



M11 EGR Test Matrix Status

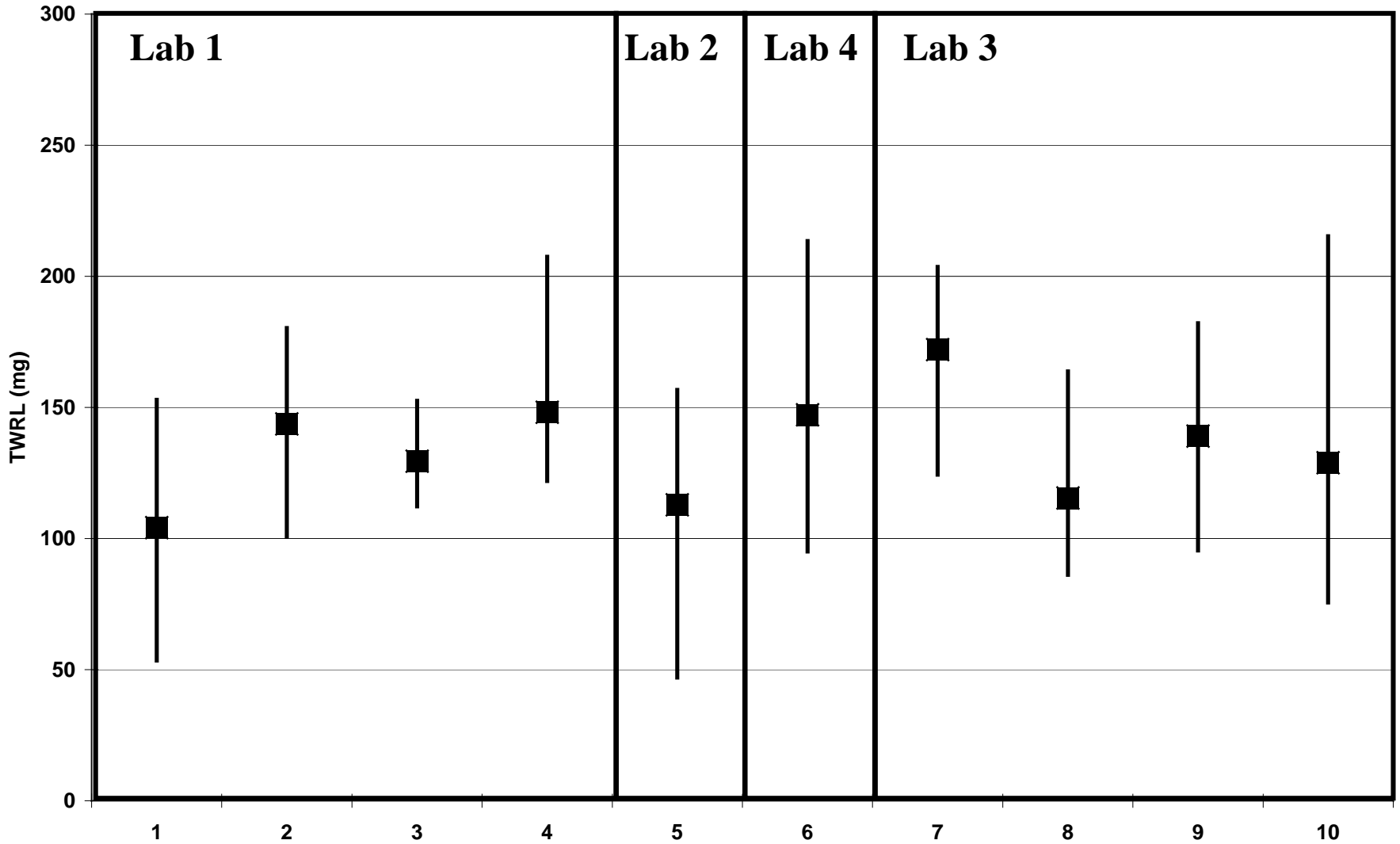
**Presentation to
HDEOCP
June 19, 2001
David M Stehouwer**

