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Production Quality Control Using Six Sigma Method in Shock Absorber Industry (Case Study at PT.XYZ)

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ABSTRACT
PT.XYZasadistributorformanufacturingvehicleshockabsorber parts has a problem with the production front forkparts, namely a leak in the area above the front fork found intheclaimmarket.ResearchersusedtheDMAICmethod,wherethere are steps to reduce defects and variations carried outsystematically by defining, measuring, analyzing, improving,and controlling which are known as the 5 phases of DMAIC(Define, Measure, Analysis, Improvement, Control). Researchand data collection were taken from one of the claim marketcases at PT. XYZ and PT Astra Honda Motor for the periodJanuary to December 2019. The results showed that after thedefine and measure process was carried out, 2 main problemswere found that caused the front fork to leak in the upper area,namelyadefectiveo-ringconditionandminusinnertubedimensions. This is evidenced by the measurement of processcapability,wherethedefectiveo-ringconditionsobtainedCp 0.62andCpk0.58andforthedimensionsinnertubeminus,theCpvalueswere9.4andCpk0.24.Afterthat,from the2problems, an analysiswas carriedout andthefactors thatcaused the o-ring defect and the minus inner tube dimensionswere analyzed. In the defective o-ring, there is a condition thatexceedsthelifetime,andthediesthatarenotcleancausetheo-ring to be defective. So that the addition of control over thereplacement of dies and socialization related to the cleanlinessof dies. For the problem of minus inner tube dimensions, it iscaused when tools change is not reset, from these findings, adocumentfor toolchange controlismade.
Keywords: FrontFork,Leak,DMAIC

1.INTRODUCTION

Theproductionprocesshasaveryimportantroleinkeepingtheproducts produced following specifications, but there are stillproductsthatdonotcomplywithestablishedstandardsordefective products [1]. The existence of defects found in theproductwillhaveanimpactontheadditionofproductioncostswhichareconsideredaswasteandcannotuseresourcesproperly. Quality control is a process or activity to ensure thatthequalityofeachproductisfollowingpredeterminedspecificationsbasedon companyregulations.
PT XYZ is a distributor for the manufacture of shock absorberpartsformotorizedvehicles,boththree-wheeledandfour-wheeledvehicles,incollaborationwithseveralmanufacturing companies in the automotive sector to support the motorcycleassembly process. PT XYZ is responsible for any complaintsfromconsumersregardingtheuseofmotorbikesandisobligedto make repairs to be able to maintain trust with cooperatingcompanies.Toobtainproductionquality,asustainableproductqualitycontrolmethodisneeded,oneofwhichisthesixsigmamethod. The main objective of this research is to analyze thequality of a part of a motorcycle through the DMAIC phase(Define, Measure, Analyze, Improve, Control). One type ofconsumercomplaint(claimmarket)thatrequiresserioushandling is the Front Fork (Figure 1.1) with the problem of aleakintheUpperarea(markedinred)whichoccursinalltypesof motorbikes. Front Fork (Shock Absorber) is an importantcomponent of a vehicle's suspension system, which functionsto dampen the oscillating force of the spring. The front forkslows down and reduces the magnitude of vibration - motion,byconvertingthekineticenergyfromthesuspensionmovementintoheatenergy thatcan bedissipatedthroughhydraulicfluids[2].

Figure1: PartFrontFork(left)andUpperFrontForkLeakingArea(right)

From the results of research conducted by Hidayat [3] usingMinitab software on the KVL type L type crankcase, it wasfoundthattheaverageprocessinthediecastingsectionresultedin a total defect of 2473 for the period January to March 2008,whichisthecompany'sbenchmarkforimprovement.sustainable.TheapplicationofDMAICcanincreaseeffectiveness while providing adequate reactions to problemsthatarise(SmętkowskaandMrugalska,2018)aswellasidentifyingtheoptimal level oftoleranceand opportunities for

improvement[4].

1. Knowing the type of defect that causes the front fork in theupper area.
2. Identifythebiggestfactorcausingthefrontforkintheupperarea.
3. Formulate corrective actions and make improvements in thecompanytoeliminatetheleakyfrontforkproblemintheupperarea.
4. ComparingCP/CPkbeforeandafterrepairs.

Based on previous research, my research this time is at themeasurement stage, I use process capability tools because theanalysisthatwillbecarriedoutensuresthattheprocesscapabilityofamachineisuptostandardornot.Andtheseconddifference is in the control tools stage that is used using SPC(StatisticalProcessControl)wherefromthiscontroltheconsistencyofimprovementcanbecontrolled everyday.

2. RESEARCH AND METHOD

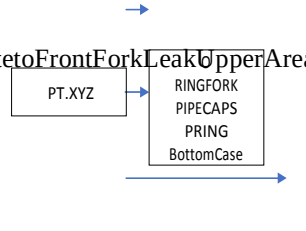
SixSigmaisamethodusedtoidentifyproblemsintheproduction process and describe burdensome defects in termsoftime,money,customers,andopportunities(Supriyadi,2017). Kibria, Kabir, &Boby (2014) revealed that Six Sigmaincreasesprofitmargins,improvesfinancialconditionsbyminimizing the level of product defects. Researchers used theDMAIC method, where there are steps to reduce defects andvariations carried out systematically by defining, measuring,analyzing, improving, and controlling which are known as the5phasesofDMAIC(Define,Measure,Analysis,Improvement,Control). Research and data collection were taken from one oftheclaim market casesatPT.XYZandPTAstraHondaMotorfromJanuarytoDecember2019.

