



भारत सरकार - रेल मंत्रालय
अनुसंधान, अभिकल्प और मानक संगठन
लखनऊ - 226 011
EPBX (0522) 2451200
Fax (0522) 2456500

Government of India-Ministry of Railways
Research Designs & Standards Organisation
Lucknow - 226 011
OIC (0522) 2450115
DID (0522) 2455310



क्रमांक - 11

TM/HM/TEX/pt.III

Date: 14-03-2019

- I- मुख्य अभियन्ता (ट्रैक मशीन)
1. मजरा रेलवे, सीएचटी, गुवाहाटी-400 001
 2. फैरिली प्लेस, ई ई रेलवे, कोलकाता-700 001
 3. बार्डा हाउस, उत्तर रेलवे, नयी दिल्ली-110 001
 4. उत्तरपूर्व रेलवे, गोरखपुर-273 012
 5. मालिगांव, उत्तरपूर्व रेलवे, गुवाहाटी-781 011
 6. पार्क टाउन, दक्षिण रेलवे, चेन्नई-600 003
 7. रेल निलय, दक्षिण मध्य रेलवे, सिकंदराबाद-500 371
 8. गार्डन रीच, दक्षिणपूर्व रेलवे, कोलकाता-700 043
 9. चर्चगेट, पश्चिम रेलवे, मुंबई-400 020
 10. उत्तर अभिनव रेलवे, जयपुर-302 001
 11. पूर्व मध्य रेलवे, हाज़ीपुर-844 101
 12. दक्षिण पश्चिम रेलवे, हुबली-580 023
 13. उत्तर मध्य रेलवे, इलाहाबाद-211 015
 14. पूर्व रेलवे, भुवनेश्वर-751 001
 15. पश्चिम मध्य रेलवे, जबलपुर-482 001
 16. दक्षिण पूर्व मध्य रेलवे, बिलासपुर-495 004
- II- उप मुख्य अभियन्ता (ट्रैक मशीन)
1. सी पी डी एवं कार्यशाला, गोरखपुर-273 012
 2. सी पी डी एवं कार्यशाला, दक्षिण मध्य रेलवे सिकंदराबाद, सिकंदराबाद, जिला गुंटूर, आंध्र प्रदेश-521241
- III- प्रमोवाइजरी कार्गो व सप्लाय मशीन गैरलालाबाद-211011

Chief Engineer (Track Machines)
CST, C R, Mumbai - 400 001,
Fairlie Place, E R, Kolkata-700 001,
Baroda House, N R, New Delhi-110 001,
N E R, Gorakhpur-273 012,
Maligaon, N F R, Guwahati -781 011,
Park Town, S R, Chennai-600 003,
Rail Nilayam, SCR, Secunderabad-500 371,
Garden Reach, S E R, Kolkata-700 043,
Churchgate, W R, Mumbai-400 020,
N W R, Jaipur-302 001,
E C R, Hazipur-844 101
SWR, Hubli-580 023
NCR, Allahabad-211 015
East Coast Rly, Bhubaneswar-751 001
WCR, Jabalpur-482 001
South East Central Rly, Bilaspur-495 004
Dy Chief Engineer (Track Machines)
CPOH WPRKSHOP, PO, Dhoomanganj
Allahabad-221012
CPOH WPRKSHOP, South Central Railway,
Rayanapadu, Vijaywada, Dist.-
Krishna, Andhra Pradesh-521241
Principal, IRTMTC, Pipal
Gaon, Allahabad-211011

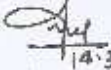
विषय : हाई आउटपुट टैम्पिंग एवं स्टेबलाइजिंग मशीन (09-3X) डायनेमिक की क्लिटिकल स्पेर्स पार्ट सूची ।

Sub: Critical Spares Part list of High Output Tamping & Stabilizing Machine (09-3X) Dynamic

हाई आउटपुट टैम्पिंग एवं स्टेबलाइजिंग मशीन (09-3X) डायनेमिक की क्लिटिकल स्पेर्स पार्ट सूची की अनंतिम पत्र सं सीएम/एच/एम / टेक्स पार्ट III दि. 11.02.2019 द्वारा जारी किया गया था । जिसमें सुधार के प्रस्ताव सुची तैयार की गई है । (निकट) प्रो. आपकी सूचनाएं तथा मशीन के कर्मचारियों की फीडबैक में काम कर रहे हैं । जो मार्गदर्शन हेतु सहायक है । यद्यपि उपरोक्त सूची बनाते समय सभी सावधानियां बरती गई हैं किंतु भी यदि कोई त्रुटि हो तो आपका ध्यान सुझावों/ टिप्पणियों को सुधार हेतु ई-मेल/ फॉक्स/ पोस्ट द्वारा अद्योद्योक्तियों को भेजे ।

Provisional Critical Spares Part list of High Output Tamping & Stabilizing Machine (09-3X) Dynamic has been circulated vide letter no. TM/HM/TEX pt.III dt.11.02.2019. After correction in it, the list is prepared. A copy of the same is enclosed herewith for your information and guidance of the machine staff working in the field. However every care has been taken during preparation of the above said list, the discrepancy noticed, if any, may be brought to the knowledge of the undersigned by email/fax/post for further improvement.

DA: As above


14.3.19

(श्याम प्रकाश)

निदेशक स्तंभक मशीन - III

INDIAN RAILWAYS

CRITICAL SPARES OF TRACK MACHINES

BOOKLET FOR WORK SITE TAMPERS

High Output Tamping & Stabilizing Machine

(09-3X) Dynamic

March-2019

PREFACE

For maintenance of any machine, timely availability of spare parts and consumables play an important role. Thus, to keep the machine in sound condition, first and foremost prerequisite is availability of spares and consumables. As there are thousands of items/spares which are required for maintenance of machine, it is very much required to identify critical spares which are vital and in turn, to ensure availability of such spares well within the scheduled time.

