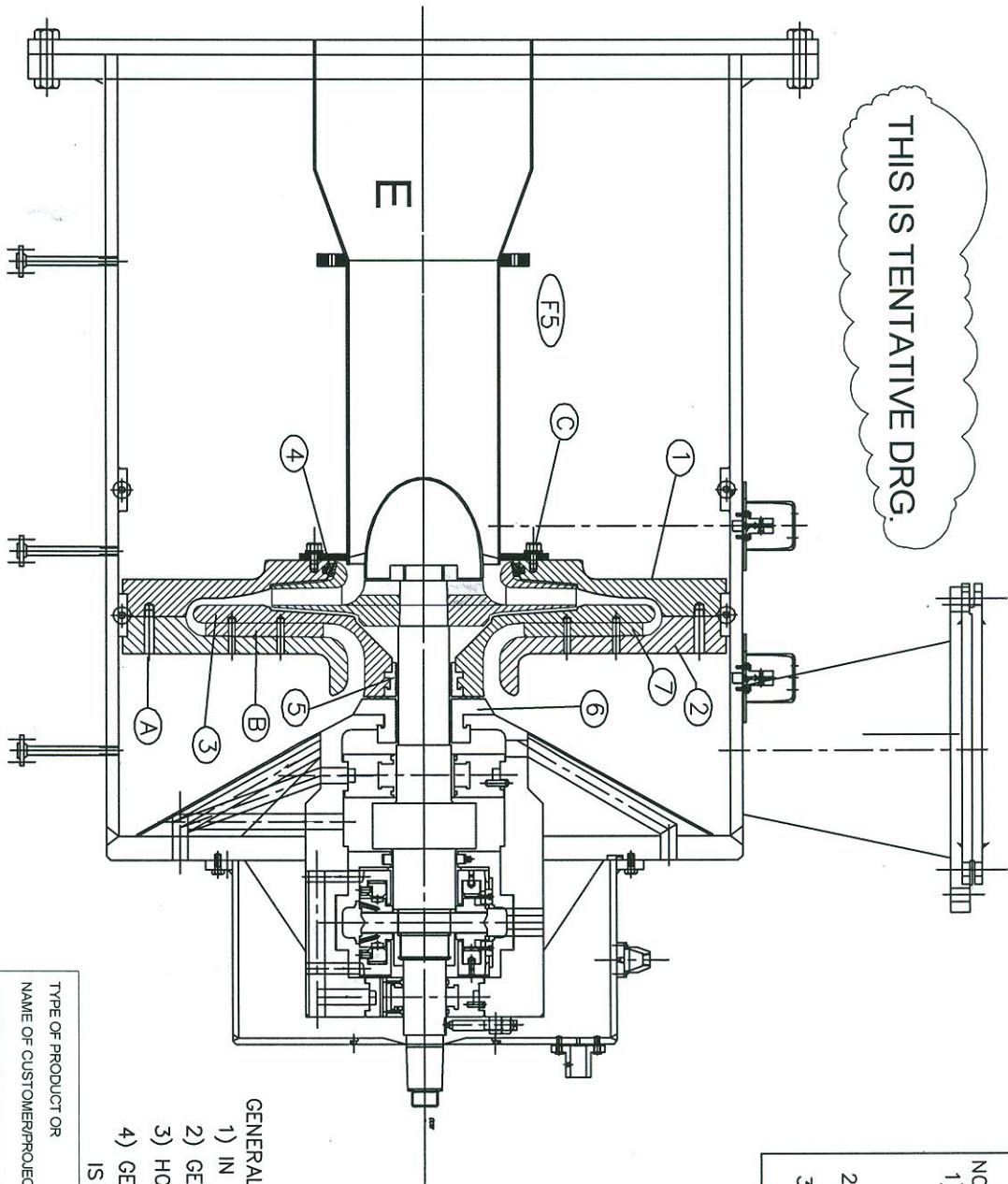


THIS IS TENTATIVE DRG.



- NOTE:
- 1) THIS DRAWING IS STUDY DRAWING WHICH SHOWS THE NEW PARTS TO BE MANUFACTURED FOR F-5 2D IMPELLER TEST RIG.
 - 2) ALL DIAPHRAGM SHOULD BE MADE 2062-FE-410-W
 - 3) MECHANICAL SEALS SHOULD BE MADE AVONAL-14

FASTENER LIST

ITEM	DESIGNATION	SIZE	QTY.
C	HEX. HEADED BOLT	M12X30L	16
B	HEX. HEADED BOLT	M12X60L	16
A	HEX. HEADED BOLT	M16X85L	16

GENERAL NOTE:

- 1) IN CASE OF DOUBT, DON'T ASSUME, PLEASE ASK.
- 2) GENERAL TOLERANCE ± 0.1
- 3) HORIZONTAL SPLIT
- 4) GENERAL SURFACE FINISH WHERE IT IS NO MENTIONED IS 3.2 MICRONS.

