British Anzani

UNITWIN STOCK OUTBOARD MOTORS

COMPETITION MODELS - CLASS A AND CLASS B

MOST ADVANCED DESIGN

EVER OFFERED FOR SALE IN THE OUTBOARD FIELD!
WILL CONTINUE THE LEADER FOR YEARS TO COME.

HIGHEST QUALITY MANUFACTURE

IN THE ENGLISH TRADITION OF FINE MOTOR CRAFTSMANSHIP.

"For The Man Who Wants The Best"

The English have long been known for high quality production of fine cars and engines. (Rolls Royce, Bentley, Jaguar, etc.). BRITISH ANZANI follows the English tradition of fine craftsmanship.

Crankshafts are built up from heat treated steel forgings, hardened and ground all over. Crank webs are 9/16 inch thick, with center journal and two center webs of one piece construction. Crankpin ends are taper ground and fit in matching taper ground holes in crank webs.

Underwater unit gears and shafts are made in one piece; no pinned or splined gear hubs. Unique propeller shaft bearings with micrometer type gear adjustment.

Entire motor exemplifies finest precision manufacture.

HIGHEST
QUALITY
MANUFACTURE
FINE
ENGLISH

MOST ADVANCED OUTBOARD EVER DESIGNED

SUPERIOR DESIGN PRODUCES

MORE POWER
MORE SPEED
MORE RELIABILITY

BRITISH ANZANI is the originator of, and the only motor built with: Breathing through side port (third port) inlet plus dual internal rotary valves. Yet uses single carburetor.

Features reverse flow scavenging with symmetrical "flat top" piston crown, plus the most advanced port design. Four intake ports and two exhaust ports per cylinder. Separate aluminum cylinder head of high turbulence design, with "quench" area. Intake and bypass ports accessible from outside of cylinder block by means of removable cover plates.

Ball bearing crankshaft. One piece connecting rods with 10,000 rpm. roller bearings. Journal bearing alignment guaranteed by line bored, longitudinal split crankcase.

Underwater unit has least frontal area and least drag. Correct hydrodynamic design for highest speed plus good handling qualities. Replaceable skeg and nose section.

BRITISH ANZANI UNITWIN STOCK OUTBOARD MOTORS—COMPETITION MODELS

The Class A and Class B motors are identical except for cylinder block, pistons and cylinder head assembly.

Twin cylinder, alternate firing, two cycle engines with magneto ignition.

Underwater unit gear ratio 1:1. Left hand propeller rotation. Uses U. S. propellers.

Class A - 2.047" bore x 2.244" stroke; 14.77 cu.in. piston displacement. Class B - 2.437" bore x 2.244" stroke; 19.65 cu.in. piston displacement.

Manufactured and sold as Stock outboard motors, complete with underwater exhaust, single gasoline carburetor, clamp type stern bracket, etc., as required for fast pleasure use.

DISTRIBUTED IN U.S. BY BILL TENNEY, AEROMARINE COMPANY, CRYSTAL BAY, MINNESOTA

RESEARCH • DEVELOPMENT

• PULSE JET ENGINES AND ALLIED DEVICES

• 2-STROKE CYCLE RECIPROCATING ENGINES AND ALLIED DEVICES

SOLE U.S. AGENT BRITISH ANZANI COMPETITION OUTBOARD MOTORS

AEROMARINE COMPANY

CRYSTAL BAY, MINNESOTA 55323

July 12, 1965

Mr. Philip H. Smith, Jr.
17159 - 4th Avenue S.W.
Seattle, Washington 98166

Dear Sir:

Thank you for your recent inquiry concerning the British Anzani Outmin competition model outboard motors. We are enclosing a leaflet and a brief specification sheet describing the A and B motors which we believe will prove of interest.

British Anzani has proven itself to be the fastest and most reliable motor through nine seasons of U. S. competition. These motors have won more A-2 Class World and National Championships, and have set more A-3 Class World Records, than any other make. They are also consistant winners of lesser events wherever they are raced.

In Micro Midget car racing, the British Anzani A outboard powerhead has held the NMRRA asphalt track World Records continuously since 1962.

In Go-Kart racing, the fastest karts (such as Tom Spalding's famous kart featured on the cover of Hot Rod magazine) are Anzani powered.

British Anzani A and B Class competition model outboard motors are now available for immediate delivery, price $499.50 f.o.b. Crystal Bay, Minn. (less carburetor) for both A and B Class models. Complete instructions by Bill Tenney for making alcohol conversions, alcohol fuel system, tuned exhaust stacks, etc. are included with each engine.

Complete Bill Tenney A and B alcohol outboard racing conversions, with exhaust stacks, special fuel system, etc. are available on special order at $599.50 f.o.b. Crystal Bay. All alcohol conversions are test run for power and performance, and are 100% ready to go out and win races as delivered.

The Class A powerhead is available for immediate delivery, price $350.00 f.o.b. Crystal Bay, (less carburetor) for Micro Midget and Kart use.

The new four cylinder Class C and D motors are also available for immediate delivery. All powerhead parts are interchangeable with those in the A and B motors, and the powerhead specifications are the same as those enclosed, covering the A and B motors, except that four cylinders are utilized. These C and D motors are available at a price of $950.00 f.o.b. Crystal Bay.

A complete supply of spare parts for all British Ansani competition model motors is carried in stock, available for immediate delivery.

All shipments C.O.D. All prices subject to change without notice.

Order your Ansani now, so as to be the first in your area with this <u>proven fastest</u> motor.

Sincerely yours,

W. L. Tenney
AERO-MARINE COMPANY

WLT/jss
Encls.

RECENT RECORDS: On September 22, 1963, at Lawrence Lake, Washington, the following A/BA Five Mile Competition Records were set by these motors:

A Hydro Competition, 66.716 MPH by Gerry Walin 68.945
B Runabout Competition, 62.327 MPH by Lee Sutter 63.7 Probable

Also, on October 26-27, 1963, the following A/BA Kilo Straightaway World Records were set at Devils Lake, Oregon, by Ansani motors:

A Hydro, 77.01 MPH by Mike Smith 81.504 within (87 max. try)
B Hydro, 80.633 MPH by Mike Smith 88.281 within (90 max. try)
B Runabout, 71.143 MPH by Lee Sutter 74.608 within

On September 8, 1963, at Lake Spivey, Georgia, a new AOA B Hydro Straightaway World Record of 90.357 MPH was set by Kay Harrison.

