



SURFACE VEHICLE RECOMMENDED PRACTICE

J631™

APR2025

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Radiator Nomenclature

RATIONALE

Five-Year Review.

1. SCOPE

This SAE Recommended Practice documents nomenclature in common use for various types of radiator and radiator core construction, as well as for various radiator-related accessories.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J151 Pressure Relief for Cooling System

SAE J164 Cooling System Metallic Caps and Filler Necks

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1004 Glossary of Engine Cooling System Terms

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3. DEFINITIONS - RADIATOR NOMENCLATURE

3.1 BAFFLE

A barrier plate used to direct fluid flow within a tank, as under a filler neck or through an in-tank oil cooler, or to divide a tank into separate chambers, as in a deaeration tank or multi-pass radiator tank. See Figure 1.

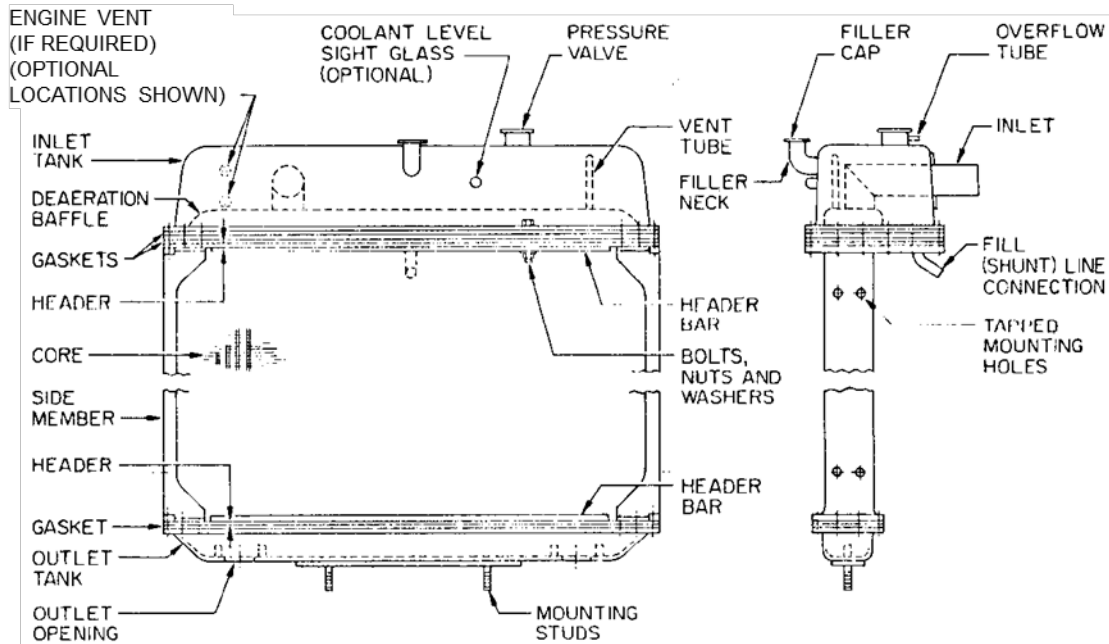


Figure 1 - Bolted-type radiator, drawn tanks (typical deaeration system shown)

3.2 BOLTED RADIATOR

A radiator whose inlet and outlet tanks are bolted to the headers of the core, usually with an O-ring or gasket seal between tank and header and bolting strips to back up the header. See Figures 1, 2, 3, and 4.

