

PROSERIES[®]

Battery Bull Hydraulic Battery Handling Equipment



OWNER'S MANUAL

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INTRODUCTION

PROSERIES[®]

The information contained in this document is critical for safe handling and proper use of the Battery Bull Hydraulic. 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 made accessible to all users responsible for working with the battery handling equipment. Users are responsible for ensuring that all applications of the system are appropriate and safe, based on anticipated and encountered operating conditions.

This owner's manual contains important safety instructions. Read and understand the sections on safety and operation of the battery 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 Hydraulic 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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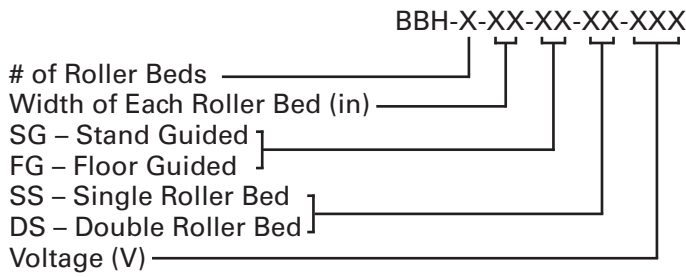
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Your Safety and the Safety of others is Very Important

⚠ 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 BBH-Battery Bull Hydraulic 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.

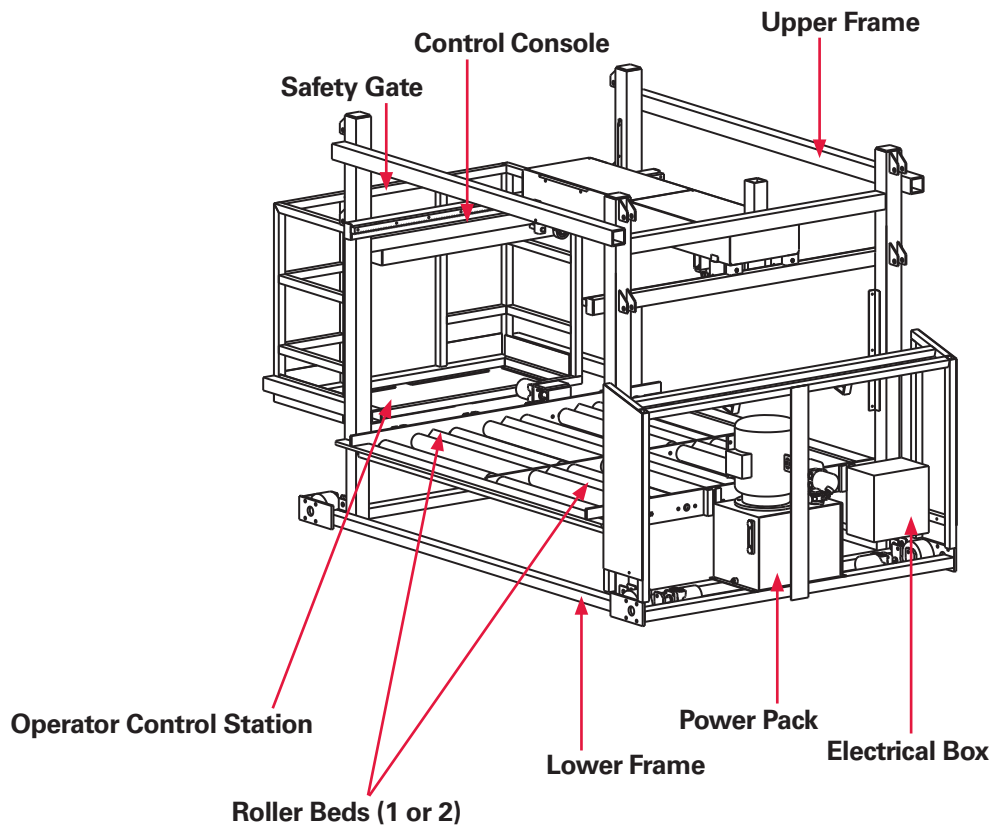
⚠ DANGER!	
	Crush Hazard! Keep body clear.

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

⚠ CAUTION!	
	Pinch Hazard! Keep hands clear.

