

STAHL HEADERS/CAMS  
1513/1515 Mt. Rose Ave.  
York, PA 17403



ADDRESS CORRECTION REQUESTED

September 1991

**STAHL HEADERS/CAMS NEWSLETTER**  
**ISSUE #9**

**COMPUTER SOFTWARE**

After the response from our last newsletter we discovered we are not set up to efficiently sell computer software. Thus new prices. Rod I is \$45.00. Rod III which now includes frictional horsepower and time measurement for specified crank angle degrees is \$95. Comp I is \$45.00. Comp II is \$95.00. Torque I, which is Richard Howell's instantaneous torque monograph, is available for \$95.00. The Stahl flow bench program is being dropped as the Flow Pro program offered by Audie Technology is far superior. We have made arrangements for owners of the Stahl flow bench computer program to upgrade to Audie Technology's program for a reasonable fee.

**HEADERS**

Header testing over the past 24 months is showing that there is nothing you can do to an engine that will make as much difference below 5000 RPM as the exhaust system. The engines in 1/2 mile dirt cars spend more than 50% of the time under 5000 rpm.

**ENGINE INSIGHT**

Fortunately there are some people who feel comfortable in passing on their thoughts to me. Recently Randy McKinnley was telling me he doesn't understand how there is enough time for a fresh charge to cool down a cylinder etc. It was like a big light being turned on in my head. I now believe there is flame in the cylinder most of the time. Now for the first time in my life I can see the cause of pre-ignition in race engines and the cause of reversion traces in cyl heads. Since I discovered the best way to understand something is to write it out...I've started working out the thoughts involved. If you are interested in participating in helping me get this thing more meaningful, call or write and we'll send you a copy of it...it's now up to 5 pages and needs much work. According to the most recent version of our Rod Angle program which will now calculate time and frictional horsepower (\$95.00 or \$45.00 to upgrade from version 1, \$25.00 to upgrade from version 2.) it takes .016 seconds for a 355 to make 2 complete revolutions @7500 and .024 seconds to do it at 5000 rpm.

**STAHL CAMS (717) 846-3123**

**STAHL HEADERS (717) 846-1632**

# STAHL HEADERS/CAMS NEWSLETTER QUESTIONNAIRE

Your Name: _____	Specialty: _____
Company _____	Drag Race: _____
Address: _____	Oval Track: _____
_____	Road Race: _____
Phone: _____	Other: _____
Flow Bench: _____	Cams Used Most:
Brand _____ Model _____	Flat Tappet : _____
Dyno: _____	Roller : _____
Brand _____ Model _____	<b>Please complete &amp; return to:</b>
Computer: _____	<b>STAHL HEADERS/CAMS</b>
	1515 Mt. Rose Ave.
	York, PA 17403
	<b>(717) 846-1632 or 846-3123</b>

## ATTENTION!

DO YOU WANT TO CONTINUE TO RECEIVE THIS NEWSLETTER?

Check you mailing label!

????? Return above questionnaire to remain on our mailing list for future issues.

XXXXX This will be your last issue unless you return your questionnaire. Those that do not respond are either not reading our newsletter or don't care and, in any event, we don't need to waste. Previous issues are available upon written request only.

## STAHL

**#1 QUALITY HEADERS FOR OVER 28 YEARS**

**#1 QUALITY CAMS FOR 5 YEARS**

### MANUAL DYNO VALVING

Steady state control of dynos such as Go Power's or Stuska's may be improved significantly for small RPM changes by paralleling the existing load control valve with a needle valve. 400 + HP engines will prefer a 3/4" needle valve while a 1/2" is more ideal for the under 400 HP. Make two Y adapter's out of pipe or tubing via cutting and mitering to obtain better flow quality and not to use elbows etc. These Y's are positioned in the main feed water line on each side of your console. Use your existing load control valve to get within 200 or so RPM of the desired test point and then use the needle valve to dial in. If you position a ball valve on the pump side of the Y, you will be able to turn off the water, breathe the engine and then repull at the same RPM by opening the ball valve.

