



Mechanical and Manufacturing BEng
Plant and Asset Engineering ACMA6007
Assignment 1
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Applicable Words: 2177

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Introduction

The purpose of this report is to highlight key assets within Safran Seats GB (SSGB), which are utilized in the manufacturing process for first, and business class seats. SSGB is currently one of the world's leading manufacturers for bespoke business and first class seats, where they are required to manufacture high-end quality products, for leading airlines within a short time period.

For high precision and short lead-time products, the machinery used to produce these parts are required to be fully functional at all times within any down time kept to a minimum. To keep this from happening maintenance strategies and controls are put in place by the business to try to mitigate any risks, which could occur with the tight schedule. This report will look into these and critically analyse them.

Critical Review of Maintenance Practices

Importance of Asset Management

Asset management is the *“systematic and coordinated activities and practices through which an organization optimally and sustainably manages its assets and asset systems, their associated performance, risks and expenditures over their life cycles for the purpose of achieving its organizational strategic plan.”* (The Institute of Asset Management, 2018). It is critical for businesses to make sure their machinery is maintained not only to prolong the life of the equipment but also to make sure that it is safe to use for the operator.

The company has a legal obligation to make sure that all equipment is safe to use, the company has the duty to maintain work equipment to (The Provision and Use of Work Equipment Regulations, Section 5, 1998) where they have to manage risks from maintenance according to (The Provision and Use of Work Equipment Regulations, Section 22, 1998). Both these build on general duties of section 2 in (Health and Safety at Work, 1974) which requires work equipment to be maintained so that it is safe so work can be undertaken safely.

Trumatic 5000R

Trumatic 5000R or sometimes referred to as TruPunch is a CNC punching machine (Figure 7), which is used within SSGB to manufacture a wide range of sheet metal parts such as seat pans (Figure 4), support brackets (Figure 5) & cable supports (Figure 6). The machine uses a hydraulic drive to punch a tool through material up to 8mm thick. The backlash free drives enable the machine to operate at a very high pace, punching up to 1,600 strokes per minute, full technical sheet can be found in Figure 8.

Sheets of material are loaded on the machine bed where they are positioned up against the stop pins; tools and programme are loaded into the machine to match the job required. The machine runs according the pre-set programme, which has been developed by another department; once the part has been punched out, it goes into a chute where there is a bin ready to catch the cut out parts.

The machine has several safety features incorporated in it to prevent injury; there are three isolation/emergency stop buttons on the machine, one at the operators control panel, laser beam barrier and the isolation switch on the control panel. The use of a laser beam is a necessity for the machine due to the speed and movement of the bed in an open environment.

Current Maintenance

SSGB currently are currently using various different maintenance practices on the traumatic machine to try to prevent it breaking down. Standard Operating Procedures (SOP) (Figure 9, Figure 10, Figure 11, Figure 12 & Figure 13) was created for the trumpf to provide clear-cut directions and instructions for the employees that operated the machine what they were required to do to ensure that tasks are completed consistently and efficiently, and to reduce the risk of errors or omissions.

This SOP highlight in part two the need to complete the 'MU start of shift checklist', which can be seen in Figure 14 & Figure 15, which consists of ten checks for the trumpf machine.

- Visible Elec' Cables Unbroken
- Control Knobs &/OR Control Panel Displays Switches Functional
- Check ALL Waste Material Removed
- ALL Emergency Stops Functional
- Light/interlock Guards Functional
- Check filters are clean and not clogged as per SOP
- Handles and Level Functional
- Check around machines for Oil spills/leaks. Use soak up mats, place/remove/replace as required.
- Lubrication Oil/ Grease/ PTFE – As per POS (Top up if required)
- Aluminium Dressing Table Filter check & clean (Change 3 months after date shown on filter) - As per SOP

All of these checks can be classed as external inspections, which are used to pick up obvious faults, the strength of manual inspection lies in its low cost and simplicity. The issue with this is that inspections are completed with a pass or fail instead of any trending; it is possible that the equipment

may fail at any time before the next inspection, and this could be crucial with safety equipment (Barron, 1996)

A good maintenance practice, which SSGB has evoked, is the identification of critical parts on the Trumatic machine; identifying which components of the machine are critical for the operation and keeping spares of these in case of any emergency maintenance required. This approach to maintenance is often confused with corrective maintenance; its precise definition illustrates the difference between the two.

“Emergency maintenance is the maintenance which it is necessary to put in hand immediately to avoid serious consequences”. (British Standards Institution, 1984).

