



Editor – Rolf Hill

MMXIV – No.7

# The Official VKA Newsletter

## July 2014

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### IN THIS ISSUE

**SPRINGFIELD & NEW CASTLE RESULTS – Tillotson Mods for Alky and more.**

#### VKA EVENTS & TBO

<b>1/23 – 25</b>	<b>Jacksonville, FL</b>	<input checked="" type="checkbox"/>	<b>5/23 &amp; 24</b>	<b>Springfield, IL</b>	<input checked="" type="checkbox"/>	<b>9/11 – 13</b>	<b>Quincy, IL/MO</b>
<b>1/30 – 2/1</b>	<b>Riverside, CA</b>	<input checked="" type="checkbox"/>	<b>6/12 – 14</b>	<b>New Castle, IN</b>	<input checked="" type="checkbox"/>	<b>9/12 – 14</b>	<i>MKC at MIS</i>
<b>2/8 – 9</b>	<i>SKC Roebling Rd</i>	<input checked="" type="checkbox"/>	<b>7/10 - 12</b>	<b>Brodhead, WI</b>		<b>9/26 – 27</b>	<b>Delmar, IA</b>
<b>3/27 – 29</b>	<b>Barnesville, GA</b>	<input checked="" type="checkbox"/>	<b>7/12 – 13</b>	<i>CES Grattan</i>		<b>10/4 &amp; 5</b>	<i>SKC Roebling Rd.</i>
<b>4/10 – 12</b>	<b>Circleville, OH</b>	<input checked="" type="checkbox"/>	<b>7/25 – 27</b>	<i>WKC VIR</i>		<b>10/10 – 12</b>	<b>Cuddebackville, NY</b>
<b>4/26 – 27</b>	<i>WKC NCCAR</i>	<input checked="" type="checkbox"/>	<b>7/31 – 8/2</b>	<b>Camden, OH</b>		<b>10/11 – 12</b>	<i>WKC Summit Pt.</i>
<b>5/2 &amp; 3</b>	<b>Whiteland, IN</b>		<b>9/5 – 7</b>	<i>WKC Summit Pt.</i>		<b>11/1 &amp; 2</b>	<b>Atwater, CA</b>

**Bold** = VKA Event    *Italics* = vintage enduro event    VIR = VA Intl. Raceway    CES = Championship Enduro Series

SKC = Southern Kart Club    MKC = Michigan Kart Club    WKC = Woodbridge Kart Club

**The Dart Kart Club (DKC), promoter of enduro races at Mid-Ohio and Grattan, has removed the Vintage Karts from their programs at both tracks.** Check the official schedule posted on the VKA web site for any last minute corrections.

#### EDITOR'S COMMENTS (SEND YOUR COMMENTS TO KARTNUMBER4@YAHOO.COM)

I said enough last month. No comments! No room. [See DISCLAIMER in previous edition.][Despite what it said on the 2014 VKA Wall Calendar, Father's Day really was June 15. Sorry for the confusion.]

*Rolf*

#### MAY BOARD MEETING SUMMARY

Website Meeting Minutes area is fixed. VKA will need someone to volunteer for the Membership duties soon. We have 299 Members. Yamaha class, clutch incident at Barnesville, 3<sup>rd</sup> Bearing supports, qualified member response to accidents and Historic Class confusion were discussed. Kart Show Certificates are ready for the year. Midwest Regional Coordinator needs help (as does the VKA Board ... see last month's Editor's Comments). Work continues to promote VKA Enduros. The Board is considering a survey to better understand membership wants, needs and opinions.

Balance as of 4/30/14 was \$11,889.92.

#### SPRINGFIELD SUMMARY & RESULTS BY GERRY BOOTH

After a long winter in the Midwest, sunny skies and warm weather greeted vintage kart enthusiasts at Springfield, Illinois this Memorial Day weekend for the 9<sup>th</sup> Annual Vintage Kart Race and Show. Paul Booth and family coordinate this event with the help of the Midstate Kart Club membership.

The weekend began Friday morning with open practice, allowing time to learn the track layout, shake off the winter driving rust, and make necessary kart adjustments. The track remained open until 4:30PM when it was time to take a break and prepare for dinner. Each year the Midstate Kart Club hosts dinner for drivers and family members at the track.

After dinner, the first round of heat races was completed. Saturday morning began with a kart show and raffle followed by the completion of the races.

