Mechanical Speedometer

Operation

Pitot tube type speedometers operate by pressure from the water being forced into the pitot tube. This pressure is then transmitted through flexible tubing to the bourdon tube movement inside the speedometer head where it is converted into a speed reading by the movement mechanism. See Appendix I for speedometer dimensions. Instrument part numbers are located on a label attached to the outside of the outside of the case (i.e. SE0000A).

Troubleshooting

Symptom:

Speedometer does not register or sticks during operation - Slightly loosen nut(s) holding backclamp and check operation. If speedometer now operates properly and is not loose in panel, it should now provide suitable service.

If the speedometer continues to stick, follow the tubing from the speedometer head to the pitot tube water pickup, checking for any sharp bends or kinks that may be impeding the air flow to or from the speedometer unit. Also check for blockage at the pitot tube inlet hole.

NOTE: Compressed air at *NOT MORE THAN 20 PSI* may be used to check speedometer movement for free operation. This is equivalent to approximately 40 MPH. Due to variation in air gauges, etc., this is not a valid test for accuracy.

If tubing is free of obstructions, water pickup is not restricted, and unit continues to stick in operation, replace the speedometer.

If unit is not registering at all, check for breaks in the tubing and loose connections at the pitot tube and the back of the speedometer. If loose connections are apparent, remove tubing from pitot tube or speedometer head respectively, cut back tubing approximately 1/2” with a sharp knife and reattach. No adhesive is recommended due to the fact that it may be introduced into the speedometer movement and cause a malfunction. If speedometer still does not register, replace the speedometer.

Electronic Speedometer

Operation

Electronic speedometers operate by capturing pulses produced by a paddlewheel rotating in the water stream under the hull. The pulses are then electronically converted to a speed-reading very much like a tachometer converts ignition pulses to RPM. Instruments part numbers and labeling are similar to a mechanical speedometer.

Calibration

For best results calibration should be performed in calm water with no current or tidal flow present. You will need to time your boat's run over a known distance (such as a measured mile) to calculate MPH, or compare your speed to a GPS, Loran, or Radar gun. **Speed runs should be done on plane, at cruise speed, at a constant RPM, and several times to obtain an accurate average speed to which the speedometer will be adjusted.** After you are satisfied you are maintaining a known constant speed through your runs, proceed as follows.

1. Coarse adjustments may be necessary due to variations in hull shape and mounting limitations.
The coarse adjustment is made by turning the six-position selector switch at the rear of the case. Start with the switch in position 3 or 4. Increase the setting if the speedometer reads high or decrease the setting if the speedometer reads low.

2. Fine adjustments remove the weather seal plug on the rear of the speedometer located in the hole marked "ADJ".

3. With the boat at the known speed, carefully vary the adjustment pot (through the hole in the case) with tool provided(5/64" Allen wrench) until your Faria Marine Instruments speedometer is in agreement with the boat's known speed. Turning the pot clockwise raises readings, counter clockwise lowers readings.

Note: For speedometers with the externally adjustable option, the knob on the dash takes the place of the internal fine adjustment pot.

Troubleshooting

Troubleshooting electronic speedometers can be accomplished in much the same way as troubleshooting a tach. Refer to page 12 for general symptoms.

First be sure that the Speed Sensor is properly installed.

The sensor is to be mounted so that it is parallel to the water flow at the boat's transom with the small "lip" of the adjustable paddle wheel support hooked against the transom's bottom.

Note: It may be necessary to tilt the paddlewheel deeper than parallel to increase high-speed sensitivity. The sensor is adjustable for transoms with zero to 16 degrees aft rake. It is important that the sensor be mounted on the "upwash" side of the prop. This is the Port side for a clockwise rotation and Starboard side for a counterclockwise rotation as viewed from aft. Ideally the sensor should be located 2 to 4 inches outside the swing of the prop and away from any strakes or bottom features that may disturb the smooth flow of water to the paddlewheel.

Testing the Speed Sensor output.
Calibration: 152 HZ = 35 MPH (4.34 HZ / MPH)
Sensor wiring color codes: **Black**: Signal, **Blue**: Positive 12VDC, **Clear**: Ground
Test the sensor on the boat connected to the speedometer:

Note: You may not be able to spin the paddlewheel with the boat in the water.

1. Turn on the key to supply power to the instrument.

2. With the paddle wheel still.

Check the VDC Signal to Ground at the back of the speedometer, it should be a bit less than battery voltage. (For example, with a battery voltage of 13VDC at the rear of the speedometer, Signal to Ground voltage would be about 10VDC). If Signal to Ground reading is (Zero VDC) turn the paddle wheel slowly until you get a (10VDC) reading on the voltmeter. If you slowly turn the paddle wheel and get these alternating voltage readings the sensor is **good**. If you slowly turn the paddle wheel and the voltage stays the same (10VDC or Zero VDC), the sensor is **bad**.

3. Spin the paddlewheel. If the sensor is **good**: You will read about one half the Signal to Ground VDC or about (5VDC) with sensor spinning.

4. Spin the paddlewheel. If the sensor is **bad**: You will read the original Signal to Ground voltage, (10VDC or Zero VDC) with sensor spinning.