

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 toll free:

Website: SauberMfg.com
Voice Communications: (800) 323-9147
Fax Communications: (630) 365-6610

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.

Serious Hazards

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 blow out.

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

- **Improper sizing of the tow vehicle for the trailer**

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 drive-train 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 proper sized fasteners. Always secure doors or lids if present on your trailer by securing it's 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 be 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.

Common sense measures may be necessary, such as; being alert for slippery conditions, anticipate trailer sway and be ready to reduce speed, use small, trim-like steering adjustments to re-gain control, check rear view mirrors frequently to evaluate trailer towing and traffic conditions, use a lower gear when driving downhill or on long grades, be aware of your trailer height at all times, 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 break-away 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.

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 control of the trailer can still be maintained. Improper rigging of the safety chains could result in loss of control. 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.

Do not tow the trailer on the road until:

- The trailer breakaway system is operational

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. Have it serviced or repaired.

- Tires and wheels are checked

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 listed in this manual and 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.

- The trailer lights and brakes are connected and checked

Be sure the trailer brakes and all the 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.

If your trailer has hydraulic, or "surge" brakes, pull the emergency breakaway lanyard to check the operation of the emergency brake system.

Straight Air Brake Systems

Air systems include spring applied brakes as standard equipment. There is no breakaway cable; connecting the emergency and service glad hands is all that is required. The spring brakes are shipped in a mechanically retracted position for receiving and handling purposes. They must be activated prior to use. Loosen the nut on the threaded rod located on the back side of the spring brake canister. Rotate the threaded rod one quarter turn, remove the threaded rod and insert it in the storage pipe provided on the brake actuator casting. Insert the rubber plug provided into the center spring brake canister hole.

ABS Information

If your trailer is equipped with an anti-lock braking system. Anti-lock brakes greatly enhance trailer stability while braking. Because a sliding wheel always leads, a brake lockup situation under manual braking can cause loss of control as the trailer slides sideways. Anti-lock brakes provide the electronic and physical control to prevent wheel lockup and the ensuing control problems. Although Anti-lock brakes may not necessarily help you stop over shorter distances, it will help keep you in control while eliminating excessive tire wear and *flat spotting*.

Anti-lock brakes use microprocessor technology to sense when the wheels are about to lock up under braking and then controls the brake pressure and timing to prevent it. Each wheel must be controlled independently, although only one axle of a multi-axle configuration needs to be equipped with sensors. An exciter ring (sometimes referred to as a tone ring) is installed on the inside of the hub. A sensor *reads* the level of magnetism present as the teeth of the exciter ring pass it. Since they don't touch, there is no wear or friction between them. The sensors provide wheel speed information to the Electronic Control Unit (the ECU or system brain). Input from the sensors is used to determine if a wheel is about to lock during braking. If so, the system can release and apply the brake up to six times per second through the modulator valve.

The system is powered by the stoplight circuit. This allows any of your trucks currently equipped to pull trailers to be used with a Sauber ABS equipped trailer. The system is off while the brakes are off and powers on and checks itself when the brakes are applied. It is so fast that it can test itself sixty times before air from the tow vehicle gets to the trailer brake valves. A warning light is provided on the trailer side and will illuminate if any component is not functioning. The system will continue to have normal brakes until the problem is resolved. Although there are no batteries in the system, the electronic control unit (ECU) has a special microprocessor that can remember up to ninety-nine problems and keep them stored until they're fixed. A number displayed on the hand held display unit (DDU) identifies one of sixty-three fault codes - providing accurate and quick troubleshooting. This unit is available from Sauber Mfg. Co. and should be kept at each garage location expecting to service ABS brakes. All cables are sealed, weatherproof and polarized to provide high reliability and mistake-free serviceability.

Air Over Hydraulic Brake Systems

Air over hydraulic systems have a built-in valve to allow application of the hydraulic trailer brakes in the event of a breakaway. The energy for this operation is stored in the air tank of the system. Therefore, once the air is expended, braking power is released unless equipped with a spring brake mechanism.

Hydraulic Brake Systems

Straight hydraulic systems are equipped with a surge-actuated braking system. Pressure exerted on the towing eye is transferred to the axle brake hydraulic cylinders. The greater the braking inertia, the more pressure is applied to the brakes. An over-center actuator provides breakaway protection.