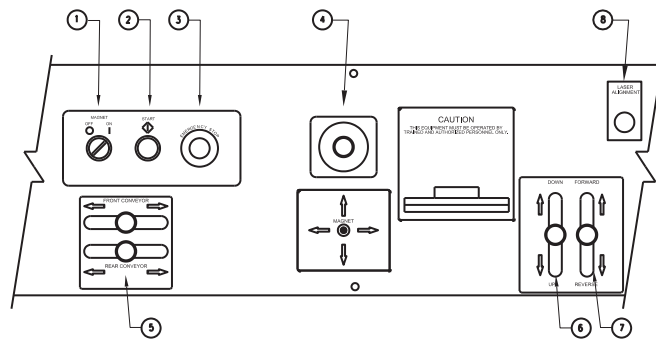
OVERVIEW & CONTROLS

BBH–Battery Bull Overview



Operator Controls Description

Model: BBH



#	Description
1	Magnet ON/OFF
2	Start Button
3	Emergency Stop
4	Bridge/Magnet Joystick

#	Description
5	Roller Bed Joystick (1 or 2)
6	Lift/Lower Joystick
7	Forward/Reverse Joystick
8	Laser Alignment On/Off

CONTROL CONSOLE

Control Console

The Battery Bull is operated using one 4-position Joystick (**Number 4**, page 6) to control the position of the bridge/magnet, one (or two) 2-position Joystick (s) (**Number 5**, page 6) to control the powered roller bed (s), one 2 position Joystick (**Number 6**, page 6) to control lift/lower and one 2 position Joystick (**Number 7**, page 6) to control drive fwd/rev.

All control joysticks are logical in their direction and proportional in their control. For example: if you push the Drive Joystick forward from the operator the machine will move in the forward direction. The further the joystick is pushed the faster the machine will move.

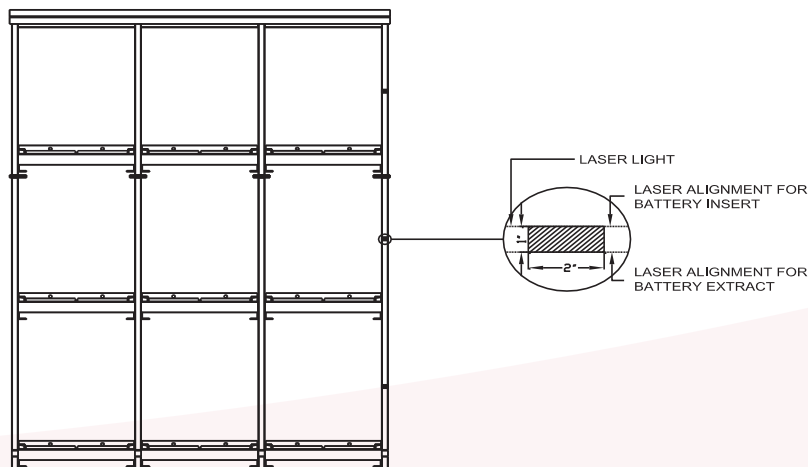
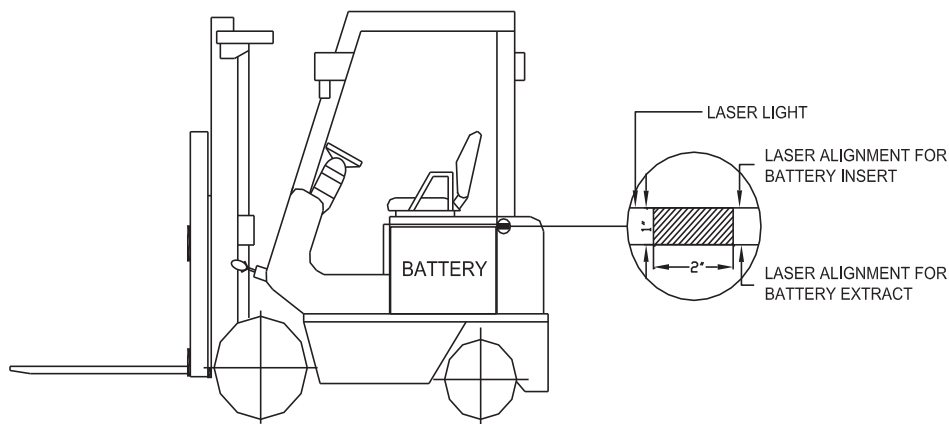
The ON/OFF Function of the magnet is controlled by a rotating switch (**Number 1**, page 6). To turn the Magnet ON rotate the switch to the right; to turn the Magnet OFF rotate the switch to the left.

