VKA FIRST TURN

The *Official* Vintage Karting Association *Magazine*

June 2015

Rolf Hill, Editor

www.VKAkarting.com

Circleville

In this issue:

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MMXV – No. 6

VKA Logo Courtesy of Tom Medley

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* If anyone else wants to contribute, that's fine with me. Send me your input: KartNumber4@yahoo.com

2015 VKA TOUR EVENTS

2015 EVENT SCHEDULE					
1/22 – 24	**Jacksonville, FL**	☑	*7/24-26*	*VIR (WKC)*	
2/5 – 7	**Riverside, CA**	☑	**7/30 – 8/1**	**Quincy, IL/MO**	
3/20-22	*Roebling Rd.(SKC)*	☑	*8/15-16*	*Corvette Museum Pk.(DKC)*	
3/26 – 28	**Barnesville, GA**	☑	**8/20 - 22**	**Camden, OH**	
4/23 – 25	**Circleville, OH**	☑	*8/28-30*	*Summit Pt.(WKC)*	
5/2-3	*Summit Pt. (WKC)*	☑	*9/19-20*	*MIS (MKC)*	
5/15-16	*Grattan, MI (DKC)*	☑	**9/25 & 26**	**Delmar, IA**	
5/22 & 23	**Springfield, IL**	☑	**10/1-3**	**Bakersfield, CA – Tier II**	
6/13-14	*Summit Point (WKC)*		*10/ 3-4*	*Roebling Rd.(SKC)*	
6/18 – 20	**New Castle, IN**		**10/9 – 11**	**Cuddebackville, NY**	
6/19-21	*Mid-Ohio (DKC)*		*10/10-11*	*Summit Pt.(WKC)*	
7/9 – 11	**Brodhead, WI**		*10/23-25*	*Corvette Museum Pk. (WKC)*	
7/23 – 25	**Avon, NY**		**11/?????**	**Atwater, CA**	
VKA Events in BOLD			*Vintage Enduro Events in ITALICS*		

VIR = VA Intnl. Raceway **MIS** = Michigan International Speedway
SKC = Southern Kart Club **DKC** = Dart Kart Club **MKC**= MI Kart Club
WKA = World Karting Assn. **WKC** = Woodbridge Kart Club

Check the VKA web site for last minute changes (www.VKAkarting.com).

EDITOR'S COMMENTS

If Yogi Berra had been a vintage karter, I'll bet one of his famous ***Yogi-isms*** would have been, "Vintage karting is **90% safety**. The **other half is fun**." If your helmet is Snell 2000, you need a new one **now**. If your helmet is a Snell 2005, plan to get one before next season. If your helmet is a Snell 2010, you are good for another five years. (That's my unofficial interpretation. Official word will be forthcoming from the VKA Safety Committee, but I want people to keep thinking about it.)

Rolf Hill - #4

JOIN THE FUN.

TRIVIA QUESTION

A couple months ago, we ran a bunch of "Throwback Thursday" pictures of active VKA members from their younger years. This guy didn't make that issue, but now's your chance to identify this active VKA Member. Here are a couple of hints: He is part of a three generation VKA Team; he currently races in "over-60;" his son runs in 6.1 Rear (and other classes); and his granddaughter races in Junior ... with the **SAME** WB 510 engine on her kart! Who is he?

Give up? The answer and his current photo are on page 12.

APRIL BOARD MEETING - SHORT SUMMARY

Gary Wlordarsky was recognized for handling a couple of on-track problems at Barnesville. He handled the situations very well. Also at Barnesville, some clutch guards did not appear satisfactory. Greater attention needs to be paid to adequate clutch guards. Membership is climbing. We now have 364 Members including one Member who is 100 years young. (At Riverside, 18 memberships {new and renewed} were paid.) The Circleville event is ready. Due to another local event, hotels are full. A block of rooms was reserved at a Baymont Inn 12 miles away. The FIRSTURN© Editor plans on repeated reminders regarding Snell helmet 2005 certification expiring at the end of this season. Barnesville pictures by Dick Teal were posted. One enduro kart was registered at Barnesville. More are expected at future events. American Kart Racing Association (AKRA) incorporated rules for three vintage classes. They are posted on AKRA and Dart Kart Club websites. Adkins will open on May 31. There were 50-55 karts in the Barnesville Kart Show. New show stickers were a big hit.

The balance as of 4/30/15 is $13,757.78.

CIRCLEVILLE RESULTS BY ROLF HILL

Full disclosure: I like Circleville. It is one of the smoother tracks, lots of challenging turns and great track people … and it's **only** 425 miles/7 hours away. Our weather was … well, weather … always changing. Although all three Heats were supposed to be on Saturday, a great "command decision" was made to run two Heats on Friday. The weather was great on Friday, and Saturday's forecast was … not so great. A close look at Saturday's forecast was "rain" starting after "noon."

