

Bendi

NARROW AISLE FORKLIFT

TROUBLESHOOTING AND CORRECTIVE MAINTENANCE MANUAL

BENDI IC TIER II MODEL



MATERIAL
HANDLING PRODUCTS

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Hydraulic Problems

Chart - Hydraulic Problems			
#	Problem	Cause	Suggested Repair
Lift, Tilt, and Sideshift Problems			
1.	Mast does not lift load.	<p>Attempting to lift a load in excess of the truck's capacity.</p> <p>Low hydraulic oil.</p> <p>Faulty hydraulic control valve.</p> <p>Faulty pump.</p> <p>Note: If the pump were faulty, other mast functions would also be affected.</p> <p>Hydraulic cylinders leaking or binding.</p> <p>Mechanical damage of the mast.</p>	<ul style="list-style-type: none"> • NEVER attempt to lift a load heavier than the specified rating of the truck. • Also see "Traveling and Load Handling," in the Bendi IC Operator's Manual (F-407-__) for additional information. • See "Understanding Stability," in the Bendi IC Operator's Manual (F-407-__) • Low levels can cause the pump to "cavitate" and not permit full lift of the mast. See "Check Lift Operation," in the Bendi IC Planned Maintenance Manual (F-411-__). • Check reservoir oil level. Replenish as needed. See "Check Hydraulic Oil Level," in the Bendi IC Planned Maintenance Manual (F-411-__). • Bent or damage plunger, worn internal seals - repair or replace as needed. • Check appropriate "Appendix" index tab, for vendor service information, where applicable. • The hydraulic pump sections may be damaged - replace the pump. • Check appropriate "Appendix" index tab for vendor service information, where applicable. • Determine which cylinder is leaking or binding - rebuild or replace. • Seal kits are available for most cylinders - see Mast Parts List (F-387-__ or F-389-__). • Check mast for damage and signs of misadjustment. See "Check Lift Operation," in the Bendi IC Planned Maintenance Manual (F-411-__).

Chart - Hydrostatic Drive Problems			
#	Problem	Cause	Suggested Repair
15.	Flash 15 System Voltage High	System over 15 volts	<ul style="list-style-type: none"> • Check alternator for proper charging
16.	Flash 16 Engine Speed Sensor Low	Key on without engine running Short circuit or cable break Misadjusted mag sensor Defective mag sensor	<ul style="list-style-type: none"> • Start up engine • Check all wiring and connections • Refer to manual for adjustments • Replace sensor
17.	Flash 17 Engine Speed Sensor High	Shorted or broken wire Misadjusted mag sensor Defective mag sensor	<ul style="list-style-type: none"> • Check wiring • Refer to manual for adjustments • Replace sensor
18.	Flash 18 Throttle Feedback Low	Short circuit or cable defect Bad hydrostatic controller	<ul style="list-style-type: none"> • Check wiring • Check controller with program and replace if needed
19.	Flash 19 Throttle Feedback High	Short circuit or cable defect Bad hydrostatic controller	<ul style="list-style-type: none"> • Check wiring • Check controller with program and replace if needed
20.	Flash 20 Seat Switch	Operator error Broken wire Defective switch	<ul style="list-style-type: none"> • Make sure operator sits in center of seat. • Check wiring for bad wire • Check switch with software. • Replace switch
21.	Flash 21 Engine Shut Down	Oil pressure too low Engine over temperature	<ul style="list-style-type: none"> • Check oil pressure • Refer to Engine Manual in the Appendix • Check coolant temperature • Refer to Engine Manual in the Appendix
22.	Flash 22 Charge Pressure Switch	Charge pressure too low	<ul style="list-style-type: none"> • Check charge pressure readings to confirm • Refer to "Replacing Charge Pressure Switch," on page 3-94.

