LIFT PILOT®

FLOOR LEVEL
PALLET POSITIONER

Bishamon®

Installation & Service MANUAL

Model LP-25

MADE IN USA

Issued Patents
United States No. 7,604,452
US and Foreign Patents Pending

Please note: This manual was current at the time of printing.
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BISHAMON INDUSTRIES CORPORATION

5651 East Francis Street

Ontario, California 91761, USA

(909) 390-0055 (800) 358-8833

Date Placed in Service:
Serial Number:
Dealer:

Version 1.02

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GETTING STARTED

PLEASE READ THIS MANUAL CAREFULLY BEFORE USING THE Lift Pilot® Pallet Positioner. The safety of all persons installing, using or servicing the Lift Pilot® is of utmost importance to Bishamon. The Lift Pilot® is capable of lifting heavy loads and is capable of causing SEVERE PERSONAL INJURY if used improperly or certain safety precautions are not taken. When properly used and maintained, the Lift Pilot® will provide many years of safe, trouble free service. If you have any questions about any of the instructions in this manual or about the use of this product, PLEASE contact your DEALER or Bishamon Industries Corporation.

Lift Pilot® is a registered trademark of Bishamon Industries Corporation. Throughout this service manual the Lift Pilot® may be referred to as the "unit", the "lift" or the "positioner".

SAFETY DEFINITIONS

Bishamon uses the following system to identify the degree of risk associated with hazards and unsafe practices.

DANGER - Immediate hazard which will result in **SEVERE PERSONAL INJURY** or **DEATH**.

WARNING - Hazard or unsafe practice which could result in **SEVERE PERSONAL INJURY** or **DEATH** and **PROPERTY DAMAGE**.

CAUTION - Hazard or unsafe practice which could result in **MINOR PERSONAL INJURY** and **PROPERTY DAMAGE**.

⚠DANGER

1. **DO NOT** operate the Lift Pilot unless you have been trained and authorized to do so. All operators must understand and be familiar with the operation and function of all controls and indicators.
2. A lowering load can cause **SEVERE PERSONAL INJURY** or **DEATH**. **NEVER** go under the elevated load. **ALWAYS** keep hands and feet clear while lowering the load. Entrapment could occur and cause **SEVERE PERSONAL INJURY** or **DEATH**.
3. A falling load can cause **SEVERE PERSONAL INJURY** or **DEATH**. **ALWAYS** ensure others are well clear of the Lift Pilot when loads are raised or lowered. All maintenance should be performed with the unloaded forks in the fully lowered position or securely blocked in a raised position.
4. **NEVER** place feet on the perimeter base frame while in use. Feet could be **CRUSHED** by the lowering structure and cause **SEVERE PERSONAL INJURY** or **DEATH**.
5. **NEVER** sit, stand or ride on the pallet or load. Moving components could cause loss of balance. **SEVERE PERSONAL INJURY** or **DEATH** could result.
6. The lift's electrical circuits use voltages which can cause **SEVERE PERSONAL INJURY** or **DEATH**. **DO NOT** work with the electrical components unless you are a **QUALIFIED ELECTRICAN**
7. The Lift Pilot's electrical components can create sparks. **DO NOT** install the lift in an area where potentially explosive dusts, gases, or vapors may be present. Failure to comply may result in an explosion and cause **SEVERE PERSONAL INJURY** or **DEATH**.

⚠WARNING

1. The Lift Pilot is designed for use with stable, uniformly distributed, palletized loads on a solid, level and dry floor. **DO NOT** use the lifter for any purpose other than its intended use. Improper use could result in **SEVERE PERSONAL INJURY** and **PROPERTY DAMAGE**.

   DO NOT install the Lift Pilot on asphalt or other similar unstable surfaces. The column is supported **ONLY** by the anchors in the floor. Refer to the Lift Pilot Concrete and Anchoring section of this manual.

   DO NOT overload the Lift Pilot. NEVER exceed the designated capacity and load center ratings. **ALWAYS** ensure the forks completely engage the pallet and are centered in the pallet.

   DO NOT concentrate the load at one point on the pallet. **ALWAYS** uniformly distribute each layer of load over the pallet surface.

   DO NOT use the Lift Pilot with an unstable, unbalanced or loosely stacked load. Unbalanced loads may become unstable and fall.
2. **SHEARING HAZARD**. **ALWAYS** keep hands and feet clear of all moving components. **SHEARING HAZARDS** are created as the carriage moves up and down. **DO NOT** place hands or fingers on the mast or carriage when in use. **SEVERE PERSONAL INJURY** could result.

3. **CRUSHING HAZARD**. **ALWAYS** keep hands and feet away from the underside of the pallet and all moving components. **CRUSHING HAZARDS** are created as the carriage moves up and down. **SEVERE PERSONAL INJURY** could result.
4. **PINCH POINT HAZARD**. **ALWAYS** keep feet, hands and fingers away from the underside of the pallet and all moving components. **PINCH POINT HAZARDS** are created as the carriage moves up and down. **SEVERE PERSONAL INJURY** could result.
5. **NEVER** leave the Lift Pilot unattended unless the carriage is in the fully lowered position.
6. **DO NOT** change the hydraulic pump's relief valve setting. The relief valve is installed to protect the operator and the lift. Changing the relief valve setting may cause the forks to suddenly fall. **SEVERE PERSONAL INJURY** and **PROPERTY DAMAGE** could result.
7. **ALL** lift servicing must be performed by qualified personnel only. Unauthorized modifications to the Lift Pilot, its hydraulic power unit or its control system may compromise the performance and safety of the system resulting in S**EVERE PERSONAL INJURY** and **PROPERTY DAMAGE**.

   UNDER NO CIRCUMSTANCES should you attempt any repair or service that is not covered in this manual. The release of hydraulic fluid under high pressure can be dangerous. Before servicing the lift, follow the instructions in the manual to complete release the hydraulic pressure.

   ALWAYS disconnect the power cord before servicing the electrical system. Not doing so could result in a **SEVERE ELECTRICAL SHOCK**.
8. **ALWAYS** ensure all safety warning labels are in place and legible. If not, remove the Lift Pilot from service and replace the required labels.

⚠CAUTION

1. **DO NOT** continue to operate the pump if a squealing noise is heard coming from the pump. The pressure relief valve is operating. Continued use of the pump with the relief valve operating will cause permanent damage the pump. **REDUCE** the load to prevent the relief valve from operating.

HAZARD LOCATIONS

Figure 1 Hazard Locations

SAFTEY WARNING LABEL LOCATIONS

Figure 2 Safety Warning Label Locations

RESPONSIBILITIES OF OWNERS/USERS

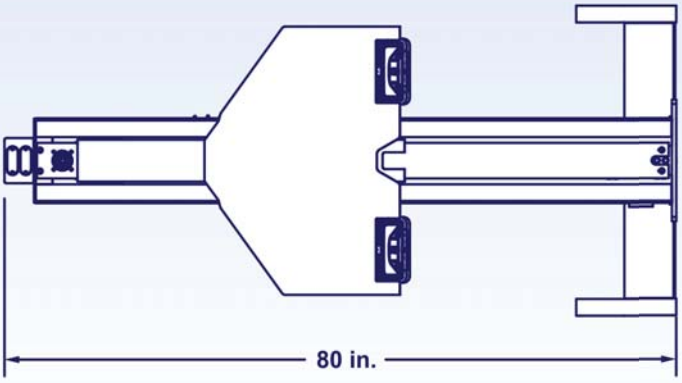
It is the responsibility of the Owners/Users to:

- Ensure the Lift Pilot is properly installed and the concrete meet the minimum requirements.
- Ensure only trained and authorized personnel are permitted to operate the Lift Pilot and that all operators understand the operating instructions, safety rules and hazards associated with this lift.
- Ensure the Lift Pilot is inspected and maintained in proper working order in accordance with the operation/ maintenance instructions provided in this manual.
- Ensure any Lift Pilot not in safe operating condition is removed from service and repaired to Bishamon's standards. Unsafe conditions include, but are not limited to: excessive leakage, missing pins or fasteners, bent or cracked structural members, cut or freyed hydraulic lines and damaged or malfunctioning controls or safety devices.
- Ensure all repairs are made by qualified personnel in conformance with the instructions provided by Bishamon Industries Corporation.
- Ensure the Lift Pilot is used in accordance with the guidelines provided in this manual.
- Ensure modifications or alterations of any Lift Pilot are made only with the written permission of Bishamon Industries Corporation.

