

टेलैक्स : 0535-2424 RDSO-IN
फैक्स : 91-0522-458500
तार : 'रेलमानक' लखनऊ
Telegram : 'RAILMANAK', Lucknow
टेलीफोन/Tele : 451200 (PBX)
450115 (DID)



भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226 011
Government of India-Ministry of Railways
Research Designs & Standards Organisation
LUCKNOW - 226 011



TECHNICAL CIRCULAR NO. 32

No. EL/3.6.4

Dated 28.10.98

CHIEF ELECTRICAL ENGINEER,

1. Central Railway, Mumbai CSTM-400 001
2. Eastern Railway, Fairlio Place, Calcutta-700 001
3. Northern Railway, Baroda House, New Delhi-110 001
4. Southern Railway, Park Town, Chennai-600 003
5. South-Eastern Railway, Garden Reach, Calcutta-700 043
6. Western Railway, Churohgate, Mumbai-400 020
7. South-Central Railway, Rail Nilayam, Secunderabad-500 371
8. Chittaranjan Locomotive Works, Chittaranjan-713 331
9. Railway Electrification, CORE, Allahabad
10. Director, IRIEEN, Nasik Road, Nasik - 422101

Sub: Machine and Plant for sheds holding upto 120 electric locomotives.

The list of M & P for electric locomotive sheds for 100 locos was drawn in 1972. Over a period of more than 25 years, there has been considerable changes in the type to M and P particularly in view of more and more use of electronic equipments and sea change in M.I.S. and communications.

The revised M & P requirements for shed holdings of upto 120 locos is enclosed for guidance of the Railways.

DA:As above

(Ramesh Chandra)
for Director General (Elect).

Copy to: Secretary (Electrical), Railway Board, New Delhi-110001 Encl: As above

(Ramesh Chandra)
for Director General (Elect).

TECHNICAL CIRCULAR NO. 32

ANNEXURE

**LIST OF MACHINE TOOLS, INSTRUMENTS, LIFTING, HANDLING,
COMMUNICATION, TEST EQUIPMENT AND TRANSPORT FACILITIES**

LIST 1 - MACHINE TOOLS (GENERAL PURPOSE MACHINES)	Shed Holding	
	100	120

A- Machine Shop			
1	Lathe 250 mm swing x 1500 mm between centres	1	1
2	Lathe 150 mm swing x 1000 mm between centres	1	1
3	Radial drilling machine	1	1
4	Universal milling machine 900 mm x 300 mm table With indexing attachment	1	1
5	Shaping machine, 600 mm stroke	1	1
6	Power drill (40 mm hole in M.S.)	1	1
7	Power Hacksaw to cut 150 mm dia M.S.	1	1
8	Pipe Threading machine	1	1
9	Pipe Threading die sets	2	2
10	Pipe bending machine	1	1
11	Marking table	1	1
12	1.5 KVA portable generating sets	4	4

B- Relay Room			
1	Sensitive drill (20 mm hole in M.S.)	1	1
2	Watchmaker`s lathe	1	1


EDSE/RDSO

C- Welding & Whitemetalling Section			
1	Portable welding set 300 A dc	1	2
2	Portable transformer welding plant 350 A	6	6
3	Oxyacetylene welding and cutting set with 25 sets of cylinders for oxygen and acetylene.	3	3
4	Eutectic weld deposit torch set	1	1

D- Painting Section			
1	Spray guns portable Compression unit and reservoir with 2 spray guns	1	1

E- Tool Room			
1	Portable electric tools grinder drills wrenches set	3	3
2	Torque wrenches (Pneumatic/electrically operated)	5	5

F- Compressed Air Set			
1	Air compressor-complete with air drier filter after cooler, reservoir, outlet valves 250 cfm.-9 kg/cm sq.	2	2

G- Vacuum cleaning, Water pumps and Sanding			
1	Portable vacuum plant	2	2
2	Filter cleaning plant	1	1
3	Pit dewatering portable electric pump	3	3
4	Booster pump for washing lines	2	2
5	Sand drying and sieving plant	1	1

M. S. S.

EDSE/RDSO

H - Other Electrical Equipment			
1	Battery charger	2	2
2	Portable battery charger	1	1
3	Loading resistor for battery	1	1
4	Distilled water plant (Electrical)	2	2
5	Oil centrifuging and filtering plant	1	2
6	Pneumatic crimping tool for power cable	1	1
7	Hand crimping tool for control cables	4	4
8	Panto assembly fixture	1	1