The ON/OFF function of the Laser Alignment is controlled by the toggle switch (**Number 8**, page 6). When the laser Alignment is set to ON, a green horizontal light shoots off the laser.

The green horizontal light indicates the height of the roller bed.





Battery Bull roller bed height alignment procedure:

- Push the green Start Button (**Number 2**, page 6) to activate the machine.
- Flip the Laser Alignment toggle switch to the ON position (**Number 8**, page 6).
- Align the top of the roller with the bottom of the battery compartment in the LiftTruck or the roller's top in the roller stand frame.
- Mark the side of the battery compartment with a 1" wide white tape aligning the center of the tape with the laser light.
- Align the horizontal laser light with the lower edge of the white tape when extracting the battery from the LiftTruck or roller stand.
- Align the horizontal laser light with the upper edge of the white tape when inserting the battery in the LiftTruck or in the roller stand frame.









OPERATING INSTRUCTIONS

Operating Instructions

 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.

 Before operating the Battery Bull the operator must thoroughly review and understand 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**. **Do not stare into the laser light.**

Preparation:







- Park the LiftTruck in a parallel position adjacent to the Battery Bull leaving approximately 2" (50 mm) clearance (a painted reference line on the floor will ensure the correct LiftTruck position every time).
- Prepare the LiftTruck 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.






- Open the Safety 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.
- Secure the Safety Gate and then push the green Start Button (**Number 2**, page 6) to activate the machine.



OPERATING INSTRUCTIONS

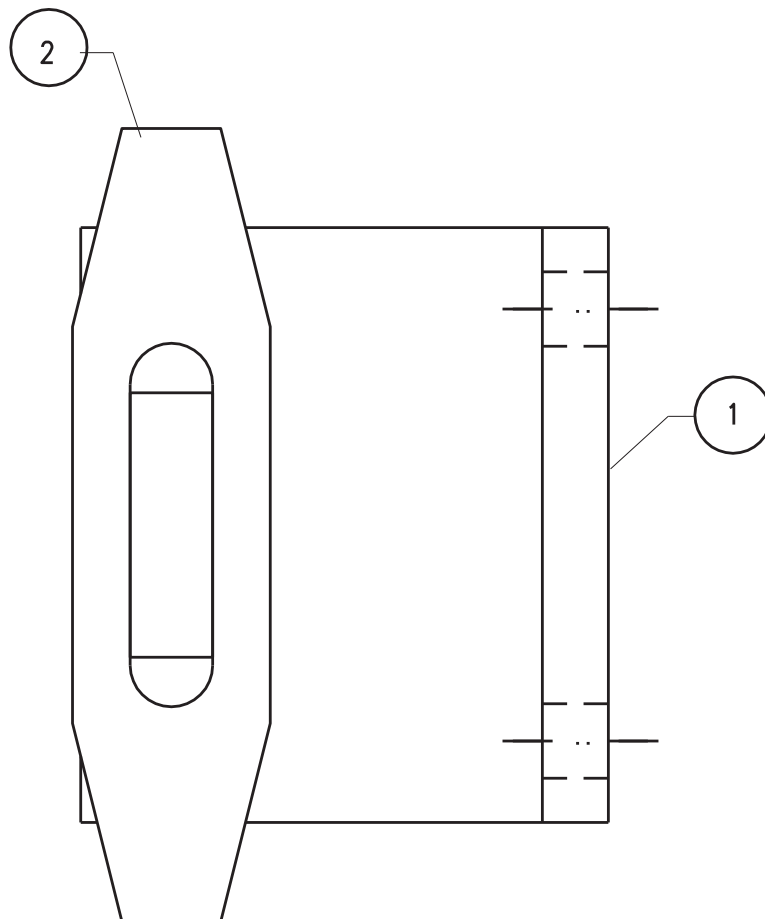
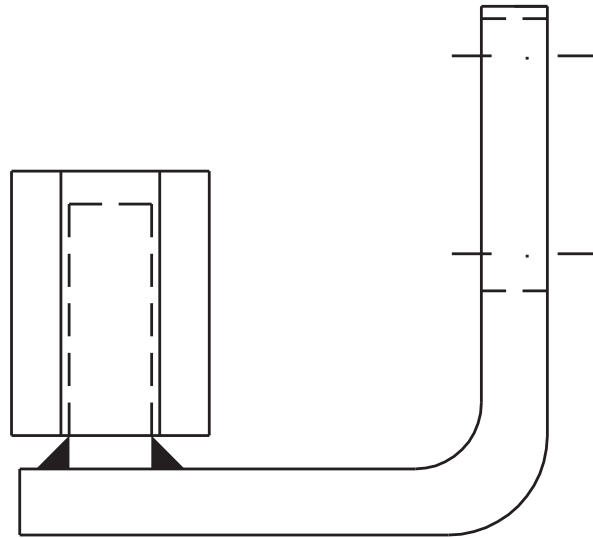
Operating Instructions (cont.)

