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Product Information

This Service and Replacement Parts Manual applies to the following Bushman AvonTec machinery:

Product Type:	Scissors Lift Table
Model Number:	
Rated Load Capacity:	
Serial #:	
Registered User:	
Date Shipped:	

For warranty information, service, and replacement parts information; please call your local dealer or Bushman AvonTec at (800) 558-7850. Please have the above Product Information available when calling.

This manual should be kept with the machine at all times. In the event the machine is re-sold, or transferred to another facility, please contact the factory so that we can update our service and warranty records.

Responsibilities of Owners/Users

The following are the Responsibilities of owners and users of this equipment:

1. **Deflection.** It is the responsibility of the user/purchaser to advise the manufacturer in those cases where deflection may be critical to the operation.
2. **Inspection and Maintenance.** The lift shall be inspected and maintained in proper working order in accordance with the manufacturer's operating/maintenance manual and safe operating practices.
3. **Removal from Service.** Any lift not in safe operating condition shall be removed from service until it is repaired to the original manufacturer's standards.
4. **Repairs.** All repairs shall be made by authorized personnel in conformance to the manufacturer's instructions.
5. **Operators.** Only trained and authorized personnel shall be permitted to operate the lift. A copy of the service manual should be kept with the lift at all times so that it may be referred to by all operators.
 - A. **Before Operation.** Before using the lift, the operator shall have:
 - Read and/or have explained and understood, the manufacturer's operating instructions and safety rules, or be trained by a qualified person.
 - Inspected the lift for proper operation and condition. Any suspect item shall be carefully examined and a determination made by a qualified person as to whether it constitutes a safety hazard. All unsafe items shall be corrected before further use of the lift.
 - B. **During Operation.** The lift shall be used only in accordance with its intended use and within the manufacturer's limitations and safety rules.
 - (1) Do not overload the lift.
 - (2) Ensure that all safety devices are operational and in place.
6. **Safety Warning Labels.** It is the responsibility of the owner to maintain all safety warning labels in a clear, readable condition in the same positions as originally applied by the manufacturer. Contact the supplier for additional safety labels and information on their correct application and location.
7. **Modifications and Alterations.** Modifications or alterations of industrial scissor lifts shall be made only with the written permission of the original manufacturer. These changes shall be in conformance with all applicable provisions of the standard covering the safety requirements for Industrial scissors lifts and shall be at least as safe as the equipment was before modification. These changes shall also satisfy all safety recommendations of the original equipment manufacturer for the particular application of the lift.

