



**Cooper Equipment Inc.**  
Densification Technology



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## **BULK BED MODEL 2100**

# **Operation, Service, and Maintenance Manual**

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## **INTRODUCTION**

The Cooper Equipment Bulk Bed 2100 is a highly efficient and durable system for carrying farm produce. The easy operation of this Bulk Bed and the safety features make it a desirable piece of farm equipment.

The Cooper Equipment Bulk Bed 2100 uses Power Take Off (PTO) technology with hydraulic lifts to open the side dump door, the rear discharge door, and the conveyor belt. No electrical components are required for discharging product.

The Bulk Bed 2100 is covered by Cooper Equipment's standard warranty, which is determined by the customer's contract. Cooper Equipment must approve all warranty service prior to it being performed.

All inquiries regarding the Bulk Bed 2100 should be directed to:

Cooper Equipment, Inc.  
227 W. 20 S. Knox Drive  
Burley, Idaho 83318  
(208) 678-8015  
(208) 678-0169/FAX.

## **MODEL 2100 BULK BED SAFETY CONSIDERATIONS**

The owners and operators of the Cooper Equipment, Inc., Bulk Bed machinery are responsible for the safe operation, service and maintenance of their equipment. All operators and anyone performing service or maintenance on the Bulk Bed must be trained in the operation, service, and maintenance procedures and other related SAFETY information contained in this manual.

**⚠ WARNING OBSERVE ALL SAFETY PROCEDURES, WARNINGS AND SYMBOLS!**

**NOTICE** All operators and maintenance personnel must receive annual training from their employer annually to comply with OSHA CFR 1928.57. It is the employer's responsibility to insure that all individuals associated with the Bulk Bed 2100 read, understand, and comply with operating and safety instructions discussed in the OSHA standards and this manual.

**⚠ WARNING MODIFICATION OF BULK BED EQUIPMENT WITHOUT AUTHORIZATION FROM COOPER EQUIPMENT MAY RESULT IN SEVERE INJURY OR DEATH! ANY UNAUTHORIZED MODIFICATIONS TO THE MACHINE IS CONSIDERED A BREACH OF CONTRACT AND REMOVES ALL LIABILITY FROM THE MANUFACTURER.**

**⚠ WARNING DEATH OR SEVERE INJURY CAN RESULT FROM IMPROPER OPERATION, SERVICE, OR MAINTENANCE OF BULK BED EQUIPMENT!**

**⚠ WARNING BULK BED EQUIPMENT AND THE VEHICLE ON WHICH IT DEPENDS FOR POWER MUST BE FULLY STOPPED AND TURNED OFF PRIOR TO ANY SERVICE OR MAINTENANCE BEING PERFORMED. FAILURE TO DO SO MAY RESULT IN SEVERE INJURY OR DEATH!**

### **SAFETY LABELS**

1. Keep all safety labels and signs clean and visible at all times.
2. Be certain that all replacement parts display the appropriate safety signs and symbols.

3. Worn or missing signs and labels are the responsibility of the employer to replace.
4. Safety labels and signs are available from Cooper Equipment.

### **Installation of Safety Labels**

1. Clean and dry the area where the label is to be installed.
2. After determining the position for the label remove the smaller portion of the backing paper.
3. Align the label over the area and position the exposed sticky backing in its place.
4. Peel the remaining backing paper and smooth the decal into place.
5. Pierce air pockets with a small pin and smooth them out after applying the label.

### **GENERAL SAFETY PROCEDURES**

1. Primary responsibility for safe operation of the Cooper Equipment Bulk Bed 2100 equipment lies with the employer and operator.
2. OSHA CFR 1928.57 requires that the employer train all operators, service, and maintenance personnel of the Bulk Bed 2100 in the Safety procedures for the equipment. OSHA also requires that these individuals be trained annually in these safety procedures.
3. Children must NOT be allowed on or around the Bulk Bed at anytime.
4. No untrained person should be allowed to operate, service, maintain or otherwise work with the Bulk Bed 2100.
5. Keep safely away from all moving and rotating parts.
6. Long hair, clothing, and any other items, which have the potential to get caught in

the machinery, must be kept away from moving and rotating parts.

7. **WARNING** DO NOT perform any service or maintenance to the Bulk Bed while it is in operation.
8. Visually inspect all mechanisms prior to starting the Bulk Bed. Replace all worn or damaged parts with dealer authorized replacement items only.
9. Insure that all guards and shields are properly installed and secured prior to operation the Bulk Bed.
10. All worn or missing parts must be replaced with dealer-authorized parts.

