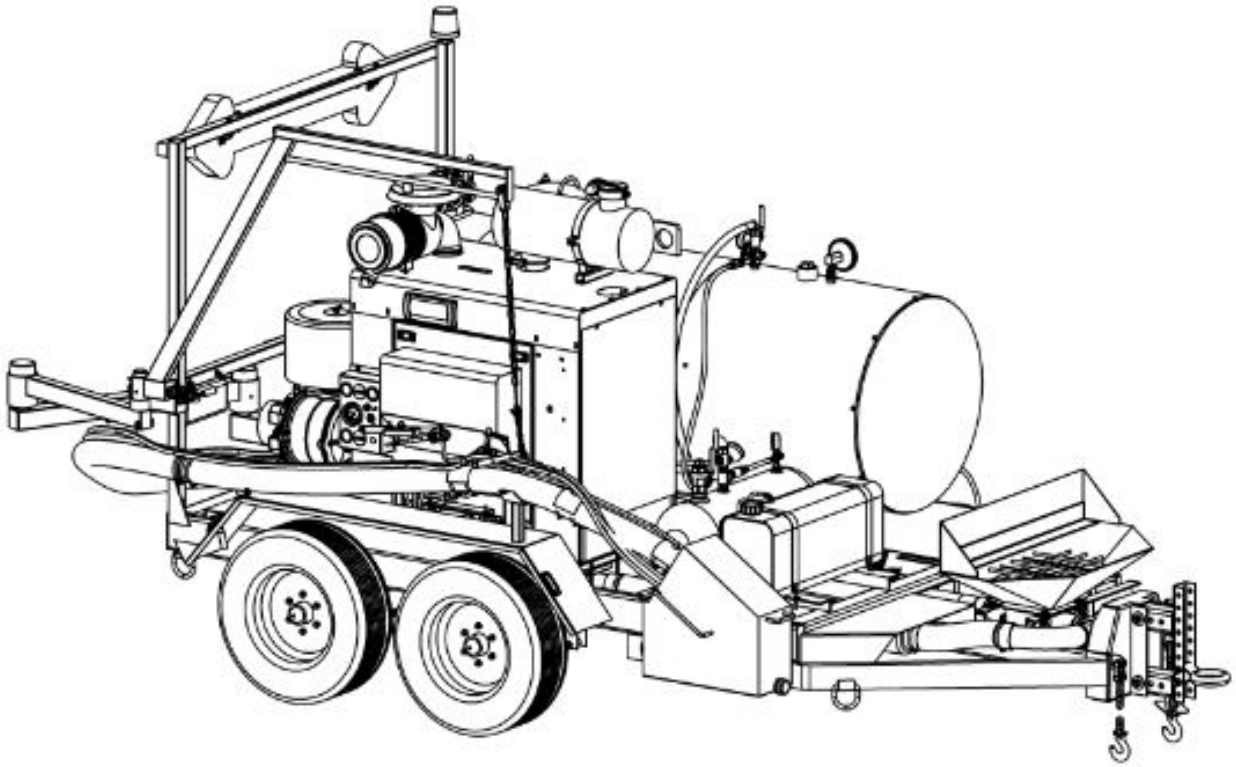
DURA PATCHER

Spray Injection Road Repair

DuraPatcher

Owner/Operator Manual



2000 Old Whitfield Road · Pearl, MS 39288 · (601) 932-2100 · (866) 60-PATCH · Fax (601) 936-6039

Part # 161458

Revised 11DEC18

Table of Contents

Parts Section

Shipping Papers and Information

A packet containing IMPORTANT INFORMATION has been enclosed with your Dura-Patcher. This packet contains:

1) Operation Manual / Parts Lists

2) Manufacturer's Documents
   a) Engine Manual
   b) Blower Manual

IMPORTANT: This manual contains the basic information required to operate, maintain and repair the DuraPatcher you have purchased. The use of this manual ensures accurate adjustments, operation and proper lubrication of your equipment. Please read it and keep it handy.

Any parts orders or service problems relating to Duraco equipment should be directed to the Duraco Parts Department at either (601) 932-2100 or (866) 60-PATCH or email at durapatcher@durapatcher.com. When ordering parts, please have the following information available.

Serial Number: _____

Engine Model (H.P.): _____

Engine Serial Number: _____

Blower Serial Number: _____

State of California Proposition 65 Warning

Breathing diesel engine exhaust exposes you to chemicals known to the state of California to cause cancer and birth defects or other reproductive harm. Always start and operate the engine in a well ventilated area. If in an enclosed area, vent the exhaust to the outside. Do not modify or tamper with the exhaust system.

www.p65warnings.ca.gov/diesel

WARNING!
THIS MACHINE IS DESIGNED TO CREATE PATCHES IN ROADWAYS USING THE TECHNIQUES DESCRIBED IN THIS MANUAL. ANY OTHER USE MAY CAUSE SERIOUS INJURY OR DEATH TO PERSONNEL.

Safety

Keep this manual with the DuraPatcher at all times. This will allow new users to read it before operating the machine. It is the DuraPatcher owner's responsibility to ensure that all workers using this machine are thoroughly trained. Provide workers with this manual and make sure they understand its contents. Read it to them if necessary. Letting poorly trained workers use this machine can result in property or machine damage and/or serious injury or death to personnel.

SAFETY SYMBOL

This Safety Alert symbol means

ATTENTION! BECOME ALERT!

YOUR SAFETY IS INVOLVED!
The Safety Alert symbol identifies important safety messages on the DuraPatcher 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.

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.

SAFETY

YOU are responsible for the SAFE operation and maintenance of your DuraPatcher. **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 alerts you to all good safety practices that should be adhered to while operating the DuraPatcher.

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 follows all 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 possible 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.

General Safety

1. Read and understand the Operator's Manual and all safety signs before operating, maintaining, or adjusting this equipment.

2. Have a first-aid kit available for use should the need arise and know how to use it.

3. Have a fire extinguisher available for use should the need arise and know how to use it.

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

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 because of the possibility of being run over or struck with the boom.

10. DO NOT get into a big rush. Use recommended hand holds and steps with at least three points of support when getting on and off the DuraPatcher. 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 occur from falls.

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

12. Do not run 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 by traffic colliding with the DuraPatcher.

14. Do not inflate tires beyond the maximum recommended inflation pressure. Death or serious injury can occur due to tire exploding.

15. Do NOT hang additional components from the discharge hose support boom. The hose support boom is 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 occur by becoming entangled in moving parts.

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

4. Clean reflectors and lights so that they are visible before transporting to avoid collusion hazards with other traffic.

5. Do not smoke around machine. Fuel, emulsion and the fumes from both can explode when exposed to flame or heat from smoking or other sources.

6. Operate the machine only in well ventilated areas. Death can occur due to carbon monoxide poisoning.

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

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

9. Rotate boom to the right, raise and lock in place before transporting or servicing. A lowered boom may be a collision hazard for both traffic and pedestrians that could result in death or serious injury.

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

11. Turn warning lights ON when operating the DuraPatcher. Lack of warning to oncoming traffic can cause death or injury due to collision.

12. Review safety instructions with all operators annually.

13. 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.

14. Operation shall be limited to personnel with the following minimum qualifications:
    -Designated persons.
    -Trainees under the direct supervision of a designated person.
    -Maintenance and test personnel (when it is necessary in the performance of their duties).

Conduct of Operators

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

2. Each operator shall be responsible for those operations under the operator's 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 starting the DuraPatcher, the operator shall see that all controls are in the 'OFF' or neutral position and that all personnel are clear of DuraPatcher.

5. In accordance with OSHA regulations, operating instructions must be provided initially to operators, employees before allowing them to operate the DuraPatcher and should be reviewed annually thereafter.

6. 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!

7. **DO NOT** modify the patcher in any way. Unauthorized modification may impair function and/or safety and affect the working life of the 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. Hot emulsion can also cause injury.

3. To avoid serious burns, allow the machine to cool before repairing or maintaining working components.

4. 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. Refer to SDS sheet on your emulsion for the flash point and other safety data.

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 due to electrical shock.

3. Do not attempt to service or perform maintenance on electrical components without disconnecting the power first. 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 occur due to violent explosion and/or fire.

3. Do not mix grades of asphalt material. Hot asphalt can vaporize material with lower flash point temperature 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. Keep away from sparks, open flames and incandescent materials. Hot 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 both can explode when exposed to flame or heat from smoking or other sources.

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

2. Keep all sparks and flames away from batteries, as gas given off by the batteries electrolyte solution is extremely explosive. An explosion could result in acid coming in contact with a person’s eyes causing blindness.

3. Avoid contact with battery electrolyte solution: wash off any spilled electrolyte immediately. Spilled electrolyte can cause chemical burns. Do not tip batteries more than 45° to avoid spilling electrolyte solution.

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. Do not jump start a damaged battery.

Maintenance Safety

1. Follow ALL the 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 DuraPatcher 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.

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 DuraPatcher.

9. Wear proper hand and eye protection when searching for fluid leaks.

10. Keep hands, feet, hair, and clothing away from moving or rotating parts. Death or serious injury can occur by becoming entangled in moving parts.

11. Clear the area of bystanders when carrying out any maintenance and repairs or making any adjustments.

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

13. Lock the boom in place before servicing to avoid it suddenly dropping and hitting or crushing someone.

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

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

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

Trailer Stabilizing Procedure

Going under the trailer puts a person at risk of severe injury or death. Follow procedure below to stabilize trailer before going under the trailer

Method #1 Hitch to Vehicle

Park both the tow vehicle and trailer on a flat level surface. Place tow vehicle in park and remove keys.

Method #2 Unhitched

Park trailer on a level surface. Place wheel blocks in front of and behind wheels on both sides of the trailer. Inspect your swivel jack thoroughly for damage or abnormal wear, especially if it was subjected to abnormal load or shock. [*If damaged do not use, replace swivel jack*.] Turn the swivel jack to the vertical position and pin in place. Use the swivel jack to decouple trailer from tow vehicle. After raising the hitch coupler, crib, block, or otherwise secure the trailer at once.

Transport Safety

DO NOT DRINK AND DRIVE.

1. Make sure you are in compliance with all local regulations regarding transporting equipment on public roads and highways.

2. Make sure the lights and reflectors that are required by the local highway and transport authorities are in place, are clean, are in good working order, and can be seen clearly by all overtaking and oncoming traffic to avoid accidents.

3. Do not exceed 55 MPH (88 KM/H) when transporting the machine. Reduce speed on rough roads and surfaces and when making turns.

4. 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 occur due to slips and falls.

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

4. If possible, store the DuraPatcher inside a building or cover with a weather-proof tarpaulin and support securely.

Tire Safety

1. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion separation of the tire and rim which may result in 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 service perform required tire maintenance.

4. When inflating tires, use a self-attaching inflation chuck with remote shut off and stand 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. Block the tire and wheel on opposite side of the vehicle before you place a jack in position.

9. Place hardwood blocks under the jack regardless of how hard or soft the ground is. ALWAYS support the vehicle with blocks or preferably jack stands in case the jack should slip.

Refueling Safety

1. Handle fuel with care. It is highly flammable.

2. DO NOT SMOKE when refueling and never refuel when near an open flame. Also never refuel when the engine is running. Death or serious injury can occur due to 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 filler nozzle when filling the tank. Fire can result from fuel contacting hot components.

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

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

8. Tighten the fuel tank cap securely. Should the fuel cap be lost, replace it only with the original manufacturer's approved cap. Use of 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. Replaced parts, that displayed a safety sign, should also display the current sign.

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

DECAL INSTALLATION

1. Be sure that the installation area is clean and dry. Use hot soapy water and dry 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 location for the decal and remove the smallest adhesive backing 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 place.

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

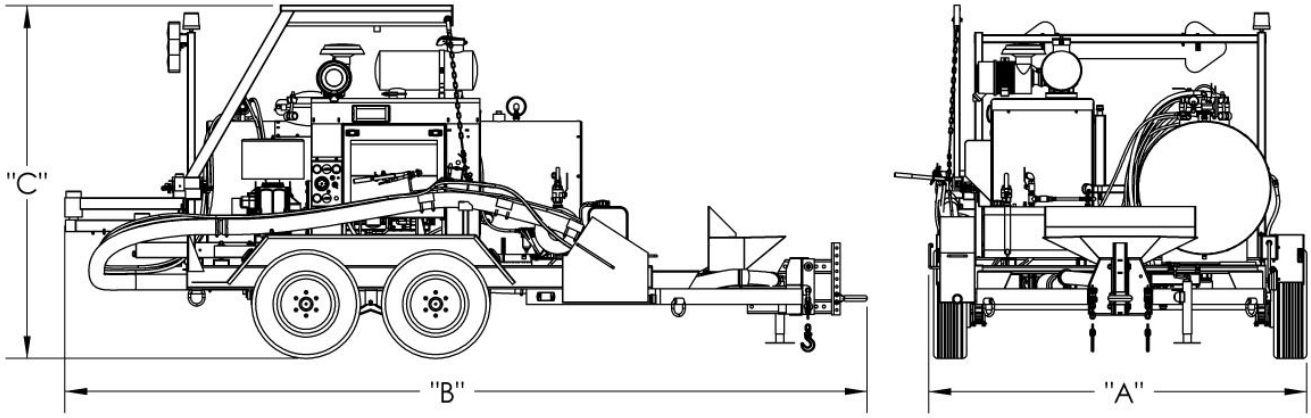
6. Small air pockets can be pierced with a pin and smoothed out using a piece of decal backing paper.

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 may be pierced with a pin and smoothed out. When the decal is completely smoothed out, carefully remove the top paper.

Weights and Dimensions

Model	"A" in/cm	"B" in/cm	"C" in/cm	Weight lbs./kg (empty)
Domestic	98/249	204/518	90/229	5500/2495
Export	90/229	204/518	90/229	5500/2495
			Weights are without options	



WARNING!!!

DO NOT USE BIODIESEL FOR CLEANING SOLVENT!!!

DO NOT USE ANY SOLVENT CONTAINING METHYL ESTER FOR CLEAN OUT!!

USE OF THESE PRODUCTS IN THE DURAPATCHER WILL VOID THE WARRANTY OF ALL HOSES.

BIODIESEL MAY BE USED IN JOHN DEERE ENGINE IF USED IN ACCORDANCE WITH JOHN DEERE RECOMMENDATIONS.

DURAPATCHER OPERATION

NOTE: This list does not take the place of nor is it in lieu of the instructions and safety warnings contained in the operator's manual. These instructions do not take the place of nor are they in lieu of proper "On-site" training by a qualified operator. This is only a guide**.**

MACHINE PREPARATION PRIOR TO PATCHING

1. Inspect machine for any defects, loose or damaged items.
2. Verify that the trailer is securely fastened to tow vehicle with safety chains and lights are in proper working order
3. Verify the diesel fuel tank and air/diesel cleanout tank are full. Vent before inspection. Fill as needed.

Air/Diesel Cleanout Tank

Diesel Fuel Tank

4. Fill the asphalt emulsion tank with liquid asphalt emulsion. Make sure that the air pressure relief valve on top of the emulsion tank is open and all pressure is relieved from the tank before opening the 12" fill cap. **DO NOT OVER FILL THE TANK!!** Leave at least 5" of space below the filler neck to allow for expansion when heated. Before closing the 12" filler cap, make sure that the rubber O-ring on the lid is properly seated in the cap. Carefully lower the cap in place and tighten. Do not drop the lid as it may cut the O-ring and allow air pressure to escape.

The most commonly used emulsions for patching are CRS-2 Cationic (positive charged) and RS-2 Anionic (negative charged). These are rapid set emulsions that react very quickly with aggregate and form a fast curing patch which can support traffic immediately. In certain climates, rapid set emulsions may set up too quickly. If this is the case, medium set emulsions such as MS-2 and CMS-2 may be recommended. It is always best to consult your emulsion supplier to determine the best type of emulsion to use in your geographic area.

CAUTION!

NEVER MIX CATIONIC OR ANIONIC EMULSIONS WITHOUT PROPERLY CLEANING THE EMULSION TANK. MIXING THESE WILL RESULT IN A HARDENED MASS OF MATERIAL THAT IS DIFFICULT TO REMOVE OR CLEAN.

5. Replace all tank caps securely and close pressure valve.

6. Check engine oil and add as needed.

7. Inspect and clean engine air filter and blower air filter. Replace when clogged or as per service intervals.

8. **Remove the spray nozzle from the drip tank.** Verify nothing is in the way of the blower discharge hose end and the emulsion control station is closed.

9. Start engine and allow air pressure to build up in emulsion and diesel cleanout tanks. When pressure has reached 80-90 psi, turn off engine.

Warning: **Do not go to next steps with engine running.**

10. Return nozzle to drip tank.

11. When ready to begin patching, turn the emulsion/diesel selector valve (located on top rear of emulsion tank) to proper position to spray emulsion. Verify the nozzle is over the drip tank and slightly open emulsion control valve at boom control station. The emulsion traveling through the supply line will push out the cleaning fluid (diesel) leaving it ready for patching. Turn off the emulsion control valve at the operator handle.

12. Remove hose from drip tank. Verify nothing is in the way of the hose end. Start engine and make sure oil circulation pump is on.

13. Remove chain from dump truck aggregate gravity feed hose. Tilt dump truck bed to cause aggregate to flow through the hose into the aggregate hopper located at the front of the DuraPatcher.

14. Fill the aggregate hopper with clean crushed aggregate. The DuraPatcher will patch with dusty or dirty aggregate, but this type material can negatively affect the patching process. Too much dust or dirt can retard curing of the patch and limit adhesion of the emulsion to the aggregate.

15. Verify traffic is routed away from your work area. You are now ready to begin patching.

MAKING ROAD REPAIRS

1. To begin the repair process the operator utilizes the airstream from the large aggregate hose to blow out any loose debris and water from the area to be repaired. It may be necessary to increase the rpm of the engine to produce the velocity of airflow to accomplish this task. After the area is cleaned, reduce the engine rpm to between 1200-1500 rpm.

2. Next the operator should **slowly** pull handle on the emulsion valve located at the operator boom control station. This causes the flow of emulsion to begin. Pull the valve handle back until the spray coming out of the nozzle resembles the spray similar to that of a can of spray paint. Lightly coat (or tack) the area to be repaired with emulsion. Note: When tacking a non-absorptive surface use a light coat of tack to prevent bleeding of the excess emulsion. When repairing an absorptive area, such as a gravel road, use enough emulsion to reach a solid surface underneath. After you have tacked the area DO NOT turn off or adjust the emulsion control valve.

3. While the emulsion is still spraying from the boom nozzle the operator should place the aggregate control switch (small toggle located on the operator handle) in the “on” position. This starts the flow of aggregate through the large supply hose. Adjust the emulsion control valve if needed to achieve a salt and pepper looking mixture. This mixture is still black but allows you to see some of the natural color of the stone being used. Avoid using excess emulsion as this may cause the repair to “bleed” in hot weather.

4. When the repair is up to the desired level with aggregate emulsion mixture, gently push the emulsion control handle forward thus stopping the flow of emulsion. The machine is only distributing dry rock at this point. Cover the mixture with a light coat of dry aggregate to prevent traffic from tracking any emulsion from the patch while curing. After the desired coating of dry aggregate is achieved flip the toggle to the “off” position. The aggregate will continue to flow until the blower airstream empties any remaining aggregate left in the hose. The repair is now complete. Repeat “MAKING ROAD REPAIRS” steps for each repair.

CLEANUP

1. When you are finished with the DuraPatcher and are ready to store the unit overnight or any extended time, the emulsion supply line must be purged with diesel or other solvent.

WARNING: DO NOT PROCEED TO THE NEXT STEP WITH THE ENGINE RUNNING!

DO NOT USE BIO-DIESEL FOR CLEANING SOLVENT!

2. Verify the emulsion nozzle is over the catch tank on the DuraPatcher. Place the Emulsion/Clean out selector valve on the emulsion tank to the “clean out” position. Place the diesel valve to the “on” position. **Slowly** open the emulsion control handle at the boom control station. Diesel will force any remaining emulsion from the supply line. Allow to flow until there is no emulsion in the line.

3. Once clean out is complete, move the emulsion control valve at the top of tank to the “off” position and the diesel clean out tank valve to the “off” position.

4. Lower the dump truck bed and secure the chain to the aggregate flow hose.

5. Secure the boom and hoses into their proper transport position.

NEVER TRANSPORT THE DURA PATCHER WITHOUT THE BOOM LATCHES PROPERLY SECURED!

ELECTRIC HEATING SYSTEM

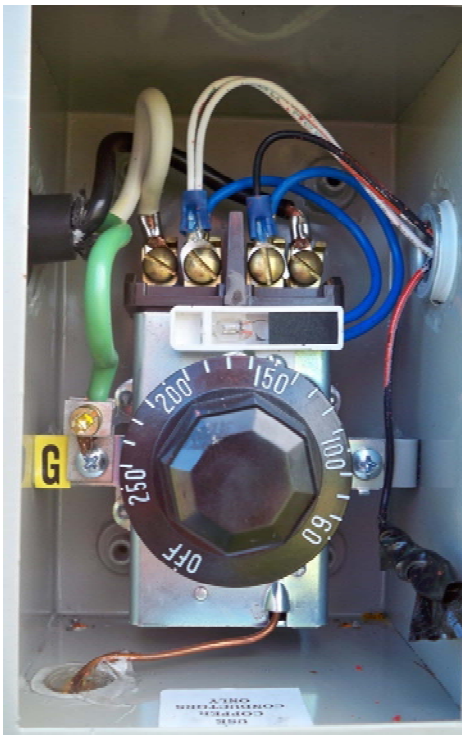
1. The asphalt emulsion heating system is heated using (2) 1500 watt 120 or 220 volt heater blankets that are thermostatically controlled. The blankets are designed to heat the tank itself therefore no direct heat is put on the emulsion. This indirect heating reduces the possibility of cooking the emulsion with direct heat. It also allows an empty tank to be preheated before loading it with hot emulsion. The temperature control is located on the machine frame rail near bottom of the emulsion tank. The normal operating temperature is 140 to 160 degrees F.

CONSULT YOUR EMULSION SUPPLIER CONCERNING THE PRODUCT
YOU ARE USING TO SELECT THE CORRECT OPERATING TEMPERATURE.

2. **To set the temperature,** use a screw driver to remove the thermostat cover and set the dial to the desired temperature. Replace cover. Plug the power cord into a standard 120 volt or 220 electrical outlet **(Warning: make sure voltage is correct)** and the thermostat will maintain the emulsion at the selected temperature for overnight heating. Each blanket uses approximately 12 amps (@ 120V). In most climates, the use of only one heater blanket is needed for overnight heating. If only one blanket is being used a circuit with a 20 amp breaker is sufficient.

