

TROUBLESHOOTING THE 8494 SIDEWINDER WATER VALVE

Refer to wiring schematics P/N 98184010 (12v system) or P/N 98184510 (24v system) for trouble shooting. Refer to the 8494 Electric monitor system layout drawings P/N 98184000 (8494010 12v system) and P/N 98184500 (8494510 24v system) for repair part reference. These drawings are available for download from our website www.elkhartbrass.com

First check these items:

- Voltage at the monitor control module and valve control module should be 11-14 VDC for a 12v system (22-27 VDC for a 24v system) when measured under load. Make sure polarity is correct and there is a good ground connection. Chassis grounds are not recommended.
- If this is a repair job or new installation where the gear case position has been moved from the as received (Standard position 4) position, see [Figure 1](#) to make sure the gear case parts have been reassembled correctly.
- All testing to be done with power on for both the monitor and valve control modules.

Problem; Valve will operate in one direction only or not at all.

Checking for faulty position sensor(s).

1. Disconnect 4-position sensor harness connection (J13 & P13) and try to operate water valve.
 - If it now operates in both directions replace the valve position sensor components. The same parts are used for both the 12v & 24v systems. See [Figure 2](#) to determine which style you have. Disconnect valve module power until valve is repaired.
 - For Old Style cover assembly replace Sensor & Harness assembly p/n 36782000 & cover gasket p/n 33048000. Use pipe thread sealant on the strain relief threads and 242 (blue) Loctite on the fasteners.
 - For the New Style cover assembly replace these parts. Sensor Harness p/n 36809000, o-ring p/n 57295000, & circuit board p/n 81264000. Use 242 (blue) Loctite on the fasteners.
 - If there is no change move on to step 2.

Checking for motor power output.

2. Disconnect the 2-position harness connection (P14 & J14) at the valve and check for power using a Volt Meter at P14. Perform test with power turned on to both Monitor and Valve Control Modules. Connect meter Positive to female contact (Red/White wire color) and meter negative to male contact (Black/White wire color). If you have a Joystick squeeze and hold trigger or place the water valve switch to the ON position. If you have a switch box control place the water valve switch in the ON position. The meter should read negative (-) voltage. If you have a Joystick release the trigger or place the water valve switch in the JOYSTICK position. If you have a switch box control place the water valve switch in the OFF position. The meter should read positive (+) voltage. (Once a switch is activated the motor voltage can only be maintained continuously for approximately 12 seconds before the Valve Module cuts it off. This is a feature to prevent continuous motor stall in the event of position sensor failure. If motor power does not cut off in both directions within 10 to 14 seconds replace the valve control module.)

- **Passed;** If testing detects power in both directions repair or replace motor assembly and move on to step 8. The 12v & 24v systems both use the same 12v valve motor. The valve motor may also be tested by applying 12v power to the contacts in J14. Positive to male contact, negative to female contact closes the valve. Reversing polarity reverses the valves direction of travel.
 - To repair by replacing the motor only order motor p/n 46062000 2 each of o-ring p/n 57348000. These two o-rings are to be coated with grease and put onto the motors output shaft before attaching it to the mounting plate.
 - To replace the motor assembly order p/n 81147001.
- **Failed;** If power is not detected in both directions move to step 3.

3. Disconnect harness connector P12 & J12. Repeat the tests from step 2 In the output harness connector on the valve control module (J12) with the meter Positive connected to the contact in position G (Red/White wire color) and the meter Negative connected to the contact in position E (Black/White wire color). Once again you should get (-) negative voltage from an OPEN command and (+) from a CLOSE command. Remember the 12 second power cut-off.

- **Passed;** If the testing is successful replace the harness between the valve control module and the valve with a new harness and start over at step 1.
 - See Item 10 on the system layout drawing that matches your system voltage. Choose the p/n for the length you need.
- **Failed;** If the testing is unsuccessful move to step 4.