5. Locate the Forward/Reverse Joystick (**Number 7**, page 6). Move the Joystick Forward/Reverse and drive the Battery Bull alongside the LiftTruck so that the center line of the selected Roller Bed is centered to the battery in the LiftTruck. Use the Lift/Lower Joystick (**Number 6**, page 6) to raise or lower the roller bed so that it is approximately 1/2" [12 mm] below the battery compartment of the LiftTruck. (Align laser line with lower edge of the florescent tape on the LiftTruck).
6. Use the Lift/Lower Joystick (**Number 6**, page 6) to raise or lower the roller bed. So that it is approximately 1/2" [12 mm] below the battery compartment of the Lift Truck (Align laser line with the lower edge of the florescent tape on the LiftTruck). 
7. Drive the magnet using the Bridge/Magnet Joystick so it is just touching the center of the battery in the LiftTruck, activate the magnet (**Number 1**, page 6). 
8. When contact is made and the magnet has a firm grip on the battery, move the Bridge/Magnet 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. Use the Lift/Lower Joystick to lift the roller bed until it starts to lift the battery. (Do not lift more than 1/2" [12 mm] above the truck bed height.)
10. Deactivate the magnet. Use the Bridge/Magnet Joystick to move the magnet to a neutral position (centered between the two roller beds). 
11. Move the appropriate Roller Bed Joystick away from the LiftTruck so the urethane rollers will pull the battery from the LiftTruck and into the Battery Bull. 
12. Using the Forward/Reverse 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 area below Roller Bed is clear before lowering.
15. Drive the magnet toward the selected charged battery using the Bridge/Magnet Joystick and when contact is made, activate the magnet. 
16. Use the Bridge/Magnet 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. Move the Lift/Lower Joystick to lift the battery. (Do not lift more than 1" [25 mm] above the Charging Stand roller height.)
18. Deactivate the magnet. Use the Bridge/Magnet Joystick to move the magnet to a neutral position (centered between the two roller beds).
19. Move the appropriate Roller Bed 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 Roller Bed Joystick toward the vacated Charging Stand to propel the discharged battery into the vacated Charging Stand.
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 LiftTruck and align the charged battery to the LiftTruck compartment.
25. Lift the powered Roller Bed until the bottom of the battery is approximately 1" [25 mm] above the top of the LiftTruck compartment rollers/slider.
26. Use the appropriate Roller Bed Joystick to propel the charged battery into the LiftTruck. 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 all the way 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 LiftTruck for use as follows: 
 - Plug the battery into the LiftTruck.
 - Install the battery Retaining Gate.
 - Install all Protective Covers.

SIDE GUIDE

Side Guide



MAINTENANCE

General Maintenance Summary

Check Bridge and Roller Bed chain tension	First 20 Hours
Check lift posts for gouging and build-up	@ First 100 Hours

1	Clean magnet face	Daily
2	Check joystick handles for loose linkage bolts on console	Weekly
3	Check entire hydraulic system for leaks	Weekly
4	Wipe down entire unit with mild detergent (non abrasive) to remove any dirt build-up	3 months
5	Tighten any loose bolts and nuts	250 Hours
6	Check Roller Bed Chain tension	250 Hours
7	Grease rack and spur gear on bridge	250 Hours
8	Change hydraulic oil filter	500 Hours
9	Grease travel wheel bearings	750 Hours
10	Grease all bearings	750 Hours
11	Check spur gears on bridge for wear	750 Hours
12	Check and lubricate travel arm chain tension inside bridge	750 Hours
13	Check wheel wear	1500 Hours
14	Grease lift mechanism guide posts	1500 Hours
15	Change hydraulic oil	3000 Hours

