

**PALFINGER**

 *Liftgates*

# Model ILSL Sideloader Liftgate Maintenance and Troubleshooting



REV-021920

## ALL MODELS OF PALFINGER LIFTGATES

Installation, Operator(Owner) and Parts Manuals, are available for download or viewing on our website at <https://www.palfinger.com/en-US/usa/products/lift-gates>.

Diagrams of decal placement are in the Installation and Operator Manuals. Decals are furnished at no cost to our customers.

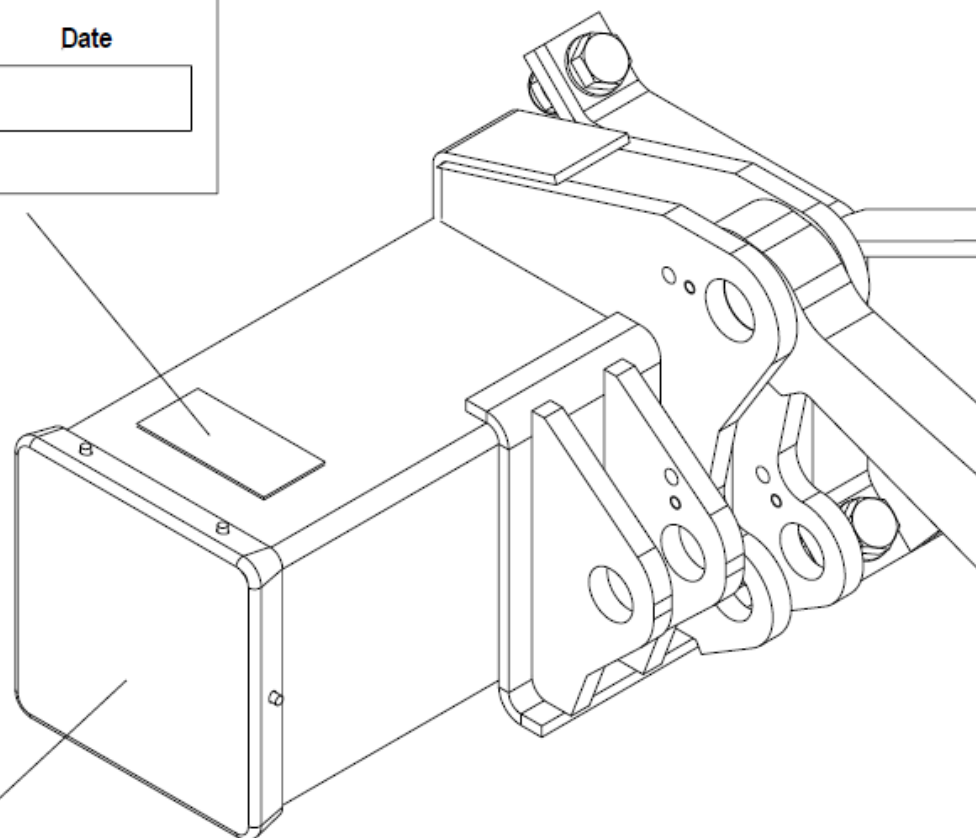
**REPLACE MISSING AND/OR DEFACED DECALS!**

All Models of Liftgate Operator Manuals have diagrams of pivot points needing Lubrication in the Preventive Maintenance Section.

## Serial Number Tag

<b>PALFINGER</b>		
(888) 774-5844		CERRITOS, CA. TRENTON, N.J.
Model	Serial No.	Date
<input type="text"/>	<input type="text"/>	<input type="text"/>

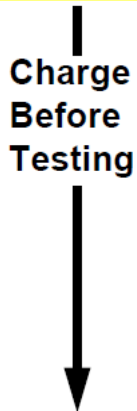
Mount Frame  
(Left Side)



**Basic Flooded Battery Conditions and Testing**

# State of Charge Vs. Voltage

<u>State of Charge</u>	<u>Open Circuit Voltage</u>
100%	12.70 V
90%	12.60 V
80%	12.50 V
70%	12.35 V
60%	12.25 V
50%	12.10 V
40%	11.95 V
30%	11.85 V
20%	11.70 V
10%	11.55 V



**BEFORE YOU START TROUBLESHOOTING**

**10-10 TEST**

**CHECK BATTERY VOLTAGE**

Using a multimeter set on DC Voltage:

Place Negative lead on Negative Post on Motor.

Place Positive lead on Positive Post on Motor.

Using the Lift Switch raise the platform to bed level.

Keeping the switch activated. Deadhead the Motor.

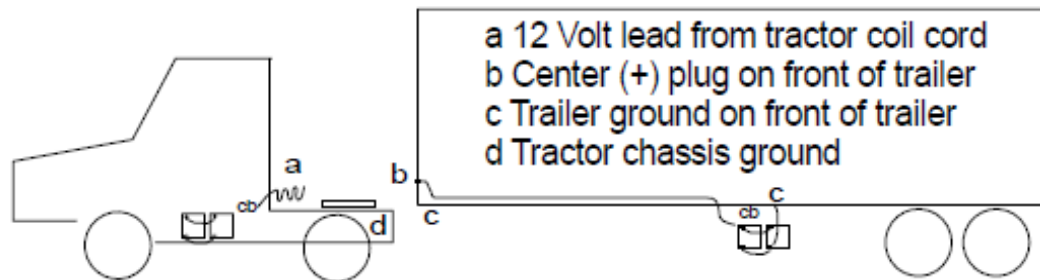
Keep switch activated for ten(10) seconds and observe the multimeter readings.

Ten(10) Volts for Ten(10) Seconds is the desired result.

If the reading is less than Eight(8) Volts the batteries are low and need to be charged.

Retest after charging. Replace batteries and check all connections and grounds if you cannot get 10-10.

# CROSS TEST ON ENTIRE CHARGE SYSTEM



Testing of full system using a battery load tester:

## Tractor Test:

1. Ground battery load tester on tractor chassis point (d)  
 Hook up positive load tester cable on positive pole of single pole plug at end of tractor coil cord (a)  
 Run load test- This will test entire circuit on tractor including ground from batteries to tractor chassis

## Trailer Test:

2. Ground battery load tester on trailer chassis (c)  
 Hook up positive cable on positive pole of single pole plug receptacle on trailer (b)  
 Run load test - This will test entire circuit on trailer including ground between trailer batteries and trailer chassis.

## Tractor and Trailer charging system Test

3. Ground battery load tester on tractor chassis (d)  
 Hook up positive cable on positive pole of single pole plug receptacle on trailer (b)  
 Run load test- This will test entire circuit on tractor - trailer including ground between tractor and trailer and circuit breaker on trailer.

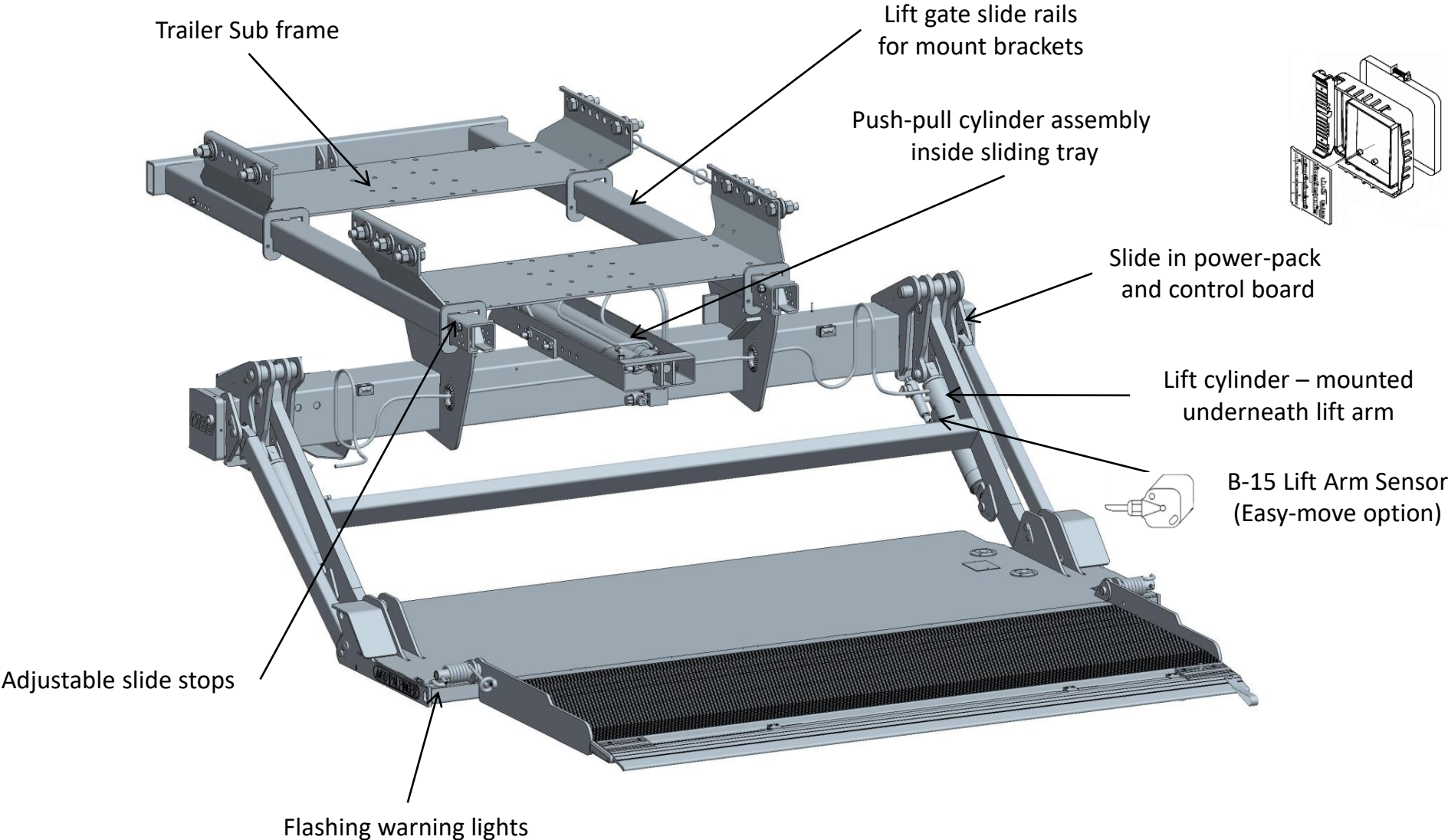
A simple low amp voltage test at the front of the trailer or at the tractor will not show insufficient connections or ground problems

Does Fifth Wheel have a ground strap to the tractor chassis?

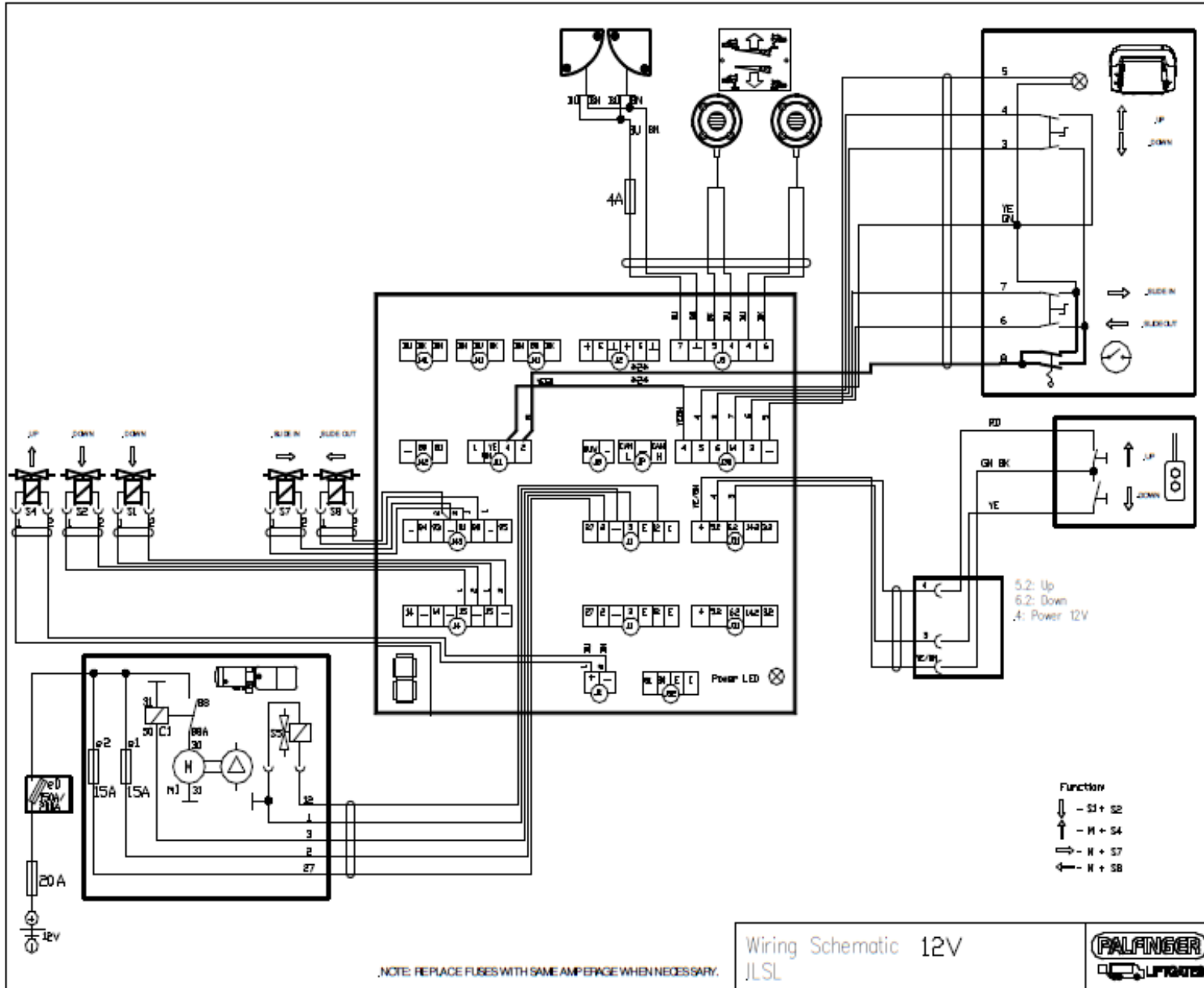
Make sure King Pin Plate is grounded to side rail.



