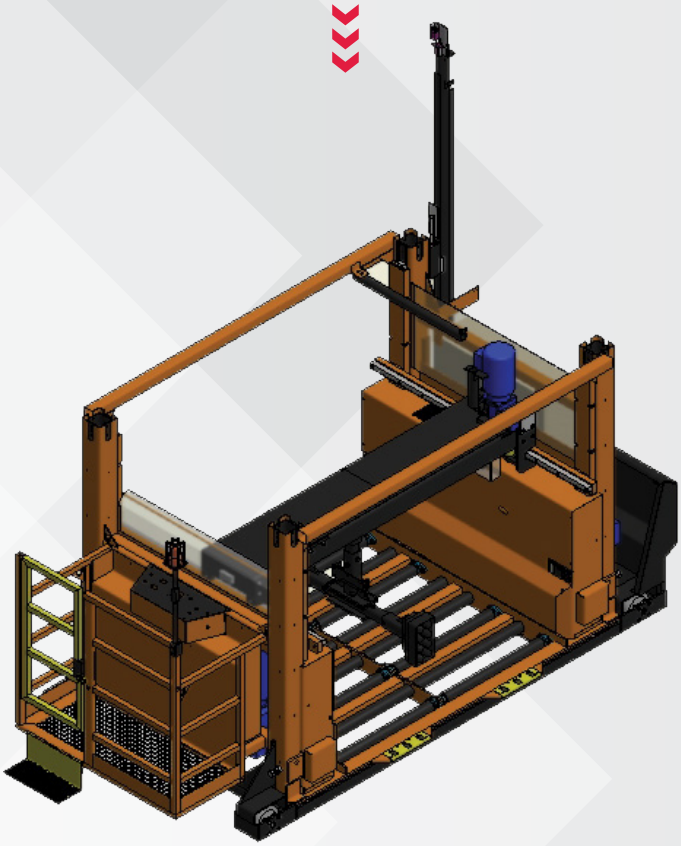
PROSERIES®

Battery Bull Electric Level 1–3
Battery Handling Equipment



OWNER'S MANUAL

CE UKCA

EnerSys®
Power/Full Solutions

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INTRODUCTION

PROSERIES®

The information contained in this document is critical for safe handling and proper use of the Battery Bull Electric Level 1–3. 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 this documentation and all related activities comply with applicable legal requirements in their respective countries.

This owner's manual is not intended to substitute for any training on handling and operating the Battery Bull Electric Level 1–3 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.

For service, contact your sales representative or call:

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Your Safety and the Safety of others is Very Important

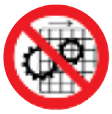
⚠ WARNING You can be killed or seriously injured if you don't follow these instructions.

SYMBOL IDENTIFICATION

BBE-2-30-TS-SG-415

- # of Roller Beds
- Width of Each Roller Bed (in)
- SG – Stand Guided
- FG – Floor Guided
- WG – Wheel Guided
- Voltage (V)

Symbol Identification Chart

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

This manual contains important information to help you properly operate and maintain your BBE-TS 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.

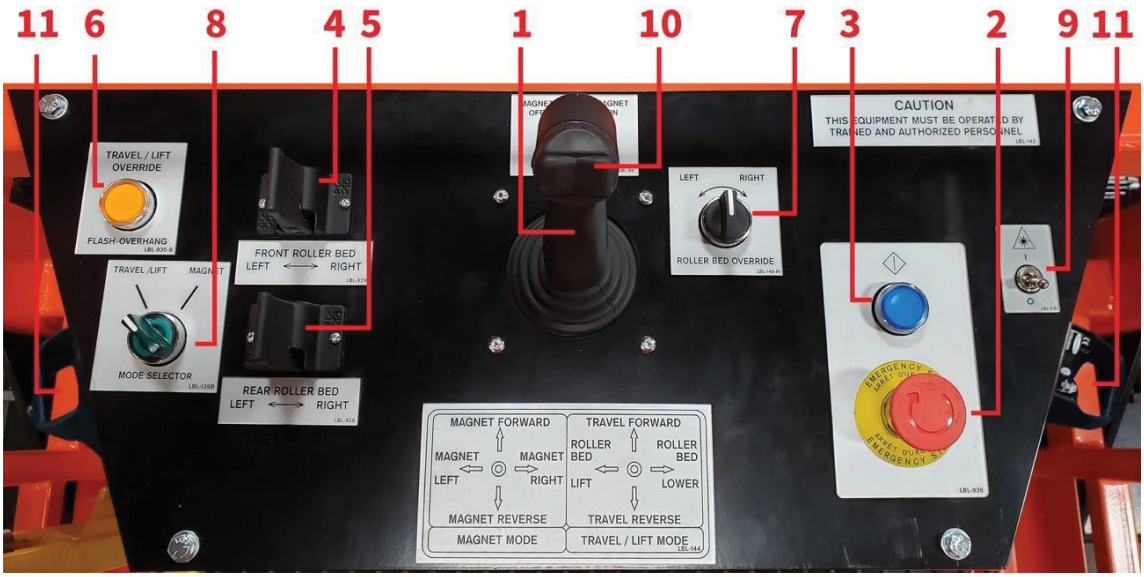
⚠ CAUTION!

