



**HEADWORKS**

1150 Pike Lane #2 • Oceano, CA 93445 • 805-481-6300 • [www.floheadworks.com](http://www.floheadworks.com)

ATTENTION Twin Cam Owners:

## *High Performance Begins Here*

After many hours of Dyno testing and thousands of dollars in R&D we have figured out how to make a massive amount of horsepower and torque in the lower RPM range without losing the "Fun to Ride" factor for street driven Harley-Davidson motorcycles using pump gasoline.

The information in this file is provided for your inspection and education. The contents represent the products and technical insights involved with the FLO Headworks Twin Cam High-Performance Kit.

We are excited about sharing this information with you for your riding pleasure.

After you have read and digested the info, please call or E-mail with any questions. I am easy to reach during business hours. Thanks for your interest in our products.

Sincerely,

A handwritten signature in blue ink that reads "Perry Kime".

Perry Kime, CEO



# TECH TIPS

## Research and Development of FLO Headworks High Performance Engine Kit for Harley-Davidson Twin Cam 88/95

R&D on the heads started in April 1999. The porting process was meticulously documented step by step all the way through. The exhaust port was the biggest challenge because the flow was quite low at around 89 cfm at .600 lift. The exhaust ports actually went flat at .400 lift. That's real bad! The intake was flowing around 109 cfm at .600. The exhaust to intake ratio after rounding all figures was 77%.

The CFM target is controlled by the exhaust to intake ratio. Ideal numbers are 90 to 92 percent. Evacuation of the gas is the key to making the Twin Cam engine happy.

Atomization of the incoming fuel and evacuation of the burnt gas will noticeably reduce engine vibration. Many of our tuners have reported this along with improved gas mileage, longer spark plug life, and of course a lot more horse power and torque.

We make the combustion chambers hemispherical because the shape and size combined with the dual plug increases atomization and burning efficiency of the fuel over the entire piston top.

Up to now we have made recommendations on compatible components to compliment our heads by using Dyno Test data and tuners reports to get the complete picture. After many years of experience I found a way to incorporate all the main factors into a computer program that would give analysis on specific information requested from the owner/rider of the particular motorcycle. Such as, model, type of riding, average packing weight, geographical location, with short list of things you require in performance. List any and all modifications that have been done. This information was valuable to us because now we can design other products to meet their needs.

This TC88/95 project bike engine was designed with careful consideration for the owner's needs and his desire to have excessive horsepower at his command, with absolutely no side effects or adverse reactions of any kind.

We like some of the Screamin' Eagle® parts. Their ignition system is good, their Keihin 44mm CV carburetor is good after we blueprint it. Our Big Bore Kit and JE 9.5:1 pistons are a superb combo. However, other areas need special attention.



# TECH TIPS

After graduating from Harvey Crane's Cam School in March of 1998, I was ready to use information from "The Master" himself for the cam design.

The exhaust system in a lot of cases is a choice made by the owner, however, looks are deceiving. Our Dyno test results indicate only a handful of options will be considered for this project. What we actually used will now be revealed.

We begin with disassembly, of course, but very carefully. This is a different animal. Now the boring but necessary part, reading the factory manuals. Once that part passes we actually start looking inside. The top end was pretty straight forward but this Twin Cam stuff is lot different. We meticulously remove and replace the cams, bearings, etc. by the book.

The rest of the top end goes back together by the numbers, pretty much uneventful.

Now its Dual Plug Wire Kit time. Every fabrication is different and this TC88/95 is no disappointment. This Screamin' Eagle® coil takes a special terminal and boot. The dual plug side is so tight we decide to use deeper boots and remove a little rubber on the sides.

The carburetor goes on followed by my bulletproof 700 cfm air filter kit. This 95 cubic incher is going to need it.

A lot more Dyno testing helped us blueprint the carburetor and we ended up with some very impressive numbers, especially in the lower RPM range. The Thunderheader™ Exhaust System made the most horsepower and torque by 5% over exhaust systems that we tested.

Our High Performance Engine Kit now joins the FLO Headworks line of the finest products available for your Harley-Davidson.

## **High Performance Kit for Twin Cam Harley-Davidson manufactured & installed by:**

Perry Kime, CEO, FLO Headworks  
1150 Pike Lane #2, Oceano, CA 93445  
Telephone: (805) 481-6300  
[www.HarleyHeads.com](http://www.HarleyHeads.com)



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## Fun to Ride Guide

***You Want How Much Horsepower and How Many Foot-pounds of Torque at the Rear Wheel? Are We Talking About a “Street Bike on Pump Gas?”***

Well, I don't know what magazine ads you've been reading, but that's just not going to happen in real life. In my 25 years experience working with Harleys, the most you're going to get on a street bike running unleaded gas is about "1 per." What I mean by "1 per" is 1 horsepower and 1 foot pound of torque per cubic inch of engine displacement. That is without sacrificing low end performance and life expectancy which equals "street ability" and means "fun to ride!"

Simply put, you can't get performance at both ends of the power spectrum. Low end power, low end torque is what your engine was designed to produce. Take that away and you destroy the "fun to ride" factor.

For many years it has been common knowledge that companies specializing in high-performance products will build an engine specifically for Dynamometer use. We know Dynos are used to measure horsepower and torque. What these advertisements don't tell you is just exactly how they got their figures. Most commonly the engine will have cam timing that is not acceptable for pump gasoline or street use. The next trick is to bump up the compression and select a compatible gasoline. Racing gas at 98 octane with lead works good up to about 10.5:1. 104 octane is good up to 12.5:1. And 108 octane is good up to 15:1. Keep in mind each time compression and octane are raised it decreases engine life by 15% to 20%. With 10.5:1 compression, a good engine builder can get a Twin Cam 95 cubic inch up to about 1.1 ratio giving 105 HP and torque in the upper RPM range. 12.5:1 compression at 1.15 ratio will give 110 HP and torque. 15:1 compression at 1.2 should give you about 114 HP and torque.

The point I'm trying to make here is to the average Harley rider, pump gas is the rule, not the exception. Don't be misled by the advertisements you read in the magazines. Most high performance companies place those ads to get your money not for their credibility. So, buyer beware and don't believe everything you read.

