

200-WS-02Fx Repair Kit

- 200-WS-02FA-RK01** Potentiometer assembly (potentiometer, wires, and heat shrink tubing)
- 200-WS-02FA-RK02** Aluminum potentiometer holder (holder, set screws, lock washer, and jam nut)
- 200-WS-02FA-RK03** Anemometer cup and hub assembly (cups, bearing, and retainer)

Discussion:

The original 200-WS-02F was constructed with a plastic part that held the potentiometer (pot) which measures wind direction. The pot was glued to the holder, making it difficult to remove. The new design includes an aluminum pot holder that uses four set screws to secure the potentiometer.

Tools Required:

0.050" Allen wrench	Slip-joint pliers
1/16" Allen wrench	Channel-lock pliers
Small flat-blade screwdriver	7/16" Nut driver or socket
Phillips screwdriver	Soldering iron

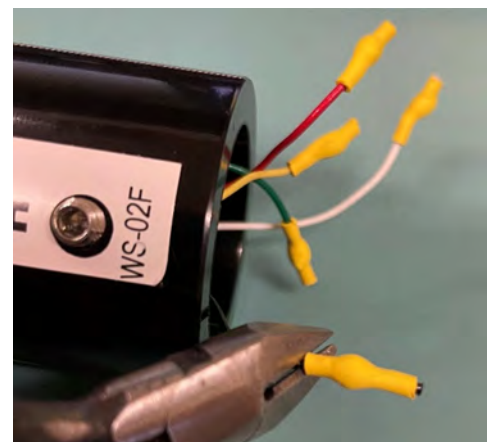
Preparation:

Remove the wind vane assembly from the sensor. Use the 1/16" Allen wrench to loosen the set screw recessed in the side of the wind vane carrier cap, then lift the cap straight up to remove the vane assembly.



Remove the base extension from the sensor by loosening the set screw that is located in the NORTH label area.

Tease out the yellow, red, black and green wires that are tucked inside the cavity. For each of these wires, cut out the splice that is under the yellow shrink wrap, saving as much of the wire as possible. Do NOT cut the white or brown wires. Straighten the wires that will be pulled up through the shaft in the next step.



Plastic Style Potentiometer Holder

If the pot holder is the original plastic style, it will be necessary to unscrew it from the shaft using pliers as shown. There will be some resistance because the plastic is glued to the shaft. After removal, clean off any glue or plastic that remains on the threads. Also, if the anemometer cup assembly is going to be replaced, it is very important to smooth off any burrs that might have formed on the shaft because of the pliers. If the shaft is not smooth, the bearing will not slide off.



Aluminum Style Potentiometer Holder

If the pot holder is the newer aluminum style, simply back out the four setscrews and remove the potentiometer. If the anemometer cup assembly is going to be replaced, unscrew the jam nut in the center of the pot holder, then unscrew the pot holder.

