T-12: Introducing new batch of parts

E. Santos

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Data Source

- Dataset – LTMS 08/09/2023
  - Tests on Reference oil PC-10E/821 and re-blends
  - Exclusions:
    - Exclude tests with Chart = N (except W/ Y/ Z/ Q/ F)
    - Testkeys:
      - 98459, 98867 (goofy tests)
      - 109182 (thrown out in previous analyses)
      - 110864 (VUXPB)
 - Total number of tests: 135

General comments

- Latest batch of parts:
    - Cyl.Liner/TopRing/Rodbearing/MainBearing/PistonCrown[W/ Y/ Z/ Q/ F **randomized subgroups excluding subgroup A**]

- Original precision matrix
    - LTMS adopted use natural logarithm transformations for Pb, Pb2, and OC.

- The most recent review adopted LN transformation for CLW and TRWL

Liner Wear

Before ICF

There are only three W/Y tests... and they overlap with N/N parts from *target* tests, back in 2005 (all N/N and most P/P were part of the target)
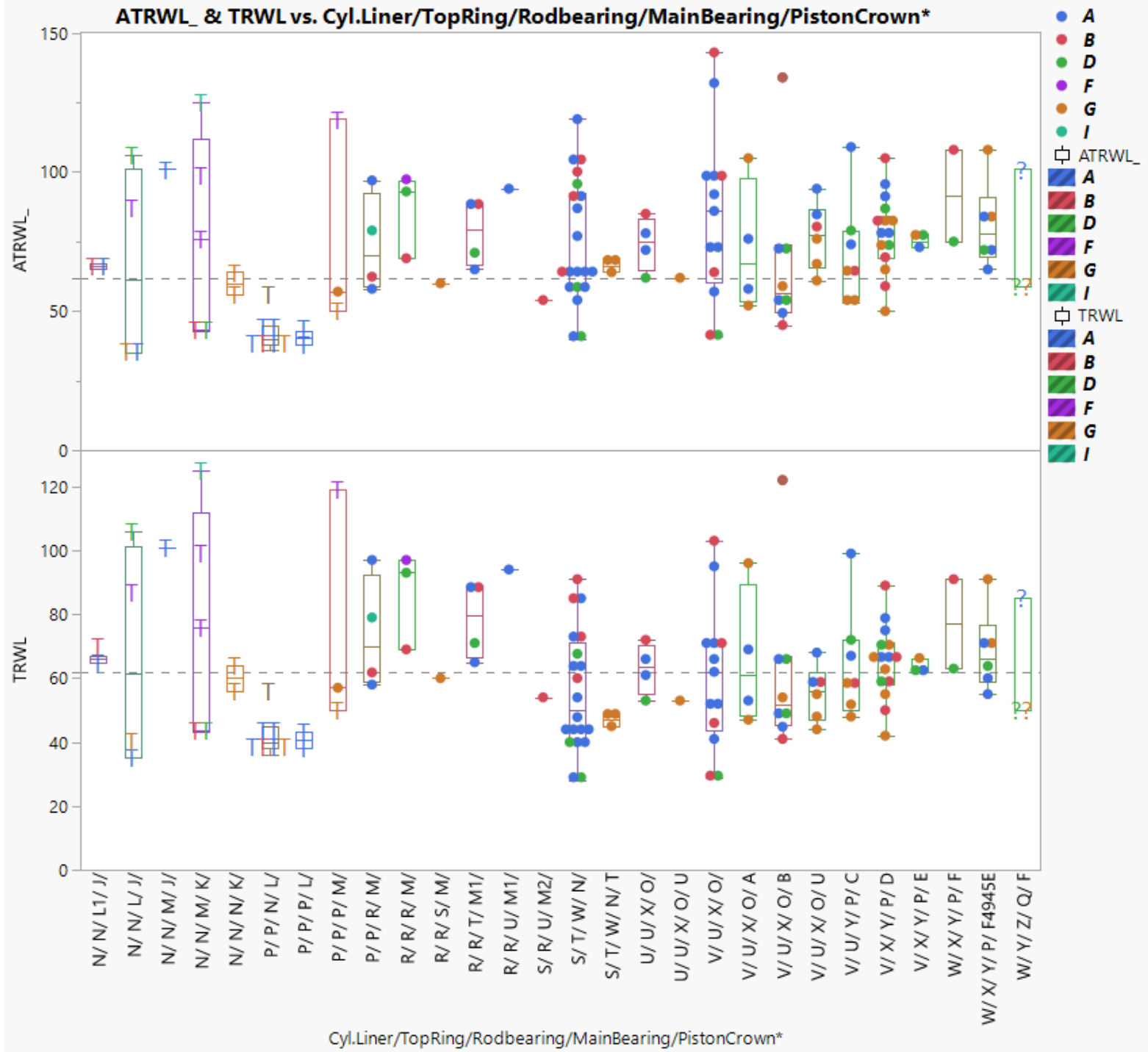
After current
multiplicative ICF = 0.761
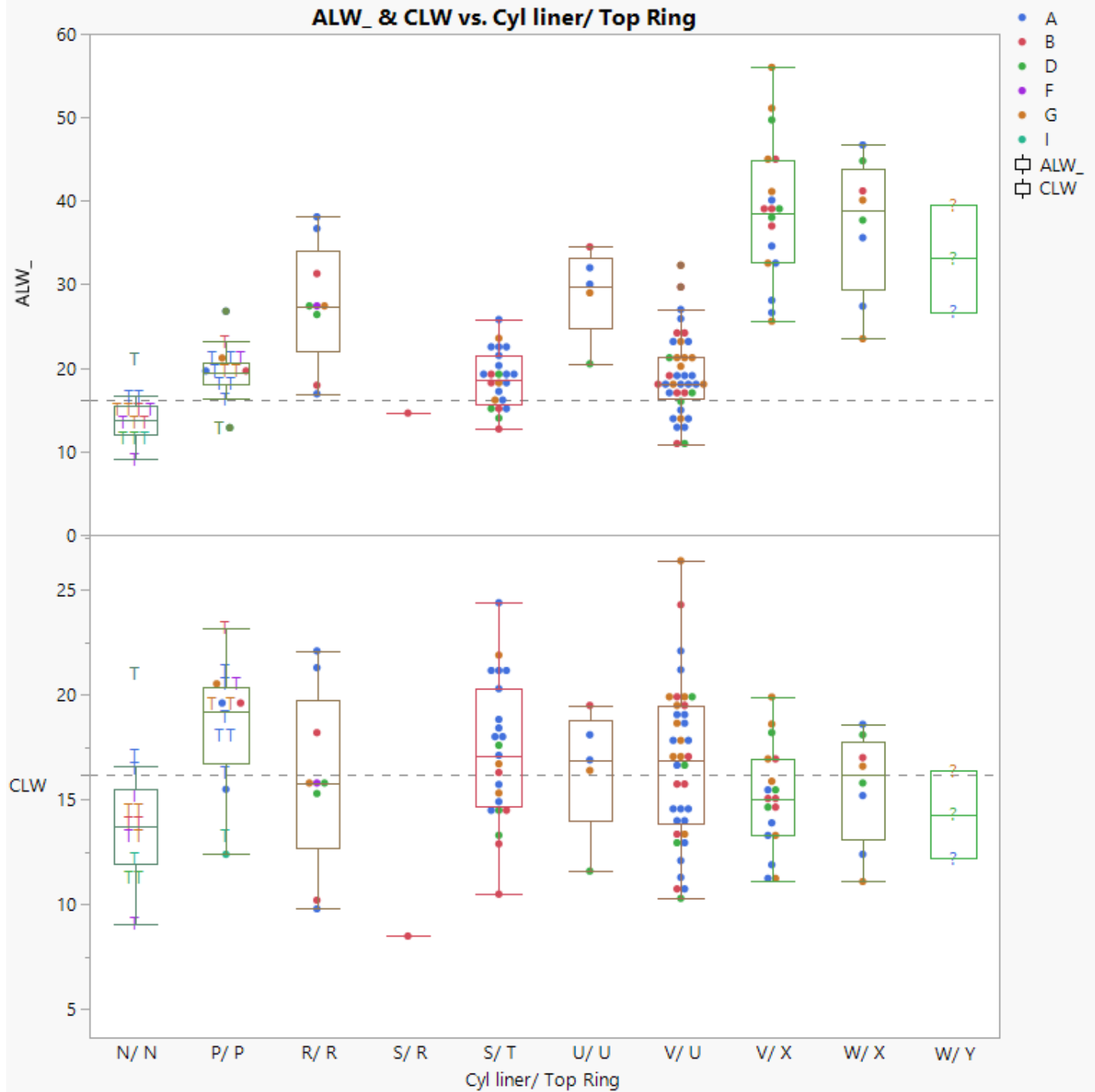
Top Ring Weight Loss

