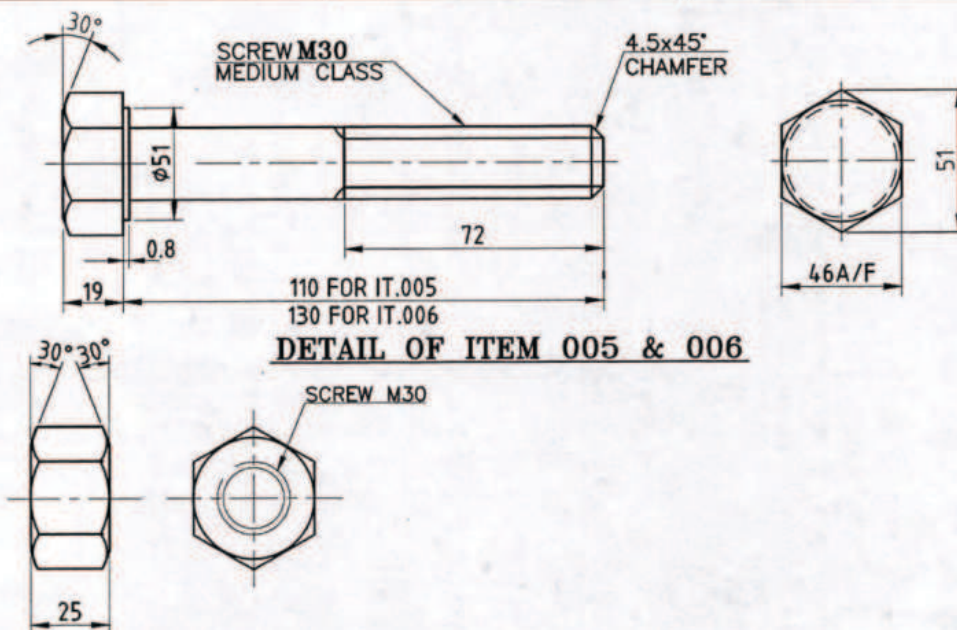


FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL W.O.No.
		CHECKED			CHECKED	INFORMATION 18002-Q-11267
		APPROVED			APPROVED	STATUS OF DRG.LIST No.
						DRAWING 4-17053-41065
						DISTRIBUTION CDE-2 STM-4
						OF PRINTS



DETAIL OF ITEM 005 & 006

ITEM-007

TECHNICAL REQUIREMENTS(TR):

1. MACHINE ALL OVER EXCEPT ON HEXAGONAL SURFACE.
2. ALL THREADS TO BE AS PER IS:4218; PART-2, PITCH:COARSE.TOLERANCE QUALITY:MEDIUM; TOLERANCE CLASS:6g.OF IS:1364 FOR BOLT & 6H FOR NUT.
3. MECHANICAL PROPERTIES
TO CONFIRM TO PROPERTY CLASS 4.6 AS SPECIFIED IN IS:1367:PART-3;
FOR BOLT & PROPERTY CLASS 4.0 AS SPECIFIED IN IS:1367:PART-6 FOR NUT.
(TENSILE,YIELD STRESS, ELONGATION & HARDNESS).
4. THREADS ARE TO BE FORMED BY ROLLING & HEAT TREATED.
5. NO NEGATIVE TOLERANCE ON LENGTH OF BOLT.

4-17053-41028

REF. DRG. NO.

SIGN. & DATE

INVENTORY NO.

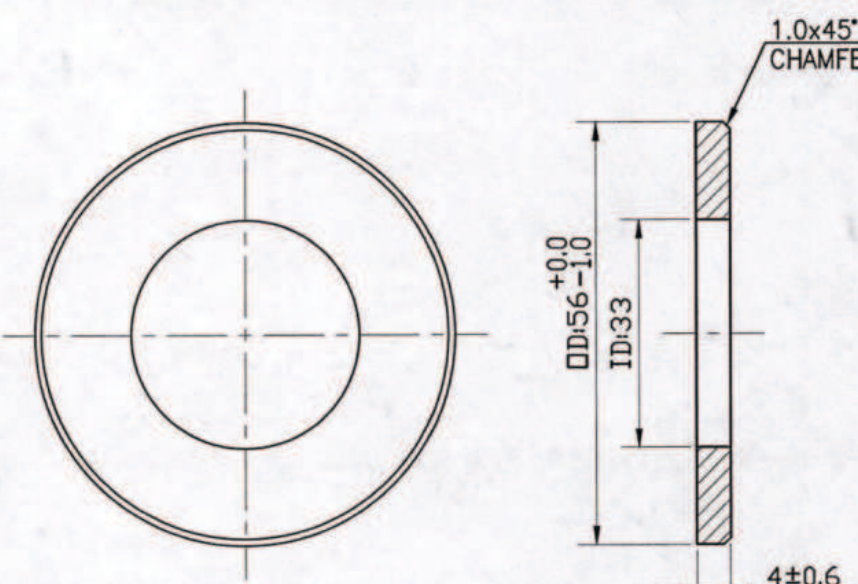
1X660 MW PANKI TPS EXTN.

C-BOM REFER DRG.No. 3-17053-41924					ITEM No.005,006,007		PRODUCT GROUP No.1			
X660 MW PANKI TPS EXTN.	नीएचईएल भारत हेवी इलेक्ट्रिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL				कम्पा DRN.	नाम / NAME	हस्ता / SIGN.	दि. / DATE	वेरि नं. NO. OF VAR.	
					चैक CKD.	दिलीप सुरवाडे		03.03.20		
					अनुम APPD.	पवन राय		04.03.20		
						ए.के.माहौर		05.03.20	01	
विभाग DEPT.CDE		उत्प.उत्प. नाम की श्रेणी UNTOL. DIMS. GR. M			उत्प.उत्प. SCALE	भारत हेवी इलेक्ट्रिकल्स लिमिटेड WEIGHT(K.G.)		उत्प. ड्राइंग का संदर्भ REF. TO ASSY. DRG.	सद. नं. ITEM NO.	सद. संख्या NO. OF ITEM
कोड CODE 411	AA0230208		1;5		0.86,0.95 0.23	3-17053-41924		005,006 007	003	
वर्णन / TITLE						ड्राइंग नं. / DRAWING NO.			उत्प./REV.	
BOLTS & NUT						4-17053-41084			00	
						पृष्ठ नं. / SHT. NO. 1			पृष्ठों की सं. NO. OF SHT. 1	

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL INFORMATION	W.O.No. 18002-Q-11267
		CHECKED			CHECKED		
		APPROVED			APPROVED		
		STATUS OF DRAWING			DRG.LIST No. 4-17053-41065		
DISTRIBUTION OF PRINTS						CDE-2 STM-4	



ITEM No.009

TECHNICAL REQUIREMENTS(TR)

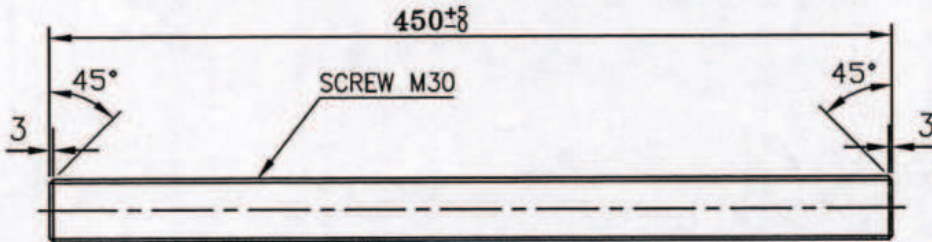
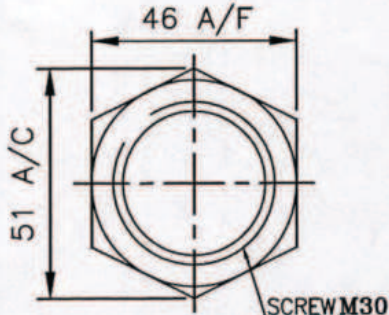
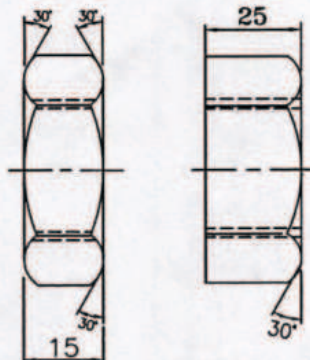
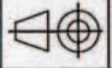
1. MACHINE ALL OVER FINISH 1.6 MICRONS OR, BETTER.
2. DIMENSIONS TOLERANCE AS PER IS:2016;1967(TABLE-1).
3. MATERIAL- CARBON STEEL TO IS: 2062 Gr.A

