

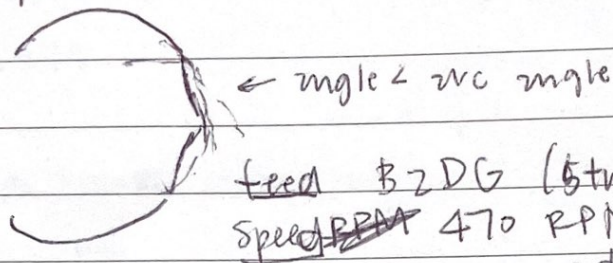
~~SP 24~~ 24-3A05  
Spherical Joint Inserts

8/20/24

Purpose: extend rotational range

Annoying: angle of diagonal

- squint <sup>tool post</sup> to tailstock



- compound to 90° (only <sup>adjust</sup> change compound)  
~ 90°-23° good for roughing

Steps ★ check tool height! ★ remove compound  
brnds in 800 RPM, 1 feed  
bzecksh

1) turn to OD <sup>RT tool</sup> ★ gentle touch-off

~~2) heavy tool plunge to 0.375?~~

3) ~~add~~ <sup>center</sup> 5° to get angle and go to 0.375 ~~again~~

4) turn down right side boss (pliers) <sup>go to about 20 thou less than (0.29) max</sup>

5) drill w/ carbide 1/4" (no need ~~to~~ to center drill) <sup>3</sup>

→ split point (cutting edge goes int into center)

→ ~~center drill needed~~ → 525 RPM → coolant down flute (orient so gravity brings coolant thru flute)

→ peck light <sup>at first</sup> → clear chips

→ to zero, eyeball point to edge

→ lock Z-axis

→ peck plunge

→ coolant!

→ go slow

→ increase RPM near end and have smooth coolant

→ ~~leave~~ increase RPM more

→ leave tool in valley for while to reduce chatter

- part-off 80 to 115 RPM in increments

→ ~~go~~ slow! otherwise burn tool!

→ at ~~0.505~~ 0.85" (account for tool width)

ream 250 RPM  
check shoulder  
bit fit

measure at 0.640  
- slow X out to prevent burr  
- 1st pass go to 0.305  
- deburr - test fit

↓  
Keep going if needed

int: 0.750"  $\rightarrow$  0.736 - .002

1" stick-out

0.7421

0.7491

$\rightarrow$  3 thou off file

0.7358

~~0.7438~~  
~~0.7410~~

1st pass

0.7400

$\rightarrow$  8 thou ~~of~~ depth of cut turn

$\rightarrow$  set  $\phi$  before turning

$\rightarrow$  measure after and ~~add/subt~~ <sup>2d just</sup> DPO accordingly

$\rightarrow$  go to ~~0.83 Z~~ <sup>0.95 Z</sup>  $\sim (0.695 + 0.125)$

0.7441

0.7398

0.7357

2nd pass

- turn down to 0.625

0.7357

- 0.625

0.1107

30 thou passes

~~0.7357~~

0.7357

~~0.7330~~

~~0.7057~~

~~0.7100~~

~~0.7300~~

~~0.6757~~

~~0.6800~~

go to Z 0.29

~~0.7270~~

~~0.6457~~

~~0.6500~~

~~0.7240~~

~~0.6400~~

0.6400

~~0.7210~~

~~0.6400~~

STOP!

~~0.7180~~

~~0.7150~~

~~0.7120~~

~~0.7300~~

3/22/24

~~0.7090~~

~~0.6800~~

fix angle

~~0.7060~~

~~0.6700~~

(doesn't

~~0.7030~~

0.6500

fit

0.6400

over)

turning  
 # 60 thou passes  
 left side ~~right~~ yoke side  
 File 0.4065 12 thou pass

3/23/24

0.3970

~~0.3970~~ 0.3860

0.3824

turn

① 0.74 0.7400  
~~0.68~~ 0.6800 0.6736  
~~0.62~~ 0.6200  
~~0.56~~ 0.5600  
~~0.50~~ 0.5000  
~~0.44~~ 0.4400  
 0.4380 0.4389

turn 0.3822 (Mr intermu)

turn ~~0.7374~~ 0.7365 0.7363  
 0.4995  
 0.7366 0.4503  
 0.4988 0.4388  
 0.4502  
 0.4390

0.7366 0.7364  
 0.4997 0.4987  
 0.4389 0.4500  
~~0.4504~~ 0.4388

24-3A05

Spherical Joint Inserts (Upright) Sprues

4/17/24

Steps

- 1) face (600 RPM)
- 2) turn to OD (~~to max~~) (470 RPM) PD26
- 3) angle (5.32°) (390-490 RPM increment)
- 4) turn to base OD (.625) to  $\pm .29$  (20 thou < max  $\pm$ )
- 5) part-off (80-115 increments)
- 6) turn to Smallest OD
- 7) drill (hot split-point so center drill small divot then peck w/ lots of coolant) 525 RPM (600 RPM actually)

OD	Smallest OD	to <del>± .29</del> <sup>.20</sup>	angle base length
.7493	.7359		.3939
.7416	.7100		.3822
.7361	.6800		
.7359	.6500		
	.6250	.6249	

angle	Smallest OD (438)
.6483	.7359
<del>.6200</del>	.70
.6257	.65
.6244	.6
	.55
	.5
	.45
	.438

OD	Smallest OD	to <del>± .29</del> <sup>.20</sup>	angle base length
.742	.6405		
.736	.6244 (no lock!)		
	.624	.3129	