On the basis of experience of Track machine working on Indian Railways, a need for this list was felt. Accordingly, list for Critical Spares of High Output Tamping & Stabilizing Machine (09-3X) Dynamic have been prepared. It may be noted that this is the list of spares required for the normal maintenance of the machine for one year only and does not include the spares required for IOH, POH and other spl. Maintenance. Requirement for such schedule maintenance (IOH/POH) and emergency maintenance/attention, may be assessed separately on need basis by zonal railways itself

March, 2019

(Om Prakash)
Director Track Machine-III

INDEX

| Sl. No. | Category | Page no. |
|----------------|------------------------------------|-----------------|
| 1 | ENGINE | 1 |
| 2 | HYDRAULICS | 2-6 |
| 3 | MECHANICAL | 7-9 |
| 4 | ELECTRICAL & ELECTRONIC | 10 |
| 5 | PNEUMATIC | 11-12 |

SITE = At Machine, STMD= Satellite Machine Depot, ZTMD= Zonal Track Machine Depot

| S.No | Brief description | Part no. | Nos per M/C | Estt. life cycle in year | Requirement per m/c | | |
|--------------------------------|--|---------------------------------------|-------------|--------------------------|---------------------|---------|---------|
| | | | | | SITE | STMD | ZTMD |
| 1.0 ENGINE MODEL NO- C9 & C-18 | | | | | | | |
| 1.1. | Self-starter | 105-5081(C9) | 1 | 3 | 1 | 0 | 0 |
| 1.2. | Self-starter | 105-5080(C18) | 1 | 3 | 1 | 0 | 0 |
| 1.3. | Alternator(C-9) | 081769643 | 1 | 6 | 0 | 0 | 0.5* |
| 1.4. | Alternator(C-18) | 081769643 | 1 | 6 | 0 | 0 | 0.2* |
| 1.5. | Alternator(Power Pack) | 081852021 | 2 | 6 | 0 | 0 | 0.3* |
| 1.6. | Fuel –Filter (C-9) | 1R-0749 | 1 | 0.5 | 1 | 1 | 0 |
| 1.7. | Fuel –Filter (C-9) | 1R-0751 | 1 | 0.5 | 1 | 1 | 0 |
| 1.8. | Fuel –Filter (C-18) | 1R-0749 | 2 | 0.5 | 2 | 2 | 0 |
| 1.9. | Fuel –Filter (Diesel tank) | HYD-501.10.10/H300W/ES FITTEINSATZ | 2 | 0.5 | 2 | 2 | 0 |
| 1.10. | Fuel Filter (water Separator) | 326-1643 | 1 | 0.5 | 1 | 1 | 0 |
| 1.11. | Lube Oil (C-9) | CAT DEO 15W-40 | 40 lts. | 0.5 | 148lts** | 74lts** | 74lts** |
| 1.12. | Lube Oil (C-18) | CAT DEO 15W-40 | 36 lts. | 0.5 | | | |
| 1.13. | Engine oil Filter (Advanced efficiency) (C-9-1 no. & C-18-2nos.) | 1R-1808 | 3 | 0.5 | 2 6 | 0 | 0 |
| 1.14. | Lub. Oil Pressure gauge | 275-2096 | 1 | 6 | 0 | 0 | 0.2* |
| 1.15. | Air Cleaner outer (C-9) | 1327167 | 1 | 1 | 1 | 0 | 0 |
| 1.16. | Air Cleaner inner (C-9) | 612510 | 1 | 1 | 1 | 0 | 0 |
| 1.17. | Air Cleaner outer (C-18) | 1063969 | 1 | 1 | 1 | 0 | 0 |
| 1.18. | Air Cleaner inner (C-18) | 1063973 | 1 | 1 | 1 | 0 | 0 |
| 1.19. | V-belt (C-9) for radiator fan | C 1610 C61 | 2 | 1 | 2 | 0 | 0 |
| 1.20. | V-belt (C-9) for water pump | A-4896 | 1 | 1 | 1 | 0 | 0 |
| 1.21. | V-belt (C-9) for alternator | B 1080 B41 | 1 | 1 | 1 | 0 | 0 |
| 1.22. | V-belt (C-18) for radiator fan | 6N-7054 CAT F 5211F5 | 3 | 1 | 3 | 0 | 0 |
| 1.23. | V-belt (C-18) for alternator | XPB 1500 | 1 | 1 | 1 | 0 | 0 |
| 1.24. | V belt for Alternator Motor Drive | AVX13X 925La | 1 | 1 | 1 | 0 | 0 |
| 1.25. | V belt for Alternator Motor Drive | 13X1040La | 2 | 1 | 2 | 0 | 0 |
| 1.26. | V belt for Motor for Alternator | HY90N42N | 1 | 1 | 1 | 0 | 0 |

*MINIMUM QUANTITY 1

** (40+36) lts/0.5=152lts, plus 12lts/month is given for top up.

| S.No | Brief description | Part no. | Nos per M/C | Estt. lifecycle in year | Requirement per m/c | | |
|----------------|-----------------------------------|-----------------------|-------------|-------------------------|---------------------|------|------|
| | | | | | SITE | STMD | ZTMD |
| 2.0 HYDRAULICS | | | | | | | |
| 2.1. VALVE | | | | | | | |
| 2.1.1. | Servo valve for lining/ levelling | EL-T76.00-MO | 3 | 6 | 0 | 0 | 0.5* |
| 2.1.2. | Check Valve | HY155.12 | 2 | 6 | 0 | 0 | 0.3* |
| 2.1.3. | Check Valve | HY151.33/0,5BAR12 | 4 | 6 | 0 | 0 | 0.6* |
| 2.1.4. | Plug-In Check Valve | HY6RS/EINSTECK-RSV | 3 | 6 | 0 | 0 | 0.5* |
| 2.1.5. | Check Valve | HY151.217/5BAR | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.6. | Check Valve | 90382 | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.7. | Check Valve | 90381 | 3 | 6 | 0 | 0 | 0.5* |
| 2.1.8. | Check Valve | HY151.33/5BAR16 | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.9. | Check Valve | HY151.19 | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.10. | Check Valve | HY151.13/5 | 2 | 6 | 0 | 0 | 0.2* |
| 2.1.11. | Check Valve | HY151.33/5BAR24 | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.12. | Check Valve | HY151.13/3 | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.13. | Check Valve | HY151.33/0,5BAR06 | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.14. | Check Valve | HY155.12 | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.15. | Check Valve | HY151.33/0,5BAR16 | 2 | 6 | 0 | 0 | 0.3* |
| 2.1.16. | Proportional Valve | HYN25-RPE325.TD | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.17. | Proportional Valve | HY151.187/75BAR | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.18. | Proportional Valve | HYA25-RPE2-325.DSO728 | 4 | 6 | 0 | 0 | 0.6* |
| 2.1.19. | Prop. Pressure Relief Valve | HY511.46 | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.20. | Pressure Relief Valve | HY511.38-160BAR | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.21. | Safety Valve | HY 56R | 2 | 6 | 0 | 0 | 0.3* |
| 2.1.22. | Safety Valve | HY511.50/350/DS | 2 | 6 | 0 | 0 | 0.3* |
| 2.1.23. | Safety Valve | HY151.188/5 | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.24. | Safety Valve | HY151.215 | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.25. | Cut Off Valve | HY511.11 | 2 | 6 | 0 | 0 | 0.3* |
| 2.1.26. | Reducing Valve | HY55R-B | 3 | 6 | 0 | 0 | 0.5* |
| 2.1.27. | Reducing Valve | HY511.31 | 4 | 6 | 0 | 0 | 0.6* |
| 2.1.28. | Reducing Valve | HY511.51 | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.29. | Pressure Relief Valve | HY511.15 | 2 | 6 | 0 | 0 | 0.3* |
| 2.1.30. | Pressure Relief Valve | HY511.08 | 2 | 6 | 0 | 0 | 0.3* |
| 2.1.31. | Pressure Relief Valve | HY511.07 | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.32. | Pressure Relief Valve | HY511.10 | 1 | 6 | 0 | 0 | 0.2* |
| 2.1.33. | Pressure Relief Valve | HY511.06 | 4 | 6 | 0 | 0 | 1 |