Before ICF

At this time, there is no need for updating the ICF
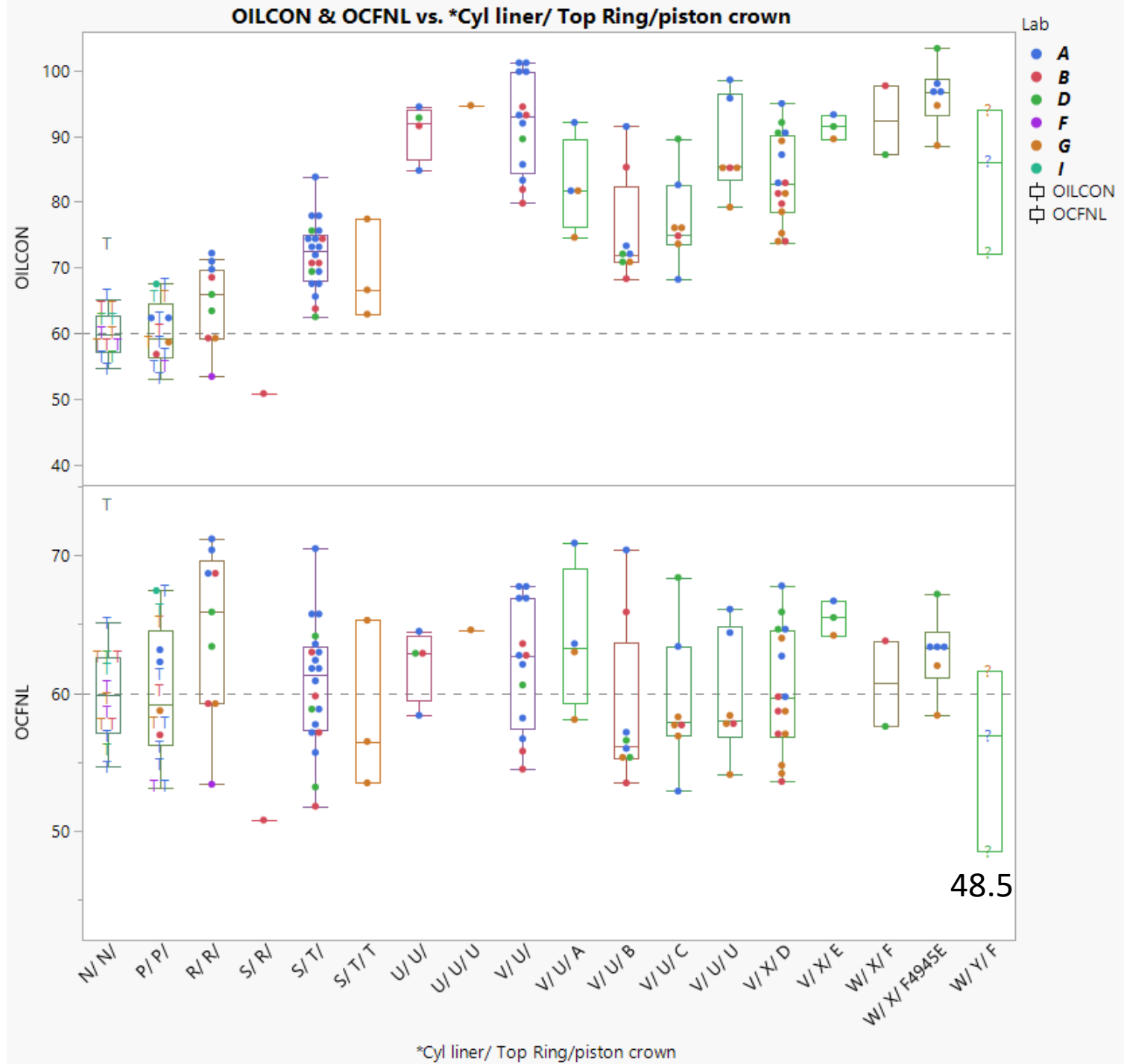
After Current ICF=0.846

