



Report Date:	January 29, 2015
Name:	Liqui Moly Oil Additives Service
Objective:	Before and After Dyno and Data Monitoring Test Results
Test Vehicle:	2009 Porsche Cayenne GTS Mileage: 152,555 KMS Transmission: Automatic Measured in 4 th Gear Ratio 1.16:1 Ambient Temperature: 6°C
Test Date:	January 23, 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 Temperature at Start of Test 1: 67°C
 - Running Engine Temperature at Start of Test 2: 70°C
4. Performed Partial Load Test between 2000-4000RPM (*Attachment 8*).
 - Running Engine Temperature at Start: 82°C
 - Running Engine Temperature at End: 105.7°C
5. Partial Load Test Time is approximately 12 Minutes.
6. After 8 minutes driving in Partial Load Test the Engine Temperature reached 105°C.

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 Temperature at Start of Test 1: 61°C.
 - Running Engine Temperature at Start of Test 2: 64°C.
4. Performed Partial Load Test between 2000-4000RPM (*Attachment 8*).
 - Running Engine Temperature at Start: 61°C
 - Running Engine Temperature at End: 82°C.



Post Treatment Testing (cont'd):

5. Partial Load Test Time is approximately 12 Minutes.
6. After 8 minutes driving in partial load test the engine temperature reached 67°C.

Test Results:

1. At Full Load, the overall gain in Engine HP is 15.5HP (+4.5%) and Torque 26ft/lbs (+8%) and is consistent over the complete engine speed range. (*Attachment 7*)
2. At Partial Load 2500 rpm, the overall gain in Engine HP is 20HP (15.3%) and Torque 42ft/lbs (14.4%). (*Attachment 8*)
3. As a result of the Liqui Moly additives used, the Engine Temperature stays lower and stable over the full RPM range. (*Attachment 8*)
4. HP and Torque increase is confirmed as the **Air flow g/s** has clearly increased by the same load/throttle position. HP Increase in Partial Load is between 5% and 15.4% and Torque Increase is between 3.2% and 17.1%. (*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

Air Flow Grams/Second (g/s) & Engine Temperature Measurement Comparison Before and After Service.

