

Annexure For Techno Commercial Bid

Check List - to be filled and submitted along with Technical Bid

BHEL Commercial Terms and Conditions for Indigenous Supplies	Vendor's Confirmation / Comments
Technical confirmation to BHEL's Specification as called for in BHEL Format shall be furnished. If needed additional sheets shall be used.	
Prices shall be quoted item wise only as per the model format enclosed	
Prices shall be quoted on "FIRM PRICE" basis only The prices should be only on F.O.R / Despatching station basis with Packing & Forwarding charges if any. Applicable % of GST & Freight & Insurance, Installation & Commissioning Charges should be clearly Indicated	
Validity of offer shall be for a minimum period of 120 days from the date of Tender opening	
Delivery period from the date of Letter of Intent / Purchase order shall be clearly mentioned in the offer	
Liquidated damages @ '0.5% per week subject to a maximum of 10% of the order value shall be applicable for delay in deliveries For Details Refer Annexure- v	
Following Risk Purchase clause shall be applicable The purchaser at his option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or dispatch within the time stipulated or if the same were not available, the best and the nearest available substitute therefore The supplier shall be liable for any loss which the Purchaser may sustain by reason of such risk purchases	
Payment term for supply portion: Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials For details Refer Annexure- v	
Erection / commissioning: (if applicable only) Erection / commissioning charges if any has been mentioned in the offer or else confirmation that Erection /commissioning shall be done at free of cost is available in the offer,	
The equipment shall be guaranteed for a period of 12 months from the date of commissioning	
Final inspection and acceptance of equipment will be after installation at BHEL, Trichy	
The vendor shall provide necessary drawings, Test Certificates and Operating Maintenance Manuals etc., as called for in the Technical Specification, in the required number of copies at no extra cost	
Any warranty replacement during warranty period shall be supplied free of charge on FOR BHEL, Trichy basis.	
Confirm MSE vendor or not (Incase of MSE vendor necessary documentary proof shall be furnished as per Annexure VI)	
% of applicable GST	
Packing & Forwarding Charges (if any in % only)	
Percentage of Freight& transit insurance charges, if any Freight charges from Dispatching station to BHEL, Tiruchirappalli • Supplier should quote for F.O.R-BHEL Trichy Stores.	
As per Commercial terms and conditions, acceptance for participation in Reverse auction (RA).Yes/No to be indicated	
Name of the person for participating reverse auction	
Land Line Number	
Fax Number	
Mobile Number	
E-mail ID	

NOTE:-

- It is confirmed that all the terms and conditions stipulated In the Enquiry have been fully understood by us and all clarifications & details have been obtained.
- Your offer should be indicating applicable If any P&F Charges, % of GST, Freight, Insurance and Installation and Commissioning Charges etc., as per our Price Format
- Your specific acceptance to our Payment terms, LD & Risk Purchase Clause are essential for consideration of your offer. Other wise your offer is liable for rejection.
- No row shall be left blank. Please indicate NA, in case the item is "not applicable"

Annexure For Price Bid

Bharat Heavy Electricals Limited TIRUCHIRAPPALLI CAPITAL PURCHASE
MODEL PRICE BID FORMAT FOR INDIAN BIDDERS Annex

Annexure-IV

Enquiry No. & Date:

Bidder's Offer No. & Date:

Sl No	Description of item	Unit	Quantity	Rate in Rs.	Value in Rs.	
	TOTAL VALUE IN RS.					
	Packing & Forwarding charges in % if any					
	Freight& Insurance Charges In % if freight charges are not mentioned it will be considered as FOR-BHEL TRICHY.					
	GOODS AND SEVICES TAX (indicate in %)					
	A) GST (%)					
	B)					
	C)					
	Approximate Net weight of the total consignment					
	Approximate Gross weight of the total consignment					
	Approximate Dimensions of the Consignment					
	The price indicated shall be inclusive of all accessories, spares etc. as given in the scope of supply. Individual item-wise break-up price shall be attached as an annexure to this price bid format.					

Signature & Seal of Vendor

NOTE:

- 1. The price bid should be submitted only as per the above format. No row shall be left blank. Please indicate NA, in case the item is "not applicable".**
- 2. Prices shall be quoted item-wise only as per the above format.**
- 3. If Price quoted is Inclusive of taxes, the included tax Value and Base Value shall be indicated item-wise.**

Annexure-V

Offers of indigenous Suppliers with any other Payment terms will be rejected.	
Payment Term (Indigenous)	
If offer is received from both OEM/Manufacturer and authorized dealers or agent, then OEM/Manufacturer offer will only be considered and dealers or agent offer will be ignored.	
If materials are receivable at Stores/Trichy without PBG	Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials.
If materials are receivable at Stores/Trichy with PBG	Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials and against 10% PBG valid for the warranty period.
Any deviation in the above payment term will attract loading as mentioned below. “Base rate of SBI (as applicable on the date of bid opening. Techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.	

Liquidated Damages / Penalty -
The delivery of the goods specified in the purchase order should be made within the time prescribed. LD for delay in ‘Supply’ and/or ‘E&C’ will be applicable to the delays attributed to vendor. LD will be considered separately for ‘Delivery’ and ‘E&C’. Where the seller supplies or dispatches the goods, beyond the delivery period Liquidated damages shall be applicable 0.5% of the total order value per week or part thereof subject to a maximum of 10% of the total order value. Material Despatched after Due date: Once the delivery due date is crossed, <u>bills have to be clubbed till final despatch and forwarded for processing of payment as a single bunch</u>. LD percentage will be calculated from Delivery due date to final despatch date. The rate of LD for delayed E&C shall be @ 0.5% per week of delay of total PO value (Supply + E&C) in E&C subject to a maximum of 10% of total PO value (Supply + E&C). For staggered delivery schedule, LD shall be 0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the total order value. Any deviation from the above LD clause, loading will be applied to the extent to which it is not agreed by the bidder (at offered value). For the purpose of Imposing LD, the FOB delivery (B/L date) shall be considered.

Guarantee / Warranty Period – (if applicable)
Normally No deviation permitted and the deviated offers are liable for rejection.

Ranking-
BHEL will consider the ranking after the loading is applied as referred above wherever deviations are observed.

Performance Bank Guarantee – (if applicable)
Normally No deviation permitted and the deviated offers are liable for rejection.

Fraud prevention clause: The bidder along with its associate/collaborator/sub-contractor/sub-vendor/consultants/service providers shall strictly adhere to BHEL fraud prevention policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL management about any fraud or suspected fraud as soon as it comes to their notice.

NOTE:- 1. If the due date of tender opening happens to be a holiday, the tenders will be opened on the next working day.

2. BHEL reserves the right to go for a reverse auction (RA) instead of opening the submitted bid which will be decided after technical evaluation. Information and general terms and conditions covering RA are given in commercial terms and conditions.

3. Corrigendum if any, with respect to this tender will be hosted only in the website <http://www.bhel.com> or <http://tenders.gov.in>. You are requested to visit the website regularly for updates.

Special Provisions for Micro and Small Enterprises (MSE)

1. 20% of the tendered quantity is earmarked for MSE suppliers in this tender.
2. Out of the 20% tendered quantity reserved for MSE suppliers, 4% shall be earmarked for procurement from MSE owned by SC/ST entrepreneurs.
Such Micro/Small Enterprises registered vendors must state the sub-category to which they belong and submit documentary proof for the same. The sub-categories are:
 - (a) Enterprises owned by Scheduled Castes.
 - (b) Enterprises owned by Scheduled Tribes.
 - (c) Enterprises owned by other than above two categories

The enterprises under (a) & (b) means the proprietor in case of single owned firm and all partners in case of partnership firm and all directors in case of private/public limited must belong to SC/ST category.
3. In case MSE vendor participating in the tender quotes within the price band of L1+15%, they will be allowed to supply the portion of the requirement subject to acceptance of L1 price by MSE vendor. In case of more than one such MSE, the supply shall be shared proportionately.
4. "MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (five years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM II certificate along with attested copy of a CA certificate (Format enclosed at Annexure -VII where deemed validity of EM II certificate of five Years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer."

