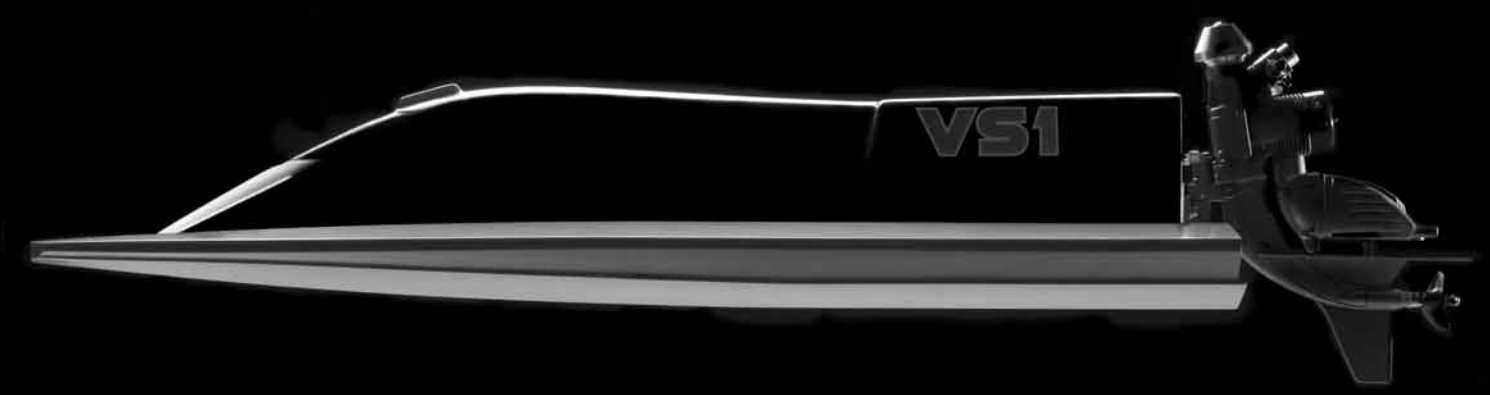
VS1™

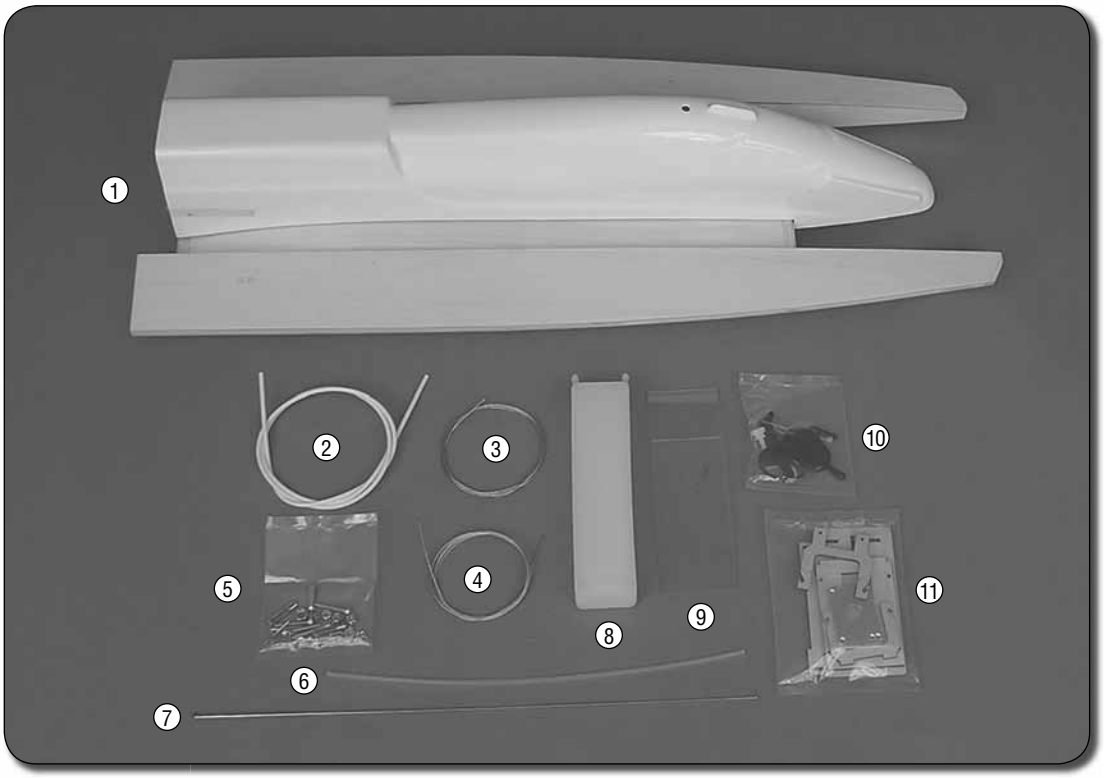


AQUACRAFT™ Models

WARNING:

- **Never attempt to swim after a stalled R/C boat.**
- **Never operate your R/C boat while standing in the water.**
- **Never operate your R/C boat in the presence of swimmers.**
- **Always use a Personal Flotation Device (PFD) when boarding and operating your retrieval craft, i.e. Jon boat or duck boat. NOTE: Because of the sharp running hardware included with this R/C boat, we do not recommend a rubber blow up raft.**
- **R/C boat running hardware is very sharp. Be very careful when working on and around the metal parts.**
- **While the motor is running pay close attention to the propeller. Do not come in contact with the propeller at any time the engine is running or serious injury will result.**
- **AquaCraft products are to be used by ages 14 and over.**

ITEMS INCLUDED



1. VS1 Hull and Cowl
2. Throttle Outer Pushrod Tube
3. Throttle Cable (Gold)
4. Rudder Cable (Silver)
5. Screw Bag
6. Antenna Tube
7. On/Off Switch Pushrod
8. Fuel Tank
9. Radio Box Cover
10. Hardware Bag
11. Tank Mount Bag

Decal Sheet

WARRANTY

AquaCraft will warrant your VS1 for 90 days after the purchase from defects in materials or workmanship of original manufacture. AquaCraft, at their option, will repair or replace at no charge, the incorrectly made part. This warranty does not cover damage caused by crash, abuse, misuse, alteration or accident. To return your boat for repairs you need to provide proof of purchase. Your store receipt or product invoice will suffice. IN NO EVENT SHALL THE PURCHASER BE ENTITLED TO ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT. This warranty gives you specific legal rights and you may also have other rights, which vary from state to state. (Outside USA and Canada, contact local importer for warranty information.)

Hobby Services
3002 N. Apollo Drive, Suite 1
Champaign, Illinois 61822
Attn: Service Department
Phone: (217) 398-0007 9:00 am - 5:00 pm Central Time M-F
E-mail: **hobbyservices@hobbico.com**

STANDARD REPAIR SERVICE

After the 90-day warranty has run out you can still have your VS1 repaired for a service fee by the experts at AquaCraft.™ To speed up the repair process, please follow these four simple steps:

Important Note: For standard repair service you must specify whether you wish the charges to be billed COD or if you wish to be notified of the charges so you can send a check.

1. Please return the ENTIRE system, boat and radio.

2. Make sure batteries are removed from the transmitter.

3. Send written instructions which include a list of all items returned, a THOROUGH explanation of the problem or problems of the service needed. Be sure to include your return address and daytime phone number. If you have access to e-mail please provide us with your e-mail address to help speed communication.

4. Send to the address above.

INTRODUCTION

Thank you for purchasing the AquaCraft™ VS1! We want the time you spend with your new R/C boat to be fun and successful so please fully read the manual. If for any reason you think this R/C model is not for you, return it to your local hobby dealer immediately. Your hobby dealer cannot accept returns on any model after final assembly or after your boat has been operated.

SAFETY PRECAUTIONS

- **Never, ever, attempt to swim after a stalled R/C boat. Do not get in the water for any reason to retrieve your boat. To aid you in retrieving a stalled R/C boat, set up a fishing reel with a tennis ball tied to the end of the line. Or better yet, get yourself a small boat so you can row out and pick up your R/C boat. Remember to use a PFD any time you enter your retrieval craft.**

- AquaCraft products are to be used by ages 14 and over.

- Do not touch the propeller anytime the motor is running. Pay equally close attention to items such as loose clothing, shirtsleeves, ties, scarves, long hair or anything that may become entangled in the spinning prop. If your fingers, hands, etc., come in contact with the spinning propeller, you may be severely injured.

- The speed and mass of this boat can inflict property damage and severe personal injury if a collision occurs. Never run this boat in the presence of swimmers or where the possibility of collision with people or property exists.

- Glow engines produce heat. Do not touch any part of your motor until it has cooled.

- This boat is controlled by radio signals, which are susceptible to possible interference from other R/C transmitters, paging systems, or other electrical noise. Before turning your radio transmitter and receiver on, make sure no one else in the area is operating a radio on the same frequency (channel).

- In the event that weeds become entangled in the propeller, stop the motor before attempting to remove them.

- If your VS1 should happen to stall, water currents will slowly carry it to shore. The bad news is that the boat could be carried to the opposite shore. When surveying areas to run your boat, keep variables in mind such as wind direction, size of the lake, etc. It is not advisable to run R/C boats on any free-flowing bodies of water such as creeks or rivers.

SPECIFICATIONS

VS1 SPECIFICATIONS:
Hull Length: 28" (710mm)
Overall Length: 34-1/4" (870mm)
Width: 11-1/2" (290mm)
Height: 5-1/2" (140mm)
Weight (less fuel): 4lbs, 2oz

VS1 FEATURES:
ARR Pro-built construction
Race-winning heritage
Lightweight wood, foam and ABS construction
High-gloss, fuel resistant, natural wood finish
Water-resistant radio box
Molded waterproof radio box cable output
8 oz. molded plastic fuel tank
Pull-pull steering system

BOAT TERMINOLOGY

TUNNEL HULL: Is a style of boat that traps air between two sponsons to gain lift.
BOW: The front of the boat.
TRANSOM: Aft most structure on the back of the boat.
PORT: This is the left side of the boat when aboard and facing the front (bow). An easy way to remember this is that port and left both contain four letters.
STARBOARD: This is the right side of the boat when aboard and facing the front (bow).
HULL: The body of the boat.
DECK: The top of the hull.
COWL or CANOPY: Removable ABS top.
SPONSON: Left or right structure this type of boat rides on.
KEELSON: The inner side of the sponsons.
SKEG: The rudder blade on your outboard that extends below the propeller shaft.

MANUAL SPECIFICATION AND DESCRIPTION CHANGES

All pictures, descriptions, and specifications found in this instruction manual are subject to change without notice. AquaCraft maintains no responsibility for inadvertent errors in this manual.