# Gate components



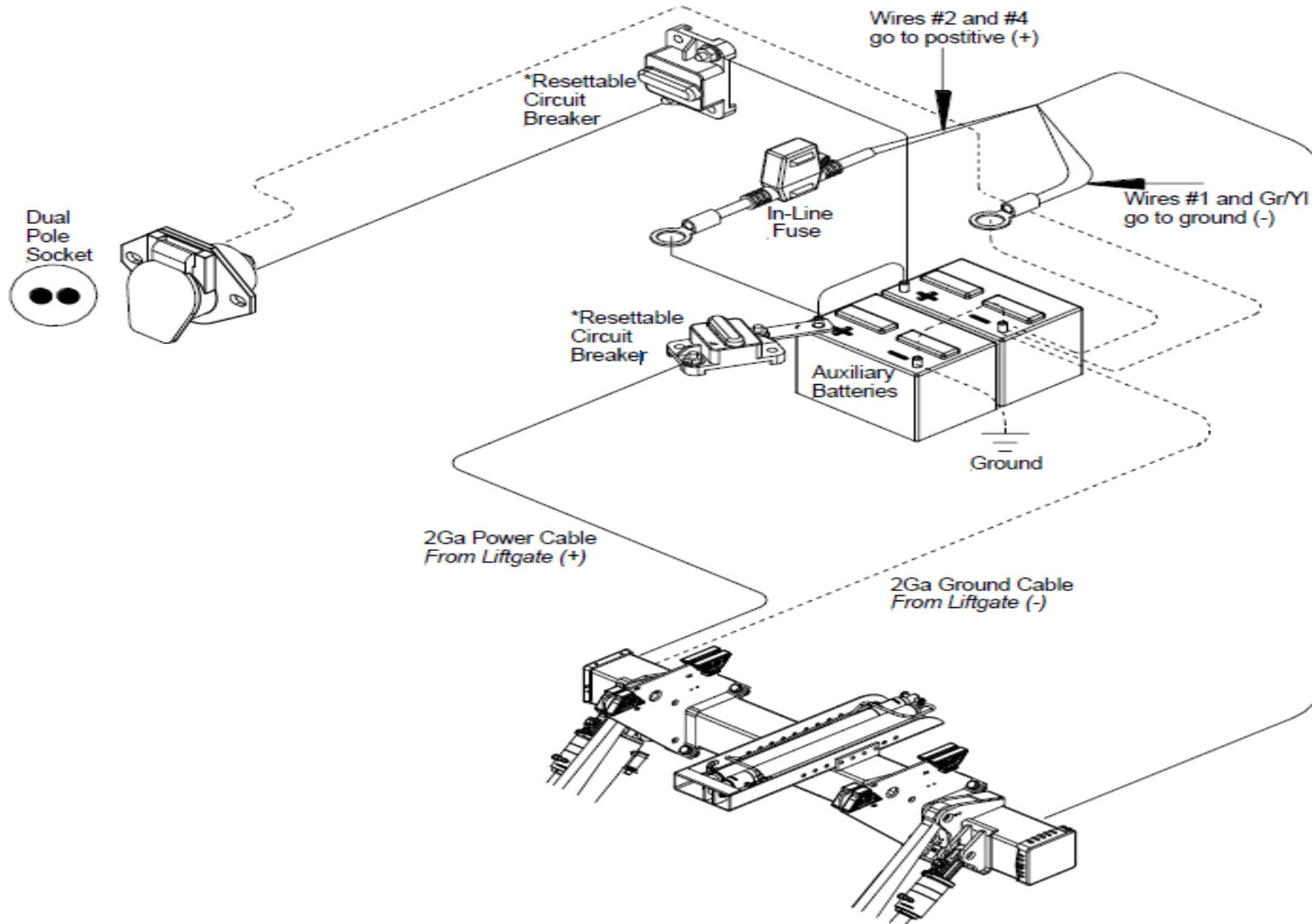
# Circuit Board – Schematic





# Battery Connections for Trailers Circuit Board & Liftgate

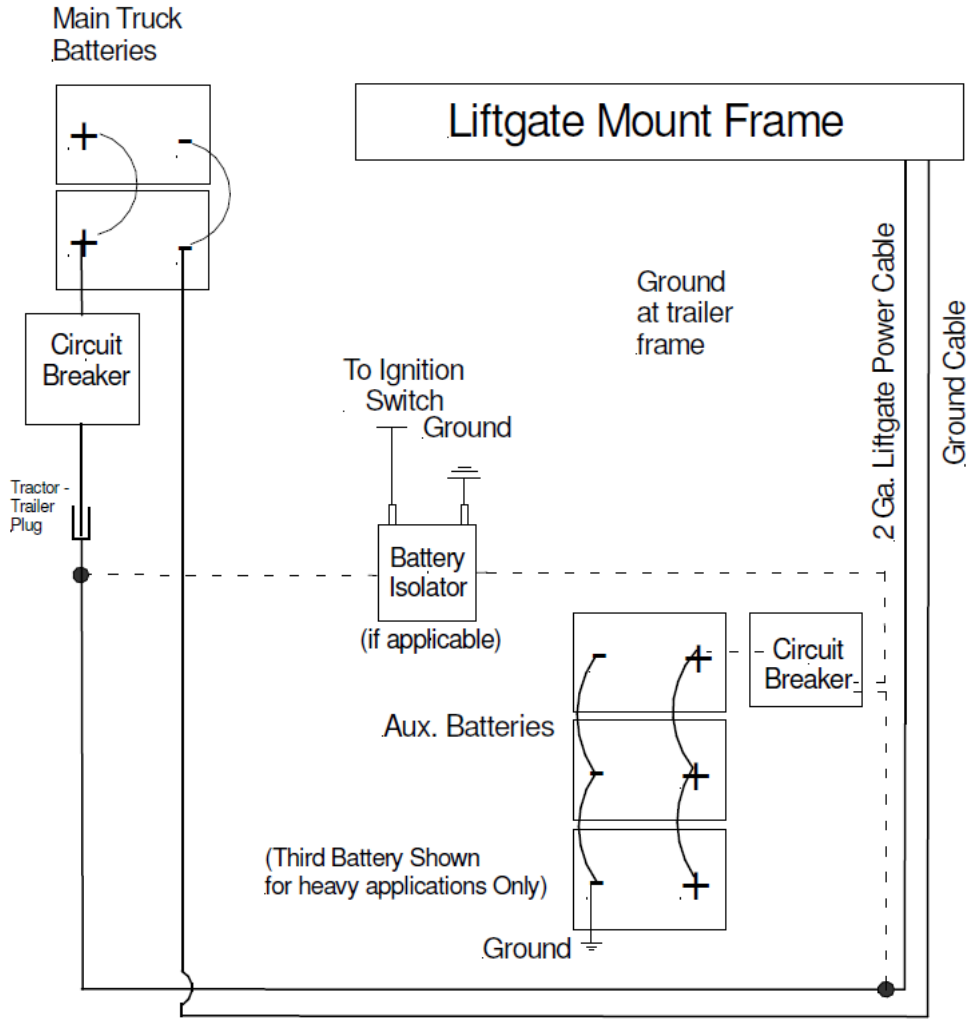
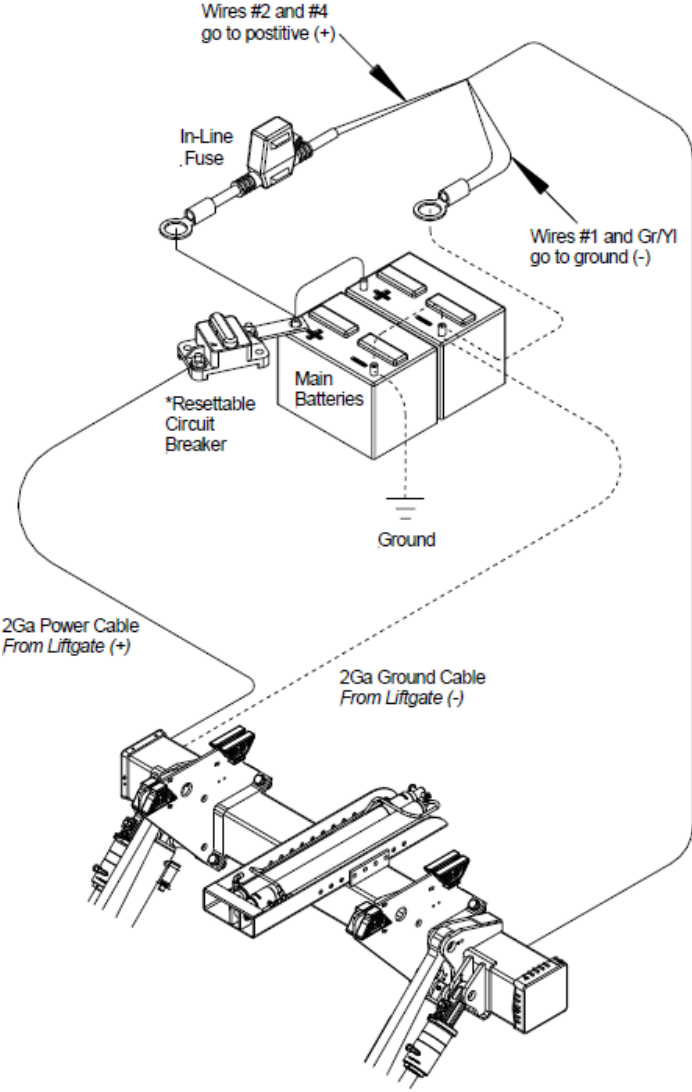
## Positive and Negative connections





# Battery Connections for Trucks Circuit Board & Liftgate

## Positive and Negative connections



# Circuit Board – September 2013 to Present

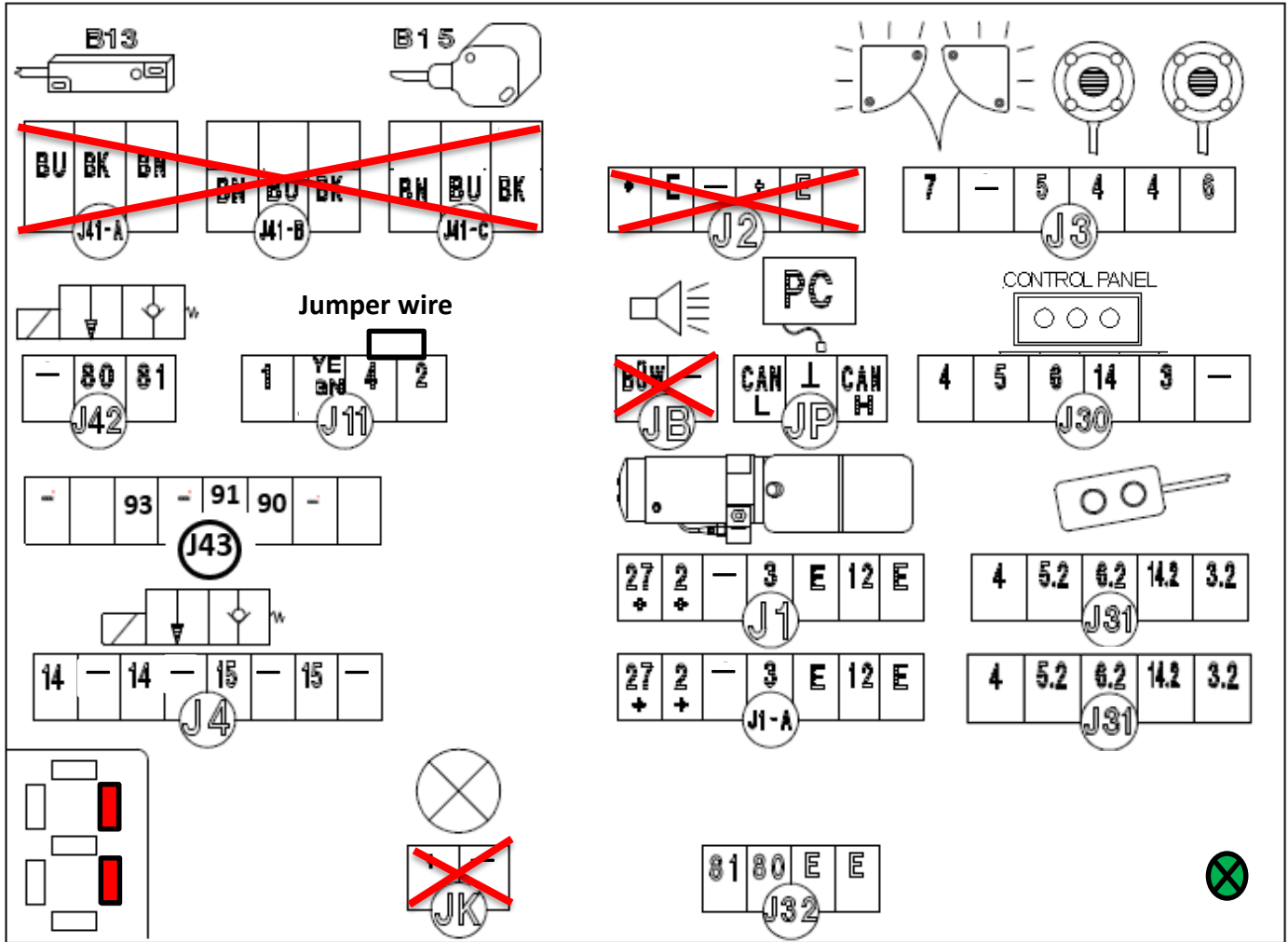
**Not used on ILFP**

Each Plug on Circuit Board Has a Alphabetical Letter and number on the bottom of plug to represent location On circuit board ( J1 )

In Each Plug on Circuit Board have numbers or Letters Or symbols that represent Terminal Locations in that plug

Positive Connection for Circuit board at J1 Plug, #2 & #4 black wire with 20 amp fuse from battery positive post with two 15 amp fuses at board for power to 27 & 2 terminals

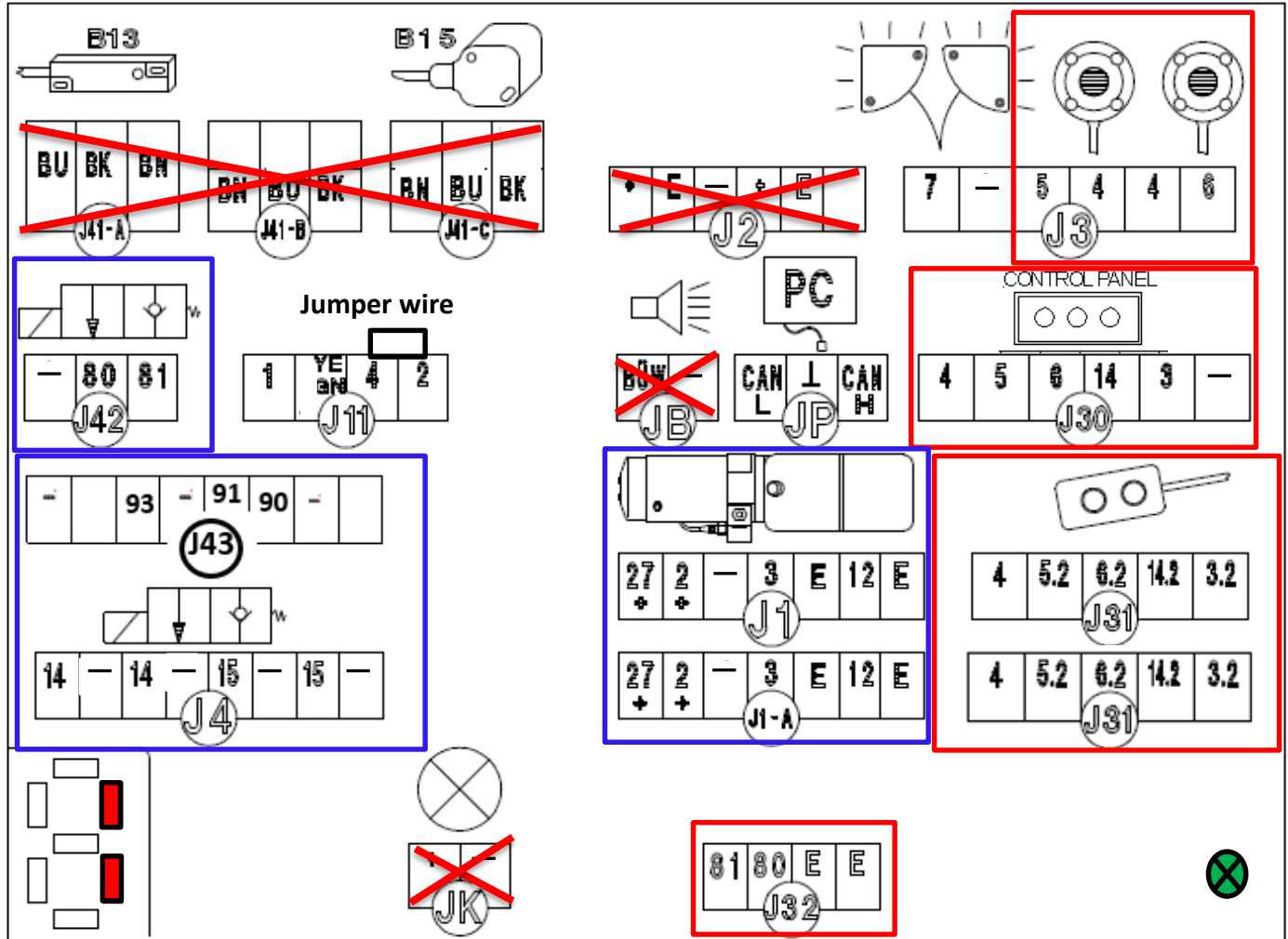
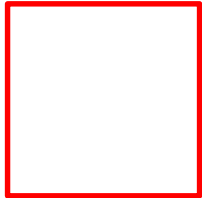
Negative Connection for Circuit board J1A Plug, #1 black wire & Green & Yellow striped wire from battery negative post.



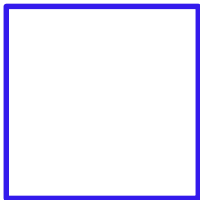
# Circuit Board – September 2013 to Present

**Not used on ILFP- X**

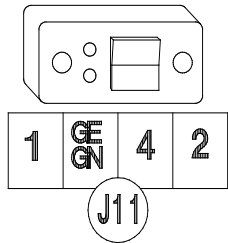
Inputs



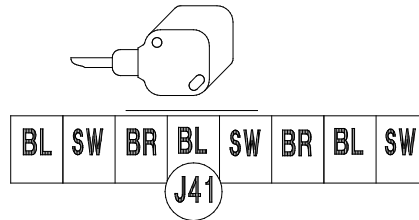
Output



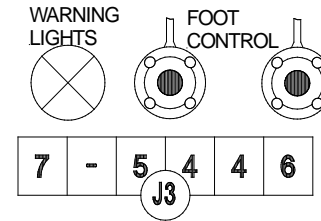
## Electric controls – connector overview



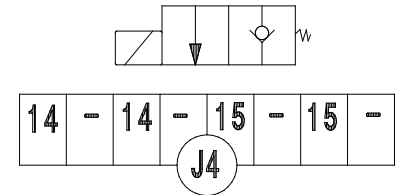
- Cab Switch J11**
- 2 Permanent Hot
  - 4 Control Power
  - (-) Ground
  - 1 LED Signal



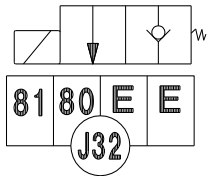
- Sensor J41**
- B15 -> Brown, Blue, Black



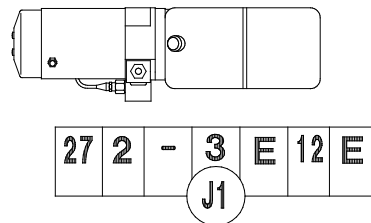
- Platform cable J3**
- 7 Signal f. Lights
  - 5 lift
  - 6 lower
  - 4 Control power



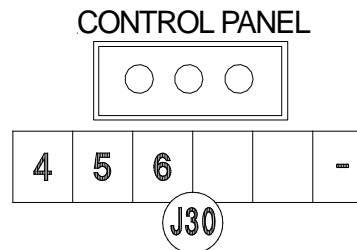
- Valves J4**
- 15 Lift cylinder



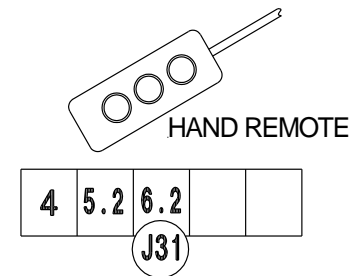
- Slide Valves J32**
- 80 Slide in
  - 81 Slide out



- Main Power J1**
- 27 Power for processor
  - 2 Permanent Hot
  - (-) Ground
  - 3 Motor Solenoid
  - E Special input
  - 12 Shift Valve
  - E Special input



- Control Box J30**
- 4 Control Power
  - 5 lift
  - 6 lower
  - (-) Ground



- Hand control J31**
- 4 Control Power
  - 5.2 lift
  - 6.2 lower
  - (-) Ground

# Electric controls – control cable wiring

SIGNAL	PC-BOARD	CABLE #
--------	----------	---------

## Control box wire setup

J-30	12 V HOT	- 4	# GREEN/YELLOW
	UP	-5	# 4
	DOWN	-6	# 3
	GROUND	- (-)	# 5

J-11	MAIN POWER	- 2	# 8	Only if Control box has off & on switch
	12 V HOT	- 4	# GREEN/YELLOW	

