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SAE J631 AUG88

Radiator Nomenclature

SAE Standard
Revised August 1988

Submitted for Recognition as an American National Standard

SAE The Engineering Society For Advancing Mobility Land Sea Air and Space ®
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HIGHWAY VEHICLE STANDARD

Submitted for recognition as an American National Standard

SAE J631

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RADIATOR NOMENCLATURE

1. RADIATOR CORES:

1.1 Tube and Plate Fin Core: An assembly of fluid-carrying tubes of any cross sectional form, the tubes being joined by heat conducting fins or plates common to all tubes or groups of tubes. See Fig. 1.

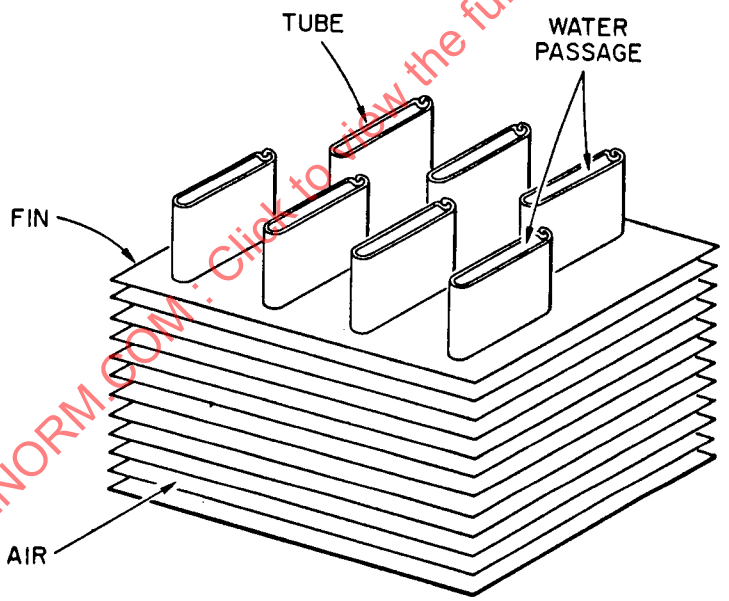

FIGURE 1 - Tube and Plate Fin Core

1.2 Cellular Core: 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. See Fig. 2.

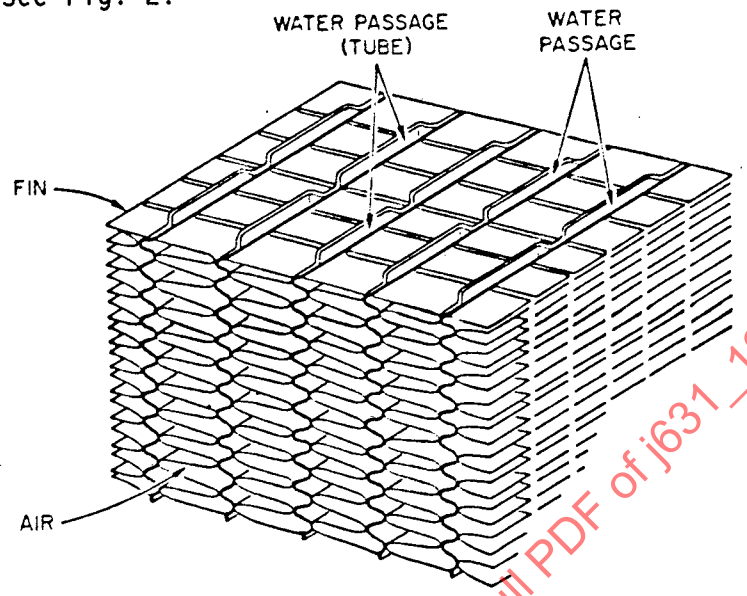

FIGURE 2 - Cellular Core

1.3 Tube and Serpentine Fin Core: An assembly of fluid tubes in line in the direction of airflow and joined in heat transfer relation by corrugated conduction fins inserted between adjacent line of tubes. See Fig. 3.