SPECIFICATIONS AND SPECIFICATION DRAWING

SPECIFICATIONS:

1. Capacity = **2500 lbs. @ 24 in. load center**
2. Fork Length = **40 or 48 in. (operator selectable)**
3. Fork Lowered Height = **3 5/8 - 4 5/8 in. (operator selectable)**
4. AC Power = **115 volt (20 amps)**
5. Lift / Lower Operation = **Hydraulic**
6. Fork Operation = **24 VDC electro-mechanical operation**
7. Product Weight = **800 lbs.**
8. Sound Pressure Level = **<70dB(a)**
9. Operating Environment = **Indoors**
10. Operating Temperature = **+32°F - +120°F**
11. Lighting Requirement = Good General Lighting



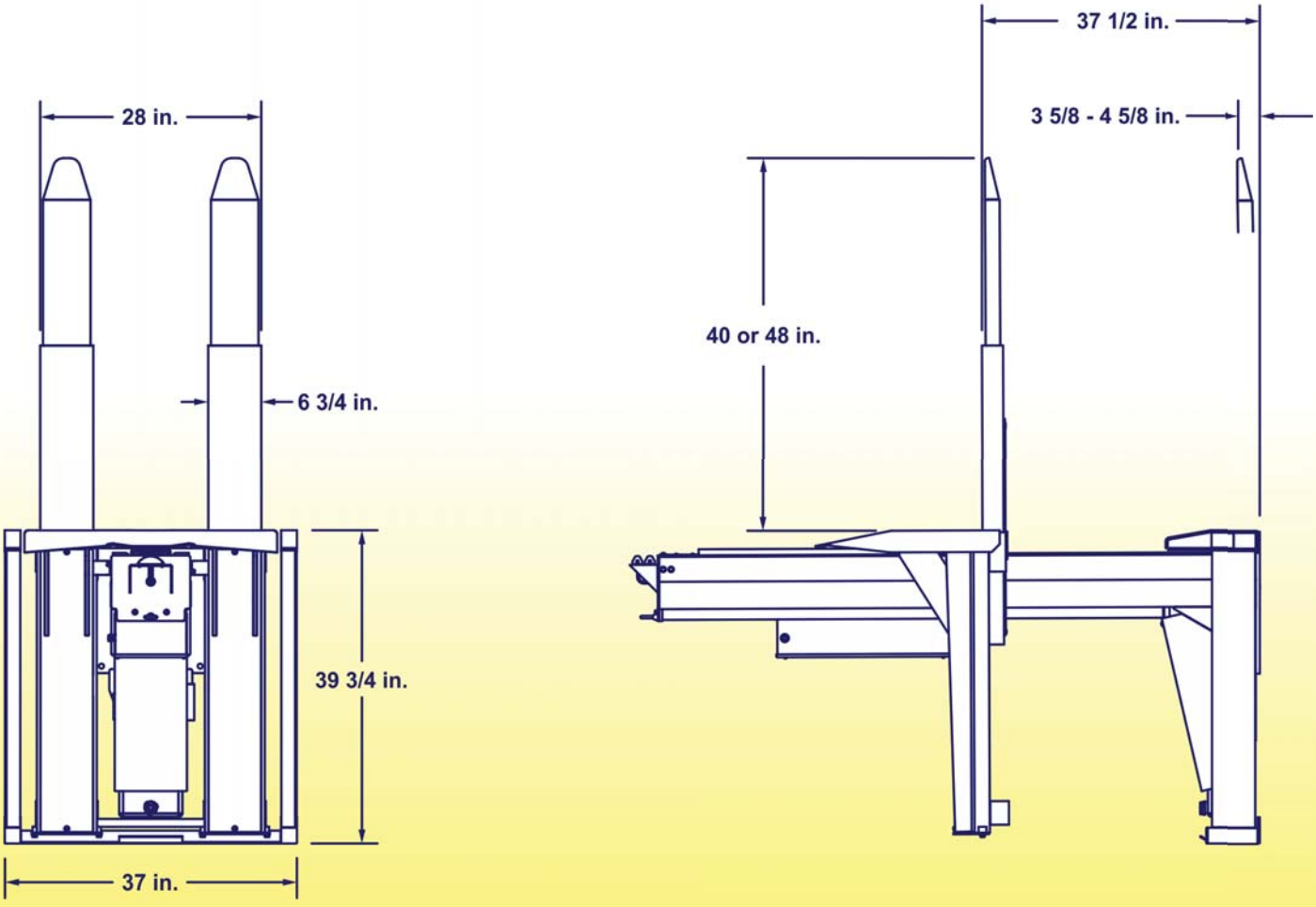


Figure 3 Specifications and Specification Drawing

RECOMMENDED FLOOR AREA

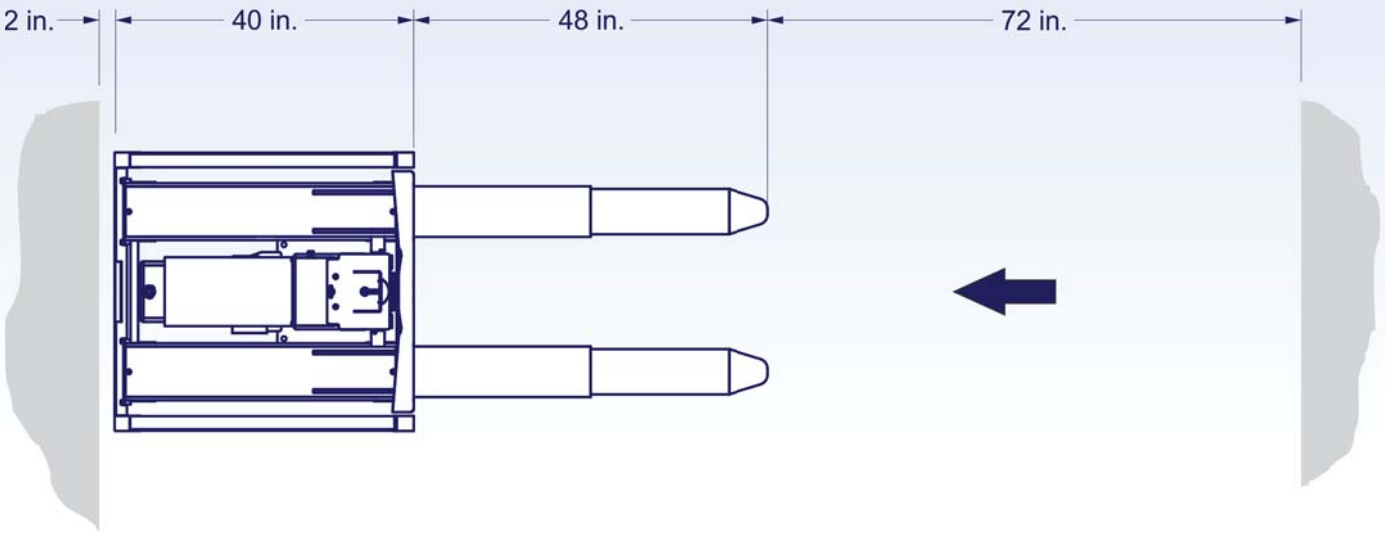


Figure 4 Front Approach

The Bishamon Lift Pilot is designed to work with standard GMA (48 in. x 40 in.) pallets and with standard US CHEP (48 in. x 40 in.) pallets. The GMA pallet can only be accessed from the end (Front Approach) with the forks extending along the 48-inch length. The recommended floor area for a front approach is shown above in Figure 4. A total of 120 inches of floor space is recommended in front of the Lift Pilot to allow for easy pallet jack entry and maneuvering.

