

# K – Series (1997 - 2005)

## Troubleshooting: ILK with rectangle circuit board

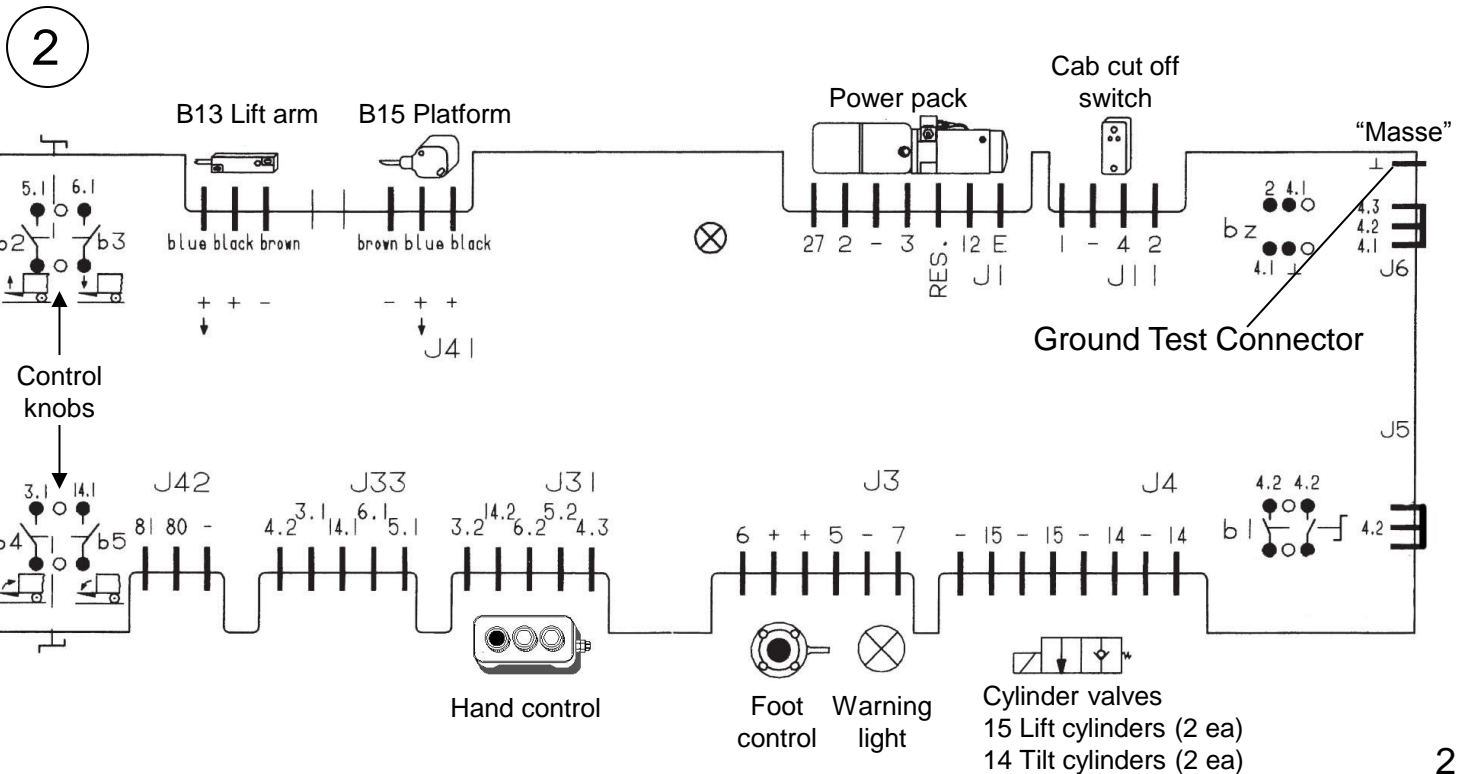