Class	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
Historic Participants	Kevin Rice and Ray Reasons		
Mac 49	Steve Welte	Shawn Welte	Lyle Caswell
Junior/Women	Averi Klingler	-----	-----
Sportsman	Tom Day	Nip Swenson	-----
Rear 6.1	Kevin Rice	Scott Klingler	-----
Rear 8.2	Terry Walters	Jerry Nagel	-----
Dual American Rear	Mike Birdsell	Mathew Laukaitis	Jerry Nagel
S/W Amer. 6.1	Bobby Lee	Robert Noel	Gary Young
S/W Amer. 8.2	Bobby Lee	Vernon Bergman	Scott Nagel
S/W For. 100	Matt Morgeson	Rick Creamer	-----
S/W For. 135	Mathew Laukaitis	Steve Jamison	-----
Stock Appearing	Mike Birdsell	Sandy Daniel	Kevin Rice
Sr. Over-60	Richard Sharer	Ted Klingler	Tommy Carnet

## SPRINGFIELD SHOW RESULTS

<b>Rear Unrestored</b>	(Yr; Make/Model, Motor not available) Mike Morrall, Sr.
<b>Rear Restored</b>	(Yr; Make/Model, Motor not available) Averi Klingler
<b>Rear Modified</b>	(Yr; Make/Model, Motor not available) Jerry Nagel
<b>Past Champion</b>	(Yr; Make/Model, Motor not available) Shawn Welte
<b>S/W Restored</b>	(Yr; Make/Model, Motor not available) Scott Klingler
<b>S/W Modified</b>	(Yr; Make/Model, Motor not available) Gary Young
<b>Past Champion</b>	(Yr; Make/Model, Motor not available) Nip Swenson
<b>Peoples' Choice</b>	'63 Fox Flyweight w/ 58 Power Products; Ella Rice





## Modifying the

# TILLOTSON for Alcohol

### Part II

New HL units required for checking purposes furnished by Kuchman Power Tools, East Huntington, L. I., New York.

Text and Pictures — Ted Powell

The ball seat and cavity concentricity must be checked, since an offset seat hole can also cause trouble. The steel ball can be tapped into seat lightly, using a plastic mallet, to make certain a good seat is obtained. The seating seal is then checked with mouth suction. This will prevent syphon-drool troubles.

The writer has experimented with this Reed unit with an Ace Plastic Co. precision 5/32" nylon ball in place of the heavier stainless-steel ball. The lighter nylon ball would be less likely to be affected by engine vibration. Properly adjusted, the Reed ball-check inlet seat really turns on the alcohol faucet. The 195A Christensen uses a nylon-ball and a smooth conical-seat inlet valve.

After a few weeks of jousting on alky fuels, the inlet control lever position should be checked to see if it is still flush with the recess hole edges. The nylon needle may yellow and swell slightly to cock the control arm below the recess hole rim to alter regulating diaphragm control. The lever arm must be bent slightly — if necessary — to bring it back into the horizontal flush position.

**Fuel Supply Holes** — Some of the HL units, such as the 93A and the 115B, use separate fuel supply holes to the it. These two holes and the adjusting screw passages. These two holes are opened up to drill sizes #42 and #51 for the high speed and low speed jet systems. The 115A and B carbs come through with this size high speed hole, and some of the newer units approach it. These two holes and the adjusting screw seat holes are drilled out large to make the venturi jets "boss," and to prevent the supply system holes from doing any of the "regulating" (which would result in marginal operation on alcohol fuel).

Most of the other HL carbs use a single, common fuel supply hole near the high speed venturi jet, which feeds a common cross passage. In turn, the cross passage feeds both the high speed and low speed venturi nozzles. This common cross passage may be intended to function as a low speed air bleed when the throttle shutter is in low speed position, and the venturi air stream may tend to back up into the fuel chamber via the high speed nozzle. The writer has tried adding a type 93A carb separate low speed supply hole at the low speed screw passage, with and without blocking off the cross passage, with inconclusive results. A blocked cross passage, with two independent supply holes, seemed to produce better high- to low-speed isolation and the writer sets up all his Tillotsons this way, especially with the new 1/4" ball check high speed nozzles.

The supply cross passage can be blocked off by removing the body flange end cap plug. A #53 (drill) hole is punched into the brass cap plug, and it is then removed by driving in a small sheetmetal screw and pulling it out. A #31 or 1/8" drill is run halfway into the cross passage and a new cap plug, #01058, is slowly tapped into it with a smooth end #42 drill-rod. The flange end hole is then plugged up with another cap plug of the same type. Some of the older carbs, such as the 101A and 107A, use a combination brass sleeve and lead ball plug which can be removed in much the same way as the brass cap plug and the inner #31 hole plugged up with the brass cap plug.

The new #51 fuel supply hole can be drilled anywhere along the low speed screw passage from 1/8" away from the screw seat or Welch plug to the edge of the fuel bowl fillet bottom. Although there is no particular prob-

lem with the low speed alcohol fuel supply, the writer prefers to drill out at the bottom of the fuel bowl fillet to get away from the regulating diaphragm center plate.