J-32	SLIDE OUT	- 80	# 6
	SLIDE IN	- 81	# 7



## Hand control wire setup

J-31	UP	-5.2	# YELLOW
	DOWN	-6.2	# BROWN
	12V HOT	-4.3	# RED

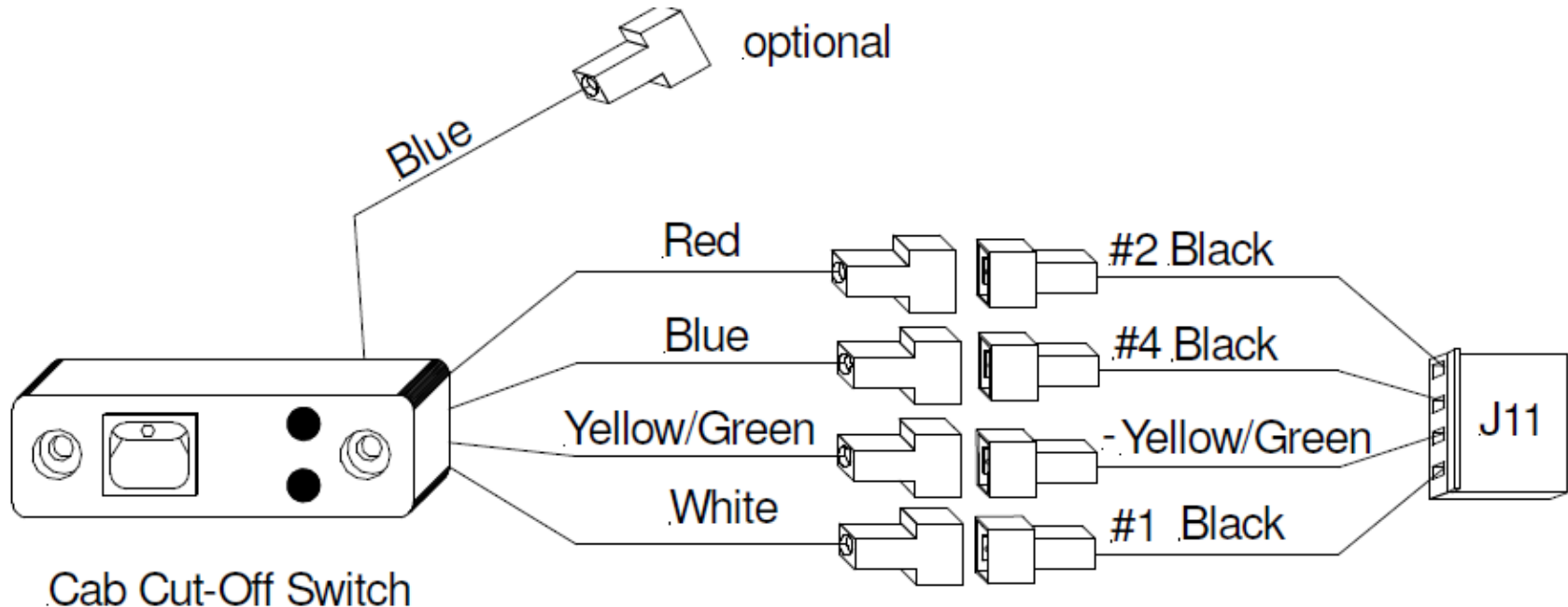


## Electric controls – Truck Cab Switch

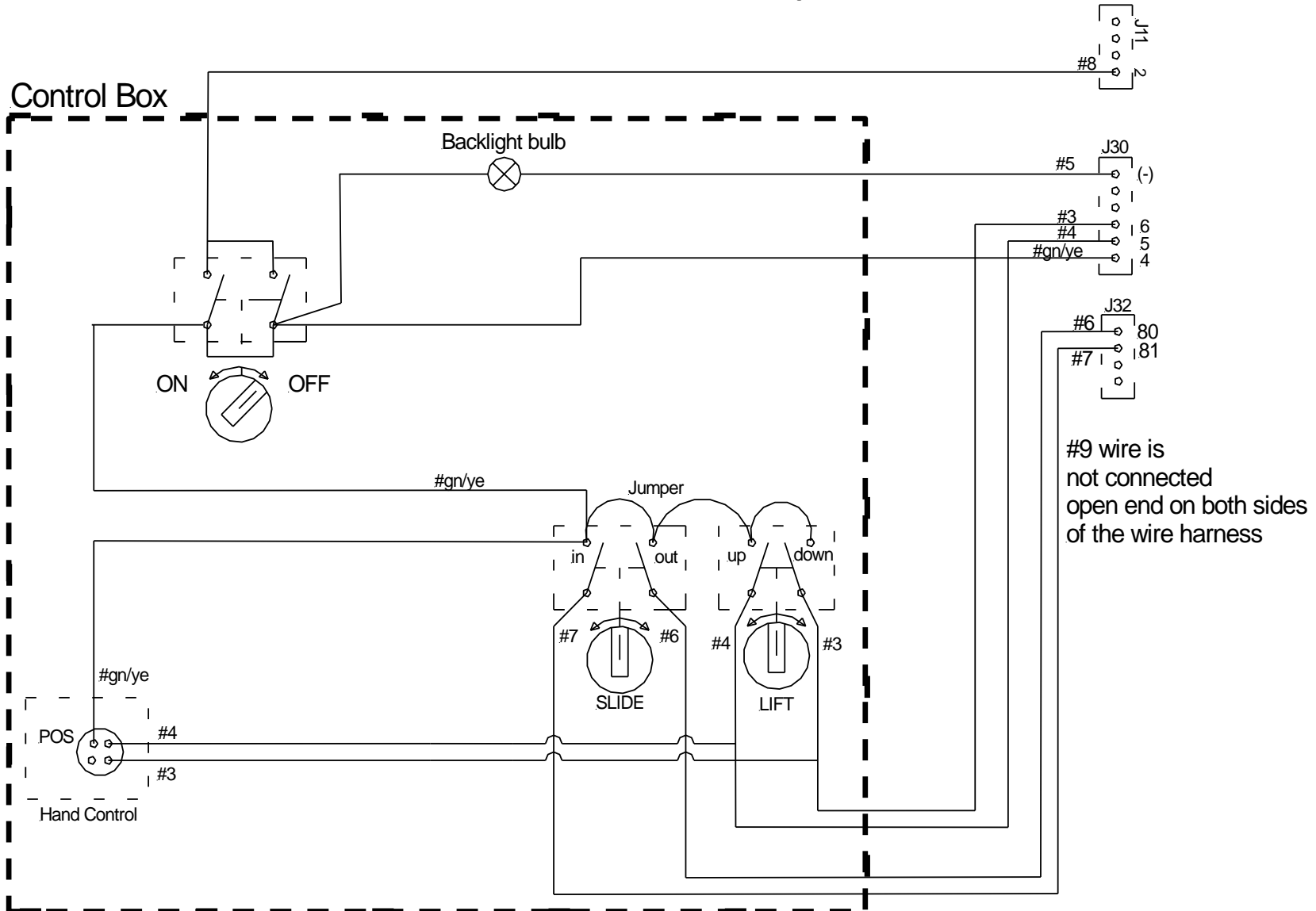
**NOTE: All Models of Palfinger gates supply the power for the cab switch**

J11 Plug on Circuit Board is connection for Cab Switch, Main Power on terminal # 2 is sent to cab switch and when Switch is turned on Main Power is sent back to Circuit Board to power all # 4 terminals for outputs on Circuit Board.

Yellow/Green wire is the negative connection from Circuit Board for Cab switch light and #1 Terminal on board is 12 volt power for Cab Switch Light.

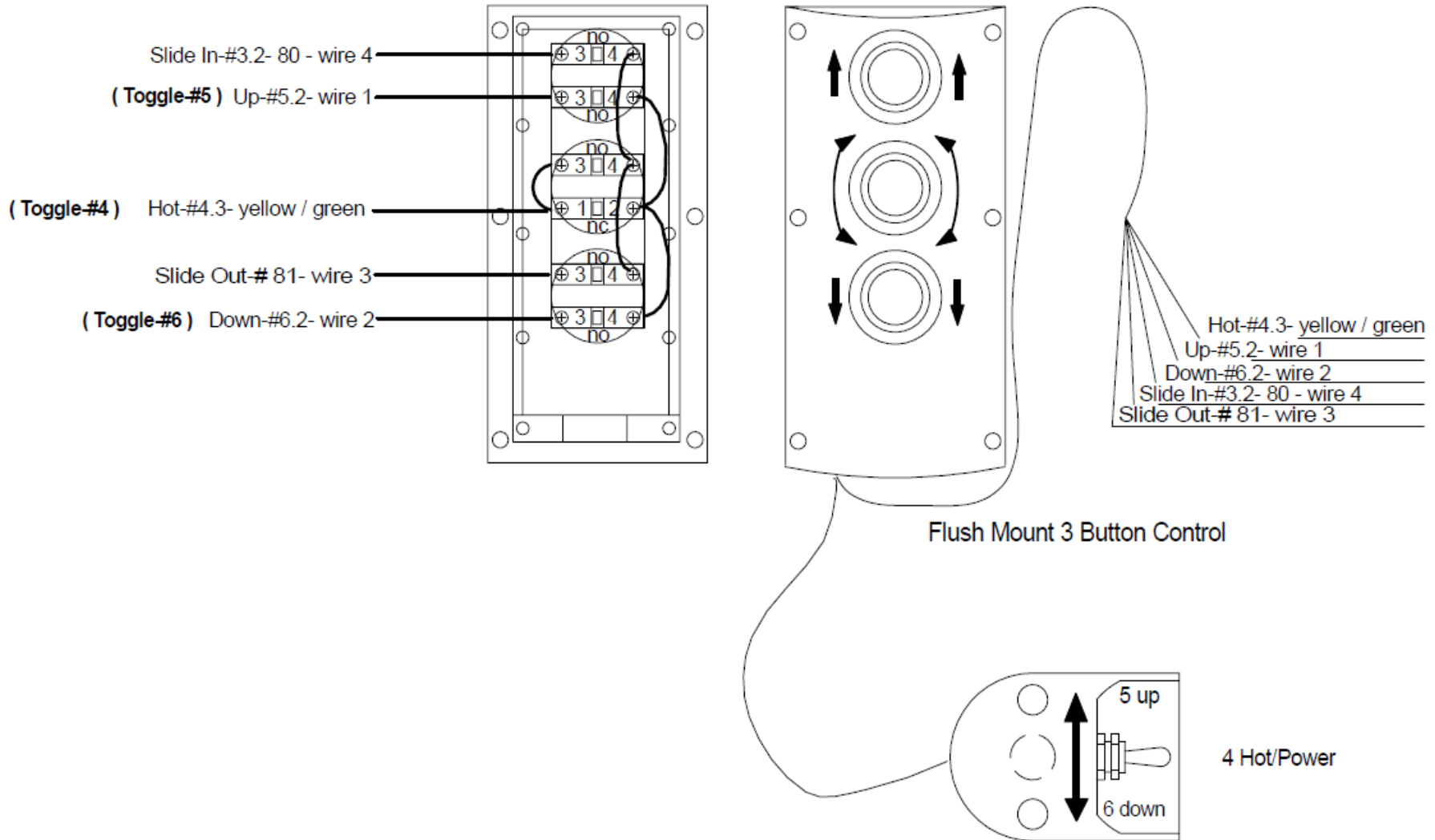


# Electric controls – control box setup

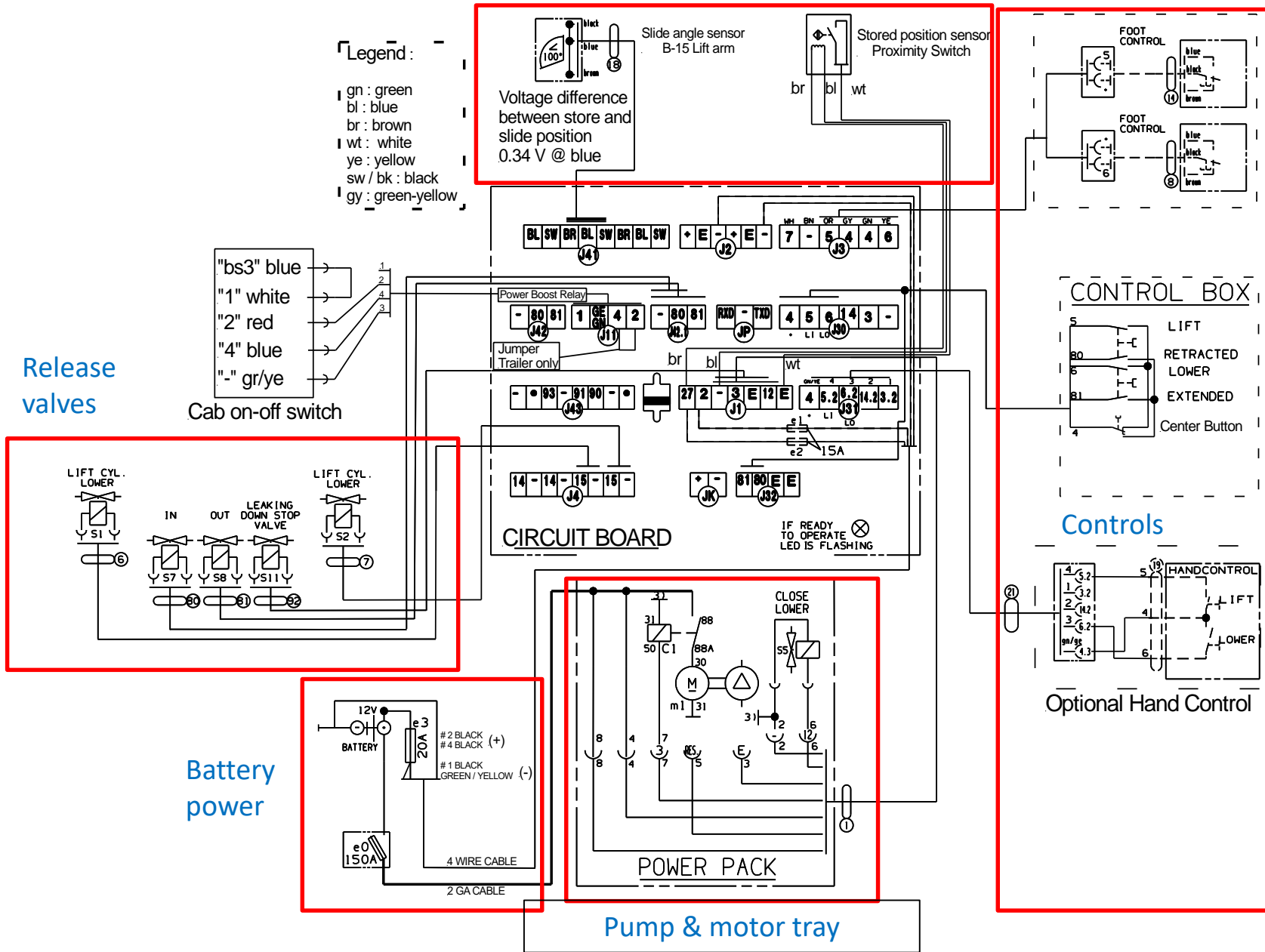




## Flush Mount 3 Button Control

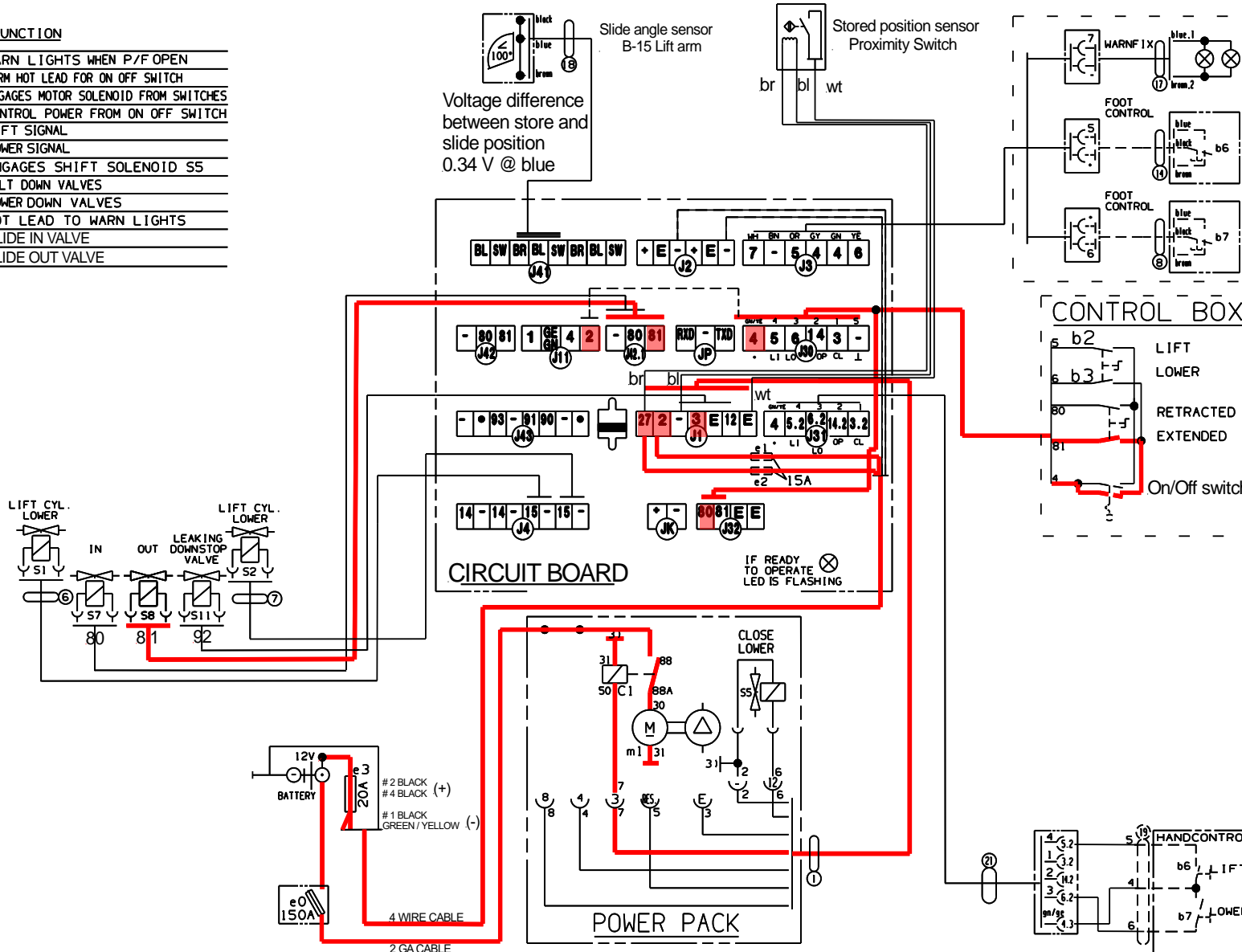


# Wiring schematic – control overview



# Wiring schematic – sliding out activities

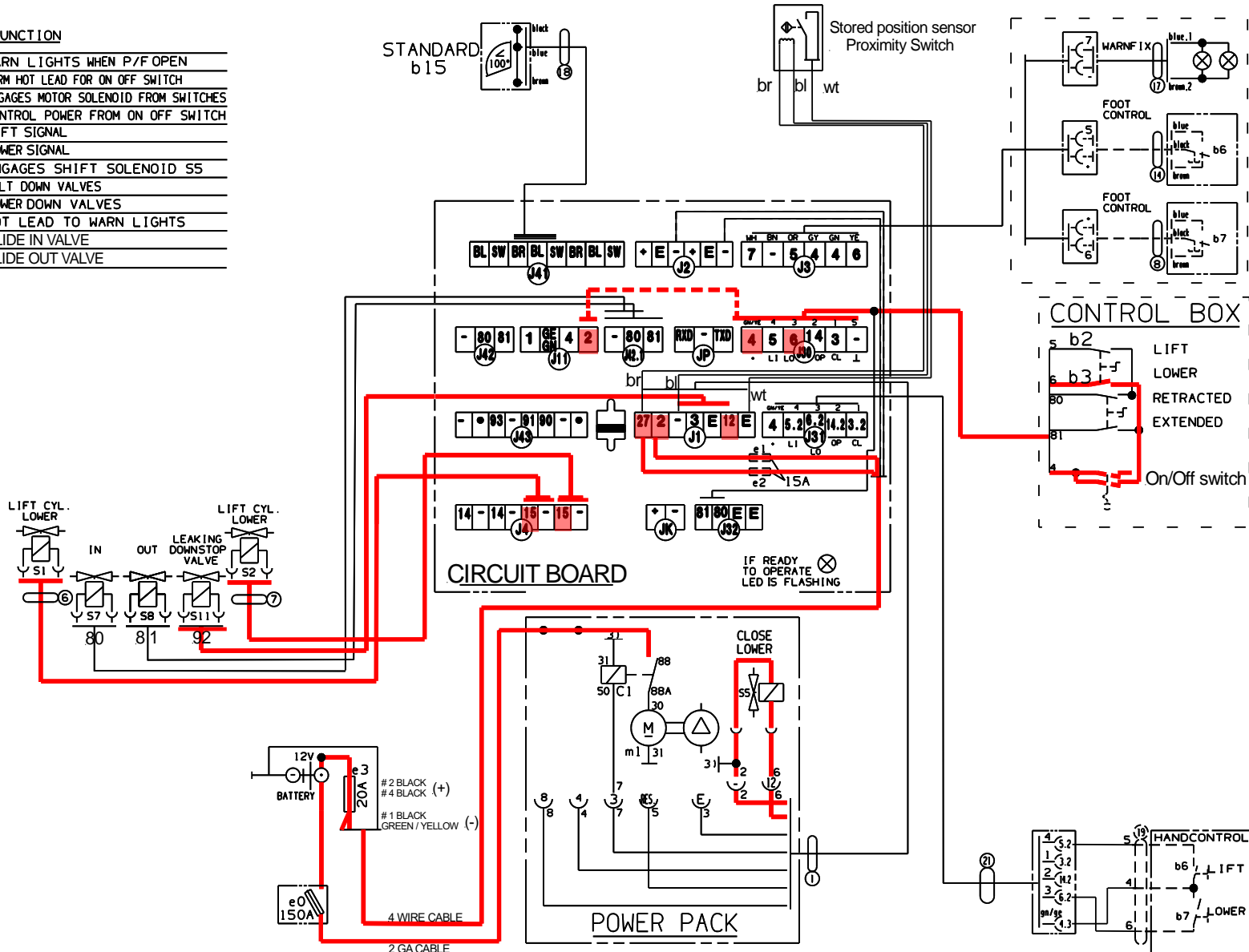
PIN IDENT.	FUNCTION
1	WARN LIGHTS WHEN P/F OPEN
2/27	PERM HOT LEAD FOR ON OFF SWITCH
3	ENGAGES MOTOR SOLENOID FROM SWITCHES
4	CONTROL POWER FROM ON OFF SWITCH
5	LIFT SIGNAL
6	LOWER SIGNAL
12	ENGAGES SHIFT SOLENOID S5
14	TILT DOWN VALVES
15	LOWER DOWN VALVES
7	HOT LEAD TO WARN LIGHTS
80	SLIDE IN VALVE
81	SLIDE OUT VALVE



