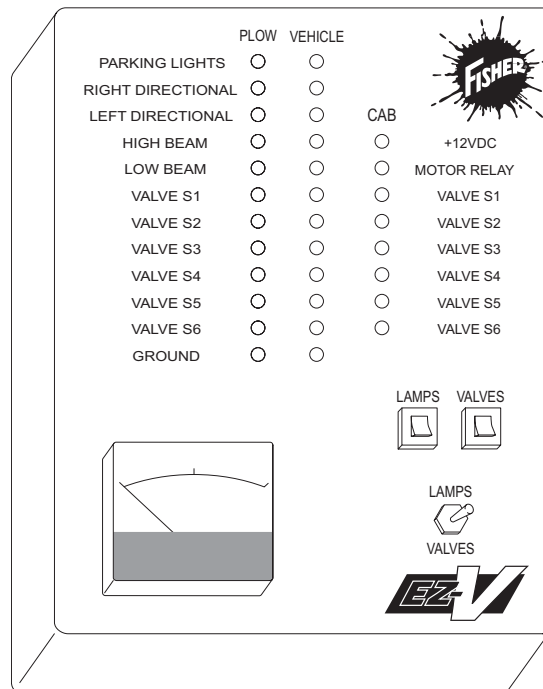




Electrical Tester Operator's Manual for EZ-V® Snowplows with Isolation Module Electrical System



⚠ CAUTION

Read this document before testing any FISHER® snowplows.

⚠ CAUTION

See your FISHER® outlet for application recommendations. The Kit Selection Guide has specific vehicle and snowplow requirements.

SAFETY

SAFETY DEFINITIONS

WARNING

Indicates a potentially hazardous situation, that if not avoided, could result in death or serious personal injury.

CAUTION

Indicates a situation that, if not avoided, could result in damage to product or property.

NOTE: Identifies tips, helpful hints, and maintenance information the owner/operator 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.

FUSES

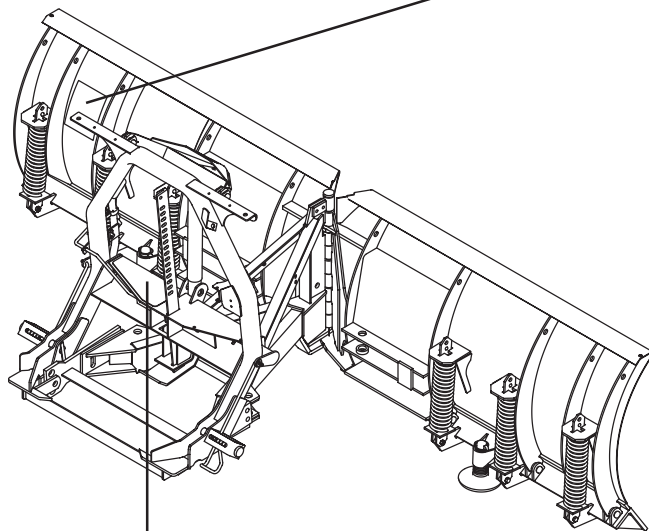
The vehicle control harness contains two automotive-style fuses. One fuse is for the snowplow park/turn lamp power and the other is for the snowplow control power. If a problem should occur and fuse replacement is necessary, the replacement fuse should be of the same value as the original. Installing a fuse of a larger value could damage the system.

SAFETY

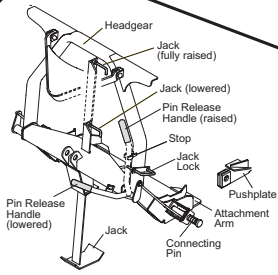
WARNING/CAUTION & INSTRUCTION LABELS

Become familiar with and inform users about the warning labels on the back of the blade, and the instruction label located either on the headgear or back of the blade.

Minute Mount® 2 System



Instruction Label



1. Push Pin Release Handle down to pull out Connecting Pins.
2. Drive vehicle slowly to engage Pushplates into Attachment Arms.
3. Stand in front of blade. Fully raise Pin Release Handle to release Connecting Pins.
4. Push Headgear toward vehicle to allow Connecting Pins to fully engage Pushplates.
5. Pull out Jack Lock. Push Pin Release Handle into Stop.
6. While holding Jack Lock out, use Jack Handle to raise Jack fully. Release Jack Lock.
7. Attach all electrical connectors.

