

MPFC Adjustment Instructions

The threshold setting and full output setting are factory adjusted for your specific valve coil. Additional field adjustments are recommended to tune each machine function to the desired operation.

CW rotation increases the output.
CCW rotation decreases the output.

Some interaction may occur between adjustments of the trim pots and some re-adjustment of the trim pots may be required to achieve the optimum setting. The trim pots are 22 turn devices and will require several turns before an appreciable change in response is observed.

Adjustment Priority.

1. **Full Output Adjust Trim pot (MAX 1):** With the handle fully deflected adjust the **MAX 1** trim pot CW until the desired speed is achieved. **Caution:** Do not over adjust. To insure that the full speed adjustment is not saturated, back the handle off from full travel 5-10 , a change in performance should be observed. If no change is noticed **MAX 1** is saturated (over adjusted). Turn **MAX 1** CCW 5 turns and re-check for a response change just off the end of the travel again.
2. **Threshold (THRES 1):** Deflect handle slowly about 5 from off to adjust where the LED turns on then adjust the **THRES 1** trim pot CW to increase the start speed of the function you are controlling. To obtain a slower speed at this position turn the **THRES 1** trim pot CCW until the desired speed is observed. Re-check maximum speed setting and re-adjust **MAX 1** again if necessary to the desired maximum speed. A correctly adjusted controller will start the function moving when the handle is initially deflected and reach full speed just at the end of travel.

Option Adjustments

3. **Dual Full Output Adjust (MAX 2):** An independent adjustment of the full output in each direction can be achieved with this option. **MAX 1** adjusts the output at full handle travel in "A" direction. **MAX 2** adjusts the output at full handle travel in "B" direction. Follow the instructions for **MAX 1** adjustment above when adjusting **MAX 1** for "A" and **MAX 2** for "B" direction.
4. **Hi-Lo Range Adjustment (HLRA):** Two high-speed settings can be achieved when the handle is fully deflected. Full proportionality is maintained between the threshold setting and either the low range or the high range full output setting. The selection of each range is achieved by either connecting or disconnecting the supply voltage to terminal J5 pin 2. When the supply voltage is applied to J5-2, the circuit selects the high range setting. When power is removed from J5-2, the circuit defaults to the low range setting.

High Range Adjustment HI (MAX 1): Apply power to J5-2 and fully deflect the handle in the 'A' direction. Begin adjustment by following Adjustment Priority (1) procedures and adjust **MAX 1** trim pot, which is now your high range trim pot. Whenever source power is connected to J5-2 maximum output will be achieved for this function.

High Range Adjustment HI (MAX 2): Apply power to J5-2 and fully deflect the handle in the 'B' direction. Begin adjustment by following Adjustment Priority (1) procedures and adjust **MAX 2** trim pot, which is now your high range trim pot. Whenever source power is connected to J5-2 maximum output will be achieved for this function.

Low Range Adjustment LO (HI/LO): When the source voltage is disconnected from J5-2 by an external contact or other means the circuit will default to low range. With J5-2 disconnected deflect the handle fully and adjust the **HI/LO** trim pot to the desired low speed output. Again begin this adjustment by following the procedures outlined in Adjustment Priority (1) for **MAX 1** trim pot. With handle fully deflected re-connect the source power to J5-2 and then disconnect it again. A noticeable change in full output speed should be observed.

Reference MPFC Electronics Hook up and Wiring Instructions
for trim pot designation code and description.



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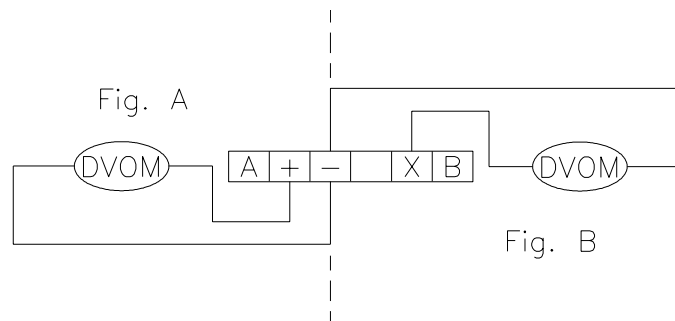
5. **Ramp (RAMP 1):** The ramp option compensates for jerky handle movements by providing a smooth response. Turning the trim pot Ramp 1 CW increases the ramp time and lessens the response time to handle movement. CCW adjustment decreases the ramp time and increases the response time to handle movement. The standard ramp time is adjustable from 0-2.5 seconds. 0 to 1, 2, 3, 4 or 5 seconds adjustment range is available on request. Ramping occurs between the threshold setting and the full output setting. If the handle is returned to off the function will ramp down to the threshold level and then stop.
6. **Dual Threshold Adjust (THRES 2):** An independent adjustment of the threshold output in each direction can be achieved with this option. Follow **THRES 1** threshold adjustment procedure and adjust **THRES 2** pot to adjust threshold in the reverse direction.
7. **Dual Ramp (RAMP 2):** An independent adjustment of the ramp time in each direction can be achieved with this option. Allows the user to independently adjust the ramp time for each direction of a particular function. Follow Ramp adjustment procedures and adjust Ramp 2 pot to adjust the ramp in the reverse direction.

