

SNOWDOGG® 1615200B SCHEMATIC REFERENCE VX PLOWS



Welcome

This manual is intended to aid in a better understanding of how the SnowDogg 16152000B vee blade hydraulic power unit operates for use in troubleshooting.

The 16152000B power unit is used on all SnowDogg vee plows and is fully backwards compatible. The VUT vee plow uses a smaller reservoir, but the rest of the power unit is identical.

Power unit operation relies on clean oil, properly functioning valves, and good electrical connections. Before doing extensive troubleshooting, check and clean all connections and make sure that the hydraulic fluid is clean and properly filled.

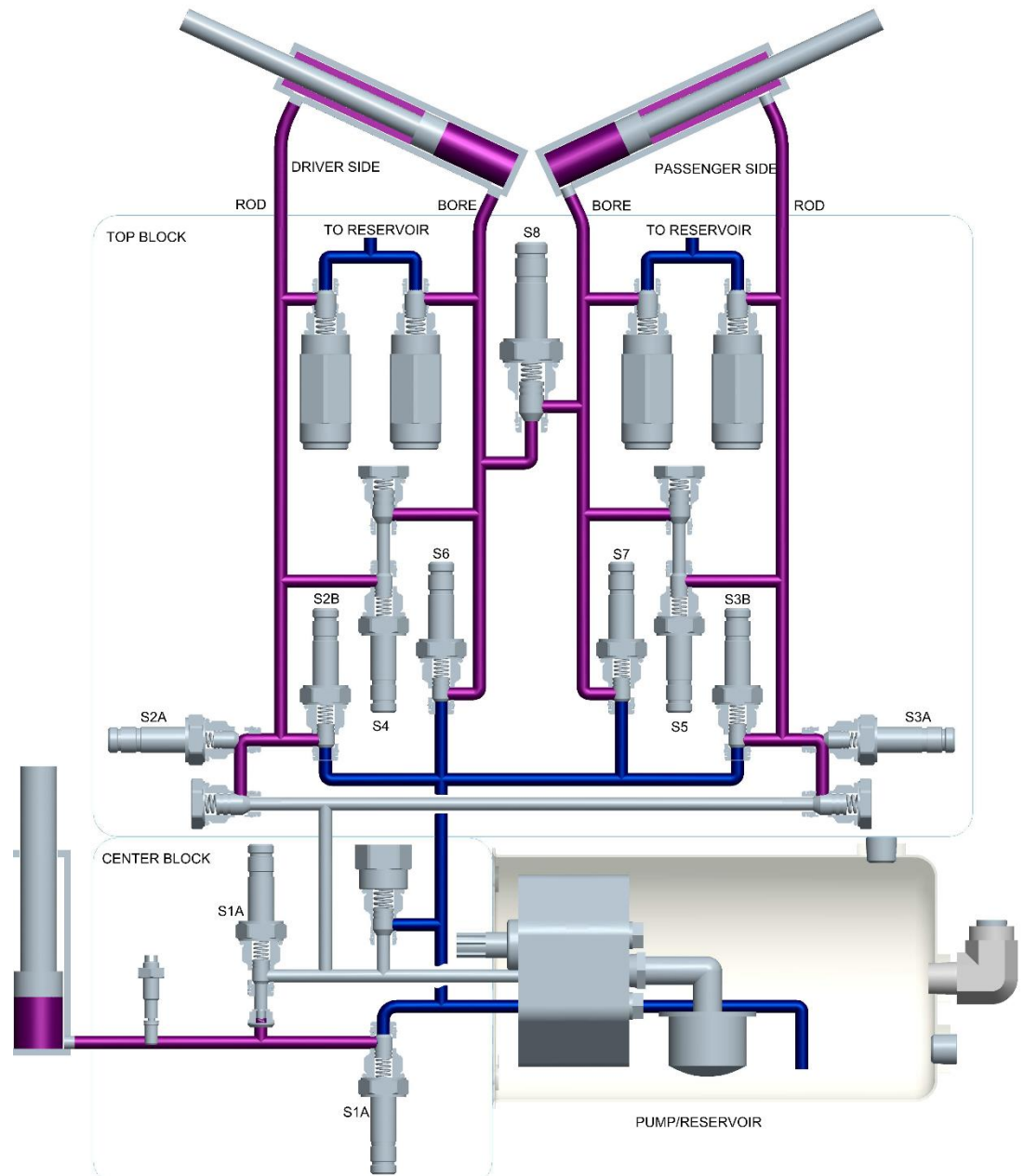
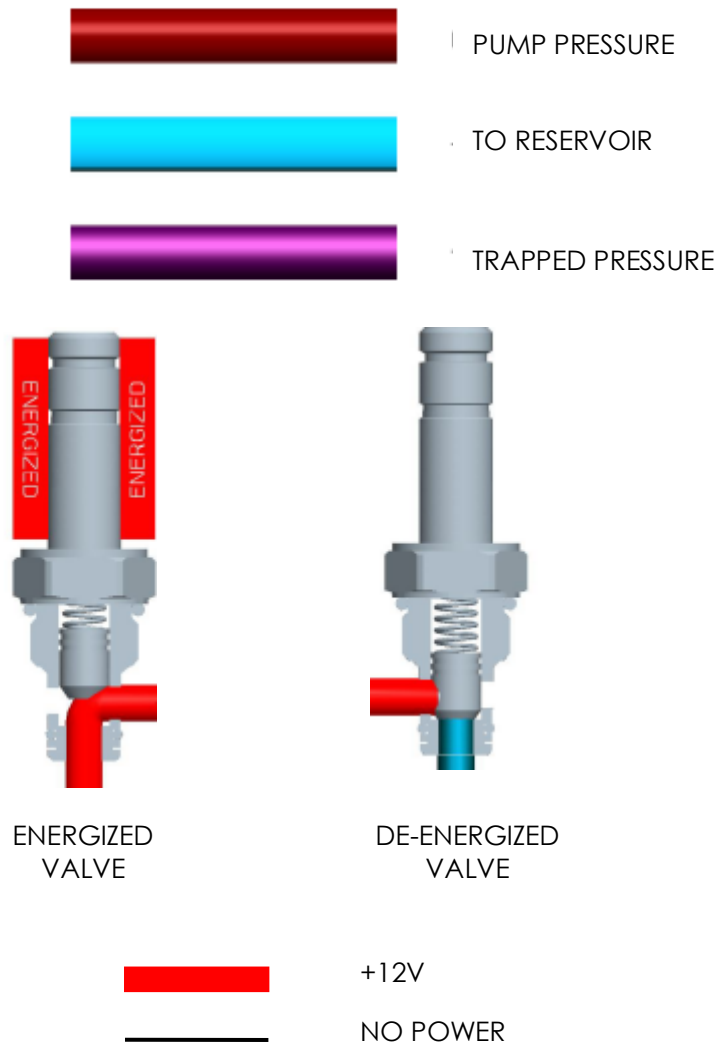
Cartridge valves are not intended to be serviced beyond cleaning and seal replacement. It is recommended to replace a valve that shows any signs of damage or distortion. Pressure spikes from plowing can cause the solenoid to stick without resulting in any visible damage.

It is often much faster to replace a valve than it is to do extensive troubleshooting.

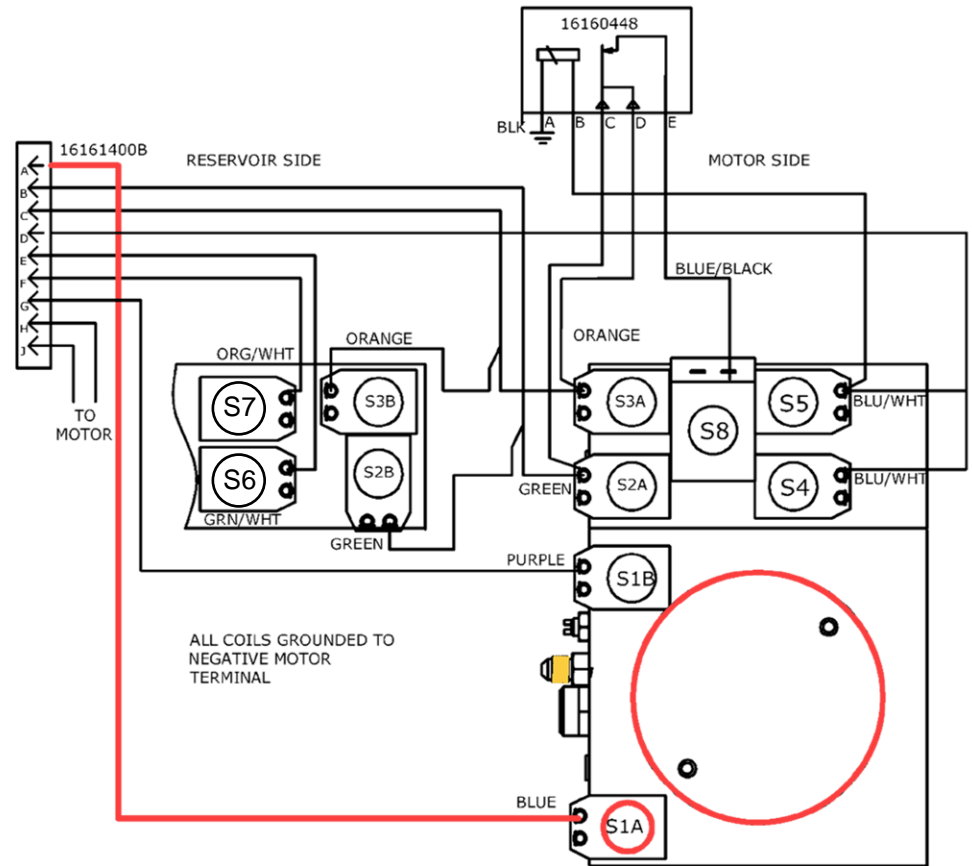
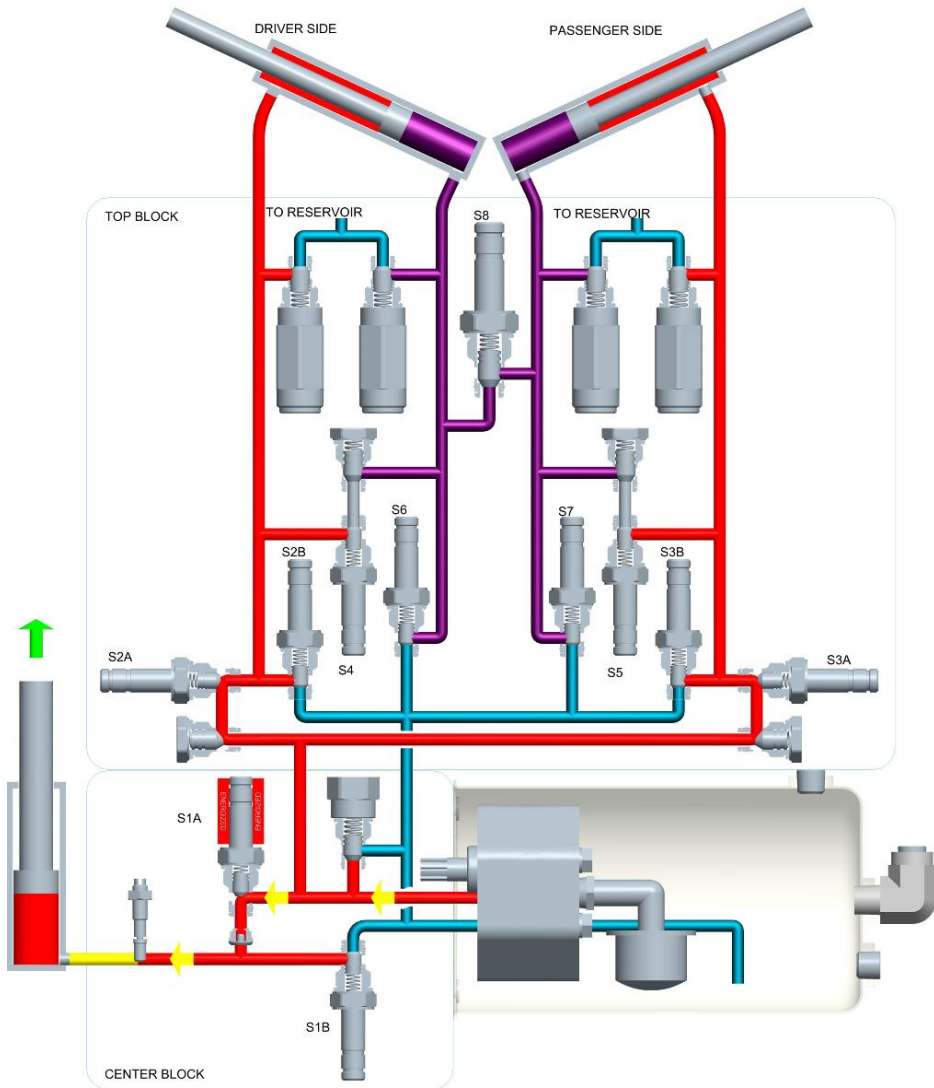
SCHEMATIC REFERENCE