Orange – Before

Green – After



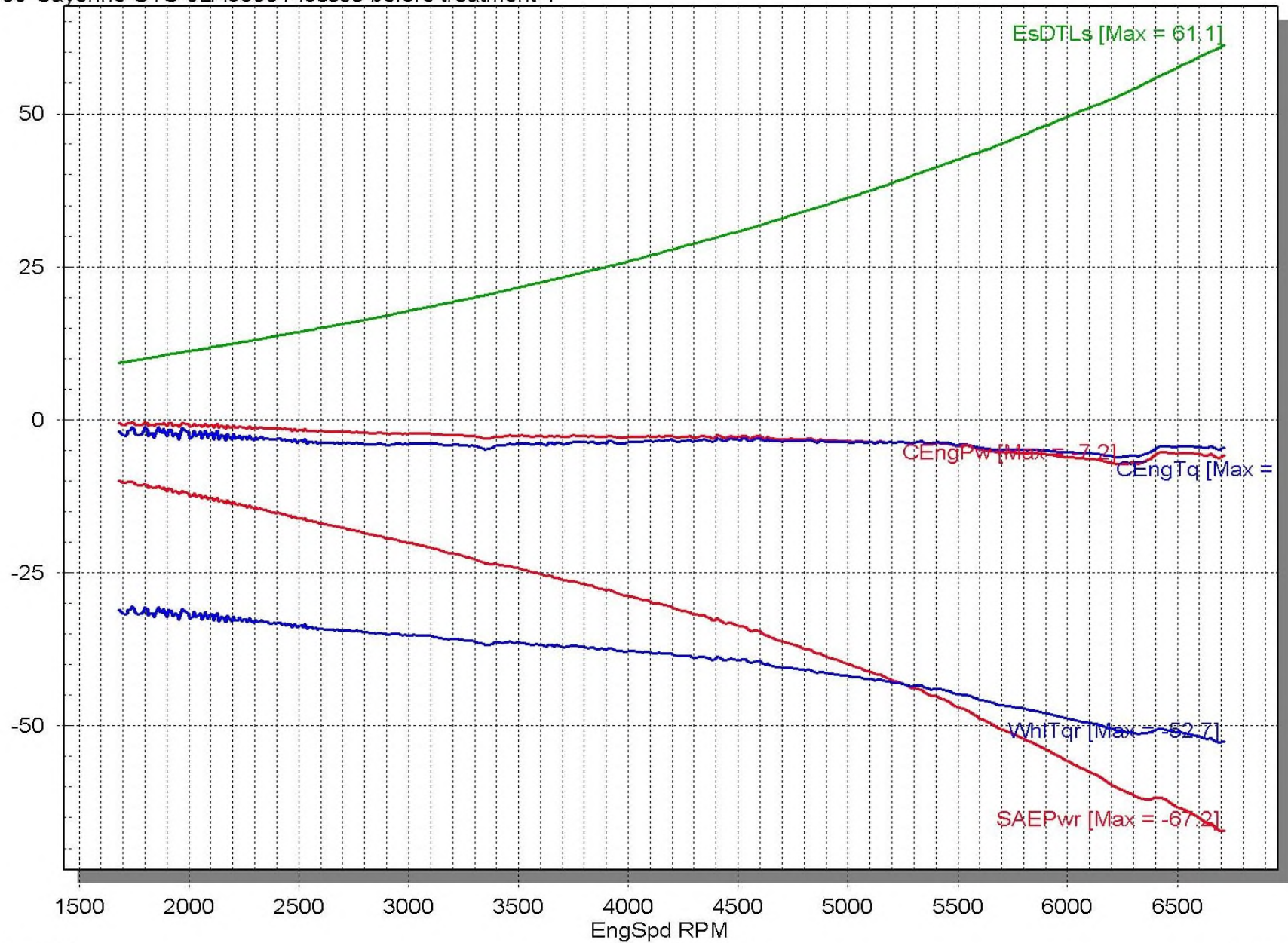
Corrected Brake Power vs. RPM

RSP-Motorsports Inc

2009-Cayenne GTS-9LA63501-losses-before treatment-1,

Attachment 1

2009-Cayenne GTS-9LA63501-losses-before treatment-1



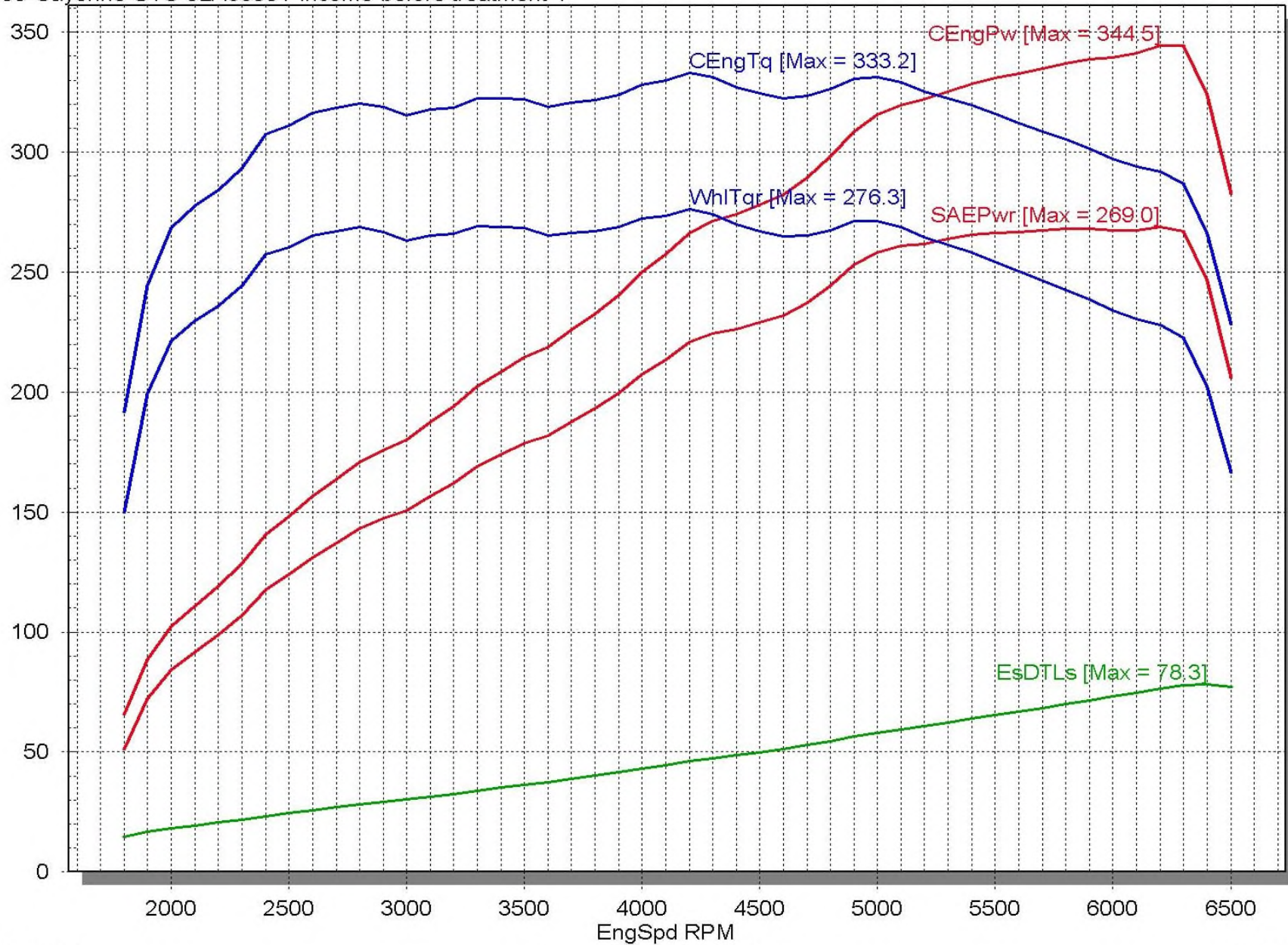
Corrected Brake Power vs. RPM

RSP-Motorsports Inc

2009-Cayenne GTS-9LA63501-Income-before treatment-1,

Attachment 2

2009-Cayenne GTS-9LA63501-Income-before treatment-1



Vehicle: 2009 Porsche Cayenne GTS

ATTACHMENT 3

VIN: known_to_LIQUI_MOLY

Transmission: Automatic

measured in 4th Gear Ratio 1.16:1

Mileage: 152,555 KM

Tire Pressure Front 2.6 Bar 255/55 R18

Tire Pressure Rear 2.6 Bar 255/55 R18

INCOME BEFORE ENGINE TREATMENT

EngSpd RPM	CEngPw CHp	SAEPwr CHp	EsDTLs Hp	CEngTq Clb-ft	WhlTqr Clb-ft
1800	65.7	51.4	14.5	191.8	149.9
1900	88.5	72	16.6	244.5	199.1
2000	102.2	84.2	18.2	268.3	221.2
2100	111	91.9	19.4	277.6	229.8
2200	119	98.8	20.5	284.1	235.8
