



# Boron Nitride Oil Additive

## Performance Test

Compare to

Motor Oil with TSD BN Oil Additive

Vs.

Motor Oil without TSD BN Oil Additive

On-Vehicle Test



March 21, 2006

Tested by:  
TopSpin Design Co.

## TABLE OF CONTENTS

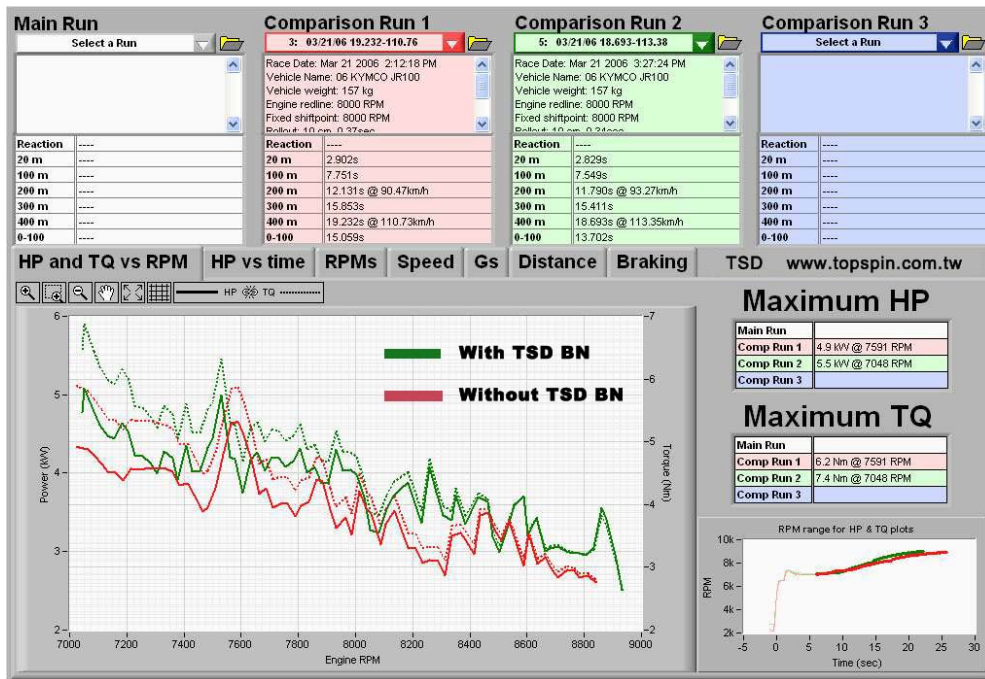
<b><u>Contents</u></b>	<b><u>Pages</u></b>
<b>Test Result – Preview .....</b>	<b>1</b>
<b>Introduction .....</b>	<b>2</b>
<b>Performance Testing .....</b>	<b>3</b>
<b>Test Procedure .....</b>	<b>4</b>
<b>Test Result Analysis .....</b>	<b>5</b>
<b>HP &amp; TQ &amp; RPM .....</b>	<b>5</b>
<b>RPM .....</b>	<b>6</b>
<b>Speed .....</b>	<b>7</b>
<b>Forward Acceleration (Gs) .....</b>	<b>8</b>
<b>Appendix I – Product Images .....</b>	<b>9</b>
<b>Appendix II – Testing Process Images .....</b>	<b>10</b>
<b>Appendix III – 2006 Kymco JR100 Specifications .....</b>	<b>11</b>

# TEST RESULT - PREVIEW

Test Date: March 21, 2006  
 Test Equipment: G-Tech Pro RR  
 Test Vehicle: Model: 2006 Kymco JR100 Stock  
 Weight: 157 KG (total weight including rider)  
 Fuel Used: CPP 95 octane premium unleaded  
 Motor Oil: Castrol Activ 10W-40 4-stroke Motor Oil  
 Oil Additive: TSD Boron Nitride Thermal Coating

HP increase with TSD BN Oil additive: 12%  
 Torque increase with TSD BN Oil additive: 19%

