INTERPLANT STANDARD — STEEL INDUSTRY

IP SS

DESIGN PARAMETERS FOR AUTO-DUMP CAR

IPSS : 2-01-006-83

CORRESPONDING INDIAN STANDARD DOES NOT EXIST

0. Foreword

0.1 Interplant standardization activity in steel industry has been initiated under the aegis of the Indian Standard Institution (ISI) and the Steel Authority of India Ltd (SAIL). This Interplant Standard prepared by the Working Group on Steel Plant Ladle and Rolling Stock, IPSS 2 : 1 with the active participation of the representatives of the steel plants, established manufacturers of auto-dump cars and reputed consulting organizations was adopted by the Approval Committee on Design Parameters, IPSS 2, on 15 March 1983.

0.2 Interplant Standards on design parameters primarily aim at achieving rationalization and unification of parts and assemblies of process and auxiliary equipment used in steel plants and these are intended to provide guidance to the steel plant engineers, consultants and manufacturers in their design activities.

0.3 This standard attempts at prescribing uniform overall dimensions and other parameters of design of auto-dump cars so that varieties of these cars are rationalized, enabling standardization of the sub-assemblies and components. Broad guidance in material selection has also been given in this standard. However, for the details of manufacturing practices, including heat treatment and testing, good manufacturing practices and/or the relevant Indian Standard are applicable.

0.4 Since this standard is essentially futuristic in nature, it should be implemented without deviations in the new plants and in the expansion programmes of the existing plants. However, in the modification/modernisation programmes of the existing plants, deviations from the stipulations in this standard may be permitted on a selective basis if the prevailing situations so demand.

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1. Scope — This Interplant Standard covers the design parameters and related aspects of auto-dump cars, used for transporting the loose bulk materials, like, ore and other minerals from the mine face to the ore processing plant or from one shop to the other in an integrated steel plant for mechanical unloading of materials.

1.1 The auto-dump cars covered by this standard are suitable for track curvatures of radius 75 m and above.

2. Design and Construction — Auto-dump car shall comprise a steel under-frame over which shall rest the top frame carrying the body of the car. The body shall be made out of pressed steel plates adequately stiffened along the entire length and corners. The under-frame shall rest on two bogies which can run on rails and negotiate curves. Each bogie shall comprise two wheel sets fitted with antifriction bearings and suitable for axle load of 31 tonnes. The car shall be provided with auto coupler at both ends for connecting it to the loco or other cars. The car shall have suitable braking arrangements.

2.1 Unloading shall be effected through pneumatic cylinders which shall be installed on both the sides of the car. Provision shall be made for tilting the car on either side. Compressed air supply shall be effected through hoses from the locomotive. A schematic diagram is given at Fig. 1

3. Technical Characteristics — The technical characteristics, such as capacity, dimensions, etc shall be as given in Table 1.

Amendments Issued (*to be filled up by the user department*) :

