

**Section VI**

Tender No.: -----

**CNC-TANDEM UNDER FLOOR WHEEL LATHE (BG) to Specification No.CR/IR/CNC-TUFW  
(BG)/ WITH WORKS / WITH WORKS/2024****Table of contents**

<b>Item</b>	<b>Contents</b>	<b>Page no</b>
<b>Section-VI</b>	<b>Format &amp; Drawings</b>	
Annexure-A	Format to be filled up by Bidder for submitting the Technical Bid	2
Annexure-B	Format for Joint Receipt Inspection Note	10
Annexure-C	Format for Joint Commissioning Note	11
Annexure-D	Performance Appraisal Form (Appraisal on Completion of Warranty period)	12
Annexure-E	List of Components to be loaded on machine	13
Annexure-F	Format for Consignee's Certificate for Quarterly Work Done under CAMC	28
Annexure-G	Format for Quality Assurance Plan	29
Annexure - H	Format for Prove Out Test Certificate	30

**FORMAT FOR SUBMISSION OF TECHNICAL BID**

1. We, M/s.----- offer our ----- machine, model no. ----- as per the description given in Schedule of Requirements. We further state that, except for the following, for which clause wise brief description and justification for deviation has been indicated, our machine fully complies with all the clauses as given in Important features of the tender in section IV & Technical specification Section-V and we also confirm all the schedules given in the Delivery Schedule at para7of Section-IV.

S.No.	Clause/Item	Brief description of Deviation	Justification for deviation

**Note 1:** In case there is a contradiction in any information provided (between any parametric values given in the specification and those given in the brochure or some other document enclosed by the tenderer), unless specifically mentioned in the deviation cum confirmation statement under Annexure A of Section VI, the values as given in the specification shall be taken as confirmed by the tenderer and offer evaluated accordingly.

**Note 2:** In case of incomplete / sketchy / illegible information, the technical bid may be considered as incomplete and is liable to be rejected. Bidder must furnish clause wise compliances against the individual clauses of Section IV and V clearly indicating 'complied' in case of compliance to the clause, 'non complied' in case of non compliances to clause . Informative clauses can be indicated as 'noted' . Bidder must provide necessary information as asked for in the relevant clauses. Bidder must provide necessary information as asked in Section VI. Bid will be considered incomplete and liable to be rejected in case of noncompliance to this instruction.

2. We further certify that :
- (A) We are the regular manufacturer of this type of machine.
- (B) We have made the following past supplies of machines as Conditions for eligibility of tenderers.

SN.	Name of purchaser with postal address	P.O.No. and date (along with the copy of PO)	Name of contact person with designation	Phone/ fax /e-mail nos. of contact person	Date and place of commissioning of the machine	Axle Load	Tread Diameter

- (C) We are submitting following performance certificate from past users as per Eligibility of tenderer.

SN.	User Name	Date Supplied	Date of issue of certificate	Application /Use	Axle Load	Tread Diameter	Performance

3. We are having following facilities available with us or our agent for providing adequate after-sales service in India during warranty period. Complete details of after sales service, availability of technically competent engineers and warehousing facilities for spares is indicated below:
- After sales service centers;
  - Availability of technically competent engineers;
  - Warehousing facilities for spares;

4. We have quoted for the following optional accessories as indicated under clause 4.3 of section IV.

SN	Description of the optional accessory	Quantity (in Nos.)	Rate (in Rs.)	Indigenous	Shelf Life (in Months)

5. We have quoted for following recommended perishable and non-perishable spare required for normal maintenance to cover complete range of mechanical, hydraulic and electrical equipments including controls on double shift working basis:

**Perishable Spares:**

SN	Description of the spares	Part number	Quantity (In Nos.)	Rate (In Rs.)	Shelf Life (in Months)

**Non-perishable spares:**

SN	Description of the spares	Part number	Quantity (In Nos.)	Rate (In Rs.)

6. \*We hereby confirm that we are the OEM and undertake to supply spare parts for a period of expected life of machine.

**OR**

\*We hereby confirm that we are not the OEM, but are submitting undertaking from OEM for supply of spare parts for a period of expected life of the machine to provide maintenance spares (as and when ordered) after the expiry of the Warranty for 2 years (life of machine minus 2yrs) including the maintenance spares required for the bought out sub-assemblies and parts.

(\*Strike out whichever is not applicable)

7. We have quoted consumables required as per clause 6.1 of Section V in the format

give below

SN.	Description of the consumable spares	Quantity	Unit	Rate

8. It is certified that we are having suitable facilities at our works for carrying out various performance tests on the sub-assembly/assembly/machine and these shall be made available to the inspecting authority.

9. **BOUGHT OUT ITEMS:** We hereby furnish a list of all critical items/ sub- assemblies which are bought out by us and proposed to be used, along with the manufacturer's name, brand model etc.

S.No.	Description	Item no.1	Itemno.2	Itemno.3
1.	Brief description of item			
2.	Model no.			
3.	Make			
4.	Quantity/machine			
5.	Manufacturer's name and Complete address			
6.	Whether imported or indigenous			
7.	Country of origin			

10. We have quoted for Comprehensive Annual Maintenance Contract as per clause clause 17.0 of section-V respectively. Details of preventive maintenance services including cleaning of Machine to be provided by us during warranty and CAMC is given in the following format.

SN	TYPE OF PREVENTIVE SCHEDULE	PERIODICITY	ITEMS TO BE CHECKED	ITEMS OF REPLACEMENT	EXPECTED PLANT DOWNTIME

11. We further submit the following information about the offered machine as per the technical specification section V and Important Features of the tender section IV. We understand that any omission of any of the below mentioned information will render our offer incomplete to that extent.

S.No.	Information required	As per Clause No.	Value /Write up/Brochure
1.	Leading Parameters 1. Major Parameters(cl.2.2.1&2.2.2 of Section-IV) 2. Other Parameters(cl.2.2.3 of Section - IV)	2.2 of section IV	values
2.	Technical Details/Particulars of Motors, Control Gears, Voltage Stabilizer& Isolation Transformer	2.0 of Section V	
2.1	A.C. Motors and Control Gears <b>AC MOTOR</b> <input type="checkbox"/> Manufacturer's Name <input type="checkbox"/> Type of enclosure <input type="checkbox"/> Type of duty(Ref. IS:325)(Latest) <input type="checkbox"/> Rating-Continuous/intermittent		Write-Up/brochure/details/value s

	<ul style="list-style-type: none"> <li><input type="checkbox"/> Output(KW/BHP)</li> <li><input type="checkbox"/> AC voltage across phases, number of phases &amp; frequency,</li> <li><input type="checkbox"/> Speed in RPM</li> <li><input type="checkbox"/> Class of insulation</li> <li><input type="checkbox"/> Normal full load current</li> <li><input type="checkbox"/> Starting current</li> <li><input type="checkbox"/> Maximum current at the time of change over from lower speed to higher speed</li> <li><input type="checkbox"/> Type of motor- Squirrel cage /slip ring (wound rotor)</li> <li><input type="checkbox"/> Temperature rise of windings and other parts Allowed above an ambient temperature of 50 degree C.</li> <li><input type="checkbox"/> Frame size of motor</li> <li><input type="checkbox"/> End use of motor</li> </ul> <p><b>CONTROLGEARS</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Manufacturer's Name</li> <li><input type="checkbox"/> Type of control gear (Direct online/Star Delta/Auto- transformer etc.)</li> <li><input type="checkbox"/> Rating of starting gear in KW &amp; amps.</li> <li><input type="checkbox"/> Short circuit protection(y/n)</li> <li><input type="checkbox"/> No volt trip (y/n)</li> <li><input type="checkbox"/> Overload trip(y/n)</li> <li><input type="checkbox"/> Delayed action current sensitive single phasing Prevent or(y/n)</li> <li><input type="checkbox"/> Standard specifications to which the motor control Gear and its ancillary offered conform to</li> </ul>		
2.2	<p><b>D.C Motors and Control Gears</b></p> <p><b>DC MOTOR</b></p> <ul style="list-style-type: none"> <li>• Manufacturer's Name</li> </ul>		Write- Up/brochure/ details/values
	<ul style="list-style-type: none"> <li>• Type of enclosure</li> <li>• Type of duty (Ref. IS:4722)(Latest)</li> <li>• Rating-Continuous/intermittent</li> <li>• Output(KW/BHP)</li> <li>• DC voltage across phases, number of phases &amp; frequency</li> <li>• Method of excitation whether shunt, series, Compound or separately excited if separately Excited state excitation voltage.</li> <li>• Speed in RPM</li> <li>• Class of insulation</li> <li>• Normal full load current in amps.</li> <li>• Starting current</li> <li>• Temperature rise of windings and other parts Allowed above an ambient temperature of 50 degree C.</li> <li>• Frame size of motor</li> <li>• End use of motor</li> </ul>		