2300	128.4	106.9	21.8	293.3	244.2
2400	140.6	117.6	23.3	307.6	257.3
2500	148.1	123.9	24.5	311	260.4
2600	156.6	131.3	25.8	316.4	265.2
2700	163.8	137.3	26.9	318.6	267
2800	170.9	143.2	28.1	320.5	268.7
2900	176	147.3	29.1	318.7	266.8
3000	180.1	150.4	30.1	315.3	263.3
3100	187.5	156.6	31.4	317.7	265.3
3200	194.1	162	32.6	318.6	265.9
3300	202.5	169.1	33.9	322.3	269.1
3400	208.6	174	35.1	322.3	268.8
3500	214.6	178.8	36.3	322	268.3
3600	218.6	181.7	37.5	319	265.1
3700	225.8	187.6	38.8	320.6	266.3
3800	232.8	193.2	40.1	321.7	267.1
3900	240.4	199.6	41.5	323.8	268.7
4000	249.8	207.4	43	328	272.3
4100	257.4	213.6	44.5	329.8	273.6
4200	266.4	221	46.1	333.2	276.3
4300	271.3	224.5	47.5	331.3	274.2
4400	274.1	226.2	48.6	327.2	270
4500	278.1	229	49.9	324.6	267.2
4600	282.4	231.9	51.2	322.5	264.8
4700	289.5	237.4	52.8	323.6	265.3
4800	298.3	244.5	54.5	326.4	267.5
4900	308.6	253	56.4	330.8	271.2
5000	315.5	258.3	58	331.5	271.4
5100	319.7	261.1	59.4	329.3	268.9
5200	321.9	261.9	60.8	325.1	264.5

