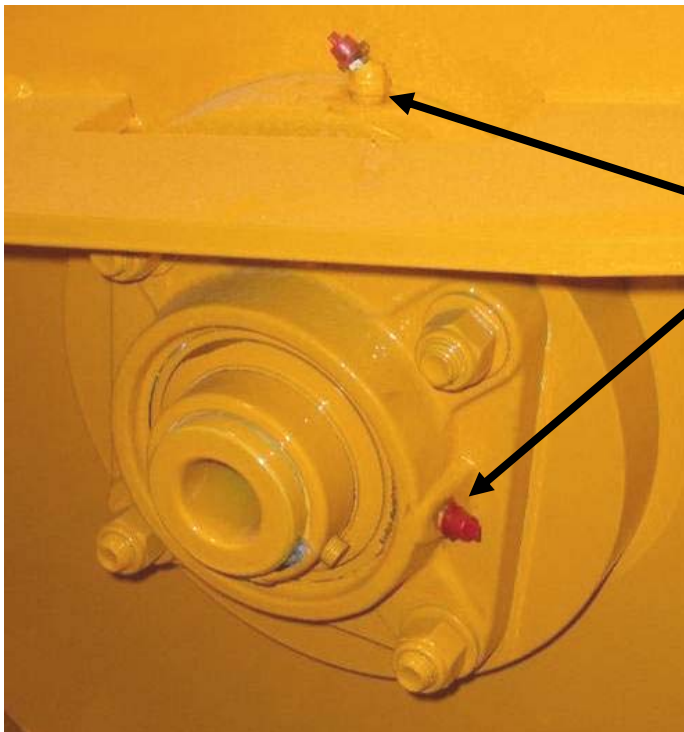


AGITATOR LUBRICATION

HYDRAULIC MOTOR SIDE
GREASE POINT



NON-HYDRAULIC MOTOR SIDE
GREASE POINTS





HYDRAULIC SYSTEM

Hydraulic pumps are used to supply the flow of oil necessary to operate actuators of the concrete pump.

CAUTION

Contamination of the Oil Is the Leading Contributor to System Malfunctions

Extreme care must be exercised to prevent contaminants from entering the system. Always cap or plug open ports and hydraulic lines.

HYDRAULIC TANK

The hydraulic tank is equipped with an access cover with breather and magnetic suction strainers inside the tank. A sight and temperature gauge is installed on the tank to determine the fluid level and temperature inside the tank. The tank is also equipped with drain valve.

In addition to the magnetic suction strainers, filtration is accomplished by use of a hydraulic return filter located on top of the hydraulic tank. The return filter is equipped with an indicator gauge to monitor filter restriction. An oil cooler is adjacent to the engine cooling unit.



HYDRAULIC SYSTEM MAINTENANCE ITEM DESCRIPTIONS

FLUID

Check fluid level and oil clarity daily with sight gauge provided. Maintain level at full mark. Add hydraulic oil through the return filter fill port when necessary.

TANK BREATHER

Clean every 50 hours of operation. Remove from tank, clean with solvent and air blow dry.

FILTER

Change after first 50 hours of operation. Thereafter change every 250 hours of operation or when condition gauge indicates change is necessary.

HYDRAULIC TANK

Change oil in tank every 500 hours of operation or yearly, whichever comes first.

HYDRAULIC FLUID

The hydraulic system is filled with Shell Oil Company TELLUS #46. It is to be used in ambient temperatures of 39-90° F (4-32° C). The normal fluid temperature will range from 100-167° F (38-75° C).

For ambient temperatures of 90° F (32° C) and above, use fluid designated with an ISO rating of 68. Use ISO 32 for ambient temperatures of 32° F (4° C) and below.

CAUTION

Use Only Shell Tellus 46 or Equivalent
Never Mix With Other Types of Fluids

CAUTION

Always Use Clean and New Fluid

Using impure or other type of fluids not specified will contaminate the hydraulic system and lead to eventual system malfunction and/or damage.



ADDING HYDRAULIC FLUID

Exercise extreme care when adding fluid to the hydraulic tank to avoid contamination.

- To prevent any dirt or water from entering the hydraulic tank, thoroughly clean area around filter fill port.
- Remove filter fill port.
- Fill system with new clean hydraulic fluid.

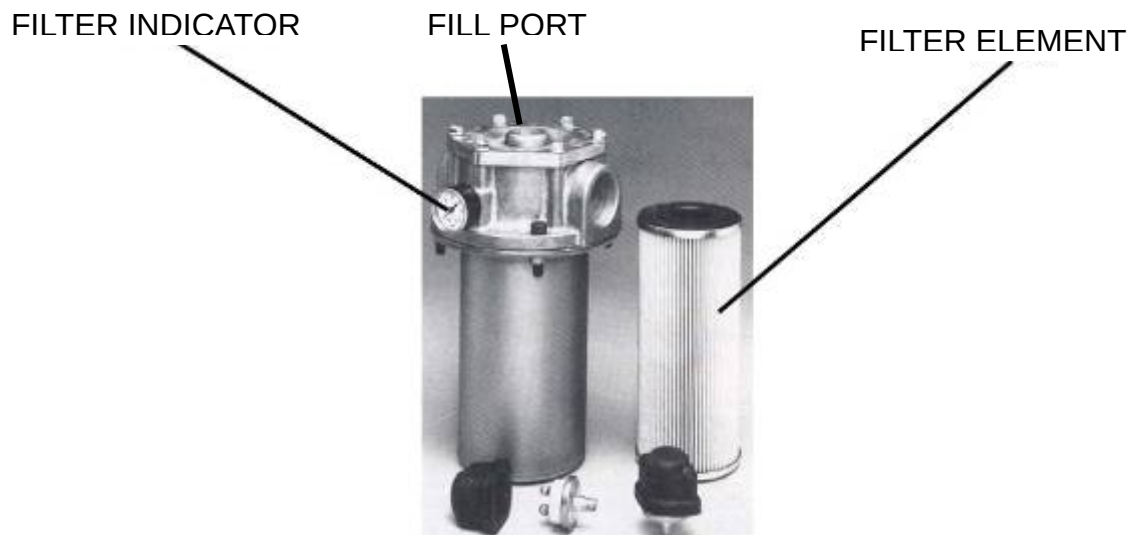
If a pump is used to transfer the fluid, ensure the pump filter is clean. If pouring fluid from a container, pour it through a fine wire mesh screen, 200 mesh or finer.

- Replace filter fill port immediately after filling tank to proper level.

CAUTION

Do Not Use Cloth for Straining Fluid
Lint Is a Contaminant Harmful To the Hydraulic System

FILTER SERVICING



Hydraulic filters provide a means of continuous hydraulic fluid filtration in an effort to prevent recirculation of contamination which will cause rapid wear and component breakdown.

The filter is equipped with a condition indicator gauge which should be checked daily and the element changed when indicated.



To change the filter elements:



1. Shut off machine allowing accumulator system to depressurize
2. Wipe clean any dirt and grime from area surrounding filter housing
3. Loosen the bolts holding on top plate of filter
4. Carefully remove cover so as not to damage the gasket
5. Remove bypass valve and element
6. Discard only element and discard responsibly
7. Install bypass valve and new element and replace cover
8. Wipe clean any contaminants around high pressure filter
9. Remove filter housing then remove and discard filter element
10. Check and replace o-ring or gasket if necessary
11. Replace filter element and install filter housing
12. Start up machine and observe for leakage



Do Not Wash Out and Reuse Disposable Filter Elements

CLEANING THE HYDRAULIC TANK

The hydraulic tank should be drained and cleaned after 500 hours of operation or yearly, whichever occurs first, to assist in keeping the systems clean and in proper condition.

1. Shut off machine allowing the hydraulic system to depressurize
2. Place a suitable size container under the hydraulic tank drain fitting and then remove drain plug.
3. After draining, remove the access cover on the hydraulic tank being careful not to damage the gasket
4. Remove, disassemble and clean magnetic suction strainers before reassembly
5. Flush the inside of the hydraulic tank with a clean solvent and wipe clean with lint free cloths
6. Install suction strainers
7. Replace sight gauge
8. Install the tank drain plug and access cover with gasket
9. Replace the breather cap
10. Change the hydraulic system filter element
11. Refill the hydraulic tank with new clean hydraulic fluid
12. Start machine and check for leaks



COMPONENT REPLACEMENT

When parts are worn, do not delay in replacement. Continued usage with worn parts may lead to damage of other components.

This section is provided as a general guideline to assist in replacing major components that will wear. Please contact the **REED** Service Department or your local dealer for technical support.

S-TUBE, WEAR RING, AND WEAR PLATE

The sealing characteristics of the s-tube depend on the positive contact of the wear ring, located inside the s-tube, to the wear plate mounted inside of the hopper. the abrasiveness and friction of the concrete will cause wear and a breakdown of the sealing action. As this breakdown occurs, periodic adjustments to the s-tube can be made. This will help to improve the sealing quality; however, eventually the components will need to be replaced.

Adjustment or parts are required if:

- s-tube concrete build up
- deep grooves have developed on the face of the wear plate and/or on the wear ring
- When the output volume at the end of the delivery line noticeably begins to decrease or eventually stops
- When the material being pumped is being forced back into the hopper under pressure



Accumulator Pressure Must Be ZERO
BEFORE AND DURING Any Maintenance Procedures



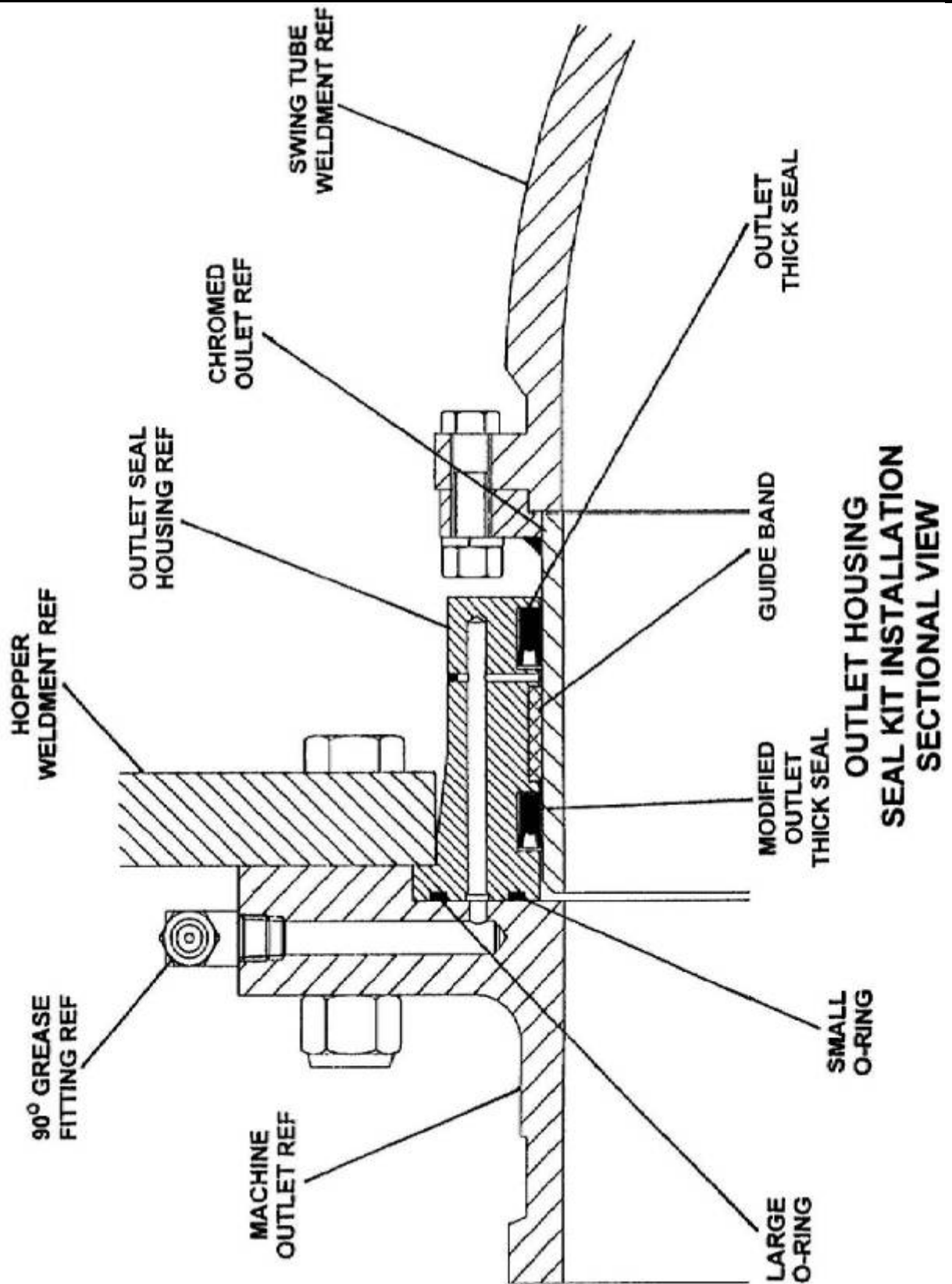
Engine Must Be Turned OFF and Lockout / Tagout Procedures Must Be Followed
BEFORE AND DURING Any Maintenance Procedures

NOTE: The following graphics are for REFERENCE ONLY.



OPERATION and MAINTENANCE

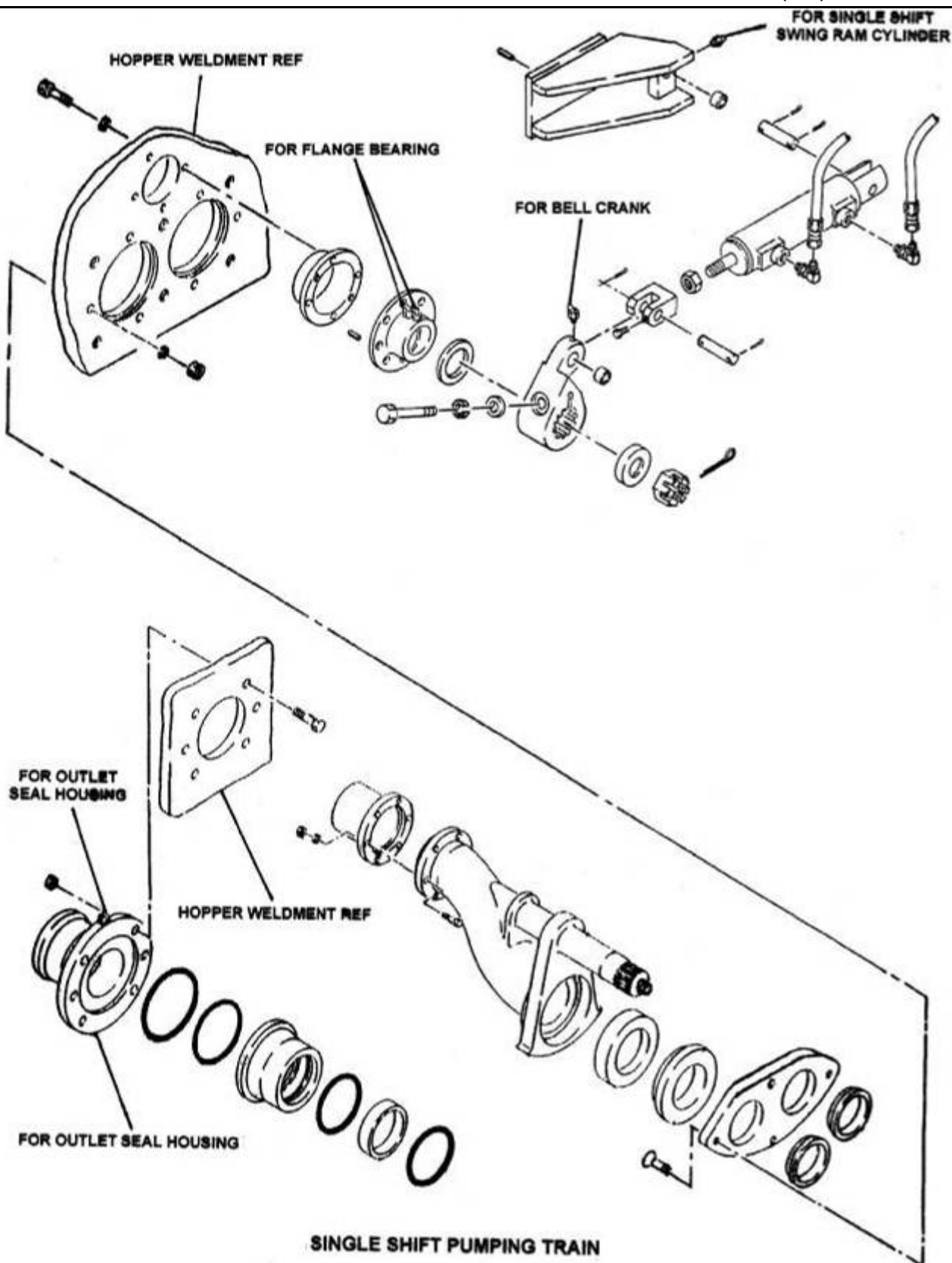
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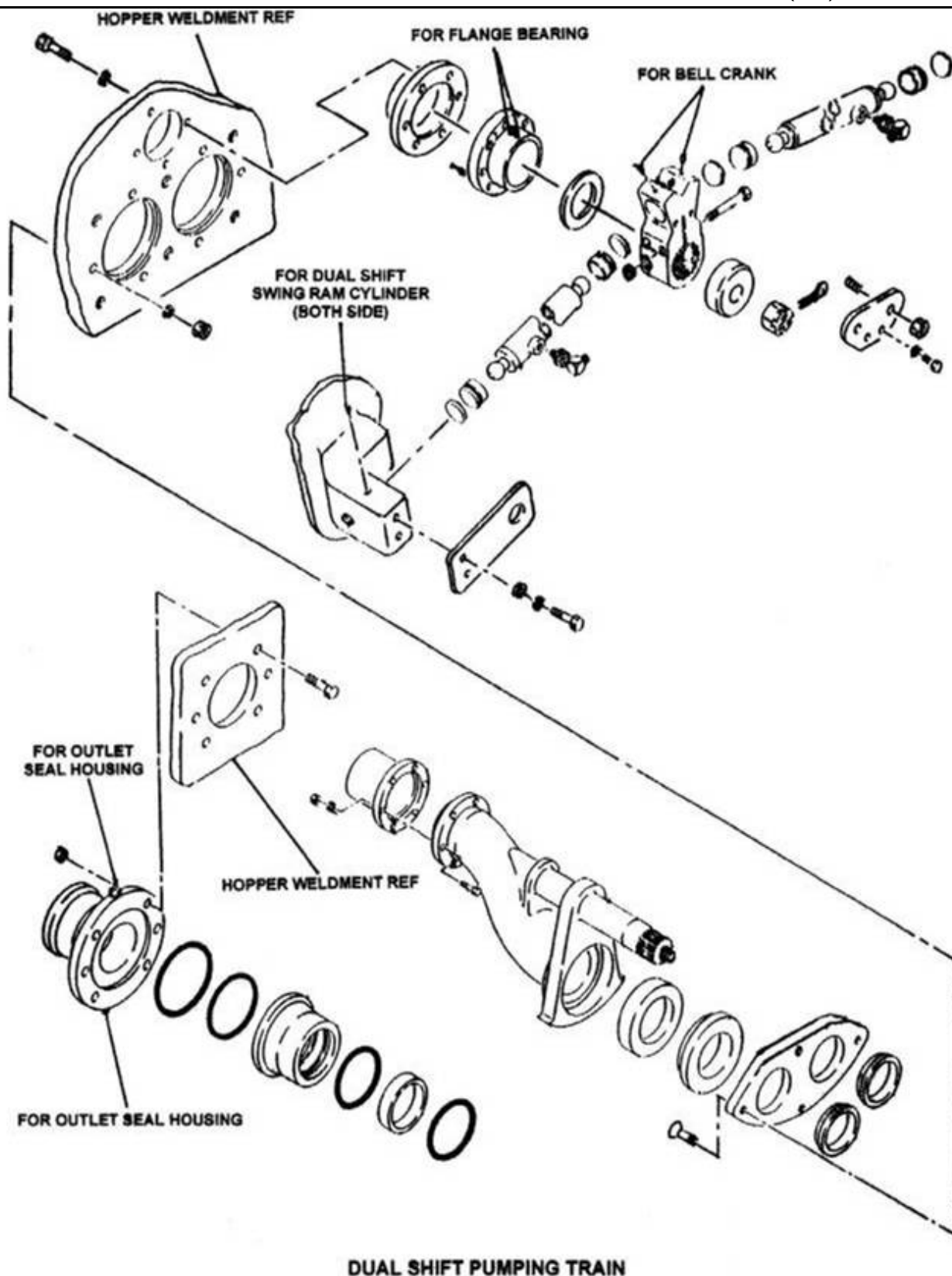
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Accumulator Pressure Must Be ZERO
BEFORE AND DURING Any Maintenance Procedures



Engine Must Be Turned OFF and Lockout / Tagout Procedures Must Be Followed
BEFORE AND DURING Any Maintenance Procedures

1. Turn off engine to shut down the system. Confirm gauges show no pressure.
2. Remove outlet bolts, remove outlet
3. Loosen bell crank pinch bolt (s), remove cotter pin, loosen s-tube nut 1 turn
4. Remove outlet seal housing followed by s-tube nut, spacer, bell crank, washer, swing ram(s)
5. Place a sling from an overhead hoist around the discharge end of s-tube to help support the tube.
6. Pry s-tube toward outlet, remove wear ring & thrust seal. The s-tube may be swung upside down for easy access to clean. Thrust seal groove must be properly cleaned

Note: the s-tube may be removed from hopper for better access by removing flange bearing, seal and chromed outlet and hoisting it out of hopper

7. If wear plate is to be changed, remove wear plate mounting bolts. Pry wear plate from hopper using provided jack bolt.
8. Pry anti-chip rings out of hopper bore. Use caution not to damage chrome concrete cylinder. Clean anti-chip ring bore and wear plate area. Replace o-rings (if applicable). Test-fit new bolts in new wear plate, they should not protrude (grind if necessary). Apply small bead of silicone to outer diameter of anti-chip rings, install into hopper bore with split at bottom
9. Apply small amount of silicone to hopper-side of wear plate, and bolt-heads. Install wear plate, hand tighten bolts. Use a pair of bolts with nuts underneath new wear plate to adjust and align to concrete cylinders. Torque wear plate mounting bolts to 250 ft lbs, remove adjusting bolts.
10. Install new thrust seal & wear ring in s-tube.
11. Install shaft seal and flange bearing (if removed), torque bolts to 100 ft lbs



12. Slide s-tube forward against wear plate, install washer, align/ mount bell crank, install spacer and castle nut. Do not tighten yet.
13. Replace outlet seals in proper orientation, apply grease and install outlet seal housing. Install outlet, torque outlet bolts to 100 ft lbs. Grease all zerk fittings for s-tube until grease comes out of seals.
14. Remove sling, tighten s-tube nut/bolt. It may be helpful to start machine and cycle s-tube to help new parts seat. Do final tightening to s-tube nut/bolt, install cotter pin/retainer, tighten bell crank pinch bolt (s). The nut should be as tight as possible without hampering the shift of s-tube

S-TUBE ADJUSTMENT



Accumulator Pressure Must Be ZERO
BEFORE AND DURING Any Maintenance Procedures



Engine Must Be Turned OFF and Lockout / Tagout Procedures Must Be Followed
BEFORE AND DURING Any Maintenance Procedures

The s-tube will require periodic adjustment as the wear parts wear in order to ensure the good contact and sealing characteristics of the wear plate and wear ring, as well as maintaining a constant squeeze of the thrust seal behind the wear ring. S-tube adjustment is performed by tightening the castle nut. Generally, the castle nut should be as tight as it can be without slowing or hindering the throw of the s-tube.

1. With engine off and no pressure showing on gauges, loosen the bell crank pinch bolts
2. Remove cotter pin and tighten castle nut one flat or to next cotter pin slot.
3. Start and cycle machine to ensure proper s-tube operation. Adjust further if necessary, following lock out tag out rule for each adjustment.
4. When adjustment has been satisfied, install cotter pin and tighten bell crank pinch bolts.



PISTON CUP AND GUIDE BAND REMOVAL/REPLACEMENT

Because of the abrasiveness of the material being pumped, it will be necessary to periodically replace the piston cups.

Signs and identifying systems of worn parts might be:

- Slurry of the material being pumped starts to appear in the flush box
- The water or lubricating oil in water box begins to rapidly lower level without any sign of leakage
- Operation is rough and erratic



Accumulator Pressure Must Be ZERO
BEFORE AND DURING Any Maintenance Procedures



Engine Must Be Turned OFF and Lockout / Tagout Procedures Must Be Followed
BEFORE AND DURING Any Maintenance Procedures

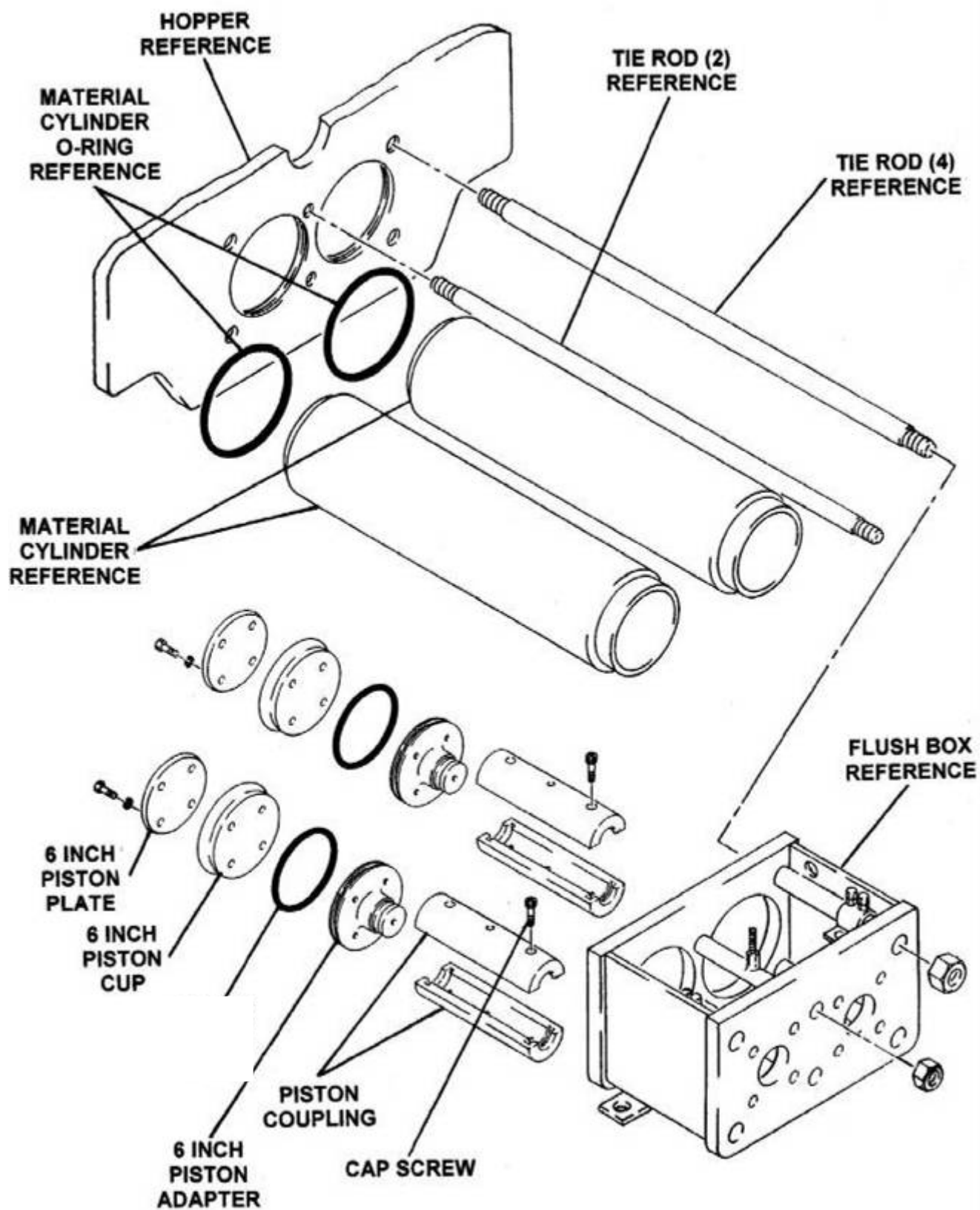
1. Drain all oil or water from the flush box.
2. Cycle machine using appropriate controls until one of the cylinders is completely retracted. Turn off engine and allow hydraulic systems to completely depressurize.
3. As a precaution, mark location of proximity sensor adjusting bracket. Remove proximity sensor cross bracket.
4. Mark the end of the piston coupler so that it can be placed in the same relation during reassembly.
5. Unbolt and remove top and bottom halves of coupler. Pry the piston assembly into flush box.
6. Disassemble and clean piston adapter and plate. Check flatness of plate, replace if necessary.
7. Install and grease new guide band. Push adapter/guide band squarely into cleaned and greased concrete cylinder.
8. Install coupler using medium strength Loctite on bolts and torque to 90 ft lbs.
9. Start and completely extend the adapter and guide band to hopper side. Jog s-tube if necessary to expose fully extended piston adapter.
10. Turn off engine and allow hydraulic systems to completely depressurize



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11. Install one alignment bolt (3/8"x24x5" with head cut off) into the piston adapter to assist in locating the cup in the correct position to line up the holes.
12. Slide new piston cup, small end first, over alignment bolt until it meets wear plate. Use a rubber hammer to drive piston cup into concrete cylinder until it seats against piston adapter
13. Slide piston plate into place.
14. Apply medium strength Loctite to bolts. After three bolts with lock washers are started, remove alignment bolt and thread in the last bolt. Tighten bolts equally and firmly using hand tools.
15. One concrete piston is complete. Follow steps 2-14 again for the other side.
16. Install proximity sensor cross bracket.
17. Install flush box plug, fill to top of rods with oil or water, and install flush box cover.





ACCUMULATOR



The hydraulic accumulator is a pressurized vessel and only QUALIFIED TECHNICIANS should perform the necessary repairs. Always drain the fluid COMPLETELY from the accumulator before performing any work on the component.

A qualified technician can check the pre-charge pressure of the accumulator using an accumulator charge kit if low pressure is suspected. Check the pre-charge pressure of the accumulator if the needle of the hydraulic s-tube gauge does not suddenly drop off at the specified pressure when the hydraulic s-tube circuit is depressurizing.



PUMP MAINTENANCE SCHEDULE AND CHECKLISTS

Providing a maintenance schedule defined specifically by run hours or yardage pumped serves only as a general guideline given the large amount of variables a unit might be subject to, such as weather and ambient temperature conditions, jobsite conditions, material differences of concrete mix design, the load burden the unit is typically subject to, i.e. light, medium or heavy duty operation, etc.

The list that follows is to be used as a reference guide. However, the end user is encouraged to develop a preventative maintenance program that specifically suites their needs depending on the usage of the equipment.

DAILY PUMP MAINTENANCE CHECKLIST		
Actual Hours _____		Date ____ / ____ / ____
#	Maintenance Description	Initials
1	Check engine fluid levels (see engine manufacturer maintenance schedule for additional requirements)	
2	Check hydraulic tank fluid levels	
3	Check flush box fluid levels	
4	Check condition of hydraulic oil for water or other contamination	
	Additional Notes:	
5	Drain water from tank	
6	Check hydraulic filter indicator condition	
7	Lubricate lubrication points, during and after pumping	
8	Inspect unit for fluid leaks, loose hoses, loose nuts, bolts, fasteners etc.	
	Additional Notes:	
9	Trailer Towing Safety Inspection	
	a) brakes functional	
	b) air pressure in tires is adequate and tire condition	
	c) all "lug nuts" are secure and in place	
	d) tow hitch is secure and in good condition	
10	Additional Notes:	



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INITIAL 50 HOUR MAINTENANCE CHECKLIST		
Actual Hours _____		Date ____ / ____ / ____
#	Maintenance Description	Initials
1	Change engine oil and filters (see engine manufacturer maintenance schedule for additional requirements)	
	Additional Notes:	
2	Change hydraulic oil filters	
3	Inspect hydraulic hoses and fittings for any signs of external wear or damage	
	Additional Notes:	



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EVERY 100 HOUR MAINTENANCE CHECKLIST		
Actual Hours _____		Date ____ / ____ / ____
#	Maintenance Description	Initials
1	Clean hydraulic tank breather	
2	Inspect all structural components (check frame, hopper, axle, hood, towing hook, and other structural members for any damage)	
	Additional Notes:	
3	Adjust "S-Tube Nut" or "Castle Nut" (refer to "S-Tube Adjustment" in Maintenance Section)	
	Additional Notes:	
4	Change flush box oil and examine for excessive amounts of contamination (excessive contamination might indicate need to change the Piston Cups)	
	Additional Notes:	
5	Check coolers and radiators for dirt or debris. Clean as necessary	
6	Check condition of engine drive belts. Change if necessary (see engine manufacturer maintenance schedule for additional requirements)	
Additional Notes:		



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EVERY 250 HOUR MAINTENANCE CHECKLIST		
Actual Hours _____		Date ____ / ____ / ____
#	Maintenance Description	Initials
1	Change hydraulic filters (or change more frequently as indicated by indicator gauge on filter)	
2	Check that S-Tube, wear parts and seals in hopper are secure and adjusted well, rotate wear ring and replace seal if necessary	
	Additional Notes:	
3	Check swing cylinder components: cylinders, bell crank, pins, bushings, bearings and grease fittings are secure, tight, and not worn excessively	
	Additional Notes:	
4	Check piston cup wear (as indicated by analysis of contaminants found in flush box oil)	
	Additional Notes:	
5	Check that all electrical wires, cables, terminals, plugs are in good condition	
	Additional Notes:	
6	Change engine oil and filters (see engine manufacturer guide for all engine requirements)	
	Additional Notes:	
7	Check condition of fuel hoses, fittings, and clamps	
	Additional Notes:	
8	Inspect all safety decals to ensure that they are completely visible and legible	



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EVERY 250 HOUR MAINTENANCE CHECKLIST		
Actual Hours _____		Date ____/____/____
#	Maintenance Description	Initials
9	Perform complete inspection of the controls	
10	All toggles in good condition, stay in position or momentarily return to center	
11	Control identification in good condition, legible	
12	Gauges in good condition	
	Additional Notes:	
13	Remote controls, control console in good condition	
14	Switch in good condition	
15	Cord in good condition, no cuts, securely mounted to box	
	Additional Notes:	
16	Trailer frame integrity, visually check welds, cracks	
17	Torsion axle secure	
18	Wheels and tires, lug nuts tight, tire inflation	
19	Electric brakes, breakaway switch connected	
20	Front jack stand handle turns easily, smoothly	
21	Manual jacks slide freely, lock pins in place	
22	Lighting good condition operational	
Additional Notes:		



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EVERY 500 HOUR MAINTENANCE CHECKLIST		
Actual Hours _____		Date ____ / ____ / ____
#	Maintenance Description	Initials
1	Inspect hydraulic hoses and fittings for any signs of external wear or damage	
	Additional Notes:	
2	Inspect all wear parts and change as necessary (excessive wear may cause inefficient performance and/or shutdown of operation)	
	Additional Notes:	
3	Change hydraulic fluid, clean the reservoir and the suction strainers within reservoir, and replace all hydraulic oil filters	
	Additional Notes:	
4	Complete inspection of the engine (refer to engine manufacturer maintenance schedule for details)	
5	Inspect mountings, bolts, brackets	
6	Oil level proper, coolant level proper, check for leaks	
7	Fuel system, tank mounting, filter condition, check for leaks, damaged lines	
8	Battery hold down, condition, tightness of cables	
9	Key switch, indicator lights operable	
10	Throttle control functional	
11	Air cleaner and muffler securely mounted	
Additional Notes:		



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EVERY 500 HOUR MAINTENANCE CHECKLIST		
Actual Hours _____		Date ____ / ____ / ____
#	Maintenance Description	Initials
12	Pump cell check for structural damage, cracked welds	
13	Hydraulic drive cylinders in good condition, secure, check for leaks	
14	Material cylinders secure, tie rods tight	
15	Water box structurally sound, clean, cover in place	
16	S-Tube shift mechanism structurally sound, all pins and retainers in place	
17	Hydraulic shift cylinders in good condition	
18	Bearing housing, seals etc. in good condition	
19	Hydraulic hoses secure no leaks	
	Additional Notes:	
20	Hopper check for structural damage, cracked welds	
21	S-Tube secure, in good condition	
22	Check condition of wear plate, wear ring, seals	
23	Check connection of S-Tube to outlet, seals, bearing	
24	Hopper drain is functional	
Additional Notes:		

EVERY 500 HOUR MAINTENANCE CHECKLIST

ADDITIONAL GENERAL NOTES:



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PARTS

13822 Oaks Avenue
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PARTS	3
PUMPING TRAIN ASSEMBLY	3
S-TUBE ASSEMBLY	5
4" OUTLET ASSEMBLY ASSEMBLY	5
4"OUTLET SEAL KIT INSTALLATION	6
WEAR PLATE ASSEMBLY	7
4" PISTON CUP ASSEMBLY	8
DRIVE CYLINDER ASSEMBLY	9
SINGLE SHIFT BELL CRANK ASSEMBLY	10
SINGLE SHIFT SWING CYLINDER ASSEMBLY	11
DUAL SHIFT BELL CRANK ASSEMBLY	12
DUAL SHIFT SWING CYLINDER ASSEMBLY	13
HOPPER	14
AGITATOR ASSEMBLY (OPTION 1)	14
AGITATOR ASSEMBLY (OPTION 2)	15
SAFETY GRATE	17
GRATE ASSEMBLY	18
CLEAN OUT DOOR ASSEMBLY	19
POWER TRAIN	20
ENGINE, PUMPS, AND FILTERS	20
FITTINGS	22
EXHAUST	23
TANKS	24
FUEL TANK ASSEMBLY	24
HYDRAULIC TANK ASSEMBLY	25
MANIFOLDS	27
DRIVE CYLINDER CIRCUIT MANIFOLD ASSEMBLY	27
DRIVE CYLINDER SOLENIOD VALVE ASSEMBLY	28
S-TUBE CIRCUIT MANIFOLD ASSEMBLY	29
S-TUBE CIRCUIT SOLENOID VALVE ASSEMBLY	30
ACCUMULATOR ASSEMBLY	31
ELECTRICAL GROUP	32
BATTERY	32
PROXIMITY SWITCHES	33
STARTER AND ALTERNATOR	34
TRAILER HARNESS AND BREAKAWAY	35
TAIL LIGHTS	36
WIRING HARNESS	37
CONTROLS	38
B-SERIES CONTROL BOX	38
CONTACT BLOCKS	39
RELAYS AND FUSES	40
CONNECTORS	41
50 FT CABLE REMOTE	42
FRAME INSTALLATION	43



B20HPCV10

PARTS

13822 Oaks Avenue
Chino, CA 91710
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909-287-2100

FRAME, TIRES, JACK, AND TOW EYE.....	43
7000LB AXLE MOUNTING ASSEMBLY.....	44
FENDERS AND OUTRIGGERS	46
CONTROL BOX MOUNT.....	47
OPTIONS	48
LUBE BLOCK	48
AUTOLUBE PUMP (PLASTIC TUBING)	49
HYDRAULIC OUTRIGGER GROUP	51
ELECTRIC HYDRAULIC OUTRIGGER CONTROLS	52
3 SPOOL CONTROL VALVE.....	54
HYDRAULIC OUTRIGGER CYLINDER.....	55
AGITATOR GROUP	56
1 SPOOL AGITATOR VALVE.....	57
AGITATOR GROUP CONTINUED	58
VIBRATOR (COUGAR)	59
VIBRATOR (VIBCO).....	60
RADIO REMOTE KIT (KAR-TECH).....	61
RADIO REMOTE KIT (OMNEX)	62
CHROME WHEEL AND TIRE	63
LIFTING EYE KIT	64
WATER PUMP	65
CARBIDE WEAR PARTS	68



B20HPCV10

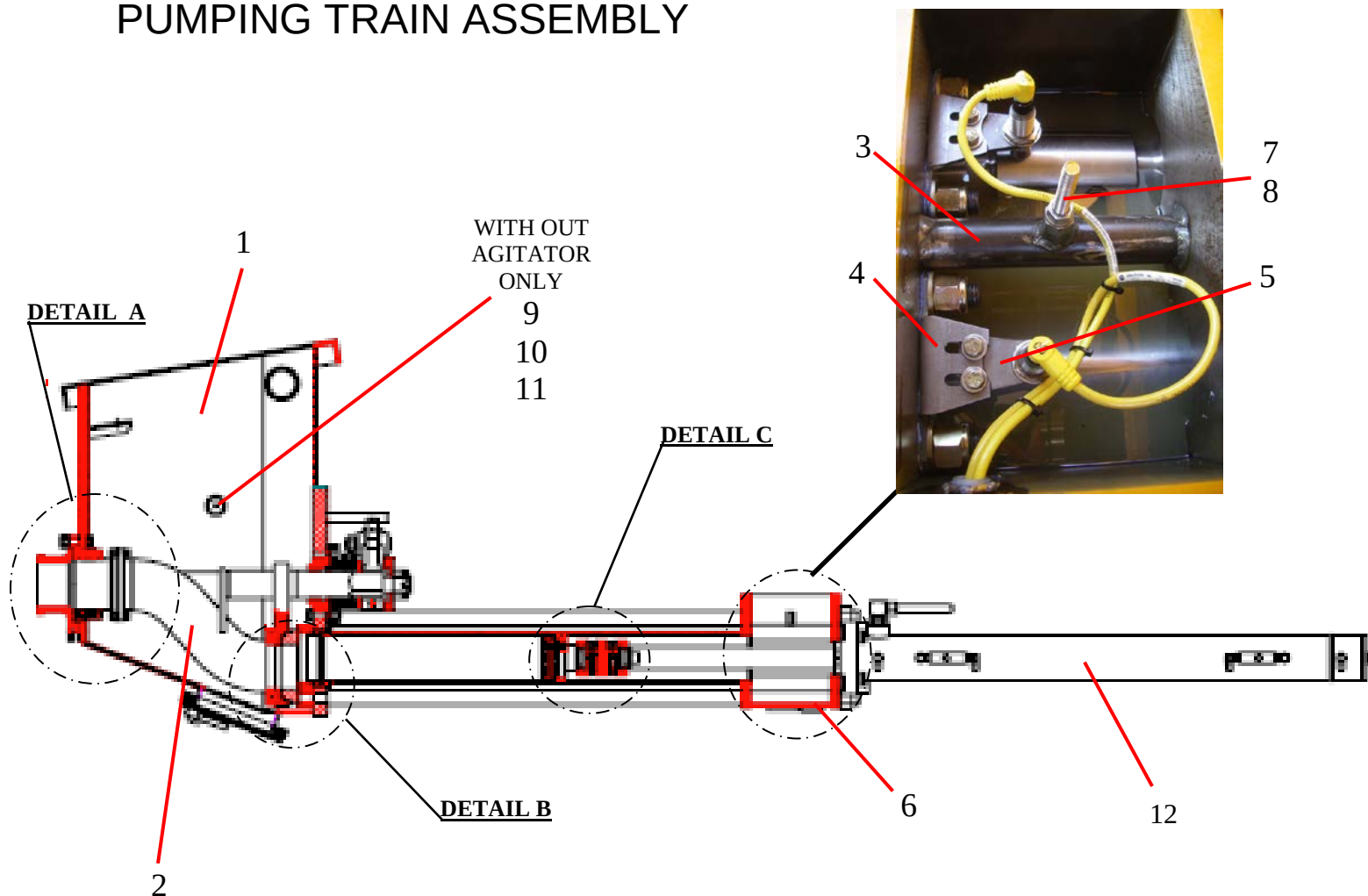
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PARTS