	<b>CONTROLGEARS</b> <ul style="list-style-type: none"> <li>• Manufacturer's Name</li> <li>• Type of control gear(Direct on line/Resistance type/Thyristor type)</li> <li>• Rating of starting gear in KW &amp; amps.</li> <li>• Short circuit protection(Y/N)</li> <li>• No volt trip (y/n)</li> <li>• Overload trip (y/n)</li> <li>• Standard specifications to which the motor Control gear and its ancillary offered conform to</li> <li>• Standard specification to which control gear Conforms to</li> </ul>		
2.3.	Voltage Stabilizer & Ultra Isolation Transformer  <b>VOLTAGE STABILISER</b> <ul style="list-style-type: none"> <li>• Manufacturer's Name</li> <li>• Type of voltage stabilizer:               <ul style="list-style-type: none"> <li>a) DC servo motor type</li> <li>b) AC servo motor type</li> <li>c) Solid state</li> </ul> </li> <li>• Rated capacity in KVA</li> <li>• Nos. of phases &amp; frequency</li> <li>• Type of input supply unbalanced</li> <li>• Input voltage</li> <li>• Output voltage</li> <li>• Rate of correction</li> <li>• Class of insulation &amp; winding (only copper wound is acceptable)</li> <li>• Type of control circuitry</li> <li>• Class of duty</li> <li>• Type of cooling</li> <li>• Indicating instruments and their ranges</li> <li>• Safety features</li> </ul> <b>ULTRAISOLATIONTRANSFORMER</b> <ul style="list-style-type: none"> <li>• Manufacturer's Name</li> <li>• Rated capacity</li> <li>• Ratio of input/output voltage</li> <li>• Class of insulation</li> <li>• Arrangement for suppression of power line surges, spikes, transients and noises</li> <li>• Type for cooling.</li> </ul>		Write-Up/brochure/details/value s
3.	Break up of floor to floor cycle time and other necessary details	2.4 of section IV	Write-up/ (tabular sheet)
4.	Details as per subject clause	2.4.6 of Section IV	Graph
5..	Details of concomitant accessories	4.2 of section IV	Write-Up/brochure
6.	Details as per subject clause	4.3.2 of Section IV	Write-up

7.	Details as per subject clause	4.3.3 of section IV	Write-Up/brochure
8.	Details of safety features present in the machine	1.1 of section V	write-up
9.	Full technical details of the Rail cum Road shunter including make and model, power rating ,capacity, etc.	1.2.2.1 of section V	write-up
10.	Full technical details as per clauses of Section-V	1.2.2 & 1.2.2.1 & 1.2.2.3 of Section V	write-up
11.	Details of material composition and load bearing Capacity of rollers	1.2.3.2 of Section V	write-up
12.	Axle box support and clamping arrangement	1.2.3.3 of Section V	Write-up/ Schematic Drawing
13.	Arrangement provided for positioning the wheels in vertical, horizontal and in lateral direction	1.2.3.5 of Section V	Write-up/ Schematic Drawing
14.	Details as per subject clause	1.2.4.1 of Section V	write-up
15.	Material specification hardness & surface finish of drive rollers	1.2.4.2 of Section V	Write/values
16.	Type, size, precision class and make of bearings. Details of detecting slip between drive roller and wheel set to be provided.	1.2.4.2 of Section V	Write up/values
17.	Method of speed control	1.2.4.3 of Section V	Write up
18.	Details of fully floating drive rollers	1.2.4.4 of Section V	Write up
19.	Detailed design calculation for cutting force at minimum and maximum depth of cut and feed rate	1.2.4.6 of Section V	Write up/values/calculations
20.	Constructional details of measuring system	1.2.5.1 of Section V	Drawings/write up
21.	Working principals of measuring system	1.2.5.1(c) Of section V	Write up
22.	Configuration and make of computer, monitor and printer	1.2.5.3 of Section V	Write up/ manufacturer literature
23.	Method of setting up, time taken for setting up and recommended frequency for setting up of equipment	1.2.5.4 of Section V	Write up/values/tabulated values
24.	Capability of CNC system for performing automatic cutting cycle integrated within process of measuring system	1.2.6.1 of Section V	Write up
25.	Details of No. axes provided in CNC system	1.2.18.1 of Section V	values
26.	Determination of min. Metal removal as per subject clause	1.2.6.3 of Section V	Write up/values

27.	Arrangement to indicate treat diameter before and after turning	1.2.6.6 of Section V	Write up/values
28.	Details as per subject clause to be explained	1.2.7.1 of Section V	Write up
29.	Details of chiller type heat exchanger	1.2.9.4 of Section V	Write up
30.	Details of electrostatic oil filtration equipment	1.2.10.1 of Section V	Write up
31.	Details of lubrication system	1.2.11.3 of Section V	Write up
32.	Details of swarf disposal system as per subject clause	1.2.12.1 of Section V	Write up/ schematic drawing
33.	Details of chip crusher arrangement and safety measures	1.2.12.2 of Section V	Write up/ schematic drawing
34.	Details of Hold-down Device	1.2.14.1 of Section V	Write up/ schematic drawing
35.	Details of Axle Box Support Jack	1.2.14.2 of Section V	Write up/ schematic drawing
36.	Details of cable, IS and make	1.2.17.1 of Section V	Write up
37.	Details as per clause	1.2.18.1 of Section V	Write up
38.	Details as per subject clause	1.2.18.20 Of section V	Write up
39.	Comments on infrastructure of repairs of control sand PCBs/Module	1.2.18.33 Of section V	Write up
40.	Hardware and software arrangement for predictive maintenance to be explained.	1.2.19.3 of Section V	Write up
41.	System of adjustment for wear compensation	3.6.1 of Section V	Write up
42.	Details of coolant System (if applicable)	3.7.1 of Section V	Write up
43.	Brand names of lubricating oil of Indian oil companies.	3.8.6 of Section V	Write up
44.	Details of lubricating system	3.8.7 of Section V	Write up
45.	Details of pneumatic control & make (if applicable)	3.9.4 of Section V	Write up
46.	Brand name of hydraulic oil of Indian oil companies	3.10.6 of Section V	Write up
47.	Catalogue of the machine	4.1 of Section -V	Brochure
48.	Quality Assurance Plan & ISO certificate	9.1 of section-V	Write-up
49.	Sample Inspection Chart	9.4 of section-V	Drawing



50.	Training Schedule	10.3 of section-V	Write-up
51.	Service facility in India	13.0 of section V	Write-up
52.	Maximum height between the rails by which the Machine protrudes above the rail level with location of protrusion.		Write-up/value
53.	Wheel set rotational speed in RPM for turning wheels having tread diameter of 800mm,900mm,1000mm and 1250mm	2.2.1.2 of section-IV	Value
54.	Main motor power		Value
55.	<ul style="list-style-type: none"> <li>Total weight of the machine.</li> <li>Model of machine</li> <li>Total weight of machine along with packing</li> <li>Total connected electrical load and its breakup.</li> <li>Total working area</li> <li>Maximum floor space area required for installation and commissioning of the machine.</li> <li>Facilities required during commissioning of the machine</li> <li>Overall dimensions of the machine in packed condition.</li> <li>Maximum size of packing and no. of packages</li> </ul>	Misc.	Values Write-up Values Values Values Values Values Write-up Write-up Values
56.	Dimensions(lxbxh)& weight of the major sub-assemblies: <ul style="list-style-type: none"> <li>Machine Bed</li> <li>Headstock</li> <li>Tailstock</li> <li>Carriage</li> </ul>	Misc	Values Values Values Values Values
57.	Clausewise compliance against Sections IV&V (which are not covered above in this table)		Write-up/ values/brochures

**Signature of the**  
**authorized representative of the bidder**  
**With company stamp**

**ANNEXURE-B OF SECTION-VI**  
**JOINT RECEIPT INSPECTION NOTE**

Date:.....