	Pinch Hazard! Keep hands clear.

OPERATOR CONTROLS

Operator Controls Description

Model: BBE-TS



#	Description
1	Control Joystick
2	Emergency Stop (Optional Key)
3	Start Button
4	Front Roller Bed
5	Rear Roller Bed
6	Travel and Magnet Override

#	Description
7	Battery Stop Override
8	Travel, Lift, and Magnet Mode Selector
9	Laser Alignment
10	Magnet ON/OFF Switch
11	Two-Handed Operation Button

Control Console

The BBE-TS Battery Bull is operated using one 4-position Joystick (**Number 1**) that utilizes two different Function Modes, combined with two Paddle Switches.

NOTE: TWO-HANDED CONTROL IS REQUIRED FOR ALL OPERATIONS when this option is chosen, **Number 11.**

Travel/Lift Mode (Default/Mode)

To drive the Battery Bull forward, push either one of the Two-Handed Operation buttons and squeeze the joystick (**Number 1**) to activate the dead man switch. Then slowly push the joystick forward to travel forward or slowly pull the joystick back to travel backward.

To lift/lower the roller bed, push either one of the Two-Handed Operation buttons and squeeze the joystick. Push the joystick to the left to raise the roller bed or to the right to lower the roller bed.

Control Console (cont.)

NOTE: All functions are logical and variable i.e. move the joystick in the direction that you want to travel and the further you move it the faster you will travel

Magnet Mode: This mode is activated by pressing the small green Magnet Mode button (**Number 8**) a green light will appear when this mode is active. To move the magnet, push either one of the Two-Handed Operation buttons then squeeze the joystick handle. Push the joystick to the left to move the magnet left, to the right to move the magnet right, forward to move the magnet forward, or pull the joystick back to reverse the magnet.
NOTE: left/right functions are variable but the forward/reverse functions are at a fixed speed. To exit this mode push the green Magnet Mode button again.

The Roller Beds are each controlled by a Paddle Switch that is independent of the 4 position Joystick Handle. Moving the Front Roller Bed (**Number 4**) to the left will power the front Roller Bed. And moving it to the right will power the front Roller Bed to the right.

This functionality is the same for the Rear Roller Bed (**Number 5**) and the rear Roller Bed.

This machine is equipped with electrically powered mechanical battery safety stops. These battery safety stops automatically retract when a battery is being loaded into the Battery Bull. Once the battery is completely inside the Battery Bull the battery safety stops automatically extend up to prevent any accidental rollout of the battery. The only way to unload a battery from the Battery Bull is to power the roller bed left or right and as the battery moves toward the stop, turn the Battery Stop Override switch (**Number 7**) to retract the battery safety stop for the appropriate side to allow the battery to exit the Battery Bull.

The ON/OFF Function of the magnet is controlled by a rocker switch on top of the Control Joystick (**Number 1**). To turn the magnet ON, depress the switch to the right; to turn the magnet OFF, depress the switch to the left.

Flash-overhang LED indicator will flash when the magnet arm is within the right and left overhang photo eyes. The light will also turn on when the Travel and Magnet Override button is pressed. This indicates that the travel and lift operation is permitted.

Operating Instructions

Before operating the Battery Bull it is important that the operator thoroughly reviews and understands the proper safety procedures and Instructions as outlined in this Owner's Manual and as indicated on the console in front of the operator's station.

Safety shoes, safety glasses ,and protective clothing are mandatory in battery rooms. Be sure to wear them at all times. Rubber gloves, rubber apron, and full face shields are required when washing and servicing forklift batteries. Always use caution and common sense.