PUMPING TRAIN ASSEMBLY

WATERBOX TOP VIEW



ID #	PART #	PART DESCRIPTION	QUANTITY	
	87894-5	STD SHIFT PUMPING TRAIN ASSEMBLY	1	EA
1	86803A	HOPPER WELD B20 SAFETY	1	EA
2	71349	S TUBE WLD, 4X4	1	EA
3	88172	FLUSH BOX WELDMENT, B20/B20HP	1	EA
4	88180	BKT-PROX SENSOR, FLUSH BOX	2	EA
5	88179	BRACKET PROXIMITY SWITCH MOUNT	2	EA
6	10282	PLUGS-PIPE GALV 1"	1	EA
7	86665	STUD, 3/8-16 X3" LONG	1	EA
8		3/8-16 JAM NUT	1	EA
9	73433	COVER REMIX (OUTSIDE)	1	EA
10	73434	COVER PLATE (INSIDE)	1	EA
11	86623	SEAL, AGITATOR (INSIDE)	1	EA
12	86224A	DRIVE CYLINDER -3.25 X 2.00 X 35.75	2	EA

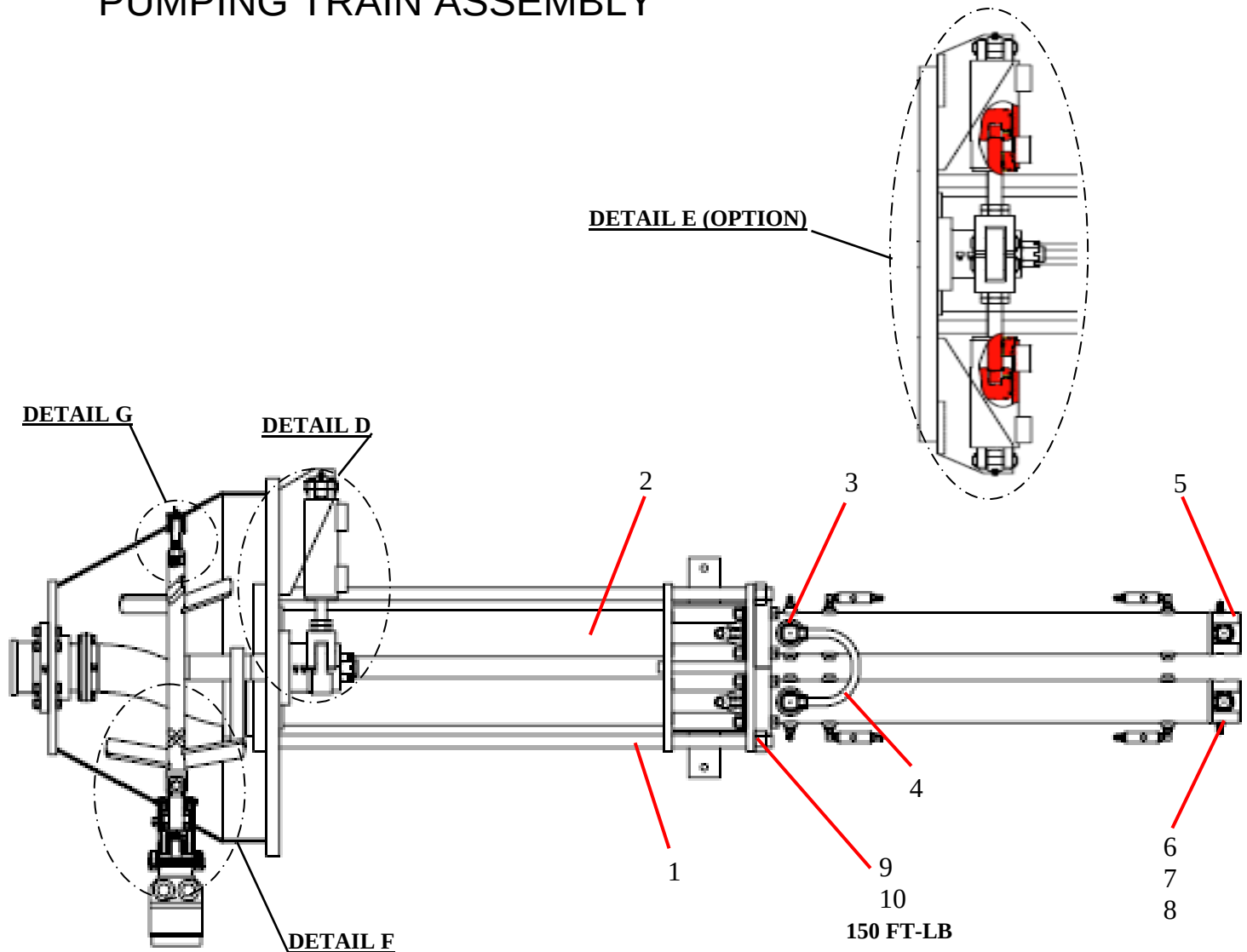


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PUMPING TRAIN ASSEMBLY



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	70315	TIE ROD, 1¼" -12 X 48½"	4	EA
2	71232	CONCRETE CYLINDER, 4" X 36"	2	EA
3		ELBOW, MB – MJ-16-16	2	EA
4	85688	TUBE, HYD, LOOP LINE	1	EA
5	71401	END PLATE – HYD.CYL,M20 PAINTED	1	EA
6		HHCS, ½" – 13X1 ¼" GR	4	EA
7		LOCK WASHER, 1/2	4	EA
8		FLATWASHER, 1/2	4	EA
9		HEX NUT 1 ¼"- 12	4	EA
10		LOCK WASHER, 1 ¼"	4	EA



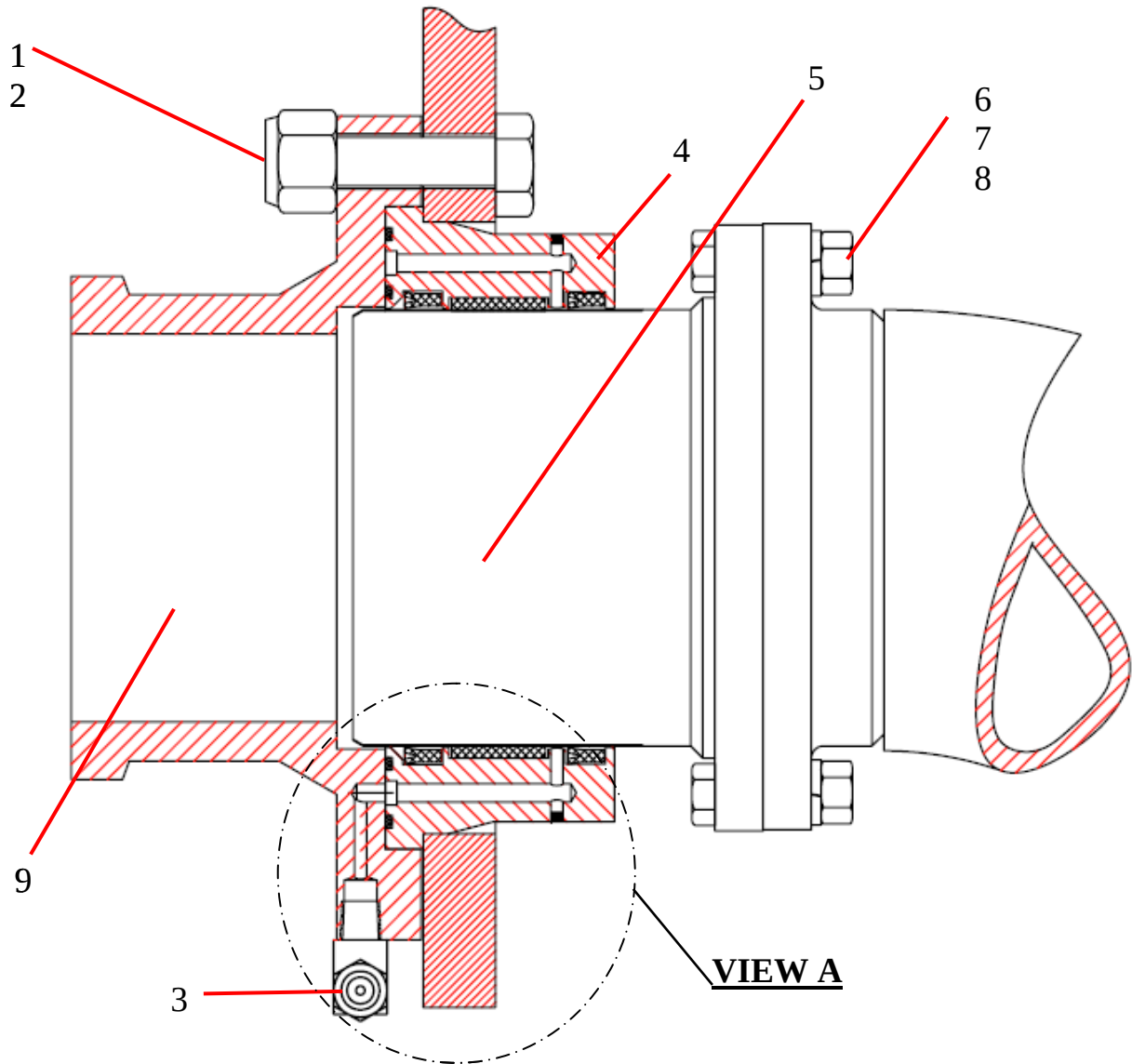
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S-TUBE ASSEMBLY 4" OUTLET ASSEMBLY ASSEMBLY

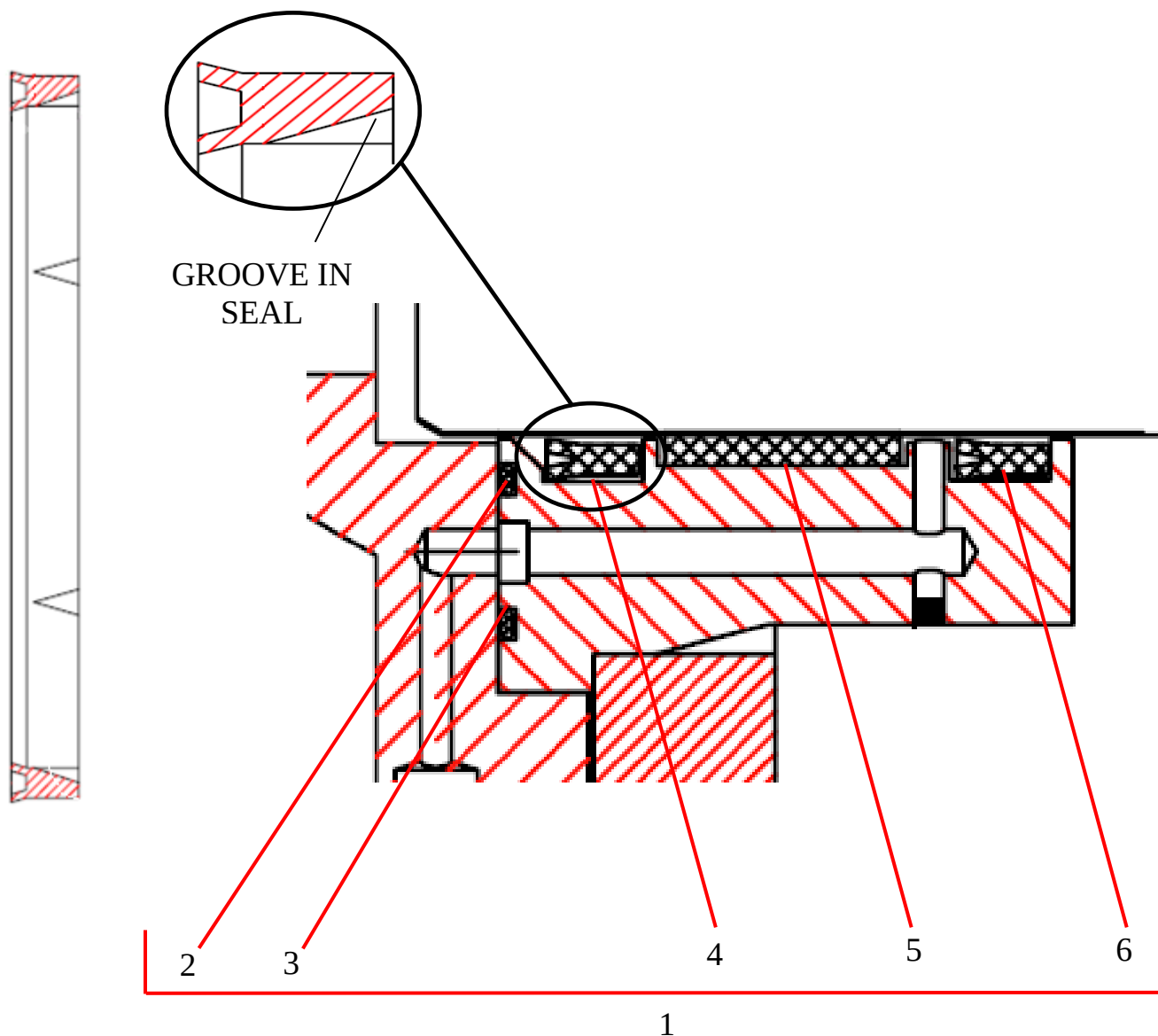
DETAIL A



ID #	PART #	PART DESCRIPTION	QUANTITY	
1		HHCS, 9/16-12 X 2 1/2 GR/8	6	EA
2		LOCK NUT, 9/16 -12	6	EA
3		GREASE FITTING, 1/8" NPT 90°	2	EA
4	86335	OUTLET SEAL HOUSING- 4"	1	EA
5	71343	CHROMED OUTLET	1	EA
6		HHCS, 3/8 – 16X1 1/2" GR 8	6	EA
7		HEX NUT, 3/8" - 16	6	EA
8		LOCK WASHER, 3/8"	6	EA
9	86336	OUTLET, 4" (1-PIECE)	1	EA

4"OUTLET SEAL KIT INSTALLATION

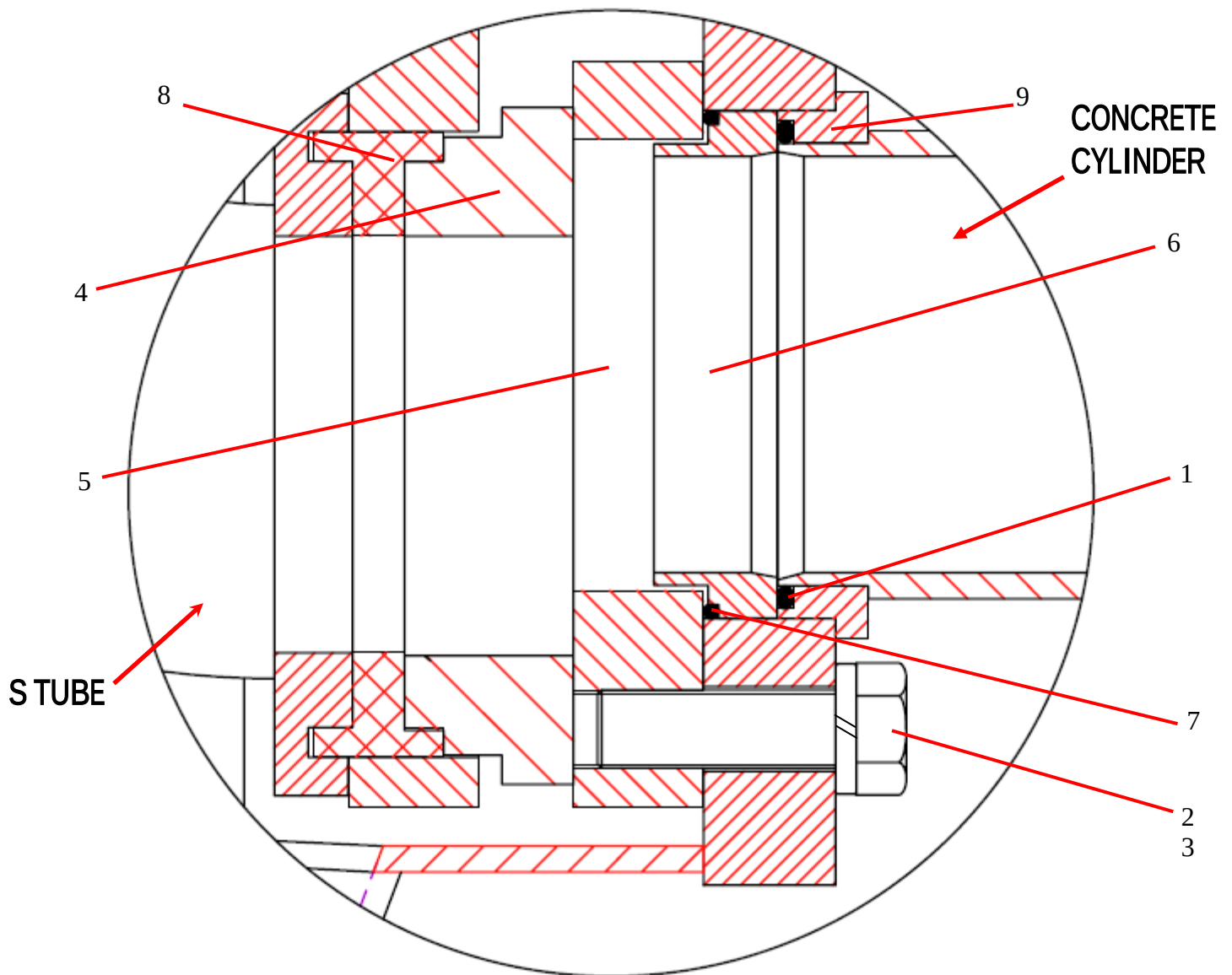
VIEW A



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	86621	SEAL KIT	1	EA
2	86369	O-RING-#158 BUNA 90	1	EA
3	86370	O-RING-#163 BUNA 90	1	EA
4	86614	SEAL-MODIFIED- 4 IN OUTLET	1	EA
5	86371	GUIDE BAND - 4.75 OD X 1.00W	1	EA
6	86372	LIP SEAL -4.50 ID X 4.88 OD X.38	1	EA

WEAR PLATE ASSEMBLY

DETAIL B



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	71249	O-RING, #347 BUENA 70	2	EA
2		HHCS, 3/4 - 10X 2 1/2" GR 8	5	EA
3		LOCK WASHER, 3/4"	5	EA
4	72384	WEAR RING, 4" DOUBLE LIP, 26% CHROME	1	EA
5	71251	WEAR PLATE-CAST 4" M20	1	EA
6	71254	ANTI CHIP RING, 4"	2	EA
7	71247	O-RING FOR CHIP RING	2	EA
8	72285	SEAL, DOUBLE LIP 4"	1	EA
9	71257	CONC, CYL. ADAPTER	2	EA



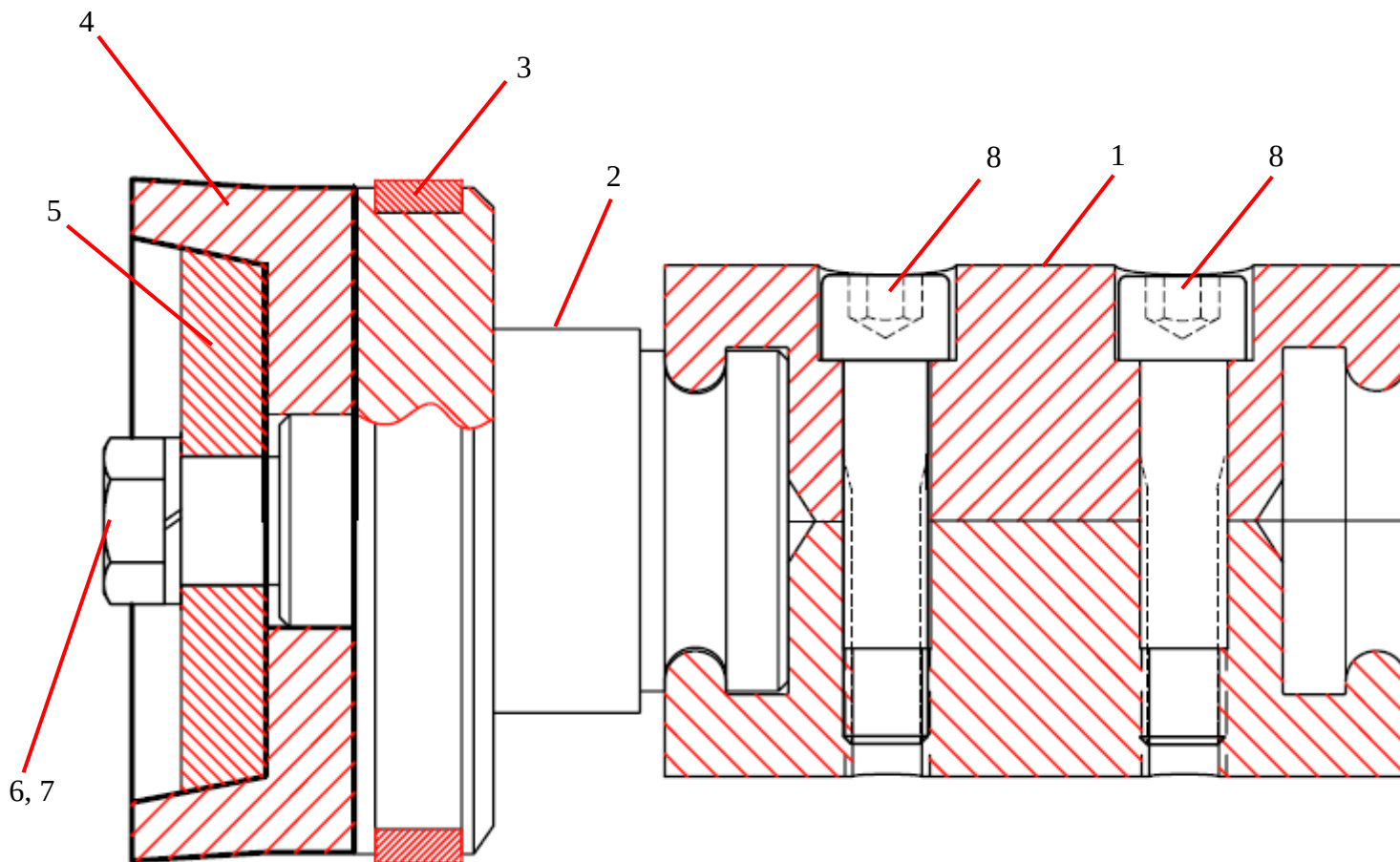
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4" PISTON CUP ASSEMBLY

DETAIL C



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	70077	PISTON COUPLING,	1	EA
2	87940	PISTON ADAPTER 4" WITH GUIDE BAND	1	EA
3	87994	WEAR RING(GUIDE BAND) 4"	1	EA
4	76500	PISTON CUP, 4 IN	1	EA
5	88011	PISTON PLATE 4" SINGLE BOLT	1	EA
6	87982	HHCS 3/4-16 1.5" LONG GR8 PLATED	1	EA
7	80010	LOCKWASHER-3/4 STL ZINC PLATED	1	EA
8		SHCS 1/2 - 13 X 2 1/4"	2	EA

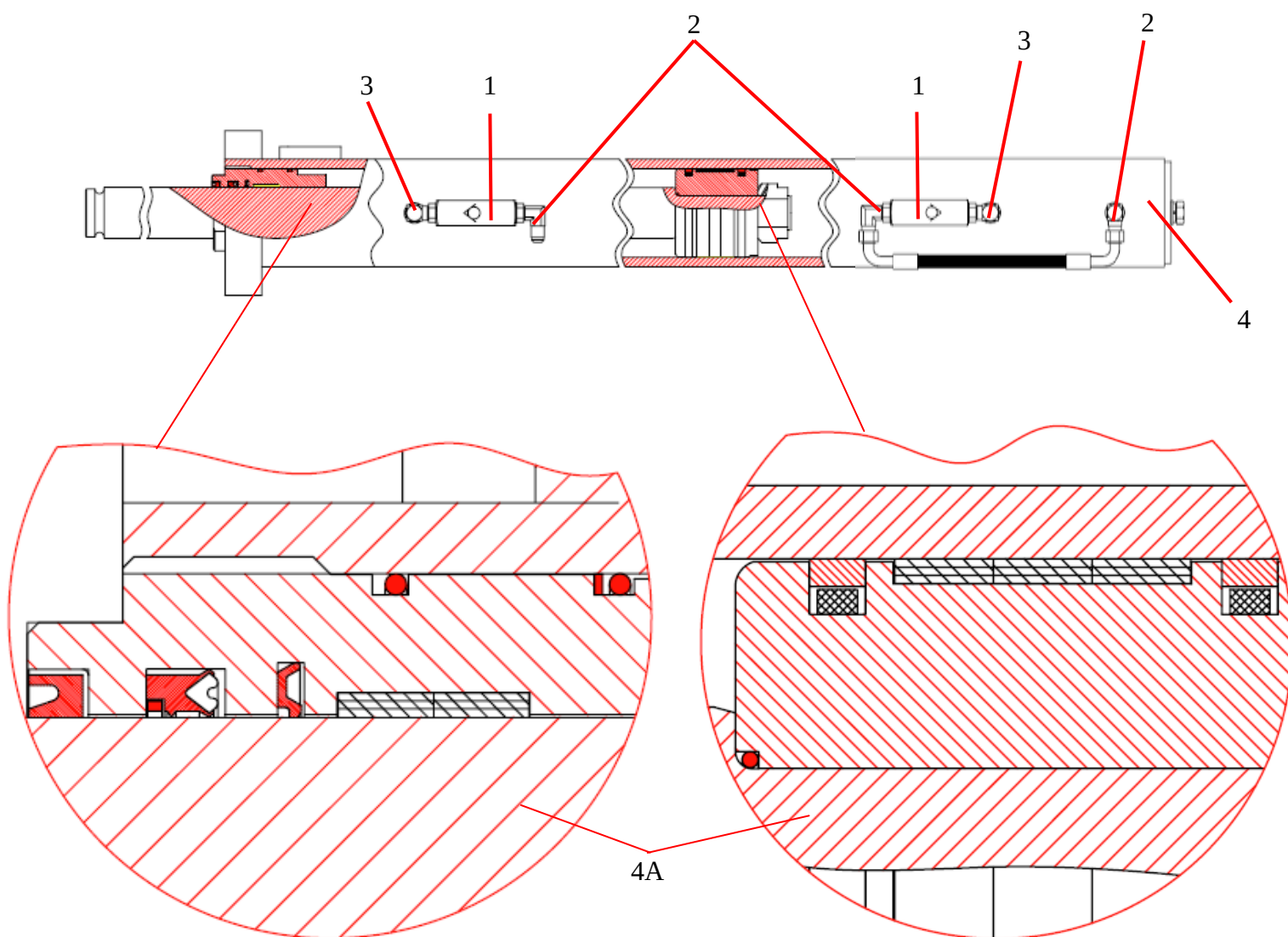


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DRIVE CYLINDER ASSEMBLY



86224A-SK SEAL KIT
ASSEMBLY

ID #	PART #	PART DESCRIPTION	QUANTITY	
1	78961	CHECK VALVE-5K PSI O-RING	4	EA
2	86748	FITTING-MB-MJ90-6-6	4	EA
3		ELBOW, MB-MB90-6-6	2	EA
4	86224A	DRIVE CYLINDER -3.25 X 2.00 X 35.75	1	EA
4A	86224A-SK	SEAL KIT	1	EA



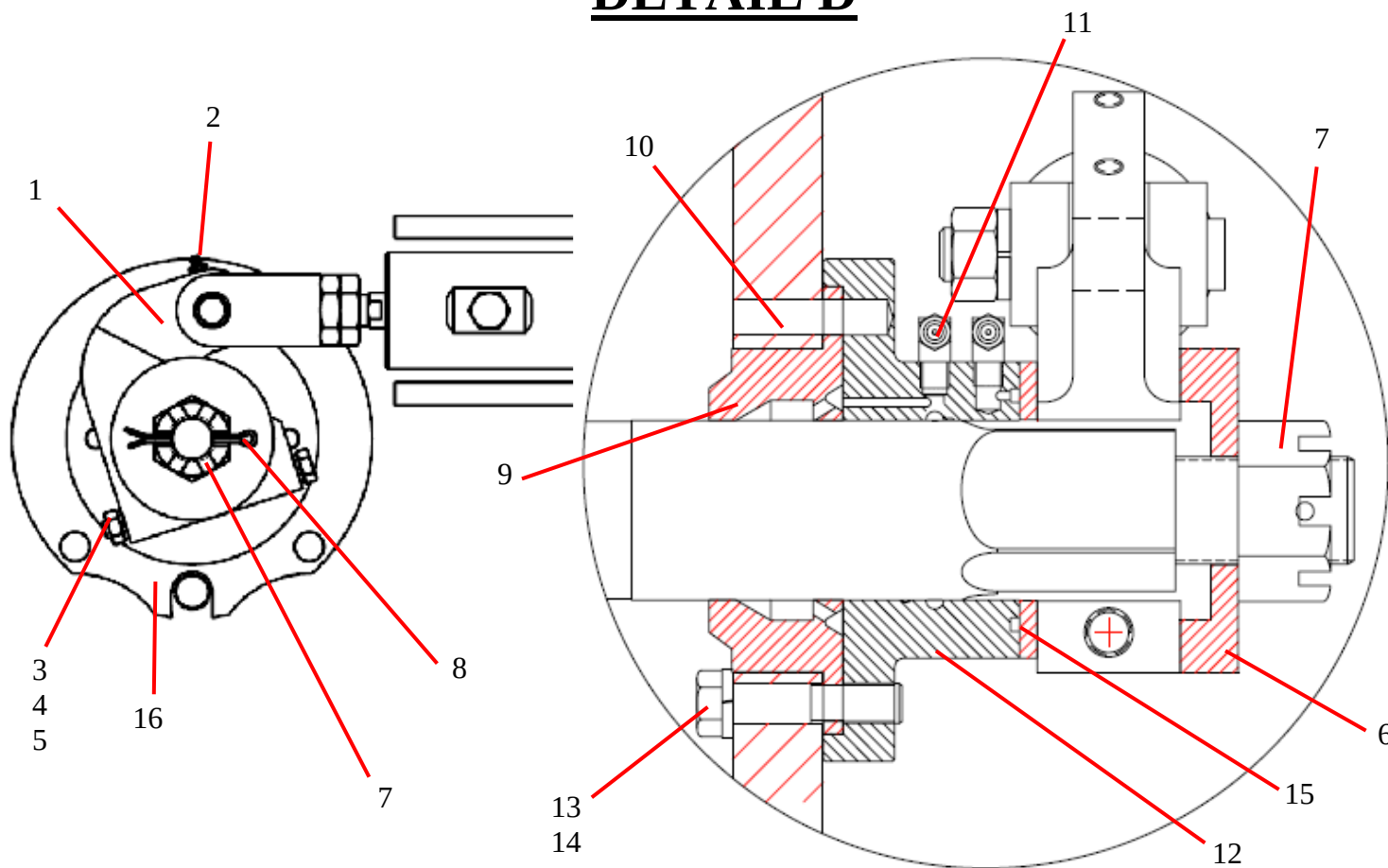
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SINGLE SHIFT BELL CRANK ASSEMBLY

DETAIL D



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	71234	BELL CRANK,	1	EA
2		GREASE FITTING, 1/8" NPT 45°	1	EA
3		HHCS, 5/8"-18X5 1/2" GR 8	1	EA
4		LOCK WASHER, 5/8"	1	EA
5		JAM NUT, 5/8	1	EA
6	70125	SPACER, S-TUBE NUT	1	EA
7	70825	NUT 1 1/2" - 12 CASTLE	1	EA
8		COTTER PIN, 1/4 X4"	1	EA
9	73564	SEAL, FLANGE BEARING 2.5 SHAFT	1	EA
10		DOWEL PIN, 1/2" DIA X 2"	2	EA
11		GREASE FITTING, 1/8" NPT	2	EA
12	70124	FLANGED BEARING	1	EA
13		HHCS, 9/16 - 12X3" GR 8	4	EA
14		LOCK WASHER, 9/16"	4	EA
15	70141	THRUST WASHER, S -TUBE	1	EA
16	86502	LOCATOR RING- FLANGE BEARING	1	EA



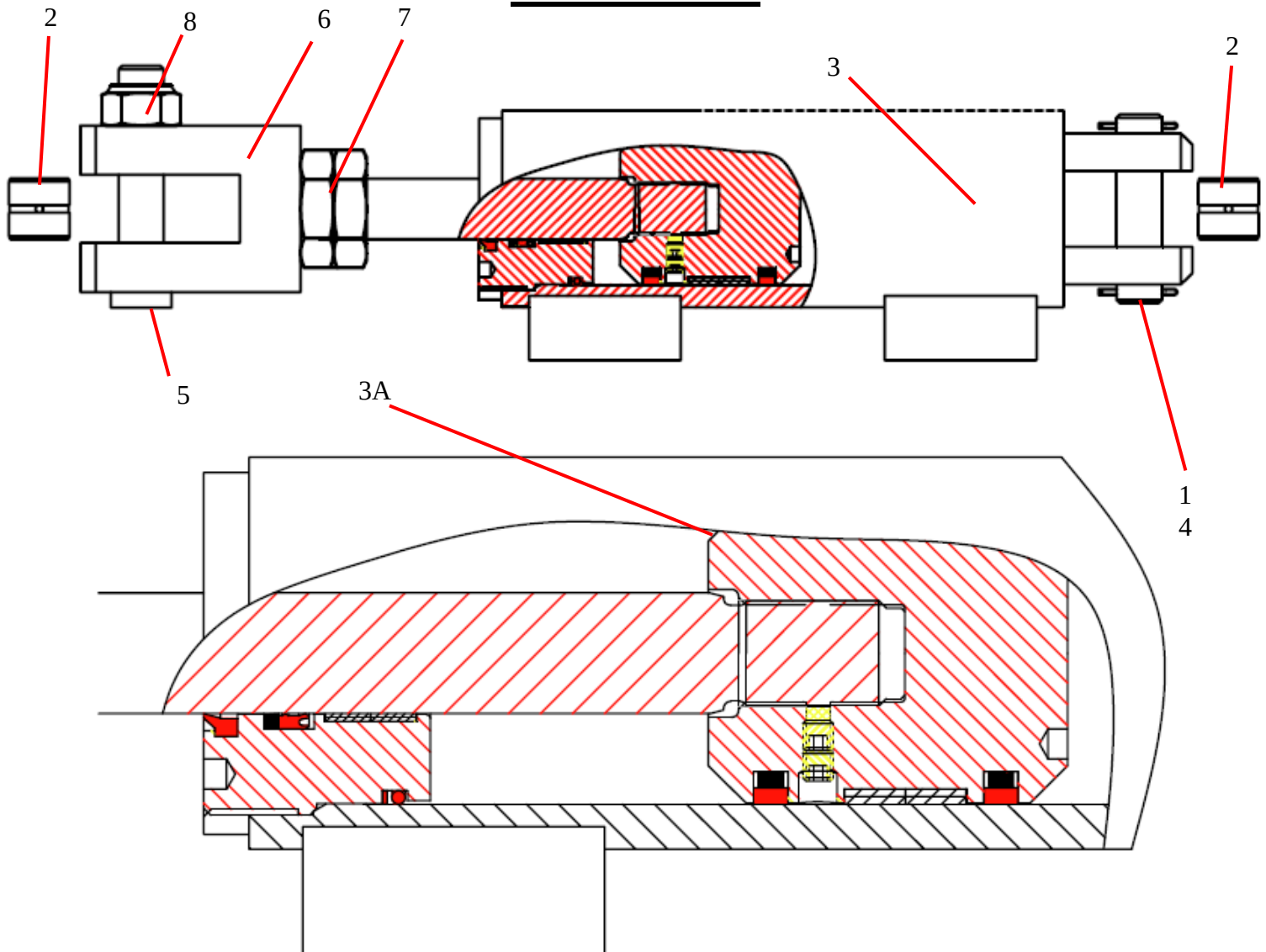
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SINGLE SHIFT SWING CYLINDER ASSEMBLY

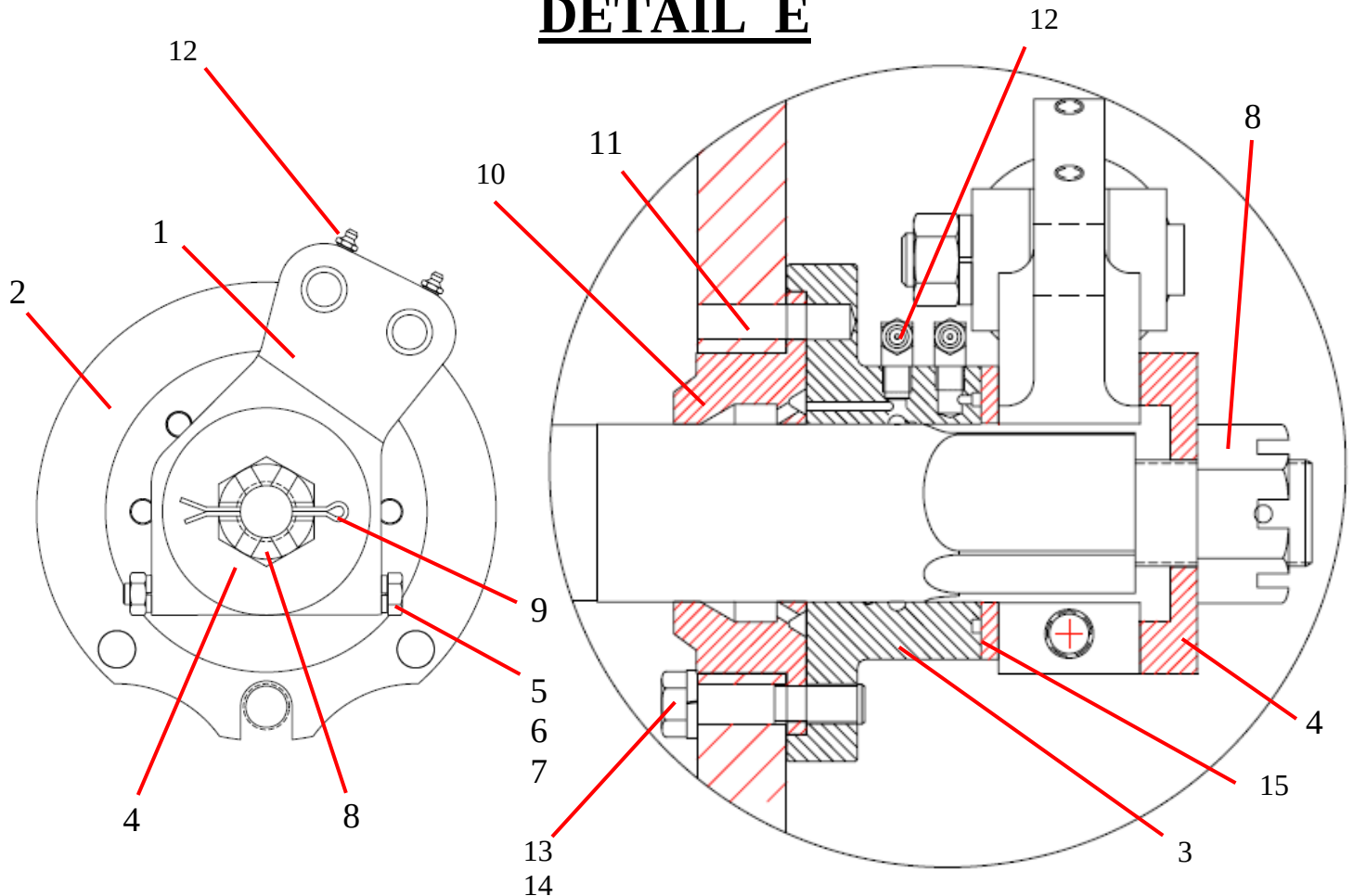
DETAIL D



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	74207	PIN - CLEVIS - .750 DIA	1	EA
2	71011	BUSHING - SHIFT CYLINDER	2	EA
3	71487	SWING CYLINDER - 2.50 X 1.00 X 3.25	1	EA
3A	71487-SKTX	SEAL KIT	1	EA
4		COTTER PIN, 3/32X1 3/4"	2	EA
5	70142	PIN, CLEVIS	1	EA
6	70143	CLEVIS, SHIFT CYLINDER	1	EA
7		1"X14 JAM NUT	2	EA
8		3/4 -10 LOCK NUT	1	EA

DUAL SHIFT BELL CRANK ASSEMBLY

DETAIL E



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	85604	BELL CRANK, B10R, 2 CYLINDER	1	EA
2	86502	LOCATOR RING- FLANGE BEARING	1	EA
3	70124	FLANGED BEARING	1	EA
4	70125	SPACER, S-TUBE NUT	1	EA
5		HHCS, 5/8"-18X5 1/2" GR 8	1	EA
6		LOCK WASHER, 5/8"	1	EA
7		JAM NUT, 5/8	1	EA
8	70825	NUT 1 1/2" - 12 CASTLE	1	EA
9		COTTER PIN, 1/4 X4"	1	EA
10	73564	SEAL, FLANGE BEARING 2.5 SHAFT	1	EA
11		DOWEL PIN, 1/2" DIA X 2"	2	EA
12		GREASE FITTING, 1/8" NPT	2	EA
13		HHCS, 9/16 - 12X3" GR 8	4	EA
14		LOCK WASHER, 9/16"	4	EA
15	70141	THRUST WASHER, S -TUBE	1	EA



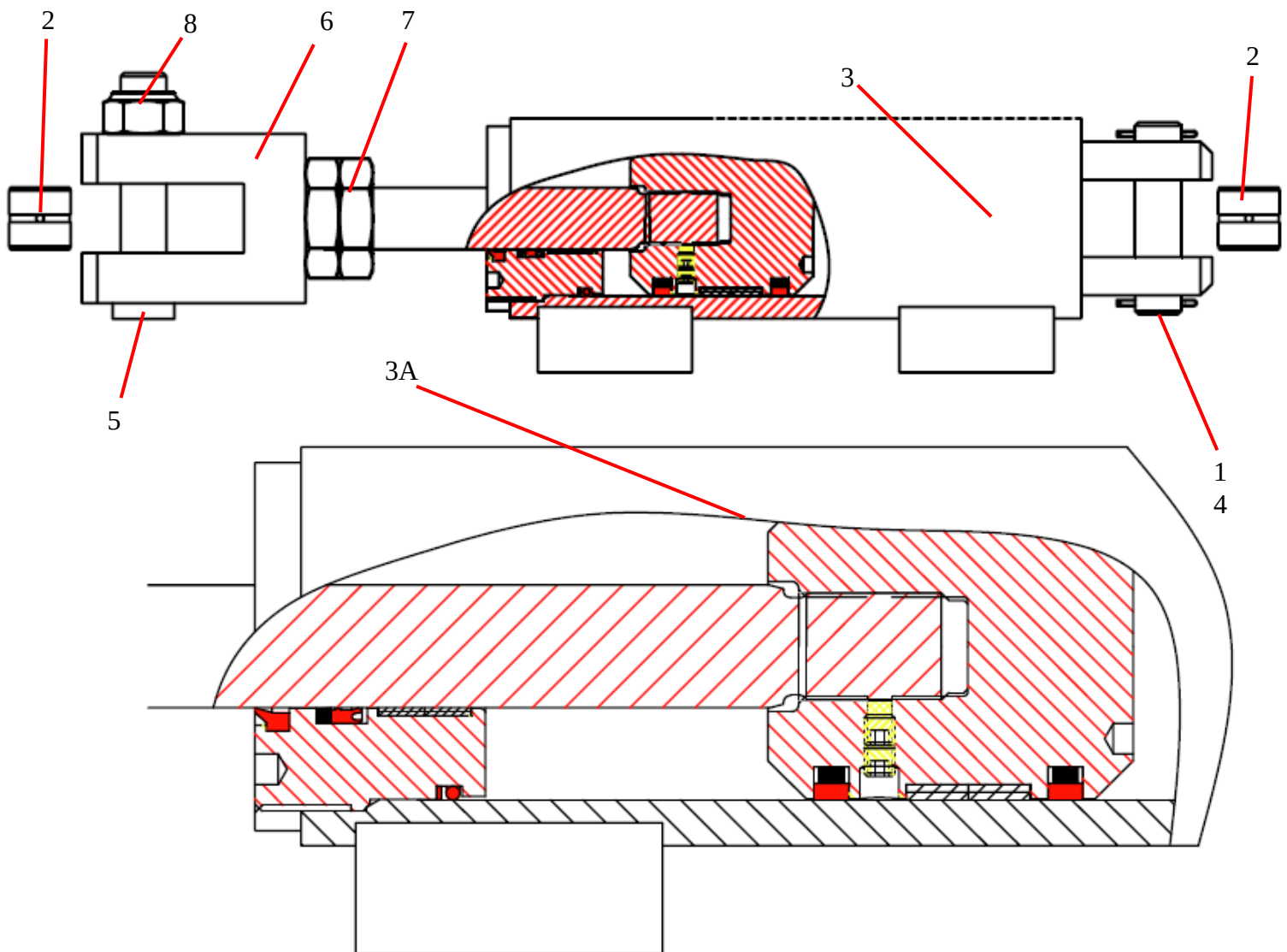
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DUAL SHIFT SWING CYLINDER ASSEMBLY

