
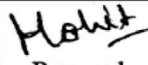
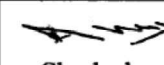
	PRODUCT STANDARD TME DIVISION, BHOPAL	TM 10462																													
		TME/2011	PAGE 01 OF 03																														
<u>SPECIFICATION FOR 'STANDARD HARDWARE KIT'</u> <u>FOR HITACHI TRACTION MOTOR</u>																																	
<div style="display: flex;"> <div style="width: 15%; border: 1px solid black; padding: 5px; writing-mode: vertical-rl; transform: rotate(180deg);"> COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company </div> <div style="width: 85%; padding-left: 10px;"> <p>1. FOREWARD :</p> <p>This specification covers the requirements of 'STANDARD HARDWARE KIT' for manufacturing of Hitachi Traction Motor.</p> <p>2. Requirement : Requirement per set in the 'KIT' form are indicated here under : Suppliers shall quote their rates per set in 'KIT' form taking all items together, otherwise their offers are liable to be summarily rejected.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">Sl. No.</th> <th style="width: 60%;">Description & Drg. / Specn.No.</th> <th style="width: 35%;">Qty. /TM (Nos)</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>Hex. Socket set screw M6 X20 Phosphated to IS:6094'81-CP</td> <td>15 Nos.</td> </tr> <tr> <td>02</td> <td>Hex. Socket set screw M10 X10 Phosphated to IS:6094'81-CP</td> <td>15 Nos.</td> </tr> <tr> <td></td> <td>Total</td> <td>30 Nos.</td> </tr> <tr> <td>01</td> <td>Hex. Hd. Bolt M24 X95-8.8 Phosphated to IS:1364(Part-1) '92 ISO:4014'88</td> <td>12 Nos.</td> </tr> <tr> <td>02</td> <td>Hex. Hd. Screw M24 X55 (Head height 15mm) 8.8 Phosphated to IS:1364(Part-2) '92 ISO:4017'88</td> <td>05 Nos.</td> </tr> <tr> <td>03</td> <td>Hex. Hd. Screw M24 X55 (Head height 13mm) 8.8 Phosphated to IS:1364(Part-2) '92 ISO:4017'88</td> <td>04 Nos.</td> </tr> <tr> <td>04</td> <td>Hex. Hd. Screw M20 X55-8.8/10.9-Zn-plated to IS:1364(Part-2) '92 ISO:4017'88</td> <td>04 Nos.</td> </tr> <tr> <td></td> <td>Total</td> <td>22 Nos.</td> </tr> </tbody> </table> </div> </div>							Sl. No.	Description & Drg. / Specn.No.	Qty. /TM (Nos)	01	Hex. Socket set screw M6 X20 Phosphated to IS:6094'81-CP	15 Nos.	02	Hex. Socket set screw M10 X10 Phosphated to IS:6094'81-CP	15 Nos.		Total	30 Nos.	01	Hex. Hd. Bolt M24 X95-8.8 Phosphated to IS:1364(Part-1) '92 ISO:4014'88	12 Nos.	02	Hex. Hd. Screw M24 X55 (Head height 15mm) 8.8 Phosphated to IS:1364(Part-2) '92 ISO:4017'88	05 Nos.	03	Hex. Hd. Screw M24 X55 (Head height 13mm) 8.8 Phosphated to IS:1364(Part-2) '92 ISO:4017'88	04 Nos.	04	Hex. Hd. Screw M20 X55-8.8/10.9-Zn-plated to IS:1364(Part-2) '92 ISO:4017'88	04 Nos.		Total	22 Nos.
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Revision Details: As per revision sheet			Distribution	Qty.	Approved:  Manish Verma (Sr.DGM/TME)																												
Rev. No.	Date of Rev.	Reaffirmed Year	TME	1	 Prepared: Mohit Parothia Engineer/TME	 Checked: Anurag Sharma Manager/TME	Date of 1st Issue 04.02.11																										
			TXM	1																													
			TNX	1																													
00	04.02.11	Feb 2022	QTM	3 2																													



