



**Bendi B3-30 AC/DS Series 5
Articulated Counterbalance Forklift
Maintenance Manual**



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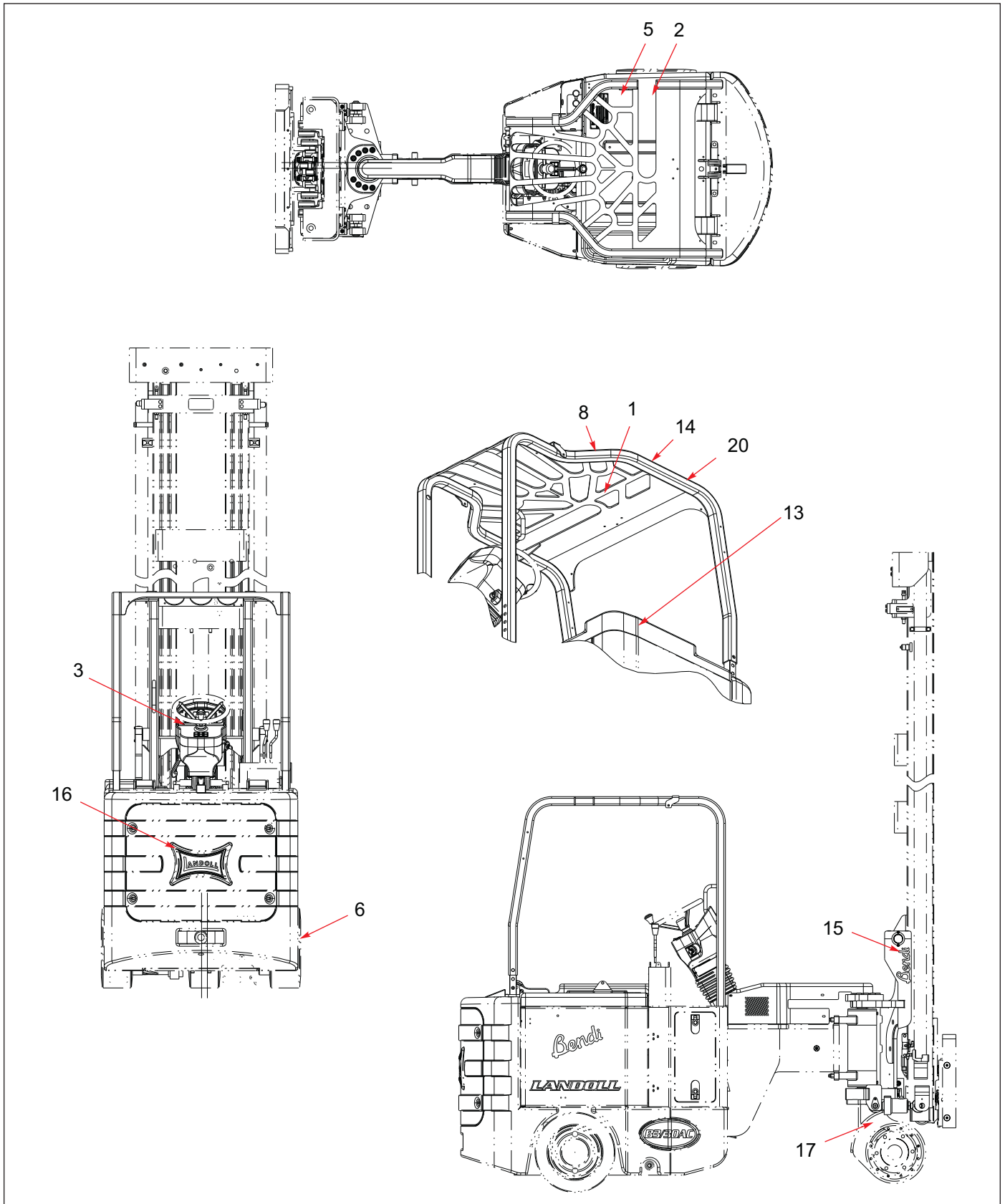


Figure 1-3: Decal Location (2 of 2)

UNF SAE Torque Specifications

Size	SAE Grade 2		SAE Grade 5		SAE Grade 8	
	Ft-lbs.	Nm.	Ft-lbs.	Nm.	Ft-lbs.	Nm.
1-14	210 [263]	285 [357]	540 [675]	732 [915]	760 [950]	1030 [1288]
1 1/8-12	300 [375]	407 [508]	660 [825]	895 [1119]	1080 [1350]	1464 [1830]
1 1/4-12	420 [525]	569 [712]	920 [1150]	1247 [1559]	1500 [1875]	2034 [2542]
1 3/8-12	560 [700]	759 [949]	1260 [1575]	1708 [2135]	2010 [2512]	2725 [3406]
1 1/2-12	730 [912]	990 [1237]	1640 [2050]	2223 [2779]	2660 [3325]	3606 [4508]

Metric Torque Specifications:

Coarse thread metric class 10.9 fasteners and class 10.0 nuts and through hardened flat washers, phosphate coated, Rockwell "C" 38-45. Use value in [] if using prevailing torque nuts.