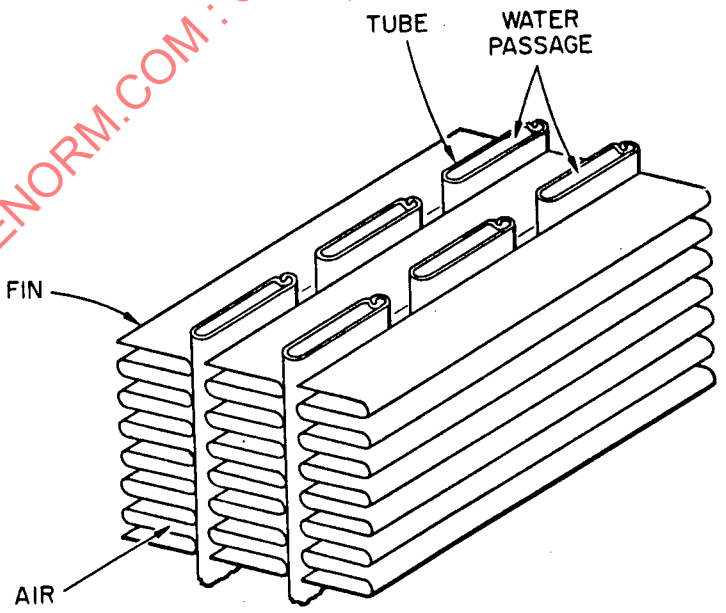

FIGURE 3 - Typical Tube and Serpentine Fin Core (Often Referred to as Tube and Center Core and CT Core)