*MINIMUM QUANTITY 1

| S.No | Brief description | Part no. | Nos per M/C | Estt. life cycle in year | Requirement per m/c | | |
|---------------------|---|----------------------------|-------------|--------------------------|---------------------|------|------|
| | | | | | SITE | STMD | ZTMD |
| 2.2. PUMP | | | | | | | |
| 2.2.1. | Triple Pump | HY832X24.17.06LI | 1 | 6 | 0 | 0 | 0.2* |
| 2.2.2. | Dual Pump | HY843X35.35LI | 2 | 6 | 0 | 0 | 0.3* |
| 2.2.3. | Triple Pump | HY832X31.17.14LI | 1 | 6 | 0 | 0 | 0.2* |
| 2.2.4. | Dual Pump | HY831X38.22RE | 1 | 6 | 0 | 0 | 0.2* |
| 2.2.5. | Triple Pump | HY842X38.22.12RE | 1 | 6 | 0 | 0 | 0.2* |
| 2.2.6. | Variable Displacement Pump | HY718X125R/EP4/35A | 1 | 6 | 0 | 0 | 0.2* |
| 2.2.7. | Variable Displacement Pump | HY718X125L/EP4/21A! | 1 | 6 | 0 | 0 | 0.2* |
| 2.2.8. | Single Pump | HY72SX31LI | 2 | 6 | 0 | 0 | 0.3* |
| 2.2.9. | Single Pump | HY72SX31RE | 2 | 6 | 0 | 0 | 0.3* |
| 2.3. MOTOR | | | | | | | |
| 2.3.1. | Hyd. Motor for Sat. Drive | HY901N200/E | 2 | 6 | 0 | 0 | 0.3* |
| 2.3.2. | Hyd. Motor | HY90N42M | 3 | 6 | 0 | 0 | 0.5* |
| 2.3.3. | Hyd. Motor | HY90N52M | 1 | 6 | 0 | 0 | 0.2* |
| 2.3.4. | Hyd. Motor | HY916N800 | 1 | 6 | 0 | 0 | 0.2* |
| 2.3.5. | Hyd. Motor | HY935.N10-P | 3 | 6 | 0 | 0 | 0.5* |
| 2.4. FILTER ELEMENT | | | | | | | |
| 2.4.1. | Servo Filtering element | DL40.60.3H | 2 | 0.5 | 2 | 1 | 1 |
| 2.4.2. | Filter Cartridge for ZF | HY-D501.225.25H/ES | 1 | 0.5 | 2 | 0 | 0 |
| 2.4.3. | Suction Filter Cartridge | HY-S501.560.150ES | 6 | 0.5 | 10 | 1 | 1 |
| 2.4.4. | Suction Filter Cartridge | HY-S501.160.P10H/ES | 1 | 0.25 | 2 | 1 | 1 |
| 2.4.5. | Proportional filter | HYD.501.32.10.ES | 5 | 0.25 | 10 | 5 | 5 |
| 2.4.6. | Return filter Cartridge | HY-R501.330.10 / ES | 2 | 0.5 | 2 | 2 | 0 |
| 2.4.7. | DTS suction filter cartridge | HYD 501.225.10 / ES | 1 | 0.5 | 2 | 0 | 0 |
| 2.4.8. | Superfine filter cartridge | HY-R507.05.01HES! | 4 | 0.5 | 6 | 1 | 1 |
| 2.5 CYLINDER | | | | | | | |
| 2.5.1. | Tamping Unit-Lifting Cylinder | HZDPA.080.040.0835.1.001PA | 4 | 6 | 0 | 0 | 0.6* |
| 2.5.2. | Damper Cylinder | HY600.05A(A) | 2 | 6 | 0 | 0 | 0.3* |
| 2.5.3. | Acceleration Cylinder (Boosting Cylinder) | HZQB.080.050.0800.1.003 | 1 | 6 | 0 | 0 | 0.2* |
| 2.5.4. | Lateral Control Cylinder | NZGB.100.050.0400.1 | 1 | 6 | 0 | 0 | 0.2* |
| 2.5.5. | Satellite Support Cylinder | HZGB.080.036.0180.2 | 2 | 6 | 0 | 0 | 0.3* |
| 2.5.6. | Locking Cylinder | HZGB.040.025.0170.1 | 2 | 6 | 0 | 0 | 0.3* |
| 2.5.7. | Track Lifting Cylinder | NZGB.125.050.0450.1.002 | 2 | 6 | 0 | 0 | 0.3* |
| 2.5.8. | Clamp Cylinder | HZGB.063.036.0100.1 | 8 | 6 | 0 | 0 | 1.3 |
| 2.5.9. | Lining Cylinder | NZGB.100.045.0300.1.001 | 2 | 6 | 0 | 0 | 0.3* |