Certificate by Chartered Accountant

This is to certify that M/s., hereinafter referred to as 'company') having its registered office at is registered under MSMED Act 2006, Entrepreneur Memorandum No (Part - II) dtd:....., Category :.....(Micro / Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as on date as per MSMED Act 2006 is as follows:

1. For Manufacturing Enterprises: Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.5.0.1722(E) dated October 5, 2006:

Rs.....Lacs

2. For Service Enterprises: Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:

Rs.....Lacs

The above investment of Rs..... Lacs is within permissible limit of Rs.....Lacs for Micro / Small (Strike off which is not applicable) Category under MSMED Act 2006.

Date:

(Signature)

Name -

Membership Number -

Seal of Chartered Accountant

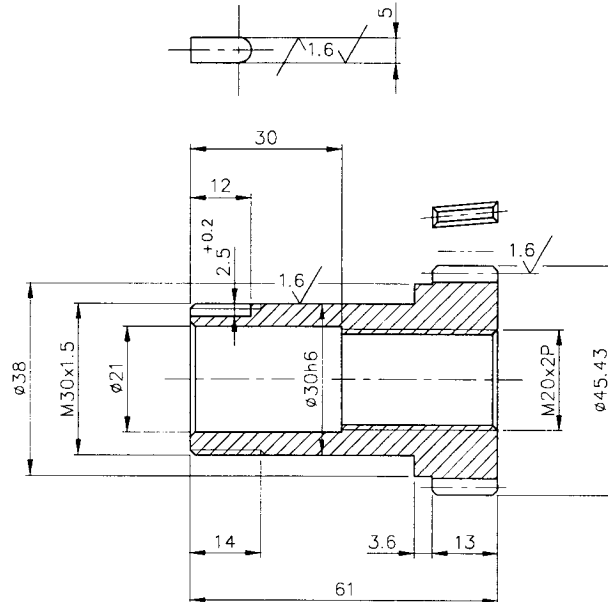
3-M-12B47-15738

DRAWING NO.

ALL DIMENSIONS ARE IN MILLIMETRES

ø30h6	-0.000
	-0.013

3.2/1.6



NO.OF TEETH	20
MODULE	1.5
PRESSURE ANGLE	20°
HELEX ANGLE	45°
HAND OF HELIX	LH
CORRECTION FACTOR	NIL
WIDTH A/C 3 TEETH	11.490 ^{+0.113} _{-0.150}
QUALITY & TOL.ZONE	9c.DIN 3967
MATING GEAR No.OF TEETH	20
MATING GEAR DRG.No.	4-M-12B47-29929
CENTRE DISTANCE	42.43

NOTE: -

1. SHARP CORNERS TO BE REMOVED
2. HARDNED TO HRC 60^{±2}
3. CASE DEPTH 0.75mm

REV	DATE	ALTERED	CHECKED	APPROVED
ZONE				

CAUTION: 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.

ITEM NO		DESCRIPTION	DRAWING NO	IS: 4432	0.44
				13Ni13Cr3	1
				MATL CODE	UNIT WT
				MATL SPEC	QTY
EQPT: PORTABLE END SCARFER WITH SPARES PORTABLE INSERT SCARFER WITH SPARES /WEST COAST					
DEPT		NAME		SIGNATURE	DATE
M&S		TCD.S.SELVAMANICKAM		S. Selvamanickam	11.04.17
CODE		CHD		G.GOVINDARAJ	13.04.17
		APPD		G.Thiagarajan	15.04.17
GRADE OF UNTOL DIM		SCALE		WEIGHT (Kg)	
2597		1:1		0.44	
TITLE		DRAWING NO :		REV	
DRIVEN GEAR Ø45.43x20T		3-M-12B47-15738		00	
(MAIN ASSY.)		U 01			

A3-SIZE

ALL DIMENSIONS ARE IN MILLIMETRES

3-M-12B47-15756

DRAWING NO.

Ø12j6

+0.008
-0.003

Ø32h6

-0.000
-0.016

Ø23k6

+0.015
+0.002

Ø20.75H7
Ø28H7
Ø28.6H7

+0.021
0.000

6p6

+0.020
+0.012

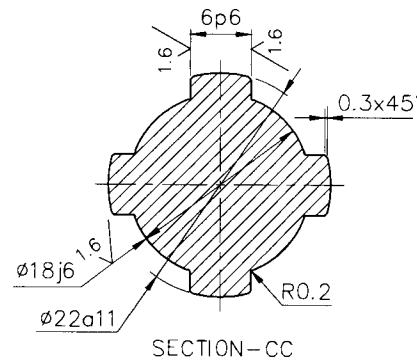
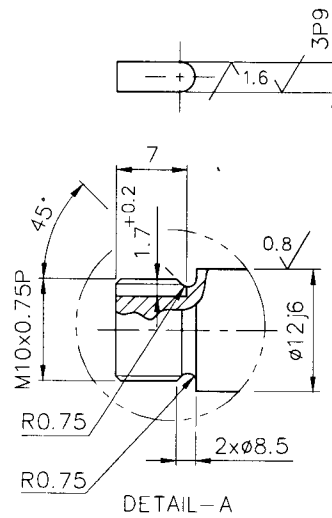
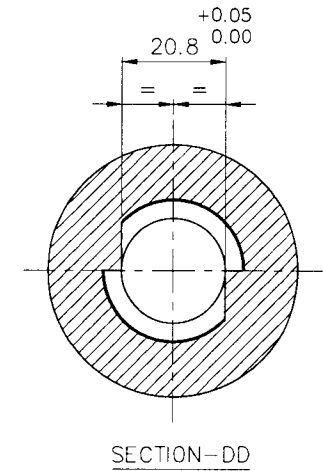
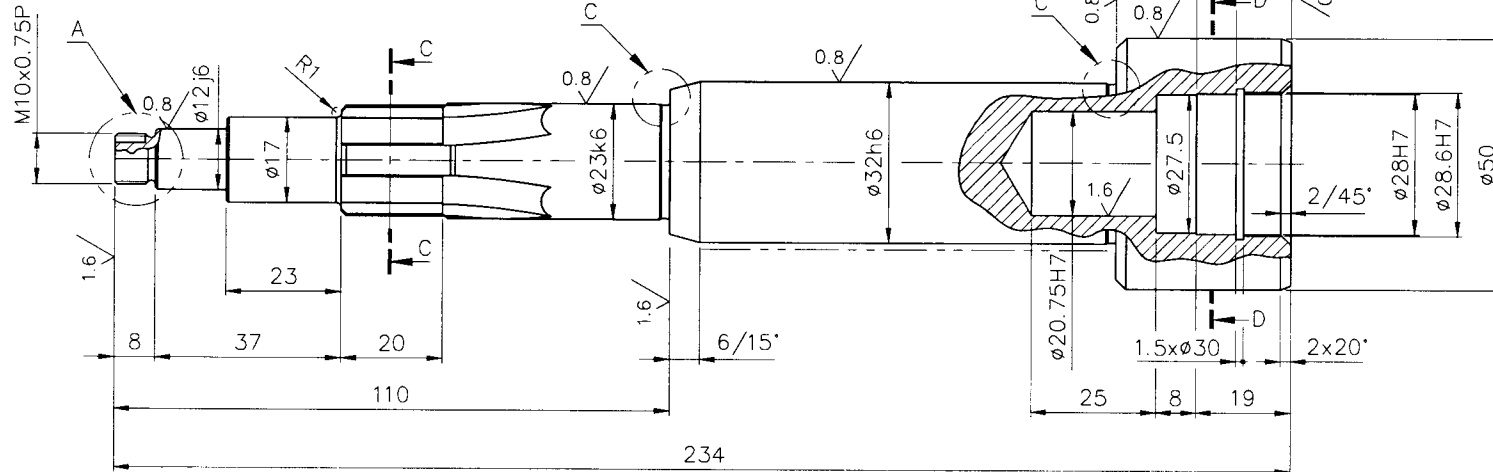
Ø18j6

+0.008
-0.003

Ø22o11

0.000
-0.130

1.6//0.8/



NOTE: -

--- CASE HARDENED TO HRC.60 ± 2 TO A DEPTH OF 0.8MM
SHARP CORNERS TO BE REMOVED

Ø50x234 L		IS: 4432		1.35
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
EQPT: PORTABLE END SCARFER WITH SPARES PORTABLE INSERT SCARFER WITH SPARES/WEST COAST			MATL SPEC	QTY
Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014		DRN	N.MADURAIVEERAN	SIGNATURE N. Maduraiveeran
		CHD	G.COVIDARAJ	S. Govindaraj
		APPD	G.THAGARAJAN	S. Thagarajan
DEPT	GRADE OF UNDL DIM	SCALE	WEIGHT (Kg)	REF TO ASSY DWG NO
M&S	φ/M/F	1:1 2:1	1.35	REF TO DLD DWG NO
CODE	IS: 2102	3-M-12B47-15617		ITEM
TITLE MODIFIED SPINDLE SHAFT Ø50x234L (MAIN ASSY.)		CARD CODE U 01	DRAWING NO : 3-M-12B47-15756	
REV		DATE	ALTERED	REV
ZONE		CHECKED	APPROVED	00