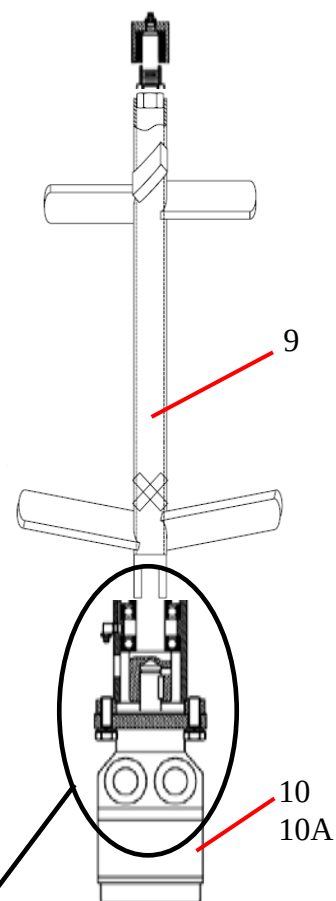
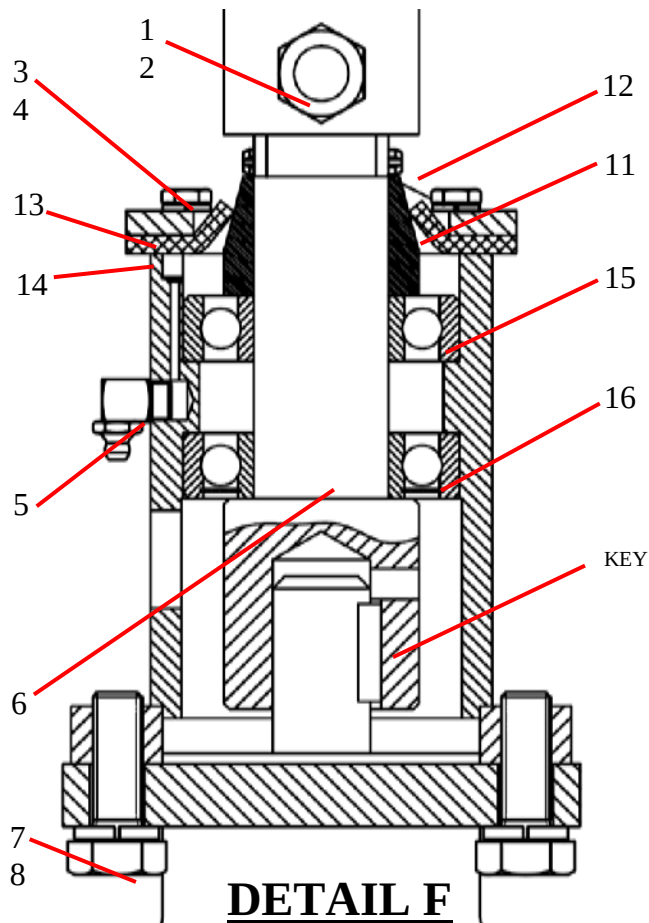
DETAIL D



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	74207	PIN - CLEVIS - .750 DIA	1	EA
2	71011	BUSHING - SHIFT CYLINDER	1	EA
3	86221A	SWING CYLINDER 2.50 X 1.00 X 5.00 JARP	2	EA
3A	86221-SK	SEAL KIT	2	EA
4		COTTER PIN, 3/32X1 3/4"	2	EA
5	70142	PIN, CLEVIS	1	EA
6	70143	CLEVIS, SHIFT CYLINDER	1	EA
7		1"X14 JAM NUT	2	EA
8		3/4 - 10 LOCK NUT	1	EA

HOPPER

AGITATOR ASSEMBLY (OPTION 1)



DETAIL F

ID#	PART #	PART DESCRIPTION	QUANTITY	
	85761	AGITATOR ASSEMBLY		
1		HHCS, ½ -13X2 ¼" GR 8	1	EA
2		LOCK NUT, ½" -13	1	EA
3		¼-28X3/4"	6	EA
4		LOCK WASHER, ¼"	6	EA
5		GREASE FITTING, 1/8" NPT 90°	1	EA
6	85923	SHAFT, AGITATOR	1	EA
7		HHCS, ½ -20X1 ½" GR 8	2	EA
8		LOCK WASHER, ½"	2	EA
9	85717	AGITATOR, PADDLE-B20	1	EA
10	85811	HYD MOTOR, 45.6 CID, 1" SHAFT	1	EA
10A	85809SK	SEAL KIT	1	EA
11	85976	WEAR RING, AGITATOR	1	EA
12		SPRING PIN, ¼" DIA X 1 ¾"	1	EA
13	70211	FLANGE SEAL SMV	1	EA
14	70212	SEAL REMIXER	1	EA
15	85978	BEARING, BALL, PLAIN	1	EA
16	85979	BEARING, BALL 1 SEAL	1	EA

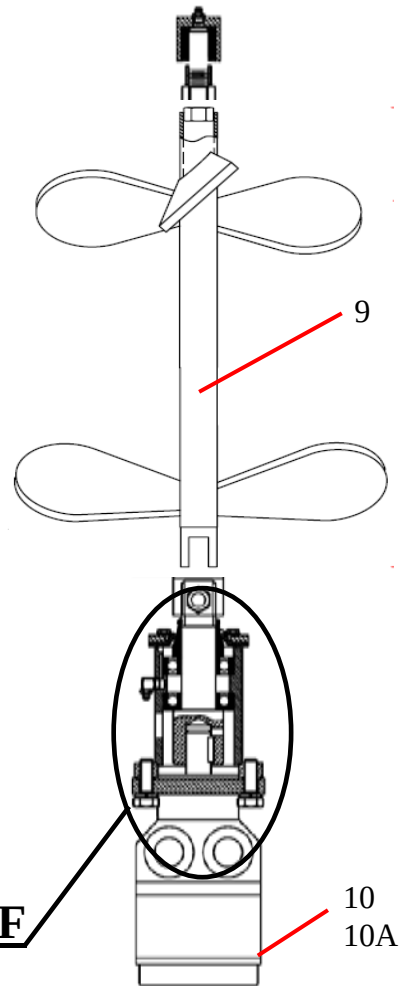
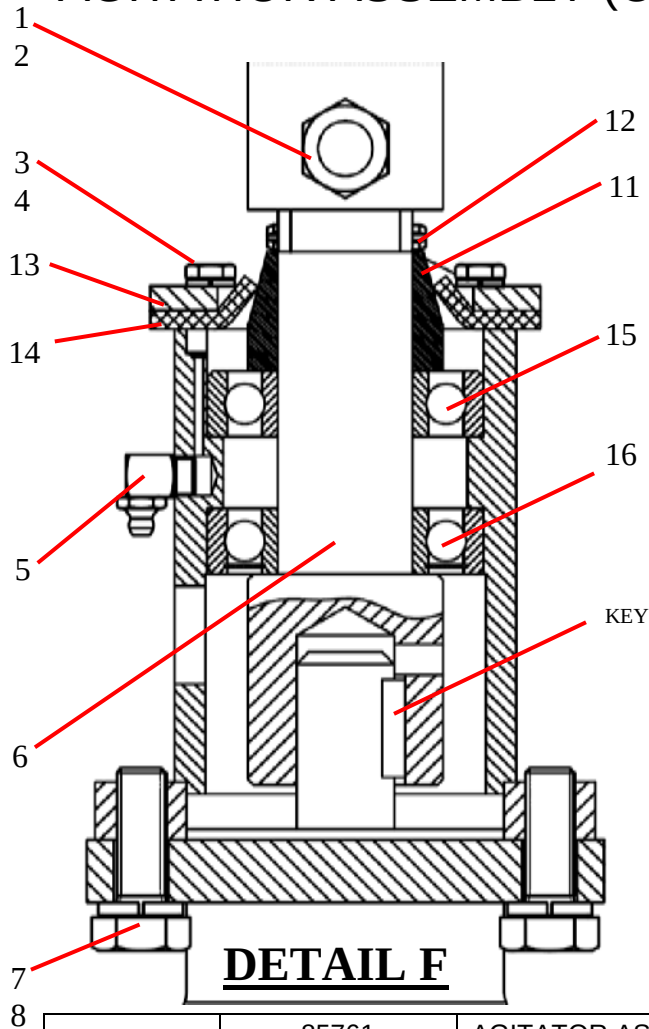


B20HPCV10

PARTS

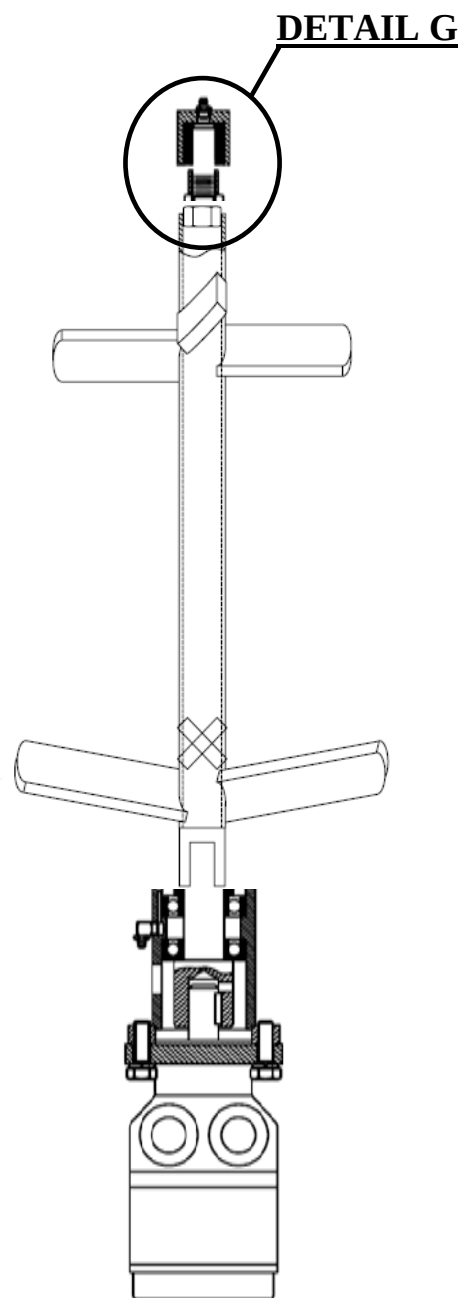
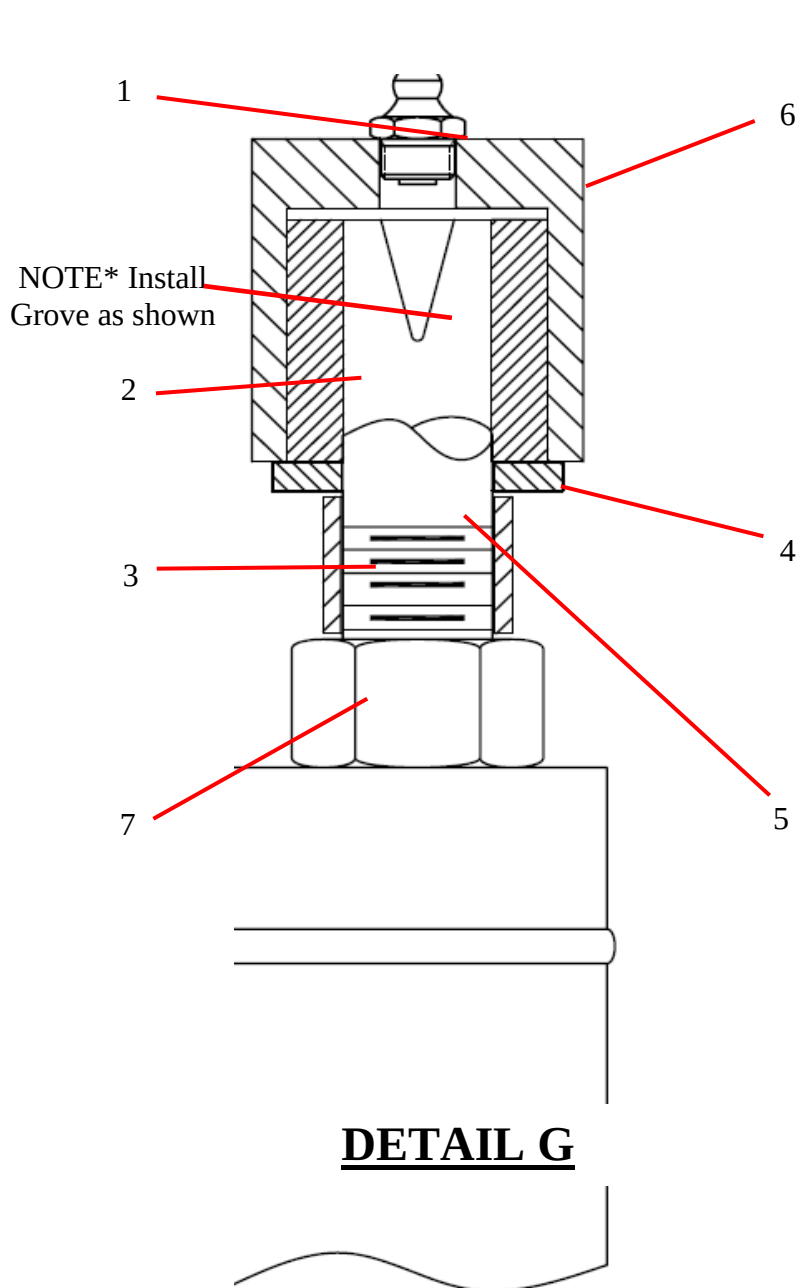
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AGITATOR ASSEMBLY (OPTION 2)

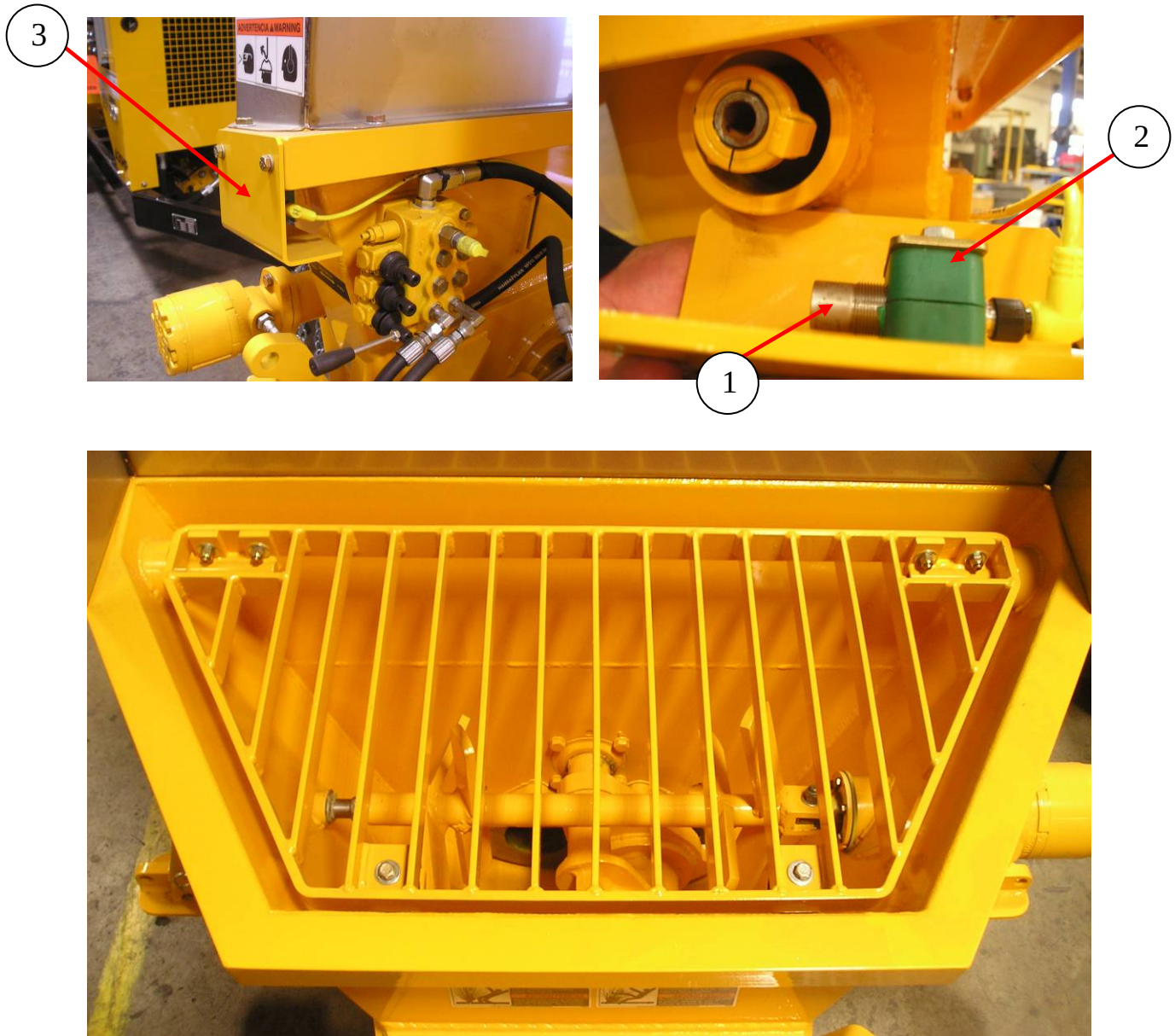


8	85761	AGITATOR ASSEMBLY		
1		HHCS, 1/2 -13X2 1/4" GR 8	1	EA
2		LOCK NUT, 1/2" -13	1	EA
3		1/4-28X3/4"	6	EA
4		LOCK WASHER, 1/4"	6	EA
5		GREASE FITTING, 1/8" NPT 90°	1	EA
6	85923	SHAFT,AGITATOR	1	EA
7		HHCS, 1/2 -20X1 1/2" GR 8	2	EA
8		LOCK WASHER, 1/2"	2	EA
9	87356	AGITATOR, PADDLE-B20	1	EA
10	85811	HYD MOTOR, 45.6 CID, 1" SHAFT	1	EA
10A	85809SK	SEAL KIT	1	EA
11	85976	WEAR RING, AGITATOR	1	EA
12		SPRING PIN, 1/4" DIA X 1 3/4"	1	EA
13	70211	FLANGE SEAL SW	1	EA
14	70212	SEAL REMIXER	1	EA
15	85978	BEARING, BALL, PLAIN	1	EA
16	85979	BEARING, BALL 1 SEAL	1	EA

AGITATOR ASSEMBLY CONTINUED



ID #	PART #	PART DESCRIPTION	QUANTITY	
1		GREASE FITTING, 1/8" NPT STRAIGHT	1	EA
2	70219	REMIX SHAFT BUSHING	1	EA
3	77877	SPACER, REMIX	1	EA
4	86824	FLAT WASHER, 3/4" SAE	1	EA
5	70214	IDLER SHAFT, AGITATOR	1	EA
6	70210	IDLER BEARING HOUSING	1	EA
7	80030	HEX NUT-M20X2.5 PLATED	1	EA

SAFETY GRATE

ID #	PART #	PART DESCRIPTION	QUANTITY	
1	87369	PROXIMITY SENSOR PNP HOPPER GRATE	1	EA
2	801902-006	CLAMP,18MM TUBE CLAMP SET	1	EA
3	87997	COVER WELD PROX SWITCH HOPPER	1	EA

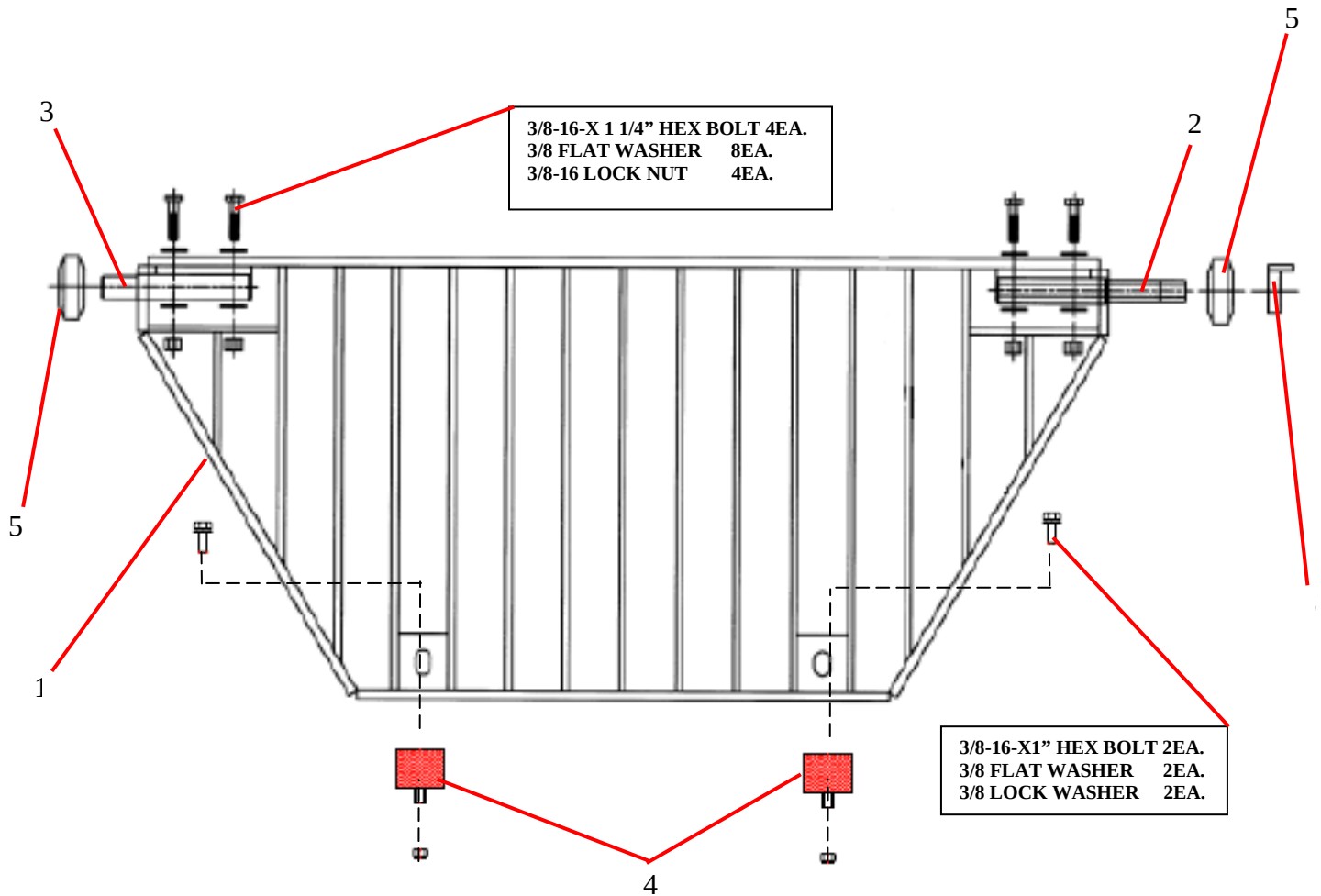


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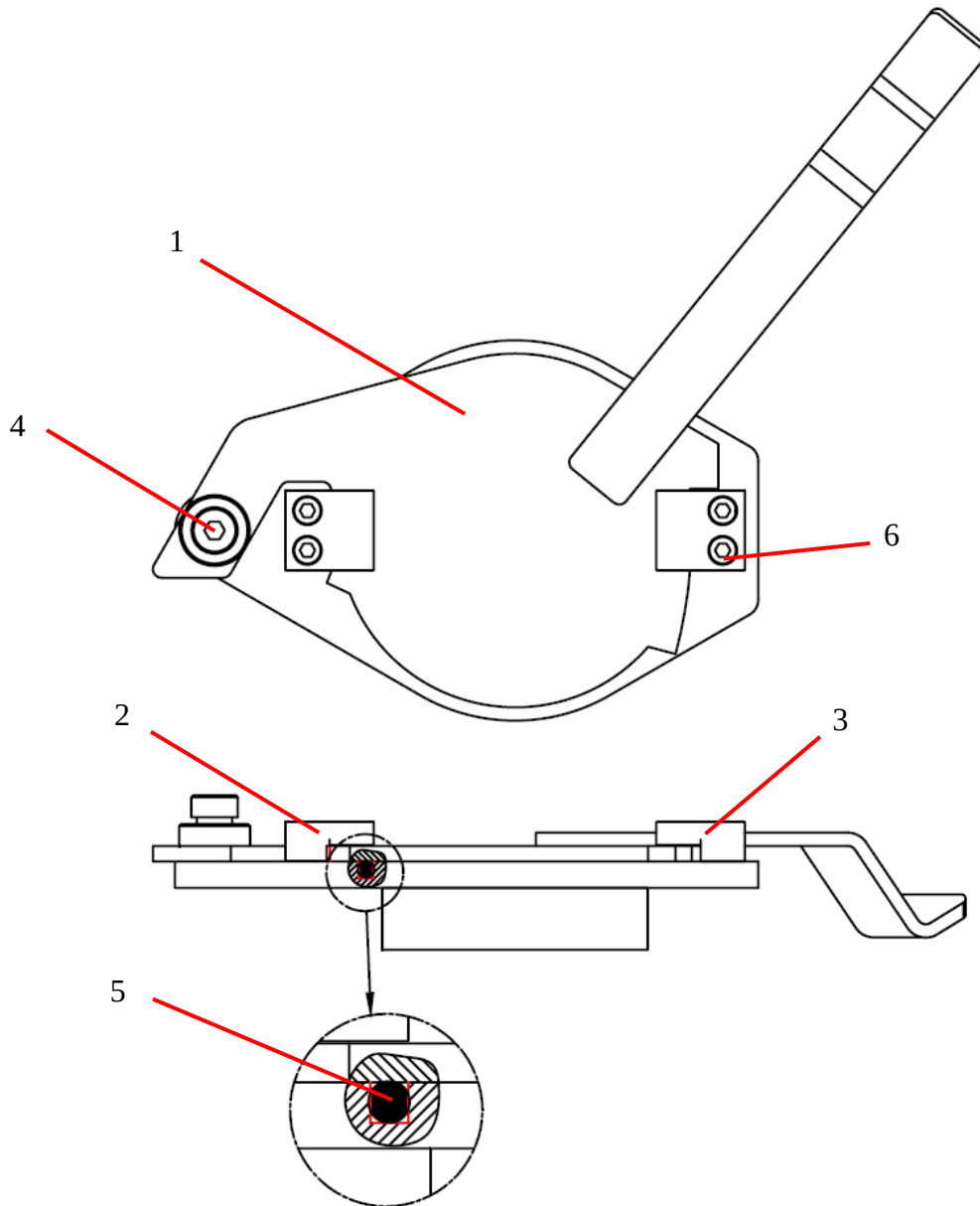
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GRATE ASSEMBLY



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	87892	GRATE WELDMENT, STD HOPPER	1	EA
2	87857	PIN WELDMENT LONG	1	EA
3	87858	PIN WELDMENT SHORT	1	EA
4	86083	BUMPER, HOPPER GRATE	2	EA
5	W-102490	RUBBER BUFFER 65X22.5X26	2	EA
6	87769	COLLAR SHAFT, 7/8" DIA	1	EA

CLEAN OUT DOOR ASSEMBLY

ID #	PART #	PART DESCRIPTION	QUANTITY	
1	86988	DOOR WELDMENT, CLEAN OUT	1	EA
2	86559	BLOCK, CLEAN OUT DOOR, LH	1	EA
3	86560	BLOCK, CLEAN OUT DOOR, RH	1	EA
4	86922	SHOULDER SCREW 1" DIA-1 1/4"	1	EA
5	W102908A	O-RING CORD, HOPPER DOOR	2.21	FT
6		SHCS 1/2"-13 X 1 1/4"	4	EA

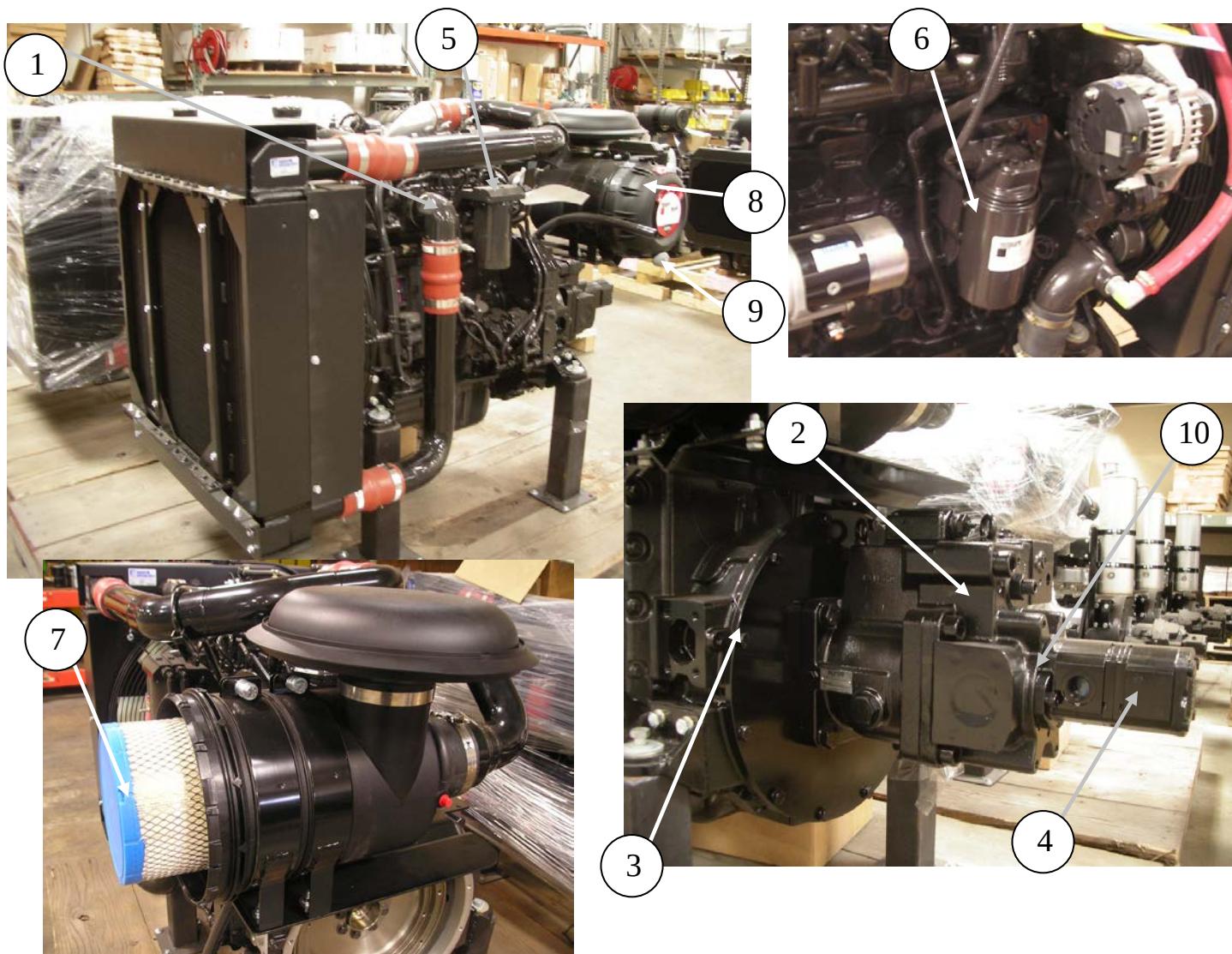


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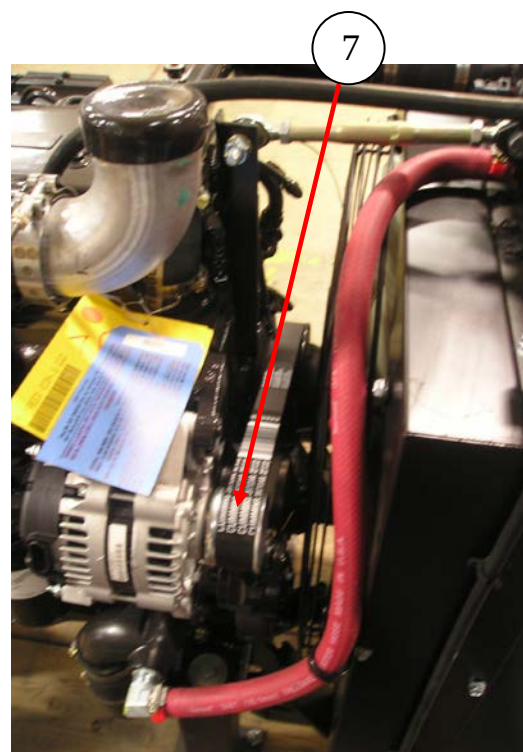
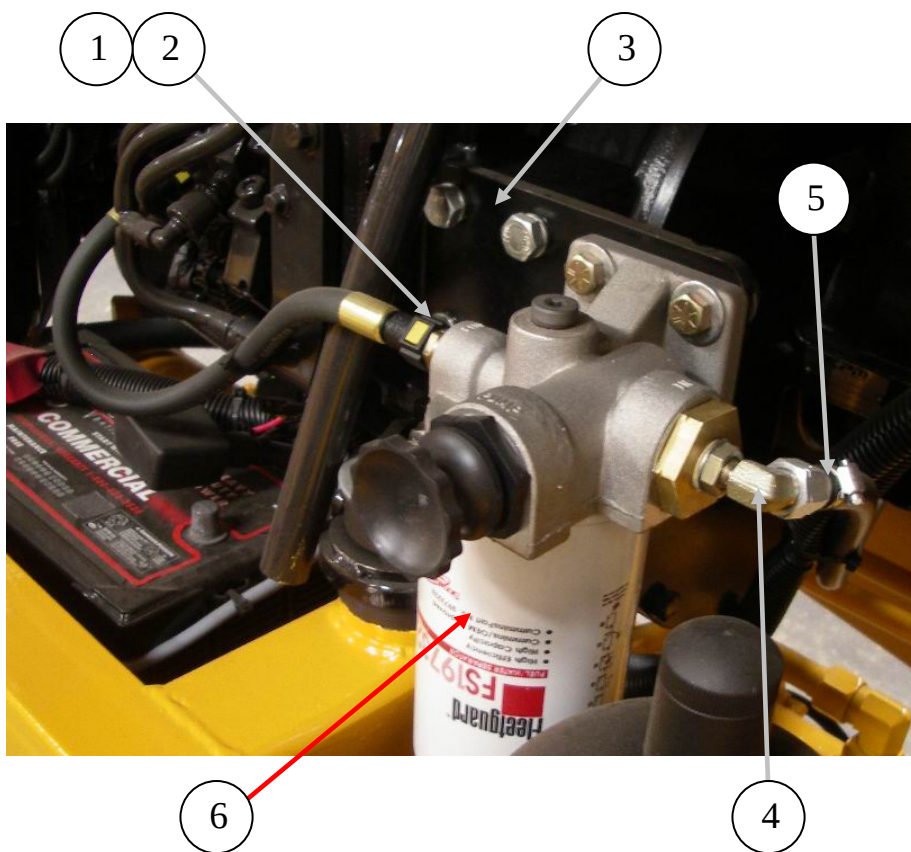
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POWER TRAIN ENGINE, PUMPS, AND FILTERS



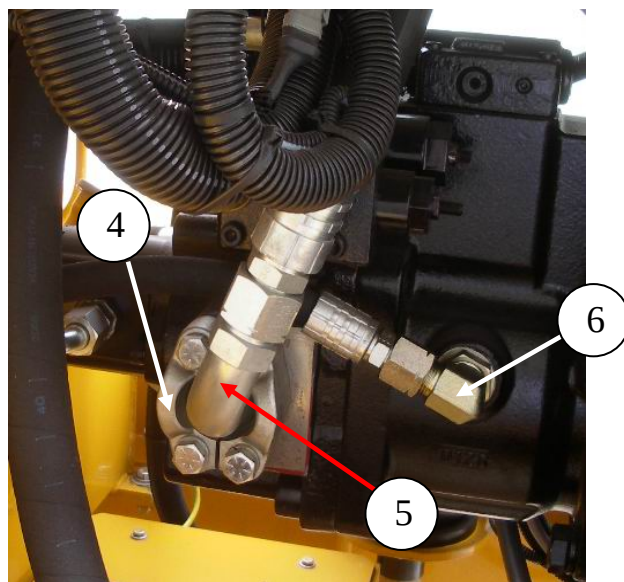
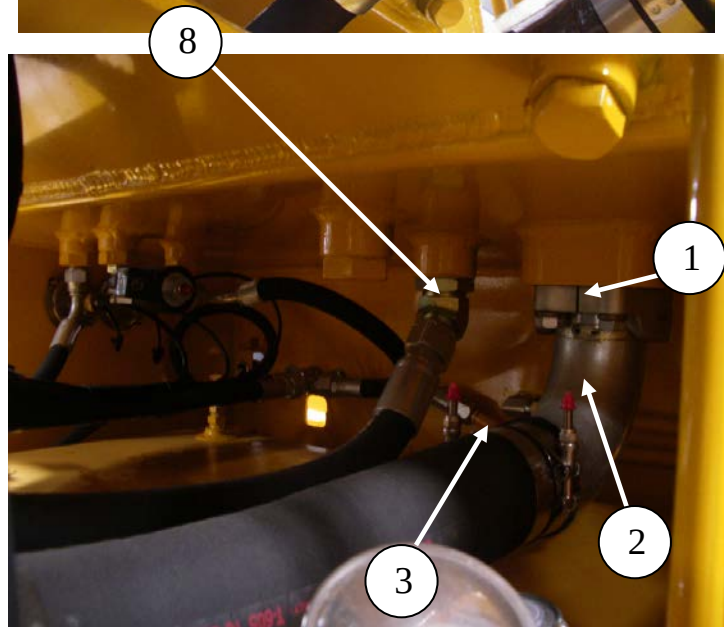
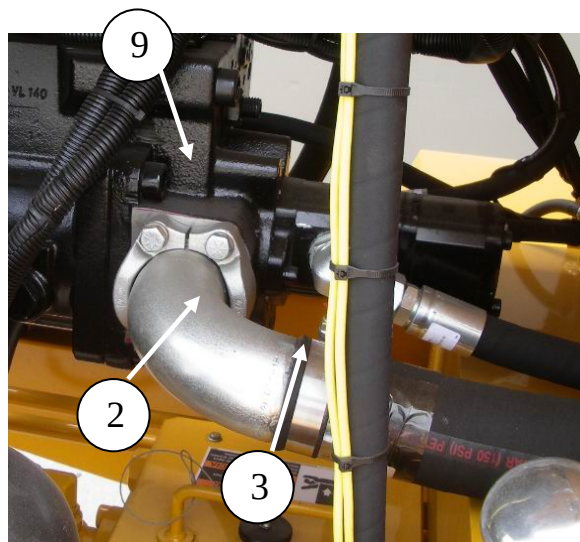
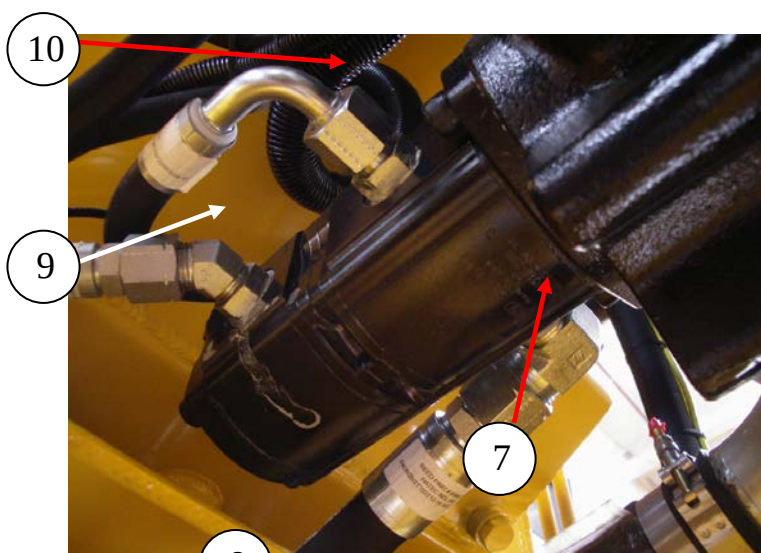
ID #	PART #	PART DESCRIPTION	QUANTITY	
1	87724-1	ENGINE QSB4.5 110 HP CUMMINS	1	EA
2	85124-006	PUMP, P1100PS, PARKER	1	EA
3	88448	PUMP DRIVE -SAE 3 - SAE C-C	1	EA
4	87153-001	PUMP-RH-DBLE GEAR, 11. 3/8.2 CC BOSCH	1	EA
5	87725-002	FUEL FILTER	1	EA
6	87725-001	OIL FILTER	1	EA
7	87725-010	AIR FILTER ELEMENT	1	EA
8	87725-014	AIR FILTER HOUSING ASSEMBLY	1	EA
9	87725-015	AIR FILTER HOUSING COVER, DUST EJECTION	1	EA
10	88174	O-RING	1	EA

ENGINE, PUMPS, AND FILTERS CONTINUED



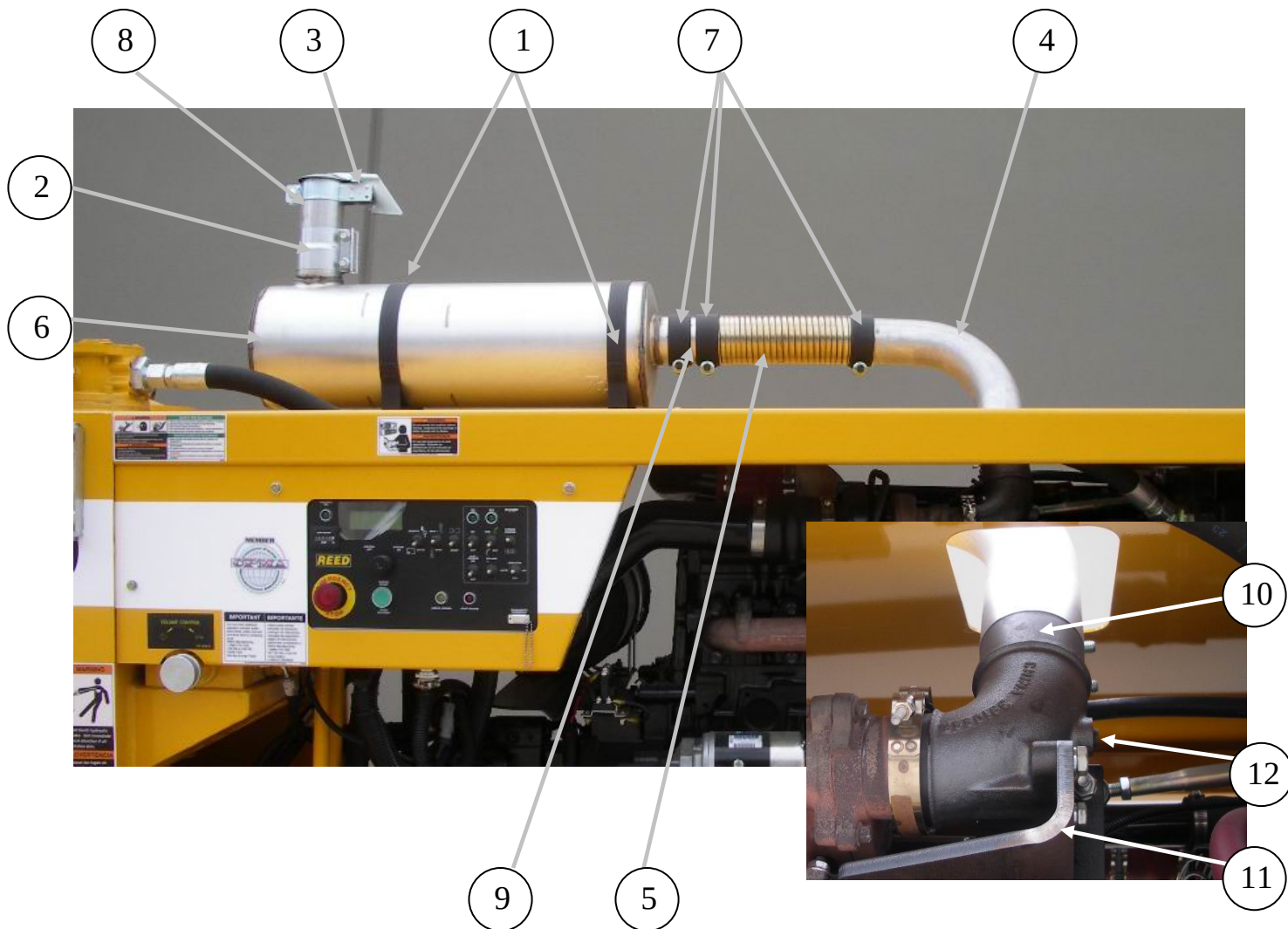
ID #	PART #	PART DESCRIPTION	QUANTITY	
1	88036	FITTING FUEL LINE, QUICK DISCONNECT	1	EA
2	88037	WASHER SEALING FOR 88036 FITTING	1	EA
3	87793	MOUNT FUEL FILTER, B SER CUMMINS	1	EA
4	87567	FITTING 90DEG METRIC TO JIC	2	EA
5	87566	FITTING BARBED JIC-STEM, 3/8-3/8	2	EA
6	87725-003	FUEL / WATER SEPARATOR REPLACEMENT ELEMENT	1	EA
7	87725-005	FAN BELT	1	EA