P. S. We use and recommend Lubriplate Hypoid 90 gear lubricant, which you can obtain locally.

W.L.T.

BRITISH ANZANI STOCK UNITWIN OUTBOARD MOTORS

CLASS A AND B COMPETITION MODELS

SPECIFICATIONS

POWERHEAD: Alternate firing Twin Cylinder motors for Class A and B, bore 2.047 inches for Class A, and 2.362 inches for Class B. Stroke 2.244 inches for both Class A and Class B. Engine design features four transfer ports per cylinder, rotary inlet valves and deflectorless pistons. Single carburetor, with side port (third port) induction in addition to twin rotary valves. Cylinder block is cast iron, with detachable aluminum cylinder head. The crankshaft is 180 degrees two throw, built up from components which are machined from forgings and hardened and ground on all surfaces. Connecting rods are steel, with roller big end bearings. Connecting rods are one piece, and are not split at the big end. The crankshaft main bearings run in ball bearings, and the center journal incorporates the twin rotary valves. Ignition is by gear driven Lucas magneto. Amal carburetor is provided for stock competition, for use with gasoline. Flywheel is solid steel. The short rigid crankshaft allows very high rotational speeds.

GENERAL: The motors are manufactured as stock motors, for use with gasoline. Fuel tank is not supplied with motor since most drivers prefer to make their own arrangements. A pressure line fitting is provided for crankcase and full details for setting up fuel system are included with operating instructions.

Motors are fitted with underwater exhaust as standard equipment.

Alcohol conversions for racing are available.

These motors have been approved by AFBA for the Racing Outboard classes. They are also approved by NOA for Professional Racing. Not yet approved for "Stock" classes.

SPECIAL NOTE: Competition Motors have special care in selection of materials, assembly and final test. Racing may however impose such unforeseen stresses by accident or otherwise, that it is seldom possible to determine the cause of breakage. Owing to the unusual and strenuous service of racing, no guarantee applies to competition motors.

[redacted]

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

March, 1959

NOTE: This confidential information is released for the benefit and use of Anzani owners only. Do not quote it to others.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION III, D. THINGS TO WATCH FOR

With the exhaust stacks curved and overhanging fore and aft, heavy strains are placed on the stack structure. Check the stacks and stack braces for cracks regularly, so as not to get caught in a race with a broken stack.

The coil in the Lucas magneto is held in place by two screws, the heads of which penetrate the front of the magneto housing casting, one on each side of the front and nearer the top. In a new magneto, these screw heads are covered with a black compound to match the black crackle finish of the housing casting. After the engine has been run for some time, this black compound may fall out and expose the coil screw heads. If and when this happens, check the screws for tightness, since a loose screw may have caused the compound to drop out. Keep checking the coil screw tension, since a loose coil can cost you a race.

The magneto gear cover plates are held in place by two countersunk head screws, one on the side of each cover plate. Keep these screws tight, and locked in place with a punch mark. If these screws loosen through vibration, the cover plates are likely to contact the fiber magneto gear teeth and damage the fiber gear.

Keep the magneto variable timing lock knob tight, and mark the correct advance lever location, so that you do not take a chance on losing a race due to a shift in magneto timing.

...you use a pressure tank system, remember that the pressure outlet on ... Anzani crankcase is connected to the shaft rotary valve. If the flywheel ...pped in a position where the pressure outlet connects with the open ... valve, you will not be able to pump up pressure in the fuel tank, and ...ssure in the fuel tank will bleed back into the crankcase. With a full ... under such conditions, fuel may be forced back into the crankcase and ...d the motor, causing very hard starting. The motor does not ordinarily ...p with the rotary valve in open position, but it is good policy to keep an eye on the clear plastic lines to make sure that the motor is not sitting with the rotary valve open. A slight change of flywheel position will close the rotary valve so that pressure may be pumped up for starting.

March, 1959

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

FOREWORD

British Anzani motors represent the most advanced design ever offered in a high speed outboard motor. They are also representative of the highest quality manufacture, with accurate machine work and parts alignment throughout.

The advanced design features assure you of owning an engine which will be a winner for years to come, without model change. Other makes are already planning or bringing out new models in an attempt to compete, but Anzani remains the fastest.

The advanced design of these engines also assures you of having to do a minimum of modification work, at minimum expense, in order to have a winning engine. The only changes from the stock, gasoline, design required for race winning performance are the few Racing (alcohol) modifications described below.

Likewise, the excellence of factory machine work and parts alignment assures you of a successful engine with minimum re-work and minimum expense. We have carried out no re-machining on any of our Championship or World Record motors. All of our race winning and record holding motors are running with factory piston fit, factory cylinder bores, factory piston rings, factory compression ratio, etc.

Crankcase, crankshaft, connecting rod, and bearing fit and alignment have not been modified in any way. The engines are machined, fit and aligned properly at the factory.

The above is in direct contrast to other make motors which require extensive and expensive re-work and re-machining to fit them for top competition.

The only work required to make a winning Anzani motor is that described below.

In the case of our Racing (alcohol) conversions, this work has already been carried out at Aeromarine (except for the hand-filing of the underwater unit).

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

MARCH, 1959

SECTION I

A. STACKS

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION I, A - STACKS

SUPPLIES TO BE FURNISHED BY AEROMARINE FOR MAKING STACKS:

a. 4 cast aluminum filler plugs
b. 2 - 90° x 1/1/2" tube bends
c. 2 - semi-finished exhaust gaskets

INSTRUCTIONS FOR MAKING STACKS

Aeromarine Co. supplies four (4) small aluminum castings. These are filler plugs to adapt the cylinder exhaust ports to the stacks. They are marked with three letters on each piece. The first letter will always be "A" or "B". The four "A" pieces fit the "A" motor, and the four "B" pieces fit the "B" motor.