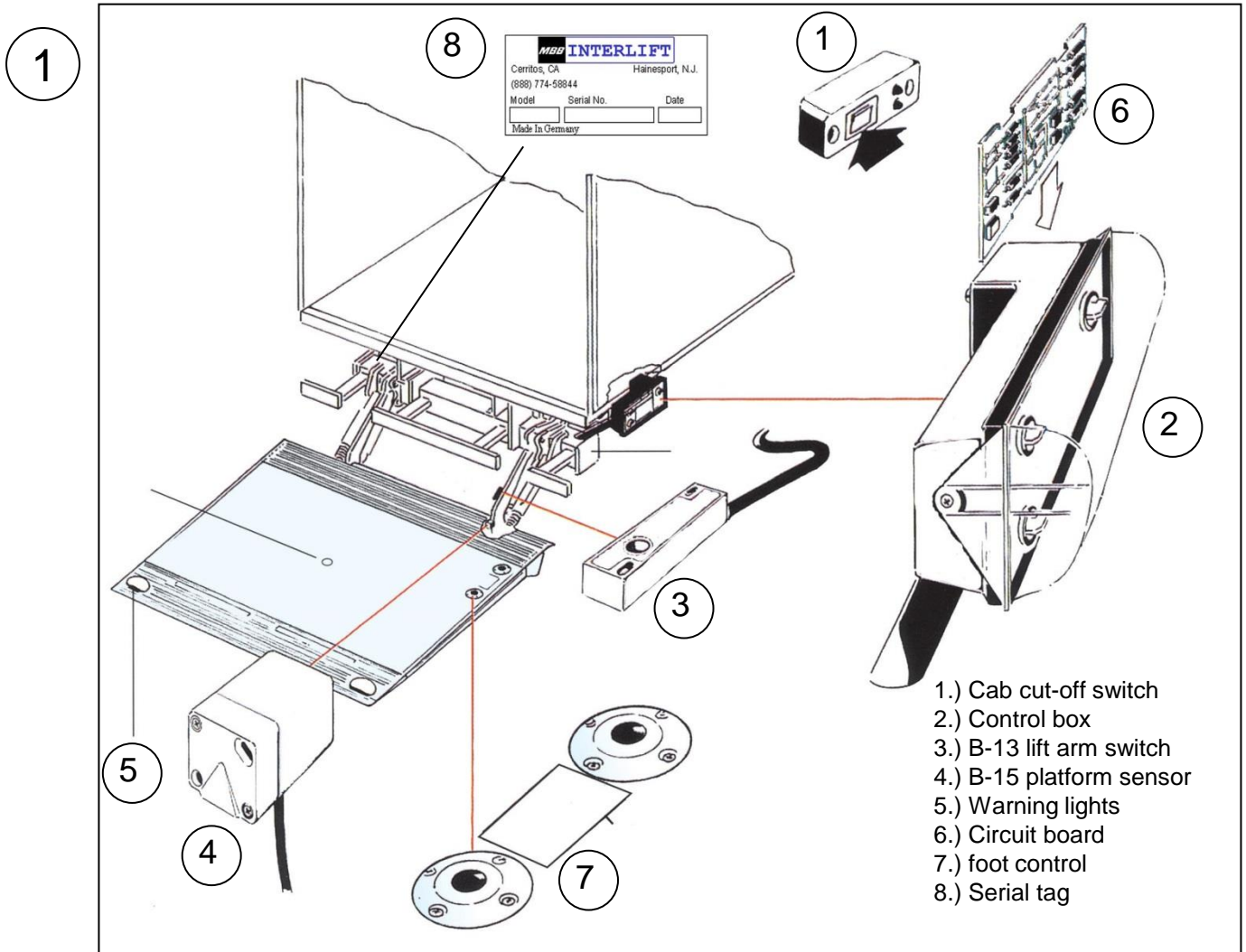
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Tools needed:

- 1.) Voltmeter
- 2.) Test light
- 3.) 8" jumper cable (16ga. or smaller)
- 4.) Screw driver flat head or 13mm (1/2") wrench

**\*\*\*\*\*MAKE SURE YOUR BATTERIES ARE FULLY CHARGED AND IN GOOD CONDITIONS\*\*\*\*\***

# Overview of liftgate and schematic of circuit board



# 1) GATE DOES NOT TILT OPEN UP



## 1.1) Check Battery Power

- Check resettable Circuit Breaker on top of batteries → Push Reset Tab back in, if popped out
  - Check fuse on top of batteries (qty 1),  
at pump & motor (qty 2) inside the main tube on passenger side and/or at circuit board (qty 2)
  - Start truck and run engine in fast idle for charging the battery  
→ if liftgate starts working, recharge batteries → test batteries and truck charging system
  - Check power on board between J-11 #4 and Ground "Masse" with voltmeter by turning the up-function knob and hold for 10 sec with gate in stored position (DEADHEAD GATE)  
(above 10 Volt is necessary for proper use of liftgate) → less than 10 V; Jump #2 to #4 on J-11 → voltage jumps more than 1 volt, call Palfinger for assistance
- \*\*\*\*DO NOT LEAVE JUMPER ON J-11 – GATE MUST BE SHUT OFF WHEN NOT IN USE\*\*\*\***

## 1.2) Check for short in optional equipment

- Unplug J-3(warning light and foot control), J-41(B-13 and B-15 Sensors) and J-31(Hand control)  
Keep the 3 connectors unplugged (gate will operate without plugs connected)
- Unplug J-1 (Main power), wait 10 seconds and plug J-1 back to the board (Reset the board)
- Plug each connector back, one at a time and check functions of gate after plugging in each

## 1.3) Check voltage supply to release valves on tilt cylinder

- Check voltage at J4 #14 and Ground "Masse" while turning the tilt knob for opening up the release valves at the tilt cylinders. No Voltage → check for bad turning knob or loose wire in control box
- Listen for clicking of the release valves at the tilt cylinders (outer cylinders)  
- If valves are not clicking → check wire for damaged spots, loose connections or a bad valve

## 1.4) Check motor solenoid power

- Check voltage at J-1 #3 and Ground "Masse" to engage motor solenoid while turning knob  
No voltage → board might be damaged
- Check voltage at small motor solenoid studs and Ground "Masse" while turning knob and listen for clicking of the motor solenoid – no voltage or clicking → check wire to motor solenoid
- Check for voltage across the small motor solenoid studs (#3 and -) with test light while turning knob  
See a light → power is reaching solenoid.
- Check for main power at the big solenoid studs, one has voltage; if not check connections to battery
- Check both big solenoid studs for voltage while turning the opening knob → if not → solenoid is bad
- Jump large terminals at motor solenoid
  - If motor runs → motor solenoid is bad
  - If motor does not run → Bad motor or bad ground
  - Tap on motor → motor starts running – bad brushes

## 2) GATE IS NOT LOWERING DOWN



### 2.1) Check Battery Power

- Check resettable Circuit Breaker on top of batteries → Push Reset Tab back, if popped out.
- Check fuse on top of batteries (qty 1)  
at pump & motor (qty 2) inside the main tube on passenger side and/or at circuit board (qty 2)
- Start truck and run engine in fast idle for charging the battery  
→ if liftgate starts working, recharge batteries → test batteries and truck charging system
- Check power on board between J-11 #4 and Ground "Masse" with voltmeter by turning the up-function knob and hold for 10 sec with gate in stored position (DEADHEAD GATE)  
(above 10 Volt is necessary for proper use of liftgate) → less than 10V; Jump #2 to #4 on J-11 → voltage jumps more than 1 volt, call Palfinger for assistance

**\*\*\*\*DO NOT LEAVE JUMPER ON J-11 – GATE MUST BE SHUT OFF WHEN NOT IN USE\*\*\*\***

### 2.2) Check for short in optional equipment

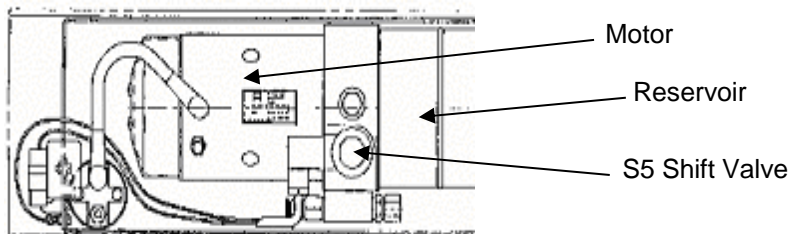
- Unplug J-3(warning light and foot control), J-41(B-13 and B-15 Sensors) and J-31(Hand control)  
Keep the 3 connectors unplugged (gate also operates without plugs connected)
- Unplug J-1 (Main power), wait 10 seconds and plug J-1 back to the board (Reset the board)
- Plug each connector back one at a time and check functions of gate after plugging in each

