

Technical Specification No. M 04-85-2019

For

Rebuilt Bogie, Type Y25
22,5 Tonnes axle load

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1. GENERAL

1.1 The rebuilt bogies are intended to freight wagons that operated in Israel Railways' (ISR) .

1.2 The wagons shall be able to run unrestricted in "S" traffic (100 km/h operating speed according to UIC 432, fully loaded, 90 ton gross, or where the axle loads of the most heavily loaded bogie may not exceed 22,5 ton). The empty wagon shall be able to run at speed of 120 km/h.

1.3 The bogies must be manufactured after 1990.
The bogies should be in a excellent state.
The bogies can be brand new.

1.4 The bogies will be offered in a welded construction according to general drawing ERRI 12/R44 A2 given in Appendix A .

1.5 The rebuilt work will be carried out according to SNCF, SNCB, DB, VPI, ect. Revision procedure, european regulations, standards of inspection and Israel Railways technical requirements stipulated in this specification.
The workshop should be certificated according to european regulations, EN, IRIS, ECM and approved by ISR.

1.6 The bogie shall be provided with a weighing valve for the automatic empty-load change-over and its corresponding pipings the connection pipes between the valve and the wagon body shall be according to UIC 510-1 Appendix 7.

1.7 The bogies will be supplied with upper pivots.

1.8 The bogie has not to be involved in accidents/derailments

2. MAIN CHARACTERISTICS

Track Gauge.....	1435 mm
Wheel diameter.....	920 mm
Wheelbase.....	1.800 mm
Distance between wearplates.....	1.700 mm
Height of wearplates (under tare of 20 Ton)...	905 mm
Height of pivot (under tare of 20 Tn).....	925+3/-5mm
Maximum axle load.....	22.5 ton
Tare weight not exceed (with wheelsets).....	4,750 kg± 3%.

3. **OPERATING CONDITIONS**

3.1 Prevailing climate conditions

- Temperature range 0 - 45 °C 90% humidity.
- Dusty conditions.

3.2 Track Data

Track Gauge.....1435 mm
Maximum gradient2.5%
Minimum vertical radius500 meter
Rail typeU-50 and UIC54, UIC60
Loading gauge - see Appendix "C"

4. **WHEELSETS**

4.1 General

The wheelsets shall be according to drawing UIC/ERRI 100M 1110.0001 comply with the requirements of UIC 813 or EN13260.

The electric resistance of the assembly complies requirements of UIC 512, and therefore doesn't exceed 0.01 Ohms.

4.2 Wheels

The wheels shall be new of the soiled type with a diameter of 920 mm drawing ME 399.00.3 (B) and shall be provided according to the requirements of EN 13262:2004.

The wheel material shall be in accordance with EN 13262:2004 steel grade ER7.

The wheel profile shall be in accordance with UIC 510-2.

The maximum wear of wheel shall be 25mm in radius.

The wheels shall be provided with an oiling hole and plug, to make pressing out easier.

4.3 Axle

The axle is as indicated in UIC 510-1, "B" type, for journals of

130 X 191mm, (drawing ME 431.00.2B).

The grade of the steel is as per UIC-811-1-OR (A1N), normalized.

4.4 Axleboxes

The axleboxes, in cast steel, (E 300-52Mc 2 quality drawing UIC/ERRI 100 M 115 00004) are fitted with lateral lugs, symmetrically arranged to accommodate the suspension coil spring. The axleboxes shall be for journals of 130 X 191 mm. According to UIC 514-1.

The roller bearing shall be of the cylindrical rollers type manufactured by SKF or FAG.

The grease to be used shall be lithium based grade EP2 at the rate of 1.2 kg./Axlebox.

5. SUSPENSION

5.1 The suspension shall consist of coil springs arranged in groups of 2 with different heights in order to obtain different flexibilities under tare and load.

5.2 Under tare weight and up to an a bogie load on the rail of 13.3 ton. the flexibility of the spring system shall be 2.46 mm/ton per bogie. For an bogie load of over 13,3 ton the flexibility of the spring system shall be 0,93 mm/ton.

5.3 One of the spring groups in each axlebox shall be fitted with a damping device of LENOIR type. This device shall consist essentially of a friction element rubbing against the wearplate of the axlebox.