*MINIMUM QUANTITY 1

| S.No | Brief description | Part no. | Nos per M/C | Estt. life cycle in year | Requirement per m/c | | |
|------------------------------------|---|-----------------------------|-------------|--------------------------|---------------------|------|------|
| | | | | | SITE | STMD | ZTMD |
| 2.5.10. | Brake Cylinder | HZGB.040.025.0130.1 | 2 | 6 | 0 | 0 | 0.3* |
| 2.5.11. | Brake Cylinder | UD160.50-DG | 2 | 6 | 0 | 0 | 0.3* |
| 2.5.12. | Small Squeezing Cylinder 09-3x(female) | HZSI-G.52.425 | 8 | 6 | 0 | 0 | 1.3 |
| 2.5.13. | Small Squeezing Cylinder 09-3x(male) | HZSI-A.36.426 | 8 | 6 | 0 | 0 | 1.3 |
| 2.5.14. | Big Squeezing Cylinder | HZSA-G.150.273 | 8 | 6 | 0 | 0 | 1.3 |
| 2.5.15. | Squeezing Cylinder | 2E34.41A | 1 | 6 | 0 | 0 | 0.2* |
| 2.5.16. | Fork Cylinder | HZSI-G.50.429 | 1 | 6 | 0 | 0 | 0.2* |
| 2.6. SEAL KIT & O' RING | | | | | | | |
| 2.6.1. | Seal kit for cylinder Hoist Limiting Cylinder | 2E34.150BDS | 8 | 6 | 0 | 0 | 1.3 |
| 2.6.2. | Seal kit for cylinder Tamping Unit-Lifting Cylinder | HZD02.080.040PA | 4 | 6 | 0 | 0 | 0.6* |
| 2.6.3. | Seal kit for Damper Cylinder | HY600.05DS | 2 | 6 | 0 | 0 | 0.3* |
| 2.6.4. | Seal kit for Boosting Cylinder | HZ01.080 | 1 | 6 | 0 | 0 | 0.3* |
| 2.6.5. | Seal kit for Boosting Cylinder | HZ02.080.050.001 | 1 | 6 | 0 | 0 | 0.3* |
| 2.6.6. | O-RING SEAL for Boosting Cylinder) | 50X3-N-DIN3771-NBR90 | 2 | 6 | 0 | 0 | 0.3* |
| 2.6.7. | Seal kit for Satellite Support Cylinder | HZ01.080 | 2 | 6 | 0 | 0 | 0.3* |
| 2.6.8. | Seal kit for Lateral Control Cylinder | NZ01.100 | 1 | 6 | 0 | 0 | 0.2* |
| 2.6.9. | Seal kit for Lateral Control Cylinder | HZ22.100.050 | 1 | 6 | 0 | 0 | 0.2* |
| 2.6.10. | Seal kit for Satellite Support Cylinder | HZ22.080.036 | 2 | 6 | 0 | 0 | 0.3* |
| 2.6.11. | Seal kit for Locking Cylinder | HZ01.040 | 2 | 6 | 0 | 0 | 0.3* |
| 2.6.12. | Seal kit for Locking Cylinder | HZ22.040.025 | 2 | 6 | 0 | 0 | 0.3* |
| 2.6.13. | Seal kit for Track Lifting Cylinder | NZ01.125 | 2 | 6 | 0 | 0 | 0.3* |
| 2.6.14. | Seal kit for Track Lifting Cylinder | HZ22.125.050 | 2 | 6 | 0 | 0 | 0.3* |
| 2.6.15. | Seal kit for Clamp Cylinder | HZ01.063 | 8 | 6 | 0 | 0 | 1.3 |
| 2.6.16. | Seal kit for Clamp Cylinder | HZ22.063.036 | 8 | 6 | 0 | 0 | 1.3 |
| 2.6.17. | Seal kit for Lining &Support Cylinder | NZ01.100 | 2 | 6 | 0 | 0 | 0.3* |
| 2.6.18. | Seal kit for Lining Cylinder | HZ22.100.045 | 2 | 6 | 0 | 0 | 0.3* |
| 2.6.19. | Seal kit for Hyd. motor HY90N52M | S14-09944 | 6 | 6 | 1 | 0 | 0 |
| 2.6.20. | O-Ring seal | 101,32X1,78-N-DIN3771-NBR90 | 2 | 6 | 1 | 0 | 0 |
| 2.6.21. | Seal kit for Hyd. motor HY90N42M | S14-09944 | 6 | 6 | 1 | 0 | 0 |
| 2.6.22. | Seal kit for Hyd. Cylinder HY72SX31 | HY72SX/DS | 1 | 6 | 1 | 0 | 0 |
| 2.6.23. | Seal kit for Hyd. Cylinder HY916N800 | HY916N/DS | 1 | 6 | 1 | 0 | 0 |
| 2.6.24. | Seal kit for Hyd. Cylinder HY938X55/MS | HY938X55/MS-DS | 1 | 6 | 1 | 0 | 0 |
| 2.6.25. | O-Ring seal | 85X6-N-DIN3771-NBR90 | 1 | 6 | 1 | 0 | 0 |
| 2.6.26. | Shaft sealing ring | BA230-255-15DIN3760-NB | 4 | 6 | 1 | 0 | 0 |

