

Caterpillar C13 Test Criteria

500 hour – Steady State Test Cycle with CCV

Test Pass/Fail Criteria:

1. No Loss of Oil Consumption Control
<50% or lower? (based on average of EOT vs SOT)
2. Last 150 hours stable Oil Consumption
3. No stuck rings/Loss of ring side clearance
4. CCV pass/fail to be assessed



Caterpillar C13 Test Status

Status Test Development:

- 1) Test Cycle Completed
- 2) C13 Test engines installed – 13
- 3) C13 Test engines provided to date - 13
- 4) CCV Pseudo system defined and being tested



Caterpillar C13 Test Status

Status Hardware:

- 1) Close tolerance Production Liners, Piston and rings supplied to all labs
 - Initial Oil Consumption studies on-going
- 2) Low reference Ref Oil supplied to all labs
- 3) Three Potential High reference oils being assessed
- 4) Complete test by end Nov '04



Caterpillar C13 Test Update

3 more C13 tests running – two Low Ref and 1
Potential High Ref oils

Repeat of one, two or three tests as required.

Two tests showed loss of oil consumption. (Hi & Lo)

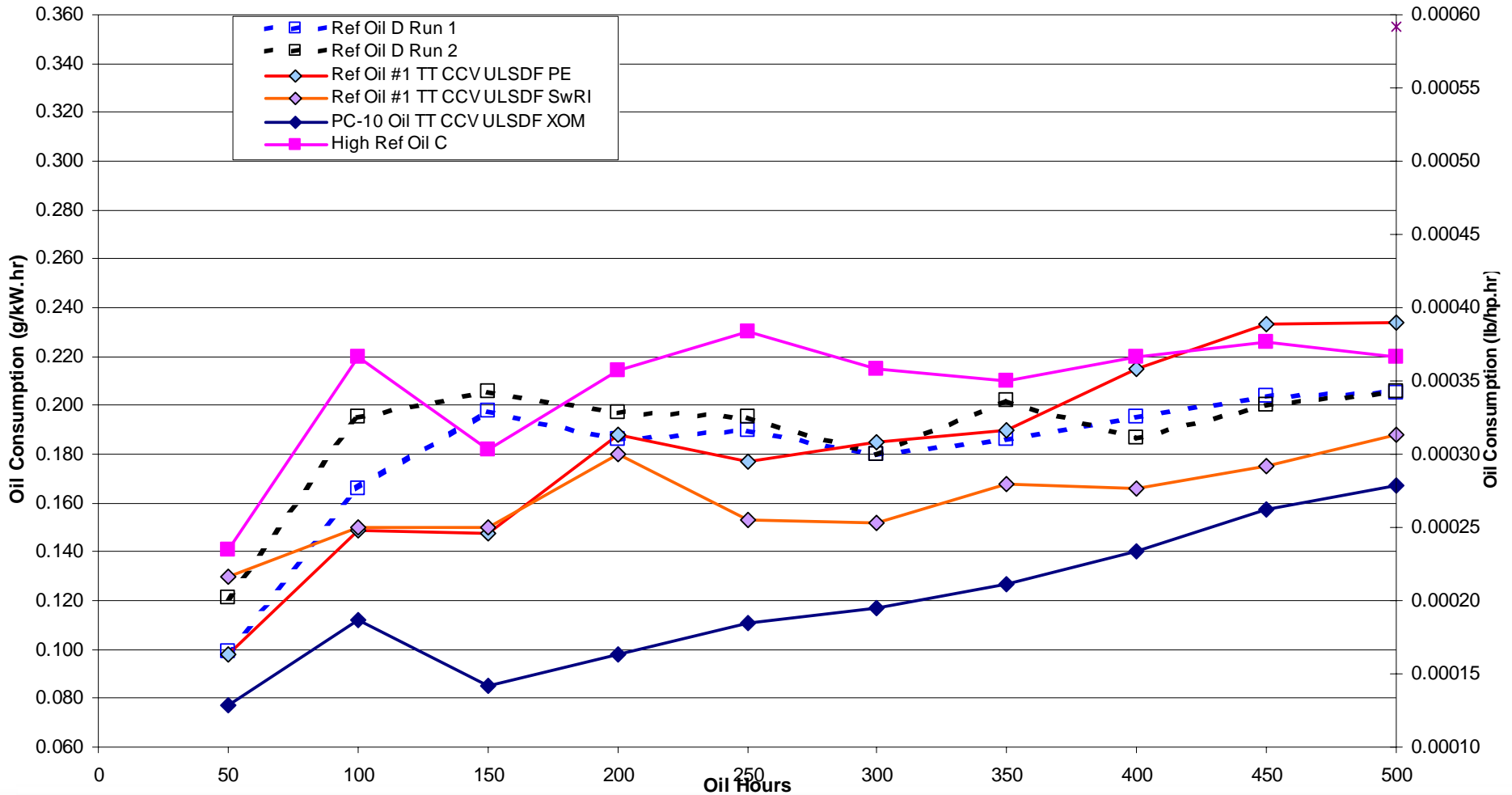
Two tests showed oil consumption control. (Hi & Lo)

