DIAGNOSTIC FLOW CHART FOR E-58H & E-61H ELECTRO LIFT® UNITS WITH TOUCH PAD

These charts are intended to be used as an aid in diagnosing problems on the Electro Lift® units. They are not a substitute for factory training and experience. Be certain to read the General Information and Testing Tips sections before attempting any troubleshooting.

IMPORTANT: Maintenance and repairs must be performed with the moldboard on the ground.

**General Information**

Before any troubleshooting is started, make certain the following conditions are met.

1. The moldboard is pointing straight ahead. This can often be done by coupling the left cylinder into the right cylinder and pushing the moldboard by hand.
2. The power angling cylinders must be installed correctly on to the A-frame. The left cylinder (Driver's side) has a hose attached with a male half of a coupler at the end; the right cylinder (Passenger side) has a hose attached with a female half of a coupler at the end.
3. The solenoid coils must be on their proper valve. (See drawing below).

**TESTING TIPS**

Many tests do not require removing the Electro Lift® unit from the vehicle. However, more thorough testing can be performed using the Meyer Test Stand which allows direct pressure and amperage readings.

1. Using a screwdriver or other small tool to check for magnetism of the solenoid coils “A”, “B” and “C”. Place the tool on the nut securing the coil and have an assistant operate the switch. You should feel strong magnetic attraction.
2. Use a test light or volt meter to determine whether there is power at the harness or switch.
3. When determining AMP draw of the motor, always obtain the highest value possible, i.e., at maximum raise or maximum angle with motor running.
4. Proper rotation for the 4-1/2” motor (Fenner/Iskra) is clockwise by looking at the motor shaft from the bottom of the motor.
5. The pump shaft of a good pump can be turned smoothly using two fingers. If it can’t be turn easily, the pump is too tight and must be replaced.
6. Pump pressure can be measured at an angle hose (note pressure at full angle) or in the pressure filter port (an adaptor is necessary for the filter port).
7. Flush the complete system including unit, hoses and power angling rams with a non wax (Napthenic) oil / cleaner. If kerosene (Paraffinic) is used to flush the system, the system must be flushed again to remove any kerosene with a (Napthenic) based oil / cleaner that is wax free.

The current 22154 Electro-Touch Control has been redesigned. The Touch Pad now has raised buttons and its circuitry has been changed from analog to digital, functions have not changed. For troubleshooting for power at the solenoids do not disconnect wires. To check for power, prick the wire through the insulation for testing. The Electro-Touch Control knows when a short or an open connection occurs and will go into overload mode for the function being activated. To reset the Touch Pad turn the switch on and off. The Electro-Touch Control will not operate if not wired properly as per the installation instructions (1-690 & 1-759).
SNOW PLOW WILL NOT RAISE

1. **Does the Motor Operate?**
   - **YES**: Replace the Motor.
   - **NO**: Is there power going to the motor?

2. **Is there power going to the motor?**
   - **YES**: Inspect Motor - Armature, Brushes. Repair or Replace Motor as necessary.
   - **NO**: Charge Battery - Clean and tighten all electrical Connections.

3. **Is Battery Charged?**
   - **YES**: Clean and tighten all electrical Connections.
   - **NO**: Remove motor. Does motor run when 12 volts is applied?

4. **Does motor run when 12 volts is applied?**
   - **YES**: Replace the Motor Solenoid.
   - **NO**: Inspect Motor - Armature, Brushes. Repair or Replace Motor as necessary.

5. **Are all electrical connections clean and tight?**
   - **YES**: Replace the Motor Solenoid.
   - **NO**: Is there power going to the motor solenoid, at White Wire?

6. **Is there power going to the motor solenoid, at White Wire?**
   - **YES**: Replace the Wiring Harness.
   - **NO**: Is there power leaving the switch? Check switch for Continuity.

7. **Is there power leaving the switch? Check switch for Continuity**
   - **YES**: Replace the Wiring Harness.
   - **NO**: Check Wires at Molded connector.

8. **Check Wires at Molded connector.**
   - **YES**: Replace the Touch Pad.
   - **NO**: Replace Fuse. Check for short in Harness, "B" Coil, Switch Connections, Motor Solenoid, Electric Motor.

9. **Does the Motor Operate?**
   - **YES**: Does the snow plow angle to the left instead of raising?
   - **NO**: Does the snow plow angle when the Angle Switch is activated?

10. **Does the snow plow angle when the Angle Switch is activated?**
    - **YES**: Is there pressure (or flow) at the Filter port?
    - **NO**: Are the Filters Clogged?

