ENFORCER BOAT INSTRUCTION OPERATIONS OWNERS MANUAL 2008

DESIGN AND DRAWINGS BY: TONY CASTRONOVO

MODEL-_____
SERIAL #_____
PRODUCTION DATE-_____
OWNER-_____

GLOSSARY OF MODEL BOATING RELATED TERMS

Many of the terms commonly used in gasoline model boating were actually thought up by Tony Castronovo of Warehouse Hobbies Inc. in the early 80's when Enforcer Manufacturing Company was first started. These terms were used to identify specific products towards a new customer base. Today many of these terms have become household names to model boaters and so generic that some of our competitors use them to market their products. These specific terms coined by Warehouse Hobbies Inc. will be identified bellow with an asterisk.

PARTS AND OR PRODUCTS

BIG BORE CARBURETOR* - The term given to a carburetor with a larger intake diameter, usually identified as a performance enhancement.

ISO—PAD* - A device originated in concept and design by Warehouse Hobbies to firmly secure the drive shaft tube by adhesion with common silicone to the hulls bottom. This concept offers the ability to easily replace the shaft tube as well as offer a vibration dampener when used as a mounting point connected to the engine.

SPD*- The term to describe the unit that holds the prop shaft assembly to the rear of the transom for surface drive applications, (a concept used in full size off shore boats introduced to model boating by Warehouse Hobbies in 1981). Referred to as "Surface Plaining Drive", or SPD.

PRO-WET-TUNED EXHAUST*- The performance "water injection tuned" system conceived and designed by Warehouse Hobbies, enables the tuning of a shorter exhaust system that operates at relatively low temperatures and can be concealed inside a closed hull.

PULSE TAP FITTING*- The term to describe the fitting to operate the water pump by means of a vacuum port from the engines crank case pressure / pulse.

PULL-N-SEAL*– A device used to seal the antenna wire through the radio box without the need for sealer.

ON BOARD GREASING*– The ability to grease the drive shaft components by means of a port located inside the hull.

GEL COAT– The polyester based glossy finish on the hulls exterior.

COMMON REFERENCES OF ENGINE TERMS

CARBURETOR

RICH- A term to indicate that there is too much gas to air ratio in the carburetor.
LEAN- A term to indicate that there is too little gas to air ratio in the carburetor.

INTAKE MANIFOLD– The device located between the carburetor and engine (intake side) used to mount the carburetor

EXHAUST MANIFOLD– The device located between the exhaust header and engine (exhaust side) used to mount the header to the engine.

EXHAUST HEADER– The tube or pipe between the tuned pipe and the exhaust manifold.

CLUTCH DRUM– The "drum" shaped device where the clutch assembly expands to couple the engine to the drive train.

RESISTOR SPARK PLUG– A specific spark plug that contains an internal resistor device to limit potential radio disruption caused by the high voltage ignition system.

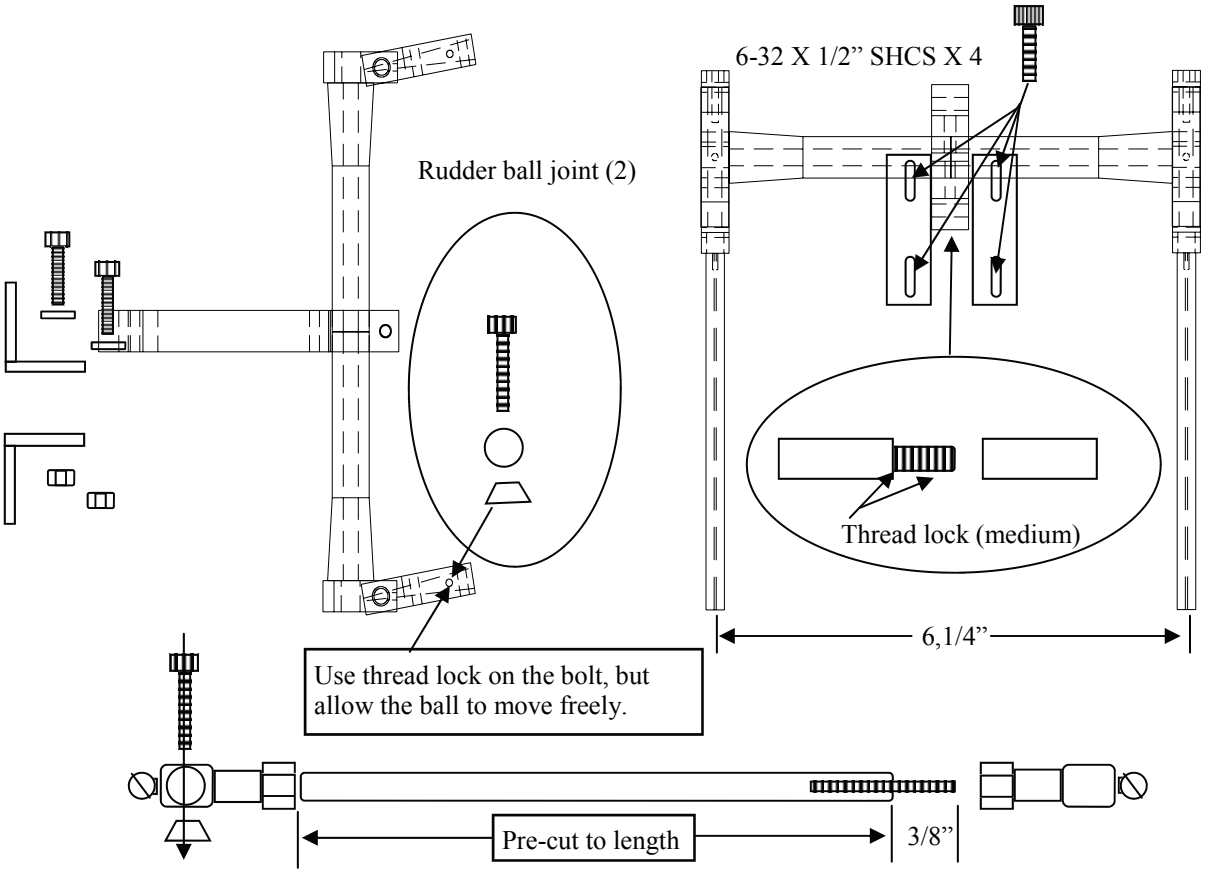
HARDWARE

SHCS- SOCKET HEAD CAP SCREW
HHMS– HEX HEAD MACHINE SCREW
SMS– SHEET METAL SCREW
SS– STAINLESS STEEL EXAMPLE: SSSMS– STAINLESS STEEL SHEET METAL SCREW
PH– PAN HEAD EXAMPLE: PHSMS– PAN HEAD SHEET METAL SCREW
CLEVIS– The device that connects the steering rod to the control arms on both the steering servo and the rudder.
EZ CONNECTOR– The device that connects the throttle cable to the throttle servo.
LT BEARINGS– Replaceable bearings in the SPD cartridge that support the prop shaft made out of a lead /Teflon materials.
DRIVE HUB– The device that locks the propeller to the prop shaft.

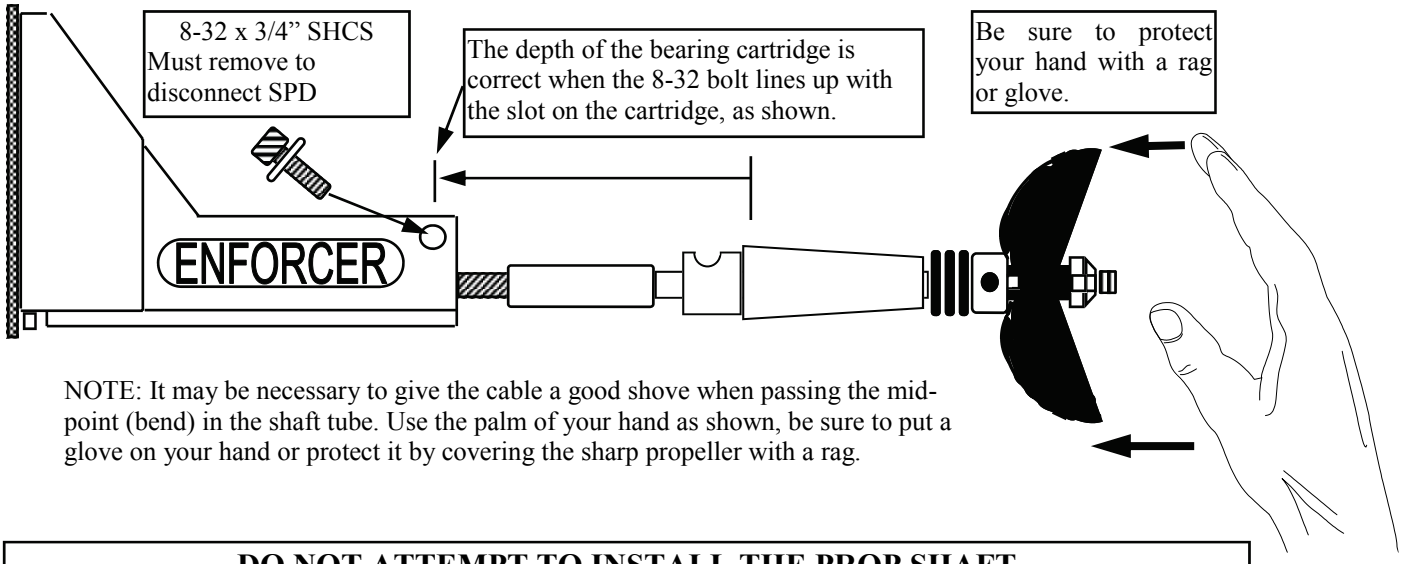
PREPARING YOUR ENFORCER FOR MAIDEN VOYAGE

For shipping purpose the following parts must be re-installed and adjusted prior to operation. Please follow the directions on this page and in this booklet before operation your Enforcer Boat.

Step 1– Locate the Dual Rudder assembly and re-install it to the transom bracket with the supplied hardware. When adjusting the rudders be sure that they are parallel to the transom. Also, make sure that both rudders are even at the top and the bottom as shown. Use the adjustable ball/joints to make any necessary adjust ments. To shorten tie rod turn ball/joints clockwise and opposite to lengthen.



Step 2– Apply a coat of shaft grease to the drive cable and insert the assembly with the square end first into the SPD body. Push the assembly in until the bearing cartridge fully inserts into the SPD body and the groove on the cartridge lines up with the hole on the SPD body. Insert the 8-32 screw and tighten snug.

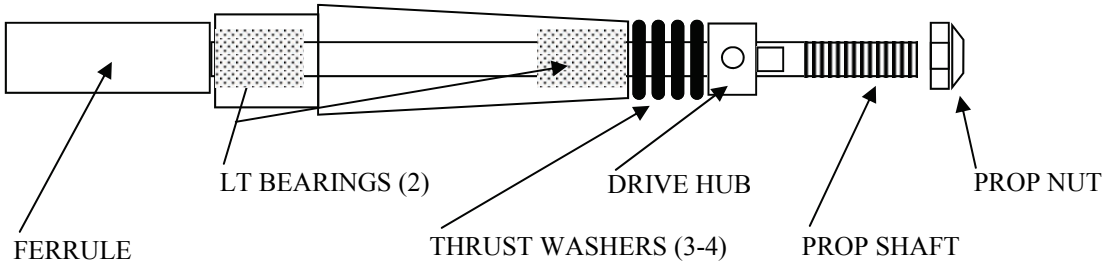


NOTE: It may be necessary to give the cable a good shove when passing the mid-point (bend) in the shaft tube. Use the palm of your hand as shown, be sure to put a glove on your hand or protect it by covering the sharp propeller with a rag.

DO NOT ATTEMPT TO INSTALL THE PROP SHAFT ASSEMBLY WITH ENGINE RUNNING

DRIVE LINE MAINTENANCE AND WEAR ITEMS FOR ENFORCER SPD III CARTRIDGE

SEE THRU VIEW OF ENFORCER SPD III CARTRIDGE



The **Thrust Washers** (4) are located between the Drive Hub and the SPD Cartridge. These take the thrust load from the prop and are designed to wear, and eventually they will simply disintegrate. As they wear they need to be replaced. You can safely operate your boat with as little as (2) Thrust washers, but we recommend that 3-4 are present at all times. If operated without the Thrust Washers in place damage to the SPD Cartridge and the Drive Hub will occur, as well as a loss of performance.
When replacing Thrust Washer (s) it is important to leave 0.40-0.60 clearance (endplay) between the Drive Hub and the SPD Cartridge.

The **Lead Teflon Bearings** (2) are pressed in place, one on each end of the SPD Cartridge. Refereed to as; LT Bearings, they are manufactured with a thin Teflon coating that the prop shaft spins in. These bearings are designed to wear over time and require to be replaced. The proper time to replace them is when there is a noticeable amount of side to side play or "slop". This is very important as worn out bearings can cause damage to the drive system, and can be dangerous when in operation.
To change the LT Bearings, simply press the old ones out using a metal dowel pin the diameter of the bearing. You can use a vise as a press to push one bearing against the other, then locate the end of the cartridge over a surface where the bearings can be passed through, yet support the cartridge.
LT bearings are sold in pairs.

The **Drive Hub** can be removed by loosing the (2) set screws. Theses set screws are factory installed with (blue) thread lock. If they do not loosen easily, install the Allen key and carefully heat it with a small torch close to the Drive Hub. You will now be able to loosen the set screw easily. Do not force the set screw loose or you can strip the set screw.
When re-installing the drive hub be sure that one of the set screws seats into the groove on the prop shaft.
When replacing Thrust Washer (s) it is important to leave 0.40-0.60 clearance (endplay) between the Drive Hub and the SPD Cartridge, the Drive Hub

The **Prop Nut** is a nylon locking type nut that securely holds the propeller firmly against the drive hub as well as keeps it from coming off of the prop shaft. It is important that when re-installing the prop nut that you do not over-tighten it. If you apply too much force to the prop nut, it can push the drive hub tightly against the thrust washers and cause the entire assembly to bind, resulting in loss of performance and possible damage to the thrust washers and drive cable. Once the nut is up against the prop and the prop is seated into the drive hub, apply only 1/4 turn to the prop nut, this will provide the required pressure to hold the prop in place.