5.4 The friction effort shall be transmitted to the friction element through the inclined rings of the suspension, being therefore proportional to the actual load.

5.5 The helical spring has to be mounted in pairs to keep the bogie height and ever wheel loads.

The components of frictional damping are wear- resistant designees.

The functional clearance of the friction damping must be guaranteed.

- 5.6 The suspension will be supplied with following new parts:
- Suspension link - SNCF 21671 (4MCR7.2. 86) or equivalent.
 - PIN - SNCF 21671 (4MCR7.2. 96) or equivalent.
 - PIN - SNCF 21671 (4MCR7.2. 97) or equivalent.

6. **FRAME**

6.1 Welded bogie

The frame is to be a welded unit consisting essentially of two sole bars receiving the primary suspension, a central fixed bolster which bears the pivot and bearplates, two (2) longerons to fix the brake and two (2) headbeams in U section.

The side members and pivot bolster shall be able to withstand the bending moments due the load.

The quality of the plates shall be A42FP or Fe-2 Kp (Euronorm 28) or equivalent those indicated in RP28 of the ERRI B12.

The frame shall be designed to obtain a uniform distribution of the stresses in service and of the residual stresses due to the welding process. Due to this fact it is not necessary to provide any stress relieving heat treatment after welding.

7. **PIVOT BEARING AND SIDE BEARERS**

7.1 Pivot bearing and side bearers - welded bogies

The wagon body shall rest via a spherical pivot bearing and elastic side bearers on the bogie.

The lower pivot part of the welded bogie is welded into the cross girder, and shall be equipped with RAILKO type AL2 or NF21 slide bar according to UIC/ERRI 100 M 12500010 as well as the flexible slide bars, according to drawing (UIC/ERRI 100 M 1255023) or and equivalent material which shall take up lubrication and wear.

The side bearer consists of a lower part, which is rigidly connected to the cross girder, two helical compressive springs, and an upper part with surface lining of compound material.

The rotary braking, which is necessary for safety and riding quality must be within the limits of UIC-510-1.

7.2 The following new parts will be installed:

Center pivot bearing - Railko AL-2 or NF21, side bearers with slide - Railko AL-2 or NF21, Helical springs - drawings No. UIC/ORE300M1342 0004, Upper pivot - UIC/ORE 200M1254 00006 with connection parts.

8. **BRAKE**

The brake rigging shall be designed for "S" service for loaded wagon and 120 km/h for empty wagon. Braking power will be in accordance with the directives given in UIC Leaflet 544-1-0.

The brake triangles shall be according to drawing (UIC/ERRI 187 M3323) for a resistance of 120 KN in accordance with UIC 833.

All the articulated joints shall be fitted with pins and bushes both made of carbon or alloy steel induction hardence with a hardness

of 58 to 62 HRC and a hardened depth of 1 to 1.5 mm.

The dimensions of pins and clearances shall be in accordance with UIC 542 for S service.

The leverage shall be in multiplication of 4 and four (4) brakeshoes per wheel, sixteen (16) per bogie shall be provided.

The brakeshoes shall be of phosphorus cast iron P-14, in accordance with UIC 832.

The bogie shall be provided with a weighing valve for the automatic empty-load change-over and its corresponding pipings the connection pipes between the valve and the wagon body shall be according to UIC 510-1, Appendix 7.

9. **PAINING AND COROSION PROTECTION**

- 9.1 All suitable material shall be blasted with malleable iron abrasive to DIN 55926, or S.I.S. 055900, SA 2 1/2
- 9.2 Painting of bogie to be according to UIC 842-2, 842-3 and 842-6.

A minimum thickness of 130 micron for the bogie completely painted and dry will be quarantined.
Color of final painting to be RAL 8012.

The supplier will submit detailed painting specification for prior approval by ISR.

