



**Torque
Developments
International**

Oil Testing Project

This testing project was designed to investigate the performance of "high performance" oils.

We were specifically interested in measuring the effect that these oils had on the engines maximum effort output as well as their ability to cool the engine by way of direct heat exchange.

It is important to note that no attempt was made to gather data about the boundary layer film strength of these oil products or the ability for the oil to operate over extended periods of time.



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Oil Testing - Test Detail

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Location - West Thurrock, Essex, UK

Test Vehicle:

Honda Civic Type-R FN2

Test Engine:

Honda K20Z4

Modifications

Basic air box upgrade (HKS SPF)

Basic cat-back exhaust upgrade (HKS silent hi-power)

Hondata Flash-pro (calibrated by Torque Development International)

Test equipment:

Rototest VPA-R5/9 hub mounted chassis dynamometer - dead weight calibrated before testing and verified after (0.01% discrepancy)

Torque Developments ventilated test cell - airflow rate set to maximum

Data acquisition Rototest Data-Q 16

Test Method:

Engine coolant temperature was regulated to within a window of 90-94degC

Engine oil was between 75-76degC at the start of any given oil test set

The dyno cell ambient temperature was controlled to within a tight window with a low temp of 21.0degC and 22.5degC

Engine oils were tested with the engine sump filled to the maximum level indicated by the manufacturers standard dipstick, level tested warm

DIN 70 020 dynamometer atmospheric correction protocol has been applied to the raw dynamometer measurements

The dynamometer test carried out was of the constant acceleration type

A start of test engine speed of 2000rpm, with the end of test defined by the engines rev limiter set to 8200rpm

The engine speed ramp rate used was 318.2rpm per second

The temperature of the engine oil in the engines sump was noted at the start of each test sweep

Three test sweeps were carried out in direct succession

This was followed by a 5minute period during which the engine is not running and the test cell airflow is turned off

After five minutes time had elapsed the test cell airflow was reinstated, the engine is restarted coolant temps are brought to within test parameters and then another three tests are performed in direct succession to one another

In total six separate whole sets of run data were created for each individual oil tested and the mean average results from all six data sets were taken to create the power and temperature measurements

Between the testing of different oil brands the engine was run up to temperature for 10minutes using specific break-in oil in order to prevent the mixing of the respective chemical packages

The test oils

Gold Crest 10w40 Semi-synth (our basic reference oil)

