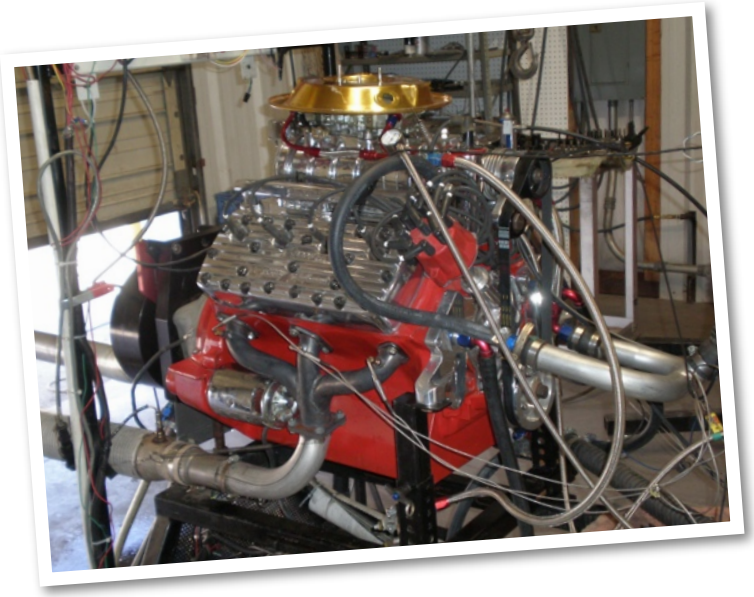
ROADRUNNER ENGINEERING NEWSLETTER

PO BOX 53296 ALBUQUERQUE, NM 87153
(505) 268-6768
E-MAIL: RoadrunnerEngr@msn.com
Website: www.blownflathead.com or www.roadrunnerengineering.com

AUGUST, 2012



Owner Bert Griffin's Blown Flathead Ford Engine on the Dyno

Inside This Issue

Secrets Revealed

This month you will read about two of the most powerful flatheads we have had the pleasure of testing at Roadrunner Engineering. Bert Griffin of Stanton, CA had the engines built by Taylor Precision Engines of Whittier, CA to run in his Model A roadster at Bonneville and El Mirage. These engines were serious contenders built with good parts including the Roadrunner Big Kahuna supercharger kits and full girdles for main cap support. The engines were very similar and performed as such. Even though they performed at a very high level, I believe they were both capable of 375+ hp with more attention to the porting and other details. Ten years ago I would not have believed this possible with an almost-streetable flathead on gasoline.

Joe Abbin

Dyno Test Report on Griffin 293 and 296 cu. in. Engines, Dyno Tested 4/29-30/2009, Albuquerque, NM

Summary: Results are summarized for the dynamometer testing of the subject engines. Table 1 and Figure 1, shown later, report the measured torque & horsepower for the 293 cu.in. (#1) and the 296 cu.in. (#2) blown flatheads. Engine #1 produced 350 hp @ 5600 rpm and 350 ft-lbs. of torque @ 4300 rpm. Engine #2 produced 333 hp @ 5100 rpm and 363 ft-lbs. of torque @ 4300 rpm. All

results are corrected to standard sea level conditions. 74% overdrive supercharger pulleys produced about 7 psi peak boost in Engine #2 and 8 psi in Engine #1. These figures equate to 8-10 psi at sea level. The engines ran on 110-octane VP racing gas during test.

The engine characteristics as I understand them are listed below.

Engine #1 Test Definition:

Long Block Assembly

The long block assembly was built by Taylor Precision Engines of Whittier, CA. I have no documentation on detailed engine measurements, but consisted of the following:

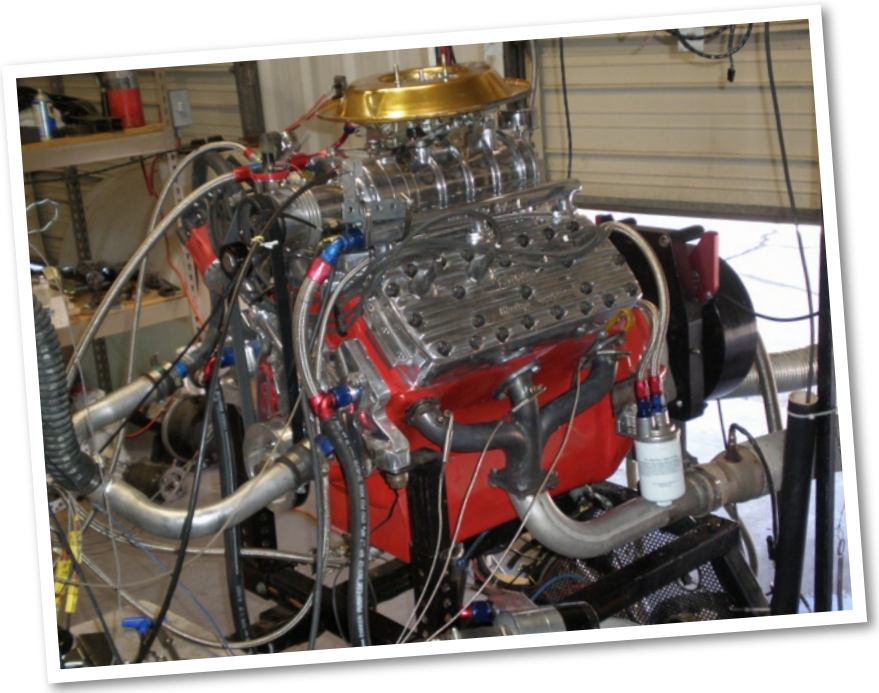
- 3-5/16 in. bore, Arias forged pistons with 7/16 in. popup domes.
- 4.25 in. stroke Scat crank, Cunningham rods, full girdle main cap supports.
- 1.687 in. stainless intake and 1.562 in. exhaust valves, block ported and relieved.
- Melling M15 High volume oil pump.
- American 410 cam with single Isky 185G valve springs (85 lbs on seat). Johnson hollow lifters.

Heads

Baron aluminum heads with a 7.5:1 compression ratio (144 cc head volume).

Intake-Supercharged

Roadrunner manifold and Weiand 174 blower (S/N 30205) with 74% overdrive (3.23/5.63) pulleys. Several 4-bbl carburetors were tested, but best results were obtained with a custom Holley/ ProForm carburetor built by C & J Engineering of Whittier, CA. This carburetor had an 812 cfm capacity and best power was obtained with #71 primary jets and #81 secondary jets. 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

Top mount electronic (magnetic pickup) MSD distributor with mechanical advance and high performance coil. Autolite 404 plugs, gapped at .025-.030 in. were used with a slow advance curve (4-6 degrees initial, 16-22 degrees total) that was not fully advanced until about 3000 rpm.

Water pumps

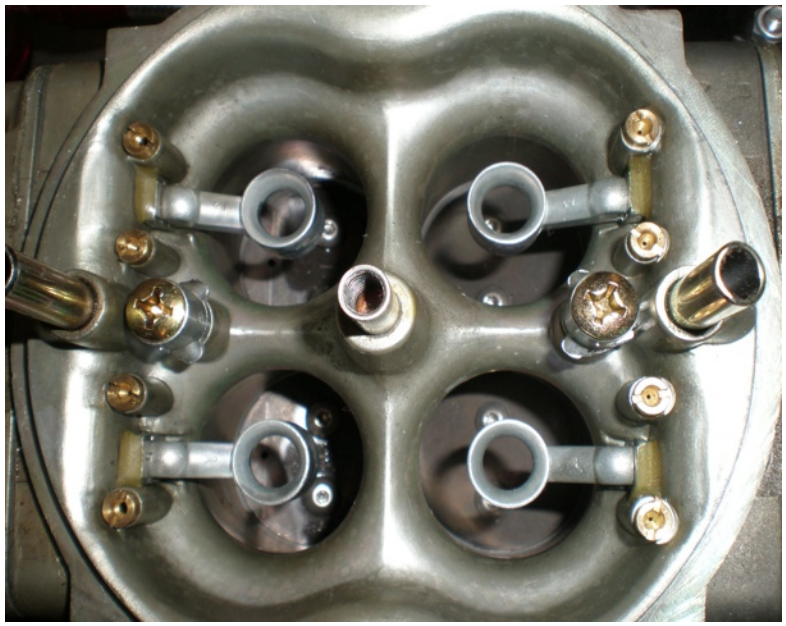
A single electric water pump was used during test and for racing.