3. **Cold weather setup,** if both blankets are being used**, a circuit with a 30 amp breaker is needed**. When using both blankets on a 30 amp circuit, it is recommended that the larger spade type plug that came with the DuraPatcher be installed on the power cord in place of the standard plug.

See page 27 of manual for thermostat box wiring diagram.



CAUTION!

RUNNING 2 BLANKETS THROUGH THE STANDARD PLUG CAN CAUSE OVERHEATING OF PLUG AND FIRE.

4. Turn all valves off and relieve pressure from tanks.

5. Inspect entire unit, including, but not limited to: Tires and wheels, hoses and all other components for damage before unit is put into service again. Repair or replace any worn or damaged components before operation.

Cold Weather Operation

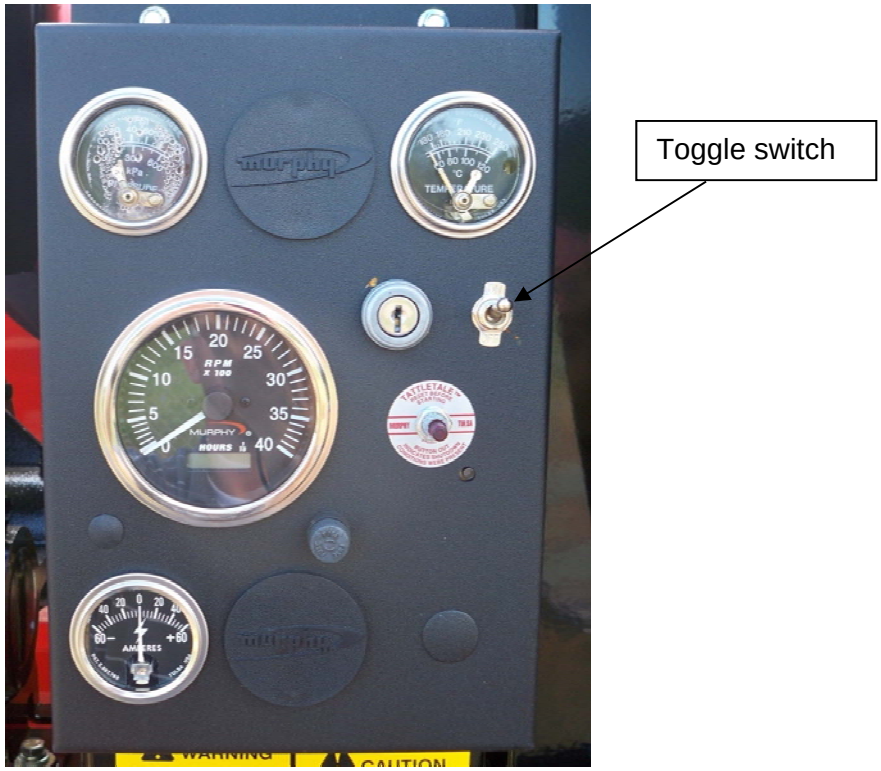
The operating procedures for cold weather are the same as normal temperatures with the following exceptions.

1. In cold weather, start the John Deere power unit before going to the job site. Allow the engine temperature to come up to operating temperature (at least 130 degrees F). The cover over the radiator may be dropped to speed up the warm-up procedure

2. Once the engine up to operating temperature, turn on the hot oil heating system. The toggle switch to turn on the pump is located on the control panel with the ignition switch for the John Deere engine. Allow the hot oil to circulate prior to doing the startup procedure to begin patching. The circulation of the hot oil will preheat the emulsion lines and valves prior to loading them with emulsion and prevent hot emulsion from entering cold lines and valves.

3. Let the circulating pump remain on all day while patching. The system is designed to keep all components hot while patching in cold weather.

4. The reservoir that holds the heat transfer oil for the hot oil heating system is located on the John Deere power unit between the engine and the emulsion tank. The oil level in the reservoir should be checked regularly to make sure that the oil level is correct.



Remember: Safety First!

Do not attempt to operate this machine until you have read the operator's manual and understand it!

EMULSION TANK CLEANOUT PROCEDURE:

Tank should be cleaned out at least once every 12 months. More often may be necessary if emulsion becomes old and thick in the tank.
Use as much of the emulsion from the tank during normal patching operation as possible. As the tank begins to empty the operator will notice that more air than emulsion is coming from the spray nozzle as the tank becomes empty.

At the yard:
1. Release the air pressure from the emulsion tank using the ¾ ” air pressure valve on top of the tank. Leave valve open.

2. Open Fill Port and add approximately 5 gallons of an approved solvent / diesel fuel to the tank and close the fill port. Close fill port and air pressure valve.

DO NOT UNDER ANY CIRCUMSTANCES USE GASOLINE OR A KEROSENE BASED PRODUCT AS THESE ARE EXTREMELY FLAMABLE.

3. Plug the machine in at the power source with the thermostat set at 125 to 135 degrees (F). This will aid in heating the drain valve.

4. After the tank has been heated for 10 to 12 hours, unplug the machine and carefully drive it around the yard to let the heated diesel / solvent move around in the tank to dissolve hardened emulsion.

5. Unhook from the truck and slightly elevate the front of the machine with the jack to move material to the back of the tank where the drain valve and pickup tube are located.

6. Make sure that air drain valve is closed and the fill port is secure. Crank power unit and let it run until you build about 50 to 60 PSI in the tank. Shut off power unit.

7. Wear proper personal protective equipment, Gloves, Eye Protection. Move the Emulsion Control Valve on top of the tank to “Emulsion” position then slowly open the ½” emulsion valve on the operator’s handle to allow the heated diesel/solvent to flow through the valves and lines into the flush tank or bucket. This will make sure that all valves and lines are cleaned of any old emulsion. If the material is too thick to pass through the spray slot in the nozzle, the emulsion line can be removed from the nozzle to allow the thick material to flow freely to clean the valves and lines.

8. Move the emulsion valve to the clean out position and slowly open the ½” emulsion valve on the operators handle to allow clean diesel from the clean out tank to flow through the valve and lines to remove any mixture of diesel and old emulsion left in the emulsion line. Move the emulsion valve and the clean out valve to the off position. Drain the air from the emulsion tank by slowly opening the ¾” drain valve on top of the emulsion tank. Check the pressure gauge to make sure that all air pressure has been released before opening the fill port.

9. Place a container (5 gallon bucket, etc) under the drain valve and slowly open the valve to drain the material from the tank.

*******DO NOT USE A TORCH OR OTHER HEAT SOURCE ON OR NEAR THE DRAIN VALVE AS OPEN FLAME MAY IGNITE THE DIESEL FUEL AS IT DRAINS FROM THE TANK*******

10. Once the tank has been drained, open the fill port slowly and check to make sure all thick or hard material has been removed. You should be able to stick a rod or pole into the tank and it should touch bare metal in the bottom of the tank. Then you know it is clean.

11. Machine is now ready to have fresh emulsion loaded and to be plugged in to get the temperature up to patching temperature. Normal temperature for most materials being used is 160 to 170 degrees in the winter and 150 degrees in the summer. If there is a question about the correct recommended temperature for the emulsion being used please Always consult your emulsion supplier and the Safety Data Sheets (SDS) for their recommendation.

NOTE: EMULSION DOES HAVE A SHELF LIFE. IF THE MACHINE IS TO BE PARKED FOR A WEEK OR LONGER WITH EMULSION IN THE TANK, ONE OR TWO THINGS NEED TO BE DONE.

SUMMER OR HOT WEATHER: YOU CAN LEAVE THE MACHINE PARKED UNPLUGED AND THE AIR DRAIN VALVE CRACKED OPEN SO THAT YOU ARE NOT COOKING THE WATER OUT OF THE EMULSION BY HAVING CONSTANT HEAT ON IT. WE RECOMMEND THAT ONCE A WEEK YOU OPEN THE FILL PORT AND GENTLY STIR THE MATERIAL WITH A CLEAN BOARD OR POLE TO GENTLY AGITATE THE EMULSION. THIS WILL AID IN KEEPING A “SKIN” FROM FORMING ON THE TOP OF THE EMULSION IN THE TANK. REMEMBER TO PLUG THE MACHINE INTO THE POWER SOURCE AND TURN THE THERMOSTAT BACK UP TO OPERATING TEMPERATURE THE DAY BEFORE YOU PLAN TO PATCH TO MAKE SURE THAT THE EMULSION IS UP TO OPERATING TEMPERATURE.

WINTER OR COLD WEATHER: DO NOT ALLOW THE EMULSION TO FREEZE. FOR SHORT TERM STORAGE IN THE WINTER, SET THE THERMOSTAT TEMPERATURE CONTROL AT 80 TO 90 DEGREES AND PLUG INTO THE POWER SOURCE. THIS LOWER TEMPERATURE WILL KEEP THE EMULSION WARM AND MAKES SURE IT DOES NOT FREEZE. THIS WILL WORK IF ONLY STORING FOR 2 TO 3 WEEKS. REMEMEBR TO RAISE THE TEMPERATURE ON THE THERMOSTAT BACK TO THE OPERATING TEMPERATURE THE DAY BEFORE YOU PLAN ON PATCHING TO MAKE SURE THE EMULSION IS BACK UP TO OPERATING TEMPERATURE. IF THE STORAGE TIME IN THE WINTER IS LONGER THAN THIS IT IS RECCOMENED THAT YOU PATCH THE MATERIAL OUT OF THE TANK AND STORE IT WITH APPROXIMATELY 5 GALLONS OF DIESEL UNTIL YOU ARE READY TO PUT IT BACK IN SERVICE.

DO NOT UNDER ANY CIRCUMSTANCES USE GASOLINE OR A KEROSINE BASED PRODUCT AS THESE ARE EXTREMELY FLAMABLE. IF USING A SOLVENT OTHER THAN DIESEL, MAKE SURE YOU CHECK THE FLASH POINT OF THE PRODUCT BEFORE HEATING IT IN THE TANK.

Installation and Operation of the 518PH, 518APH & 518E TATTLETALE®

00-02-0187
Revised 10-06
Section 25

MURPHY

Please read the following information before installing. A visual inspection of this product for damage during shipping is recommended before mounting. It is your responsibility to have a qualified person install this unit.

GENERAL INFORMATION

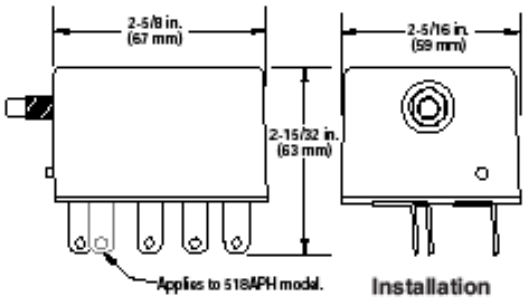
WARNING

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT
- ✔ Disconnect all electrical power to the machine.
- ✔ Make sure the machine cannot operate during installation.
- ✔ Follow all safety warnings of the machine manufacturer.
- ✔ Read and follow all installation instructions.

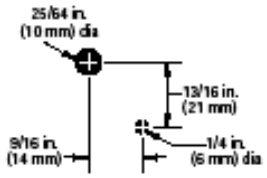
Specifications

Case: Polycarbonate
Contact Rating: 10 A
Coil Circuit Resistance: 339 ohms ± 10% 12 Volt
678 ohms ± 10% 24 Volt
Minimum Latch Voltage: 12 Volt model: *10 VDC*
24 Volt model: *20 VDC*
Minimum Latch Current: 12 Volt model: *30 mA*
24 Volt model: *30 mA*
Operating Temperature Range: -40 to 176°F (-40 to 80°C)

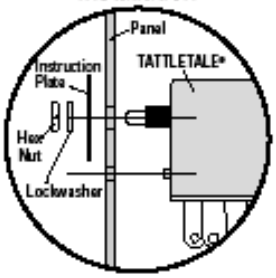
Dimensions and Installation



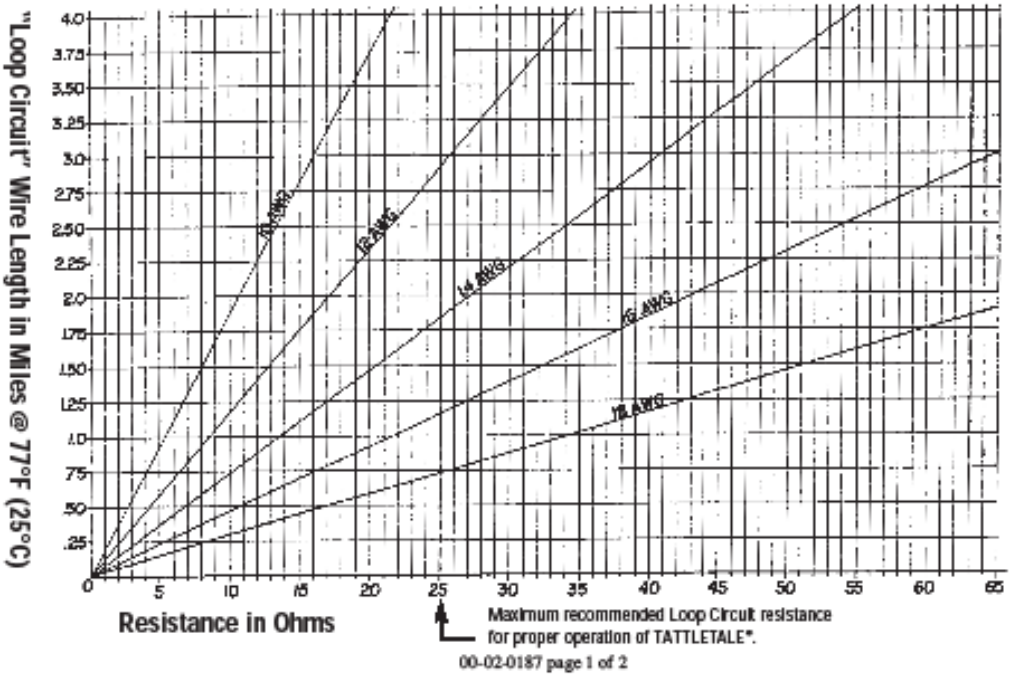
Mounting Holes



Installation



CAUTION: Certain dangers to human safety and to equipment may occur if some equipment is stopped without pre-warning. It is recommended that monitored functions be limited to alarm only or to alarm before shutdown.

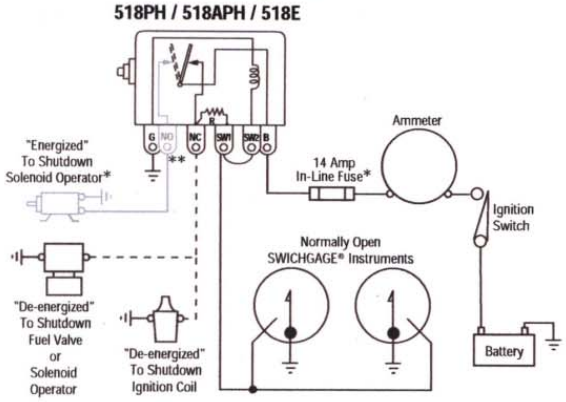


Engine Controls

TYPICAL WIRING DIAGRAMS

Figure 1 shows a jumper installed between "SW1 and "SW2". SWICHGAGE® instruments are normally open. This is not a Closed Loop™ circuit.

Figure 1

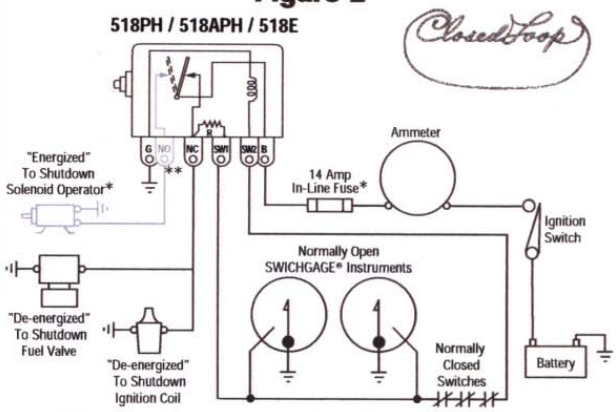


* In-Line Fuse should be removed on "energized" to shutdown configurations.

** Applies to 518APH model.

Figure 2 shows a Closed Loop™ circuit with normally open Murphy SWICHGAGE® instruments and Normally Closed switches (alignment and "V" belt switches, etc.).

Figure 2



* In-Line Fuse should be removed on "energized" to shutdown configurations.

** Applies to 518APH model.

TROUBLESHOOTING

Push button will not remain in the depressed position after engine startup (wired according to Figure 2).

- Be sure oil pressure is adequate to raise pointer past SWICHGAGE® contact. (Not necessary if oil pressure SWICHGAGE® is equipped with push button lockout.)
- Visually check wiring for loose connections, frayed wiring, etc. on all terminals and within switch loop circuit.
- Check 14 amp fuse connected to "B" terminal.
- Check for good ground on "G" terminal.
- Disconnect switch loop circuit from "SW1" and "SW2" terminals. Place a temporary jumper between SW1 and SW2 and restart engine. If the push button stays in with engine running, the 518PH, 518APH & 518E is not the problem. This indicates either an open circuit, unwanted ground, or too high resistance in switch loop circuit wiring between "SW1" and "SW2".
- Verify continuity by performing the following:
  1. Disconnect switch loop circuit from "SW1" and "SW2" terminals.
  2. Remove power from "B" terminal.
  3. Use an ohmmeter to check for "good continuity" (25 ohms or less) through **switch loop circuit**. If good continuity is indicated, proceed to Step 4.
  4. Adjust SWICHGAGE® contact away from pointer. Check continuity between one end of loop circuit, "SW1 or "SW2" and ground. Good continuity (25 ohms or less) indicates an unwanted ground in loop circuit such as a terminal rotating against the mounting panel. Remove ground, restore loop circuit connections to "SW1" and "SW2".
  5. Reconnect power to "B" terminal and restart engine.
  6. Using an ohmmeter, check resistance between one end of the loop circuit to the other. Resistance should not exceed 25 ohms. If resistance is too high, check for loose connections in loop circuit. Otherwise select larger size wire for loop circuit.

Engine fails to shutdown when contacts close on one-wire to ground SWICHGAGE® controls (wired according to Figure 1).
With engine running, jumper "SW1" to "G" terminal. If switch trips and engine shuts down, trouble could be SWICHGAGE® contacts not making contact, lack of good case ground on SWICHGAGE®, or broken/cut wire.

Lack of case ground on SWICHGAGE®.
Verify that mounting bracket on the SWICHGAGE® has broken through the panel paint and has made good contact with bare metal. If good contact has not been made, tighten mounting stud nuts accordingly.

Failure of contacts on SWICHGAGE® to make contact.
Adjust contacts back and forth against the pointer to give a wiping and cleaning action on contacts. If this does not correct the problem, replace SWICHGAGE®.

FW MURPHY
P.O. Box 470248
Tulsa, Oklahoma 74147 USA
+1.918.317.4100 Fax: +1.918.317.4266
E-mail: sales@fwmurphy.com

INDUSTRIAL PANEL DIVISION
Fax: 918.317.4124
E-mail: ipdsales@fwmurphy.com

MURPHY POWER IGNITION
Web site: www.murphy-pi.com

www.fwmurphy.com

CONTROL SYSTEMS & SERVICES DIVISION
P.O. Box 1819
Rosenberg, Texas 77471 USA
Phone: 281.633.4500 Fax: 281.633.4588
E-mail: sales@fwmurphy.com
Web site: www.fwmurphy.com

FRANK W. MURPHY, LTD
Church Rd Laverstock
Salisbury SP1 1QZ UK
Phone: +44 1722 410055 Fax: +44 1722 410088
E-mail: sales@fwmurphy.co.uk
Web site: www.fwmurphy.co.uk

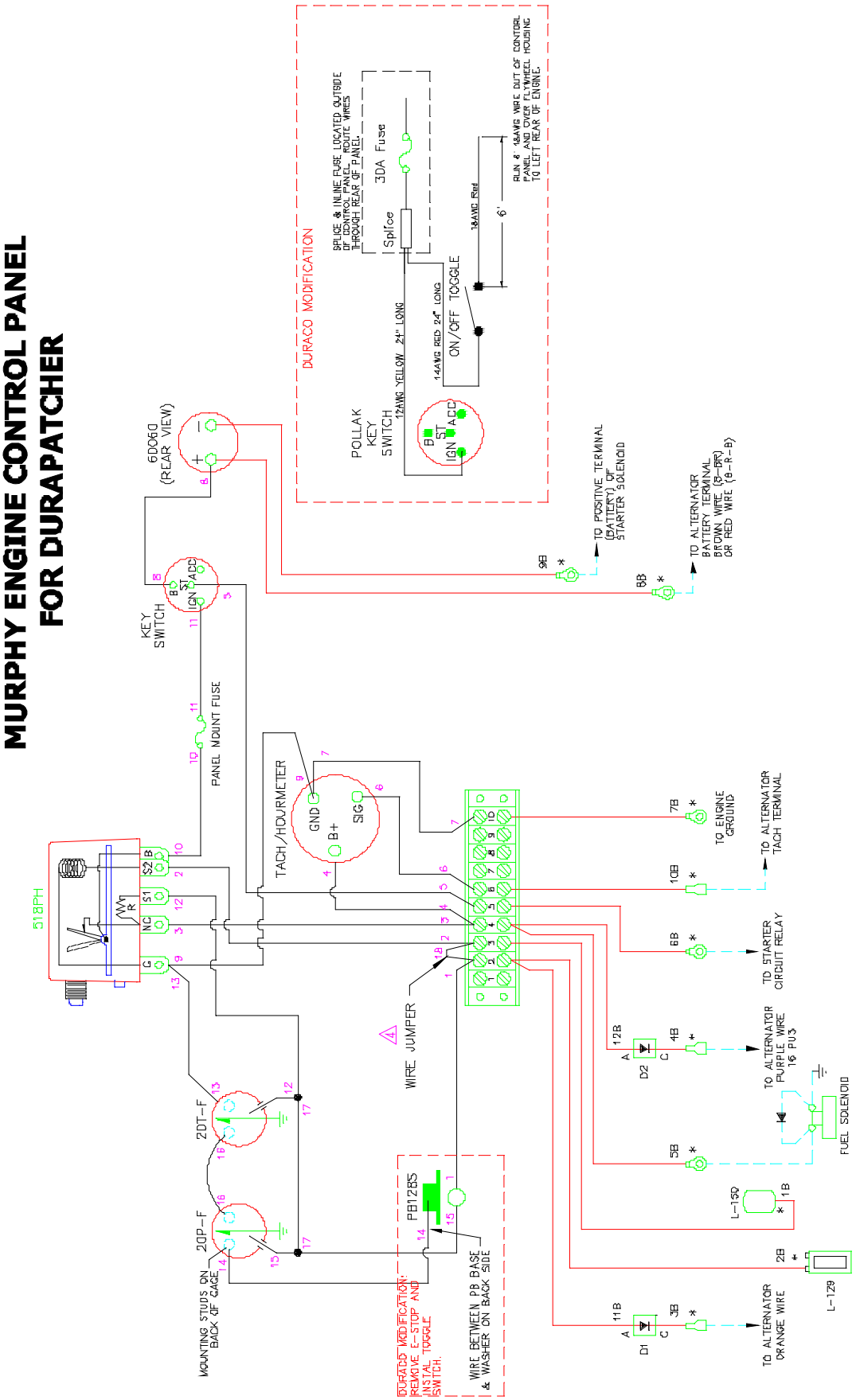
COMPUTRONIC CONTROLS, LTD
41 - 43 Railway Terrace Nechells
Birmingham B7 5NG UK
Phone: +44 121 327 8500 Fax: +44 121 327 8501
E-mail: info@computroniccontrols.com
Web site: www.computroniccontrols.com