1.4 Sheet Metal Radiators: Figs. 4-7 illustrate the nomenclature for sheet metal radiators.

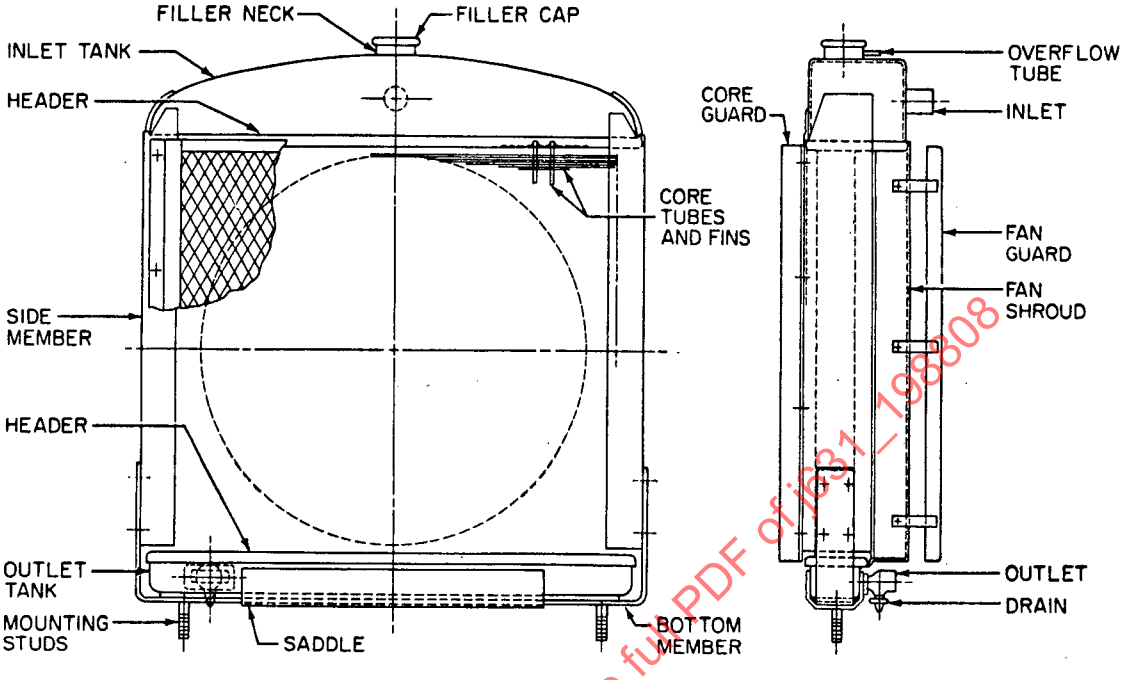

FIGURE 4 - Sheet Metal Radiator

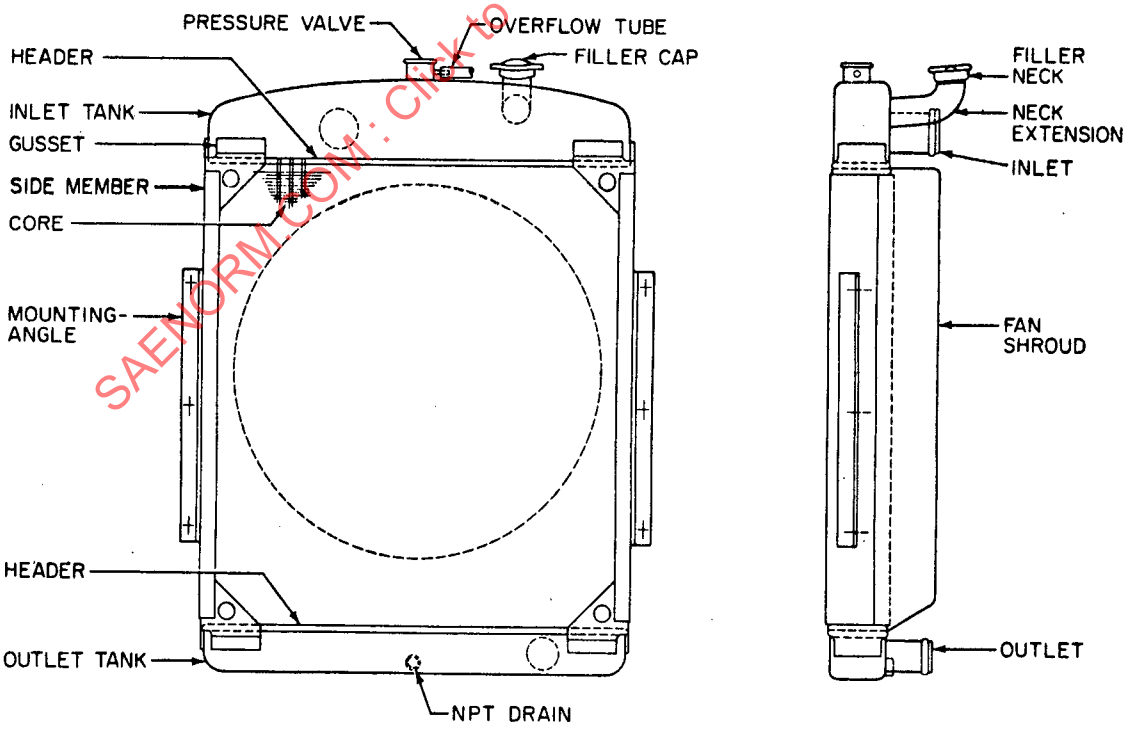

FIGURE 5 - Heavy-Duty Radiator, Sheet Metal Type

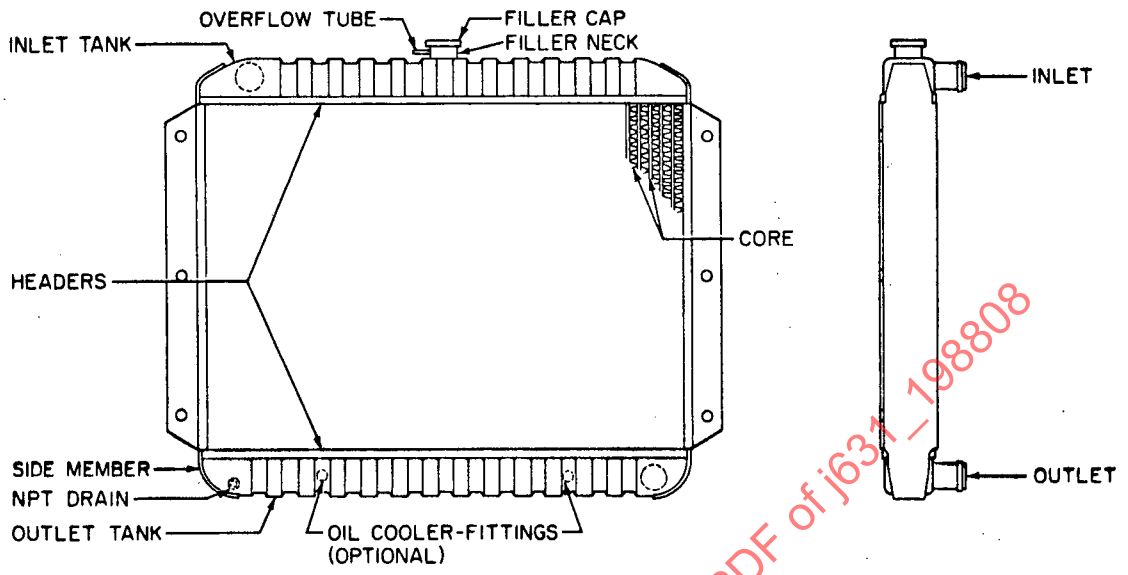

FIGURE 6 - Automotive Radiator (Down Flow)

