



ROADRUNNER ENGINEERING NEWSLETTER

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Roadrunner Big Kabuna Supercharger Kit with Auto Tensioner and Custom Polished 1-Wire Alternator.

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What's Happening?

Flathead Book News

Blown Flathead has been sold out for years, although used copies are available. A new collector's edition will be released later this year.

The *335HP Flathead Ford V-8 Performance Handbook* third printing is still available. Described by some readers as the "bible" for flathead modification, it features actual dyno test and track results.

The Ford & Mercury Flathead V-8 Identification and Rebuilder's Guide reprint has been selling well. Determine what you have and what you need to build a quality engine that meets your performance and appearance goals.

Info on these books is available on line at www.roadrunnerengineering.com.

New Book Dealer in New Zealand - Magoo's Street Rods at www.magoos.co.nz

Why Buy a Roadrunner Kit for Your Flathead?

- Great street performance: the quickest flathead street rod in the US (Joe Abbin) and in Europe (Jim Turnbull)
- Great race performance: Bonneville (Red Matthei, Rich Stuhan, Bert Griffin, Dennis Murray, etc.), quarter mile (Jeff Andreen, Kent Hendershot, Doug Hampton, etc.)
- Great looks: America's Most Beautiful Roadster Contenders (Dick Bennett, Willy Stryker); magazine covers (Dave Gazaway, Ray Dunham)
- Best buy, best selling: over 300 kits on the street! Only six kits left for 2017.

New Engine Building Videos Available on Line

The blown flathead channel on YouTube has been expanded to include a series of five short videos featuring the buildup and test of a high performance flathead built for Dr. Royal Langford of Broken Arrow, OK. These videos provide an overview of the major engine assembly processes and dyno testing of the engine both normally aspirated and supercharged. I think you will find the videos instructive and entertaining.

See **Blown Flathead Channel** link on YouTube:

<https://www.youtube.com/channel/UC19XOrRgRHCiON-zIPAcFAQ>

Dyno Test Report - 316 HP Supercharged Flathead Engine

Tested 12/10-12/14/16 at Albuquerque Dyno Service, Albuquerque, NM.

Engine test and evaluation conducted by Gary McGlasson and Joe Abbin.

Summary

The attached sheets summarize the results of dynamometer testing and analyses of the subject engine. The purpose of the testing and major findings follows:

- 1) Break-in, tune, and evaluate the engine. Several problems were encountered which extended testing to four days or more and resulted in a post-test partial tear down, revealing a defective piston ring. In spite of these problems the engine performed well overall.

- 2) Comparison tests of set of restored original Stromberg 97 carburetors vs. a set of brand new Stromberg 97s. Both sets of carburetors performed flawlessly and essentially identically.
- 3) Evaluate suitability of an unmodified set of Edelbrock 1116 (74cc) heads for normally aspirated and supercharged flathead applications. These heads performed as well as the best custom heads evaluated in the past.

Partial test results are given in Table 1. Detailed individual tabular data sheets are available upon request. Normally aspirated, the 293 cu.in. engine produced a best of 214 hp at 4400 rpm with a peak torque of 286 ft-lbs at 3000 rpm. Supercharged, the engine produced 316 hp at 5200 rpm and 324 ft-lbs. at 4200 rpm with 7-8 psi peak boost (at sea level) All readings are corrected to standard sea level conditions. The engine specifications are listed below.

Engine Definition

Block assembly

The French long block machining, porting and assembly were performed by Gary McGlasson The block assembly utilized a Scat stroker kit and consisted of the following:

- a) 3-5/16" bore, Ross forged pistons with stock domes and Grant cast rings.
- b) 4.25" stroke Scat crank and Scat rods, and stock French main caps.
- c) 1.6" stainless intake and exhaust valves, block ported and relieved.
- d) Melling M15 high volume oil pump.
- e) Isky 400Jr cam with single Isky 185G valve springs (75 lbs on seat) & Johnson hollow lifters.

Heads

Unmodified Edelbrock 1116 aluminum heads with a 74 cc head combustion chamber volume (approximately 8:1 compression ratio for this engine).

Intake – Normally Aspirated

An unmodified Offenhauser Triple manifold was used for all the normally aspirated tests. The first series of normally aspirated tests used a set of restored original Stromberg 97 carburetors from Jere Jobe of Vintage Carburetion Technology Inc, of Somers, MT. These carburetors used #44 main jets based on previous testing with good results at the test location.

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Intake – Normally Aspirated (Continued)

The second series of normally aspirated test used a brand new set of Stromberg 97 carburetors from the new Stromberg Company, England. The initial testing with these carbs with #45 jets produced somewhat rich air-fuel mixtures at the 5300 ft test altitude and the jets were replaced with #43 jets with very little difference in performance.

Intake - Supercharged

Roadrunner manifold and Weiland 142 blower (s/n 98164) with various overdrive pulleys. A 570 cfm Holley Street Avenger 4-bbl carburetor (p/n 0-80570) was used initially, followed by a Holley 650 cfm 4-bbl (p/n 4777-4). Best power was obtained with the 650 carb running #70 primary jets and #71 secondary jets at the test altitude. These jets should be replaced by #72 and #74 jets at sea level. No air cleaner was used.

