MERCURY
MARINER
MERCURY SportJet

service information

✓ ADVISORY

☐ BULLETIN

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SmartCraft Troubleshooting

Models Affected

ALL SMARTCRAFT COMPATABLE MERCURY/MARINER MODELS

OPERATIONAL

1. **Question:** Our Smart Speed blanks out on occasion and the only way we can get it to work again is to unplug it from the gauge head and re-plug it in again. Is the problem in the gauge head?

Answer: Yes, replace the Speedo head with the new 2.8 software gauge. Part numbers are described below.

P/N 79-859003A2   Black 120 MPH/KPH
P/N 79-859020A2   Black 80 MPH/KPH
P/N 79-859068A2   White 80 MPH/KPH
P/N 79-859069A2   White 120 MPH/KPH

2. **Question:** What components are compatable with each other?

Answer: See chart for compatibility.

Models	Products			
	SmartTach & SmartSpeed	System Monitor	System Tach & Speed	System View
5 Pin Tach Harness	Yes	No	No	No
System Link Gauges	No	Yes	Yes	Yes
Blue Cable	No	Yes	Yes	Yes
Resistors	No	Yes	Yes	Yes

3. **Question:** What is the test procedure for testing the harness on the System Monitor?

Answer: First perform a continuity test on the blue and white wires in the blue harness. Then check to make sure the terminator resistors have not failed by performing an ohm test. They should read 60 ohms total. If you read 120 ohms you only have 1 terminator functioning or installed.

4. **Question:** What are the options when calibrating fuel and oil for Smart Tach and Speed?

Answer: Smart Tach and Speed can be calibrated two methods. Both need a capacity entered by the user. One method to get a fuel level reading is to calibrate the gauge by adding fuel. This is done by first entering a tank capacity. Then starting at empty depress the troll + (SAVE) button. Continue at each level to add the proper amount of fuel and depressing the troll + (SAVE) button. You can also calibrate the gauge by using the default method. This process allows you to calibrate the tank without adding fuel. The user must start, again, by inputting a tank capacity. Then depress the troll - (DFT) button at each level. This allows the gauge to divide the entered capacity into equal quarters. See the Operation, Maintenance & Warranty Manual Supplement, part number 90-10229101, for details.

FUEL TANK CAPACITY [DOWN] [SAVE] [UP]	Lets you enter the capacity of your boats fuel tank. This option is the same for tank 1 as it is for tank 2 (oil tank).
CALIBRATION FUEL TANK [SKIP] [EDIT]	Lets you enter the mode where you can calibrate your fuel tank. Fuel tank calibration procedure is the same for tank 1 as it is for tank 2 (oil tank).
EMPTY TANK THEN PRESS PLUS BUTTON [DFLT] [SKIP] [SAVE]	You can choose to have an empty tank and hit SAVE, or hit DFLT and a default value will be entered based on the capacity of the tank.
FILL TO 1/4 THEN PRESS PLUS BUTTON [DFLT] [SKIP] [SAVE]	You can choose to have tank at 1/4 and hit SAVE, or hit DFLT and a default value will be entered based on the capacity of the tank.
FILL TO 1/2 THEN PRESS PLUS BUTTON [DFLT] [SKIP] [SAVE]	You can choose to have tank at 1/2 and hit SAVE, or hit DFLT and a default value will be entered based on the capacity of the tank.
FILL TO 3/4 THEN PRESS PLUS BUTTON [DFLT] [SKIP] [SAVE]	You can choose to have tank at 3/4 and hit SAVE, or hit DFLT and a default value will be entered based on the capacity of the tank.
FILL TO FULL THEN PRESS PLUS BUTTON [DFLT] [SKIP] [SAVE]	You can choose to have tank at full and hit SAVE, or hit DFLT and a default value will be entered based on the capacity of the tank.