Emergency maintenance is only suitable in circumstances where unscheduled stoppages cause minimal inconvenience, but where components fail randomly and provide no indication of impending failure this is the only option (Williams, 1994). Looking at the spare part list in Figure 1 these components are known to fail at random times, such as proximity sensors where no monitoring or visual inspection can tell when the part will fail. With the machine being labelled as a ‘*high risk*’ (Figure 16) to the business due to the age of the machine with parts ‘*extremely limited*’ the business has no choice but to stock up on critical parts.

MUS Inventory Critical Spares Items Trump 5000 Punch							
Item Code	Description	UOM	Avail Stock	Stocked	Re-order Lead Time	Section	Sub Section
1480627	Cylinder 9110-42	Each	0.000	FALSE	OEM Overnight	MU	MUS
345714	Proximity Switch 2mm 10	each	1.000	True	OEM Overnight & Sturdy Fluid Power Ex-stock	MU	MUS
145163	O-ring 4X1	Each	10.000	True	OEM Overnight	MU	MUS
94250	Proximity Switch	Each	1.000	True	OEM Overnight	MU	MUS
917997	Receiving ring 9110-40-65	Each	5.000	True	OEM Overnight	MU	MUS
142275	Cylinder D12 d6 H5	Each	0.000	FALSE	OEM Overnight	MU	MUS
353471	Swivel joint M5-6/4 messing	Each	1.000	True	OEM Overnight	MU	MUS
141555	Proximity switch 2mm 10EFFNER	Each	1.000	True	OEM Overnight	MU	MUS
139966	Proximity switch 1 0EFFNER	Each	1.000	True	OEM Overnight	MU	MUS
342525	Energy chain 2795mm	Each	0.000	FALSE	OEM Overnight	MU	MUS
143874	Regulator 6bar 40um	Each	0.000	FALSE	OEM Overnight	MU	MUS
363292	Bearing	Each	5.000	True	OEM Overnight	MU	MUS
956947	Round Nut	Each	5.000	True	OEM Overnight	MU	MUS
955444	Hose	Each	1.000	True	OEM Overnight	MU	MUS
343434	Hose	Each	1.000	True	OEM Overnight	MU	MUS
141554	Switch	Each	1.000	True	OEM Overnight	MU	MUS
369204	Enegery chain	Each	1.000	True	OEM Overnight	MU	MUS

Figure 1 - MUS Inventory Critical Spares Items

SSGB does also take a Planned Preventive maintenance (PPM) approach by outsourcing the maintenance to the supplier of the machine, Trumpf. Figure 2 shows the plan for Manufacturing Unit – Sheet metal (MUS) with the Trumatic 5000R being highlight to have PPM undertaken in May of this year.

EJ	I/H	C = COMPLETE	P = PLANNED	R = Recovery	PPM Maintenance Plan 2023											
DEPT	MU MC#	Company	Machine Type	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
MUM				Mach PPM	Mach PPM	Mach PPM	Mach PPM	Mach PPM	Mach PPM	Mach PPM	Mach PPM	Mach PPM	Mach PPM	Mach PPM	Mach PPM	
MUS																
INT	MUS	BP3	In House	PromeCam RG2512											P	
EXT	MUS	BP2	Trumpf	Trubend 5085					P							
EXT	MUS	PU1	Trumpf	Trumatic 5000R				P								
EXT	MUS	GU1	Avon CNC	Edwards Trucont	C											
EXT	MUS	GU2	Avon CNC	K & B 4-2500									P			
EXT	MUS	SP02	West Country Welding	Techna 82020				P								
EXT	MUS	TIG002	West Country Welding	Esab 4300i AC/DC				P								
EXT	MUS	TIG02	West Country Welding	Esab 4300i AC/DC				P								
EXT	MUS	MIG01	West Country Welding	Esab MAG C170				P								
EXT	MUS	OX101	West Country Welding					P								
EXT	MUS	Roller	Bailiegh	PR413												
EXT	MUS	Pipe Bend	Bailiegh	M250CE												
EXT	MUS	Pipe Bend	Taurang	Delta 50												

Figure 2 - PPM Maintenance Plan 2023

This approach looks to reduce the probability of failure of the machine by changing components before failure is reached but by doing it in a cost-effective way by trying to reduce the down time of the machine in-line with live projects so the impact is minimal. Taking a PPM, approach it will allow for SSGB to order in the parts required (Figure 17) to carry out the maintenance, but by outsourcing, the servicing to a company comes with some risks such as uncontrollable costs and hidden costs, which were unforeseen putting serious pressure on the yearly budget.

Previously this work would have been undertaken by the in-house maintenance department, but as previously mentioned with the machine now deemed as high risk; the business has taken the correct approach to outsource the maintenance. This will allow the maintenance to be carried out by specialists in this type of machinery, which in turn will allow SSGB to concentrate on their own core activities allowing the contractors to deal with tactical elements (Taylor, 2009).