**Sub: Receipt of consignment for machine.....**

**Ref: Central Contract No.....**

1.	Name of consignee/Railway	
2.	Machine name	
3.	Quantity	
4.	Name of supplier	
5.	Consignment of the machine received on	

It is certified that the consignment of the machine has been received complete and in good condition as per specification shown in the contract.

**Tentative plan for installation and commissioning of the machine is as under:**

1.	Date of clear site provided	
2.	Contract	Turnkey/Non-turnkey
3.	<b>Status of readiness of foundation:</b>	
3(a)	Already constructed on	
3(b)	Under construction & likely Date of its completion	
3(c)	Construction yet to be started from .....and & likely date of its completion	
4.	Status of availability of Electrical power, water and compressed air etc.	Available/Not-available
5.	Number of components to be proved out on the machine	
6.	Likely date for start of erection	
7.	Likely date for switch-on the machine	
8.	Likely date of completion of commissioning of the machine	

**Representative of firm**

**Representative of consignee**

**Designation**

**Designation  
(Minimum Gazetted level)**

**JOINT COMMISSIONING NOTE**

Date:.....

**Sub:** Commissioning of (name of machine).....  
**Ref:** Central Contract No.....

1.	Name of consignee/Railway	
2.	Machine name	
3.	Quantity	
4.	Name of supplier	
5.	Machine received on	

6. All the parameters of the machine are found okay. The proving test on the machine was conducted from.....to..... and machine is working satisfactorily.
7. Machine has finally been commissioned on..... The machine has been handed over for regular use and kept under one month Observation to watch its performance.
8. Following minor deficiencies (if any) found during joint observation trials are to be attended/rectified by the firm during one month observation and before issuing the PTC for the machine:
- a.
  - b.
  - c.

**Representative of firm**  
**Designation**

**Representative of consignee**  
**Designation**  
**(Minimum Gazetted level)**

## ANNEXURE – D OF SECTION-VI

PERFORMANCE APPRAISAL FORMAPPRAISAL ON COMPLETION OF WARRANTY PERIOD

Dated:.....

To, M/s.....

1.	AT No.	
2.	Consignee/Railway	
3.	Name of supplier	
4.	Machine Name	
5.	Machine received on	
6.	Machine commissioned on	
7.	PTC issued on	
8.	Warranty period expired on	
9.	<b>Performance during warranty period:</b>	
9(a)	Total number of breakdowns	
9(b)	Total downtime in number of days	
10(a)	Any warranty complaint pending on date	Yes/No
10(b)	If yes, then the date and nature of defect(s)	

11. In case, of the machine with mandatory PMC during warranty period, following details of breakdown hours for preceding Eight quarters must also be furnished.

Quarter	From	Period To	Breakdown hours
1			
to			
8			

Signature-----

Name-----

Designation : JAG OFFICER(Consignee)

Office Stamp

1. PCME/CR

2. PCMM/CR

3. Sr. DFM / WAO / Dy. CAO/ PFA/CR

**Note:**

- i.) This appraisal may please be sent immediately on completion of warranty period. If any extension of warranty period required, may please also be mentioned with details.
- ii) Sr. Scale Officer having independent charge is also authorized to sign.

# ANNEXURE - E OF SECTION VI

## DETAILS OF COMPONENTS TO BE LOADED ON THE MACHINE

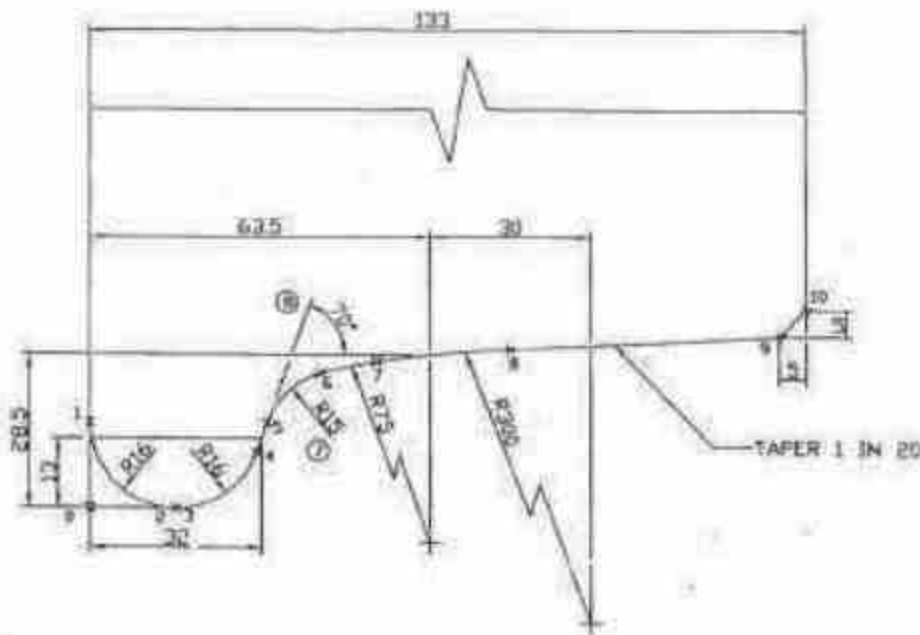
S.NO.	(A) RDSO DRAWING NO.	Loco/Wagon/Coach
1.	SKDL-2561, alt-8	LOCO
2.	SKVL-526, alt-NIL	LOCO
3.	SKDL-4461, alt-NIL	LOCO
4.	CSL-3040, alt-2	LOCO
5.	SKETCH-92082 alt-1	COACH
6.	WD-89060/S-2	WAGON
S.NO.	(B) DRAWING NO.	Details
1.	COFMOW/UFWL/BG/2007 sheet 1 of 7	ROLLING STOCK
2.	COFMOW/UFWL/BG/2007 sheet 2 of 7	LOCO
3.	COFMOW/UFWL/BG/2007 sheet 3 of 7	COACH & WAGON
4.	COFMOW/UFWL/BG/2007 sheet 4 of 7	WAGON
5.	COFMOW/UFWL/BG/2007 sheet 5 of 7	WAG1 & WAG4 LOCO
6.	ICF DRG. NO. 89102003 sheet 6 of 7	VANDE BHARAT
7.	ICF DRG. NO. 89102004 sheet 7 of 7	VANDE BHARAT

INDIAN RLYS.  
RDSO(MP)

APPLICABLE FOR  
B.G. LOCOS.

