

Operation & Maintenance Manual

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Sauber Mfg. Co.'s Model 1572 Rapid Overhead Deployment Trailer

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Preface

Thank you for choosing Sauber Mfg. Co. You have purchased a trailer designed and built with care. With minimal maintenance and by understanding its operation, your new trailer will provide you with years of excellent service. We welcome your suggestions for improvement and stand willing to assist you if any questions arise during its operation. If we can help in any way, please contact your account representative:

- Website: <https://saubermfg.com/sauber-contact-about/>
- Phone: (630) 365-6600

The following manual provides important safety information and instruction. Please read this manual before operating your new trailer. It is important to follow safety instructions and cautions.

We acknowledge that not every situation or combination of tow vehicle and trailer can be addressed, therefore we ask that you use sound judgment after reading the following outlines.

Some components may be produced by a third party. When available, separate service manuals and instructions may apply.

Component Sourcing Information

Our equipment is designed and built with operators and maintenance personnel in mind. To this end, non-rusting hardware and bolt-on / bolt-off componentry is used at every possible opportunity. This encourages routine maintenance by making the work easier on the technician, as well as on the equipment. Sauber Mfg. Co. will have most of the components that might need replacement in stock at our facility, and we are always ready to help get you any replacement parts you might need.

Serious Hazards

DRIVING BEHAVIOR AND CONDITIONS

Loss of control of the tow vehicle/trailer combination could result in serious injury or death. The most common causes for loss of control include:

- Failure to adjust driving behavior when towing a trailer
- Immoderate speed; driving too fast for the conditions

With ideal road conditions, the maximum recommended speed for safely towing a trailer is 60 mph. If you drive too fast, the trailer is more likely to sway, increasing the possibility for loss of control. In addition, it is possible that the tires may overheat, increasing the chance of a blowout.

Decrease your speed as road, weather, lighting, and other conditions decline.

IMPROPER SIZING OF THE TOW VEHICLE

Trailers that weigh too much for the tow vehicle can cause unsafe stability issues which can lead to loss of control and a serious accident. Know your vehicle tow rating and Gross Combination Weight Rating (GCWR.) Vehicle manufacturers will provide you with maximum towing capacities, as well as the GCWR. The additional strain put on the engine and drivetrain of the vehicle may also lead to serious maintenance problems. For these reasons, the maximum towing capacity of your towing vehicle should not be exceeded. The towing capacity of your vehicle can be found in the tow vehicle's owner's manual.

Use of a hitch with a load rating less than the load rating of the trailer can result in loss of control and may lead to a serious accident. Ensure that your hitch and tow vehicle are rated for the Gross Vehicle Weight Rating (GVWR) and tongue weight of your trailer.

OVERLOADING AND/OR IMPROPER WEIGHT DISTRIBUTION

The total weight of the load you put in or on the trailer, plus the empty weight of the trailer itself, must not exceed the trailer's Gross Vehicle Weight Rating (GVWR.) If you do not know the empty weight of the trailer plus the cargo weight, you must weigh the loaded trailer at a commercial scale. In addition, you must distribute the load in the trailer such that the load on any axle does not exceed the Gross Axle Weight Rating (GAWR.) The GVWR and GAWR are located on the OEM certification and VIN label attached to the front frame of the trailer.

Never exceed the trailer Gross Vehicle Weight Rating or the Gross Axle Weight Rating. Do not load a trailer so that the weight on any tire exceeds its rating.

Improper front/rear load distribution can lead to trailer sway and poor handling conditions. Undesirable trailer sway results from tongue weights that are too low, while tow vehicle instability results from tongue weights that are too high.

Uneven left/right load distribution can cause tire, wheel, axle or structural failure. To the extent possible, be sure your trailer is evenly loaded left/right. Towing stability also depends on keeping the center of gravity as low as possible.

Make certain the tongue weight is within the allowable range. Keep the center of gravity as low as possible.

UNSECURED LOADS

Your trailer may be designed for specific cargo, such as reels, or poles. If your trailer is designed for specific cargo, do not carry any other cargo such as people, hazardous substances or containers of flammable materials.

It is important to avoid shifting cargo. The trailer ride can be bumpy and rough. Securing cargo so that it does not shift or bounce out of the trailer is imperative. Tie down all loads with properly-sized fasteners. Always secure doors or lids if present on your trailer by securing its latch.