There is some problem with the high speed alcohol fuel supply system, however, and several things can be done to avoid the masking action of the regulating diaphragm center plate. One, is to drill an extra high speed supply hole at a downward angle from the control lever recess hole sidewall to the cross passage next to the high speed screw passage, as was done in some of the earlier Tillotsons. Another, is to heavily countersink the supply holes. Still another, is to cut a slot from the control lever recess hole over the high speed supply hole. The new 194A, 195A and 198A alky carbs use huge supply holes ranging from #20 up to 1/4", which may affect high speed-low speed isolation.

**High Speed and Low Speed Adjusting Screw System** — In opening up the high speed screw set hole to #45 drill size and the low speed screw seat to #52, two problems may develop. The high speed screw tip will move in much deeper before seating and the screw may then either bottom against its thread end, or else against the completely compressed tension spring. Hence, it may not be possible to stop the engine from four-cycling. Similar trouble may develop with the low speed screw in the case of some carb models, even though the seat hole is smaller.

After the adjusting screw seat holes have been drilled out, the screw tips are blued and the naked screws run in to check if they bottom on the new seats, or on the thread ends. If the threads are too long, one or two end threads will have to be turned or filed off in a drill chuck or lathe.

After seating marks are obtained on

KARTING WORLD

## NEW CASTLE RESULTS

Class	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
Junior	Autumn Nagel	-----	-----
Historic Participants	Christan Gravolas and Joan Hertzig		
Mac 49	Pam Orndorff	Jimmy Gay	Steve Seewer
Sportsman Rear	Lyle Caswell	David Lovell	Richard Hoff
Rear 6.1	Troy Brown	Robert McKnight	Mark McKnight
Rear 8.2	Jerry Nagel	Scott Nagel	-----
Dual American Rear	Jim Merritt	Gary Wlodarsky	Jerry Nagel
Sportsman S/W	Vern Bergman	Jim Ryder	William Danahy
S/W Amer. 6.1	Bobby Lee	Kirt Bennett	Steve Civils
S/W Amer. 8.2	Jerry Culp	Tom Crosby	Marc Nagel
S/W For. 100	Bobby Lee	Tom Wisniewski	Dave Sagen
S/W For. 135	Scott Ader	Troy Brown	Matthew Laukaitis
80 – 85 SW	Bill McCornack	Troy Cozad	Scott Ader
Yamaha	Troy Cozad	Cory Patterson	Doug Reider
Dual S/W	Hal Orndorff	Kirt Bennett	Craig Bennett
Sr. Over-60	Richard Sharer	Bill Bloodworth	Gary Wlodarsky

## NEW CASTLE SHOW RESULTS

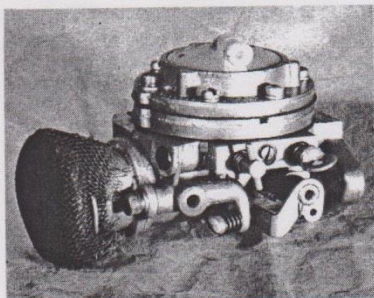
<b>Rear Unrestored</b>	1964, Rupp A-Bone; WB 820; Gordon Juhasz
<b>Rear Restored</b>	1964, Cates TF; MC-9; Gordon Juhasz
<b>Rear Modified</b>	1961, Lancer GT; 3-Homelite K92s; Robert Hartman
<b>Past Champion</b>	1960, Bentley Scrambler; PP-1000; John Copeland
<b>Best Unrestored [Wheelchair]</b>	Dave Bessinger
<b>S/W Restored</b>	1977, Burton Magnum; MC-101; Tom Crosby
<b>S/W Modified</b>	UNK yr., Kee Raider Euro; MC-92; Steve Civils
<b>Peoples' Choice</b>	1976, Hartnam; Blue Streak; MC-101s; Steve Civils





the conical tips, the screw head to body clearances and the relative cross-bar and screw-slot positions noted down. The tension spring ends are then ground down a bit to shorten. The complete spring, ring washer and O-ring assemblies are installed and the screw tips rechecked for seating marks after rebluing. The screw head positions are also checked to see if they match the first check. A fine blade screwdriver can be used to press down on the spring ends to see whether they are fully closed and hanging up the screws or not.

The high speed screw set hole can be opened up to a #44 size, but this comes fairly close to allowing the screw tip shank to ease right through the seat hole. Many an expensive alky carb has been "teknischewerken alles kaput" via this happy just-a-teeny weeny-bit-more race-mechanic route, requiring a messy screw-plug repair job. A #45 drill hole is safer here, even though this hole needs to be opened up to the maximum for alcohol work (and even though the writer admittedly uses a #44 drill).



