ROSCO

A LeeBoy Company

RA-300
THE PATCHER

OPERATION - MAINTENANCE - SERCVICE - PARTS MANUAL

MANUAL PART NO. 38253

EFFECTIVE SERIAL NO. 35908 and higher

REVISED 7/15/99

NOTE: It is the responsibility of the customer or user's management to train, educate and supervise the employee in the proper operation and manintenance of this equipment.

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Denver, North Carolina
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INTRODUCTION

MACHINE INFORMATION SECTION

INTRODUCTION

This manual has been compiled to assist the owner and/or operator with the correct operation, safe handling, troubleshooting and routine preventive maintenance procedures for the Model RA-300 Patcher as manufactured by ROSCO /LeeBoy , 688 North Highway 16, Denver, North Carolina. A parts catalog is also included in this manual to allow for the accurate ordering of repair parts from authorized ROSCO/LeeBoy dealers/distributors.

This manual is not intended as an asphalt patching training manual, as it does not contain the vast amount of knowledge needed, which is a prerequisite to becoming a qualified operator or service person for this machine. Some of the knowledge necessary to be a qualified operator and/or service person includes, but is not limited to:

* A knowledge and actual experience in the handling of various asphalt products.
* An understanding and practical experience of job site safety.
* Experience and knowledge of heavy construction equipment operation and maintenance.
* Knowledge and practical experience in the variety of situations involved with mobile job site traffic control. This includes a familiarity with federal, state and local laws.

If you do not have this level of both knowledge and practical experience, you are not qualified to operate or maintain the RA-300. Go to your supervisor and request this training and job experience. To continue to operate the Patcher without this knowledge and experience is dangerous to yourself and others on the job site.

THIS MANUAL HAS BEEN ORGANIZED INTO TEN (10) MAJOR SECTIONS:

0. INTRODUCTION & WARRANTY
1. SPECIFICATIONS
2. SAFETY
3. SAFETY DECAL LOCATIONS
4. MATERIAL CONSIDERATIONS
5. OPERATION
6. MAINTENANCE
7. TROUBLESHOOTING
8. PARTS CATALOG
9. OPTIONAL EQUIPMENT

A general contents page is located at the beginning of this manual as a quick reference to the sections and their major sub-sections. In order to receive the performance and efficiency that has been designed into the RA-300 Patcher, it is very important that you:

* Read this manual thoroughly before operating or servicing the Patcher.
* Keep this manual in a convenient place for ready reference.
* Do not attempt to make repairs or adjustments you do not understand. If you require additional information or service, contact your authorized ROSCO dealer/distributor.

Throughout this manual references are made to the **LEFT SIDE** and **RIGHT SIDE** of the Patcher. These terms are used as the Patcher is viewed from the rear of the machine.

SERIAL NUMBER - It is important to know the serial number of this equipment. The serial number plate is located on the left front frame rail of the Patcher (see Fig. 0-A), and a space has been provided on the following page to record it. Use the serial number in all correspondence referring to the RA-300 Patcher and when ordering parts.

ROSCO / A LeeBoy Company reserves the right to make design or specification changes without prior notification or to make any other improvements without incurring obligations to add them to any machine in existence.

ROSCO / A LeeBoy Company is continuously improving its products. The technical information found in this manual was correct at the time it was approved for publication. However, if you find differences between your Patcher and the information contained in this manual, please contact your local authorized ROSCO dealer/distributor.

SERIAL NUMBER LOCATION

Always give your dealer the serial number of your ROSCO RA300 Patcher when ordering parts or when requesting service or other information.

The serial number plate is located where indicated by the arrow in the illustration below. Please make note of the number in the space provided on this page for easy reference.

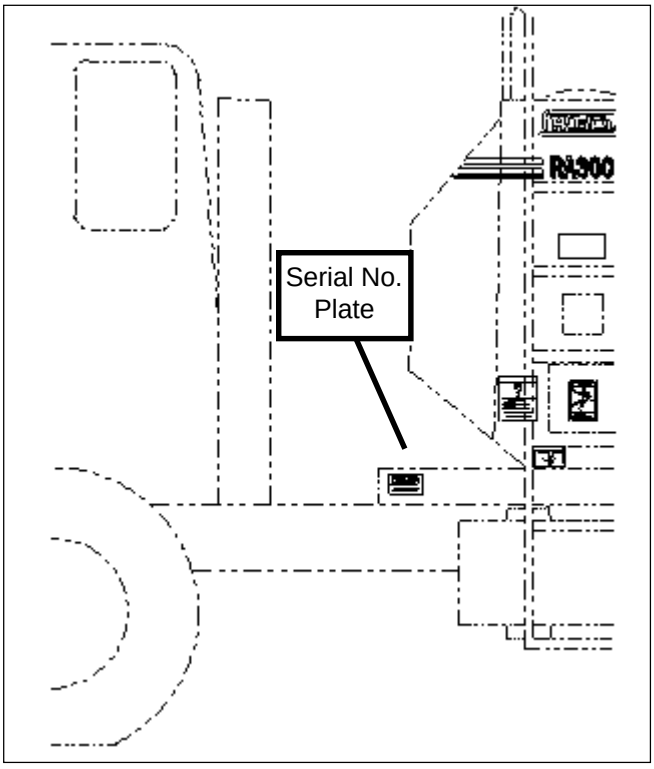

Figure 0-A

Model _____

Serial Number _____

Production Year _____

LIMITED WARRANTY POLICY & PROCEDURES

A. WARRANTY

1. If a defect in material or workmanship is found and the authorized Dealer is notified during the waranty period, ROSCO will repair or replace any part or component of the unit or part that fails to conform to the warranty during the warranty period.

2. The warranty will begin upon the completion of the warranty form by the initial customer and will expire after twelve (12) months have passed. The Warranty Card must be filled out within ten (10) days of delivery of the unit.

3. Engines and truck chassis are warranted by their manufacturers and may have warranty coverage that differs from that of ROSCO.

4. Replacement parts furnished by ROSCO are covered for the remainder of the warranty period applicable to the unit or component in which such parts are installed.

5. ROSCO has the right to repair any component or part before replacing it with a new part.

6. All new replacement parts purchased by a ROSCO dealer will carry a six (6) month warranty. Remanufactured parts purchased by a ROSCO dealer will carry a ninety (90) day warranty.

B. LIMITATIONS

ROSCO has no obligation under this warranty for:

1. Any defects caused by misuse, misapplication, negligence, accident or failure to maintain or use in accordance with the most current operating instructions.

2. Unauthorized alterations.

3. Defects or failures caused by any replacement parts or attachments not manufactured by or apporved by ROSCO.

4. Failure to conduct normal maintenance and operating service, including without limitation, providing lubricants, coolant, fuel, tune-ups, inspections or adjustments.

5. Unreasonable delay, as established by ROSCO, in making the applicable units or parts available upon notification of a service notice ordered by ROSCO.

6. The warranty responsibility on all engines and/or truck chassis rests with the respective manufacturer.

7. ROSCO may have support agreements with some engine and/or truck chassis manufacturers for warranty and parts support.

LIMITED WARRANTY POLICY & PROCEDURES

C. ITEMS NOT COVERED

ROSCO is not responsible for the following:

1. Charges for travel time, mileage or overtime.

2. Charges related to transporting the product to and from the place at which warranty work is performed.

3. Freight charges related to transporting repair parts to the place at which warranty work is performed.

4. All used units or used parts of any kind.

5. Repairs made necessary by normal wear and tear or brought about by abuse or lack of maintenance of the equipment, except for premature failures.

6. Attachments not manufactured or installed by ROSCO.

7. Liability for incidental or consequential damages of any type, including, but not limited to lost profits or expenses of acquiring replacement equipment.

8. Miscellaneous charges.

D. OTHER WARRANTIES

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESSED, STATUATORY AND IMPLIED WARRANTIES APPLICABLE TO UNITS, ENGINES OR PARTS, WITHOUT LIMITATION, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE OR PURPOSE. IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY, OR ALLEGED NEGLIGENCE OR LIABILITY WITHOUT FAULT, SHALL ROSCO BE LIABLE FOR SPECIAL, INDIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOSS OF PROFIT OR REVENUE, COST OF CAPITAL, COST OF SUBSTITUTED EQUIPMENT, FACILITIES OR SERVICES, DOWN TIME COSTS, LABOR COSTS OR CLAIMS OF CUSTOMERS, PURCHASERS OR LESSEES FOR SUCH DAMAGES.

SPECIFICATIONS

ROSCO / A LeeBoy Company reserves the right to make design or specification changes without prior notification or to make any other improvements without incurring obligations to add them to any machine in existence.

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Dimensions

Weight, Shipping ..... 18000 lbs (8165 kg)
Length ..... 315 inches (8001 mm)
Width ..... 96 inches (2438 cm)
Height ..... 131 inches (3327 cm)

Chassis

GVW ..... 33000 lbs (14970 kg)
Lights ..... Beacons (2), Stop, Turn, Tail, Clearance
..... and Traffic Control Arrow Board

Hydraulic System

Pump (Aux. Engine) ..... 10 GPM each at 1500 rpm
Pump (Dual) ..... 10/16 GPM each at 1000 rpm
Fluid Type ..... See chart on page 4 of Maintenance Section
Filter ..... 10 Micron
Tank ..... 20 gallons (75.7 liter)

Air System

Blower Make ..... Roots
Displacement ..... .323 cu. ft./rev (9.15 litre/rev)
Blower Volume ..... 881 CFM @1 psi
Maximum Speed ..... 2850 rpm
Maximum Pressure Rise ..... 7 psi
Maximum Temperature Rise ..... 200° F (93.3° C)
Drive System ..... Hydraulic Motor
Air Cleaner ..... Dry Type Replaceable Element

Asphalt Emulsion System

Nominal Tank Capacity	400 U.S. Gallons (1514 litres)
Tank Insulation	4 inches (102 mm) Styrofoam
Tank Skin	16 ga Steel
Fill Opening	12 inch (305 mm) opening
Heating Elements	Two 4500 watt, 240 VAC wired for 120 VAC
Temperature Control	110° to 180° F. (43° to 82° C)

Aggregate System

Type	Pressurized Hopper
Storage Hopper	5 cu. yd. struck capacity or 8079 lbs
Delivery System	Gravity, Slide Gate feed into air stream
Aggregate Feed Hopper	Slide Gate, one moving part
Control	On/Off Switch in truck

Discharge Hose and Nozzle

Hose Type	Abrasion Resistant
Hose Diameter	3.00 inches ID (76 mm)
Hose Length	Approx. 22 feet (6706 mm)
Hose Reinforcement	Wire Helix
Emulsion Supply Hoses	1/2 inch (13 mm) High Temp
Nozzle Construction	Welded Steel
Controls	Valves remotely operated from the truck cab.

Boom Assembly

Boom Type	Telescoping
Working Radius	13.5 feet (4115 mm)
Boom Suspension	Hydraulic Cylinders

Cleanout System

Type	Air Pressurized Solvent
Solvent Type	Diesel Fuel/Typical
Cleanout Tank Capacity	30 U.S. Gallons (114 litre)

SAFETY SECTION

SAFETY

Safety Alert Symbol

This Safety Alert symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

The Safety Alert symbol identifies important safety messages on the ROSCO RA-300 Patcher and in this manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

3 Big Reasons:

- **Accidents Disable and Kill**
- **Accidents Cost**
- **Accidents Can Be Avoided**

Signal Words

Note the use of the signal words **DANGER, WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guide-lines:

DANGER An immediate and specific hazard which WILL result in severe personal injury or death if the proper precautions are not taken.

WARNING A specific hazard or unsafe practice which COULD result in severe personal injury or death if proper precautions are not taken.

CAUTION Unsafe practices which COULD result in personal injury if proper practices are not taken, or as a reminder of good safety practices.

Equipment Damage Symbol

Throughout this manual, whenever you see this "broken bolt" symbol, it means:

ATTENTION - Equipment on the machine could be damaged through improper performance of an operation, maintenance or repair procedure.

SAFETY

YOU are responsible for the **SAFE** operation and maintenance of your ROSCO RA-300 Patcher. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the patcher be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alert you to all good safety practices that should be followed while operating the Patcher.

Bituminous asphalt is a volatile material that must be handled at high temperatures. Serious burns can occur from touching the material or machine. Wear protective clothing at all times and keep the machine in good working condition. Fumes from hot emulsions could ignite. If cutback asphalts are used by mistake, they are highly explosive. Read all instructions and follow them. Emulsified asphalts are used at lower temperatures, but are still hot enough to cause serious injury.

Remember, **YOU** are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this equipment is familiar with the recommended operating and maintenance procedures and that they follow all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- ☞ Patcher owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter.

- ☞ The most important safety device on this equipment is a **SAFE** operator. It is the operator's responsibility to read and understand **ALL** Safety and Operating instructions in the manual and to follow them. All accidents can be avoided.

- ☞ A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to serious injury or death.

- ☞ **DO NOT** modify the equipment in any way. Unauthorized modification may impair function and/or safety and affect the life of the equipment.

- ☞ ROSCO / A LeeBoy Company assumes no liability for accident or injury incurred through the improper use of this equipment.

GENERAL SAFETY

1. Read and understand this Operation Manual and all safety signs before operating, maintaining, or adjusting this equipment.

2. Have a first-aid kit available and know how to use it.

3. Keep a charged fire extinguisher available and know how to use it. Have the correct type of extinguisher for your situation.

Type A: Wood, paper, textile, rubbish
Type B: Flammable liquid
Type C: Electrical equipment

4. Wear appropriate protective gear. This list includes but is not limited to:

- Boots
- Protective glasses, goggles / face shield
- Heavy gloves
- Protective coveralls
- Hearing protection
- Protective head gear
- Orange safety vest

GENERAL SAFETY

5. Install and secure all guards before starting.

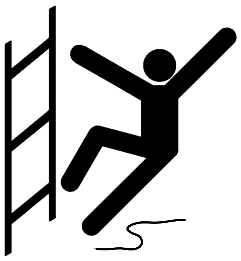
6. Bituminous asphalt material must be hot to be applied. Protect yourself from contacting the machine or material with bare skin. Severe burns can occur.

7. Wear appropriate ear protection for prolonged exposure to excessive noise. Failure to wear protection could result in permanent loss of hearing.

8. Place all controls in neutral, stop engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, or repairing. Death or serious injury can result from entanglement in moving parts.

9. Clear the area of people before starting or operating the unit. Death or serious injury can occur to bystanders if they are run over or struck with the boom.

10. Do not hurry. Use recommended hand holds and steps with at least three points of support when getting on and off the Patcher. Keep steps, floor, hand holds and controls clean and free from grease. Face the machine when climbing up and down and never jump off or dismount while the machine is in motion. Severe injury can result from falls.



11. Review safety related items annually with all personnel who will be operating or maintaining the Patcher.

GENERAL SAFETY

12. Do not run truck engine in an enclosed area. Exhaust gases contain carbon monoxide, an odorless and deadly poison, which can cause death.

13. Do not use the Patcher without first providing proper traffic control measures to prevent accidents caused by traffic colliding with the Patcher.

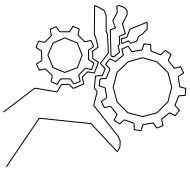
14. Do not inflate truck tires beyond the maximum recommended inflation pressure. Refer to the truck manufacturer's manual for proper inflation pressures. Death or serious injury can occur when/if a tire explodes.

15. Do not hang additional components from the discharge hose support boom. The hose support boom in not designed to be used as a means for lifting.

OPERATING SAFETY

1. Do not allow riders on the Patcher when transporting. Death or serious injury can occur if riders fall off or under the machine.

2. Keep hands, feet, hair, and clothing away from moving parts. Death or serious injury can result from entanglement in moving parts.



3. Never extend the discharge boom into unprotected or uncontrolled lanes of traffic. Death or serious injury can result from the boom coming in contact with passing traffic.

4. Operate machine only from inside the truck cab. Hot asphalt can cause severe burns.

OPERATING SAFETY

5. Keep all hydraulic lines, fittings, and couplers tight and free of leaks. Leaking fittings can cause a fire hazard as well as cause hydraulic fluid to pierce the skin. If hydraulic fluid pierces your skin, serious injury or toxic reaction can occur. **Seek medical attention immediately.**

6. To avoid collision hazards, clean reflectors and lights so that they are visible to all traffic.

7. Do not smoke around machinery. Fuel, emulsion and the fumes from both can explode when exposed to sparks, flame or heat.

8. Operate the machine only in well ventilated areas. Death can result from carbon monoxide poisoning.

9. Pressure in asphalt or flush tank MUST be released with pressure relief valve before checking or filling the tank. The cap or lid can come off with explosive force causing death or serious injury.

10. Asphalt tank level is checked by level gauge on tank. If you must open the cap and measure the asphalt, do so ONLY after fully releasing all air pressure and making sure all safety considerations are followed. The cap or lid can come off with explosive force causing death or serious injury.

11. Rotate boom to the right, raise and lock in place before transporting or servicing. A lowered boom is a collision hazard to both traffic and pedestrians which could cause death or serious injury.

12. Lower discharge boom before tilting truck cab.

OPERATING SAFETY

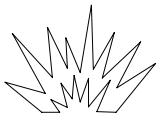
13. Disconnect electrical power before adjusting thermostat or servicing electric heaters. Serious injury or death can result from electrical shock.

14. Stay away from rock hopper lid when loading. Use extreme caution when loading during windy conditions. Death or serious injury can result from becoming trapped or crushed by the lid.

15. Always brace rock hopper lid open when servicing hopper, and **never** enter hopper when working alone.

16. Turn warning lights *ON* when operating the Patcher. Failure to do so can cause death or injury from traffic collisions.

17. **Do Not** use Cutback Asphalts. Violent explosions and fire can result causing death or serious injury.



18. Review safety instructions with all operators annually.

19. The operator is responsible for the work area. Keep all bystanders at least 30 feet away from the work area. The high velocity air, oil and aggregate can cause injury.

RA-300 OPERATORS

Operation of the Patcher shall be limited to the following persons:

1. Designated personnel.

2. Trainees under the direct supervision of a designated person.

3. Maintenance and test personnel (when it is necessary in the performance of their duties).

RA-300 OPERATORS

No one other than the personnel specified above shall operate the Patcher, with the exception of persons such as oilers, supervisors and others authorized by supervisors, whose duties require them to do so, and then only in the performance of their duties and with the knowledge of the operator or other appointed persons.

QUALIFICATIONS FOR OPERATORS

1. Operators shall be required by the employer to pass a practical operating examination. All operators must meet state licensing requirements including but not limited to a (CDL) commercial drivers license and hazardous material handling license.

2. Operators and operator trainees shall meet the following physical qualifications:
   a. Vision of at least 20/30 Snellen in one eye and 20/50 in the other, with or without corrective lenses.
   b. Ability to distinguish colors, regardless of position, if color differentiation is required for operation.
   c. Adequate hearing, with or without hearing aid, for the specific operation.

3. Evidence of physical defects or emotional instability which could render a hazard to the operator or others, or which in the opinion of the examiner could interfere with the operator's performance, may be sufficient cause for disqualification. In such cases, specialized clinical or medical judgments and tests may be required.

4. Evidence that an operator is subject to seizures or loss of physical control shall be sufficient reason for disqualification. Specialized medical tests may be required to determine these conditions.

5. Operators and operator trainees should have normal depth perception, field of vision, reaction time, manual dexterity, coordination and no tendencies to dizziness or similar characteristics.

QUALIFICATIONS FOR OPERATORS

6. In addition to the above listed requirements, the operator shall demonstrate to the employer:
   a. The ability to comprehend and interpret all labels, operator manuals, safety codes and other information pertinent to appropriate patcher operation.
   b. Knowledge of emergency procedures and ability to implement same.
   c. The ability to operate the specific type of equipment.
   d. Familiarity with applicable safety regulations.
   e. An understanding of, and responsibility for, maintenance requirements of the Patcher.
   f. Thorough familiarity with the Patcher and its control functions.
   g. An understanding of the operating procedures as outlined by the manufacturer.

CONDUCT OF OPERATORS

1. The operator shall not engage in any practice which will divert his/her attention while actually engaged in operating the patcher.

2. Each operator shall be responsible for those operations under his/her direct control. Whenever there is any doubt as to safety, the operator shall consult with the supervisor.

3. If there is a warning sign on a switch, engine control or component, the operator shall not close the switch, start the engine or use the component until the warning sign has been removed or acknowledged by the appointed person.

4. Before operating the Patcher, the operator shall see that all controls are in the *OFF* or neutral position and that all personnel are cleared from the area.

CONDUCT OF OPERATORS

5. In accordance with OSHA regulations 1928.51 and 1928.52, operating instructions must be provided initially to operators/employees before allowing them to operate the RA-300. Operating instructions should be reviewed annually thereafter.

The most **IMPORTANT** safety device on this equipment is a well trained and safe operator. It is his/her responsibility to read and understand all safety and operating instructions in this manual. A person who has not read and understood all operating and safety instructions is not qualified to operate the patcher. An untrained operator exposes himself/herself and bystanders to possible serious injury or death. **All accidents can be avoided!**

DO NOT modify the Patcher in any way. Unauthorized modification may impair function and/or safety and affect the working life of the equipment.

ROSCO / A LeeBoy Company assumes NO LIABILITY for accident or injury incurred through the improper use of this equipment.

HOT MATERIAL SAFETY

1. Wear protective gear for face, hands, feet and body when working on the Patcher.

2. Keep bystanders away from the machine when operating. High velocity air, emulsion and aggregate can cause injury.

3. Hot emulsion can also cause injury. To avoid serious burns, allow the machine to cool before repairing or maintaining working components.

4. When hot asphalt touches the skin, flush area immediately with cold water. **Do not** apply ice directly to the affected area.

HOT MATERIAL SAFETY

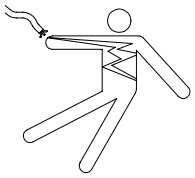
DO NOT ATTEMPT TO REMOVE ASPHALT CEMENT with products containing solvents or ammonia. Natural separation will occur in about 48-72 hours. **Get medical attention as soon as possible.**

5. Avoid discharge area of boom. Rocks, asphalt emulsion and solvent may spray out suddenly.

ELECTRIC HEATER SAFETY

1. Do not exceed asphalt flash temperature. Hot fumes can explode causing serious injury.

2. Follow electric heater operating instructions. Stay away from electric heaters when heating material in tank and keep others away from machine when operating electric heaters. Death or serious injury can result from electrical shock.



3. Disconnect the power before servicing or performing maintenance on electrical components. Severe injury or death could result. Always use an electrical outlet with ground fault circuit interrupter (GFCI) protection.

EXPLOSION PREVENTION

1. Keep the machine and asphalt material away from sparks, incandescent material, and open flames. Fumes are flammable and can explode if ignited.

2. Do not use Cutback Asphalts. Death or serious injury can result from violent explosion and/or fire.

EXPLOSION PREVENTION

3. Do not mix grades of asphalt material. Hot asphalt can vaporize material with lower flash point temperatures and cause an explosion.

4. Pressure in asphalt or flush tanks MUST be released with vent valve before checking or filling the tank. The lids/covers can fly open with explosive force causing death or serious injury.

FIRE PREVENTION

1. Avoid sparks, open flames and incandescent materials. Hot bituminous asphalt and its fumes are flammable and can ignite causing fire or explosion. Death or serious injury could result.

2. Do not smoke around machine. Fuel, emulsion and the fumes from either can explode when exposed to sparks, flame or heat.

3. Clean off asphalt and oil accumulations from surfaces that can get hot. Fire can occur in accumulated asphalt or oils and get out of hand quickly.

BATTERY SAFETY

1. Keep all sparks and flames away from batteries. Fumes given off by the battery's electrolyte solution are extremely explosive. An explosion could cause acid to come in contact with a person's eyes causing blindness.

2. Wear safety glasses when working near batteries. Battery acid in the eyes can cause blindness.

BATTERY SAFETY

3. Do not tip batteries more than 45 degrees to avoid spilling electrolyte solution. Electrolyte solution can cause chemical burns. Avoid contact with battery electrolyte solution. Wash off any spilled electrolyte immediately.

4. To avoid injury from burns or shock caused by a spark or short circuit, disconnect the battery ground cable before servicing any part of the electrical system.

5. Use jumper cables in recommended manner. Improper use can result in battery explosion or unexpected Patcher motion.

MAINTENANCE SAFETY

1. Follow ALL operating, maintenance, and safety information in this manual.

2. DO NOT attempt repairs or maintenance procedures you do not understand. Refer to manuals and experienced repair personnel for help.

3. Support the truck with blocks or safety stands when changing tires or working beneath it. Death or serious injury can result from the machine falling off of a jack and crushing you.

4. Place all controls in neutral, stop engine, remove ignition key, and wait for all moving parts to stop before servicing, adjusting, or repairing. Death or serious injury can result from entanglement in moving parts.

5. Follow good shop practices:
- Keep service area clean and dry.
- Be sure electrical outlets and tools are properly grounded.
- Use adequate light for the job at hand.

MAINTENANCE SAFETY

6. Make sure all guards are in place and properly secured when maintenance work is completed. Serious injury can occur from being caught in unguarded moving parts.

7. Never wear loose-fitting, baggy, or frayed clothing when working around or on any of the drive system components. Loose garments can become entangled in moving parts, pulling the person into the machine which could cause serious injury or death.

8. Wear protective glasses and other required safety equipment when servicing or repairing the Patcher.

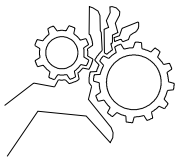
9. Before doing any repair or maintenance work on the hydraulic system, relieve the pressure on the system. Escaping hydraulic fluid or oil under pressure has sufficient force to penetrate the skin which could cause serious personal injury or toxic reaction.

10. Wear proper hand and eye protection when searching for hydraulic leaks. Use a piece of wood or cardboard as a backstop, instead of hands to isolate and identify a leak. If hydraulic oil has penetrated the skin, **get medical attention immediately.**

11. Insure that all pressure is relieved before disconnecting lines, hoses and/or valves. Before reapplying pressure to a hydraulic system, make sure all lines, fittings, and couplers are tight and in good condition.

MAINTENANCE SAFETY

12. Keep hands, feet, hair, and clothing away from moving or rotating parts. Death or serious injury can result from entanglement in moving parts.



13. Clear the area of bystanders when performing any maintenance, repairs or adjustments.

14. Allow the machine and material to cool before working on it. Hot asphalt and hot machine components can cause serious burns.

15. Lock the boom in place before servicing to prevent sudden movements which can cause death or serious injury.

16. Brace rock hopper lid open when servicing hopper and never enter hopper when working alone. Always have a helper. Death or serious injury can result from becoming trapped or crushed by the hopper lid.

17. Disconnect the battery before working on the electrical system. Death or serious injury can result from electrical shock.

18. DO NOT make repairs on pressurized components, fluid, fuel or mechanics until the pressure has been relieved according to instructions.

19. Replace all missing, illegible or damaged safety decals or signs. Keep all safety decals and signs clean and legible.

HYDRAULIC SAFETY

1. Make sure that all components in the hydraulic system are kept in good condition and are clean.

2. Replace any worn, cut, abraded, flattened, or crimped hoses and metal lines.

3. Do not attempt any makeshift repairs to the hydraulic lines, fittings, or hoses by using tape, clamps, or cements. The hydraulic system operates under extremely high pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

4. Before doing any repair or maintenance work on the hydraulic system, relieve the pressure on the system. Pressurized hydraulic fluid or oil has sufficient force to penetrate the skin which could cause serious personal injury or toxic reaction.

5. Wear proper hand and eye protection when searching for a high pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak. If hydraulic oil has penetrated the skin, **get medical attention immediately.**

6. Insure that all pressure is relieved before disconnecting lines, hoses and/or valves. Before reapplying pressure to a hydraulic system, make sure all lines, fittings and couplers are tight and in good condition.

TRANSPORT SAFETY

1. Make sure you are in compliance with all local regulations regarding transporting equipment on public roads and highways. DO NOT DRINK AND DRIVE and ALWAYS USE SEAT BELTS.

2. The RA-300 can be overloaded by completely filling the tanks with heavier than normal material. The maximum weight of rock that may be loaded is 5.5 tons (4990 kg). Death or serious injury can result from exceeding the machine's load capacity and braking ability.

3. Make sure the lights and reflectors that are required by the local highway and transport authorities are in place, are clean, are in good repair and can be seen clearly by all overtaking and oncoming traffic.

4. Do not exceed 55 MPH (88 KMH) when transporting the machine. Reduce speed on rough roads and surfaces and when making turns.

5. Lock pintle hitch (or other highway authority approved hitch for size of load being towed) and attach safety chains to hitch if towing a load.

STORAGE SAFETY

1. Store the Patcher in an area away from human activity.

2. Do not permit children to play on or around the stored machine. Serious injury can result from slips and falls.

3. Make sure the unit is stored in an area that is firm, level and free of debris.

4. Store the Patcher inside a building or cover it with a weather-proof tarpaulin and support it securely.

TIRE SAFETY

1. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may cause serious injury or death.

2. Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.

3. Have a qualified tire dealer or repair person perform required tire maintenance.

4. When inflating tires, use a self-attaching inflation chuck with remote shut off and stay clear of the tire. The tire can explode with great force.

5. DO NOT inflate the tire beyond the tire manufacture's recommended inflation pressure.

6. DO NOT operate the machine with loose wheels or rims. Check wheel nuts periodically for proper tightening torque.

7. DO NOT hammer on rims with steel hammers. Use rubber, lead, plastic or brass faced mallets if necessary.

8. When changing tires, support the machine with blocks or safety stands in case the jack slips. Put hardwood blocks under the jacks regardless how hard the ground is.

REFUELING SAFETY

1. Handle fuel with care. It is highly flammable. Do not over fill fuel tank. Expansion and spillage creates a fire hazard.

2. DO NOT SMOKE when refueling. Never refuel near open flame or sparks. Never refuel when the engine is running. Death or serious injury can result from explosion and/or fire. Be sure to clean up spilled fuel before restarting the engine.

3. Fill the fuel tank outdoors to reduce the chance of fumes accumulating and causing a fire or explosion.

4. Prevent fires by keeping machine clean of accumulated trash, fuels, grease, and debris.

5. DO NOT allow fuel to spill on hot components. Maintain control of the fuel nozzle when filling the tank. Fire can occur when fuel contacts hot components.

7. When refueling, keep the hose nozzle or the funnel and container in contact with the metal of the fuel tank to prevent an electrical spark igniting the fuel.

8. Do not overfill the fuel tank. Allow room for expansion to reduce the risk of fuel expanding and spilling from the tank.

9. Tighten the fuel tank cap securely. If the fuel cap is lost, replace it only with the original manufacturer's approved cap. A non-approved cap without proper venting may result in pressurization of the tank.

SAFETY DECALS

1. Keep safety decals and signs clean and legible at all times.

2. Replace safety decals and signs that are missing or have become illegible.

3. When replacing parts, replace any safety decals that were on the original part.

4. Safety decals or signs are available from your authorized ROSCO parts dealer.

SAFETY DECAL INSTALLATION

1. Be sure that the installation area is clean and dry. Use hot soapy water and dry the area thoroughly before installing decals.

2. Decide on the exact position by taking measurements and test fitting before you remove any of the backing paper.

3. For decals with no top protection paper, decide on the decal location and remove the smallest portion of the split backing paper.

4. Align the decal over the specified area and carefully press the small portion with the exposed adhesive backing in to place.

5. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.

6. Small air pockets can be pierced with a pin and smoothed out using a piece of decal backing paper.

7. If the decal has a protective top paper, use hot soapy water on the surface to which the decal is being applied. Leave wet. After deciding on the location, remove the backing paper and soak the decal in clean soapy water before application. This will help to alleviate air bubbles in the finished decal.

8. Smooth the decal into place with a squeegee, and check for air bubbles. Small air pockets can be pierced with a pin and smoothed out. When the decal is completely smoothed out, carefully remove the top paper.

SIGN-OFF FORM

ROSCO / A LeeBoy Company follows the general Safety Standards specified by the Society of Automotive Engineers (SAE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining the RA-300 Patcher must read and clearly understand ALL Safety, Operating and Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information has been reviewed. Annually review this information before the season start-up.

Make these periodic reviews of SAFETY and OPERATION a standard practice for all of your equipment. An untrained operator is unqualified to operate this machine.

A sign-off sheet is provided for your record keeping to show that all personnel who will be working with the Patcher have read and understand the information in the Operator's Manual and have been instructed in the operation of this equipment.

SIGN-OFF FORM

Date	Employee's Signature	Employer's Signature

SAFETY DECAL LOCATIONS

The types of Safety Decals and their locations on the RA-300 Patcher are shown in the illustrations that follow. Good safety requires that you familiarize yourself with the various Safety Decals, the type of warning and the area, or particular function related to that area, which requires your SAFETY AWARENESS.

Think SAFETY! Work SAFELY!

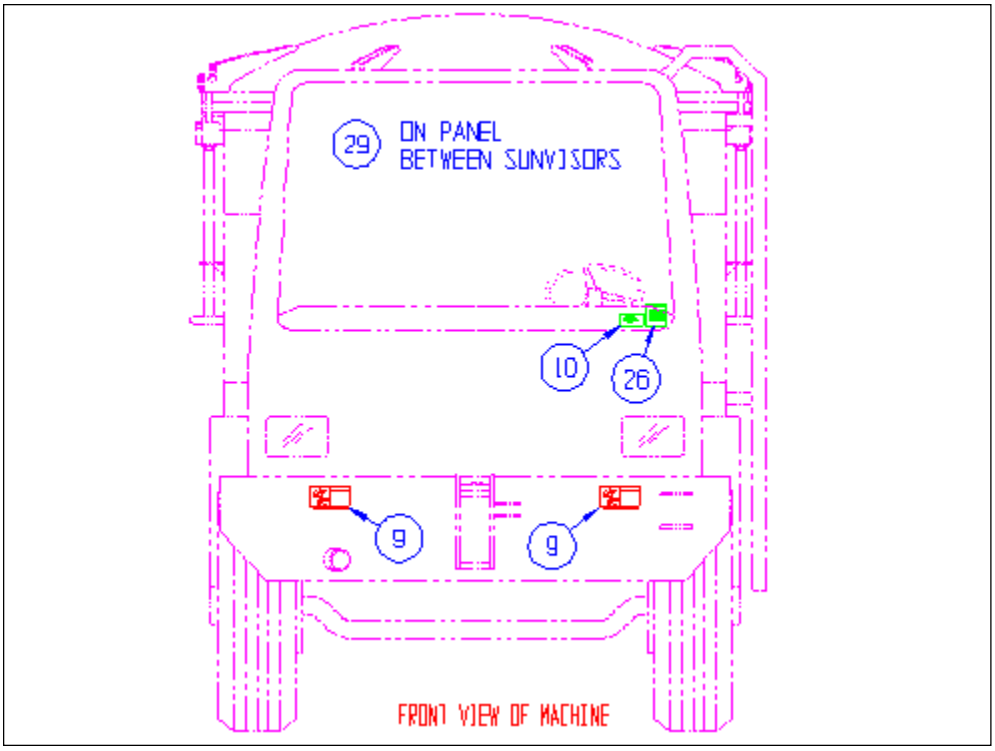
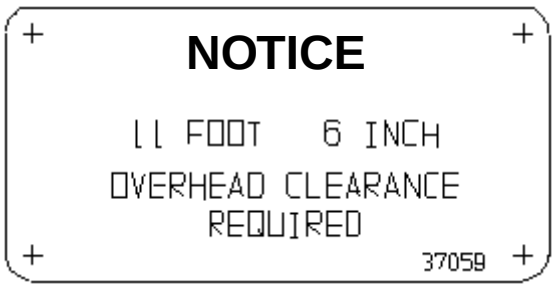


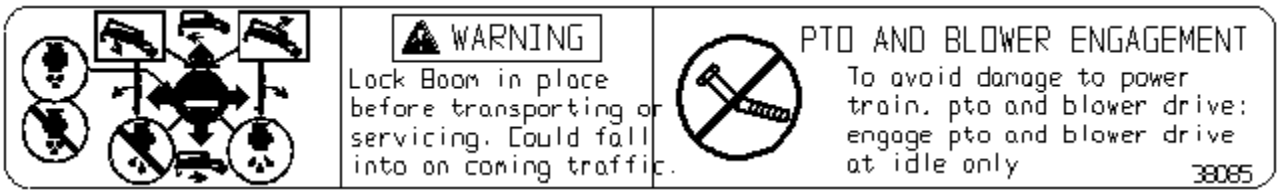
Figure 3-A
Safety Decals, Front View

ITEM 9
PART#36193
SEE FIG. 3-A

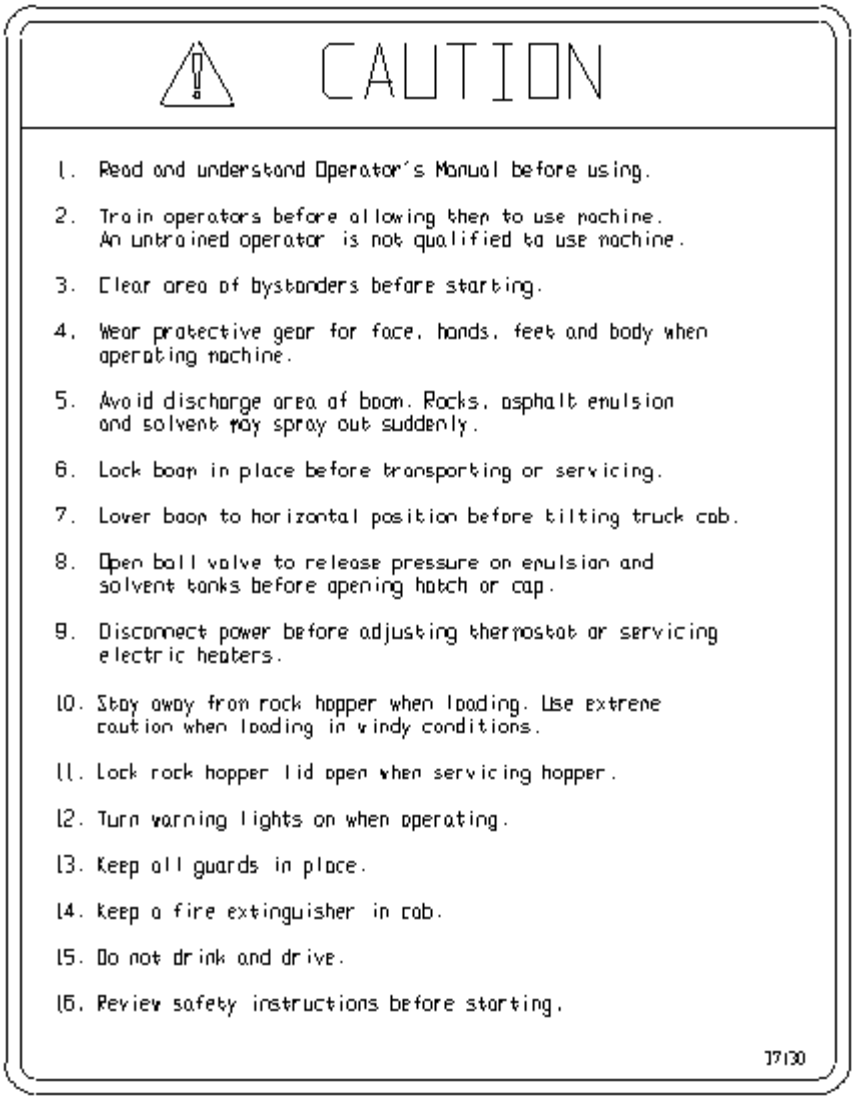


ITEM 10
PART#37059
SEE FIG. 3-A

REMEMBER - If Safety Decals are illegible or missing because of wear or replacement of parts, new decals must be applied. New decals are available from your Authorized ROSCO Dealer.



ITEM 29
PART # 38085
SEE FIG. 3-A



ITEM 16
PART # 37130
SEE FIG. 3-B

REMEMBER - If Safety Decals are illegible or missing because of wear or replacement of parts, new decals must be applied. New decals are available from your Authorized ROSCO Dealer.

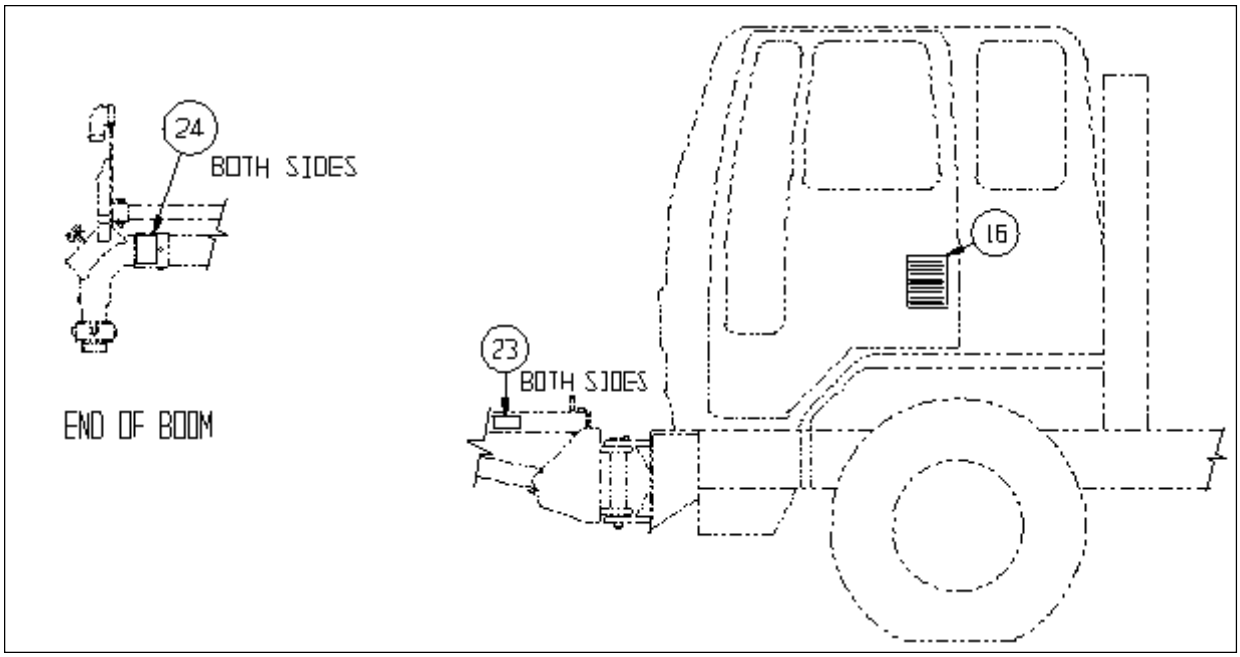
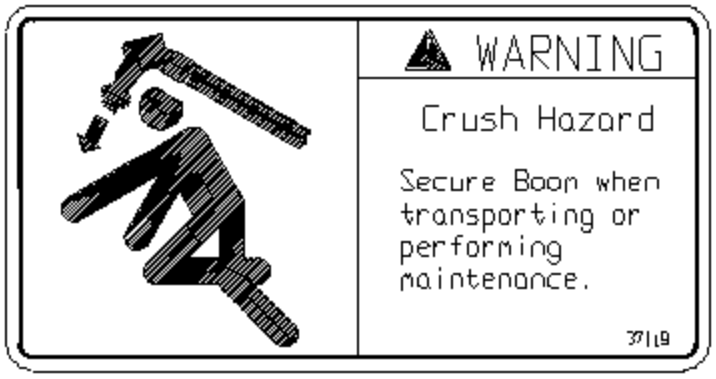


Figure 3-B
Safety Decals, Drivers Side



ITEM 23
PART # 37119
SEE FIG. 3-B

ITEM 24
PART # 37129
SEE FIG. 3-B

REMEMBER - If Safety Decals are illegible or missing because of wear or replacement of parts, new decals must be applied. New decals are available from your Authorized ROSCO Dealer.

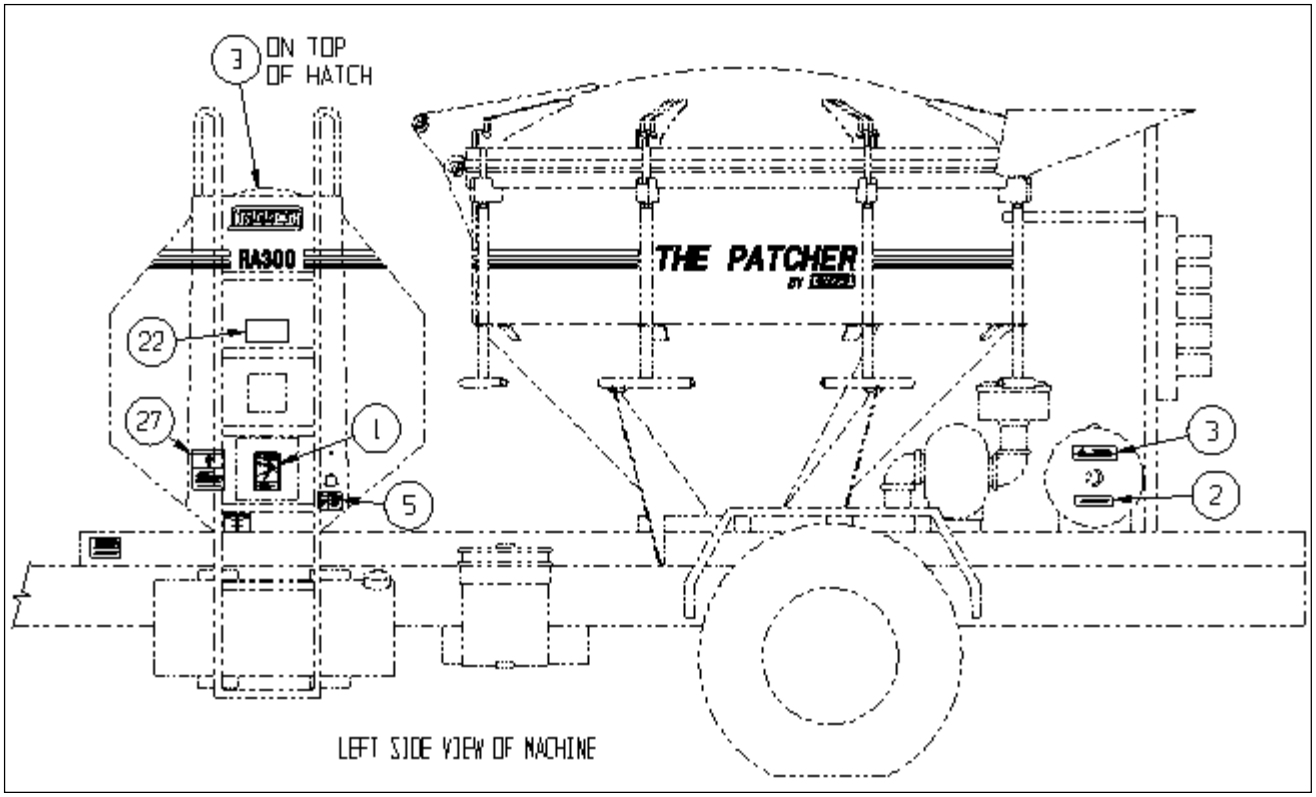
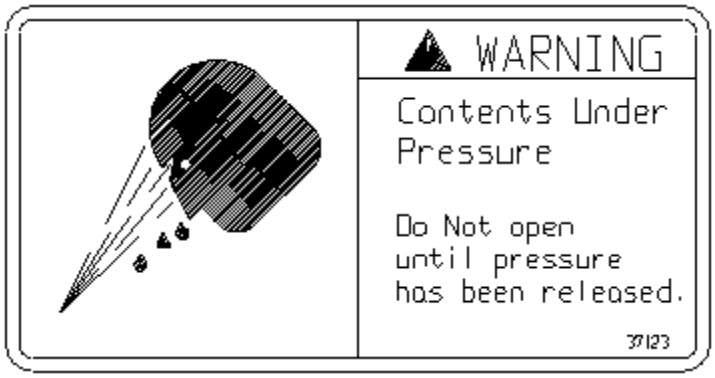


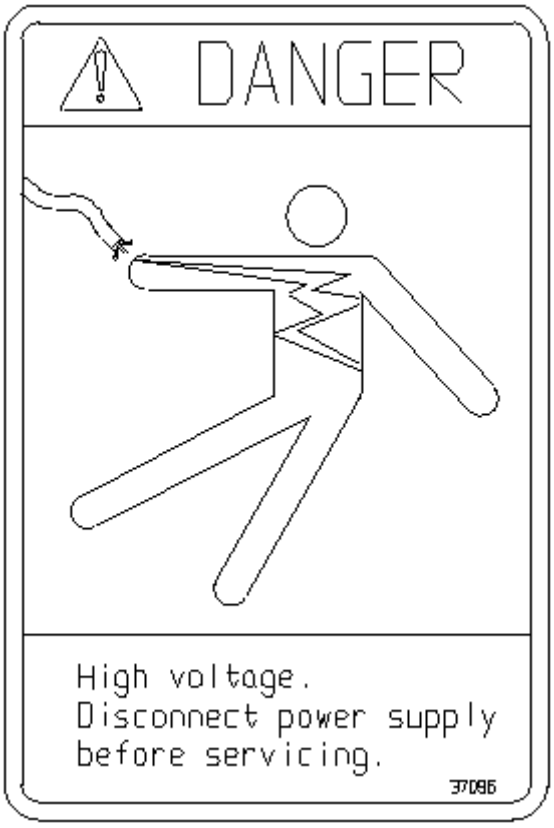
Figure 3-C
Safety Decals, Drivers Side



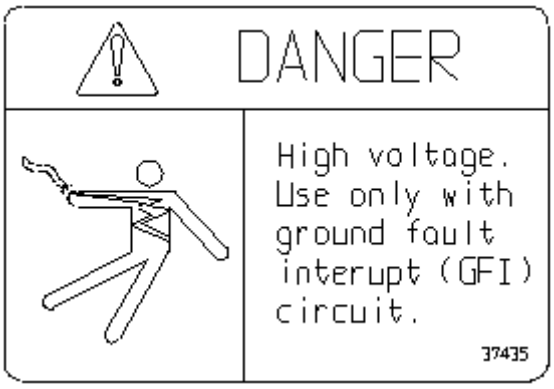
ITEM 3
PART # 37123
SEE FIG. 3-C

ITEM 27
PART # 35689
SEE FIG. 3-C

REMEMBER - If Safety Decals are illegible or missing because of wear or replacement of parts, new decals must be applied. New decals are available from your Authorized ROSCO Dealer.

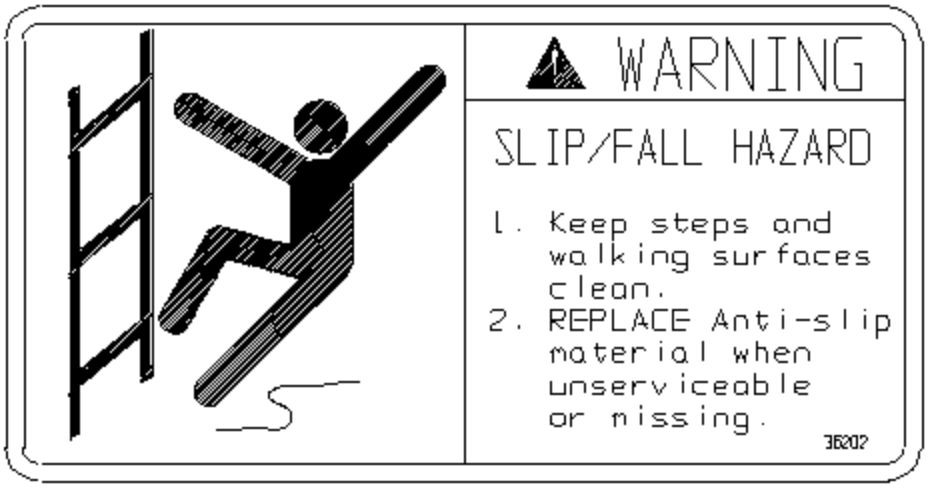


ITEM 1
PART # 37096
SEE FIG. 3-C



ITEM 5
PART # 37435
SEE FIG. 3-C

ITEM 2
PART # 10553
SEE FIG. 3-C



ITEM 22
PART # 36202
SEE FIG. 3-C

REMEMBER - If Safety Decals are illegible or missing because of wear or replacement of parts, new decals must be applied. New decals are available from your Authorized ROSCO Dealer.