The calibration for the System Monitor is slightly different. There are 3 ways to calibrate the gauge. Before starting make sure that the fuel sender harness (part number 84-859743T 2) has been installed.

a. In (CAL 2) "fuel tank calibration" select "0". No other input is required from here. The Monitor will use raw fuel values from the fuel sender. Calibrating this way will not give you a range reading.

b. Put in the tank capacity by going to the "fuel tank capacity" setting in Cal 1. Then go to the Cal 2 section and into "fuel tank calibration". Select "1". Next depress the light button at each level without adding fuel or changing the resistance of the fuel sender. This will put default values in using the capacity as a reference. If you have a System Link Speedometer installed you will also get range. Accuracy of the range will depend on how square the fuel tank is. Calibrating this way will give an estimated range based off of a square tank.

c. Put in a "tank capacity" as described above. Then calibrate the fuel tank by going to the Cal 2 section and, again, select "1". Here you need to add fuel and save as described in the operations manual. Calibrating the fuel tank this way will give you an estimated range based off the true shape of the fuel tank.
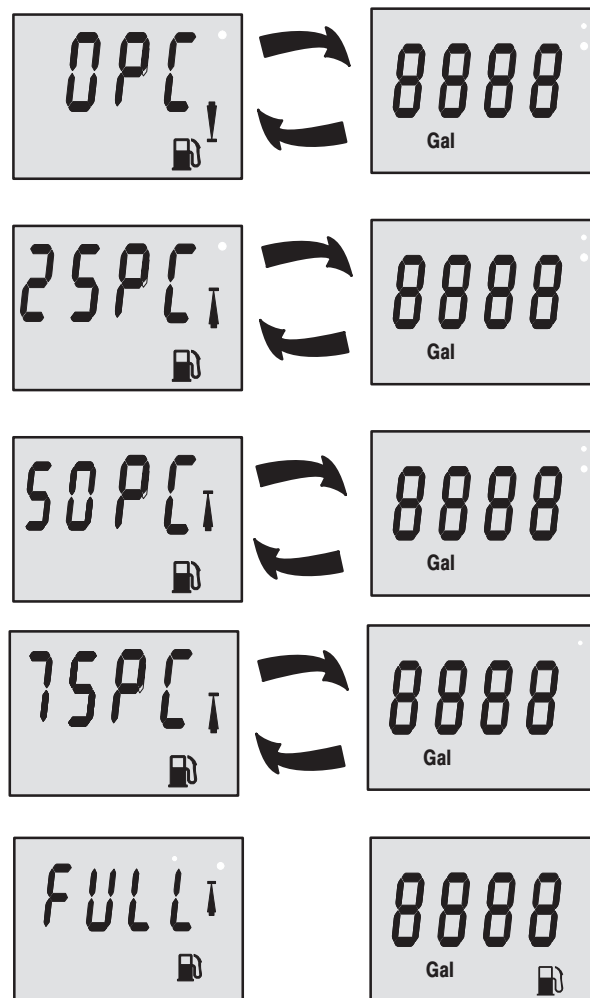
E=0%, ¼=25%, ½=50%, ¾=75% and F (Full). If you have a System Link Speedometer you will now get true range.

5. **Question:** We are setting up a System Monitor and we cannot calibrate it. It shows 4 dashes - - - - when the gauge is turned on. What is wrong?

Answer: There are several items that could cause this type of problem. The reason for the 4 dashes is that there is a communication break between the ECM and the gauge. Items to check are:

a. 15 amp. fuse. Make sure it hasn't failed

b. Make sure all the wires in both ends of the harness are fully pushed into the black plug.