Evaluation of Current Approaches

One of the ways, which the current process could be improved, would be to introduce a better-computerized maintenance management system (CMMS's) the current approach is becoming outdated and confusing system to understand. While conducting research for information for this assignment the author found it difficult to find relevant information about recent breakdowns, work carried out and day-to-day maintenance carried out.

It has become commonly accepted that a large portion of cost is down to maintenance; with companies trying to reduce costs to compete with global competitors, SSGB must be able to track maintenance costs to the asset level (Gober, 2014). To review the breakdown log the author had to review the Requisition (Req) Order log to have any idea of potential breakdowns (Figure 3).

	Purchase		Date		Date		Processed					
Raised b	Rec #	Cost Cent	Raised	Supplier	Process	Order #	By	Spend	Items	M/C		
Rob L	PR-193365	D31350	01/Feb/23	Sturdy		MO-23-0313		£48.50		Trumpf		
Rob L	PR-205781	D31350	28/Mar/23	MLPS				£315.45	Repair to Trumpf punch	Trumpf		
Rob L	PR-205973	D31350	28/Mar/23	MLPS				£452.18	Fit new sensor	Trumpf		

Figure 3 - Req Spreadsheet Tracker 2023

There is a 'Breakdown' Folder in the MU Maintenance section of the company's database but as shown in Figure 18 the documents have not been updated since 2008, I spoke with the maintenance who provided the rest of the information in paper form. This is acceptable but doesn't provide total transparency into the issues with the machine keeping a log of all the issues together on one document can lead to resolution to stop them occurring.

Figure 19 shows the breakdown log from 2004-2008 where clearly shows an issue with the tool being stuck in the punch head occurs four times in a 2-year period, this issue could have been prevented by the business carrying out root cause analysis. After speaking to an operator about this, they fed back information that they overcome this issue by lubricating the sheet metal before the operations started. They found the extra lubrication allowed for the tool head to cut smoother and reduce the damage of the tool leading to reduction of the tool head being stuck.

Another approach the business could take would be to focus on the number of breakdowns within a specified time period and related measures such as mean time between failures (MTBF) and mean time to repair (MTTR). (Wilson, 1999) Looks into how MTBF and MTTR are used to measure equipment achievement and how they relate to objectives such as functional performance and process capability. Thorough analysis of these two elements enables the maintenance function to improve equipment's availability by either increasing the MTBF or reducing the MTTR.

(Zineb, 2019) Looks into how these two factors (MTBF & MTTR) can be introduced into petri nets, to try to improve on the effectiveness of preventive maintenance plan. In their findings, they were able to increase the machines' availability and the overall equipment effectiveness (OEE). There is issues with using these data points to plan maintenance, one issue MTBF is that it is a single data point, when breakdowns occur on a timeline. This meaning that if a problem was to occur after an initial repair could distort the MTBF by registering as many smaller downtime instances over a shorter period.

Costs and Resources

With the proposed changes there would not be too much of an impact to the business if it were to adopt this change early on. What is meant by this is that in the next few months a new PLM system is being introduced into SSGB, Wind Chill is being rolled out throughout the business to help deal with data management in the business. The business could look introduce a package to complement this such as eWorkOrders CMMS or eMaint where these software packages can be used to track the complete lifecycle of each asset, assign work orders, and manage vendor relationships.

These packages vary in cost starting from \$69 up \$120 depending on company size and usage (eMaint, 2023), with the size of the company and equipment required to track the best packages would be the enterprise package. As with any change within business, there needs to be a cultural preparation where the employees buy into the idea of change and believe it the long-term outcome. This culture change has already begun with all departments in the business having One PLM training courses provided to them to get them ready for Wind chill.

Conclusion

In this report the findings we found in SSGB is that there is many procedures in place to try to maintain the machines as much as possible. The SOP's in place are to keep commonality between different operators and make sure the machines are being used in the correct manor. The inclusion of checks on the oil, electrical cables and filters all help to make sure the machine is fit to be operated, with a clear PPM put in place for the year gives time and clarity to the rest the business of machine availability.

Short terms recommendations would be start to convert all paper copies of maintenance reports, quotes and information on to the database to give clear visibility of issues which the machine has experienced to try to understand best way to avoid these.

Medium term recommendations would introduce a new software system where MTTR & MTFB can be used to help plan maintenance activities and drive any decisions when it comes to planned services with outside companies coming in to complete the work. With the new wind chill system due to come into the business around June 2023 would be ideal for the business to follow it up with another package, which works in unison with wind chill.