Safety Instructions

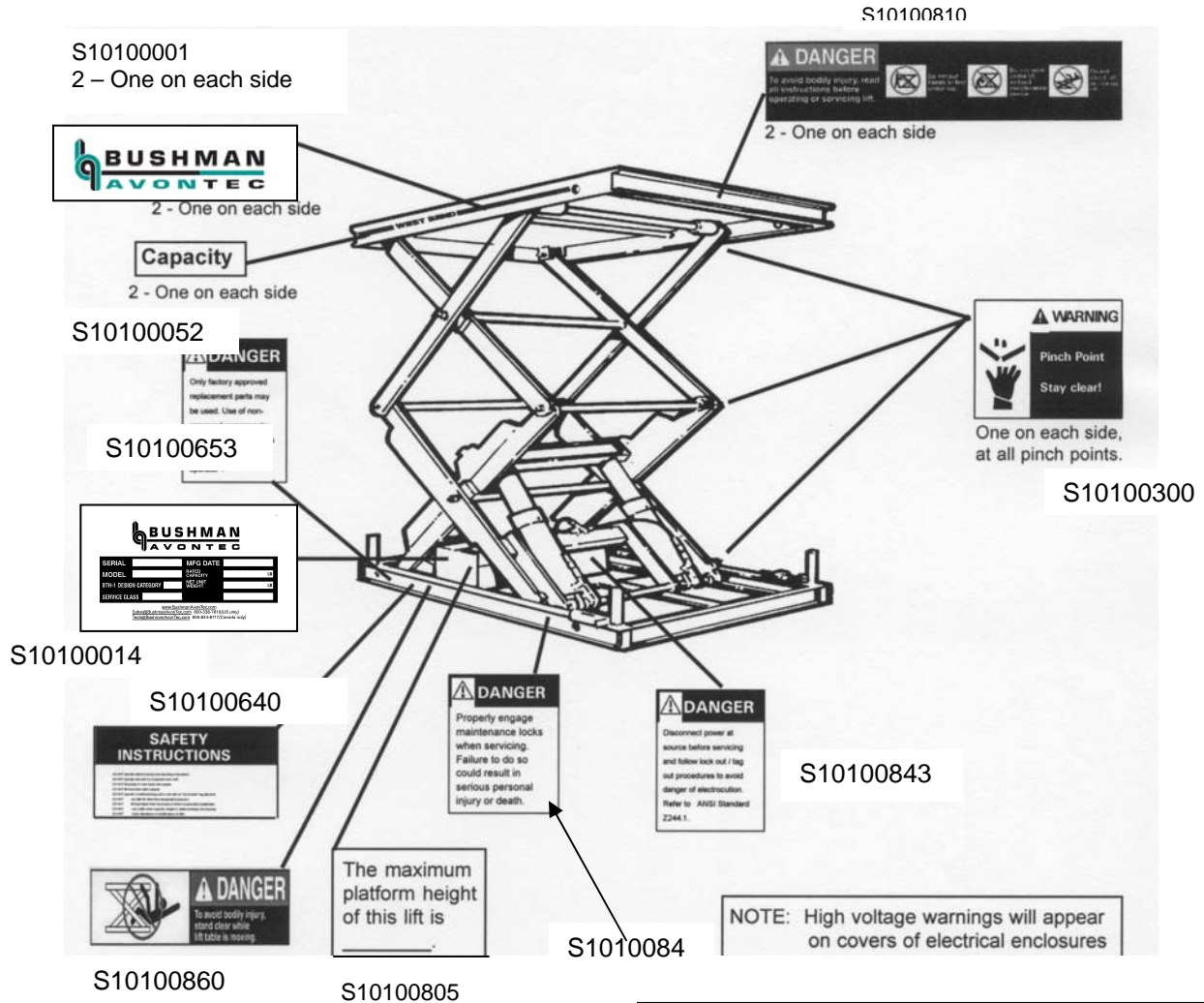
Safety Instructions for Hydraulic Scissor Lifts:

1. Do not operate this equipment unless you have been trained and authorized to do so.
2. Know and follow all of these warnings and instructions as well as those contained in the lift owner's manual.
3. Prior to using lift, inspect it for proper operation and condition.
4. Prior to using lift, inspect all safety devices to be certain they are in place and functioning properly.
5. Do not exceed the lift's capacity as stated on the serial number plate.
6. Center loads on the lift platform.
7. If load is mobile, secure load in a fixed position before operating lift.
8. Keep the entire load within the perimeter of the platform while lift is in motion.
9. Ensure that people and objects are clear of the areas beneath the platform and immediately surrounding the perimeter of the lift while lift is in motion.
10. Do not work under the lift without the maintenance device(s) in position. See owner's Manual for how to ensure the safe use of the maintenance device.



SCISSORS LIFTS STXS and Related Models

NOTE: High voltage warnings will appear on covers of electrical enclosures and junction boxes when motor controls are furnished.



All safety decals must be kept clean and legible and replaced when necessary. Call or send an email to Bushman Equipment to obtain free replacement decals.