INVENTORY NO

COMPUTER FILE NAME

B3320900169-S00-R00.DWG

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GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

ITEM	DESCRIPTION	DRAWING NO.	NO. OF Sht.	MATERIAL
7	RETURN CHANNEL VANE	RD DG 3 16 F3-9	1	IS: 2062 FE 410 W
6	BEARING SEAL	RD DG 3 16 F3-8	1	AVONAL-14
5	SHAT SEAL	RD DG 3 16 F3-7	1	AVONAL-14
4	IMPELLER SEAL	RD DG 3 16 F3-6	1	AVONAL-14
3	DIAPHRAGM-3	RD DG 3 16 F3-5	1	IS: 2062 FE 410 W
2	DIAPHRAGM-2	RD DG 3 16 F3-4	1	IS: 2062 FE 410 W
1	DIAPHRAGM-1	RD DG 3 16 F3-3	1	IS: 2062 FE 410 W



BHARAT HEAVY ELECTRICALS LIMITED
Corp. R&D Division, Vikasnagar
HYDERABAD - 500 093

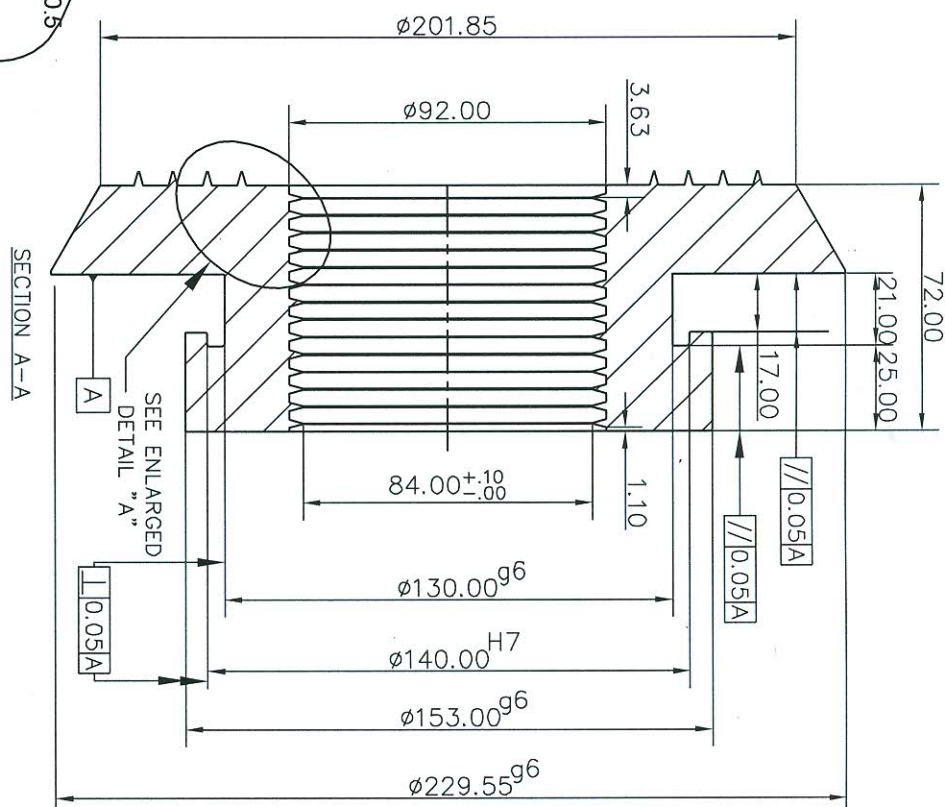
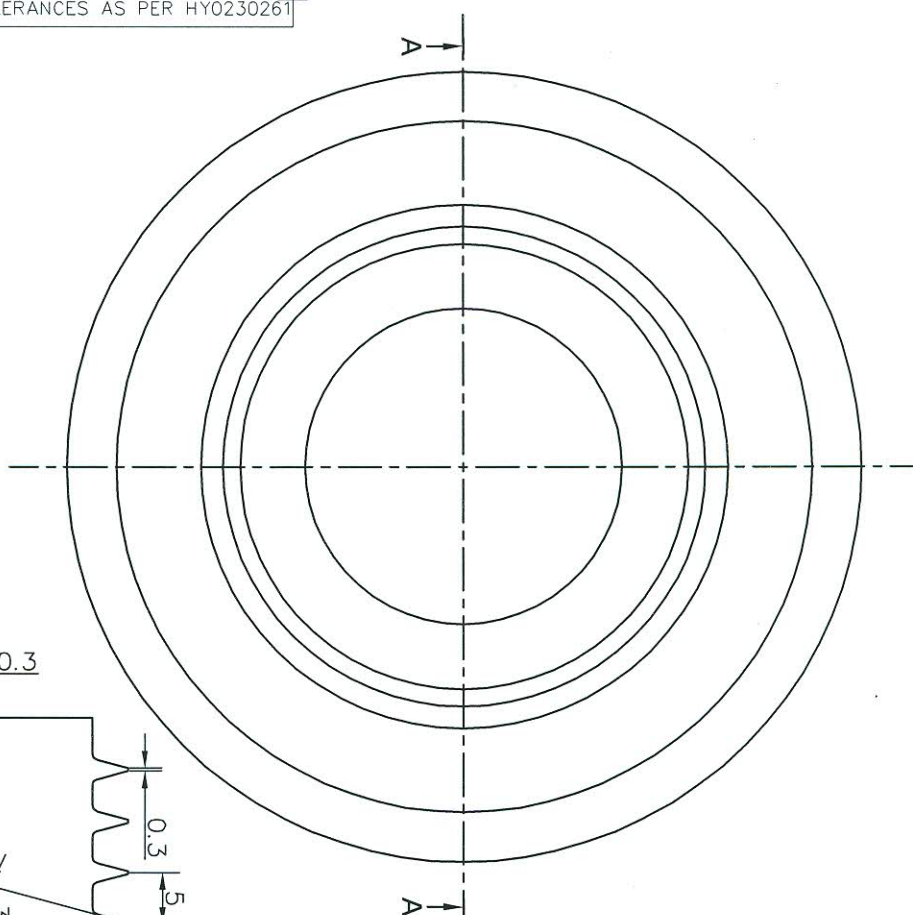
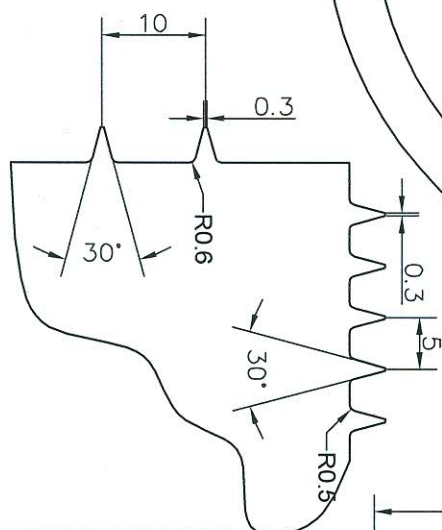
TITLE
ASSEMBLY OF F-3 DIA. 500 MM
2D IMPELLER STAGE (STUDY DRAWING)
SECTIONAL FRONT VIEW

