ASSEMBLY NOTES
MACHINE No 5
MIT

PATERSON INSTRUMENTS
CANBERRA.
This is our spec: 230.100/230.060

Measured 2/2/95 & 6/3/95:

Before final presurizing (prelim runs to ~300 kPa, maybe 500):

<table>
<thead>
<tr>
<th></th>
<th>Top</th>
<th>Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>65.068</td>
<td>65.062</td>
</tr>
<tr>
<td>After</td>
<td>65.081</td>
<td>65.084</td>
</tr>
<tr>
<td>780 kPa</td>
<td></td>
<td>+0.013</td>
</tr>
<tr>
<td></td>
<td>+0.022</td>
<td></td>
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</tbody>
</table>
Pressure vessel no. 5

<table>
<thead>
<tr>
<th></th>
<th>Top</th>
<th>Bottom</th>
</tr>
</thead>
<tbody>
<tr>
<td>OD</td>
<td>230.110</td>
<td>230.115</td>
</tr>
<tr>
<td>End boss</td>
<td>67.001</td>
<td>67.025</td>
</tr>
<tr>
<td>Central bore</td>
<td>65.055</td>
<td>65.056</td>
</tr>
<tr>
<td>Larger end boss</td>
<td>145.009</td>
<td></td>
</tr>
</tbody>
</table>

The M16 thread on the pressure connection is slightly loose (bit more than in no. 4) but this can be corrected for in making the gland nut.

Pressure vessel sleeve measured to be 230.010 OD to 229.992 ID.

So max interference = 0.123 (at top)  
add \( \frac{0.100}{0.223} \) clearance

\[
\text{Needs } \frac{0.223}{12.10^{-6} \cdot 230} = 81.1 \text{ K}
\]

\[
+ 25 \text{ room temp}
\]
\[
+ 100 \text{ superheat}
\]

\[
-159.758 = 206
\]

So 200°C should be OK.
Oil cylinder  130.013  bottom

Oil piston  129.940  top
  129.935  bottom

Gas piston  40.960  parallel

Intensif Caroyl:  ID  41.008  top
  41.010  bottom
  OD  160.074  top
  160.060  bottom.

30/9/83

Gasoyl also recorded as 160.078  bottom
  160.066  top.

Gasoyl sleeve after remachining
  ID  159.953
  965
  970

Max interference  =  160.086 - 159.953
  =  0.133

Add
  0.1
  0.233  clearance

Needs  0.233
  12.10  .160  =  121 K
  +  .25  room temp
  + 100  superheat

240°C should be 246°C

OK.
Checking of actuator parts B:

Pain body 2401:
- Box for ball screw cap 80.017 to 80.044
  Top
  Bottom
- Box for thrust bearing seat 149.986
  (under size: should be ~0.020 larger)

Ball screw cap 2402:
- (No:2)
  OD φ 79.975 to 79.985 — out of round
  ID φ 44.024 to 44.047 (over size at one end)

Ball screw nut housing 2404
- ID φ 71.992 to 72.007 (a bit on low side)
  Upper limit on ball nut is -030+9 or -010 gb.
- OD of thrust lug: 100.002 upper) within 100.005 lower tolerance

Register for Harmonic drive 26.98 — OK.

Yarn body 2405:
- Thrust lug location 149.990 — 010 under size
- Harmonic drive register 68.932 — OK
- Bottom cap
- Connector plate register 107.982-109.991
  ie 0.018 to 0.009 under size
Bottom cap 2407
Register to body 109.96 OK

for key housing 60.018 upper
60.015 lower OK.

Bearing housing 2408
-16: OD 60.020 oversize
   ID 32.012 OK
-17: OD 60.027 oversize
   ID 32.009 OK.
SWP-20K Load Cell (B)

63.460

Eccentricity 0.015

Parallel to 0.000

152.120

Bob Watergard machined face of base to be flat. Now

OD = 152.120

Boss D = 63.460

On 2410, recheck dimension = 63.470, 63.489

On 2104, recheck dimension = 152.134, 152.159
P.V. Top Closure Plug

ACCEPT.

I.D. (Small) Ø 30.014 (DWG 30.000 - 30.021)

I.D. (Large) Ø 35.65 (DWG 35.650 - 35.700)

O.D. Ø 66.983 (DWG 66.970 - 66.990)

Thickness. 35.03mm (DWG 35 nom)

FEED THROUGH'S NEED POLISHING.
ALL OTHER DIMENSIONS ARE WITHIN Specs.

MIT & ETH. PLUGS RETURNED FOR RE-WORKING OF FEED-THROUGH Holes.

RETURNED 18/4/94!
Earlier measurements on plug gage:

- Over load cell piston hole = 30.010 30.017
- Comp. piston = 42.425 30.047

Thickness = 39.08 mm (4.0632 in.)

Keep tolerances and finish within spec.

Mix & try inconel insert

For re-marking of feed - throughput.
The load cell body was picking up a bit in bottom plug.
Bore of load cell guide honed out a bit in bottom plug.

Chucked piston diameters:
Load cell piston: 29.960

Comp. piston = 42.370
29.960

Honed 5 pm out of bore for load cell piston & honed out load cell guide a bit.
No clearances now:
Load cell 30φ piston: 0.062
Comp. 42φ " " 0.055
" 30φ " " 0.087
Machine in Boston when I arrived

30/3/95

Unloaded in morning & stood up downstairs using fork lift & A-frame. Upstairs in left & into place by lunchtime. Connecting up in afternoon.

Put 10 amp SB fuses in two fuses holders. The power is ±110 V, ie when one side goes to +110 V the other side goes to -110 V, so there is no neutral.

Problems:
1. Case of main housing sl. damaged.
2. Some rust, esp on pressure vessel support.
3. Oil obtained for interphase much more viscous than Teller 012.
4. Screws for end plates missing.
5. Springs sent inadvertently.
6. Need a bigger cut-out on R/F end plate? & a bottom cut-out for power cable on C/H end plate.
7. Many small screws shaken out of furnace power & THC connections & THC support arm.
8. Support screws on cradle had shaken loose.
THE REMAINING PAGES
IN THIS NOTEBOOK
ARE BLANK