Serial Number _____
 Date _____
 Customer _____

Installation Instructions

Installation Instructions for Hydraulic Scissors Lifts:

Unloading and positioning the equipment

1. Prior to installation, inspect the lift. If the lift has been damaged in shipment the responsibility of the buyer/owner to file a claim immediately with the carrier who delivered the lift.
2. Bushman AvonTec lifts are usually shipped completely assembled and ready to install. Installation of scissors lifts may be subject to local codes, rules and regulations, permits and inspections. Check local regulations before you install the lift.
3. The lift may be equipped with four lifting eyes bolted or welded to the base frame. Use these lifting eyes for unloading the lift and positioning it in its final location.
4. Ensure the lift is mounted on a stable surface. If the lift is mounted on an unstable surface, it may tip over when it is in use. This could result in severe personal injury or death, and damage to the unit and its payload. The mounting surface should be capable of supporting the maximum rated load of the lift, plus the net shipping weight of the lift itself. Refer to the shipping documents that come with the lift for the net weight of the equipment.
5. The lift should be securely fastened to the mounting surface. Lifts are usually supplied with “lag-down” holes. Make sure adequately rated and sized lagging bolts are used to secure the lift. If the lift is mounted on a concrete foundation, ensure that this work is done by a qualified contractor.

Hydraulic Installation

Lift with Internal Hydraulic Power Unit:

No hydraulic connections need to be made on lifts with internal hydraulic power units. When operating the lift for the first time, check to see that no leaks or other malfunctions occur before putting the lift into operation.

Lift with External Hydraulic Power Unit:

If hydraulic lines are supplied with this equipment, match up the numbered fittings on the hydraulic lines with the numbered ports on the hydraulic power unit manifold and on the lift manifold. When operating the lift for the first time, check to see that no leaks or other malfunctions occur before putting the lift into operation.

If hydraulic lines are not supplied with this equipment, appropriately sized hydraulic hose or piping should be installed between the numbered ports on the hydraulic power unit manifold and the lift manifold. Hydraulic lines should only be installed by a trained and qualified person. Incorrectly sized or installed hydraulic lines may result in improper hydraulic flow and could result in damage to the equipment, serious personal injury or death.

Electrical Installation**Electrical installation instructions for hydraulic scissors lifts:**

The lift's electrical circuits use voltages that can cause severe injury or death. **DO NOT WORK WITH THE ELECTRICAL PARTS UNLESS YOU ARE A QUALIFIED ELECTRICIAN!**

Protect the power unit and any electrical components from rain and moisture. If electrical components get wet, personnel may be severely injured or killed by electrical shock. Electrical parts may fail if they are wet. The lift's electrical components can create sparks. DO NOT install the lift, the power unit, or any controls in an area where potentially explosive dusts, gases or vapors may be present. Failure to comply with this warning may result in an explosion.

If the lift was ordered to operate on 110 volt, 60 hertz, single phase current, it is necessary to attach a power supply cord to an outlet box that can be found in the base frame. If the push button, toggle switch or foot switch control is shipped loose, this should be attached with a sufficient length of cord to reach the outlet box in the lift base. If the lift was ordered to operate on 60 hertz, 3 phase, either 208, 220, 440 or 550 volt, it is necessary to connect a power supply cord to the magnetic motor starter (see schematic drawing for connection point.) If the starter was supplied with the lift, it will be found under the lift if there is enough room to accommodate the starter. If the starter is under the lift, the power connection can be made to the starter or to the toggle box at quick disconnects on the toggle box, if provided.

The toggle box, push button, or foot switch, if not attached, should be attached to an outlet box in the base frame provided for this operating control.

If the starter is provided for remote mounting, it will be necessary to supply 3 phase power to the starter and then wire the starter to the motor under the lift. In most cases, the motor leads will terminate in an outlet box in the base frame, and the leads from the starter can be wired to this outlet box. If a control circuit transformer is provided with the magnetic starter, then additional control wires will be required from the transformer to an outlet box under the lift. These wires will pick up the limit switch, relays, and the push button, or foot switch, which also can be attached to this outlet box...