WEAR ADAPTED WHEEL PROFILE  
FOR DIESEL & ELECTRIC LOCOMOTIVES

C-146



⑤  
CO-ORDINATES ARE GIVEN BELOW:-

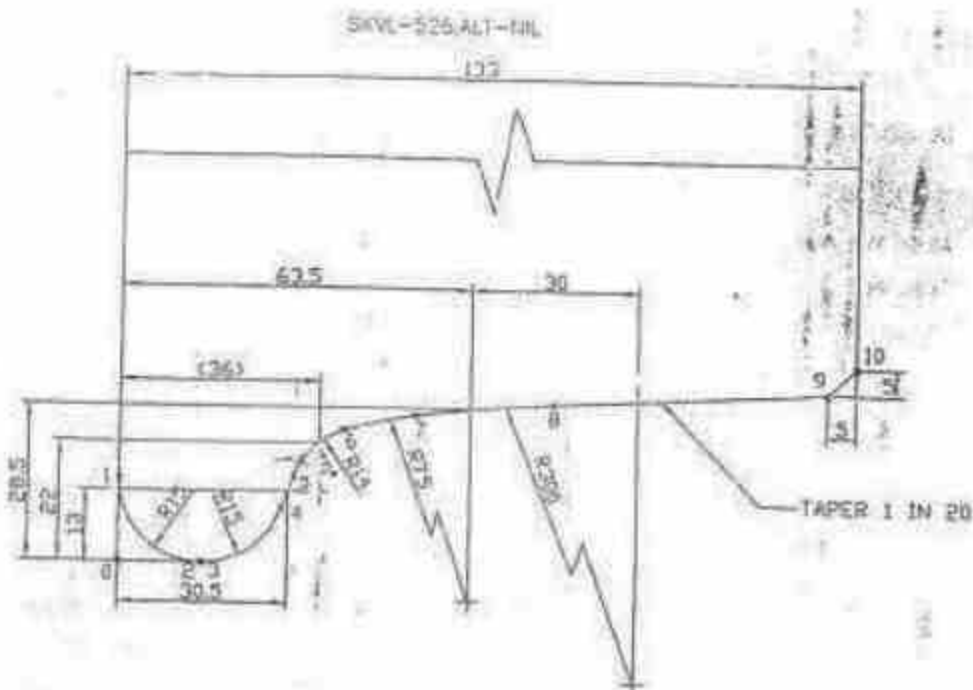
PL	X	Y
0	0.0000	0.0000
1	0.0000	16.0000
2	16.0000	0.0000
3	16.0651	0.0000
4	31.1001	10.5277
5	33.0371	15.8495
6	43.0407	25.1503
7	53.5000	27.3251
8	78.5187	29.8295
9	128.0000	32.1035
10	133.0000	37.1035

⑥  
NOTE: GIVEN POINTS CO-ORDINATES ARE ROUNDED  
OFF UPTO FOUR DECIMAL PLACE.

ALL DIMENSION ARE IN mm.

VALID COPY  
AS ON 24/10/2010

②	-	FLANGE RADIUS 70° SHARPEN	L2-990	27/17336
⑦	-	REPT RADIUS CHANGED FROM R17 TO R25 CO-ORDINATES OF THE POINTS SBA REVISED ACCORDINGLY.	L2-977	54/- 87305
③	-	DRG REVISED & NOT. ADDED	24/2/98	54/- 23682
④	-	DRG REVISED	24/2/98	54/- 23682
⑤	-	DRG REVISED	24/2/98	54/- 23682
⑥	-	DRG REVISED	24/2/98	54/- 23682
⑧	-	DRG REVISED	24/2/98	54/- 23682
⑨	-	DRG REVISED	24/2/98	54/- 23682
⑩	-	DRG REVISED	24/2/98	54/- 23682
⑪	-	DRG REVISED	24/2/98	54/- 23682
⑫	-	DRG REVISED	24/2/98	54/- 23682
⑬	-	DRG REVISED	24/2/98	54/- 23682
⑭	-	DRG REVISED	24/2/98	54/- 23682
⑮	-	DRG REVISED	24/2/98	54/- 23682
⑯	-	DRG REVISED	24/2/98	54/- 23682
⑰	-	DRG REVISED	24/2/98	54/- 23682
⑱	-	DRG REVISED	24/2/98	54/- 23682
⑲	-	DRG REVISED	24/2/98	54/- 23682
⑳	-	DRG REVISED	24/2/98	54/- 23682
㉑	-	DRG REVISED	24/2/98	54/- 23682
㉒	-	DRG REVISED	24/2/98	54/- 23682
㉓	-	DRG REVISED	24/2/98	54/- 23682
㉔	-	DRG REVISED	24/2/98	54/- 23682
㉕	-	DRG REVISED	24/2/98	54/- 23682
㉖	-	DRG REVISED	24/2/98	54/- 23682
㉗	-	DRG REVISED	24/2/98	54/- 23682
㉘	-	DRG REVISED	24/2/98	54/- 23682
㉙	-	DRG REVISED	24/2/98	54/- 23682
㉚	-	DRG REVISED	24/2/98	54/- 23682
㉛	-	DRG REVISED	24/2/98	54/- 23682
㉜	-	DRG REVISED	24/2/98	54/- 23682
㉝	-	DRG REVISED	24/2/98	54/- 23682
㉞	-	DRG REVISED	24/2/98	54/- 23682
㉟	-	DRG REVISED	24/2/98	54/- 23682
㊱	-	DRG REVISED	24/2/98	54/- 23682
㊲	-	DRG REVISED	24/2/98	54/- 23682
㊳	-	DRG REVISED	24/2/98	54/- 23682
㊴	-	DRG REVISED	24/2/98	54/- 23682
㊵	-	DRG REVISED	24/2/98	54/- 23682
㊶	-	DRG REVISED	24/2/98	54/- 23682
㊷	-	DRG REVISED	24/2/98	54/- 23682
㊸	-	DRG REVISED	24/2/98	54/- 23682
㊹	-	DRG REVISED	24/2/98	54/- 23682
㊺	-	DRG REVISED	24/2/98	54/- 23682
㊻	-	DRG REVISED	24/2/98	54/- 23682
㊼	-	DRG REVISED	24/2/98	54/- 23682
㊽	-	DRG REVISED	24/2/98	54/- 23682
㊾	-	DRG REVISED	24/2/98	54/- 23682
㊿	-	DRG REVISED	24/2/98	54/- 23682
1	-	DRG REVISED	24/2/98	54/- 23682
2	-	DRG REVISED	24/2/98	54/- 23682
3	-	DRG REVISED	24/2/98	54/- 23682
4	-	DRG REVISED	24/2/98	54/- 23682
5	-	DRG REVISED	24/2/98	54/- 23682
6	-	DRG REVISED	24/2/98	54/- 23682
7	-	DRG REVISED	24/2/98	54/- 23682
8	-	DRG REVISED	24/2/98	54/- 23682
9	-	DRG REVISED	24/2/98	54/- 23682
10	-	DRG REVISED	24/2/98	54/- 23682
11	-	DRG REVISED	24/2/98	54/- 23682
12	-	DRG REVISED	24/2/98	54/- 23682
13	-	DRG REVISED	24/2/98	54/- 23682
14	-	DRG REVISED	24/2/98	54/- 23682
15	-	DRG REVISED	24/2/98	54/- 23682
16	-	DRG REVISED	24/2/98	54/- 23682
17	-	DRG REVISED	24/2/98	54/- 23682
18	-	DRG REVISED	24/2/98	54/- 23682
19	-	DRG REVISED	24/2/98	54/- 23682
20	-	DRG REVISED	24/2/98	54/- 23682
21	-	DRG REVISED	24/2/98	54/- 23682
22	-	DRG REVISED	24/2/98	54/- 23682
23	-	DRG REVISED	24/2/98	54/- 23682
24	-	DRG REVISED	24/2/98	54/- 23682
25	-	DRG REVISED	24/2/98	54/- 23682
26	-	DRG REVISED	24/2/98	54/- 23682
27	-	DRG REVISED	24/2/98	54/- 23682
28	-	DRG REVISED	24/2/98	54/- 23682
29	-	DRG REVISED	24/2/98	54/- 23682
30	-	DRG REVISED	24/2/98	54/- 23682
31	-	DRG REVISED	24/2/98	54/- 23682
32	-	DRG REVISED	24/2/98	54/- 23682
33	-	DRG REVISED	24/2/98	54/- 23682
34	-	DRG REVISED	24/2/98	54/- 23682
35	-	DRG REVISED	24/2/98	54/- 23682
36	-	DRG REVISED	24/2/98	54/- 23682
37	-	DRG REVISED	24/2/98	54/- 23682
38	-	DRG REVISED	24/2/98	54/- 23682
39	-	DRG REVISED	24/2/98	54/- 23682
40	-	DRG REVISED	24/2/98	54/- 23682
41	-	DRG REVISED	24/2/98	54/- 23682
42	-	DRG REVISED	24/2/98	54/- 23682
43	-	DRG REVISED	24/2/98	54/- 23682
44	-	DRG REVISED	24/2/98	54/- 23682
45	-	DRG REVISED	24/2/98	54/- 23682
46	-	DRG REVISED	24/2/98	54/- 23682
47	-	DRG REVISED	24/2/98	54/- 23682
48	-	DRG REVISED	24/2/98	54/- 23682
49	-	DRG REVISED	24/2/98	54/- 23682
50	-	DRG REVISED	24/2/98	54/- 23682
51	-	DRG REVISED	24/2/98	54/- 23682
52	-	DRG REVISED	24/2/98	54/- 23682
53	-	DRG REVISED	24/2/98	54/- 23682
54	-	DRG REVISED	24/2/98	54/- 23682
55	-	DRG REVISED	24/2/98	54/- 23682
56	-	DRG REVISED	24/2/98	54/- 23682
57	-	DRG REVISED	24/2/98	54/- 23682
58	-	DRG REVISED	24/2/98	54/- 23682
59	-	DRG REVISED	24/2/98	54/- 23682
60	-	DRG REVISED	24/2/98	54/- 23682
61	-	DRG REVISED	24/2/98	54/- 23682
62	-	DRG REVISED	24/2/98	54/- 23682
63	-	DRG REVISED	24/2/98	54/- 23682
64	-	DRG REVISED	24/2/98	54/- 23682
65	-	DRG REVISED	24/2/98	54/- 23682
66	-	DRG REVISED	24/2/98	54/- 23682
67	-	DRG REVISED	24/2/98	54/- 23682
68	-	DRG REVISED	24/2/98	54/- 23682
69	-	DRG REVISED	24/2/98	54/- 23682
70	-	DRG REVISED	24/2/98	54/- 23682
71	-	DRG REVISED	24/2/98	54/- 23682
72	-	DRG REVISED	24/2/98	54/- 23682
73	-	DRG REVISED	24/2/98	54/- 23682
74	-	DRG REVISED	24/2/98	54/- 23682
75	-	DRG REVISED	24/2/98	54/- 23682
76	-	DRG REVISED	24/2/98	54/- 23682
77	-	DRG REVISED	24/2/98	54/- 23682
78	-	DRG REVISED	24/2/98	54/- 23682
79	-	DRG REVISED	24/2/98	54/- 23682
80	-	DRG REVISED	24/2/98	54/- 23682
81	-	DRG REVISED	24/2/98	54/- 23682
82	-	DRG REVISED	24/2/98	54/- 23682
83	-	DRG REVISED	24/2/98	54/- 23682
84	-	DRG REVISED	24/2/98	54/- 23682
85	-	DRG REVISED	24/2/98	54/- 23682
86	-	DRG REVISED	24/2/98	54/- 23682
87	-	DRG REVISED	24/2/98	54/- 23682
88	-	DRG REVISED	24/2/98	54/- 23682
89	-	DRG REVISED	24/2/98	54/- 23682
90	-	DRG REVISED	24/2/98	54/- 23682
91	-	DRG REVISED	24/2/98	54/- 23682
92	-	DRG REVISED	24/2/98	54/- 23682
93	-	DRG REVISED	24/2/98	54/- 23682
94	-	DRG REVISED	24/2/98	54/- 23682
95	-	DRG REVISED	24/2/98	54/- 23682
96	-	DRG REVISED	24/2/98	54/- 23682
97	-	DRG REVISED	24/2/98	54/- 23682
98	-	DRG REVISED	24/2/98	54/- 23682
99	-	DRG REVISED	24/2/98	54/- 23682
100	-	DRG REVISED	24/2/98	54/- 23682