IMPROPER BRAKING AND STEERING UNDER SWAY CONDITIONS

When towing a trailer, you will have decreased acceleration, increased stopping distance, and increased turning radius. The trailer will change the handling characteristics of your towing vehicle, making it more sensitive to steering inputs and more likely to have its stability affected in windy conditions or when passed by large vehicles. You will also need to adjust driving accordingly, i.e. taking a longer distance to pass and allowing for increased braking distances, etc.

Taking common-sense measures will be necessary, such as:

- Being alert for slippery conditions
- Anticipating trailer sway, being ready to reduce speed and using small, trim-like steering adjustments to regain control
- Check rear view mirrors frequently to evaluate trailer towing and traffic conditions
- Using a lower gear when driving downhill or on long grades
- Being aware of your trailer height always, especially when approaching bridges and roofed areas.

IMPROPER OR INCORRECT COUPLING OF THE TRAILER TO THE HITCH

It is critical that the trailer be securely coupled to the hitch, and that the safety chains and emergency breakaway cable (electric brakes) and air hoses (air brakes) are correctly attached. Uncoupling of the trailer during transit can lead to a serious accident or a fatality.

Ensure that the pintle hook capacity rating, including installation, is sufficient for the GVWR and the tongue weight of the trailer being towed. Make sure that the pintle hook is physically compatible with the trailer drawbar. Compatibility information is available from the pintle hook manufacturer.

Observe the drawbar and pintle hook for wear, corrosion and cracks before coupling. Replace worn, cracked or corroded components per the manufacturer's recommendations.

Ensure the hitch drawbar and pintle hook are installed with grade-8 fasteners and are properly torqued before coupling to the tow vehicle.

Check Prior to Moving

Do not move the trailer if any of the following conditions appear:

- The drawbar is not secured and locked to the pintle hook.
- The safety chains are not secured to the tow vehicle. If your trailer detaches from the pintle hook for any reason, we have provided safety chains so that coupling of the trailer can still be maintained. Improper rigging of the safety chains could result in loss of coupling. Fasten chains to the frame of the towing vehicle. Do not fasten chains to any part of the hitch unless the hitch has special holes or loops specifically designed for that purpose. Cross chains underneath hitch and coupler with enough slack to permit turning and to suspend the trailer tongue should it become detached.
- The trailer jacks are not fully retracted.

Check Prior to Towing

Do not tow the trailer on the road until:

Trailer Breakaway System

The breakaway switch must be connected and verified. If equipped with electric brakes, your trailer will be equipped with a breakaway system that can apply the brakes on your trailer if it becomes detached from the tow vehicle for any reason. The breakaway system, including the battery, must be in good condition and properly rigged to be effective. An inoperative breakaway can result in a runaway trailer. The breakaway cable must be attached to the towing vehicle and not to any part of the hitch. Before towing the trailer, test the system. If the system is not working, do not tow the trailer and have it serviced or repaired. The sealed breakaway with charging circuit and LED battery condition indicator allows your operators to check the system with a quick pull of the plunger. A green light shows the battery is charged, wiring is connected, and the system is ready.

Tires and Wheels

Failure to maintain proper tire condition and pressure can lead to loss of control.

Just as with your tow vehicle tires, the trailer tires and wheels are important safety items. It is essential to inspect them before each tow.

If a tire is found to include defects such as a bald spot, bulge, cut, cracks or is showing any cords, replace before towing. Have the tires inspected by qualified persons. Check inflation pressure on all tires prior to towing.

Failure to keep lug nuts tightened properly may cause the wheels to be seated to the hub improperly. Before each tow, check to make sure they are properly torqued. The proper torque for lug nuts is available from the manufacturer. Use a torque wrench to tighten the lug nuts, use a crisscross star pattern.

Lug nuts are also prone to loosen after first being assembled. When driving a new trailer (or after wheels have been remounted,) check to make sure they are tight after the first 10, 25, and 50 miles of use and before each tow thereafter. Our wheel nuts are torqued to manufacturer specifications and are then fitted with high-visibility wheel nut indicators. The indicators are fitted in a uniform pattern, so when a wheel nut has loosened, the indicator will become out of sequence. The wheel nut indicators are also heat sensitive. If there is a binding brake or seized bearing, the heat is transferred through the stud and nut. If this temperature exceeds 120° C (248° F), the indicator will start to blister around the circumference and eventually start to distort. Pre-flight walkaround checks should include wheel nut checks.