ITEM		MOTOR OIL	WITH BN
HP	Metric	4.9 kW @ 7591 RPM	5.5 KW @ 7048 RPM
	US	6.6 HP @ 7591 RPM	7.4 HP @ 7048 RPM
Torque	Metric	6.2 Nm @ 7591 RPM	7.4 Nm @ 7048 RPM
	US	4.6 ft-lbs @ 7591 RPM	5.5 ft-lb @ 7048 RPM
Acceleration	0-40 km/h	2.629s	2.485s
	0-60 km/h	5.291s	4.923s
	0-80 km/h	9.342s	8.529s
	0-100 km/h	15.097s	13.702s (1.3s quicker )
	0-120 km/h	23.889s	22.116s
	40-80 km/h	6.713s	6.044s
	60-100 km/h	9.806s	8.786s
	80-120 km/h	14.547s	13.587s
0-400 meter		19.232s @ 110.73km/h	18.693s @ 113.35km/h
Highest RPM		8903	9203



## INTRODUCTION

TopSpin Design is proudly presenting product of **Boron Nitride Oil Additive** for motorcycle motor oil. The TSD BN Oil Additive provides superb lubrication with low coefficient and effectively increasing horse power, torque, and acceleration.

Advantages:

- Nano boron nitride particles for superior lubrication and excellent thermal management.
- Attached, fill, form a protected slippery layer onto alloy.
- Reduce engine parts friction
- Increase horsepower and torque
- Increase MPG
- Easy to crank start engine
- Increase engine operating life
- Excellent cleaning property
- Decrease engine noise

### **USE FOR:**

- **4-stroke motorcycle engines**
- **After engine work**
- **Oil change**
- **Use with conventional and synthetic motor oils**

### **INSTRUCTION**

**Pour into engine oil**

### **MIX RATIO**

**60 ml TSD BN oil treatment use with 900~1000 ml oil**



## **Formulation:**

TSD use most advanced material formulation for the best oil additive. Nano boron nitride particles are the main ingredient combining with titanium nanoxide and nano molybdenum. Boron nitride is known to have superb lubrication with 0.2 coefficients regardless of temperature changes. With all the nano particles and characterizes of the formulation, TSD BN oil additive able to offer best engine protection with best engine performance in any giving conditions.

## PERFORMANCE TESTING

Test Product: TSD Boron Nitride Oil Additive  
Purpose of Test: Compare the scooter 4-stroke engine performance difference between **motor oil without TSD BN Oil Additive** and with **motor oil with TSD BN Oil Additive**.  
Test Vehicle: 2006 Kymco JR100 4-stroke scooter  
Test Rider: Fenix Chen (scooter racer)  
Measurement: G-Tech Pro RR  
Test Location: Taiwan Sophisticated Autodrome (400m drag strip)  
Test Date: March 21, 2006  
Test Time: 10am ~ 4pm  
Weather Temp.: 30°C~31°C

**Test Vehicle Specification:** (See appendix for Kymco factory specification)

Make: Kymco            Model: JR100 4-Stroke Carburetor  
Manufactured date: January 2006  
Purchased date: March 3, 2006 (registered 3 km on odometer)  
Vehicle modification: None (all factory stock)  
Test Odometer: 370 km  
Test Weight:        Vehicle:                    93 kg  
                          Fuel:                        5 kg (estimate 5 liter)  
                          Rider:                      55 kg  
                          Gear:                       4 kg (racing suit, helmet, boots)  
                          Total test weight:    157 kg  
Fuel used: CPP 95 octane premium unleaded  
Motor oil used: Castrol Activ 10W-40 4-stroke Motor Oil

## TESTING PROCEDURE

### **Test 1 (Motor oil without TSD BN oil additive)**

Scooter with Castrol Activ 10W-40 4-stroke Motor Oil (without TSD BN oil additive)

- Perform 400m dash run 20 times.

### **Test 2 (Motor oil without TSD BN oil additive)**

Scooter with Castrol Activ 10W-40 4-stroke Motor Oil (with TSD BN oil additive)

- Perform 400m dash run 20 times.

### **Test Control (measured):**

1. Fuel level is control at full tank each run for weight accuracy.
2. New Castrol oil replaced before Test 1
3. New Castrol oil mixed with TSD BN oil additive replaced before Test 2
4. 10 km run after replace oil for Test 2
5. Temperature (1 meter above ground) measured before each run.
6. Each run driver retained same riding position.