Metric Torque Specifications

Nominal thread diameter (mm)	Newton Meters	Foot Pounds
6	10 [14]	7 [10]
7	16 [22]	12 [16]
8	23 [32]	17 [24]
10	46 [60]	34 [47]
12	80 [125]	60 [75]
14	125 [155]	90 [115]
16	200 [240]	50 [180]
18	275 [330]	205 [245]
20	385 [450]	290 [335]
24	670 [775]	500 [625]
27	980 [1105]	730 [825]
30	1330 [1470]	990 [1090]
33	1790 [1950]	1340 [1450]
36	2325 [2515]	1730 [1870]
39	3010 [3210]	2240 [2380]

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PLANNED INSPECTION AND MAINTENANCE

500 Hour Technicians Inspection Checklist - Bendi B3-30 AC/DS Series 5

To be performed every 500 hours or 2 months of truck operation, whichever comes first. In addition to the required pre-shift daily inspection. All service and repairs must be performed by a qualified technician.

Date	Inspector	Shift	Truck Number	Model Number

Location	Hour Meter	Hydraulic Oil Added	Battery Water Added	Brake Fluid Added

Safety & Operational Checks	Description	Done	Comments
Nuts, Bolts and Screws	Check torque		
Wheel Bearings	Clean and grease		
Tires	Check for damage and debris		
Drive Wheel (front)	Retorque lug nuts to 225 lbs (305 Nm)		
Braking Wheels (back)	Retorque lock nut to 20-25 in/lbs (102 Nm) then back off 1/2 turn		
ESD (static) Strap	Check condition		
Battery Cover	Lifts smoothly and easily		
Battery	Check for leaks, clean and neutralize		
Battery Roll-out Tray (if equipped)	Check safety restraints and safety switch		
Battery Restraint (if installed)	Securely fastened		
Brake Fluid	Check level		
Safety Warning Decals	Attached and legible		
Operators Manual	Present and legible		
Data Plate	Attached, legible and accurate		
Seat Adjustments	Check function of all levers		
Seat Belt, Buckle & Retractor	Check condition and operation		
Electrical	Check wires and connectors		
Key Switch (turn power on)	Listen for unusual noises		
Dash Display	Check hour meter, BDI and fault codes		
Parking Brake	Check operation and pad wear		
Horn	Check function		
Accelerator Pedal	Check operation		
Directional Control	Check forward and reverse operation		
Backup Alarm	Check operation		
Service Brake	Check operation		
Seat Switch	Check operation		
Mast Controls	Check Lift/Lower Controls		
	Check Tilt Controls		
	Check Side-Shift Controls		
Lights	Check Switch and operation		
Controller	Check for faults		
	Clean surface		
	Check operation and contactor points		
Forks, Retaining Pins & Heal	Check condition		
Load Backrest	Retorque bolts to 150 ft/lbs (205 Nm)		
Hydraulic Hoses & Fittings	Check for damage and fluid leaks		

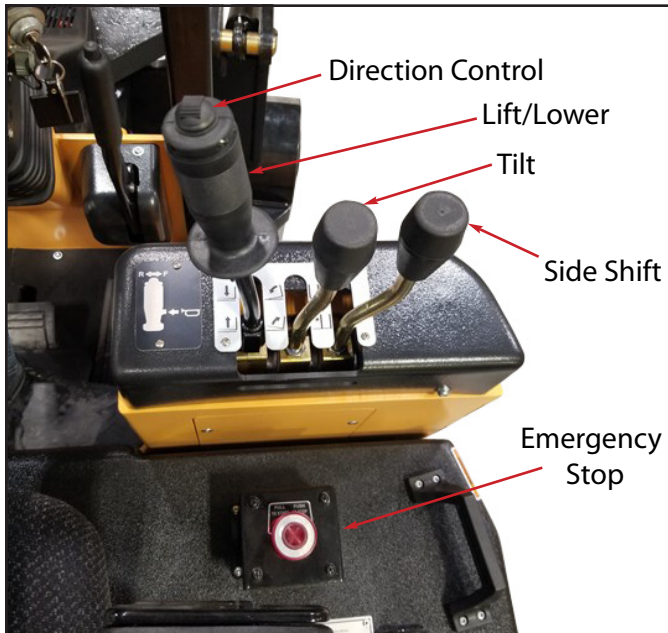


Figure 2-7: Operator Controls

Accelerator Pedal, Directional Switch & Backup Alarm

The directional control lever, located to the right of the driver seat, as well as the backup alarm can be checked at the same time as the accelerator pedal function.