c. Make sure that the blue and white wires are not switched in the ends of the harness.
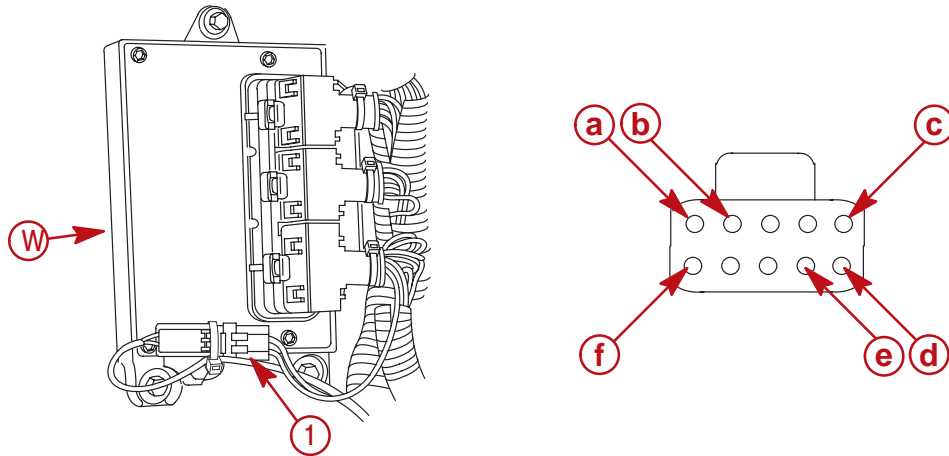
1 - Diagnostic Test Plug
2 - ECM

a - Red
b - Black
c - Yellow (gauge end only) SC1000 2RSL Cable
d - Blue
e - White
f - Purple

d. Check the ECM to ensure that it is set to match the gauge i.e. Starboard to Starboard (STB) or Port to Port (PRT).

e. Reset the gauges engine location to its original setting. This is done in CAL 2 by changing the setting (STB or PRT) to one of the other locations. Then depress the mode and light button to save. Next reset the gauge to its original setting (STB or PRT) and, again, depress mode and light to save. The Monitor is now reset to its original location.

f. The gauge should also be set to the correct station (STN). Single station for a single station. If it is a dual station boat the second gauge should be set to the second station.

g. Check for too many (more than two), or failed, terminator resistors.

h. Possible break in the blue cable. Confirm by performing a continuity check.

i. ECM failure

j. Gauge head failure

6. **Question:** Our System Monitor keeps getting a constant fuel & bell icon with no horn sound. What is the problem?

Answer: This is an indication that there is a fuel capacity amount calibrated into the Monitor without a harness connected to the fuel-sending unit. The capacity should be set to "0". Follow the procedure below to rectify.

PROGRAM PROCEDURE

    a. Power up the system.

    b. Press both MODE and LIGHT button for 4 seconds until Cal "1" is displayed.

    c. Press MODE button and scroll through the menu until the fuel tank capacity is displayed. (Gas pump and gallons displayed) This screen should read 0 gallons.

    d. If not push and hold LIGHT button until the capacity goes back to zero. (Capacity goes from 0 to 999 gallons or 0 to 3780 liters)

    e. Depress and hold both the MODE and LIGHT buttons, until the rpm screen appears.

    f. Power the SC1000 monitor down.

    g. Power up the SC1000 monitor and verify that it is now calibrated correctly.

7. **Question:** We can't get our Smart Speed to read speed input. It will not read at all on the gauge. What is wrong?

Answer: If the paddle wheel and pitot sensors are calibrated into the Tach, the Speedometer should work unless there is damage to the paddle wheel or it is not rotating. If it is not rotating then go into the calibration and edit out the paddle wheel sensor until the paddle wheel is repaired. Doing this will still allow you to get a reading on the speedometer off the pitot. Note: You will not be able to use the troll control off the speedometer until the paddle wheel is fixed.

8. **Question:** Will the Smart or System Speedometer work without the Tachometer Installed.

Answer: No. The tachometer must be installed to allow the speedometer to work. The speedometer gets its power from the tachometer.

9. **Question:** When does the paddle wheel transition to the pitot system?

Answer: On the Smart Speedometer the transition is at 15mph. On the new System Speedometer (2002) this transition can be calibrated between 5 and 25 mph.

10. **Question:** Will the new System Tachometer and Speedometer work with my 2001 Opti-Max engine?

