

**Report Date:** June 29, 2015

**Name:** Liqui Moly Oil Additives Service

**Objective:** Before and After Dyno and Data Monitoring Test Results

**Test Vehicle:** 1995 Porsche 993 Coupe  
Mileage: 83753 KMS  
Transmission: Manual 6 speed  
Measured in 4<sup>th</sup> Gear Ratio 1:1  
Ambient Temperature: 25°C

**Test Date:** June 29, 2015

**Maintenance Service & Engine Treatment Performed:**

1. Engine Flush before Oil Change with Liqui Moly *Pro-Line Engine Flush*.
2. Lube, Oil and Filter Service with Liqui Moly *Leichtlauf High Tech 5W40* Full Synthetic Motor Oil.
3. Engine Treatment with Liqui Moly *Cera Tec* and Liqui Moly *Motor Oil Saver*.

**Pre-Treatment Testing:**

1. Install car on dyno.
2. Performed drive train losses and calibrate dyno speed (*Attachment 1*).
3. Performed Two Income Performance Test on Full Load (*Attachment 2 & 3*).
  - Running Engine Oil Temperature at Start of Test 1: 85°C
  - Running Engine Oil Temperature at Start of Test 2: 85°C
4. Performed Partial Load Test between 2000-4000RPM (*Attachment 8*).
  - Running Engine Oil Temperature at Start: 86°C
  - Running Engine Oil Temperature at End: 110.0°C
5. Performed Partial Load Test (Fuel Consumption) between 2000-4000RPM (*Attachment 9*).  
Test performed on each Testpoint with 2 minutes measuring time in (L/h)
6. Partial Load Test Time is approximately 20 Minutes

**Post Treatment Testing:**

1. Install car on dyno.
2. Performed drive train losses (*Attachment 4*).
3. Performed Two Income Performance Test on Full Load (*Attachment 5 & 6*).
  - Running Engine Oil Temperature at Start of Test 1: 85°C.
  - Running Engine Oil Temperature at Start of Test 2: 85°C.
4. Performed Partial Load Test between 2000-4000RPM (*Attachment 8*).
  - Running Engine Oil Temperature at Start: 89°C
  - Running Engine Oil Temperature at End: 112°C.
5. Performed Partial Load Test between 2000-4000RPM (*Attachment 9*).  
with 2 minutes measuring time in L/h at each Testpoint.

## **Test Results:**

1. At Full Load, the overall gain in Engine HP is 13HP (+8.8%) and Torque 16ft/lbs (+8.8%) and is consistent over the complete engine speed range. (*Attachment 7*)
2. At Partial Load 3320 rpm, the overall gain in Engine HP is 3.3HP (19.6%) and Torque 4.2 ft/lbs (12.7%). (*Attachment 8*)
3. As a result of the Liqui Moly additives used, the Fuel Consumption in Partial Load at 2080rpm in 3.Gear is (-8.82%) and at 3600 rpm in 6.Gear is (-7.05%). (*Attachment 9*)
4. HP and Torque increase has clearly increased by the same load/throttle position. HP Increase in Partial Load is between 5.3% and 19.6% and Torque Increase is between 5.9% and 15.9%. (*Attachment 8*)

### **Attachment 1**

Drive Train Losses Before Service

### **Attachment 2**

Incoming Performance Test Before Service - Graph

### **Attachment 3**

Incoming Performance Test Before Service - Data

### **Attachment 4**

Drive Train Losses After Service

### **Attachment 5**

Incoming Performance Test After Service - Graph

### **Attachment 6**

Incoming Performance Test After Service - Data

### **Attachment 7**

Performance Test Comparison. Before and After Service

**Red – Before**

**Black – After**

### **Attachment 8**

Engine speed, Car speed & Horsepower and Torque Measurement Comparison Before and After Service.

**Orange – Before**

**Green – After**

### **Attachment 9**

Engine speed, Car speed and Gear with Fuel Consumption Comparison as Table Before and After Service.

**Orange – Before**

**Green - After**

### **Attachment 10**

Fuel Consumption Chart (Graphic)