- Slide-out signals
- Activated pins
- Activated lines

# Wiring schematic – lowering

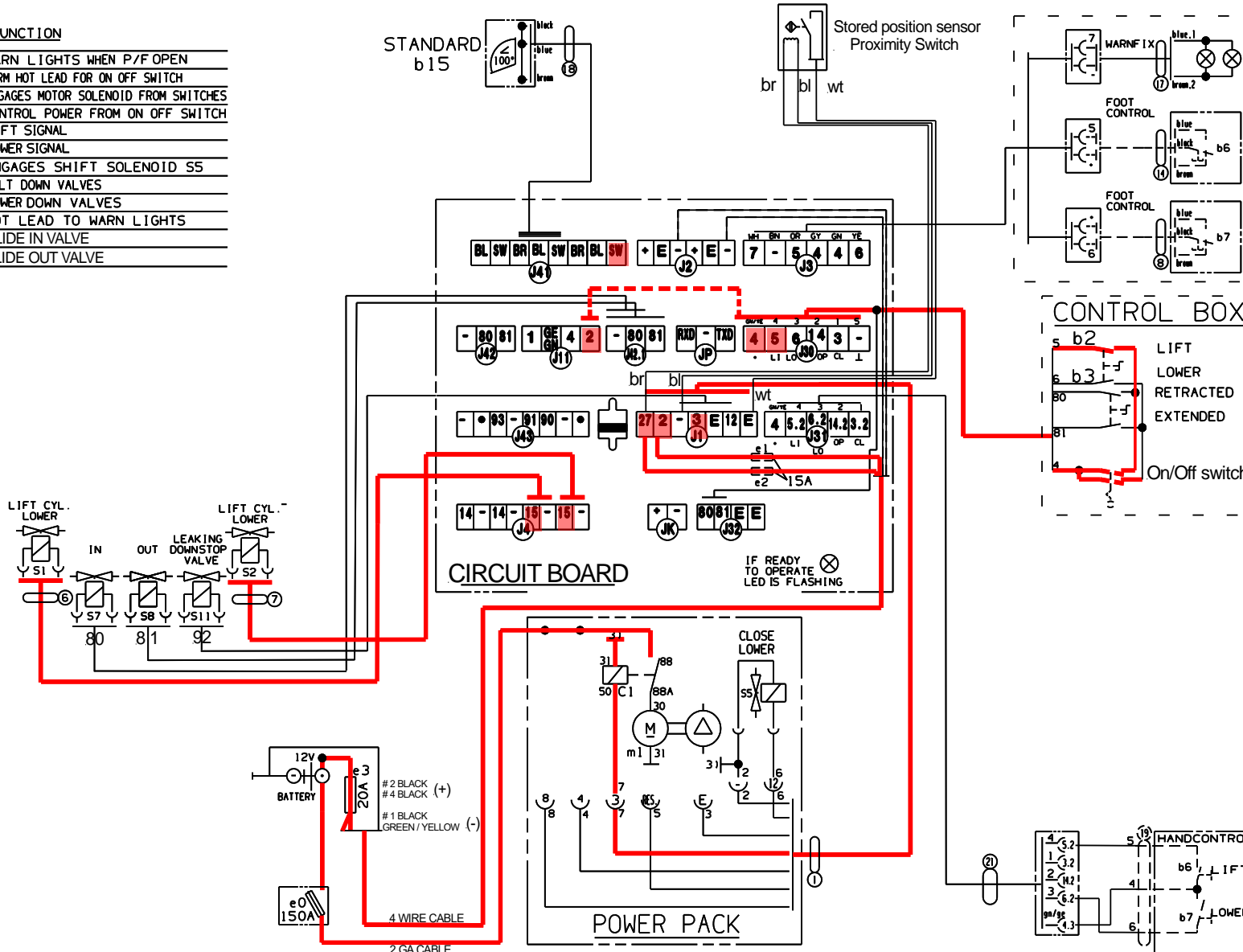
PIN IDENT.	FUNCTION
1	WARN LIGHTS WHEN P/F OPEN
2/27	PERM HOT LEAD FOR ON OFF SWITCH
3	ENGAGES MOTOR SOLENOID FROM SWITCHES
4	CONTROL POWER FROM ON OFF SWITCH
5	LIFT SIGNAL
6	LOWER SIGNAL
12	ENGAGES SHIFT SOLENOID S5
14	TILT DOWN VALVES
15	LOWER DOWN VALVES
7	HOT LEAD TO WARN LIGHTS
80	SLIDE IN VALVE
81	SLIDE OUT VALVE



Lowering signals  
■ Activated pins  
— Activated lines

# Wiring schematic – lifting activities

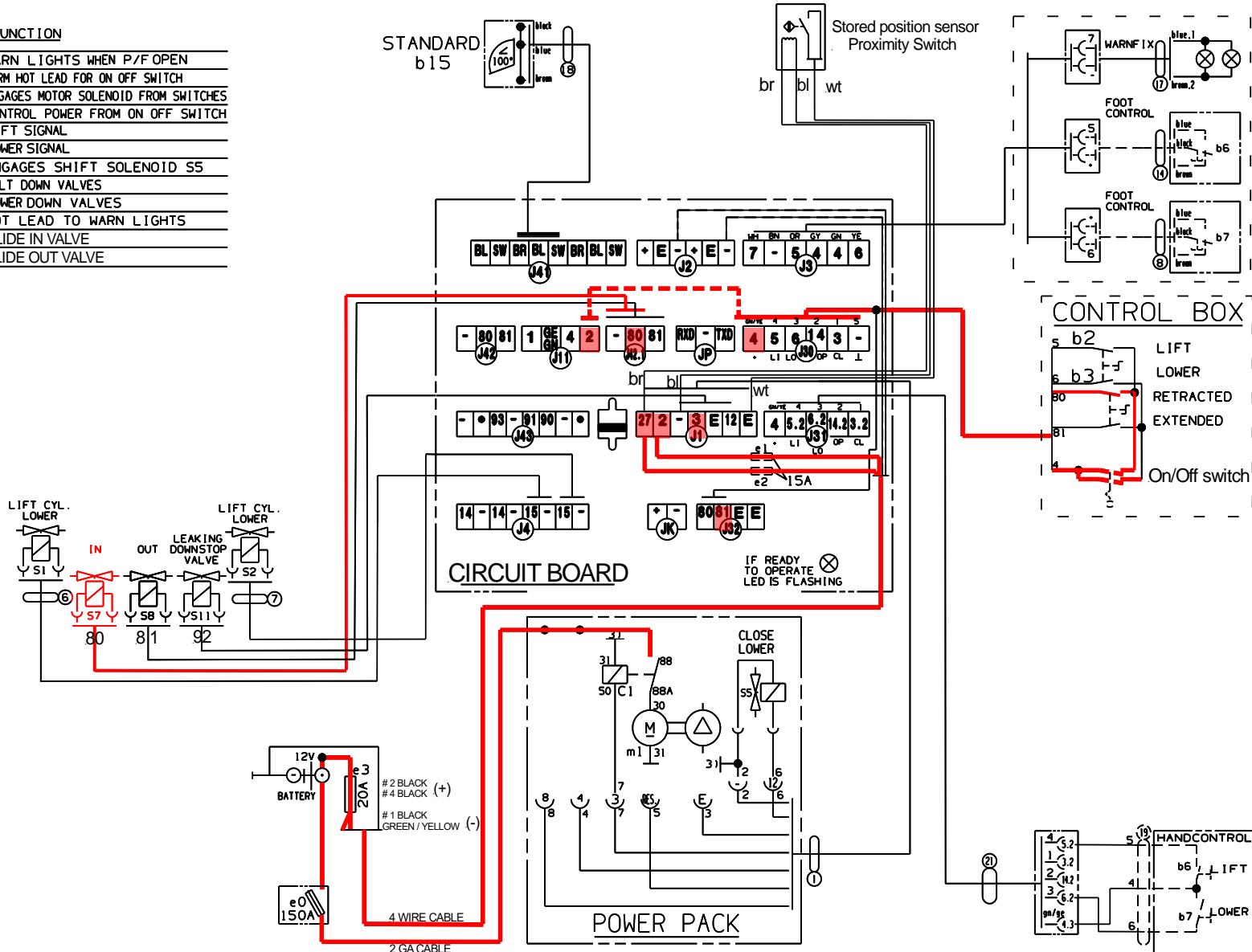
PIN IDENT.	FUNCTION
1	WARN LIGHTS WHEN P/F OPEN
2/27	PERM HOT LEAD FOR ON OFF SWITCH
3	ENGAGES MOTOR SOLENOID FROM SWITCHES
4	CONTROL POWER FROM ON OFF SWITCH
5	LIFT SIGNAL
6	LOWER SIGNAL
12	ENGAGES SHIFT SOLENOID SS
14	TILT DOWN VALVES
15	LOWER DOWN VALVES
7	HOT LEAD TO WARN LIGHTS
80	SLIDE IN VALVE
81	SLIDE OUT VALVE



Lifting signals  
■ Activated pins  
— Activated lines

# Wiring schematic – sliding in activities

PIN IDENT.	FUNCTION
1	WARN LIGHTS WHEN P/F OPEN
2/27	PERM HOT LEAD FOR ON OFF SWITCH
3	ENGAGES MOTOR SOLENOID FROM SWITCHES
4	CONTROL POWER FROM ON OFF SWITCH
5	LIFT SIGNAL
6	LOWER SIGNAL
12	ENGAGES SHIFT SOLENOID S5
14	TILT DOWN VALVES
15	LOWER DOWN VALVES
7	HOT LEAD TO WARN LIGHTS
80	SLIDE IN VALVE
81	SLIDE OUT VALVE



Slide-in signals

Activated pins

Activated lines

## Pins, Bushings and Restrictor Valves



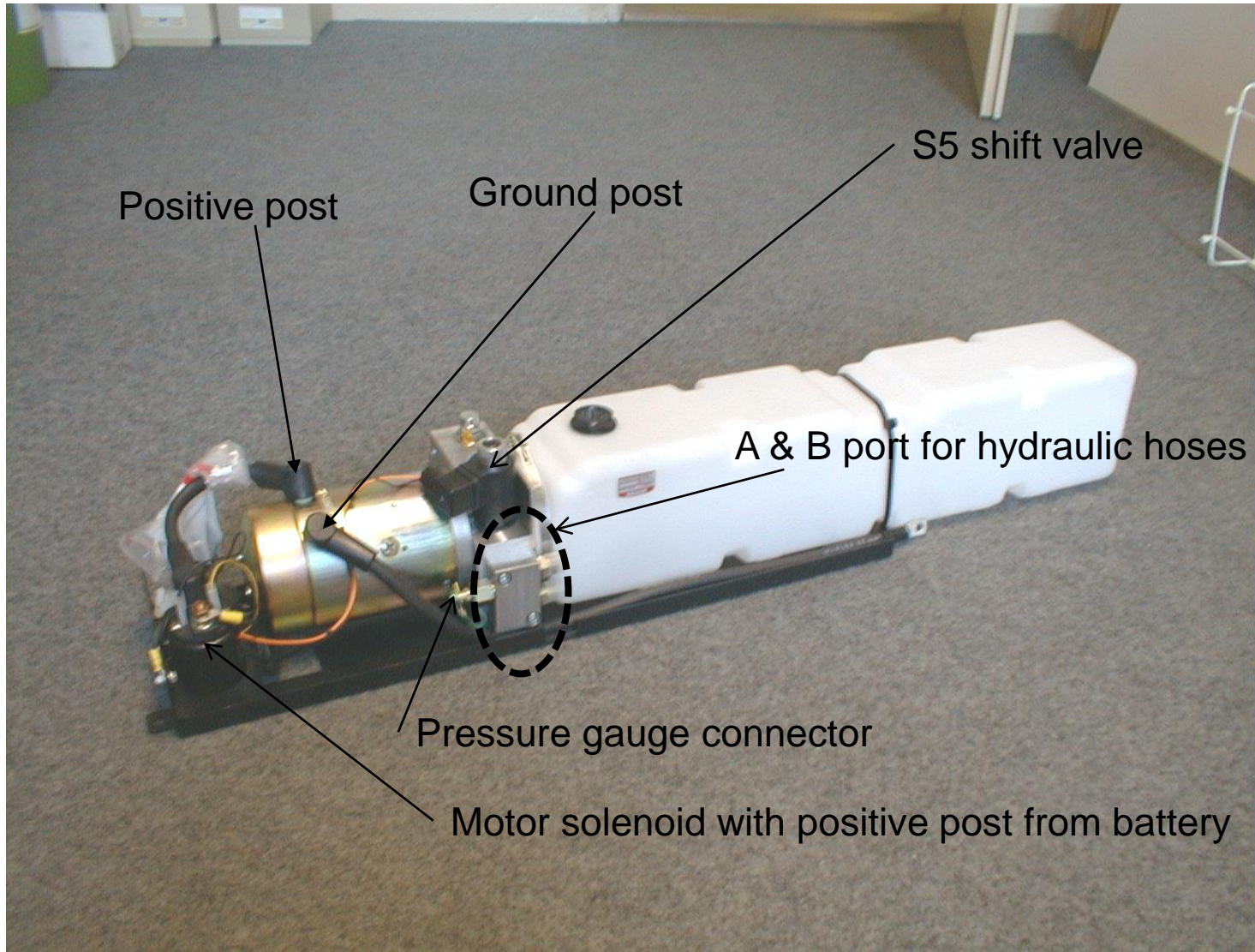
**Pin diameter determines lifting capacity**