*HL-93A, set up for alcohol, is fitted with stub air horn and plastic screen-wire air cleaner.*

A key alcohol mod item with the Tillotsons, is to grind or file away the high speed screw tip until about a 1/32" conical stump is left. Again, we apply some elementary arithmetic here. The main inlet seat and the high speed supply holes are #42 and the high speed nozzle is #41, while the high speed screw seat can only be opened up to #45 or #44. In turning out the high speed screw three or four full turns, about 1/3rd of the conical needle tip is still left in the seat hole to create a possible methanol fuel bottleneck with a ported Super A. (This is one of the reasons for the prevalent karter notion that a single pump-carb cannot pour the coals to a ported Super A alky burner). The new 7/8" bore Christensen alky carb has about 1/4 of its high speed needle screw tip removed.

A few years ago during a panic check-out of a West Bend Five-holer Super-A, the writer accidentally stuck a

short (134A) needle into a long-needle (115A) carb and promptly laid down a ridiculous 4-cycle blue fog a city block long. Here, one possible pump-carb alky traffic-jam was found which was invariably blamed on the impulse-pump system, or the inlet needle and seat jet.

Two things can be done to get more high speed system alcohol fuel flow past a basically gasoline jet system, besides shortening the high speed needle tip. One, is to drill a separate shunt #57 hole about 1/8" away from the high speed cavity or nozzle so as to clear the needle seat. This will feed fuel directly to the high speed nozzle past the open stump-end of the needle tip. The other shunt-feed hole method will be discussed later in the section on venturi jets. Teammate Joe Prisco deliberately inserts shorter L.S. screws here, but this is a risk.

The writer also usually files away about 1/2 the low speed needle tip, although this is not really necessary (since the low end seldom gives trouble). Clipping the needle tips, of course, makes for a more abrupt control of the air fuel mixture ratio.

Most of the older 2-number carbs used plain knurled-head adjusting screws for both high and low speeds. This was OK for gas-eating chainsaw engines, but made racing kart carb adjusting "on the run" rather difficult. This is especially true when racing gloves are worn, even with small finger holes cut in. The screw heads can be drilled with a 1/16" drill and roll-pin bar-handles driven in; or 1,4" or #10 heavy flat-washers hard-soldered into the screw slots.

The older carb plain high speed screws can be replaced by the newer bar-handle screws, such as used on the 93A McCulloch carb. The needles must be compared carefully "side-by-side" to make certain they are directly interchangeable since most of them carry different part numbers and differ slightly. The newer bar-handle high speed screws also differ from each other in most cases.

Nearly all the newer Tillotsons now come through with bar-handle high speed screws, but the low speed screws still come through with plain knurled heads. It is preferable to hard-solder a thick washer handle into the screw slot, instead of driving a cross bar into it. This enables the driver to quickly differentiate between the screws, by feel, out on the track.

It should be noted that the plain knurled adjusting screws on the older carbs are differentiated by a diamond knurl on the high speed screw and a bar knurl on the low speed screw. Accidentally mixing up the two can cause some adjustment troubles on some carb models.

The adjusting screw shanks should be checked for occasionally galled or scored surfaces at the O-ring seating areas. These might cause worn and possibly leaky O-ring seals and some carburetion trouble. If damaged, they can be chucked up in a drill-press and lightly honed down with fine emery and crocus cloth.

The 115A and B alcohol carbs, incidentally, use a long high speed needle which passes through the high speed nozzle and feeds it from the opposite side of the carb, a la McCulloch style. Low Speed Venturi Jet Cavity — Some of the Tillotsons, such as the 66A and the 134A, carry three venturi nozzles in the low speed venturi cavity — an idle, low speed, and an angled by-pass or air bleed jet. The air bleed jet is usually angled against the incoming venturi airstream. It is not necessary to enlarge the angled air-bleed jet holes in either the low speed or high speed cavities when modifying for alcohol operation.

The writer has experimented with both vertical and slanted third jets in other carb models not using them. Re-

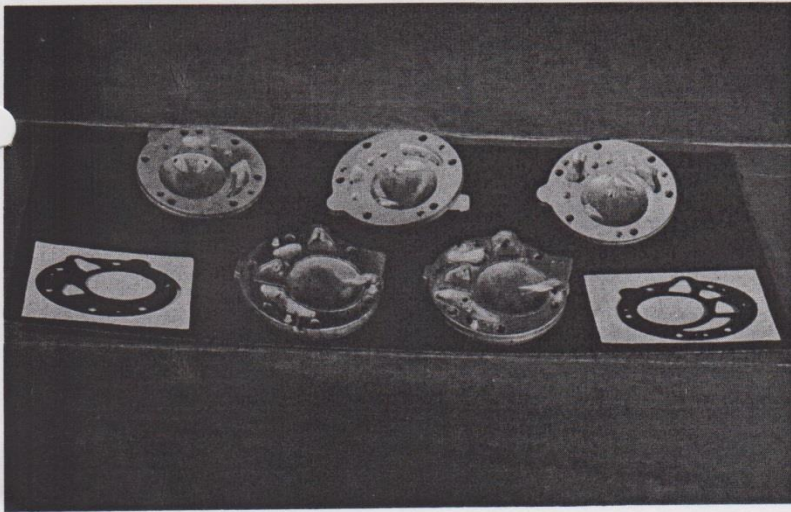


*Single impulse pump cover, showing added nipple for attaching external pulse line from crankcase.*

sults were not too conclusive since a dyno test stand was not available at the time. In some cases, a bit of mid-range rich-mixture 4-cycling was noted. A small intermediate-speed jet, in the #50 size range, drilled through the inlet control lever recess is now under experimental tests.

