

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS DT-16
		Former Designation: CEMS DT-16
TITLE: Scratch and Mar Testing for Hard Plastic Trim		CURRENT REV No.: 1702
		DATE: Feb. 2017
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<i>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.</i>		

1.0 APPLICATION

This specification applies to all hard trim plastic surfaces on the truck interior.

2.0 SCOPE

This specification covers a test method to determine the susceptibility of hard plastic trim to scratching, marring, gouging, and other damage.

2.1 Restricted Chemical Substances

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.

NAVISTAR MPAPS B-50
 Taber® Multifinger Scratch/Mar Tester 710 product literature
 Erichsen® Scratch Hardness Tester 430P product literature
 FORD FLTM B0 162-01
 FORD FLTM BI 109-01
 GMW 14688
 ISO 7724

4.0 TEST METHODS

Samples may be tested by either of the following test methods. Test Method A is based on the Taber® Multifinger Scratch and Mar test and Ford five finger test. Test Method B is based on the Erichsen® and GM scratch and mar tests. The test method performed must be approved by Navistar Design or Materials Engineering prior to testing and the procedure used must be submitted along with the results to the responsible Navistar party. Requirements listed on part drawings take precedence over the following test procedure. Any changes or alterations to the below method must be documented in the report.

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FEBRUARY 2017



Documents

Page 1 of 4
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4.1 Test Method A: Taber® Multi-finger Scratch Test (FLTM BO 162-01)

4.1.1 Test Apparatus: Taber® Multi-Finger Scratch/Mar Tester Model 710 or similar

4.1.2 Test Procedure: All tests shall be carried out at ambient conditions (exact temperature and humidity should be recorded in the lab report). 1.0 mm diameter polished stainless steel balls shall be used as scratch tips. 7.0 mm diameter polished stainless steel balls shall be used as mar tips. All tips should be evaluated prior to testing under a microscope to insure the surfaces are intact and free of defects or evidence of deterioration. If a tip is defective, it should be replaced with a new tip prior to testing. Each tip should be pre-loaded with the following weights:

Scratch finger number:	1	15.0 N
	2	10.0 N
	3	7.0 N
	4	3.0 N
	5	2.0 N

Sample plaques should be molded in color a minimum of 300 mm in length. Separate plaques should be molded if interior trim parts are to have different colors or textures/ grains. The plaques should be securely loaded in the instrument with the grain side up. Measure the loading forces on each pin using a spring balance; adjust the weights to insure the correct forces are applied on the surface of the sample. Push the fingers, one at a time, across the sample plaque at an approximate rate of 100 mm per second. Each scratch line should be approximately 200 mm in length, or two seconds per scratch. Indicate the direction of the movement on the sample. Repeat the scratch test on a minimum of three test samples.

4.1.3 Sample Evaluation: Perform both a visual and microscopic analysis of the scratches. Visually evaluate the sample by holding the sample under natural lighting (FLTM BI 109-01)

Scratch - Defined as a deformation or cutting of the grained/ungrained surface

Rating Scale	Scratch (Deformation) Requirement
Rating 1	No deformation at any angle
Rating 2	Deformations visible at some angles, no more than 30% of the evaluated lines at all angles shall show deformation. Note: The 30% does not need to be a continuous line
Rating 3	Deformation present at all angles

Whitening/Color Change - Defined as a white line or color change visible at all the angles for mold in color materials

Rating Scale	Whitening/Color Change Requirement
Rating 1	White line/Color Change not present at all angles
Rating 2	Visible white line/Color Change present at all angles

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Page 2 of 4
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