If the magnetic starter is not furnished with the lift and the operating current is 3 phase, 60 cycle, then a magnetic starter should be used to start the motor. Unless specified otherwise, all control circuit components furnished with the lift are 110 volt, 60 hertz, single phase and will require the addition of a control circuit transformer for the proper operation of these components.

After the starter and operating switch have been hooked up as above, and in accordance with the attached wiring diagrams, the equipment is ready to operate. The circuit breaker or disconnect switch (not supplied with the table), is closed, and the UP-DOWN control can be operated.

Load Capacity

Load capacity rating for hydraulic scissor lifts:

Bushman AvonTec lifts have the axle load capacity rating and serial number stamped on a metal plate attached to one end of the lift platform. Note that the serial number plate is only valid for the platform supplied with the lift in an unmodified condition. If you remove, replace or modify the platform, contact Bushman AvonTec to obtain a new serial number plate.

The capacity is a net capacity rating for a lift furnished with the standard steel deck. The relief valve of the pumping unit has been set to raise the weight of the deck, plus the rated capacity, plus any surface mounted equipment installed by Bushman AvonTec. Where gravity roller sections, special tops, etc. are installed on the lift, deduct the weight of these from the load rating to obtain the net capacity.

To prevent damage to the lift and/or severe personal injury or death, NEVER EXCEED THE RATED CAPACITY OF THE LIFT.



The net capacity is based on a uniformly distributed load. If the load is not uniformly distributed, then edge or axle loads must be considered.

Edge loads:

Edge load capacity ratings are the maximum amount of static load that can be applied to the edge of platform (side or end) when the lift is in ANY raised position. EDGE LOADS ARE 50% OF RATED CAPACITY.

Axle loads:

Axle loads are the maximum amount of rolling load, which may be applied to the loading edge (side or end) when the lift is in its RAISED position. AXLE LOADS ARE 25-50% OF RATED CAPACITY.

UNBALANCED LOADING

The net load capacity assumes that the product or material will be balanced (centered). This means that the center of gravity of the load should be positioned midway between the left and right scissor sections of the lifts. Refer to ANSI standard MH29.1 for further details. Allowances for unbalanced loads can be designed into these lifts. Consult the factory at (800) 558-7850, if uncertain.

Daily Operator Checks

Daily operator checks for hydraulic scissors lifts:

Before using the lift platform to raise equipment, the operator should perform the following checks.



1. Walk around the lift to see that the surrounding area is clear and to check that there will be no interference with the lift platforms movement on the sides or from above.
2. Check for any visible signs of damage or wear. Report any damage to an authorized service person, and do not use the platform until this condition has been corrected. Do not enter the area under the lift platform. See maintenance instructions.
3. Operate the lift platform through one complete lift and lower cycle. If any unusual vibration or noises occur during this initial use, report these immediately to a trained and authorized service person before using the lift platform.
4. Allow only authorized and trained personnel to operate the lift platform.

Operator Instructions

Operator instructions for hydraulic scissors lifts:

This equipment is provided with a 2-button pushbutton control pendant. The pendant provides controls to raise and lower the platform.

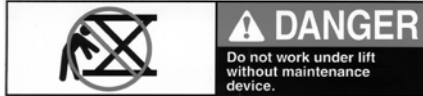
Raise/Lower

To raise the lift, depress the button marked "Up" on the control pendant. The lift will continue to rise until the operator removes pressure on the button, or the lift encounters the upper limit switch position.

To lower the lift, depress the button marked "Down" on the control pendant. The lift will continue to lower until the operator removes pressure on the button, or the lift encounters its lower down-stop position.

The hydraulic power unit on this equipment is provided with a pressure relief valve. The pressure on this valve has been set at the factory to provide sufficient hydraulic pressure to lift the maximum rated load for this equipment. Do not adjust or tamper with this valve. Doing so may damage the equipment and will void the warranty.

When operating the lift platform, it is important that the operator pay close attention to the platform. The platform should not be operated when any obstruction is under the platform.