Chart - Visible Problems			
#	Problem	Cause	Suggested Repair
7.	Frayed or broken wires.	This may be caused by improperly secured wires or harnesses allowing pinching or excessive movement (vibration).	<ul style="list-style-type: none"> • Repair or replace wires and harnesses and secure properly. • See “Inspect Electrical Connections,” in the Bendi IC Planned Maintenance Manual (F-411-__). • Make sure wires do not come in contact with any moving parts or are not pinched in access doors or cover panels.
8.	Lights do not work.	<p>Blown bulb.</p> <p>Tripped Circuit Breaker.</p> <p>Electrical problem - frayed or broken wires, faulty switch or electronics.</p>	<ul style="list-style-type: none"> • Replace the bulb. • See “Lights,” on page 3-115. • Check Circuit Breaker labeled "Lights". • Check related wire harnesses and connectors for contact problems, broken wires, etc. • Continuity check on/off switches - replace as needed. • See “Intermittent Electrical Problems,” on page 2-23.
9.	Intermittent electrical problems.	Loose electrical connections.	<ul style="list-style-type: none"> • Check for excessive vibration or poor maintenance procedures. • Tighten contacts as needed. • Examine cable assemblies for tight connections. • Wire terminal crimps should be secure and wire stranding must not be frayed or corroded.
10.	Scraping marks on the mast.	Rail misalignment.	<ul style="list-style-type: none"> • Realign rails. See “Mast,” on page 3-9.
11.	Excessive tire wear.	Hard starting and stopping.	<ul style="list-style-type: none"> • Examine operator’s driving habits and train operator accordingly. • Excessive “hard” stops and starts contribute to abnormal brake and tire wear. • See “Check Service Drum Brakes,” in the Bendi IC Planned Maintenance Manual (F-411-__). • See “Inspect Tires,” in the Bendi IC Planned Maintenance Manual (F-411-__).

Mast

⚠ WARNING

Only trained and experienced technicians or your Landoll service representative must be allowed to service the mast assembly.

Never place any part of one's body into the working area of the mast. Never work on the mast while it is loaded; remove the load first.

Observe all safety precautions while operating the overhead crane and lifting apparatus.

Removing the Mast From the Truck

To remove the mast, the work area must be clean and clear of obstacles, large enough to lay the mast horizontally, have a concrete floor and an overhead crane and frame rated to at least three (3) tons and three or four 6" x 6" x 48" (53 mm x 53 mm x 1,219 mm) solid planks of wood.

It is recommended to thoroughly steam clean the mast, removing all dirt, debris and grease.

Record the roller clearances and chain adjustments before removing the carriage or rails (See "Mast Maintenance" in the Bendi IC Planned Maintenance Manual (F-411-___)).

Make notes as you disassemble the mast while referring to the Appendix section of this manual, index tab I-P "Mast". A separate manual is available for the triplex (3-stage) and quad masts.

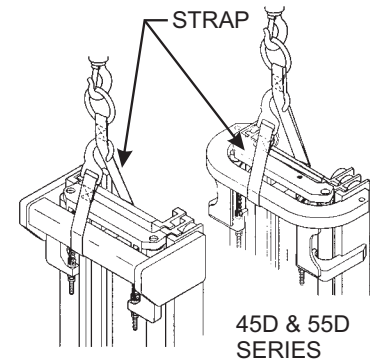


Figure 3-7 Supporting the Mast

1. Review "To Begin...," on page 3-18.
2. Remove the forks. Review "Removing Forks," on page 3-6.
3. Remove the four bolts and hardware holding the backrest to the mast. Carefully remove the backrest; it can be heavy - use adequate lifting apparatus or ask for a helper.
4. At the mast, disconnect the lift cylinder hose (1) and both sideshift hoses (2) from the hydraulic control valve (See Figure 3-5 on page 3-7).
5. Oil will drain from the cylinder lines and the hoses. Have shop rags handy to clean oil spills. Plug and/or cap the cylinder ports and hoses to prevent further oil drainage. Tag each hose for identification.
6. Attach an overhead crane and strap, rated to 3 tons, and apply slight lift to the mast (See Figure 3-7).
7. Disconnect the two tilt cylinders from the mast - see "Tilt Cylinders," beginning on page 3-11 (See Figure 3-6).

