

Casting Crack Issue of KOLA

COUNTERMEASURE

CONDITIONS FOR OCCURRENCE

- **Phenomenon:** Casting Crack

- **Customer-** Endurance Technologies Ltd. Narsapur

- **Model-** KOLA drum LH
- **Parts name-** Outer Tube
- **Qty NG-** 118 No Each



- KOLA Parts Stock check results

Action

Area	Total Stock	Checked	Checking Method	NG Qty	Status
Dekson Final Stage	528	520	Visual	8	OK
Dekson VMC Stage	422	418	Visual	4	OK
Dekson Casting Stage	516	510	Visual	6	OK

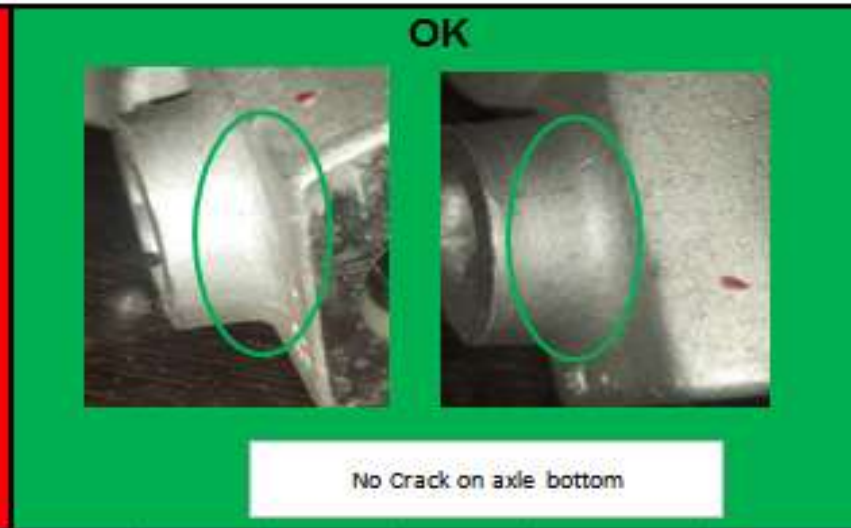
Q- Alert



ONE POINT LESSON

Problem	Crack on axle bottom	Occ.	<i>New</i>
Cust.	Customer Complaint	OPL NO	DC/OPL-21
Part Name	K0LA	Date	15.06.2024
<input type="checkbox"/> In house Problem	<input checked="" type="checkbox"/> Customer complaint	<input type="checkbox"/> Improvement Idea	