The low speed cavity welch plug (3/8") is drilled through cautiously with a 1/4" drill and the plug pried out without damaging the plug seat. The idle hole is drilled out to a #60 size; the low speed hole to #53; and the air bleed by-pass hole, if any, is left alone. All the jet holes are countersunk lightly. All drill shavings are cleaned out with a small brush and an air-hose. A new #02531 welch plug is driven in with a 5/16" drift-pin or smooth-end drill rod, with the convex plug dome bowed nearly level with the plug rim. If bowed in too much, weakening of the rim seal and possible masking off





*Old and new in fuel pump bodies and covers. Top row, right, is new cover plate and gasket.*

of the jet nozzles will result.

These low speed holes may appear a bit king-sized to some kart engine mechanics. Actually, they probably could be made smaller, especially for mildly ported engines. A comparison check of

British Amal carb's gasoline and alcohol metering needles, discloses a decreasingly less taper-diameter at the thicker low speed and idle shank sections. However, the large low speed jet sizes are intended for (1) 90-100% methanol fuels; (2) a radically ported Super A engine; (3) a nylon-cap-down mounting of the carb to place the reservoir pool below the venturi bore to reduce siphon-drool and plug-wetting tendencies during throttle back-off; and (4) an insurance of low speed rich-mixture capability for low speed acceleration since the Tillotsons do not use an acceleration dump-jet, as do the Brown carbs. The rough criterion used here was — can a single carb feed alcohol to a radically ported Super A? In spite of the large low speed hole sizes of up to plus 50% in diameter in some cases, the writer's alcohol Tillotsons' adjusting screws usually wind up at about a normal 3/4 open (low), and 1-3/4 open (high) which reasonably confirms the introductory analysis.

An interesting item noted in the early days of karting, was that when all of a gasoline-burner's port tops were slant-squared, difficulty was sometimes encountered in attempting to four-cycle the engine on gas fuel in all speed ranges with both Tillotson and McCulloch carbs. Oddly, most of the trouble lay in the mid-range and not at the high end. By opening all the hole diameters plus 10% in diameter, mid-range

lean-out was solved. Curiously enough, opening up a circular jet diameter by plus 10%, increases its area by 21%; while squaring a round port, increases its area by 21.46%. This area-boost coincidence indicates that porting, much like a decrease in exhaust system back-pressure or an improvement in exhaust resonance-tuning, generally results in a corresponding increase in two-stroker carb air fuel supply requirements, assuming that an over-porting wet-stacking condition does not exist.

Racing versions of the Tillotsons, such as the 115B, might possibly be better racing units if they were equipped with an intermediate speed adjusting screw, although they would be a bit tricky to adjust. The superbly made Dellortos and Amals, incidentally, have about five overlapping speed-range adjustments.

**High Speed Venturi Cavity and Nozzle** —The older 2-number carbs have a small 1/8" high speed jet cavity plugged with a brass cap, #010588. Removal is the same as in the case of the same type plug in the body end-flange cross-passage hole (by drilling and prying out with a screw). The #52 or #53 high speed venturi nozzle is drilled out to #41 and a new brass cap plug driven in.

Three "dump tube" procedures can be resorted to here in order to improve high speed venturi suction on the nozzle. On the older 2-number carbs, a pair of V-notches, 1/16" deep and 1/4" wide, can be filed on each side of the venturi jet to form a raised-boss dump-tube effect. Or, a 1/8" dump-tube (with 3/32" bore) can be driven into

the cavity. A #45 hole is then drilled through from the high speed screw seat side, and a short 3/32" plug is driven into the top end. A second method is: The 1/8" high speed cavity can be slotted another 1/8" away from the screw-seat side and drilled and precision-reamed to take the 1/4" ball-check, #012700, from the 115B alcohol kit, RK-542. This will duplicate the small bore 101A, or the 107A.

Some of the older 2-number carbs use a small #70 auxiliary air-bleed (or by-pass jet) angled toward the venturi air stream. This can be left as is, but might cause some high speed lean-out trouble in an alcohol carb and it is safer to plug it. (Teammate Joe Prisco spills hot solder on an aluminum plate to obtain an assortment of tiny solder balls. The correct size ball is then driven into the air bleed jet hole, using a fine drill rod of about #55 size.)