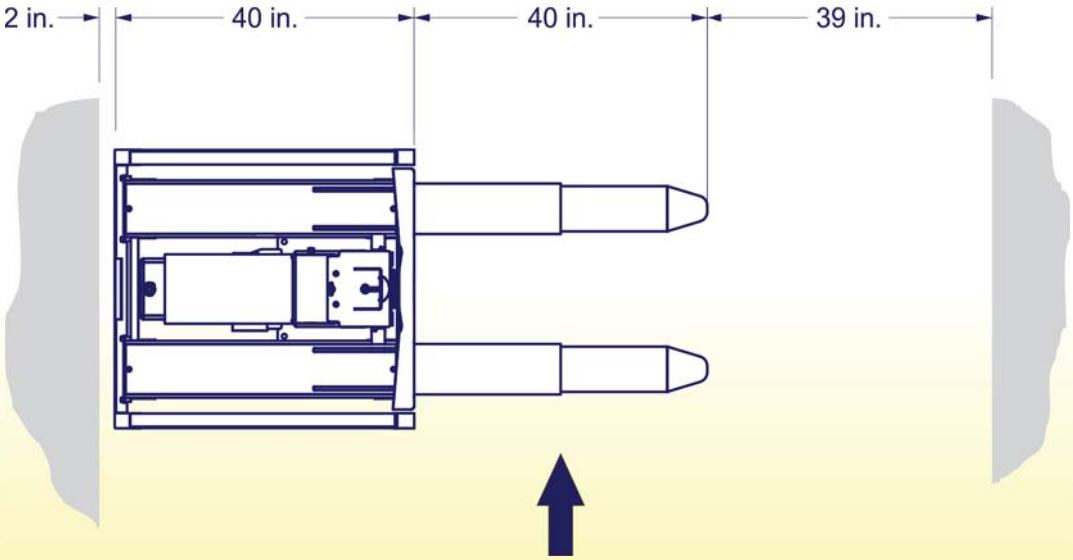


Figure 5 Side Approach

Typical US CHEP pallets can be entered from the end (Front Approach) or the side (Side Approach).The recommended floor area for a side approach is shown in Figure 5. When using this approach, the Lift Pilot forks should be set at the 40-inch length. A total of 79 inches of floor space in front of the Lift Pilot is recommended. This provides 39 inches for the operating zone which allows the operator to safely work around the pallet.

DANGER ZONE

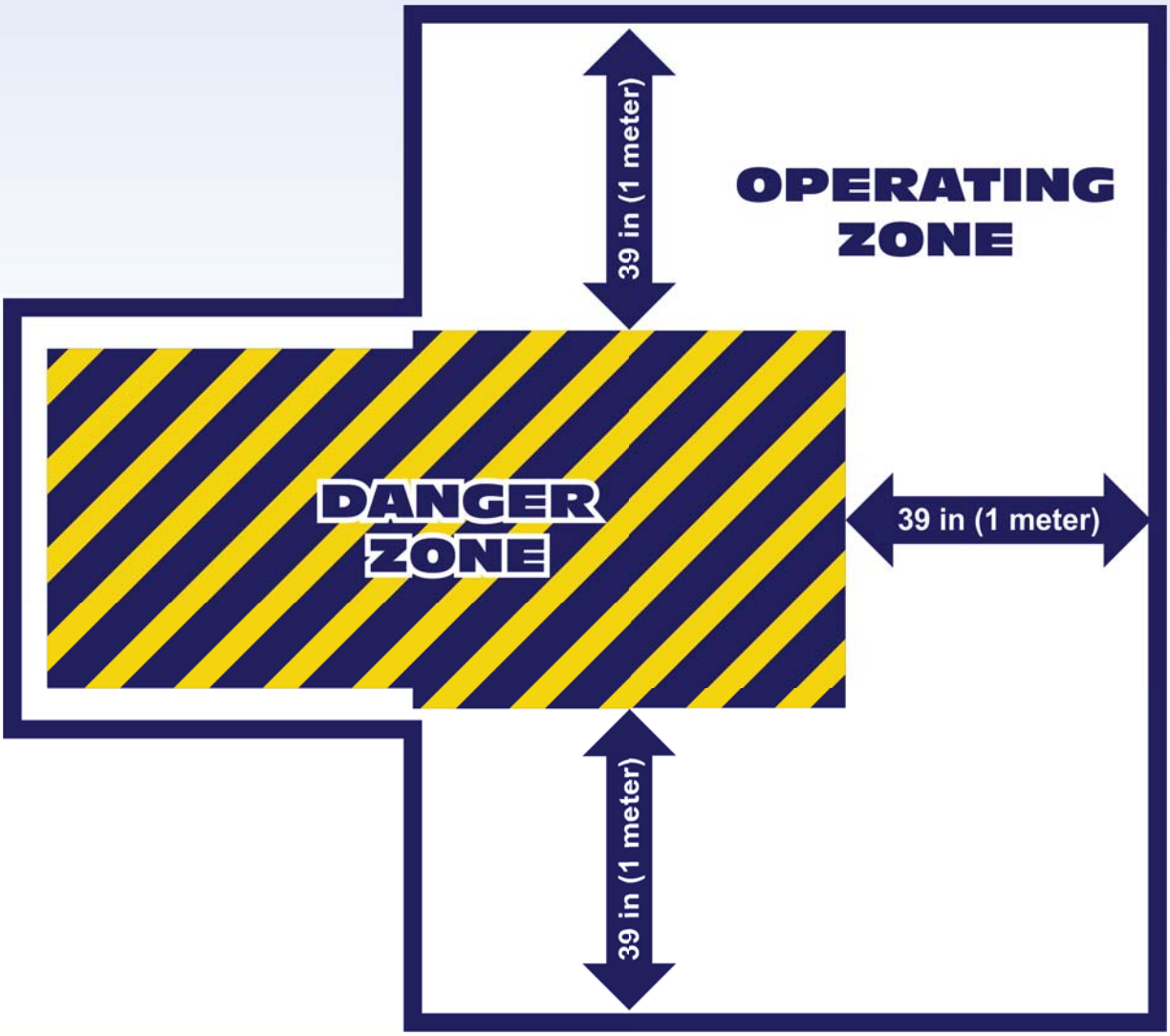


Figure 6 Danger Zone

The Lift Pilot's Danger Zone is identified in Figure 6. The Danger Zone is the area inside the toe guard frame and under the pallet. The recommended Operating Zone is a distance of 39 inches (1 meter) extending beyond the danger zone on all sides.

UNPACKING THE LIFT PILOT

The Lift Pilot is shipped on a pallet and only requires removal from the pallet and installation before it is ready for use. Although removal from the pallet is a simple process, certain precautions must be taken to ensure product damage does not occur.

Tools Required

- Banding or strap cutters
- Knife or single sided razor blade

Equipment Required

- Forklift or overhead hoist

Unpacking Instructions

1. Using a forklift, pallet truck or similar equipment, move the palletized Lift Pilot to the location where it is to be installed. The area should be clean and have good general lighting.
2. Next, using the strap cutter, remove the bands securing the UniLift to the pallet. Remove all packing material and place it off to the side.
3. Remove the Lift Pilot's toe guard frame and set it off to the side.
4. Locate the box containing the Lift Pilot concrete anchors and set it off to the side.
5. Next, attach a lifting sling or chain to the eyebolt and carefully lift the Lift Pilot off the pallet. Slide the pallet to the side and gently lower the Lift Pilot to the floor.