You will note that the 2nd and 3rd letters are TC, TP, BC, and BP. These markings designate in which ports the plugs fit. TC stands for Top, Carburetor Side; TP stands for Top, Port Side; BC stands for Bottom, Carburetor Side; BP stands for Bottom, Port Side. There are two exhaust ports in the top cylinder, and two exhaust ports in the bottom cylinder, and there is a plug to match each port.

The first move is to file each plug carefully so that it fits between the cylinder exhaust flange and the exhaust port; a good snug fit. When each plug is fit carefully, so that the entire exhaust manifold cast into the cylinder is plugged up, then a U-shaped section must be cut out of each plug to allow the exhaust gases to escape.

The purpose of the plugs is to fill up the cylinder exhaust manifold passage so that the opening at the exhaust flange is the same length and width as the actual exhaust ports. The exhaust gases must escape from the exhaust ports and proceed to the exhaust flange without expanding. You will note that the cylinder opening at the exhaust flange is much larger than at the ports. The purpose of the plugs is to provide a passage from the ports to the exhaust flange which is the same length and width as the ports. Therefore, after the plugs are fit, it is necessary to cut a U-shape section out of each plug to provide the necessary straight passage, with parallel sides, from exhaust ports to exhaust flange.

When the passage is cut correctly in the plugs, you will have a rectangular opening at the exhaust flange which is the same shape and size as the exhaust ports. Measured along the long axis, the opening will be as long as the two

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION I , A - STACKS - Instructions for Making Stacks (cont.)

exhaust ports, plus the port bar between them. Measured along the short axis of the rectangle, the opening will be the same height (in direction of piston travel) as the ports.

Be sure that the plugs do not block off any exhaust port at the edge of the port nearest to, and parallel to, the cylinder head.

The exhaust plugs will be held in place by a 1/4" thick steel flange which you will make to match the exhaust flange on the cylinder block. The semi-finished gaskets which are furnished by Aeromarine Co. fit between the cylinder exhaust flange, and the 1/4" steel exhaust stack flange you will make.

Fit a semi-finished gasket over the cylinder flange and plugs, and carefully cut the exhaust opening in the gasket to match the exhaust opening in the plugs. Then use the gasket as a pattern to match the 4 bolt holes and exhaust opening in the plugged cylinder flange with the 4 bolt holes and exhaust opening you will cut in your 1/4" thick steel exhaust stack flange.

When the flanges and plugs are fit, cut, and finished, you are ready to work on the tubular portion of the stacks.

The important point on the stacks is that they measure 16" long from the cylinder exhaust flange to the outlet.

The 16" length measurement is taken along the center line of the tubing. You can vary the length ± 1/4" without hurting anything.

You will also receive 2 - 90° tube bends from Aeromarine Co. One end of each bend must be beat out to a rectangular shape, to match the rectangular opening cut in each 1/4" steel flange you have made. The rectangular shape can easily be made by heating the 90° ell and hammering it over a suitable piece of steel. Match each 90° ell to one 1/4" steel flange.

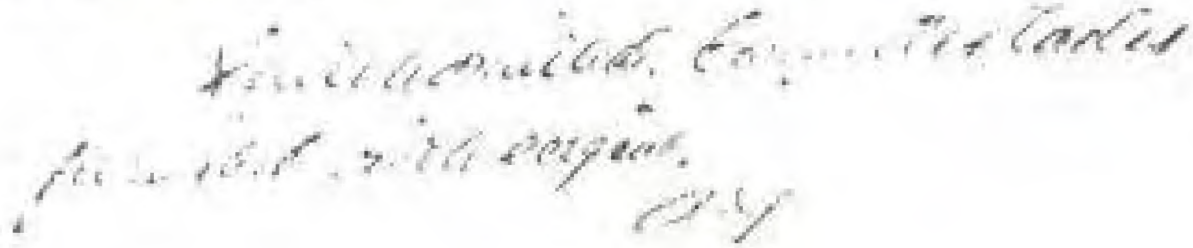
BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION I , A - STACKS - Instructions for Making Stacks (cont.)

The rectangular shape at one end of the ell must blend fairly smoothly into the regular round cross-section of the tube within a length of about 1/1/2" - 2".

The "megaphone" portion of the stack is rolled from light sheet metal (steel, preferably, 19 ga.) and welded along the seam. The outlet end of the megaphone should measure 5" diameter.

You will note that the 90° tube ell measures 1/1/2" O.D. Make your stack so that the megaphone portion measures 1/1/2" O.D. at one end, and tapers to 5" O.D. at the outlet end, in a length of 12". If your finished 90° ell measures more than 4" long, along the tube centerline, then the rolled-up megaphone must be made less than 12" long, in order to keep the total length at 16". If this is the case you will have to taper out the end of the tube ell a bit, to keep the taper portion 12" long. The taper length of 12" may vary ± 1/2" without causing harm.



The sketch shows the bend being 4" long, and the rolled-up megaphone 12" long but this may be varied, as above, if the bend winds up more than 4" long.

Weld the beat-out rectangular end of the 90° ell to the corresponding opening in the 1/4" steel flange. Then braze over the welded area, using plenty of brazing rod, and extend the brazing over a wider area than the weld, especially on the tube portion. The purpose of the brazing is to brace the stack and spread the vibration loading over a wider area of reinforced metal.

Your stack will now be complete, except for the side braces. Since there is much overhanging weight in the stack, vibration will cause it to break off or crack near the 1/4" flange, unless it is braced. Make the braces out of steel strips 1/8" x 1", with rounded edges.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION I , A - STACKS - Instructions for Making Stacks (cont.)

Braze one end of your strip braces to the 1/4" steel flange plate. Do not brase the other end to the stack. The stack must be free to expand lengthwise with heat. Form a taper collar (preferably 19 ga.) to match the outer end of the stack, and braze the braces to the collar. The collar permits the stack to expand lengthwise, but supports the stack by way of the brazed-on brace strips.

To finish, clean up the inside of the 90° ell portion where it is brased and welded, and file the bottom of the 1/4" steel flange until it is flat. The flange will warp from the brazing and welding.

Each time you run the motor, check the stacks and braces for cracks. Watch the stacks near the base flange, particularly. The braces may crack near the base flange, also.

Do not expect the motors to run fast without the stacks.

