



Troubleshooting **Manual Control Panel** (Old Platform) Electronic Control- Prior to 2008, Using Pressure Switch

Control Panel part # 2086 (number located on back of printed circuit board)

This guide addresses the troubleshooting of electronic controls used on Equalizer Systems' manual control panels manufactured prior to 2008. These systems can be identified by having a 12 pin connector located at the back of the control panel and the # 2086 on a tag on the back of the printed circuit board. These original (old platform) control panels are obsolete. There is not an exact replacement. Replacement will require the filling out of the [Panel Replacement Form](#) so that a proper part(s) may be identified.

Control panel will not power up: When the power switch is pressed, the power light should come on regardless of the position of the vehicle's ignition switch. Check for power at the back of the control panel. On panels that have an ATO fuse at the back of the panel, the power connection (12 VDC positive) will be next to the fuse. If the fuse is present check it. The fuse should be rated at 20 amps. If a 20 amp fuse is blown, there may be an issue (short) that needs resolved. The ground for these panels will be the black wire in the end of the 12 pin connector. If there is no fuse, the power and ground connector will be a 2 pin connector with a red (12 VDC positive) and black wire (12 VDC negative or ground). Check across these wires for voltage. If power and ground are present and the panel will not power up, then the control panel is defective. If there is no power or ground to the control panel, the source must be located and repaired. On later model year units that have the 2 pin power and ground connector, the power and ground generally comes from the pump assembly. Locate the 2 pin connector at the pump and check the fuse at the pump assembly (if equipped). Check for power and ground to the pump assembly. On earlier units the power and ground supply may have been supplied from the vehicle fuse panel or directly from the battery. You will need to trace and locate to determine the issue.

Control panel powers up then shuts down when one or more switch commands is attempted: This is known as a power reset: If a control panel shuts off when one or more switches are pressed and then can be powered right back up by pressing the power switch, this is known as a power reset. This is caused by very low voltage or poor ground to the control panel. Check the power feed and the ground (noted above) to the control panel.

Control panel powers up but you only get a solid beep from the control panel and the power light flashes (or turns red on later models) when trying one or more operations: This is low system voltage. Check the voltage and ground to the control panel. If the voltage falls to 10.5 VDC, operations will be denied. Oftentimes voltage will start out high then fall below the lower limit when load is applied to the circuit. Generally voltage should stay above 11 VDC during operation.

Control panel powers up, pump motor won't run when switch commands occur: Locate the blue wire in the 12 pin connector at the back of the panel. This blue wire is the 'exciter' for the motor solenoid at the pump assembly. The blue wire should be "Hot" (12 VDC positive) when any run command is attempted. If there is no voltage (12 VDC positive) and no disables are in play (see section on disables) and panel supply voltage and ground are good (see the prior sections on voltage), the control panel is defective. If there is voltage, then trace the blue wire down to the pump and check for breaks in the wire. Check for voltage on the blue wire at the pump solenoid. If no issue is found with the blue wire and voltage is present on the blue wire when attempting to run, refer to the troubleshooting guide for motors and solenoids.

Pump motor runs, however the jacks will only extend: If jacks extend when a retract command is given (manual 'up' arrow) locate the green wire in the 12 pin connector at the back of the control panel. There should be 12 VDC positive (min 10.5 VDC) on the green wire when retract is attempted. If there is no voltage on the green wire and the supply voltage and ground (see prior sections on voltage), then the control panel is defective. If there is voltage, trace and test the green wire down to the pump directional valve (DV 1) for issues with the green wire. The green wire is the 'exciter' for the directional valve (DV 1). If the valve does receive voltage (at least 10.5 VDC) during a retract command, the directional valve (DV 1) is stuck in the extend position- or the coil is defective. Remove the directional valve (DV 1) and coil. Clean or replace the valve and coil. If the coil is corroded, replace it. Also check the coil with an ohm meter for a shorted or open coil. On a 2 terminal coil there should be continuity across the 2 terminals. There should be no continuity between either of the terminals and ground- with the wires to it disconnected (on a two terminal coil one of the terminals goes to ground via a black wire that goes to the pump ground stud). If there is no voltage or low voltage on the green wire and voltage was good on the green wire at the back of the control panel, then there is a wiring or connector issue. Trace and repair the green wire.

Pump motor runs, no jacks will extend, and jacks are fully retracted: Check for voltage at the green wire at the directional control valve (DV 1). There should be no voltage when trying to extend. If there is no voltage then the directional control valve (DV 1) is probably stuck in the retract position. Remove and clean the directional valve (DV 1) or replace it. If voltage is present, there is a control panel or a wiring issue.

Pump motor runs and one or more jacks work, however one or more jacks do not extend or retract: Locate the manifold valve (V 1 Thru V 4) for the jack(s) that do not work and check for voltage when trying to extend or retract. There should be at least 10.5 VDC applied to the valve coil when the correct up or down button is pressed. If voltage is good, the valve or coil is defective. If there is no voltage, check the same color wire at the back of the control panel for voltage. If there is no voltage at the back of the control panel, then the control panel is defective. If there is no voltage to the wire at the coil but there is voltage to the same wire color at the back of the control panel, then there is a wiring issue. Trace and repair as needed. See chart for wire function/colors.

