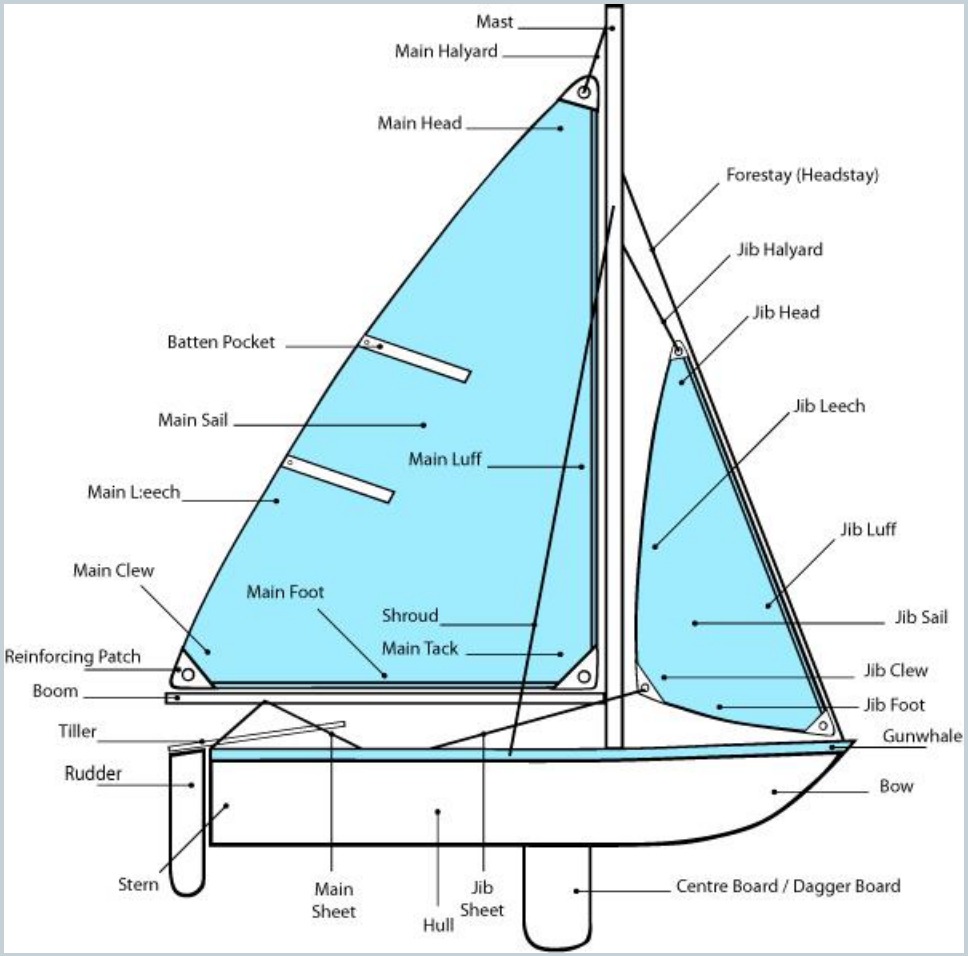
Marine Technology

MONDAY – APRIL 21, 2014

Review – The Sailboat



Today at Marine Technology

- Compression Testing & Other 4 Stroke Considerations – AM PM
- Sailboat Sails – Quiz AM PM
- Fuel Ratios – 2 Stroke –Math AM PM
- Compression Testing AM PM
- Web Search – Old Outboard Motors

