TEC Backbone Reed Switch Sensors

The purpose of the trailing edge backbone reed switches is to verify the presence of the clamps. If any one clamp is missing, the sensors must be able to detect that missing clamp to avoid many potential problems, from plate fly-off to plot quality. The following section is an excerpt from the actual production procedure. It explains how the sensors work, and how to verify they are reading correctly.

Adjustment Of Reed Switch Sensors

Theory Of Operation

The purpose of the five horizontally mounted sensors is to detect if all of the trailing edge clamps are on the backbone. Four sensors are responsible for identifying one magnetic clamp and one sensor identifies two clamps. (See figure 1.)

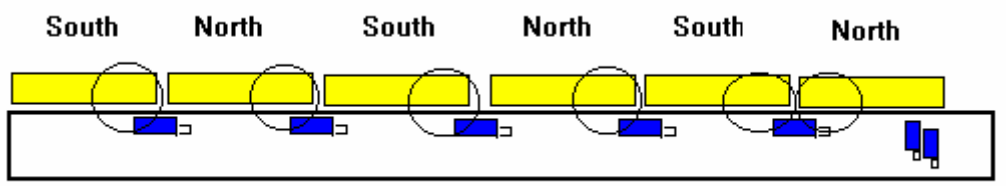


Figure 1.

The two vertically mounted sensors are to detect the position of the slider bar inside the backbone.

Reed Switch Adjustment Procedure

1. Turn off power to the output device.
2. With the TEC lock pins facing up, starting on the left side of the backbone, place a south magnetic clamp (50-1131A) and a north magnetic clamp (50-1091A) on the backbone (drawing 50-1088 -*- AD03) and slide the lock bar to hold the clamps on.
3. Plug in the reed switch tester box to the sensor in between the two magnetic clamps. The green light, on the sensor box should be lit. If not slide the sensor around until the green light is lit.
4. While leaving the north clamp on the backbone remove the south clamp. The green light should go out. If not re-adjust the sensor.
5. Move the south clamp to the right side of the north clamp, plug the tester into the second sensor and remove the north clamp. The light should go off again. Readjust if necessary.
6. Repeat steps 4 and 5 for the rest of the sensors.

7. On the last sensor make sure that the sensors checks both the south and the north clamp. By removing either one the light of the tester should turn off.
8. Plug the reed switch tester box into either of the two vertically mounted sensors and move the slider bar toward the sensor. The green light, on the sensor box, should be lit. If not slide the sensor around until the green light is lit.
9. Repeat step 6 with the other vertical sensor.

Purpose of the shim

The sensors can vary quite drastically. Some sensors are very weak, and others are very sensitive. Shims are added under the sensors if they are too sensitive.

Note: We have worked with the sensor vendor to reduce this variability. We have received parts that are not as sensitive, and we will continue testing. Initial tests show shims are **not** needed with these less sensitive sensors.

Consider the sensor on the far left in the drawing above. When the clamp to its left is removed, the sensor should turn off. However, if the sensor is very sensitive, it will detect the clamp to the *right*, and remain on. This is obviously dangerous if only the far left clamp is missing.

The misconception lies in the testing. Just because the system turns “on” when all the clamps are present and turns “off” when all the clamps are removed does not mean the system is working properly. Each clamp must be removed individually to test if the system recognizes the missing clamp.

If a sensor is sensitive, the shim is added under the sensor to reduce the sensitivity. This works because the shims are ferrous and alter the magnetic field the sensor is trying to detect. This allows the sensor to see only the clamp to the left.

The most difficult sensor to adjust is on the far right. It is responsible for the clamps to its left *and* right. This sensor must detect if *either* clamp is missing. This can be difficult to achieve.