Stacks are the same for both A and B motors, except as to dimensions of opening in 1/4" thick base flange.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

MARCH, 1959

SECTION II

A. FUEL
B. CARBURETOR
C. FUEL SYSTEM
D. PISTONS
E. ELECTRICAL SYSTEM
F. HEAD GASKET
G. UNDERWATER UNIT

(Corrected Master)

March 1959

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION II A. FUEL

We use and recommend Chris-Go regular. We do not recommend any fuel which has less than 7% castor oil content.

The Anzani motors run well on nitro, and we regularly use 20% mixtures. For nitro, use nitromethane manufactured by Commercial Solvents Corp. Keep your nitro cans tightly capped at all times.

We make our nitro mix as follows: ALCOHOL - METHANOL OPT → NITRO NOT OVER 20% OIL 8-9% LIQUID OR CASTOR

Into a 5-gallon glass jug we pour 3 gallons of Chris-Go regular fuel. Then we add 3 quarts of nitromethane and mix thoroughly.

Nitro mixes are corrosive, especially to solder. Therefore make sure that all nitro mix is drained from the fuel system, after each use. Nitro may cause metal carburetor floats to leak at soldered joints.

It is good policy to flush the power head with plain fuel, after running nitro. This is a nuisance, however, and such flushings may be confined to times before the motor is to lie idle for long periods. It is also good policy to store your nitro mix in glass jugs. Keep the jugs tightly stoppered at all times.

SECTION II B. CARBURETOR

We do not supply carburetor with engine, except on special order, since stock Anzani carburetor is gasoline type Amal, and has not proven suitable for use with special fuels.

We have expended much time and effort in attempts to adapt the Carter carburetor, supplied for Mercury and Champion motors, for use with the Anzani motor. The Carter carburetor has proven to be too small to do the job, however, and its use is not recommended. We have also investigated the carburetors of other U. S. manufacturers, and have been as yet unable to find anything suitable except the Vacturi AO-500.

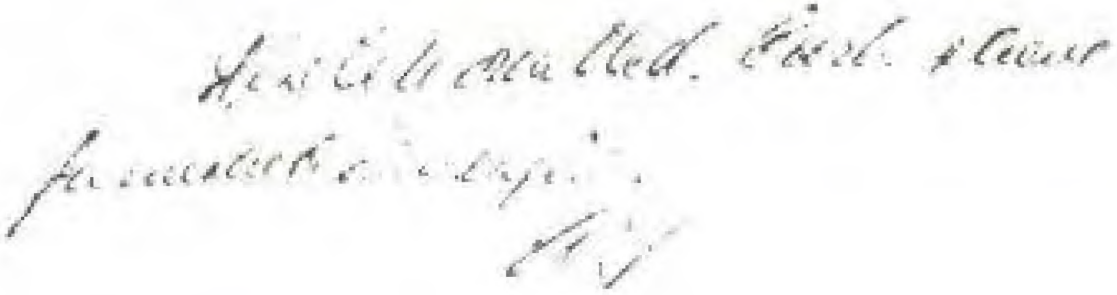
The Vacturi AO-500 carburetor, properly modified, has proven ideally suited to the Anzani engine. Although this carburetor is currently out of production, there are many in existence supplied with Johnson PR and SR engines, 4-60's, Storm Boat engines, P-500 pumpers, Evinrude Service C's, etc. Old Johnson and Evinrude racing drivers and dealers generally have such carburetors on hand.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION II B. Carburetor (cont.)

The Vacturi AO-500 carburetor is of simple construction and proven reliability, and has proven capable of handling the large fuel flows required. It has also proven capable of operating properly with a larger bore (less venturi restriction) than any other carburetor we have seen. We can convert these carburetors for Anzani use (price on request) or the work may be carried out elsewhere, as described below.

First, the main bore of the carburetor must be sleeved down to 1-3/8" diameter. The sleeve is made as per sketch.



Thus, the sleeve is 2" O.D., made to fit inside the standard Vacturi straight bore. Note that the 2" O.D. must be made to fit each particular carburetor, since the bores of these carburetors vary slightly as to size, and also incorporate a slight taper. The sleeve may be made from aluminum, or any other suitable material.

As per the sketch, the sleeve is simply made with a straight bore of 1-3/8" I.D., tapered out and radiused at the intake end for streamline air flow.

Of course it is also necessary to cut holes in the sleeve for the jets, etc., and to cut the throttle butterfly down to match the 1-3/8" bore.

When running nitro with this carburetor, you will probably have to put in a new float at least once a year. Nitro eats the protective coating on the float and eventually the float will soak up fuel and become too heavy to float properly.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITEH ANZANI MOTORS

SECTION II B. Carburetor (cont.)

Particularly with the Class B motor, it is well to use a Vacturi modified for use with the PR Johnson, having 1/4" diameter needle valve and having the various fuel flow passages and orifices suitably enlarged. 1 ½ times of

To use the Vacturi carburetor, it is of course necessary to make an adapter to fit the carburetor to the Anzani cylinder block. Such an adapter can be fabricated from 3/4" thick aluminum plate. The intake opening in the cylinder block may be enlarged and streamlined somewhat to fit the carburetor adapter, and the adapter base itself should incorporate a transition section between carburetor base and cylinder block opening.

SECTION II C. FUEL SYSTEM

Using the Vacturi carburetor, gravity feed to the carburetor float bowl is a must. We have tried various types of fuel pressure regulating devices in an effort to use pressure fuel feed to the Vacturi carburetor, without success. The Vacturi float mechanism will lock closed under even slight fuel pressure, and we know of no pressure regulating device which will flow sufficient fuel to meet the engine demand and at the same time avoid locking the float valve mechanism under all conditions.

Gravity feed provides a constant, low pressure and you can anticipate trouble with the Vacturi float mechanism if you use any other method of feeding it.

A plain gravity tank provides the simplest and most reliable fuel system. However, it is difficult to make a neat gravity tank installation on these motors. For this reason we have developed a special fuel system which we use on our own motors and which we fit to all motors which we convert to alcohol in our own shop. This system is both neat and reliable, and will be described below.