Shown is the snowplow with NO valves energized – all cylinders are locked. This simplified representation shows the actual state of the valve poppets to aid in understanding the circuit. Standard colors are used to represent the circuit in various states. Arrows have been added to depict the direction of oil flow and cylinder movement.

LEGEND



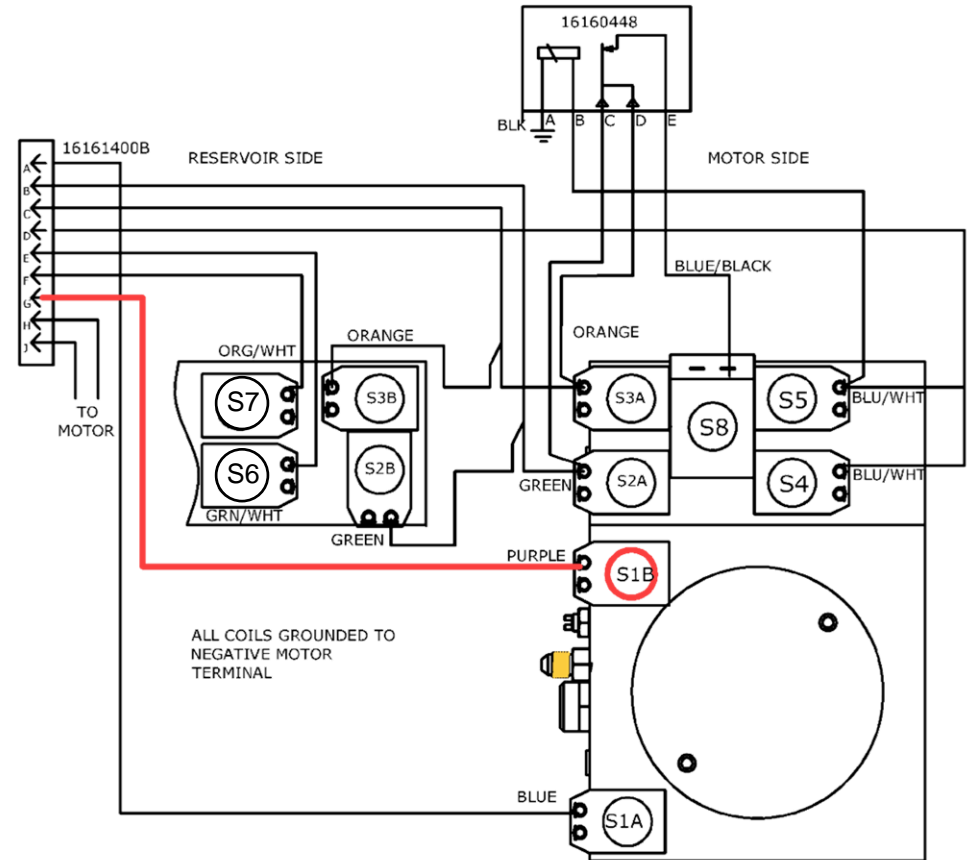
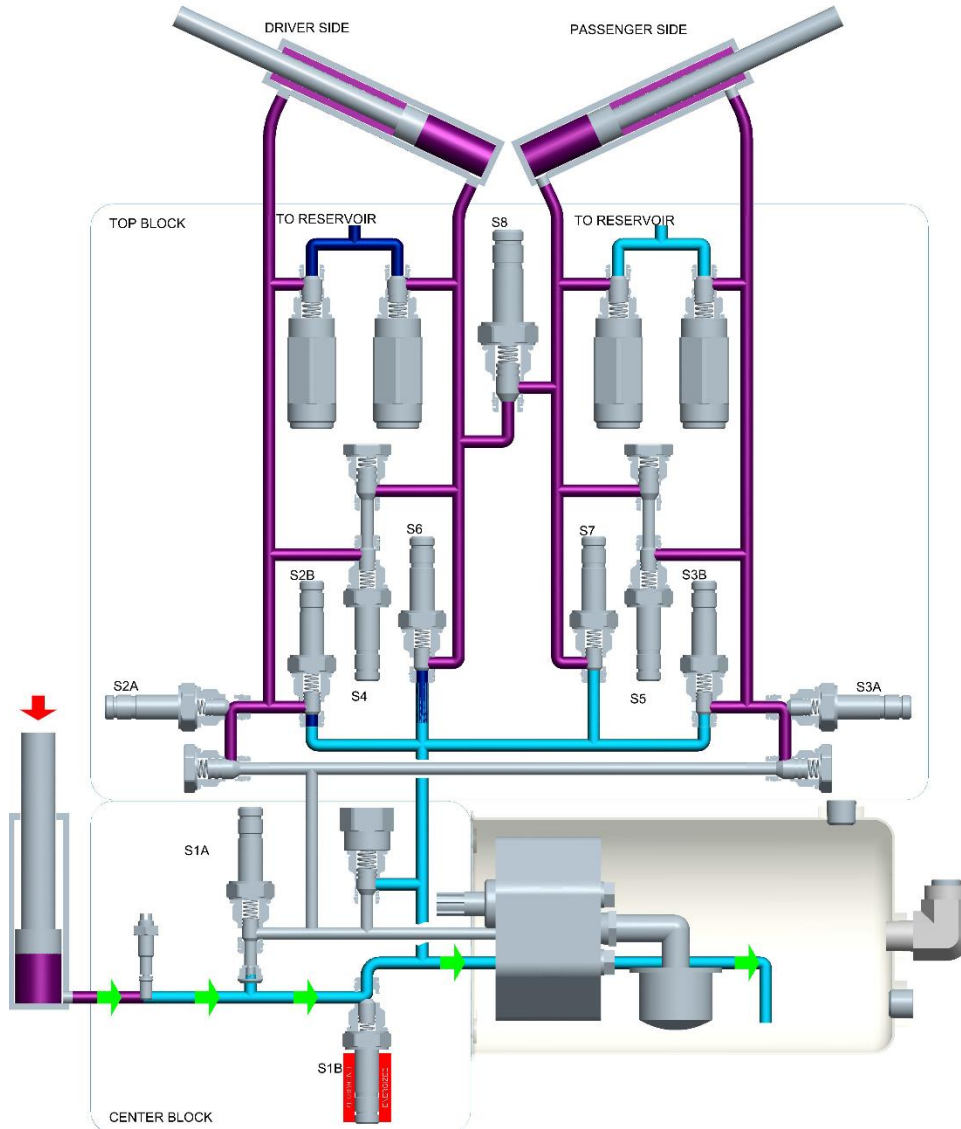
LIFT



When the LIFT button is pressed, the MOTOR and VALVE S1A are energized and fluid from the pump flows through S1A and a CHECK VALVE into the lift cylinder. VALVE S1B and a check valve prevent the lift cylinder from retracting. If the cylinder reaches end of stroke or the lift cylinder is blocked while the LIFT button is pressed, oil goes through the PUMP RELIEF to the reservoir. When the LIFT button is released, the MOTOR and VALVE S1A de-energize. The CHECK VALVE and VALVE S1B keep the lift cylinder locked in position.