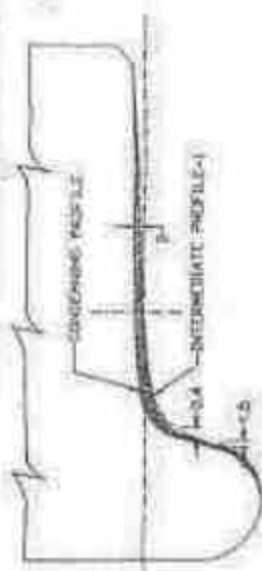


CO-ORDINATES ARE ROUNDED OFF UP TO FOUR DECIMAL PLACE.

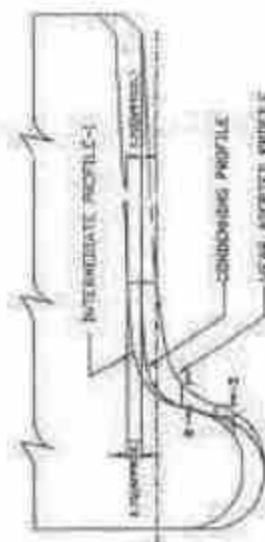
Pt.	X	Y
0	0.0000	0.0000
1	0.0000	15.0000
2	15.0000	0.0000
3	15.2653	0.0000
4	24.3617	9.8657
5	31.5214	15.0063
6	40.3571	24.3349
7	51.5800	27.2251
8	70.5107	29.6295
9	128.0000	32.0035
10	133.0000	37.1035

NOTE: WHEEL PROFILE FOR FIELD PERFORMANCE TRIALS ON PROTOTYPE LOCOMOTIVES ONLY.  
ALL DIMENSIONS ARE IN mm.

*Co-ordinates are extracted  
as per Rev. 526, Alt. w/1.  
Dew*



DRAWING SHOWING MARGIN OF INTERMEDIATE PROFILE-1 FOR WEARING DURING SERVICE TO REACH UP TO SPECIFIED CONTAINING PROFILE FOLLOWING FLAT WEAR



BRASSING SHOWING REDUCTION IN WHEEL DIA. =  $3.7500 \times 2 = 7.5000$ MM (APPROX.)  
DURING WHEEL TURNING BY USING INTERMEDIATE PROFILE-1 OVER CONCERNING PROFILE  
HAVING ROOT WEAR = 0.5MM, FLANGE WEAR = 3MM & TRACK WEAR = 4MM EXCLUDING  
FLAT WEAR.

Point	X	Y
1	90.0000	10.0000
2	78.0000	10.0000
3	30.5413	13.0000
4	33.4582	23.0000
5	43.5000	20.0000
6	48.0000	12.0000
7	62.0000	14.0000
8	70.0000	20.0000

CO-ORDINATES ARE GIVEN IN DEGREES

**NOTE:-**

THIS PROFILE SHOULD BE ADOPTED DURING THE LAST WHEEL TURNING IF THE WHEEL DIAMETER IS LIKELY TO GO BELOW THE SPECIFIED CONCERNING DIAMETER WITH ADOPTION OF STANDARD WEAR ADOPTED PROFILE.