3. RESULTS

3.1. Define

In2019,consumercomplaints(ClaimMarket)werefoundwithcomplaints received due to the front fork leaking in the upperareawhichcanbe seenintable 1. belowthis

Table1: TotalCustomersComplaintsRelatetoFrontForkLeakUpperArea in2019



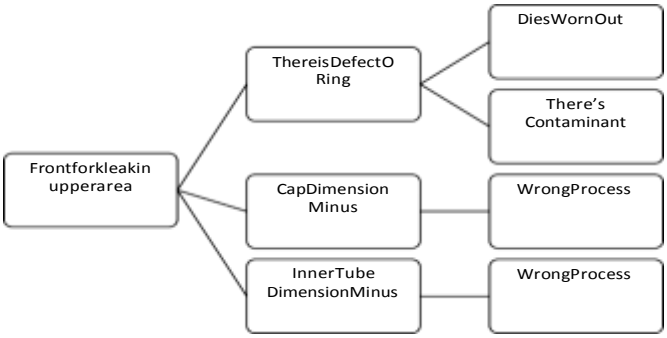


Figure2: LogicTreeDiagramPenyebabFrontForkBocorAreaUpper

Figure3: FrontForkUpperArea

To define the process of the front fork components and partsassociated with the front fork, starting from material suppliers,sub-parts, front fork assy, assy units, output distribution toconsumers,amapofSupplier,Input,Process,Output,Customers (SIPOC) will be made diagram which can be seeninFigure 4below

Oil leaks in the front fork can be caused by several things. Tosee the possible causes of oil leakage, you can see the LogicTree Diagram in Figure 2 for the process of defining the causeof oil leakage in the upper front fork area, and in Figure 3 arethepartsintheupperfrontforkarea

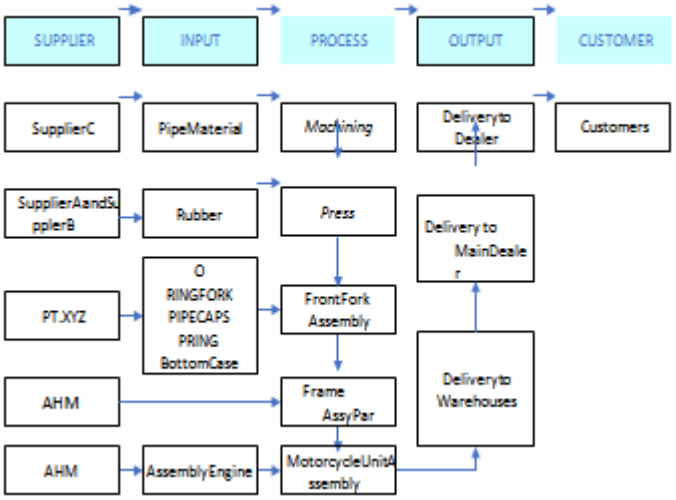


Figure4:SIPOCDiagram

3.2. Measure

AttheMeasure stage,themain activity carried outisthemeasurement of calculating the capability process

conditionwhere the output is the value of Cp, Cpk. The processingcapabilitywillbecalculatedfirstbymappingthepartprocess,

thendeterminingthecriticalpointbymakingalogictreediagramonthepartprocess.Theprocessingcapabilitythatwillbecalculatedincludes:

1. ORingDimensions
2. InnerTubeDimensions
3. CapDimensions

DimensionalMeasurementofORing

Measurementofprocesscapability thatismeasuredisthepointsthataffectthedensitywiththeinnertuber,including:

1. InsideDiameter
2. RingDiameter

ForCPo-ringmeasurement,itwillinvolve2suppliers,namelySupplier A and Supplier B. Standard dimensions of the insidediameterandringdiameter canbeseeninFigure5 below.

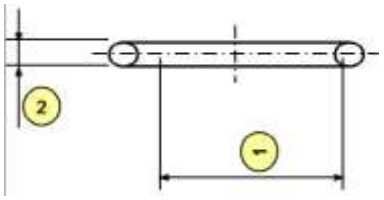


Figure5: StandardDimensionORing

The results information based on the Cp and Cpk values are asfollows:

- BadProcess:CpkorCp<0.67
- EnoughProcess:0.67 <CpkorCp<1
- Good Process:1 <CpkorCp<1.33
- VeryGoodProcess:CpkorCp>1.33

The calculation of Cp, Cpk begins with the calculation of theinside diameter of the ring for supplier A which can be seen inFigure6below.