Recommended Oil and Lubricant

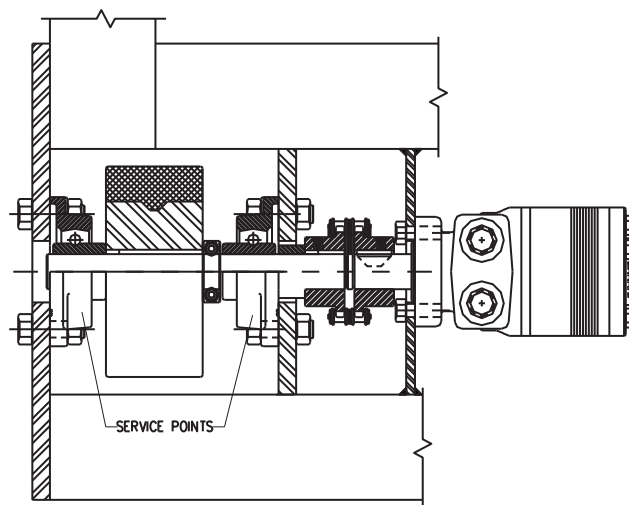
Hydraulic Oil	4021 PARADENE 32 AW or equivalent
Grease	ROTANIUM Blue Grease (Waterproof)
Chain Lubricant	TEF-LUBE 2000
Oil	S.A.E. 30

MAINTENANCE

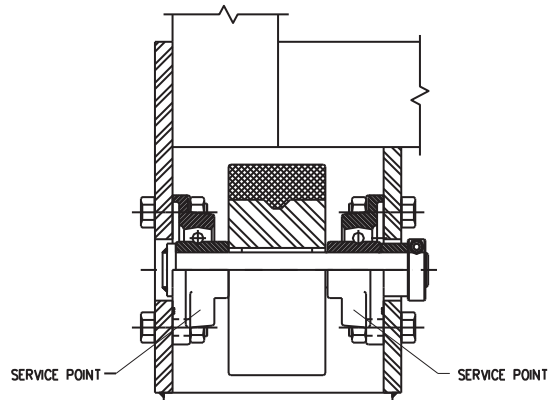
Wheel Maintenance

Maintenance Points	# Service Points	Lubricant	Intervals (hours)
Bearing 4 Bolt Flange	8	Rotanium Blue Grease	750
Check Wheel wear	N/A	N/A	1500

ATTENTION: Replace wheel if the diameter is 5 1/2" (140 mm) or less; the wheel face is 2 3/4" (70 mm) or less.



