ENGINE/DRIVE SYSTEMS

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- ***Engine Highlights***

Built by Suzuki,
Developed by Arctic Cat

1100 L/C Turbo
1100 L/C
1000 L/C
800 HO L/C ** NEW **
600 L/C
500 L/C
570 F/C

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Z1 1100 Turbo Engine Specifications

- Narrow, Parallel Twin Design
- 98.0 x 70.0 mm Bore x Stroke
- 1056 cc Displacement
- 9:1 Compression Ratio
- Multi-Port Fuel Injection, 2 Injectors per cylinder
- 4 Valves per Cylinder, Double Overhead Cams
- Turbocharger boosts to 9 psi
- Intercooler reduces intake temperature to increase charge density
- 46 mm single Throttle Body for excellent throttle response
- 360 Crankshaft Pin offset for turbo efficiency
- Dual Balance Shafts cancel all 1st order imbalance

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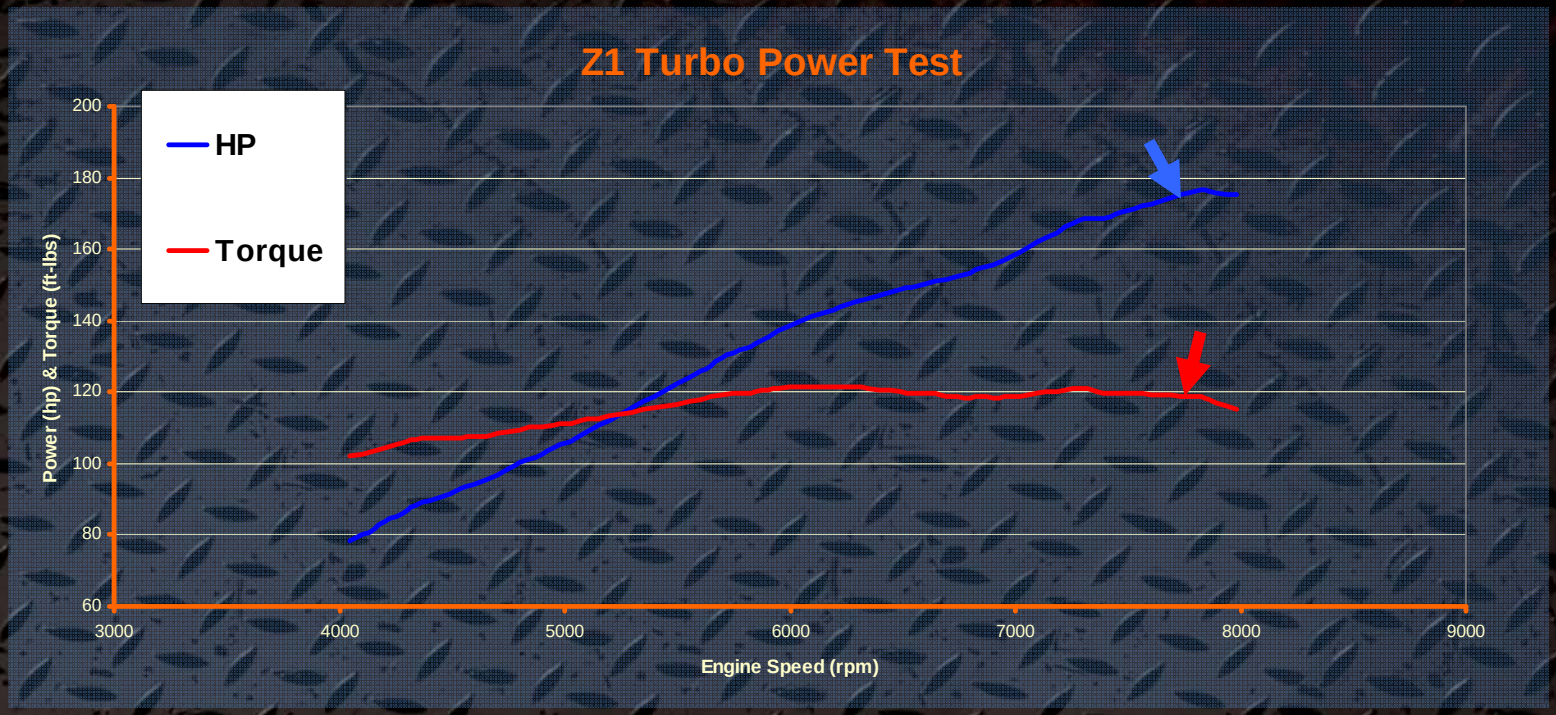