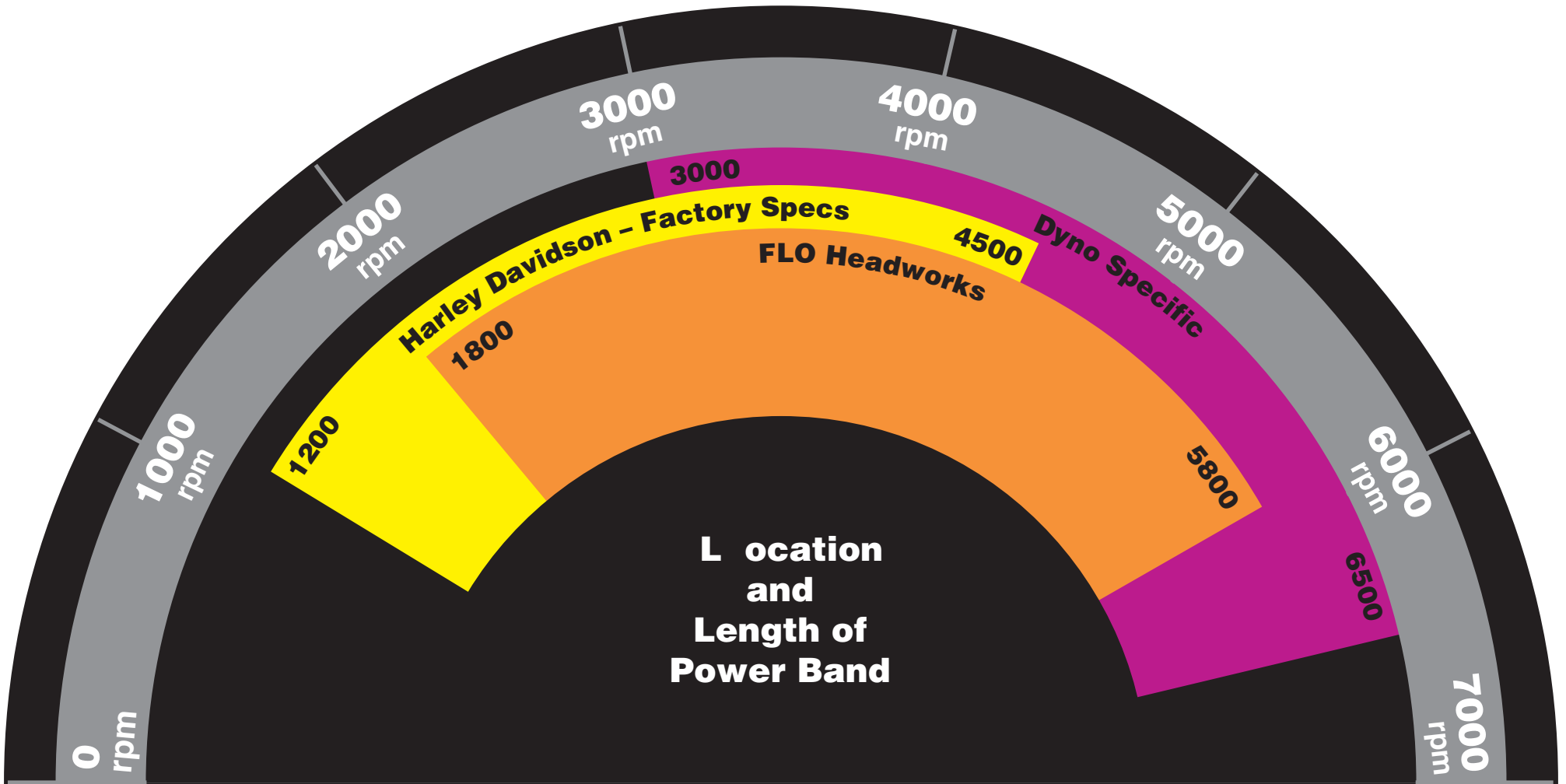
Our philosophy at FLO Headworks is to "accentuate the positive" and improve the characteristics that were inherently designed into the HD engine.

What can you expect? Starting at 2000 rpm on the Dyno Curve, our Performance Kit can give you more horsepower and foot pounds of torque per cubic inch of engine displacement than any other high performance kit. The focus is on the potential improvement on the lower RPM range where the Harley Davidson engine was designed to perform.

To quote the owner of our first R&D project bike, "I can pull the front wheel off the ground at 70 MPH in 3rd gear!" Now that's "Fun to Ride."

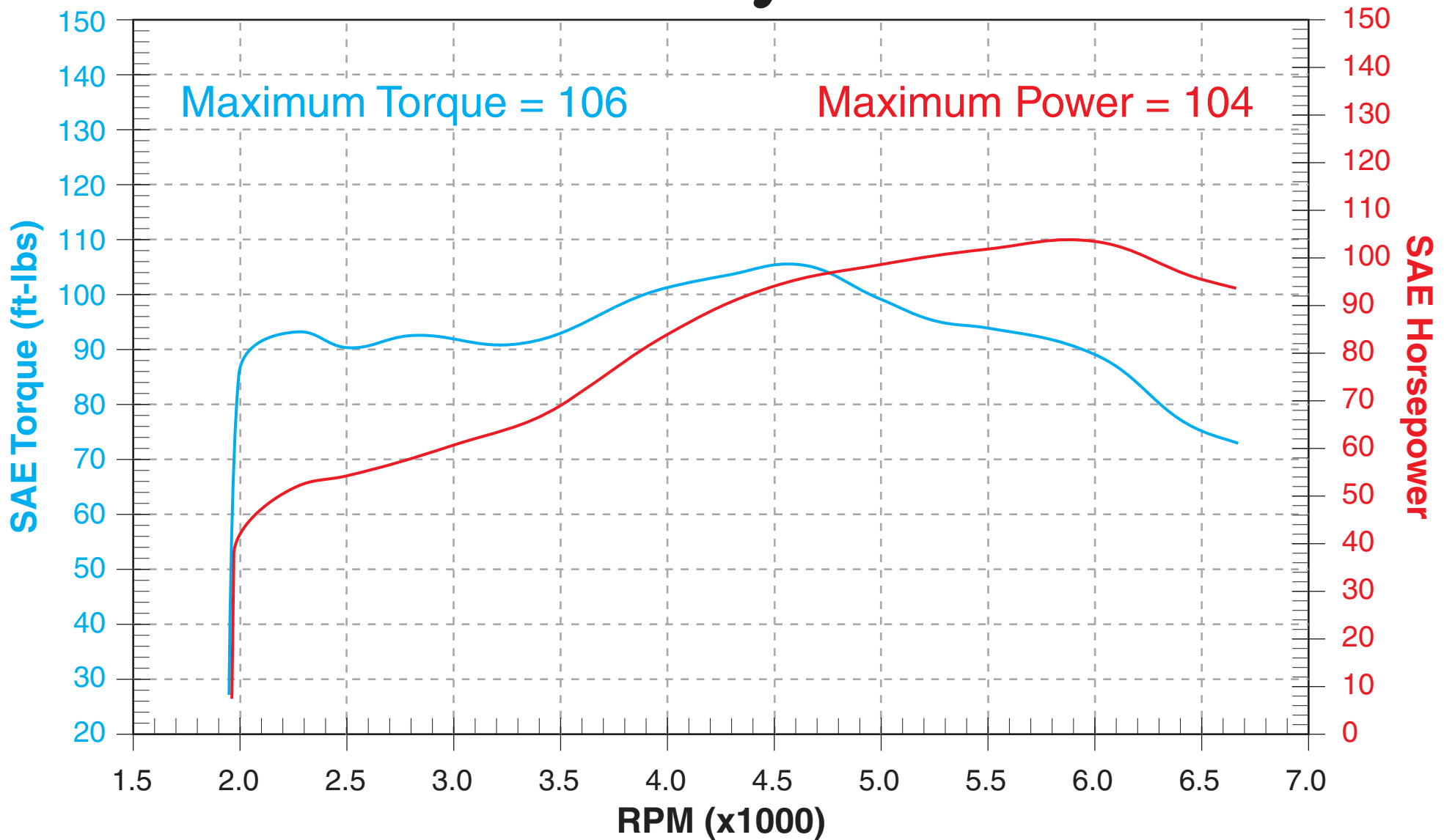
# Fun to Ride Guide

A Power Band Comparison of RPM, Horsepower and Torque for Harley-Davidson Twin Cam 88/95