	LOGIC TABLE									
	MOT	A	G	B	C	D	E	F	S7	S8
		S1A	S1B	S2A/B	S3A/B	S4	S5	S6		
LIFT	X	X	-	-	-	-	-	-	-	-
LOWER	-	-	X	-	-	-	-	-	-	-
FLOAT	-	-	X	-	-	-	-	-	-	-

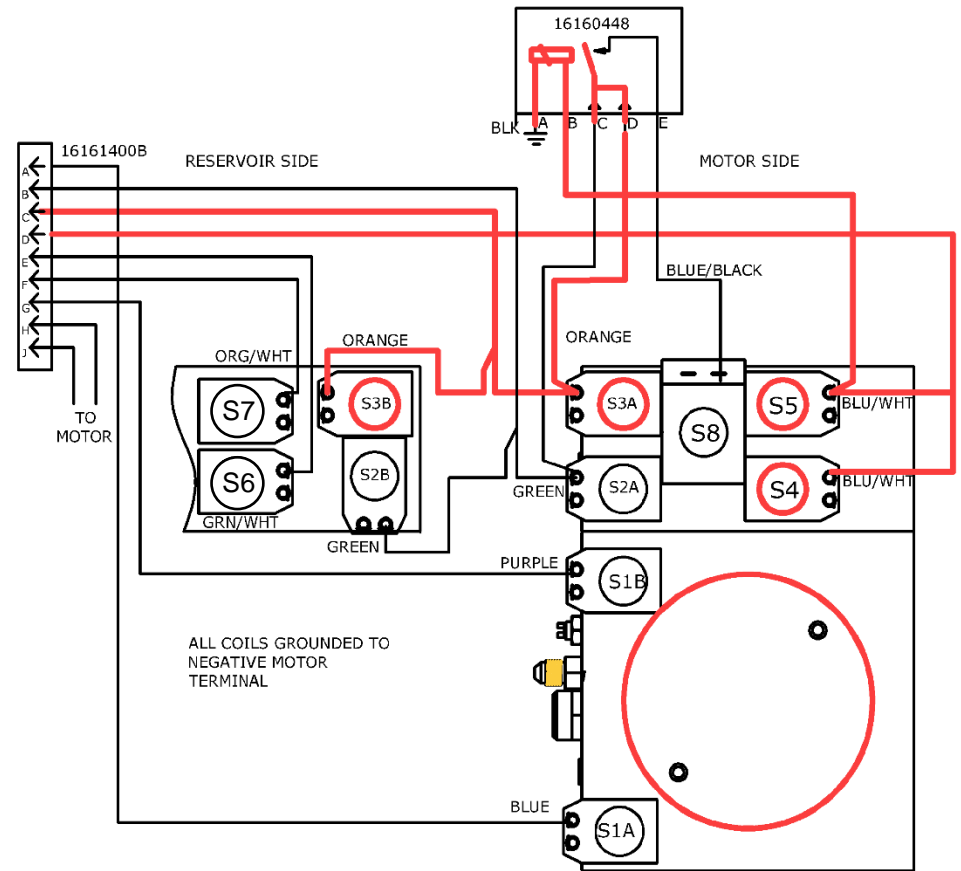
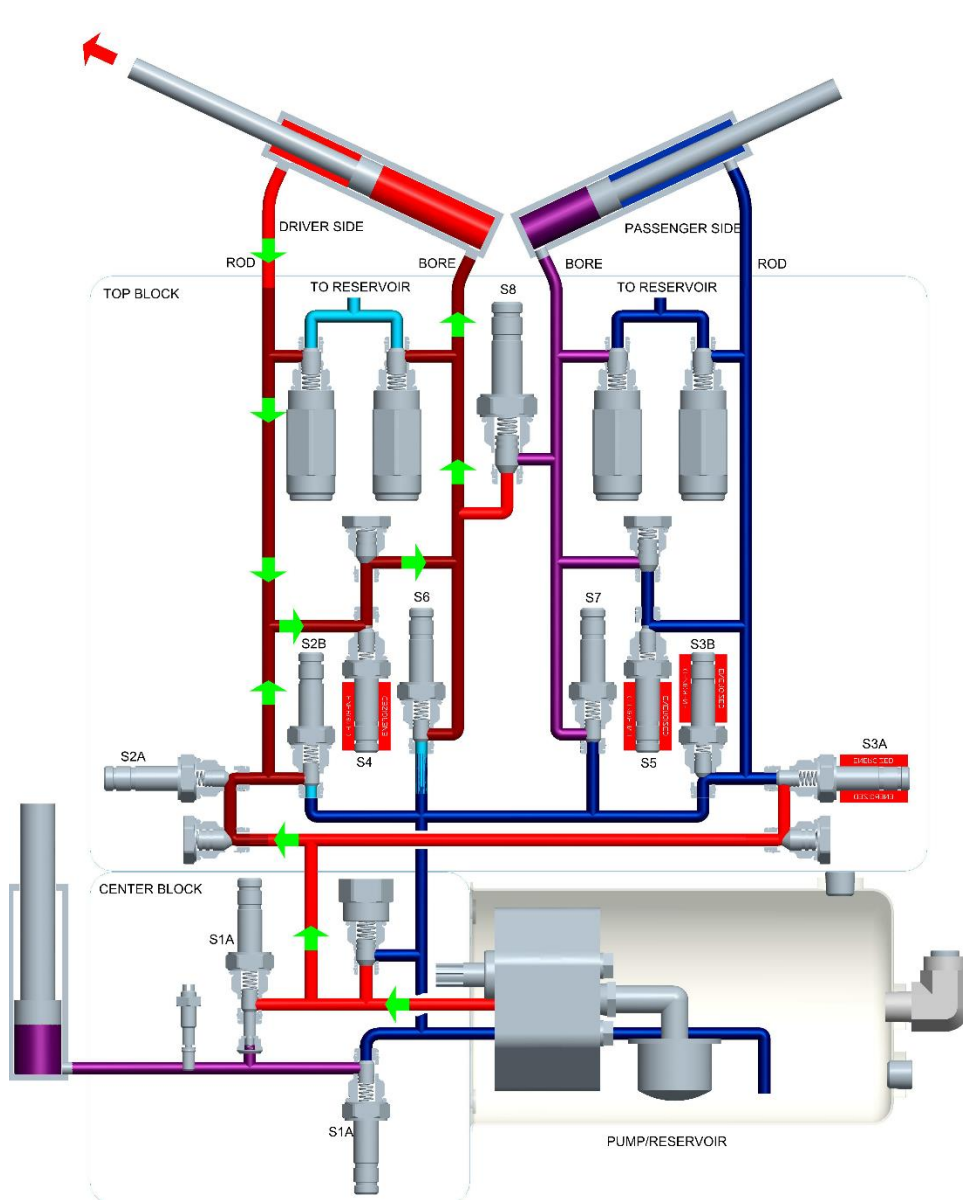
LOWER/FLOAT



When the LOWER button is pressed, valve S1B is energized and fluid from the lift cylinder is drained to tank through valve S1B and the LOWERING NEEDLE to the reservoir. If the LOWER button is held for more than one second, the controller goes into FLOAT mode and lights the FLT indicator where valve S1B remains energized.

PIN VALVE	LOGIC TABLE								
	MOT	A S1A	G S1B	B S2A/S2B	C S3A/S3B	D S4/S5	E S6	F S7	S8
LIFT	X	X	-	-	-	-	-	-	-
LOWER	-	-	X	-	-	-	-	-	-
FLOAT	-	-	X	-	-	-	-	-	-

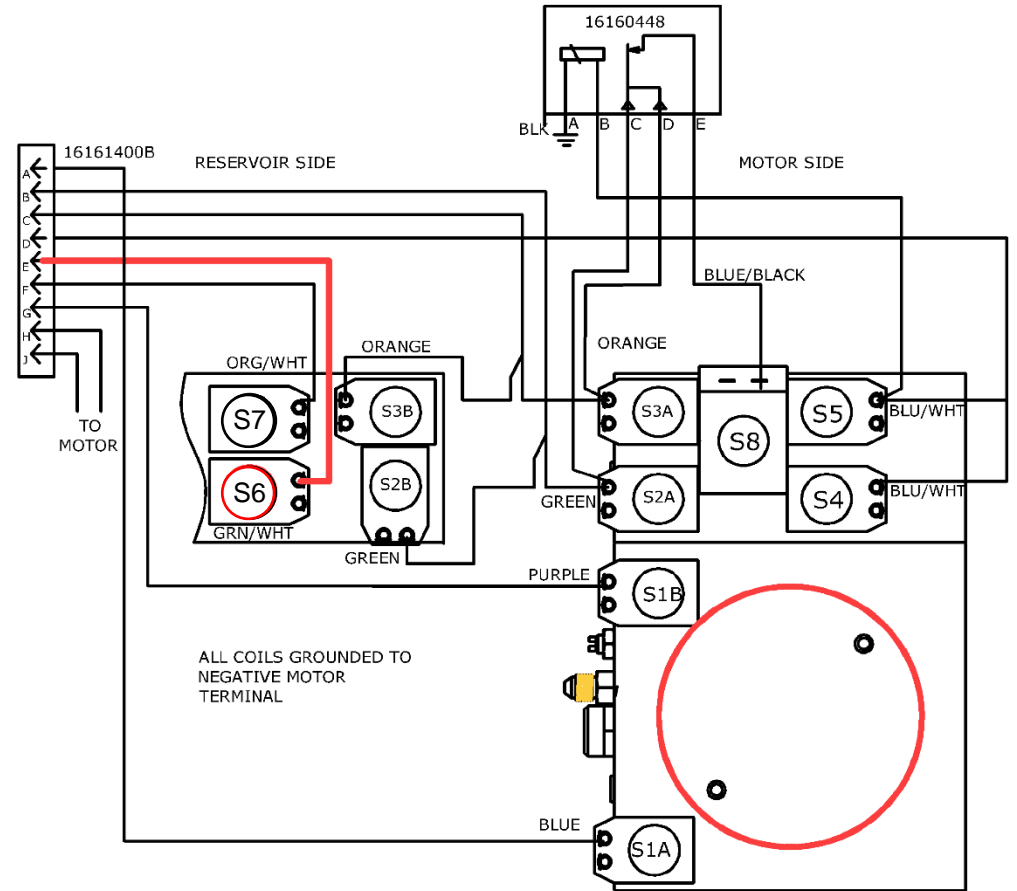
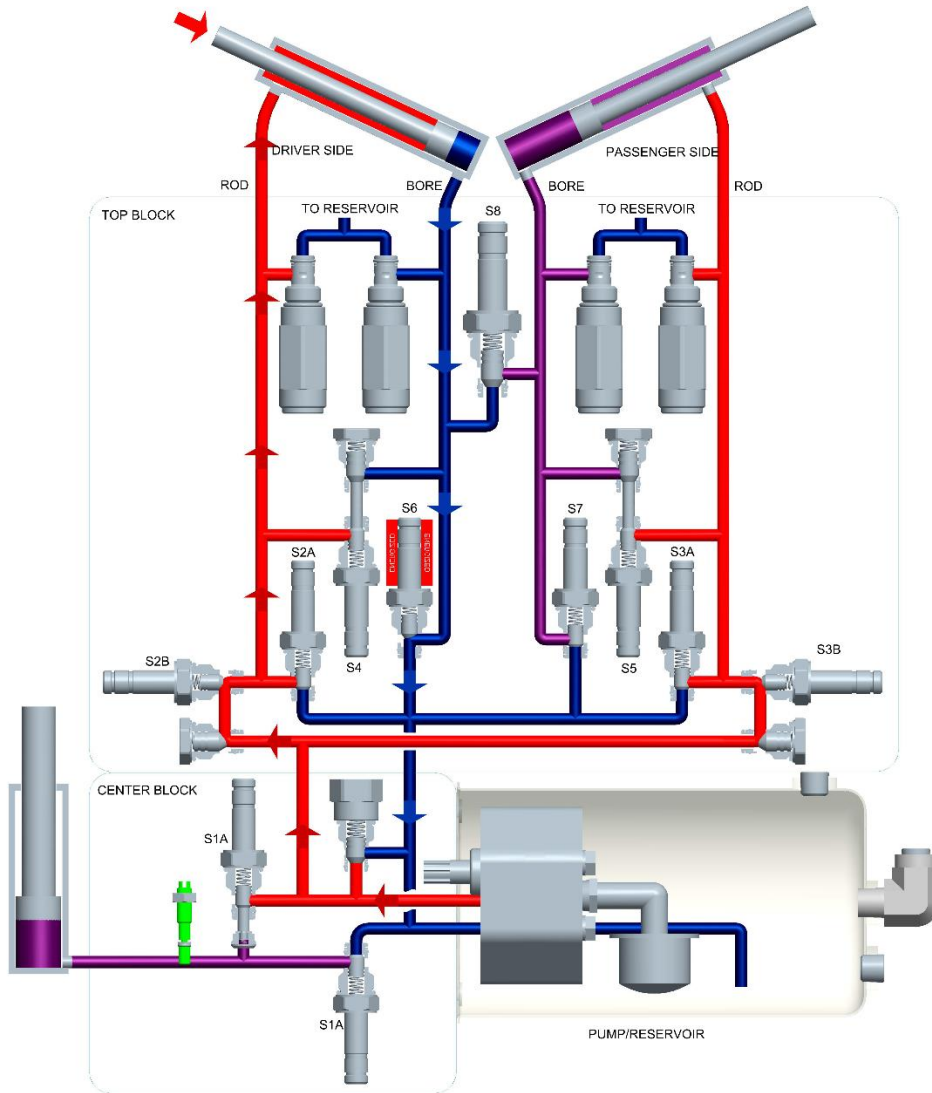
LEFT WING EXTEND