## **SAFETY PROCEDURES HYDRAULIC EQUIPMENT**

**WARNING** HYDRAULIC CYLINDERS CONTAIN HIGH PRESSURE FLUIDS! DO NOT WORK ON OR MODIFY HYDRAULIC SYSTEMS WITHOUT PRIOR AUTHORIZATION FROM COOPER EQUIPMENT. **SEVERE INJURY OR DEATH CAN OCCUR!**

1. Wear appropriate eye protection while working on the hydraulic system.
2. DO NOT allow any flame near hydraulic fluids. High-pressure hydraulic fluids can ignite when exposed to open flames or sparks.
3. **CAUTION** DO NOT support hydraulically assisted parts with their own hydraulic system while performing service or maintenance to those parts. Use a brace having the configuration and strength sufficient to SAFELY hold the part without relying on its own hydraulics to do so.
4. Insure that all hoses, connectors, fittings, lines, and other components are not damaged or loose.
5. **CAUTION** Seek immediate medical attention if hydraulic fluid pierces the skin. Serious toxic reactions or infections can result.

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## **MAINTENANCE AND SERVICE**

1. Disengage PTO power to the Bulk Bed prior to performing repairs, service, or maintenance.
2. Check oil in gearboxes every one hundred hours of operation. Gearboxes use SAE gear oil. Change whenever oil is dirty or contaminated.
3. The hydraulic system used to power auxiliary functions uses Dextron III automatic transmission fluid (ATF) for the prime mover. Hydraulic reservoir levels should be checked each season and filled or replaced as needed.
4. Replace ATF in hydraulic systems whenever it becomes dirty or contaminated.
5. To avoid contamination visually check all hydraulic fittings daily. Replace or tighten all fittings that leak or are worn out.
6. Grease all bearings once at the beginning of each season. All bearings are of a sealed type and are pre-lubricated by the manufacturer. Do not over grease bearings, as this may cause the seals to be broken resulting in bearing failure.
7. The conveyor belt must be kept in alignment with tension sufficient to allow the free movement of product from the bulk bed. Belts that are too loose or too tight will result in unnecessary replacement or repairs.
8. The conveyor belt should be centered and aligned evenly between the Bulk Bed sides (Figure 3F).

## **BELT ALIGNMENT PROCEDURE**

1. Loosen the locking bolts on both the operator side and off-side of the belt tension adjustment assembly (Figures 3D & 3E).

2. Loosen the tension on the conveyor belt using the tension adjustment mechanisms located on both the operator and off-side of the tensioning assembly (Figures 3B & 3C).
3. Tension must be such that the belt will be centered during operation. Center the conveyor belt by tightening the belt from the rear on the operator and off-side belt tension adjustment mechanisms.
4. Belt tension must be great enough to prevent belt slippage between the drive rollers and the belt while discharging product.
5. Once the belt is aligned properly retighten the locking bolts on the belt tension adjustment assembly located on both the operator side and off-side of the belt (Figures 3D & 3E).

## CONVEYOR BELT REPLACEMENT PROCEDURE

### Removing the old conveyor belt.

1. This procedure will take at least two people to accomplish.
2. Disengage PTO power.
3. **CAUTION** DO NOT pull the conveyor belt from inside the Bulk Bed. Always pull from the rear of the Bulk Bed using a rope or light chain.
4. Loosen the conveyor belt tensioning assembly until it releases the pressure off the conveyor belt to be replaced. If the old conveyor belt is already off, the tensioning assembly must still be loosened prior to installing the new belt.
5. Clamp a pair of modified vice grips, with a 2-1/4" ring welded to the adjustment bolt, to the leading end of the conveyor belt.
6. Tie a rope or a light chain to the ring that was welded to the vice grips.
7. Take the slack out of the rope. Using a Come-Along pull the rope over and down the rear

drive roller of the Bulk Bed until it comes completely off the bulk bed.