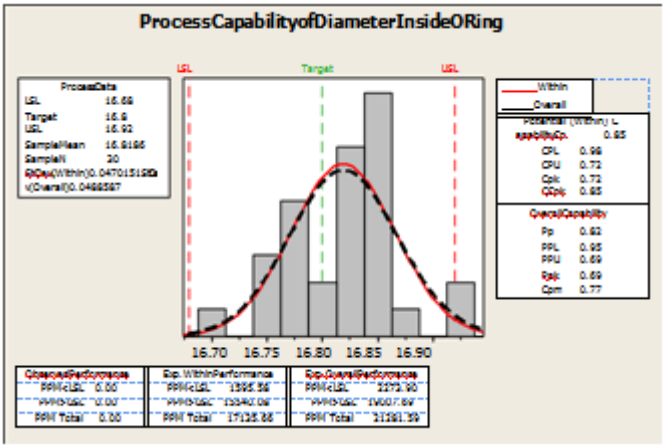


Figure6: GraphicDataCp,CpkDiameter InsideORingSupplierA

Basedontheabovecalculations,theCpvalueis0.85andthe

concluded that the results of the Process are Enough and it isdecided OK.

Next,takingCp,Cpk,calculatingtheringdiameterforsupplierAcanbeseeninFigure7below.

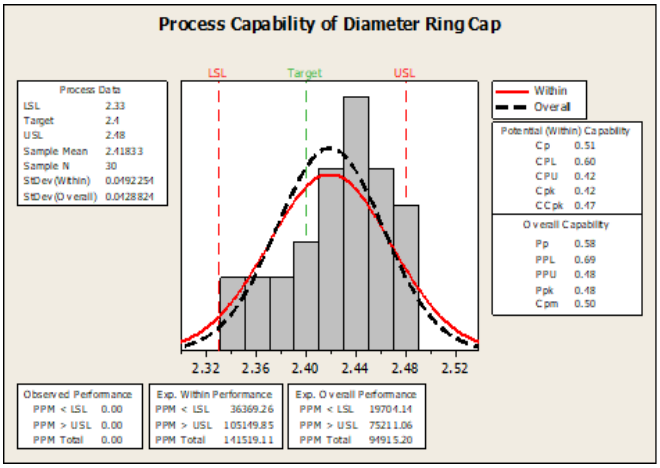


Figure7: GraphicDataCp,CpkRingDiameterO-RingSupplierA

Basedon theabovecalculations, theCpvalueis 0.62andCpk
0.58. From these results, it can be decided that the process isnotgoodanditisdecidedbyNG.
Furthermore, the calculation of Cp, Cpk starts on the diameterof the ring cap for supplier B which can be seen in Figure 8below.

ObservedPerformance	Exp.WithinPerformance	Exp.OverallPerformance
PPM<LSL0.00	PPM<LSL0.00	PPM<LSL0.00
PPM>USL0.00	PPM>USL0.00	PPM>USL0.00
PPM Total0.00	PPM Total0.00	PPM Total0.00

16.695 16.730 16.765 16.800 16.835 16.870 16.905

Figure 8: Graphic Data Cp, Cpk DiameterInside O RingSupplierBasedoncalculationsonsupplierB,theCpvalueis 5.34andtheCpkvalueis5.28,withtheCpCpkvalueobtained,it can be concluded that the results of the Process are Very Goodand itisdecidedthattheresultsoftheprocessareOK

AndtakingCp,Cpk,thelastcalculationisdoneonthering

Cpkis0.72,withtheCpCpkvalueobtained,itcanbe
diameterforsupplierBwhichcanbeseeninFigure9below

inFigure12below

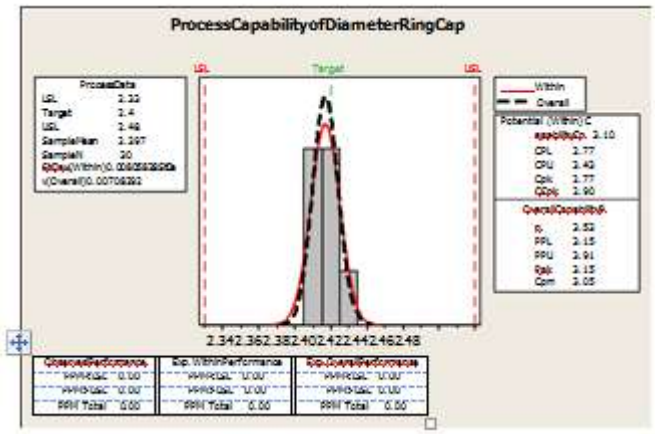
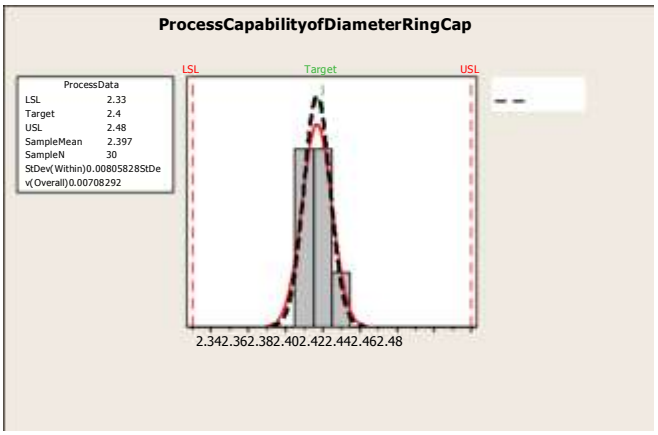