No.	Date of Issue	No.	Date of Issue
1		3	
2		4	

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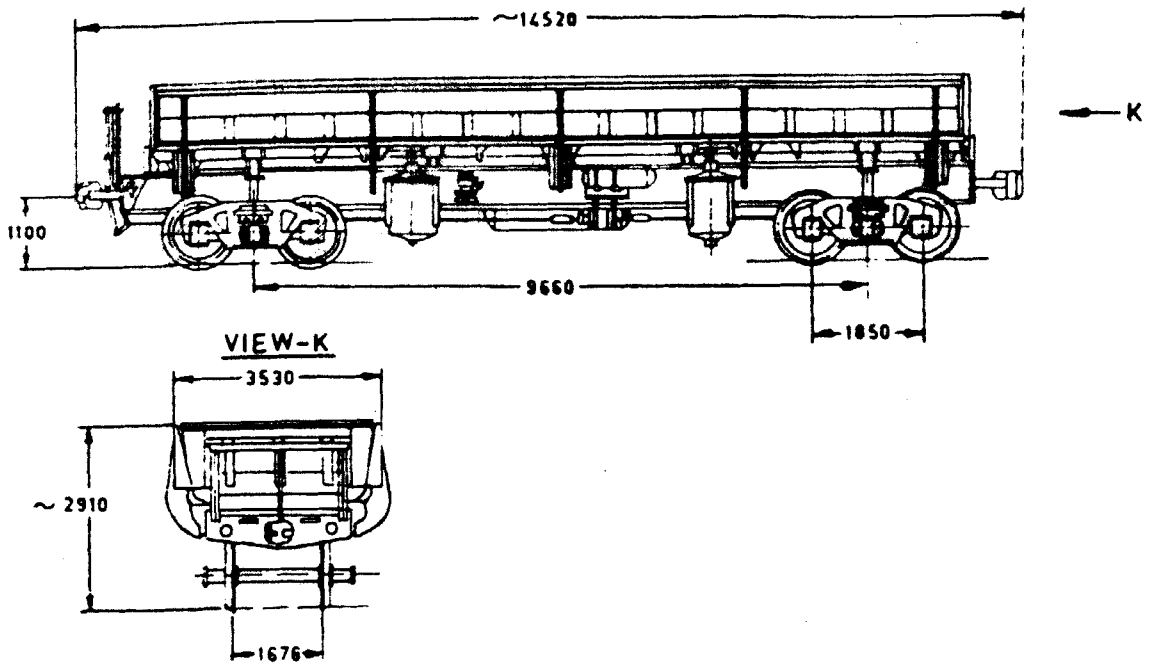

FIG. 1 AUTO-DUMP CAR

TABLE 1 TECHNICAL CHARACTERISTICS OF AUTO-DUMP CARS

(*Clause* 3)

1.	Load carrying capacity	80 tonnes
2.	Useful volume of the car body	36 m³
3.	Maximum angle of body during unloading	48 – 50°
4.	Compressed air pressure in feeding main and in-supply reservoir	9 kg/cm² (*Max*)
5.	Volume of supply reservoir	900 litres
6.	Track	1 676 mm
7.	Type of coupler	AAR type E conforming to Indian Railway Standard
8.	Overall dimensions	
	Length	14 520 mm
	Breadth	3 530 mm
	Height	2 910 mm
9.	Clearance required for tilting : Width—distance from centre line to the end towards the side of tilting	2 500 mm
	Height	4 400 mm
10.	Diameter of the wheel	950 mm
11.	Maximum speed at which the car can be hauled	25 km/h
12.	Type of brakes recommended	Pneumatic for automatic braking system Mechanical for parking brake
13.	Pressure of compressed air for braking system	5·5 kg/cm²
14.	Height of auto coupler over top of rail	1 100 mm
15.	Axle load (*Max*)	31 tonnes
16.	Number of axles	4

4. **Materials of Construction** — The materials of construction of different parts of the auto-dump cars shall be as given in Table 2.

TABLE 2 MATERIALS FOR THE MAIN PARTS OF AUTO-DUMP CARS

(*Clause* 4)

	Part	Material	Relevant Specification
1.	Top frame	Steel Fe 410-W	IS : 2062-1980 'Specification for structural steel (fusion welding quality (*second revision*)'
2.	Under-frame	Steel Fe 410-W	IS : 2062-1980
3.	Body	Steel Fe 410-S	IS : 226-1975 'Specification for structural steel (standard quality) (*fifth revision*)'
4.	Bogie		
	a) Side and cross beam	Cast Steel, CS 26-52	IS : 1030-1974 'Specification for carbon steel castings for general engineering purposes (*second revision*)'
		or	
		Steel Fe 410-W welded fabrication	IS : 2062-1980
	b) Wheel	Forged steel, C 50 or C 65	IS : 1570-1961 'Schedules for wrought steel. for general engineering purposes'
	c) Axle	Forged steel, 45 C8	IS : 1875-1978 'Specification for carbon steel billets, blooms, slabs and bars for forgings (*fourth revision*)'
	d) Springs	Steel, 55 Si 7	IS : 3431-1975 'Specification for volute, helical and laminated springs for automotive suspension (*first revision*)'
	e) Axle box	Cast steel CS 26-52	IS : 1030-1974
		or	
		Steel Fe 410-S	IS : 226-1975