**Restrictor Valve**  
Number on valve describes the fluid flow (liters per minute)

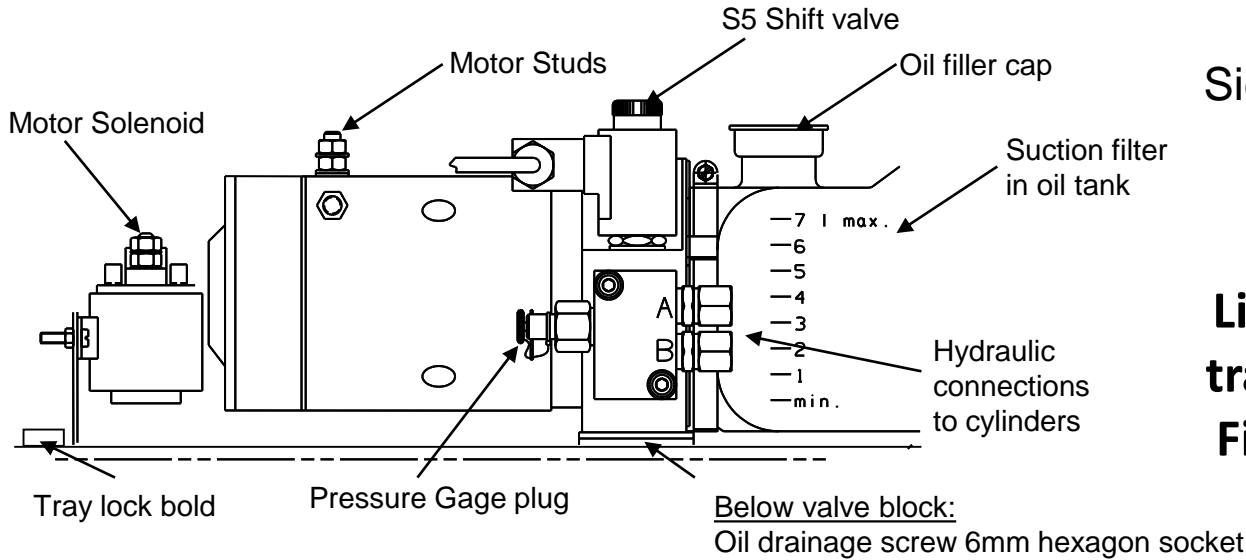




## Power-pack and components



# Power-pack and components

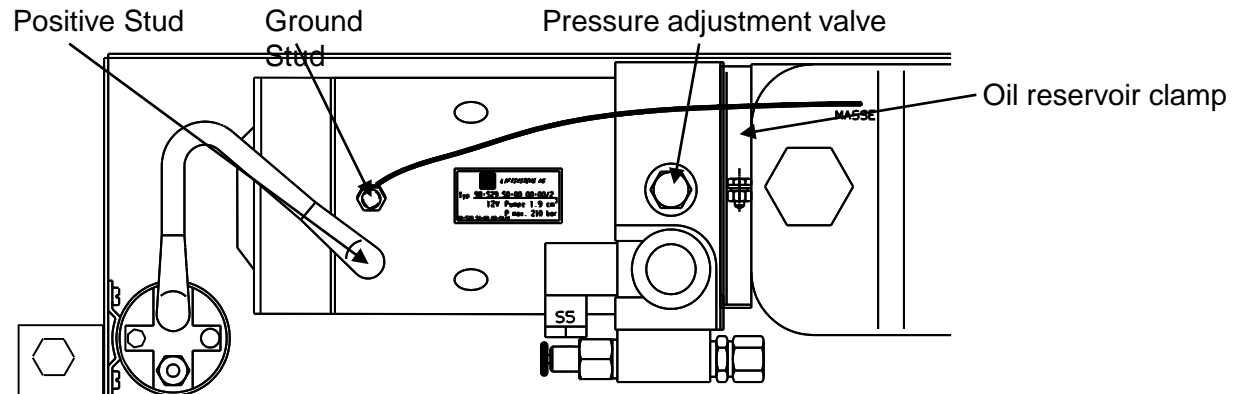


Side view

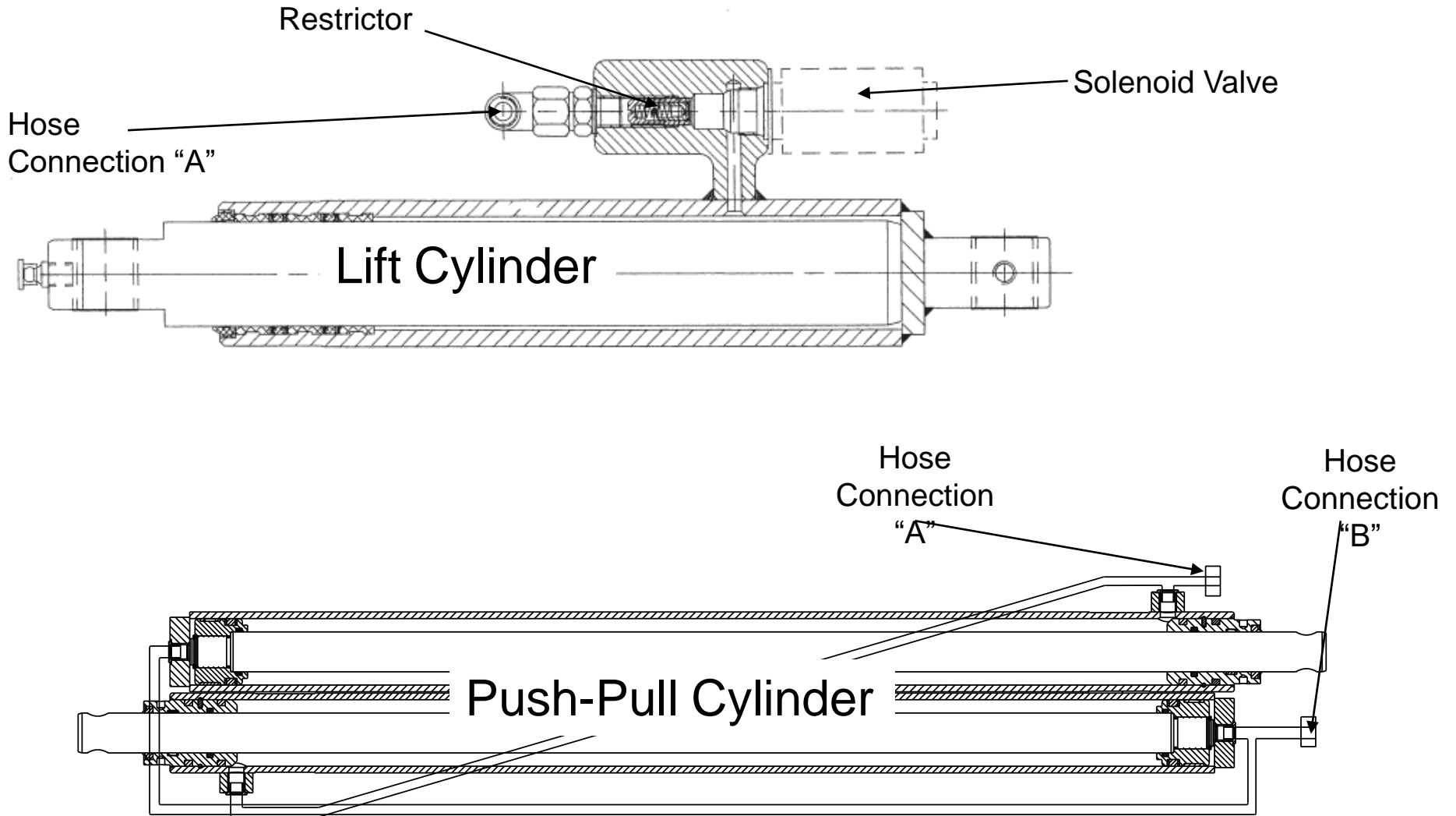
## CHECKING FLUID LEVEL

Liftgate retracted underneath trailer, lowered to the ground.  
 Fill to approximately 1" from top of reservoir.

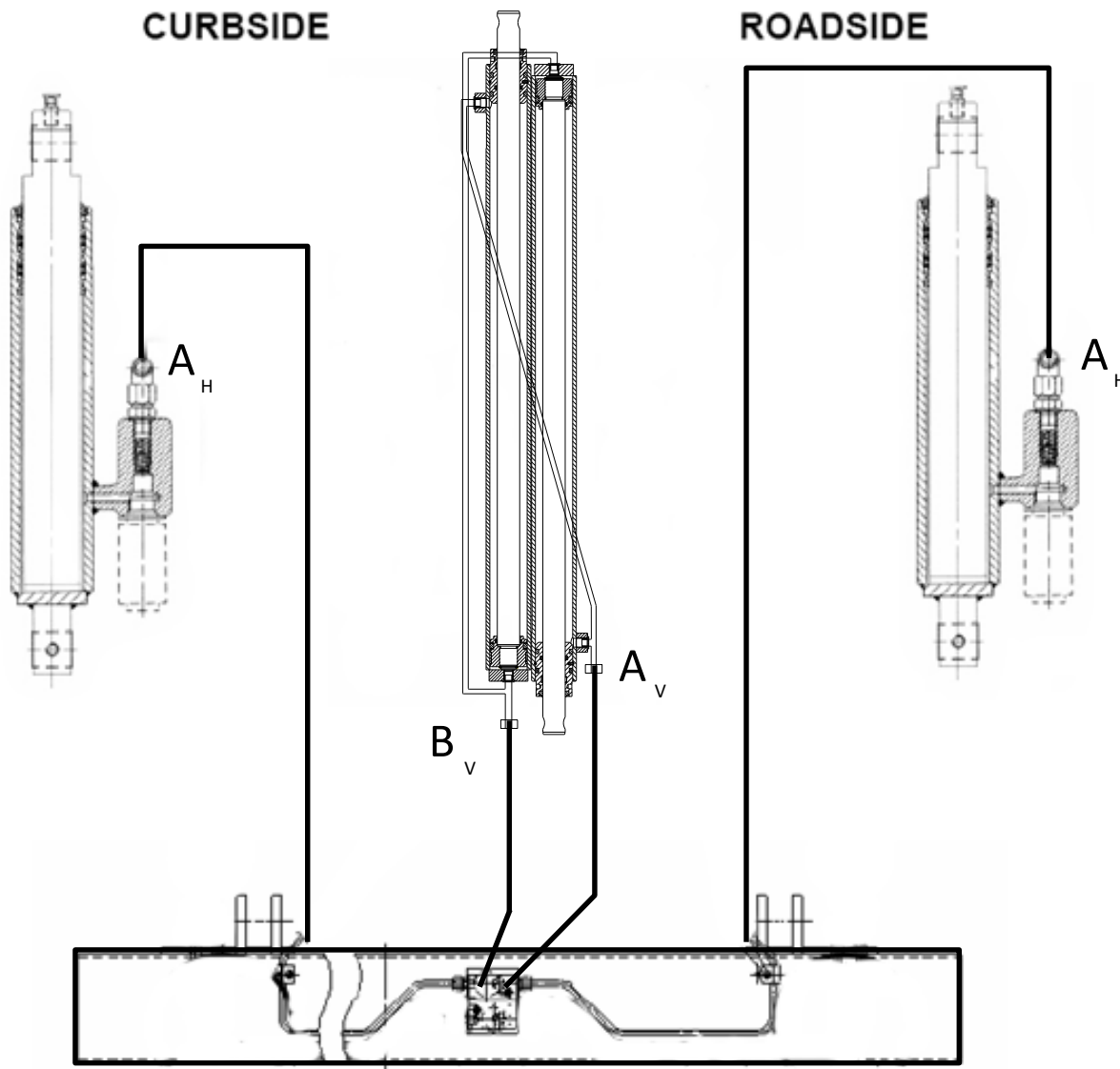
Top view



## Lift and Push-Pull cylinders

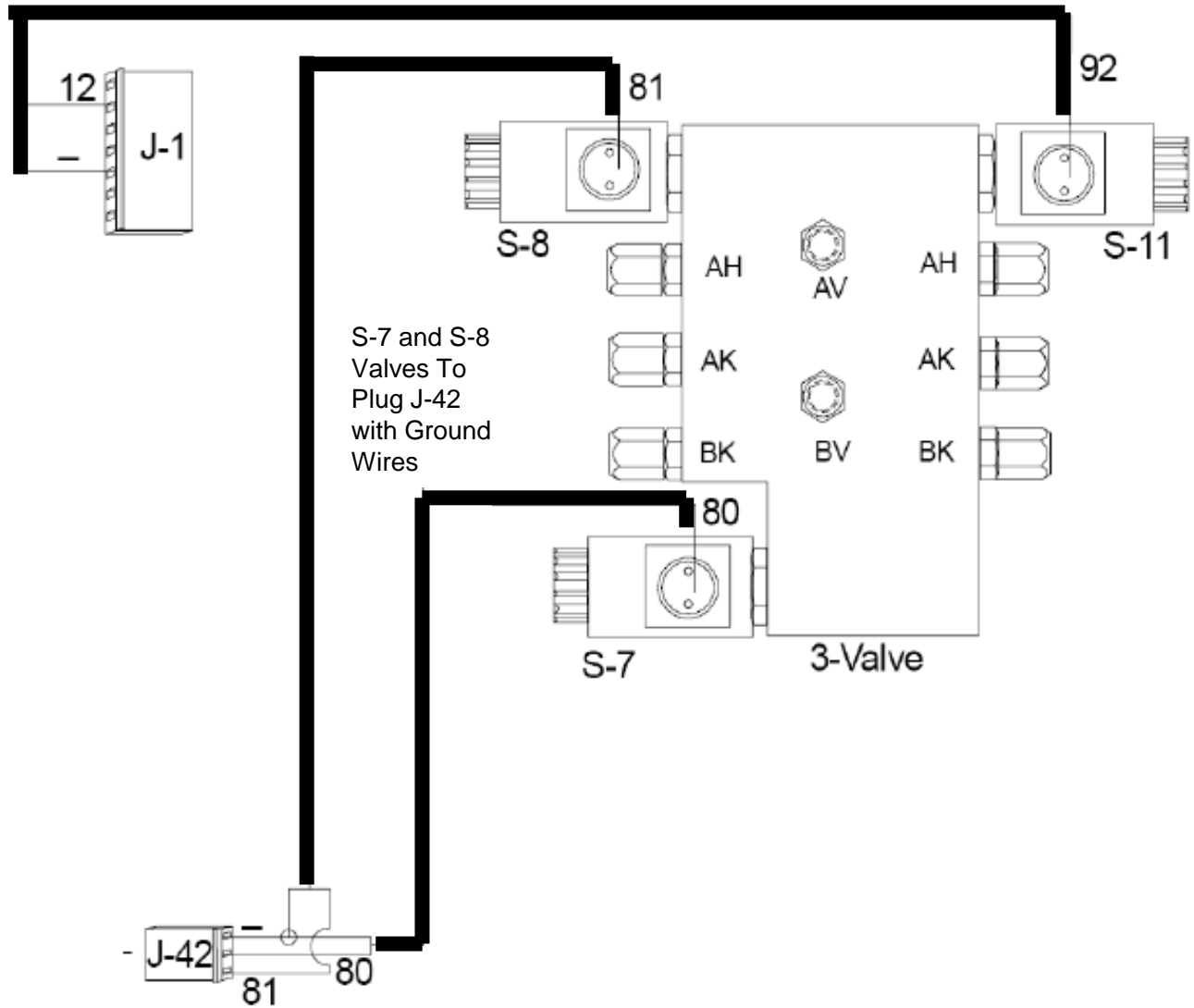


# Lift and Push-Pull cylinder connection

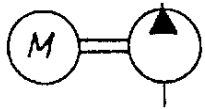


## Valve Block connections

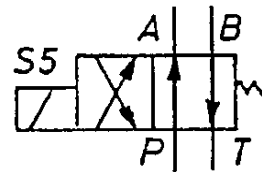
3-Valve Part Numbers
S-8 & S-7 Double Locking P-1284466
S-11 Single Locking P-67282345
S-11 Opens When Lowering, Lift Cylinder Return Line
Hydraulic Ports
AV-Push/Pull In BV-Push/Pull Out AH-Lift Cylinder
Push/Pull Cylinder Out
S-7 - Closed S-8 - Open
Push/Pull Cylinder In
S-7 - Open S-8 - Closed



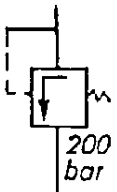
# Hydraulic symbols in schematics



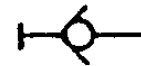
Motor with Pump



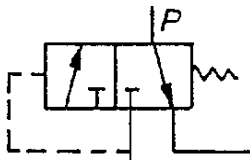
Shift valve S5



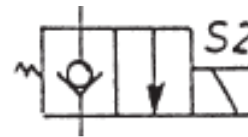
Pressure relief valve



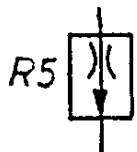
Pressure gauge



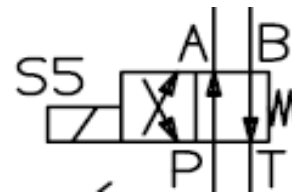
Shuttle valve / (Flow divider)



Single locking valve



Restrictor valve

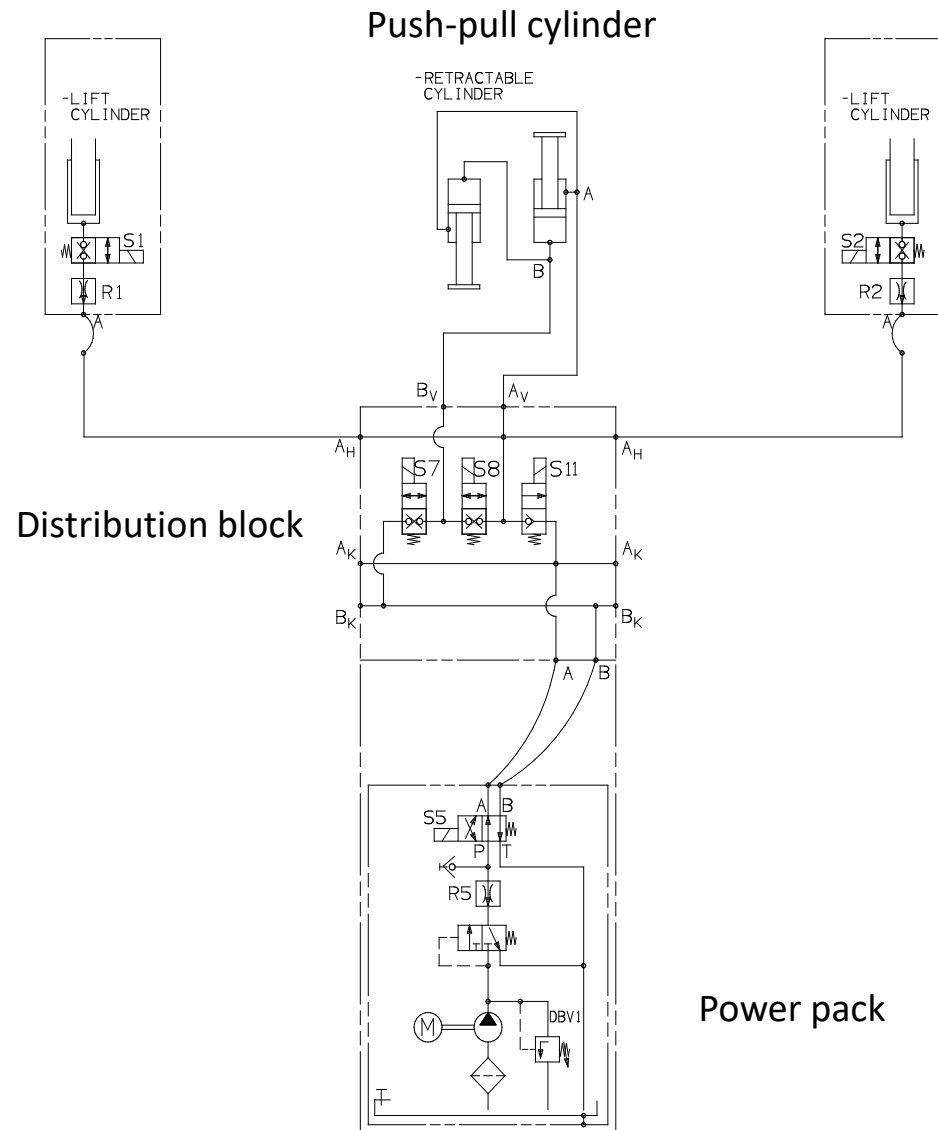


Double locking valve

# Hydraulics

Hydraulic components of the Underslider unit:

- Powerpack with pump & motor and shift valve S5
- Distribution block on back of main tube with lock valve and Slide valves S7 & S8
- Push-pull cylinder assembly centered in tray on main frame
- (2) lift cylinder installed onto lift arm assembly