Maintenance Instructions

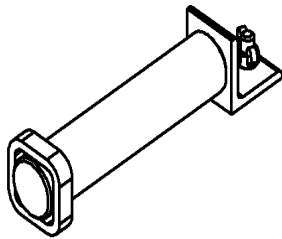
A falling lift can cause personal injury or death. Before working under the lift, RAISE THE LIFT AND ENGAGE THE MAINTENANCE DEVICE AS SHOWN IN THE DIAGRAM. Do this every time you work under the lift.

Securing the Lift for Maintenance and Repair

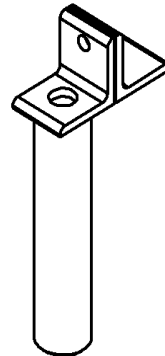
1. Remove all loads from the lift.
2. The lift has two maintenance safety devices or pins mounted in the base frame, one on each side of the lift - locate them.
3. Raise the lift to its maintenance position.
4. Place each of the safety devices in position.

NOTE: On some lifts it may be necessary to disable the "Up" limit switch so that the table can be raised sufficiently to position the maintenance stops. Disable the "Up" limit switch by removing the limit switch arm with an Allen-key or similar tool. Make sure there is no load on the table before performing this service, and replace the limit switch before returning the equipment to operating condition.

Shown outside of maintenance hole



Shown inside of maintenance hole



5. Lower the lift until the lower channel rollers or scissor arms are in contact with the safety devices.
6. Lock out tag out all lift controls using approved procedures to ensure that none of the lift controls may be used.
7. It is now safe to enter below the lift and perform routine maintenance procedures.
8. Do not attempt to remove or loosen center pivot pins, hinge pins or leg Rollers. Removing or loosening these parts could cause the lift to suddenly collapse, even if the maintenance device is engaged. If any of these components require service: Lock-out power to the lift and tag as unsuitable for service. Clear the area surrounding the lift. Remove all loads from the lift platform. Contact Bushman AvonTec at (800) 558-7850 for instructions.
9. After completing maintenance under the lift, reverse the above procedure to restore the lift to operational use.

Adjustments to Lift

Adjusting hydraulic scissors lifts:

1. Bushman AvonTec scissors lifts are shipped completely assembled, ready to install, and should not normally require adjustment prior to use.
2. In the event that the lift in the fully raised position is significantly lower, or significantly higher than the specified height shown in the approval drawing when the lift was ordered, it may be necessary to adjust the limit switch that controls the upward travel limit of the lift.

3. **Limit Switch Adjustment**

Limit switches have a certain amount of adjustment to them and can be adjusted to stop the lift's travel slightly before the limit of travel has been reached. This can be done by changing the position of the operating arm of the limit switch.

At no time should the limit switch be adjusted to extend the travel of the lift beyond the contract raised height, since continued operation in this position may cause damage to the hydraulic relief valve and to the hydraulic cylinder seals.

4. **Hydraulic Relief Valve**

The hydraulic and structural components of the lift are designed to handle a certain amount of pressure. The relief valve is set to relieve this pressure before it becomes too great. The relief valve has been included for the protection of all personnel who use the lift.

The hydraulic relief valve is pre-set at the factory to open approximately 100 p.s.i. above the maximum operating pressure of the system when the lift is carrying the rated load. It should not be necessary to adjust this valve. In the event that the lift is not operating correctly at its rated capacity, please contact Bushman AvonTec before attempting to make any adjustments to the relief valve. **DO NOT CHANGE THE SETTING ON THE RELIEF VALVE.** If the setting is changed, this may cause the lift to fail suddenly. Severe personal injury or death may result, and/or the lift and the payload may be damaged.