First, it must be emphasized that the gravity feed to the Vacturi carburetor must be of large capacity. The very smallest gravity feed line that can be considered is a single 1/2" I.D. fuel hose, using fittings having the largest possible inside diameter (in no case less than 7/16"). Such a gravity feed line has thus far proven adequate for the A, and in most cases for the B motor. However, with some of the fastest B's we have had to fit two such feed lines.

The special fuel system which we use and recommend utilizes a Champion Hot Rod pressure tank mounted in usual fashion in the boat. However, the fuel pressure regulator is removed. Run plastic hose from Anzani crankcase pressure outlet (projects from crankcase just to left of magneto) to

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION II C. Fuel System (cont.)

Champion tank air pressure inlet fitting. Then run plastic hose directly from Champion tank fuel outlet (with pressure regulator removed) to two Dellorto fuel float bowls located on a special bracket. The bracket holds the two fuel float bowls in a position above the Vacturi carburetor. Fuel feed to the Vacturi carburetor is by gravity from the two Dellorto float bowls. The two Dellorto float bowls will close off the pressure fuel flow, and maintain a constant gravity fuel head to feed the Vacturi carburetor. No spring loaded or diaphragm operated pressure regulating devices are required. We have found such devices to be unreliable.

We use two Dellorto bowls because one bowl alone does not have sufficient float volume to close off the full fuel pressure. Since the two Dellorto float bowls will maintain a constant fuel level against full crankcase fuel pressure, then gravity feed from these Dellorto bowls will provide a satisfactory feed to the Vacturi carburetor.

For the sake of simplicity, it might seem desirable to use only one float bowl, instead of two, to receive the crankcase fuel pressure. There is no available single float bowl, however, which has a float big enough to close off the full crankcase fuel pressure.

When using the two Dellorto float bowls, be sure to provide a gravity feed line to the Vacturi carburetor of at least 1/2" I.D., as emphasized earlier. Two 1/2" gravity feed lines are safer yet, especially with the B motor. On some of our fastest B's we have used three Dellorto float bowls with two 1/2" gravity lines, in order to be sure of feeding enough fuel.

We can furnish the correct Dellorto fuel float bowls at a price of $12.50 each, or at $10.00 each in lots of 4, on special order.

We have devoted considerable space to describing the fuel system, since a correct fuel system which will supply plenty of fuel, by gravity feed to the Vacturi carburetor, is essential for correct operation of the Anzani motors.

SECTION II D. PISTONS

In the case of the Class B motor, we have found a definite increase in speed when the piston skirts are cut back 3/8" in the area where they open and close the side port intake from the carburetor manifold opening through the cylinder walls. Cutting the piston skirts back 3/8" in this area increases the duration of side port intake opening and results in increased power at racing speeds. This modification should be carried out on all Class B motors.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION II D. Pistons (cont.)

The cut back portion should take the form of a rectangular notch in the pistons skirts. This notch should extend around each piston skirt for a circumferential length equal to and matching with the side port opening in the cylinder wall. We refer here to the port in the cylinder wall which leads direct to the carburetor. The notch is made to a depth of 3/8", thus shortening the piston skirt in this area by 3/8" and increasing the side port timing.

The shape of the notch can be scribed on the pistons, to match the side port shape, by scribing through the carburetor flange opening with the carburetor removed, before removing the cylinder block.

It is best to dismount the pistons from the connecting rods, when cutting the notch in the skirts. It will be necessary to warm the pistons with a torch before removing the wrist pins. The wrist pins are purposely made a tight press fit in the cold pistons, and they should not be either removed or installed without first heating the pistons to loosen the fit.

Note also that the piston heads are stamped "exh." near the edge which opens and closes the exhaust ports. Be sure to re-assemble the pistons on the connecting rods with the "exh." stamp mark next to the exhaust ports. It is possible to get the pistons on upside down, if attention is not paid to the "exh." mark stamped on the heads. If the pistons are thus incorrectly installed, the ends of the piston rings will catch in the ports.

In some cases it has also helped the Class A motor a bit to notch the pistons in the same fashion as described above, except only 1/4" deep. This modification is not essential for the A, however, and some of the fastest A's are running with standard piston skirts.

SECTION II E. ELECTRICAL SYSTEM

1. Spark Plugs

Use Champion L-58R plugs with the B motor for either plain alcohol fuel or 20% nitro fuel. These plugs have proven very satisfactory in the B.

Use either Champion LA-14 or L-55T plugs in the A motor for either straight alcohol fuel or 20% nitro fuel. The L-58R plugs will not work properly in the A. We find that new L-55 plugs often will not fire for starting. Therefore LA-14 plugs are preferable.

TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION II E. Electrical System (cont.)

2. Magneto

We set the magneto to fire at .150 inch to .160 inch Before Top Center, and lock it in this position, for both A and B motors. We have a dial indicator adapted to mount in the spark plug hole which we use to determine the exact piston travel BTC. The piston travel BTC may also be determined by means of a scale inserted through the spark plug hole, although this is not nearly as accurate or convenient as the dial indicator device.

The moment of breaker point opening can be determined without opening the magneto cover or having access to the points. Simply use a small dry battery wired to a household door buzzer. Complete the battery-buzzer circuit by grounding one wire on the motor and holding the other wire on the magneto "shut-off" post. The buzzer will then change tones from a high pitched buzz to a low pitched buzz at the moment the breaker points open.

It is good practice to mark the fiber magneto gear so that if the magneto is removed for any reason, it can be replaced with the appropriate gear teeth in mesh. To do this, set the top piston at top dead center. Then scribe an arc on the fiber gear, following the arc described by the fly-wheel rim. If the magneto has been removed for any reason, all you have to do is set the top piston of the motor at top dead center, and turn the magneto gear so that the scribed arc is in line with the flywheel rim, and mount the magneto in place. The gear tooth mesh will then be the same as before magneto removal.

Do not spin this magneto without grounding the high tension leads. The magneto contains no built-in "safety gap", and damage will result if the magneto is spun without some place for the high tension spark to go.

The recommended gap for the magneto points is .012 inch. It is essential that the magneto point gap be kept at .012 inch. In a new motor, the edges of the cam follower will wear quite rapidly at first, reducing the point gap.

If the motor should develop a "miss" at high rpm, or fail to sound "clean", first clean the points and the inside of the distributor cap, and be sure the point gap is .012 inch.