### **Test Control (not measured):**

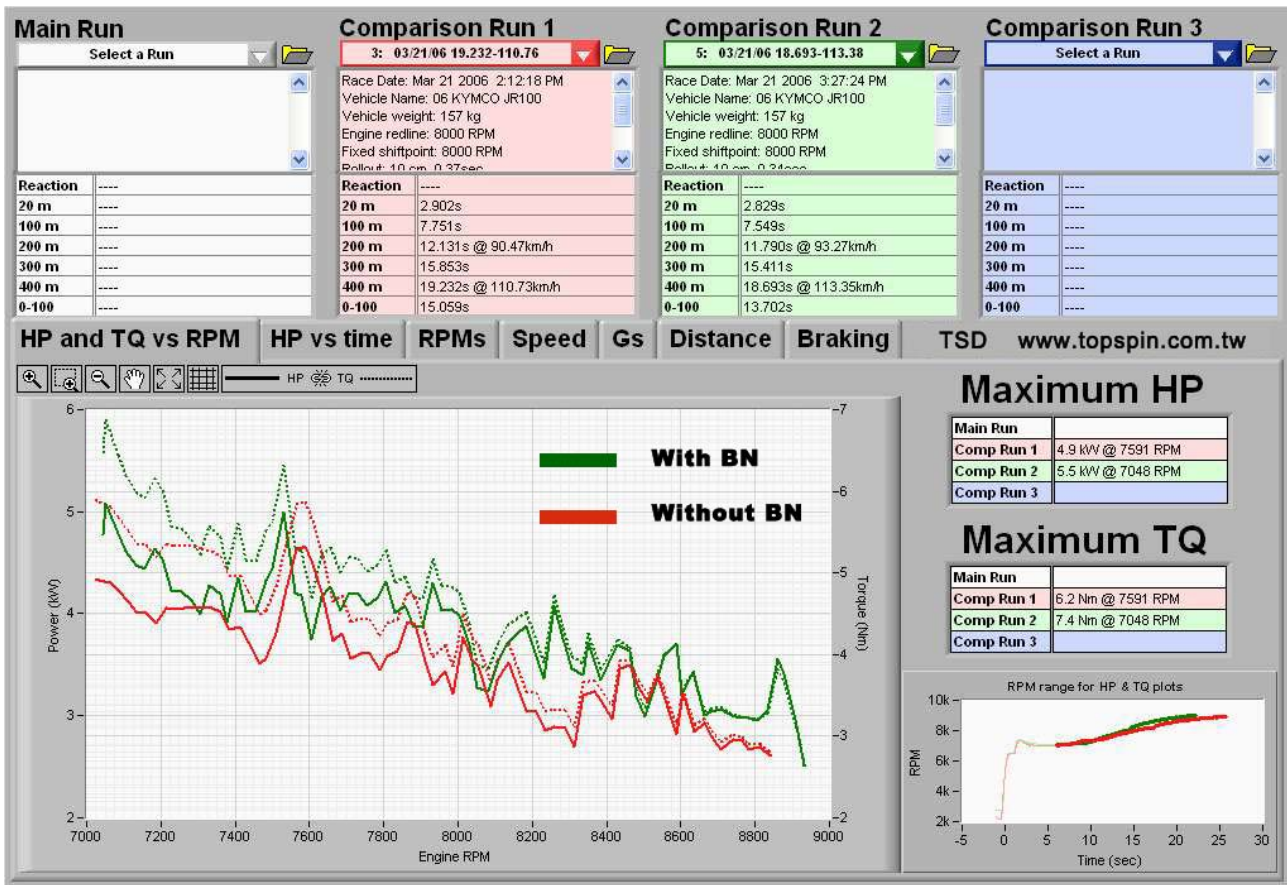
1. Wind direction and wind speed.
2. Oil temperature.
3. Fuel consumption.

