

standard's requirements with standard industry practices. Incorporating many of the SAE standard's performance requirements is consistent with Office of Management and Budget (OMB) Circular A-119, which directs federal agencies to use and/or develop voluntary consensus industry standards, in accordance with Public Law 104-113, the "National Technology Transfer and Advancement Act of 1995."

The agency's proposal differs in a number of respects, however, from that requested by the petitioners—

First, as explained in greater detail below, instead of simply incorporating complete SAE standards by reference as the FMCSRs currently do, NHTSA proposes to incorporate only the specific requirements/specifications of the SAE standards that are either more rigorous than those in Standard No. 106 or are not present at all in FMVSS No. 106.

Second, the agency does not propose to limit the application of those SAE requirements/specifications to brake hose, tubing, and fittings used on commercial motor vehicles. NHTSA tentatively concludes that all brake hose, tubing, and fittings can and should meet the requirements/specifications, regardless of their end use.

Third, although NHTSA agrees with the petitioners that proposed changes to FMVSS No. 106 should be based on the most recent versions of the SAE standards, instead of the older versions cited in the FMCSRs, the agency notes that a number of SAE's standards have been updated since the joint petition was filed. Accordingly, NHTSA proposes to rely on the most recent versions of the SAE standards.

Fourth, the agency does not propose to incorporate SAE standards relating to copper tubing, galvanized steel pipe, or end fittings used with metallic or non-metallic tubing because these materials are occasionally used in chassis plumbing and these products are not considered to be brake hoses, thus it would not be appropriate to include them in FMVSS No. 106.

Fifth, NHTSA is not proposing to incorporate the material and construction specifications for Type A and Type B tubing contained in SAE J844, *Nonmetallic Air Brake System Tubing*, and SAE J1394, *Metric Nonmetallic Air Brake System Tubing* because the agency tentatively concludes that incorporating those material specifications would be design-restrictive.

Sixth, NHTSA does not propose to incorporate the manufacturer identification requirements in SAE

J1401, *Hydraulic Brake Hose Assemblies for Use with Nonpetroleum-Base Hydraulic Fluids*, because it tentatively concludes that the manufacturer identification requirements already present in FMVSS No. 106 are sufficient.

#### IV. Proposed Revisions to FMVSS No. 106

The following sections describe the changes NHTSA proposes to make to Standard No. 106's performance requirements and test procedures relating to: (a) Hydraulic brake hose; (b) air brake hose; (c) vacuum brake hose; (d) plastic air brake tubing; and (e) plastic air brake tubing assemblies and end fittings. Each section contains a table comparing the performance requirements and test procedures of FMVSS No. 106 to the relevant SAE Recommended Practice/Standard and a requirement-by-requirement/procedure-by-procedure explanation of the changes NHTSA is proposing. Generally speaking, whenever an SAE specification is more stringent than the corresponding FMVSS No. 106 requirement/procedure, NHTSA proposes to incorporate the SAE specification.

##### A. Hydraulic Brake Hoses

NHTSA's performance requirements and test procedures relating to hydraulic brake hoses are located in paragraph S5., *Requirements—Hydraulic brake hose, brake hose assemblies, and brake hose end fittings*, and paragraph S6., *Test procedures—Hydraulic brake hose, brake hose assemblies, and brake hose end fittings* of FMVSS No. 106. The corresponding SAE specifications are contained in SAE Surface Vehicle Standard J1401, *Hydraulic Brake Hose Assemblies for Use with Nonpetroleum-Base Hydraulic Fluids*, Rev. September 1999 (SAE J1401).

The performance requirements and test procedures for hydraulic brake hoses in FMVSS No. 106 and SAE J1401 are similar, but not identical. In many cases, the requirements and procedures in SAE J1401 are more stringent than the corresponding requirements and procedures in paragraphs S5 and S6 of FMVSS No. 106. For example, in recognition of the fact that underhood temperatures have increased in modern passenger cars and, therefore, front brake hoses near the engine compartment are subjected to these higher temperatures, SAE J1401 recommends subjecting hydraulic brake hose to a hot impulse test. In contrast, FMVSS No. 106 does not specify a hot impulse test because many of the specifications in the standard originated

in the late 1960s, when underhood temperatures were lower.

Generally, in those instances in which the performance requirements and test procedures in SAE J1401 are more rigorous, as with the hot impulse test specification, NHTSA is proposing to incorporate the SAE J1401 requirement/procedure. Where the requirements and procedures of FMVSS No. 106 are either more stringent or are not addressed at all in SAE J1401, however, the agency is proposing to retain the FMVSS No. 106 requirement/procedure.

The agency notes that because the reach of § 393.45 of the FMCSRs is limited to "commercial motor vehicles," the performance requirements and test procedures in SAE J1401 are, at present, only being applied to hydraulic brake hose in use on those vehicles. In contrast, FMVSS No. 106's requirements/procedures apply to all hydraulic brake hoses, regardless of their end use. One question that arises in connection with NHTSA's proposal to incorporate many of SAE J1401's specifications, therefore, is whether to restrict application of those specifications to hydraulic brake hoses designed for use on commercial motor vehicles. NHTSA proposes to apply the specifications of SAE J1401 to all hydraulic brake hoses, regardless of the type of vehicle on which it is installed. The agency does not favor the creation of a separate category of, for example, "commercial" hydraulic brake hoses that would include the more severe test conditions only for those particular brake hoses because NHTSA tentatively concludes that all types of brake hoses can and should meet the current SAE J1401 specifications.

Many light vehicles, including passenger cars, are currently manufactured using brake hoses that meet SAE J1401 specifications or other, proprietary standards that are more severe than Standard 106. Although it is not clear whether replacement brake hoses are also designed to meet these more rigorous specifications, NHTSA tentatively concludes that it is in the interest of safety to specify that they do so. From a safety standpoint, if a replacement brake hose which does not meet SAE J1401 specifications were to be installed on a vehicle originally outfitted with hose designed to meet the specifications of SAE J1401 (or another proprietary standard more stringent than FMVSS No. 106), the vehicle brake hose would be more prone to failure. Requiring all hydraulic brake hoses, both original equipment manufacturer (OEM) brake hoses and replacement brake hoses, to meet the current SAE J1401 requirements/specifications