DEPT. TNL. CODE 050	UNTO. DIMS. GR. CMWF	SCALE N.T.S.	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF ITEMS
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT			PERFORMANCE TESTING OF 500 MM DIA. 2D F3 IMPELLER (B-F-20-15-752-RD-50)			
DRN. VINAY		NAME		DATE		NO. OF VAR.
CHD. P. G. SHANKAR		SIGN.		13.02.16		N/A
APPL. P. G. SHANKAR		REF. TO ASSY. DRG.		ITEM NO.		NO. OF ITEMS
CARD CODE N.A.		DRAWING NO.		REV.		
SHT. No 1		NO. OF SHT. 1				

GENERAL DIMENSIONAL LIMITS,FITS & TOLERANCES AS PER HY0230261

- 1) IN CASE OF DOUBT, DON'T ASSUME, PLEASE ASK
- 2) GENERAL TOLERANCE ± 0.1
- 3) HORIZONATL SPLIT
- 4) MATERIAL: AVONAL-14
- 5) GENERAL SURFACE FINISH WHERE IT IS NOT MENTIONED

THIS IS TENTATIVE DRG



TYPE OF PRODUCT OR PERFORMANCE TESTING OF 500 MM DIA. 2D F3 IMPELLER		NAME OF CUSTOMER/PROJECT (B-F-20-15.752-RD-50)			
		BHARAT HEAVY ELECTRICALS LIMITED Corp. R&D Division, Vikasnagar HYDERABAD - 500 093			
				DEPT. T.M.L. CODE 0550	
				UNTOL. DIMS. GR C/M/F	
					
TITLE BEARING SEAL		SCALE N.T.S.			
CARD CODE N/A		WEIGHT (KG)			
DRAWING NO. RD DG 3 TM 16 F3-8		REF. TO ASSY DRG. RD DG 3 TM 16 F3-1A			
REV. 01		ITEM NO.			
SHT. No 1		NO. OF ITEMS N/A			
SHT. No 1		NO. OF SHT. 1			