FOR C-BOM REFER DRG.No.3-17053-41924				ITEM No.009		PRODUCT GROUP No.1	
SIGN. & DATE	1X660 MW PANKI TPS EXTN.	 भारत हेवी इलेक्ट्रिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL		वर्ग / NAME	हस्ता / SIGN.	दि. / DATE	वै. सं. संख्या NO. OF VAR.
				वर्ग / DRN.	वर्ग / CKD.	वर्ग / APPD.	
				वर्ग / DRN.	वर्ग / CKD.	वर्ग / APPD.	
DEPT./CDE	उत्प. सं. संख्या UNTOL. DIMS. GR.	उत्प. सं. संख्या M	उत्प. सं. संख्या AA0230208	उत्प. सं. संख्या 1:5	उत्प. सं. संख्या 0.10	उत्प. सं. संख्या 3-17053-41924	उत्प. सं. संख्या 009
कोड CODE 411	वर्ग / TITLE			वर्ग / TITLE			वर्ग / REV.
CONVENTIONAL R.E.JOINT				WASHER			00
(MCD)				4-17053-41085			00
वर्ग / SHT. NO. 1				वर्ग / SHT. NO. 1			वर्ग / SHT. NO. 1

A4 SIZE

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

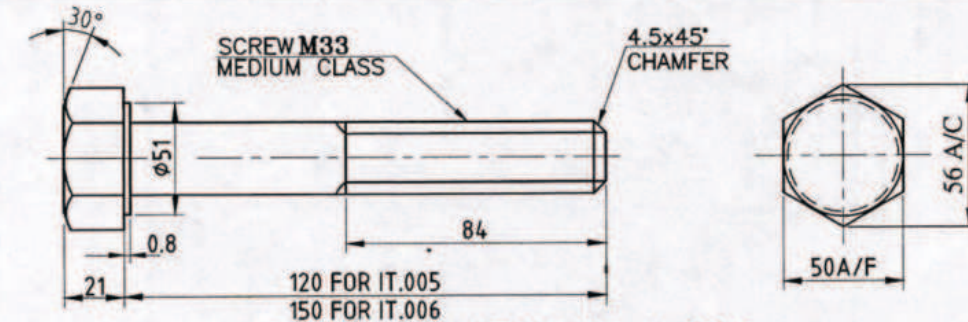
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN THE WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.	REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL INFORMATION W.O.No.18002-Q-11267 STATUS OF DRAWING DRG.LIST No. 4-17053-41065 DISTRIBUTION OF PRINTS CDE-2 STM-4	
			CHECKED			CHECKED		
			APPROVED			APPROVED		
4-17053-41037 REF. DRG. NO.								
	DETAIL OF ITEM-003							
								
								
TECHNICAL REQUIREMENTS (TR):-								
1. MACHINE ALL OVER EXCEPT ON HEXAGONAL SURFACE. 2. THREADS : AS PER IS:4218 PART-2, <u>PITCH</u> : COARSE. TOLERANCE QUALITY:MEDIUM CLASS. TOLERANCE CLASS : 6g FOR STUD & 6H FOR NUT AND LOCK NUT OF IS:1364. 3. THREADS ARE TO BE FORMED BY ROLLING AND HEAT TREATED. 4. MECHANICAL PROPERTIES: MATERIAL USED SHALL MEET REQUIREMENTS OF PROPERTY CLASS 8.8 AS PER IS:1367 PART-3 FOR BOLT & PROPERTY CLASS 8.0 AS PER IS:1367 PART-6 FOR NUT & LOCK NUT. (TENSILE,YIELD STRESS,ELONGATION & HARDNESS)								
FOR C-BOM REFER DRG.No.3-17053-41924 ITEM No.003,004,010								
SIGN. & DATE	 भारत हेवी इलेक्ट्रिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL		नाम / NAME दलीप सुरवाडे पवन राय ए.के.माहौर		हस्ता / SIGN.   		दि. / DATE 04.03.20 05.03.20 06.03.20	चेक की संख्या NO. OF VAR. —
	DEPT.CDE कोड CODE 411	उन्.टोल. नाम की ग्रेड UNTOL. DIMS. GR. M AA0230208		उन्. वजन WEIGHT(K.G.) 2.5,0.15 0.23	उन्. ड्राईंग का संदर्भ REF. TO ASSY. DRG. 3-17053-41924		मद. क. ITEM NO. 003,004 010	मद. संख्या NO. OF ITEM —
INVENTORY NO.	1X660 MW PANKI TPS EXTN.			ड्राईंग क./ DRAWING NO. 4-17053-41083			पुन. / REV. 00	
स्ट्रेचर/ TITLE STRETCHER BOLT, NUT & LOCK NUT							पुन. क./ SHT. NO. 1 पुन. की सं. NO. OF SHT. 1	

A4 SIZE

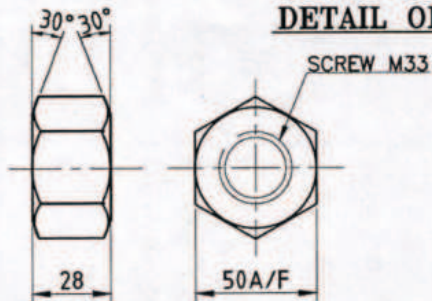
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL W.O.No.
		CHECKED			CHECKED	INFORMATION 18002-Q-11267
		APPROVED			APPROVED	STATUS OF DRG.LIST No.
						DRAWING 4-17053-41065
						DISTRIBUTION CDE-2 STM-4
						OF PRINTS



DETAIL OF ITEM 005 & 006



ITEM-007

TECHNICAL REQUIREMENTS(TR):

1. MACHINE ALL OVER EXCEPT ON HEXAGONAL SURFACE.
2. ALL THREADS TO BE AS PER IS:4218; PART-2, PITCH:COARSE.TOLERANCE QUALITY:MEDIUM; TOLERANCE CLASS:6g.OF IS:1364 FOR BOLT & 6H FOR NUT.
3. MECHANICAL PROPERTIES
TO CONFIRM TO PROPERTY CLASS 4.6 AS SPECIFIED IN IS:1367:PART-3; FOR BOLT & PROPERTY CLASS 4.0 AS SPECIFIED IN IS:1367:PART-6 FOR NUT.
(TENSILE,YIELD STRESS, ELONGATION & HARDNESS).
4. THREADS ARE TO BE FORMED BY ROLLING & HEAT TREATED.
5. NO NEGATIVE TOLERANCE ON LENGHT OF BOLT.

4-17053-41028

REF. DRG. NO.

4	C-BOM REFER DRG.No. 3-17053-41923 ITEM No.005,006,007		PRODUCT GROUP No.1																
SIGN. & DATE	INVENTORY NO. 1X660 MW PANKI TPS EXTN.			भारत हेवी इलेक्ट्रिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL	<table><tr><td>वर्क / NAME</td><td>हस्ता / SIGN.</td><td>दि. / DATE</td><td>वर्क को संख्या NO. OF VAR.</td></tr><tr><td>वर्क DRN.</td><td>दिलीप सुरवाड़े</td><td>11.06.20</td><td rowspan="3">01</td></tr><tr><td>वर्क CKD.</td><td>पवन राय</td><td>12.06.20</td></tr><tr><td>वर्क APPD.</td><td>ए.के.माहोर्</td><td>13.06.20</td></tr></table>	वर्क / NAME	हस्ता / SIGN.	दि. / DATE	वर्क को संख्या NO. OF VAR.	वर्क DRN.	दिलीप सुरवाड़े	11.06.20	01	वर्क CKD.	पवन राय	12.06.20	वर्क APPD.	ए.के.माहोर्	13.06.20
		वर्क / NAME	हस्ता / SIGN.	दि. / DATE	वर्क को संख्या NO. OF VAR.														
		वर्क DRN.	दिलीप सुरवाड़े	11.06.20	01														
		वर्क CKD.	पवन राय	12.06.20															
वर्क APPD.	ए.के.माहोर्	13.06.20																	
DEPT.CDE	उत्त.उत्त. कार्य की श्रेणी M AA0230208		उत्तुपात SCALE 1:5	भारत भार. WEIGHT(K.G.) 1.2,1.4 0.3	उत्त. ड्राईंग का संदर्भ REF. TO ASSY. DRG. 3-17053-41923	वर्क को संख्या ITEM NO. 005,006 007	वर्क को संख्या NO. OF ITEM 003												
वर्क कोड CODE 411																			
वर्क / TITLE		BOLTS & NUT (M33)				ड्राईंग नं. / DRAWING NO. 4-17053-41082	वर्क को संख्या 00												
						पृष्ठ नं. / SHT. NO. 1	पृष्ठों की संख्या NO. OF SHT. 1												

A4 SIZE

FIRST ANGLE PROJECTION

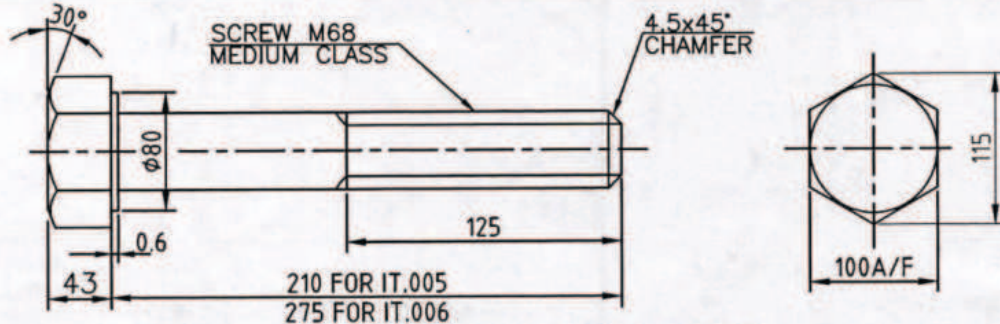
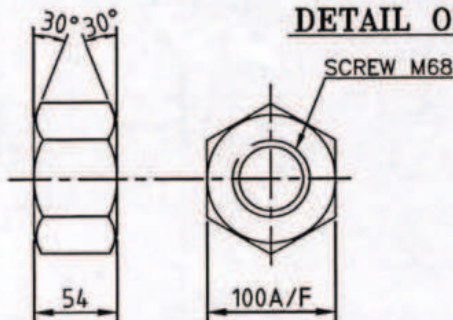
(ALL DIMENSIONS ARE IN mm)

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4-17053-41032

REF. DRG. NO.

REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL W.O.No.-18002-Q-11267
		CHECKED			CHECKED	INFORMATION
		APPROVED			APPROVED	STATUS OF DRG.LIST No.
						DRAWING 4-17053-41065
						DISTRIBUTION CDE-2
						OF PRINTS STM-4

**DETAIL OF ITEM 005 & 006****ITEM-007****TECHNICAL REQUIREMENTS(TR)**

1. MACHINE ALL OVER EXCEPT ON HEXAGONAL SURFACE.
2. ALL THREADS TO BE AS PER IS:4218; PART-2, PITCH:COARSE TOLERANCE QUALITY:MEDIUM; TOLERANCE CLASS:6g OF IS:1364 FOR BOLT & 6H FOR NUT.
3. MECHANICAL PROPERTIES:-
TO CONFORM TO PROPERTY CLASS 4.6 AS SPECIFIED IN IS:1367 PART-3 FOR BOLT & PROPERTY CLASS 4.0 AS SPECIFIED IN IS:1367 PART-6 FOR NUT.
(TENSILE, YIELD STRESS, ELONGATION & HARDNESS)
4. THREADS ARE TO BE FORMED BY ROLLING & HEAT TREATED.
5. NO NEGATIVE TOLERANCE ON LENGTH OF BOLT.

FOR C-BOM REFER DRG.No. 3-17053-41914 | ITEM No.005,006,007 | PRODUCT GROUP No.1

SIGN. & DATE	DEPT.CDE	UNTO. DIMS. GR.	SCALE	WEIGHT(K.G.)	REF. TO ASSY. DRG.	ITEM NO.	REV.
1X660 MW PANKI TPS EXTN.	411	AA0230208	1:5	8.93, 10.9	3-17053-41914	005,006,007	003
BOLTS & NUT					DRAWING NO. 4-17053-41072		
CONVENTIONAL R.E.JOINT:(2800NB)					SHT. NO. 1		

A4 SIZE

FIRST ANGLE PROJECTION

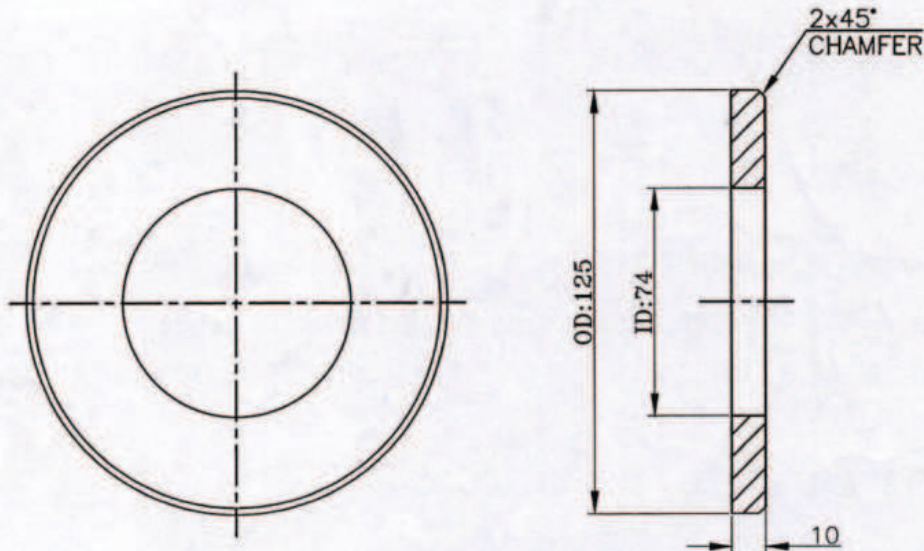
(ALL DIMENSIONS ARE IN mm)

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN THE WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

4-17053-41033

REF. DRG. NO.

REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL INFORMATION	W. O. NO.
		CHECKED			CHECKED	18002-Q-11267	
		APPROVED			APPROVED	STATUS OF DRAWING	DRG. LIST NO. 4-17053-41065
						DISTRIBUTION OF PRINTS	CDE - 2 STM - 4

**TECHNICAL REQUIREMENTS (TR)**

1. MACHINE ALL OVER.
2. DIMENSIONS TOLERANCE AS PER IS:2016-67(TABLE-1).
3. MATERIAL OF CONSTRUCTION: IS:2062 Gr.A.

FOR C - BOM REFER DRG. NO. 3-17053 - 41914

ITEM NO. 009

PRODUCT GROUP No. 1

INVENTORY NO. 1X660 MW PANKI TPS EXTN.	SIGN. & DATE	भारत हेवी इलेक्ट्रिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL		क्याया DRN.	नाम / NAME	हस्ता / SIGN.	दि. / DATE	चेकि की संख्या NO. OF VAR.
				क्याया CKD.	PAWAN RAI	<i>Pawan Rai</i>	06.03.20	
				क्याया APPD.	MAHOR AK	<i>MAHOR AK</i>	07.03.20	
				डिप्ट. कोड DEPT. CODE	उत्प. कोड UNTO. DIMS. GR.	उत्प. कोड SCALE	भारत भार WEIGHT (K.G.)	
कोड CODE 411	M AA 0280208	1:5	0.63	3-17053-41914	009	-		
कोड / TITLE CONVENTIONAL R.E. JOINT (2800NB)				ड्राइंग को. / DRAWING NO. 4-17053-41074				उत्प. / REV. 00
WASHER (MCD)				पृष्ठ को. / SHT. NO. 1				पृष्ठों की सं. NO. OF SHT. 1

A4 SIZE

FIRST ANGLE PROJECTION

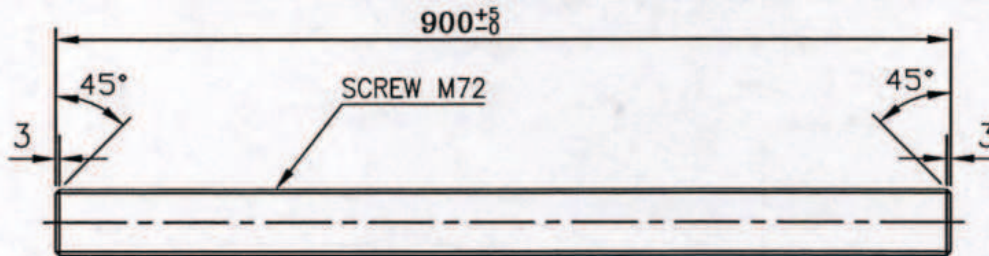
(ALL DIMENSIONS ARE IN mm)

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN THE WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

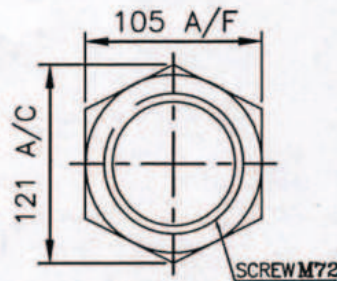
4-17053-41037

REF. DRG. NO.

REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL INFORMATION
		CHECKED			CHECKED	W.O.No.18002-Q-11267
		APPROVED			APPROVED	STATUS OF DRAWING
						DRG.LIST No. 4-17053-41065
						DISTRIBUTION OF PRINTS CDE-2 STM-4



DETAIL OF ITEM-003



ITEM-004



ITEM-010

TECHNICAL REQUIREMENTS (TR):-

1. MACHINE ALL OVER EXCEPT ON HEXAGONAL SURFACE.
2. THREADS : AS PER IS:4218 PART-2, PITCH: COARSE.
TOLERANCE QUALITY:MEDIUM CLASS.
TOLERANCE CLASS : 6g FOR STUD & 6H FOR NUT AND LOCK NUT OF IS:1364.
3. THREADS ARE TO BE FORMED BY ROLLING AND HEAT TREATED.
4. **MECHANICAL PROPERTIES:**
MATERIAL USED SHALL MEET REQUIREMENTS OF PROPERTY CLASS 8.8 AS PER IS:1367 PART-3 FOR BOLT & PROPERTY CLASS 8.0 AS PER IS:1367 PART-6 FOR NUT & LOCK NUT.
(TENSILE,YIELD STRESS,ELONGATION & HARDNESS)

FOR C-BOM REFER DRG.No.3-17053-41914

ITEM No.003,004,010

SIGN. & DATE	1X660 MW PANKI TPS EXTN.	भीएचईएल भारत हेवी इलेक्ट्रिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL		कनवरा DRN.	नाम / NAME	हस्ता / SIGN.	दि. / DATE	चेक की संख्या NO. OF VAR.
		कोटा CKD.	दिलीप सुरवाडे		04.03.20	—		
स्वीकृत APPD.		पवन राय		05.03.20				
		ए.के.माहौर		06.03.20				
डिप्टा DEPT.CDE		उत्तोल. माप की वेदी UNTOL. DIMS. GR.		उत्पन्न SCALE	भारत भार. WEIGHT(K.G.) 28.8,1.82, 2.94	उत्ते. ड्राईंग का संदर्भ REF. TO ASSY. DRG.	मद क. ITEM NO.	मद संख्या NO. OF ITEM
कोड CODE 411	M AA0230208							
शीर्षक / TITLE					ड्राईंग क. / DRAWING NO.	पृष्ठ / REV.		
STRETCHER BOLT, NUT & LOCK NUT					4-17053-41071	00		
					पृष्ठ क. / SHT. NO. 1	पृष्ठों की सं. NO. OF SHT. 1		

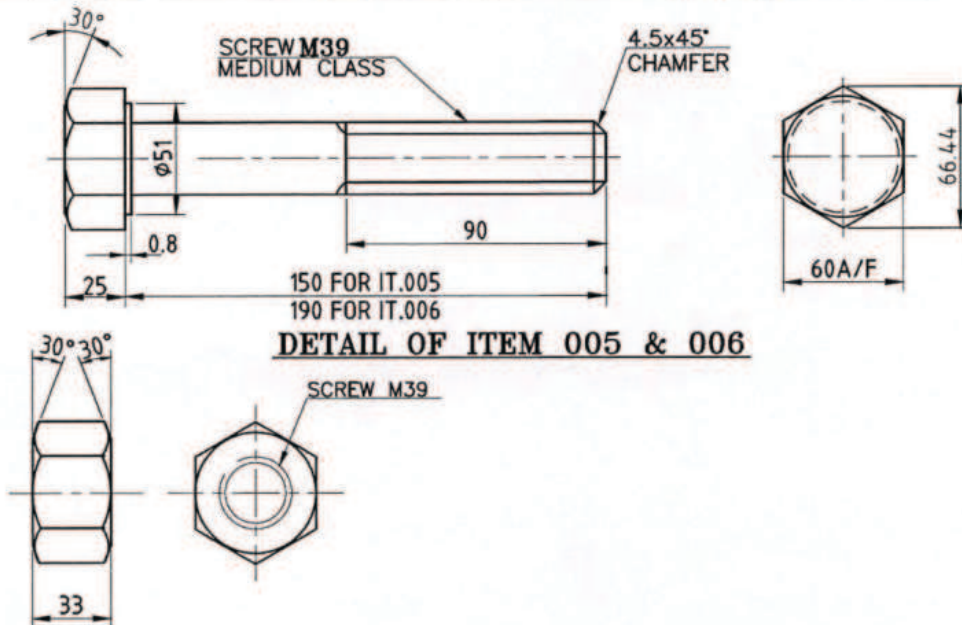
A4 SIZE

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL W.O.No.
		CHECKED			CHECKED	INFORMATION 18002-Q-11267
		APPROVED			APPROVED	STATUS OF DRG.LIST No.
						DRAWING 4-17053-41065
						DISTRIBUTION CDE-2 STM-4
						OF PRINTS

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 IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN THE WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

 4-17053-41028
 REF. DRG. NO.

DETAIL OF ITEM 005 & 006
ITEM-007
TECHNICAL REQUIREMENTS(TR):

1. MACHINE ALL OVER EXCEPT ON HEXAGONAL SURFACE.
2. ALL THREADS TO BE AS PER IS:4218; PART-2, PITCH:COARSE.TOLERANCE QUALITY:MEDIUM; TOLERANCE CLASS:6g.OF IS:1364 FOR BOLT & 6H FOR NUT.
3. MECHANICAL PROPERTIES
TO CONFIRM TO PROPERTY CLASS 4.6 AS SPECIFIED IN IS:1367:PART-3; FOR BOLT & PROPERTY CLASS 4.0 AS SPECIFIED IN IS:1367:PART-6 FOR NUT. (TENSILE,YIELD STRESS, ELONGATION & HARDNESS).
4. THREADS ARE TO BE FORMED BY ROLLING & HEAT TREATED.
5. NO NEGATIVE TOLERANCE ON LENGTH OF BOLT.

C-BOM REFER DRG.No. 3-17053-41913		ITEM No.005,006,007		PRODUCT GROUP No.1					
SIGN. & DATE	1X660 MW PANKI TPS EXTN.	भारत हेवी इलेक्ट्रिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL		नाम / NAME	हस्ता / SIGN.	दि./ DATE	वै. की संख्या NO. OF VAR.		
				कवचा DRN.	दिलीप सुरवाडे	03.03.20	01		
				जोका CKD.	पवन राय	04.03.20			
				स्वीकृत APPD.	ए.के.माहौर	05.03.20			
INVENTORY NO.	1X660 MW PANKI TPS EXTN.	डिपार्ट. DEPT.CDE	उत्प.सं. नाम की वै.सं. UNTOL DIMS. GR.	उत्पाद SCALE	भारत की.व. WEIGHT(K.G.)	उत्प. ड्रॉग का संदर्भ REF. TO ASSY. DRG.	मद क. ITEM NO.	मद संख्या NO. OF ITEM	
		कोड CODE 411	M AA0230208		1:5	1.95,2.35 0.5	3-17053-41913	005,006 007	003
		वर्क / TITLE					ड्रॉग क. / DRAWING NO.	पृ.सं./REV.	
		BOLTS & NUT					4-17053-41069	00	
पृष्ठ क./ SHT. NO. 1 पृष्ठों की सं. NO. OF SHT. 1									

A4 SIZE

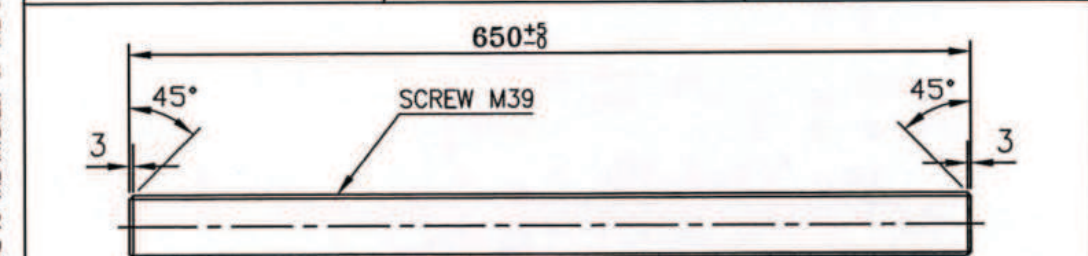
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

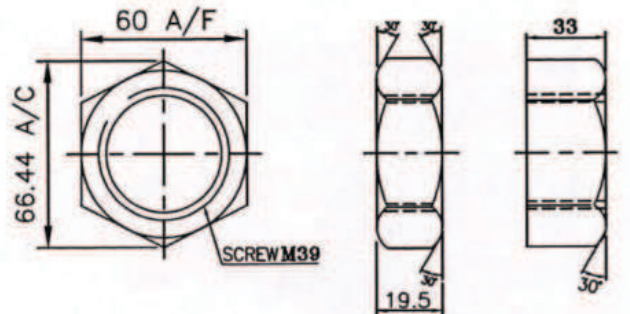
REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL INFORMATION
		CHECKED			CHECKED	W.O.No.18002-Q-11267
		APPROVED			APPROVED	STATUS OF DRAWING
						DRG.LIST No. 4-17053-41065
						DISTRIBUTION OF PRINTS CDE-2 STM-4

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN THE WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

4-17053-41037
REF. DRG. NO.



