



Model PTV Liftgate Training, Troubleshooting & Maintenance Manual Training Manual



SALES AND TECHNICAL INFORMATION 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>.

Additionally, troubleshooting guides, hydraulic and electrical schematics are available for download and/or viewing.

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

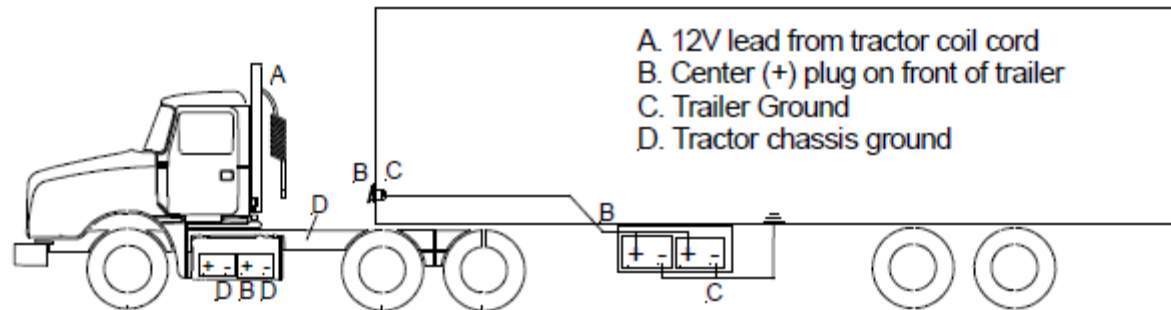
REPLACE MISSING OR DEFACED DECALS!

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

State of Charge vs Open Circuit Voltage,

OPEN CIRCUIT VOLTAGE		
% CHARGE	FLOODED	AGM
100	12.6-12.7	12.8 or HIGHER
75	12.4	12.6
50	12.2	12.3
25	12	12
0	11.8	11.8

TRACTOR TO TRAILER GROUND TEST



Testing of full system using a battery load tester. Start with testing each individual battery on both tractors and trailer before proceeding to check the system:

1. Tractor Test:

Ground battery load tester on tractor chassis point (D)

Connect 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

2. Trailer Test:

Ground battery load tester on trailer chassis point (C)

Connect positive cable on positive pole of single pole plug receptacle on trailer (B).

Run load test- This will test entire circuit on trailer including circuit breakers and ground between trailer batteries and trailer chassis.

3. Tractor and Trailer Charging system test while connected:

Ground battery load tester on tractor chassis point (D)

Connect positive cable on positive pole of single pole plug receptacle on trailer (B).

Run load test- This will test entire circuit on tractor and trailer including ground between tractor, 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.

10-10 VOLTAGE TEST

PRIOR TO TROUBLESHOOTING PERFORM BATTERY VOLTAGE TEST

IF OPEN CIRCUIT BATTERY VOLTAGE IS LESS THAN 12.5V (80%) RECHARGE BATTERIES BEFORE PROCEEDING

ALL TESTS ARE PERFORMED WITH ENGINE OFF AND TRAILER DISCONNECTED FROM TRACTORS

- MAKE SURE MASTER DISCONNECT SWITCH ON RIGHT SIDE OF BATTERY BOX IS ON
- REMOVE RUBBER CIRCUIT BOARD COVER FROM INSIDE OF PUMP BOX (LEFT SIDE WALL) AND MAKE SURE TO CHECK THE STATUS CODE NUMBER IN THE LOWER LEFT CORNER OF THE CIRCUIT BOARD. VERIFY CODE 1 AND FLASHING GREEN LIGHT IN LOWER RIGHT CORNER OF BOARD BEFORE PROCEEDING.
- SET MULTIMETER TO DC VOLTS AND CONNECT NEGATIVE LEAD TO EITHER GROUND WIRE AT J2 (Y/G OR BLK)
- CONNECT POSITIVE LEAD TO #27 PIN ON J1, THEN #2 ON J1 BOTH MUST READ BATTERY VOLTAGE
- RAISE THE PLATFORM FULL UP WHILE MONITORING VOLTAGE. IF IT DROPS BELOW 10 AT ANY POINT FIND THE REASON PRIOR TO PROCEEDING. CHECK VOLTAGE AT J-1 #2 AND J-1#27
- FOLD THE PLATFORM AND HOLD THE CENTER AND UP SWITCHES FOR 10 SECONDS, VOLTAGE SHOULD NOT DROP BELOW 10v

NOTE: #27 AND #2 CONNECTIONS ON J1 TAKE POWER FROM THE PRIMARY MOTOR SOLENOID AND IS CONTROLLED BY THE SWITCHED SIDE OF THE MASTER DISCONNECT SWITCH (ON RIGHT WALL OF BATTERY BOX) THROUGH A 15 AMP INLINE FUSE. THE J-1 #27 TERMINAL POWERS THE PROCESSOR IN THE BOARD AND THE J-1 #2 TERMINAL PROVIDES WORKING POWER FOR J11 PULG WHERE THAT POWER IS SWITCHED TO #4 TERMINAL FOR ALL BOARD OUTPUTS. BOTH MUST HAVE 12.5V OR MORE FOR PROPER LIFT GATE FUNCTION.

- ATTACH VOLT METER NEGATIVE TO MOTOR NEGATIVE POST
- ATTACH VOLTMETER POSITIVE TO MOTOR POSITVE POST
- WITH PLATFORM FULL UP AND FOLDED HOLD CENTER AND UP BUTTONS TO DEAD HEAD FOR 10 SECONDS

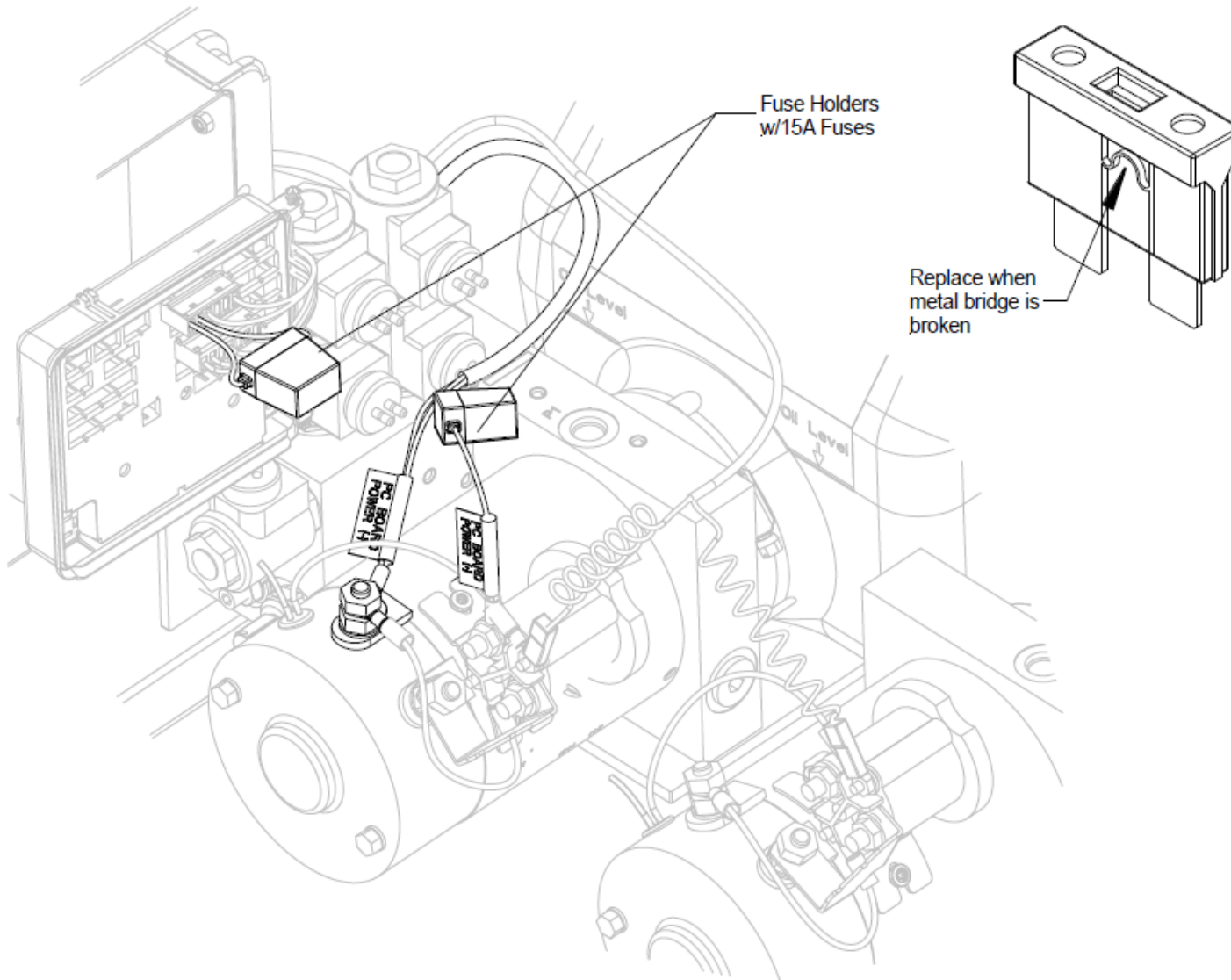
NOTE: ON DUAL PUMP/MOTOR UNITS ATTACH VOLTMETER TO EITHER MOTOR AND INSURE BOTH MOTORS ARE OPERATING SHOULD NOT DROP BELOW 10V AFTER 10 SECONDS IF VOLTAGE IS LESS THAN 8V CHECK THE FOLLOWING TO DETERMINE IF IT'S CAUSED BY *POOR WIRING *FAILED BATTERIES, OR *FAILED MOTORS:

- CHECK ALL CONNECTIONS BETWEEN BATTERIES AND MOTORS POWER AND GROUND CONNECTIONS
- ATTACH NEGATIVE VOLTMETER LEAD TO NEGATIVE POST OF BATTERY AND POSITIVE LEAD TO POSITIVE POST OF BATTERY. REPEAT 10/10 VOLT TEST IF READING IS LOW (8V OR LESS) LOAD TEST INDIVIDUAL BATTERIES. IF READING IS GOOD (10V OR MORE) PROCEDE TO NEXT STEP
- CHECK VOLTAGE AT EACH MOTOR WITH THE OPPOSITE MOTOR DISCONNECTED. IF ONE MOTOR INDICATES LOW VOLTAGE PERFORM AN AMP DRAW TEST ON THAT MOTOR AND REPLACE MOTOR OR MOTORS IF NECESSARY

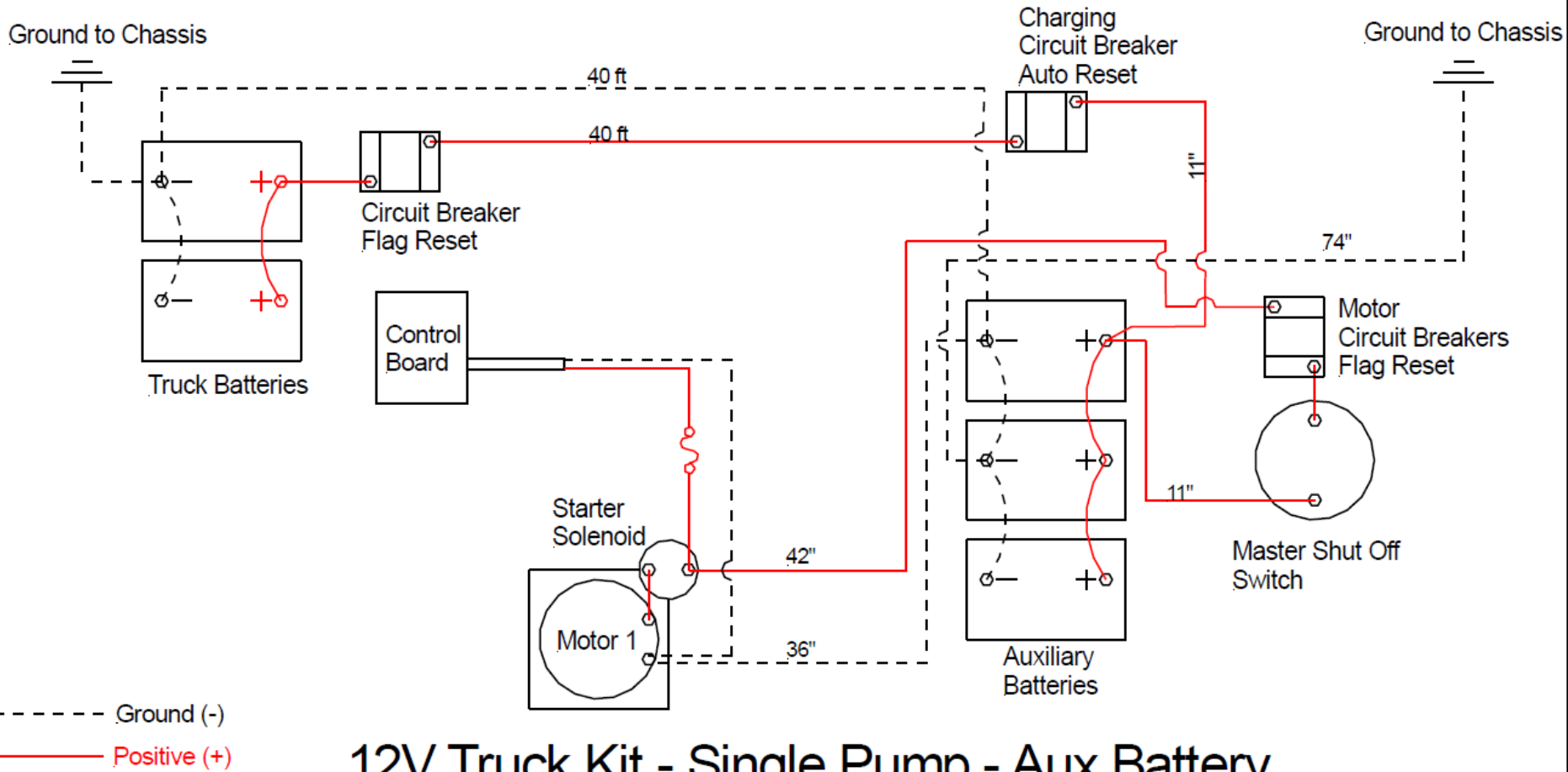
NOTE: ANY VOLTAGE BELOW 9 VOLTS WILL TRIGGER FAULT CODE 2 (LOW VOLTAGE) ON CIRCUIT BOARD

CIRCUIT BOARD POWER CONNECTIONS

1. #1 & #2 Black wire connect to fuse holder and supply power to Terminals #27 & #2 on J1 Plug.
2. #3 Black wire & Green/Yellow wire connect to Ground Stud on Primary Motor supplying ground to J2 Plug.
3. Fuse Holder on J2 Plug is the connection which allows Circuit Board to Select and alternate Motors.