EngSpd RPM	CEngPw CHp	SAEPwr CHp	EsDTLs Hp	CEngTq Clb-ft	WhlTqr Clb-ft
5300	325.4	263.8	62.4	322.5	261.5
5400	328.6	265.5	63.9	319.6	258.3
5500	331	266.4	65.3	316	254.4
5600	332.9	266.9	66.8	312.2	250.3
5700	334.9	267.5	68.3	308.6	246.4
5800	337.1	268	69.9	305.3	242.7
5900	338.8	268.1	71.5	301.6	238.7
6000	339.6	267.4	73.1	297.3	234
6100	341.4	267.6	74.7	294	230.4
6200	344.5	269	76.4	291.9	227.8
6300	344.3	267.1	78	287	222.7
6400	323.9	246.4	78.3	265.8	202.2
6500	282.6	206	77.2	228.3	166.5

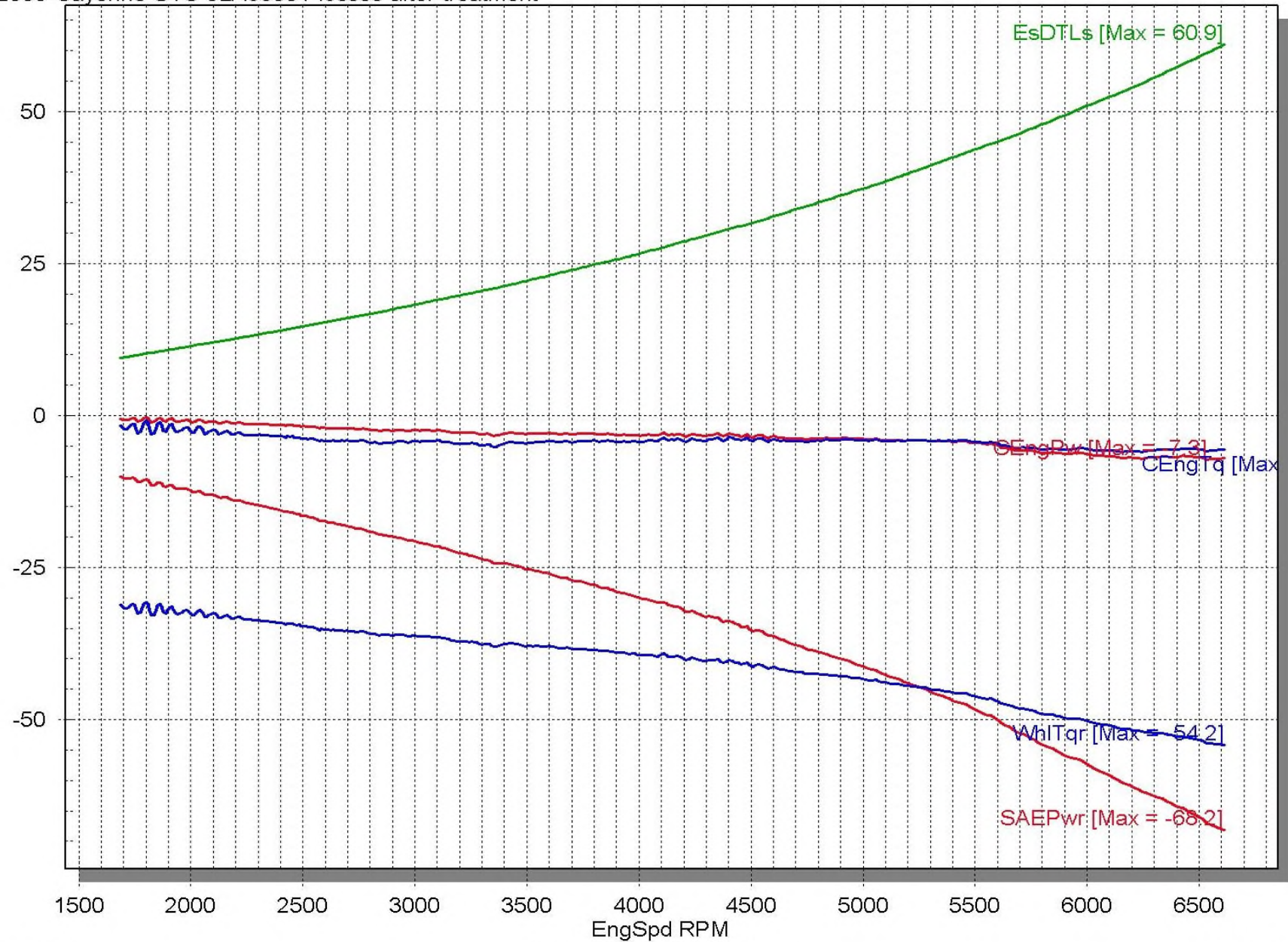
Corrected Brake Power vs. RPM

RSP-Motorsports Inc

2009-Cayenne GTS-9LA63501-losses-after-treatment,

Attachment 4

2009-Cayenne GTS-9LA63501-losses-after-treatment



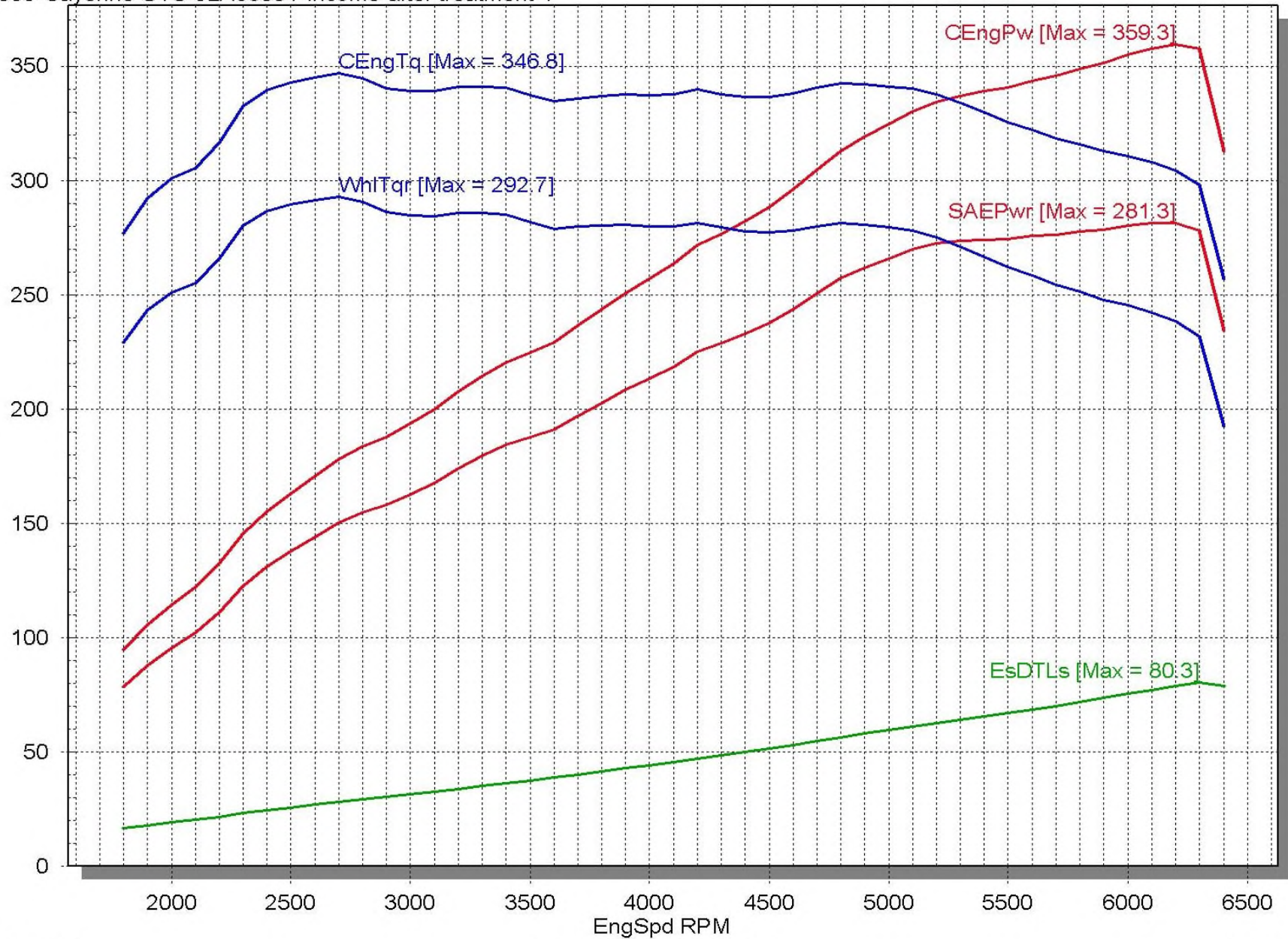
Corrected Brake Power vs. RPM

RSP-Motorsports Inc