- Harley Davidson
- FLO Headworks
- Dyno Specific

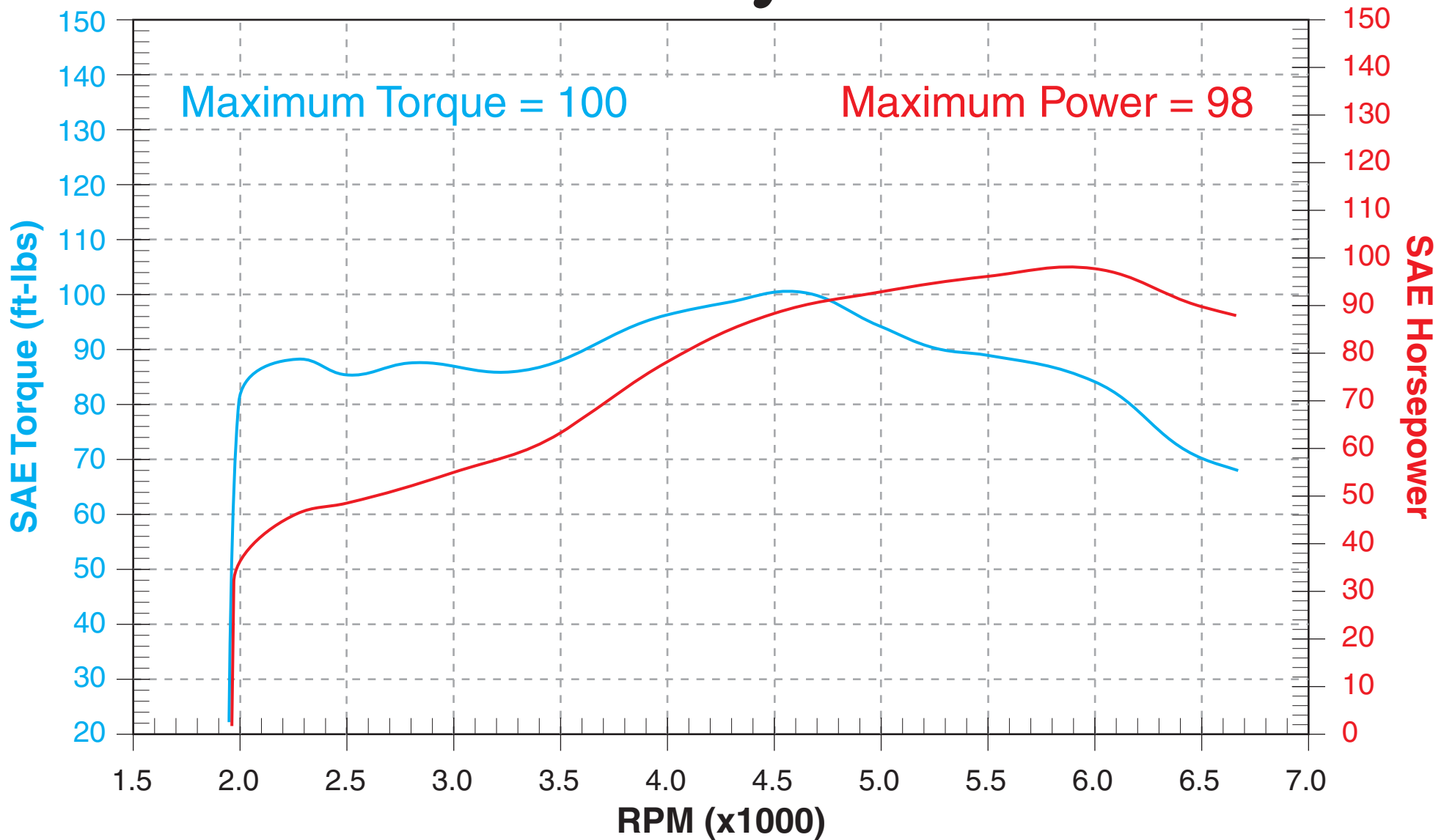
# FLO Headworks Twin Cam Carburetor Performance Kit Dyno Test Results



ROWE 037 99 FXDX (A) 8/04/00 8:37:56 AM  
FLOJE 95 C.I. Kit, FLO Heads, FLO Cam Kit #525, S/E 44CV, FLO Air Filter Kit,  
S/E 7000 Ign. Kit, FLO Dual Plug Wire Kit, Thunderheader Exhaust System



# FLO Headworks Twin Cam EFI Performance Kit Dyno Test Results



SCOTT 023 2001 FLHTC 2/10/01 12:04 PM  
FLOJE 95 C.I. Kit, FLO Heads, FLO Cam Kit #525, FLO Dual Plug Wire Kit,  
Techlusion EFI Management System, SE Air Filter, Thunderheader Exhaust System





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## CNC Port Flow Cylinder Heads For Harley-Davidson Twin Cam 88

After much time and flow testing we are pleased to offer a major breakthrough in the High Tech world of Volumetric Efficiency. Our optional "Tooled Finish" in the ports has effectively doubled the atomization factor over the polished surface used by other head porting companies.

Another interesting discovery that applies to the HD V-twin engine is the exhaust to intake ratio of the air flowing through the ports. Generally speaking they like a fairly high ratio around 90 to 92 percent at .650" lift. The Twin Cam 88 C.I. castings

stock tested at 82 percent at .650" lift.



The process of events that lead to a significant increase in the flow characteristics throughout the entire range of valve lift is lengthy and tricky to say the least. Our flow bench technics

have enabled us to improve the low lift flow of both the intake and exhaust ports arriving at exhaust to intake ratio of 92 percent at .650" lift. This will give the engine a smoothly tuned effect even with some of the more radical cams. The



high lift flow at .650" lift has been increased in the intake port by 25 percent and in the exhaust port by 33 percent.

During this process a large amount of metal is removed from the ports and combustion chamber area. The seat pockets are polished with a radius up to the valve seating area. Our hemispherical combustion chambers are matched to the bore size and polished to give the most effective flame travel. The dual spark plug option is the finishing touch to give your engine its full potential.

The valves are hand made in-house from 21-4N stainless steel with polished tuliped heads. The backside is machined with a .750" radius to increase the flow characteristics and nitrided along with the stem to minimize wear. The valve seating area measures .060" wide on the exhaust valves and .045" on the intake

valves. The head diameter has been increased from 1.574" on the exhaust to 1.690" and from 1.841 on intake to 1.940". Valve stem clearance is fit to .001" on the intake and .002" on the exhaust.



*Photos by Perry*

This high performance cylinder head modification package includes:

- Hand lapping the head gasket surface on the Microflat.
  - Glass beading and paint touch-up.
  - Testing valve springs.
- Assembly with our all Teflon valve stem seals to the specification required by manufacturer of your particular cam.

Additional information is available from FLO Headworks Customer Service Hotline at 805-481-6300.

These heads, like all FLO Headworks products, are guaranteed for one year on street driven motorcycles.