FW MURPHY INSTRUMENTS (HANGZHOU) CO. LTD
77 23rd Street
Hangzhou Economic & Technological Development Area
Hangzhou, Zhejiang, 310018, China
Phone: +86 571 8788 6060 Fax: +86 571 8684 8878

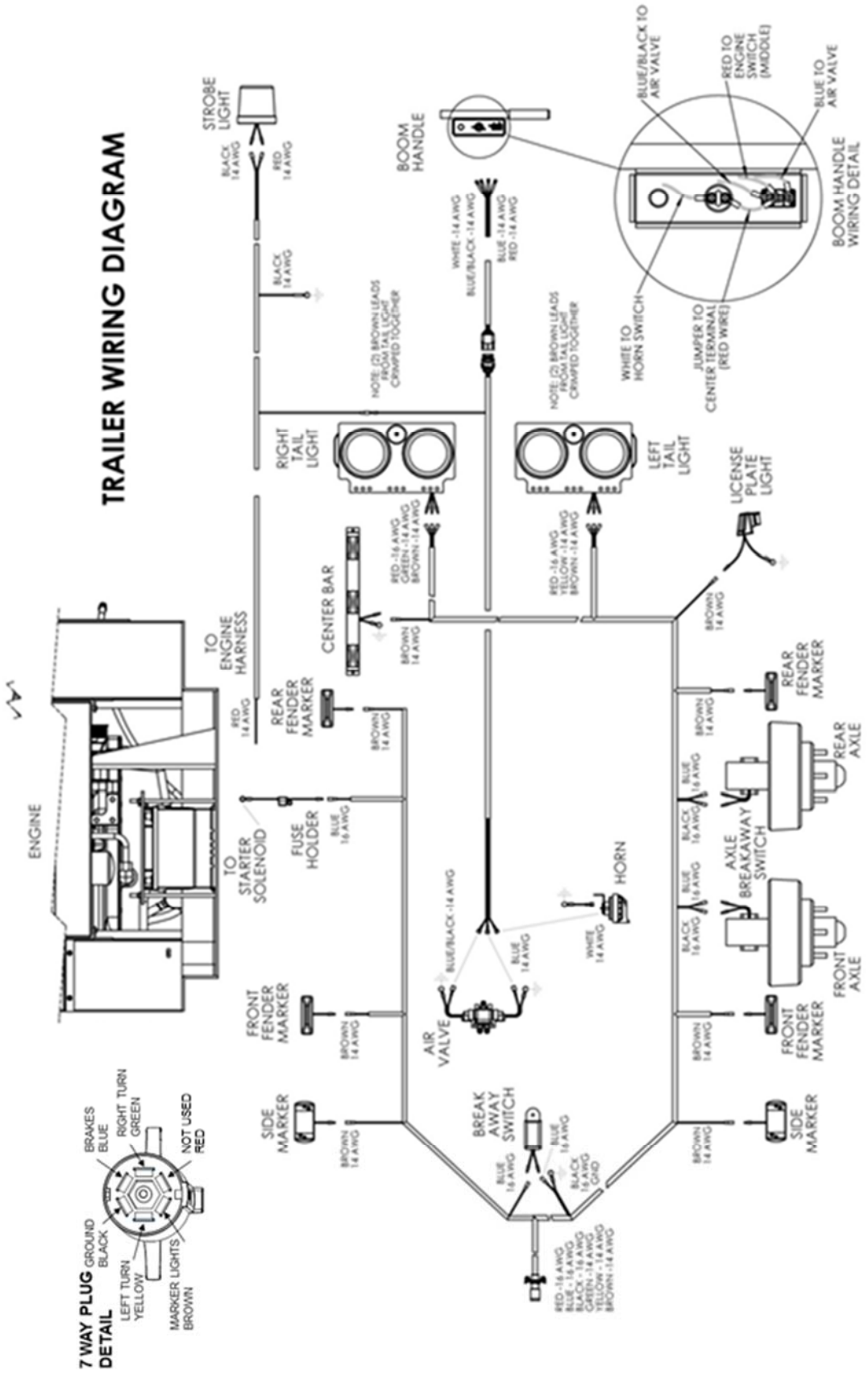
ISO 9001 REGISTERED

Printed in U.S.A.

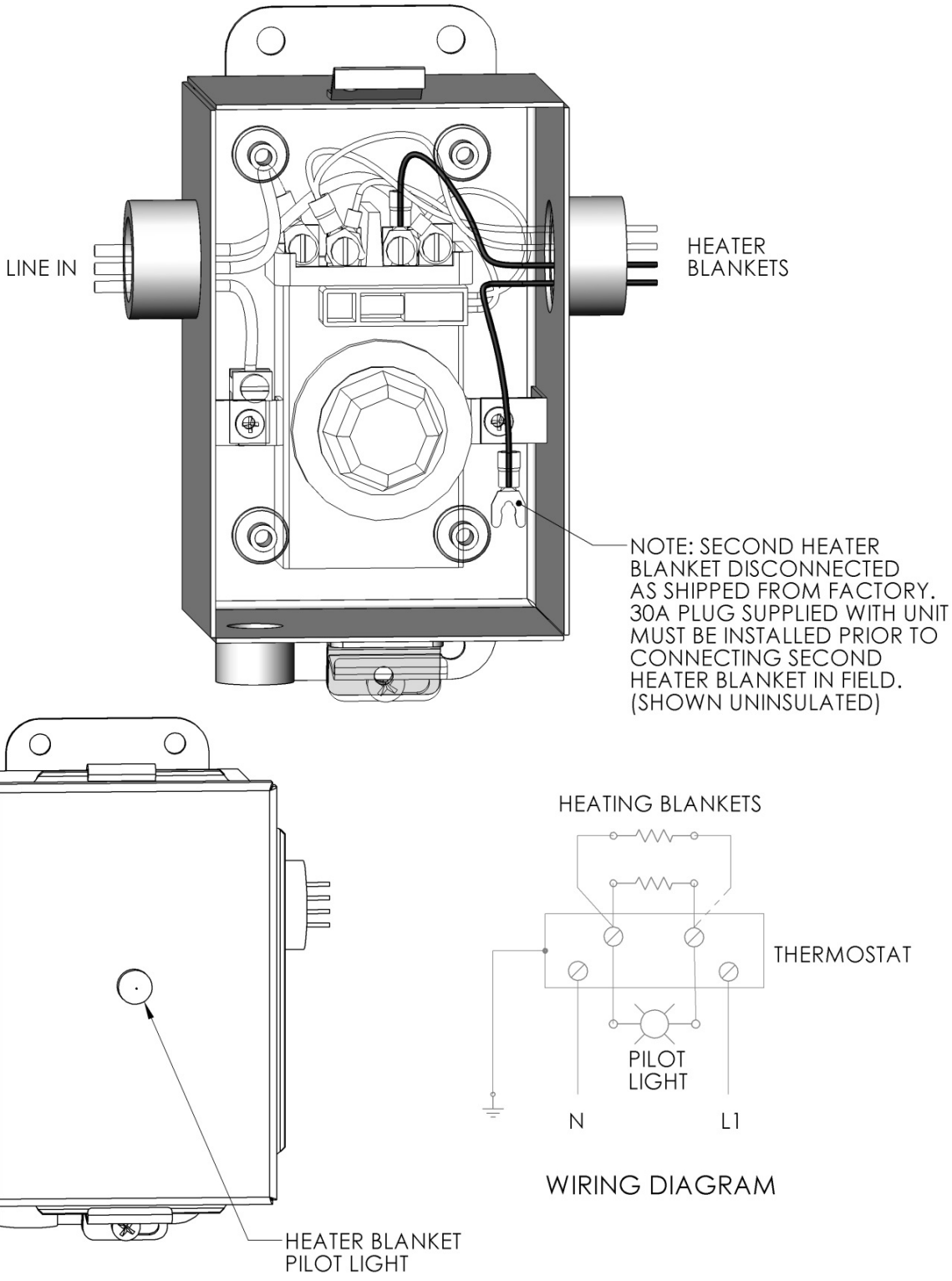
Engine Control Panel Wiring



Trailer Wiring



Thermostat Box Wiring



Emulsion Tank Chart

DuraPatcher

250 Gallon Emulsion Tank

Measure from Bottom of Emulsion Tank

Inches	Gallons
1	3
2	7
3	13
4	20
5	28
6	36
7	45
8	54
9	64
10	74
11	84
12	95
13	106
14	116
15	127

Inches	Gallons
16	138
17	148
18	159
19	169
20	179
21	189
22	199
23	208
24	217
25	225
26	232
27	238
28	244
29	248

All measurements ± 10%

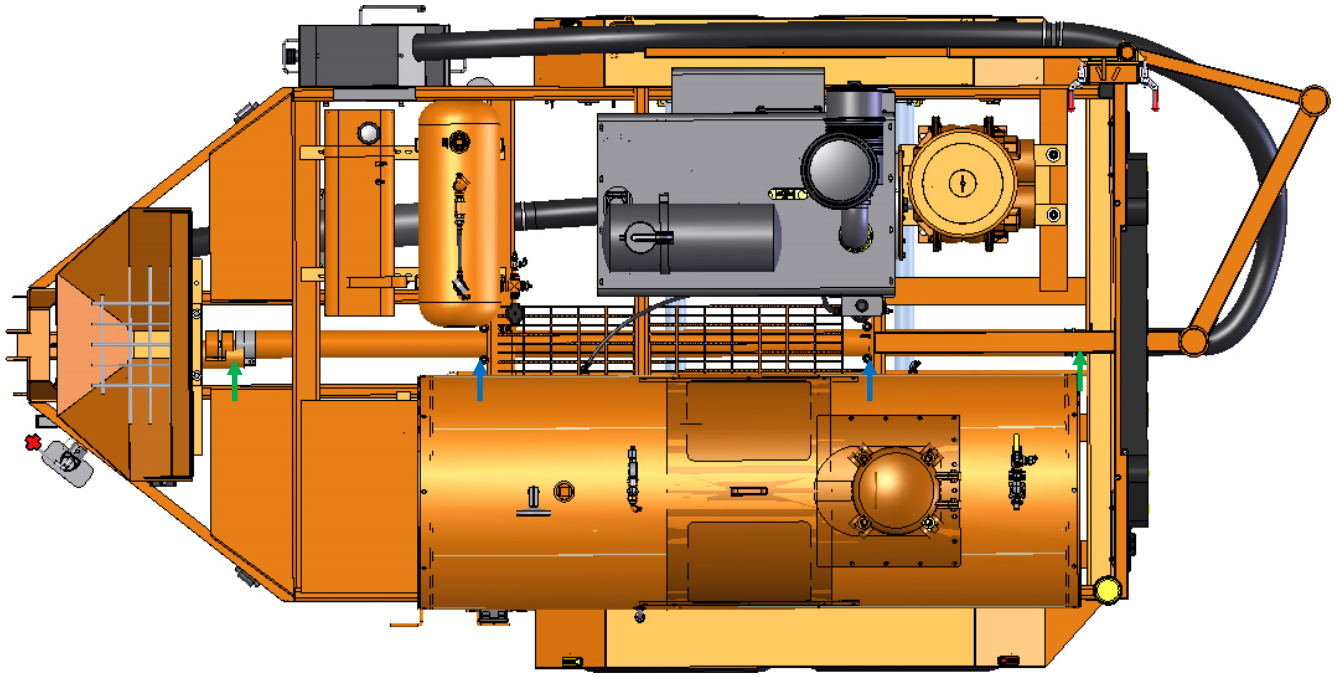
MAINTENANCE

This section of the manual is meant to be used as a guide for basic instruction on how to maximize the value, life, and performance of your DuraPatcher machine. These next pages describe how to perform simple steps that can extend the life of wear parts and get the most out of major components. While Duraco cannot give a specific recommendation to maintenance intervals for the wear items due to the differences in the aggregate, users can do initial inspections to help determine their own interval.

ROTATING THE AGGREGATE PIPE

The job of the aggregate pipe is to convey the rock from the venturi to the aggregate hose. It normally sees wear on the bottom of the pipe. Rotating the pipe 1/4 turn at regular intervals can yield four times the normal service life of this component.

1. Loosen the U-Bolts located by the blue arrows shown below. Truck mount Patchers will have slightly different clamping methods to secure the aggregate pipe.
2. Loosen the band clamp and hose clamp located by the green arrows shown below.
3. Slide aggregate hose off of aggregate pipe.
4. Rotate the aggregate pipe 1/4 turn. The direction of the turn does not matter, it only matters that it is turned the same direction every time. The pipe should turn by hand, but a pipe wrench may also be used if the pipe is stuck.
5. Slide aggregate hose back on to aggregate pipe. Tighten all clamps and bolts to secure aggregate pipe in position.



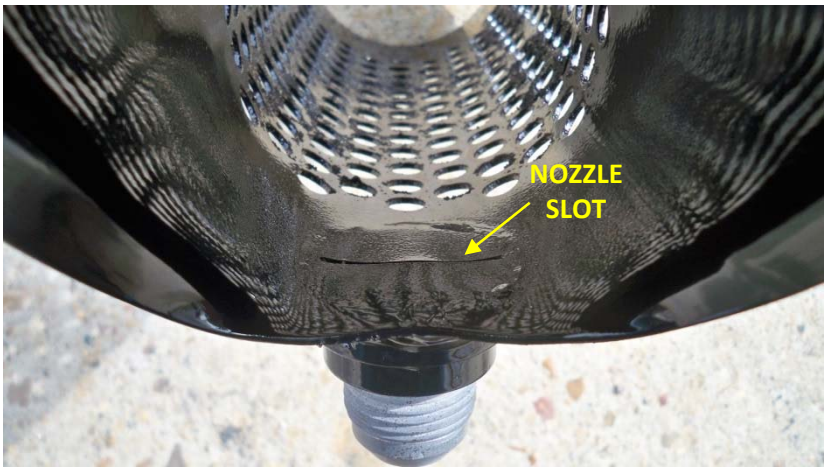
ROTATING THE AGGREGATE HOSE

The aggregate hose carries aggregate from the aggregate pipe out to the nozzle. It is actually made up of two different hoses. The “A” hose is nearest to the aggregate pipe and the “B” hose is nearest to the nozzle. The different hoses have different characteristics for wear and flexibility, and Duraco recommends users keep them in their intended locations. The procedure for rotating the hose(s) is basically the same. The hoses may be rotated together or independently.

1. Loosen the hose clamps securing the hose to the aggregate pipe and/or operator handle (orange arrows).
2. Undo the reusable plastic buckle straps found along the hose (green arrows).
3. Manually rotate the hose 1/4 turn. The direction of the turn does not matter, it only matters that it is turned the same direction every time. A helper may be needed as the coated chains may grab the hose.
4. Make sure the nozzle is twisted back to its correct position.
5. Reinstall the reusable plastic buckle straps along the hose, securing it to the insulated lines and throttle cable.
6. Tighten hose clamps securing the hose to the aggregate pipe and/or operator handle.

NOZZLE MAINTENANCE

The nozzle on the DuraPatcher has the important job of coating the dry aggregate with liquid emulsion. There is a slot in the bottom of the nozzle for emulsion spray. It is important that this slot be kept clean in order to achieve a fan pattern and sufficiently coat the aggregate. A pick or other narrow blade tool may be used to clean emulsion debris from this slot. Soaking the nozzle in solvent overnight can also help keep the nozzle clean and operating correctly. When emulsion or aggregate debris builds up too much on the nozzle and can no longer be removed, the nozzle must be replaced.



1. Make sure there is no pressure on the system and the emulsion valve is in the “off” position.
2. Use 1 1/4” wrench to undo the elbow fitting from the bottom of the nozzle (yellow arrow).
3. Loosen hose clamps around nozzle, hose, and operator handle (green arrows).
4. Slide nozzle out of hose.
5. Insert new nozzle into hose. There is a small bump on the outside of the nozzle. Ensure that this bump gets inserted past the first hose clamp.
6. Tighten the hose clamps around the nozzle, hose, and operator handle.
7. Use 1 1/4” wrench to attach the elbow fitting to the new nozzle.

EMULSION TANK BLANKETS

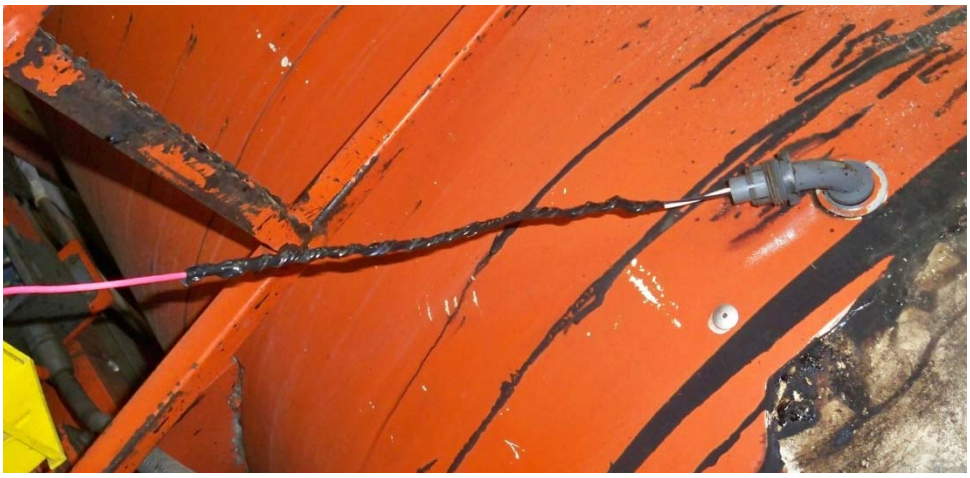
The emulsion tank on the DuraPatcher is equipped with two heating blankets used for overnight heating of the emulsion. These blankets may go bad and need to be replaced in the field.

It is important to note that every DuraPatcher comes equipped with two heating blankets under the emulsion tank. Only one of these blankets is wired to the thermostat at the factory. If you have not connected both heating blankets to the thermostat, it may be possible to just hook up the other heating blanket and postpone a blanket replacement. See the Electric Heat System (P. 16) portion of the operator's manual for details.

1. Verify that the cord from the thermostat box is not plugged into an outlet.
2. Remove the flexible conduit from the gray plastic elbow by unscrewing the collar on the elbow and pulling the flexible conduit free.
3. Use a 5/16" nut driver to undo the screws holding the emulsion tank cover on both sides of the tank. Remove this cover from the tank.
4. Identify the bad blanket. Cut the two wires coming from the bad blanket near the blanket.
5. Remove the springs holding the bad blanket at the pegs of the tank.
6. On the outside side (driver's side) of the tank, connect the loose springs of the bad blanket to the hooks on the new blanket. You should be connecting the end of the new blanket that does not have the lead wires. Clamp the ends of the springs to make sure they do not loosen from the hooks of the new blanket.

7. Stand between the tank and the engine and slowly pull the old blanket from the tank. As you are doing this, you should also be pulling the new blanket under the tank.
8. Once the new blanket is under the tank, remove the springs from the old blanket and string them between the new blanket and the tank pegs.

9. Connect the wires of the new blanket to the old wires cut in Step 2. It is recommended that these wires be twisted together and then taped to ensure they do not pull out when they are being fished through the elbow & flexible conduit.



10. Use a screwdriver to open the thermostat box.
11. Loosen the terminals in the thermostat for the blanket wires.
12. Reach into the thermostat box and pull the bad wires out. This should also pull the new wires into the thermostat box. Pull smoothly and do not break the tape bond between the wires.
13. Crimp on fork terminals to the new blanket wires and connect the new wires to the appropriate terminals in the thermostat.
14. Plug the thermostat into an outlet. Place your hand near the blanket to verify that it is heating. Unplug thermostat from outlet.
15. Replace screws holding cover to the emulsion tank and reinstall cover on thermostat.

REPLACING THE VENTURI

The aggregate enters the airstream at the venturi. Due to the aggregate dropping and getting sucked down into the venturi, the bottom of the venturi will wear. Even though the venturi is made of hardened steel and has an additional wear plate, it will eventually wear enough to need to be replaced.

1. Unbolt the hopper from the slide track by loosening and removing the four bolts located underneath the hopper. Remove the hopper.
2. Unbolt the air cylinder from the slide track by unscrewing the four bolts located on the bottom of the air cylinder. Lay air cylinder onto nearby Patcher step.

3. Unbolt the slide track from the mounting feet.
4. Loosen the hose clamp around the large hose going to the silencer.
5. Loosen the band clamp between the venturi and aggregate pipe. Slide band clamp onto aggregate pipe. Cut the duct tape seal between venturi and aggregate pipe.
6. Use a team lift to remove the slide track, venturi, elbows, and hose as one unit.

7. Unbolt the venturi from the slide track. Remove the venturi from the slide track.

8. Swap the hose, elbows, and cleanout cover from the old venturi to the new venturi. A vise may be needed to hole the venturi while the elbows are unscrewed.

9. Bolt the new venturi assembly back to the slide track using existing hardware. Use a caulking gun to apply caulk to the gaps at the front and rear of the slide track. This will seal potential leak spots for aggregate and air.