After the two Friday Heats, Jim Donovan served-up another of his fabulous pulled pork dinners. Saturday morning we had an abbreviated Kart Show and got right into the third Heat. Results were completed before noon. Everyone was packed and headed home as the first rain drops fell.

I brought my new toy … a drone! Strapped my helmet cam on it and flew over the pits and the track before karts got out. I'm still learning what works and what doesn't work as far as aerial shots are concerned, but if you want to see what Circleville looks like from above, check out **YouTube.com/RolfP4**. My plan … no promises … is to get aerial shots of the tracks I go to and to get some action shots of karts on the track. It all takes time and my first priority is running my kart on the track, but I hope to combine this new hobby into my "other duties as assigned" and the videos I do anyway. Stay tuned …..

Rolf

CIRCLEVILLE DEMONSTRATION EVENT RESULTS			
Class	**1st**	**2nd**	**3rd**
Rear 6.1	Rolf Hill	Gary Wlordarsky	Kevin Rice
Rear 8.2	Jerry Nagel	Bruce Riston	- - - - -
Mac-49	Jeff Brown	Scott Kneisel	Pearl Gamble
Yamaha	Kent Windham	Doug Reider	Doug Rossing
S/W 8.2	Marc Nagel	Butch Stewart	Scott Nagel
80-85 S/W	Sandy Crittle	- - - - -	- - - - -
Over-60	Jerry Nagel	Gary Wlordarsky	Joann Hertzig
Dual Rear	Marc Nagel	Jerry Nagel	Don Renton
Dual S/W	Bobby Brown	- - - - -	- - - - -
Sportsman Rear	Robert Lefevre	Dean Scarbrough	Kevin Rice

CIRCLEVILLE KART SHOW BY ROLF HILL

The Kart Show was abbreviated due to the weather and the tight Saturday schedule. Six karts were displayed and ballots for the Peoples' Choice were distributed. Pearl Gamble's 1960 Century Mark 2 with dual Homelites was the winner. → → → → → →

JOIN THE FUN

FAMOUS/NOT FORGOTTEN: QUINCY BY COLM O'HIGGINS

T 'N' T kartways

"Quincy" is a magical name in karting. Built in the early 1960's, Quincy is, along with Barnesville, Batavia, and Brodhead, one of the finest competition kart racing locations we know, and still in operation. The Traeder Family name is synonymous with the track and they have endured both success and calamity. In 1966 ABC Wide World of Sports with Chris Economaki interviewed driver Ken "King" Burden live on TV during the Nationals. The place overflowed with entrants and spectators. On the calamity-side, large scale flooding occurred in 1993 and in 2008, and though Quincy, **Illinois** was protected by bluffs, the track was located in low-lying West Quincy, **Missouri** and was completely submerged. A "high-water-mark" that defies explanation is on the scoring tower. The Traeders, however, always emerged from these severe episodes and were undaunted to host kart races again.

The town of Quincy has an interesting history of its own. It was a major port on the Mississippi River; became home to many Germans starting new roots, and hosts a Summer Blues Festival. Population has numbered around 40,000 people over the past decades. The German-style homes and architecture are in particular, notable. Karters are honored to be drawn to this very special place in Middle America due to the proximity of Traeder's track to all corners of the country.

In the first days the track was about a 1/2 mile long, but in the 1970's Gus extended it to 3/4 miles by adding a longer back straight and a 'Monza' turn on the west side. Many buildings dotted the property for TNT Kartway's growing motorcycle and golf cart business. This track design became legendary in kart racing circles and its location ensured that there was an even number of racers from the East, the West, and the South. All of the major US endorsing bodies appeared: I.K.F., P.K.A., W.K.A. and now V.K.A. Industry personalities such as John Hartman, Chuck Hammond, Gil Horstman, Mike Burris, Dan Lumello, Doug Stokes and Jerry O'Brien, Don Freiber, Richard Peck and the Wests were always present. Dealers abounded; Runt Denson and Diz Dismore were prominent. Memorable drivers included Knapp, Pruett, the Adkins & Hartmans, Goodyear, Berlt, Stewart, Burden, Leiber, Haddock, Speed, Gamble, Harbin,

Vaughn, and Michel. There were any others. For tire manufacturers, Quincy results made history.

A lap goes like this: The Start/Finish Line was on the main front straight next to the pits and then into a fast 90 degree left followed by a flat out left/right chicane where you could 'cheat' a little. Still hard on the throttle and down to a popular passing zone led one into another left and then to the rather narrow infield section. This bore to the left at first and then to the sole and difficult right turn, a short straight and a quick left; then the power back straight, heavy on the brakes, to the 'Monza'. And after that, the longer front leg which adjoined the pits. Balanced, hard to get correct, requiring both power and handling. Lap times were round 30 seconds depending on your class.