1. With the key switch set to “ON”,
2. Move the direction control switch forward and gradually push on the accelerator pedal.
 - The further pressed, the faster the forklift will operate.
3. Let up on the accelerator pedal and the forklift should come to a controlled stop.
4. Move the directional control switch backwards and gradually press on the accelerator pedal. Truck should move in reverse.
 - Backup alarm should sound when directional control switch is pulled back.
5. Return directional control to neutral.

If any problems are detected, remove the forklift from service immediately until it is repaired.

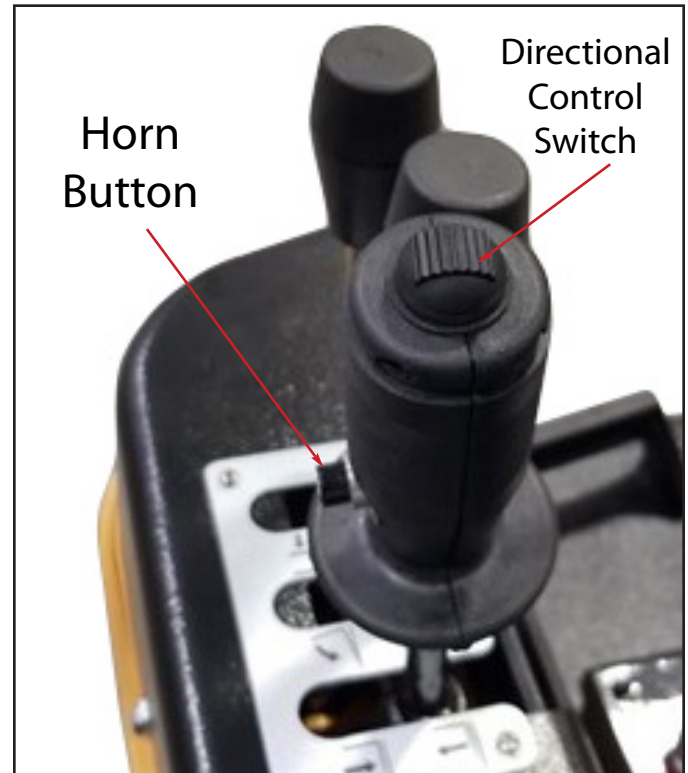


Figure 2-8: Directional Control

Service Brakes

1. With the key switch set to “ON”, drive forward slowly and then steadily apply the brake pedal.
2. The forklift should stop smoothly without noticeable vibration.
3. Any problems with the brake system must be repaired immediately. **DO NOT** use the forklift until proper maintenance has been performed.

Seat Switch

This procedure checks the physical mechanics (actuation) of the driver’s seat switch only.

The switch is part of the seat as shown in Figure 2-9.

1. Start the forklift and release the parking brake.
2. The seat switch and actuator are internal to the seat cushion, located on the under side of the seat cushion between the cushion and the bottom plate.
3. Set the direction control lever in either FORWARD or REVERSE and slowly apply acceleration. As the forklift begins to slowly move in either direction, the operator should raise off of the seat just enough to disengage the switch located under the seat cushion.
 - There is a few second delay programmed into the seat switch to avoid inadvertent shut down from operator normal movements.

Troubleshooting

General Bendi B3-30 AC/DS Troubleshooting Charts

Shown on the following pages are general Bendi B3-30 AC/DS troubleshooting charts that will allow the service technician to diagnose areas of failure, by way of audible, performance and pump conditions and then proceed to proper chapter in this Maintenance Manual for detailed service.