Exhaust

Free flowing center-dump dyno headers and large truck mufflers were used during test. No center exhaust baffles.

Ignition

A top-mount electronic (magnetic pickup) Mallory distributor with mechanical advance and an MSD 7 box and high performance coil were used for most of the testing. The distributor advance was varied during test to produce best power.

A slow advance curve (4 degrees initial, 24 degrees total) that is not fully advanced until about 2500-3000 rpm is recommended for normally aspirated service. The same curve can be used for supercharged service with the addition of a boost retard device such as the MSD 6462 set at 1-1/2 for starters. Champion RC12YC or Autolite 65 sparkplugs, both gapped at .025" for supercharged service and .035" for normally aspirated, are recommended.

Water pumps

Stock type 59A water pumps with 8BA impellers available from Bob Drake and Speedway were used during test.

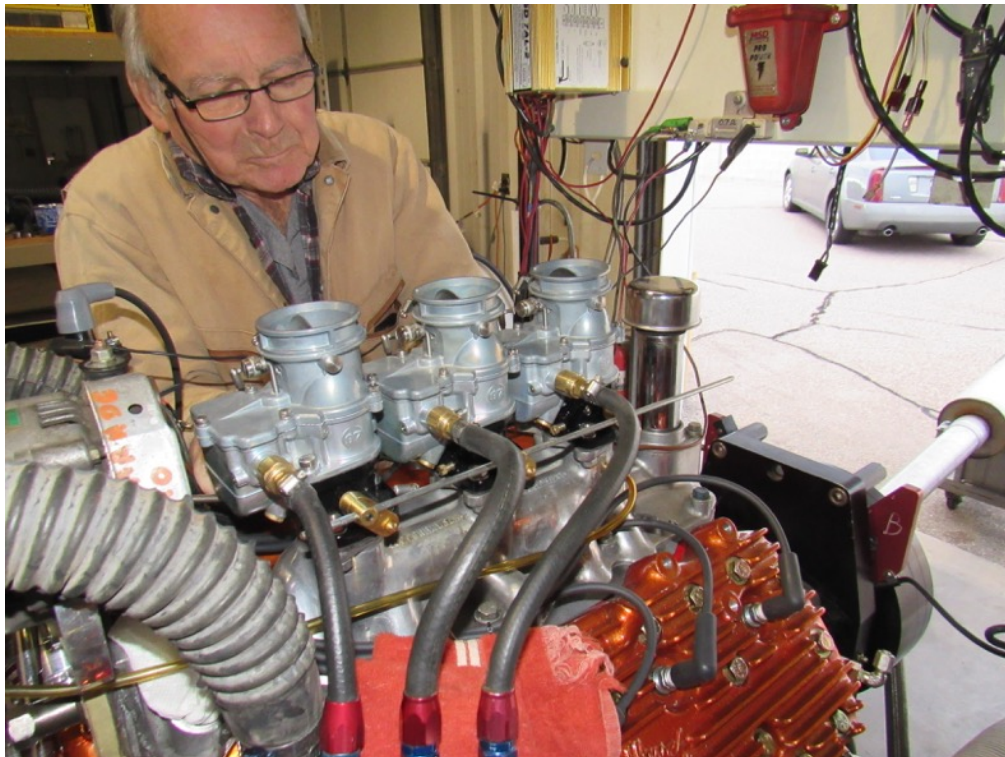
Thermostats

None.

Discussion (Refer to Table 1)

Series 1 and 2 testing compared performance of the restored vs. the new Stromberg 97s. Both sets of carburetors performed very well with no significant difference. No leaks. Fuel pressure was set at 3 psi. Both series of tests demonstrated a minor high speed miss. For Series 3 testing the stock type 12 volt coil was replaced by an MSD 7 capacitive discharge unit and an MSD high performance coil with improved results. This ignition combination was left in place for all further testing.

Series 4 supercharged testing revealed unacceptable blower belt slippage that was greatly reduced by cleaning the pulleys and replacing the Continental brand belt with a Gates belt. Bando belts are recommended where available. (See Tech Tips.) Carburetion for this series of test was a Holley 570 cfm unit with vacuum operated secondaries which has given good results in the past for smaller displacement engines (e.g. 276 cu.in.). Series 5 testing with a bigger Holley 650 carb with mechanical secondaries made significantly more boost and power. For the street, a Holley 670 Street Avenger or equivalent would be a good choice for this engine.



**Figure 1. Master Tuner and Dyno Operator, Gary McGlasson
With Bonner Engine with New Stromberg 97s Installed.**

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Following all testing a compression test revealed cylinder #1 was low (80 psi vs. 110 psi) compared to the others. A leak-down test confirmed the problem and indicated poor ring seal. Prior inspection of the spark plugs indicated oiling and fouling of the spark plug from this cylinder. This was the most probable cause of the miss experienced with the standard coil. Upon disassembly of the piston assembly, the compression ring was found to be out of round and was replaced. This is very unusual. I doubt the power was greatly affected by this problem, but power was certainly not enhanced. These were cast iron rings and are usually not a problem. However, I prefer the steel thin “metric” ring packs for quick break-in, low friction and durability.

