

# Oil Cooler Nomenclature and Glossary—SAE J1244

SAE Recommended Practice  
Approved March 1979

S. A. E.  
LIBRARY

THIS IS A PREPRINT WHICH IS  
SUBJECT TO REVISIONS AND  
CORRECTIONS. THE FINAL  
VERSION WILL APPEAR IN THE  
1980 EDITION OF THE SAE  
HANDBOOK.

Society of Automotive Engineers, Inc.  
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096



**PREPRINT**

SAENORM.COM : Click to view the full PDF of J1244-1979

SAENORM.COM : Click to view the full PDF of J1244 - 197903

Copyright © 1979 Society of Automotive Engineers, Inc.

**SAE Technical Board Rules and Regulations**

All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE Standard or SAE Recommended Practice, and no commitment to conform to or be guided by any technical report.

In formulating and approving technical reports, the Technical Board, its Councils and Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents.

PRINTED IN U.S.A.

# OIL COOLER NOMENCLATURE AND GLOSSARY—SAE J1244

## SAE Recommended Practice

Report of Engine Committee approved March 1979.

1. *Scope*—This report presents general nomenclature and glossary of terms for oil coolers.

2. *Type of Applications*—Oil coolers covered in this report are used for cooling of hydrostatics, bearings, differentials, transmissions, engines, power steering, aircraft, and stationary systems.

3. *Types of Unit*—The basic types are oil to air and oil to water or other liquids. See Nomenclature for examples.

### 4. Glossary of Oil Cooler Terms

4.1 *Baffle*—A partition which directs flow of fluids across the core. See Fig. 2 in Nomenclature.

4.2 *Baffle Cut*—Expresses percentage of area removed from baffle. See Fig. 2 in Nomenclature.

4.3 *Baffle Spacing*—Distance between adjacent baffles.

4.4 *Bonnet*—Collector or manifold on end of shell and tube heat exchanger which directs flow of tube-side fluid.

4.5 *Core*—That section of an oil cooler assembly which is comprised of the heat transfer surfaces.

4.6 *End Zone*—Space between first or last baffle and adjacent tube sheet (or header) of a shell and tube oil cooler.

4.7 *Face Area*—Area defined by the core width times core height. (Oil to air coolers.)

4.8 *Face Velocity*—The velocity of air approaching the core.

Note: Volume per unit time divided by face area.

4.9 *Fin*—Extended Heat Transfer Surface—See Figs. 1, 4, and 6 in Nomenclature.

Note: Shell and tube oil coolers may have fins or other extended surface.

4.10 *Fixed Bundle Oil Cooler*—A shell and tube heat exchanger with the tube bundle permanently installed in the shell. See Fig. 3 in Nomenclature.

4.11 *Fouling Factor*—See Fouling Resistance.

4.12 *Fouling Resistance*—The resistance to heat transfer resulting from accumulation of foreign material on the heat transfer surfaces of an oil cooler.

4.13 *Header*—This term has a dual meaning. It is sometimes used synonymously with tube sheet or tank. See Figs. 2, 3, and 6 in Nomenclature.

4.14 *Heat Dissipation*—The quantity of heat, usually expressed in British Thermal Units per minute (kilowatts), that an oil cooler can dissipate under specified conditions.

4.15 *Inlet Temperature Differential*—The difference in temperature between the fluid being cooled and the cooling medium at the point each

enters the heat exchanger.

4.16 *Manifold*—See Tank or Bonnet. Refer to Figs. 1, 6, 7, and 8 in Nomenclature.

4.17 *Multi-Pass Oil Cooler*—An oil cooler that is so circuited that either fluid passes across or through the core more than once.

4.18 *Oil Cooler Pressure Relief Valve*—A pressure differential activated device which allows oil to bypass the oil cooler.

Note: Commonly used for protection under low temperature, high viscosity conditions, or any pressure surge condition where inlet pressure can become excessive.

4.19 *Oil Cooler Thermostat*—A temperature activated device in the oil cooler circuit, which can either by-pass oil around or modulate oil flow through the cooler.