LIST 2 - SPECIAL PURPOSE MACHINE TOOLS	Shed Holding	
	100	120

A- Bogie and Wheel Sets			
1	Pit type wheel lathe (with mechanical scrap removal and disposal)	1	1
2	Horizontal boring machine 1000 mm x 1000 mm table.	1	1
3	Hack's burners	2	2
4	Bogied squaring Jig	1	1
5	Wheel profiling set (tool room)	1	1
6	Grease guns and lubricating equipment (One set for each type of oil or grease)	5	5
7	Lifting beam for locomotive body with stand	3	3
8	Lifting tackle for bogie	4	4
9	Spring testing equipment	1	1
10	Shock absorbers snubbers testing rig	1	1
11	Hydraulic Dampers testing and Calibration Machine	1	1

M. S. S.

EDSE/RDSO

B- Traction Motor Armature Rewinding Shop			
1	Pinion extractor	2	2
2	Pinion heating oil bath or induction heater	2	2
3	Autotransformer-rectifier unit 100 V x150 A dc	1	1
4	Commutator turning, Mica undercutting and chamfering and armature banding lathe	1	1
5A	Dynamic balancing machine for Aramature (1 tonne)	1	1
5B	Dynamic balancing machine for impellers (200 kg)	1	1
5C	Portable balancer for balancing of rotors and impellers of auxiliary machine in position (500-6000 r.p.m. range)	1	1
6	Vacuum impregnating plant	1	1
7	Baking oven 200 °C with trolley	2	2
8	Brazing tongs with transformer	1	1
9	Bearing extractor set	2	2
10	Hand opeated shearing machine for insulation	1	1
11	Traction Motor assembly fixture set (shop made), One set for each type of motor.	1	1
12	Electric motor Checker tyep EMC-22 (SMI/163) for checking rotor bar cracks in the rotors of auxiliary machine & arno	1	1

LIST 3 - TESTING AND MEASURING INSTRUMENTS AND PANELS	Shed Holding	
	100	120

A - Testing Panels			
1	Test and calibration panel with meters for each type of relay	1	1
2	Test and calibration panel with meter for speedometer	1	1
3	Test panel with meters for auxiliary machines	1	1

M. S. D. S.
EDSE/RDSO

4	Loading dynamometer with test bed for auxiliaries	1	1
5	Test panel with meters for contactors circuit breakers	1	1
6	Brake and pneumatic equipment test panel including air compressor 500 litres per min 15 kg/cm sq	1	1
7	Air brake pneumatic testing rig	1	1
8	Test panel for testing of SMGR	1	1

B- Testing and Measuring Instruments			
1A	Megger 2500 V	2	2
1B	Megger 1000 V	6	6
2	Megger 500 V	4	4
3	Universal multimeter	6	6
4	Portable voltmeter dc	3	3
5	Portable voltmeter ac	3	3
6	Portable ammeter dc	3	3
7	Portable ammeter ac	3	3
8	Current transformer set 20 to 2000 A	2	2
9	Ammeter shunts 75 m V 2000 A	2	2
10	Millivoltmeter 0-75 mV	2	2
11	Cathode Ray Oscilloscope 10 cm display double beam (Storage type)	1	1
12	High voltage tester 0-15 kV	1	1
13	High voltage 0-75 kV	1	1
14	Oil tester 0-50 kV	2	2
15	Current injection set 2000 A 3 V dc	1	1

M. S. S.
EDSE/RDSO

16	Silicon diode tester	3	3
17	Electroplating thickness measuring equipment	1	1
18	Contact pyrometer (0 - 200 °C)	3	3
19A	Ultrasonic crack detector for testing wire metal bonding in suspension bearing	1	1
19B	Ultrasonic crack detector for Axles and traction motor shafts	2	2
20	Zygo ultraviolet light crack detector	1	1
21	Brinell hardness tester	1	1
22	Shore hardness tester	1	1
23	Spring balance (0-1 kg)	2	2
24	Spring balance (0-3 kg)	2	2
25	Spring balance (0-5 kg)	2	2
26	Spring tester	1	1
27	Recording ammeter	2	2
28	Recording voltmeter	2	2
29	Aneomometer	2	2
30	Manometer	2	2
31	Vibration meter	1	1
32	Capacitance and induction bridge	1	1
33	Clip on ammeter 0-5-10-25-50-100-250 A	2	2
34	Dial gauge, Cernier valiper, micrometer and feeler gauge (1 set each)	4	4
35	Revolution counters	3	3
36	KWHr meter with accessories for mounting on loco	2	2
37	Electric coil tester	1	1
38	Electric timer	1	1