HKS 10w35

HKS 10w45

HKS 0w42HR

Carlube 10w60 Synthetic

Joe Gibbs - Driven XP6 15w50

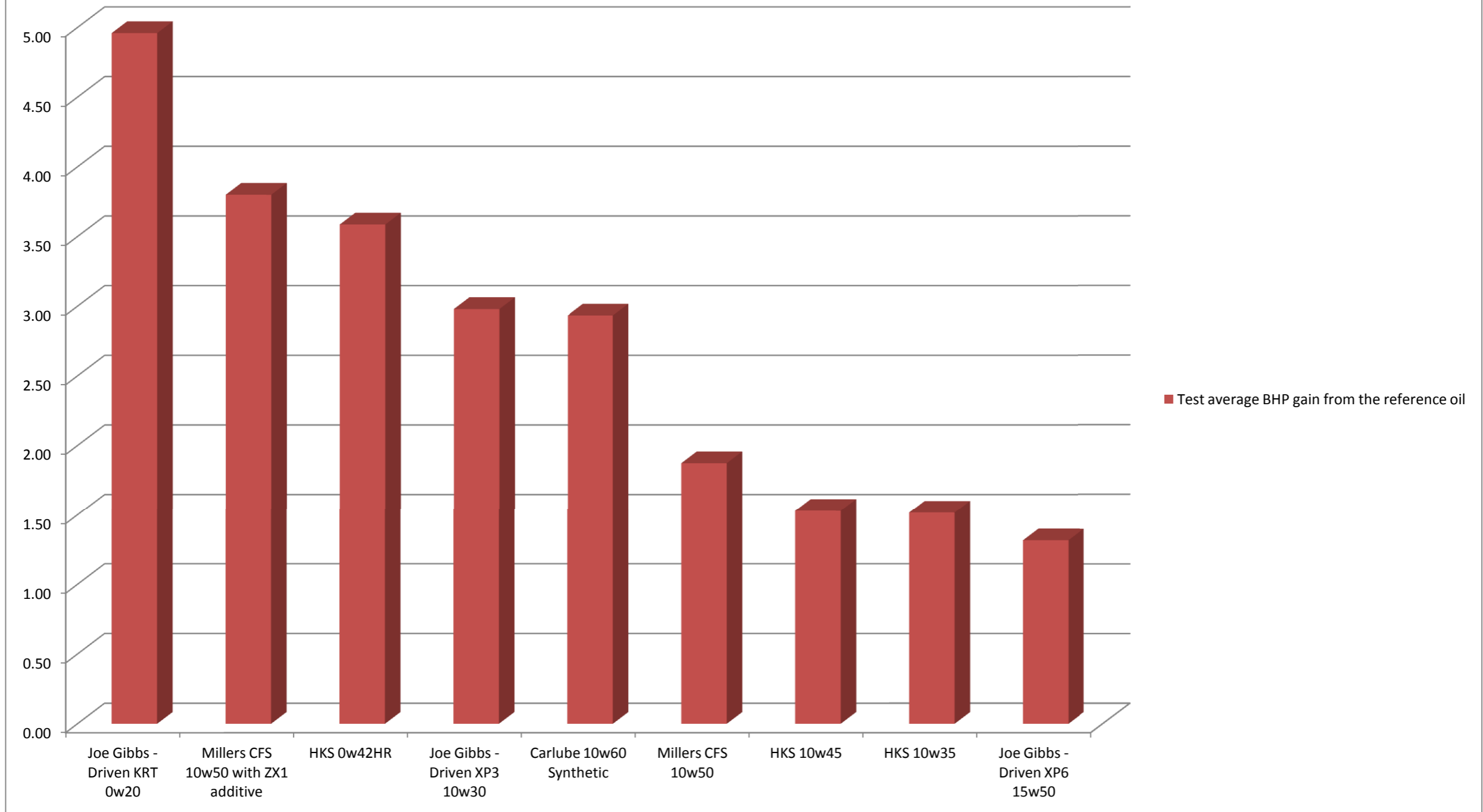
Joe Gibbs - Driven XP3 10w30

Joe Gibbs - Driven KRT 0w20

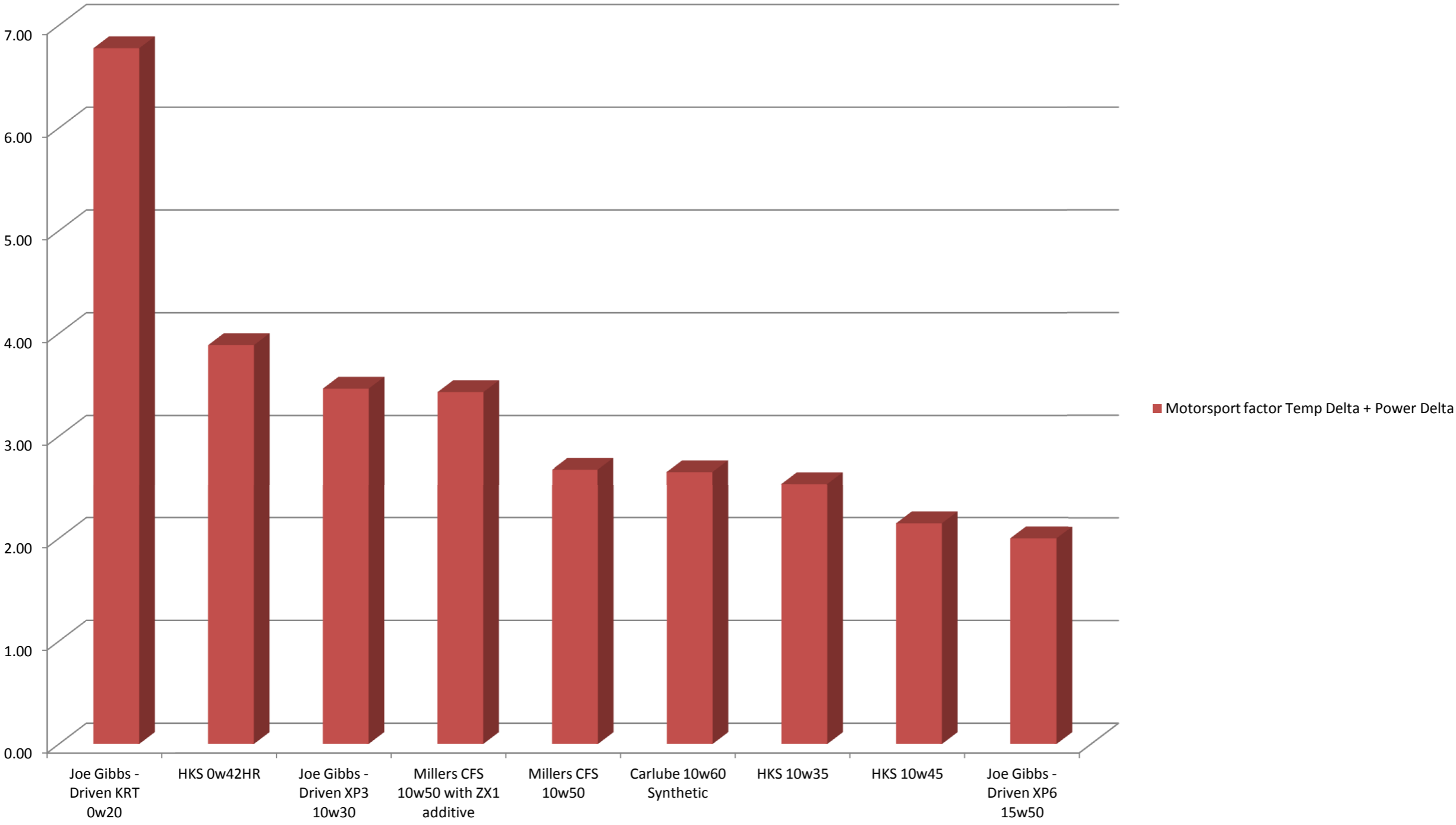
Millers CFS 10w50

Millers CFS 10w50 with dose of ZX1 oil additive

Test average BHP gain from the reference oil



Motorsport factor Temp Delta + Power Delta



Test Order

	Test Avg BHP (DIN) 6000- 8000rpm	BHP Delta from Ref	Test Avg Oil temp delta over a test run (DegC)	DegC Delta from Ref
Gold Crest 10w40 Semi-synth (Reference oil)	184.26	0.00	0.85	0.00
HKS 10w35	185.78	1.52	1.87	1.02
HKS 10w45	185.79	1.53	1.47	0.62
HKS 0w42HR	187.85	3.59	1.15	0.30
Carlube 10w60 Synthetic	187.19	2.93	0.57	-0.28
Joe Gibbs - Driven XP6 15w50	185.58	1.32	1.53	0.68
