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भारतीय मानक *मसौदा*

पावर टिलर के लिए ट्राली – विशिष्टि

(*आइ एस 10806 का दूसरा पुनरीक्षण*)

Draft **Indian Standard**

TRAILERS FOR POWER TILLERS — SPECIFICATION

(*Second Revision* of IS 10806)

ICS 65.060.10

Agricultural Machinery and Equipment Sectional Committee, FAD 11	Last date for Comments: **05 February 2025**

FOREWORD

(*Formal clause would be added later*)

Trailers are used with power tillers for transportation purposes. In order to provide guidelines for manufacturing of quality trailers, a need was felt to prepare this standard.

This standard was first published in 1984 and subsequently revised in 2003 to incorporate the requirements of axles and brakes of trailer for power tillers covered in IS 10807 : 1984 'Axles with brakes of trailer for power tillers' and modifying some constructional requirements. At the time of preparation of this standard due assistance was derived from JIS B 9207-1977 'Trailers for power tiller' published by the Japanese Standards Association.

The current revision of the standard has been undertaken to incorporate following modifications:

a) Maximum capacity of trailer has been increased from 1 to 1.5 tonnes and range of 0.5 to 1.5 tonnes has been provided to cover all the models falling in this range.
b) Minimum wheel track has been decreased from 1200 mm to 1000 mm and range of 1000 to 1500 mm has been provided to cover all the models falling in this range.
c) Necessary editorial changes have been made including updating of referred Indian Standards and schematic diagrams given in the standard.

The figures given in the standard are intended to serve only as illustrations and should not be considered as suggestive of any standard design.

The dimensions of the trailer and its accessories shall not, in any way, infringe the rules and regulations of the Local Transport Authority in force from time to time.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Draft **Indian Standard**

TRAILERS FOR POWER TILLERS — SPECIFICATION

(*Second Revision* of IS 10806)

1 SCOPE

This standard specifies material, dimensions and other requirements of trailers for power tillers.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standard.

3 TERMINOLOGY

For the purpose of this standard, definitions given in IS 9821 and IS 8213 shall apply.

4 NOMENCLATURE

For the purpose of this standard, the nomenclature of various parts shall be as given in Fig.1, Fig.2 and Fig.3.

5 MATERIALS

The material for axle assembly shall be as given in Annex B. The material for some of the important components of trailers shall be as given in col 3 of Table 1. The material should conform to the relevant Indian Standard and grade given in col 4 of Table 1.

6 CAPACITY

The capacity of a trailer shall be its gross load and shall be 0.5 to 1.5 tonnes. The gross load along with the pay load shall be declared by the manufacturer.

7 DIMENSIONS

7.1 The dimensions given under **7.2** to **7.8** shall not in any way infringe the rules and regulations of the local transport authority.

