	TECHNOLOGICAL PROCESS FOR VENDOR	Production Order	Date
Plant: P001	Equipment No:	101965323	26.03.2022

Type	WBS Element	Customer	Part No
	P-1043800900-33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks	MDCC
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW	YES

BOM Details

Pos.No	IC	Material Code	P.No	Remarks

Matl.Spec	SPK	Qty	MU	Size 1	Size 2	Size 3	Formula Key	MPcs	St.
0001	L	TC32028-260FI		33210003					
		1.000	EA	0.000	0.000	0.000		0.000	IS08

Material Description : IMPELLER FORGING OD= 730 / ID= 235, L= 190	Reservation : 0014161475	Item : 0001	Picklist:

0002	L	TC32028-259FI		33210005					
		1.000	EA	0.000	0.000	0.000		0.000	IS08

Material Description : IMPELLER FORGING OD= 730 / ID= 435, L= 140	Reservation : 0014161475	Item : 0002	Picklist:

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				
Sub Operation Text								
0010	AJ9863	P001	QM01					

CAUTION:- INTERCHANGEBLE JOB NO DEVIATION PERMITTED.
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Verify the material attestation marks on the
forgings.

HUB: Material code - TC32028-260FI
SHROUD: Material code - TC32028-259FI.

Verify the certificates duly attested by quality inspector and technical
delivery conditions and furnish them to third party Inspector as per the
customer approved quality plan.

Note:
1. Ensure the material of Disc and Counter Disc are of the same Melt No.
2. Ensure the colour coding on the forgings of Disc and Counter disc as
per the required specification of the impeller raw material.

0020	AB9421	P001	ZP99				

Collect

HUB: Material code - TC32028-262FI - OD 730 X ID 235 X L 190
SHROUD: Material code - TC32028-261FI - OD 730 X ID 435 X L 140

0030	AB9864	P001	ZP04				

Inspect and ensure the forgings for dimensional suitability and

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	1	12

	TECHNOLOGICAL PROCESS FOR VENDOR	Production Order	Date
Plant: P001	Equipment No:	101965324	26.03.2022

Type	WBS Element	Customer	Part No
	P-1043800900-33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks	MDCC
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW	YES

BOM Details

Pos.No	IC	Material Code	P.No	Remarks

Matl.Spec	SPK	Qty	MU	Size 1	Size 2	Size 3	Formula Key	MPcs	St.
0001	L	TC32028-262FI		33210008					
		1.000	EA	0.000	0.000	0.000		0.000	IS08
Material Description : IMPELLER FORGING OD= 730 / ID= 235, L= 160				Reservation : 0014161476		Item : 0001		Picklist:	
0002	L	TC32028-261FI		33210010					
		1.000	EA	0.000	0.000	0.000		0.000	IS08
Material Description : IMPELLER FORGING OD= 730 / ID= 410, L= 130				Reservation : 0014161476		Item : 0002		Picklist:	
0003	L	TC92950-03		33210012					
		17.000	EA	0.000	0.000	0.000		0.000	IS01
Material Description : BALANCING WEIGHT (HUB)				Reservation : 0014161476		Item : 0003		Picklist:	
0004	L	TC92950-04		33210014					
AA10721		31.000	EA	0.000	0.000	0.000		0.000	IS01
Material Description : BALANCING WEIGHT (HUB)				Reservation : 0014161476		Item : 0004		Picklist:	
0005	L	TC9752001017		33210016					
TC52001-01		48.000	EA	0.000	0.000	0.000		0.000	ST01
Material Description : GRUB SCREW M4X10				Reservation : 0014161476		Item : 0005		Picklist:	

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				
Sub Operation Text								
0010	AJ9863	P001	QM01					

CAUTION:- INTERCHANGEBLE JOB NO DEVIATION PERMITTED.

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Verify the material attestation marks on the forgings.

HUB: Material code - TC32028-262FI

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	1	13

	TECHNOLOGICAL PROCESS FOR VENDOR	Production Order	Date
Plant: P001	Equipment No:	101965328	26.03.2022

Type	WBS Element	Customer	Part No
	P-1643800901-33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks	MDCC
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW	YES

BOM Details

Pos.No	IC	Material Code	P.No	Remarks

Matl.Spec	SPK	Qty	MU	Size 1	Size 2	Size 3	Formula Key	MPcs	St.
0001	L	TC32028-260FI		33210003					
		1.000	EA	0.000	0.000	0.000		0.000	IS08

Material Description	Reservation	Item	Picklist
IMPELLER FORGING OD= 730 / ID= 235, L= 190	0014161605	0001	

Matl.Spec	SPK	Qty	MU	Size 1	Size 2	Size 3	Formula Key	MPcs	St.
0002	L	TC32028-259FI		33210005					
		1.000	EA	0.000	0.000	0.000		0.000	IS08

Material Description	Reservation	Item	Picklist
IMPELLER FORGING OD= 730 / ID= 435, L= 140	0014161605	0002	

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				
Sub Operation Text								
0010	AJ9863	P001	QM01					

CAUTION:- INTERCHANGEBLE JOB NO DEVIATION PERMITTED.
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Verify the material attestation marks on the forgings.

HUB: Material code - TC32028-260FI
SHROUD: Material code - TC32028-259FI.

Verify the certificates duly attested by quality inspector and technical delivery conditions and furnish them to third party Inspector as per the customer approved quality plan.

Note:
1. Ensure the material of Disc and Counter Disc are of the same Melt No.
2. Ensure the colour coding on the forgings of Disc and Counter disc as per the required specification of the impeller raw material.

0020	AB9421	P001	ZP99				

Collect

HUB: Material code - TC32028-262FI - OD 730 X ID 235 X L 190
SHROUD: Material code - TC32028-261FI - OD 730 X ID 435 X L 140

0030	AB9864	P001	ZP04				

Inspect and ensure the forgings for dimensional suitability and

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	1	12

TECHNOLOGICAL PROCESS FOR VENDOR

Production Order	Date
101965329	26.03.2022

Plant: P001 | Equipment No:

Type	WBS Element	Customer	Part No
	P-1643800901-33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks	MDCC
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW	YES

BOM Details

Pos.No	IC	Material Code	P.No	Remarks
Matl.Spec	SPK	Qty	MU	Size 1	Size 2	Size 3	Formula Key	MPcs	St.
0001	L	TC32028-262FI	33210008						
		1.000	EA	0.000	0.000	0.000		0.000	IS08
Material Description : IMPELLER FORGING OD= 730 / ID= 235, L= 160				Reservation : 0014161606		Item : 0001		Picklist:	
0002	L	TC32028-261FI	33210010						
		1.000	EA	0.000	0.000	0.000		0.000	IS08
Material Description : IMPELLER FORGING OD= 730 / ID= 410, L= 130				Reservation : 0014161606		Item : 0002		Picklist:	
0003	L	TC92950-03	33210012						
		17.000	EA	0.000	0.000	0.000		0.000	IS01
Material Description : BALANCING WEIGHT (HUB)				Reservation : 0014161606		Item : 0003		Picklist:	
0004	L	TC92950-04	33210014						
AA10721		31.000	EA	0.000	0.000	0.000		0.000	IS01
Material Description : BALANCING WEIGHT (HUB)				Reservation : 0014161606		Item : 0004		Picklist:	
0005	L	TC9752001017	33210016						
TC52001-01		48.000	EA	0.000	0.000	0.000		0.000	ST01
Material Description : GRUB SCREW M4X10				Reservation : 0014161606		Item : 0005		Picklist:	

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				
Sub Operation Text								
0010	AJ9863	P001	QM01					

CAUTION:- INTERCHANGEBLE JOB NO DEVIATION PERMITTED.

Verify the material attestation marks on the forgings.

HUB: Material code - TC32028-262FI

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	1	13

	TECHNOLOGICAL PROCESS FOR VENDOR	Production Order	Date
Plant: P001	Equipment No:	101967839	29.04.2022

Type	WBS Element	Customer	Part No
	P-1043800900-33210	Indian Oil Corporation Limited	33210019

Drawing No.-Var	E.Rev.	T.Rev	Material No.	Name Of The Part
33321000036-00		00	33321000036-00	MOCKUP 3D IMPELLER N5 700 CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks	MDCC
0013	1.000	1.000	EA	IS01	340.000	MOCKUP 3D IMPELLER N5 700 CCW	YES

BOM Details

Pos.No	IC	Material Code	P.No	Remarks
0010	R	AA1011819392	33210019	

Matl.Spec	SPK	Qty	MU	Size 1	Size 2	Size 3	Formula Key	MPcs	St.
AA10119		553.497	KG	710.000	235.000	0.000	F4	1.000	ST12

Material Description : PLATE 200 IS2062 GRE250(FE410W) QLTY-B	Reservation : 0014191614	Item : 0001	Picklist:

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				
Sub Operation Text								
0010	DE9412	P006	ZP04					
Mark for gas cutting the plate 200 mm thick to size OD 710 mm & ID 235 mm.								
0020	DE9421	P006	ZP01					
Drill a pilot hole of dia. 10 mm for gas cutting the inside diameter.								
0030	DE2818	P006	ZP01					
Pre heat and gas cut the plate as per marking.								
0040	DE9421	P006	ZP01					
Clean and grind the gas cut edges.								
0050	DE9863	P006	QM01					
Inspect at the above operation. Send to W.C 01-3113.								
0060	AC4292	P001	ZP99					
Machining of disc: ---------- Finish machine the disc completely to dimensions including the bore dia. 259 H7 with 3 X 3 mm step at dia. 710 + /- 0.1 mm. Also finish R145; R89, R103 including R10 at dia. 311.5 as indicated in the drawing. Tools Required:								
0070	AC9863	P001	QM01					
Inspect the above operation.								
0080	AC9412	P001	ZP04					
Mark for the holes as per drg.								
0090	AC4821	P001	ZP99					