Lighting, Signaling and Brakes

Be sure the trailer brakes and all the general and signaling lights on your trailer are functioning properly before towing your trailer. Brakes and lights on a trailer are controlled via a connection to the tow vehicle.

Electric Brakes

Check the trailer brake lights by having someone operate the brake and turn signals on the tow vehicle while you visually verify it is functioning. If your trailer has electric brakes, your tow vehicle will have an electric brake controller that is required to be installed at the driver's position that sends power to the brakes. To check the condition of the electrical brake system, pull the breakaway pin and check for the illumination of the green LED indicator light. When fully lit, the battery is charged, and the system wiring is correct. To test this system, operate the brake controller while trying to pull the trailer at a speed of less than 5mph to verify they are operating, and you can feel them engage.

Proper Tongue Weight

It is critical to have a portion of the trailer load carried by the tow vehicle. The trailer tongue should always exert a downward force on the hitch. Proper tongue weight is essential to good trailer tracking and safe operation. If too little weight is distributed to the tongue, towing will be erratic. Too much tongue weight may overload the towing vehicle's rear axle or the pintle hitch rating. Ten to twenty percent weight transfer is considered a normal range. Smaller, single axle trailers can transfer weight on the high side of this range. Larger, multiple axle trailers are designed to transfer less because of the limited capacity of the towing vehicle's rear axle.

When necessary, tongue weight can be controlled by distributing the load or by adjusting the pintle eye. Even loading is ideal, but when this is not possible, place more weight toward the trailer front to provide a safe tongue weight. Be aware that too much tongue weight from an uneven load can overload tow vehicle components. It is incumbent upon the operator to provide a safe, towable tongue weight without excessive hitch weight transfer that could place the tow vehicle in a non-compliant condition. If your trailer is equipped with an adjustable eye, lowering it will generally increase tongue weight while raising it will decrease tongue weight - especially on multi-axle models. Additional loading instructions may be included with your trailer and should be followed.

Once the trailer pintle eye is secured in the towing vehicle hitch, cross the safety chains and connect them to the rings provided at the towing vehicle bumper. Insert the electrical connection cord and check trailer lighting. Connect the air glad hands if present and check brake operation. Ensure the trailer axle(s) do not exceed their GAWR and the entire trailer and load does not exceed the GVWR rating.

Grounding

Your trailer may be equipped with a bronze grounding lug. When the trailer is used near energized conductors the trailer must be grounded. A grounding lug is provided to help you follow your company's safety practices.

Outriggers

Stability is an important part of safe trailer use. Because the towing vehicle can provide additional stability, leave it connected to the trailer when you can. Set the rear outriggers to their lowest level. If you need to decouple the towing vehicle, lower the front jack slightly, set the outriggers and then raise the jack to seat the outriggers firmly in the ground.

Wheel Chocks

Set the chocks at each rear wheel in the direction of the expected load or grade.

Trailer Modifications

Your trailer is a custom engineered piece of equipment. Essential safety items can be damaged by altering your trailer. The simplest modifications, such as driving a screw or punching a hole to install a hanger can inadvertently damage an electrical wire or other hidden component. Before making any alteration to your trailer, contact Sauber Mfg. Co. at (630) 365-6600.