**Black – Before**

**Red - After**



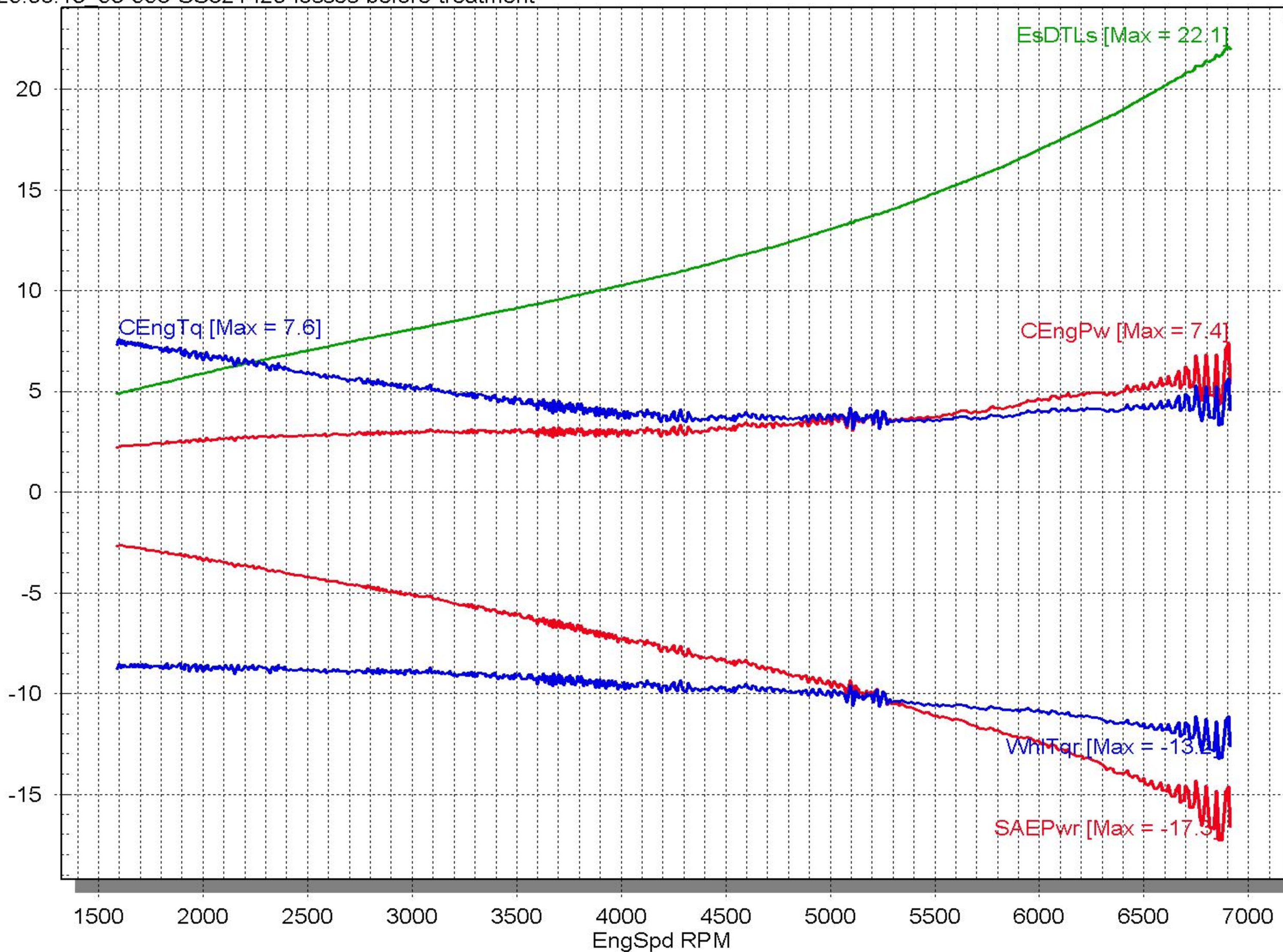


# Corrected Brake Power vs. RPM

RSP-Motorsports Inc

29.06.15\_95-993-SS321420-losses-before-treatment,

29.06.15\_95-993-SS321420-losses-before-treatment



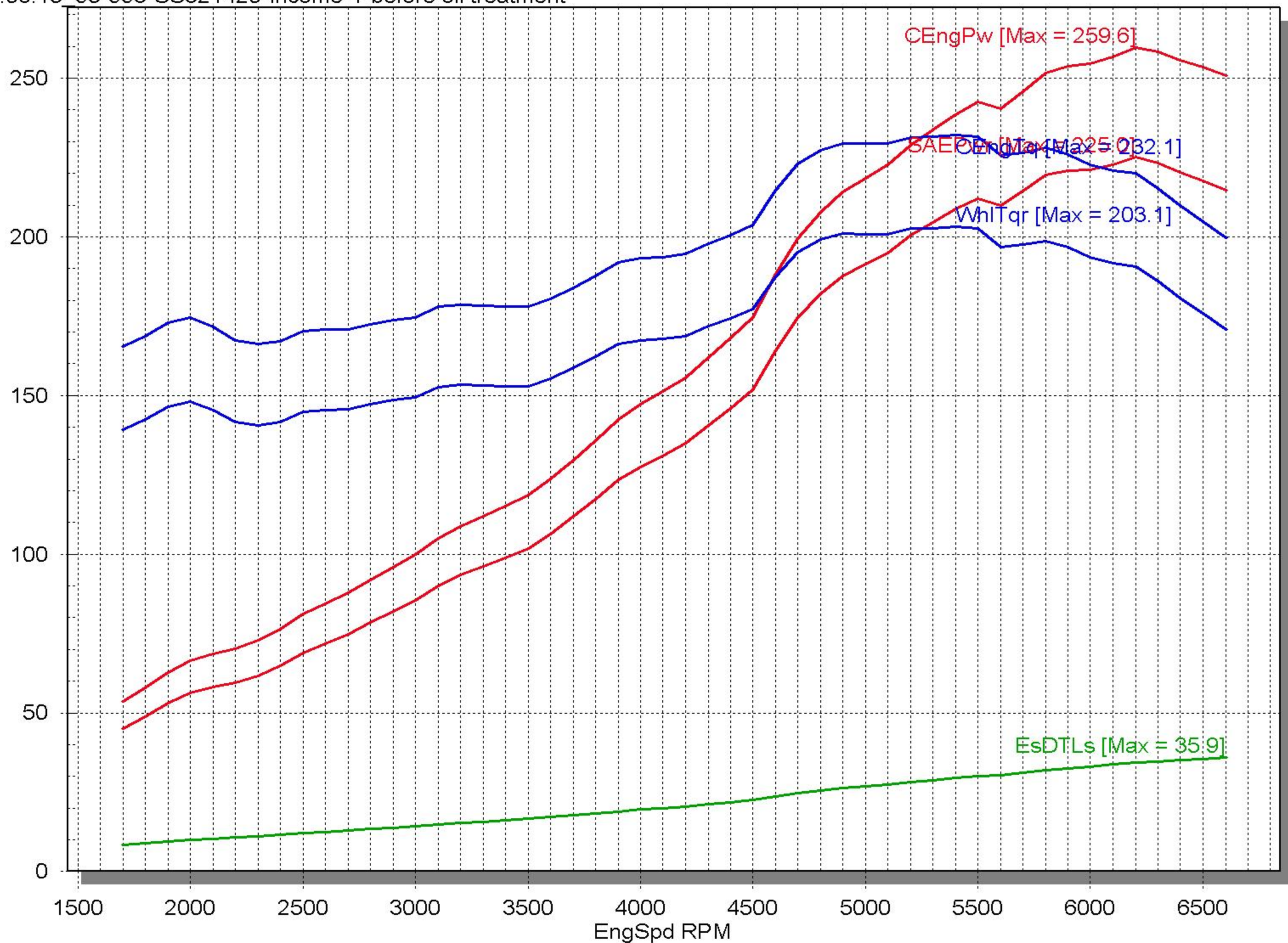


# Corrected Brake Power vs. RPM

RSP-Motorsports Inc

29.06.15\_95-993-SS321420-Income-1-before oil treatment,

29.06.15\_95-993-SS321420-Income-1-before oil treatment



Customer: RSP-Motorsports Inc. (Donna Chhangte)

VIN: known\_to\_LIQUI\_MOLY

License: AXJD 911

Transmission: manual 6speed

measured in 4 Gear Ratio 1:1

Milage: 83753 km

### Attachment 3

Tirepressure/size Front 2.5bar 225/40 ZR18

Tirepressure/size Rear 3.0bar 285/35 ZR18

Before Oil-Treatment

Inspector: Stefan Gunther

EngSpd RPM	CEngPw CHp	SAEPwr CHp	EsDTLs Hp	CEngTq Clb-ft	WhITqr Clb-ft	AirTem deg C
1700	53.5	45	8.4	165.4	139.1	25
1800	57.8	48.8	8.9	168.7	142.4	25
1900	62.6	53	9.5	173	146.5	25
2000	66.4	56.4	10	174.5	148	25