Long-term recommendations would be potentially look to upgrade the machinery with in the factory, as highlighted in Figure 16 the punch machine is now listed as a high risk, with parts limited due to technology going obsolete. With this machine, being the only CNC punch in the business, any down time can have a catastrophic effect on production; it could lead to backlogs with working having to be outsourced to try to meet tight deadlines.

Bibliography

Barron, R., 1996. *Engineering Condition Monitoring*. New York: Addison Wesley Longman Inc..

British Standards Institution, 1984. *BS 3811 British Standard Glossary of Maintenance Management Terms in Terotechnology*. London: BSI.

eMaint, 2023. *eMaint CMMS pricing and plans*. [Online]
 Available at: <https://www.emaint.com/>
 [Accessed 1 April 2023].

Gober, T. A., 2014. Computerized Planning and Scheduling. In: Eighth, ed. *Maintenance Engineering Handbook*. s.l.:McGraw-Hill, pp. 235-247.

Health and Safety at Work (1974) Legislation Government .

Taylor, C., 2009. Outsourcing. In: Fourth, ed. *Facilities Management*. Oxford: Elsevier Ltd., pp. 256-273.

The Institute of Asset Management, 2018. *Asset Management*. London: British Standards Institution.

The Provision and Use of Work Equipment Regulations, Section 22 (1998) Legislation Government.

The Provision and Use of Work Equipment Regulations, Section 5 (1998) Legislation Government.

TRUMPF, 2023. *TruPunch 5000*. [Online]
 Available at: https://www.trumpf.com/en_INT/products/machines-systems/punching-machines/trupunch-5000/
 [Accessed 24 March 2023].

Williams, J. H., 1994. *Condition Based Maintenance and Machine Diagnostics*. 1st ed. London: Chapman & Hall.

Wilson, A., 1999. *A Guide to Developing Strategy & Improving Performance*. s.l.:Conference Communication.

Zineb, A., 2019. Impact of Improving Machines' Availability Using Stochastic Petri Nets on the Overall Equipment Effectiveness. In: 1st, ed. *Maintenance Management*. s.l.:IntechOpen.