The **SPD III Cartridge** is the cone shaped aluminum tail piece that houses the two (2) Lead Teflon Bearings. This unit is designed to slip fit into the SPD body and secure in place with the 8-32 socket head cap screw. You will notice that there is a "C" groove located on the area that penetrates the SPD body. This groove must face up and align with the hole on the SPD body in order for the 8-32 screw to be installed. Once in place re-install the 8-32 screw and tighten snug. Do not over tighten you can strip or possibly break the 8-32 screw.

The **Prop Shaft and Ferrule** are of no real maintenance . After a days use it is best to simply remove the entire cartridge and clean the cable with a rag and apply some spray oil to the assembly. It is best to store it left out of the drive assembly. The drive shaft can be removed from the ferrule by simply heating the assembly with a torch and un-screwing the pieces in a normal counter clockwise rotation. When using pliers to hold round parts, be sure to use a rag or rubber directly against the metal parts. The prop shaft is a bearing surface and can not be scared.

WELCOME TO THE ENFORCER FAMILY

Dear Customer,

Congratulations, and welcome to the Enforcer family, the worlds finest gasoline powered radio controlled model boats. There is no doubt that you now own the most reliable, highest in quality and easiest to operate gasoline powered boat available. With all this said there are a few things that we must go over before our maiden voyage to insure that you understand and enjoy the exciting hobby of fast paced gas model boating. Though these boats are often refereed to as "toy's", they need to be treated with care and respect, they can cause bodily harm and or property damage if improperly used. In these directions we provide you with the necessary information to safely operate your Enforcer boat. We require that these instructions are carefully followed and the contents of this booklet is completely understood prior to operating your model.

The use of common sense is also necessary when operating a model of this caliber. Enforcer boats are capable of very high speeds, and must be used in unrestricted bodies of water where there is no human activities, (swimming, personal watercraft, water skiing, etc.) in the relative area.

Noise is also an important consideration. Always get permission to operate your model before doing so. Always operate your model at the time of day where noise will not be inconsiderate to others. We also recommend that no one operates an Enforcer boat under the age of 18 without experienced adult supervision present.

Important things to know

Your Enforcer boat is made in the USA using the most advanced in materials, however care must be taken to assure a long life. The engine is manufactured by Zenoah the leading manufacture of gas powered engines. We have included specific instructions provided by Zenoah for operating directions and maintenance. Please be sure to read and understand them prior to starting your engine.

AVOID– Operating your model in water that is less than 50 degrees F. Cold water can cause the Gel coat finish to fracture under operating conditions. Though this will not normally breach the structural integrity, it can produce visible hairline cracks.

AVOID– Jumping large waves (6" +) at high speeds. In reality a wave is 10 times the size to the model, therefore a 6 inch wave would be 60 inches in real life. The same damages that can occur to a real boat can occur to your model. The Gel coat finish on your model is the same finish as a full size fiberglass boat, It is the most durable finish available, however if you subject your boat hull to severe pounding it will become compromised resulting in Gel Coat fractures and possible fiberglass damage.

Your Enforcer is equipped with "floatation" foam factory installed in the bow of the boat. This will keep the boat from sinking. In the event of a overturned boat follow all of the relevant directions located in the back pages of this manual. Failure to properly follow these procedures can cause serious damage to your boats engine and or radio equipment. NEVER swim for a stalled or overturned boat. Always have a safe and approved retrieval device, such as a small boat/raft. Always wear an approved life saving vest when ever in a retrieval vessel. Enforcer boats can be replaced.

Carefully follow all the instructions provided in this manual. If at any time you do not understand a particular step or area of information, please call us at: (863) 699-1231 and we will be happy to assist you. Our company hours are: Monday - Friday 9:30 am - 5:30 pm Est.

Thank you for purchasing one of our fabulous Enforcer model boats. I am quite sure that you will be amazed at the quality and performance of your new model. Who knows, this time next year you may even own an entire fleet of Enforcer boats, don't laugh we have hundreds of customers who are multiple Enforcer owners…

On behalf of Warehouse Hobbies I would like to personally thank you once again for choosing Enforcer.

Welcome aboard,

Tony Castronovo

President, Warehouse Hobbies Inc.

INSTALLING THE ISO-PAD SHAFT TUBE MOUNT

DIRECTIONS TO INSTALL ISO-PAD

Step 1– From the bottom center of the keel, measure up 1/2" and make a mark. Use a 1/16" drill bit and make a pilot hole on the mark. See figure 1.
Use a 3/8" drill bit and with the drill in reverse mode, start to drill a hole on the pilot hold until the bit has evenly cut through the Gel coat. Once this has been done put the drill in normal right hand rotation and complete the hold through the transom.
Clean any debris from the area.

Step 2– Use acetone to completely clean the Enforcer Iso-Pad. Once clean scuff the bottom of the pad with some 80-100 grit sand paper.
Using acetone on a rag carefully clean the bottom inside of the hull between the stringers (rails) forward about 4 inches.
Make sure the inside bottom is flat and there are no lumps of fiber-glass or resin. If there is use sand paper on a block to sand the area flat. The contact portion of the Iso-Pad Must be adhered to a flat surface.
Using NAPA Auto brand "Even Bead" Pt. #- 765-1483, apply a liberal amount of silicone sealer as shown in fig. # 2.

Step 3– Press the Iso-Pad in place against the bottom and firmly against the inside back of the transom. Be sure that the 3/8" hole through the transom aligns with the 3/8" hole in the Iso-Pad.
Use (2) 1" X 2" X 4" wood blocks, one on each side with small weights as shown in figure 3 to apply pressure to the Iso-Pad until the silicone cures.
The weights should stay in place for a couple of hours, however you should wait 24 hours minimum before using your boat. After a few hours you can make the engine/shaft installation being careful not to move the pad out of place.

Concept and Design by: Tony Castronovo 1997
Drawing by: Tony Castronovo 2008

Fig. 1

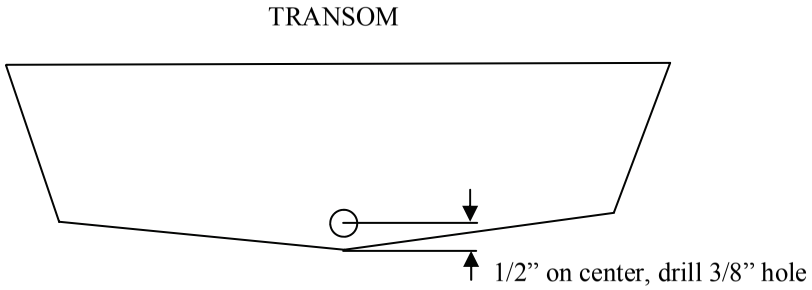
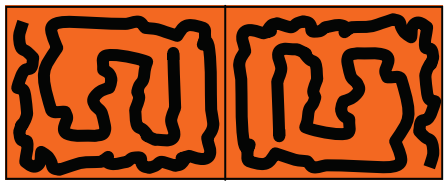
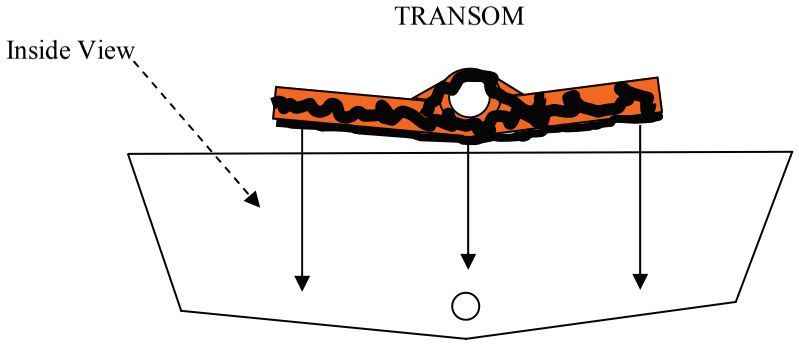


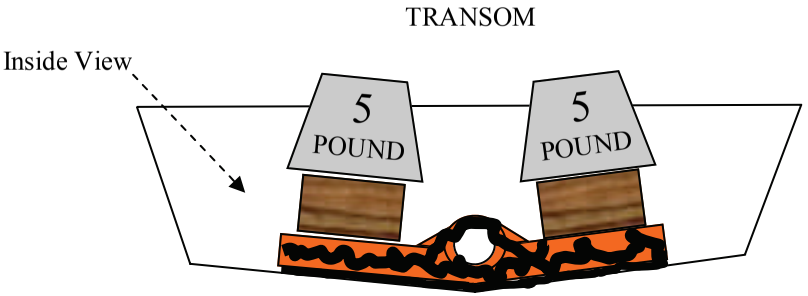
Fig. 2

Apply NAPA Even Bead as shown, Pt.#- 765-1483
Be sure to apply on both sides of the bottom of the pad as well as the back of the pad that makes contact with the transom, this is important to form a water-tight seal.





Step 3



PREPARING YOUR ENFORCER FOR MAIDEN VOYAGE

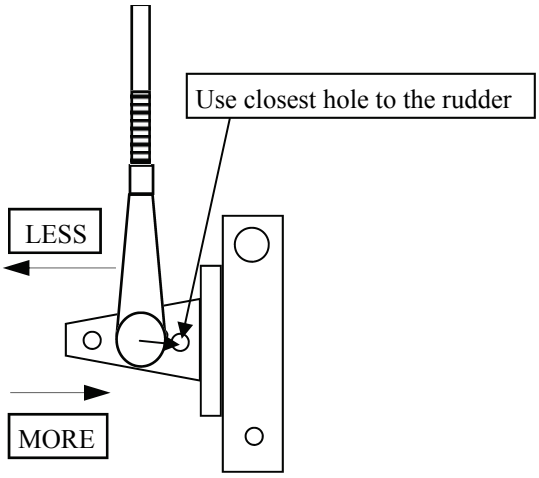
RADIO SYSTEM INSTALLATION

Choose a quality 2-channel radio system to command your Enforcer. Standard servos are adequate for the throttle servo only. All Enforcer models must use a 1/4 scale servo for rudder control. We recommend the Hitec HS700BB servo. If you are using an older radio system you have previously used, make sure it range checks (see Radio Range Check) properly and is on the proper ground frequency required by the FCC; 27 MHz or 75 MHz only. The servo trays are pre-cut to accept most standard radio systems on the market. Follow the diagram supplied with your boat to safely install your radio system. If you are not certain on the installation procedure find a hobby shop that is capable of this type of installation.

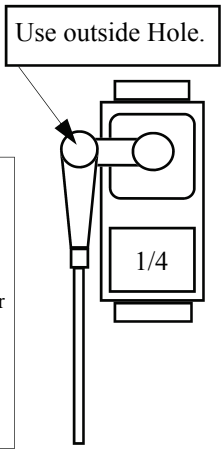
ADJUSTING YOUR RUDDER & RADIO SYSTEM (BOATS SOLD WITH RADIO SYSTEMS)

Install (8) AA (Penlite type, **Alkaline Only**) into the transmitter. Next, install (4) AA (Penlite type, **Alkaline Only**) into the battery pack located in the radio box in the boat. Use either electrical tape or a rubber band and/or balloon around the batteries, this will ensure that they will stay in place in the event of rough water conditions.If you choose to use NiCad rechargeable batteries, we have designed the radio box to hold as large as 4 sub c cells to fit under the radio tray, between the two servos. Even though your radio system was factory set, it will be necessary to re-set the rudder adjustment because of the removed control arm. Turn both the transmitter and the receiver on. The servos will find their position according to the transmitter sticks (wheel). Next locate the trim button under the steering stick or on the control panel if you have a wheel type radio. This should be in the center position; if not re-position so that it is centered. Now you can hook the clevis to the rudder arm. We recommend using the closest hole from the rudder. Simply screw on the clevis and set the rudders so they favor the left 2 or 3 degrees. This will help offset the torque caused by the propeller. More steering can be acquired by moving closer to the pivot pin, and lesser as you move further from the pivot pin. Next set the rudders so they are 90 degrees to the transom, be sure that they are secured tightly.

TOP VIEW OF RUDDER ASSEMBLY



STEERING SERVO



When re-installing the steering arm on the servo, make sure your radio system is on, both receiver and transmitter. Allow the servo to center making sure the trim switch located under steering arm is in the center. Use the extreme outside hole.

ADJUSTING YOUR THROTTLE & RADIO SYSTEM

If your Enforcer was purchased with the radio system factory installed, the throttle has been adjusted. However, it never hurts to double check and familiarize yourself with this function. It is quite simple, as you increase throttle stick or trigger (if you have wheel type radio), the carburetor should open to its maximum; as you decrease throttle the carburetor should close. If this function is not properly operating you can adjust the throttle cable from the throttle servo in the radio box. With a tiny Allen key, loosen the set screw located on the cable stay. You can now adjust the cable to perform both functions properly. **DO NOT** operate your boat if the throttle does not close entirely allowing your boat to idle with no prop movement when placed in the water. If you are still uncertain, we will be glad to assist you. Phone: Warehouse Hobbies Technical Service Line - Monday thru Friday - 10 a.m. to 5:30 p.m. EST at (863) 699-1231.