DETAIL OF ITEM-003



ITEM-004

ITEM-010

TECHNICAL REQUIREMENTS (TR):-

1. MACHINE ALL OVER EXCEPT ON HEXAGONAL SURFACE.
2. THREADS : AS PER IS:4218 PART-2, PITCH: COARSE, TOLERANCE QUALITY:MEDIUM CLASS, TOLERANCE CLASS : 6g FOR STUD & 6H FOR NUT & LOCK NUT OF IS:1364.
3. THREADS ARE TO BE FORMED BY ROLLING AND HEAT TREATED.
4. **MECHANICAL PROPERTIES:**
MATERIAL USED SHALL MEET REQUIREMENTS OF PROPERTY CLASS 8.8 AS PER IS:1367 PART-3 FOR BOLT & PROPERTY CLASS 8.0 AS PER IS:1367 PART-6 FOR NUT & LOCK NUT. (TENSILE,YIELD STRESS,ELONGATION & HARDNESS)

FOR C-BOM REFER DRG.No.3-17053-41913

ITEM No.003,004,010

SIGN. & DATE	INVENTORY NO.	1X660 MW PANKI TPS EXTN.	भारत हे वी इलेक्ट्रिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL		कलम DRN.	नाम / NAME	हस्ता / SIGN.	दि / DATE	पै. क्र. संख्या
			कोड CKD.	दिलीप सुरवाडे		02.03.20	NO. OF VAR.		
					मंजूर APPD.	पवन राय		03.03.20	
						ए.के.माहौर		04.03.20	—
			डिप्ट.कोड DEPT.CDE	उत्त.दिम. नाम की ग्रेड UNTOL. DIMS. GR.	उत्त.पता SCALE	भर. वजन. WEIGHT(K.G.)	उत्त. ड्राइंग का संदर्भ REF. TO ASSY. DRG.	मंड. क्र. ITEM NO.	मंड. संख्या NO. OF ITEM
			कोड CODE 411	AA0230208		6.1,0.31, 0.5			—
			वर्क/TITLE STRETCHER BOLT, NUT & LOCK NUT				ड्राइंग क्र. / DRAWING NO. 4-17053-41067		उत्त./REV 00
							पृष्ठ क्र. / SHT. NO. 1		पृष्ठों की सं. NO. OF SHT. 1

A4 SIZE

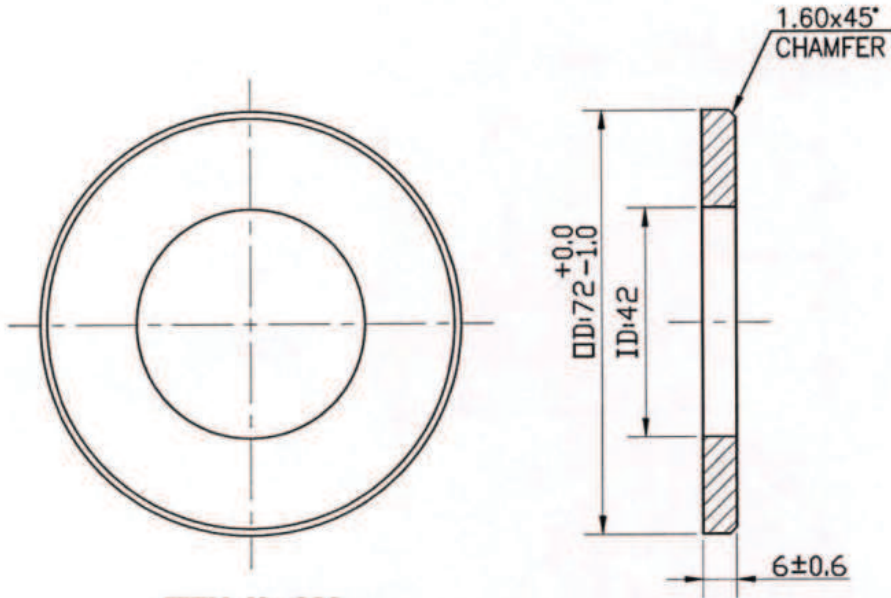
(ALL DIMENSIONS ARE IN mm)

A4 SIZE

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL INFORMATION	W.O.No.
		CHECKED	01	29.05.20	CHECKED	17057-A-11265	
		APPROVED			APPROVED	STATUS OF DRAWING	DRG.LIST No. 4-17053-41017
WEIGHT CORRECTED.						DISTRIBUTION OF PRINTS	CDE-2 STM-4



ITEM No.009

TECHNICAL REQUIREMENTS(TR)

1. MACHINE ALL OVER FINISH 1.6 MICRONS OR, BETTER.
2. DIMENSIONS TOLERANCE AS PER IS:2016;1967(TABLE-1).
3. MATERIAL- CARBON STEEL TO IS: 2062 Gr.A

417053-40795

REF. DRG. NO.

SIGN. & DATE	FOR C-BOM REFER DRG.No.3-17053-41853				ITEM No.009		PRODUCT GROUP No.1	
	भारत हेवी इलेक्ट्रिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL				नाम / NAME दिलीप सुरवाडे पवन राय ए.के.माहीर	हस्ता / SIGN. 	दि./ DATE 11.04.19 12.04.19 13.04.19	वेरि की संख्या NO. OF VAR. —
INVENTORY NO.	विभाग DEPT.CDE कोड CODE 411	उत.उत्प. माप की वेदी UNTOL. DIMS. GR. M AA0230208		अनुपात SCALE 1:5	भार कि.ग्रा. WEIGHT(K.G.) 0.13	उद्देश्य REF. TO ASSY. DRG. 3-17053-41913	मद क. ITEM NO. 009	मद की संख्या NO. OF ITEM —
	विवरण/TITLE CONVENTIONAL R.E.JOINT WASHER (MCD)					ड्राइंग क./ DRAWING NO. 4-17053-41029		पुनः/REV. 01
					पृष्ठ क./ SHT. NO. 1		पृष्ठों की संख्या/ NO. OF SHT. 1	

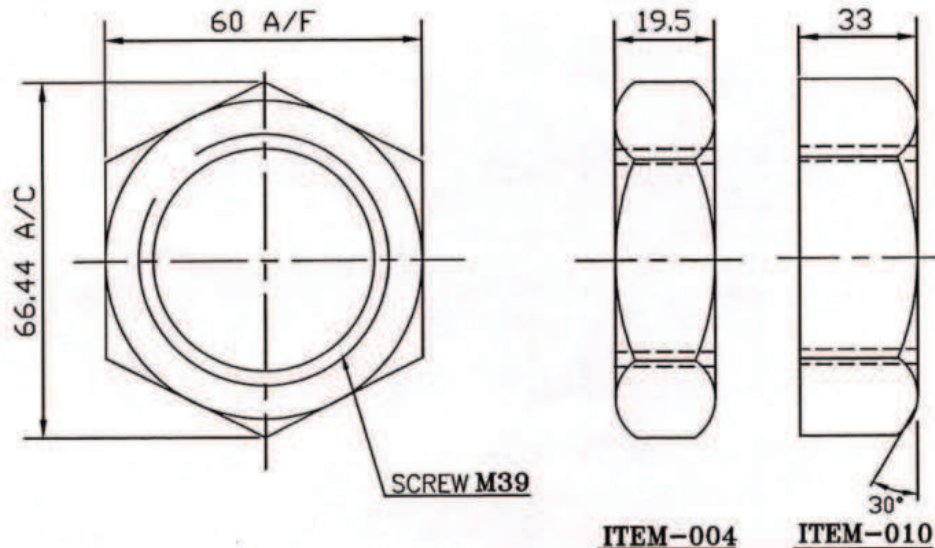
A4 SIZE

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL	W.O.No.
		CHECKED	01	01.06.20	CHECKED	INFORMATION	17057-A-11265
		APPROVED			APPROVED	STATUS OF	DRG.LIST No.
						DRAWING	4-17053-41017
						DISTRIBUTION	CDE-2 STM-4
						OF PRINTS	

NUT THICKNESS CORRECTED.

**TECHNICAL REQUIREMENTS(TR)**

1. MATERIAL OF CONSTRUCTION USED SHALL MEET REQUIREMENTS OF PROPERTY CLASS: P8.0 AS- PER IS:1367; PART-6.
2. MACHINE ALL OVER EXCEPT ON HEXAGONAL SURFACE.
3. THREADS AS PER IS: 4218; PART-2, PITCH:COARSE
4. TOLERANCE CLASS: 6H OF IS:1364
5. TOLERANCE QUALITY: MEDIUM CLASS
6. MECHANICAL PROPERTY:
MATERIAL FOR MANUFACTURE OF NUT TO BE TESTED AND CERTIFIED TO MEET THE MECHANICAL PROPERTY OF CLASS P8.0.HARDNESS OF NUT SHALL BE AS PER IS:1367; PART-6.

4-17053-40583

REF. DRG. NO.