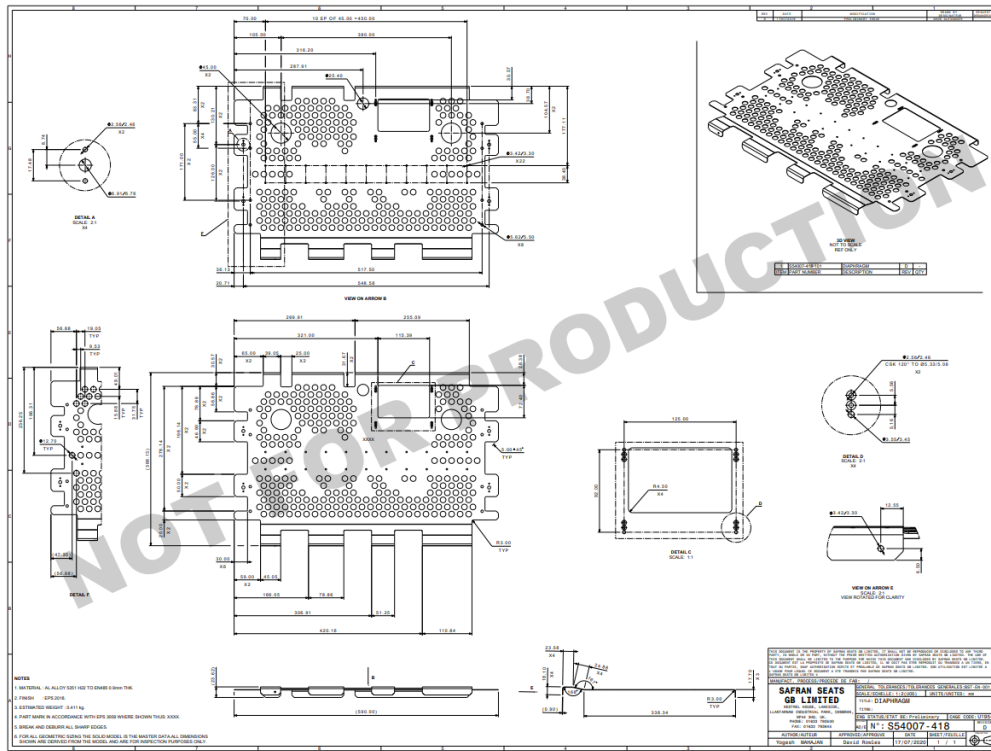


Figure 4 - Seat Pan Drawing

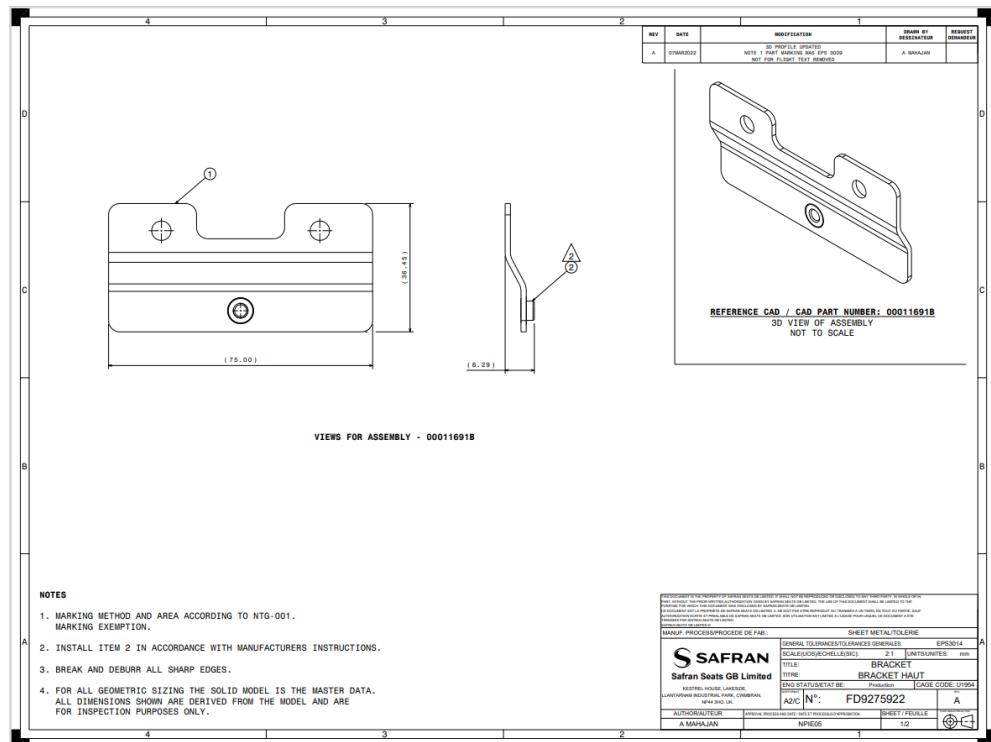


Figure 5 - Support Bracket

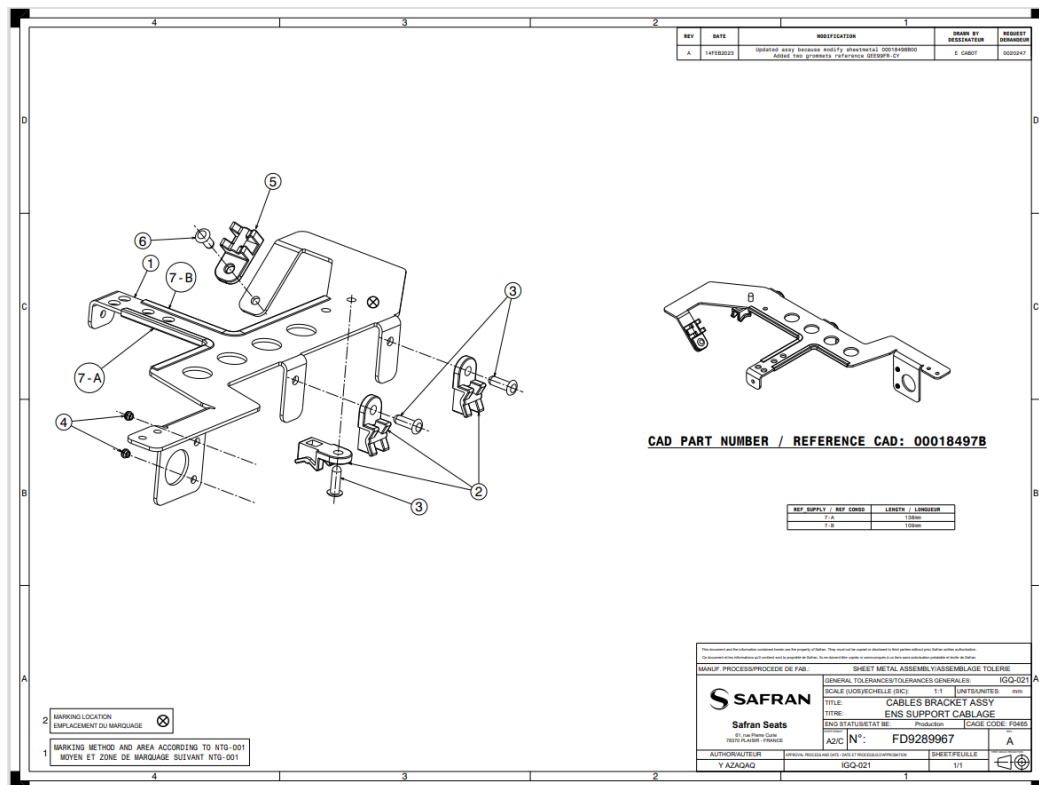


Figure 6 - Cable Supports



Figure 7 - Trumatic 5000R

	TruPunch 5000 large format	TruPunch 5000 medium format
DIMENSIONS		
WIDTH	7610 mm ¹	257.480 in ¹
DEPTH	8171 mm ¹	291.142 in ¹
HEIGHT	2072 mm ¹	81.575 in ¹
MAXIMUM STROKE RATE		
PUNCHING (E = 1 MM)	1350 1/min	1600 1/min
MARKING	3000 1/min	3000 1/min
WORKING RANGE		
PUNCHING MODE, X AXIS	3050 mm	2500 mm
PUNCHING MODE, Y AXIS	1550 mm	1250 mm
MAXIMUM SHEET THICKNESS	8 mm	8 mm
MAXIMUM WORKPIECE WEIGHT	280 kg	200 kg
MAXIMUM PUNCHING FORCE	220 kN	220 kN
TOOLS		
MULTITool TOOL CHANGING TIME	0.3 s	0.3 s
NUMBER OF TOOLS/CLAMPS	21 pieces / 4 pieces	18 pieces / 3 pieces
PART REMOVAL		
MAXIMUM PART SIZE, PART REMOVAL FLAP, PUNCHING	500 mm x 500 mm	500 mm x 500 mm
MAXIMUM PART SIZE, FIXED CHUTE, PUNCHING (WITH MOVING TABLE)	80 mm x 50 mm	80 mm x 50 mm
CONSUMPTION VALUES		
AVERAGE POWER INPUT OF ACTIVE AUTO-SHUTDOWN	0.5 kW	0.5 kW
AVERAGE POWER INPUT IN PRODUCTION	9.5 kW	9.5 kW

Figure 8 - TruPunch 5000 Technical Sheet (TRUMPF, 2023)



STANDARD OPERATING PROCEDURE

Document Number: 0238

Revision: 001

Trumatic 5000R (General Guide Line)



	Acceptance	Date
Author	B Budhathoki	26/04/2018
Manufacturing Engineer	B Budhathoki	26/04/2018
Quality Engineering	Gary BaronDuff	26/04/2018

Figure 9 - SOP Front cover

[illegible]

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Forms should always be printed from the 'S' Drive to ensure that the correct issue is used.

1

Figure 10 - SOP Header sheet

	Process	Trumatic 5000R (General Guide Line)	Written By Manufacturing Eng.	B Budhathoki B Budhathoki	Document No:	0238
			Quality Engineer	Gary Baron/Duff	Revision:	001
					Page No:	3 of 5

Safety Protection Required					