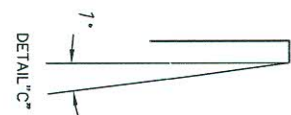
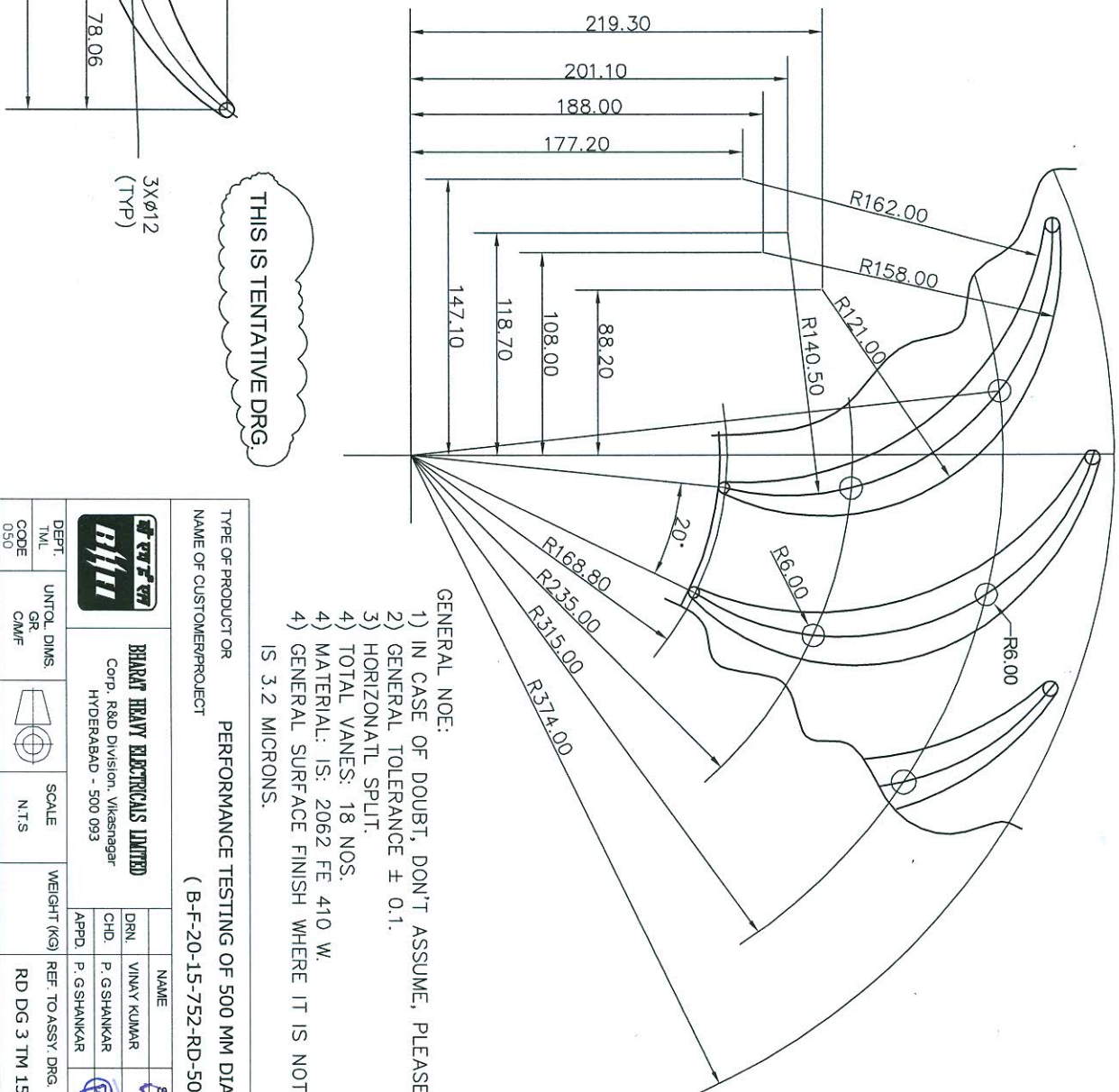
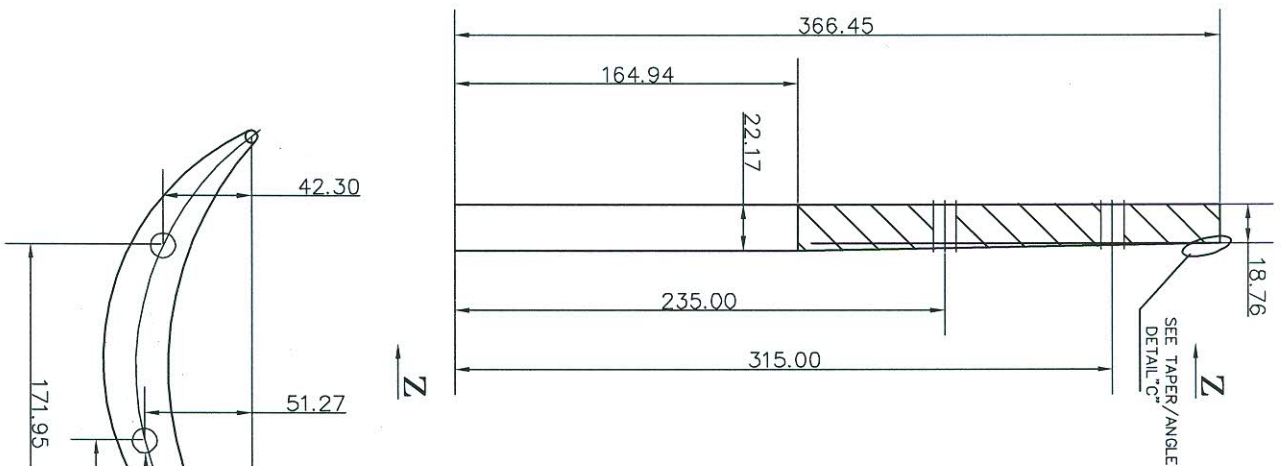
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COMPUTER FILE NAME

B3320900169-S00-R00.DWG

INVENTORY NO

GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261



GENERAL NOE:
1) IN CASE OF DOUBT, DON'T ASSUME, PLEASE ASK.
2) GENERAL TOLERANCE ± 0.1 .
3) HORIZONTAL SPLIT.
4) TOTAL VANES: 18 NOS.
4) MATERIAL: IS: 2062 FE 410 W.
4) GENERAL SURFACE FINISH WHERE IT IS NOT MENTIONED IS 3.2 MICRONS.

TYPE OF PRODUCT OR PERFORMANCE TESTING OF 500 MM DIA. 2D F3 IMPELLER
NAME OF CUSTOMER/PROJECT (B-F-20-15-752-RD-50)



BHARAT HEAVY ELECTRICALS LIMITED
Corp. R&D Division, Vikasnagar
HYDERABAD - 500 093

DEPT. TML	UNTO. DIMS. OR CM/F	SCALE N.T.S	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF ITEMS
050				RD DG 3 TM 15 F3-1A		N/A

