



Hydraulic Upender Service and Operating Manual

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Hydraulic Upender Service and Operating Manual

Product Information

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

Product Type:	Hydraulic Upender
Model Number:	
Rated Load Capacity:	
Serial #:	
Registered User:	
Date Shipped:	

For warranty, service, and replacement parts information, please call your local dealer or Bushman AvonTec at (262) 790-4200.

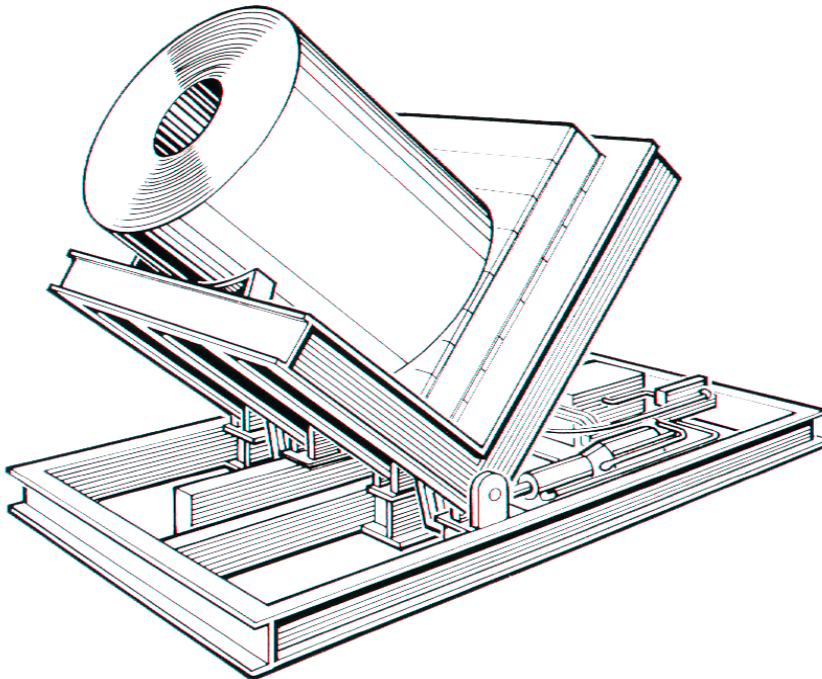
This manual should be kept with the machine at all times. In the event the machine is re-sold, or transferred to another facility, please contact the factory so that we can update our service and warranty records.

Hydraulic Upender Service and Operating Manual

Introduction

Congratulations on your purchase of a Bushman AvonTec hydraulic upender. When correctly installed, operated, and maintained, the hydraulic upender is a reliable and efficient means of turning large and heavy loads. Hydraulic upenders have been successfully used to turn products as diverse as large injection molds and rocket booster components, as well as their more common use as a tool for upending coils prior to mounting on a stamping line.

The Bushman AvonTec hydraulic upender is designed and built to provide many years of efficient service. As for any piece of industrial equipment, there are important safety rules to follow when installing and operating this equipment. This manual provides instructions for correctly installing, using and maintaining this equipment. Due to the customized nature of the equipment, some information may not apply to your upender. If you are not the first owner of this equipment, you should consult the factory before operating to ensure that its specifications are appropriate for the application.



Safety Instructions

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

Responsibilities of Owners/Users

Inspection and Maintenance

The machine shall be inspected and maintained in proper working order in accordance with the manufacturer's operating/maintenance manual and safe operating practices.

Removal from Service

Any machine not in safe operating condition shall be removed from service until it is repaired to the original manufacturer's specifications.

Repairs

All repairs shall be made by authorized personnel in conformance to the manufacturer's instructions.

Operators

Only trained and authorized personnel shall be permitted to operate the machine.

Before Operation

Before using the machine, the operator shall have:

- 1.) Read and/or have explained and understood the manufacturer's operating instructions and safety rules, or be trained by a qualified person.
- 2.) Inspected the machine 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 machine.