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
	09.05.2022			GS		1	2

	TECHNOLOGICAL PROCESS FOR VENDOR	Production Order	Date
Plant: P001	Equipment No:	101968300	29.04.2022

Type	WBS Element	Customer	Part No
	P-1043800900-33210	Indian Oil Corporation Limited	33210020

Drawing No.-Var	E.Rev.	T.Rev	Material No.	Name Of The Part
33321000037-00		00	33321000037-00	MOCKUP 3D IMPELLER N9 700 CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks	MDCC
0023	1.000	1.000	EA	IS01	280.000	MOCKUP 3D IMPELLER N9 700 CCW	YES

BOM Details

Pos.No	IC	Material Code	P.No	Remarks
0010	R	AA1011819392	33210021	

Matl.Spec	SPK	Qty	MU	Size 1	Size 2	Size 3	Formula Key	MPcs	St.
AA10119		553.497	KG	710.000	235.000	0.000	F4	1.000	ST12

Material Description : PLATE 200 IS2062 GRE250(FE410W) QLTY-B	Reservation : 0014191615	Item : 0001	Picklist:

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				
Sub Operation Text								
0010	DE9412	P006	ZP04					
Mark for gas cutting the plate 200 mm thick to size OD 710 mm & ID 235 mm.								
0020	DE9421	P006	ZP01					
Drill a pilot hole of dia. 10 mm for gas cutting the inside diameter.								
0030	DE2818	P006	ZP01					
Pre heat and gas cut the plate as per marking.								
0040	DE9421	P006	ZP01					
Clean and grind the gas cut edges.								
0050	DE9863	P006	QM01					
Inspect at the above operation. Send to W.C 01-3113.								
0060	AC4292	P001	ZP99					
Machining of disc: ---------- Finish machine the disc completely to dimensions including the bore dia. 259 H7 with 3 X 3 mm step at dia. 710 + /- 0.1 mm. Also finish R229; R110, R62 including R10 at dia. 302.74 as indicated in the drawing. Tools Required:								
0070	AC9863	P001	QM01					
Inspect the above operation.								
0080	AC9412	P001	ZP04					
Mark for the holes as per drg.								
0090	AC4821	P001	ZP99					

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
	09.05.2022			GS		1	2

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965323	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

attestations.

0040	KB4292	P055	ZP99				

GET IT ENSURE THE CORRECTNESS OF THE PROGRAMME BEFORE STARTING.

Machining of Counter disc: Refer Fig-B.

Finish machine the Counter disc completely to dimensions including the bore dia. for fixture as per drawing.

Machining of disc: Refer Fig - A.

(FOR DISC MACHINING, SAME PROGRAME SHALL BE USED WHCIH WAS USED ON MOCK UP PIECE OF DRAWING No. 33321000036.
Finish machine the disc completely to dimensions including the bore dia. for fixture as per drawing.

NOTE:
Shrinkage allowance of 1.5 mm already considered for welding.

Tooling Required:

FOR DISC:
Checking template for the profile R145/R89/R103/ at dia. 311.5mm:
45-08-14548

FOR COUNTER DISC:
Checking template for the profile R142/R86/R100/ at dia. 467.06mm:
45-08-14547

0050	AB9863	P001	QM01				

Inspect the above operation.
Also ensure the profile of disc,is similar to counter disc profile.

0060	AC9412	P001	ZP04				

Mark for lifting holes on counter disc left face as per Fig-B of drawing.

Mark for peripheral holes on outside dia. of DISC as per Fig-A.

0070	AC4645	P001	ZP99				

Drill & tap on the Counter disc 2 holes for M16 X 24/28 as per drawing.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	2	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965324	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

SHROUD: Material code - TC32028-261FI.

Verify the certificates duly attested by quality inspector and technical delivery conditions and furnish them to third party Inspector as per the customer approved quality plan.

Note:
1. Ensure the material of Disc and Counter Disc are of the same Melt No.
2. Ensure the colour coding on the forgings of Disc and Counter disc as per the required specification of the impeller raw material.

0020	AB9421	P001	ZP99				

Collect

HUB: Material code - TC32028-262FI - OD 730 X ID 235 X L 160
SHROUD: Material code - TC32028-261FI - OD 730 X ID 410 X L 130

0030	AB9864	P001	ZP04				

Inspect and ensure the forgings for dimensional suitability and attestations.

0040	KB4292	P055	ZP99				

GET IT ENSURE THE CORRECTNESS OF THE PROGRAMME BEFORE STARTING.

Machining of Counter disc: Refer Fig-B.

Finish machine the Counter disc completely to dimensions including the bore dia. for fixture as per drawing.

Machining of disc: Refer Fig - A.

(FOR DISC MACHINING, SAME PROGRAME SHALL BE USED WHCIH WAS USED ON MOCK UP PIECE OF DRAWING No. 33321000037.
Finish machine the disc completely to dimensions including the bore dia. for fixture as per drawing.

NOTE:
Shrinkage allowance of 1.5 mm already considered for welding.

Tooling Required:

FOR DISC:

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	2	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965328	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

attestations.

0040	KB4292	P055	ZP99				

GET IT ENSURE THE CORRECTNESS OF THE PROGRAMME BEFORE STARTING.

Machining of Counter disc: Refer Fig-B.

Finish machine the Counter disc completely to dimensions including the bore dia. for fixture as per drawing.

Machining of disc: Refer Fig - A.

(FOR DISC MACHINING, SAME PROGRAME SHALL BE USED WHCIH WAS USED ON MOCK UP PIECE OF DRAWING No. 33321000036.
Finish machine the disc completely to dimensions including the bore dia. for fixture as per drawing.

NOTE:
Shrinkage allowance of 1.5 mm already considered for welding.

Tooling Required:

FOR DISC:
Checking template for the profile R145/R89/R103/ at dia. 311.5mm:
45-08-14548

FOR COUNTER DISC:
Checking template for the profile R142/R86/R100/ at dia. 467.06mm:
45-08-14547

0050	AB9863	P001	QM01				

Inspect the above operation.
Also ensure the profile of disc,is similar to counter disc profile.

0060	AC9412	P001	ZP04				

Mark for lifting holes on counter disc left face as per Fig-B of drawing.

Mark for peripheral holes on outside dia. of DISC as per Fig-A.

0070	AC4645	P001	ZP99				

Drill & tap on the Counter disc 2 holes for M16 X 24/28 as per drawing.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	2	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965329	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

SHROUD: Material code - TC32028-261FI.

Verify the certificates duly attested by quality inspector and technical delivery conditions and furnish them to third party Inspector as per the customer approved quality plan.

Note:
1. Ensure the material of Disc and Counter Disc are of the same Melt No.
2. Ensure the colour coding on the forgings of Disc and Counter disc as per the required specification of the impeller raw material.

0020	AB9421	P001	ZP99				

Collect

HUB: Material code - TC32028-262FI - OD 730 X ID 235 X L 160
SHROUD: Material code - TC32028-261FI - OD 730 X ID 410 X L 130

0030	AB9864	P001	ZP04				

Inspect and ensure the forgings for dimensional suitability and attestations.

0040	KB4292	P055	ZP99				

GET IT ENSURE THE CORRECTNESS OF THE PROGRAMME BEFORE STARTING.

Machining of Counter disc: Refer Fig-B.

Finish machine the Counter disc completely to dimensions including the bore dia. for fixture as per drawing.

Machining of disc: Refer Fig - A.

(FOR DISC MACHINING, SAME PROGRAME SHALL BE USED WHCIH WAS USED ON MOCK UP PIECE OF DRAWING No. 33321000037.
Finish machine the disc completely to dimensions including the bore dia. for fixture as per drawing.

NOTE:
Shrinkage allowance of 1.5 mm already considered for welding.

Tooling Required:

FOR DISC:

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	2	13

TECHNOLOGICAL PROCESS

Production Order	Date
101967839	29.04.2022

Plant: P001 | Equipment No:

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210019

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
33321000036-00		00	33321000036-00	MOCKUP 3D IMPELLER N5 700 CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0013	1.000	1.000	EA	IS01	340.000	MOCKUP 3D IMPELLER N5 700 CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Drill and tap 2 x M16 to depth 24/28 equi-spaced as per drawing for lifting purpose.

0100	AC9863	P001	QM01				

Inspect at the above operation.

0110	KB5392	P055	ZP99				

a) Refer the notes given on the drawing for informative details for machining.

b) Mill the groove 12 H7 x 5 + /- 0.1 mm depth to length 85 + /- 1 mm from outside dia. on right face for centering and locating the job as per drawing.

c) Mill 3 vanes to prove Blade machining program on this MOCK UP piece for drawing no. 33321000036-00.

For detail of vane profile refer impeller drawing 13321001074-01 or the UG model provided for the above drawing for establishing the program proving.

