

(b) Gauges to indicate engine revolutions per minute (RPM), jacket water discharge temperature, and lubricating oil pressure must be provided for all propulsion engines installed in the vessel. The gauges must be readily visible at the operating station.

(c) An enclosed space containing machinery powered by gasoline or other fuels having a flash point of 43.3° C (110° F) or lower must be equipped with a flammable vapor detection device in compliance with § 182.480.

(d) In systems and applications where flexible hoses are permitted to be clamped:

(1) Double hose clamping is required where practicable;

(2) The clamps must be of a corrosion resistant metallic material;

(3) The clamps must not depend on spring tension for their holding power; and

(4) Two clamps must be used on each end of the hose, or one hose clamp can be used if the pipe ends are expanded or beaded to provide a positive stop against hose slippage.

#### § 182.415 Carburetors.

(a) All carburetors except the downdraft type must be equipped with integral or externally fitted drip collectors of adequate capacity and arranged so as to permit ready removal of fuel leakage. Externally fitted drip collectors, must be covered with flame screens. Drip collectors, where practicable, should automatically drain back to engine air intakes.

(b) All gasoline engines installed in a vessel, except outboard engines, must be equipped with an acceptable means of backfire flame control. Installation of backfire flame arresters bearing basic Approval Numbers 162.015 or 162.041 or engine air and fuel induction systems bearing basic Approval Numbers 162.042 or 162.043 may be continued in use as long as they are serviceable and in good condition. New installations or replacements must meet the applicable requirements of this section.

(c) The following are acceptable means of backfire flame control for gasoline engines:

(1) A backfire flame arrester complying with Society of Automotive Engineers (SAE) J-1928, "Devices Pro-

viding Backfire Flame Control for Gasoline Engines in Marine Applications," or UL 1111, "Marine Carburetor Flame Arrestors," and marked accordingly. The flame arrester must be suitably secured to the air intake with a flametight connection.

(2) An engine air and fuel induction system that provides adequate protection from propagation of backfire flame to the atmosphere equivalent to that provided by an acceptable backfire flame arrester. A gasoline engine utilizing an air and fuel induction system, and operated without an approved backfire flame arrester, must either include a reed valve assembly or be installed in accordance with SAE J-1928, or other standard specified by the Commandant.

(3) An arrangement of the carburetor or engine air induction system that will disperse any flames caused by engine backfire. The flames must be dispersed to the atmosphere outside the vessel in such a manner that the flames will not endanger the vessel, persons on board, or nearby vessels and structures. Flame dispersion may be achieved by attachments to the carburetor or location of the engine air induction system. All attachments must be of metallic construction with flametight connections and firmly secured to withstand vibration, shock, and engine backfire. Such installations do not require formal approval and labeling but must comply with this subpart.

(4) An engine air induction system on a vessel with an integrated engine-vessel design must be approved, marked, and tested under § 162.043 in subchapter Q of this chapter, or other standard specified by the Commandant.

#### § 182.420 Engine cooling.

(a) Except as otherwise provided in paragraphs (b), (c), (d), and (e) of this section, all engines must be water cooled and meet the requirements of this paragraph.

(1) The engine head, block, and exhaust manifold must be water-jacketed and cooled by water from a pump that operates whenever the engine is operating.

(2) A suitable hull strainer must be installed in the circulating raw water