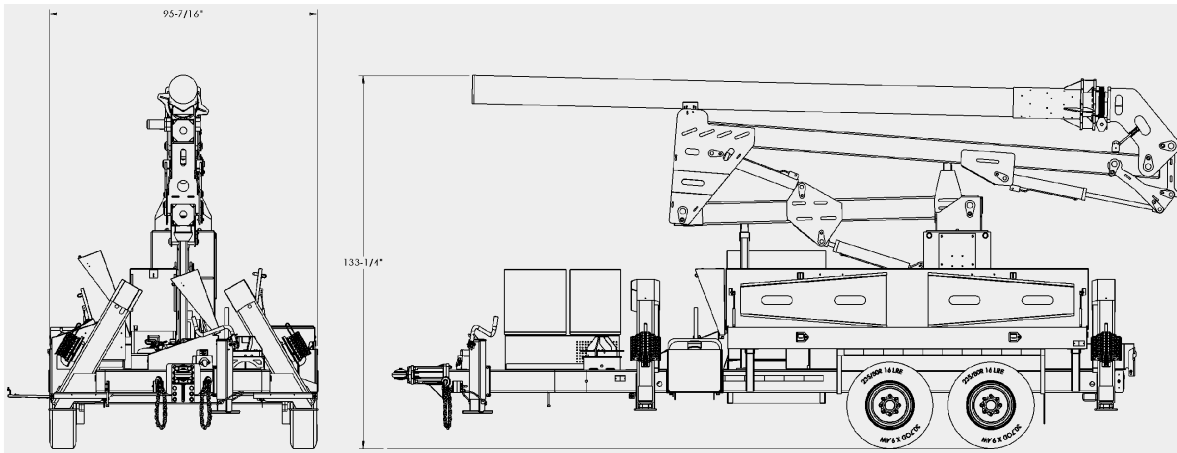
Fuel and Battery Levels

Ensure any on-board fuel sources in spare gas cans, or power sources are in adequate quality and supply before departure to the work zone. Additionally, check the voltage and load test, if possible, any on-board batteries to ensure maximum capacity at the work zone.

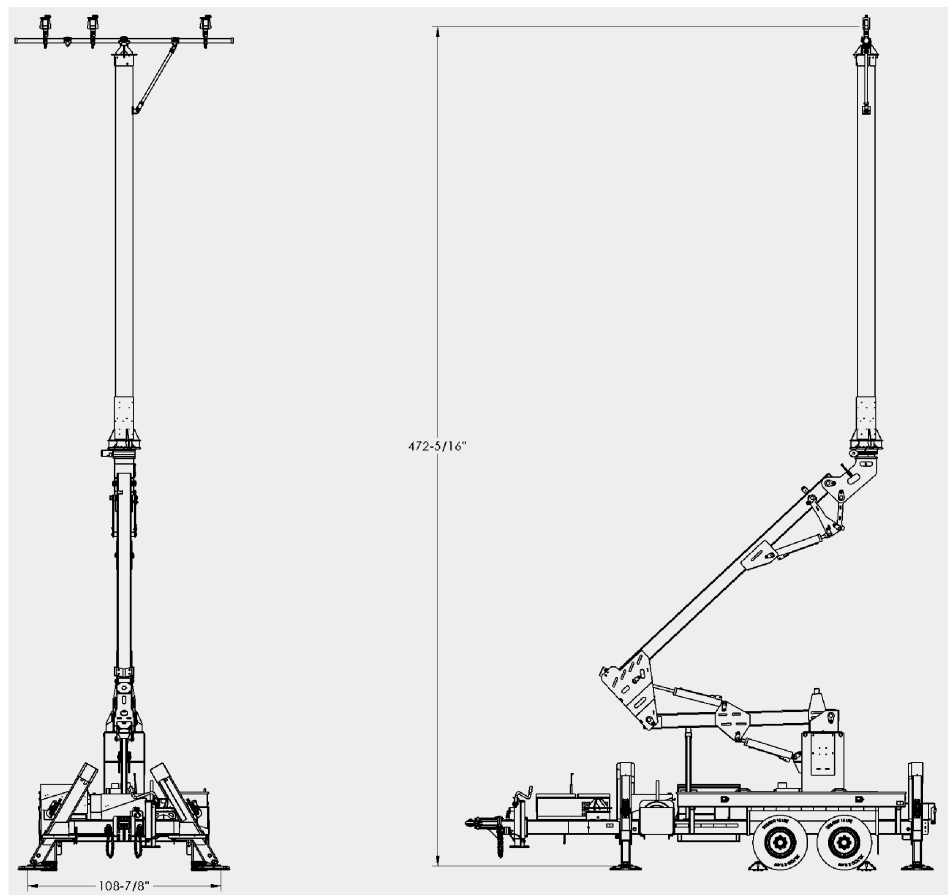
Maintenance Reference

Operation	Interval
Check Trailer Lighting	Every Use
Check Battery Condition	Every Use
Check Trailer Breakaway	Every Use
Torque Wheel Nuts	First 50 Miles, then Monthly
Check Tire Wear and Inflation Pressure	Monthly
Adjust and Inspect Trailer Brakes	Monthly
Check Trailer Suspension	Monthly
Check Oil Bath Level in Axle Hubs	Monthly
Inspect Any Hydraulic Hoses and Connections	Monthly
Check Pintle Eye Wear	Annually

Physical Dimensions and Component Detail



Collapsed, transportation-ready dimensions



Typical deployment Dimensions

Suggested Work Methods

INTRODUCTION

There is no single, standard work method to assign to this trailer. As with any other tool in the line worker's toolbox, practices and methods will need to be outlined according to the individual organizational requirements. The following points illustrate a rubric for operation, in the order of operation, but do not necessarily represent all potential operational methods and orders for the device. The last section of this document is a provisional space for any work methods that might be specific to the owner / operating company-specific work methods.