7.2 The width of loading platform (*see* W_1 in Fig. 1) shall be maximum of 1 m.

7.3 The length of loading platform (*see* L_1 in Fig. 1) shall be maximum of 2 m.

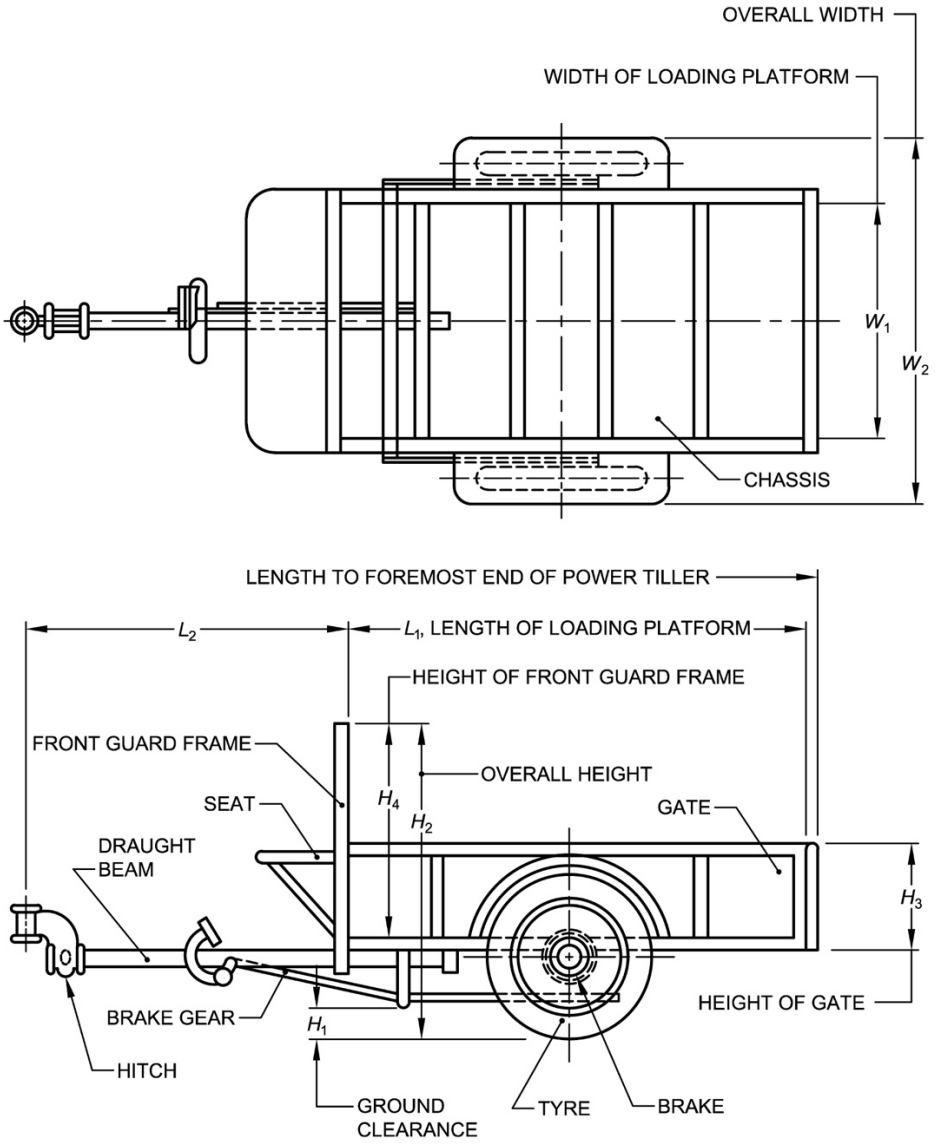

FIG. 1 DIMENSIONS OF TRAILER

Table 1 Material of Construction

(*Clause* 5)

Sl. No.	Components	Material	Applicable IS
(1)	(2)	(3)	(4)
i.	Chassis	Mild steel	IS 2062
ii.	Gate	Mild steel	IS 2062
iii.	Front guard frame	Mild steel	IS 2062
iv.	Seat support	Mild steel	IS 2062
v.	Draught beam	Mild steel	IS 2062
vi.	Hitch	Malleable Cast Iron Carbon steel	IS 14329 IS 1875
vii.	Platform	Mild steel	IS 2062
viii.	Brake pedal	Mild steel	IS 2062
ix.	Pull rod	Mild steel	IS 2062
x.	Lever	Mild steel	IS 2062
xi.	Adjustment nut	Mild steel	IS 2062

xii.	Joint block	Carbon steel	IS 2831
xiii.	Hand brake lever handle	Mild steel Carbon steel	IS 2062 IS 3601
xiv.	Hand brake lever pawl release	Carbon steel	IS 7904
xv.	Hand brake lever pawl	Carbon steel	IS 2831
xvi.	Hand brake ratchet	Mild steel	IS 2062
xvii.	Pawl spring	Spring steel	IS 4454 (Part 1)
xviii.	Hand brake base plate	Mild steel	IS 2062
xix.	Hand brake lever	Mild steel	IS 2062
xx.	Hand brake link	Mild steel	IS 2062
xxi.	Hand brake pull rod	Mild steel	IS 2062