# Flow Test Data Sheet

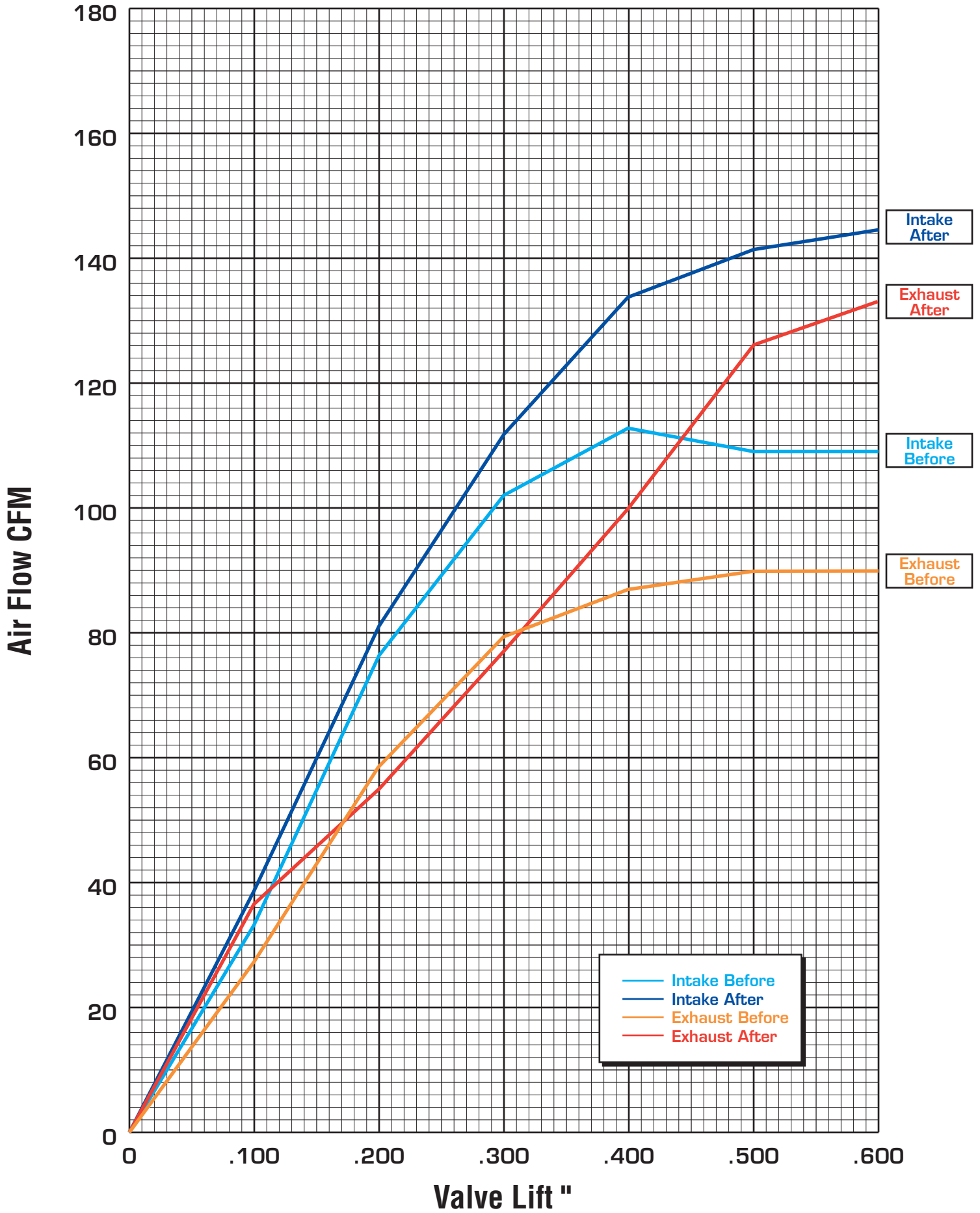
## HEADWORKS

Description HD Twin Cam 88 C.I.  
 Intake Valve Make & Size HD 1.841" Exhaust Valve Make & Size HD 1.574"  
 Inch Flow 10" Combustion Chamber Volume CC 85

#	MODIFICATION	FRONT INTAKE	Lift	1	2	3	4	5	6
1	Stock		.100"	34					
			.200"	74					
			.300"	103.6					
			.400"	116.4					
			.500"	115					
			.550"	115.2					
			.600"	115.5					
			.650"	115.5					
		Total CFMs							
#	MODIFICATION	REAR INTAKE	Lift	1	2	3	4	5	6
1	Stock		.100"	33.8	38.5				
2	CNC Port Flow		.200"	76.3	80.9				
	Open Chambers to 100 CC		.300"	102.3	111.9				
	FLO Valves 1.940"		.400"	113.5	133.9				
	Radius and Polish Seats		.500"	110.5	140.2				
			.550"	109.1	141.1				
			.600"	109	143				
			.650"	109	144.5				
		Total CFMs		763.5	934				
#	MODIFICATION	FRONT EXHAUST	Lift	1	2	3	4	5	6
1	Stock		.100"	29.1					
			.200"	59.9					
			.300"	81.9					
			.400"	89.1					
			.500"	91.8					
			.550"	92.4					
			.600"	93.1					
			.650"	93.1					
		Total CFMs							
#	MODIFICATION	REAR EXHAUST	Lift	1	2	3	4	5	6
1	Stock		.100"	27.3	36.6				
2	CNC Port Flow		.200"	58.5	55				
	Open Chambers to 100 CC		.300"	79.9	77.2				
	FLO Valves 1.690"		.400"	86.7	99.9				
	Radius and Polish Seats		.500"	88.5	119.3				
			.550"	89	126.2				
			.600"	89.5	132.1				
			.650"	88.5	132.8				
		Total CFMs		608.9	779.1				
Gain INTAKE Port @ .650 Lift			CFM	35.5	%	24.6	Gain Average from .100 to .650 Lift		
Gain EXHAUST Port @ .650 Lift			CFM	43.3	%	33.7	Gain Average from .100 to .650 Lift		
Exhaust to Intake Ratio Before @ .650 Lift			82.1%						
Exhaust to Intake Ratio After @ .650 Lift			91.9%						
Exhaust to Intake Ratio Average from .100 to .650 Lift			83.4%						
Test Notes:									

Test Head

*HD Twin Cam 88 C.I.*





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## Super Port Flow Cylinder Heads for Screamin Eagle Twin Cam 120



Photos by Perry Kime

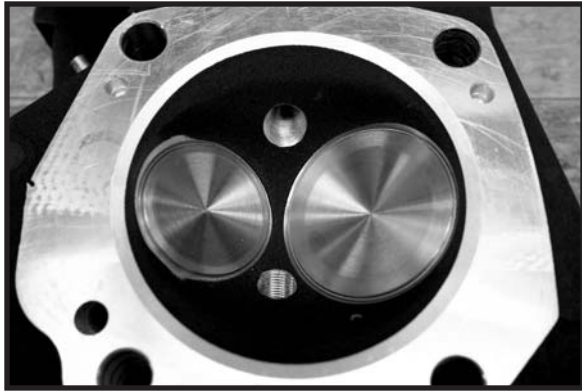
Our Flow Bench Techniques have enabled us to offer some big CFM numbers while maintaining OEM size valves. These Stock heads have a big problem in the Exhaust Ports, averaging only 88 CFM at .650" lift. Intake Ports average 145 CFM at .650" lift. Exhaust to Intake Ratio is extremely low, 60% at .650" lift. Needless to say, "We had our work cut out." After all is said and done, with our Patented "Tooled Finish" the numbers look like this:

Intake Gain is 7.4 CFM at .650" lift.

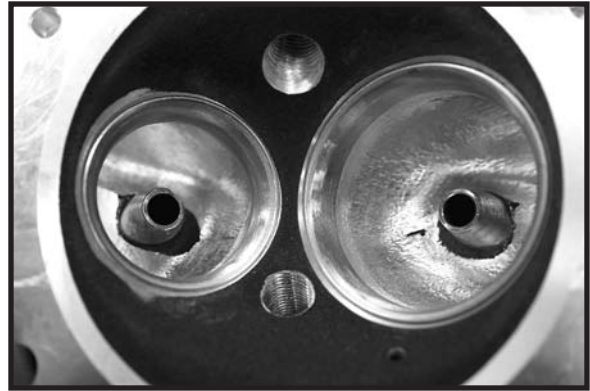
Exhaust Gain is 44.1 CFM at .650" lift.