Gus Traeder is 90 years young now. Along with son Terry and daughter Tammy (hence the name … T'N'T) and his wife, Fern, (whose food tent was home cooking!) the family has raced Quincy and made its name legendary in our sport. Traeder is an innovator, always involving the town and local businesses and media at major events. A true Promotor.

Magazines devoted pages of prime space to race reports of events there. Advertisers followed suit. The real measure of the Traeder Family success was in the question kart racers always wanted to know, "How did you do … at Quincy?"

In a word, Quincy is … **Legendary**.

EDITOR'S NOTE: Very timely article, since this year's event (July 30 – Aug. 1) will be the Traeder family's "Final Act" according to the flyer I just received in the mail from Gus. Thanks to Colm for this article.

I.C.E. BY ROLF HILL

I.C.E. in this case does not stand for Immigration and Customs Enforcement. For the purposes of this discussion, **I.C.E.** stands for **IN CASE OF EMERGENCY!**

What happens if …. ? I'm not talking about the ignition on your engine, I'm talkin' about **you**! What happens if you are in an accident while on one of your kart trips, or even on a family vacation? Do the people you are with know whom to contact **IN CASE OF EMERGENCY?**

Granted, you may not always travel alone, but I know several of the karters at the events do. I'm one of them. Do you know my wife's name? Do you have **her** phone number? (It won't do any good to call **my** cell number … it'll just be ringing in my pocket. And besides, if you have my wife's number … we need to talk.)

So here is what I'm suggesting. It is a multi-faceted plan to be sure every vintage karter has provided I.C.E. information to someone else. I.C.E. information can be as simple as NAME, RELATIONSHIP and PHONE NUMBER. It'll take some work and it might even involve VKA Board approval for some of it, but it is important to start the discussion.

The first place it can be provided is on the **VKA Membership Form**. Of course, this means another printing ($orry Jim), but it is the place to start. (Bill Bloodworth may quit if I suggest he add all this information to the spreadsheet he already has, but if it became part of the membership process, it would be there if needed, even if Bill wasn't at an event. Read on, Bill; there are other options that don't require any additional work on your part.) The event normally receives a print-out of all current members so they know whether a registrant needs to pay the extra "non-member" fee. This print-out could contain I.C.E. information.

Next is the **Event Registration Form**. This will capture information at the track and will include VKA Members and non-

members. If the additional information is only NAME, RELATIONSHIP and PHONE NUMBER, the additional time to complete the registration process should be minimal.

Even if the event Registration Form is used, a second place would be on a **Tech Card**. At Riverside, each registrant was given a blank card to identify their karts/engines. They had to be filled-out prior to the inspector going over the kart. This would be an ideal place to get the I.C.E. information. "No ticky, no laundry." (OOPS! Call the PC Police.)

Finally, even if all that is done, VKA Members and other event participants could be given a "**luggage-tag kind of tag**" to write their I.C.E. information on and tie it to the visor of their car. (It can be tucked-up and out of the way while you are driving, but would be accessible at the track **IN CASE OF EMERGENCY!**

Multiple locations for this information **is** important **IN CASE OF EMERGENCY** to be sure it is accessible. (The car might be locked, it might not get filled-out on the Membership Form, or on the Registration Form, or the tech inspector might not ensure it is filled-in, but chances are, it'll get filled-in on **one** of them. I.C.E. information is needed for everyone in the pit; not only pit crews and drivers, but the track chef and track photographer as well. It is important that the information is somewhere ……

IN CASE OF EMERGENCY!)

EDITOR'S NOTE: Next month the plan is to address … what happens next? What if you have to make that call? Have you thought about it? Let's hope none of us have to make the call. And what if **YOU** are the one with a medical emergency? Do you have a plan? Just like a good Boy Scout, let's "be prepared." After all, this **is** VINTAGE karting.

GALLOWS HUMOR BY ROLF HILL

Here is a take-off on the saying, "Life is short. Eat dessert first" …

When setting the class schedule in vintage karting,

"Life is short. Run Over-60 first."

CLAMP-FREE AXLES BY RICK CHAPMAN

When I am asked to help Judge karts, I am always taken-back by the real quality of workmanship and time that many of you guys put into restoring these historic go karts. The period accuracy, the quality of the reproduction of hard to get parts and the pride that you put into these karts is amazing. They are a beautiful representation of our sport.

BUT, I am also surprised that so many guys use so many axle clamps on these karts. In my opinion, these clamps take away from the clean look.