Answer: No. The ECM on the 2001 product will not work with the System Tachometer and Speedometer. They will work on 2002 product and up.

11. **Question:** Is the ECM on the OptiMax set to Starboard when we receive them?

Answer: Yes. All engines leave the factory set for a Starboard installation. The System Monitor is also set to Starboard. If the engine setup is a dual application with a single trunk line, both the Port engine and Monitor must be set to Port. The engine is changed with the DDT.

$$Stb$$

12. **Question:** The CAN cable in the boat is black shouldn't it be blue?

Answer: Yes it should be blue. Some early System Monitor cables were black. They should be replaced with the blue cable.

13. **Question:** Why does the number 4095 show up on our System Monitor.

Answer: This is a default value telling the user that there is no input for fuel range at this time. Either the fuel sender is open of there is not a harness installed.

14. **Question:** What happens if I accidentally hook an analog fuel gauge to the sending unit with the SmartCraft fuel harness also hooked up?

Answer: The 12-volt battery source from the analog gauge would feed back into the ECM's 5 volt, sensor reference circuit, damaging the circuit and ***FAILING THE*** ECM.

15. **Question:** Will SmartCraft technology be utilized on additional product?

**Answer:** Yes. 2002 product will see limited applications on 4stroke product as well as V-6 EFI's.

16. **Question:** We are using an analog trim gauge with our Smart Tach and Speed and shortly after engine start up, the idle speed will increase to about 1000-1500 RPM, then will stall/shut down. The engine can be restarted but the symptom will then repeat.

Answer: The analog trim gauge has been incorrectly connected to the ECM, through the DDT test port BROWN/WHITE wire. Remove the BROWN/WHITE connection between the control harness and the DDT test port. If analog trim gauge is required, install the analog trim sender on the engine and connect to the ignition harness. See Service Advisory 2000-11 for correct installation.
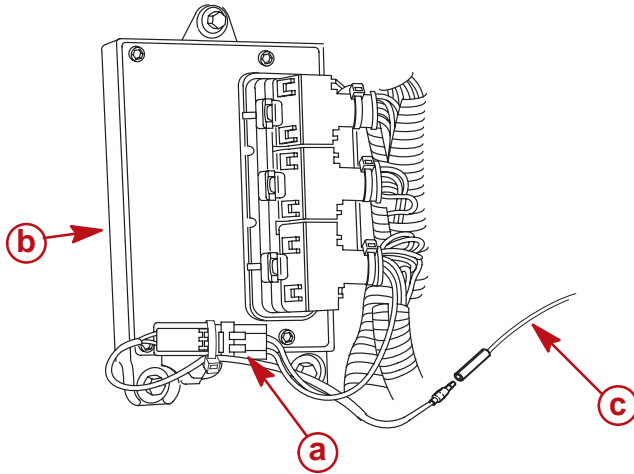
Incorrect   **Correct**

a - Diagnostic Test Plug
b - ECM
c - Brown/White Wire
d - Main Engine Cannon Plug
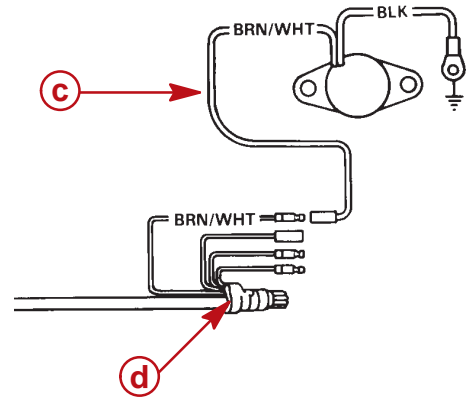
17. **Question:** Is there a cover/cap for the harness, on the engine, that is used for the paddle wheel, fuel and oil sender?

Answer: Yes. The part number is 881065A1.

18. **Question:** Is there a harness for installing a third tachometer on a triple application using the Smart Tach and Speed?

Answer: Yes. The part number is 877561A2.