4. Leave the meter connected and go to the control side of the valve control module and disconnect J10 and P10. Place a jumper between P10 contacts A (Black wire/common ground) and B (Yellow wire/open signal). The meter should show negative voltage. Jumping A (Black wire/common ground) to C (Orange wire/closed signal) should result in positive voltage. (Once a jumper is connected the motor voltage can only be maintained continuously for approximately 12 seconds before the Valve Module cuts it off. This is a feature to prevent continuous motor stall in the event of position sensor failure. If motor power does not cut off in both directions within 10 to 14 seconds replace the valve control module.)

- **Passed;** If the testing is successful move on to step 5.
- **Failed;** If the testing is unsuccessful replace the valve control module. See Item 8 on the system layout drawing that matches your system voltage. Choose the p/n for the Valve Control Module you need. Connect the new module, reconnect all harnesses, and retest system starting at step 1.

5. Reconnect J10 and P10 and disconnect P01 and J01. Place a jumper between P01 contacts 16 (Black wire/common ground) and 18 (Yellow wire/open signal). The meter should show (-) negative voltage. Jumping 16 (Black wire/common ground) to 17(Orange wire/closed signal) should result in (+) positive voltage. (Once a jumper is connected the motor voltage can only be maintained continuously for approximately 12 seconds before the Valve Module cuts it off. This is a feature to prevent continuous motor stall in the event of position sensor failure. If motor power does not cut off in both directions within 10 to 14 seconds replace the valve control module.)

- **Passed;** If test is successful check contacts in connectors P01 and J01. If they appear damaged replace the component with the damaged contacts, reconnect all harnesses, and retest starting at step 1. If they do not appear damaged move on to step 6.
 - If P01 contacts are damaged replace Joystick p/n 81172001 (Item 7) or Switch Box 81122001 (Item 2).
 - If P02 contacts are damaged replace Monitor control harness p/n 36787000 (Item 5).
- **Failed;** If test is unsuccessful replace the control harness 36787000 (Item 5), reconnect all harnesses, and retest system starting at step 1.

6. Check for power coming to the Joystick or Switch Box controller from the monitor control module at terminal position 1 in connector P01.
 - **Passed;** If there is power at terminal position 1 in connector P01 replace the Joystick p/n 81172001 (Item 7) or Switch Box controller p/n 81122001 (Item 2). Then reconnect all harnesses, and retest system starting at step 1.
 - **Failed;** If there is no power at terminal position 1 in connector P01 go on to step 7.

7. Move to the monitor control module connector P02 and check for power at position A.
 - **Passed;** If power is detected replace the Monitor Control harness p/n 36787000 (Item 5). Then reconnect all harnesses, and retest system starting at step 1.
 - **Failed;** If no power is detected replace Monitor Control Module p/n 81713000 (Item 3). Then reconnect all harnesses, and retest system starting at step 1.

Testing for power & ground required for sensor activation.

8. With power on to the Valve Control Module check for these outputs at the 4-way connector J13.

Connector position; A, wire color; Red, function; power +10 to +14 VDC

Connector position; B, wire color; Orange, function; Closed signal +4.5 to +5.5 VDC

Connector position; C, wire color; Yellow, function; Open signal +4.5 to +5.5 VDC

Connector position; D, wire color; Black, function; negative or common ground

- **Passed;** If the tests are successful move on to step 10.
 - **Failed;** If any one of these outputs does not test within parameters go to step 9.
9. Disconnect P12 & J12 on the output harness of the valve control module and test for outputs on the contacts of connector J12. Repeat the tests from step 8 (Same connector positions, wire colors and outputs).
 - **Passed;** If the tests are successful replace the harness between the valve control module and the valve. See Item 10 on the system layout drawing that matches your system voltage. Choose the p/n for the length you need. Then reconnect all harnesses, and start over at step 1.
 - **Failed;** If the tests are unsuccessful replace the valve control module. See Item 8 on the system layout drawing that matches your system voltage. Choose the p/n for the Valve Control Module you need. Then reconnect all harnesses, and start over on step 1.