LIFT PILOT CONCRETE AND ANCHORING

The lift Pilot installation surface must meet the following requirements:

Concrete Requirements:

- 6 in. thick, 3000 psi, uncracked, rebar reinforced concrete slab.
- Lift Pilot primary (1/2 in.) anchors should be 8 in. minimum edge distance to a crack or seam in any direction.

Bishamon supplies the following concrete anchors for use with the Lift Pilot:

Main Post Anchor = Redhead Trubolt + Seismic Anchor CWS-1254

- Anchor Diameter = 1/2 in. with 1/2-13 threads
- Overall Anchor Length = 5 1/2 in.
- Anchor Thread Length = 3 7/8 in.
- Nominal Drill Bit Diameter = 1/2 in.
- (A) Drill Hole Depth = 4 1/2 in. minimum
- (B) Nominal Anchor Depth = 3 3/4 in. minimum
- (C) Effective Anchor Embedment Depth = 3 1/4 in. minimum
- Anchor Installation Torque = 45 ft-lbs

Toe Guard Frame Anchor = Redhead Trubolt Anchor WS-3836

- Anchor Diameter = 3/8 in. with 3/8-16 threads
- Overall Anchor Length = 3 3/4 in.
- Anchor Thread Length = 2 1/2 in.
- Nominal Drill Bit Diameter = 3/8 in.
- (A) Drill Hole Depth = 3 in. minimum
- (B) Nominal Anchor Depth = 2 1/4 in. minimum
- (C) Effective Anchor Embedment Depth = 1 3/4 in. minimum
- Anchor Installation Torque = 25 ft-lbs

Figure 7 Anchor Bolt Specification

In order to achieve required anchor loads, a minimum concrete thickness of 6 inches and an anchor embedment of 3-3/4 inches is required at each primary anchor location. When using the Bishamon supplied anchors, if the top of the anchor exceeds 1-3/4 inches above the floor grade, you DO NOT have enough embedment.INSTALLATION TOOLS REQUIRED

RED HEAD GENERAL ANCHOR INSTALLATION INSTRUCTIONS

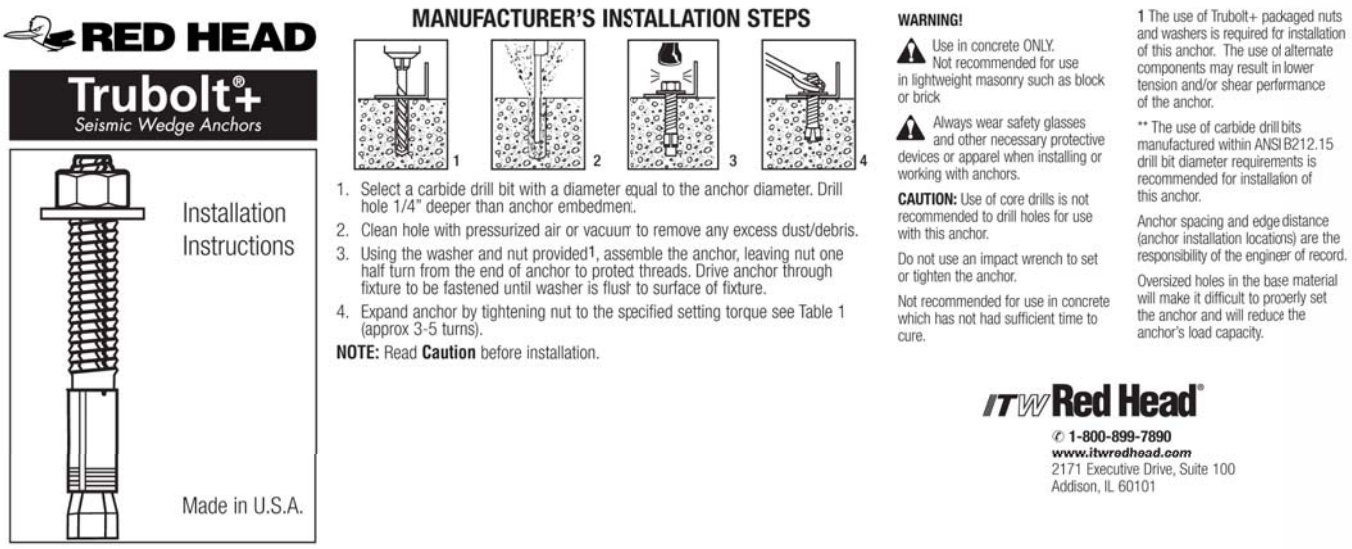


Figure 8 Manufacturer's Installation Steps

Tools Required:

- 1/2 in. carbide concrete drill bit.
- 3/8 in. carbide concrete drill bit.
- Hammer drill
- Shop vacuum or compressed air
- Torque wrench (45 ft-lbs minimum)
- 3/4 in. socket
- 9/16 in. socket
- 6 in. socket extension
- Bubble level
- Hammer
- Philips screw driver (#2)
- Tape measure
- Floor maker

INSTALLATION INSTRUCTIONS

The Lift Pilot is shipped in maintenance-carriage mode. The UP/DOWN controls will only raise and lower the carriage.

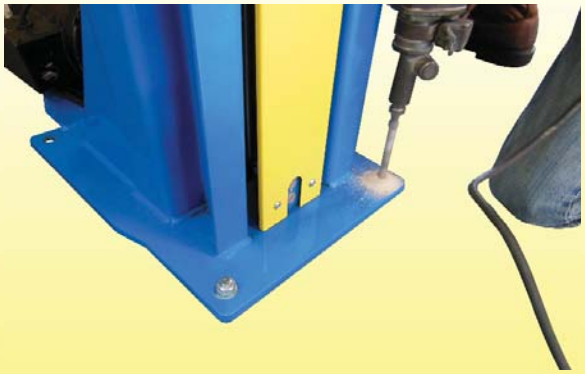
1. Move the Lift Pilot to the installation area and stand it in the final location. Ensure the floor is clean and meets the minimum concrete requirements.
2. Plug the Lift Pilot power cord into a 20 amp 115 volt AC outlet. Switch the ON/OFF switch to the ON position. Next, depress the UP button to raise the carriage to its full raised height. The Lift Pilot is free standing without load, but is NOT stable. Use extreme caution not to bump the post or exert force on the structure.
3. Remove the screw securing the motor cover to the rear of the post. Remove the cover and set it off to the side.
4. Following the Red Head General Anchor Installation Instructions, drill a 1/2 in. diameter hole x 4 1/2 in. minimum depth at the location shown (front left)

5. Using compressed air or a vacuum, remove all dust and debris from the hole.

6. Using the washer and nut provided, assemble the anchor as shown below. Position the nut 1/2 turn from the end of the anchor

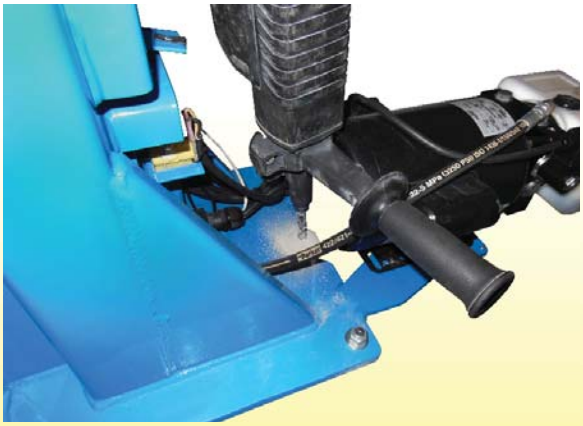
7. As shown below, install the first anchor. Drive the anchor through the base plate until the washer and nut are flush with the base plate.