In the News

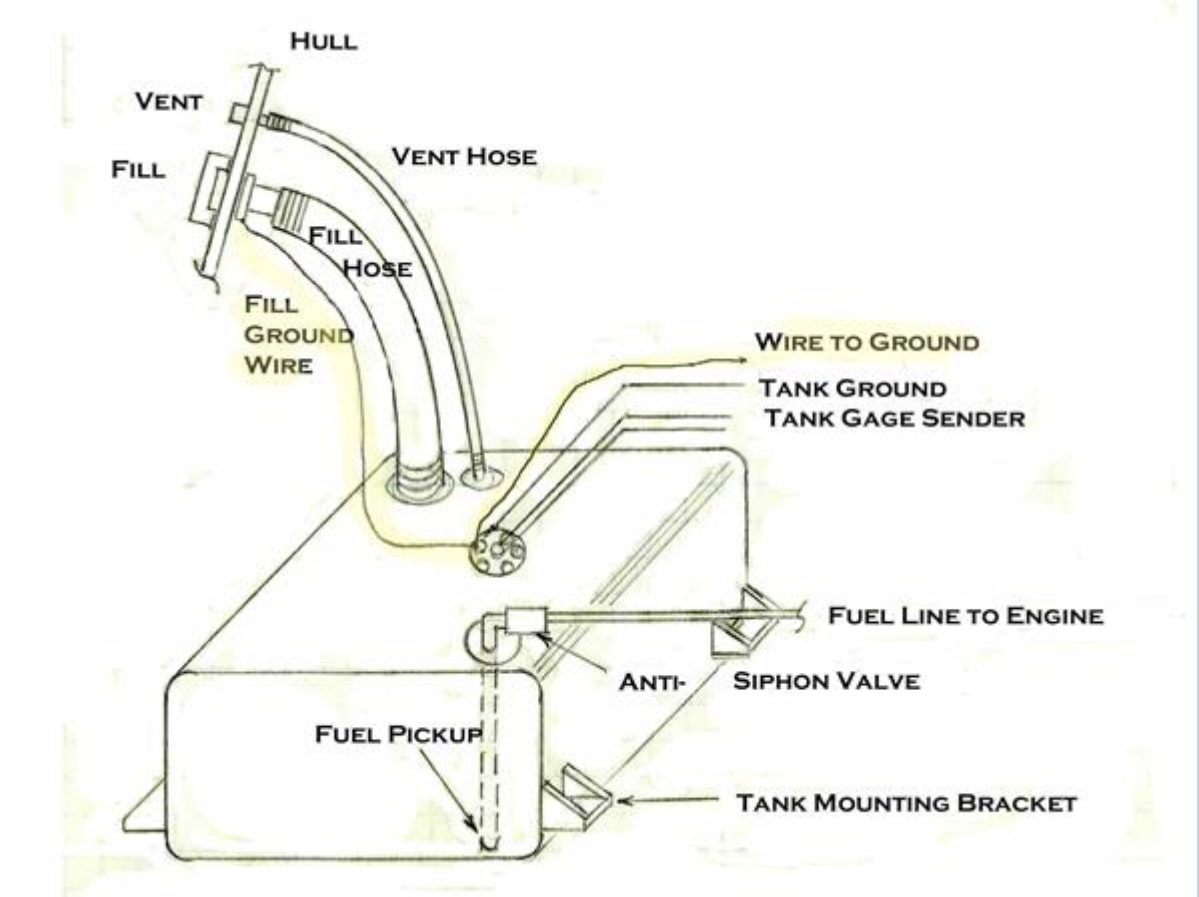
- Ferry Disaster – Update
- Missing Jet - Update
- Boston Strong
- Corvette Sink Hole - Update

Warm-up Question 1

- You notice that the ground wire to your gasoline tank has corroded at the connection and as a consequence is barely attached. What should you do?
  - A. Ignore the problem because it does not matter
  - B. Cut back the wire, replace the connector, and reattach
  - C. Inspect and clean ground wire connections at both ends to ensure proper grounding of the tank
  - D. Both B & C

  - Answer – Both B & C

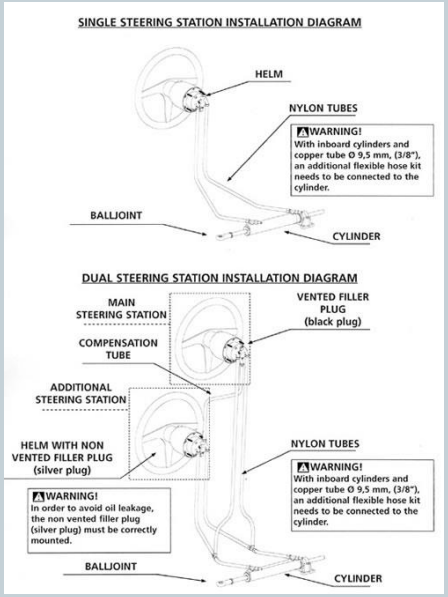
Grounded Fuel Tank



Warm-up Question 2

- Your runabout's hydraulic steering wheel is making a clicking sound and the outboard does not always move when turning the wheel. What may be a possible reason?
  - A. The propeller has been dinged
  - B. Steering has air in the system
  - C. The outboard is experiencing cavitation
  - D. None of the above