Front Rotation Assembly

This section explains servicing the:

- **Front rotation bull gear (large)** - see page 3-19.
- **Rotation seals and bearings** - see page 3-20.
- **Stop blocks** - see page 3-23.
- **Steer pot** - see page 3-23.

You will need an approximate 2 to 3 ton (1,814-2,722 kg.) overhead crane to support the mast and/or the front end weldment when you separate it from the truck front rotation arm. You will also need hydraulic jacks or large block of wood and a portable hydraulic press.

This service is best performed at your service center as opposed to the customer facility.

To Remove Bull Gear

1. First, review "Before You Begin," page 3-2.
2. Park the truck on a clean, flat, level surface with enough room to work in the area safely.
3. Apply the parking brake and block all wheels.
4. Relieve hydraulic pressure in the system by turning the steering wheel two times to the left, then two times to the right and move both joysticks in both directions.
5. **Set the key switch to OFF and place the key in your pocket.**
6. Disconnect the battery.
7. Support the front end of the truck (between the front rotation arm and the truck frame) using support stands or blocks of wood capable of handling the weight. Review "Lifting the Truck," page 3-3.
8. Connect a strap from the overhead crane around the top center cross member of the mast and apply slight tension only (See Figure 3-7). Also see "Removing the Mast From the Truck," on page 3-9.
9. Remove the:
 - Switch activator cam - 3/8"-16 setscrew
 - Cotter pin and slotted hex nut - 2"-12
 - Upper bearing spacer - use flat blade screw driver to pry bearing upwards (See Figure 3-11).

IMPORTANT !

If the pump requires servicing, disconnecting the suction line hose will cause excessive oil drainage from the hydraulic tank.

To limit the amount of drainage:

- You could empty the hydraulic tank, especially if an oil and oil filter change is near or if dirty oil could be suspect in a pump failure.
- You could remove the oil filler cap located on the truck. Then have a helper hold an operating shop vac over the filler opening to create a "partial" vacuum in the tank. It is not necessary to seal the opening tight. Wrapping your hand around the opening is sufficient.

Note: Immediately plug and cap all tube ends and pump ports and tag each for identification. Have shop rags handy to soak up any oil spills.

6. Place hand winch between overhead guard and hydrostatic pump. Put tension on the winch to raise the hydrostatic pump up about 1/2".
7. Slide socket, swivel socket, 20" extensions, and ratchet underneath the steer motor from the front to get to the bottom bolt of the pump (See Figure 3-16).
8. Remove hose assemblies.

Note: Immediately plug and cap all tube ends and pump ports and tag each for identification. Have shop rags handy to soak up any oil spills.

9. Remove top bolt and slide out pump.
10. Remove and replace fittings in new pump.
11. Reinstall in reverse order.

Linear Accelerator Module

The accelerator assembly consists of the linear accelerator and interconnecting cable and the accelerator pedal (See Figure 3-17).

Replacing the Throttle (Accelerator) Pot

1. First, review "Before You Begin," page 3-2.
2. **Set the key switch to OFF and place the key in your pocket.**
3. Apply the parking brake, disconnect the battery and block all wheels.
4. Remove the driver's compartment floor plate. (See "Floor Plate Removal," on page 3-4).
5. Raise the floor panel as far as possible and disconnect the accelerator cable connector from the main harness.