RADIO RANGE CHECK

This next procedure is very important both in safety and property. It is necessary to perform a range check each day before you begin operation of your radio controlled boat, this will ensure your radio is working properly. Turn both the transmitter and receiver on. Keep the antenna on your transmitter in the down position. While walking away from your boat, move the rudder stick or wheel back and forth watching for rudder movement. Your radio should operate at a distance of 50 feet from the boat with the antenna down. If it does not operate, check your batteries. If, after replacing the batteries, you still cannot properly perform this range check, your radio may need service from the manufacturer. ***DO NOT OPERATE IF YOU ARE NOT CERTAIN OF YOUR RADIOS RANGE!***

ADJUSTING YOUR CARBURETOR

Your engines carburetor has been pre-set at the factory for proper "break in". After the first full tank of gasoline has been burned you can fine tune the carburetor to reach top speed and optimum performance. There are three (3) adjustments on your carburetor, Low Speed Needle, High Speed Needle, Main Idle. The Low and High speed needle valves adjust the internal fuel metering. Each is marked on the carburetor block next to the respective needle, (H) (L). The low speed needle valve controls the fuel metering from idle to mid range. The high speed needle valve controls the fuel metering from mid to full range. The main idle screw adjusts the butterfly plate for a consistent low idle rpm. We recommend that your engines idle rpm's be set to allow the clutch to disengage at idle speed. **NOTICE: Read and understand the engine manual supplied with your model before starting your engine.**

DEFAULT SETTINGS

If your adjustments have caused the engine to not run properly you can always reset the needles to these default settings. H– 1 5/8 +/- 1/4 turn L– 1 +/- 1/4 turn Main– User discretion
Refer to the engine manufactures service manual for specific details.

PRIMER BULB

The clear plastic bulb located on the top of the carburetor is the "primer bulb".
Prior to starting your engine you must push this bulb several times until the bulb becomes full of fuel.

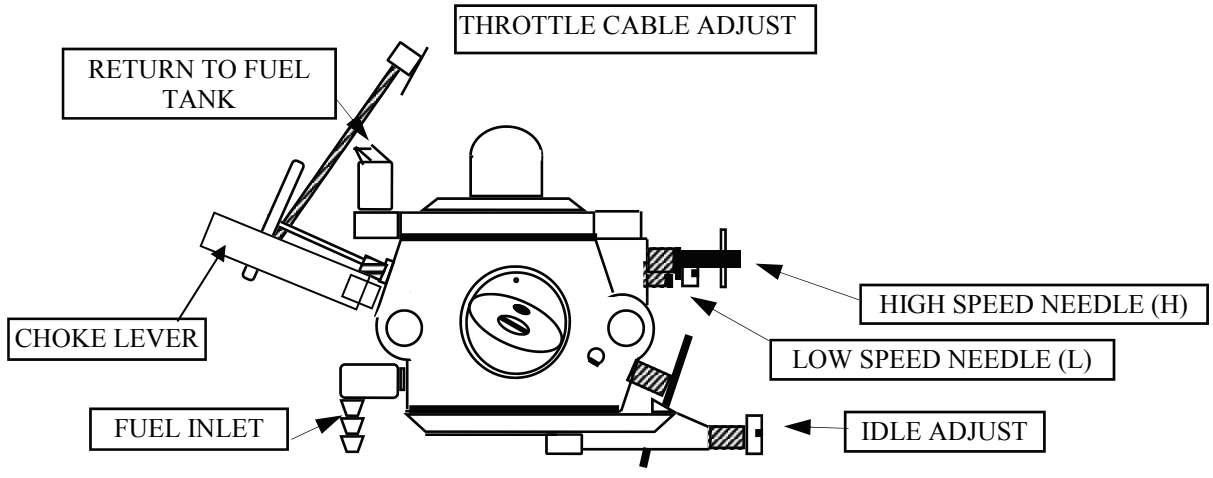
CHOKE

The (yellow) 1" tube on the carburetor is the choke lever. The lever turned clockwise (Right) is the start or "choke" position. Counter clockwise (Left) is the "run" open position. It may be necessary to choke a cold engine at the beginning of the days use. If you flood the engine the best way to start it is to hold the throttle wide open with the lever in the run position, pull the starter rope until the engine fires and runs, decrease the throttle at that point to avoid over revving. It may be necessary to have someone help by controlling the transmitter (throttle). **NOTE: READY TO RUN BOATS ARE SHIPPED WITH CHOKE CLOSED**

FINE TUNING

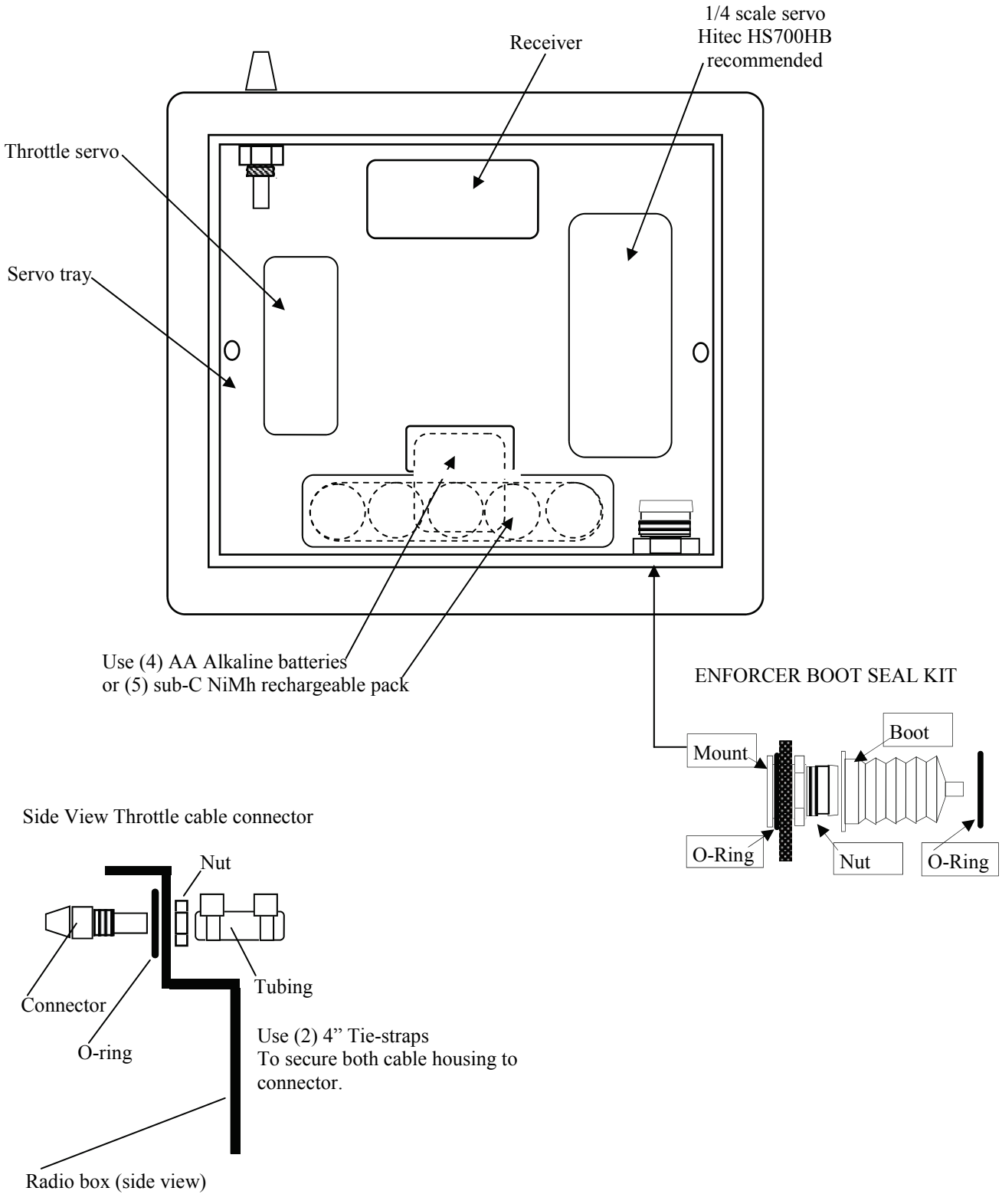
The low speed needle is generally set very close and may not require any additional adjustment. The high speed needle can be turned clockwise to lean (faster), or counter clockwise to richen (more fuel). It is best to make very minor adjustments 1/16-1/8 turn testing between each. Too far one way or another will have a negative effect on your boats performance.

ZENOAH CARBURETOR (25cc G260 MARINE)

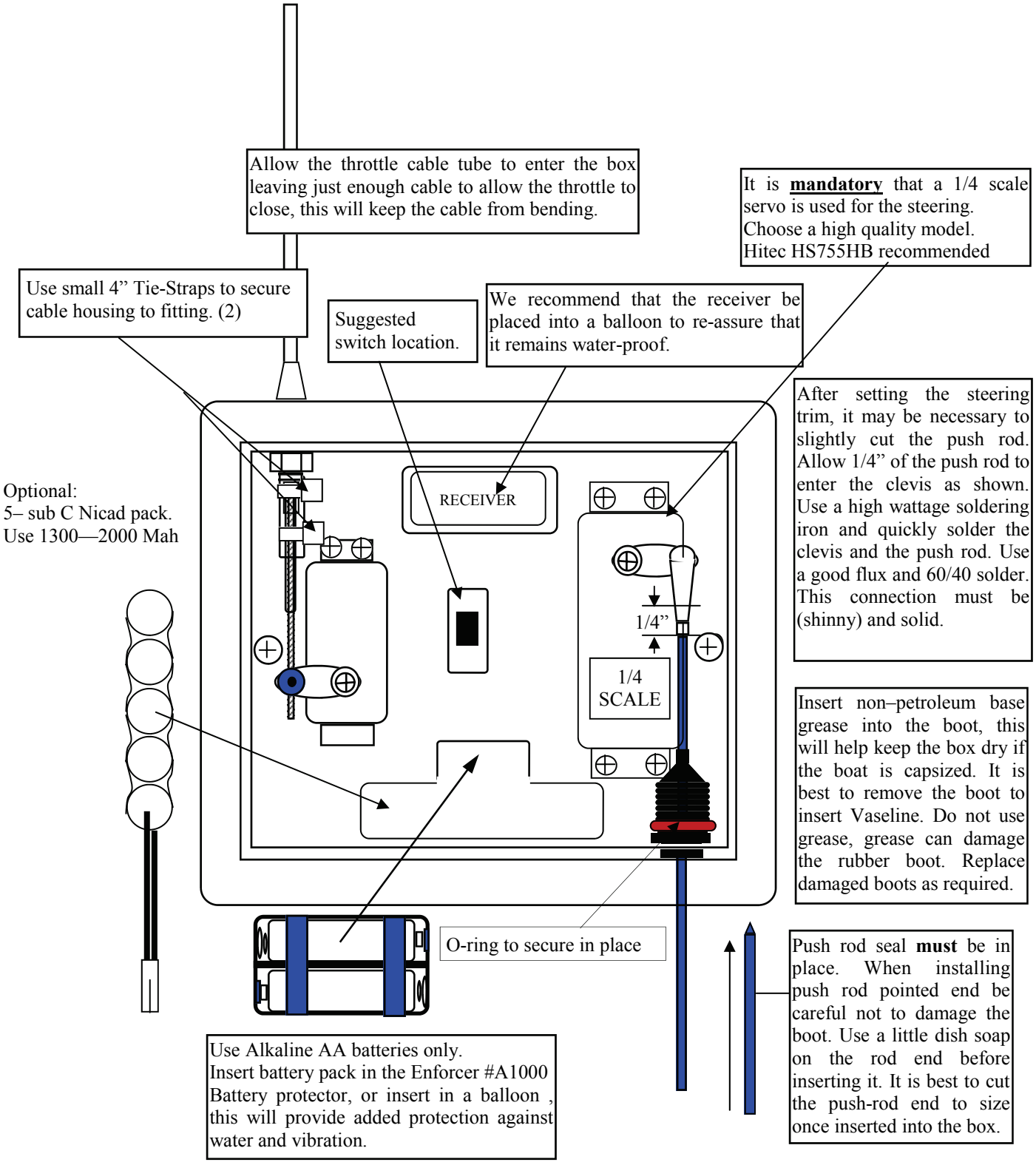


RADIO BOX PREPERATION

ENFORCER RADIO BOX



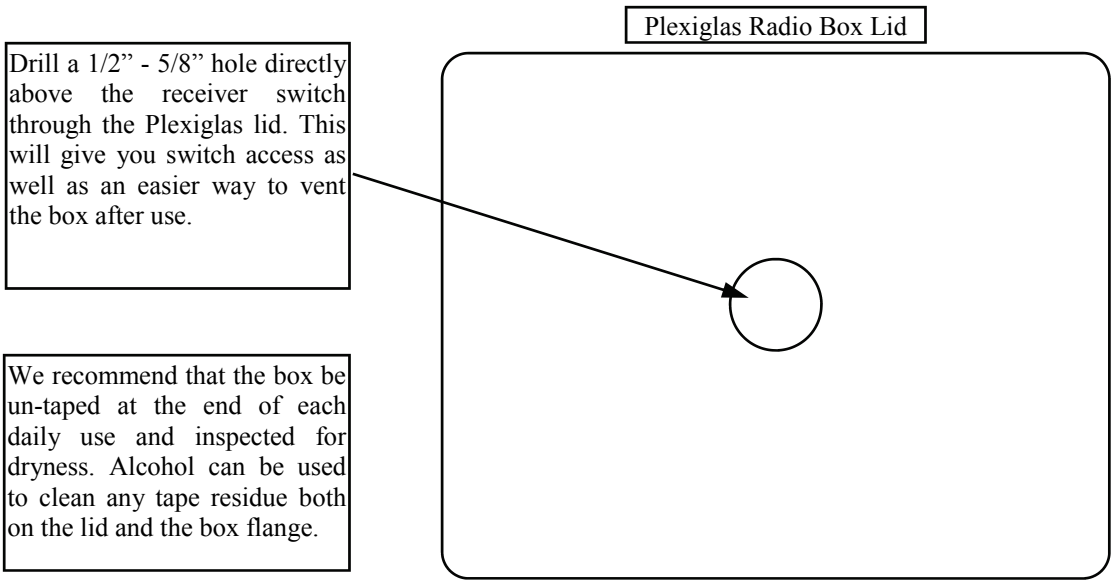
INSTALLING YOUR RADIO SYSTEM



Above are the factory recommendations for radio components installation. We **strongly recommend** that all of our suggestions on this page are followed. Over the past twenty years Enforcer has put an enormous amount of effort in making gasoline model boating as safe and "fool-proof" as possible. Installing your radio equipment properly and keeping it dry are the most importants part of a safe and enjoyable model boating experience.