Oil Consumption

Before ICF

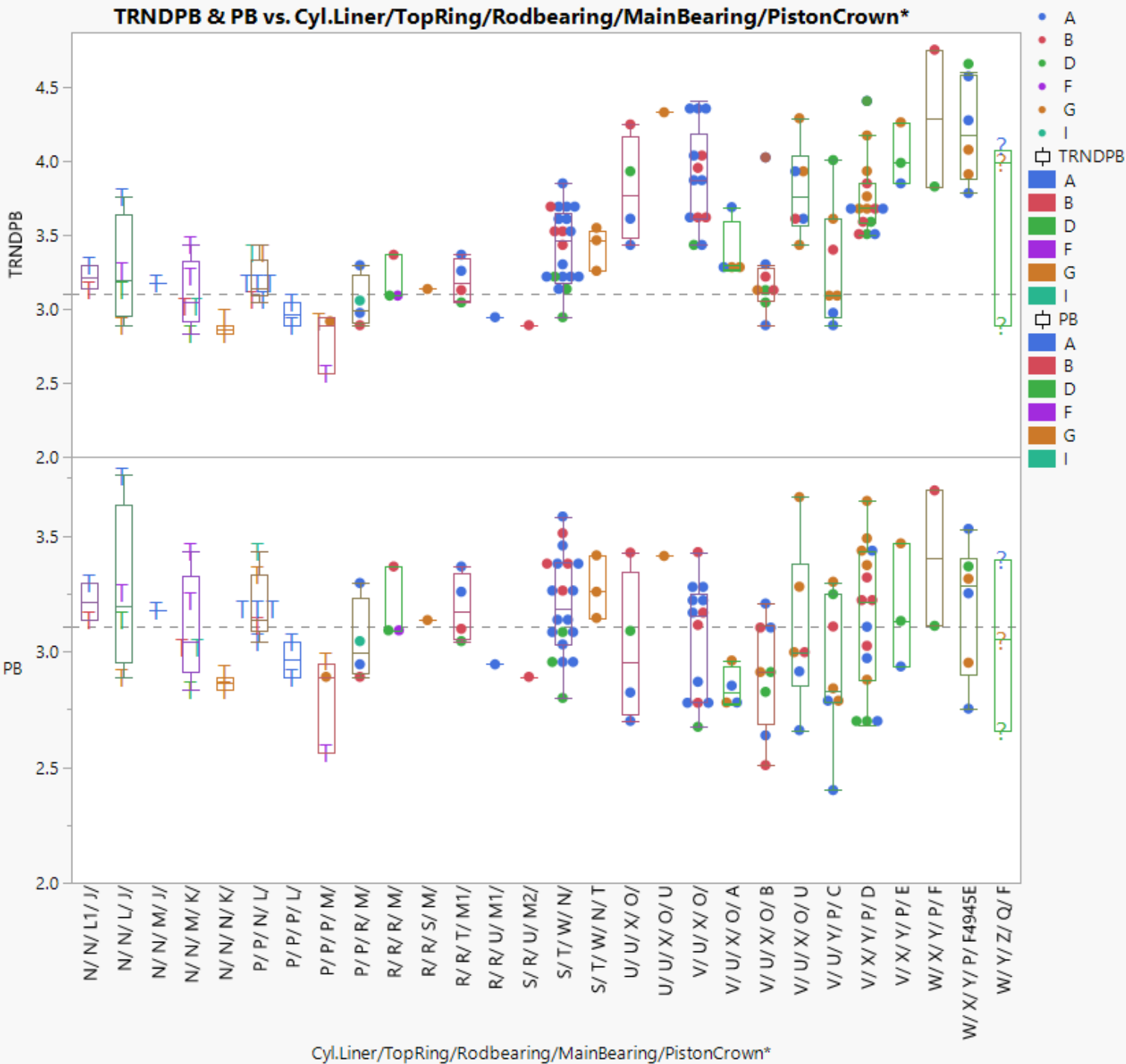One test is lower than the other two results

