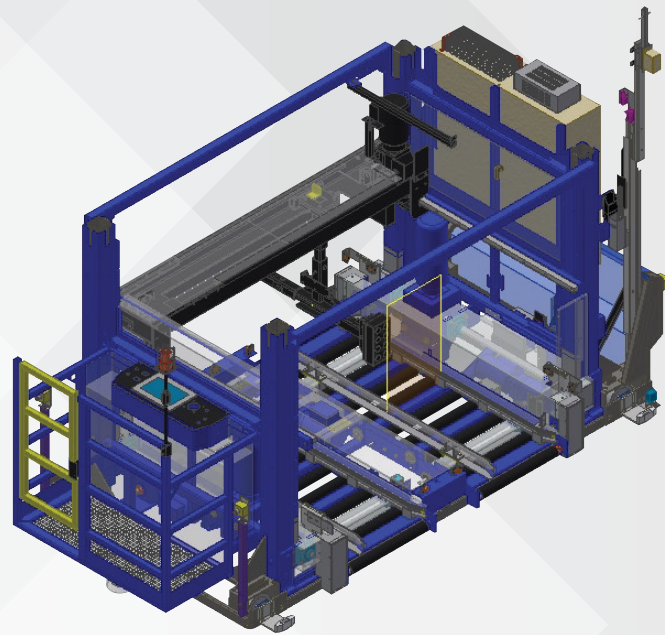


PROSERIES[®]

Battery Bull Electric Fully Automatic Battery Handling Equipment



OWNER'S MANUAL

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INTRODUCTION

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The information contained in this document is critical for safe handling and proper use of the Battery Bull Electric Fully Automatic. It contains a global system specification as well as related safety measures, codes of behavior, a guideline for commissioning and recommended maintenance. This document must be retained and available for users working with and responsible for the battery handling equipment. All users are responsible for ensuring that all applications of the system are appropriate and safe, based on conditions anticipated or encountered during operation.

This owner's manual contains important safety instructions. Read and understand the sections on safety and operation of the battery handling equipment before operating the battery and the equipment into which it is installed.

It is the owner's responsibility to ensure the use of the documentation and any activities related thereto, and to follow all legal requirements applicable to themselves and the applications in the respective countries.

This owner's manual is not intended to substitute for any training on handling and operating the Battery Bull Electric Fully Automatic that may be required by local laws and/or industry standards. Proper instruction and training of all users must be ensured prior to any contact with the battery system.

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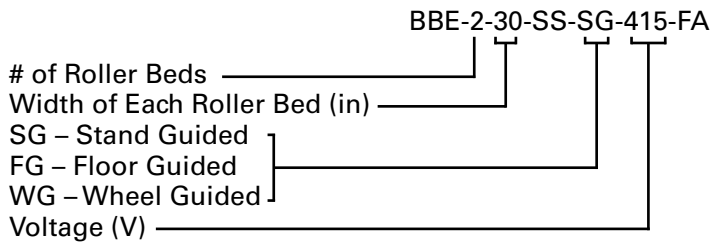
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Your Safety and the Safety of others is Very Important

⚠ WARNING You can be killed or seriously injured if you don't follow these instructions.

SYMBOL IDENTIFICATION






Symbol Identification Chart


	Refer to accompanying documentation		Hazardous Fumes
	Do not operate without all guards and covers in place		Crush Hazard – Keep Hands Clear
	Entanglement Hazard – From chain, gear, or pulley		Pinch Point Hazard
	Crush Hazard From Falling Load		Crush Hazard – Keep Feet Clear
	Eye Protection Required		Safety Shoes Required
	Slip Hazard		Danger – Hazardous Voltage
			Face Shield Required

This manual contains important information to help you properly operate and maintain your BBE-SS Battery Bull for maximum performance, economy, and safety. By practicing correct operating procedures and by carrying out the recommended preventive maintenance suggestions, you will experience long, dependable, and safe service.

LABELS

Danger, Warning, Caution Labels

⚠ DANGER!	
	Only certified operators should attempt to lift/carry loads with this unit. Keep the area under load clear when operating the unit.
	Hazardous Fumes. Corrosive gases from battery acid can cause blindness, lung damage, and burn skin. Use caution when transporting batteries. Refer damaged batteries to qualified personnel.
	Do not attempt to operate this equipment if you are impaired (ill, under the influence of medication, alcohol, etc.). Errors in operation can cause hazardous and potentially LETHAL conditions.

⚠ DANGER!	
	Do not attempt to gain access to areas of the unit where dangerous voltages are present. Refer servicing to qualified service personnel.

⚠ WARNING!	
	Crush Hazard! Keep hands clear.