TITLE

RETURN CHANNEL VANES

DRAWING NO.
RD DG 3 TM 16 F3-9REV.
00

CARD CODE	SHT. No.	NO. OF SHT.
N.A.	1	1

NAME	SIGN.	DATE	NO. OF VAR.
VINAY KUMAR		15.02.16	
P. GSHANKAR			
P. GSHANKAR			

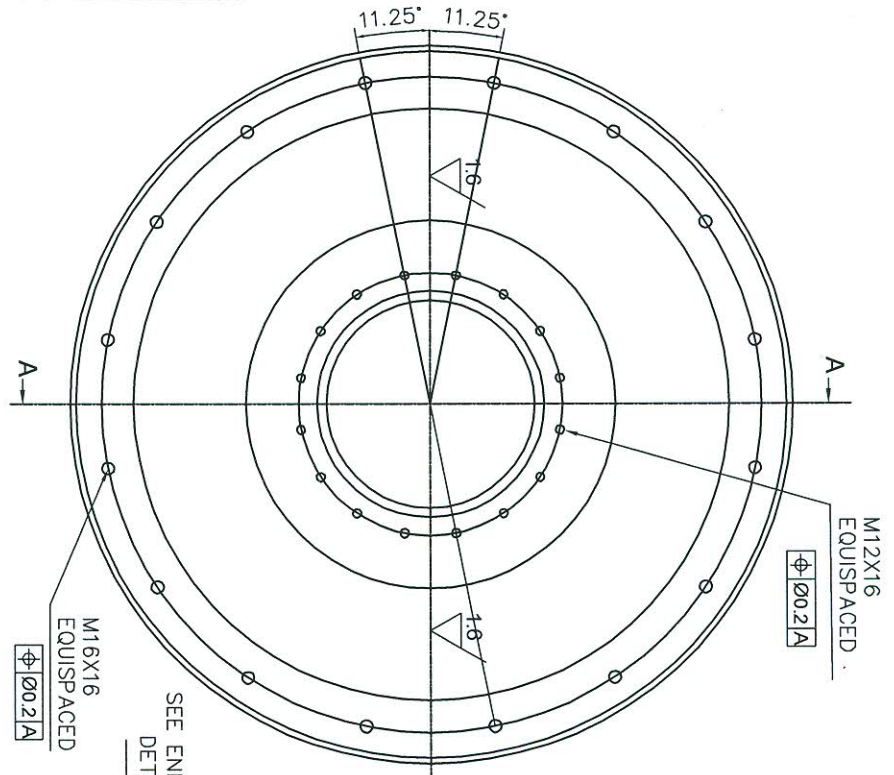
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COMPUTER FILE NAME

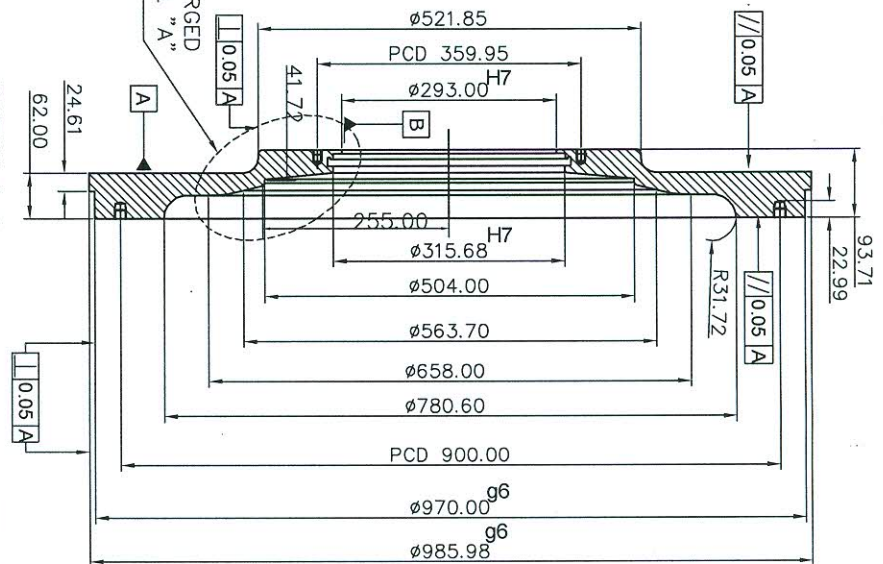
33320900169-500-R00.DWG

INVENTORY NO

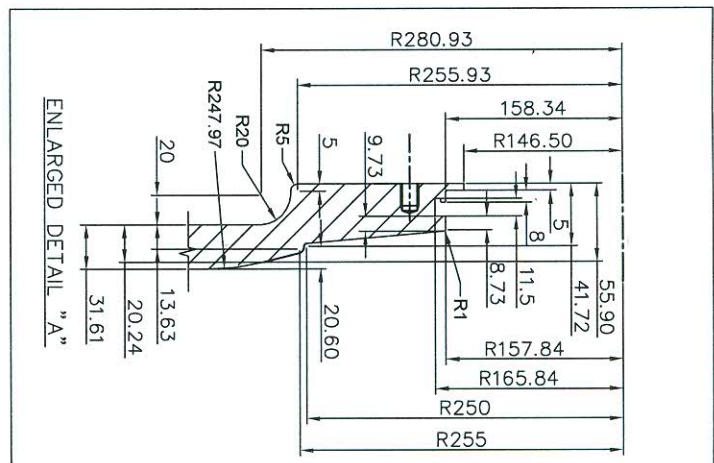
GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261



SECTION A-A



SPLIT IN TO TWO PARTS



THIS IS TENTATIVE DRG.

GENERAL NOTE:

- 1) IN CASE OF DOUBT, DON'T ASSUME, PLEASE ASK.
- 2) GENERAL TOLERANCE ± 0.1
- 3) HORIZONTAL SPLIT
- 4) MATERIAL: IS: 2062 FE 410 W
- 5) GENERAL SURFACE FINISH WHERE IT IS NOT MENTIONED IS 3.2 MICRONS.



BHARAT HEAVY ELECTRICALS LIMITED
Corp. R&D Division, Vikasnagar
HYDERABAD - 500 093

TYPE OF PRODUCT OR PERFORMANCE TESTING OF 500 MM DIA. 2D F3 IMPELLER
NAME OF CUSTOMER/PROJECT (B-F-20-15-752-RD-50)

DEPT.	TML	UNTO.	GR.	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF ITEMS
050	CMF			N.T.S				
DRN.	CHD.	APPD.	NAME	SIGN.	DATE	NO. OF		
VINAY KUMAR	P. G. SHANKAR	P. G. SHANKAR			13.02.16	VAR		
						N.A		

TITLE

DIAPHRAM PART-1

DRAWING NO.

RD DG 3 TM 16 F3-3

REV.