M. S. D. S.
EDSE/RDSO

39	Portabel relay testing kit	1	1
40	Commutator profile recorder	1	1
41	Stop watch	2	2
42	Illumination meter	1	1
43	Wheat stone bridge	1	1
44	Distilled water tester	1	1
45	Stroboscope/techometer	1	1
46	Gear teeth micrometer	1	1
47	Tan-delta measuring instrument	1	1
48	Ultrasonic hardness tester	1	1
49	Dissolved gas analysis apparatus	1	1
50	Universal tensile testing machine (40 tonne)	1	1
51	Test rig for VCB	1	1
52	Surge comparison tester	1	1
53	Shock pulse meter for bearing	1	1
54	Bearing room with ultrasonic cleaning facility	1	1
55	Induction heater for mounts dismounting of bearing	1	1

Note: Relay maintenace, bearing maintenance, speedometer section, SMGR overhauling section to be in air conditioned rooms


EDSE/RDSO

LIST 4 – LIFTING, HANDLING AND TRANSPORT EQUIPMENT		Shed Holding	
		100	120
A - Lifting and Handling Equipment			
1	50 tonne electric overhead travelling crane with 6 tonne auxiliary hoist	2	2
2	25 tonne EOT crane with 6 t auxiliary hoist	1	1
3	15 tonne EOT crane	1	2
4	Lifting tackles for transformer traction motor, armature loco underframe, roof sections, bogie, wheel set, loco body etc.	2	2
5	2 tonne chain pulley hoist	3	3
6	Capstan units 3 tonnes	6	6
7	Turfors 3 tonnes	3	3
10	30 tonne screw jack electrically operated with traversing bases (4 numbers a set)	1	1
11	20 tonne high lift hydraulic jack (4 numbers a set)	1	1
12	Accommodation bogies for each type of loco (loco set)	1	1
B. Transport Facilities			
1	2 tonne fork lift battery truck	1	1
1A	5 tonne fork lifter	2	2
2	1 tonne pallet battery truck	1	1
3	1 tonne material hand trolley platform type (rubber tyres)	3	3
4	1 tonne hand pallet trolley	3	3
5	7.5 tonne trolley on rail (for traction motors)	2	2
6	10 tonne truck	1	1
7	Jeep with trailer	1	1
8	Departmental wagon	1	1
9	Material handling van fitted with crane	1	1
10	Breakdown vehicle	1	1

M. S. S.
EDSE/RDSO

C. Weighing machine/Scales			
1	Weighing machine 1 tonne (Stores Depot)	1	1
2	Weighing machine 50 kg (Stores Depot)	1	1

LIST 5 – COMMUNICATION FACILITIES		Shed Holding	
		100	120

1	Fax machine	1	1
2	Telex machine	1	1
3A	Telecom facility (with electronic exchange of 100 lines)	1	1
3B	Linkage of shed computer with Zonal head Quarter and Divisional HQs		
3C	V.H.F. sets (Walkie- Talkie)	30	30
4	Laptop P.C.	1	1
5	PC based computer system with tape drive, printer etc and linked with stores computer	1	1

LIST 6 – GENERAL PURPOSE MACHINES		Shed Holding	
		100	120

1	Rain water leakage testing (shed made)	1	1
2	Facility for mechanised washing of loco body for coaching locos	1	1
3	Floor scrubber	5	5
4	Portable compressed Air system for blowing out the pipelines in IOH/POH in situ	1	1
5	Industrial vacuum cleaner for cleaning inside the loco	2	2

M. S. S.

EDSE/RDSO

LIST 7 – WORK BENCHES , LOCKERS Etc.		Shed Holding	
		100	120

1	Workmen's tables, Battery charging Benches, Armature Trestles.		
2	Bench vices		
3	Individual fitters tools		
4	Steel lockers for workmen		
5	Steel almirahs and stores racks		
6	Steel tables and chairs, cardex boards, filing cabinets, index cards cabinets, typewriter, calculating machines for PPO's office.		
7	Tables, chairs for officers and supervisors, almirahs, filing racks, cabinets, typewriters, duplicator, drawing office and ferro printing equipment.		
8	Time office equipment, Time clock, ticket filing racks, tables and chairs.		

Manda

EDSE/RDSO