#	Major Step	Key Point	Key Point Reason	Step Symbol Application	Time
1	DO NOT OPERATE MACHINE UNLESS YOU HAD ADEQUATE TRAINING AND ARE AUTHORISED TO SO	ONLY PERSONNEL NAMED ON TRAINING MATRIX ARE AUTHORISED TO RUN THE MACHINE	YOUR HEALTH & SAFETY		
2	Complete start of shift check sheet OEMM02/F07	* Check hydraulic oil level * Coolant- top up if necessary. * Clean filters as required.	Part of daily TPM		
3	Images showing gauges and Vacuum filter.	If gauge indicate that hydraulic oil are below min level inform senior operator/ team leader to raise agility call with maintenance.	Clogged up Vacuum filter/ "due to swarf build" restricts punched out metal/ slugs fall freely through die.		

Step 1	Step 2	Step 3
		HYDRAULIC OIL COOLANT RESERVOIR VACUUM FILTER

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1

Figure 11 - SOP Sheet Three

C2 - Confidential

SAFRAN		Process	Trumatic 5000R (General Guide Line)	Written By B Budhathoki	Document No: 0238
				Manufacturing Eng. B Budhathoki	Revision: 001
				Quality Engineer Gary BaronDuff	Page No: 4 of 5

Safety Protection Required						Safety	Ergonomic	Quality	Knack	Environment

#	Major Step	Key Point	Key Point Reason	Step Symbol Application	Time
4	*Inspect tooling/ multitool *Refer to "Quick guide" Trupunch 5000	Check condition of tools- if worn or blunt sharpen tool (!!know limit for regrind length of tool)/ if below minimum height- replace with new tooling.	Tool maintenance.		
5	Emergency stops.	Machine can be isolated by pressing E-stop on control panel or breaking light barrier.	Health and Safety		
6	Machine start up	If the machine has previously been shut down, switch machine back on by turning isolator to up right position "1".			
7	Machine setup/ tooling	* Select programme (Nest number) on the control unit. *Load tools/ clamp on assigned rail position.	Ensure machine is safe to run prior to running the M/C. No object/ personnel are inside light barrier		

Step 4	Step 5	Step 6	Step 7

BIP07/F01 Iss 01

Forms should always be printed from the 'S' Drive to ensure that the correct issue is used.