2100	68.6	58.2	10.4	171.6	145.5	25
2200	70.2	59.4	10.7	167.5	141.8	25
2300	72.8	61.6	11.1	166.1	140.7	25
2400	76.4	64.8	11.5	167.2	141.8	25
2500	81.1	69	12	170.4	144.9	25
2600	84.5	71.9	12.5	170.7	145.3	25
2700	87.8	74.8	12.9	170.8	145.5	25
2800	91.9	78.5	13.4	172.5	147.2	25
2900	96	82	13.8	173.8	148.6	25
3000	99.8	85.4	14.3	174.7	149.5	25
3100	105	90.1	14.8	177.9	152.6	25
3200	108.8	93.4	15.3	178.6	153.3	25
3300	112.1	96.2	15.7	178.4	153.2	25
3400	115.2	99	16.1	178	152.9	25
3500	118.6	101.9	16.5	178	153	24
3600	123.7	106.4	17.1	180.4	155.3	25
3700	129.7	111.8	17.7	184	158.7	25
3800	135.8	117.3	18.3	187.6	162.1	25
3900	142.5	123.4	19	192	166.2	25
4000	147.2	127.5	19.5	193.2	167.4	25
4100	151.2	131	20	193.6	167.8	25
4200	155.7	135	20.5	194.7	168.8	25
4300	162	140.6	21.2	197.9	171.8	25
4400	168.1	146	21.8	200.6	174.3	25
4500	174.6	151.9	22.5	203.8	177.2	25
4600	188.1	164.2	23.7	214.8	187.5	25
4700	199.5	174.5	24.7	222.9	195.1	25
4800	207.6	181.9	25.5	227.2	199	25
4900	214.1	187.6	26.2	229.5	201.1	25