Occasionally the projection inside the distributor rotor or "wing" bore, which keys into the driving slot on the armature shaft, may become worn or broken, causing poor ignition.

Be sure the condenser mounting screw is tight. Also, we have seen a few instances where the condenser mounting clip has broken. To prevent this, the condenser can be mounted with a tube clamp type clip.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION II E. Electrical System (cont.)

2. Magneto (cont.)

The distributor cap can be removed, without dismounting the magneto from the engine, by turning the engine on the steering pivot bearing so that the engine tilt pivot casting is no longer beneath the magneto. To turn the engine this far, it will be necessary to unscrew and temporarily remove the steering limit stop pin. This pin is located in the drive shaft housing and runs in a notch at the bottom of the steering pivot casting.

If the magneto is dismounted by removing the four countersunk head bolts which fasten the variable timing plate to the angle steel magneto mounting bracket, care must be observed in re-mounting to insure proper gear clearance. Magneto gear clearance can be adjusted through play of the four countersunk head bolts in their bolt holes. When the gear clearance is properly adjusted there will be a slight amount of "play" or "backlash" between the gears. Excessive "backlash" will cause gear damage, but of course some "backlash" must be present.

SECTION II F. HEAD GASKET

The standard Anzani head gasket works satisfactorily with the gasoline fuels for which it is designed. When running nitro fuels, however, the standard gasket deteriorates rapidly and causes loss of power through gas leakage.

For nitro fuels, a head gasket must be hand fabricated from sheet copper of approximately the same thickness as the factory gasket material. Use the factory gasket as a pattern, and make the water jacket openings larger than in the factory gasket. The completed hand made sheet copper gasket should be annealed before use. This can easily be accomplished by heating it between two steel plates. The steel plates insure that the gasket is flat after annealing. The steel plates can also be used to flatten irregularities in gaskets which have already been annealed.

With the annealed sheet copper gasket there will still be some gas leakage around the cylinder bore holes. To eliminate this leakage, the cylinder head surface must be mill relieved to a depth of .003 inch, except for a ring 3/16 inch wide left around each cylinder bore hole. Additional gasket clamping pressure is supplied by the .003 inch high ring thus left around each cylinder bore hole, and gas leakage is eliminated.

Torque the cylinder head bolts to 28- 30 ft. lbs. Do not exceed 30 ft. lbs. torque.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION II G. UNDERWATER UNIT

The Anzani underwater unit is of the most advanced design and offers the least frontal area and water resistance of any legal unit. It should be treated carefully, however, and not considered as a "workhorse" unit.

The unit should be drained and re-filled with Lubriplate Hypoid 90 Gear Grease after each use. If any water shows up in the drained grease, it will help to wash the lower unit out with alcohol fuel prior to re-filling.

Do not use Lubriplate 105 Gear Grease, or similar types of greases. Such grease is too thick to readily reach into all the bearings, etc., permitting water or air pockets to form.

Fill the unit via the gear grease plug which is located in the bottom of the "cigar" portion of the unit. When filling, try to make sure that air pockets or bubbles do not keep the gear oil from reaching all parts of the unit. A little tilting of the unit, while filling, will help to get rid of any air bubbles.

The gasket at the nose-skeg section is unnecessary and may be removed. However, each time the nose-skeg section is removed, the mating surfaces should be cleaned and sealing compound, such as Aviation Permatex, should be applied. The gears may be inspected by removing the nose-skeg section. This section contains no bearings, and serves only as a cover plate for the gears. Thus if any damage occurs to the skeg or nose cap, it can be repaired by welding without disturbing the bearing alignment.

On new motors the streamlined tail nut at the rear end of the "cigar" section should be checked to make sure that it has been tightened sufficiently. This tail nut has a right-hand thread, and thus differs from Konig and Mercury motors which carry a left hand thread on this part. The tail nut of the Anzani unit does not carry any bearings and therefore a left hand thread is not necessary.

There is a propeller shaft bearing sleeve lock screw located out of sight, underneath the rearwardly overhanging portion of the skeg. This screw is uncovered by removing the skeg-nose cap portion, and on a new motor it will do no harm to make sure that this screw has been tightened properly.

It is possible to hand file this unit so as to increase the speed by about 1.5 mph. In common with most sand cast units, it is possible that the leading and trailing edges of the underwater surfaces may be located off center. Therefore the first step in hand filing should be to lay out accurate center lines on all leading and trailing edges, and work to these center lines. Also, all underwater sections should of course be filed symmetrical on each side of the center line.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION II G. Underwater Unit (cont.)

The skeg portion of the standard unit is made quite large for best possible handling on short courses. Drag may be reduced by reducing the skeg size somewhat, and by improving the skeg streamlining. Keep the skeg much larger than on the short skeg Mercury unit, for good control at high speeds. You are far better off with too much skeg than too little.

On some of the earlier units, the skeg was made too thin at its juncture with the nose cap. This made it prone to breaking. This defect can be repaired by welding, and load tending to breakage can be minimized by cutting down particularly the rearwardly overhanging area of the skeg.

Also, on some of the earlier units the streamlining of the top of the "cigar" section requires modification. The front of the top section is too high, so that the curve of the top section runs "uphill" instead of parallel to the propeller shaft. The top section of the "cigar" portion should exhibit a smooth, fair and even curve which runs parallel to the propeller shaft. The upper point of the "chisel point" at the front of the cigar should be located at the same height above the propeller shaft center line as the rear edge of the tail nut.

The unit can be filed to meet either APBA or NOA specifications. The "E" dimension in NOA is 1-9/16 inch, whereas in APBA it is 1.850 inch. The APBA size will meet NOA specs, but not vice versa because of the difference in the "E" dimension.

When filing, make sure not to file through the "cigar" section where it is thinnest, at the pinion gear area. Thickness of section to be filed can be determined by removing the skeg-nose cap portion. Also, do not file too thin around the internally threaded area of the "cigar" near the junction with the tail nut. The propeller shaft bearing sleeve screws into this area, and heavy loads occur here. If the "cigar" section is filed too thin here, improper support for the propeller shaft bearings may result.