DRIVE WHEEL ASSEMBLY



FREE WHEEL ASSEMBLY

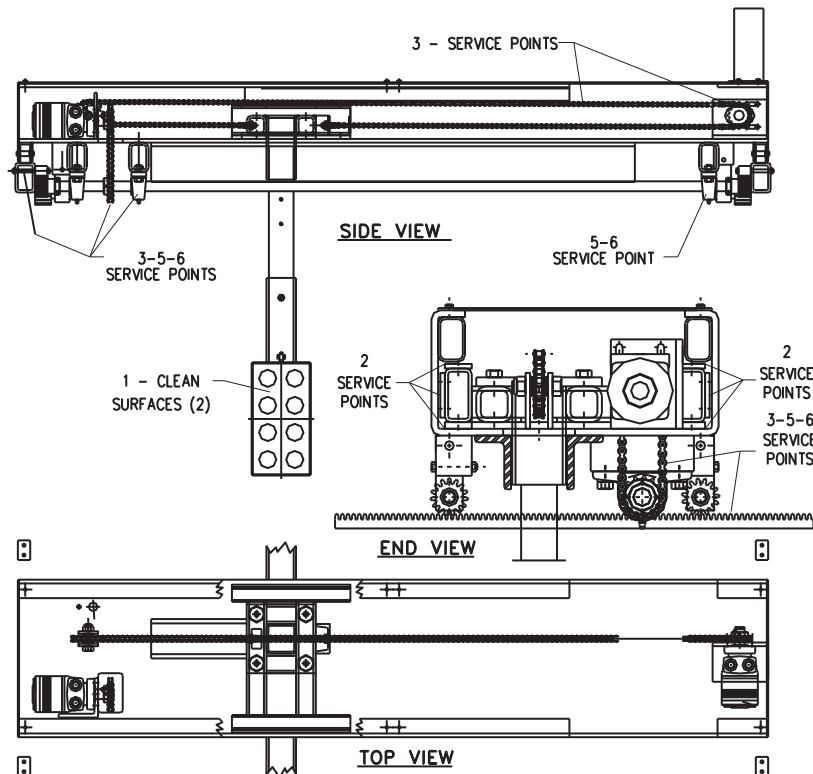
MAINTENANCE

Bridge Maintenance

#	Maintenance Points	# Service Points	Lubricant	Intervals (hours)
1	Magnet Face	2	Clean with Soft Cloth & Varsol	Daily
2	UHMW Slides	6	Clean with Soft Cloth	Monthly
3	Traveler/Drive Chains	2	TEF-LUBE 2000	250
4	Spur Gear Rack 6ft	2	Rotanium Blue Grease	250
5	Bearing Pillow Block	3	Rotanium Blue Grease	750
6	Bearing Cam Follower	4	Rotanium Blue Grease	750

ATTENTION:

- Check monthly and tighten ANY bolts that may have become loose.
- Check Roller Chain tension and use the adjusting bolt to remove any slack. Recommended at first 20 hours then every 250 hours.
- If any chain becomes worn, stretched, or corroded, replace it.
- Clean the magnet face daily.