*MINIMUM QUANTITY 1

| S.No | Brief description | Part no. | Nos per M/C | Estt. life cycle in year | Requirement per m/c | | |
|-------------------|--------------------------|----------------------|-------------|--------------------------|---------------------|------|------|
| | | | | | SITE | STMD | ZTMD |
| 2.6.27. | Seal Ring | DL12.22A/A | 12 | 6 | 2 | 0 | 0 |
| 2.6.28. | Seal ring | A13X20X1,5DIN7603-CU | 1 | 6 | 1 | 0 | 0 |
| 2.6.29. | Packing Ring | 223-12295-2 | 110 | 6 | 18 | 0 | 0 |
| 2.7. HOSES | | | | | | | |
| 2.7.1. | Hose pipe | R02-4x1450 | 3 | 6 | 1 | 0 | 0 |
| 2.7.2. | Hose pipe | R02-4x2150 | 3 | 6 | 1 | 0 | 0 |
| 2.7.3. | Hose pipe | R02-4x3350 | 1 | 6 | 1 | 0 | 0 |
| 2.7.4. | Hose pipe | R02-4x2050 | 5 | 6 | 1 | 0 | 0 |
| 2.7.5. | Hose pipe | R02-4x6200 | 1 | 6 | 1 | 0 | 0 |
| 2.7.6. | Hose pipe | R02-6x1050 | 1 | 6 | 1 | 0 | 0 |
| 2.7.7. | Hose pipe | R02-6x2150 | 2 | 6 | 1 | 0 | 0 |
| 2.7.8. | Hose pipe | R02-6x2550 | 1 | 6 | 1 | 0 | 0 |
| 2.7.9. | Hose pipe | R02-6x4600 | 1 | 6 | 1 | 0 | 0 |
| 2.7.10. | Hose pipe | R02-10x1100 | 1 | 6 | 1 | 0 | 0 |
| 2.7.11. | Hose pipe | R02-6x670 | 2 | 6 | 1 | 0 | 0 |
| 2.7.12. | Hose pipe | R02-8x2750 | 1 | 6 | 1 | 0 | 0 |
| 2.7.13. | Hose pipe | R02-8x5150 | 1 | 6 | 1 | 0 | 0 |
| 2.7.14. | Hose pipe | R02-10x730 | 1 | 6 | 1 | 0 | 0 |
| 2.7.15. | Hose pipe | R02-10x4700 | 2 | 6 | 1 | 0 | 0 |
| 2.7.16. | Hose pipe | R02-10x1850 | 1 | 6 | 1 | 0 | 0 |
| 2.7.17. | Hose pipe | R02-12x1650 | 1 | 6 | 1 | 0 | 0 |
| 2.7.18. | Hose pipe(One Side Bend) | R02-12x6800 | 1 | 6 | 1 | 0 | 0 |
| 2.7.19. | Hose pipe | R02-12x2700 | 1 | 6 | 1 | 0 | 0 |
| 2.7.20. | Hose pipe(One Side Bend) | R02-16x6800 | 1 | 6 | 1 | 0 | 0 |
| 2.7.21. | Hose pipe | R02-16x950 | 1 | 6 | 1 | 0 | 0 |
| 2.7.22. | Hose pipe | R02-16x3800 | 1 | 6 | 1 | 0 | 0 |
| 2.7.23. | Hose pipe | 2781-20x3040 | 1 | 6 | 1 | 0 | 0 |
| 2.7.24. | Hose pipe | 2781-20x1450 | 2 | 6 | 1 | 0 | 0 |
| 2.7.25. | Hose pipe | 2781-20x1750 | 9 | 6 | 1 | 0 | 0.5* |
| 2.7.26. | Hose pipe | R5R-24x1200 | 3 | 4 | 1 | 0 | 0 |
| 2.7.27. | Hose pipe | R5R-24x6800 | 1 | 4 | 1 | 0 | 0 |
| 2.7.28. | Hose pipe | R5R-24x3350 | 1 | 4 | 1 | 0 | 0 |
| 2.7.29. | Hose pipe | R1-24(1½")x6800 | 1 | 6 | 1 | 0 | 0 |
| 2.7.30. | Hose pipe | R1-24(1½")x1300 | 1 | 6 | 1 | 0 | 0 |
| 2.7.31. | Hose pipe | R1-24(1½")x3100 | 1 | 6 | 1 | 0 | 0 |
| 2.7.32. | Hose pipe | GH506-16x900 | 1 | 6 | 1 | 0 | 0 |

*MINIMUM QUANTITY 1

09-3x,Dynamic**HYDRAULICS**

| S.No | Brief description | Part no. | Nos per M/C | Estt. life cycle in year | Requirement per m/c | | |
|-------------------|-------------------------------|---------------|-------------|--------------------------|---------------------|------|------|
| | | | | | SITE | STMD | ZTMD |
| 2.7.33. | Hose pipe | GH506-16x1750 | 1 | 6 | 1 | 0 | 0 |
| 2.7.34. | Hose pipe | GH506-20x3250 | 1 | 6 | 1 | 0 | 0 |
| 2.8.OTHERS | | | | | | | |
| 2.8.1. | Pressure Gauge | HY154.25 | 3 | 6 | 0 | 0 | 0.5* |
| 2.8.2. | Pressure Gauge for sat. drive | HY154.03 | 1 | 6 | 0 | 0 | 0.2* |