8. Repeat steps 3-6 for the second (front right) anchor.



9. Repeat steps 3-6 for the third and forth (outer rear) anchor locations.

10. Using care not to damage the motor or cords, install the fifth (rear center) anchor.



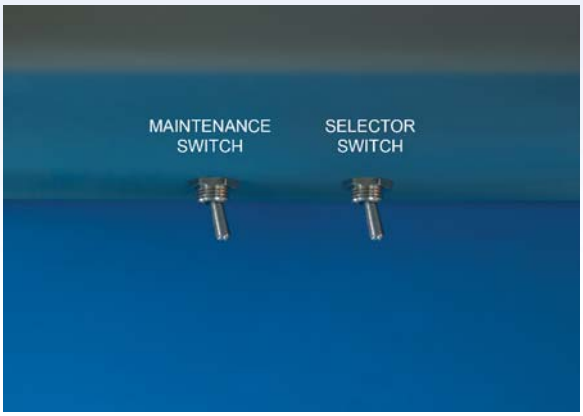
11. Using the same sequence as drilling, expand the anchors by tightening each nut to 45 ft-lbs of torque. If the anchors do NOT tighten to 45 ft-lbs of torque or the top of the anchor exceeds 1 3/4 in. above the floor, the installation is faulty. Consult with your installer or Bishamon Industries Corporation.

12. Next, using a level, check the post side-to side and front-to-back level. If required, use the provided shims to level the mast from side-to side. As shown below, the bubble should be centered within the level lines.

13. By design the post should have a slight amount of front-to-back tilt.

14. Depress the Down Button to fully lower the carriager

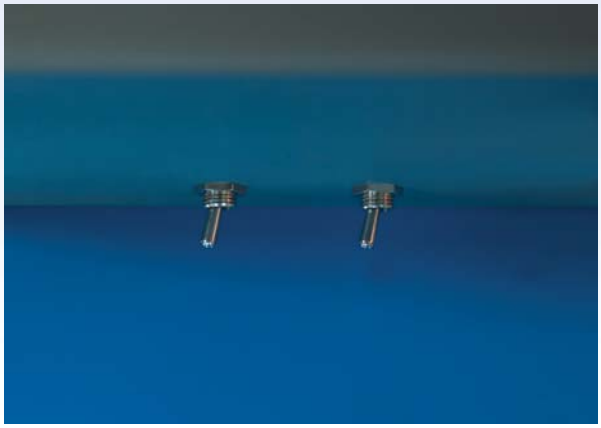
15. Next, locate the 2 toggle switches at the bottom of the control box. The left toggle switch is the MAINTENANCE switch and should be in the right (MAINTENANCE) position. The right toggle switch is the SELECTOR switch and it should be in the right (CARRIAGE) position.



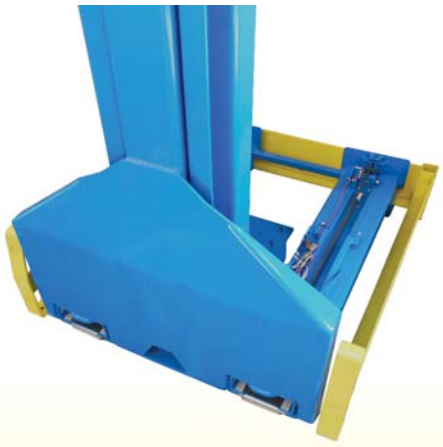
16. As shown below, toggle the SELECTOR switch to the left (FORK) position. Depress the UP button to extend the forks to their fully extended position.

17. Measure the height of the fork tips from the floor. For easy pallet entry, the fork tips should not be higher than 3 3/4 in. If required, loosen the 3 rear anchor bolts and shim as required to lower the fork tips.

18. Press the DOWN button to retract the forks. As shown below, toogle the MAINTENANCE switch to the left to put the Lift Pilot in RUN mode.



19. As shown below, position the toe guard frame around the Lift Pilot. Remove the rubber grommet from the rear of the frame. Next, feed the power cord through the hole in the frame. Next, stretch the grommet over the plug and slide it along the cord. Finally, insert the grommet back into the toe guard frame.



20. Center the toe guard frame around the Lift Pilot Carriage.

21. Position the front of the frame 1/4 - 3/8 in. in front of the Lift Pilot carriage. This measurement is critical and will prevent pallet impact damage to the Lift Pilot.

22. With the toe guard frame properly positioned, mark the center of all 4 mounting holes.

23. Move the frame out of the way for drilling. Following the Red Head General Anchor Installation Instructions, drill a 3/8 in. diameter hole x 3 in. minimum depth at the location shown (front left).

24. Using compressed air or a vacuum, remove all dust and debris from the hole. Repeat steps 21 - 22 for the remaining 3 mounting hole locations.
25. Using 2 of the provided nuts, assemble the anchor as shown below. Position the end nut 1/2 turn from the end of the anchor.

26. Drive the assembled anchor into the hole until the bottom nut contacts the floor. Remove both nuts, then add a single washer and nut. Tighten 1 - 2 turns to set the anchor. Remove the nut and washer.

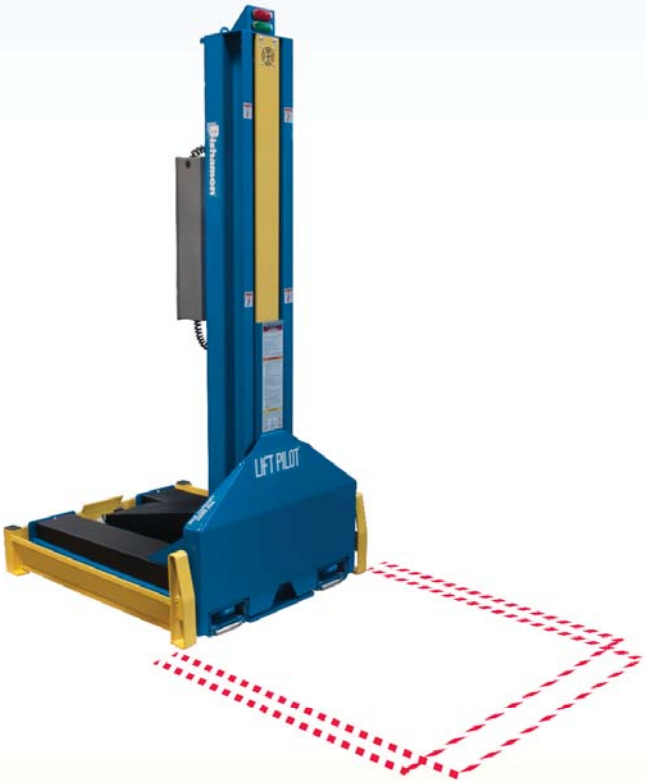
27. Repeat steps 24 and 25 for the remaining 3 mounting locations.
28. Reposition the frame into place over the 4 mounting anchors. Completely expand the anchors by tightening each nut to 25 ft-lbs of torque.

29. Replace the power unit cover and mounting screw. Next, plug the power cord into the AC outlet
30. The Lift Pilot installation is now complete. . Refer to the following sections for complete operating instructions. See step 31 for optional floor marking instructions.

OPTIONAL FLOOR MARKING INSTRUCTIONS

Most Lift Pilot users find it helpful to have floor stripes outlining the proper pallet position. Floor target stripes can be either high quality aisle marking tape or painted with a high quality concrete paint.

31. Position a typical pallet on the floor in front of the Lift Pilot. Ensure the pallet is properly centered and approximately ½ inch in front of the pallet stops. As shown below, tape or paint stripes around the perimeter of the pallet on 3 sides.