M-11 EGR Test Matrix Status

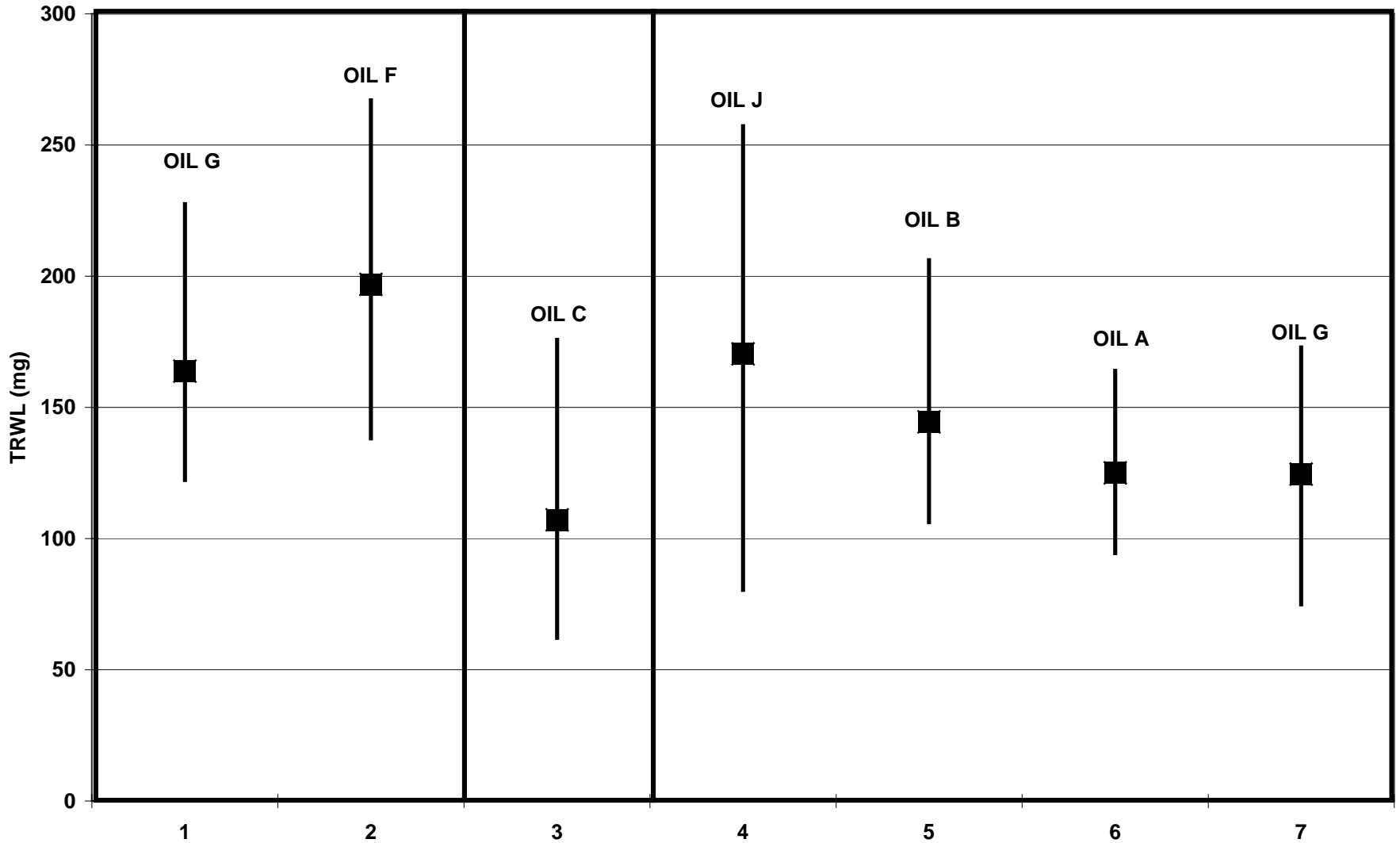
- All runs are complete
- M11 EGR Task Group to meet July 9/10
- Accept data and analyze statistics
- Report to next HDEOCP

Cummins Inc. M11 - EGR Test Matrix Design					
Featured Oil E					
Lab 1		Lab 2	Lab 3		Lab 4
1	2	3	4	5	6
E	E	E	E	E	E
H	E	H	B	E	B
A	G	D	G	A	D
F	C	C	F	J	J*
E			E		
		Complete		* assumed complete	
		Pending		19-Jun	