### Installing the new conveyor belt.

1. This procedure will take at least two people to accomplish.
2. Disengage PTO power.
3. **CAUTION** Always pull the conveyor belt from the rear of the Bulk Bed using a rope or light chain.
4. Loosen the conveyor belt tensioning assembly until it releases the pressure off the conveyor belt to be replaced. If the old conveyor belt is already off, the tensioning assembly must still be loosened prior to installing the new belt.
5. Clamp a pair of modified vice grips, with a 2-1/4" ring welded to the adjustment bolt, to the leading end of the new conveyor belt. DO NOT damage the end brackets on the conveyor belt.
6. Tie a fifty-foot rope or a light chain to the ring that was welded to the vice grips.
7. Beginning at the discharge end of the Bulk Bed thread the rope forward over the topside of all the carry-back braces located beneath the Bulk Bed. (Figure 3A)
8. Loop the rope under and then over the top of the front conveyor roller and run it back to the rear of the discharge end of the Bulk Bed.
9. Pull the rope over and down the rear drive roller of the Bulk Bed.
10. Take the slack out of the rope. Using a Come-Along pull the rope and the new conveyor belt over and down the rear drive roller of the Bulk Bed. The conveyor belt must thread forward over the carry-back braces, loop around the front roller and return over the rear roller on the discharge end (Figure 4A).
11. Attach the leading and trailing ends of the drive belt together (Figure 4B).
12. Adjust the belt tension as needed. Remember to center the belt prior to adjusting the tension.

13. Test the conveyor belt operation and adjust the tensioning assembly on both the operator and off-sides to insure proper operation.

14. **CAUTION** DO NOT adjust the conveyor belt tension while the belt is in operation.

## **SAFETY PROCEDURES FOR BULK BED OPERATION**

**WARNING** BULK BEDS HAVE DOORS THAT CAN CAUSE INJURY WHEN OPENED. BE AWARE OF THOSE DOORS (Figures 5A & 6A). INSURE THAT NO PERSON IS IN POSITION TO BE INJURED BEFORE OPENING ANY BULK BED DOOR. **IMPROPER OR ACCIDENTAL OPENING OF BULK BED DOORS MAY CAUSE SEVERE INJURY OR DEATH!**

1. **CAUTION** Visually check all door mounting brackets each day. Tighten and maintain all bolts regularly.
2. Insure that the PTO power to the Bulk Bed is disengaged before cleaning rollers or chain. Remove all obstructions and dirt buildup from all moving components.
3. **CAUTION** DO NOT perform any service or maintenance on the Bulk Bed while it is in operation.
4. **WARNING** Prior to making repairs or adjustments the side dump door must be latched in place with the safety pin installed to insure that it will not fall open. **FAILURE TO DO SO COULD CAUSE SEVERE INJURY OR DEATH!**
5. **WARNING** Use caution when entering the Bulk Bed while the conveyor belt is in operation. **SEVERE INJURY OR DEATH CAN OCCUR!**
6. DO NOT enter the Bulk Bed without having a means to escape. Open and block the back door in the open position whenever you are required to work inside the Bulk Bed.

7. **CAUTION** DO NOT drive the Bulk Bed on the road with the side door open or with out first securing the safety pin in place. (Figure 5A). Insure that the safety pin for the side door is in place as soon as the side door has been closed.

## **BULK BED OPERATION PROCEDURES**

### **REAR DISCHARGE DOOR**

The rear discharge door (Figure nn) is a hydraulically operated door that must be raised or opened before discharging produce. The rear discharge door must be in the down or closed position prior to transporting produce.

Bulk Bed conveyor controls are located on the driver side at the rear of the Bulk Bed adjacent to the discharge chute.

1. Align the discharge end of the Bulk Bed with the hopper at the receiving station.
2. Close the hydraulic Flow Control handle (Figure 7A).
3. Engage the bulk bed's PTO system.
4. **NOTICE** Open the rear discharge door prior to engaging the conveyor system to discharge produce. This is done by engaging the discharge door switch located to the right of the conveyor Flow Control Handle (Figure 7A). Pushing the switch up will lift the discharge door while pushing the switch down will close the door.
5. The discharge door should be raised to a position that makes unloading the Bulk Bed most efficient.
6. Once the produce is discharged stop the conveyor belt by returning the Flow Control Handle to the stop position.
7. The discharge door can then be closed by pushing the discharge door switch downward until the door has sealed.

## CONVEYOR OPERATION

Bulk Bed conveyor controls are located on the driver side at the rear of the Bulk Bed adjacent to the discharge chute.

**CAUTION** In order to safely discharge the product, only one person should operate the controls of the conveyor. This individual should insure they are positioned safely away from the discharge area.