- **Proper Tongue Weight is established**

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 is 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.

- **Do not modify your trailer**

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 (800) 323-9147.

Turrets

Your trailer is equipped with one or more rotating turrets. The turret frames are galvanized and can be removed, allowing the trailer to be used for other applications. These individual frames can also be used on other transportation equipment to string wire. The turrets are free turning and can be locked on six degree intervals by the stainless steel locking handle. Always stop the reel rotation before locking it into place. Large forces from heavy, turning reels can damage the locking mechanism if an attempt is made to lock the reel while rotating.

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Series 1602 Tensioning Brake

Apply the brake by rotating the tensioning adjustment wheel clockwise. Continue to apply braking pressure until the desired wire sag is present. The brake has a maximum torque of 3000 ft-lbs. This provides 3000 lbs of line tension 1' from the reel bar center. If wire is filled to 2' from the reel bar center the resulting line pull would be 1500 lbs (3000/2).

The reel bar can be removed with a continuous sling. Loop the sling through the hooks on the power arm and reel positioning collar and elevate the load line. Your tongue and groove assembly will automatically line up. There is nothing to disassemble.

Model 1000 Take-Up/Retriever

Engage the retriever by moving the black engagement lever towards the outside of the hub. Pressurize the retriever using the tool circuit on your line truck or power source. The bi-directional valve has full feathering capabilities and is set to relieve at 1500 PSI. When paying wire out under tension or "free-wheeling", always disengage the hub. This is necessary because the directional control valve has a tandem spool to prevent loss of line tension when in neutral. This spool will not allow oil to circulate and may cause damage to the motor and drive mechanism if the hub is forced to rotate while in the engaged position. The spool will, however, allow oil to circulate to tank while in neutral.

Retriever Type	Relief Pressure	Speed @ 8 GPM	Torque @ Relief Pressure
Model 1000	1500 PSI	18 RPM	1300 ft-lbs
Model 1000-T	2250 PSI	17 RPM	2600 ft- lbs
Model 1000-2S	2250 PSI	34 RPM High Speed 17 RPM High Torque	1300 ft- lbs High Speed 2600 ft-lbs High Torque

Bronze Sleeve Hinge Collar

Install the insert sleeve(s) over the reel bar and into the reel bar receiver hole as far as possible. Apply the hinge collar directly behind the sleeve flange and tighten the locking bolt to 30 ft-lbs of torque. If a torque wrench is not available, you can approximate this specification by tightening the bolt by hand (finger tight) and then applying one complete turn of the bolt. If lifting hooks are provided on the collar, do not exceed the rating on the hook.



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Sauber Mfg. Co. Standard Wiring Code for Trailers

Function	From ABS/ECU (as applicable)	7-Way SAE ABS Socket Terminal ID / Color / Pos	7-Way SAE Socket Terminal ID / Color / Pos	6-Way SAE Socket Terminal ID / Color / Pos
LT	n/a	3 / Yellow / 4:00	3 / Yellow / 4:00	LT / Yellow / 4:00
RT	n/a	5 / Green / 8:00	5 / Green / 8:00	RT / Green / 7:00
Ground	White	1 / White / 12:00	1 / White / 12:00	GD / White / 2:00
Brakes	Blue	7 / Blue / Center	7 / Blue / Center	A / Blue / Center
Clearance/Tail	n/a	6 / Brown / 10:00	6 / Brown / 10:00	™ / Brown / 12:00
Stop	Red	4 / Red / 6:00	4 / Red / 6:00	S / Red / 10:00
Breakaway	n/a	n/a	Black / To Battery	Black / To Battery

Notes:

Clock positions are as viewed from male pin side

Center pin on chassis is expected to be wired hot on ABS

4-Lite systems will be wired in parallel unless otherwise noted

If clearance and tail need to be run on separate circuit, breakaway wire (orange) must be run outside 7/C Cable.

Breakaway may be wired directly to battery or through the 7/C cable depending on proximity to battery box.