10. Use a team lift to install the slide track, venturi, hose, and elbows as one unit. Verify the hose clamp is on the hose and slide the hose onto the silencer while nesting the slide track into the mounting feet. Tighten the hose clamp and bolt the slide track to the mounting feet.
11. Wrap the gap between the venturi and aggregate pipe with 3 – 4 layers of duct tape. Then, slide the band clamp onto the butt joint and clamp it securely.

12. Bolt the air cylinder onto the slide track. Bolt the hopper onto the slide track. Stroke the air cylinder to make sure it is not binding between the hopper mount flat bar.

FILTERS

Duraco recommends that users follow John Deere suggested service intervals as shown in the Engine Lubrication and Maintenance Service Interval Chart to replace all filters associated with the John Deere engine.

Duraco also recommends that users check the blower filter daily by unscrewing the wing nut on top of the filter housing and visually inspecting the condition of the filter. Blower filters should be kept clean and replaced as necessary.

Please refer to the following Engine Lubrication and Maintenance, engine filter cross reference, and fluid capacities chart when servicing your DuraPatcher.

John Deere PowerTech Diesel Engines

Lubrication and Maintenance Service Interval Chart—Standard Industrial Engines

	Lubrication and Maintenance Service Intervals			
Item	Daily	500 Hour/ 12 Month	2000 Hour/ 24 Month	As Required
Check Engine Oil and Coolant Level	•			
Check Fuel Filter/Water Bowl	•			
Check Air Cleaner Dust Unloader Valve & Restriction Indicator Gauge [1]	•			
Visual Walk Around Inspection	•			
Service Fire Extinguisher		•		
Check Engine Mounts		•		
Service Battery		•		
Check Manual Belt Tensioner and Belt Wear		•		
Change Engine Oil And Replace Oil Filter [2,3]		•		
Check Crankcase Vent System		•		
Check Air Intake Hoses, Connections, & System		•		
Replace Fuel Filter Elements		•		
Check Automatic Belt Tensioner and Belt Wear		•		
Check Engine Electrical Ground Connection		•		
Coolant Solution Analysis-Add SCAs as required		•		
Pressure Test Cooling System		•		
Check Engine Speeds		•		
Check Cooling System		•		
Test Thermostats			•	
Flush and Refill Cooling System [4]			•	
Check and Adjust Engine Valve Clearance			•	
Add Coolant				•
Replace Air Cleaner Elements				•
Replace Fan and Alternator Belts				•
Check Fuses				•
Check Air Compressor (If Equipped)				•
Bleed Fuel System				•

[1] *Replace primary air cleaner element when restriction indicator shows a vacuum of 625 mm (25 in) H2O.*

[2] *During engine break-in, change the oil and filter for the first time before 100 hours of operation.*

[3] *If the recommended engine oils, John Deere PLUS-50™, ACEA-E7 or ACEA E6 are not used, the oil and filter change interval is reduced (see DIESEL ENGINE OIL AND FILTER INTERVALS chart). If diesel fuel with a sulfur content greater than 0.05% is used, the oil and filter change interval is also reduced.*

[4] *If John Deere COOL-GARD is used, the flushing interval may be extended to 3000 hours or 36 months. If John Deere COOL-GARD is used and the coolant is tested annually AND additives are replenished as needed by adding a supplemental coolant additive, the flushing interval may be extended to 5000 hours or 60 months, whichever occurs first.*

Deere 74 HP Engine

	Oil Filter	Fuel Filter	Air Filter
Duraco	155632	155635	155624
John Deere	RE506836	RE522868	AT171853
WIX	57750S	33739	46562
Baldwin	B7322	BF7952-D	RS3544
Donaldson	P550779	P551424	P828889
Fleetguard	LF16243	FS19983	AF25557
NAPA	7750S	3739	6562

Deere 49 HP Engine

	Oil Filter	Fuel Filter	Air Filter
Duraco	155634	155633	155461
John Deere	RE518977	RE508202	PMAF25555
WIX	57076	33752	46671
Baldwin	B7306	BF7904-D	RS3542
Donaldson	P550758	P550914	P827653
Fleetguard	LF16173	FS19912	AF25555
NAPA	7076	3752	6671

Fluid Capacities

Item	Capacity	Factory Fill Fluid
Deere 74 HP Engine	16 quarts	Deere 15W40 Engine Oil
Deere 49 HP Engine	8 ½ quarts	Deere 15W40 Engine Oil
Blower	1 ½ quarts	Chevron Meropa 220
Heat Transfer System	6 quarts	Chevron Regal R&O 32

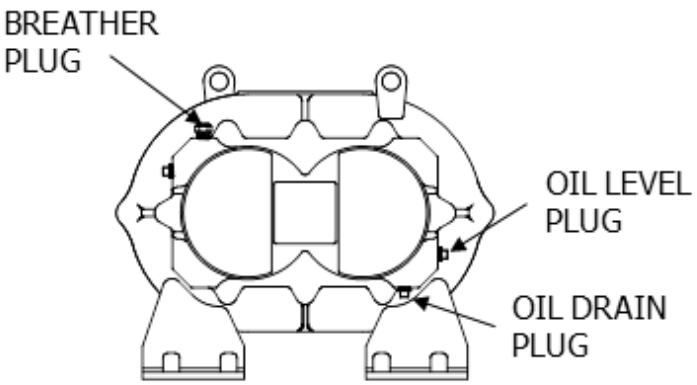
Capacities listed should only be used as a reference. Always refer to the dipstick, sight glass, and/or level plug when checking fluid levels.

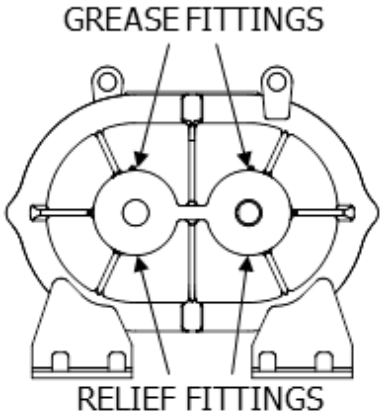
Blower can also accept most types of ISO 220W or SAE 90W gear oils.

Heat Transfer System can also utilize most low weight circulating oils or heat transfer oils.

Both the blower & heat transfer system should use oils that resist rust & oxidation and have low foaming characteristics.

BLOWER LUBRICATION & MAINTENANCE





At the gear end the timing teeth are lubricated by being partially submerged in oil. The gear teeth serve as oil slingers for gear end bearings. At the drive end the bearings are grease lubricated.

Bearings on the drive end of blower require grease every 500 hours of operation. Lubricate the bearings through grease fittings. When greasing, old grease will be forced out of the relief fittings. Use a No. 2 Non Corrosive Bearing Type Grease.

FILLING PROCEDURE

Remove OIL LEVEL PLUG and the BREATHER PLUG from gear cover. Add oil to the gear case until oil drips out of the OIL LEVEL hole. Secure all plugs in their correct location.

APPROXIMATE GEAR OIL CAPACITY

1 ½ Quarts ISO 220W or SAE 90W

Quantities listed are for purchase estimates only

LUBRICATION SERVICE

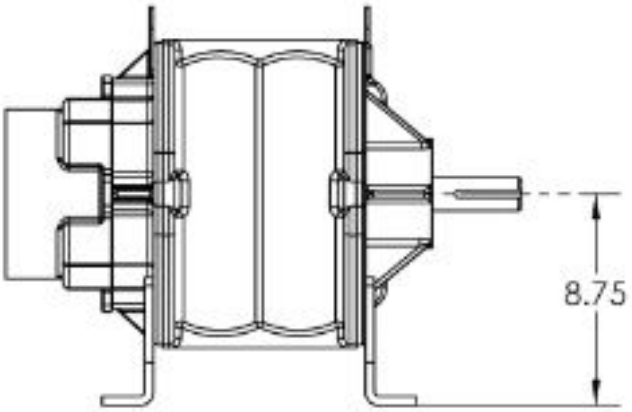
Add fresh oil as required to maintain proper level. The oil should be drained, flushed, and replaced every 1500 hours of operation.

WARNING

Do **not** overfill as this will tend to cause excessive heating to the gears and may damage the unit.

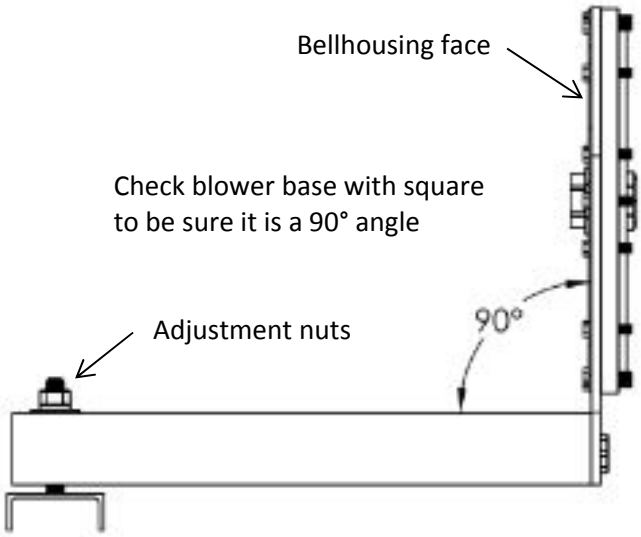
Blower Re-Alignment Procedure

STEP ONE

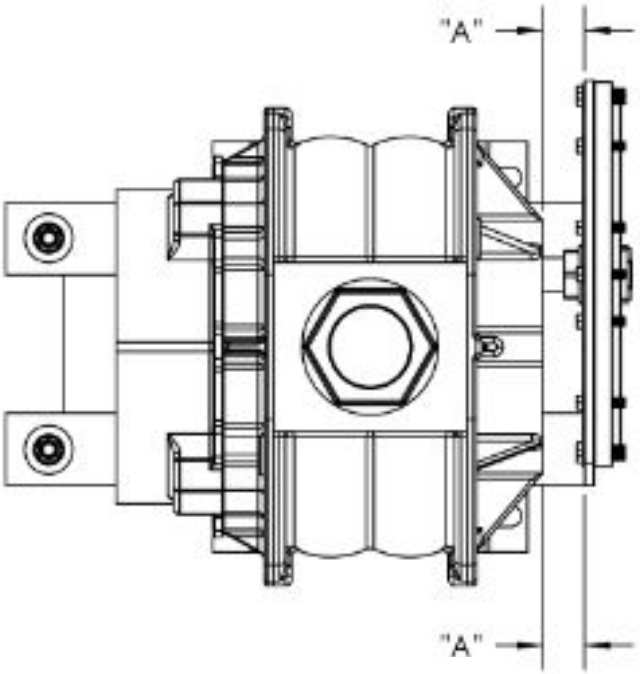


Distance from bottom of blower feet to center of shaft is 8.75”

STEP TWO

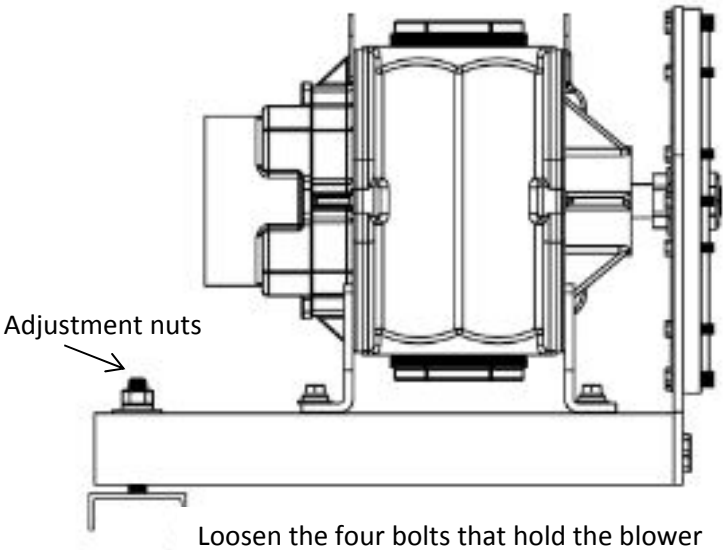


STEP THREE



Blower face has to be parallel with bracket face after rubber element is flush with aluminum ring on flywheel

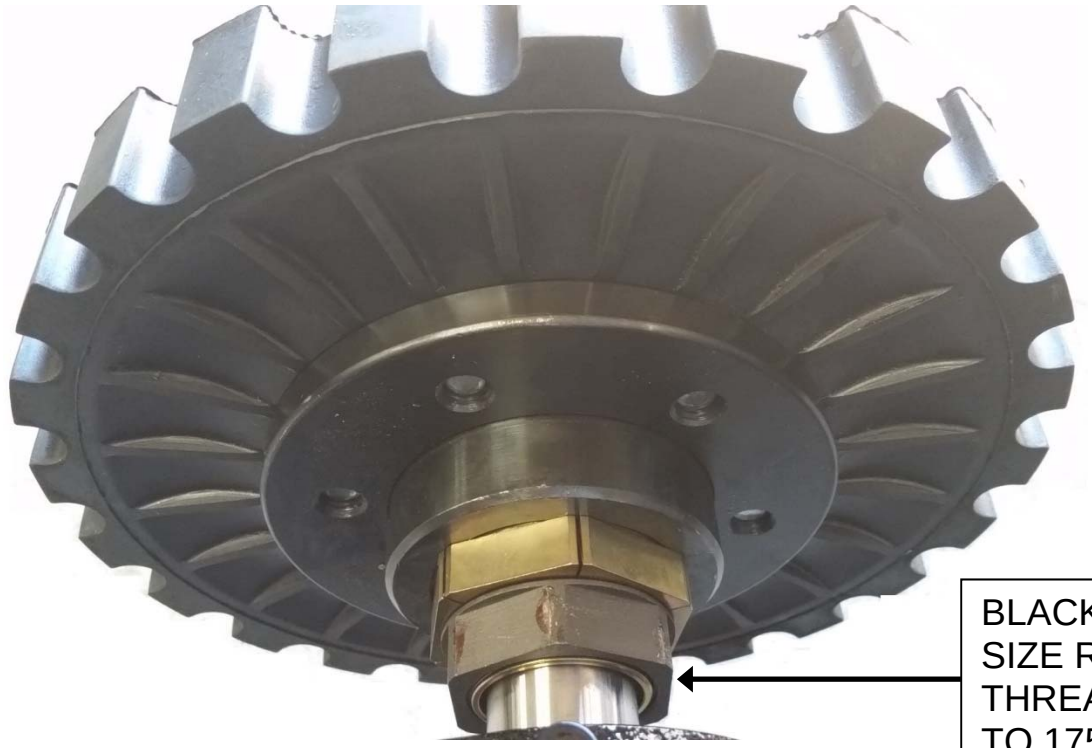
STEP FOUR



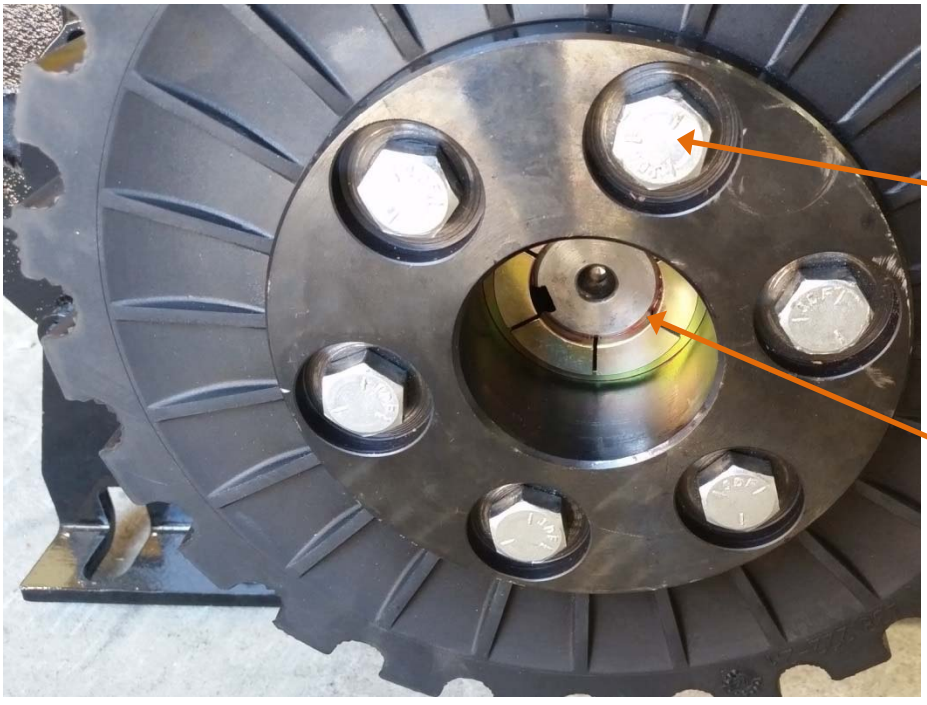
Loosen the four bolts that hold the blower in place. Then check to see if all four points are touching the platform. If there is a gap between any of the feet, adjust the adjustment nut on the appropriate side of the platform until all four feet are touching. Then retighten the blower feet bolts.

Blower Coupling Installation

The blower coupling connects the blower shaft to the rubber flexible element. No shaft key is used; rather it relies on friction and a taper lock to join the shaft to the hub. All care must be taken not to damage the shaft on the blower. Damage to the shaft could result in blower replacement.



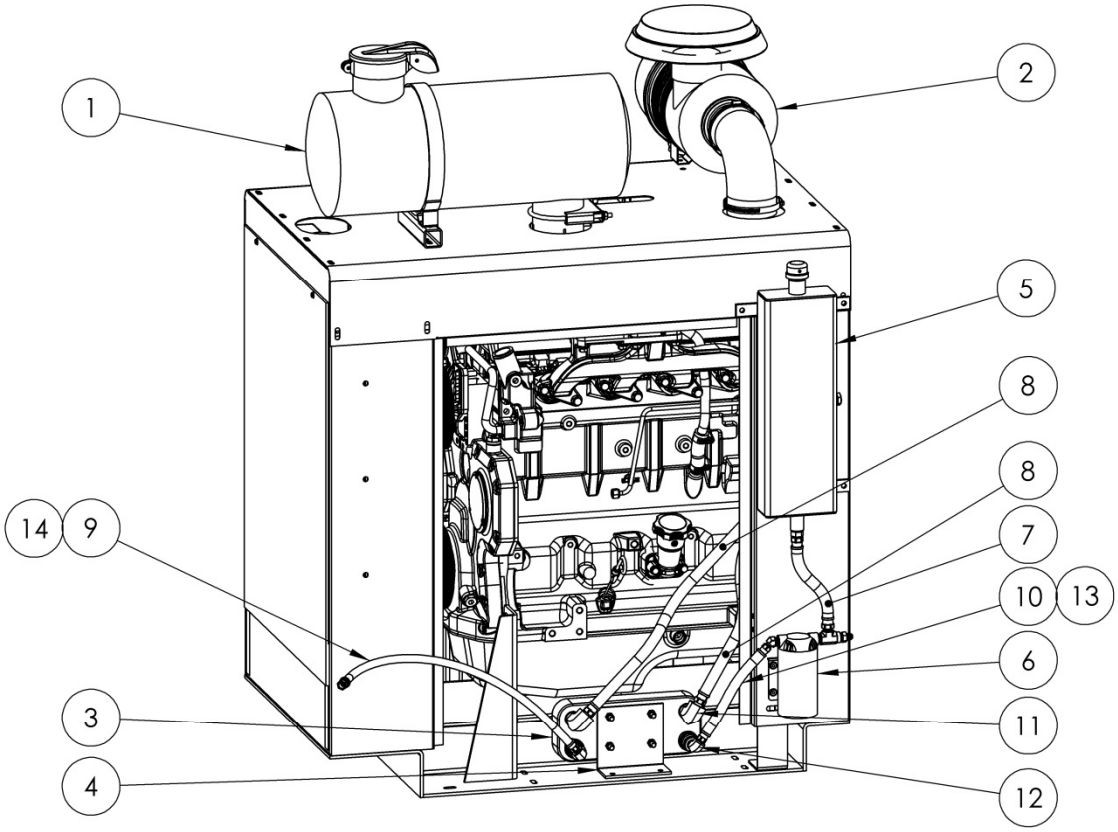
BLACK NUT IS 2 ¼" SIZE RIGHT HAND THREAD. TORQUE TO 175 FT LBS MINIMUM.



TORQUE SIX MOUNTING NUTS TO 63 FT LBS

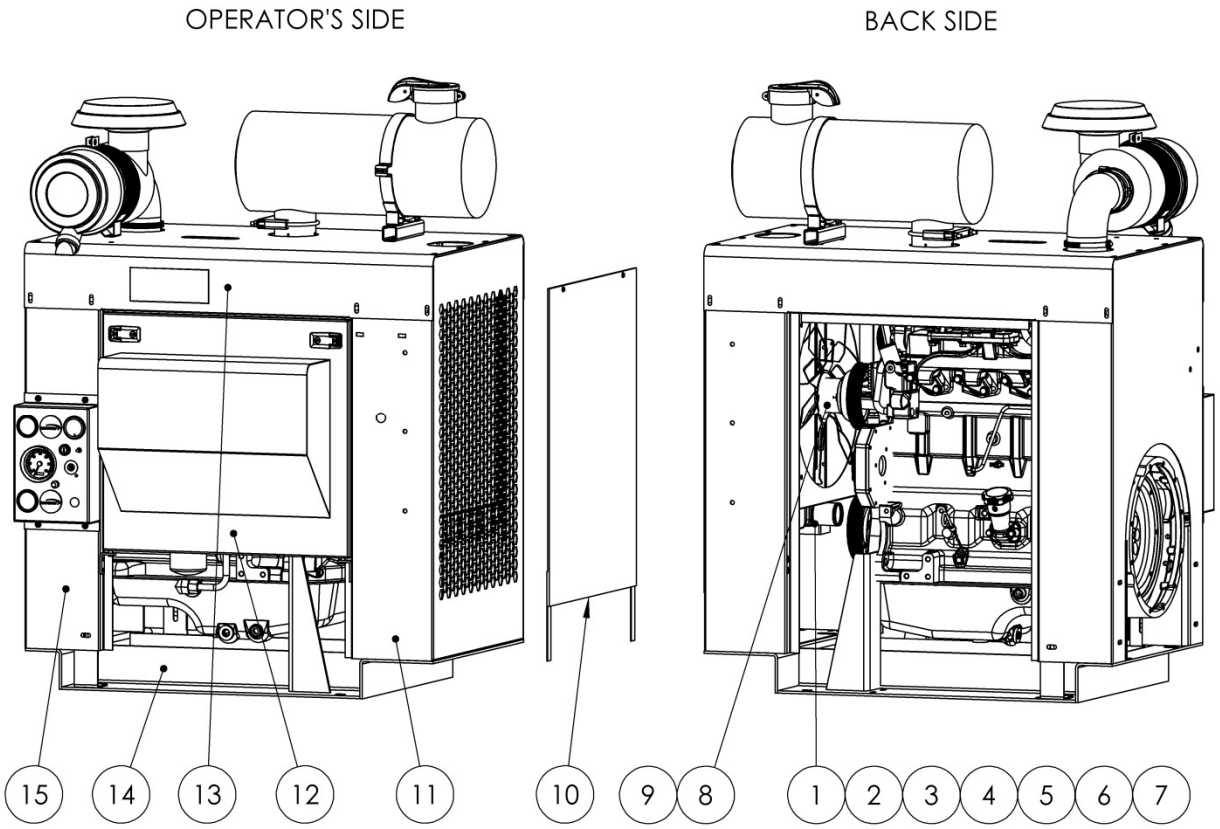
GOLD PORTION OF COUPLER WILL SIT PROUD OF BLOWER SHAFT 1/8".