Condition	Cause	Suggested Repair
AUDIBLE PROBLEMS		
Back up alarm does not sound.	Faulty alarm module. Electrical problem - frayed or broken wires, faulty direction control switch or electronics.	<ul style="list-style-type: none"> • Continuity check alarm module - replace as needed • Check related wire harnesses and connectors for contact problems, broken wires, etc. • Examine cable assemblies - tighten connections • Wire terminal crimps should be secured and wire stranding must not be frayed or corroded.
Unusual noise when truck is in motion.	Rubbing or binding brake shoes in rear wheels (frozen brake cylinder). Faulty gearbox assembly	<ul style="list-style-type: none"> • Attempt to isolate cause of noise. • Drive truck slowly, having another operator check for the unusual noise. • Step on brakes lightly to see if brakes are biding or rubbing excessively - repair or replace. • Replace if defective.
Singing noise.	Insufficient fluid level in gearbox. Faulty motor bearing.	<ul style="list-style-type: none"> • Check fluid level. Check and add lubricating oil as needed. • Repair or replace bearing or motor.
Muffled grinding noise.	Faulty wheel bearings - could be insufficient fluid or high pre-stress or excessive play on bearings. Damaged planetary gearing - could be insufficient fluid, excessive play in bearing	<ul style="list-style-type: none"> • Determine if noise is in the front or rear. • Dismount gearbox and examine for damage.
Clicking noise during a turn.	Loose or shifting component	<ul style="list-style-type: none"> • Try to isolate the area of the noise, then check for loose parts, misalignment, load shifting, etc. • Check that components are in place and properly torqued.

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To Replace a Battery:

Removal:

1. Return the forklift to service charging station area.
2. Set the key switch to "OFF" and remove key from easy access.
3. Place blocks in front of and behind all wheels.
4. Unlatch the compartment cover (below drivers seat) and raise the battery compartment top cover.
5. Secure the cover to the overhead guard latch. **See Figure 4-5.**
6. Open the right side door by sliding the locking lever to the right, then swing the door fully opened. **See Figure 4-4**
7. Disconnect the battery/forklift cable disconnect and lay the battery cable across the battery top.
8. Slide the compartment side door spring latch towards the front of the forklift to release the side door. Open the door. **See Figure 4-4.**
9. Connect the appropriate lift and support apparatus (overhead crane, crossbar and chains) within the overhead guard cutout, then carefully lift and slide the battery from the forklift.