2009-Cayenne GTS-9LA63501-Income-after treatment-1,

Attachment 5

2009-Cayenne GTS-9LA63501-Income-after treatment-1



Vehicle: 2009 Porsche Cayenne GTS

ATTACHMENT 6

VIN: known_to_LIQUI_MOLY

Transmission: Automatic

Measured in 4th Gear Ratio 1.16:1

Mileage: 152,555 KM

Tire Pressure Front 2.6 Bar 255/55 R18

Tire Pressure Rear 2.6 Bar 255/55 R18

INCOME AFTER ENGINE TREATMENT

EngSpd RPM	CEngPw CHp	SAEPwr CHp	EsDTLs Hp	CEngTq Clb-ft	WhlTqr Clb-ft
1800	94.9	78.5	16.6	276.8	229
1900	105.7	88	18	292.1	243.2
2000	114.6	95.7	19.2	300.9	251.2
2100	122.1	102.1	20.3	305.4	255.2
2200	132.7	111.3	21.7	316.7	265.7
2300	145.6	122.7	23.2	332.5	280.2
2400	155.2	131	24.6	339.6	286.7
2500	163.1	137.7	25.8	342.7	289.4
2600	170.9	144.3	27	345.2	291.4
2700	178.3	150.5	28.2	346.8	292.7
2800	183.8	155	29.3	344.8	290.7