Note: This device regulates oil cooler heat transfer to allow rapid heating of oil at start up or prevent excessive cooling under light load conditions.

4.20 *Operating Pressure*—That fluid pressure to which the oil cooler is normally exposed during operation.

4.21 *Partition*—A device that is installed in a manifold, header, bonnet, or tank to create multiple pass of fluids through the core.

4.22 *Peak Pressure*—The highest pressure to which the oil cooler is intermittently subjected.

4.23 *Pressure Drop*—The pressure differential between inlet and outlet at a specified fluid flow rate and viscosity.

Note: 1. Air side is measured in inches (millimeters) of water.

2. Oil side is measured in psi (kPa).

3. Water side is measured in psi (kPa).

4.24 *Removable Tube Bundle Oil Cooler*—A shell and tube heat exchanger utilizing seals between the shell and tube fluids allowing the tube bundle to be removed from the shell.

Note: Normally used to provide for disassembly and/or thermal expansion. See Fig. 2 in Nomenclature.

4.25 *Tank*—An enclosure, located at the inlet and/or outlet of an oil cooler, which is sealed against the tube sheet or individual tubes and distributes the tube side fluid into the tubes or collects the tube side fluid as it exits the tubes. See Fig. 6 in Nomenclature.

4.26 *Tube Sheet*—See Figs. 2 and 3 in Nomenclature.

4.27 *Turbulator*—A device that increases fluid turbulence for the purpose of increasing heat transfer.

Note: For typical configurations see Figs. 1, 5, 6, and 8 in Nomenclature.

