



ROADRUNNER ENGINEERING NEWSLETTER

PO BOX 53296 ALBUQUERQUE, NM 87153

(505) 268-6768

E-MAIL: roadrunnerengr.com

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OCTOBER, 2010

3x2's vs. 4x2's Contest Results



Four Stromberg 97's on a Weiland Manifold

Engine Build and Test Summary

The engine was built to produce a strong, reliable street engine for Dr. Royal Langford, Broken Arrow, OK. Automotive Machine Service in Albuquerque, NM did part of the machine work. Gary McGlasson of McGlasson Racing Engines, Albuquerque, NM built, tested and tuned the engine including the porting and relieving of the block. Gary also performed the head modifications. The engine was built per the guidelines in **335 HP Flathead Ford Performance Handbook**.

The engine was subjected to 35+ dyno runs ("pulls") over the

test period. The first series of pulls was performed normally aspirated to break-in the engine, do initial tuning and check for proper function of all components. Normally aspirated the engine made about 210 HP peak at 4800 rpm with both the 3x2 and 4x2 manifolds.

Supercharged, the engine produced 270 HP peak at the maximum 5000 test rpm with about 4 psi boost. The boost level was limited to allow safe operation at sea level with the 7.3:1 compression ratio and 91-octane fuel.

Contest Summary and Winners

The contest consisted of the participants estimating the peak horsepower for a 284 cu.in. street flathead when tested with an Offenhauser 3x2 setup and a Weiland 4x2 setup. The carburetors were identical Stromberg 97's, except for the jetting which was optimized for peak power with each setup. A summary of the complete engine and the test series is given later in this newsletter.

The official numbers for determining the contest winners were 211 hp for the 3x2 setup and 209 hp for the 4x2 setup. A plot of the dyno results is given in the discussion. Note that the results were essentially identical (within the accuracy of the dyno) for both setups for this particular engine.

Nobody correctly estimated the results exactly but two contestants came very close. The winner of the \$50 was Jay Hertz who estimated 212 and 214 hp. The runner-up was Bob Higgins who estimated 210 and 204 hp. The total difference was the same for these entries, but Jay's entry was earlier. Bob will get a \$25 prize. The runner ups were Alan Samura, Fred Edeskuty, and Scott Yockstick, who will receive the 335 HP Flathead Ford Performance Handbook. Thanks to all who entered! We will have more contests and I welcome suggestions.



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Measured torque & horsepower curves for this strong 284 cu.in. flathead engine are shown in a plot at the end of this report. All testing was performed with an alternator (or simulator) and the water pumps installed using 91-octane premium pump gas. All power values are corrected to standard dyno (sea level) conditions of 60 F and 29.92 in.Hg.

Engine Test Definition:

8BA-Type Short Block Assembly

- 3-5/16" bore, Ross forged pistons with stock dome and metric rings (1.5 mm, 1.5 mm, 3 mm width).
- 4-1/8" inch-stroke Scat crank, H-beam rods, mild steel center main cap.
- Manley 1.6" stainless intake and exhaust valves, block ported and relieved.
- Melling M19 standard volume oil pump.
- Iskenderian Maxi cam with single Isky 185G valve springs, shimmed as necessary to get a seated force of 70-85 lbs. Valve clearance was .012" (intake) and .014" (exhaust).

Heads

Mercury EAC iron heads with an 81 cc head volume were used. These were prepared by Gary McGlasson and configured for a supercharged flathead designed to operate at sea level with moderate boost and premium pump gas.

Intake-Normally Aspirated

Offenhauser 3x2 and Weiand 4x2 intake manifolds were used for break-in and normally aspirated testing. Stromberg 97 carburetors prepared by Jere Jobe of Vintage Carburetion Technology Inc. in Somers, MT were used on both manifolds.

Intake-Supercharged

A Roadrunner single-plane blower manifold and a Weiand 142 blower with 50% overdrive pulleys were used for the supercharged tests. A 570 cfm Holley Street Avenger (4-bbl) carburetor with vacuum



Three Stromberg 97's on an Offenhauser Manifold

secondaries was used for supercharged testing and will be used on the street. No air cleaner was used during testing. A large capacity air cleaner will be used in service.

Exhaust

Free flowing center-dump headers and large (4" inlet/exhaust) truck mufflers were used during all tests. The engine had no center exhaust baffles.