Joe Gibbs - Driven XP3 10w30	187.24	2.98	1.33	0.48
Joe Gibbs - Driven KRT 0w20	189.22	4.96	2.67	1.82
Millers CFS 10w50	186.13	1.87	1.65	0.80
Millers CFS 10w50 with ZX1 additive	188.06	3.80	0.48	-0.37

Power Gain Order

	Test Avg BHP (DIN) 6000- 8000rpm	Test average BHP gain from the reference oil	Test Avg Oil temp delta over a test run (DegC)	DegC Delta from Ref
Gold Crest 10w40 Semi-synth (Reference oil)	184.26	0.00	0.85	0.00
Joe Gibbs - Driven KRT 0w20	189.22	4.96	2.67	1.82
Millers CFS 10w50 with ZX1 additive	188.06	3.80	0.48	-0.37
HKS 0w42HR	187.85	3.59	1.15	0.30
Joe Gibbs - Driven XP3 10w30	187.24	2.98	1.33	0.48
Carlube 10w60 Synthetic	187.19	2.93	0.57	-0.28
Millers CFS 10w50	186.13	1.87	1.65	0.80
HKS 10w45	185.79	1.53	1.47	0.62
HKS 10w35	185.78	1.52	1.87	1.02
Joe Gibbs - Driven XP6 15w50	185.58	1.32	1.53	0.68