FITTINGS



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	86264-007	SPLIT FLANGE-CODE 61- 40 SAE	2	EA
2	86911-009	STEM, 2 ½" 90 DEG, 40GL-40FL90	2	EA
3	79803	CLAMP - T-BOLT - 3.00 DIA	4	EA
4	86265-003	SPLIT FLANGE-CODE 62- 20 SAE	1	EA
5	86912-006	FLANGE, FLH6K-MJ90-20-16	1	EA
6		ADAPTOR, MB-MJ-90-12-10	1	EA
7	86900-030	ADAPTOR, MB-MJ-20-16	1	EA
8	87754-020	ELBOW, MB-MJ45-20-16	1	EA
9		MB-MJ-45-10	1	EA
10	86900-017	MB-MJ0-10-10	1	EA

EXHAUST



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	87199	MOUNTING BAND, 8.5" DIA	2	EA
2	87198	CLAMP, TORCTITE, 3"	1	EA
3	73475	RAIN CAP 3"	1	EA
4	86648	EXHAUST ELBOW 3"	1	EA
5	87579	EXHAUST FLEX TUBE, 3" 12" LONG	1	EA
6	87792	MUFFLER B SER CUMMINS	1	EA
7	87578	EXHAUST CLAMP, BENT BOLT 3"	3	EA
8	87465	TUBE EXHAUST, B SERIES, LONG	1	EA
9	87878	TUBE EXHAUST, B SERIES, SHORT	1	EA
10	88013	CLAMP EXHAUST 3" TORCTITE	1	EA
11	88016	BRACKET 4 CYL CUMMINS EXHAUST	1	EA
12	74679	PLUG 1/4" NPT SOCKET HEAD	1	EA

TANKS

FUEL TANK ASSEMBLY



ID #	PART #	PART DESCRIPTION	QUANTITY	
	85363	FUEL TANK ASSY B-SERIES	1	EA
1	85111	FUEL TANK WELDMENT, B-SERIES	1	EA
2	85570	FUEL CAP, 1 1/2 IN VENTED	1	EA
3	85362	TUBE, FUEL PICKUP, B-SERIES	2	EA
4	85569	FUEL GAUGE, 9 IN	1	EA
5	10297	PLUG-GALV 1/2"	1	EA

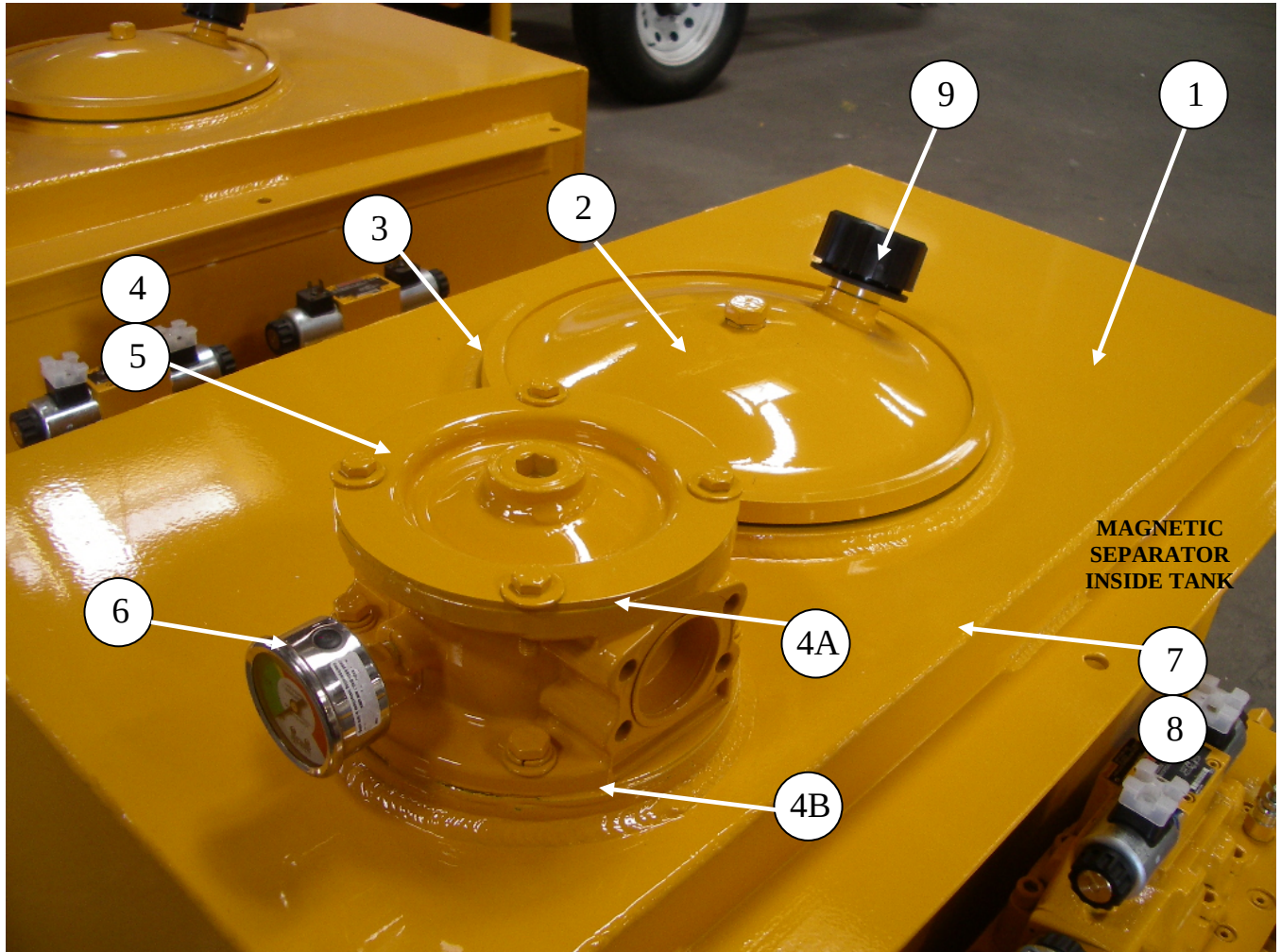


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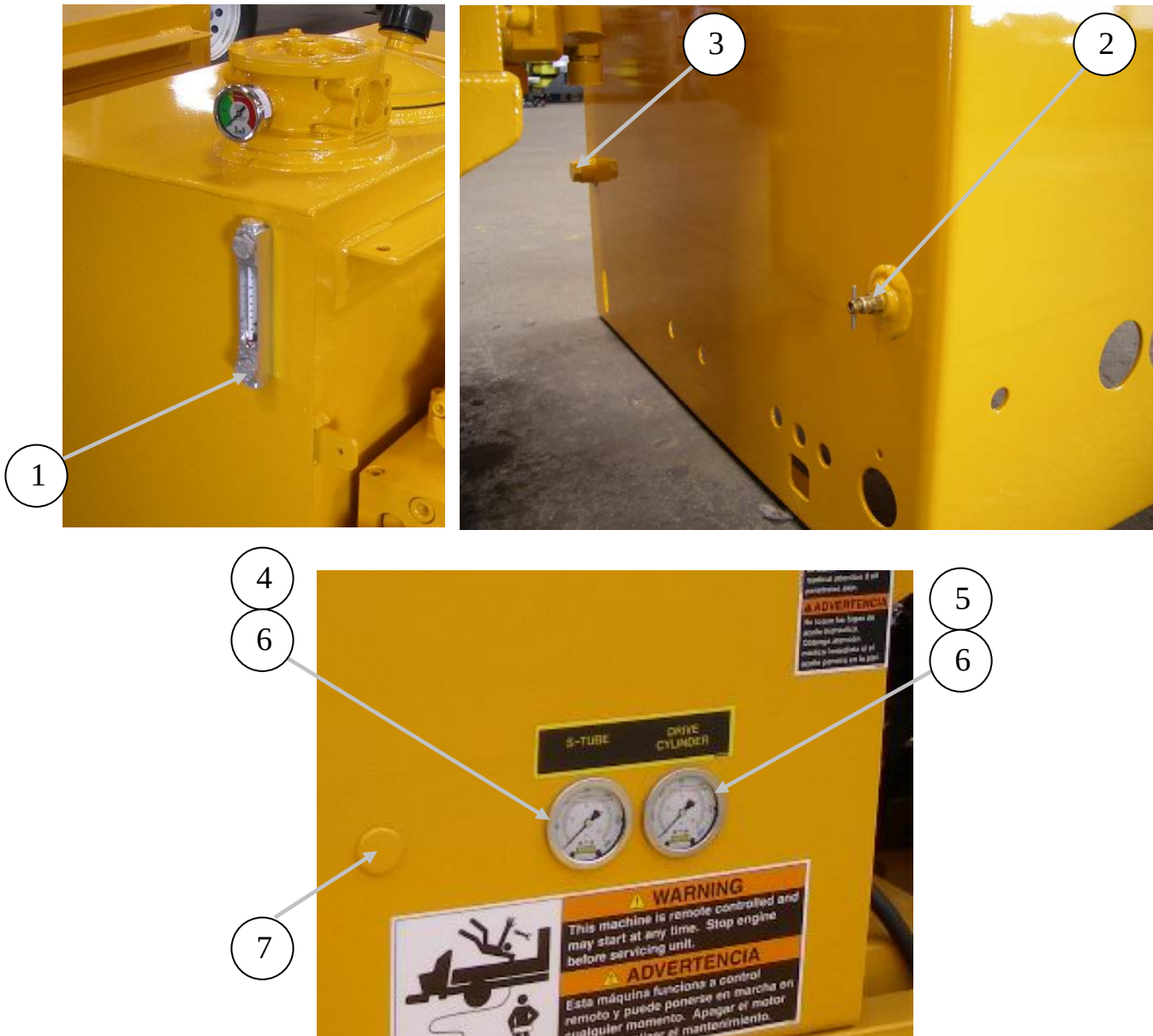
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HYDRAULIC TANK ASSEMBLY



ID #	PART #	PART DESCRIPTION	QUANTITY	
	85361	HYD TANK ASSY B-SERIES	1	EA
1	85102	HYDRAULIC TANK WELDMENT, B-SERIES	1	EA
2	85529	ENDCOVER KIT, 12 IN W/DRAIN	1	EA
3	85867	GASKET- END COVER 12"	1	EA
4	85282	FILTER, RETURN, TANK MOUNTED	1	EA
4A	BW10241	SEAL KIT FOR 85282 FILTER RETURN	1	EA
4B	85282-G	GASKET-CORK	1	EA
5	85283	FILTER ELEMENT, PN 85282 FILTER	1	EA
6	85575	GAUGE, PN 85282 RETURN FILTER	1	EA
7	79247	MAGNETIC SEPERATOR 1 ¼ " NPT	1	EA
8	800230	MAGNETIC SEPARATOR,3"NPT	1	EA
9	85537	FILLER BREATHER, 3/4 NPT	1	EA

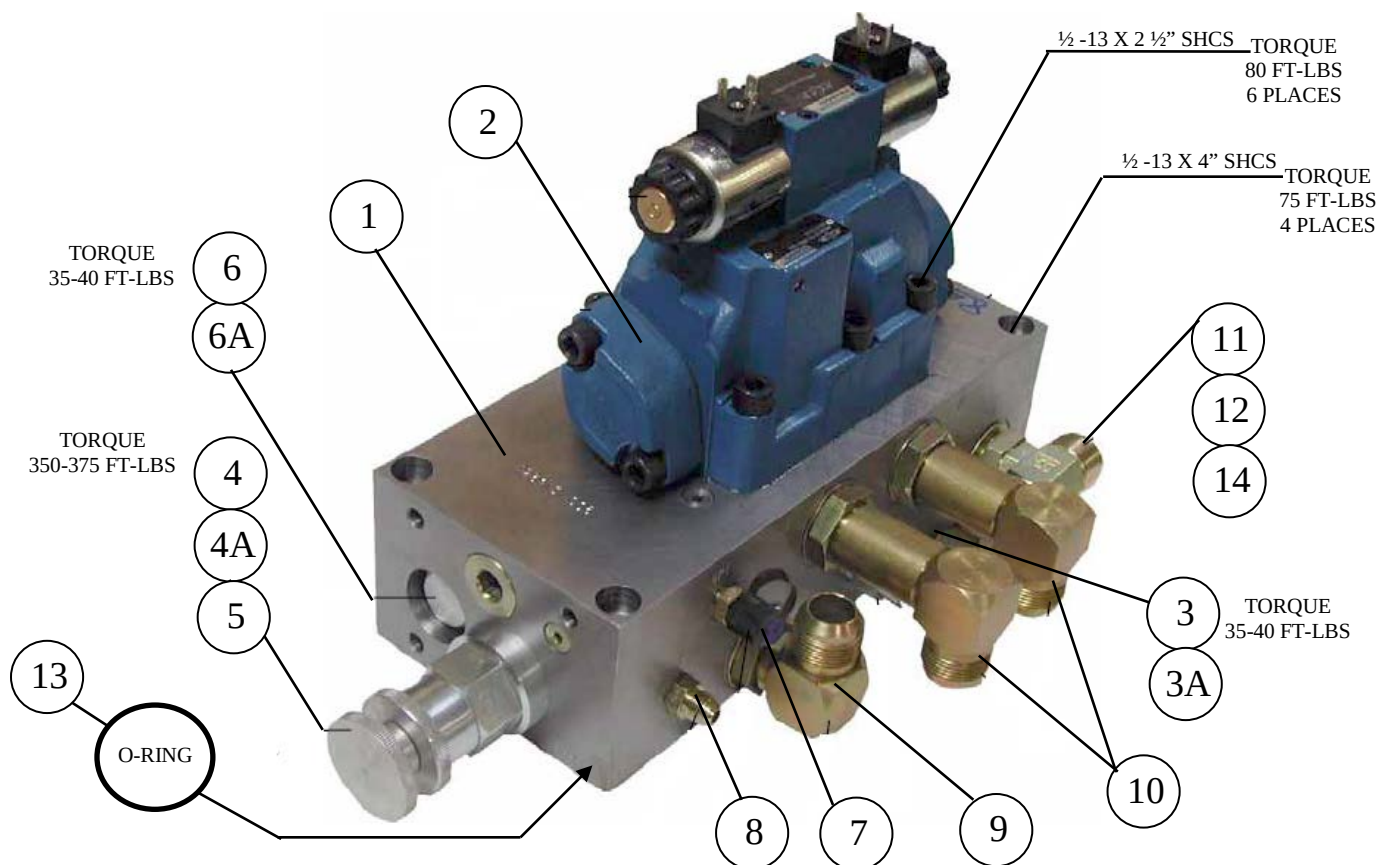
HYDRAULIC TANK ASSEMBLY CONTINUED



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	74509	GAUGE-SIGHT/TEMPERATURE	1	EA
2	801025	DRAIN COCK, 1/4 NPT	1	EA
3	BG-12	3/4" SAE PLUG	1	EA
4	70366	PRESSURE GAUGE, 3000 PSI/BAR	1	EA
5	74562	PRESSURE GAUGE, 6000 PSI/BAR	1	EA
6	78594	MINICHECK GAUGE ADAPTOR, 1/4 NPT	2	EA
7		HOFFMAN PLUG	1	A/R

MANIFOLDS

DRIVE CYLINDER CIRCUIT MANIFOLD ASSEMBLY



ID #	PART #	PART DESCRIPTION	QUANTITY	
	85248	MANIFOLD, CYLINDER CIRCUIT ASSEMBLY	1	EA
1	86820	MANIFOLD, MACHINED CYLINDER CIRCUIT	1	EA
2	85689	SOLENOID VALVE, DRIVE CYLINDER	1	EA
3	85696	RELIEF VALVE CARTRIDGE	1	EA
3A	85696-SK	SEAL KIT		
4	85697	FLOW CONTROL CARTRIDGE	1	EA
4A	85697-SK	SEAL KIT		
5	86947	KNOB KIT, ALUMINUM	1	EA
6	85698	CHECK VALVE CARTRIDGE	1	EA
6A	85698-SK	SEAL KIT		
7	78593	MINICHECK ADAPTOR, SAE 4	1	EA
8	86900-002	ADAPTOR, MB-MJ-4-6	1	EA
9	86728-023	ELBOW, MB-MJ45-16-16	1	EA
10	86904-012	ELBOW, MB-MJ90LL-16-16	2	EA
11	86945-001	TEE, MJ-MB-MJT-16	1	EA
12	86905-016	ELBOW, MJ-FJX90-16-16	1	EA
13	86946	O-RING #230 BUNA 90DUR	1	EA
14	86948-001	REDUCER, JIC MJ-FJ-10-16	1	EA

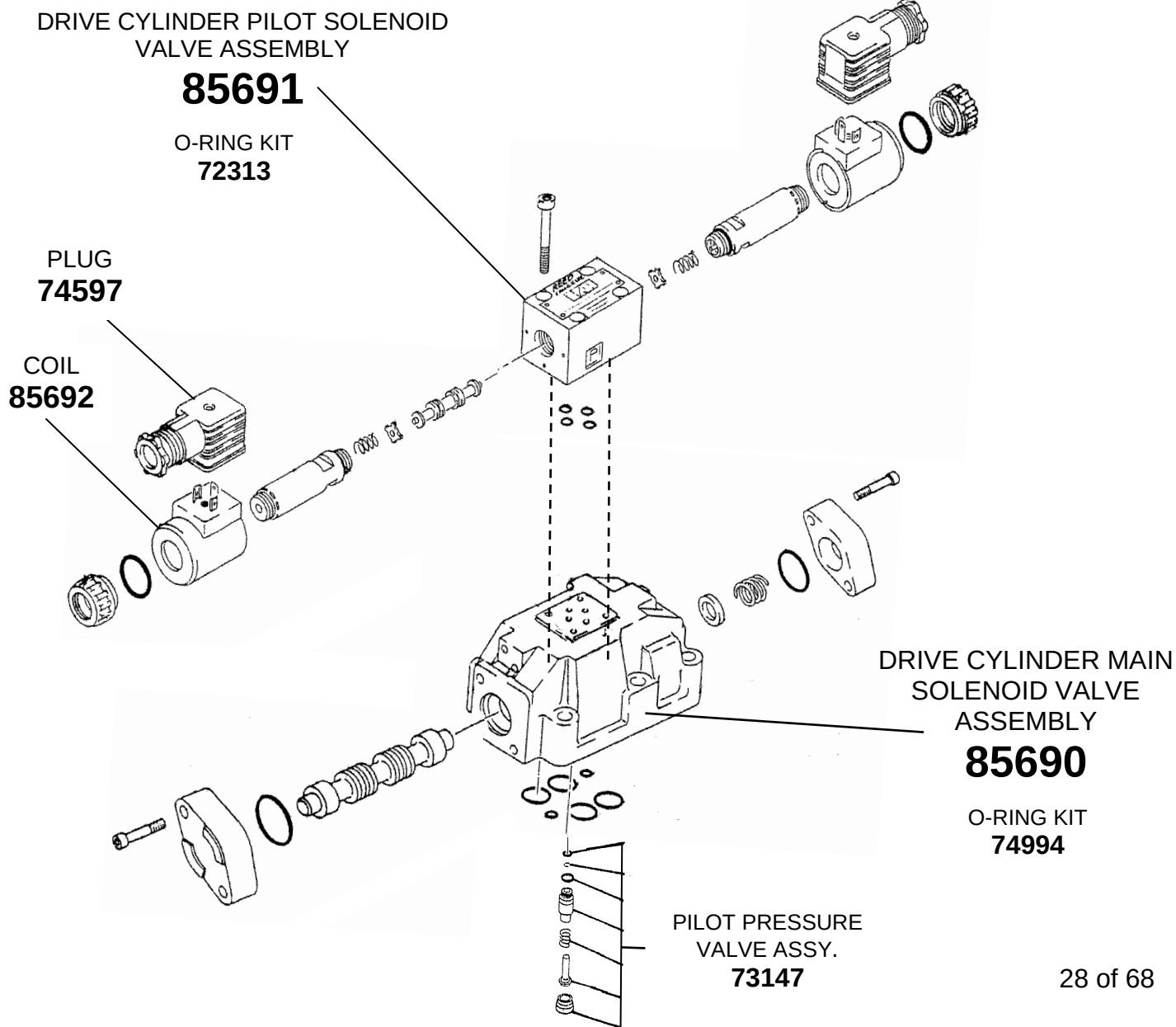
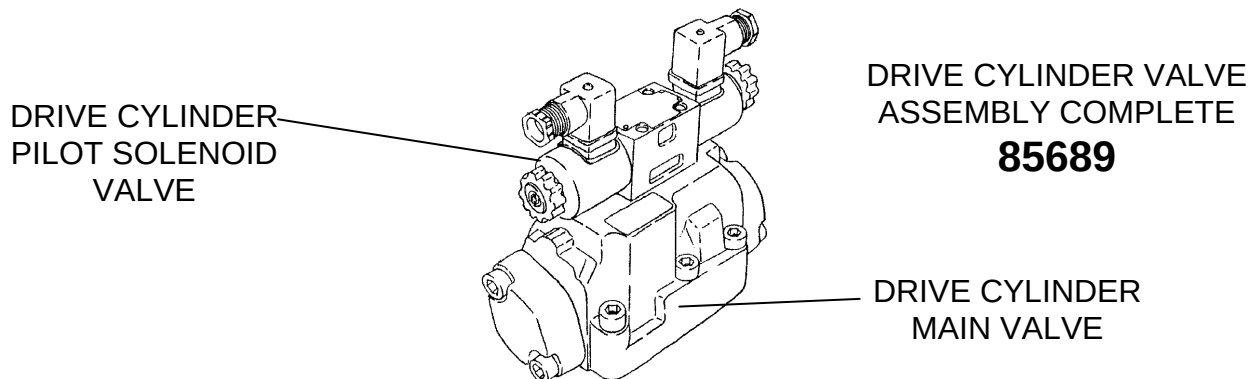


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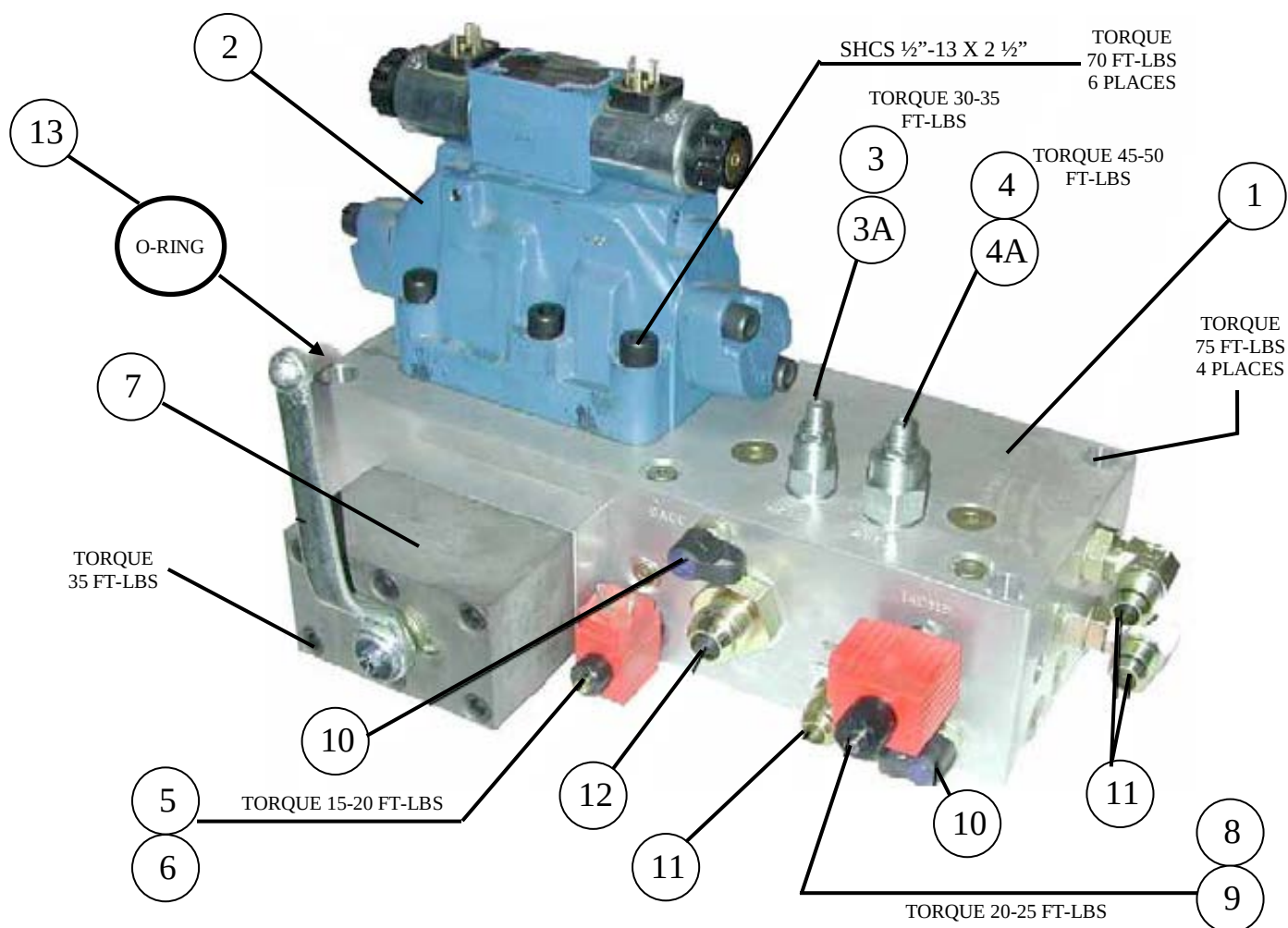
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DRIVE CYLINDER SOLENIOD VALVE ASSEMBLY



S-TUBE CIRCUIT MANIFOLD ASSEMBLY



ID #	PART #	PART DESCRIPTION	QUANTITY	
	85249	MANIFOLD, SWING TUBE CIRCUIT ASSEMBLY		
1	86821	MANIFOLD, MACHINED S-TUBE CIRCUIT	1	EA
2	85693	SOLENOID VALVE, S-TUBE SHIFT	1	EA
3	85704	UNLOADER VALVE CARTRIDGE, (QCDB)	1	EA
3A	85704-SK	SEAL KIT		
4	85703	RELIEF VALVE CARTRIDGE, (RVEA)	1	EA
4A	85703-SK	SEAL KIT		
5	87246	SOLENOID VALVE CARTRIDGE, (12CHS)	1	EA
6	87247	COIL, 12VDC,	1	EA
7	85705	BALL VALVE,	1	EA
8	87248	SOLENOID VALVE CARTRIDGE, (14CHS)	1	EA
9	87249	COIL, 12V DC FOR PN-87248	1	EA
10	78593	MINICHECK ADAPTOR, SAE	2	EA
11	86728-014	ELBOW, MB-MJ90-10-10	2	EA
12	86900-027	ADAPTOR, MB-MJ-16-12	1	EA
13	86946	O-RING #230 BUNA 90DUR	1	EA



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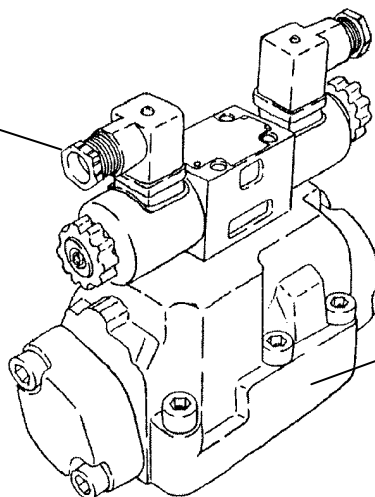
S-TUBE CIRCUIT SOLENOID VALVE ASSEMBLY

SWING TUBE
PILOT SOLENOID
VALVE

SWING TUBE VALVE
ASSEMBLY COMPLETE

85693

SWING TUBE
MAIN VALVE



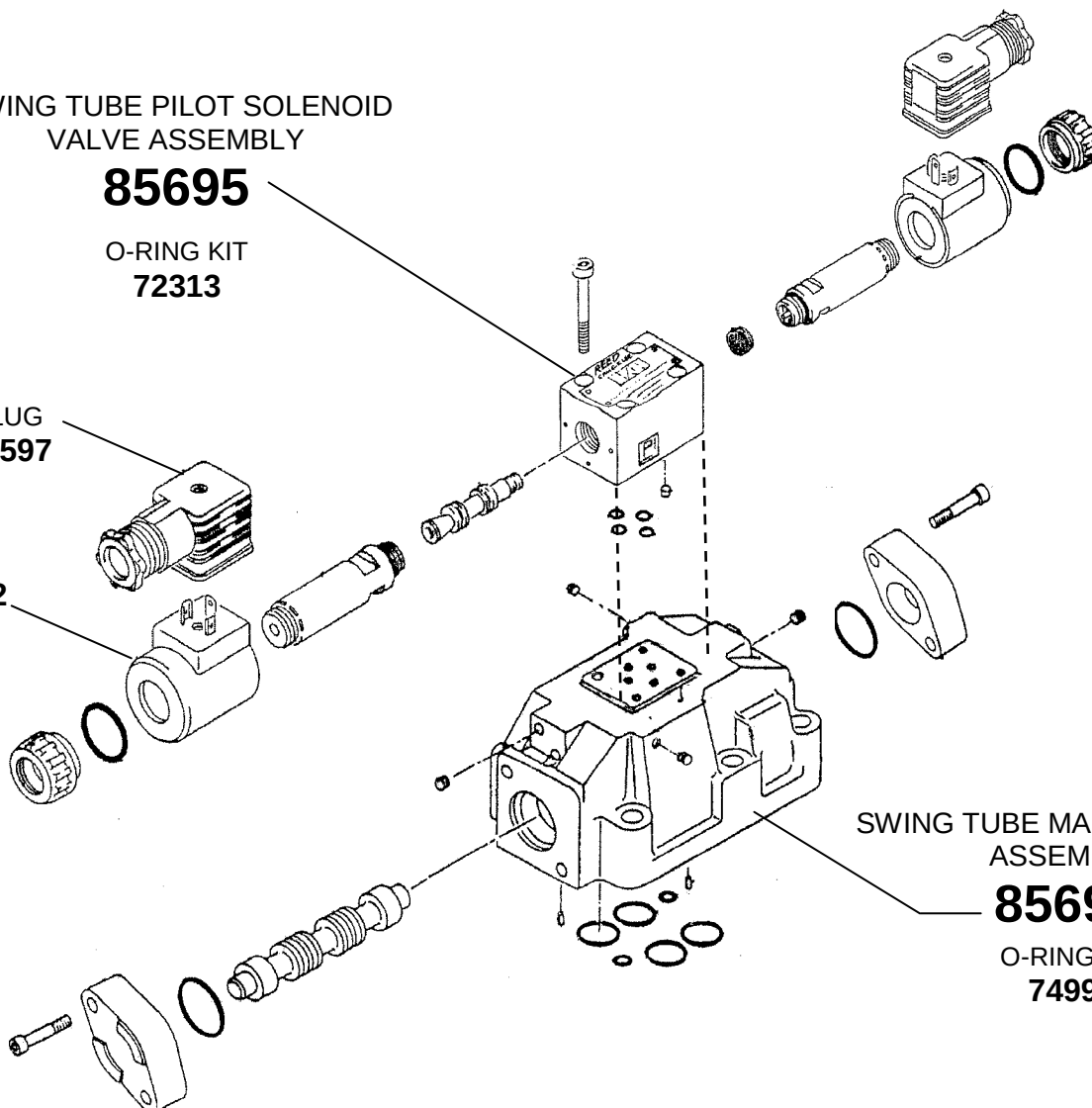
SWING TUBE PILOT SOLENOID
VALVE ASSEMBLY

85695

O-RING KIT
72313

PLUG
74597

COIL
85692

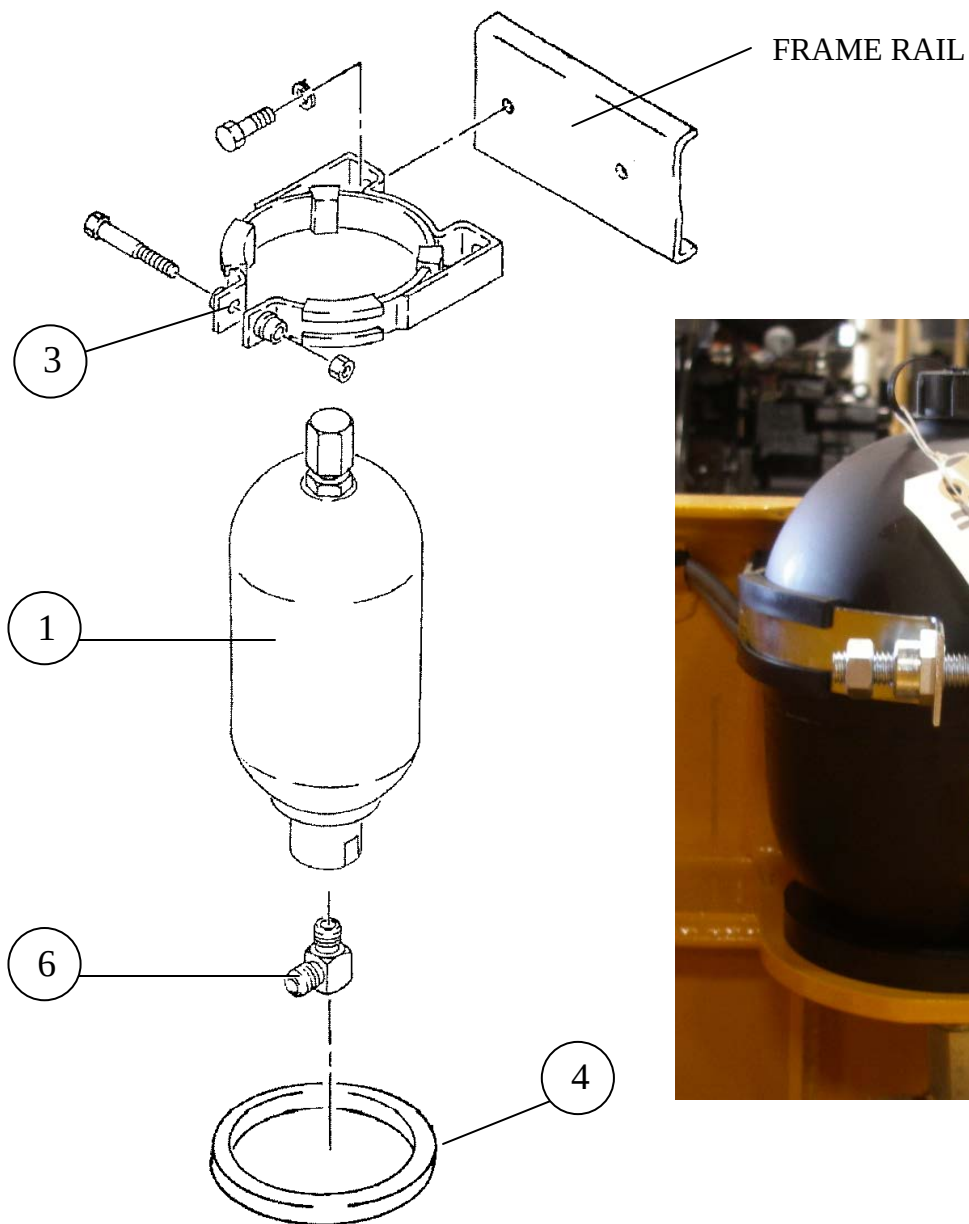


SWING TUBE MAIN SOLENOID
ASSEMBLY

85694

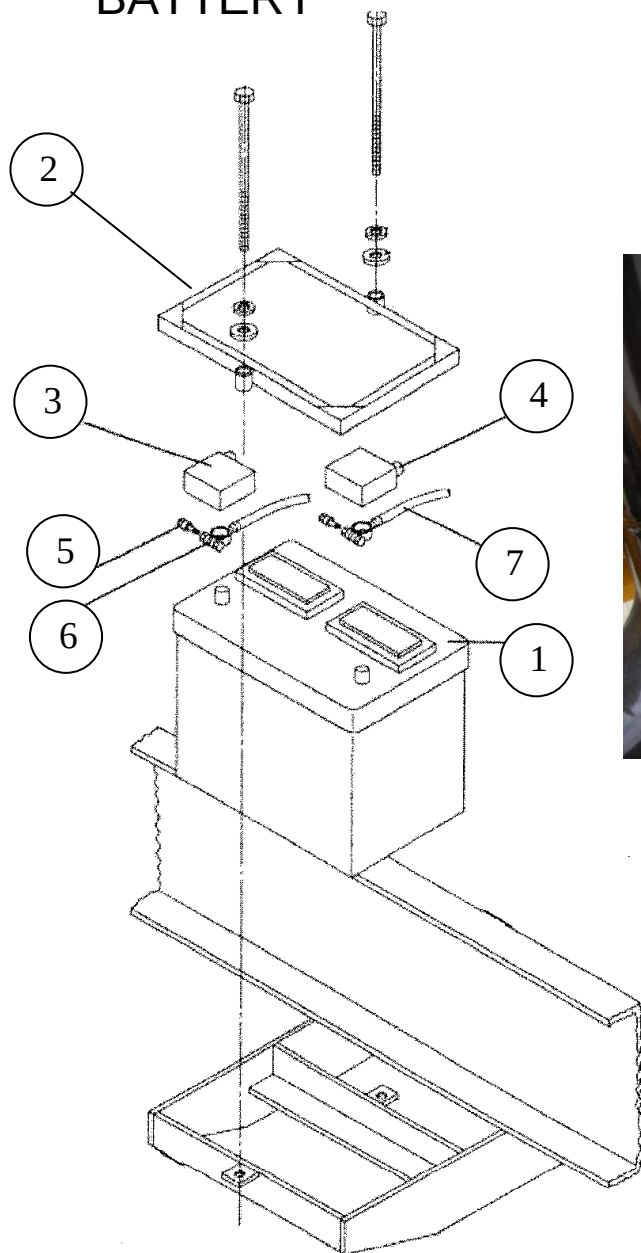
O-RING KIT
74994

ACCUMULATOR ASSEMBLY



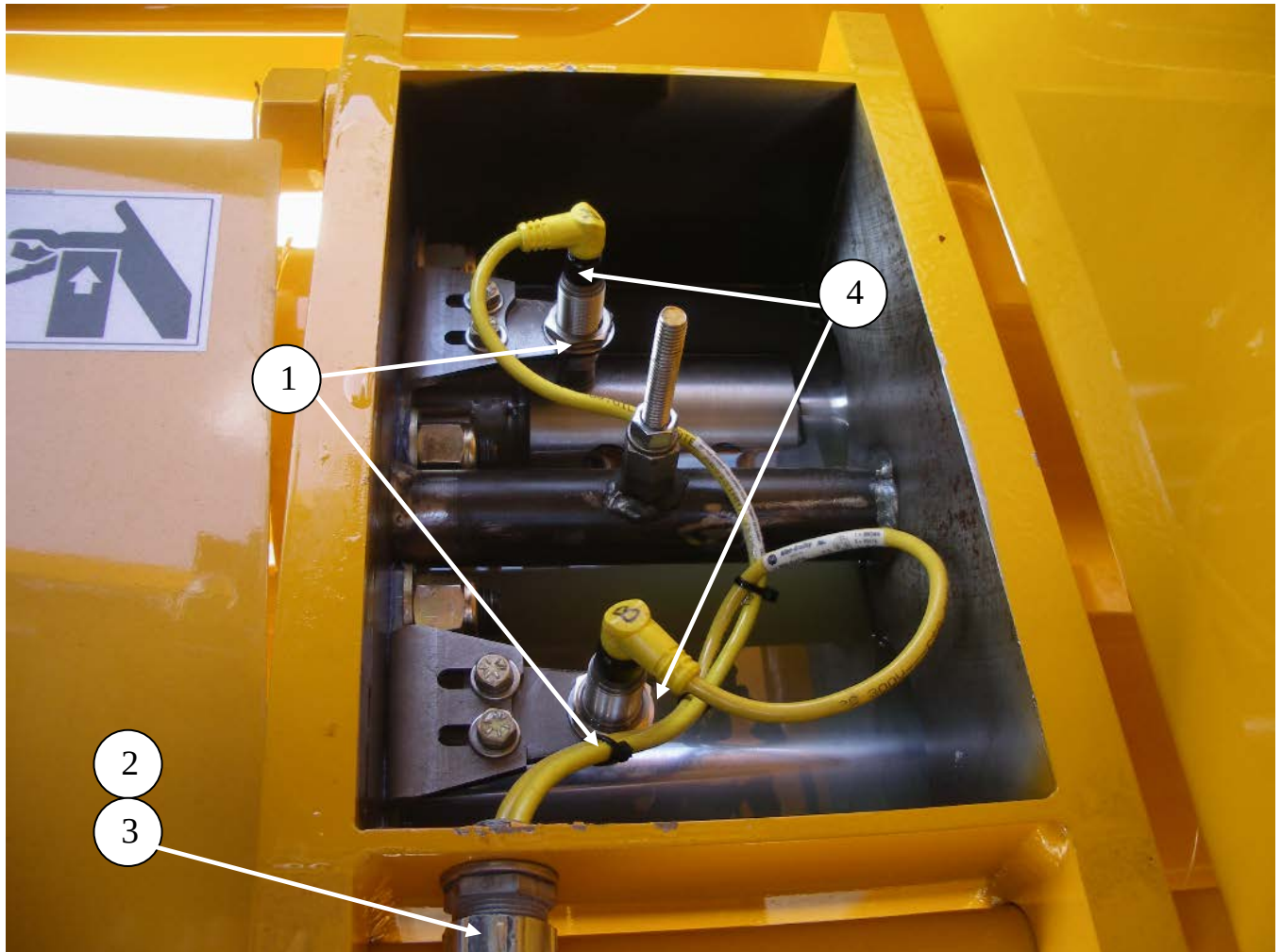
ID #	PART #	PART DESCRIPTION	QUANTITY	
1	71360	ACCUMULATOR-3/4 GAL	1	EA
2	73171	ACCUMULATOR BKT.W/CLOSING HARDWARE	1	EA
3	801028	GROMMET, ACCUMULATOR	1	EA
4	86904-009	ELBOW, MB-MJ90LL-12-12	1	EA