K0LA drum Crack on axle bottom



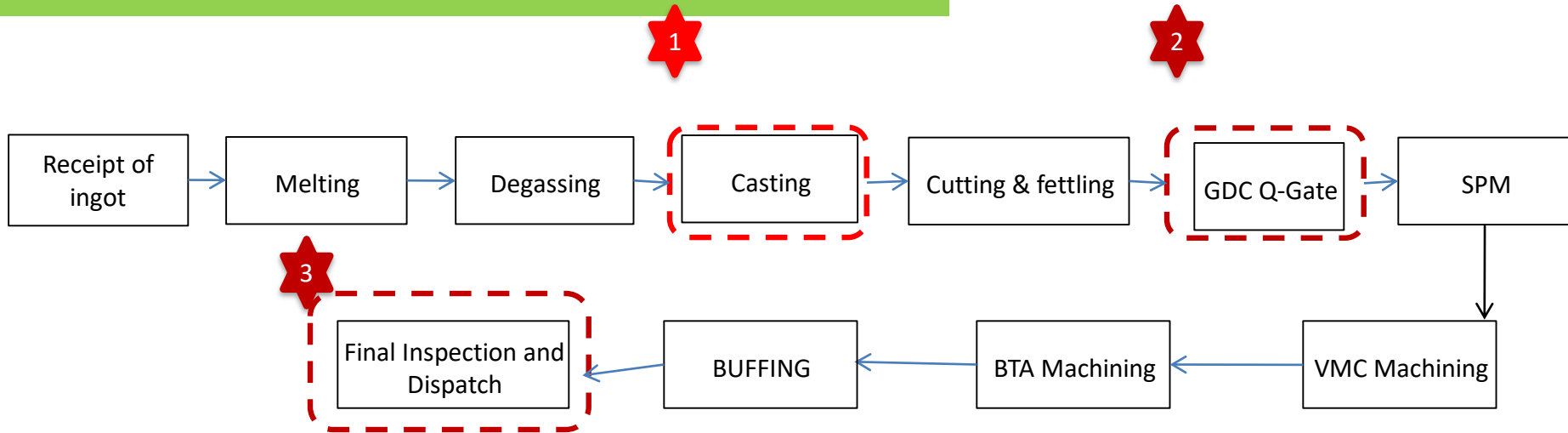
Prepared E Shubham


Approved I Mahan Singh

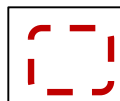
F-QA-022 / Rev. 00 (28.10.17)