When the TOP LEFT button is pressed, valves S3/S4/S5 are energized. Fluid goes through valve S2 to the rod end and through valve S4 to the bore end, regeneratively extending the LEFT cylinder. S3 is closed, so no fluid goes to the RIGHT cylinder.

	LOGIC TABLE								
	MOTOR	A	G	B	C	D	E	F	
	S1A	S1B	S2A/S2B	S3A/S3B	S4/S5	S6	S7	S8	
LEFT OUT	X	-	-	-	X	X	-	-	-
LEFT IN	X	-	-	-	-	-	X	-	-
ANG LEFT	X	-	-	-	X	-	-	-	X

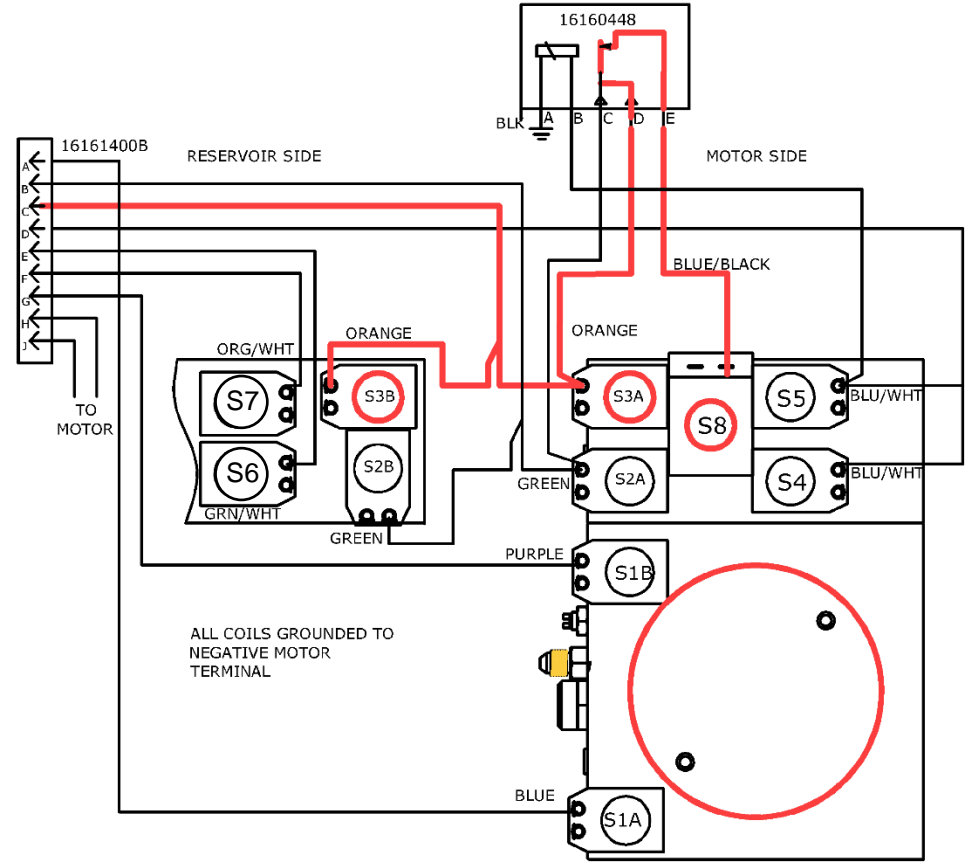
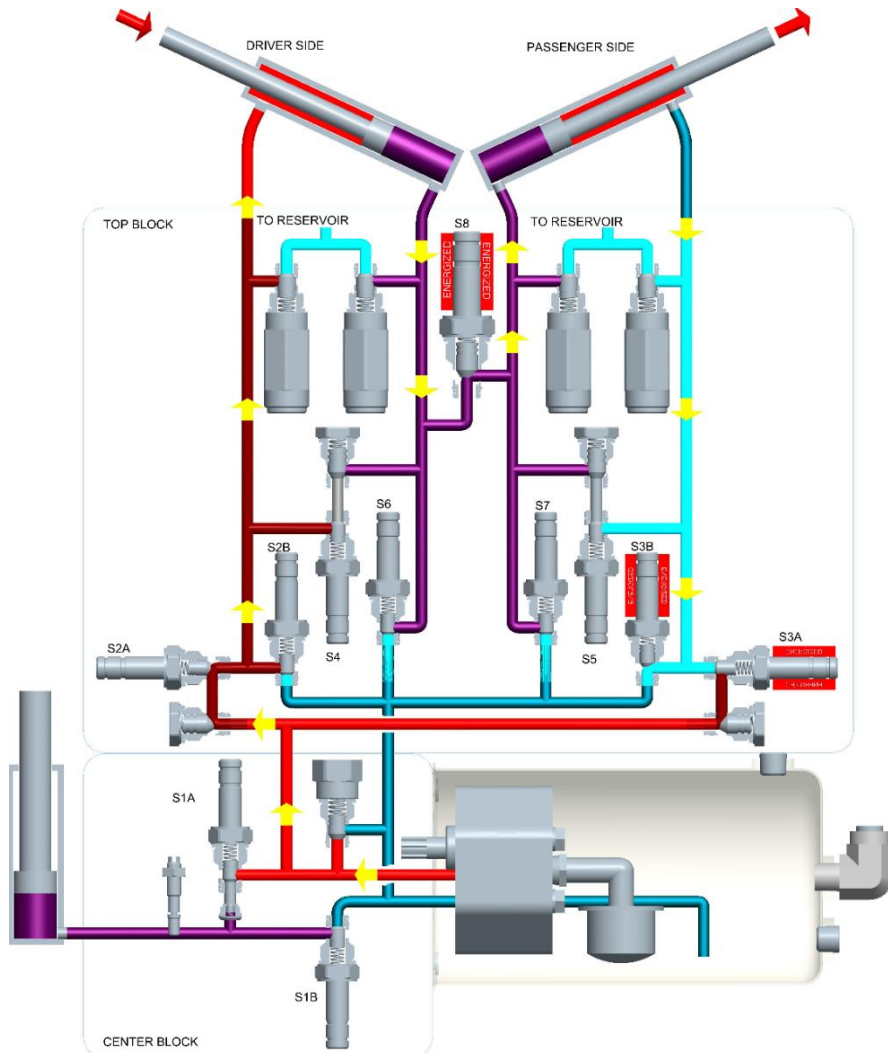
LEFT WING RETRACT



When the BOTTOM LEFT button is pressed, valve S6 is energized. Fluid flows through valve S2 to the rod end of the LEFT cylinder. The bore ends empties to reservoir and the cylinder retracts. The RIGHT cylinder remains locked, as valve S7 remains closed. When released, both cylinders remain locked in place.

	LOGIC TABLE									
	MOTOR	A	G	B	C	D	E	F	S	S
		S1A	S1B	S2	S3	S4	S5	S6	S7	S8
LEFT OUT	X	-	-	-	X	X	X	-	-	-
LEFT IN	X	-	-	-	-	-	-	X	-	-
ANG LEFT	X	-	-	-	X	-	-	-	-	X