2900	187.9	158	30.3	340.2	286.1
3000	193.7	162.6	31.5	339	284.7
3100	200	167.8	32.7	338.9	284.3
3200	207.7	174.2	34	340.9	285.9
3300	214.2	179.5	35.2	340.9	285.7
3400	220.4	184.5	36.4	340.5	285
3500	224.7	187.7	37.6	337.2	281.6
3600	229.4	191.1	38.8	334.6	278.8
3700	236.6	197	40.1	335.9	279.7
3800	243.7	202.7	41.5	336.8	280.2
3900	250.6	208.4	42.9	337.5	280.6
4000	256.8	213.2	44.2	337.2	279.9
4100	263.6	218.6	45.7	337.7	280
4200	271.8	225.2	47.2	339.8	281.6
4300	276.6	228.7	48.6	337.8	279.3
4400	282.1	232.7	50	336.7	277.8
4500	288.4	237.7	51.4	336.6	277.4
4600	296.1	243.7	53.1	338	278.3
4700	304.7	250.6	54.8	340.4	280
4800	312.9	257.2	56.5	342.4	281.4
4900	319.2	261.9	58.1	342.2	280.7
5000	324.8	265.9	59.6	341.1	279.4
5100	330.5	270.1	61.2	340.3	278.1
5200	334.3	272.3	62.7	337.6	275