1. **NOTICE** Verify that the hydraulically operated rear discharge door is open.
2. Engage the conveyor system with the Flow Control handle (Figure 7A). The position of the Flow Control handle will control the speed of the conveyor belt and the discharge of produce.
3. When the load has been completely discharged, return the Flow Control handle to the closed position.
4. **NOTICE** Do not allow the conveyor belt splice to stop on the rear drive roller.
5. Insure that all discharge doors are closed and secured prior to moving the Bulk Bed vehicle.

## SIDE DUMP DOOR

The hydraulically operated Side Dump Door (Figure 5A) is located on the driver's side of the Bulk Bed. This door is latched on both the front and rear and operated with the Bulk Bed hydraulic system.

1. Remove the Safety Pin (Figure 5A) located to the right of the bottom bracket holding the hydraulic cylinder. This pin is attached to a small chain and will hang next to the assembly when removed.
2. Close the hydraulic Flow Control handle (Figure 7A).
3. Engage the bulk bed's PTO system.

4. Engage the Side Dump Door hydraulic system to open the door.

## REAR INSPECTION/ENTRY DOOR

The Rear Inspection/Entry Door (Figure 6A) is located at the rear of the Bulk Bed immediately above the Discharge Door.

**NOTICE** The Rear Inspection/Entry Door is not a produce discharge door. This door allows easier entry into the Bulk Bed itself. It should always be in the closed and latched position while in transport.

1. The Rear Inspection/Entry Door opens into the interior of the Bulk Bed. *Be certain no one is in the Bulk Bed before you operate this door.*
2. The door is opened by pulling on the rope located on the conveyor operator side at the rear of the Bulk Bed. This will open the latch that holds the door closed.
3. Control the opening of the door by holding the rope and slowly allowing it to slip. This can best be done by leaving a wrap around the rope-securing bracket.
4. This door is closed by pulling on the rope and raising the door until the latch engages and holds the door closed.
5. Tie the rope off by wrapping it around its securing bracket.