*MINIMUM QUANTITY 1

| S.No | Brief description | Part no. | Nos per M/C | Estt. life cycle in year | Requirement per mc | | |
|-------------------------------|-------------------------------------|-------------------------|-------------|--------------------------|--------------------|------|------|
| | | | | | SITE | STMT | ZTMD |
| 3.0 MECHANICAL | | | | | | | |
| 3.1.SHAFT (VIBRATION+ CARDON) | | | | | | | |
| 3.1.1. | Cardan Shaft | KGV180.0900.110.80 | 1 | 6 | 0 | 0 | 0.2* |
| 3.1.2. | Cardan Shaft | KGV 180.1250.110.80 | 1 | 6 | 0 | 0 | 0.2* |
| 3.1.3. | Cardan Shaft | KGV180.1550.110.80 | 1 | 6 | 0 | 0 | 0.2* |
| 3.1.4. | Cardan Shaft | KGW 180.0900.110.00 | 1 | 6 | 0 | 0 | 0.2* |
| 3.1.5. | Cardan Shaft | KGW 180.1000.110.00 | 1 | 6 | 0 | 0 | 0.2* |
| 3.1.6. | Cardan Shaft | KGW 180.1500.110.00 | 1 | 6 | 0 | 0 | 0.2* |
| 3.1.7. | Vibration Shaft | UD 25.1101 | 4 | 6 | 0 | 0 | 0.6* |
| 3.1.8. | Vibration Shaft | UD 25.1102 | 4 | 6 | 0 | 0 | 0.6* |
| 3.2.BEARING & BUSH | | | | | | | |
| 3.2.1. | Plain Bearing Bush | MB5050DX | 1 | 6 | 0 | 0 | 0.2* |
| 3.2.2. | Bush satellite working mode support | UD80.4230 | 4 | 6 | 0 | 0 | 0.6* |
| 3.2.3. | Universal joint | GE 35AX | 3 | 6 | 0 | 0 | 0.5* |
| 3.2.4. | Intermediate Bushing | WN121-30H7.35j6.20-1 | 8 | 6 | 0 | 0 | 1.3 |
| 3.3 NUT ,BOLT & WASHER | | | | | | | |
| 3.3.1. | Lock Washer | VS12/VERZ | 315 | 6 | 12 | 0 | 40 |
| 3.3.2. | Allen Bolt | M8x20DIN 6912-8.8 | 4 | 6 | 0 | 0 | 0.7* |
| 3.3.3. | Stopping Disc | UD 150-1554/8 | 8 | 6 | 1 | 0 | 0.3* |
| 3.3.4. | Support Ring | U21-720 | 8 | 6 | 1 | 0 | 0.3* |
| 3.3.5. | Fitting Disc / Washer | PS40X50X1,DIN 988 | 20 | 6 | 1 | 0 | 2.3 |
| 3.3.6. | Spring washer | B42DIN127/VERZ | 24 | 6 | 1 | 0 | 3 |
| 3.3.7. | Lock Washer | VS 10 | 98 | 6 | 3 | 0 | 13 |
| 3.3.8. | Lock Washer | VS 10 VERZ | 491 | 6 | 12 | 0 | 70 |
| 3.3.9. | Washer | 10 DIN 1440/VERZ | 39 | 6 | 1 | 0 | 6 |
| 3.3.10. | Washer | 14DIN1440/VERZ | 25 | 6 | 1 | 0 | 3 |
| 3.3.11. | Allen Bolt | M 6x 16 DIN 912 | 32 | 6 | 1 | 0 | 4 |
| 3.3.12. | Hexagon Bolt | M16X90DIN931-8.8/VERZ. | 32 | 6 | 1 | 0 | 4 |
| 3.3.13. | Hexagon Socket Screw | M12X50DIN6912-8.8/VERZ. | 26 | 6 | 1 | 0 | 3 |
| 3.3.14. | Hexagon Bolt | M8X35DIN931-8.8/VERZ. | 5 | 6 | 1 | 0 | 0 |
| 3.3.15. | Countersunk Screw | M10X20DIN7991-8.8/VERZ. | 12 | 6 | 1 | 0 | 1 |
| 3.3.16. | Hexagon Socket Screw | M8X30DIN912-8.8/VERZ. | 22 | 6 | 2 | 0 | 2 |
| 3.3.17. | Hexagon Socket Screw | M8X20DIN6912-8.8 | 4 | 6 | 1 | 0 | 0 |

*MINIMUM QUANTITY 1

| S.No | Brief description | Part no. | Nos per M/C | Estt. life cycle in year | Requirement per mc | | |
|-------------------|----------------------|------------------------|-------------|--------------------------|--------------------|------|------|
| | | | | | SITE | STMT | ZTMD |
| 3.3.18. | Hexagon Bolt | M16X35DIN933-8.8 | 28 | 6 | 1 | 0 | 3.6 |
| 3.3.19. | Hexagon Bolt | M14X30DIN933-8.8/VERZ. | 8 | 6 | 1 | 0 | 0.3* |
| 3.3.20. | Hexagon Bolt | M10X50DIN931-8.8/VERZ. | 10 | 6 | 1 | 0 | 0.6* |
| 3.3.21. | Hexagon Socket Screw | M10X25DIN912-8.8/VERZ. | 128 | 6 | 6 | 0 | 15 |
| 3.3.22. | Hexagon Socket Screw | M12X30DIN912-8.8/VERZ. | 15 | 6 | 1 | 0 | 1.5 |
| 3.3.23. | Hexagon Socket Screw | M8X40DIN912-8.8/VERZ. | 2 | 6 | 0 | 0 | 0.3* |
| 3.3.24. | Hexagon Bolt | M12X40DIN933-8.8/VERZ. | 8 | 6 | 1 | 0 | 0.3* |
| 3.3.25. | Hexagon Bolt | M10X30DIN933-8.8/VERZ. | 39 | 6 | 1 | 0 | 5.5 |
| 3.3.26. | Hexagon Bolt | M10X55DIN931-8.8/VERZ. | 6 | 6 | 0 | 0 | 1 |
| 3.3.27. | Hexagon Bolt | M5X45DIN931-8.8/VERZ. | 26 | 6 | 1 | 0 | 3.3 |
| 3.3.28. | Schnorr-Lock Washer | VS 20 /VERZ | 136 | 6 | 5 | 0 | 18 |
| 3.3.29. | Schnorr-Lock Washer | VS 12 /VERZ | 324 | 6 | 14 | 0 | 40 |
| 3.3.30. | Schnorr-Lock Washer | VS12 | 31 | 6 | 1 | 0 | 4.2 |
| 3.3.31. | Schnorr-Lock Washer | VS 16 | 78 | 6 | 3 | 0 | 10 |
| 3.3.32. | Schnorr-Lock Washer | VS 16 /VERZ | 277 | 6 | 12 | 0 | 34 |
| 3.3.33. | Schnorr-Lock Washer | VS 24/VERZ | 17 | 6 | 1 | 0 | 1.8 |
| 3.3.34. | Schnorr-Lock Washer | VS 8/VERZ | 149 | 6 | 6 | 0 | 19 |
| 3.3.35. | Schnorr-Lock Washer | VS 6/VERZ | 120 | 6 | 5 | 0 | 15 |
| 3.3.36. | Schnorr-Lock Washer | VS 5 /VERZ | 98 | 6 | 4 | 0 | 12 |
| 3.4.T/UNIT | | | | | | | |
| 3.4.1. | Tamping Arm Bolt | 2E31.04 | 6 | 6 | 1 | 0 | 0 |
| 3.4.2. | Connecting Rod Bolt | G20.13 | 32 | 6 | 2 | 0 | 3.3 |
| 3.4.3. | Connecting Rod Bolt | UD19.221 | 8 | 6 | 1 | 0 | 0.3* |
| 3.4.4. | Bush | G20.26B | 24 | 6 | 2 | 0 | 2 |
| 3.4.5. | Spacer Bush | UD19.222 | 8 | 6 | 1 | 0 | 0.3* |
| 3.4.6. | Spacer Sleeve | 2E31.02A | 24 | 6 | 2 | 0 | 2 |
| 3.4.7. | Washer | G20.14 | 48 | 6 | 2 | 0 | 6 |
| 3.4.8. | Bearing Washer | 2E34.228-6,95 | 16 | 6 | 1 | 0 | 1.6 |
| 3.4.9. | Washer | 2E32.05 | 24 | 6 | 2 | 0 | 2 |
| 3.4.10. | Thrust Washer | EB-2E34.211 | 48 | 6 | 2 | 0 | 6 |