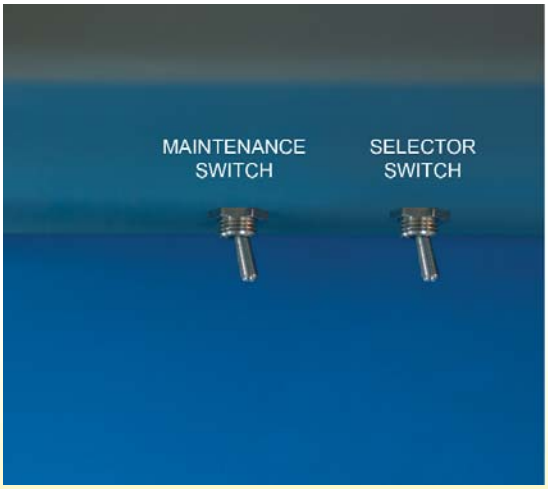
PREPARATION FOR USE

Before you begin, locate and identify the following controls and functions. These controls will be referred to throughout the “Operating” procedures. Make sure you understand the function of each control before proceeding.

Power ON/OFF Switch: This switch powers the Lift Pilot’s electrical system ON or OFF.

Fork Length Switch: This switch changes the fork length extension beyond the carriage. LONG sets the fork length to 48 in., whereas SHORT sets the fork length to 40 in. The switch can be changed at any time; however, the forks will have to be retracted before the new setting will take effect.

Carriage Height Knob: This knob changes the lowered height of the forks. LOW sets the fork height to the lowest possible height, whereas HIGH sets the fork height 1 in. higher than the LOW setting. The knob can be set at any position in between. Likewise, the knob can be changed at any time; however, the new height setting will not take effect until the fork carriage has been raised above the lower limit switch.



Maintenance / Selector Switch: The MAINTENACE switch (left) and the SELECTOR switch (right) are located on the underside of the control box. These switches are primarily used for preventative maintenance and allow the Lift Plot to operate without the presence of a pallet. Switch positions are shown below.

Switch	Switch Position	
	Left	Right
Maintenance	Run	MAINTENANCE
Selector	Fork	CARRIAGE

The Lift Pilot has an audible announcement when the MAINTENANCE switch’s position is changed and will announce “RUN MODE” or “MAINTENANCE MODE”. In MAINTENANCE MODE, the hand control independently operates the forks or carriage depending on the SELECTOR switch position.

UP DOWN Control: This push button control allows the operator to extend or retract the forks and to raise or lower the carriage. Pressing the UP button will first extend the forks before raising the carriage. Likewise, pressing the DOWN button will lower the carriage and retract the forks. Once fork retraction has begun the operator may release the button as the forks will auto-retract.

UP DOWN Control - Maintenance Mode: When the Lift Pilot is in maintenance mode, the UP/DOWN button will control:

Fork extension and fork retraction without raising or lowering the carriage.

Carriage raise and lower without extending the forks.

Pallet Sensors: These sensors detect the presence of a pallet in front of the Lift Pilot. The sensor range is only a few inches in front of the carriage and is designed to detect the pallet's center stringer. When using a standard GMA or CHEP pallet, the pallet must be well centered and resting against the pallet stops. The forks cannot be extended unless a pallet is correctly positioned in front of the Lift Pilot.

Indicator Lights: The red and green indicator lights at the top of the mast are used to indicate various conditions or faults.

All Lights OFF: No pallet and no fault.

Green Light On: Pallet presence detected.

Red Light Flashing: Pallet not detected when the UP button is depressed or a pallet obstruction is detected.

Pallet Not Detected - Pallet not detected when the UP button is depressed.

Fork Obstruction – Forks encountered an obstruction when entering or exiting the pallet.

Lift Is Lowering – Forks are lowering from the Foot Clear Safety Position to the floor when the DOWN button is depressed.

Audible Announcements: The Lift Pilot has the following audible announcements:

Position Pallet – Pallet not detected when the UP button is depressed.

Fork Obstruction – Forks encountered an obstruction when entering or exiting the pallet.

Stand Clear the Lift is Lowering – Forks are lowering from the Foot Clear Safety Position to the floor when the DOWN button is depressed.

Run Mode – Maintenance switch is toggled to the left (RUN) position.

Maintenance Mode - Maintenance switch is toggled to the right (MAINTENANCE) position.

BLOCKING INSTRUCTIONS

Certain maintenance and/or repair operations may require working under an elevated fork carriage. For safety during these operations, the fork carriage MUST be blocked in an elevated position. In preparation to block the fork carriage, cut a premium 2x4 stud to a length of 33 ½ inches long. The stub should be a Douglass Fir or equivalent, free of knots and defects with the ends cut square. To properly block the fork carriage:

1. Place the Lift Pilot in maintenance/carriage mode by toggling both the MAINTENANCE switch and the SELECTOR switch to the right. Depress the UP button to raise the fork carriage about 12 inches above the floor.
2. Next, carefully remove the two (2) screws at the bottom of the mast guard that secure the yellow mast guard to the mast.
3. Stand clear of the fork carriage and depress the DOWN button to completely lower the fork carriage.
4. Next, remove the two (2) screws at the top of the mast guard that secure the yellow mast guard to the mast cap. Flex the mast guard away from the mast using care not to permanently bend the guard. Carefully reach inside the mast and disconnect the speaker.
5. Flex the mast guard forward and lift the mast guard assembly out of the mast and above the carriage. Take care not to damage the guard or the speaker. Set the mast guard to the side.
6. Stand clear of the fork carriage and depress the UP button to fully raise the carriage. As shown below in Figure 9, place the prepared 2x4 inside the mast. The board should be positioned behind the sensor plate and slightly in front of the cylinder rod.

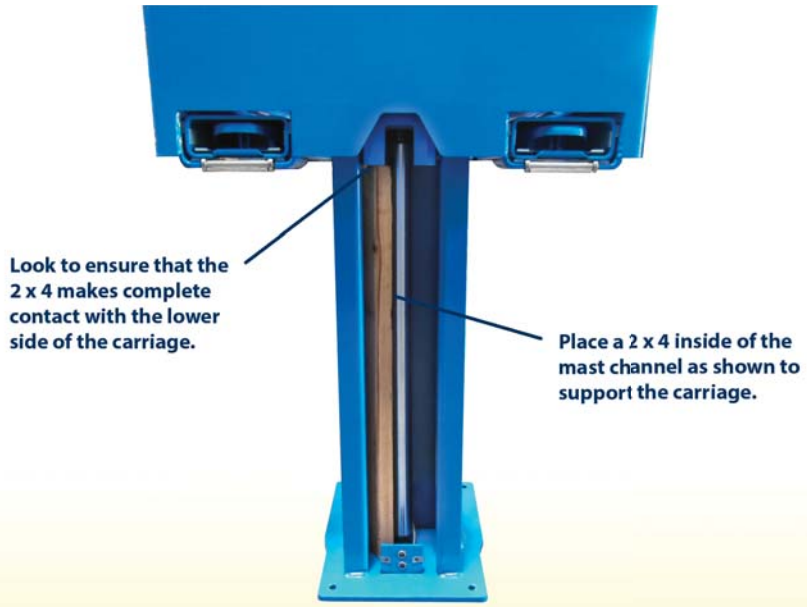


Figure 9 Maintenance Blocking

7. Next, depress the DOWN button to lower the fork carriage onto the 2x4 stud. Check to ensure the board is straight and properly positioned. The board should fully contact the bottom of the carriage.
8. The carriage is now blocked for service. When complete, reassemble the mast guard by reversing steps 1-7.

⚠DANGER

A falling load can cause SEVERE PERSONAL INJURY or DEATH. ALWAYS ensure others are well clear of the Lift Pilot when loads are raised or lowered. All maintenance should be performed with the unloaded forks in the fully lowered position or securely blocked in a raised position.

ROUTINE MAINTENANCE

The Lift Pilot is designed to provide years of trouble free service and requires very little maintenance. However, a routine inspection and maintenance program will prevent costly replacement of parts and/or downtime. All service should be performed by a qualified service person who has an understanding of lift equipment, hydraulic diagrams and electrical schematics. This person should also be thoroughly familiar with the operation and use of this type of equipment. The use of appropriate PPE (Personal Protection Equipment) is recommended during most maintenance procedures.