### **Data Comparison:**

1. HP & Torque
2. Acceleration in different speed level

# TESTING RESULT ANALYSIS

## Horse Power & Torque

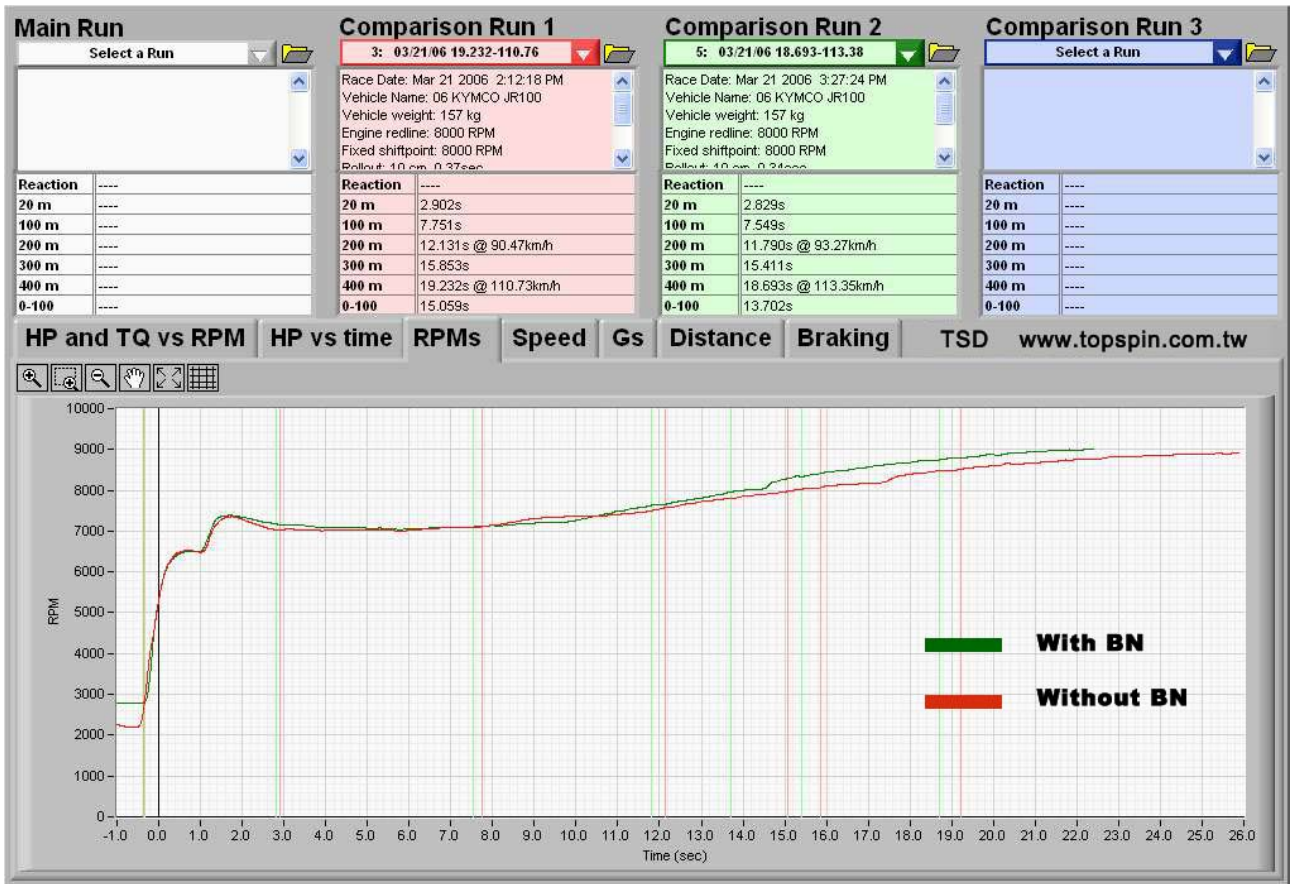


HP increase with TSD BN Oil additive: 12%

Torque increase with TSD BN Oil additive: 19%

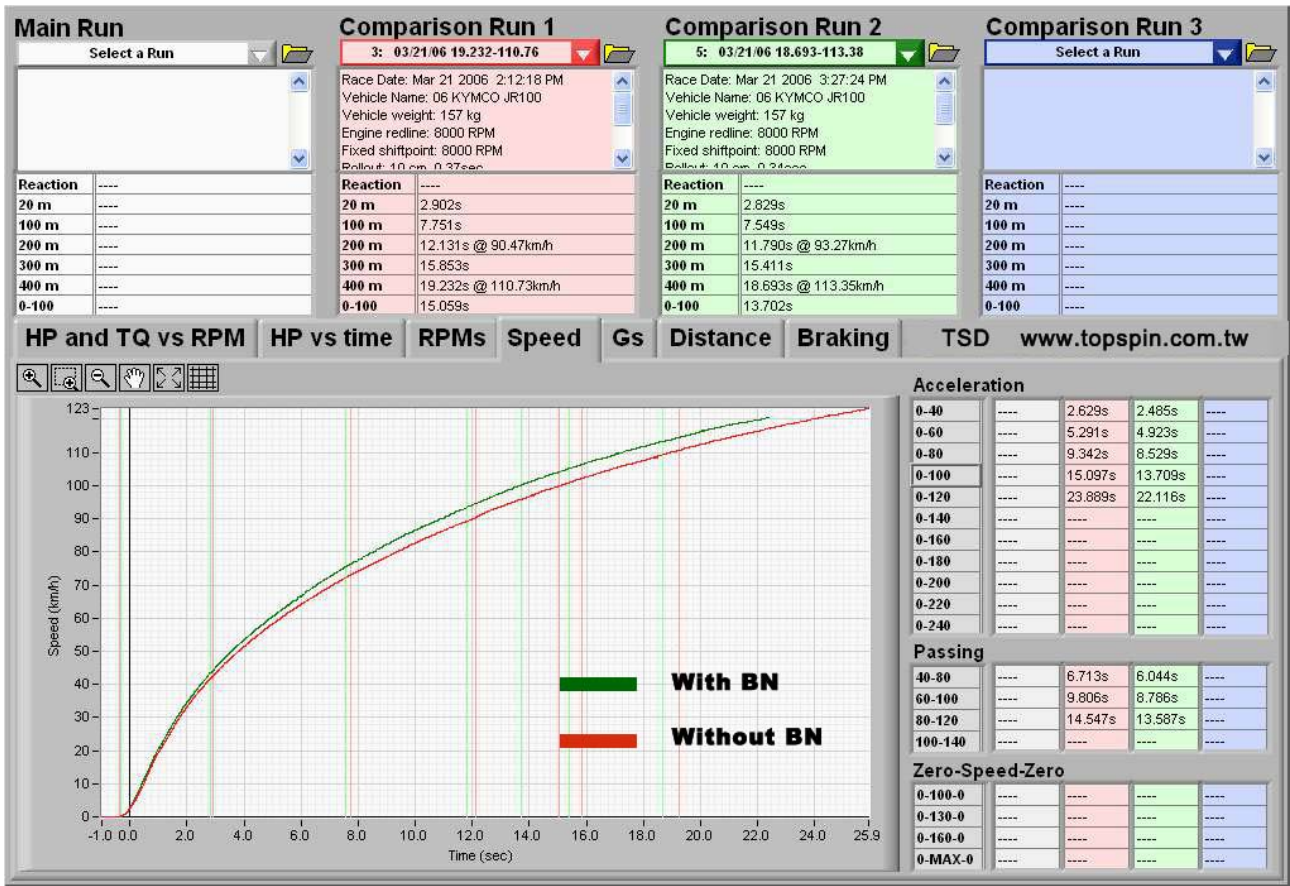
Test	Without BN	With BN	Improve
HP (KW)	4.9 KW @ 7591 RPM	5.5 KW @ 7048 RPM	12%
TQ (Nm)	6.2 Nm @ 7591 RPM	7.4 Nm @ 7048 RPM	19%
20 m	2.902s	2.829s	0.073s
100 m	7.751s	7.549s	0.302s
200 m	12.131s @ 90.47 km/h	11.790s @ 93.27 km/h	0.422s
300 m	15.853s	15.411s	0.442s
400 m	19.232s @ 110.73 km/h	18.693 @ 113.35 km/h	0.629s
0-100 km/h	15.059s	13.702s	1.357s

# RPMs



This graph is showing the accuracy of both tests with and without TSD BN oil additive. The JR100 scooter gear box is CVT and proving both tests with consistence RPMs throughout the run time.

