Villain Owner's Manual

Model 1506

7.2v

TRAXXAS

Introduction

The Traxxas Villain boat series has set the standard for reliable, high-performance R/C boating. The Villain you have purchased has raised the bar even further with faster top speed, sealed radio box, and stunning graphics. The Villain is powered by twin motors and a water-cooled electronic speed control. The dual, steerable outdrive units utilize surface-piercing, counter-rotating propellers for efficient performance. The trim angle on the outdrives is adjustable to tune how the boat performs on the water. The deep-V hull design and low center of gravity allow the Villain to have superior stability in all kinds of water conditions.

Please keep in mind that this boat is not a toy, and is not intended to be used by children without responsible adult supervision. This is due to the inherent dangers that are always associated with any body of water. Please respect the water and use extreme caution when launching and retrieving boats.

We're confident that you will enjoy the power, speed, and reliability that the Villain has to offer. Thank you for purchasing a Traxxas product.

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Carefully read and follow all instructions in this and any accompanying materials to prevent serious damage to your Villain boat. Failure to follow these instructions will be considered abuse and/or neglect.

Before running your Villain, look over this entire manual, and examine the boat carefully. If for some reason you decide the Villain is not what you wanted, then do not continue any further. **Your hobby dealer absolutely cannot accept a Villain for return or exchange after it has been run.**

Warnings, helpful hints, and cross-references

Throughout this manual, you'll notice warnings and helpful hints, identified by the icons below. Be sure to read them!

An important warning about personal safety or avoiding damage to your Villain and related components.

Special advice from Traxxas to make things easier and more fun.

Refers you to a page with a related topic.

Support

If you have any questions about your Villain or its operation, call the Traxxas Technical Support line toll-free* at:
1-888-TRAXXAS (1-888-872-9927)

Technical support is available Monday through Friday from 8:30am to 9:00pm central time. Technical assistance is also available at www.Traxxas.com. You may also e-mail customer support with your question at support@Traxxas.com. Join thousands of Traxxas R/C enthusiasts in our online community at www.Traxxas.com

Traxxas offers a full-service, on-site repair facility to handle any of your Traxxas service needs. Maintenance and replacement parts may be purchased directly from Traxxas over the phone, through our website at www.BuyTraxxas.com, or you can save shipping and handling costs by purchasing them from your local hobby dealer.

* Toll free in United States only.

All instructions and precautions outlined in this manual should be strictly followed to ensure safe operation of your model.

The Villain is not intended for use by those under 16 years of age without the supervision of a responsible and knowledgeable adult.

All of us at Traxxas want you to safely enjoy your new Villain. Operate your Villain sensibly and with care, and it will be exciting, safe, and fun for you and those around you. Failure to operate your Villain in a safe and responsible manner may result in property damage and serious injury. The precautions outlined in this manual should be strictly followed to help ensure safe operation. You alone must see that the instructions are followed and the precautions are adhered to.

Important Points to Remember

- Do not drive the Villain at night.
- Never, under any circumstances, operate the Villain in any water where people are swimming or wading. The Villain is fast and could cause injury if allowed to collide with anyone. Avoid running in areas reserved for water fowl (check local regulations).
- Because the Villain is controlled by radio, it is subject to radio interference from many sources that are beyond your control. Since radio interference can cause momentary loss of radio control, always allow a safety margin in all directions around the boat in order to prevent collisions.
- Do not reach underneath the rear of the Villain. The propellers could spin unexpectedly. Always pick up the boat from the front or the side.
- Because of the many dangers involved with any body of water, Traxxas recommends that you **never try to wade or swim to retrieve the boat.** Another section in this manual outlines safer, alternative methods for boat retrieval.
- Due to the high-performance nature of the electric motors, they can become **extremely hot** during use. Do not touch the motors when installing and removing battery packs.
- **Most importantly, use good, common sense** when you are around the water to avoid mishaps such as slipping on a muddy bank. Always observe water safety rules and regulations.

Where to Run

Select a body of fresh water which is calm and free of debris, tree stumps, moss, etc. Also, find a clean, stable area of shoreline to launch from. The water must be at least 10-inches deep. Be aware that some ponds restrict the use of model boats. Always choose a launch site which is downwind so that the wind and waves will drift the boat back to you if it should ever become disabled or capsize. **Running the Villain in salt water is not recommended. Damage from corrosion is not covered by the warranty. The Villain is too fast to run in a swimming pool.**

Tools, Supplies, and Required Equipment

Your Villain comes with a set of specialty tools. You'll need to purchase other items, available from your hobby dealer, to operate and maintain your model.