Several people who have Depacs report using only the ball valve when doing sweep testing. For those of you who are not familiar, the Depac permits sweeping or accelerating the engine over an rpm range. The engine builder who has provided us with the most Depac dyno tests frequently tests from 2000 to 7500+ in less than 25 seconds. He then repeats most tests 2 times for a total of 3 tests @ each change. In other words he gets 55 to 60 test points per test for a total of 165 to 180 lines of test data in the time it takes to record 3 or 4 single rpm test points in steady state testing. The most impressive part of the Depac is its ability to compensate for different engine acceleration rates and produce acceptable data below 5000 while the repeatability at higher rpms is very good.

## DEPAC OWNERS

Always leave the printer hooked up to the Depac unit. **DO NOT** disconnect it and connect to a computer. A similar printer is available for less than \$200. By leaving it connected to the Depac you will never lose the test data. There are rare times that EMFI appears to cause test data to be lost or get scrambled on its way to the computer. If you have any important tests that you cannot load or would like to recover, call us. To achieve better records we urge you to write down the barometric pressure, carb air temp and the baseline combination on the top of the first printout of the series. On subsequent tests if there is no change, write ie. "repeat test ###". When you make a change, write down only what was changed, ie. *'CHANGE INTAKE MANIFOLD TO HOLLEY 300-41 BY AFR'*: This minimizes the amount of writing, and will give you a permanent record. This original printout should always be filed. If you are doing customer dyno work and are to provide them with test printouts, make new printouts for the customer from your computer. As many of you already know, versions of the link program supplied by Depac in 1991 permit the 1st line of notes to be displayed in graphic mode. Thus, the methodology you use to type in notes can be very critical. If you are interested in this system, send me a couple of data files on a disk with your notes typed in and I'll retype them to show you the system we've developed. For those of you who are struggling with Model T's or 1940 to 1980 concept tools, buy a Depac. It will turn a Superflow into a real test tool so long as the facility is functioning properly. Perhaps after enough people add Depacs to their Superflows, Superflow will see fit to change their concepts from 1980 to 1990 and write the necessary software. I personally find their pc based software to be so archaic I can't stand to use it. But then I've been a computer user for 12 years and have had about 100 programs written to my specifications, plus we have in our possession over 2000 programs that were either purchased, shareware, freeware or whatever. Dave Manzolini, who is DEPAC, certainly deserves much credit for lifting the standards for dyno data acquisition from the 1980's into the 1990's. The user interface makes the program so easy for people to use. In addition if you have a manually controlled dyno there is no other data-acquisition system that is useable in a sweep or acceleration mode. Manzolini has received a patent for his method of accounting for engine rpm, direction and acceleration.

## COMPUTERIZED FLOW BENCH

We recently had a chance to observe the installation of a production version of Audie Technology's "Flo Pro" package which computerizes a Super-flow flowbench to read depression /pressure, valve opening and cfm on the computer screen and saves to a disk file. The installation required less than 1 hour including putting the card in the computer. (Anyone over the age of 10 can put a card in a PC type desktop computer.) I was really impressed by how it speeds up the gathering of data and reduced the time it took to flow the cyl head. I estimate there is a 10 to 15% reduction in the time to gather the data. Combined with the ability to produce a neat organized flow sheet in less than 20 seconds of operator time makes the package a cost effective investment which will pay for itself from a labor saving standpoint. The best reason for buying the system is the ability to graphically see the shape of flow curves, do comparisons and other analysis. It does not require a person to be a typist to be an efficient user. There is a video tape from Audie Technology showing the installation and using the software. The software has a very easy to use interface and may be obtained separately and used as a stand alone program. The system adapts to the Superflow very easily and does not change its operation for non-computer use. It does however require moving the computer near the flowbench and we suggest using a cart that may be purchased from Radio Shack for under \$80.00. Interested people should call Audie Technology (315-363-8530). Highly recommended for serious engine builders. Also available is "Cam Pro" which is a \$175.00 computer program that permits those people who just had to buy a Cam Doctor to now use it simply and effectively. It is the program that should have come with the Cam Doctor. Please don't call Stahl....call Audie Technology.