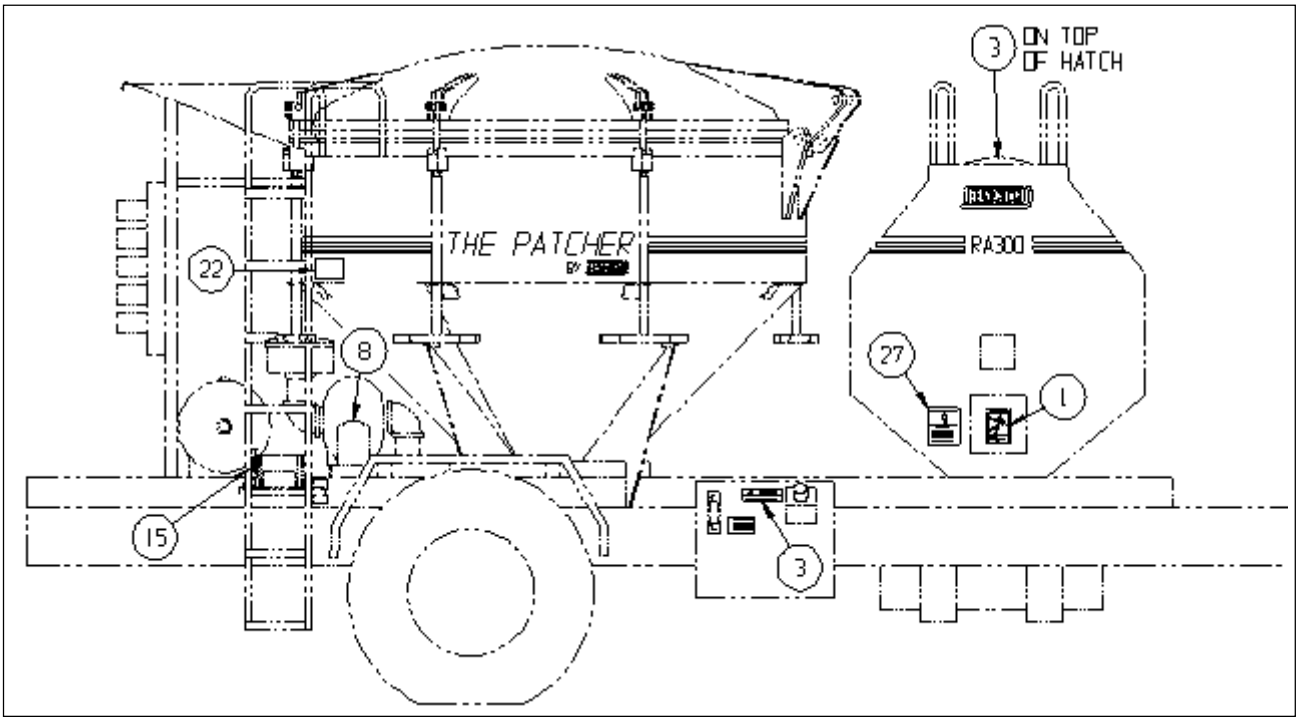
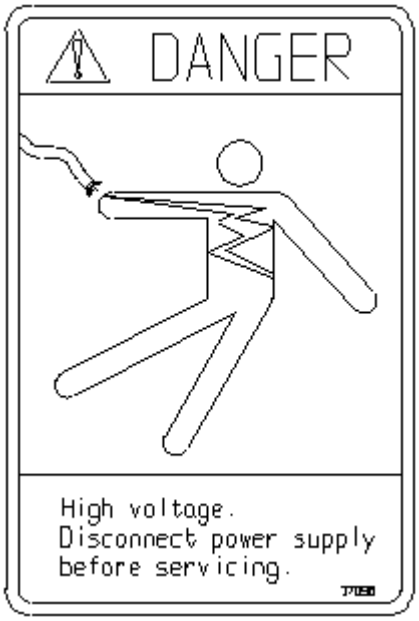
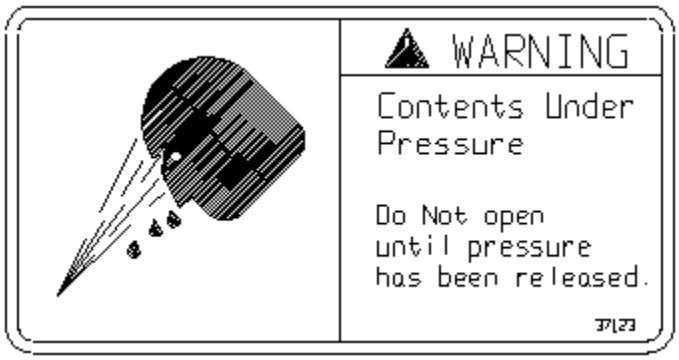


Figure 3-D
Safety Decals, Passenger Side

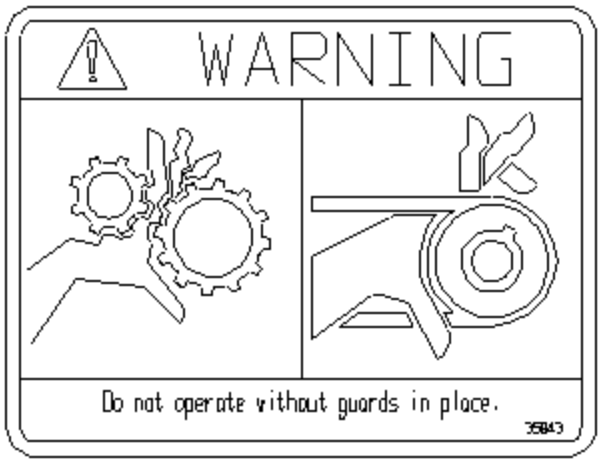


ITEM 1
PART # 37096
SEE FIG. 3-D

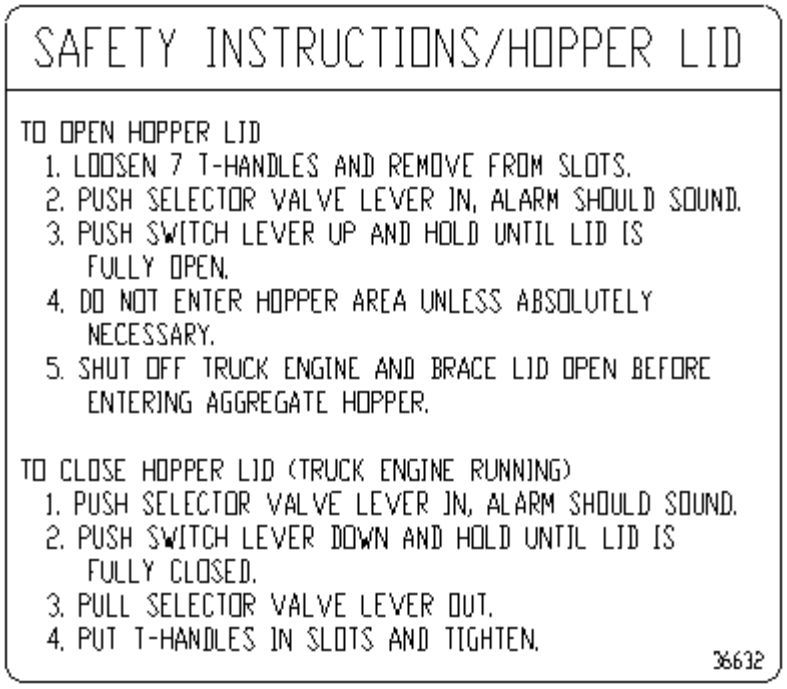


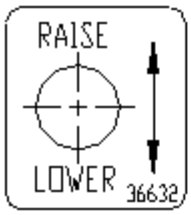
ITEM 3
PART # 37123
SEE FIG. 3-D

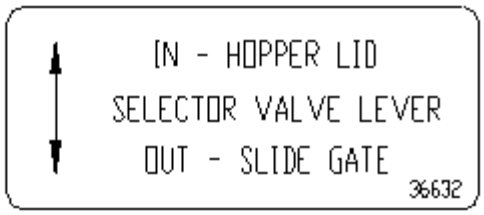
REMEMBER - If Safety Decals are illegible or missing because of wear or replacement of parts, new decals must be applied. New decals are available from your Authorized ROSCO Dealer.



ITEM 8
PART # 35355
SEE FIG. 3-D

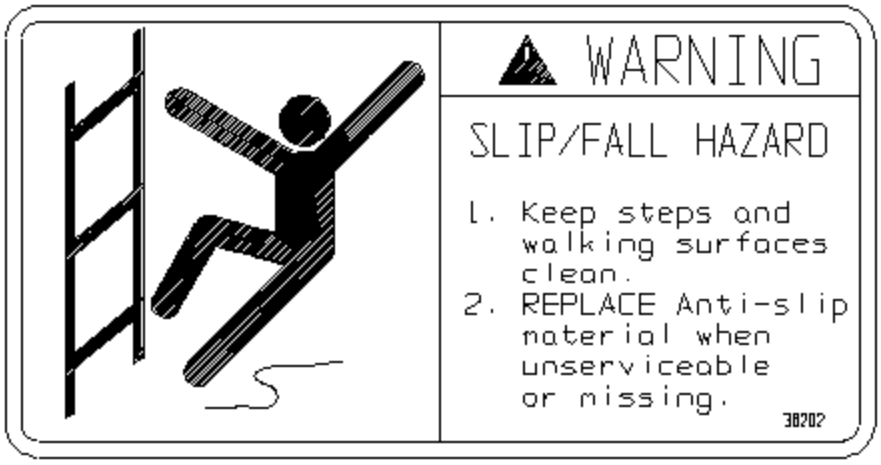






ITEM 15
PART # 36632
SEE FIG. 3-D

REMEMBER - If Safety Decals are illegible or missing because of wear or replacement of parts, new decals must be applied. New decals are available from your Authorized ROSCO Dealer.



ITEM 22
PART # 36202
SEE FIG. 3-D

ITEM 27
PART # 35689
SEE FIG. 3-D

REMEMBER - If Safety Decals are illegible or missing because of wear or replacement of parts, new decals must be applied. New decals are available from your Authorized ROSCO Dealer.

MATERIAL SECTION

AGGREGATE SELECTION

General Guidelines

The ROSCO RA-300 Patcher is designed to use a variety of aggregate types, but certain sizes and shapes have proven to produce the most durable patch. The following guidelines should be considered when choosing aggregate:

A. Use clean aggregate. Dirty aggregate or excessive fines will retard curing of the patch, may lessen the life of the patch and limit adhesion of the emulsion to the aggregate. Use a 200 grade sieve to test your agrregate for excessive fines. No more than 3% should pass through.

B. Generally, the largest aggregate particles should be no more than twice the size of the smallest particle.

C. For most patching applications, including potholes, cracks and thin overlays, aggregate of 1/4 or 5/16 inch (6.35 or 7.94 mm) grades are recommended. For larger areas and deeper repairs, aggregate up to 1/2 inch (12.7 mm) grade may be used.

D. Smaller sized aggregate is recommended to help limit loose rock damage to vehicles.

E. Finer grade material is recommended for patching, as it will have less voids. Coarse grades may be used under special conditions such as base stabilization.

F. The aggregate shape is also important. Angular particles with rough surface texture, such as crushed aggregate, will produce an interlocking effect and relatively low absorption, which commonly produce the best patch.

Electrical Charge of Aggregates

When Emulsified Asphalts are to be used in the Patcher, the final consideration of aggregate selection is the ELECTRICAL CHARGE of the particles. The Asphalt Emulsion Manufacturers Association manual states:

A. ANIONIC emulsions (with a negative (-) charge on the asphalt droplets) perform best with aggregates having positive (+) surface charges such as limestone and dolomite.

B. CATIONIC emulsions (with a positive (+) charge on the asphalt droplets) perform best with aggregates having negative (-) surface charges such as siliceous or granitic aggregates.

PLEASE NOTE: It is important to consider the availability of suitable liquid asphalts, and their electrical charge, before selecting aggregate.

LIQUID ASPHALT SELECTION

General Guidelines

Recommendations on liquid asphalt selection for use with the Patcher are given below. However, optimum results can best be obtained by trying several different types of asphalt and aggregates. Laboratory evaluations are strongly recommended to determine the compatibility of a given asphalt grade with an aggregate. For more information on Liquid Asphalt selection, obtain a copy of the following manual:

"A Basic Asphalt Emulsion Manual"
Manual Series No. 19 (MS-19)
from
The Asphalt Institute
Research Park Drive, P.O. Box 14052
Lexington,Ky, USA 40512-4052
Telephone: (606) 288-4960 Fax: (606) 288-4999

The selection of a liquid asphalt for application by the Rosco RA-300 Patcher is generally dependent on the following considerations:

A. Availability of various types of aggregate.
B. Availability of various liquid asphalt grades.
C. Climate conditions anticipated during application.
D. Traffic conditions during application.

SPECIAL NOTE: The liquid asphalt most commonly used in the Patcher is a rapid-set grade of Emulsified Asphalt. The rapid-set CATIONIC CRS-2 or the ANIONIC RS-2 emulsions are designed to react quickly with aggregate thus forming a fast curing patch which can support traffic immediately after completion of the repair work. It is for this reason that most recommendations and directions found in this section will be directed at Emulsified Asphalts.

In certain climates, rapid-set emulsions may set up too quickly. Moderate-set emulsions are then recommended (MS-2 & CMS-2). It is important to note that some emulsion manufacturers have grades or mixtures which do not conform to industry standards. These materials are often tailored to local geographic conditions and may provide superior performance to the standard grades.

Classifications & Grades of Liquid Asphalt

As previously stated, there are a number of considerations when choosing liquid asphalts, and the best results can be obtained by trying several different types of asphalt and aggregates. The following classifications and grades of liquid asphalts can be applied by the air patching method:

A. **EMULSIFIED ASPHALT:** Asphalt product made fluid by emulsifying asphalt cements with water and an emulsifier. On exposure to atmospheric conditions, the water evaporates, leaving the asphalt cement to perform its function. The current primary uses of emulsified asphalts are surface treatments, fog seal, prime coat, cold mix patching, road mix and tack coats.

Standard grades of Emulsified Asphalt are:

1. **ANIONIC** (negative (-) charge): RS-1, RS-2, MS-1, HFMS-1, MS-2, HFMS-2, MS-2h, HFMS-2h, HFMS-2s, SS-1, SS-1h

2. **CATIONIC** (positive (+) charge): CRS-1, CRS-2, CMS-2, CMS-2h, CSS-1, CSS-1

ATTENTION: *Do not mix emulsion types, especially anionic with cationic.*

B. **CUTBACK ASPHALT:** Asphalt products made by blending asphalt cement with gasoline or naphtha for rapid cure grades, with kerosene for medium cure grades, or with non-volatile liquids like fuel oil for slow curing grades. Upon exposure to atmospheric conditions the dilutents evaporate, leaving the asphalt cement to perform its function. Cold mix patching and road mix are the main uses of cutback asphalt. **DO NOT USE!!**

WARNING: *Do not use cutback asphalts in the RA-300 Patcher. These asphalt solutions are highly flammable and when pressurized become explosive.*

C. **ASPHALT CEMENTS:** Basic asphalt refined from petroleum by fractional distillation. Hot mixes and surface treatments are the most common uses. **DO NOT USE!!**

ATTENTION: *The RA-300 is not capable of heating liquid asphalts to a high enough temperature to use asphalt cements. Highly viscous asphalts or asphalts that must be heated higher than 200° F to become thin enough to pump CANNOT BE USED in the ROSCO RA-300 Patcher. These asphalts will cause problems by plugging hoses or piping and will be extremely diffucult to remove. Consult the factory for clean out suggestions if such materials have accidently been loaded into the RA-300.*

LIQUID ASPHALT STORAGE & HANDLING

General Guidelines

The Asphalt Institute has published a leaflet entitled “Storing and Handling Emulsified Asphalt” (CL-21). A portion of the guidelines contained in the leaflet are also listed in this section of the RA-300 Patcher manual.

Emulsified Asphalt Storage

A. Store emulsified asphalts as you would store water, 50° F to 185° F (10° C to 85° C), depending on the grade of emulsion and its intended use.

B. Use hot water as the heating medium for storage tanks with heating coils. Low pressure or waste steam also may be used, providing the temperature on the coil surface is controlled and limited to not more than 185° F (85° C).

C. Store emulsified asphalts at the temperature specified for the particular grade. The higher viscosity rapid-set spray grades are stored at 125° F to 185° F (52° C to 85° C) since they are usually applied in this temperature range.

D. **DO NOT** permit emulsified asphalt to be heated above 185° F (85° C). Elevated temperatures evaporate the water, resulting in an increase in viscosity and an asphalt layer in the tank. The materials can no longer be used as intended and it will be difficult to empty the tank.

E. **DO NOT** let emulsified asphalts freeze. Freezing breaks the emulsion, separating the asphalt from the water. The result will be two layers in the tank, neither suited for the intended use, and the tank will be difficult to clean.

F. **DO NOT** allow the temperature of the heating surface to exceed 205° F (96° C). This will cause premature breakdown of the asphalt on the heating surface.

G. **DO NOT** use forced air to agitate emulsified asphalts. This action may cause the emulsion to break down.

Storage Facilities for Emulsified Asphalts

The following guidelines have been provided to assist Patcher owners and users in the development of proper storage facilities for their emulsified asphalts.

PLEASE NOTE: These guidelines apply **only to emulsified asphalts.** Do not use cutback asphalts or asphalt cements with the ROSCO RA-300 Patcher. Consult the supplier or manufacturer to determine the proper storage facilities for these asphaltic materials.

A. For protection from freezing and best utilization of heat, storage tanks should be insulated.

B. A skin of asphalt can form on the surface of emulsions when exposed to air. It is best, therefore, to use tall vertical tanks as they will expose the least amount of the emulsion surface area to the air. Most fixed storage tanks are vertical but horizontal tanks are often used for short term field storage. Skinning can be reduced in horizontal tanks by keeping them full to minimize the area exposed to air.

C. Side-entering propellers located about three feet up from the tank bottom may be utilized to prevent surface skin formation. Large diameter, slow-turning propellers are best and should be used to roll the material over. **AVOID OVER MIXING.**

D. Tanks may be circulated from top to bottom with a pump. **AVOID OVER PUMPING.**

E. In tanks not equipped with propellers or a circulating system, a very light film of kerosene or oil on the surface of the asphalt can reduce skin formation.

F. Cathodic protection should be provided to avoid possible corrosion of tank walls and heating coils.

Handling Liquid Asphalts

The RA-300 Patcher owner or user should consider the following guidelines when handling liquid asphalt materials, especially emulsified asphalts:

A. Use pumps with proper internal clearances for handling asphalt. Pumps with tight internal clearances could be affected by binding and seizing.

B. Warm pumps to about 150° F (65° C) to ease start up. Use a mild heating method to apply heat to the pump packing or casing to free a seized pump. ***Do not*** use open flame types of heat to warm pumps.

C. Fill the pump with No.1 or No. 2 fuel oil when it is to be out of service, even for a short period of time, to ensure a free start up.

D. Flush out pump and circulating system lines and leave drain plugs open during periods when the equipment is not in service.

E. Protect pumps, valves, and lines from freezing in winter. Drain pumps or fill them with antifreeze according to the pump manufacturer's recommendation.

F. Haul liquid asphalt materials in truck transports equipped with baffle (surge) plates to prevent sloshing.

G. Pump with the suction line placed at the bottom of the storage tank to minimize contamination from skinning that may have formed.

H. Place inlet pipes and return lines at the bottom of storage tanks to prevent foaming.

I. Avoid repeated pumping and recycling since the viscosity may drop and air may become entrained, causing the emulsion to be unstable.

J. Mix emulsions by circulation prior to application if they have been in prolonged storage.

K. Remember that emulsions with the same grade designation can be very different chemically and in performance.

L. Guard against mixing different classes, types, and grades of emulsified asphalt in storage tanks, transports, and distributors. Because it is hard to visually determine the difference between various emulsified asphalts, always make a trial blend of the newly delivered emulsion with the stored emulsion before pumping off. Check the trial blend for compatibility.

M. Use warm water for diluting emulsified asphalts and always add the water slowly to the emulsion (not the emulsion to the water).

N. Check the compatibility of the water with the emulsion by testing in a flask before diluting grades of emulsified asphalt.

OPERATION SECTION

OPERATION

SYSTEM DESCRIPTION

The **ROSCO RA-300 PATCHER** consists of a combination of equipment mounted on a tilt cab, mid-size truck. This equipment may be viewed as three systems working together to produce the road repair or patch. A thorough understanding of these three systems is required for the proper operation and general maintenance of the RA-300 Patcher. The three systems are:

1. The Hydraulic System
2. The Aggregate Delivery System
3. The Asphalt Delivery System

1. The **Hydraulic System** provides power and control of Patcher functions. The system consists of:

A. Two (2) hydraulic pumps
B. Five (5) solenoid valves
C. Five (5) hydraulic cylinders
D. One (1) solenoid relief valve
E. One (1) double selector valve
F. Hydraulic oil reservoir tank and filter
G. The electric controls in the truck cab.

The hydraulic pump is PTO-driven off the transmission. The rear pump produces power to move the front discharge boom (to position and place patching materials), to power the rock slide gate feeder (to interject aggregate into the material delivery line), to raise and lower the aggregate tank lid (in order to load aggregate). Discharge boom and slide gate hydraulic functions are controlled by five (5) electric solenoid valves with switches in the truck cab.

The front pump powers the blower. The blower speed is controlled by a proportional valve. Maximum speed is reached at an engine speed of 1000 rpm.

2. The **Aggregate Delivery System** provides storage of aggregate and its delivery to the mixing nozzle mounted at the front of the boom. The system consists of:

A. Aggregate hopper
B. Slide gate feeder
C. High volume, low pressure, lobe type blower
D. Muffler
E. Delivery hose
F. Telescoping discharge boom
G. +/- Gate set control

Appropriate sized, relatively clean aggregate is loaded into the aggregate hopper (see Section 4 - Material Considerations). The blower pressurizes the hopper, then the slide gate feeder introduces the aggregate into the pressurized delivery hose. The high volume air produced by the blower first passes through the muffler and then propels the rock through the feeder and out the delivery hose on the boom.

3. The **Asphalt Delivery System** provides storage of liquid asphalt and its delivery to the mixing nozzle on the boom. The system consists of:

A. Insulated storage tank
B. Immersion type heating element
C. Insulated delivery line
D. Remote operation from truck cab
E. Mixing nozzle
F. Flush system

System Description (cont.)

Liquid asphalt is loaded into the storage tank, which in turn is pressurized. This emulsion is forced down the delivery line, through the asphalt valve and out to the mixing nozzle on the boom. At the mixing nozzle, the asphalt is forced through spray nozzles to coat the passing aggregate. The flush tank is filled with solvent (diesel fuel or other suitable solvent). By changing the position of the three-way valve located on the driver's side (under the asphalt tank), solvent can be forced through the delivery lines to clean out the asphalt delivery system.

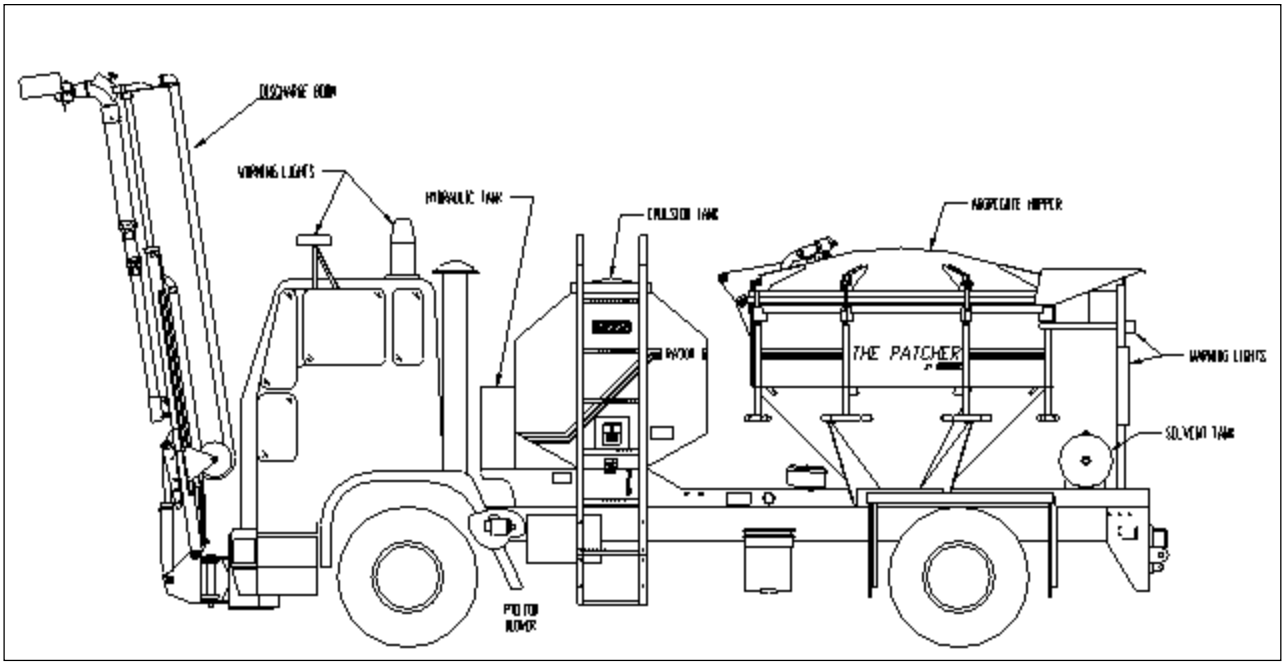


Figure 5-A
ROSCO RA300 - The Patcher

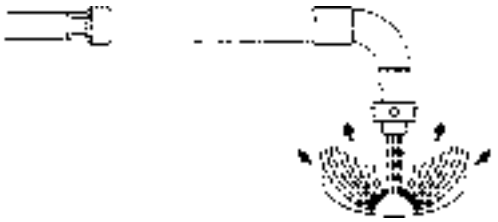
THEORY OF OPERATION

The ROSCO RA-300 Patcher was designed to provide an alternative to conventional methods of pothole patching. By understanding the method and procedures of its operation, Patcher owners and operators will discover that this machine can be used anywhere asphalt patching is needed: potholes, highway cracks, bridge approaches, eroded areas, parking lots and many other applications.

The Four Basic Steps of Patching With The RA-300 PATCHER:

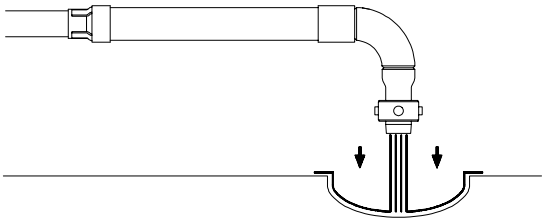
CLEAN

The Patcher's telescoping discharge boom is placed over the pothole or patch area. Dust, dirt, water and debris are removed with high velocity air provided by the blower.



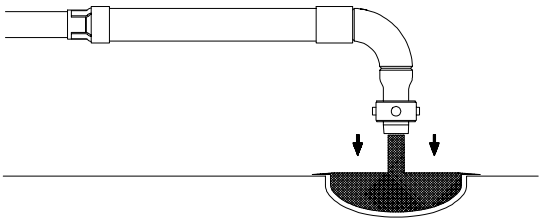
TACK

Liquid asphalt is blown into the clean hole, lining the sides, filling cracks and fissures, and providing a "glue" for the patch material. All edges are sealed to produce a seamless patch.



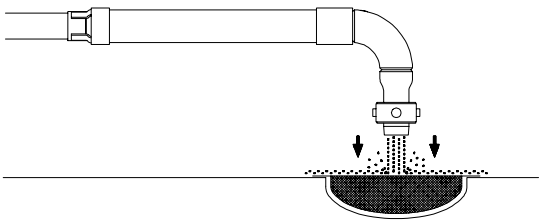
FILL and COMPACT

Aggregate is coated with liquid asphalt in the mixing chamber and blown at high velocity into the hole simultaneously, compacting the patch from the bottom up. This action provides a dense and durable patch. ***Note:*** *Do not crown the mix. This will result in a hump that will not compact out.*



DUST COAT

Finally, a protective "dust coat" of aggregate is applied to the patch area. This completes the process and traffic can immediately drive over the patch without damage to it or to passing vehicles.



PRE-START & ASPHALT HEATING

Pre-Start Instructions

1. Fill the **Aggregate Hopper** with relatively clean aggregate. Aggregate that is too large or contains excessive fines (dust) will negatively affect the patching process. Refer to **Material Considerations**, section 4 in this manual, for more information on selecting aggregate. Instructions for operating the Aggregate Hopper lid can be found on the decal attached to the Selector Valve housing (see Figure 5-B). A copy of this decal is shown in Figure 5-C

2. Fill the **Asphalt Tank** to the desired level with high quality liquid asphalt. Refer to **Material Considerations**, section 4 in this manual, for more information on selecting emulsions or other liquid asphalts.

CAUTION: *The Air Regulator Valve, located between the asphalt tank and the aggregate hopper must be closed before opening the Vent Valve to relieve tank pressure prior to filling. Failure to do so can lead to loss of truck brake pressure.*

DO NOT OVER FILL. Leave at least 4 to 5 inches for expansion when heated. For best results, fill the asphalt tank daily. This will reduce sludge build-up on the inside of the tank.

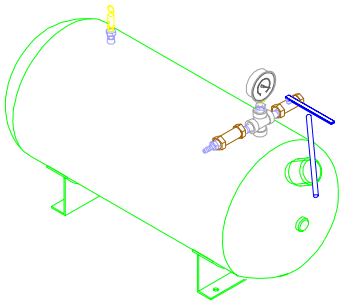
DANGER: *Vent Valve lever (ball valve) on top of tank must be opened and <u>All</u> pressure relieved <u>Before</u> opening or filling the tank. Pressure gauge near the Vent Valve must read 0 (zero) psi.*

ATTENTION: *The Asphalt Tank must be cleaned thoroughly before switching types of emulsion or liquid asphalt.*

3. Fill the **Flush Tank (Solvent Tank)**, located at the rear of the aggregate hopper, with solvent. Keep the solvent tank full so that the lines can be cleaned at any time.

CAUTION: *The Air Regulator Valve, located between the asphalt tank and the aggregate hopper, must be closed before opening the Vent Valve to relieve tank pressure prior to filling. Failure to do so can lead to loss of truck brake pressure.*

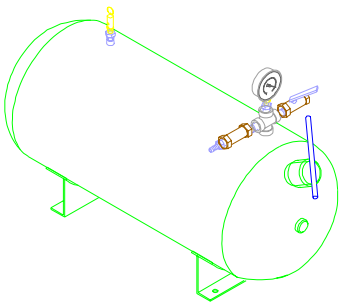
DANGER: *Vent Valve lever (ball valve) on top of tank must be opened and <u>All</u> pressure relieved <u>Before</u> opening or filling the tank. Pressure gauge near the Vent Valve must read 0 (zero) psi. (See Figure 5-J below.)*



Closed Position - Lever must be in this position to pressurize the Flush (Solvent) Tank. This interfers with the tank fill cap so it cannot be opened when pressurized.

Figure 5-J
Flush Tank Ball Valve Lever Positions

Open Position - Lever must be in this position to relieve pressure in the Flush (Solvent) Tank before opening or filling.



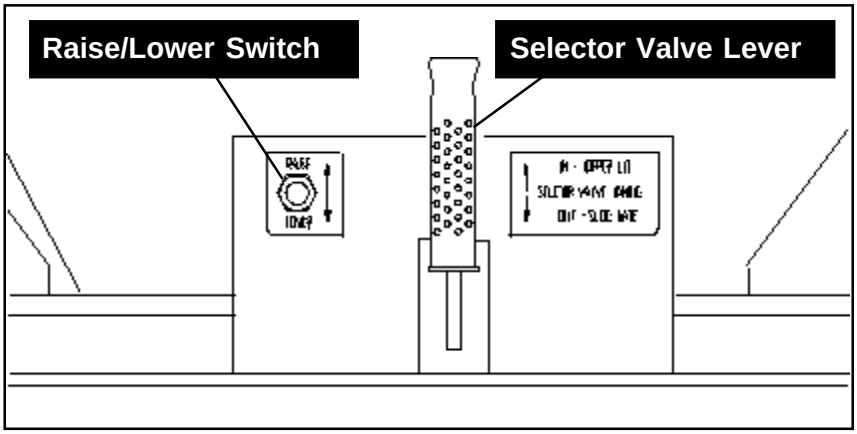


Figure 5-B
Control Valve, Aggregate Hopper Lid & Slide Gate Operation
Located on Passenger Side of RA-300

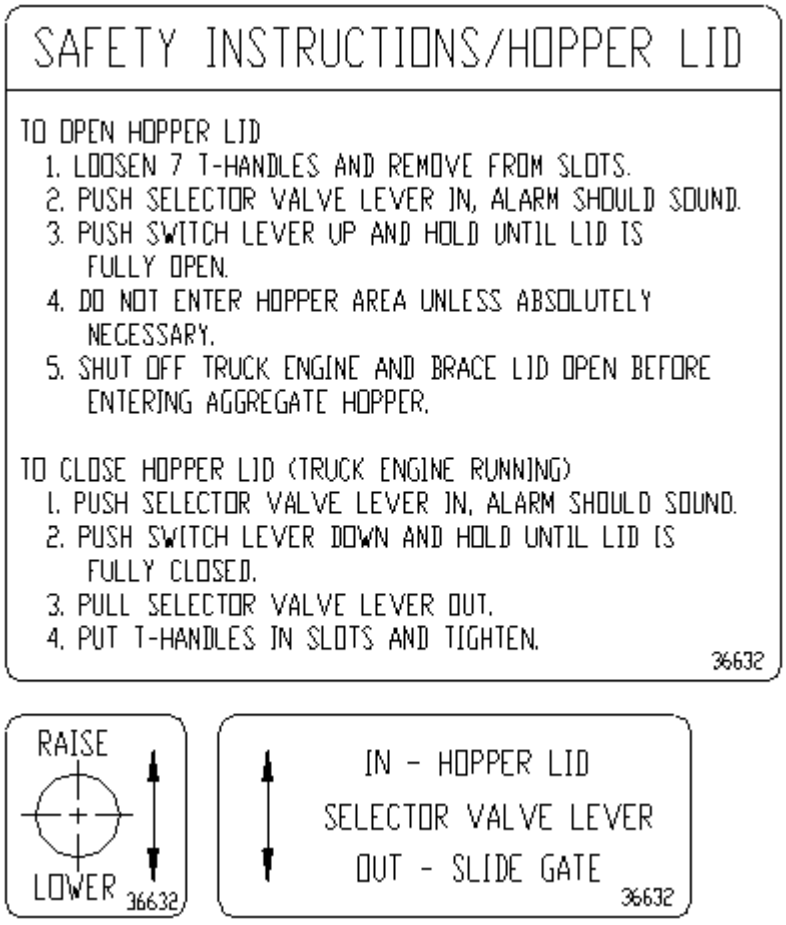


Figure 5-C
Instructions Decal, Hopper Lid & Slide Gate Operation

Pre-Start Instructions (cont.)

4. Be sure **Vent Valves** on the Asphalt and Flush Tanks and the **Air Regulator Valve** are set back to their normal operating positions. Also, open both **Asphalt Supply Valves** at the discharge nozzle.

5. After the Aggregate Hopper, Asphalt Tank and Flush Tank have been filled, the Patcher is ready to operate.

6. Pressurize the Asphalt and Flush Tanks by turning "*ON*" the **Air Shutoff Valve**, located on the driver's side frame of the truck. The gauge on the **Air Regulator Valve** should read 60 psi when tanks are fully pressurized.

CAUTION: *After flushing the system, close the air shutoff valve and move the flush tank ball valve to the open position to relieve the Flush Tank pressure. Some solvents are flammable and when pressurized could explode and/or create a fire hazzard if the tank is punctured.*

Liquid Asphalt Heating - General

The RA-300 Patcher is equipped to heat liquid asphalt by using ordinary 120 volt AC household current. The temperature of the asphalt can then be maintained in the field using heat generated from the engine's liquid cooling system.

Spraying Temperatures - Determine the proper application temperature for the grade of asphalt being used from the chart that follows, and set the thermostat control to this temperature BEFORE going on with heating procedures.

DANGER: *HEATING LIQUID ASPHALTS CAN BE DANGEROUS and if done improperly, can cause serious personal injury. Refer to Section 2, Safety Considerations, before attempting to heat liquid asphalts.*

WARNING: *DO NOT EXCEED THE RECOMMENDED ASPHALT TEMPERATURES. Serious personal injury may result. Refer to the recommendations in the "Asphalt Spraying Temperatures" section that follows.*

Asphalt Spraying Temperatures

The highest temperature used for spraying should be that at which no fogging occurs when the asphalt material leaves the discharge nozzle.

Emulsified Asphalts

Type & Grade	Fahrenheit	Celsius
RS-1	70° -140°	21° - 60°
RS-2	125° -185°	52° - 85°
MS-1	70° -160°	21° - 71°
MS-2	70° -160°	21° - 71°
MS-2h	70° -160°	21° - 71°
HFMS-1	70° -160°	21° - 71°
HFMS-2	70° -160°	21° - 71°
HFMS-2h	70° -160°	21° - 71°
SS-1	70° -160°	21° - 71°
SS-1h	70° -160°	21° - 71°
CRS-1	125° -180°	52° - 82°
CRS-2	125° -180°	52° - 82°
CMS-2	70° -160°	21° - 71°
CMS-2h	70° -160°	21° - 71°
CSS-1	70° -160°	21° - 71°
CSS-1h	70° -160°	21° - 71°

Electric Heating System

The material in the asphalt tank is heated by two electric AC elements, immersed in the engine cooling system coolant, one at either side of the tank.

The temperature control is located at the left side of the asphalt tank, under an access door (*see Figure 5-D below*). Refer to the "*Asphalt Spraying Temperatures*" chart in this section for desired emulsion temperature or check with your emulsion supplier. To set the temperature control, use a small screwdriver to move the temperature control pointer to the desired temperature. The numbers on the temperature control indicator on a standard unit indicate degrees Fahrenheit.

The element indicator light will come on during the heating cycle. The electrical plug can be connected to a standard 120 Volt minimum 20 amp AC outlet.

Electric Heating System (cont.)

Normally, the heater elements are adequate for heating. However, in cold weather conditions the patcher may need to be parked inside a warm building to warm the asphalt more quickly.

DANGER: *When using the RA-300 electrical heating system, use only with a plug protected by a Ground Fault Interrupt (GFI) circuit.*

Operation in Cold Climates

The spray patchers manufactured by ROSCO are designed for normal operation at temperatures of 40° F (4° C) or higher. The machines can be used successfully at colder temperatures with special considerations to the following items:

Freezing aggregate - The RA-300 can be equipped with an optional aggregate heating system that will warm frozen rock in the machine.

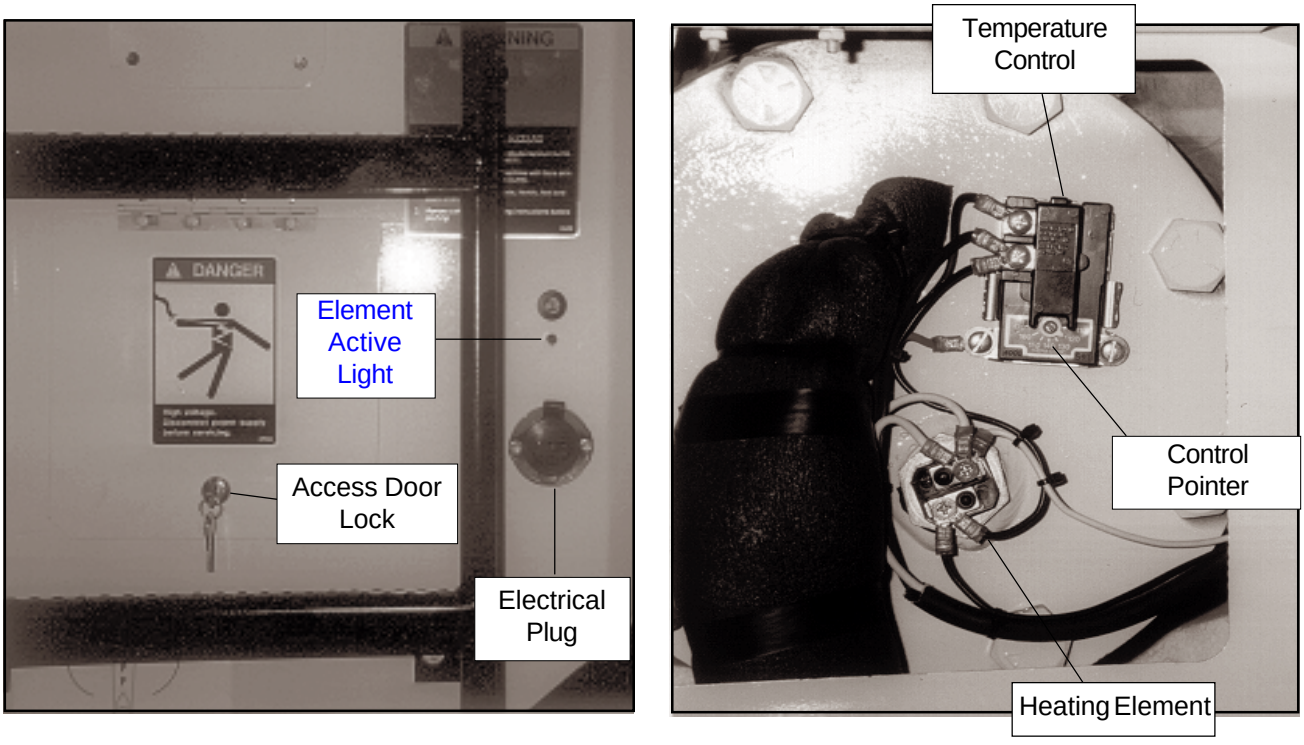


Figure 5-D
Electric Heater Temperature Control

Operation in Cold Climates (cont.)

Emulsion types - Special emulsions may be needed for operation below freezing.

Patch quality - Patches made below freezing are subject to many conditions that lower the quality of the patch. Some but not all conditions include ice in the pothole, freezing of the emulsion before it breaks, cooling of the emulsion and operator experience.

The RA-300 has made patches at temperatures as low as -15° F (-26° C). The life of these patches, on average, is less than those made at 40° F (4° C) and above, but compare well to other patching techniques.

Combating Poor Visibility

Increasingly, asphalt maintenance equipment is being used during less than ideal light conditions such as fog, smog and at night. Usage during these and similar types of conditions presents safety hazards to workers, bystanders and passing traffic. People can be injured or killed by the equipment, passing traffic or from driving into ditches, holes, down embankments or into other obstructions.

WARNING: *When operating the machine under less than ideal light conditions, equip the unit with special lighting. Such lighting will help prevent serious injury and death as well as machine and property damage.*

To help combat these hazards, the Patcher must be equipped with front and rear lighting options as well as back-up lights. Equipment must also have shielded, rotating beacons. The shielding prevents loss of visibility to the operator caused by eye strain. Use conspicuous reflective tape on the sides of all machines that may be used at night. Be sure all personnel wear reflective vests. Install impact barriers (movable or stationary) to protect the workers from traffic and to help direct the traffic flow away from any road hazards.

RA-300 PATCH ON THE GO

Some customers want to use the RA-300 to patch long cracks up the pavement while creeping ahead slowly. This requires a hydraulic system that acts independently of the truck engine rpm. To accomplish this the RA-300's hydraulic system is powered one of two ways:

1. The **Auxiliary Engine** is a separate engine that powers the hydraulic system independently of the truck engine. The patching procedure is the same as the standard machine with the added ability to control the auxiliary engine rpm during blow-out of the hole.

2. Hydraulic **Patch-On-The-Go** is the result of a modified hydraulic system which allows the air blower to operate at a high rpm when the truck engine is at low rpm. A large hydraulic pump and modified PTO were incorporated which gives enough flow to blow the patch out when the truck engine is at low rpm. An electrically controlled hydraulic flow control valve (item "S" in figure 5-F) holds the blower speed constant and independent of the truck engine rpm.

To operate the Patch-On-The-Go, use the rheostat on the center console (item "S" in figure 5-F) to set the air for optimum movement of the aggregate being used. Once set, this is not changed until a different size rock is used. To get more air to blow out the hole, move the Air Speed switch (item "H" in figure 5-E) on the console of the joystick to "Blowout". For coating the inside of the hole and patching, move the switch back to "Patch".

Because the pump on the machine is so large, it would produce too much hydraulic flow and hydraulic heat at higher engine rpms. The PTO disengages at 1300 rpm and will reengage at 900 rpm. Therefore, all patching should be done at engine rpms around 1100.

USING THE CONTROLLER

General

Your unit is equipped with a joystick styled controller. The instructions that follow will explain how the controller works and how to control flow of rock and emulsion. The relay panel for the controller is located behind the passenger seat of the truck. Be sure there is a secure connection between the controller and the relay panel.

Become familiar with your controller and the general working of the unit before attempting any patching work.

The Joystick Controller (refer to figures 5-E, 5-F, 5-G)

The joystick is mounted on a pedestal on the driver's right side. The controller uses rocker switches and a joystick to control the rock flow, the emulsion flow and the movement of the boom.

1. The hydraulic pump must be engaged to run all hydraulic functions of the RA-300. To start the pump, push the **Mode** button **(P)** on the Transmission console. A red light will appear on the Transmission console **(R)** and on the Gauge panel **(R)**. To stop the the hydraulic functions, push the **Mode** button **(P)** again.

2. To start the blower push the **Blower 1/O** switch **(E)** to the "*1*" position. The speed of the blower is controlled by rotating the **Air** knob **(S)** on the Gauge panel. The blower is at maximum capacity with engine rpm at 1000. The blower will not put out any more air above 1000 rpm and the PTO will disengage at 1300 rpm. To stop the blower, push the **Blower 1/O** switch **(E)** to the "*O*" position.

3. The **Air Speed** switch **(H)** controls the mode operation of the blower. The turtle indicates the Patching Mode and the rabbit indicates the Blowout Mode. Air speed is controlled by the **Air** knob **(S)**. Maximum blower speed is obtained in Blowout Mode.

The Joystick Controller (cont.)

4. The beacon is activated by pushing the **Beacon 1/O** switch **(F)** to the "*1*" position, and turned off by pushing the rocker switch to the "*O*" position.

5. The boom is controlled with two items. The **Joystick (D)** controls the motion of the boom from side to side and also the in and out telescoping of the boom. The **Boom Up/ Down** switch **(C)** controls the up and down movement of the boom by repeated brief toggles in the desired direction.

6. The rock flow is controlled by two switches. The first switch is the **Rock On/ Off** switch **(K)** which is located on the left side of the **Joystick (D)**. This switch is activated by pressing and holding the switch UP to open the gate and start the rock flow. Press the switch DOWN and hold it to stop the flow and close the gate. A red light **(T)** indicates the rock gate is open.

The second control switch is the **Rock Flow +/-** switch **(G)** which will increase or decrease the amount of rock flow only when the gate is open. This switch is a momentary switch. Increase or decrease the amount of rock by pressing the switch briefly in the desired direction and then releasing.

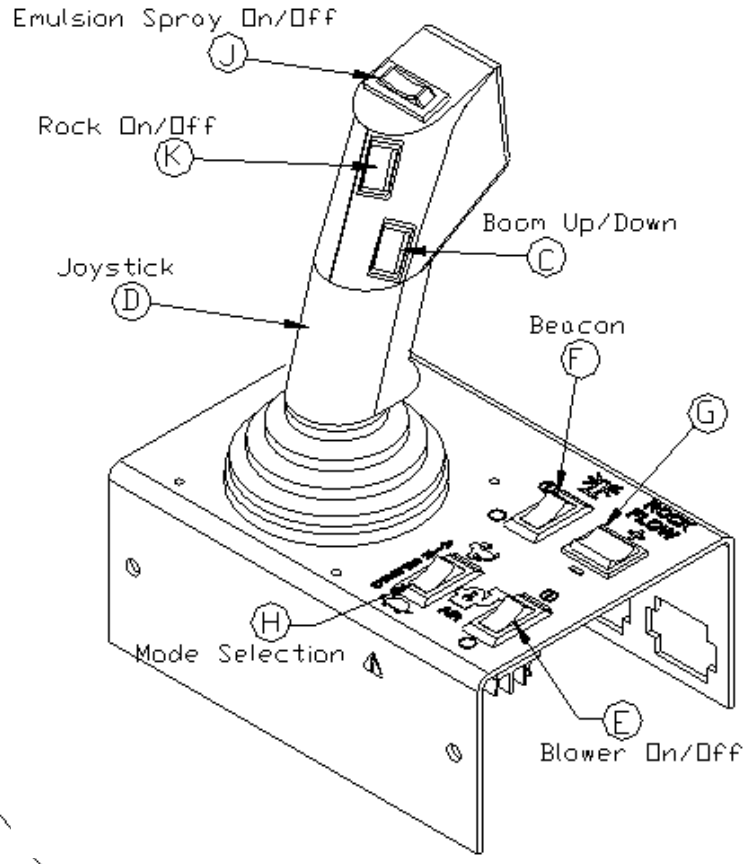


Figure 5-E
Joy Stick Controller

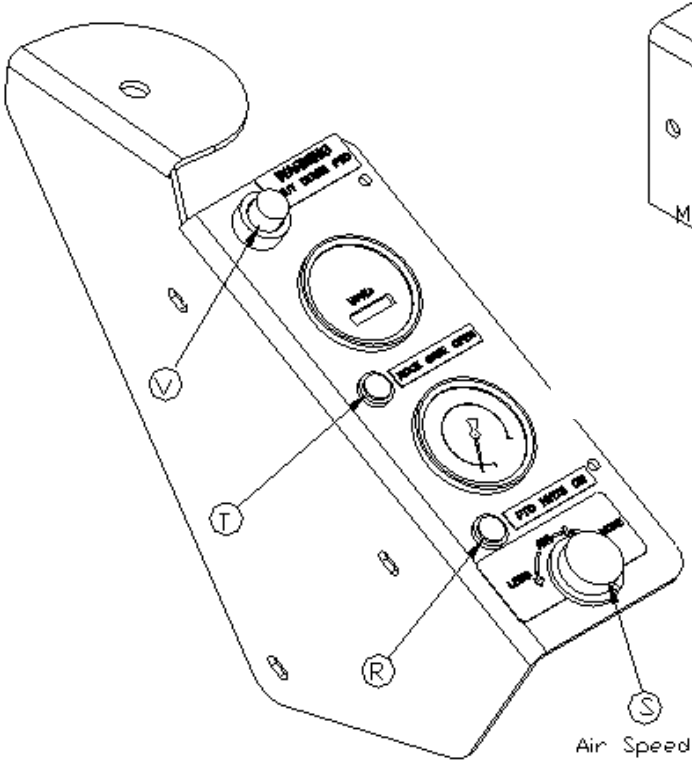


Figure 5-F
Gauge Panel

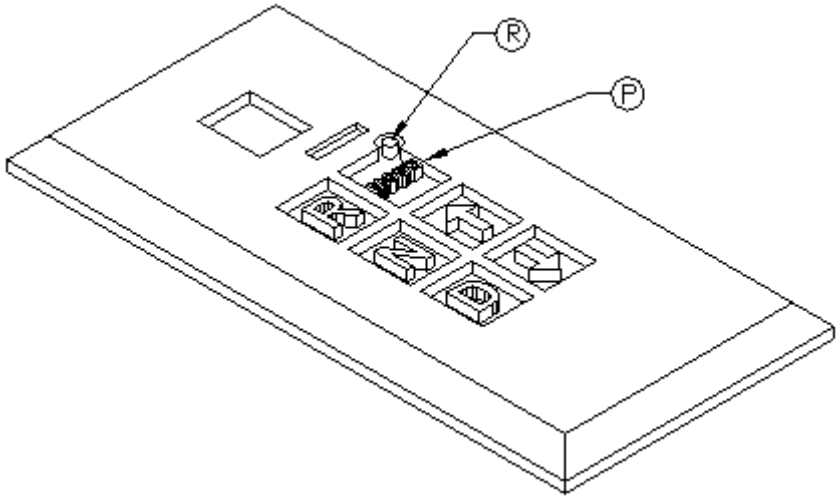


Figure 5-G
Transmission Panel

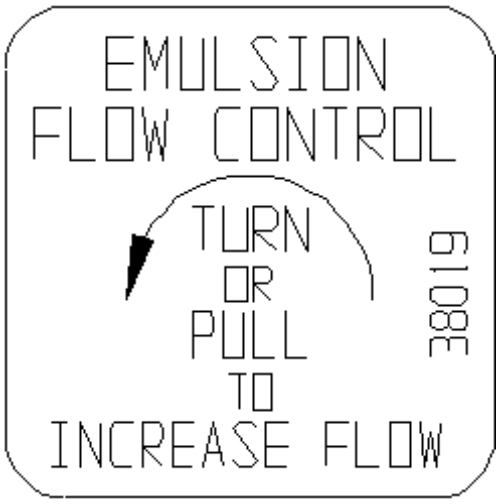
The Joystick Controller (cont.)