### 2.3) Check voltage supply to release valves on lift cylinder

- Check voltage between Ground "Masse" to J4 #15 while turning the lowering knob for opening the release valves at the lift cylinders. No voltage → check for bad knob or loose wire at control panel
- 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

### 2.4) Gate is lowering down very slowly → S5 at motor not engaged

- Check Voltage at Ground "Masse" and J1 #12 while turning down knob to engage the shift valve at the pump and motor inside the main tube
- 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



### 3) GATE IS NOT AUTO TILTING AT GROUND LEVEL



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#### 3.1) Check Battery Power

- a) Check resettable Circuit Breaker on top of batteries → Push Reset Tab back in, if popped out
- b) Check fuse on top of batteries (qty 1)  
at pump & motor (qty 2) inside the main tube on passenger side and/or at circuit board (qty 2)
- c) Start truck and run engine in fast idle for charging the battery  
→ if liftgate starts working, recharge batteries → test batteries and truck charging system
- d) Check power on board between J-11 #4 and Ground "Masse" with voltmeter  
(above 10 Volt is necessary for proper use of liftgate) → less than 10V; Jump #2 to #4  
on J-11 → voltage jumps more than 1 volt, call Palfinger for assistance

**\*\*\*\*DO NOT LEAVE JUMPER ON J-11 – GATE MUST BE SHUT OFF WHEN NOT IN USE\*\*\*\***

#### 3.2) Check adjustment of auto-tilt sensor B-13

- a) Check the position of the B-13 Sensor on the inside of the passenger side lift arm  
→ Sensor has to be in a horizontal position when gate is 8"-10" above ground
- b) Check if the outer J-41 Plug is loose (color sequence = blue, black, brown)

#### 3.3) Check function of turning knobs

- a) Check voltage at lowering knob # 6.1 to Ground "Masse" for lowering signal  
→ Voltage on lowering knob # 6.1 → knob is ok;  
→ No voltage → Check for tight fit of knob and if necessary change knob incl. contact block

#### 3.4) Check voltage supply to release valves on tilt cylinder

- a) Check voltage at J-41 #(BLACK)(B-13) to Ground "Masse" while platform is on ground → 12V
- b) Check voltage at J-41 #(BLUE)(B-13) to Ground "Masse" while platform is on ground → 12V  
→ No voltage on BLUE → Look for damaged spots or loose connection or B-13 is bad
- c) Check voltage at J4 #14 and Ground "Masse" while turning the lowering knob when gate is on ground for opening up the release valves at the tilt cylinders
- d) Listen for clicking of the release valves at the tilt cylinder (outer cylinders)  
→ If valves are not clicking → check wire for damaged spots or loose connections



## 4) GATE IS NOT TILTING UP AT GROUND

### 4.1) Check Battery Power

- a) Check resettable Circuit Breaker on top of batteries → Push Reset Tab back in, if popped out
- b) Check fuses on top of batteries (qty 1)  
at pump & motor (qty 2) inside the main tube on passenger side and/or at circuit board (qty 2)
- c) Start truck and run engine in fast idle for charging the battery  
→ if liftgate starts working, recharge batteries → test batteries and truck charging system

### 4.2) Check function of turning knobs

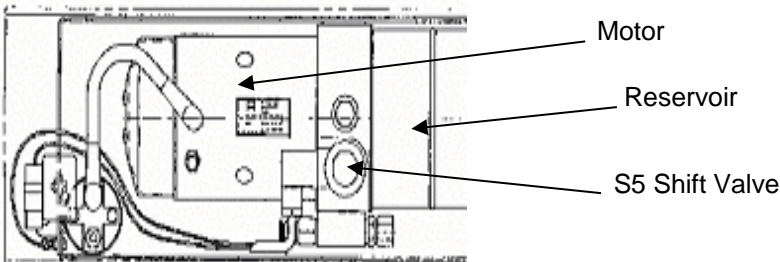
- a) Check voltage at lowering knob # 5.1 to Ground “Masse” for lifting signal  
→ Voltage on lowering knob #5.1 → knob is ok;  
→ No voltage → Check for tight fit of knob and if necessary change knob incl. contact block