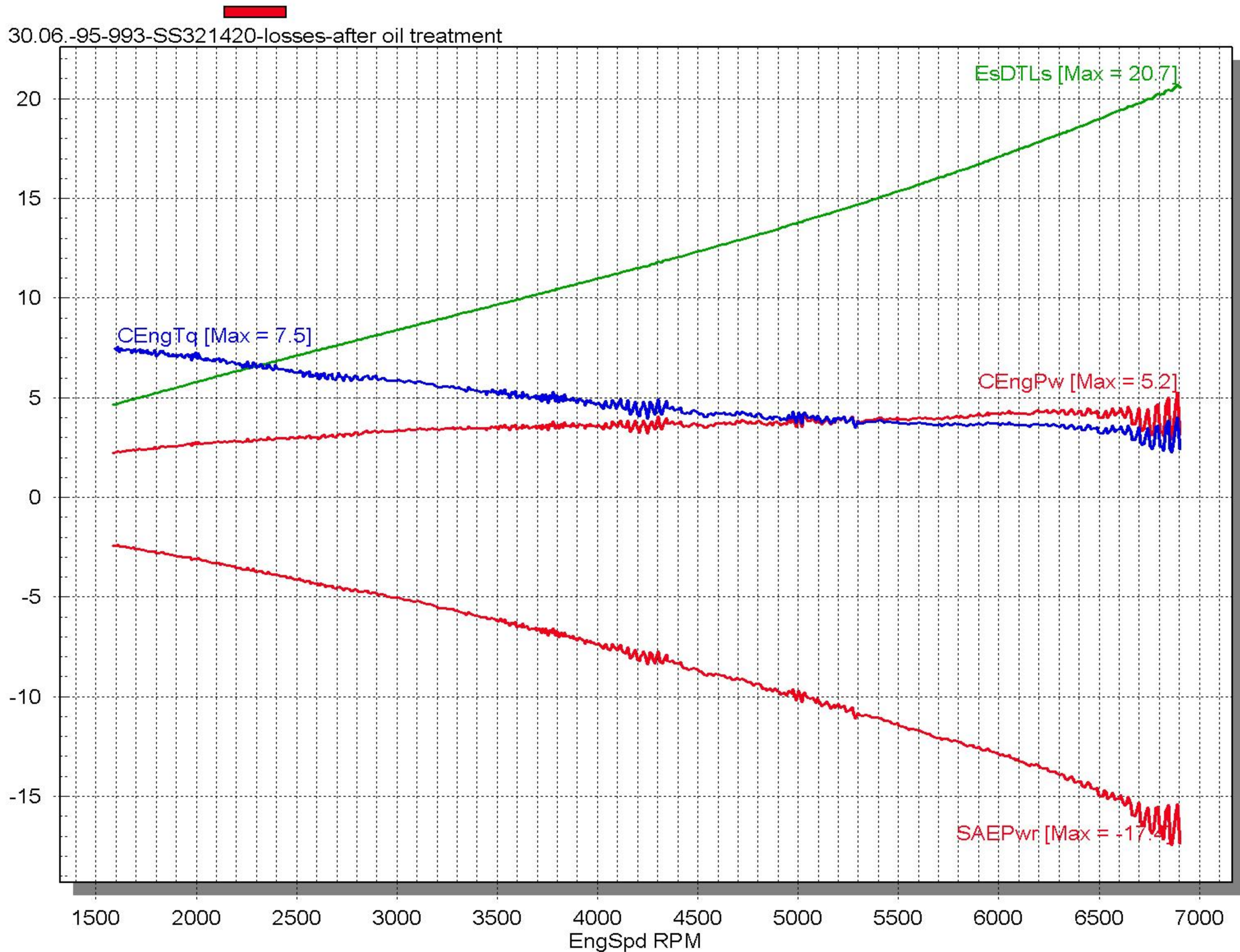
5000	218.3	191.3	26.8	229.4	200.9	25
5100	222.7	195	27.4	229.3	200.8	25
5200	228.9	200.5	28.1	231.2	202.5	25
5300	233.6	204.6	28.8	231.5	202.7	25
5400	238.6	208.9	29.5	232.1	203.1	25
5500	242.5	212.1	30.1	231.6	202.5	25
5600	240.5	209.8	30.4	225.5	196.8	25
5700	245.8	214.4	31.1	226.5	197.5	25
5800	251.7	219.5	31.9	227.9	198.8	25
5900	253.8	221	32.5	225.9	196.7	25
6000	254.5	221.1	33	222.8	193.6	25
6100	256.7	222.7	33.6	221	191.8	25
6200	259.6	225	34.3	219.9	190.6	25
6300	258.3	223.3	34.7	215.4	186.1	25
6400	255.6	220.3	35.1	209.8	180.8	25
6500	253.4	217.6	35.5	204.7	175.8	25
6600	250.9	214.7	35.9	199.6	170.8	25



