Operation and Maintenance Manual



Valued Customer:

Please review the following manual. If you have any questions or need assistance of any kind, please contact your account representative toll free:

Voice Communications	
Fax Communications	(800) 833-3264

We welcome feedback on your manuals and our marketing communications. We need, and are driven to constantly improve. If you have any suggestions, comments or criticisms we'd love to hear from you.



Custom Engineered for Duke Energy S/N: 1F9UZ1325DV048048

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.



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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 be 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 and 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.

Control Console

A control console is provided at the curb side front of the trailer. A multi-stack directional control valve is used to engage all hydraulic functions. The functions are:

- * Reel Loading Loading
- * Left Outrigger L Outrigger
- * Right Outrigger R Outrigger
- * Drive Tire Engagement Drive Assy
- * Retriever Operation Retr
- * Front Jack (Optional) Jack

The console also includes power source operation controls. These are discussed later in the manual.



In addition to the control console, your unit is provided with a

Hand Held Wireless Remote with a Trailer Mounted Receiver

This unit features (6) On/Off/On toggle switches, a dial speed control and a stop button.

Functions are:

- Reel Payout
- Reel Take-up
- Master On; Master Off
- Left Outrigger Up; LOR Down
- Right Outrigger Up; ROR Down
- Reel Load; Reel Unload
- Drive Engage; Drive Disengage

Remote operation instructions are located inside the storage box lid, and are as follows:

- 1. Set direction toggle switches to off
- 2. Set speed dials to 7:00 position
- 3. Disengage emergency stop rotate clockwise
- 4. Turn on transmitter
- 5. Start the hydraulic power source

After emergency stop is pressed, repeat above steps to resume operation.

Preparation For Loading Operations

Refer to the Hydraulic Power Source section of the manual for pre-operation checks. Extend outriggers fully using the control valves located at the console. Outriggers can be lowered individually or simultaneously and should be used to level the trailer. Set the trailer and truck chocks to the rear of the tires. Set the truck parking brake. Survey the area and make sure that only personnel involved in the operation of the trailer are near the work site.

Unloading The Reel Bar

Release the strap binders and use the *Loading* control valve to lower the bar until the cam arms can be pivoted to the front resting position. Continue unloading the bar until the elevation cylinder is fully extended. Release the loading arm safety latches and remove the reel bar. Two operators should be utilized; one at each end of the reel bar. Care must be taken when releasing and handling the reel bar. Operator injury can result from heavy or falling reel bars if these recommendations are not followed. The bar is now ready for installation into a reel.

Loading The Reel Bar Only

Two operators should be utilized; one at each end of the reel bar. Care must be taken when releasing and handling the reel bar. Operator injury can result from heavy or falling reel bars if these recommendations are not followed. With the loading arms extended, insert the reel bar into the loading arm safety latches on each side. Ensure that the latches on each end are completely engaged. Elevate the reel bar using the *Loading* control valve until the cam arms, when positioned toward the trailer rear, will rest on the reel bar. Continue loading the bar into the lower saddle on the cam arms. Then, fully retract the loading cylinder. Use the strap binders provided at each fender to secure the loading arms for travel. A hook is provided for this purpose at each arm.



Inserting The Reel Bar

Remove both the positioning collars and # SC1 multi-step sleeves from the bar. Insert one sleeve onto the reel bar shaft, matching the sleeve orientation to your reel's arbor hole dimension. Insert the reel bar into the reel and install the second SC1 sleeve on the bar. Slide the reel bar horizontally to obtain the most favorable position for attaching the reel loading arms. Install the hinge locking collars on each end of the reel bar and tighten the bronze bolt. If maximum width steel reels are being used, the multi-step collars and hinge locking collars should be installed on the inside of the reel to maintain proper loading clearances.

Loading The Reel

Never attempt to load a reel outside the minimum/maximum parameters provided in the "Components Sourcing" section. It is recommended that the trailer and vehicle stay coupled at all times. The trailer *must* be coupled to the towing vehicle if loading or unloading will be attempted on un-even ground.