# Speed

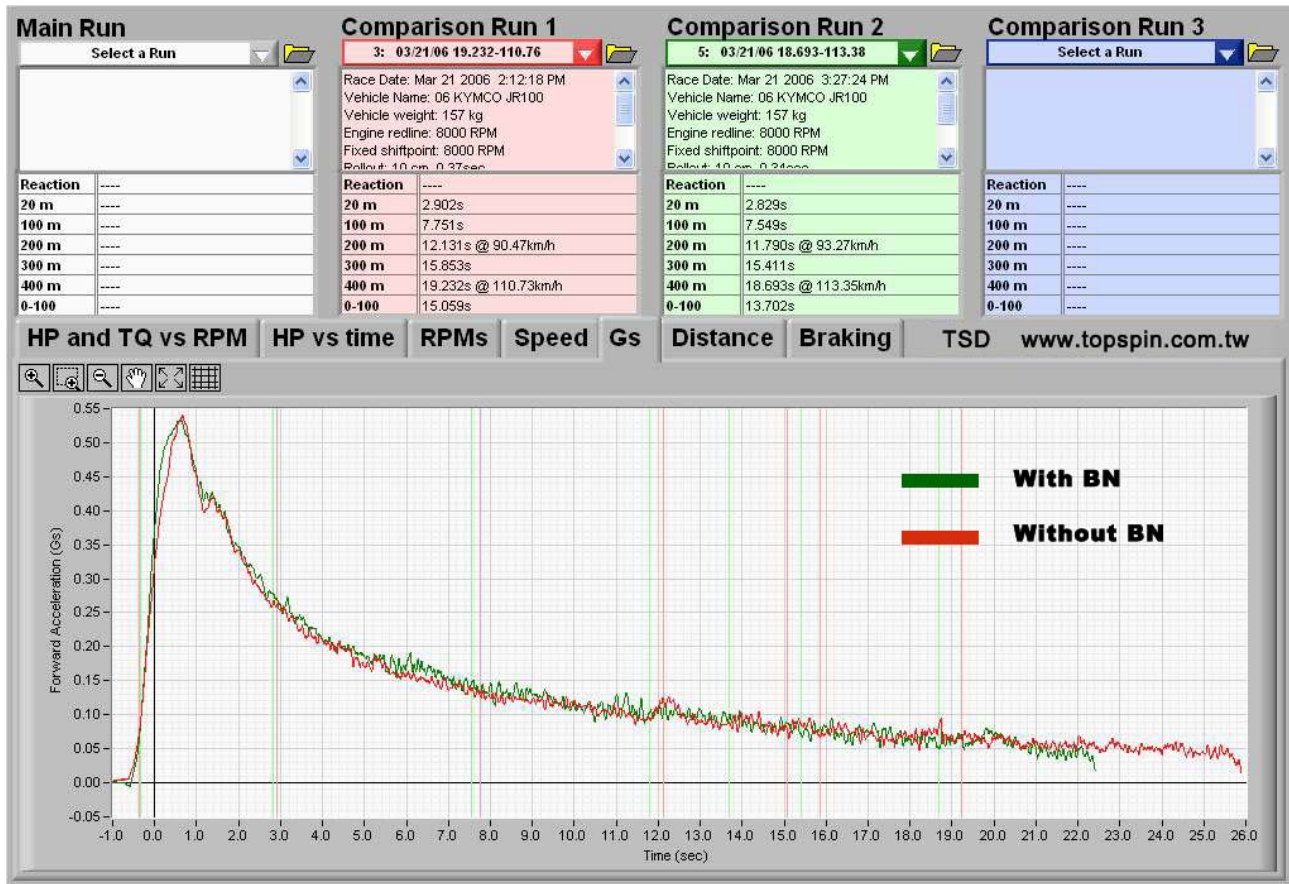


This graph analyzes the speed (km/h) over time between both tests with and without TSD BN oil additive. From this graph shown the test with BN oil additive generate higher speed with faster acceleration in every category.

Acceleration	Without BN	With BN	Improve
0-40	2.629	2.485	0.144
0-60	5.291	4.923	0.368
0-80	9.342	8.529	0.813
0-100	15.097	13.709	1.388
0-120	23.889	22.116	1.773

Passing	Without BN	With BN	Improve
40-80	6.713	6.044	0.669
60-100	9.806	8.786	1.02
80-120	14.547	13.587	0.96

## Forward Acceleration (Gs)



This graph analyzes both forward acceleration G-force of both test according to test time. The test shown the rider full throttle in acceleration and created similar Gs.