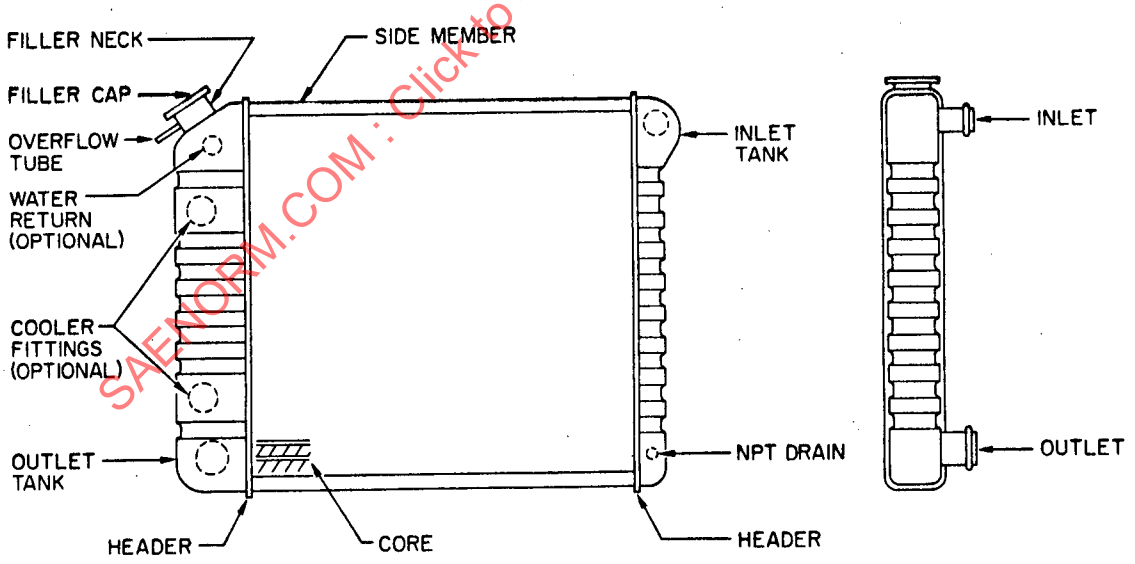

FIGURE 7 - Automotive Radiator (Cross Flow)

1.5 Plastic Tank Radiators: Figs. 6 and 7 can also represent radiators having plastic inlet and/or outlet tanks. Inlet and outlet are integral with the appropriate tank. The filler neck and other parts and/or fittings may also be integral with a tank. Tanks are gasketed and secured to the headers.