Figure9: GraphicDataCp,CpkDiameterInsideORingSupplierB

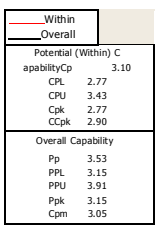
Based on calculations on supplier B, the Cp value is 5.34 andthe Cpk value is 5.28, with the CpCpk value obtained, it canbeconcludedthattheresultsoftheProcessareVeryGoodanditisdecidedthatthe resultsoftheprocessareOK
And taking Cp, Cpk, the last calculation is done on the ringdiameterforsupplierBwhichcanbeseeninFigure10below



ObservedPerformance		Exp. WithinPerformance		Exp.Overall Performance	
PPM<LSL	0.00	PPM<LSL	0.00	PPM<LSL	0.00
PPM>USL	333333.33	PPM>USL	237509.67	PPM>USL	351334.32
PPM Total	333333.33	PPM Total	237509.67	PPM Total	351334.32

Figure12: GraphicDataCp,CpkInsideUpperDiameter

BasedonthecalculationofCp,Cpk,thevalueofCpis9.4andCpk is 0.24. Because the Cpk value is below 0.67, it can bestatedthattheresultoftheprocessisnotgoodanditisdecidedbyNG
MeasurementofCapDimensions
Themeasurementofthefrontforkcap,especiallyontheoutsidediameter,iscarriedoutonthepartclaim,inthispart



Observed Performance PPM<LSL 0.00 PPM>USL 0.00 PPM Total 0.00	Exp. WithinPerformance E PPM<LSL 0.00 PPM>USL 0.00 PPM Total 0.00	xp.OverallPerformance PPM<LSL 0.00 PPM>USL 0.00 PPM Total 0.00

Figure10: GraphicDataCp,CpkDiameter RingORingSupplierB

BasedonthelatestcalculationsfortheringdiameteratsupplierB, the Cp value is 3.10 and the Cpk value is 2.77. Thus it canbe concluded that the result of the Process is Very Good and itwasdecidedOK.

InnerTubeDimensionMeasurement

Measurement of process capability is measured on the innertuber part, namely the inside upper diameter as seen in Figure11 below

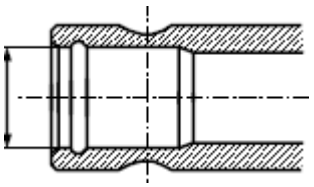


Figure 11: Standard Dimension Inside Upper DiameterCalculationofCp,Cpkontheinsideupperdiametercanbeseen

measurement,theprocesscapabilitymeasurementisnotcarried out and the process mapping is carried out because thecomponentsofthispartareimportedsothatthemanufacturingprocesscannotbeanalyzed,ifaproblemisfoundonthedimensions then a claim or rejection will be made to the partmaker.ThemeasuredpartclaimcanbeseeninFigure13belowandtheresultsofmeasuringpartclaimasmanyas10part scanbeseeninTable 2

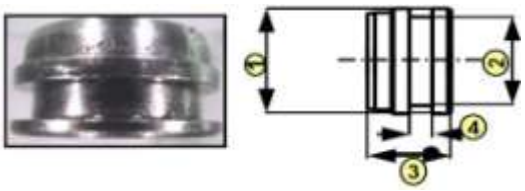


Figure13: CapFrontForkIllustration

Table2: MeasurementDataMarketClaimFrontForkPart

No	InspectionItem	Standard	MeasurementResult										Judge
			1	2	3	4	5	6	7	8	9	10	
1	OutSideDiameter	Ø21.6-0.1-0.3	21.39	21.38	21.39	21.39	21.38	21.41	21.4	21.38	21.4	21.39	OK
3	GroovingDiameter	Ø17.60-0.06	17.58	17.57	17.59	17.58	17.59	17.57	17.58	17.58	17.59	17.58	OK
4	TotalLength	10±2	10.02	10.12	10.13	10.18	10.8	10.12	10.13	10.13	10.05	10.12	OK
5	WidthofGrooving	3.2+0.10	3.24	3.24	3.21	3.22	3.21	3.21	3.24	3.24	3.21	3.22	OK

Basedontheabovemeasurementdata,especiallyinthediametergroovingareawheretheoringisinstalled,dimensionally there are no dimensional problems so that theconclusion on the front fork cap part is declared OK and nofurther analysisisneeded.

3.3. Analyze

The main activity at the Analyze stage is to determine thefactorsthataffectthefrontforkleakintheupperareabasedonthe results of the previous stage, namely measurement. Thefollowing is a technical analysis based on measurement resultsonpartcomponentsthataffecttheperformanceofthefrontforkwhichcancause thefrontforkto leakintheupper area

Tabel3: TechnicalAnalysisfor FrontForkLeakUpperArea

MainProblem	**PotentialProblem**	Judge(measurement)	**Description**
FrontForkLeakUpperArea	InsideORingDiameter	**OK**	SupplierMeasurement-Based
	O Ring SupplierA	**NG**	SupplierMeasurement-Based
	CapDiameter	**OK**	SupplierMeasurement-Based
	InsideORingDimension	**OK**	SupplierMeasurement-Based
	O Ring SupplierB		
	CapDiameter		
	Inner TubeDimension	Dimensi Inside UpperDiameter	**NG**	SupplierMeasurement-Based
	CapDimension	Dimensi on	**OK**	MeasurementPartClaim Based