11. **Are the Filters Clogged?**
    - **YES**: Clean or Replace Filters.
    - **NO**: Replace the Pump.

12. **Replace the Pump.**
    - **YES**: Disassemble unit. Inspect O-rings, Cylinder Piston assembly. Look for blockage in Sump Casting passages. Can pump relief pressure be adjusted to 2000 P.S.I.
    - **NO**: Does the motor turning the proper direction?

13. **Does the motor turning the proper direction?**
    - **YES**: Replace the Pump. Repair or Replace the motor.
    - **NO**: Replace the Pump. Does the motor armature turn tightly?

14. **Does the motor armature turn tightly?**
    - **YES**: Replace the "B" Coil.
    - **NO**: Is there power to the "B" Coil? (Red Wire) at Harness.

15. **Is there power to the "B" Coil? (Red Wire) at Harness?**
    - **YES**: Replace the "B" Coil. (Red Wire) at Harness.
    - **NO**: Is there power leaving the switch at the red wire?

16. **Is there power leaving the switch at the red wire?**
    - **YES**: Replace the wiring harness.
    - **NO**: Are wires in molded connector making contact with the switch?

17. **Are wires in molded connector making contact with the switch?**
    - **YES**: Replace Touch Pad.
    - **NO**: Replace the "B" Valve "O"Rings in good Condition?

18. **Are the "B" Valve "O"Rings in good Condition?**
    - **YES**: Clean or Replace the "B" Valve and retest.
    - **NO**: Replace O-Rings.

19. **Replace O-Rings.**
    - **YES**: Clean or Replace the "B" Valve and retest.
    - **NO**: Replace P.A. Block with E-46 plate and retest. Does snow plow raise now?

20. **Does snow plow raise now?**
    - **YES**: Replace P.A. Block.
    - **NO**: Replace P.A. Block with E-46 plate and retest. Does snow plow raise now?

21. **Can the pump shaft turn by hand?**
    - **YES**: Replace pump.
    - **NO**: Is the fluid level 1-1/2" below filler hole?

22. **Is the fluid level 1-1/2" below filler hole?**
    - **YES**: Replace pump.
    - **NO**: ADD M-1 Fluid.

23. **ADD M-1 Fluid.**
    - **YES**: Does the "B" Coil (Red Wire) have magnetism?
    - **NO**: Are the "B" Valve "O"Rings in good Condition?

24. **Are the "B" Valve "O"Rings in good Condition?**
    - **YES**: Clean or Replace the "B" Valve and retest.
    - **NO**: Replace O-Rings.

25. **Replace O-Rings.**
    - **YES**: Clean or Replace the "B" Valve and retest.
    - **NO**: Replace P.A. Block.

26. **Replace P.A. Block.**
    - **YES**: Replace P.A. Block with E-46 plate and retest. Does snow plow raise now?
    - **NO**: Replace the "B" Valve "O"Rings in good Condition?

27. **Are the "B" Valve "O"Rings in good Condition?**
    - **YES**: Clean or Replace the "B" Valve and retest.
    - **NO**: Replace O-Rings.

28. **Replace O-Rings.**
    - **YES**: Clean or Replace the "B" Valve and retest.
    - **NO**: Replace P.A. Block.

29. **Replace P.A. Block.**
    - **YES**: Replace P.A. Block with E-46 plate and retest. Does snow plow raise now?
    - **NO**: Replace P.A. Block with E-46 plate and retest.
SNOW PLOW WILL NOT ANGLE LEFT

**Can the snow plow raise?**

**YES**

**See the Raise Flow Chart Section**

**NO**

**Does the motor run when angle switch is pushed?**

**YES**

**Is there power to the motor solenoid? (White Wire)**

**YES**

**Replace Harness**

**NO**

**Is there power leaving the switch?**

**YES**

**Replace Touch Pad**

**NO**

**Is the amplitude less than 100 amps while trying to angle snow plow?**

**YES**

**Can the snow plow be angled by hand when the P.A. Rams are disconnected from A-Frame?**

**NO**

**Relieve the interference between the Sector and A-Frame.**

**YES**

**Is the electrical draw less than 50% while trying to angle snow plow?**

**YES**

**Replace both the Coupler sets and/or clean or replace the "C" Valve.**

**NO**

**If both hoses are stiff inspect the Pilot Check Piston and "C" Valve for binding.**

**YES**

**If one hose is stiff inspect the "C" Valve for binding. Replace Coupler sets.**

**Does pressure remain in angle hose when the motor is not running?**

**YES**

**Temporarily put 1/2" blocks between the Sector and A-Frame to limit the degree of angle. Will the snow plow now angle?**