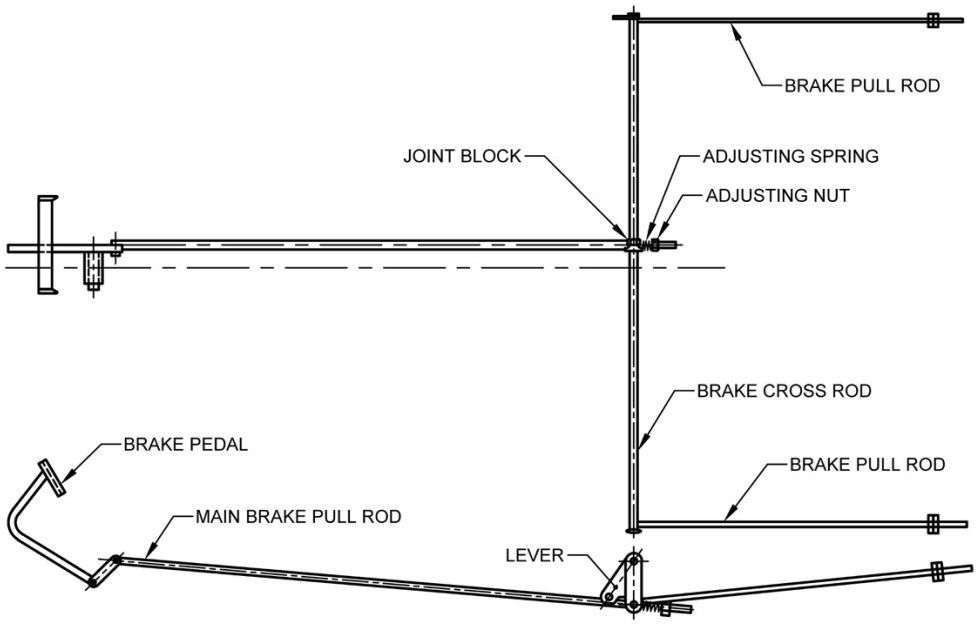

FIG. 2 SERVICE BRAKE GEAR

7.4 The distance between the centre of hitch to the front guard frame (*see* L_2 in Fig.1) shall be maximum of 1.5 m.

7.5 Overall width (*see* W_2 in Fig. l) shall be maximum of 1.7 m.

7.6 Ground clearance (see H_1 in Fig.1) shall be minimum of 150 mm.

7.7 Overall height (H_2 in Fig.1) shall be maximum of 2 m.

7.8 Length to foremost end of power tiller may be maximum of 4.7 m.

8 CONSTRUCT1ONAI. REQUIREMENTS

8.1 The loading platform may be plain and provided with hinged or fixed side boards.

8.2 The trailers shall be provided with lashing hooks for tying down the load.

8.3 For single-axle trailer, tow eye of the drawbar or hitch of the trailer, when fully loaded maybe parallel to the level surface after hitching with towing power tiller. For balanced trailer drawbar or hitch of the trailer shall of hinged type so that load from trailer is not transferred to the towing power tiller. In the towing hitch, a suitable shock absorbing device shall be provided. The hitch height of trailer should always be below rear axle height of the power tiller.

8.4 Tow eye of the trailer shall be capable of rotating at 360° angle to take on even rigid trailer hook of the towing power tiller. Ring type hitches shall conform to IS 11270.

8.5 For balanced trailers, the front axle shall have the capability to swivel to a maximum of 120° (60° on either side) about the vertical axis.

8.6 The trailer should be fitted with pneumatic tyres and rims as recommended by Indian Tyre and Technical Advisory Committee (ITTAC), revised from time to time.

8.7 The axle(s) shall conform to requirements given in Annex B.

8.8 Trailers shall have service brake.

8.9 The trailer shall be fitted with two red coloured reflectors at rear sides and two white coloured reflectors on front sides at a distance not more than 150 mm from extreme ends to the centre of reflectors. The reflectors shall be round with reflecting area for reflectors shall be as per CMVR requirements for agricultural tractor/trailer.