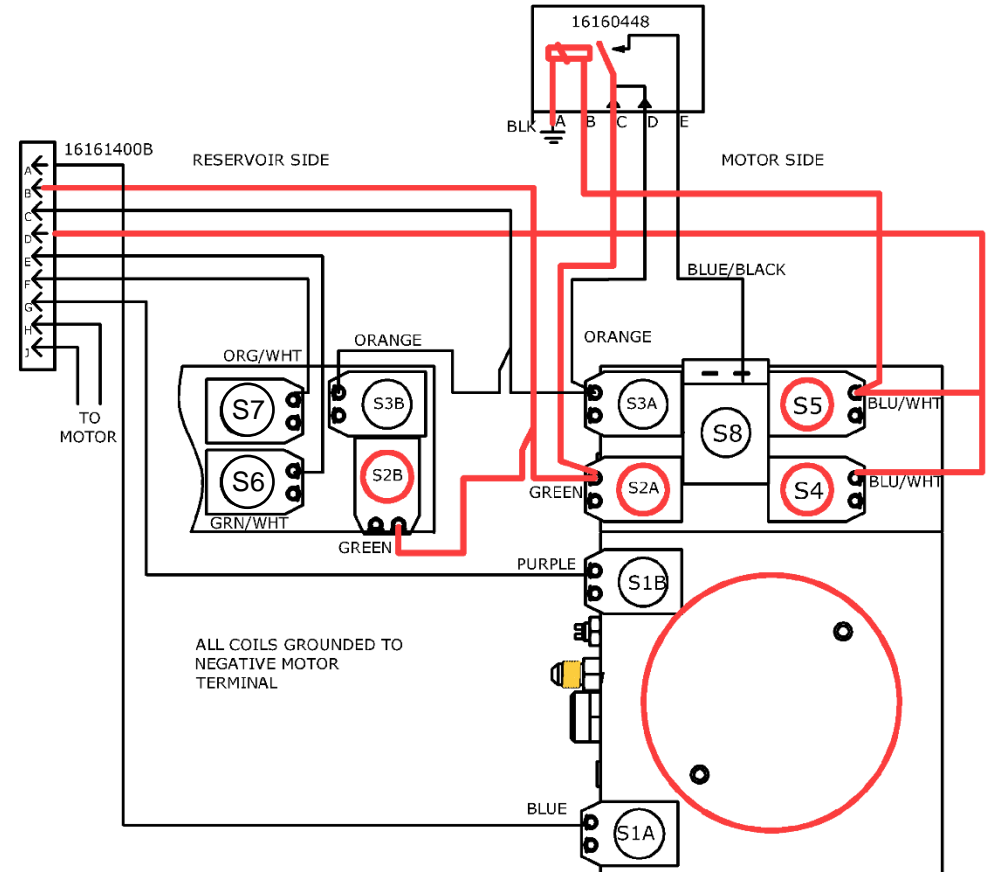
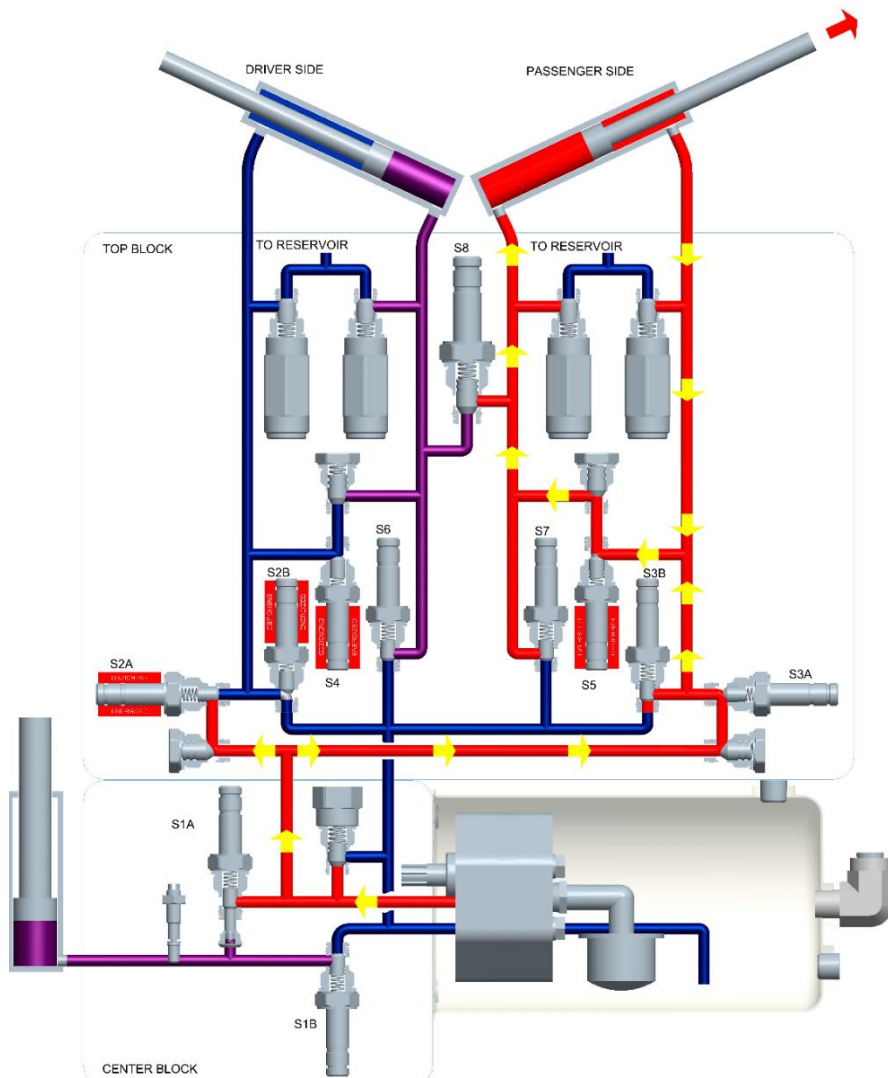
ANGLE LEFT



When the MIDDLE LEFT button is pressed, valves S3 and S8 are energized. Fluid flows through S2 to the rod end of the LEFT cylinder. Fluid flows from the bore end of the LEFT cylinder to the bore end of the RIGHT cylinder through S8. Fluid flows from the rod end of the RIGHT cylinder to tank through S3. This hydraulically locks the two cylinders together.

	LOGIC TABLE									
	MOTOR	A	G	B	C	D	E	F	S7	S8
		S1A	S1B	S2	S3	S4	S5	S6		
LEFT OUT	X	-	-	-	X	X	X	-	-	-
LEFT IN	X	-	-	-	-	-	-	X	-	-
ANG LEFT	X	-	-	-	X	-	-	-	-	X

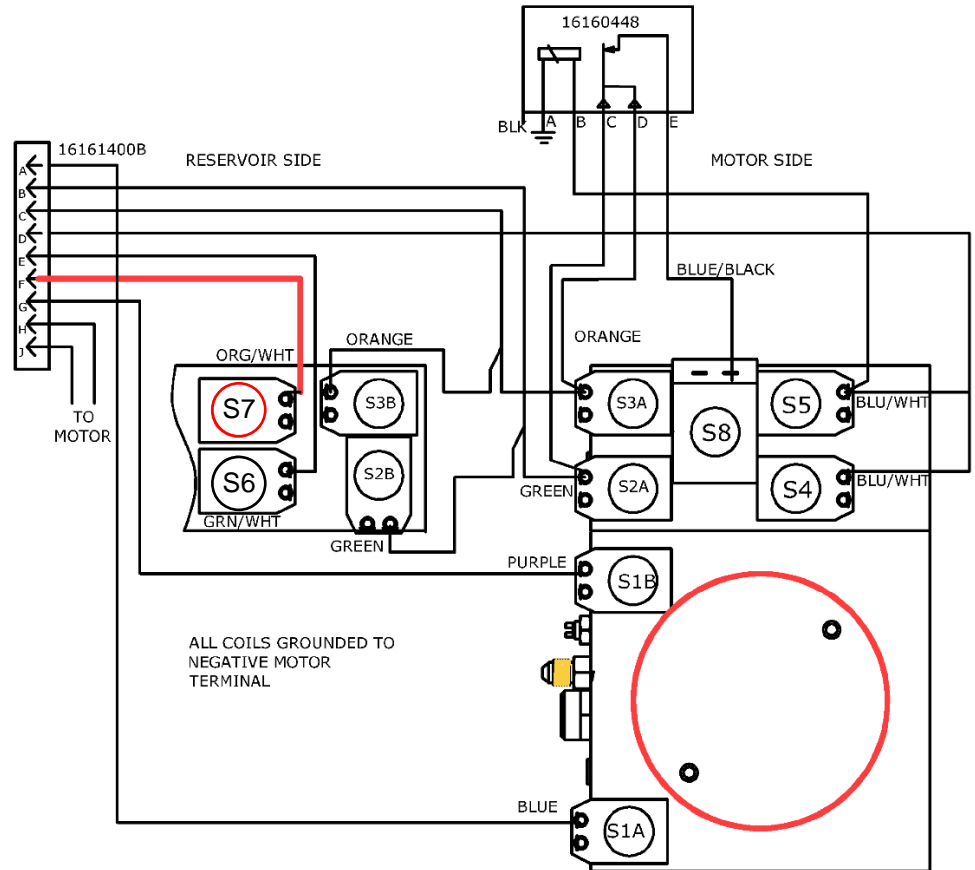
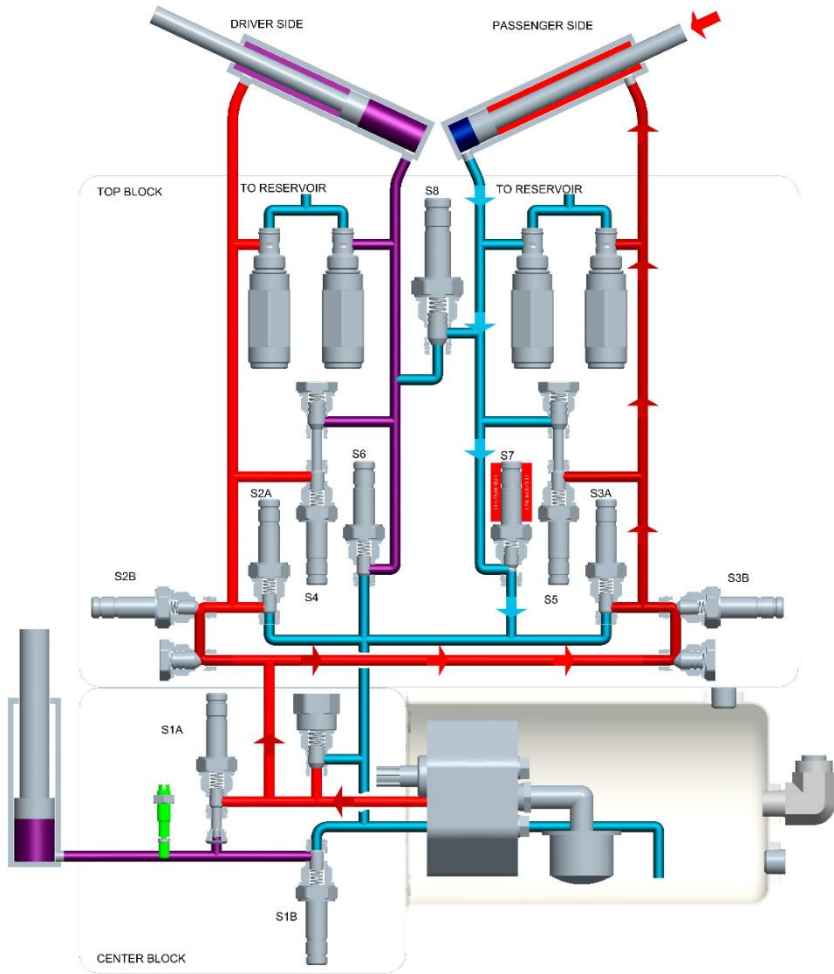
RIGHT WING EXTEND



When the TOP RIGHT button is pressed, valves S2/S4/S5 are energized. Fluid goes through valve S3 to the rod end and through valve S5 to the bore end, regeneratively extending the LEFT cylinder. S2 is closed, no fluid goes to the LEFT cylinder.