EngSpd RPM	CEngPw CHp	SAEPwr CHp	EsDTLs Hp	CEngTq Clb-ft	WhlTqr Clb-ft
5300	336.9	273.5	64.3	333.9	271
5400	339	274.1	65.7	329.7	266.6
5500	340.8	274.4	67.2	325.4	262
5600	343.6	275.7	68.7	322.3	258.6
5700	345.7	276.3	70.2	318.5	254.6
5800	348.7	277.6	72	315.8	251.4
5900	351.3	278.4	73.7	312.7	247.9
6000	354.9	280.2	75.4	310.6	245.3
6100	357.6	281.2	77.1	307.9	242.2
6200	359.3	281.3	78.8	304.4	238.3
6300	357.6	278	80.3	298.1	231.8
6400	312.9	234.5	79.1	256.8	192.5

Corrected Brake Power vs. RPM

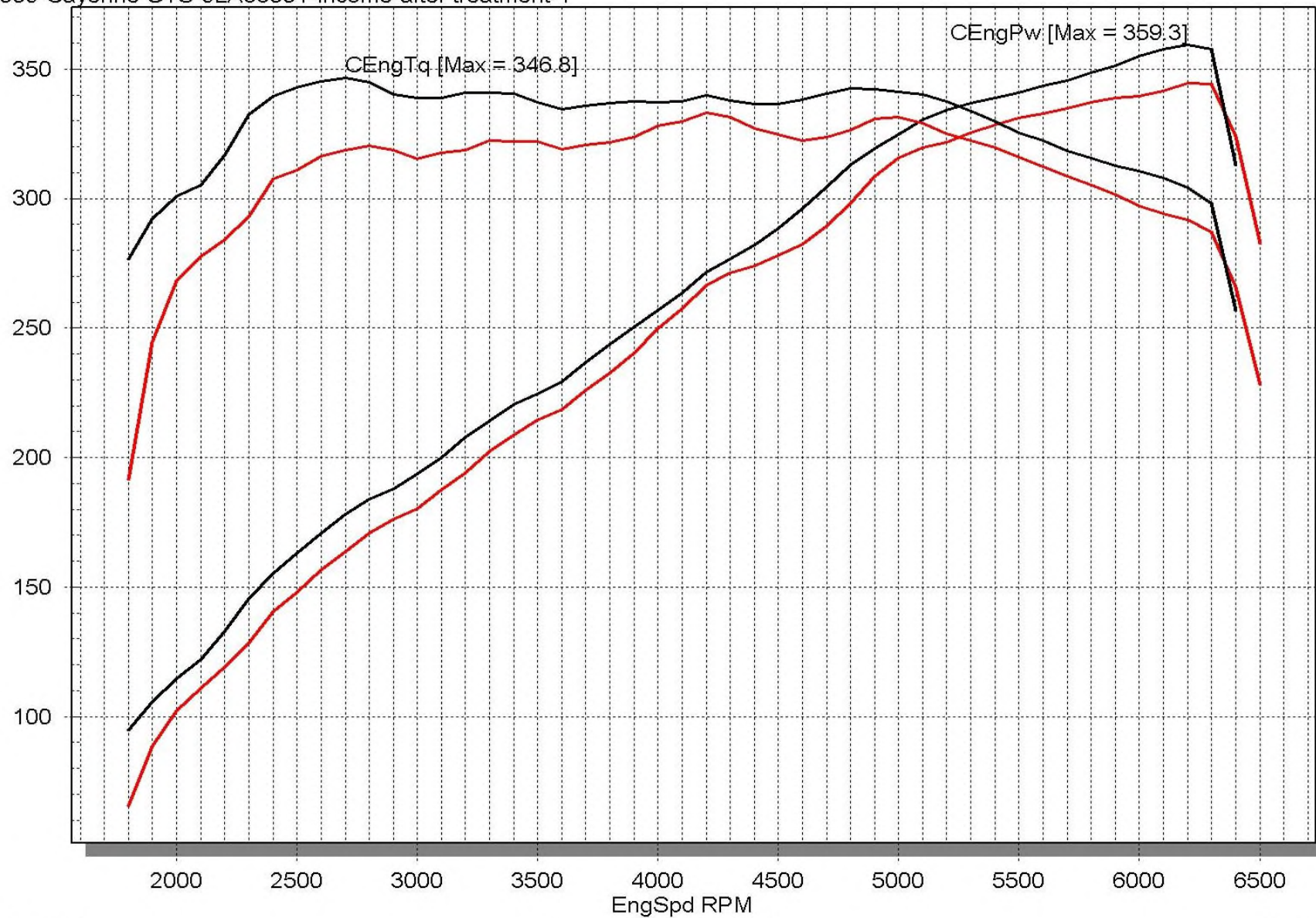
RSP-Motorsports Inc

2009-Cayenne GTS-9LA63501-Income-before treatment-1, 2009-Cayenne GTS-9LA63501-Income-after treatment-1,

2009-Cayenne GTS-9LA63501-Income-before treatment-1

ATTACHMENT 7

2009-Cayenne GTS-9LA63501-Income-after treatment-1



Engine Treatment with Liqui Moly

Vehicle: 2009 Porsche Cayenne GTS

VIN: known_to_LIQUI_MOLY

Transmission: Automatic

Mileage: 152,555 KM

Measured in 4th Gear Ratio 1.16:1

Ambient Temperature: 6°C

ATTACHMENT 8

RPM	Throttle %	Car Speed Km/h	Airflow g/s	Engine Temperature C°	Horsepower (HP)	Torque ft/lbs	Gain (HP)	Gain (HP) %	Gain (Torque)	Gain (Torque) %
2000	15.00	56.60	60.00	85.50	78.00	213.00				