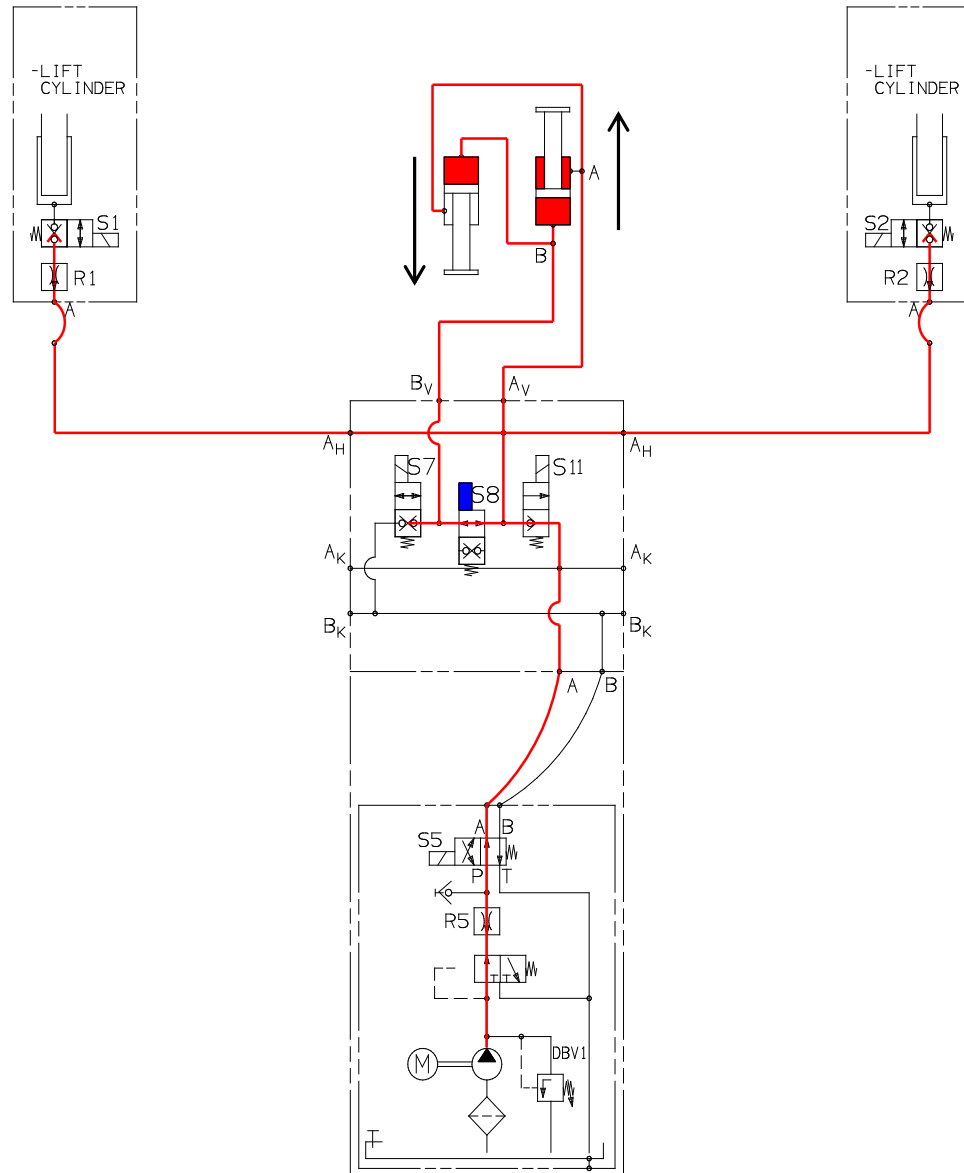




## Hydraulic action – sliding out

**Motor starts running and S8 valve is energized.**

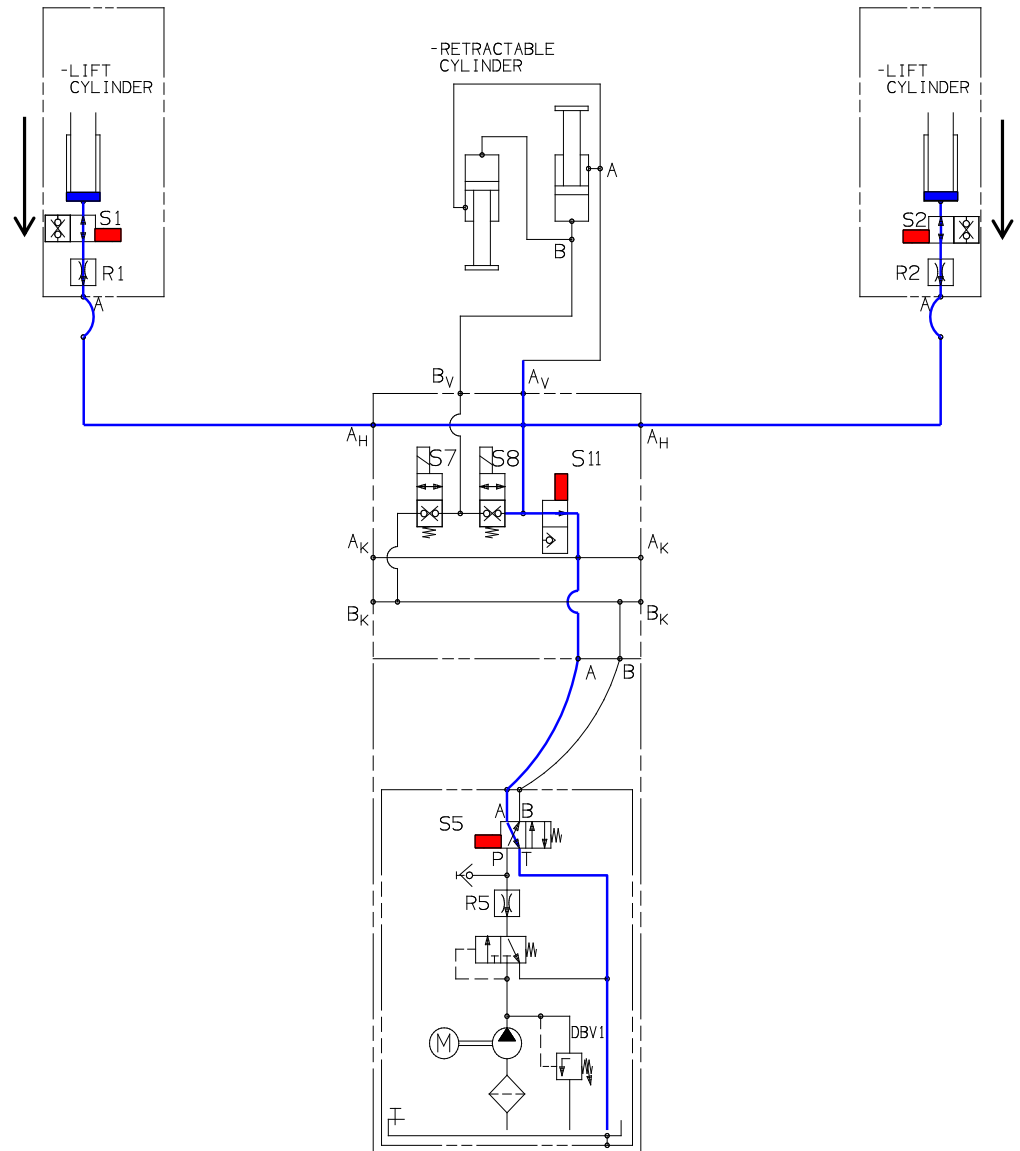
- Oil pressure on input “A” sets exits “Av” and Bv” at the valve block under pressure.
- The surface at the piston rod on input “B” is larger than on the shaft at input “A”
- This creates a stronger force at the piston rod (“B”) than at the shaft (“A”)
- This factor forces the cylinder to move out.
- The liftgate will slide out to the end of the rails.
- Hydraulic pressure on “A” port at lift cylinder has no effect due to lock valves not activated



## Hydraulic action – lowering

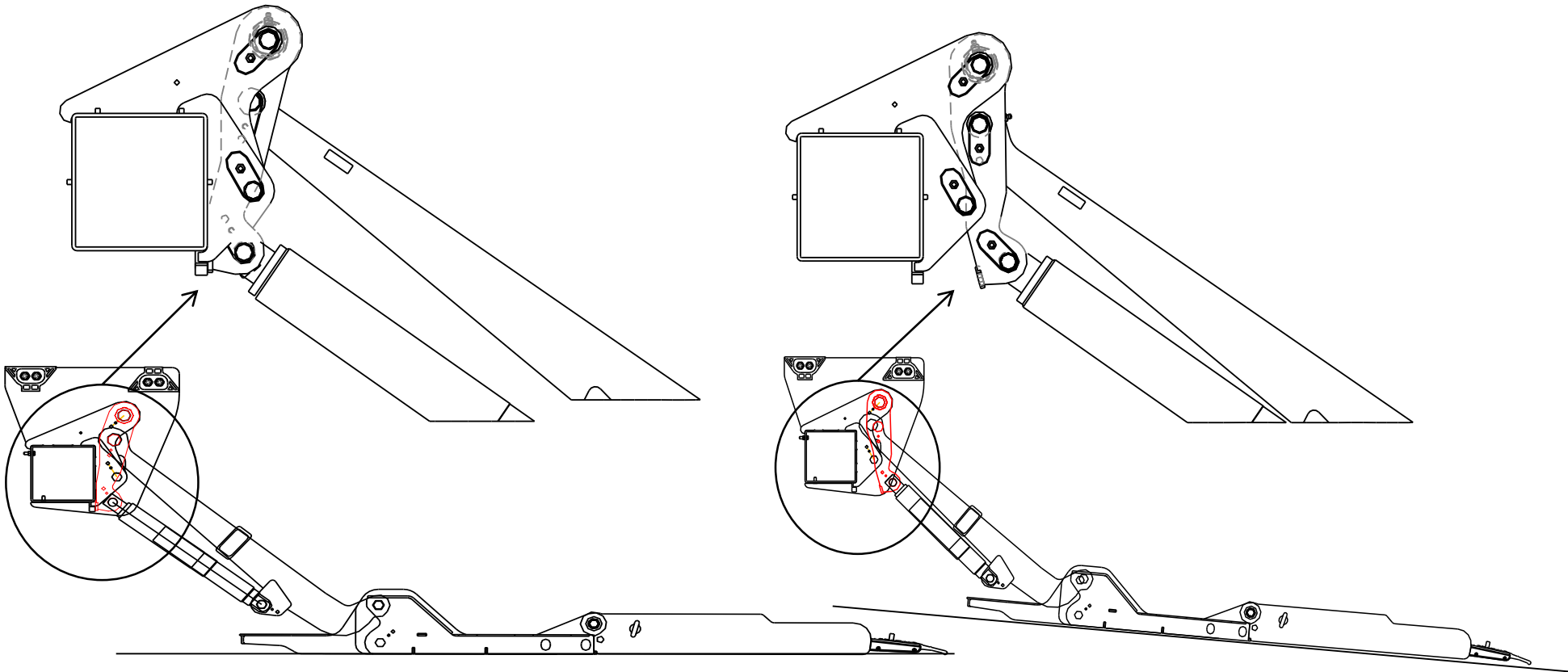
The shift valve S5 at the pump and the solenoid release valves S1 and S2 at the cylinders will get energized. In addition the leaking down stop valve S11 in the back of the mount frame is also energized.

- The gate is designed to lower down by gravity. It will push the hydraulic oil out of the lift cylinder into the reservoir.
- The oil passes the activated solenoid release valves S1 and S2.
- It also passes the energized S11 valve in the back of the mount frame and the shift valve S5 at the pump.



## Action – auto tilt down

The automatic tilt function is based on a mechanical swing fixture which is swinging away from the main tube to tilt the platform down. This allows the gate to always sit flat on the ground for an easy loading and unloading.

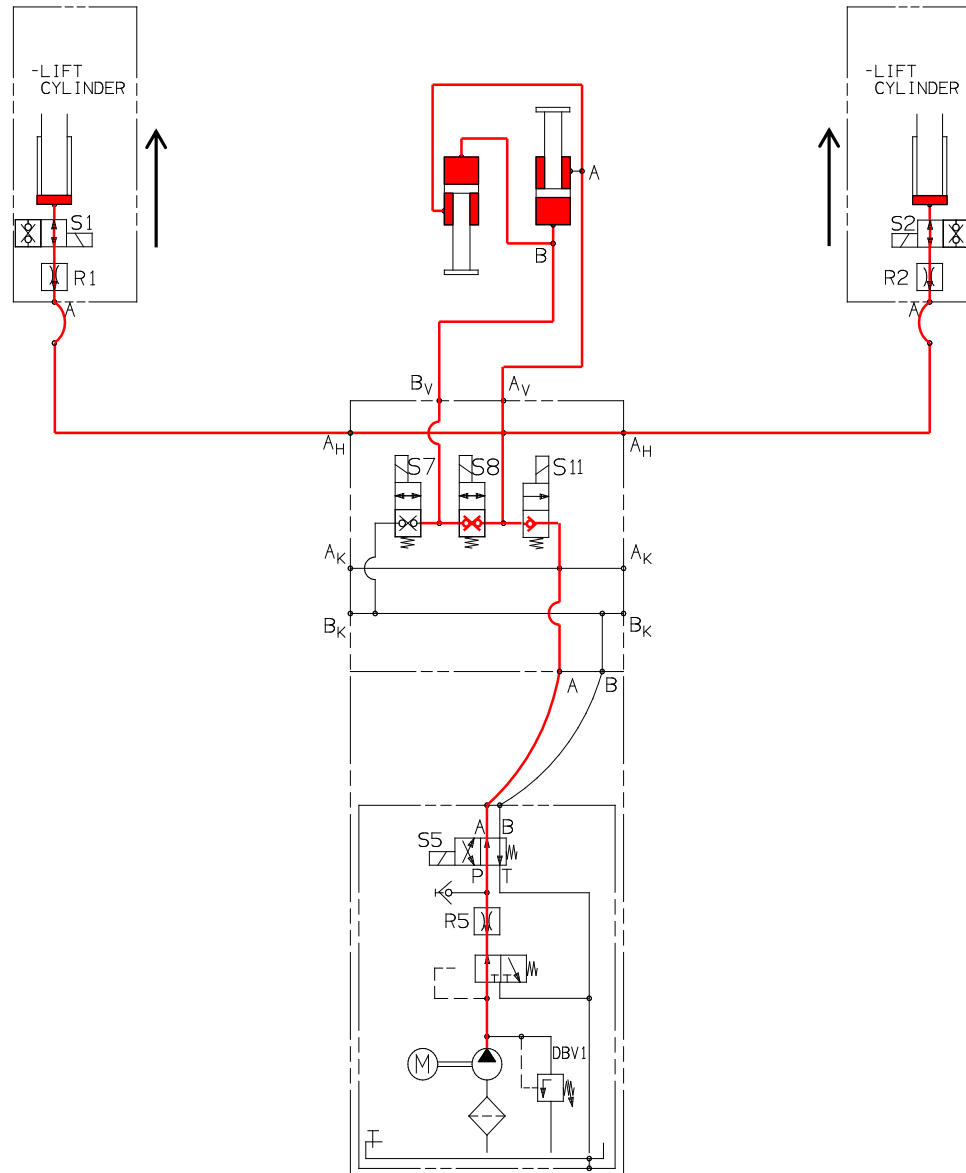


## Hydraulic action – lifting

**Motor starts running and double locking release valves S1 and S2 are energized.**

- The pressure is on input “A” at the valve block. The oil passes the S11 valve and sets pressure on exit “AH”.

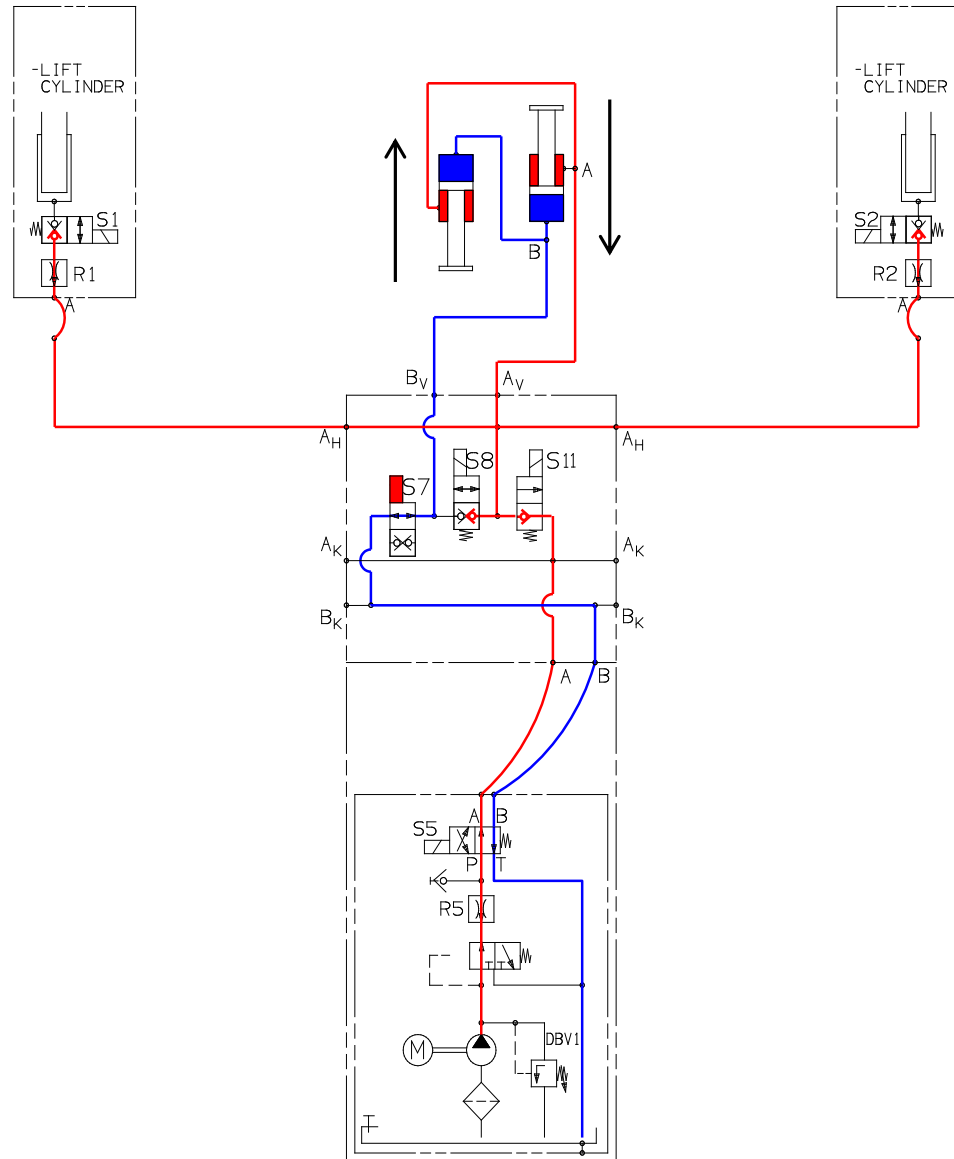
- The energized double locking release valves S1 and S2 allow the fluid to push the lift cylinder to extend. The platform raises up.



## Hydraulic action – sliding in

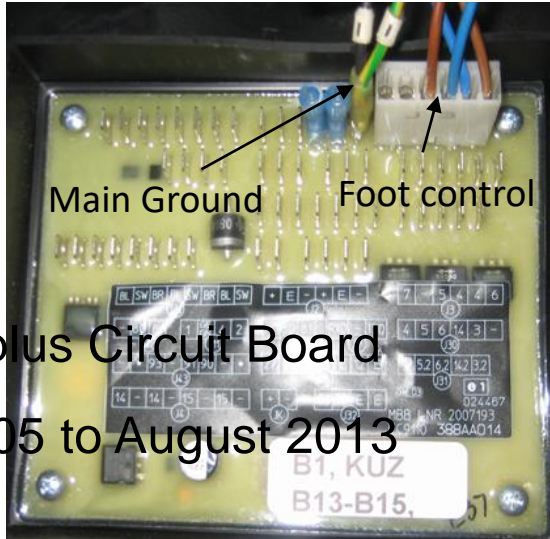
### Motor starts running and S7 valve is energized.