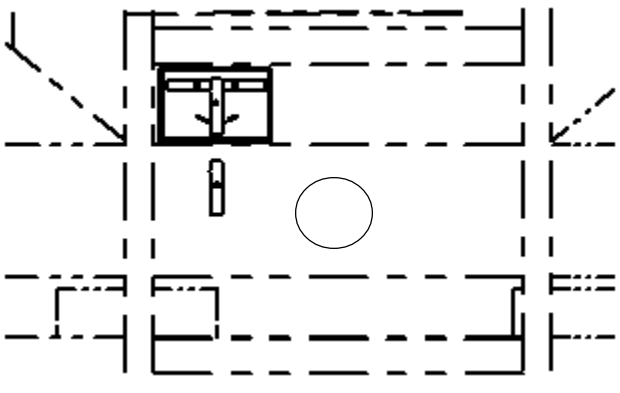
When setting the rock flow, you should first close the gate by pressing DOWN and holding the **Rock On/Off** switch **(K)**. Then press the **Rock Flow +/-** switch **(G)** to minus(-) to fully stop any rock flow. Now open the rock gate by pressing UP and holding the **Rock On/Off** switch **(K**). Press the **Rock Flow +/-** switch **(G)** to plus (+) in small increments until the desired rock flow is reached. It will take about 4 seconds after each increase or decrease to notice the change.

7. The emulsion flow is controlled by the **Emulsion Spray** switch **(J)** on the top of the **Joystick (D)** and a vernier cable, located on the lower left side of the truck dash. The cable should be used to regulate your flow, and the switch **(J)** should be used to turn the emulsion on and off.

Emulsion flow is regulated by pressing the knob on the cable and moving the cable in and out. After optimum flow is achieved, turn the knob on the vernier cable to fine tune the flow further. See diagram opposite of decal #38019. Refer to Parts Section for further details and diagram of the vernier cable. To stop the flow, hold the **Emulsion Spray** switch to the left.

8. The **Warning** light **(V)** indicates the hydraulic system is overheating and the PTO should be shut down until the heating problem is solved.





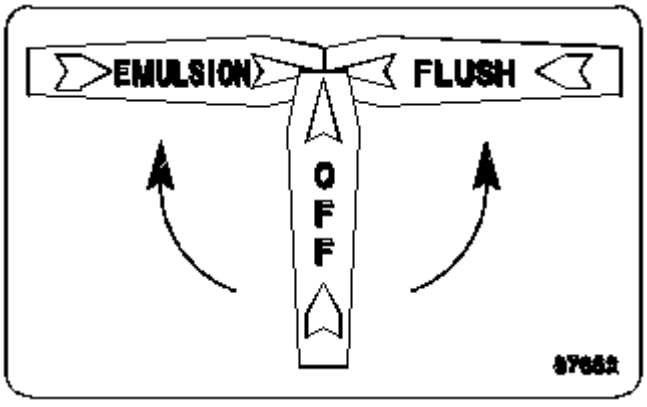


Figure 5-H
3-Way Valve Location and Decal Detail. Driver's Side of RA300

PATCHING INSTRUCTIONS

General

In the following patching instructions, components and system controls of the RA-300 Patcher are illustrated in **Figures 5-E, 5-F, 5-G and 5-H** on the previous pages. Letters inside parentheses refer to item letters on those illustrations.

ATTENTION: *At the beginning of each day, the "solvent" must be emptied from the emulsion line. This procedure should be done as close to the job site as possible to prevent the set up of new asphalt in the nozzle. With the* ***3-way Valve (B)*** *on the asphalt tank in "Emulsion" position and the* ***Blower 1/O*** *switch* ***(E)*** *at "O", place the waste catch bucket under the nozzle and be sure that both asphalt supply valves at the discharge nozzle are open. Press the* ***Emulsion Spray*** *switch* ***(J)*** *"ON" (to the right). When all solvent is removed and liquid asphalt begins to flow from the nozzle, press the* ***Emulsion Spray*** *switch* ***(J)*** *"OFF" (to the left) to stop the flow. Cover waste catch bucket and store on left side of the truck. If you must travel to the job site, cap the discharge nozzle and move the boom to the travel position and lock in upright position.*

Preparing to Patch

1. Position the truck behind the pothole or patch area.

2. Turn on the beacon and directional signal control with the **Beacon** switch **(F)** to warn traffic to go around the truck.

3. Set the truck parking brake and put truck transmission in *"Neutral"*.

4. Engage the PTO(s).

For Manual Transmission: Depress the clutch and engage hydraulic drive by pressing the **Mode** button **(P)** on the Transmission console. The PTO lights **(R)** on the Gauge panel and the Transmission console will light up when it is engaged.

For Automatic Transmissions: You may have to put the transmission in *"Drive"* with the brakes locked to stop the spinning of the gears before engaging the PTO as above. Put the transmission back in *"Neutral"* before PTO's are engaged.

5. Unlock the boom travel locks and lower the discharge boom. Using the **Boom Up/ Down** switch **(C)** and the **Joystick (D)**, bring the discharge boom and nozzle down so the nozzle is positioned directly over the pothole at a height of 12 - 14 inches (30.5 - 35.5 cm). Remove the nozzle cap. Check that both asphalt supply valves at the discharge nozzle are open.

Preparing to Patch (cont.)

ATTENTION: ***Be sure to lower the boom*** *before swinging in either direction to avoid possible damage to the truck.*

6. Set the engine rpm at 1000. Be sure the machine is in "*Neutral*" and the park brake is set. Raise the rpm to the desired level and lock it in by pressing the Fast Idle button on the center truck dash.

Cleaning Out the Hole

1. Engage the blower by pressing the **Blower 1/O** switch **(E)** to the *"1"* position and moving the **Air Speed** switch **(H)** to "*Blowout*" position. Refer to **Preparing to Patch - Step 4**. Clean out the hole using the **Joystick (D)** to move the nozzle around the entire pothole area and a 4 - 6 inch (10 - 15 cm) border area around the pothole edge.

Cleaning Out the Hole (cont.)

2. The hole can be damp, but should have very little freestanding water in it. If there is water in the hole extra emulsion is needed to be sure the oil is not diluted.

Tack Coating the Hole

1. Raise the discharge nozzle to a patching height of 24 - 48 inches (61 - 122 cm) above the hole by pushing the **Boom Up/ Down** switch **(C)** in the "*UP*" direction. Move **Air Speed** switch **(H)** to "*Patch*" position and adjust speed.

2. Push the **Emulsion Spray** switch **(J)** "*ON*" (to the right). Regulate the emulsion flow using the knob on the vernier cable, located on the lower left side of the truck dash. While holding the knob down, push and pull the cable to adjust the flow. Fine tune the flow by turning the knob. Begin spraying the edges, sides and bottom of the pothole using the **Joystick (D)**. The liquid asphalt should be carried out of the nozzle in a mist.

3. If excessive dribbling occurs, try one or more of the following:

a. Increase the truck engine speed (blower speed) slightly for more air flow.

b. Check that both emulsion line valves on the discharge boom, near the nozzle, are completely open.

c. Slightly close off the **Emulsion Spray** switch **(J)**, or in some cases, open it more. Dribbling can occur because of too much asphalt spray or not enough asphalt spray to properly mix with the air stream.

d. Clean the emulsion spray nozzles (inside the discharge nozzle). Emulsion spray nozzles can be cleaned by flushing with solvent, applying hot air to their exterior, or unplugging with a pick. You can also close off one nozzle which will

Tack Coating the Hole (cont.)

build pressure on the other side to force the material out, and then reverse the order.

e. Replace emulsion spray nozzles.

f. Increase air pressure at the regulator. This increases discharge pressure in the emulsion tank and at the spray nozzles.

g. Increase the liquid asphalt material temperature.

NOTE: In general, the Blower speed and Asphalt Tank pressure should be set as low as possible, yet high enough to produce a good asphalt spray coverage.

Filling the Hole

1. After the hole is tacked, activate the aggregate delivery system by depressing the **Rock On/Off** switch **(K)**. Do this while the **Emulsion Spray** switch **(J)** is *"ON"* (to the right) so that liquid asphalt will coat the aggregate as it emerges from the nozzle.

NOTE: There is a slight delay of three to four seconds in aggregate flow to the nozzle, so the **Rock On/Off** switch **(K)** should be activated in advance of need.

2. Adjust the rock flow with the **Rock Flow +/-** switch **(G)**. For instructions on how to adjust the rock flow see directions on page 5.10.

3. To insure an even patch, move the nozzle around the damaged area while repairing the pothole. A proper asphalt/ aggregate mixture can be maintained by adjusting the **Emulsion Spray** switch **(J).**

4. Using the vernier cable and the **Emulsion Spray** switch **(J),** adjust the flow so that only a slight covering of asphalt is applied to the aggregate. The normal tendency is to apply too much asphalt, which

Filling the Hole (cont.)

causes slowed curing rates and is a waste of materials. The final appearance should be a darkly mottled or heavily speckled patch, but not quite entirely black.

Each operator tends to develop certain techniques that work for his/her individual needs. The following suggestions may be helpful in establishing your technique.

a. Fill large shallow holes from the furthest point out and work towards the machine in semi-circular arcs.

b. Large deep holes may be patched by filling the deepest point of the hole first and then working outwards, building a slight ledge or shelf to build successive layers upon.

c. If you find the surface of the patch is uneven, try one of the following solutions to correct the problem:
* raise the boom a little higher,
* increase the air speed **(S)** or
* slightly decrease the rock flow.

d. If excessive rock bounce is encountered, reduce blower speed and/or raise the discharge nozzle away from the surface of the patch. More asphalt may also be needed to help the material stick together and to the patch.

e. Poor coating of the aggregate may be caused by several things. The rate of the aggregate flow may be too fast (near or above 150 lbs/min), the emulsion pressure may be set too high, or the rock is too large and does not coat well.

To correct these problems, try slowing down the aggregate flow and keep the nozzle moving. If too much emulsion pressure is the problem, reduce the air pressure. If the rock is too large, try using smaller rock.

Filling the Hole (cont.)

f. **Do not overfill the pothole.** The natural tendency is to fill the pothole slightly above level to allow for traffic compaction. This is not necessary. The pothole should be filled flush to the existing road surface. Extra fill will create a rough spot in the road surface.

5. Compaction of the patch in the pothole occurs by the impact as the material is applied (see *"Theory of Operation"*). No other compaction is necessary, however, compaction won't hurt this type of patch. Compaction will provide a more finished appearance, and should be done after applying a dust coat to the patch as outlined in this section.

Dust Coating the Patch

1. Push the **Emulsion Spray** switch **(J)** *"OFF"* (to the left).

2. Elevate the discharge nozzle slightly and lightly cover the patch with dry aggregate. The purpose of the dust coat is to help prevent the tires of passing vehicles from picking up asphalt.

3. Push the **Rock On/Off** switch **(K)** *"OFF"* (down) to stop the flow of aggregate.

4. Raise the discharge boom to travel position or near vertical position.

NOTE: Some dribbling from the nozzle occurs which may get on the truck cab. Cap the discharge nozzle if traveling a long distance or traveling at highway speeds.

5. Slow the truck engine speed and/or depress the clutch and turn off both PTOs by pressing the **Mode** button **(H)** and pushing the **Blower 1/O** switch **(E)** to *"O"*.

6. Drive the Patcher slowly at low engine rpm to the next hole.

Stopping Application

When stopping the patching operation for any extended period of time (10-20 minutes), it is advisable to clean out the asphalt delivery system.

To Clean the Asphalt Lines:

1. Turn the **3-way Valve (B)** on the asphalt emulsion tank to *"Flush"* position.

2. Position the waste catch bucket below discharge boom nozzle.

3. Push the **Emulsion Spray** switch **(J)** to the right to start the solvent circulating through the system.

4. Push the **Emulsion Spray** switch **(J)** *"OFF"* (to the left) when solvent begins to spray from the nozzle instead of liquid asphalt.

5. Close both valves on discharge boom nozzle.

6. Reopen one nozzle and then the other to assure that solvent flows from each nozzle and each one is clean.

7. Cap the discharge nozzle.

8. Put cover on the waste catch bucket and store it in the holder on the left side of the truck.

9. Dispose of waste asphalt/emulsion properly at the end of each work day.

NOTE: In some cases waste material can be added back into the asphalt tank.

DANGER: *Vent Valve lever (ball valve) on top of solvent tank must be opened and All pressure relieved Before opening or filling the tank. Pressure gauge near the Vent Valve must read 0 (zero) psi. (See Figure 5-J)*

Aggregate Hopper Clean Out (as needed)

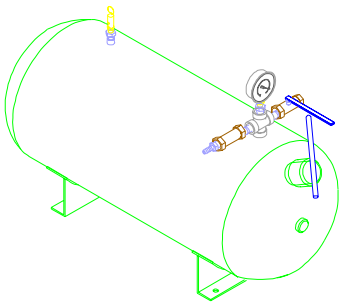
1. Be sure the slide gate is closed before starting cleaning procedure.

2. Remove the cover on the bottom of the aggregate hopper and clean out all accumulated fines and rock.

3. Replace door.

4. Use a high pressure water system to flush the hopper and gate opening.

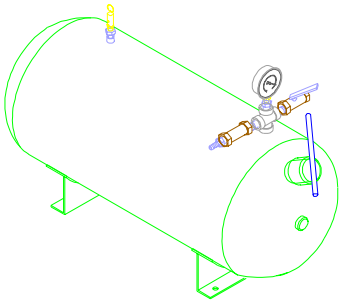
5. When water flushing is complete, turn on the blower to remove any water and debris from the system.



Closed Position - Lever must be in this position to pressurize the Flush (Solvent) Tank. This interfers with the tank fill cap so it cannot be opened when pressurized.

Figure 5-J
Flush Tank Ball Valve Lever Positions

Open Position - Lever must be in this position to relieve pressure in the Flush (Solvent) Tank before opening or filling.



HYDRAULIC PATCH-ON-THE-GO (POG)

General

This feature allows for patching cracks and/or shoulders while the machine is moving. The same steps for good patching previously covered are needed to obtain a good and long lasting patch. The system is designed to operate when the truck is idling. The PTO will disengage at engine rpm above 1300.

Preparing to Patch

1. Place **Air Speed** switch **(H)** in "*Patch*" position. See Figure 5-E.

2. Place **Blower 1/O** switch **(E)** in "*1*" position. This provides power for the blower operation.

3. On the Gauge panel (Figure 5-F), the **Air** knob **(S)** is used to set the air speed of the blower. Adjust this to the desired air flow for your patching application.

4. When you need to blow out the patch area, move the **Air Speed** switch **(H)** to the "*Blowout*" position. This provides maximum air flow for cleaning out the patch area.

Patching Instructions

1. Make a pass over the area to be covered with the blower operating at maximum flow to clean excessive material and/or moisture from the area.

2. Reverse your direction and change the **Air Speed** switch **(H)** to the "*Patch*" mode and apply your emulsion to the area.

3. Move forward and spray the area with a mixture of aggregate and emulsion to fill the patch area.

4. Reverse your direction and apply a cover coat of aggregate. This should complete your patching application.

NOTE: See previous pages for more detail on these four steps.

Rock Gate Adjustment

This feature sets the rock gate opening to the desired flow and will return the gate to the same position when the gate is opened, using the **Rock On/Off** switch **(J)**, at future operations.

After the gate is opened with switch **(J)**, control of the gate opening is managed with the **Rock Flow +/-** switch **(G)**. (See Figure 5-E).

RA-300 AUXILIARY ENGINE OPERATION

Starting the Auxiliary Engine

1. Turn the key clockwise on the engine control panel.

2. Make sure that the engine speed control is turned all the way to the left.

3. Turn the key to the “1” position and pilot light will come on.

4. Push key in and turn further clockwise against spring pressure.
- Position 2: no function
- Position 3: start

5. Turn the key to the “start” position and begin the crank cycle.

6. The engine should begin to turn over and should run on its own. Pilot light will go out.

7. The engine is equipped with a self-priming fuel pump. It may need to crank several times to fill the fuel lines.

8. Once the engine begins to run, move the knob (potentiometer) to increase the speed of the engine.

Determining the Engine Speed for Patching

1. Set engine rpm to approximately 1500 rpm (potentiometer knob in 9 o’clock position).

2. Adjust the **Rock On/Off** switch and/or the engine rpm to get the desired rate of rock flow. NOTE THE KNOB POSITION. Watch the air pressure gauge. It should be 2 to 4 psi. Above 4 psi will plug the rock hose. DO NOT GO OVER 5 psi.

3. Return the engine to idle.

Patching With the Auxiliary Engine

NOTE: Refer to Patching Intructions on page 5.13-5.16 for a more detailed explanation of the patching procedure.

1. To blow water and loose material from hole, increase engine rpm to approximately 2000 rpm (potentiometer knob in 12 o’clock position). Be sure **Rock On/Off** switch is *"OFF"* and **Blower 1/O** switch is in the *"1"* position.

2. After hole is cleaned out, move potentiometer knob to the position determined in step 2 of previous paragraph.

3. Lower engine rpm and proceed with tack coating and filling the hole.

4. Dust coat the patch with dry rock. When this is completed, return the potentiometer knob to the idle position.

5. Move to the next hole and repeat process.

MAINTENANCE SECTION

MAINTENANCE

GENERAL

The suggestions and recommendations contained in this manual for maintenance should be followed to obtain long life and best performance from the RA-300 Patcher. **REMEMBER:** Do not attempt to service or repair major components unless authorized to do so by your ROSCO dealer/distributor. Any Unauthorized Repair Will Void The Warranty.

PROPERLY MAINTAINED EQUIPMENT IS SAFE EQUIPMENT! The operator of the Patcher is responsible for inspecting the machine daily. The operator is responsible for seeing that worn or damaged parts are replaced or repaired to prevent damage to other areas of the machine. Daily inspection of the Patcher should include inspection for missing guards, loose bolts, fluid leaks, worn or damaged hoses, debris or dirt accumulations which could cause a service or safety problem.

A PREVENTIVE MAINTENANCE CHART is included at the end of this section as a guide for establishing a Preventive Maintenance schedule.

A CLEAN MACHINE is the first and most important requirement for satisfactory RA-300 performance. Many failures in the field are due to an accumulation of excess dirt on the equipment, indicating that ordinary adjustments and lubrication have been neglected.

DO NOT MODIFY THE RA-300. Any unauthorized modification may impair the function and/or safety and affect the working life of the equipment. Any unauthorized modifications may void the warranty.

TRUCK MAINTENANCE

Perform all service functions on the vehicle as defined in the truck owner's manual. This will include but is not limited to:

1. Check fuel level. Add as required.
2. Check engine oil level. Add as required.
3. Check coolant level. Add as required.
4. Check transmission fluid and brake fluid levels. Add as required.
5. Check all belts and hoses. Replace as needed.
6. Check the tire inflation pressure.
7. Clean all lights and lenses.

Consult the truck manufacturer's Operation & Maintenance Manual for detailed instructions. A copy of this manual was provided with the truck at the time of its delivery from the dealership.

ALLISON TRANSMISSION

The following is a guideline for programming the Diagnostic Data Reader (DDR):

1. Check ECU program groups and insure that "*Mode*" selection is available. (ROSCO uses Group 70.) This package number may change for different groups. If the group used does not support the "*Mode*" selection, a toggle switch will need to be installed to activate the #118 wire to use the overspeed options in the transmission.

2. PTO Enable - Maximum Speeds:

Engine speed for engagement	900rpm
Engine speed for operation	1300 rpm
Output speed for engagement	900rpm
Output speed for operation	1300rpm

3. When using *"Mode"* selection (group 70), check to insure that wire #112 is enabled.

HYDRAULIC SYSTEM MAINTENANCE

The Patcher hydraulic system consists of a truck-mounted hydraulic gear pump, a five-station valve block with solenoid operated valves, 5 hydraulic cylinders, hydraulic reservoir and filter.

The valve block is the most complex component of the system in that it contains a flow modulating valve, a relief valve, pressure compensated flow control valves and needle valves, in addition to the 12V DC directional solenoid valves. The relief valve should be set at 1500 psi for normal operations but can be reset as high as 2500 psi to free a stuck slide gate. The pressure should always be reset to 1500 psi.

This manual contains general system maintenance guidelines. More detailed service and maintenance information is available directly from the hydraulic component manufacturers if necessary or desired.

Hydraulic Fluid

When adding or changing hydraulic system fluid, refer to the chart on the following page. The use of hydraulic oils or fluids that are not equal to those listed could result in substandard performance or even possible failure of the Patcher's hydraulic components. If you are not sure whether a specific hydraulic oil is suitable for use in the Patcher, consult your authorized ROSCO Dealer/Distributor or if necessary, ROSCO's Factory Service Department.

1. Drain and replace hydraulic oil and filter after the first 100 hours of service, then after every 500 hours of service or seasonally. Use genuine ROSCO replacement parts when changing the filter element. Refer to the *"Preventive Maintenance Chart"* in this manual for additional information.

2. Make certain the level of hydraulic oil is maintained at a minimum of 2 to 2-1/2 inches (5 to 6.35 cm) below the top surface of the reservoir in order to allow for expansion when the oil temperature rises. Use the glass sight gauge on the side of the hydraulic tank as a reference when checking hydraulic oil level. If oil cannot be seen in the glass bubble of the sight gauge, hydraulic oil should be added until the glass bubble of the sight gauge is at least half-full.

Hydraulic System Maintenance (cont.)

USE EXTREME CAUTION WHEN REMOVING THE HYDRAULIC FILLER CAP to prevent any foreign matter from entering the Hydraulic Reservoir.

3. Clean around the reservoir cap and neck thoroughly before removing the cap.

4. Inspect the Patcher before each use for hydraulic leaks. Also, an operator should inspect the machine occasionally during operation for hydraulic leaks which may only be noticeable while the unit is running.

DANGER*: Never use your hand to locate hydraulic leaks. Hydraulic fluid under pressure will pierce the skin and is dangerous. If hydraulic oil has pierced the skin,* ***get immediate medical attention.***

DANGER*: Always wear eye protection when inspecting for leaks in the hydraulic system.*

HYDRAULIC FLUIDS

The below recommended hydraulic oils have been reviewed by ROSCO and are recommended as replacements. It is best to use the heaviest weight oil that can be safely used for the temperature range of machine operation. If your machine will never be used at temperatures below 0° F, we recommend that you use a heavier weight oil.

If you are considering using an oil that is not listed, contact the ROSCO factory to obtain the specifications that the hydraulic oil must meet to provide the needed lubrication and cooling for the unit's hydraulic components.

Hydraulic Oil Requirements and Approved Brands For Field Fill:

DO NOT MIX manufacturers or grade weights when adding hydraulic oil.

Be sure hydraulic oil selection is compatable with your hydraulic system.
Be sure to use mineral base hydraulic oil.
Be sure hydraulic oil selection assistance is from a reputable supplier.
Be sure the hydraulic specifications meet or exceed the following specifications.

Hydraulic oil must provide anti-wear properties that meet or exceed those found in the API (American Petroleum Institute) classification SD, SE or CC crank case oil.

Hydraulic oil viscosity must not fall below 70 SUS (13 cs) in the reservior under the most adverse conditions. The best viscosity being 80 to 300 SUS (17 cs to 65 cs). The viscosity rating at the lowest expected start-up temperature should not exceed 10,000 SUS (2158 cs).

Hydraulic oil must have rust and oxidation inhibitors that will maintain chemical stability. When changing the hydraulic oil, the hydraulic system must be completely drained. Be sure to purge or drain all hoses, cylinders, valves, motors and pumps of hydraulic oil. All hydraulic oil filters must also be changed at this time.

AMBIENT TEMP. *-25° F TO 80° F (-32° to 27° C)*	*AMBIENT TEMP.* *-10° F TO 95° F (-23° to 35° C)*	*AMBIENT TEMP.* *0° F TO 105° F (-18° to 41° C)*
Amoco Rykon 32	Amoco Rykon 46	Amoco Rykon 68
Exxon Univis N32	Exxon Univis N46	Exxon Univis N68
Gulf Harmony 32 AW	Gulf Harmony 46AW	Gulf Harmony 68AW
Mobil DTE 13M	Mobil DTE 15M	Mobil DTE 16M
Phillips 66 Magnus A32	Phillips 66 Magnus A46	Phillips 66 Magnus A68
Shell Tellus 32	Shell Tellus 46	Shell Tellus 68
Texaco 32	Texaco 48	Texaco 68
Chevron MV ISO 32	Mobilfluid No. 424	Conoco 68

PATCHING SYSTEM MAINTENANCE

Aggregate Hopper

The aggregate hopper and slide gate, located at the rear of the patcher, were designed and constructed by ROSCO / A LeeBoy Company specifically for use on this product. The slide gate is the only wear item (in addition to the discharge hose), and it may need to be replaced after 2000 hours of use. Refer to *"Parts Catalog"* in the back of this manual for replacement part numbers.

Air Blower

The RA-300 Patcher is equipped with a medium-pressure air blower. A manual is available to provide detailed service and maintenance procedures. Figure 6-A illustrates maintenance and lubrication points on the blower.

1. Check the condition of the air blower filter prior to each day's use of the Patcher. Clean or replace when restriction indicator (if equipped) shows red or when visual inspection indicates the need. Use genuine ROSCO replacement parts when changing this filter element.

2. To check the oil level of the air blower, remove **Oil Level Plug (E)** and the **Vent Plug (B)** from the gear cover on the back side of the air blower. Add oil to the gear case until oil drips out of the **Oil Level Plug** hole **(E)**. Check the *"Preventive Maintenance Chart"* in this section for air blower oil type.

Air Blower (cont.)

Do not overfill air blower gear case as this will cause excessive heating of gears and may damage the unit.

3. ROSCO recommends changing the oil in the air blower after every 500 hours of operation.

4. To change oil in the air blower:

a. Remove the **Oil Drain Plug (A).**

b. Drain the used oil through the drain port and replace the plug.

c. Remove the **Oil Level Plug (E)** and the **Vent Plug (B)**. Pour fresh oil into the vent hole as required until oil drips out of the **Oil Level Plug** hole **(E)**.

d. To determine the approved oil capacity and type for use in the blower, refer to the *"Preventive Maintenance Chart"* at the end of this section.

A. OIL DRAIN PLUG

B. VENT PLUG

C. GREASE FITTING

D. GREASE VENTS

E. OIL LEVEL PLUG

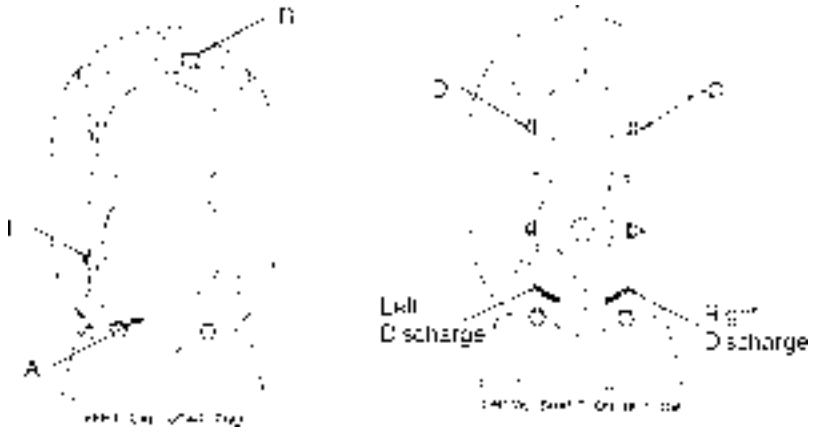


Figure 6-A
Air Blower, Lubrication Points

Air Blower (cont.)

5. Bearings on the drive end of the air blower require greasing every 500 hours of operation. Lubricate the bearings through **Grease Fittings** located at **(C)**. The old grease will be forced out of the **Grease Vents (D)**. To prevent damage to seals, these vents must be kept open at all times.

6. Check blower coupler for excessive wear or looseness every 40 hours or weekly.

CAUTION: ***Always*** *shut off truck engine before inspecting blower drive components to prevent PTO engagement. Serious injury can result from moving hydraulic components.*

Liquid Asphalt (Emulsion) Tank

1. When filling the Liquid Asphalt Tank, always allow 4 to 5 inches minimum free space. This free space will allow room for expansion when the material is heated.

DANGER: *Relieve <u>All</u> pressure in tank by opening vent valve before opening hatch or serious injury will result.*

DANGER: *No smoking should be allowed in the area while filling the asphalt tank. The danger of explosion and severe personal injury exists.*

2. If sludge builds up in the bottom of the Liquid Asphalt Tank, the drain plug should be removed and the tank flushed with steam or cleaning fluid/solvent. Because of the wide variety of liquid asphalts that can be used in the RA-300, the asphalt supplier should be consulted for the proper solvent for each type of asphalt used.

ROSCO recommends cleaning the tank in the above manner if the Patcher will be out of service for an extended period of time.

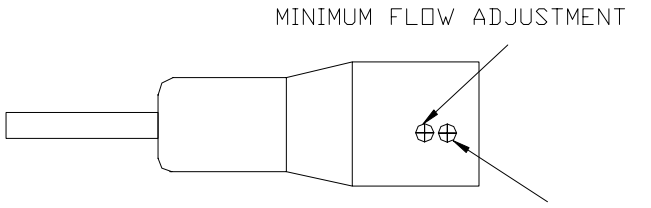
TEST PROCEDURE FOR HYDRAULIC PATCH-ON-THE-GO

1. Check relief valve setting on Proportional valve. The setting should be 2450 to 2500 psi.

2. Check the relief valve setting on the front manifold valve. The setting should be 1450 to 1550 psi.

3. Adjust maximum blower speed. The truck engine should be running 1050 to 1150 rpm. The Air Speed switch should be in "*Blowout*". Adjust the Maximum Flow screw on the amplifier (see detail below) to the Proportional valve so that the blower runs at 2800 to 2850 rpm. No adjustment on the Minimum Flow screw is required.

4. Overspeed should be set at 1300 rpm maximum (disengage) and 900 rpm maximum (engage).



PROPORTIONAL VALVE AMPLIFIER

TESTING PROPORTIONAL VALVE & CONTROL

Testing the Control Panel Connections:

1. Unplug harness at Proportional Valve.

2. With key switch "*OFF*", place Air Speed switch, on the Joystick Controller panel, to "*Blowout*".

3. At the harness, put an Ohm Meter, set on 10K or more, to the following:

a. One lead on the brown pin and one on the gray pin. The meter should read approximately 10,000 ohms.

b. One lead on the orange/yellow pin and one on the gray pin. The meter should read approximately 0 (zero) ohms.

c. One lead on the brown pin and one on the orange/yellow pin. The meter should read approximately 10,000 ohms.

4. With key switch "*OFF*", place Air Speed switch, on the Joystick Controller panel, to "*Patch*".

a. One lead on the brown pin and one on the gray pin. The meter should read approximately 10,000 ohms.

b. One lead on the orange/yellow pin and one on the gray pin. The meter should vary from 0 (zero) to10,000 ohms when the potentiometer in the cab is rotated.

Testing Proportional Valve & Control (cont.)

c. One lead on the brown pin and one on the orange/yellow pin. The meter should vary from 0 (zero) to10,000 ohms when the potentiometer in the cab is rotated.

Testing the Amplifier Card:

1. The card should be unplugged from the harness, but the red wire on the card should be connected to the white wire on the harness. The black wire on the card should be connected to the black wire on the harness.

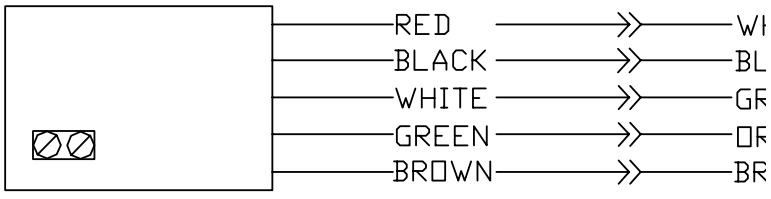
2. Place a jumper between the white and green wires on the Amplifier Card.

3. This will supply full power to the valve when the engine is running at 1000 rpm, with the PTO "*ON*" and the Blower 1/O switch at "1" (*ON*). Adjust the Maximum Flow screw on the amplifier (see detail below) to the Proportional valve to vary the blower speed. No adjustment on the Minimum Flow screw is required.

CAUTION*: Do not overspeed the blower. Maximum rpm is 2850.*

4. You can also check to see if the Amplifier Card is providing proper voltage using a voltmeter attached to the white and brown wires on the Amplifier Card. When the blower and keyswitch are "ON" you should read approximately 5V DC.

NOTE: Harness wire colors may vary among models, but Amplifier Card wires will not vary.



PROPORTIONAL VALVE CIRCUIT

REMOVING BROKEN ASPHALT EMULSION

The following suggestions are for removal of broken ***asphalt emulsion only.*** If you are unsure of the emulsion tank contents, or if the tank contains asphalt cement or cutback, contact an expert for clean out advice.

Asphalt emulsion is considered "broken" when it separates into the components of asphalt and water. The mixture will not flow, and forms layers in the tank. There is usually a watery layer on the top and a gooey mess of asphalt below. A crust will sometimes form over the top of the mixture consisting of a hard black surface with lumps in it. No amount of stirring will recombine the components, so it must be removed and properly disposed of.

Of course, it is best to take all steps outlined in the operator's manual to prevent this from happening, but if it should occur, use the following steps to remove the emulsion from the tank. Allow plenty of time for this process as it will take one to two days to complete.

Causes of Breaking

Asphalt emulsion will break under a variety of conditions. Temperature is a major factor. If the emulsion is allowed to freeze or is heated over 185° F (85° C) the material can break.

Another common cause is the mixing of anionic and cationic grades of emulsions.

The way the mixture is handled can be another cause of breaking. Remember, do not over-agitate the emulsion. Do not allow the water to evaporate off of the emulsion and do not blow air through the emulsion.

Always be sure all emulsion is removed from the tank if the unit will not be used for a long period of time. This will eliminate the possibility of breaking or setting up during storage.

Removing the Broken Asphalt

If the asphalt has broken, add enough water to **cover** the heating elements. Heat the material to 150° F (67° C). The emulsion should be held at this temperature for four (4) to eight (8) hours. This is necessary to allow heat to make the emulsion more fluid. The material should be ready to be drained from the machine.

Connect a five (5) foot piece of 1 inch (24.4 mm) diameter hose with a 212° F (100° C) rating to the drain valve on the emulsion tank. The hose must be equipped with a 1 inch (24.4 mm) male hose barb fitting (P#70036) held on with a #20 worm hose clamp (P#33164) on one end. Connect this end to the emulsion tank drain valve.

Estimate the number of barrels needed to hold the material and have more than enough on hand. This is important because once the draining process has begun, it should be carried out to completion to prevent the material becoming even more difficult to remove.

Pressurize the tank to 65 psi. Open the drain valve very slowly while making sure the hose stays in the barrel. Blow the material out through the hose into the barrels and watch for leaks.

If the emulsion will not pump out, heat the material to 180° F (82° C) and repeat the procedure.

WARNING: *Wear protective gear for face , hands, body, and feet when handling hot material. If hot material touches the skin, flush the area with cool water and get medical attention.*

The emulsion should now be able to be drained. **Handle with extreme care.**

Removing the Broken Asphalt (cont.)

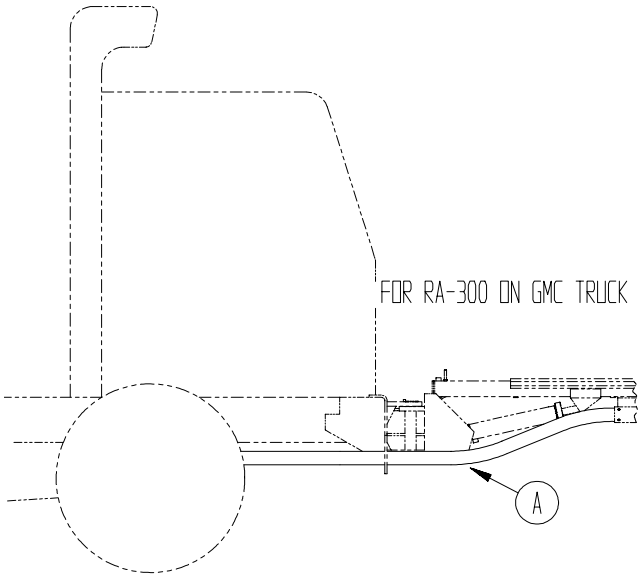
Once the tank is empty, close the drain valve and remove the hose and replug the hole. Then clean the tank according to the procedure in this manual. If, however, the tank cannot be satisfactorily cleaned using the outlined method, call the supplier of the emulsion or material that is in the tank for suggestions on the proper removal of the material.

DANGER: *Do not use flammable liquids to dissolve the asphalt emulsion. These materials are dangerous because they can explode, start on fire or cause asphyxiation.*

AGGREGATE HOSE CARE

To prolong the life of the aggregate hose (A) that connects the aggregate hopper to the boom, rotate the hose at least every 100 hours.

The hose runs from the boom to the rear of the truck.



RA-300 STORAGE

A stored machine requires as much periodic maintenance as a machine at work. Units not in use must receive periodic scheduled maintenance. Many instances of customer downtime and dissatisfaction can be traced to parts that became defective due to inattention during storage.

All units should be stored where they are protected from damage, dirt and adverse weather conditions. All replacement parts, assemblies, component repair parts and service kits should be stored in a dry sheltered area.

The following preventative maintenance procedures should be performed on any units which will not be used for more than two (2) months:

Check for Water in Hydraulic Fluid

Any machine that is stored for an extended period in a climate that has a wide range of temperatures and/or humidity, should have the hydraulic fluid checked on a regular basis for possible moisture contamination. This moisture is generally produced by condensation on the inside of the tank walls.

Hydraulic oil that is contaminated must be drained, the filter elements replaced and the tank refilled with ROSCO approved fluid. Failure to do this could result in premature failure of the pumps and/or motors.

Warm-up and Cycling

Start and run engine until warm. Cycle all hydraulic and/or hydrostatic functions until all components are warm and the hydraulic fluid is up to operating temperature.

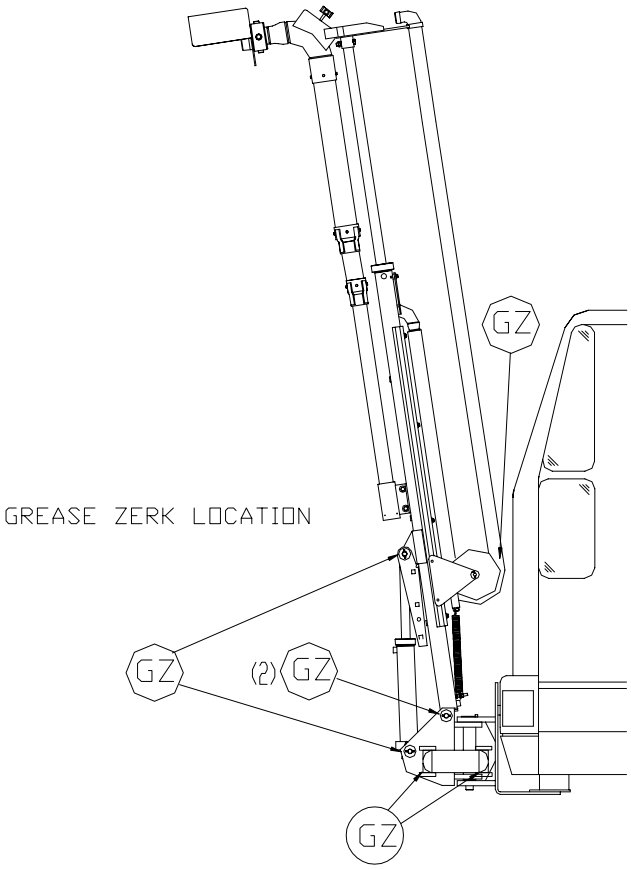
RA-300 STORAGE

Lubrication

After the machine is warmed-up, grease all pivot points, following standard maintenance procedures. There are eight (8) pivot points on the boom which require greasing. There is a grease zerk at each end of the hydraulic lift cylinder and the hydraulic swing cylinder, one on the main pivot point, one on the hose retractor wheel and two on the lower end of the long boom cylinder.

Protection of Exposed Cylinder Rods

During periods of extended storage, (two (2) months or longer), all cylinder rods should be retracted as far as possible. Any part of the cylinder rod that is left exposed should be coated with grease to prevent rusting. On any stored cylinder, all exposed seals, o-rings, etc., should also be coated with grease to prevent cracking.



POSITIVE DISPLACEMENT AIR BLOWER

Storage Procedure

If the unit will not be used for at least two (2) months or longer, the following steps should be taken for corrosion protection:

1. Coat intervals of the cylinder and the gearbox with Nox-Rust No. VC110 or an equivalent. Repeat at the end of each season or as conditions require. Motorstor is oil soluble and does not require removal before lubrication. To remove VC110 from within the cylinder shortly before startup, spray a fine mist of petroleum solvent through the blower while it is running at a slow speed. Be sure the inlet and discharge are open. If the VC110 will not harm the connected systems, it can be left in the unit.

WARNING: *Petroleum solvents are flammable and explosive if confined. Keep all sources of sparks, flame or hot objects away during use of petroleum solvents. Death or serious injury will result from explosion.*

2. Fill the drive end bearing cavities with grease.

3. Paint the shaft extensions, inlet and discharge flanges and all other exposed surfaces with Nox-Rust X-110 or an equivalent.

4. Seal the inlet, discharge and all vent openings with tape. We do not recommend the unit be stored, piped to the system and allowed to remain idle for extended periods of time. Any parts that are left open to the atmosphere will allow the Motorstor vapor to escape and lose its effectiveness.

5. Do not expose units to excessive vibration during storage. If the unit is to be stored outdoors, be sure to cover with a tarpaulin or lean-to.

Positive Displacement Air Blower Storage Procedure (cont)

6. Rotate the drive shaft three or four revolutions every two weeks.

7. Prior to startup, remove the flange covers on both the inlet and discharge. Inspect the internal components to be sure they did not rust during storage. Check all internal clearances. This is also a good time to remove the gearbox and inspect the gear teeth for rust.

Before returning the unit to service, remove plugs, covers or seals from blower inlet and discharge connections and inspect the interior for any dirt or other foreign material. Wash the cylinder, headplates and impeller with a petroleum solvent such as DuPont Triclene D.

Positive Displacement Air Blower Storage Procedure (cont)

After thoroughly washing the blower, turn the drive shaft by hand to ensure that the impeller turns freely at all points. The same petroleum solvent may be used to clean anti-rust compounds on the drive shaft extensions.

After cleaning, replug the inlet and discharge connections until ready to reinstall the blower to the air piping. The corrosion inhibitor that was used during storage will vaporize during operation, so does not need to be removed prior to reassembly.

WARNING: *Keep hands, feet, hair and clothing away from blower inlet and discharge ports and any other rotating parts.*

Air Blower Lubrication

After the unit has been stored for a long period of time, it is recommended that the grease in the bearings be replaced. Remove the relief fittings, then flush out the old grease with kerosene or #10 lubricating oil. Drain thoroughly and replace with fresh bearing grease. Reinstall the grease relief fittings.

Once the machine is back in use, grease should be added to the drive end bearings of the blower with a hand operated grease gun. The chart below shows the recommended schedule for greasing the drive end bearings based on the operating hours per day and RPM used. However, you may need to grease more often depending on the operating temperature of the grease or if operating under unusual conditions.

Speed in RPMs	Operating Hours Per Day		
	8	16	24
	Greasing Intervals in Weeks		
750 - 1000	7	4	2
1000 - 1500	5	2	1
1500 - 2000	4	2	1
2000 - 2500	3	1	1
2500 - 3000	2	1	1
3000 and up	1	1	1

USING BOOSTER CABLES

WARNING: *Shield eyes and face from batteries at all times. Battery acid in eyes can cause blindness.*

Before jump starting a vehicle, make sure the vehicles do not touch and the ignitions are off. Be sure all vent caps are tight and level. DO NOT jump start a battery that is damaged.

1. Connect positive (+) booster cable to positive (+) terminal of discharged battery.

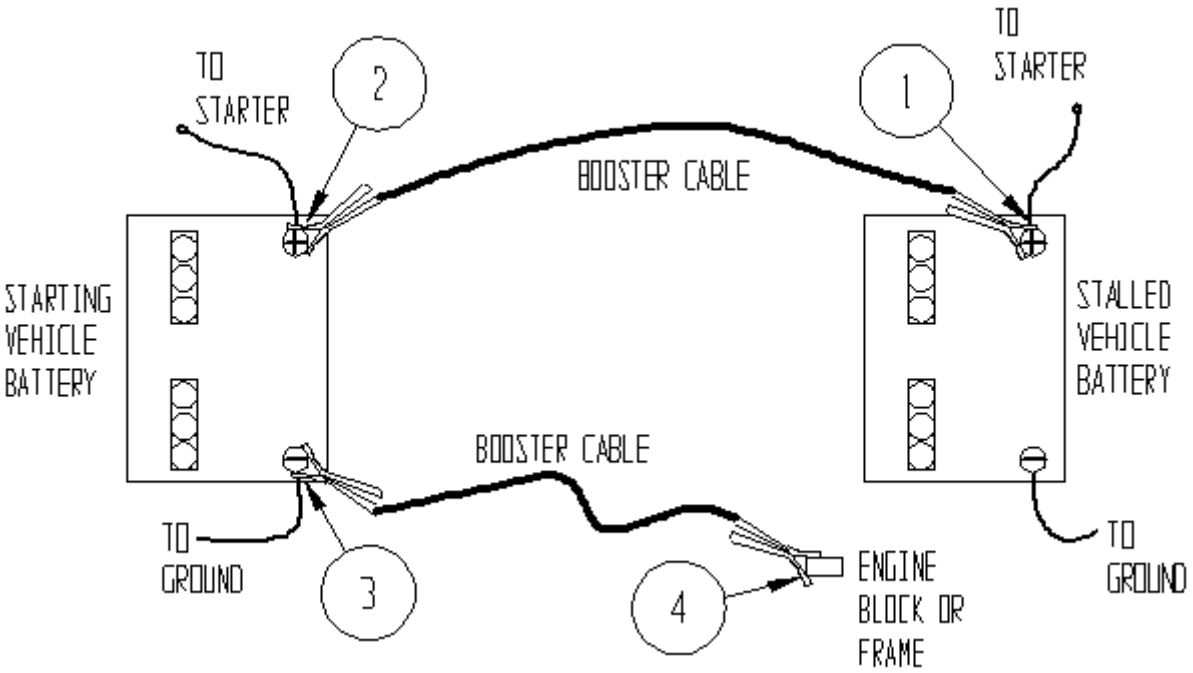
2. Connect other end of positive (+) cable to positive (+) terminal of assisting battery.

3. Connect negative (-) cable to negative (-) terminal of assisting battery.

4. MAKE FINAL CONNECTION OF NEGATIVE (-) CABLE TO ENGINE BLOCK OF STALLED VEHICLE, AWAY FROM BATTERY.

5. Start assisting vehicle and then stalled vehicle. Remove cables in REVERSE order of connection.

EXPLOSION WARNING!



PREVENTIVE MAINTENANCE CHART

Identifying Codes:
I = Inspect
A = Adjust
R = Replace
L = Lubricate
S = Service
* = Initial Breakin Period Only

ITEM	FREQUENCY 10 HRS	50 HRS	100 HRS	250 HRS	500 HRS	2000 HRS	CAPACITY	PART NUMBER	TYPE
Air Blower Oil	I				R		1 PT	36485	AEON Blower Lubricant
Air Blower Filter Element	I		S		R			36531-1	Dry Type Element
Air Blower Bearings			L		L	I/R		36530-01 36530-02 Seals	No. 2 Non-Corrosive Grease
Air Blower Drive Shaft		I	L					See Parts Catalog	No. 2 Non-Corrosive Grease
Hydraulic Oil	I		S		R		26 GAL		See Chart on Page 4
Hydraulic Oil Filter Element			R*		R			38327-01	Spin-On Cartridge
Discharge Hose	I		A		I/R			37334	

BOLT TORQUE CHART

BOLT SIZE	 GRADE 5 TORQUE (ft-lbs) DRY	LUBE	 GRADE 8 TORQUE (ft-lbs) DRY	LUBE
1/4-20 UNC 1/4-28 UNF	8 10	6 7	12 14	9 11
5/16-18 UNC 5/16-24 UNF	17 19	13 15	24 27	18 21
3/8-16 UNC 3/8-24 UNF	31 35	24 27	44 49	34 38
7/16-14 UNC 7/16-20 UNF	49 55	38 42	70 78	54 60
1/2-13 UNC 1/2-20 UNF	75 85	58 65	105 120	82 90
9/16-12 UNC 9/16-18 UNF	110 120	84 93	155 170	120 132
5/8-11 UNC 5/8-18 UNF	150 170	115 130	210 240	165 185
3/4-10 UNC 3/4-16 UNF	270 295	205 230	375 420	290 320
7/8-9 UNC 7/8-14 UNF	395 435	305 335	605 670	455 515
1-8 UNC 1-14 UNF	590 660	455 510	905 1030	695 785

HYDRAULIC FITTING TORQUE

Tightening Flare Type Tube Fittings

1. Check the flare and flare seat for defects that might cause leakage.
2. Align tube with fitting before tighting.
3. Lubricate connection and hand tighten swivel nut until snug.
4. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second tighten the swivel nut to the torque shown.

Note: The torque values shown are based on lubricated connections as in assembly.

Tube Size OD	Nut Size Across Flats	Torque Value (see note)		Recommended Turns to Tighten (After Finger Tightening)	
(in)	(in)	(N.m)	(lb-ft)	(Flats)	(Turns)
3/16	7/16	8	6	1	1/6
1/4	9/16	12	9	1	1/6
5/16	5/8	16	12	1	1/6
3/8	11/16	24	18	1	1/6
1/2	7/8	46	34	1	1/6
5/8	1	62	46	1	1/6
3/4	1-1/4	102	75	3/4	1/8
7/8	1-3/8	122	90	3/4	1/8

Tighteneng O-Ring Fittings

1. Inspect o-ring and seat for dirt or obvious defects.
2. On angle fittings, back the lock nut off until washer bottoms out at top of groove.
3. Hand tighten fitting until back-up washer or washer face (if straight fitting) bottoms on face and o-ring is seated.
4. Position angle fittings by unscrewing no more than one turn.
5. Tighten straight fittings to torque shown.
6. Tighten while holding body of fitting with a wrench.

NOTE: The torque values shown are based on lubricated connections as in reassembly.

Tube Size OD	Nut Size Across Flats	Torque Value (see note)		Recommended Turns to Tighten (After Finger Tightening)	
(in)	(in)	(N.m)	(lb-ft)	(Flats)	(Turns)
3/8	1/2	8	6	2	1/3
7/16	9/16	12	9	2	1/3
1/2	5/8	16	12	2	1/3
9/16	11/16	24	18	2	1/3
3/4	7/8	46	34	2	1/3
7/8	1	62	46	1-1/2	1/4
1-1/16	1-1/4	102	75	1	1/6
1-3/16	1-3/8	122	90	1	1/6
1-5/16	1-1/2	142	105	3/4	1/8
1-5/8	1-7/8	190	140	3/4	1/8
1-7/8	2-1/8	217	160	1/2	1/12

TROUBLE SHOOTING SECTION

TROUBLE SHOOTING

GENERAL

The following Trouble-Shooting information includes some problems that an operator may encounter during the course of operating the RA-300 Patcher. It also includes some acceptable corrections to these problems. Unless otherwise noted, the problems listed here are those which an operator can diagnose and repair. See an Authorized ROSCO Dealer/Distributor for diagnosis and repair of problems not listed. For specific engine and hydraulic problems not covered by this guide, please refer to the manuals for major components that you received with this unit.

DO NOT ATTEMPT TO SERVICE OR REPAIR MAJOR COMPONENTS, such as the blower, hydraulic cylinders or pressure control equipment, unless authorized to do so by your ROSCO Dealer/Distributor.
Any Unauthorized Repair Will Void The Warranty.

When a problem occurs, don't overlook the simple causes. A malfunction could be caused by something as simple as a valve that is not fully open or closed. After a mechanical failure has been corrected, be sure to locate and correct the cause of the problem.