ELECTRICAL GROUP BATTERY



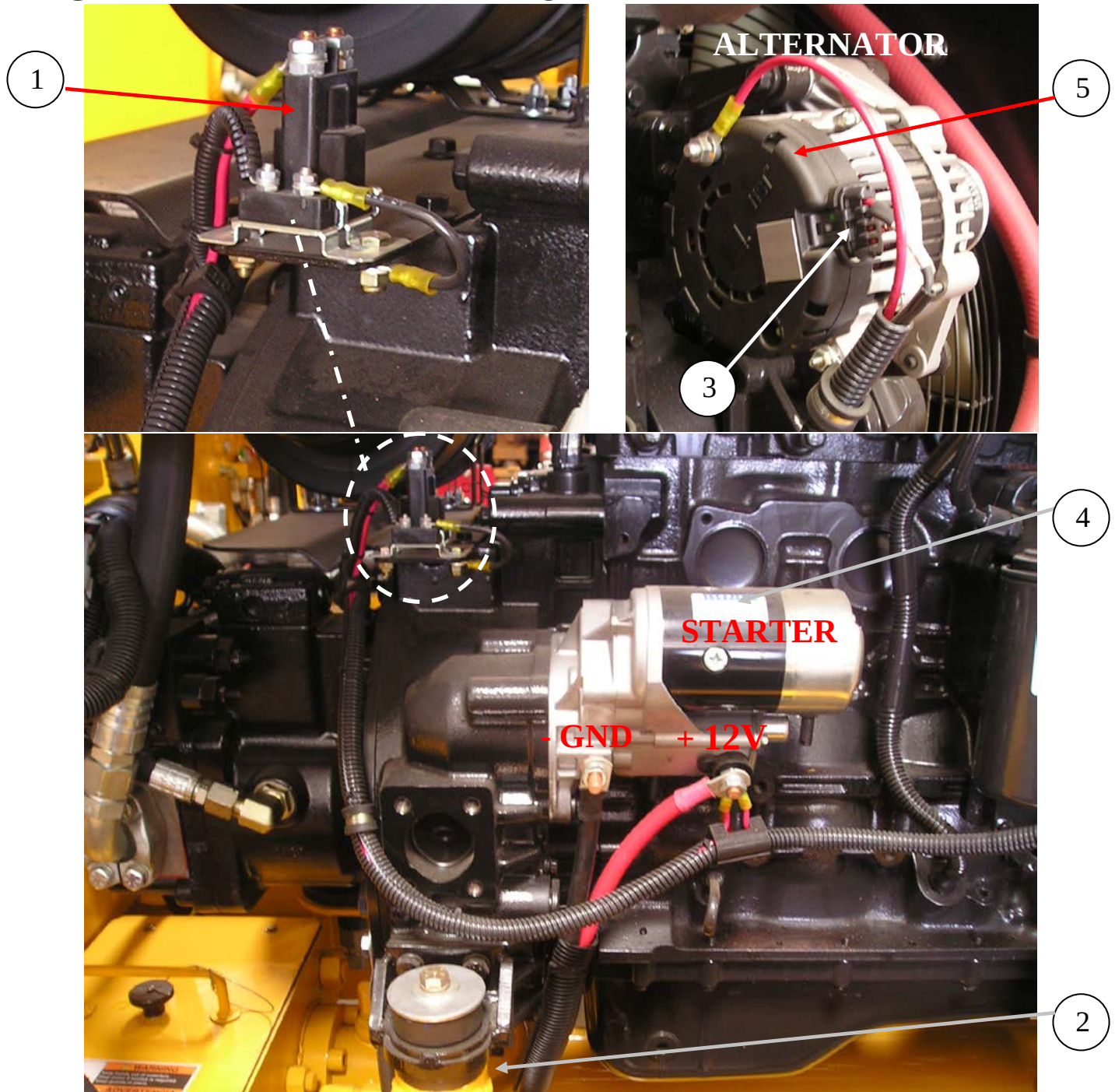
ID #	PART #	PART DESCRIPTION	QUANTITY	
	87930	ELECTRICAL GROUP B SER 2008 CUMMINS	1	EA
1	77075	BATTERY-12V 1000 CCA31	1	EA
2	72945	BATTERY HOLD DOWN	1	EA
3	87221	INSULATOR, RIGHT ELBOW-RED	1	EA
4	87222	INSULATOR, LEFT ELBOW-BLACK	1	EA
5	87223	EXTENDER, TOP TERMINAL BOLT	2	EA
6	87732	CABLE-43" BATTERY-RED 2/0	1	EA
7	87733	CABLE-37" BATTERY-BLACK 2/0	1	EA

PROXIMITY SWITCHES



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	77998	PROXIMITY SENSOR NPN FLUSH BOX MOUT	2	EA
2	10522	STRAIN RELIEF	1	EA
3	30240	GASKET LIQUID TITE ½" -ELECT	1	EA
4	10528	NUT-1/2" BONDING TYPE LOCK	1	EA
5	77990	CABLE, PROXIMITY SWITCH, 5M	2	EA

STARTER AND ALTERNATOR



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	87541	RELAY STARTER 12VDC-SELL W/87544	1	EA
2	73269	GROUND STRAP	1	EA
3	87669	PIGTAIL HARNESS, FOR CUMMINS ALTERN	1	EA
4	87725-006	STARTER MOTOR	1	EA
5	87725-007	ALTERNATOR	1	EA

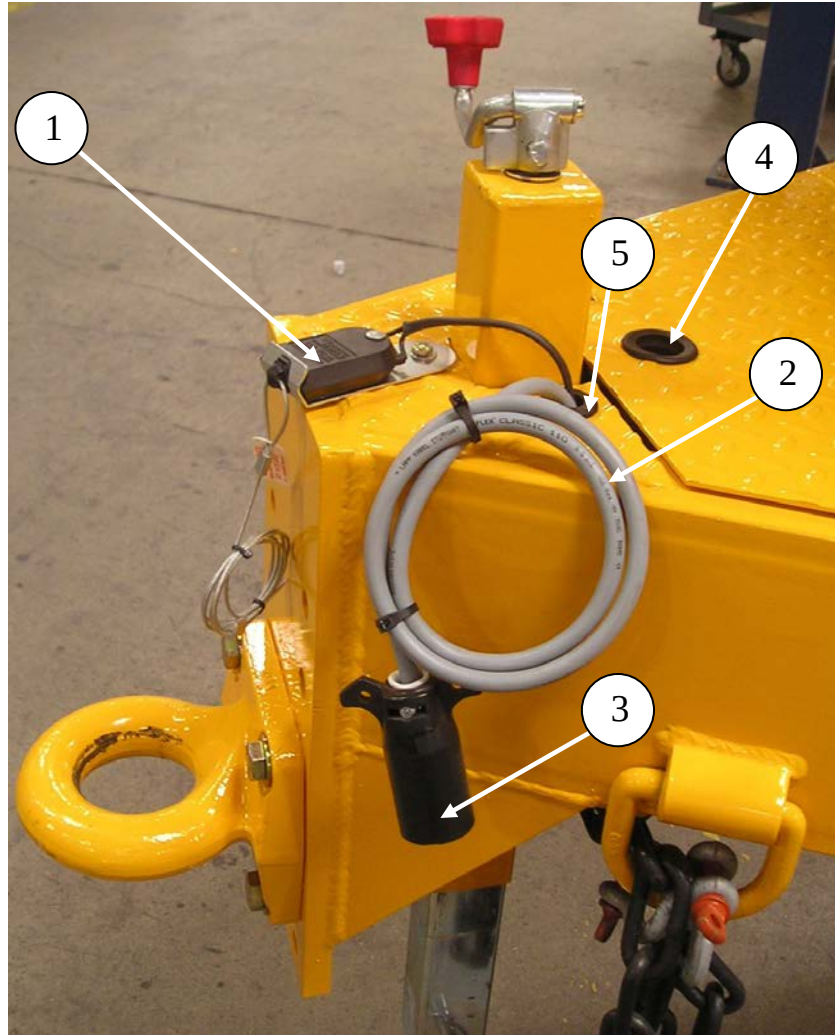


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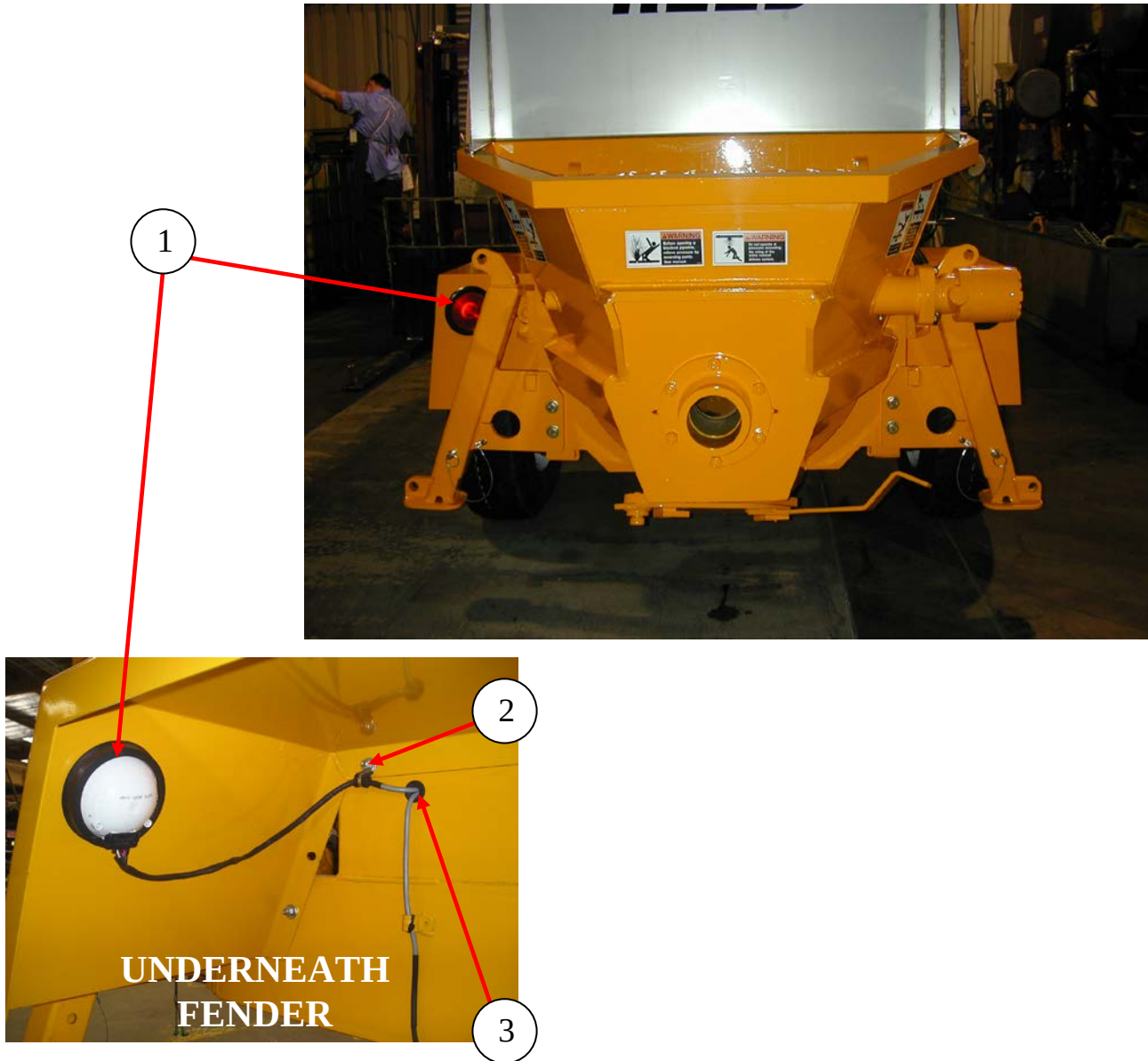
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TRAILER HARNESS AND BREAKAWAY



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	77705	BREAK-AWAY KIT	1	EA
2	86533	TRAILER HARNESS- B-SERIES	1	EA
3	86579	TRAILER PLUG 7C FLAT PI	1	EA
4	72949	GROMMET	1	EA
5	72813	GROMMET	1	EA

TAIL LIGHTS



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	72948	TAIL LIGHT	2	EA
2	87665	LOOM CLAMP 7/8"	2	EA
3	72949	GROMMET	2	EA

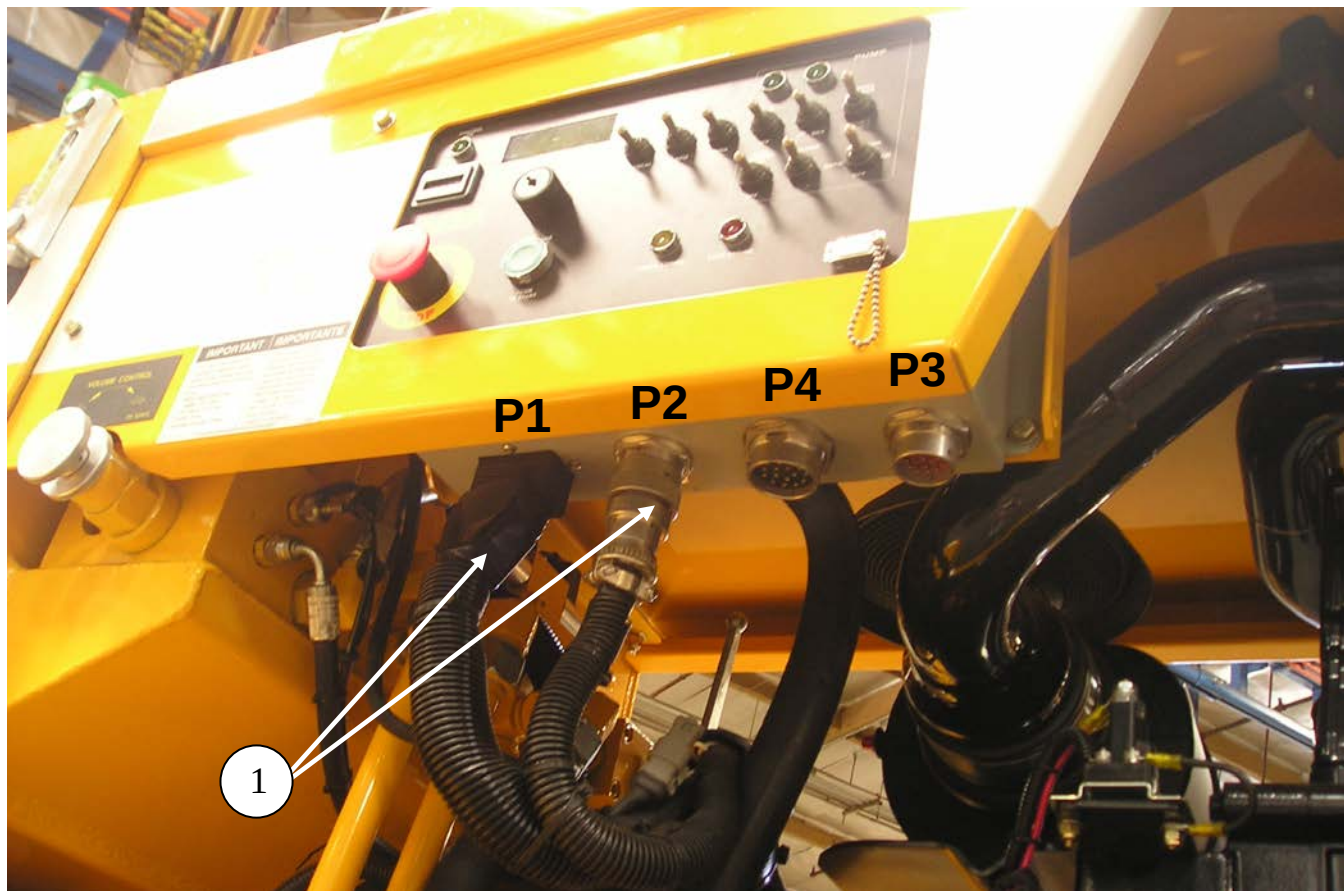


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WIRING HARNESS



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	87734-2	WIRING HARNESS B SER HOPPER SAFETY	1	EA
	BW10145	PLUG CONNECTOR	1	EA
	BW10146	BOOT, FOR BW10145 PLUG	1	EA
	BW10147	PIN, FOR BW10145 PLUG	24	EA
	87540	CABLE SOLENOID VALVE, WITH DIN PLUG	7	EA
	77990	CABLE, PROXIMITY SWITCH, 5M	3	EA
	10522	STRAIN RELIEF	1	EA
	87456	PLUG CONNECTOR, 8 PIN	1	EA
	87457	PIN, FOR 87456 PLUG	8	EA
	85615	CABLE, 14AWG-2C, PVC-GRY	15.5	FT
	85617	CABLE, 14AWG-4C, PVC-GRY	8.75	FT
	77640	DIODE, 1N4003	1	EA
	BW10324	WIRE, #8 SRML BLACK	8.75	FT
	85619	CABLE, 16AWG-4C, PVC-GRY	8	FT
	87669	PIGTAIL HARNESS, FOR CUMMINS ALTERN	1	EA

CONTROLS

B-SERIES CONTROL BOX



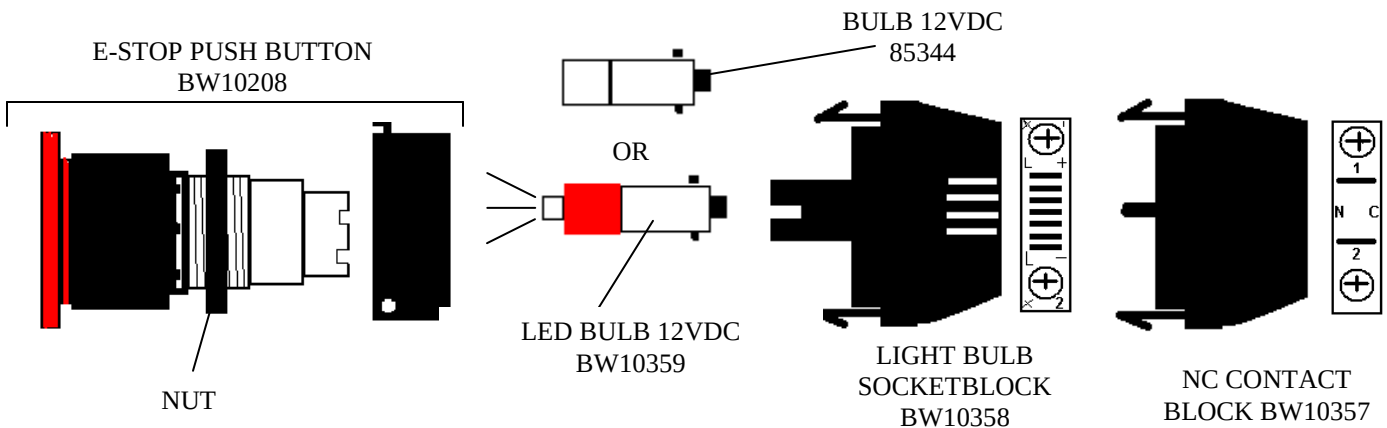
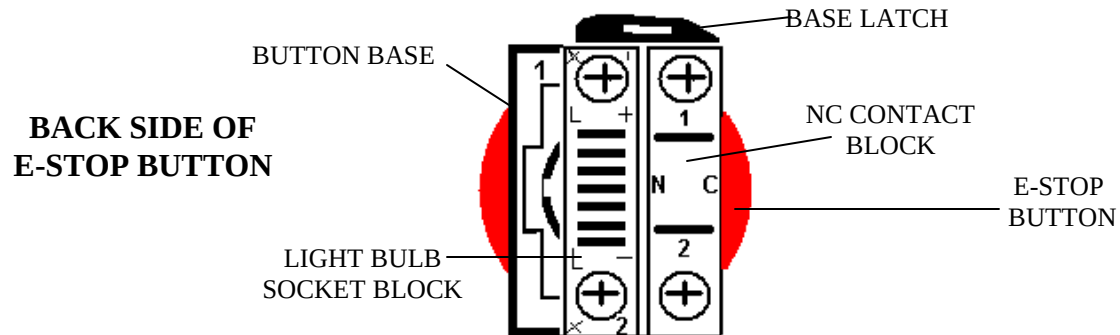
ID #	PART #	PART DESCRIPTION	QUANTITY	
	87346-2	CONTROL BOX, REV-F	1	EA
1	BW10372	SW,TOGGLE, (ON-OFF-ON) VIBRATOR	1	EA
2	BW10207	SW,TOGGLE, (ON-OFF) PUMP ON/OFF & FWD/REV	2	EA
3	BW10223	SW,TOGGLE, (ON-ON) LOCAL/REMOTE	1	EA
4	BW10206	SW,TOGGLE,(ON-OFF) STROKE CHANGE& HORN	2	EA
5	BW10205	SW,TOGGLE,(ON-OFF-ON) RPM+/- & VOLUME+/-	2	EA
6	BW10361	SW, SEALING BOOT	9	EA
7	BW10208	MUSHROOM HEAD MAINTAINED BUTT.	1	EA
8	BW10209	E-STOP LIGHT(POWER SUPPLY)	1	EA
9	BW10210	NC CONTACT BLOCK	1	EA
10	BW10211	LGT, WL-41047MINI RED 15	1	EA
11	87952	SW, (FAST CHANGE)	1	EA
12	BW10355	SW, PB GRN FLUSH (ENG START)	1	EA
13	BW10354	SW, KEYSWITCH BLK	1	EA
13A	BW10204-1	KEY ONLY	2	EA
14	88017	SW, CONTACT BLOCK N.O. (SYS ON) (ENG START)	3	EA
15	BW10212	MINI HOURMETER	1	EA
16		DISPLAY,LCD 20CX4L W/BACKLIT	1	EA
17	BW10369	LED, PILOT LIGHT, (GRN)	3	EA
18	BW10370	LED, PILOT LIGHT, (RED)	1	EA
19	BW10371	LED, PILOT LIGHT, (AMBER)	1	EA
20	72862	GAUGE FOR PROX.SENSOR SETTING	1	EA



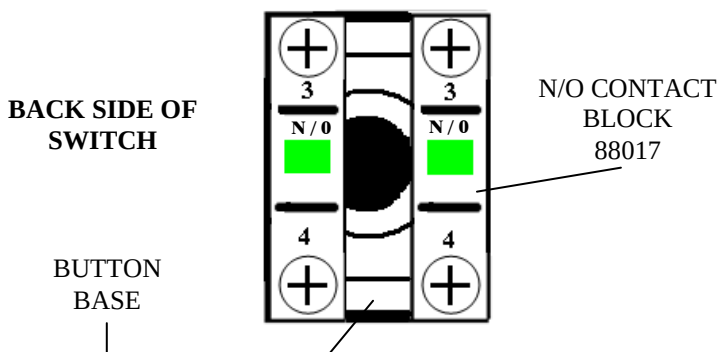
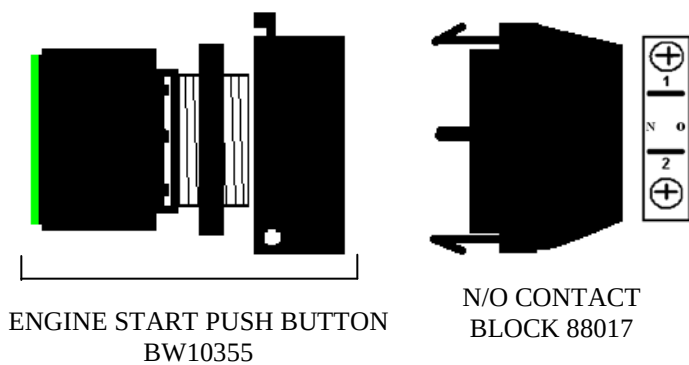
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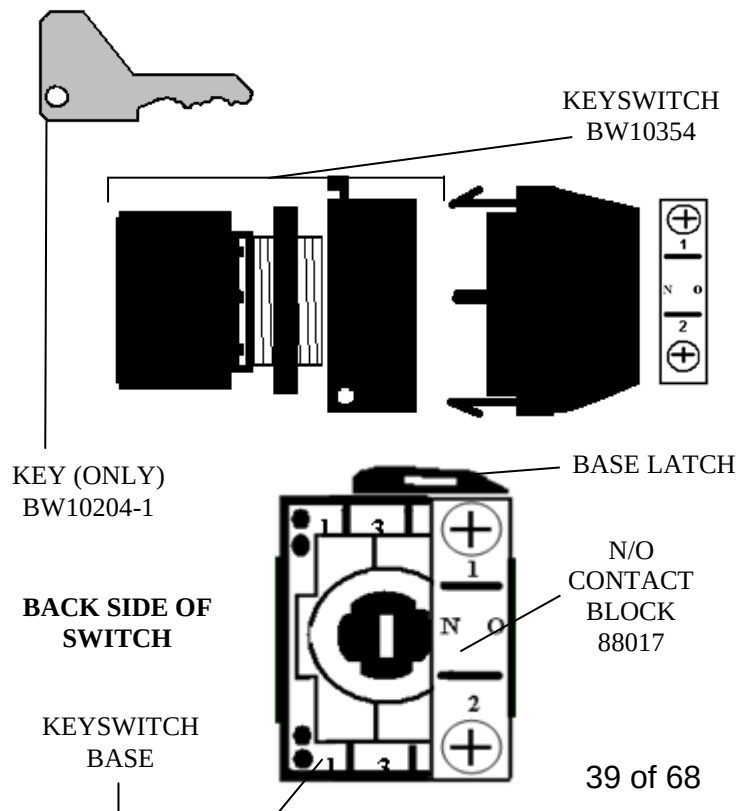
CONTACT BLOCKS



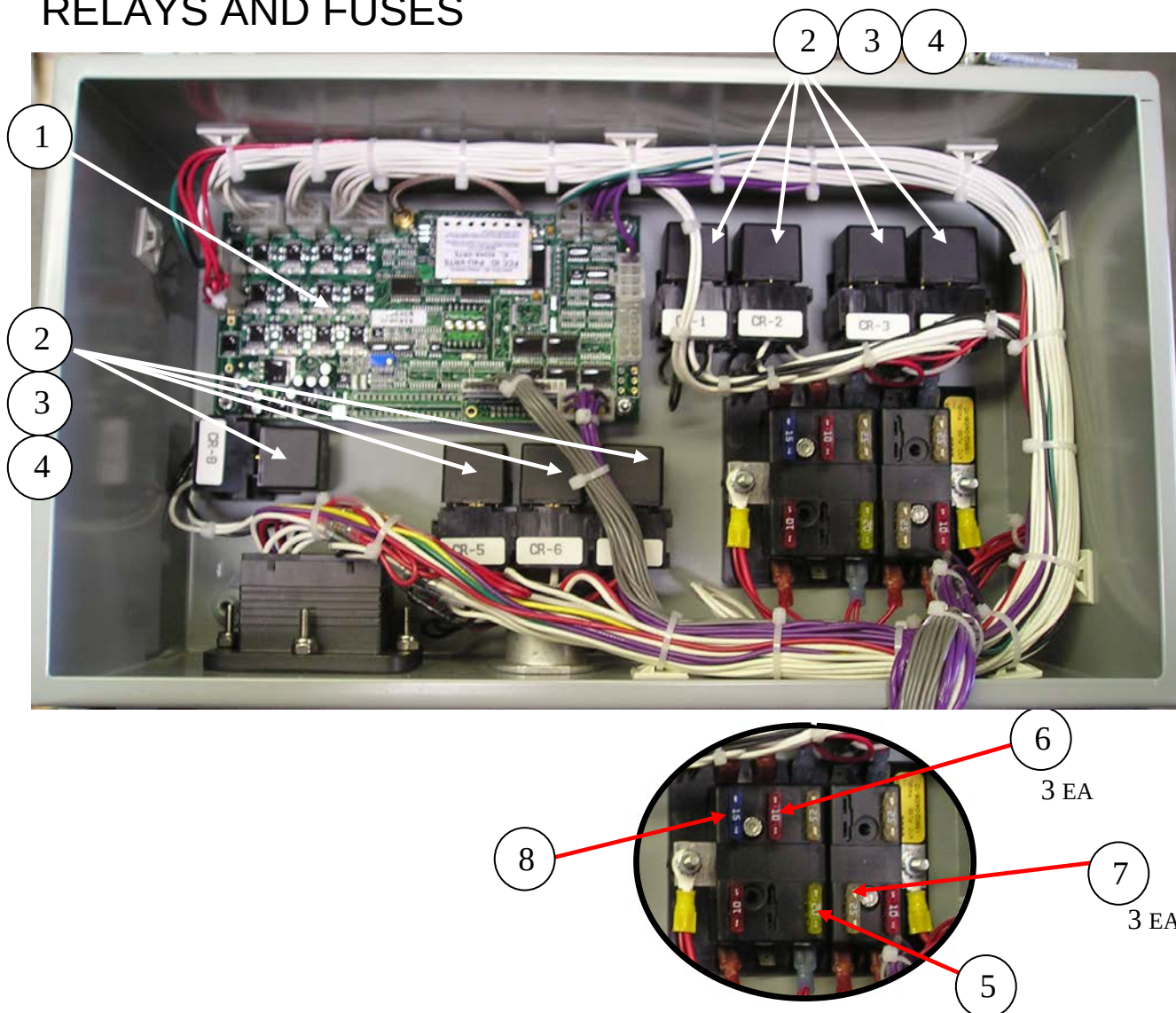
ENGINE START BUTTON ASSEMBLY



SYSTEM ON BUTTON ASSEMBLY



RELAYS AND FUSES



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	87346-BOARD	CONTROL BOARD	1	EA
2	87970	RELAY, DIODE SUPRESSED	8	EA
3	72927	RELAY, PINS	32	EA
4	BW10224	SOCKET, RELAY	8	EA
5	800448	FUSE, 20A ATO	1	EA
6	800449	FUSE, 10A ATO	3	EA
7	800447	FUSE, 25A ATO	3	EA
8	90391	FUSE, 15A ATO	1	EA



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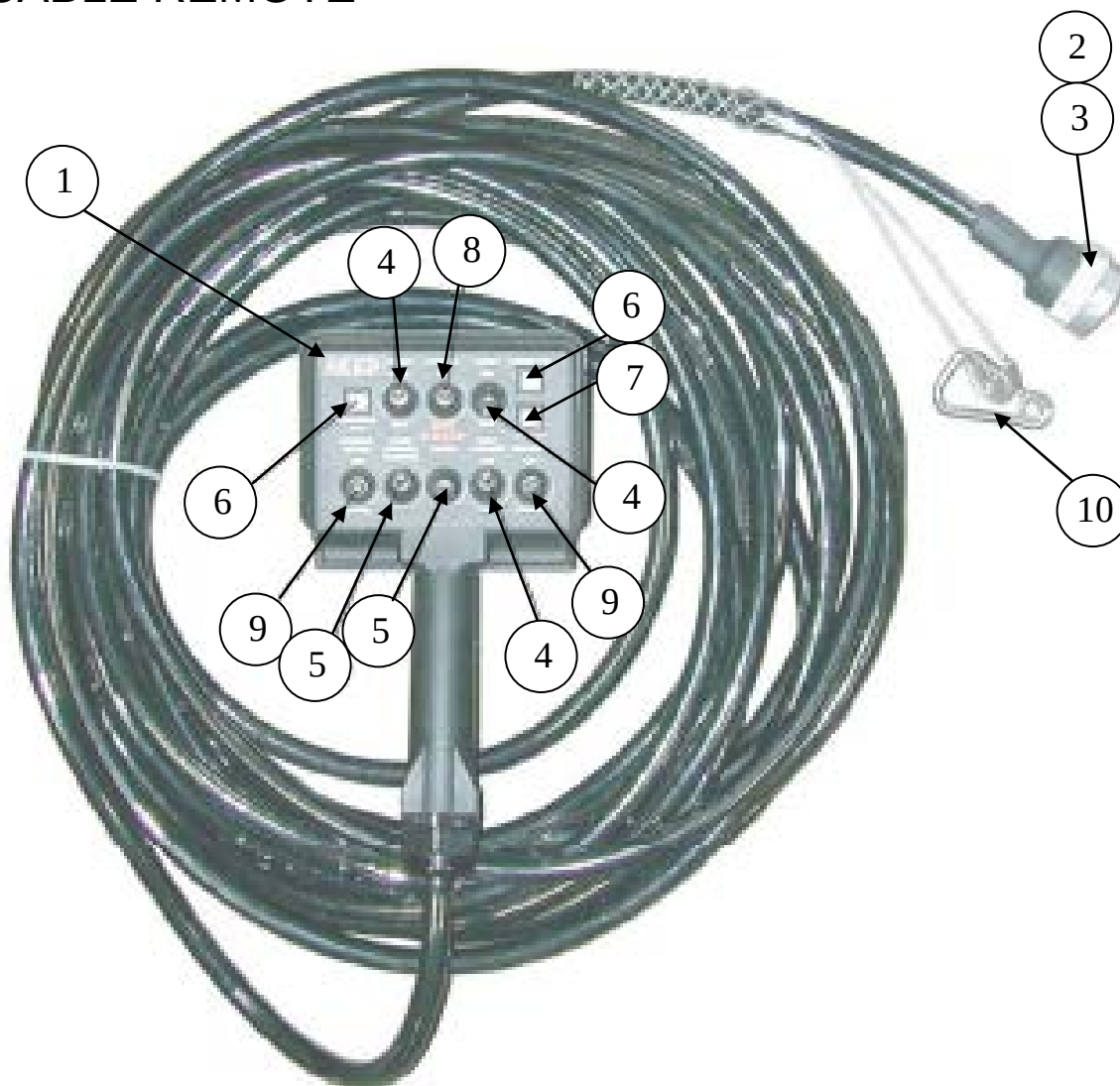
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CONNECTORS



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	BW10217	CONN,DRC12-24PA (P1)	1	EA
2	BW10220	CONN,DRC24-GASKET	1	EA
3	BW10221	CONN, DEUTSCH PINS	24	EA
4		CONN,HD34-18-08PN (P2)	1	EA
5	87807	DEUTSCH PINS, MALE	8	EA
6	87806	CONN, 10-11-2163, 16 PIN (P4)	1	EA
7	87808	PINS, FEMALE	16	EA
8		CONN,HD34-18-14PN (P3)	1	EA
9	BW10221	CONN, DEUTSCH PINS	14	EA

50 FT CABLE REMOTE



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	87347-1	REMOTE CONTROL, 87346 REV-D & UP	1	EA
2	87915	CONNECTOR, 87347-1 CABLE REMOTE	1	EA
3	BW10147	PINS (FEMALE)	14	EA
4	BW10207	SW,TOGGLE, (ON-OFF) PUMP ON/OFF & FWD/REV FAST CHANGE	3	EA
5	BW10206	SW,TOGGLE,(ON-OFF) HORN & STROKE CHANGE	2	EA
6	88170	LED, CONTROL ON (GREEN)	2	EA
7	88171	LED, CONTROL ON (RED)	1	EA
8	BW10223	SW, POWER ON/ OFF	1	EA
9	BW10205	SW,TOGGLE,(ON-OFF-ON) RPM+/- & VOLUME+/-	2	EA
10	87875	SPRING SNAP	1	EA
REF	BW10361	SW, SEALING BOOT	8	EA



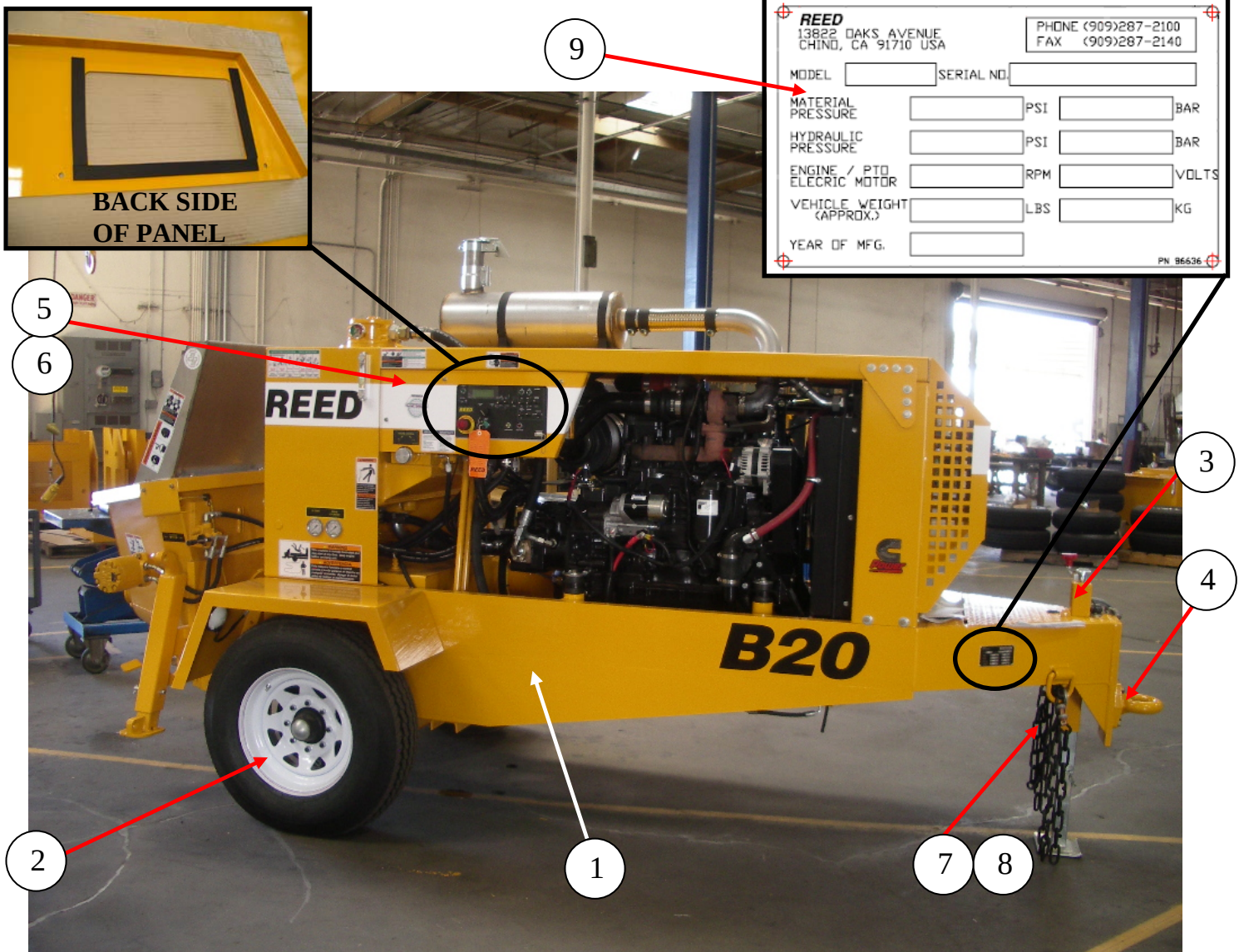
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FRAME INSTALLATION

FRAME, TIRES, JACK, AND TOW EYE



ID #	PART #	PART DESCRIPTION	QUANTITY	
	87838	FRAME ASSY B20 SER, 2007 W/CUMMINS	1	EA
1	87728	FRAME WELDMENT B SER 2007 CUMMINS	1	EA
2	85423	TIRE & WHEEL ASSY -215/75R16.5 H	2	EA
3	85527	JACK WELDMENT	1	EA
4	87037	DRAW BAR	1	EA
5	87449	COVER CONTROL BOX, PAINTED	1	EA
6	13257	WEATHERSTRIP, RUBBER, 5/32 X 1	30	IN
7	86730	CHAIN-3/8 PROOF COIL GR 70 PHOSPATE	5.5	FT
8	87085	SHACKLE ANCHOR, SCREW PIN, 1/2 6600	4	EA
9	86636	SERIAL NUMBER PLATE (BLANK)	1	EA

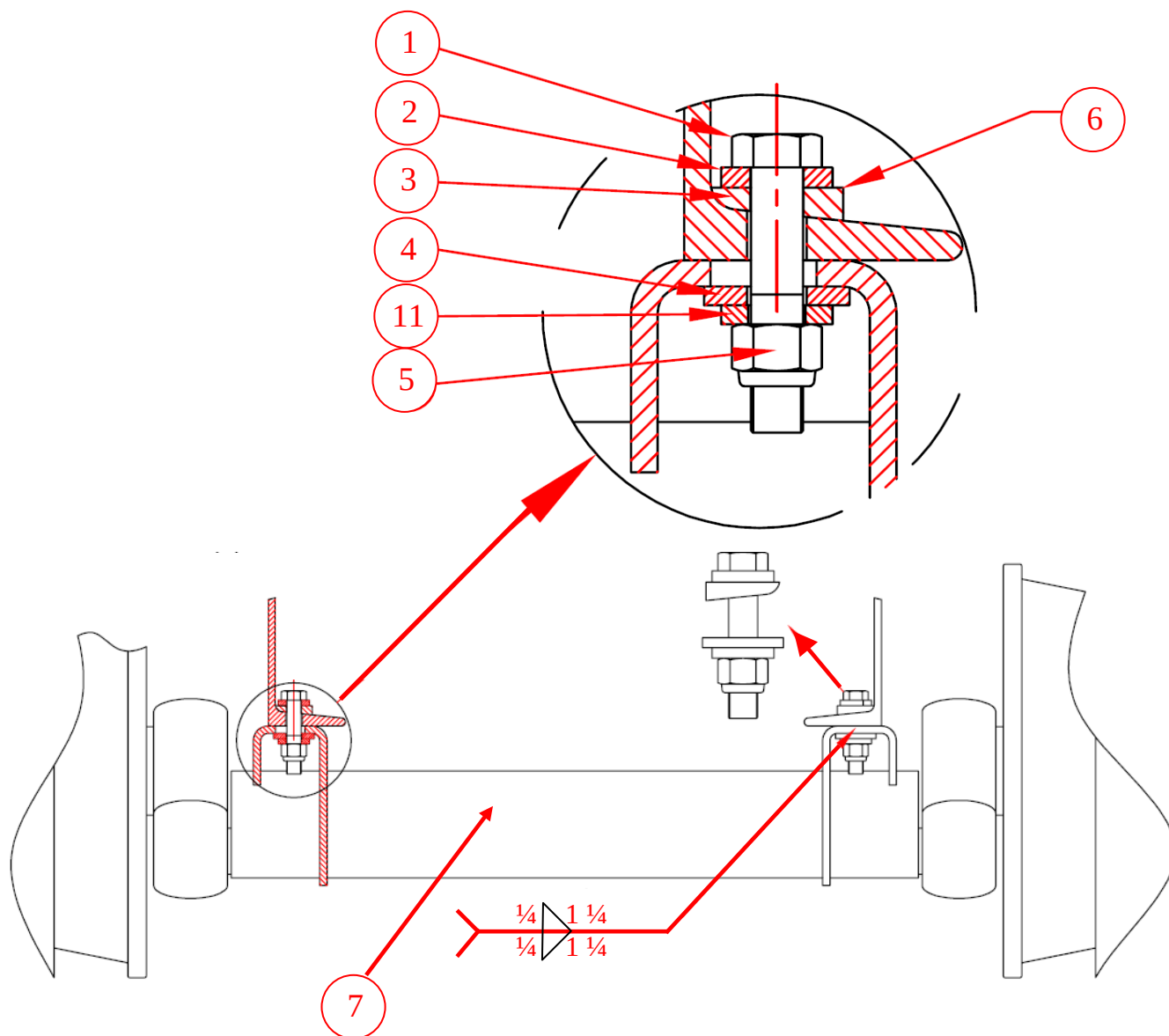


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7000LB AXLE MOUNTING ASSEMBLY



ID #	PART #	PART DESCRIPTION	QUANTITY	
	87542	AXLE MOUNTING HARDWARE KIT	1	EA
1		1/2" -20 X 2.5 HHCS GR8	4	EA
2		1/2" SAE WASHER	8	EA
3		1/2" USE WASHER	4	EA
4		1/2" SAE WASHER	4	EA
5		1/2" - 20 LOCK NUT	4	EA
6		1/2" BEVELED WASHER	4	EA
7	85424	AXLE, TORSION, 7000 LB 8 on 6.50 (AL-KO)	1	EA

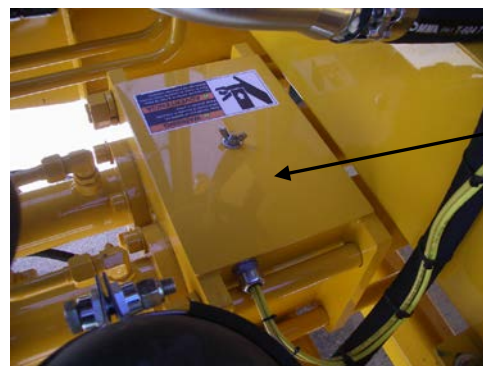
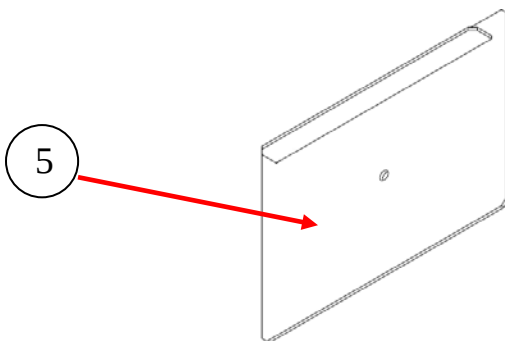