- Oil pressure on input “A” sets pressure on exits “Av” at the valve block.
- The Oil pressure on exit “Av” at the valve block sets pressure on input “A” at the cylinder
- The energized valve S7 is allowing the oil at the bottom of the piston rod to get back through the S5 into the reservoir.
- The pressure on the shaft will force the piston rod to retract.
- The lift gate will slide in under the body.
- The locked S1 and S2 valve avoid a movement of the lift cylinders

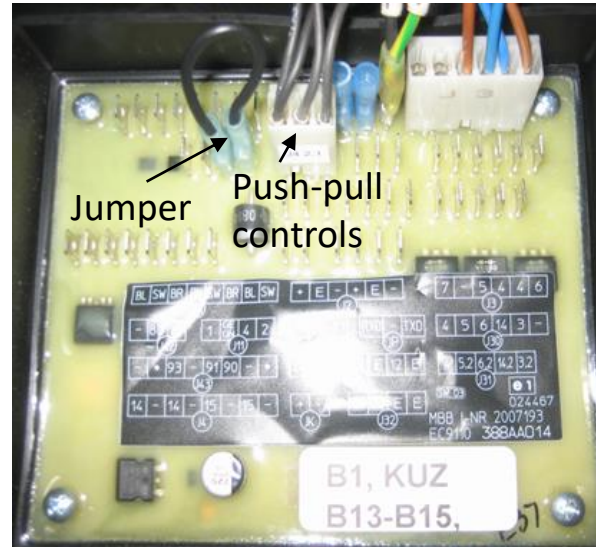


# K plus Circuit Board 2005 to August 2013 – board connectors by row

Row 1



Row 2

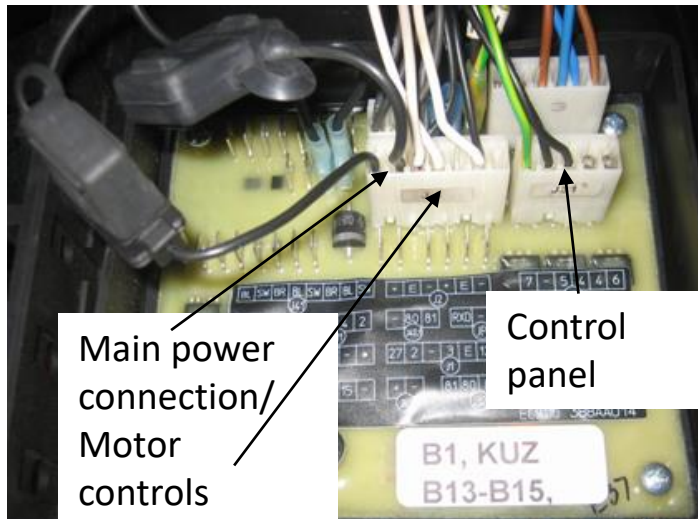


J-3 foot controls & w/lights

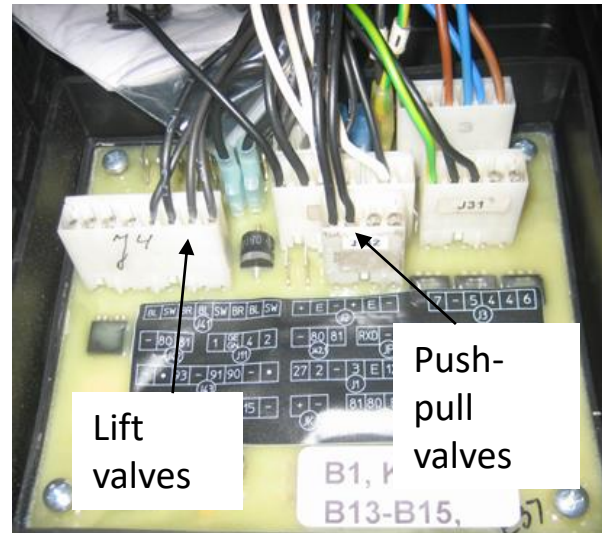
J-11 cab on/off switch

J-42.1 Push-Pull valves

K plus Circuit Board  
2005 to August 2013



Row 3



Row 4

J-1 main battery power  
motor solenoid &  
shift valve at block

J-30 main control cox

J-4 lift cylinder valves

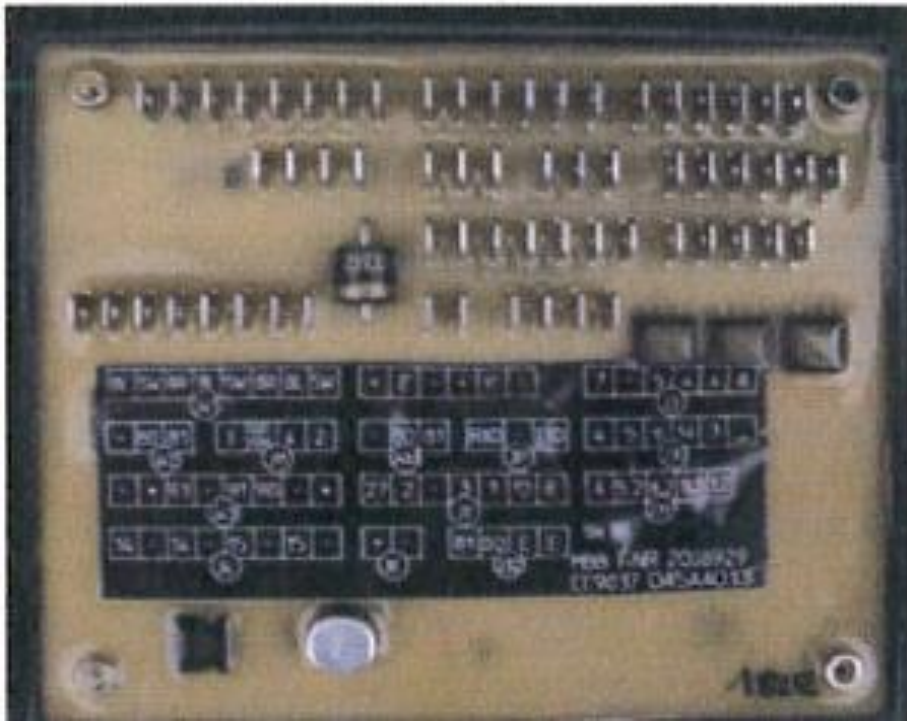
J-32 Push-Pull control signals

# ILFP Electrical Control

Overview of Circuit Board, Connectors and Electrical Schematic

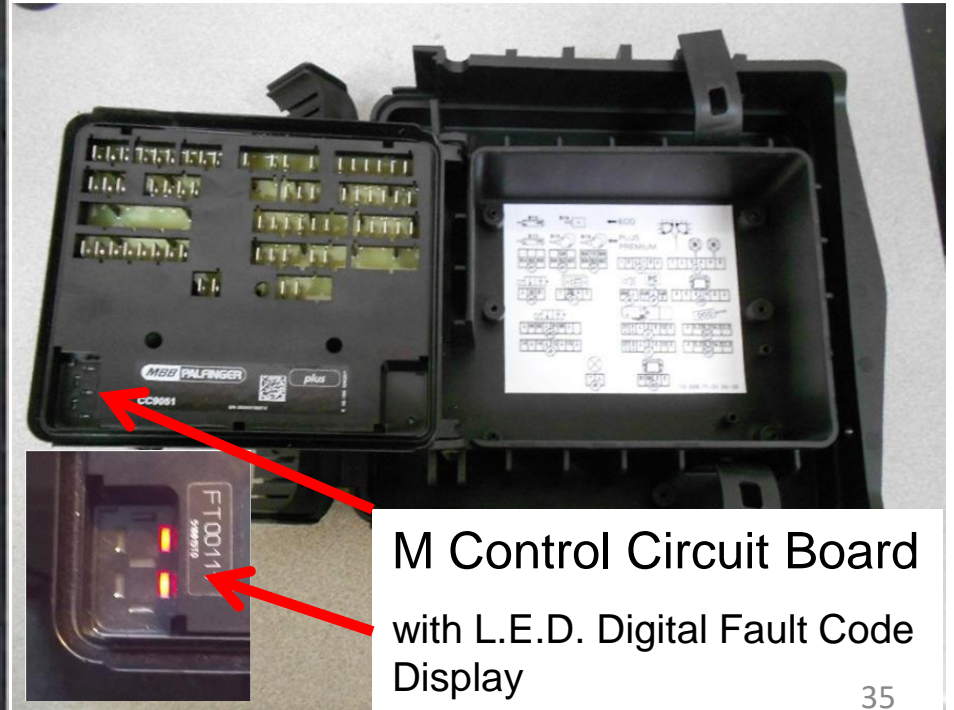
K plus Circuit Board

2005 to August 2013



M Control Circuit Board

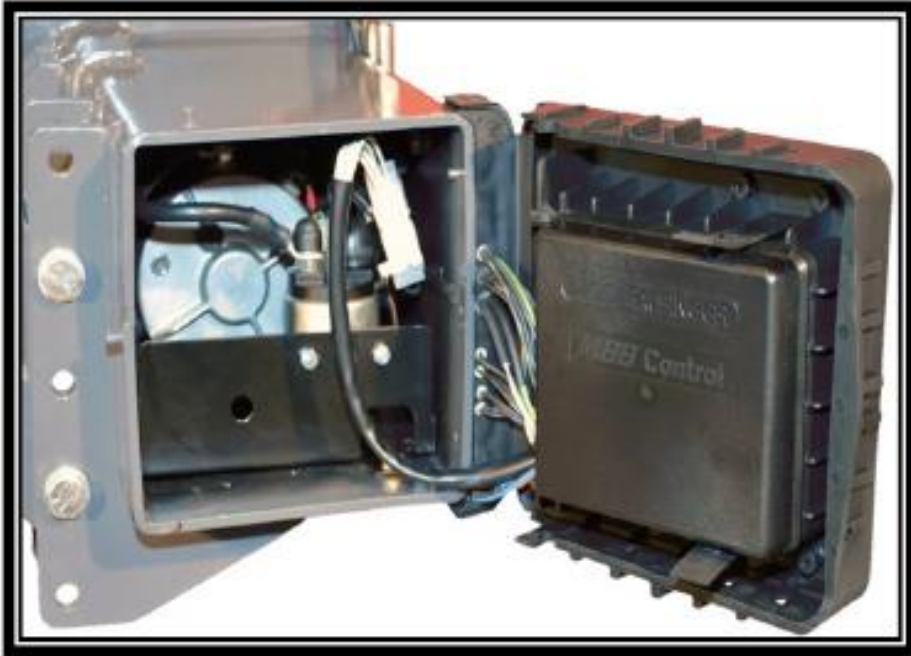
August 2013 and newer



M Control Circuit Board  
with L.E.D. Digital Fault Code  
Display



## New Style Circuit Board – M Control



Protective Cover

Slots sized for specific plugs

Prevent plugs from being plugged in wrong



LED flashes green when OK

LED flashes red when a fault exists

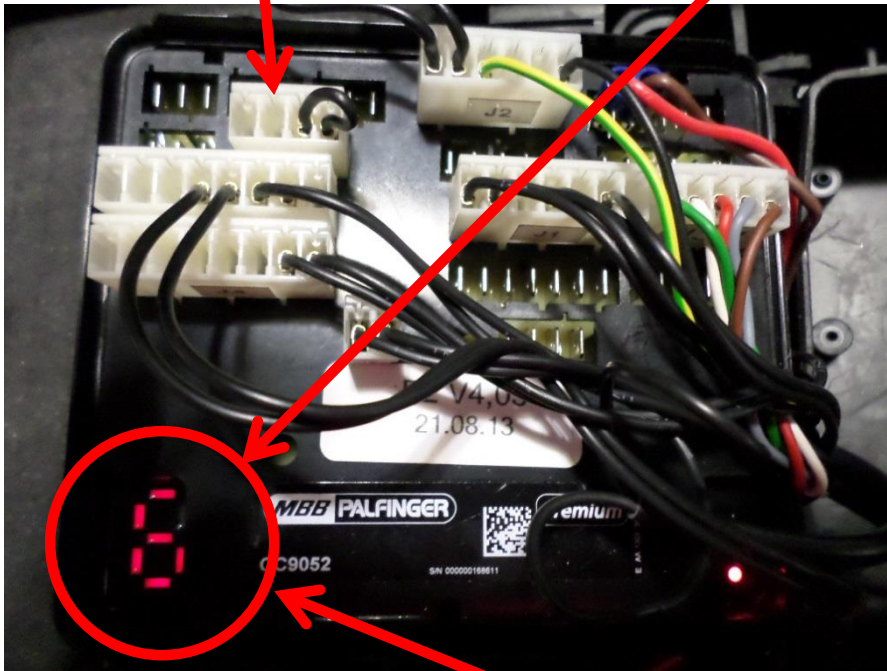
LED in lower left corner shows code for fault

## Circuit Board – M Control Fault Codes

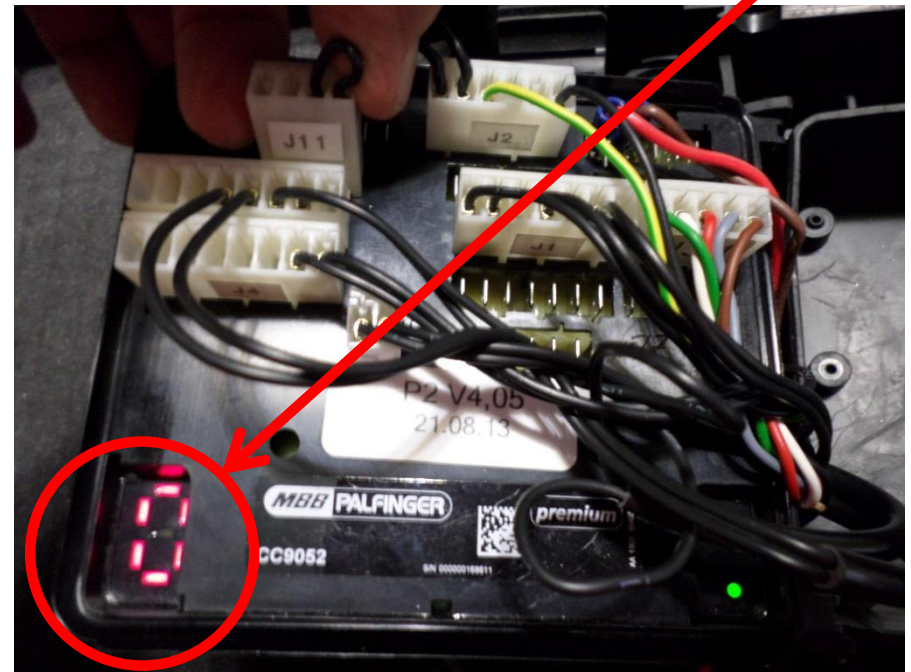
Code:	Description	Reason:	Solution 1:	Solution 2:	Solution 3:	Solution 4:
<b>0</b>	System OK / control system: <b>OFF</b>	System OK / control system: <b>OFF</b>	System OK / control system: <b>OFF</b>			
<b>1</b>	System OK / control system: <b>ON</b>	System OK / control system: <b>ON</b>	System OK / control system: <b>ON</b>			
<b>2</b>	Low voltage	Voltage J1 pin 2 too low	Check J-1 & J-2 power cable at PC board and Battery for tight connection, oxidation and damage	Check the battery condition / battery charged	Motor could have worn carbon brushes / motor could be bad	-
<b>5</b>	Showing defective / missing B-15	B-15 not on the ILFP & ILSL	Check Circuit Board for correct Program			
<b>6</b>	Short on platform warning lights	Power consumption J3 pin 7 to high	Check J-1 & J-2 power cable at PC board and Battery for tight connection, oxidation and damage	Check warning lights	-	-
<b>7</b>	Short control system	Power consumption J11 pin 1 to high	Check J-1 & J-2 power cable at PC board and Battery for tight connection, oxidation and damage			
<b>8</b>	General short	General power consumption to high	Check J-1 & J-2 power cable at PC board and Battery for tight connection, oxidation and damage	Unplug wires one by one	-	-
<b>9</b>	Defect in motor solenoid during lifting.	Power consumption J1 pin 3 too high	Check J-1 & J-2 power cable at PC board and Battery for tight connection, oxidation and damage	Check the battery condition / battery charged	Possible short in diode jumper wire on Motor Solenoid : Remove Jumper	Possible short in Thermo switch inside motor : Bypass and test , replace Thermo switch
<b>A</b>	Fuse 15A damaged on power pack (J1 Pin2).	Defective fuse J1 pin 2	Check fuses at power pack	-	-	-
<b>P</b>	Error diagnostic mode active.	Attached service plug	-	-	-	-
<b>TO CLEAR CODE :</b>						
<b>UNPLUG J-11 AND PLUG BACK IN</b>						- 37

## Clear Fault Code on MBB Control Circuit Board

Remove J-11 Plug from Circuit Board for 10 seconds to clear fault code.



Plug in J-11 on Circuit Board. Digital display should read 0 or 1.



***If fault code is still displayed after plugging in the J-11 plug, a fault still exists in the system. Continue corrective action to determine fault.***

# Power Cable to Solenoid Coil Test

Check for broken power wire in solenoid cable:

- Unplug connector at valve.
- Set multimeter to read DC voltage.
- Put positive lead of multimeter in plug.
- Put negative lead of multimeter in other hole of plug.
- Activate down function on gate.
- Preferred reading should be 10V or higher.



Check for broken wire in solenoid cable:

- Set multimeter to OHM function.
- Place a test lead of the multimeter at each end of the wire.
- If there is resistance in the wire, then the continuity test is positive and will show a value on the multimeter.
- If the amount of resistance shows zero (0), then the wire is broken.

# Solenoid Coil Test

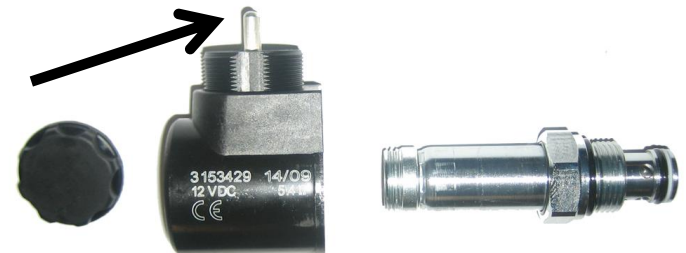
If one or both release valves on lift cylinders are not opening up, low voltage may be the cause. A *minimum* of **9V** is necessary to properly energize each of the solenoid coils.

If the minimum voltage is present at both coils, the coil may not be generating the magnetism needed to open the solenoid valve.

## How to check coils for resistance

Multimeter set OHM function.  
Place test leads on coil nodes.

