

Time:

Engine and Fuel Tank Ventilation (Gasoline)

Key Concepts:

Main Teaching Points:

- 1) **Discuss engine and fuel tank ventilation requirements compulsory on all PC with inboard gasoline engines—except those with an open engine compartment.**
 - a) require at least two ventilator ducts fitted with cowls.
 - b) intake cowls are raked forward (openings facing forward) and exhaust cowls are raked (aft) openings facing aft.
 - c) there must be at least one exhaust duct extending from the lower third of the compartment, above the normal accumulation of bilge water to the open atmosphere.
 - d) at least intake duct shall direct the air from the open atmosphere into the compartment at any point midway to the bilge, or at least below the carburetor intake.
 - e) the intake may form part of the engine cover and not always be a cowl or louver.
 - f) the cowls shall be located and trimmed to prevent displaced fumes from being re-circulated and separated by a suitable distance.
- 2) **Describe examination criteria for PC with inboard gasoline engines**
 - a) check cowls/ducts for obstructions
 - b) intake cowl openings located outside the superstructure, facing forward.
 - c) exhaust cowls openings located outside the superstructure, facing aft.
 - d) cowls are positioned to prevent water from entering (during normal operations)
 - e) cowls should be located at least 380mm (15in.) from any gasoline filling pipe and/or gasoline tank vent - to prevent re-circulation of gasoline fumes.
 - f) ducts in good serviceable condition;
 - g) intake duct midway to bilge or below carburetor intake level.
 - h) exhaust duct extended from lower third of compartment, above bilge H2O accumulation

Notes

Quick Points

	Engine and Fuel tank ventilation requirements
	Examination Criteria

Instructor notes:

Engine and fuel tank space ventilation is compulsory on all PC with inboard gas engines.

“Opened Compartment” means an engine or fuel tank compartment with at least 0.34m² (3.5 ft²) exposed to the atmosphere per cubic meter of net compartment volume (about 1 ft² of compartment exposed to the atmosphere per 11 ft³ of net compartment volume); Where there are no long or narrow un-vented spaces in which a flame front might propagate.

Reference material:

TP1332 Engine and Fuel Tank Ventilation (gasoline)
<http://www.tc.gc.ca/marinesafety/TP/TP1332/pdf/E-Section6.pdf>
Safe Boating guide 55
PCCC Manual pg 95

Rationalization: Fuel vapours do not accumulate under the hood of a car, but they quickly reach explosive levels in the engine room on a boat. *Operators must remove explosive gas from bilge and fuel tank compartment, prior to start up.*

Suggested Activities:



<i>Method of Evaluation & Condition</i>	<i>Skill / Knowledge and Standard</i>
<u>Skill</u>	
Each candidate shall participate in a thorough examination the engine and fuel tank ventilation system demonstrating the inspection criteria listed in the skills column, or may be evaluated for these points by written examination or oral questioning during table top exercises.	<p>While examining inboard gasoline engines each candidates shall:</p> <ul style="list-style-type: none"> • Check cowls for obstructions, • Ensure intakes cowls face forward, and exhaust cowls face aft, • Ensure cowls are positioned to prevent water from entering (during normal operations) and prevent recirculation of gas fumes. • Intake duct midway to bilge or below carburetor intake level. • Exhaust duct extended from lower third of compartment, above bilge H2O accumulation
<u>Knowledge</u>	
Each candidate shall participate in a thorough examination the engine and fuel tank ventilation system demonstrating the inspection criteria listed in the skills column, or may be evaluated for these points by written examination or oral questioning during table top exercises.	<p>Each candidate will be able to explain that engine and fuel tank space ventilation is compulsory on all PC with inboard gas engines.</p> <p>Diesel Engines-- natural ventilation is not required to eliminate diesel vapours, but opening must exist to provide air to engine to not starve.</p>