Engine Assembly – Heat Exchanger Side



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	155460	ENGINE MUFFLER - 74HP	1
2	155624	ENGINE AIR FILTER ELEMENT - 74HP	1
3	155364	HEAT EXCHANGER	1
4	427215	HEAT EXCHANGER MOUNTING BRACKET	1
5	405482	OIL TANK	1
6	155365	PUMP	1
7	406038	HOSE ASSEMBLY	1
8	406041	HOSE ASSEMBLY	2
9	406040	HOSE ASSEMBLY	1
10	406039	HOSE ASSEMBLY	1
11	120948	FITTING	2
12	172369	FITTING	2
13	155453-1	HOSE INSULATION COVER (NOT SHOWN)	1
14	155453-2	HOSE INSULATION COVER (NOT SHOWN)	1

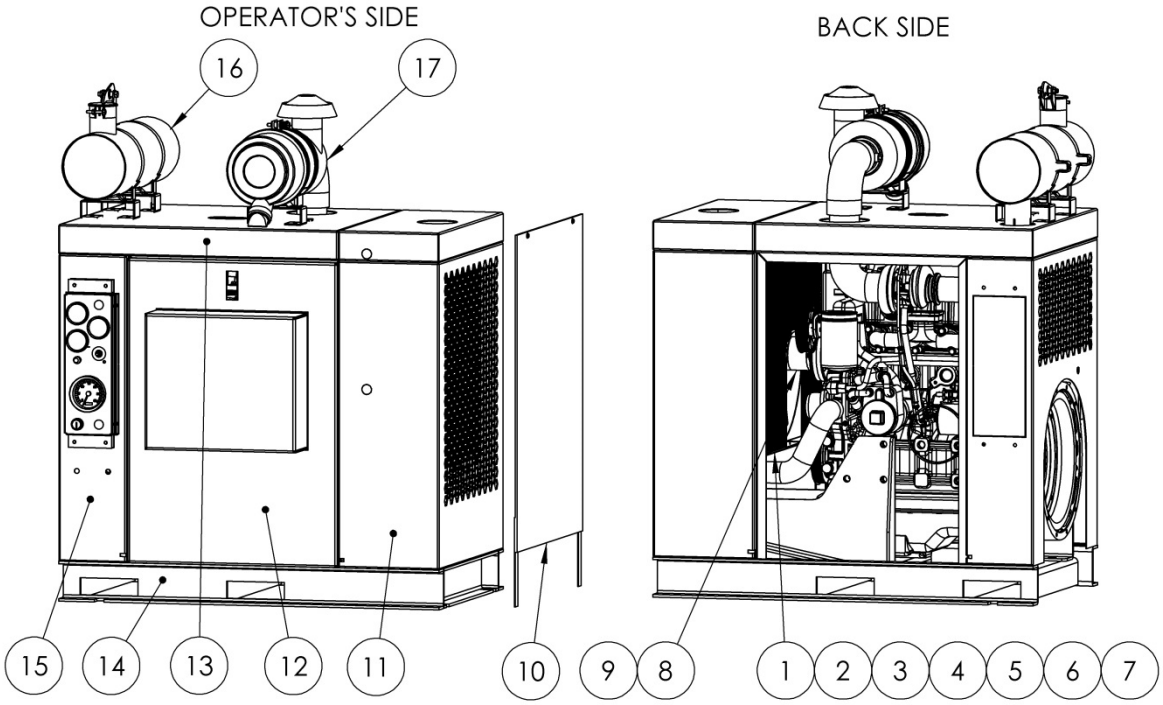
Engine Components – 74hp John Deere



ITEM	PART NUMBER	DESCRIPTION	QTY
1		RADIATOR: ENGINE 74HP	
2		CAP: RADIATOR 74HP	
3		DRAIN: RADIATOR 74HP	
4		HOSE: RADIATOR - UPPER 74HP	
5		HOSE: RADIATOR - LOWER 74HP	
6		CLAMP: HOSE - UPPER	
7		CLAMP: HOSE - LOWER	
8		FAN: ENGINE 74HP	
9		SPACER: FAN 74HP	
10	155456	COVER: ENGINE RADIATOR	1
11		COVER: RADIATOR 74HP	
12		COVER: REMOVABLE ACCESS 74HP	
13		COVER: TOP 74HP	
14		BASE: ENGINE FRAME 74HP	
15		COVER: ENGINE REAR 74HP	

*SEE YOUR AUTHORIZED JOHN DEERE DEALER FOR PARTS AND SERVICE

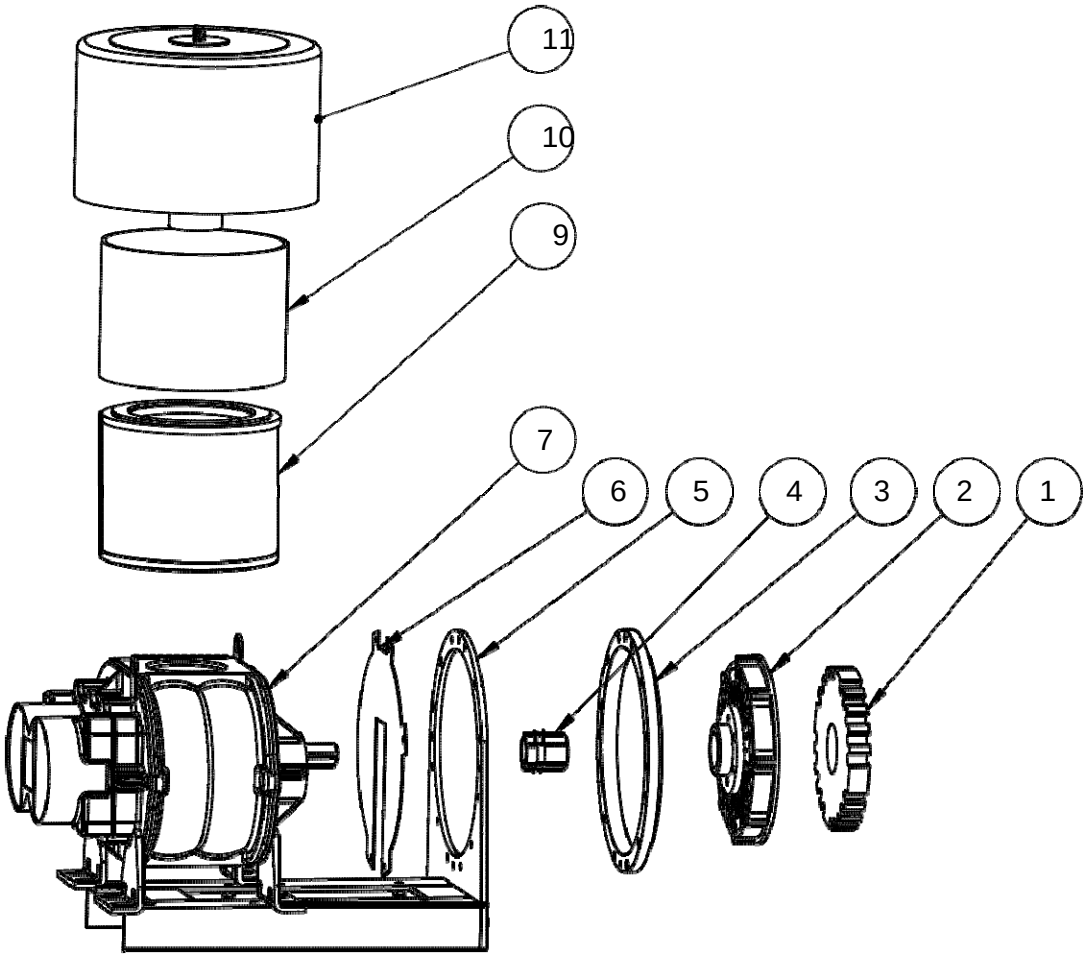
Engine Components – 49hp John Deere



ITEM	PART NUMBER	DESCRIPTION	QTY
1		RADIATOR: ENGINE 74HP	
2		CAP: RADIATOR 74HP	
3		DRAIN: RADIATOR 74HP	
4		HOSE: RADIATOR - UPPER 74HP	
5		HOSE: RADIATOR - LOWER 74HP	
6		CLAMP: HOSE - UPPER	
7		CLAMP: HOSE - LOWER	
8		FAN: ENGINE 74HP	
9		SPACER: FAN 74HP	
10	155456	COVER: ENGINE RADIATOR	1
11		COVER: RADIATOR 74HP	
12		COVER: REMOVABLE ACCESS 74HP	
13		COVER: TOP 74HP	
14		BASE: ENGINE FRAME 74HP	
15		COVER: ENGINE REAR 74HP	
16		ENGINE MUFFLER - 49HP	
17		ENGINE AIR FILTER ELEMENT - 49HP	

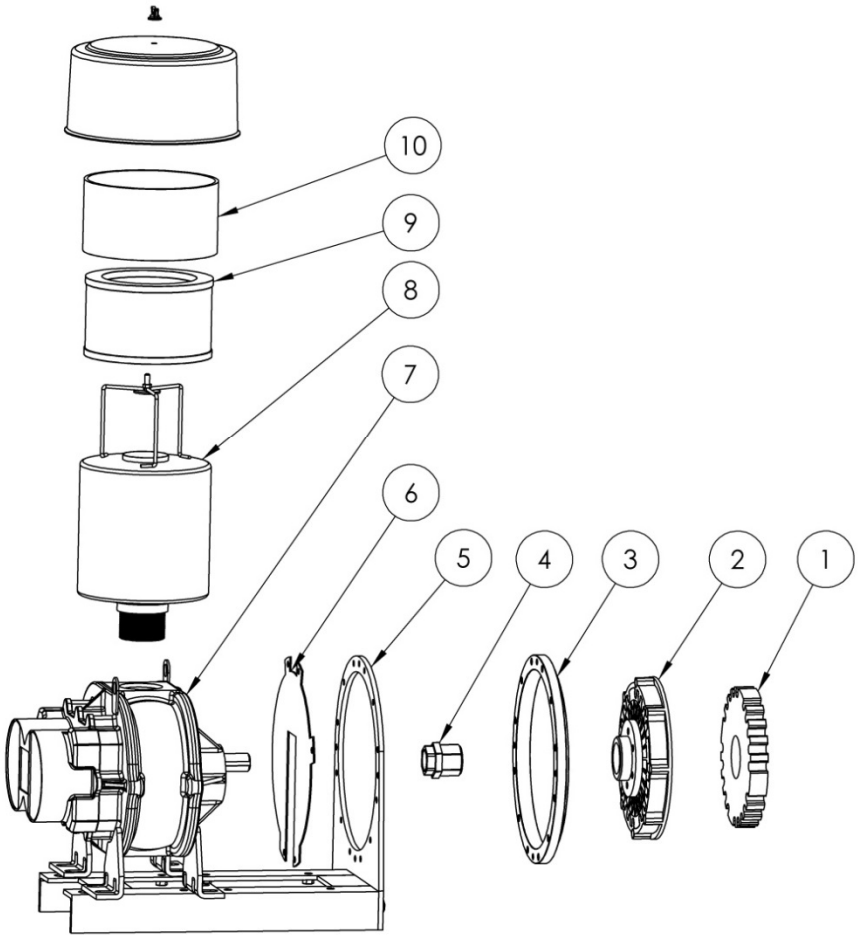
*SEE YOUR AUTHORIZED JOHN DEERE DEALER FOR PARTS AND SERVICE

74 HP Blower and Drive Assembly



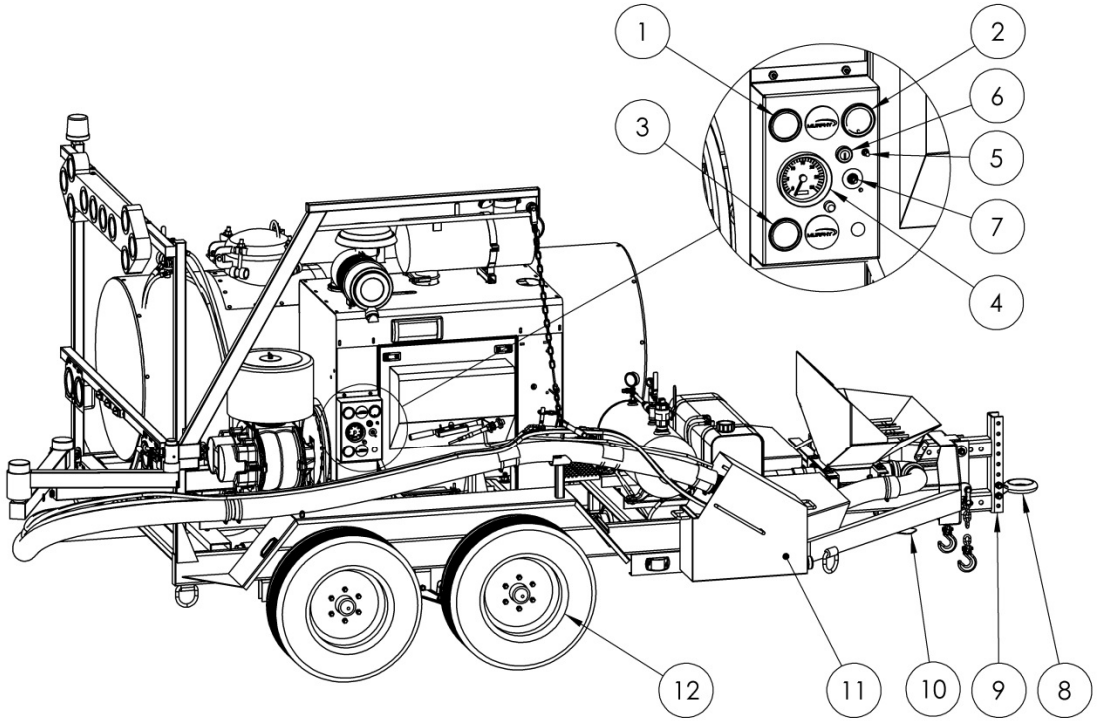
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	155321	FLEXIBLE ELEMENT, COUPLER	1
2	111755	BLOWER COUPLING (INCLUDES ELEMENT)	1
3	155372	BLOWER STAND RING	1
4	111713	KEYLESS BUSHING	1
5	405600	BLOWER MOUNT ASSEMBLY	1
6	155371	BELL HOUSING COVER	1
7	408307	BLOWER ASM	1
9	155339	FILTER, BLOWER	1
10	155341	PRE-FILTER, BLOWER	1
11	155340	BLOWER FILTER ASSEMBLY	1

49 HP Blower and Drive Assembly



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	155321	FLEXIBLE ELEMENT, COUPLER	1
2	155322	BLOWER COUPLER	1
3	155372	BLOWER STAND RING	1
4	111713	KEYLESS BUSHING	1
5	405600	BLOWER MOUNT ASSEMBLY	1
6	155371	BELL HOUSING COVER	1
7	200578	BLOWER ASM	1
8	155242	BLOWER AIR FILTER ASM	1
9	155320	FILTER, BLOWER	1
10	155319	PRE-FILTER, BLOWER	1

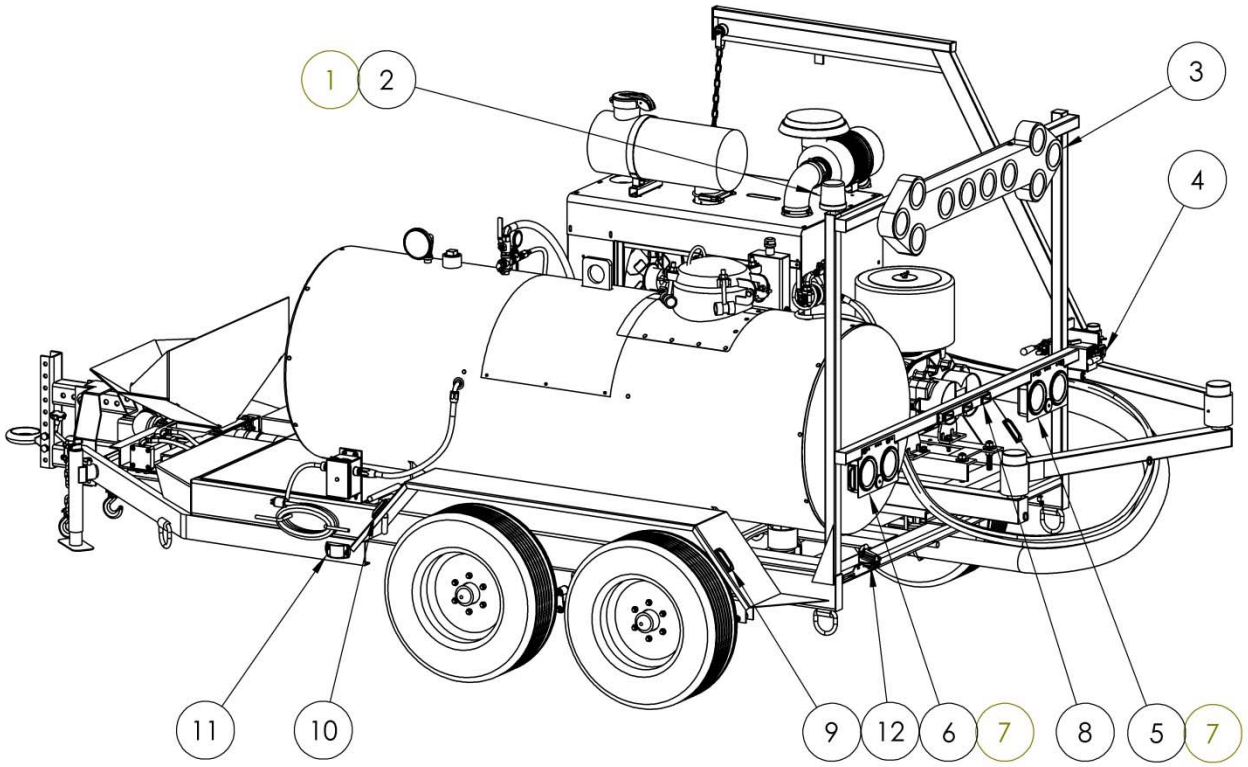
Trailer Patcher Control Side



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	155464	OIL PRESSURE GAUGE	1
2	155466	TEMPERATURE GAUGE	1
3	155468	AMP GAUGE	1
4	155469	TACHOMETER W/ DIGITAL HOURMETER	1
5	155467	OIL CIRCULATING SWITCH	1
6	155463	IGNITION SWITCH	1
7	155462	TATTLETALE SWITCH	1
8	140617	PINTLE	1
9	406760	TONGUE/HITCH WELDMENT	1
10	140573	JACK	1
11	405743	DRIP TANK ASSEMBLY	1
12	140618	RIM	4

	130678	TACHOMETER W/ ANALOG HOURMETER	1
	155465	TACHOMETER W/O HOURMETER	1

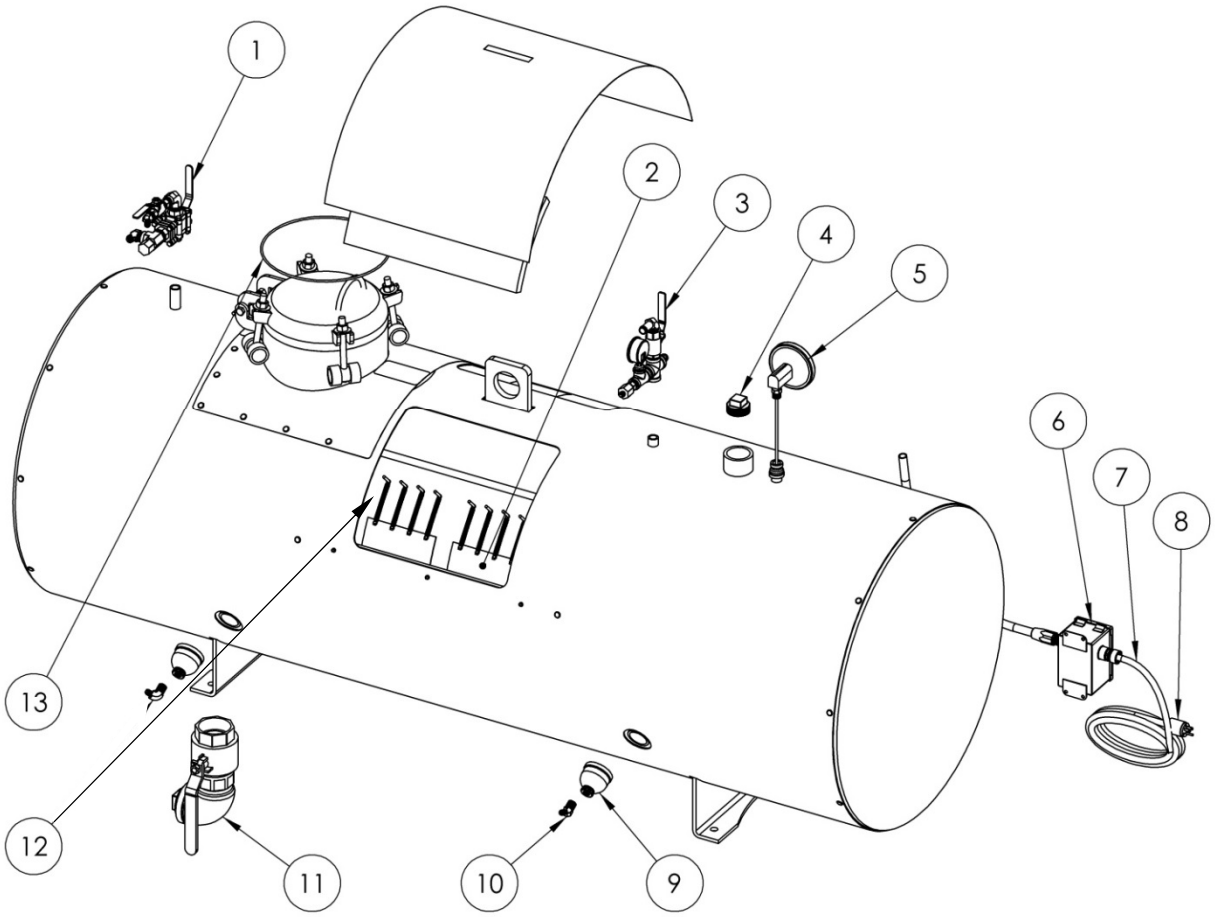
Trailer Light and Latch Assembly



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	130566	STROBE LIGHT	1
3	130585	ARROW BOARD	1
4	154237	BOOM LATCH	2
5	130586	RIGHT TAIL LIGHT ASSEMBLY	1
6	130587	LEFT TAIL LIGHT ASSEMBLY	1
8	130588	BAR LIGHT	1
9	130572	RED REAR FENDER LIGHT	2
10	130570	AMBER FRONT FENDER LIGHT	2
11	130571	AMBER SIDE RUNNING LIGHT	2
12	140620	LICENSE PLATE LIGHT ASSEMBLY	1