RIGGING

19. **Question:** The large connector on the SC1000 (blue) harness used with the System Monitor and link gauges, is sometimes difficult to route through the boat from the helm to the engine. Is there an easier method to use when routing the cable?

Answer: The connector can be removed by "popping off" the purple cap to release the locking tabs and pulling the wires from the rear of the plug. The wire ends and a pull cord/rope can then be wrapped with electrical tape to protect the wire ends. Care must be taken to reinstall the wires in the correct location.
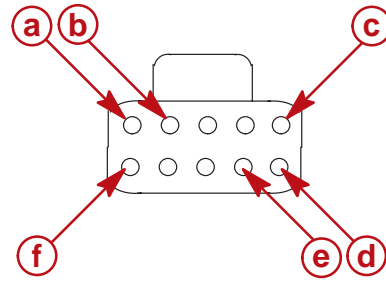
    a - Red
    b - Black
    c - Yellow (gauge end only) SC1000 2RSL Cable
    d - Blue
    e - White
    f - Purple

20. **Question:** Is there a method to prevent the plastic corrugated ends on the blue harness from sliding down the cable?

Answer: A small plastic tie wrap will hold the corrugated end in place.

21. **Question:** I installed a blue cable for future use with a System Monitor and link gauges but currently the boat has the Smart Tach and Speed installed. After the engine is started, a data bus error is showing up on the tach with all systems functioning properly, why?

Answer: If the blue cable is installed and not attached to a gauge but plugged in to the engine harness it will cause this type of data error message. Disconnecting the plug from the engine will solve this problem.

22. **Question:** If the purple cap comes off the end of the cable, what can I do?

Answer: With the power off remove the purple cap from the junction box and reinstall it onto the cable. When installing the cap back into the cable make sure it is secured properly.

23. **Question:** How do you tell the difference between the current Smart Tach and Speedo and the new System Tach and Speed?

Answer: The new System Tach and Speed will have a blue back. It also has the SmartCraft logo on the dial face, the background is one color and it has what we call "eyebrows".
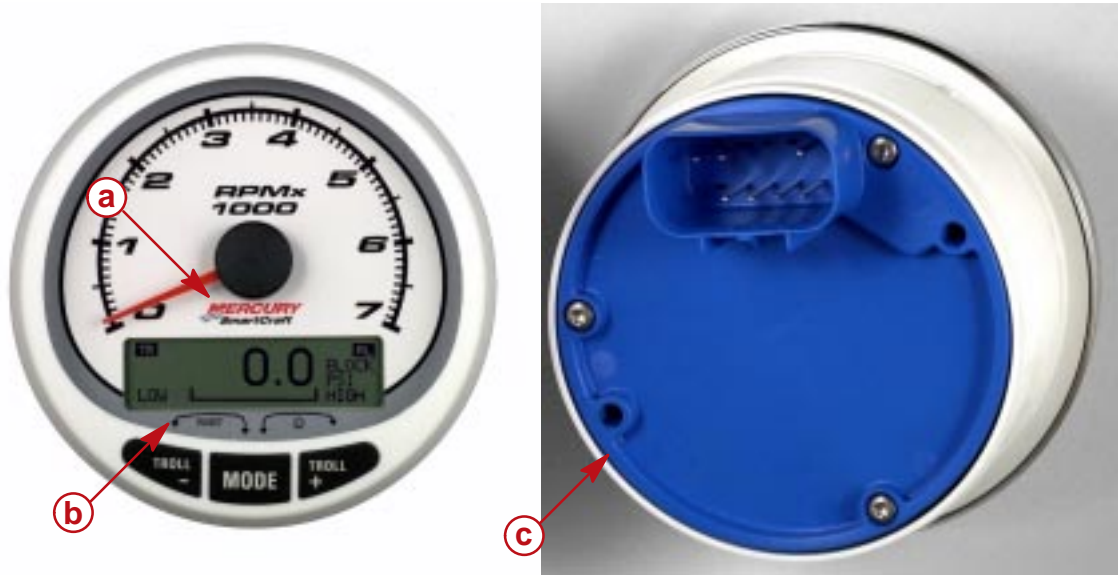
    a - Logo
    b - Eyebrow
    c - Blue Back Cover

24. **Question:** The Smart Tach and Speed needles do not return to 0 (zero) and the clock loses calibration when the ignition key is turned off. What is happening?