## APPENDIX A

### FIGURES AND PARTS LIST

#### REPLACEABLE SAFETY LABELS



Figure 1A



Figure 1B



Figure 1C

## SAFETY LABEL PLACEMENT



Figure 2A



Figure 2B



Figure 2C



Figure 2D

**BOTTOM CONVEYOR BRACES AND TENSION ADJUSTMENT ASSEMBLY**



Figure 3A



Figure 3B



Figure 3C



Figure 3D



Figure 3E



Figure 3F

**TENSIONING FRAME ASSEMBLY**

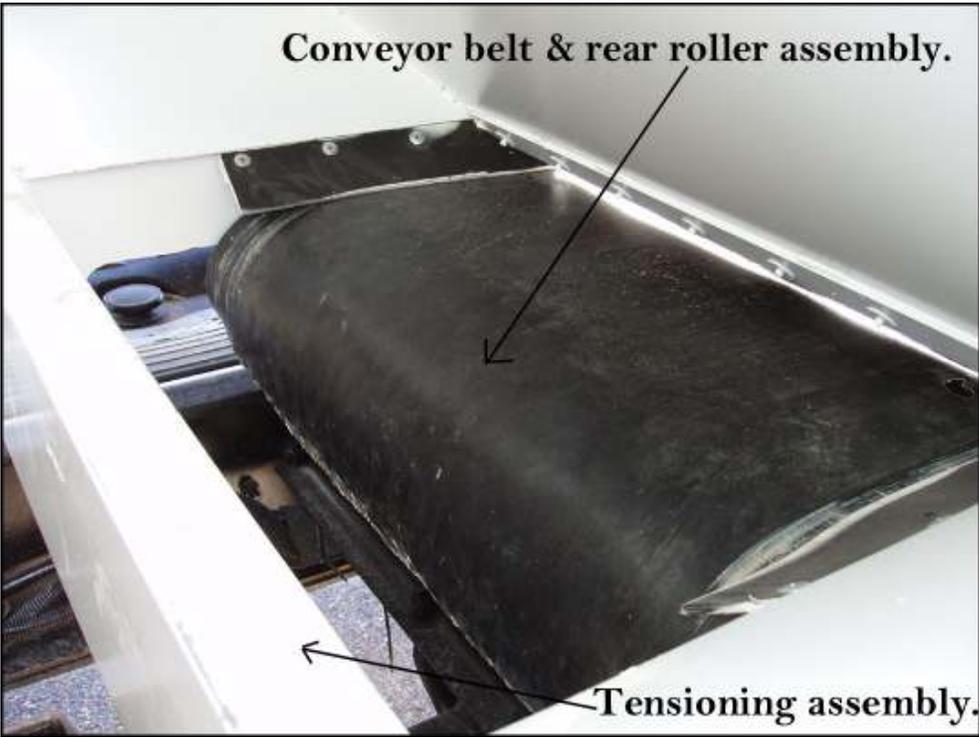


Figure 4 A



Figure 4 B

## SIDE DOOR OPENER ASSEMBLY



Figure 5A

**TAILGATE ASSEMBLY**

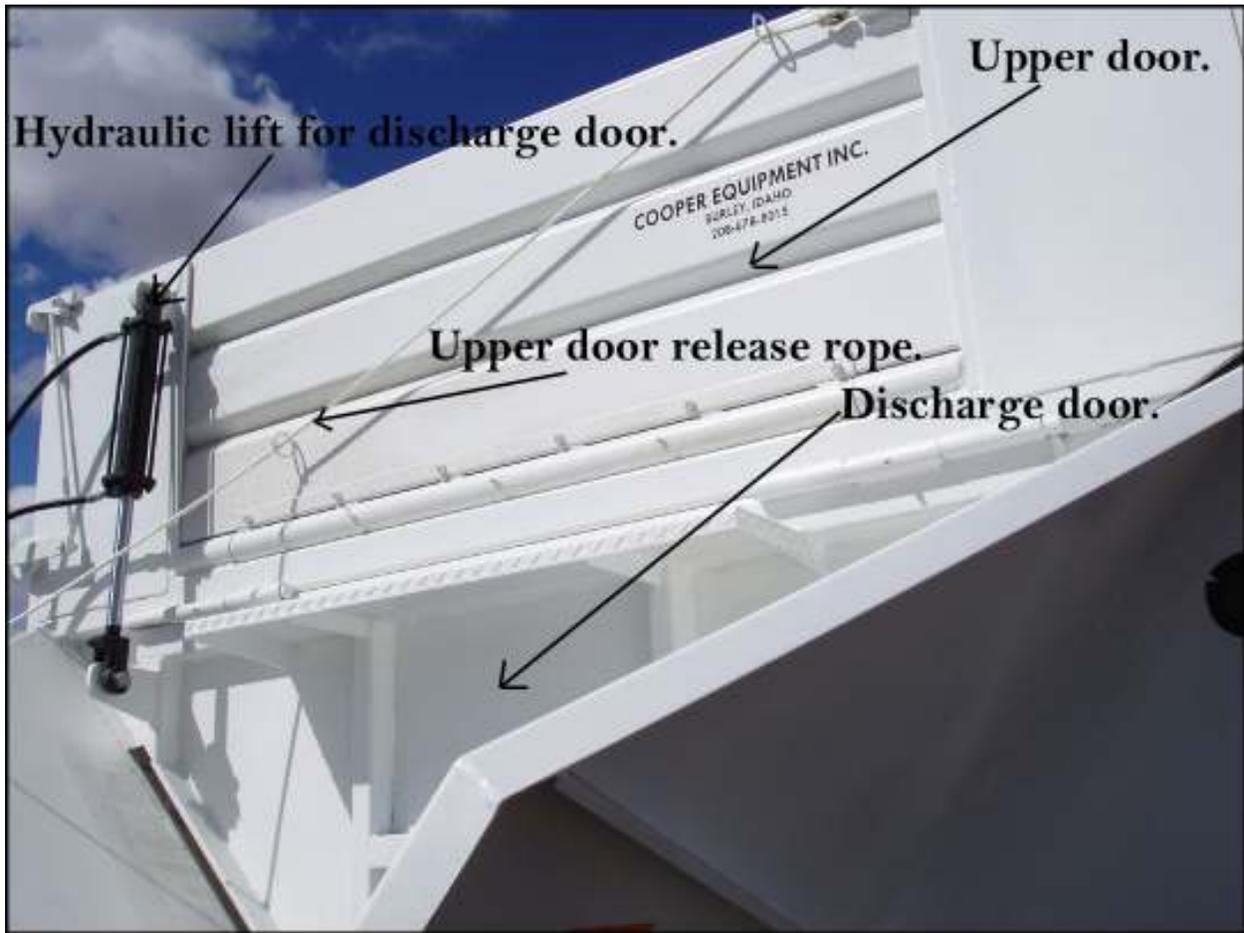


Figure 6A

**HYDRAULIC CONTROLS**



Figure 7A

## WIRING- OILDYNE PUMP