The blade geometry is as per TC93114

Tools Required:

Centering fixture dia. 185 H7: 45 - 72 - 11028
Tool for bevel as per TC72022: 45 - 31 - 7002
Ball nose cutter with radius R 6 for finishing: HY6287400480

0120	KB9863	P055	QFNL				

Final inspection of the vane profile on 3D Coordinate Measuring Machine.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
	09.05.2022			GS		2	2

TECHNOLOGICAL PROCESS

Production Order	Date
101968300	29.04.2022

Plant: P001 | Equipment No:

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210020

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
33321000037-00		00	33321000037-00	MOCKUP 3D IMPELLER N9 700 CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0023	1.000	1.000	EA	IS01	280.000	MOCKUP 3D IMPELLER N9 700 CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Drill and tap 2 x M16 to depth 24/28 equi-spaced as per drawing for lifting purpose.

0100	AC9863	P001	QM01				

Inspect at the above operation.

0110	KB5392	P055	ZP99				

a) Refer the notes given on the drawing for informative details for machining.

b) Mill the groove 12 H7 x 5 + /- 0.1 mm depth to length 85 + /- 1 mm from outside dia. on right face for centering and locating the job as per drawing.

c) Mill 3 vanes to prove Blade machining program on this MOCK UP piece for drawing no. 33321000037-00.

For detail of vane profile refer impeller drawing 13321001075-01 or the UG model provided for the above drawing for establishing the program proving.

The blade geometry is as per TC93114

Tools Required:

Centering fixture dia. 185 H7: 45 - 72 - 11028
Tool for bevel as per TC72022: 45 - 31 - 7002
Ball nose cutter with radius R 6 for finishing: HY6287400480

0120	KB9863	P055	QFNL				

Final inspection of the vane profile on 3D Coordinate Measuring Machine.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
	09.05.2022			GS		2	2

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant: P001	Equipment No:	101965323	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Refer fig - B.

0080	AC4821	P001	ZP99				

Drill and tap 2 X M 16 to depth 24/28 on outside diameter as per marking for lifting purpose.

0090	AC9863	P001	QM01				

Inspection of above operations on both disc and counter disc.

0100	KB5392	P055	ZP99				

Mill the groove 12 H7 X 5 + /- 0.1 mm depth, to length 85 + /- 1 from outside dia. on right face, for centering and locating the disc.

Mill the vanes on DISC:

For the blade profile, refer the UG model provided. Also, refer the standard TC93114.

NOTE: FOR VANES MACHINING, PROGRAME SHALL BE USED SAME AS PROVED ON MOCK UP PIECE drawing no.

Mill the 17 blades equidistant as per the drawing.

a) Mill the weld bevel on the vanes as per TC 72022.
b) Mill the vanes with R10, formation at bottom on either sides.

Note:
Maintain a positive allowance of 0.5 mm on vane thickness.

Tools Required:

Centering fixture dia. 259 H7: 45-72-11041/04 / dia. 50
Tool for bevel as per TC 72022: 4531-07002/00
End mill for roughing: 4531-07024/00
Ball nose cutter with radius R8 for finishing: 4531-07024/00

0120	KB9863	P055	QM01				

3 D CO-ORDINATES CHECKING MACHINE:
Inspect the vanes on the counter disc on 3D CMM

0130	AB9425	P001	ZP99				

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	3	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965324	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Checking template for the profile R229/R110/R62/ at dia. 283.59 mm:
45-08-14552

FOR COUNTER DISC:
Checking template for the profile R226/R107/R59/ at dia. 437.56mm:
45-08-14551

0050	AB9863	P001	QM01				

Inspect the above operation.
Also ensure the profile of disc,is similar to
counter disc profile.

0060	AC9412	P001	ZP04				

Mark for lifting holes on counter disc left face as per Fig-B of
drawing.

Mark for peripheral holes on outside dia. of DISC as per Fig-A.

0070	AC4645	P001	ZP99				

Drill & tap on the Counter disc 2 holes for M16 X 24/28 as per drawing.
Refer fig - B.

0080	AC4821	P001	ZP99				

Drill and tap 2 X M 16 to depth 24/28 on outside diameter as per marking
for lifting purpose.

0090	AC9863	P001	QM01				

Inspection of above operations on both disc and counter disc.

0100	KB5392	P055	ZP99				

Mill the groove 12 H7 X 5 + /- 0.1 mm depth, to length 85 + /- 1 from
outside dia. on right face, for centering and locating the disc.

Mill the vanes on DISC:

For the blade profile, refer the UG model provided. Also, refer the
standard TC93114.

NOTE: FOR VANES MACHINING, PROGRAME SHALL BE USED SAME AS PROVED ON MOCK
UP PIECE drawing no.

Mill the 17 blades equidistant as per the drawing.

a) Mill the weld bevel on the vanes as per TC 72022.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	3	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965328	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Refer fig - B.

0080	AC4821	P001	ZP99				

Drill and tap 2 X M 16 to depth 24/28 on outside diameter as per marking for lifting purpose.

0090	AC9863	P001	QM01				

Inspection of above operations on both disc and counter disc.

0100	KB5392	P055	ZP99				

Mill the groove 12 H7 X 5 + /- 0.1 mm depth, to length 85 + /- 1 from outside dia. on right face, for centering and locating the disc.

Mill the vanes on DISC:

For the blade profile, refer the UG model provided. Also, refer the standard TC93114.

NOTE: FOR VANES MACHINING, PROGRAME SHALL BE USED SAME AS PROVED ON MOCK UP PIECE drawing no.

Mill the 17 blades equidistant as per the drawing.

a) Mill the weld bevel on the vanes as per TC 72022.
b) Mill the vanes with R10, formation at bottom on either sides.

Note:
Maintain a positive allowance of 0.5 mm on vane thickness.

Tools Required:

Centering fixture dia. 259 H7: 45-72-11041/04 / dia. 50
Tool for bevel as per TC 72022: 4531-07002/00
End mill for roughing: 4531-07024/00
Ball nose cutter with radius R8 for finishing: 4531-07024/00

0120	KB9863	P055	QM01				

3 D CO-ORDINATES CHECKING MACHINE:
Inspect the vanes on the counter disc on 3D CMM

0130	AB9425	P001	ZP99				

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	3	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965329	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Checking template for the profile R229/R110/R62/ at dia. 283.59 mm:
45-08-14552

FOR COUNTER DISC:
Checking template for the profile R226/R107/R59/ at dia. 437.56mm:
45-08-14551

0050	AB9863	P001	QM01				

Inspect the above operation.
Also ensure the profile of disc,is similar to
counter disc profile.

0060	AC9412	P001	ZP04				

Mark for lifting holes on counter disc left face as per Fig-B of
drawing.

Mark for peripheral holes on outside dia. of DISC as per Fig-A.

0070	AC4645	P001	ZP99				

Drill & tap on the Counter disc 2 holes for M16 X 24/28 as per drawing.
Refer fig - B.

0080	AC4821	P001	ZP99				

Drill and tap 2 X M 16 to depth 24/28 on outside diameter as per marking
for lifting purpose.

0090	AC9863	P001	QM01				

Inspection of above operations on both disc and counter disc.

0100	KB5392	P055	ZP99				

Mill the groove 12 H7 X 5 + /- 0.1 mm depth, to length 85 + /- 1 from
outside dia. on right face, for centering and locating the disc.

Mill the vanes on DISC:

For the blade profile, refer the UG model provided. Also, refer the
standard TC93114.

NOTE: FOR VANES MACHINING, PROGRAME SHALL BE USED SAME AS PROVED ON MOCK
UP PIECE drawing no.

Mill the 17 blades equidistant as per the drawing.

a) Mill the weld bevel on the vanes as per TC 72022.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	3	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965323	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Clean the milled surfaces and deburr the sharp edges.

Check the contact surfaces and clean them.

Assemble the disc and counter-disc as per TC 72022 and get them tack welded using auxiliary pieces.

Tooling Required:

Centering fixture for assembly of disc & Counter disc at Dia. 259 H7: 4586-11128/07

0140	AB2852	P001	ZP01				

Tack weld at the above operation.
1. Assemble the impeller on the welding positioner.
2. Pre heat the impeller and get it ensured by Q.C. inspector to required temperature (Refer WE-137) at nearest to the weld joint.
3. Weld the vanes as per welding instruction sheet WPS NO. WE - 137.

NOTE:

Non uniform depositing of material resulting in higher material removal during balancing and hence ensure uniform depositing of material.

Cut the 3 mm tip and make chamfer for facilitating proper welding. Get the other side of the vanes chip backed by rotary files and after inspection weld the vanes completely as per welding instructions. Get the weld procedure approval, review of records and welders qualification records reviewed by third party Inspector as per the customer approved quality plan.

Tools Required:

Welding fixture: 45 - 86 - 07093

0150	AB9421	P001	ZP01				

1) Cut the 3 mm tip and make chamfer.
2) Chip back, by rotary files during the above operation.

0160	AB9863	P001	QM01				

Inspect the pre heating temperature at operation no. 013.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	4	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965324	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

b) Mill the vanes with R10, formation at bottom on either sides.

Note:
Maintain a positive allowance of 0.5 mm on vane thickness.

Tools Required:

Centering fixture dia. 259 H7: 45-72-11128/07 / dia. 50
Tool for bevel as per TC 72022: 4531-07002/00
End mill for roughing: 4531-07024/00
Ball nose cutter with radius R10 for finishing: 4531-07013/00

0120	KB9863	P055	QM01				

3 D CO-ORDINATES CHECKING MACHINE:
Inspect the vanes on the counter disc on 3D CMM

0130	AB9425	P001	ZP99				

Clean the milled surfaces and deburr the sharp edges.