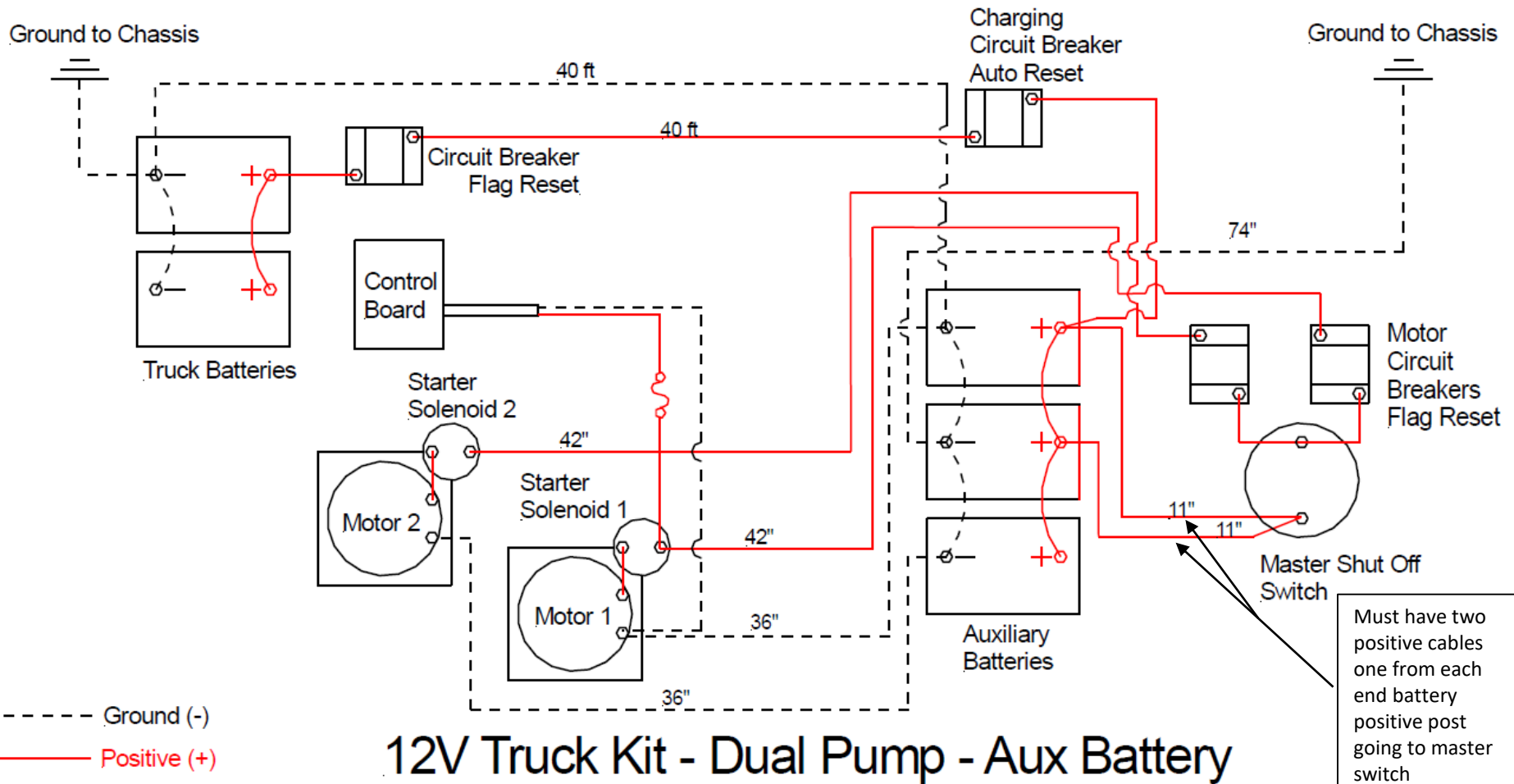


BATTERY CONNECTION INFORMATION

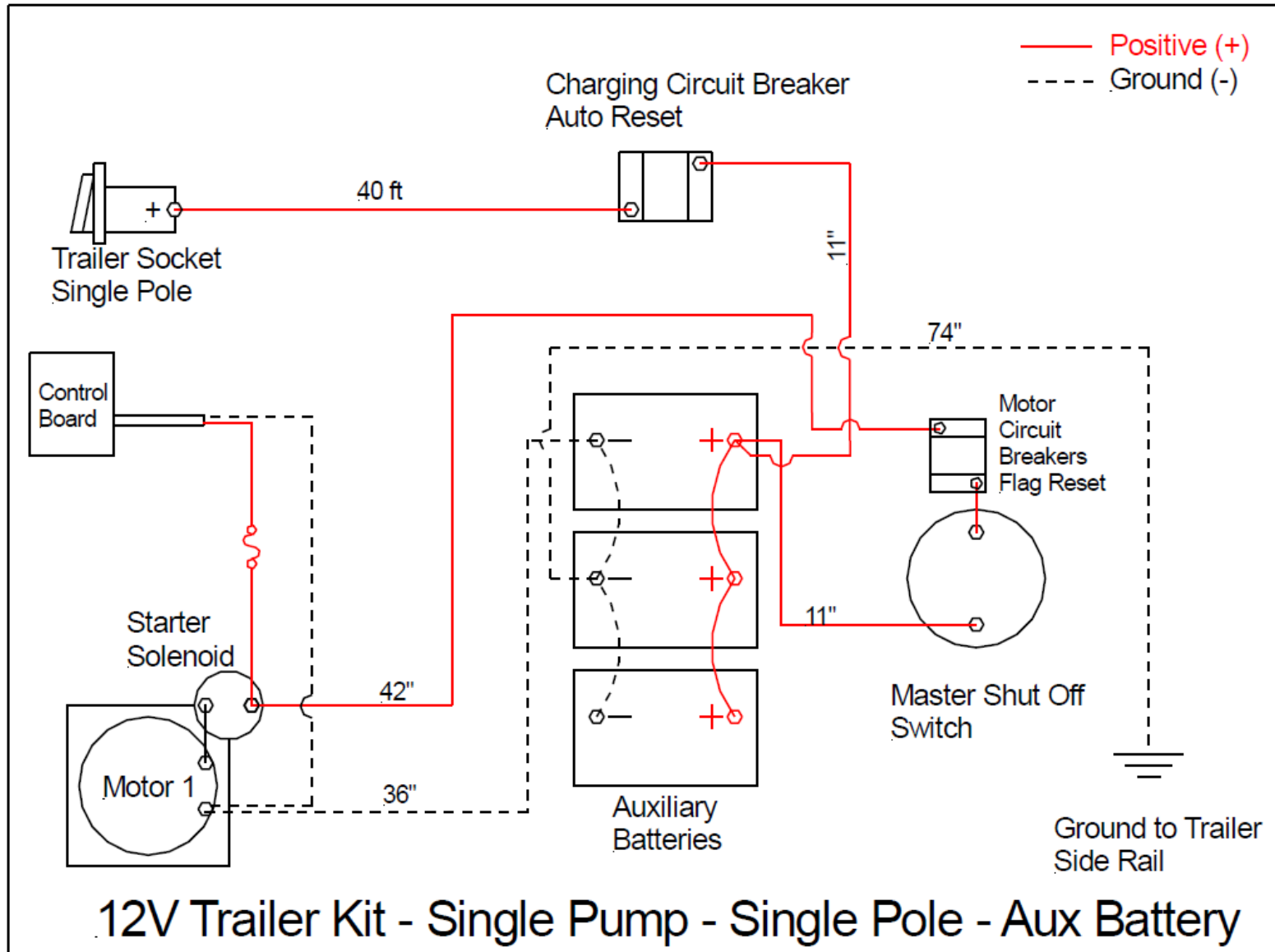


12V Truck Kit - Single Pump - Aux Battery

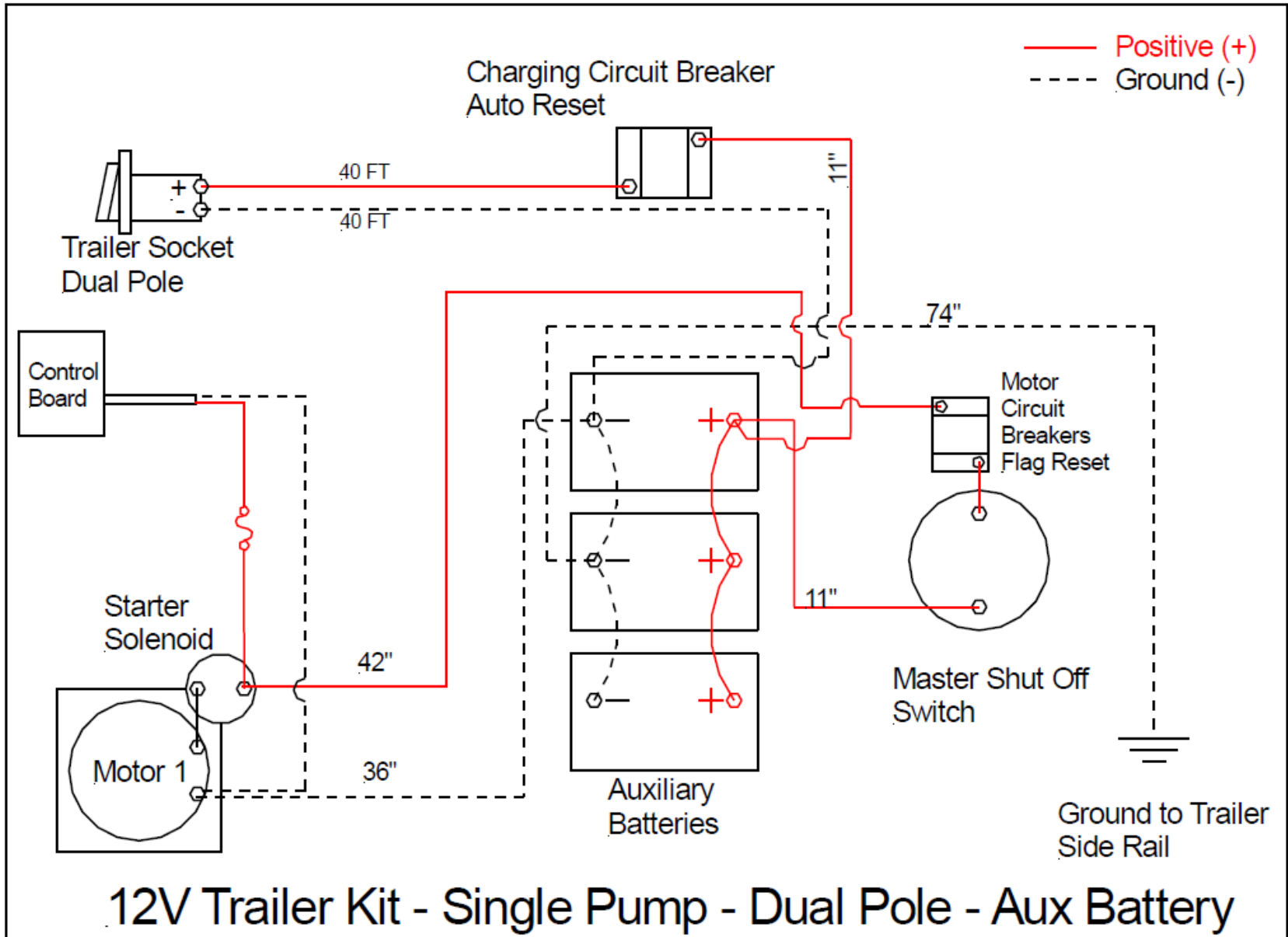
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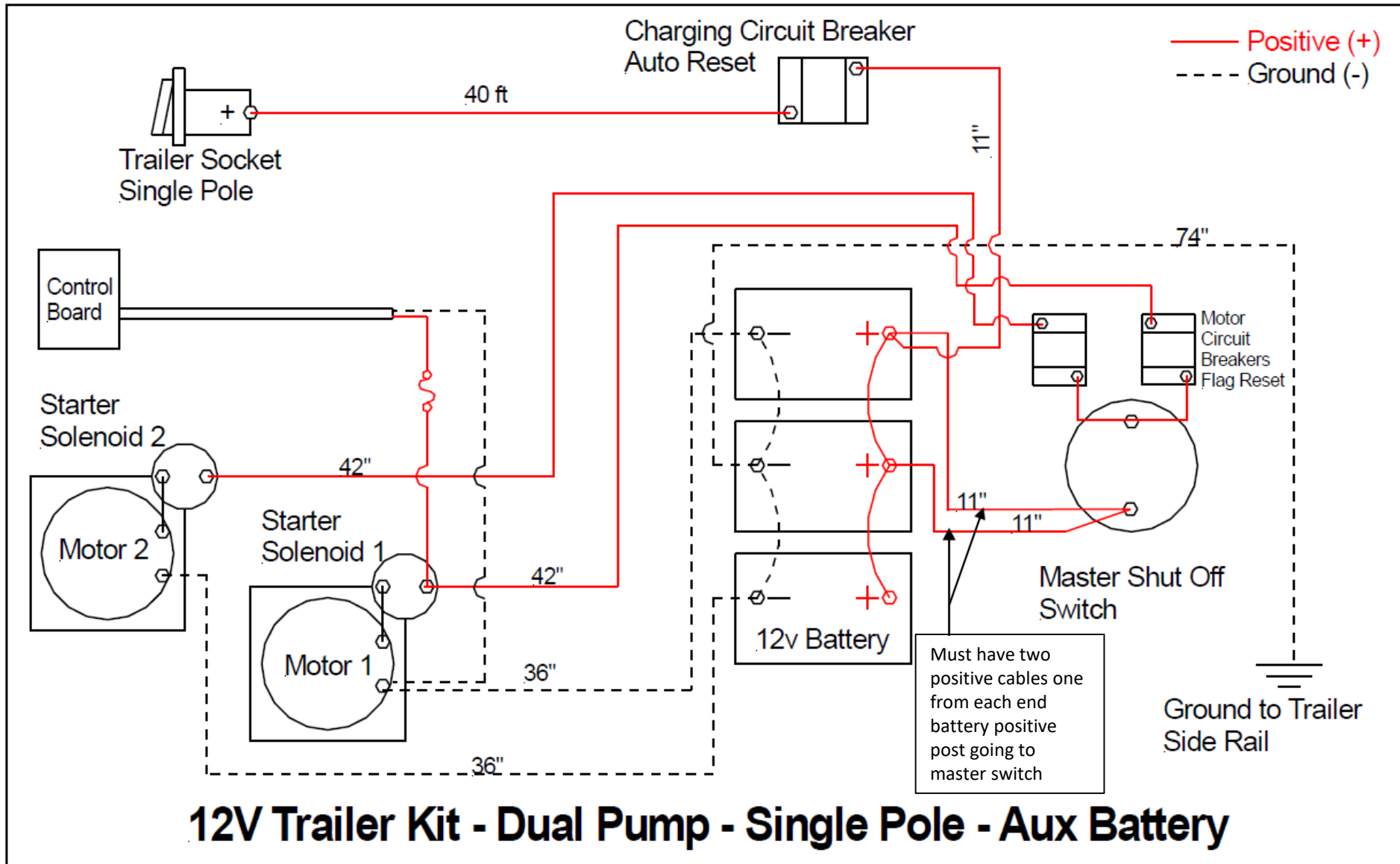
BATTERY CONNECTION INFORMATION



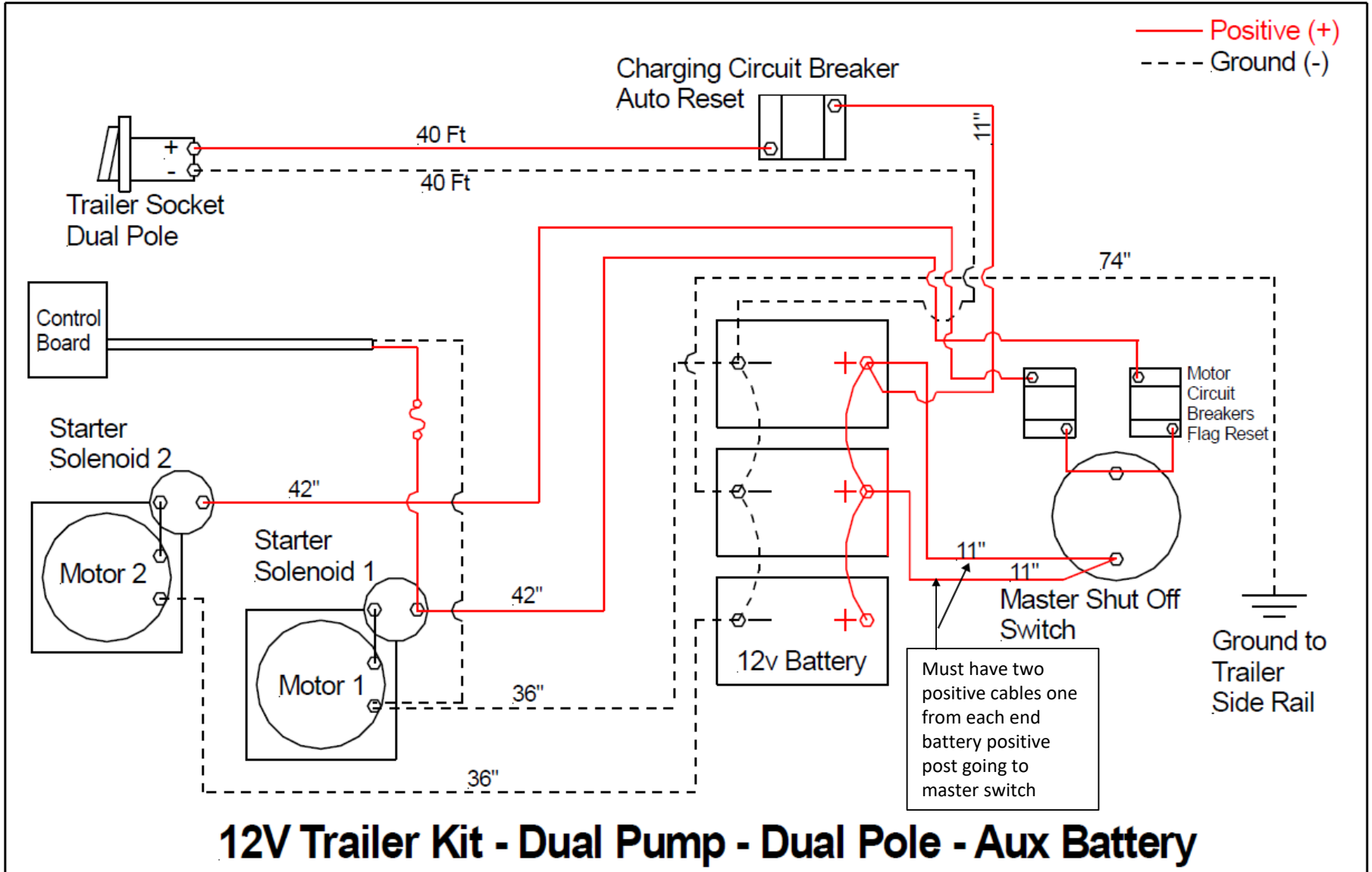
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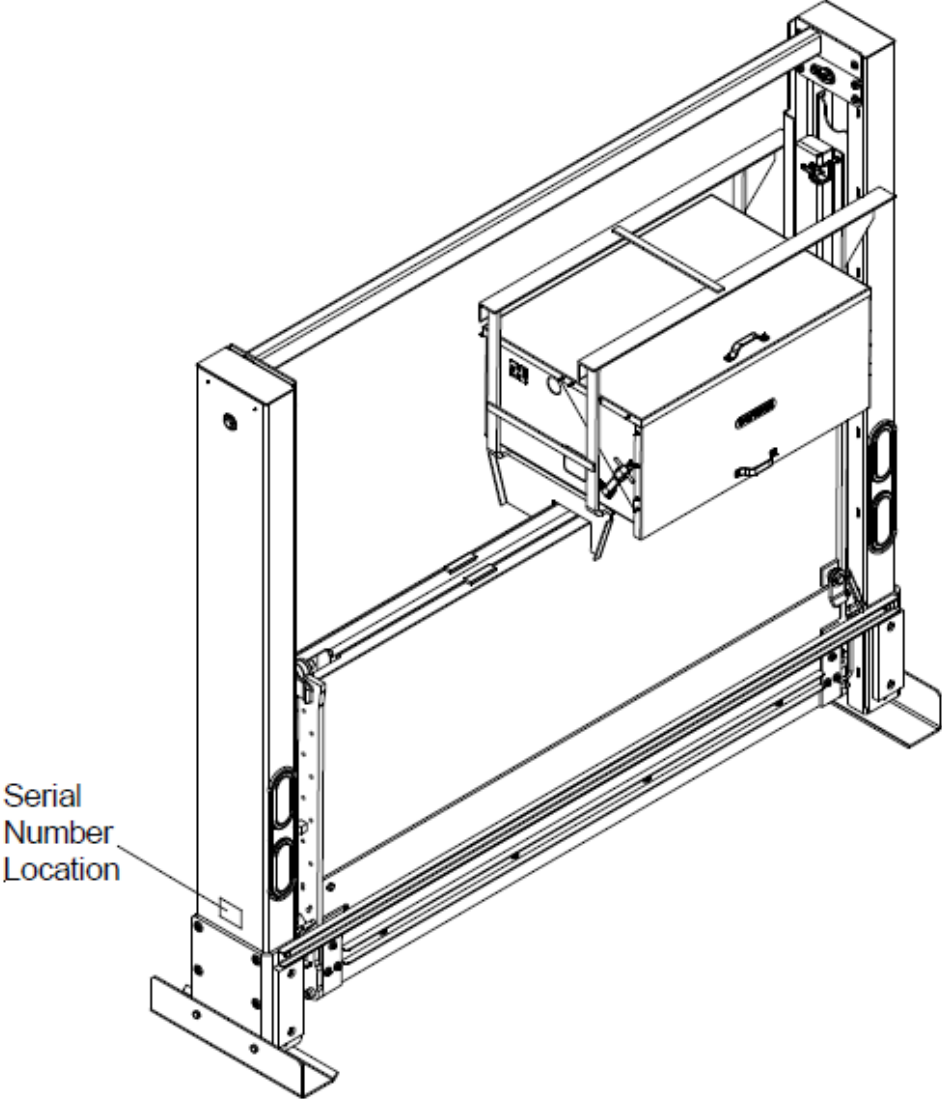
BATTERY CONNECTION INFORMATION