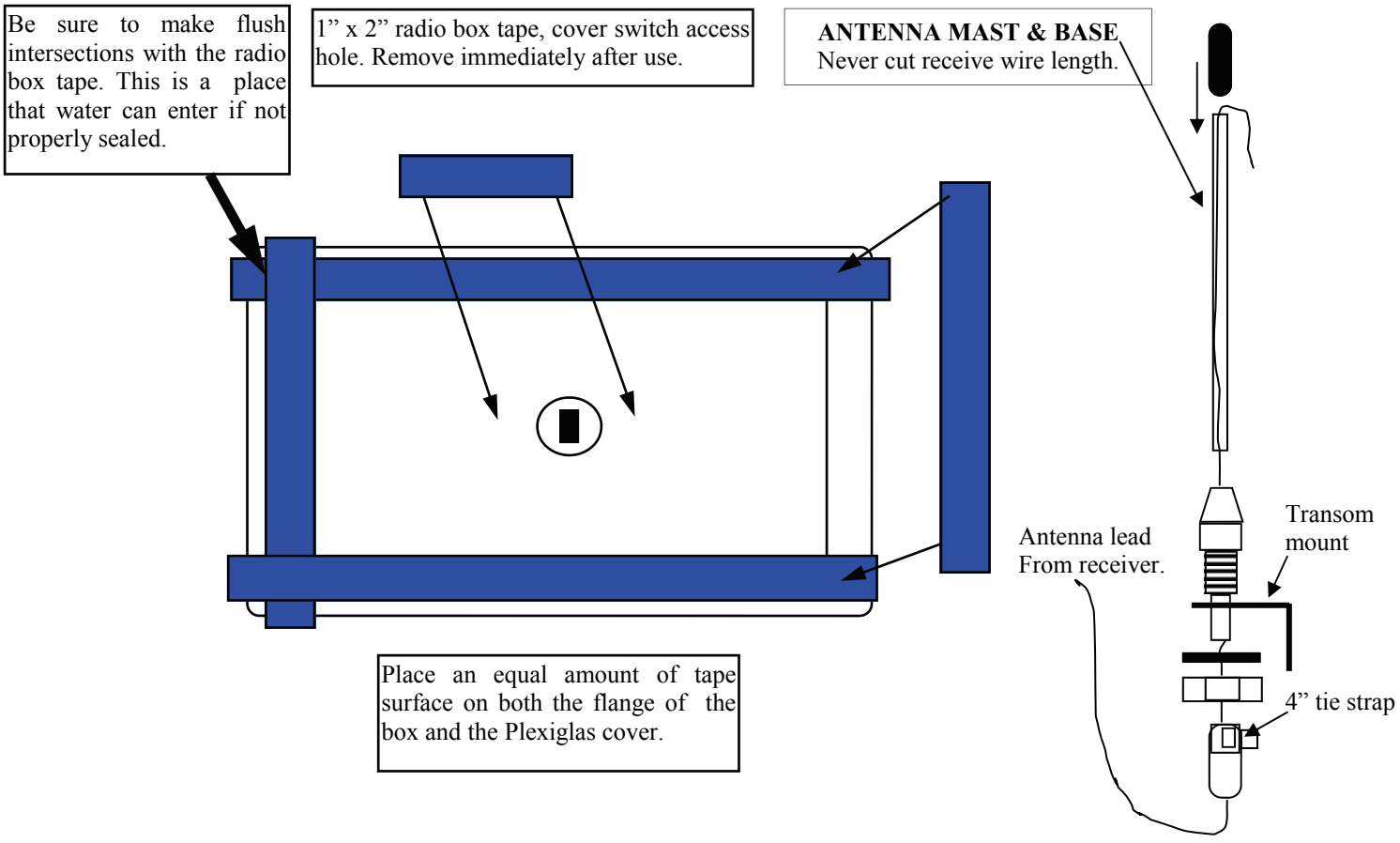
Note: A small dry sponge can be placed at the bottom of the radio box between the steering and throttle servos. In the event that the box is submerged for an extended period of time, any water that may leak into the box will be able to be absorbed by the sponge.

PREPARING YOUR RADIO BOX FOR VOYAGE

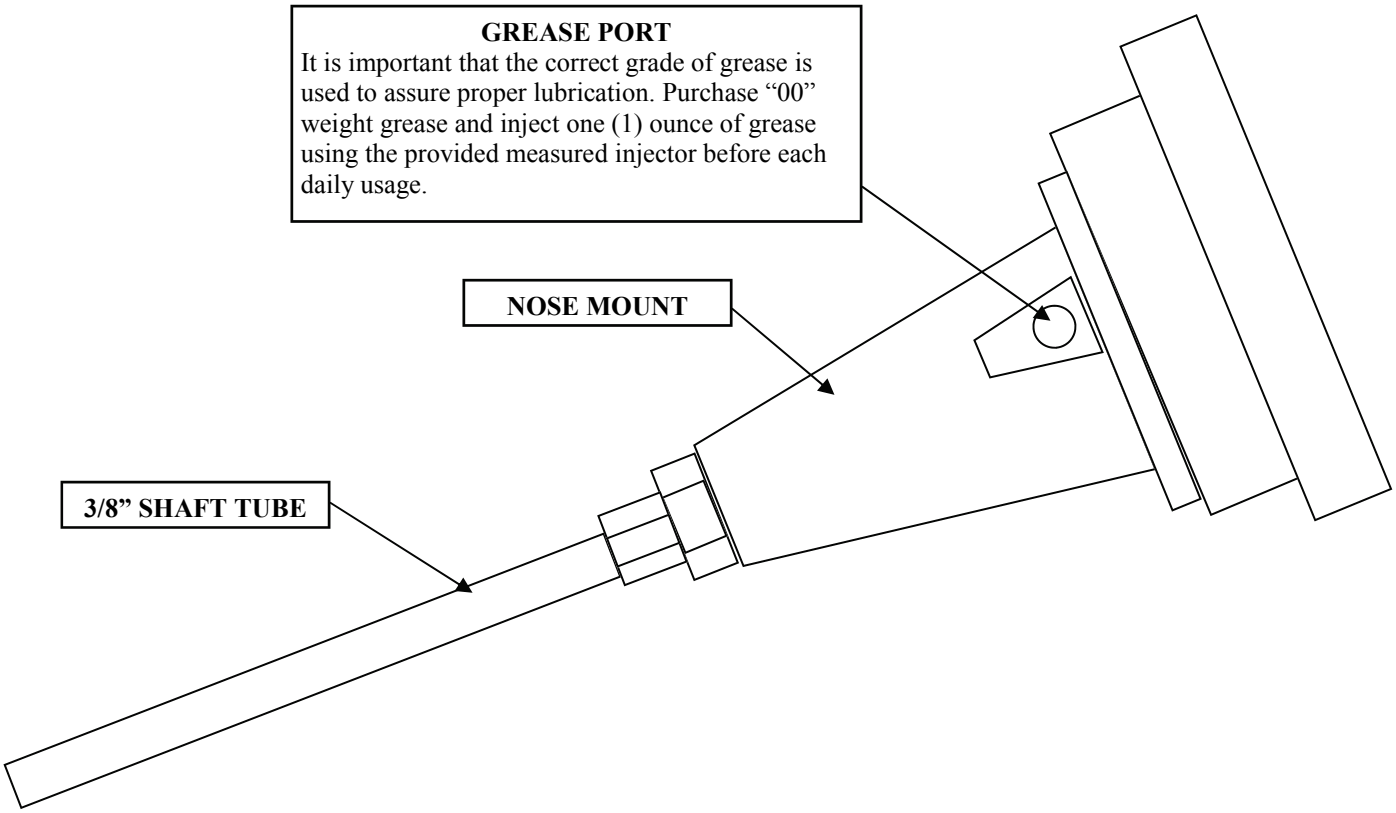


SEALING THE RADIO BOX

The radio box must be sealed correctly before operating your Enforcer. Use Warehouse Hobbies Radio Box Seal Tape (Part #RB5030) or 1" electrical tape which works comparably well. Simply tape the lid on the box with (4) pieces making sure not to leave any gaps. Rub the tape with your fingers to assure a good seal. Next, cut a piece of tape approx. 2" in length and cover the switch access hole, making sure you have completely covered the hole. This access hole (piece of tape) must be vented after each daily use to avoid condensation in the radio box, which will damage your radio's electrical equipment. We recommend not leaving the box taped for a period more than a week. Alcohol can be used to clean the tape residue on the box and cover. Do not use acetone based products or the box will be damaged. All cleaners must read, (safe for use on plastics).



GREASING YOUR DRIVE CABLE AND CLUTCH BEARING



The grease port and nose mount serve two purposes. The flexible drive cable also receives lubrication by this grease once the engine reaches operating temperature. When your boat is placed in the water and during operation water can enter the shaft tube and contaminate the grease in the system. It is important that this grease is replenished before each daily run. We supply the correct grease injector with your engine/kit. Add one (1) ounce of "00" weight grease and inject into the tube connected to the nose fitting.

It is best to remove the drive/cable after a days use and wipe it clean. Keep it un-installed until the next days use. Always grease the flexible cable by hand prior to re-installing it in the boat.

DRIVE LINE / CABLE AND SHAFT TUBE

There is very little maintenance involved with the drive cable and shaft tube. Your shaft tube is equipped with a Teflon liner tube that is designed to wear over time, preventing premature wearing of the steel shaft tube.
As long as you grease the drive shaft cable as directed, you should get many hours of use out of the Teflon liner. The liner can easily be inspected by simply pulling it out of the shaft tube from the rear of the boat once the SPD body has been removed. When replacing the Teflon liner you must remove the old liner first. Push the new liner all the way up the tube until it makes contact with the clutch, (you can feel this). Allow about 1" inch to protrude past the transom and cut of the excess.

Your drive cable has been designed to provide many hours of use, however it is a wear item and care must be taken to assure a good lifespan. Lack of lubrication (grease) is the most common reason that will cause premature drive line failure. The drive cable system is under a tremendous load when the boat is in operation, excessive added loads caused by wave jumping or high speed spin outs can cause the cable to break. It is a good idea to pull the throttle back if the prop leaves the water, this limits the excessive load or bite when re-entering. The drive cable assembly has been designed to be repaired by our factory or can be done in your work shop with the proper tools and direction. Models after August 2008 feature the solder-less drive cable system. This type of drive cable can simply be replaced in your shop or at the water side without any special skills or tools. Factory soldered drive cables can be purchased complete as well. Solder-less drive cables can be installed on most older Enforcer boat, contact us for details. Regardless of the cable type, we recommend that a spare is kept in your tool box. The forward thrust pressure is transmitted into the (4) thrust washers located between the prop drive hub and the strut blade. These thrust washers are designed to wear and must be replaced as necessary. When replacing thrust washers be sure to leave endplay in the shaft assembly between 1/32—1/6".

STARTING AND MAIDEN VOYAGE

If you are at this stage we are to assume that you have completely read and understand this entire manual, and your boat has been prepared as shown and stated according to this manual.

WARNING! BEFORE STARTING YOUR ENGINE

Before you start your engine make sure that you performed the radio range check and all systems are in correct working order.
Your engine requires a pre-mix (32-1) oil/gas mixture. You MUST use a good quality pre-mix oil that is designed to be mixed with pump gasoline. We recommend Amsoil SABER 100-1, 2 cycle premix. There are many more choices in pre-mix lubricants available, however we have over 25 years of experience using Amsoil, and highly recommend the product. Amsoil is available at most quality motorcycle and marine shops. Poor grades of pre-mix oils can cause damage to the internal workings of your engine.
Failure to add or reduce the required amount of pre-mix lubricant to gasoline will severely damage your boats engine voiding any and all warranties.
Stock engine mixture: 32—1 = 32 parts gasoline to 1 part oil
Formula
Gasoline by volume in 1 US gallon = 128 ounces
128 ounces divided by 32 = **4**
4 ounces of pre-mix lubricant added to each gallon of gasoline = 32—1
In a 1-5 gallon approved container add the correct amount of pre-mix lubricant to the gasoline.
We recommend that a smaller container such as a (1) gallon be used and mixed. Once oil is added to gasoline it will degrade the octane level over time faster than if un mixed. Using a smaller container will give your boat better performance.

NOTE: M5 ENGINES MUST BE PRE-MIXED AT 6 OUNCES PER GALLON A 20—1 MIX RATIO.

Amount of gasoline	Amount of pre-mix oil (stock engines)	Amount of pre-mix oil (modified engines)
1 gallon	4 ounces	6 ounces
2 gallon	8 ounces	12 ounces
3 gallon	12 ounces	19 ounces
4 gallon	16 ounces	25.5 ounces
5 gallon	20 ounces	32 ounces

STARTING YOUR ENGINE & RUNNING YOUR BOAT

Read and follow all Zenoah tuning and starting instructions in the Zenoah manual included.
Carefully fill the gas tank in your boat until the gas reaches the bottom of the filler neck. **(MUST REMOVE AFTER DAILY USE)**
Turn the transmitter on first followed by the receiver, be sure to re-tape the switch hole on the radio box cover.
Push the primer bulb several times until you can see the fuel return back to the gas tank through the return line.
Push the choke lever down
Grasp the starter handle and slowly pull it until it grabs, without jerking pull the rope quickly as many times necessary until your engine fires or pops. It may be necessary to open the choke lever one notch or to the open position so the engine will continue to run.
Allow the engine to warm up for at least 30 seconds, make sure you open the choke to the full up position before placing the boat in the water.
Make sure your transmitter antenna is in the full up position. Give the throttle a squeeze as well as the rudder left and right movement, making sure that each command is an exact duplicate in response.
Stay clear of the propeller and carefully place the boat in the water. Slowly increase the throttle to move the boat forward. Once the boat is under way and clear of any obstacles test the steering making sure the boat responds to your commands. If so, stay at least 100 feet off shore and familiarize yourself with the steering characteristics of your boat. Avoid fast speeds until you are confident that you can control your boat. Your effective radios range is about 300 feet with a brand new set of batteries. As the batteries lessen in power so does your effective range. We strongly recommend that your run your first and even second full tank of gas through the engine before attempting high speeds. This is not only better for proper engine "break-in", but the added time is sure to be a benefit of additional practice. Your Enforcer can hit speeds of 40 miles per hour, and that is fast! Be sure that you have ample room and the water conditions warrant these high speeds. It is very possible to capsize your model at high speeds, especially in rough water conditions. In the event of a capsize certain procedures MUST be carried out immediately to avoid possible engine / radio system damage, see these procedures below.