ATTACH

U.S. Patents 4,280,062; 4,999,935; 5,353,530; 5,420,480; RE 35,700; 6,253,470; CAN Patent 2,060,425; and other patents pending.

Read Owner's Manual For Complete Instructions

1. Place control in Lower/Float to put blade down.
2. Pull and hold Jack Lock out. Jack will drop to ground. Then pull Pin Release Handle away from Stop and Jack Lock. Release Jack Lock.
3. Stand in front of blade. While pushing Headgear toward vehicle with left hand, push Pin Release Handle down to disengage Connecting Pins. Make sure Connecting Pins are fully retracted.
4. Detach all electrical connectors.

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DETACH

Warning/Caution Label

WARNING

LOWER BLADE WHEN VEHICLE IS PARKED.

REMOVE BLADE ASSEMBLY BEFORE PLACING VEHICLE ON HOIST.

DO NOT EXCEED GVWR OR GAWR INCLUDING BLADE AND BALLAST.

CAUTION

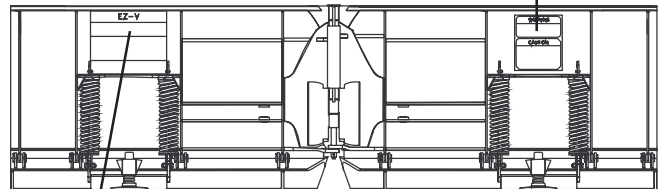
READ OWNER'S MANUAL BEFORE OPERATING OR SERVICING SNOWPLOW.

TRANSPORT SPEED SHOULD NOT EXCEED 45 MPH. REDUCE SPEED UNDER ADVERSE TRAVEL CONDITIONS.

PLOWING SPEED SHOULD NOT EXCEED 10 MPH.

SEE YOUR SALES OUTLET FOR APPLICATION RECOMMENDATIONS.

Original Minute Mount® System

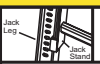


Instruction Label


U.S. Patent 4,280,062; 4,999,935; 5,353,530; 5,420,480; and other patents pending.

MOUNTING PLOW


1. Drive vehicle forward fully engaging pushplates into attachment arms.
2. Twist connecting pin to release tension.
3. Remove electrical covers on vehicle.
4. Attach electrical connector to corresponding connector on vehicle.
5. Repeat these steps on passenger side of vehicle.
6. Release carrying chain and reattach it leaving plenty of slack.
7. Push headgear upward toward vehicle until connecting pins snap in place.
8. Pull jack lever outward and raise the jack leg.




Jack Leg



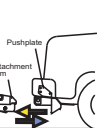
Connecting Pin




Jack Lever



Lift Arm



Pushplate



Carrying Chain

PLOW REMOVAL

9. Remove slack from carrying chain and reattach.
10. Back vehicle away from plow.
5. Disconnect electrical connectors and cover with protective covers.
6. Insert release rod in lowest possible slot on jack leg above A-frame.
7. Push down on release rod as you pull and twist connecting pin.
8. Repeat these steps on passenger side of vehicle.
1. Position blade in the "straight" mode before removing.
2. Place control in "Lower" mode.
3. Push lift arm down.
4. Pull jack lever outward. Jack leg will adjust to proper height.

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EZ-V® ELECTRICAL TEST PROCEDURE

TEST PREPARATION

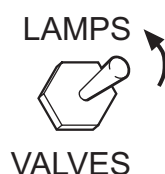
- Connect the Electrical Tester's red clip to the positive battery terminal and the black clip to the negative terminal. Connect the black clip last. When disconnecting, disconnect it first.
- If a tester LED does not come on, the fault could be an open lamp element, an open circuit, or both.
- All vehicle lamps must be operational. An open lamp may cause false test results.
- 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 in the button located on the front panel.
- There are no user-serviceable parts inside the Electrical Tester. For repair, return the Electrical Tester to your sales outlet.

SNOWPLOW HARNESS TEST

This procedure tests continuity in the snowplow harness.