00

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COMPUTER FILE NAME

B3320900169-S00-R00.DWG

INVENTORY NO

GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

16 NO OF HOLES DIA. 18 FOR
M16 BOLTS EQUISPACED

$\Phi 0.02A$

MECHANISM FOR
PROBE ARRANGEMENT

18 NO. OF HOLES DIA. 13
FOR M12BOLTSEQUISPACED

$\Phi 0.02A$

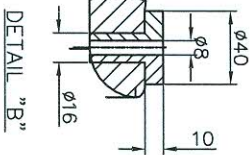
18 NO. OF HOLES DIA. 13
FOR M12BOLTSEQUISPACED

$\Phi 0.02A$

SEE ENLARGED
DETAIL "A"

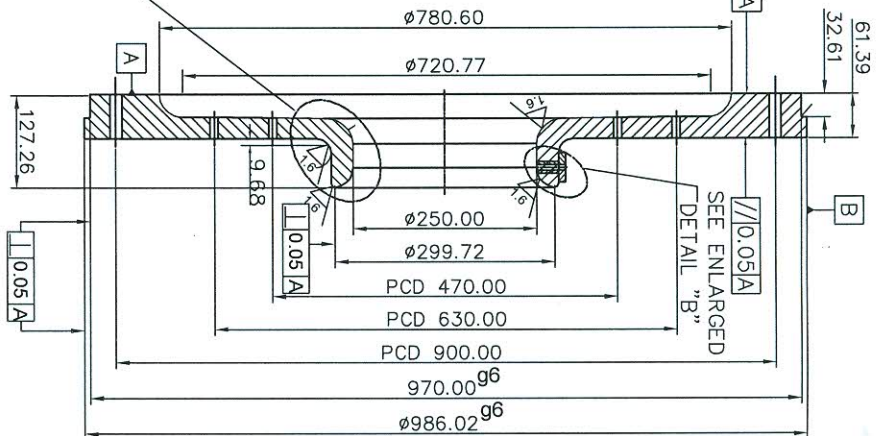
THIS IS TENTATIVE DRG.

- GENERAL NOTE:
- 1) IN CASE OF DOUBT, DON'T ASSUME, PLEASE ASK.
 - 2) GENERAL TOLERANCE ± 0.1
 - 3) HORIZONTAL SPLIT
 - 4) MATERIAL: IS: 2062 FE 410 W
 - 5) GENERAL SURFACE FINISH WHERE IT IS NO MENTIONED IS 3.2 MICRONS.

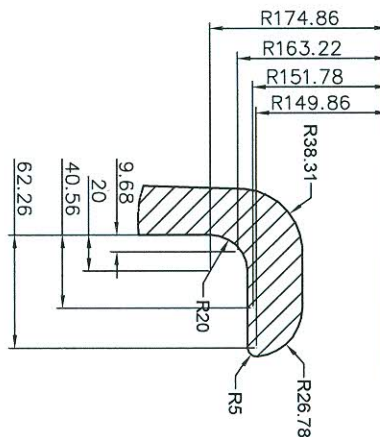


SECTION A-A

SPLIT IN TO TWO PARTS



DETAIL "A"



TYPE OF PRODUCT OR PERFORMANCE TESTING OF 500 MM DIA. 2D F3 IMPELLER
NAME OF CUSTOMER/PROJECT (B-F-20-15-752-RD-50)



BHARAT HEAVY ELECTRICALS LIMITED
Corp. R&D Division, Vikasnagar
HYDERABAD - 500 093

DRN.	NAME	SIGN	DATE	NO. OF
P. G. SHANKAR	VINAY KUMAR		13.02.16	VAR.
APPD.	P. G. SHANKAR			N/A

DEPT.	UNTOOL. DIMS.	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF
TML	GR. CMF	N.T.S		RD DG 3 TM 16 F3-1A		ITEMS
CODE						N/A
050						

TITLE	CARD	SHT. No	NO. OF SHT.	REV.
DIAPHRAM PART-2	RD DG 3 TM 16 F3-4	1	1	00

INVENTORY NO

83320900169-S00-R00.DWG



15.54

A

SEE ENLARGED DETAIL "B"

29.99

SECTION A-A

1/8

1/8

119.97

104.00

119.8

129

110.8

129.00

224.00

504.00

SEE ENLARGED DETAIL "A"

PCD 470.00

PCD 630.00

0.2A/B

1/8

1/8

119.8

129

110.8

129.00

224.00

504.00

SEE ENLARGED DETAIL "A"

PCD 470.00

PCD 630.00

0.2A/B

1/8

1/8

119.97

104.00

119.8

129

110.8

129.00

224.00

504.00

SEE ENLARGED DETAIL "B"

29.99

SECTION A-A

15.54

A



4) MATERIAL: IS: 2062 FE 410 W
4) GENERAL SURFACE FINISH WHERE IT IS NO MENTIONED IS 3.2 MICRONS.

(B-F-20-15-752-RD-50)

बिना

NAME	SIGN.	DATE	NO. OF VAR.
DRN. VINAY KUMAR		13.02.16	VAR.
P. G. SHANKAR			NA

WEIGHT (KG)

ITEM NO.	NO.OF
----------	-------

DIAPHRAM PART-3

SHT. No

1

NO. OF SHT.

1

DRAWING NO.
RD DG 3 TM 16 F3-5REV.
00

(ALL DIVISIONS ARE IN FULL)

33320900169-S00-R00.DWG

GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

IN THE DIAPHRAGM-1.

Technical drawing of a mechanical part with dimensions: 4, 5, 30°, R0.5, 0.3, 1.0H7.

Technical drawing of a mechanical part, likely a valve or plug, showing a cross-section with various dimensions and tolerances. The drawing includes a central threaded section with a diameter of 280 H7. The overall diameter is 317.67 H7. The drawing also shows a detailed view of the "TYPICAL FILLE SHARP CORNER" with dimensions 11.5, 9, and 5. The drawing includes various surface finish symbols and tolerances.