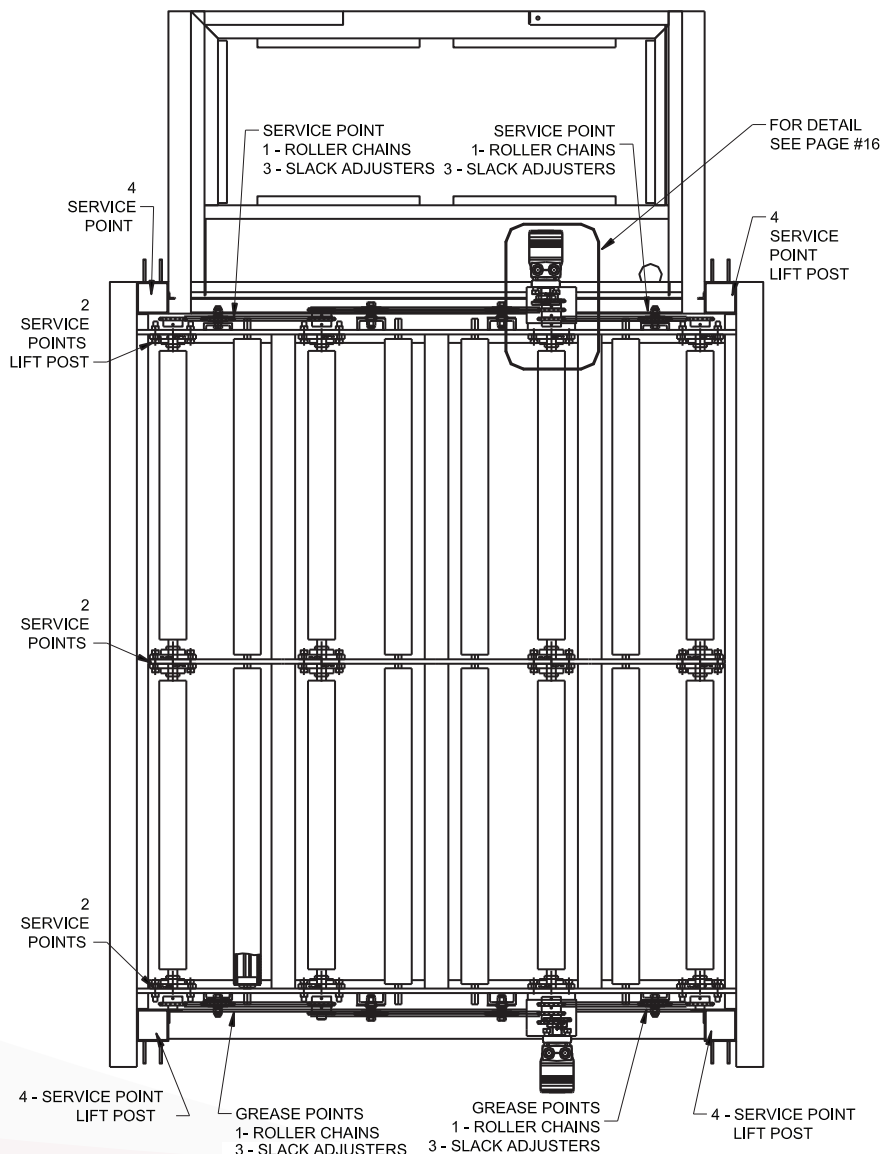
MAINTENANCE

Powered Roller Bed Maintenance

#	Maintenance Points	# Service Points	Lubricant	Intervals (hours)
1	Roller Drive Chain	8	TEF-LUBE 2000	250
2	Flange Bearing	16	Rotanium Blue Grease	750
3	Roller Chain Slack Adjusters	8	N/A	250
4	Lifting/Guide Posts	4	Rotanium Blue Grease	1500

ATTENTION:

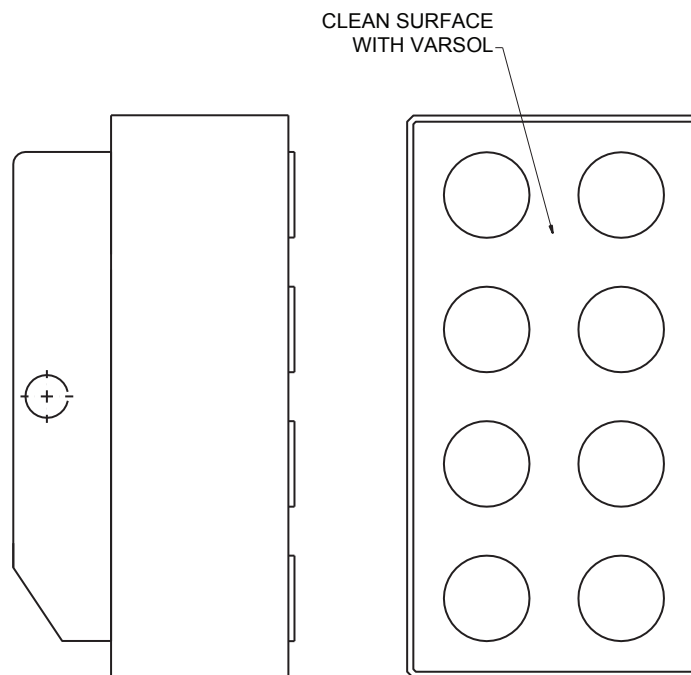
- Check monthly and tighten ANY bolts that may have become loose.
- Lower Slack Adjuster to maintain roller chain tension. If excessive slack, remove ONE full link or 1/2 link and readjust as required. Recommended at first 20 hours, then every 250 hours.
- If any chain becomes worn, stretched, or corroded, replace it.
- Lift the roller bed to its highest position. Check the inside guide posts at each of the four (4) corners of the roller bed for any excessive wear. Clean any build-up of metal chips and re-grease posts.



Electromagnet Maintenance

ATTENTION:

- Electromagnets require very little maintenance to provide a long useful life. Daily use of a shop towel with Varsol to wipe the magnet face free of debris, grease, oil, or other foreign matter, will ensure years of service life and thousands of safe operations.
- The pulling capacity is greatly reduced when the face of the magnet is dirty. Use care when handling the magnet so as not to nick or mark the pulling surface. If the face is heavily worn, lightly surface grind a few thousandths off the face to clean up the pulling surface.
- Never try to remove the electrical cord mounted in the magnet. Should you do this, you will destroy the magnet and it will require rebuilding or replacement.



LIFTING CYLINDERS

Lifting Cylinders Bleeding Procedure

If any of the lift cylinders are spongy (ie. They pop up after being fully lowered) there is air in the hydraulic system. Air can be purged from the system as follows; (This procedure will require two (2) people to complete.)

1. Lower the Roller Bed to its lowest position.
2. Remove Cap–Extra Port for Bleeding and Flushing Purposes) from both Front Cylinders.
3. Connect the Bleeding Kit (BK-100) to both fittings.
4. The Needle Valve of the Bleeding Kit must be closed and directed into a container at the front of the machine.
5. Start the machine.
6. Locate the two (2) Needle Valves at the rear of the machine on the Hydraulic Cylinders.
7. Open both Needle Valves one (1) full turn.
8. Open the Needle Valve of the Bleeding Kit 1/4

turn and pull the Lift Up lever to SLOWLY lift the Roller Bed until it reaches its maximum height. Continue to lift as you close the three (3) Needle Valves. This procedure should be done as slowly as possible to allow all the trapped air to escape and prevent excessive splashing.