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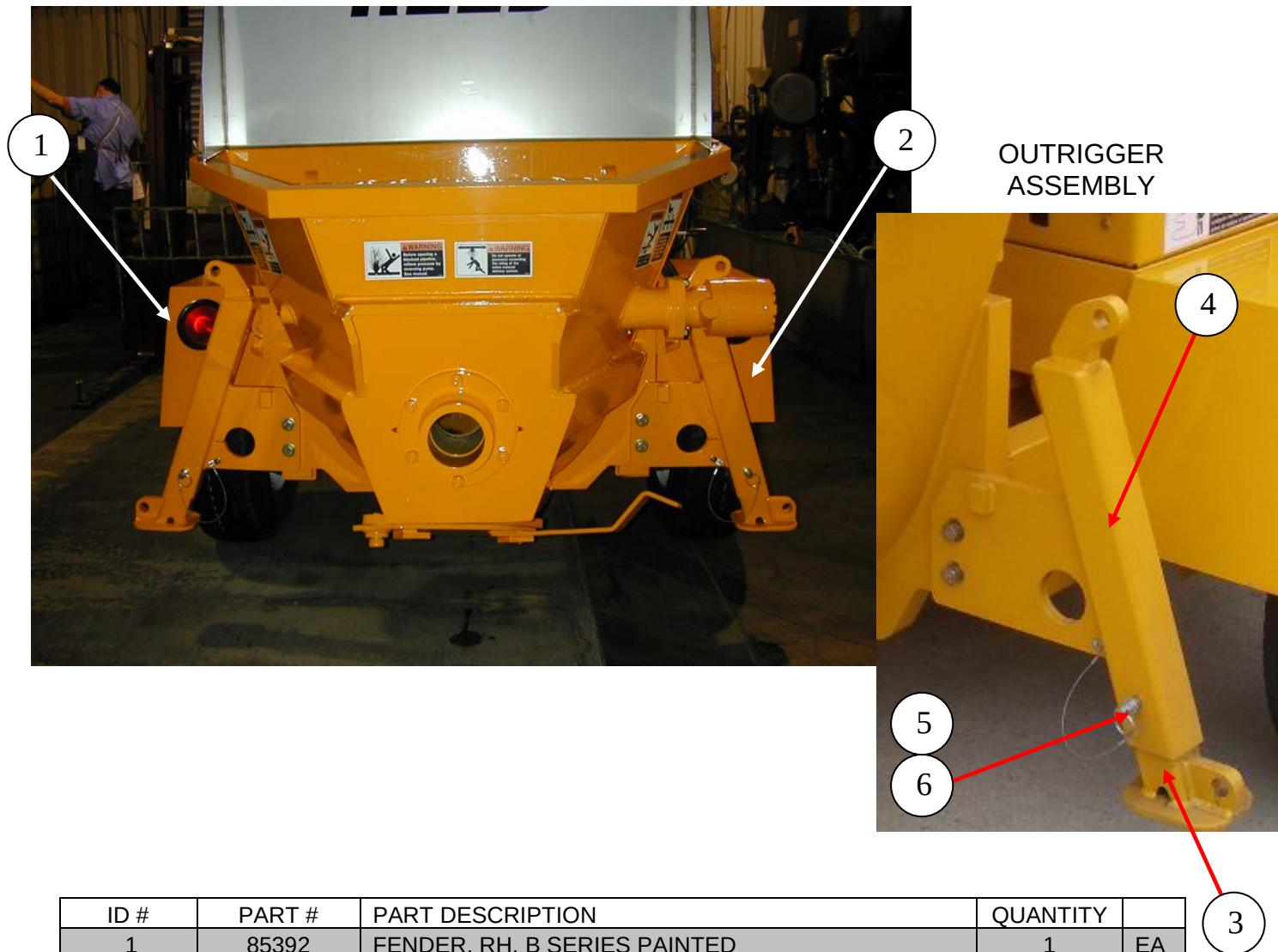
HOOD AND COVERS



**FLUSH
BOX**

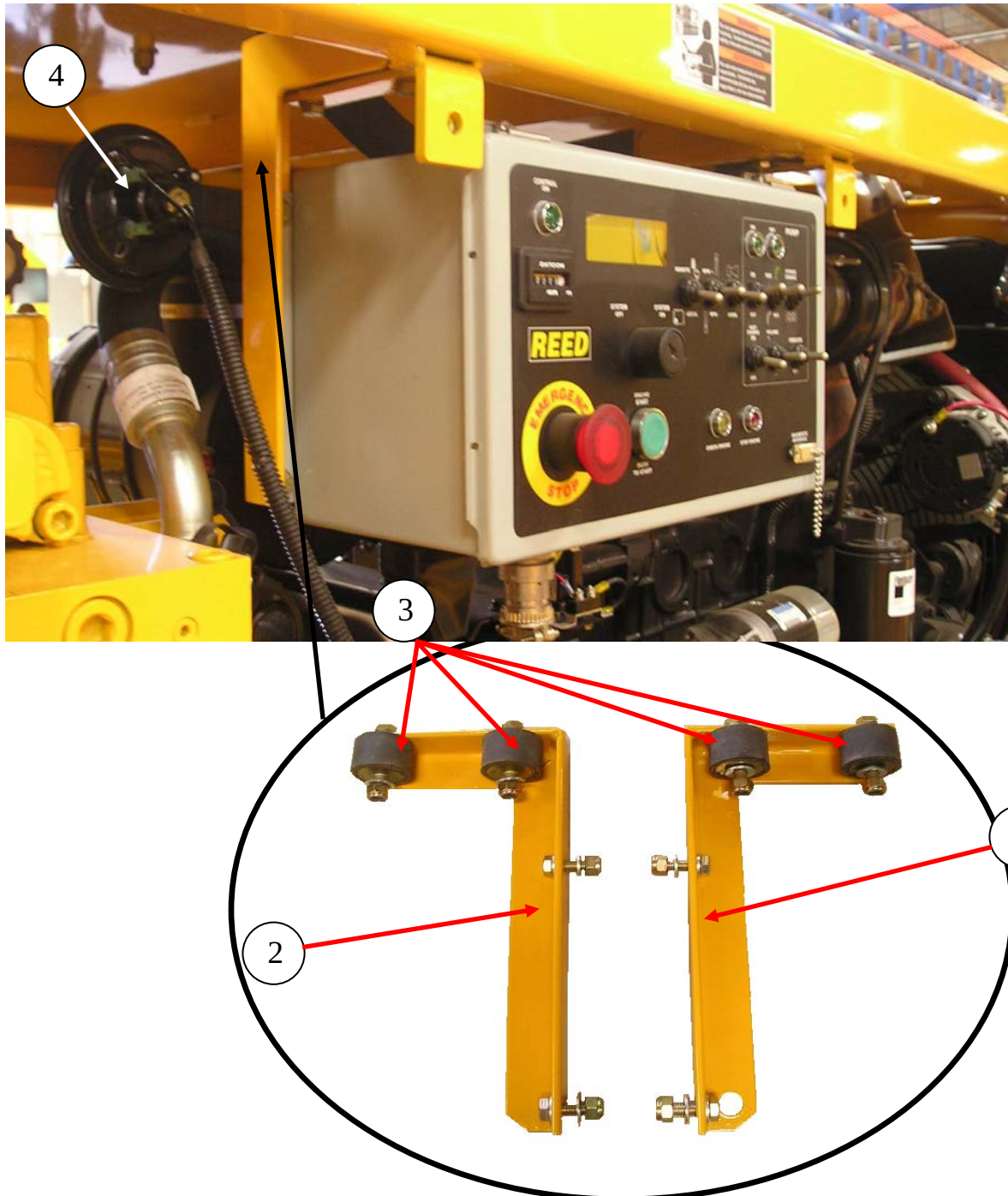
ID #	PART #	PART DESCRIPTION	QUANTITY	
1	87737	COVER TOP, B SER CUMMINS PAINTED	1	EA
2	87681	COVER FRONT WELD, B SER CUM PAINTED	1	EA
3	87647	GUSSET ENGINE COVER PAINTED	2	EA
4	85714-1	SPLASH GUARD, B-20 W/HOPPER SAFETY GRATE	1	EA
5	71933	LID, FLUSHBOX	1	EA

FENDERS AND OUTRIGGERS



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	85392	FENDER, RH, B SERIES PAINTED	1	EA
2	85393	FENDER, LH, B SERIES PAINTED	1	EA
3	86553	OUTRIGGER WELDMNT, INNER-PAINTED	2	EA
4	86550	OUTERTUBE, O/R B & C - PAINTED	2	EA
5	85595	PIN, Q/R, 5/8 DIA X 3 1/2 L	2	EA
6	800418	LANYARD, Q/R PIN	2	EA

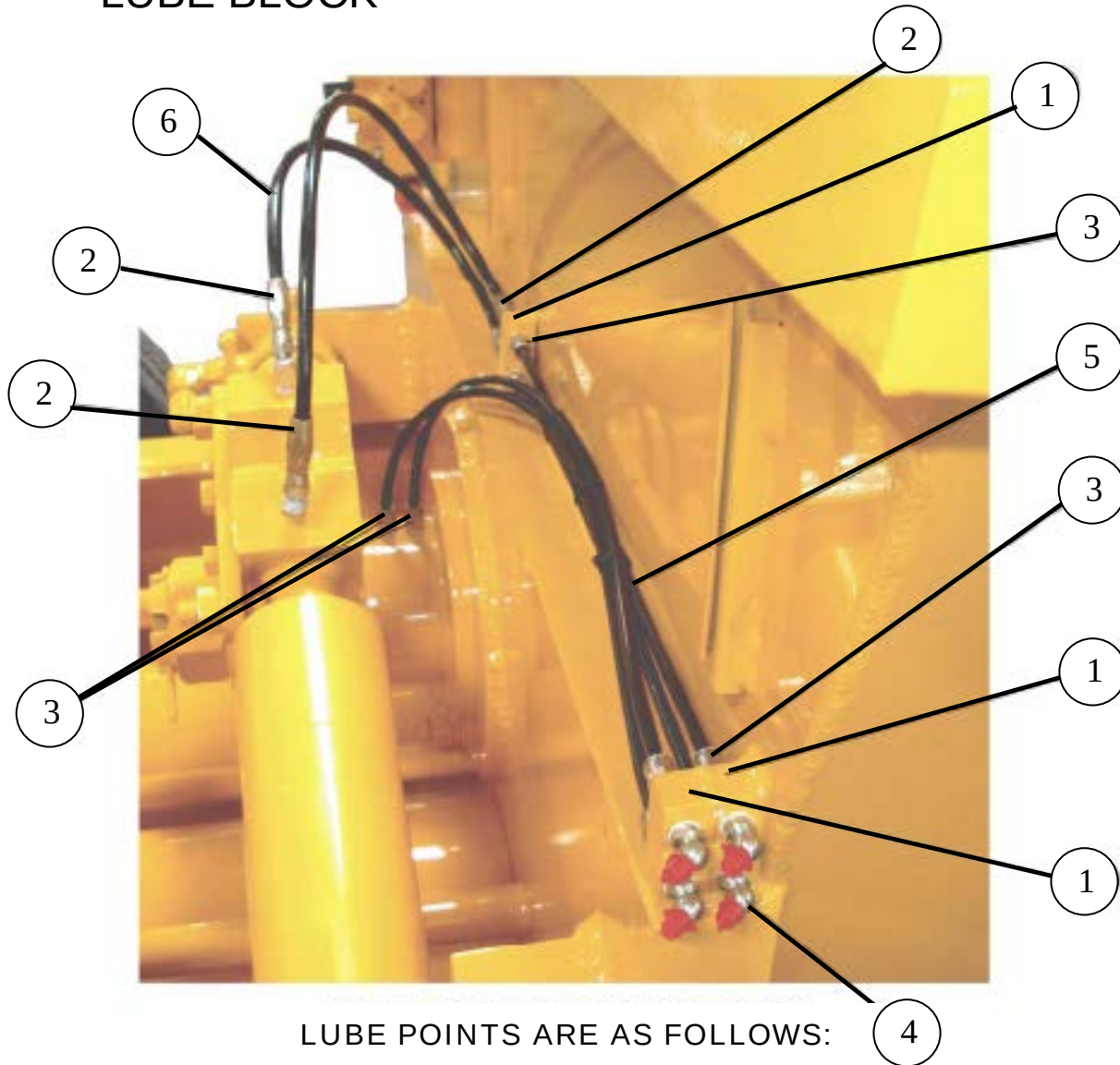
CONTROL BOX MOUNT



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	87397	ANGLE CONTROL BOX MOUNT RH	1	EA
2	87398	ANGLE CONTROL BOX MOUNT LH	1	EA
3	73748	BUMPER	4	EA
4	800347	HORN, 12V	1	EA

OPTIONS

LUBE BLOCK

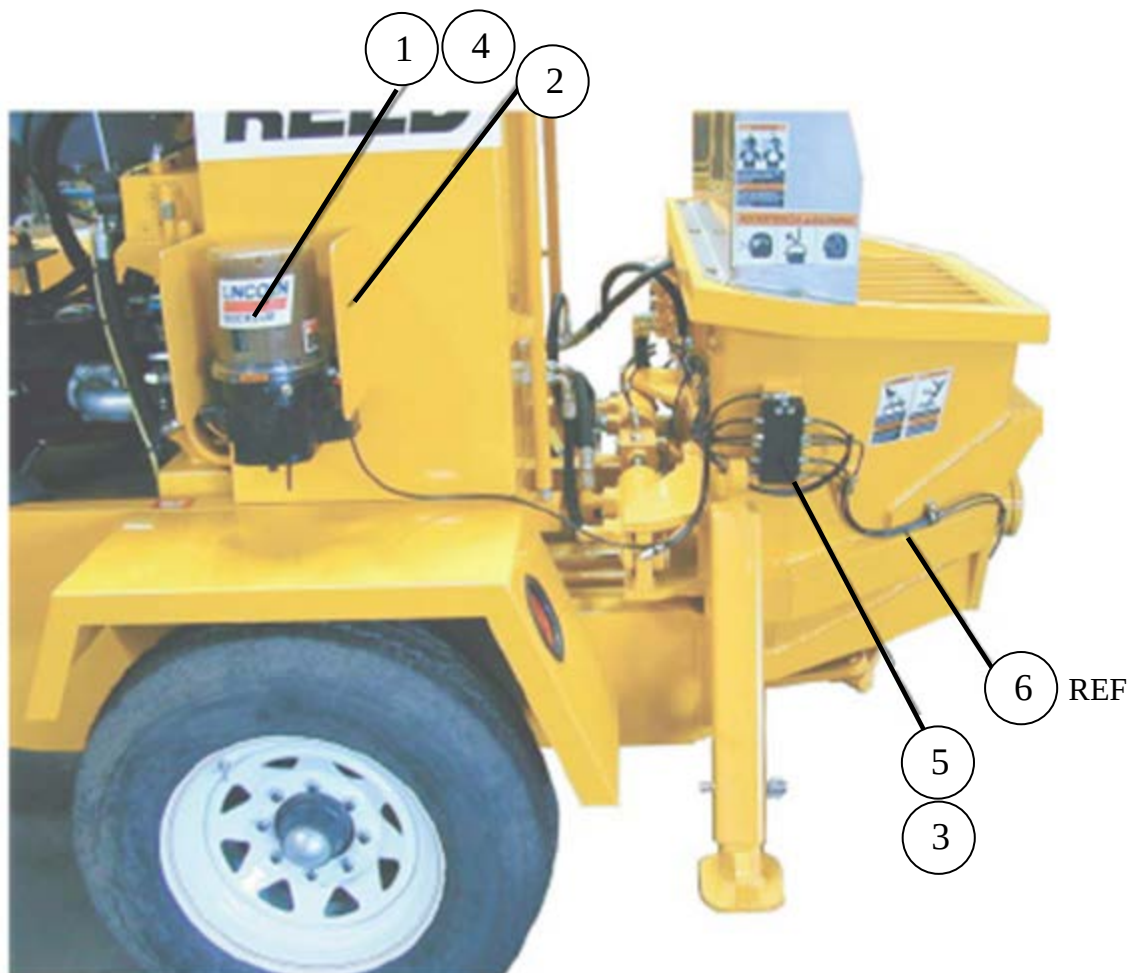


LUBE POINTS ARE AS FOLLOWS:
BELL CRANK AND FLANGED BEARING

ID #	PART #	PART DESCRIPTION	QUANTITY	
	87539	ASSEMBLY, CENTRALIZED LUBE BLOCK	1	EA
1	87437	BLOCK	3	EA
2	87628	HOSE, COUPLING	4	EA
3	87629	FITTING, HOSE	8	EA
4		FITTING, GREASE	4	EA
5		HOSE, PLASTIC- 1/4 " O.D. TUBING	A/R	
6		HOSE, PLASTIC 5/16" O.D. TUBING	A/R	

OPTIONS

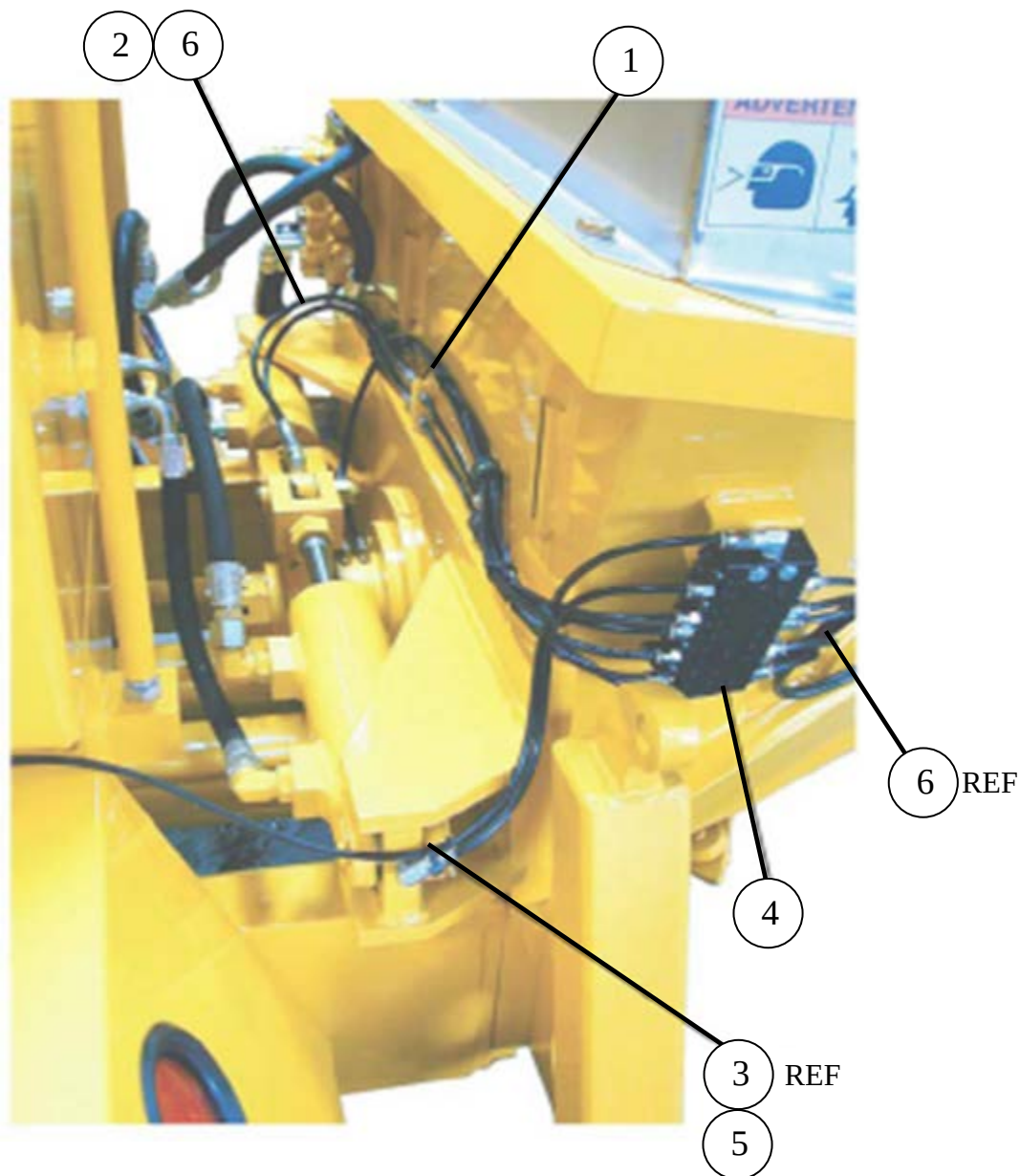
AUTOLUBE PUMP (PLASTIC TUBING)



ID #	PART #	PART DESCRIPTION	QUANTITY	
	87476	ASSEMBLY, AUTO LUBE 12V PLASTIC TUBE	1	EA
1	87193	LUBE PUMP ASSY (PLACTIC TUBING)	1	EA
2	87257	GUARD	1	EA
3	87475	BRACKET, LUBE BLOCK MOUNT	1	EA
4		VALVE, PRESSURE RELIEF	1	EA
5		BLOCK, DIVIDER VALVE -18 OUTLET	1	EA
6		HOSE, PLASTIC- 1/4" O.D.	A/R	
7		HOSE, PLASTIC-5/16" O.D.	A/R	

OPTIONS

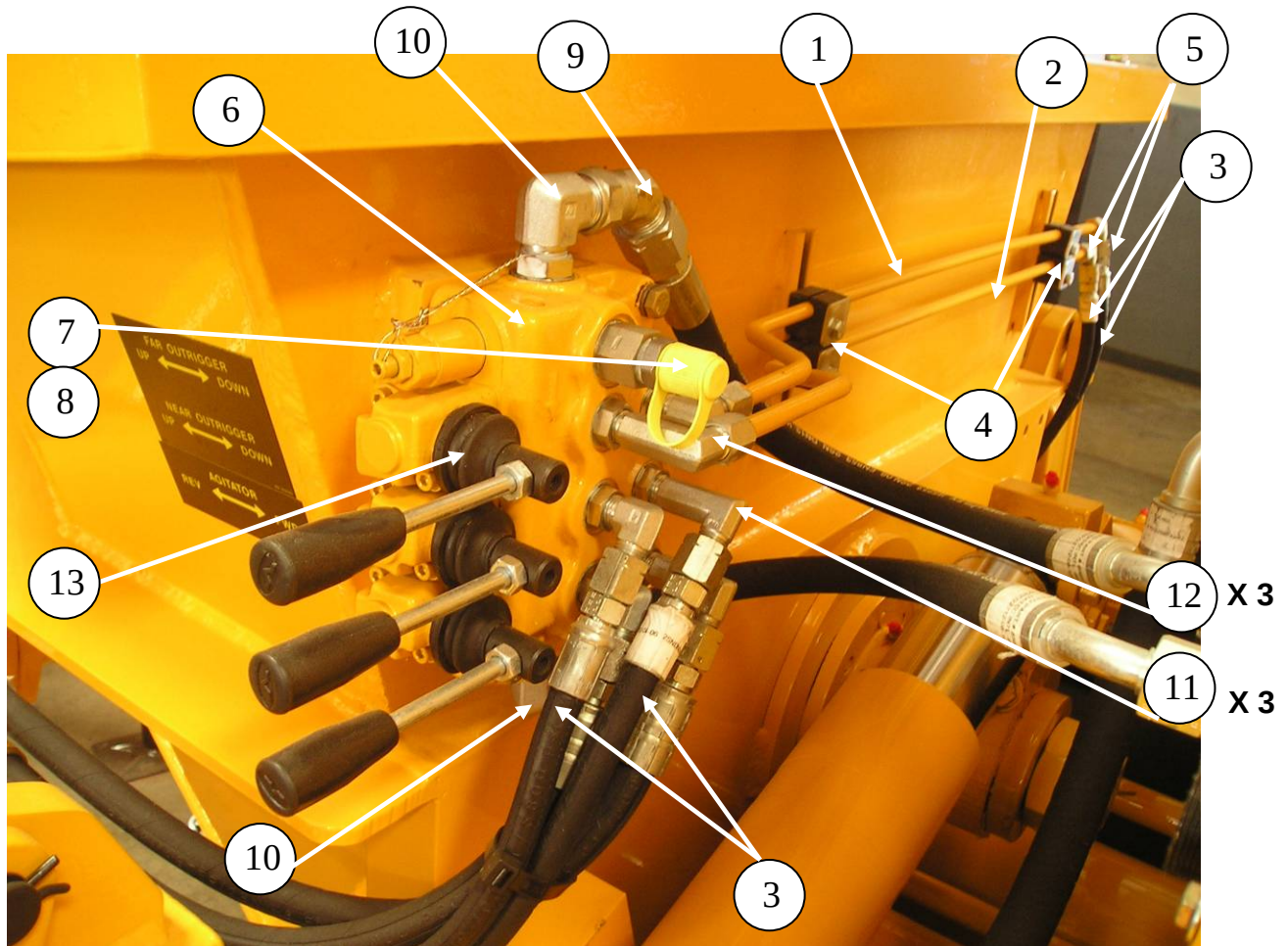
AUTOLUBE PUMP (PLASTIC TUBING) CONTINUED



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	87437	BLOCK	1	EA
2	87628	HOSE COUPLING	4	EA
3	87629	FITTING, HOSE	22	EA
4		BLOCK, DIVIDER VALVE -18 OUTLET	REF	EA
5		HOSE, PLASTIC- 1/4" O.D.	A/R	
6		HOSE, PLASTIC-5/16" O.D.	A/R	

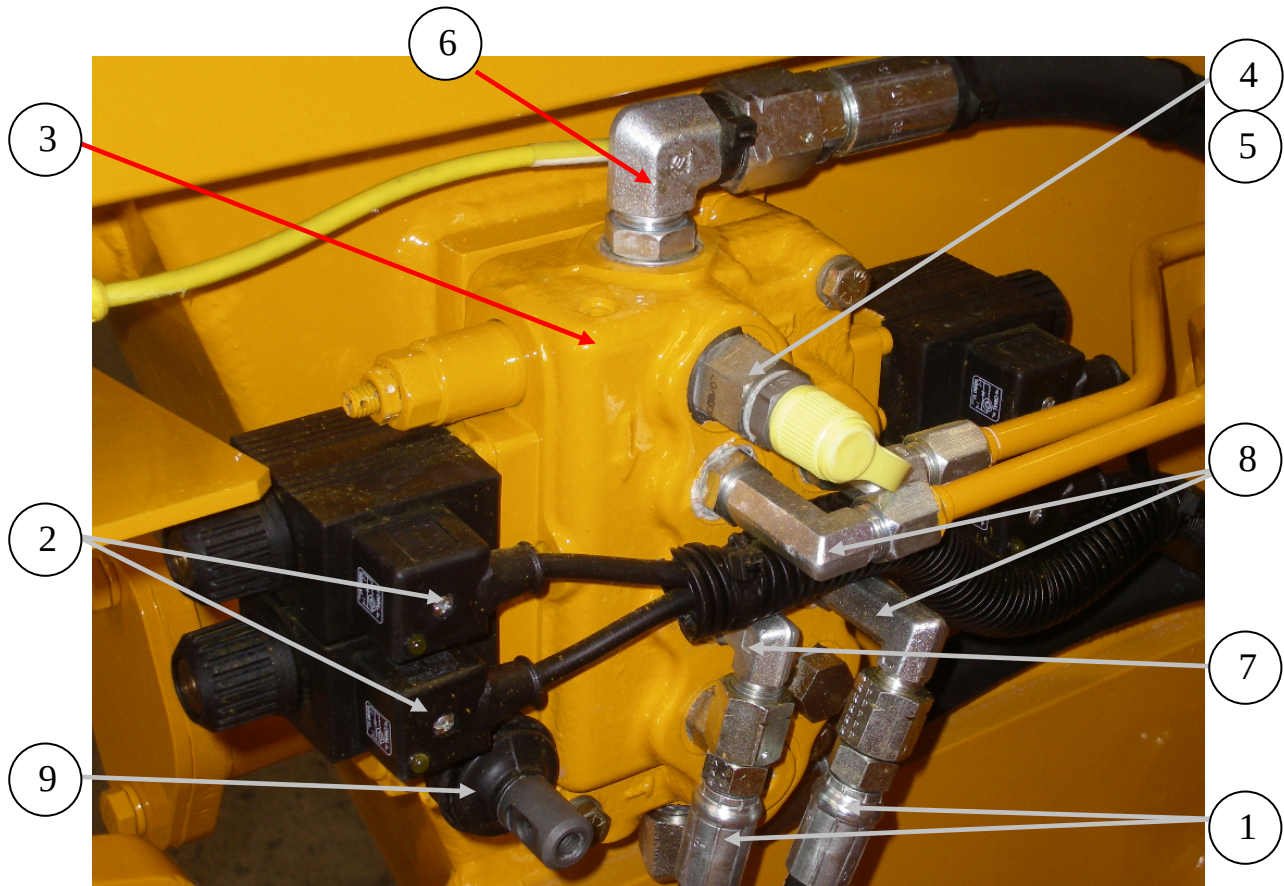
OPTIONS

HYDRAULIC OUTRIGGER GROUP



ID #	PART #	PART DESCRIPTION	QUANTITY	
	86334	HYD OUTRIGGER GROUP	REF	
1	85685	TUBE, HYD, OUTRIGGER - PAINTED	1	EA
2	85686	TUBE, HYD, OUTRIGGER - PAINTED	1	EA
3	85659-010	HOSE, 4M2T-6FJX-6FJX-33.00	4	EA
4	801902-020	TUBE CLAMP - 3/8 IN - HALF	4	EA
5		MJ-MJ90-6-6	2	EA
6	74471	VALVE, MAUNAL-3 SPOOL	1	EA
7	800083	FITTING, MINI CHECK (PORT)	1	EA
8	86750	ADAPTER, MB-FB-8-6	1	EA
9	86749	FITTING, MJ-FJX45-10-10	1	EA
10	86746	FITTING, 90° MB-MJ-90-8-10	2	EA
11	86748	FITTING, 90° MB-MJ90-6-6	3	EA
12	86747	FITTING, 90° MB-MJ90LL-6-6	3	EA
13	74471-B	BOOT, COVER	3	EA

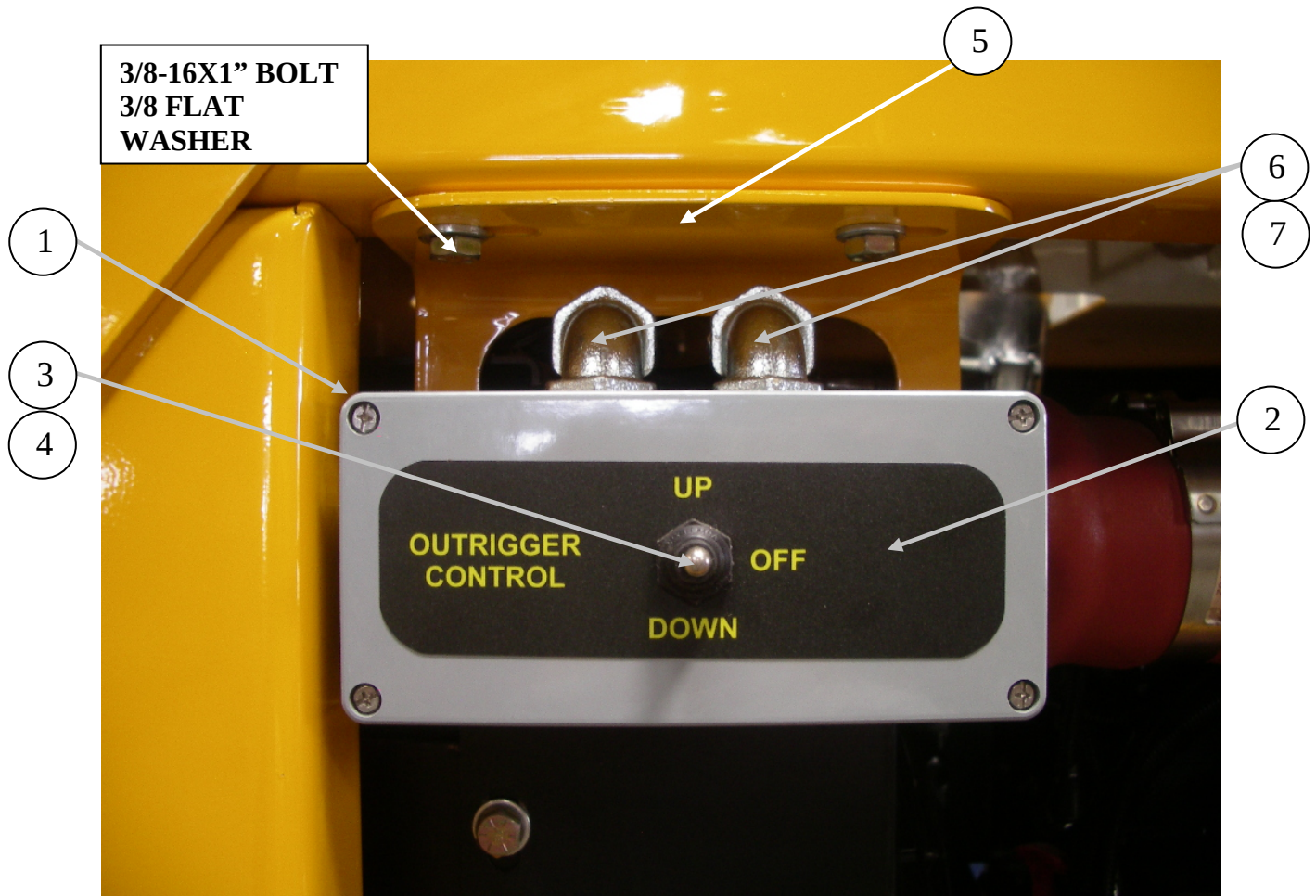
OPTIONS ELECTRIC HYDRAULIC OUTRIGGER CONTROLS



ID #	PART #	PART DESCRIPTION	QUANTITY	
	88041-O	HYD OUTRIGGER ASSEMBLY, REMOTE	REF	EA
1	85659-010	HOSE, 4M2T-6FX-6JX-33.00	2	EA
2	87540	CABLE SOLENIOD VALVE, WITH DIN PLUG	4	EA
3	88026	VALVE, 3SPOOL, 2EA. VDC SPOOL	1	EA
4	800083	FITTING, MINI CHECK (PORT)	1	EA
5	86750	ADAPTER, MB-FB-8-6	1	EA
6	86749	FITTING, MJ-FJX45-10-10	1	EA
7	86748	FITTING, 90° MB-MJ90-6-6	3	EA
8	86747	FITTING.90° MB-MJ90LL-6-6	3	EA
9	74471-B	BOOT, COVER	3	EA

OPTIONS

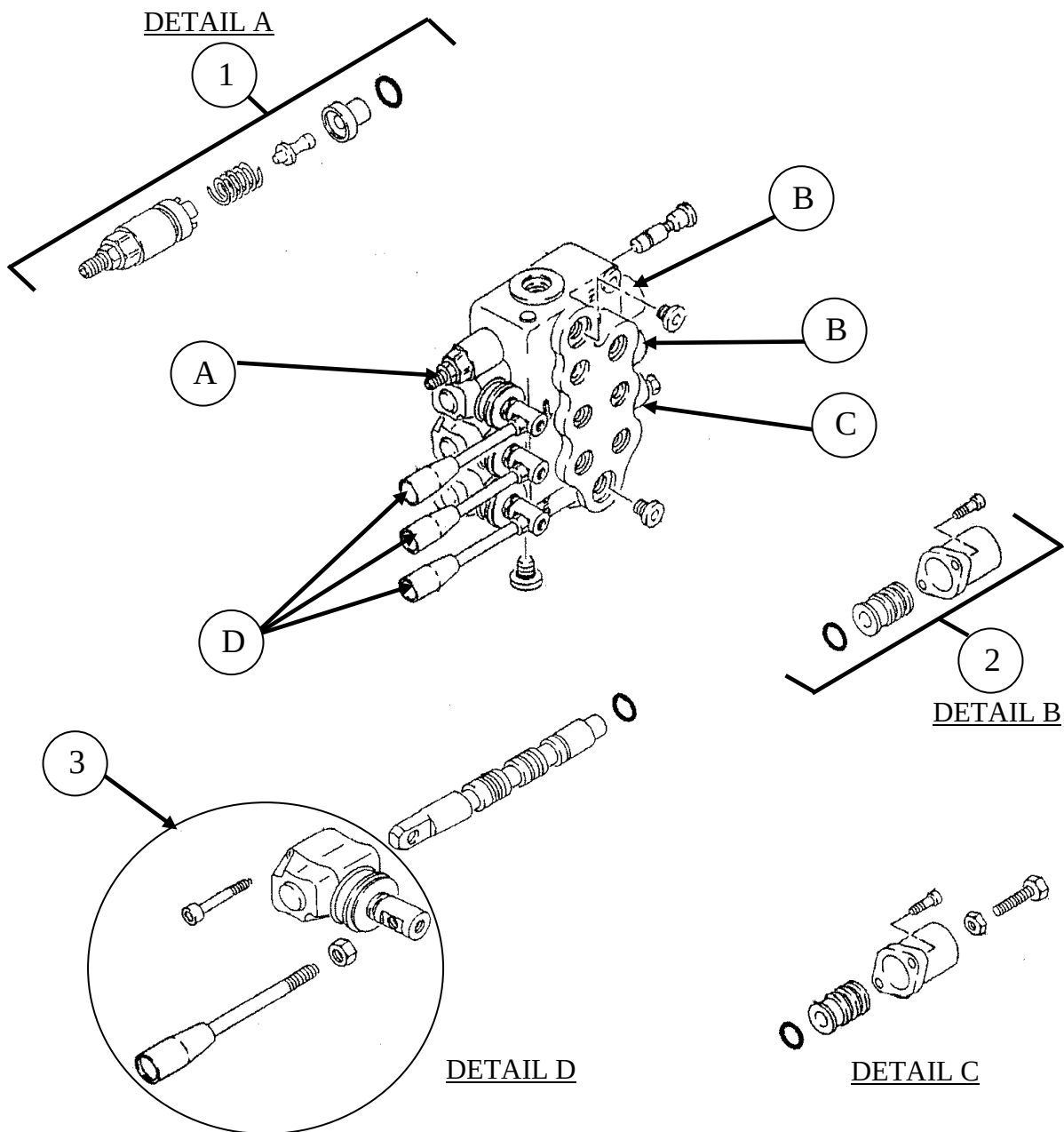
ELECTRIC HYDRAULIC OUTRIGGER CONTROLS



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	801206	ENCLOSURE 6X3X3, FIBERGLASS	2	EA
2	88163	DECAL OUTRIGGER UP/DOWN	2	EA
3	BW10205	SWITCH, 3 POSITION MOM/SPDT	2	EA
4	BW10361	SW, SEALING BOOT	2	EA
5	88164-A	BRACKET OUTRIGGER CONTROL MOUNT	2	EA
6	73531	90° STRAIN RELIEF	4	EA
7	10528	NUT ½", BONDING TYPE LOCK	4	EA

OPTIONS

3 SPOOL CONTROL VALVE



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	85706	RELIEF, CARTRIDGE	1	EA
2	74469	DETENT KIT, #11 WALVOIL VALVE	A/R	EA
3	74471-020	VALVE ACTUATOR FOR 74471, 74585, 74584 VALVES	A/R	EA



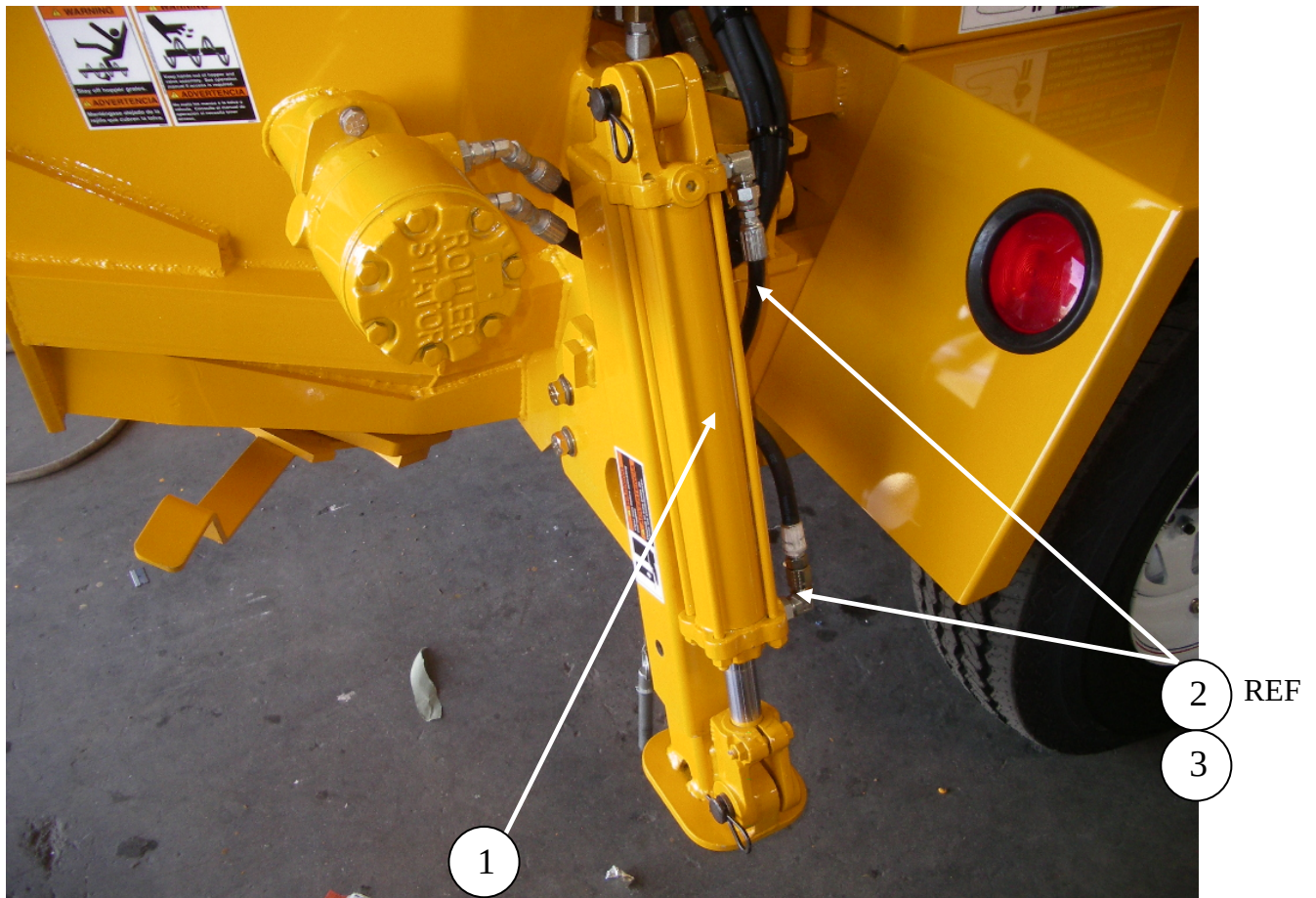
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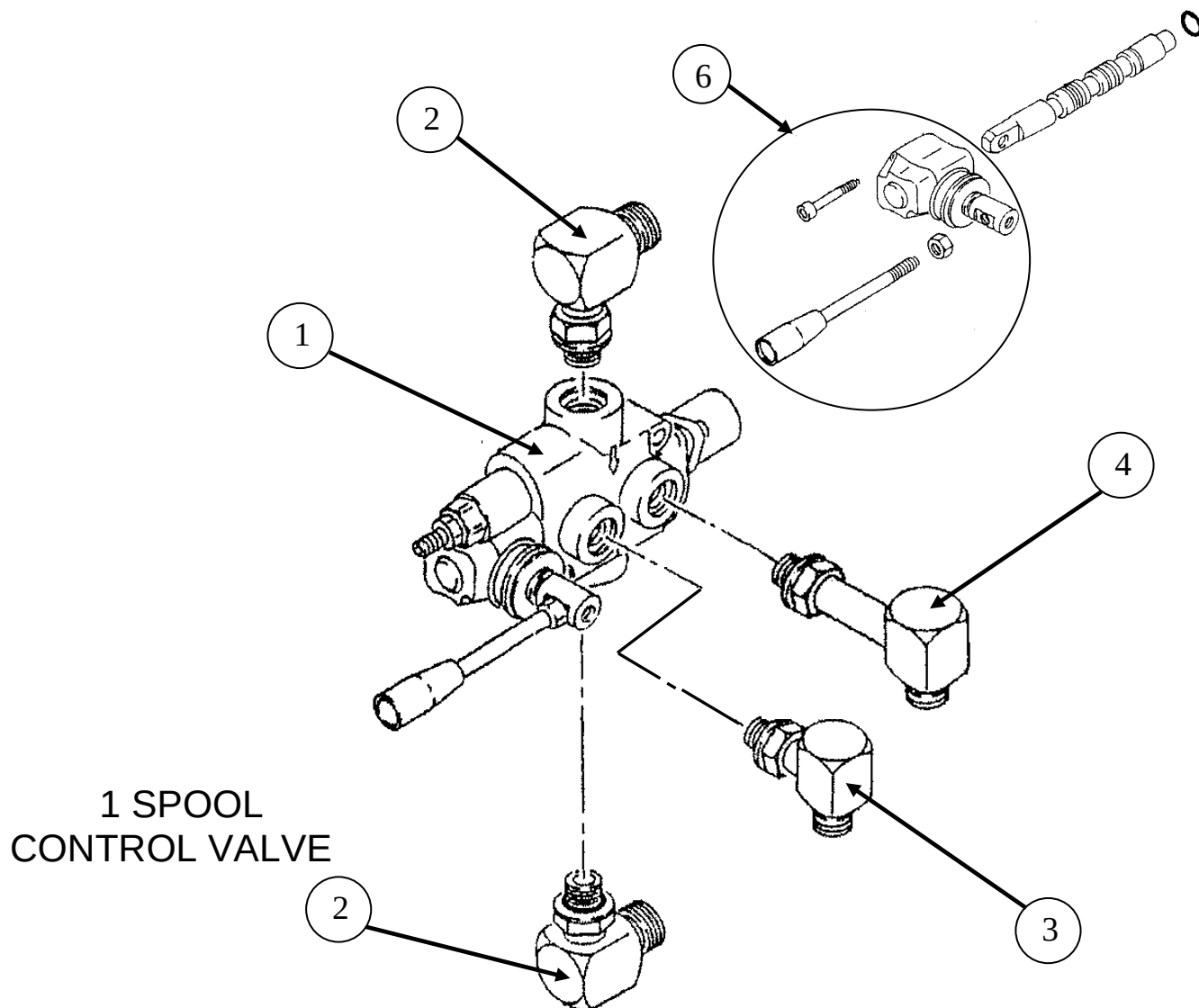
OPTIONS