PRODUCT STANDARD
TME DIVISION, BHOPAL

TM 10462

TME/2011


PAGE 02 OF 03

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Sl. No.	Description & Drg. / Specn.No.	Qty. /TM (Nos)
01	Hex. Hd. Bolt M20 X70-8.8 Phosphated to IS:1364(Part-1) '92 ISO:4014'88	06 Nos.
02	Hex. Hd. Screw M16 X45-8.8 Phosphated to IS:1364(Part-2) '92 ISO:4017'88	08 Nos.
03	Hex. Hd. Screw M16 X40-8.8 Phosphated to IS:1364(Part-2) '92 ISO:4017'88	03 Nos.
04	Hex. Hd. Screw M16 X35-8.8 Phosphated to IS:1364(Part-2) '92 ISO:4017'88	02 Nos.
05	Hex. Hd. Bolt M12 X 90-8.8 Phosphated to IS:1364(Part-1) '92 ISO:4014'88	04 Nos.
06	Hex. Hd. Bolt M12 X 65-8.8 Phosphated to IS:1364(Part-1) '92 ISO:4014'88	08 Nos.
07	Hex. Hd. Bolt M12 X 50-8.8 Zn plated to IS:1364(Part-1) '92 ISO:4014'88	08 Nos.
08	Hex. Nut M16 -8 Zn plated to IS:1364(Part-3) '92 ISO:4032'86	02 Nos.
09	Hex. Nut M12 -8 Phosphated to IS:1364(Part-3) '92 ISO:4032'86	04 Nos.
10	Hex. Hd. Screw M18 X45-8.8 -Patch 2.5 (Cad plated) to IS:1364(Part-2) '92 ISO:4017'88	04 Nos.
11	Hex. Hd. Screw M24 X55 (Head height 15mm) 8.8 Phosphated to IS:1364(Part-2) '92 ISO:4017'88	06 Nos.
	Total	55 Nos.

∴ Qty / TM of "STANDARD HARDWARE KIT(HTM) " = 01 set

∴ In 01 set = (30+22+55) Nos. = 107 Nos.

<p style="text-align: center;">COPYRIGHT AND CONFIDENTIAL</p> <p>The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED It must not be used directly or indirectly in any way detrimental to the interest of the company</p>		PRODUCT STANDARD TME DIVISION, BHOPAL	TM 10462
	TME/2011	PAGE 03 OF 03	
	<p>3. Special Condition :-</p> <p>(a) Brands approved as per BHEL's approved vendors only are acceptable.</p> <p>(b) Dealers / Distributors should indicate their brand clearly along with their quotations.</p> <p>(c) Supplies will be acceptable with OEM's Guarantee / Test Certificate.</p> <p>(d) Dealers / Distributors of OEM if quoting should enclose dealership / distributorship certificate with validity given by OEM to prove the credential without which offers are liable to be summarily rejected.</p> <p>4. Marking & Packing : Manufacturer's identification mark shall be provided on each item . One set of KIT shall be properly packed in box of suitable material to avoid damage during handling and transportation. All the items should be first kept in durable polythene packet, each type in separate packet and then finally kept in box. Two cards indicating description of the material under stocking of individual item including quantity duly signed by BHEL's inspector shall be tagged one inside and the other outside the box.</p> <p>5. <u>Inspection</u> :-</p> <p>Few Hardwares of each size shall be selected at random.</p> <p>6. This specification is equivalent to CLW spec. No. 4TMS.095.042</p>		

SPECIFICATION FOR
STANDARD HARDWARE KIT
FOR
HITACHI TRACTION MOTOR

प्रमाण

डि. क. दास

सुभा

SEED

CHKD

ALT. NO.

Authority

Description

SPECIFICATION FOR
 STANDARD
 HARDWARE KIT FOR
 HITACHI TRACTION MOTOR

DT: 09/04/2025

CHITTARANJAN Traction Motors Pvt. Ltd.
 West Bengal, India

NO. 4TMS 095 042

DATE: 09/04/2025

4TMS 095.042

Signature Not
Verified

Digitally signed by
 RANJAN KUMAR
 Date: 2025.04.08
 11:40:30 +05'30'

Reason: IREPS-CRIS
 Location: HEP New Delhi

File No. HEP-TXM20500 (519/118/2025-HEP-TXM20500 (Computer No. 229101)

Generated from eOffice by Kamal Singh Narvariya, MANAGER(KSN)-MNX35400-HEP, MANAGER, HEP-HEAVY ELECTRICALS PLANT (HEP) on 24/09/2025 09:04 am

1. FOREWORD:-

This Specification covers the requirements of 'STANDARD HARDWARE KIT' for manufacturing of Hitachi Traction Motor.

2. Requirement : Requirement per set in the 'KIT' form are indicated here under :-
Suppliers shall quote their rates per set in 'KIT' form taking all items together, otherwise their offers are liable to be summarily rejected.