	121104	1 X ½ HEX BUSHING FOR STROBE LIGHT	1

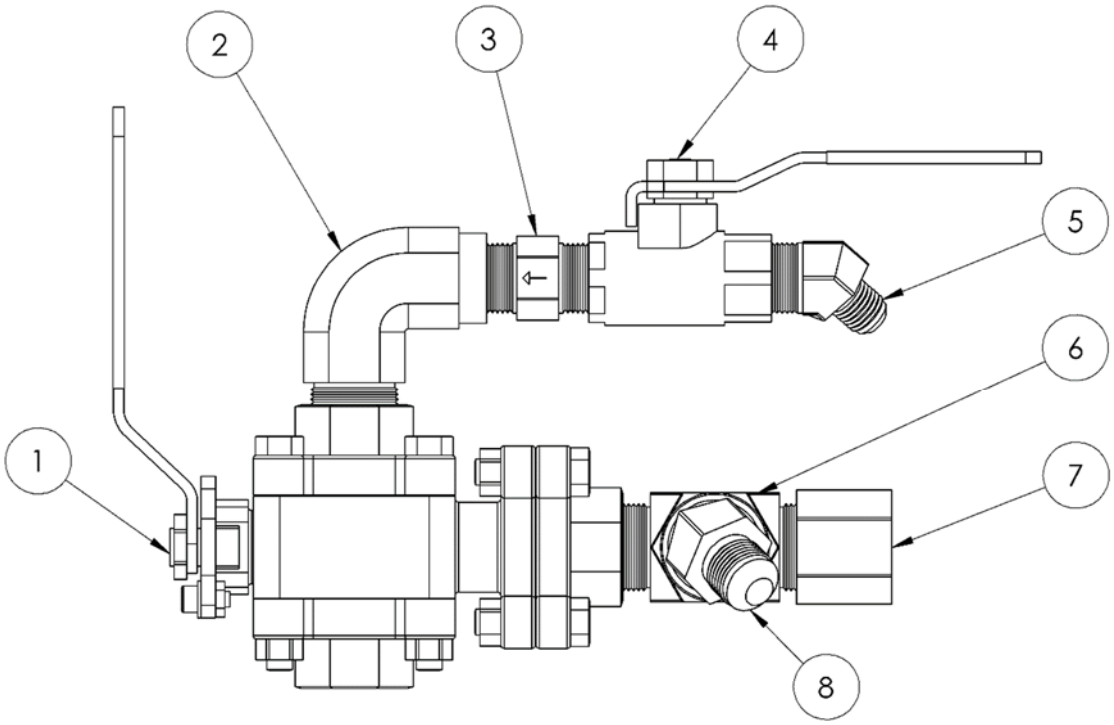
Emulsion Tank and Fittings



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	405735	THREE WAY VALVE ASSEMBLY	1
2	130590	250/300 GALLON HEATER BLANKET 120V	2
3	405734	AIR ASSEMBLY	1
4	120971	2" PLUG	1
5	130592	TEMPERATURE GAUGE	1
6	130595	THERMOSTAT	1
7	130607	CORD (FT)	1
8	130608	PLUG	1
9	121052	BELL REDUCER	2
10	120973	FITTING	2
11	405736	DRAIN VALVE ASSEMBLY	1
12	101053	HEATER BLANKET SPRING	16
13	155451	TAR TANK O-RING 12 INCH	1

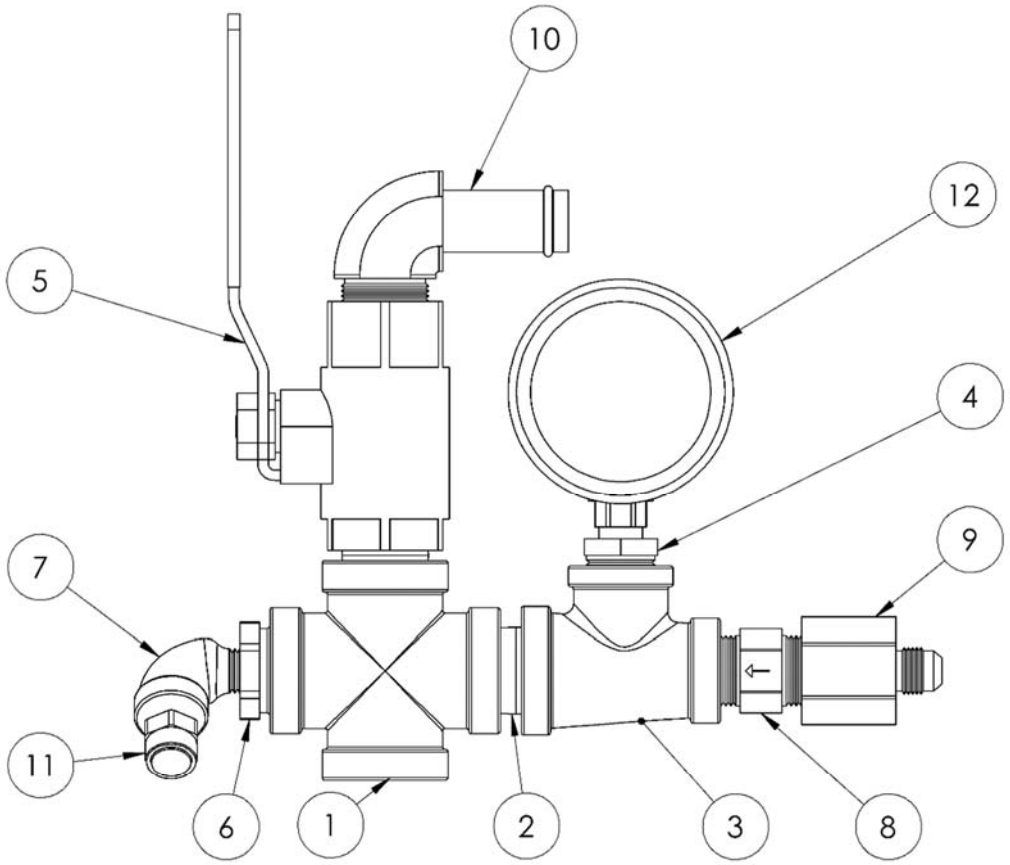
	155741	TAR TANK O-RING 6 INCH	1
	155742	TAR TANK O-RING 8 INCH	1
	130702	250/300 GALLON HEATER BLANKET 220V	2

Three Way Valve Assembly



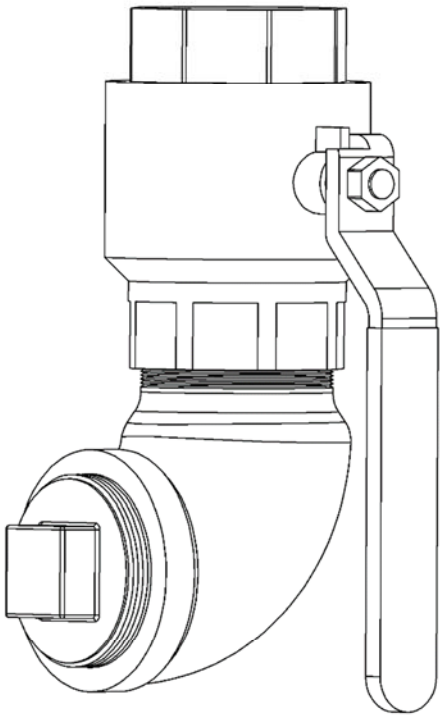
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	120988	THREE WAY VALVE	1
2	120987	3/4"MALE TO 1/2" FEMALE 90 DEG ELBOW	1
3	120978	1/2" X 1/2" N.P.T. CHECK VALVE	1
4	172362	1/2" BALL VALVE	1
5	120973	1/2" MALE NPT X 45 DEGREE 3/8" MALE JIC	1
6	120986	3/4" STAINLESS TEE	1
7	120985	3/4" CAP, THREAD ON	1
8	120984	3/4" MALE NPT X 45 DEGREE 1/2" MALE JIC	1

Air Assembly



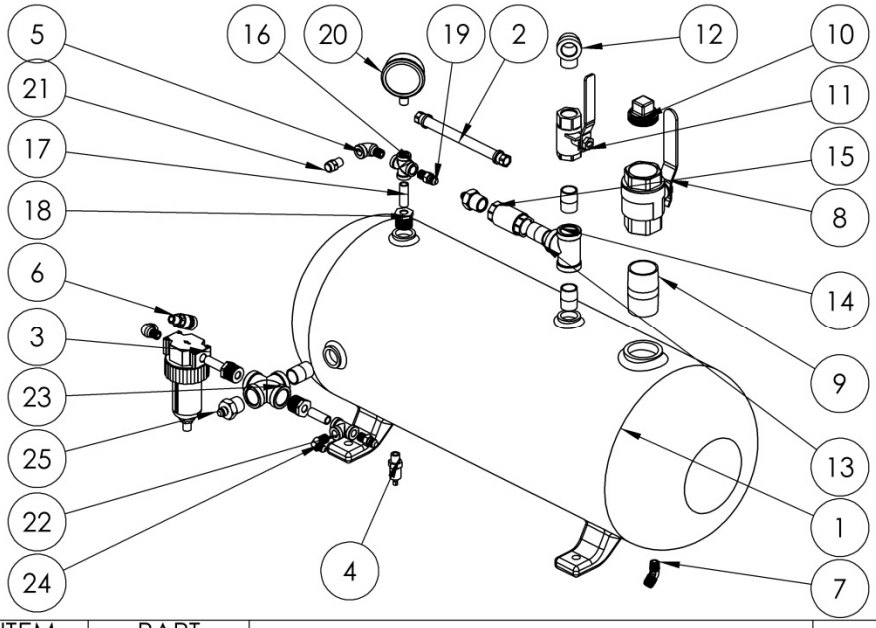
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	172349	3/4" CROSS PIPE FITTING	1
2	172344	3/4" CLOSE NIPPLE	2
3	121058	3/4" TO 1/2" TEE	1
4	172363	1/2" TO 1/4" REDUCER	1
5	172339	3/4" BALL VALVE	1
6	172353	3/4" TO 1/4" REDUCER	1
7	172355	1/4" 90 DEGREE FEMALE TO MALE ELBOW	1
8	120978	1/2" X 1/2" N.P.T. CHECK VALVE	1
9	172502	1/2" FEMALE N.P.T. TO 3/8" MALE JIC FITTING	1
10	121024	3/4" TO 3/4" HOSE 90 DEGREE ELBOW	1
11	172354	POP OFF VALVE	1
12	150952	0-200 PSI AIR GAUGE 1/4" N.P.T.	1

Drain Valve Assembly



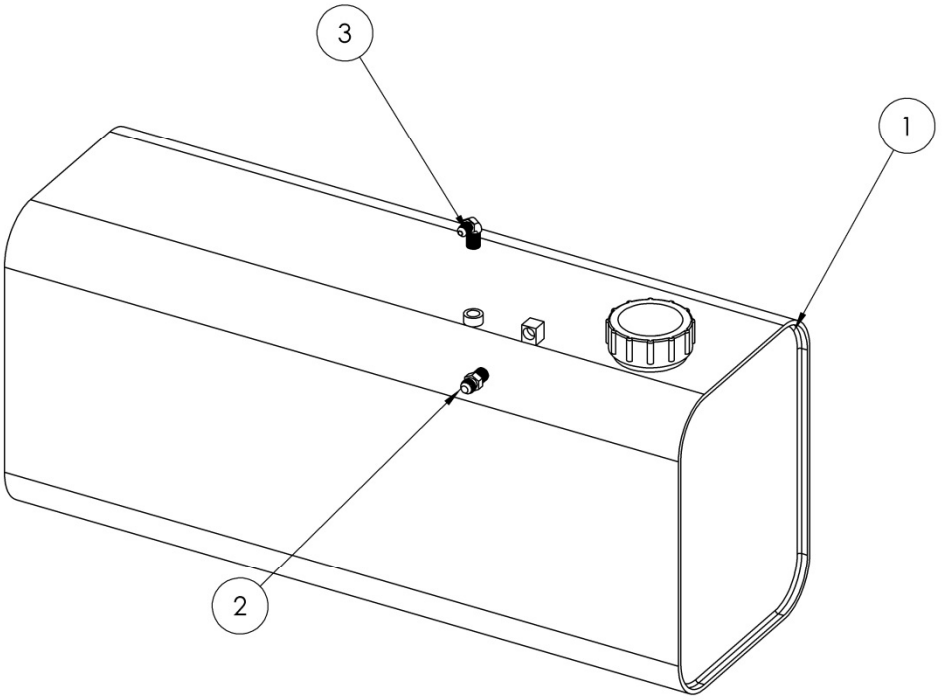
PART NUMBER	DESCRIPTION	QTY
121015	3" BALL VALVE	1
121007	3" N.P.T. PLUG	1
121006	3" 90 DEG FEMALE - MALE ELBOW	1

Fuel / Air Receiver Tank Assembly



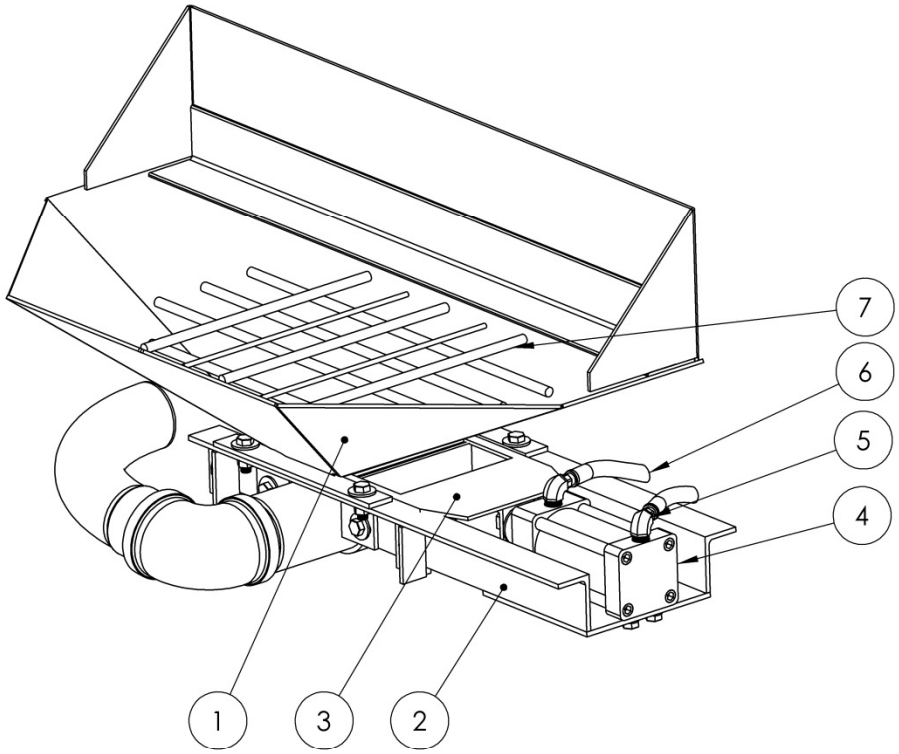
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	150953	TANK, FUEL/AIR RECEIVER	1
2	407816	HOSE ASSEMBLY, AIR GAUGE	1
3	155731	PARKER AIR DRYER	1
4	172346	VALVE, DRAIN	1
5	172355	1/4" 90 DEGREE FEMALE TO MALE ELBOW	2
6	172352	3/8" AIR QUICK DISCONNECT	1
7	172345	ELBOW, 45 DEGREE 3/8" X 1/4" J.I.C.	1
8	172340	1-1/2" BALL VALVE	1
9	172375	1-1/2 NPT x 3" NIPPLE	1
10	172338	1-1/2" PVC SCREW IN CAP	1
11	172339	3/4" BALL VALVE	1
12	172337	3/4" 90 DEGREE FEMALE TO MALE ELBOW	1
13	172344	3/4" CLOSE NIPPLE	4
14	172342	3/4" TEE PIPE FITTING	1
15	172341	3/4" CHECK VALVE (4030E FLOWMATIC)	1
16	172356	1/4" FEMALE N.P.T. CROSS	1
17	172350	1/4" X 1-1/2" NIPPLE	3
18	172353	3/4" TO 1/4" REDUCER	3
19	172357	FITTING, J.I.C. 3/8" TO 1/4" NPT	2
20	150952	AIRGAUGE 1/4" N.P.T. (9692015-0002)	1
21	172354	POP OFF VALVE	1
22	172348	1/4" TEE PIPE FITTING	1
23	172349	3/4" CROSS PIPE FITTING	1
24	172347	FITTING, 90DEG. 1/4"NPT TO 1/4" J.I.C.	1
25	172376	FITTING, 3/4" NPT TO 3/8"JIC	2

Fuel Tank Assembly



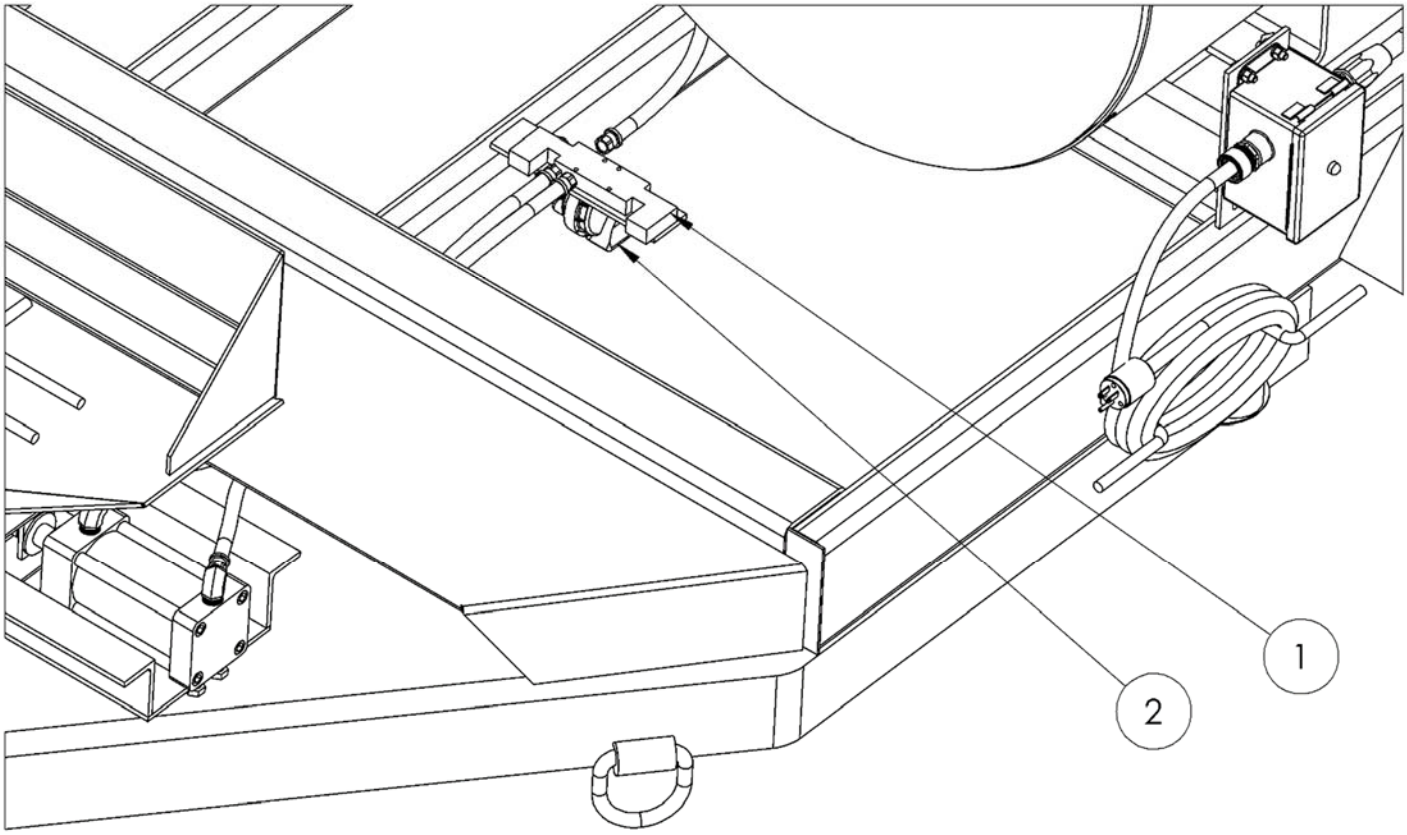
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	155423	FUEL TANK	1
2	172357	FITTING, J.I.C. 3/8” TO 1/4” NPT	1
3	172347	FITTING, 90 DEG. 1/4” NPT TO 1/4" J.I.C.	1
	155568	FILLER CAP WITH GAUGE	1