Required Tools and Supplies

#2 Phillips screwdriver

#1 Phillips screwdriver

Small flat-blade screwdriver (1/8 inch blade)

Hobby knife

Needlenose pliers

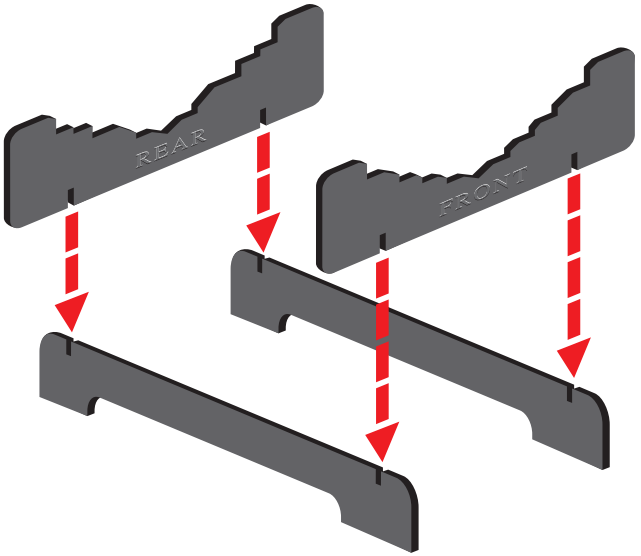
Batteries

8 AA alkaline batteries for the transmitter

7.2-volt NiCad battery pack

NiCad battery charger

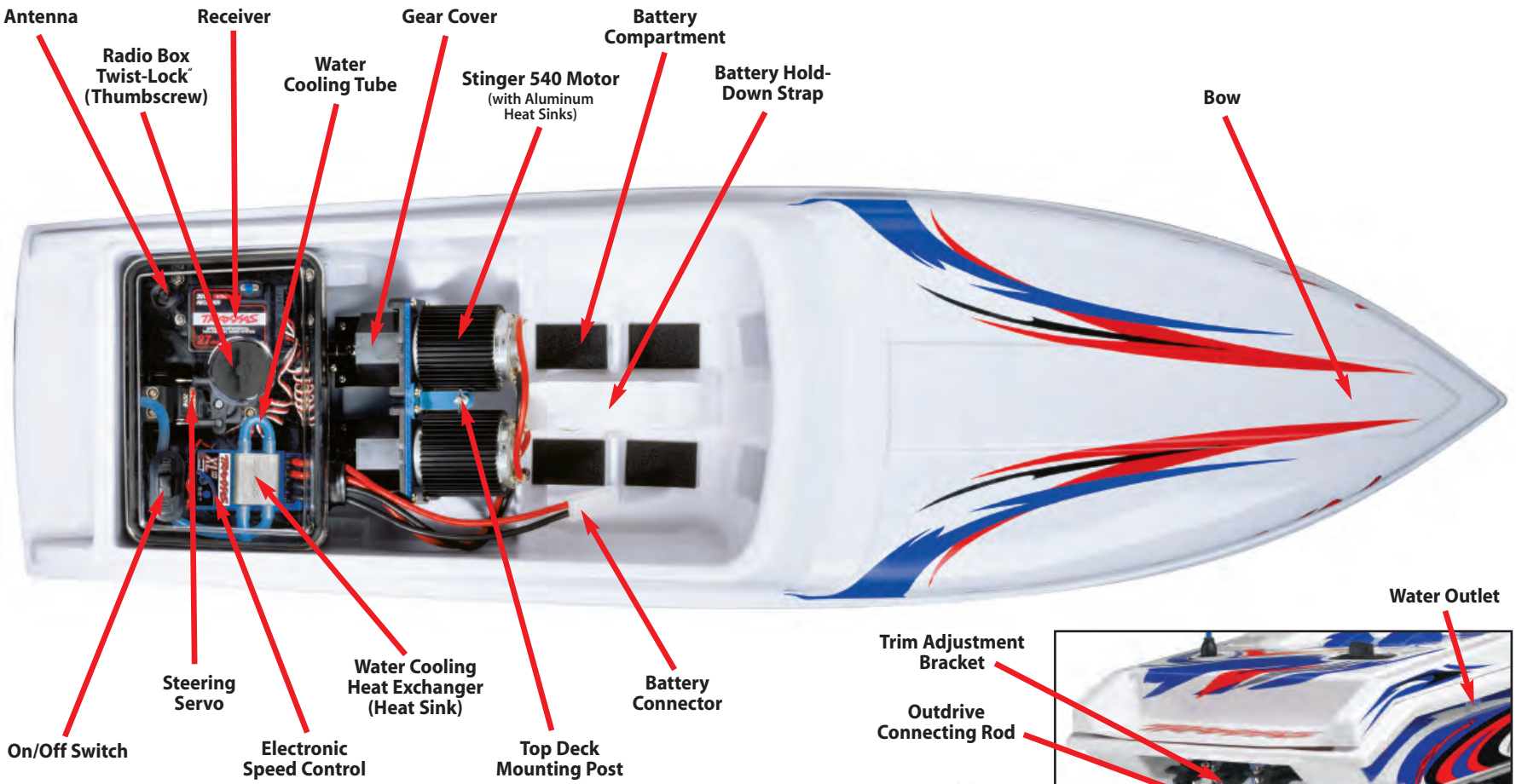
Boat Stand Assembly

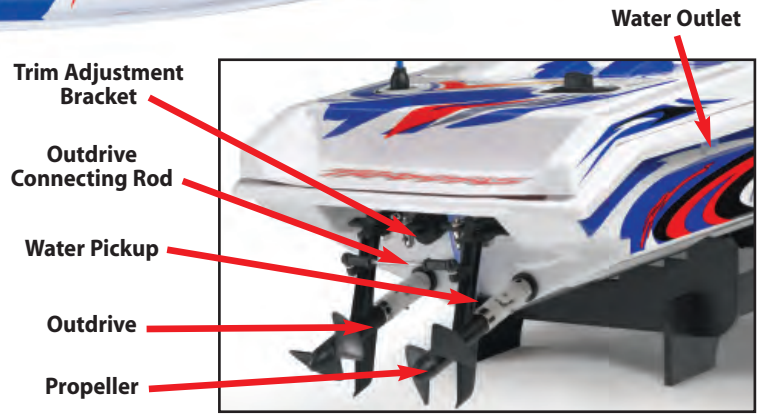


For more info on batteries, see *Use the Right Batteries* on page 11.

A peak-detecting charger is recommended for best performance and longest battery life. For more information, see *Charging the Batteries* on page 11.

Anatomy of the Villain





Quick Start: Getting up to Speed

The following guide is an overview of the procedures for getting your Villain set up and running. Refer to the pages indicated for details on each step. Look for the Quick Start logo on the bottom corners of Quick Start pages.

1. **Charge the battery pack • See page 11**
   The Villain requires a fully charged 7.2-volt battery pack (not included). Charge your battery now so it will be ready when you finish the other setup procedures.

2. **Install the antenna • See page 12**
   Install the antenna mast in the Villain.

3. **Install batteries in the transmitter • See page 11**
   The transmitter requires 8 AA alkaline batteries.