MPFC Electronics Trouble Shooting Instructions

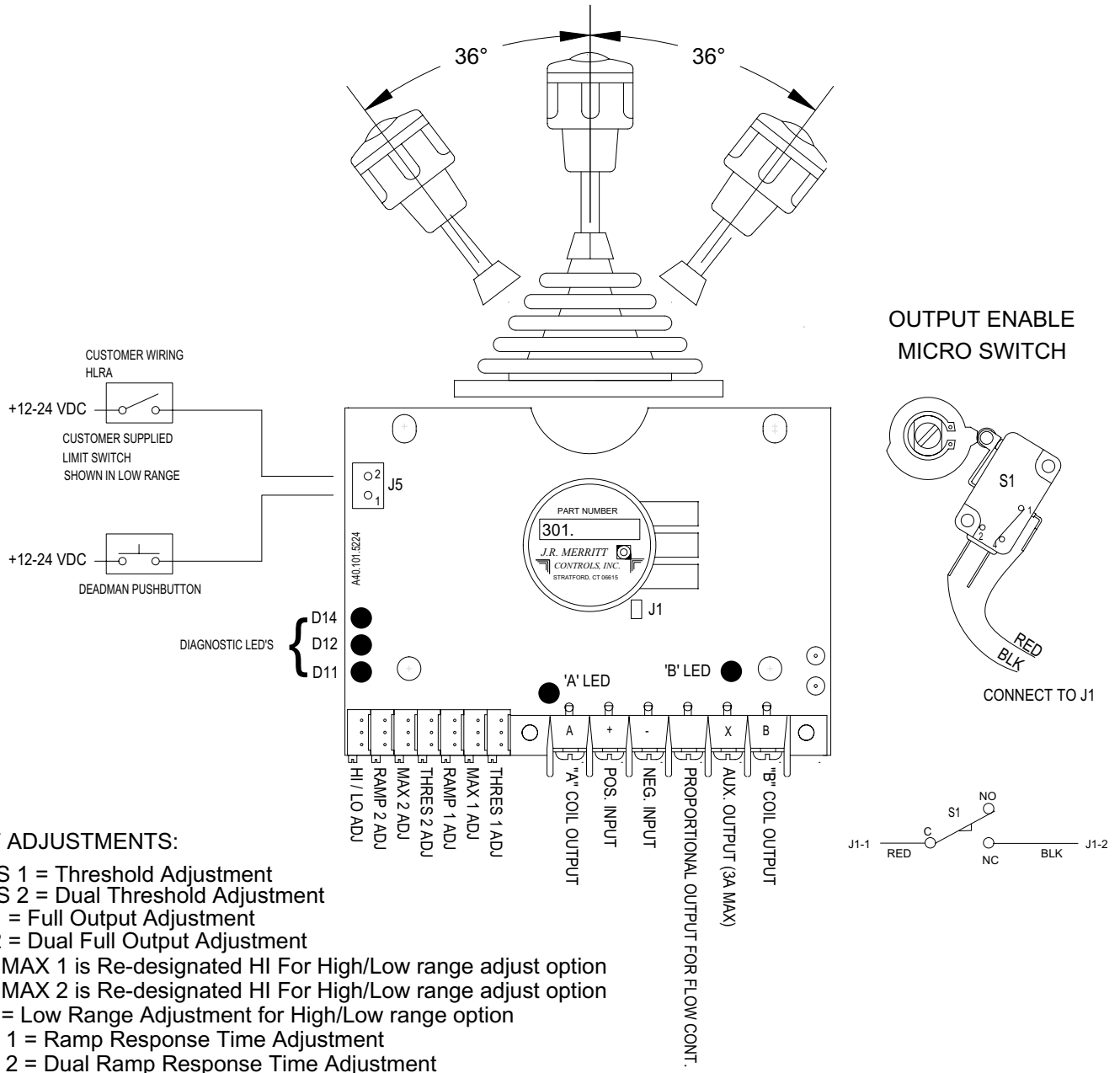
PROBLEM	PROBABLE CAUSE	ITEM TO CHECK
1. Function inoperative when controller is operated.	1.1 No power to the controller.	1.1.1 LED's will not light 1.1.2 Check fuse 1.1.3 Check for supply voltage with VM at (+) and (-) terminals. Fig. A 1.1.4 Check for disconnected plugs and connectors at controller.
	1.2 Defective on/off switch on controller.	1.2.1 With VM check supply from (-) terminal to (x) terminal. Deflect handle, voltage should be present. If not, replace contact. Fig. B
	1.3 Controller output shorted to ground. LED's will not light.	1.3.1 Locate shorted coil or wire and replace or repair wire. 1.3.2 Replace fuse if applicable. 1.3.3 If voltage is present at the (x) terminal and LED's fail to light replace the circuit board. 1.3.4 Note: If you have more than one identical electronic amplifier in the system, re-connect one in place of the other to confirm your diagnosis at this time.
	1.4 Open circuit between controller and coil.	1.4.1 'A' or 'B' LED will light, but no change in brilliancy is noticed when handle is deflected in both directions. 1.4.2 Re-connecting of an adjacent identical controller to this function, if available. 1.4.3 If function is still inoperative, look for the broken wire, open coil or loose connection at valve or controller.
	1.5 Trim pots out of adjustment.	1.5.1 Refer to MPFC Adjustment Instructions. 1.5.2 Turn all trim pots CCW 10-15 turns. You should hear a click. Then follow MPFC Adjustment Instructions.
2. Function Jerks on turn on.	2.1 Threshold trim pot adjustment too high.	2.1.1 Turn threshold trim pot CCW several turns. Refer to MPFC Adjustment Instructions.