SEE ENLARGED
DETAIL "A"

(B-F-20-15.752-RD-50)

PERFORMANCE TESTING OF 500 MM DIA. 2D F3 IMPELLER (B-F-20-15.752-RD-50)

BHARAT HEAVY ELECTRICALS LIMITED
Corp. R&D Division, Vikasnagar
HYDERABAD - 500 093

NAME	SIGN.	DATE	NO. OF VAR.
VINAY KUMAR		15.02.16	
P. G. SHANKAR			N.A
P. G. SHANKAR			
APPD.			

DEPT. T.M.L.	UNTO. DIMS GR CMF	SCALE	WEIGHT (KG)	ITEM NO.	INSTRUMENT ITEMS
CODE 050		NTS	RD DG 3 TM 16 F3-1A		NA

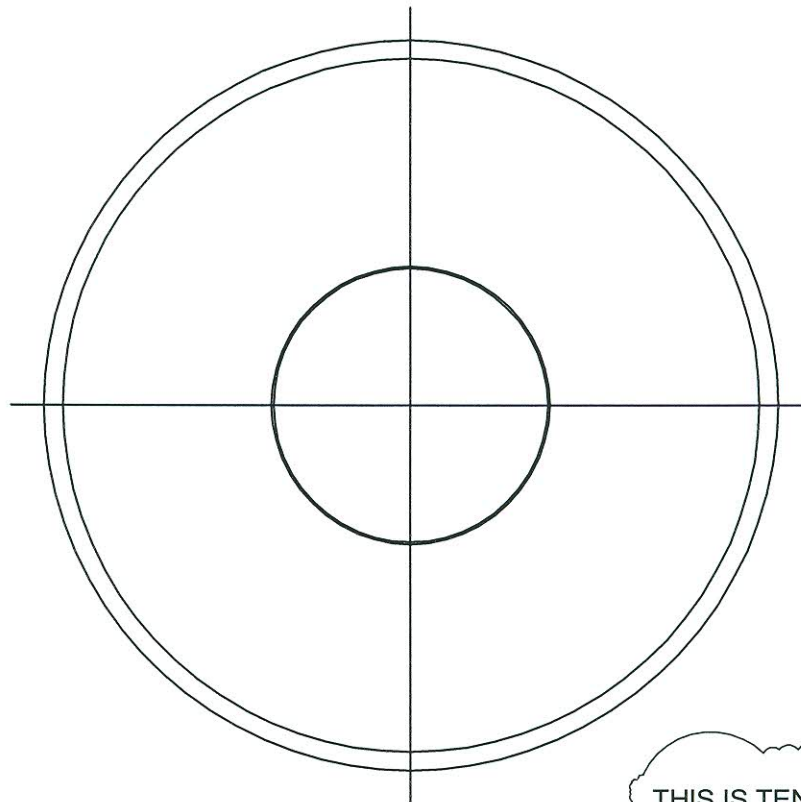
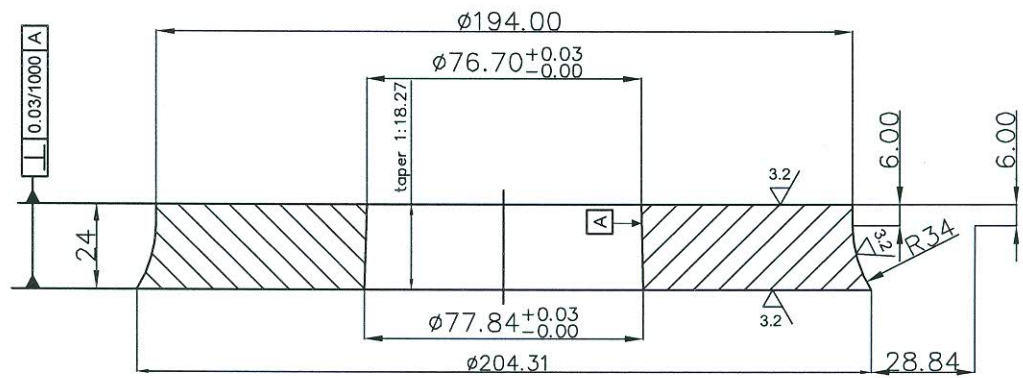
IMPELLER SEAL

TITLE		DRAWING NO.		REV
IMPELLER SEAL		RD DG 3 TM 16 F3-6		00
CARD CODE		N/A		
SHT. No	1	NO OF SHT.	1	

TITLE		DRAWING NO.		REV
IMPELLER SEAL		RD DG 3 TM 16 F3-6		00
CARD CODE		N/A		
SHT. No	1	NO OF SHT.	1	

(ALL DIMENSIONS ARE IN mm)