### 5. Nomenclature

SAENORM.COM . Click to view PDF SAE J1244-1979

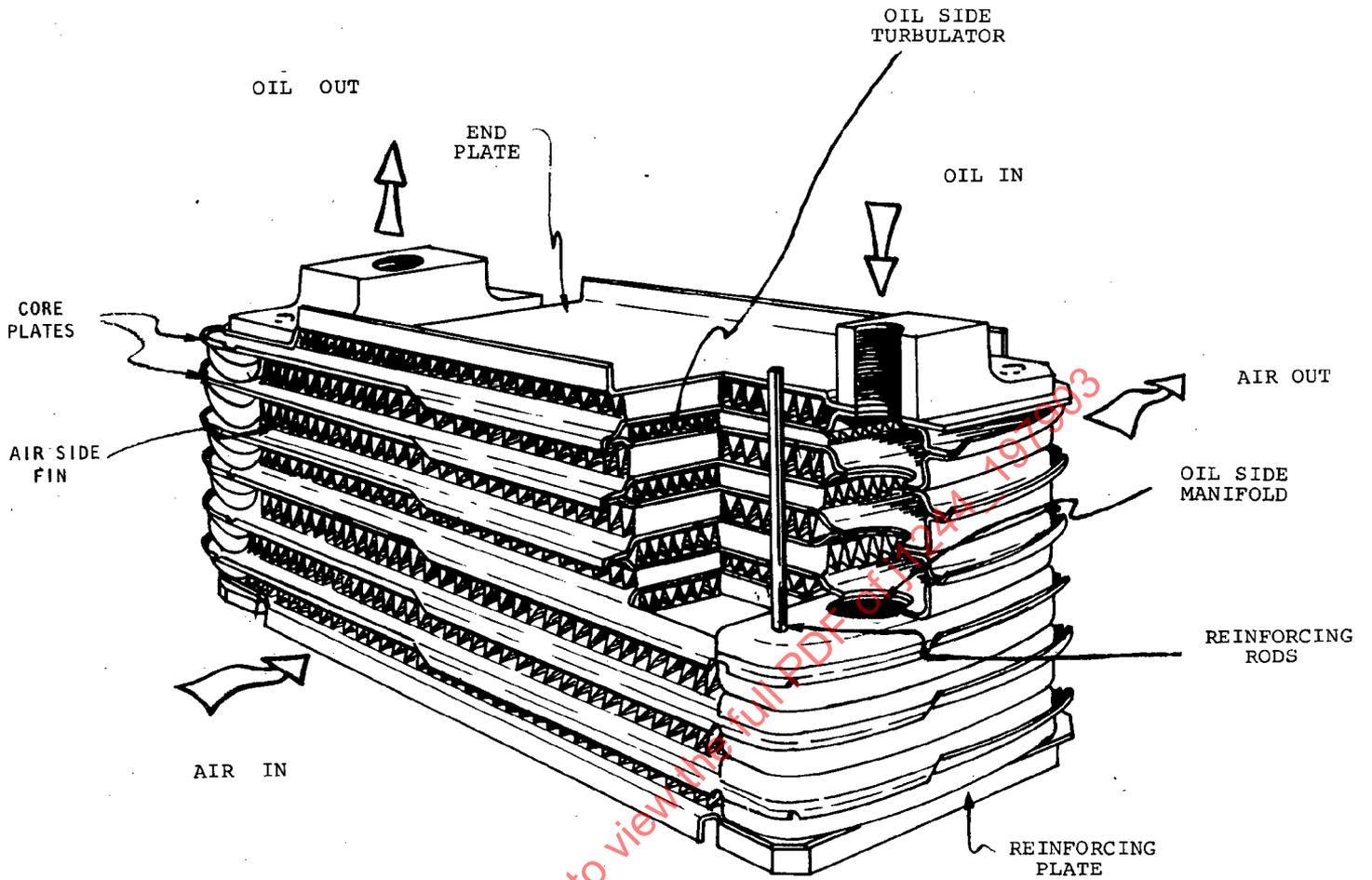