After Current ICF = 0.907

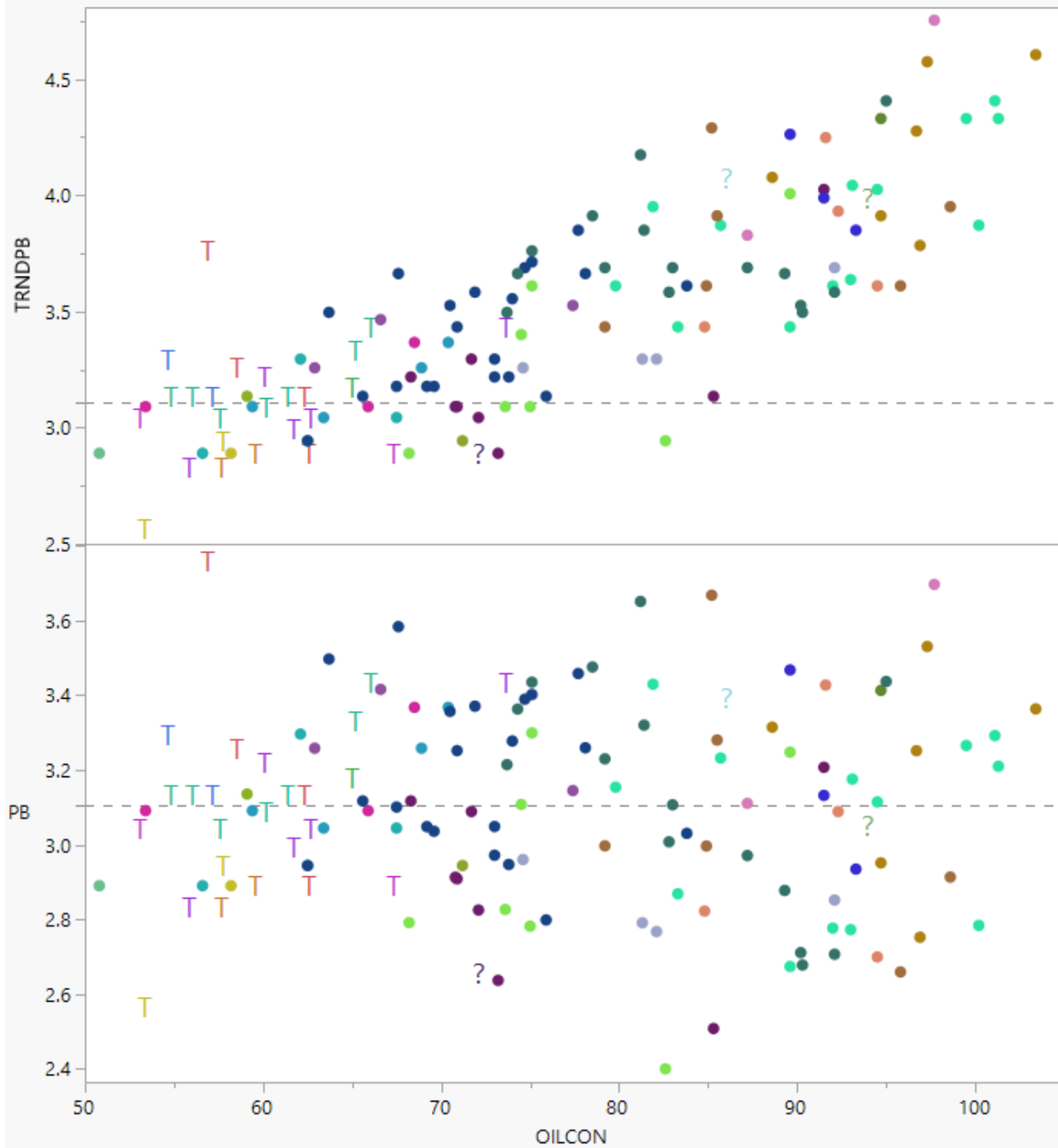
48.5

Pb Oil Consumption Correction

At this time, there is no need to propose new correction