Some of the newer carbs use a tricky ball check nozzle (#012084) with a perimeter groove about 1/16" wide at the base, which has two #54 feed holes on opposite sides (which feed the central #42 ball cavity feed hole). It should be noted that the 1/8" nylon check ball sits in a relatively small cavity only a couple of drill sizes larger, or #28. Hence this ball-check nozzle is obviously only a gasoline jet and doesn't have enough annular clearance area around the check-ball to pass sufficient alcohol fuel. It should be replaced by the alcohol ball-check nozzle (#012700) which has a huge #20 ball cavity. The extra length of this nozzle also gives more dump-tube action. A dump-tube allows a bigger carb bore for the same engine displacement. The #012084 gasoline nozzle (used in the 101A, 123AX, 107A and 134A carbs) can be reworked into an alcohol nozzle, if the #012700 nozzles are not on hand. The two #54 perimeter feed holes are opened up to #43 to the full outer width of the groove. The ball cage disc is removed from the end by tapping the crimp shoulder outward and prying out. After dumping out the nylon ball, the cavity is carefully reamed to a #20 size in two operations. The nozzle is cleaned out, the ball replaced and the cage disc crimped back in place. A nylon ball slightly smaller (by 1/64") would save some reaming work. In an emergency, the #012084 nozzle can be used for methanol work by simply removing the cage and ball and reaming out the two perimeter supply holes a bit. However, the venturi air stream may tend to back up into the fuel chamber in the L.S. ranges.

Since one possible alcohol fuel bottleneck with the pump carbs is the high speed screw seat, Joe Prisco suggested an ingenious high speed venturi



by-pass feed hole system. A #60 drill is run right through the top of the 1/8" venturi cavity cap plug (in older carbs), and through the top of the 1/4" high speed nozzle top in newer carbs. The high speed screw then has about one turn "built in," and is now used as a vernier control. The idea works very nicely with a smooth control over the rich mixture range.

As a word of caution on modified and replaced carb parts, a record should be kept of all such part numbers, dimensions and hole sizes; and at least one or two samples of all replaced or modified stock parts should be kept on hand for future mod and reference purposes.

**Fuel Chamber Drain Screw** — The 8/32 drain screw between the two adjusting screws can be used for priming the carb, but it is much better to do this by squirting fuel into the nylon cover inlet nozzle. In this way, the air pocket in the inlet side channel is cleared out.

The fuel chamber in the new 7/8" bore carbs (194A, 195A and 207A) does not have the slanted rim ramp as in the smaller bore HL carbs. This provides a larger fuel reservoir capacity. The slanted ramp can be machined away in the smaller carbs for this purpose.

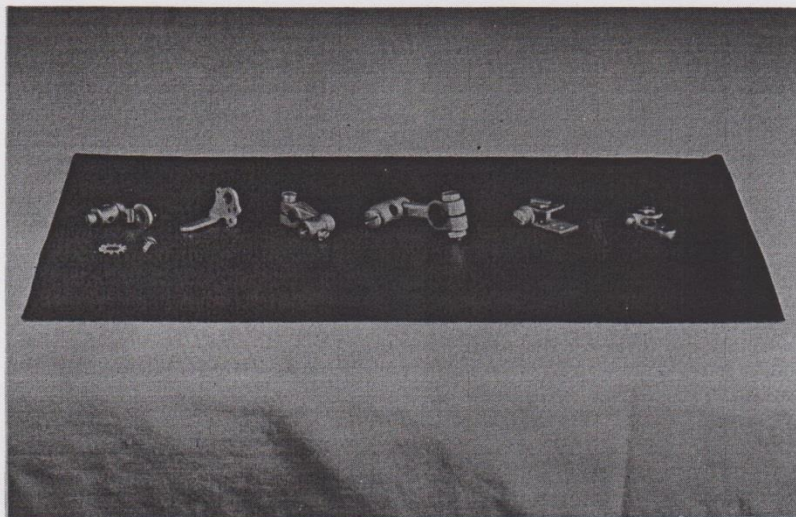
Most of the newer 7/8" bore carbs use a lead ball plug in the 8/32" drain plug hole instead of the headless 8/32 screw plug used in the smaller bore carbs.

**Throttle Assembly** — The older carbs used a lighter retaining clip for the throttle shaft. This should be replaced by the newer and heavier clip used on newer carbs. Both have the same part number, #09678. This change reduces chances of clip fracture under engine vibration, with resultant side wear of the throttle shutter. The very thin #8 lockwasher (#0992) under the clamp screw should also be replaced with a wider one for the same reason. Loctite should be used on this screw.