Sl No	C&D No.	Description & Drg./Specn. No.	Qty. TM (nos)	Remarks
01	5522/078	Hex. Socket Set Screw M 6 X 20-Phosphated to IS:6094'81-CP	15 nos.	Stocking C&D No. is 5522/031 (Shop-2308)
02	5522/068	Hex. Socket Set Screw M 10 X 10-Phosphated to IS:6094'81-CP	15 nos.	
Total (for Shop- 2308 only)			30 Nos	
03	5582/003	Hex. Hd. Bolt- M 24 X 95- 8.8-Phosphated to IS:1364(Part-1)'92 ISO : 4014'88	12 nos.	Stocking C&D No. is 5582/015 (Shop-2106)
04	5582/004	Hex. Hd. Screw- M 24 X 55 (Head Height 15 mm) 8.8-Phosphated to IS:1364(Part-2)'92 ISO : 4017'88	05 nos.	
05	5582/005	Hex. Hd. Screw- M 24 X 55 (Head Height 13 mm) 8.8-Phosphated to IS:1364(Part-2)'92 ISO : 4017'88	01 no.	
06	5560/614	Hex. Hd. Screw- M 20 X 55-8.8/10.9- Zn-Plated to IS:1364(Part-2)'92 ISO : 4017'88	04 nos.	
Total (for Shop- 2106 only)			22 nos.	
07	5570/209	Hex. Hd. Bolt- M 20 X 70- 8.8-Phosphated to IS:1364(Part-1)'92 ISO : 4014'88	06 nos.	Stocking C&D No. is 5582/016 (Shop-2103)
08	5570/204	Hex. Hd. Screw- M 16 X 45-8.8-Phosphated to IS:1364(Part-2)'92 ISO : 4017'88	08 nos.	
09	5528/205	Hex. Hd. Screw- M 16 X 40-8.8-Phosphated to IS:1364(Part-2)'92 ISO : 4017'88	03 nos.	
10	5528/042	Hex. Hd. Screw- M 16 X 35-8.8-Phosphated to IS:1364(Part-2)'92 ISO : 4017'88	02 nos.	
11	5565/782	Hex. Hd. Bolt- M 12 X 90- 8.8-Phosphated to IS:1364(Part-1)'92 ISO : 4014'88	04 nos.	
12	5560/601	Hex. Hd. Bolt- M 12 X 65- 8.8-Phosphated to IS:1364(Part-1)'92 ISO : 4014'88	08 nos.	
13	5560/605	Hex. Hd. Bolt- M 12 X 50- 8.8- Zn-Plated to IS:1364(Part-1)'92 ISO : 4014'88	08 nos.	
14	5560/630	Hex. Nut -M 16-8- Zn-Plated to IS:1364 (Part-3)'92 ISO : 4032'86	02 nos.	
15	5565/802	Hex. Nut -M 12-8- Phosphated to IS:1364 (Part-3)'92 ISO : 4032'86	04 nos.	
16	5560/602	Hex. Hd. Screw - M 18X45-8.8-Patch 2.5 (Cad Plated) to IS:1364 (Part-2)'92, ISO:4017'88	04 nos.	
17	5528/041	Hex. Hd. Screw- M 24 X 55 (Head Height 15 mm) 8.8-Phosphated to IS:1364(Part-2)'92 ISO : 4017'88	06 nos.	
18	5582/004	Hex. Hd. Bolt- M 20 X 70- 8.8-Phosphated to IS:1364(Part-1)'92 ISO : 4014'88	06 nos.	
Total (Shop-2103 only)			55 Nos.	

∴ Qty/TM of "Standard Hardware KIT (HTM)" = 01 set against Stocking C&D NO. 5582/014.
∴ In 01 set = (30 + 22 + 55) nos = 107 nos.

SPECIFICATION FOR
'STANDARD HARDWARE
KIT' FOR
HITACHI TRACTION
MOTOR.


D.Y. CH/TMD

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA

NO. 4TMS.095.012
DATE: 16-05-2010


3. Special Condition:-

- a) Brands approved as per CLW's approved vendors only are acceptable.
- b) Dealers/ Distributors should indicate their brand clearly along with their quotations.
- c) Supplies will be acceptable with OEM's **Guarantee/Test Certificate**.
- d) Dealers / Distributors of OEM if quoting should enclose **dealership/ distributorship certificate** with validity given by OEM to prove the credential, without which offers are liable to be summarily rejected.

4. Marking & Packing:- Manufacturer's identification mark/ shall be provided on each item. One set of **KIT** shall be properly packed in box of suitable material to avoid damage during handling and transportation. All the items should be first kept in durable polythene packet, each type in separate packet and then finally kept in box. Two cards indicating description of the material under stocking C&D No. **5522/031** (for Shop-2308) & **5582/015** (for Shop-2106) & **5582/016** (for Shop-2103) and also the description and C&D No. of individual item including quantity duly signed by CLW's inspector shall be tagged, one inside and the other outside the box.