⚠ WARNING!	
	Crush Hazard! Keep feet clear.

⚠ WARNING!	
	Moving Parts! Keep hands and fingers clear.

⚠ CAUTION!	
	Use care when entering or exiting the operator control station. Do not attempt to enter or exit the control station when the machine is elevated except in emergencies.
	
	Eye protection required when operating this equipment.
	Safety shoes are required to operate equipment safely.
	To reduce the risk of accident or collision, use caution when driving the unit in reverse.

⚠ DANGER!	
	Crush Hazard! Keep body clear.

⚠ CAUTION!	
	Do not operate without all guards, covers, and panels in place.

⚠ CAUTION!	
	Pinch Hazard! Keep hands clear.

PREOPERATIONAL CHECKLIST

Battery Room Preoperational Checklist and Handover

Housekeeping		Checked	Pass	Fail
1	Is the work area clean			
2	Is the work area dry			
3	Is the work area safe			

Batteries and Chargers		Checked	Pass	Fail
4	Are all the charging stand safety stops engaged			
5	Are any battery cables protruding into the runway aisle			
6	Are any charger cables protruding into the runway aisle			
7	Are any drip trays protruding into the runway aisle			
8	Is the runway aisle clean and dry			
9	Are there any hydraulic oil drips/marks in the runway aisle			
10	Is the vahle system collector secure in the track and connected to the Battery Bull antenna			
11	Are all the chargers in working order			
12	Check state of batteries on staging stands and charge any that are dead			
13	Are there any unauthorized personnel in the area			

Battery Change Cart		Checked	Pass	Fail
14	Is operator safety harness in good working condition			
15	The operator safety gate works			
16	The warning backup beeper works			
17	The warning strobe light works			
18	The forward reverse travel function works			
19	The lift/lower function works			
20	The roller beds are working in both directions			
21	The roller beds are level, front to back and left to right			
22	The battery safety stops work on left and right side			
23	The battery stop override on left and right works			
24	The travel and magnet forward/reverse override works			
25	The magnet mode selector switch works			
26	The magnet on/off switch works			
27	The joystick moves magnet forward/reverse and left/right			
28	The large mushroom emergency stop button works			
29	The laser alignment switch and light works			
30	The Battery Bull runs and operates as it always has			
31	Do a visual inspection of the entire unit to confirm there are no missing parts or any physical damage			

MOUNTING & ADJUSTMENT

Antenna Mounting

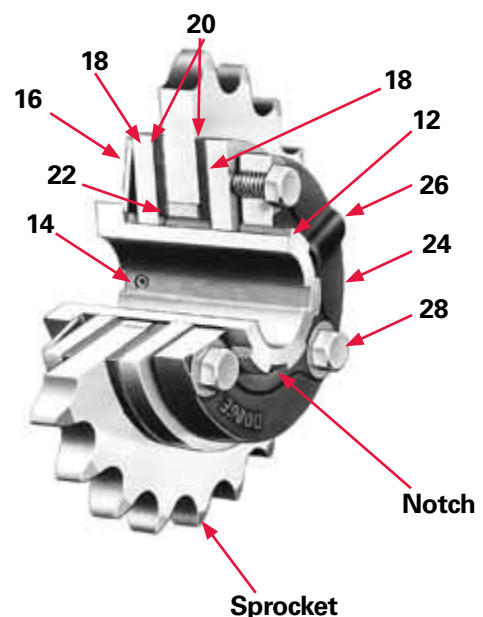
1. Mount the antenna to the side of the machine.
2. Before tightening the bolt completely, make sure that the antenna is parallel with the lift post (measure the distance between the post and the antenna at the bottom and the top).
3. Locate the slider strip tube mounting bracket (**Number 1**) on the post.
4. Mount the slider strip tube bracket as shown in the picture at right.
5. This now completes the antenna mounting.



TORQUE-TAMER™ Adjustment

⚠ WARNING To ensure that the drive is not unexpectedly started, turn off and lock out or tag the power source before proceeding. Failure to observe these precautions could result in bodily injury.

1. Back off tension screws **Number 28** at least three times.
2. Loosen adjusting nut set screw **Number 26** at least nine turns.
3. Tighten adjusting nut assembly **Number 24** hand tight.
 - For travel TORQUE-TAMER™, No back off required.
 - For bridge TORQUE-TAMER™, unscrew adjusting nut assembly **Number 24** until set screw #26 passes over 5 notches.
 - For roller-bed TORQUE-TAMER™, unscrew adjusting nut assembly **Number 24** until set screw **Number 26** passes over 6 notches.
 - For magnet TORQUE-TAMER™, unscrew adjusting nut assembly **Number 24** until set screw **Number 26** passes over 8 notches.