NOTE: A safety harness may be required; check local codes/regulations.

Operating Instructions (cont.)

⚠ 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.

⚠ 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 is 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.

Preparation:

1. Park the Lift Truck in a parallel position adjacent to the Battery Bull, leaving approximately 2" clearance (a painted reference line on the floor will ensure the correct Lift Truck position every time).
2. Prepare the Lift Truck for battery removal as follows:
   - Lower the forks until they sit flat on the floor.
   - Engage the parking brake.
   - Remove any protective covers.
   - Remove the battery retaining gate.
   - Unplug the battery and position the connector plug and cable to prevent snagging or pinching during the battery removal process.
   - Inspect the battery for any damage (physical, leaks, etc.) and report to the supervisor immediately. Follow proper handling procedures.
3. Open the access gate and enter the operator's platform of the Battery Bull. **NOTE:** Do not disable the Safety Gate limit switch. Do not exit the operator's platform when elevated, except in an emergency. Visibility is limited when elevated.

4. Secure the access gate and then push the Start Button (**Number 3**) to activate the machine. Locate the Control Joystick (**Number 1**). Push one of the Two-Handed Operation buttons and then push the Joystick Forward/Reverse and drive the Battery Bull alongside the Lift Truck so that the center line of the selected Roller Bed is centered to the battery in the Lift Truck. Lift/Lower the roller bed so that it is approximately 1" [25 mm] below the battery compartment of the Lift Truck.

5. Enter Magnet Position Mode (**Number 8**). The green light will be on. Drive the magnet so it is just touching the center of the battery in the Lift Truck, activate the magnet. (Thumb controls on **Number 1**–Right turns the magnet ON–Left turns OFF).

6. If the photo switch beam is broken by the magnet arm the machine will not travel until the magnet is retracted. This is to prevent the machine from traveling when the magnet is protruding out of the machine.
7. Push the Travel Override button (**Number 6**) and the two-handed operator button (optional) to gingerly power the machine forward or reverse when lining up to insert a battery into a lift truck or roller stand.

Operating Instructions (cont.)

8. When contact is made and the magnet has a firm grip on the battery, move the joystick to pull the battery from the lift truck until the leading edge of the battery is approximately 2" [51 mm] past the center line of the first roller in the Battery Bull.
9. Enter Travel/Lift Mode (**Number 8**). The green light will be off. Move the Joystick to the left until the roller bed starts to lift the battery. (Do not lift more than 1" [25 mm] above the truck bed height.)
10. De-activate the magnet. Enter Magnet Position Mode. The green light will be on. Use the joystick to move the magnet to a neutral position (centered between the two roller beds). Enter Travel/Lift Mode. The green light will be off.


11. Move the Paddle Switch for the appropriate Roller Bed, away from the Lift Truck. The urethane rollers will pull the battery from the Lift Truck and into the Battery Bull.
12. Using the Control Joystick, drive the Battery Bull to the next available fully charged battery.
13. Stop the Battery Bull so that the operator's station is adjacent to the selected battery. Turn off the charger (if necessary), unplug the battery, and disengage the roller bed safety stop.


14. Reverse the Battery Bull until its empty roller bed is centered with the selected charged battery.

⚠ WARNING Be sure the area below the roller bed is clear before lowering it.

15. Enter Magnet Position Mode. The green light will be on. Drive the magnet toward the selected charged battery and when contact is made, activate the magnet.