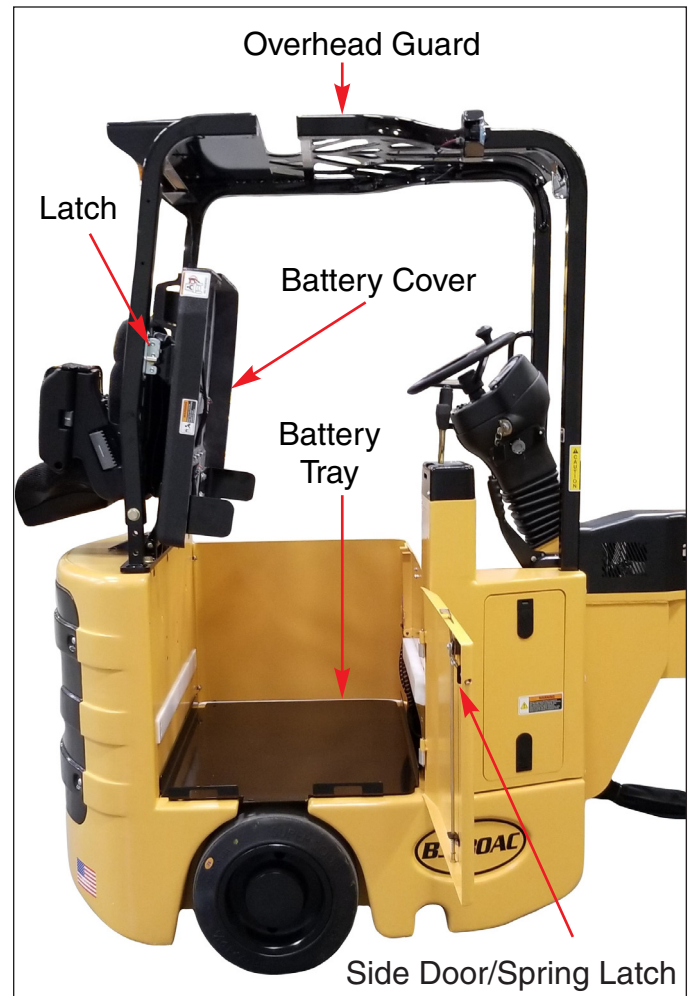


Figure 4-4: Removing the Battery

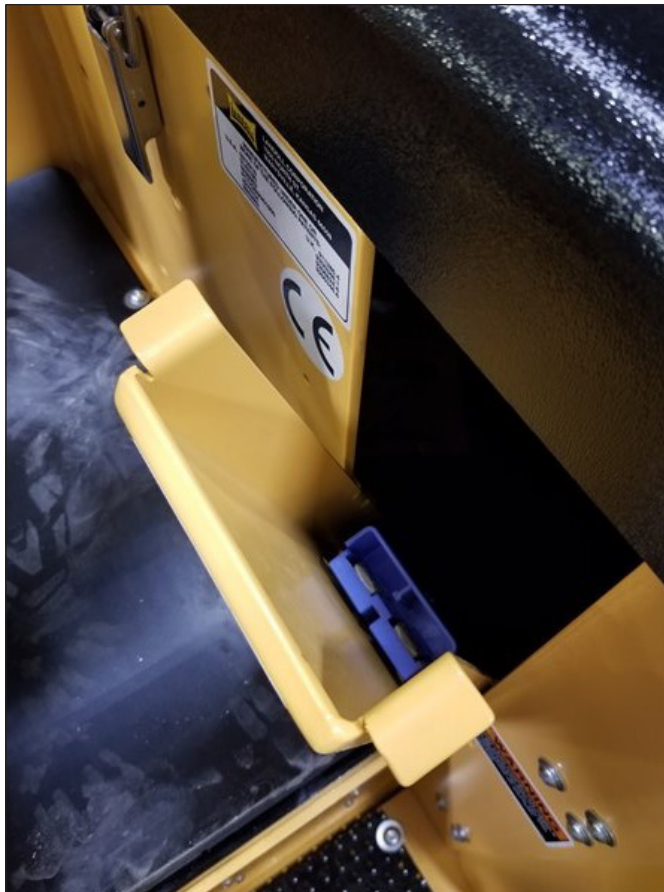


Figure 4-3: Battery Disconnects

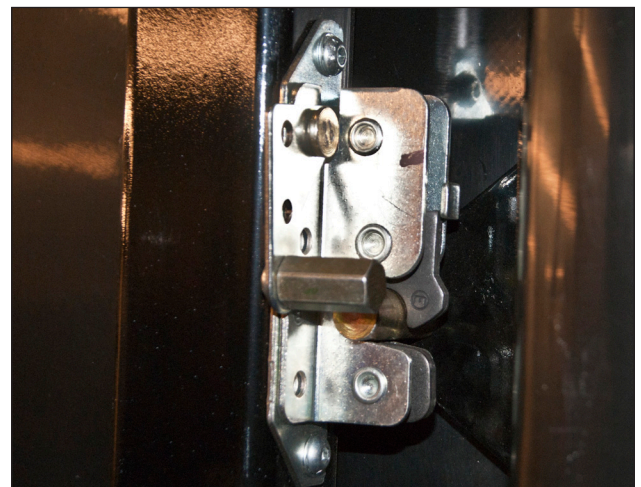
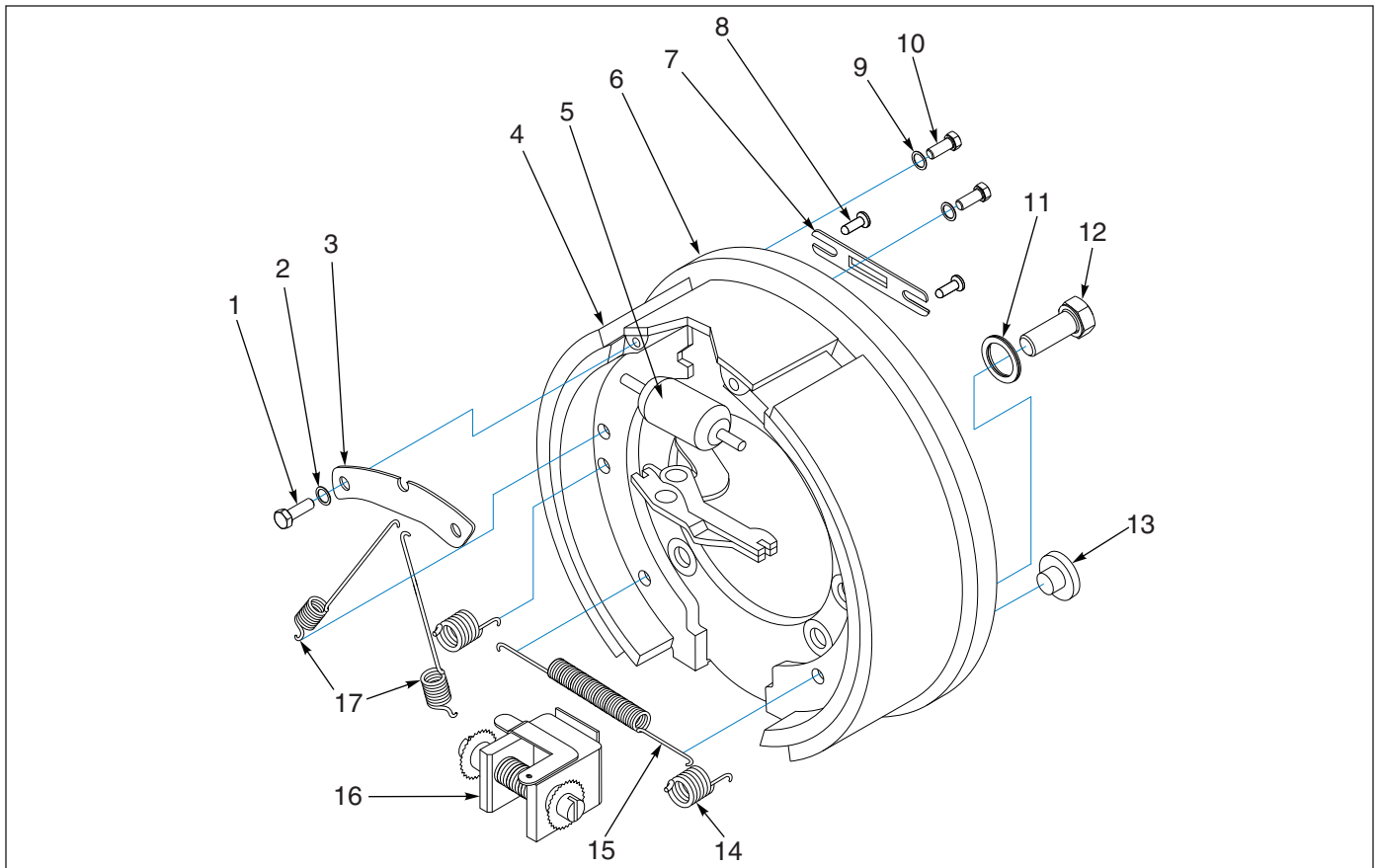