OVERTURNED BOAT RE-START

If you overturn your boat while running the following procedures MUST be performed prior to attempting to re-start the engine.
1)- Remove the radio box cover and inspect for any water. If wet and the radio is "glitching" or not working, dry the components with a hair dryer. It may be necessary to open the receiver and or servos up to expose the circuitry. Do not attempt to operate your boat with a radio system that is less than 100 % operational.
2)- Remove the spark plug and drain the fuel out of the tank, (properly dispose the contaminated fuel).
3)- Turn the boat up-side-down and pull the starter several times to expel the water out of the engine.
4)- Re-fill the tank and re-prime the engine. Install the spark plug ***finger tight,*** do not tighten.
5)- Start the engine with the plug ***loose*** and allow to run for 30-45 seconds before stalling and tightening the plug. It may be necessary

SAFETY AND MAINTENANCE

This is probably the most important page in this manual and we urge that all these directions are followed.

SAFETY RULES

Never allow anyone under the age of 18 or with minimal or no experience operate your model.
Never operate your model in a body of water where there are swimmers present.
Never operate your model in bodies of water that are restricted, make sure you have permission before use.
Never chase or follow full size boats or personnel watercraft with your model.
Never smoke when fueling your boat, or allow anyone within 15 feet while filling.
Never swim for a stalled or over turned boat, use a small retrieve boat /raft with approved life saving vest.
Keep all spectators a minimum of 15 feet from your boat when started on shore.
Keep your boat a safe distance off shore at all times. When returning back to shore always skirt the shoreline, never return straight in.
Keep your clothes, hands, and any objects away from your propeller when running.
Keep your gasoline in an approved container and out of the way of spectators and hazardous areas.
Although your model may be considered a toy, in reality it can cause property damage and bodily harm if misused or used in areas where humans or animals are present. Use good common sense when operating your model and you will enjoy the benefits of this great hobby.

DAILY MAINTENANCE

Replace receiver batteries (4) Alkaline AA after each 4 hours of use.
Replace transmitter batteries as required by the battery meter on the transmitter. (Meter is for transmitter only).
Grease the drive cable before each daily use, (Inject (1) Ounce "00" weight grease)
Remove the drive cartridge assembly after each daily use, wipe the drive cable clean.
Remove radio box tape after each daily use and clean radio box and cover with denatured alcohol.
Apply grease to the cable before re-installing. (optional, you may wait until following run).
Use a light spray oil to inject lubricant into throttle cable on a regular basis.
There is no need to lubricate the shaft bushings (LT bearings), some lubricants can damage the bushings.
Check daily for loose nuts and bolts, retighten as necessary.
Drain the fuel tank after each days use, do not store with fuel in the tank. **THIS IS NOT OPTIONAL**
Replace worn bushings when necessary.
Replace worn Teflon shaft liner when necessary.
Clean your boats hull with mild detergents that are recommended for safe use on fiberglass, use a soft cloth.
Clean the bilge or inside of your hull with a water soluble degreaser (mild mixture).
Remove all batteries if the boat will be stored for more than a couple of weeks.
Run the engine to clear the fuel lines if the boat will be unused or stored for more than a couple of weeks.
Replace steering boot seal if cracks become evident. (use a non-petroleum based grease such as).

WINTER STORAGE

Drain the gas tank and all gas lines.
Remove all batteries
Remove drive cartridge assembly and wipe clean.
Lubricate throttle cable.
Wash inside and outside of boat, wax the outside with Gel coat approved wax.
Dry entire boat and cover with a breathable material, cloth is recommended.
Do not store the boat on a boat stand, place it on a pillow or soft blanket. Boat stands can cause warp age to the bottom of the boat if left for an extended period of time.
Store the boat in a cool dry place.

NOTE: *If you spill gasoline into the hull it* ***must*** *be neutralized and removed immediately for safety and damage reasons. Quickly flush the hull out with fresh water. Gasoline will attack the Iso-Pad shaft mounting system as well as the fiberglass resin, if left for a period of time.*

NOTE: *Do not use gasoline with alcohol at more than 10% alcohol, commonly sold in the Northern climates during winter months. The alcohol will damage the rubber diaphragms in the carburetor and water pump.*

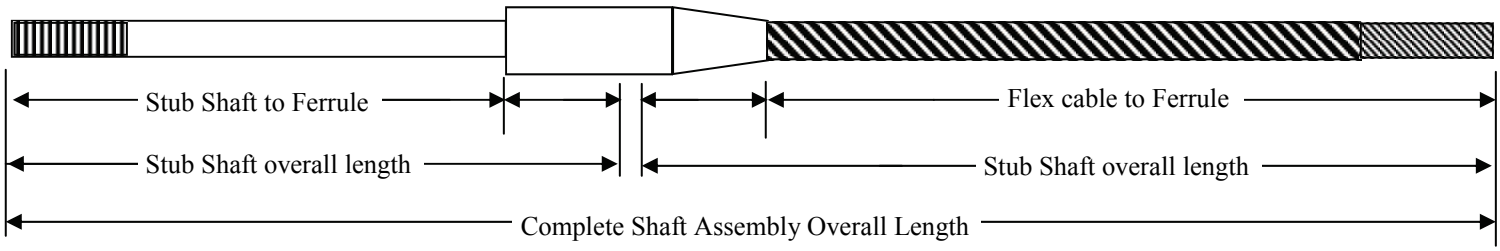
NOTE: *Do not operate your boat in water that is less than 50 degrees Fahrenheit, these temperatures can cause hairline cracks in the Gel coat finish by sheer water impact.*

NOTE: *Always make sure that you are the ONLY person operating on your radios frequency. If two or more radios are occupying the same frequency you will no longer have control of your boat.*

STANDARD ENFORCER DRIVE CABLE REPLACEMENT AND REPAIR ORDERING INSTRUCTIONS

The Enforcer Flexible Drive Cable is produced from the best possible materials for its design. A 1/4" spring steel cable is soldered into a brass ferrule on end (drive connector), and a 1/4" O.D. stainless steel precision ground prop shaft is threaded into the other (prop end). When combined it produces the strongest drive assembly available, however the drive cable is a wearable item. Drive cables will eventually break and for the most part the overall life can different it each case. The drive cable is under extreme stress in normal operations and over time it will simply give in and break. We have designed this assembly to be repaired at home by means of standard 50/50 plumbing solder and a propane torch. We provide all the instructions necessary to do so when a spare drive cable is purchased. Complete drive cables are available factory made from Warehouse Hobbies or your local hobby shop.

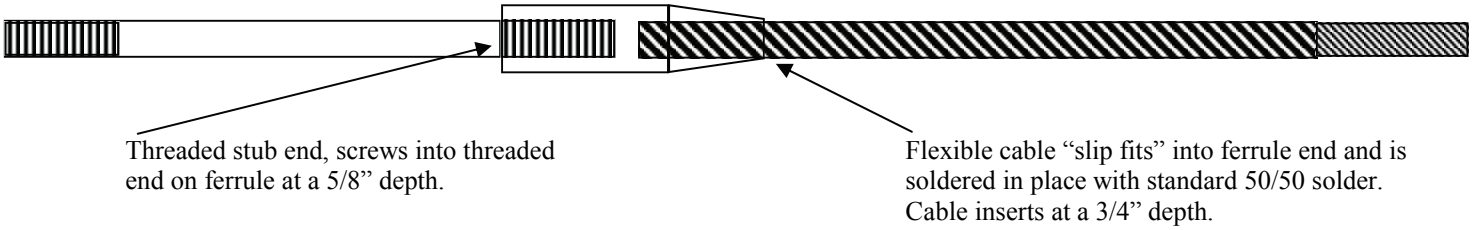
SPD III DRIVE CABLE ASSEMBLY



Sep. 2003 to current

STUB SHAFT	4,3/4"
FERRULE	1.5"
CABLE (OA)	10 5/8"
OVERALL	15 1/4"

NOTE: Current production for the SPD drive cable is for the following Enforcer production models:
TEAM PRO, SUPER SPORT SC, MAN-O-WAR, MANTA RAY, MAGNUM 57
For use with SPD III drive systems only.
Please call for older model applications or use the diagrams provided to have a custom cable produced, or to order repair parts.



Here are a few tips that will extend drive cable life:

1)- GREASE YOUR DRIVE CABLE DAILY.

The most important operation you can do to extend drive cable life is to grease the cable at the beginning of each days operation. It is best to grease it by hand before installing the cable assembly into the SPD body. Once installed apply 1 ounce of grease into the nose (grease fitting) on your engine.

2)- Avoid jumping large waves, (6" +) When the boat re-enters the water from a wave roll back the throttle.

When your boat becomes airborne the engine load is released allowing the prop rpm's to rapidly climb. Once the prop re-enters the water the extreme re-loading is transmitted directly to the drive cable. These actions can cause pre-mature drive cable failure.

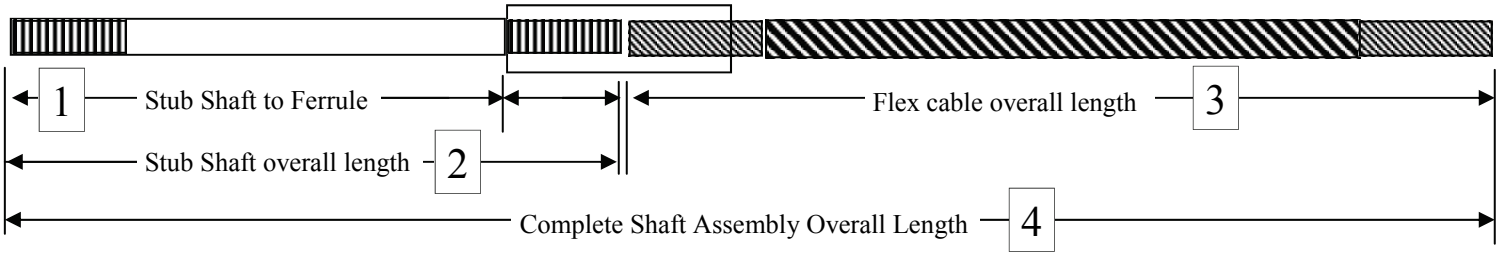
3)- Avoid high speed "spin-outs".

High speed spin-outs are also very hard on your drive line. The same results are present when the prop airs out and then bits hard when re-entering the water.

4)- Replace Teflon Shaft Liner.

The 3/8" steel drive shaft tube is protected by a removable 3/8" o.d. X 7" Teflon liner material. This material helps protect both the shaft tube as well as the flexible cable. It can be pulled out from the back of the boat and inspected for holes or tears and should be replaced if evident. We recommend that you replace the Teflon line every other drive cable replacement. When installing the new Teflon liner, insert it into the shaft tube until it makes contact with the drive connector on the engine. Allow 1" to be exposed past the transom and cut off any excess.

ENFORCER SOLDER-LESS DRIVE CABLE REPLACEMENT AND REPAIR ORDERING INSTRUCTIONS



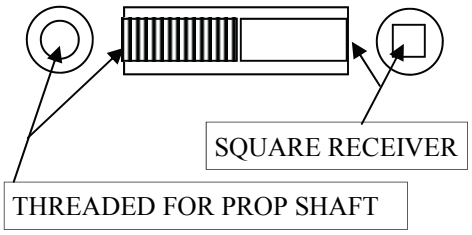
Note: The number system above 1 through 4 can help us in determining what type of cable you have and what type or length you may need. Please have this page handy when calling us for service.

1 _____ 2 _____ 3 _____ 4 _____

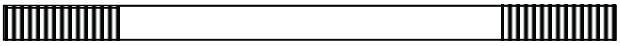
COMPLETE SOLDER-LESS CABLE KIT FOR REPLACEMENT AS OF 8/08
(Includes; cable, ferrule, prop shaft)

SUPER G: 13, 3/16”
TEAM ENFORCER: 15, 1/4”
MAN-O-WAR: 15, 1/4”
MANTA RAY: 15, 1/4”
MAGNUM 57: 15, 1/4”

SOLDER-LESS FERRULE



PROP SHAFT 1/4” DIA.