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Figure 12 - SOP Sheet Four

C2 - Confidential

SAFRAN		Process	Trumatic 5000R (General Guide Line)	Written By B Budhathoki	Document No: 0238
				Manufacturing Eng. B Budhathoki	Revision: 001
				Quality Engineer Gary BaronDuff	Page No: 5 of 5

Safety Protection Required						Safety	Ergonomic	Quality	Knack	Environment

#	Major Step	Key Point	Key Point Reason	Step Symbol Application	Time
8	Load sheet into bed, and locate at clamps/ stop pin.	Follow correct procedure when lifting sheet (always check your surrounding). If heavier gauge sheet are used ask for assistance.	Do not try to lift heavy gauge by yourself.		
9	Part stuck on head/ chute?- Use correct tooling to remove part.	If you encounter parts that are not removed through chute/ or by stop command. And are concerned about particular tooling/ machining method report by login on "Trumpf Error form" located under control unit. Tool breakage should also be reported on this form for replacement.	Programming will be reviewed to improve process.		
10	Removal of sheet- bed is at unload position.	Once punching sequence have been completed. Dispose off skeleton on waste rack.	Larger sheet can be cut into smaller section by running "Large Slit Prg".		

Step 8	Step 9	Step 10

BIP07/F01 Iss 01

Forms should always be printed from the 'S' Drive to ensure that the correct issue is used.

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Figure 13 - SOP Sheet Five

Figure 14 - MU Start of Shift Checklist Sheet 1

		MUM / MUS / YAC / CMP	VAC & CMP	MUM Only	MUS Only	CMP Only	Surtech / Phosphoric Anodise Plant	
		Light/Network Guards Functional Check Filter air clean and not clogged - As per PDS Handle and Levers Functional Check around machines for Oil spills/leaks, like seal up mats, place/remove replace as required Lubrication Oil (Grease / PTFE - As per PDS (Top up if Required)) Check extractor bit level Check extractor shaker is functioning Remove and clean filter on vacuum pump Check condition of extraction line from dust head on machine / bench Coolant - As per PDS (Top up if Required) Aluminium Dressing Table Filter check as per Change 3 points after date shown on MUM - As per PDS Check condition of Tool 2 & Tool 6 (even if changed last time) Check condition of X & Y axis pinions Check condition of X & Y axis racks Roller and filter on table & outside fan (main control panel) Check All Tank Levels are Correct Check No Leaks Visible in Area Check Emergency Personal Safety Shower is Functional Check Pressure Control Panel Status Check All Flow Valves & Manips Functioning Correctly Check All Extraction On And Functioning Check tank temperature (Cabinet & Decolouriser) Check All Tanks Are Agitated Generate Stamp Number or Check Number						
Sunday								
	Morning							
	Afternoon							
	Night							
Monday								
	Morning							
	Afternoon							
	Night							
Tuesday								
	Morning							
	Afternoon							
	Night							
Wednesday								
	Morning							
	Afternoon							
	Night							
Thursday								
	Morning							
	Afternoon							
	Night							
Friday								
	Morning							
	Afternoon							
	Night							
Saturday								
	Morning							
	Afternoon							
	Night							

Comments are only to pass on information and not recording of faults!

Figure 15 - MU Start of Shift Checklist Sheet 2

Business Risk				
LOW	MEDIUM	HIGH		
Age Yrs	Machine	Dept	Type	Comments
28.7	BP3	MUS	Pressbrak	Technology obsolete, parts extremely limited
7.5	BP2	MUS	Pressbrake	
19.4	PU1	MUS	Punch	Technology obsolete, parts extremely limited
19.4	GU1	MUS	Guilotine r	Technology obsolete, parts extremely limited
19.4	GU2	MUS	Guilotine r	Technology obsolete, parts extremely limited
2.2	SP02	MUS	Spot Weld	OK
6.1	TIG002	MUS	Tig Set	OK
5.4	TIG02	MUS	Tig Set	OK
5.4	MIG01	MUS	Mig Set	OK
5.4	OXI01	MUS	Oxy Set	OK
6.1	Roller	MUS	Manual Fo	OK
6.1	Pipe Bend	MUS	Manual Rd	OK
6.1	Pipe Bend	MUS	CNC 2 Ax	OK
6.1	Linisher	MUS	Manual	OK
6.1	Linisher	MUS	Manual	OK
6.1	Grinder	MUS	Manual	OK