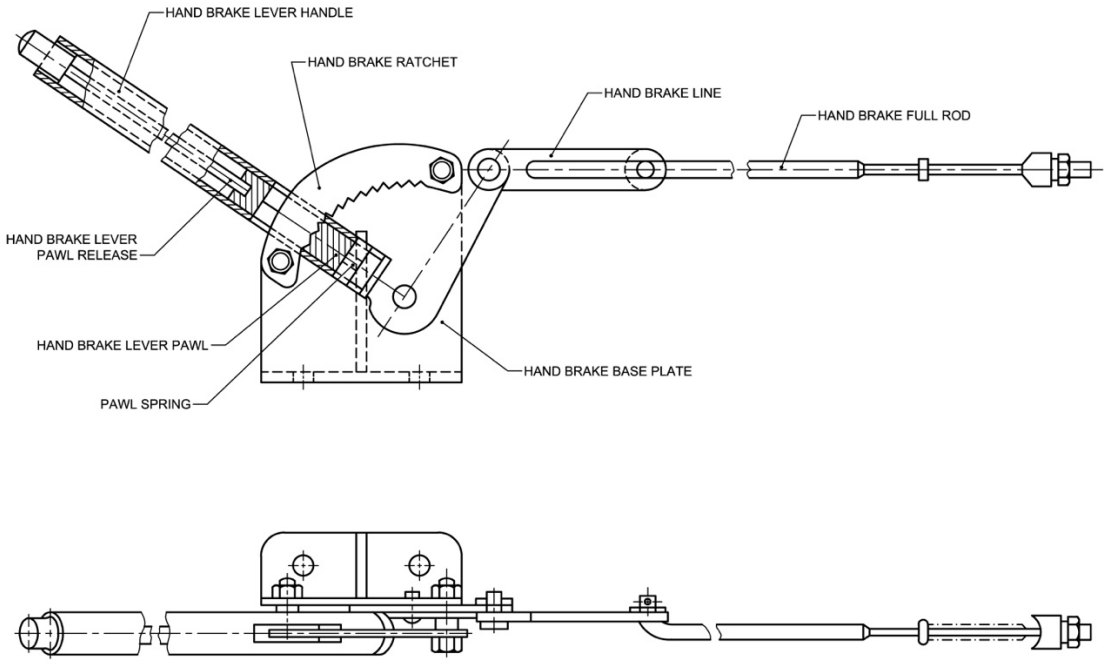

FIG. 3 PARKING BRAKE GEAR

9 PERFORMANCE

9.1 When the trailer is loaded with 300 kg, load on seat and the recommended pay load nearly uniformly distributed on the loading platform, while statically supported at hitch with the draught beam horizontal, no breakdown or defect shall develop in any part.

9.2 When the brake pedal is applied with a pedal pressure of 500 N, the torque generated on each brake cam shaft shall be not less than 80 Nm.

9.3 When the brake pedal is applied with a pedal pressure of 1 kN no breakdown shall occur in any part.

9.4 The brake gear shall be able to stop the running trailer, nearly uniformly loaded with its pay load on the loading platform, connected to a suitable power tiller with a stopping distance not more than 5 m from 15 km/h initial speed on a dry horizontal paved road and shall be able to safely stop and maintain the trailer with the same load, on a slope of ~~12°~~ 12 percent.

10 WORKMANSHIP AND FINISH

10.1 All sharp edges and corners shall be removed.

10.2 Castings and forgings shall be clean and free from all visual defects.

10.3 Welding shall not be porous. As far as possible, it should be done in accordance with IS 816.

10.4 The surfaces which have been treated for anticorrosive shall be free from defects such as wrinkle, unevenness and scars.

11 MARKING

11.1 The trailer shall be marked with the following particulars:

a) Manufacturer's name and registered trademark, if any;
b) Gross load and pay load; and
c) T-sign at the rear (*see* IS 9942).

11.2 BIS Certification Marking

The trailer may also be marked with the Standard Mark.