1/4” X 28 THREADED ENDS

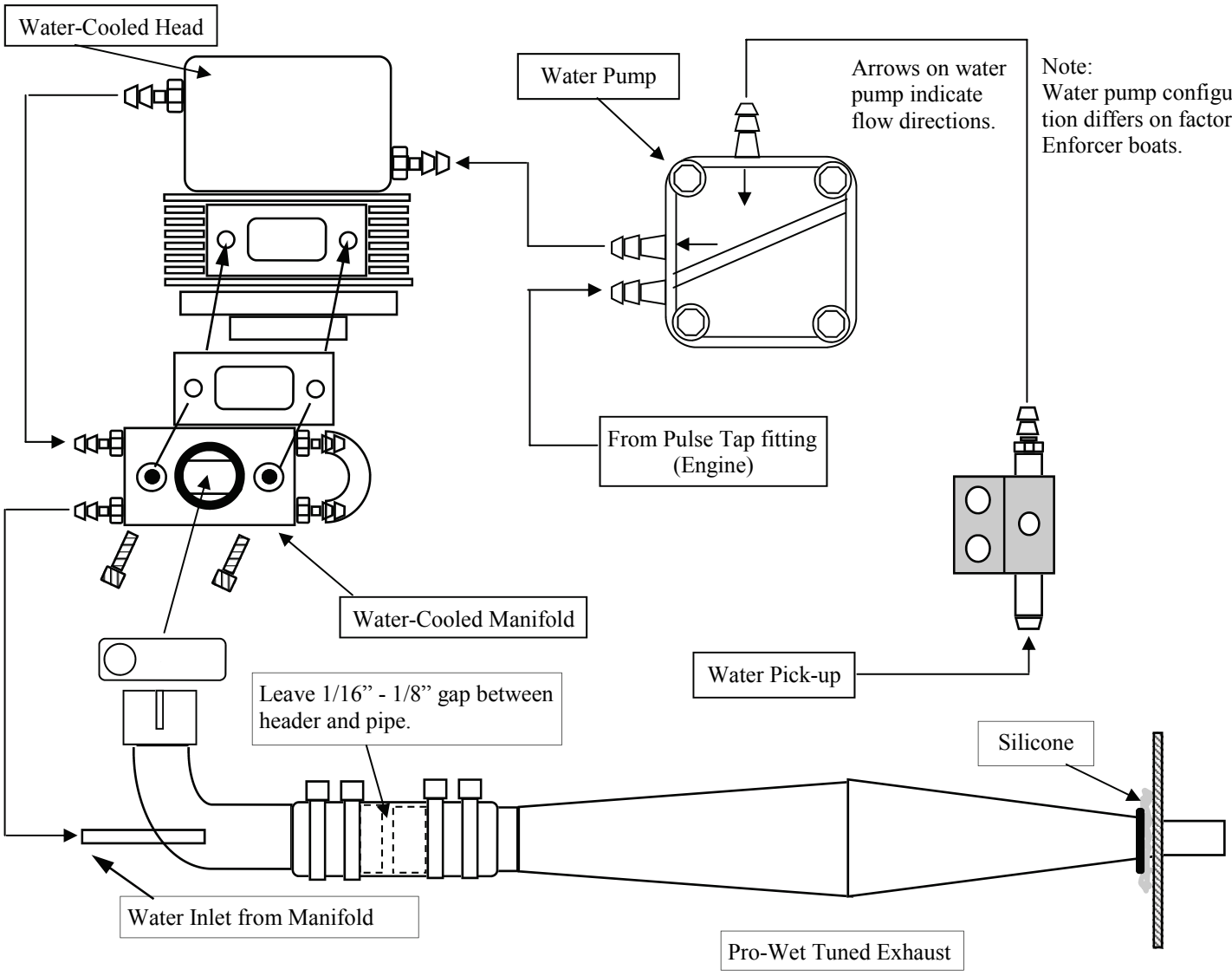
There are (2) Enforcer prop shaft lengths available.
1– Overall, 4, 3/4” SPD III Drive System
2– Overall, 3, 1/2” XP-2 and XP-2P Drive System

ENFORCER DOUBLE SQUARE END 1/4” STEEL WOUND FLEXIBLE CABLE

STOCK LENGTHS FOR ENFORCER PRODUCTION BOATS AND KITS
SUPER G— 9, 3/8” (+ -) 1/8”
ALL BOATS WITH SPD III DRIVE— 10, 1/2” (+ -) 1/8”

WATER PUMP AND COOLING SYSTEM

SYSTEM PLUMBING DIAGRAM



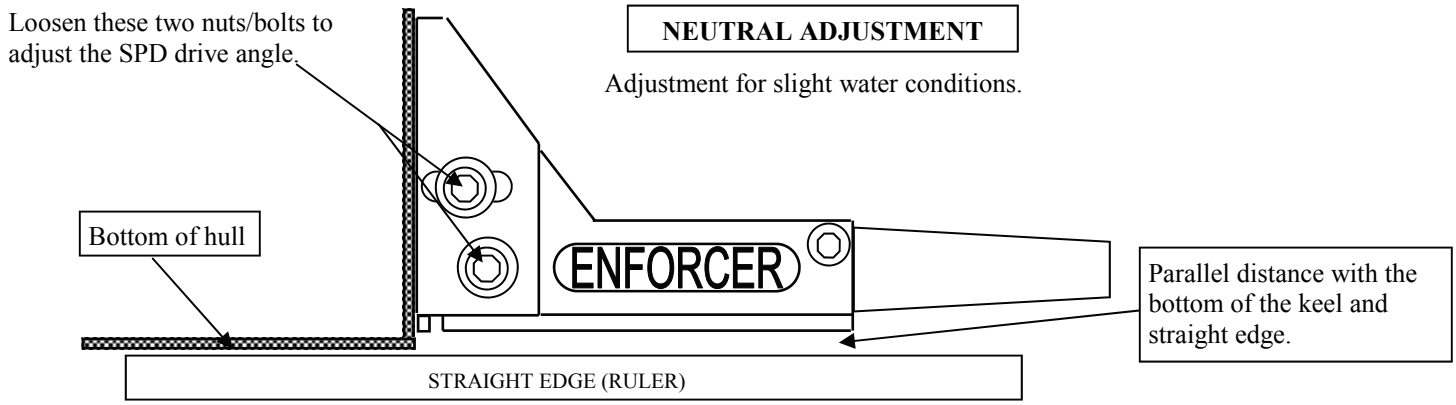
The **Water Pump** and cooling system requires very little maintenance. The water pump is operated by the negative and positive vacuum created in the engines crank case when the engine is running, therefore no outside replaceable power source (batteries) are required. The pump can be operated in both fresh and salt water, however when used in salt water the system must be flushed with fresh water for a minimum of 3 minutes after use. Failure to do so can cause serious damage to the entire cooling system.

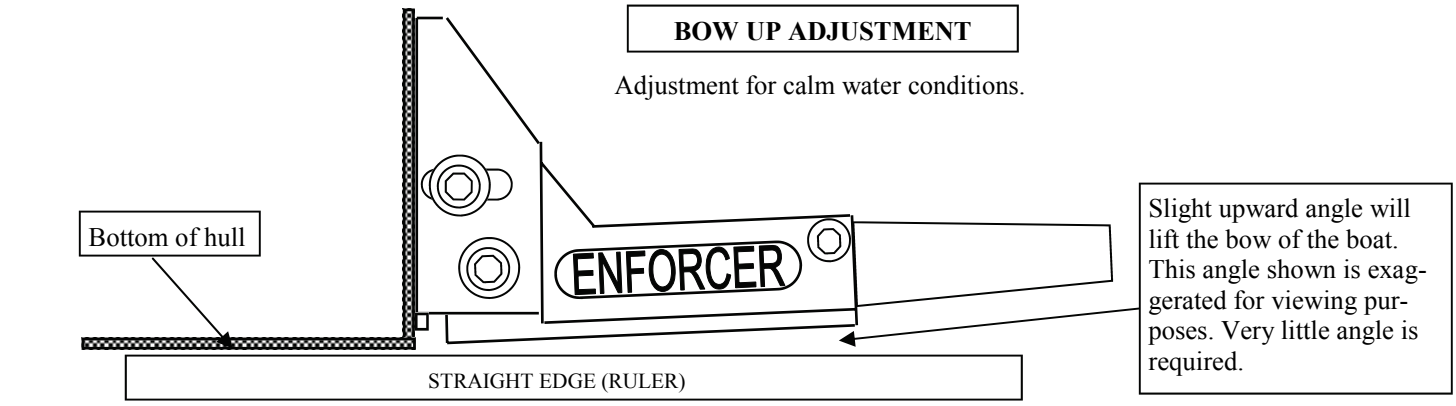
The **Pump Pulse Port** is located on the underside of the intake manifold on your engine. This is the point that the pressure and vacuum is taken from the engine and directed to the diaphragm section of the water pump. This hose should be checked for leaks or cracks over time and replaced when necessary. Any breach in this tube will result in a very high idle speed and poor performance.

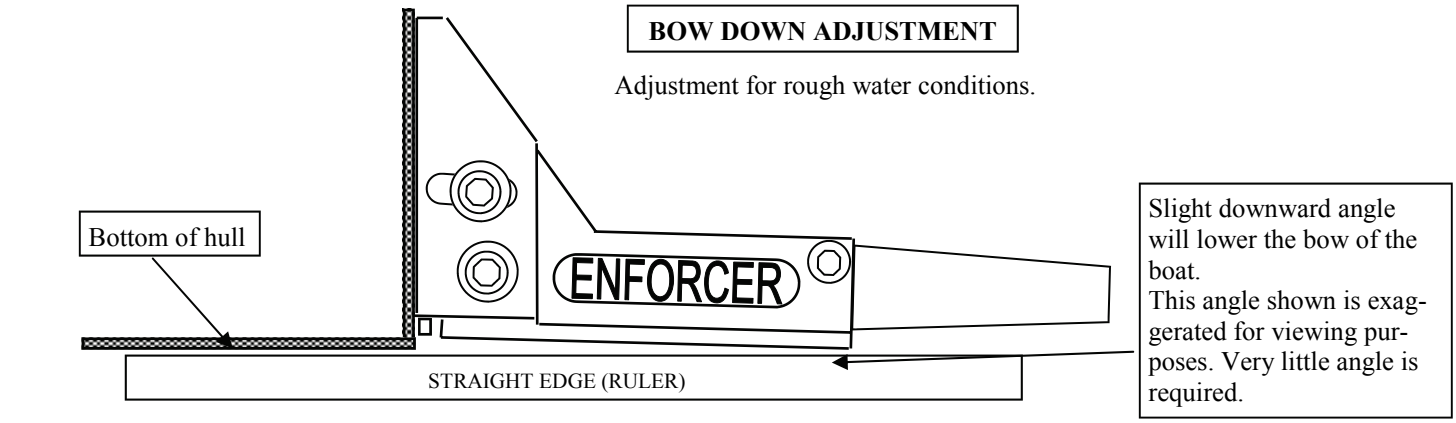
The **Water-Cooled Head, Exhaust Manifold and Header** are vital to the performance of your Enforcer. The Water-Cooled head, Exhaust Manifold, and Exhaust Header all work together keeping the engine and exhaust system at the proper operating temperatures. They must receive cooling water at all times when the boat is in operation. It is good to periodically check all hoses for leaks and obstructions. This hose MUST NOT be longer than 5".

The **Pro-Wet Tuned Exhaust** requires no maintenance however it is vital that water flows unobstructed through the pipe and out of the boat when in operation. The pipe is tuned with the water induced, in the event that the water-cooling system becomes clogged, the boats performance will reduce greatly. This is very obvious, at full throttle without water your boat can loose as much as 15 miles per hour. If this becomes obvious during operation bring the boat back to the shore immediately and rectify the problem. Failure to do so can cause damage to the engine and exhaust system.

SPD III DRIVE SYSTEM ADJUSTMENTS



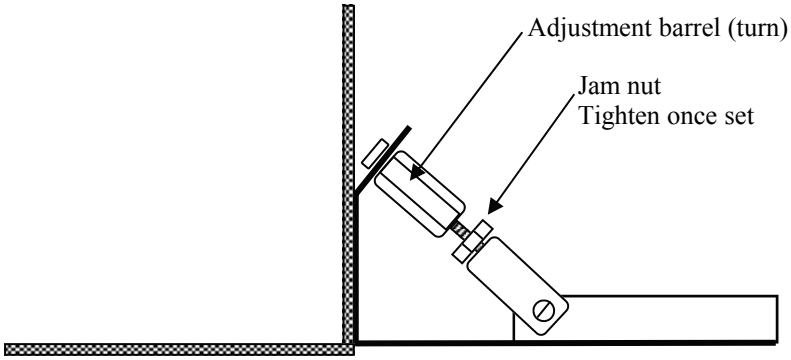




The above three diagrams show how the SPD Drive can effect the performance, or "running attitude" of your boat. We recommend that the drive is adjusted as shown in the first drawing, (Neutral) position. This is a good starting place especially for the first time model boater. The best way to determine how and when your drive should be adjusted will come with time and experience. When the water conditions are calm the hull will tend to stick to the water and run what is refereed to as "wet". The best way to get the boat to run bow high or, "dry" is to adjust the drive angle slightly positive or "up". The same goes for rough water conditions only opposite , you adjust the drive negative, "downward". Remember it takes very little adjustment to make a difference, so it is best to make small adjustments and test between each. If too much adjustment is made either way, performance will be greatly reduced. The easiest way to tell if your boat and propeller is running efficient is to observe the "rooster tail". A low and long rooster tail is optimum. Example; 1-2 feet in height and 6-8 feet in length. Once you become familiar with water conditions and the way your boat performs in them, you will easily be able to observe the water and make the correct adjustments.

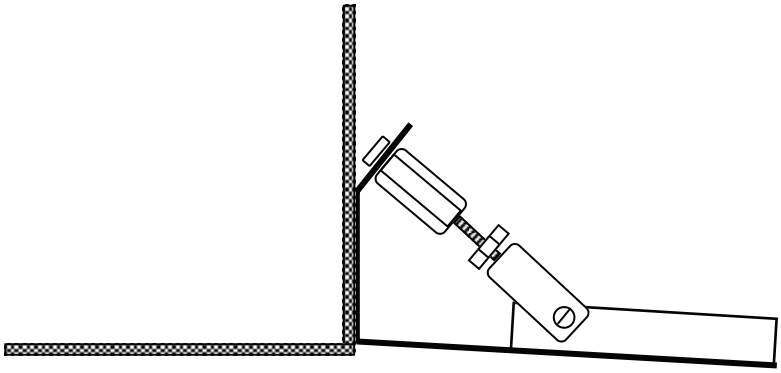
ADJUSTING YOUR TRIM TABS

(If applicable)



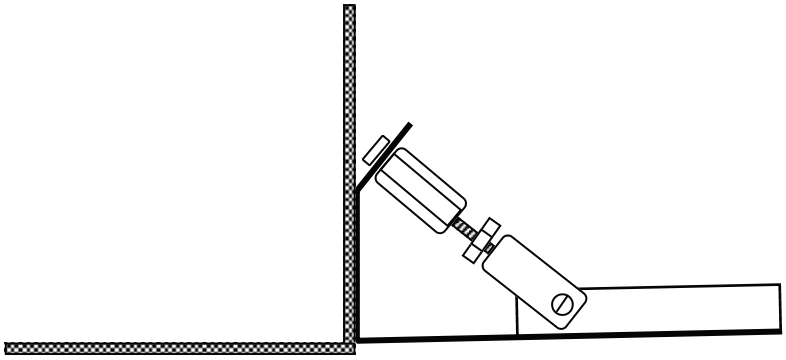
NEUTRAL

This is the best starting point when setting up your new boat.
Use this setting when the water has a minimal to moderate chop, smooth to 1 - 2 inches of chop.
Use a straight edge to determine a neutral trim tab setting.