Thermostats

None.

Engine #2 Test Definition:

Engine #2 was identical to #1 with the exception of a slightly bigger bore (3-5/16+.020 in.), the pistons (J & E popup), and the cam (Iskenderian 433). A second Weiand 174 blower (S/N 30004) was used on this engine.



Bird's Eye View of the C&J Carburetor

Discussion:

Engine #2 was tested first and subjected to several undocumented dyno "pulls" to do initial tuning and check for proper function of all components. Approximately 10 pulls followed for actual tuning and hardware optimization. The testing took place over the period of 4/29-4/30/2009. Table 1 (attached) summarizes the test results. In hindsight, this engine would possibly have performed as well or better than Engine #1 if the maximum test rpm had been raised. On the other hand, valve float may have been limiting peak rpm. During later operation in the car, this engine suffered severe valve float at an unknown rpm.

Based on the test results from Engine #2, Engine #1 was tested with the best performing carburetor and tuneup specs. However, the power for Engine #1 did not appear to be peaking

at 5100 rpm and the max rpm was raised until the power leveled out. The peak for this engine appears to have occurred at 5600 rpm. The dyno controls the maximum rpm to the set point by loading the engine and sometimes it is difficult to discern the maximum power point for the engine from the dyno control point. The worst case is destruction of the engine, so the maximum rpm is conservatively chosen and the only downside is that the full capability of the engine may not be measured.

Overall, both engines performed very well and represent two of the most powerful flatheads tested by Roadrunner. The only area for improvement that I noted was the intake port/gasket/manifold matching.

For land speed racing it will be important to keep the engines cool for maximum power and resistance to detonation. Less than 160 degrees would be a desirable target.

Please contact Roadrunner Engineering if you require further information.

Master Tuner and Dyno Operator, Gary McGlasson and Owner Bert Griffin

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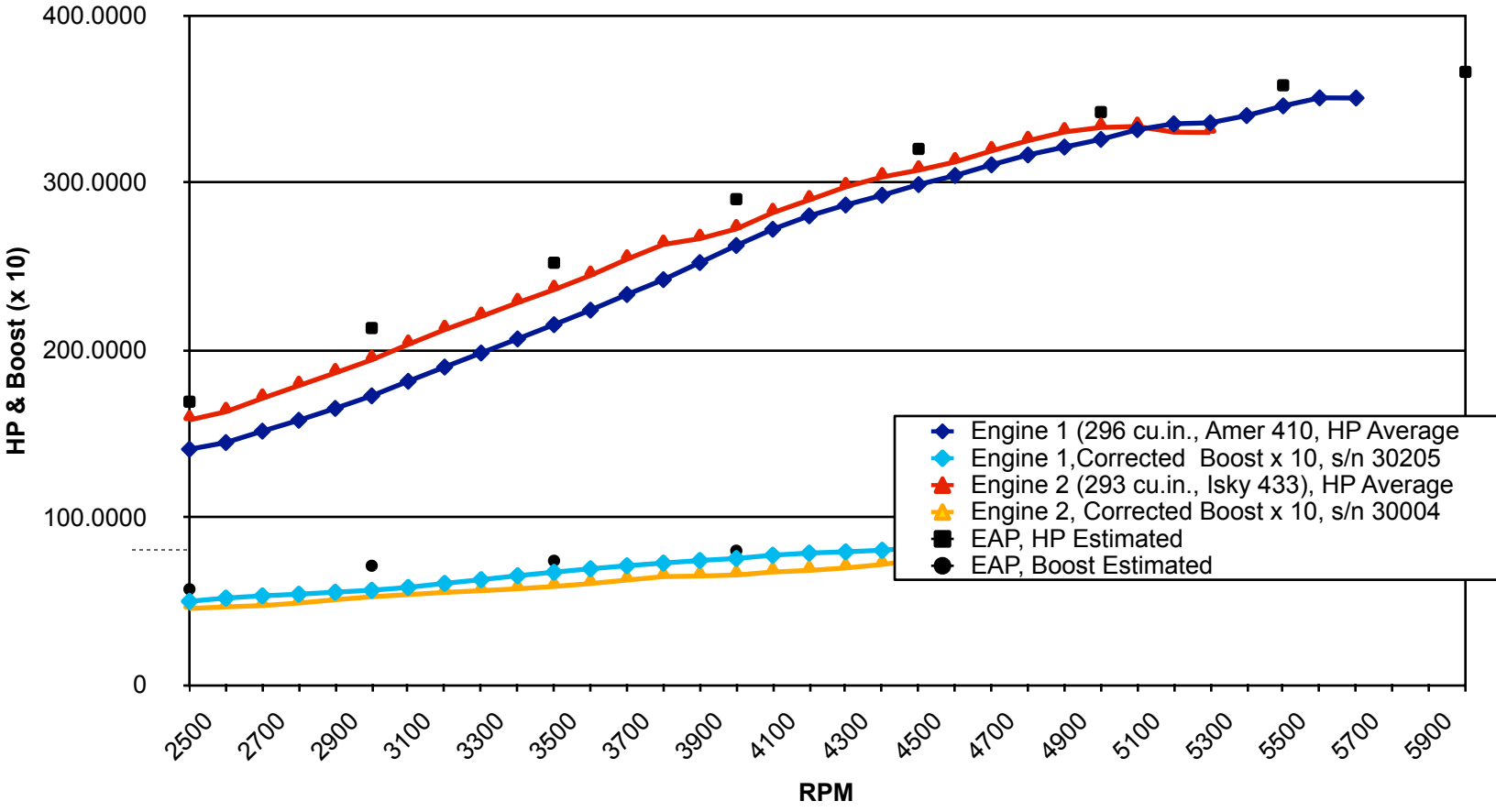
Figure 1 Bert Griffin Flathead Dyno Test Comparison Tests Run 4/30/2009