Check the contact surfaces and clean them.

Assemble the disc and counter-disc as per TC 72022 and get them tack welded using auxiliary pieces.

Tooling Required:

Centering fixture for assembly of disc & Counter disc at Dia. 259 H7:
4586-11128/07

0140	AB2852	P001	ZP01				

Tack weld at the above operation.
1. Assemble the impeller on the welding positioner.
2. Pre heat the impeller and get it ensured by Q.C. inspector to required temperature (Refer WE-137) at nearest to the weld joint.
3. Weld the vanes as per welding instruction sheet WPS NO. WE - 137.

NOTE:

Non uniform depositing of material resulting in higher material removal during balancing and hence ensure uniform depositing of

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant: P001	Equipment No:	101965328	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Clean the milled surfaces and deburr the sharp edges.

Check the contact surfaces and clean them.

Assemble the disc and counter-disc as per TC 72022 and get them tack welded using auxiliary pieces.

Tooling Required:

Centering fixture for assembly of disc & Counter disc at Dia. 259 H7: 4586-11128/07

0140	AB2852	P001	ZP01				

Tack weld at the above operation.
1. Assemble the impeller on the welding positioner.
2. Pre heat the impeller and get it ensured by Q.C. inspector to required temperature (Refer WE-137) at nearest to the weld joint.
3. Weld the vanes as per welding instruction sheet WPS NO. WE - 137.

NOTE:

Non uniform depositing of material resulting in higher material removal during balancing and hence ensure uniform depositing of material.

Cut the 3 mm tip and make chamfer for facilitating proper welding. Get the other side of the vanes chip backed by rotary files and after inspection weld the vanes completely as per welding instructions. Get the weld procedure approval, review of records and welders qualification records reviewed by third party Inspector as per the customer approved quality plan.

Tools Required:

Welding fixture: 45 - 86 - 07093

0150	AB9421	P001	ZP01				

1) Cut the 3 mm tip and make chamfer.
2) Chip back, by rotary files during the above operation.

0160	AB9863	P001	QM01				

Inspect the pre heating temperature at operation no. 013.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	4	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965329	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

b) Mill the vanes with R10, formation at bottom on either sides.

Note:
Maintain a positive allowance of 0.5 mm on vane thickness.

Tools Required:

Centering fixture dia. 259 H7: 45-72-11128/07 / dia. 50
Tool for bevel as per TC 72022: 4531-07002/00
End mill for roughing: 4531-07024/00
Ball nose cutter with radius R10 for finishing: 4531-07013/00

0120	KB9863	P055	QM01				

3 D CO-ORDINATES CHECKING MACHINE:
Inspect the vanes on the counter disc on 3D CMM

0130	AB9425	P001	ZP99				

Clean the milled surfaces and deburr the sharp edges.

Check the contact surfaces and clean them.

Assemble the disc and counter-disc as per TC 72022 and get them tack welded using auxiliary pieces.

Tooling Required:

Centering fixture for assembly of disc & Counter disc at Dia. 259 H7:
4586-11128/07

0140	AB2852	P001	ZP01				

Tack weld at the above operation.
1. Assemble the impeller on the welding positioner.
2. Pre heat the impeller and get it ensured by Q.C. inspector to required temperature (Refer WE-137) at nearest to the weld joint.
3. Weld the vanes as per welding instruction sheet WPS NO. WE - 137.

NOTE:

Non uniform depositing of material resulting in higher material removal during balancing and hence ensure uniform depositing of

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965323	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				
Sub Operation Text								
Also inspect the quality of weld & Chip backing at the above operation < (> ,<)> by visual.								
0170	MB1716	P004	ZP01					
Solutionize the impeller as per WPS No. WE-137.								
0180	MB9863	P004	QM01					
Inspect the above operation.								
0190	AB9421	P001	ZP01					
Identify the position of the test rings on disc & counter disc. Punch the P.No., W.O.No.< (> ,<)> Heat No., Material No. on the identified portion .								
0200	AB9863	P001	QM01					
Verification of the above numbers punched and attestation of the same.								
0210	AC4142	P001	ZP01					
Machining for test ring: Refer Fig - C. (Cut off the test ring and hand over to Q.C. for preservation.) Turn the outside diameter by removing 2 mm material. Get the quality of weld inspected by visual. Then finish machine the impeller by matching the end faces taper after parting off the test rings as per drawing. Refer Fig-C. Tools Required: Grooving tools: Std.								
0220	AB9863	P001	QM01					
Inspect the quality of weld at the above operation by visual and ensure it' s proper penetration.								
0230	AB6151	P001	ZP01					
Clean the impeller internal surfaces thoroughly by sand blasting.								
0240	AB9421	P001	ZP01					
Clean and grind the extra weld beads and prepare R10 (Refer Welding detail) by rotary files. If necessary, round off the blade heads with R10.								

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	5	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965324	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

material.

Cut the 3 mm tip and make chamfer for facilitating proper welding.
Get the other side of the vanes chip backed by rotary files and after inspection weld the vanes completely as per welding instructions.
Get the weld procedure approval, review of records and welders qualification records reviewed by third party Inspector as per the customer approved quality plan.

Tools Required:

Welding fixture: 45 - 86 - 07093

0150	AB9421	P001	ZP01				

1) Cut the 3 mm tip and make chamfer.
2) Chip back, by rotary files during the above operation.

0160	AB9863	P001	QM01				

Inspect the pre heating temperature at operation no. 013.
Also inspect the quality of weld & Chip backing at the above operation < (> ,<)> by visual.

0170	MB1716	P004	ZP01				

Solutionize the impeller as per WPS No. WE-137.

0180	MB9863	P004	QM01				

Inspect the above operation.

0190	AB9421	P001	ZP01				

Identify the position of the test rings on disc & counter disc. Punch the P.No., W.O.No.< (> ,<)> Heat No., Material No. on the identified portion .

0200	AB9863	P001	QM01				

Verification of the above numbers punched and attestation of the same.

0210	AC4142	P001	ZP01				

Machining for test ring: Refer Fig - C.
(Cut off the test ring and hand over to Q.C. for preservation.)

Turn the outside diameter by removing 2 mm material.

Get the quality of weld inspected by visual.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	5	13

TECHNOLOGICAL PROCESS

Production Order	Date
101965328	26.03.2022

Plant: P001 | Equipment No:

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Also inspect the quality of weld & Chip backing at the above operation < (> ,<)> by visual.

0170	MB1716	P004	ZP01				

Solutionize the impeller as per WPS No. WE-137.

0180	MB9863	P004	QM01				

Inspect the above operation.

0190	AB9421	P001	ZP01				

Identify the position of the test rings on disc & counter disc. Punch the P.No., W.O.No.< (> ,<)> Heat No., Material No. on the identified portion .

0200	AB9863	P001	QM01				

Verification of the above numbers punched and attestation of the same.

0210	AC4142	P001	ZP01				

Machining for test ring: Refer Fig - C.
(Cut off the test ring and hand over to Q.C. for preservation.)

Turn the outside diameter by removing 2 mm material.

Get the quality of weld inspected by visual.

Then finish machine the impeller by matching the end faces taper after parting off the test rings as per drawing.

Refer Fig-C.

Tools Required:
Grooving tools: Std.

0220	AB9863	P001	QM01				

Inspect the quality of weld at the above operation by visual and ensure it's proper penetration.

0230	AB6151	P001	ZP01				

Clean the impeller internal surfaces thoroughly by sand blasting.

0240	AB9421	P001	ZP01				

Clean and grind the extra weld beads and prepare R10 (Refer Welding detail) by rotary files. If necessary, round off the blade heads with R10.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	5	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965329	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

material.

Cut the 3 mm tip and make chamfer for facilitating proper welding.
Get the other side of the vanes chip backed by rotary files and after inspection weld the vanes completely as per welding instructions.
Get the weld procedure approval, review of records and welders qualification records reviewed by third party Inspector as per the customer approved quality plan.

Tools Required:

Welding fixture: 45 - 86 - 07093

0150	AB9421	P001	ZP01				

1) Cut the 3 mm tip and make chamfer.
2) Chip back, by rotary files during the above operation.

0160	AB9863	P001	QM01				

Inspect the pre heating temperature at operation no. 013.
Also inspect the quality of weld & Chip backing at the above operation < (> ,<)> by visual.

0170	MB1716	P004	ZP01				

Solutionize the impeller as per WPS No. WE-137.

0180	MB9863	P004	QM01				

Inspect the above operation.

0190	AB9421	P001	ZP01				

Identify the position of the test rings on disc & counter disc. Punch the P.No., W.O.No.< (> ,<)> Heat No., Material No. on the identified portion .

0200	AB9863	P001	QM01				

Verification of the above numbers punched and attestation of the same.

0210	AC4142	P001	ZP01				

Machining for test ring: Refer Fig - C.
(Cut off the test ring and hand over to Q.C. for preservation.)

Turn the outside diameter by removing 2 mm material.