During Operation

The machine shall be used only in accordance with its intended use and within the manufacturer's limitations and safety rules.

- 1) Do not overload the machine.
- 2) Ensure that all safety devices are in place and operational.

Modifications and Alterations

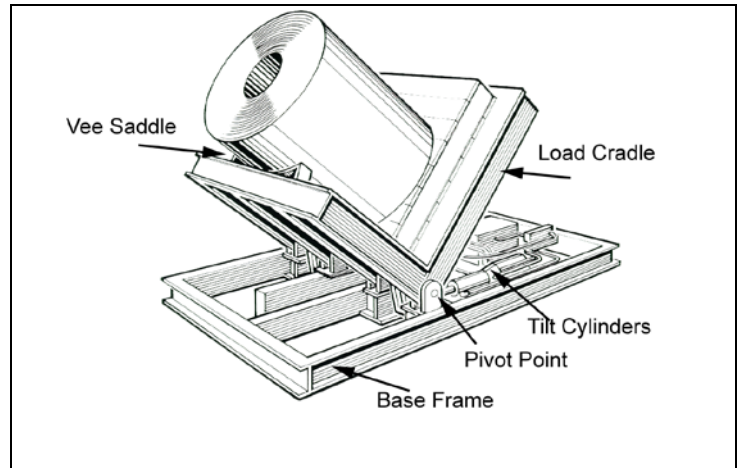
Modifications or alterations of machinery shall only be made with the written permission of the original manufacturer. These changes shall be in conformance with all applicable standards and shall render the equipment at least as safe as it was before modification. These changes shall also satisfy all safety recommendations of the original equipment manufacturer for the particular application of the machine.

Hydraulic Upender Service and Operating Manual

Description of Equipment

Hydraulic upenders consist of two square or rectangular platforms welded at 90 degrees to each other to form a load cradle. Mounted below the junction of the two platforms are the pivot ears of the cradle.

The base frame of the upender is usually constructed of welded steel channel and tube sections. Located in the center of the equipment are the support ears. Steel shafts or axles, pressed through the support ears and pivot ears form the “pivot point” of the upender. One or more double-acting hydraulic tilt cylinders are used to rotate the platforms through 90 degrees. Usually the blind end of the cylinder is attached to the base frame, and the rod end is connected to crank ears, mounted on the upending cradle.



Upenders often have a V-saddle mounted on one of the platforms. The purpose of the V- saddle is to receive coil or roll product, and to support it during the rotation process. A slot is frequently provided between the V-saddle and the opposite platform to provide space for the pallet or skid.

Some upenders are supplied with a coil horn in place of a flat platform to support coils in the “eye-to-the-wall” orientation.

The hydraulic upender is provided with hard “down stops” to provide a rest for the platforms at each extreme of its rotation. The “down stops” are usually capped with nylon pads to prevent metal-on-metal contact. Additionally, electrical limit switches cut off hydraulic flow to the tilt cylinders once the limits of rotation have been reached.

Operation of Equipment

Hydraulic upenders are usually used to transfer coils and rolls from an "eye to the wall" position to an "eye to the sky" position, or vice versa. They may also be used to palletize or de-palletize products, or for performing maintenance on dies or other tooling fixtures.

Normal operation consists of placing a pallet against the vertical platform surface, nesting the edge of the pallet into the slot between the end of the V-saddle and the vertical platform surface. The coil or roll material is then brought to the machine and placed on the platform with the V-cradle. A variety of material handling equipment may be used to accomplish this task.

When the coil material is safely seated on the V-saddle platform, the rotation push button is activated and the machine is rotated through 90 degrees. The coil may then be removed together with the pallet on which it is resting. The equipment may also be used in the reverse mode to take material from a pallet and reorient it for further processing.

The power to rotate the cradle is provided by means of a hydraulic power unit, usually mounted within the base frame. An electric motor is used to drive a hydraulic pump that generates hydraulic pressure. This hydraulic pressure is directed by means of solenoid valves to either the rod or blind ends of the double-acting tilt cylinders to control the direction of rotation. Electrical limit switches, positioned in the base frame, limit the total rotation of the unit, usually to 90 degrees, and prevent over-rotation of the cradle.