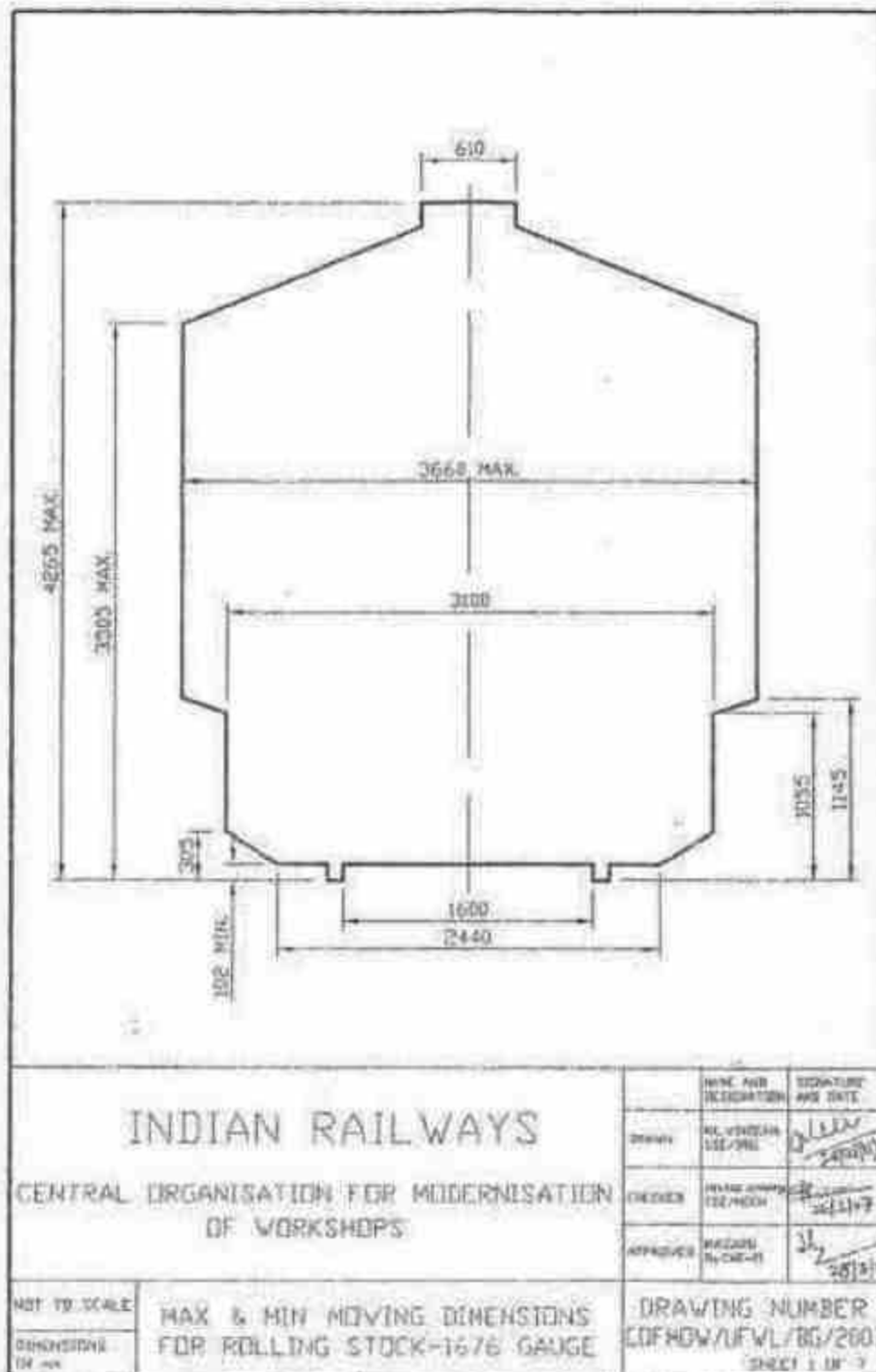
[illegible]







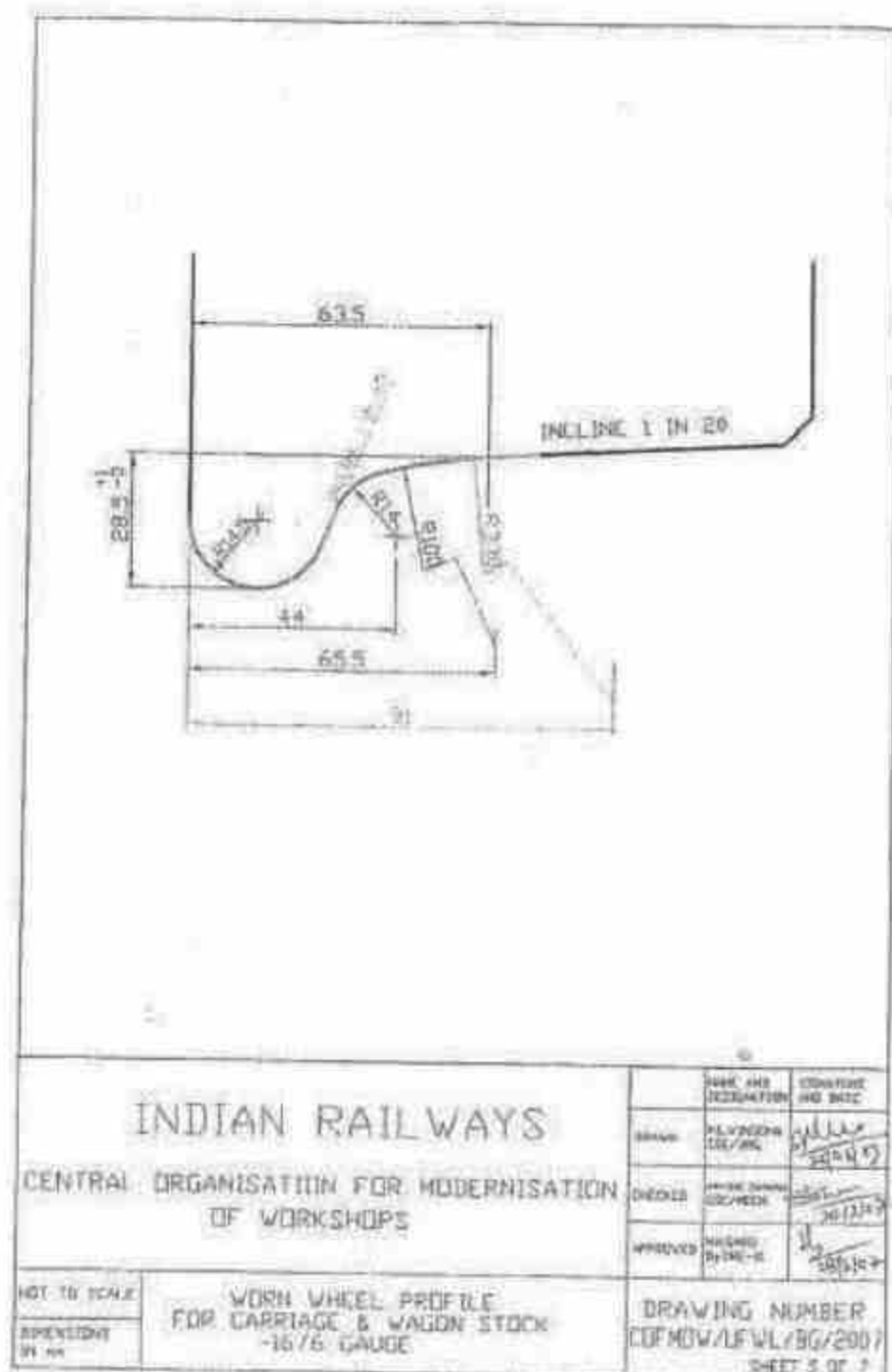
FOR WORN WHEEL PROFILE		INTERMEDIATE PROFILE		WD-89050/S-2	
B.G. (W)		B.G. (W)		B.G. (W)	