TORQUE-TAMER™ Adjustment (cont.)

4. Tighten adjusting nut set screw **Number 26** in the selected spline notch. Do not tighten the setscrew on threads of the hub.
5. Tighten tension screws **Number 28** alternately and evenly until heads bottom. Do not use washers under heads of these screws.
6. Check the alignment of the drive. If necessary, loosen hub set screw **Number 14** and shift hub **Number 12** on the shaft.

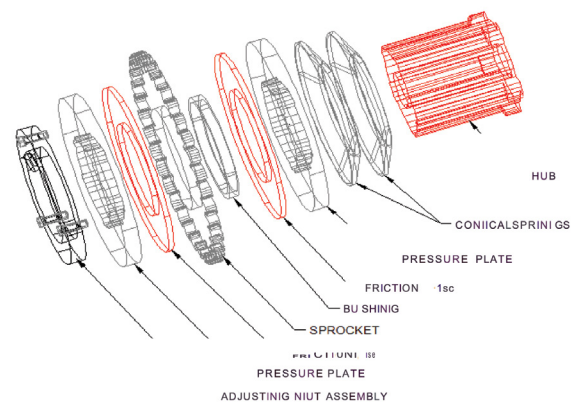
A shaft would extend from left to right through the bore of the hub **Number 12**. A sprocket would be captured between the two friction discs **Number 20** and this sprocket is free to rotate on the bushing **Number 22**. The hub **Number 12** is keyed to the shaft; therefore any rotational force applied to the sprocket will be transmitted to the shaft through the friction discs **Number 20** to the pressure plates **Number 18** which are splined to the hub **Number 12**. The amount of torque transmitted to the shaft depends on how much the spring #16 is compressed which is determined by the distance between the spring and the adjusting nut **Number 24**. It is important to understand that to increase

or decrease the amount of torque transmitted, the adjusting nut **Number 24** must be turned clockwise to increase or counterclockwise to decrease the torque. See the above instructions for details. Do not try to adjust the clutch by loosening or tightening the tension screws **Number 28**; results will be unpredictable. The only position these screws should be in when the clutch is in operation is fully bottomed out. Do not over-tighten these bolts; the heads twist off easily.

Number 22 is a sacrificial bushing made of sintered iron. Its purpose is to provide a wear surface between the sprocket and the hub during the period when the clutch is slipping. The inexpensive bushing will be worn rather than the sprocket or hub. This bushing will, in time, wear away entirely. This will allow the sprocket to move off-center and rotate eccentrically. If you observe a chain that drives a TORQUE-TAMER™ alternating between very tight and too loose, the most likely cause is the wearing away of this bushing and it should be replaced.

TORQUE-TAMER™ Installation Instruction

1. Insert two conical springs onto the hub. Ensure that the conical springs are positioned as shown in the diagram.
 2. Insert one pressure plate onto the hub.
 3. Insert one friction disc into the hub.
 4. Insert bushing onto the hub.
 5. Insert a sprocket onto the hub. Ensure that the sprocket sits onto the bushing.
 6. Insert a second friction disc onto the hub.
 7. Insert the second pressure plate onto the hub.
 8. Insert adjusting nut assembly onto the hub.
- NOTE:** Friction disc must be kept clean and free of oil or moisture at all times to obtain proper functioning of the TORQUE-TAMER™. Do not use washer under heads of tension screws.



MAINTENANCE

General Maintenance Summary

Please follow the maintenance schedule and operator handover sheet closely to maintain the warranty of the machine.

To clean the machine, use WD-40 and wipe down all metal and plastic parts.

Lexan guards should only be cleaned using a soft cloth and glass cleaner.

Recommended Lubricant

Item	Description	Number
All Spur Gears and Gear Racks	SCHAEFFER'S-SILVER STREAK MULTI-LUBE	CBS-3597
All Roller Chain	SCHAEFFER'S-MOLY ROLLER CHAIN LUBE	CBS-3600
All Slider Strips and Blocks	CRC- DRY GRAPHITE LUBRICANT	CBS-3712
All Shafts	LOCTITE®-SILVER ANTI-SEIZE LUBRICANT	CBS-4236
All Bearings	ROTANIUM LUBE GREASE HT P3500 OR EQUIVALENT	CBS-5390
Cleaner	WD-40 (LOCAL PURCHASE)	
Antiseize	LOCTITE®-SILVER ANTI-SEIZE LUBRICANT	CBS-4236