Before ICF

After Current ICF

TRNDPB & PB vs. OILCON
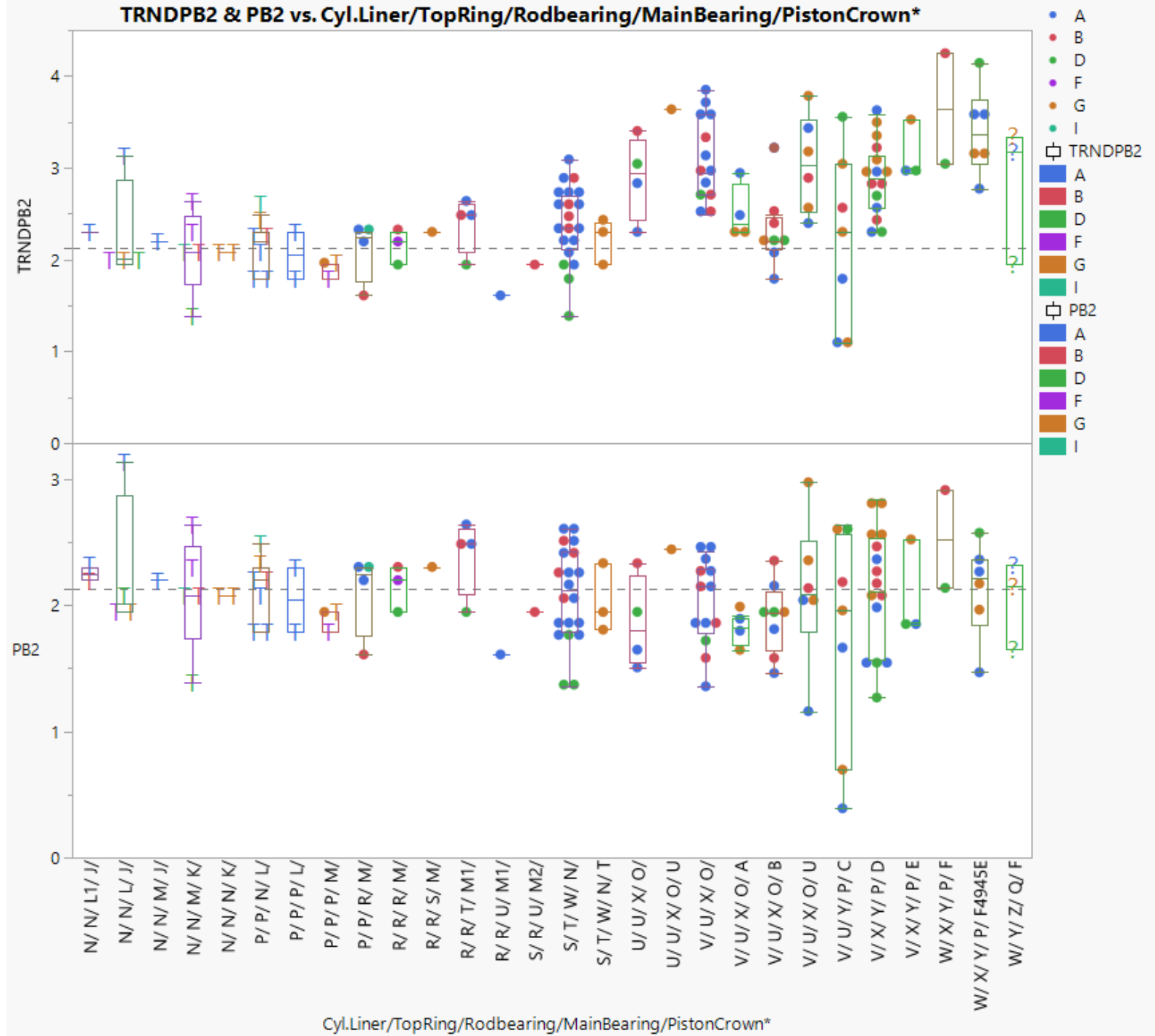
Cyl.Liner/TopRing/Rodbearing/MainBearing/PistonCrown