PARTS NEEDED TO COMPLETE YOUR VS1

RADIO SYSTEM:

- Futaba® 3PM 2.4GHz Transmitter, Receiver and Switch Harness (FUTK2020) ***OR*** Futaba 4PK 2.4GHz Transmitter, Receiver and Switch Harness (FUTK4900)
- Steering Servo, Futaba S3305 (FUTM0045), ***OR*** Futaba S9405 (FUTM0098)
- Throttle Servo, Futaba S3115 (FUTM0415) ***OR*** Futaba S3201 (FUTM0034)
- Receiver pack, DuraTrax® 5-cell 6V NiMH (DTXM2011)
- Futaba Receiver Pack Wall Charger (FUTM1705)
- 8AA batteries (transmitter) (3PM Only)
- Boat stand

ENGINE:

- O.S.® 21XM Marine Outboard Engine (OSMG1721) or equivalent

ACCESSORIES NEEDED TO OPERATE YOUR VS1

- TorqMaster™ Electric Starter (HCAP3200)
- 30% Boat Fuel (ODOP3130, Quart) or 50% Boat Fuel (ODOP3150, Quart)
- Hot Shot™ 2 Glow Igniter (HCAP2520)
- Hand Crank Fuel Pump (HCAP3015)
- Fuel Line (AQUB6903)
- Fuel Filter (GPMQ4150)
- Glow Plug Wrench (GPMP2000)
- AquaCraft GrimRacer™ Pro Radio Box Tape (AQUB9514)
- AquaCraft GrimRacer Speed Grease (AQUB9500)

TOOLS NEEDED TO COMPLETE YOUR MODEL

- Soldering Iron
- Solder
- Small Phillips Screwdriver
- 5-64 Hex Wrench
- Needle Nose Pliers
- Hand Drill
- Drill Bits
- Silicone Sealer
- Masking Tape
- 12-Minute Epoxy
- Denatured Alcohol
- Paper Towels
- Rotary Tool with Cut-Off Wheel
- Side Cutters

OPTIONAL PERFORMANCE PROPS

- AquaCraft GrimRacer 40x52/3 Metal 3-blade Prop (AQUB9720)
- AquaCraft GrimRacer 40x53 Metal Prop (AQUB9715)

EXTRA SUPPLIES

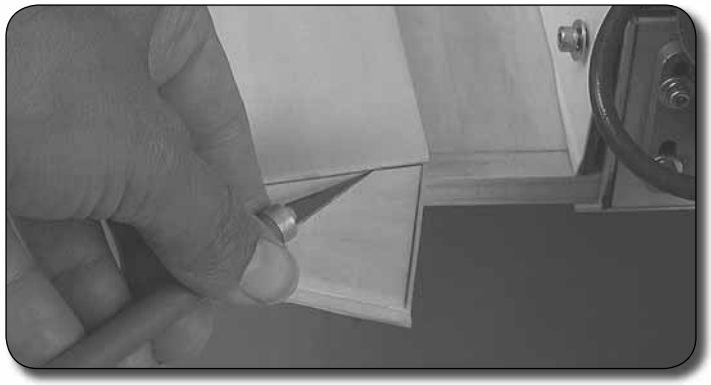
As with any hobby, it is a good idea to assemble a useful collection of tools and accessories to bring along when you head to the pond. Here are some items you will want to keep handy:

Extra “AA” batteries
Extra glow plugs
Spare prop
Small standard screwdriver
Hobby knife
Hex wrenches

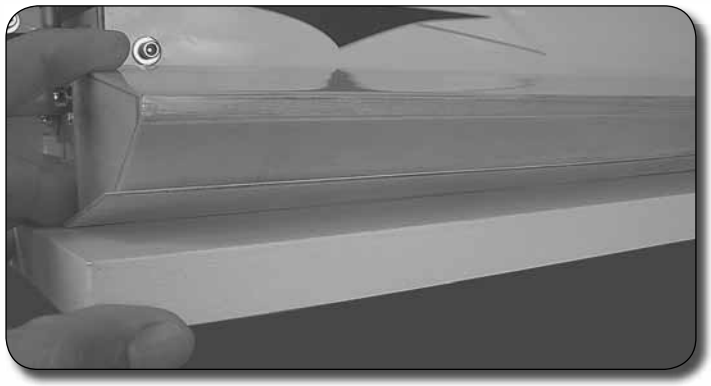
Waders or rubber boots
Paper towels
Spray-on cleaner
Sunglasses
Sun block
Folding table
Lawn chair
First-Aid kit
Cooler with plenty of ice and water
Canopy or shelter

Your VS1 does not include a boat stand. You can build one out of wood or make one from PVC tubing that you buy from your local home store.

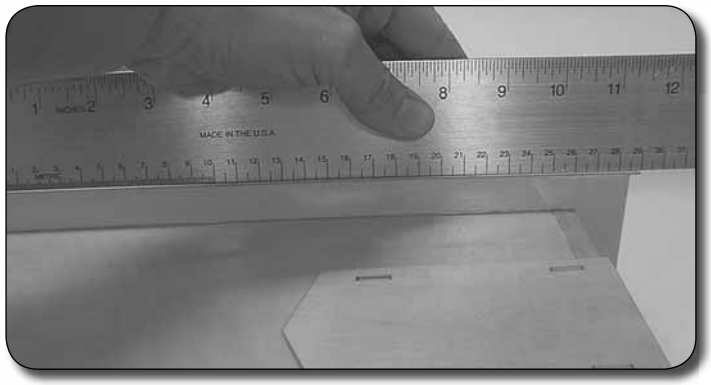
INSPECT THE HULL



1. Check the hull for any open gaps in the seams. We have done our best to make sure the seams are closed, but it is still necessary to check it over. I like to use the tip of a hobby knife to probe around the seams. If you suspect a seam might be open or allow water to enter the structure you need to seal it. It is best to do this with 12 minute epoxy. Mix a small amount of epoxy and work it into the seam using a razor blade or small acid brush. Keep some denatured alcohol and paper towel handy to wipe away any excess epoxy. It is also a good time to look for any exposed wood and seal it from the water, including the wood parts of the cowl.



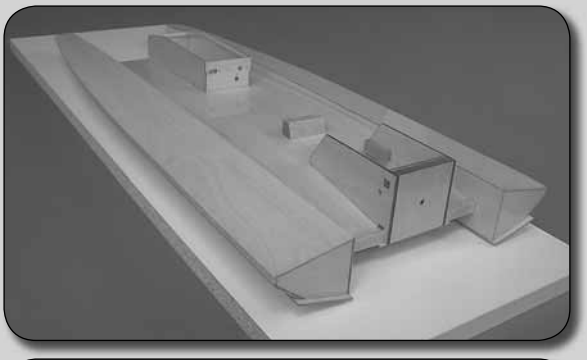
2. Place the boat on a flat surface and check the alignment of the sponsons. Your sponsons should be parallel to each other and touch the flat surface at the same time.

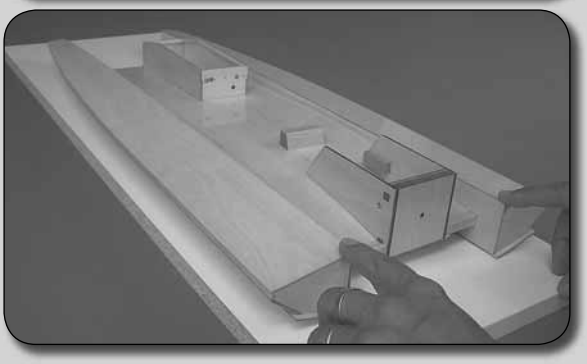


3. Place a straightedge on the bottom of each sponson (ride pad). Make sure the last 10"-11" are flat. If not, you can "blueprint" them - or make them identical - using sandpaper and a long, flat sanding block. Keep the bottom edges sharp and re-seal any exposed wood. TAKE YOUR TIME! The finished sponsons must be parallel to each other and flat.

Grimracer says: Blueprinting is the process of straightening and/or matching parts. When we talk about blueprinting the bottom of your VS1, we are mostly talking about the bottom of the sponsons. Your VS1, like other hand built performance boats, will likely need to be trued (blueprinted) get maximum performance.

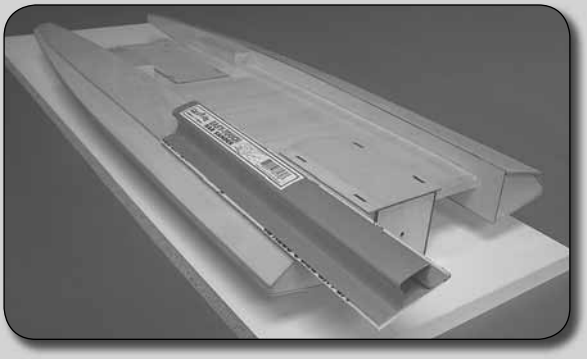
To do this, you are going to need an 11" sanding bar with 80 grit sandpaper as well as 220 grit sandpaper; a flat surface from which to base your progress; as well as some sealer to re-seal any areas of clear coat you might sand through.



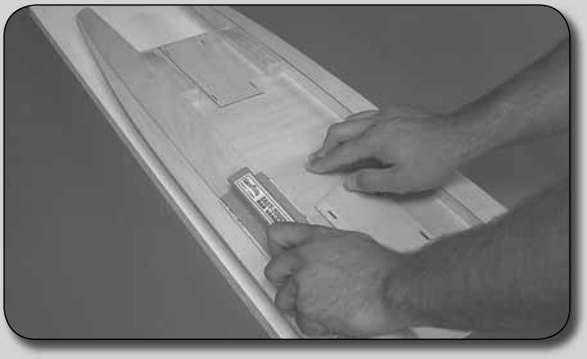


To begin, set the boat on your flat surface and put finger pressure on the top back sides of the sponsons. We need to do this to see if the two sponsons are parallel to each other. If the boat rocks from side to side AT ALL, it's best to match them. Also take a look down the length of each sponson. The sponsons work best if they are dead flat from the back of the sponsons to around 11" forward of that point.

If your boat's sponsons are not parallel to each other, you will have to decide which sponson needs to be changed. I like to pick the sponson that is lower in back and work this sponson forward to match the other.



Load your sanding block with 80 grit sandpaper and place it on the lower sponson. Start removing material off the sponson, making sure you keep the sanding block flat. Check your progress often and work slowly. Be careful not to round off any of the edges on the bottom of the boat. They need to remain sharp.



Once you have the two sponsons parallel it's time to move on, making sure the sponson bottoms are flat. You will have noticed that the sponson that you just sanded had some low spots; if you did not get all the low spots out do your best to remove them, making sure you do not change the sponsons' angle. Once that sponson is completely flat, sand the other sponson bottom flat as well. Finish up with some 220 grit sand paper.

