

# SURFACE VEHICLE DRAFT TECHNICAL REPORT

**SAE** J1643

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Superseding J1643 FEB1993

## Diesel Catalytic Converter Nomenclature and Terminology

**Foreword**—This Document has not changed other than to put it into the new SAE Technical Standards Board format.

This SAE Draft Technical Report was prepared to standardize terminology and the definition of terms for diesel engine catalytic converters to facilitate clearer understanding for engineering discussions, comparisons, and the preparation of technical papers.

The purpose of this Draft Technical Report is to give the technical community an opportunity to review, comment on, and use the Draft Technical Report prior to its final approval by SAE.

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Comments on this draft are welcome and should be submitted in writing to Secretary, Technical Standards Board, SAE Headquarters, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

This document shall have a lift span of no more than 3 years from approval which may not be renewed.

1. **Scope**—This SAE Draft Technical Report applies to nomenclature of diesel engine catalytic converter parts and various configurations.
2. **References**—There are no referenced publications specified herein.
3. **Nomenclature**
  - 3.1 **Aftertreatment**—Post-combustion treatment of exhaust gases for the purpose of reducing undesirable gaseous and/or particulate emissions. The device or devices would be located to act on the exhaust stream at some position after leaving the combustion chamber of the engine.
  - 3.2 **Catalytic Converter**—A device located in the exhaust stream of an engine promoting chemical reaction to reduce air pollutants. This device is commonly called a converter.
  - 3.3 **Catalytic Converter Substrate**—A device with high macro surface area constructed of a metal or ceramic matrix and used as the structural support of the washcoat and/or catalytic metal. Commonly used terms to describe the substrate are monolith or pellets. (See Figure 1.)

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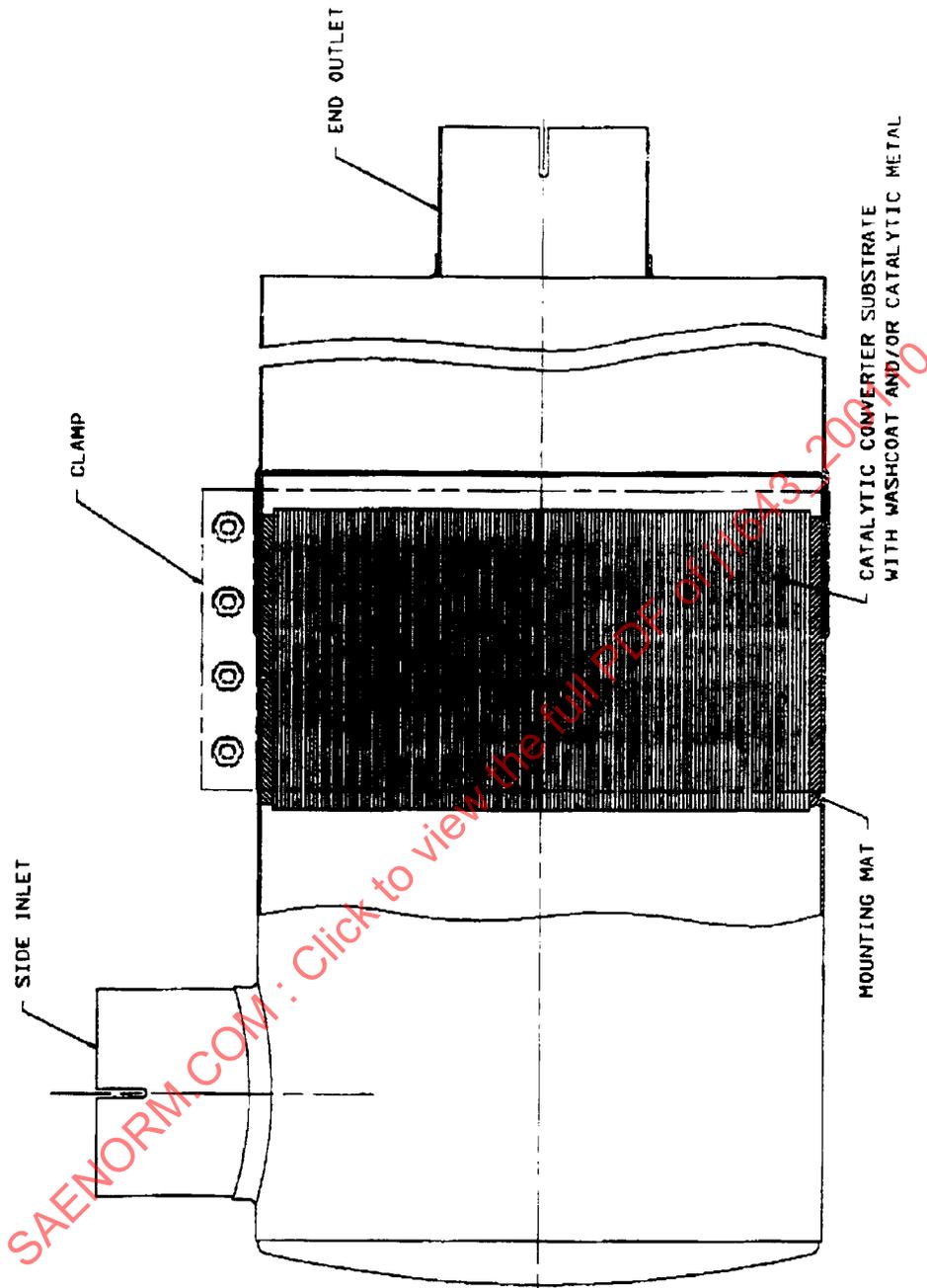