In "dead-man" type units, the push button control switch must be held down for the time necessary to rotate the load. If the push button is released before the limit switch is activated, the cradle and load will stop at an intermediate position. Once the limit switch stops rotation, the machine cannot be rotated any further in that direction. Pushing the other button on the control pendant will then cause the machine to rotate in the opposite direction.

Installation

Unloading

This machine may be equipped with four lifting brackets attached to the base frame. Use these lifting brackets for unloading the machine and positioning it in its working location.

If lifting brackets are not provided, lift the upender by using four slings around the base frame of the machine, ensuring that they lift the machine at each corner of the base frame.

Installation

Bushman AvonTec upenders are shipped completely assembled and ready to use.

1. The upender should be bolted in position prior to use. The base frame is provided with four or more lag-down brackets for this purpose. Use appropriately sized Grade 8 bolts or equivalent to ensure that the machine is mounted firmly in position.
2. If the machine has a remote mounted power unit, it may be necessary to connect this to the hydraulic manifold in the base of the upender hydraulic ports on the power unit and in the hydraulic manifold will be identified. Make sure that the correct ports are connected together with the hydraulic lines supplied or provided by the installer.
3. If the machine has a remote mounted power unit, it may be necessary to connect the machine control circuit of the upender to the power unit. A junction box in the base of the upender has a numbered terminal strip with the connections from the machine. These must be connected to the similarly numbered terminals in the power unit control box. An electrical schematic can be found in the electrical section of this manual.
4. The electrical control box on the power unit must be connected by a qualified person to a power disconnect switch following applicable local and national electrical codes. Connect the power leads to the magnetic motor starter. If the pump runs in reverse, it may be necessary to reverse the L-1 and L-3 leads. If the control pendant is furnished loose, it must be connected.
5. Once the unit is connected electrically, the hydraulic circuit should be checked to see that all hydraulic lines are charged with fluid and that there is sufficient fluid in the reservoir on the power unit.
6. When all hydraulic lines have been charged, the unit may be operated using the control pendant. Ensure that all air is purged from the hydraulic system before attempting to load the machine.
7. Most upenders are supplied with constant pressure type, controls that require the operator to keep the "UP" or "DOWN" button depressed throughout the upender operation. If the upender is furnished for maintain operation, the pushbuttons activate the machine, and holding the button is not necessary. The machine then travels to its limit and stops.

Operation

After the starter and operating switches have been connected as above, and are in accordance with the attached wiring diagrams, the upender is ready to operate. The circuit breaker or disconnect switch (not supplied with the upender) is closed, and the UP-DOWN control can be operated. Most, upenders are furnished for deadman type operation. The operator keeps the UP-DOWN button depressed throughout the 90 degrees of travel. The upender will stop when the button is released. Once the rotating platforms have reached the end of their cycle, they engage a limit switch, which prevents further rotation.

If the upender is equipped for maintaining operation, the operator merely depresses the UP or DOWN button and then releases it and the upender will travel 90 degrees until it reaches its limit of travel, or until the operator depresses the STOP button, at which time it will stop.

Hydraulic System Pressure

Hydraulic upenders are rated so that the maximum rated load can be safely turned. The maximum rated load is expressed at a stated "Load Center". Usually the load center is expressed as one half the length of the longest platform on the upender. For example, an Upender rated at 10,000 pounds with the longest platform being 72" inches, can safely turn a load of 10,000 pounds. The center of gravity of the load must be located no more than 36" from the opposite platform. The upender is factory tested at its maximum capacity, and the pressure relief valve is set at a maximum allowable value. This valve should NOT be adjusted without written authorization from the factory.

Using your Upender

Upenders supplied to upend coil materials are usually supplied from the factory with a V-saddle installed on one of the platforms. The purpose of this V-saddle is to prevent sideways rolling of the circular cross-section material when it is in the core-horizontal position. If the unit is being used for down-ending, this platform will be the unload platform.