*MINIMUM QUANTITY 1

| S.No | Brief description | Part no. | Nos per M/C | Estt. life cycle in year | Requirement per mc | | |
|-------------------|-------------------------------|-------------------------|-------------|--------------------------|--------------------|------|------|
| | | | | | SITE | STMT | ZTMD |
| 3.4.11. | Seal Ring | DL12.22A/A | 48 | 6 | 2 | 0 | 6 |
| 3.4.12. | Bush | EB-2E34.210 | 48 | 6 | 2 | 0 | 6 |
| 3.5 OTHERS | | | | | | | |
| 3.5.1. | Laminum Adjusting Ring | 90x 75x1 -6B 1 MS | 4 | 6 | 1 | 0 | 0 |
| 3.5.2. | Packing Ring | 223-12295-2 | 10 | 6 | 1 | 0 | 0.6* |
| 3.5.3. | Cap Nut | 223-12374-9 | 10 | 6 | 1 | 0 | 0.6* |
| 3.5.4. | Fish Plate F.Universal Joint | WN141-19H7.40.15-2 | 4 | 6 | 0 | 0 | 0.6* |
| 3.5.5. | Fish Plate F.Universal Joint | WN141-35J7.65.20-1 | 2 | 6 | 0 | 0 | 0.3* |
| 3.5.6. | Fish Plate F.Universal Joint | WN141-28H7.180.20-1 | 4 | 6 | 0 | 0 | 0.6* |
| 3.5.7. | Fish Plate F.Universal Joint | WN141-35J7.180.50.20-1 | 2 | 6 | 0 | 0 | 0.3* |
| 3.5.8. | Fish Plate F.Universal Joint | WN141-62H7.100.150.35-1 | 2 | 6 | 0 | 0 | 0.3* |
| 3.5.9. | Locking Plate | MB 7 | 8 | 6 | 1 | 0 | 0.3* |
| 3.5.10. | Precision Steel Tube Seamless | ROHR30X2-ST35BK-DIN2391 | 2 | 6 | 0 | 0 | 0.3* |
| 3.5.11. | Tapered Lubrication Nipple | R1/8ZDIN71412-H1/GERADE | 1 | 6 | 0 | 0 | 0.2* |
| 3.5.12. | Threaded Nipple | WN7-R1/4A-R1/4IX44 | 16 | 6 | 1 | 0 | 1.6 |
| 3.5.13. | Flat Lubricator Nipple | R1/8ZDIN3404-M1/GERADE | 40 | 6 | 4 | 0 | 2.6 |
| 3.5.14. | Grease gun adopter brass | ----- | 1 | 6 | 1 | 0 | 0 |
| 3.5.15. | Flat Lubricator Nipple | R1/4ZDIN3404-M1/GERADE | 13 | 6 | 2 | 0 | 0.2* |
| 3.5.16. | Circlip | A30 DIN 471 | 6 | 6 | 1 | 0 | 0 |
| 3.5.17. | Spring key | UD 22.350 | 24 | 6 | 1 | 0 | 3 |
| 3.5.18. | Screw plug | R1/2DIN910-5.8 | 3 | 6 | 1 | 0 | 0 |
| 3.5.19. | Adopter | 2088-4-4S | 24 | 6 | 1 | 0 | 3 |
| 3.5.20. | Hex Screw with coned half dog | WN119-M16.80-1 | 1 | 6 | 0 | 0 | 0.2* |
| 3.5.21. | Roller Complete | UD257.406 | 4 | 6 | 0 | 0 | 0.6* |

*MINIMUM QUANTITY 1

09-3x, Dynamic**ELECTRICAL / ELECTRONICS**

| S.No | Brief description | Part no. | Nos per M/C | Estt. life cycle in year | Requirement per mc | | |
|--------------------------------|-------------------------------|-------------------------|-------------|--------------------------|--------------------|------|------|
| | | | | | SITE | STMT | ZTMD |
| 4.0 ELECTRICAL / ELECTRONICS | | | | | | | |
| 4.1.TRANSDUCER & POTENTIOMETER | | | | | | | |
| 4.1.1. | Versine Transducer | ELT902T1D-01 | 2 | 6 | 0 | 0 | 0.3* |
| 4.1.2. | Roller Chord Transducer | ELT-903-00001-U/1000 | 4 | 6 | 0 | 0 | 0.6* |
| 4.1.3. | Roller Chord Transducer | ELT-903-00001-U/2000 | 1 | 6 | 0 | 0 | 0.2* |
| 4.1.4. | Proportional Transducer | ELT904T1D-01A | 2 | 6 | 0 | 0 | 0.3* |
| 4.1.5. | Longitudinal Level Transducer | ELT904T1Q-01 | 2 | 6 | 0 | 0 | 0.3* |
| 4.1.6. | Transducer | ELT902T1F-01 | 1 | 6 | 0 | 0 | 0.2* |
| 4.1.7. | Roller Chord Transducer | ELT903T1A-01 | 5 | 6 | 0 | 0 | 0.8* |
| 4.2.OTHERS | | | | | | | |
| 4.2.1. | Pressure Gauge/0-25BAR/24V | EL-T1001.00B | 2 | 6 | 0 | 0 | 0.3* |
| 4.2.2. | Operational Amplifier | OP11EPZ | ----- | 6 | 4 | 0 | 2 |
| 4.2.3. | Tachometer | EL-T1263.00/120/B | 1 | 6 | 0 | 0 | 0.2* |
| 4.2.4. | Proximity Switch | EL-T1151A-NPN-ST | 1 | 6 | 1 | 0 | 0 |
| 4.2.5. | Proximity Switch | EL-T1422/K/U-ST | 7 | 6 | 1 | 0 | 0.2* |
| 4.2.6. | Levelling chord | 2MMDX 80 MLG-BOWDEN 2UG | 100m | 2 | 50m | 0 | 0 |
| 4.2.7. | Steel chord / chord wire | ELT .576.10B | 10m | 2 | 5 | 0 | 0 |
| 4.2.8. | Steel chord / chord wire | ELT .576.1.35 | 15m | 2 | 7.5m | 0 | 0 |
| 4.2.9. | Carrier complete | ELT 67.00C | 3 | 1 | 1 | 0 | 2 |
| 4.2.10. | Power Relay | RM 738024 | 1 | 6 | 1 | 0 | 0 |