HYDRAULIC OUTRIGGER CYLINDER



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	86574	HYD CYL – 2.00 BORE X 12.00 STR – PAINTED	2	EA
2	85659-010	HOSE, 4M2T-6FJX-6FJX-33.00	REF	EA
3	86728-008	FITTING, 90° MB-MJ90-8-6	4	EA

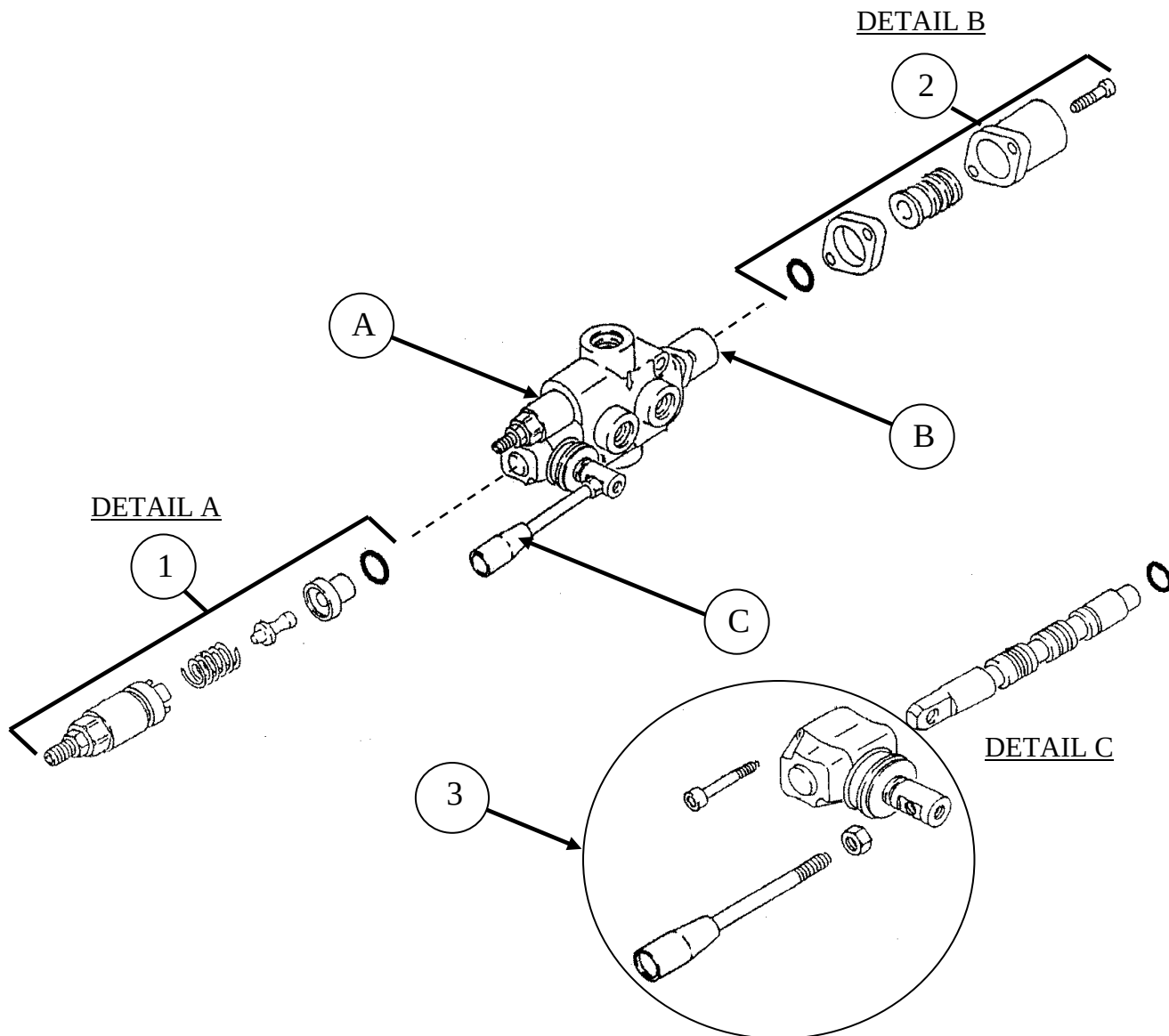
OPTION AGITATOR GROUP



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	74584	VALVE, MAUNAL-1 SPOOL	1	EA
2	86746	FITTING, 90° MB-MJ-90-8-10	2	EA
3	86748	FITTING, 90° MB-MJ90-6-6	1	EA
4	86747	FITTING, 90° MB-MJ90LL-6-6	3	EA
5	74471-B	BOOT, COVER	1	EA
6	74471-020	VALVE ACTUATOR FOR 74471, 74585, 74584 VALVES	A/R	EA

OPTIONS

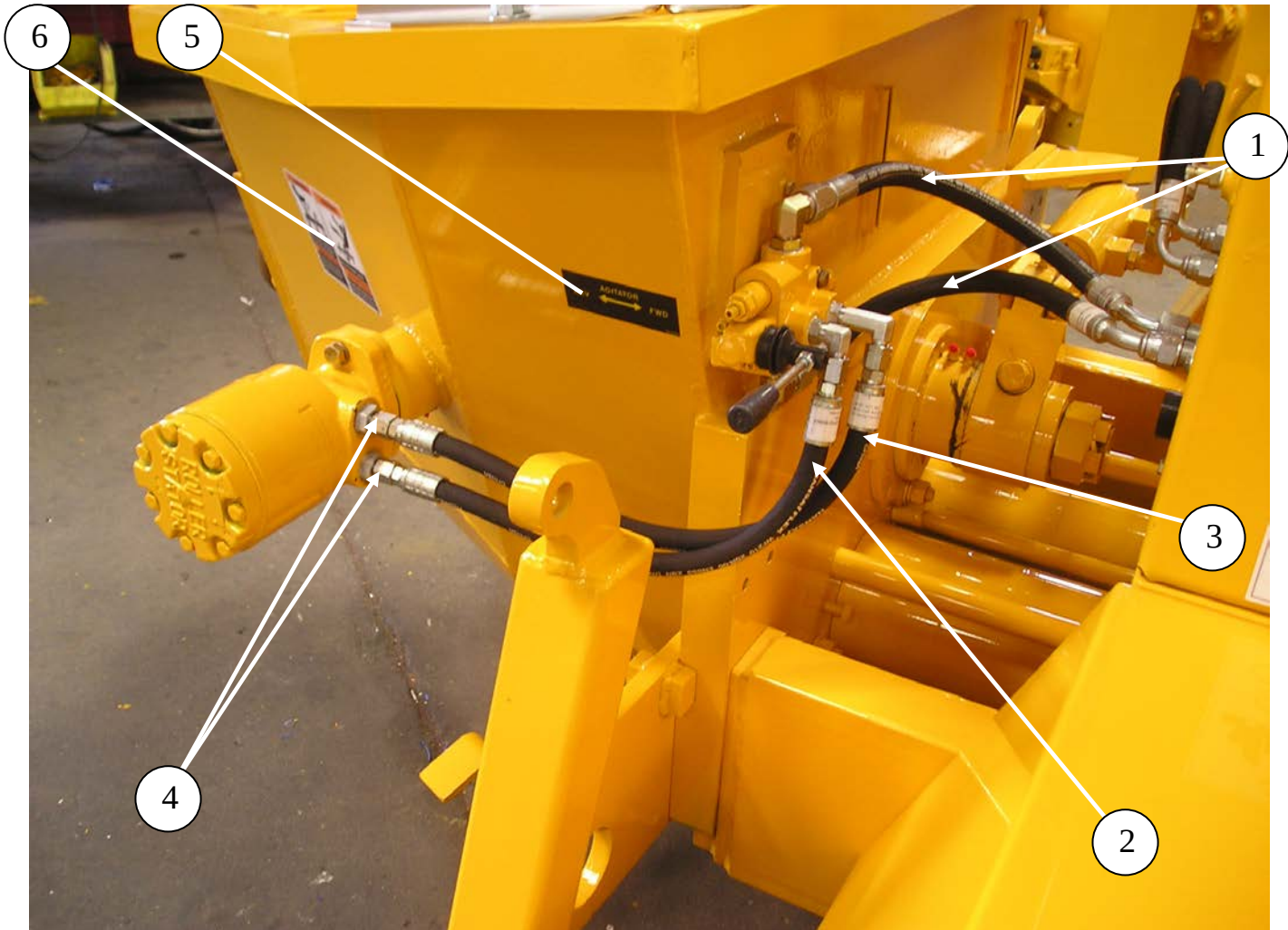
1 SPOOL AGITATOR VALVE



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	85706	RELIEF, CARTRIDGE	1	EA
2	74469	DETENT KIT, #11 WALVOIL VALVE	A/R	EA
3	74471-020	VALVE ACTUATOR FOR 74471, 74585, 74584 VALVES	A/R	EA

OPTIONS

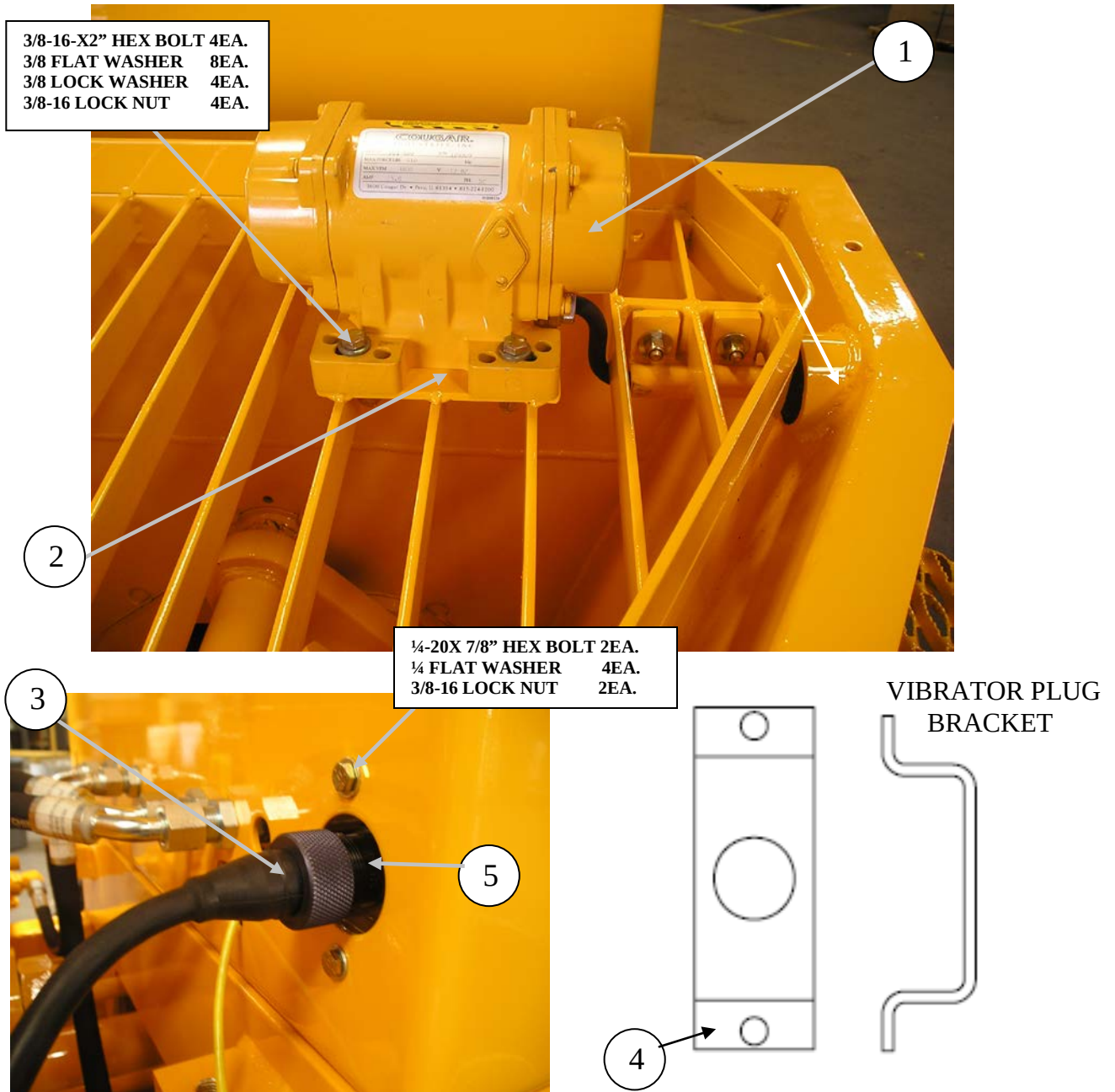
AGITATOR GROUP CONTINUED



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	85657-016	HOSE, 8M2T-10FJX-10FJX45-20.00	2	EA
2	85658-011	HOSE, 6M2T-6FJX-6FJX-21.00	1	EA
3	85658-010	HOSE, 6M2T-6FJX-6FJX-20.00	1	EA
4		FITTING,MB-MJ-10-6	2	EA
5	85845	DECAL, OUTRIGGERS	1	EA
6	800919	DECAL, WARNING, STAND CLEAR	2	EA

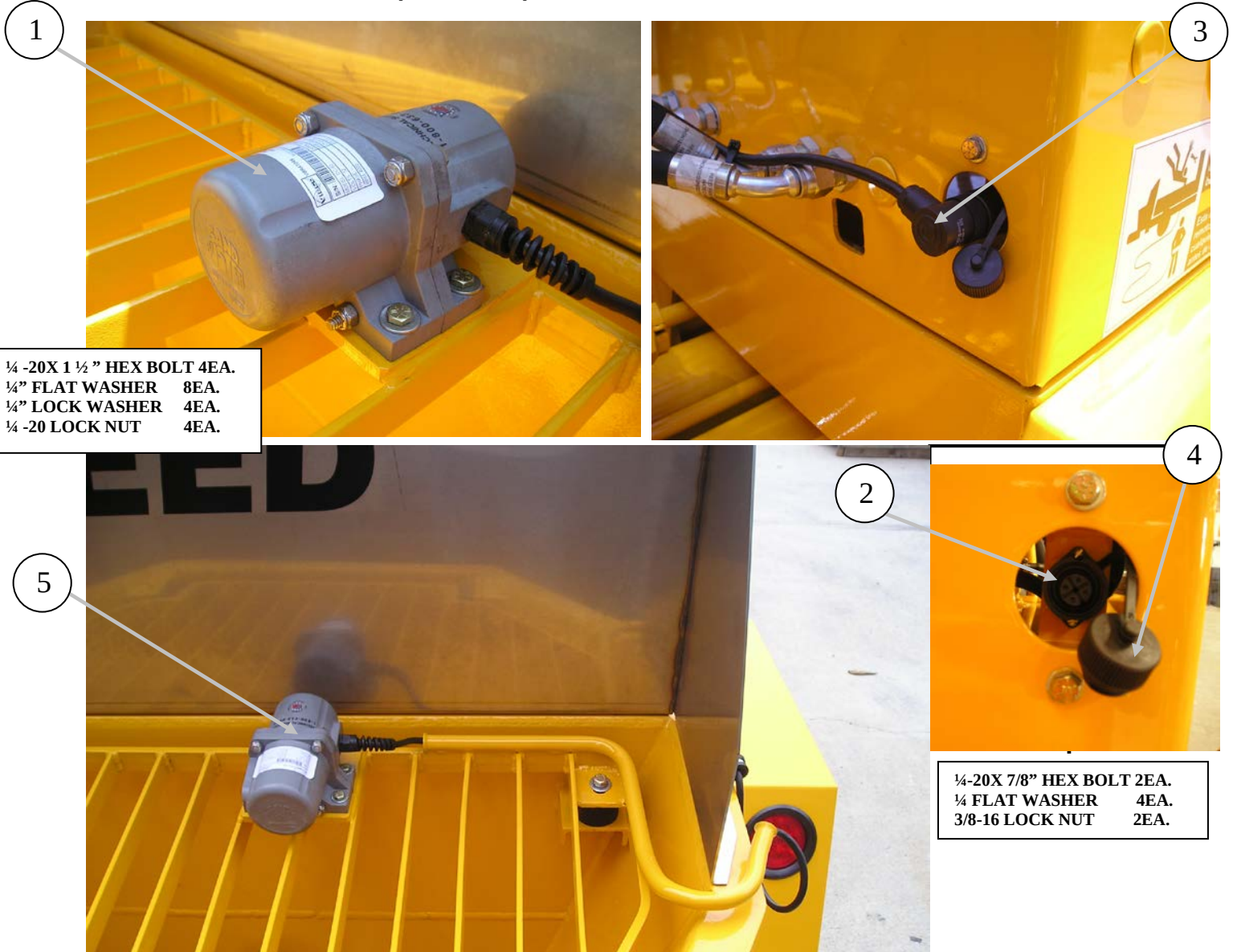
OPTION

VIBRATOR (COUGAR)



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	71429	VIBRATOR, 12VDC ROTARY (COUGAR)	1	EA
2	85893	BRACKET, VIBRATOR	1	EA
3	85898-1	CORD W/PLUG, MALE 14AWG X 8 FT	1	EA
4	87472	BRACKET, VIBRATOR PLUG MOUNT	1	EA
5	85899	VIBRATOR, PLUG	1	EA

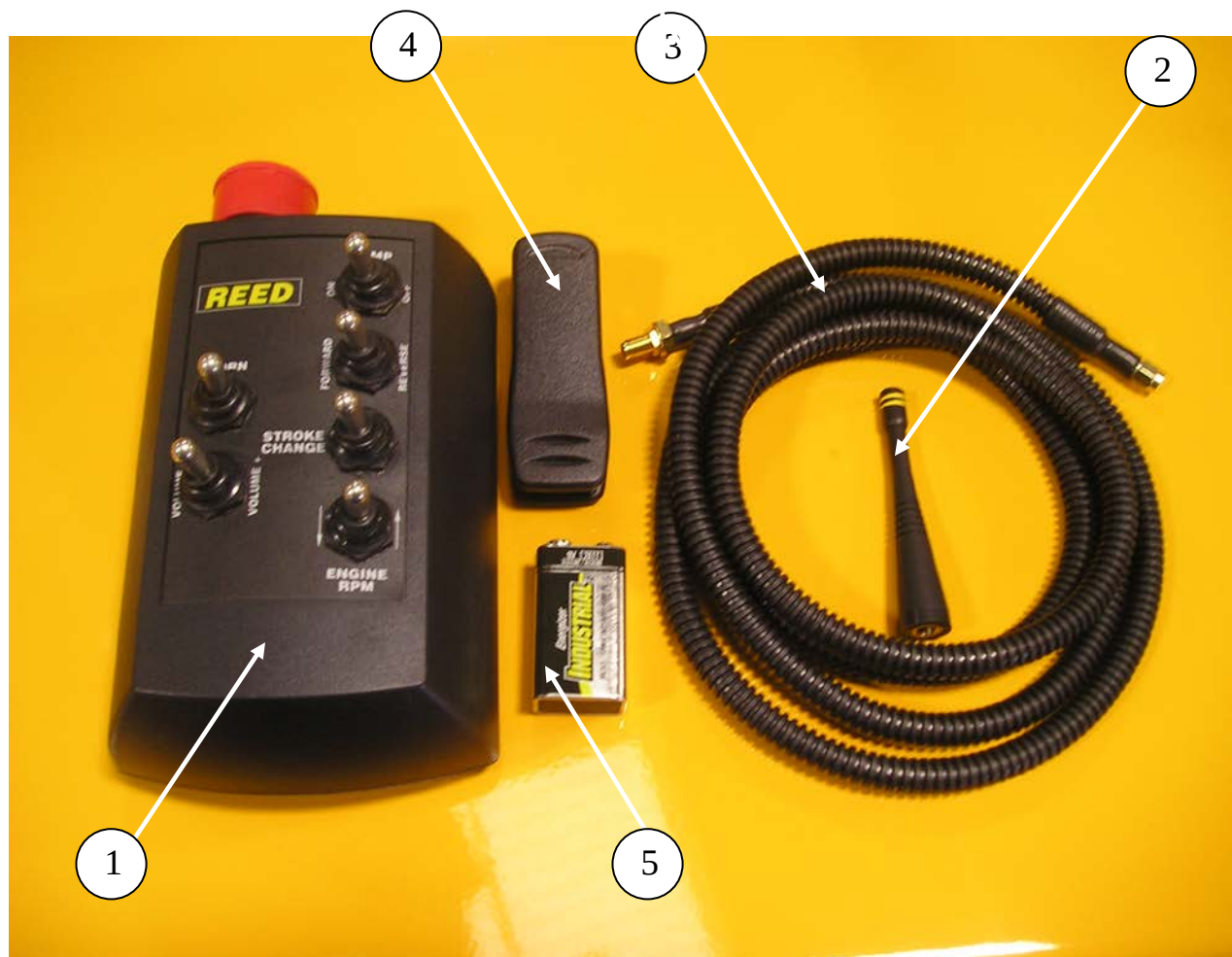
OPTION VIBRATOR (VIBCO)



ID #	PART #	PART DESCRIPTION	QUANTITY	
	88021	VIBRATOR, ASSY, ELECTRIC, 100LB	1	EA
1	87916	VIBRATOR, 12 VDC SMALL	1	EA
2	88024	CONNECTOR, FEMALE	1	EA
3	88023	CONNECTOR, MALE 90°	1	EA
4	88025	CAP, SOCKET FEMALE FOR 88024	1	EA
5	88022	BRACKET, 87916 VIBRATOR MOUNT	1	EA

OPTIONS

RADIO REMOTE KIT (KAR-TECH)



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	87348-1	TRANSMITER, REMOTE CONTROL ASSEMBLY	1	EA
2	BW10285	ANTENA	1	EA
3	BW10285-1	ANTENA CABLE	1	EA
4	87348	CLIP	1	EA
5		9V BATTERY	1	EA

OPTIONS RADIO REMOTE KIT (OMNEX)



NOTE: KIT CONTAINS ALL PARTS SHOWN ABOVE.

ID #	PART #	PART DESCRIPTION	QUANTITY	
	85833-002	OMNEX RADIO REMOTE KIT	1	EA
1		RECEIVER R160	1	EA
2		TRANSMITTER T110C	1	EA
3		CABLE ASSEMBLY R160	1	EA
4		REMOTE STRAPS	2	EA
5		NI-MH RECHARGEABLE BATTERIES	4	EA
6		ANTENNA CABLE	1	EA
7		ANTENNA	1	EA
8		ANTENNA BRACKET	1	EA
9		BATTERY CHARGER DOCK	1	EA



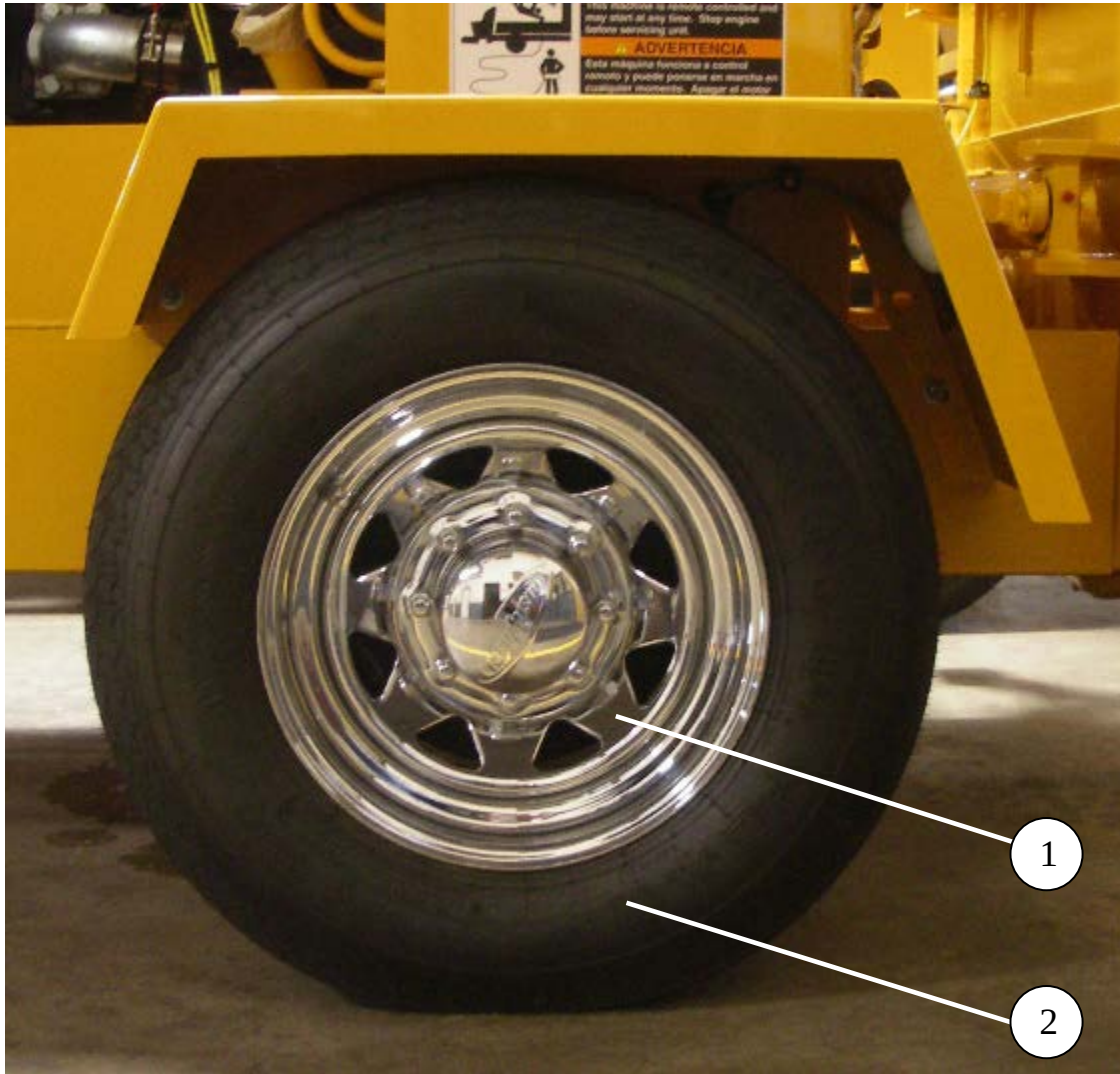
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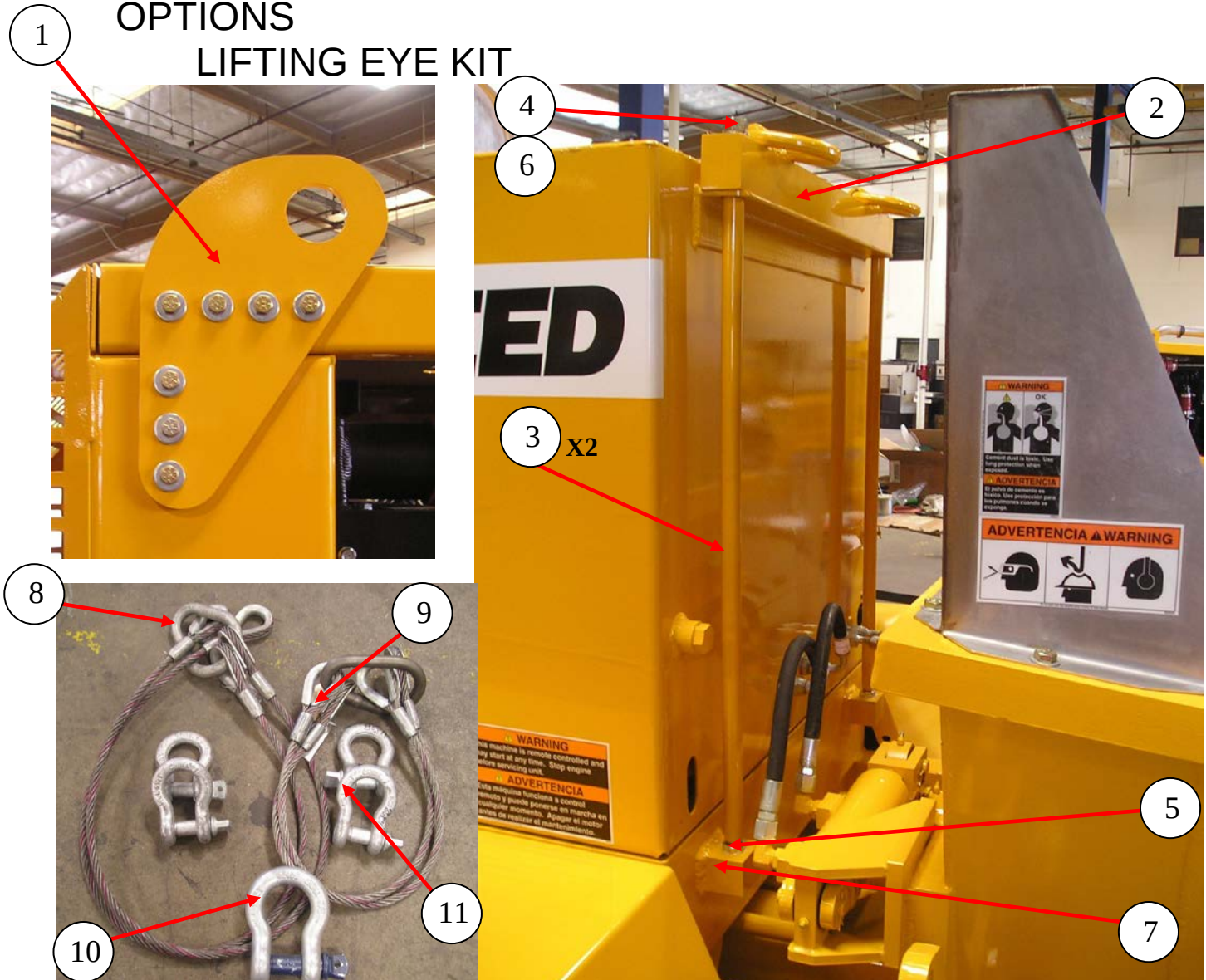
OPTIONS

CHROME WHEEL AND TIRE



ID #	PART #	PART DESCRIPTION	QUANTITY	
	86059	TIRE & WHEEL-CHROME ASSEMBLY	2	EA
1		WHEEL-CHROME	2	EA
2		TIRE-215/75R17.5H	2	EA

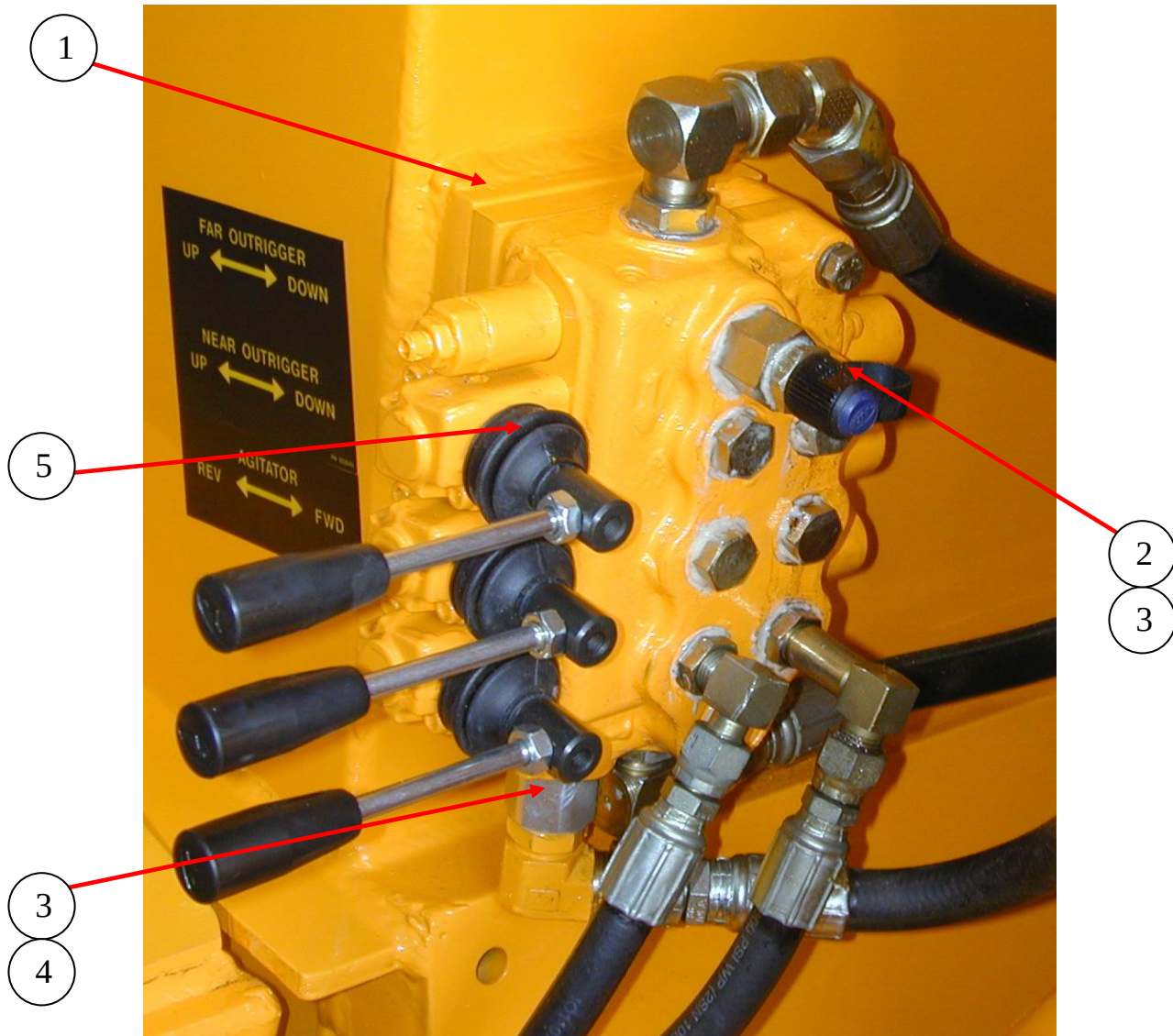
OPTIONS LIFTING EYE KIT



ID #	PART #	PART DESCRIPTION	QUANTITY	
	87859	LIFTING EYE ASSEMBLY B SERIES	REF	
1	87594	GUSSET ENGINE COVER PAINTED	2	EA
2	86799	LIFTING BAR, WELDMENT-REAR	1	EA
3	86762	LIFTING TIE ROD	2	EA
4	80008	HEX NUT 3/4-10UNC GR 8 ZINC	2	EA
5	80009	HEX JAMNUT 3/4-10UNC GR 8 ZINC	2	EA
6	80010	LOCKWASHER- 3/4-STL ZINC	2	EA
7	85823	BLOCK, TRALIER LIFTING	2	EA
8	86776	LIFT CABLE, FRONT	1	EA
9	86777	LIFT CABLE, REAR	1	EA
10	86778	SHACKLE, ANCHOR W/SCREW PIN	1	EA
11	86811	SHACKLE, ANCHOR W/SCREW PIN	4	EA

OPTIONS

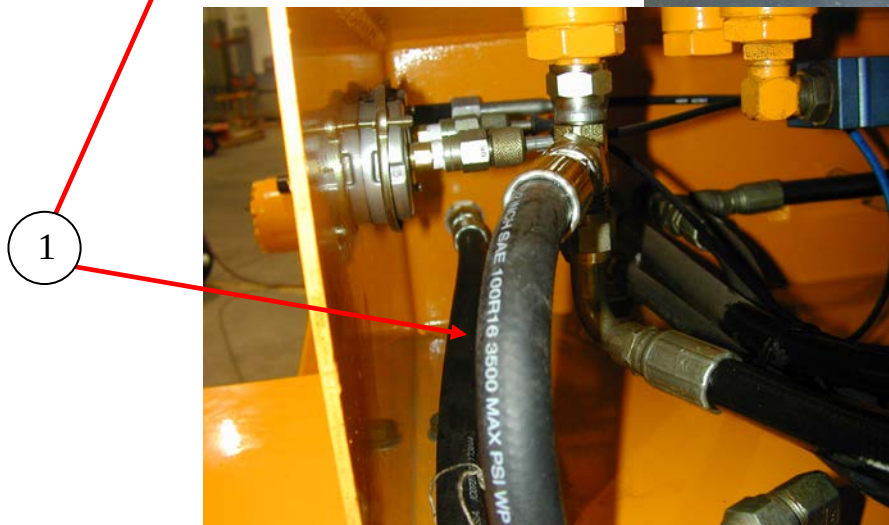
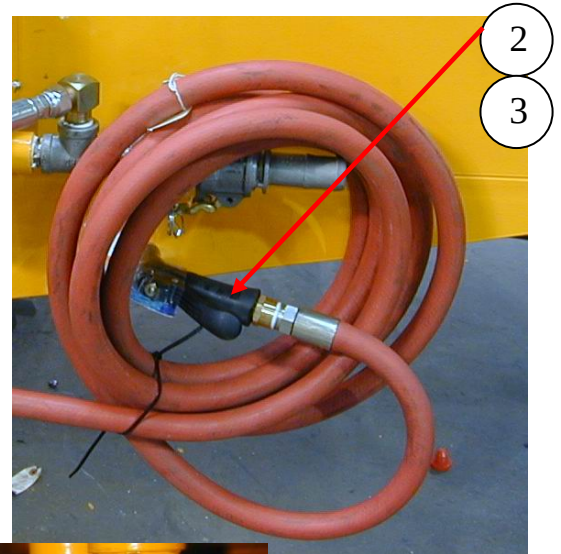
WATER PUMP



ID #	PART #	PART DESCRIPTION	QUANTITY	
	86720	WASH PUMP INSTALLATION, B-SERIES	REF	EA
1	86692	SPACER, AGITATOR VALVE	1	EA
2	86384	POWER BEYOND SLEEVE	1	EA
3	86746	FITTING, 90° MB-MJ-90-8-10	1	EA
4	85657-021	HOSE, 8M2T-10FJX-10FJX45-12.25	1	EA
5	74471-B	BOOT, COVER	3	EA

OPTIONS

WATER PUMP CONTINUED



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	85657-023	HOSE, 8M2T-10FJX-10FJX45-52.00	2	EA
2	86267	WATER HOSE, 12 ENCONO-12FXP-12MP-20FT	1	EA
3	800098	NOZZLE, GARDEN HOSE	1	EA