Answer: Make sure that the red wire on the tach harness is connected to a, constant, 12-volt power source. On dual engines the red wires from each tach should be connected to separate 12-volt sources.
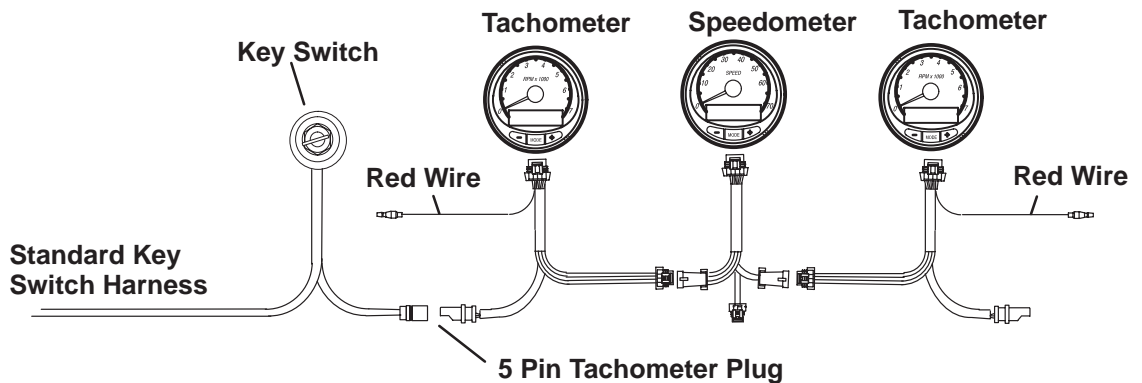
25. **Question:** Why do we need to disconnect the three-wire engine harness when rigging multi engine applications?

Answer: On multi engine applications using any of the SC1000 gauges, with a single trunk line, it is necessary to disconnect the three wire harness because it may cause damage to the ECM, alternator or the ability to shut the engine off. On a triple application this harness should be disconnected on two engines.

