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Document Title: Specification of Self-Propelled Light Weight Trolley			



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Government of India

**Specification of Self-Propelled Light Weight Trolley  
(Spec. No. - TM/SM/28)**

**Third Revision- 2022.**

**Track Machines & Monitoring Directorate**

**RESEARCH DESIGNS AND STANDARDS ORGANISATION  
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## SPECIFICATION OF SELF PROPELLED LIGHT WEIGHT TROLLEY (No. TM/SM/28)

### 1.0 DESCRIPTION:

Self Propelled light weight Trolley is a light vehicle propelled by a portable air cooled engine and it can run on railway track for inspection/quick access to an emergency work site.

### 2.0 SCOPE:

- 2.1** This specification covers performance requirements of self propelled light weight trolley in completely assembled and furnished conditions for operation on 1676 mm and 1000 mm (Nominal) gauge on main line and branch line of Indian Railways.
- 2.2** The trolley shall be self propelled light weight, low cost, vehicle having a speed potential of 20 kmph.
- 2.3** The manufacture may submit their own model/version according to their specifications which can meet the requirements as mentioned in this specifications.

### 3.0 FUNCTIONAL REQUIREMENTS:

- 3.1** The trolley shall be self propelled powered by an air cooled diesel/petrol engine or a light weight generator set and shall have potential to run at a speed of 20 kmph on level section. Manufacturer may use governor or any other suitable device to restrict the speed to 20 kmph (max).
- 3.2** Trolley shall have two nos. head light/front light to work the trolley during night. The visibility during night in dry and clear weather shall not be less than 50 m approx. The manufacturer shall also provide suitable tail lights. Wattage and voltage of bulbs used in head lights and tail lights shall be such that these are commonly available in market (Head lights used in motorcycles may be found suitable).
- 3.3** Self weight of trolley shall be 90-95kg to enable two/three trolley men to lift and off track it.
- 3.4** The trolley may consist of strong, light weight welded tubular aluminum alloy frame or any other light weight high strength material capable of giving required strength and rigidity.
- 3.5** The trolley shall have two number chairs of plastic moulded sheet with height adjustable feature enabling officials to sit comfortably while doing track works.
- 3.6** The rated pay load capacity of trolley shall be 400 kg.
- 3.7** The wheel dia. of the trolley shall be 250-280 mm to provide stability at maximum designed speed.

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- 3.8** The trolley shall be capable of running at designed speed in curves (upto and including 10 degree curves) and shall also be capable of negotiating points and crossings, diamond crossings and single/double slips at a speed of 8 kmph approx.
- 3.9** The wheels may be of cold pressed steel, drop forged steel, cast steel or light alloy wheels and shall have self adjusting ball bearings.
- 3.10** The wheels/trolley shall be insulated so that it does not activate switches and signals while moving in track circuited areas.
- 3.11** The trolley shall have proper and efficient braking system operated by foot pedal or mechanical hand brake. Trolley shall also have mechanical parking brakes.
- 3.12** The trolley shall have proper suspension system to give good riding at designed speed.
- 3.13** The trolley shall have
- (i) Provision for showing a red flag by day and a red light by night, during thick, foggy or tempestuous weather.
  - (ii) Suitable detachable guards to remove stone pebbles and stone ballast from rail top.
  - (iii) A light weight detachable hood.
  - (iv) A moulded plastic tool kit of adequate size to keep detonators, search light, diary, stationary etc.
- 3.14** The trolley should preferably have electric horn to give adequate audible warning of approach.
- 3.15** The trolley shall have necessary speed controlling device to increase or decrease the speed to run at desired speed.
- 3.16 VIBRATION AND NOISE LEVEL:**
- 3.16.1** The trolley sub-system and their mounting arrangements shall be designed to withstand satisfactorily the vibration and shocks/encounter in service.
- 3.16.2** Noise level shall be such that there is no discomfort to the user. Manufacturer/supplier shall use a suitable silencer to reduce the noise level.