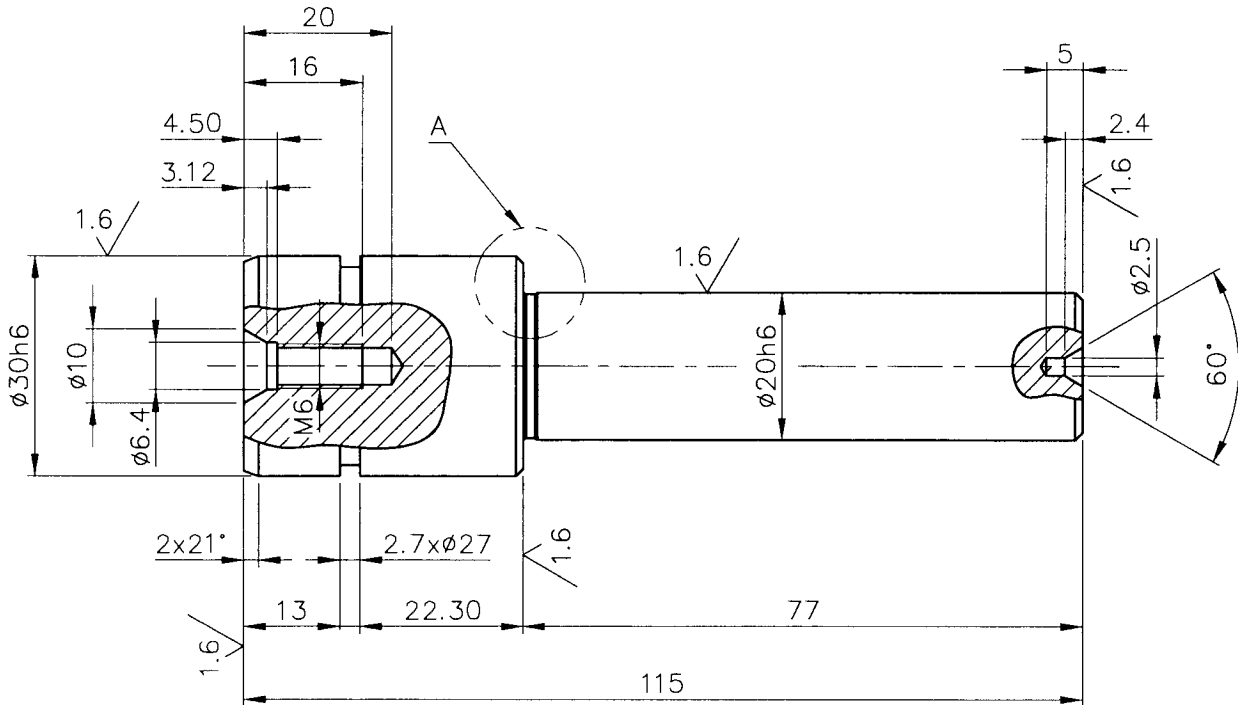
A3-SIZE

ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
		CHECKED
		APPROVED
ZONE		

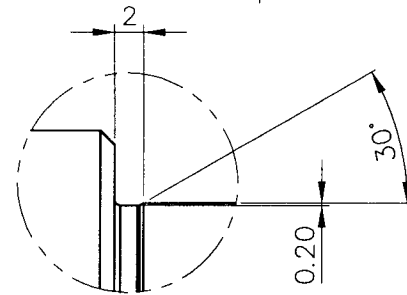
Ø30h6	-0.000
Ø20h6	-0.013

3.2//1.6/



NOTE: -

1. SHARP CORNERS TO BE REMOVED
2. HARDNED TO HRC 60^{±2}



DETAIL-A

CAUTION: 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.

	ø30x115L		IS: 4432		0.39	
			13Ni13Cr3		1	
ITEM NO	DESCRIPTION	DRAWING NO		MATL CODE	UNIT WT	
				MATL SPEC	QTY	
EQPT: PORTABLE END SCARFER WITH SPARES PORTABLE INSERT SCARFER WITH SPARES /WEST COAST						
 Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI – 620014		DRN	NAME	SIGNATURE	DATE	
		CHD	G.GOVINDARAJ	S. Govindaraj	12.04.17	
		APPD	G.THAGARAJAN	S. Thagorajan	13.04.17	
DEPT M&S	GRADE OF UNTOL. DIM		SCALE	WEIGHT (Kg)	REF TO ASSY DWG NO	ITEM
CODE	✓ C/M/AF IS: 2102		1:1 2:1	0.39	ISM-ND2-01-09	
2597					REF TO OLD DWG NO	
TITLE			CARD CODE	DRAWING NO :		REV
IDLER SHAFT Ø30x115.33L (MAIN ASSY.)			U 01	4-M-12B47-29930		

A4-SIZE

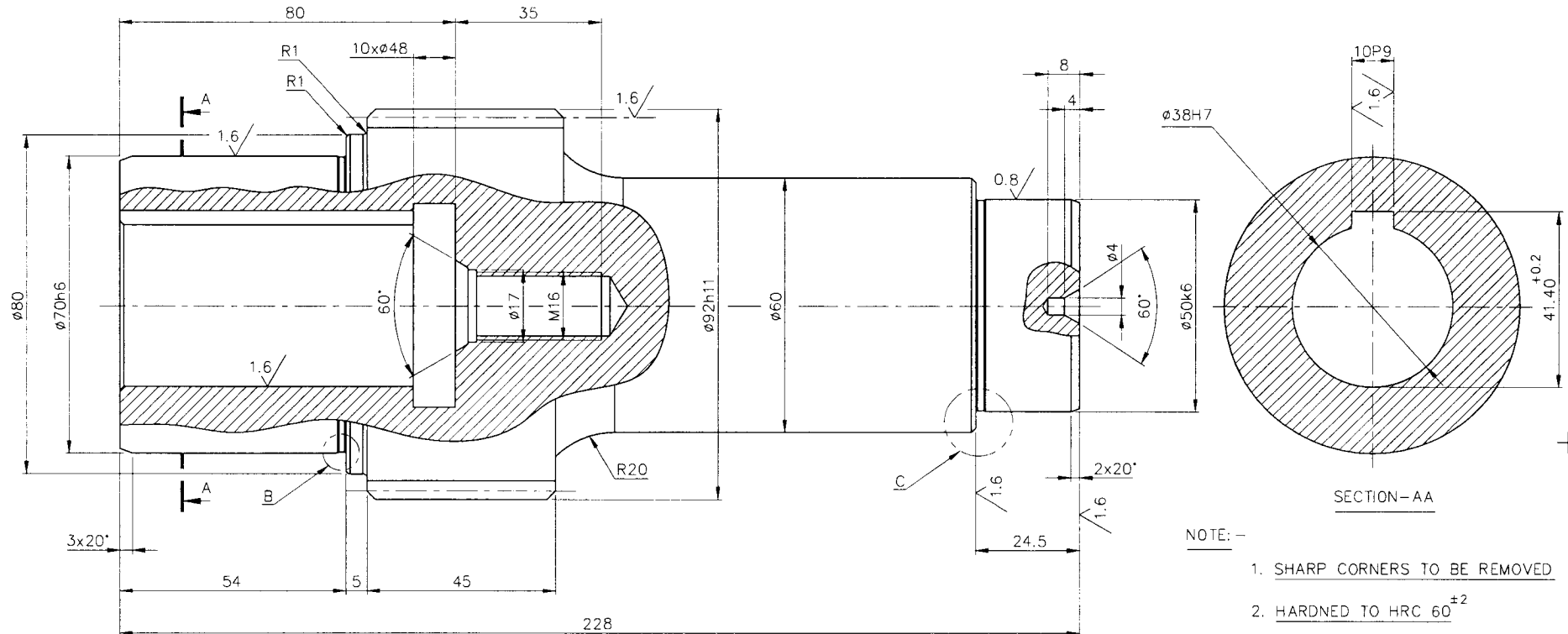
ALL DIMENSIONS ARE IN MILLIMETRES

3-M-12B47-15741

DRAWING NO.