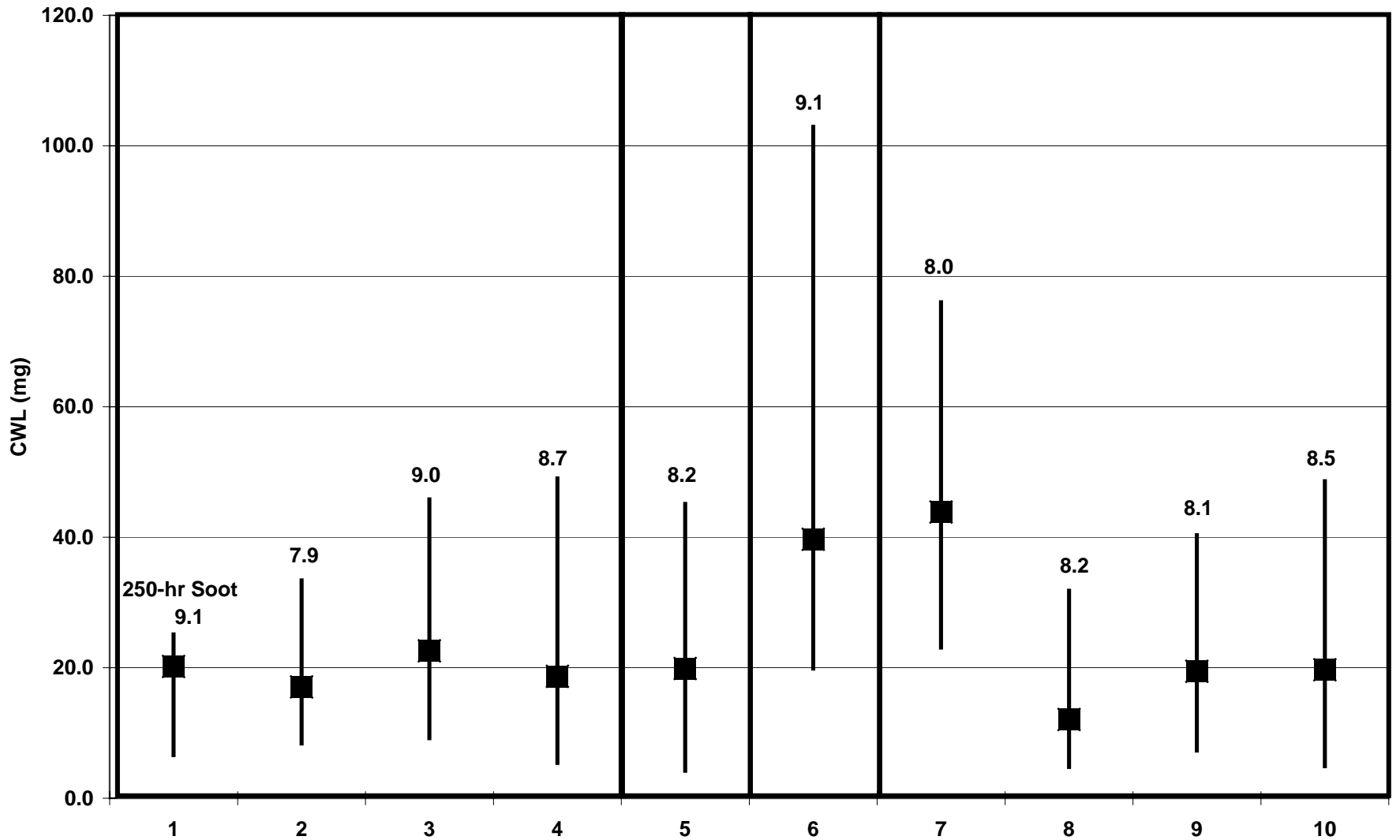
Top Ring Weight Loss - Matrix Oil E



Top Ring Weight Loss

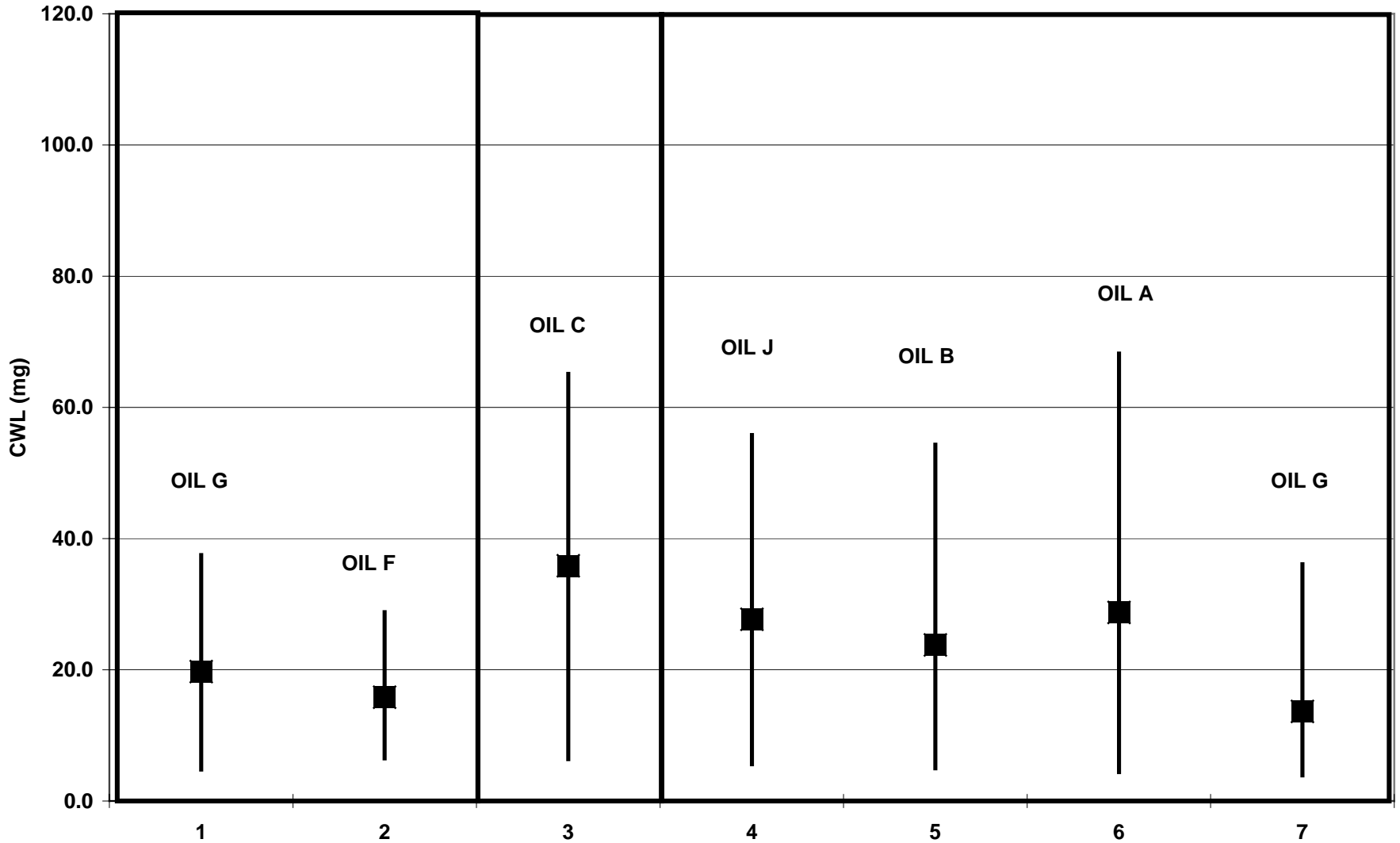


Crosshead Weight Loss - Matrix Oil E

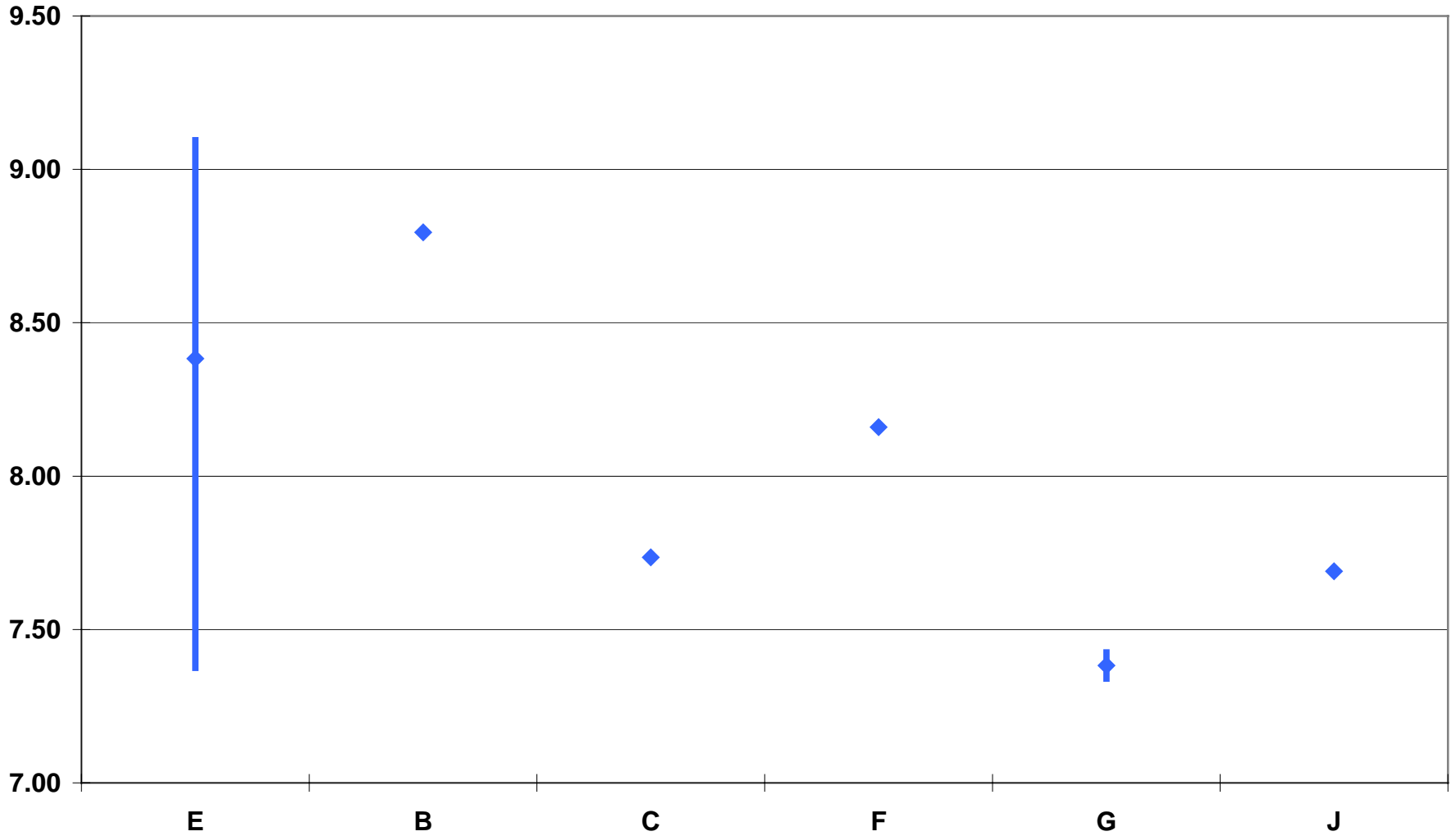