Get the quality of weld inspected by visual.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	5	13

TECHNOLOGICAL PROCESS

Production Order	Date
101965323	26.03.2022

Plant: P001 | Equipment No:

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				
Sub Operation Text								
0250	AB9863	P001	QM01					
Conduct dye-penetrant test on impeller especially on welding to detect any cracks as per Product Std. TC 7 2020.								
0260	AB9421	P001	ZP01					
Clean the impeller, collect the corresponding test rings from Q.C. and get them tack-welded.								
0270	AB9863	P001	QM01					
Verify the attestation of the test rings and proper placement of same on the impeller.								
0280	MB1716	P004	ZP01					
Heat treat the impeller with it's rings in atmosphere controlled furnace to obtain the strength values in presence of quality inspector. Refer - C W 1002. YIELD STRENGTH: 68 - 80 Kg/mm sq. IMPACT STRENGTH: 40 J (2 mm notch Room temperature) HARDNESS: Max. 300 BHN. AS per the customer approved data sheet< (> ,<)> Min. Yield strength: 462000 kg/sq. cm. Max. Hardness: 300 BHN.								
0290	MB9863	P004	QM01					
Remove the test rings from the impeller, conduct hardness test. If hardness test values are satisfactory, send the test rings to Laboratory.								
0300	DM9863	P006	QM01					
Machine the test bars from the rings of disc and counter disc, and conduct yield point test and impact test, on test bars of rings from disc & counter disc. YIELD STRENGTH: 68 - 80 Kg/mm sq. IMPACT STRENGTH: 40 J (2 mm notch Room temperature) HARDNESS: Max. 300 BHN. AS per the customer approved data sheet< (> ,<)> Min. Yield strength: 462000 kg/sq. cm.								

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	6	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965324	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Then finish machine the impeller by matching the end faces taper after parting off the test rings as per drawing.

Refer Fig-C.

Tools Required:
Grooving tools: Std.

0220	AB9863	P001	QM01				

Inspect the quality of weld at the above operation by visual and ensure it's proper penetration.

0230	AB6151	P001	ZP01				

Clean the impeller internal surfaces thoroughly by sand blasting.

0240	AB9421	P001	ZP01				

Clean and grind the extra weld beads and prepare R10 (Refer Welding detail) by rotary files. If necessary, round off the blade heads with R10.

0250	AB9863	P001	QM01				

Conduct dye-penetrant test on impeller especially on welding to detect any cracks as per Product Std. TC 7 2020.

0260	AB9421	P001	ZP01				

Clean the impeller, collect the corresponding test rings from Q.C. and get them tack-welded.

0270	AB9863	P001	QM01				

Verify the attestation of the test rings and proper placement of same on the impeller.

0280	MB1716	P004	ZP01				

Heat treat the impeller with it's rings in atmosphere controlled furnace to obtain the strength values in presence of quality inspector. Refer - C W 1002.

YIELD STRENGTH: 68 - 80 Kg/mm sq.
IMPACT STRENGTH: 40 J (2 mm notch Room temperature)
HARDNESS: Max. 300 BHN.

AS per the customer approved data sheet< (> ,<)>

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	6	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965328	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				
Sub Operation Text								
0250	AB9863	P001	QM01					
Conduct dye-penetrant test on impeller especially on welding to detect any cracks as per Product Std. TC 7 2020.								
0260	AB9421	P001	ZP01					
Clean the impeller, collect the corresponding test rings from Q.C. and get them tack-welded.								
0270	AB9863	P001	QM01					
Verify the attestation of the test rings and proper placement of same on the impeller.								
0280	MB1716	P004	ZP01					
Heat treat the impeller with it's rings in atmosphere controlled furnace to obtain the strength values in presence of quality inspector. Refer - C W 1002. YIELD STRENGTH: 68 - 80 Kg/mm sq. IMPACT STRENGTH: 40 J (2 mm notch Room temperature) HARDNESS: Max. 300 BHN. AS per the customer approved data sheet< (> ,<)> Min. Yield strength: 462000 kg/sq. cm. Max. Hardness: 300 BHN.								
0290	MB9863	P004	QM01					
Remove the test rings from the impeller, conduct hardness test. If hardness test values are satisfactory, send the test rings to Laboratory.								
0300	DM9863	P006	QM01					
Machine the test bars from the rings of disc and counter disc, and conduct yield point test and impact test, on test bars of rings from disc & counter disc. YIELD STRENGTH: 68 - 80 Kg/mm sq. IMPACT STRENGTH: 40 J (2 mm notch Room temperature) HARDNESS: Max. 300 BHN. AS per the customer approved data sheet< (> ,<)> Min. Yield strength: 462000 kg/sq. cm.								

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	6	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965329	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Then finish machine the impeller by matching the end faces taper after parting off the test rings as per drawing.

Refer Fig-C.

Tools Required:
Grooving tools: Std.

0220	AB9863	P001	QM01				

Inspect the quality of weld at the above operation by visual and ensure it's proper penetration.

0230	AB6151	P001	ZP01				

Clean the impeller internal surfaces thoroughly by sand blasting.

0240	AB9421	P001	ZP01				

Clean and grind the extra weld beads and prepare R10 (Refer Welding detail) by rotary files. If necessary, round off the blade heads with R10.

0250	AB9863	P001	QM01				

Conduct dye-penetrant test on impeller especially on welding to detect any cracks as per Product Std. TC 7 2020.

0260	AB9421	P001	ZP01				

Clean the impeller, collect the corresponding test rings from Q.C. and get them tack-welded.

0270	AB9863	P001	QM01				

Verify the attestation of the test rings and proper placement of same on the impeller.

0280	MB1716	P004	ZP01				

Heat treat the impeller with it's rings in atmosphere controlled furnace to obtain the strength values in presence of quality inspector. Refer - C W 1002.

YIELD STRENGTH: 68 - 80 Kg/mm sq.
IMPACT STRENGTH: 40 J (2 mm notch Room temperature)
HARDNESS: Max. 300 BHN.

AS per the customer approved data sheet< (> ,<)>

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	6	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965323	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Max. Hardness: 300 BHN.

0310	AB6151	P001	ZP01				

Carry out sand blasting on internal surfaces of impeller to remove scales etc.

0320	AB9863	P001	QM01				

Conduct D.P. test on welded areas to detect any cracks, as per Product Std. TC 7 2020.

0330	AB9421	P001	ZP01				

Clean the impeller completely.

0340	AC4142	P001	ZP01				

Transfer the material attestation marks in the presence of inspector during machining.

JOB SETTING:

1. Place the impeller resting on disc face, clamp & align.
2. Place the dial on tool carriage at approachable place to adjust the planarity points (on diameter at inside of counter disc).
3. Take indications at 4 points 90 deg apart.
4. Adjust all the 4 points to the mean of the indication by placing shims wherever required.
5. Tighten the impeller fully.

OPERATION:

Take a skim cut (for reference) on outside diameter, Counter disc face < (> &<)> eye outside diameter.

0350	AC9863	P001	QM01				

Inspect at the above operation< (> ,<)> for planarity setting.
Carryout the planarity check for planarity control and make protocol.

0360	AB9421	P001	ZP01				

Maintain planarity as desired by the inspector< (> ,<)> by grinding the material from the tip of the disc.

0370	AC4292	P001	ZP01				

GET IT ENSURED THE CORRECTNESS OF THE PROGRAMME BEFORE STARTING.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	7	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965324	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Min. Yield strength: 4620 kg/sq. cm.
Max. Hardness: 300 BHN.

0290	MB9863	P004	QM01				

Remove the test rings from the impeller, conduct hardness test. If hardness test values are satisfactory, send the test rings to Laboratory.

0300	DM9863	P006	QM01				

Machine the test bars from the rings of disc and counter disc, and conduct yield point test and impact test, on test bars of rings from disc & counter disc.
YIELD STRENGTH: 68 - 80 Kg/mm sq.
IMPACT STRENGTH: 40 J (2 mm notch Room temperature)
HARDNESS: Max. 300 BHN.

AS per the customer approved data sheet< (> ,<)>

Min. Yield strength: 4620 kg/sq. cm.
Max. Hardness: 300 BHN.

0310	AB6151	P001	ZP01				

Carry out sand blasting on internal surfaces of impeller to remove scales etc.

0320	AB9863	P001	QM01				

Conduct D.P. test on welded areas to detect any cracks, as per Product Std. TC 7 2020.

0330	AB9421	P001	ZP01				

Clean the impeller completely.

0340	AC4142	P001	ZP01				

Transfer the material attestation marks in the presence of inspector during machining.

JOB SETTING:

1. Place the impeller resting on disc face, clamp & align.
2. Place the dial on tool carriage at approachable place to adjust the

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965328	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Max. Hardness: 300 BHN.

0310	AB6151	P001	ZP01				

Carry out sand blasting on internal surfaces of impeller to remove scales etc.

0320	AB9863	P001	QM01				

Conduct D.P. test on welded areas to detect any cracks, as per Product Std. TC 7 2020.

0330	AB9421	P001	ZP01				

Clean the impeller completely.

0340	AC4142	P001	ZP01				

Transfer the material attestation marks in the presence of inspector during machining.

JOB SETTING:

1. Place the impeller resting on disc face, clamp & align.
2. Place the dial on tool carriage at approachable place to adjust the planarity points (on diameter at inside of counter disc).
3. Take indications at 4 points 90 deg apart.
4. Adjust all the 4 points to the mean of the indication by placing shims wherever required.
5. Tighten the impeller fully.

OPERATION:

Take a skim cut (for reference) on outside diameter, Counter disc face < (> &<)> eye outside diameter.

0350	AC9863	P001	QM01				

Inspect at the above operation< (> ,<)> for planarity setting.
Carryout the planarity check for planarity control and make protocol.