Intake to Exhaust Ratio is 86% at .650" lift.

We offer these SE 120 heads exchange or just do yours PDQ. Satisfaction guaranteed.



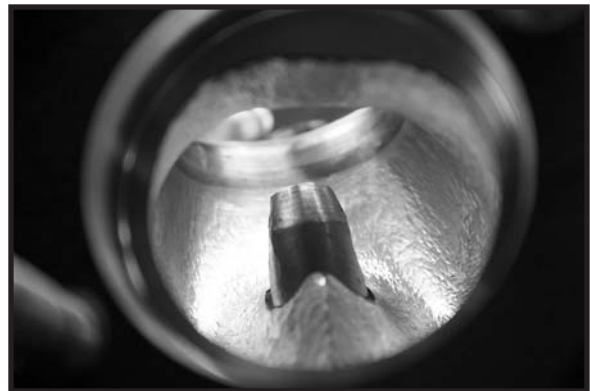
Assembled Head, Ready-to-Install



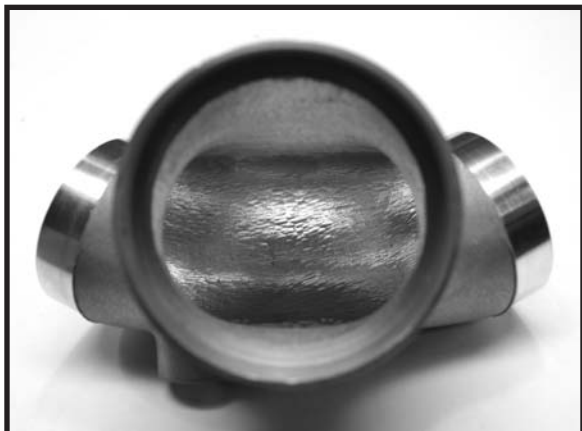
Dual Plugged Combustion Chamber



Intake Port and Polished Seat



Exhaust Port and Polished Seat



Ported and Tooled Finish  
Intake Manifold



Recontoured and  
Swirl-Polished Valves



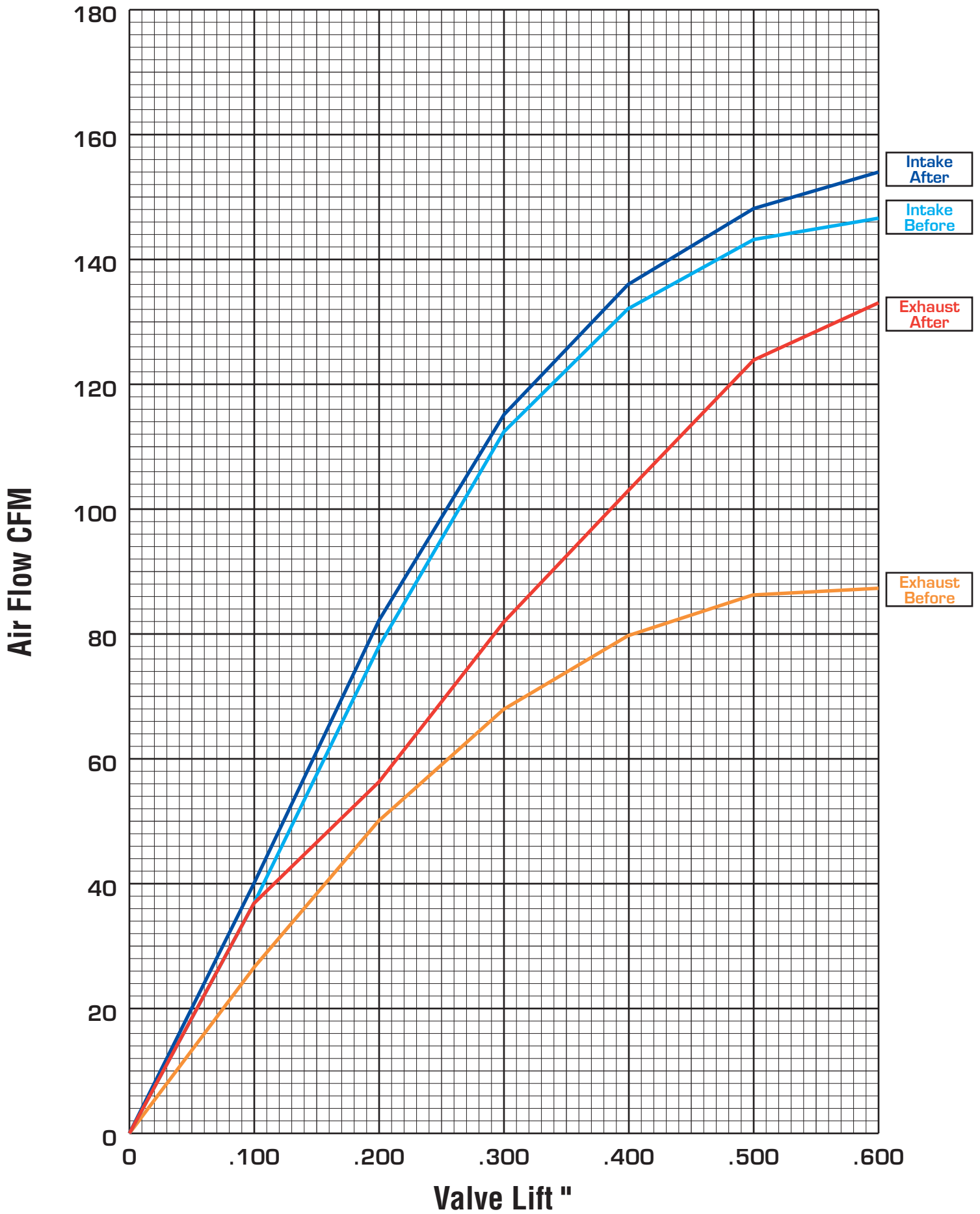
# Flow Test Data Sheet

## HEADWORKS

Description Screamin' Eagle™ Twin Cam 120 C.I.  
 Intake Valve Make & Size SE 2.080" Exhaust Valve Make & Size SE 1.625"  
 Inch Flow 10" Combustion Chamber Volume CC 100

