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## Machine Improvement For Machining Half Shaft (fixture)

Milind Balasahbh Jadhav<sup>1</sup>, Shubham Pramod Saraf<sup>2</sup>, Rohit Sanjay. Aher<sup>3</sup>,  
Shubham Mohan Hagawane<sup>4</sup>, Neeraj Anil Kukreja<sup>5</sup>

<sup>1,2,3,4,5</sup> Mechanical Engineering Department, Guru Gobind Singh Polytechnic, Nashik, Maharashtra, India

**ABSTRACT-** The yoke shaft is machined on SPM machine. The half shaft can be machined on same SPM machine by improving certain elementary parts. Before our project, this machine is employed for machining of yoke shaft (20-RY-1788202). But customer also require the machining of half shaft (17-NY-1768202) which is similar to construction of yoke shaft. The half shaft had smaller diameter and longer linear length that of yoke shaft.

**Keywords-** Interchangeability, Special Purpose Machine, Facing, Centering, Changeover, Half Shaft, Yoke Shaft.

### I. INTRODUCTION

The half shaft can be machined on same SPM machine by improving certain elementary in lotus engineering works satpur, a special purpose (SPM) machine for facing centerings used. On this machine yoke shaft is machined. This machine is only employed for machining of yoke shaft (17NY1768202). Customer also required the machining of half shaft (17NY1768202) which is similar to construction of yoke shaft. The half shaft has similar diameter and longer linear length that of yoke shaft. Part of machine by studying the dimensions. And design of half shaft and by this data designing new part like centres, stoppers, stopper sensors, v-block. The changeover between yoke shaft standard setting to half shaft settings which consumes time may cause loss in machining hours. To overcome this too, parts of half setting should be designed in such way that changeover will consume less time. This will be done under the technique of single minute exchange of dies.

### I. OBJECTIVE

1. To increase production rate.
2. To increase accuracy and making easy production of machining half shaft.
3. To provide interchangeability.

### II. REVIEW

SPM (Special Purpose Machine) 100 machine for cantering and facing has two facing heads and 2 cantering heads. The both are mounted on both sides of main table slide. The process of drilling is carried out by d20 process of drilling. Hydraulic cylinder is utilized for purpose of movement of main slide job clamping is done by hydraulic system along with drilling slide operation rapid as well as feed cycle moves forward. The special purpose machine can be used for machining of yoke shaft unto 70 to 150mm diameter and 700 to 1800mm of length the spm is manufactured by sai shrddha engineering works. The spm machine for centering and facing can be used only for machining of yoke shaft the machine cannot be utilized for any other machining purpose without modifications according to specifications. The machining of yoke shaft takes 5 minutes and 53 seconds.

### III. S.P.M. (Special Purpose Machine)

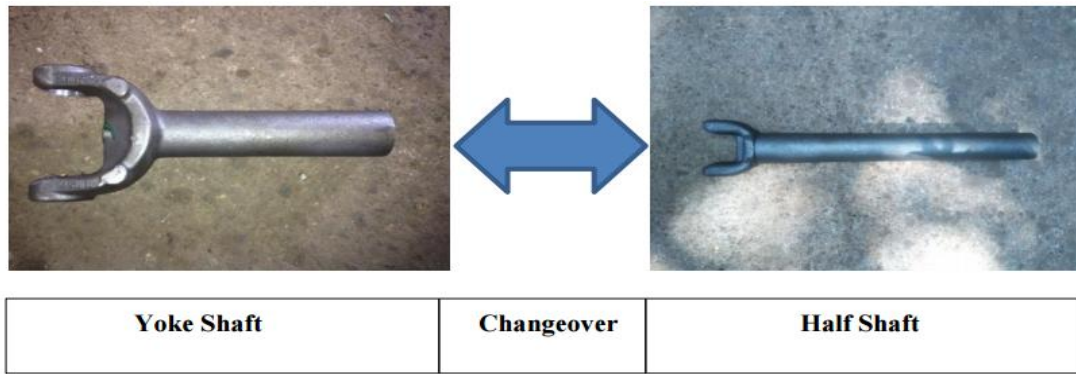
\*ZONE: ZONE01

\*MACHINE: SPM

\*PROCESS: yoke shaft facing & centering

\*Why this machine & process?

*\*This machine is industrial bottle neck, which machines only yoke shaft*




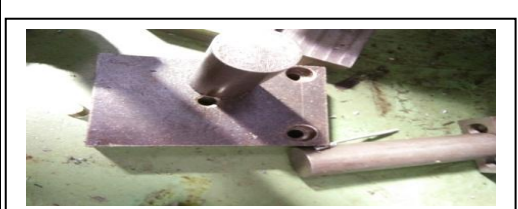
Special purpose machine

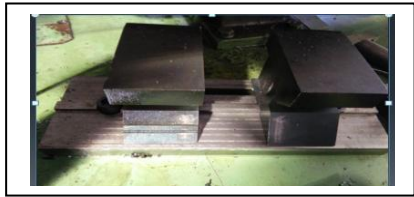




Figure – 1

#### IV. COMPONENTS

- The parts which we are manufactured for machining of half shaft are as follows:

Sr no.	Part Name	Pictures	Qty.
1.	Stopper Sensor		2
2.	Stopper		2

3.	Holder		2
4.	V-Block		1
5.	Centers		2

### V. WORKING

In lotus engineering works only yoke shaft of different sizes are machine (Facing and centering operations) on Special Purpose Machine (S.P.M.). For yoke shaft we use the fixture parts of matching dimensions, but industry have requirement of machining half shaft. When we use above parts, we can easily machine half shaft. The process is only remove the yoke shaft fixture setting parts and replace it by above elementary parts for machining of half shaft . The setup time for replacing these parts is only about 10-12 minutes.

### VI. DESIGN

**Total Costing Table**

Cl.No.	Total Costing Table											Total Amount Ix D		
	A	B	C	D	E	F	G			H			I	
	Part Name	Sub Part Name	Size (with xtra 5mm)	Quantity	Weight in Kg/part	Material cost-M.S. 65Rs/Kg	Machining time in Minutes			Machining Rate in Rs/hr			Amount (Single Part)	
Sr.No.							Lathe	Mill.	DRO.	120	150	240	F+G+H	J
1	Stop Sensor-A	Block	60x28x28	1	0.369	24		90	10		225	40	289	289
		Cylinder	R-12.5,H-97	1	0.373	25	30		10	60		40	125	125
2	Stop Sensor-B	Block	60x27x22	1	0.27	18		90	10		225	40	283	283
		Cylinder	R-12.5,H-46	1	0.177	12	30		10	60		40	112	112
3	Stopper	Block	95x75x30	2	1.677	109		120	10		300	40	449	898
		Cylinder	R-12.5,H-60	2	0.231	15	35		10	70		40	125	250
4	Holder	Block	107x54x30	1	1.36	89		120	10		300	40	429	858
5	V-Block	Block	260x107x103	1	22.49	1462	WCEDM-480		10	WCEDM-600/hr=4800		40	6302	6302
<b>Total Cost</b>													<b>9117.00</b>	

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