TROUBLE	POSSIBLE CAUSE	REMEDY
No Aggregate Flow (Be sure there is aggregate in the tank.)	1. Delivery hose plugged. (Check air pressure gauge. Above 5 psi indicates a problem.) The machine may have been driven with the aggregate tank slide gate open allowing rock into the hose. Be sure **Rock On/Off** switch is "*OFF*" when traveling.	1a. Open at coupling on boom and clean out. 1b. Disconnect hose at slide gate, remove from hangers and clean out. 1c. Increase engine rpm while monitoring blower pressure. **Do not exceed 7 psi.**
	2. Valve not activated to open slide gate.	2. Activate valve.
	3. Insufficient air volume.	3a. Check blower rpm. Should be 1200-1800. 3b. Check & clean blower air filter. 3c. Check for air leaks in discharge piping and at aggregate hopper lid, slide gate and hoses.

TROUBLE	POSSIBLE CAUSE	REMEDY
No Aggregate Flow (cont.)	4. Slide gate jammed closed.	4a. If frozen, use heat to thaw. If jam is caused by limestone buildup, spray with high pressure water to clean.
		). Increase relief pressure to 2000 psi, open gate & cycle several times. Then reset relief pressure to 1500 psi.
	5. Rock frozen in hopper.	5. Warm/thaw. (Order optional aggregate heat kit.)
	6. Cap still on discharge nozzle.	6. Remove cap.
	7. Build up of fines on inside walls of hose.	7a. Use clean aggregate.
		7b. Use rubber hammer to tap on outside of hose to loosen build up.
Poor or Uneven Aggregate Flow	1. Aggregate is wet and/or bridging.	1a. Run vibrator.
		1b. Run clean, dry rock.
		1c. Swing boom side to side rapidly which causes material to slide down hopper walls.
	2. Delivery hose needs cleaning.	2a. Remove and clean hose. Flush nozzle.
		2c. Flush delivery system with water (optional).
	3. Insufficient air volume.	3a. Check blower rpm. Should be 1400-1800.
		3b. Check & clean blower air filter.
		3c. Check for air leaks in discharge piping and at aggregate hopper lid, slide gate and hoses.

TROUBLE	POSSIBLE CAUSE	REMEDY
Dusty Delivery Of Aggregate	1. Dry, dusty material.	1a. Dampen rock in hopper. 1b. Replace with new aggregate material.
No Liquid Asphalt / Emulsion Available at Nozzle	1. 3-way valve on asphalt tank in "*OFF*" or "*Flush*" position.	1. Select "*Asphalt*" position.
	2. Low air pressure.	2. Check air lines, valves and gauges.
	3. Line, valve or nozzles clogged.	3. Check and clean or replace.
	4. Separated emulsion.	4. Drain tank and fill with good emulsion.
	5. Low tank level.	5. Fill tank.
		Relieve All Pressure Before Opening Load Hatch.
	6. Valves on discharge nozzle or in cab closed.	6. Open valves.
	7. Asphalt cement or cut back asphalt has been used by mistake.	7. Consult the ROSCO service dept. or an authorized dealer for clean out procedure.
Poor Or Uneven Asphalt / Emulsion Flow	1. Separated emulsion.	1. Drain and replace with new material.
	2. Low air pressure.	2. Check air lines, valves and gauges.
	3. Asphalt / Emulsion too cool.	3. Heat to proper spray temperature for material.
	4. Outside temperature too cool for type of material being used.	4. Consult local supplier for recommendations.
	5. Nozzles plugged or too large.	5. Unplug or use smaller nozzles.

TROUBLE	POSSIBLE CAUSE	REMEDY
No Solvent For Clean Out	1. No solvent in tank.	1. Fill tank with solvent.
		Relieve All Pressure Before Removing Cap.
	2. 3-way selector valve on asphalt tank is in wrong position.	2. Select "*Flush*" position.
	3. No air pressure to solvent tank.	3a. Open air valve.
		3b. Fix pinched airline.
		3c. Set regulator to 60 psi.
	4. Valves on nozzle or in cab closed.	4. Open valves.
Low / No Air From Blower	1. Valve not activated.	1. Activate valve.
	2. Plugged air cleaner.	2. Clean / Replace element.
	3. Plugged discharge hose or piping.	3. Clean out hose or piping.
PTO Will Not Engage (if equipped)	1. Truck not in neutral or clutch not fully depressed.	1. Be sure truck is in neutral or clutch is fully engaged.
	2. Blown fuse.	2. Inspect and replace.
	3. PTO solenoid bad.	3. Replace solenoid.
Control Panel Inoperative	1. Tripped circuit breakers or blown fuse.	1. Reset or replace.
	2. Wire loose.	2. Check all wiring.
120-volt AC Heat System Not Working	1. Tripped circuit breakers or blown fuse.	1. Reset or replace.
	2. Thermostat not set to desired temperature.	2. Reset temperature or thermostat

TROUBLE	POSSIBLE CAUSE	REMEDY
120-volt AC Heat System Not Working (cont.)	3. Faulty wiring.	3a. Check wiring with volt/ ohmmeter **Use Extreme Caution When Checking 120-volt AC Circuits - May Cause Death.** 3a. Test for continuity with 120-volt power disconnected. 3b. Be sure circuit breaker is rated properly for this use.
	4. Electric element(s) burned out.	4. Replace element(s).
Truck Coolant System Not Heating Asphalt / Emulsion to High Enough Temperature (Refer to Valve Block illustration in Figure 7 and schematics at end of this section)	1. Asphalt temperatures needed are above 180° F.	1. Coolant heating system was not intended to heat asphalts / emulsions above 180° F.
	2. Faulty truck engine thermostat.	2. Replace with 195° F or higher thermostat.
	3. Pinched or plugged circulation hose.	3. Inspect, clean or replace.
Hydraulic System Overheats	1. Low hydraulic fluid level.	1. Fill reservoir to proper level in sight gauge.
	2. Engine RPM higher than needed to patch.	2. Slow engine rpm to 1400 rpm.
	3. Running hydraulic system when roading for long distances.	3. Shut off PTO for hydraulics when not needed.
	4. Hydraulic oil cooler plugged with debris.	4. Clean oil cooler fins.
	5. Relief valve set too low.	5. Set relief valve to 1500 psi.

TROUBLE	POSSIBLE CAUSE	REMEDY
Hydraulic System Overheats (cont.)	6. Flow modulating valve defective.	6. Replace valve.
	7. Worn/defective pump.	7. Replace pump.
	8. Defective electric fans.	8. Check / replace fuse.
No Movement Of Boom, Hopper Lid or Slide Gate Movement (Refer to Valve Block illustration in Figure 7 and schematics at end of this section)	1. PTO not engaged.	1. Engage PTO that drives hydraulic pump.
	2. No or low hydraulic oil pressure.	2a. Check oil level in reservoir. Check that inlet oil valve is open. 2b. Adjust relief pressure on valve block.
	3. Electrical or hydraulic failure.	3. Activate manual override on valve block to determine if problem is electrical or hydraulic. If problem is electrical, you will be able to control functions with manual overrides.
	4. Boom flow controls out of adjustment.	4. Adjust flow controls.
	5. Blown fuse, tripped circuit breaker or bad electrical connection.	5a. Check fuse, reset circuit breaker. 5b. Check control panel power line at battery. 5c. Check electrical connections at solenoid valve.
Poor Or Uneven Cylinder Action (Refer to Valve Block illustration in Figure 7 and schematics at end of this section)	1. Low hydraulic fluid level.	1. Check level. Check that oil inlet valve is open.
	2. Boom flow controls out of adjustment.	2. Adjust (applies to Lift and Side Shift only).
	3. Relief valve set too low.	3. Adjust relief valve.

TROUBLE	POSSIBLE CAUSE	REMEDY
Discharge Boom Settles	1. Pressure setting on counter-balance valve set too low.	1. Extend boom fully. Loosen jam nut and turn adjusting screw in until boom no longer settles.
	2. Hydraulic cylinder seals are leaking.	2. Replace seals.
	3. Counter-balance valve and/or seals are bad.	3. Replace valve and/or seals.
Aggregate Hopper Lid Settles	1. Pressure setting on counter-balance valve set too low.	1. Lower or raise lid so rear edge is open 4 to 6 inches. Loosen jam nut and turn adjusting screw in until lid no longer settles. Turn an additional 1-1/2 turns.
	2. Hydraulic cylinder seals are leaking.	2. Replace seals.
	3. Counter-balance valve and/or seals are bad.	3. Replace valve and/or seals.
Hydraulic Cylinders onBoom Not Operating Properly	1. Loss of hydraulic power. Check by watching the pressure gauge on top of the valve when the valve is manually activated by pushing on the solenoid valve end. If no pressure shows, the problem is hydraulic. Main cause would be contamination of the main relief valve or flow control.	1. Clean the cartridge component on the valve. Check hydraulic filter and replace if necessary.
	2. Loss of electric power. Check by checking voltage when controls are activated. Lack of power could be caused by loose/bad connections or by a bad micro-switch in the Joystick handle.	2. Check all connections - Replace any bad connections. Replace micro- switch if necessary.

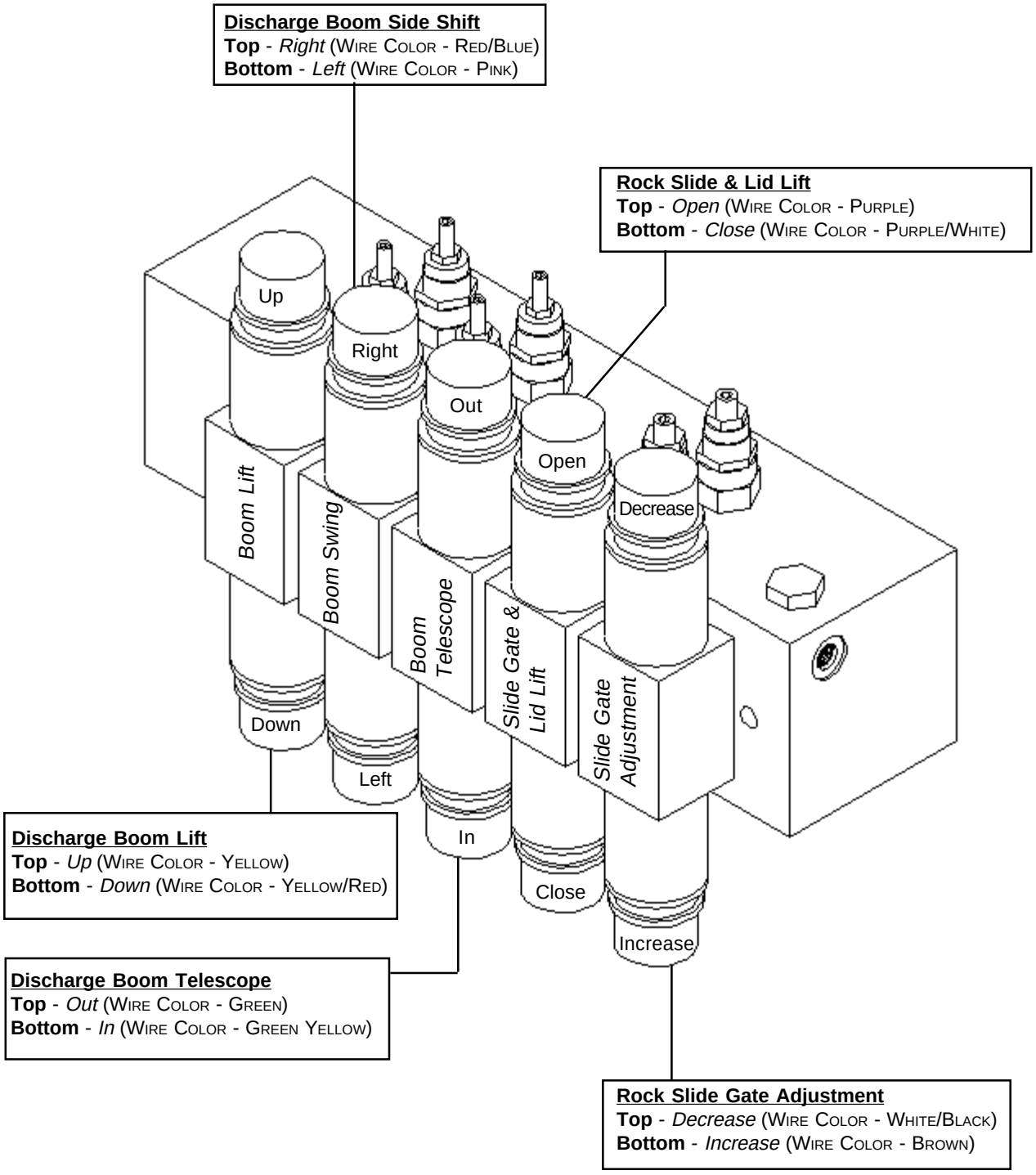


Figure 7-A
Hydraulic Valve Block, Wire and Function Schematic

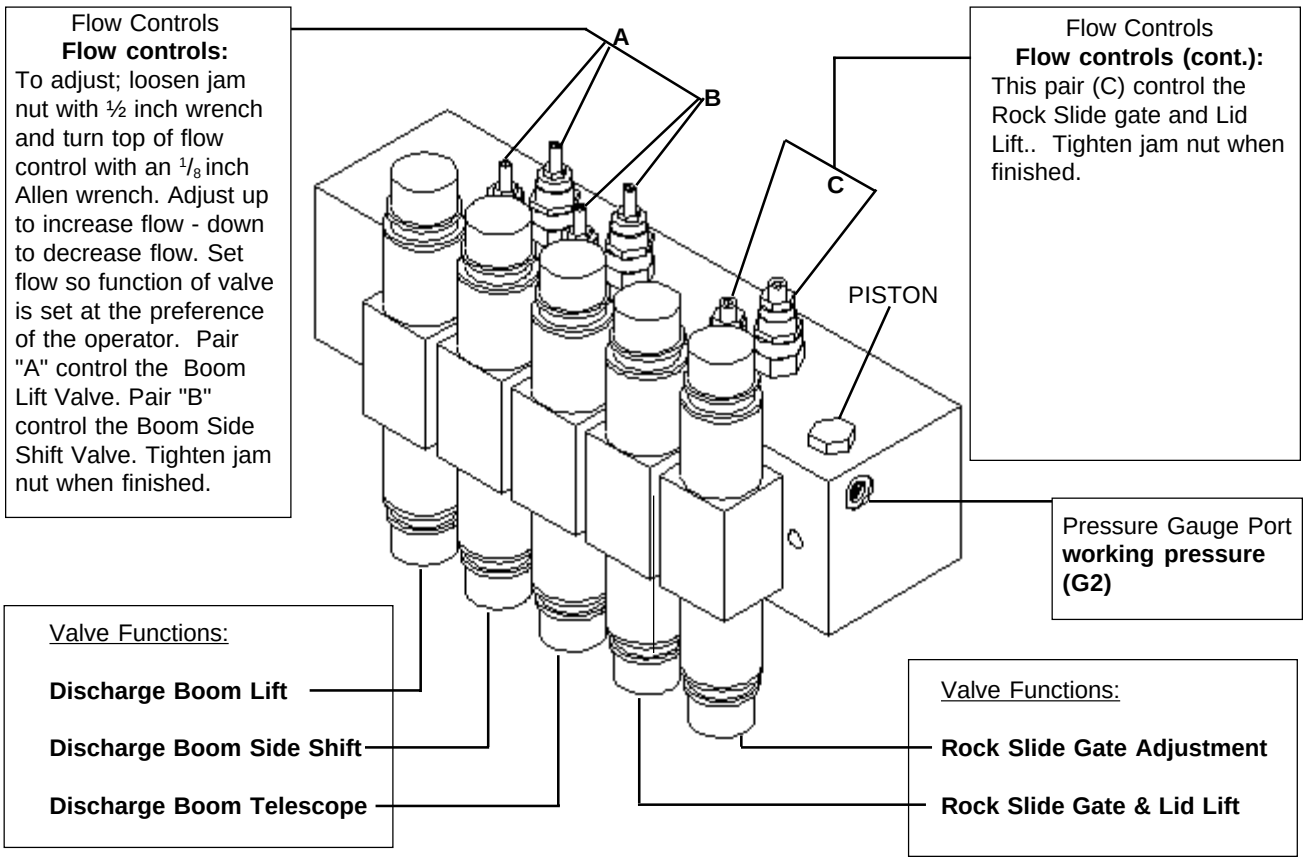


Figure 7-B
Hydraulic Valve Block, Isometric View

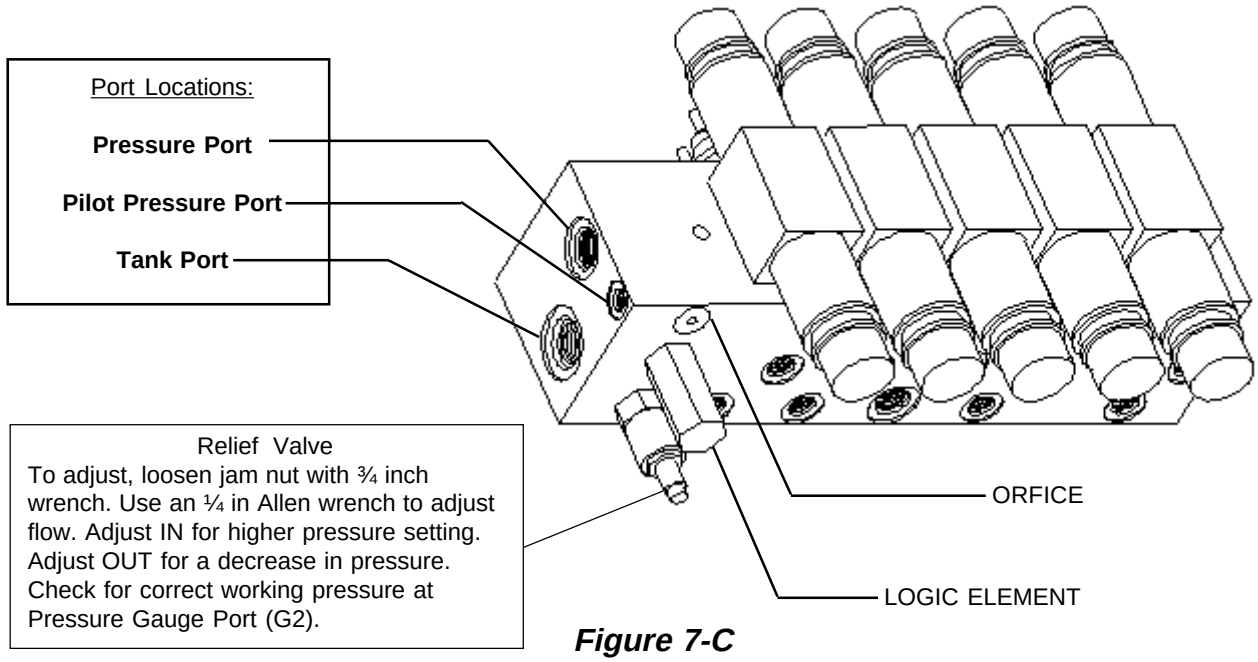
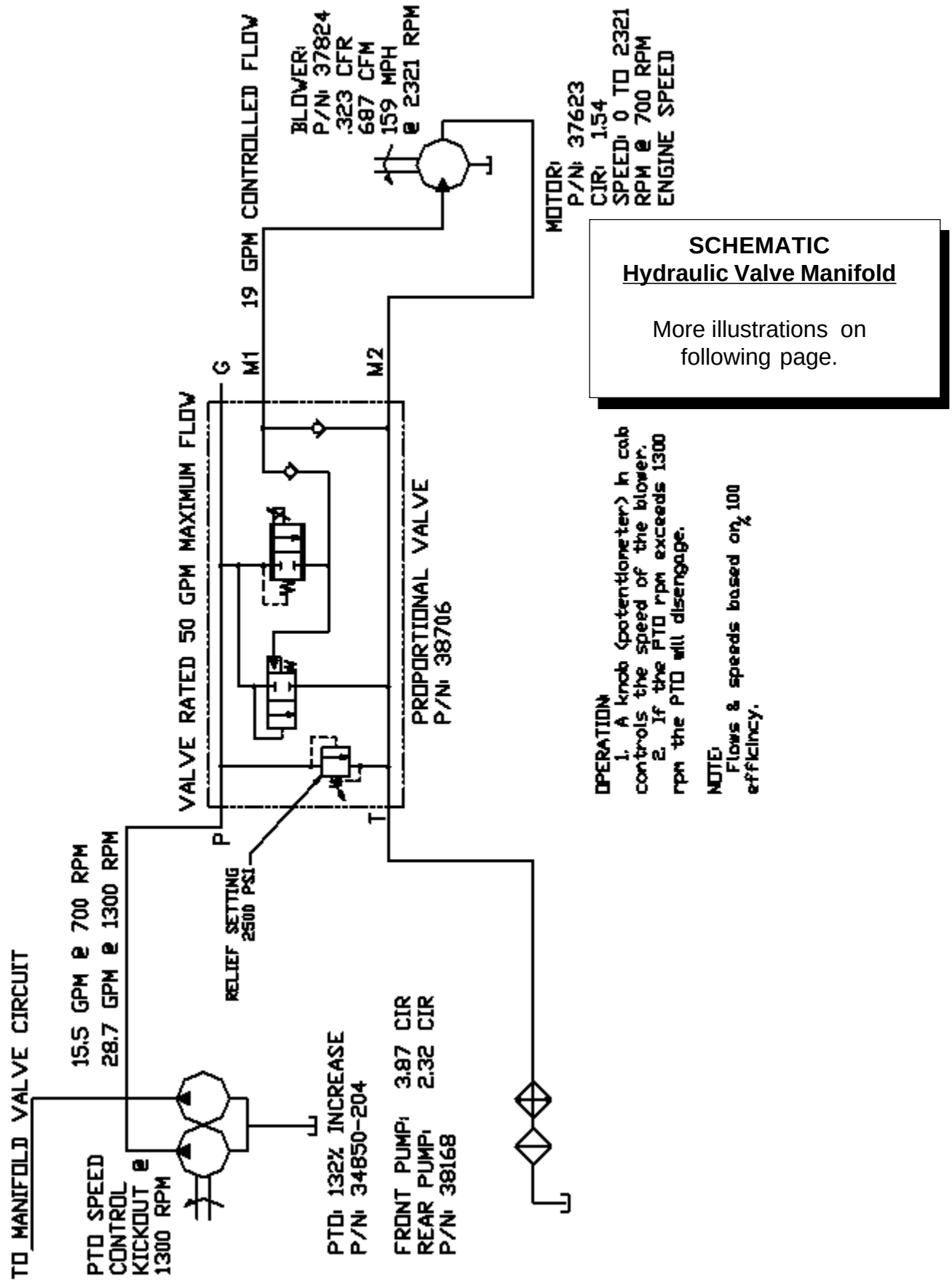
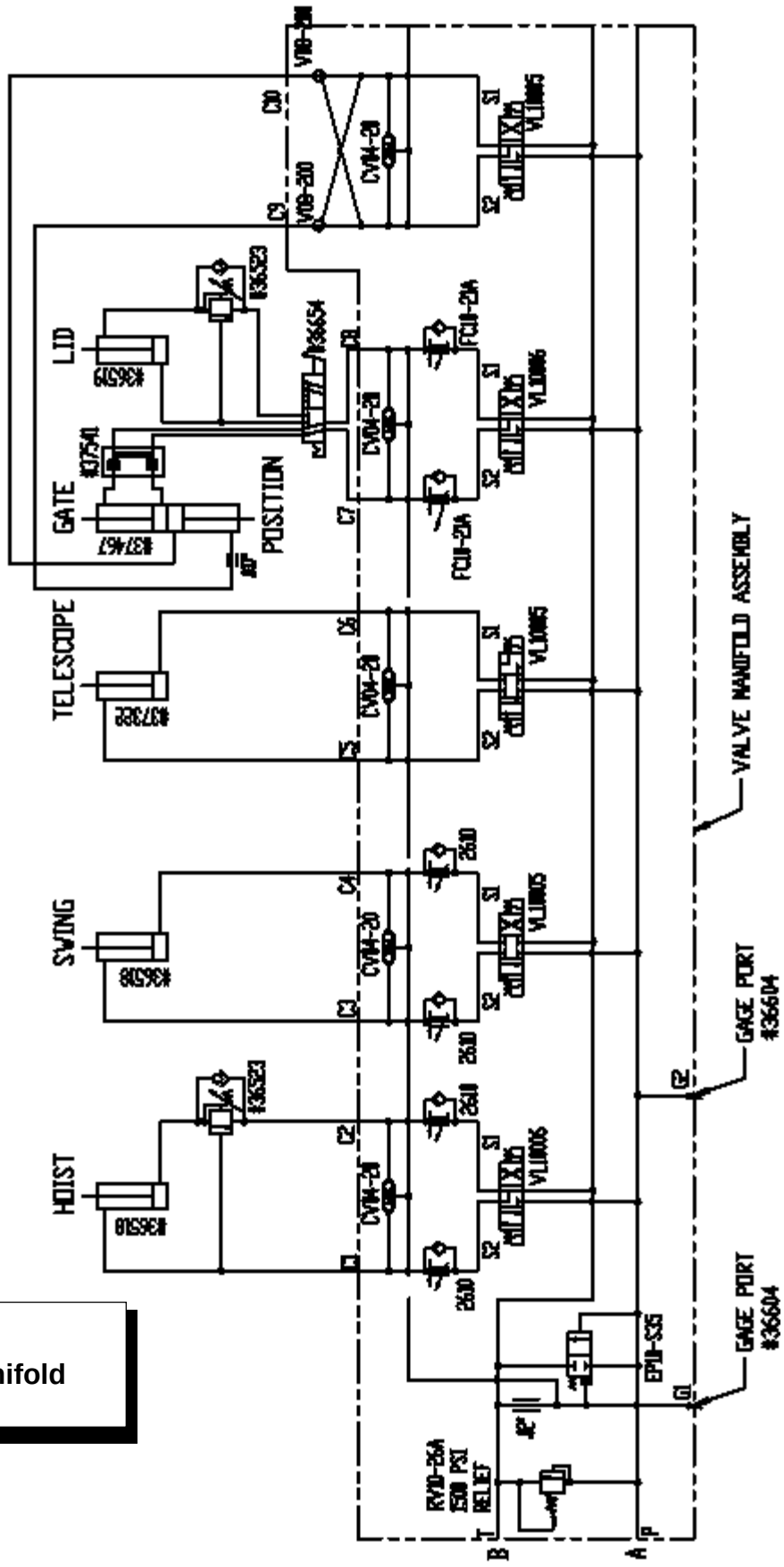


Figure 7-C
Hydraulic Valve Block, Rotated



SCHEMATIC
Hydraulic Valve Manifold

More illustrations on following page.



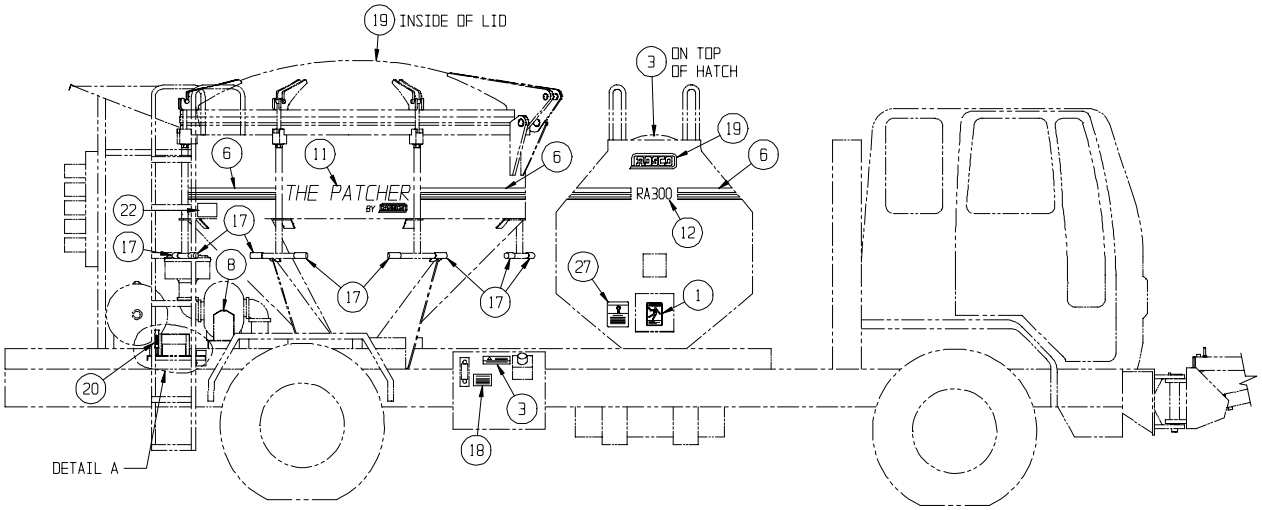
SCHEMATIC
Hydraulic Valve Manifold

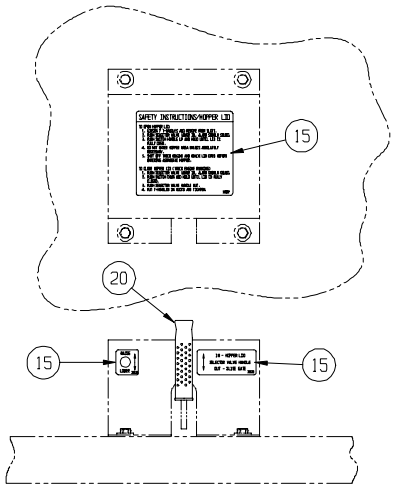
STANDARD EQUIPMENT PARTS CATALOG

Table of Contents

ROSCO

ITEM	PART NO.	QTY.	DESCRIPTION
1	37096	2.00	DECAL,DANGER,HIGH VOLTAGE
3	37123	3.00	DECAL,WARNING,UNDER PRESSURE
6	35745	47.00	DECAL,STRIPING,3 BAND BLACK
8	35943	1.00	DECAL,WARNING,GUARDS (on guard over blower motor coupler)
11	36472	2.00	DECAL,THE PATCHER
12	36494	2.00	DECAL,RA 300
15	36632	1.00	DECAL SET,HOPPER LID OPERATION
17	72244	14.00	GRIP,HANDLE,FLEX
18	37664	1.00	DECAL,HYD OIL,SIGHT GLASS
19	D50	3.00	DECAL,ROSCO LOGO,MEDIUM,BLACK
20	R135	1.00	RUBBER GRIP
22	36202	2.00	DECAL,WARNING,KEEP CLEAN
27	35689	2.00	DECAL PLATE,WRN,HOT MAT'L HAZ

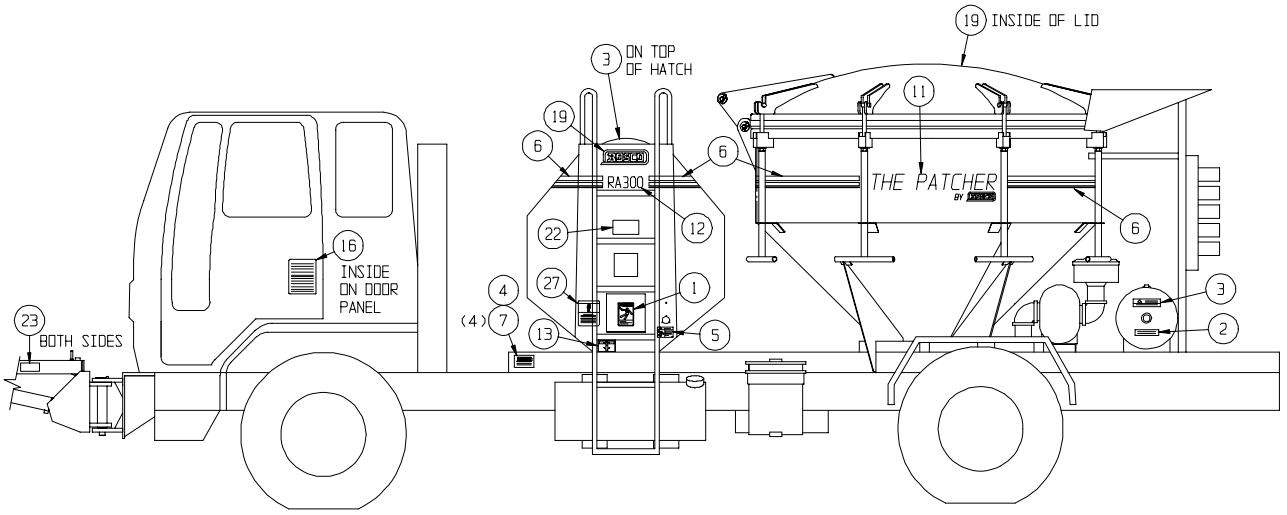


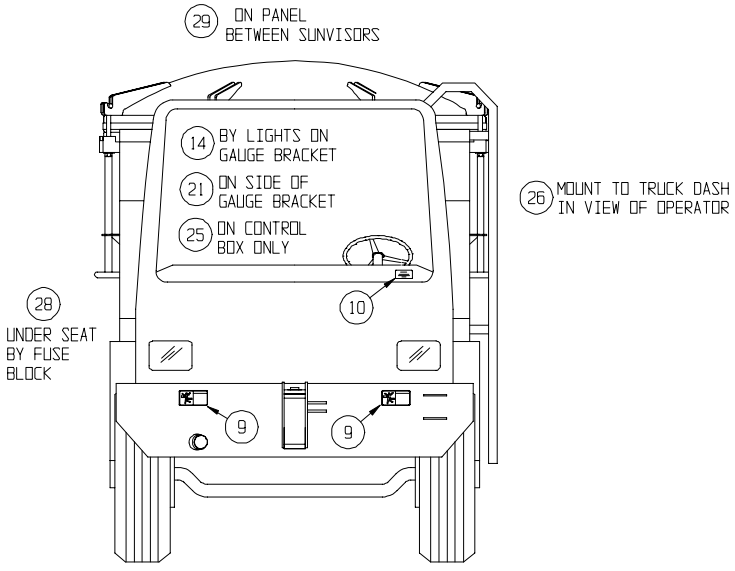


DETAIL A

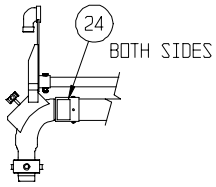
Rotated View

ITEM	PART NO.	QTY.	DESCRIPTION
1	37096	2.00	DECAL,DANGER,HIGH VOLTAGE
2	10553	1.00	DECAL,SOLVENT TANK
3	37123	3.00	DECAL,WARNING,UNDER PRESSURE
4	35355	1.00	PLATE,SERIAL NUMBER ROSCO
5	37435	1.00	DECAL,DANGER,USE GFI CIRCUIT
6	35745	47.00	DECAL,STRIPING,3 BAND BLACK
7	81159	4.00	TACK,DIA.146/.104X.04 GRIP LG
9	36193	2.00	DECAL,DANGER,PINCH ZONE
10	37059	1.00	DECAL,OVERHEAD CLEARANCE,PENDT
11	36472	2.00	DECAL,THE PATCHER
12	36494	2.00	DECAL,RA 300
13	37652	1.00	DECAL,EMULSION VALVE,GMC
14	37681	Ref	DECAL,GATE/PTO
16	37130	1.00	DECAL,CAUTION,OPERATOR INSTRU
19	D50	3.00	DECAL,ROSCO LOGO,MEDIUM,BLACK
21	36686	1.00	DECAL,RA-300 PATENT NO
22	36202	2.00	DECAL,WARNING,KEEP CLEAN
23	37119	2.00	DECAL,WARNING,CRUSH HAZARD
24	37129	2.00	DECAL,CAUTION,PROTECTIVE GEAR
25	38071	1.00	DECAL,CONTROL BOX,RA300
26	37763	1.00	DECAL,BACKUP ALARM
27	35689	2.00	DECAL,PLATE,WRN,HOT MAT'L HAZ
28	38050	1.00	DECAL, FUSE/RELAY LOCATION
29	38085	1.00	DECAL,ENGAGE HYDRAULIC PTO





FRONT VIEW OF MACHINE

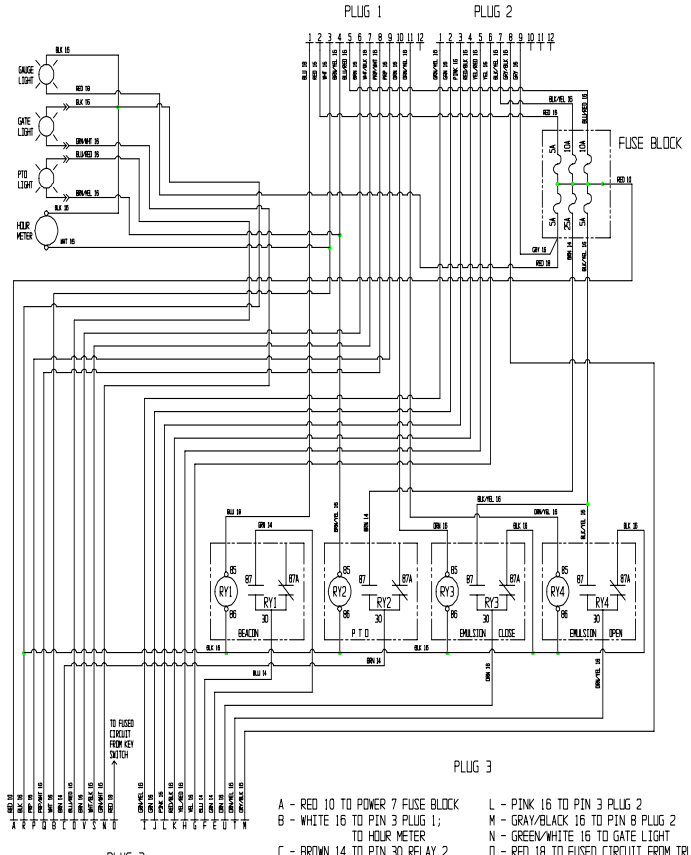


END OF BOOM

Rotated View

ITEM	PART NO.	QTY.	DESCRIPTION
1	25611	1.00	GAUGE CONSOLE,STERLING
2	25615	1.00	DOOR,GAUGE CONSOLE
3	31983	2.00	LIGHT,RED,DASH,.50 HOLE
25	33435	1.00	LIGHT & SOCKET,12V,2.00 GAUGE
NS	33589	2.00	LOOM,SPLIT,CONVOLUTED,.500
NS	33620	1.00	TERM,RING,12-10 GA,#10 STUD
28	34467	2.00	CONN HOUSING,PLUG,12 CIRCUIT
29	34469	11.00	CONTACT,PIN,20-14 GA
30	34471	9.00	CONTACT,SOCKET,20-14 GA
NS	35123	1.00	TERM,RING,16-14 GA,#6 STUD
34	35385	1.00	GAUGE,HOUR METER
35	36085	4.00	RELAY,SPDT,40AMP,12VDC
36	36086	4.00	BRACKET,RELAY MOUNT
37	36118-2	18.00	TERM,CRIMP,16-14 GA
38	36340	2.00	FUSE,BLADE,10AMP,ATC-10
39	36348	5.00	TERM,PUSH-ON,.25,M,18-14,SLV
40	36349	5.00	TERM,PUSH-ON,.25,FEM,18-14,SLV
41	36746	3.00	FUSE,BLADE,5AMP,ATC-5
42	37303	1.00	FUSE,BLADE,25AMP,ATC-25
43	37681	1.00	DECAL,GATE/PTO
44	37698	1.00	GAUGE,PRESS,0-15 PSI,02MP
45	37699	1.00	DECAL,AIR,GAUGE LABEL
46	38047	1.00	CONNECTOR,22WAY,MALE,PASS THRU
47	38049	22.00	TERM,SEALED CONN,16-14 GA,FEM
48	38050	1.00	DECAL,FUSE/RELAY LOCATION
49	40137	1.00	HINGE,FUSE PANEL
53	80350	2.00	NUT,FLEXLOC,.250-20,FULL,LT
54	80891	2.00	MACH SCR,PH,#10-32X1.00
55	80924	10.00	NUT,FLEXLOC,#10-24,FULL,LT
56	851201417	10.00	TIE WRAP,.094X4.00
57	871052400	8.00	MACH SCR,RH,#10-24X.50
58	36695	1.00	FUSE BLOCK,BLADE-TYPE,6 POS
59	35136-6	1.00	PLUG,HOLE,.750,FLUSH MT,PLSTC

SEE SCHEMATIC AT END OF PARTS SECTION.



A - RED 10 TO POWER 7 FUSE BLOCK
B - WHITE 16 TO PIN 3 PLUG 1; TO HOUR METER
C - BROWN 14 TO PIN 30 RELAY 2
D - BLUE/RED 16 TO PTO LIGHT
E - GREEN 14 TO PIN 87 RELAY 1
F - BLUE 14 TO PIN 30 RELAY 1
G- YELLOW 16 TO PIN 6 PLUG 2
H - YELLOW/RED 16 TO PIN 5 PLUG 2
I - GREEN/YELLOW TO PIN 1 PLUG 2
J - GREEN 16 TO PIN 2 PLUG 2
K - RED/BLACK 16 TO PIN 4 PLUG 2
L - PINK 16 TO PIN 3 PLUG 2
M - GRAY/BLACK 16 TO PIN B PLUG 2
N - GREEN/WHITE 16 TO GATE LIGHT
O - RED 18 TO FUSED CIRCUIT FROM TRUCK KEY
P - PURPLE 16 TO PIN 9 PLUG 1
Q - PURPLE/WHITE 16 TO PIN 8 PLUG 1
R - BLACK 16 GROUNDS
S - WHITE/BLACK 16 PIN 7 PLUG 1
T - ORANGE/YELLOW 16 PIN 30 RELAY 4
U - ORANGE 16 PIN 30 RELAY 3
V - BROWN 16 PIN 6 PLUG 1

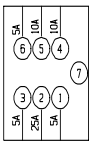
PLUG 1

1 - BLUE 18 TO PIN 85 RELAY 1
2 - RED 16 TO FUSE BLOCK 5 AMP
3 - WHITE 16 TO PIN B PLUG 3; TO HOUR METER
4 - BROWN/YELLOW 16 TO PIN 85 RELAY 2; TO PTO LIGHT
5 - BLUE/RED 16 TO FUSE BLOCK 10 AMP
6 - BROWN 16 TO PIN V PLUG 3
7 - WHITE/BLACK 16 TO PIN S PLUG 3
8 - PURPLE/WHITE 16 TO PIN Q PLUG 3
9 - PURPLE 16 TO PIN P PLUG 3
10 - ORANGE 16 TO PIN 85 RELAY 3
11 - ORANGE/YELLOW 16 TO PIN 85 RELAY 4
12 - OPEN

PLUG 2

1 - GREEN/YELLOW 16 TO PIN I PLUG 3
2 - GREEN 16 TO PIN J PLUG 3
3 - PINK 16 TO PIN L PLUG 3
4 - RED/BLACK 16 PIN K PLUG 3
5 - YELLOW/RED 16 TO PIN H PLUG 3
6 - YELLOW 16 TO PIN G PLUG 3
7 - BLACK/YELLOW 16 TO FUSE BLOCK 10 AMP
8 - GRAY/BLACK 16 TO PIN M PLUG 3
9 - GRAY 16 FUSE BLOCK 5 AMP
10 - OPEN
11 - OPEN
12 - OPEN

FUSE BLOCK



FUSE 1 - 5 AMP - BLACK/YELLOW 16 TO PIN 87 RELAY 3
FUSE 2 - 25 AMP - BROWN 14 TO PIN 87 RELAY 2
FUSE 3 - 5 AMP - GRAY 16 TO PIN 9, PLUG 2; RED 18 TO GAUGE LIGHT
FUSE 4 - 10 AMP - BLUE/RED 16 TO PIN 5 PLUG 1
FUSE 5 - 10 AMP - BLACK/YELLOW 16 TO PIN 7 PLUG 2
FUSE 6 - 5 AMP - RED 16 TO PIN 2 PLUG 1
POWER 7 - RED 10 TO PIN A PLUG 3

RELAY 1 - BEACON

30 - BLUE 14 TO PIN F PLUG 3
85 - BLUE 18 TO PIN 1 PLUG 1
86 - BLACK 16 TO PIN R PLUG 3
87 - GREEN 14 TO PIN E PLUG 3
87a - OPEN

RELAY 2 - PTO

30 - BROWN 14 TO PIN C PLUG 3
85 - BROWN/YELLOW 16 TO PIN 4 PLUG 1; TO PTO LIGHT
86 - BLACK 16 TO PIN 86 RELAY 1
87 - BROWN 14 TO FUSE BLOCK, 25 AMP
87a - OPEN

RELAY 3 - EMULSION CLOSE

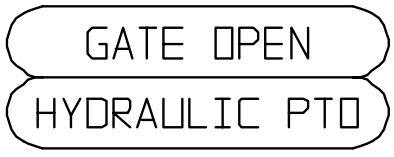
30 - ORANGE 16 TO PIN U PLUG 3
85 - ORANGE 16 TO PIN 10 PLUG 1
86 - BLANK 16 TO PIN 86 RELAY 2
87 - BLACK/YELLOW 16 TO FUSE BLOCK, 5 AMP
87a - BLACK 16 TO PIN 86 RELAY 3

RELAY 4 - EMULSION OPEN

30 - ORANGE/YELLOW 16 TO PIN T PLUG 3
85 - ORANGE/YELLOW 16 TO PIN 11 PLUG 1
86 - BLACK 16 TO PIN 87a RELAY 3
87 - BLACK/YELLOW 16 TO 87 RELAY 3
87a - BLACK 16 TO PIN 86 RELAY 4

CONSOLE BASE ASSEMBLY

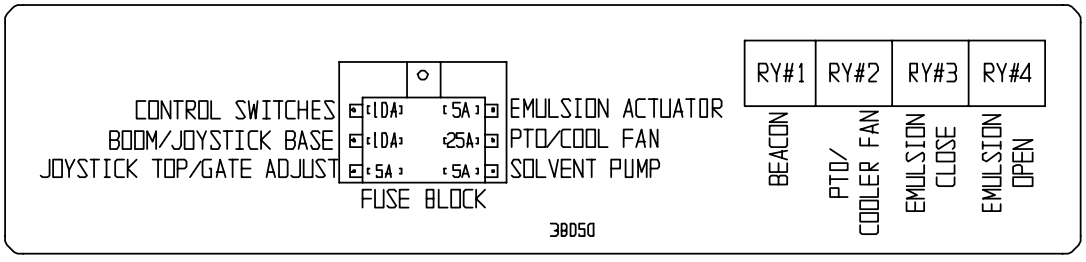
DRAWING NO. 25683 REV. Ø



ITEM 43

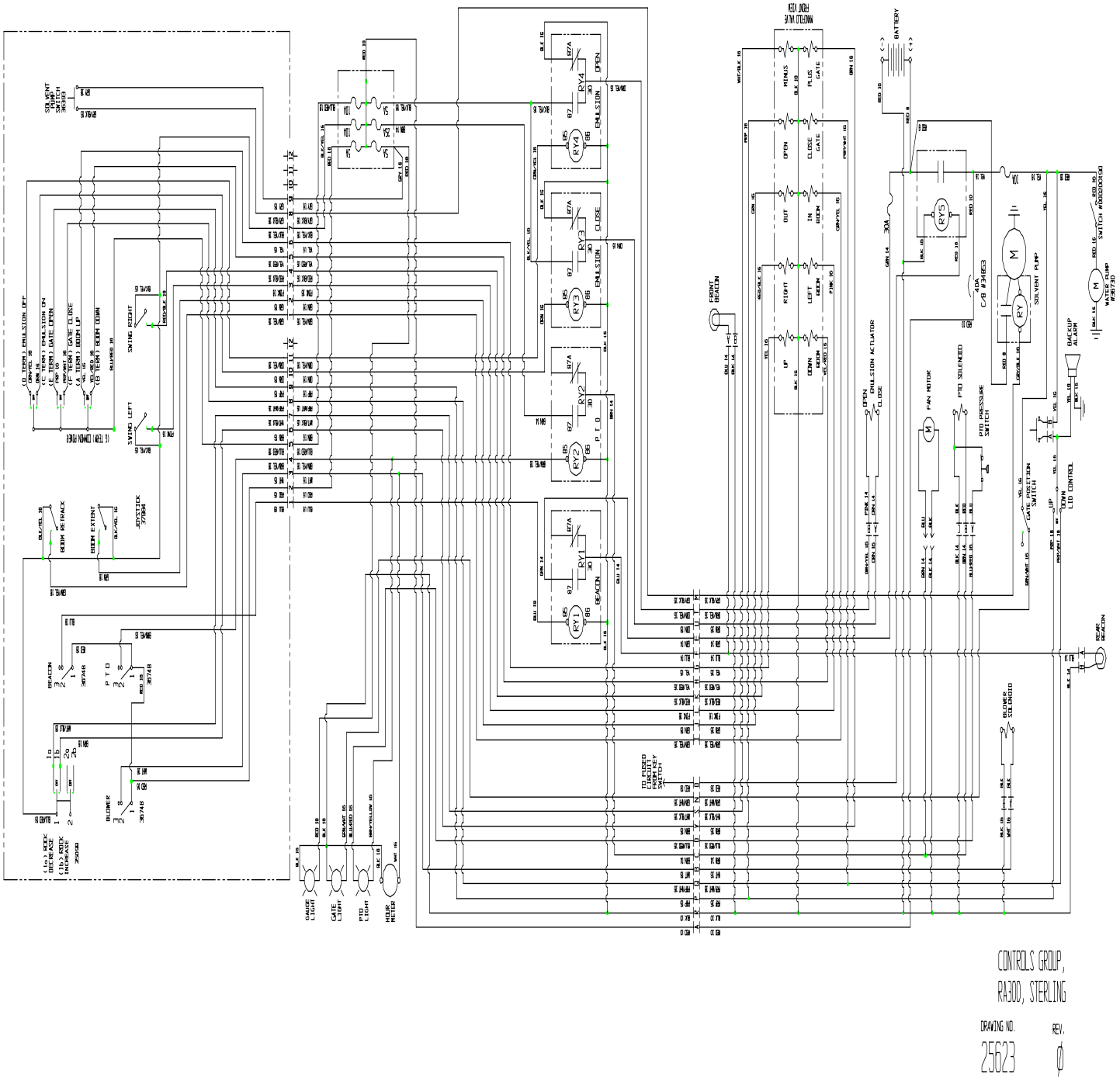
ITEM 45

ITEM 48



ITEM	PART NO.	QTY.	DESCRIPTION
1	25683	1.00	CONSOLE BASE ASSY
2	25678	1.00	HARNESS,MAIN,RA300,GMC/STERLNG
3	25852	1.00	MOUNT,GATE SWITCH
4	33963	1.00	ALARM,BACKUP
5	35139	2.00	CONNECTOR,SEALED,TOWER,2-PIN
6	36165	7.00	TERM,SEALED CONN,16-14 GA,FEM
7	34853	1.00	CIRCUIT BREAKER,40 AMP
8	36300	1.00	CONNECTOR,SEALED,TOWER,3-PIN
9	36623	7.00	SEAL,CABLE,14 GA
10	36674	1.00	SOLENOID,CONT DUTY,12V
11	25247	1.00	SWITCH,PUSH BTN,ON-MOM OFF,MOD
12	37688	1.00	TERM,PUSH-ON,.25,FUSE TAP-IN
13	6508	1.00	SWITCH,TOGGLE,SPDT,3-POS,MOM
14	80036	4.00	NUT,HEX,.250-20
15	80140	8.00	WASHER,TYPE A PLAIN,.250
16	80160	6.00	WASHER,SPLIT LOCK,.250
17	80185	10.00	CSHH,.250-20X1.00,GR5
18	80350	4.00	NUT,FLEXLOC,.250-20,FULL,LT
19	80798	2.00	MACH SCR,PH,#10-24X1.00
20	80824	2.00	NUT,HEX,#10-24
22	871066120	1.00	SEAL,SWITCH,NUT,.469-32
23	871071601	2.00	WASHER,SPLIT LOCK,#10
24	80142	2.00	WASHER,TYPE A PLAIN,.375
25	33312	1.00	CLAMP,MUFFLER,2.5
26	33964	1.00	SWITCH,BACKUP ALARM
27	25650	1.00	COVER,SOLENOIDS

See wiring schematic included on fold out pages at the end of this section.