Unfortunately, the owner of this engine passed away before installation of this engine in his vehicle. **If you are interested in purchasing the engine**, please contact Joe Abbin at roadrunnerengr@msn.com or call to discuss at 505-268-6768.



Figure 2. Bonner 293 Cu.In. Flathead with Roadrunner Supercharger

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Table 1. Bonner Flathead Dynamometer Test Summary

Test ID	Peak Torque	@ RPM	Peak HP	@ RPM	Total Timing	Main Jet pri/sec	Air/Fuel @ Max HP	Boost @ Max HP	Comments
12/10/2016	Series #1 - 293 cu.in., Isky 400 Jr cam, Offy Triple Intake, VCTI 97 carbs, Mallory Electronic Distributor with std coil								
16-01-26	275	2500	196	4000	24	44	12.89	na	
16-21-15	278	2500	201	4300	24	44	13.1	na	
16-31-26	279	2900	202	4300	18	44	13.18	na	
17-06-16	279	2900	200	4200	18	44	13.4	na	
12/12/2016	Series #2 - 293 cu.in., Isky 400 Jr cam, Offy Triple Intake, New Stromberg 97 carbs, Mallory Distributor with std coil								
14-58-52	275	2900	200	4200	18	45	12.95	na	
15-18-09	271	2800	200	4200	18	45	12.42	na	
15-33-28	272	2900	209	4300	25	45	12.56	na	adv timing
15-39-38	275	2900	210	4400	25	45	12.61	na	
15-48-15	273	2900	205	4200	22	45	11.62	na	rtd timing
16-22-07	276	2900	205	4300	22	45	11.6	na	
16-46-14	282	3000	207	4200	22	43	12.09	na	re-jetted
17-10-56	280	2900	208	4200	22	43	11.91	na	
12/13/2016	Series #3 - 293 cu.in., Isky 400 Jr cam, Offy Triple Intake, New Stromberg 97 carbs, Mallory Dist with MSD 7 box & coil								
11-21-55	286	3000	214	4400	22	43	13.14	na	
11-23-55	285	2900	214	4300	22	43	13.07	na	
12/14/2016	Series #4 - 293 cu.in., Weiand 142 SC with 5.63/3.07 pulleys, Holley 570 carb, Mallory Dist with MSD 7 box & coil								
15-07-51	338	3900	302	5100	20	53/64	12.18	6.84	
15-20-24	340	3900	303	5200	20	53/64	12.06	6.77	
12/14/2016	Series #5 - 293 cu.in., Weiand 142 SC with 5.63/3.07 pulleys, Holley 650 carb, Mallory Dist with MSD 7 box & coil								
15-42-25	347	3900	315	5100	20	70/71	12.3	7.18	
15-51-12	346	3900	316	5200	20	70/71	12.32	7.38	

Notes:

- 1) Test results are corrected to standard dyno conditions: 60F, 29.92 Hg and dry air.
- 2) Installing a Roadrunner Engineering Supercharger Kit resulted in a 100 HP gain over normally aspirated.

Tech Tips

Better Blower Belts

The 6-rib, K-series serpentine belts used on the Roadrunner flathead supercharger kits should be generally capable of transmitting up to 50 horsepower, and last a long time. Not all brands are equal however, and the current brand I recommend is Bando. This brand is well known among original equipment suppliers as a premium product. They provide high traction and can last for 100,000+ miles. Unfortunately these are not commonly available locally (you can try). Amazon has these belts and the prices, availability, and delivery are competitive. Each Roadrunner kit belt installation must be fitted individually because of the different pulley combinations. For example, your installation may require a 6-rib, K-series, 79 inch long belt. The Bando part number for this belt is 6PK2005 (or K060790 or 790K, etc. for the same belt). The 790 in the part number represents the length in inches and the 2005 represents the nearest length in centimeters (one inch = 2.54 centimeters). This belt sells for about \$20.

Intake System Vacuum Leaks

Does your engine idle rough but then smooths out with more throttle? Check for a vacuum leak. Often a vacuum leak at the base of the carburetor or somewhere around the intake manifold can be severe enough to make the engine hard to start and sometimes not even run at low rpm. Vacuum leaks at the gaskets, missing or loose fitting vacuum plugs, etc. are not uncommon. These leaks can often be found easily with the aid of a handheld propane torch. The propane is turned on (low flow) but the torch is not lit and the tip of the torch is moved around all the potential leak sites with the engine running. When the propane encounters the leak the engine will respond audibly. This technique is much less messy than using liquids and the risk is minimal (use at your own risk).

Engine Storage Prep

If your engine will not be started for several months then it is good practice to drain the fuel system and oil the cylinders. This can be handled in one step by shutting off the fuel supply and letting the engine run until it just starts to starve for fuel and then pour about an ounce per cylinder of motor oil or ATF down the carburetor inlet. If the fuel has already been drained and the engine will not be started before storage, then the protective oil or ATF can be sprayed into the spark plug holes. Adding 10-20% acetone to the added oil will make the oil thinner for good penetration of the piston ring areas.