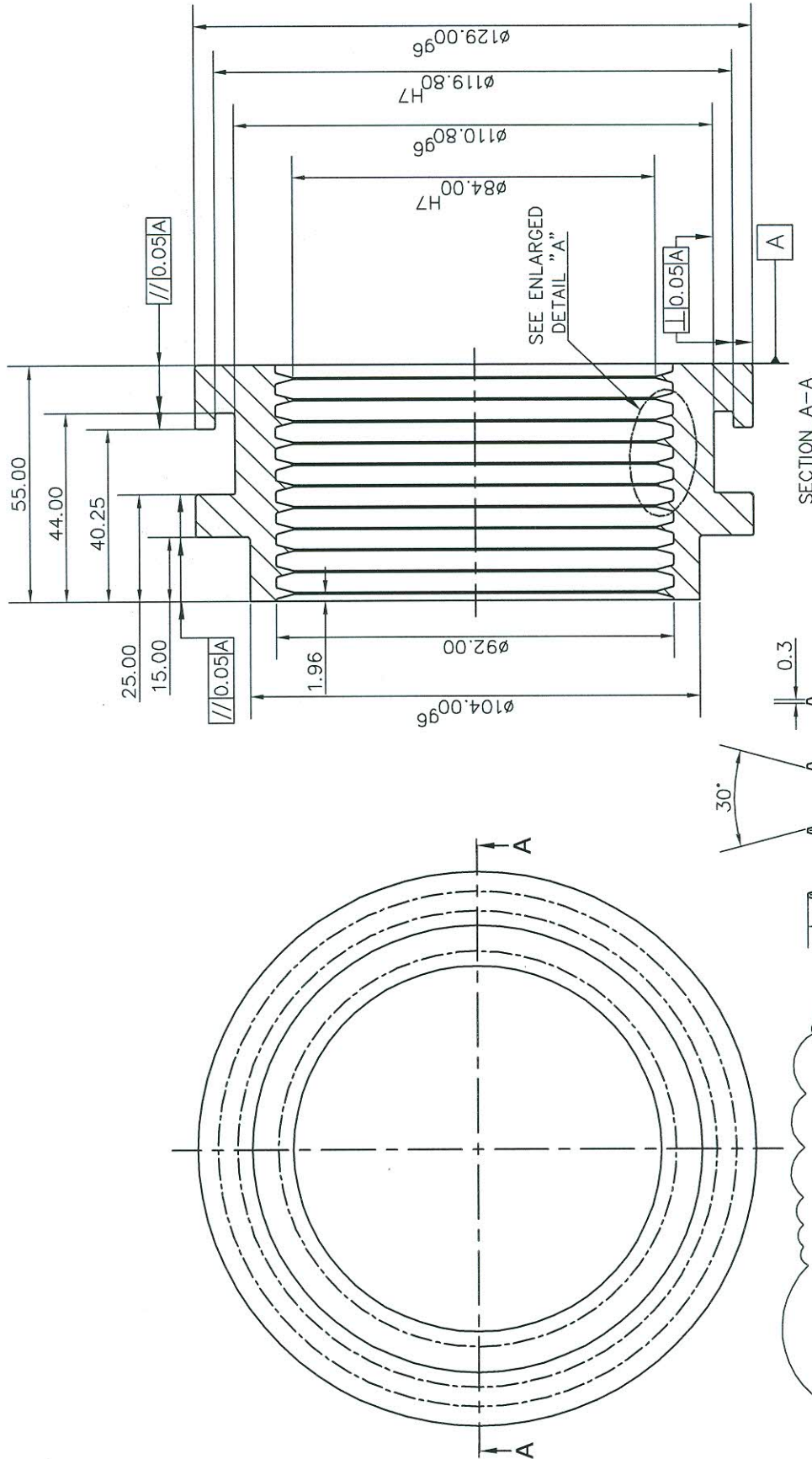
INVENTORY NO



1. MATERIAL IS TO BE HEAT TREATED TO A HARDNESS 230/260 BHN.
2. CONCENTRICITY ON ALL DIAMETERS W.R.F. (A) IS 0.02.
3. GENERAL TOLERANCE IS $\pm 0.1\text{MM}$.

THIS IS TENTATIVE DRG.

REMARKS		ITEM NO	DESCRIPTION	STD	MATL. CODE		A/C	UNIT	UNIT Wt.
					MATL. SPEN.				QTY.
 BHARAT HEAVY ELECTRICALS LTD. HYDERABAD					NAME		SIGN.	DATE	NO.OF VAR.
					DRN.	VINAY KUMAR	<i>[Signature]</i>	15.02.16	
					CHD.	P.G.S	<i>[Signature]</i>		-N.A-
					APPD.	P.G.S			
DEPT. I.T.D	UNTOL. DIM. GR. c/M/F		SCALE NTS	WEIGHT (KG)	REF. TO ASSY DRG.			ITEM NO.	NO.OF ITEMS
DEPT. CODE 415					-N.A-			-N.A-	-N.A-
TITLE LOCK NUT FOR F-3 DIA 500MM 2D IMPELLER					CARD CODE	DRAWING NO.			REV.
						RD DG 4 TM 16 F3-1_2			
					SHT No. 1		NO OF SHT. 1		



THIS IS TENTATIVE DRG.

GENERAL NOE:

- 1) IN CASE OF DOUBT, DON'T ASSUME, PLEASE ASK.
- 2) GENERAL TOLERANCE ± 0.1
- 3) HORIZONTAL SPLIT
- 4) MATERIAL: AVIONAL-14
- 5) GENERAL SURFACE FINISH WHERE IT IS NOT MENTIONED IS 3.2 MICRONS.
- 6) SEAL DIMENSIONS SHOULD BE MATCHED WITH THE CORRESPONDING GROOVE IN THE DIAPHRAGM-2.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT
PERFORMANCE TESTING OF 500 MM DIA. 2D F3 IMPELLER
(B-F-20-15-752-RD-50)

	Bharat Heavy Electricals Limited		NAME	SIGN.	DATE	NO OF VAR.
	Corp. R&D Division, Vikasnagar		DRN.	VINAY KUMAR	15.02.16	
	HYDERABAD - 500 093		CHD.	P. G. SHANKAR		NA
DEPT. TML	UNTO. DIMS. GR. CM/F	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO OF ITEMS
CODE 050		N.T.S.		RD DG 3 TM 16 F3-1A		NA
TITLE			DRAWING NO.		REV.	
SHAFT SEAL			RD DG 3 TM 16 F3-7		00	
			SHT. No	1	NO. OF SHT.	1