CONTROLS GROUP,
RA300, STERLING
DRAWING NO.
25623
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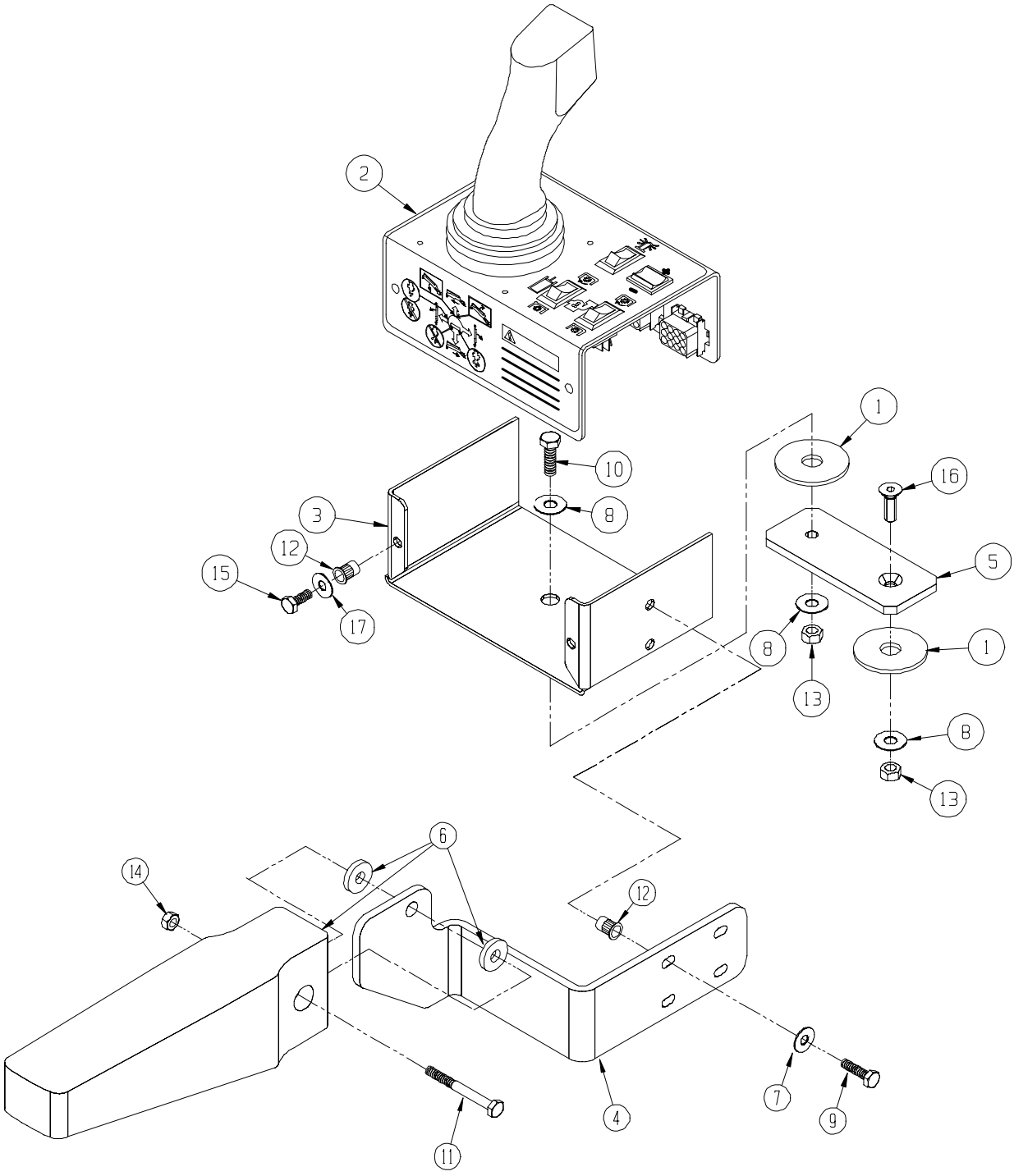
ITEM	PART NO.	QTY.	DESCRIPTION
1	106004605	2.00	DISC,FRICTION
2	25679	1.00	WIRING,CONSOLE,RA300 (See Detail)
3	25681	1.00	CONTROL BOX,BOTTOM
4	24422	1.00	MOUNT,ARM REST
5	24417	1.00	PIVOT,CONTROL BOX
6	37547	1.00	ARM RESTS,W/SPACERS,V-818
7	80140	2.00	WASHER,TYPE A PLAIN,.250
8	80141	3.00	WASHER,TYPE A PLAIN,.312
9	80185	2.00	CSHH,.250-20X1.00,GR5
10	80208	1.00	CSHH,.312-18X1.00,GR5
11	80226	1.00	CSHH,.375-16X1.50,GR5
12	37986	4.00	NUT,INSERT,.250-20,.027-.165,S
13	80351	2.00	NUT,FLEXLOC,.312-18,FULL,LT
14	80352	1.00	NUT,FLEXLOC,.375-16,FULL,LT
15	80192	2.00	CSHH,.250-20X.75,GR5
16	81181	1.00	CSFHS,.312-18X1.00,GR5
17	80970	2.00	WASHER,SAE PLAIN,.250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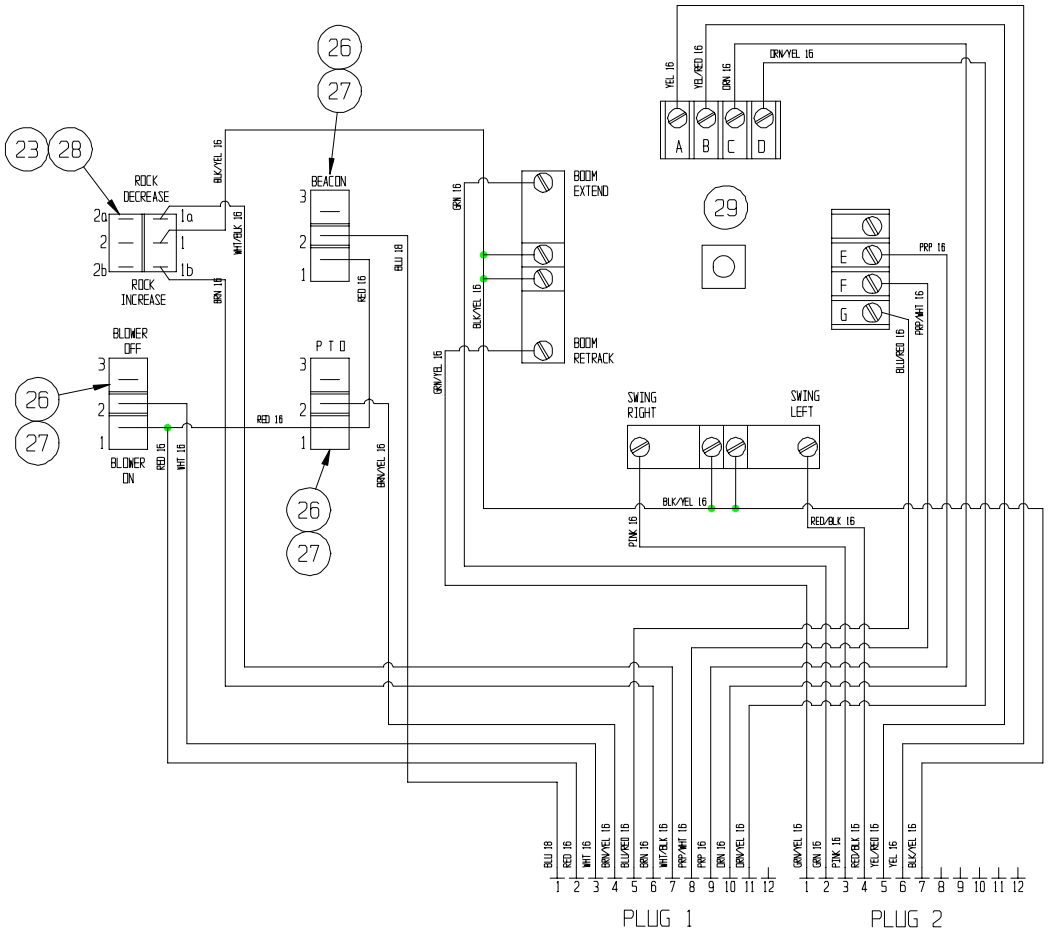
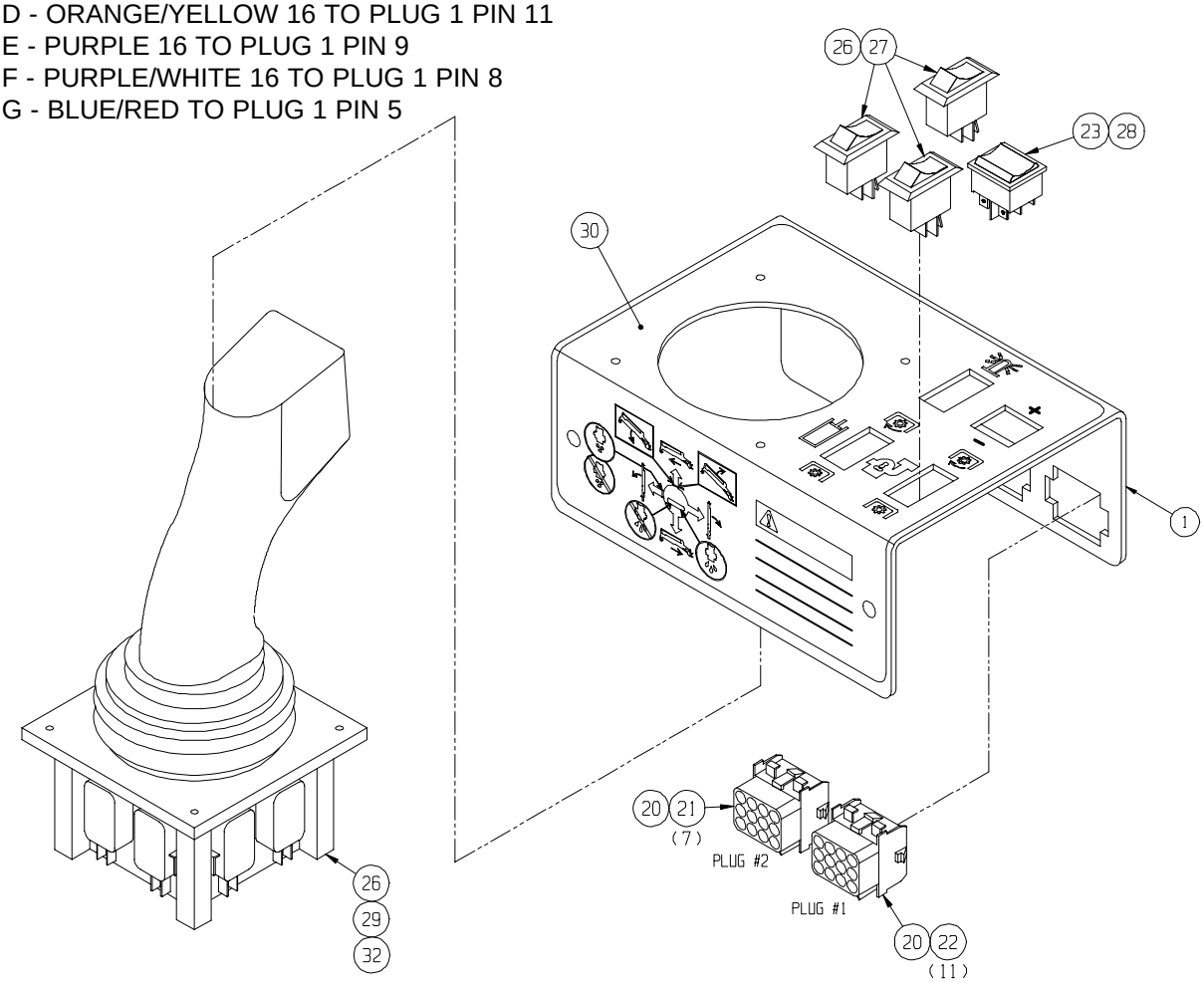
ITEM	PART NO.	QTY.	DESCRIPTION
1	25680	1.00	CONTROL BOX,TOP
20	34468	2.00	CONN HOUSING,CAP,12 CIRCUIT
21	34469	11.00	CONTACT,PIN,20-14 GA
22	34471	7.00	CONTACT,SOCKET,20-14 GA
23	35098	1.00	SWITCH,ROCKER,DPDT,MOMENTARY
NS	35123	7.00	TERM,RING,16-14 GA,#6 STUD
26	35926	15.00	TERM,PUSH-ON,.25,FEM,22-18 GA
27	36748	3.00	SWITCH,ROCKER,SPDT,ON/ON
28	37217	3.00	TERM,PUSH-ON,.18,FEM,22-18 GA
29	37984	1.00	JOYSTICK,DUAL AXIS,3-ROCKER (COMPLETE)
	37984-01	1.00	HANDLE, FOR JOYSTICK
	37984-02	1.00	SWITCH,ROCKER,JOYSTICK
	37984-03	1.00	SWITCH,ROCKER,JOYSTICK,SMALL
	37984-04	1.00	SPRING ARM (PER PAIR)
	37984-05	1.00	BOOT,JOYSTICK
30	38071	1.00	DECAL,CONTROL BOX,RA300
NS	851201417	18.00	TIE WRAP,.094X4.00
32	81206	4.00	MACH SCR,M3X0.5X16



JOYSTICK BASE

A - YELLOW 16 TO PLUG 2 PIN 6
B - YELLOW/RED 16 TO PLUG 2 PIN 5
C - ORANGE 16 TO PLUG 1 PIN 10
D - ORANGE/YELLOW 16 TO PLUG 1 PIN 11
E - PURPLE 16 TO PLUG 1 PIN 9
F - PURPLE/WHITE 16 TO PLUG 1 PIN 8
G - BLUE/RED TO PLUG 1 PIN 5



NOTE: LABLE CONNECTORS

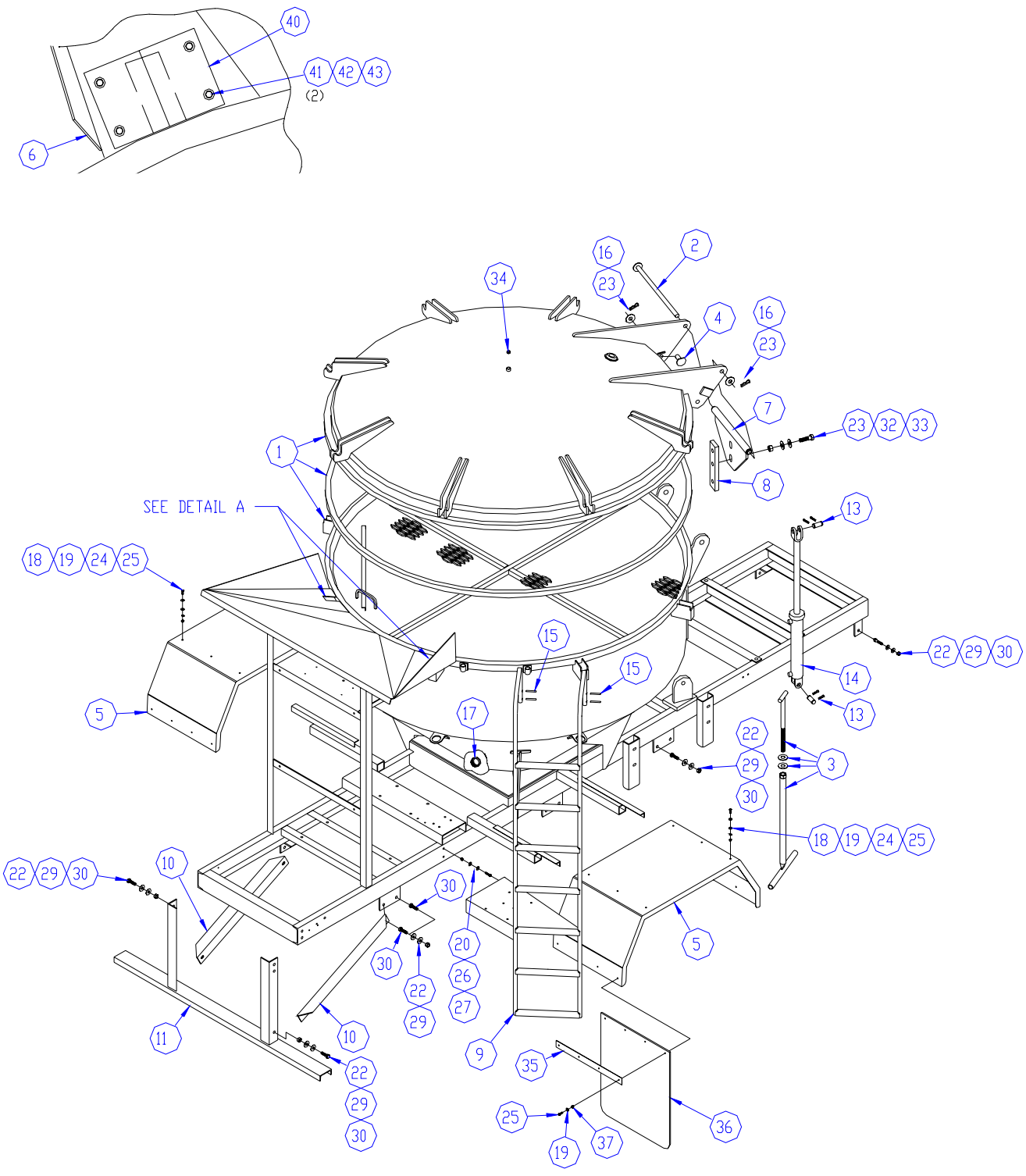
PLUG 1

1 - BLUE 18 TO BEACON TERM 2
2 - RED 16 TO BLOWER/PTO/BEACON TERM 1
3 - WHITE 16 TO BLOWER TERM 2
4 - BROWN/YELLOW 16 TO PTO TERM 2
5 - BLUE/RED 16 TO JOYSTICK BASE TERM G
6 - BROWN 16 TO ROCK TERM 1b
7 - WHITE/BLACK 16 TO ROCK TERM 1a
8 - PURPLE/WHITE 16 TO JOYSTICK BASE TERM F
9 - PURPLE 16 TO JOYSTICK BASE TERM E
10 - ORANGE 16 TO JOYSTICKBASE TERM C
11 - ORANGE/YELLOW 16 TO JOYSTICK BASE TERM D
12 - OPEN

PLUG 2

1 - GREEN/YELLOW 16 TO BOOM RETRACT NO
2 - GREEN 16 TO BOOM EXTENT NO
3 - PINK 16 TO SWING LEFT NO
4 - RED/BLACK 16 SWING RIGHT NO
5 - YELLOW/RED 16 TO JOYSTICK BASE TERM B
6 - YELLOW 16 TO JOYSTICK BASE TERM A
7 - BLACK/YELLOW 16 TO EXTENT/RETRACT COM TO SWING RIGHT/LEFT COM
8 - OPEN
9 - OPEN
10 - OPEN
11 - OPEN
12 - OPEN

ITEM	PART NO.	QTY.	DESCRIPTION
1	25459	1.00	FRAME,SUB-ASSY,RA300,STERLING
	35406	2.00	BUSHING,1.003ID,1.25300,.75
	36529	1.00	SEAL,RUBBER,DOUBLE LIP
2	20457	1.00	PIN,PIVOT LID LIFT
3	20458	7.00	T BOLT ASSEMBLY,LID LOCK
	20459	1.00	T-BOLT,1B UNCX14.00
	20460	1.00	HANDLE,T-BOLT
	80149	2.00	WASHER,TYPE A PLAIN,1
4	20796	2.00	PIN W/M,LID PIVOT
5	22181	2.00	FENDER,SINGLE AXLE,STL
7	24101	1.00	HINGE PLATE W/M
8	24103	1.00	BAR,LID LIFT
9	25553	1.00	REAR LADDER,W/M,STERLING
10	24254	2.00	BRACE,BUMPER
11	24260	1.00	BUMPER,REAR
13	36129-02	2.00	PIN,CLEVIS,1.00 OD
14	36519	1.00	CYL,HYD,3.00X14,3000PSI,32.0
15	80347	4.00	ROLL PIN,.250X2.00
16	36544	3.00	HAIR PIN COTTER,7GA(.177)
17	70444	1.00	PIPE,PLUG,2.00MP,SQ HD,MI
18	80037	12.00	NUT,HEX,.312-18
19	80141	32.00	WASHER,TYPE A PLAIN,.312
20	80142	8.00	WASHER,TYPE A PLAIN,.375
22	81201	40.00	WASHER,SAE,HARDENED,.625
23	80149	7.00	WASHER,TYPE A PLAIN,1.000
24	80161	12.00	WASHER,SPLIT LOCK,.312
25	80208	20.00	CSHH,.312-18X1.00,GR5
26	80226	4.00	CSHH,.375-16X1.50,GR5
27	80352	4.00	NUT,FLEXLOC,.375-16,FULL,LT
29	80356	20.00	NUT,FLEXLOC,.625-11,FULL,LT
30	80988	20.00	CSHH,.625-11X2.50,GR8
32	81075	2.00	NUT,STOVERS 1.00-8, GR C
33	81080	2.00	CSHH,1.000-8X3.00,GR8
34	99537	1.00	PIPE,PLUG,08MP,SQ HD,MI
35	13960	2.00	MOUNT BAR,MUD FLAP
36	71513	2.00	MUD FLAP,24WX30,PLAIN BLACK
37	80351	8.00	NUT,FLEXLOC,.312-18,FULL,LT
38	24591	.00	BRAKE VALVE RELOCATION
40	24732	4.00	COVER,CHUTE,T-BOLT
41	80140	16.00	WASHER,TYPE A PLAIN,.250
42	80185	8.00	CSHH,.250-20X1.00,GR5
43	80350	8.00	NUT,FLEXLOC,.250-20,FULL,LT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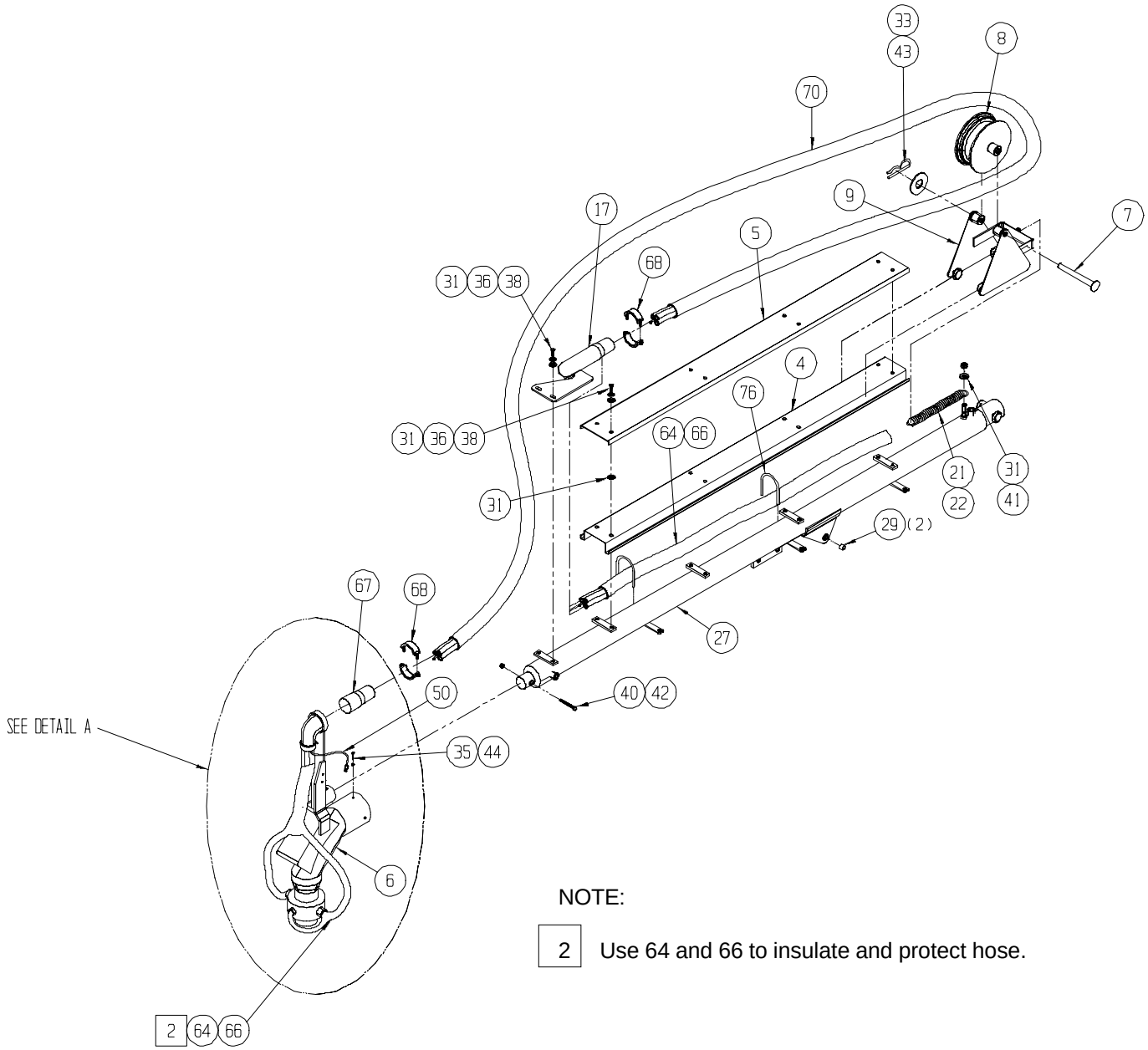
ITEM	PART NO.	QTY.	DESCRIPTION
4	20825	1.00	TRACK BOTTOM,HOSE RETRACTOR
5	20826	1.00	TRACK TOP,HOSE RETRACTOR
6	20831	1.00	NOZZLE W/M
7	20860	1.00	PIN W/M,HOSE RETRACTOR
8	20862	1.00	RETRACTOR WHEEL W/M
9	20865	1.00	SUPPORT W/M,RETRACTOR WHEEL
17	20857	1.00	RETAINER,HOSE W/M
21	36538	1.00	SPR,.99 DIA X 15.25
22	36539	1.00	SPR,1.375 DIA X 16.25
27	37322	1.00	CYL,HYD,3.00 X 72.00,IRELAND
29	37470	10.00	BUSH,TENSION,1.25ODX1.00IDX.50
31	80142	18.00	WASHER,TYPE A PLAIN,.375
33	80146	1.00	WASHER,TYPE A PLAIN,.625
35	80160	12.00	WASHER,SPLIT LOCK,.250
36	80162	10.00	WASHER,SPLIT LOCK,.375
38	80224	10.00	CSHH,.375-16X1.25,GR5
40	80289	1.00	CSHH,.625-11X3.50,GR 5
41	80354	10.00	NUT,FLEXLOC,.500-13,FULL,LT
42	80356	1.00	NUT,FLEXLOC,.625-11,FULL,LT
43	80389	1.00	COTTER PIN,.125X1.00
44	80423	12.00	CSHH,.250-20X.50,GR5
50	24419	1.00	HARNESS,BOOM,ACTUATOR/LIGHTS
64	37002	15.00	SLEEVE,ABRASION,NYLON,3.20ID
66	36664	15.00	INSULATION,TUBE,1.62IDx.38WALL
67	6063	1.00	PIPE,NIPPLE,KING,2.00NPT
68	33332	2.00	CLAMP,HOSE,#33 KNOX
70	36353	12.00	HOSE,WATER,SUCT/DISCH,2.00 ID
76	37720	2.00	CLAMP,MUFFLER,2.25

(continued on next page)

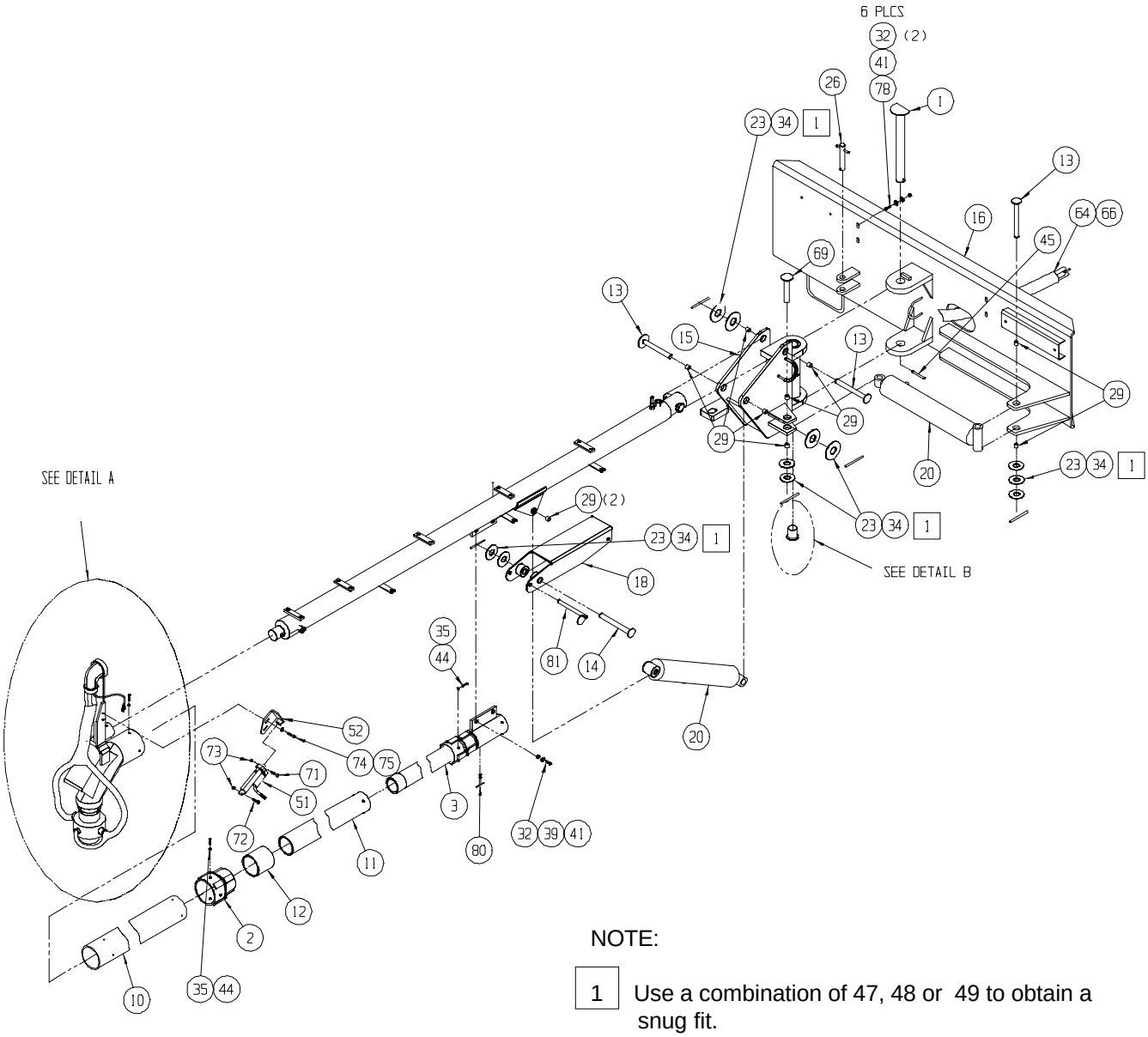
Other Views of This Group Shown on Following Pages...



NOTE:

2 Use 64 and 66 to insulate and protect hose.

ITEM	PART NO.	QTY.	DESCRIPTION
1	20491	1.00	PIN,PIVOT W/M
2	20798	1.00	REDUCER W/M,4 PVCX3 PVC
3	20823	1.00	BASE,DISCHARGE TUBE
10	20867	1.00	DISCHARGE PIPE, 4 PVC
11	20868	1.00	DISCHARGE PIPE, 3 PVC
12	20869	1.00	PVC COUPLING MODIFIED, 3
13	20874	3.00	PIN,CYLINDER W/M 1.00OD
14	22201	1.00	CYLINDER PIN W/M,1.00 X 5.94
15	24057	1.00	BOOM PIVOT W/M,RA300T
16	25510	1.00	W/M,FRONT BUMPER,STERLING
18	24303	1.00	LIFT CYL LOCK W/M
20	36518	2.00	CYL,HYD,3.00X16.0,3000PSI,24
23	80346	5.00	ROLL PIN,.250X1.75
26	37134	1.00	PIN,QUICK RELEASE,1.00 X 3.50
29	37470	10.00	BUSH,TENSION,1.25ODX1.00IDX.50
32	80144	20.00	WASHER,TYPE A PLAIN,.500
34	80149	5.00	WASHER,TYPE A PLAIN,1.000
35	80160	12.00	WASHER,SPLIT LOCK,.250
39	80261	2.00	CSHH,.500-13X2.50,GR5
41	80354	10.00	NUT,FLEXLOC,.500-13,FULL,LT
44	80423	12.00	CSHH,.250-20X.50,GR5
45	871081835	1.00	ROLL PIN,.375X2.00
47	R48-1	2.00	WASHER,1.50X1.031X.062
48	R48-2	2.00	WASHER,1.50X1.031X.075
49	R48-3	2.00	WASHER,1.50X1.031X.125
51	23252	1.00	ACTUATOR,THROTTLE/EMULSION
52	24778	1.00	MOUNT,ACTUATOR,RA300
64	37002	15.00	SLEEVE,ABRASION,NYLON,3.20ID
66	36664	15.00	INSULATION,TUBE,1.62IDx.38WALL
69	20872	1.00	PIN,CYLINDER W/M 1.00 OD
71	80194	1.00	CSHH,.250-20X1.50,GR5
72	80187	1.00	CSHH,.250-20X1.25,GR5
73	80350	2.00	NUT,FLEXLOC,.250-20,FULL,LT
74	80141	2.00	WASHER,TYPE A PLAIN,.312
75	80208	2.00	CSHH,.312-18X1.00,GR5
78	81140	8.00	CSHH,.500-13X1.75,GR8
80	21553	2.00	T-HANDLE W/M
81	37117	1.00	PIN,QUICK RELEASE,.50 X 6.00

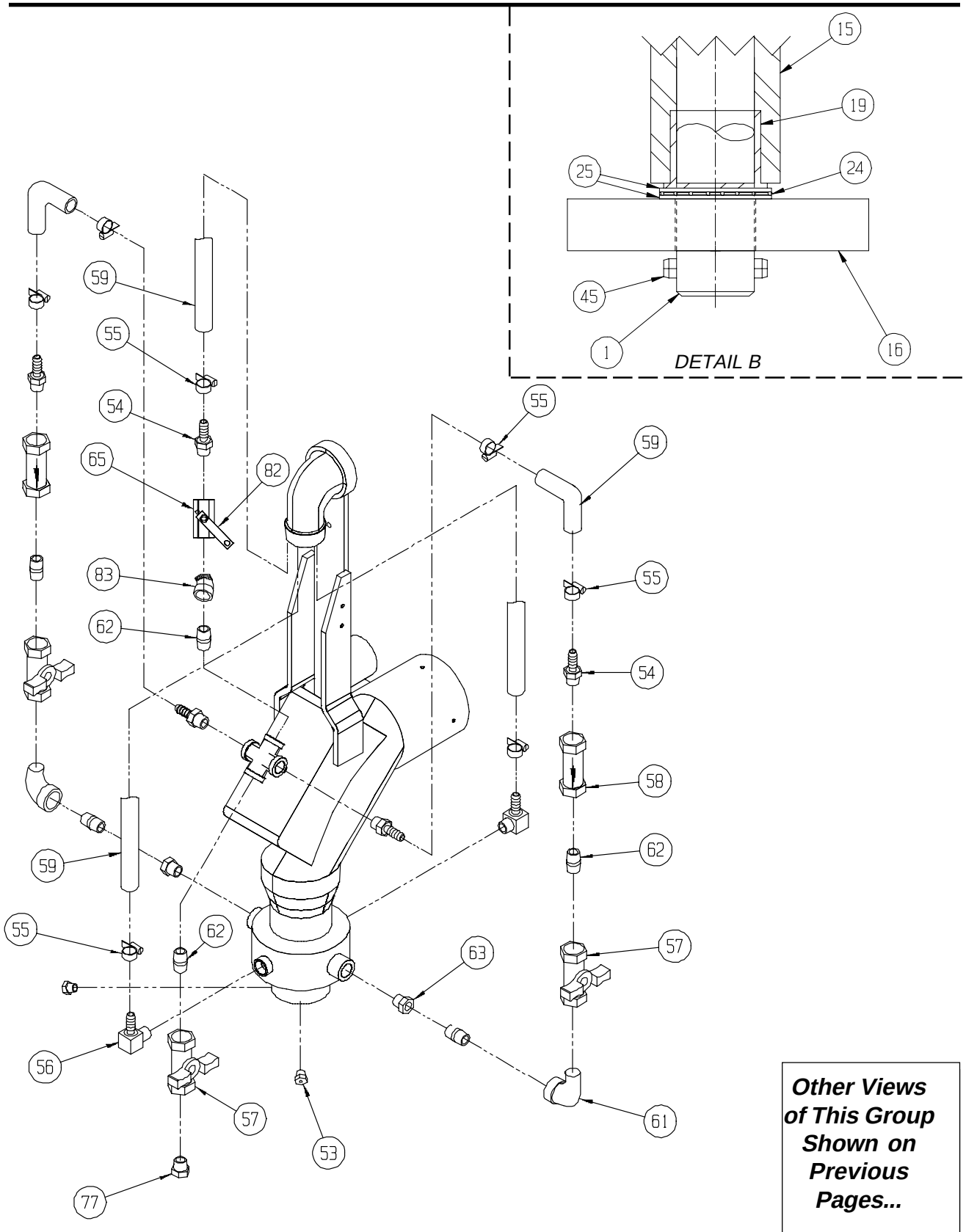


NOTE:

1 Use a combination of 47, 48 or 49 to obtain a snug fit.

Other Views of This Group Shown on Following Pages...

ITEM	PART NO.	QTY.	DESCRIPTION
1	20491	1.00	PIN,PIVOT W/M
15	24057	1.00	BOOM PIVOT W/M,RA300T
16	25510	1.00	W/M,FRONT BUMPER,STERLING
19	32833	2.00	BUSHING,1.503ID,1.754OD,1.5
24	36613	1.00	BEARING,THRUST 1.50 ID X.0781
25	36614	2.00	WASHER,THRUST 1.50IDX.062
45	871081835	1.00	ROLL PIN,.375X2.00
53	24594-078	4.00	NOZZLE,EMULSION SPRAY,.078
54	31046	5.00	FITT,STR 08MP-08HB,PUSH-ON
55	33163	7.00	CLAMP,HOSE,.50-.91,WORM,#08
56	33328	2.00	FITT,90 08MP-08HB,CRIMPED
57	36622	3.00	VLV,BALL,08 NPT,T HANDLE
58	36871	2.00	VLV,CHECK,.50 NPT FEM,5 PSI
59	6352	45.00	HOSE,08,PUSH-ON,250
61	99526	2.00	PIPE,90,08MP-O8FP,MI
62	99596	6.00	PIPE,NIPPLE,08XCLOSE
63	99985	2.00	PIPE,BUSH,12MP-08FP,STL
65	36220	1.00	VLV,BALL,08 NPT
77	99537	1.00	PIPE,PLUG,08MP,SQ HD,MI
82	24679	1.00	LEVER,3-WAY 08 NPT VALVE
83	99519	1.00	PIPE,45,08MP-08FP,MI

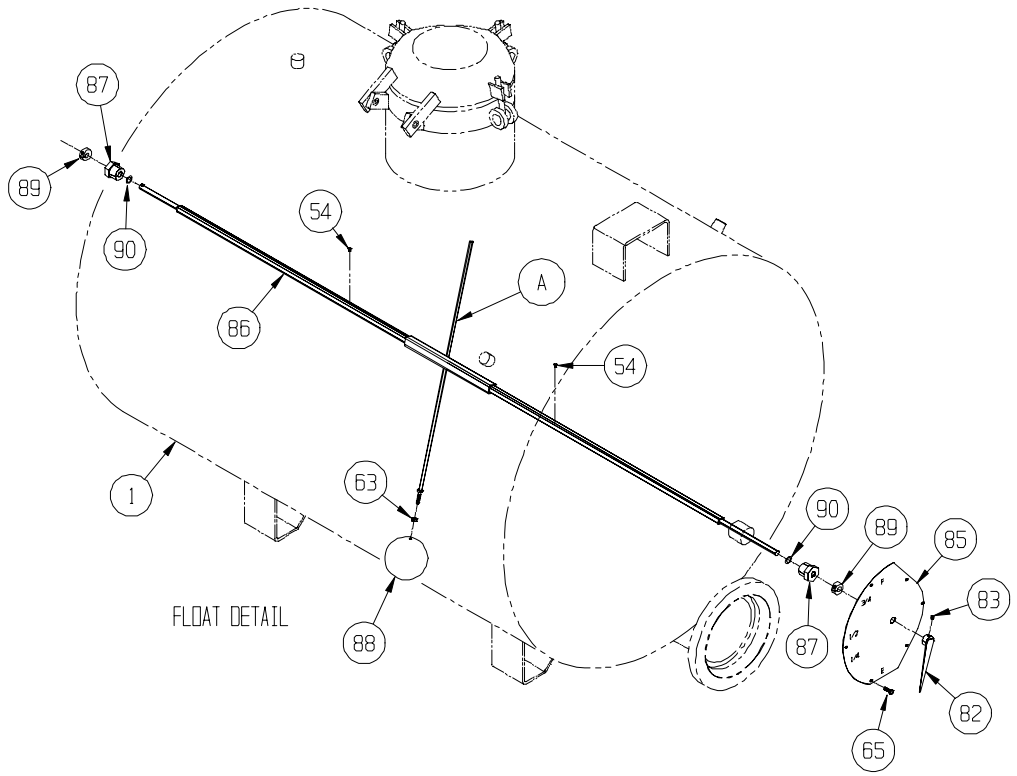


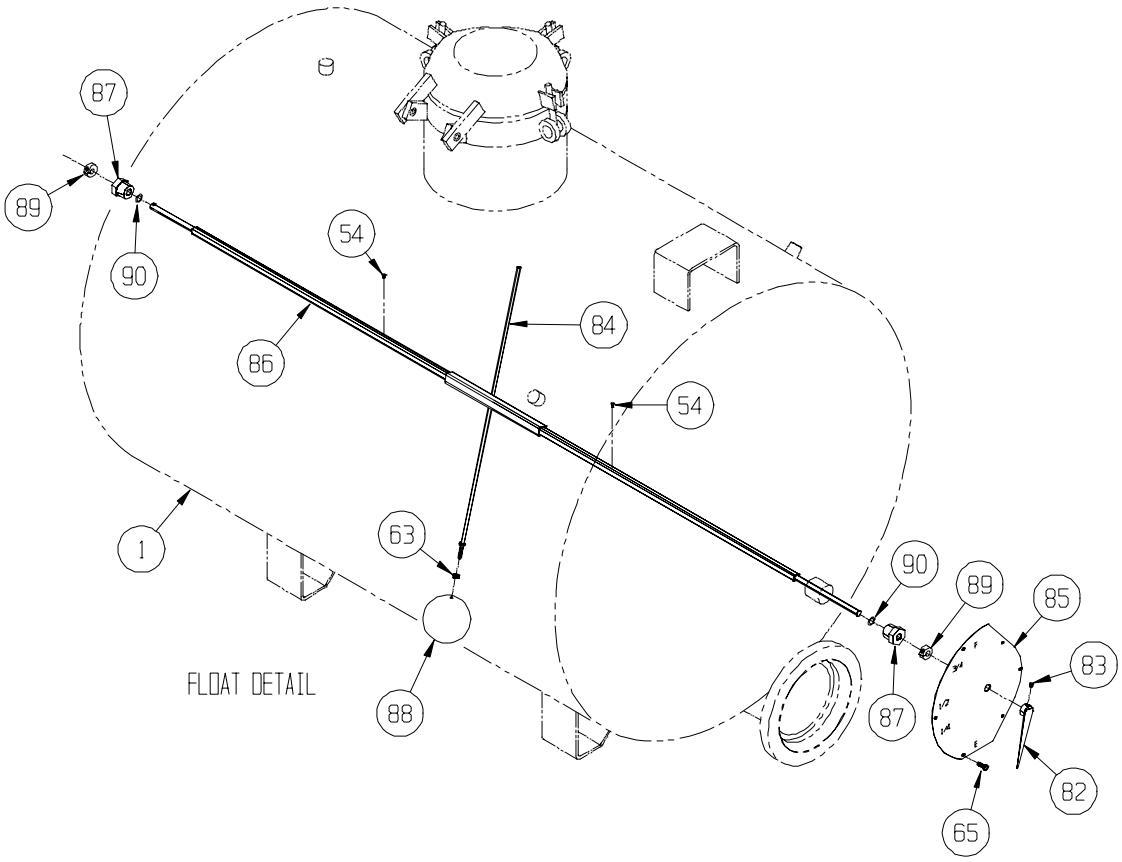
Other Views of This Group Shown on Previous Pages...

ITEM	PART NO.	QTY.	DESCRIPTION
1	24998	1.00	EMULSION TANK INSULATE,RA300
54	81177	2.00	MACH SCR,PH,#8-32X.25
63	80036	1.00	NUT,HEX,.250-20
65	81160	12.00	SCR,SLFDRL,HH,#10X1.00,#3PT
82	8119	1.00	POINTER ASSY
83	80392	1.00	SET S,.250-20X.50
84	23725	1.00	FLOAT ROD W/M, RA300
85	23728	1.00	CONTENTS PLATE,RA300
86	23730	1.00	FLOAT PIVOT ROD W/M,RA300
87	23735	2.00	NUT,FLOAT ROD PIVOT
88	35845	1.00	FLOAT,4.00 SPHERICAL SS304
89	37505	2.00	COLLAR,SHAFT,SPLT,.50IDX1.12OD
90	37506	2.00	O-RING,.487IDX.103CS,VITON

Float Pivot Rod Installation

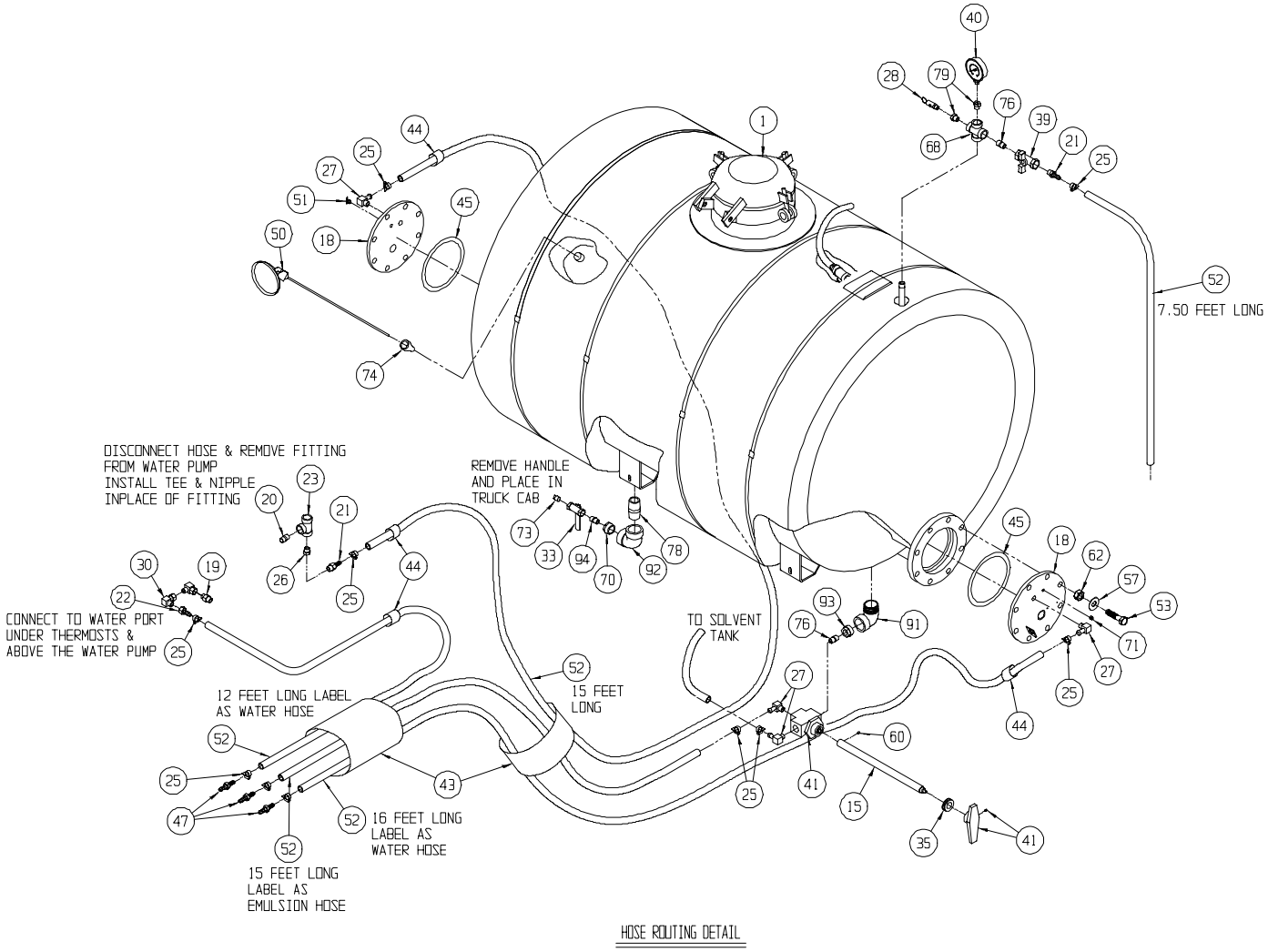
Note: Install one #8-32 screw (Item 54) into the float pivot rod (Item 86) on the left side of the unit. Insert float pivot rod (Item 86) into the tank far enough to install the complete float assembly (A). Then push the float pivot rod (Item 86) through the opening on the right side of the tank until the hole for the second screw (Item 54) is visible. Insert the screw. Now push the pivot rod back through the left side of the tank, only enough to install o-ring (Item 90), bushing (Item 87) and lock collar (Item 89). Then install o-ring,bushing and lock collar on right side of tank to secure rod. Finally, adjust float pivot rod for pointer to allow for installation and proper operation of contents plate (Item 85) and pointer assembly (Item 82).





Other Views of This Group Shown on Following Pages...