5. **Flow Limiters/Velocity Fuses**

DO NOT remove, adjust or tamper with the velocity fuses or flow limiters at the base of the cylinders. Tampering with them could cause the fuses to fail, which would prevent the fuses from slowing the descent of the lift in the event of a hose failure. A free-falling lift can cause severe personal injury or death to persons working in its vicinity, as well as causing damage to the lift structure and components.

Lubrication

Lubricating hydraulic scissors lifts:

1. The lift is equipped with aluminum-bronze bearings at all pivot points where components rotate, and the cam rollers in the scissor mechanisms are equipped with similar bearings or needle roller bearings.
2. All lubrication points are equipped with zerk fittings. They have a red plastic cap for easy identification of each lubricating point.
3. Under normal conditions of use, all lubricating points should be flushed with grease every three months. In addition to providing lubrication to the bearing surfaces, flushing with grease assists in removing dirt and other foreign matter from the bearings.
4. Recommended Grease: Sonoco Multi-Purpose 2 E P industrial grease or equivalent.

Hydraulic Fluid

Hydraulic fluid recommendations for standard lifts:

1. Replace the hydraulic oil filter (if provided) at least annually.
2. If the oil level in the reservoir should become low as evidenced by a noisy pump and the lift not reaching its full limit of travel, then oil should be added to the reservoir. The following hydraulic oil should be used: Medium M S Non- Foaming Approximately 330 Ssu Viscosity @ 100 Deg. F. With Anti-corrosion and Anti-oxidation Properties.

Some equipment may be supplied with special hydraulic fluid - see Technical Documentation at the back of this manual for further info.

Troubleshooting Guide

- 1) Lift will not rise:
Check electrical circuit. See electrical section. On new installations with 3-phase motors, if lift does not start rising in about 10 seconds, pump motor is probably running in reverse. Have a qualified electrician check motor connection and reverse power supply leads to correct pump rotation. Check oil level in hydraulic power unit reservoir. When the lift is fully raised, oil level should be about 1-1/2" above bottom of reservoir.
- 2) Lift will not lower:
Test solenoid valve coil. If voltage is correct, replace coil.
Check for mechanical restrictions blocking lift from lowering.
- 3) Lift rises slowly or only lifts a partial load:
Check voltage to pump motor under load. Low voltage affects capacity.
Check for foam in hydraulic reservoir. Foam is usually caused by air. Check for loose connections in suction line.
- 4) Lift settles slowly when down valve is not energized:
Operate lift up and down without load several times to flush down solenoid valve.
If lift continues to settle, replace down solenoid valve.
- 5) Lift does not reach maximum height:
With table top fully lowered, check for low hydraulic oil level. Add oil if necessary.
Check limit switch adjustment. See next section.
- 6) Lift does not operate smoothly:
Run lift up and down under load to purge air from hydraulic system.



Limited Warranty

Warranty for Hydraulic Scissors Lift Tables and Mechanical Screw Lifts

Bushman AvonTec will replace, F.O.B. the factory, any goods which are defective in materials and workmanship within 12 months of date of shipment, provided the buyer returns the defective materials, freight and delivery prepaid, to the manufacturer, which shall be the buyer's sole remedy for defective materials.

Manufacturer shall not be liable to purchaser or any other person or entity for consequential or incidental damages. The end user is responsible for the integrity of any structure, crane or fixture to which Bushman products have been attached. This warranty does not apply to equipment and/or components, which have been altered in any way or subjected to abusive or abnormal use, inadequate maintenance or lubrication, or use beyond seller recommended capacities and specifications.

Manufacturer shall not be liable under any circumstances, for labor costs expended on such goods or consequential damages. Manufacturer shall not be liable to purchaser or any other person or entity for loss or damage directly or indirectly arising from the use of goods or from any other cause.

No employee, agent, officer or seller is authorized to make further oral or written representations or warranty of fitness or to waive any of the foregoing terms of sale, and none shall be binding on the manufacturer.

If there are any problems or questions regarding this equipment or its application, contact your local sales representative or Bushman AvonTec directly at 262-790-4207.

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