BATTERY CONNECTION INFORMATION



PTV Serial number Tag location

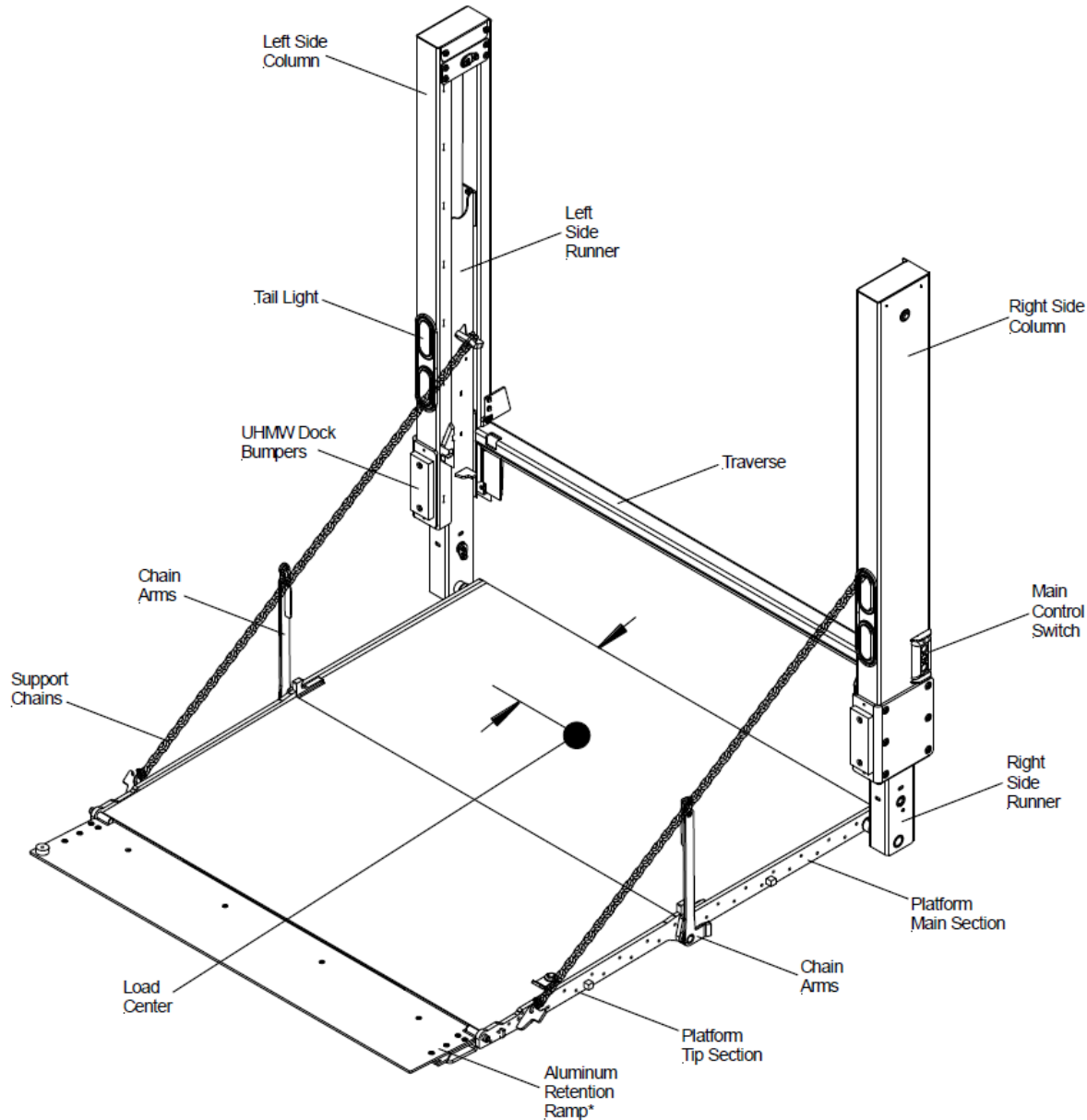


PALFINGER	<input type="checkbox"/>
PTV XXXX	
ML680-VL-A	
XXXXXXXXXX	
20XX	

OR

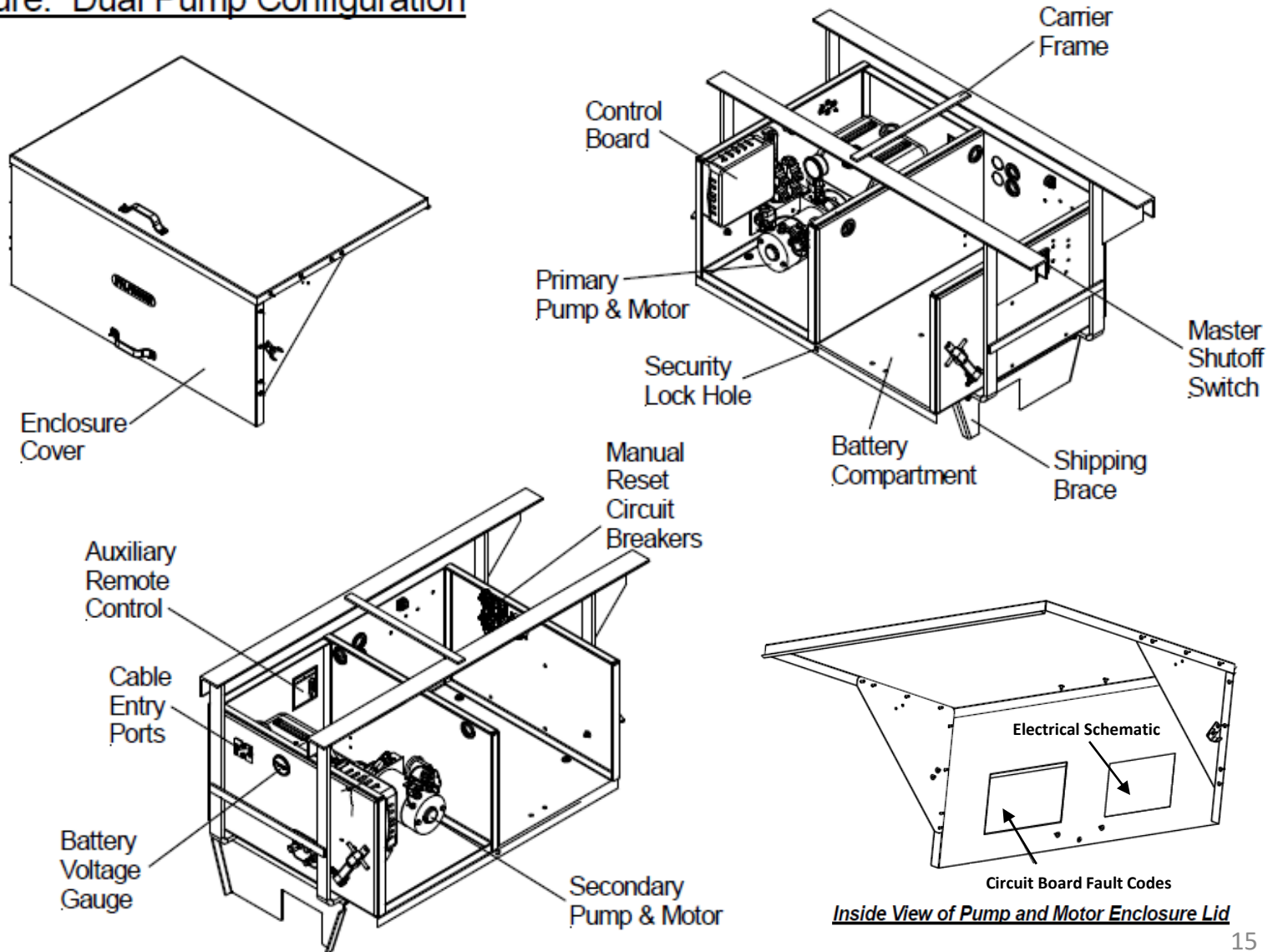
PALFINGER		
(888) 774-5844	Cerritos, CA. Trenton, N.J.	
Model	Serial No.	Date
<input type="text"/>	<input type="text"/>	<input type="text"/>

PTV Liftgate Components

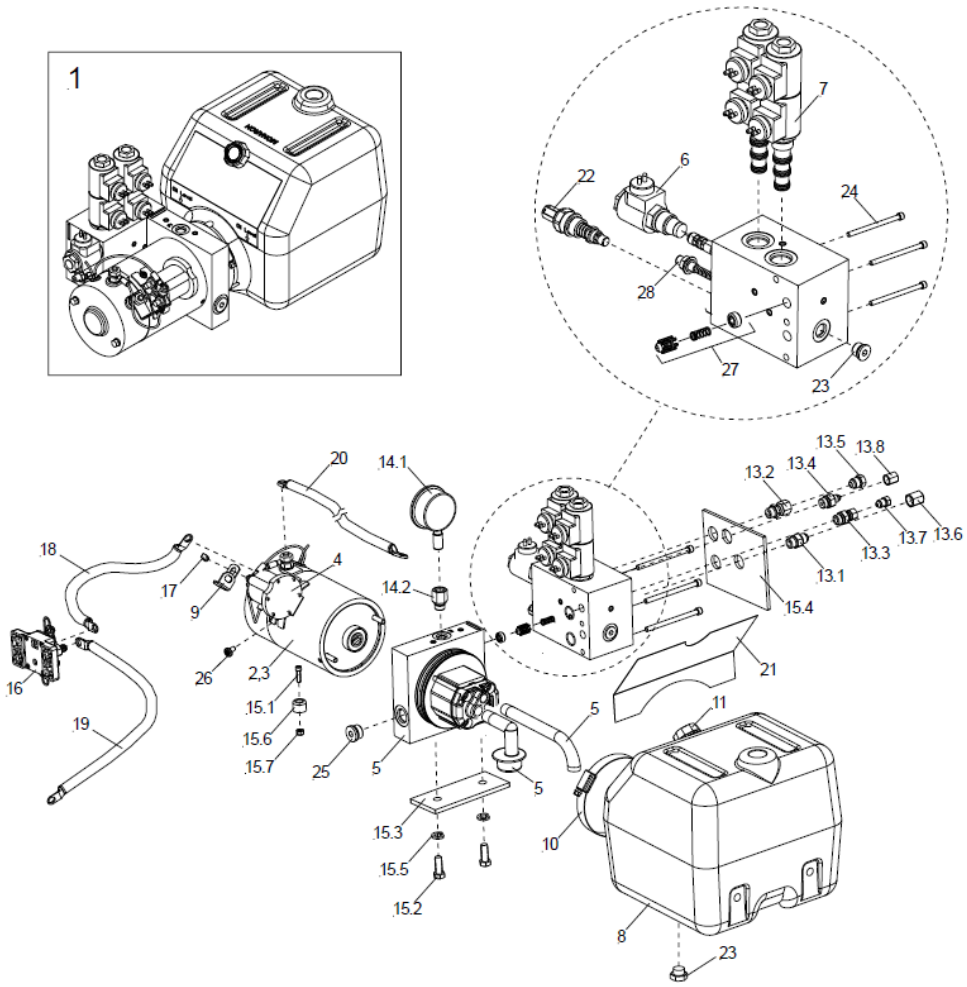


PTV Liftgate Pump Box Components

Hydraulic Enclosure: Dual Pump Configuration



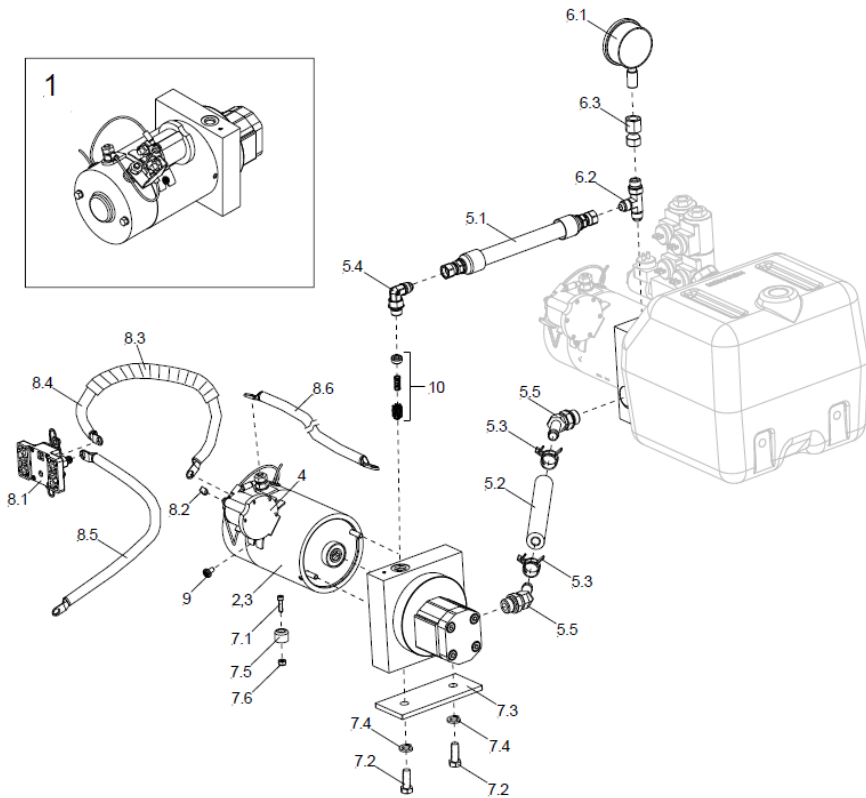
PTV Liftgate Primary Pump & Motor Components



21 – PUMP AND MOTOR –PRIMARY PUMP			
NO.	DESCRIPTION	PART NO.	QTY.
1	Power Pack, Primary, Pump & Motor, 1.7CC, 12V	50-1117-001	1
	Power Pack, Primary, Pump & Motor, 1.7CC, 24V	50-1118-102	1
2	Motor, 12v	2020866	1
3	Carbon Brushes Kit	1410330	1
4	Motor Solenoid, 12v	1404303	1
	Motor Solenoid, 24v	1404302	1
5	Pump, Incl. Coupler, Pipe, Filter	2020618	1
6	Two Way Release Valve	2021832A	4
7	Single Locking Release Valve	67282345	1
8	Oil Reservoir	50-1118-002	1
9	Bracket, Copper Bridge, Solenoid	50-1118-001	1
10	Clamp For Oil Reservoir	50-0313-954	1
11	Breather Cap	50-0709-914	1
12	Pump Filter	2018681	1
13	Fitting Kit, Primary Pump	80-1117-100	1
13.1	Adapter, Male 3/8" JIC - 3/8" ORB	HV826	1
13.2	Adpater, Female 3/8" JIC - 3/8 ORB	HV829	1
13.3	Adpater, Female 1/2" JIC - 3/8 ORB	HV830	1
13.4	Adpater, Male 1/2" JIC - 3/8 ORB	HV831	1
13.5	Plug, 3/8" JIC Male	EA6022	1
13.6	Cap, 3/8" JIC Female	EA6023	1
13.7	Plug, 1/2" JIC Male	EA6024	1
13.8	Cap, 1/2" JIC Female	EA6025	1
14	Gauge Kit, Primary Pump	80-1117-101	1
14.1	Pressure Gauge	OS3121327	1
14.2	Adapter, 3/8" ORB - 1/2"-18 NPT	HV 836	1
15	Hardware Kit, Primary Pump	99-1117-000	1
15.1	Socket Head Cap Screw, 10-24 X 3/4", Zinc	ES3448	1
15.2	Hex Head Cap Screw, 3/8-16 X 1", Gr.5, Zinc	ES3446	2
15.3	Rubber, 2.5" X 5.5" X 1/4"	50-1117-003	1
15.4	Gasket, 5" X 4" X .03"	50-1117-004	1
15.5	Washer, Splitlock, 3/8"	EK3238	2
15.6	Snubber, 1/2"OD X 3/16"ID X 9/16"H	EK3698	1
15.7	Nut, Nylock, 10-24, Gr.2, Zinc	EM730	1
16	Circuit Breaker, Manual, 175A	70-8114-009	1
17	Electrical Terminal	1474387	1
18	Cable, 20", 3/8" Lugs, Red	KET05919A	1
19	Cable, 35", 3/8" Lugs, Red	KET05920A	1
20	Cable, 35", 3/8" Lugs, Black	KET05921A	1
21	Oil Level Decal	85-1117-002	1
22	Relief Valve	50-0313-953	1
23	Plug, SAE, 9/16-18, Hex Socket	50-1118-003	2
24	Socket Head Cap Screw, 1/4-20x3.50", Zinc	ES4086	3
25	Plug, SAE, 3/4"-16, Hex Socket	50-1118-004	1
26	Pan Head Screw, #10-32x0.312", Torx Drive	ES4080	2
27	Valve, Check, Primary/Secondary Pump	50-1118-005	1
28	Valve, Assembly, 1001 PSI & Up	50-1118-006	1