  - Answer B



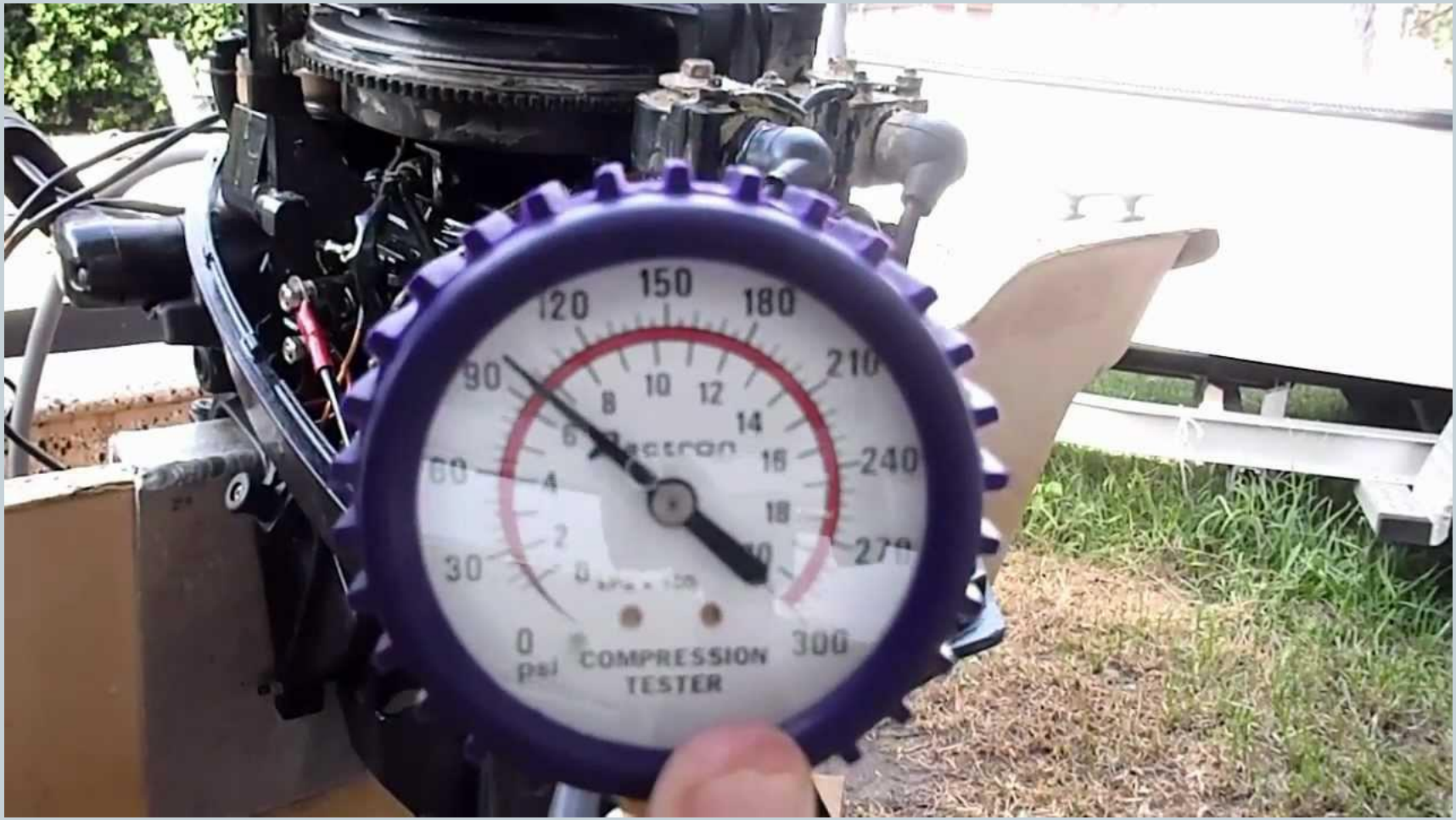
Compression Testing

- To test compression, bring engine up to normal operating temperature
- Testing Annually is a great idea so that you can detect early signs of failure
  - Find a potential problem early and save money
  - Example - gummed up piston rings can be readily fixed using a de-carbonizing solvent
- The service manual will provide the proper specifications for compression

Compression Testing - Benchmarks

- As it is important to be within the manufacturer's recommendations it is EQUALLY important to establish a benchmark for future diagnostics
  - If there is more than a 15 PSI difference drop from the benchmark – be concerned and proactive
- Also important is the variation between cylinders
  - Ensure that there is not more than a 15 PSI difference between cylinders