Dual Engine

Single CAN Bus

Engine

Engine

Cap
881176A1

Cap
881175A1

SmartCraft Harness Connector
on Engine

RED/BLK
BLK
PPL

BLUE
WHITE

RED
BLK
PPL
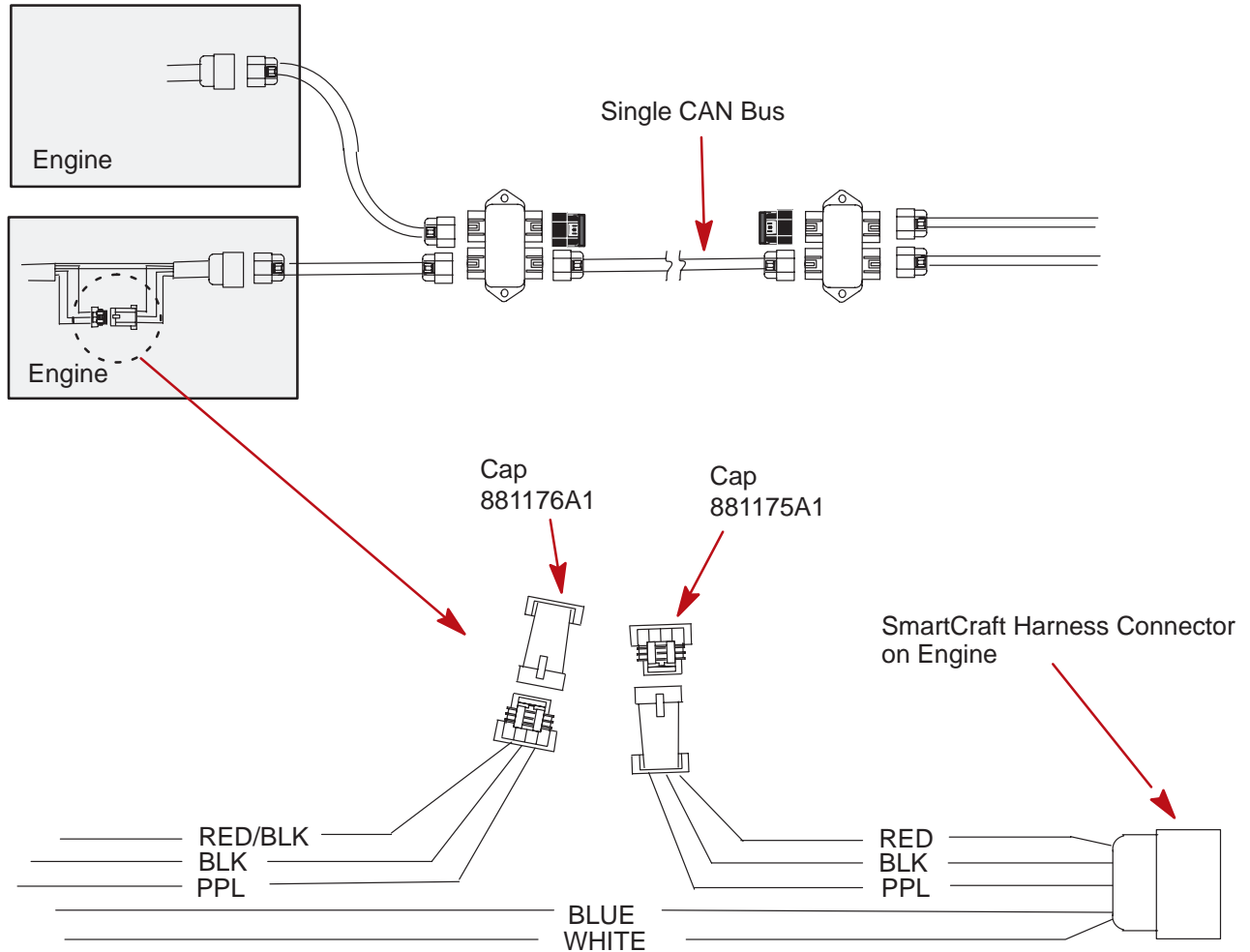
26. **Question:** On a multi engine application I want to troll with one engine but don't want to build any additional hours idling the second engine. What needs to be changed to power the system with either engine when using the Smart Tach and Speed or the System Monitor?

Answer: On a SmartCraft installation you can use one engine one day with the speedometer paddle wheel calibrated into the tach, allowing the use of the speedometer to set the troll control. The other tach would have to have the paddle wheel and pitot calibrated out. When the second engine is to be used for trolling, you can either run the troll control off the tach or install a second paddle wheel and calibrate the first engine's paddle wheel and pitot out when the second engine is used.

When using the System Monitor the procedure is slightly different because troll control is not an option. If one engine is preferred for trolling and switching engines is desired to keep the hours equal, then one of the following procedures should be used depending on your cable installation.

a. If two separate, blue, harnesses are used for each engine (two trunk lines) then no additional inputs to either the engines or gauges are required. Just run one engine one day and the other the next.

b. If both engines are connected to a single, blue, trunk line the internal three-wire (power) harness should be disconnected on one engine. The engine (A) that does not have the harness disconnected must have the key switch turned on (supplying power) to operate the gauges on the engine (B or C) with the disconnected harness when this engine is used for trolling. Having the key on will not accumulate run hours on the engine (A).