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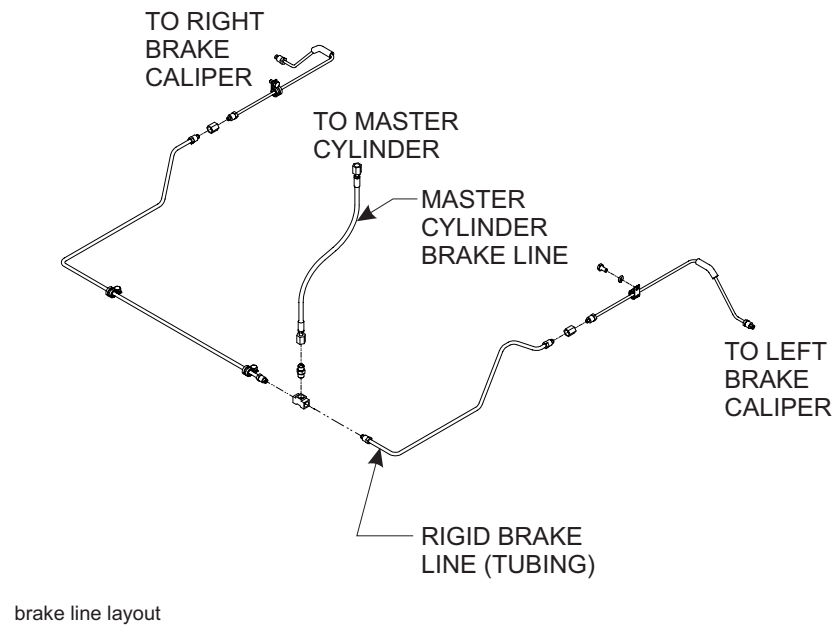


Figure 3-24 Brake Line Layout

To Replace a Damaged Line

1. First, review "Before You Begin," page 3-2.
2. **Set the key switch to OFF and place the key in your pocket.**
3. Apply the hand brake and disconnect the battery and block the wheels.
4. Remove the driver's compartment floor plate (See "Floor Plate Removal," page 3-4).
5. Remove the battery and the battery tray (See "Replacing the Battery," in the Bendi IC Operator's Manual (F-407-___)).
6. Replace the damaged line (See Figure 3-24).

Use flare-nut wrenches to remove these lines. Do not overtighten the fittings to avoid stripping the brass threads.

7. Bleed the brakes (See "Bleeding Brakes," page 3-40).

Steering Wheel

1. Pry the plastic cover from the steering wheel using your finger tips. If you cannot grab the cover, you can start it by carefully using a medium sized flat blade screw driver and gently prying upwards. **DO NOT** force it or you may crack the cover.
2. Loosen the wheel nut (See Figure 3-28).
3. Pry the steering wheel upwards by wiggling and pulling straight up. It is important to pull up evenly on both sides of the wheel.

Note: If the wheel is difficult to remove, tap the wheel nut using a dead-blow hammer a few times. The wheel should remove easily.

4. Install the steering wheel by placing it over the shaft, aligning the wheel and shaft splines and pushing downward evenly until the nut can be installed.
5. Tighten the nut, keeping in mind the tighter the nut the more difficult it will be to remove the steering wheel later on.

Steering Column (Console)

This is a two man operation, due to weight of steering column (approximately 30 pounds/14 kgs.). If an overhead crane is available, the crane could be strapped to the steering wheel for support.

1. Remove the driver's compartment floor plate (See "Floor Plate Removal," on page 3-4).
2. Disconnect the two plugs that connect the dash harness to the main harness and any optional lighting harnesses.
3. Relieve hydraulic pressure in the system by turning the steering wheel a few times to the left and right.