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Z1 1100 Engine Specifications

- Narrow, Parallel Twin Design
- 98.0 x 70.0 mm Bore x Stroke
- 1056 cc Displacement
- 12:1 Compression Ratio
- 48 mm Bore Dual Throttle Body
- Multi-Port Fuel Injection, Single injector per cylinder
- 4 Valves per Cylinder, Double Overhead Cams
- Dual Balance Shafts

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1000 cc ENGINE HIGHLIGHTS

- "ACER" Arctic Cat Engine Reverse
  - Reverse function is done by reversing the engine crankshaft rotation.
  - Oil pump, and water pump still functions when in reverse
- Improved mapping
  - Better high and low altitude performance

- Insert video of Greg S final

ENGINE/DRIVE SYSTEMS

800 HO L/C

** NEW **

- 10% more hp than 2009 model as measured on Arctic Cat's Dyno
  - 10% increase in hp was substantiated by an independent 3rd party lab which measured 160+ hp
- "ACER" Arctic Cat Engine Reverse
- 8250 – 8350 peak operating RPM
- Rapid throttle response
- Clean and efficient operation in all driving ranges
- 4.5 lb weight reduction
- Standard in all 2010 800 models

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Crankshaft

- Low inertia, light weight crankshaft assembly
  - Reduced inertia and mass provides quicker throttle response and acceleration
  - New connecting rod design provides high strength and light weight

2009

2010

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Cylinders

- Redesigned cylinder
  - Completely new transfer and exhaust port timing, also new shape improves power and trapping efficiency
  - New exhaust tract passage shape increases power and improves combustion efficiency
  - Redesigned cylinder skirt shape increases airflow

2010

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Cylinder heads

- Redesigned combustion chamber shape
  - Increases combustion efficiency
  - Reduced volume for increased compression ratio
  - Provides smooth, clean power delivery at all operating RPM's

2010

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Pistons

- Redesigned piston and piston pin
  - New piston skirt shape for improved air flow
  - New piston profile shape for improved ring seal and reduced scuffing
  - New light weight, high strength piston pin, shape is optimized for weight and durability

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Intake reed cage

- Redesigned intake reed cage petals
  - Reed lift increased to improve peak HP
  - Increased material thickness of reed petals which results in improved low to midrange throttle response
  - Reed petal base changes improves peak HP while maintaining low to midrange throttle response, also reed petal durability is improved

2010

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Y-pipe

- New Y-pipe design
  - Improves HP and torque in all operating RPM's
  - Improves exhaust trapping efficiency