T N/ N/ L1/ J/	V/ U/ X/ O/ B
T N/ N/ L/ J/	V/ U/ X/ O/ U
T N/ N/ M/ J/	V/ U/ Y/ P/ C
T N/ N/ M/ K/	V/ X/ Y/ P/ D
T N/ N/ N/ K/	V/ X/ Y/ P/ E
T P/ P/ N/ L/	W/ X/ Y/ P/ F
T P/ P/ P/ L/	W/ X/ Y/ P/ F4945E
P/ P/ P/ M/	? W/ Y/ Z/ Q/ F4945E
P/ P/ R/ M/	? W/ Y/ Z/ Q/ F
R/ R/ R/ M/	? W/ Y/ Z/ Q/ F(S)
R/ R/ S/ M/	
R/ R/ T/ M1/	
R/ R/ U/ M1/	
S/ R/ U/ M2/	
S/ T/ W/ N/	
S/ T/ W/ N/ T	
U/ U/ X/ O/	
U/ U/ X/ O/ U	
V/ U/ X/ O/	
V/ U/ X/ O/ A	

Pb2 Oil Consumption Correction
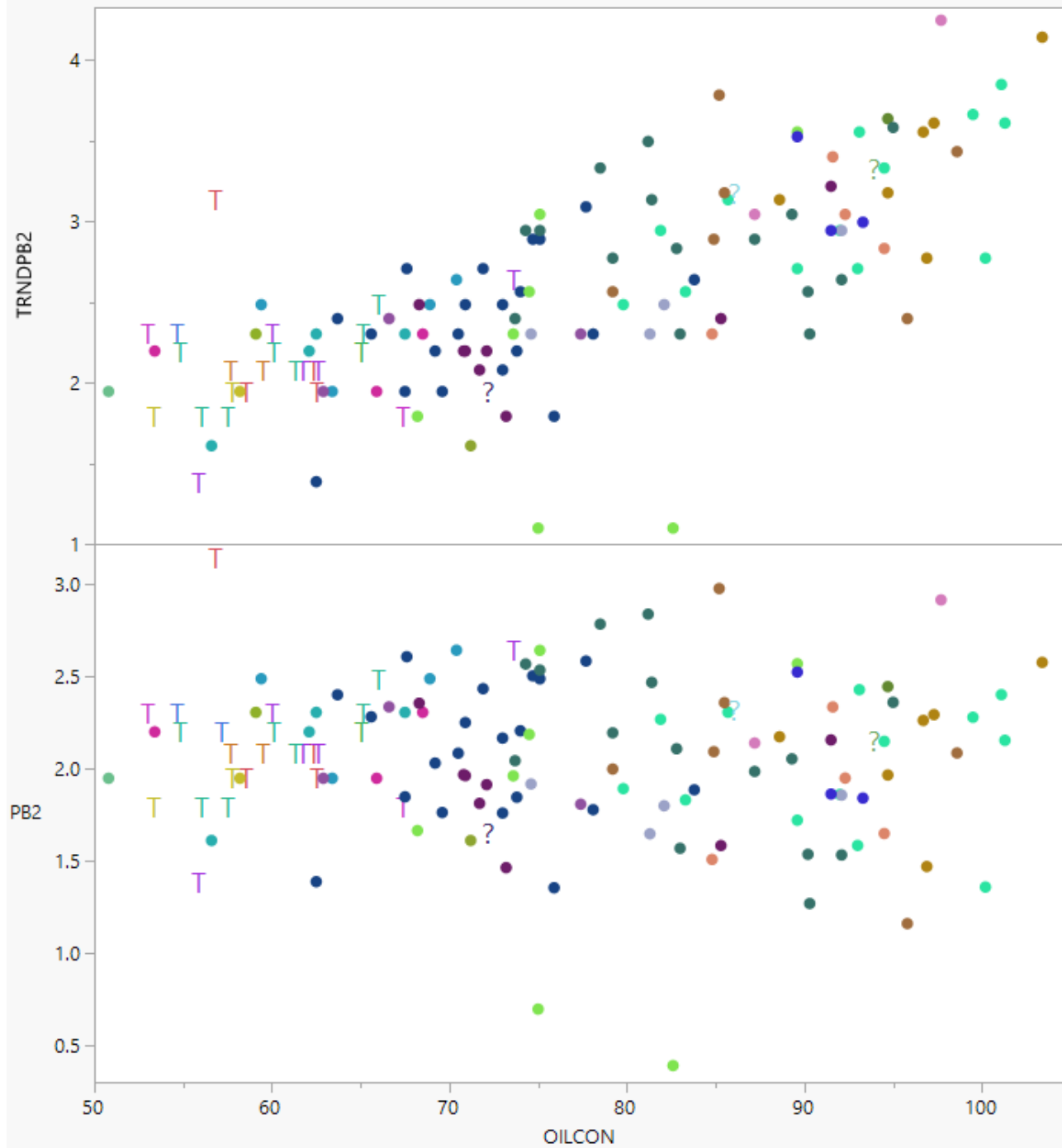
Before ICF