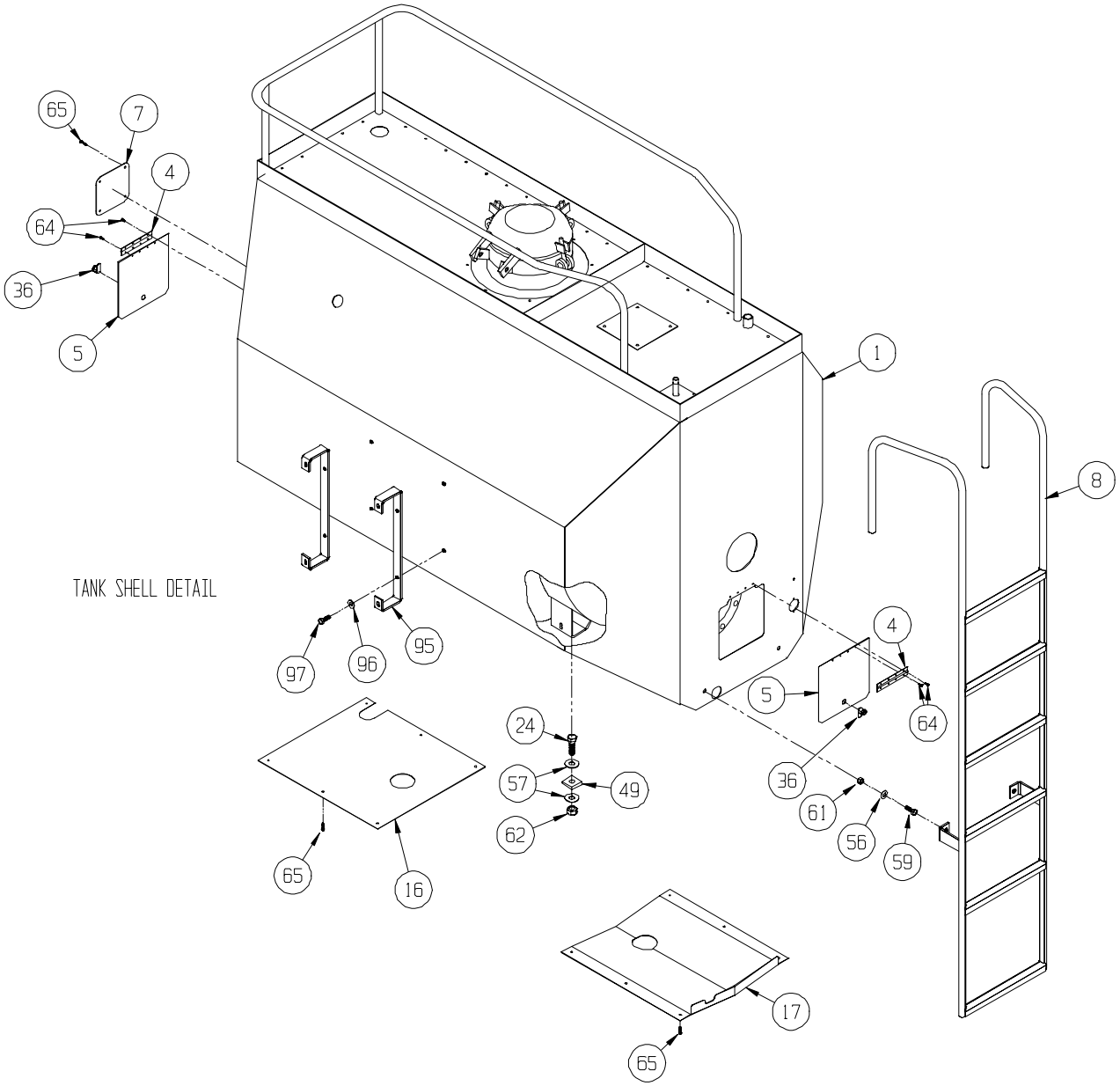
ITEM	PART NO.	QTY.	DESCRIPTION
1	24998	1.00	EMULSION TANK INSULATE,RA300
15	24382	1.00	HANDLE EXTENTION
18	24490	2.00	FLANGE W/M,WATER TUBE
19	33937	1.00	FITT,STR 08MJ-08MP
20	99834	1.00	PIPE,NIPPLE,08XCLOSE,GALV
21	31046	2.00	FITT,STR 08MP-08HB,PUSH-ON
22	31109	1.00	FITT,STR 08FJX-08HB,PUSH-ON
23	99845	1.00	PIPE,TEE,08FP,GALV
25	33163	5.00	CLAMP,HOSE,.50-.91,WORM,#08
26	99985	1.00	PIPE,BUSH,12MP-08FP,STL
27	33328	4.00	FITT,90 08MP-08HB,CRIMPED
28	33750	1.00	VLV,AIR,SAFETY,125PSI,04 NPT
30	33900	2.00	FITT,90 08MJ-08FJX
33	34402	1.00	VLV,BALL,1.00,BRONZE
35	35465-05	1.00	GROMMET,INSULATION 1.00ID
39	36622	1.00	VLV,BALL,08 NPT,T HANDLE
40	36656	1.00	GAUGE,PRESS,0-160 PSI,2.5 OD
41	36662	1.00	VLV,BALL,3-WAY,08 NPT
43	36664	20.00	INSULATION,TUBE,1.62IDx.38WALL
44	36665	15.00	INSULATION,TUBE,1.12IDX.38WALL
45	36684	2.00	GASKET,FLANGE,6.00,NON-ASB
47	37003	3.00	FITT,STR,08HB-08HB
50	5470	1.00	THERM,DIAL,5.0 FACE,500 F
51	5822	2.00	VLV,DRAIN COCK,.25
52	6352	66.00	HOSE,08,PUSH-ON,250
53	71646	16.00	CSHH,.750-10X3.00,GR5
57	80147	24.00	WASHER,TYPE A PLAIN,.750
60	80300	1.00	SET S,HSKT,KCUP,.250-20X.25
62	80357	20.00	NUT,FLEXLOC,.750-10,FULL,LT
68	99498	1.00	PIPE,CROSS,08FP,MI
70	99247	1.00	PIPE,BUSH,2.00MP-16FP,MI
71	99535	2.00	PIPE,PLUG,04MP,SQ HD,MI
73	99539	1.00	PIPE,PLUG,16MP,SQ HD,MI
74	99551	1.00	PIPE,RED,08FP-04FP-MI
76	99596	2.00	PIPE,NIPPLE,08XCLOSE
78	99436	1.00	PIPE,NIPPLE,2.00X5.00
79	99980	2.00	PIPE,BUSH,08MP-04FP,STL
91	99283	1.00	PIPE,90,2.00MP-2.00FP,MI
92	99271	1.00	PIPE,90,2.000FP,MI
93	99440	1.00	PIPE,BUSH,2.0MP-08FP,MI
94	99606	1.00	PIPE,NIPPLE,16XCLOSE
NS	91378	5.00	ANTIFREEZE,DEX-COOL
NS	36541-01	1.00	GASKET,MANHOLE,150TB CLOSURE



HOSE ROUTING DETAIL

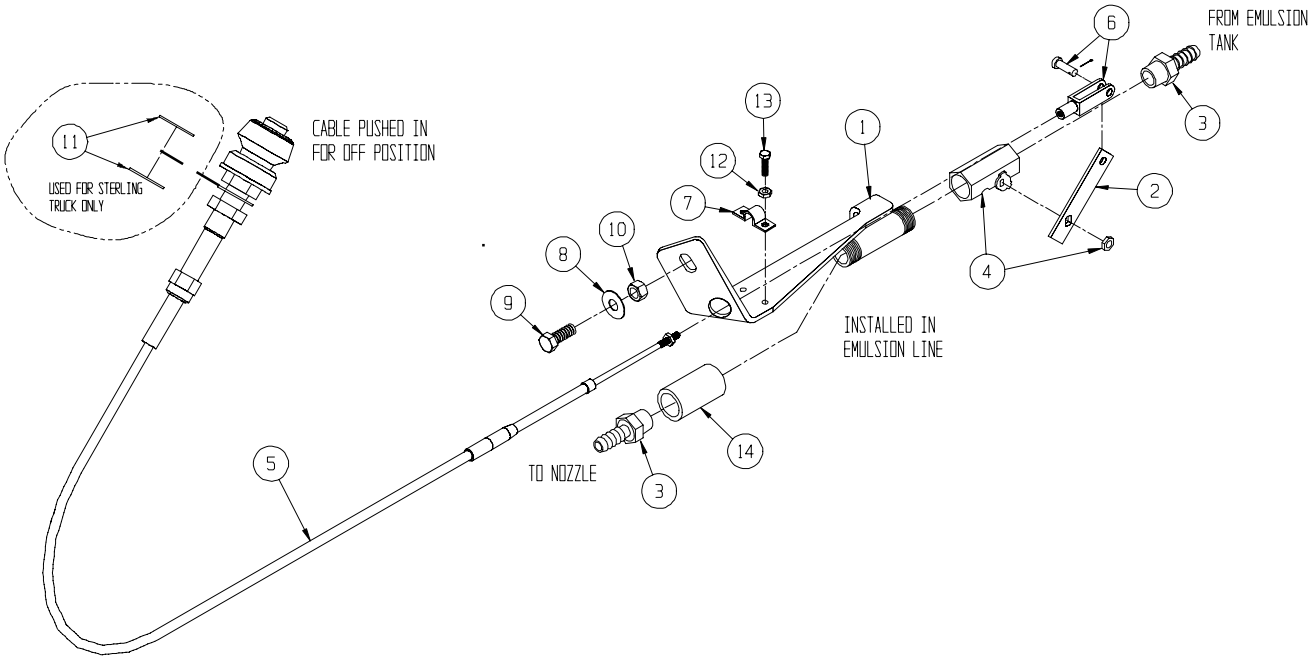
Other Views of This Group Shown on Following Pages...

ITEM	PART NO.	QTY.	DESCRIPTION
1	24998	1.00	EMULSION TANK INSULATE,RA300
4	20963	2.00	HINGE,CONTROL BOX
5	20974	2.00	SERVICE DOOR
7	23729	1.00	COVER,POTENTIOMETER
8	24170	1.00	LADDER,SIDE,WELDMENT
16	24384	1.00	COVER,DRAIN
17	24743	1.00	COVER,SELECTION VALVE
24	33137	4.00	CSHH,.750-10X2.50,GR5
36	35812	2.00	LOCK,WITH OFFSET CAM
49	37670	4.00	WASHER,SQ,BEVEL,.750
56	80144	2.00	WASHER,TYPE A PLAIN,.500
57	80147	24.00	WASHER,TYPE A PLAIN,.750
59	80248	2.00	CSHH,.500-13X1.00,GR5
61	80354	2.00	NUT,FLEXLOC,.500-13,FULL,LT
62	80357	20.00	NUT,FLEXLOC,.750-10,FULL,LT
64	871080437	16.00	RIVET,BLIND,AL,.188,.126-.250
65	81160	12.00	SCR,SLFDRL,HH,#10X1.00,#3PT
95	24847	2.00	MOUNT,OIL COOLER
96	80162	4.00	WASHER,SPLIT LOCK,.375
97	80219	4.00	CSHH,.375-16X.75,GR5



Other Views of This Group Shown on Previous Pages...

ITEM	PART NO.	QTY.	DESCRIPTION
1	25498	1.00	BRACKET,EMULSION VAVLE
2	25517	1.00	LEVER,3-WAY,08NPT,VLV,2.25 C-C
3	31046	2.00	FITT,STR 08MP-08HB,PUSH-ON
4	36220	1.00	VLV,BALL,08 NPT
5	37845	1.00	CABLE,THROTTLE,VERNIER,3"TX126
6	37846	1.00	CLEVIS,10-32X1.25,W/.250 PIN
7	37847	1.00	CLAMP,CABLE,30 SERIES
8	80142	1.00	WASHER,TYPE A PLAIN,.375
9	80221	1.00	CSHH,.375-16X1.00,GR5
10	80352	1.00	NUT,FLEXLOC,.375-16,FULL,LT
11	80698	2.00	WASHER,SAE PLAIN,.750
12	80924	2.00	NUT,FLEXLOC,#10-24,FULL,LT
13	81200	2.00	CSHH,#10-24X.75,GR5
14	99492	1.00	PIPE,CPLG,08FP
15	38019	1.00	DECAL,EMULSION FLOW ADJUSTMENT


FROM EMULSION TANK
CABLE PUSHED IN FOR OFF POSITION
USED FOR STERLING TRUCK ONLY
INSTALLED IN EMULSION LINE
TO NOZZLE
1
2
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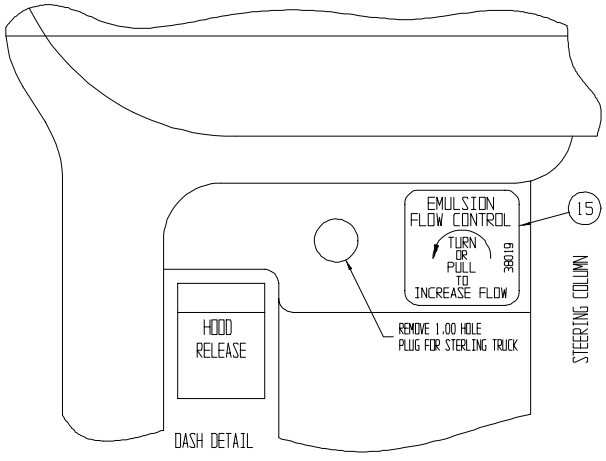
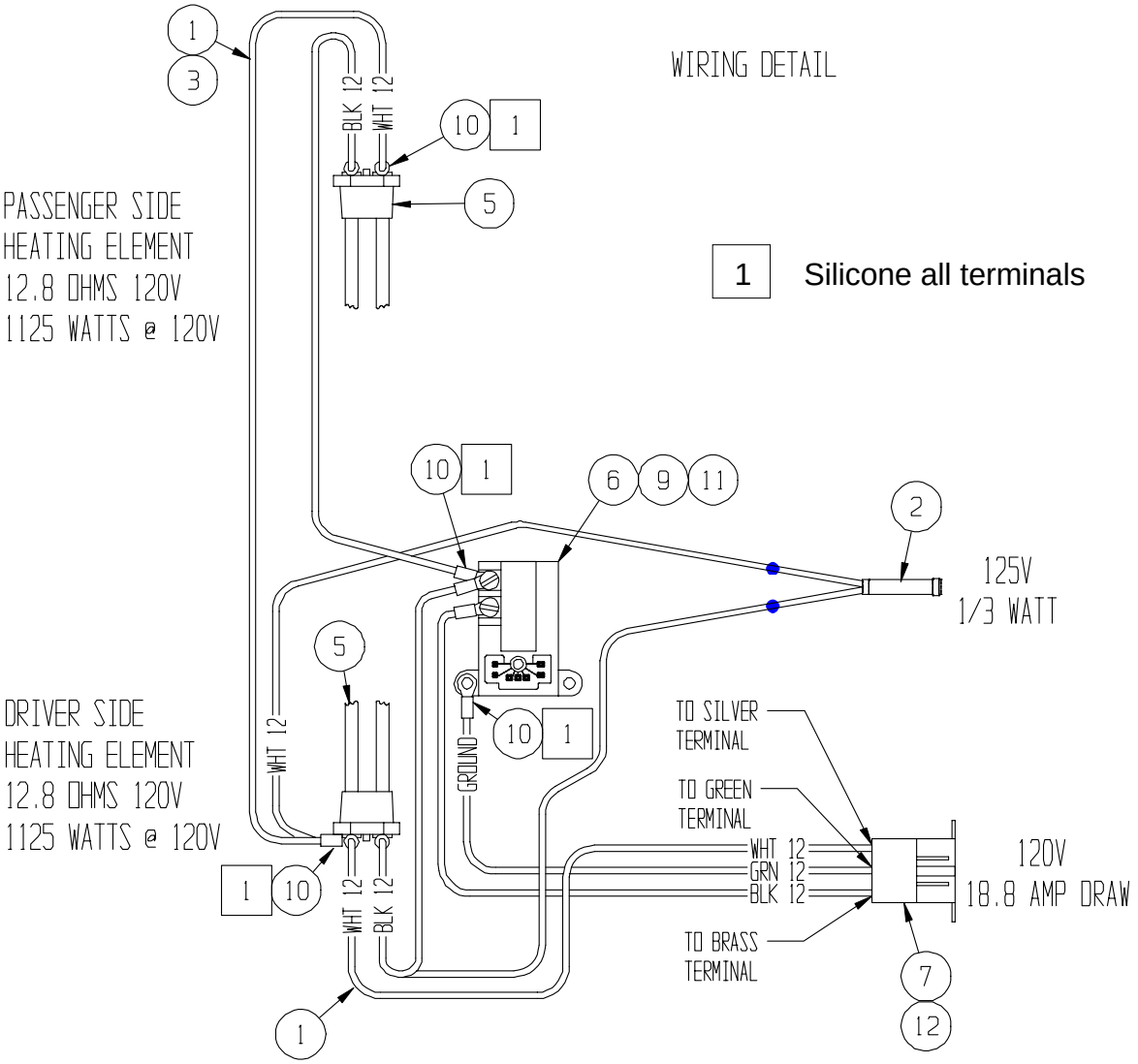
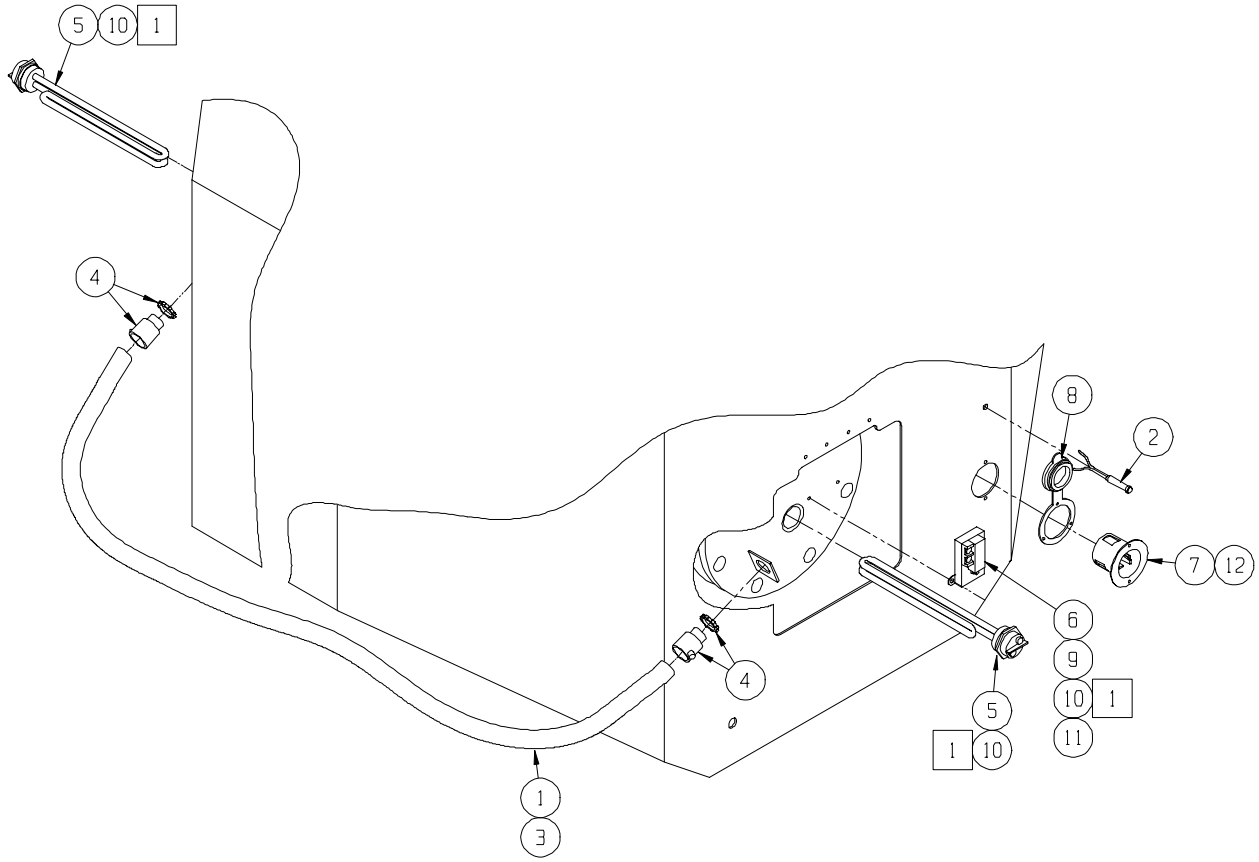
14


EMULSION FLOW CONTROL
TURN OR PULL TO INCREASE FLOW
38019
15
HOOD RELEASE
REMOVE 1.00 HOLE PLUG FOR STERLING TRUCK
STEERING COLUMN
DASH DETAIL

ITEM	PART NO.	QTY.	DESCRIPTION
1	33783	12.00	CORD,ELEC,3WIRE,300V
2	34167	1.00	LIGHT,GREEN INDICATOR
3	34729	9.00	CONDUIT,METAL FLEX,.50 ID
4	34732	2.00	CONNECTOR,STR,FLEX CONDUIT,.50
5	36681	2.00	ELEMENT,HEATER,4500 W @ 240VAC
6	36682	1.00	THERMOSTAT,ELEC,110-170 DEG F
7	37591	1.00	RCPT,ELEC,MALE,20A,125V,FLG IN
8	37721	1.00	CAP,WEATHER SEAL
9	80496	2.00	MACH SCR,PH,#10-32X.25,PHIL
10	851390204	11.00	TERM,RING,16-14 GA,#10 STUD
11	871071601	2.00	WASHER,SPLIT LOCK,#10
12	81150	2.00	SCR,SLFTPG,PH,#10X.500,AB
NS	37728	1.00	PLUG,ELEC,FEMALE,20A,125V




5
10
1
4
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2
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12
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9
10
1
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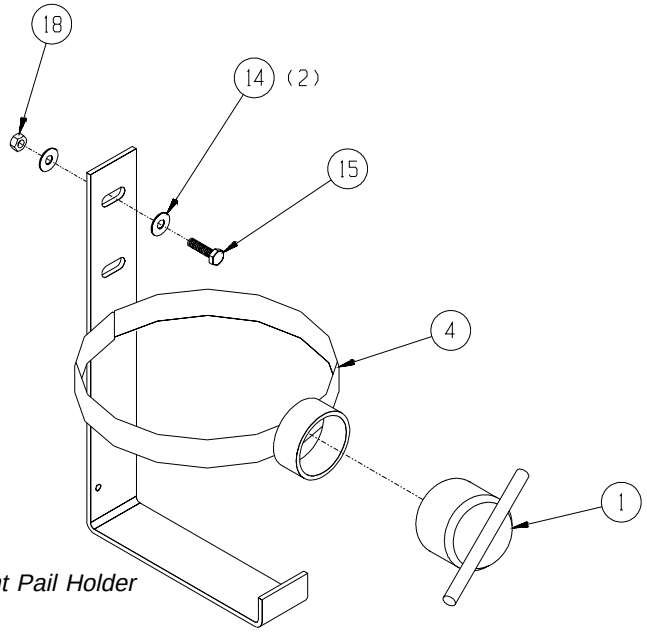
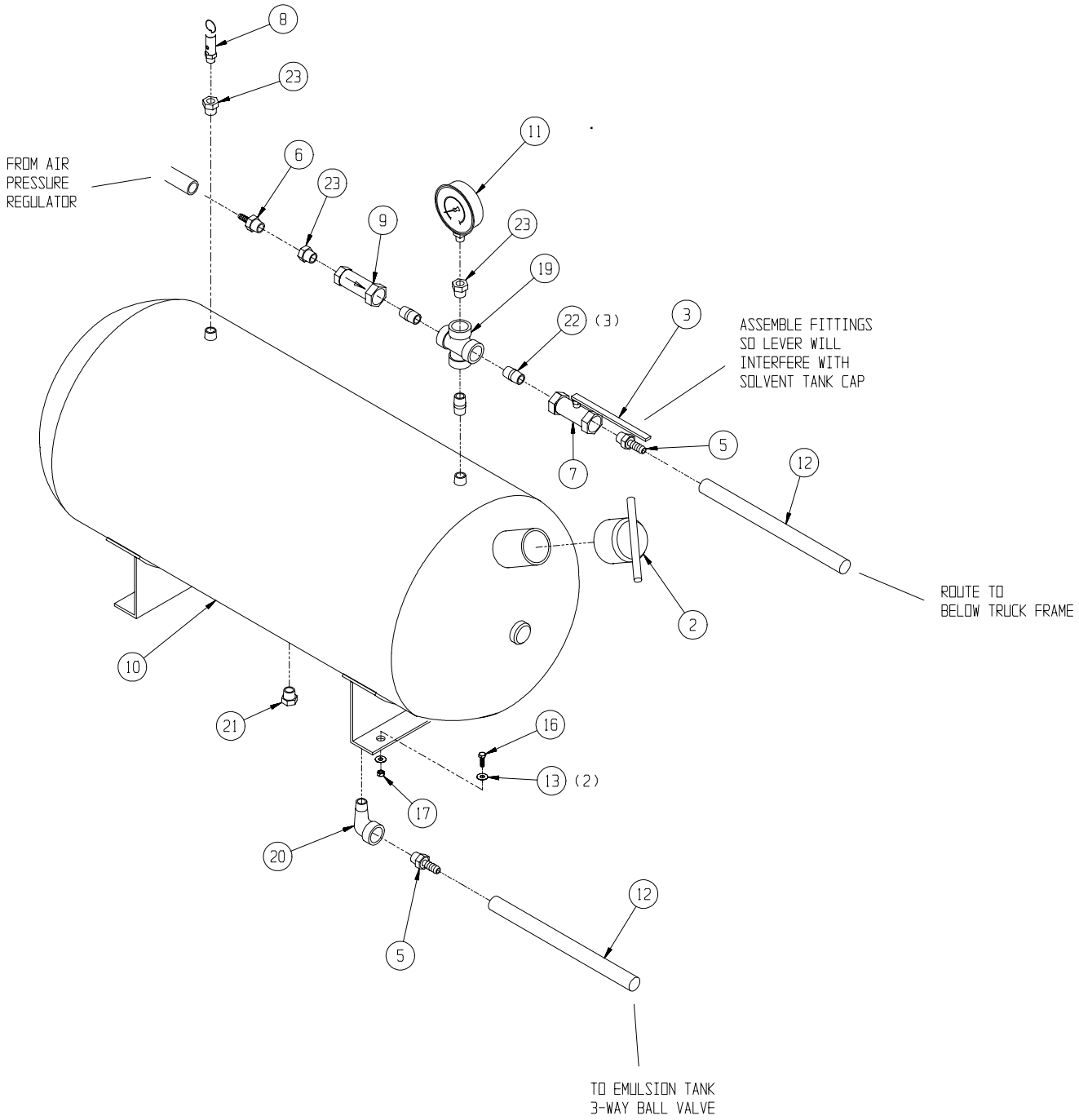
1
10
4
1
3

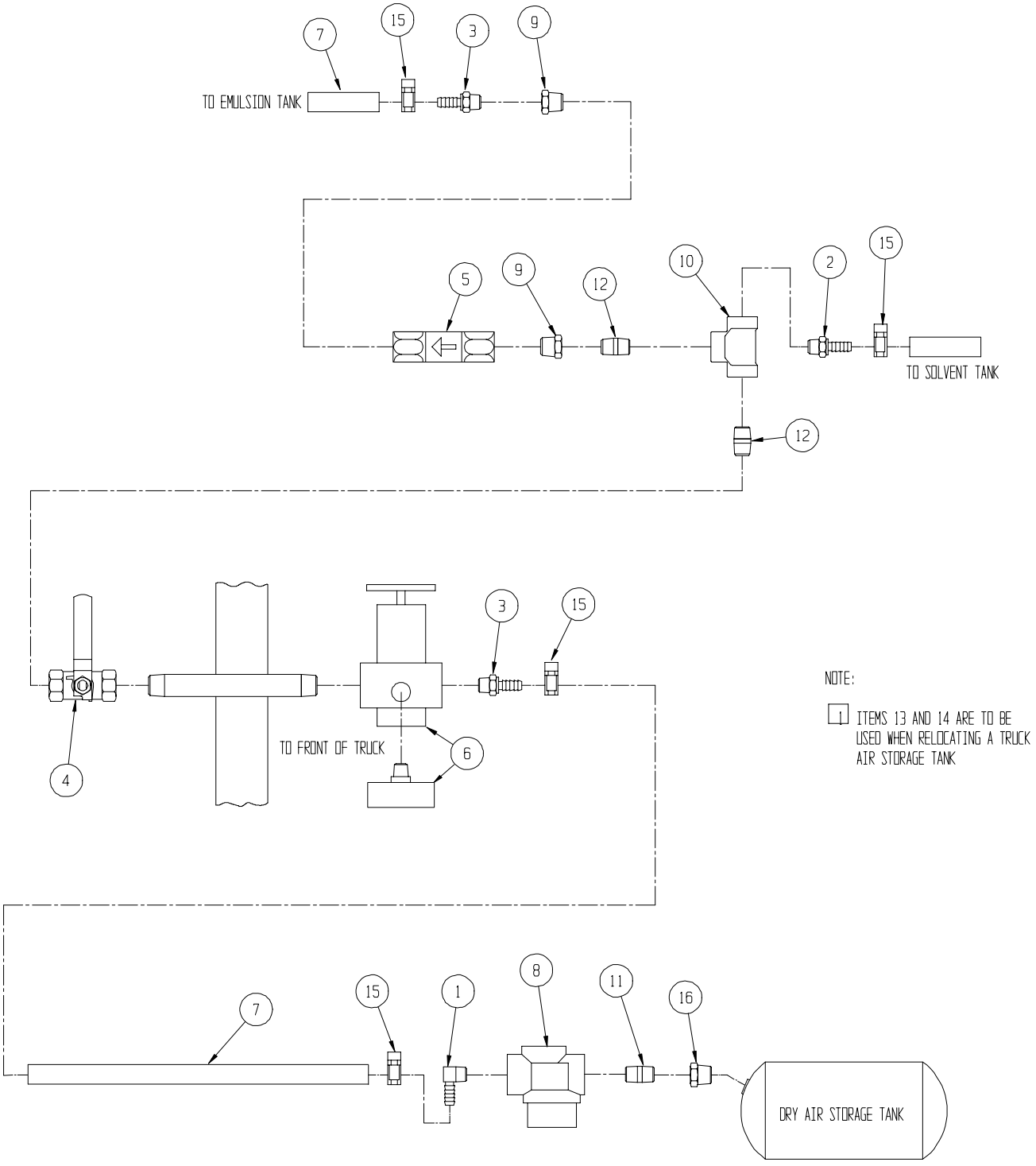
ITEM	PART NO.	QTY.	DESCRIPTION
1	20498	1.00	CAP W/M, 3 NPT
2	20954	1.00	CAP W/M, 2 NPT
3	24387	1.00	LEVER,08 BALL VALVE
4	24388	1.00	HOLDER,WASTE SOLVENT PAIL
5	31046	2.00	FITT,STR 08MP-08HB,PUSH-ON
6	31167	1.00	FITT,STR 04MP-04HB,PUSH-ON
7	32874	1.00	VLV,BALL,08-BRASS
8	33750	1.00	VLV,AIR,SAFETY,125PSI,04 NPT
9	34393	1.00	VLV,CHECK
10	36537	1.00	TANK,SOLVENT,100 PSI,30 GAL
11	36656	1.00	GAUGE,PRESS,0-160 PSI,2.5 OD
12	6352	20.00	HOSE,08,PUSH-ON,250
13	80142	8.00	WASHER,TYPE A PLAIN,.375
14	80144	2.00	WASHER,TYPE A PLAIN,.500
15	80186	1.00	CSHH,.500-13X1.75,GR5
16	80228	4.00	CSHH,.375-16X1.75,GR5
17	80352	4.00	NUT,FLEXLOC,.375-16,FULL,LT
18	80354	1.00	NUT,FLEXLOC,.500-13,FULL,LT
19	99498	1.00	PIPE,CROSS,08FP,MI
20	99526	2.00	PIPE,90,08MP-O8FP,MI
21	99537	1.00	PIPE,PLUG,08MP,SQ HD,MI
22	99596	3.00	PIPE,NIPPLE,08XCLOSE
23	99980	3.00	PIPE,BUSH,08MP-04FP,STL



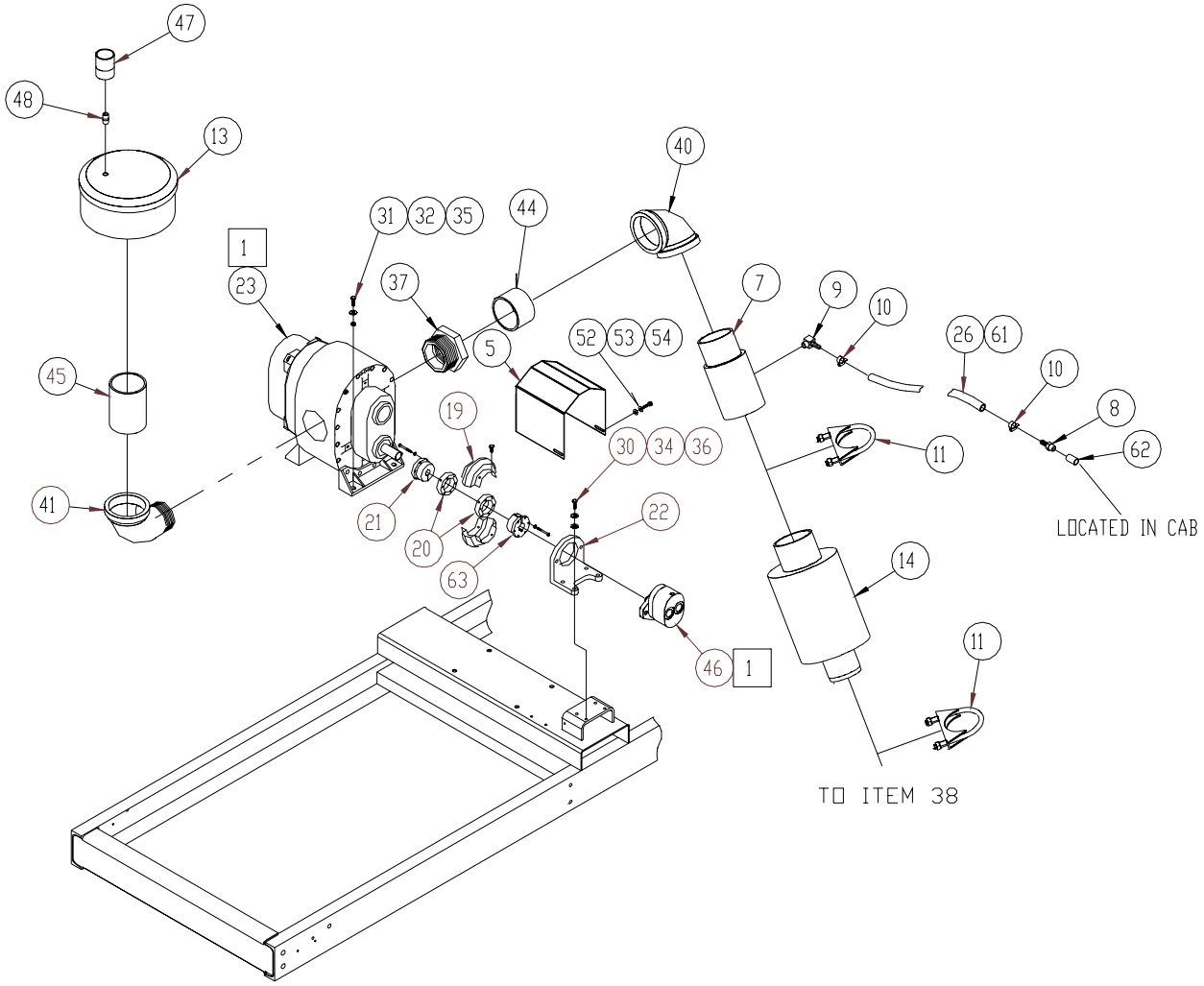
Waste Solvent Pail Holder


8
23
11
6
23
FROM AIR
PRESSURE
REGULATOR
9
23
19
22 (3)
3
ASSEMBLE FITTINGS
SO LEVER WILL
INTERFERE WITH
SOLVENT TANK CAP
5
7
12
ROUTE TO
BELOW TRUCK FRAME
2
10
21
16
13 (2)
17
20
12
5
TO EMULSION TANK
3-WAY BALL VALVE

ITEM	PART NO.	QTY.	DESCRIPTION
1	31971	1.00	FITT,90 04MP-04HB,CRIMPED
2	31959	1.00	FITT,STR 06MP-06HB,PUSH-ON
3	33280	2.00	FITT,STR 06MP-04HB,PUSH-ON
4	33588	1.00	VLV,BALL,06 NPT
5	34393	1.00	VLV,CHECK
6	35435	1.00	AIR PRESS REGULATOR 5-125 PSIG
7	5347	21.00	HOSE,04,PUSH-ON,LOW PRESS
8	6534	1.00	VLV,CHECK
9	99450	2.00	PIPE,BUSH,08MP-06FP,MI
10	99568	1.00	PIPE,TEE,06FP,MI
11	99591	1.00	PIPE,NIPPLE,04XCLOSE(7/8)
12	99638	2.00	PIPE,NIPPLE,06XCLOSE
13	36481	3.00	TUBING,AIR BRAKE,BLK,-08
14	37611	2.00	FITT,STR 08NT-08NT,BRASS
15	33277	4.00	CLAMP,HOSE,.22-.62,WORM,#04
16	99980	1.00	PIPE,BUSH,08MP-04FP,STL


7
15
3
9
TO EMULSION TANK
5
9
12
10
2
15
TO SOLVENT TANK
12
3
15
4
TO FRONT OF TRUCK
6
NOTE:
1 ITEMS 13 AND 14 ARE TO BE USED WHEN RELOCATING A TRUCK AIR STORAGE TANK
7
15
1
8
11
16
DRY AIR STORAGE TANK

ITEM	PART NO.	QTY.	DESCRIPTION
5	25226	1.00	SHIELD,COUPLING
7	24330	1.00	MUFFLER COUPLER W/M
8	33343	1.00	FITT,STR 02MP-04HB,PUSH-ON
9	31971	1.00	FITT,90 04MP-04HB,CRIMPED
10	33277	2.00	CLAMP,HOSE,.22-.62,WORM,#04
11	34040	2.00	CLAMP,MUFFLER,4.00
13	36531	1.00	SILENCER,INTAKE/FILTER
14	36534	1.00	MUFFLER,4.00 INLETX4.00 OUTLET
19	37272	1.00	ELEMENT,FLEX COUPLING
20	37273	2.00	HUB,FLEX COUPLING
21	34219	1.00	BUSHING,1.125ID,1.871OD,1.3125
22	37626	1.00	MOUNT,FOOT (SAE “A”)
23	37824	1.00	BLOWER,POSITIVE DISPL,.323CFR
26	5347	25.00	HOSE,04,PUSH-ON,LOW PRESS
30	80142	8.00	WASHER,TYPE A PLAIN,.375
31	80144	4.00	WASHER,TYPE A PLAIN,.500
32	80186	4.00	CSHH,.500-13X1.75,GR5
34	80352	8.00	NUT,FLEXLOC,.375-16,FULL,LT
35	80354	4.00	NUT,FLEXLOC,.500-13,FULL,LT
36	80228	4.00	CSHH,.375-16X1.75,GR5
37	90108	1.00	PIPE,BUSH,4.00MP-3.00FP,MI
40	99273	1.00	PIPE,90,3.00FP,MI
41	99287	1.00	PIPE,90,4.000MP-4.000FP,MI
44	99793	1.00	PIPE,NIPPLE,3.00XCLOSE
45	99814	1.00	PIPE,NIPPLE,4.00X4.00
46	37623	1.00	MOTOR,HYD,GEAR,1.5 CIR,A-MNT
47	853521158	1.00	INDICATOR,AIR CLEANER
48	99610	1.00	PIPE,NIPPLE,02XCLOSE
52	80350	2.00	NUT,FLEXLOC,.250-20,FULL,LT
53	80185	2.00	CSHH,.250-20X1.00,GR5
54	80140	2.00	WASHER,TYPE A PLAIN,.250
61	35465-10	1.00	GROMMET,INS .50IDX1.00X.063
62	99489	1.00	PIPE,CPLG,02FP
63	37876	1.00	BUSHING,.625ID,1.871,4MMKEY


47
48
13
45
41
1
23
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32
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37
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40
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53
54
19
21
20
63
30
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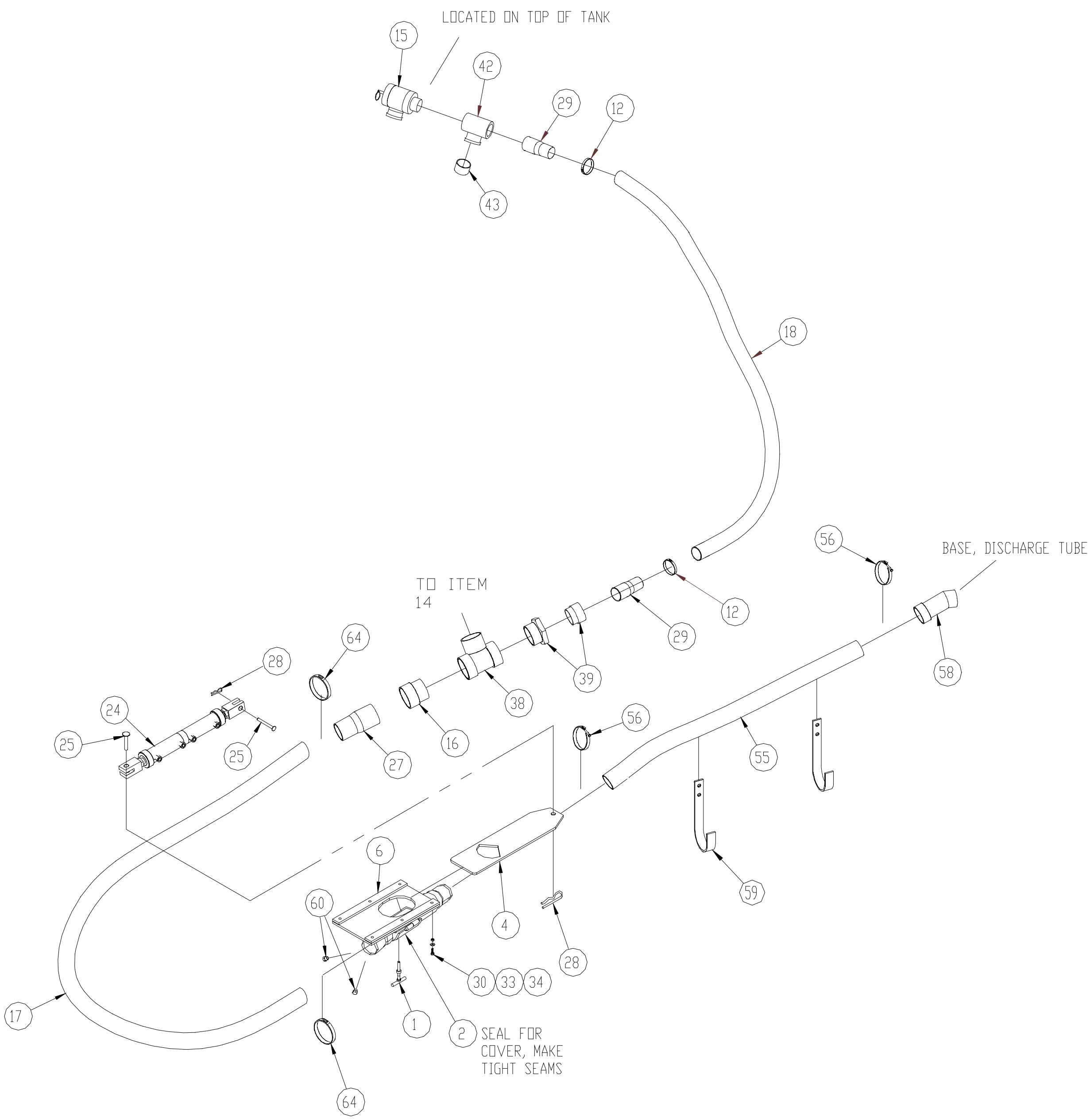
36
22
46
1
7
9
10
26
61
10
8
62
11
LOCATED IN CAB
14
11
TO ITEM 38

ITEM	PART NO.	QTY.	DESCRIPTION
1	25587	1.00	T-HANDLE W/M
2	38043	2.00	RUBBER STRIP,SPONGE
4	25653	1.00	SLIDE GATE
6	25630	1.00	GATE HOUSING, STERLING
12	33170	2.00	CLAMP,HOSE,1.56-2.50,WORM,#32
15	36536	1.00	VLV,RELIEF,8 PSI,2.00 NPT
16	36617	1.00	PIPE,ADPTR,3.00MSOCX3.00FP,PVC
17	36876	.50	HOSE,SUCTION,3.00,WIRE HELIX
18	36927	11.00	HOSE,SUCTION,2.00 ID,158 DEG
24	37650	1.00	CYL,HYD,DUAL OUTPUT,4.00STROKE
25	37662	2.00	PIN,CLEVIS .750X2.00
27	5700	1.00	PIPE,NIPPLE,KING,3.00NPT
28	5928	2.00	HAIR PIN COTTER,#9,.148 DIA
29	6063	2.00	PIPE,NIPPLE,KING,2.00NPT
30	80142	8.00	WASHER,TYPE A PLAIN,.375
33	80230	4.00	CSHH,.375-16X2.00,GR5
34	80352	8.00	NUT,FLEXLOC,.375-16,FULL,LT
38	91374	1.00	PIPE,TEE,3.00 SOC,PVC
39	91377	1.00	PIPE,BUSH,3.00MSOCX2.00FP,PVC
42	99333	1.00	PIPE,TEE,2.000FP,MI
43	99434	1.00	PIPE,NIPPLE,2.00XCLOSE
55	37334	23.00	HOSE,3.00,SABERTOOTH
56	36644	2.00	CLAMP,T-BOLT,4 OD HOSE
58	24549	1.00	CONNECTOR PIPE,W/M
59	24522	2.00	HOOK,HOSE,4.00,LONG
60	99536	2.00	PIPE,PLUG,06MP,SQ HD,MI
64	34516	2.00	CLAMP,HOSE,1.875-3.75,WORM,#52


LOCATED ON TOP OF TANK
TO ITEM 14
BASE, DISCHARGE TUBE
SEAL FOR COVER, MAKE TIGHT SEAMS
15
42
29
12
43
18
56
12
29
39
38
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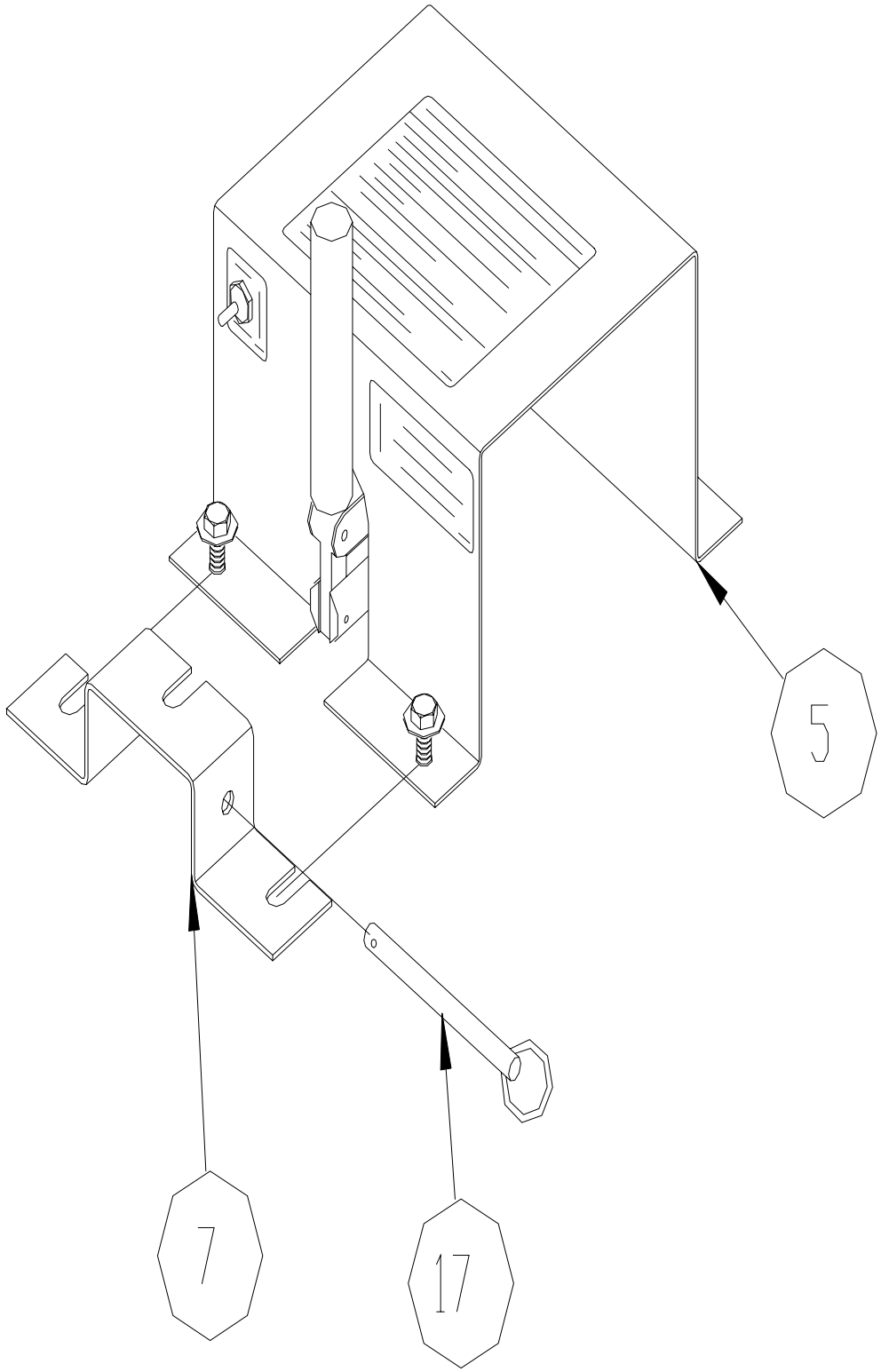
64

ITEM	PART NO.	QTY.	DESCRIPTION
10	72370	3.00	FITT,TEST 04MB-02PD
12	36523	2.00	VLV,HYD,COUNTER BALANCE
13	36604	1.00	GAUGE,PRESS,0-2000 PSI, 2.5 OD
20	38060	1.00	KIT,HOSE,RA300,STERLING
21	37647	1.00	VLV,HYD,MAN,DO3,5 SOL,12V
32	72372	3.00	FITT,PLUG 02PD,DUST
42	72691	1.00	FITT,TEST 04FP-02PD COUPLER

The following items are part of Item 20..... - Part Number 38060 - Kit,Hose,RA300,Sterling

103	34536	5.00	FITT,90 06MJ-08MP
104	30992	1.00	FITT,STR 16MJ-12MB
105	36634	2.00	FITT,90 08MP-08MP
106	36637	2.00	FITT,TEE 06MJ-06MJ-04MP
109	37533-057	1.00	HOSE,08,08FJ-08FJ,3000
110	37533-138	1.00	HOSE,08,08FJ-08FJ,3000
114	72549-014	1.00	HOSE,06,06FJX-06RJ90,3000
118	71882	1.00	FITT,STR 12MJ-10MB
122	72550-026	3.00	HOSE,06,06FJX-06FJX,3000
123	72550-062	2.00	HOSE,06,06FJX-06FJX,3000
124	72550-246	2.00	HOSE,06,06FJX-06FJX,3000
127	37043-176	1.00	HOSE,16,16FJX-16FJX,1000
131	38062-128	1.00	HOSE,12,12FJX-12RJ90,3000
133	72599-310	2.00	HOSE,06,06FJX-08FJX,3000
134	72614	8.00	FITT,45 06MJ-06MB
138	X161	2.00	FITT,90 08MJ-08MP
141	X274	2.00	FITT,45 08MJ-08MB
148	34082	1.00	FITT,STR 06MJ-08MP

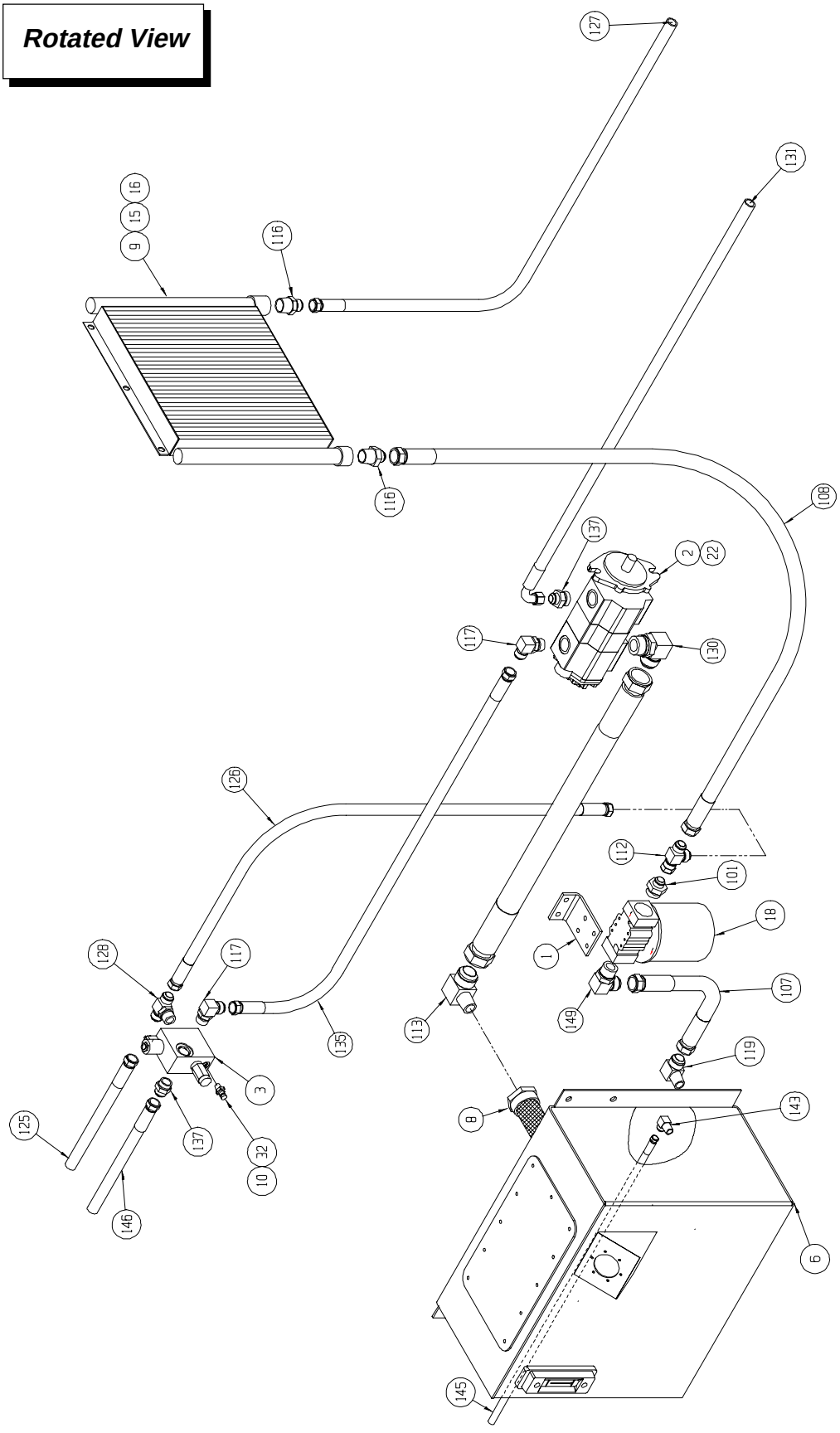

5
7
17

ITEM	PART NO.	QTY.	DESCRIPTION
1	25646	1.00	SUPPORT,FILTER
2	34850-179	1.00	PTO DRIVE,113%,SAE"B",ENG
3	37624	1.00	VLV,HYD,SOLENOID W/RELIEF
6	24360	1.00	HYD RESERVOIR ASSY,20 GAL
8	33148	1.00	STRAINER,SUCT,2 NPT,100 MESH
9	35735	1.00	COOLER,OIL,HYDRAULIC,19X20
10	72370	3.00	FITT,TEST 04MB-02PD
15	36997	1.00	FAN,ELEC,12VDC,1940 CFM
16	36998	4.00	GROMMET,ELEC FAN
18	72543	1.00	FILTER,RETURN,20 ORB,W/GAGE(assembly)
	72543-01	1.00	INDICATOR,FILTER 25 PSI (0-60)
	6442	1.00	ELEMENT,FILTER (only)
22	37648	1.00	PUMP,HYD,DUAL GEAR,1.6/1.6CIR
32	72372	3.00	FITT,PLUG 02PD,DUST
NS	RES1001	1.00	HYDRAULIC SPECIFICATION

The following items are part of Item 20 - Part Number 38060 - Kit,Hose,,RA300,Sterling

101	36180	1.00	FITT,STR 16MJ-20MB
107	37807-024	1.00	HOSE,20,20FJX-20FJX,200
108	37043-065	1.00	HOSE,16,16FJX-16FJX,1000
112	34111	1.00	FITT,TEE,16MJ-16FJX-16MJ
113	37632	1.00	FITT,90 24MJ-20MP
116	6345	2.00	FITT,STR 16MJ-16MP
117	71775	4.00	FITT,90 12MJ-12MB
119	33890	2.00	FITT,90 20MJ-20MP
125	72558-088	1.00	HOSE,12,12FJX-12RJ90,1250
126	72559-056	1.00	HOSE,12,12FJX-16FJX,1250
127	37043-176	1.00	HOSE,16,16FJX-16FJX,1000
128	72566	1.00	FITT,TEE 12MJ-12MJ-12MB
129	72575-084	1.00	HOSE,24,24FJX-24FJX,150
130	72577	1.00	FITT,90 24MJ-20MB
131	38062-128	1.00	HOSE,12,12FJX-12RJ90,3000
135	38062-080	1.00	HOSE,12,12FJX-12RJ90,3000
137	853180160	2.00	FITT,STR 12MJ-12MB
143	35808	1.00	FITT,90 04MJ-08MP
145	72416-091	1.00	HOSE,04,04FJX-04FJX,3000
146	38062-100	1.00	HOSE,12,12FJX-12RJ90,3000
149	33493	2.00	FITT,90 20MJ-20MB

Rotated View

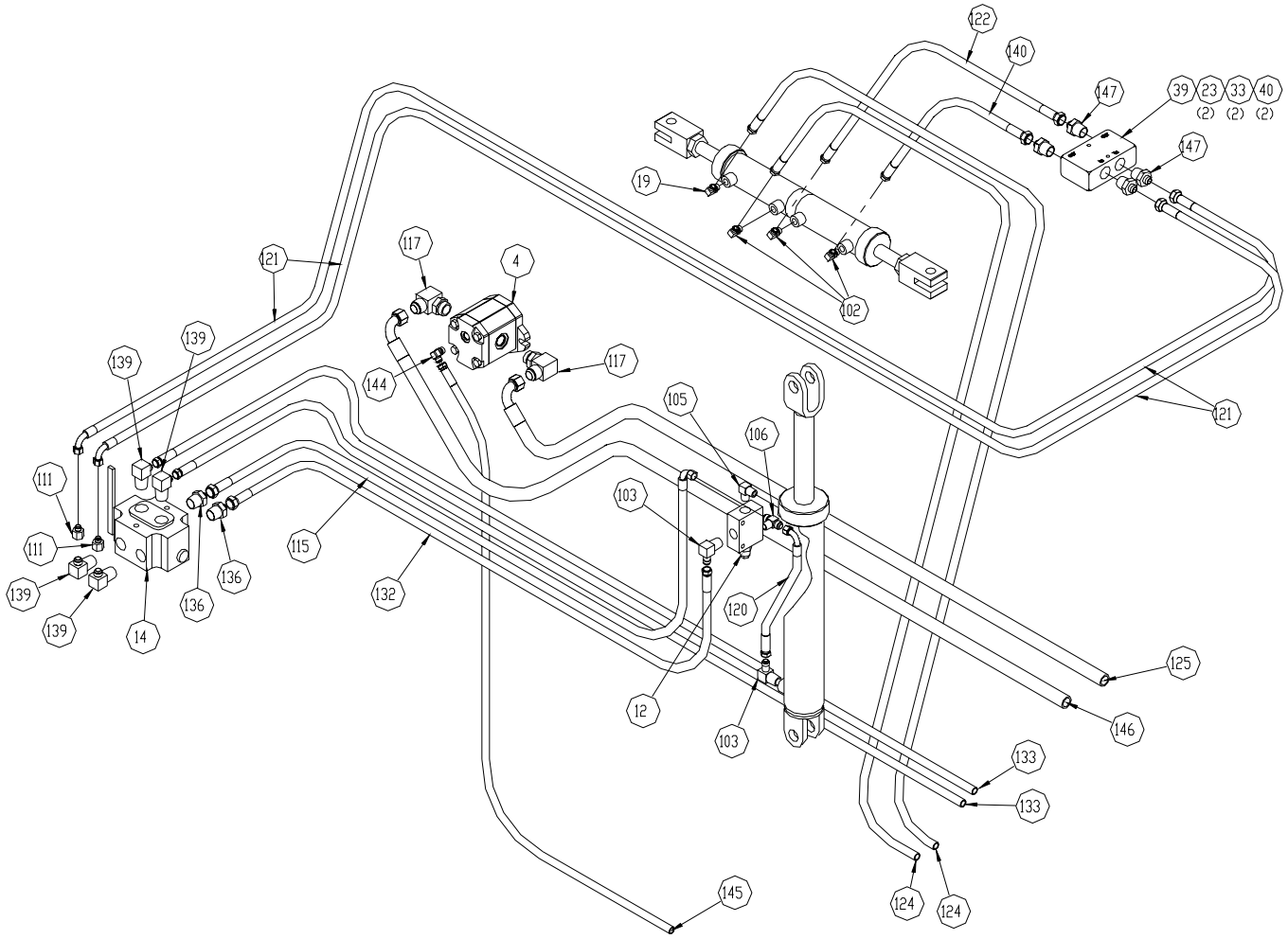


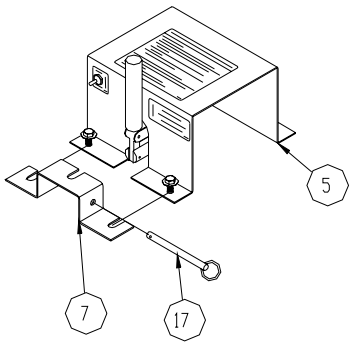
Other Views of This Group Shown on Following Pages...