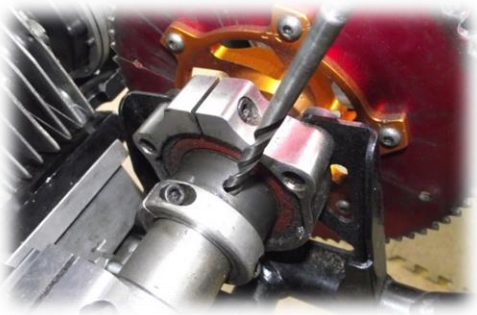
How do you keep your axle from sliding inside the bearing and retain that clean look to the kart's axle???

I am glad you asked….

Here is what I do on my sprint sidewinder, rear engine karts, enduros and TAGs, and I have done this for 25 or more years.

To start, I center the axle where I want it in the chassis.

On the engine side of the axle, whether it is a 1" or 1 ¼" or 40mm axle, I get bearings that have set screws on the inside race. I find the tap that is the same thread as the set screw holes (usually it is a ¼-28 or 6 x 1.00 or 5/16-24 tap) and I find a drill that will just pass through the bearing set screw hole. I then drill the axle through the bearing race set screw hole, into the axle about ½" on 1" axles and into the hollow part of a 1 ¼" and 40mm axle. Now, take an appropriate cap screw and screw the race to the axle. If you want to make the rear of the kart more ridged, do the same to the brake side also.



Now, you need to be careful taping the axles because axle material is very "gummy" and

you should use lots of oil. Be sure you are drilling straight into the axle. Start by turning tap only ¼ turn, then reverse it a ¼ turn; turn ¼ additional turn forward. Work the tap back and forth until you reach the bottom of the hole or through the axle wall. A little off is fine, but turn the tap slowly, keep oil on the tap and do not force it. Use a new, sharp tap if you can.

Remove all set screws from the bearings, if you left them in, and you are ready to go. The axle will roll free and it will never slide around. In fact, you will see how much the frame flexes if you look at the other side bearing if you do just the engine side.

Rick Chapman
Rixkart@aol.com

JOIN THE FUN

HELP US OUT!

The Staff of ***FIRSTURN***© would like to make a special request for Members' input*, to share the wealth of their expertise with all readers. We would love to include your **Technical Article**, **Restoration Project** write-up, or a ***Member's Memory*** ... a short story about a Member's karting life or karting experience, and don't forget **Team Photos**. You can write it yourself, or we can help you. Find me at the track or email me at: KartNumber4@yahoo.com. *Rolf - #4*

* Especially if you are critical of the job I'm doing.

MEMBERSHIP REMINDER: Full Mmbr = $35 Assoc. Mmbr = $10 Foreign Mmbr = $45
New VKA Memberships are issued for a 12-month period. Only Full Members receive **VKA FIRSTURN©.** Applications are on the VKA website (www.VKAkarting.com) or from Bill Bloodworth (BillBloodworth@gmail.com). Completed forms should be sent to: **Bill Bloodworth, 4621 Wooded Acres Dr., Arlington, TX 76016.**

VKA T-SHIRTS

With the addition of Greg Gouveia to the 2015 VKA Board, there is a renewed effort to create a VKA T-Shirt. The VKA Board unanimously approved the effort and the process has begun.

Grey shirts will be available at events and by mail. The prices is $17, plus postage. At the track, find Jim Donovan. If you want one sooner, email Bill Bloodworth to reserve yours. (BillBloodworth@gmail.com).

VKA will only accept cash, checks made payable to "VKA," or Money Orders. (Jim has suggested if you want one of his fabulous, mouth-watering pulled pork sandwiches, you better be wearing one of these equally fabulous t-shirts. I'm just sayin'.)

TRIVIA ANSWER (FROM P. 3)

TED KLINGLER-

EDITOR'S NOTE: I enjoy racing against Ted in Over-60 and his son in Rear 6.1. I'm not sure I'm going to like running against his granddaughter when she starts in Rear 6.1 … unless she has to carry around a 60# bag (or two) of sand to make things a little more even.

MODIFYING MACS (JIM AKKERMAN)

(Thanks to Jeff Campbell for providing this article from *Modern Karting*, 1969.)
[For what it's worth, I found 4 or 5 errors in the text. I only fixed one. The others are typos, I'm sure.]

The first question about modifying any engine is "why?" Why modify the engine? For more power obviously. But why doesn't the stock engine have all the power possible? Normally the reason is "cost". The necessary design features required to give peak power simply cost too much to produce and sell at a competitive price. The real question is "What would the engine manufacturer to do the engine if cost were not the limiting factor?" The answer is concealed in the mystery of 2-cycle technology.

Some of the trade-off features are not easy to establish. For example, large ports are desirable, and they can be made larger by "raising" them. However, this reduces the time for the hot gases to push on the piston. Obviously there is a "trade-off", but what is the best choice? Engines modified with high ports have won national championships, but so have engines with low ports.