At this time, there is no need to propose new correction

After Current ICF

TRNDPB2 & PB2 vs. Cyl.Liner/TopRing/Rodbearing/MainBearing/PistonCrown*

TRNDPB2 & PB2 vs. OILCON

Cyl.Liner/TopRing/Rodbearing/MainBearing/PistonCrown

T	N/ N/ L1/ J/	•	V/ U/ X/ O/ B
T	N/ N/ L/ J/	•	V/ U/ X/ O/ U
T	N/ N/ M/ J/	•	V/ U/ Y/ P/ C
T	N/ N/ M/ K/	•	V/ X/ Y/ P/ D
T	N/ N/ N/ K/	•	V/ X/ Y/ P/ E
T	P/ P/ N/ L/	•	W/ X/ Y/ P/ F
T	P/ P/ P/ L/	•	W/ X/ Y/ P/ F4945E
•	P/ P/ P/ M/	?	W/ Y/ Z/ Q/ F4945E
•	P/ P/ R/ M/	?	W/ Y/ Z/ Q/ F
•	R/ R/ R/ M/	?	W/ Y/ Z/ Q/ F(S)
•	R/ R/ S/ M/		
•	R/ R/ T/ M1/		
•	R/ R/ U/ M1/		
•	S/ R/ U/ M2/		
•	S/ T/ W/ N/		
•	S/ T/ W/ N/ T		
•	U/ U/ X/ O/		
•	U/ U/ X/ O/ U		
•	V/ U/ X/ O/		
•	V/ U/ X/ O/ A		

Appendix 3: Equations for PB and PB2

PB

Determine the final ΔLead at EOT result by applying the correction factor calculated according to the following equations:

If $OC_{100-300} > 65.0$

$$\Delta Lead_{Final} = \exp[\ln(\Delta Lead) + (65.0 - OC_{100-300}) \times \mathbf{\color{red}{0.03234}}]$$

If $OC_{100-300} \leq 65.0$

$$\Delta Lead_{Final} = \Delta Lead$$

Where:

$\Delta Lead$ = final ΔLead at EOT

$OC_{100-300}$ = average oil consumption

PB2

Determine the final ΔLead (250 to 300) h by applying the correction factor calculated according to the following equations:

If $OC_{100\text{-}300}>65.0$

$\Delta Lead\ (250\text{-}300)_{Final} = \exp[\ln(\Delta Lead(250\text{-}300)\ )+(65.0 - OC_{100\text{-}300})\ x\ \textbf{\textcolor{red}{0.04089}}$

If $OC_{100\text{-}300}\leq65.0$

$\Delta Lead\ (250\text{-}300)_{Final} = \Delta Lead(250\text{-}300)$

Where:

$\Delta Lead\ (250\text{-}300)$ = final ΔLead (250 to 300) h

$\Delta Lead\ (250\text{-}300)$ = value calculated per XXXX

$OC_{100\text{-}300}$ = average oil consumption