MPFC Electronics Trouble Shooting Instructions

PROBLEM	PROBABLE CAUSE	ITEM TO CHECK
3. Function speed shows small proportional change over handle range.	3.1 Trim pots out of adjustment.	3.1.1 Full output trim pots (MAX or HI/LO) possibly saturated (set too high). Fully deflect handle and then back off 10 degrees. Change in function output should be noted. If not, turn trim pot CCW several turns and observe. Refer to MPFC Adjustment Instructions.
4. High-Low range option will not transfer between Low and High settings.	4.1 No power at terminal J5 pin 2	4.1.1 Check for source voltage at terminal J5-2 in the high range mode. Check that the voltage is no longer present when in low range mode. If no voltage is present check wiring and integrity of switching device responsible for controlling this function. 4.1.2 Check if HI/LO and MAX trim pots are adjusted properly. See MPFC Adjustment Instructions for HLRA.
5. Ramp ineffective or function response is too slow.	5.1 Trim pot out of adjustment.	5.1.1 Turn Ramp trim pot CW to slow down the output rate of change (increases ramp time and reduces the functions response time to handle movement). 5.1.2 Turn Ramp trim pot CCW to speed up the output rate of change (reduces ramp time and increases the functions response time to handle movement).
6. Diagnostic LED's lighting	6.1 D11 Blinks	6.1.1 D11 Blinks for eight seconds during power-up. The board runs a self-diagnostic routine. Output is inoperative during this time
	6.2 D12 Blinks	6.2.1 D12 blinks during normal operation. Board should work properly.
	6.3 D14 Blinks once	6.3.1 Command pot was not centered at startup. Center controller handle and restart power.
	6.4 D14 Blinks twice	6.4.1 Broken pot wire. Turn power off and check all wiring for open connections.
	6.5 D14 Blinks 3 times	6.5.1 Forward threshold greater than high range. Increase MAX. 1 adjustment or reduce Thres.1 pot adjustment
	6.6 D14 Blinks 4 times	6.6.1 Reverse threshold greater than high range. Increase MAX. 2 pot adjustment or reduce Thres.2 pot adjustment
	6.7 D14 Blinks 5 times	6.7.1 Forward threshold greater than low range. Increase HI/LO pot adjustment or reduce Thres.1 pot adjustment
	6.8 D14 Blinks 6 times	6.8.1 Reverse threshold greater than low range. Increase HI/LO pot adjustment or reduce Thres.2 pot adjustment



MPFC Electronics Hook Up and Wiring Instructions



TRIMPOT ADJUSTMENTS:

- THRES 1 = Threshold Adjustment
- THRES 2 = Dual Threshold Adjustment
- MAX 1 = Full Output Adjustment
- MAX 2 = Dual Full Output Adjustment
- HI 1 = MAX 1 is Re-designated HI For High/Low range adjust option
- HI 2 = MAX 2 is Re-designated HI For High/Low range adjust option
- HI/LO = Low Range Adjustment for High/Low range option
- RAMP 1 = Ramp Response Time Adjustment
- RAMP 2 = Dual Ramp Response Time Adjustment

IMPORTANT:

- 6 Amp fuses are customer supplied and strongly recommended
- See MPFC adjustment instructions for trimpot adjustment and adjustment priority