10. **TESTING**

- 10.1 The bogies should be subjected to strength test and to torsional stiffens measurements according to ORE B12 RP17 (7the edition).
- 10.2 Every bogie frame shall meet the dimensional requirements stated in the dimensional sheet page No. 1 of Appendix D. Such a dimensions sheet will be filled out for every frame.
- 10.3 One of ten frames submitted for acceptance, selected by the acceptance engineer, will be tested as follows:

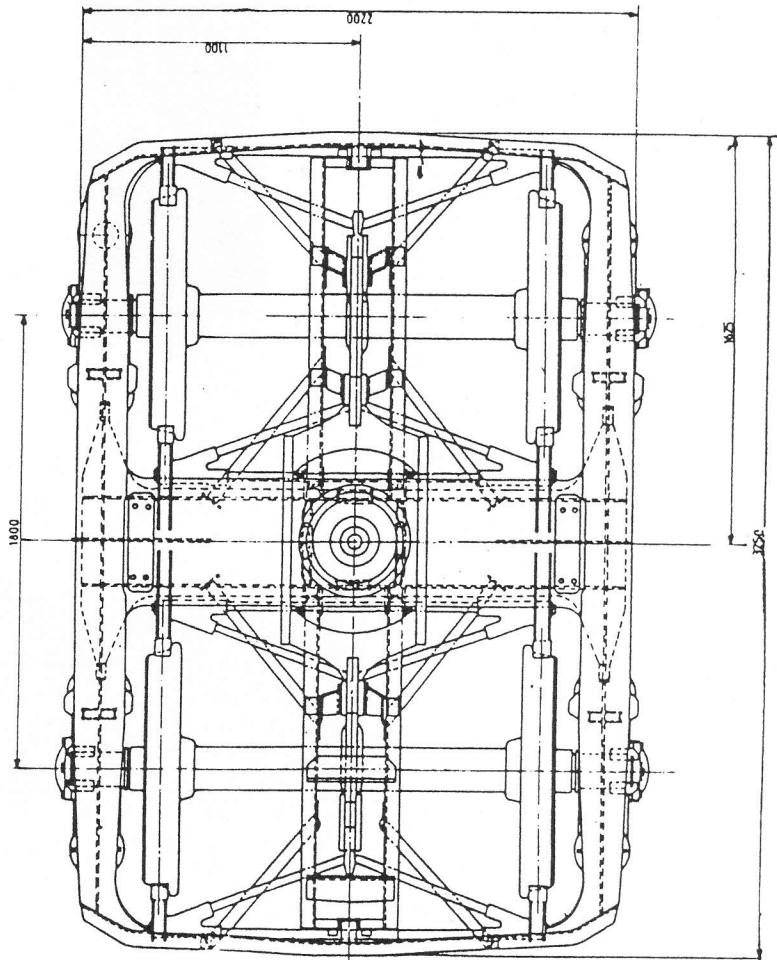
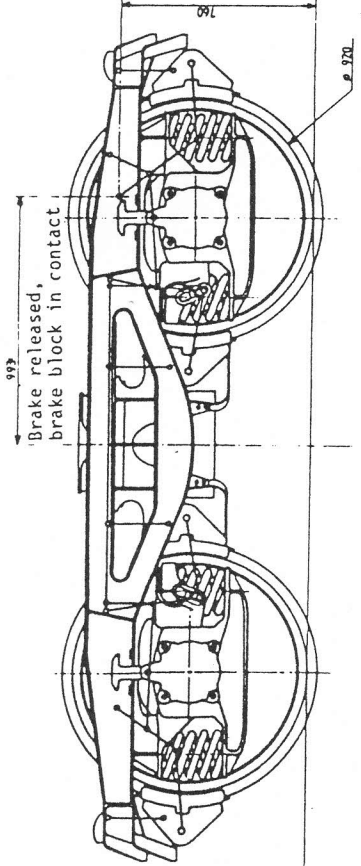
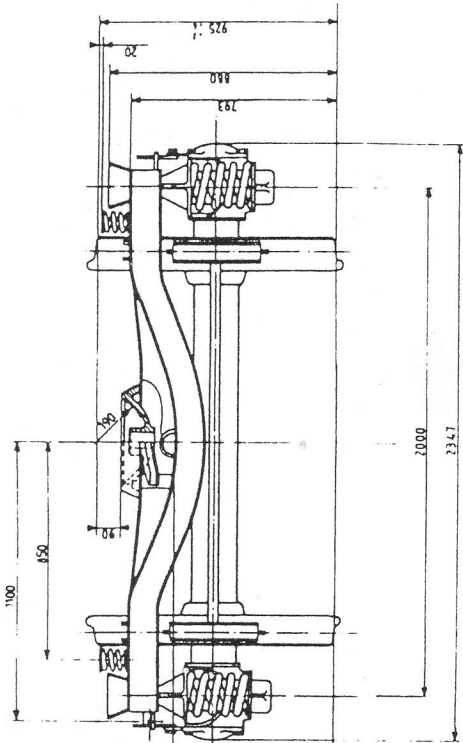
The frame, placed on four supports corresponding to the sites of