After you have both sponsons parallel to each other and the bottoms are dead flat, you will have to reseal the bare wood. I like to use clear catalyzed auto paint but a good finishing epoxy works well, too. Note: Avoid laminating epoxies for this process.

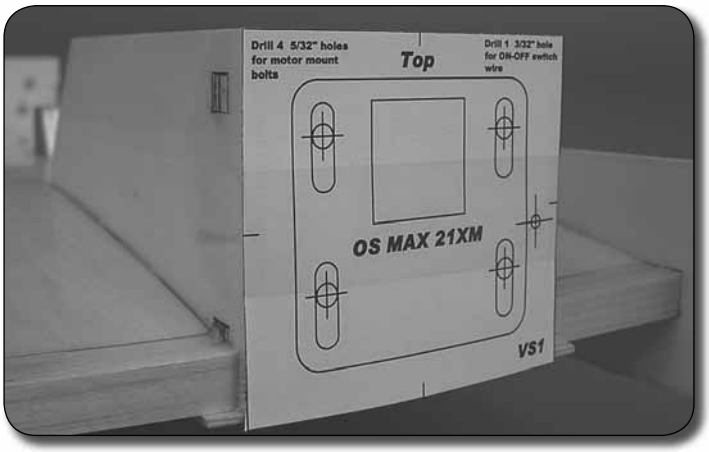
After the sealer is cured, scrape the sponson bottoms flat with a single edge razor blade. If you need to apply more sealer do so now. When that is cured, repeat the scraping process and finish by scuffing the sponson bottoms with a red scratch pad.

4. Test fit the cowl and make sure there is foam flotation in the front. Again check for any exposed wood and seal it at this time if needed.

DRILLING THE TRANSOM FOR THE ENGINE

Parts list and tools needed for this step:
Engine mount template (back cover of this manual)

Hand drill	3/32" drill	5/32" drill
Masking tape	Toothpick	Epoxy



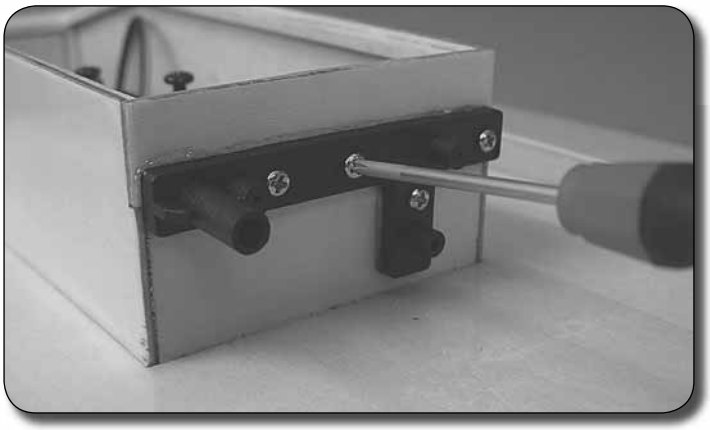
Carefully cut the engine mount template out from the back of this manual. Position it on the back of the transom using tape to hold it in place. Using a 3/32" drill bit, drill the On-Off hole location as well as pre-drill the holes for the motor mount bolts. Switch to the larger 5/32" bit and re-drill the four motor mount bolt locations. Remove the pattern and do your best to seal the holes using epoxy and a toothpick. After the epoxy has cured it's a good idea to pass the appropriate drill bit back through the holes to clean out any excess epoxy buildup.

INSTALLING THE CABLE OUTPUT, SERVO TRAY AND SERVOS

List of parts and tools needed to complete this step (Collect the parts and supplies you need and let's get started. This step goes quite fast.):
Output (VS1 Kit)
Eight 2 x 8mm wood screws (VS1 Kit)
Servo Tray (VS1 Kit)

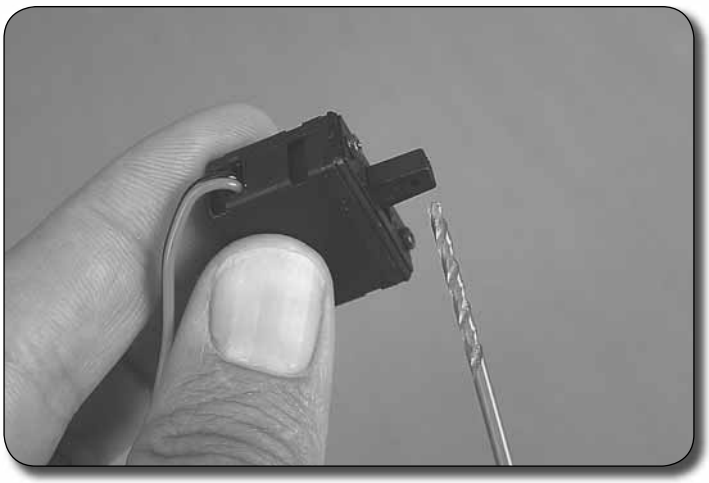
Throttle servo	Steering servo	Switch harness
Hand drill	1/16" drill bit	5/64" drill bit

Small tube of silicone sealer



1. Place a small amount of silicone sealer onto the back of the output and screw it into place on the back of the radio

box using four of the 2 x 8mm wood screws. Be careful not to get any silicone sealer into the small holes in the output that the cables pass through and do not over tighten the screws.



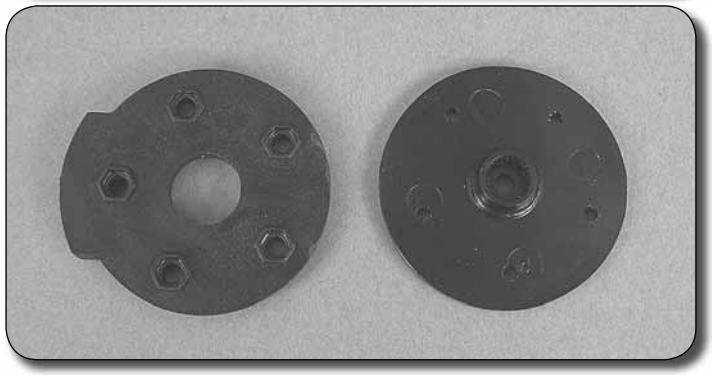
2. Next take a 5/64" drill bit and carefully over drill the small hole that passes through the finger lever of the on/off switch.

3. Install the switch harness onto the servo tray, making sure that the switch is positioned on the starboard side of the tray and that the off position of the switch is towards the back of the boat. For safety reasons you want to have your switch “PUSH” to turn the boat on. Slip the servo tray into the radio box. Use four of the provided 2 x 8mm wood screws to hold the tray in place. Install the rubber grommets and eyelets (eyelets slide in from the bottom) onto the servos and place the servos into the proper openings. Do your best to center the servos in the opening so the sides of the servos do not touch the edge of the wood. Using a 1/16" drill, pre-drill the holes in the servo tray for the servo attaching screws. Screw the servos in place using the screws provided with the servos, being careful not to over tighten. Make sure you have the output shaft positioned towards the front of the boat on the steering servo and the output shaft to the port side on the throttle servo.

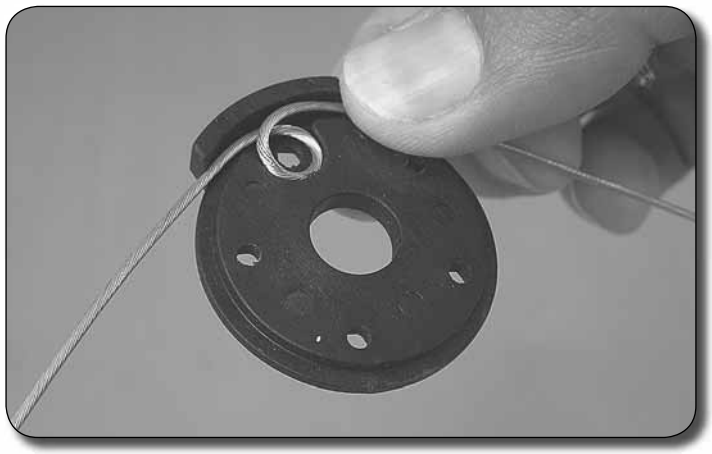
ASSEMBLING THE PULL-PULL WHEEL

This step requires the following kit parts and tools:

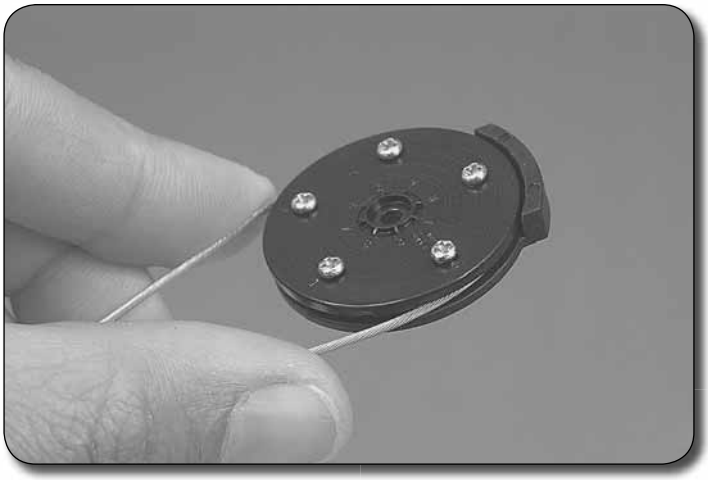
35mm pull-pull wheel (VS1 Kit)
Five 2 x 6mm machine screws (VS1 Kit)
Five 2mm machine nuts (VS1 Kit)
.049" pull-pull silver cable (VS1 Kit)
35mm servo wheel (FUTM2000, comes with most standard size Futaba servos)
Hand drill
5/64" drill bit



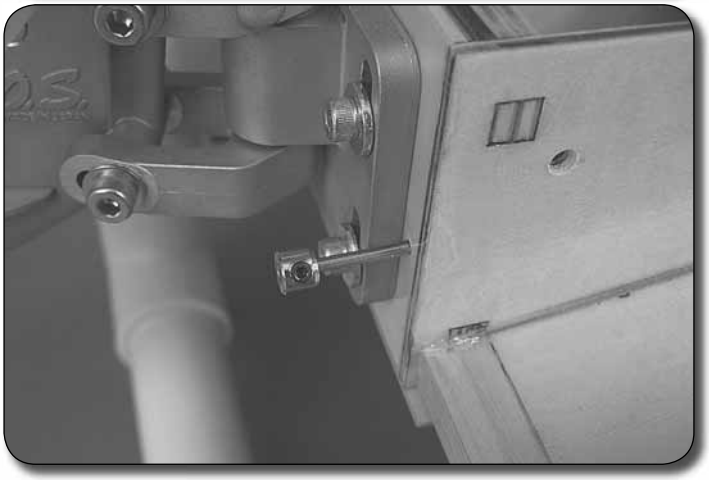
1. Place the Futaba 35mm servo wheel over the top of the pull-pull wheel. From the bottom side drill five matching holes into the Futaba servo wheel that coincide with the five bolt holes in the pull-pull wheel.