#### **4.0 SPECIFICATIONS AND TECHNICAL REQUIREMENTS**

**4.1** The trolley shall fulfill following technical requirements.

1. Track Gauge (Nominal) : 1676 mm/1000 mm as per demand of purchaser.
2. Pay load capacity : 400 kg

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3. Seating capacity : 2 + 2 Nos. persons
4. Self weight : 90-95 kg
5. Speed : 20 kmph (approx)
6. Gear system : 2 speed gear box or hand operated clutch device to increase/ decrease the speed

**4.2** The trolley shall be operable in climatic conditions mentioned below:

1. Atmospheric temperature : 0-55<sup>0</sup>C
2. Altitude : 0-300 m
3. Humidity : 100% saturation during rainy season
4. Rainfall : Very heavy in certain area
5. Atmosphere during hot weather : Extremely dusty and desert terrain in certain areas
6. Coastal area : Humid and salt laden terrain

**4.3** The design of trolley shall conform to IS/BS/DS/ISO/IRS Specifications wherever applicable.

**4.4** The profile of wheels shall conform to IRS profile. The flange thickness shall not be less than 6mm.

## **5.0 GENERAL CONSTRUCTION**

**5.1** The trolley shall be robust, sturdy, compact in design and capable of working in conditions mentioned under clause 4.2 above.

**5.2** All hydraulic, electrical, electronic and mechanical control as well as parts such as pipes, wiring, cables, control panel etc. shall be interconnected and included in trolleys as self contained unit.

**5.3** The trolley shall be designed and constructed in such a way so as to ensure simple operation.

## **5.4 ENGINE:**

1. The petrol/diesel engine shall be of reputed make indigenously available and of proven performance in traction/automotive application.
2. The Engine shall be of adequate power having sufficient reserve power to work in conditions mentioned under clause 4.2. The continuous rating of engine under standard I.S. conditions shall not be less than 2 HP.
3. The engine shall be air cooled.
4. A fuel tank of adequate capacity shall be provided for a run of 60 km.

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## 5.5 TRANSMISSION SYSTEM:

Manufacturer shall provide a suitable transmission system. The transmission system may be mechanical transmission through 2-speed gear box or a V-belt drive or chain drive, hand operated driving front/rear axles.

## 6.0 WORKMANSHIP AND FINISH:

**6.1** All the metal surfaces shall be properly finished, rough and sharp edges shall be removed.

**6.2** All the working parts subjected to wear shall be accurately machined to such tolerances as will ensure the fitting of spares with minimum of adjustments.

**6.3** Overall workmanship and finish shall be as per best trade practices.

## 7.0 INSPECTION:

**7.1** All the materials, components, fittings, subassemblies etc. covered by the specification shall be subjected to inspection by the inspecting officer, to be nominated by purchaser and shall be to his entire satisfaction.

**7.2** The trolley shall not be dispatched or packed until it has been passed by the inspecting officer, such passing shall in no way exonerate the supplier/manufacturer of his obligations in respect of quality and performance of the equipment.

**7.3** The manufacturer/ supplier shall provide all testing facilities including transportation that are required by the Inspection Officer for proper inspection of Trolley. In case these facilities are not available at manufacturer's/supplier's premises, he shall be required to get them arranged in the near by test house of institution approved by the purchaser.

**7.4** The trolley shall be tested and inspected as per manufacturer/suppliers design, drawing and specification approved by RDSO/Railway Board.

**7.5** Any modification found necessary after test on trolley, the same shall be carried out by the manufacturer/supplier at his own cost.

**7.6** In the event of dispute between the inspecting officer and the supplier/manufacturer, the decision of the purchaser shall be final and binding.

**7.7** Before offering the trolley for inspection, manufacturer/ supplier himself check and test his trolley and ensure that it conforms to this specification. A certificate to this effect shall also be given to inspecting officer.

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8.0 **Acceptance test:** Supplier/ manufacturer shall provide trolley for acceptance test for approval of purchaser or his authorized representative before commencement of series production Acceptance tests are meant to be conducted on samples which are taken from supplies under inspection against zonal railways/purchaser's purchase order. Following test shall be carried out as acceptance test in the factory premises and field (if not arranged in the factory premises).