the axle section points of the wheel sets and on the supporting axes of the springs in the longitudinal plane of the sole bars shall be loaded at the lower bogie bolster by a vertical force of 820 KN for 2 minutes.

During this loading, the frame is pounded with a hammer weighing 500 g near the welding seams and will be inspected visually.

There should be not differences between the measurement results according to page No.2.

10.4 Such sheet shall be filled out for every bogie with and without wheelsets.



MAIN FEATURES

- FRAME: Cut and welded steel sheets, cast steel sections and parts
- AXLES: ORE standard, axle journal \varnothing 130 to 191
- AXLE-BOX: Bearing of an accepted type
- SUSPENSION: By spiral springs with friction damping
- VERTICAL STIFFNESS: Of entire bogie
 - Up to 13.3 t on rails 2.46 mm/t
 - Beyond 0.93 mm/t
- DAMPING: Variable according to the load
- LOAD: 22.5 t per axle
- BRAKE RIGGING: In series mounted in the longitudinal axle of the bogie
- CLEARANCE: Transverse between axle-box and frame \pm 10 mm
- MASS: With steel wheel R7 (25 mm wear) 4 500 kg
- BRAKE: On 8 blocks. Multiplication 4. Reinforced rigging.
- NB: The bogie is shown in position under a 20 t wagon on rails. The bogie is the subject of a patent. See drawing for frame design No. 10-4 008 166.

Ra12.5 / (Ra6.3)