16. Use the Joystick to slowly pull the battery from the charging stand until the leading edge of the battery is approximately 2" [51 mm] past the center line of the first roller in the Battery Bull.
17. Enter Travel/Lift Mode. The green light will be off. Move the joystick to the left until the roller bed starts to lift the battery. (Do not lift more than 1" [25 mm] above the Charging Stand roller height.)
18. Deactivate the magnet. Enter Magnet Position Mode. Green light will be on. Use the joystick to move the magnet to a neutral position (centered between the two roller beds).
19. Move the appropriate Paddle Joystick away from the charging stand. The urethane rollers will pull the battery from the charging stand and into the Battery Bull.
20. Drive the Battery Bull forward/reverse until the discharged battery is in line with the newly vacated charging stand.
21. Move the appropriate Paddle Switch toward the vacated charging stand to propel the discharged battery into the vacated charging stand. Remember to turn the Battery Stop Override switch (**Number 7**) to retract the appropriate Battery Safety Stop and allow the battery to exit the Battery Bull.
22. If the battery does not fully enter the charging stand, use the magnet to gently push it completely in (it is not necessary to activate the magnet). Return the magnet to its neutral position.
23. Drive the Battery Bull forward allowing the operator access to engage the Roller Bed Safety Stop and plug the discharged battery into the charger.
24. Drive the Battery Bull toward the Lift Truck and align the charged battery to the Lift Truck compartment.
25. Lift the powered roller bed until the bottom of the battery is approximately 1" [25mm] above the top of the Lift Truck compartment rollers/slider.
26. Use the appropriate Paddle Switch to propel the charged battery into the Lift Truck. If the battery does not go completely in, lower the Battery Bull roller bed 1 to 2" [25 to 51 mm] and then use the magnet to gently push the battery to the Back Stop (it is not necessary to activate the magnet).
27. Return the magnet to its neutral position and park the Battery Bull in its designated spot.
28. Prepare the Lift Truck for use as follows:
    - Plug the battery into the Lift Truck.
    - Install the battery retaining gate.
    - Install all protective covers.

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			

Battery Room Preoperational Checklist and Handover (cont.)

	Battery Change Cart	Checked	Pass	Fail
32	The creep mode works at the top and bottom of the lift			
33	The automatic stop switch works at the top and bottom of the lift			
34	The two handed operation switch works (optional)			
35	The travel clutch stops the machine in 2 feet or less from full speed			
36	Record hour meter reading Hrs.			

NOTE: If any failures have been recorded, incoming operators are not allowed to proceed further until the failure has been corrected or their supervisor has been notified and instruction has been given.

Did the handover result in the requirement to cease operation? Yes ☐ / No ☐

Handover date and time:

Date:_____/_____/_____ Time:_____ am ☐ / pm ☐

Month Day Year

From operator:_____ _____

Signature Print

To operator:_____ _____

Signature Print

NOTE: This battery room preoperational checklist and handover document has been developed to assist our customers in taking control of the battery charging and battery changing operation in their facility. It will also enhance safety and force the operators to take responsibility for the equipment. This checklist is a guide only and therefore, not all items may apply. It is the customer's responsibility to modify this checklist by adding or deleting information to accurately represent their operation.

MOUNTING & ADJUSTMENT

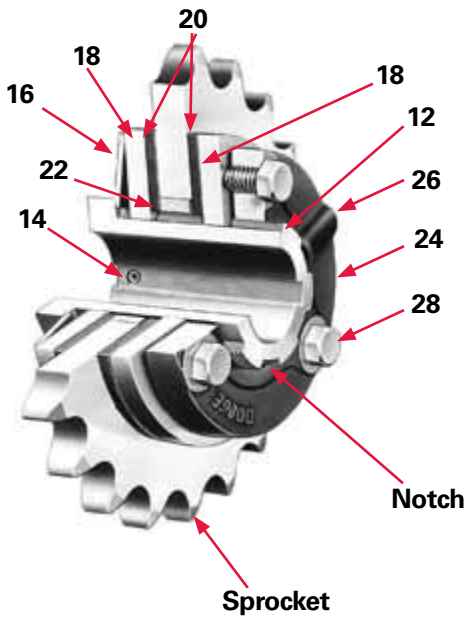
Antenna Mounting

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 below.
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 the heads bottom. Do not use washers under the 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 shaft.

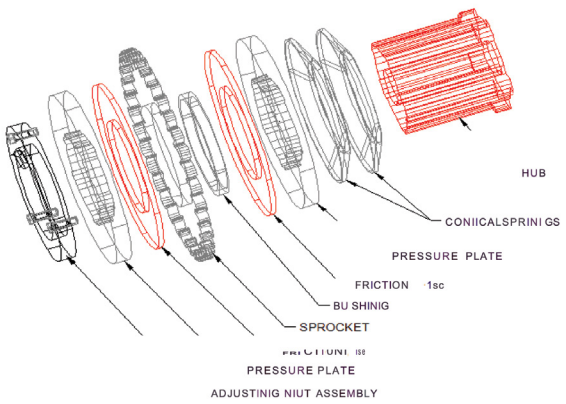
A shaft would extend from left to right through the bore of the hub **Number 12**. A sprocket would be captured between the two friction discs **Number 20** and this sprocket is free to rotate on the bushing **Number 22**. The hub **Number 12** is keyed to the shaft; therefore any rotational force applied 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.