ø70h6	-0.000 -0.019	ø92h11	-0.000 -0.220	ø50k6	+0.018 +0.002
		ø38H7	+0.025 0.000	10P9	-0.015 -0.051

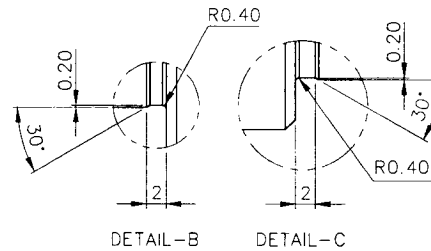
3.2//1.6//0.8/



NOTE: -

1. SHARP CORNERS TO BE REMOVED
2. HARDENED TO HRC 60^{±2}

NO.OF TEETH	44
MODULE	2
PRESSURE ANGLE	20°
WITH ACROSS 6 TEETH	33.705 ^{-0.127} -0.169
CORRECTION FACTOR	NIL
QTY.&TOL.ZONE	9C DIN 3967
MATING GEAR NO.OF TEETH	56
MATING GEAR DRAWING NO.	3-M-12B47-15739
CENTRE DISTANCE	100



DETAIL-B

DETAIL-C

REV	DATE	ALTERED CHECKED APPROVED
ZONE		

CAUTION: 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.

ø92x228L		IS: 4432		5.21
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
			MATL SPEC	QTY
EQPT: PORTABLE END SCARFER WITH SPARES PORTABLE INSERT SCARFER WITH SPARES /WEST COAST				
Bharat Heavy Electricals Ltd		DRN	NAME	SIGNATURE
HIGH PRESSURE BOILER PLANT		CHD	TCD.S.SELVAMANICKAM	S. Selvamanickam
TIRUCHIRAPALLI - 620014		APPO	G.GOVINDARAJ	S. Govindaraj
			G.THIAGARAJAN	S. Thiagarajan
DEPT	GRADE OF UNTOL. DIM	SCALE	WEIGHT (Kg)	REF TO ASSY DWG NO
M&S		1:1	5.21	REFER DRG.NO.D2-01-05
CODE	2597	2:1		REF TO OLD DWG NO
TITLE			CARO CODE	DRAWING NO :
DRIVE SHAFT Ø92x228L			U 01	3-M-12B47-15741
(MAIN ASSY.)				REV
				00

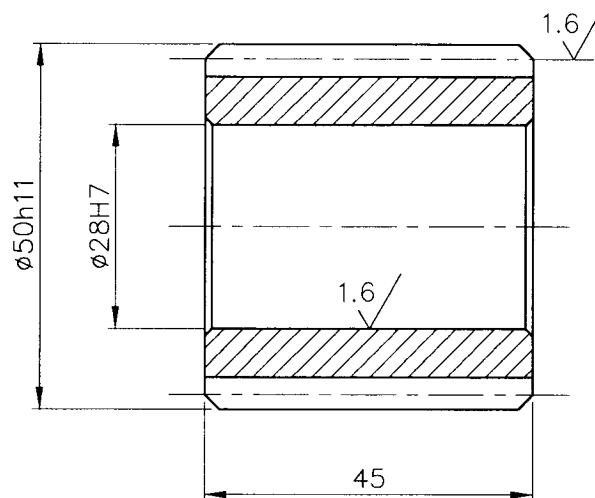
A3-SIZE

ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
		CHECKED
		APPROVED
ZONE		

ø50h11	-0.000	ø28H7	+0.021
	-0.016		0.000

3.2/1.6/



NOTE: -

1. SHARP CORNERS TO BE REMOVED
2. HARDNED TO HRC 60^{±2}

NO.OF TEETH	23
MODULE	2
PRESSURE ANGLE	20°
WITH ACROSS 3 TEETH	15.404 ^{-0.141} -0.188
CORRECTION FACTOR	NIL
QLTY.&TOL.ZONE	9C DIN 3967
MATING GEAR NO.OF TEETH	18
MATING GEAR DRAWING NO:	4-M-12B47-29926
CENTRE DISTANCE	41

CAUTION: 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.

ITEM NO		DESCRIPTION	DRAWING NO		IS: 4432		0.48
		ø50x45L			13Ni13Cr3		1
					MATL CODE		UNIT WT
					MATL SPEC		QTY
EQPT: PORTABLE END SCARFER WITH SPARES PORTABLE INSERT SCARFER WITH SPARES /WEST COAST							
DEPT M&S		GRADE OF UNTOL. DIM	SCALE	WEIGHT (Kg)	REF TO ASSY DWG NO	ITEM	
CODE 2597		Ø/M/F IS: 2102	1:1	0.48	ISM-ND2-01-07		
TITLE		CARD CODE			DRAWING NO :		REV
SPUR GEAR Ø50x23T (MAIN ASSY.)		U 01			4-M-12B47-29927		

A4-SIZE

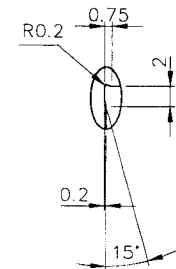
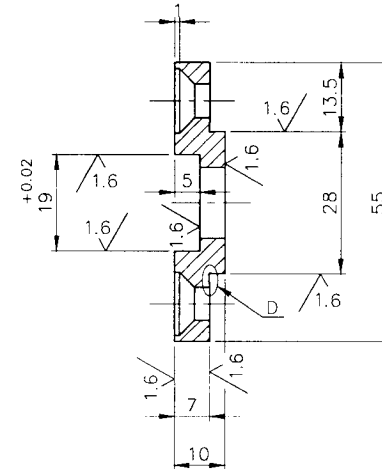
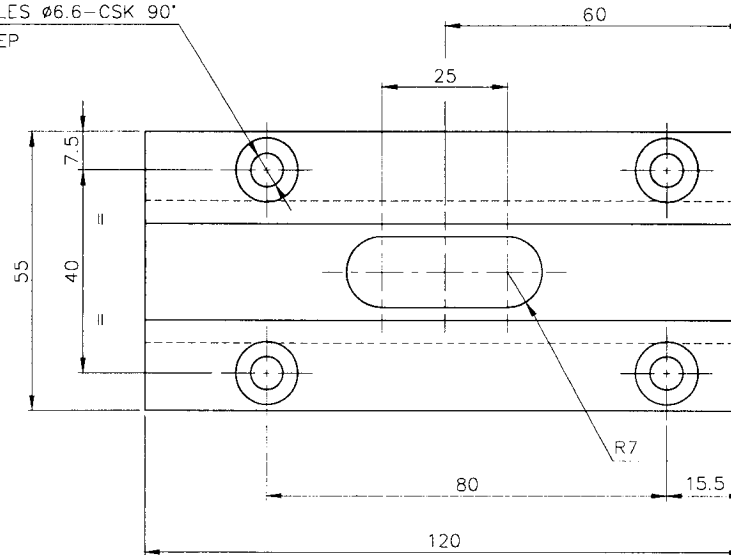
ALL DIMENSIONS ARE IN MILLIMETRES

3-M-12B47-15740

DRAWING NO.

3.2//1.6/

4 HOLES Ø6.6-CSK 90°
4 DEEP



DETAIL-D

NOTE: -

1. SHARP CORNERS TO BE REMOVED
2. HARDNED TO HRC 50^{±2}

CAUTION: 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.