○	0,2
⌒	0,5

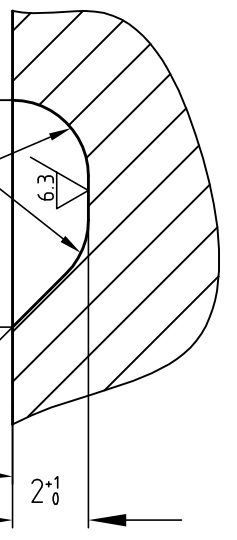
A

5x45°

PROFILE
UIC 510-2 OR
appendix B1

1

DETAIL C
Scale 5:1



φ920⁺⁴₀

φ854⁰₋₂

φ820⁰₋₄

2

MARKINGS

φ260⁺⁵₋₀

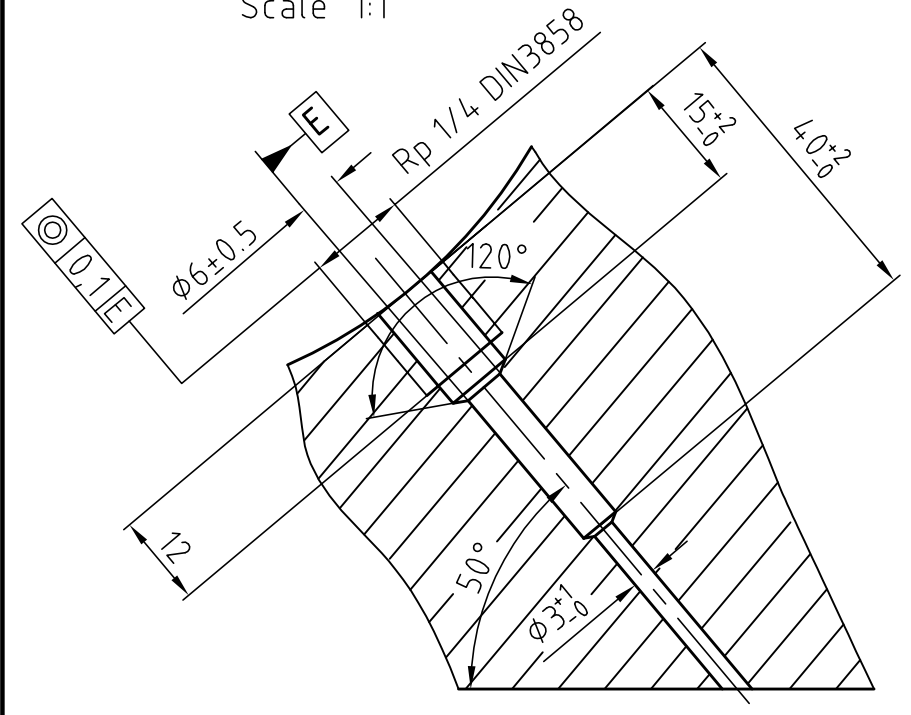
B

⊕	0,2
⌒	0,2
⌚	A

φ193⁰₋₂

φ270⁺⁵₋₀

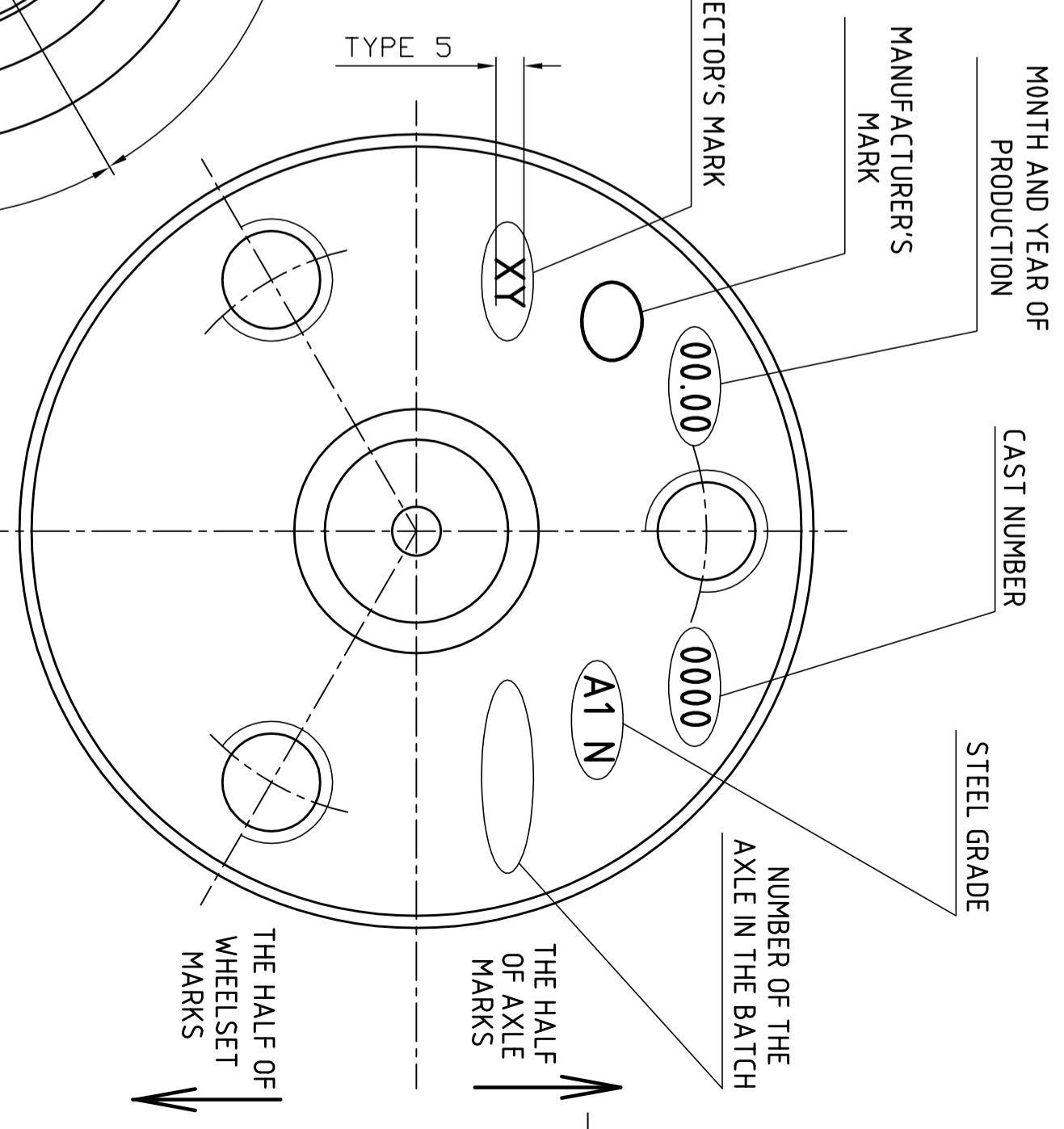
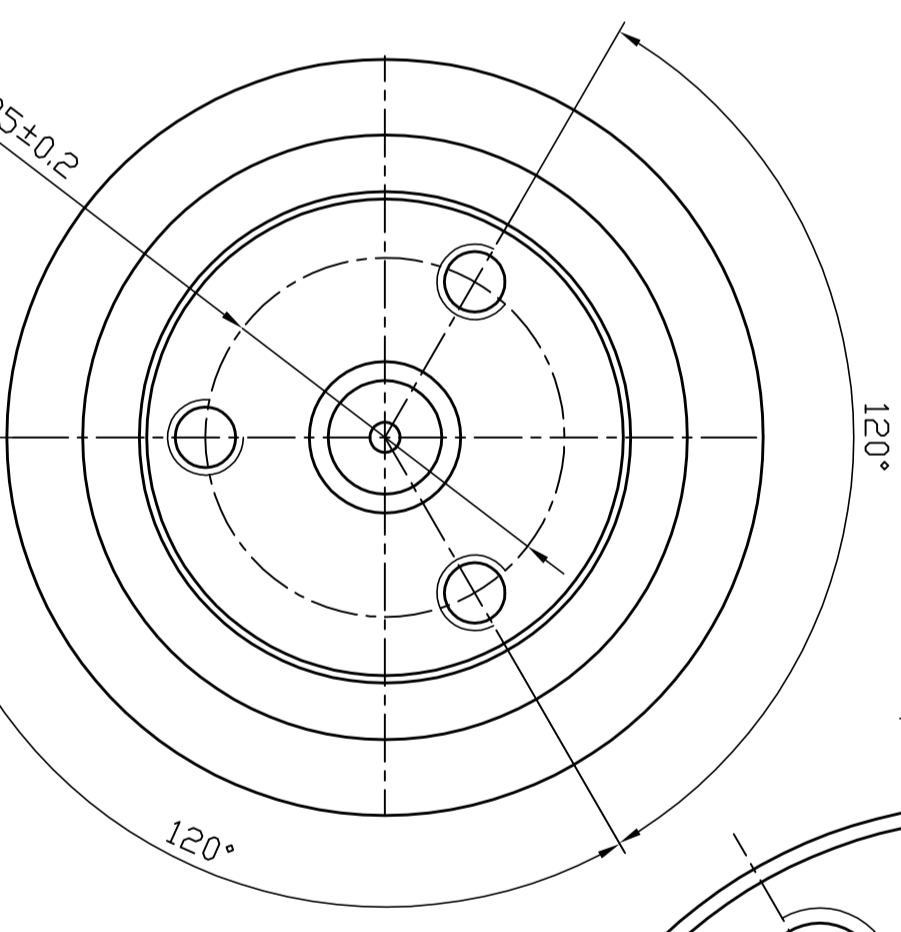