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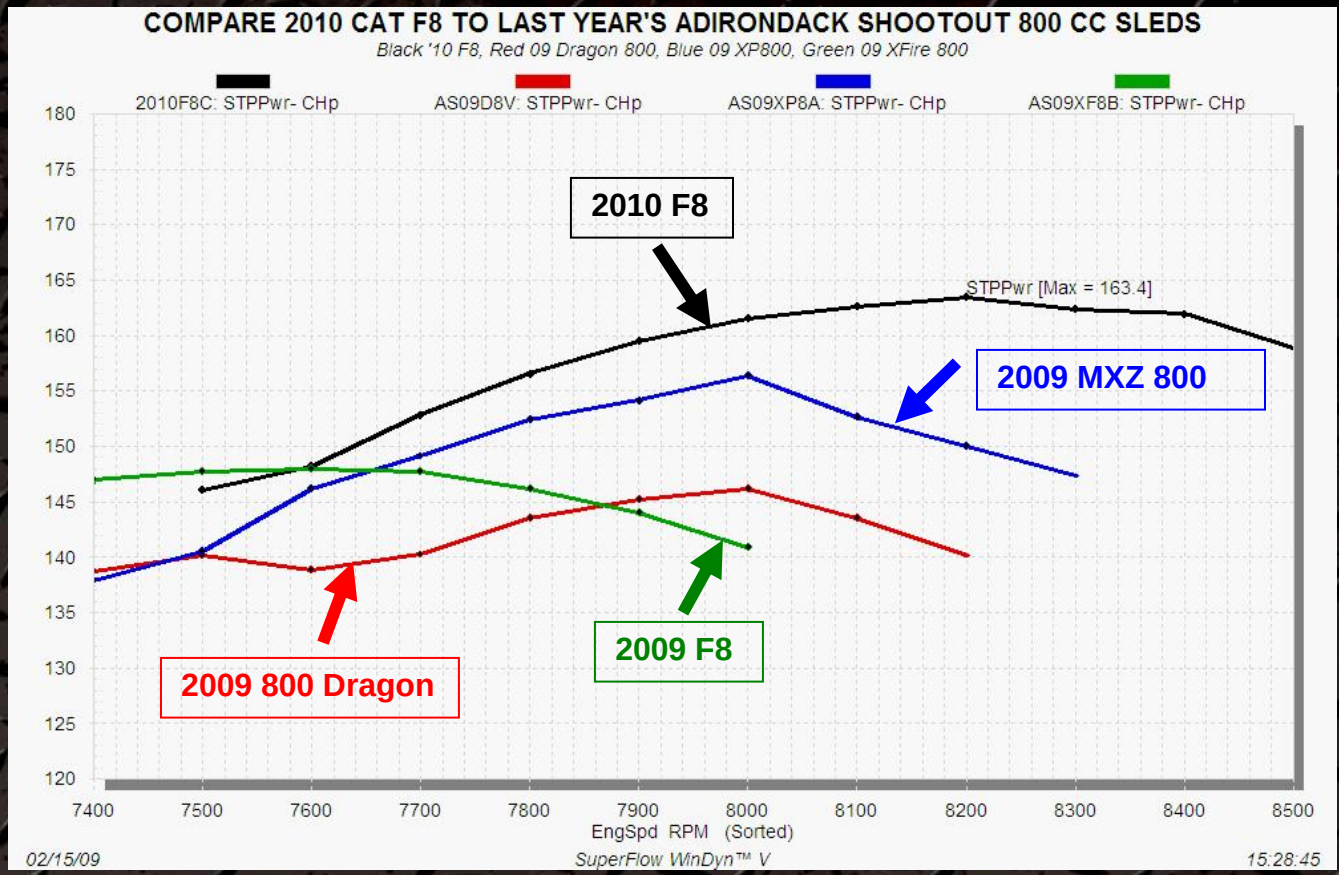
Exhaust pipe

- New design of exhaust pipe
  - New exhaust pipe improves power
  - Quick throttle response
  - Consistent power delivery over a broad range of rpm’s

INDUSTRY-LEADING HORSEPOWER



Data courtesy of DynoTech Research using a 2010 Pre-production F8 SnoPro

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New Requirement of 800 HO engine:

- MUST run a minimum of 91 octane fuel!

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600 L/C:

- Same specifications as 2009

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500 L/C:

- Improved mapping
  - Improved cold drive away
  - Cleaner warm drive away

ENGINE/DRIVE SYSTEMS

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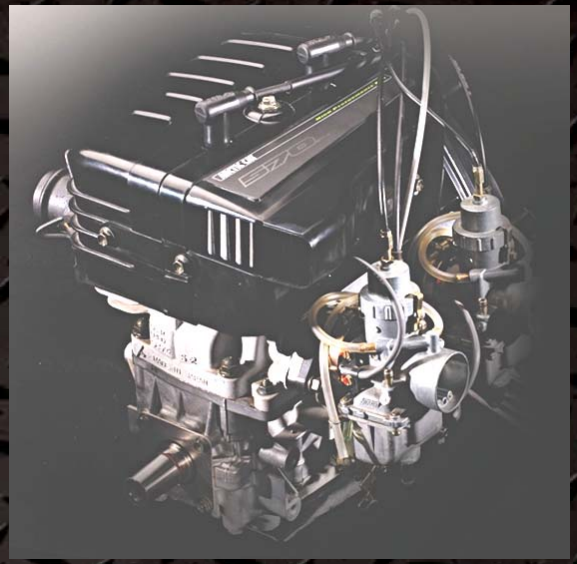
570 F/C:

- "ACER" Arctic Cat Engine Reverse
  - Reverse function is done by reversing the engine crankshaft rotation
  - Oil pump still functions when in reverse
  - Internal component changes include:
    - Pistons
    - Flywheel
    - Oil pump
    - CDI
- Improved calibration