250-hr Soot

Crosshead Weight Loss

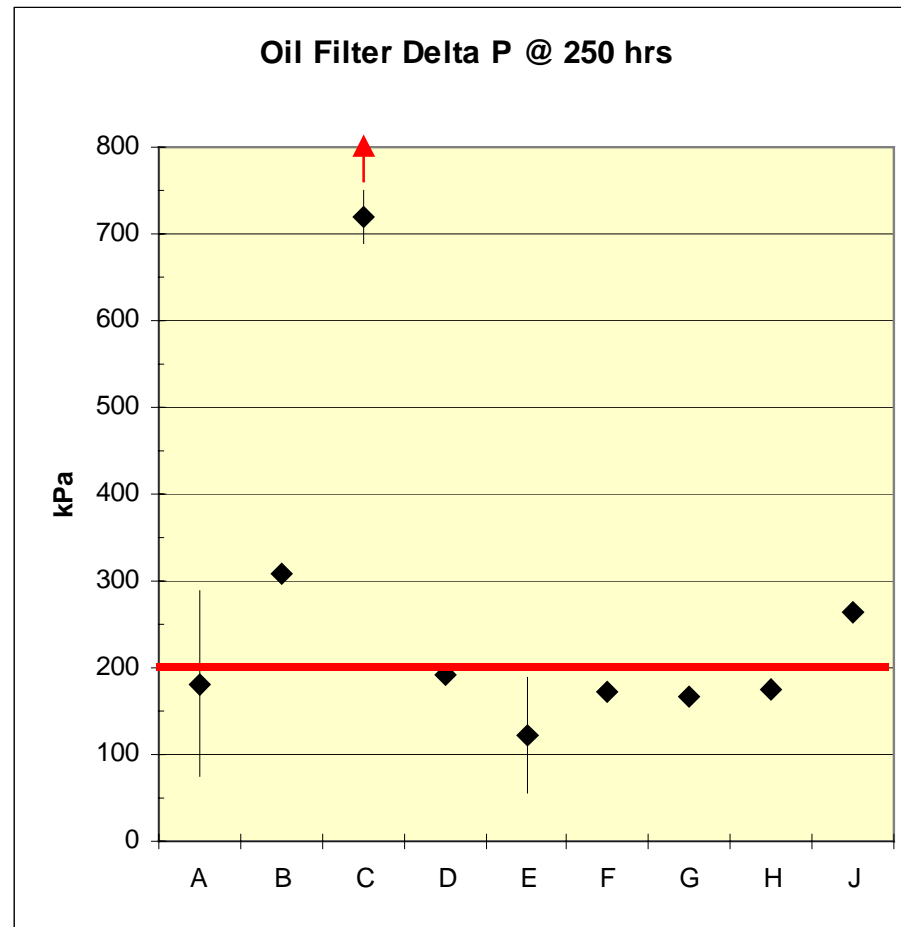


M11 EGR Sludge Ratings

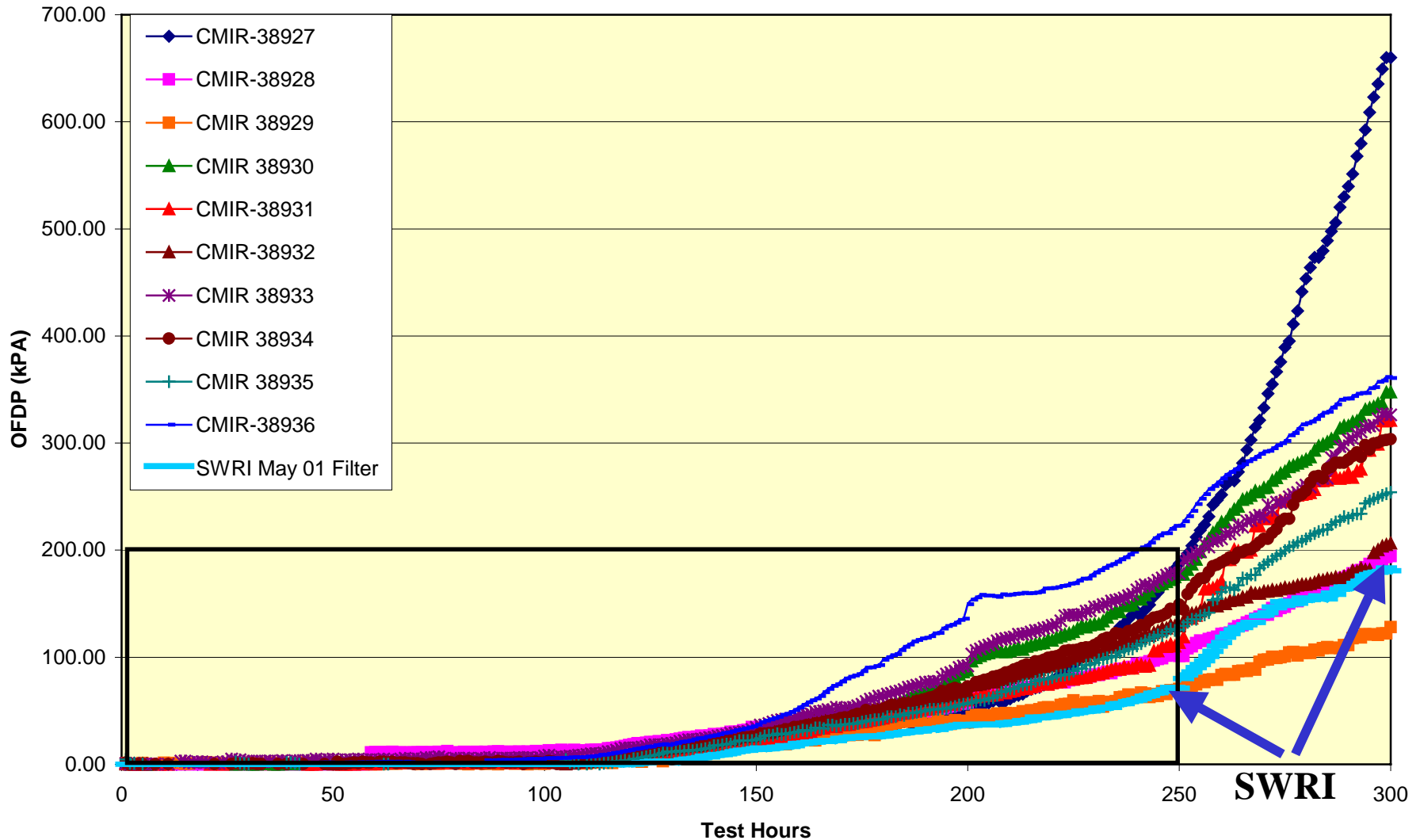


M11 EGR: Filter Delta P Matrix Results

- Apply HST correction factor to delta P