2. Test fit, and bolt the two parts together using the provided M2 screws and nuts. Do not fully tighten the parts as we are just checking the alignment of the holes you drilled. Remove the screws from the assembly and install the pull-pull cable. To do this grab the cable and make a small loop in the center of it. Slip the loop into the recess in the pull-pull wheel as shown.



3. Carefully reinstall the Futaba servo wheel back over the top of the pull-pull wheel and reinstall the screws and nuts. You can place a small dab of thread lock on the screws before tightening them down. Also, it is not a bad idea to use a small amount of epoxy in the area the cables cross over each other to keep them from slipping during operation.



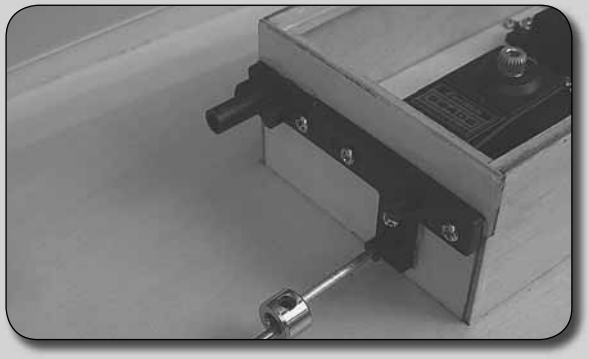
2. Carefully slide the servo tray back into position, taking note the on/off pushrod wire needs to exit the transom you drilled earlier. The wire will flex around the tank mount block. Install the small lock collar on the end of the wire to complete this step.

INSTALLING THE ON/OFF PUSHROD WIRE

This step requires:
On/Off rod wire .069" dia. 16" long (VS1 Kit)
3/32" collar with M3 set screw (VS1 Kit)
Needle nose pliers
1.5mm hex wrench

1. Slip the wire through the on/off hole in the output of the radio box. You are going to want to do this by inserting the wire from the inside of the box through the cable output. Temporarily remove the steering servo and 4 screws that hold the servo tray into the box. Slip the tray forward but do not remove it. Slide the bent end into the hole you enlarged into the switch.

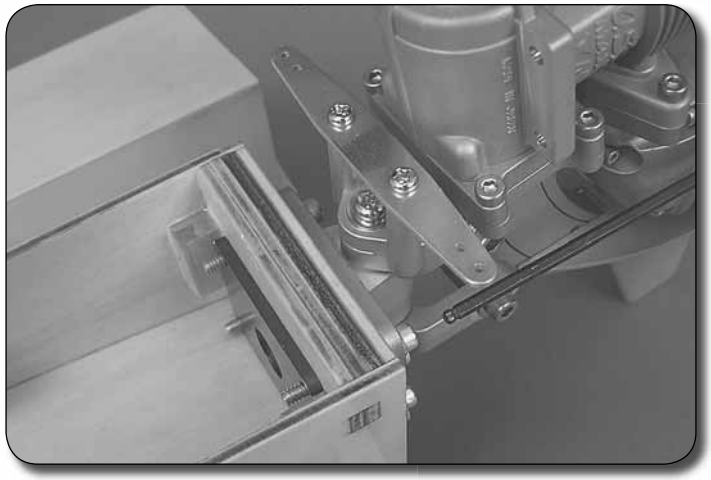
Grimracer says: One way to protect your on/off switch from accidentally being turned on or off is by clipping the wire to just 1" long after it exits the radio box. This shorter inside switch position requires you to unscrew the cowl before and after each run but makes the on/off switch less susceptible to accidental bumping.

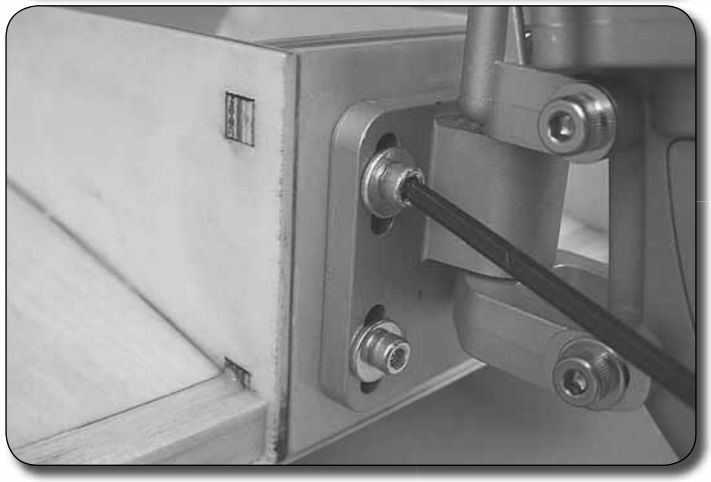


In the future if you decide you would like to move the switch back out through the transom, this can easily be done by saving your cut-off length of wire and binding the two wires together using a 5/32" locking collar (not included).

INSTALLING THE ENGINE

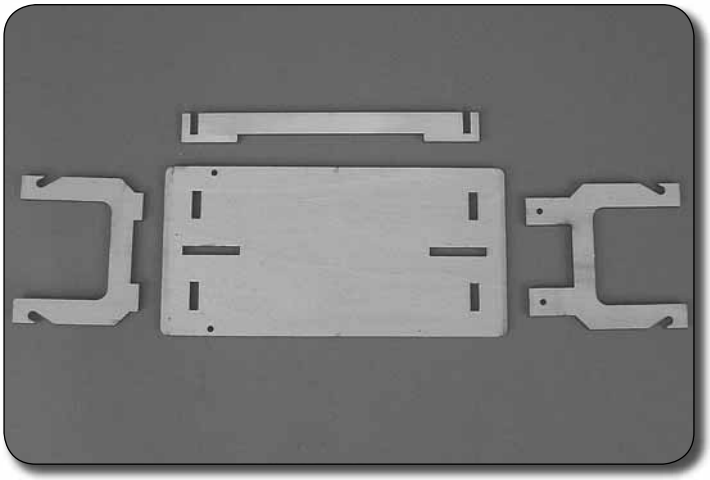
Parts and tools you are going to need:
Engine
Four 6-32 x 1" Socket head bolts (VS1 Kit)
Four #6 washers (VS1 Kit)
Metal backing plate (VS1 Kit)
7/64" hex wrench



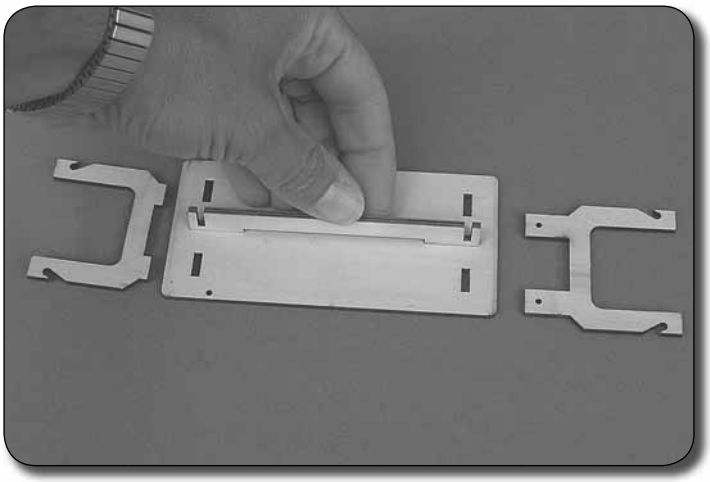


Place the motor against the transom. Set the metal backing plate inside the motor box. Using the 6-32 bolts and washers, bolt the motor to the transom. The metal backing plate is tapped to the correct size so there is no need for lock nuts. At this time there is no need to adjust the height of the motor; we will get to that during the “Hull Tuning Tips” section (page 15) of this manual.

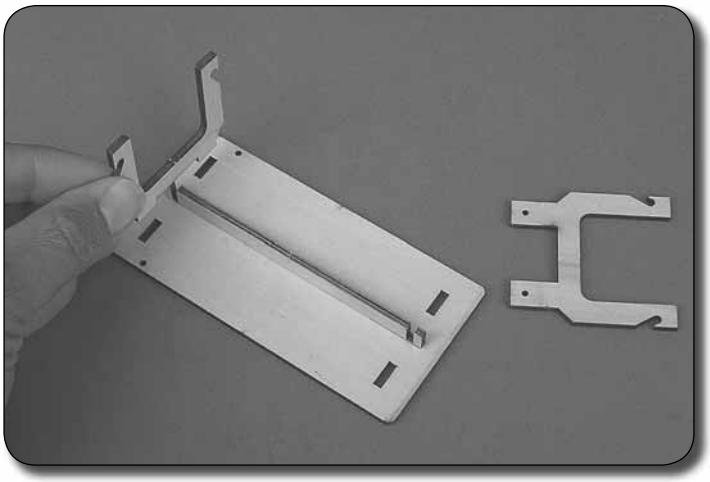
ASSEMBLING THE FUEL TANK MOUNT



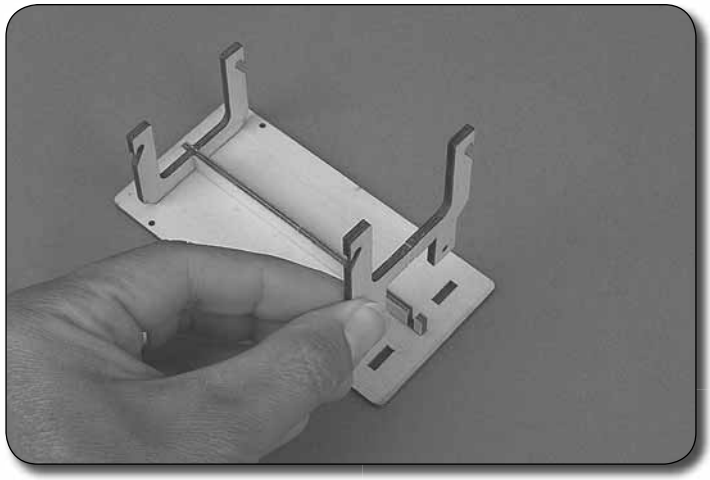
1. Take a few moments to study the parts layout in the picture. You will notice that one end of the base plate has holes in it and the other end does not. The upright with the shorter bottom legs glues to the end of the base plate without the holes. The part fit is tight; if needed, file or sand the slots a bit larger for more clearance.



