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Product Information

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

Product Type:	Mechanical Turntable
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.

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.

Introduction

Congratulations on your purchase of a Bushman AvonTec mechanical turntable. When correctly installed, operated, and maintained, the mechanical turntable is a reliable and efficient means of turning large and heavy loads. Mechanical turntables 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 positioning loads.

The Bushman AvonTec mechanical turntable is designed and built to provide many years of safe and efficient service. Like any piece of industrial equipment, there are some 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 turntable. If you are not the first owner of s 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 turntable inspect it for proper operation and condition.
3. Prior to using turntable, inspect all safety devices to be certain they are in place and functioning properly.
4. Do not exceed the turntable's capacity as stated on the serial number plate.
5. Center loads on the turntable platform.
6. If load is mobile, secure load in a fixed position before operating turntable.
7. Keep the entire load within the perimeter of the platform while turntable is in motion.
8. Ensure that people and objects are clear of the areas beneath the platform and immediately surrounding the perimeter of the turntable while it is in motion.
9. **DANGER!** Do not work on the turntable drive without the using lock-out tag-out procedures for the electrical power.

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 operational and in place.

Modifications and Alteration:

Modifications or alterations of machinery shall be made with the written permission of the original manufacturer. These changes shall be in conformance with all applicable standards 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 machine.

Description of Equipment

Mechanical turntables consist of a round upper platform made in three sections. The upper platform mounts to the base assembly with an alignment weldment and a center pin. The pin also locates a thrust bearing. The turntable rotates about the center pin with a roller chain and sprocket on the motor driven gear reducer.

Operation of Equipment

Mechanical turntables are usually used to allow loading of a motorized cart from one side and rotating the cart 90 degrees to allow for unloading.

When the cart is safely seated on the platform, the rotation push button is activated and the machine is rotated through 90 degrees. The cart may then be removed. The equipment may also be used in the reverse mode to load another cart.

The power to rotate the platform is provided by an electric motor that drives a sprocket through a reduction gearbox. The sprocket engages on a chain or chains that are securely held in a circular path around the rolled channel on the machine. The turning of the sprocket causes the platform to turn. Electrical limit switches positioned in the cradle limit the total rotation of the unit, usually to 90 degrees, and prevent over-rotation of the turntable.

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

The Bushman AvonTec mechanical turntable is shipped with the center turntable section assembled to the base and rolled channel assembly. The bolt on turntable sections and outer roller assemblies (4) are shipped loose. If the unit is to be pit-mounted, an appropriate size pit should be prepared before moving the unit into position.

Note: the center table section is a loose piece that sets on the base and is located with a center pin. Lifting the center table section with its lift-lugs will not lift the base.

Careful consideration should be given to placement of the turntable within the plant. It should be placed on a level, dry floor, of suitable strength to bear the weight of the equipment and its load. There should be sufficient space to allow the unit to be loaded and unloaded during operation. Consideration should also be given to the placement of the power supply cable and control box cord. Severe personal injury and or death can result if electrical cables are cut accidentally. Sufficient overhead clearance should be provided so that the largest potential load can rotate freely.

Turntable base and outer roller assemblies are supplied with lag-down holes in the base plates to anchor unit to the floor. The turntable and outer roller assemblies must be placed on a level, flat and solid surface or damage to the rolling surfaces and drive system will occur. Unit should be level $\pm 1/32"$. The more accurate the leveling, the better the unit will operate.

The turntable may be transported through the plant by these methods:

1) Lift-eyes are provided at each corner of the turntable base. An appropriately rated chain may be attached to each lift eye and the unit may be moved via overhead cranes or hoists. **These lift eyes can be used to lift base only or can be used to lift base and center table assembly at one time.** Refer to Manufacturer Plate on base of turntable or assembly drawing for weight information.

2) Lift-lugs are also provided on the center table section (4) and on the bolt on table sections (2 each). **The lift-lugs on the bolt on sections can only be used to lift the bolt on sections. The lift lugs on the center section can be used to lift the complete turntable platform (both center and bolt on sections).**

Voltage Requirements:

The turntable is designed to operate on a variety of power supply voltages. The Bushman AvonTec turntable uses a multi-voltage motor; however, it is shipped with overload protection heaters appropriate to the operator requirements as specified to the factory at the time of order.

If the unit is connected to a power supply with a different voltage to that originally specified to the factory, replacement overloads should be installed prior to operation. Failure to install correct overloads will result in upender failure, and can result in damage to the upender and possible serious or fatal personal injury.

Remote Motor Starter:

If the starter is mounted externally, it will be necessary to supply 3-phase power of the appropriate voltage to the starter, and then wire the starter to the motor in the base frame. 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. A control circuit transformer is provided with the magnetic starter and additional wires will be required from the transformer to an outlet box in the base frame. These will pick up the limit switch and the push button, which can be attached to this outlet box.

Operation:

After the starter and operating switches have been connected as above, and are in accordance with the attached wiring diagrams, the turntable is ready to operate. The circuit breaker or disconnect switch (not supplied with the turntable) is closed, and the CW_CCW control can be operated. Unless specified otherwise, all turntables are furnished for dead man type operation where the operator keeps the CW-CCW button depressed throughout the 90 degree travel. The turntable will stop when the button is released. Once the rotating platform has reached the end of its cycle, it engages a limit switch, which prevents further rotation.

If the turntable is furnished for maintaining operation, the operator merely depresses the CW or CCW button and then releases it and the turntable will rotate 90 degrees until it reaches its limit of travel, or until the operator depresses the STOP button, at which time it will stop.

Refer to the electrical wiring diagram for connection to the power supply. Check for correct polarity.