Item **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 into the hub.
3. Insert one friction disc onto the hub.
4. Insert bushing onto the hub.
5. Insert a sprocket onto the hub. Ensure that the sprocket sits on 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 washers under heads of tension screws.



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)	
Anti-Seize	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

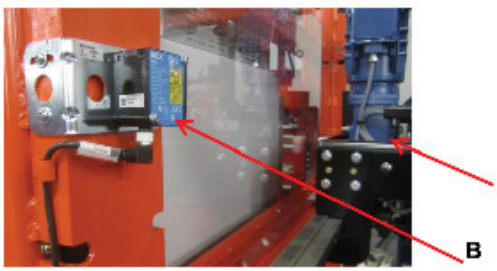
Size	Grade 5		Socket Head Cap Screws		Flat Head Cap Screws		Grade 8		Grade L9	
	Torque FT-LBS (Nm)									
1/4-20 UNC	8	(10)	17	(22)	8	(11)	12	(16)	16	(21)
5/16-18 UNC	17	(22)	35	(45)	17	(22)	25	(33)	33	(42)
3/8-16 UNC	31	(40)	62	(80)	29	(38)	44	(57)	58	(76)
1/2-13 UNC	75	(98)	150	(195)	71	(92)	107	(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)

Sensor Set-up

Setting up bridge sensor, height sensor, and collision sensor

Bridge Sensor:
Equipment: All electric Battery Bulls (BBE) or machines that have this option.

Overview: All electric-powered Battery Bulls use a 3hp gear motor to power the bridge nearest and farthest. To prevent excessive wear and damage caused by shock in the drive system we have installed a laser distance measuring device on the bridge to limit the travel and stop the bridge just before it contacts the end stops.



Procedure:

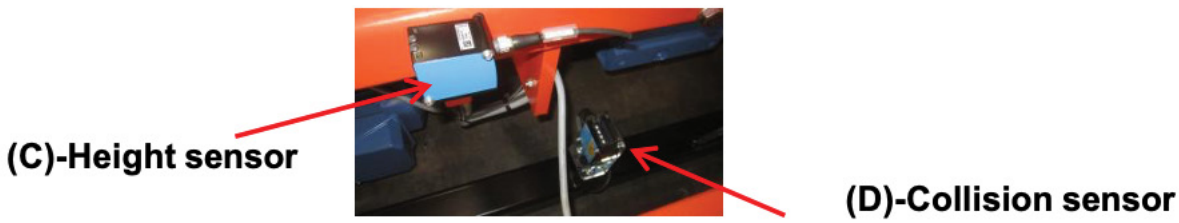
1. Unplug the sensor cable. Calibrate the sensor to its nearest position to the battery, (move the bridge (A) close to sensor [B]). Connect the cable to the sensor (B), the sensor should have power and display. Unlock the sensor by pushing the Set button and holding it for 5 seconds.
   a. Push the Set button again until the display shows "Menu". Push the up/down arrows until 0V appears.
   b. Push Set and the LED will flash twice. Push Esc and go back to the menu.
   c. The nearest position of the bridge is now calibrated.
2. Unplug the sensor cable, and move the bridge (A) away from the sensor (B) until the farthest position.
   a. Connect sensor cable to the sensor and the sensor should have power & display. Push the Set button again until the display shows Menu.
   b. Push the up/down arrows until 10V appears. Push Set and the LED will flash twice.
   c. Push Esc and go back to the menu. The farthest position of the bridge is now calibrated.
3. Lock the laser settings
   a. You must now lock all the laser settings by pushing the Set button until the menu appears.
   b. Push Set again and use the up/down arrows until lock appears.
   c. Push the Set button again and select Yes. The unit is now locked.
   d. Push Esc and the display will show the current bridge location.

Sensor Set-up (cont.)

Height Sensor:
Equipment: All electric Battery Bulls (BBE) or machines that have this option.

Procedure:
1. Make sure the machine is empty (no batteries).
2. Lower the machine completely and make sure it is level. Laser sensor (C) may need to be disconnected in order to lower all the way.
3. Locate the sensor under the operator platform.
4. Plug the cable back in.
5. Mark down floor level reading of the sensor display (example 335).
6. Push the Set button to the Mode display, and push the up/down arrows until Q1 display. The display should show the factory default value setting (00200) for Q1 near press Esc key.
7. Press up/down to Q1, press the Set button, and Set Q1 far 1700, press Set and Esc key.