# Corrected Brake Power vs. RPM

RSP-Motorsports Inc

30.06.-95-993-SS321420-losses-after oil treatment,



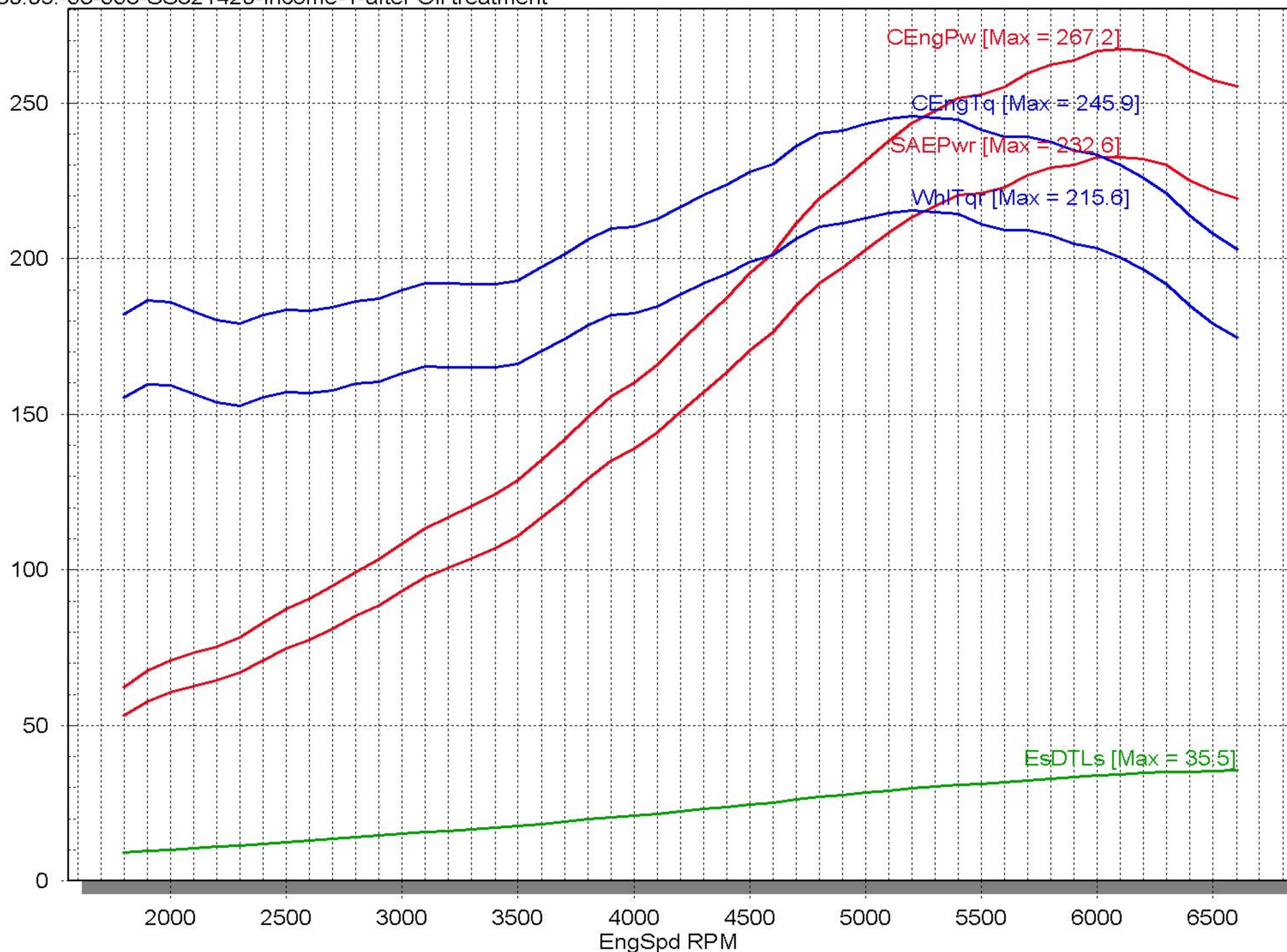


# Corrected Brake Power vs. RPM

RSP-Motorsports Inc

30.06.-95-993-SS321420-Income-1-after Oil treatment,

30.06.-95-993-SS321420-Income-1-after Oil treatment



Customer:RSP Motorsports Inc. (Donna Chhangte)

VIN:known\_to\_LIQUI\_MOLY

License:AXJD 911

Transmission>manual 6speed

measured in 4 Gear ratio 1:1

Milage:83753 km

Tire:225/40 ZR18 2.5bar

Rear:285/35 ZR18 3.0bar

#### Attachment 6

Notice:with Liqui Molly Oil-Treatment

Stock:270hp@6100rpm 243ft-lbs@5000rpm

EngSpd RPM	CEngPw CHp	SAEPwr CHp	EsDTLs Hp	CEngTq Clb-ft	WhlTqr Clb-ft	AirTem deg C
1800	62.4	53.2	9.1	182	155.3	22
1900	67.5	57.8	9.7	186.6	159.7	22
2000	70.8	60.6	10.1	186	159.2	22
2100	73.2	62.5	10.6	183.1	156.4	22
2200	75.4	64.4	11	180.1	153.7	21
2300	78.4	66.9	11.4	179	152.7	21
2400	83	71	12	181.7	155.3	21
2500	87.3	74.7	12.5	183.5	157	21
2600	90.7	77.6	13	183.2	156.7	21
2700	94.7	81.1	13.5	184.2	157.8	21
2800	99.3	85.2	14	186.3	159.8	22
2900	103.3	88.6	14.5	187	160.4	21
3000	108.4	93.2	15.1	189.8	163.1	21
3100	113.4	97.6	15.7	192.1	165.3	21
3200	116.9	100.6	16.2	191.9	165.2	21
3300	120.5	103.7	16.7	191.8	165.1	21
3400	124.2	106.9	17.1	191.9	165.2	22
3500	128.6	110.7	17.7	192.9	166.1	21
3600	135.3	116.7	18.4	197.4	170.3	21
3700	141.8	122.6	19	201.3	174	21
3800	149.1	129.2	19.8	206.1	178.6	21
3900	155.7	135.1	20.4	209.7	181.9	21
4000	160.2	139	21	210.3	182.5	21
4100	166	144.2	21.6	212.6	184.7	21
4200	173.2	150.6	22.4	216.6	188.3	21
4300	180.5	157.2	23.1	220.5	192	22
4400	187.4	163.4	23.8	223.7	195	21
4500	195.3	170.4	24.6	227.9	198.9	21
4600	201.8	176.3	25.3	230.4	201.3	21
4700	211.2	184.7	26.2	236	206.4	21
4800	219.5	192.2	27	240.1	210.3	21
4900	225	197.1	27.6	241.2	211.2	21
5000	231.5	202.8	28.4	243.1	213	21
5100	237.8	208.4	29.1	244.8	214.6	21
5200	243.5	213.4	29.7	245.9	215.6	21
5300	247.4	216.8	30.3	245.1	214.8	21