*MINIMUM QUANTITY 1

| S.No | Brief description | Part no. | Nos per M/C | Estt. life cycle in year | Requirement per mc | | | |
|--------------------------|--|---------------------|-------------|--------------------------|--------------------|------|------|--|
| | | | | | SITE | STMT | ZTMD | |
| 5.0 PNEUMATICS | | | | | | | | |
| 5.1 CYLINDERS & SEAL KIT | | | | | | | | |
| 5.1.1. | Tamping Unit Locking Cylinder | PN2Z-G.35/12/100 | 4 | 6 | 0 | 0 | 0.6* | |
| 5.1.2. | Hoist Limiting Cylinder | 2E34.150B | 8 | 6 | 0 | 0 | 1.3 | |
| 5.1.3. | Pneumatic Cylinder | PN2Z-KF.35/18/102UB | 1 | 6 | 0 | 0 | 0.2* | |
| 5.1.4. | Pneumatic Cylinder | PN2Z-KF.50/18/70 | 1 | 6 | 0 | 0 | 0.2* | |
| 5.1.5. | Pneumatic Cylinder | PN2Z-KF.50/18/28 | 1 | 6 | 0 | 0 | 0.2* | |
| 5.1.6. | Coupling Cylinder | PN1Z-ML.50/12/63 | 1 | 6 | 0 | 0 | 0.2* | |
| 5.1.7. | Pneumatic Cylinder | PN2Z-G.35/12/50 | 2 | 6 | 0 | 0 | 0.3* | |
| 5.1.8. | Pneumatic Cylinder | PN2Z-G.35/12/60 | 1 | 6 | 0 | 0 | 0.2* | |
| 5.1.9. | Pneumatic Cylinder | PN1Z-G.35/12/150 | 1 | 6 | 0 | 0 | 0.2* | |
| 5.1.10. | Brake Cylinder | UD160.50-DG | 2 | 6 | 0 | 0 | 0.3* | |
| 5.1.11. | Recorder Cord Cylinder | PN2Z-G.50/16/200 | 1 | 6 | 0 | 0 | 0.2* | |
| 5.1.12. | Rear Tensioning Trolley Cylinder | PN2Z-G.100/25/300 | 2 | 6 | 0 | 0 | 0.3* | |
| 5.1.13. | Rear Tensioning Trolley Cylinder | PN2Z-G.70/20/350 | 2 | 6 | 0 | 0 | 0.3* | |
| 5.1.14. | Measuring Trolley Cylinder | PN2Z-G.70/20/250 | 2 | 6 | 0 | 0 | 0.3* | |
| 5.1.15. | Measuring Trolley Cylinder | PN2Z-G.100/25/300 | 2 | 6 | 0 | 0 | 0.3* | |
| 5.1.16. | Front Trolley Cylinder | PN2Z-G.100/25/300 | 2 | 6 | 0 | 0 | 0.3* | |
| 5.1.17. | Front Tensioning Trolley Cylinder | PN2Z-G.70/20/350 | 2 | 6 | 0 | 0 | 0.3* | |
| 5.1.18. | Front Trolley Cylinder | PN2Z-G.70/20/250 | 1 | 6 | 0 | 0 | 0.2* | |
| 5.1.19. | Locking Cylinder | PN1Z-G.35/12/50 | 2 | 6 | 0 | 0 | 0.3* | |
| 5.1.20. | Locking Cylinder | PN2Z-G.35/12/50 | 1 | 6 | 0 | 0 | 0.2* | |
| 5.1.21. | Lining Trolley Cylinder | PN2Z-G.70/20/300 | 4 | 6 | 0 | 0 | 0.5* | |
| 5.1.22. | Automatic Forward driving Control Cylinder | PN2Z-G.35/12/100/F | 1 | 6 | 0 | 0 | 0.2* | |
| 5.1.23. | Automatic Forward driving Control Cylinder | PN2Z-G.35/12/50 | 1 | 6 | 0 | 0 | 0.2* | |
| 5.1.24. | Cord Levelling Rear Cylinder | PN2Z-G.50/16/150 | 2 | 6 | 0 | 0 | 0.3* | |
| 5.1.25. | Middle Feeler Rod Cylinder | PN2Z-G.70/20/250 | 2 | 6 | 0 | 0 | 0.3* | |

*MINIMUM QUANTITY 1

09-3x,Dynamic**PNEUMATICS**

| S.No | Brief description | Part no. | Nos per M/C | Estt. life cycle in year | Requirement per mc | | |
|-------------------|-----------------------|----------------|-------------|--------------------------|--------------------|------|------|
| | | | | | SITE | STMT | ZTMD |
| 5.2 VALVES | | | | | | | |
| 5.2.1. | Safety valve | 79965/2120 | 1 | 6 | 0 | 0 | 0.2* |
| 5.2.2. | Safety valve | I79965/2105 | 1 | 6 | 0 | 0 | 0.2* |
| 5.2.3. | Valve | 90344 | 30 | 6 | 1 | 0 | 4 |
| 5.3 OTHERS SPARES | | | | | | | |
| 5.3.1. | Double Pressure Gauge | 90283-A-BAR/BP | 4 | 6 | 0 | 0 | 0.6* |

*MINIMUM QUANTITY 1

ACKNOWLEDGEMENT

Following officers and staff have made their valuable contributions in Preparation of Provisional Critical spares Part List of High Output Tamping & Stabilizing Machine (09-3X) Dynamic

RAILWAYS

1. Shri Ashwini Kumar Singh SSE/TMC/NER
2. Shri Anand Suman Srivastava SSE/TMC/NER

RDSO

1. Shri Muslim Ahmad ARE/TM
2. Shri Ashish Kumar Srivastava SSE/TM
- 3 “ ” D.G.Sharma SSE/ENGG/TM

12-03-2019