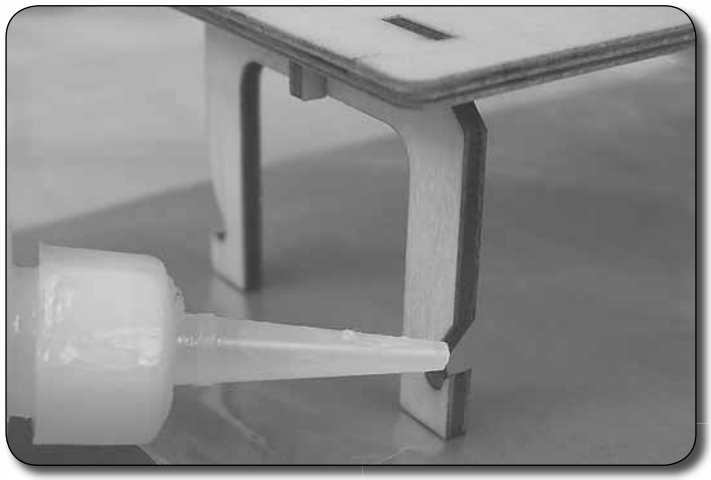
2. Using 12-minute epoxy, glue the center spine to the base plate.



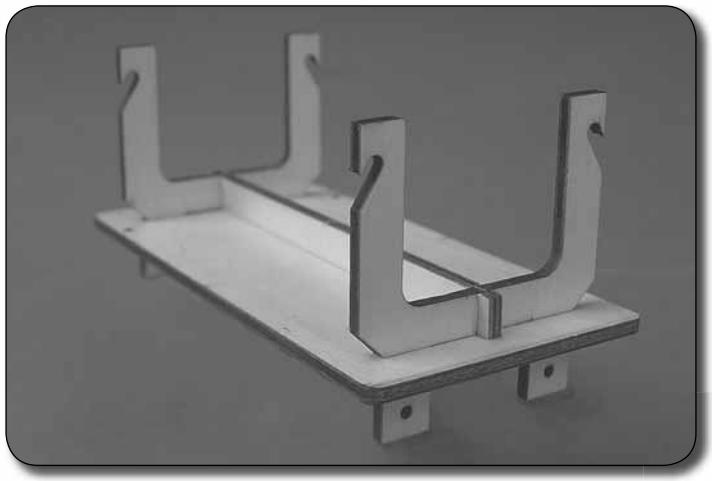
3. Epoxy the rear (short) upright into the slots in the back of the base plate.



4. Next, epoxy the front (longer) upright into the base.



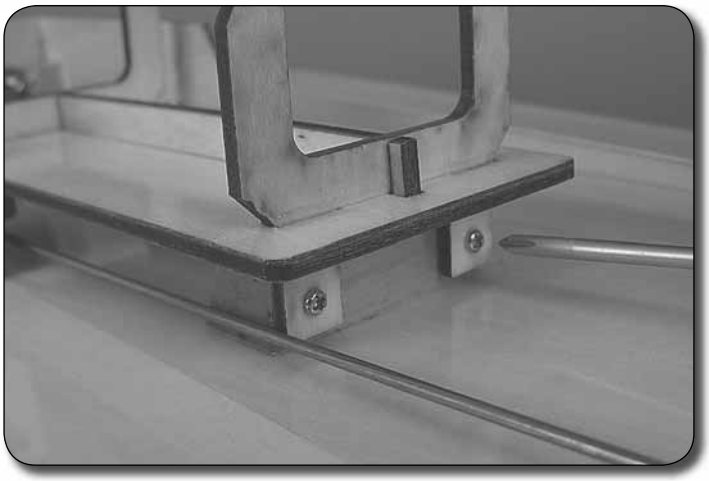
5. To help strengthen the area that the O-rings attach to, it is a good idea to place a few drops of thin CA on the hook end of the uprights.



6. The completed mount.

INSTALLING THE FUEL TANK

Parts and tools you are going to need:
Pre-built mount (VS1 Kit)
Four 2 x 10mm wood screws (VS1 Kit)
Small Phillips screwdriver
Fuel tank (VS1 Kit)
O-rings (VS1 Kit)
Fuel line



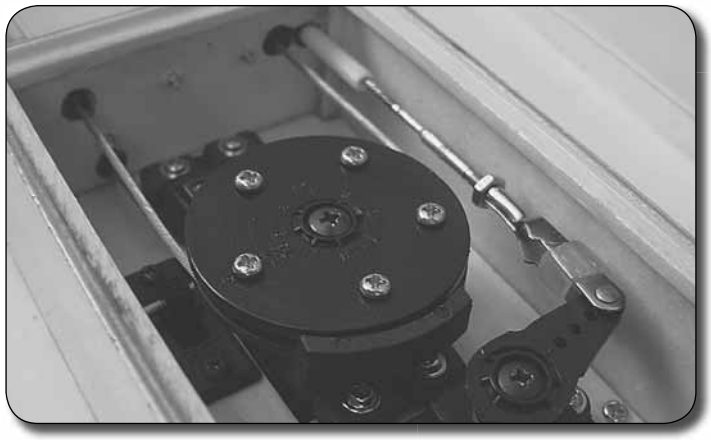
1. Align the fuel tank mount's front tabs in front of the forward mounting block. Screw the mount in place using the four 2 x 10mm wood screws provided.

2. Carefully slip fuel line onto each fitting on the fuel tank. Place the fuel cell in the mount cradles and secure with the included O-rings. If you like, you can cut the fuel line to length. When doing so, make sure you have enough line length to place the lower fuel line to the carburetor and the upper line to the muffler pressure. Note: Please use a fuel filter from the tank to the engine carburetor.

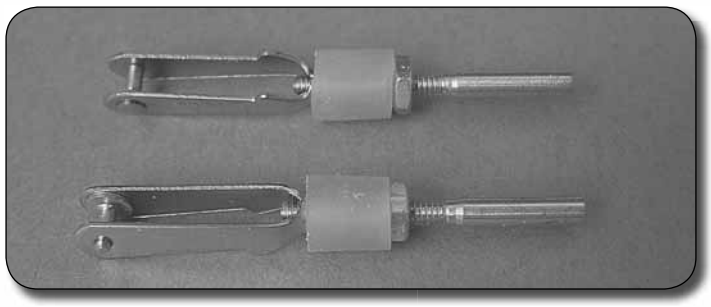
INSTALLING THE STEERING CABLE SYSTEM

Parts and tools you are going to need:

Assembled pull-pull wheel
Two clevises (VS1 Kit)
Two 2-56 nuts (VS1 Kit)
Two threaded couplers (VS1 Kit)
Two 1/4" lengths of fuel line (VS1 Kit)
Rotary tool w/cutoff wheel
Safety glasses/goggles
Soldering iron
Solder

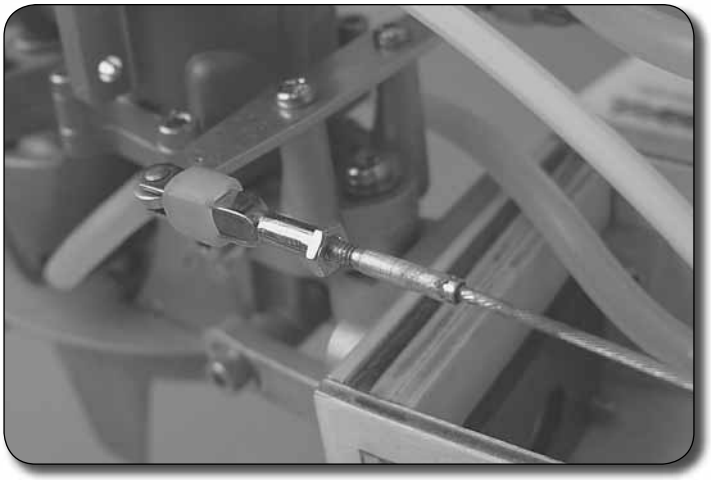


1. Position the pull-pull wheel so that the Futaba wheel is facing up and the cable is towards the back of the boat. Slide the cable through the small holes in the back of the output. Place the pull-pull wheel on the steering servo and align the wheel so the cable is centered on the servo.



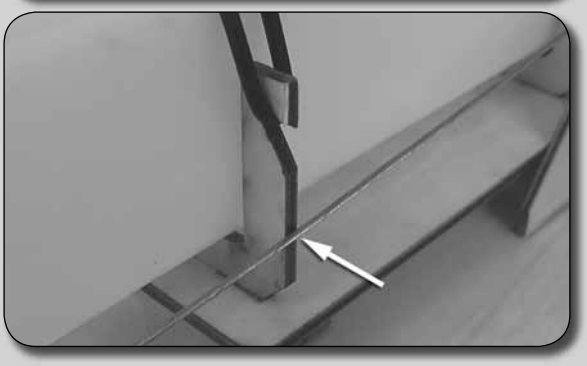
2. Screw the nuts onto the threaded couplers, then the couplers onto the clevises to the point where you have an even amount of threaded portion showing both front and back. It's a good idea to install the short length of fuel line onto the clevis at this time so as not to forget.

3. Clip the clevises to the outermost holes on the engine's tiller arm. Make sure the servo wheel and tiller are centered. Then, place a mark on the cable so you know where to cut it.



4. Using a rotary tool and safety glasses, cut the cable on the marks. Install the end of the cables into the threaded couplers and solder them together. Repeat this on the other side. Slip the short lengths of fuel tube up over the clevis. This will help keep the ends from popping off in the event of a blow off or rollover.

Grimracer says: When installed, the cables will touch the fuel tank mount. This is OK and will not cause any binding in the system.