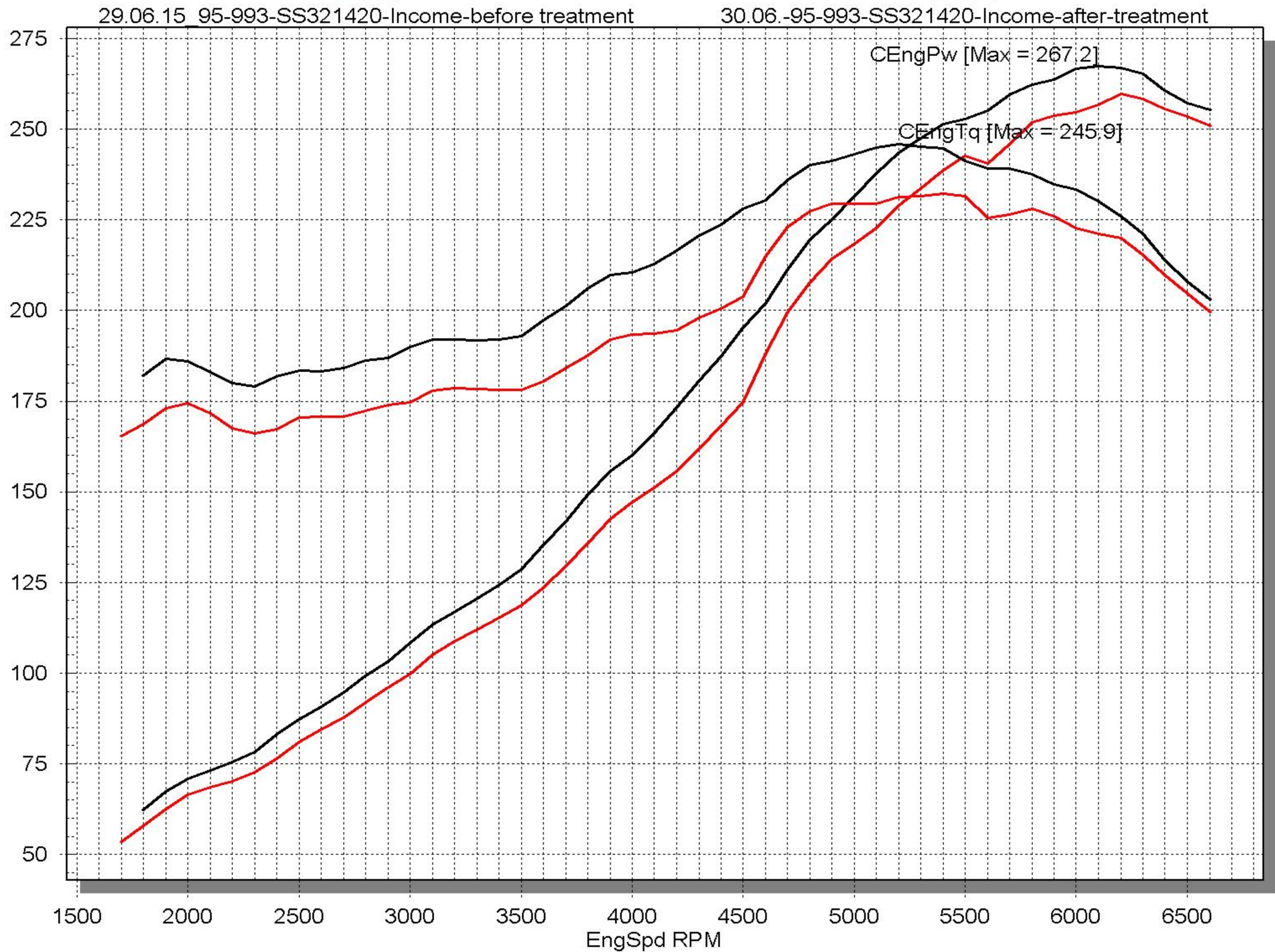
5400	251.5	220.3	30.9	244.6	214.2	21
5500	252.7	221.1	31.3	241.3	211.1	21
5600	255	222.9	31.8	239.2	209.1	21
5700	259.5	226.8	32.4	239.1	209	22
5800	262.3	229.1	32.9	237.5	207.4	21
5900	263.7	230	33.3	234.7	204.7	21
6000	266.6	232.4	33.9	233.4	203.4	21
6100	267.2	232.6	34.3	230.1	200.2	21
6200	266.8	231.8	34.6	226	196.4	21
6300	265.2	229.9	34.9	221.1	191.7	21
6400	260.6	225.2	35	213.8	184.8	21
6500	257.2	221.7	35.2	207.9	179.2	21
6600	255.3	219.5	35.5	203.1	174.6	21



# Corrected Brake Power vs. RPM

RSP-Motorsports Inc

29.06.15\_95-993-SS321420-Income-before treatment, 30.06.-95-993-SS321420-Income-after-treatment,



## Engine Treatment with Liqui Moly

Vehicle:1995

VIN:known\_to\_LIQUI\_MOLY

Licence:AXJD 911

Transmission>manual 6 speed

Milage:83753km

Stock 270HP@6100rpm 243ft/lbs@5000rpm

measured in 4th Gear Ratio 1:1

Ambient Temperature: 22-25°Celsius

## Attachment 8

RPM	Gear	Throttle %	Car Speed Km/h	Horsepower HP	Torque ft/lbs	Ramp-Dyno %	Gain (HP)	Gain (HP) %	Gain (Torque)	Gain (Torque) %
2080	3	7.00	50.00	10.80	33.50	1.00				
2080	3	7.00	50.00	10.80	35.50	1.00	0.00 HP	0	+2.00 ft/lbs	+5.9%
2880	3	10.00	70.00	14.40	33.50	1.00				
2880	3	10.00	70.00	16.10	36.80	1.00	+1.70 HP	+11.8%	+3.3 ft/lbs	+9.8%
3320	3	10.00	80.00	16.80	33.00	1.00				
3320	3	10.00	80.00	20.10	37.20	1.00	+3.30 HP	+19.6%	+4.2 ft/lbs	+12.7%
2640	4	10.00	80.00	16.90	32.00	2.00				
2640	4	10.00	80.00	18.70	37.10	2.00	+1.80 HP	+10.6%	+5.1 ft/lbs	+15.9%
3280	4	11.00	100.00	22.00	36.00	2.00				
3280	4	11.00	100.00	25.20	40.10	2.00	+3.20 HP	+14.5%	+4.1 ft-lbs	+11.3%
3920	4	13.00	120.00	30.00	41.00	2.00				
3920	4	13.00	120.00	32.80	45.30	2.00	+2.80 HP	+9.3%	+4.3 ft/lbs	+10.4%
3200	5	13.00	120.00	30.50	39.00	2.00				
3200	5	13.00	120.00	35.00	43.20	2.00	+4.5 HP	+10.7%	+4.2 ft/lbs	+10.7%
3760	5	15.00	140.00	38.00	42.50	2.00				
3760	5	15.00	140.00	40.20	46.00	2.00	+2.20 HP	+5.7%	+3.5 ft/lbs	+8.2%
3160	6	15.00	140.00	42.00	46.50	2.00				
3160	6	15.00	140.00	40.50	45.80	2.00	-1.5 HP	-0.37%	- 0.7 ft/lbs	-1.6%
3600	6	16.00	160.00	47.00	47.00	2.00				
3600	6	16.00	160.00	49.50	50.50	2.00	+2.5 HP	+5.3%	+3.5 ft/lbs	+7.4%