2000	15.00	56.60	61.00	60.60	83.00	228.00	+5HP	6.4%	+15 ft/lbs	7.0%
2000	30.00	56.60	74.00	87.00	99.00	273.00				
2000	30.00	56.60	82.00	65.60	113.00	308.00	+14HP	14.1%	+35 ft/lbs	12.8%
2500	15.00	70.00	68.00	92.00	91.00	198.00				
2500	15.00	70.00	75.00	66.00	98.00	220.00	+7HP	7.6%	+ 22ft/lbs	11.1%
2500	30.00	70.00	100.00	97.00	130.00	290.00				
2500	30.00	70.00	106.00	69.00	150.00	332.00	+20HP	15.4%	+42 ft/lbs	14.5%
3000	15.00	84.00	75.00	105.00	94.00	173.00				
3000	15.00	84.00	80.00	70.00	104.00	192.00	+10HP	10.6%	+19 ft/lbs	10.9%
3000	30.00	84.00	120.00	105.00	166.00	308.00				
3000	30.00	84.00	129.00	72.00	182.00	340.00	+16HP	9.6%	+32 ft/lbs	10.4%
3500	15.00	99.00	76.00	105.00	88.00	135.00				
3500	15.00	99.00	85.00	74.00	100.00	158.00	+12HP	13.6%	+23 ft/lbs	17.1%
3500	30.00	99.00	141.00	105.00	200.00	320.00				
3500	30.00	99.00	151.00	76.50	210.00	330.00	+10HP	5.0%	+10 ft/lbs	3.2%
4000	15.00	113.00	80.00	105.00	89.00	121.00				
4000	15.00	113.00	86.00	77.00	96.00	131.00	+7HP	7.8%	+10 ft/lbs	8.3%
4000	30.00	113.00	155.00	105.00	214.00	292.00				
4000	30.00	113.00	160.00	81.00	228.00	311.00	+14HP	6.5%	+19 ft/lbs	6.5%

Before Oil Treatment
 After Oil Treatment