Figure 16 - MU Business Risk on Machinery

Service Consumables Order Form TC5000R				
Company			Contact	
Fax Number			Order Number	
Please complete the Quantity you require in the Quantity Required Box. The number in the Quantity Box is per machine. If you have more than one machine of the Type stated at the top of this form please adjust the quantity you require accordingly and Fax this form back to Trumpf Ltd on 01582 399260				
Part Number.	Description.	Quantity Per Machine	Price Each	Quantity Required
357079	Nalco 2513 125ml	1	£104.84	1
344670	Nalco 2594 125ml	1	£107.84	1
146881	Battery plug in unit	1	£171.94	1
143467 *	Buffer Battery	1	£22.65	1
145400	De-min Water	50litres	£21.00	Use Own Stock
034874	V-Ring	1	£2.38	1
045002	Foamed Material	2	£10.90	2
149230	Filter Mat 170x170	4	£2.51	4
142023	VLP Accumulator	2	£56.47	2
349866	Hydraulic Filter 150 ltr	1	£319.98	1

* Required every 3 years

** Either will be required dependent on original type fitted.

Figure 17 - Service Consumables Order Form

SGB Cwmbran Shared (S:) > MU Maintenance > Breakdown Log

Name	Date modified	Type	Size
Restored File	09/03/2015 21:46	File folder	
BREAKDOWN REPORTING PROCEDURE	21/09/2007 10:16	Microsoft Word 97...	48 KB
BREAKDOWN RF	02/02/2021 14:50	Microsoft Excel 97...	10,339 KB
Machine Shop Breakdowns	09/10/2008 17:55	Microsoft Excel 97...	2,114 KB
Mazak breakdowns	26/10/2006 08:46	Microsoft Excel 97...	17 KB
MU Bdowns Service Process	29/04/2008 18:04	Microsoft Word 97...	43 KB
Saw Breakdowns	02/05/2008 12:46	Microsoft Excel 97...	63 KB
Sheet Metal Breakdowns	27/01/2009 16:03	Microsoft Excel 97...	311 KB
Vac Form Breakdowns	11/03/2008 12:07	Microsoft Excel 97...	81 KB

Figure 18 - Breakdown Log

	TRUMPF	TRUMATIC 5000R	
	SERIAL No. A0060 A0179		
Date	Problem	Corrective Action	Tech
	Clamp ring seal U/S	Replaced	
	Clamp ring seal U/S	Replaced	
	Clamp ring seal U/S	Replaced	
	Hydraulic leak	Replaced tubing to sheet clamp	
		Recharged hydraulic system	
	Tool stuck in punch head	Stripped tool holder OK	
24-Oct-04	Tool clamping ring broken	Renewed	KL
23-Sep-05	Tool changer not working	Proximity replaced sourced Trumpf	KL/JE
10/2005	Service		ENG
13-Oct-05	Tool not changing	Lazer positioning reflector replaced	NG
16-Oct-05	Head alignment	Re-align	ENG
18-Oct-05	Noise head		ENG
19-Oct-05	Hose split 18/10/05	Replaced (Acorn Fluid supplied hose)	KL
26-Jan-06	Oil leak	No.2 plate clamp leaking	
		New joint made dowty seal replaced	KL
31-Mar-06	Hydraulic leak	Replaced tubing to sheet clamp	
2-May-06	Tool stuck in head	Stripped head to release tool and replaced seal ring	
12-May-06	Catenery track came apart	Reassembled OK	
30-Jul-06	Clamp ring seal U/S	Replaced	
31-Jul-06	Turret alarm	Oiler refilled (EP480)	
9-Aug-06	Light barrier U/S	Reset M/c OK	
15-Aug-06	Tool stuck in head	Stripped head to release tool and replaced seal ring	
11-Sep-06		Energy chain replaced	
20-Sep-06	Machine failure	Air pressure adj to 2.5bar	
27-Sep-06		Multi tool repaired	
10-Oct-06	Tool stuck in head	Stripped head to release tool and replaced seal ring	
8-Nov-06		"2x hydraulic accumulators replaced	
		Tilting shute repaired	
		Oil cooler filter cleaned	
		Linear slides lubricated	
6-Feb-07	M/c jammed	Parts shute repaired	
8-Feb-07	M/c jammed	Parts shute repaired	
18-Feb-08	Vacuum waste shute leaking	Flap fractured, removed, repaired refitted	

Figure 19 - Trumatic 5000R Breakdown Log