All underwater units should be checked by the owner for compliance with APBA or NOA specs. Even in new units, variations in sand casting and finishing may produce a lower unit which could be off-spec.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

MARCH, 1959

SECTION III

A. PROPELLER
B. BOATS AND SETUP
C. STARTING AND OPERATION
D. THINGS TO WATCH FOR

March, 1959

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

6-2Y 10 & Boat
6-4Y 10

SECTION III, A. PROPELLER

Selection of the proper propeller is one of the most important points in getting speed from the Anzani motor. Do not try to use propellers recommended for or proven successful on other motors. Anzani motors have tremendous power and torque, and generally require much higher pitched propellers than are used with other motors of the same size. If a propeller with too little pitch for the Anzani is used, the motor will over-rev and low boat speeds will result.

In general, the highest pitched propeller you can run, without spoiling acceleration, will prove the best. The motors have to exceed a certain "hump" rpm before they reach their speed range of very fast acceleration. This "hump" speed can easily be felt when driving the boat. The proper propeller will keep the rpm above the "hump" speed in a boat race, to provide for good acceleration, and at the same time will keep the top rpm down to a reasonable figure for high straightaway speeds.

We have gained more speed through testing propellers, in the past two years, than by any other means. A short review of our experience will help guide you in selecting a good propeller.

Out of our 1957 experience in testing many different propellers, we found that the Johnson (Oakland) OJAH-1 was the best stock propeller for the A-Hydro, and the Johnson (Oakland) OJBH-4 was the best stock propeller for the B-Hydro. We also found the OJBH-1 to be useful occasionally for very short courses in B-Hydro. Also used some for B-Runabout. We carried these propellers in stock (price $21.50), as a customer convenience, and still have a few at this writing.

In the course of 1958 and early 1959 testing, we found that these propellers did not permit the highest speeds to be obtained. In general, it was not possible to exceed 62-63 mph in A-Hydro with the Ojah-1, nor to exceed 70 mph in B-Hydro with the OJBH-4. We found that we needed more propeller, to hold the top rpm down, in order to get more top speed. At this point we started working with steel Kaaine propellers modified by B. Allen Smith, 6329 Thornhill, Shreveport, La. Allen Smith's modified steel Kaaine propellers have proven the most successful for Anzani motors, and at present he has the most experience of anyone in making suitable props for these motors.

We highly recommend Allen Smith as a source for Anzani propellers.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION III, A. Propeller (cont.)

In B-Hydro, we now use and recommend an Allen Smith modified steel C Kaminc propeller. This propeller permits straightaway speeds well over 70 mph, and still gives good accelleration. Duplicates of this propeller can be ordered direct from Allen Smith.

We do not carry Allen Smith propellers in stock.

In mid-1958 we standardized on an Allen Smith modified steel B Kaminc, for A-Hydro. Later, we found that top speed with this propeller was limited to 64-65 mph. We now use this propeller principally for short course A-Hydro racing, and have gone to a larger propeller for longer courses and higher top speeds. The 1958 recommended Allen Smith modified B Kaminc can be used for A-Runabout racing, quite successfully. This propeller, for short course A-Hydro use, or for A-Runabout use, can be purchased direct from Allen Smith.

In ordering these wheels from Allen, specify for the B motor the 1959 model Ansand E propeller, modified from steel C Kaminc, and the 1958 model Ansand A propeller, modified from steel B Kaminc, both as made for Bill Tenney.

For top speeds in A-Hydro, we are presently having best success with a specially made Italian forged steel E wheel. This wheel permits top speeds in the 70 mph range, together with suitable accelleration for the average race course. These propellers are expensive ($60.00), and at present we have only a very limited supply. They can only be purchased direct from Aeromarine. The same wheel can be used for B-Runabout.

We are trying to get a lower cost and more readily available wheel for top speed A-Hydro, and for B-Runabout, from Allen Smith. Please contact Smith direct for news of availability of such a propeller.

At present, we recommend propellers as listed above for top performance in the uses described. These recommendations come from a great deal of testing, plus success in winning Championship races and setting World Records.

We recognize that other owners' outfits may require different propellers than our own, but we strongly recommend that you use the propellers as recommended above, as a starting point. Otherwise you will be simply "taking a shot in the dark", with probable adverse results due to not taking advantage of the large amount of test work we have done in this field.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION III, B. BOATS AND SETUP

We have tested several different types and makes of hydroplanes with these motors and have thus far found the Swift, Sid Craft, and Neal to be the most suitable.

In A-Hydro, we formerly used the Swift Atomic A. At speeds in excess of 65 mph, however, we have found that we need a bigger boat for competition use. We now use the Swift Big Bee, or Sid-Craft A-B, for A-Hydro competition. More drivers seem to run the Sid-Craft, but the choice at present seems to be largely a matter of personal preference.

In B-Hydro, most drivers have been running a Sid-Craft A-B, with a few running the Swift Big Bee. We have been running a lightweight, standard size (old type) Neal C because we have felt the need for a more stable hull at the high speeds attainable with the B Anzani. Lately, when we have attained speeds in the 75 mph range, we have felt the need for a still larger more stable boat. We have seen a Sid-Craft C-D Hydro run successfully with a B motor, and know two prominent drivers who have ordered these boats. They state that the C-D boat is far more stable at high speeds than the A-B, and that there is little or no loss in top speed, but that acceleration is considerably slower.

Boats for B-Hydro are now undergoing a change, due to attainment of 75 mph speeds. It looks as if a change to C sized hydros will be necessary, but not too many drivers have yet reached these speeds, or made the change to bigger boats. It is our opinion that a bigger boat will be necessary for competition, and that in addition to the Sid-Craft C-D, the Neal C line of boats may be worth investigating. We have been running the old style (small) Neal C, as already mentioned, and the medium size Neal C, built to light weight, might prove ideal. Even the large Neal C, built to a light weight, might prove best.

We are dealers for the Sid-Craft and Swift boats.

In Racing Runabouts, it is our experience that DeSilva builds the best. There is some difference of opinion as to whether the A DeSilva or the B DeSilva is best for competition. The B DeSilva is larger, but going against the wind a longer boat may have more tendency to become airborne.