Daily Inspection

1. Before use, visually inspect the Lift Pilot for worn, damaged or broken components. If any of these conditions exist, REMOVE the lift from service and contact a qualified service person.
2. Check the condition of the warning labels. The warning labels are for the safety of the operator. If the labels are worn, missing or unreadable, REPLACE them before placing the lift back in service.
3. Test the pallet position sensor by placing a small box or object in front of the sensor. The green light should illuminate. Remove the object and depress the UP button. The red mast light should flash and the Lift Pilot should announce “Position Pallet”. If the Lift Pilot fails either test, remove the lift from service and contact a qualified service person.

Monthly Inspection and Maintenance

Before beginning the Monthly Inspection and Maintenance, remove the single screw that secures the power unit cover. Remove the power unit cover and set it to the side. Next, place the Lift Pilot in “Maintenance” mode. At the end of the inspection, replace the power unit cover and screw. Finally, toggle the Maintenance switch to “Run” mode.

1. Check the level and appearance of the hydraulic fluid. All lifts are equipped with translucent plastic reservoirs making it possible to visually determine the fluid level without opening the reservoir cap. The proper fluid level in the fully lowered position is marked by a Fluid Level decal. If required, add the correct hydraulic oil to the reservoir. Next, remove the reservoir cap and check the condition of the oil, it should appear light in color. The oil should be changed, if it the color has darkened or if it feels gritty. Replace the reservoir cap.
2. Toggle the Selector switch to “Carriage” and depress the UP button to fully raise the carriage. Visually inspect the hydraulic cylinder for signs of leakage. The presence of a small amount of fluid around the cylinder rod is normal. However, excessive fluid at the base indicates worn seals. Replace the cylinder seals at once.
3. Inspect the hydraulic power unit for signs of leakage.
4. Inspect the flexible hydraulic line for chaffing and sign of wear. If worn, replace at once.
5. Inspect the hydraulic line connections for tightness. Tighten if necessary.
6. While standing at the rear of the lift, depress the DOWN button and then release. The safety latch shown below in Figure 10, should open and close. Repeat depressing and releasing the DOWN button several times while watching the operation of the latch. The latch should freely open and close. If the safety latch does not function properly, it should be immediately repaired by a qualified service person.

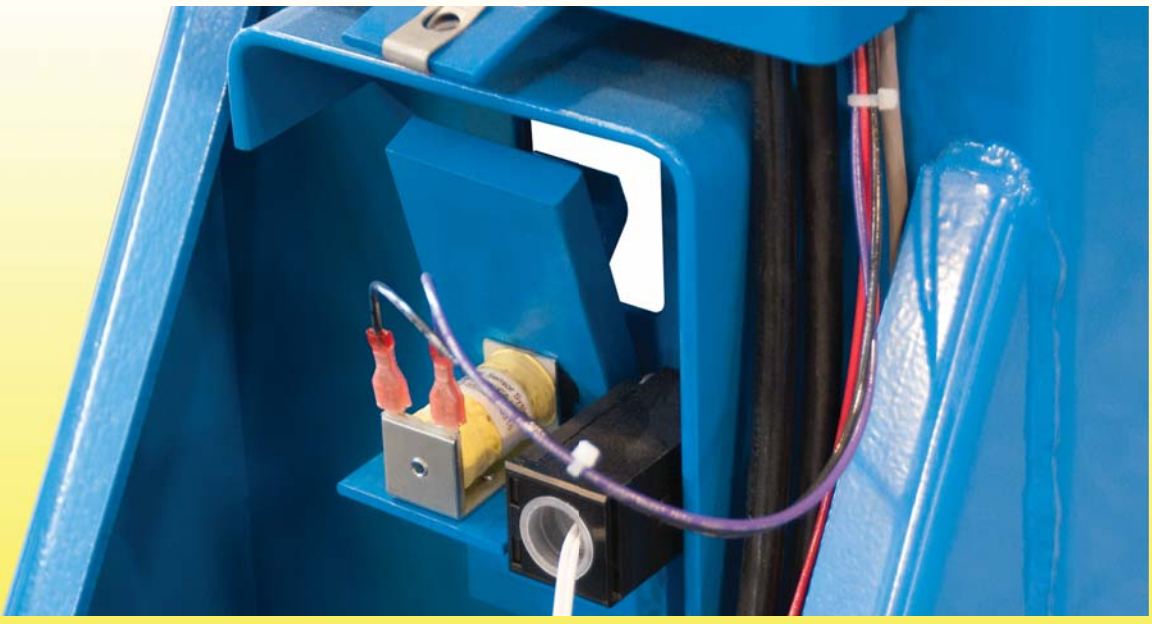


Figure 10 Safety Latch

7. Depress the UP button to fully raise the carriage. Next, toggle the Selector switch to “Fork” and depress the UP button to fully extend the forks.
8. Visually inspect the underside of the forks for worn or damaged components. Next, inspect the cables and pulleys for signs of wear and/or fraying. If worn, contact a qualified service person for replacement. The extend cable includes a compression spring for preloading the cable tension. As shown in Figure 11, the correct spring length is 5/8 - 3/4 inches. If required, hold the cable adjustment screw then rotate the spring adjustment nut to set the spring to the proper tension.

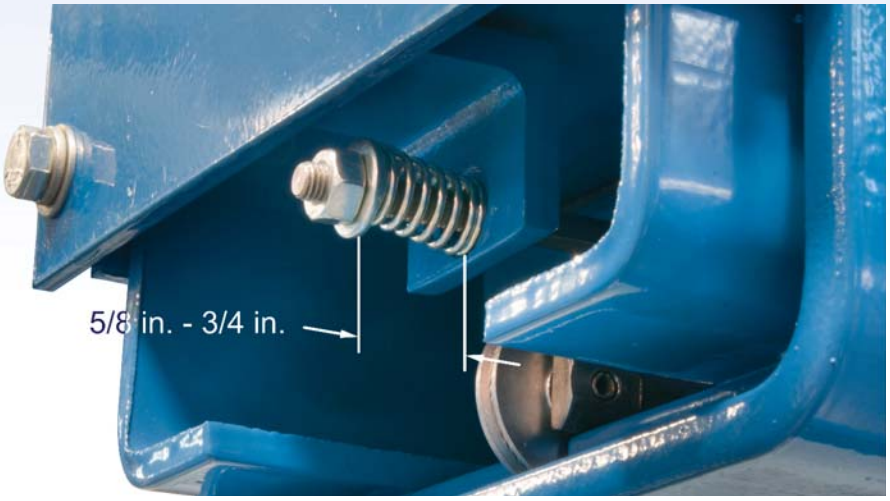


Figure 11 Extend Cable Spring Adjustment

9. Next, run the forks in and out several times to monitor their movement. They should move in and out without binding or excessive motor torque. If excessive binding occurs, contact a qualified service person for repair.
10. Depress the DOWN button to fully retract the forks. Next, toggle the Selector switch to carriage and fully lower the carriage. The monthly inspection is complete.

Semi Annual & Annual Inspection and Maintenance

In addition to the monthly inspection items, the following inspections should be performed.

1. Turn the machine off by switching the ON-OFF toggle to OFF. Next, disconnect the power cord from the power source or follow the proper Lock Out and Tag Out procedures to ensure the unit is de-energized.
2. Remove the two (2) screws that secure the fork covers to the carriage and set each cover aside.
3. Inspect the chain drive assembly for each fork. The sprockets and/or chain rollers should not show signs of excessive wear. In addition, the drive chain includes a compression spring for setting the proper chain tension. As shown in Figure 12, the correct spring length is 1 1/8 - 1 1/4 inches. If adjustment is required, hold the chain adjustment screw then rotate the spring adjustment nut to set the spring to the proper length and tension.