Ignition

A top mount electronic Mallory distributor with mechanical advance and Autolite 216 spark plugs gapped at .035" were used for test. Total advance was limited to 26 degrees maximum for normally aspirated testing and 20 degrees maximum for supercharged testing.

For supercharged street use, an ignition retard device such as those available from MSD (P/N's 5462 or 6462) with a retard setting of 1-2 degrees per psi of boost is recommended to allow the total timing to be set to 24-28 degrees for part load cruising economy.

Water pumps

Stock 8RT-type new pumps with modern seals and bearings were used along with Roadrunner serpentine pulleys and hubs for all tests.



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Belt Tensioner (supercharged)

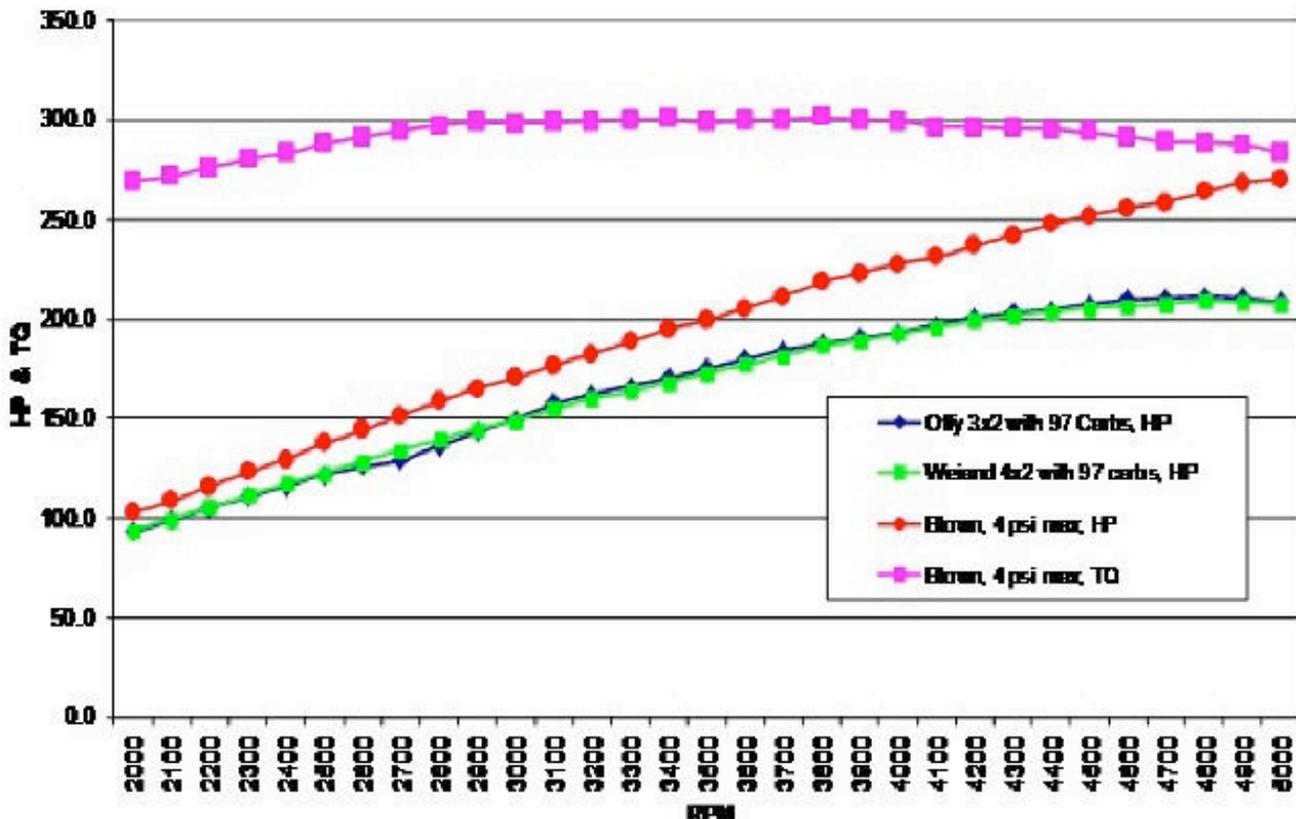
An automatic belt tensioner was used for all supercharged testing. The automatic unit provides better belt wrap on the crank and maintenance free operation.