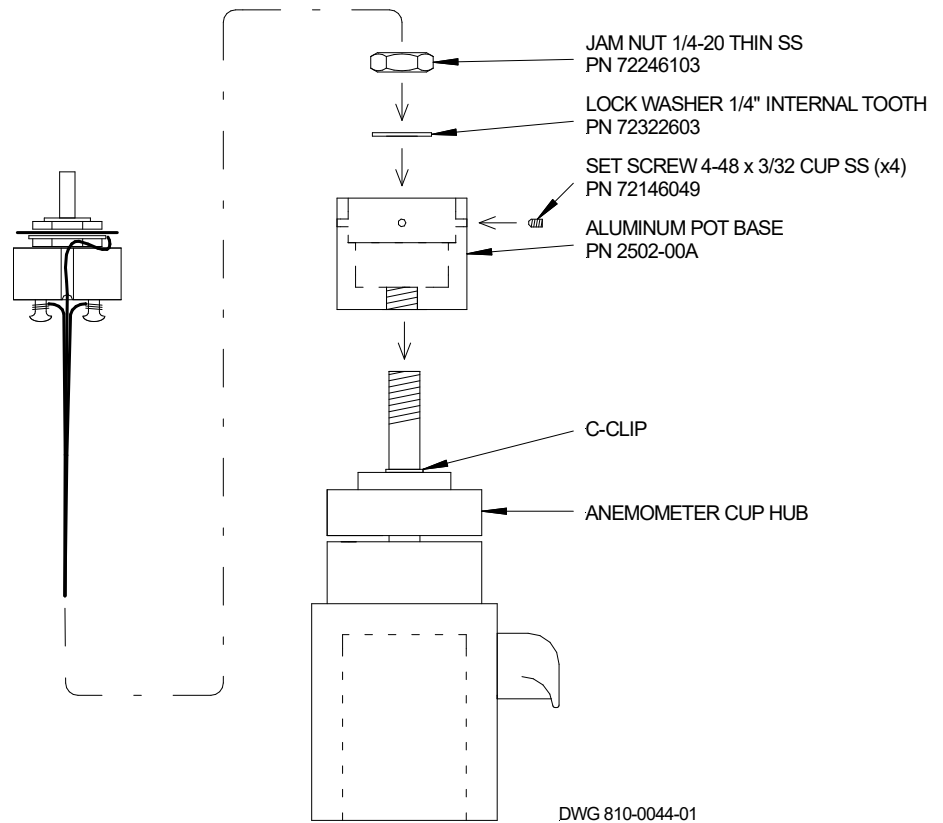


To remove the anemometer cup assembly, use needle nosed pliers to push against the ends of the C-ring clip that retains the top of the bearing. A small screwdriver may help to get the ring off.

Lift the old cup assembly off, clean the shaft, and place the new assembly on the shaft. Secure it with the E-ring provided with the kit. Spin the cups to ensure they turn freely.

Screw the aluminum pot holder onto the shaft until it bottoms out on the threads. Place the internal-tooth lock washer on the shaft, then the jam nut, and tighten.

Make sure the yellow wire follows the groove in the side of the potentiometer. Form the wires on the new potentiometer so that they are straight and do not overlap each other. Carefully feed them into the shaft and lower the pot into place.



Start all four set screws in their holes until each one touches the potentiometer. Before tightening, turn the pot shaft with your fingers to get the "feel" of how much pressure it takes to turn the shaft. Then tighten each setscrew 1/2 turn. Again, turn the shaft of the potentiometer to ensure that the shaft still turns smoothly and without binding. It may be possible to tighten the setscrews a little more, but not much otherwise the plastic body of the potentiometer will be deformed and the pot will bind and not turn smoothly.

Turn the sensor over and splice the new wires to the output cable. Match the wire colors, except in the case of the yellow wire, which connects the shield (bare) wire. Tuck all the wires into the cavity and replace the base extension.



Locate the black line on the direction pot shaft. The line indicates north, which is the electrical dead-band of the potentiometer.

Rotate the shaft of the potentiometer until the black line on the shaft aligns with the NORTH label on the sensor.

Align the pointed nose of the vane with the NORTH label. Carefully lower the vane assembly onto the potentiometer. It should slide down leaving a small gap between the cap and the rotating cup assembly.

Use the 1/16" Allen wrench to tighten the set screw.



Mechanical Test

Spin the cup assembly to ensure it is not binding against the cap.

The vane assembly has been balanced and should not need adjustment. To check the balance, turn the sensor on its side while holding it above the workbench. Rotate the vane until it is horizontal and release it. It should not show any tendency to rotate further. Adjust the balance if needed.

Anemometer Electrical Test (optional)

Set the ohm-meter to a low resistance range. Connect the meter to the wind speed output signal wire and ground wire. Rotate the cup assembly slowly until you notice the meter reading drop to less than 10 ohms. Continue to rotate until the switch opens (high resistance). Do this for each of the 3 magnets in the cup assembly.

Potentiometer Electrical Test (optional)

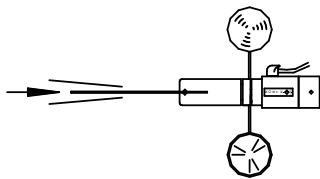
Set the ohm-meter to the 20k range (or greater range if needed). Connect the red meter lead to the wind direction output wire. Connect the black meter lead to the wind direction ground wire. Rotate the vane slowly while observing the meter. Check the "dead-band" where the meter goes to "infinite" and verify that the counterweight is pointing the same direction as the NORTH label on the base of the sensor. Now rotate the vane slowly clockwise and observe that the resistance changes smoothly from near zero to the maximum just before hitting the "dead band" again as you approach north.