	LOGIC TABLE									
	MOTOR	A S1A	G S1B	B S2	C S3	D S4	E S5	F S6	S7	S8
RIGHT OUT	X	-	-	X	-	X	X	-	-	-
RIGHT IN	X	-	-	-	-	-	-	-	X	-
ANG RIGHT	X	-	-	X	-	-	-	-	-	X

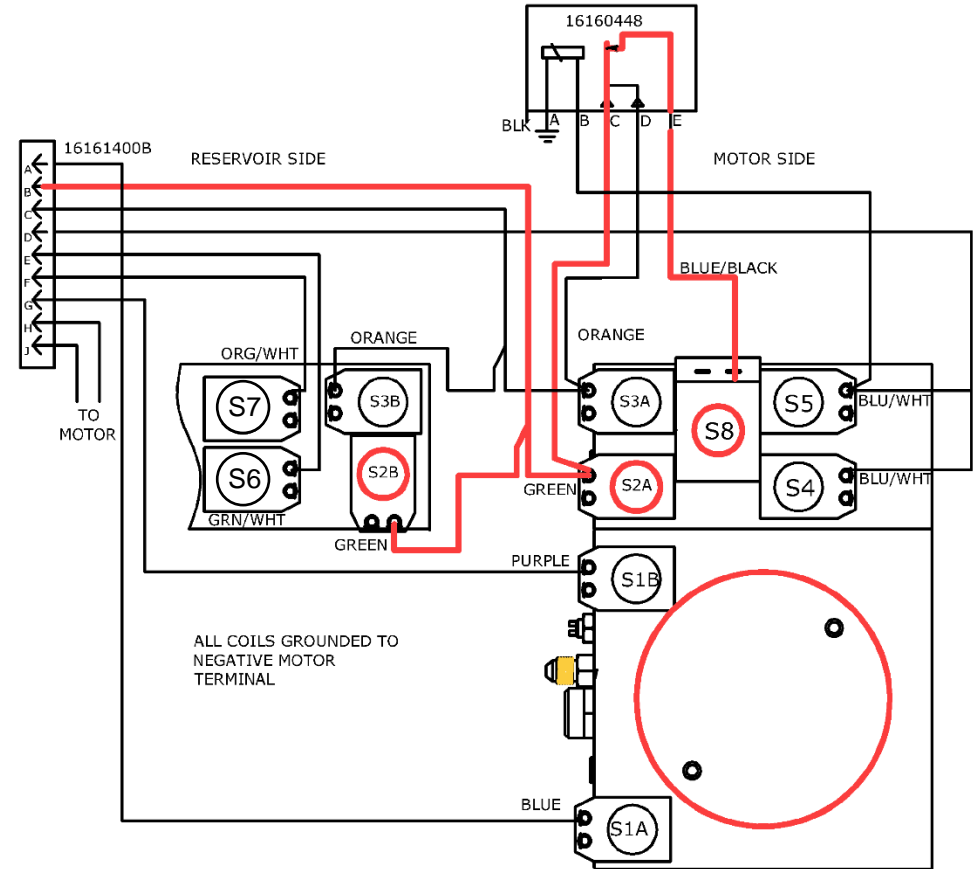
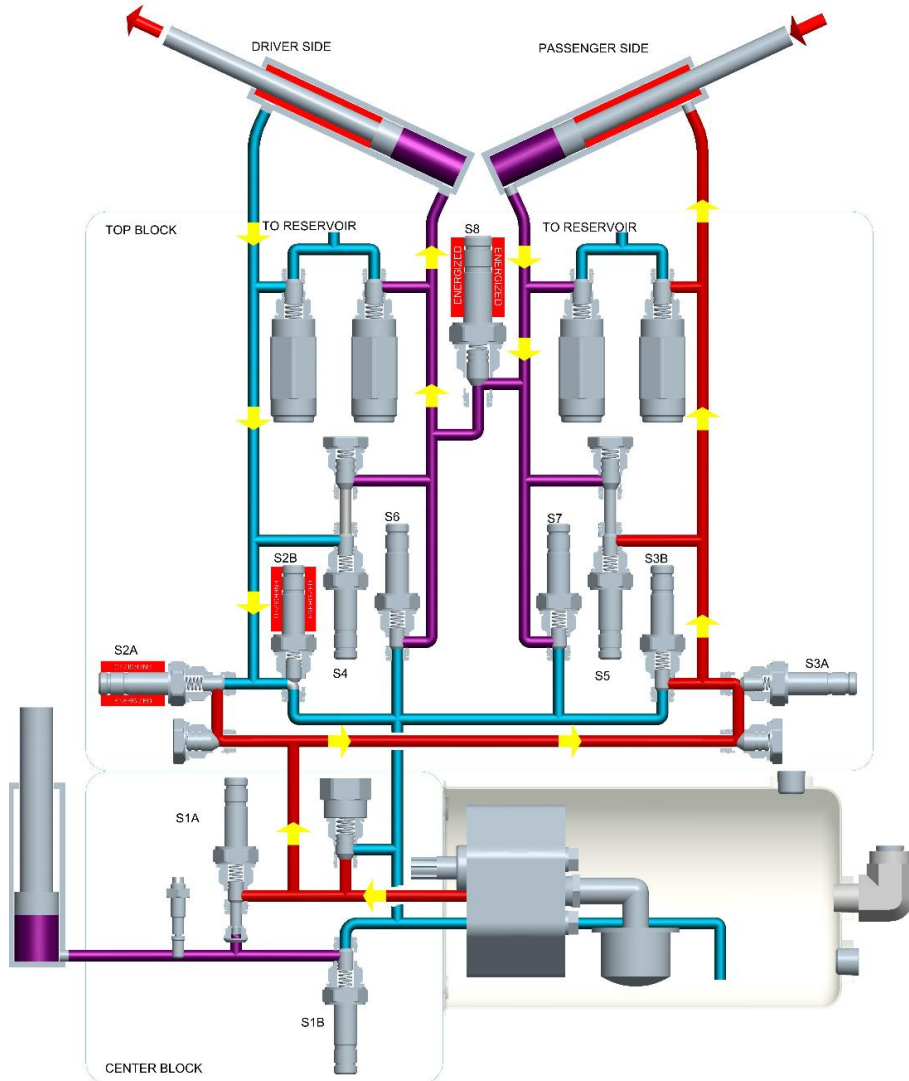
RIGHT WING RETRACT



When the BOTTOM RIGHT button is pressed, valve S7 is energized. Fluid flows through valve S3 to the rod end of the RIGHT cylinder. The bore end drains through valve S7 to tank and the cylinder retracts. The LEFT cylinder remains locked, as valve S6 remains closed.

	LOGIC TABLE									
	MOTOR	A S1A	G S1B	B S2	C S3	D S4	E S5	F S6	S7	S8
RIGHT OUT	X	-	-	X	-	X	X	-	-	-
RIGHT IN	X	-	-	-	-	-	-	-	X	-
ANG RIGHT	X	-	-	X	-	-	-	-	-	X