ITEM	PART NO.	QTY.	DESCRIPTION
4	37623	REF	MOTOR,HYD,GEAR,1.5 CIR,A-MNT
5	24087	1.00	COVER,SELECTOR VALVE
7	22605	1.00	VALVE STOP
12	36523	2.00	VLV,HYD,COUNTER BALANCE
14	36654	1.00	VLV,HYD,SELECT,2 POS,12 NPT PT
17	37095	1.00	PIN,QUICK RELEASE,.375X4.00
19	37540	1.00	FITT,90 06MJ-06MB,.037 ORF
23	80140	12.00	WASHER,TYPE A PLAIN,.250
NS	80141	4.00	WASHER,TYPE A PLAIN,.312
NS	80142	4.00	WASHER,TYPE A PLAIN,.375
NS	80149	3.00	WASHER,TYPE A PLAIN,1.000
NS	80162	4.00	WASHER,SPLIT LOCK,.375
NS	80187	4.00	CSHH,.250-20X1.25,GR5
NS	80195	2.00	CSHH,.250-20X1.75,GR5
NS	80208	4.00	CSHH,.312-18X1.00,GR5
NS	80219	4.00	CSHH,.375-16X.75,GR5
33	80350	8.00	NUT,FLEXLOC,.250-20,FULL,LT
NS	80351	4.00	NUT,FLEXLOC,.312-18,FULL,LT
NS	80352	4.00	NUT,FLEXLOC,.375-16,FULL,LT
NS	80816	2.00	CSHH,.375-16X3.75,GR5
NS	81102	2.00	CSSH,.375-16X5.00
NS	99462	1.00	PIPE,BUSH,1.25MP-16FP,MI
39	38063	1.00	VLV,HYD,CHECK,PO,06FP,30G,3000
40	80449	2.00	CSHH,.250-20X2.75,GR5

The following items are part of Item 20 - Part Number 38060 - Kit,Hose,,RA300,Sterling

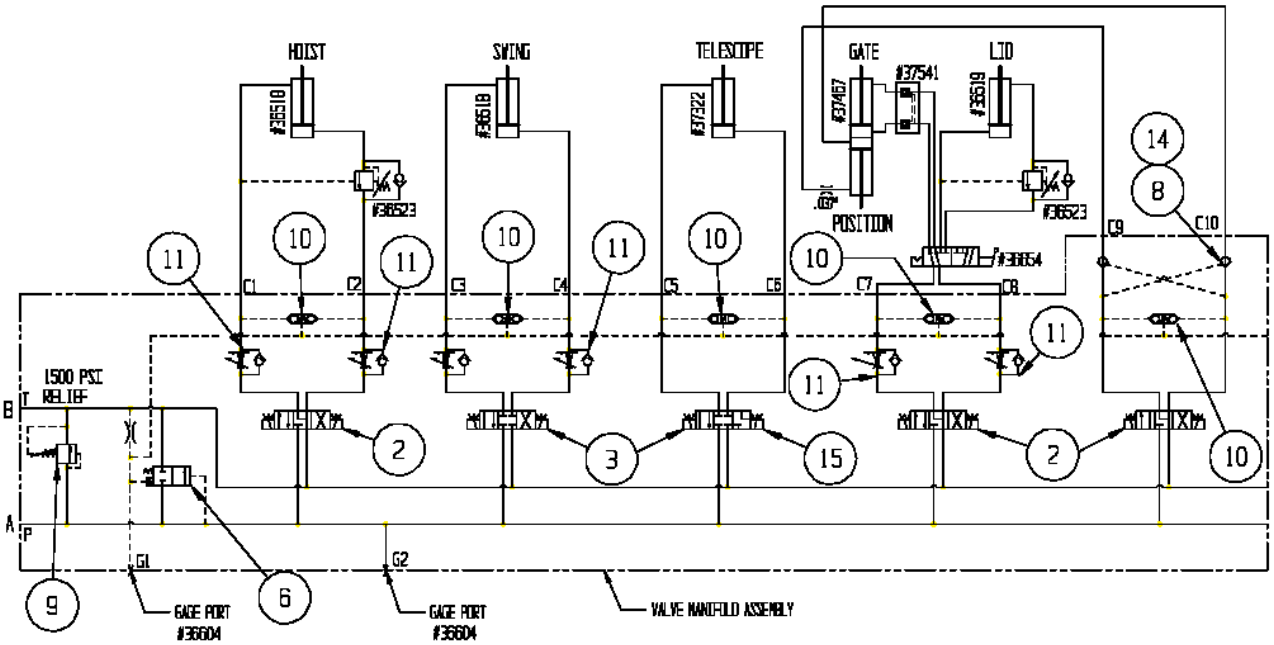
102	33892	3.00	FITT,90 06MJ-06MB
103	34536	5.00	FITT,90 06MJ-08MP
105	36634	2.00	FITT,90 08MP-08MP
106	36637	2.00	FITT,TEE 06MJ-06MJ-04MP
109	37533-057	1.00	HOSE,08,08FJ-08FJ,3000
111	37631	2.00	FITT,STR 06MJ-08FJ
115	37635-126	1.00	HOSE,06,08FJS-06FJ90,180 OFF
117	71775	4.00	FITT,90 12MJ-12MB
120	72549-011	1.00	HOSE,06,06FJX-06RJ90,3000
121	72549-163	2.00	HOSE,06,06FJX-06RJ90,3000
122	72550-026	3.00	HOSE,06,06FJX-06FJX,3000
124	72550-246	2.00	HOSE,06,06FJX-06FJX,3000
125	72558-088	1.00	HOSE,12,12FJX-12RJ90,1250
132	72599-126	1.00	HOSE,06,06FJX-08FJX,3000
133	72599-310	2.00	HOSE,06,06FJX-08FJX,3000
136	853180103	2.00	FITT,STR 08MJ-12MP
139	X180	4.00	FITT,90 08MJ-12MP
140	72550-021	1.00	HOSE,06,06FJX-06FJX,3000
144	35562	1.00	FITT,90 04MJ-06MB
145	72416-091	1.00	HOSE,04,04FJX-04FJX,3000
146	38062-100	1.00	HOSE,12,12FJX-12RJ90,3000
147	X217	4.00	FITT,STR 06MJ-06MB

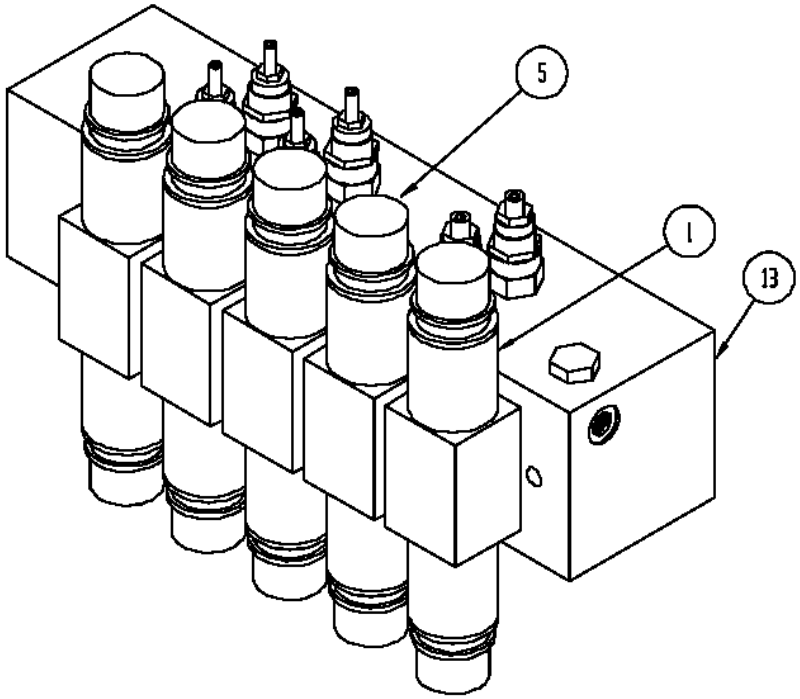




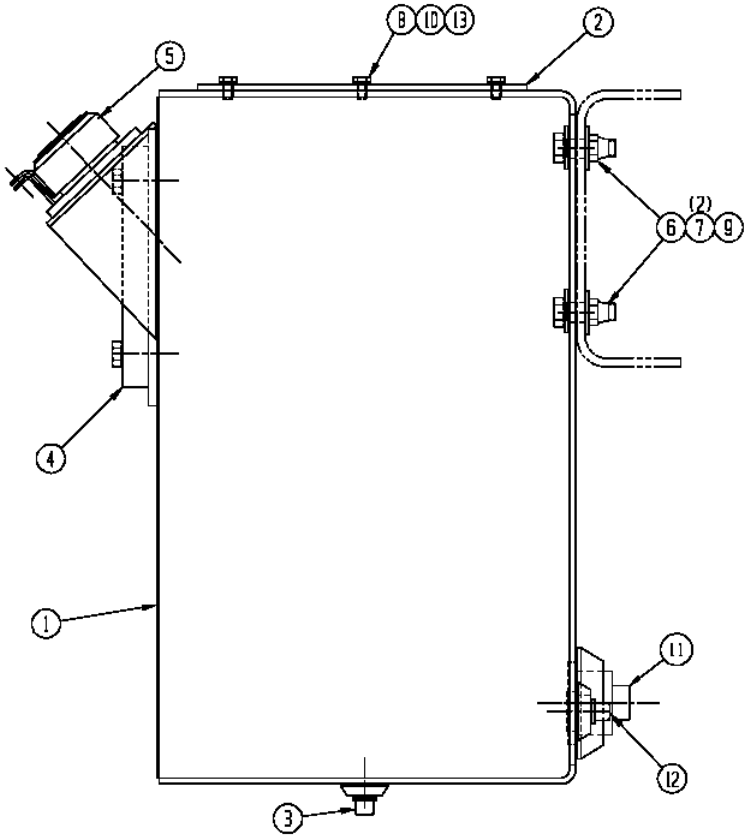
Other Views of This Group Shown on Previous Pages...

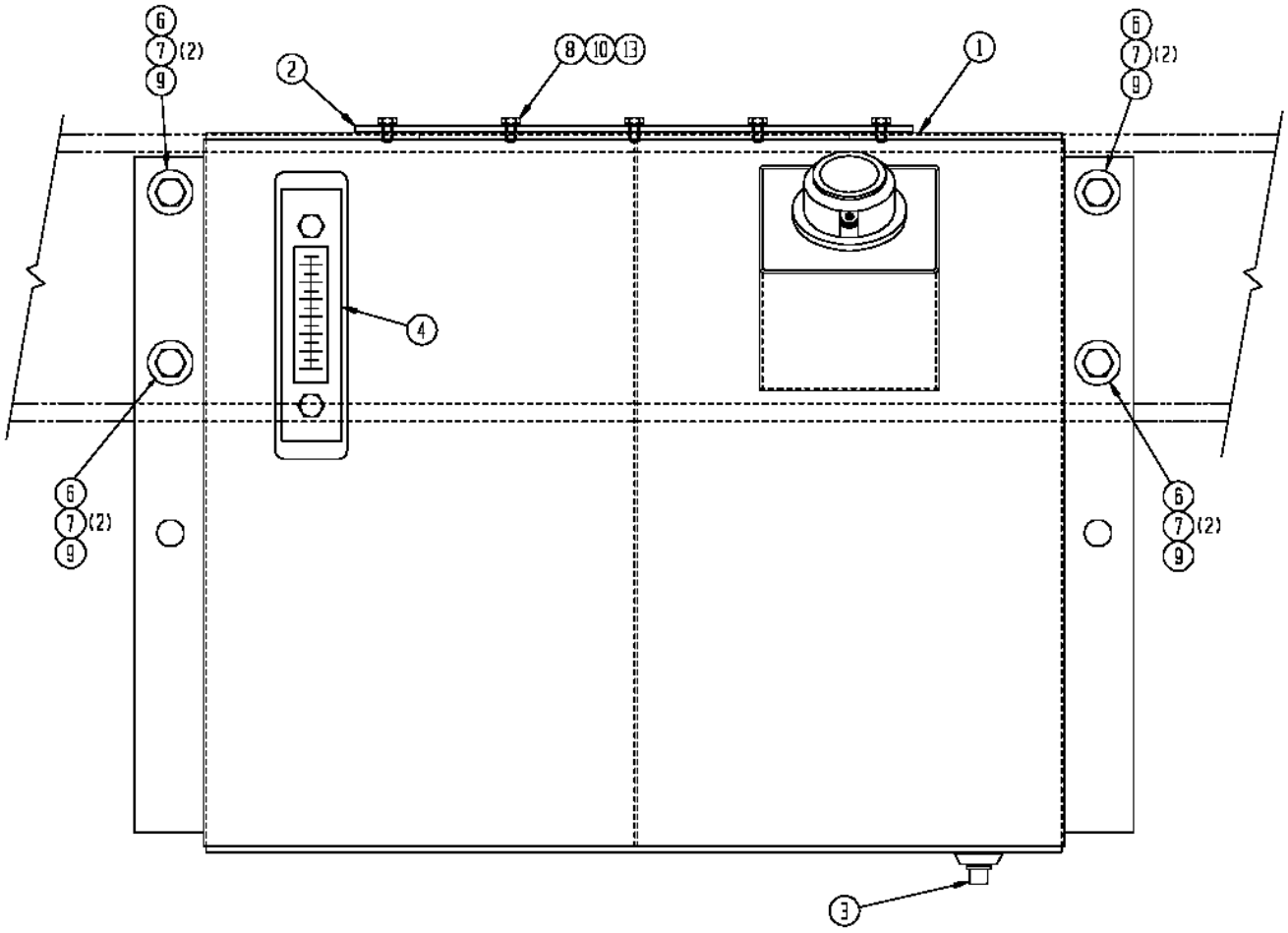
ITEM	PART NO.	QTY.	DESCRIPTION
1	37647-01	10.00	COIL,SOLENOID 12V,BOSCH DO3
2	37647-02	3.00	VLV,4-WAY,OPEN,BOSCH DO3
3	37647-03	2.00	VLV,4-WAY,CLOSE,BOSCH DO3
NS	37647-04	5.00	KIT,SEAL VALVE,BOSCH DO3
5	37647-05	10.00	CAP,MANUAL OVERRIDE,BOSCH DO3
6	37647-06	1.00	VLV,LOGIC ELEMENT
8	37647-08	2.00	VLV,CHECK,CYL
9	37647-09	1.00	VLV,RELIEF
10	37647-10	10.00	VLV,CHECK,PILOT
11	37647-11	6.00	VLV,PRESS COMP FLOW
NS	37647-12	2.00	CONNECTOR,DIN
13	37647-13	1.00	MANIFOLD
14	37647-14	1.00	PISTON W/SEAL
15	37647-15	1.00	VLV,SPOOL,REGEN,DO3


HOIST
SWING
TELESCOPE
GATE
LID
#37541
#36523
#36654
POSITION
1500 PSI
RELIEF
GAGE PORT
#36604
GAGE PORT
#36604
VALVE MANIFOLD ASSEMBLY



ITEM	PART NO.	QTY.	DESCRIPTION
1	22489	1.00	RESERVOIR,20 GAL
2	22750	1.00	RESERVOIR,CLEANOUT COVER
3	35254	1.00	PIPE,PLUG,06MP,SQ HD,MAGNETIC
4	37137	1.00	GAUGE,SIGHT LEVEL/TEMP, 5.00
5	37680	1.00	FILLER,HYD FLUID,10 PSI
6	71627	4.00	CSHH,.500-13X1.50,GR5
7	80144	8.00	WASHER,TYPE A PLAIN,.500
8	80160	12.00	WASHER,SPLIT LOCK,.250
9	80354	4.00	NUT,FLEXLOC,.500-13,FULL,LT
10	80192	12.00	CSHH,.250-20X.75,GR5
11	99299	1.00	PIPE,PLUG,2.00MP,SKT HD,MI
12	99537	1.00	PIPE,PLUG,08MP,SQ HD,MI
13	81161	12.00	WASHER,WEATHER SEAL,#10

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7 (2)
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8 10 13
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7 (2)
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7 (2)
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7 (2)
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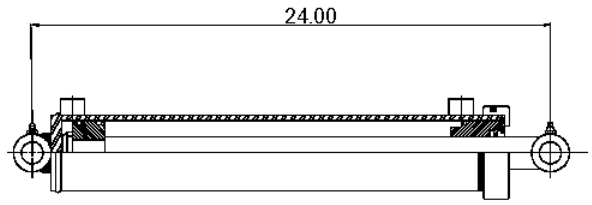
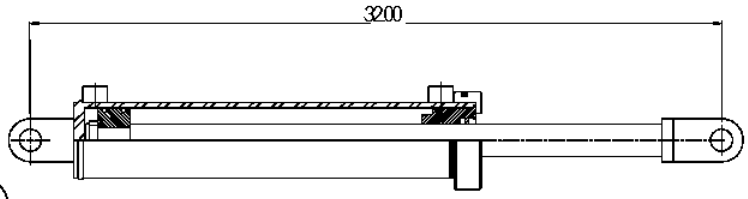
3

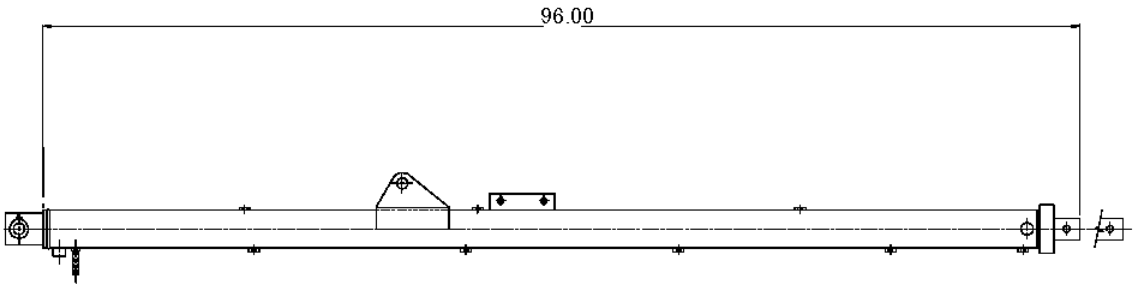
ITEM	PART NO.	QTY.	DESCRIPTION
1	36518-02	1.00	KIT,SEAL,HYD.CYLINDER,3.00BX1.50 (ROSENBOOM)
2	36519-02	1.00	KIT,SEAL,HYD.CYLINDER,3.00BX1.50 (ROSENBOOM)
3	36521-02	1.00	KIT,SEAL,HYD.CYLINDER,3.00BX2.00 (ROSENBOOM)
4	37467-01	1.00	KIT,SEAL,HYD.CYLINDER,2.00BX4.00



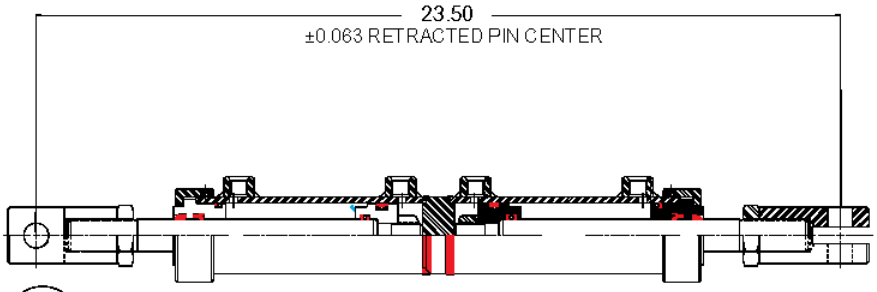
1 *36518 Boom Lift / Retract Cylinder*



2 *36519 Lid Lift Cylinder*

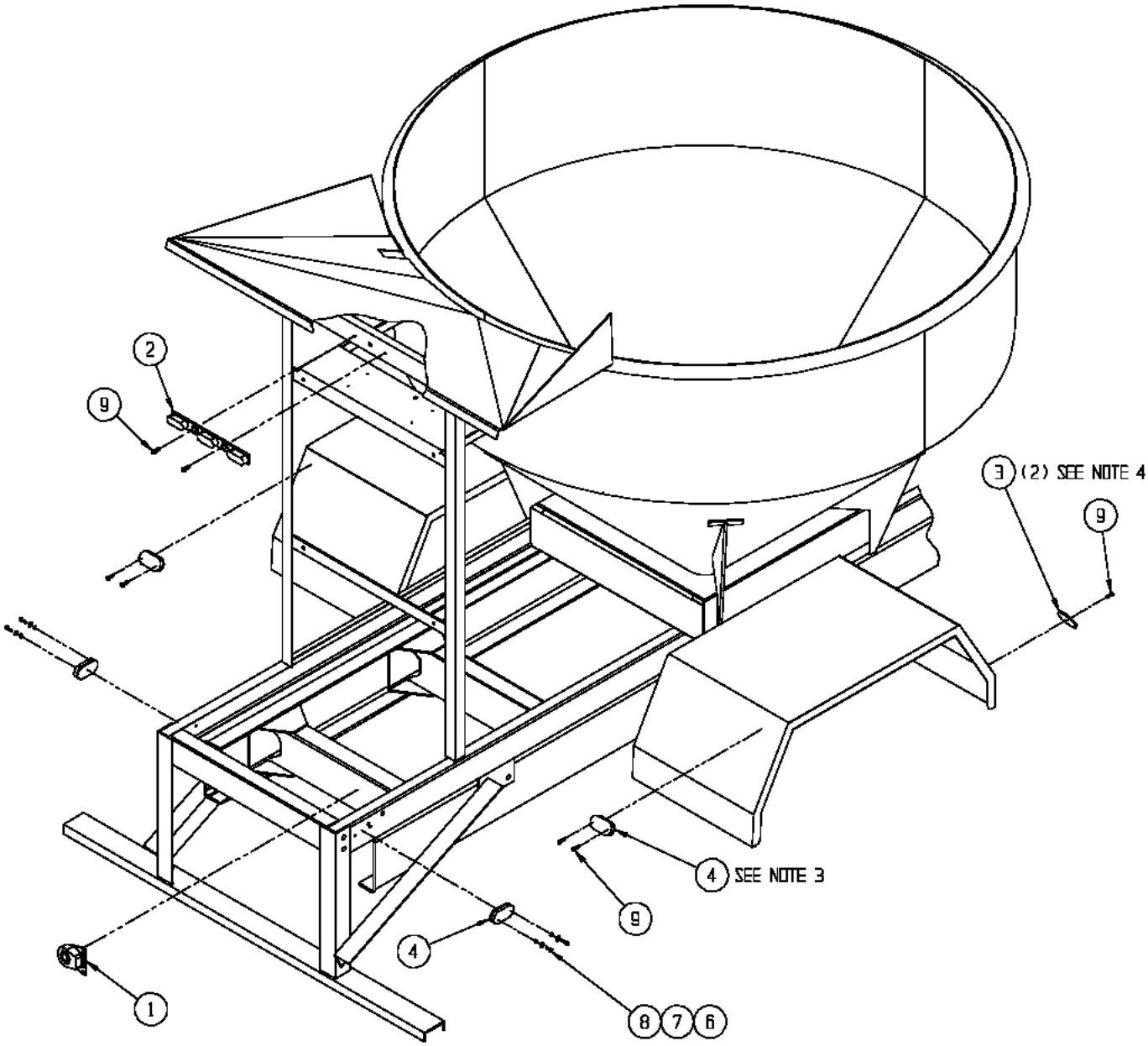


3 *37322 Boom Extend / Retract Cylinder*



4 *37650 Gate Cylinder*

ITEM	PART NO.	QTY.	DESCRIPTION
1	21975	1.00	BACKUP ALARM GROUP
	21956	1.00	BRKT,BACKUP ALARM
	36110	1.00	ALARM,BACKUP,ECCO 450
	36111	1.00	GROMMET,RUBBER,LAMP/ALARM
	80037	2.00	NUT,HEX,.312-18
	80141	2.00	WASHER,TYPE A PLAIN,.312
	80161	2.00	WASHER,SPLIT LOCK, .312
	80208	2.00	CSHH,.312-18X1.00,GR5
2	35663	1.00	LIGHT BAR,RED,KD502
3	5037	2.00	REFLECTOR,AMBER
4	5096	4.00	LIGHT,CLEARANCE,RED W/REFLECT
5	24506	1.00	WIRE HARNESS
6	80798	4.00	MACH SCR,PH,#10-24X1.00
7	80995	4.00	WASHER,TYPE A PLAIN,#10
8	81005	4.00	NUT,FLEXLOC,#10-24,FULL,LT
9	81160	8.00	SCR,SLFDRL,HH,#10X1.00,#3PT


2
9
3
(2) SEE NOTE 4
9
4
SEE NOTE 3
9
4
1
8
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6

ITEM	PART NO.	QTY.	DESCRIPTION
1	37596-01	1.00	LAMP, HALOGEN, BEACON,12V,55W
2	37596-02	1.00	BEACON,REFLECTOR & GEAR ASSY.

RA300 Standard Parts Index

RA300 Standard Parts Index

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OPTIONAL EQUIPMENT PARTS CATALOG

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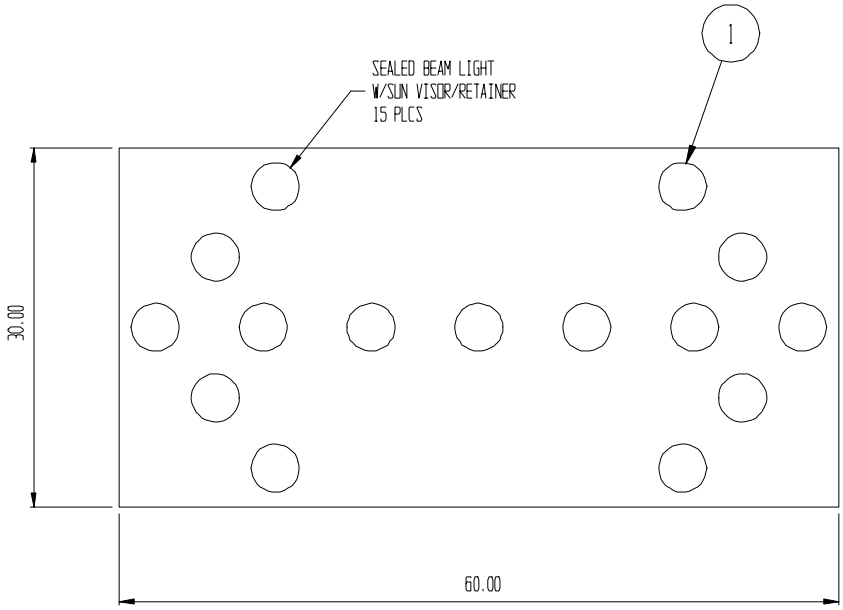
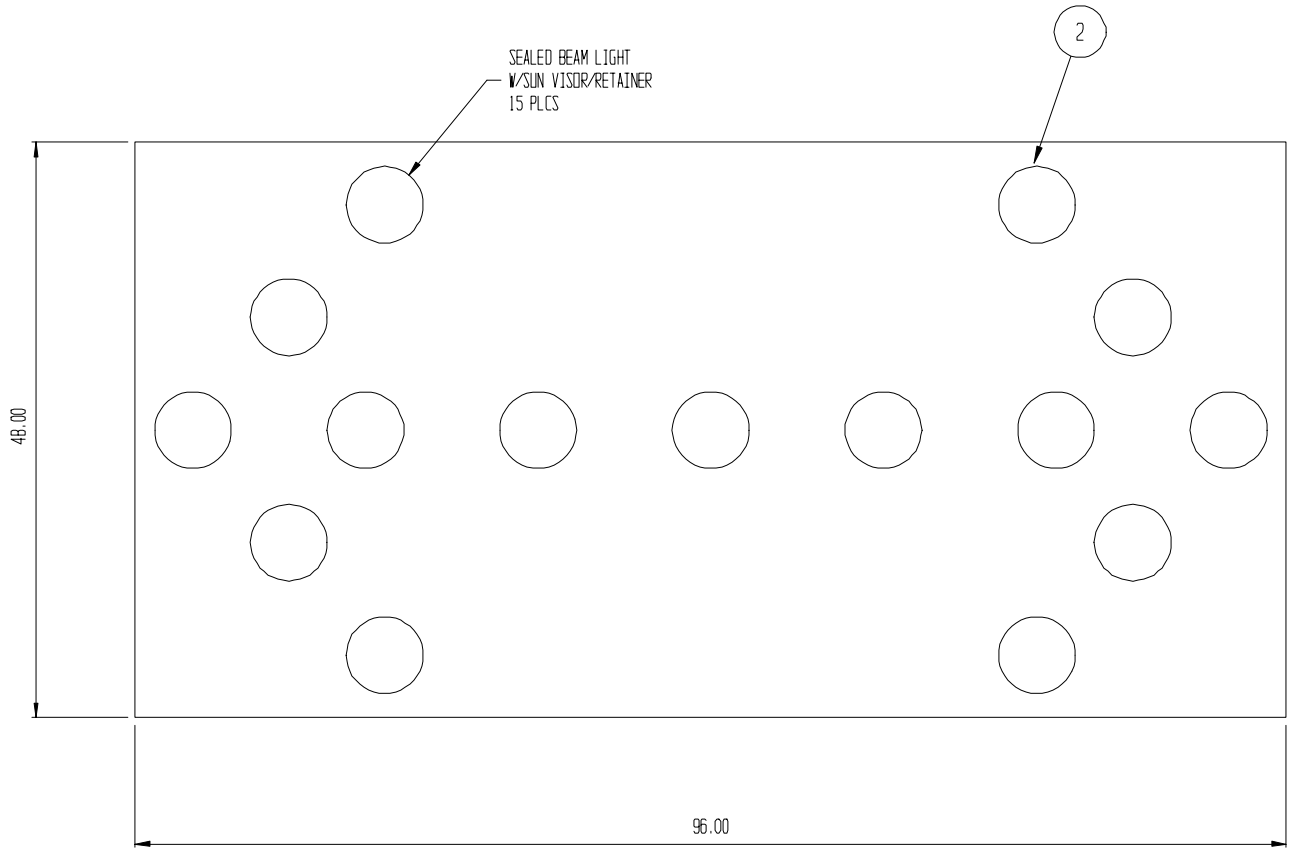
ITEM	PART NO.	QTY.	DESCRIPTION
1	36657	1.00	ARROW BOARD,W/O BRKT,15 LIGHTS,W/40' HARNESS & 20' CORD
1A	36657-01	15.00	BULB,LIGHT,ARROW BOARD
1B	36657-02	A/R	SUN VISOR/RETAINER,LAMP
1C	36657-03	1.00	CONTROLLER,AMIDA BOARD OVM3060
1D	36657-04	1.00	COD,POWER,ARROW BOARD
2	36819	1.00	ARROW BOARD, 48X96, 40' HARNESS
2A	36819-01	15.00	BULB,LIGHT,ARROW BOARD
2B	36819-02	1.00	CABLE,POWER
2C	36819-03	1.00	CABLE,ARROW BOARD,40 FT
2D	36819-04	1.00	GROMMET KIT,LIGHT,ARROW BOARD
2E	36819-05	A/R	LIGHT,YELLOW,CLEARANCE
2F	36819-06	A/R	HOOD,LIGHT
3	37009	1.00	ARROW BOARD,36X72, 30' HARNESS
3A	37009-01	25.00	BULB,LIGHT,ARROW BOARD

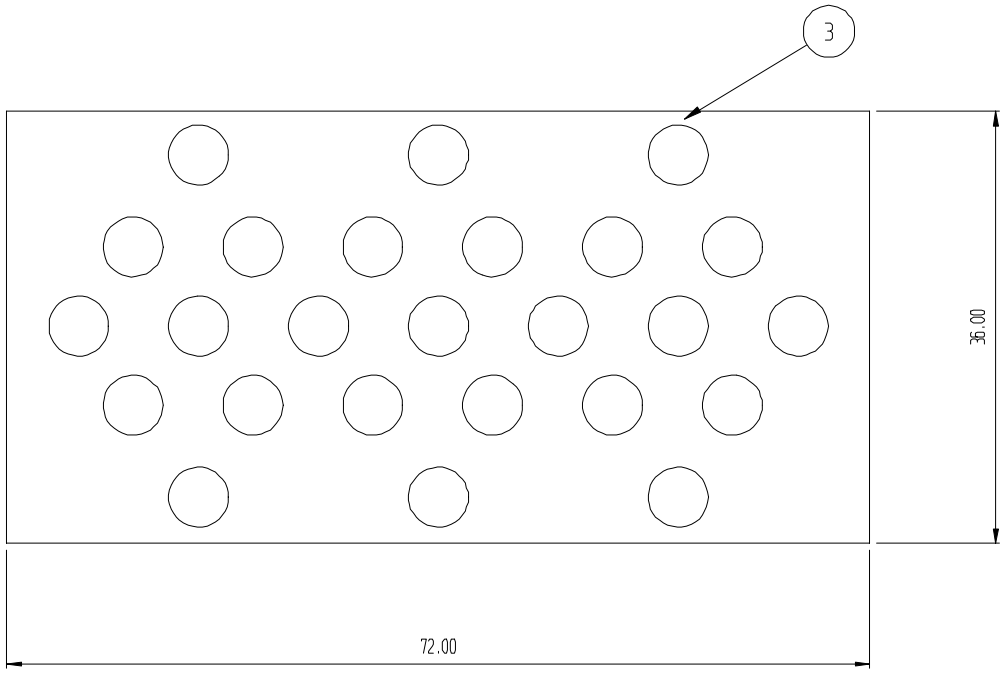


Item 1 - 30" x 60" Arrow Board (Rev. B)

A/R - AS REQUIRED

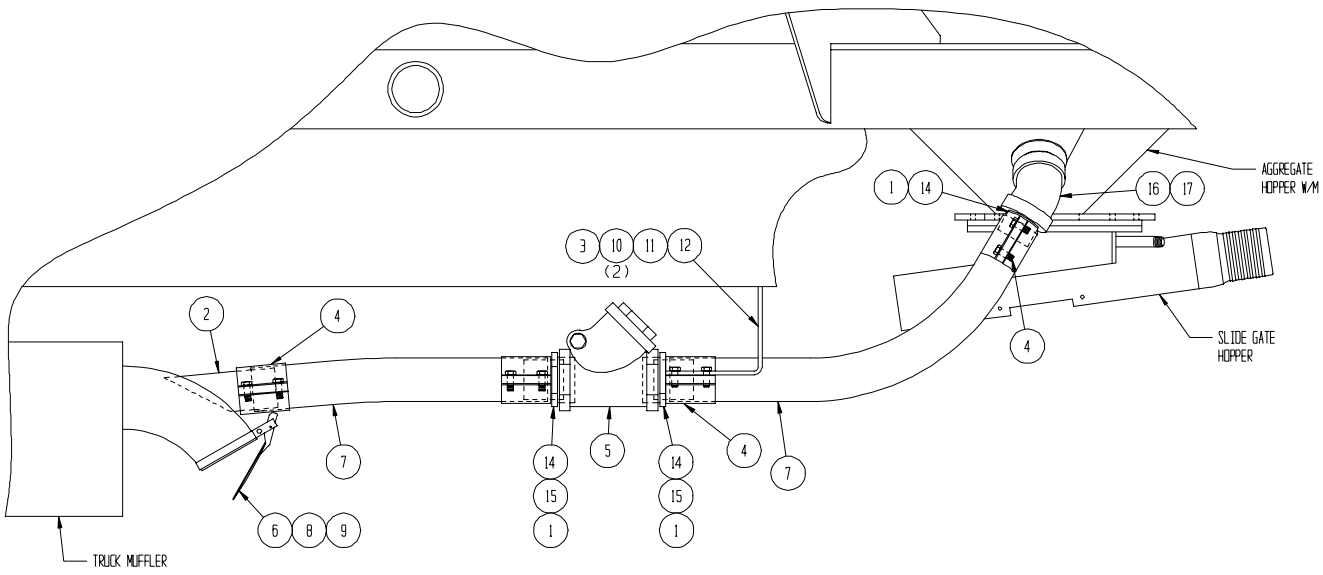


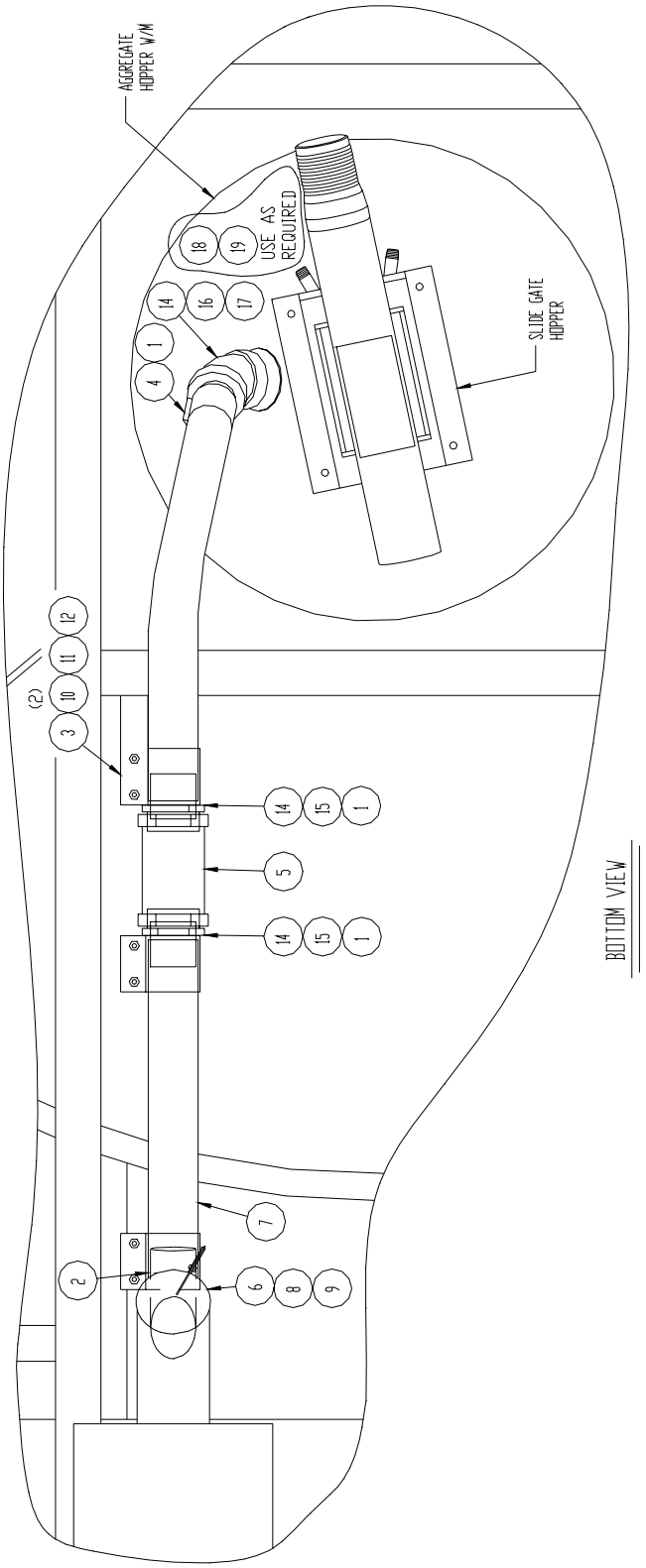
Item 2 - 48" x 96" Arrow Board (Rev.Ø)



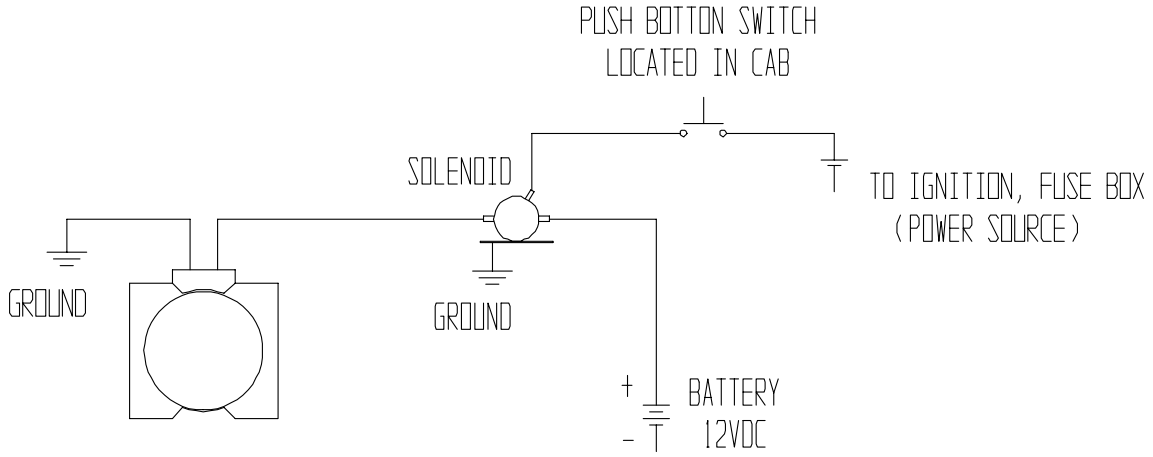
Item 3 - 36" x 72" Arrow Board (Rev. B)

ITEM	PART NO.	QTY.	DESCRIPTION
1	25831	3.00	TUBE,RND,2.500X16GA,2.00,SPLIT
2	21383	1.00	TUBE,RND,2.500X16GAX7.00,CUT
3	25832	1.00	BRACKET,HEAT EXHAUST CLAMP
4	38087	4.00	CLAMP,MUFFLER,2.50,STRAP
5	33400	1.00	VLV,CHECK,2.50 NPT
6	35516	1.00	TIE DOWN,RUBBER W/1 HOOK 6.5
7	35653	3.10	TUBE,FLEX EXHAUST,2.50 ID
8	36542	1.00	TIE DOWN,RUBBER,15,W/HOOKS
9	36824	1.00	RAIN CAP 4.00
10	80140	2.00	WASHER,TYPE A PLAIN,.250
11	80194	1.00	CSHH,.250-20X1.50,GR5
12	80350	1.00	NUT,FLEXLOC,.250-20,FULL,LT
14	90588-28	3.00	PIPE,TOE,2.00X2.50
15	99249	2.00	PIPE,BUSH,2.50MP-2.00FP,MI
16	99271	1.00	PIPE,90,2.00FP,MI
17	99434	1.00	PIPE,NIPPLE,2.00XCLOSE
18	99265	1.00	PIPE,45,2.00FP,MI
19	99434	1.00	PIPE,NIPPLE,2.00XCLOSE

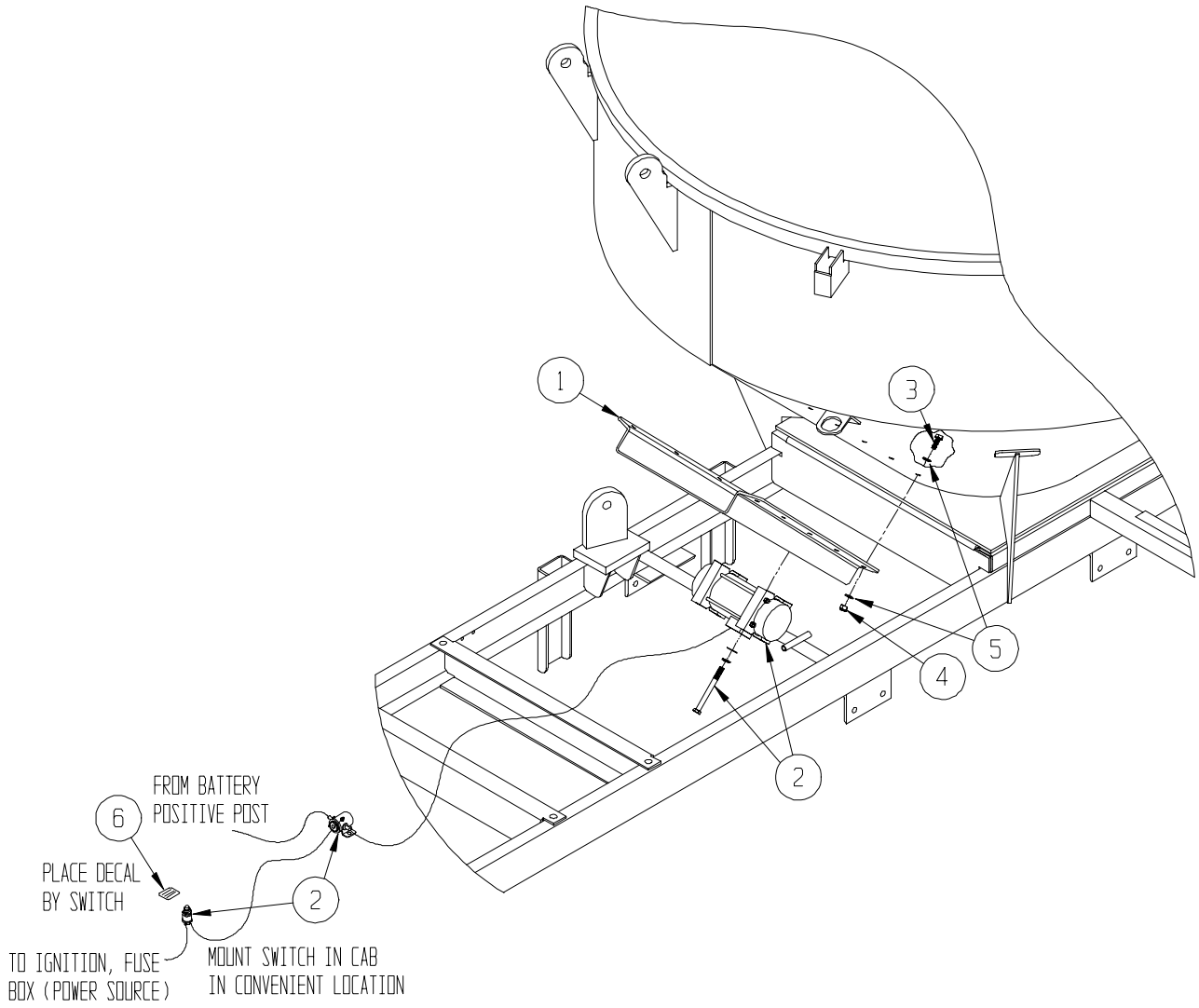



AGGREGATE HOPPER W/M
USE AS REQUIRED
SLIDE GATE HOPPER
BOTTOM VIEW
(2)