13.04.19

SIGN. & DATE

1X660 MW BHUSAWAL TPS U#06

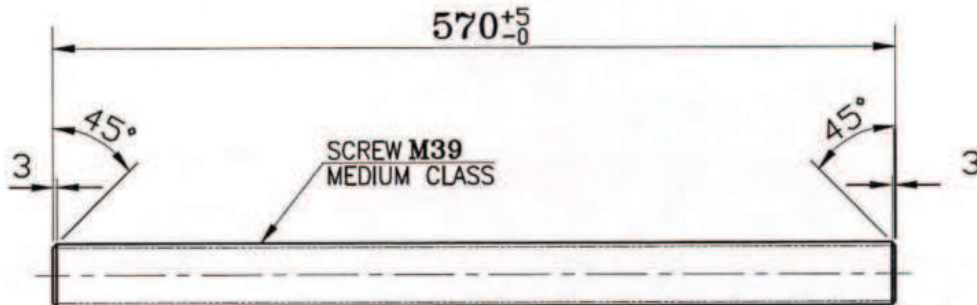
FOR C-BOM DRG.No. 3-17053-41853				ITEM No.004,010		PRODUCT GROUP No.1		
भारत हेवी इलेक्ट्रिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL				वर्क / NAME	हस्ता / SIGN.	दि / DATE	पेज / पृष्ठ NO. OF VAR.	
				वर्क DRN.	दिलीप सुरवाडे	11.04.19	004	
				वर्क CKD.	पवन राय	12.04.19	010	
				वर्क APPD.	ए.के.माहीर	13.04.19	010	
विभाग DEPT.CDE	उत्तोल. दिस. GR. M		उत्तोल. दिस. GR. SCALE 1:5	भारत लि.वट WEIGHT(K.G.) 0.31 0.5	उत्तोल. दिस. GR. REF. TO ASSY. DRG. 3-17053-41853	वर्क ITEM NO. 004 010	वर्क NO. OF ITEM —	
कोड CODE 411	AA0230208							
वर्क/TITLE CONVENTIONAL R.E.JOINT				ड्रॉग क. / DRAWING NO. 4-17053-41027			पृष्ठ / REV. 01	
HEX NUT & LOCK NUT (P8.0)								
				पृष्ठ क. / SHT. NO. 1 पृष्ठों की सं. NO. OF SHT. 1				

A4 SIZE

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL INFORMATION	W.O.No.
		CHECKED	01	01.06.20	CHECKED PAVAN RAE		17057-A-11265
		APPROVED			APPROVED MAHAR AK	STATUS OF DRAWING	DRG. LIST No. 4-17053-41017
			DRG. REVISED TO CORRECT WEIGHT.			DISTRIBUTION OF PRINTS	CDE-2 STM-4



DETAIL OF ITEM-003

TECHNICAL REQUIREMENTS(TR)

1. MATERIAL USED SHALL MEET REQUIREMENTS OF PROPERTY CLASS P8.8. AS PER IS:1367.
2. THREADS : AS PER IS-4218 PART-2, PITCH:COARSE.
3. TOLERANCE QUALITY : MEDIUM CLASS.
4. TOLERANCE CLASS : 6g OF IS:1364.
5. THREADS ARE TO BE FORMED BY ROLLING & HEAT TREATED.

4-17053-40799

REF. DRG. NO.

FOR C-BOM REFER DRG.No. 3-17053-41853		ITEM No.003		PRODUCT GROUP No.1	
SIGN. & DATE	भारत हेवी इलेक्ट्रिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL	कम्पा DRN.	नाम / NAME	हस्ता / SIGN.	दि. / DATE
		कैप CKD.	दिलीप सुरवाडे		11.04.19
		स्वीकृत APPD.	पवन राय		12.04.19
डिप्ट. CDE	उत्प. उल. नाप की सेवा	उत्प. स्केल	भार. वजन	उत्प. ड्राइंग का संदर्भ	सद. क. नं.
कोड CODE 411	UNTOL DIMS. GR. M	1:2	5.3	REF. TO ASSY. DRG. 3-17053-41853	ITEM NO. 003
शीट/टITLE			ड्राइंग नं. / DRAWING NO.		पृष्ठ/REV.
CONVENTIONAL R.E.JOINT			4-17053-41026		01
STRETCHER BOLT			पृष्ठ नं. / SHT. NO. 1		पृष्ठों की सं. / NO. OF SHT. 1

A4 SIZE

(ALL DIMENSIONS ARE IN mm)

A4 SIZE

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

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4-17053-40901

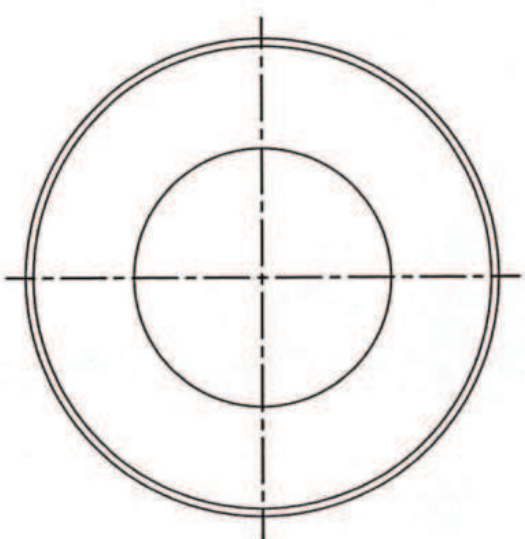
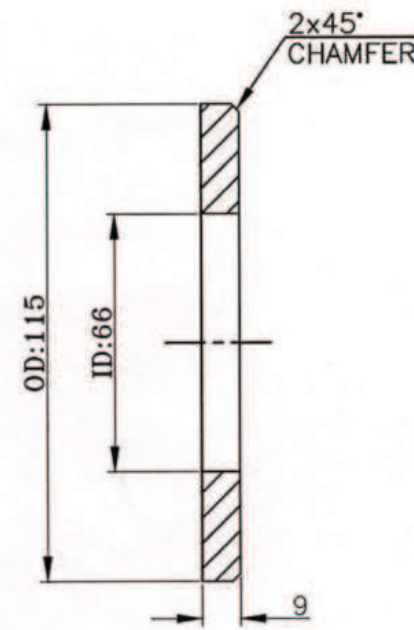
REF. DRG. NO.

14.11.13

SIGN. & DATE

INVENTORY NO.

REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL INFORMATION	W. O. NO.
		CHECKED			CHECKED		17057-A-11265
		APPROVED			APPROVED	STATUS OF DRAWING	DRG. LIST NO. 4-17053-41017
						DISTRIBUTION OF PRINTS	CDE - 2 STM - 4

TECHNICAL REQUIREMENTS (TR)

- MACHINE ALL OVER.
- DIMENSIONS TOLERANCE AS PER IS:2016-67(TABLE-1).
- MATERIAL OF CONSTRUCTION: IS:2062 Gr.A.

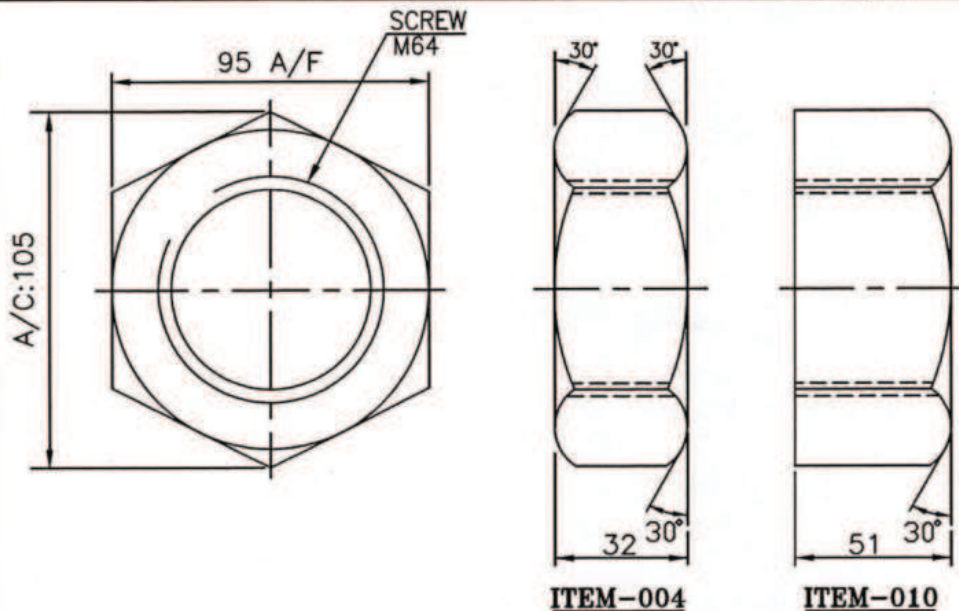
FOR C - BOM REFER DRG. NO. 3-17053 - 41855				ITEM NO. 009		PRODUCT GROUP No. 1	
भारत हेवी इलेक्ट्रिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL				नाम / NAME D SURWADE		हस्ता / SIGN. 	
विभाग DEPT.CDE कोड CODE 411				जॉब चक्र / JOB CKD. PAWAN RAI		दि. / DATE 16.04.19	
				स्वीकृत / APPD. MAHAR AK		दि. / DATE 17.04.19	
उन्.टल. नाप की श्रेणी UNTOL. DIMS. GR.		अनुपात SCALE		भार वजन WEIGHT(K.G.)		उद्देश्य / REF. TO ASSY. DRG.	
M AA 0280208		 1:5		0.5		3-17053-41855	
वर्क / TITLE CONVENTIONAL R.E.JOINT (2300NB)				ड्राइंग नं. / DRAWING NO.		मद नं. / ITEM NO.	
WASHER (MCD)				4-17053-41033		009	
				पृष्ठ नं. / SHT. NO. 1		पृष्ठों की सं. / NO. OF SHT. 1	