REV	DATE	ALTERED
		CHECKED
		APPROVED

ZONE

PI.120x55x10		IS: 5517		0.51		
		55C8		1		
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT		
		MATL SPEC		QTY		
EQPT: PORTABLE ENO SCARFER WITH SPARES PORTABLE INSERT SCARFER WITH SPARES /WEST COAST						
 Bharat Heavy Electricals Ltd HIGH PRESSURE BDILER PLANT TIRUCHIRAPALLI - 620014		DRN	NAME TCO.S.SELVAMANICKAM	SIGNATURE <i>S. Selvamani</i>	DATE 10.04.17	
		CHD	G.GOVINDARAJ	<i>S. Govindaraj</i>	13.04.17	
		APPD	G.THAGARAJAN	<i>S. Thagaranjan</i>	14.04.17	
DEPT M&S	GRADE OF UNTOL. DIM <i>φ/M/f</i> IS: 2102		SCALE 1:1 2:1	WEIGHT (Kg) 0.51	REF TO ASSY DWG NO REFER DRG.NO.ND2-01-31	ITEM
CODE 2597				REF TO OLD DWG NO		
TITLE ADAPTOR PLATE (MAIN ASSY.)				CARD CODE U 01	DRAWING NO : 3-M-12B47-15740	REV 00

A3-SIZE

3-M-12B47-15617

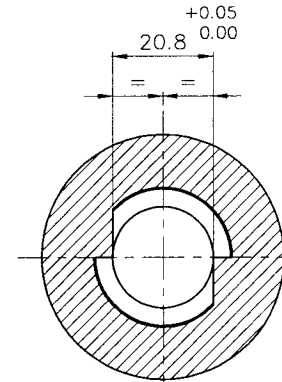
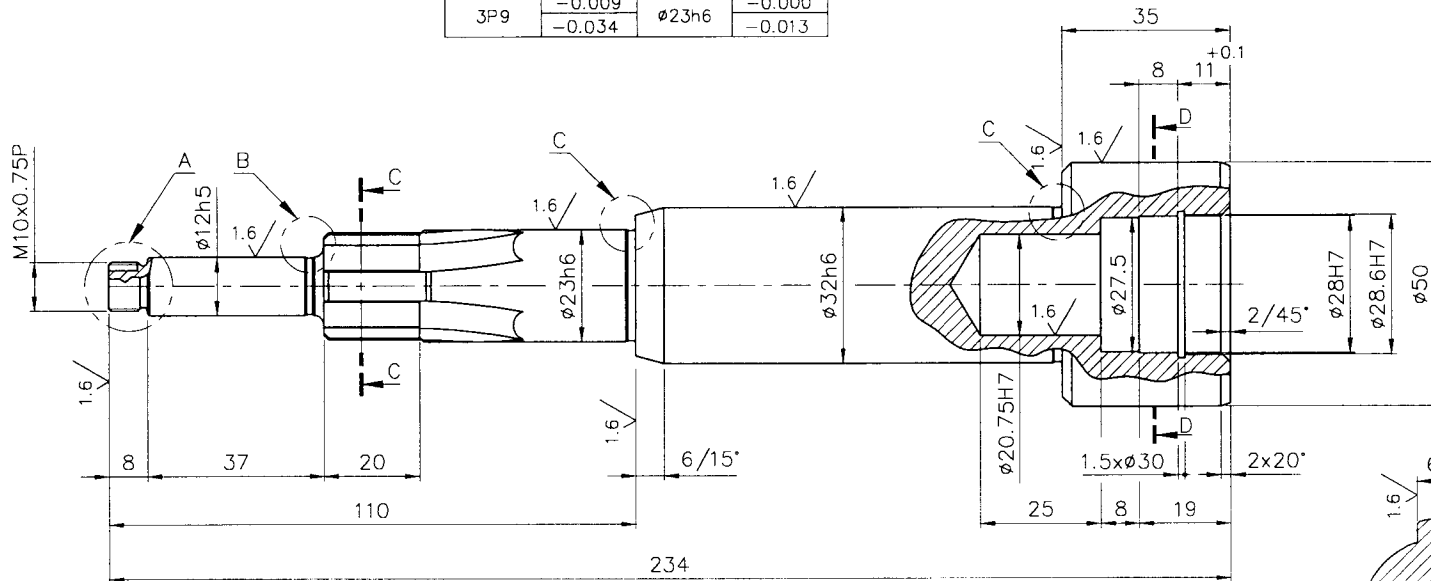
DRAWING NO.

ø12h5	-0.000 -0.008	ø32h6	-0.000 -0.016
3P9	-0.009 -0.034	ø23h6	-0.000 -0.013

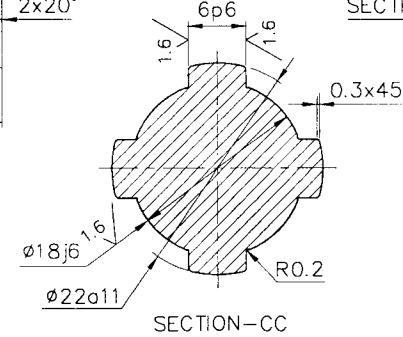
ALL DIMENSIONS ARE IN MILLIMETRES

ø20.75H7	+0.021	6p6	+0.020 +0.012	ø18j6	+0.008 -0.003	ø22o11	0.000 -0.130
ø28H7	0.000						
ø28.6H7							

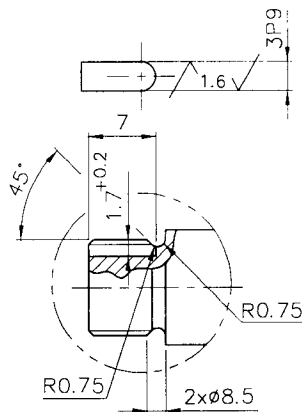
3.2//1.6



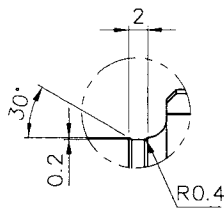
SECTION-DD



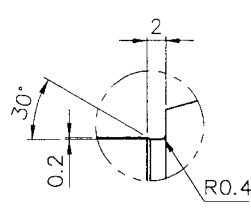
SECTION-CC



DETAIL-A



DETAIL-B



DETAIL-C

NOTE: -

1. HARDENED TO HRC.35 ± 2
2. SHARP CORNERS TO BE REMOVED

REV	DATE	ALTERED CHECKED APPROVED
ZONE		

CAUTION: 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.

Ø50x234 L		IS: 5517		1.17		
		55C8		1		
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT W		
			MATL SPEC	QTY		
EQPT: PORTABLE END SCARFER WITH SPARES PORTABLE INSERT SCARFER WITH SPARES/WEST COAST						
	Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI – 620014	DRN	NAME TCD.S.SELVAMANICKAM	SIGNATURE <i>S. Selvamani</i>	DATE 14.07.16	
		CHD	G.GOVINDARAJ	<i>G. Govindaraj</i>	15.07.16	
		APPD	G.THIAGARAJAN	<i>G. Thiagarajan</i>	16.07.16	
DEPT M&S	GRADE OF UNIT. DIM		SCALE 1:1 2:1	WEIGHT (Kg) 1.33	REF TO ASSY DWG NO	ITEM
CODE 2597	Ø/M/F IS: 2102			REF TO OLD DWG NO ISM-ND2-01-03		
TITLE SPINDLE SHAFT Ø50x234L (MAIN ASSY.)				CARD CODE U 01	DRAWING NO : 3-M-12B47-15617	REV 00