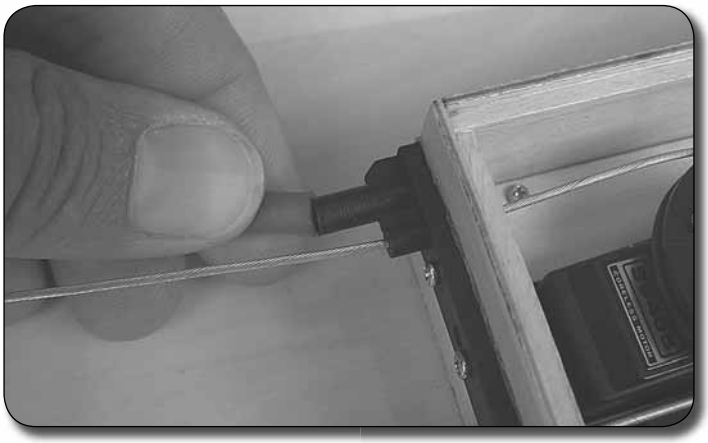


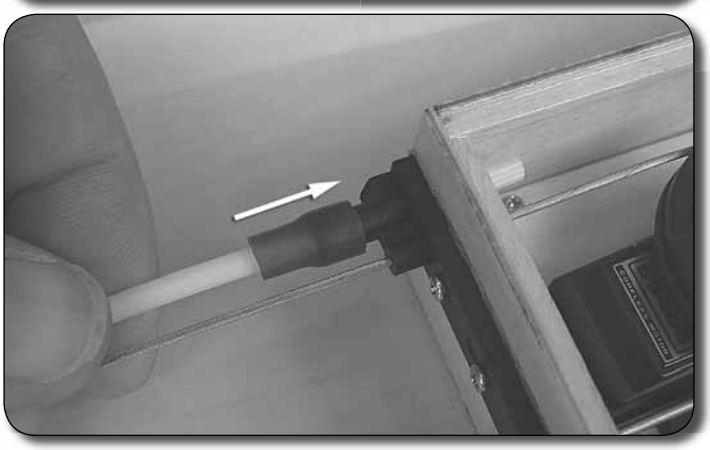
This is also a good time to place a small amount of cable grease on the steering cables and on/off wire where they exit the output guide.

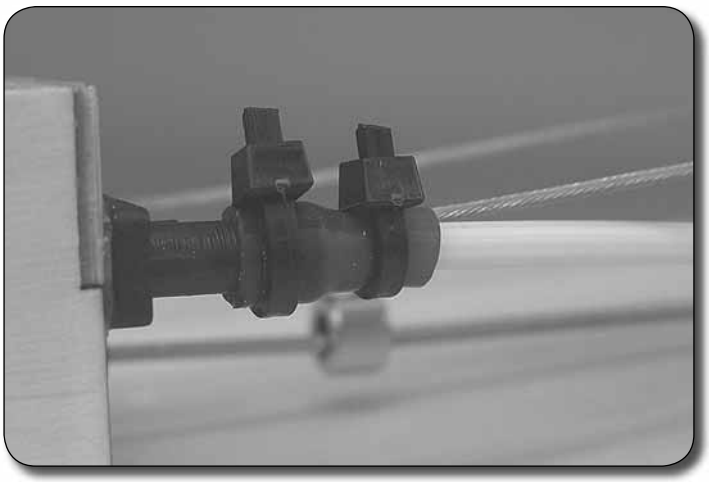
INSTALLING THE THROTTLE CABLE

Parts and tools you are going to need:
Outer white sheath (VS1 Kit)
Inner metal cable (VS1 Kit)
Four metal clevises (VS1 Kit)
Four threaded couplers (VS1 Kit)
Four 1/4" lengths of fuel line (VS1 Kit)
1/2" length of fuel line (VS1 Kit)
Two zip ties (VS1 Kit)
Rotary tool with cut off wheel
Soldering iron
Solder
Side cutters
Small Phillips screwdriver

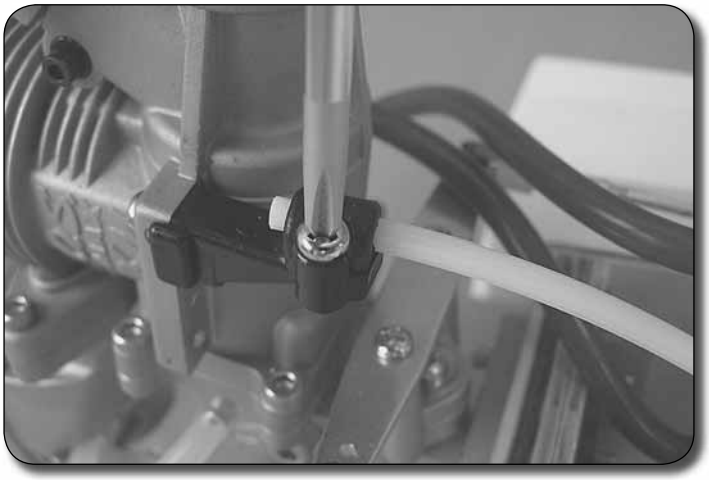
1. Using a pair of side cutters prepare the throttle servo horn by clipping away three of the four protrusions. I like to keep things neat so I sand away any sharp edges that the side cutters leave.







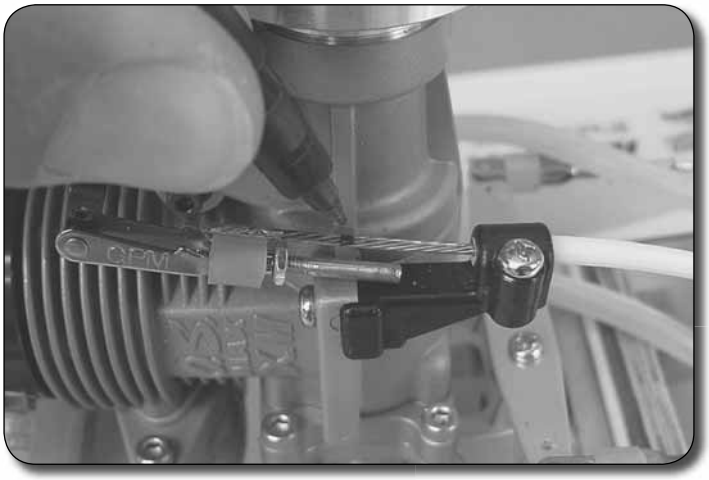
2. Cut the outer white sheath to 16" long. Slip the 1/2" length of fuel tubing onto the large protruding barrel of the output. Then, slide the white sheath inside the output. Secure the white sheath to the output by using the two provided zip ties.

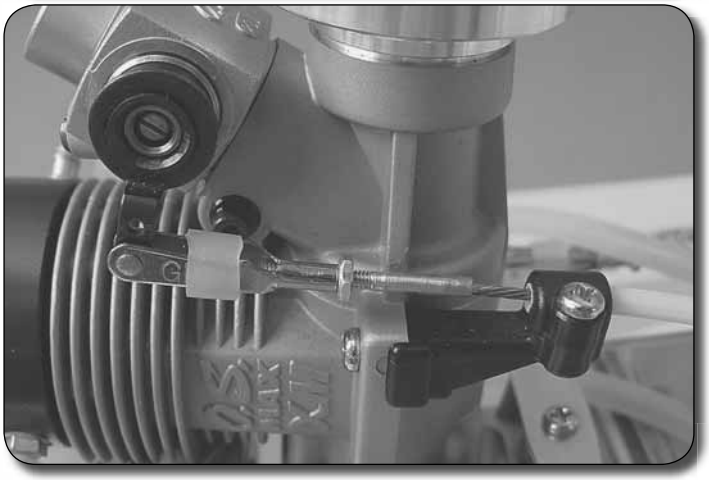


3. Insert the other end of the white sheath into the cable clamp that comes with your motor and tighten.

4. Solder the metal clevis to one end of the steel cable; slide the cable into the outer sheath from the radio box side. Attach the metal clevis to the servo horn and position the horn parallel with the servo.

5. Next slide the short length of fuel line over the clevis so as not to forget it. Temporarily slide the clevis over the metal cable and attach to the throttle arm of the motor. Position the throttle arm so the carburetor barrel is half open.





6. Place the threaded coupler along side the clevis and mark the approximate location to cut the cable. Using a rotary tool and cut off wheel cut the cable at the mark. Solder the threaded coupler to the cable and install the clevis.

POWER UP AND FINAL SET UP

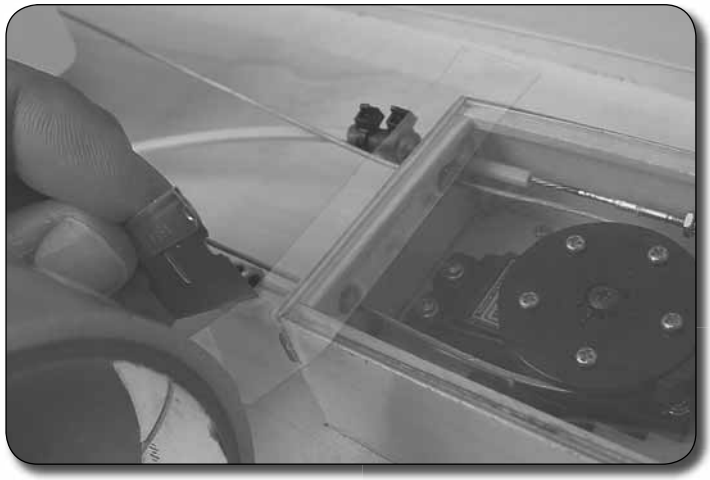
Parts and tools you are going to need:
Small Phillips screwdriver
Clear plastic radio box cover (VS1 Kit)
Antenna mount and tube (VS1 Kit)
Hand drill
1/4" drill bit
Silicone sealer

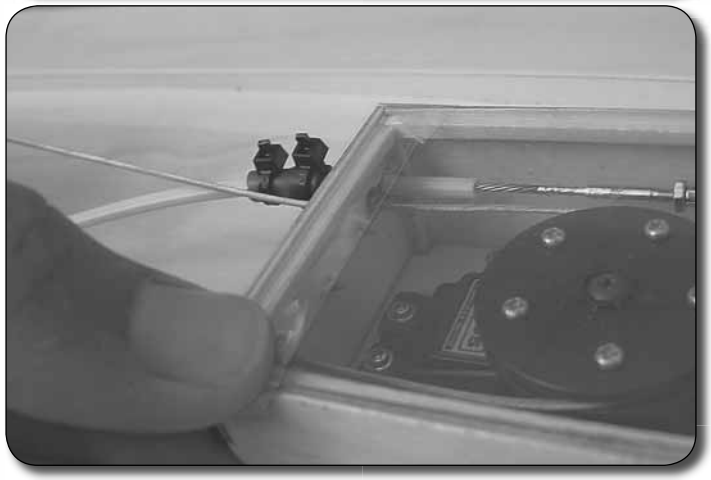
1. If you have installed the servo horn screws, remove them at this time. Pull the servo horns off the servo output shafts and power up the radio. Allow the servos to center. If you are using a multiple memory radio system, select a model and rename your model VS1. Reinstall the servo horns and check the directions and centering of the servos. Adjust the throttle linkage so that you can fully open and fully close the carburetor. Remember, you MUST be able to stop the engine with the radio system or you could risk a disqualification (DQ) in one of your heats.

