



INFRASTRUCTURE MAINTENANCE

SPECIFICATION

Specification For A Hydraulic 12.7 mm (1/2") Impact Wrench

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Contents

1. Scope	3
2. Operating Conditions	3
3. Qualifications	3
4. Performance	3
5. General Requirements	4
6. Detailed Requirements	4
6.1 Mass	4
6.2 Hydraulic System Requirements	4
6.3 Operator Comfort	4
6.4 Noise Emission	4
6.5 Speed	5
6.6 Torque Range	5
6.7 Impact Mechanism	5
6.8 Body	5
6.9 Ergonomics	5
7. Quality Control	5
8. Legal and Operational	6

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1. Scope

1.1 This specification outlines the requirements of a heavy duty hydraulic 12.7 mm ($\frac{1}{2}$ "") impact wrench that will be used for the maintenance of railway infrastructure.

2. Operating Conditions

2.1 Machines will be operated in all weather conditions at altitudes varying from sea level to 1850 m above sea level, relative humidity 10% to 90% and atmospheric conditions which vary from heavily saline to dry and dusty.

2.2 Ambient air temperatures ranging from -5° C to 45° C.

3. Qualifications

3.1 The design of the machine is to be that of the manufacturer, but must be of robust construction in order to meet sustained heavy-duty demands of railway infrastructure maintenance.

3.2 A "no-tool" adjustment machine is preferred.

3.3 Only products proven in service will be considered. A list of users, both South African and international, is to be submitted.

4. Performance

4.1 A service life of not less than 7 years is expected from each machine. The actual design life of the machine is to be stated.

4.2 The impact wrenches are to be easily and economically maintained with standard workshop tools and equipment.

4.3 The impact wrenches must be compatible with hydraulic oil of viscosity grades 46 and 68 – details as per SANS 1218:2005 (Hydraulic Oil – Anti-wear Type)

5. General Requirements

- 5.1 The machine must be a heavy-duty reversible impact wrench having a 12.7 mm ($\frac{1}{2}$ " square drive).
- 5.2 Heavy duty impact sockets and extensions will be used on the machine.
- 5.3 The impact wrench will be used in both vertical and horizontal positions.

6. Detailed Requirements

6.1 Mass

- 6.1.1 The mass of the impact wrench (including whip hoses) is to be in the range of 3.5kg.

6.2 Hydraulic System Requirements

- 6.2.1 The machine must comply to HTMA standards for hydraulic tool operation.
- 6.2.2 The machine must operate on the "Open Centre Circuit" hydraulic system.
- 6.2.3 The hydraulic input will meet the requirements of HTMA Type 1 System and the impact wrench must operate effectively on this standard.
- 6.2.4 The machine must be equipped with 12mm ($\frac{1}{2}$ " hydraulic whip hoses that comply to DIN EN 853 - 2SN (Rubber Hoses and Hose Assemblies - Wire Braid Reinforced Hydraulic Type).
- 6.2.5 The whip hoses must be 400mm long.
- 6.2.6 The whip hoses must be fitted with 12mm ($\frac{1}{2}$ " fixed male and female quick release flat-face fittings that comply to HTMA standards. The quick release fittings must be fitted with dust caps.
- 6.2.7 Hose connections must be placed in a position that would assist in the balance of the machine and make it easy for the operator to handle and move the machine.
- 6.2.8 Coupling points are to indicate whether they are supply or return points.

6.3 Operator Comfort

- 6.3.1 The impact wrench must comply with SANS 8662-1:1998 (Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle Part 1:General) and SANS 8662 - 7:2003 (Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle Part 7: Wrenches, screwdrivers and nut runners with impact, impulse or ratchet action).

6.4 Noise Emission

- 6.4.1 The impact wrench must comply to BS EN ISO 4871:1997 (Declaration and verification of noise emission values of machinery and equipment).

6.5 Speed

6.5.1 The speed of the impact wrench under no load must not exceed 1300 impacts per minute.

6.6 Torque Range

6.6.1 The impact wrench must have an adjustable torque range from 0 Nm to maximum.

6.6.2 The torque range must be from 0 to not less than 500 Nm.

6.6.3 The maximum torque output must not exceed 700 Nm.

6.7 Impact Mechanism

6.7.1 The impact mechanism is to be maintenance free.

6.8 Body

6.8.1 The body of the tool and its components must be robust.

6.8.2 The machine must be well protected against rust.

6.8.3 The grip on the handles must have a non-slip surface.

6.8.4 Machines will be acceptable in standard factory production finish and colour. Details to be furnished. Due cognisance must be given to the life requirement of the machine.

6.9 Ergonomics

6.9.1 The tool must be ergonomically designed for maximum operator productivity and safety.

6.9.2 The impact wrench must have an anti-vibration handle.

7. Quality Control

7.1 All machines must be manufactured in an environment that complies to the latest ISO 9000 to ISO 9004 or similar quality control standards. Details must be furnished.

7.2 Machines will be subject to a technical evaluation and the final decision will, amongst others, be based on these findings.

8. Legal and Operational

- 8.1 All machines must comply with the requirements of the Machinery and Occupational Safety Act, (Act 85 of 1993 – General Machinery Regulations) and The Machinery Directive 98/37/EC.
- 8.2 The machine must be completely assembled and filled with lubricants and ready for service in all respects.
- 8.3 Where grease nipples are fitted these are to be to DIN 71412 (Lubricating Nipples – Cone Type) in easily accessible positions.
Full details of lubrication applicable to machines on offer to be submitted.
- 8.4 An operator’s handbook, service manual and spare parts list must be supplied with each machine in order to ensure that the machine is operated in accordance to the manufacturer’s instructions.
- 8.5 All machines and equipment must be supplied complete with essential tools such as allen keys, spanners etc. in order to make essential adjustments as well as to fit or remove consumable items.
- 8.6 Suppliers of hydraulic machinery will be required to stock a full range of readily available spare parts required for the maintenance of these machines throughout their life span.
Full details of service organisation is to be submitted.
- 8.7 Consumable items must be available locally and must be of standardised format in order to be used on equipment of more than one supplier.
- 8.8 All machines and equipment is to be guaranteed for a minimum period of 12 months against faulty material and workmanship - fair wear and tear excluded. Full details of guarantee is to be submitted.
- 8.9 The information as requested by the various clauses in this specification are to be supplied in the form of technical data, pamphlets and/or drawings. If this is not complied to, offers may be overlooked.
- 8.10 Each machine purchased will be issued with a project number consisting of 20 characters which must be stamped or engraved directly onto the machine **or** on the manufacturer’s data plate **or** a separate riveted plate on the particular machine.
- 8.11 Sufficient training must be given to all operators of these machines.
- 8.12 Machines not already in service with Transnet Freight Rail must be made available for testing/evaluation during the adjudication of the tender. Technical improvements on existing machines/equipment is to be substantiated by physical examples.