#	MODIFICATION	FRONT INTAKE	Lift	1	2	3	4	5	6			
1	Stock		.100"	37.8								
			.200"	79.4								
			.300"	112.5								
			.400"	130								
			.500"	138.3								
			.550"	140.2								
			.600"	142								
			.650"	142.8								
		Total CFMs										
#	MODIFICATION	REAR INTAKE	Lift	1	2	3	4	5	6			
1	Stock		.100"	37	40							
2	Super Port Flow with "Tooled Finish"		.200"	78	82.3							
	Short Radius Seats		.300"	112.5	115.2							
	Recoutour Valves		.400"	131.9	136							
			.500"	140.3	145.3							
			.550"	143.4	148.2							
			.600"	145.6	151							
			.650"	146.6	154							
		Total CFMs		935.3	972							
#	MODIFICATION	FRONT EXHAUST	Lift	1	2	3	4	5	6			
1	Stock		.100"	26.8								
			.200"	49.9								
			.300"	68.1								
			.400"	79.5								
			.500"	85.1								
			.550"	86.2								
			.600"	86.8								
			.650"	87.2								
		Total CFMs										
#	MODIFICATION	REAR EXHAUST	Lift	1	2	3	4	5	6			
1	Stock		.100"	27	37.1							
2	Super Port Flow with "Tooled Finish"		.200"	51.1	56.4							
	Long Radius Seats		.300"	70.2	81.9							
	Recontour Valves		.400"	81.5	103							
			.500"	87.6	119.1							
			.550"	88	124.1							
			.600"	88.6	129							
			.650"	88.9	133							
		Total CFMs		582.9	783.6							
Gain INTAKE Port @ .650 Lift			CFM	7.4	%	4.9	Gain Average from .100 to .650 Lift		CFM	36.7	%	3.8
Gain EXHAUST Port @ .650 Lift			CFM	44.1	%	33.2	Gain Average from .100 to .650 Lift		CFM	200.7	%	25.7
Exhaust to Intake Ratio Before @ .650 Lift			60%									
Exhaust to Intake Ratio After @ .650 Lift			86%									
Exhaust to Intake Ratio Average from .100 to .650 Lift			80.6%									
Test Notes:												

Test Head *Screamin' Eagle™ Twin Cam 120 C.I.*





# TECH TIPS

# DETONATION

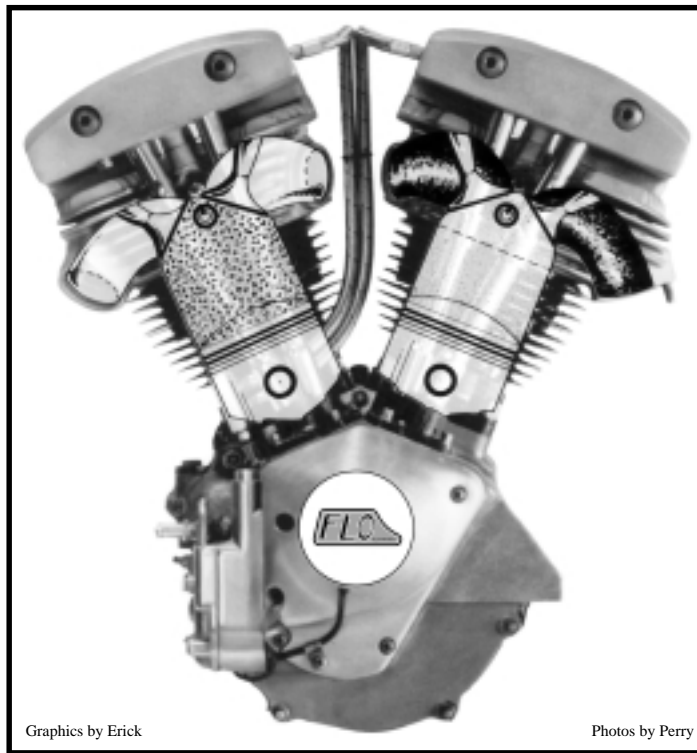
## TROUBLE IN PARADISE

For the most part detonation is invisible. You can't feel it, you can't see it, and most of the time you can't hear it. But for 99.44 percent of the people who ride Harleys on pump gas, it could be going on right now inside your engine.

Now that I've got your attention we will discuss in detail the cure. The key words are Atomization, Flame travel, and Complete burn.

It's like taking a trip to the center of your combustion chamber where Volumetric Efficiency is the final judge of how you live or how you die.

In 1985 the EPA passed a new law that has drastically changed the requirements of pump gasoline. Prior to this new law premium leaded gas was



Graphics by Erick

Photos by Perry

rated at 98 octane with 4 grams of lead per gallon. Today the best gas available has 92 octane with no lead. As a result your cylinder heads have become the most important part of your engine. Detonation and extremely high temperatures which were previously no problem are now causing warpage and cracks, valve

seats and guides coming loose, burnt valves and seats, bronze valve guides seizing, valve stems gauged and excessively worn, holes burned right through pistons, rings that have been so hot that all the spring tension is gone. The bottom line is your cylinder heads are serious Hi-Tech business. The use of space age materials and technology is

now absolutely necessary for the survival of your engine. Solutions to these problems haven't come easy. Many years of effort and extensive research and development have paid off and now it's time to give you the hottest Tech Tips ever released to the public.

Atomization of the incoming fuel is achieved in the intake port and manifold, primarily by the rough surface of the casting. If you are one of the unfortunate people who has sent your heads to a person or company who claims to be knowledgeable in the area of flow characteristics and your heads come back with the ports polished you have a problem. Not only will your motor go slower but it will run hotter and detonation will be much more apparent, considerably shortening the life expectancy of your top end.

The next key word is Flame travel. Your HD engine has one spark plug located on the left side of the combustion chamber. This chamber is deeply concave in shape and partially filled with the piston dome at the point of ignition. Because of the location of this single spark plug and the piston dome the flame travel is partially blocked and does not cover the piston evenly. High compression pistons increase this problem considerably. In 1970 Warner Riley set a new land speed record at Bonneville of 202 MPH with a Harley Davidson. In 1972 he went faster with lower

compression pistons and it was later discovered that the flame front was partially blocked by the piston dome. Flame travel notches were used in the later 1970s by

many knowledgeable engine builders.

Last but not least is the Complete burn. This is achieved by simply adding another spark plug to the opposite side of the combustion chamber and increasing the voltage at the plugs to at least 15,000 volts each. Dual plugging alone of a stock motor will eliminate most detonation, stop plug fouling and hard starting, increase horsepower by 5 percent or more, increase gas mileage, double spark plug life, and

lower emissions. Some tuners have reported 6 to 8 percent increase in gas mileage. Dual plugging is nothing new. In the USA it was first used by Liberty Aircraft in 1917. A little later by Continental and Lycoming in the 1920s and 30s. Primarily used as a safety factor it also reduced spark plug fouling and detonation and increased RPM by 6 percent.

Well Bros now you've got the straight answers to all those questions you been askin'. For more info on your particular application, call the FLO Headworks customer service hotline, 805-481-6300



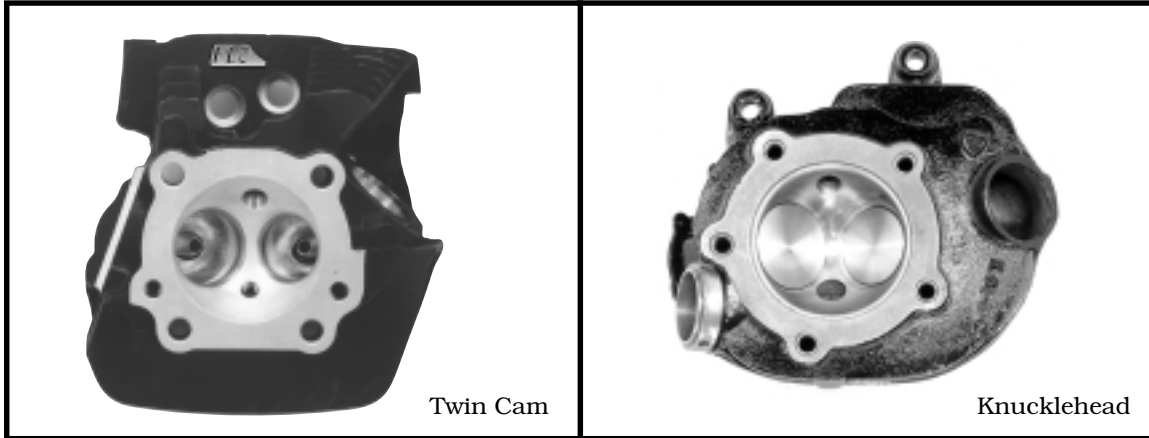
## Super Port Design

R&R Specialties the leading manufacturer of carbide cutters, has teamed up with FLO Headworks to perfect a "Tooled Finish" that will effectively double the atomization of the incoming fuel. Many other improvements have been well documented. Reduced engine temperature, detonation, spark plug fouling, and emissions. Improved horsepower and gas mileage. Especially effective with Hi-Performance cams and high compression pistons. For more Info and a flow chart on your model Harley Davidson contact Perry at FLO Headworks 1150 Pike Lane #2, Oceano California 93445. Or call 805-481-6300.