2. Pick a location in the top of the clear plastic radio box cover and drill a 1/4" hole through it. Using a small amount of silicone sealer place it around the base of the antenna mount and bolt in place. You can finger tighten the nut on the back side or use a 10mm wrench, but be careful to not overtighten the nut.

3. If you are using the latest 2.4GHz technology, you can shorten the antenna tube that exits the radio box by cutting it down. Caution: Do not cut the antenna wire from the receiver. Also, if you are using 2.4GHz you can just let the antenna fold back as you slide the cowl in place. If you are using 75MHz technology, you are going to have to drill a corresponding hole in the top of the cowl to allow the antenna to protrude through the top.

TAPING THE RADIO BOX LID





1. Start at the back of the radio box. Place tape so that half is on the clear plastic top and the rest hangs over the side. Fold the corners down, then press down firmly on the top and the back side of the box.

2. Repeat at the front of the box.

3. Finish by taping the sides. Check again to make sure you've pressed all the tape firmly in place, and you're done. Remember: After running the boat, pull up the tape to remove the lid and unplug the battery from the switch.

PAINTING TIPS

SAFETY FIRST!

1. Always use a dust mask when sanding and a respirator when painting.
2. It is required to have access to a proper spray booth or outside ventilation.
3. You must wear protective gloves when painting and working with chemicals.
4. If you are not willing to follow the above steps, do not proceed with painting your boat.

To save weight the main hull and sponsons are best not painted. However, to make the boat easier to see on the water and to help protect the cowl from the elements, you can paint it. Here are a few tips on painting your cowl. I will list out a quick and easy way to paint the cowl as well as a more professional way to paint the cowl.

QUICK AND EASY

Quick and easy paint supplies:
White Primer, Top Flite® LustreKote® (TOPR7527)
Color Paint, Top Flite LustreKote (TOPR7502 – TOPR7518)
Clear Top Coat, Top Flite LustreKote (TOPR7501)
Stick (to hold cowl when applying paint)
Double-sided tape
Isopropyl alcohol
Lint-free cloth

1. Follow the recommended usage on the paint cans for proper application.
2. Prep your cowl by installing a paint fixture of some type. I like to use a 36" length of 3/4" square dowel (paint stick).

3. Wipe the cowl down with isopropyl alcohol to remove any fingerprints or other oils. Allow the alcohol to completely evaporate.
4. Prime the cowl using LustreKote white primer.
5. Paint the cowl with the LustreKote color of your choice.
6. Clear coat the cowl using LustreKote clear top coat.
7. Add some decals and you're set to go!

Sounds simple and it is. This is a great way to add a personal touch to your VS1!

PROFESSIONAL FINISH:

Supplies you will need:
Spray equipment (i.e. compressor, spray gun)
Stick (to hold cowl when applying paint)
Double sided tape
Tack rag
Lint free cloth
Fine line masking tape
Painter's masking tape
Sandpaper (320 wet/dry)
Red scratch pad
Two part automotive primer/surfacer
Two part automotive color (your choice/s)
Two part automotive clear top coat

Let's get started! Prep your cowl by installing a paint fixture of some type. I like to use a 36" length of 3/4" square dowel (paint stick). You can get a length of wood like this at either your local hobby shop or your local home store. Take some double-sided tape and place a 10" to 12" length of it onto the stick. Remove the backing and attach the stick to the inside of the cowl. The longer stick makes a great handle to turn the cowl as you paint.

Prep the cowl by wiping it down with a lint-free cloth and isopropyl alcohol. Allow the alcohol to completely evaporate before going any further. Using the red scratch pad scuff the cowl to remove the gloss. Clean again with the isopropyl alcohol and allow time to dry. Do not touch the cowl after this step. Mix up some primer using the mixing ratios that come with the primer. Prime the cowl starting with a light tack coat followed by a slightly heaver coat. No need to go to a full wet coat when using primer, as we are not going for the ultimate finish but rather good adhesion. After the primer has dried, inspect for any imperfections. Use the 320 sandpaper on a sanding block to flatten any high spots or imperfections. Re-spray any areas that need to be touched up.

After the primer is fully dry, mix and spray the color. With the color, you are looking for good adhesion and uniformity. Begin by spraying a light tack coat. After the solvents have flashed off apply another tack coat, wait just a few minutes and apply a full wet coat. Be careful to avoid any runs in the paint. After the color coat has fully cured, you can add details like painting the windshield area or any fancy designs you might like to try. I like to paint my windshield a medium gray with a black anti-glare fade near the top. I also like to add more than one color. *Grimracer Says: Odd numbers of base colors look better than an even number of colors. In other words, 3 colors look better than 2 or 4.*

After the color coats have cured, mix up your clear coat. Spray the first coat on using a light to medium coat. Wait for the paint to flash off and apply another medium weight coat. After you have that medium coat applied, wait approximately 5 minutes and apply a full wet coat. Be careful to avoid runs in the clear. Move the cowl around in the light to look for any dry spray or runs, adjust or add more paint if needed. If you take your time you will be rewarded with a very long lasting, tough and great looking paint job for years to come.

LAUNCH PROCEDURE

Before running the engine, read the instruction manual that came with your engine.

1. Turn the transmitter on and then the receiver, in that order.
2. Start the engine. It is important to note, the propeller will start spinning as you start the engine. Be sure to keep clear of the propeller.
3. Once the engine is running and you are safely at the water's edge, launch the boat with a slight forward motion, applying a slight amount of throttle as you release the boat.
4. Advance the throttle, taking note of the forward track of the boat. Use the steering trim adjustment knob on your transmitter to adjust the track of the boat.
5. When you are ready to bring the boat in, drive it parallel to shore and push back on the trigger to stop the engine. Never bring your boat to shore by driving it straight at you. Always drive parallel to shore, stop the motor and then retrieve the boat. This way if for some reason your engine does not kill you can still go around and make another attempt.

ENGINE MAINTENANCE

When you are done running your VS1 for the day it is important to properly maintain the engine.

1. Remove any fuel from the tank.
2. Remove the glow plug from the engine.
3. Open the carburetor.
4. Fill the carburetor with after run oil.
5. Place a rag over the head of the engine and apply short bursts to the starting cone with your electric starter to coat the inside of the engine. Repeat this step a few more times.
6. Reinstall the glow plug.
7. Remove the stub shaft from the lower unit and slide out the cable. Re-grease the cable and reinstall.

When you are ready to run the boat again, remove the plug and turn the engine over with the starter. Try to remove as much oil as you can before restarting your motor.

CARE AND MAINTENANCE

- If you should happen to drip or spill fuel on the finish of your VS1, carefully wipe it off as soon as you can. Some fuels, especially high nitro fuels and some with special oil additives, can damage your boat's finish.
- Open the radio box and unplug the battery from the switch harness. Leave the lid off the radio box over night to make sure any water that might have entered can evaporate.
- Clean the exterior of the boat and check the mounting hardware.
- After a few runs and things have had a chance to settle you are going to have to re-tighten the pull-pull cables leading to the motor. There is no need to overtighten the cables. I have found that even a fair amount of slack cannot be detected when the boat is running.
- If you should happen to flip your VS1 you are going to need to remove any water that might have entered the engine. We recommend removing the glow plug and turn the engine over a few times by hand to remove water. After most of the water has been removed, leave the glow plug out and turn the engine over with the electric starter to expel the rest of the water. Make sure you hold a rag over the glow plug hole. NOTE: Be careful to keep your rag and fingers away from the spinning prop. Re-install the glow plug and start the engine. It is best to start the engine after you have flipped the boat to make sure ALL THE WATER IS OUT OF THE ENGINE. It is also a good idea to inspect the radio box to make sure no water entered the radio compartment.

HULL TUNING TIPS

The major tuning areas of your VS1 are:

- Propeller shaft (stub shaft) height
- Propeller shaft (stub shaft) angle
- Hinge Pin Angle
- Center of Gravity (C.G.)
- Propeller

Let's start with propeller shaft height. To simplify, what we are trying to do with propeller shaft height is to raise the propeller to a height that gives us the greatest speed with the least loss in stability. Let's expand on this.

To measure the height of the shaft most racers use a set up board. A typical tunnel hull set up board can be a simple piece of shelf board with a slot cut into one end so the user can reference the height of the prop to the bottom riding surface of the sponsons.

Adjusting the shaft height plays a huge part in the speed as well as the handling of the boat. Typically adjusting the propeller higher makes the boat run faster but at a greater risk of blowing off the water (flipping over backwards). It also can cause loss of steering in the corners if set too high. Lowering the shaft has the opposite effect and makes the boat more stable but considerably slower. It is also important to note that having the shaft too low can cause the boat to stuff or tuck under when going around the corner. Setting the shaft (prop height) is a very important part of tuning your boat. It is also good to note that even 1/16" higher or lower can make or break a good running tunnel boat.

Propeller Shaft Angle: Changing the propeller shaft angle causes the bow of the boat to either run higher or lower depending on the angle. What we are trying to accomplish by changing the shaft angle is to loosen up the boat on the water to make it go as fast as possible. More positive (+) shaft angle lifts the bow, causing the boat's tunnel to capture more air, hence less drag and more speed. The risk of having too much positive shaft angle is the possibility of blowing the boat off the water. Too much negative (–) and the boat will run too wet. Typical modern R/C tunnel boats run with about 1/2° of negative (–) shaft angle.

Hinge Pin Angle: Not all outboard engine mounting systems allow you to change the hinge pin angle separately from the stub shaft angle. It is worth noting, however, that outboard engines that do have a distinct advantage over the ones that don't. Let me explain. When the servo swings your engine left or right, the stub shaft follows the arc that the hinge pin has been set at. If you have a positive hinge pin angle, your stub shaft swings in a positive, neutral, positive motion (+ 0 +). If your hinge pin angle is set negative, your stub shaft swings in a negative, neutral, negative motion (– 0 –). It's important to note this, as the more positive angle the hinge is set at the higher the bow raises in the corners and the opposite regarding negative pin angle. These can be a huge tuning advantage for the way you drive. To adjust the hinge pin angle you must shim either the top or the bottom of the engine mount plate from the transom. Also: You are going to want to avoid engine mounts that set the hinge pin past the back of the sponsons. Having the pin in front of the sponson we call under steer and behind the back of the sponsons over steer. The VS1 likes the pin in the under steer position.

Center Of Gravity (C.G.): The center of gravity "balance" of your boat is just as important as other adjustments you make. Adding or removing weight from the front of the boat ultimately decides the stability of the boat as it flies over the top of the water. The further forward you have the C.G., the more speed the hull can handle, but like other adjustments to your boat it comes with a price. As a model tunnel boat operates, the boat's ride can become disrupted. Any "acting forces" (i.e. wind, waves, drag and or acceleration/deceleration) can cause the boat to lose its balance. A properly set C.G. gives you the best overall balance regarding all those changing conditions.

