NAVISTAR, INC.			
Material, Parts, and Process Specifications (MPAPS)		*NUMBER:* **MPAPS F-6037**	
		Former Designation: TMS-6037	
TITLE: **Hydraulic Brake Hose**		*CURRENT REV No:* **1410**	*DATE:* **OCT. 2014**
WRITTEN/EDITED BY: **Materials Engineering**	*APPROVED BY:* **Materials Engineering**	*SUPERSEDES :* **TMS-6037 – February 2012**	

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This specification may involve hazardous materials, equipment, and procedures. This specification does not purport to address all of the safety issues associated with its use. The user is responsible to consult appropriate safety and health practices and to determine the applicability of regulatory limits prior to use.

Change Notice: **Updated to new MPAPS format; revised Section 4.3.1 for tubing requirements; editorial changes.**

1.0 APPLICATION

This specification covers two sizes (1/8" and 3/16") of hydraulic brake hose and hose assemblies for use with non-petroleum based brake fluids as per SAE J1703/J1705 and TMS-6820.

2.0 SCOPE

This specification covers general requirements, dimensional tolerances, property and performance requirements, designation on drawings, source approval and quality control, and approved sources.

2.1 Restricted Chemical Substances

Effective January 1, 2007, all product supplied to the requirements of this specification must comply with the requirements of the MPAPS B-50 specification.

3.0 REFERENCE DOCUMENTS

Unless otherwise specified the latest issue of all referenced standards shall apply. The following Specifications, Standards, and Regulations are referenced in this specification.

Quality System Standard ISO 9001 or TS-16949	MPAPS A-37	ASTM D 380
NAVISTAR Manufacturing Std. MS-D-13	CEMS C-3	SAE J1402
CFR Title 29, Part 1910	FMVSS 106	SAE J1703
NAVISTAR MPAPS A-0, Pt. I	ASTM D 1149	SAE J1705
NAVISTAR MPAPS A-0, Pt. II	ASTM D 622	SAE J1873
NAVISTAR MPAPS B-50	MPAPS A-40	SAE J1401
NAVISTAR Engineering Design Standard A-16	MPAPS P-9543	TMS-6820
ASTM B 840	SAE J527	ASTM A 254
ASTM B 841		ISO 6945
ASTM B 842		SAE J524

4.0 GENERAL REQUIREMENTS

Product supplied to the requirements of this specification shall meet all requirements of FMVSS 106 and SAE J1401.

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4.1 Hose Construction

4.1.1 1/8 Inch ID Hose: The tube shall consist of a ethylene-propylene-diene terpolymer (EPDM) or a suitable blend of butyl and EPDM, suitably reinforced with 2 braids of polyvinyl alcohol yarn separated by a butyl or chloroprene friction layer and covered by an EPDM elastomer.

4.1.2 3/16 Inch ID Hose: The tube shall consist of a chloroprene elastomer suitably reinforced with 2 braids of rayon yarn separated by a chloroprene friction layer and covered by a chloroprene elastomer.

4.2 Fittings

The fittings shall be permanently attached with brass or steel fluid connectors.

4.2.1 Brass Fittings: Unless otherwise specified, brass fittings will be made from Bar Stock, C36000, half hard, or from C37700 per CEMS C-3.

4.2.2 Steel Fittings:

4.2.2.1 Tube Nuts: Steel, Code 0-115, MPAPS A-0, Part II. Stainless steel fittings shall be made from 18-8 stainless steel per MPAPS A-37, and are **passivated** per MPAPS A-37, Type 5 finish.

4.2.2.2 Flareless ferrules: Steel, 1008, 1012, 1112, or 12L14 per MPAPS A-0, Part I, case hardened to Class 3 or Class 3A per MPAPS A-40.

4.2.2.3 Crimp hose fittings: Crimp hose fittings do not require case hardening.

4.2.2.4 Finish: Steel fittings will be plated with a zinc-alloy finish to provide corrosion protection comparable to the steel tubing finish.

4.3 Steel Tubes

4.3.1 Tubing: Tubing shall be brazed double-wall steel tubing conforming to SAE J527. For non-flared heavy single-walled tubing applications, the material must comply with requirements of SAE J524 or equivalent tubing approved by Engineering.

4.3.2 Tubing Finish: The outer surfaces of the steel tubing will be plated with zinc-alloy plating (e.g., ASTM B 840 zinc-cobalt, ASTM B 842 zinc-iron, or ASTM B 841 zinc-nickel), and must provide a minimum salt spray performance (ASTM B 117) of 120 hrs to white corrosion and 600 hr to red rust for straight tubes, and 480 hrs to red rust for post-bent tubes. Use of hexavalent chromate conversion coatings is prohibited, however trivalent chromate or chrome-free topcoats are allowed. Plating of internal surfaces is optional. (Refer to Section 4.5.3 for corrosion requirements of hose assemblies.)

4.4 Dimensions And Tolerances

4.4.1 Hose: Hose I.D., O.D., and concentricity limits are shown in Table 1.

TABLE 1. HOSE DIMENSIONAL TOLERANCES

Nominal ID	1/8	3/16
Inside Diameter	3.20-3.61 mm (.126-.142 in)	4.65-4.90 mm (.183 - .193 in)
Outside Diameter	9.98-11.0 mm (.393-.433 in)	12.2-12.7 mm (.480 - .500 in)
Concentricity	.50 mm (.020 in) max	.635 mm (.025 in) max

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