5. Inspection:-

Few Hardwares of each size shall be selected at random.

पूजा SEE/TMD	डि.के.एस CHK.D.	DRN. SPECIFICATION FOR STANDARD HARDWARE KIT FOR HITACHI TRACTION MOTOR.	 DY.CEE/TMD	CHITTARANJAN LOCOMOTIVE WORKS WEST BENGAL, INDIA NO. 4TMS.095.042 DATE : 16 - 06 - 2010
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Annexure-1

Sl.No.	Description & Drg./ Specn.No.	Qty / TM (Nos.)	C&D No
01	Hex.Socket set screw M6X20 Phosphated to IS:6094'81-CP	15 Nos.	5522/078
02	Hex. Socket set screw M10X10 Phosphated to IS:6094'81-CP	15 Nos.	5522/068
	TOTAL	30 Nos.	
01	Hex. Hd. Bolt M24 X 95-8.8 Phosphated to IS:1364 (Part -1) '92 ISO:4014'88	12 Nos.	5582/003
02	Hex. Hd. Screw M24 X 55 (Head height 15mm) 8.8 Phosphated to IS:1364 (Part -2) '92 ISO:4017'88	05 Nos.	5582/004
03	Hex. Hd. Screw M24 X 55 (Head height 13mm) 8.8 Phosphated to IS:1364 (Part -2) '92 ISO:4017'88	01 Nos.	5582/005
04	Hex. Hd. Screw M20 X 55 -8.8/10.9 Zn plated to IS:1364 (Part -2) '92 ISO:4017'88	04 Nos.	5560/614
	TOTAL	22 Nos.	

Sl.No.	Description & Drg./ Specn.No.	Qty / TM (Nos.)	C&D no
01	Hex. Hd. Bolt M20 X 70-8.8 Phosphated to IS:1364 (Part -1) '92 ISO:4014'88	06 Nos.	5570/209
02	Hex. Hd. Screw M16 X 45-8.8 Phosphated to IS:1364 (Part -2) '92 ISO:4017'88	08 Nos.	5570/204 5518/205
03	Hex. Hd. Screw M16 X 40-8.8 Phosphated to IS:1364 (Part -2) '92 ISO:4017'88	03 Nos.	5528/042
04	Hex. Hd. Screw M16 X 35-8.8 Phosphated to IS:1364 (Part -2) '92 ISO:4017'88	02 Nos.	5565/782
05	Hex. Hd. Bolt M12 X 90-8.8 Phosphated to IS:1364 (Part -1) '92 ISO:4014'88	04 Nos.	5560/601
06	Hex. Hd. Bolt M12 X 65-8.8 Phosphated to IS:1364 (Part -1) '92 ISO:4014'88	08 Nos.	5560/605
07	Hex. Hd. Bolt M12 X 50-8.8 Zn Plated to IS:1364 (Part -1) '92 ISO:4014'88	08 Nos.	5560/630
08	Hex. Nut M16-8 Zn Plated to IS:1364 (Part -3) '92 ISO:4032'86	02 Nos.	5565/802
09	Hex. Nut M12-8 Phosphated to IS:1364 (Part -3) '92 ISO:4032'86	04 Nos.	5560/602
10	Hex. Hd. Screw M18 X 45-8.8-Patch 2.5 (Cad Plated) to IS:1364 (Part -2) '92 ISO:4017'88	04 Nos.	5528/041
11	Hex. Hd. Screw M24 X 55-(Head height 15mm) 8.8-Phosphated to IS:1364 (Part -2) '92 ISO:4017'88	06 Nos.	5582/004
	Total	55 Nos.	


Qty/TM of "STANDARD HARDWARE KIT (HTM) = 01 SET

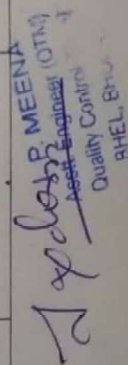
IN 01 SET = (30+22+55) = 107 NOS

BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL
QUALITY CONTROL TRANSPORTATION
QUALITY ASSURANCE PLAN (QAP)

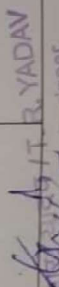
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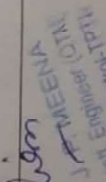
Sl. No.	Name of the Process	Parameters of Inspection	Quantum of Check*		Mode of Inspection/ Equipment used	Drawing No./Spec./Std.	Acceptance Norms	Requirement from supplier
			TP/Supplier	TP/IA/QC**				
1.	Melt analysis	Chemical composition	One sample per heat	100% TC to be verified	Spectrometer / Wet analysis method	As per the specification	As per the specification	TC (as per specification) to be provided to BHEL.
2.	Mechanical testing	Mechanical properties mentioned in the specification	One sample per heat per treatment batch	100% TC to be verified	Mechanical testing equipment	As per the specification	As per the specification	One sample (Ø 25 x 300 mm) per heat per heat treatment batch is to be verified by TPIA (for heat & heat treatment batch punched by supplier matching with test certificate reports above) and provided to BHEL for chemical & mechanical testing at BHEL works.