If the dead-band does not align with the NORTH label then the position of the vane can be changed to correct the alignment:

1. Using a 1/16" Allen wrench, loosen the potentiometer set screw located on one side of the wind vane cap.
2. Lift upwards to remove the vane assembly from the sensor. Note that the potentiometer body is bonded to the sensor body and should not move.
3. Using an ohmmeter to monitor the potentiometer output, turn the potentiometer shaft until the center of the dead-band is located. Align the dead-band to the NORTH label.
4. Aim the counterweight in the same direction as the NORTH label and carefully lower the vane assembly onto the potentiometer shaft. Tighten the set screw.
5. Check your work by observing the meter as you swing the vane across north.

200-WS-02Fx FUNCTIONAL TESTS

GOOD

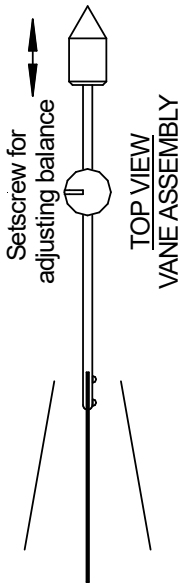


TAILPIECE ALIGNMENT

When assembled to the vane arm, the tail should align with the vertical axis of the sensor.

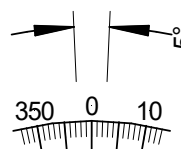
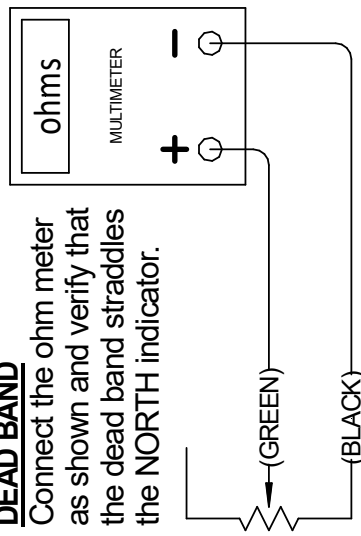
BALANCE

When both the tailpiece and counterweight are assembled to the vane arm, the vane should be balanced when tilted to the horizontal.



DEAD BAND

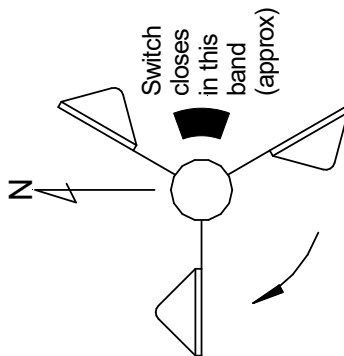
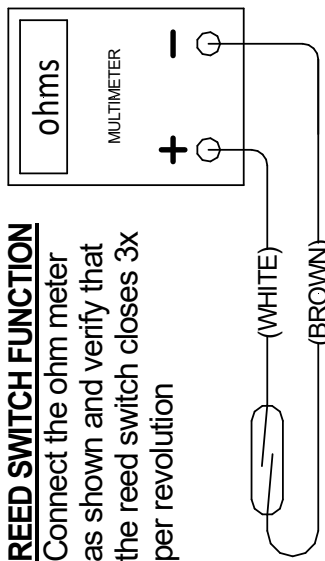
Connect the ohm meter as shown and verify that the dead band straddles the NORTH indicator.



Approximate deadband area
Varies from unit to unit

REED SWITCH FUNCTION

Connect the ohm meter as shown and verify that the reed switch closes 3x per revolution



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TITLE ASSY PROCEDURE			
200-WS-02Fx TESTS			
MOD. USAGE	200-WS-02F	SCALE	SHEET 1 OF 1
BY	JDC	DWG. NO.	840-0047-01
DATE	4-25-2022	1:1	