7. Disconnect the control levers (three) from the valves. Tag the levers for identification.
8. Disconnect hoses at fittings and immediately plug cap all lines. Tag the lines for identification during reassembly.
9. Remove the two hex nuts and hardware holding the valve assembly to the truck base. Lift the valve from the truck and place it on your workbench. It is heavy - be prepared.
10. If a valve is being replaced, remove the hydraulic fittings from the defective valve and note how the fittings are arranged.
11. Before placing the truck back into operation, test it to make sure all functions are operating properly and that there are no oil leaks.
12. If the hydraulic control valve manifold is being replaced,
 - Clean the mating surfaces of the valve spools and make sure the O-ring seal is properly seated before sealing the parts together.
 - Disconnect hoses at the fittings and immediately plug/cap all lines. Have shop rags handy to clean any oil spills.
 - Remove the fittings from the defective valve and note their alignment, then remove the mounting hardware and replace the valve.
 - Install the fittings in the replacement valve maintaining proper alignment - see "IMPORTANT !," beginning on page 3-53.
 - When installing fittings, apply a light film of oil to the O-ring seal and do not overtighten. Excessive pressure could damage the seals.
 - If the pressure relief valve is being replaced, you must Readjust the pressure setting before operating the truck (See "To Check and/or Adjust Pressure," on page 3-54).
 - Reassemble in reverse order.

Calibration/Programming

NOTE: NOT ALL REAR PANEL ORIENTATIONS ARE THE SAME, BUT THE PIN CONNECTIONS USED ARE THE SAME.

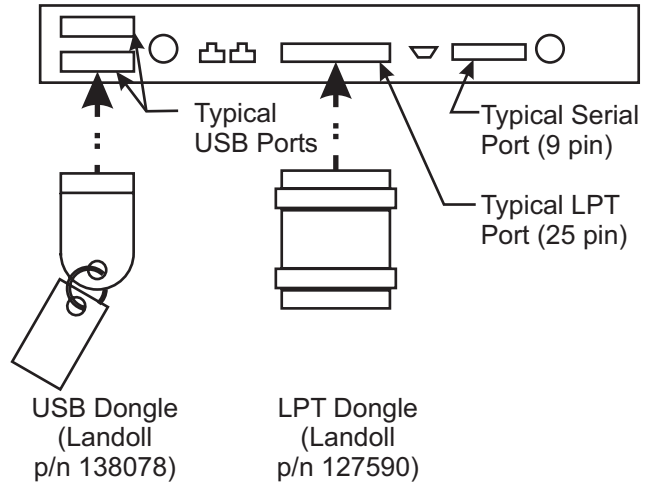
To Get Started Using Bodem/2 Software

NOTE: STEPS 1 THRU 3 ARE RECOMMENDED TO DO AT THE DEALERSHIP AND NOT AT THE CUSTOMER LOCATION. IF PROBLEMS OCCUR WHEN LOADING THE BODEM/2 SOFTWARE, PLEASE CONSULT THE FACTORY.

1. Install the two programs (Bodem/2 and CBN software) included with your dongle and cable by following the software installation instructions inside the CD cover.
2. Attach dongle to the proper port (See Figure 3-44).
3. Start Bodem software only. An error message should come up stating "conflict with Baudrate".

NOTE: IF "NO DONGLE DETECTED" APPEARS, EITHER THE SOFTWARE IS LOADED INCORRECTLY OR THE DONGLE IS NOT INSTALLED.

4. If steps 1 thru 3 are ok, proceed to hook up the hydraulic on-board computer interface cable to the truck (See Figure 3-45).



laptop rear connections

Figure 3-44 Connection View of Laptop (Dell D600 Latitude Laptop Rear Panel Shown)