A3-SIZE

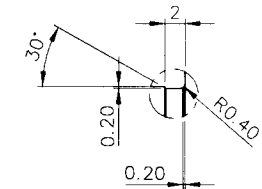
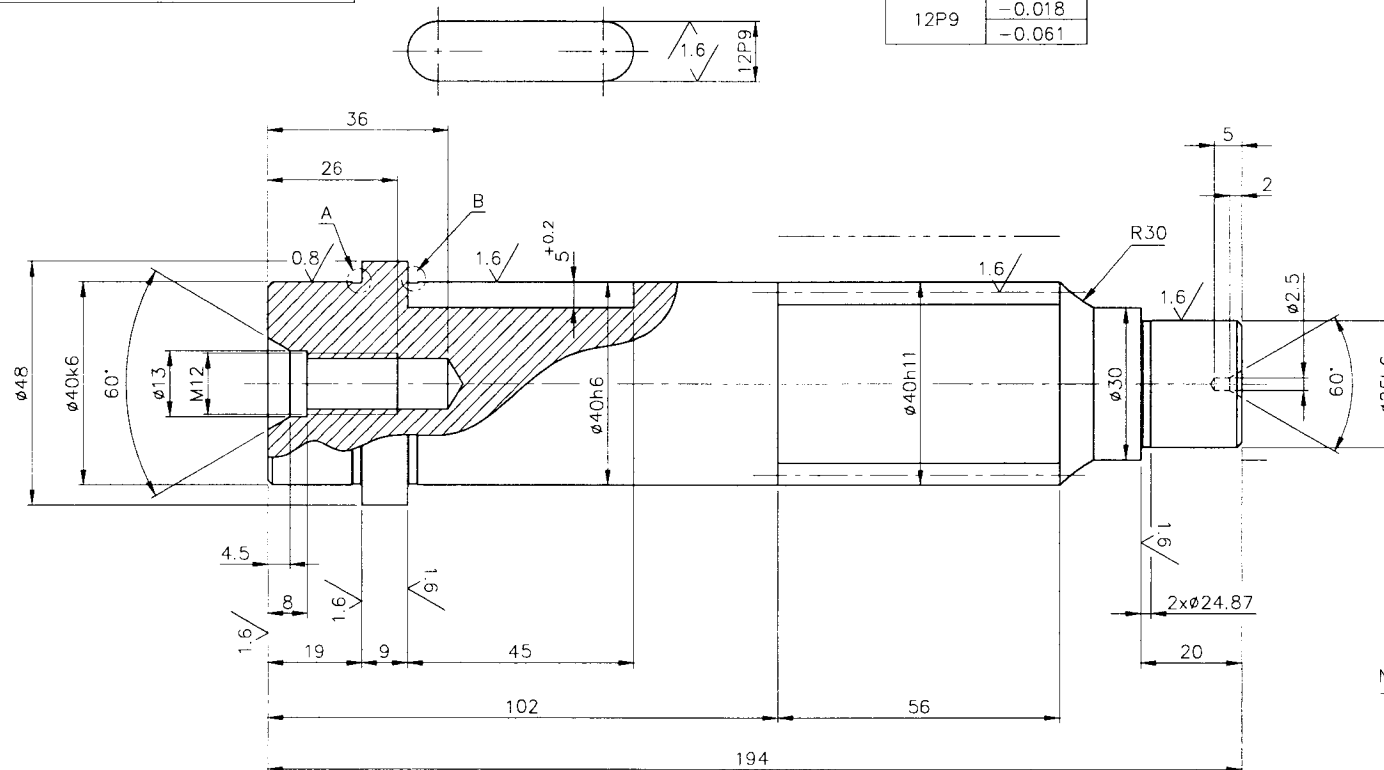
3-M-12B47-15742

DRAWING NO.

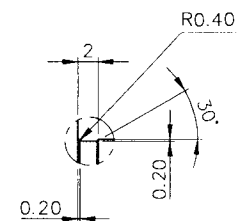
ALL DIMENSIONS ARE IN MILLIMETRES

ø40k6	+0.018 +0.002	ø25h6	-0.000 -0.013	ø40h6	-0.000 -0.016	ø40h11	-0.000 -0.016
12P9	-0.018 -0.061						

3.2 // 1.6



DETAIL - A



DETAIL - B

NOTE: --

1. SHARP CORNERS TO BE REMOVED
2. HARDNED TO HRC 60^{±2}
3. CASE DEPTH 0.8mm

NO.OF TEETH	18
MODULE	2
PRESSURE ANGLE	20°
WITH ACROSS 3 TEETH	15.264 ^{-0.127} -0.169
CORRECTION FACTOR	NIL
QLTY.&TOL.ZONE	9C DIN 3967
MATING GEAR NO.OF TEETH	27
MATING GEAR DRAWING NO:	4-M-12B47-29928
CENTRE DISTANCE	45

REV	DATE	ALTERED CHECKED APPROVED

ZONE

CAUTION: 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.

ø50x200L		IS: 4432		1.98
ITEM NO		DESCRIPTION		DRAWING NO
EQPT: PORTABLE END SCARFER WITH SPARES PORTABLE INSERT SCARFER WITH SPARES /WEST COAST		NAME		SIGNATURE
DEPT		TCD.S.SELVAMANICKAM		DATE
M&S		G.GOVINDARAJ		11.04.17
GRADE DF UNTDL. DIM		G.Thiagarajan		13.04.17
SCALE		G.Thiagarajan		15.04.17
WEIGHT (Kg)		REF TO ASSY DWG NO		ITEM
2597		REFER DRG.NO:ISM-ND2-01-04		
TITLE		DRAWING NO :		REV
MIDDLE SHAFT Ø50x194L		3-M-12B47-15742		00
(MAIN ASSY.)		CARD CODE		
		U 01		

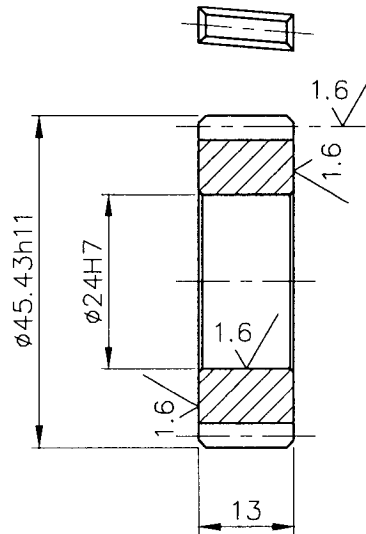
A3-SIZE

ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
		CHECKED
		APPROVED
ZONE		

ø45.43h11	-0.000	ø24H7	+0.021
	-0.016		0.000

3.2//1.6/



NO.OF TEETH	20
MODULE	1.5
PRESSURE ANGLE	20°
HELEX ANGLE	45°
HAND OF HELIX	RH
CORRECTION FACTOR	NIL
WIDTH A/C 3 TEETH	$11.490^{+0.113}_{-0.150}$
QUALITY & TOL.ZONE	9c.DIN 3967
MATING GEAR No.OF TEETH	20
MATING GEAR DRG.No.	3-M-12B47-15738
CENTRE DISTANCE	42.43

NOTE: -

1. SHARP CORNERS TO BE REMOVED
2. HARDNED TO HRC $60^{\pm 2}$

CAUTION: 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.

ø43.43x13L		IS: 4432		0.12
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
			MATL SPEC	QTY
EQPT: PORTABLE END SCARFER WITH SPARES PORTABLE INSERT SCARFER WITH SPARES /WEST COAST				
 Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014		DRN	NAME TCD.SELVAMANICKAM	SIGNATURE <i>S. Selvamanickam</i>
		CHD	G.GOVINDARAJ	<i>G. Govindaraj</i>
		APPD	G.THAGARAJAN	<i>G. Thagarajan</i>
DEPT M&S	GRADE OF UNTOL. DIM	SCALE 1:1	WEIGHT (Kg) 0.12	REF TO ASSY DWG NO ISM-ND2-02-04
CODE 2597	φ/M/F IS: 2102			REF TO OLD DWG NO
TITLE MIDDLE GEAR Ø45.43x20T (FEED GEAR BOX ASSY.)			CARD CODE U 01	DRAWING NO : 4-M-12B47-29929
				REV

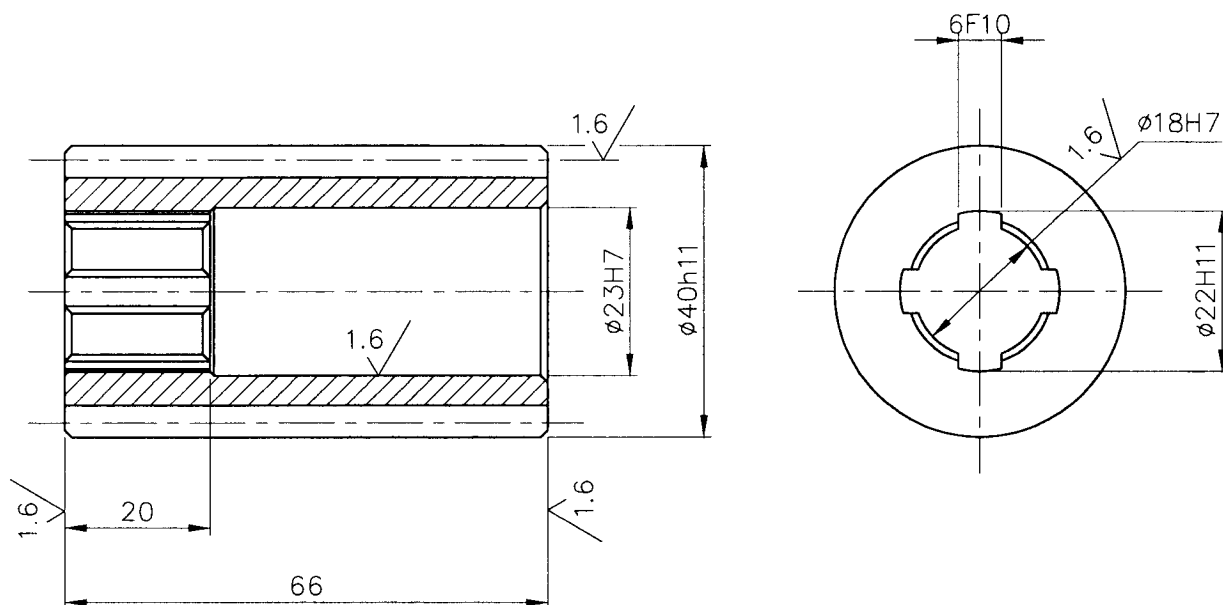
A4-SIZE

ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
		CHECKED
		APPROVED
ZONE		

ø22H11	+0.130 0.000	ø18H7	+0.018 0.000
		6F10	+0.010 +0.020

3.2//1.6/



NO.OF TEETH	18
MODULE	2
PRESSURE ANGLE	20°
WITH ACROSS 3 TEETH	15.264 ^{-0.127} _{-0.169}
CORRECTION FACTOR	NIL
QLTY.&TOL.ZONE	9C DIN 3967
MATING GEAR NO.OF TEETH	23
MATING GEAR DRAWING NO:	4-M-12B47-29927
CENTRE DISTANCE	41