Motorsport Suitability Factor Order

	Test Avg BHP (DIN) 6000-8000rpm	BHP Delta from Ref	Test Avg Oil temp delta over a test run (DegC)	DegC Delta from Ref	Motorsport factor Temp Delta + Power Delta
Gold Crest 10w40 Semi-synth (Reference oil)	184.26	0.00	0.85	0.00	0.00
Joe Gibbs - Driven KRT 0w20	189.22	4.96	2.67	1.82	6.78
HKS 0w42HR	187.85	3.59	1.15	0.30	3.89
Joe Gibbs - Driven XP3 10w30	187.24	2.98	1.33	0.48	3.46
Millers CFS 10w50 with ZX1 additive	188.06	3.80	0.48	-0.37	3.43
Millers CFS 10w50	186.13	1.87	1.65	0.80	2.67
Carlube 10w60 Synthetic	187.19	2.93	0.57	-0.28	2.65
HKS 10w35	185.78	1.52	1.87	1.02	2.53
HKS 10w45	185.79	1.53	1.47	0.62	2.15
Joe Gibbs - Driven XP6 15w50	185.58	1.32	1.53	0.68	2.00

Viscosity Order

	Test Avg BHP (DIN) 6000-8000rpm	BHP Delta from Ref	Test Avg Oil temp delta over a test run (DegC)	DegC Delta from Ref	Motorsport factor Temp Delta + Power Delta
Gold Crest 10w40 Semi-synth (Reference oil)	184.26	0.00	0.85	0.00	0.00
Joe Gibbs - Driven KRT 0w20	189.22	4.96	2.67	1.82	6.78
Joe Gibbs - Driven XP3 10w30	187.24	2.98	1.33	0.48	3.46
HKS 10w35	185.78	1.52	1.87	1.02	2.53
HKS 0w42HR	187.85	3.59	1.15	0.30	3.89
HKS 10w45	185.79	1.53	1.47	0.62	2.15
Millers CFS 10w50 with ZX1 additive	188.06	3.80	0.48	-0.37	3.43
Millers CFS 10w50	186.13	1.87	1.65	0.80	2.67
Joe Gibbs - Driven XP6 15w50	185.58	1.32	1.53	0.68	2.00
Carlube 10w60 Synthetic	187.19	2.93	0.57	-0.28	2.65

Gold Crest 10w40 (Reference Oil)

Dyno results DIN corrected

	Run Number 7	Run Number 8	Run Number 9	Run Number 10	Run Number 11	Run Number 12
Engine speed (RPM)	TEST RUN 1	TEST RUN 2	TEST RUN 3	TEST RUN 4	TEST RUN 5	TEST RUN 6
6000	167.1	167.4	167	166.6	167.1	<i>Bad Data</i>
6500	178.2	178.7	178.8	177.7	178.3	<i>Bad Data</i>
7000	188.3	189.4	189.4	188.1	188.2	<i>Bad Data</i>
7500	192.8	194	194.2	193	194.2	<i>Bad Data</i>
8000	193.3	194	193.9	192.5	194.3	<i>Bad Data</i>
Test Run Average BHP (din)	183.94	184.7	184.66	183.58	184.42	<i>Bad Data</i>
Test oil temp delta (DegC)	0.1	0.9	0.8	0.8	1.3	1.2
Whole test average BHP (din)	184.26					
Whole test average oil temp delta (DegC)	0.85					

HKS 10w35

Dyno results DIN corrected

	Run Number 15	Run Number 16	Run Number 17	Run Number 18	Run Number 19	Run Number 20
Engine speed (RPM)	TEST RUN 1	TEST RUN 2	TEST RUN 3	TEST RUN 4	TEST RUN 5	TEST RUN 6
6000	167.7	169.2	168.6	167.6	167.8	168.2
6500	180	180.7	180.8	177.8	178.8	179.3
7000	190.5	191.3	191.7	188.3	189.2	190
7500	195.9	196.3	196.6	194.2	195.2	195.8
8000	195.6	196.1	196.2	193.9	194.9	195.1
Test Run Average BHP (din)	185.94	186.72	186.78	184.36	185.18	185.68
Test oil temp delta (DegC)	1	0.5	1.4	4.5	2.5	1.3