Hopper Feed Assembly



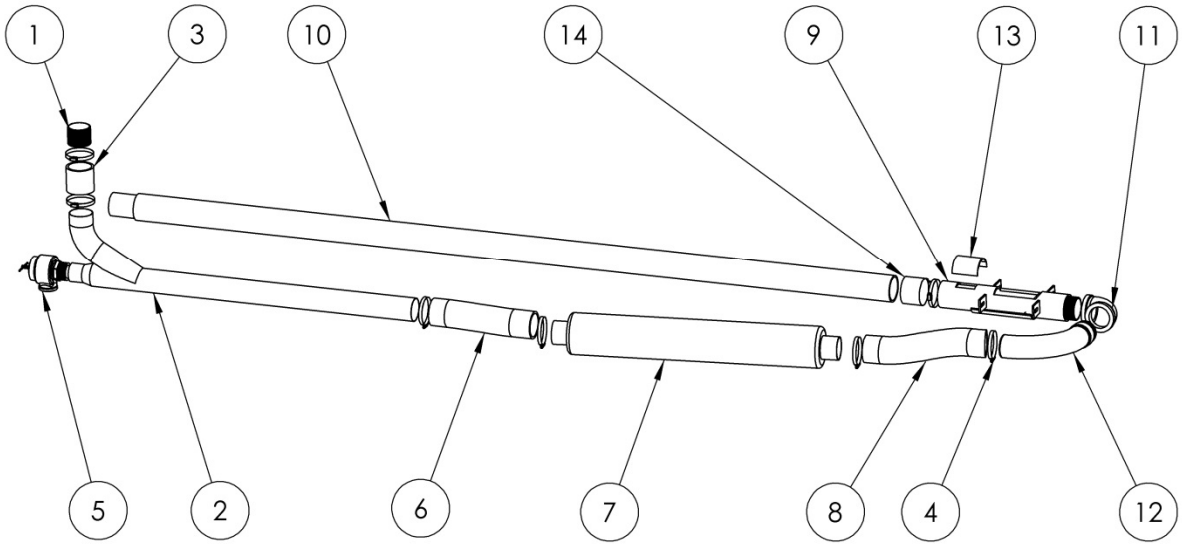
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	408491	REPLACEMENT HOPPER BOX (GRATE INCL)	1
2	405602	SLIDE TRACK WELDMENT	1
3	405732	HOPPER GATE WELDMENT	1
4	155727	PARKER AIR CYLINDER 4" STROKE	1
5	172504	FITTING: 90 DEGREE JIC	2
6	407837	HOSE, AIR CYLINDER	2
7	407582	HOPPER GRATE	1

Solenoid Valve & Horn



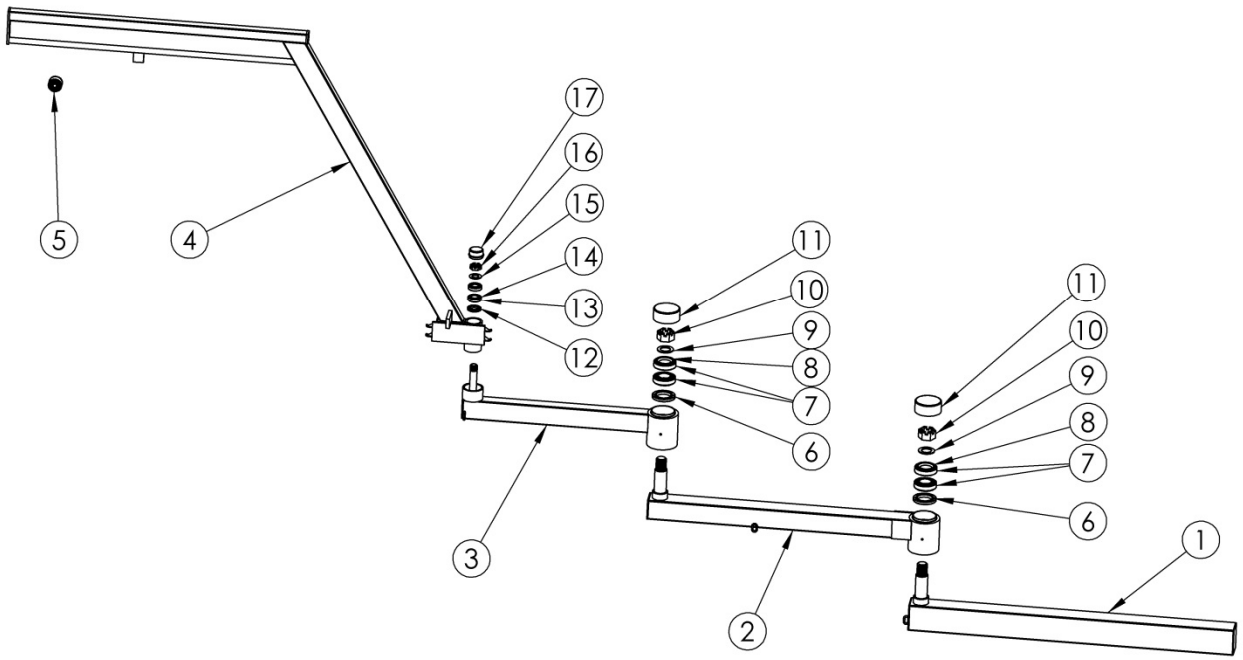
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	155729	PARKER SOLENOID VALVE	1
2	130589	HORN	1
	129018	AIR EXHAUST FILTER/MUFFLER 1/4 NPT	2
	172360	EXHAUST MUFFLER 1/8 NPT	2
	172357	3/8 JIC TO 1/4 NPT ADAPTER FITTING	3
	130659	AIR SOLENOID CONVERSION KIT: INCLUDES ALL COMPONENTS TO UPDATE EARLIER STYLE SOLENOID VALVE	

Aggregate Feed Assembly



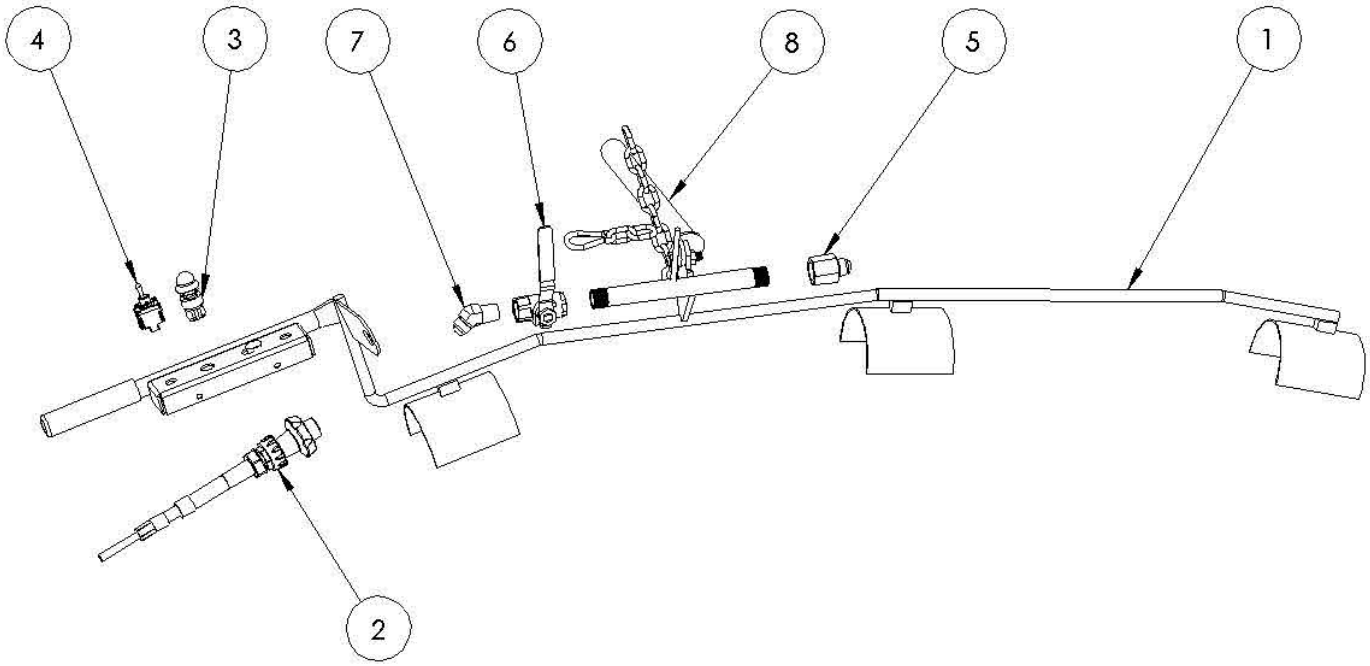
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	120924	3" CLOSE NIPPLE	1
2	155370	BLOWER PIPE, DURAPATCHER	1
3	172379	HOSE, BLOWER PIPE TO BLOWER	1
4	120862	CLAMP, 3-1/2" TO 4-1/2"	7
5	155313	VALVE, PRESSURE RELIEF, 2"	1
6	172378	HOSE, BLOWER PIPE TO SILENCER	1
7	155314	SILENCER	1
8	172377	HOSE, BLOWER PIPE TO VENTURI, 24"	1
9	405608	VENTURI WELDMENT	1
10	405609	TRANSFER PIPE WELDMENT	1
11	120861	3" 90 DEGREE CAST IRON ELBOW	1
12	120863	3" 90 DEGREE GALVANIZED ELBOW	1
13	408176	VENTURI ACCESS COVER	1
14	120865	4" STAINLESS STEEL EXHAUST CLAMP	1

Boom Arm Assembly



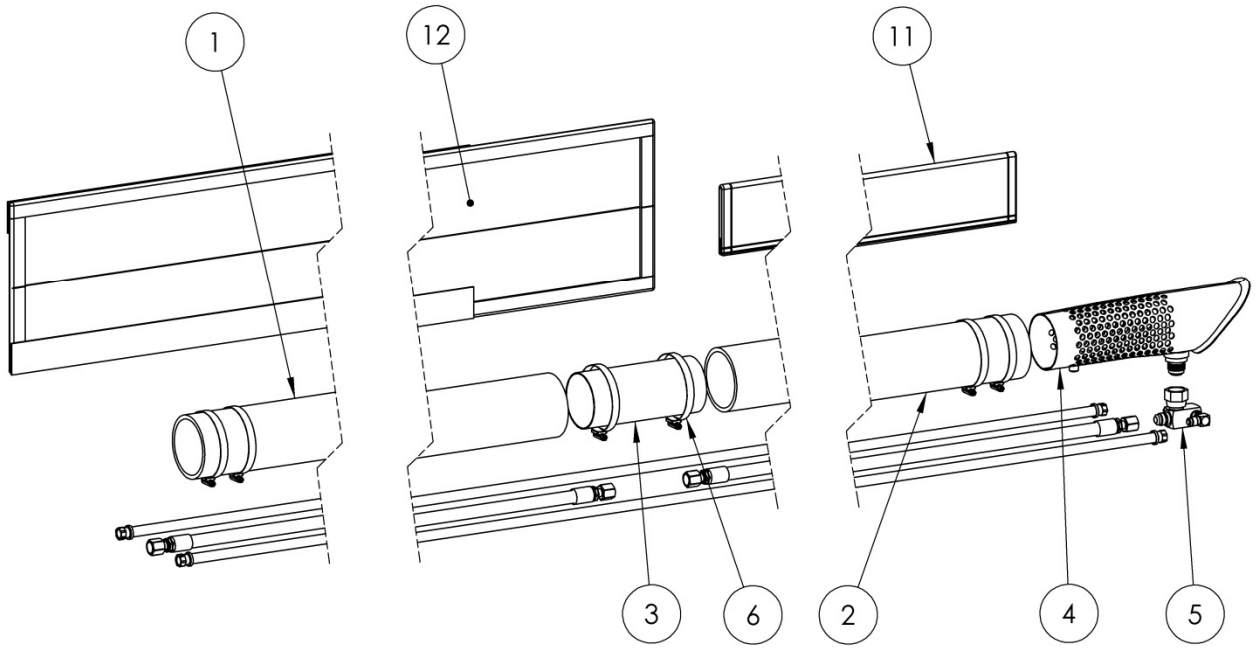
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	405622	BOOM ARM ASSEMBLY	1
2	405623	BOOM ARM, SECOND SECTION	1
3	405624	BOOM ARM THIRD SECTION	1
4	405625	BOOM ARM FORTH SECTION	1
5	155446	ROLLER: YOKE	1
6	172079	SEAL, 3.375 O.D X 2.0 I.D. P0S225333TTBN	2
7	154433	RACE, 2" RB TECH 25520	4
8	111511	BEARING, ROLLER, 1.75 I.D. RBI 25580	4
9	423444	WASHER, SPECIAL FAB, 2.360 X 1.505 X .120 THICK	2
10	100971	NUT, CASTLE, 1-1/2-6	2
11	140576	CAP, BEARING, 3.875 O.D X 3.500 I.D X 1.69 TALL	2
12	172078	SEAL, BOOM SPINDLE SMALL	1
13	154434	RACE, 1" RB L44610	2
14	111512	BEARING, ROLLER, 1.00 I.D. RB L44643	2
15	100347D	WASHER, FLAT 1.0 PLN	1
16	100972	NUT, CASTLE, 1"	1
17	140577	CAP, BEARING, 2" DIAMETER PRESS ON	1

Operator Handle Assembly



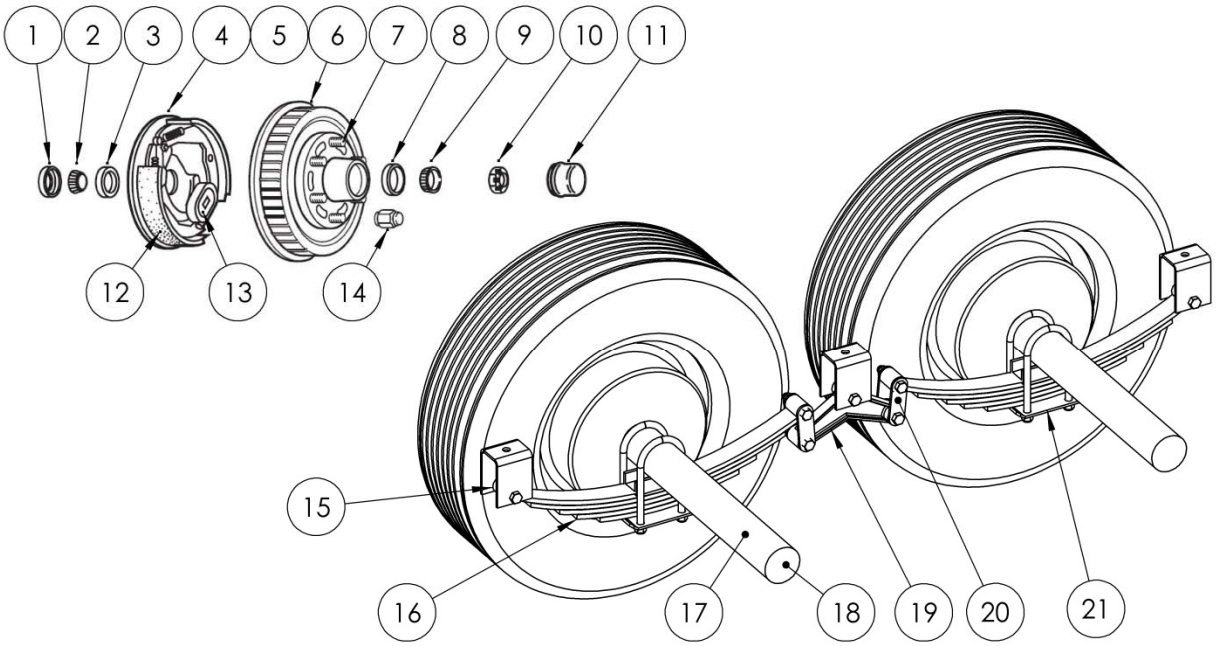
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	405480	OPERATOR HANDLE WELDMENT	1
2	130562	THROTTLE CABLE ASM	1
3	130561	HORN SWITCH	1
4	130560	TOGGLE SWITCH	1
5	172503	FITTING: 1/2" NPT - JIC	1
6	172362	1/2" BALL VALVE	1
7	172509	1/2 X 1/2 45 FITTING	1
8	426778	OPERATOR HANDLE (HANDLE ONLY)	1

Hose and Nozzle Assembly



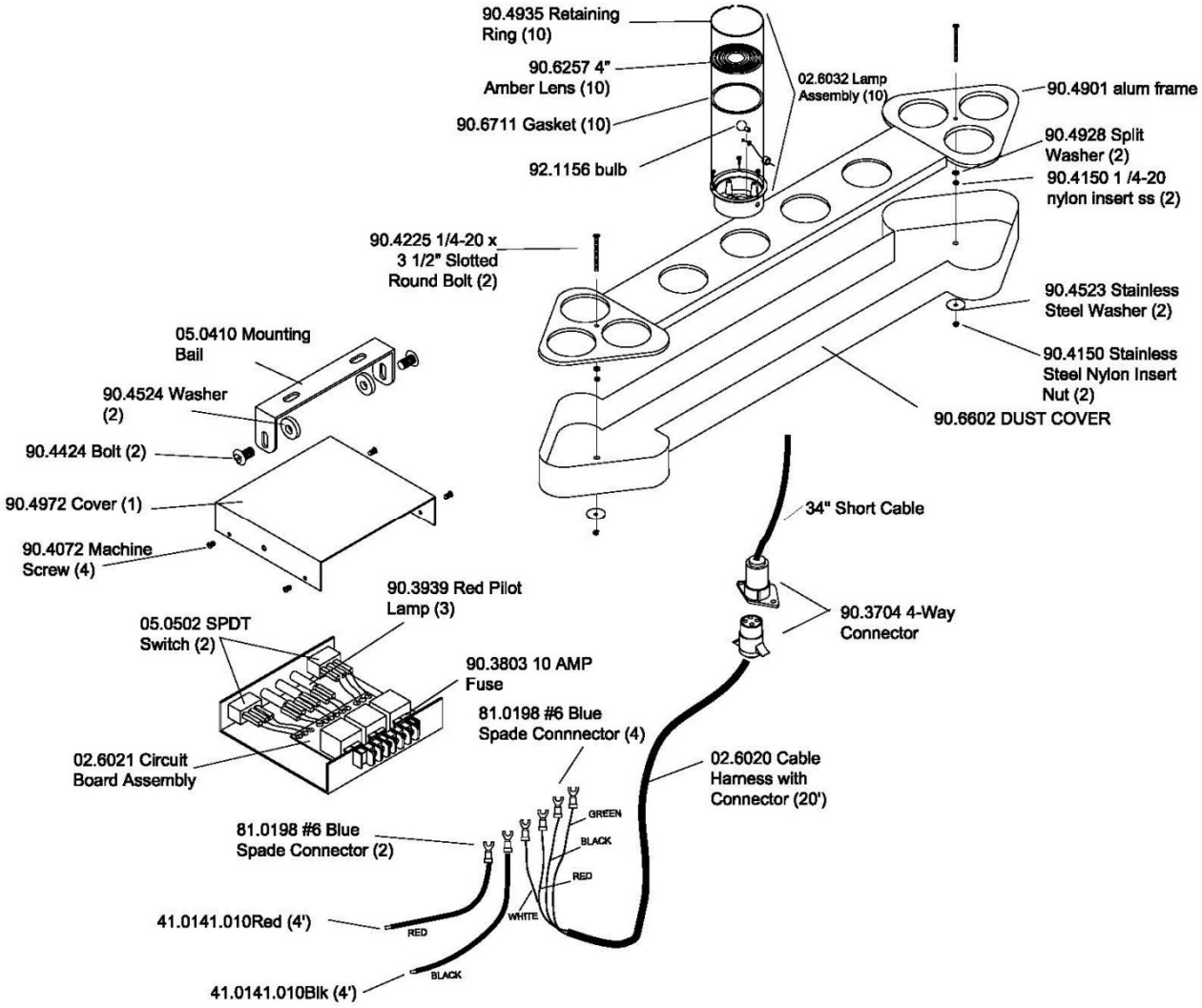
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	155218	HOSE, "A" SECTION	1
2	155219	HOSE, "B" SECTION	1
3	426760	TUBE, CONNECTOR	1
4	407832	NOZZLE WELDMENT	1
5	120946	FITTING, NOZZLE HEATER	1
6	120862	CLAMP, 3-1/2" TO 4-1/2"	6
7	407836	HOSE ASSEMBLY: BOOM EMULSION - SHORT	1
8	407835	HOSE ASSEMBLY: BOOM EMULSION - LONG	1
9	407834	HOSE ASSEMBLY: BOOM HEAT - SHORT	1
10	407833	HOSE ASSEMBLY: BOOM HEAT - LONG	1
11	155452	INSULATION COVER - SHORT	1
12	155455	INSULATION: COVER - LONG W/VELCRO	1