NOTE: Items 6 & 7 valves are the same as on Previous models

PTV Liftgate Secondary Pump & Motor Components



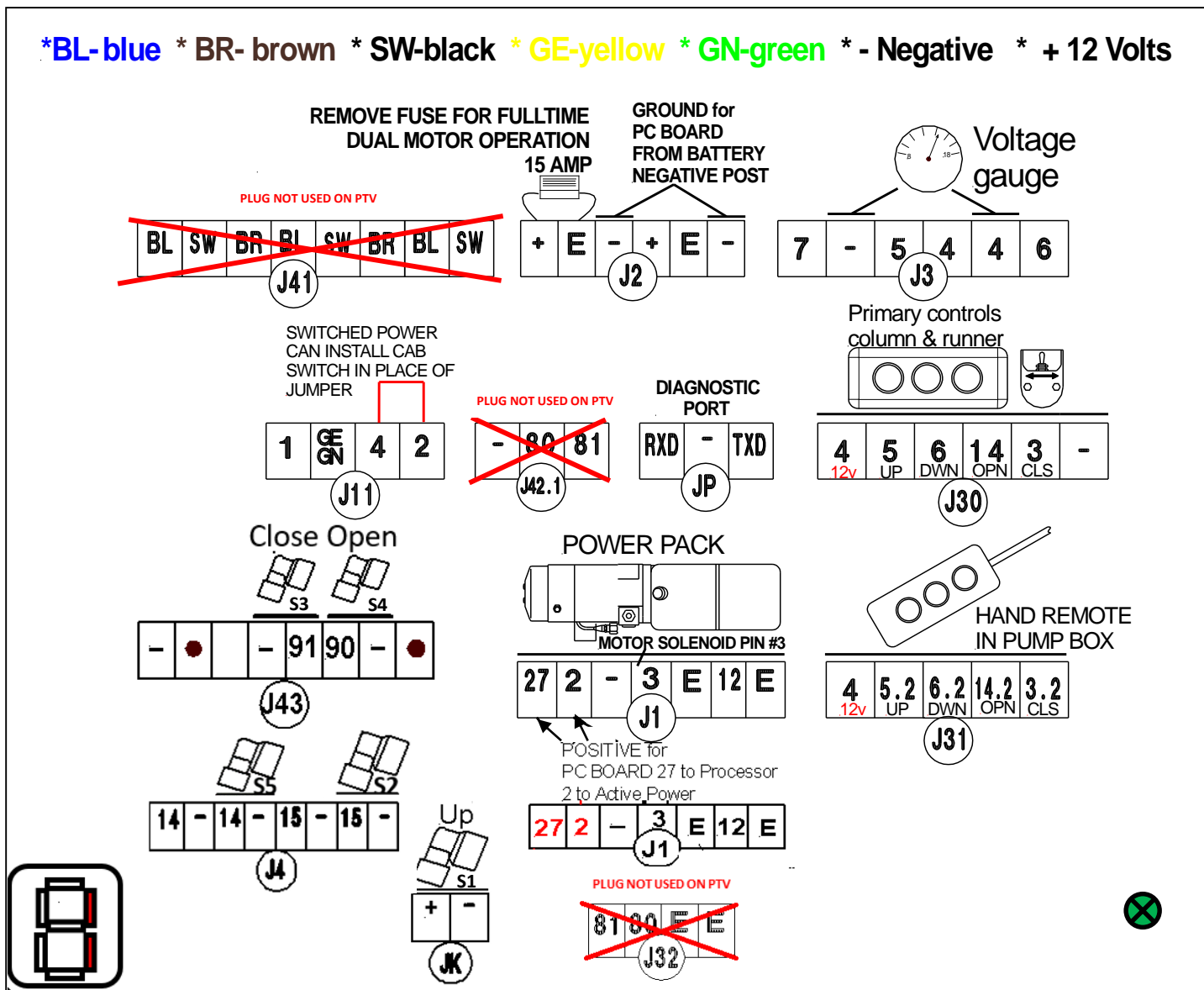
22 – PUMP AND MOTOR – SECONDARY

NO.	DESCRIPTION	PART NO.	QTY.
1	Power Pack, Secondary- Pump and Motor, 1.7CC, 12V	50-1117-002	1
	Power Pack, Secondary- Pump and Motor, 1.7CC, 24V	50-1118-103	1
2	Motor, 12v	2020866	1
3	Carbon Brushes Kit	1410330	1
4	Motor Solenoid, 12v	1404303	1
	Motor Solenoid, 24v	1404302	1
5	Hydraulic Kit, Secondary Pump	80-1117-200	1
5.1	Hose, Female 3/8 JIC X 7" L	EH14737	1
5.2	Hose, 1/2" ID X 5" L, Raw	EH14739	1
5.3	Hose Clamp, 3/4" OD, Spring-Band	EQ1708	2
5.4	Elbow, Male 3/8 JIC - 3/8 ORB	HV 832	1
5.5	Elbow, 45°, 1/2 ORB - 1/2 BARB	HV 833	2
6	Pressure Gauge Kit, Secondary Pump	80-1117-202	1
6.1	Pressure Gauge	OS3121327	1
6.2	Tee, Male 3/8 JIC - 3/8 ORB RUN	HV 827	1
6.3	Adapter, Female 3/8 JIC – Female 1/4-18 NPTF	HV 828	1
7	Hardware Kit, Secondary Pump	99-1117-001	1
7.1	Socket Head Cap Screw, 10-24 X 3/4", Zinc	ES3448	1
7.2	Hex Head Cap Screw, 3/8-16 X 1", Gr.5, Zinc	ES3446	2
7.3	Rubber, 2.5" X 5.5" X 1/4"	50-1117-003	1
7.4	Washer; Splitlock, 3/8"	EK3238	2
7.5	Snubber, 3/4"OD X 3/16"ID X 9/16"H	EK3698	1
7.6	Nut, Nylock, 10-24, Gr.2, Zinc	EM 730	1
8	Electrical Kit, 12V, Secondary Pump	70-1117-300	1
8.1	Circuit Breaker, Manual, 175A	70-8114-009	1
8.2	Electrical Terminal	1474387	1
8.3	Split Loom, 1/2" X 6.25"	EZ7073	1
8.4	Cable, 20", 3/8" Lugs, Red	KET05919A	1
8.5	Cable, 35", 3/8" Lugs, Red	KET05920A	1
8.6	Cable, 35", 3/8" Lugs, Black	KET05921A	1
9	Pan Head Screw, #10-32x0.312", Torx Drive	ES4080	2
10	Valve, Check, Primary/Secondary Pump	50-1118-005	1

Circuit Board Overview - PTV

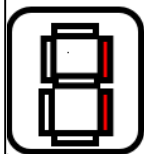
*BL-blue * BR-brown * SW-black * GE-yellow * GN-green * - Negative * + 12 Volts

- ❖ ALL NUMBERS ON THE BOARD ARE PLUG POSITION NUMBERS
- ❖ 2 DIGIT LETTER MARKINGS INDICATE WIRE COLOR PER LEGEND.
- ❖ "E" NORMALLY INDICATES EMPTY SLOT OR PIN
- ❖ "+" INDICATES 12V WITH BOARD POWERED
- ❖ "-" INDICATES GROUND WITH BOARD GROUNDED TO BATTERIES (J-2) "-" PINS
- ❖ ALL #2 PINS ARE 12v WITH BATTERY POWER TO J-1 PLUG PIN #2
- ❖ ALL #4 PINS ARE HOT WITH J-11 JUMPER FROM #2 to #4

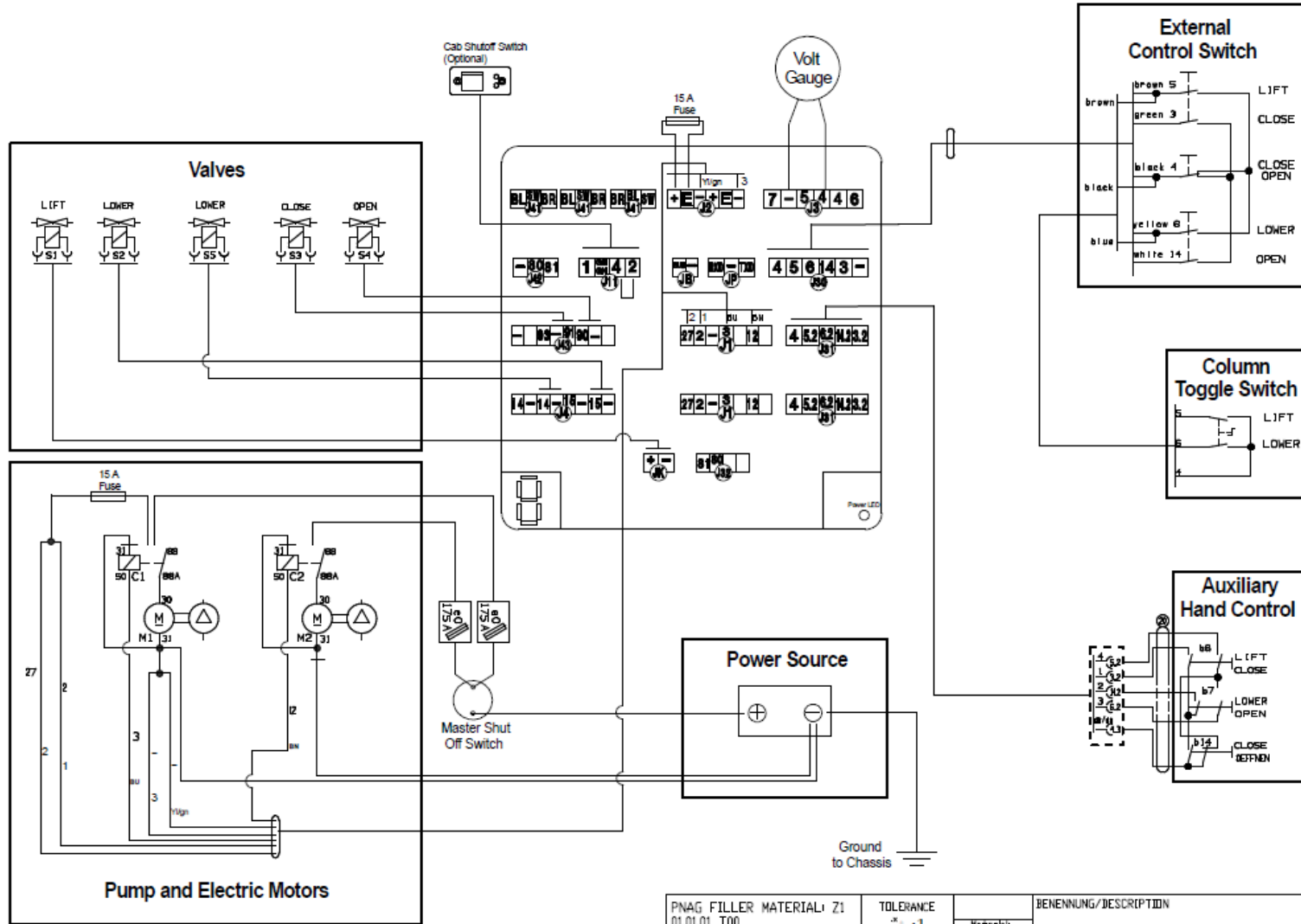


GATE WILL NOT FUNCTION WITHOUT :

- ❖ GROUND AT J-2
- ❖ 12v AT J-1 #2 AND #27
- ❖ JUMPER J-11 #2 TO #4
- ❖ 12v AT ALL #4 PINS



PTV ELECTRICAL SCHEMATIC



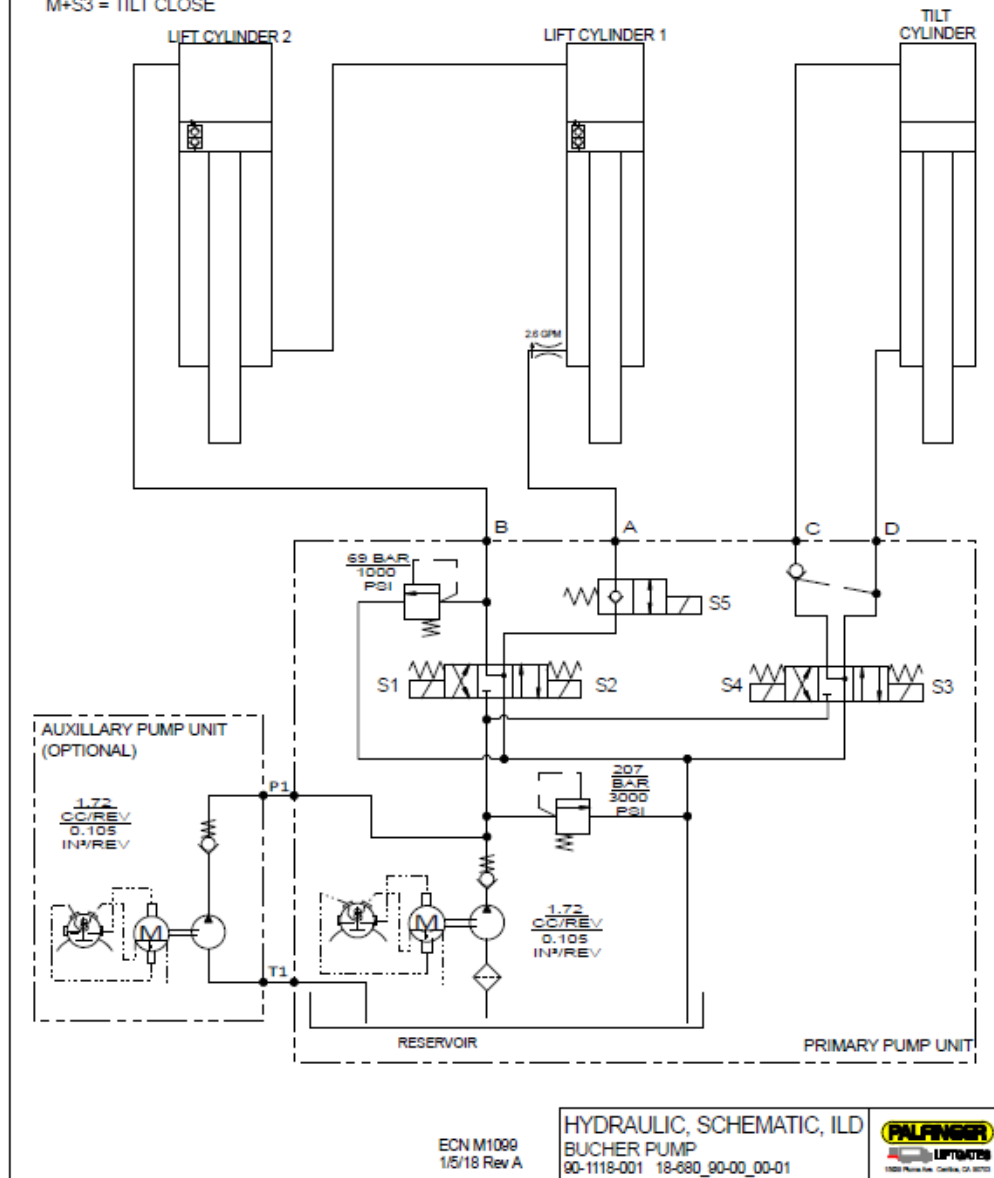
Rev.	ECN #	Date	Name	Description
A	M1541	2/25/21	TP	Release to production

PNAG FILLER MATERIAL: Z1 01.01.01 T00	TOLERANCE - .1 xxx .003 xxxx .0010 xxxxx .0005 ANGLE 1:1:10	Material	BENENNUNG/DESCRIPTION
WELD EVALUATION: 01.03.01 T03E	FRACTION	Geacht/Velght	SCHEMATIC; ELECTRICAL; PTV
ADDITIONAL NDT: -	TATUM DATE	NAME	ZEICHNUNGS-Nr./DRAWING-NO
PREHEAT: -	BEARE DATE	P.TIM	21-680_70-00_00-01
WELD CALL-OUT ACCORDING TO AWS STANDARD	GEN FR.	-	SACHNUMMER/PART-NO
			70-1121-001
			VERWENDUNG APPL.
			PTV
			STATUS: In Work VERSION: A_D
			MASSTAB SCALE
			1:000
			BLATT/SHEET 1 OF 1