1.6 Bolted Radiators: Figs. 8-11 give the nomenclature for bolted radiators.

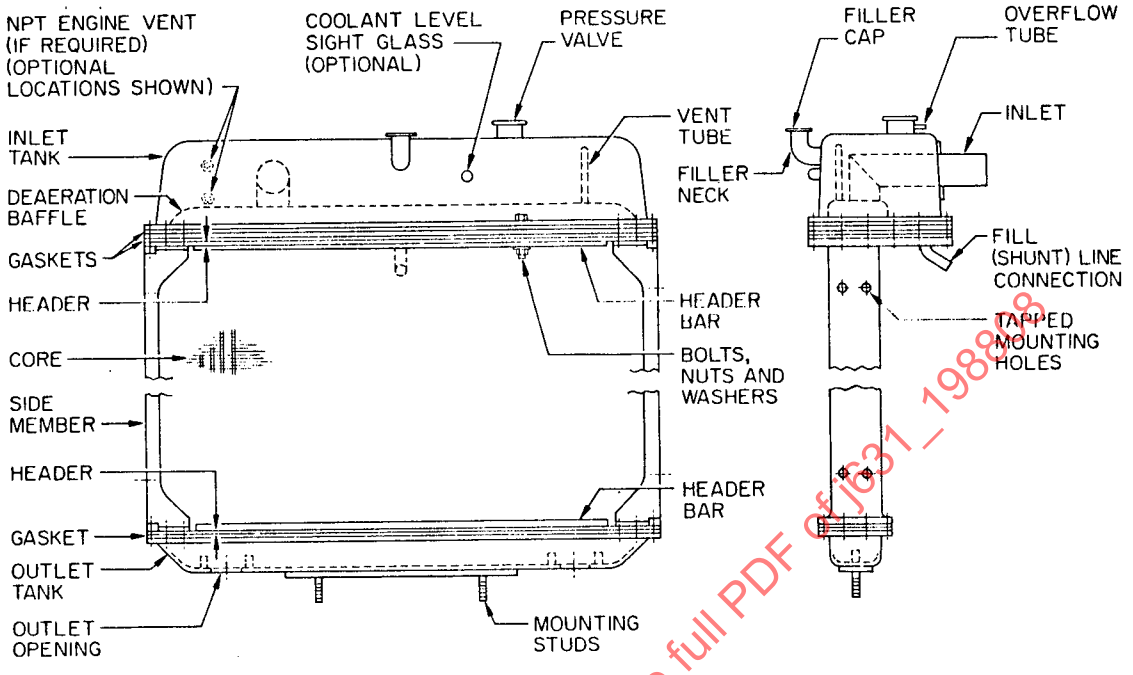

FIGURE 8 - Bolted Type Radiator, Drawn Tanks (Typical Deaeration System Shown)