Bert Griffin's Model A Race Car

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Table 1. Bert Griffin Flathead Dynamometer Test Summary

Test Date Time	Peak Torque	@ RPM	Peak HP	@ RPM	Total Timing	Main Jets	Air/Fuel Average	Boost @ Max HP	Comments
Engine #1 - 296 cu.in., American 410 cam, C&J Engineering 812 cfm 4-bbl									
4/30/2009									
14-08-03	346	4200	333	5300	20	73/82	11.7	8.3	
14-35-18	348	4400	334	5200	20	73/82	12.0	8	
14-43-40	352	4400	344	5500	20	73/82	11.9	8.3	
14-51-55	350	4300	350	5600	20	73/82	11.9	8.3	
Engine #2 - 293 cu.in., Iskenderian 433 cam, Various 4-bbls									
4/29/2009		C&J Engineering 812 cfm 4-bbl							
14-06-52	345	4200	313	5100	20	73/82	11.2	7.2	
14-21-47	349	4300	321	5200	20	73/82	11.3	7	
16-01-58	351	4400	318	5100	20	73/82	11.1	6.8	
16-54-48	350	4300	323	5100	20	71/81	11.6	7	New Belt
17-12-12	355	4300	327	5100	20	71/81	11.7	6.9	
17-22-17	354	4300	330	5300	16	71/81	11.6	7	
4/30/2009		Various 4-bbls							Carb CFM
08-55-43	338	4300	304	4900	16	NA	9.9	6.8	650 #1
09-09-07	295	4200	270	5000	16	NA	10.4	6.9	650 #2
09-45-36	351	4200	323	5000	16	77/77	12.4	6.8	750 Holley
10-05-25	363	4300	333	5100	21	71/81	11.6	7.2	812 C&J

Notes:
1) Test results are an average from two or more tests (dyno "pulls").
2) Test resuls are corrected to standard dyno conditions: 60F, 29.92 in.Hg and dry air.

Featured Question - Flathead Rebuild Costs

Question: What does a flathead overhaul cost in the Albuquerque area? I'm just looking for a price range here.

Answer: The cost of a flathead rebuild varies with the core condition, the desired parts, and the builder of course, but around here I estimate the cost for rebuilding your 59L complete engine at about $3500-$4000 with new wear parts and balancing.

What's Coming Up?

Next issue we will feature Bob Agnew and his blown flathead–powered 1951 Ford Victoria. Bob recently completed a 6400+ mile tour with his Ford. We will cover what happened as well as the car and the engine.