After considerable experimenting on both the track and the dyno, we have found a particular combination of features that will produce a fairly acceptable kart racing engine. There is no reason to believe that additional tinkering won't produce a better combinationm, but this is the best we've been able to do so far.

The model of engine is not really important as far as power is concerned. However, some of the models are basically more reliable than others. We prefer the "super" series (Mc 20,30,40,45 etc)., especially the models with the bridge in the exhaust. All the "super" series engines feature a shorter crankshaft, dual ball bearings and a well protected ignition breaker setup which all promote reliability, but add nothing to power. Your old Mc 7,8,9 91 or 91a will work fine for modifying. Other parts you will need are:

1.A flat side piston to accommodate a "7" port arrangement.

2. A dual carburetor manifold for the top side (Gem V12).

3. A pair of tillotsen carburetors modified for alcohol. The work begins with modifying the block. This is the heart of your engine. The shape of the port openings, their angular direction and their timing will determine the "personality" of your engine. The first step in producing an agreeable personality is to assemble the crank, rod and piston in the block and scribe a mark at the proper port height. We use blue layout fluid to cover the cylinder. Leave the rings off the piston for this operation. Attach a degree wheel and mark the exhaust opening at 95 degrees after top dead center. Using the top edge of the piston, scribe another line 19 degrees below the exhaust level in the transfer port area. Rotate the crank another 4 degrees and mark the top edge of the future "7" port. Finally, put the piston on bottom dead center and mark the cylinder for reference.

While the engine is assembled for marking, check to see how close the piston comes to the top of the cylinder. The block should be machined to be flush with the piston. This will be discussed later in connection with final assembly.

The required opening shape of the ports is shown in figure1. The shape of the ports is at least as important as the timing. Ports with squarer corners work satisfactorily with higher ports, and conversly, rounder ports are required with lower porting. It seems that neither of the other choices produces a very satisfactory personality in the engine. The high ported square ported jobs are too peaky for most tracks, and the low ported round hole engines produce peak power at such a low speed that they are difficult to gear properly for best racing. Our experience indicated that any of the port configurations can generate about the same power, but the particular arrangement recommended here is the best we've found so far (all factors considered). The profile in figure 1 can be used to make a full scale cut-out for scribing the cylinder providing the printing process has not produced a size change. Note that the stock holes are superimposed and can be used as a guide in working your cylinder. Be sure to complete the marking before you begin to cut.

Port angle is important too. The transfer port next to the exhaust ports must be directed flat across the piston by griding out the top side of the port only. This port should be directed as far toward the back of the cylinder as possible to keep the transfer gas from spilling out the exhaust. Note that on the

Continued on p. 15

MODIFY A McCULLOCH ENGINE FOR RACING

The author, current National IKF Enduro Champion, has compiled this McCulloch modification data from racing experiences past and present as well as pointedly answering the most often-asked questions on how to update "vintage" mills to the point of competitive advantage.

By JIM AKKERMAN

20/FEBRUARY 1969

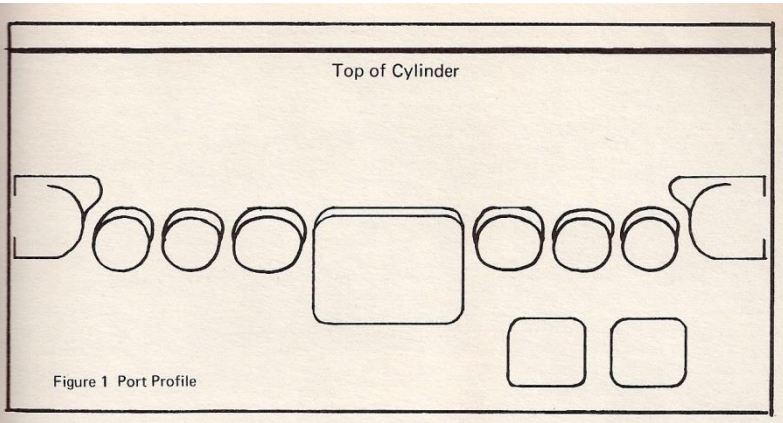


Figure 1 Port Profile

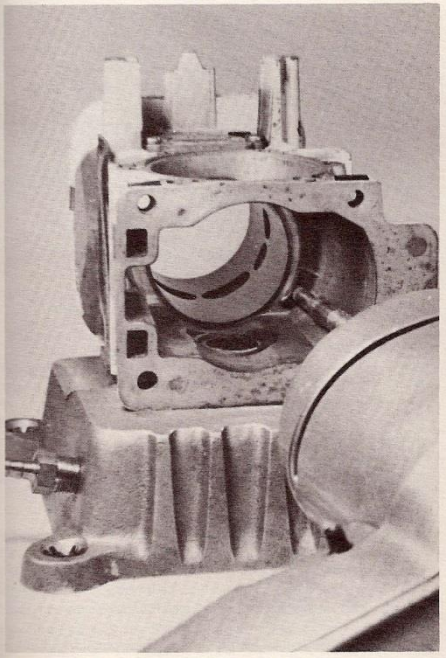


Figure 2 Transfer port enlargement from the bottom a long burring tool or a rat-tail file is required.