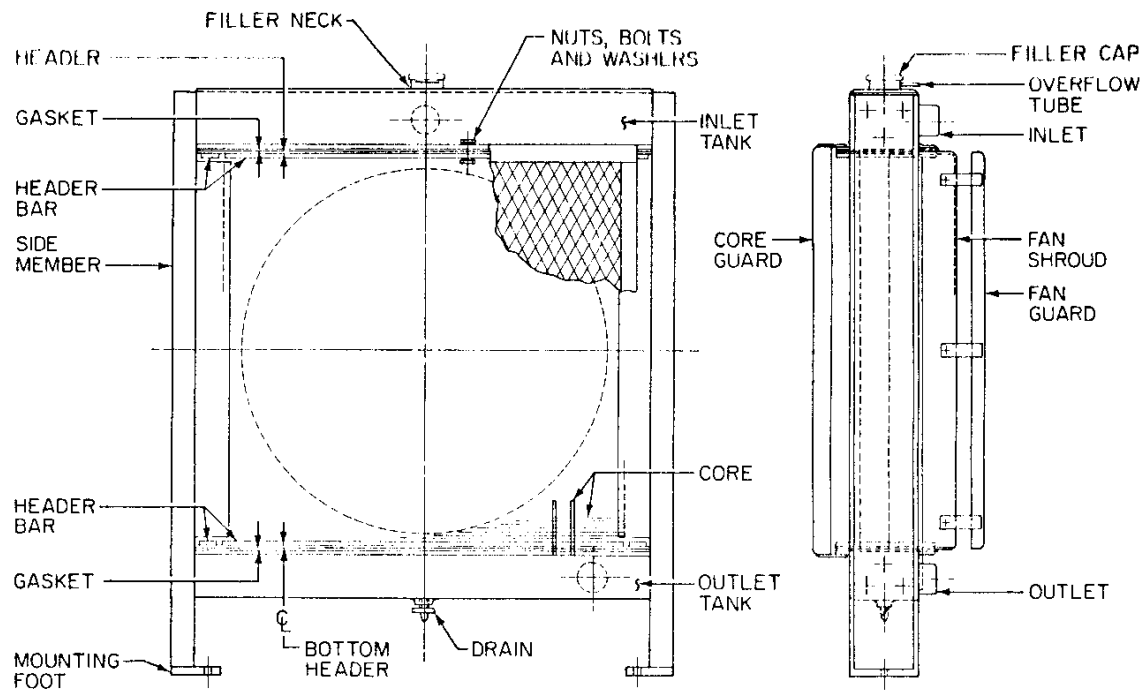


Figure 2 - Fabricated-type (one-piece core) radiator

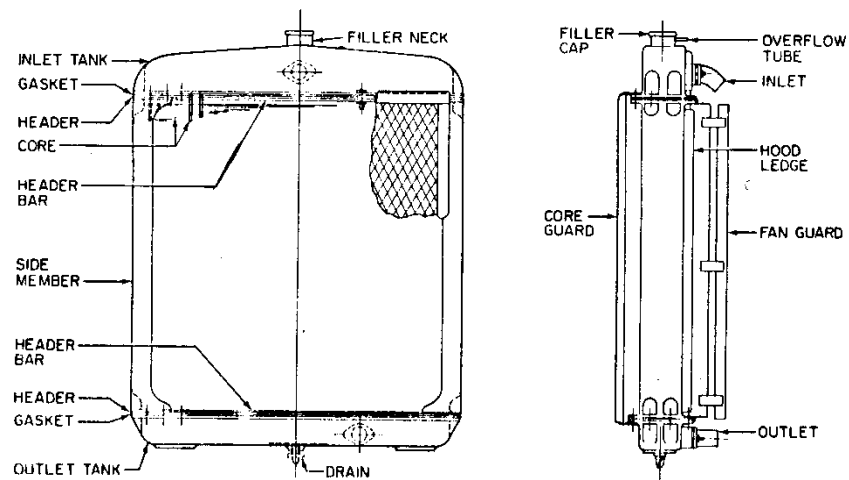


Figure 3 - Cast-type (one-piece core) radiator

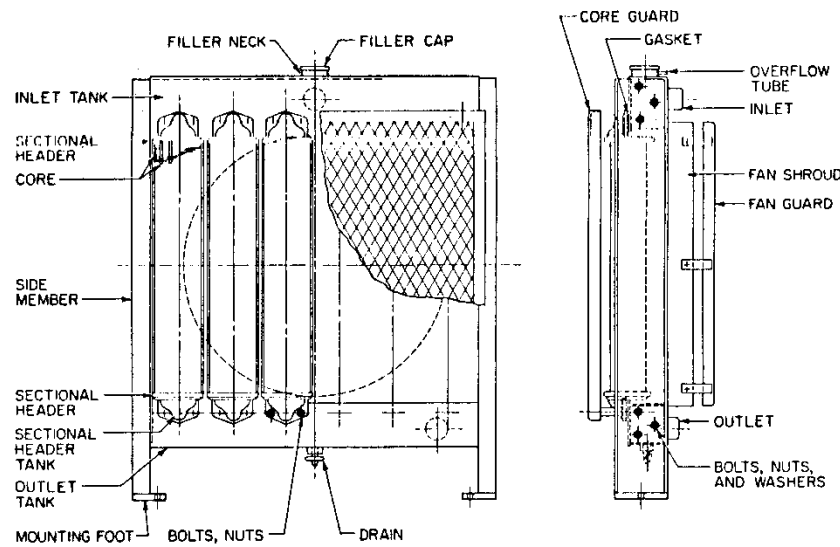


Figure 4 - Cast- or fabricated-type (sectional core) radiator

3.3 BOLTING STRIP

A strip of metal having a series of holes matching the bolting hole pattern of the tanks and headers of a bolted radiator and placed on the side of the header opposite to the tank and gasket for the purpose of clamping the joint between the tank and header by means of bolts and nuts; also called header bar. Some radiators with very light gauge tanks have bolting strips on the tank flange as well; also known as core washer. See Figures 1, 2, and 3.

3.4 BRAZED RADIATOR

A radiator in which the bond between the fins and tubes, and between the tubes and headers, is accomplished by brazing. Includes vacuum brazed aluminum radiators and controlled atmosphere brazed aluminum and copper/brass radiators. Brazing is normally conducted inside a furnace. See Figures 6 and 7.

3.5 BREATHER HOLE

A small hole in the side of a radiator filler neck extension for the purpose of venting the air in the expansion volume of a radiator to the filler neck during engine warm-up.