BOW DOWN

By angling the trim tabs downward as shown the bow of the boat will be forced downward. Use this setting in rough water conditions.
Settings to extreme can cause bow steering. In some instances where the water is too rough and aggressive "bow down" setting may be required as well as negative strut angle and slower running speeds.



BOW UP

Use this setting when the water is calm. This will allow the bow to climb as the speed is increased.
A "bow up" setting virtually eliminates the usefulness of the trim tabs which can make it very easy to overturn commonly referred to as a "blow over" your boat.

To make adjustments first loosen the "jam" nut, then turn the "adjusting barrel" clockwise to lower and counter clockwise to raise. Practice is required when adjusting your boats trim tabs.

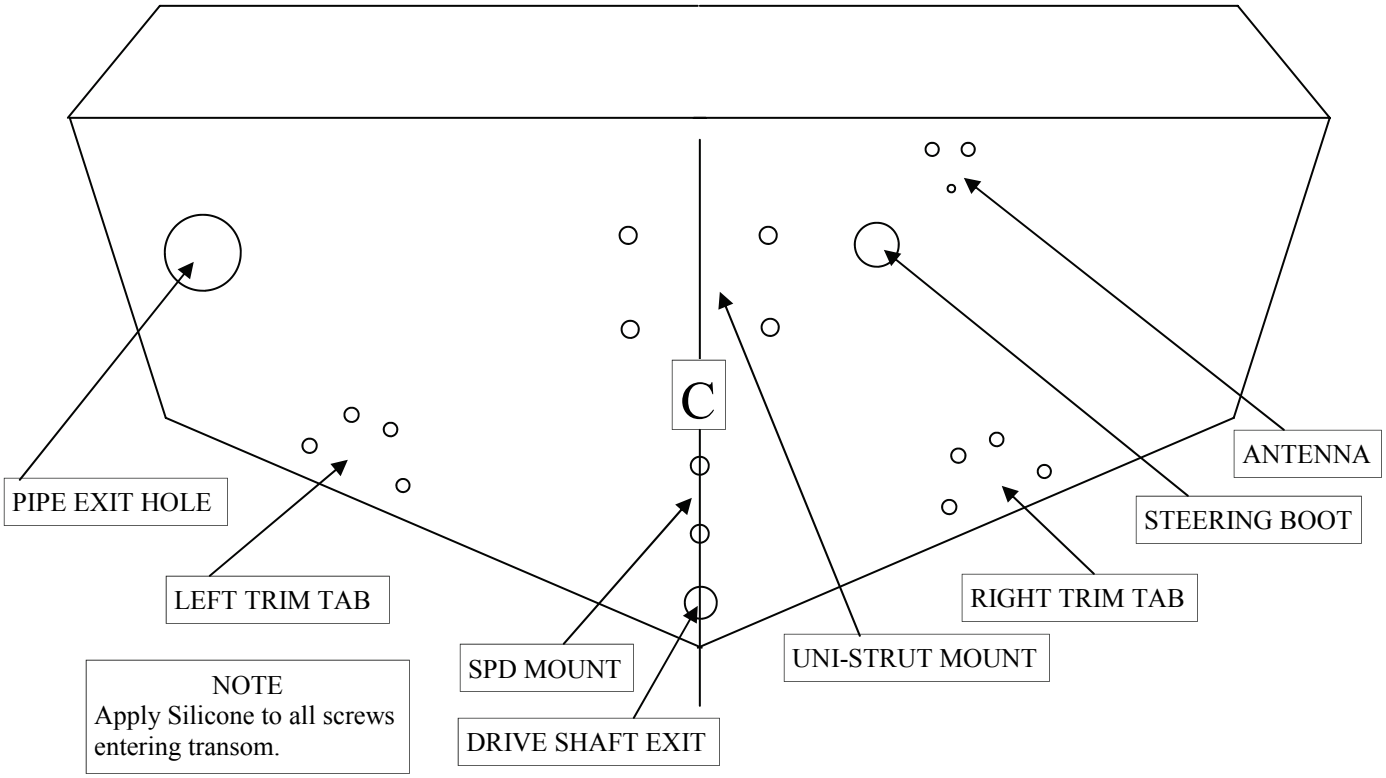
The trim tabs can work in conjunction with the drive systems strut angle. We recommend that all new boaters set the strut angle neutral and adjust the trim tabs to control the boats running attitude. As you become more failure with your boats environment and adjustments, both the strut angle and trim tabs can be fine tuned for optimum running in different water conditions. In extreme water conditions where the water chop exceeds 4 inches a model running at speeds of 40 miles per hour can easily loose control and even "blow over" or "barrel roll". There is a point that extreme adjustments will actually cause erratic handling and these rough water conditions can only be mastered by slower operating speeds.

We recommend that you make very miner adjustments and test between each until you are satisfied with your boats performance. Once satisfied keep a journal handy and record your successful settings for future use, these can be used in comparison with similar water conditions.

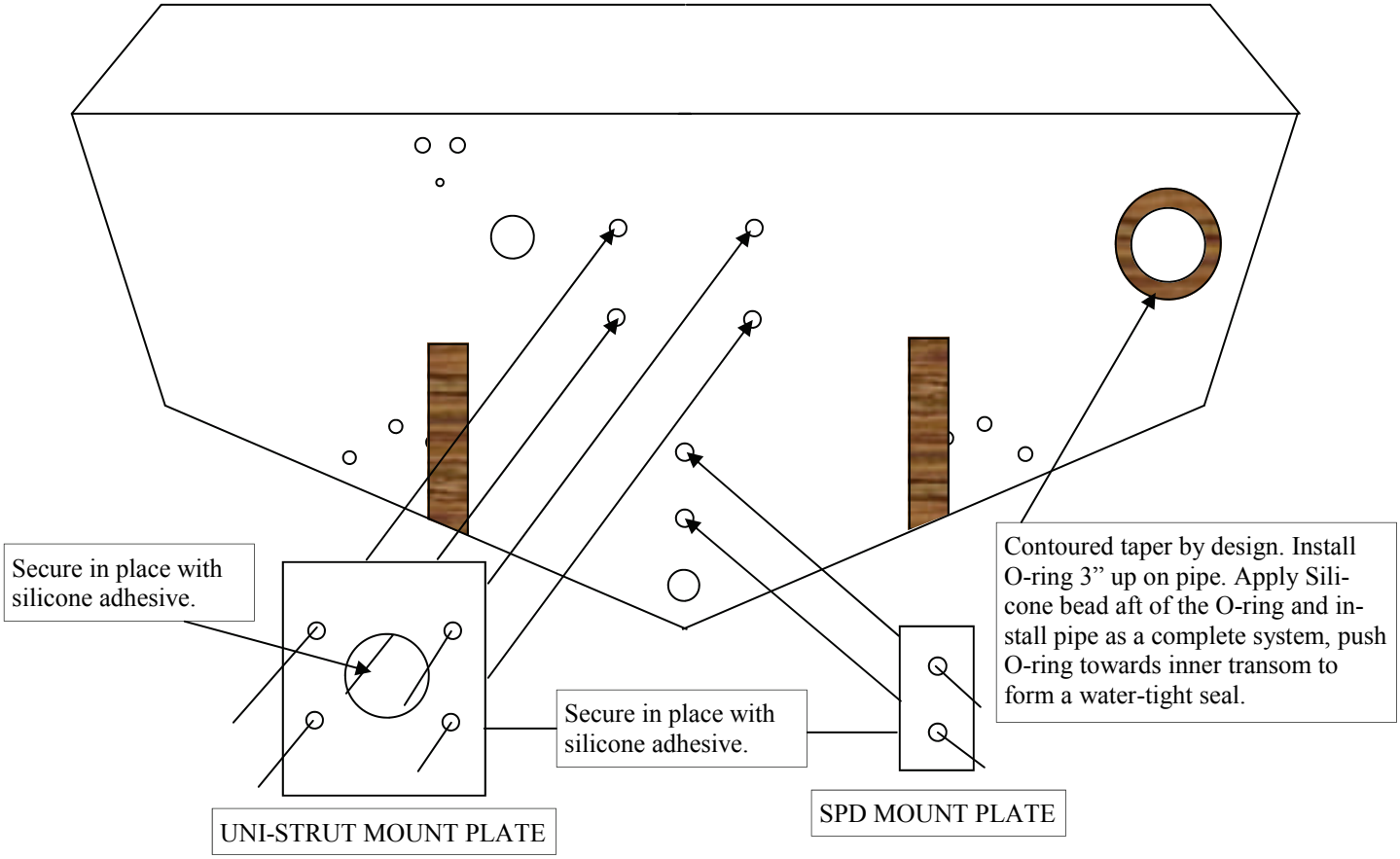
Note: Be sure to tighten jam nut after making adjustments.

TYPICAL TRANSOM HARDWARE LAYOUT

TRANSOM (REAR) VIEW



TRANSOM (INSIDE) VIEW



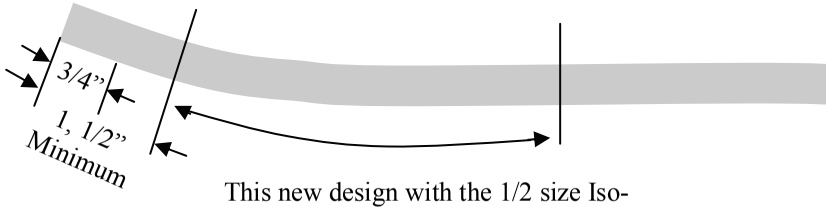
TYPICAL ENGINE AND DRIVE SHAFT TUBE INSTALLATION USING ENFORCER “EASY-MOUNTS” AND ISO-PAD

PREPARING THE DRIVE SHAFT TUBE

Note: When bending the shaft tube it is best to make the least degree of bend as possible. We recommend not to exceed 25 degrees.
It is best to make the bend over a longer distance and gradual as shown below.
You can use a 2” X 4” mounted in a vice with a 3/8” hole drilled in the center. Insert the steel tube and gradually bend the tubing as you work it out of the 2” X 4” block. Make gradual bends testing after each.

Note: Mount the engine as low as possible to keep the CG low, however leave at least 1/8” clearance between any portion of the engine and the fiberglass hull.

Determine where the engine will mount. Taking consideration the required shaft angle, mount the engine by drilling (2) 1/4” holes in each stringer (rail) as shown.

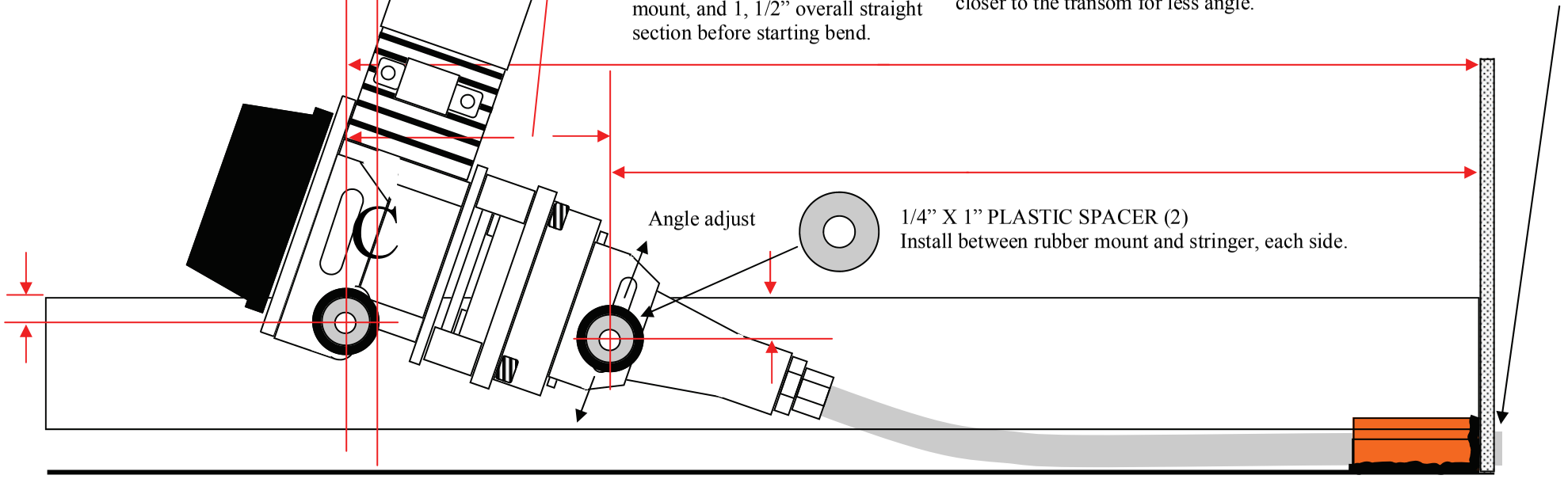


This new design with the 1/2 size Iso-Pad allows you to begin the bend closer to the transom for less angle.

G260PUM ENGINE SHOWN

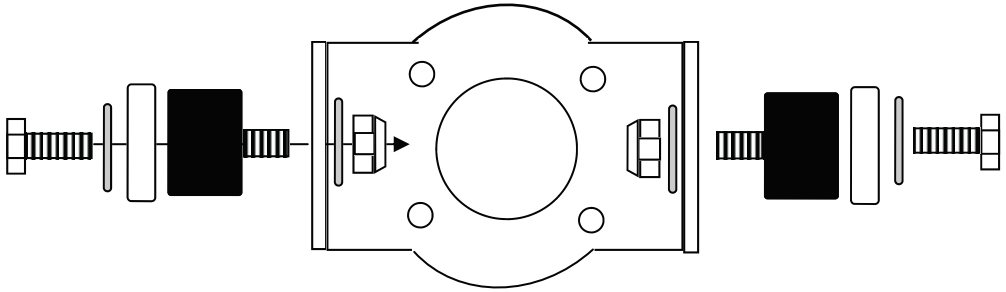
Allow 3/4” to penetrate nose mount, and 1, 1/2” overall straight section before starting bend.