## DYNO CELL PLANS

We've finally got some diagrams available that show the dimensions, locations etc. of the dyno cell, how to position the cell air blowers, carb air blower, cell air outlet air duct and fans, mufflers etc. Due to handling costs we've got to charge non-current Stahl customers \$10.00 for the drawings.

Hooray.... we finally scrapped Word Perfect. This issue was done with Textra. Sells for \$69.00 (313-769-9088). Try it... you'll like it!

## NEW INTAKE LOBE

Ready now: 255B .420 cam lift. This is a 259 lobe with 4 o off the closing side. So it closes harder than the 259. The 259 with titanium intakes, 220 pound spring on the seat and a Jesse1 1.6 will run reliably to 9200 on a 1/2 mile car. We recommend using 8700 as a max with the 255B. Initial feedback has been very positive. We also have some new exhaust lobes: 264E, 264F, 268B that will be available soon.

## CARB AIR BLOWER

Got a dyno? Do you have a carb air blower? What is a carb air blower? A blower that sources air from inside the building and has a large diameter duct or rubber hose connecting it to a hood/diffuser/air cleaner assembly. The air flow around an engine is for all practical purposes an unknown element and uncontrollable. Since it is probable that the engine will consume some hot and/or polluted air, we have found it absolutely necessary to use an air source that is relatively clean from pollution and stable in temperature. Since most dyno facilities are geographically located where the temperature varies more than 50 deg over the course of a year and we have found it's generally ridiculous to run an engine with a carb air inlet temperature of less than 65 - 70 degrees F, the practical solution is to pull air from inside the building. The blower only needs to be turned on about 1 minute before the test is initiated and run during the test and then it may be turned off while breathing the engine or warming up. Proper cell ventilation and engine air supply appear to be 2 of the major challenges/problems facing engine dyno testing. Perhaps we need to review the basics. The temperature of the air along with its humidity content are a major factor in correcting torque and horsepower. Thus to do relative testing the temperature of the air entering the engine must be measured quite close to the carb/fuel injection inlet entrance/stack. The "standard" or 1951 SAE horsepower correction formula that most of us seem to prefer which corrects to a barometer of 29.92 and 60 deg (f) says that for every 9 degrees (f) the temperature changes there will be a 1% difference in power. In addition, not all engines respond the same to air temp changes. Thus, it is ideal to maintain a carb air temp over as small a range as possible so as to reduce the effect of carb air temp on the final results. The humidity or wet/dry bulb

measurements SHOULD BE TAKEN FROM EXACTLY THE SAME AIR the engine is consuming. Too many people in the northeast test with a carb air temp of 50 deg and use wet/dry bulb readings of 68/54 in the winter. Meaning they are measuring the air in the console area and yet are consuming air from outside the building. We have found that testing the engine with a carb air inlet temp of less than 65 deg to produce erroneous results. In order to achieve the above we find it necessary to use a separate blower to supply engine air. We refer to this as a carb air blower. It should source its air from inside the building whereas the ventilation system should source its air from outside the building. In the north it seems there is only time for testing over the winter months. With the cost of heat energy we have found it possible to warm up and achieve the desired oil/water temps and then turn the carb air blower on about 1 minute before initiating the test. The air passing thru the blower should have a small quantity redirected so as to pass over a wet/dry bulb measuring affair. Sling psychrometers are a disaster. Pick one up, sling it, record your readings. Lay it down for 2 minutes and then do the same procedure 5 times to check out the repeatability. The most cost effective wet/dry we have seen is sold by Taylor at many hardware stores and is called a masons hygrometer. If you are one of those who was misguided in building a duct that seals the engine to the ceiling and requires the engine to pull the air it is consuming down the duct, run, don't walk to change the system....its a disaster.

## USED DYNO'S

Used Dynos for sale! It seems we see used dyno's become available for one of three reasons: (1) we're buying a newer dyno and are selling the older one, (2) we're going out of the engine building or racing business, (3) we're selling it because our customers don't want to pay us to use it.??? The truth is we can't use it competently or we can't get numbers that make any sense and we have to end up going to the race track to find out what happened anyway. GOT A DYNO FOR SALE?? WE'LL MENTION IT IN A NEWSLETTER. It doesn't make any difference why. Hell, those of us that stay in this business don't have all our marbles anyway.