3.6 CAST TANK RADIATOR

A radiator having inlet and outlet tanks of cast metal, usually aluminum, or sometimes cast iron. See Figure 3.

3.7 CELLULAR CORE

A radiator core having a number of fluid passages made by joining metal ribbons at the edges and grouped to form a cellular structure. Parts of the cellular structure may be of formed or flat ribbon, which is not a part of the fluid passages. Typical construction is made by face dipping formed copper alloy components in solder. See Figure 5.

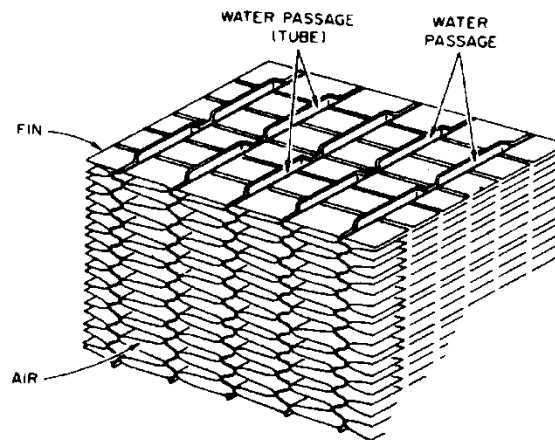


Figure 5 - Cellular core

3.8 COOLANT RECOVERY TANK

A non-pressurized auxiliary radiator tank designed to capture the expansion or after-boil overflow of coolant from the radiator, but not to perform a deaeration function.

3.9 CORE GUARD

A screen-type device sometimes provided to protect the radiator core from damage due to dirt and debris in the cooling airstream. Can also be referred to as an Insect or Rock Protection Grille. See Figures 2 and 4.

3.10 CRIMPING STRIP

A metal strip, separate from the header and usually having tabs, that may be folded or crimped around a (usually plastic) radiator tank flange and a radiator header to clamp the two together with a gasket seal between.