Propeller: First and foremost you need to balance or use a balanced propeller. Not only will this provide the best performance but it is necessary to avoid damaging your engine. You can learn more about how to balance your propeller at **www.aquacraftmodels.com**

The propeller is probably the most important aspect of how fast your boat goes and or how well it handles. A poor handing, slow boat can become an instant winner just by using the right propeller. As a rule of thumb, non-lifting propellers are best suited for your tunnel hull. Some lifting propellers can work but typically need to be "re-worked" to make work well on a Tunnel Hull. For the best overall performance stick with a low lift propeller like the AquaCraft GrimRacer 40x53 or AquaCraft GrimRacer 40x52/3. Testing your propeller is best done with a stop watch. The most important reading is the time the boat takes to go from buoy one (1) to buoy three (3) IMPBA and buoys one (1) through five (5) NAMBA. The second most important time to capture is overall lap speed. Your boat may sound or look faster with a prop change but don't let that fool you. Course timing is the best way to determine what if any changes your prop change as made.

Rudder Deflection: Your VS1 needs very little rudder deflection to make it around a corner. Obviously your boat will turn tighter with more rudder defection but the truth is this can upset the boat in the corners. It is best to have just enough rudder deflection to make a nice sweeping corner PLUS just a tad tighter. To set the amount of rudder deflection, run your boat on the race course at half throttle. Adjust the steering dual rate until the boat makes a nice sweeping corner a few feet off the buoys. Next: Run the boat at top speed (remember to lift off the throttle just a little going into the corner) and drive the course. Add in more dual rate until the boat runs the course smooth and fast. Give a few more clicks on the dual rate adjustment. The extra movement might be needed to get you out of danger in the middle of a race.

VS1 BASIC SETUP PARAMETERS:

Motor Height:	.200" Center of the prop shaft to the bottom of the sponsons
Propeller Thrust Angle:	.5° Negative
Hinge Pin Angle:	Parallel to the transom
C.G. Range:	7.5" (27%) to 8.6" (31%) from the back of the sponsons
Prop:	40x52/3 (AQUB9720)
Rudder Deflection:	1-3/4" left – 1-3/4" right

DRIVING AND RACING TIPS FROM 12-TIME NATIONAL AND WORLD RACING CHAMPION MIKE "GRIMRACER" ZABOROWSKI

Your VS1 makes a fantastic Sport Class racing boat. The VS1 was designed ultra light to take full advantage of low power stock style motors. The VS1 is fully capable of wining races against boats with a lot more power.

Grimracer says, *"Don't just drive your VS1 around, drive your VS1 around something!"* To reach the full potential this boat has to offer, you need to get it on the water running around the race course. Running your boat on the race course allows you to build depth perception as well as get to know the needs of the boat.

The VS1 responds best if you drive it as if you were driving a car or any other type of wheeled vehicle. Your lap times will go down if you lift off the throttle and set the boat as you enter the corner and accelerate out. Driving "white knuckled" you will likely not be paying attention to your entry point, losing valuable seconds off your lap time.

If the pond you test at has an elevated driver's platform, make sure you stand on it even during testing. Also stand in multiple locations. This way if you do not get your favorite spot on race day you will not be surprised by what you experience. It is also good to take a quick look at the water and race course before you launch the boat for your heat. If you see a buoy out of place or an obstacle in the water it's best to identify it before you launch the boat.

Starting and launching the boat later in clock time is far better than starting and launching at the beginning. If your clock time is 2:30 like most, be warned, if you go out early you are adding to the seconds your boat can get into trouble. During the race it's best to be on the water ONLY as long as you need to be.

Also have your caller show you the back of the boat before he or she launches it. Move your rudder back and forth and make SURE it is working before the boat is launched.

The VS1 was designed for the use of "stock" or "sport" outboard motors. The ultra light weight of the VS1 and long flat section on the sponson bottoms take full advantage of the lower power stock motors have. We do not recommend the use of a modified (piped engine) on this hull.

ORDERING REPLACEMENT PARTS

To order replacement parts for the AquaCraft VS1 use the order numbers in the replacement parts list that follows. Replacement parts can be purchased from your local hobby shop or by mail order. If you need assistance locating a dealer to purchase parts, visit www.hobbico.com and click on “Where to buy”. If you are missing parts, contact Hobbico Product Support at:

Phone: 217-398-8970
Fax: 217-398-7721
E-mail: **productsupport@hobbico.com**

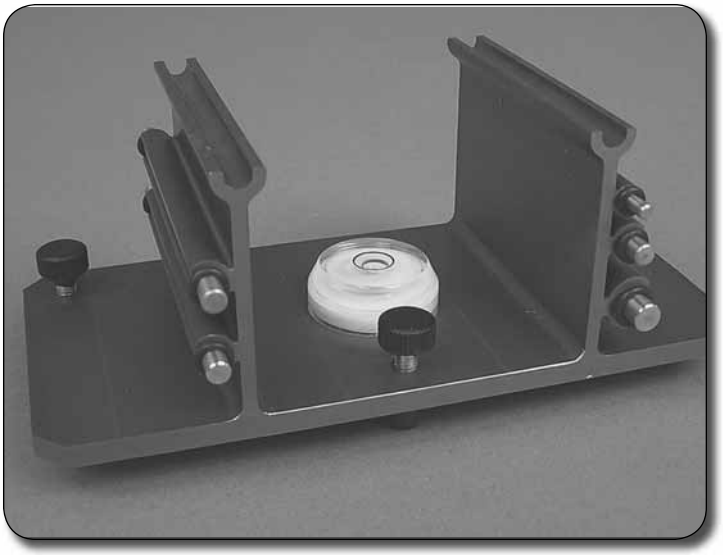
REPLACEMENT PART NUMBERS

AQUB9535	GrimRacer Tunnel Hull Fuel Tank 8oz
AQUB6899	Fuel Tank Hold Down O-Rings
AQUB7768	Pull-Pull Cable Tunnel Hull
AQUB8611	Radio Box Lid VS1
AQUB8610	Radio Box Output Guide VS1
AQUB9536	GrimRacer Pull-Pull Wheel Assembly 35mm
AQUB9537	GrimRacer Antenna Mount Assembly
AQUB6506	Engine Mounting Plate VS1
AQUB6226	Cowling
AQUB6898	Fuel Tank Mount
AQUB6328	Decal Sheet
AQUB9538	GrimRacer 8-32x1/2 Cowl Thumb Screw
GPMQ3790	Steel Clevis 2-56
GPMQ3830	2-56Threaded Coupler
GPMQ3702	Throttle Cable
GPMQ3300	2-56 Nut
GPMQ3404	#6 Flat Washer
GPMQ3038	6-32x1 Socket Head Cap Screw

Below are some great web sites to help you in your R/C boating quest.

www.aquacraftmodels.com
www.futaba-rc.com
www.osengines.com
www.odonnellracing.com
www.intlwaters.com
www.rcuniverse.com
www.rcgroups.com
www.metimeproductions.com

GrimRacer™ Precision Prop Balancer

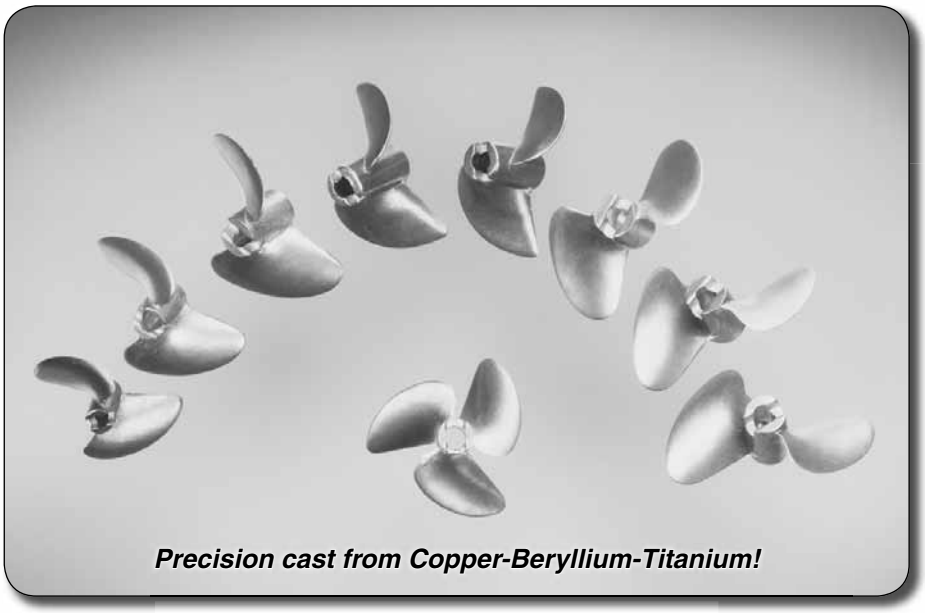


To maximize performance — and minimize damage to on-board electronics and parts —balance your props with the GrimRacer Precision Prop Balancer. It’s easy to use. Three thumb screws provide perfect level adjustment, and a precise bubble level is built into the one-piece extruded aluminum base. The balancer includes balancing shafts for 1/8” (3.2 mm), 3/16” (4.8 mm) and 1/4” (6.4 mm) bore prop hubs. Propeller not included. **AQUB9575**

GrimRacer™ Pro Radio Box Tape
Like champion racer Michael “Grimracer” Zaborowski, use this 3/4” wide, clear electrical 3M tape to seal your boat’s radio box water-tight. **AQUB9514**

GrimRacer™ Speed Grease™ Cable Lube
This waterproof blue lubricant — with specially formulated, “non sling” properties — reduces friction and wear on the cable and direct drive systems in electric and nitro boats. **AQUB9500**

GrimRacer™ HIGH-PERFORMANCE METAL PROPELLERS



Precision cast from Copper-Beryllium-Titanium!

Give your VS1 an added burst of speed — as easily as bolting on a high-quality copper-beryllium-titanium GrimRacer metal prop! Racer-designed and USA-made, these are the most accurately cast metal props available. Ultra-clean casting and true center-bore hubs place each prop near its balance point right out of the package. You can fine-tune them using less effort than stainless steel props require — and they hold their shape better for balancing, sharpening, and changing pitch.

Stock #	Description	Type	Diameter	Pitch	Bore	Octura Equivalent	Prather Equivalent
AQUB9715	40 x 53	2-Blade	40mm	53mm	3/16"	440	215
AQUB9720	40 x 52/3	3-Blade	40mm	52mm	3/16"	440	220

ENGINE MOUNT TEMPLATE