A4 SIZE

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL
		CHECKED	01	01.06.20	CHECKED PAVAN RAI	W.O.No.
		APPROVED			APPROVED MAHAR AK	INFORMATION 17057-A-11265
DRG. REVISED TO CORRECT WEIGHT.						STATUS OF DRG.LIST No.
						DRAWING 4-17053-41017
						DISTRIBUTION CDE-2
						OF PRINTS STM-4

**TECHNICAL REQUIREMENTS (TR)**

1. MATERIAL OF CONSTRUCTION USED SHALL MEET REQUIREMENTS OF PROPERTY CLASS-P8.0 AS PER IS:1367; PART-6.
2. MACHINE ALL OVER EXCEPT ON HEXAGONAL SURFACE.
3. THREADS AS PER IS:4218 PART-2,PITCH: COARSE.
4. TOLERANCE CLASS: 6H OF IS:1364.
5. TOLERANCE QUALITY: MEDIUM CLASS
6. DIMENSION TOLERANCE AS PER IS:3138 (EXCEPT THICKNESS)
7. MECHANICAL PROPERTY:-
MATERIAL FOR MANUFACTURE OF NUT TO BE TESTED AND CERTIFIED TO MEET THE MECHANICAL PROPERTY OF CLASS P8.0 HARDNESS OF NUT SHALL BE AS PER IS:1367;PART-6.

417053-40898

REF. DRG. NO.

14.11.13

SIGN. & DATE

1x660MW BHUSAWAL TPS U#6

INVENTORY NO.

DEPT.CDE

CODE 411

AA0230208

UNTO. DIMS. GR.

M

SCALE

1:5

WEIGHT(K.G.)

1.32

2.1

REF. TO ASSY. DRG.

3-17053-41855

ITEM NO.

004

010

NO. OF ITEM

002

CONVENTIONAL R.E.JOINT(2300NB)

HEX NUT &

HEX LOCK NUT (P8.0)

DRAWING NO.

4-17053-41031

REV.

01

SHT. NO. 1

PAGES NO. OF SHT. 1

PRODUCT GROUP No.1

ITEM No.004,010

FOR C-BOM DRG.No.-3-17053-41855

MAHAR AK

PAWAN RAI

D SURWADE

18.04.19

17.04.19

16.04.19

SIGN.

DATE

NAME

NO. OF VAR.

NO. OF

REV.

A4 SIZE

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

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417053-40897

REF. DRG. NO.

14.11.13

SIGN. & DATE

INVENTORY NO.

REV.	DATE	ALTERED	REV.	DATE	ALTERED	ADDITIONAL INFORMATION	W.O.No.- 17057-A-11265
		CHECKED			CHECKED		
		APPROVED			APPROVED	STATUS OF DRAWING	DRG. LIST No. 4-17053-41017
						DISTRIBUTION OF PRINTS	CDE-2 STM-4

DETAIL OF ITEM-03

TECHNICAL REQUIREMENTS

1. MATERIAL USED SHALL MEET PROPERTY CLASS P8.8 AS PER IS:1367;PART-3.
2. THREADS : AS PER IS-4218 PART-2, PITCH:COARSE
3. TOLERANCE QUALITY : MEDIUM CLASS.
4. TOLERANCE CLASS : 6g OF IS:1364.
5. THREADS TO BE FORMED BY ROLLING PROCESS.
6. DIMENSION TOLERANCES: AS PER IS:3138 UNLESS OTHERWISE SPECIFIED.

FOR C-BOM REFER DRG.No. 3-17053-41855				ITEM No.003		PRODUCT GROUP No.1	
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1x660M.W BHUSAWAL TPS U#6 DEPT.CDE CODE 411	भारत हेवी इलेक्ट्रिकल्स लिमिटेड BHARAT HEAVY ELECTRICALS LTD. BHOPAL UN.TOL. DIMS. GR. M AA0230208	ड्राफ्टिंग SCALE 1:2	भार का.ग. WEIGHT(K.G.) 22.0	नाम / NAME D SURWADE PAWAN RAI MAHOR AK ड्राईंग का संदर्भ REF. TO ASSY. DRG. 3-17053-41855	हस्ता / SIGN. 	दि./ DATE 16.04.19 17.04.19 18.04.19	सेट की संख्या NO. OF VAR. - 01
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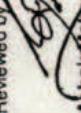
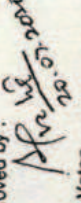
कोष/ TITLE CONVENTIONAL R.E.JOINT:(2300NB) STRETCHER BOLT	ड्राईंग का. / DRAWING NO. 4-17053-41030 पृष्ठ का. / SHT. NO. 1 पृष्ठों की सं. NO. OF SHT. 1
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A4 SIZE

		Heat Exchanger Group		STANDARD QUALITY ASSURANCE PLAN					QAP No.		CDE-20-3475	
				CS PLAIN FASTENERS (BOLTS, NUTS & STUDS)					Revision No.		00	
				ITEM					Date of Issue		20.07.2020	
				BHEL Bhopal					Page		3 of 3	
S.No.	Components & Operations	Characteristics	Class	Type of Check	Quantum of check	Reference Document	Acceptance Norms	Format of Records	Agency	Remarks		
1	2	3	4	5	6	7	8	9	10	11		
Note 1) In the absence of original correlated MTC, material to be tested for chemical test at Govt. Approved Lab / BHEL TSD / manufacturer's lab having spectrometer. In presence of original co-related MTC : No testing is required, record of the same duly endorsed by BHEL-IA with respect to original one to be furnished. <i>In case of spectrometer for chemical testing, calibration by OEM is also acceptable.</i> 2) All Instruments, Gauges, HT facilities etc shall be duly calibrated by NABL approved agency with valid calibration record. BHEL-IA to ensure the same during inspection. Name of HT agency to be mentioned in the IR. 3) Mechanical & chemical Testing to be carried out in Government approved lab / reputed lab using calibrated instruments / manufacturer's lab having calibrated instruments (duly approved by NABL / NABL appointed agency). 4) No repair of thread is permitted. In case of any damage in the threaded area, same shall be rejected. 5) Important Note : Fasteners received at our works may be subjected to random sampling destructive test & other checks (e.g. mechanical, chemical) at BHEL-TSD to ensure compliance as per drawing and specification requirements. Rejection if any shall be intimated to supplier for replacement. 6) Vendor to ensure use of latest issue/revision of drawing / Spec. before start of any manufacturing activities. 7) For conflict if any between this QAP and any other document, this QAP shall prevail. 8) Items if supplied in assembled condition : Assembly to be checked manually by hand for full threaded length of bolts / studs. Ensure proper fitment. 9) Studs and Bolts • For total length 100mm and above : Tensile, Yield, Elongation, Hardness, etc. • For total length less than 100mm : Hardness only. Co-relation with tensile strength to be established and reported in the IR based on hardness achieved. • Nuts of size M39 and below : Proof load test and hardness on top / bottom face of nut. • Nuts of size above M39 : Hardness on top / bottom face of nut only. Co-related tensile strength to be established and reported in the IR based on hardness achieved. • In this case, proof load test shall be in the scope of BHEL. Approval does not relieve supplier from meeting our requirements as per the drawing / specification.												
				Prepared by :				Reviewed by :		Approved by :		
				Pawan Rai Sr. Engineer (D) CDE				Ashok Mahapatra Sr. Dy. General Manager (D) CDE		S.P. Vatsa Add. General Manager (D) CDE		