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- ***Drive Train***

Clutch parallelism
Clutch offset
Drive belt break in

- Insert video of Kevin T final

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Clutch parallelism

- Arctic Cat uses sophisticated tools to measure engine movement
  - One such tool is a string potentiometer
- The string potentiometer measures engine movement of about 2.4 mm under full acceleration
- In order to compensate for engine movement, it has been determined the optimum position for a 4-stroke Turbo engines is +.060” clutch offset

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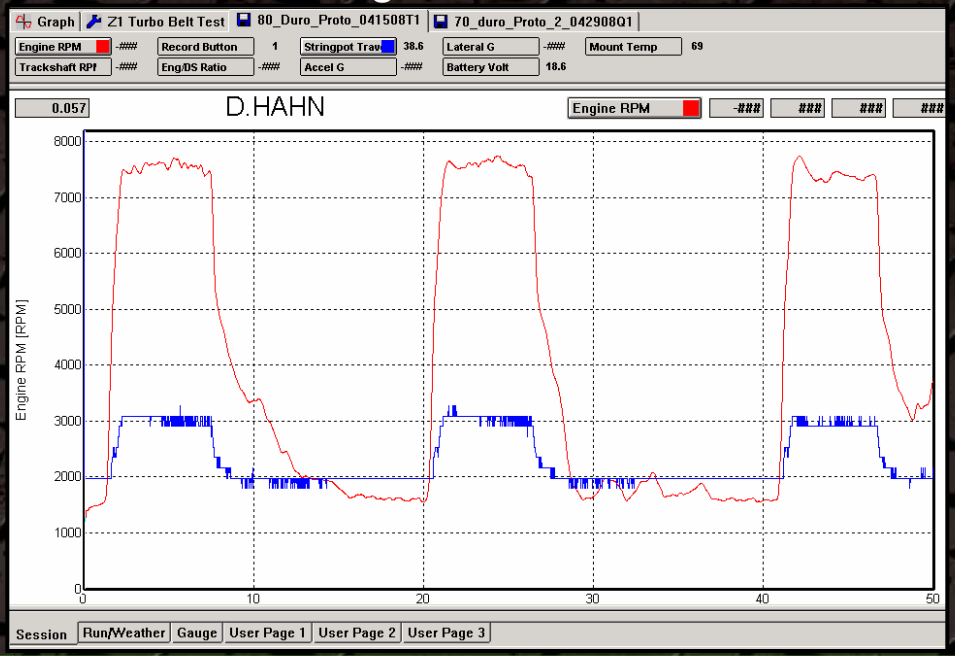
Clutch parallelism (cont)

- To help illustrate this movement, here is the graph that Kevin used in his video to demonstrate the engine movement under acceleration



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Clutch parallelism (cont)

- A parallelism bar, p/n 0644-509 is used measure clutch parallelism
  - The driven clutch is opened to insert the bar
  - Measurements are taken from the back and front side of the drive clutch to the alignment bar
  - The front measurement must be .060” larger than the back measurement
- In order to compensate for engine movement, it has been determined the optimum position for a 4-stroke Turbo engines is +.060” clutch offset
  - +.060” clutch offset will provide maximum drive belt durability throughout the full range of engine rpm’s

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Clutch offset

- Use the 1.655 clutch alignment bar to measure 4 stroke Turbo clutch offset (p/n 0644-494)
- Take the measurement and adjust as necessary by adding or subtracting washers

Drive Belt Break-In

- Drive belts require a break-in period of approximately 25 miles. After installing a new drive belt:
  - Do not exceed 3/4 throttle
  - Do not exceed 60 mph
  - Vary engine RPM
- Break-in process accomplishes:
  - Belt will operate at various diameters on the clutch sheaves
  - Contact surfaces of drive belt will wear in to match clutch sheaves
  - Maximum friction between belt and clutch sheaves will be developed
  - Belt cords will be “cauterized” and “smoothed over” before applying high engine loads
  - Belt temperatures will be reduced at all operation points
  - Premature drive belt failure will be avoided
- Note: Before starting the snowmobile in extremely cold temperatures, the drive belt should be removed and warmed up to room temperature. Once the drive belt is at room temperature, install the drive belt.