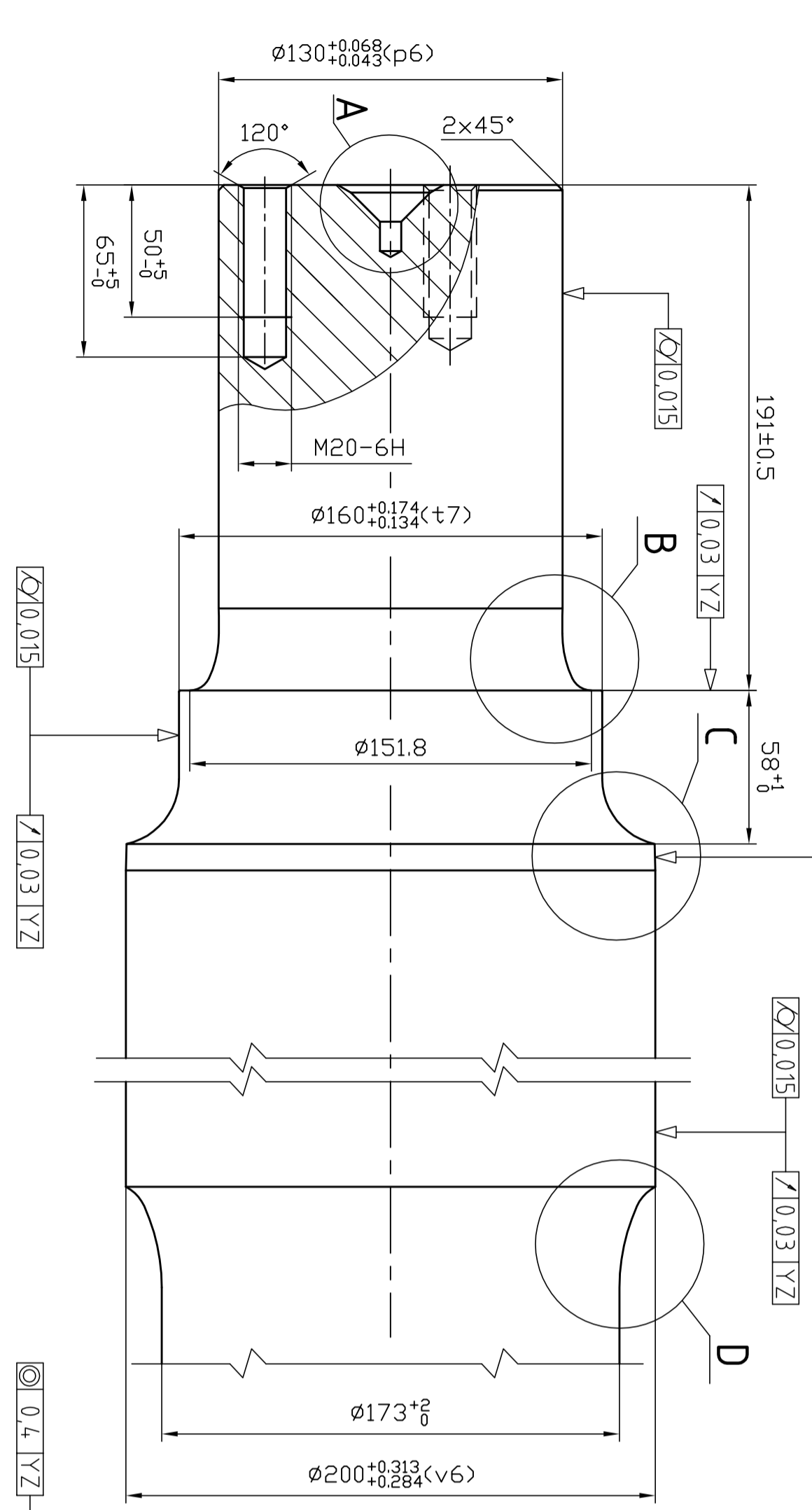
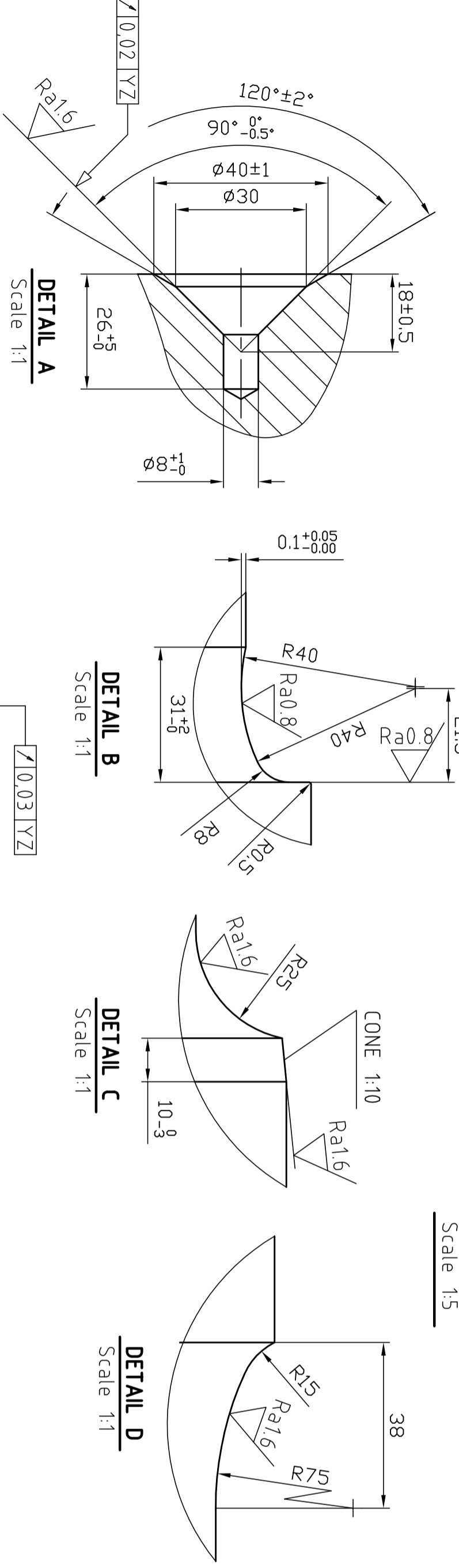
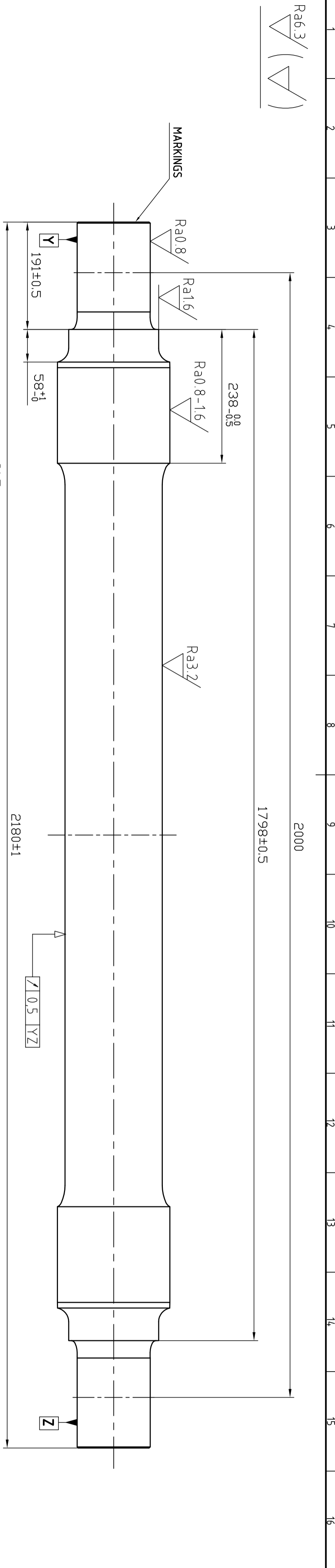
DETAIL B
Scale 1:1