NOTE: -

1. SHARP CORNERS TO BE REMOVED
2. HARDNED TO HRC 60^{±2}

CAUTION: 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.	ø40x66L		IS: 4432		0.44
			13Ni13Cr3		1
	ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
				MATL SPEC	QTY
EQPT: PORTABLE END SCARFER WITH SPARES PORTABLE INSERT SCARFER WITH SPARES /WEST COAST					
 Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014	DRN	NAME	SIGNATURE	DATE	
	CHD	G.GOVINDARAJ	G. Govindaraj	12.04.17	
	APPD	G.THAGARAJAN	G. Thagarajan	13.04.17	
DEPT M&S	GRADE OF UNTOL. DIM	 SCALE 1:1	REF TO ASSY DWG NO		ITEM
CODE 2597	 IS: 2102		ISM-ND2-01-06		
TITLE			WEIGHT (Kg)	REF TO OLD DWG NO	
SPUR GEAR Ø40x18T (MAIN ASSY.)			0.44		
CARD CODE			DRAWING NO :		REV
U 01			4-M-12B47-29926		

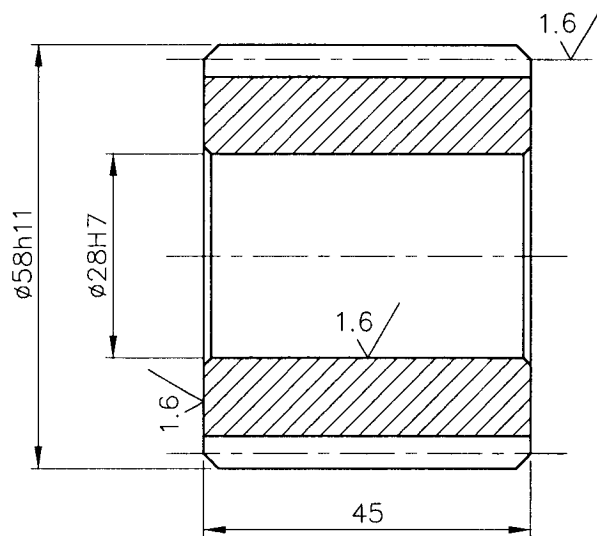
A4-SIZE

ALL DIMENSIONS ARE IN MM

REV	DATE	ALTERED
		CHECKED
		APPROVED
ZONE		

ø58h11	-0.000	ø28H7	+0.021
	-0.190		0.000

3.2 // 1.6



NOTE: -

1. SHARP CORNERS TO BE REMOVED
2. HARDNED TO HRC 60^{±2}

NO.OF TEETH	27
MODULE	2
PRESSURE ANGLE	20°
WITH ACROSS 4 TEETH	21.421 ^{-0.141} ^{-0.188}
CORRECTION FACTOR	NIL
QLTY.&TOL.ZONE	9C DIN 3967
MATING GEAR NO.OF TEETH	18/23
MATING GEAR DRAWING NO	3-M-12B47-15742 4-M-12B47-29927
CENTRE DISTANCE	45/50

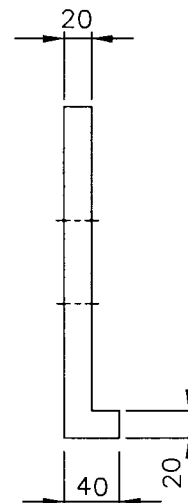
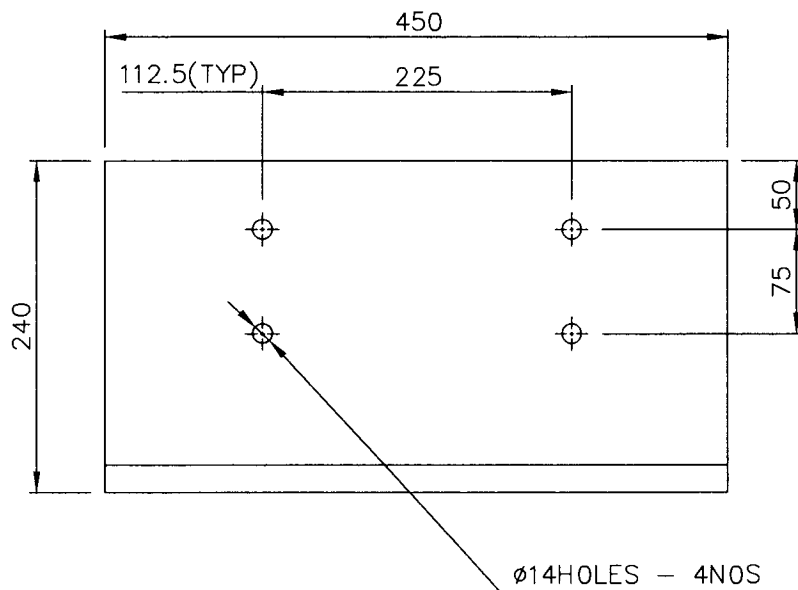
CAUTION: THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.	ø58x45L		IS: 4432		0.72
	ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
				MATL SPEC	QTY
	EQPT: PORTABLE END SCARFER WITH SPARES PORTABLE INSERT SCARFER WITH SPARES /WEST COAST				
 Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014	DRN	NAME	SIGNATURE	DATE	
	CHD	G.GOVINDARAJ	<i>G. Govindaraj</i>	10.04.17	
	APPD	G.THAGARAJAN	<i>G. Thagaranjan</i>	12.04.17	
DEPT M&S	GRADE OF UNTOL. DIM	SCALE	WEIGHT (Kg)	REF TO ASSY DWG NO	ITEM
CODE 2597	ø/M/F IS: 2102	1:1	0.72	ISM-ND2-01-08	
TITLE			CARD CODE	DRAWING NO :	REV
SPUR GEAR Ø58x27T (MAIN ASSY.)			U 01	4-M-12B47-29928	

A4-SIZE

CAUTION: THIS DRAWING IS OUR SOLE PROPERTY AND SHOULD NOT BE USED IN ANY FORM FOR ANY PURPOSE WITHOUT THE WRITTEN PERMISSION OF BHARAT HEAVY ELECTRICALS LIMITED TRICHIRAPPALLI - 620 014.

