*Fisher Engineering*

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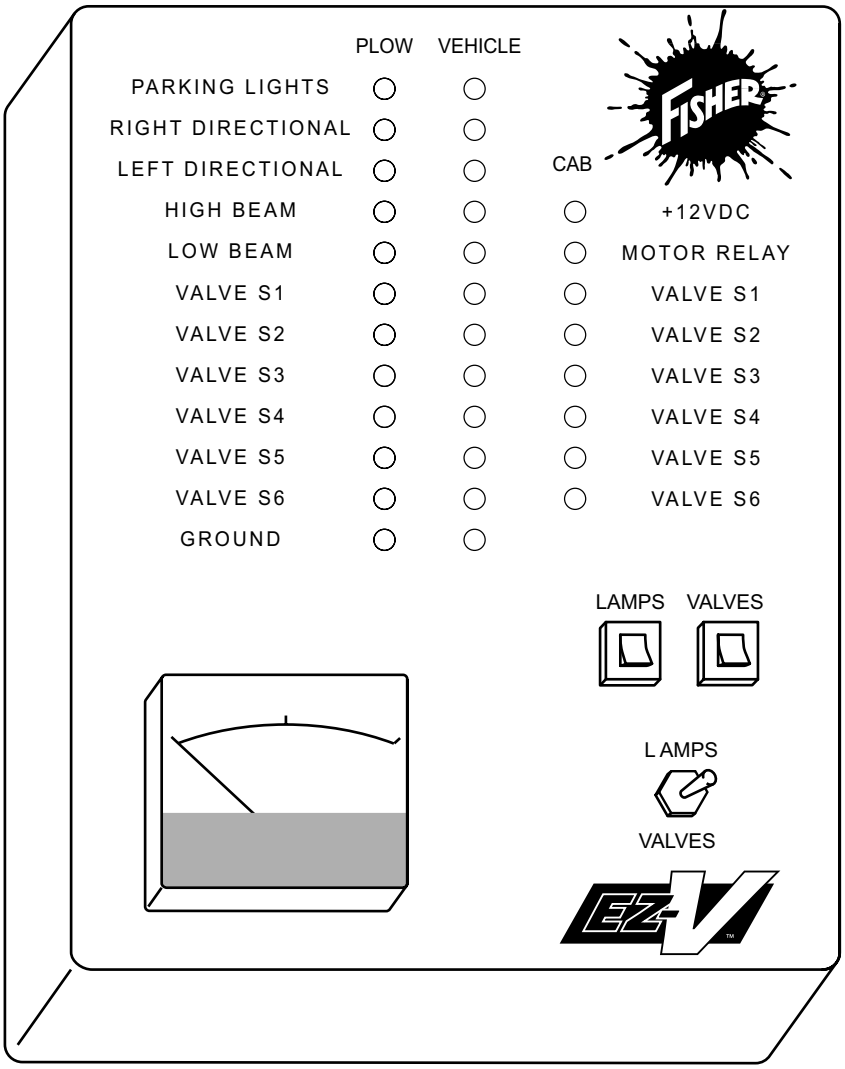
# Electrical Tester Operator's Manual for the EZ-V™ Snowplow




**⚠ CAUTION**

**Read this Electrical Tester Operator's Manual before testing any FISHER® snowplow.**

# Safety Information

**⚠ WARNING**

**Indicates a potentially hazardous situation that may result in death or serious injury if not avoided.**

**⚠ CAUTION**

**Indicates a potentially hazardous situation that may result in minor or moderate injury and/or property damage if not avoided.**

**NOTE: Identifies tips, helpful hints and information the tester should know.**

## BEFORE YOU BEGIN

**⚠ WARNING**

**Lower blade when vehicle is parked. Temperature changes could change hydraulic pressure, causing the blade to drop unexpectedly or damaging hydraulic components. Failure to do this can result in serious personal injury.**

**⚠ WARNING**

**The tester shall keep bystanders clear of the blade during this test. Do not stand between the vehicle and the blade. A moving or falling blade could cause personal injury.**

**⚠ CAUTION**

**Before starting any test, the snowplow must be properly attached to the vehicle.**

- Park the vehicle on a level surface, place shift lever in PARK or NEUTRAL and set parking brake.