Position the trailer beavertail against both reel flanges. Lock loading arms onto the reel bar ensuring that the safety latches on each side are completely engaged. Load the reel onto the trailer. These operations should be done at full throttle to minimize the possibility of engine stall. 54" Diameter reels and larger should be position for road travel directly on the beveled trailer deck. This "cradle" position should not be used for reels with diameters smaller than 54". These reels should be carried in the lower bronze saddles on the cam arms. Use the binders provided to secure the reel in this position. Route the binder strap under the cam arms and attach the ring to the hook located on the loading arms. When using the Overspin Brake or Retriever, begin unloading the reel until the cam arms can be positioned at the trailer rear, resting on the reel bar. As the reel elevation cylinder is retracted, the reel will be elevated off the trailer deck.

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



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Payout/Take-up

After positioning the reel in the cam arm position, position the drive tire laterally, centering it with the reel flange. Elevate the drive unit toward the reel slowing by feathering the *Drive Assy* valve until it firmly contacts the reel flange. When paying out in overhead conditions, utilize the binders at each side to secure the loading arms with a light amount of tension on the reel bar. This will prevent the reel from elevating when low reel weight and higher tension conditions combine. Always payout wire or cable over the rear of the trailer.

Loading Arm Linkage

The loading arm linkage provides the mechanism to load and unload the reel bar without contacting the trailer. This is accomplished through a linkage control cable which keeps the loading arms elevated during loading and unloading operations when no reel is present. The cable length may need adjusting through time due to minor stretching. If the cable appears frayed or strained in any way, replace it. Because this cable is not designed for shock loads that accompany over the road travel, the trailer cannot be transported safely empty, without a reel bar secured in the lower bronze saddles of the cam arms.

lte	em	.Source	Description/Specification
Tir	es	Major Brand	235/80R16, LR E - 80 PSI
Wł	neels	Dexter	8 on 6.5"
Ax	le	Dexter	7K/Slipper Springs - 90 ft-lbs
Bra	akes	.Dexter	12" x 2" H.P.
Hit	ch Extension	Sauber	Model 8818-B1
Pir	ntle Eye	.Holland	11144, 3" I.D.
Sa	fety Chain	.Sauber	8256ST 3/8" Grade 70 Chain Group w/ 8250ST Cru
	2		cifix Chain Traps – 26400# Breaking Strength
Cle	evis Slip Hook	.Sauber	17186, 3/8" -GR70 w/Latch
Tra	ansport Chain	.Sauber	15265 3/8" -GR70 Gold Chain – Galv -43"L w/Hitch
			Extension
So	lar System	.Sauber	Model 8852 - 2 Watt
Str	iping	3-M	# 29804-SP DOT-C2, 2"W Red/White
То	ngue Jack	.Sauber	10380 Spring-Loaded Drop Leg
Hy	draulic Valve	.Bucher	17853, 1-Section
Hy	draulic Selector Valve	.Sauber	13211, 20GPM Push/Pull
So	cket Housing	Sauber	13802 – SAE 6-Way Socket
Ju	mper Cord	.Sauber	11099, w/ 11121 7-Way plug both ends
Bre	eakaway	.Warner	10475 w/ Charging Circuit
Wł	neel Chocks	.Sauber	Model 8500 All Weather Wheel Chock
Ch	ock Holders	.Sauber	Model 8505 All Purpose Holder
Re	gistration Container	Truck Lite	16755
Gr	ounding Reel	.Driveze	18289 w/o cable, 15194 Bronze grounding Lug
Hy	draulic Cylinders	Sauber	11298, 11440, 11430
Bo	ggie Drive Tire Assy	.Sauber	11448
Sa	ddle	.Sauber	13085
Re	el Positioning Collar	Sauber	18596 w/10610 Sleeve

Components Sourcing Information



Tensioning Brake	.Sauber	.1602, Details to Follow
Retriever	.Sauber	.Model 1000, Details to Follow
Power Source	.Sauber	.1010-H, Details to Follow
Hydraulic Valve	.Bucher	.18245, 5-Section Valve for RF Control 2100 PSI
Proportional Flow Control	.Bucher	.18246 8 GPM Max Flow
Quick Couples	.Sauber	.11776 1/2" Fe FF, 11775 1/2" Ma FF
Ratchet Assembly	.Sauber	.10562 w/11172 2"W Strap
Wireless Remote/Receiver	.Sauber	.18244, BP-9H14 Hand Held Unit

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	TM / 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

Note: Most items listed here are in stock at Sauber Mfg. Co.