Testing for motor power shut off when simulating position sensor activation.

10. Perform the following tests with power on to both the Monitor and Valve Control Modules and with the Volt Meter attached to motor power leads as described in step 2.

- If you have a Joystick squeeze and hold trigger or place the water valve switch to the ON position. If you have a switch box control place the water valve switch in the ON position. Within the 12 second window place a jumper between the terminals in connector position C (Yellow wire) pin and position D (Black wire), (-) negative motor power should cease when the jumper is connected.
- If you have a Joystick release the trigger or place the water valve switch in the JOYSTICK position. If you have a switch box control place the water valve switch in the OFF position. Within the 12 second window place a jumper between the contact in connector position B (Orange) pin and position D (Black) pin on the 4-way connector, (+) positive motor power should cease when the jumper is connected.

Note: If test is not completed within the twelve second window, cycle trigger or water valve switch and repeat test. Be sure motor power is stopped due to the use of a jumper and not because the 12 second time limit has expired.

- **Passed;** If the tests are successful move on to step 11.
- **Failed;** If the tests are unsuccessful replace the valve control module. See Item 8 on the system layout drawing that matches your system voltage. Choose the p/n for the Valve Control Module you need. Then reconnect all harnesses, and start over on step 1.

Testing for motor power shut off by position sensor activation.

11. Remove the gear case cover with the position sensor harness or sensor board attached, remove the stainless steel thrust washer, and inspect the sensor components for damage. Look for damage on the harness, sensors, or a damaged magnet. Replace any damaged parts. Remove the gear segment with the magnet attached. Reconnect the sensor harness to the harness from the Valve Module via 4-way connectors P13 and J13 and move on to step 12.

12. Perform the following tests with power to both Monitor and Valve Control Modules and Volt Meter still attached to motor power leads as described in step 4.

- If you have a Joystick squeeze and hold trigger or place the water valve switch to the ON position. If you have a switch box control place the water valve switch in the ON position. Within the 12 second window pass the magnet on the gear segment within 1/8" from the open sensor on the gear case cover assembly (see Fig. 2), the motor power should cease when the magnet is detected.
- If you have a Joystick; release the trigger (or place the water valve switch in the JOYSTICK position). If you have a switch box control; place the water valve switch in the OFF position. Within the 12 second window, pass the magnet mounted on the gear segment within 1/8" from the closed sensor on the gear case cover assembly (see Fig. 2), the motor power should cease when the magnet is detected.

Note: If test is not completed within the twelve second window, cycle trigger or water valve switch and repeat test. Be sure motor power is stopped due to the presence of the magnet to the sensor and not because the 12 second time limit has expired.

- **Passed;** If testing is successful move on to step 13.
- **Failed;** If testing is not successful for both sensors replace the valve position sensor components. The same parts are used for both the 12v & 24v systems. See Figure 2 to determine which style you have. Disconnect valve module power until valve is repaired.
 - For Old Style cover assembly replace Sensor & Harness assembly p/n 36782000 & cover gasket p/n 33048000. Use pipe thread sealant on the strain relief threads and 242 (blue) Loctite on the fasteners.
 - For the New Style cover assembly replace these parts. Sensor Harness p/n 36809000, o-ring p/n 57295000, & circuit board p/n 81264000. Use 242 (blue) Loctite on the fasteners.