0360	AB9421	P001	ZP01				

Maintain planarity as desired by the inspector< (> ,<)> by grinding the material from the tip of the disc.

0370	AC4292	P001	ZP01				

GET IT ENSURED THE CORRECTNESS OF THE PROGRAMME BEFORE STARTING.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	7	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965329	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Min. Yield strength: 4620 kg/sq. cm.
Max. Hardness: 300 BHN.

0290	MB9863	P004	QM01				

Remove the test rings from the impeller, conduct hardness test. If hardness test values are satisfactory, send the test rings to Laboratory.

0300	DM9863	P006	QM01				

Machine the test bars from the rings of disc and counter disc, and conduct yield point test and impact test, on test bars of rings from disc & counter disc.
YIELD STRENGTH: 68 - 80 Kg/mm sq.
IMPACT STRENGTH: 40 J (2 mm notch Room temperature)
HARDNESS: Max. 300 BHN.

AS per the customer approved data sheet< (> ,<)>

Min. Yield strength: 4620 kg/sq. cm.
Max. Hardness: 300 BHN.

0310	AB6151	P001	ZP01				

Carry out sand blasting on internal surfaces of impeller to remove scales etc.

0320	AB9863	P001	QM01				

Conduct D.P. test on welded areas to detect any cracks, as per Product Std. TC 7 2020.

0330	AB9421	P001	ZP01				

Clean the impeller completely.

0340	AC4142	P001	ZP01				

Transfer the material attestation marks in the presence of inspector during machining.

JOB SETTING:

1. Place the impeller resting on disc face, clamp & align.
2. Place the dial on tool carriage at approachable place to adjust the

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965323	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Finish machine the impeller: Refer Sec P-P.

NOTE:
PROVIDE AN ALLOWANCE OF 2 MM ONLY ON THE BORE DIAMETER, WHICH WILL BE MACHINED AFTER OVER SPEED TEST.

JOB SETTING:

Set the impeller butting on counter disc face and align with respect to outside diameter within 0.01 mm.

OPERATION: Finish turn, all EXCEPT SEAL & BORE DIAMETERS.

Finish turn all the dimensions except seal diameter & bore.

Maintain 1 mm allowance on seal diameters and 2 mm allowance in the bore.

JOB SETTING: Reverse, clamp on hub seal dia. with soft jaws align, with respect of finished diameters, with in 0.01 mm.

OPERATION:
Finish turn all the dimensions except seal diameter & bore

Maintain 1 mm allowance on seal diameters and 2 mm allowance in the bore, rest completely as per drawing.

Tooling Required:

Checking template for disc 4 deg/R60: 45-08-14549
Checking template for counter disc 8 deg/R106/R170: 45-08-14550

0380	AC9863	P001	QM01				
Inspect the above operation.							
0390	AB6151	P001	ZP01				
Clean the impeller inside and outside with fine sand.							
0400	AB9863	P001	QM01				
Carryout the dye-penetrant test to detect any cracks< (> ,<)> as per product Std. TC 72020.							

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	8	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965324	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

planarity points (on diameter at inside of counter disc).
3. Take indications at 4 points 90 deg apart.
4. Adjust all the 4 points to the mean of the indication by placing shims wherever required.
5. Tighten the impeller fully.

OPERATION:

Take a skim cut (for reference) on outside diameter, Counter disc face < (> &<)> eye outside diameter.

0350	AC9863	P001	QM01				

Inspect at the above operation< (> ,<)> for planarity setting.
Carryout the planarity check for planarity control and make protocol.

0360	AB9421	P001	ZP01				

Maintain planarity as desired by the inspector< (> ,<)> by grinding the material from the tip of the disc.

0370	AC4292	P001	ZP01				

GET IT ENSURED THE CORRECTNESS OF THE PROGRAMME BEFORE STARTING.

Finish machine the impeller: Refer Sec P-P.

NOTE:
PROVIDE AN ALLOWANCE OF 2 MM ONLY ON THE BORE DIAMETER, WHICH WILL BE MACHINED AFTER OVER SPEED TEST.

JOB SETTING:

Set the impeller butting on counter disc face and align with respect to outside diameter within 0.01 mm.

OPERATION: Finish turn, all EXCEPT SEAL & BORE DIAMETERS.

Finish turn all the dimensions except seal diameter & bore.

Maintain 1 mm allowance on seal diameters and 2 mm allowance in the bore.

JOB SETTING: Reverse, clamp on hub seal dia. with soft jaws align, with respect of finished diameters, with in 0.01 mm.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	8	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965328	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Finish machine the impeller: Refer Sec P-P.

NOTE:
PROVIDE AN ALLOWANCE OF 2 MM ONLY ON THE BORE DIAMETER, WHICH WILL BE MACHINED AFTER OVER SPEED TEST.

JOB SETTING:

Set the impeller butting on counter disc face and align with respect to outside diameter within 0.01 mm.

OPERATION: Finish turn, all EXCEPT SEAL & BORE DIAMETERS.

Finish turn all the dimensions except seal diameter & bore.

Maintain 1 mm allowance on seal diameters and 2 mm allowance in the bore.

JOB SETTING: Reverse, clamp on hub seal dia. with soft jaws align, with respect of finished diameters, with in 0.01 mm.

OPERATION:
Finish turn all the dimensions except seal diameter & bore

Maintain 1 mm allowance on seal diameters and 2 mm allowance in the bore, rest completely as per drawing.

Tooling Required:

Checking template for disc 4 deg/R60: 45-08-14549
Checking template for counter disc 8 deg/R106/R170: 45-08-14550

0380	AC9863	P001	QM01				
Inspect the above operation.							
0390	AB6151	P001	ZP01				
Clean the impeller inside and outside with fine sand.							
0400	AB9863	P001	QM01				
Carryout the dye-penetrant test to detect any cracks< (> ,<)> as per product Std. TC 72020.							

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	8	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965329	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

planarity points (on diameter at inside of counter disc).
3. Take indications at 4 points 90 deg apart.
4. Adjust all the 4 points to the mean of the indication by placing shims wherever required.
5. Tighten the impeller fully.

OPERATION:

Take a skim cut (for reference) on outside diameter, Counter disc face < (> &<)> eye outside diameter.

0350	AC9863	P001	QM01				

Inspect at the above operation< (> ,<)> for planarity setting.
Carryout the planarity check for planarity control and make protocol.

0360	AB9421	P001	ZP01				

Maintain planarity as desired by the inspector< (> ,<)> by grinding the material from the tip of the disc.

0370	AC4292	P001	ZP01				

GET IT ENSURED THE CORRECTNESS OF THE PROGRAMME BEFORE STARTING.

Finish machine the impeller: Refer Sec P-P.

NOTE:
PROVIDE AN ALLOWANCE OF 2 MM ONLY ON THE BORE DIAMETER, WHICH WILL BE MACHINED AFTER OVER SPEED TEST.

JOB SETTING:

Set the impeller butting on counter disc face and align with respect to outside diameter within 0.01 mm.

OPERATION: Finish turn, all EXCEPT SEAL & BORE DIAMETERS.

Finish turn all the dimensions except seal diameter & bore.

Maintain 1 mm allowance on seal diameters and 2 mm allowance in the bore.

JOB SETTING: Reverse, clamp on hub seal dia. with soft jaws align, with respect of finished diameters, with in 0.01 mm.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	8	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965323	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				
Sub Operation Text								
0410	AB9421	P001	ZP01					
Clean the impeller completely.								
0420	AC4292	P001	ZP01					
Set the impeller butting on counter disc face and align with respect to outside diameter within 0.01 mm. Finish turn Hub seal diameters. KEEP 2 MM ALLOWANCE ON BORE DIAMETER< (> ,<)> WHICH WILL BE MACHINED AFTER OVER SPEED TEST. Reverse< (> ,<)> clamp on hub seal dia. with soft jaws align< (> ,<)> with respect to finished diameters within 0.01 mm. Finish turn< (> ,<)> eye outside diameter as per drawing.								
0430	AC9863	P001	QM01					
Inspect the above operation.								
0440	AA9412	P001	ZP04					
Mark for the key ways as per view-M and Sec. P-P. Consider the 2 mm allowance existing in bore.								
0450	AA4928	P001	ZP01					
Slot two key ways on the impeller as per marking. By maintaining the offset for both keyways with in 0.02 mm as per drawing. Tooling Required: Key way tool (20E7) with R2:45 -								
0460	AB9863	P001	QM01					
Inspect at the above operation.								
0470	AB9421	P001	ZP01					
Clean the impeller completely.								
0480	AH9863	P001	QM01					
Inspect and ensure the concentricity of outside dia., eye dia., bore dia. and record their dimensions.								
0550	AB9421	P001	ZP01					
Make necessary arrangements for polishing the impeller in the impeller polishing machine.								

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	9	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant: P001	Equipment No:	101965324	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

OPERATION:
Finish turn all the dimensions except seal diameter & bore

Maintain 1 mm allowance on seal diameters and 2 mm allowance in the bore, rest completely as per drawing.

Tooling Required:

Checking template for disc 4 deg/R60: 45-08-14549
Checking template for counter disc 5 deg/R155/r103: 45-08-14554

0380	AC9863	P001	QM01				

Inspect the above operation.

0390	AB6151	P001	ZP01				

Clean the impeller inside and outside with fine sand.