FIG. 1—PLATE FIN SEPARATOR OIL TO AIR COOLER

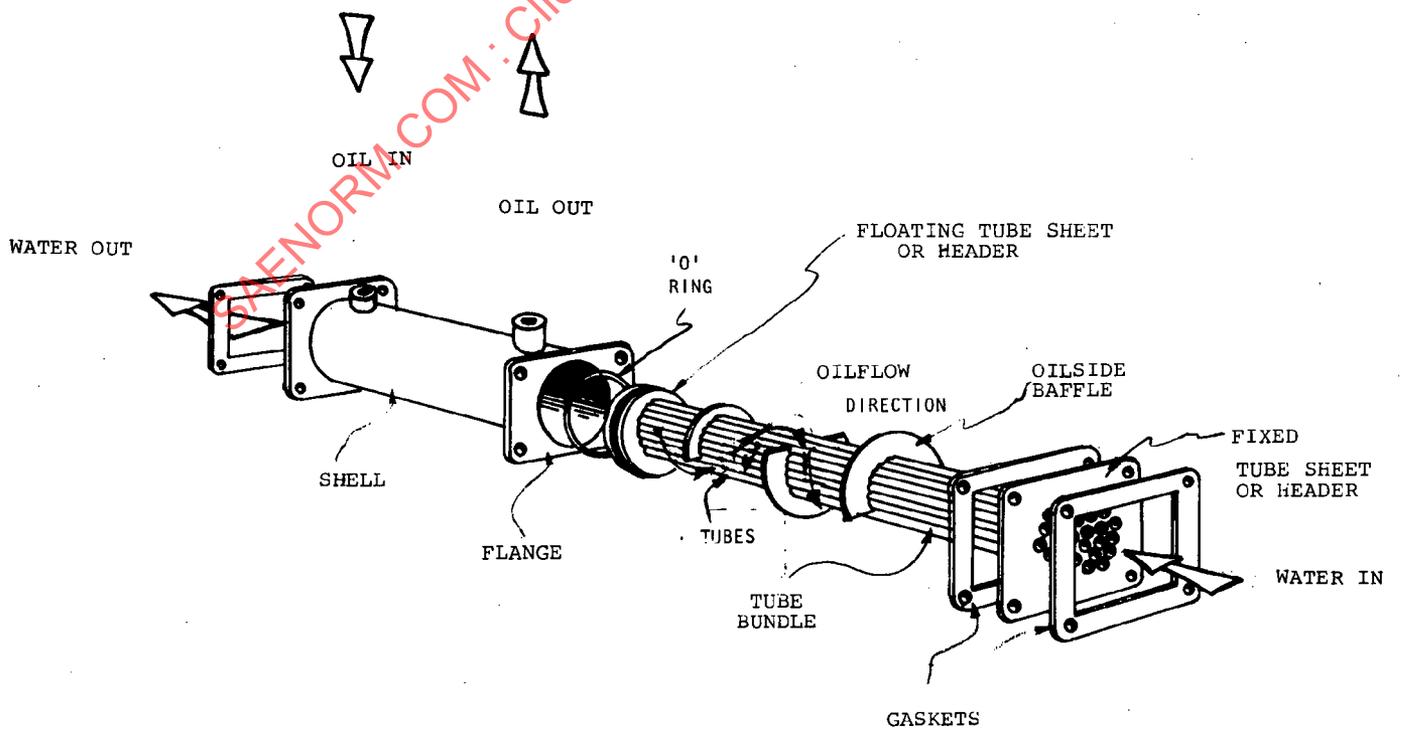


FIG. 2—SHELL AND TUBE REMOVABLE