Technical Bulletin # 118

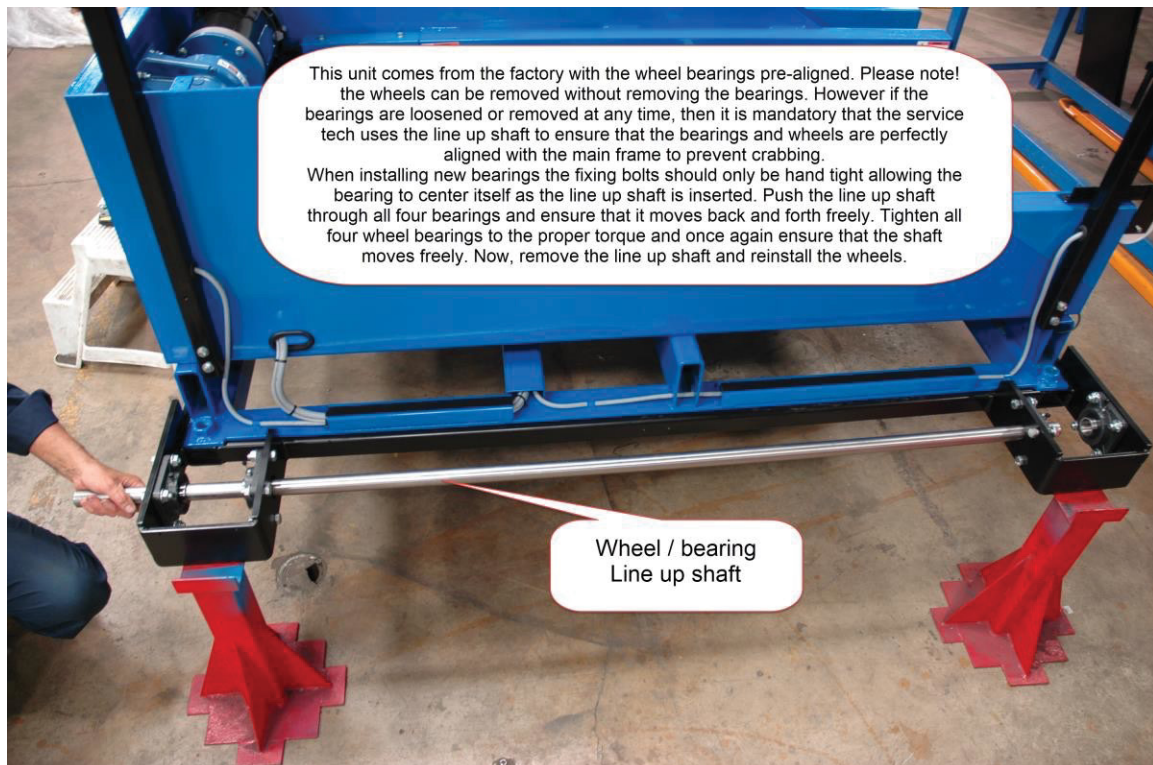
Description: How to realign a rear wheel (free wheel).

Equipment: MAC-II and all Battery Bulls

Overview: If for any reason the wheel bearings are loosened or removed it is mandatory to realign the bearings when the wheel is installed. This allows the wheel to run parallel with the base frame. The bearing mounting holes in the wheel housing are oversized by 1/64" dia. to provide enough movement for bearing alignment.

Procedure

1. Lift the lower frame and travel wheels off the floor and remove both wheels from the wheel housings.
2. Loosen all the fixing bolts on all four bearings so they are only hand-tight. This will allow the bearings to center themselves in the wheel housing as the shaft is inserted.
3. Gently slide the line-up shaft through all 4-wheel bearings and ensure that it moves freely.
4. Tighten all the wheel bearing bolts to the proper torque.
5. Do a final check to confirm that the shaft moves freely.
6. Remove the line-up shaft and reinstall the wheels.



TORQUE VALUES

Recommended Torque Values for Bolts/Screws

Size	Torque FT-LBS (Nm)									
	Grade 5		Socket Head Cap Screws		Flat Head Cap Screws		Grade 8		Grade L9	
1/4-20 UNC	8	(10)	17	(22)	8	(11)	12	(16)	16	(21)
5/16-18 UNC	17	(22)	35	(45)	17	(22)	25	(33)	33	(42)
3/8-16 UNC	31	(40)	62	(80)	29	(38)	44	(57)	58	(76)
1/2-13 UNC	75	(98)	150	(195)	71	(92)	107	(139)	142	(184)
5/8-11 UNC	150	(195)	283	(368)	142	(184)	212	(276)	281	(366)
3/4-10 UNC	266	(346)	500	(650)	250	(325)	376	(489)	500	(650)

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