UNDERSTANDING OF ACTUAL CONDITION AND CONTROL

KOLA Outer Tube Process Flow

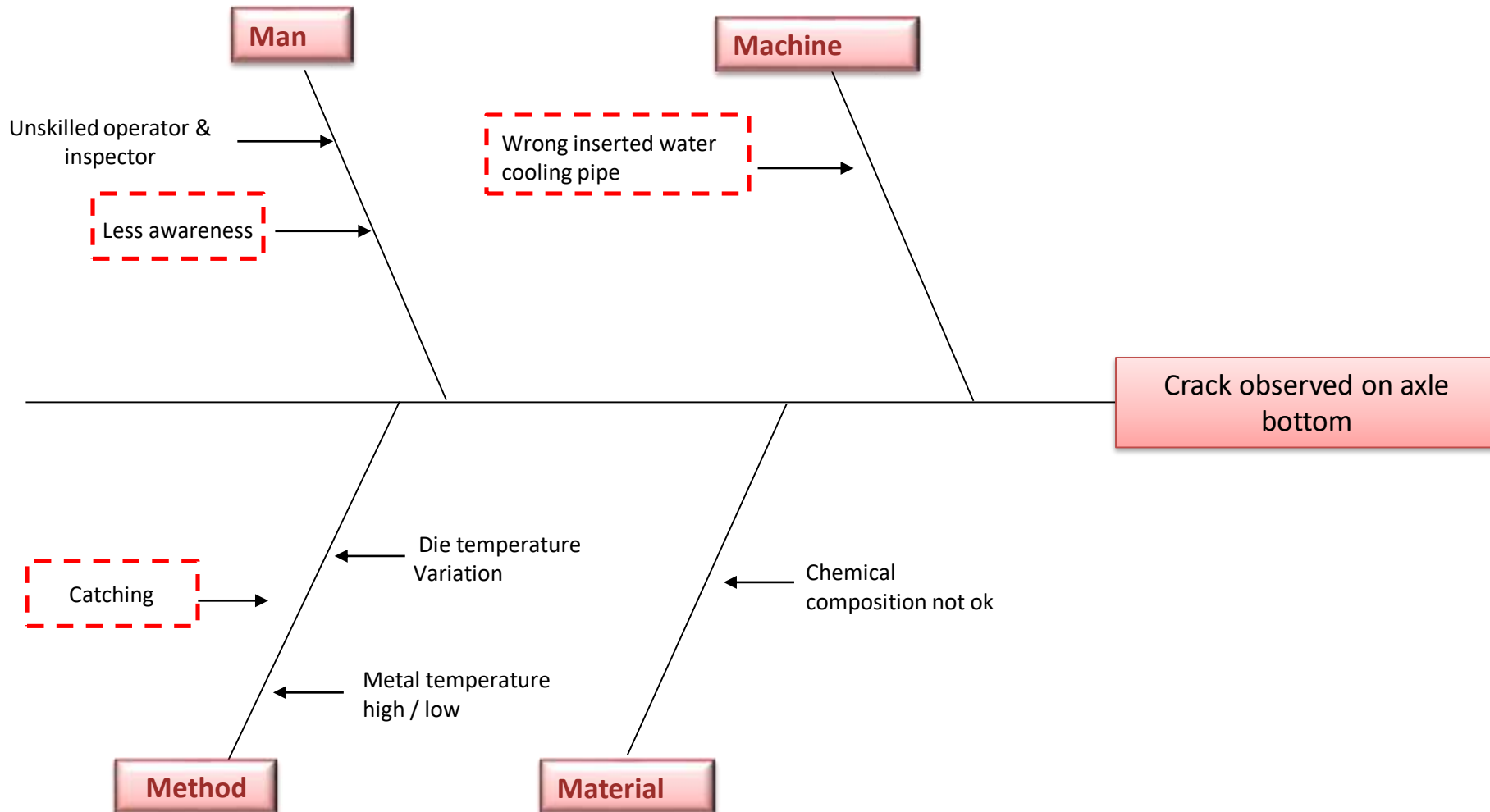


 Possible defect occurrence area.

 Possible defect detection area.

UNDERSTANDING OF ACTUAL CONDITION

• Understanding the actual cause – (Factor analysis)



FACTS VERIFICATION

Sr No.	4M	PROBABLE CAUSES	FACTS VERIFICATION	Judgment
1	MAN	Unskilled operator	Skilled operator deputed at particular stage	O
		Less awareness	verify Awareness of operator and found Not Ok	X
2	Machine	Wrong inserted water cooling pipe	Chilling pipe location as per process bottom side. (axle side area)	X
3	Method	Die temperature Variation	Die temperature found within specification.	O
		Metal temperature high / low	Molten metal temperature observed as per specification	O
		Catching	Due to hotspot area creation casting get catching defect.	X
4	Material	Chemical composition not ok	Chemical composition found as per specification	O

ROOT CAUSE ESTABLISHMENT COUNTERMEASURES

(WHY-WHY ANALYSIS)

	WHY-1	WHY-2	WHY-3
Occurrence Side	Crack observed in KOLA Outer Tube	Catching on part	Centre location -Wrong inserted chilling pipe
Detection side	Crack observed in KOLA Outer Tube	Not detected in Inspection	Oversight

- **Conclusion:** The operator incorrectly placed the chilling pipe in the centre of the die, so the bottom side of the part did not cool properly, resulting in a crack.

COUNTERMEASURES



☐ Countermeasures:

Cause	Countermeasure	Tgt. Date	Status
<Occurrence >	<ul style="list-style-type: none">• Cooling pipe should be on bottom side verify by Supervisor and QA Engineer during every shift.• Chilling pipe location, SOP displayed at concern location.• Awareness Training Provided to Concern Person.	15.06.2024	Completed
<Detection>	<ul style="list-style-type: none">• Magnification Glass is Mounted on GDC Q Gate.• Awareness Training Provided to Concern Person	15.06.2024	Completed

IMPROVEMENT ACTIONS

Shop : **GDC**

Operation :

Date of Implementation: **15.06.2024**

BEFORE



AFTER



Chilling pipe inserted to **middle**
side

Chilling pipe inserted to **bottom**
side

IMPROVEMENT ACTIONS

Shop : GDC
Operation : Q Gate

Date of Implementation: 15.06.2024

BEFORE



Inspection done by Visual as Per limit sample

AFTER



Magnification Glass is Provided to Arrest defect

Problem/Present Status:

- Inspection done by Visual as Per limit sample but chances of Minor defect skip

Countermeasure:

- Additional Magnification Glass is Provided to Arrest all casting defect

IMPROVEMENT ACTIONS- Customer Complaint Awareness Training



Shop : GDC, VMC, Final
 Operation : Production & Quality

Date of Training: 15/06/2024

Deksos [®] Expect the Best.		TRAINING RECORD						
Name Of Trainer - Mr. Shubham					DATE - 15/06/2024			
TRAINING TOPIC- kola crack on bottom side								
SR NO	NAME OF TRAINEE	SIGN	SR NO	NAME OF TRAINEE	SIGN	SR NO	NAME OF TRAINEE	SIGN
1	Kavita Dabhade		13			25		
2	Priyanka Singh		14			26		
3	Shubham Bodre		15			27		
4	Krishna D.		16			28		
5	Kiran S.		17			29		
6	Pathan. S		18			30		
7	Chintamary K		19			31		
8			20			32		
9			21			33		
10			22			34		
11			23			35		
12			24			36		

PREPARED BY

F-MRP-010

APPROVED BY
 REV. 00 (15/04/2016)

CONDITIONS FOR OCCURRENCE

- **Phenomenon:** concentricity up to 0.3
- **Supplier-** Endurance Technologies Ltd. Narsapur
- **Model-** KOLA DISC / DRUM LH RH
- **Parts name-** Outer tube
- **Qty NG-** 1740 No Each



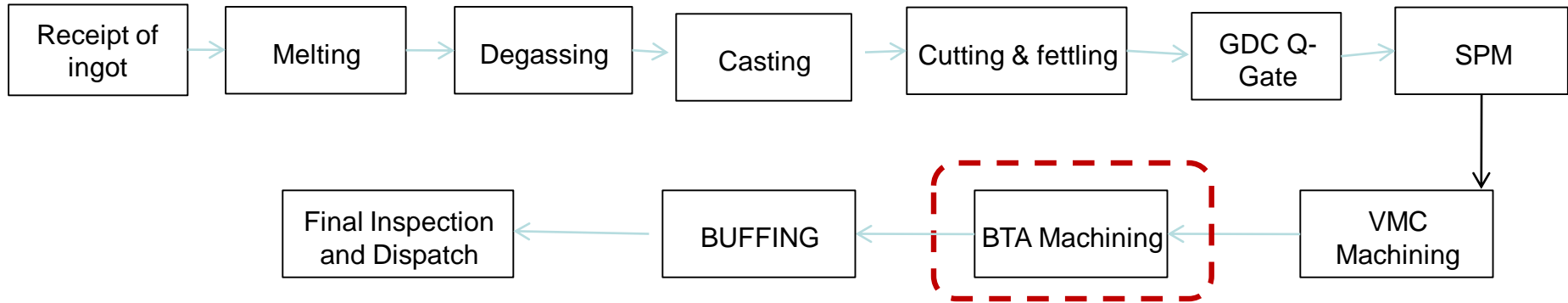
● KOLA Parts Stock check results


Action


Area	Total Stock	Checked	Checking Method	NG Qty	Status
Dekson VMC Stage	632	624	Mandrill & dial guage	8	OK