Pump motor runs, jacks operate from manual ‘up’ and ‘down’ buttons, however jacks down status lights do not operate properly:

Check for proper operation of the jacks down lights: There is a pressure switch in the manifold that triggers the jacks down lights. The lights should come on if the jack(s) is not in the retracted position and go out when the jack(s) is fully retracted. If the lights do not operate in this manner, there is an issue with the jacks down light circuit. The pressure switch has 2 terminals, one that connects to ground (black wire) and the other terminal connects to the main harness that connects to the back of the control panel in the twelve pin connector. See the chart for the wire colors and pin placement. When the jack extends from the stowed position the pressure on the retract side goes low which closes the switch connecting the panel wires to ground thru the ground wire which turns the panel lights on. When the jack foot retracts and pressure goes high the switch opens which breaks the connection to ground and turns the lights off.

Check the pressure switch for continuity: Remove the wires from the pressure switch. There should be continuity across the terminals when the jacks are extended (pressure switch closed). When the jacks are fully retracted there should be no continuity (pressure switch is open). If not then the pressure switch is defective or the pump cannot create enough pressure to trip the pressure switch.

Check for wiring/panel light issues: If you ground the wire(s) going to the pressure switch from the harness/panel the jack status light(s) should come on. If you ground the wires at the pressure switch and the lights do not come on then try to ground them right at the back of the panel. If they come on then but would not before at the pressure switch then you have a wiring or pressure switch issue. If they won't come on when grounding at the back of the panel then the panel is defective.

Jacks down Status lights go on and off correctly however they won't stay out: If the jacks down status lights work correctly as above however they come back on after they have went out then there is a pressure loss on the retract side of the hydraulic circuit. This could be one of or a combination of the below items.

Check for external fluid leaks at the jacks, the pump/manifold assembly, hose and fittings and at the slide cylinders: A leak anywhere in the retract side of the circuit (including the slides if equipped) can create the jacks down lights coming on or not going off.

Check manifold valve DV1: This valve is the retraction hold valve. If this valve is defective the retract side pressure will not hold high causing the jacks down lights to come on. This can also allow the jacks or slides to drift from the stowed position. Verify that the override screw or knob is in the correct position (check owner's manual for this). Also check the o ring and backing ring on the nose of the valve (valve must be removed from manifold to do this). If the o ring is damaged there could be an issue with the manifold sealing surface which would require the replacement of the manifold.

One or more of the cylinders (jacks or slides) is defective (has internal piston seal bypass). Generally after checking/repairing leaks and checking/replacing the DV 1 valve we would then look for a drifting cylinder (one that does not stay in place (extended or retracted)). This cylinder would most likely be defective and would need to be checked for bypass and or replaced.

Other items to consider:

- 1. Ignition or 'key on' disable:** In the twelve pin connector there is a red or pink wire. If this wire is hot (12 VDC positive), extension of jacks will be denied. Generally, this is connected to a source on the vehicle that is "Hot" (12 VDC positive) when the ignition key is turned to the engine run or on position. This also is used to trigger the alarm and flash the jacks down lights should a leg drift from the stowed position when the key is in the on position. This is a required connection as it is a safety alert.
- 2.** Most 2086 control panels the all retract is on a preset timer that runs the pump for up to 90 seconds when the all retract button is pressed regardless of the position of the jacks. This is normal.
- 3.** Most 2086 control panels will run the pump for a few seconds any time the key is turned to the on position or the panel is powered up. This is a pre-drive check that is done to verify that the pressure switch which operates the jacks down status lights was not incorrectly triggered by the operation of the hydraulic slide outs. (Note not all units have hydraulic slide outs however this function will exist regardless of slide presence or not).
- 4. Gulf Stream Conquest units (Endura/Super C):** These units will have the front jacks "Teed" together hydraulically and electrically so that an attempt to run the left front or the right front will result in the operation of both front legs. See the document for Gulf Steam/Conquest for more on this.
- 5.** Most 2086 control panels will not allow you to fully retract the jacks with the manual "up" arrows. Retraction using up arrows will be denied after 3 five second attempts per switch. Retraction from the up arrows is to be used only during the leveling process. To retract the jacks prior to travel the ALL Retract Switch must be used.

Wiring connections at back of control panel

Connector	#Wire	Position/Wire Color	Function
J1 (12 pin)	1	Brown	Left front jack valve output 12 VDC +
	2	Brown/trace	Left front jack light/pressure switch
	3	White	Right front jack valve output 12 VDC +
	4	White/trace	Right front jack light/pressure switch
	5	Orange	Left rear jack valve output 12VDC +
	6	Orange/trace	Left rear jack light/pressure switch
	7	Yellow	Right rear jack valve output 12VDC +
	8	Yellow/trace	Right rear jack light/pressure switch
	9	Green	Directional Control Valve DV1 output 12 VDC +
	10	Pink or Red	Ignition disable input 12 VDC + from Key On
	11	Blue	Pump motor solenoid output 12 VDC +
	12	Black	Control panel Ground 12 VDC – (chassis ground)
J3 (2 pin) (If present)	1	Red	Power input 12VDC + Minimum 12ga/20amp
	2	Black	Ground input 12VDC –
J3 (fused)	1	(installed supplied)	Power input 12 VDC + Minimum 12ga/20amp

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