BUNDLE OIL TO WATER COOLER

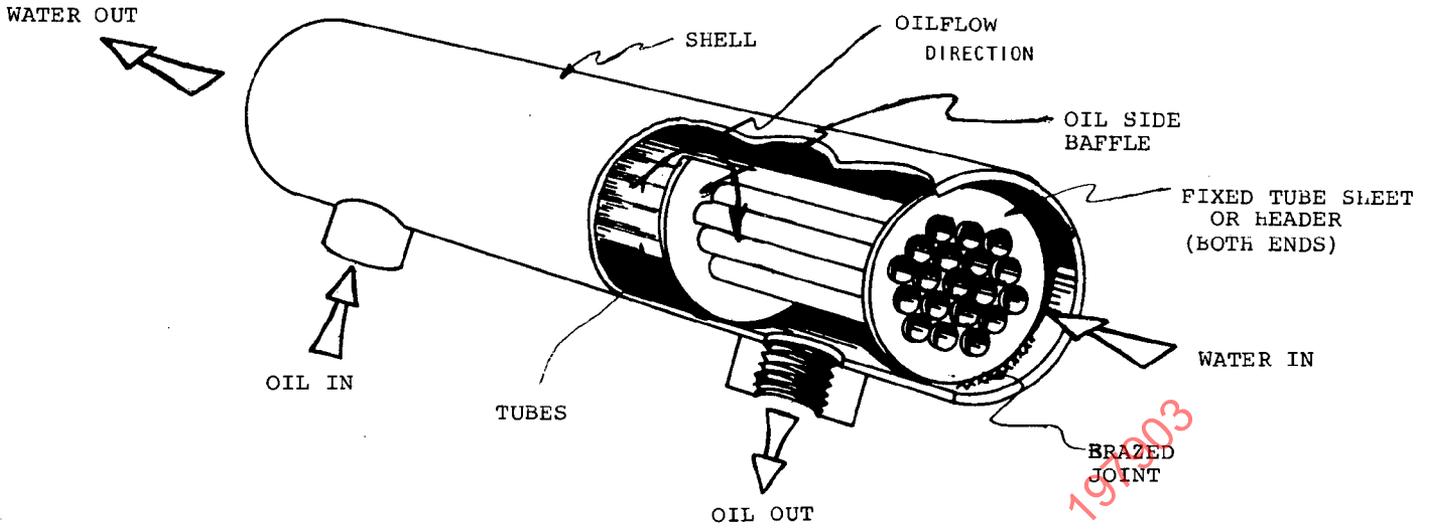
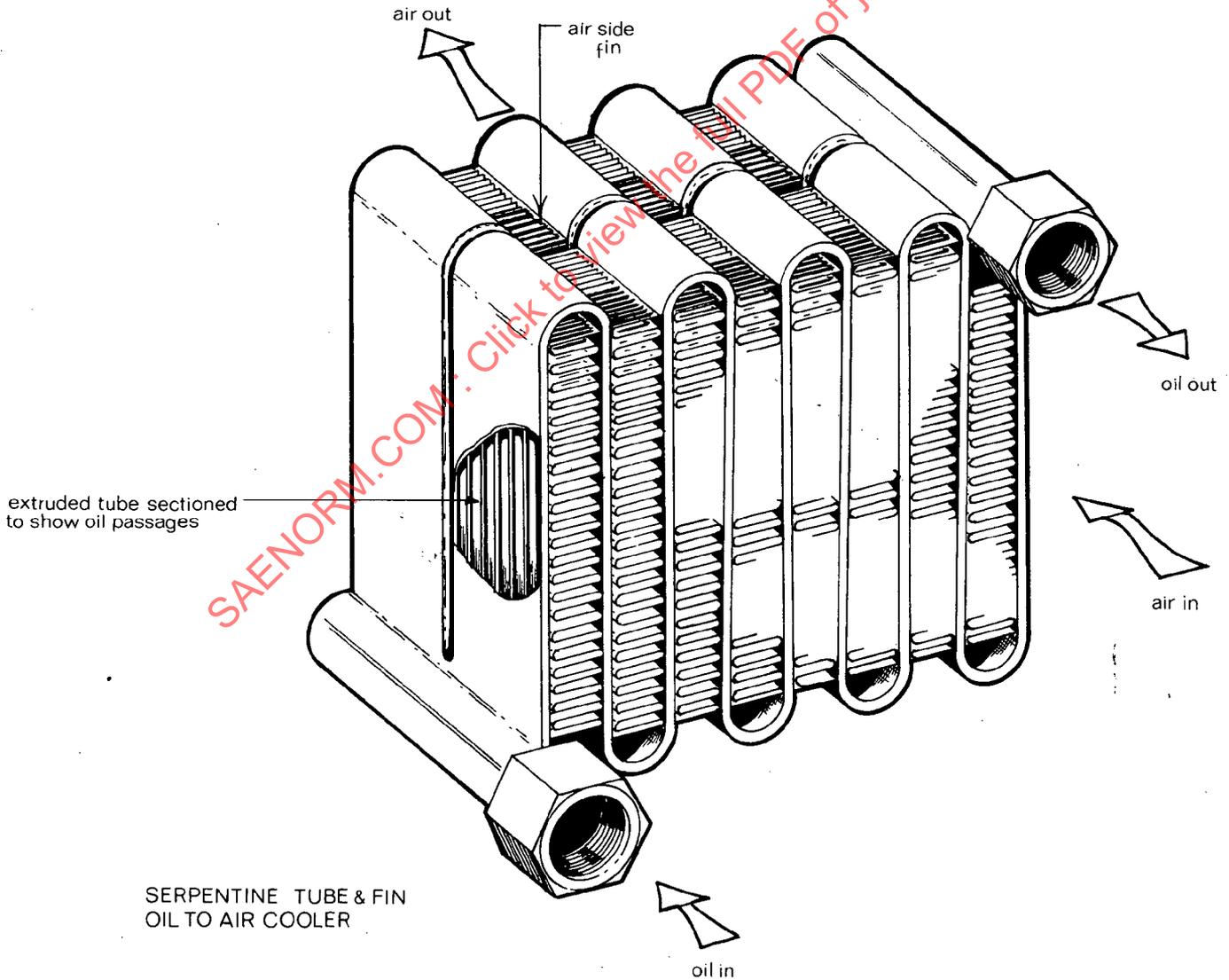