### 4.3) Check motor solenoid power to run the motor

- a) Check voltage at J-1 #3 to Ground “Masse” while turning lift knob to engage motor solenoid
- b) Check for voltage at small motor solenoid studs and Ground “Masse” 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 (#3 and -) 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
- e) Check both big solenoid studs for voltage while turning the opening 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
  - Tap on motor → motor starts running – bad brushes

### 4.4) Check function of shift valve S5 at pump & motor

- a) Check voltage at J-1 #12 and Ground “Masse” while turning knob to engage the shift valve at the pump and Motor inside the main tube
- b) While turning the knob to make the motor run, override shift valve by pushing down the center brass pin with small Phillips screwdriver  
→ Gate will tilt up, if not → check the valve and look for damaged wire or loose connections



## 5) GATE IS NOT LIFTING UP



### 5.1) Check Battery Power

- Check resettable Circuit Breaker on top of batteries → Push Reset Tab back in, if popped out.
- Check fuse on top of batteries (qty 1) at pump & motor (qty 2) inside the main tube on passenger side and/or at circuit board (qty 2)
- Start truck and run engine in fast idle for charging the battery → if liftgate start working, recharge batteries → test batteries and truck charging system
- Check power on board between J-11 #4 and “Masse” with voltmeter (above 10 volt is necessary for proper use of liftgate) → less than 10V; Jump #2 to #4 on J-11 → voltage jumps more than 1 volt, call Palfinger for assistance

**\*\*\*\*DO NOT LEAVE JUMPER ON J-11 – GATE MUST BE SHUT OFF WHEN NOT IN USE\*\*\*\***

### 5.2) Check function of turning knobs

- Check voltage at lowering knob # 5.1 to Ground “Masse” for lifting signal → Voltage on lowering knob #5.1 → knob is ok; → No voltage → Check for tight fit of knob and if necessary change knob incl. contact block

### 5.3) Check for short in optional equipment

- Unplug J-3(warning light and foot control), J-41(B-13 and B-15 Sensors) and J-31(Hand control) Keep the 3 connectors unplugged (gate also operates without plugs connected)
- Unplug J-1 (Main power), wait 10 seconds and plug J-1 back to the board (Reset the board)
- Plug each connector back one at a time and check functions of gate after plugging in each.

### 5.4) Check motor solenoid power to run the motor

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

## 6) GATE IS NOT CLOSING



### 6.1) Check Battery Power

- Check resettable Circuit Breaker on top of batteries → Push Reset Tab back in, if popped out
- Check fuse on top of batteries (qty 1)  
at pump & motor (qty 2) inside the main tube on passenger side and/or at circuit board (qty 2)
- Start truck and run engine in fast idle for charging the battery  
→ if liftgate start working, recharge batteries → test batteries and truck charging system
- Check power on board between J-11 #4 and “Masse” with voltmeter by turning the up-function knob and hold for 10 sec with gate in stored position (DEADHEAD GATE) (above 10 Volt is necessary for proper use of liftgate) → less than 10V; Jump #2 to #4 on J-11 → voltage jumps more than 1 volt, call Palfinger for assistance

**\*\*\*\*DO NOT LEAVE JUMPER ON J-11 – GATE MUST BE SHUT OFF WHEN NOT IN USE\*\*\*\***

### 6.2) Check function of turning knobs

- Check voltage at lowering knob # 3.1 to Ground “Masse” for tilting signal  
→ Voltage on lowering knob #3.1 → knob is ok;  
→ No voltage → Check for tight fit of knob and if necessary change knob incl. contact block

