

PC-9 Matrix Design Task Force

Status Report

To

ASTM Heavy Duty Engine Oil Classification Panel

Thursday November 2, 2000

Holiday Inn O'Hare

Chicago, IL

PC-9 Matrix Design Task Force Update

Final Formulations Matrix (9 Test Oils)

Code	Technology	Base Oil	Featured Oil for This Test
PC-9A	X	1	T-10/EGR
PC-9B	X	2	---
PC-9C	X	3	---
PC-9D	Y	1	---
PC-9E	Y	2	M11/EGR
PC-9F	Y	3	---
PC-9G	Z	1	---
PC-9H	Z	2	---
PC-9J	Z	3	1Q/EGR

PC-9 Matrix Design Task Force Update

Final Experimental Test Matrix Designs

PC-9 Matrix Design Task Force Update

I. Assumptions

- o 3 DI /VI combinations, 3 base oils, and 1 Featured Oil
- o Every factor level should be run at least 3 times to maintain Power, and at least 4 valid test results in each Matrix Test Stand to account for bias
- o At least 8 degrees of freedom (DF) to estimate test variability, and at least 6 repeats on identified Featured Oils
- o Maximize the percentage of Featured Oils runs in the Matrix
- o Main effects and 2-Way Interactions (Except with Stand) are estimable
- o Decision rules for Industry Matrix Testing have been satisfied

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II. Experimental Test Matrix Design Oils

Nine Matrix Oils are Formulated (Blended Lubricants).

Note:

PC-9A is the featured oil for the T-10/EGR,

PC-9E is the featured oil for the M11/EGR,

PC-9J is the featured oil for the 1Q/EGR.

	Technology		
Base Oil	X	Y	Z
1	PC-9A	PC-9D	PC-9G
2	PC-9B	PC-9E	PC-9H
3	PC-9C	PC-9F	PC-9J

PC-9 Matrix Design Task Force Update

III. T-10/EGR Test Design

Lab/Stand						
Lab 1		Lab 2	Lab 3		Lab 4	Lab 5
1	2	3	4	5	6	7
G	B	G	D	E	A	D
E	H	B	H	F	E	A
C	F	A	C	J	J	J
A	A	A	A	A	A	A

PC-9 Matrix Design Task Force Update

IV. M11/EGR Test Design

Lab/Stand					
Lab 1		Lab 2	Lab 3		Lab 4
1	2	3	4	5	6
H	D	H	B	G	B
A	G	D	G	A	D
F	C	C	F	J	J
E	E	E	E	E	E
		E			E

PC-9 Matrix Design Task Force Update

V. 1Q/ EGR Test Design

Lab/Stand						
Lab1		Lab2	Lab3		Lab4	Lab5
1	2	3	4	5	6	7
C	H	C	F	E	J	F
E	B	H	B	D	E	J
G	D	J	G	A	A	A
J	J	J	J	J	J	J

PC-9 Matrix Design Task Force Update

Proposed Timeline:

- PC-9 Formulations Matrix

- Technologies Selected
- Technologies Available
- Base Oils Available
- Blends Prepared (Available)

April 11, 2000

September 7, 2000

October 10, 2000

November 7, 2000

- PC-9 Matrix Testing

- Matrix Start
- Matrix Completion
- Data Evaluation Completed

November 10, 2000

March 22, 2001

April 30, 2001