Toresolvetheindicationofthefrontforkleakintheupperareabased on the technical analysis table above, the analysis stage,themaintooltobe used isasfollows:

- CauseandEffectDiagram(FishboneDiagram)
- FailureTreeAnalysis(FTA)
- FailureModeEffectandAnalysis(FMEA)

Afterobtainingthecausaldiagram,thenextstepistocalculatethefailuremodeeffectandanalysis(FMEA).FailureModeandEffect Analysis (FMEA) is used to see which part of the processis the most dominant in producing process failures where thistime the process is in the pressing process. From the FailureMode and Effect Analysis (FMEA), a table will be created toseethegroupingcarriedoutinTable4below.Tabel4:.FailureModeEffectandAnalysis(FMEA)PressProcess

Table4: MinusInnerTubeDiameterAnalysis

No	ProcessStep	Potential FailureMode	PotennTialFailureEffect	SEV	PotentialCauses	OCC	CurrentControl	DET	RPN
1	DiesProcess	DiesWornOut	O-Ring Defect	8	Maintenace not Done	10	NoInspection	8	640
2	Parameter Process	Out of OrderDisplay	O-RingDefect	5	MaintenacenotDone	2	Incomplet Control	5	50
3	Press Process	Lackofpress	OvalO-Ring	5	Settingparameter process	4	PartIncpection	5	100
4	DiesProcess	DirtyDies	O-RingDefect	5	CleancingwasnotDone	10	ManPower don'tFollowSOP	5	250

The analysis is also carried out the same as the previous partusing the fishbone diagram. In the FishboneDiagram for theminusinnertubeproblem,thesameasthepreviousdiagramthedominant factors that cause problems based on 5M + 1E willbe analyzed based on the machining process. The cause andeffectdiagramoftheminusinnertubecanbeseeninFigure15below.

ManPower Machine

AnalysisofORingDefects
Fortheanalysisoforingdefectsusingacauseandeffect
diagramtofindthedominantfactorthatallowsarisingbased
_____WorkEthos _____SettingProcess

on5M+1E,inthisdiagram,the5M+1Efactortobeanalyzedis the pressing process where the process greatly affects thequalityoftheoringwhichcanbeseeninFigure14below

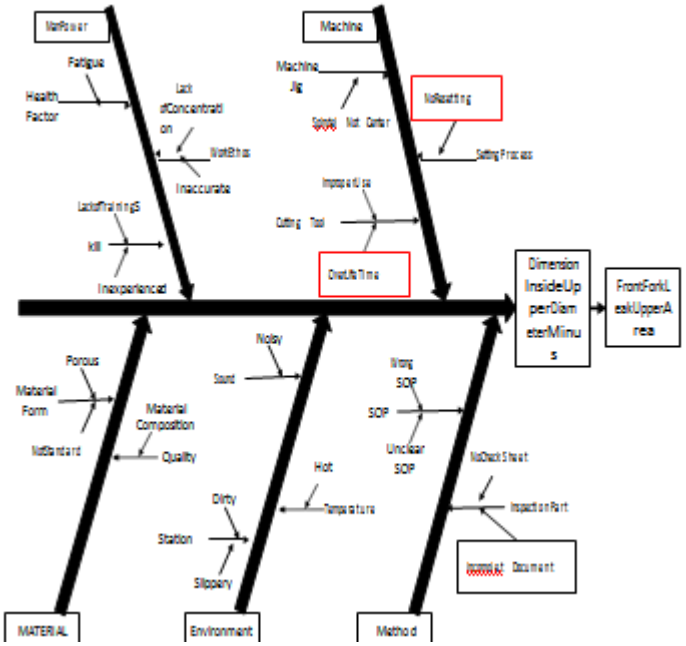


Figure15: FishboneDiagramDiameterInnerTubeMinus

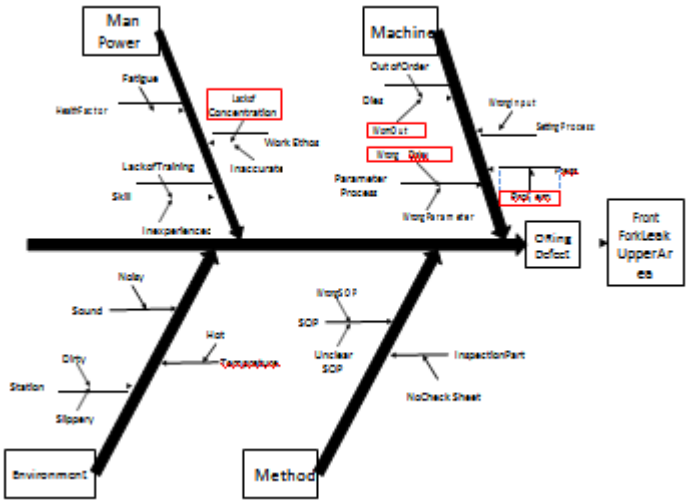


Figure14: FishboneDiagramORingDefect

TableFailureModeEffectandAnalysis(FMEA)MachiningProcess
ThelastanalysisprocessiscalculatingtheFailureModeEffectandAnalysis(FMEA)MachiningProcessafterthepreviou s
process the causes of the minus inner tube diameter have beenobtained through the analysis of the causal diagram (FishboneDiagram).ThecalculationofFailureModeEffectandAnalysis(FMEA)canbeseeninTable5below.
Table5: FailureModeEffectandAnalysis(FMEA)MachiningProcess