# TECH TIPS

## Dual Plugging



Twin Cam

Knucklehead

FLO Headworks is now Dual Plugging all Harley Davidson models from Knucklehead through Twin Cam.

Dual Plugging in the U.S. was first used in aircraft engines in 1917 by Liberty Aircraft. In the 1920s and '30s, Continental and Lycoming used dual plugging as a safety factor because it considerably reduced spark plug fowling and detonation. RPM was also increased by 6% percent.

In 1970 Warner Riley set a new Land Speed Record at Bonneville of 202 MPH with Harley Davidson. In 1972 he

went faster with lower compression pistons and it was later discovered that the flame front was partially blocked by the piston dome. Flame travel notches were used in the late 1970s by some knowledgeable engine builders.

We began Dual Plugging Harleys in 1982 and have since come to some amazing conclusions. The deeply concave combustion chamber in HD heads has created a large lack of combustion efficiency. That problem combined with the gasoline available today makes Dual Plugs an absolute must.

The test results are impressive. With 15,000 Volts output from the coil, using our Dual Plug Wire Kit we guarantee it will stop spark plug fowling and hard starting, eliminate detonation, increase horsepower by at least 5% percent, increase gas mileage, double the life of your spark plugs, and lower emissions. Some tuners have reported 6% to 8% increase in gas mileage. Also, especially effective with most Hi Performance cams.

Steel thread inserts are used on Panhead, Shovelhead and Evolution 1340 and Twin Cam.



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## Dual Spark Plug Wire Kit for Harley Davidson Twin Cam Single Fire Ignition System



**M**anufactured and tested by FLO Headworks, this wire kit is designed especially for the TC88. The kit allows the stock single fire electronic ignition system to fire dual plugs. The very highest quality Belden Black High Temperature 7mm GZ with Supression Core IRS/350 is used. Designed to fit all Harley Davidson models, this wire kit measures 23 inches long and

comes with special terminals and boots to fit the coil. Sparky brand neoprene watertight spark plug boots and easy-to-install terminals are used for the plugs.

For more info, contact the FLO Headworks Customer Service Hotline at 805-481-6300, fax 805-481-6341 or E-mail [info@floheadworks.com](mailto:info@floheadworks.com).



# TECH TIPS



Dual Plugging the Twin Cam



Dual Plug Wire Kit installed



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## Twin Cam Big Bore Kit for 95 Cubic Inch Harley-Davidson Engines



**W**e are proud to offer a 98% percent seal of piston rings. These cylinders look exactly like Screamin Eagle™ with one big difference. Our cylinders are machined to precision tolerance with "Torque Plates" at 38 ft. pounds. This increases the percentage of leak-down from the factory average of 90% percent to our minimum acceptable average of 98% percent.

The pistons are manufactured by

J.E. exclusively for our High Performance kit with valve pocket clearance for 1.940 intake valves and 1.690 exhaust valves at valve lift of .600 thousandths. Utilizing high-tech CNC based manufacturing and purpose designed forgings, J.E. is able to maintain exacting specifications on each and every piston. They are forged and come complete with pins, clips and rings. The compression ratio is 9.5:1 with our Super Port Flow cylinder heads.



# TECH TIPS

## Camshaft Design for the Harley Davidson

How to Pick the Right One the First Time



**W**e asked Harvey Crane, the world famous cam designer and his answer was, "whatever works," or WEW, his patented one-liner.

There are so many factors to consider. For

example, our three day crammed cam school should have taken three weeks to digest, and now we have officially scratched the surface of cam design. Computer programs are high-tech

sophisticated, top secret stuff in the camshaft business. And seems just like overnight, everyone has one. So where do you go from here?

In addition to the correct cam profile, other



# TECH TIPS

## Camshafts for the Harley Davidson

### How to Pick the Right One the First Time

compatible components must be used, such as Intake, Exhaust, and Ignition Systems. Heads with good flow characteristics including a high exhaust to intake ratio are also necessary. Other important factors that must be taken into consideration are many. Just to mention a few; Cubic Inch displacement, Bore and Stroke configuration, RPM, Piston speed, Cylinder Head Port Flow CFM chart; Weight of the motorcycle, Gear ratio, etc. Also terminology used to describe important factors currently required to design cam lobe profiles properly. Valve lift, Valve timing, Duration degrees, overlap, lobe centers, Cam base circle diameter, Cam lift, Rocker arm

ratio, Valve train weight, valve springs pressure, Lifter type, Roller diameter, Hydraulic lifter leak down rate, Hydraulic intensity, Major intensity, Minor intensity, Ramp acceleration, Opening Ramp type and velocity, Closing Ramp type and velocity, JERK, and Smoothing.

So, what does all this technical jargon mean to a person who is buying a cam(s)? the short answer is to be sure the cam manufacturer knows how to use it, and The Master definitely does. Our cams are specially designed for use with EPA formulated pump gasoline in California and other states where air pollution requirements are stringent. Our cams are especially

designed to create maximum Horsepower and Torque across a broad power band from 1800 to 5800 rpm. Our cams are especially designed to be compatible with all Screamin Eagle high performance parts available for the Twin Cam 88 and 95 cubic inch engines.

Now the design and testing process is complete and we are proud to announce to Harley Davidson owners around the world the release of our new Cam Kit for the Twin Cam 88 and 95 C.I.

Technical Information is available from the FLO Headworks Customer Service Hotline at 805-481-6300, or E-mail [Perry@floheadworks.com](mailto:Perry@floheadworks.com).



# HEADWORKS

1150 Pike Lane #2 • Oceano, CA 93445 • 805-481-6300 • [www.floheadworks.com](http://www.floheadworks.com)

## FLOMASTER™ Cam Kit for The Harley-Davidson Twin Cam



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**FLOMASTER  
Cams**  
Grind #525 FH

**Application: Engine I.D. Harley-Davidson Twin Cam 1999 up 88-95 C.I.**

Valve Setting: Hydraulic Rocker Arm Ratio 1.628

Valve	Timing	Duration at .053	Valve Lift	Lift @ TDC
Intake	22/42	244°	.525	.218
Exhaust	44/22	248°	.525	.176

Valve Spring Requirements (FLO Spring Kit)			
On the Seat	1.840"	120 lbs.	
Open @ Lift	.525"	280 lbs.	

### Application Information

Designed by The Master for the Harley-Davidson Twin Cam engine.  
Bolt In, Street Driven, Pump Gasoline. Compatible with all Screamin' Eagle parts.  
Broad Power Band 1800 to 5800 RPM.