Most of the Tillotson HL units use a fairly light throttle shaft return spring (#010775), while some of the newer carbs use a heavier spring (#012244). The stiffer spring may be preferable for some types of throttle linkage with regard to a possible partially stuck throttle.

Most of the carbs use a simple stamped throttle shaft link arm, type C9, or #012148. The newer West Bend 134A comes through with a heavier stamping part number #A2770589. The 115B alcohol carb uses a stamped swivel, type C10, or #012781, and a die-cast swivel, type C5, or #04911, for coupling to a piano-wire throttle link. The simple stamping type can wear through a throttle wire link under engine vibration.

MAY 1966



*Throttle shaft levers, l to r: Type C8, Type C2, Type C5, automotive type, West Bend A2770589, and Type C9.*

The smaller bore carbs use a throttle shaft with a milled flat only at the butterfly screwhead side. Two 5/16" flats can be filed into the shaft on each side of the screw end half of the shaft to improve air flow. The throttle stop pin can also be filed down on the unused side for the same reason.

When installing a throttle butterfly, the idle speed screw should be backed off and the throttle butterfly screw or twin screws loosened (if not solder-anchored). The loose butterfly is then jiggled while the throttle shaft is slightly opened and closed, until the butterfly is properly centered and tightly shut against the throttle bore. A flashlight can be beamed down the venturi bore to check the alignment. This is done to center the airflow over the low speed jets and insure proper idle and low end operation. The 3/4" carbs use a twin screw shutter, and the new 7/8" bore carbs (194A, 195A and 207A) use a single screw.

The throttle shutter screws are Loctited and drawn up tightly to insure against loosening. Some mechanics drastically nick the screw ends with a fine chisel, but a better method is to solder the screw heads, as is done on some of the newer HL twin screw butterfly carbs.

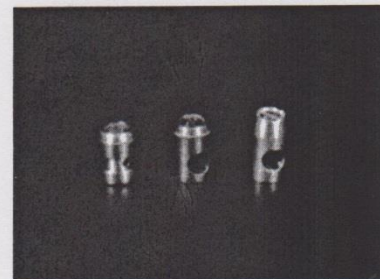
In the early karting days, the throttle link arrays were sometimes set up to produce a pusher action on the throttle arm. This required a stiffer piano wire link, with excessive throttle shaft thrust and severe throttle shaft, boss hole and shutter side wear. This, in turn, resulted in shunt by-pass air leaks past the throttle assembly and venturi jets, with erratic idle and low end operation.

*The die-cast C5 lever is most commonly used.*

The throttle linkage should be re-worked to produce a puller action so that a thin and flexible piano wire link can be used. Some mechanics use a single turn loop in the wire to cushion stresses on the throttle assembly and reduce wear. The throttle linkage system should be laid out to reduce vibration resonance effects and possible vibration fracture.

In event throttle shaft boss-holes become worn from an improperly set up throttle link assembly, steel insert shaft bushings, #09780, are available. Some of the HL units have such shaft inserts (HL-93A and HL-195A). The egg-shaped holes are line reamed for a 1/4" size; the new inserts pressed in and then line reamed for the 7/32" shaft hole size.

Throttle-shafts from different carb models may look alike and may carry different part numbers. Hence they may not be quite interchangeable, unless modified.



*Three types of high speed (ball check) nozzles. L to R: Standard gasoline, #012084; short gasoline, #013155; and alcohol, #012700. The latter is used in -115B, -194A, and -198A carburetors.*

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## RESOURCES FOR VINTAGE KARTERS

**AWS R&D Machining-** Scott Wigginton, 3535 Victor St., Santa Clara, CA 95054;

4" & 5" Go Power rims; front and rear;

Tel: 408-748-6949 Email: [aswInc2@aol.com](mailto:aswInc2@aol.com)

**Jeff Brown Engine** rebuilding modifications for all types since 1967, BM

130 parts available – rotary valves for B Bombs & BM 130s.

Tel: 248-613-5839 after 5pm EST Email: [invaderjb@gmail.com](mailto:invaderjb@gmail.com)



**CKT Racing Engines, Inc.-** Jim Perry- Full-time, full-service Kart shop; Frame/Axle straightening; In-house Dyno – Red Line Oil; Gas; Alky.

Tel: 630-513-5857 Email: [CKTracing@sbcglobal.net](mailto:CKTracing@sbcglobal.net)

**Fox Valley Kart -** John Copeland - VKA required 3rd Bearing supports for sidewinders. Also motor mounts and other machined accessories.