No	ProcessStep	PotentialFailure Mode	PotennntialFailureEffect	SEV	PotentialCauses	OCC	CurrentControl	DET	RPN
1	InnerDiameter	Resettingwas not done	Minus Diameter	8	Cuttingtoolover use	10	NoResetting	8	640
2	InnerDiamet	Excessivelife	Minus	5	BluntCutting	2	Periodic	5	5

	er	time	Diameter		tool		Inspection		0
3	Dimension	Dimensionoutof spec	Minus Diameter	8	Cuttingtoolover use	10	IncompletFinal Inspection	5	400

3.4. Improve

Based on the FMEA table that has been created, the followingtable of technical analysis (5-why method) and priority basedon the value of the Risk Priority Number (RPN) on the factorsthatcausefrontforkleaksintheupperareacanbeseeninTable6.

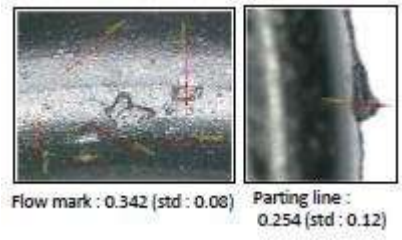
cause of the worn condition of the dies due to the usage thatexceeds the lifetime, this condition can be seen in Figure 17wherethe conditionofthediesexceedsthe lifetime.

Figure17: CheckSheetdanMaintenance ScheduleDies

From the above findings, it can be seen that in the 3rd week ofMarch, there were conditions for the use of dies that exceededthe plan or standards set by production. From the condition ofthediesthatexceedthelifetime,thepartsproducedhavevisualdefects whichcanbeseeninFigure 18 below

Table6:5WhyMethod Front ForkLeakUpperArea

Symptoms	**Why?**	**Why?**	**Why?**	**Why?**	**Why?**	**RPN**
Front ForkLeakUpperArea	ORing Defect	Diameter ORing out ofstandard	Worn OutDies	MaintenancenotDone	Tidakada diesinspeksi	640
			DirtyDies	CleaningwasnotDone	ManPowerdon't Follow SOP	250
	There's Gapin innertube	Inner TubeDimensionMinus	Noresettingwhen in repairperiod	Cuttingtoolover	NoResetting	640
					IncompletFinalInspection	400



Improved Dies Use Control During O-Ring Making Processand SOPSocialization

In the press process of making an O ring, there are importantthingsthathavebeenpreviouslydiscussedattheanalysisstagethat the use of dies is very important in manufacturing. Afteranalysis, the cause of the CP / CPK NG on the ring diameterwascausedbytheuseofthediesitself.Whenchecking thedies,awornconditionis foundwhichcanbeseeninFigure16

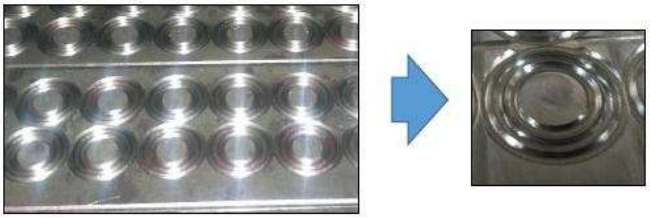


Figure16: DiesatPressProcess

With the condition of the dies that are worn out, when thepressingprocesstakesplacetheresultofthe¬oringisdefective.This defectin theoring causesoiltocomeout.The

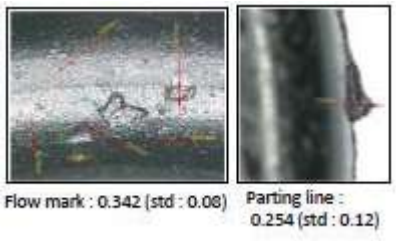


Figure18: DefectRubberTriggerbyWornOutDies

With the discovery of worn-out dies conditions that were notdetected by the operator, it is necessary to improve the controloftheuseofdiesto avoid thereoccurrenceof worn-outdies.
Apart from that, the conditions that need to be maintained bytheoperatorarerelatedtothecleanlinessofthedies,theconditionofthedieswheretheremainingburryfromtheprevious process can also cause the condition of the o ring tohavedefects.Sothatre-socializationisneededforoperatorssothatnoimportantprocessesintheSOParemissed.Re-socializationhasbeencarriedoutandcanbeseeninFigure19

Figure19:SOPPressProcessSocialization

ImprovedControlofToolChangeandAdditionofFinalInspections
Repair activities that will be carried out this time are to fixproblemsthatoccurintheinnertubedimension.Theinnertube

dimensionitselfisfoundinthebarin(insidediameter)process,whichhasagradual infeed
Aftertheanalysiswascarriedout,therewasafindingthatwhenthetoolswerereplaced,theoperatordidnotsettheoffsetwear,which caused an insert over to be carried out at the beginningof the feeding process. This is found when the operator hasreplaced the worn insert with a new insert, the operator doesnot set the offset wear and is shown on the monitor parametersettinginFigure 20below