FIGURE 1—DIRECT-COUPLED CONVERTER/MUFFLER SHOWN

- 3.4 **Washcoat**—A highly porous ceramic material applied to the catalytic converter substrate to serve as a high micro surface area matrix for location of catalytic materials.
- 3.5 **Mounting Mat**—A compliant material cut in sheet form used to secure substrates by applying constant pressure inside a metal housing to form a catalytic converter. (See Figure 1.)
- 3.6 **Catalytic Converter Housing**—Metal casing around mounting mat and substrate to form a catalytic converter. Commonly used terms to describe the housing are shell or can.

**3.7 Catalytic Metal (2 types)**

- 3.7.1 CATALYTIC PRECIOUS METAL—Metals such as Palladium, Platinum, and Rhodium used to accelerate the chemical reaction in order to reduce air pollutants.
- 3.7.2 CATALYTIC BASE METAL—Metals such as Copper used to accelerate the chemical reaction in order to reduce air pollutants.

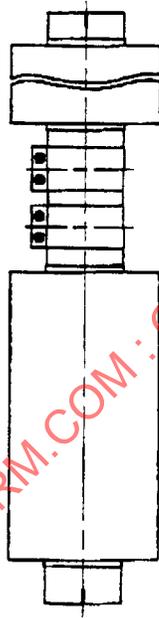
**3.8 Catalytic Metal Loading**—The amount of catalytic metals applied to the washcoat to promote the chemical reaction in order to reduce air pollutants. Typically reported as weight of catalytic metal per volume of substrate.

**4. Configuration Terminology**

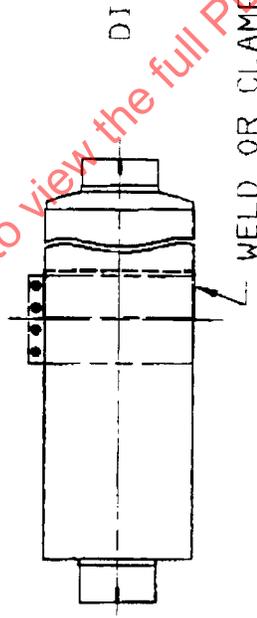
- 4.1 **Side Inlet**—Exhaust flow entrance of a catalytic converter/muffler usually perpendicular to the flow axis of the catalytic converter/muffler. Also referred to as the radial inlet. (See Figure 1.)
- 4.2 **Side Outlet**—Exhaust flow exit of a catalytic converter/muffler usually perpendicular to the flow axis of the catalytic converter/muffler. Also referred to as the radial outlet.
- 4.3 **End Inlet**—Exhaust flow entrance of a catalytic converter/muffler usually parallel to the flow axis of the catalytic converter/muffler either centered or offset from the center of the catalytic converter/muffler body. Also referred to as the axial inlet.
- 4.4 **End Outlet**—Exhaust flow exit of a catalytic converter/muffler usually parallel to the flow axis of the catalytic converter/muffler either centered or offset from the center of the catalytic converter/muffler body. Also referred to as the axial outlet. (See Figure 1.)
- 4.5 **Separate Converter/Muffler**—Catalytic converter and muffler are two separate units connected together by standard exhaust tubing and clamps. (See Figure 2.)
- 4.6 **Direct-Coupled Converter/Muffler**—Catalytic converter and muffler are two separate units connected together by clamping or welding around the outside diameter of the units. (See Figure 2.)
- 4.7 **Integral Converter/Muffler**—Catalytic converter and muffler are combined into a single unit. (See Figure 2.)

CATALYTIC CONVERTER/MUFFLER CONFIGURATIONS

SEPARATE CONVERTER/MUFFLER



DIRECT-COUPLED CONVERTER/MUFFLER



INTEGRAL CONVERTER/MUFFLER

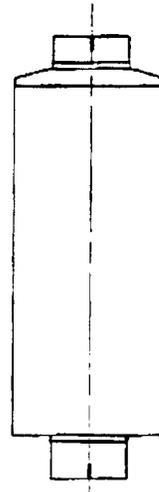


Figure 2—CATALYTIC CONVERTER/MUFFLER CONFIGURATIONS

PREPARED BY THE SAE MOTOR VEHICLE COUNCIL