**Pushrod Cover Kit Included** (not pictured)



# HEADWORKS

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## FLOMASTER™ Cams for the Harley-Davidson Twin Cam



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### FLOMASTER Cams Grind #550 FH

**Application: Engine I.D. Harley-Davidson Twin Cam 1999 up 88-95 C.I.**

Valve Setting: Hydraulic      Rocker Arm Ratio 1.628

Valve	Timing	Duration at .053	Valve Lift	Lift @ TDC
Intake	22/46	248°	.525	.218
Exhaust	50/22	252°	.550	.176

Valve Spring Requirements (FLO Spring Kit)

On the Seat	1.840"	120 lbs.
Open @ Lift	.525"	280 lbs.

#### Application Information

Designed by The Master for the Harley-Davidson Twin Cam engine.  
Broad Power Band 2000 to 6000 RPM.  
Street Driven, Pump Gasoline. FLO Valve Spring Kit clearance required.  
Valve to Piston clearance required. Cam Case clearance required.



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### FLOMASTER Cams Grind #575 FH

**Application: Engine I.D. Harley-Davidson Twin Cam 1999 up 95 C.I.**

Valve Setting: Hydraulic      Rocker Arm Ratio 1.628

Valve	Timing	Duration at .053	Valve Lift	Lift @ TDC
Intake	22/50	252°	.550	.218
Exhaust	54/22	256°	.575	.176

Valve Spring Requirements (FLO Spring Kit)

On the Seat	1.840"	120 lbs.
Open @ Lift	.525"	280 lbs.

#### Application Information

Designed by The Master for the Harley-Davidson Twin Cam engine.  
Broad Power Band 2200 to 6200 RPM.  
Street Driven, Pump Gasoline. FLO Valve Spring Kit clearance required.  
Valve to Piston clearance required. Cam Case clearance required.



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### FLOMASTER Cams Grind #600 FH

**Application: Engine I.D. Harley-Davidson Twin Cam 1999 up 95-107 C.I.**

Valve Setting: Hydraulic      Rocker Arm Ratio 1.628

Valve	Timing	Duration at .053	Valve Lift	Lift @ TDC
Intake	22/54	256°	.575	.218
Exhaust	58/22	260°	.600	.176

Valve Spring Requirements (FLO Spring Kit)

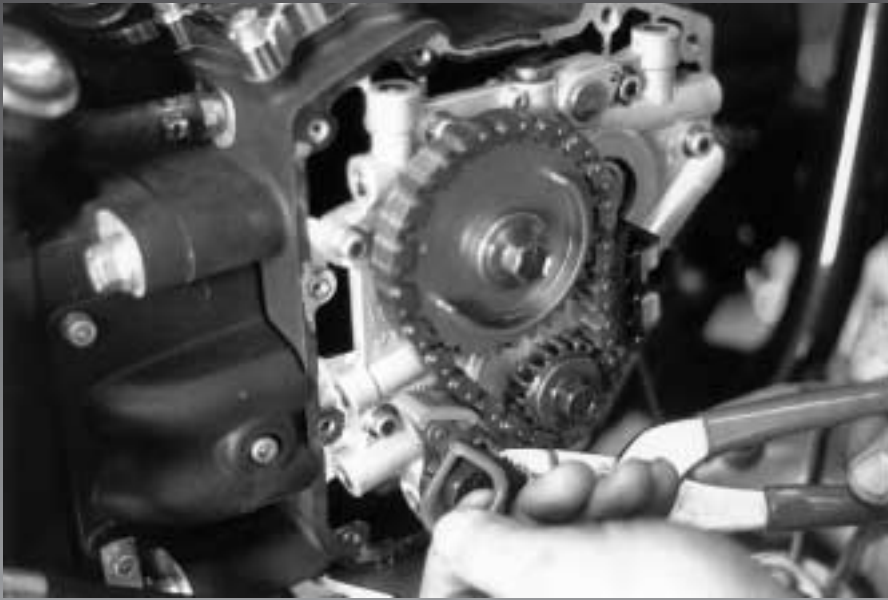
On the Seat	1.840"	120 lbs.
Open @ Lift	.525"	280 lbs.

#### Application Information

Designed by The Master for the Harley-Davidson Twin Cam engine.  
Broad Power Band 2400 to 6400 RPM.  
Street Driven, Pump Gasoline. FLO Valve Spring Kit clearance required.  
Valve to Piston clearance required. Cam Case clearance required.



# TECH TIPS



Cam installation



Remove and replace cams



# HEADWORKS

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## Blueprinting Keihin 40 and 44 mm CV Carburetors



After much time and testing, FLO Headworks is pleased to announce to Harley-Davidson owners everywhere. We have finally finished designing a Computer Program that will allow us to Blueprint the Keihin CV Carburetor on the bench, guaranteed to work perfectly for **your** specific engine.

All Constant Velocity Carburetors are designed to compensate for changes in altitude and barometric pressure, however, the slightest modification to increase engine performance will require a carburetor tuning. One of the biggest problems occurs in the design of the air filter

chamber and the air filter element. Most air velocity problems are caused by a restrictive air filter.

Many factors are considered such as Engine Displacement in Cubic Inches, Bore and Stroke configuration, Compression Ratio, Flow Chart with CFM figures on the ports, Ignition System information if other than stock, Exhaust System type, and most important Cam Specifications.

For more info and tuning tips, contact the FLO Headworks Customer Service Hotline at 805-481-6300.



# HEADWORKS

1150 Pike Lane #2 • Oceano, CA 93445 • 805-481-6300 • [www.floheadworks.com](http://www.floheadworks.com)

## High Flow Air Filter Kit For Keihin CV Carburetors



**W**e are pleased to offer the highest flow Air Filter Kit ever manufactured for Harley-Davidson Motorcycles. K&N Engineering has been helpful in the development of the filter element that will flow in excess of 700 CFM. A must for big cubic inch engines.

Maintained properly, this filter has a lifetime guarantee. The air filter backing plate is made of .125 inch thick steel with welded mounting

fixtures for all Harley-Davidson V-Twin models from 1937 to present, including the Twin Cam 88. This kit comes complete with all mounting hardware including a radius venturi ring. Detailed installation instructions with photos also comes with the kit to make this modification easy.

Catalog and price list is available from the FLO Headworks Customer Service Hotline at 805-481-6300.



# TECH TIPS



Blueprinted Keihin 44mm Carburetor



700 CFM Air Filter Kit installed



# TECH TIPS

## Exhaust Systems for the Harley-Davidson

*Which is the right one for you?*

We get a lot of questions about exhaust systems for Harleys and I must say to all you guys out there, "Its like choosing a woman." The right size and shape or just the right sound to satisfy your personal taste.

Technically speaking in a High Performance application, the proper function of the exhaust system is to evacuate or scavenge exhaust pulses by keeping them connected together. Imagine, if you will, a railroad train with all the cars connected together. They actually pull each

other down the track. This is the same objective that we want to create in the exhaust pipe. The diameter and length of this pipe is determined by the size and frequency of the pulses coming out of your engine. Some engines require a little back pressure to run properly because of poorly designed ports in the head giving a low exhaust to intake ratio or cam timing designed to comply with EPA Emissions Standards.

All I can tell you for sure is what works the best

with our Hot Setup. The basic Info is to use a 1 3/4 inch diameter pipe 36 to 40 inches long, straight through with no obstructions or baffles of any kind. Dyno testing tells us that some exhaust systems are consistently better at making horsepower and torque like the Thunderheader with its patented anti-reversion system.

More info is available at the FLO Headworks Customer Service Hotline, (805) 481-6300.