1. Move the tester toggle switch to LAMPS.
2. Connect the tester 12-pin connector to the **"Y" Adapter Cable** (part number 26482) 12-pin connector. Connect the **"Y" Adapter Cable's** 7 and 11-pin connectors to the snowplow harnesses.
3. Connect the **"Y" Adapter Cable** orange/black wire to a good vehicle ground.
4. Connect the adapter cable red wire to the red receptacle on the tester.
5. Connect tester leads to the vehicle battery.
6. Check the snowplow circuit continuity. Verify that all snowplow tester LED's are ON.
7. If any LED is not ON, repair or replace components, and retest.
8. The test is complete. Disconnect the tester.

For further information refer to the *EZ-V® Snowplow Mechanic's Guide featuring the Isolation Module Electrical System*.



| SNOWPLOW 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 | ● | |

EZ-V® ELECTRICAL TEST PROCEDURE

CURRENT DRAW TEST – CARTRIDGE COILS

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

1. Connect the snowplow and vehicle control harnesses.
2. Connect the snowplow and vehicle lighting harnesses.
3. Use the amp meter adjusting screw to adjust the meter to zero.
4. Find and remove the 10A control fuse, part of the vehicle control harness and located near position #1 of the Isolation Module.
5. Install the jumper wire blade terminal into position B of the fuse holder.
6. Connect the banana plug end to the red receptacle on the tester.
7. Connect the tester leads to the vehicle battery.
 - The tester +12VDC LED is ON.
8. Move the tester toggle switch to VALVES.
9. Plug the cab control into the vehicle. Turn the ignition switch to run, but do not start the engine.
 - 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.

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 the MODE button for approximately 2 seconds. 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 and jumper lead.
13. Reinstall the 10A fuse and fuse holder cover.

For further information refer to the *EZ-V® Snowplow Mechanic's Guide featuring the Isolation Module Electrical System*.

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 |

LAMPS



VALVES

*may appear to be (0)

EZ-V® ELECTRICAL TEST PROCEDURE

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 LED's come on.
 - Verify the control time-outs. For all except the LOWER function, if you press and hold the buttons, the tester's Motor Relay and Valve LED's time out automatically.

The Motor Relay LED times out in approximately 4.25 seconds (2.5 seconds for the RAISE

function), and the Valve LED's 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.

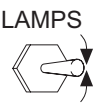
Wing mode: Press the MODE button for approximately 2 seconds. The MODE LED flashes, indicating the Wing mode.

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 *EZ-V® Snowplow Mechanic's Guide featuring the Isolation Module Electrical System*.

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 | ○ | ○ | ○ | ○ | ○ | ● | ○ | ● | ○ | ○ |

EZ-V® ELECTRICAL TEST PROCEDURE

VEHICLE CONTROL HARNESS TEST

This procedure tests continuity in the vehicle control harness.

1. Move the tester toggle switch to the center position.
2. Disconnect all snowplow electrical connectors from the vehicle except the lighting harness.
3. Connect the tester 12-pin connector to the **"straight" Adapter Cable** (part number 26483) 12-pin connector. Connect the **"straight" Adapter Cable** 7-pin connector to the vehicle control 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.
6. Plug the FISH-STIK® Control into the vehicle.
 - The LED under the control logo is ON.



7. 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 the MODE button for approximately 2 seconds. The MODE LED flashes, indicating the Wing mode.

8. Refer to the cab control chart below, and operate the control. For each control function verify that the indicated tester vehicle LED's come on. For all but the LOWER function, listen for the click as the motor relay energizes. To cancel LOWER/FLOAT, depress the RAISE button.
9. If any LED does not come on, or the motor relay does not energize, repair or replace components, and retest.
10. The test is complete. Turn off the ignition and disconnect the tester.

For further information refer to the *EZ-V® Snowplow Mechanic's Guide featuring the Isolation Module Electrical System*.

| 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 (first press) | L/SCP (second press) |
| Motor Relay | CLICKS | | CLICKS | CLICKS | CLICKS | CLICKS | CLICKS | CLICKS | CLICKS | CLICKS |
| VALVE S1 | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| VALVE S2 | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ● | ● |
| VALVE S3 | ● | ● | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ |
| VALVE S4 | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○ | ● |
| VALVE S5 | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| VALVE S6 | ○ | ○ | ○ | ○ | ○ | ● | ○ | ● | ○ | ○ |



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