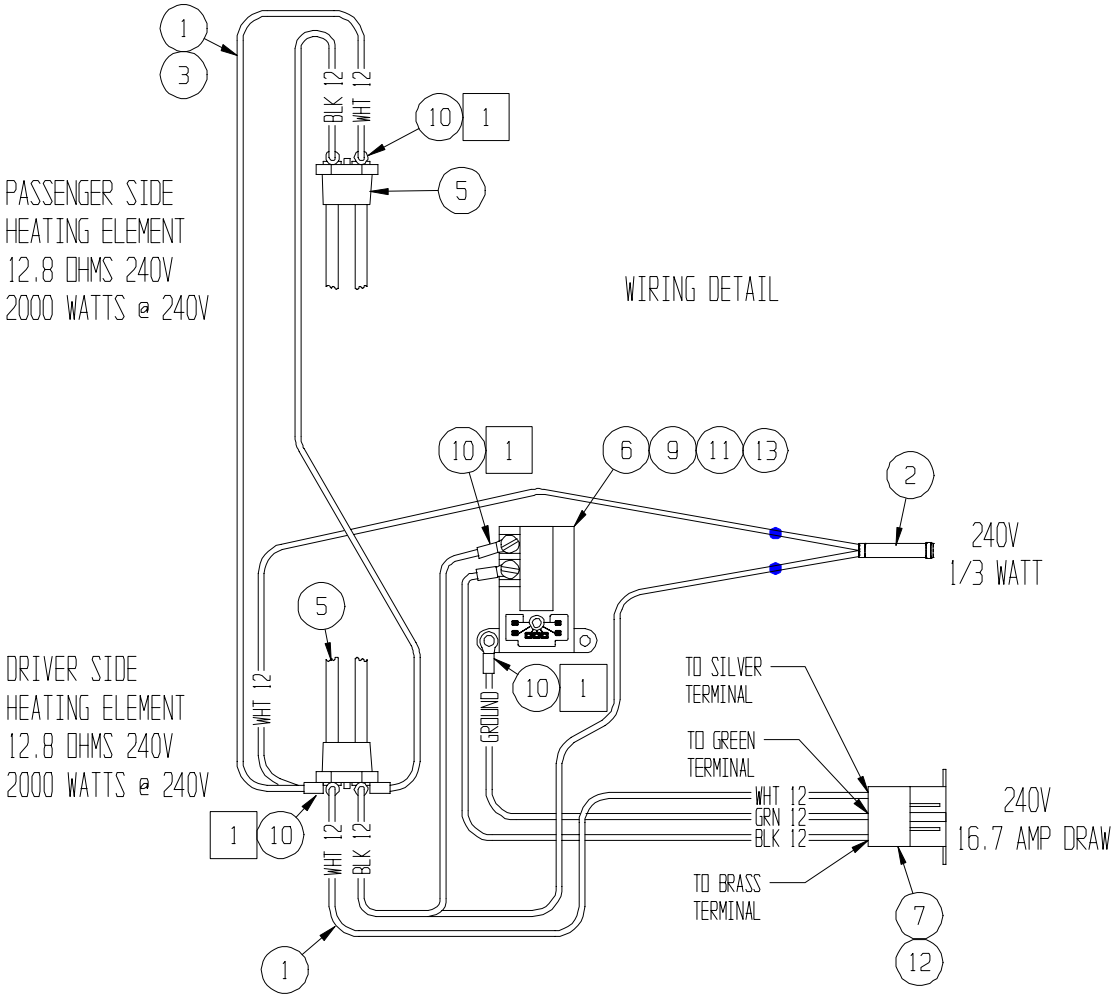
ITEM	PART NO.	QTY.	DESCRIPTION
1	25800	1.00	MOUNT,VIBRATOR DC1600,BOLT-ON
2	37985	1.00	VIBRATOR,DC1600 W/SWITCH KIT
3	80186	10.00	CSHH,.500-13X1.75,GR5
4	80354	10.00	NUT,FLEXLOC,.500-13,FULL,LT
5	81141	20.00	WASHER,SAE,HARDENED,.500
6	37730	1.00	DECAL,VIBRATOR,RA300

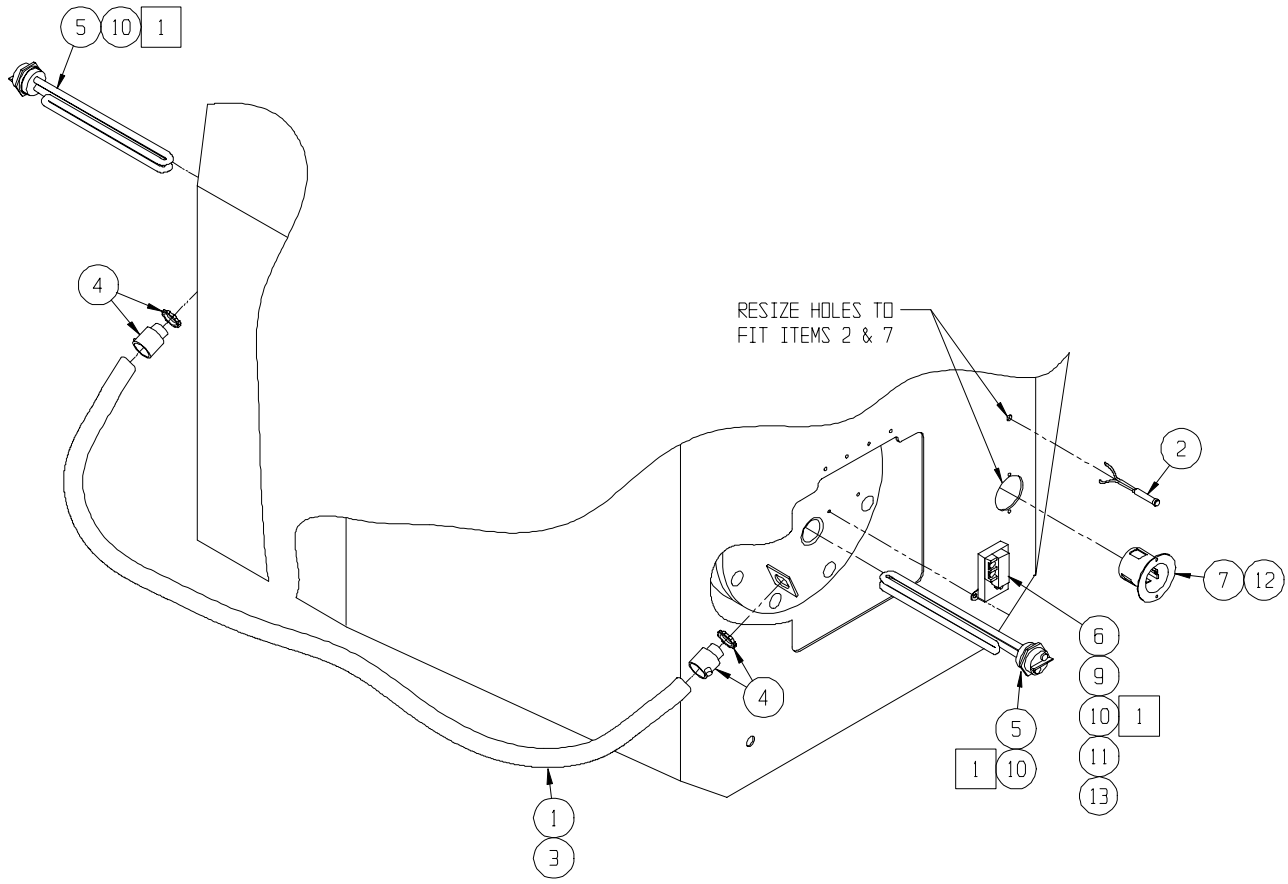


WIRING DETAIL


1
3
5
4
2
6
FROM BATTERY
POSITIVE POST
PLACE DECAL
BY SWITCH
2
TO IGNITION, FUSE
BOX (POWER SOURCE)
MOUNT SWITCH IN CAB
IN CONVENIENT LOCATION

ITEM	PART NO.	QTY.	DESCRIPTION
1	33783	12.00	CORD,ELEC,3WIRE,300V
2	37226	1.00	LIGHT,240V,.33W,RED
3	34729	9.00	CONDUIT,METAL FLEX,.50 ID
4	34732	2.00	CONNECTOR,STR,FLEX CONDUIT,.50
5	37459	2.00	ELEMENT,HEATER,2000W @ 240VAC
6	36682	1.00	THERMOSTAT,ELEC,110-170 DEG F
7	37800	1.00	RCPT,ELEC,MALE,30A,250V,FLG IN
NS	37801	1.00	PLUG,ELEC,FEMALE,30A,250V
9	80496	2.00	MACH SCR,PH,#10-32X.25,PHIL
10	851390204	11.00	TERM,RING,16-14 GA,#10 STUD
11	871071601	2.00	WASHER,SPLIT LOCK,#10
12	81150	2.00	SCR,SLFTPG,PH,#10X.500,AB
13	37220	1.00	DECAL,TEMP CELSIUS (FOR 36682)



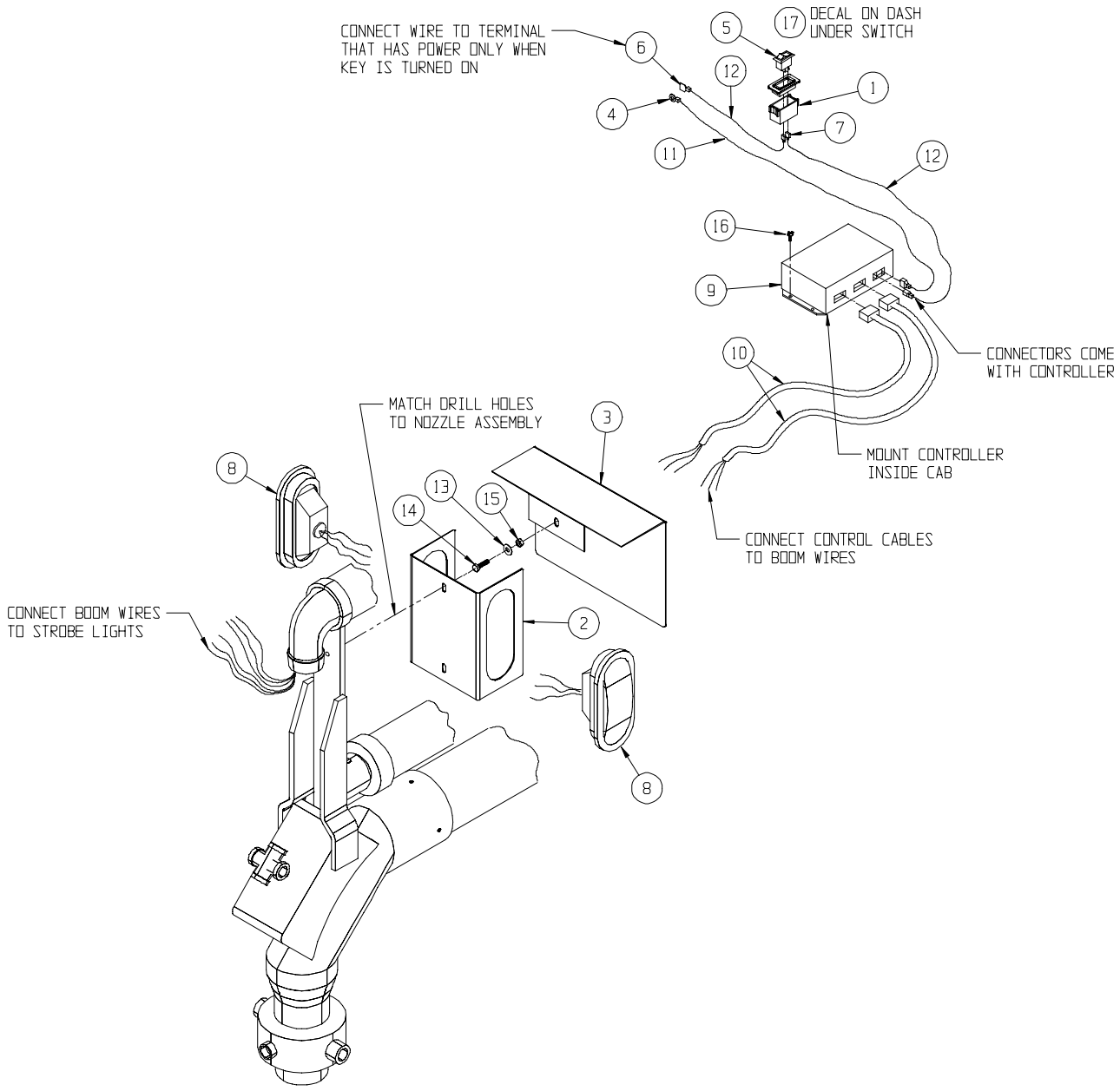


NOTE:

1. Silicone all terminals.

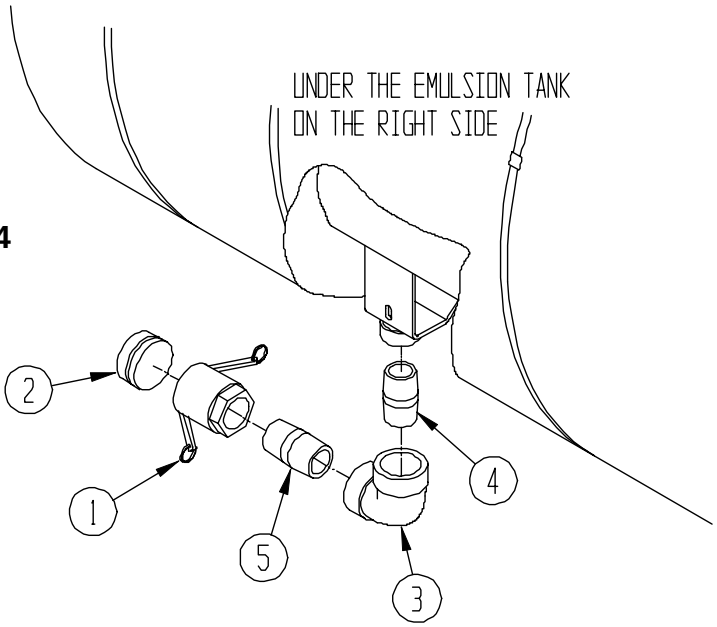
ITEM	PART NO.	QTY.	DESCRIPTION
	24429		**BOOM STROBE LIGHT GROUP** (See Illustration)
1	24264	1.00	SWITCH HOUSING MODIFICATION
2	24504	1.00	HOUSING,LIGHTS
3	24505	1.00	SHIELD,LIGHTS
4	33607	1.00	TERM,RING,16-14 GA,.250 STUD
5	35892	1.00	SWITCH,ROCKER,SPST,OFF/ON
6	36348	1.00	TERM,PUSH-ON,.25,M,18-14,SLV
7	36349	2.00	TERM,PUSH-ON,.25,FEM,18-14,SLV
8	37683	2.00	LIGHT,STROBE,AMBER,OVAL
9	37683-02	1.00	POWER SUPPLY,STROBE LIGHT
10	37683-03	2.00	CABLE,STROBE LIGHT
11	71064	4.00	WIRE,14 GA,BLACK
12	71065	4.00	WIRE,14 GA,RED
13	80140	2.00	WASHER,TYPE A PLAIN,.250
14	80185	2.00	CSHH,.250-20X1.00,GR5
15	80350	2.00	NUT,FLEXLOC,.250-20,FULL,LT
16	81150	4.00	SCR,SLFTPG,PH,#10X.500,AB
17	37718	1.00	DECAL,NOZZLE LIGHTS

ITEM	PART NO.	QTY.	DESCRIPTION
	24251		**BOOM LIGHTING OPTION** (Not Illustrated)
1	24363	1.00	MOUNT,LIGHT,NOZZLE
2	24364	1.00	MOUNT,LIGHT,MIDDLE
3	33271-1	30.00	WIRE,16 GA,BLACK
4	33271-2	15.00	WIRE,16 GA,YELLOW
5	33271-4	25.00	WIRE,16 GA,GREEN
6	33271-7	5.00	WIRE,16 GA,RED
7	33271-11	15.00	WIRE,16 GA,BLUE
8	35892	3.00	SWITCH,ROCKER,SPST,OFF/ON
9	36348	8.00	TERM,PUSH-ON,.25,M,18-14,SLV
10	36349	14.00	TERM,PUSH-ON,.25,FEM,18-14,SLV
11	37667	1.00	DECAL,WORKLIGHTS,RA300,FORD
12	71060	30.00	LOOM,SPLIT,CONVOLUTED,.250
13	72318	4.00	LAMP,HALOGEN,FLOOD,80X30 DEG
14	80161	2.00	WASHER,SPLIT LOCK,.312
15	80207	2.00	CSHH,.312-18X.75,GR5

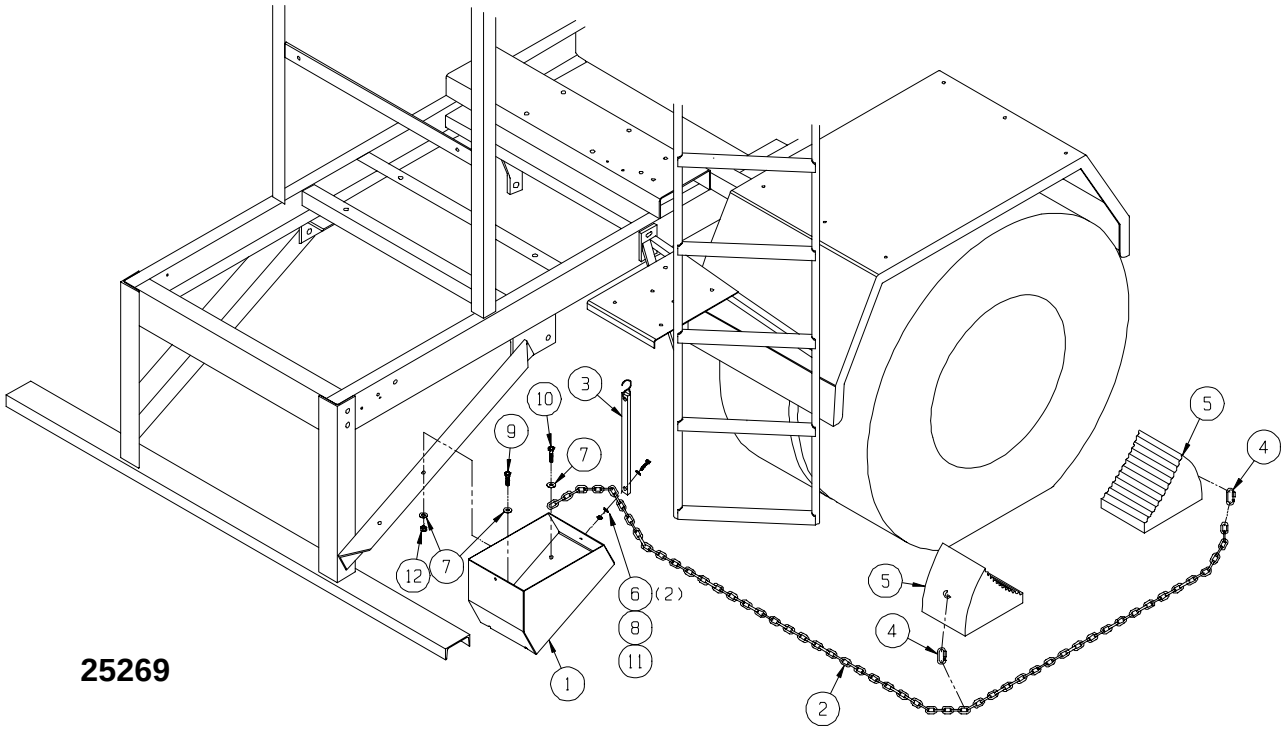

CONNECT WIRE TO TERMINAL THAT HAS POWER ONLY WHEN KEY IS TURNED ON
6
5
17
DECAL ON DASH UNDER SWITCH
12
1
4
7
11
12
16
9
CONNECTORS COME WITH CONTROLLER
10
MATCH DRILL HOLES TO NOZZLE ASSEMBLY
3
MOUNT CONTROLLER INSIDE CAB
8
13
15
14
CONNECT CONTROL CABLES TO BOOM WIRES
CONNECT BOOM WIRES TO STROBE LIGHTS
2
8

ITEM	PART NO.	QTY.	DESCRIPTION
	24744		**EMULSION TANK FILL GROUP**
1	6289	1.00	FITT,QD 3.00F-3.00FP,BRASS
2	6290	1.00	FITT,QD 3.00 PLUG
3	99291	1.00	PIPE,90,3.00FP-2.00FP,MI
4	99434	1.00	PIPE,NIPPLE,2.00XCLOSE
5	99793	1.00	PIPE,NIPPLE,3.00XCLOSE

	25269		**WHEEL CHOCK GROUP W/CHAIN**
1	25270	2.00	WHEEL CHOCK BOX,RA300 GMC
2	25273	2.00	CHAIN,.188 X 122 LINKS
3	36542	2.00	TIE DOWN,RUBBER,15
4	33071	4.00	HOOK,S
5	37932	4.00	WHEEL CHOCK,W/RING
6	80140	4.00	WASHER,TYPE A PLAIN,.250
7	80142	8.00	WASHER,TYPE A PLAIN,.375
8	80187	2.00	CSHH,.250-20X1.25,GR5
9	80226	2.00	CSHH,.375-16X1.50,GR5
10	80228	2.00	CSHH,.375-16X1.75,GR5
11	80350	2.00	NUT,FLEXLOC,.250-20,FULL,LT
12	80352	4.00	NUT,FLEXLOC,.375-16,FULL,LT


UNDER THE EMULSION TANK
ON THE RIGHT SIDE
1
2
3
4
5

24744

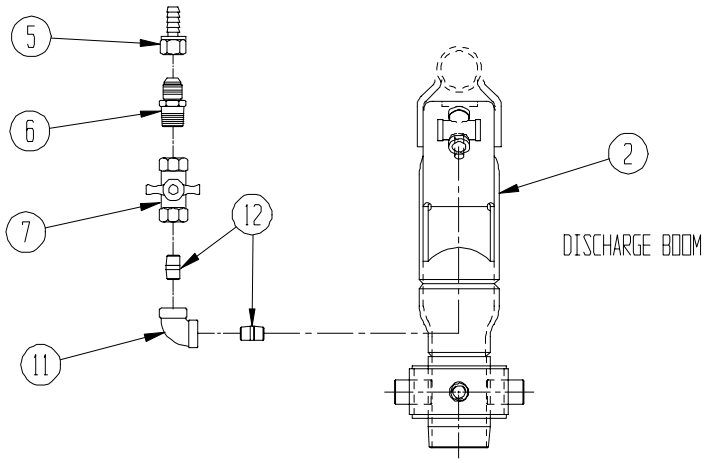

1
2
3
4
5
6 (2)
7
8
9
10
11
12

25269

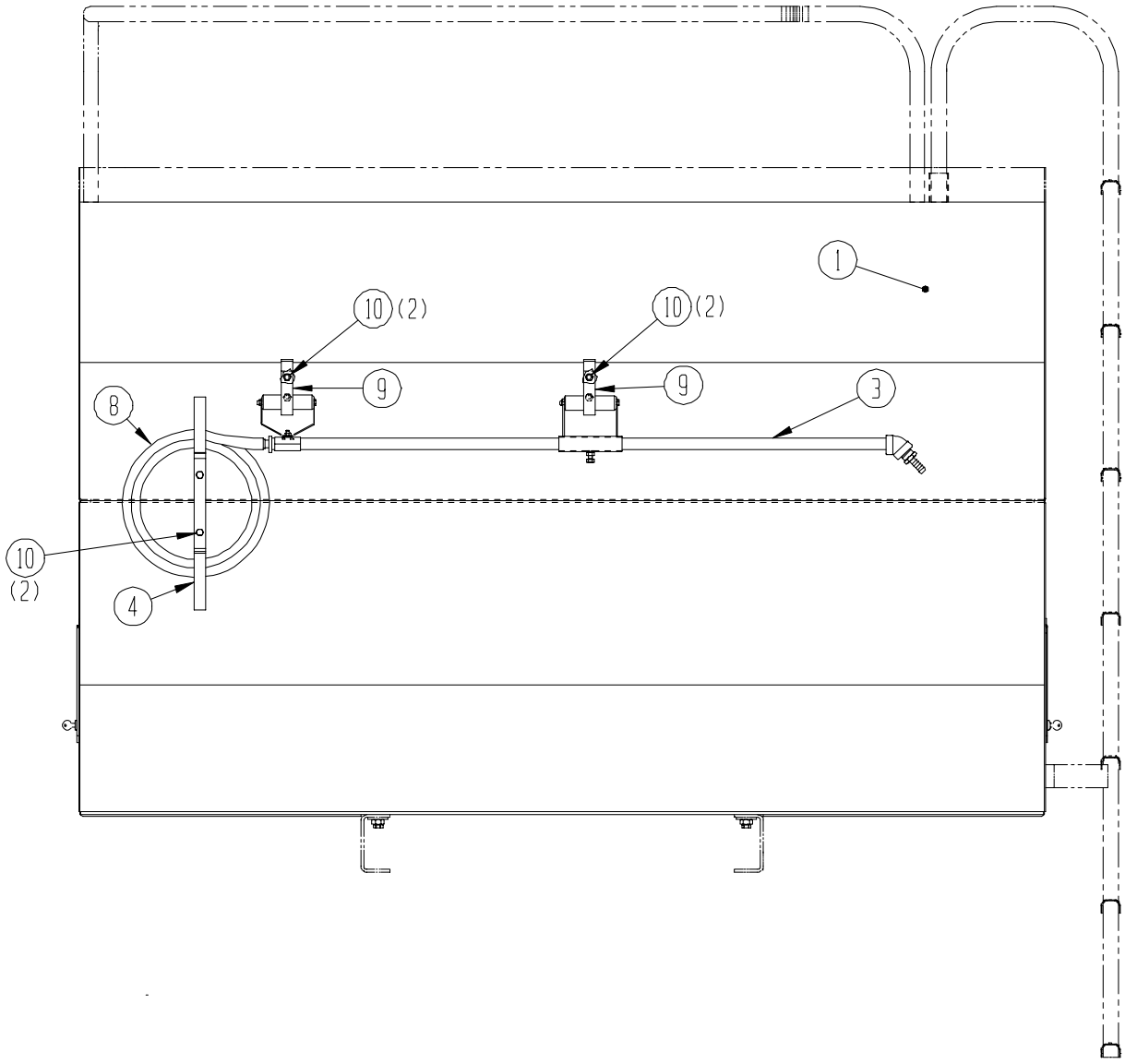
ITEM	PART NO.	QTY.	DESCRIPTION
1	20414	REF	EMULSION TANK ASSY.
2	20831	REF	NOZZLE W/M
3	13974	1.00	HANDSPRAY GUN ASSY ASP (SEE BREAKDOWN)
4	16499	1.00	HOOK,WASH DOWN HOSE
5	31109	1.00	FITT,STR 08FJX-08HB,PUSH-ON
6	33937	1.00	FITT,STR 08MJ-08MP
7	36622	1.00	VALVE,BALL,08NPT,T-HANDLE
8	6352	30.00	HOSE,08,PUSH-ON,250
9	8096	2.00	HANGER,HANDSPRAY HOSE
10	81082	6.00	SCREW,SELF TAP, BTN HD,5/16X1L
11	99512	1.00	PIPE,90,08FP,MI
12	99596	2.00	PIPE,NIPPLE,08XCLOSE

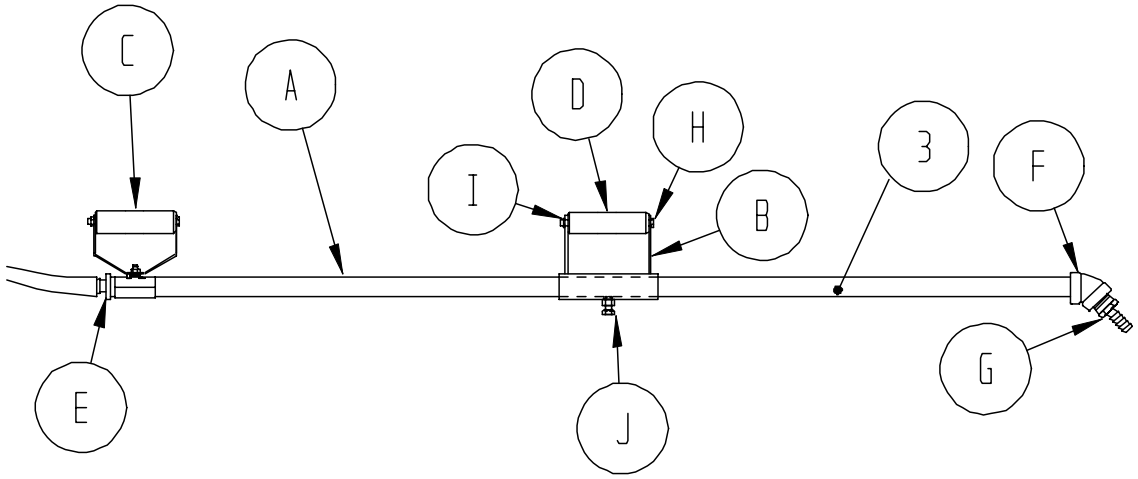
3	**13974**	**REV.B**	**HANDSPRAY GUN ASSY ASP**
A	11056	1.00	HANDSPRAY PIPE, ALUM
B	10126	1.00	HANDLE ASSY HANDSPRAY GUN
C	19606	1.00	VLV,HANDSPRAY,.50,W/HANDLE
D	1557	1.00	HANDLE,HAND SPRAY
E	X427	1.00	FITT,STR 08MP-08HB,CRIMPED
F	99835	1.00	PIPE,45,08FP,GALV
G	X144	1.00	FITT,STR 08-06HB,CRIMPED
H	80188	1.00	CSHH,.250-20X5.50,GR5
I	80000	1.00	NUT,HEX,.250-20,GR2
J	80219	1.00	CSHH,.375-16X.75,GR5

ATTACH HOSE, ITEM 8, TO ITEM 5
ON DISCHARGE BOOM TO USE
HANDSPRAY GUN ASSY

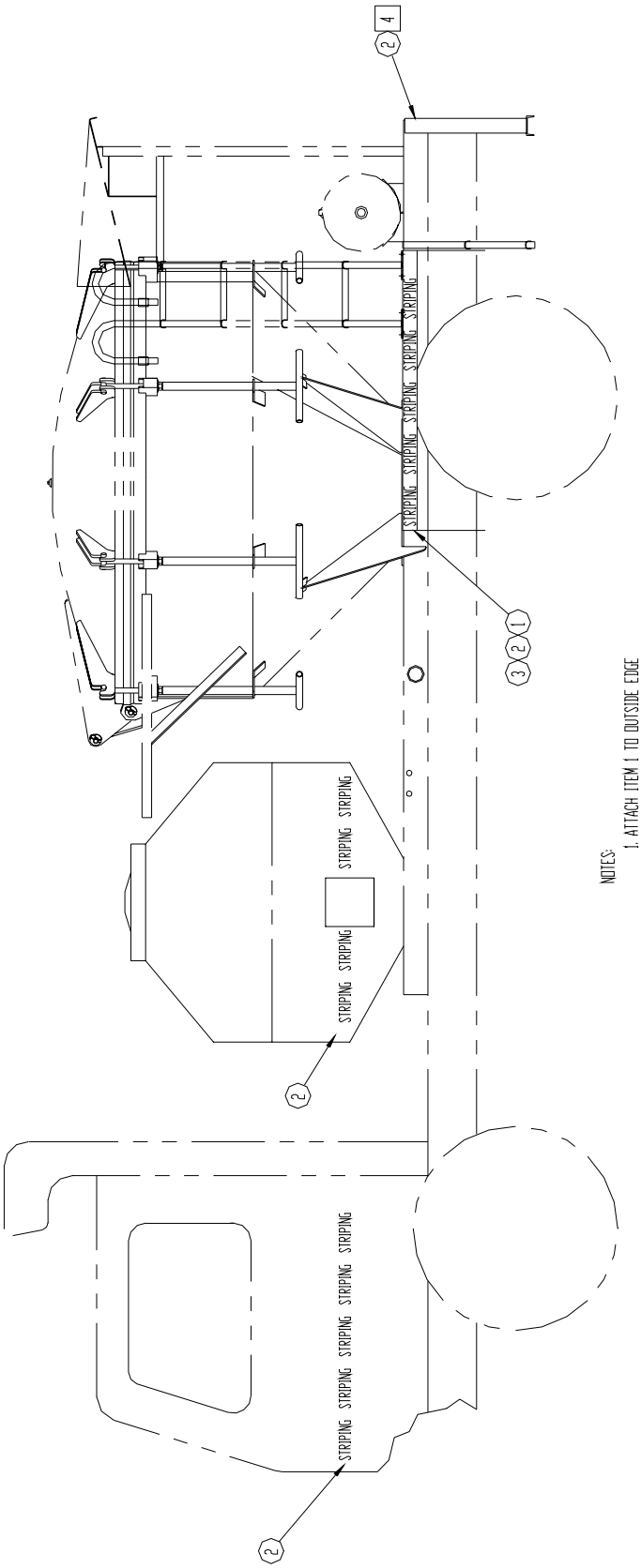


HANDSPRAY ASSY DETAIL


1
10 (2)
10 (2)
9
9
3
8
10
(2)
4


C
A
D
H
I
B
3
F
E
J
G

ITEM	PART NO.	QTY.	DESCRIPTION
1	21974	2.00	MOUNT, AL, FENDER STRIPING
2	37041	29.50	REFLECTIVE TAPE, 2.00 WIDE,RED
3	37044	16.00	RIVET,BLIND,.188,.251-.375


4
2
STRIPING
1
3
2
1
NOTES:
1. ATTACH ITEM 1 TO OUTSIDE EDGE OF FENDER WITH RIVETS, ITEM 3.
2. APPLY REFLECTIVE TAPE ON OUTSIDE EDGE OF FENDER MOUNT.
3. APPLY TAPE TO EMULSION TANK AND TRUCK CAB AT APPROXIMATE LOCATIONS ON BOTH SIDES OF TRUCK.
4. APPLY TAPE TO UPPER FRAME CROSSMEMBER.

ITEM	PART NO.	QTY.	DESCRIPTION
	24188		**WATER FLUSH GROUP** (REV.Ø)
1	000200190	1.00	SWITCH,TOGGLE,SPST,2-POS
2	24189	1.00	MOUNT,WATER TANK,W/M
3	32874	3.00	VLV,BALL,08-BRASS
4	33164	13.00	CLAMP,HOSE,.56-1.06,WORM,#10
5	33598	25.00	TIE,WRAP,.188X15.00
6	35077	2.00	U-BOLT,.250-20,1.00 IW,1.75 IL
7	35771	1.00	FITT,TEE 08HB,POLY
8	36151	1.00	FILLER,TANK,4 IN
9	36153	1.00	STRNR,LIQUID,100 MESH,-08 NPT
10	36174	2.00	FITT,STR 06MP-08HB,BLK POLY
11	36730	1.00	PUMP,WATER
12	36809	1.00	PORT KIT,08 BARBX90,EPDM
13	36846	2.00	FITT,TEE 08MP,NYLON
14	36848	1.00	VLV,CHECK,08FP,1 PSI CRACK
15	36849	2.00	NOZZLE,FULLJET,06 MP,BRASS
16	36850	1.00	NOZZLE,FULLJET,08 MP,BRASS
17	36853	1.00	DECAL,WATER FLUSH SYSTEM
18	37315	3.00	FITT,STR 08MP-08MP,BRASS
19	37318	1.00	FITT,TEE 08FP-08FP-08FP,BRASS
20	54960	2.00	STRAP,DELUXE WATER TANK
21	6352	20.00	HOSE,08,PUSH-ON,250
22	70319	4.00	FITT,90 08MP-08HB,POLY
23	71627	2.00	CSHH,.500-13X1.50,GR5
24	71717	2.00	MACH SCR,PH,#10-32X.75
25	72670	1.00	TANK,WATER,DELUX,35 GALLON
26	80036	4.00	NUT,HEX,.250-20
27	80140	4.00	WASHER,TYPE A PLAIN,.250
28	80141	6.00	WASHER,TYPE A PLAIN,.500
29	80144	4.00	WASHER,TYPE A PLAIN,.500
30	80160	4.00	WASHER,SPLIT LOCK,.250
31	80206	2.00	CSHH,.312-18X1.25,GR5
32	80351	4.00	NUT,FLEXLOCK,.312-18,FULL,LT
33	80354	2.00	NUT,FLEXLOC,.500-13,FULL,LT
34	80995	6.00	WASHER,TYPE A PLAIN,#10
35	871071601	6.00	WASHER,SPLIT LOCK,#10
	24431		**LOW OIL/HIGH TEMP ALARM GROUP** (REV.Ø)
1	33271-1	1.50'	WIRE,16 GA,BLACK
2	33271-10	20.00'	WIRE,16 GA,GREEN/WHITE STRIPE
3	33609	1.00	TERM,RING,16-14 GA,.375 STUD
4	35123	7.00	TERM,RING,16-14 GA,#6 STUD
5	36150	1.00	ALARM,BUZZ/LIGHT,RED
6	36343	1.00	SWITCH,TEMP,210 DEG F,-08MP
7	37704	1.00	SENSOR,LEVEL (OIL)
8	37719	1.00	DECAL,HYD LEVEL/TEMP

REF: See Individual List
REV:

ITEM	PART NO.	QTY.	DESCRIPTION
	24432		**FILTER KIT,RA300 (REV.Ø)**
1	37207	1.00	ELEMENT,FILTER
2	853521155	1.00	FILTER,AIR CLEANER
3	853521208	1.00	ELEMENT,SAFETY,AIR CLEANER
	24447		**AGGREGATE DELIVERY REPLACEMENT PARTS KIT** (REV. B)
1	20831	1.00	NOZZLE W/M
2	24549	1.00	CONNECTOR PIPE,W/M
3	24594-078	4.00	NOZZLE,EMULSION SPRAY,.078
4	36644	4.00	CLAMP,T-BOLT,04 OD,HOSE
5	37334	46.00'	HOSE,3.00,SABERTOOTH
	25212		**CORD,EXT,50 FT,12 GA,3 COND,20 AMP** (REV. 1)
1	37728	1.00	PLUG,ELEC,FEMALE,20A,125V
2	37923	1.00	CORD,EXT,50FT,12 GA,3 COND.
	26468		**ENGINE GROUP,AUX** (REV Ø)
1	33280	1.00	FITT,STR 06MP-04HB,PUSH-ON
2	33356	1.00	PIPE,BUSH,08MP-06FP,STL
3	38062-190	1.00	HOSE,12,12FJX-12RJ90,3000
4	38162	1.00	HEATER,IN TANK
5	38419	1.00	ENGINE ASSY,FL,DEUTZ 4-CYL
	38419-01	1.00	ELEMENT,AIR CLEANER,DEUTZ
	38419-02	1.00	ELEMENT,OIL FILTER,STD,DEUTZ
	38419-03	1.00	ELEMENT,OIL FILTER,LONG,DEUTZ
	38419-04	1.00	ELEMENT,FUEL FILTER,DEUTZ
	38419-05	1.00	BELT,BLOWER,DEUTZ
	38419-06	1.00	MANUAL,OPERATION,DUETZ FL1011F
	38419-07	1.00	MANUAL,SPARE PARTS,DEUTZ
	38419-08	1.00	DECAL,SERVICE,DEUTZ
6	70756	1.00	FITT,STR 08MP-06HB
7	80357	6.00	NUT,FLEXLOC,.750-10,FULL,LT
8	81114	6.00	CSHH,.750-10X2.50,GR8
9	81154	12.00	WASHER,SAE,HARDENED,.750

ITEM	PART NO.	QTY.	DESCRIPTION
	25259		COVER,MANIFOLD VALVE (REV. 1)
	26500		TOOLBOX,STERLING
	35070		MIRROR,MOTORIZED/HEATED
	35827		FLARE KIT, TRIANGULAR
	37596		BEACON,AMBER,DUAL MIRROR,ROT (REV. Ø)
	37725		BLOWER SIGHT GAUGE (REV. Ø)
	35828		FIRE EXTINGUISHER, 5# 2-A-10B:C

RA300 Optional Parts Index

** Bold Entries Indicate Group Headings.*

(Continued)

RA300 Optional Parts Index

** Bold Entries Indicate Group Headings.*

(Continued)

RA300 Optional Parts Index

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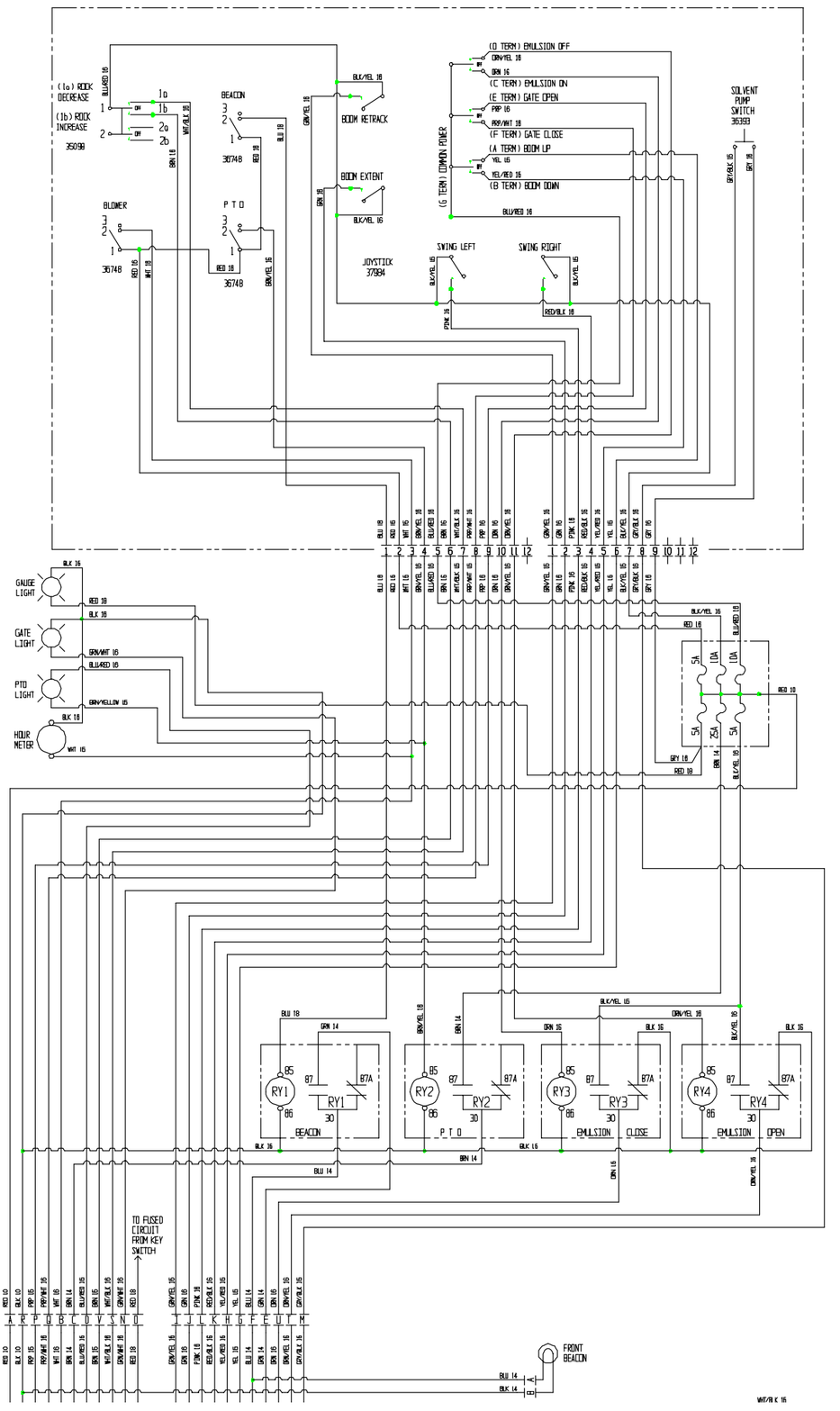
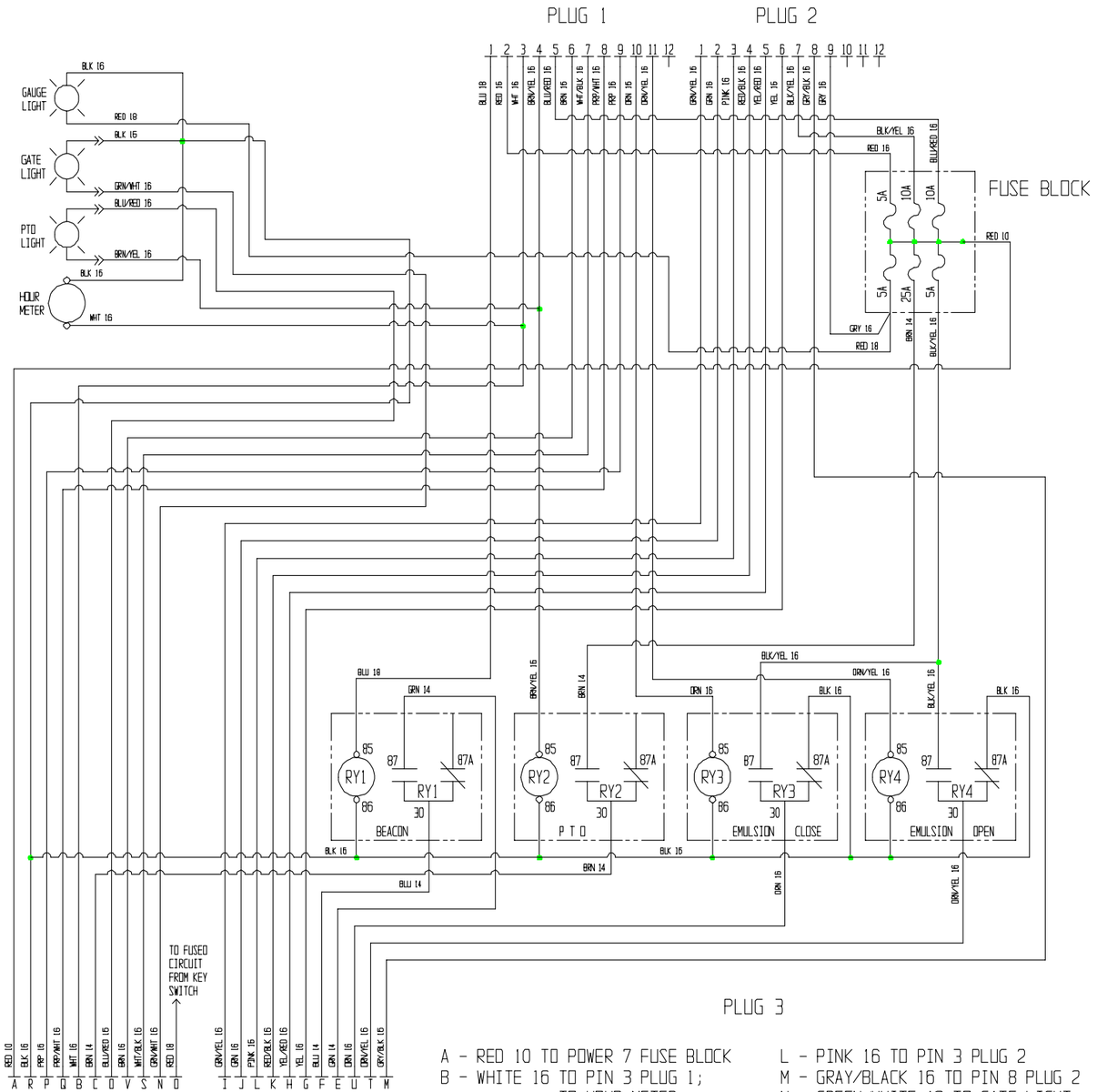

(1a) ROCK DECREASE
(1b) ROCK INCREASE
35098
BEACON
36748
BOOM RETRACK
BOOM EXTENT
BLOWER
P T O
JOYSTICK
37984
SWING LEFT
SWING RIGHT
(D TERM) EMULSION OFF
(C TERM) EMULSION ON
(E TERM) GATE OPEN
(F TERM) GATE CLOSE
(A TERM) BOOM UP
(B TERM) BOOM DOWN
(G TERM) COMMON POWER
SOLVENT PUMP SWITCH
35393
GAUGE LIGHT
GATE LIGHT
PTO LIGHT
HOUR METER
5A
10A
25A
RY1
RY2
RY3
RY4
BEACON
P T O
EMULSION CLOSE
EMULSION OPEN
TO FUSED CIRCUIT FROM KEY SWITCH
FRONT BEACON



PLUG 3

PLUG 3

A - RED 10 TO POWER 7 FUSE BLOCK
B - WHITE 16 TO PIN 3 PLUG 1; TO HOUR METER
C - BROWN 14 TO PIN 30 RELAY 2
D - BLUE/RED 16 TO PTO LIGHT
E - GREEN 14 TO PIN 87 RELAY 1
F - BLUE 14 TO PIN 30 RELAY 1
G- YELLOW 16 TO PIN 6 PLUG 2
H - YELLOW/RED 16 TO PIN 5 PLUG 2
I - GREEN/YELLOW TO PIN 1 PLUG 2
J - GREEN 16 TO PIN 2 PLUG 2
K - RED/BLACK 16 TO PIN 4 PLUG 2
L - PINK 16 TO PIN 3 PLUG 2
M - GRAY/BLACK 16 TO PIN 8 PLUG 2
N - GREEN/WHITE 16 TO GATE LIGHT
O - RED 18 TO FUSED CIRCUIT FROM TRUCK KEY
P - PURPLE 16 TO PIN 9 PLUG 1
Q - PURPLE/WHITE 16 TO PIN 8 PLUG 1
R - BLACK 16 GROUNDS
S - WHITE/BLACK 16 PIN 7 PLUG 1
T - ORANGE/YELLOW 16 PIN 30 RELAY 4
U - ORANGE 16 PIN 30 RELAY 3
V - BROWN 16 PIN 6 PLUG 1

PLUG 1

1 - BLUE 18 TO PIN E
2 - RED 16 TO FUSE E
3 - WHITE 16 TO PIN TO HOUR
4 - BROWN/YELLOW 16

5 - BLUE/RED 16 TO F
6 - BROWN 16 TO PIN
7 - WHITE/BLACK 16 T
8 - PURPLE/WHITE 16
9 - PURPLE 16 TO PIN
10 - ORANGE 16 TO PI
11 - ORANGE/YELLOW 1
12 - OPEN

FI
FI
FI

FI
FI
FI
PI

RELAY 1 - BE/

30 - BLUE 14 TO PIN
85 - BLUE 18 TO PIN
86 - BLACK 16 TO PIN
87 - GREEN 14 TO PIN
87a - OPEN

RELAY 3 - EMULS

30 - ORANGE 16 TO PI
85 - ORANGE 16 TO PI
86 - BLANK 16 TO PIN
87 - BLACK/YELLOW 16
87a - BLACK 16 TO PI