The products conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

ANNEX A

(*Clause* 2)

LIST OF REFFERED STANDARDS

IS No.	*Title*
IS 210 : 2009	Grey iron castings — Specification (*fifth revision*)
IS 617 : 2024	Aluminium and aluminium alloys ingots for remelting and castings for general engineering purposes — Specification (*fourth revision*)
IS 816 : 1969	Code of practice for use of metal arc welding for general construction in mild steel (*first revision*)
IS 1135 : 2018	Springs — Leaf springs assembly for automobiles — Specification (*sixth revision*)
IS 1875 : 1992	Carbon steel billets, blooms, slabs and bars for forgings — Specification (*fifth revision*)
IS 2062 : 2011	Hot rolled medium and high tensile structural steel - Specification (Seventh Revision)
IS 7904 : 2018	High carbon steel wire rods — Specification (*second revision*)
IS 2742 (Part 1) : 1994	Automotive vehicles — Brake linings: Part 1 Specification (*first revision*)
IS 2831 : 2012	Carbon steel cast billet ingots, billets, blooms and slabs for re-rolling into structural steel (ordinary quality) — Specification (*fourth revision*)
IS 3601 : 1984	Steel tubes for mechanical and general engineering purposes (*first revision*)
IS 4000 : 1992	High strength bolts in steel structures — Code of practice (*first revision*)
IS 4060 : 1994	Automotive vehicles — Flashers for direction indicators — Specification (*second revision*)
IS 4454 (Part 1) : 2001	Steel wire for mechanical springs — Specification: Part 1 Cold drawn unalloyed steel wire (*third revision*)
IS/ISO 6194-1 : 2007	Rotary shaft lip - Type seals incorporating elastomeric sealing elements: Part 1 nominal dimensions and tolerances
IS 7201 (Part 1): 1987	Method of sampling for agricultural machinery and equipment: Part 1 Hand tools and hand operated/animal drawn equipment
IS 7283 : 1992	Hot rolled bars for the production of bright bars and machined parts for engineering applications — Specification (First Revision)
IS 8213 : 2000	Agricultural tractor trailer — Specification (*third revision*)
IS 9821 : 1981	Glossary of terms related to farm transport equipment
IS 9942 : 1981	Specification for T-sign plate for trailers
IS 11270 : 1985	Technical requirements for ring type hitches for agricultural trailers
IS 14329 : 1995	Malleable iron castings — Specification

ANNEX B

(*Clause* 5 *and* 8.7)

REQUIREMENT OF AXLE WITH BRAKES OF TRAILER FOR POWER TILLER

B-1 NOMENCLATURE

The nomenclature of various parts of axle assembly shall be as given in Fig. 4.

B-2 CLASSIFICATION

The axles with brakes shall classified in two classes: Class 1 and Class 2, according to the class of brakes.

B-3 MATERIAL

The material for various components of the axle with brake shall be as given in col 3 of Table 2. The material should conform to the relevant Indian Standard given in col 4 of Table 2.

B-4 DIMENSIONS

The dimensions when read in conjunction with Fig. 5 shall be as given in Table 3.

B-5 METHOD OF TESTING BRAKE TORQUE

B-5.1 Testing Machine

The testing machine shall be made of a static brake testing machine equipped with one spiral scale as shown in Fig. 6.

B-5.2 Method

Firmly bind the brake on the testing machine and place the mass W suitable for applying a torque of 80 N.m on the brake cam shaft. Adjust the position of the angle adjusting stand so that the tension acts on the brake cam shaft lever always perpendicular to it. At this time bring the position of the torque farm to point a. Read the indication of the spiral spring scale (A), while the torque arm is moving from the point a to the point a by the operation of the torque handle. Read the load on the load strain diagram. Take the product of this load and the length of the torque arm as the statical braking torque.