Maintenance

Operation	Interval
Torque Wheel Nuts - See Components Sourcing	- AxleAfter 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
Grease Tensioning Brake Hub	Monthly
Oil Drive Chain	Monthly
Tensioning Brake Factory Maintenance Includes:	Aprox 2500 hours of use
* Rotor inspection/machining	
* Brake lining replacement	
* Pivot pin inspection	
* Alignment	
* Dynamic brake load testing	
Check Cylinder Rods and Packings	Yearly
Check for Hydraulic Leaks	Daily
Check Linkage Control Cable	Daily

Power Source

Preface

Thank you for choosing Sauber Mfg. Co. Your new generation Power Source represents the state of the art in mobile hydraulic power. We welcome your suggestions on its improvement and stand willing to assist you if any questions arise during its operation. With a very small amount of maintenance, and by understanding its operation, your Hydraulic Power Source will provide you with years of good service. If we can help you in any way please contact your national account representative toll free:

Voice Communications: (800) 323-9147 Fax Communications: (800) 833-3264



Principle of Operation

Your power source is designed as a compact, reliable source of hydraulic power. It features the best power plant technology available. The vertical shaft engine is mounted directly to the power source cover. Beneath the cover a mounting bracket houses the hydraulic pump. The pump is driven through a flexible shaft coupling set. It draws oil from the tank bottom through a suction strainer. Pressurized oil is delivered through a manifold providing flow and pressure regulation prior to being delivered to the tool. Oil is filtered prior to returning to the tank.

Pre-Operation Checks

Prior to using your new power source, make a complete review of the engine information provided with this manual. After doing so, invest a few minutes prior to starting the power source to perform these simple checks:

- Fuel Level
- Engine Oil Level
- Recoil Rope Condition
- Air Cleaner Condition
- Hydraulic Oil Level and Condition
- Signs of Excessive Hydraulic Leaks

Engine Starting & Operation

To assure easy starting be sure the pressure and return hoses are connected to our Retriever or any tool that will allow oil to circulate to the system tank in neutral. The valve spools in these tools are commonly referred to as "open" or "tandem" center spools. An attempt to start the power source without this connection will result in an engine stall condition and will strain the engine and pump components. If the engine is cold, the choke will be required. On single cable systems, pull the throttle out as far as possible to engage the choke. Depressing the control will disengage the choke. If the choke is controlled separately, its function will be labeled. Pull the cable out to engage the choke, push in to disengage. On electric start models, engage the starter with the keyed switch provided or pull the recoil rope with the key switch in the "RUN" position.

When work is being done, the power source should normally be operated at full throttle. This will provide maximum power capability. The unit should be returned to idle or shut off when power is not required. This will help reduce system heat build-up and conserve fuel. Although the unit may be run at "mid-throttle" to conserve fuel or reduce noise, recognize that the engine will stall prior to reaching system relief pressure. Flow is also reduced anytime the engine is operated at less than full throttle or when the flow control knob is rotated counter-clockwise.

Use With Sauber Retrievers

Your power source was designed so that both Retrieving and Tensioning functions can be used without disconnecting hydraulic lines. Therefore, once the hydraulic lines are connected, they will need to be removed only to run other hydraulic tools. Sauber Retriever valves include an internal relief, therefore your power source relief should be set to the maximum level while operating Sauber Retrievers. Disengage Retriever when tensioning.

Use With Sauber Brakes

The power source will have no effect on brake unit operation. The power source can be off or running, connected or unconnected during brake operation.



Hydraulic Leaks

With any hydraulic system, some small amount of leakage and spillage are common; but, persistent leaks pose a problem from a clean-up and operation standpoint. When hydraulic oil is found, check the following areas:

Quick Couplers Tighten or replace as necessary; try dripless fittings if problem persists Tank Lid Remove tank lid and re-seal w/ new gasket and gasket compound Engine Mounting Remove tank lid and engine and re-seal w/ gasket compound Sight Gauge Remove sight gauge and replace O-rings or entire gauge Tank Drain Tighten drain plug Return Line Filter Tighten or replace filter Pressure Manifold Remove cover and tighten fittings or replace O-rings

Oil Filtration

Keeping the oil clean in your power source is one of the best precautions you can take to ensure maximum system life. There are three components to the filtration system. The sump strainer, located inside the tank, filters large particles introduced into the tank. The return line filter is located outside the tank. This filter has a back pressure gauge that shows relative filter effectiveness. As the filter becomes dirty and clogged, the dial will move into the red area of the gauge. This signals that a filter change is required. The third element of the filtration system is the fill/breather element. This filter is designed to keep large scale impurities from entering the tank during fill operations. Hydraulic oil works at peak performance when it is pure. Therefore change the oil and flush the tank if water or impurities inadvertently enter the system. A drain plug is provided at the base of the tank. Always change the return line filter with the hydraulic oil.