13. Reassemble gear case with the gear segment oriented correctly (see figure 1) and the stainless steel thrust washer on top of the gear segment. Use a new gasket or o-ring to seal the gear case cover and secure cover screws with 242 loctite. Lastly reconnect all harnesses. Test the system for correct operation. If valve opens and closes as it should perform a final test of position sensor function. With valve closed disconnect motor power connection J14 & P14. Connect Meter leads to contacts in P14 as described in step 2. Squeeze the trigger or place the water valve switch in the ON position, the meter should detect (-) negative voltage then release trigger or place switch in close position and meter should not detect any voltage. This confirms the closed sensor is activated and preventing module output voltage for the closed direction but allowing it for the open direction. Move the valve to the open position and Squeeze the trigger or place water valve switch in the ON position, the meter should not detect any voltage, then release the trigger or place the water valve switch in the close position and the meter should detect (-) negative voltage . This confirms the open sensor is activated and preventing module output voltage in the open direction while allowing it in the closed direction. Once completed reconnect motor power connection.

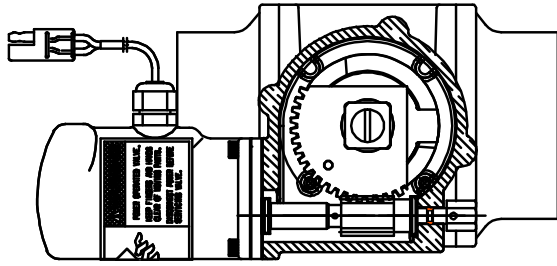
Summary:

We have tried to cover the most likely problems that can occur with the 8494 electric Sidewinder's water valve system. The valve control module is the heart of the system. Power and ground are fed into the module. Wires for each function (open & close) come from the control side of the module and carry signal voltage. When one of the function wires is switched to the common ground from the control side of the module motor power for that function is sent out from the valve side of the module to the valve motor in the polarity needed to perform that function. This troubleshooting guide is going to help diagnose whether the problem is on the monitor side of the control module, the controller side of the module, or with the module itself.

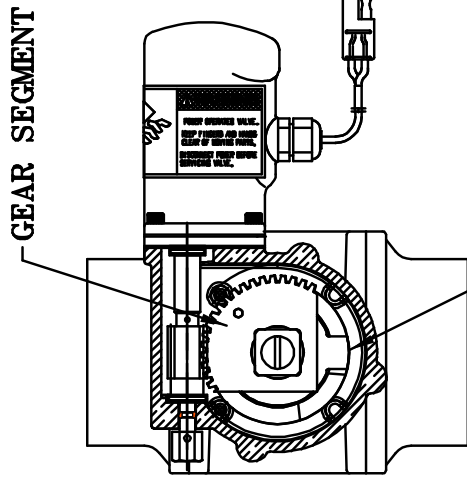
If you have any questions contact Technical Service at (800) 346-0250.

VALVE OUTLET

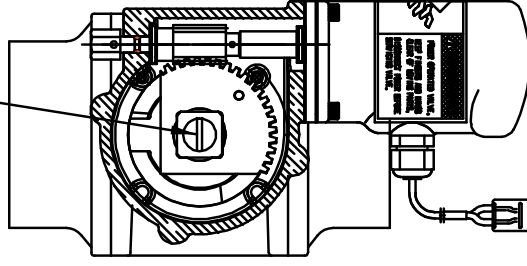
ACTUATOR SHAFT SLOT
Indicates ball position
(shown in closed position)



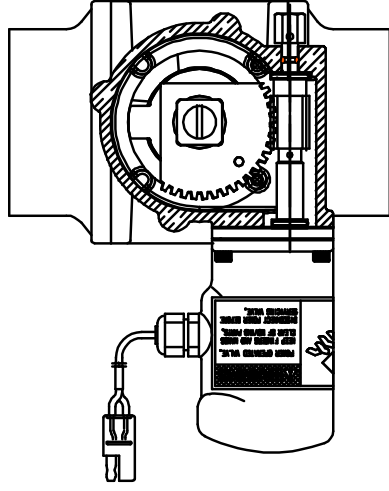
POSITION
1



POSITION
2



POSITION
3



POSITION
4

STOP PLATE
(to be in same position at
all gearcase positions)