0400	AB9863	P001	QM01				

Carryout the dye-penetrant test to detect any cracks< (> ,<)> as per product Std. TC 72020.

0410	AB9421	P001	ZP01				

Clean the impeller completely.

0420	AC4292	P001	ZP01				

Set the impeller butting on counter disc face and align with respect to outside diameter within 0.01 mm.

Finish turn Hub seal diameters.

KEEP 2 MM ALLOWANCE ON BORE DIAMETER< (> ,<)> WHICH WILL BE MACHINED AFTER OVER SPEED TEST.

Reverse< (> ,<)> clamp on hub seal dia. with soft jaws align< (> ,<)> with respect to finished diameters within 0.01 mm.

Finish turn< (> ,<)> eye outside diameter as per drawing.

0430	AC9863	P001	QM01				

Inspect the above operation.

0440	AA9412	P001	ZP04				

Mark for the key ways as per view-M and Sec. P-P.
Consider the 2 mm allowance existing in bore.

0450	AA4928	P001	ZP01				

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	9	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965328	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				
Sub Operation Text								
0410	AB9421	P001	ZP01					
Clean the impeller completely.								
0420	AC4292	P001	ZP01					
Set the impeller butting on counter disc face and align with respect to outside diameter within 0.01 mm. Finish turn Hub seal diameters. KEEP 2 MM ALLOWANCE ON BORE DIAMETER< (> ,<)> WHICH WILL BE MACHINED AFTER OVER SPEED TEST. Reverse< (> ,<)> clamp on hub seal dia. with soft jaws align< (> ,<)> with respect to finished diameters within 0.01 mm. Finish turn< (> ,<)> eye outside diameter as per drawing.								
0430	AC9863	P001	QM01					
Inspect the above operation.								
0440	AA9412	P001	ZP04					
Mark for the key ways as per view-M and Sec. P-P. Consider the 2 mm allowance existing in bore.								
0450	AA4928	P001	ZP01					
Slot two key ways on the impeller as per marking. By maintaining the offset for both keyways with in 0.02 mm as per drawing. Tooling Required: Key way tool (20E7) with R2:45 -								
0460	AB9863	P001	QM01					
Inspect at the above operation.								
0470	AB9421	P001	ZP01					
Clean the impeller completely.								
0480	AH9863	P001	QM01					
Inspect and ensure the concentricity of outside dia., eye dia., bore dia. and record their dimensions.								
0550	AB9421	P001	ZP01					
Make necessary arrangements for polishing the impeller in the impeller polishing machine.								

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	9	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant: P001	Equipment No:	101965329	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

OPERATION:
Finish turn all the dimensions except seal diameter & bore

Maintain 1 mm allowance on seal diameters and 2 mm allowance in the bore, rest completely as per drawing.

Tooling Required:

Checking template for disc 4 deg/R60: 45-08-14549
Checking template for counter disc 5 deg/R155/r103: 45-08-14554

0380	AC9863	P001	QM01				

Inspect the above operation.

0390	AB6151	P001	ZP01				

Clean the impeller inside and outside with fine sand.

0400	AB9863	P001	QM01				

Carryout the dye-penetrant test to detect any cracks< (> ,<)> as per product Std. TC 72020.

0410	AB9421	P001	ZP01				

Clean the impeller completely.

0420	AC4292	P001	ZP01				

Set the impeller butting on counter disc face and align with respect to outside diameter within 0.01 mm.

Finish turn Hub seal diameters.

KEEP 2 MM ALLOWANCE ON BORE DIAMETER< (> ,<)> WHICH WILL BE MACHINED AFTER OVER SPEED TEST.

Reverse< (> ,<)> clamp on hub seal dia. with soft jaws align< (> ,<)> with respect to finished diameters within 0.01 mm.

Finish turn< (> ,<)> eye outside diameter as per drawing.

0430	AC9863	P001	QM01				

Inspect the above operation.

0440	AA9412	P001	ZP04				

Mark for the key ways as per view-M and Sec. P-P.
Consider the 2 mm allowance existing in bore.

0450	AA4928	P001	ZP01				

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	9	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965323	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Tools required:

Impeller polishing fixtures of dia. 275: 45-72-11037/06

0560	AB9421	P001	ZP01				

Polish the impeller in the polishing machine. While polishing ensure the entire impeller gets immersed in the grit completely so that both the vane flow path on the HUB and shroud surfaces will be polished completely.

0570	AB9863	P001	QM01				

Inspect the above operation.

0580	AH9421	P001	ZP01				

Make necessary arrangements for dynamic balancing of the Impeller.

NOTE: Consider 2 mm allowance in the bore.

Tooling Required:

Balancing mandrel: 45-88-07290
Clamping pads dia. 263:45-88-11006
dia. 261:45-88-11006
Adapter: 45-88-07012

0590	AH9863	P001	QM01				

Inspect the above arrangements and check for runouts.

0600	AH8675	P001	QMQT				

Balance the Impeller dynamically.
Refer Technological Instructions. CT - 052.
Remove the unbalance material from the places indicated by Testing Engineer, as per the customer approved quality plan.

0610	AH9421	P001	ZP01				

Make necessary arrangements for conducting over speed test.

Tooling Required:

Adapter: 45-88-07011
L.C.plates: 45-88-07012

0620	AH8676	P001	ZP03				

Perform the over speed test at 8012 RPM.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	10	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965324	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Slot two key ways on the impeller as per marking. By maintaining the offset for both keyways with in 0.02 mm as per drawing. Tooling Required: Key way tool (20E7) with R2:45 - 12 -							
0460	AB9863	P001	QM01				
Inspect at the above operation.							
0470	AB9421	P001	ZP01				
Clean the impeller completely.							
0480	AH9863	P001	QM01				
Inspect and ensure the concentricity of outside dia., eye dia., bore dia. and record their dimensions.							
0490	AC9421	P001	ZP01				
Mark for the dovetail slot milling as per the detail - F of the drawing.							
0500	AC4292	P001	ZP01				
Turn the dove tail slot on the back of the impeller as per the detail - F. Tools required: Profile cutter as per the detail - F: R0.2/20deg/R1 Grooving tool left hand and right hand: 45-11-11030							
0510	AC9863	P001	QM01				
Inspect the above operation.							
0520	AB9421	P001	ZP01				
Mark for slot milling for opening the dovetail profile at two locations as per View # O and note 11 on the drawing. Note: 1. The milling should be diametrically opposite to facilitate the balancing weights assembly. 2. The millings shall be at 90 deg w.r.t to the impeller keyways and has to be carried out after the keyway milling.							
0530	AB5326	P001	ZP01				
Clamp the impeller on the table with the hub side on the top. Mill two openings on the dove tail slot with end mill of radius R6.9 mm.							
0540	AB9863	P001	QM01				
Inspect at the above operation.							
0550	AB9421	P001	ZP01				

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	10	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965328	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Tools required:

Impeller polishing fixtures of dia. 275: 45-72-11037/06

0560	AB9421	P001	ZP01				

Polish the impeller in the polishing machine. While polishing ensure the entire impeller gets immersed in the grit completely so that both the vane flow path on the HUB and shroud surfaces will be polished completely.

0570	AB9863	P001	QM01				

Inspect the above operation.

0580	AH9421	P001	ZP01				

Make necessary arrangements for dynamic balancing of the Impeller.

NOTE: Consider 2 mm allowance in the bore.

Tooling Required:

Balancing mandrel: 45-88-07290
Clamping pads dia. 263:45-88-11006
dia. 261:45-88-11006
Adapter: 45-88-07012

0590	AH9863	P001	QM01				

Inspect the above arrangements and check for runouts.

0600	AH8675	P001	QMQT				

Balance the Impeller dynamically.
Refer Technological Instructions. CT - 052.
Remove the unbalance material from the places indicated by Testing Engineer, as per the customer approved quality plan.

0610	AH9421	P001	ZP01				

Make necessary arrangements for conducting over speed test.

Tooling Required:

Adapter: 45-88-07011
L.C.plates: 45-88-07012

0620	AH8676	P001	ZP03				

Perform the over speed test at 8012 RPM.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	10	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965329	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				
Sub Operation Text								
Slot two key ways on the impeller as per marking. By maintaining the offset for both keyways with in 0.02 mm as per drawing. Tooling Required: Key way tool (20E7) with R2:45 - 12 -								
0460	AB9863	P001	QM01					
Inspect at the above operation.								
0470	AB9421	P001	ZP01					
Clean the impeller completely.								
0480	AH9863	P001	QM01					
Inspect and ensure the concentricity of outside dia., eye dia., bore dia. and record their dimensions.								
0490	AC9421	P001	ZP01					
Mark for the dovetail slot milling as per the detail - F of the drawing.								
0500	AC4292	P001	ZP01					
Turn the dove tail slot on the back of the impeller as per the detail - F. Tools required: Profile cutter as per the detail - F: R0.2/20deg/R1 Grooving tool left hand and right hand: 45-11-11030								
0510	AC9863	P001	QM01					
Inspect the above operation.								
0520	AB9421	P001	ZP01					
Mark for slot milling for opening the dovetail profile at two locations as per View # O and note 11 on the drawing. Note: 1. The milling should be diametrically opposite to facilitate the balancing weights assembly. 2. The millings shall be at 90 deg w.r.t to the impeller keyways and has to be carried out after the keyway milling.								
0530	AB5326	P001	ZP01					
Clamp the impeller on the table with the hub side on the top. Mill two openings on the dove tail slot with end mill of radius R6.9 mm.								
0540	AB9863	P001	QM01					
Inspect at the above operation.								
0550	AB9421	P001	ZP01					

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	10	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant: P001	Equipment No:	101965323	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Refer Technological Instructions. CT - 053.

in the presence of third party inspector as per the customer approved quality plan.