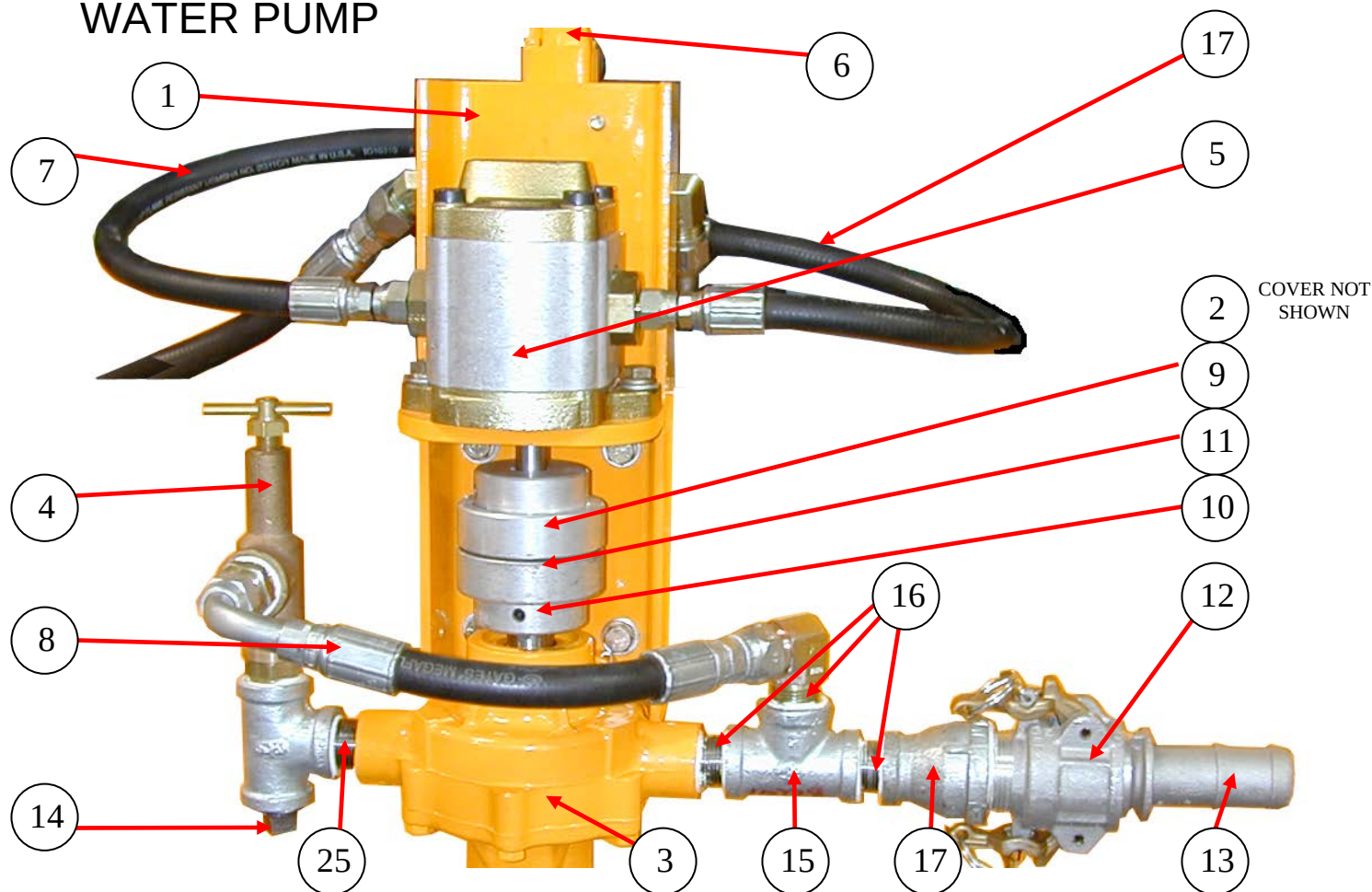


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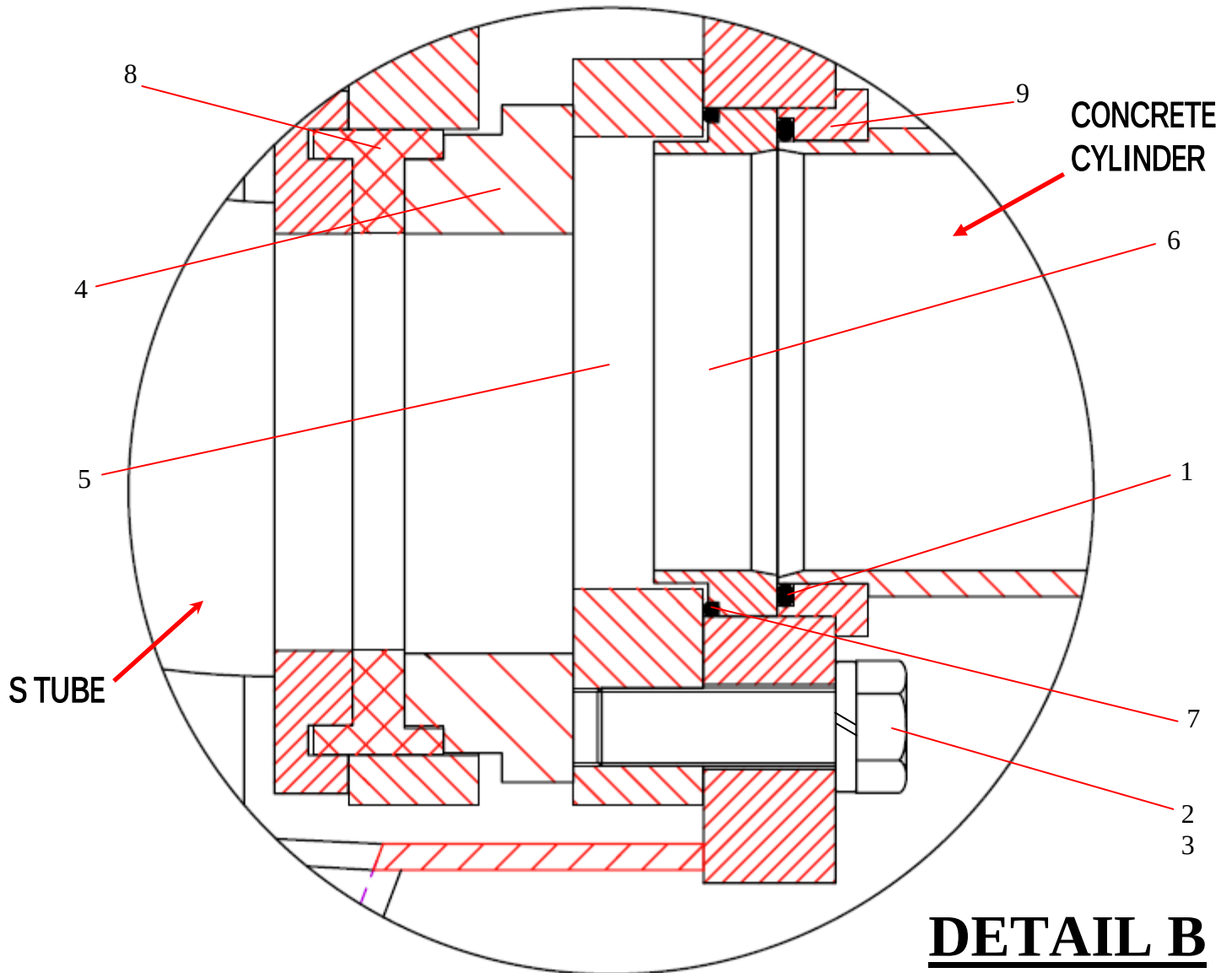
WATER PUMP



ID #	PART #	PART DESCRIPTION	QUANTITY	
	86200	WASH PUMP ASSY		EA
1	86196	WASH PUMP BASE WLDMNT	1	EA
2	86199	COVER, WASH PUMP	1	EA
3	78157	WASHPUMP-HYPRO	1	EA
4	78128	VALVE-P/RELIEF 3/4	1	EA
5	78152	MOTOR-HYD. WASH PUMP	1	EA
6	86397	VALVE-MANUAL-1 SPOOL-3 WAY	1	EA
7	85658-002	HOSE, 6M2T-6FJX-17.00	2	EA
8	85657-022	HOSE, 8M2T-10FJX-10FJX90S-11.25	1	EA
9	78153	COUPLING FOR WASH PUMP-MOTOR	1	EA
10	78154	COUPLING FOR WASH PUMP	1	EA
11	78155	SPIDER, FOR WASH PUMP	1	EA
12	10948	COUPLING-CAM/GROOVE 1.25" FEM. X MPT	1	EA
13	10947	COUPLING-CAM/GROOVE 1.25" FEM. X MPT	1	EA
14	800371	FITTING, GARDEN HOSE	1	EA
15	10228	TEE, 3/4"	2	EA
16	40047	NIPPLE-CLOSE PIPE 3/4"	4	EA
17	86398	BELL REDUCER-3/4 X 1 1/4	1	EA

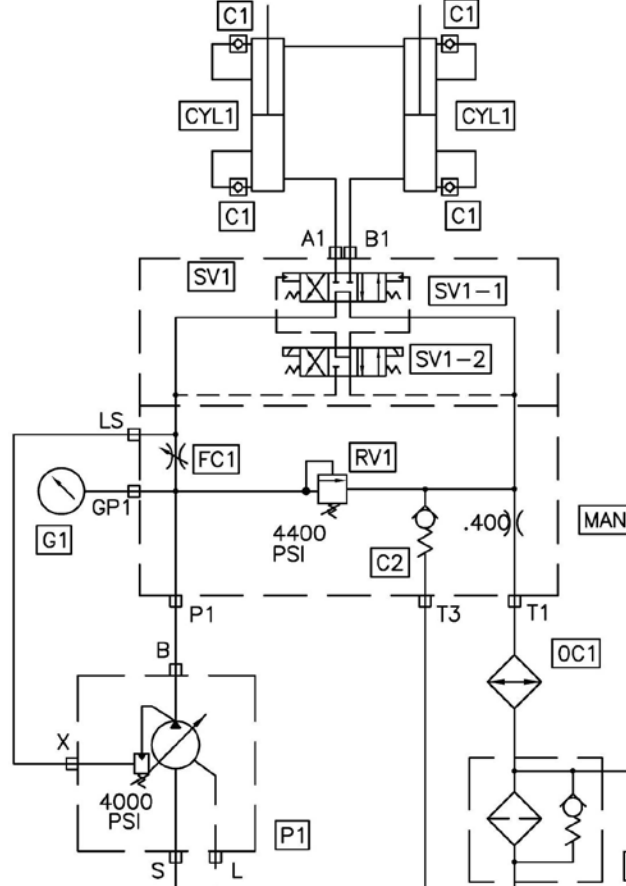
OPTIONS

CARBIDE WEAR PARTS



ID #	PART #	PART DESCRIPTION	QUANTITY	
1	71249	O-RING, #347 BUENA 70	2	EA
2		FHCS, 3/4 - 10X 3 1/2" GR 8	4	EA
3		LOCK WASHER, 3/4"	4	EA
4	72384-1	WEAR RING, 4" DOUBLE LIP, CARBIDE	1	EA
5	71251-1	WEAR PLATE-CARBIDE 4"	1	EA
6	71254	ANTI CHIP RING, 4"	2	EA
7	71247	O-RING FOR CHIP RING	2	EA
8	72285	SEAL, DOUBLE LIP 4"	1	EA
9	71257	CONC, CYL. ADAPTER	2	EA

HYDRAULIC AND ELECTRICAL SCHEMATICS

B SERIES DRIVE CYLINDER CIRCUIT HYDRAULIC SCHEMATIC																																																																																										
DATE	12/3/01																																																																																									
PART NO.	86708																																																																																									
REV.	B																																																																																									
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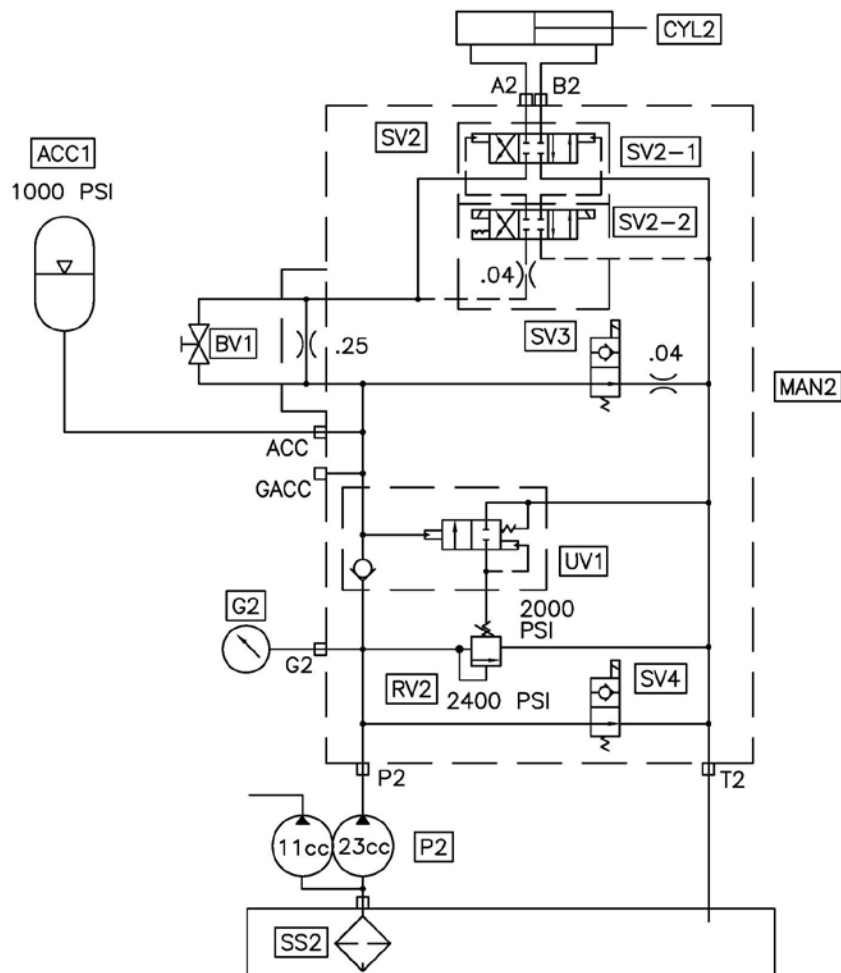
B50/60/70 SERIES SWING TUBE HYDRAULIC
SCHEMATIC, SINGLE SHIFT CYLINDER

DATE
11/7/01

REV.
B

PART NO.
86705

REED



CODE	DESCRIPTION	PART NO.	QTY.
P2	Gear Pump	87571-1	1
CYL2	S Tube Single Shift Cylinder	86221	1
	Seal Kit, GRATE BEND or TEXAS	86221-SK??	1
MAN2	Manifold S Tube Circuit	85249	1
SV2	Solenoid Valve S Tube Circuit	85693	1
SV2-1	Valve Main	85694	1
	Seal Kit	74994	1
SV2-2	Solenoid Valve Pilot	85695	1
	Seal Kit	72313	1
	Coil For SV2-2	85692	2
SV3	Solenoid Valve Cartridge	87246	1
	Coil For SV3	87247	1
SV4	Solenoid Valve Cartridge	87248	1
	Coil For SV4	87249	1
RV2	Relife Valve Cartridge	85703	1
	Seal Kit For Relife Valve	85703SK	1
UN1	Unloading Valve Cartridge	85704	1
	Seal Kit For Unloder Valve	85704SK	1
BV1	Ball Valve	85705	1
AAC1	Accumulator	74515	1
	Accumulator, Bladder	74516	1
	Seal Kit Accumulator, Bladder	85812	1
G2	Pressure Gauge 3000 PSI	70366	1
SS2	Magnetic Suction Strainer 1 1/4"	79247	1

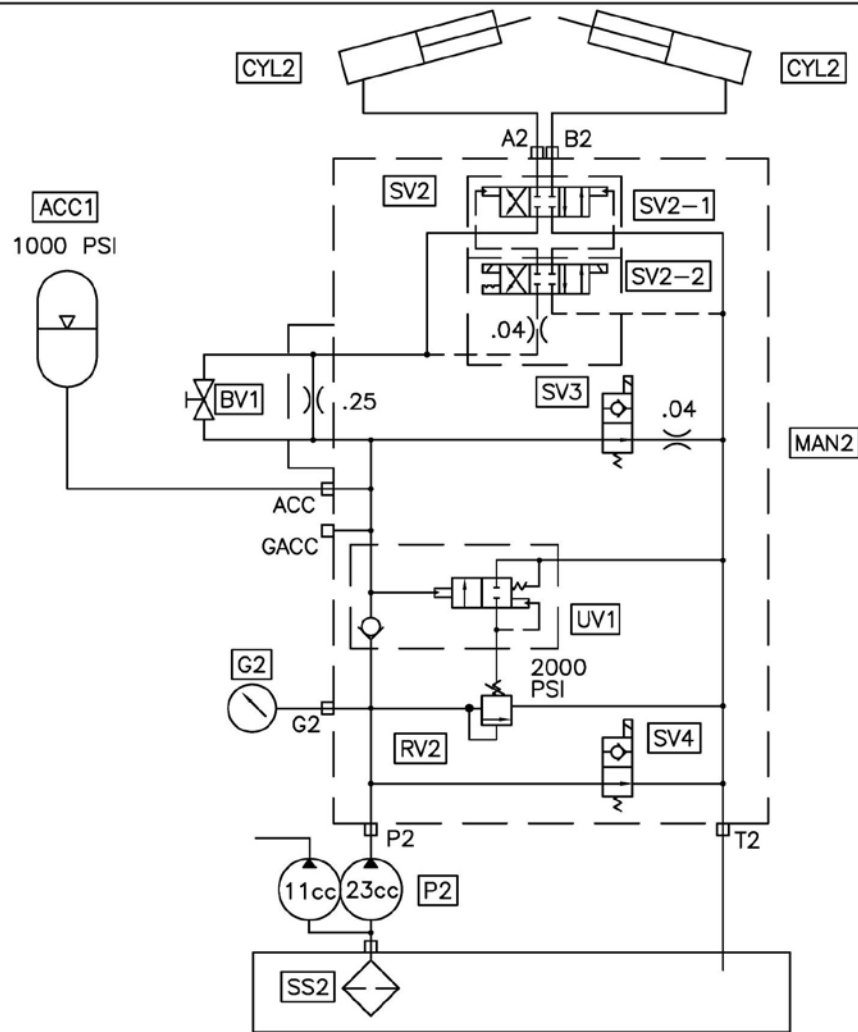
B SERIES SWING TUBE HYDRAULIC SCHEMATIC, DUAL SHIFT CYLINDER

DATE
11/7/01

REV.
B

PART NO.
86706

REED



CODE	DESCRIPTION	PART NO.	QTY.
P2	Gear Pump		1
CYL2	S Tube Single Shift Cylinder	86220	2
	Seal Kit	86220-SKTX	1
MAN2	Manifold S Tube Circuit	85249	1
SV2	Solenoid Valve S Tube Circuit	85693	1
SV2-1	Valve Main	85694	1
	Seal Kit	74994	1
SV2-2	Solenoid Valve Pilot	85695	1
	Seal Kit	72313	1
	Coil For SV2-2	85692	2
SV3	Solenoid Valve Cartridge	87246	1
	Coil For SV3	87247	1
SV4	Solenoid Valve Cartridge	87248	1
	Coil For SV4	87249	1
RV2	Relife Valve Cartrige	85703	1
UN1	Unlodng Valve Cartrige	85704	1
BV1	Ball Valve	85705	1
AAC1	Accumulator	74515	1
	Accumulator, Bladder	74516	1
	Seal Kit Accumulator, Bladder	85812	1
G2	Pressure Gauge 3000 PSI	70366	1
SS2	Magnetic Suction Strainer 1 1/4"	79247	1

REV B-5/7/2009

CODE	DESCRIPTION	PART NO.	QTY.
P2	Gear Pump		
CYL3	Hydraulic Outtrigger Cylinder	86574	2
DV1	Directional Valve Agitator/Outtrigger	74471	1
RV3	Relife Valve Cartridge	85706	1
M1	Agitator Motor	85811	1
	Seal Kit For 85811 Motor	85811SK	1
SV5	Solenoid Valve	87154	1
	Coil For SV5	87155	1
	Cartridge For SV5	87155-C	1
SS2	Magnetic Suction Strainer 1 1/4"	79247	1
	REV B-5/7/2009		

REED

PART NO.
86533

REV.
B

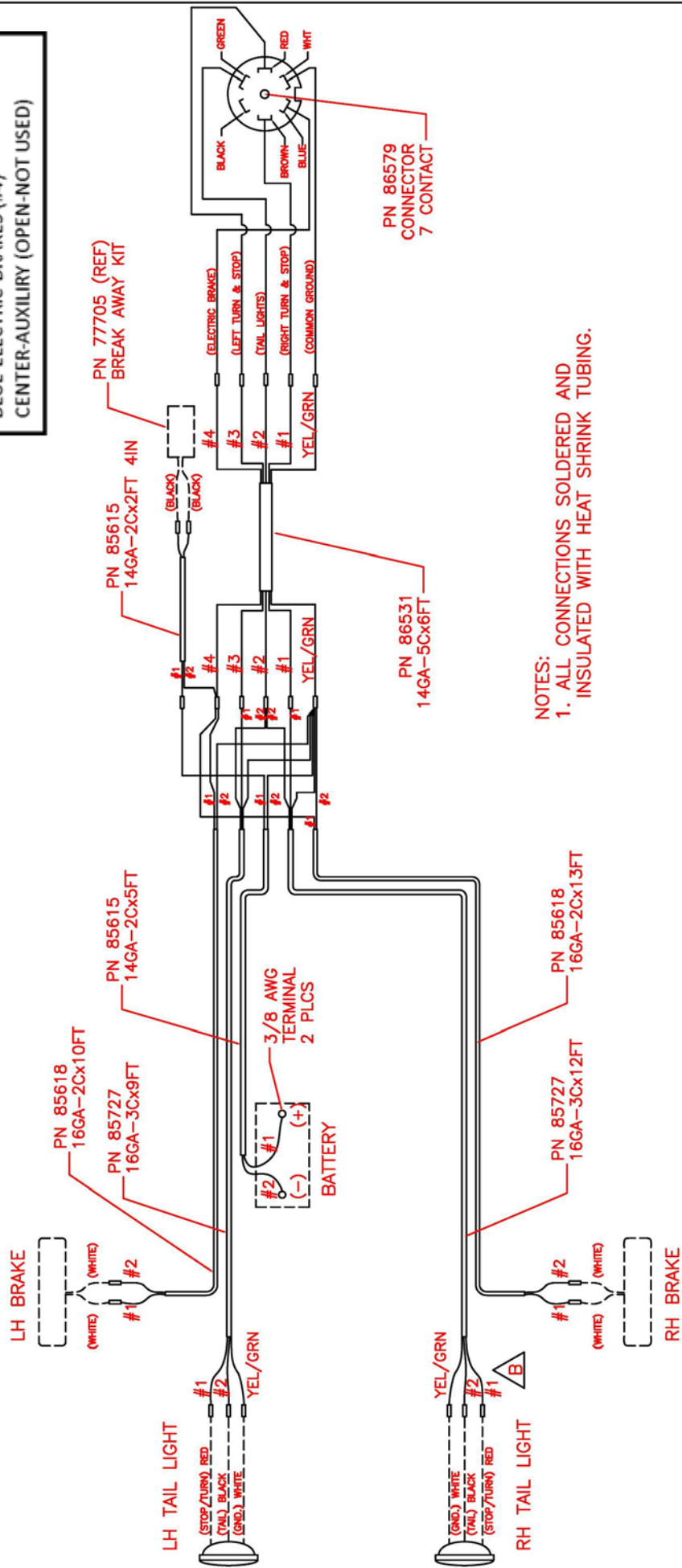
DATE
5/22/01

B SERIES

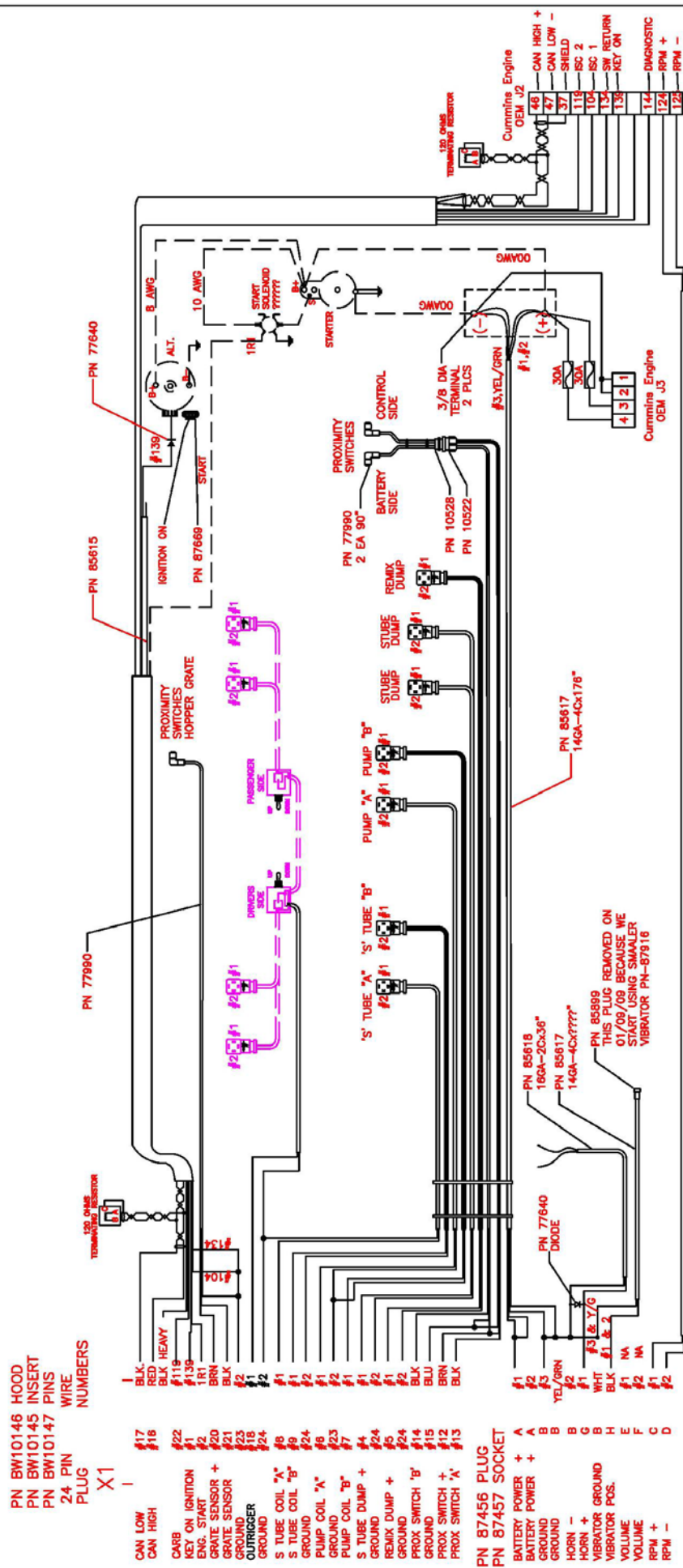
TRAILER HARNESS

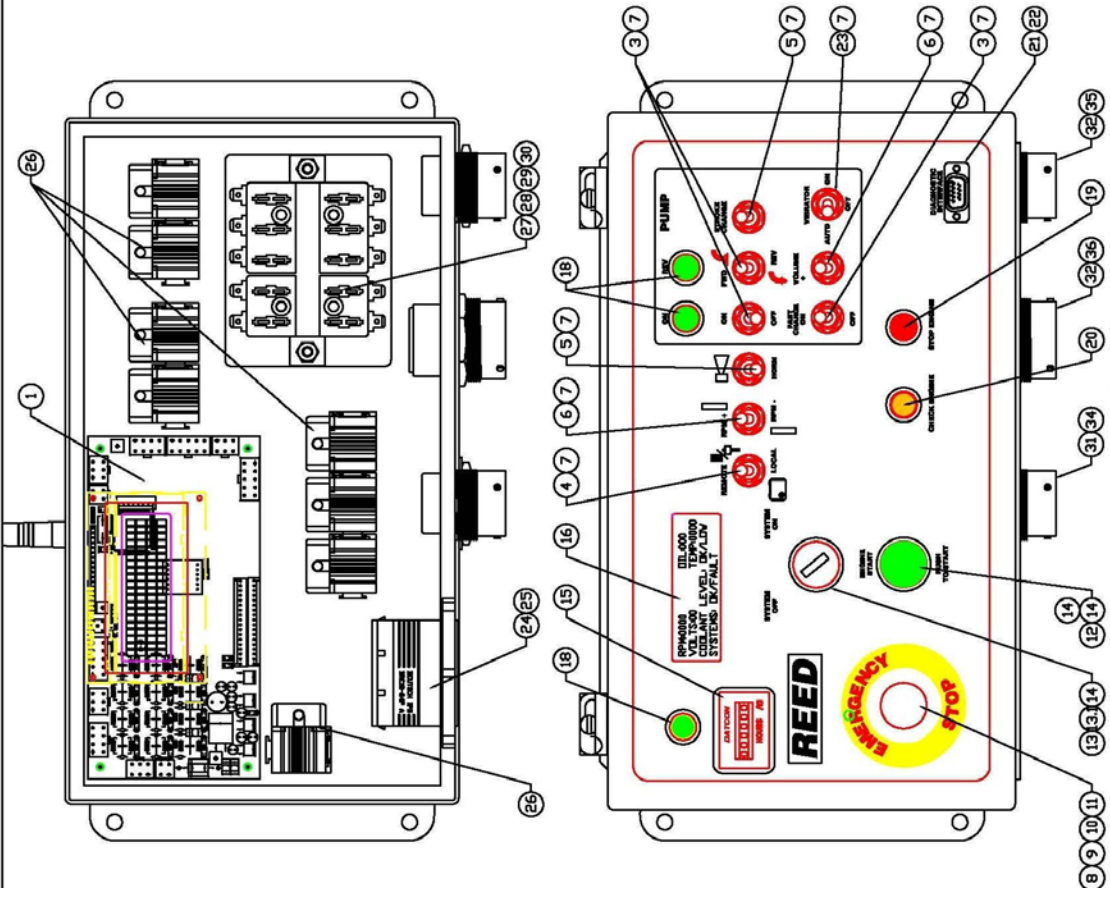
REED 7-PIN CONNECTOR KEY

WHITE- GROUND (YELLOW-GREEN)
RED- LEFT TURN & STOP (#3)
GREEN-TAIL LIGHTS (#2)
BLACK (OPEN-NOT USED)
BROWN-RIGHT TURN &STOP (#1)
BLUE-ELECTRIC BRAKES (#4)
CENTER-AUXILIARY (OPEN-NOT USED)



B SERIES WIRING HARNESS
ELECTRIC CYCLING





ITEM	QTY	REED #	DESCRIPTION
1	1	87346-BOARD	LOWER CONTROLLER BOARD
3	3	BW10207	SW. TOGGLE SPST. ON-OFF
4	1	BW10223	SW. TOGGLE SPDT. ON-ON
5	2	BW10206	SW. TOGGLE SPST. (ON)-OFF
6	2	BW10205	SW. TOGGLE SPDT. (ON)-OFF-(ON)
7	9	BW10361	SW. SEALING BOOT
8	1	BW10208	MUSHROOM HEAD MAINTAINED BUTTON
9	1	BW10356	E-STOP LIGHT (POWER SUPPLY)
10	1	BW10357	NC CONTACT BLOCK
11	1	BW10359	LGT. WL-41047 MINI BYNT RED 15
12	1	BW10355	SW. PB GRN FLUSH
13	1	BW10354	SW 90 DEG KEYSWITCH BLK WITH KEY
13.1	1	BW10204-1	KEY, FOR BW10354
14	3	88017	SW. CONTACT BLK N.O.
15	1	BW10212	MINI HOURMETER
16	1		DISPLAY, LCD, 20C X 4L, W/BACKLIT
17	16	87608	CON. 12-14GA SOCKET
18	3	BW10369	LED, PILOT LIGHT, GREEN
19	1	BW10370	LED, PILOT LIGHT, RED
20	1	BW10371	LED, PILOT LIGHT, AMBER
21	1		CONN. DB9, MALE
22	1		CONN. DB9 COVER
23	1	87952	SW. TOGGLE DPDT. ON-OFF
24	1	BW10217	CON. DRC12-24PA
25	1	BW10220	CON. DRC24-GKT GASKET
26	8	87970	RELAY, 40V 0.25 CONNECTOR
27	1	800448	FUSE, 257020 LIT. 20A ATO
28	3	800449	FUSE, 257010 LIT. 10A ATO
29	3	800447	FUSE, 257025 LIT. 25A ATO
30	1	90381	FUSE, 257015 LIT. 15A ATO
31	8	87607	CON. DEUTSCH PINS
32	41	BW10221	CON. DEUTSCH PINS
33	1		CON. 10-11-2163, 16 PIN
34	1		CON. HD34-18-06PN
35	1		CON. HD34-18-14PN
36	1		CON. HD34-24-16SN
37	1	BW10285	ANTENNA, 900MHZ
38	1		CBL. ANTENNA 6' CABLE
39	1		DECAL, CONTROL COVER

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.

TOLERANCES:
XX .030
XXX .010
FRACTION 1/32
ANGLE 1/2°

DRAWN
DATE
BY

APPROVED
DATE
BY

REED

CONCRETE PLACING EQUIPMENT

CHIND, CA 91710

TITLE

PARTS LIST FOR 87346-2 BOX

MATERIAL 87346-2

PART NUMBER
87346-2

REV
87346-2

REV

DATE

DESCRIPTION OF CHANGE

BY

REVISIONS

THIS DRAWING IS THE PROPERTY OF REED MANUFACTURING AND IS LOANED WITHOUT CONSIDERATION OTHER THAN THE BORROWER'S AGREEMENT THAT IT SHALL NOT BE REPRODUCED, COPIED, LOANED, OR DISPOSED OF, DIRECTLY OR INDIRECTLY, NOR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS SPECIFICALLY FURNISHED.

SHEET 1 OF 1

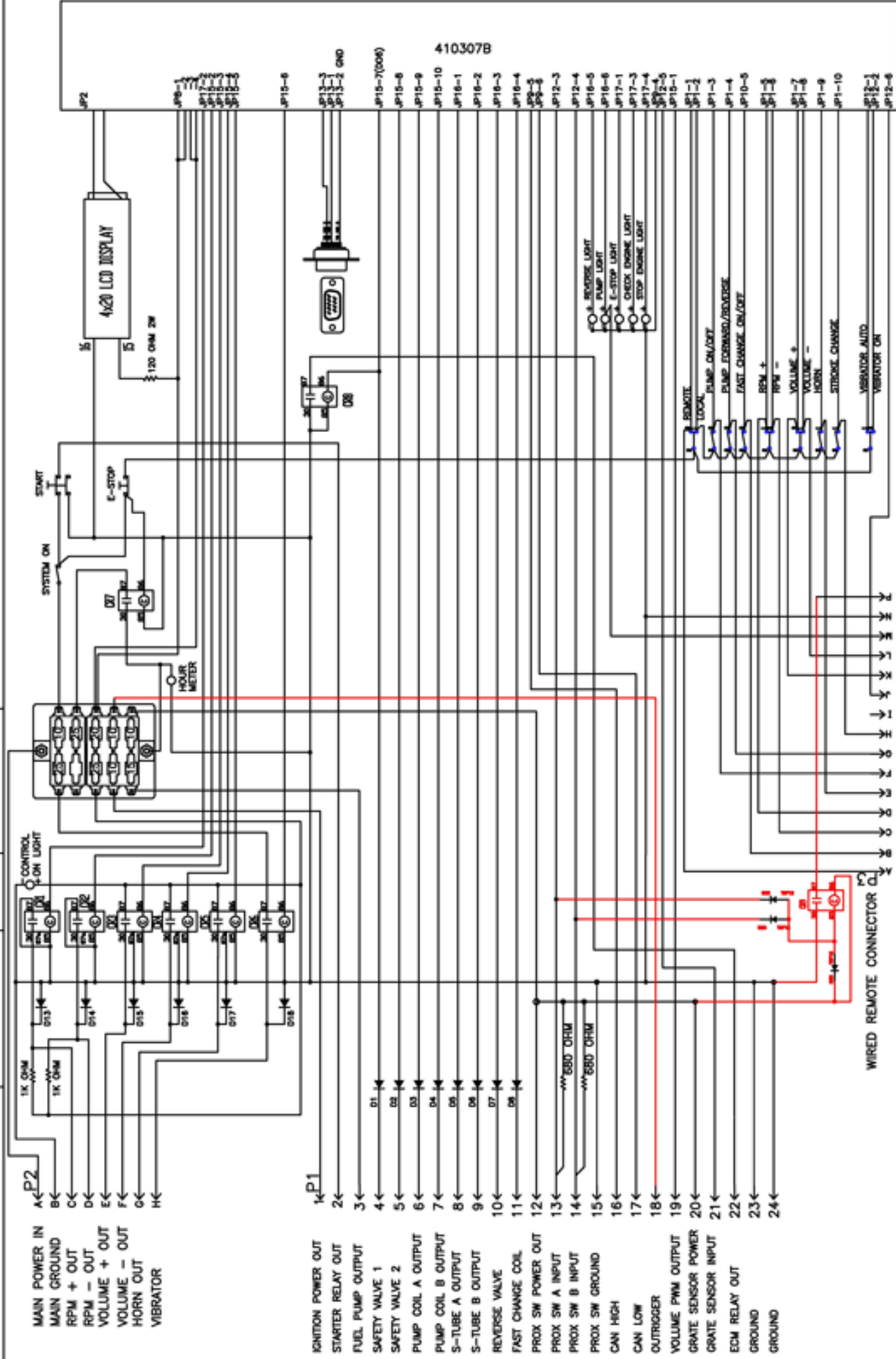
REED

PART NO.
87346-2

REV.
G

DATE
5/22/07

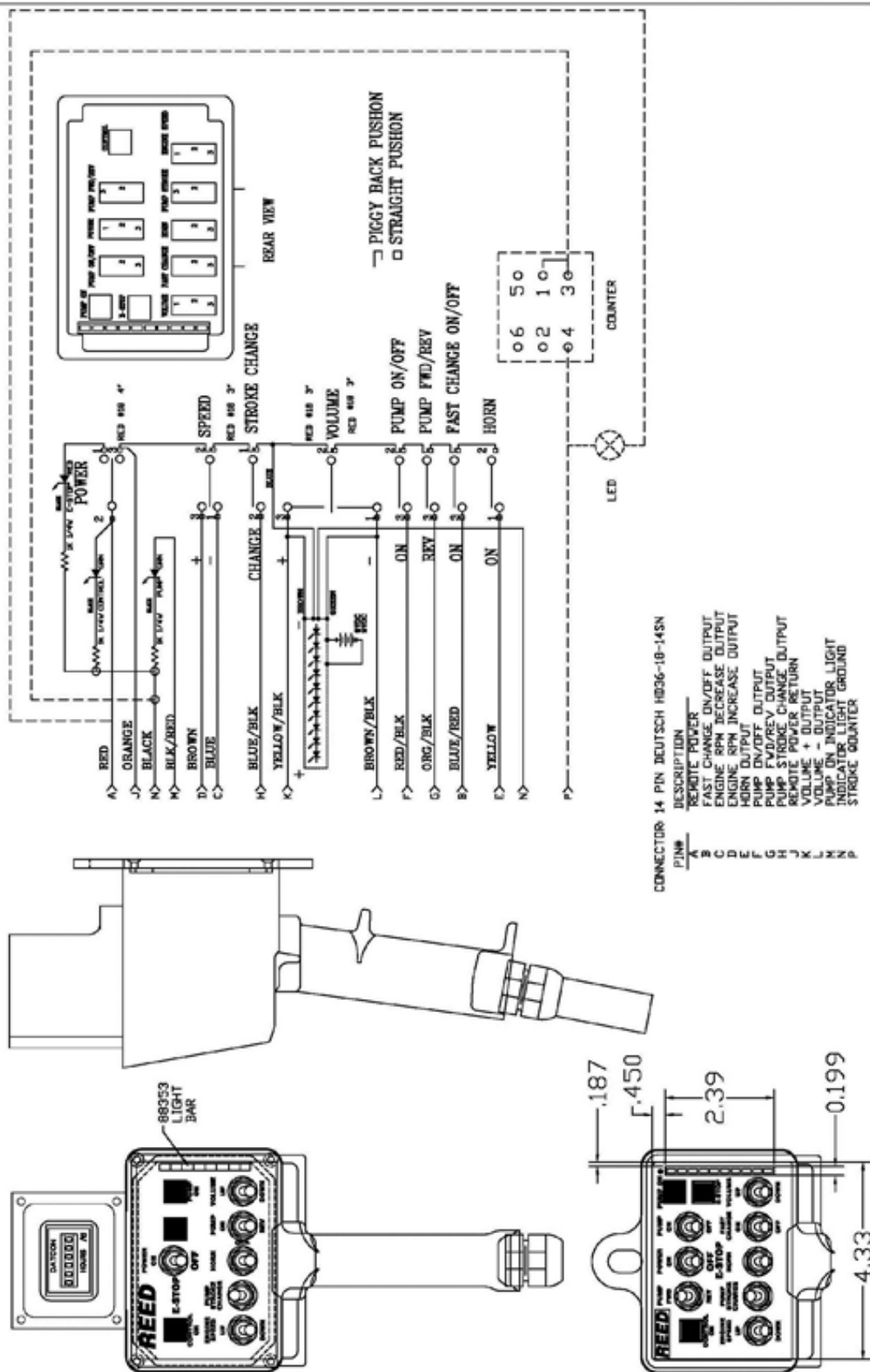
MAIN CONTROL BOX
TECHNICAL DATA



PENDANT CONTROL BOX WITH STROKE COUNTER	B & C SER
WIGHT BAR 50 FT	B & C SER
PAGE 1 of 1	

DRAWING NO.	REV	DATE
87752-4		8/18/00

PAGE 1 of 1



Cummins Error Codes **Code & descriptions**

- EC01** – No radio link (no signal from either radio or cable)
- EC02** – J1939 CAN link error
- EC03** – RPM Plus
- EC04** – RPM Minus
- EC05** – Volume Plus
- EC06** – Volume Minus
- EC07** – Horn
- EC08** – Vibrator
- EC09** – Safety Valve 1
- EC10** – Safety Valve 2
- EC11** – Pump Coil A
- EC12** – Pump Coil B
- EC13** – S Tube A
- EC14** – S Tube B
- EC15** – Reverse Coil Output – enabled when calibration checkbox for Reverse Logic Change is unchecked.
- EC16** – Fast Change – enabled when the calibration checkbox for Fast Change is checked.
- EC17** – Reverse Light out Error
- EC18** – Pump Light Out Error
- EC19** – Check Engine Light
- EC20** – Stop Engine Light
- EC21** – Volume PWM Output Error
- EC22** – Prox A&B Error
- EC23** – Wrong ID
- EC24** – Engine RPM Overspeed
- EC25** – Oil Low Pressure
- EC26** – Coolant Over Temp.
- EC27** – Low Batt. Voltage
- EC28** – High Batt. Voltage
- EC29** – Denison Fast Change
- EC30** – Denison A (only on C series with Denison Hydraulic pumps)
- EC31** – Denison B (only on C series with Denison Hydraulic pumps)

RADIO REMOTE PROGRAMING INSTRUCTIONS

START HERE

TRANSMITTER RF. I.D TEACH PRODUCE

STEP 1

TURN OFF RADIO FIRST BY PUSHING AND HOLDING THE POWER BUTTON ON THE TOP OF THE TRANSMITTER.

NOTE: IF THE TRANSMITTER IS STILL ON THE GREEN LED WILL LIGHT WHEN ANY SWITCH OTHER THAN THE POWER BUTTON IS PRESSED.

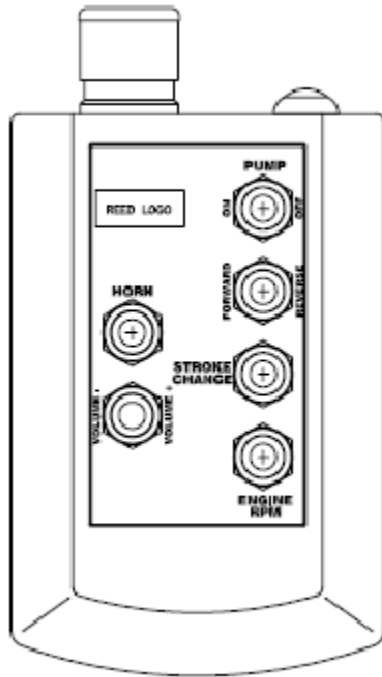
STEP 2

PRESS AND HOLD PUMP ON, RPM+, STROKE CHANGE, AND REVERSE SIMULATANEOSLY. WHILE HOLDING THESE FOUR SWITCHES, TURN THE RADIO ON BY PRESSING THE POWER BUTTON.

THEN RELEASE ALL SWITCH

RETURN PUMP ON/OFF SWITCH TO OFF AND FWD/REV SWITCH TO FORWARD.

THE RED AND GREEN LED'S SHOULD FLASH ALTERNATLY.



TRANSMITTER

CONTROL BOX SET-UP

STEP 3

TURN ON IGNITION KEY

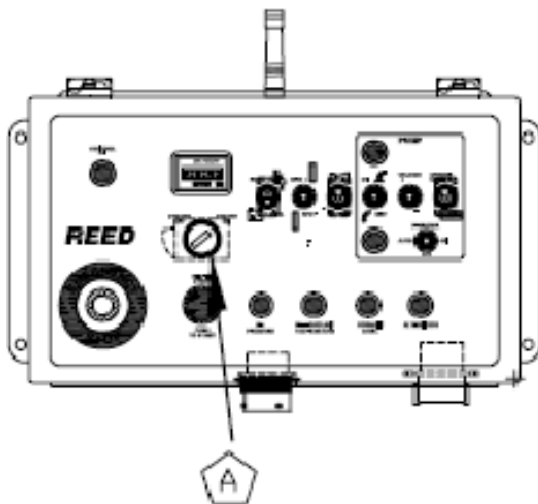
NOTE: ENGINE DOES NOT NEED TO BE STARTED

STEP 4

THE TWO LED'S ON THE TRANSMITTER WILL STOP ALTERNATELY FLASHING. WILL COME ON STEADY TOGETHER FOR A FEW SECONDS AND THEN GO OFF WHEN THE TRANSMITTER AND RECIEVER ARE CORRECTLY SET UP FOR COMMUNICATION.

SET THE CONTROL BOX TO "REMOTE" AND IF THE CONTROL BOX DOES NOT SUCCESSFULLY RECEIVE COMMANDS FROM THE TRANSMITTER.

REPEAT THE PROCEDURE FROM STEP 1.



CONTROL BOX

LINCOLN 94012 AUTO LUBE PUMP

WIRING DIAGRAM

ELECTRICAL CONNECTIONS

Connect black power cord as follows:

Red wire connects to 8 amp fuse then to Battery (+).

White wire connects to Battery (-).

Blue wire connects to ignition switch, then to Battery (+).