FIG. 3—SHELL AND TUBE OIL TO WATER COOLER-FIXED BUNDLE



SERPENTINE TUBE & FIN OIL TO AIR COOLER

FIG. 4—SERPENTINE TUBE AND FIN OIL TO AIR COOLER

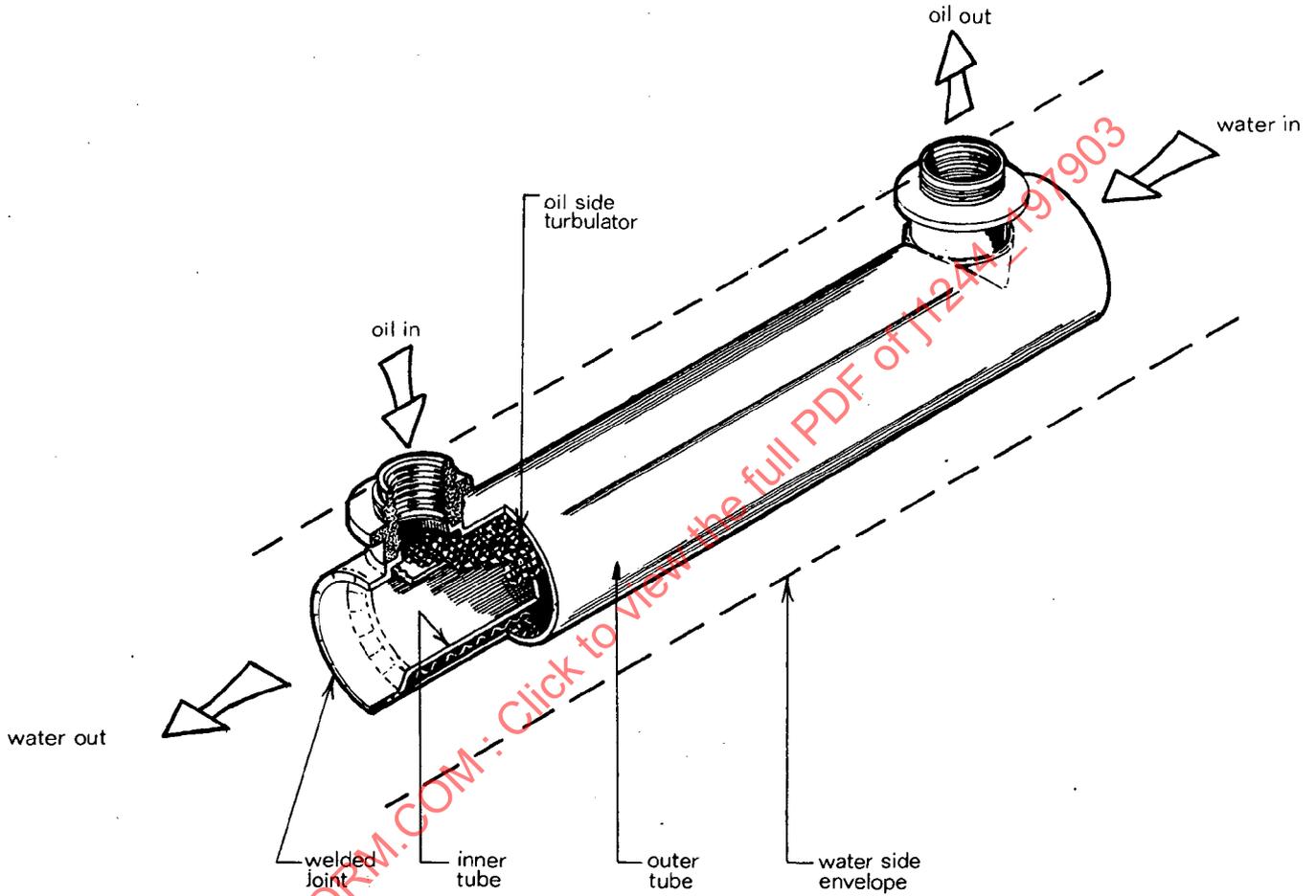


FIG. 5--CONCENTRIC TUBE OIL TO WATER COOLER