### 6.3) Check for S5 valve on pump & motor not engaged

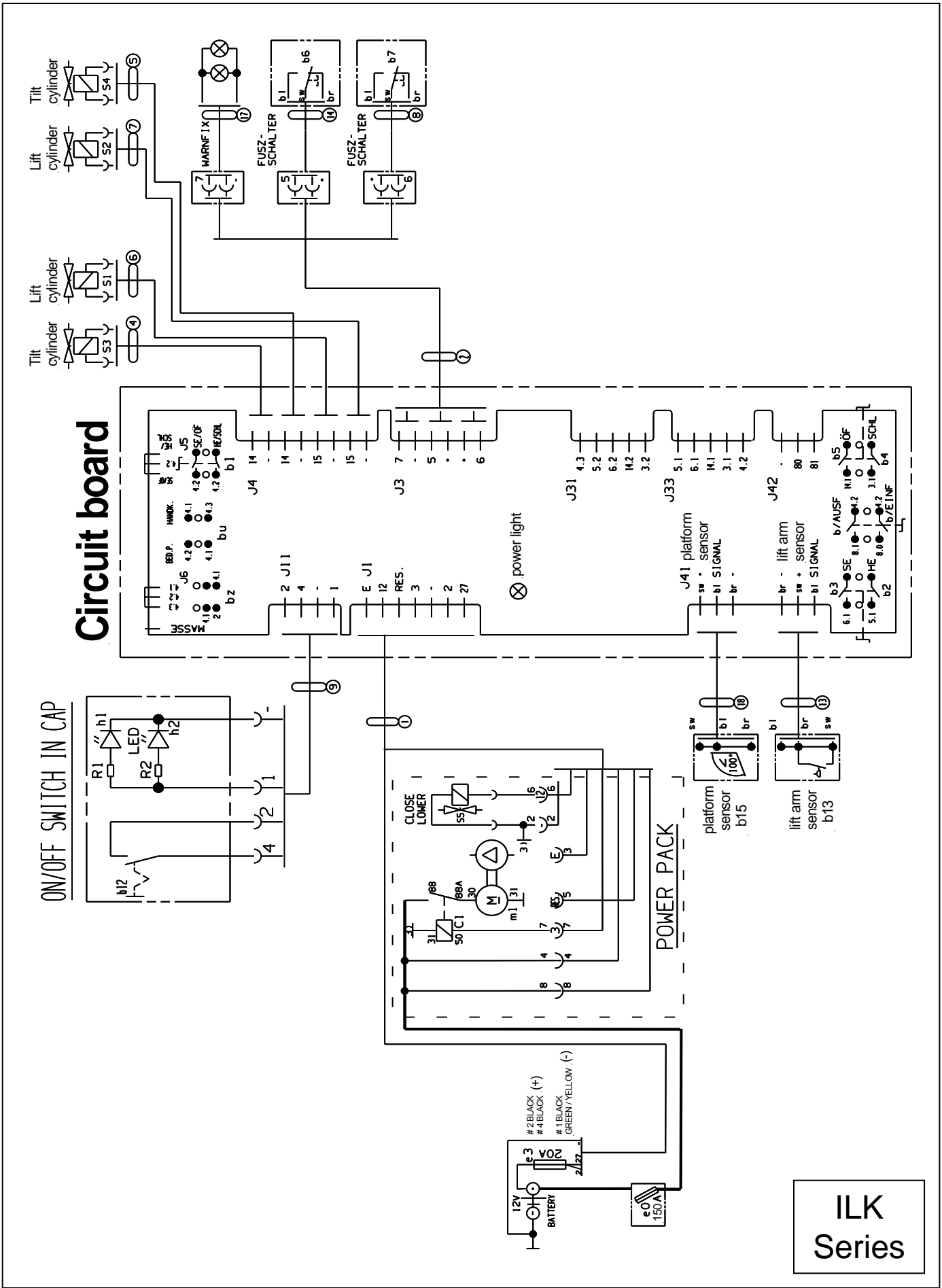
- Check Voltage at J1 #12 and Ground “Masse” while turning knob to engage the shift valve at the pump and motor inside the main tube
- Override the shift valve by pushing down the center brass pin with small Phillips screwdriver while turning the up knob  
→ Gate will close up → check the valve and look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

### 6.4) Check motor solenoid power to run the motor

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



# Electrical schematic



## Circuit board

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# Hydraulic schematic

Functions:

S1 and S2 = Release Valve for lowering function

S3 and S4 = Release Valve for tilt down function

R1 and R2 = Flow Restrictor located inside hose adaptor on lift cylinder

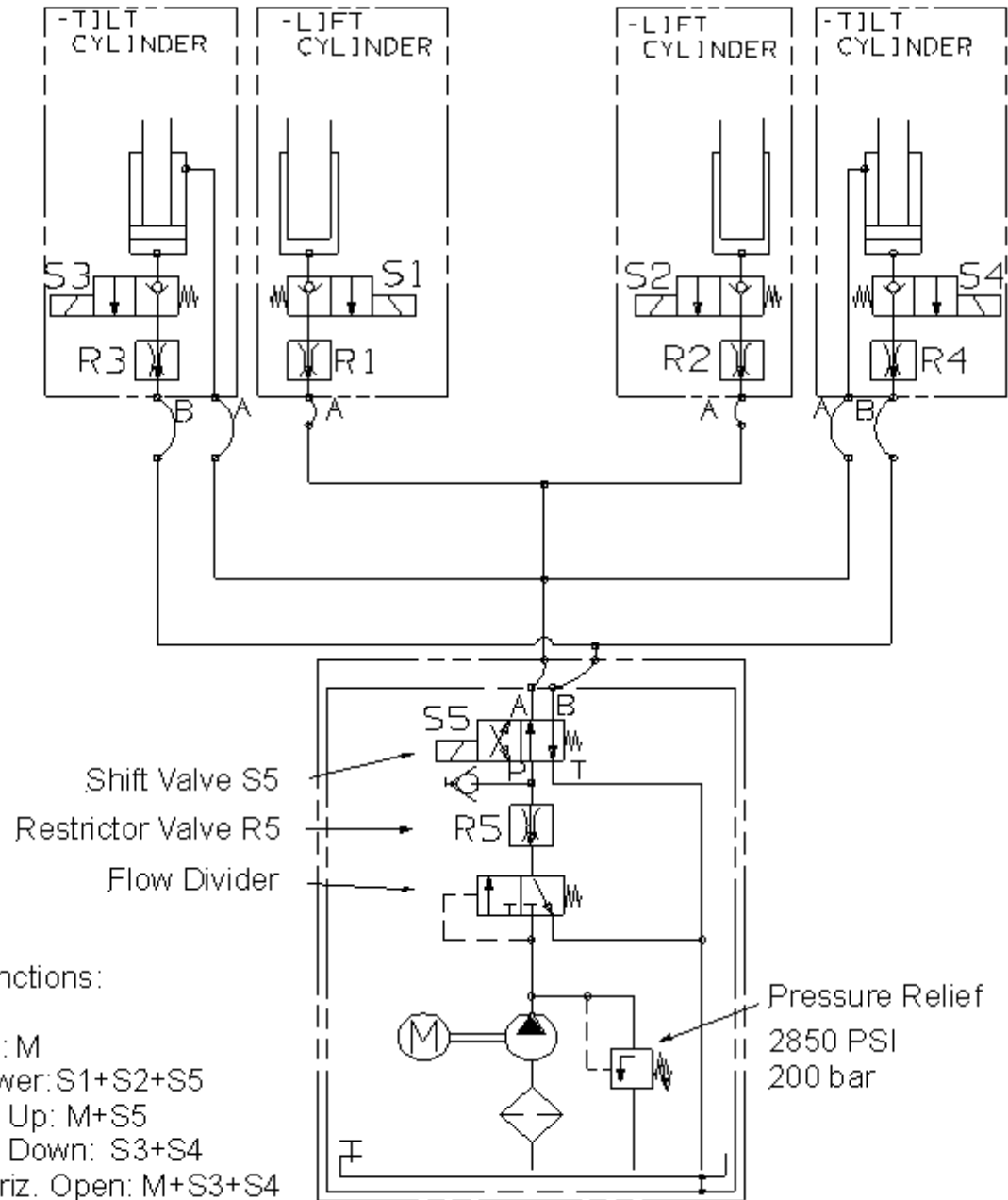
R3 and R4 = Flow Restrictor located inside hose adaptor on tilt cylinder

S5 = Shift Valve is activated on tilt up and lowering function

R5 = Restrictor Valve located in power pack

Flow Divider is activated, when fluid is going back into the power pack

If Flow Divider is loose or hanging up the fluid is circulated back in to tank



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