Units supplied without V-saddles can be used with either platform as the unload or load platform.

The normal downending procedure is to place the material to be downended onto the platform using either a forklift truck or an overhead crane. On units with a v-saddle, make sure that the load is correctly nested into the v-cradle. In most cases, this will ensure that the load is centered on the load platform. On units without a v-saddle, visually check that the load is centered on the platform.

WARNING!!

Before operating the upender, be sure that you have read and understood the safety instructions found in this manual.

Operating the Upender

- 1.) Make sure that the load is centered, correctly positioned and secured to the platform. Make sure the load does not hang over any side of the platform.
- 2.) Use the "UP" or "DOWN" buttons to activate the machine. It may be necessary to hold the push button to have the motion continue. The platform will continue to move until it has reached its stops and activated a limit switch.
- 3.) DO NOT leave the upender platform in an intermediate tilted position. If this is necessary, ensure that the correct procedures are used to avoid persons being too close to the upender or where they may be struck by the upender when motion is started again.

Operating Conditions

The upender should rotate smoothly, and without any scraping or banging noises. If any of these conditions are noted, the operator should immediately discontinue use of the equipment until it has been checked by qualified maintenance personnel. Jerking motions or scraping and banging noises are indications that the unit is not operating correctly, and requires maintenance. Never place any part of the body inside the upender while it is operating, or without first placing the maintenance pin in the locking position or properly blocking the table so it does not move.

In situations where you wish to upend a load that is not unitized (e.g. a pallet load of multiple cartons, etc.) make sure that the load is secured and banded prior to upending. Do not place and straps or chains across the rolling surfaces of the upending platform.

Safe Operating Procedures

Ensure that all operators and maintenance personnel working with the equipment have read and/or had explained, and understood these safety instructions before operating or performing work on the equipment. Failure to heed these instructions can possibly lead to severe personal injury.

1. Keep clear of the machinery at all times, and particularly when it is operating.
2. Do not climb or ride on the machine.
3. Ensure that all safety guards and limit switches are in place and are in working order.
4. Do not enter area under the machine unless the machine has been electrically locked and tagged out, and the moving cradle has been placed and blocked in the "balanced" position. The "balanced" position is when the moving cradle is halfway between its two end positions, i.e. the cradle platforms are at a 45 degree angle to both the vertical and the horizontal.
5. Never remove the hydraulic tilt cylinder(s) or any other component of the drive system without first ensuring that the moving cradle is in the "balanced" position and blocking it in this position. The cradle is held in the vertical and horizontal position by the cylinder(s). When the cylinder(s) or other hydraulic or mechanical component, the cradle will move rapidly to a "rest" position, and could cause serious injury to any person close to it.
6. Should it be necessary, for operational reasons, to be on one of the cradle platform surfaces, always use the correct ladders, safety harnesses, and other safety equipment necessary to protect persons from falling from unprotected heights.
7. Do not bump the cradle with the product being rotated, or with cranes, crane hooks, or lift trucks. Shock loads may cause failure of the tilt cylinders, pivot bearings or other components and could cause unexpected movement of the cradle and injury to persons.
8. Never try to lubricate moving machinery. Ensure lock-out and tag-out procedures are used before all lubrication and maintenance.
9. Do not adjust or otherwise tamper with the hydraulic pressure relief valve. This component should only be adjusted by trained service personnel, with written authorization from the factory.
10. Use extreme caution at all times when loading and unloading the machine to ensure that the load is always in a secure mode. Ensure that coils/rolls are correctly seated in the V saddle before removing cranes, slings etc.
11. Do not overload the machine. See the rated capacity on the serial plate.
12. Do not rotate loads that project over front edge of the cradle platform. Ensure that loads are centrally placed and even from side to side.

Maintaining Your Upender

Never perform any maintenance on your upender without bringing the platforms to the balanced position, blocking the machine and inserting the maintenance pin or properly blocking the table so it does not move!