Oil Level/Temperature Gauge

At the power source side a sight gauge has been installed. This gauge shows the level of hydraulic fluid in the tank, its temperature and visual condition. Look for signs of impurities or water (cloudiness) in the glass. If found, refer to the oil filtration section above. On level ground, the optimal oil level is 1" from the top of the sight gauge. Over-filling the tank will result in leakage through the tank/lid seal. Low oil levels will cause increased system heat and may "starve" the pump resulting in loss of flow and pressure. Check the temperature gauge period-ically during use. Hydraulic oil temperatures should not exceed 250 degrees Fahrenheit. If this temperature level is encountered, we recommend an optional oil cooler for your system.

Pressure Gauge & Control

Your unit is equipped with a gauge that indicates operating pressure in pounds per square inch (PSI). While in operation, the system pressure gauge will indicate pressures between 50 PSI and the maximum pump pressure shown in the Components Sourcing Information section. The system pressure should correlate to the amount of work being done by the tool in use. If it appears that this relationship is not true, check for restrictions in the line or excessive heat build-up.



The maximum system pressure can be controlled by changing the relief setting at the side of the power source. Turn the relief screw counterclockwise to lower the relief setting. Rotating it clockwise will raise the relief setting. Always make certain the relief setting is set at least 100 PSI below the engine stall level. Many tools, including our Retrievers have their own internal relief. The lowest relief setting in the system will prevail. Set the power source relief at the maximum level unless you wish to limit maximum tool power or your tool does not have internal relief.

If the power source will not produce its rated pressure, check other reliefs in the system. Also check for blockage between the pump and the pressure manifold/gauge. In order to produce maximum pressure, the engine must be running at top performance. Any reduction in engine horsepower will reduce system pressure and/or flow. If engine performance is satisfactory, check the pump output.

Hour Meter

Your system is equipped with an hour meter. Use this meter to track service intervals shown in maintenance section.

Flow Gauge & Control

Tool speed can be controlled by the flow control knob located above the "Slower/Faster" placard. The flow can be read directly from the flow meter located on the instrument panel. Flow is indicated in liters per minute (LPM) and gallons per minute (GPM). For most applications full flow is recommended. Some tools, however, require specific flow rates for optimal performance. This information should be available from the tool manufacturer's documentation. Sauber Retrievers can be operated at flows up to 20 GPM and therefore can be run at full flow. If oil flow is at or near 0 GPM rotate the flow control clockwise until desired flow is restored. If flow does not respond, check the hydraulic oil level in the tank and ensure that the unit is not being operated on a slope exceeding 10 degrees. Finally, check the condition of the pump.

Components Sourcing Information

Item	.Source	Description /	Specification
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Pump	.Sauber	108134043 cu-in, 2250PSI @ 6 GPM
Engine	.Honda	513230 - 13 HP Vertical
Spark Plug	.Honda	1672443
Air Filter	.Honda	2910727
Engine Parts Manual	.Honda	4799771 - GXV390
Engine Owners Manual	.Honda	3118718 - GXV390
Paint	.Ditzler	DAR 72999 Red
Tank Base	.Sauber	1010-01 18 Gallon
Tank Cover	.Sauber	1010-02 18 Gallon w/ pump housing
Tank Gasket	.Buna	250" O-Ring Cord Stock
Gasket Compound	.Form-A-Gasket	Silicone Blue
Key Switch	.Pollak	33-104
Pressure Relief Block	.Catching	112989-DV
Flow Meter	.Headland	601-010
Panel Light	.Truck Lite	15009
Hour Meter	.Veeder Root	87F-1091
Quick Couplers	.Pioneer	8010-4/4050-4 ½" NPT