CAPABILITIES

This trailer has been designed to and tested against the loading specifications for a 50' wooden pole provided to Sauber Mfg. Co. by a public utility. The trailer's moment load rating 21,778 ft.-lbs. It can withstand side strain of 500# @ 40', 600# @ 35', 725# @ 30' and 850# @ 25'.

UPON WORK SITE ARRIVAL

- Conduct a thorough job brief prior to beginning any work to ensure everyone understands the operation of the unit and the potential hazards

PRIOR TO TRAILER DEPLOYMENT

- Check that the ground is firm enough to support the trailer and pulling vehicle
- Check that the area is free of obstructions for trailer maneuvering and placement, as well as for boom deployment and rotation
- Approach the work area in a safe direction and manner, positioning the trailer either
 - Underneath the destination location if using a centered cross-arm
 - OR
 - Alongside the line of conductor, if using an offset cross-arm
- Use a spotter to direct the vehicle when backing up

WIRED AND REMOTE OPERATION

- Whenever possible, operate the unit using the wireless remote controls, which will achieve improved safety through increased distance between the operator and the work zone, and greatly-improved visibility of the work zone itself
- Only perform movements of one component at time when operating any boom section, turntable rotation, or outriggers
- Valve operation
 - Slide the outrigger lockout panel out of the way to enable operation of the valves
 - Actuate the movement of the components using the labeled valves at the control box
- Remote operation
 - Ensure the M-Stop button is in the disengaged (up) position to enable operation (alternatively, a push of this button will disable the remote controls)
 - The wireless remote control is turned on with the green button on the left, underside of the unit
 - The transmitter will attempt to sync with the receiver in the control box; the **Tx / Rx** buttons will flash green / amber, respectively when sync has been successfully completed

- Operate the controller by first selecting the desired device to operate from the row of momentary switches at the bottom of the controls with the left hand, and drive the device in the desired direction using the joystick with the right hand
 - Both the momentary switch as well as the joystick need to be actuated for movement to occur, preventing unintended actuation
- The remote will turn off automatically after 5 minutes of inactivity and will need to be turned on and synchronized with the transmitter prior to use
- To turn off the remote manually, press and hold the green button on the bottom of the remote for 3 seconds, or push the M-Stop plunger switch
- Compartment keys and additional remote batteries are kept on the Xenoy container within the control box

TRAILER DEPLOYMENT

- Always perform a thorough check of the work area taking extra precaution to ensure there are no people in the boom's potential area of reach while the unit is powered on
- Turn on flashing marker lights from the control box
- Consider any additional conspicuity measures to take such as barricades, caution cones, etc. to clearly indicate the work zone
- Always ground according to the methods outlined and accepted by your organization; this unit is not dielectrically certified, and is to be treated as any other pole-like structure whose dielectric properties are not explicitly defined (such as a common wooden pole)
 - To this end, the trailer is equipped with two bronze grounding lugs: one on the right side of trailer on the tongue, and the other on the elbow just below the base of the pole where it attaches to the rotation assembly
- The outriggers and booms are operated by hydraulics which are controlled with hard-plumbed controls on the trailer itself, or from the wireless remote controls; use the 3-position selection switch to choose **Remote** (wireless) or **Valve** (wired) operation
- Use the switch on the control panel to turn on the pump
- Outriggers
 - (4) 1818 Almag outrigger pads and (2) 1919 Almag Slope Copers outrigger pads are provided to assist with trailer incline and stability control
 - Slide the outrigger lockout at the valve control panel to the right to allow the valve handles to operate normally
 - Depress the appropriate momentary outrigger switch on the lower left and actuate the feathering joystick in the upper right to extend or retract outriggers
 - Using the inclinometers found on side and rear of the trailer, adjust the outriggers as close as possible to 0° in all directions, but never outside the range from -5° to +5°
 - After outriggers are set, re-inspect the work area for outrigger security and check inclinometers for their slope requirements; reposition trailer and outriggers as necessary to remain within the guidelines of the inclinometers
 - Once outriggers are safely and satisfactorily deployed, slide the outrigger lockout panel to the left to lock out the outrigger functions