ANGLE RIGHT

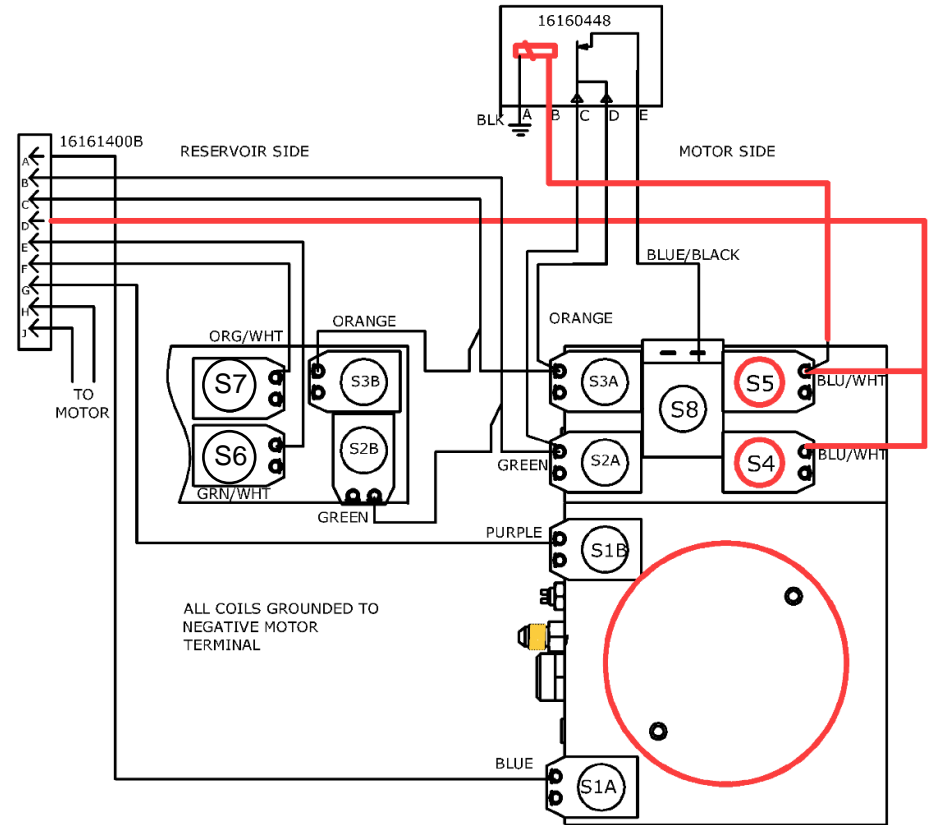
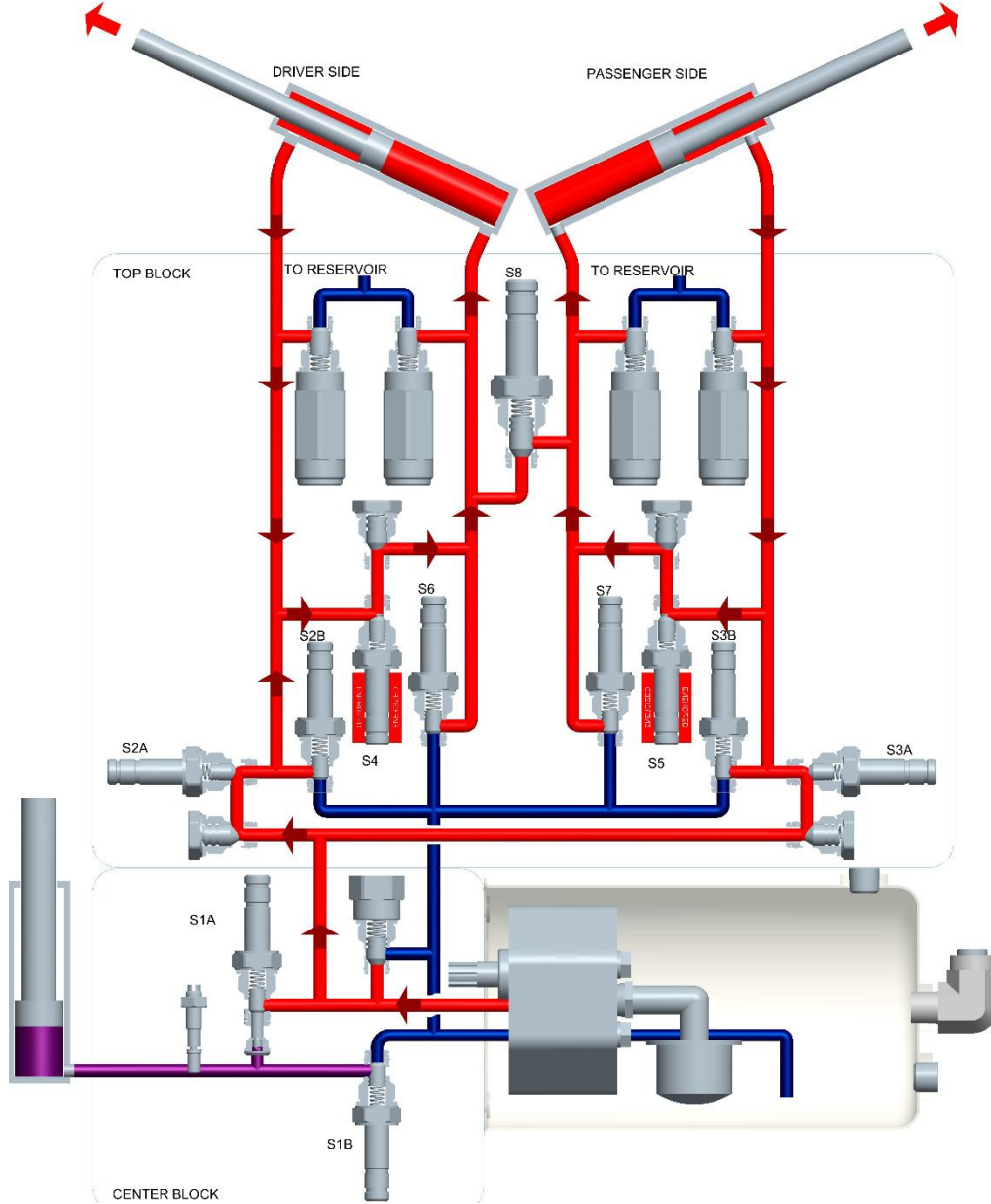


When the MIDDLE RIGHT button is pressed, valves S2 and S8 are energized. Fluid flows through S3 to the rod end of the RIGHT cylinder. Fluid flows from the bore end of the RIGHT cylinder to the bore end of the LEFT cylinder through S8. Fluid flows from the rod end of the LEFT cylinder to tank through S2. This hydraulically locks the two cylinders together.

	LOGIC TABLE									
	MOTOR	A S1A	G S1B	B S2	C S3	D S4	E S5	F S6	S7	S8
RIGHT OUT	X	-	-	X	-	X	X	-	-	-
RIGHT IN	X	-	-	-	-	-	-	-	X	-
ANGLE RIGHT	X	-	-	X	-	-	-	-	-	X

SCHEMATIC REFERENCE

SCOOP

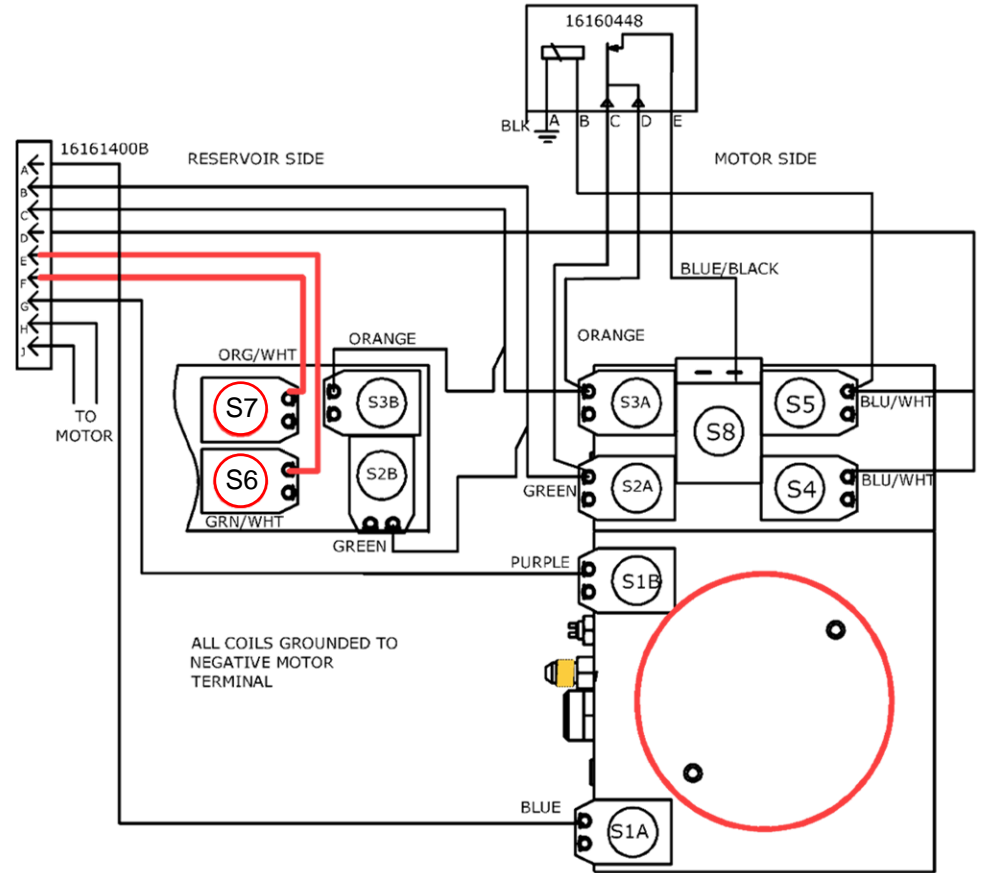
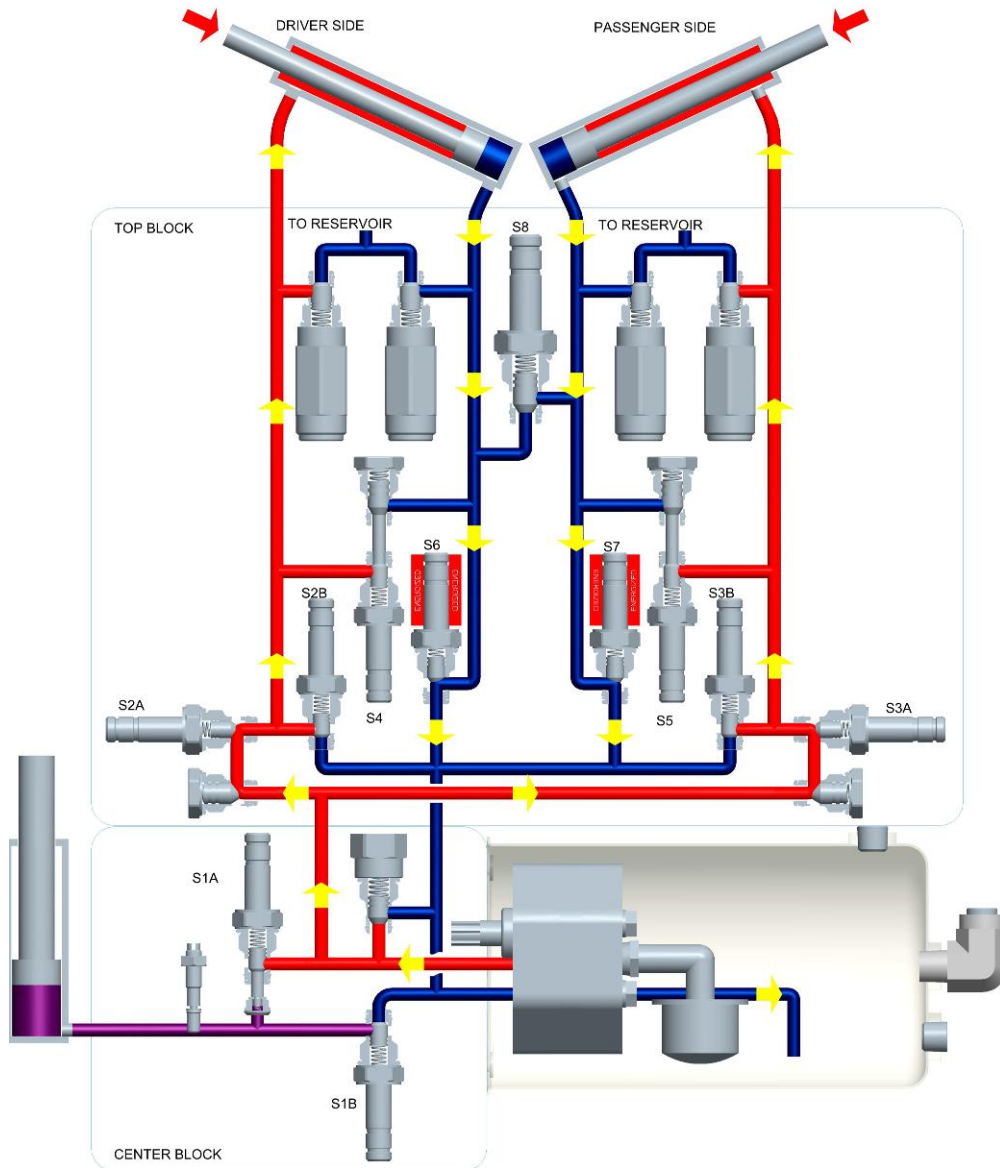


When the MIDDLE TOP button is pressed, valves S4 and S5 are energized. Fluid flows to the bore end of both LEFT and RIGHT cylinders and regenerates through S4 and S5 causing both cylinders to extend.