9. Power the Roller Bed down.
10. When the Roller Bed reaches its lowest position repeat steps 7–9.
11. Repeat this procedure until the oil in the Bleeding Line is clear of any air (approx. 3–4 times).
12. Lower the Roller Bed to its lowest position, and remove the Bleeding Kit, and install protective caps.
13. Be aware of the oil level in the Pump Reservoir and do not run dry as this procedure is performed.

Lifting Cylinder Equalization Procedure

This is a closed-loop hydraulic system, however, there is always some internal leakage around the seals. As this occurs the roller bed will begin to lift unevenly. To correct this, it is necessary to balance the oil volume between the Front and Rear Cylinders. This can be accomplished as follows:

1. Power the Roller Bed to its lowest position.
2. Locate the two (2) Needle Valves at the rear of the machine on the Hydraulic Cylinders.
3. Open both Needle Valves one (1) full turn.

4. Lift the Roller Bed to its highest position (with no load). Hold the Lift Lever back until all four (4) Cylinders reach their maximum height.
5. Close the two (2) Needle Valves and this completes the procedure.
6. This procedure is necessary every few days. However, as the seals wear the procedure will become more frequent, and ultimately the seals will require replacement.

MAINTENANCE CHECKLIST

Regular Maintenance Checklist

Repairs Required

Inspection Performed	Yes	No	Repairs Performed	Completed Date
1. Visual inspection of unit for damage or missing parts.				
2. Remove front guard panels, bridge lids and console lid.				
3. Check for hydraulic leaks.				
4. Check hydraulic oil level & condition (milky, dark, burnt, etc.) filter to be changed every 500 hours.				
5. Check power pack condition and security.				
6. Check electrical panel condition and security.				
7. Check that hoses are in good condition and contained (kinks, rub wear).				
8. Check drive wheels, shafts, couplings and chains for wear and damage. Lubricate.				
9. Check drive wheels for lateral movement – maximum 1/16".				
10. Check bearings for wear, damage and security. Lubricate every 750 hours.				
11. Check guard frame and antenna for damage and security.				

Raise Roller Bed

Inspection Performed	Yes	No	Repairs Performed	Completed Date
12. Check hydraulic cylinders for leaks or seal or rod damage.				
13. Check hydraulic cylinder pins and clips.				
14. Check hydraulic hoses (stretched, kinked, caught, rub wear, or damage).				

MAINTENANCE CHECKLIST

Regular Maintenance Checklist (cont.)

Raise Roller Bed (cont.)

Inspection Performed	Yes	No	Repairs Performed	Completed Date
15. Check roller bed drive assembly for damage, wear and alignment.				
16. Check rollers and bearings for wear and damage. Lubricate every 750 hours.				
17. Check idler wheels, shafts, and bearings for wear and damage.				

Lower Roller Bed

Inspection Performed	Yes	No	Repairs Performed	Completed Date
18. Check gear racks for broken teeth, wear, backlash and security. Lubricate every 750 hours.				
19. Check spur gears for broken teeth, wear, backlash and security. Lubricate every 250 hours.				
20. Check bridge drive shaft assembly for wear, damage and alignment—lubricate.				
21. Check magnet arm assembly and magnets for damage and security.				
22. Check inside bridge for hydraulic leaks.				
23. Check Traveler for wear and damage.				
24. Check chains for wear, damage and tension. Lubricate every 250 hours.				
25. Check needle valve settings and lock it.				
26. Check safety gate arm and rod for damage and security.				
27. Check side guides for wear, damage and security.				
28. Check directional control valves for leaks.				

MAINTENANCE CHECKLIST

Regular Maintenance Checklist (cont.)

Repairs Required

Inspection Performed	Yes	No	Repairs Performed	Completed Date
29. Check electrical control box and console for damage and security.				
30.30) Replace front guard panels, bridge lids, and console lid.				
31. Visually inspect that all fasteners are in place and secure.				
32. General cleaning of unit (wipe down with a non-abrasive cleaner).				

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