UNDERSTANDING OF ACTUAL CONDITION AND CONTROL

KOLA Outer Tube Process Flow

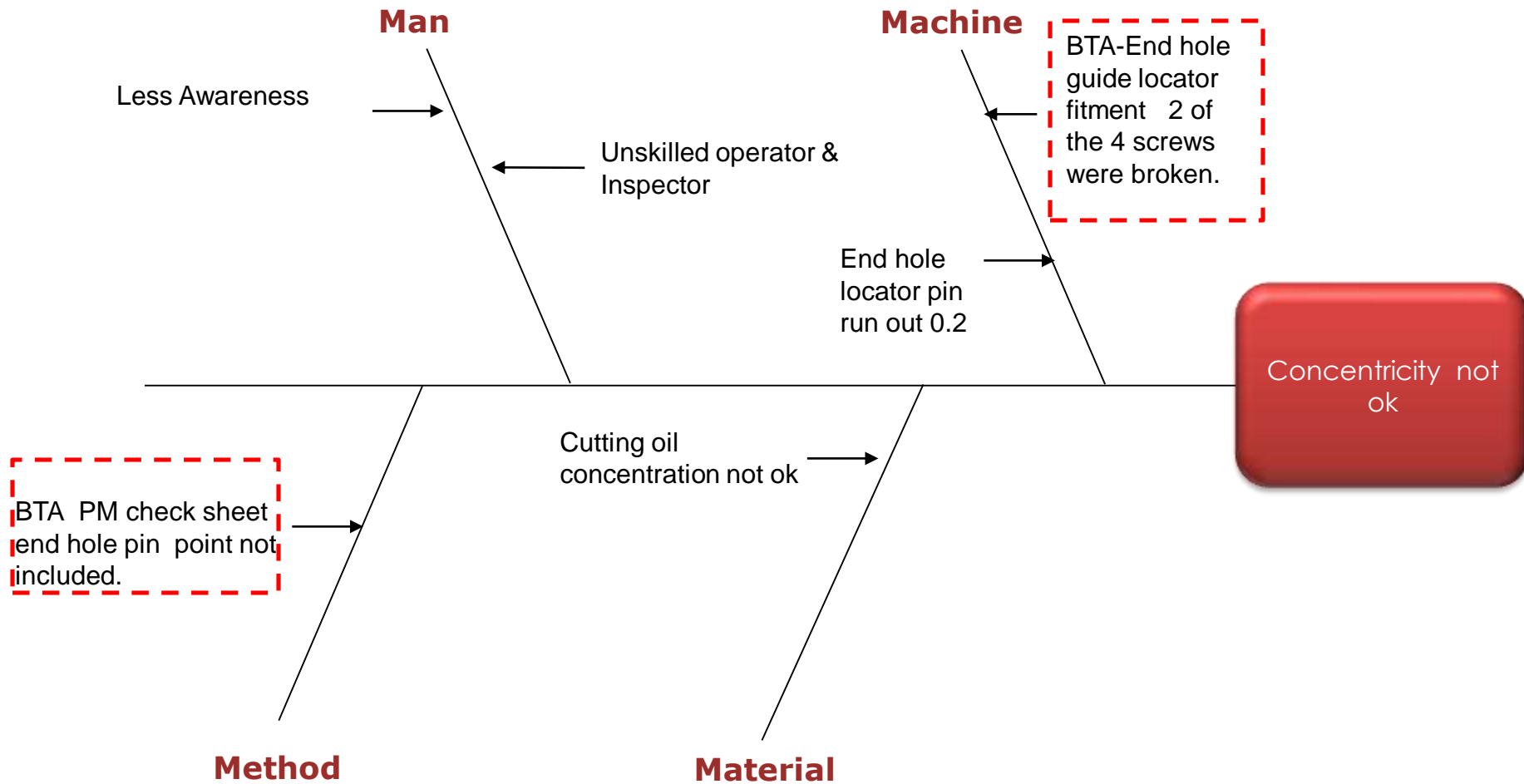


 Possible defect occurrence area.

 Possible defect detection area.

UNDERSTANDING OF ACTUAL CONDITION

• Understanding the actual cause – (Factor analysis)



ROOT CAUSE ESTABLISHMENT COUNTERMEASURES

(WHY-WHY ANALYSIS)

	WHY-1	WHY-2	WHY-3	WHY-4
Occurrence Side	Concentricity found up to 0.3	BTA-End hole guide locator fitment 2 of the 4 screws were broken.	End hole guide pin lock not properly.	guide pin run out increase up to 0.2
Detection side	In process inspection checking frequency in 2 part in one shift.	Unskilled operator & Inspector		

- **Conclusion: At the end hole guide locator proper fitment with 4 screws .**

COUNTERMEASURES



☐ Countermeasures:

Cause	Countermeasure	Tgt. Date	Status
<Occurrence >	<ul style="list-style-type: none"> BTA PM Check sheet guide end hole point added. End hole guide pin setting should be verify by Supervisor and QA Engineer during first piece and last piece approval. IN BTA operation guide end hole locator fitment 4 screws. 	25.06.2024 25.06.2024 25.06.2024	Started Started Started
<Detection>	<ul style="list-style-type: none"> Guide pin locator screw verify in that point add in JH check sheet. Awareness Training Provided to Concern Person. Inspection process 10 part checked in one shift for concentricity. 100 % inspection by concentricity gauge. 	16.06.2024 16.06.2024 16.06.2024 10.07.2024	Completed Completed Completed Under process

PM Check sheet point added



BTA MC PM CHECK SHEET										MC NO:-			
Pm Part	Check points	Standard	Check method	FRQ	Frequency		Legend		Remarks				
					●:Quarterly	■:Half yearly	○:Initially NG	■:Initially OK	PM-01 Reliability OK				
					■:Yearly	○:Initially OK	○:After rolling OK	○:After rolling OK	○:After rolling OK	○:After rolling OK			
Location					PM-01 Reliability	PM-02 Reliability	PM-03 Reliability	PM-04 Reliability					
Year					Date	Date	Date	Date					
					Before	After	Before	After	Before	After	Before	After	
Mechanical System	Check wear and damage of machine	Hourly No Damage	Hands/Vision	Q									
	Check DTR oil pressure	< 18 kg/cm ²	Vision/Hand	Q									
	Check DTR oil leak	Hand	Vision/Hand	Q									
	Check oil filler element	Hand	Hand	Q									
	Check central oil level	Hand	Vision/Hand	Q									
	Check operation of oil filter	Hand	Vision/Hand	Q									
	Check spindle drive belt condition	Hourly	Vision/Hand	Q									
	Check alignment of belt	Hand/alignment	Vision/Hand	Q									
	Check condition of pulleys	Hourly	Vision/Hand	Q									
	Check guide and hole pin location error	No loosening	Vision/Hand	Q									
Hydraulic System	Check & tight spindle motor foundation nuts & bolts	No loosening	Hand	Q									
	Check hqd. Power pack oil level	Hand	Vision/Hand	Q									
	Check hydraulic pressure setting	> 28 kg/cm ²	Vision/Hand	Q									
	Check & tight hqd. Clq. Housing nuts & bolts & tight oil	No loosening	Vision/Hand	Q									
Electrical System	Check hydraulic filler element	No clogging	Hand	Q									
	Check & tight all wiring	No loosening	Hands/Vision	Q									
	Check & tight external motor nuts & power pack motor connections	No loosening	Vision/Hand	Q									
	Check power pack motor current	< 2.5A	Multimeter	Q									
	Check & tight main incoming supply MCB connections	440V - 440V	Multimeter	Q									
	Tight motor connections	No loosening	Hand	Q									
	Check HMI display & tight its connections	Check HMI display & tight its connections	Vision/Hand	Q									
Check slide runner	Hand	Hand	Q										
Prepared By											Approved by		
DCL/MAINT/CS/DTR/884 REV.03(25/6/2024)													

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IMPROVEMENT ACTIONS

Shop : MACHINING

Operation : BTA

Date of Implementation: 25.06.2024

BEFORE



**End hole guide pin locator 2
screw broken**

AFTER



**IN BTA operation guide end hole
locator fitment 4 screws.**

IMPROVEMENT ACTIONS

Shop : MACHINING

Operation : BTA

Date of Implementation: 25.06.2024

BEFORE

AFTER



**End hole pin locator in checked
for dial stand pin run out 0.2**

**after properly fitment for 4 screw
run out upto 0.010**

IMPROVEMENT ACTIONS

Shop : **MACHINING**

Operation : BTA

Date of Implementation: **25.06.2024**



End hole clamping



Overall part clamping

THANK YOU