## PERSONAL SAFETY

- Wear only snug-fitting clothing while working on your vehicle or snowplow.
- Do not wear jewelry or a necktie, and secure long hair.
- Wear safety goggles to protect your eyes from battery acid, gasoline, dirt and dust.
- Avoid touching hot surfaces such as the engine, radiator, hoses and exhaust pipes.
- Always have a fire extinguisher rated BC handy, for flammable liquids and electrical fires.

## FIRE AND EXPLOSION

**⚠ WARNING**

**Gasoline is highly flammable and gasoline vapor is explosive. Never smoke while working on vehicle. Keep all open flames away from gasoline tank and lines. Wipe up any spilled gasoline immediately.**

Be careful when using gasoline. Do not use gasoline to clean parts. Store only in approved containers away from sources of heat or flame.

## BATTERY SAFETY

**⚠ CAUTION**

**Batteries normally produce explosive gases which can cause personal injury. Therefore, do not allow flames, sparks or lit tobacco to come near the battery. When charging or working near a battery, always cover your face and protect your eyes, and also provide ventilation.**

**Batteries contain sulfuric acid which burns skin, eyes and clothing.**

**Disconnect the battery before removing or replacing any electrical components.**

## GENERAL INFORMATION

**⚠ CAUTION**
**Read the Electrical Tester Operator's Manual before testing any FISHER® snowplow.**

- All lamps must be operational. An open lamp may cause false test results.

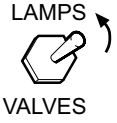
## CURRENT DRAW TEST

A zero (0) reading indicates an open circuit. A low or high reading indicates a poor connection, a burnt out bulb, a bad cartridge coil, or corrosion. The currents listed are approximate.

1. Connect the tester 3-pin connector to the plow battery cable.
2. Connect the plow 12-pin connector to the vehicle harness.
3. Use the amp meter adjusting screw to adjust the meter to zero.
4. Connect the tester leads to the vehicle battery.
   - the tester +12VDC LED is ON
5. Turn the ignition to RUN. Do not start the engine.

### Lights - Current Draw

6. Move the tester toggle switch to LAMPS.
7. Operate the lights. Refer to the chart below and verify the current draw.



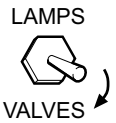

LIGHTS - CURRENT DRAW (AMPS)

| | |
|---|---|
| PARKING LIGHTS | 2.0 |
| PLOW HIGH BEAM | 11.0 |
| PLOW LOW BEAM | 8.0 |
| RIGHT/LEFT DIRECTIONALS | 3.0 - 4.0 |

### Control - Current Draw

8. Move the tester toggle switch to VALVES.
9. Plug the cab control into the vehicle.
   - The LED under the control logo is ON.

   Press the power button.
   - The PWR (power) LED is ON
10. Operate the control buttons. Refer to the chart below and verify the current draw. For all but the LOWER button, listen for the click as the motor relay energizes.




CONTROL - CURRENT DRAW (AMPS)

| | STRAIGHT BLADE | VEE / SCOOP | WING |
|---|---|---|---|
| RAISE | 3.0 | 3.0 | 3.0 |
| LOWER | 3.0 | 3.0 | 3.0 |
| R/VEE (first press) | 1.5 | 1.5 | 0.1* |
| R/VEE (second press) | N/A | N/A | 1.5 |
| L/SCP (first press) | 3.0 | 4.5 | 1.5 |
| L/SCP (second press) | N/A | N/A | 3.0 |

*may appear to be (0)

After pressing the LOWER button, cancel float by pressing the RAISE button.