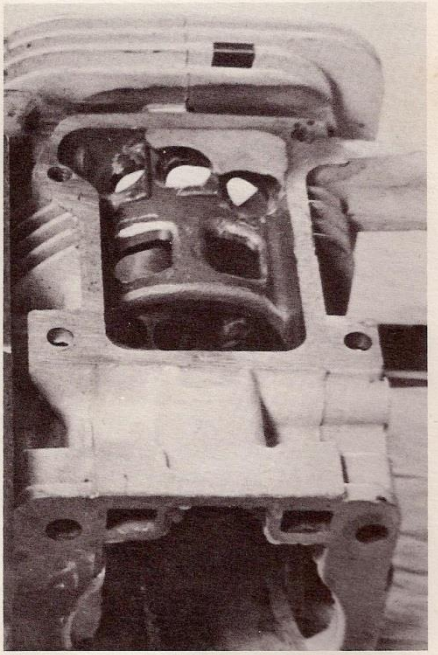


Figure 3 Transfer port redirection using epoxy.

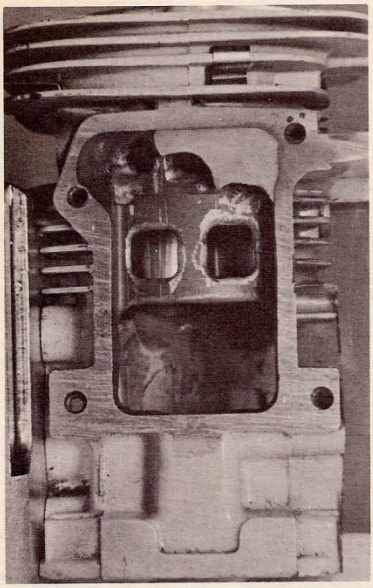


Figure 4 Front of block showing cylinder skirt modification

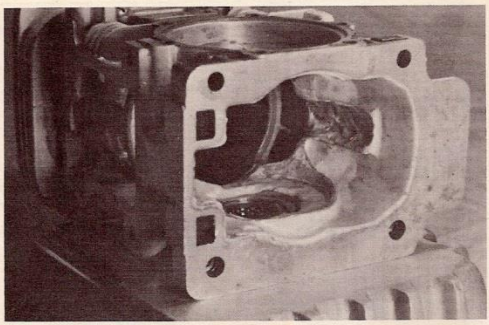


Figure 5 Crankcase stuffing showing relief for rod clearance

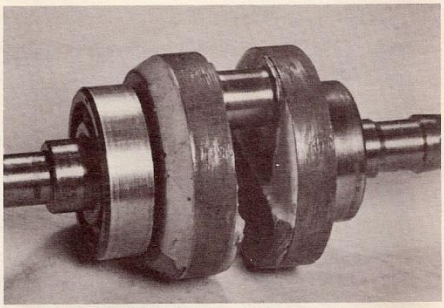


Figure 6 Crankshaft modification showing the 1/8 counterweights; the steel band and the epoxy

later model blocks, the cylinder wall is a little thicker. The transfer passage next to the exhaust on the back side should be ground out about 1/8" larger as shown in figure 2.

The center transfer port should have the stock director out into the cylinder. The third transfer port (fartherest from the exhaust) should have the stock direction into the cylinder (looking in from the top) but should be redirected upward to about 45 degrees above the piston. This will require grinding down the lower side of the port and some filling of the top side with epoxy as shown in figureIII. Remember, in redirecting the ports, the port profile previously marked on the cylinder must be maintained.

In the process of shaping the transfer ports, it is important to try to make the back and front ports flow alike. This is difficult to achieve and obviously requires removal of the plugs on the back side. It will pay to take your time and spend more time looking from various angles than you spend cutting. A small rotary burring tool is recommended rather than a file. A ball end tool works best for me.

The exhaust port passage should be made as large as possible while maintaining the opening profile on the cylinder. Be careful to avoid damaging the sealing surface that seals the exhaust system. A leak at this point is a serious matter as discussed later.

The "seven" port simply needs raising in the later model blocks. The bottom must be lowered also if a Wiseco piston is used. This will allow free flow around the ring area.

Next, the front of the block needs to be modified as shown in figure 4. Raise the cylinder skirt about 0.150 inch. The holes can be round or square, but must be closed by the piston skirt before the piston begins to uncover the transfer ports. Note that the back cylinder skirt is raised 0.150 inch also.