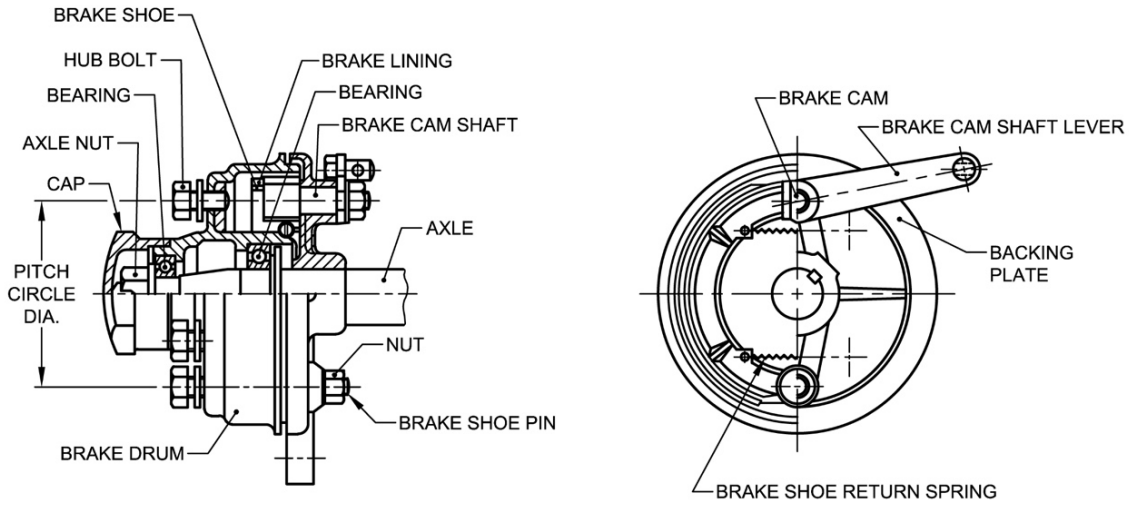

FIG. 4 NOMENCLATURE OF AXLE ASSEMBLY

Table 2 Material of Construction of Various Components of Trailer Axles

(*Clause* B-3)

Sl. No.	Components	Material	Applicable IS
(1)	(2)	(3)	(4)
i.	Brake drum	Cast iron Steel	IS 210 IS 2062
ii.	Backing plate	Cast iron Steel	IS 210 IS 2062
iii.	Brake shoe	Cast iron Steel Cast aluminium	IS 210 IS 2062 IS 617
iv.	Brake cam shaft	Carbon steel	IS 7283
v.	Brake shoe pin	Carbon steel	IS 7283
vi.	Axle	Carbon steel	IS 7283
vii.	Hub	Cast iron	IS 210
viii.	Dust Cover/Cap	Mild steel	IS 2062

B-6 OTHER REQUIREMENTS

B-6.1 Brake lining shall conform to IS 2742 (Part 1).

B-6.2 The axle assembly shall be able to maintain wheel track of 1000 to 1500 mm, with a tolerance of ± 10 mm on the declared value.

B-6.3 The brake drum shall be able to rotate smoothly without slacking when testing with the axle fitted.

B-6.4 The radial deflection of the brake shall be not more than 0.3 mm on the wheel fitting part of the brake drum and the lateral deflection not more than 0.3 mm on a circle near the pitch circle of hub bolts.

B-6.5 The brake lining shall be firmly fixed on the brake shoe.

B-6.6 Assembly particularly inside of the brake shall be leak and dust proof. Oil seals [*see* IS 6194 (Part 1)] and gaskets should be provided.

B-6.7 The hub shall be packed with multi-purpose grease between the bearings. A grease nipple (*see* IS 4000) should preferably be provided.

B-6.8 No oil shall leak on the friction surface of the brake lining.

Table 3 Dimensions of Axle with Brake

(*Clause* B-4)

Sl. No.	Characteristics	Dimensions for Class of Axles		Ref to Symbol in Fig. 5
		Class 1	Class 2	
(1)	(2)	(3)	(4)	(5)
i)	Hub bolt pitch circle diameter, mm	120 ± 0.3	120 ± 0.3	A
ii)	Brake drum and wheel fitting dimension, mm	80 + 0 – 0.2	80 + 0 – 0.2	B
iii)	Inside diameter of brake drum facing brake lining, mm	150[D]	175[D]	C
iv)	Total area of lining for one brake, cm	60 *Min*	70 *Min*	-
v)	Outside diameter or width across flats of axles, mm	28 *Min*	32 *Min*	D
[D] Recommended dimensions.				

B-7 DESIGNATION

The axle shall be designated by the number of this standard, class and the track width.

