P Retention in Sequence IIIG Engine Test vs. Field Performance

ESCIT Meeting, September 28th 2006

Approach

- Evaluate P Loss using Seq. IIIG drains
- Calculate and plot changes in P levels

$$\% \text{ P retention} = (Ca_{t=0}/Ca_t) * (P_t/P_{t=0}) * 100$$

Seq. IIIG: Engine Set-up & Operating Conditions: GM 3.8L, 6 cylinders, Port Fuel Injection

- 100 Hours
- Steady State:
    - 3600 rpm
    - 250 Nm (127.4 bhp / 95 kW)
- 115°C (239°F) coolant temperature
- 150°C (302°F) oil temperature
- 20-Hour oil level checks and forced oil adds
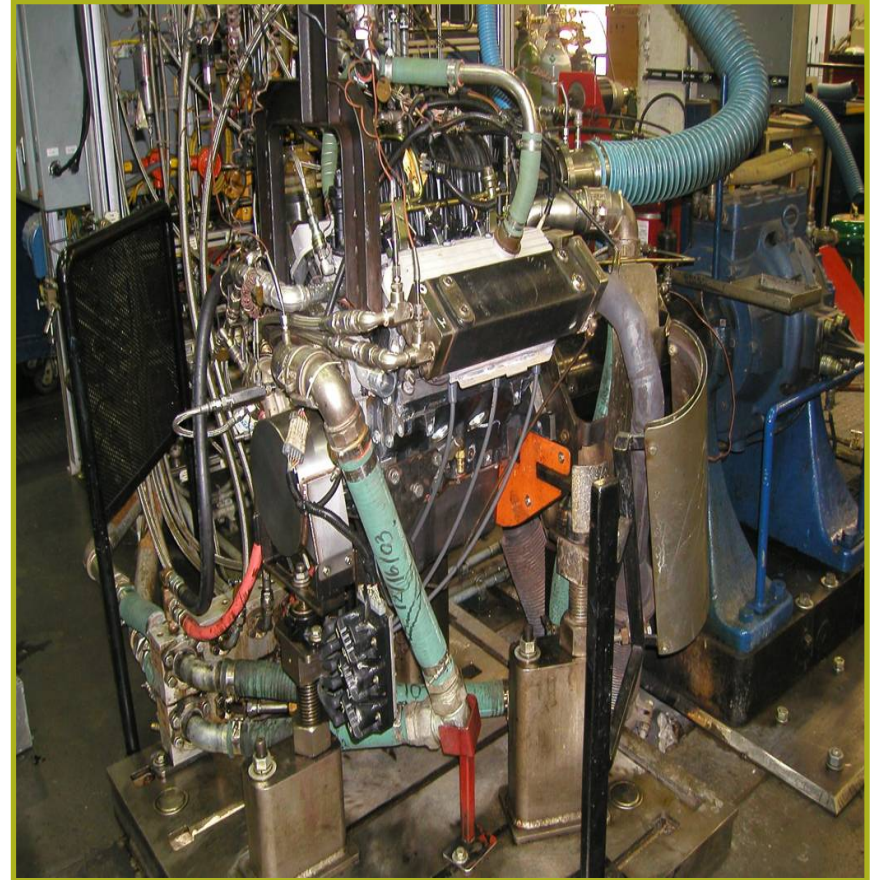
Seq. IIIG: Smoothed Average Data – Standard ZDP vs. Low Impact ZDP