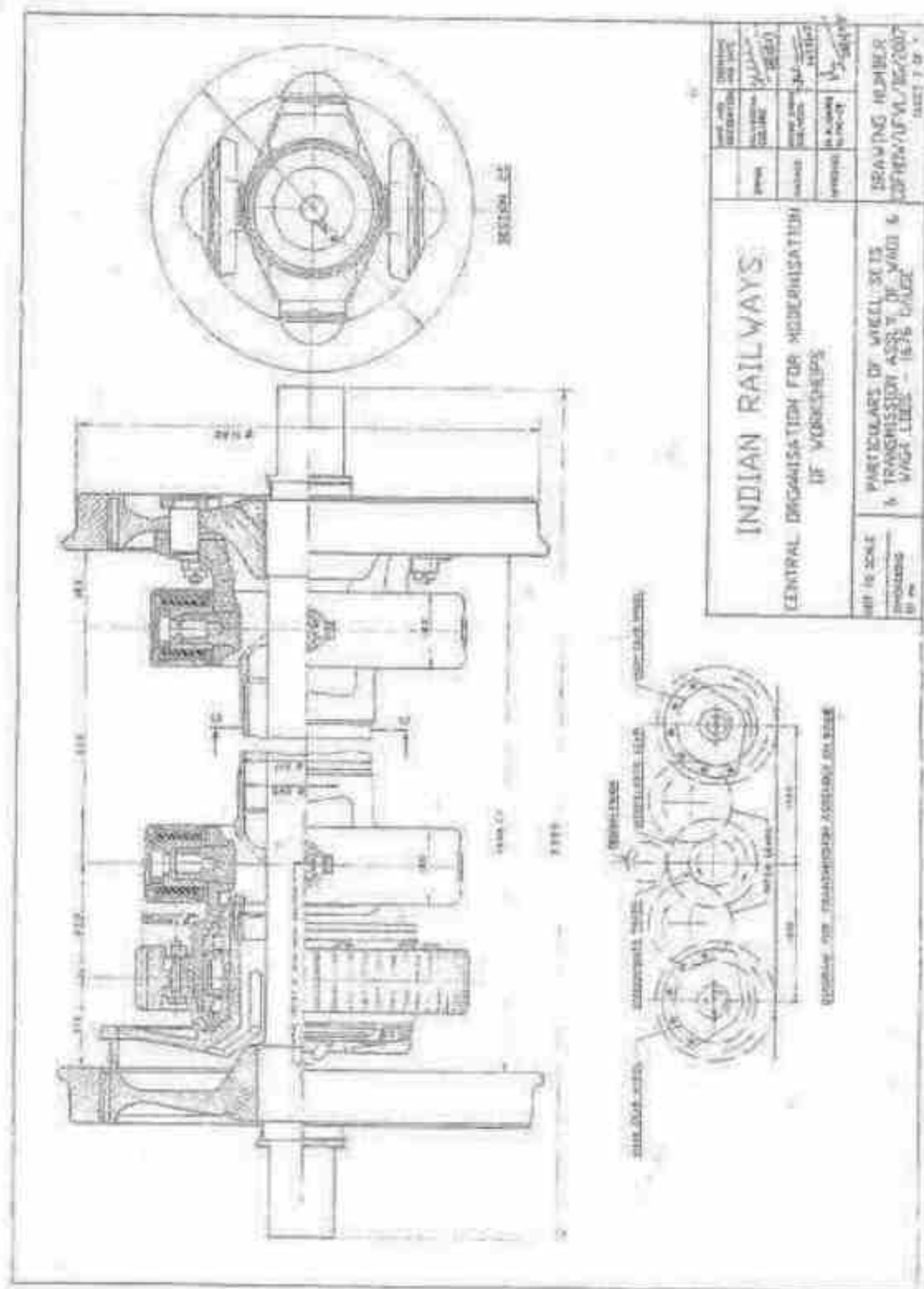
5539



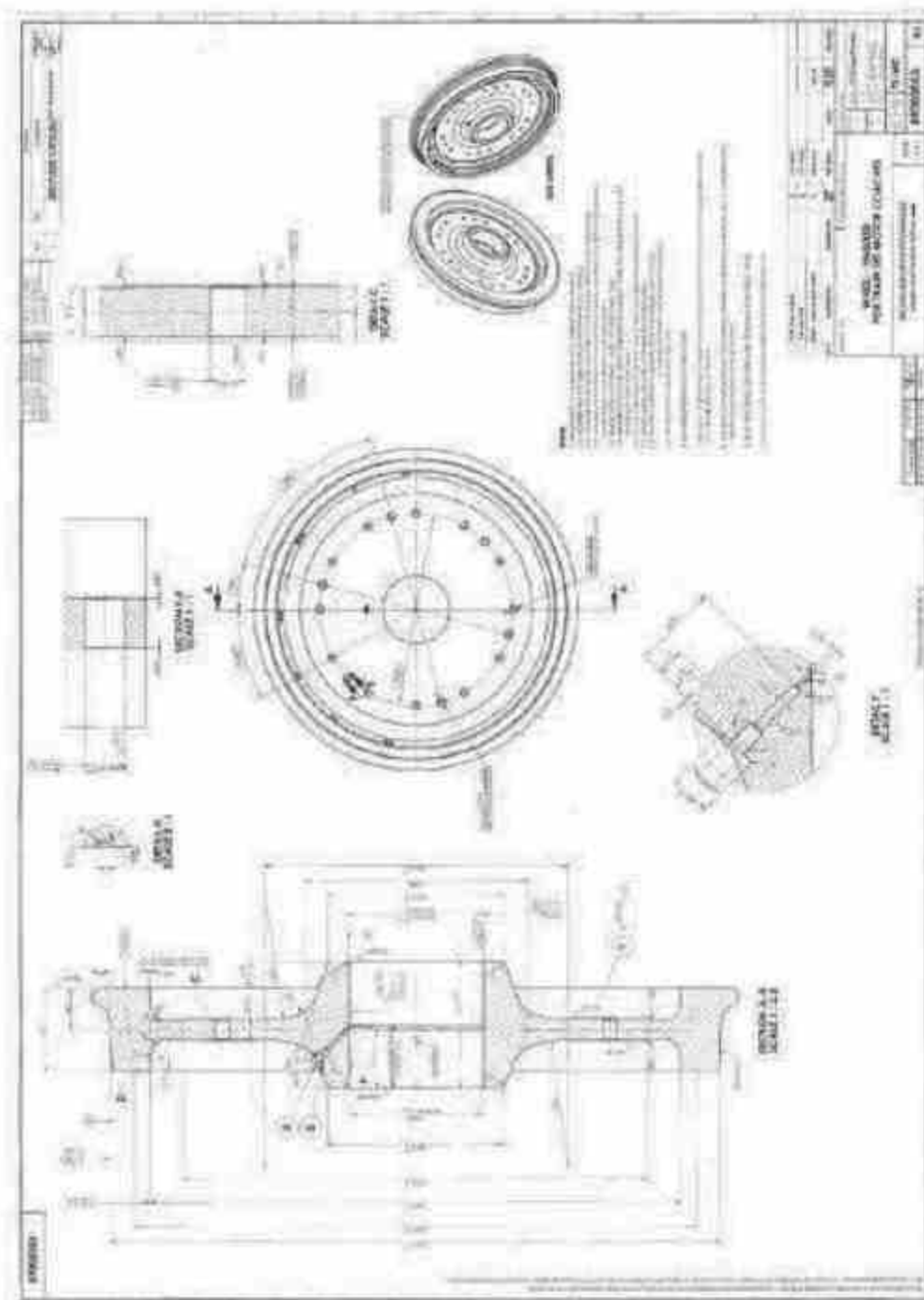




14027











**Consignee's Certificate for Quarterly Work Done Under CAMC**

1. Name of Plant: \_\_\_\_\_
2. Consignee \_\_\_\_\_
3. AT No. \_\_\_\_\_
4. Name of Contractor \_\_\_\_\_
5. Quarterly charges for CAMC(Standard): Rs. \_\_\_\_\_  
As per AT no. \_\_\_\_\_ dt. \_\_\_\_\_
6. Quarter for which bills are preferred: \_\_\_\_\_  
From: \_\_\_\_\_ To: \_\_\_\_\_
7. No. of Breakdowns during the quarter: \_\_\_\_\_
8. **Calculation of Penalty and Net CAMC charges payable to Contractor for the quarter:**
  - i. Total Plant Down Time(in days): \_\_\_\_\_
  - ii. Standard down days for preventive maintenance (in days/quarter): \_\_\_\_\_
  - iii. Total grace period for breakdown: \_\_\_\_\_
  - iv. Net downtime for the plant  $[(i) - \{(ii) + (iii)\}]$ : \_\_\_\_\_
  - v. 100% Availability for the quarter (in days): \_\_\_\_\_
  - vi. Actual availability  $[(v) - (iv)]$ : \_\_\_\_\_  
Actual availability in %age  $[\{(vi)/(v)\} \times 100]$ : \_\_\_\_\_
  - vii. Calculation of penalty:
    - a. %age availability below 90% to 80%: \_\_\_\_\_
    - b. %age availability below 80%: \_\_\_\_\_
    - c. Penalty  $[\{(vii a) \times (5) \times 0.005 + (vii b) \times (5) \times 0.01\}]$ : \_\_\_\_\_
  - viii. Net amount payable as CAMC charges to  $[(5) - (vii c)]$ : \_\_\_\_\_

It is certified that all spares borrowed by the contract or for the previous of quarter have been returned in good condition.

**Signature of authorized representative of consignee**

**ANNEXURE- G OF SECTION-VI**  
**QUALITY ASSURANCE PLAN**

**MACHINE DESCRIPTION-----**

Category	S.No.	Component/ Process	Sample Size	TypeOf Check	Quality record	TYPEOF CHECK	REMARKS
Bought Out Raw Material		Steels	1 Sample/ Size	Chemical& Mech.	TC& INV.	V	
Bought Out Components		Bearings	100%	Visual	Inv	V	
		Electric Motors	100%	Review of TC	TC & INV	V	
		Hydraulic Pumps& Elements	100%	Review of TC	TC& INV	V	
		Rubber Seals, O Rings & Seals	100%	Visual	TC& INV.	V	
		Controllers	100%	Review of T C	TC & INV	V	
		Ball Screw	100%	Visual	IIR	V	
Bought out sub assemblies		Weld joints					
		Load Bearings	100%	RT	IR	V	
		Others	5%	DPT	IIR	V	
Hardness of components		Machine Bed	100%	Hardness	IIR	V	
		Gears	100%	Hardness	IIR	V	
		Couplers	100%	Hardness	IIR	V	
		Hydraulic components	100%	Hardness	IIR	V	
In process Inspection stage		Heat Treatment	100%	Review of Inv.	IIR	V	
		Castings	100%	Visual	IIR	V	
		Spindles	100%		IIR	V	
		Surface finish of components	Random	Surface	IIR	V	
		Noise level	100%	Sound	IIR	V	
		Temperature rise	100%	Measurement	IIR	V	
		Structures Geometry alignment, Guideways	100%	Relevant ISO/DIN/IS/HS standard	IR	V	

INV - Invoice  
TC - Test Certificate  
V - Verification  
CHP- Customer Hold Point  
IIR - Internal Inspection Report  
IR - Inspection Report

ANNEXURE-H OF SECTION- VI

PROFORMA OF CERTIFICATE TO BE ISSUED BY CONSIGNEE AFTER SUCCESSFUL PROVE OUT  
/ COMMISSIONING OF THE MACHINE

No. \*\*\*\*\*

Date:- \*\*\*\*\*

M/s.

**Sub: Certificate for Prove out of Machine.**

**Ref: Central Railway Contract No. \*\*\*\*\***

1. This is to certify that the machine as detailed below, has been received in good condition along with all the concomitant / standard and special / optional accessories & spares in terms of above referred Contract (subject to remarks in Item 2) and the same has been installed and commissioned:

- a) Description of the Machine (s) :
- b) Machine No. (s) :
- c) Quantity :
- d) Name of the consignee :
- e) Date of first submission of GA/ foundation drawings (if applicable):  
Indicate delays in number of days: On Railways account: ..... days  
On Firm's account: .....days  
**Total: ..... days**
- f) Date of final approval of GA/ foundation drawings (if applicable):  