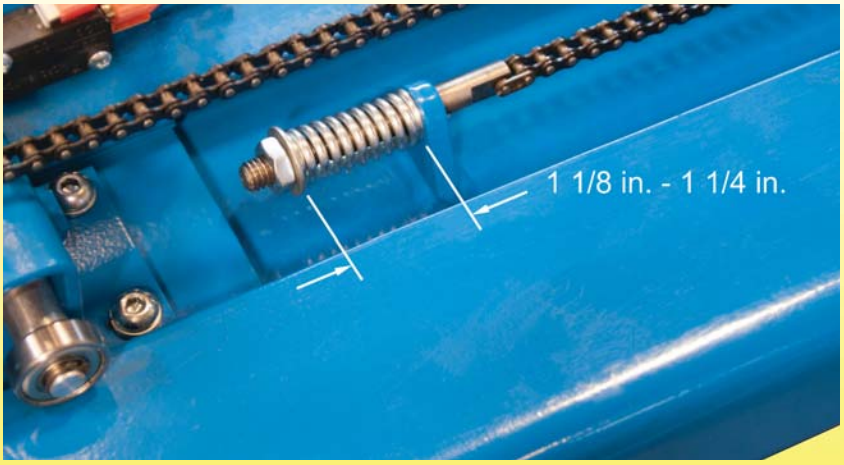


Figure 12 Drive Chain Spring Adjustment

4. Apply a light lubricating oil to the chain. Take care not to drip oil on the limit switches and wiring.
5. Inspect the limit switches and wiring to ensure all hardware and wire terminations are tight and secure.
6. Replace the motor drive covers and screws.

Change the hydraulic oil every 12 months of service or more often if conditions warrant. The frequency of fluid change will depend upon the general working conditions, severity of use and the overall cleanliness and care given to the lift. The oil change procedure will require a short length of 3/8 inch I.D. vinyl tubing from a local hardware store. Ideally, the length should be approximately 36 inches long. Caution - The old hydraulic fluid is considered hazardous waste and should be handled and disposed of properly. The use of PPE (Personal Protection Equipment) such as safety glasses and rubber gloves is required for the following procedure.

7. Remove the motor cover and set it aside. Place the Lift Pilot in the Maintenance/Carriage mode.
8. Turn the Fork Height knob to the lowest setting then depress the UP button to raise the carriage approximately 18 inches. Next, depress the DOWN button to fully lower the carriage.
9. Disconnect the hydraulic line from the power unit and cap the end to prevent contamination.
10. Insert the vinyl tubing over the elbow at the power unit and secure with a tie wrap. Place the other end of the tubing it in the suitable container capable of holding a minimum of 6 quarts of oil. The old hydraulic fluid is considered hazardous waste and should be handled and disposed of properly.
11. Quickly press and release the UP button to jog the power unit. Continue this process until the old hydraulic fluid is purged from the reservoir. Next, add a small amount of new hydraulic fluid to the reservoir and jog the pump. Repeat this process until the old hydraulic fluid is completely purged from the system.
12. Re-attach the Lift Pilot's hydraulic line to the power unit. Clean all spilled oil and thoroughly inspect all hydraulic components.

Bishamon Industries supplies the Lift Pilot with Goldenwest Lubricant Premium AW Hydraulic Oil 32, a quality hydraulic fluid with rust and oxidation inhibitors and anti-wear properties for use in normal ambient temperatures.

13. Fill the reservoir to the fluid level indicator with the new hydraulic fluid and replace the reservoir cap. Quickly run the motor by jogging the UP button to prime the pump.
14. Next, completely raise and lower the fork carriage three (3) times to remove any trapped air from the hydraulic system. Recheck the fluid level and add fluid if required.
15. Replace the power unit cover and toggle the Maintenance switch to "Run" mode. The lift is now ready for use.

CYLINDER SEAL REPLACEMENT

In the event the pump or cylinder seals are leaking, detailed instructions and replacement part kits are available. Contact the DEALER or Bishamon Industries Corporation to obtain service kits and instructions for these items.

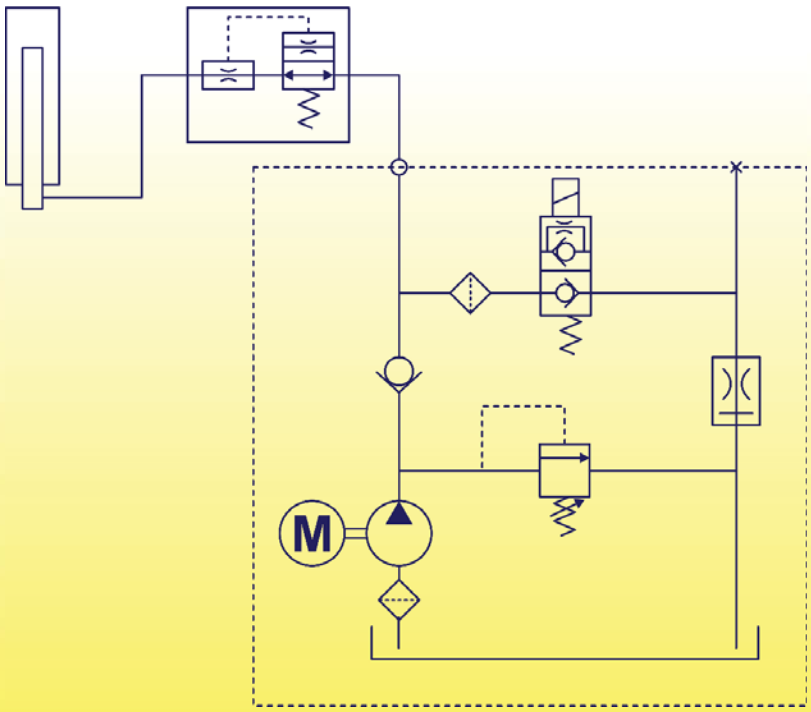


Figure 13 Hydraulic Schematic - Plumbing Diagram

WIRING DIAGRAM

Consult the factory for the Lift Pilot wiring diagram.

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Forks will not extend? (Mast lights off)	No Pallet. Pallet missing center board. Defective pallet sensor.	Position pallet. Replace pallet. Replace sensor.
Forks will not extend? (Green lights on)	Pallet obstruction. Fork drive motor overload. Fork drive malfunction. Control system malfunction.	Repair or replace pallet. Repair fork drive. Check and/or repair chain drive and cable assemblies. Check control system wiring.
Forks will not raise?	No hydraulic fluid in reservoir. Load too heavy (relief valve operating). Lowering valve held open.	Fill reservoir. Reduce load. Check lowering control for malfunction. Clean and/or replace lowering solenoid.
Forks will not remain elevated?	Lowering valve held open. Pump check valve not seated.	Check lower control for malfunction. Clean and/or replace lowering solenoid. Flush outlet check.
Forks will not lower?	Carriage obstruction. Lowering valve not opening. Obstruction in flow limiting valve.	Remove obstruction. Clean and/or replace lowering solenoid. Flush flow limiting valve.
Fork will not lower from safety height?	Safety latch malfunction.	Repair safety latch. Replace safety latch solenoid.
Forks lower too slowly?	Lowering valve not opening completely. Obstruction in flow limiting valve.	Clean and/or replace lowering solenoid. Flush flow limiting valve.
Cylinder(s) leaking?	Cylinder seals worn or damaged Valves, fitting or hoses loose.	Repack cylinder(s). Tighten fittings or hoses.
Pump leaking?	Reservoir over-filled with oil. Hose or fitting loose.	Drain excess fluid. Tighten fittings or hose.
Spongy fork carriage?	Air in hydraulic circuit.	Raise and lower fork carriage several times to remove air. Bleed air from cylinder. Check fluid level.

REPLACEMENT PARTS

Bishamon has carefully selected the components used in the manufacture of the Lift Pilot. In the event replacement parts are required, ALWAYS use genuine Lift Pilot components provided by Bishamon. These parts can be obtained from your Bishamon DEALER or by contacting Bishamon Industries Corporation.