

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS A-1067
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Steel Wheels		CURRENT REV No.: 1412
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WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES: TMS-1067 - August 2007
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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>		
Change Notice: Changed to new MPAPS format; editorial changes.		

1.0 APPLICATION

This specification applies to Navistar-designed steel wheels used for commercial trucks.

2.0 SCOPE

This specification covers the requirements for material, mechanical properties, fatigue performance, quality, and qualification.

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 standards, specifications and regulations are referenced in this specification.

Quality System Standard ISO 9001 or TS-16949	CFR Title 29, Part 1910
NAVISTAR Manufacturing Standard MS-D-13	ASTM E 8
NAVISTAR MPAPS B-50	SAE J267
NAVISTAR MPAPS G-9009	

4.0 REQUIREMENTS

4.1 Material

4.1.1 Chemical Composition

The material used to produce wheels shall be low carbon hot rolled or hot rolled temper passed and meet the following chemical composition requirements:

Carbon	0.10% max
Phosphorus	0.03% max
Sulfur	0.05% max
Manganese	0.3 – 0.5%

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4.2 Mechanical Properties

Steel wheels must meet the following tensile properties when tested in accordance with ASTM E 8. Tensile specimens will be taken from the flange region of the wheel. The testing must be performed on finished parts to ensure properties are representative of the finished part.

Yield strength	275 MPa (43 ksi) min
Ultimate tensile strength	390 MPa (56 ksi) min
Elongation (in./in.)	24.0% min

4.3 Fatigue Performance

The wheels will meet the following fatigue life requirements. For the new wheel designs, six samples for both radial and cornering fatigue shall be tested for initial qualification. For periodic quality audit or if any material or process changes are made, the following tests will be performed per the test method in SAE J267:

4.3.1. Radial Fatigue: run at 1.8 load factor – minimum is 1,000,000 cycles

4.3.2. Radial Fatigue: run at 1.6 load factor – minimum is 3,000,000 cycles

4.3.3. Cornering Fatigue: run at 1.3 load factor – minimum is 100,000 cycles

The supplier can select the accelerated load factor as required, however any load factor not specified above requires the written approval of NAVISTAR Truck Wheel Systems Engineering. At least one sample of each test will be run until failure, preferably two samples. If only one is run to failure, then at least two others shall be run to 125% of the minimum requirement.

4.4 Balancing

The 22.5 inch steel wheels shall have a maximum static wheel imbalance of 30 oz-in. The 19.5 inch steel wheels shall have a maximum static wheel imbalance of 24 oz-in.

4.5 Corrosion Resistance

Painted steel wheels must meet the corrosion requirements set forth in MPAPS G-9009.

4.6 Welding

All welds must be consistent with American Welding Society practices and requirements for steel.

5.0 QUALITY

The wheels are to be free of burrs, sharp edges, and corrosion. All welds shall be free from porosity and other weld defects which might affect the performance of the wheel. Wheels reworked for cosmetic repair shall be identified for traceability. The surface finish and cosmetic appearance of the wheels will conform to the quality initially approved by Navistar Industrial Design department and the receiving Plant Quality Control department. Master samples shall be retained by the supplier and the using plant for reference.

5.1 Leak Detection

In the initial run all wheels must be leak tested by visual inspection of bubbles at a minimum pressure of 1241 kPa (180 psi) for a duration of 30 seconds minimum when fully immersed in water. Also, whenever a new PPAP is required, all wheels must be leak tested. Continuing leak testing will be performed on a per shift basis as agreed upon with the purchaser. Wheels failing the leak detection test shall be scrapped. No repair is allowed unless approved by NAVISTAR Quality Control and Materials Engineering.

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