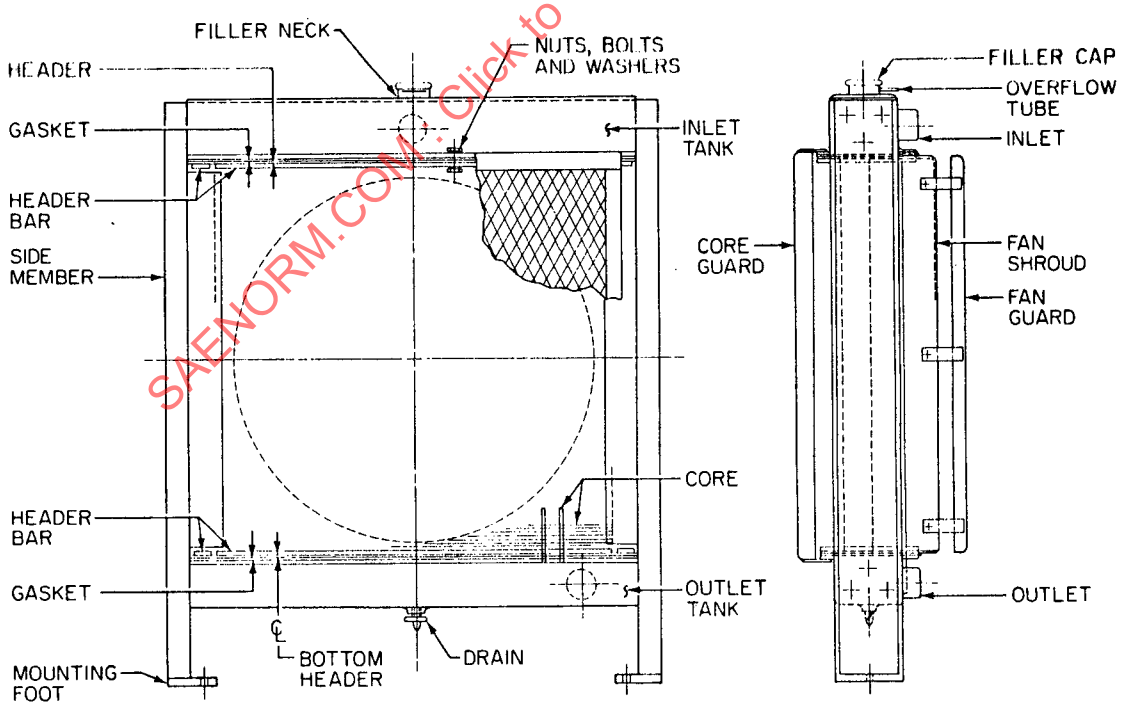

FIGURE 9 - Fabricated Type (One-Piece Core) Radiator

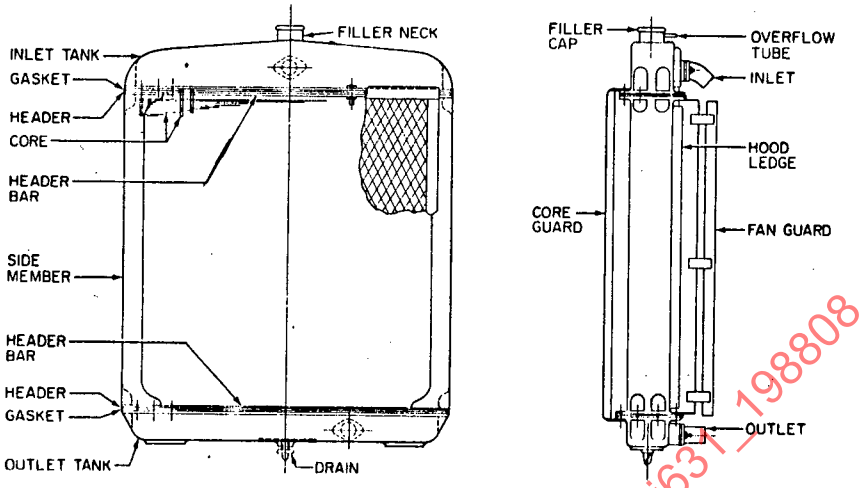

FIGURE 10 - Cast Type (One-Piece Core) Radiator

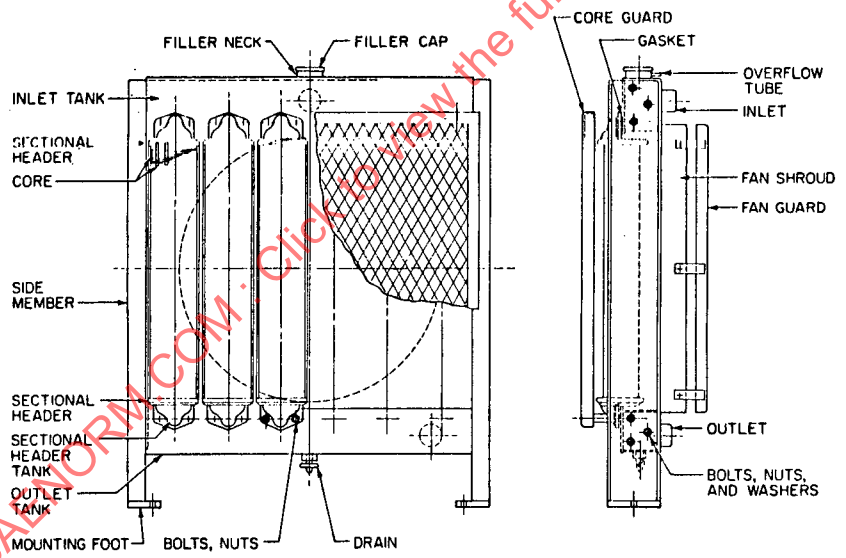

FIGURE 11 - Cast or Fabricated Type (Sectional) Radiator

2. ACCESSORIES:

2.1 Fan Shroud: An enclosure to duct air between the radiator and the fan. It provides increased fan efficiency by reducing or eliminating fan and/or radiator air recirculation. See Figs. 4, 5, 9, and 11.

2.2 LFC (Low Flow Cooling) Valve: A valve to vent the radiator to the surge tank Ø of a low flow cooling radiator to allow air (gas) to escape during system fill and start up, and to allow deaeration, but prevent or minimize coolant by-pass during normal operation.

2.3 Radiator Cap, Solid: A removable device which closes the cooling system fill opening (filler neck). When installed, it permits no leakage under any cooling system operating condition. It must be used in combination with a radiator pressure relief valve. See "Filler Cap" in Figs. 5 and 8.

2.4 Radiator Pressure Cap: A removable device which closes the cooling system fill opening (filler neck) and which incorporates both pressure and vacuum, relief valves. Refer to SAE J151 and SAE J164. See "Filler Cap" in Figs. 4, 6, 7, 9, 10, and 11.

2.5 Radiator Pressure Relief Valve: A device which provides the same features and functions as a radiator pressure cap except that it is not used for system filling. (Some hand tools are required for the removal of this valve). It must be used in combination with a radiator cap, solid. See "Pressure Valve" in Figs. 5 and 8.

2.6 Sand Grid: A device between the radiator and the blower fan on certain construction equipment. This device protects the core tubes from damage and erosion on equipment which operates in an environment such that sand, grit, and/or small stones may be picked up in the cooling air stream and hurled at the radiator with great force by the blower fan.

2.7 Tube Protector: A metal shield installed on all radiator core tubes, in the row facing a blower fan, in certain construction equipment. The tube protector prevents tube damage and erosion on equipment which operates in an environment such that sand, grit, and/or small stones may be picked up in the cooling air stream and hurled at the radiator with great force by the blower fan.

2.8 Ø Turbulated Tube: Dimples or impressions in a core tube to increase turbulence and thereby enhance core heat rejection at low coolant flow rates.

2.9 Turbulator: An insert placed inside core tubes to cause coolant flow to be turbulent, and thereby enhance core heat rejection at low coolant flow rates.

Note: Nomenclature sketches are typical and not a definitive design.

The phi (Ø) symbol is for the convenience of the user in locating areas where technical reivsions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.