PTV Hydraulic Schematic

M+S1 = LIFT
M+S2+S5 = POWER DOWN
S5 = GRAVITY DOWN
M+S4 = TILT OPEN
M+S3 = TILT CLOSE

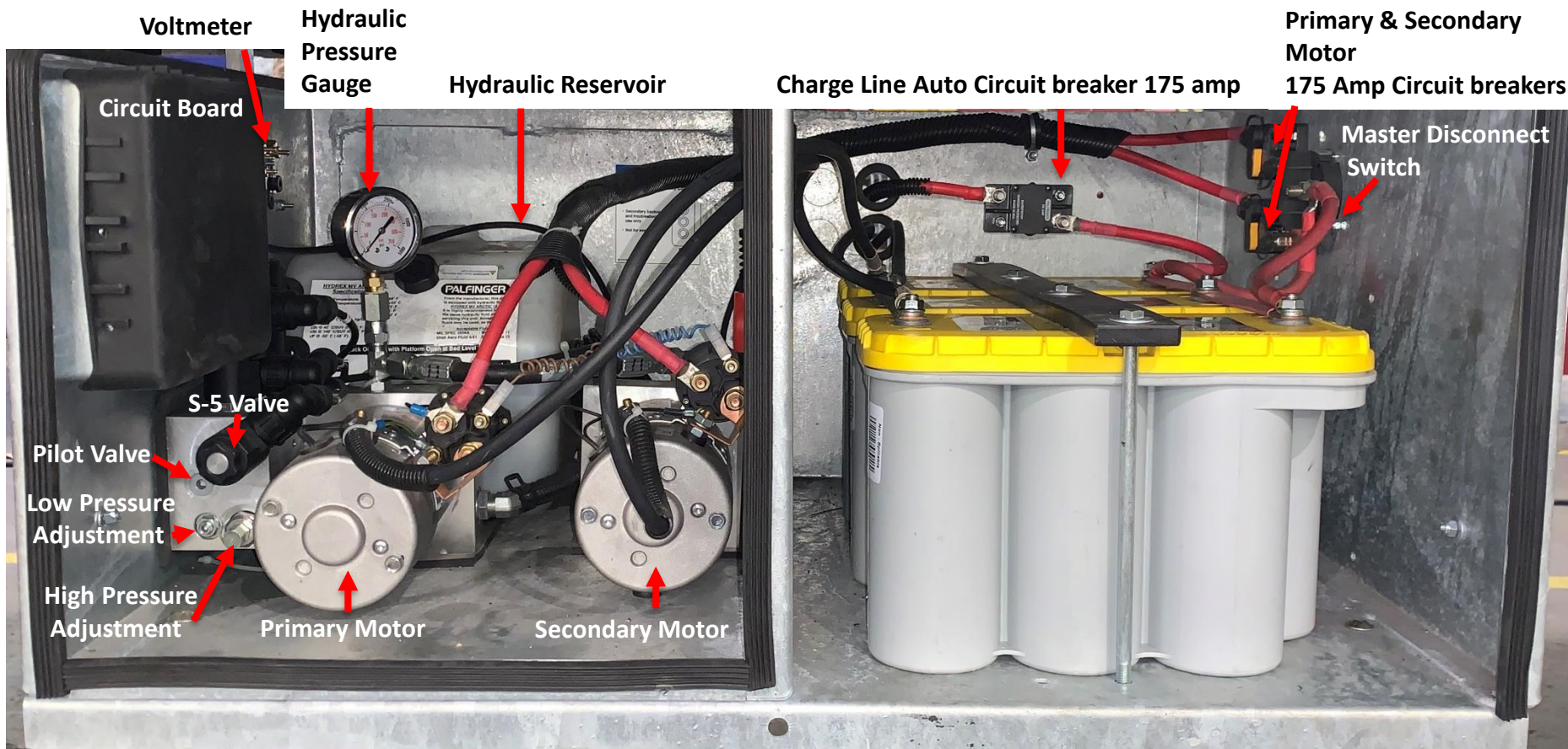


ECN M1099
1/5/18 Rev A

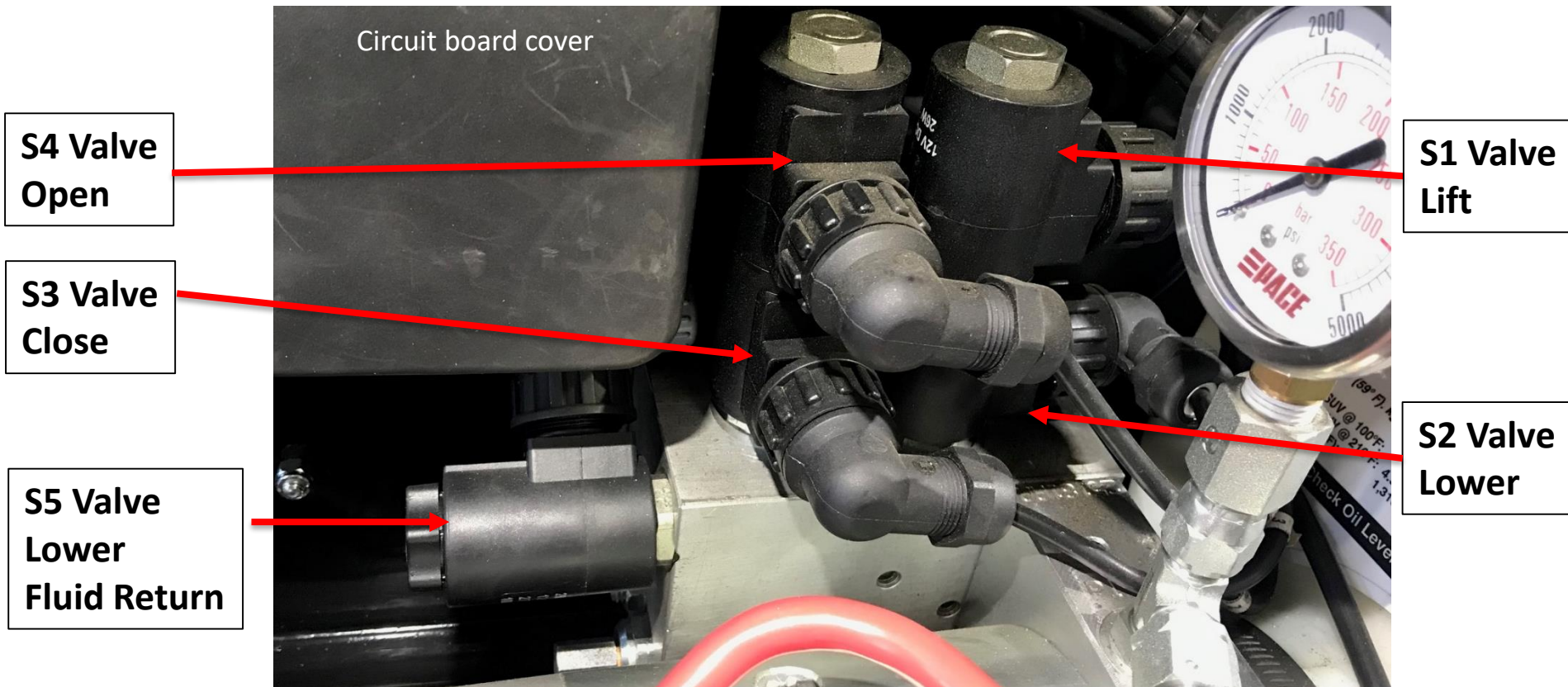
HYDRAULIC, SCHEMATIC, ILD
BUCHER PUMP
90-1118-001 18-680_90-00_00-01



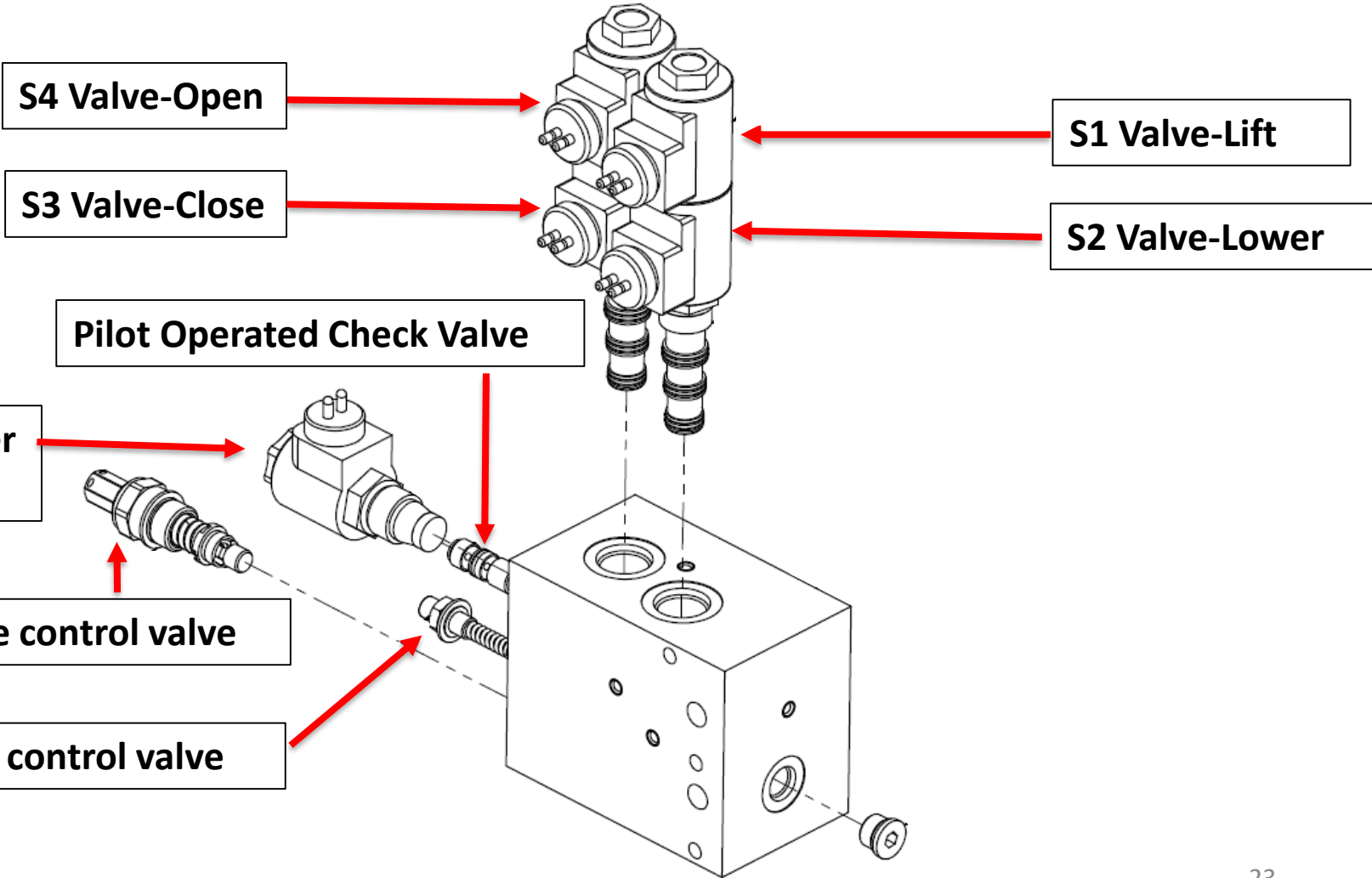
PTV Pump Box Components



PTV Pump Valve Setup

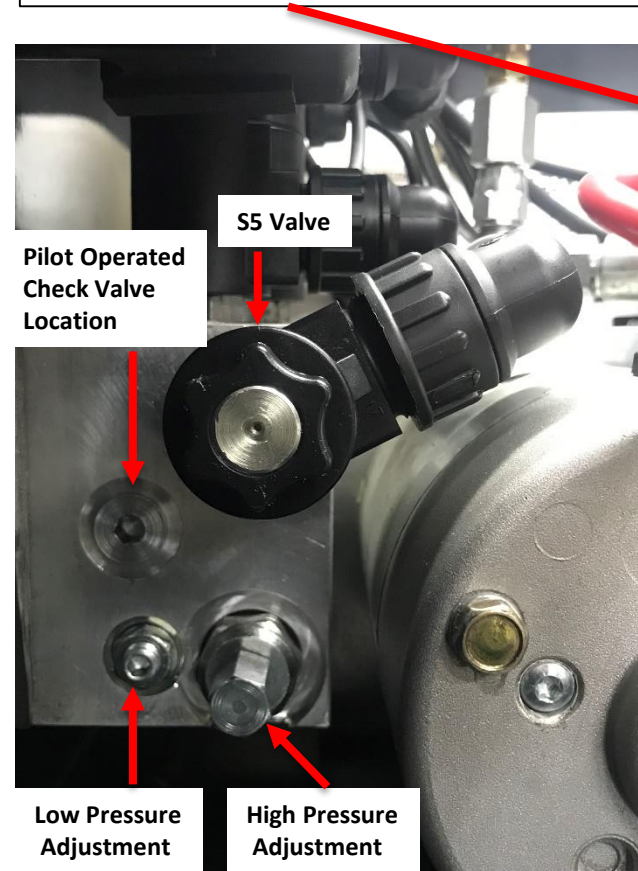


PTV Primary Pump Valve Block Setup



PTV Primary Pump Valve Block Setup Location of Pilot Operated Check Valve for Open & Close

Pilot Operated Check Valve located behind ¼" Allen plug use needle nose pliers to remove



PTV Electrical Control



LED flashes green when OK



LED flashes red when a fault exists



LED in lower left corner shows code for fault

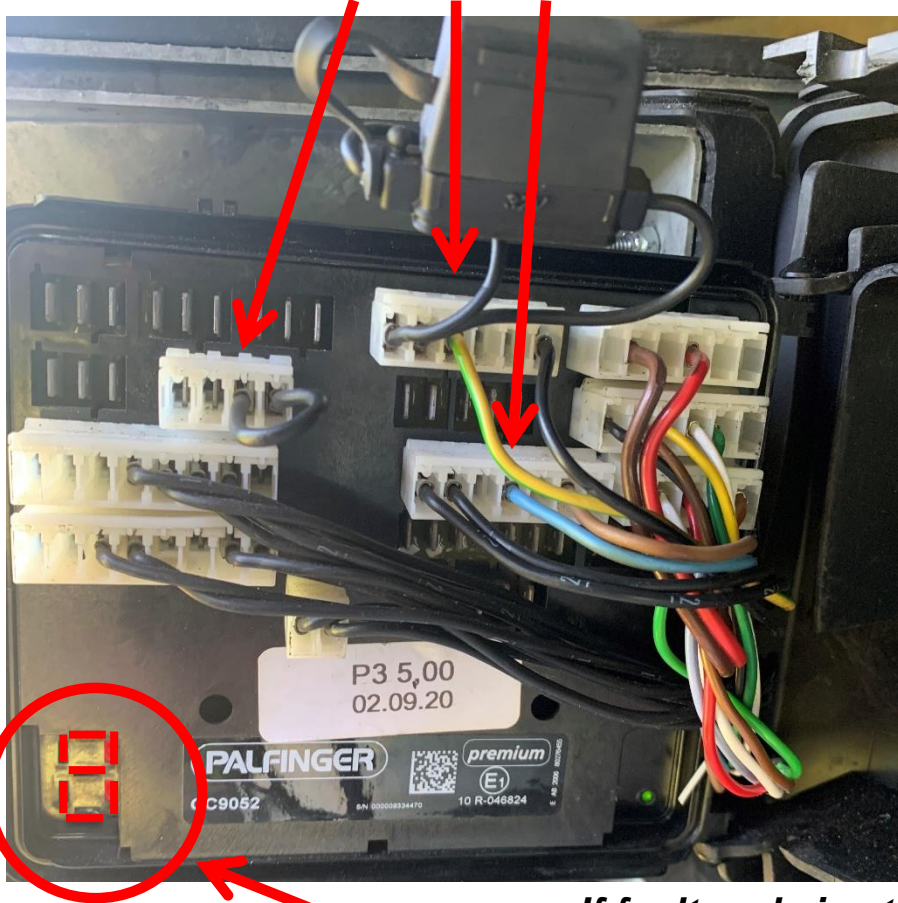
PTV Circuit Board – M Control Fault Codes

Code:	Description	Reason:	Solution 1:	Solution 2:	Solution 3:	Solution 4:	Solution 5:
0	System OK / control system: OFF	System OK / control system: OFF	System OK / control system: OFF				
1	System OK / control system: ON	System OK / control system: ON	System OK / control system: ON				
2	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	-	-
7	Short in Cab Switch /On Off switch or Aux port	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			-	-
8	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	Repair cables, connections,check for burnt crushed wires	Short in motor solenoid	Replace motor solenoid
9	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 Thermo switch inside motor : Bypass and test , replace Thermo switch		-
A	Fuse 15A damaged on power pack (J1 Pin2).	Defective fuse J1 pin 2	Check fuses at power pack	Check fuse holder replace fuse with same amp fuse	-	-	-
b	Defective motor solenoid	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		Check ohm reading of the coils	Change coils or cables
c	During operation , an error on the motor solenoid	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		Check ohm reading of the coil motor solenoid	Change coils or cables
P	Error diagnostic mode active.	Attached service plug	-	-	-	-	-
	TO CLEAR CODE : UNPLUG J-11 AND PLUG BACK IN						26

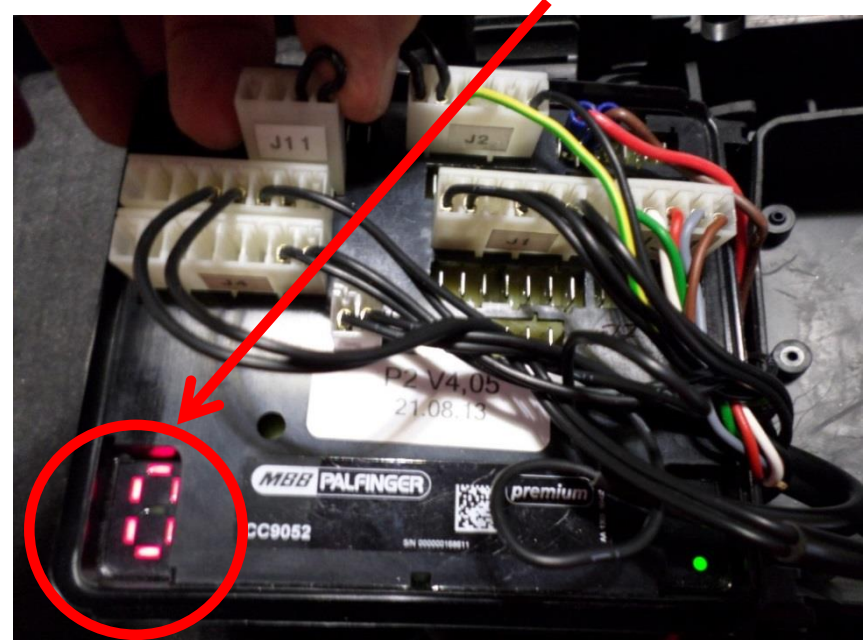
Clear Fault Code on MBB Control Circuit Board

NOTE: Always start with turning the Master switch off first and make sure the fault code goes off showing Power for Circuit Board is connected correctly, This may also clear the code.

Remove these plugs J-11 & J-2 & J1 from Circuit Board



Reconnect plugs in this order on Circuit Board.
First J-1 plug, Second J-2 plug, Third J-11 plug.
Digital display should read 0 then go to 1.