Pump Coupler	.Browning	L-095 x 5/8"
Engine Coupler	.Browning	L-095 x 1"
Coupler Insert	.Browning	.L-090/095
Throttle / Choke	.Morse Control	.438220-003-60
Sump Strainer	.Flow-Easy	.P-20-1.25 NUT-100-RV3
Filter Housing	.Gresen	.FSP-107IEDNX
Filter Element	.Gresen	.CL-22001
Sight Gauge	.Lube Devices	HSG-55
Pressure Gauge	.Headland	MPG-1-P-5000E
Back Pressure Gauge	.Gresen	.C112
Filler/Breather	.Filtration Prod	BF12
Hydraulic Oil	.Citgo	.# 32 Anti-Wear Premium
Motor Oil	.Citgo	.10W-30W All Season

Maintenance

Interval
Each Use
12 Months or 300 Hrs
12 Months or 300 Hrs
3 Months or 50 Hrs
6 Months or 100 Hrs
6 Months or 100 Hrs
12 Months or 300 Hrs
50 Hrs or at "Red" Gauge Reading
300 Hrs
100 Hrs
100 Hrs
6 Months or 100 Hrs.



All Bronze Brake & Retriever Parts Models 1602 & 1000

Reference	Item	Description
		Tensioning Brake Components
AA	10335	Brake Assembly Complete - specify for XX Dia Bar - 136 lbs
02B	10336	Set Linings - Small - 101282 (9.5" as measured around long side)
AB	10337	Tensioning Adjustment Assembly (includes items 03/04/05/06/07)
03	10338	Tensioning Adjustment Wheel
04	10341	Tensioning Adjustment Shaft
05	10342	Tensioning Adjustment Spring
06	10343	Tensioning Adjustment Nut
07	10344	Set Cup Washer w/ Insert
27A	10345	Bronze Disc w/ hub offset taper - 3/8" Holes - 26 - Current - Specify 3.50" or 3.75" hub diameter
27B	10346	Bronze Disc - 5/16" Holes - 26 - Prior 1994 - Specify 3.50" or 3.75" hub diameter
28A	10347	Inside Casting w/ 3.75" Bore - BC-1 - Current (specify reel bar diameter)
28B	10348	Inside Casting w/ 3.50" Bore - BC-1 (specify reel bar diameter)
28C	10349	Inside Slide Casting w/ 3.75" Bore - BC-1 (specify reel bar diameter) w/ 4237ST casting modifications for sliding brake mechanism
29	10350	Outside Casting - BC-2
30	10351	Clamp Casting - BC-3
32	10352	Right Caliper Arm - 101173RH
33	10353	Left Caliper Arm - 101172LH
34	10354	Brake Shoe Plate - 10179-L
35	10355	Brake Shoe Plate - 10179-R
36	10356	Stainless Steel Pin - Lower - 2.35"x.75"
37	10357	Stainless Steel Pin - Upper - 3.875"x.75"
62	10358	Upright Slide Casting - BRKS-1 w/ 4240ST machining (for sliding brake mechanism - not shown)
		Frame Components
AC	10359	Frame Assembly Complete - Includes Items 13/15/38
13	10360	A-Frame Weldment
14	10361	Set Uprights - 36"L
15	14689 14688	2 1/4" Generation II Saddle w/ Retainer 2 1/2" Generation II Saddle w/ Retainer
38	10363	Bronze Keeper Pin - Grooved - SP18 - (2) Required
\$59\$60	10364	Saddle Set Screw - Stainless - 44541
	10365	Saddle Retainer Clamp w/ Fastener - 1032ST (not shown)1/2" Grade 8 Bolt : 130-135 ft-lbs torque5/8" Grade 8 Bolt: 140-145 ft-lbs torque
	10240	Reel Dat Complete 72"O A L Indudes Itoms 16/17/19
	10340	Reel Dai Assembly Complete - 72 U.A.L Includes items 10/17/18
16	10300	
17A	10367	Reel Insert w/ Grounding Lug - RBD - 2749ST (4.25" OAL x .875" Dia)
17B	10368	Reel Insert - RBD2 - 3721ST (5.125" OAL x 1.25" Dia)
61	10369	Brass Set Screw 1.25" x.50" - 2545ST-1 (not shown)
18	10370	Reel Bar Knuckle