7/C Cable - (6) 12 Gauge; (1) 10 Gauge - White

All Primary & Brake Feed Wire: 12 gauge

All Secondary Feed Wire: 14 gauge



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Components Sourcing Information

Item.....	Source.....	Description/Specification
Tires.....	Major Brand.....	245/70R17.5, LRH - 125 PSI
Wheels.....	Dexter.....	6.75 x 17.5 8 on 6.5"
Axle.....	Dexter.....	10K/Slipper Springs - 110-120 ft-lbs
Brakes.....	Dexter.....	12" x 2" H.P.
Hitch Extension.....	Sauber.....	Model 8818-B1
Pintle Eye.....	Holland.....	11144, 3" I.D.
Safety Chain.....	Sauber.....	8256ST 3/8" Grade 70 Chain Group w/ 8250ST Crucifix Chain Traps – 26400# Breaking Strength
Clevis Slip Hook.....	Sauber.....	17186, 3/8" -GR70 w/Latch
Transport Chain.....	Sauber.....	15265 3/8" -GR70 Gold Chain – Galv -43"L w/Hitch Extension
Breakaway.....	Sauber.....	10475
Solar Battery Pack.....	Sauber.....	Model 8852-2 Watt
Striping.....	3-M.....	# 29804-SP DOT-C2, 2"W Red/White
Trailer Jack.....	Sauber.....	10380 Spring-Loaded Drop Leg
Outriggers.....	Sauber.....	8805
Electrical Connector.....	SAE.....	11122, 7-Way RV-Style w/ 10999 4' Jumper Cord
Socket Housing.....	Sauber.....	13802
Lighting.....	Sauber.....	2-Lite LED Sealed Beam/Sealed Wiring Group
Registration Container.....	Sauber.....	16755
Turntable Lock.....	Sauber.....	13770 HD Turret Lock Engagement Machined
Turntable Slide	Sauber.....	13771 HD Turret Slide Machined
Turntable Locking Handle.....	Sauber.....	13742 HD Turret Locking Handle
Slewing Ring/Bearing.....	Sauber.....	13998 Turntable Bearing w/ External Gear
Tensioning Brake.....	Sauber.....	Model 1602, Details to Follow
Retriever.....	Sauber.....	Model 1000
Flow Divider.....	Sauber.....	11307 3-Section
Grounding Lug.....	Sauber.....	15194 Bronze
Wheel Chocks.....	Sauber.....	Model 8500 w/8505 Holders
Quick Couples.....	Sauber.....	11775& 6
3-Section Valve.....	Bucher.....	17862
Capstan.....	Sauber.....	8102 w/8230 Coupler

**Note: Most items listed here are in stock at Sauber Mfg. Co.
Additional manuals are available on our website**



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Maintenance

Operation.....	Interval
Torque Wheel Nuts - See Components Sourcing - Axle.....	After 1st 50 Miles
Torque Wheel Nuts	Monthly
Check Trailer Lighting.....	Every Use
Check Tire Wear & Inflation Pressure.....	Monthly
Adjust and Inspect Trailer Brakes.....	Monthly
Check Trailer Suspension.....	Monthly
Check Pintle Eye Wear.....	Yearly
Check Battery Condition.....	Every Use
Check Trailer Breakaway.....	Every Use
Check Oil Bath Level in Axle Hubs.....	Monthly
Check Tensioning Brake Pad Condition.....	Each Use
Torque Saddle Bolts.....	Yearly
1/2"-Grade 8 fastener: 130-135 ft-lbs	
5/8"-Grade 8 fastener to 140-145 ft-lbs	
Grease Tensioning Brake Hub.....	Monthly
Tensioning Brake Factory Maintenance.....	Aprox 2500 hours of use
<i>Includes:</i>	
1. Rotor inspection/machining	
1. Brake lining replacement	
1. Pivot pin inspection	
1. Alignment	
1. Dynamic brake load testing	

Turrets

Grease Turntable Bearing.....	Every 6 Months
Torque 5/8"-Grade-8 Turntable Fasteners to 200 ft-lbs.....	Within First 6 Months; Then Yearly
** Tighten progressively @ 180-degree intervals	
** If 20% of all bolts have less than 80% of prescribed torque replace all bolts.	
** If one or more bolts are loose to less than 80% of the prescribed torque replace these and adjoining bolts.	
Replace Turntable Fasteners.....	Every 5 Years
Inspect Turret Positioning System.....	Quarterly
Inspect Reel Frame for Cracks and Deformation.....	Quarterly



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