- Plots show range and mean
- Set limit at 250 hr



PC9 Matrix Data Oil E, Corrected & Normalized



Filter Modification

- SWRI ran oil E with modified filter
- Other volunteers welcome
- Surveillance Panel to review proper action

Shifting pleats cause loss of flow area



David M Stehouwer, Cummins Inc.



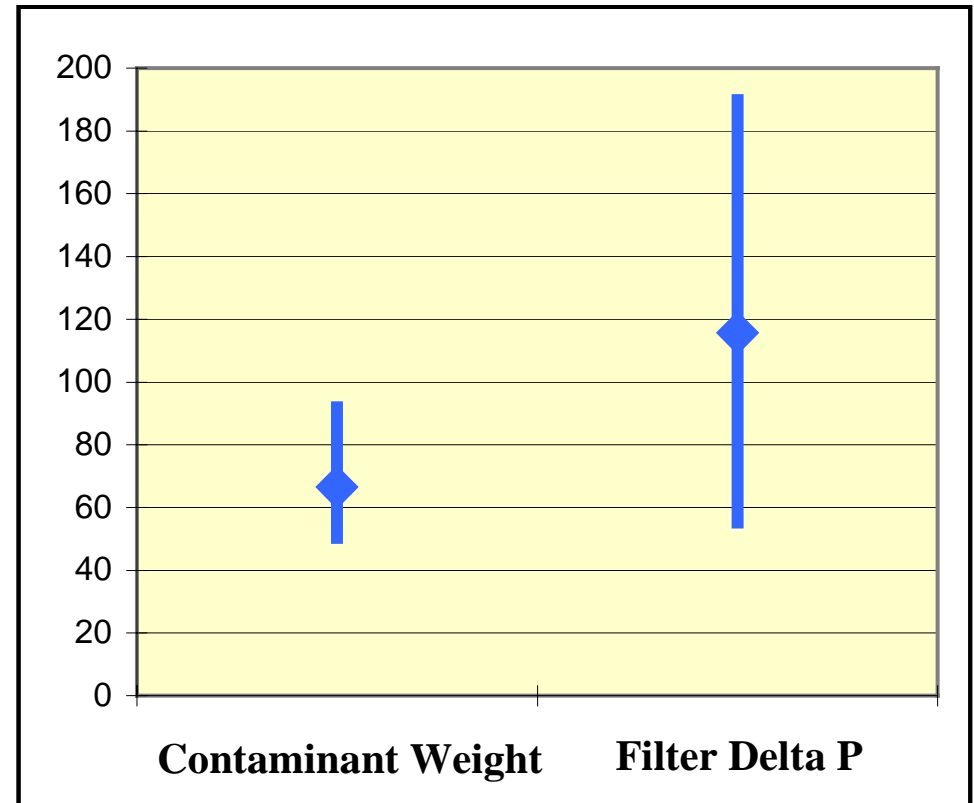
Hot-melt beads stabilize pleats

Used Filter shows stable pleats



M11 EGR Used Filter Properties: Oil E

- **Delta P variation caused by filter structure**
- **Filter contaminant more repeatable than delta P**
- **Engine test generating same contaminant each run**
- **Filter removing same contaminant each run**



Soot vs. Wear in M11 Tests