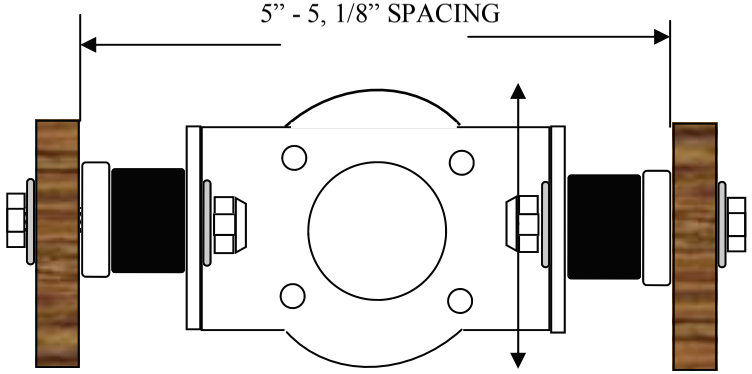
Shaft tube extends 1/16”

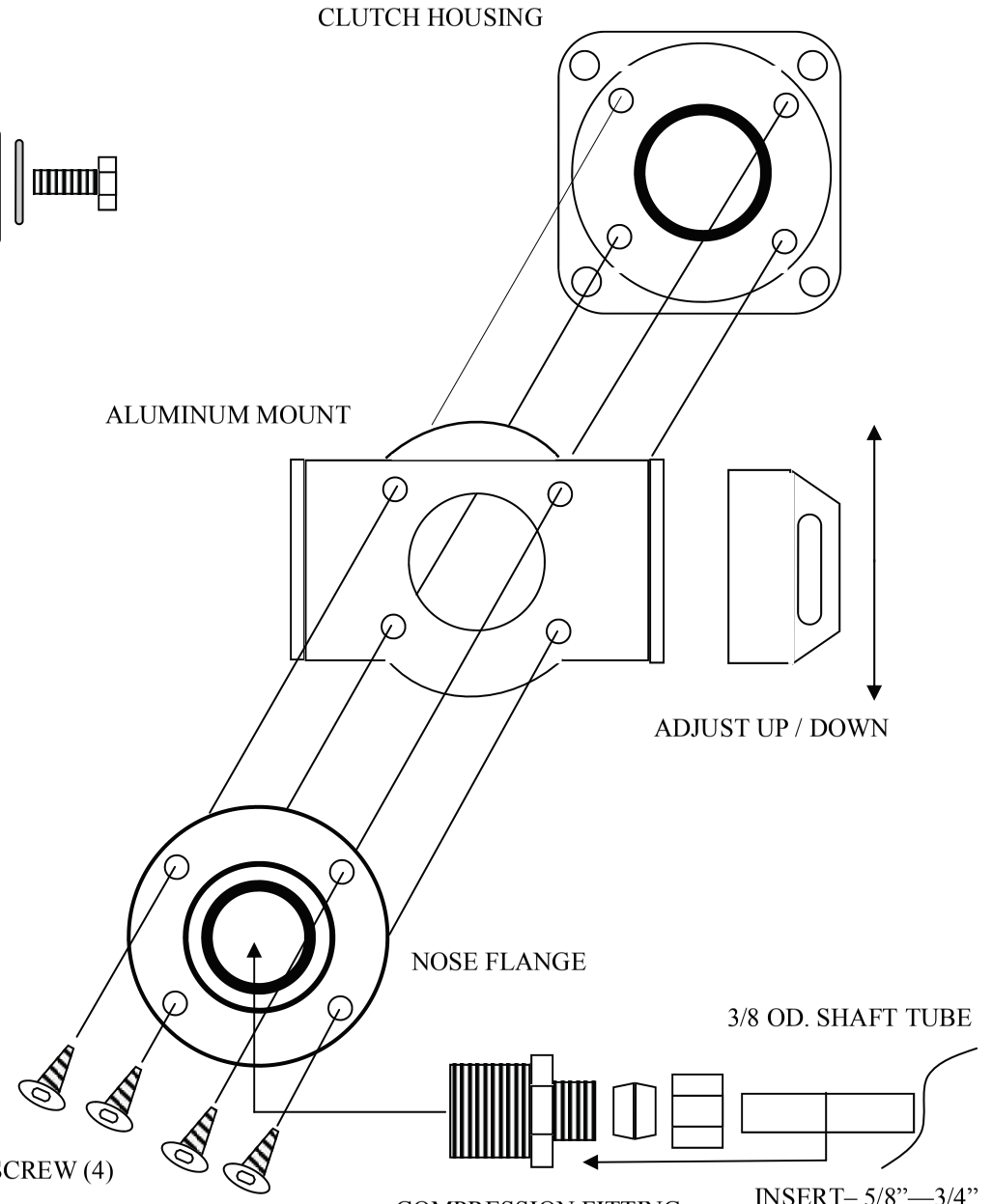


Concept and Design by: Tony Castronovo 1983, 1997, 2001, 2008
Drawing by: Tony Castronovo 2008

FRONT MOUNT INSTALLATION DIAGRAM FOR ZENOAH G260PUM MARINE ENGINE







T-25 10 X 1/2” PH SCREW (4)

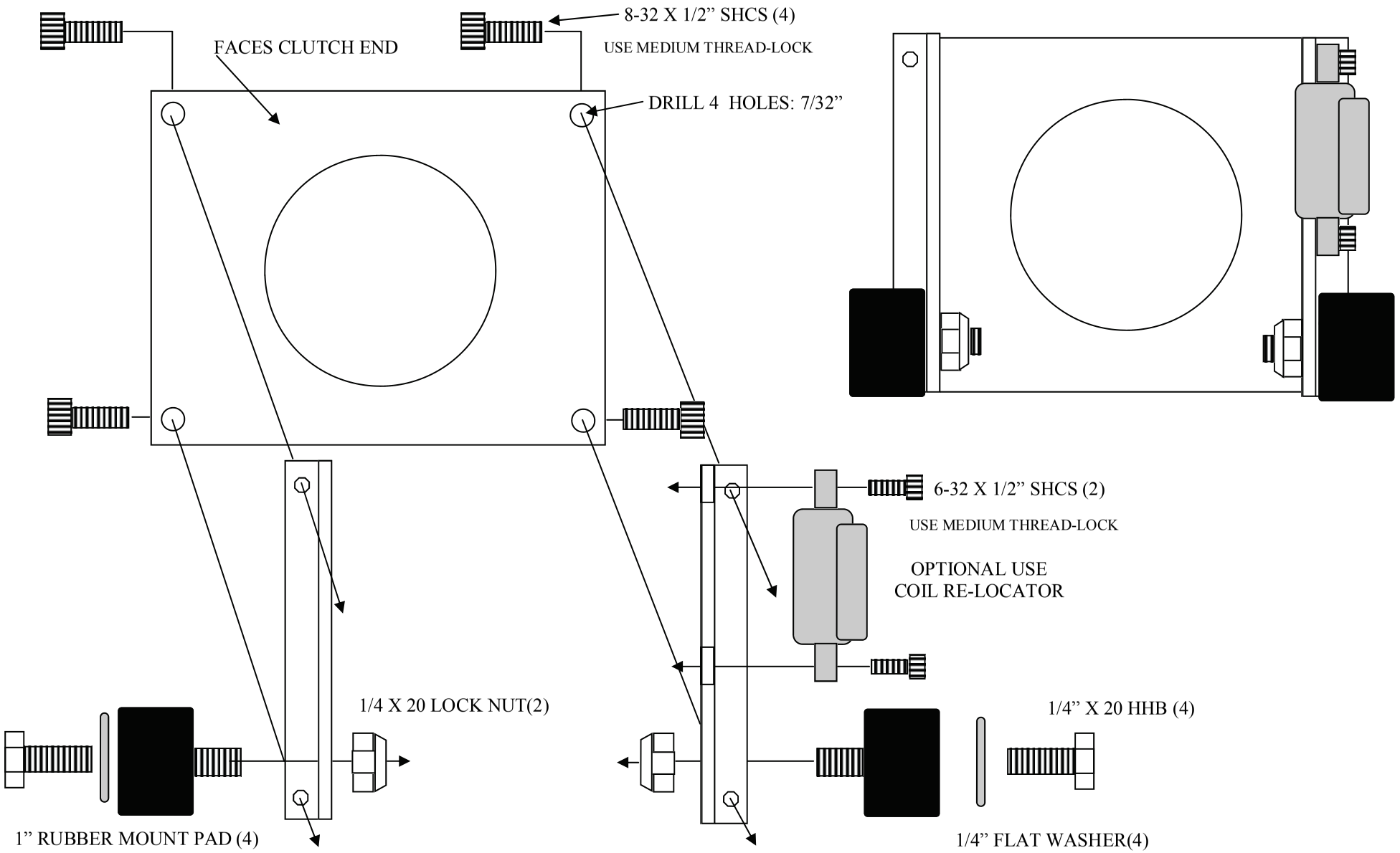
Note: Tighten firm but do not over– tighten.

Concept and Design by: Tony Castronovo 1983, 1997, 2001, 2008
Drawing by: Tony Castronovo 2008

MOUNT INSTALLATION DIAGRAM FOR ZENOAH G260PUM MARINE ENGINE

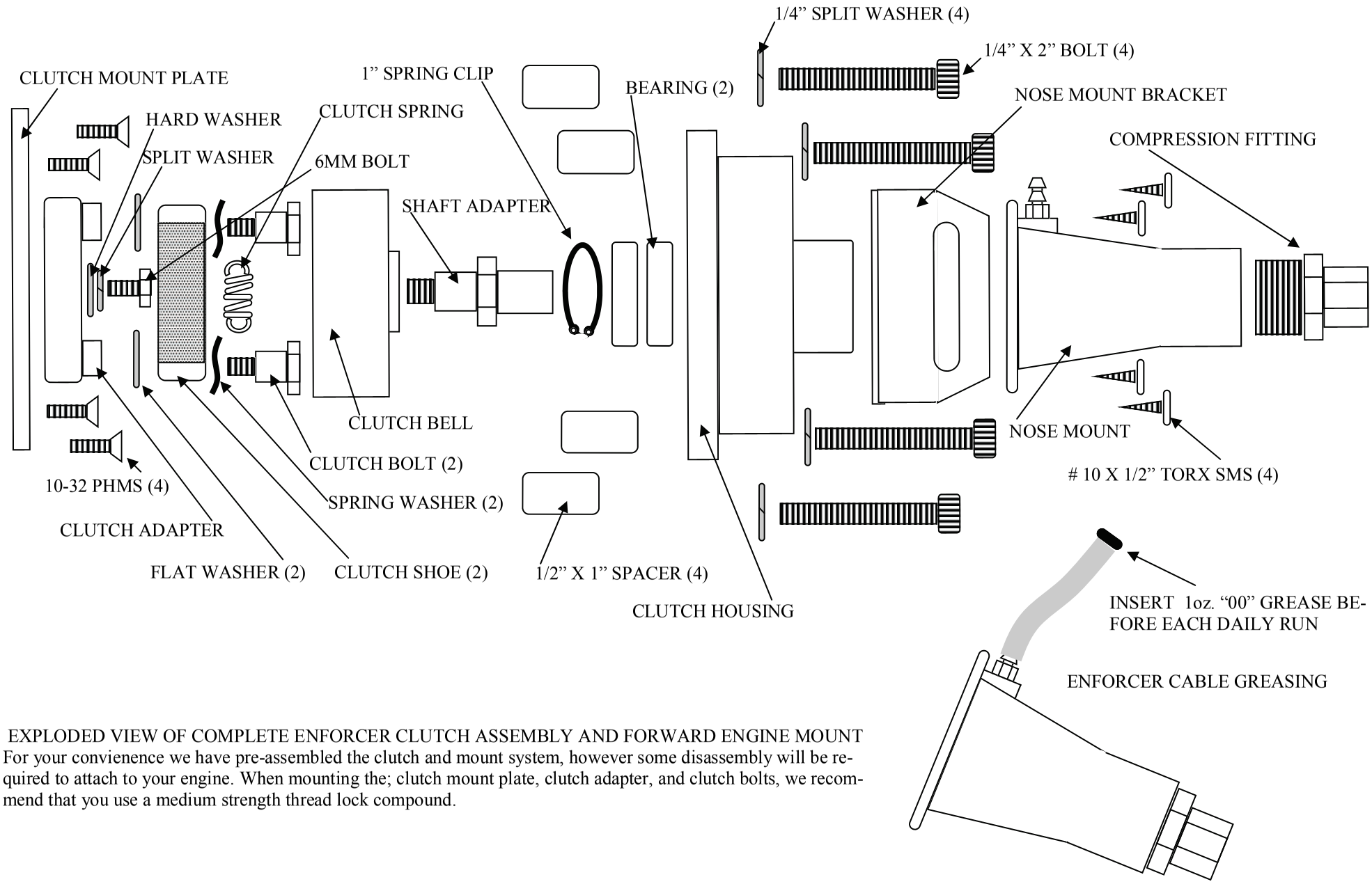
ALUMINUM PLATE SUPPLIED WITH G260 ZENOAH ENGINE

ASSEMBLED FORWARD MOUNT



Concept and Design by: Tony Castronovo 1983, 1997, 2001, 2008
Drawing by: Tony Castronovo 2008

CLUTCH AND FORWARD MOUNT ASSEMBLY



EXPLODED VIEW OF COMPLETE ENFORCER CLUTCH ASSEMBLY AND FORWARD ENGINE MOUNT

For your convienence we have pre-assembled the clutch and mount system, however some disassembly will be required to attach to your engine. When mounting the; clutch mount plate, clutch adapter, and clutch bolts, we recommend that you use a medium strength thread lock compound.

Concept and Design by: Tony Castronovo 1983, 1997, 2001, 2008
Drawing by: Tony Castronovo 2008