CROSS-ARM INSTALLATION

- Completely extend the middle-boom stage
- Extend the upper-boom until the fiberglass pultrusion (brown pole) is parallel with the ground
- Securely install cross-arms, “Christmas trees,” insulators and any other supporting components
 - Consider an offset configuration for these cross-arms if positioning directly underneath the conductor line is not possible

CONDUCTOR INSTALLATION

Conductor can be installed in the same position used for the cross-arm installation, or it can be installed once the booms are in the fully-deployed, vertical position with the use of an aerial device.

- If installing conductor in the cross-arm installation position, route the conductor through an insulated roller
- If insulated rollers are not being used, the conductor will have to be installed once all booms are in the fully-deployed, vertical position
 - Never extend, retract or rotate any boom if conductor is installed without insulated rollers
- The rotation pressure is set separately at the valve spool near 500 PSI to protect aerial plant from inadvertent rotational torque. This pressure can be adjusted upward by a maintenance technician if desired.

FINAL INSTALLATION

- Once the desired cross-arm configuration has been attained, the upper-boom section can be moved into a vertical position
- Extend the lower-boom section to achieve the height required for the work zone, ensuring the upper-boom is in the completely vertical position
- Once proper height and vertical orientation of the upper-boom has been established, the upper-boom stage can be clocked as needed to align with the conductor path
- The unit has been designed to be left on a work site, and no travel of the booms will occur due to hydraulic leakage
- If leaving the unit deployed and unattended, ensure that all tools, batteries, generator, gas safety can, controls and any other loose components are secured in the lockable boxes
- Return all switches to the OFF position except flashers if required

DEINSTALLATION

- Once permanent overhead restoration is complete, conductor can be deinstalled per the deployment scenario. The booms can be retracted back to the cross-arm installation position, where all those components can be removed and securely stowed
- Once all cross-arm components are removed, collapse all booms to their travel positions
- Return all switches to the OFF position

CHARGING & POWER

- The unit includes a fully-automatic battery charger that provides approximate capacity and current voltage for the battery pack
- The charging system charges (4) deep cycle batteries which power the unit’s operation, including the booms, outriggers, upper stage rotation, emergency flashers and the trailer breakaway system
- To view battery voltage, push and hold the button below the digital readout

- Caution: battery charge creates heat, so keep material and body aware from charger and batteries
- The charger is fully-automatic and will show “CC” in the display when the battery reaches full charge, and can therefore, be left plugged in, consuming less than 20W of power in this condition
- The unit can also be charged by the Generac iQ2000 1600W on-board portable generator, which can provide power for other 120VAC appliances and tools
 - The generator has three output settings: Turbo, Standard & Economy
 - Turbo provides maximum output of 2000 surge watts/1600 rated watt of output
 - Standard can be used for charging the battery pack in all conditions
 - Economy can be used for light loads and after the battery reaches 80% of capacity
 - The front duplex outlet can be reset with the push button switch to the left
 - Fuel capacity and power output meters combine with the operating time remaining at current power consumption to provide the operator current operating information when running
 - Always keep the compartment door open when the generator is running
 - Refer to the owner’s manual for detailed operation and maintenance information before operating the generator
- Do not run the pump for an extended period when the unit is not being operated to conserve battery power and extend component life
- Battery Maintenance
 - Deep cycle batteries perform better and last longer when they are not fully discharged
 - Leave charger plugged in when not in service to protect battery capacity and ensure the unit is ready for deployment
 - Periodically remove and reinstall power to the charger to restart the degassing cycle
 - Store batteries in a fully charged state
 - Replace batteries when required with Group 27DC 660 CCA deep cycle batteries

Owner / Operating Company Work Methods

This section is provisional space for work methods that would be specific to the owning or operating company. Incorporating the company-specific work methods here may provide for more thorough adherence to safety procedures prescribed here by Sauber Mfg. Co., as well as those that might be prescribed by the operating company itself.