8. The Q1 far value controls the height at which the travel speed will be reduced.
9. Go to Q2 near, push the Set button and change the floor level reading to (floor level reading +15), in our sample case 335+15 = 350
10. Go to Q2 far, push the Set button, and change the setting to 10000.
11. Go to Q1-Log and change to (/Q). To change the setting press up/down key.
12. Go to Q2-Log and change to (/Q).
13. Go to Q1-Hyst and change to (01).
14. Go to Q2-Hyst and change to (01).
15. Go to average change to (slow).



Distance Sensor for Rear and Front Collision Avoidance :
Equipment: All electric Battery Bulls (BBE) or machines that have this option.

BBE Distance Sensor Installation for Rear Collision Avoidance
1. Disconnect and lock out electrical power from the transfer cart.
2. Mount the Distance Sensor (**Figure 1**) on the BBE. Refer to drawing BBE-2-XX-TS- LFA-SENSOR ASSY PROVIDED
3. Refer to **Figure 2** to see the Rear Collision Sensor of the BBE.

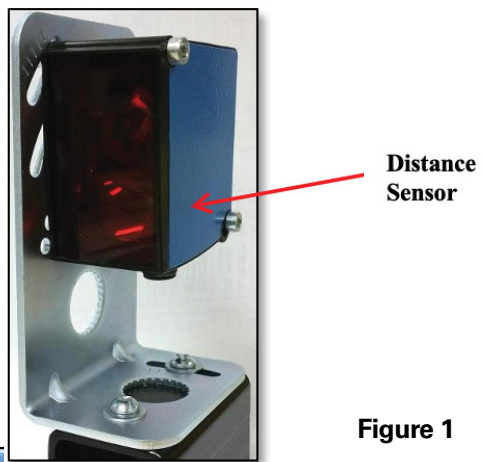


Figure 1

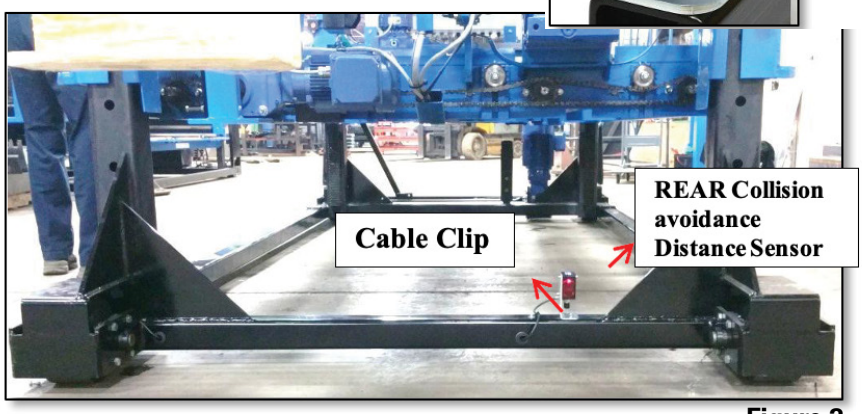


Figure 2

Sensor Set-up (cont.)

4. Check all wiring before reconnecting electrical power
5. The REAR Collision avoidance Distance Sensor has two outputs, Q1 and Q2. Q1 is set as default to 3 m to slow down and Q2 is set as default 1.5 m to stop.
6. Both Q1 and Q2 are preset by Carney to a normally open contact.
7. If the Distance Sensor needs to adjust to a new setting, press the down arrow twice until Q1 appears.
8. Move BBE 3 meters away from the start point (slow down point) and Press the Set button, then press the arrow key until Q1 is shown, then press the Set key button. (Q1 position for slow down point is set)
9. Move BBE 1.5 meters away from the stop point and press the Set button, and the down arrow key until Q2 is shown.
10. Press the Set key button. (Q2 position for stop point is set).
11. Press the Esc button to go to the display screen.
12. Update the PLC program if needed.

*** If contact states need to change**

- Press the Set key button twice.
- Press the arrow down till Q1-LOG is shown and make sure is shown Q.
- Press the Set key. If not, see below how to change state.
- Press the arrow down key until Q2-LOG is shown.
- Change contact state Q\ to Q, by pressing the arrow down key until Q is shown, then press the Set key button, then press Esc key to display the screen. (Q1-LOG = Q, Q2- LOG = Q).

****NOTE: DON'T CHANGE ANY OTHER SETTINGS.**

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