Whole test *average* BHP (din)

185.78

Whole test *average* oil temp delta (DegC)

1.87

HKS 10w45

Dyno results DIN corrected

	Run Number 21	Run Number 22	Run Number 23	Run Number 24	Run Number 25	Run Number 26
Engine speed (RPM)	TEST RUN 1	TEST RUN 2	TEST RUN 3	TEST RUN 4	TEST RUN 5	TEST RUN 6
6000	167.5	168.5	168.6	168.9	168.7	168.5
6500	178.7	180.2	180.8	179.3	179.7	179.5
7000	188.8	190.2	191	189.6	189.9	190.2
7500	193.8	195.5	196.6	194.7	196.2	196.4
8000	193.7	195.2	196.3	194.8	195.8	196.1
Test Run Average BHP (din)	184.5	185.92	186.66	185.46	186.06	186.14
Test oil temp delta (DegC)	-0.5	0.7	0.5	2.6	4.1	1.4

Whole test *average* BHP (din)

185.79

Whole test *average* oil temp delta (DegC)

1.47

HKS HR 0w42

Dyno results DIN corrected

	Run Number 27	Run Number 28	Run Number 29	Run Number 30	Run Number 31	Run Number 32
Engine speed (RPM)	TEST RUN 1	TEST RUN 2	TEST RUN 3	TEST RUN 4	TEST RUN 5	TEST RUN 6
6000	169	169.4	169.9	170.4	169.9	169.9
6500	181.3	182.1	182.6	180.8	181.2	181
7000	192.5	193.2	193.1	191.4	192	191.5
7500	197.1	198.7	198.1	196.6	197.5	197.5
8000	197.5	198.4	198.9	197.8	197.8	198.3
Test Run Average BHP (din)	187.48	188.36	188.52	187.4	187.68	187.64
Test oil temp delta (DegC)	0	1	0.9	2.6	1.5	0.9

Whole test *average* BHP (din)

187.85

Whole test *average* oil temp delta (DegC)

1.15

Carlube 10w60 synth

Dyno results DIN corrected

	Run Number 33	Run Number 34	Run Number 35	Run Number 36	Run Number 37	Run Number 38
Engine speed (RPM)	TEST RUN 1	TEST RUN 2	TEST RUN 3	TEST RUN 4	TEST RUN 5	TEST RUN 6
6000	169.1	169	168.8	168.7	169	169.3
6500	180.9	181	181.7	180	180.6	180.4
7000	191.4	191.9	191.9	190.7	191.8	191.4
7500	196.1	197.5	197.9	196.5	197.8	197.3
8000	196.2	198.2	198.1	196.4	198.2	198
Test Run Average BHP (din)	186.74	187.52	187.68	186.46	187.48	187.28
Test oil temp delta (DegC)	0.6	1.5	0.9	1	-0.3	-0.3

Whole test *average* BHP (din)

187.19

Whole test *average* oil temp delta (DegC)

0.57

Joe Gibbs Driven XP6 15w50

Dyno results DIN corrected

	Run Number 39	Run Number 40	Run Number 41	Run Number 42	Run Number 43	Run Number 44
Engine speed (RPM)	TEST RUN 1	TEST RUN 2	TEST RUN 3	TEST RUN 4	TEST RUN 5	TEST RUN 6
6000	166.3	167.3	167.2	167.9	167.9	168.6
6500	178.7	180.4	180.4	179.3	179.6	179.5
7000	188.7	190.9	191.1	189.9	189.8	190.5
7500	194	195.5	196.1	194.3	195.6	196.3
8000	194.1	194.9	195.1	195.7	195.1	196.6
Test Run Average BHP (din)	184.36	185.8	185.98	185.42	185.6	186.3
Test oil temp delta (DegC)	0.9	2.1	2.6	0.8	1	1.8