Appendix I

Products Images

Test Vehicle & Rider:



TSD BN Oil Additive



Castrol 10W-40

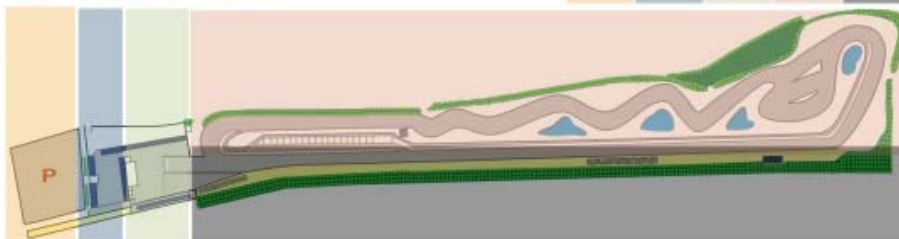
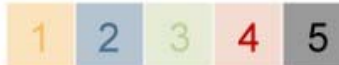


G-Tech Pro RR  
Mounting position



Test Location: Taiwan Sophisticated Autodrome (400m drag strip)

全區示意圖



### Testing Progress Images



Testing Runs



Recording Data



Uploading Data



Changing Oil



Adding BN Oil



Mixed BN Oil



Analyze Data



Fuel

## Appendix III

### 2006 Kymco JR100 Scooter Specification



		<b>Brand</b>	Kymco	<b>Frame</b>		Pipe Under Bone
		<b>Model</b>	JR100 Carburetor	<b>Suspension</b>	<b>Front</b>	Telescop
<b>Dimension</b>		Length	1723mm		<b>Rear</b>	Unit Swing
		Width	655mm	<b>Drivetrain</b>	1st Speed Reduction	Belt
		Height	1010mm		2nd Speed Reduction	Gear
		Wheel Base	1212mm		Clutch	Dry
			Gear		CVT	
<b>Weight</b>	<b>Net Weight</b>	Front	38kg	<b>Tire Size</b>	Front	90/90-10 50J
		Rear	55kg		Rear	100/80-10 52J
		Total	93kg			
		Passenger Load	2(110) person (kg)	<b>Brake</b>	Front	Disk Brake
	<b>Gross Weight</b>	Front	66kg		Rear	Drum Brake
		Rear	137kg		<b>Speed Gauge</b>	
Total		203kg	<b>Lighting</b>	Front Light	12V 30W/30WX1	
<b>Performance</b>		Top Speed		81km/hr	License Plate Light	12V LED
	Fuel Consumption	36(COMB) km/l		Brake Light	12V LED	
	Hill Climb Ability	20 Degree		Turning Signal	Flash 12V LED	
<b>Engine</b>	<b>Type</b>		4-Stroke Carburetor	<b>Horn</b>		φ 66
	<b>Fuel Requirement</b>		92 Octane Unlead or better	<b>Exhaust Muffler</b>		Obsorb Reinforced
	<b>Cooling</b>		Forced Air Cooled	<b>Emission Concentration</b>	Particle Contaminates	Below 15%
	<b>Cylinder</b>	ID	50.0mm		Carbon Oxide	Below 3.0%
		Stroke	51.8mm		Kydrocarbons	Below 2000PPM
		Cylinder	10-degree single cylinder 2-v	<b>Exhaust Location</b>		Right Rear
	<b>Displacement</b>		101.7cc	<b>Lubrication</b>		Mechanical Pump
	<b>Compression Ratio</b>		10:01	<b>Fuel Evaporate System E.E.C.</b>		Below 2g
	<b>Horsepower</b>		8.4ps @ 7500rpm	<b>Gear Box Venting P.C.V.</b>		Yes
	<b>Torque</b>		0.77kg-m@6000rpm	<b>Catalyst</b>		Yes
	<b>Location</b>		Lower frame / Rear shock	<b>Fuel Capacities</b>		5.0 Liter
	<b>Ignition</b>		E.C.U.	<b>Exhaust Cover Material</b>		Plastic Cover
	<b>Start Method</b>		Self Starter & Kick			
<b>Remark</b>	1. 1st speed reduction: 0.8~2.5 2. 2nd speed reduction: 8.5					



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