	LOGIC TABLE									
	MOTOR	A	G	B	C	D	E	F	S7	S8
		S1A	S1B	S2	S3	S4	S5	S6		
VEE	X	-	-	-	-	-	-	X	X	-
SCOOP	X	-	-	-	-	X	X	-	-	-

SCHEMATIC REFERENCE

VEE



When the MIDDLE BOTTOM button is pressed, valves S6 and S7 are energized. Fluid flows to the rod end of both LEFT and RIGHT cylinders. Fluid flows from the bore end to tank through S6 and S7.

	LOGIC TABLE									
	MOTOR	A	G	B	C	D	E	F	S8	
		S1A	S1B	S2	S3	S4	S5	S6	S7	
VEE	X	-	-	-	-			X	X	-
SCOOP	X	-	-	-	-	X	X	-	-	-

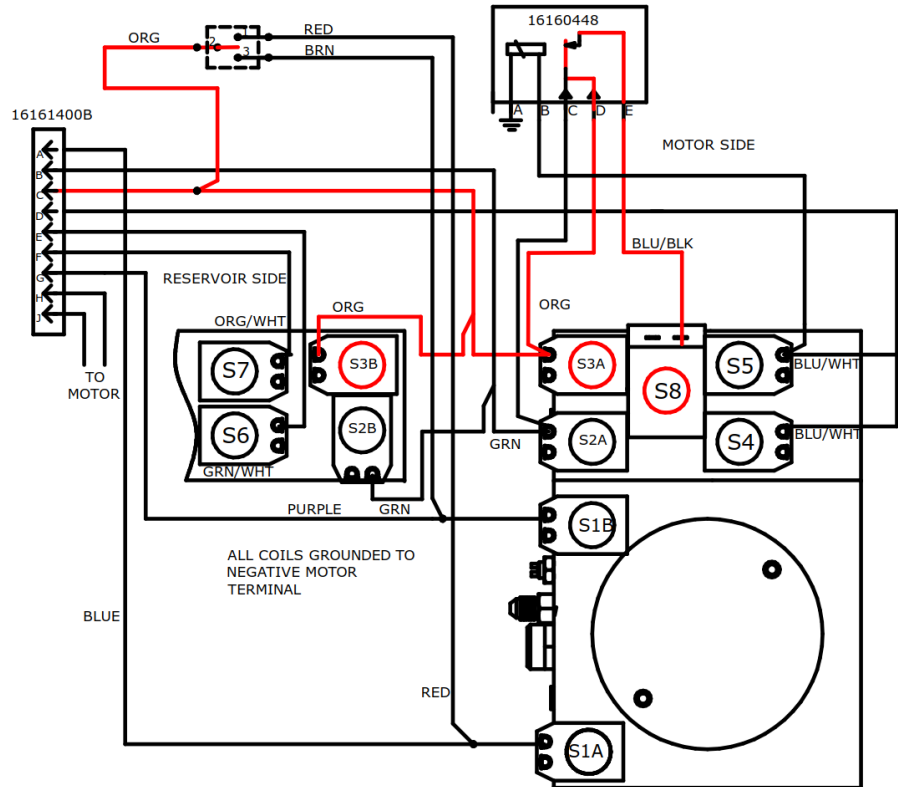
RAPIDLINK MOUNT MODE

The Rapidlink mounting system uses a switch on the plow liftframe to raise and lower the plow remotely. Activating MOUNT MODE on the controller energizes pin C on the grill connector. This is the ORANGE wire that goes to S3A/S3B. This is only intended to provide power to the switch.

Mount mode allows you to adjust the position of the lift frame ears when necessary to allow for mounting to a truck.

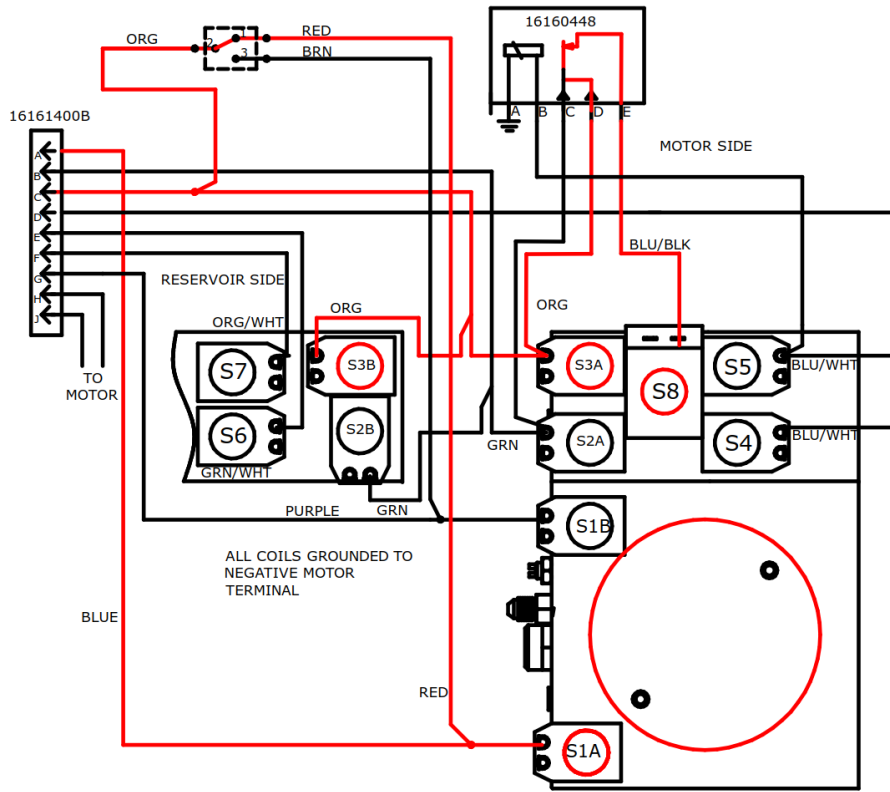
The switch can then be used to supply power to the S1A LIFT VALVE or the S1B DROP VALVE to raise or lower the plow. When the controller detects voltage on the BLUE wire for S1A it energizes the motor.

		LOGIC TABLE										
SWITCH	MOUNT SWITCH	MOT	A S1A	G S1B	B S2	C S3	D S4	E S5	F S6	S7	S8	
MOUNT	-	-	-	-	-		-	-	-	-		
MOUNT LIFT	UP						-	-	-	-		
MOUNT DROP	DOWN	-	-				-	-	-	-		



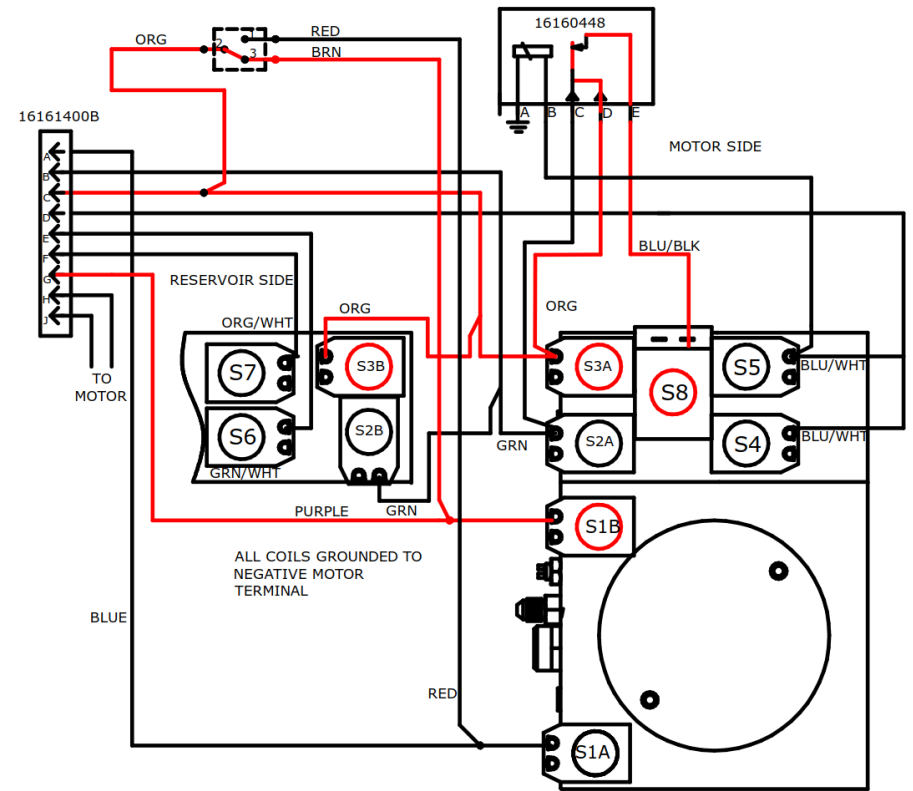
When the plow is put in in mount mode and the jack switch is in center position, pin C will energize, energizing valves S3A/S3B/S8. Nothing should move.

		LOGIC TABLE										
SWITCH	MOUNT SWITCH	MOT	A S1A	G S1B	B S2	C S3	D S4	E S5	F S6	S7	S8	
MOUNT	-	-	-	-	-	X	-	-	-	-	X	
MOUNT LIFT	UP	X	X	-	-	X	-	-	-	-	X	
MOUNT DROP	DOWN	-	-	X	-	X	-	-	-	-	X	



When the plow is put in in mount mode and the jack switch is in UP position, the controller will detect voltage at pin A and energize the motor briefly, tilting the lift frame forward as the lift cylinder extends.

	LOGIC TABLE										
	MOUNT SWITCH	MOT	A S1A	G S1B	B S2	C S3	D S4	E S5	F S6	S7	S8
MOUNT	-	-	-	-	-	X	-	-	-	-	X
MOUNT LIFT	UP	X	X	-	-	X	-	-	-	-	X
MOUNT DROP	DOWN	-	-	X	-	X	-	-	-	-	X



When the plow is put in in mount mode and the jack switch is in DOWN position, valve S1B will be energized briefly, allowing the lift frame to tilt back as the lift cylinder compresses.

	LOGIC TABLE										
	MOUNT SWITCH	MOT	A S1A	G S1B	B S2	C S3	D S4	E S5	F S6	S7	S8
MOUNT	-	-	-	-	-	X	-	-	-	-	X
MOUNT LIFT	UP	X	X	-	-	X	-	-	-	-	X
MOUNT DROP	DOWN	-	-	X	-	X	-	-	-	-	X