Indicate delays in number of days: On Railways account: .....days  
On Firm's account: .....days  
**Total: ..... days**
- g) Date of receipt of the machine:

- h) Date of Joint verification :
- i) For machines ordered on non turnkey basis:
- i) Date of power supply provided for the machine by the Railways:
  - ii) Date of call to the contractor after site/foundation /Installation etc is ready:
- j) For machines ordered on turnkey basis
- i) Date of Intimation of readiness of site for starting foundation Work:
  - ii) Date of readiness of foundation by the contractor:
  - iii) Date of readiness of other infrastructure facilities like shed, track linkage etc. by Railway/contractor(delete whichever is not applicable):
  - iv) Date of power supply provided for the machine by the Railways:
  - v) Indicate delays in number of days: On Railways account :.....days  
On Firm's account: .....days  
Total: .....days
- k) Time allowed for commissioning after date of call as per l) ii) above or after date of readiness of site as per m) iii) above. Number of days allowed .....days after receipt of the machine at site (As per clause no. 7 SN.11 of schedule IV)
- l) Date of commissioning of the machine:  
Indicate delays in commissioning in number of days: .....days
- i) On firm's account due to reasons such as non arrival of engineer, problem in machine/ tooling etc:  
.....(state reason) ..... days during commissioning  
.....(state reason) .....days during prove out
  - ii) On Railway's account due to reasons such as non provision of Raw/Trial material, Crane, staff, measuring tools/gauges etc:  
..... (state reason) ..... days during commissioning  
..... (state reason) .....days during prove out
- m) Whether delay in supply of the machine (if any), has caused any loss / inconvenience to the Railways (Yes / No)  
If Yes, extent of loss in monetary terms Rs..... .... (details to be enclosed if loss is quantifiable. However, if loss is not quantifiable then indicate "Not Quantifiable" in the space provided)

2. Details of Accessories / Spares not yet supplied and recoveries to be made on that account

S.N.	Description	Amount to be recovered
a)		
b)		

3. The proving test has been done to our entire satisfaction and the operators have been trained to

operate the machine as per provisions of Contract ; if not , the amount to be recovered on this amount Rs.-----.

4. You have failed to fulfill the contractual obligations with regard to the following:  
a)  
b)
5. The amount of recovery on account of non-supply of accessories and spares is given under para no. 2, 3 above & losses / damage on account of your failure to fulfill the contractual obligations as given in para 1 above will be advised to you by Central Railway and recovered from your bills / performance guarantee bond.
6. The issue of commissioning / PTC certificate proves only the technical acceptability and functioning of the machine on the date of issue of the certificate. This issue of PTC does not amount to waiver of any of the terms and conditions of the contract or delay in supply of drawings, machine or commissioning thereof and it does not absolve the supplier of its liability for any loss or damage suffered by the Railways do to the same.

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Designation: JAG OFFICER(Consignee)

Office Stamp: \_\_\_\_\_

Copy by Speed / Regd. Post to :

- 1) PCMM / CENTRAL RAILWAY
- 2) Sr. DFM / WAO / Dy. CAO / PFA / CENTRAL RAILWAY
- 3) PCME/CENTRAL RAILWAY
- 4) CME/Plg. CENTRAL RAILWAY

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Designation: JAG OFFICER(Consignee)

Office Stamp: \_\_\_\_\_

NOTE : Sr. Scale Officer having independent charge is also authorized to sign this certificate.