Triple Engine

Air Temp Sensor

NMEA GPS Connection
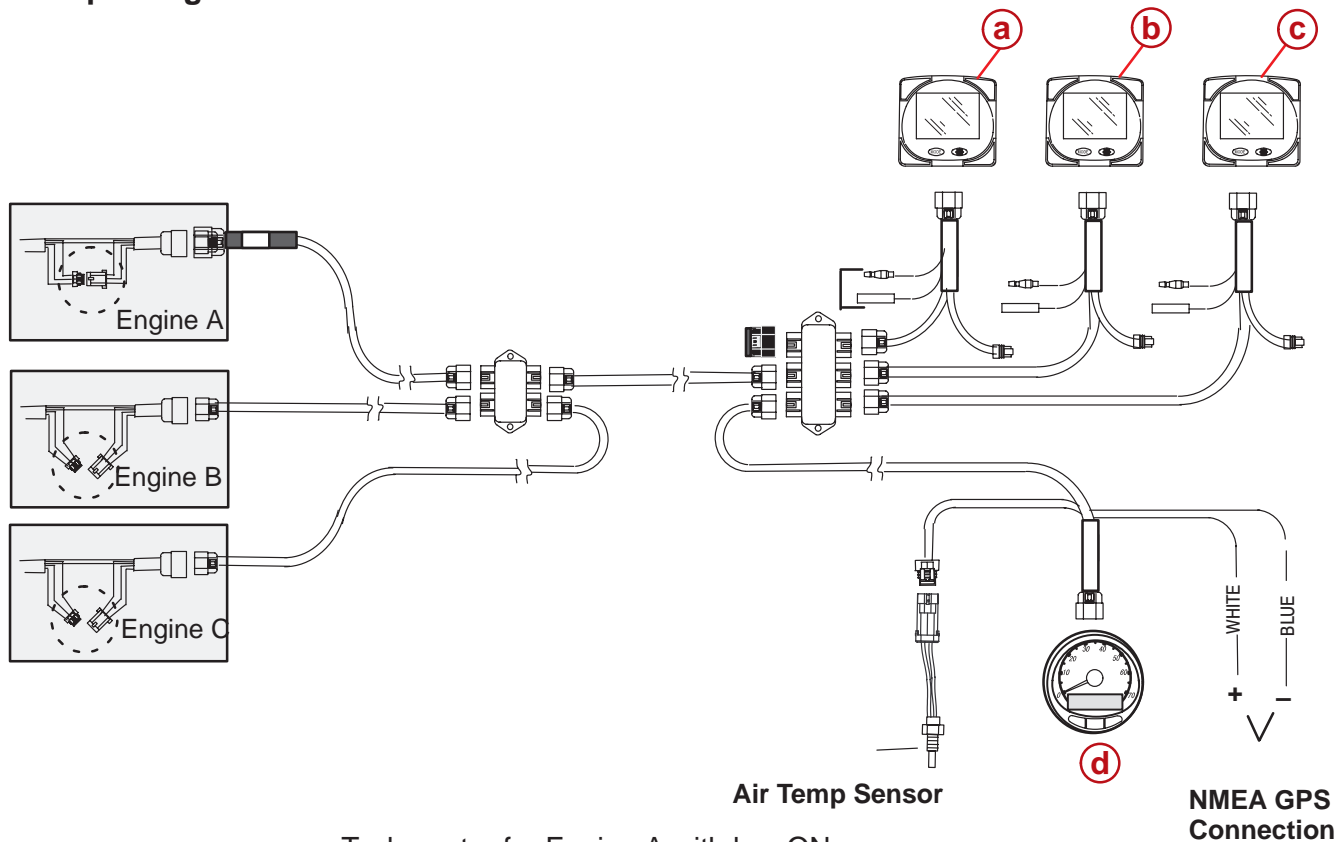
a - Tachometer for Engine A with key ON
b - Tachometer for engine B
c - Tachometer for engine C
d - Speedometer

System Monitor Legend

A = A L = L

B = b N = n

C = C O = O

D = d P = P

E = E S = 5

F = F T= t

I = I U= U

= Engine

= Fuel

= Water Temperature

= Water Pressure

= Oil

= Alarm