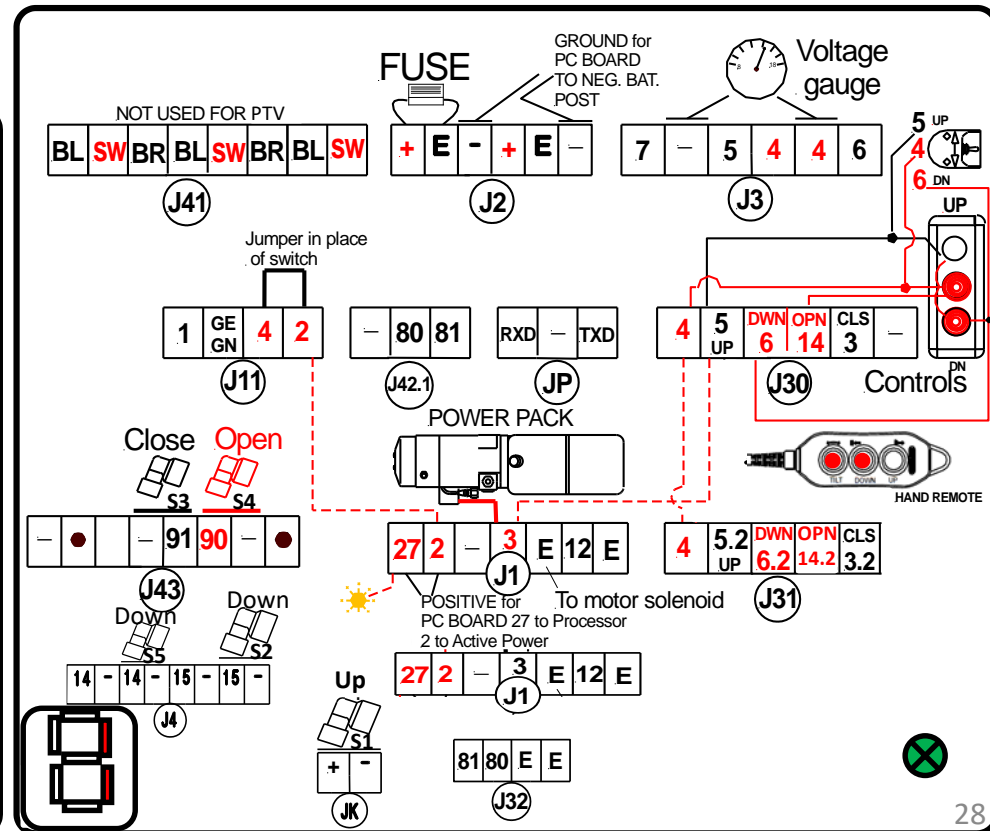
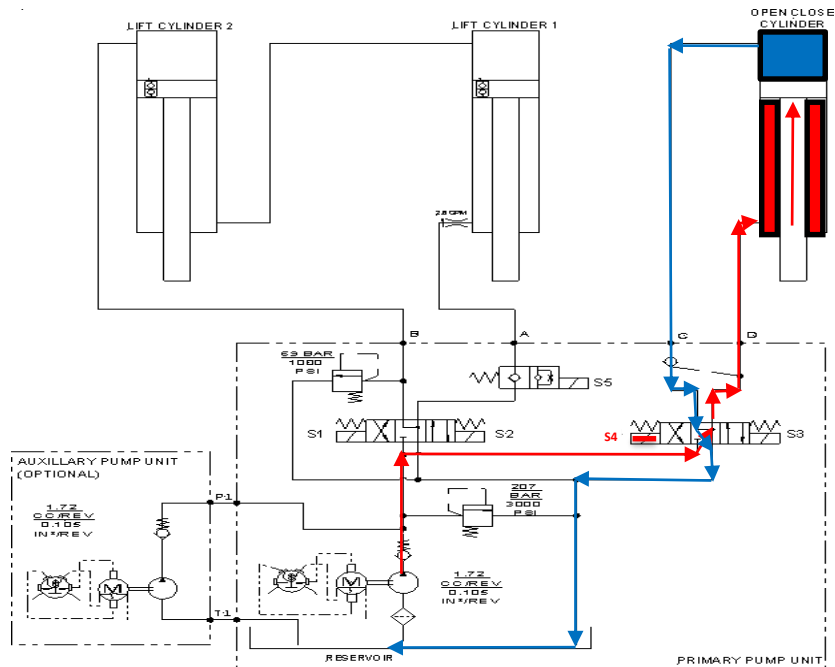
If fault code is still displayed after plugging in the J-11 plug, a fault still exists in the system. Continue corrective action to determine fault.

PTV-Electric/Hydraulic Function

Open Platform

1. S4 Valve open
2. One Motor Runs
(Selected by PC Board)

LIFT CYLINDERS NOTE: ROADSIDE CYLINDER LARGER DIAMETER

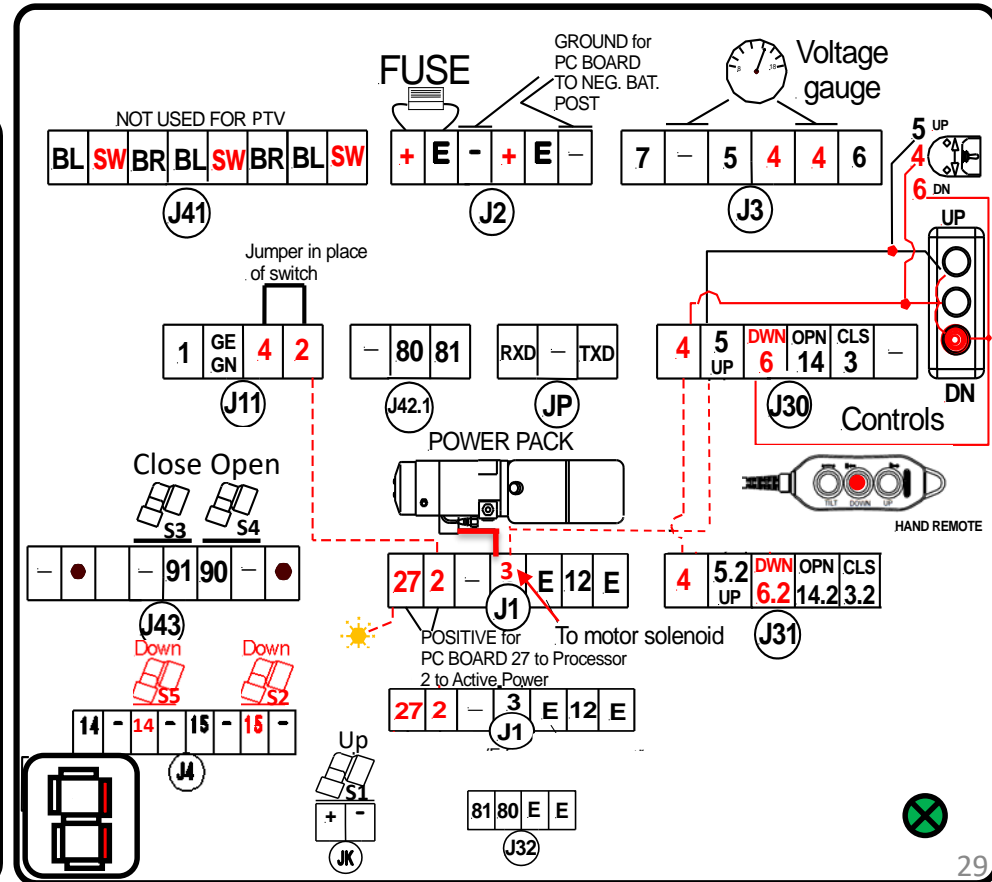
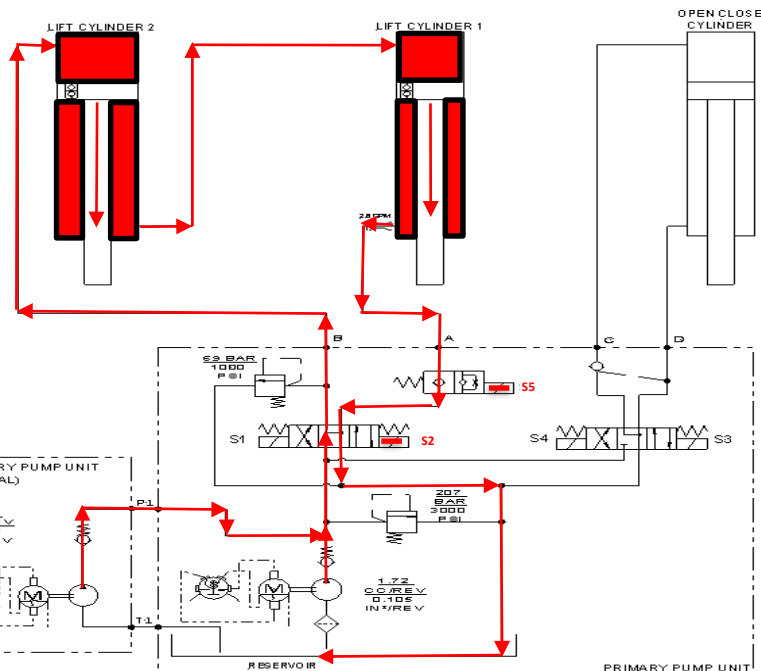


PTV-Electric/Hydraulic Function

Lower – Power Down

1. S2 & S5 Valve Open
2. One Motor Runs
(Selected by PC Board)

LIFT CYLINDERS NOTE: ROADSIDE CYLINDER LARGER DIAMETER

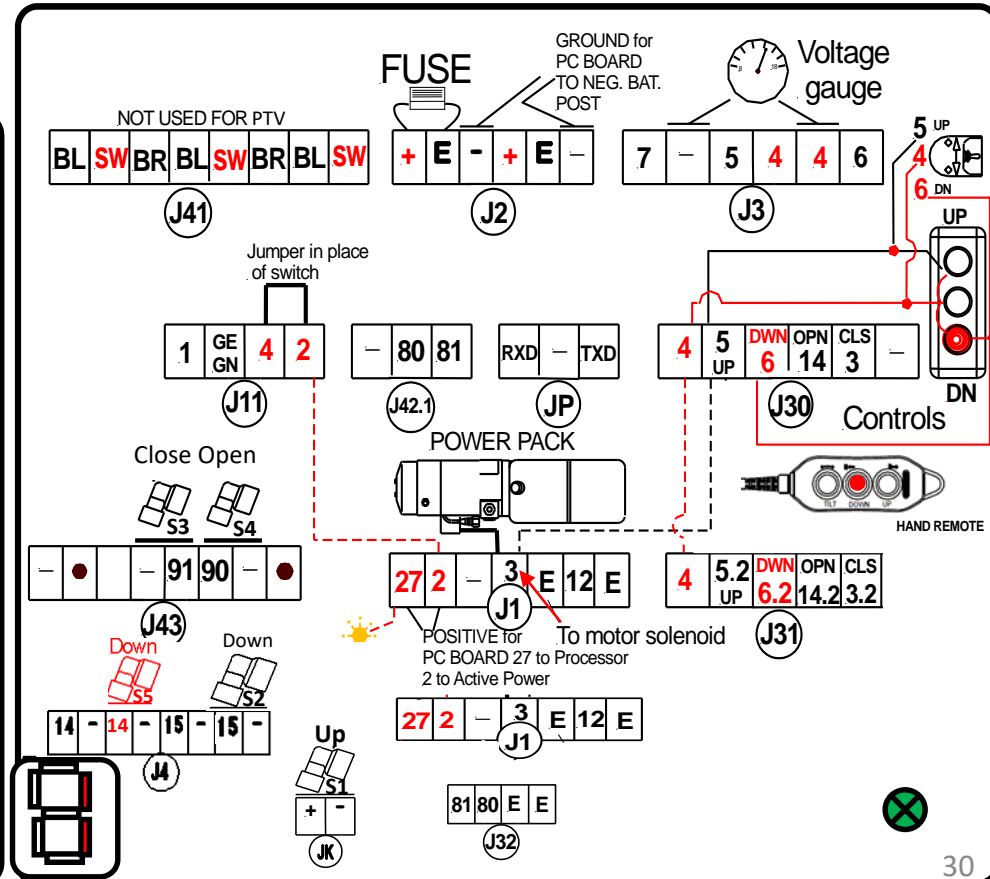
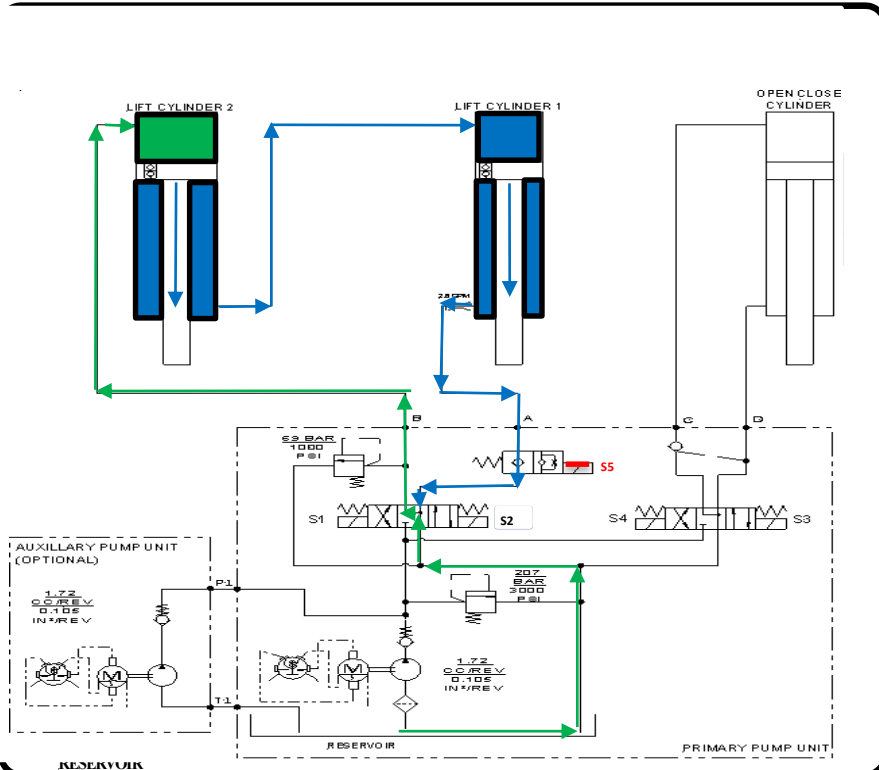


PTV-Electric/Hydraulic Function

Lower – Gravity Down

1. S5 Valve Open

LIFT CYLINDERS NOTE: ROADSIDE CYLINDER LARGER DIAMETER

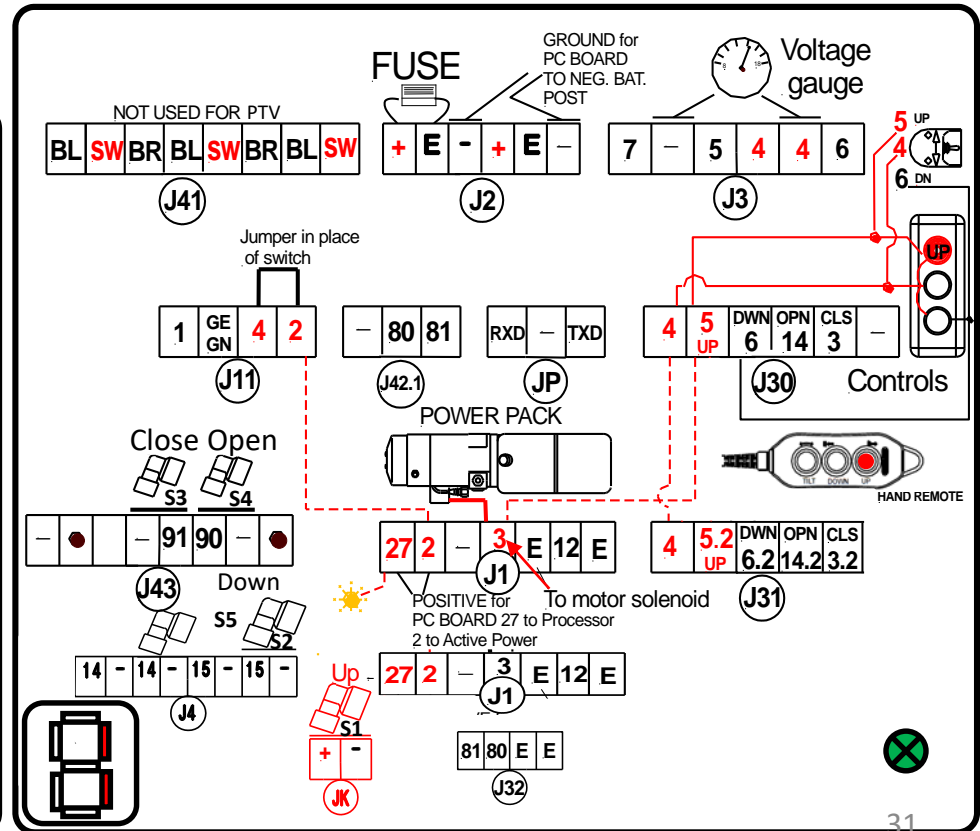
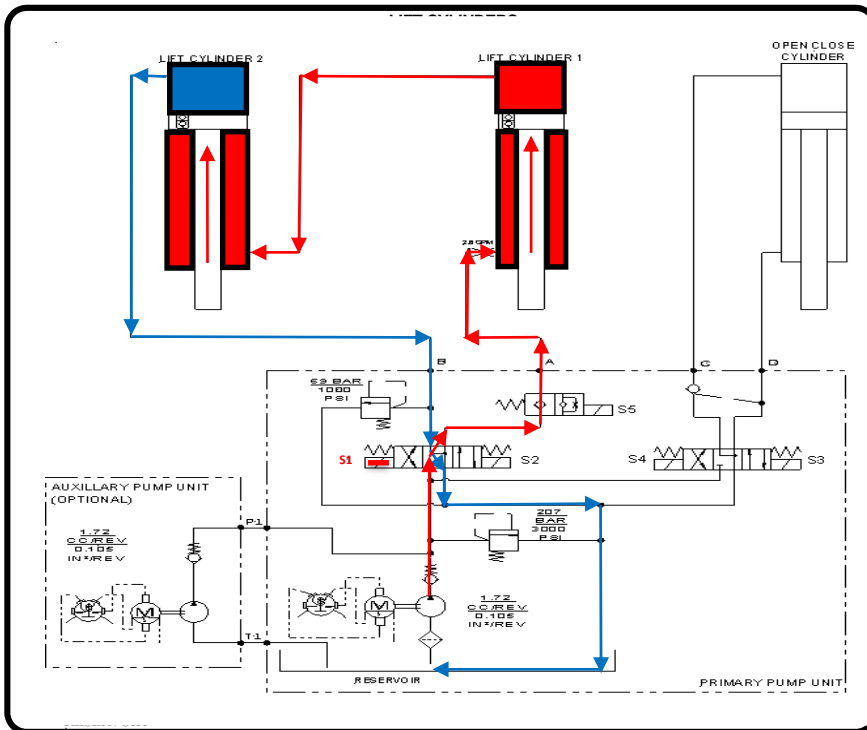