**Straight Blade** mode: Initially, the control MODE LED is off – this indicates the default Straight Blade mode.

**Vee/Scoop** mode: Press and release the MODE button. The MODE LED is now ON (steady light), indicating the VEE/SCOOP mode.

**Wing** mode: Press and hold the MODE button. The MODE LED flashes, indicating the WING mode.

11. If required, repair or replace components, and retest.
12. The test is complete. Turn off the ignition and disconnect the tester.

For further information refer to the Electrical Tester Operator's Manual or the Mechanic's Guide.

## CAB CONTROL TEST

This procedure tests the Fish-Stik™ Control functions only.

1. Move the tester toggle switch to the center position.
2. Connect the tester leads to the vehicle battery.
   - the tester +12VDC LED is ON
3. Plug the control into the tester.
   - the LED under the control logo is ON
4. Press the power button.
   - the PWR (power) LED is ON
5. Refer to the chart below and operate the control. For each control button:
   - Verify that the indicated tester Cab LEDs come on.
   - Verify the control timeouts. For all except the LOWER function, if you press and hold the buttons, the tester's Motor Relay and Valve LEDs time out automatically.

     The Motor Relay LED times out in approximately 4.25 seconds (2.5 seconds for the RAISE function), and the Valve LEDs time out approximately 1 second later**.**

     Press and hold the LOWER button – after .75 second the control FLT (float) LED comes on. Cancel float by pressing the RAISE button.

     **Straight Blade** mode: Initially, the control MODE LED is off – this indicates the default Straight Blade mode.

     **Vee/Scoop** mode: Press and release the MODE button. The MODE LED is now ON (steady light), indicating the Vee/Scoop mode.

     **Wing** mode: Press and hold the MODE button. The MODE LED flashes, indicating the Wing mode.
6. If any LED does not come on, repair or replace components, and retest.
7. The test is complete. Disconnect the tester.

For further information refer to the Electrical Tester Operator's Manual or the Mechanic's Guide.

CAB LEDs

LAMPS

VALVES

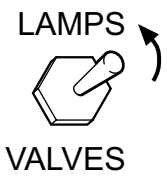
| CONTROL MODE | ALL | ALL | STRAIGHT BLADE (default) | | VEE / SCOOP | | WING | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| BUTTON | RAISE | LOWER | R/VEE | L/SCP | R/VEE | L/SCP | R/VEE (first press) | R/VEE (second press) | L/SCP (first press) | L/SCP (second press) |
| +12VDC | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| MOTOR RELAY | ● | ○ | ● | ● | ● | ● | ● | ● | ● | ● |
| VALVE S1 | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| VALVE S2 | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ● | ● |
| VALVE S3 | ● | ● | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ |
| VALVE S4 | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ● |
| VALVE S5 | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| VALVE S6 | ○ | ○ | ○ | ○ | ○ | ● | ○ | ● | ○ | ○ |

## PLOW HARNESS TEST

This procedure tests continuity in the plow harness.

1. Move the tester toggle switch to the lamps position.
2. Connect the tester 12-pin connector to the plow harness.
3. Connect the tester 3-pin connector to the plow battery cable.
4. Connect the tester leads to the vehicle battery.
   - the tester +12VDC LED is ON
5. Check for plow circuit continuity. Verify that:
   - all tester Plow LEDs are ON
6. If any LED is not ON, repair or replace components, and retest.
7. The test is complete. Disconnect the tester.

For further information refer to the Electrical Tester Operator's Manual or the Mechanic's Guide.