Example

An axle assembly of Class 1 and for wheel track 1200 mm shall be designated as:

Axle 1 × 1200 - IS 10806

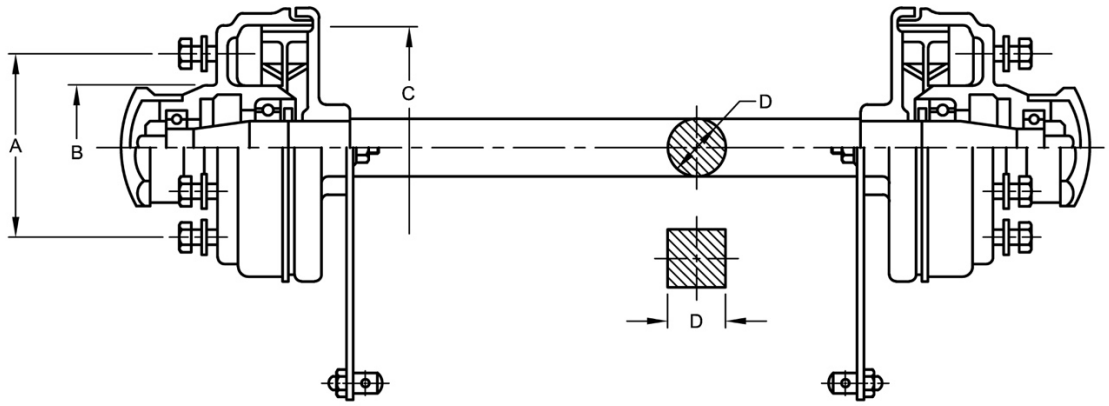

FIG. 5 DIMENSIONS OF AXLE

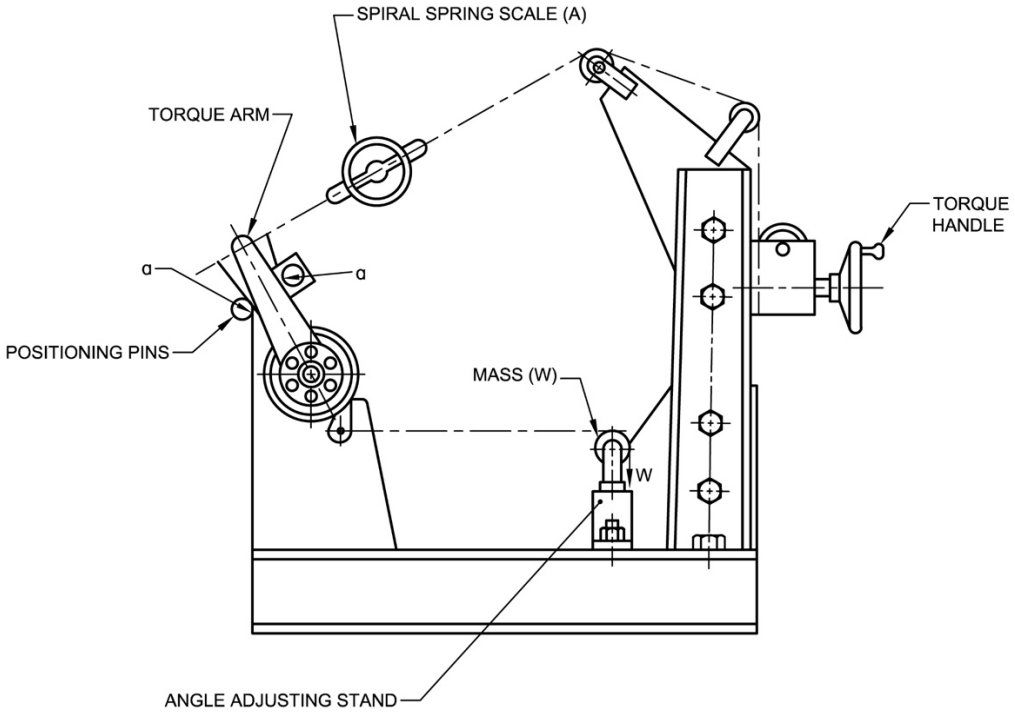

FIG. 6 TYPICAL BRAKE TESTING MACHINE