DISCONNECT AND LOCK – OUT POWER SUPPLY PRIOR TO INITIAL POWER CONNECTION OR SERVICE TO ELECTRICAL COMPONENTS.



Using your Turntable

The normal rotation procedure is to place the material to be rotated onto the platform using the motorized cart. Make sure that the load is correctly located and pinned to the table. In most cases, this will ensure that the load is centered on the load platform.

WARNING!

1. Do not place loads on the turntable which overhang the end of the turntable platform or exceed the rated load capacity of the machine. Doing so places extreme stress on the motor, gearbox, and chain, and can cause breakage of these components, and severe personal injury or death.
2. Once the load to be rotated is in place, you may begin rotating the platform. The operator should ensure that the area around and underneath the machine is free of obstructions, and that persons in the area stand clear. The operator should then depress the appropriate push-button to begin rotation. Most turntables are supplied with "deadman" type operation. In these cases, it will be necessary to keep the button depressed until the platform has reached the desired rotation angle. At the end of its cycle, the platform engages a limit switch that halts further rotation. At this point, the load may be removed from the platform.

Operating Condition:

The turntable 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 motion 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 turntable while it is operating.

Chain Breakage:

Should the chain break during operation, do not attempt to service the machine until the load has been removed and the platform removed. Chain breakage is usually an indication that the platform is not rotating freely because of damage to the frame, rollers, or because of loading in excess of the stated capacity. Do not replace chains until the cause of the breakage has been determined and corrected. If the breakage is found to be because of overloading, contact the factory regarding possible upgrading of your existing turntable.

Safe Operating Procedure

Ensure that all operators and maintenance personnel working with the equipment have read and/or had explained, and understand 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.
5. Never try to lubricate moving machinery - ensure lock-out and tag-out procedures used before all lubrication and maintenance.
6. Keep rotator chain(s) correctly adjusted to prevent excess wear and stress on the drive system – see section under "chain adjustment" for instructions on adjusting chain(s).
7. Use extreme caution at all times when loading and unloading the machine to ensure that the load is always in a secure mode and pinned to table before rotation.
8. Do not overload the machine - see the rated capacity on the serial plate.
9. Do not rotate loads that project over front edge of the table platform.

Maintaining your Turntable

Daily Operator Checks:

1. Inspect the machine to ensure that all guards and limit switches are in place.
2. Check to see that the platform is square and parallel to the floor. If this is not the case, a caster wheel bearing may have failed. DO NOT operate machine, and request maintenance assistance.
3. Before loading the machine, operate the unit unloaded through one complete cycle. Observe rotation and smoothness of operation. Report any unusual observations and/or noises, and DO NOT operate machine until it has been checked and repaired.
4. Check control power cord for wear.

During normal operation of the machine, report any unusual observations and/or noises that may suddenly occur report these, and DO NOT use the machine until it has been checked by a qualified person.

Quarterly Maintenance:

The following should be performed at least quarterly by qualified maintenance personnel:

- 1) Check chains and drive components (sprockets, bushings, etc.) for wear and correct adjustment. See instructions for adjusting chains.
- 2) Check oil level in gear reducer. If necessary, bring oil to correct operating level. See section in manual covering gear box.
- 3) Check caster wheels for wear.
- 5) Adjust spring-load motor brake if necessary - see details in section on brake
- 6) Check all electrical cords and components for wear.

Lubrication:

Bearings are found in all members that rotate during operation around a fixed shaft or in the rollers that support the rotating table assembly. At the same time, the oil level in the gear box should be checked. Please consult the lubrication and maintenance information for the gearmotor that is included at the end of this manual of this manual.

Chain Tensioning & Replacement:

These turntables are driven by a powered sprocket turning a chain that is fixed to a circular rolled channel on the center of the turntable. It is necessary to maintain adequate tension in this chain and not to allow it to become slack. Slackness in the chain will result in excess wear and shock loads on the drive system.

The chain is correctly adjusted when it is held snugly against its circular rolled channel. If the chain can be pulled away from the rolled channel, then it is too loose and requires adjustment.

Adjustment Procedure:

Remove the table platform to expose the rolled channel assembly. Disconnect power to the turntable using the correct lockout procedures.

Check anchor bolt adjustment range at the end of the chain. All bolts should have approximately the same amount of thread showing through the anchor nut. If this is not the case, loosen one end and tighten the other until the thread showing is approximately equal.

Tighten both anchor bolts equally until the chain is just snug against the rolled channel. There should be no droop in the chain, and it should not come away from the channel web when pulled at 90 degrees to the plate. The chain should still have some flex in it, if not it is over-tensioned.

Restore power and observe operation of the rolled channel assembly. The channel assembly should rotate evenly about the center pin without a tendency to move to one or the other direction.

Chain Replacement:

Should it ever be necessary to replace chain, due to either wear or breakage, and then follow the procedures above, ensuring that chain anchor bolts are correctly adjusted when the new chain is installed.

Limit Switches:

Bushman AvonTec turntables are equipped with three limit switches. Adjustable limit switch stops are located at each end of the 90 degree travel. The adjustable limit switch stops are set at the normal stopping position, which stops the platform. If the platform should begin to stop slightly short of 90 degrees or slightly beyond 90 degrees, the limit switch stops should be re-adjusted to suit. The third limit switch is set to indicate when the cart locking pin is engaged into the table.

Contact the factory for replacement limit switch information. Do not operate the turntable the limit switches are operating correctly.

Statement of Limited Warranty

Bushman AvonTec will replace, F.O.B. the factory, any goods that 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 or 800-338-7810.