CCV Pseudo system not affecting deposits

No noticeable effect of fuel sulfur on test

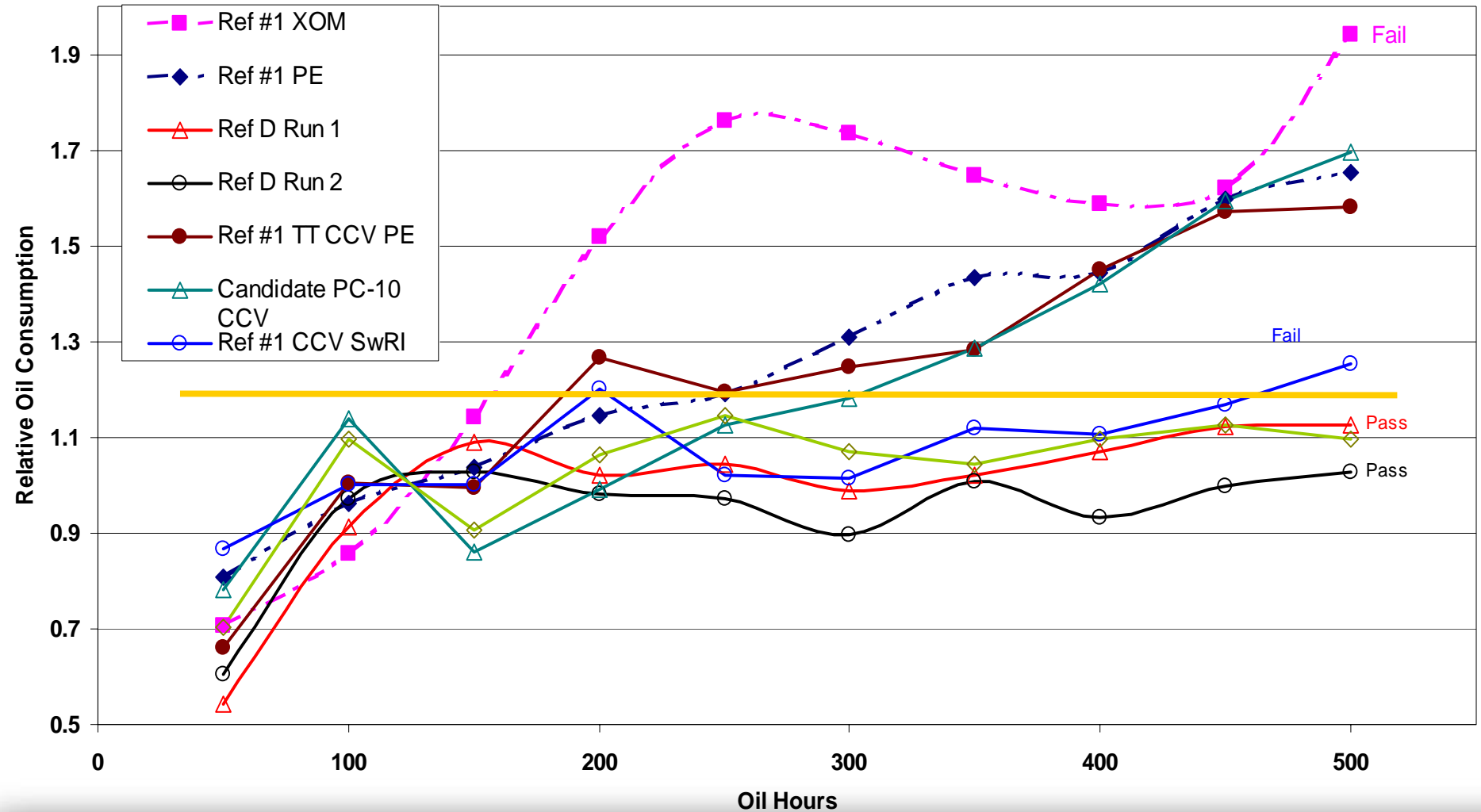


Caterpillar C13 Oil Consumption



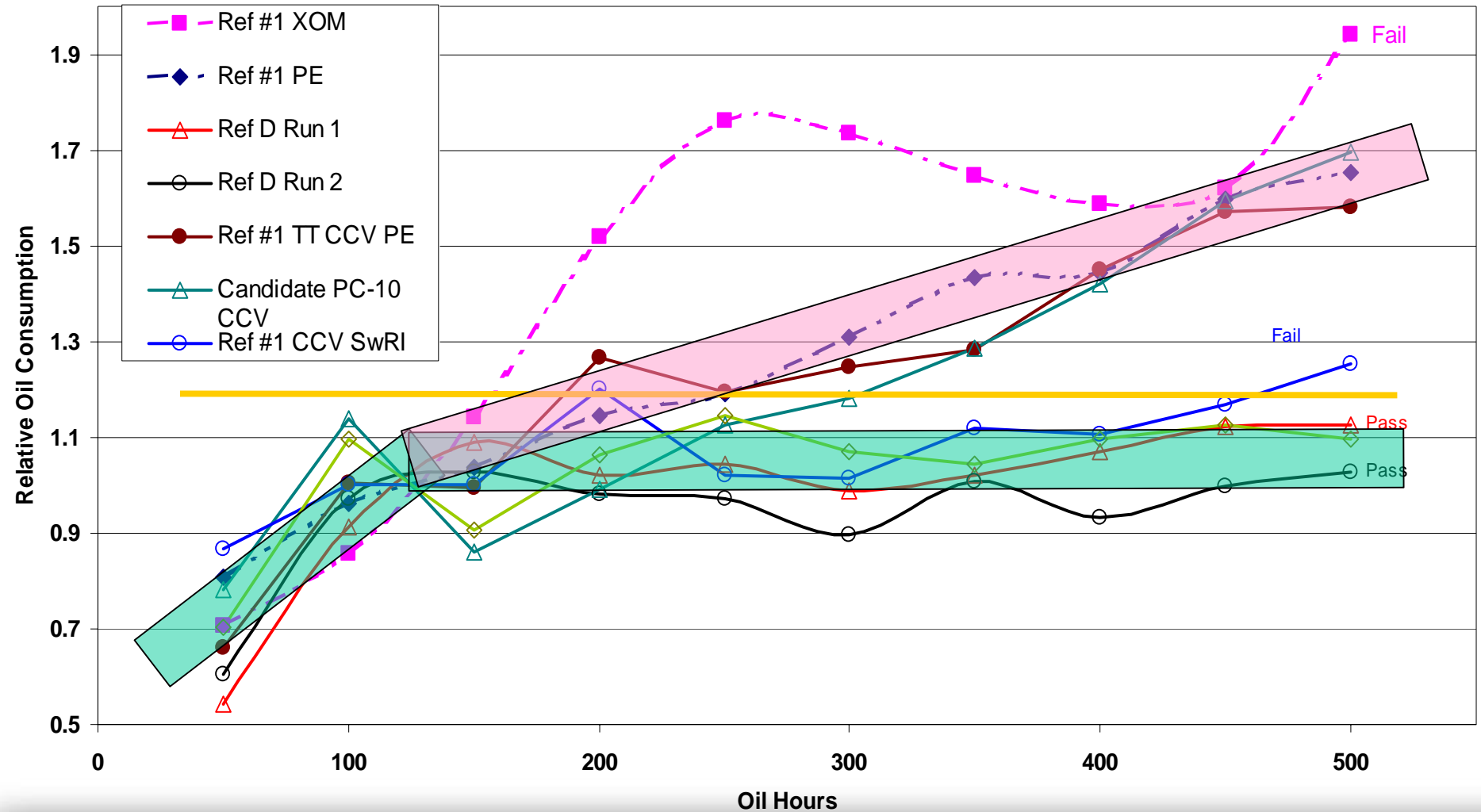
Caterpillar C13 Test Update

C13 Normalized Oil Consumption

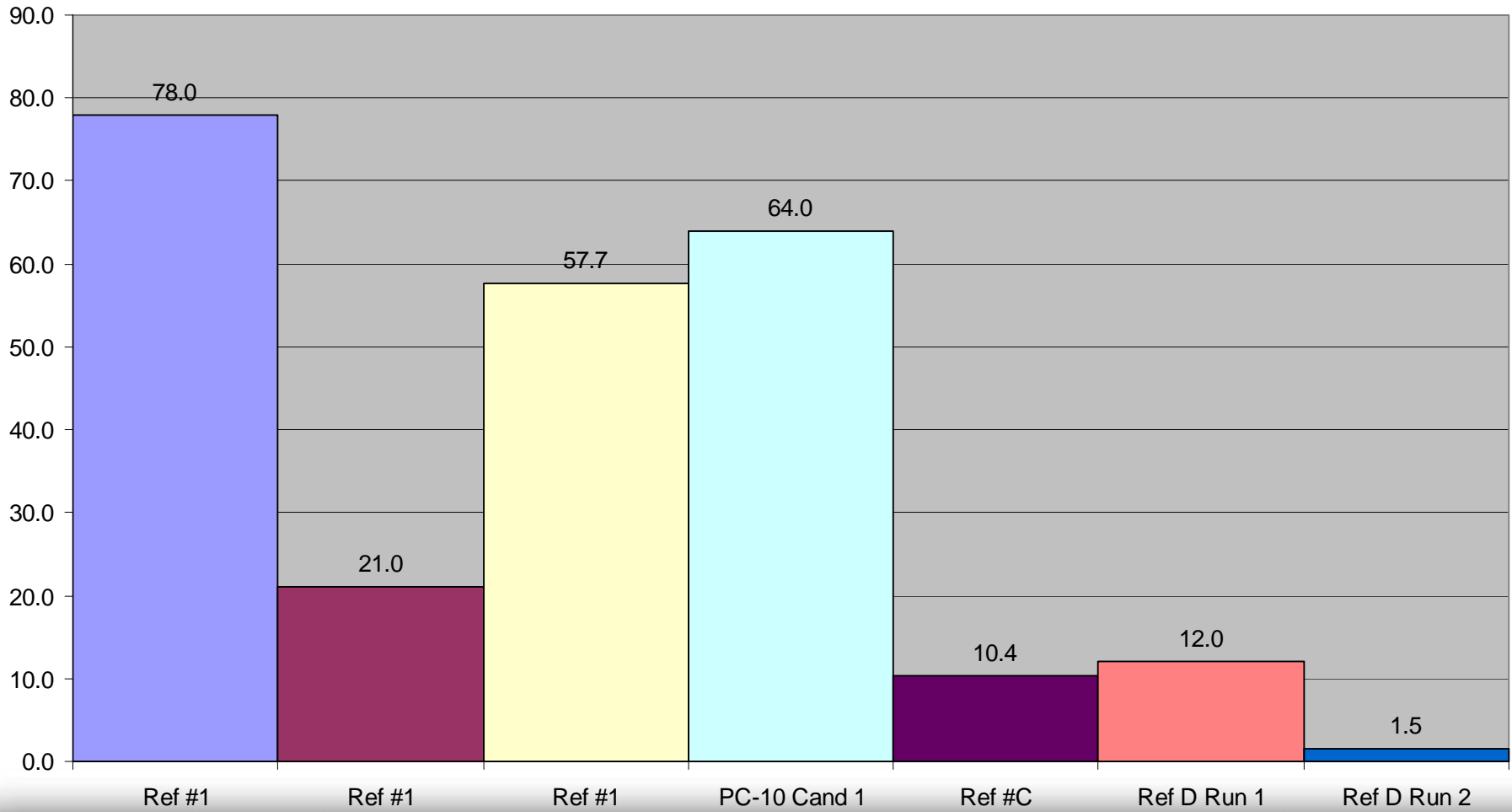


Caterpillar C13 Test Update

C13 Normalized Oil Consumption



C13 - Oil Consumption Increase (Percent)



<u>Oil</u>	<u>Stuck Rings</u>	<u>Loss of 2nd Ring Side Clearance</u>
Ref #1 SwRI	None	All
Ref #1 PE	None	2 Sluggish
PC-10 Cand 1	One	3
High Ref C	None	All
Ref Oil D	None	None



Assessment and agreement needed on:

1. Oil consumption Pass/fail criteria
2. Stuck Rings rating
3. Loss of Ring side clearance measurement method
 - Instruments (feeler thickness)
 - Location (four point vs all round)
 - Rating



Discrimination On

1. Oil consumption Pass/fail criteria
2. Stuck Rings
3. Loss of Ring side clearance