The final operation on the block is to "stuff" the crankcase. This is not a simple chore. We use epoxy as a filler material. It's best to "rough up" the crankcase to hold the epoxy and grease the base stuffer to allow simple release when the epoxy sets. About two tablespoons full of epoxy should be mixed (35-grams of Hysol or Devcon). It's best to warm the block to about 125 degrees before the epoxy is applied. This will produce a quicker cure on the epoxy applied first and a slower cure to the upper layers, allowing time in the process to make "room" for the crank and rod. As the epoxy begins to set, the bottom stuffer should be installed (without a gasket) and the crank inserted without the magplate. The crank can be rotated and wiggled back and forth to provide clearance. Remember, the rod requires extra room, so the crank must be removed occassionally to allow pushing the epoxy aside for rod clearance. Reinstall the crank to re-establish the required clearance. A quick cure epoxy is not desired for this job. Figure 5 shows the finished job with the bottom removed. Note that if you plan to use a full circle crank for additional stuffing, it should be used for molding the epoxy in the block.

Your block is now race ready, providing of course the

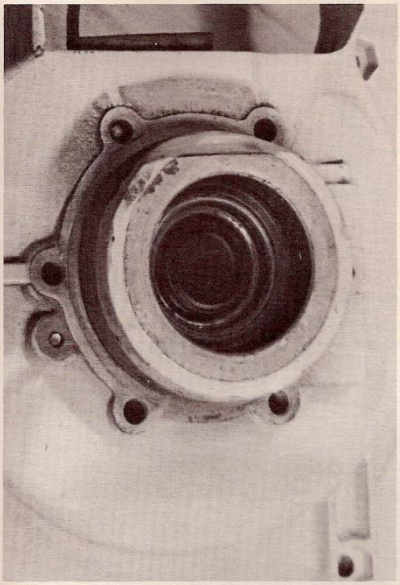


Figure 7 Magplate stuffing

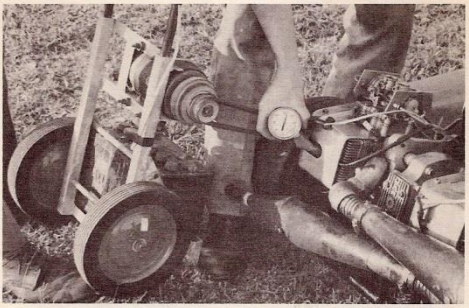


Figure 8 Compression tester in operation 200 to 250 psi is recommended for alcohol burners

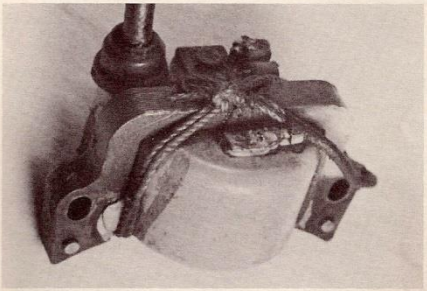


Figure 9 Coil "Tie" job. A small amount of epoxy will keep this nylon twine in position. Rubber cement holds the knot.

cylinder-piston clearance is somewhere between 0.006 and 0.008 inches. We recommend a "dab" of epoxy to help retain the plugs in the back posts. brings up a new and moderAlso, its a good idea to remove the paint from the fins if possible to allow better cooling. Sandblasting is the only thing we've found that will remove the yellow epoxy-base paint.

The next most difficult port to prepare is the crankshaft. Counterweights (1/8" thick) should be added for stuffing and balance. Also, the epoxy full circle treatment produces a very noticeable effect. About the same amount of epoxy goes on the crank as goes into the crankcase; 18 grams on the flywheel end and 25 grams on the power takeoff end. The process is fairly simple, involving the use of a thin steel band to retain the "cast-in-place" epoxy. A makeshift mold can be made using tapt to hold the metal ring. Remember, epoxy holds best on a clean surface. Sandblasting is recommended for cleaning the surfaces. Figure 6 shows the crankshaft modification. About ten additional grams of epoxy can be added to the magplate as shown in figure 7. Use tape as a mold to retain the epoxy while it cures.

Now, the toughest port of your engine modification is done--the parts are modified--but some of the most important details are yet to be attended to. Rings are very important. Make sure the rings fit the cylinder properly by making sure no light can pass between the ring and the cylinder. A ring that is too large will bind at the ends and the side opposite the ends, letting light pass inbetween. A small ring will not touch the cylinder near the ends of the ring. Make sure each ring fits all the way around and has about .008 end gap or more. You may have to try several rings to get a pair of "fitters". To assure the rings are straight in the cylinder use the piston skirt to push the rings into the cylinder each time.