Figure 4-5: Overhead Guard Battery Cover Latch

14. Press in on the hold-down spring and pop it to one side (opposite of where hook is attached) to free the spring hook from the rear of the brake backing plate. This will require some force to compress the spring to pop it free.
15. Remove both hold down screws and the hold down clamp. Carefully separate the front and rear shoes from the wheel cylinder and parking brake lever assembly.
16. Clean the area and check the wheel cylinder for leaks. Pull back on the bottom portion of the rubber boot on both sides of the cylinder. If it is not dry, see **“Repairing Brake Wheel Cylinders” on page 4-14.**



Traction Drive Motor Service

1. Repeat steps 1-8 in “**Gearbox Replacement**” on page 4-22.
2. Support the unit as the mounting bolts are removed.
3. Remove the twelve 1/2-20 X 2 hex socket screws and hardware holding the motor to the motor mount weldment.
4. With the motor supported, rotate the motor to align the electrical connecting terminals to the slots machined in the motor mount weldment.
5. Slide the motor out far enough to install a second strap around the motor. This strap is to support the motor from outside the truck frame.
6. Place the assembly on a sturdy work bench. Use wood planks to balance and support the assembly while on the workbench.
7. Assemble the new motor by following the preceding steps in reverse.
8. Tighten and torque the screws.

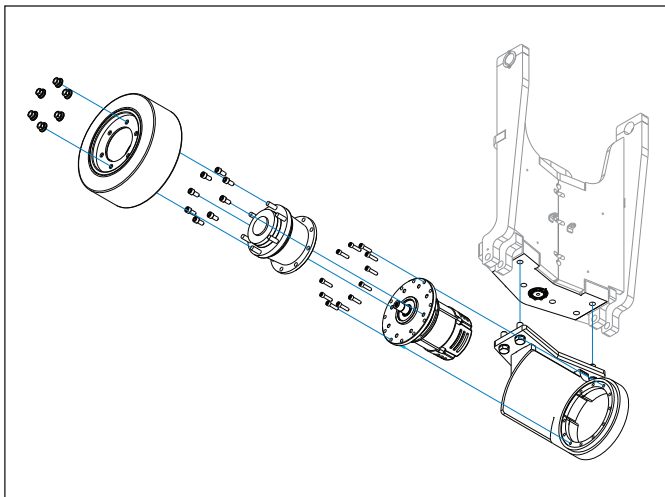


Figure 4-20: Tire, Gear Box and Motor Exploded View



Accelerator Pedal



- 18. Re-assemble the cap end of the spool with the new seals per the applicable end mechanism repair instruction.
- 19. Carefully reinsert the spool.
- 20. Install the new seal and wiper on the tang/clevis end of the spool using the seal plate to push them in prior to completing the seal plate cap screw installation and torque.
- 21. Assemble the switch pot brackets to the other end of the valve.
- 22. Apply grease (NLSI #2 Texaco #880) to actuator end prior to assembly of the spool actuator.
- 23. Reassemble valve to truck.
- 24. Attach and tighten all hoses.
- 25. Operate valve functions and check for leaks.