PTV-Electric/Hydraulic Function

Lift

1. S1 valve open
2. Both Motors Run

LIFT CYLINDERS NOTE: ROADSIDE CYLINDER LARGER DIAMETER

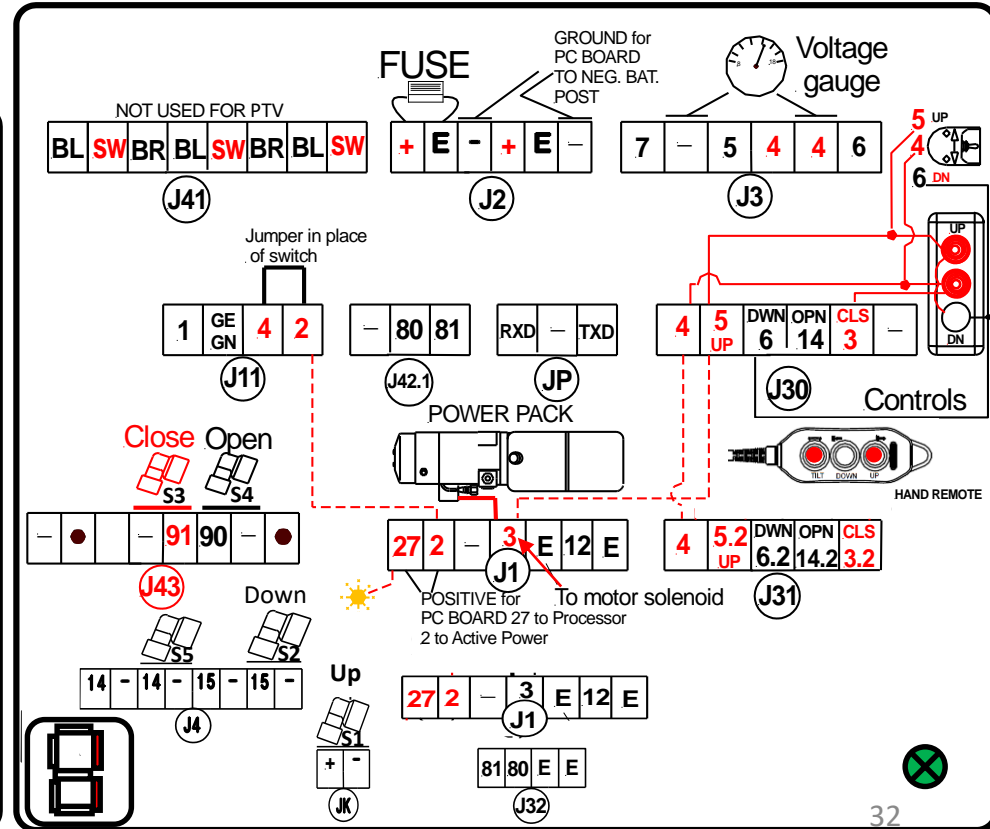
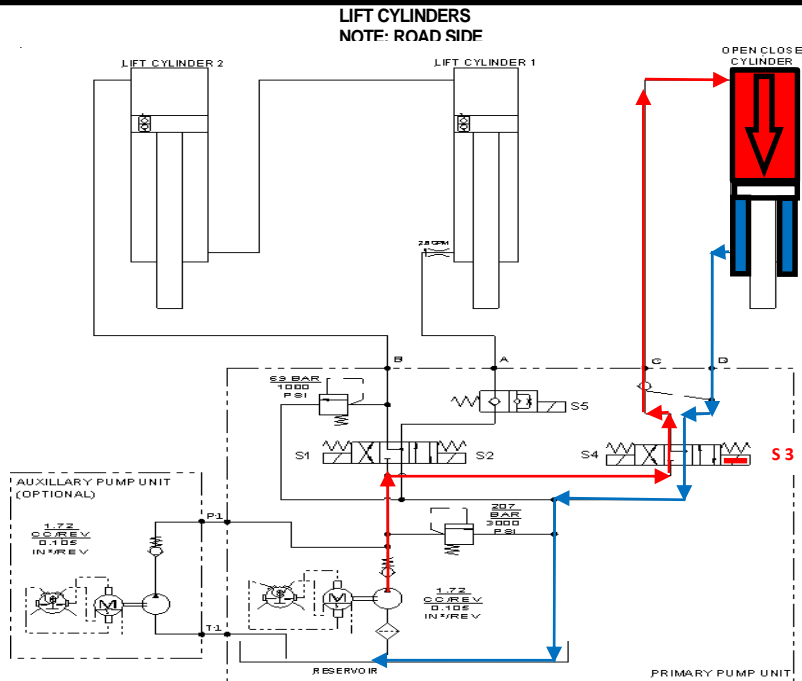


PTV-Electric/Hydraulic Function

Close Platform

1. S3 Valve Open
2. One Motor Runs
(Selected by PC Board)

LIFT CYLINDERS NOTE: ROADSIDE CYLINDER LARGER DIAMETER



How to check coils for resistance

Set voltmeter to OHM function.

Place a probe on each node of coil.

If reading shows	5.5. to 7.0Ω	Coil is good
If reading shows	.0Ω	Coil is shorted out. Replace.
If reading shows	.Overload	Coil is damaged by burn or physical damage. Replace.



How to check for broken wire inside cable for solenoid valve

Set voltmeter to OHM function.

Place one of the leads on one end of the circuit. Place the other lead on the other end of the circuit.

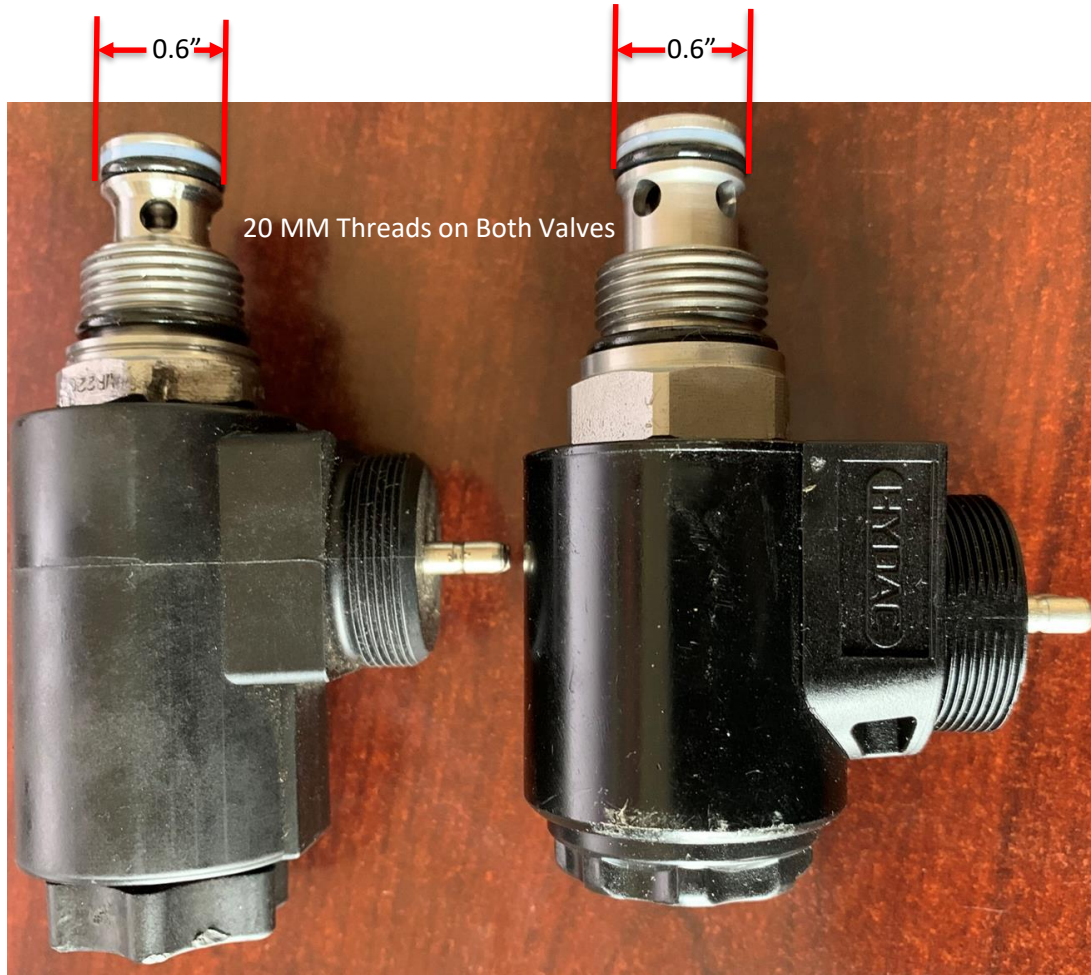
Listen to see if the voltmeter beeps if it has this function; this indicates that the circuit is connected and complete.

Check the display to see if it has a value or reads "O.L." If there is a value displayed, this confirms continuity and a complete circuit.

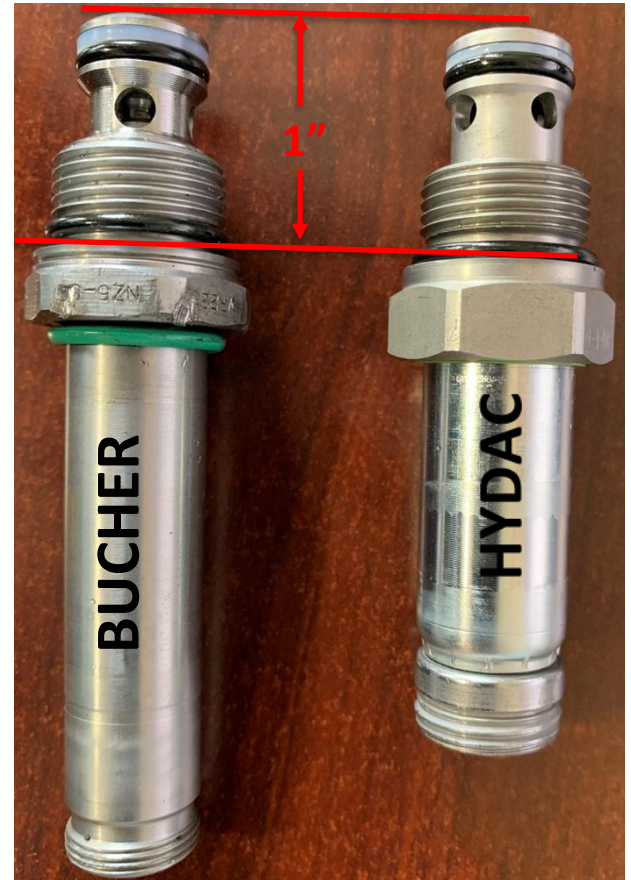
If the display reads "O.L." and the ohmmeter does not beep, then the circuit is incomplete and there is no continuity. The primary cause for a lack of continuity is the wire being broken somewhere along its length.

Bucher S5 Valve Comparison to Hydac Single Release Valve

The stem in the Bucher is longer and the Coil itself is longer but both valves interchange

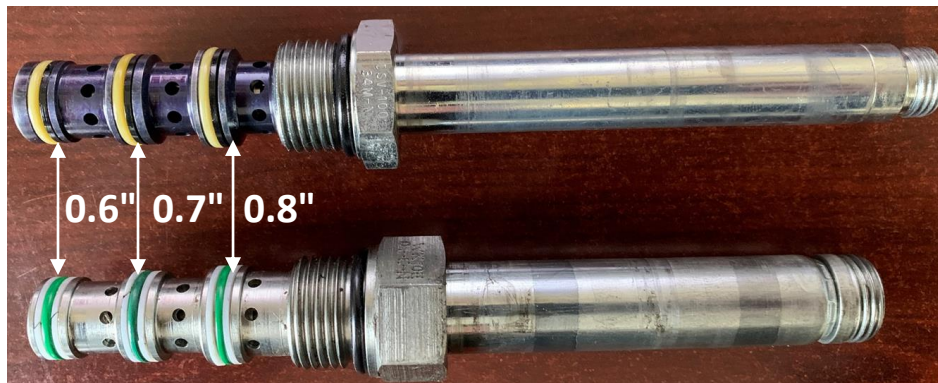
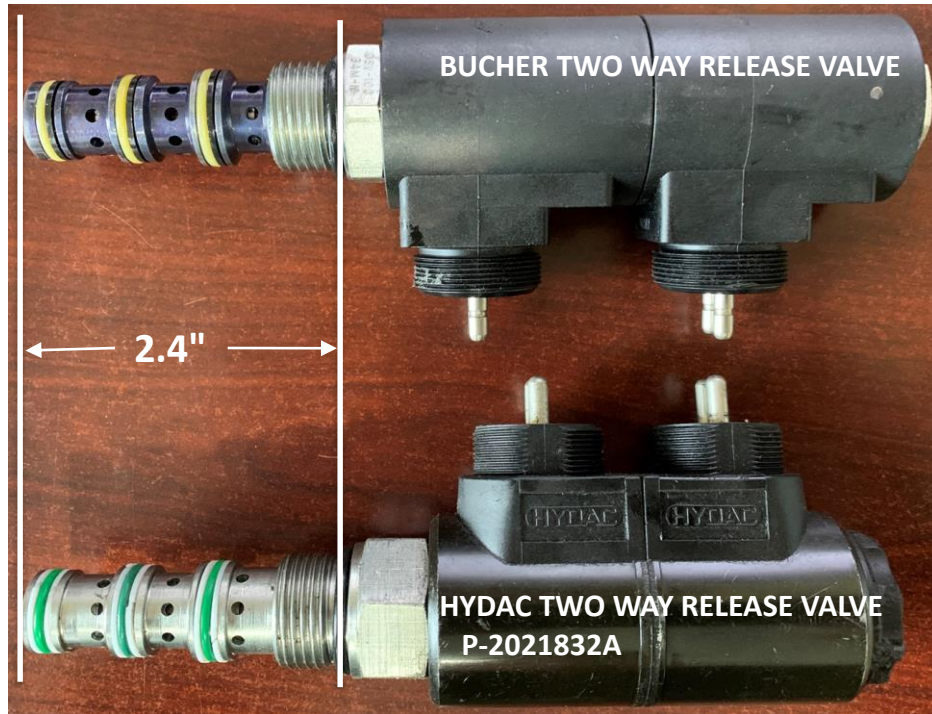


Hydac Single Lock Release Valve
Palfinger Part # P-67282345



Bucher Two Way Release Valve Comparison to Hydac Two Way Release Valve

The stem in the Bucher is longer and the Coil itself is longer but both valves interchange



First Inspection, Lift Gate Condition

- 1) Damage to lift gate : Broken or Missing Parts .
- 2) Battery connections clean and tight , No corrosion.
- 3) Lift gate wiring clean and tight , No damage , No corrosion.
- 4) Burnt fuse , Tripped circuit breaker.
- 5) All plugs in correct location on PC board , No corrosion .
- 6) Pins greased , Hydraulic oil tank full.

**The above items are not Warranty related and fall under Maintenance.
Trouble Shooting begins after 1 thru 6 are checked and corrected.**

**Customer need to be advised of corrective actions needed .
Before any Warranty work is performed**

TROUBLESHOOTING SECTION

BEFORE DOING 10 -10 TEST :

- 1. SHUT OFF TRUCK ENGINE.**
- 2. UNHOOK CHARGE COIL FROM TRACTOR .**
- 3. SHUT OFF BATTERY CHARGER .**
- 4. DISCONNECT ANY OUTSIDE BATTERY SOURCE.**

CONFIRMING BATTERY VOLTAGE WITH 10 -10 TEST :

USING A MULTIMETER , SET ON DC VOLTAGE .