3.11 CROSS FLOW RADIATOR

A radiator whose core tubes run horizontally when installed in the cooling system. See Figure 6.

3.12 DEAERATION BAFFLE

A barrier used to separate chambers in a radiator top tank or auxiliary tank to form a deaeration tank. See Figure 1.

3.13 DEAERATION TANK

A tank designed to be capable of removing entrained air or combustion gas, or both, from the circulating coolant. The deaeration tank may be integral with the radiator inlet tank or may be mounted remotely.

3.14 DISHED HEADER

A header for a radiator in which the portion of the header through which the core tubes pass is depressed from the portion that makes up the header flanges, as in a dish; usually used in connection with bolted radiator construction. Allows cores to be connected end-to-end with a gasket but without the use of a filler frame.

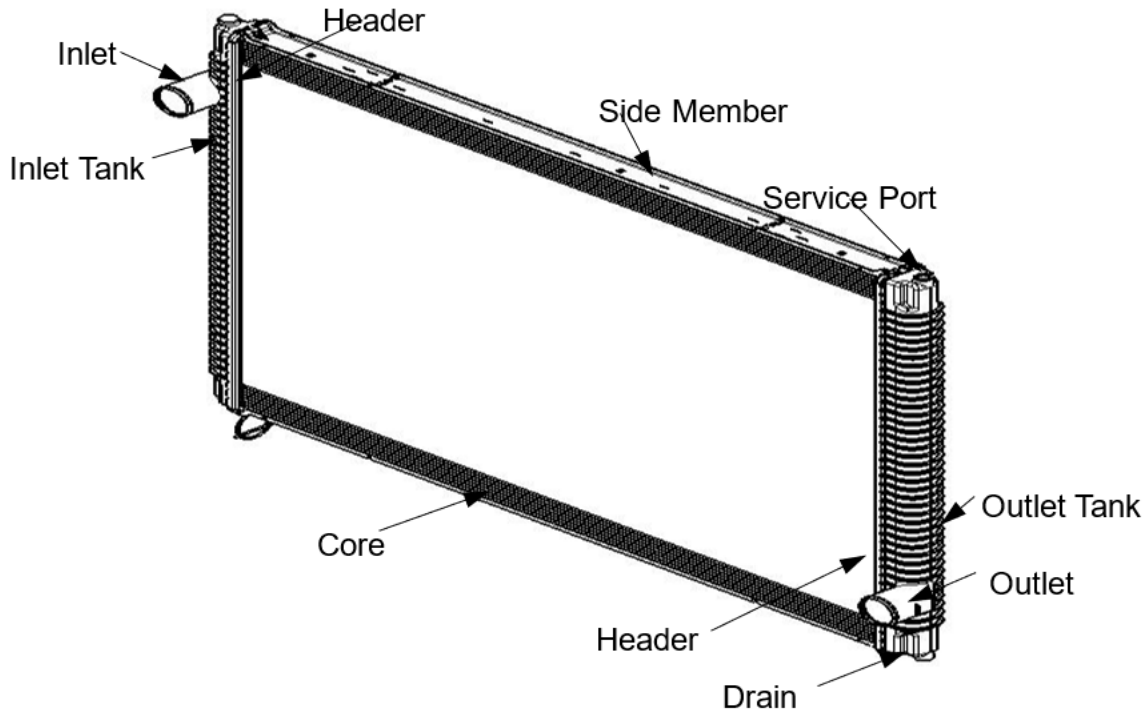


Figure 6 - Brazed automobile radiator (cross flow)

3.15 DOWNFLOW RADIATOR

A radiator whose core tubes run vertically when installed in the cooling system. See Figure 7.

3.16 DRAIN COCK

A device located at the bottom of a radiator that opens, usually by turning, to allow liquid to exit the cooling system by gravity. Also, sometimes referred to as a Drain Port.

3.17 FABRICATED RADIATOR

A radiator whose inlet and outlet tanks are fabricated, as well as its side members. Tank construction is usually made by welding of aluminum or steel plates or sheets. See Figure 2.