Solid wheel statically balanced,
admissible residual imbalance: 125 gm

NOMINAL DIAMETER OF AXLE 200 mm
AXLE LOAD 22.5t

1	HEXAGON HEAD PIPE PLUG DIN909 - R1/4- St	2	
1	ER7 (*)	1	
Qty.	Size	Material	No.
ISRAEL RAILWAYS		ROLLING STOCK DIVISION	
Name	Date	Drg. name	Drg. No.
Slousher	15.11.11	SOLID WHEEL φ 920 (FOR NEW FREIGHT WAGONS)	ME 399.00.3(B)
	Drawn		
	Verified		
Scale 1:2		Part of Technical Specification No. M-04-293	
(*) - Last revision from 26.11.2008		Page 22 of 23	



MARKINGS
Scale 1:1

NOMINAL DIAMETER OF AXLE 200 mm
AXLE LOAD 22.5t
(*) - According to UIC 510-1 (APPENDIX 2)

ISRAEL RAILWAYS		ROLLING STOCK DIVISION	
Name	Date	Dr. g. name	Dr. g. No.
Slouster	15.11.11	ME	ME
Drawn	Verified		
Qty.		Size	No.
		A1 (normalised)	
		Material	
Part of Technical specification M-04-293			

AXLE TYPE B(*)
431.00.2B