Whole test *average* BHP (din)

185.58

Whole test *average* oil temp delta (DegC)

1.53

Joe Gibbs Driven XP3 10w30

Dyno results DIN corrected

	Run Number 45	Run Number 46	Run Number 47	Run Number 48	Run Number 49	Run Number 50
Engine speed (RPM)	TEST RUN 1	TEST RUN 2	TEST RUN 3	TEST RUN 4	TEST RUN 5	TEST RUN 6
6000	169	169.4	169.2	168.6	169.2	169.6
6500	181.3	181.3	181.9	180.8	181.3	180.9
7000	191.5	192	192.1	191.1	191.4	191.8
7500	196.2	197.5	197.3	197.1	197.4	197.3
8000	196.6	197.4	197.1	196.7	197	197.2
Test Run Average BHP (din)	186.92	187.52	187.52	186.86	187.26	187.36
Test oil temp delta (DegC)	-0.5	2.8	2.5	1	0.9	1.3
Whole test <i>average</i> BHP (din)	187.24					
Whole test <i>average</i> oil temp delta (DegC)	1.33					

Joe Gibbs Driven KRT 0w20

Dyno results DIN corrected

	Run Number 51	Run Number 52	Run Number 53	Run Number 54	Run Number 55	Run Number 56
Engine speed (RPM)	TEST RUN 1	TEST RUN 2	TEST RUN 3	TEST RUN 4	TEST RUN 5	TEST RUN 6
6000	170.7	171.2	170.9	170.1	170.4	170.3
6500	183.7	183.9	183.7	182.1	181.8	182
7000	194.6	194.6	194.3	192.4	193.4	193.1
7500	200.5	200.2	199.9	198.5	199.2	199.3
8000	199.6	199.9	200	198.4	198.6	199.3
Test Run Average BHP (din)	189.82	189.96	189.76	188.3	188.68	188.8
Test oil temp delta (DegC)	4.5	2.6	2.6	2.3	2.3	1.7
Whole test <i>average</i> BHP (din)	189.22					
Whole test <i>average</i> oil temp delta (DegC)	2.67					

Millers CFS 10w50

Dyno results DIN corrected

	Run Number 57	Run Number 58	Run Number 59	Run Number 60	Run Number 61	Run Number 62
	TEST RUN 1	TEST RUN 2	TEST RUN 3	TEST RUN 4	TEST RUN 5	TEST RUN 6
Engine speed (RPM)						
6000	167.8	167.8	168.4	168.4	167.9	168.3
6500	180.2	180.6	181.3	179.7	179	179.8
7000	190.9	191.3	191.6	189.5	190.1	190.4
7500	195.2	196.4	196.5	195.3	196	196.4
8000	195.4	195.8	196.5	195.4	195.9	196.2
Test Run Average BHP (din)	185.9	186.38	186.86	185.66	185.78	186.22
Test oil temp delta (DegC)	1.5	3.9	0.9	0.8	2.7	0.1
Whole test <i>average</i> BHP (din)	186.13					
Whole test <i>average</i> oil temp delta (DegC)	1.65					

Millers CFS 10w50 + ZX1 treatment

Dyno results DIN corrected

	Run Number 63	Run Number 64	Run Number 65	Run Number 66	Run Number 67	Run Number 68
Engine speed (RPM)	TEST RUN 1	TEST RUN 2	TEST RUN 3	TEST RUN 4	TEST RUN 5	TEST RUN 6
6000	171.1	170.6	170.8	170.1	169.8	<i>Bad Data</i>
6500	182.6	183	181.5	181.6	181.2	<i>Bad Data</i>
7000	193.1	192.8	191.8	191.4	191.2	<i>Bad Data</i>
7500	197.9	198.3	197.4	197.3	197.2	<i>Bad Data</i>
8000	198.4	199	197.6	197.8	198	<i>Bad Data</i>
Test Run Average BHP (din)	188.62	188.74	187.82	187.64	187.48	0
Test oil temp delta (DegC)	-0.7	2.3	-0.4	1	0.2	

Whole test *average* BHP (din)

188.06

Whole test *average* oil temp delta (DegC)

0.48