before Oil Treatment  
 after Oil Treatment

## Fuelconsumption Test

Vehicle:1995

VIN:known\_to\_LIQUI\_MOLY

Licence:AXJD 911

Transmission>manual 6 speed

## Engine Treatment with Liqui Moly

Milage:83753km

Stock 270HP@6100rpm 243ft/lbs@5000rpm

measured in 4th Gear Ratio 1:1

Ambient Temperature: 22-25°Celsius

## Attachment 9

RPM	Gear	Car Speed Km/h	Ramp-Dyno %	Fuel consumption L/H	Gain %
2080	3	50.00	1.00	0.185	
2080	3	50.00	1.00	0.170	-8.82%
2880	3	70.00	1.00	0.250	
2880	3	70.00	1.00	0.235	-6.38%
3320	3	80.00	1.00	0.275	
3320	3	80.00	1.00	0.275	0.00%
2640	4	80.00	2.00	0.235	
2640	4	80.00	2.00	0.235	0.00%
3280	4	100.00	2.00	0.305	
3280	4	100.00	2.00	0.295	-3.38%
3920	4	120.00	2.00	0.390	
3920	4	120.00	2.00	0.370	-5.40%
3200	5	120.00	2.00	0.330	
3200	5	120.00	2.00	0.325	-1.53%
3760	5	140.00	2.00	0.410	
3760	5	140.00	2.00	0.395	-3.79%
3160	6	140.00	2.00	0.370	
3160	6	140.00	2.00	0.355	-4.22%
3600	6	160.00	2.00	0.455	
3600	6	160.00	2.00	0.425	-7.05%

before Oil Treatment

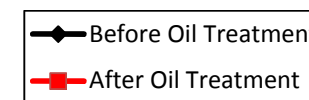
after Oil Treatment



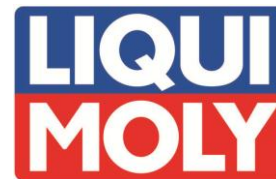
**Fuel Consumption Test - Before and After Liqui Moly Engine Treatment**  
**1995 Porsche 911 Carrera**  
**VIN:known\_to\_LIQUI\_MOLY**



**Attachment 10**



# product information



## Pro-Line Engine Flush

### DESCRIPTION:

Highly effective detergent additives in Engine Flush clean interior engine before oil change.

### PROPERTIES:

Gentle and rapid cleaning.  
Neutral to seals and other materials installed in the engine  
Compatible with catalytic converters.  
Highly economical.  
No additional environmental pollution.  
Simple to use.

### BENEFITS:

Removes Deposits, residues from all 4-stroke gasoline engines and diesel engines.  
Dissolves sludge and lacquer and isolates solid particles and liquid contaminants.  
Improves the combustion process and restores full engine performance.  
Prevents corrosion of unprotected metal surfaces.  
Recovers oil lubricating properties.

### APPLICATION:

Suitable for all gas and diesel engines.

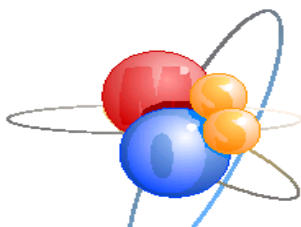
### INSTRUCTIONS:

Add to engine oil before engine oil change. Let engine run on idle speed for 10 minutes. Drain oil, change oil filter and re-fill with fresh oil of high quality. Contents sufficient for 1.3 gal (5liters) sump capacity. Fully compatible with all commercially available engine oils.



**Pro-Line  
Engine Flush  
500ml can  
Part no. LM2037  
Case Qty 6 cans.**

Our information is based on thorough research and may be considered reliable, although not legally binding.



# product information



## LEICHTLAUF HIGH TECH 5W-40

### DESCRIPTION:

Modern top class low-friction engine oil for all-season use in gasoline and diesel engines without diesel particulate filters (DPF). The combination of innovative base oils – based on synthesis technology and the latest additive technology – guarantees an engine oil that reduces oil and fuel consumption and that ensures fast lubrication of the engine. Depending on the manufacturer instructions, oil change intervals of up to 40,000 km are possible.

### PROPERTIES:

- smooth engine running
- rapid oil delivery at low temperatures
- optimum oil pressure at all engine speeds
- high lubrication reliability at high and low temperatures
- high shear and ageing stability
- saves petrol and reduces pollutant emission
- long engine service life due to high level of protection against wear
- outstanding engine cleanliness
- tested with catalytic converters and performance proved with turbos
- miscible and compatible with commercially-available engine oils.