PLOW HARNESS TEST

| | PLOW | VEHICLE |
|---|---|---|
| PARKING LIGHTS | ● | ○ |
| RIGHT DIRECTIONAL | ● | ○ |
| LEFT DIRECTIONAL | ● | ○ |
| HIGH BEAM | ● | ○ |
| LOW BEAM | ● | ○ |
| VALVE 1S | ● | ○ |
| VALVE 2S | ● | ○ |
| VALVE 3S | ● | ○ |
| VALVE 4S | ● | ○ |
| VALVE 5S | ● | ○ |
| VALVE 6S | ● | ○ |
| GROUND | ● | |

## VEHICLE HARNESS TEST

This procedure tests continuity in the vehicle harness.

1. Move the tester toggle switch to the center position.
2. Disconnect both plow electrical connectors from the vehicle.
3. Connect the tester 12-pin connector to the vehicle harness.
4. Connect the tester leads to the vehicle battery.
   - the tester +12VDC LED is ON
5. Turn the ignition to RUN. Do not start the engine.

**Vehicle Harness – Lights**

6. Refer to the Lights chart below and operate the lights. Verify that the indicated Vehicle LEDs come on.

   If any LED does not come on, repair or replace components, and retest.

**Vehicle Harness – Cab Control**

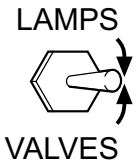
7. Plug the Fish-Stik™ Control into the vehicle.
   - The LED under the control logo is ON.
8. Press the power button.
   - The PWR (power) LED is ON

   **Straight Blade** mode: Initially, the control MODE LED is off – this indicates the default Straight Blade mode.

   **Vee/Scoop** mode: Press and release the MODE button. The MODE LED is now ON (steady light), indicating the Vee/Scoop mode.

   **Wing** mode: Press and hold the MODE button. The MODE LED flashes, indicating the Wing mode.
9. Refer to the Cab Control chart below, and operate the control. For each control function verify that the indicated tester Vehicle LEDs come on. For all but the LOWER function, listen for the click as the motor relay energizes.
10. If any LED does not come on, or the motor relay does not energize, repair or replace components, and retest.
11. The test is complete. Turn off the ignition and disconnect the tester.

For further information refer to the Electrical Tester Operator's Manual or the Mechanic's Guide.




| LIGHTS | PLOW | VEHICLE |
|---|---|---|
| PARKING LIGHTS | ○ | ● |
| RIGHT DIRECTIONAL | ○ | ● |
| LEFT DIRECTIONAL | ○ | ● |
| HIGH BEAM | ○ | ● |
| LOW BEAM | ○ | ● |
| VALVE 1S | ○ | ○ |
| VALVE 2S | ○ | ○ |
| VALVE 3S | ○ | ○ |
| VALVE 4S | ○ | ○ |
| VALVE 5S | ○ | ○ |
| VALVE 6S | ○ | ○ |
| GROUND | ○ | |

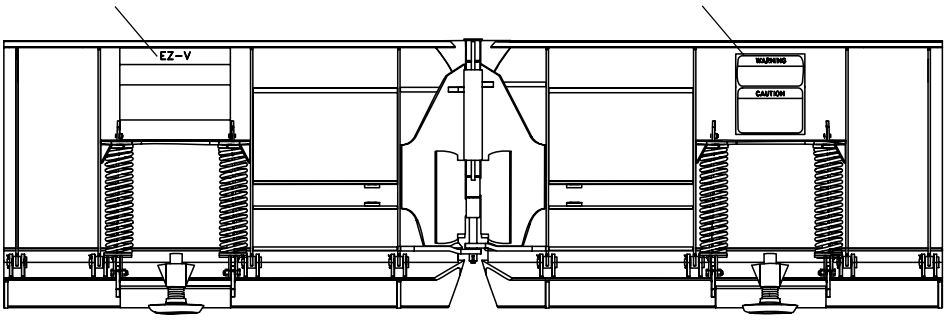
| CAB CONTROL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CONTROL MODE | ALL | ALL | STRAIGHT BLADE (default) | | VEE / SCOOP | | WING | | | |
| CONTROL BUTTON | RAISE | LOWER | R/VEE | L/SCP | R/VEE | L/SCP | R/VEE (first press) | R/VEE (second press) | L/SCP | L/SCP |
| Motor Relay | CLICKS | | CLICKS | CLICKS | CLICKS | CLICKS | CLICKS | CLICKS | CLICKS | CLICKS |
| VALVE S1 | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| VALVE S2 | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ● | ● |
| VALVE S3 | ● | ● | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ |
| VALVE S4 | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ● |
| VALVE S5 | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| VALVE S6 | ○ | ○ | ○ | ○ | ○ | ● | ○ | ● | ○ | ○ |