**YES**

**Weld 1-1/2" x 1-1/2" x 1/2" spacers to the A-Frame stops.**

**NO**

**Clean or replace the Crossover Relief. Does the snow plow now angle?**

**YES**

**Replace the P.A. Block**

**NO**

**Replace both the Coupler sets and/or clean or replace the "C" Valve.**

**Is the Pilot piston in good condition? (worn/sloppy or missing)**

**YES**

**Replace Piston**

**NO**

**Are "C" Valve O-Rings in good condition?**

**YES**

**Replace O-Rings**

**NO**

**Clean or replace the "C" Valve. Retest**

**NO**

**Clean or replace the "B" Valve. Retest**

**YES**

**Does the snow plow angle to the right the angle left switch is pushed?**

**YES**

**Clean or replace the "C" Valve. Retest**

**NO**

**Does the snow plow raise instead of angling left?**

**YES**

**Clean or replace the "B" Valve. Retest**

**NO**

**Is there power to the motor solenoid? (White Wire)**

**YES**

**Replace Harness**

**NO**

**Is there power leaving the switch?**

**YES**

**Replace Touch Pad**

**NO**

**Is the amplitude less than 100 amps while trying to angle snow plow?**

**YES**

**Can the snow plow be angled by hand when the P.A. Rams are disconnected from A-Frame?**

**NO**

**Relieve the interference between the Sector and A-Frame.**

**YES**

**Is the electrical draw less than 50% while trying to angle snow plow?**

**YES**

**Replace both the Coupler sets and/or clean or replace the "C" Valve.**

**NO**

**If both hoses are stiff inspect the Pilot Check Piston and "C" Valve for binding.**

**YES**

**If one hose is stiff inspect the "C" Valve for binding. Replace Coupler sets.**

**Does pressure remain in angle hose when the motor is not running?**

**YES**

**Temporarily put 1/2" blocks between the Sector and A-Frame to limit the degree of angle. Will the snow plow now angle?**

**YES**

**Weld 1-1/2" x 1-1/2" x 1/2" spacers to the A-Frame stops.**

**NO**

**Clean or replace the Crossover Relief. Does the snow plow now angle?**

**YES**

**Replace the P.A. Block**

**NO**

**Replace both the Coupler sets and/or clean or replace the "C" Valve.**
Can the snow plow raise?  
- See the Raise Flow Chart Section

Does the motor run when angle switch is pushed?  
- Is there power to the motor solenoid?  
  - (White Wire)
  - Replace Harness

Can the snow plow angle to the left?  
- Is there power leaving the switch?  
  - Replace Touch Pad

Clean or replace the "B" Valve.  
- Retest

Does the snow plow raise instead of angling left?  
- Is there power leaving the switch?  
  - Are the wires in molded connector making contact with the switch?  
    - Replace Harness
    - Replace Touch Pad

Does the "C" Coil have magnetism?  
- (Green Wire)
  - Replace the "C" Coil.  
    - Retest

Are "C" Valve O-Rings in good condition?  
- Replace O-Rings

Replace both the Coupler sets and/or clean or replace the "C" Valve.

Replace the P.A. Block

Clean or replace the Crossover Relief.

Does the snow plow now angle?
SNOW PLOW WILL NOT HOLD ANGLE

- Are the Rams mushy? Can you push the moldboard 6” to 8” by hand?
  - NO
  - Bleed air from the system and snug up gland nuts. Check couplers and fittings for leaks.

- Does the moldboard hold left angle & release from right angle?
  - NO
  - Are the “C” Valve “O”-Rings in poor condition?
    - NO
    - Are Crossover O-Rings in good condition?
      - NO
      - Replace Crossover O-Rings or complete Crossover.
      - NO
      - Replace the P.A. Block.
    - YES
    - Replace O-Rings

- Are the Rams mushy? Can you push the moldboard 6” to 8” by hand?
  - YES
  - Inspect “C” Valve O-rings. Change if necessary. Does snowplow now hold angle?

- Inspect Crossover Relief. (Rebuild or Replace)
  - NO
  - Replace the P.A. Block.

- Does snowplow now hold angle?
  - YES
  - Inspect Crossover Relief. (Rebuild or Replace)
    - NO
    - Replace the P.A. Block.
  - NO
  - Replace Crossover O-Rings or complete Crossover.