		Heat Exchanger Group		STANDARD QUALITY ASSURANCE PLAN										QAP No.		CDE-20-3475	
BHEL Bhopal				CS PLAIN FASTENERS (BOLTS, NUTS & STUDS)										Revision No.		00	
ITEM				CS PLAIN FASTENERS (BOLTS, NUTS & STUDS)										Date of Issue		20.07.2020	
														Page		2 of 3	
S.No.	Components & Operations	Characteristics	Class	Type of Check	Quantum of check	Reference Document	Acceptance Norms	Format of Records	Agency			Remarks					
									1	2	3						
1		3	4	5	6	7	8	9	10			11					
3.2	Test on Finished Product Sample (See Note-4 & 5)	Product (chemical) analysis Mechanical analysis (See Note-9)	Major	As per Spec.	See Remarks column.	BHEL Drg/Doc.	As per Cl. 6.0 of spec. CDE-20-3476	Lab TC	P	V	-	• For sample size refer Cl.6.0 of spec. CDE-20-3476					
			Critical	Lab Test				IR	P	W	-						
3.3	Surface finish	Quality of machined / pressed surface.	Major	Visual	100 %	See remarks	See remarks & BHEL drg.	--	P	W	*	(*) 10% witness at random from each size by BHEL-IA for physical condition and proper assay (if applicable), see note-4					
3.4	Marking	For identification	Minor	Visual	100%	As per Cl.10.0 of BHEL Spec. CDE-20-3476	As per Cl.10.0 of BHEL Spec. CDE-20-3476	IR	P	W	*	(*) 10% witness at random from each size by BHEL-IA					
3.5	Packing and dispatch	Verification of all T.C.s for completeness	---	Visual	100%	PO, Spen. Drg. & QAP	PO, Spen. Drg. & QAP	IR	P	V	V						
		Protection and packing	---	Visual	100%	As per Cl.8.0 of BHEL Spec. CDE-20-3476	As per Cl.8.0 of BHEL Spec. CDE-20-3476	IR	P	-	-						

LEGEND : 1: Fastener Supplier, 2: BHEL-IA, 3: Customer (NTPC/NPCIL/other if any) / Customer's IA; P-Perform, W-Witness, V-Verification, MTC : Mill test Certificates, TCR : Test Certificate Report, IR : Inspection report, IA : Inspection Agency, I : Instrument to be used for check, HP : Hold point.

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20.07.2020		20.07.2020		20.07.2020	

Heat Exchanger Group		STANDARD QUALITY ASSURANCE PLAN						QAP No.		CDE-20-3475	
BHEL Bhopal		CS PLAIN FASTENERS (BOLTS, NUTS & STUDS)						Revision No.		00	
ITEM		Date of Issue						20.07.2020		1 of 3	
S.No.	Components & Operations	Class	Type of Check	Quantum of check	Reference Document	Acceptance Norms	Format of Records	Agency	1	2	3
1	2	3	4	5	6	7	8	9	10	11	
1.0 MATERIAL INSPECTION											
1.1	Verification of co-related Mill Test Certificates - MTCs of rolled / forged bars	Major	Visual	100%	BHEL Drg./Doc.	BHEL Drg./Doc.	MTC	V	V	V	See Note-1
1.2	Physical verification of stock - used.	Major	NDT + I	100%	ASTM A-745 or AA-0850118	QL-1 of ASTM A-745 or Cat-2 of AA-0850118	MTC	P	V	W	In case, mention of UT is not there in the MTC, 100% UT to be done at vendor's works out of which 10% to be witnessed by BHEL-IA.
2.0	Heat treatment (if required to meet the mechanical properties)	Major	HT	100%	Material Spec.	Material Spec.	MTC	V	V	-	HT is NA for Class 4.8 & below. See Note-2
2.1	Temp. & Time	Major	VISUAL	100%	Material Spec.	Material Spec.	IR	P	V	-	10% witness at random of each size by BHEL-IA. Checking by calibrated ring / plug gauge. See Note-2 & 5
3.0 FINISHED PRODUCT INSPECTION											
3.1	Dimensional conformity	Major	Visual + Gauge	100%	As per BHEL Drg./ Doc.	As per BHEL Drg./ Doc.	IR	P	W	-	10% witness at random of each size by BHEL-IA. Checking by calibrated ring / plug gauge. See Note-2 & 5

LEGEND : 1: Fastener Supplier, 2: BHEL-IA, 3: Customer (NTPC/NPCIL/other if any) / Customer's IA; P: Perform, W: Witness, V: Verification, MTC : Mill test Certificates, TCR : Test Certificate Report, IR : Inspection report, IA : Instrument to be used for check, HP : Hold point.

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Condenser & Heat Exchanger Engg. Division

Technical Specification for

Carbon Steel Plain Fasteners

Document No.

CDE - 20 - 3476

Rev. No. 00

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8.2 **Bolts / Studs / Nuts / washers independently or as a unit** (i.e. with nuts / washers on the respective bolts/studs), shall be packed item wise separately in appropriate boxes / bags with proper identification marking to avoid mixing & damage of threads due to rubbing during handling, transportation & storage. **Preferably each unit shall be protected by bubble sheet / corrugated sheet etc.**

Fasteners of size above M30 shall be packed in wooden boxes/crates.

9.0 **Test Certificates**

All inspection reports incl. material Test certificates, Standards shall be as per BHEL approved QAP. Vendor to ensure that all reports shall be arranged in sequential manner as per the QAP with proper index sheet at top.

10.0 **Identification Marking**

Each fastener (Bolt/Stud/nut etc.) shall be stamped as per the respective code requirements. Material property class along-with manufacturer's identification marking shall be essentially stamped on each fastener. *For size M10 and below, marking on individual fastener is not required.*

Each packing case of fasteners shall also be identified with following markings;

- Manufacture's name.
- BHEL purchase order number.
- Item Description : Bolt/Nut, Size & Property Class.

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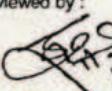
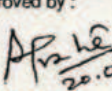
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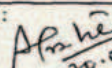
20/07/2020
Ashok Mahor
Sr. Dy. General Manager (D) CDE

Approved by :

20.07.2020
S.P. Vatsa
Add. General Manager (D) CDE

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	6.2 Mechanical Test Fasteners shall be subjected to all the mechanical tests (e.g. Tensile Strength, Yield Strength, Hardness, Stress under Proof Load, etc. – as applicable) as specified in IS-1367 Part-3 (for fasteners with external threads) and IS-1367 Part-6 / ASTM A194 / other national or international standard – as applicable (for fasteners with internal threads). Note-1 Sampling for both Product Analysis and Mechanical Test : 01 No. from each shape, size and heat batch (selected at random by BHEL-IA) for a lot size of less than 1000 Nos. Lot size of more than and equal to 1000 Nos., sample quantity shall be read as 02 nos. Note-2 Mechanical & Chemical testing to be done at any Govt. / NABL approved / manufacturer's Lab having instruments duly calibrated by NABL / NABL approved agency. <i>In case of spectrometer for chemical testing, calibration by OEM is also acceptable</i> 7.0 Inspection & Certification 7.1 All the fasteners shall be subjected to inspection by BHEL / BHEL appointed inspection agency & customer (if specified in PO) as per the standard QAP of BHEL (as mentioned in the enquiry / PO) or the QAP duly approved by BHEL. 7.2 All Test Certificates & inspection reports shall be co-related with respective fasteners and shall be duly signed by inspecting authority. 7.3 All fasteners to be checked by using calibrated plug / ring gauges only. 7.4 Important Instruction for vendors : Fasteners received at our works may be subjected to random sampling destructive / non-destructive test (mechanical, chemical etc.) to ensure compliance as per drawing & specification requirements. Acceptance/ rejection of fasteners shall be done based on the test results of sampling test. 8.0 Protection & Packing 8.1 Plain Fasteners: Threaded portion of each fastener (Bolt/Stud/Screw/Nut etc) shall be protected by applying <u>graphite grease</u> to prevent from corrosion attack. Balance (unthreaded areas) shall be protected by applying oil based rust preventive.			
Prepared by :  20.07.2020 Pawan Rai Sr. Engineer (D) CDE	Reviewed by :  20/07/2020 Ashok Mahor Sr. Dy. General Manager (D) CDE	Approved by :  20.07.2020 S.P. Vatsa Add. General Manager (D) CDE		

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	1.0 Scope This specification covers the technical requirements of Carbon Steel Plain Fasteners for RE Joints. 2.0 Technical Requirements 2.1 Material 2.1.1 Carbon steel bars - rolled / forged & shall confirm to the respective material specification requirements / as per respective drawing. 2.1.2 Bars shall be free from injurious defects and shall have a workman like appearance confirming compliance to designated finish requirements. 2.1.3 Bars for manufacturing of fasteners of bar Dia. 40MM & above shall be subjected to Ultrasonic examination as per Cat-2 of BHEL Specification AA-0850118 or QL-1 of ASTM A-745. 2.2 Manufacturing - Required fasteners shall be machined / formed from the accepted material. - Before thread forming, bar needs to be proof machined throughout its length to 6.3 microns or better. 2.3 Size & Quantity Size & quantity of each component shall be as indicated in the Enquiry / Purchase Order. 3.0 Heat Treatment All carbon steel fasteners shall be supplied in heat treated condition as per the requirements as indicated in the respective material specification to meet the property class as specified. 4.0 Repair <i>No repair of threads shall be attempted on any fastener.</i> 5.0 Tolerances Dimension Tolerances shall be as indicated in the respective standards / drawing. 6.0 Testing(s) : 6.1 Product Analysis shall be performed to ensure its chemical properties, meeting the requirements as specified in the respective material specifications.		

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