# Safety Information

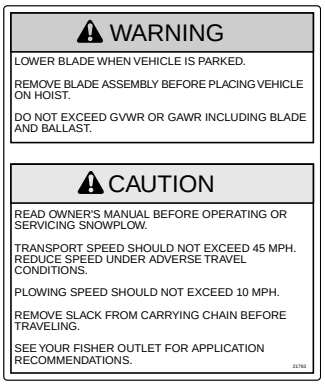
**Please become familiar with and make testers knowledgeable of the Warning and Instruction labels on the back of the blade!**

Instruction Label

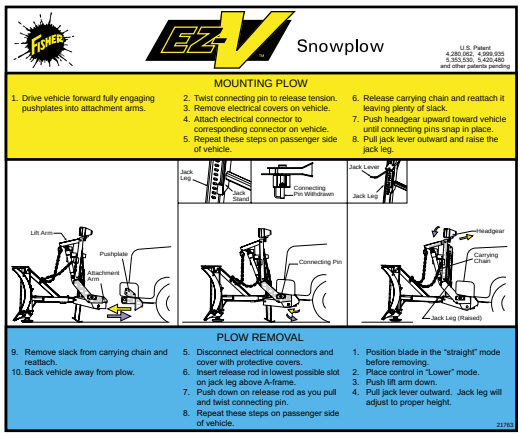
Warning Label




Warning Label




Instruction Label

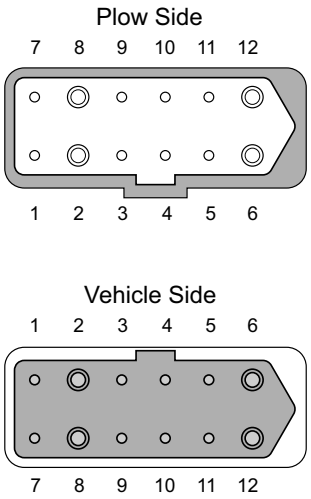



## ADDITIONAL INFORMATION

- Connect the Electrical Tester's red clip to the positive battery terminal and the black clip the negative terminal. Connect the black clip last. When disconnecting, disconnect it first.
- If a tester LED does not come on, the fault could be an open lamp element, an open circuit, or both.
- The tester cannot verify that lamp elements wired in parallel are good.
- The Electrical Tester is protected by circuit breakers. A tripped breaker indicates a direct short. Reset by pushing the button in.
- There are no user-serviceable parts inside the Electrical Tester. For repair, return the Electrical Tester to your Fisher Engineering outlet.

## CIRCUIT / WIRE COLOR CHART

| CIRCUIT SHOWN ON TESTER | CORRESPONDING WIRE COLOR | PIN # |
|---|---|---|
| PARKING LIGHTS | Brown | 11 |
| RIGHT DIRECTIONAL | Violet | 10 |
| LEFT DIRECTIONAL | Gray | 9 |
| HIGH BEAM | White | 6 |
| LOW BEAM | Black | 2 |
| VALVE S1 | White / Yellow | 1 |
| VALVE S2 | Lt Blue | 4 |
| VALVE S3 | Lt Green | 3 |
| VALVE S4 | Black / White | 7 |
| VALVE S5 | Dk Blue / Orange | 8 |
| VALVE S6 | Lt Blue / Orange | 12 |
| GROUND | Black / Orange | 5 |

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