All Bronze Brake & Retriever Parts Models 1602 & 1000

Item	Description
	Reel Positioning Collar Components
1250	Hinge Collar w/ 1602-31A Sleeve - 2225ST
10384	Collar Casting w/ Hook - NHC1A
10385	Collar Casting w/o Hook - NHC1
10386	Threaded Shaft - 2229ST
10253	Bronze Bolt w/ Spacer & Retainer
10387	Tapered Insert Sleeve - 2.5"-3.4"
	Take-Up/Retriever Components
10388	Engagement Hub Assembly - Includes Items 47/50/51/52/53/54/58
10389	Motor Housing - Bronze - NBR-1
12430	Hydraulic Motor - Standard
10391	Hydraulic Motor - Turbo - 104-1143
10392	Hydraulic Motor - 2-Speed - 700-258-AS-0-SOL
10393	Directional Control Valve - AO-755-T4-JRS
11692	90-Degree SAE Fitting - Valve Top To/From Motor
11751	90-Degree NPT Fitting - Valve Top To/From Motor
11652	90-Degree SAE Fitting - Valve Side To/From Power Source
11801	90-Degree NPT Fitting - Valve Side To/From Power Source
10394	Tandem Spool for Series AO Valve - 3/4" - SF303T4
10395	Tandem Spool for Series 34 Valve - 5/8" - P1336
10396	Open Spool for Series AO Valve - 3/4" - SF3030
10397	Open Spool for Series 34 Valve - 5/8" - P1337
10398	Chain Guard - 1645ST
17077	Retriever Guard Attachment Rod
10550	Guard Attachment Fender Washer
10572	Guard Attachment Lock Washer
10757	Gaurd Attachment Nut
10400	Hose w/ Connectors - Specify Length
10401	Plate Gear - 36-Tooth
10404	Sprocket - 9-Tooth
10405	Chain w/ Full & Half Connectors - # 60x3' - 27 Links
10406	Outer Bronze Hub - 3/8" Holes - Current
10407	Outer Bronze Hub - 5/16" Holes - Prior 1994 - Specify 7/8" or 3/4"W slot
10408	Engagement Lever - 7/8"W - Current
10409	Engagement Lever - 3/4"W - Prior 1992
10410	Lever Seating Spring
10411	Lever Seating Ball
10412	Inner Bronze Hub - 3/8" Holes - Current
10412	Inner Bronze Hub - 5/16" Holes - Prior 1994
10414	Engagement Lever Knob - 6050K16
10572	Split Lock Washer 3/8 - 18-8
10072	Hey 3/8-16 x 2 1/2 C/S V7 GD8
	Item 1250 10384 10385 10386 10386 10387 10387 10387 10387 10387 10387 10388 10387 10388 10387 10388 10391 10392 10393 11692 11751 11652 11801 10393 10394 10395 10395 10396 10397 10398 10777 10550 10757 10400 10405 10400 10405 10406 10407 10408 10409 10409 10411 10412 10413 10414

Assembly drawing next page



All Bronze Brake & Retriever Parts Models 1602 & 1000





We Guarantee

Sauber Manufacturing Company guarantees satisfactory operation of its products and will refund the full purchase price to utility customers who are not fully satisfied.

We Warranty

We specifically warranty that our products will be free from any defective materials or workmanship when purchased. We will repair or replace, at our option, any part(s) that prove to be defective within the warranty period specified below. This warranty is voided only by evidence of misuse, and does not include shipping charges.

Sauber Manufacturing offers the industry's only 10-year, comprehensive, trailer warranty. This warranty comes at no charge to our customers, yet covers parts and labor on all Sauber manufactured components.

As a leader in the utility industry, we have the financial strength and have demonstrated the integrity necessary to honor our commitments. This expanded warranty is a clear extension of who we are, what type of equipment we build, and how we are investing in our future and yours.

- 10 Year Structural, Parts & Labor on all Sauber Manufactured components
- 10 Year Galvanized Finish Warranty
- 3 Year total Parts & Labor Coverage
- Retroactive total parts & labor coverage includes all trailers built after 04/01/2006
- All warranty support will be provided directly from Sauber Mfg. Co.
- Customer Labor Reimbursement @ \$65/hour
- A credit memo will be issued for claims under \$400 and can be applied to a credit card

For additional details about our warranties, contact your sales professional, and thank you for investing in Sauber Manufacturing equipment.