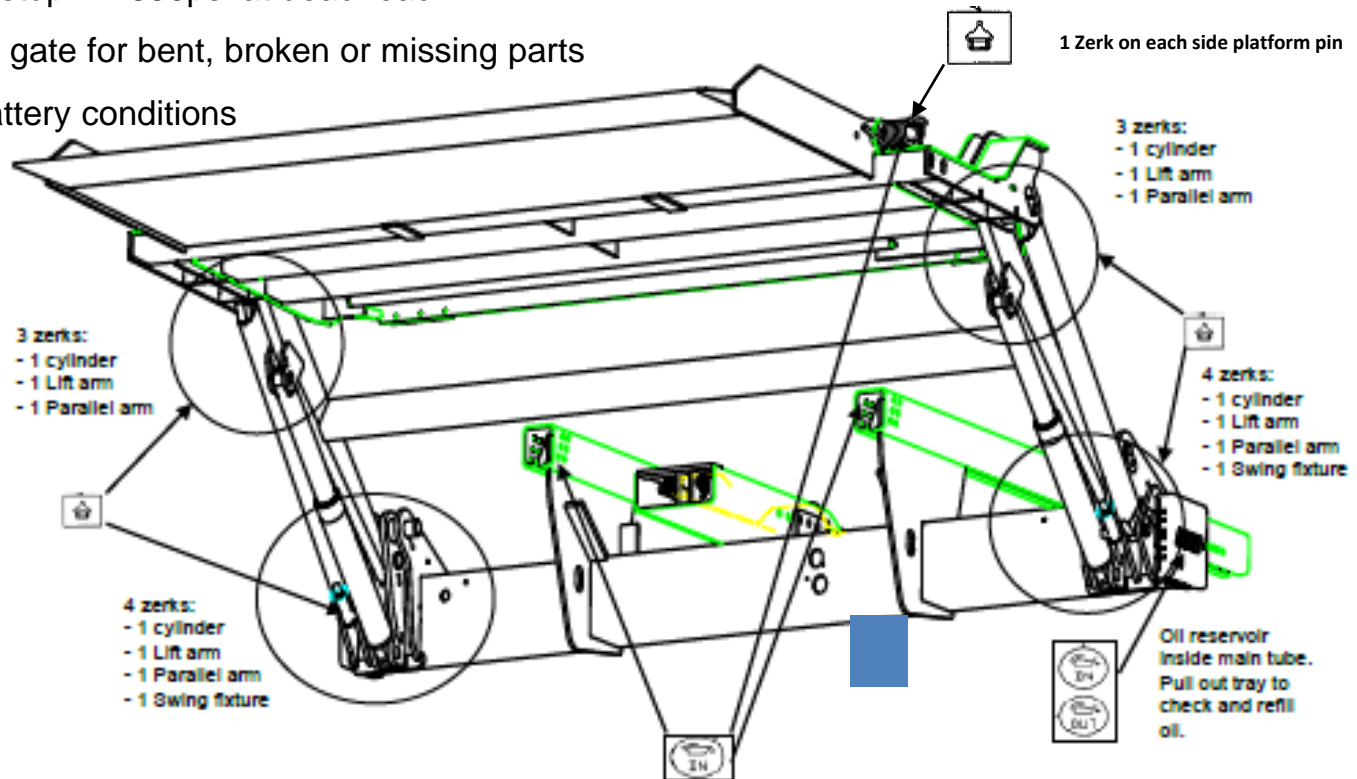
- Reading shows 5.5 to 7.0  $\Omega$  → Coil is good
- Reading shows 0  $\Omega$  → Coil is shorted out
- Reading shows Overload → Coil is destroyed by burn or physical damage





## Preventive maintenance

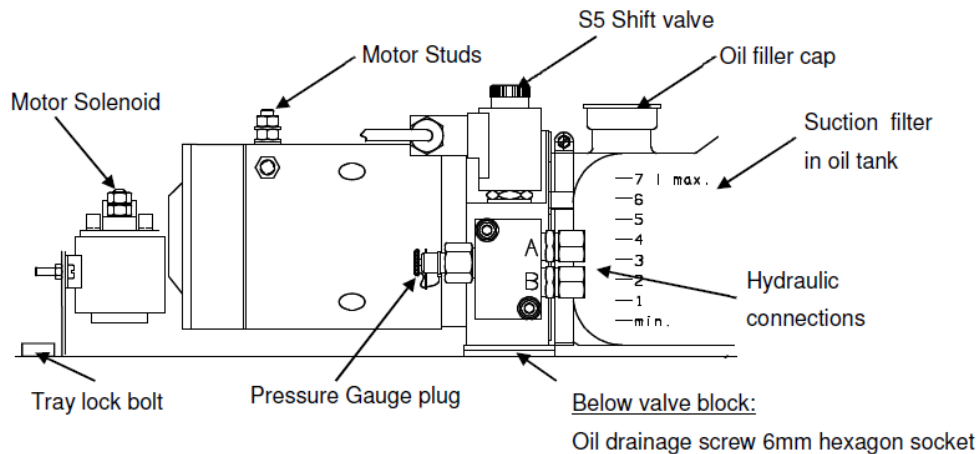
- Lubrication: 16 grease points (8 grease points each side; 4 at mount frame, 4 at platform)
- Hydraulic oil: filler cap on top of reservoir, outlet at bottom of tray underneath alum block
- Hydraulic System: Check for hydraulic leaks at hose fittings and cylinders shafts
- Power Supply: Check battery power supply (above 10V) at J11 #4 and JK(-) at deadhead\*
- Pins: Tighten up all lock bolts at every pin
- Pump pressure: Correct setup →2850psi at deadhead\*
- Visual check: Check lift gate for bent, broken or missing parts
- Battery: Check battery conditions



\*deadhead: with gate all the way out, stay on button for 10 seconds for system bypass and read voltage

## Checking and Changing the Oil

Check the quality of hydraulic fluid. Take the following steps to change the oil. In stored position, lower gate to ground (for Easy move model keep gate in stored position) and remove lock bolt. Pull the power pack out until you can reach the oil filler cap. Unscrew the oil drainage bolt (bottom of tray) and let the fluid drain out of the reservoir into an approved container. If the reservoir is empty fill it up with hydraulic oil, as shown on table 2.



## Recommended Hydraulic Fluids

<u>TEMP. RANGE</u>	<u>BRAND</u>	
-10 TO 150 F	EXXON MOBIL OIL CHEVRON ROSEMEAD	UNIVIS J26 DTE 13M AW MV32 MV 150 (32)
-50 TO 150 F	MOBIL SHELL	DTE 13M AERO FLUID 4
<b>EXTREME COLD TEMPERATURE:</b>	<b>USE MILITARY SPEC:</b>	<b>MIL H5606</b>

*Table 2: Recommended Hydraulic Fluids*

## Maintenance and Care

The following inspection and maintenance should be performed at the recommended intervals depending on operation and amount of cycles or at the time when the unit shows any signs of damage or abuse. Remember that the secret to a long life of your PALFINGER Liftgates is to maintain it through preventive care.

Recommended bases for Inspection and maintenance	Depending on use	Dally	Monthly	Quarterly
cleaning	x			
general lubrication of pins and bushings				x
general lubrication of Slider Rails with WD-40 and Push-Pull Cylinder zerks with grease				x
oil level inspection				x
oil change	x			
check hydraulic hoses and pipes for leaks				x
check controls and connections				x
check pins and pin retaining bolts			x	
check batteries and connections				x
check warning labels and other safety equipment for effectiveness and visibility		x		
visual check for loose or missing parts and unusual noise during operation		x		
check lock bolts and pins for tightness				x
check complete function of gate		x		
check mounting brackets of lift gate to frame for cracks or damage visually		x		



## MAINTENANCE CHECKLIST

1. Operate the liftgate through entire cycle of operation. Check for noise and damage, such as bent parts or cracked welds.
2. Inspect all welds and fasteners that attach the mount frame to the truck. Inspect pins and bolts that connect the lift arm to the mount frame and to the platform.
3. Visually inspect the hydraulic lines for damage, scratches, bending or leakage.
4. Inspect the cylinders for leakage and that the cylinder pins are secured with lock bolts.
5. Check the oil level when the platform is down at ground level. The level should fall between the markings 5 and 7 on the tank. We recommend replacing oil after the first 1200 cycles, after that on a yearly basis in the fall before winter begins.
6. Check for oil leakage around the power pack and inside mount tube. Tighten or replace components if needed. If you perform work on any hydraulic components bleed the air out of the system by operating all functions several times.
7. Check all electrical connections. Clean and protect battery terminals and check for tightness.
8. Inspect all the terminals on the solenoid-operated valves at the port of the cylinder. Lubricate the terminals for better protection from oxidation if needed. Additionally, check the valve block on the back of the main tube and its connections.
9. Grease all zerks on the lift gate and make sure they take grease. Sometimes it helps to operate the lift gate while you do this. There are 16 zerks.
10. Test all the lift gate functions, if possible with maximum loads placed according to load diagrams.
11. Check the function of the pressure relief valve.
12. When performing daily checks, if you find any kind of damage that can make the use of the liftgate dangerous, it must be repaired before using. All repairs should be made by an authorized technician. Use only original spare parts. If in doubt contact your PALFINGER Liftgates distributor or call PALFINGER Liftgates directly.

**Report immediately all accidents or damage; it can be dangerous for you and your co-workers!**

## Troubleshooting By Function

1. Before starting any Troubleshooting always confirm battery voltage is above 12.5 Volts.
2. All batteries have been load tested and connection are clean and connected correctly.
3. Next quick check is perform 10 -10 test refer to page 4 in this manual.
4. Jump posts on motor solenoid motor runs.
  - 4.a. Liftgate doesn't move, all Hydraulic valves and components are working correctly.  
If Liftgate moves that will point you toward the problem.
5. Check all electrical components, Circuit breakers, Battery connections and Fuses.

### 1. Liftgate Not Lowering

#### 1.1 Check Battery Power

- a) Check resettable Circuit Breaker on top of batteries → Push Reset Tab back, if popped out.
- b) Check condition of ground cable on driver side attached to gate frame and trailer/truck body.
- c) Check fuse on top of batteries (qty 1)  
at pump & motor inside the main tube on passenger side at circuit board (qty 2) behind rubber cover
- d) Check power on board between J-11 #4 and "Masse" with voltmeter by turning the lift up knob and hold for 10 sec with gate in stored position (DEADHEAD GATE)  
(above 10 Volt is necessary for proper use of lift gate) → less than 10V; → See e)
- e) Test for charged batteries and a solid working truck/trailer charging system
- f) Check Ground connection from front of trailer/truck to batteries and lift gate. Check for tight connections

## Troubleshooting By Function

### 1.2 Liftgate is not lowering but lifting and sliding

- a) If liftgate has not been used and stored under the trailer and all other functions except for lowering are working the pins and bearings might be frozen. While activating the switches and lowering the gate, pry down the platform or place a load not to exceed the capacity of the gate on the platform.  
→If the gate is now lowering, your pins are frozen and needs cleaning and lubrication

### 1.3 Check for Short in optional equipment

- a) Unplug J-3 (Lights and f/c),  
Keep the connectors unplugged (gate also operates without plugs connected)
- b) Unplug J-1 (Main power), wait 10 seconds and plug J-1 back to the board (Resetting the board)
- c) Plug each connector back one at a time and check functions of gate after plugging in each

### 1.3 Check for Short in optional equipment

- a) Unplug J-3 (Lights and f/c),  
Keep the connectors unplugged (gate also operates without plugs connected)
- b) Unplug J-1 (Main power), wait 10 seconds and plug J-1 back to the board (Resetting the board)
- c) Plug each connector back one at a time and check functions of gate after plugging in each

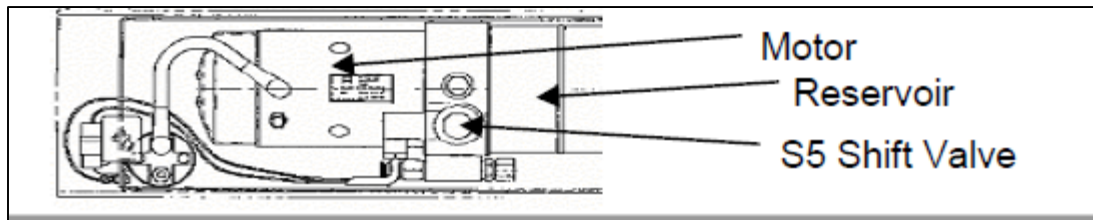
## Troubleshooting By Function

### 1.4 Check voltage supply to release valves on lift cylinders

- a) Check voltage between Ground JK #(-) and J4 #15 (release valves S1 & S2 at lift cylinders) and J1 #12 (Lock valve S11 and shift valve S5) while turning the lowering knob  
No voltage → check for bad knob or loose wire at control panel
- b) Listen for clicking of the release valves at the lift cylinders (inner cylinders)  
→ If valves are not clicking → check wire for damaged spots or loose connections

### 1.5 Gate is lowering down very slowly, S5 at pump not engaged

- a) Check Voltage at J1 #12 and Ground JK #(-) while turning knob to engage the shift valve at the pump and motor inside the main tube
- b) Override the shift valve by pushing down the center brass pin with small Phillips screwdriver while turning the down knob  
→ Gate will lower down → check the valve and look for damaged wire or loose connections



## Troubleshooting By Function

### 2. Liftgate dose not slide out

#### 2.1 Check Battery Power

- a) Check resettable Circuit Breaker on top of batteries → Push Reset Tab back in, if popped out
- b) Check condition of ground cable on driver side attached to gate frame and trailer/truck body.**
- c) Check fuse on top of batteries (qty 1),  
at pump & motor inside the main tube on passenger side at circuit board (qty 2) behind rubber cover
- d) Test for charged batteries and a solid working truck/trailer charging system
- e) Check power on board between J-11 #4 and JK #(-) with voltmeter
- f) Check Ground connection from front of trailer/truck to batteries and lift gate. Check for tight connections

#### 2.2 Check for Short in optional equipment

- a) Unplug J-3 (Lights and f/c)  
Keep the connectors unplugged (gate will operate without plugs connected)
- b) Unplug J-1 (Main power), wait 10 seconds and plug J-1 back to the board (Resetting the board)
- c) Plug each connector back, one at a time and check functions of gate after plugging in each



## Troubleshooting By Function

### 2.3 Check voltage supply to release valve for push-pull cylinder

- a) Check voltage at J-32 #81 and J-42 #81 to Ground JK #(-) while turning the slide out knob for opening up the lock valve S8 for the P-P cylinder. No Voltage → check for bad knob or loose wire in control box
- b) Listen for clicking of the release valve for the P-P cylinders (at valve block on mount frame)
  - If valve is not clicking → check wire for damaged spots, loose connections or a bad valve

### 2.4 Check motor solenoid power

- a) Check voltage at J-1 #3 and Ground JK #(-) while turning knob to engage motor solenoid
  - No voltage → board might be damaged
- b) Check voltage at small motor solenoid studs and Ground JK #(-) while turning knob and listen for clicking of the motor solenoid – no voltage or clicking → check wire to motor solenoid
- c) Check for voltage across the small motor solenoid studs with test light while turning knob
  - See a light → power is reaching solenoid.
- d) Check for main power at the big solenoid studs, one has voltage; if not check connections to battery or popped tab at circuit breaker
- e) Check both big solenoid studs for voltage while turning the slide out knob → if not → solenoid is bad
- f) Jump large terminals at motor solenoid
  - If motor runs → motor solenoid is bad
  - If motor does not run → Bad motor or bad ground (check for loose hanging cable on driver side)
  - Tap on motor → motor starts running – bad brushes

## Troubleshooting By Function

### 3. Liftgate is not lifting up

#### 3.1 Check Battery Power

- a) Check resettable Circuit Breaker on top of batteries → Push Reset Tab back in, if popped out
- b) Check condition of ground cable on driver side attached to gate frame and trailer/truck body.**
- c) Check fuse on top of batteries (qty 1),  
at pump & motor inside the main tube on passenger side at circuit board (qty 2) behind rubber cover
- d) Test for charged batteries and a solid working truck/trailer charging system
- e) Check power on board between J-11 #4 and JK #(-) with voltmeter
- f) Check Ground connection from front of trailer/truck to batteries and lift gate. Check for tight connections

#### 3.2 Check function of control box

- a) Check voltage at J30 #4 to Ground JK #(-) for power supply of the control box
- b) Check voltage at J30 #5(lift) to Ground JK #(-) for lifting signal  
→ Signal on J30 #5 → control box is ok; if no signal check for damaged wire or loose connectors inside control box or damaged turn knob

#### 3.3 Check for short in optional equipment

- a) Unplug J-3(Lights and foot control),  
(gate also operates without plugs connected)
- b) Unplug J-1 (Main power), wait 10 seconds and plug J-1 back to the board (Resetting the board)
- c) Plug each connector back one at a time and check functions of gate after plugging in each.

## Troubleshooting By Function

### 3.4 Check motor solenoid power to run the motor

- a) Check for voltage at J-1 #3 to Ground JK #(-) to engage motor solenoid while turning lift knob
- b) Check for voltage at one of the small motor solenoid studs to Ground JK #(-) while turning knob and listen for clicking of the motor solenoid – no voltage or clicking → check wire to motor solenoid
- c) Check voltage across the small motor solenoid terminals (#3 and -) with test light while turning knob  
See a light → power is reaching solenoid
- d) Check for main power at the large solenoid studs one has voltage; if not check connections to battery
- d) Check both big solenoid studs for voltage while turning the up knob → if not → solenoid is bad
- e) Jump large terminals at motor solenoid
  - If motor runs → motor solenoid is bad
  - If motor does not run → Bad motor or bad ground (check for loose wire, hanging on driver side)
  - Tap on motor → motor starts running – bad brushes

### 3.5 Check voltage supply to release valves on lift cylinder

- a) Check voltage between Ground JK #(-) and J4 #15 (release valves S1 & S2 at lift cylinders) while turning the lifting knob  
No voltage → check for bad knob or loose wire at control panel
- b) Listen for clicking of the release valves at the lift cylinder (inner cylinders)  
→ If valves are not clicking → check wire for damaged spots or loose connections
- c) Jump J-11 #2 to J4 #15 for about 8-10 min – if coils on lift cylinders are cold, look for broken wire



## Troubleshooting By Function

### 4. GATE IS NOT SLIDE IN

#### 4.1 Check Battery Power

- a) Check resettable Circuit Breaker on top of batteries → Push Reset Tab back in, if popped out
- b) Check condition of ground cable on driver side attached to gate frame and trailer/truck body.**
- c) Check fuse on top of batteries (qty 1),  
at pump & motor inside the main tube on passenger side at circuit board (qty 2) behind rubber cover
- d) Test for charged batteries and a solid working truck/trailer charging system
- e) Check power on board between J-11 #4 and JK #(-) with voltmeter
- f) Check Ground connection from front of trailer/truck to batteries and lift gate. Check for tight connections

#### 4.2 Check for short in optional equipment

- a) Unplug J-3(Lights and foot control),  
(gate also operates without plugs connected)
- b) Unplug J-1 (Main power), wait 10 seconds and plug J-1 back to the board (Resetting the board)
- c) Plug each connector back one at a time and check functions of gate after plugging in each.

#### 4.3 Check function of control box

- a) Check voltage at J-32 #80 and J-42 #80 Ground JK #(-) while turning the slide in knob for opening up the lock valve S7 for the P-P cylinder. No Voltage → check for bad knob or loose wire in control box
- b) Listen for clicking of the lock valve for the P-P cylinders (at valve block on mount frame)  
- If valve is not clicking → check wire for damaged spots, loose connections or a bad valve

## Troubleshooting By Function

### 4.4 Check motor solenoid power to run the motor

- a) Check for voltage at J-1 #3 to Ground JK #(-) to engage motor solenoid while turning lift knob
- b) Check for voltage at one of the small motor solenoid studs to Ground JK #(-) while turning knob and listen for clicking of the motor solenoid – no voltage or clicking → check wire to motor solenoid
- c) Check voltage across the small motor solenoid terminals (#3 and -) with test light while turning knob  
See a light → power is reaching solenoid
- d) Check for main power at the large solenoid studs one has voltage; if not check connections to battery
- d) Check both big solenoid studs for voltage while turning the up knob → if not → solenoid is bad
- e) Jump large terminals at motor solenoid
  - If motor runs → motor solenoid is bad
  - If motor does not run → Bad motor or bad ground (check for loose wire, hanging on driver side)
  - Tap on motor → motor starts running – bad brushes

**PALFINGER**

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