

PETERSON SWELL SHADE OPERATOR MODEL RC-100

ALIGNMENT PROCEDURE

1.0 Purpose

This document explains the various adjustments available on the model RC-100 Swell Shade Operator, and gives a procedure that can be used to optimize performance.

An understanding of the purpose and operation of the adjustments will greatly assist in the optimization of swell shade performance.

2.0 Adjustments

The swell shade operator control module has 17 potentiometers (pots). The operation of these pots can be divided into 3 categories.

1. Position settings
2. Speed settings
3. Transition settings

2.1 Position settings

Setting of the shade positions is accomplished using the 9 pots labeled SHOE POSITION ARM POSITION ADJUST. These pots set the closed and 8 open positions of the swell shade operator linkage arm.

2.2 Speed settings

There are 4 speed adjustments, covering Open speeds (fast and slow) and close speeds (fast and slow). If the shoe is moved a significant distance (usually more than 2 stages), the response of the the swell shade linkage arm is as follows. When opening, the linkage arm initially moves at the fast open speed, switches to the slow open speed, and then stops at the "linkage stopping position". When closing, the swell shade linkage arm initially moves at the fast close speed, switches to the slow close speed, and then stops at the linkage stopping position. If the displacement of the shoe is small, only the slow open or slow close speed is used.

The shade linkage arm stopping positions are set by the position settings described in paragraph 2.1. The fast-to-slow transitions are set by the speed transition settings described in paragraph 2.3.

2.3 Transition settings

There are 4 transition settings. The transition points are established equally around each of the 9 linkage arm stopping positions.

The first two pots (CDB : closing deadband & ODB : opening deadband) establish the "width" of the linkage arm stopping position.

The remaining two pots (CSP : closing slow position & OSP : opening slow position) establish the transition point from the high speed setting to the slow speed setting.

----- IMPORTANT NOTE -----

These transition points are established by the pots relative to the linkage stopping positions. The transition points are identical around each of these stopping positions.

3.0 Alignment procedure

3.1 Setting the shade positions

----- IMPORTANT NOTE -----

This procedure is to be used only if the Swell Shade Operator does not operate properly using the original factory settings.

The purpose of the first part of this procedure is to establish the shade positions. We'll make the speed adjustments later.

The procedure involves first adjusting both the fast and slow speeds to a slow speed setting, and then setting the linkage arm stopping positions.

1. Rotate the Fast and Slow Closed Speed pots fully counterclockwise (CCW).
2. Rotate the Fast and Slow Open Speed pots fully CCW.
3. Rotate the CDB and ODB pots fully CCW.
4. Rotate the Arm Position Closed pot fully CCW.
5. Rotate the Arm Position #1 pot fully clockwise (CW).
6. Rotate the CSP and OSP pots fully CW.
7. Set the Shoe Simulator Switch to Position #1.

Note: The linkage arm will likely rotate to the slow speed open transition point and then stop. If it moves all the way to its proper stopping position, skip step 8.

8. Once the linkage arm stops, rotate the Slow Open Speed pot CW until the linkage arm rotates (slowly) to its proper stopping position.

9. Set the Shoe Simulator Switch to the closed position.

Note: The linkage arm will likely rotate to the slow speed closed transition point and then stop. If it moves all the way to its proper stopping position, skip step 10.

10. Once the linkage arm stops, rotate the Slow Closed Speed pot CW until the linkage arm rotates (slowly) to its proper stopping position.

11. Rotate the CSP and OSP pots fully CCW.

12. Set the Shoe Simulator Switch to Position #1, and adjust the Arm Position pot for the desired location of Position #1. If the "Slow Open" or "Slow Closed" LED comes on and stays on, the motor is stalled. Rotate the corresponding pot CW until the arm moves and the LED goes out.

13. Repeat step 13, adjusting the Arm Position pots for positions 2 through 8. After adjusting each position, verify that the shades move to the position you have set from both higher and lower numbered positions. If a position does not repeat dependably, you have probably set adjacent positions too close together. Readjust the position to be slightly farther apart and test again for repeatability.

Note: The following steps adjust the deadband width and speed.

14. Identify the two shade positions that are closest to each other, and set the Shoe Simulator Switch to either one of these positions.

15. While cycling the Shoe Simulator Switch between the two shade positions closest to each other, adjust the CDB pot clockwise until the linkage arm movement in the closed direction becomes too short, then back off on the CDB pot setting slightly. (It may be helpful to tape a piece of paper behind the arm and mark the arm position at the two settings of interest. As the CDB pot is adjusted clockwise and you cycle between the two stages, you will be able to see when the arm begins to stop short of the mark you have made.)

16. While cycling the Shoe Simulator Switch between the two shade positions closest to each other, adjust the ODB pot clockwise until the linkage arm movement in the open becomes too short, then back off on the setting slightly.

17. Using the Shoe Simulator Switch, cycle the Swell Shade Operator between positions 8 and 0 while adjusting the Fast Open pot clockwise, until the desired speed in the open direction is achieved. (Selecting position 0, the switch position next to #8, will cause the shades to move to the position set by the "closed" pot.)

18. If the linkage arm overshoots the stopping position (you will notice it reversing to return to the correct position) rotate the CSP pot clockwise, until the overshoot stops.

19. Using the Shoe Simulator Switch, cycle the Swell Shade Operator, while adjusting the Fast Closed pot clockwise, until the desired speed in the closed direction is achieved.

20. If the linkage arm overshoots the stopping position rotate the OSP pot clockwise, until the overshoot stops.
21. Test the operation of the Swell Shade Operator over all of the shoe positions. If any of the positions exhibit a chattering (very small moves that get worse if you press against the direction of motion on the linkage arm), rotate the Slow Speed Open (or Slow Speed Closed depending on the direction of movement) slowly clockwise until the chatter goes away. **IMPORTANT NOTE** --- If the slow speed settings are changed, this may require repeating steps 19 and 21 to eliminate any overshoot.

4.0 Operating considerations

The speed of operation and the stop positions are normally determined by the performing artist. An understanding of the operating trade-offs will assist the installer in configuring the Swell Shade Operator to meet these requirements.

The Swell Shade Operator is configured at the factory to give the best results for most installations. If the swell shade operator exhibits unacceptable operation, the alignment procedure in section 3.0 should be performed. This paragraph discusses the interaction of the different settings, and may assist in the final setup. **PERFORM THE ALIGNMENT PROCEDURE IN SECTION 3.0 FIRST.**

4.1 Oscillations (linkage arm hunting)

The open/close deadbands, fast-to-slow speed transition and slow speed adjustments are used to prevent the linkage arm from oscillating (hunting) around the stopping position. Hunting is caused by the linkage arm overshooting the stopping position, and is a function of the speed of the linkage arm.

Oscillation can be suppressed by either increasing the deadband setting, or by decreasing the open/close slow speeds, or by increasing the open/close slow speed transition points.

Put simply, you can have either a wide stop position, or you can slow the linkage arm down before it reaches the stopping position.

Adjustment trade-offs

Increasing the deadband setting:

- + Easiest adjustment to make
- + Allows fastest moves
- May interfere with stop positions that are close together
- Decreases stop position accuracy

Increasing low speed transition setting:

- + Allows closer stop positions
- Adjustment involves setting both the low speed transition, and low speed adjust pots