

# Listening to Your Engines Underway Troubleshooting and Repair Techniques for the Cruiser

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# Troubleshooting



Malfunction...

Off Eluthra, the Bahamas

Steve:

Both engines and both generators just shut down all at the same time, I've tried restarting several times and I think the batteries are going dead. I dropped an anchor but it's not holding, we're on a lee shore.

Now what do I do???

Listen to what your vessel is telling  
you.

Use your senses; sight, sound, touch/feel  
and particularly smell.

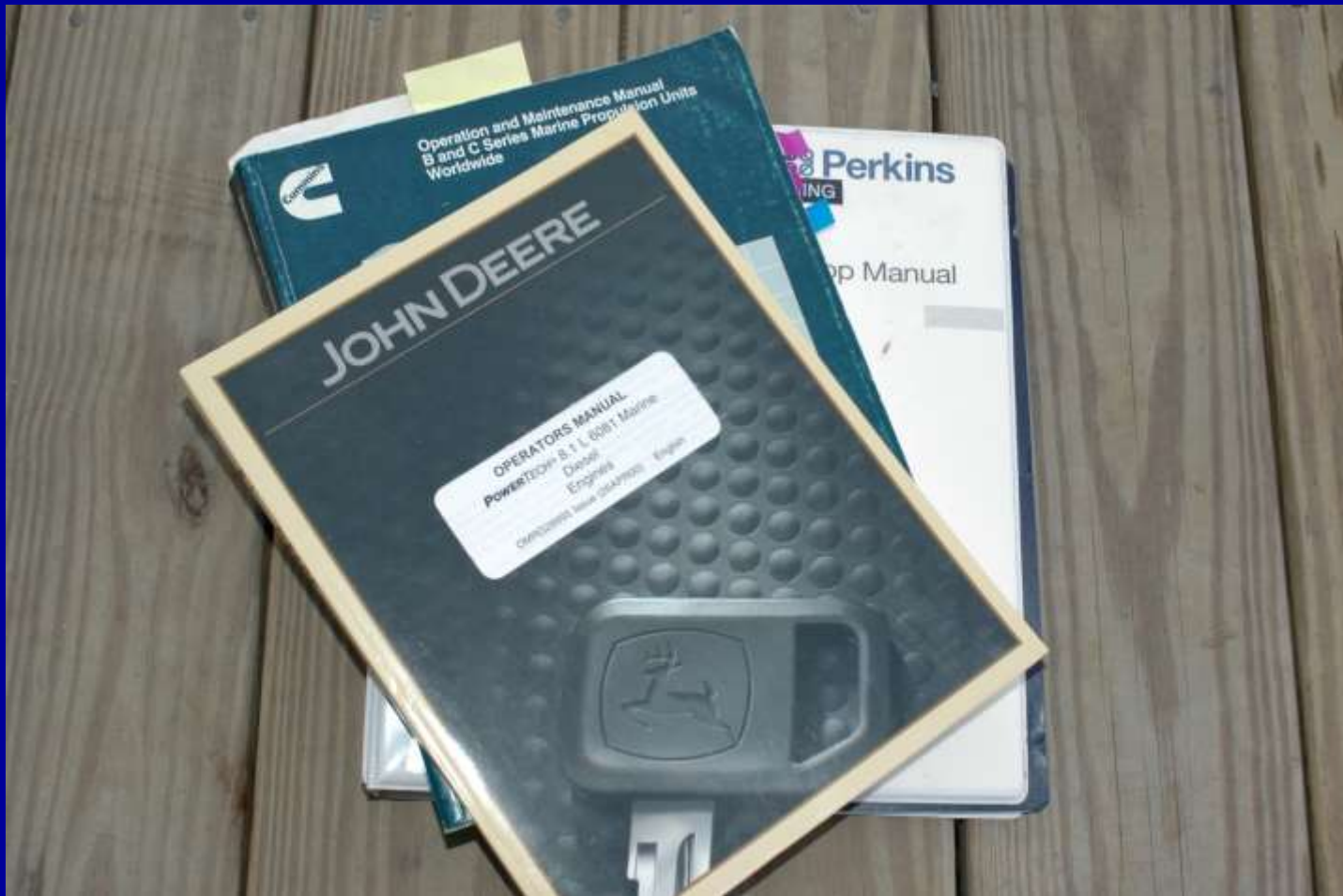




This is supposed to be fun.  
The key to keeping the fun in this is the 5 P's



# Information Please



# Information that will improve your troubleshooting technique

Every fuse, circuit breaker and switch clearly labeled. Create a “fuse map”. Keep replacements for all aboard.

Wires should be numbered or labeled at both ends.

Model and serial numbers recorded in owner’s manuals, kept aboard.

Every seacock and valve, clearly labeled. Create a through hull map.

Every fuel system valve should be clearly labeled.



# Fuel System Gauges





Among the most valuable and least expensive troubleshooting tools you can have aboard

Note the drag  
needle and  
liquid within





Air or crud, the result is the same

# Know your filters and how to change *all* of them



Less than a teaspoon full of debris can put you on the rocks.  
Prevent, troubleshoot, repair.





# The Tandem Primary Filter or “Plan B”





# Injection Pump and Injector Bleeding



Bleeding: If you haven't done it, now is the time to learn





Your bleeding  
and  
troubleshooting  
ally



# What do you do if your engine won't start?

- Make sure the fuel filters are clean and there's no evidence of air intrusion.
- Will it run on WD40?
- Is the battery voltage high enough to provide *adequate* cranking speed? 9.5 & 19 v 15 sec. at starter.



# Pyrometer/Temperature Troubleshooting

- Test engine cooling system components to identify source of overheating
- Test other areas such as stuffing boxes and exhaust systems





The most common  
cause of chronic  
overheating



The most  
common cause  
of acute  
overheating



Find *all* of the pieces...





# Would You Rather Deal With This...



# Or This?





The coolant recovery bottle is a working machine; it's the window your engine's cooling system and an invaluable troubleshooting tool





Another  
working  
machine.  
Inspect it.



Test your engine at WOT seasonally. Ensure WOT is reached and without overheating



Run at 80% for 60 minutes



You should be alarmed.

Make sure your engine's alarms are working. Consider adding an exhaust temperature alarm.



# Infrared Pyrometer Use





Stuffing box  
temperature shouldn't  
exceed about 30°F -  
40°F above seawater  
temp



Wet exhaust temp: max 200°F.  
Ideally, should not exceed 150°F at *any* RPM



# A word about hydraulic pumps/PTOs and cooling



# “I need troubleshooting assistance”

## Reliable Communications

- Cellular, satellite phone  
Internet, Skype w/  
camera.
- Consider an external  
cellular antenna with  
booster
- Lifeline, who do you  
call?





# Spare Parts



# Electrical Components



# Plumbing, Electrical Connectors, Filters, Belts Etc.





# Seizing Wire, Waterproof Tape and Pipe Thread Sealant





# Filters and Fluids



# Starter and Alternator



# Unusual Parts





# Sanitation Systems and Pumps





# Duck Bill Valve





# Gasket Material and Hose Menders



The rest of the story...





# Thank You