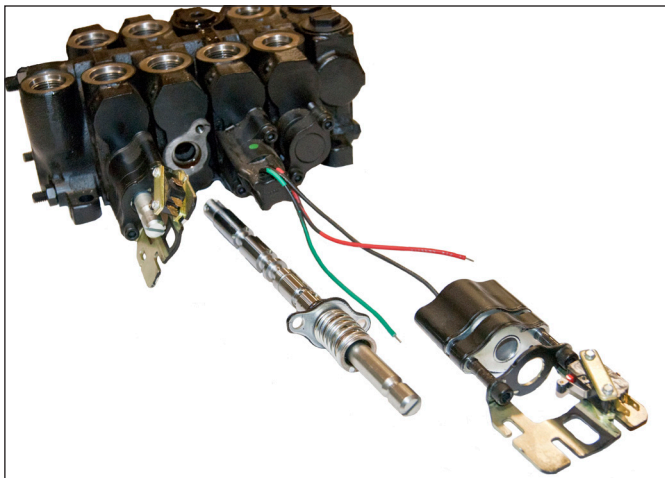
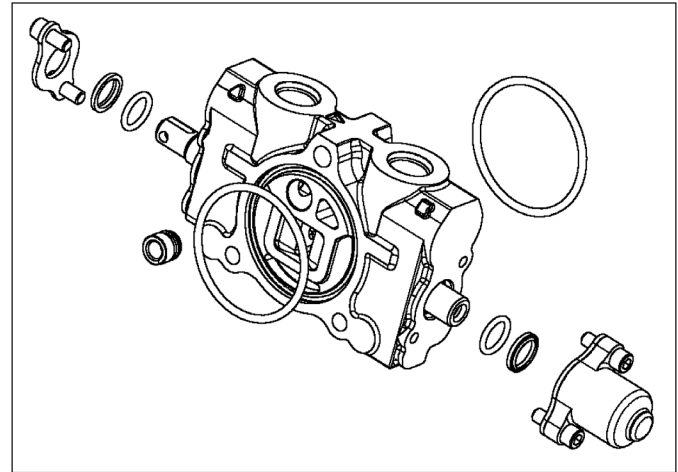
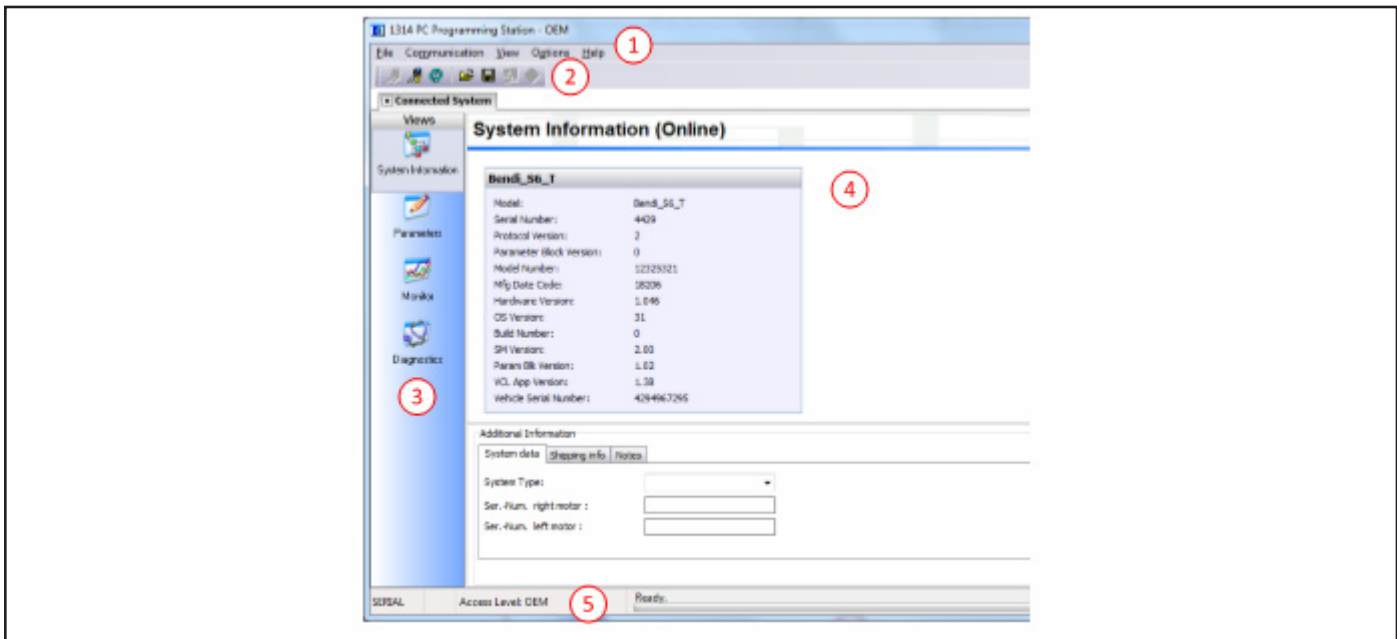