Tel: 765-742-0935 Email: [John@foxvalleykart.com](mailto:John@foxvalleykart.com)

**GL Doemelt Incorporated -** King Kart chassis and parts

Tel: 217-268-4243 Email: [gldoemelt@yahoo.com](mailto:gldoemelt@yahoo.com)

**Jim Donovan -** Max-Torque Ltd. – Clutches for most engines

Tel: 630-369-9600 [www.MaxTorque.com](http://www.MaxTorque.com)



**Richie Engel –** Relining of Clutch & Brake Shoes, McCulloch Engine Repair

Tel: 705-445-5766 Email: [rtengel55@hotmail.com](mailto:rtengel55@hotmail.com)

**Greg Gouveia –** New Fuel Tanks: Chilton, Azusa & Palmini

Shop Tel: 805-541-4310 Cell Tele: 805-305-2074

Web Site: [GregSpeedShop.com](http://GregSpeedShop.com) Email: [GregSpeedShop@att.net](mailto:GregSpeedShop@att.net)

**Charles Groeteke -** Vintage frame repair & parts, chrome stripping and re-plating

Tel: 636-942-9988 Email: [slkcharlie@sbcglobal.net](mailto:slkcharlie@sbcglobal.net)

**Nils Gustafson -** Reproduction vintage tires

Tel: 541-471-7212 [www.VintageSpeedTires.com](http://www.VintageSpeedTires.com)



**Tim Hinson –** Dealer for Azusa, RVL Tuned Exhaust, USMP West Bend; 510, 580, 700 NOS & used parts; restoration/rebuild of karts and WB & PP.

Tel: 661-253-9000, [CatKart@gmail.com](mailto:CatKart@gmail.com); [www.CatKartRacing.com](http://www.CatKartRacing.com)

**Terry Ives -** McCulloch engine repair, pistons, rings & gaskets. Azusa and Hortsman

Tel: 916-201-7707 Email: [tii@surewest.net](mailto:tii@surewest.net)

**K&P Manufacturing -** Bug chassis - parts "GEM-Style Pipes", Blendzall Dist., Bridgestone Vintage Slicks, N.O.S. Parts & "Burco Clutch Nuts"

Tel: 626-334-0334 [www.kpmfg.com](http://www.kpmfg.com)



Howard Kaplan – DXL N.O.S. High temp, semi-metallic friction discs  
Nippondenso – W34EN – Alky racing plugs for most foreign & Yamaha  
Tel: 773-965-9755 Email: [HowardKaplan@comcast.net](mailto:HowardKaplan@comcast.net)

Bill McCornack – McCulloch Engine building, Big Volume Pipes, Tillotson Carbs, Rev Grip Springs, L & T oil  
clutches for McCulloch and Yami  
Tel: 630-400-2645 Email: [bill.mccornack@comcast.net](mailto:bill.mccornack@comcast.net)

Jack Murray – Collector of Early and Mid 60's Karts, Engines, and Rare NOS Parts. NOS GEM Pyramid Reed  
Cages, NOS Margay Dual Engine Gear Boxes and Parts, New Tourek Type Ball Joints, Tel; 619-501-5066

David Nance – T.I.G. welding of MOST ALL TYPES of metal. N.O.S. Clinton engine parts type used on vintage karts, mini bikes, quarter midgets.  
Tel: 256-881-3254 Email: [NanceWelding@gmail.com](mailto:NanceWelding@gmail.com)

R&I Metals- Bill Rowan, 1876 S. Taylor Ave., Ontario, CA 91761  
Fox Satellite Seat shells and foam;  
Tel: 951-897-4951 [www.RImetal.com](http://www.RImetal.com) Email: [Bill@RImetal.com](mailto:Bill@RImetal.com)



Robron Incorporated - Dart chassis, parts and repair  
Tel: 800-624-7383 Email: [robroninc@bellsouth.net](mailto:robroninc@bellsouth.net)

Rogeo Enterprises – Will Rogers, recast Hands Wheels, Hovey Hawk kart frames, welding, parts casting. Tel:  
530-878-7594 Email: [rogeo2@sbcglobal.net](mailto:rogeo2@sbcglobal.net)

Ed Sahagian - Line boring, blueprinting, head surfacing, helicoiling & prototyping  
Tel: 912-330-9120

Lake Speed – B Bomb Engines – Parts –Buy & Sell – Service & Repair  
TRIC-LOC Kart Clutch Oil  
Tel: 704-938-4912 Email: [LakeSpeed83@gmail.com](mailto:LakeSpeed83@gmail.com)



Dick Teal – Reproduction Fox pedals - floor pans - throttle arms – etc.  
Tel: 920-485-2844 Email: [teal@charter.net](mailto:teal@charter.net)

Brian & Dotty Thomas – Custom Kart Covers & Power Products base gaskets  
Tel: 763-784-9095 Email: [wrenchhead944@hotmail.com](mailto:wrenchhead944@hotmail.com) [www.blackdogvintageracing.com](http://www.blackdogvintageracing.com)

Thomas Thorin - Simplex decals, brake linings & 5 inch cast wheels  
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<http://www.sugarriverraceway.com/vintage-karting.htm>

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