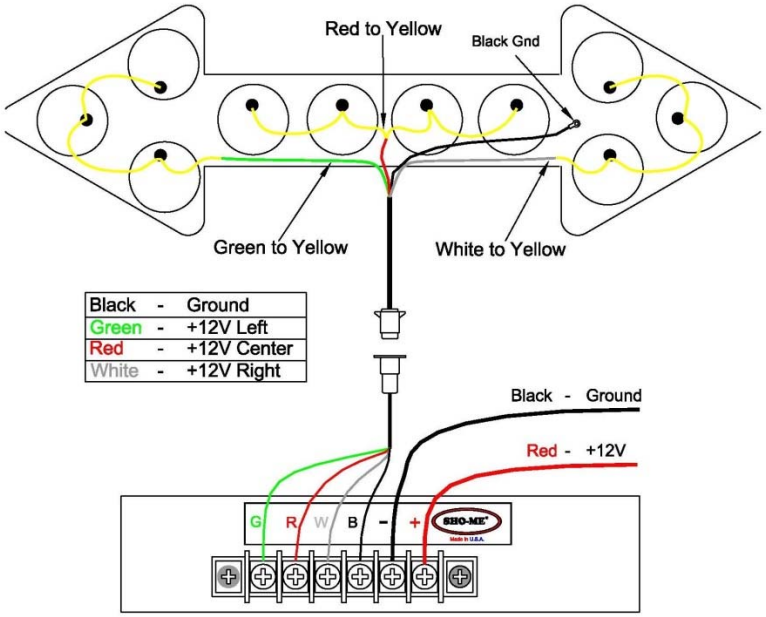
Trailer Suspension Components



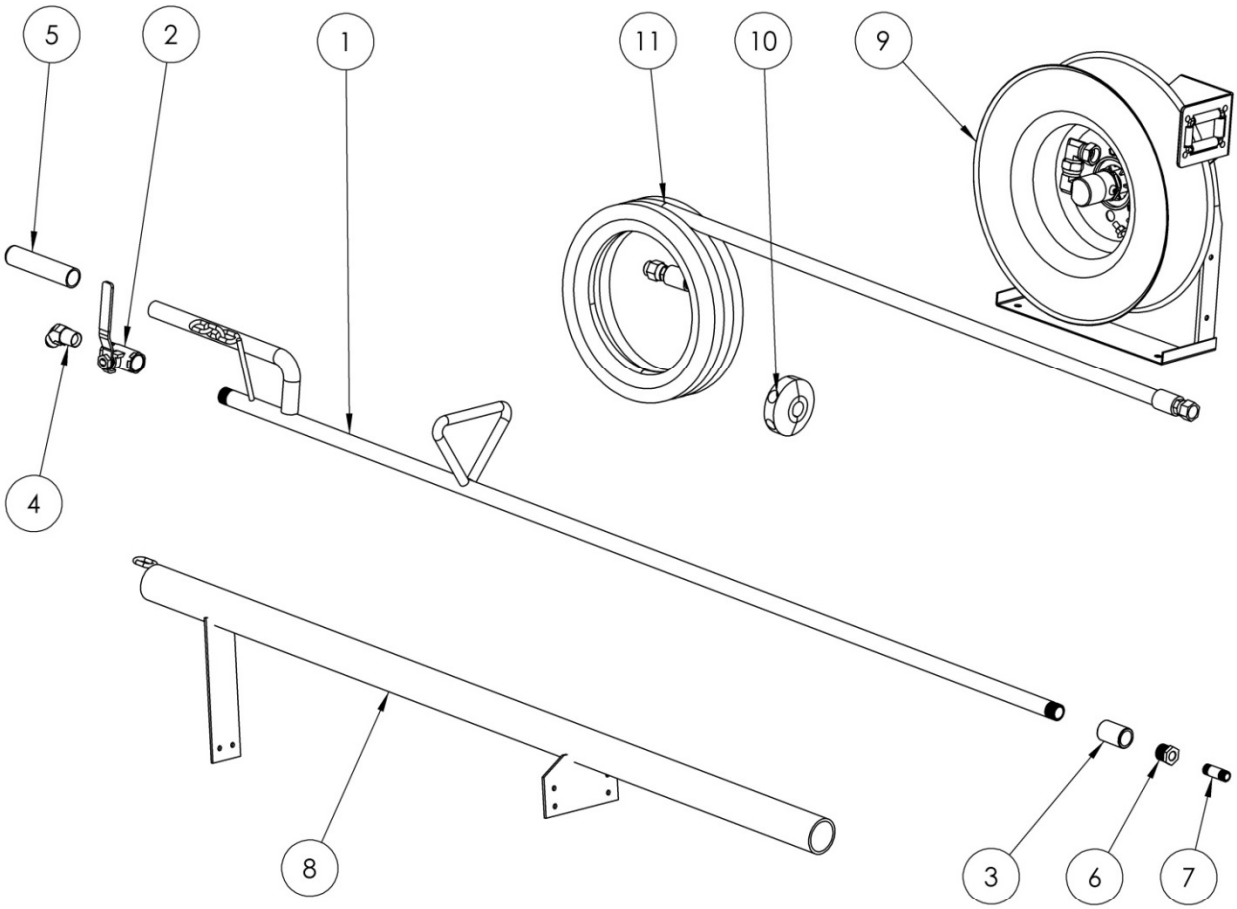
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	140622	SEAL	4
2	140623	INNER BEARING	4
3	140624	INNER RACE	4
4	140625	BACKING PLATE ASM L.H.	2
5	140626	BACKING PLATE ASM R.H.	2
6	140627	BRAKE DRUM	4
7	140628	STUD	24
8	140629	OUTER RACE	4
9	140630	OUTER BEARING	4
10	140631	SPINDLE NUT	4
11	140632	DUST COVER	4
12	140633	REPLACEMENT SHOE & LINING	4
13	140634	REPLACEMENT MAGNET	4
14	140635	LUG NUT	24
15	140636	BUSHING	12
16	140637	LEAF SPRING	4
17	140694	AXLE BEAM ONLY	2
18	140568	AXLE ASM w/ELECT BRAKES	2
19	140640	EQUALIZER BAR	2
20	140641	HANGER KIT ASM	1
21	140642	U BOLT KIT (LESS SPRINGS)	2

Standard Arrow Board Assembly



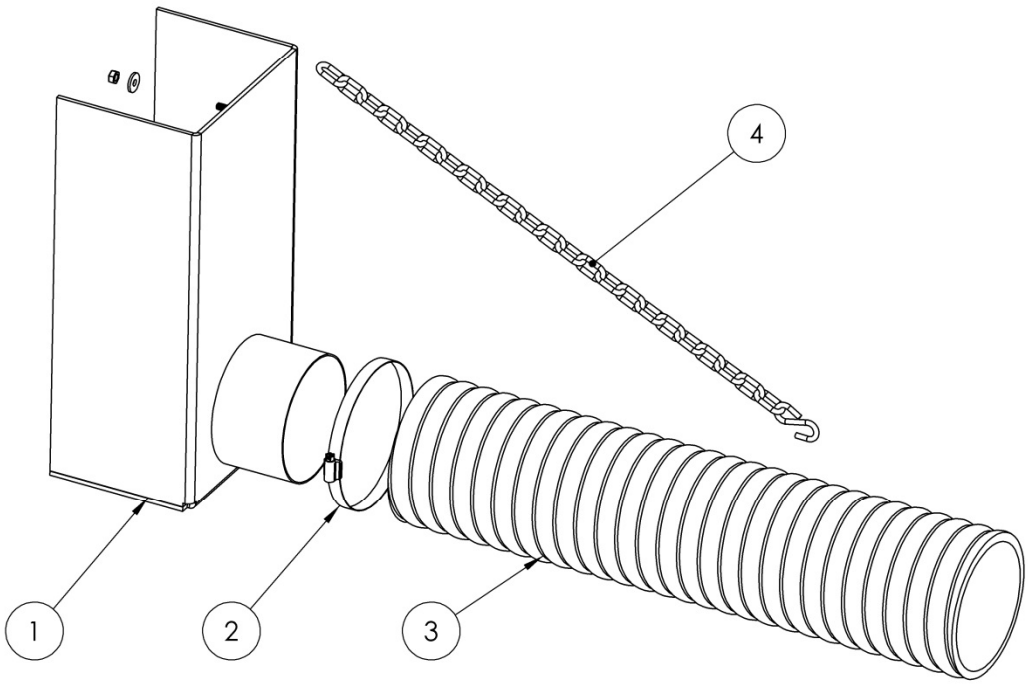


Crack Sealer Assembly (Optional)



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	407826	CRACK SEALER WAND WELDMENT	1
2	172362	1/2" BALL VALVE	1
3	120047	1/2" NPT COUPLER	1
4	172509	FITTING: 45 DEGREE JIC x 1/2" NPT	1
5	155309	GRIP: HANDLE	1
6	172363	1/2" TO 1/4" REDUCER	1
7	172364	NIPPLE: 1/4" NPT x 1.5" LG	1
8	408132	HOLDER CRACKSEALER PATCHER	1
9	155310	REEL: HOSE	1
10	172366	HOSE STOP	1
11	172365	HOSE: CRACK SEAL WAND	1

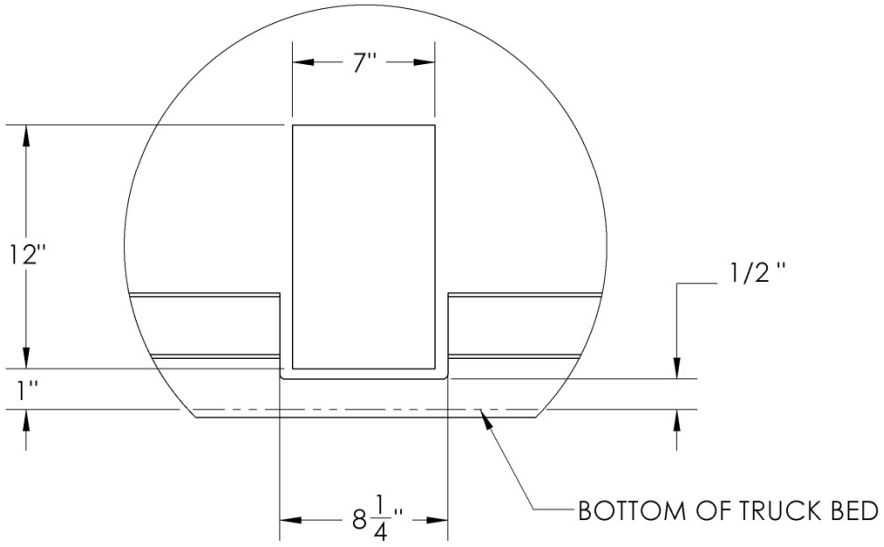
Tailgate Discharge Box Assembly



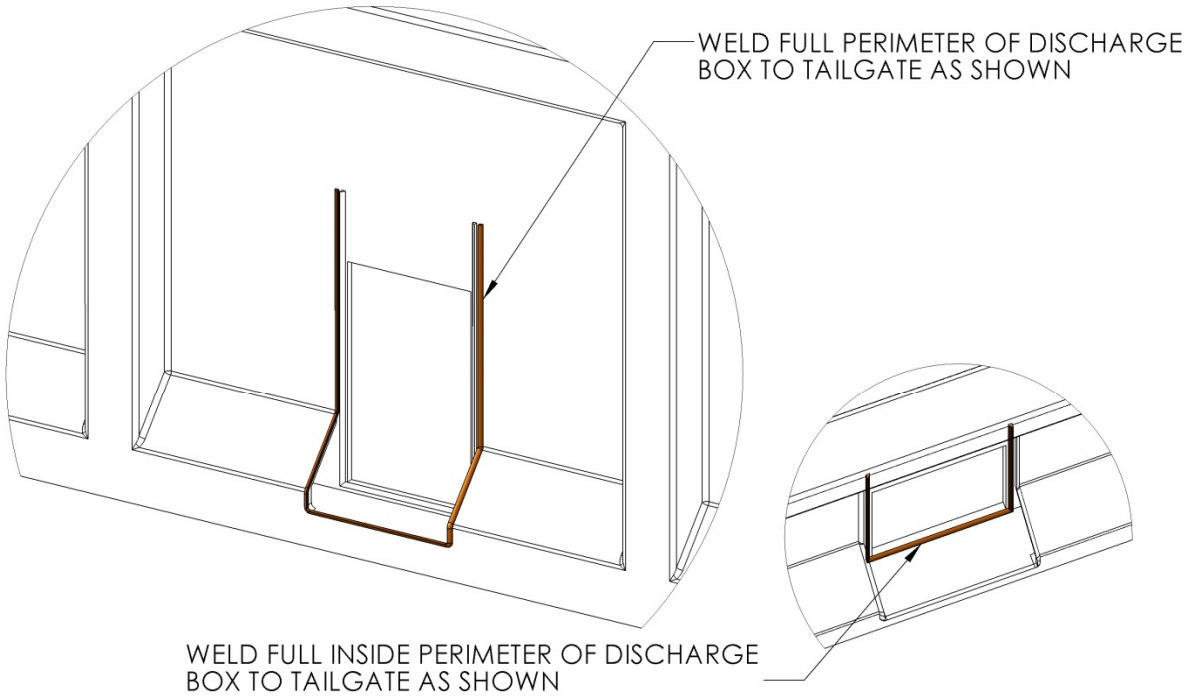
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	407976	WELDMENT: TAILGATE BOX	1
2	101060	CLAMP, 3-1/8" TO 6"	1
3	155473	HOSE: TAILGATE	1
4	407977	ASM: TAILGATE BOX CHAIN	1

Tailgate Mounting Instructions

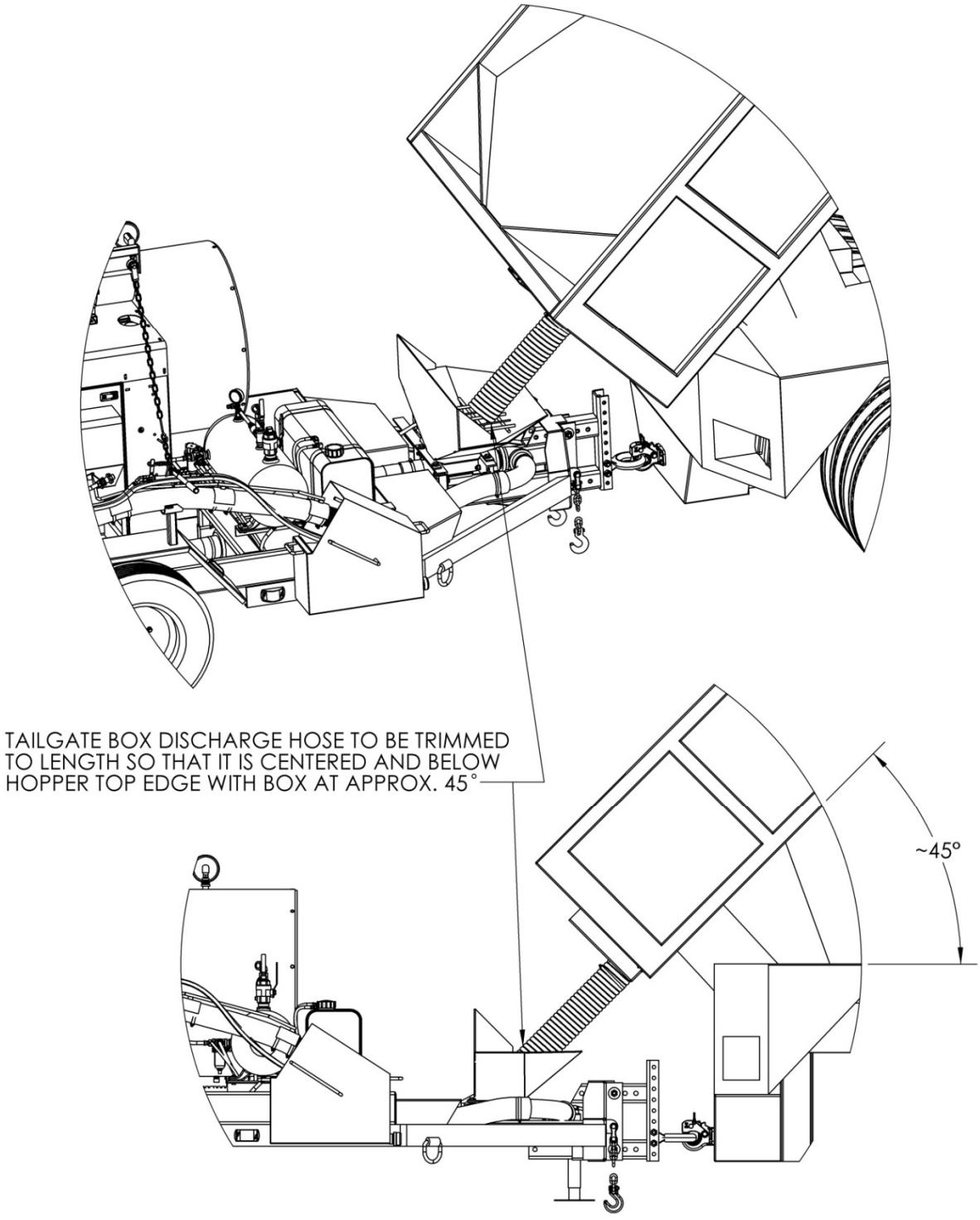
TAILGATE CUTOUT DETAIL



TAILGATE BOX WELDING DETAIL



Tailgate Hose Length and Alignment



Options & Accessories

PART NUMBER	DESCRIPTION
155598	TANK CONTENT GAUGE, FRACTIONAL DIAL
155844	2 INCH NPT ADAPTER FOR CONTENT GAUGE
103677	AMBER LED STROBE LIGHT
130740	LED ARROWBOARD ASSM
140649	LED SIDE MARKER LAMP
140651	LED REAR CENTER BAR LIGHT
140654	LED MARKER LIGHT RED
140655	LED MARKER LIGHT AMBER
140663	LED LEFT HAND TAIL LIGHT MODULE
140664	LED RIGHT HAND TAIL LIGHT MODULE
130557	ELECTRONIC THROTTLE MOTOR ASSM
408080	NOZZLE HEATER KIT
130631	NOZZLE HEATER BLANKET
428108	LOCKING RADIATOR CAP COVER
130686	METAL BATTERY COVER
140692	AXLE ASSEMBLY, HYDRAULIC BRAKE, 87” HUB TO HUB
110415	TANK AXLE HYDRAULIC LINES KIT
140657	PARKING BRAKE KIT
140696	20K LB HYDRAULIC BRAKE ACTUATOR, BOLT ON
140672	BRAKE BACK PLATE ASSEMBLY, HYD, LEFT HAND
140673	BRAKE BACK PLATE ASSEMBLY, HYD, RIGHT HAND

Troubleshooting Guide

The following trouble shooting information includes some problems and possible solutions that an operator may encounter during the course of operating the Dura-Patcher. Unless otherwise noted, the problems listed here are those an operator can diagnose and repair. See an authorized DuraPatcher / DuraMaxx dealer/distributor for diagnosis of repairs not listed. For specific engine and other problems not covered by this guide, please refer to the other guides for major components that you received with unit.

DO NOT ATTEMPT TO SERVICE OR REPAIR MAJOR COMPONENTS, SUCH AS THE BLOWER OR ENGINE UNLESS AUTHORIZED BY YOUR DEALER OR DISTRIBUTOR.

ANY UNAUTHORIZED REPAIR WILL VOID THE WARRANTY.

TROUBLE	POSSIBLE CAUSE	REMEDY
No aggregate flow	1. Delivery hose plugged.	1. Open at coupling behind venturi and clean out. 1.1 Increase engine RPM momentarily. 1.2 Check blower RPM should be 1100-1500 RPM. 1.3 DuraMaxx Only: bad aggregate switch on joy stick control.
	2. Hopper empty.	2. Fill hopper.
	3. Insufficient air volume.	3. Check blower RPM, should be 1100-1500 RPM. 3.1 Check and clean blower and filter. 3.2 Check for air leaks in discharge piping.
	4. Delivery hose plugged.	4. Open at coupling on boom and clean out. 4.1 Increase engine RPM momentarily. 4.2 Check blower RPM should be 1100~1500 RPM.
	5. Hopper empty.	5. Fill hopper.
	6. Insufficient air volume.	6. Check blower RPM, should be 1100~1500 RPM. 6.1 Check and clean blower and filter. 6.2 Check for air leaks in discharge piping.
	7. Slide gate not opening.	7. Ground not making contact at solenoid. 7.1 Check quick coupler air connection at air/diesel cleanout tank. 7.2 Fuse at engine panel. 7.3 Primary wiring harness connector by aggregate pipe and hose connect is loose.
Poor or uneven aggregate flow	1. Aggregate wet and or bridging.	1. Run vibrator. 1.1 Run clean dry rock.
	2. Delivery hose needs cleaning.	2. Remove and clean hose, flush nozzle.

	3. Insufficient air volume. 4. Hole in venturi. 5. Hole in hose. 6. Pressure relief valve not operating properly.	3. Check blower RPM. 3.1 Check for air leaks in discharge piping and hoses. 4. Replace venturi. 5. Replace hose. 6. Check for stuck rock in valve.
No emulsion at nozzle	1. Low tank level or empty.	1. Fill tank. **Relieve All Pressure Before Opening Load Hatch!**
Poor or uneven emulsion flow	1. Separated emulsion. 2. Low air pressure. 3. Emulsion too cold.	1. Drain and replace with new emulsion. 2. Check air lines, valves and gauges. 3. Heat to proper spray temp for material. (150-160° F)
No Solvent/diesel for Clean Out	1. No solvent in tank. 2. 3-way selector valve on emulsion tank in wrong position. 3. No air pressure to solvent tank.	1. Fill tank. **Relieve All Pressure Before Removing Cap!** 2. Select “Cleanout” position. 3. Valve open. 3.1 Pinched airline.
120/220-volt ac heating system not working. (120 Standard on all Units)	1. Tripped circuit breakers or blown fuse. 2. Thermostat not set to desired temperature. 3. Faulty wiring. 4. Heat blankets burned out.	1. Reset or replace. 2. Set thermostat or temperature. 3. Check wiring with volt/ohmmeter. 4. Replace blankets.
Emulsion in clean out tank.	1. Failure to close ½” ball valve after clean out.	1. Make sure ½” valve is closed after clean out.
Arrow board not working	1. Wires loose.	1. Check all plugs and wires.
Premature failure of rubber element on blower	1. High RPM at start-up and shut-down.	1. **ALWAYS** start and shut down at low idle.
Hot oil system not working properly	1. Low oil. 2. Toggle switch on engine panel is off. 3. Circulation pump not working.	1. Fill oil reservoir. 2. Turn switch to on. 3. Check and replace pump if needed.
Engine will not start		Contact customer service at Duraco Inc. or local John Deere rep.

LIMITED WARRANTY

DuraPatcher

Effective January 1, 2009

1. Limited Warranties:
   For two (2) years from the purchase date **DURACO, INC**. warrants to the original purchaser that the goods purchased are free from defects in material or workmanship on the following items:

   a) John Deere Diesel Engine
   b) Air feed system EXCLUDING the feed pipe system of 11' 8" discharge metal pipe and 1 6'4" rubber discharge hose and nozzle
   c) Air Ram
   d) Air Compressor
   e) Blower

   For one (1) year from the purchase date **DURACO, INC**. warrants to the original purchaser that the goods purchased are free from defects in material or workmanship on the following items:

   a) Blower drive coupling
   b) Heat blankets and thermostat
   c) Hot oil circulating pump
   d) Boom arm
   e) Air solenoid valve
   f) Heat exchanger

2. This warranty does not apply to any part of the goods which has been subjected to improper or abnormal use, negligence, alteration, accident, or damage due to lack of maintenance.
3. DURACO, INC. will replace for the purchaser any part or parts found upon examination at the factory, to be defective under normal use and service due to defects in material or workmanship.
4. Except as provided herein, no employer, agent, dealer or other person is authorized to give any warranties of any nature on behalf of DURACO, INC.

Warranties are subject to change without notice.