Discussion: The engine broke in quickly and ran strongly during all tests. For the normally aspirated testing with the 3x2 Offenhauser setup, the peak power of approximately 211 HP was obtained

with #45 main jets in the Stromberg 97's. This is consistent with previous testing using the same setup on other engines. Substituting #44 main jets had no significant effect on the numbers (within 1%).

Interestingly, the peak power and air-fuel ratio with the Weiland 4x2 setup was almost identical to that of the 3x2 setup, but was obtained with #40 main jets. Manifold vacuum with the 3x2 setup was 0.7 in.Hg at peak power which indicates the engine really didn't need any more carburetion. The results verified this. See the plot below.

**Langford 284 Induction Comparison
284 cu.in., EAC Heads, Max 1 Cam**





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The 4x2 setup idled fine and seemed to respond to full throttle well even at 2000 rpm with the non-progressive linkage. Perhaps a bigger displacement engine with a bigger cam would show an advantage with the 4x2 setup, otherwise this system is not worth the added complexity. The 4x2 setup certainly wins the cool looks award.

For supercharged testing, a Holley 570 cfm Street Avenger 4-bbl was used. The stock jet sizes are #54 in the primaries and #65 in the secondaries. This produced an average peak power reading of 265 hp. Leaning out the mixture with #52 and #63 jets upped the average peak to 270 hp at the 5300 ft test altitude. The stock jets were reinstalled to obtain a safe air-fuel mixture at the lower use altitude.

It is always prudent to go with a somewhat rich mixture (11.5:1 or less) for supercharged engines since

the rich mixture gives an inter-cooling effect and reduces detonation tendencies with little if any loss of power.

All supercharged tests were run with a 3.75" diameter supercharger pulley and a 5.625" crankshaft pulley. This produced peak boost readings of 4 psi or less (corrected) at full throttle. The engine will be delivered with these pulleys installed to assure fuel compatibility during cross-country driving at low altitude. There is certainly room to grow here if the owner so desires. More boost and higher rpm could have put this engine over 300 hp but with some penalty in reliability.

Overall, this engine performed like a champ on the dyno. Please contact Roadrunner Engineering if you require further information.



Roadrunner Kit with a Weiland 142 Blower and a Holley Street Avenger 4-bbl installed



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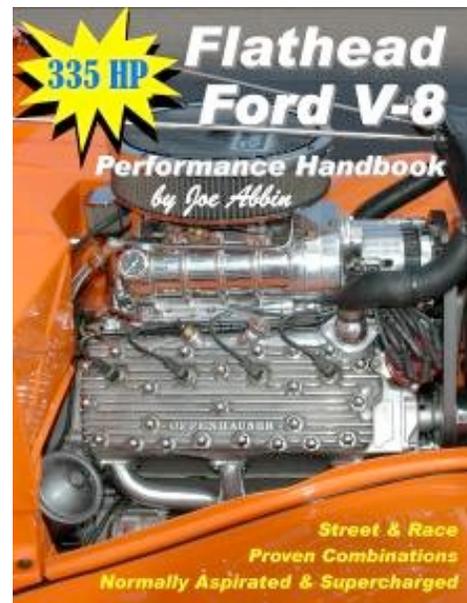
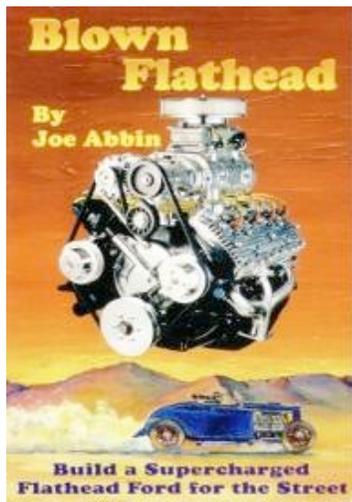
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New Production of Roadrunner Supercharger Kits Almost Gone!

Deposits and worksheets are currently being accepted for the last run of Roadrunner supercharger kits for the flathead Ford. A limited number of orders are being accepted and delivery is on a first come, first served basis. Orders require a \$500 deposit and a completed worksheet (download from www.roadrunnerengineering.com). Also see the website for the current kit prices.

Blown Flathead and 335 HP Flathead Ford V-8 Performance Handbook Books Are Available!

For more info on the books below go to www.roadrunnerengineering.com.



Blown Flathead has been out of print for some time, but a limited number are available from Speedway Motors and Roadrunner Engineering.