 T. R. YADAV
 चरि. अभियंता / Sr. Engineer
 क्यू.टी.एम. विभाग / QTM Division
 बी.एच.ई.एल., भोपाल / BHEL, Bhopal


 P. MEENA
 ज्येष्ठ अभियंता (QTM)
 ज्येष्ठ अभियंता
 Quality Control
 BHEL, Bhopal

Sl. No.	Name of the Process	Parameters of Inspection	Quantum of Check*		Mode of Inspection/ Equipment used	Drawing No./Spec./Std.	Acceptance Norms	Requirement from supplier
			TP/Supplier	TPIA/QC**				
3.	Microstructure	Hardened and tempered with no decarburisation	One sample per heat per heat treatment batch	100% TC to be verified	Metallurgical microscope	As per the specification	As per the specification	TC along with photograph of microstructure
4.	NDT testing	MPI/LPI	As per requirement mentioned in the BHEL drg. / spec.	1%	NDT equipment	As per BHEL drawing/ specification	As per BHEL drawing/ specification	NDT test report
5.	Dimensions & tolerances	<ul style="list-style-type: none"> Checking by go/no go gauge Thread length, Dia., Head size etc. Hole for wire locking (if applicable) 	5%	1%	Gauges & Instruments	As per BHEL drawing/ specification	As per BHEL drawing/ specification	Dimensional report
6.	Thread manufacturing by rolling process	Rolled/ machined	100%	-	Visual	-	Threads to be manufactured by rolling process only	Supplier to submit compliance certificate
7.	Visual Inspection	Free from visual defect	100%	1%	Visual	-	Fasteners shall be free from any surface discontinuities such as dent etc.	-


 टी. आर. यादव / T. R. YADAV
 बरि. अभियंता / Sr. Engineer
 बसु. टी. एम. विभाग / QTM Division
 बी.एस.ई.एस., भोपाल / BHEL, Bhopal


 ज.के.मीना / J. K. MEENA
 असि. अभियंता (QTM) / Asst. Engineer (QTM)
 ओ.एस.ई.एस. भोपाल / O.S.E.S. Bhopal

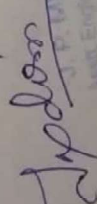
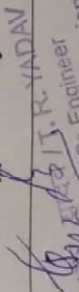
Sl. No.	Name of the Process	Parameters of Inspection	Quantum of Check*		Mode of Inspection/ Equipment used	Drawing No./Spec./Std.	Acceptance Norms	Requirement from supplier
			TP/Supplier	TP/IA/QC**				
8.	Identification marking	Vendor name Property class/grade	100%	1%	Verification	-	Embossing identification marking on bolt head	-
9.	Electroplating/ Parkerizing	-	100%	1%	Visual	As per relevant BHEL Drawing/ specification	As per relevant BHEL Drawing/ specification	-
10.	Packing	Suitable packing	100%	-	Visual	-	Packaging shall be such that during transit fasteners should not get damaged	-

Notes:

- 1) All test records checked by TP, TP/IA/QC (dully signed & sealed) as per above QAP requirement shall be submitted along with consignment.
- 2) Final acceptance will be based on inspection at BHEL, Bhopal.
- 3) (*) Quantum of inspection shall be in line with QAP unless otherwise mentioned in the drawing.
- 4) (**) Job shall be randomly selected from offered lot.
- 5) Sample inspection of fasteners does not mean that the supplier will not meet drawing & specification requirements in remaining fasteners. In case, any defect / non-conformance is observed at any stage (during processing or before and after fitment in any job), the same is liable to be rejected and same shall be replaced immediately by the supplier at BHEL or BHEL Customer site (wherever deficiency is observed).

Meaning of Legends: '#' - Supplier to submit test certificates & reports of above mentioned parameters.

Abbreviation: TP/IA - BHEL appointed third Party Inspecting Agency, TP - Task Performer (vendor), QC-QIX.

Prepared by:	Approved by:
 J. P. MEENA Asst. Engineer (QTM) Quality Control BHEL, Bhopal	 J. R. YADAV Asst. Engineer QTM Division BHEL, Bhopal