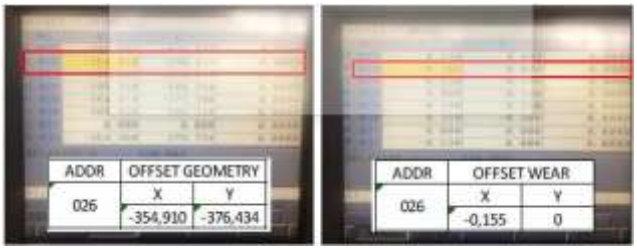


Figure20: MonitorSettingParameterBeforedanAfterChangeInsert

Fromtheabovefindings,whenanewinsertisnotsettheoffsetwear is set, it will cause when the initial infeed process iscarried out the result of the part dimensions will be minus. Forthestanderddiameteritselfbetween21.6-21.7,iftheoperatorcomparestheresultsoftheinsertinsertionbeforeitisreplacedand afterthe insertisreplaced.
Finding these conditions can cause the inner tube diameter tobe minus and cause a leak in the front fork. In the IK
(WorkInstructions)document,thereplacementoftheinserttoolisnotwrittenindetail,soitneedstoberevisedforthepointo faddingtheinserttoolsettingswhenthe replacementismade
After repairs have been made which causes the inner tubediameter to be minus, it is followed by inspection of the partsso that if the same problem occurs, the operator can catch theNG part. To better control the production results maximally,improvements were made by adding 100% plug gauge checksand when there was a change of inserts, the dimensions werecheckedwhichcanbe seeninFigure 21below

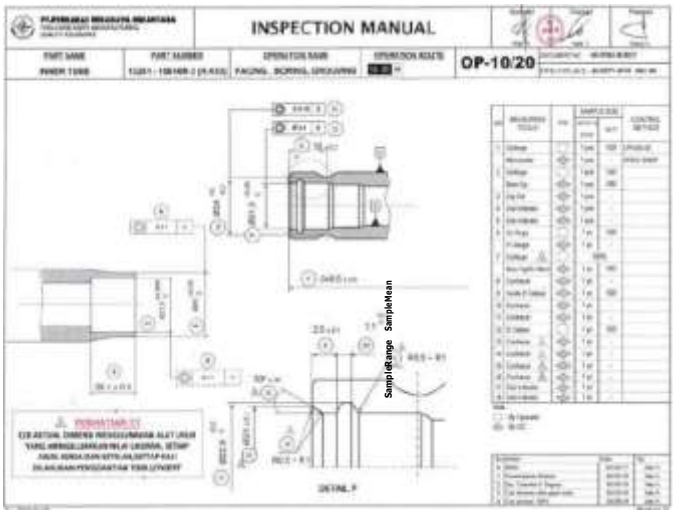


Figure21: InspectionManualRevisionInnerTubePart

3.5. Control

Themainactivityinthecontrolstageistomaintainandmaintain the condition of the repair results. Process control iscarried out using tools from SPC (Statistical Process Control),usingtheX-RControlChart.Thepointstobecontrolledinclude:

Ring Diameter O Ring on the Front Fork which can be seen inTable7

Table7:X-RControlChartRingDiameterORing

CheckPoint

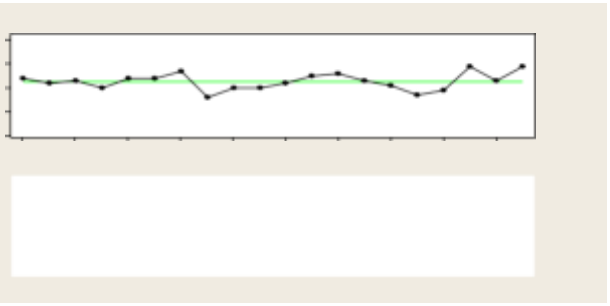
1. CL
2. UCL,LCL

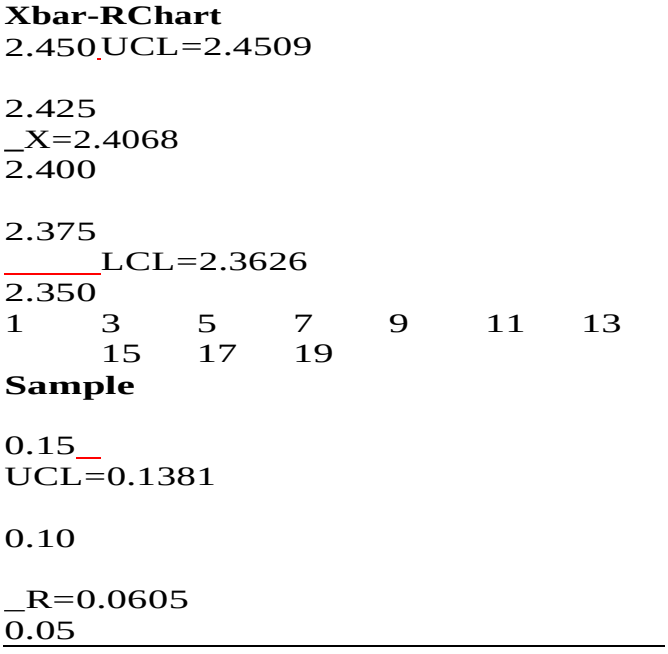
Model:AllType

Month:September2020

X-RControlChart	Preparedby	Checkedby

DATE		3	4	7	8	9	10	11	14	15	16	17	18	21	22	23	24	25	28	29	30
LOT	No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Sample(n)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
CHECK VALUE	X1	2.38	2.37	2.38	2.36	2.37	2.37	2.38	2.35	2.36	2.36	2.36	2.37	2.38	2.37	2.37	2.36	2.37	2.38	2.38	2.39
	X2	2.42	2.4	2.41	2.4	2.414	2.4	2.41	2.39	2.394	2.4	2.4	2.41	2.414	2.4	2.41	2.39	2.4	2.42	2.4	2.42
	X3	2.43	2.411	2.41	2.41	2.42	2.42	2.43	2.4	2.414	2.4	2.41	2.42	2.42	2.42	2.4	2.39	2.39	2.43	2.41	2.43
	X4	2.441	2.44	2.43	2.43	2.44	2.45	2.45	2.42	2.44	2.44	2.45	2.45	2.45	2.44	2.43	2.43	2.43	2.46	2.44	2.45
TOTAL		9.64	9.62	9.63	9.6	9.64	9.64	9.67	9.56	9.6	9.6	9.62	9.65	9.66	9.63	9.61	9.57	9.59	9.69	9.63	9.69
X(Average)		2.411	2.411	2.41	2.40	2.41	2.41	2.42	2.39	2.40	2.40	2.41	2.41	2.42	2.41	2.40	2.39	2.40	2.42	2.41	2.42
R(Range)		0.05	0.07	0.05	0.07	0.07	0.08	0.07	0.07	0.08	0.08	0.09	0.08	0.07	0.07	0.06	0.07	0.06	0.08	0.06	0.06

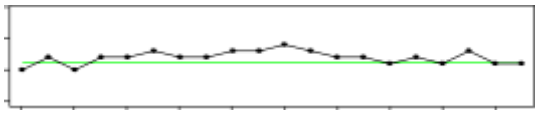




0.00
LC L=01
3 5 7 9 11 13
15 17 19
Sample

Checkedby																		
Remarkby: Chief																		

Section	**PartComp.**	**PartsName**	**SpecificofQuality**	**Tooling**	**Sampling**
FINALINSPECTION		ORING	DIAMETERORING	CALIPERRUBBER	4PCS

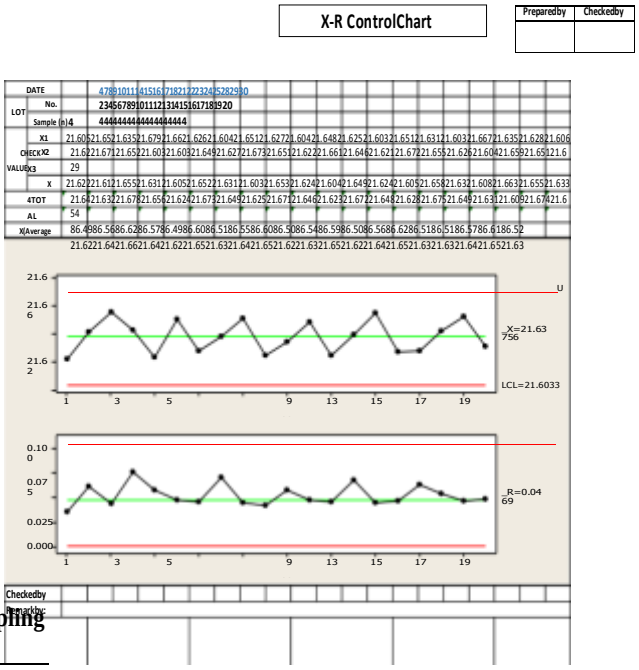


DimensionsofInsideUpperDiameterontheFrontForkwhichcanbe seeninTable8.

Table8:X-RControlChartDimensionInsideUpperDiameter

CheckPoint **Model**:All Type

1. CL **Month**:September2020
2. UCL, LCL



Section	**PartComp.**	**PartsName**	**SpecificofQuality**	**Tooling**	**Sampling**
MACHINING		FORKPIPE	INSIDEUPPERDIAMETER	CALIPER	4PCS

From the results of the X-R Chart, it can be seen that the dataretrieval was carried out 4 times a day for 1 month, showingvery good results. This control can be a reference that theimprovementsmade canrunwell.

4.SUMMARYANDCONCLUSION

FromtheDefine,MeasurementandAnalyzeprocesses,researchers found 2 factors that caused the front fork to leak intheupperarea.Wherethefirstcauseisduetoadefectiveo-ringcondition and the second cause is the minus dimensions of theinnertube.Forthisreason,theresearchercarriedoutanimprovementprocess,namelyforthecauseofthedefecto-ring,control of the use of dies was carried out during the o-ringmanufacturing process and carried out re-socialization for theSOPinthediescleaningprocessafterthepressingprocesswascomplete. And other causes related to the minus inner tubedimensions,improvementsweremadetocontroltoolchangeinthe machining process, and the addition of final inspectioncontrolsforthe resultsofthemachiningprocess.

It is hoped that PT. XYZ will pay more attention and improvethe performance of workers so that it can reduce defects in theproduction process. The need for PT XYZ's involvement andproviding training for employees to be able to participate inimprovingthe sixsigmamethod.

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