Figure 4-34: Hydraulic Valve Switches

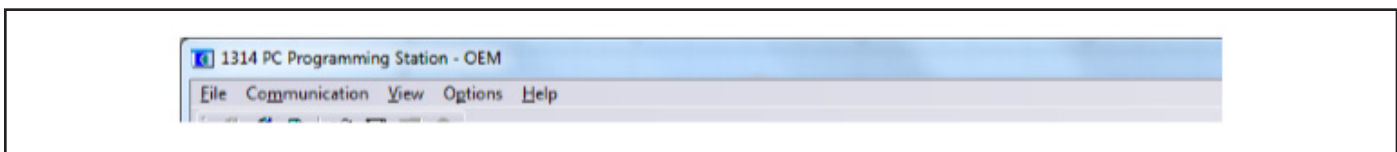
Spool Section Rebuild



1314 Software Features and Functionality



1. Menu Bar
2. Tool Bar
3. Views Navigation Bar
4. Working Area
5. Status Bar



Menu

The Menu Bar provides you with the functions available. Depending on the access level, some menus are not available. While connected to the system or while the program is loaded, not all menus are activated.

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BENDI B3/30 AC CALIBRATION AND PROGRAMMING

C O D E	PROGRAMMER LCD DISPLAY	T	P	POSSIBLE CAUSE	CLEAR CONDITIONS
18	Severe Overvoltage <i>ShutdownMotor; ShutdownMainContactor; ShutdownEMBrake; ShutdownThrottle; FullBrake; ShutdownPump.</i>	X	X	<ol style="list-style-type: none"> 1. See Monitor menu » Battery: Capacitor Voltage. 2. Battery menu parameters are misadjusted. 3. Battery resistance too high for given regen current. 4. Battery disconnected while regen braking. 	<p><i>Set:</i> Capacitor bank voltage exceeded the Severe Overvoltage limit with FET bridge enabled.</p> <p><i>Clear:</i> Bring capacitor voltage below Severe Overvoltage limit, and then cycle key switch.</p>
22	Controller Overtemp Cutback <i>Reduced drive and brake torque.</i>	X	X	<ol style="list-style-type: none"> 1. See Monitor menu » Controller: Temperature. 2. Controller is performance-limited at this temperature. 3. Controller is operating in an extreme setting. 4. Excessive load on vehicle. 5. Improper mounting of controller. 	<p><i>Set:</i> Heat sink temperature exceeded 85° C.</p> <p><i>Clear:</i> Bring heat sink temperature below 85° C.</p>
23	Undervoltage Cutback <i>Reduced drive torque.</i>	X	X	<ol style="list-style-type: none"> 1. Normal Operation. Fault shows that the batteries need recharging. Controller is performance limited at this voltage. 2. Battery parameters are misadjusted. 3. Non-controller system drain on battery. 4. Battery resistance too high. 5. Battery disconnected while driving. 6. See Monitor menu » Battery: Capacitor Voltage. 7. Blow B+ fuse or main contactor did not close. 	<p><i>Set:</i> Capacitor bank voltage dropped below the Undervoltage limit with the FET bridge enabled.</p> <p><i>Clear:</i> Bring capacitor voltage above the undervoltage limit.</p>
24	Overvoltage Cutback <i>Reduced brake torque.</i>	X	X	<ol style="list-style-type: none"> 1. Normal operation. Fault shows that regen braking currents elevated the battery voltage during regen braking. Controller is performance limited at this voltage. 2. Battery parameters are misadjusted. 3. Battery resistance too high for given regen current. 4. Battery disconnected while regen braking. 5. See Monitor menu » Battery: Capacitor Voltage. 	<p><i>Set:</i> Capacitor bank voltage exceeded the Overvoltage limit with the FET bridge enabled.</p> <p><i>Clear:</i> Bring capacitor voltage below the Overvoltage limit.</p>
25	+5V Supply Failure <i>None, unless a fault action is programmed in VCL.</i>	X	X	<ol style="list-style-type: none"> 1. External load impedance on the +5V supply (pin 26) is too low. 2. See Monitor menu » Outputs: 5 Volts and Ext Supply Current. 	<p><i>Set:</i> +5V supply (pin 26) outside the +5V ± 10% range.</p> <p><i>Clear:</i> Bring voltage within range.</p>

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