10 units

% Phos Retention Avg

Hour in IIIG test

ZDP   └┴┴ Low impact   S-S-S Standard
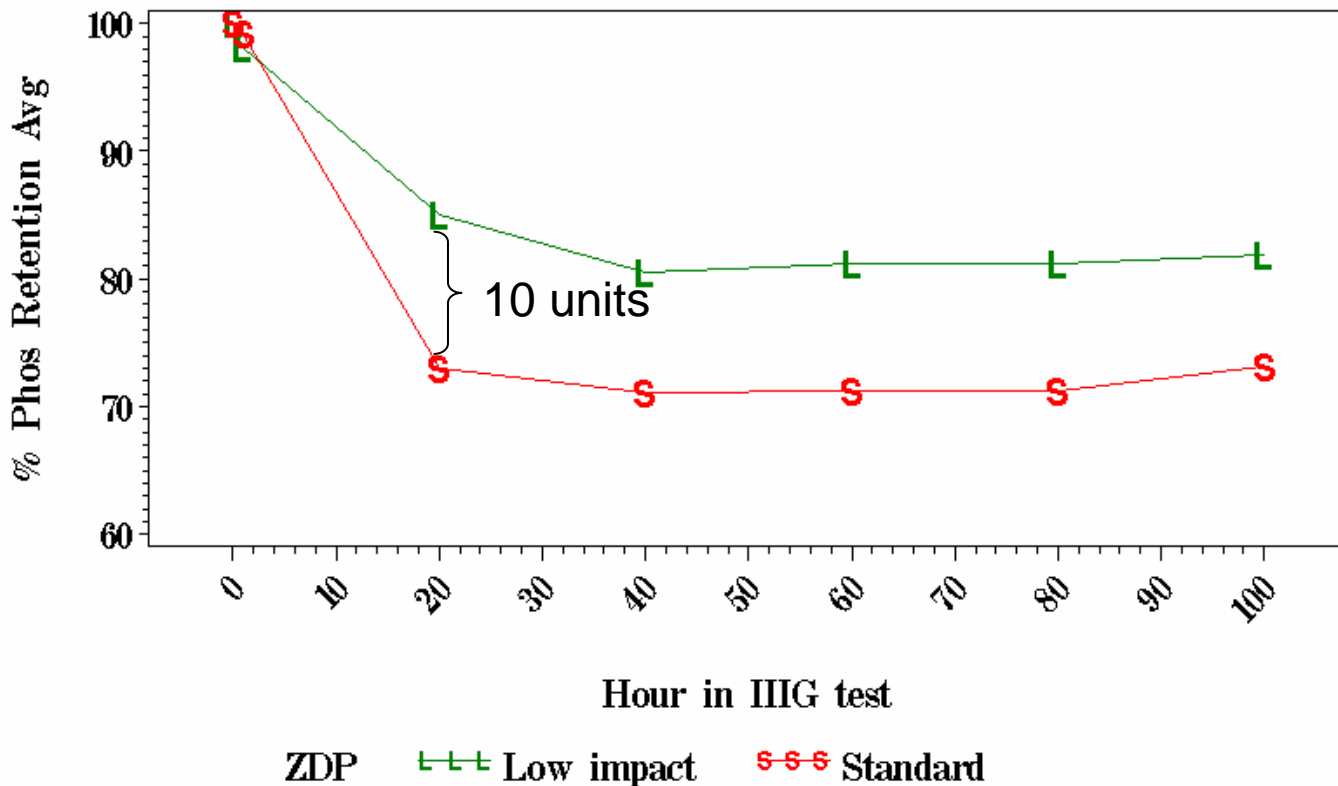
P Retention in Field Testing – Standard ZDP vs. Low Impact ZDP

- Vehicles: 2003 Ford Crown Victoria with Ford 4.6 L V-8

- Test Duration: 100,000 miles

- Oil Change Interval: 5,000 miles

- Service: moderate to high temperature urban driving

6.7 units

zdp ┗┗┗ Low_impact   ѕ ѕ ѕ Standard
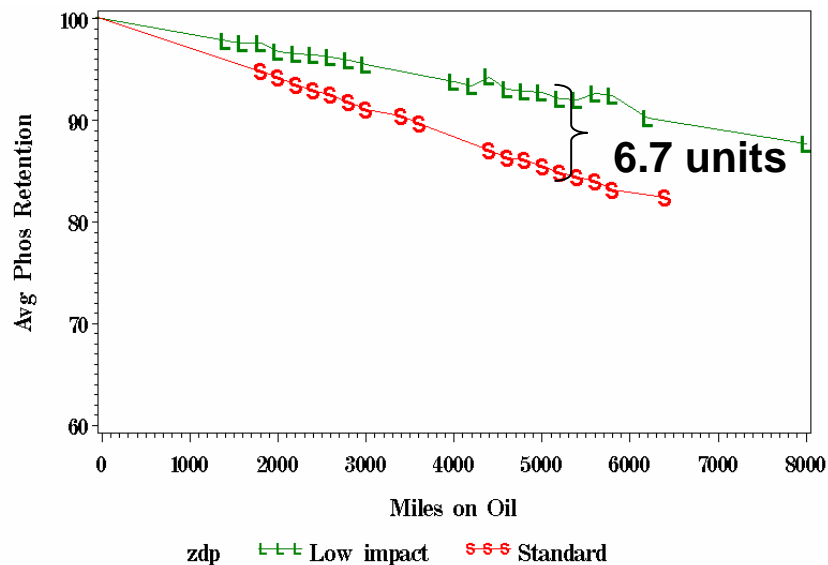
Summary

- P retention data collected from Seq. IIIG @ 20 hrs align very well with real life behavior
- Seq engine data can be used as a predictor of the field performance