8.1 **Visual & Dimensional check:** The trolley shall be checked visually and dimensionally as per clause 4.0. The trolley shall be free from all visual defects in material, construction and fabrication. The over all self weight of the trolley shall also be taken and recorded by the Inspecting officer.

**8.2 Load Test:**

The trolley shall be loaded with an overload of 25% of rated pay load capacity and shall be run at a maximum speed for 12 to 20 Kms (Two block section). The trolley shall run at a maximum speed with adequate comfort without any problem in starting, breaking, stopping and change in gears and negotiation of points and crossings. This test may be carried out in field/open line by inspecting officer.

**Note:**

The instruction laid down in GR/SR, IRPWM and other Railway codes/manuals shall be strictly followed. The assistance of competent supervisor (PWI/PWM) from open line and help of traffic block etc. shall be arranged by purchaser.

**8.3 TOOLS:**

Each trolley shall be supplied with a complete kit of tools required by the operator in emergency and or normal working of the machine.

**10.0 SPARES:**

Each Trolley shall be supplied with

- a. A chain and a padlock.
- b. One no V-belt/chain.
- c. One no spark plug.
- d. Clutch and brake wire with locks-one no.
- e. Any other spare as the manufacturer deems necessary for service/running of the trolley for twelve months initially.

**11.0 PROTECTION FROM RUST AND PACKING CONDITIONS:**

All exposed surfaces shall be painted with yellow paint of standard quality to protect it from rusting and other weathering effects. The trolley shall be supplied packed in suitable wooden crates according to best trade practices to safely transport by rail/road and reach the consignee in safe and satisfactory manner. All the working parts shall be oiled before being assembled.

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## 12.0 MARKING:

The trolley shall be legibly and indelibly marked with:

- i. Name/trade mark of manufacturer.
- ii. Serial. No. of trolley
- iii. Month and year of supply.
- iv. Pay-load capacity
- v. Contact No.

## 13.0 DOCUMENTS:

13.1 Detailed operating manual, safety precautions to be taken, maintenance and service manuals shall be supplied in three copies along with each trolley.

13.2 Copies of the maker's certificate guaranteeing the performance of the trolley shall be supplied in duplicate along with the delivery of each trolley.

13.3 In order to facilitate subsequent maintenance in service, the manufacturer shall supply one hand made set of "as made" drawing on transparent tracing linen of superior quality. The drawings shall exhibit clearly the materials that are necessary for the manufacture of these items. In case of any proprietary items, the supplier shall indicate terms and conditions under which such drawing and technical know-how can be made available to the purchaser.

## 14.0 WARRANTY AND AMC:

14.1 Any part of the trolley failing or proving unsatisfactory in service due to defective design, material or workmanship within 12 months from the date of supply shall be replaced by the supplier at his own expense. Further, shall any design modification be made in any part of the trolley offered, the period of twelve months would commence from the date, the modified part is commissioned in service.

14.2 The warranty of the engine shall be in favour of consignee/ railway, otherwise supplier/ manufacturer shall make an arrangement so that local service center of engine manufacturer honours the warranty and provides services as provided to direct purchaser.

14.3 During procurement of the machine, railways should go post-warranty AMC with the supplier for a pre-determined period as decided by the purchaser railway. This may be incorporated in the tender document as a condition of contract/Tender/Supply.

## 15.0 TRAINING

Adequate training in operation and maintenance of the trolley shall be imparted to Railway operators at the rate of two operators per trolley.

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**16.0 DEMONSTRATION AND COMMISSIONING**

The manufacturer/supplier shall give a demonstration of working and handling of his trolley to the consignee/ representative of purchaser at the place and premises agreed mutually. Such demonstration shall be only for once for the entire lot of trolley (s) supplied together.

**18.0** Supplier is fully responsible to maintain the quality of product supplied to Indian Railways.

**17.0 PREFERENCE TO MAKE IN INDIA POLICY:**

Compliance of the instructions contained in public procurement (Preference to Make in India) order 2017 or latest instructions issued on subject shall be ensure.

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