Daily Operator Checks

1. Walk around the upender to see that the surrounding area is clear, and to check that there will be no interference with the tilting platforms 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 upender until this condition has been corrected.
3. Operate the upender through one complete cycle. If any unusual noises or conditions occur during this initial use, report these immediately to a trained and authorized service person before using the upender.

Maintenance

1. **DANGER!** Before performing any maintenance or repair work on this machine block the machine to keep the lift platforms in position.
2. Remove all loads from the machine.
3. Rotate the machine until it is halfway through the upending stroke. Block the platforms securely using wooden or similar beams.
4. Lock and tag out all machine controls using approved procedures to ensure that none of the machine controls may be used. It is now safe to enter below the machine and perform routine maintenance procedures.

Lubrication

The machine is equipped with oil-impregnated sintered bronze bearings (or similar) at all pivot points where components rotate. These points do not require re-lubrication. Other lubrication points may be identified by grease zerk fittings having a red cap. All lubrication points should be flushed with grease every two months. In addition to providing lubrication to the bearing surfaces, flushing with grease assists in removing dirt and other foreign matter from the bearings. The recommended grease is SUNOCO Multi-Purpose 2 E P Industrial grease or equivalent.

Limit switch adjustment

The limit switch has a certain amount of adjustment in it and can be adjusted to stop the platform movement slightly before the limit of travel has been reached. This can be done by changing the position of the operating arm on the limit switch. At no time should this be adjusted to extend platform movement beyond the 90 degree limit of travel, since this would result in damage to the hydraulic system.

Hydraulic System

The relief valve is pre-set at the factory and requires no further adjustment.

Hydraulic Filter

Replace the hydraulic filter at least annually.

Hydraulic Oil

Check the oil level in the reservoir once a month. Add as needed. Recommended oil is Medium M S Non-Foaming 200 SSU Viscosity @100 degrees F with Anti-Corrosion and Anti-Oxidation properties.

Warning!!

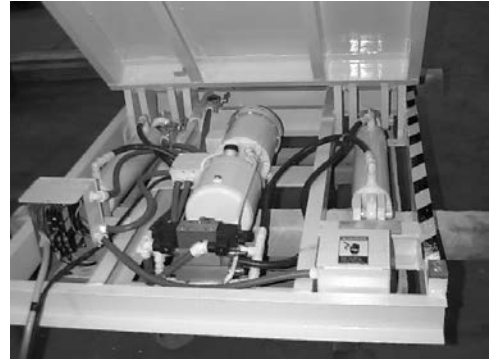
Failure to remove locking pin before restoring power can result in damage to the upender.

Recovery Procedure

The hydraulic power unit for this upender is located underneath one of the platforms. In most cases, it will be possible to perform routine maintenance by raising the platforms to the balanced (45°) position and locking the cradle in this position. However, should the upender become inoperable with the short platform in the "down position," access to the hydraulic power unit is restricted.

In order to gain access to the hydraulic power unit, it will be necessary to raise the platforms to the balanced 45° position by using a hoist or other lifting mechanism. Before attempting to raise the platforms, it is necessary to release the solenoid valve in the hydraulic power unit. This is accomplished by taking a short metal rod (an Allen wrench or similar) of $\frac{3}{16}$ inch diameter and pressing it into the end of the solenoid valve to release the spring. It is necessary to press and hold both the left and right solenoids to raise the lift.

The solenoid valves are located, as shown at right, in the center of the end of the short platform. It should be possible to reach into the machine to gain access to the solenoid valves, even with the platform fully lowered.



⚠ WARNING

Make certain that there are no loads on the platform, and that the platforms are otherwise secured, before attempting any service on the machine.

DO NOT ATTEMPT ANY SERVICE ON THE HYDRAULIC POWER UNIT WITHOUT FIRST SECURING THE PLATFORMS.



Hydraulic Upender Service and Operating Manual

Statement of Limited Warranty

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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