Next, install the crank-magplate assembly and the rod-piston ring assembly. We recommend an old "black" rod or one of the special rods available. Again, make sure the piston comes even with the block. The stock cylinder head (for a Mc91) can be installed next. Use a 0.010 head gasket. This provides minimum deck clearance without interference problems, and will produce the "squish" or turbulence required to ignite alcohol properly at high speeds. If the piston is slightly higher than the block, add this height to the gasket thickness. Next, check the compression pressure with a standard compression checker (see figure 8). It should be about 200 to 250 psi to run on alcohol and 6oz. per gallon castor oil. The use of other than the Mc 91 head will result in the pressure being too high or too low. Adjustment should be made by machining the head. Remove metal from the dome to reduce pressure; remove metal from the mating surface to increase pressure. Check the pressure at normal cranking speed of your starter (about 2000 to 4000 RPM).

The coil should be installed next. A quickie tie-up job helps hold the coil up off the flywheel as shown in figure 9. The ignition setup is next. A 24 degrees + - 1 degree setting is best for this engine. A Mc 8 or 49 'er flywheel should be used as

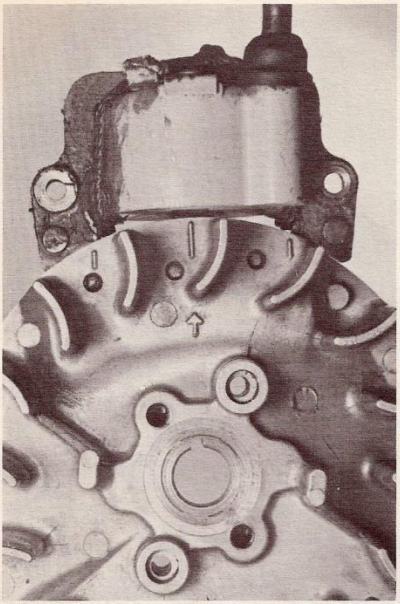


Figure 10 Magnetic Timing

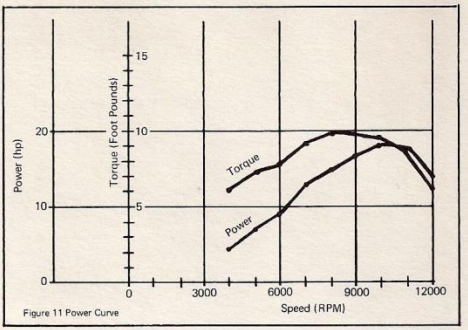


Figure 11 Power Curve

Figure 12 Two National Championships won by the little "yellow fellow" modified as described here.

this provides proper magnetic timing using the 24 degrees ignition timing. The magnetic timing is as important as the electric timing. Proper magnetic timing is obtained with the marks on the flywheel line up with the coil stator 25 shown in figure 10. This will produce a strong spark and partically eliminates fouled plugs. The use of a late model crankshaft with an "old" model flywheel produces the combination of 24 degree point opening and proper magnetic timing. Other combinations require "step-keys" or slotting of the coil mounting holes, both of which are undesirable. The remainder of the engine work is purely "bolt-on". An uncut flywheel is recommended to help cooling. Make sure the exhaust seals against the block too. A leak here causes heating and erratic carburetor performance.

If you plan to use a long reflector-type tuned exhaust, you alcohol carburetors will require a minor modification. A hole should be drilled through the welch plug that covers the low end section. About 0.070 inch size works fine. The normal low end needle is then used only as a "trim control on a basic fixed orifice" carb. You will find that this arrangement will allow very lean setting on the hi end needle (½ turn or less) which will help high end performance, but will feed the engine a rich mixture on low end through the "peak torque" period. This modification is not necessary when a short "non-tuned" exhaust is used.

Your new engine may require a few minutes of easy running to "break in", but if the rings fit properly as you installed them, only a short run-in is required to knock off the rough edges. A 6 oz. per gallon mix of alcohol and castor oil is the best fuel for this engine. If any other fuel is used, the compression pressure should be lower. Gasoline and 8 oz./gallon of oil will operate best with about 160 to 180 pounds per square inch pressure at cranking speed. Nitro requires even less pressure. Again, the alcohol mix will provide best all-round performance.

The torque curve for this engine will look something like those shown in figure 11. If the pipe length is too short, the engine will "jump" on the can at about 7,500 RPM. A more appropriate length will produce a smooth curve that will feel strong all the way through. If the exhaust is too long, a noticeable lag will result in high end. Arrange your exhaust setup so that it is adjustable and you will soon learn the best lenght for each track. Remember also, that a clutch that "holds" the engine at the speed that produces peak torque will give best acceleration.

This setup will turn out a useful 18 horsepower. That will run most karting rigs over the 80 miles an hour mark. And if you can find a 96 pound weakling for a driver, you can hit nearly a hundred. The rig in figure 12 was powered to two Enduro national championships (open light and open heavy) by the little "yellow fellow" modified as described here. Give it a try and see how it works for you.

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