ATTACH VOLT METER NEGATIVE , TO NEGATIVE POST ON MOTOR

ATTACH VOLT METER POSITIVE , TO 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 READING

TEN (10) VOLTS FOR TEN (10) SECONDS IS THE DESIRED RESULT

IF 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

LIFT GATE NOT WORKING

HEAR SOLENOIDS CLICKING

1. CHECK CIRCUIT BREAKER AT BATTERIES
2. GO TO : MOTOR NOT RUNNING

HEAR NO SOLENOIDS CLICKING

1. CHECK FUSES AT PC BOARD
2. CHECK FOR BAD SWITCHES
3. CHECK FOR BAD MOTOR SOLENOID
BAD SOLENOID VALVE

MOTOR NOT RUNNING

1. JUMP ACROSS LARGE POSTS ON MOTOR SOLENOID
IF MOTOR RUNS , TEST FOR INCOMING SIGNAL ON SMALL TERMINAL
AND GROUND ON OTHER SMALL TERMINAL
TEST THERMO SWITCH IN MOTOR FOR CONTINUITY
SIGNALS GOOD , REPLACE MOTOR SOLENOID
2. JUMP ACROSS LARGE POSTS ON MOTOR SOLENOID
IF MOTOR DOES NOT RUN , JUMP MOTOR DIRECT WITH
JUMPER CABLES FROM SEPARATE GOOD BATTERY
 - 2.a. MOTOR NOT RUNNING , TAP ON MOTOR , MOTOR RUNS , BRUSHES ARE
BAD
 - 2.b. MOTOR RUNS , CHECK MOTOR GROUND AND POWER TO MOTOR
SOLENOID

LIFT GATE NOT WORKING

TURN ON CAB SWITCH , TRUCK
TURN ON ,SWITCH AT LIFTGATE, TRAILER

CIRCUIT BREAKER FOR MOTORS

CHECK FUSE AT MASTER SWITCH

UNPLUG J30 CONNECTIONS ON PC BOARD:
J-30 MAIN CONTROL AND TOGGLE SWITCH
TRY OPERATIONS WITH HAND CONTROL REMOTE IN PUMP BOX
IF OPERATIONS ARE OK PROBLEM IN J30 HARNESS OR SWITCHES

M CONTROL CHECK FAULT CODES
CLEAR CODE , UNPLUG J-11 & J-1 -PLUG BACK IN

FAULT CODES:

# 1	LIFTGATE ON
# 0	LIFTGATE OFF
# 2	LOW VOLTAGE
# 8	SHORT
# 9	DEFECTIVE MOTOR SOLENOID DURING LIFTING
# A	15AMP DAMAGED FUSE AT MASTER SWITCH
# B	DEFECTIVE MOTOR SOLENOID
# C	DURING OPERATION ERROR AT MOTOR SOLENOID
# P	ERROR DIANOSTIC MODE ACTIVE

LIFT GATE NOT LIFTING

S1 VALVE NOT OPENING ALONG WITH MOTOR

LIFT GATE NOT LOWERING (GRAVITY DOWN)

S-5 VALVE NOT OPENING

LIFT GATE NOT LOWERING (POWER DOWN)

S-2 AND S-5 VALVE NOT OPENING ALONG WITH MOTOR

LIFT GATE NOT OPENING UP

S-4 VALVE NOT OPENING ALONG WITH MOTOR

OR CHECK RESTRICTOR AT OPEN AND CLOSE CYLINDER

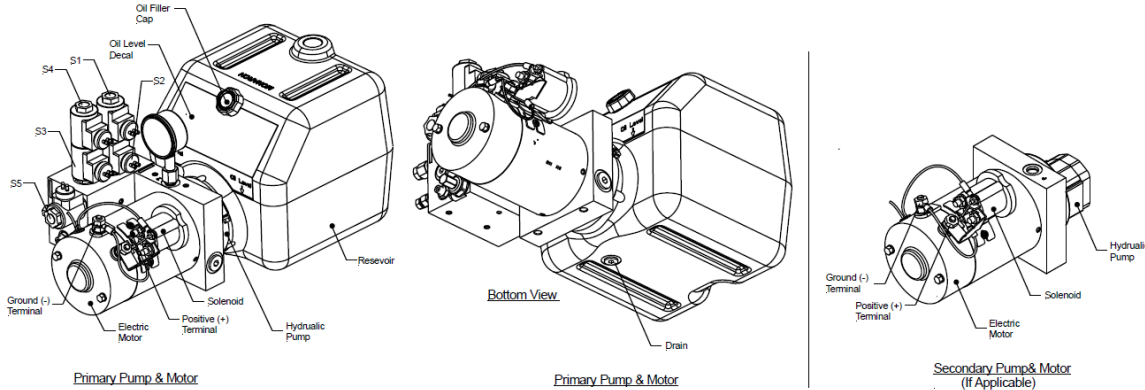
LIFT GATE NOT CLOSING

S-3 NOT OPENING ALONG WITH MOTOR

OR CHECK RESTRICTOR AT OPEN AND CLOSE CYLINDER

Checking and Changing the Oil

1. Remove the hydraulic enclosure cover.
2. Check Oil quality. If bad, follow next steps.
3. Open the platform to bed level. Remove the Oil Filler Cap.
4. Use a pump to remove the old oil. Catch the fluid in an adequate container. DO NOT disconnect any hydraulic hoses. Responsibly dispose of the old hydraulic fluid.
5. Fill up the Oil Reservoir with approved oil and secure the Oil Reservoir Cap. Maintain the fluid level to the indicated marking on the Oil Level Decal. See next page for recommended oil.
6. Operate the gate through 3 cycles to disperse the oil.
7. Reinstall the oil filler cap and the hydraulic enclosure cover.



All PTV liftgates come with Hydrex MV Arctic 15 hydraulic fluid.

When changing fluids, it is highly recommended to use Hydrex MV Arctic 15 fluid, however, the alternatives fluid brands listed below can be used.

Hydraulic Fluid Installed from Factory	
Property	HYDREX MV ARCTIC 15
Start Up Temperature	<50°C / -58°F
Operating Temperature	-45°C to +23°C / -49°F to 73°F
Pour Point	-57°C / -71°F
Flash Point	128°C / 262°F
Density 15°C (59°F). kg/L	0.834
Viscosity:	
cSt @ 40°C/SUV @ 100°F	13.0 / 69.7
cSt @ 100°C/SUV @ 210°F	4.95 / 42.5
cP @ -50°C (-58°F)	1,310

Alternative Fluids	
Temperature Range	Fluid Brand
30° TO 150°F	EXXON UNIVIS J26
	MOBIL DTE 13M
	CHEVRON AW MV32
	ROSEMEAD MV 150 (32)
-50° TO 150°	MOBILE DTE 11
	SHELL AERO FLUID 4/41
	SHELL TELLUS 15
Extreme Cold Temperature	MIL H5606 (Military Spec.)

Bleeding Hydraulic System

All Palfinger Liftgates have Vented caps on Reservoir and will Push air in Hydraulic System back to Reservoir and out vented cap by just running the liftgate through normal cycles and keeping Hydraulic fluid at the proper level in Reservoir during this process.

Preventative Maintenance and Quick Check

The PTV needs preventive maintenance in order to achieve maximum performance. Lubricate and inspect regularly. Also, check that there are no damaged components such as hoses, cables, controls, etc.

1. Operate the liftgate throughout its entire cycle and check for noise and damage such as bent parts, scratches, or cracked welds.
2. Inspect all welds and fasteners that attach the mount frame to the truck.
3. Check all pin retainer lock bolts for tight fit.
4. Visually inspect the hydraulic hoses for damage, scratches, bending or leakage. Also ensure that hoses are not routed such that rubbing/wear on the hoses will occur- hoses should be securely fastened, not loose.
5. Inspect the cylinders for leakage and make sure the cylinder pins are secured.
6. Check the oil level when platform is down. The level should be approx. 1.5" below the top of the Oil Reservoir. PALFINGER Liftgates recommends replacing oil after the first 500 cycles, and then on a yearly basis in the fall before winter begins.
7. Check for oil leakage around the power pack. 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 to self-bleed the lift cylinders. Run the gate all the way up and down to remove air from the fluid.
8. Check all electrical connections. Clean the battery terminals.
9. Inspect all terminals on the solenoid-operated valves at the port of the cylinder. Lubricate the terminals with dielectric grease for better protection from corrosion, if needed.
10. Grease all zerks and link arms on the liftgate per the lubrication instructions and make sure that they all accept grease. It helps to operate the liftgate while you do this.
11. Test all liftgates functions, if possible, with maximum loads placed according to load diagram.
12. Check the function of the pressure relief valve.

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 Liftgate is to maintain it through preventive care.

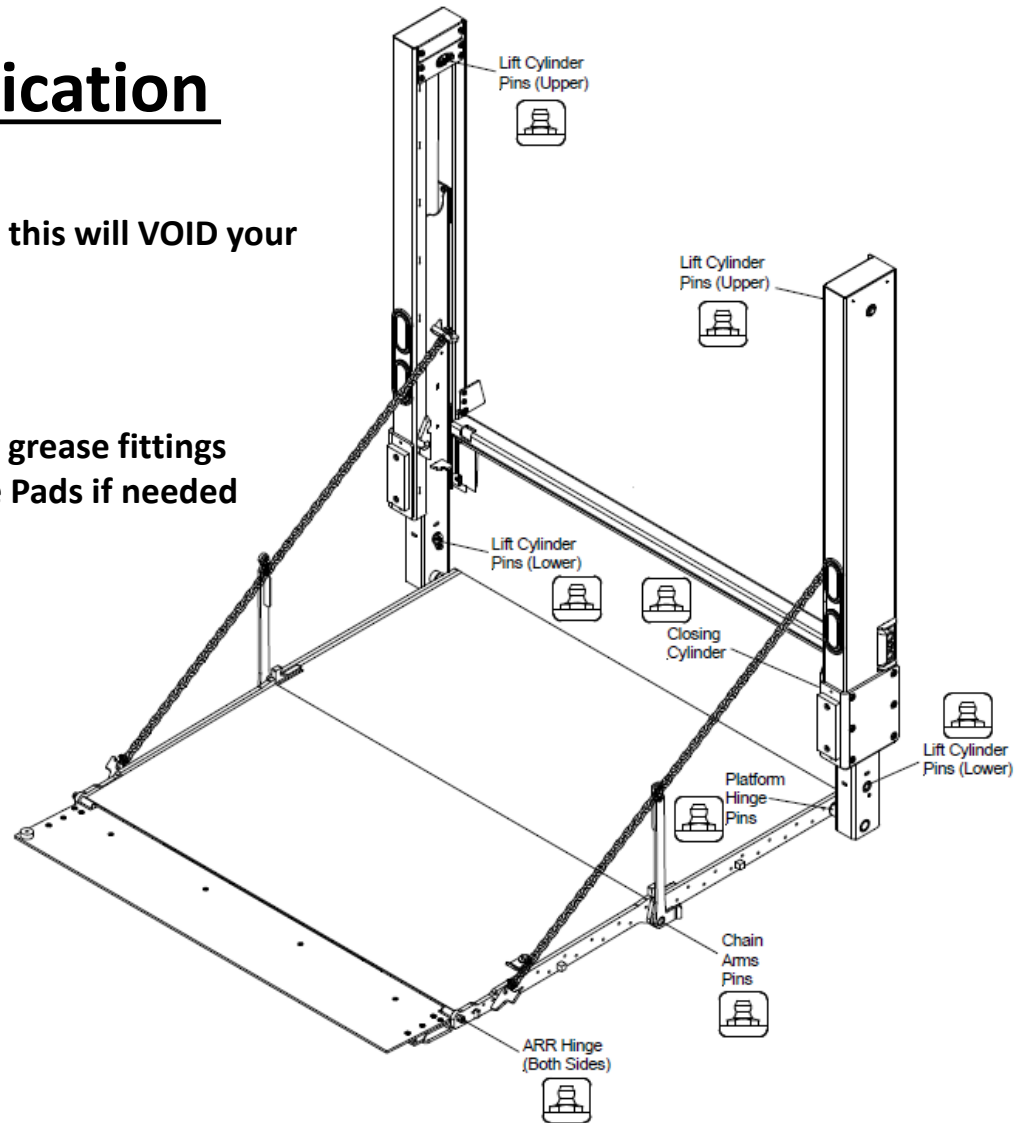
* Recommended bases for inspection and maintenance	Depending on use	Daily	Monthly	Quarterly
cleaning	x			
general lubrication of pins and bushings				x
oil level inspection			x	
oil change	x(yearly)			
check hydraulic hoses and pipes for leaks		x		
check controls and connections				x
check pins and pin 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 un-usual noise during operation		x		
check lock bolts for tightness				x
check complete function of gate		x		
check support chains			x	
check all welds			x	
Check all fasteners			x	
Lubricate grease fittings			x	

Lubrication

CAUTION

DO NOT grease the Slide Pads or Columns or Runners, as this will **VOID** your **WARRANTY** on the Slide Pads.

- . Liftgates with Fixed Ramps have 10 grease fittings
- . Liftgates with Aluminum Retention Ramp (ARR) have 12 grease fittings
- . Use WD-40 or 0W20 motor oil on hinge points and Slide Pads if needed



Proper lubrication will help ensure a long trouble-free service life for the PALFINGER PTV. Therefore, the lift-gate should be lubricated at the same time as the truck/trailer. Grease more frequently if the lift gate is heavily used or whenever the pivot points appear to be dry. Average PTV use is considered 25 cycles per day or 500 cycles per month. Lubricate the gate at least every 3 months or 1500 cycles, whichever comes first.

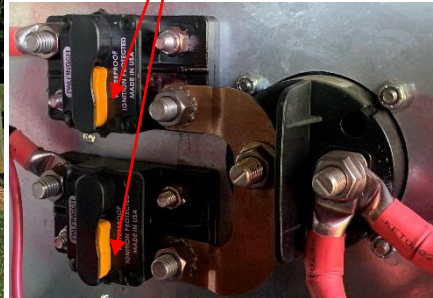
PTV-PREVENTIVE MAINTENANCE GUIDELINES

- 1) Visual check of Liftgate for mechanical damage (bent or broken parts)
- 2) General function check
 - Cycle Liftgate through every function to make sure Liftgate is working correct
 - Lift, Lower, Open, Close – Lower for Dock Loading



- 5) Check all connections for tight fit and corrosion protected terminals

Yellow Lever on resettable Circuit Breakers for Motors



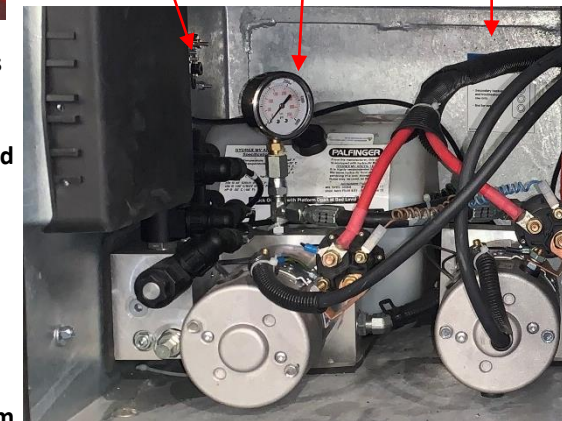
- 6) Check motor circuit breakers for
 - Tight and corrosion protected terminals
 - Tripped lever and push back in if necessary

- 7) Check power pack for hydraulic leaks
 - check fittings and hoses

- 8) Check all connections on Circuit Board
 - Tight fit and corrosion
 - Check power connections at motor solenoids and fuse for Circuit Board

- 9) Check oil level in Reservoir, full level line displayed on decal on front of Reservoir
 - Check oil level with Liftgate Platform Open and at full up position.

Voltage Gauge Pressure Gauge Remote Control



Reservoir has access hole and Drain Plug for changing oil under Pump Box

PTV-PREVENTIVE MAINTENANCE GUIDELINES

Common hydraulic pressure on gauge.

Attention: A drop in Voltage under 10 Volts can indicate a low voltage situation

Open & Close 2700 – 3000 PSI



Lifting Up 1700 PSI



Power Down 1000 PSI

Gravity Down 0 PSI



Grease Fitting Locations

10) Check every lock bolt on pin plate for tight fit total of 8 lock bolts

Road Side Top Cylinder
Grease fitting



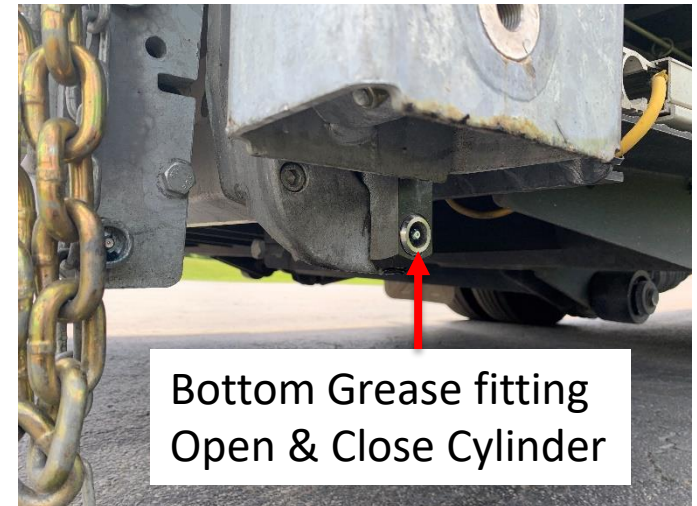
Curb Side Top Cylinder
Grease fitting



11) To grease center platform pins and bottom grease fitting in Open & Close Cylinder pin put platform in dock loading position and lower Platform to about six inches off ground to allow access to fitting



Total Grease
Fittings 12
With Alum
Retention
Ramp



Bottom Grease fitting
Open & Close Cylinder

PTV-PREVENTIVE MAINTENANCE GUIDELINES

Grease Fitting Locations

12) Check all chain attachment points make sure chains are adjusted even.

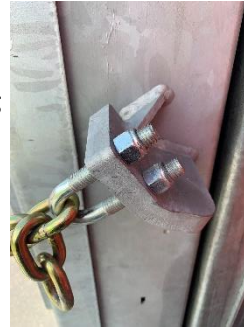
Road Side Bottom Cylinder Grease fitting & Platform Main Pin Grease Fitting



Curb Side Bottom Cylinder Grease fitting & Platform Main Pin Grease fitting & Top Open & Close Grease fitting



Road Side Top Chain U-Bolt



Curb Side Top Chain U-Bolt



Road Side U-Link



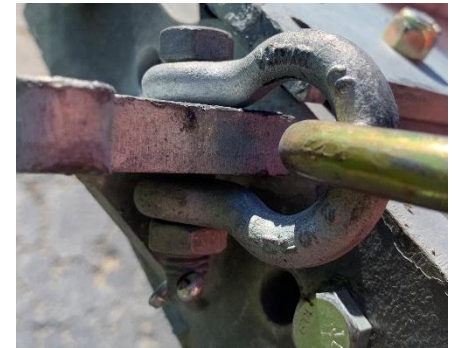
Curb Side U-Link



Road Side Retention Ramp Grease fitting



Curb Side Retention Ramp Grease fitting



Always Check that Lock nut and Cotter Pin are tight and Cotter Pin not damaged



LIFTGATES

TECHNICAL SUPPORT, PARTS & SERVICE CONTACTS

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