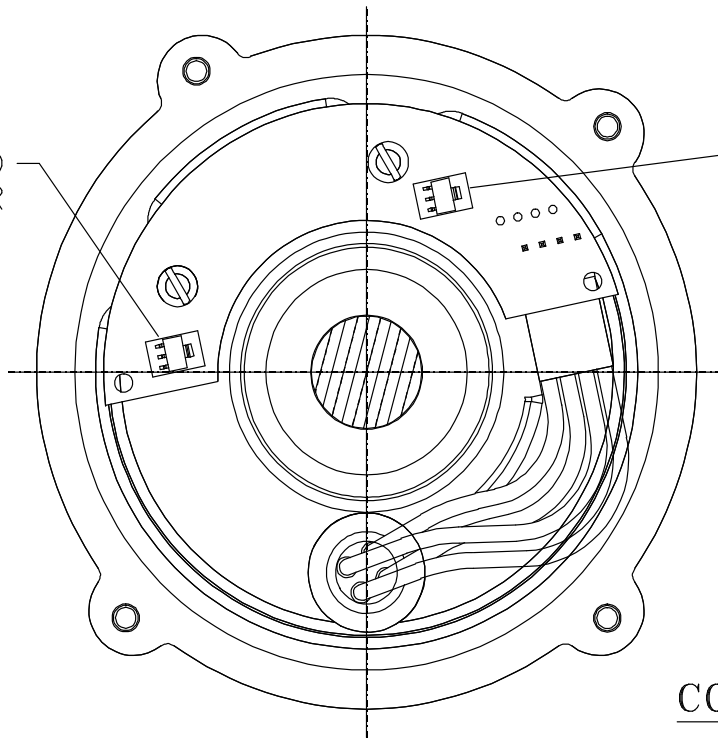
VALVE INLET

1. Rotate gear segment the same direction and angle that the gear case is rotated.
2. Do not rotate Stop Plate when Gear Case is rotated.

Figure 1

CLOSED
SENSOR

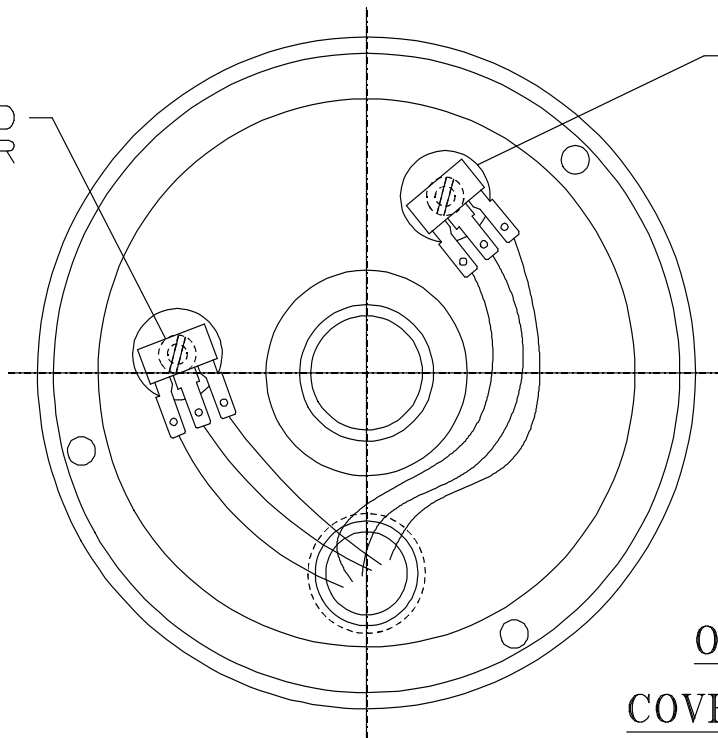
OPEN
SENSOR



NEW STYLE
COVER ASSEMBLY

CLOSED
SENSOR

OPEN
SENSOR



OLD STYLE
COVER ASSEMBLY

FIGURE 2