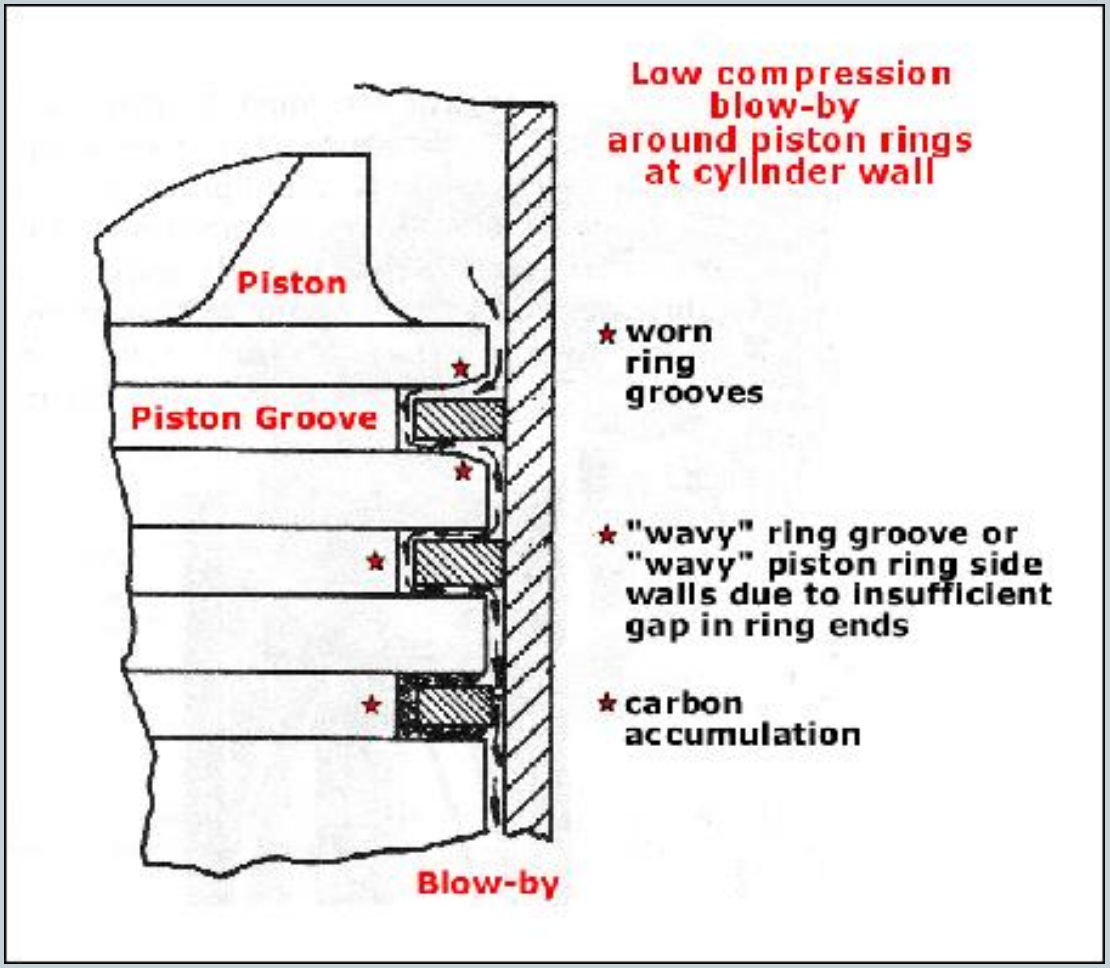
The Test


120
150
180
90
210
10
12
8
14
240
4
18
30
0
psi
COMPRESSION
TESTER
300

Steps for Compression Testing

- 1. Disable the engine's ignition system
  - Unplug the gang plug or engine kill switch
  - Ensure that there is no spark at the plugs or wires
- 2. Remove the engine's spark plugs
  - Inspect each plug to diagnose possible problems
- 3. Thread the compression tester into cylinder #1 and zero out the guage
- 4. Open the engines throttle or fast idle
- 5. Crank the engine the same number of times for each cylinder you test
- 6. Record your readings – place in engine's log book

Blow-by and Low Compression



Other Considerations

- Remember that an engine that has been in storage for some time may have relaxed
  - Run engine for several extended periods prior to use
  - If reading is low, squirt some shop oil into suspect cylinder to "Wet Test"
    - If compression improves- rings may be gummed up
    - Us a decarbonizing spray to dissolve the gum and re-test
      - Spray into air intake while engine is running
  - If the "Wet Test" does not improve compression then internal problems are probable
    - Worn rings
    - Worn cylinder lining

Worn Rings and Pistons

Gap the Spark Plugs & Run

- Once compression testing is complete
  - Replace the spark plugs with new plugs if necessary
    - If the plugs require GAPPING consult owner's manual for guage
    - Us a feeler guage to set the proper gap

Plug Diagnostics

The Compression Test

- The Compression Test