### APPLICATION:

Ideally suited for modern gasoline and diesel engines with multi-valve technology, turbocharger and with or without charge air cooling. Especially suitable where there are long intervals between changes and heavy duty engine requirements.

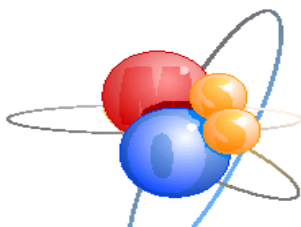
### INSTRUCTIONS:

The operating instructions of the vehicle and engine manufacturers must be followed.



### Specifications / Approvals:

API SN/CF  
ACEA A3-08/B4-08  
BMW Longlife-01  
MB-Approval 229.5  
Porsche A40  
Renault RN 0700, 0710  
VW 502 00/505 00  
LIQUI MOLY also recommends this product for vehicles for which the following specifications are required:  
Opel GM LL-B025  
Fiat 9.55535-H2, 9.55535-M2, 9.55535-N2  
Peugeot/Citroen (PSA) B71 2294, B71 2296





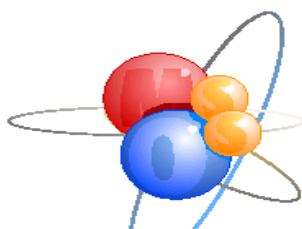
# product information



**LEICHTLAUF HIGH  
TECH 5W-40  
5 Liter  
Part no. LM2332  
Case Qty 4 Jugs**

**1 Liter  
Part no. LM2331  
Case Qty 6 Jugs**

**Our information is based on thorough research and may be considered reliable, although not legally binding.**



## Cera Tec

### DESCRIPTION

Micro ceramic solid lubricant suspension based on hexagonal boron nitride (BN) in mineral oil. The laminar graphite-similar structure reduces friction and wear and prevents direct metal-to-metal contact. The  $< 0.5 \mu\text{m}$  particle size guarantees optimal filter flow properties and protects against depositing of solid lubricant particles.

### PROPERTIES

- Mixable with all commercially available motor oils
- Stable even under high thermal and dynamic permanent loads
- No deposits and absolutely compatible with all commonly used filter systems
- Resists extremely high and low temperatures
- Reduces fuel consumption
- Increases engine service life
- Increases smooth operation
- Stable under extreme pressures
- Chemically inert
- Higher performance gain due to reduced friction
- Does not increase the phosphorous and sulfur content of the motor oil
- Tested with catalytic converters and diesel particle filter

### TECHNICAL DATA

Base	:	BN micro ceramic	
Color:	:	Yellowish white	
Ceramic particle size	:	Majority $< 0.5 \mu\text{m}$	
Temperature stability of the ceramic particles	:	To $+1,200^\circ\text{C}$	
Density at $+20^\circ\text{C}$	:	0.89 - 0.90	$\text{g/cm}^3$ DIN 51757
Viscosity at $+20^\circ\text{C}$	:	$\sim 300$	$\text{mPa}\cdot\text{s}$ DIN 51398
Flash point	:	200	$^\circ\text{C}$ DIN ISO 2592
Pour point	:	-20	$^\circ\text{C}$ DIN ISO 3016

### APPLICATIONS

Added to the lubricating oil of engines, compressors, pumps and transmissions. Excellent for use in passenger car and commercial vehicle engines (gasoline and diesel). Mixable with all commercially available motor oils.

### APPLICATION

300 ml will treat up to 5 liters of motor oil. Long-term effect up to 50,000 km.

#### Note:

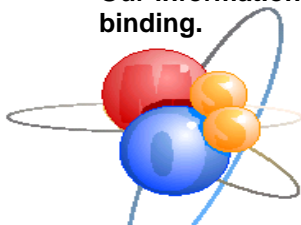
**Not suitable for use with wet clutches!**

### AVAILABLE PACK SIZES

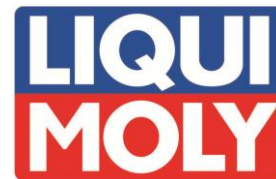
Cera Tec	300 ml can	Part no. 3721 D-GB-I-E-P-NL-F-GR-RUS
	300 ml can	Part no. 2321 Korea-D-GB-I-E-P
	300 ml can	Part no. 7181 D-GR-PL-TR-CZ-RO-H-BG

PI 05/05/13

Our information is based on thorough research and may be considered reliable, although not legally binding.



# product information



## Motor Oil Saver

### DESCRIPTION:

Rejuvenates rubber and plastic engine seals and reduces oil consumption via the piston rings and valve guides; counteracts the loss in viscosity of motor oils. Puts an end to environmentally pollutant oil patches on the road and in the garage.

### PROPERTIES:

Prevents blue, smoky exhaust fumes. Prevents leaks due to leaks at elastomeric seals. Regenerates engine seals made of plastic and rubber. Reduces engine noises. Prevents pollution of the environment due to oil dripping from the engine. Reduces oil consumption in gasoline and diesel engines.

### BENEFITS:

Lower oil consumption, better oil pressure. Elimination of blue exhaust smoke due to oil burning. Postponement of costly engine repairs. No more unsightly, soil polluting oil spots.

### APPLICATION:

For all gasoline and diesel engines. Compatible with all commercially available motor oils.

### INSTRUCTIONS:

One 300 ml can of Motor Oil Saver is sufficient up to 5 liters of motor oil. The product can be added at any time. After adding, run the engine until warm. Sealing first takes effect after about 400-600 miles. To guarantee a lasting effect, add Motor Oil Saver after each oil change.



**Motor Oil Saver**  
**300ml can**  
**Part no. LM2020**  
**Case Qty 20 cans.**

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