In B Racing Runabout we suspect that experience will show a different boat may be needed, as mentioned above for the B Hydro. In such case, a lightweight DeSilva C might prove best. At present, there is no experience with C type Runabouts running with B motors.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTORS

SECTION III, B. Boats and Setup (cont.)

Motor setup on the boat is of importance. As to motor tilt angle, we start with setting the angle so that the propeller shaft runs parallel to the surface of the water when the boat is in normal high speed running attitude. This is OK for most running, except when the bow of the boat lifts too much at top speed, as when running fast against a headwind. In B-Hydro, especially with the Sid-Craft, we set the motor angle "under" a little, so that the propeller shaft is parallel with the after plane of the boat. At highest speeds in A-Hydro, we also set the motor angle "under" a little, if the bow rides too light for safety. In Racing Runabout competition, particularly the B motor should be angled "under" by amounts varying with wind and water conditions, in order to keep the bow down and avoid blowing over backwards.

As to transom height, the motor should be set on the transom at a height that sets the lower point of the "chisel point" nose of the lower unit "cigar" at a depth of 1-3/4" - 2-1/8" below the bottom of the boat, when using the recommended propellers. If the motor is set higher than this on the transom, no worthwhile increase in speed will result and control will suffer. For very rough water the motor may occasionally be set somewhat deeper than recommended above, in order to improve propeller "bite".

SECTION III, C. STARTING AND OPERATION

The Anzani motor starts easily and is easy to operate. Like every other motor, it has its own characteristics. We have learned these characteristics through experience and have arrived at a starting and operating routine which works well.

With the large carburetor bore we use, and with the extra timing of the side intake port achieved by notching the piston skirts, the motor will not start well under normal propeller load. Therefore, it is necessary to lift the back of the boat when starting, in order to relieve the propeller load until the motor "clears out" and gains some rpm.

The normal starting procedure is as follows. First set the needle valve at the normal running setting, or 1/2 turn leaner, and set the safety throttle on the boat so that the carburetor butterfly is slightly open. The latter point is very important since the motor can accelerate very rapidly and "run away", when the propeller load is relieved. It is necessary to be much more careful than with other motors, in this respect.

A can of Western Auto Supply Stores' "Sure-Fire", or other aerosol can type of priming fluid, is a good starting aid. If the motor is in proper operating

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR RUNNING AHEAD BOAT

SECTION III, C. Starting and Operation (cont.)

condition, failure to start readily is usually caused only by "loading up". Therefore choking should be avoided, but priming through the carburetor air intake with "Sure-Fire" or other volatile priming fluid is recommended.

With a cold motor, open the throttle wide and prime through the carburetor with "Sure-Fire" or equivalent. Then immediately close the throttle to "slightly open" position, raise the back of the boat to relieve propeller load, and crank. The sooner you crank after priming, the better, since this will prevent the heavy part of the priming fluid from all running into the bottom cylinder. For the same reason, "spray" type priming cans work best.

When following the above procedure, the motor should start immediately. If it does not fire after a few pulls, it either needs more prime or has become "loaded up". The motor will not "load up" when the above routine is followed, however, unless some mistake has been made.

As soon as the motor starts, the throttle can be opened and the propeller set down in the water. Normally, the motor accelerates very rapidly after starting, and dropping the boat down is almost instantaneous with starting. However, it is sometimes necessary to hold the boat up briefly after starting in order to allow the motor to "clear out" and run "clean" if it has been "loaded up".

The driver should open the throttle and get in the front of the cockpit as soon as the propeller starts to be lowered into the water. Do not open the throttle with no propeller load, because the motor will accelerate too rapidly. The driver should get to the front of the cockpit in order to minimize the possibility of submerging the lower exhaust stack and drowning out the lower cylinder. For the same reason, the boat launchers should shove the boat forward when they lower the boat into the water.

The above procedure is the normal starting method. When the motor is warm, priming may be minimized or dispensed with. If the motor tends to run for a very brief burst and then die immediately, depress the carburetor float pin briefly before cranking to provide a little extra fuel. If the motor consistently dies out when the propeller gets a "bite" in the water, chances are that some malfunction has occurred which has caused a major loss of power, and you would have no worth while boat speed even if the motor stayed running.

The throttle can be held wide open until the boat is planing, in order to make sure the motor gets well cleared out. If the needle valve has been set "lean" for starting, it should be opened up to normal after the boat is planing and before any high speed runs are made.

BILL TENNEY'S SPECIAL INSTRUCTIONS FOR BRITISH ANZANI MOTOR

SECTION III, C. Starting and Operation (cont.)

Do not start the motor under conditions where propeller load cannot be applied immediately, as with the motor on a stand, or the boat on "horses". It accelerates so rapidly that it is likely to "run away" under such circumstances.

When milling around, running slow before the start of the race, some drivers like to run the needle valve "lean" in order to minimize the chance of fouling a plug. The condition normally most conducive to plug fouling is that which occurs when the throttle is suddenly dumped open at low engine speed. Thus, if you wish to benefit from a "lean" setting before the start, get the motor revving up and "cleaned out" before richening the needle valve. If you should encounter trouble from fouling plugs, remember to "feather" the throttle open gradually and let the motor rev up and "clean out" before applying full throttle.

Stopping the Anzani motor on a boat is somewhat different from stopping other motors. When coming 'off plane" and stopping, get your weight as far forward in the boat as possible and try to stop gradually. In order to prevent the stern wave from engulfing the lower exhaust stack and possibly getting water into the lower cylinder.

We do not recommend long break-in running. The Racing (alcohol) conversions which we furnish are already run-in, as delivered. The stock models usually do not require more than one tankful of fuel to be properly run-in.

On our Racing (alcohol) conversions equipped with Champion Hot Rod tank and DelLorto float bowl fuel feed, it is easier and quicker to pump up and charge the fuel system when the spring loaded "tickler" pins atop the Del Lorto bowls are depressed. Simply press down the Del Lorto "tickler" pins and pump air into the Champion tank until fuel squirts out of the vent holes in the Del Lorto bowl covers.

It is good practice to loosen the Champion tank cap and relieve the air pressure, when the motor is not running. THIS will prevent any possibility of fuel being forced back into the crankcase via the air pressure line, which could cause starting difficulty.