ALL DIMENSIONS ARE IN MM

3.2/1



		TYPE-'C'.Gr-1	IS: 3355	18.38		01
X						
No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE:	ALTERATIONS:		DCN REF	DATE	SIGN. INDEX
SCALE	DRAWN	<i>N. MANOJ</i>				
1: 5	CHECKED	R.RAMAMOORTHY				
	APPROVED	M.MANOHER				
	DATE	04-08-08				
	MACHINE: CONTINUOUS DISCHARGE FURNACE			TYPE: PRECISION CONTROLS-CDF		
	TITLE: <i>TOP CASTING</i>			DRAWING No:		REV.
	(MOUTH)			4M18B1028208		
	Sheet No:			No. of Sheets:		

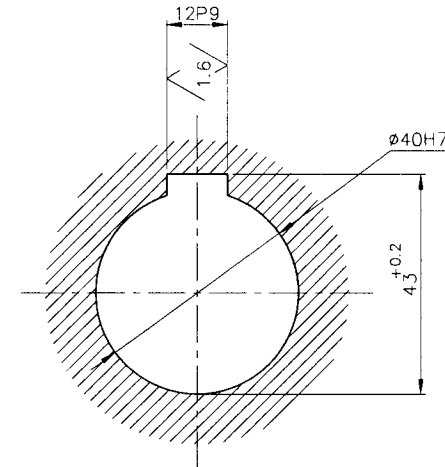
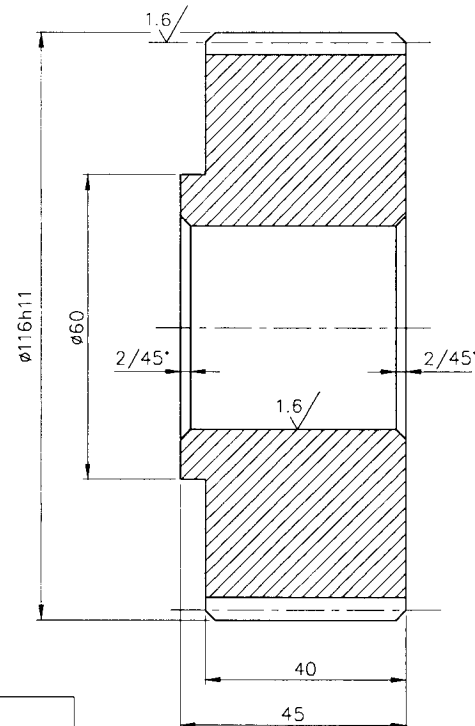
ALL DIMENSIONS ARE IN MILLIMETRES

3-M-12B47-15739

DRAWING NO.:

ø40H7	+0.025	ø116h11	-0.000	12P9	-0.018
	0.000		-0.220		-0.061

3.2//1.6/



NOTE: -

1. SHARP CORNERS TO BE REMOVED
2. HARDNED TO HRC 60^{±2}

NO.OF TEETH	56
MODULE	2
PRESSURE ANGLE	20°
WITH ACROSS 7 TEETH	39.946 ^{-0.141} -0.168
CORRECTION FACTOR	NIL
QLTY.&TOL.ZONE	9C DIN 3967
MATING GEAR NO.OF TEETH	44
MATING GEAR DRAWING NO:	3-M-12B47-15741
CENTRE DISTANCE	100

REV	DATE	ALTERED	CHECKED	APPROVED

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

ø116x45L		IS: 4432		2.98
ITEM NO		DESCRIPTION		DRAWING NO
EQPT: PORTABLE END SCARFER WITH SPARES PORTABLE INSERT SCARFER WITH SPARES /WEST COAST		NAME		SIGNATURE
DRN		TCD.S.SELVAMANICKAM		S. Selvamanickam
CHD		G.GOVINDARAJ		G. Govindaraj
APPD		G.THAGARAJAN		G. Thagargajan
DEPT		GRADE OF UNTOL. DIM		SCALE
M&S		ø/M/F		1:1
CODE		IS: 2102		WEIGHT (Kg)
2597				2.98
TITLE		DRAWING NO :		REV
DRIVEN GEAR Ø116x56T		3-M-12B47-15739		00
(MAIN ASSY.)		CARD CODE		
U 01				

A3-SIZE

3-M-12B47-15737

DRAWING NO.

$\phi 19.97h11$	+0.000
	-0.130

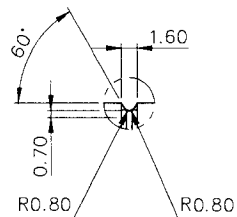
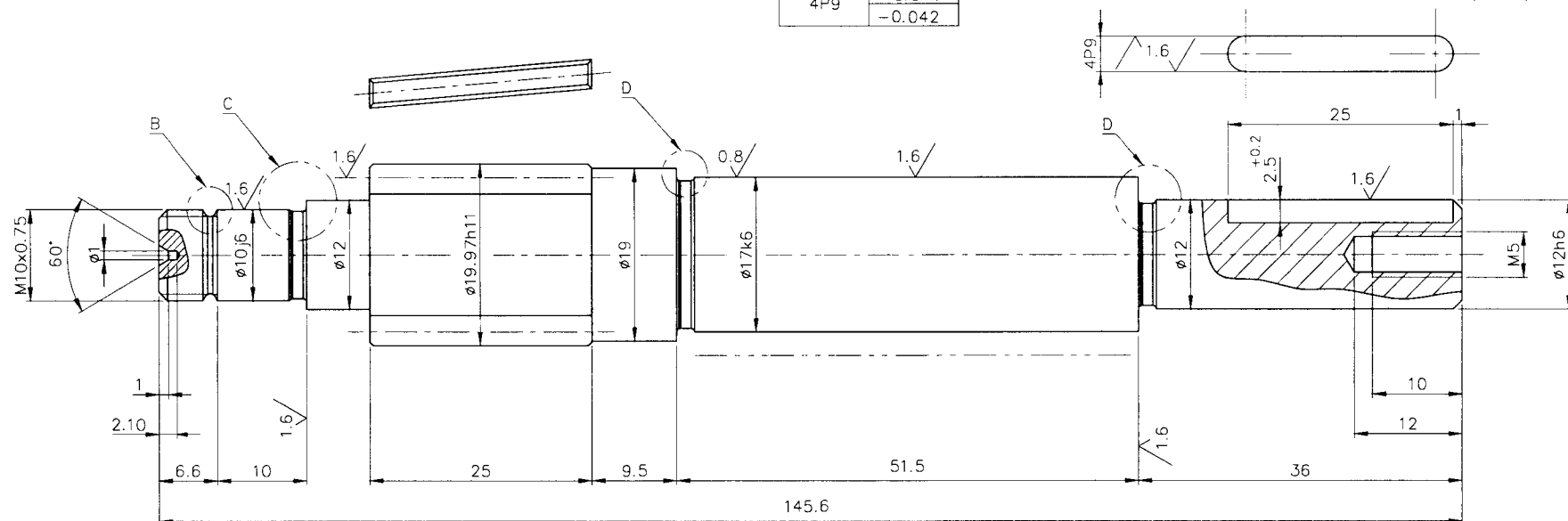
ALL DIMENSIONS ARE IN MILLIMETRES

$\phi 10j6$	+0.007
	-0.002
4P9	-0.012
	-0.042

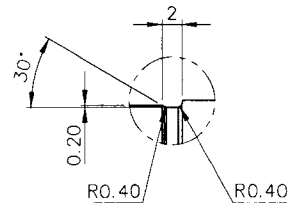
$\phi 17k6$	+0.012
	+0.001

$\phi 12h6$	0.000
	-0.011

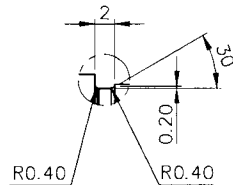
3.2	1.6	0.8
-----	-----	-----



DETAIL-B



DETAIL-C



DETAIL-D

NOTE: -

1. SHARP CORNERS TO BE REMOVED
2. HARDENED TO HRC 60⁺²
3. CASE DEPTH 0.8mm

NO.OF TEETH	8
MODULE	1.5
PRESSURE ANGLE	20°
HELEX ANGLE	45°
HAND OF HELIX	LH
CORRECTION FACTOR	NIL
WIDTH A/C 3 TEETH	-
QUALITY & TOL.ZONE	9c.DIN 3967
MATING GEAR No.OF TEETH	20
MATING GEAR DRG.No.	4-M-12B47-29929
CENTRE DISTANCE	29.70

REV	DATE	ALTERED	CHECKED	APPROVED

CAUTION: 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.

EQPT: PORTABLE END SCARFER WITH SPARES PORTABLE INSERT SCARFER WITH SPARES /WEST COAST		IS: 4432	1.94
13Ni13Cr3		1	
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE
			UNIT WT
			QTY
Bharat Heavy Electricals Ltd			
HIGH PRESSURE BOILER PLANT			
TIRUCHIRAPALLI - 620014			
DEPT	GRADE OF UNTOL. DIM	SCALE	WEIGHT (Kg)
M&S	$\phi/M/f$	1:1	1.94
CODE	IS: 2102		
2597			
TITLE		CARD CODE	DRAWING NO :
MAIN SHAFT Ø19.97x145.6L		U 01	3-M-12B47-15737
(FEED GEAR MAIN ASSY.)			REV
			00

A3-SIZE

A3-SIZE