0630	AH9863	P001	QM01				

Ensure the bore for any elongation. Send for finish machining of bore.

0640	AC4142	P001	ZP01				

Clamp & align accurately with respect to hub diameter & outside diameter.
Finish machine the bore to dimension as per assembly requirement.

0650	AC9863	P001	QM01				

Inspect at the above operation.

0660	AH9863	P001	QM01				

Inspect the above operation.

Carryout the dye-penetrate test to detect any cracks as per Product. Std. TC 7 2020 in the presence of third party Inspector as per the customer approved quality plan.

Make the dimensional check up of the Impeller particularly the outside dia., bore and eye< (> ,<)> outside dia.

The bore dimension (Dia. K) has to be checked at the following areas:

B1 - Gas entrance
B2 - Central
B3 - Opposite to Gas entrance.

Visual examination and make a protocol of all the dimensions.

Get the dimensional & D.P checks Recorded.

0670	AH9421	P001	ZP01				

Clean the Impeller thoroughly.

0675	AH9863	P001	ZQ01				
0680	AH9863	P001	QFNL				

Final Inspection.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	11	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965324	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Make necessary arrangements for polishing the impeller in the impeller polishing machine.

Tools required:

Impeller polishing fixtures of dia. 285: 45-72-11037/06

0560	AB9421	P001	ZP01				

Polish the impeller in the polishing machine. While polishing ensure the entire impeller gets immersed in the grit completely so that both the vane flow path on the HUB and shroud surfaces will be polished completely.

0570	AB9863	P001	QM01				

Inspect the above operation.

0580	AH9421	P001	ZP01				

Make necessary arrangements for dynamic balancing of the Impeller.

NOTE: Consider 2 mm allowance in the bore.

Tooling Required:

Balancing mandrel: 45-88-07290
Clamping pads dia. 263:45-88-11066
dia. 261:45-88-11066
Adapter: 45-88-07012

0590	AH9863	P001	QM01				

Inspect the above arrangements and check for runouts.

0600	AH8675	P001	QMQT				

Balance the Impeller dynamically.
Refer Technological Instructions. CT - 052.
Remove the unbalance material from the places indicated by Testing Engineer, as per the customer approved quality plan.

0610	AH9421	P001	ZP01				

Make necessary arrangements for conducting over speed test.

Tooling Required:

Adapter: 45-88-07011
L.C.plates: 45-88-07012

0620	AH8676	P001	ZP03				

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	11	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant: P001	Equipment No:	101965328	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Refer Technological Instructions. CT - 053.

in the presence of third party inspector as per the customer approved quality plan.

0630	AH9863	P001	QM01				

Ensure the bore for any elongation. Send for finish machining of bore.

0640	AC4142	P001	ZP01				

Clamp & align accurately with respect to hub diameter & outside diameter.
Finish machine the bore to dimension as per assembly requirement.

0650	AC9863	P001	QM01				

Inspect at the above operation.

0660	AH9863	P001	QM01				

Inspect the above operation.

Carryout the dye-penetrate test to detect any cracks as per Product. Std. TC 7 2020 in the presence of third party Inspector as per the customer approved quality plan.

Make the dimensional check up of the Impeller particularly the outside dia., bore and eye< (> ,<)> outside dia.

The bore dimension (Dia. K) has to be checked at the following areas:

B1 - Gas entrance
B2 - Central
B3 - Opposite to Gas entrance.

Visual examination and make a protocol of all the dimensions.

Get the dimensional & D.P checks Recorded.

0670	AH9421	P001	ZP01				

Clean the Impeller thoroughly.

0675	AH9863	P001	ZQ01				
0680	AH9863	P001	QFNL				

Final Inspection.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	11	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant:P001	Equipment No:	101965329	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Make necessary arrangements for polishing the impeller in the impeller polishing machine.

Tools required:

Impeller polishing fixtures of dia. 285: 45-72-11037/06

0560	AB9421	P001	ZP01				

Polish the impeller in the polishing machine. While polishing ensure the entire impeller gets immersed in the grit completely so that both the vane flow path on the HUB and shroud surfaces will be polished completely.

0570	AB9863	P001	QM01				

Inspect the above operation.

0580	AH9421	P001	ZP01				

Make necessary arrangements for dynamic balancing of the Impeller.

NOTE: Consider 2 mm allowance in the bore.

Tooling Required:

Balancing mandrel: 45-88-07290
Clamping pads dia. 263:45-88-11066
dia. 261:45-88-11066
Adapter: 45-88-07012

0590	AH9863	P001	QM01				

Inspect the above arrangements and check for runouts.

0600	AH8675	P001	QMQT				

Balance the Impeller dynamically.
Refer Technological Instructions. CT - 052.
Remove the unbalance material from the places indicated by Testing Engineer, as per the customer approved quality plan.

0610	AH9421	P001	ZP01				

Make necessary arrangements for conducting over speed test.

Tooling Required:

Adapter: 45-88-07011
L.C.plates: 45-88-07012

0620	AH8676	P001	ZP03				

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	11	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant: P001	Equipment No:	101965323	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Send to IS - 3105.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	12	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant: P001	Equipment No:	101965324	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Perform the over speed test at 8012 RPM.

Refer Technological Instructions. CT - 053.

in the presence of third party inspector as per the customer approved quality plan.

0630	AH9863	P001	QM01				

Ensure the bore for any elongation. Send for finish machining of bore.

0640	AC4142	P001	ZP01				

Clamp & align accurately with respect to hub diameter & outside diameter.
Finish machine the bore to dimension as per assembly requirement.

0650	AC9863	P001	QM01				

Inspect at the above operation.

0660	AH9863	P001	QM01				

Inspect the above operation.

Carryout the dye-penetrate test to detect any cracks as per Product. Std. TC 7 2020 in the presence of third party Inspector as per the customer approved quality plan.

Make the dimensional check up of the Impeller particularly the outside dia., bore and eye< (> ,<)> outside dia.

The bore dimension (Dia. K) has to be checked at the following areas:

B1 - Gas entrance
B2 - Central
B3 - Opposite to Gas entrance.

Visual examination and make a protocol of all the dimensions.

Get the dimensional & D.P checks Recorded.

0670	AH9421	P001	ZP01				

Clean the Impeller thoroughly.

0675	AH9863	P001	ZQ01				
0680	AH9863	P001	QFNL				

Final Inspection.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	12	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant: P001	Equipment No:	101965328	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210002

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001074-01			13321001074-01	IMPELLER DIA.700-N5-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0002	1.000	1.000	EA	IS01	138.000	IMPELLER DIA.700-N5-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Send to IS - 3105.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	12	12

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant: P001	Equipment No:	101965329	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Perform the over speed test at 8012 RPM.

Refer Technological Instructions. CT - 053.

in the presence of third party inspector as per the customer approved quality plan.

0630	AH9863	P001	QM01				

Ensure the bore for any elongation. Send for finish machining of bore.

0640	AC4142	P001	ZP01				

Clamp & align accurately with respect to hub diameter & outside diameter.
Finish machine the bore to dimension as per assembly requirement.

0650	AC9863	P001	QM01				

Inspect at the above operation.

0660	AH9863	P001	QM01				

Inspect the above operation.

Carryout the dye-penetrate test to detect any cracks as per Product. Std. TC 7 2020 in the presence of third party Inspector as per the customer approved quality plan.

Make the dimensional check up of the Impeller particularly the outside dia., bore and eye< (> ,<)> outside dia.

The bore dimension (Dia. K) has to be checked at the following areas:

B1 - Gas entrance
B2 - Central
B3 - Opposite to Gas entrance.

Visual examination and make a protocol of all the dimensions.

Get the dimensional & D.P checks Recorded.

0670	AH9421	P001	ZP01				

Clean the Impeller thoroughly.

0675	AH9863	P001	ZQ01				
0680	AH9863	P001	QFNL				

Final Inspection.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	12	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant: P001	Equipment No:	101965324	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1043800900-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Send to IS - 3105.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	13	13

	TECHNOLOGICAL PROCESS	Production Order	Date
Plant: P001	Equipment No:	101965329	26.03.2022

Type	Work Order / PGMA	Customer	Part No
	P-1643800901-33210/ 33210	Indian Oil Corporation Limited	33210007

Drawing No.-Var	E.Rev.	T.Rev.	Material No.	Name Of The Part
13321001075-01			13321001075-01	IMPELLER DIA.700-N9-CCW

Pos.No	BOM Qty	Ord Qty	MU	St.	Nt.Wt.	Remarks
0003	1.000	1.000	EA	IS01	121.000	IMPELLER DIA.700-N9-CCW

Operation Details

Opr No	W.C.	Plant	Ctl. ky	Prep Time	Time/ PC(M)	Time/ PC(L)	Total Time	QC Signature
PRT Cat	PRT No.			PRT Description				

Sub Operation Text

Send to IS - 3105.

Chkd. By	Dt.	ECR/ Rev No	Dt.	Pro.Plnr	Rate Fixr / Tool Plnr	Pg no	No.of Pgs
AV	09.05.2022	00		GS	MRAVI	13	13