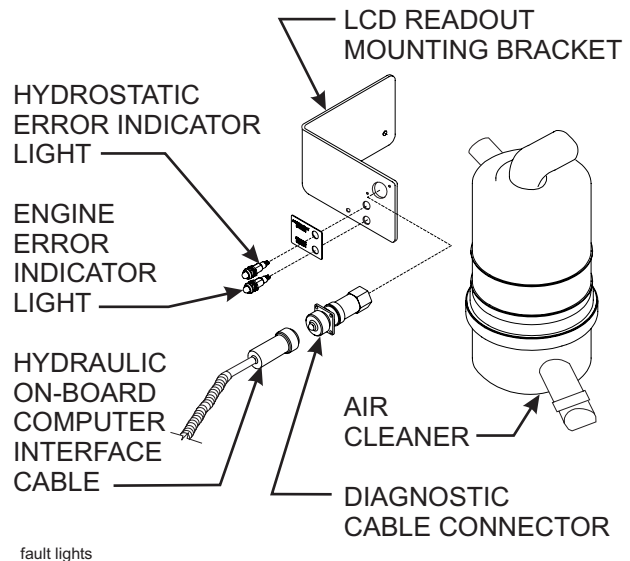


Figure 3-45 Hydraulic On-board Computer Interface Cable

NOTE: INTENTIONALLY LEFT BLANK

Figure 3-61

NOTE: INTENTIONALLY LEFT BLANK

Figure 3-62

DATA SHEET

FORWARD DIRECTION

FRONT PUMP PORT G _____ PSI.

REAR PUMP PORT G _____ PSI

REVERSE DIRECTION

FRONT PUMP PORT G _____ PSI.

REAR PUMP PORT G _____ PSI

FORK LIFT SERIAL NUMBER _____

DEALER NAME _____

CUSTOMER NAME AND ADDRESS

DATE _____

SIGN NAME _____

PRINT NAME _____

Figure 3-78 Data Sheet



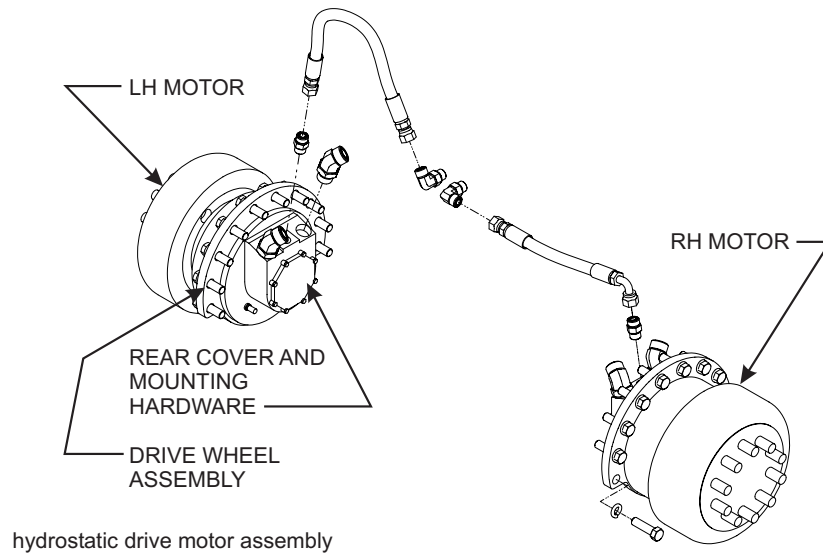


Figure 3-83 Hydrostatic Drive Motor Assembly

To Replace Hydrostatic Drive Motor Assembly

The hydrostatic drive motor assembly is very heavy and awkward to handle. It must be supported using an overhead crane as it is being removed from the truck (See Figure 3-83).

1. First, review "Before You Begin," page 3-2.
2. Connect an overhead crane and strap around the drive motor and apply slight tension to stabilize the unit as the mounting bolts are removed.
3. Remove all external dirt and debris from the area.

Note: Immediately plug and cap all tube ends and pump ports and tag each for identification. Have shop rags handy to soak up any oil spills.

4. Remove the hose assemblies and fittings.
5. Disconnect park brake and hydraulic brake lines.
6. Remove the ten 9/16-18 x 2 hex head cap screws and hardware holding the drive motor to the truck frame (See Figure 3-83).
7. Place the drive motor on a sturdy work bench. Use wood planks to balance and support the assembly while on the workbench.

Note: When the drive motor must be exchanged, see Bendi IC Model Parts List (p/n F-404-____) for an overview and replacement parts.

8. Reassemble the drive motor to the truck by following the preceding steps in reverse order.
9. Tighten and torque the screws (See Appendix B of the Bendi IC Operator's Manual (F-407-____)).

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