4. **Install the battery pack in the model • See page 11**

5. **Turn on the radio system • See page 14**
   Make a habit of turning the transmitter on first, and off last.

6. **Check servo operation • See page 15**
   Make sure the steering servo is working correctly.

7. **Range test the radio system • See page 15**
   Follow this procedure to make sure your radio system works properly at a distance and that there is no interference from outside sources.

8. **Detail your Villain • See page 8**

9. **Drive your Villain • See page 19**
   Driving tips and adjustments for your Villain.

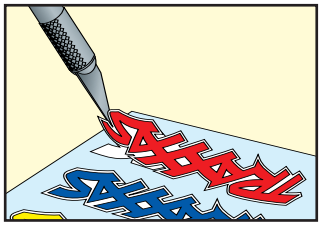
10. **Maintaining your Villain • See page 21**
    Follow these critical steps to maintain the performance of your Villain and keep it in excellent running condition.

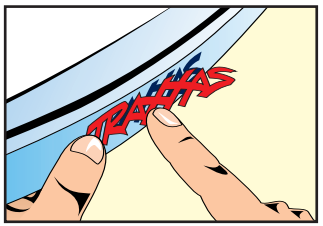
The Quick Start Guide is not intended to replace the full operating instructions available in this manual. Please read this entire manual for complete instructions on the proper use and maintenance of your Villain.

Applying the Decals

The decals are printed on self-adhesive clear Mylar™. To apply the decals, place one end down, hold the other end up, and gradually smooth the decal down with your finger as you go. This will prevent air bubbles. Placing both ends of the decal down and then trying to smooth it out will result in air pockets.

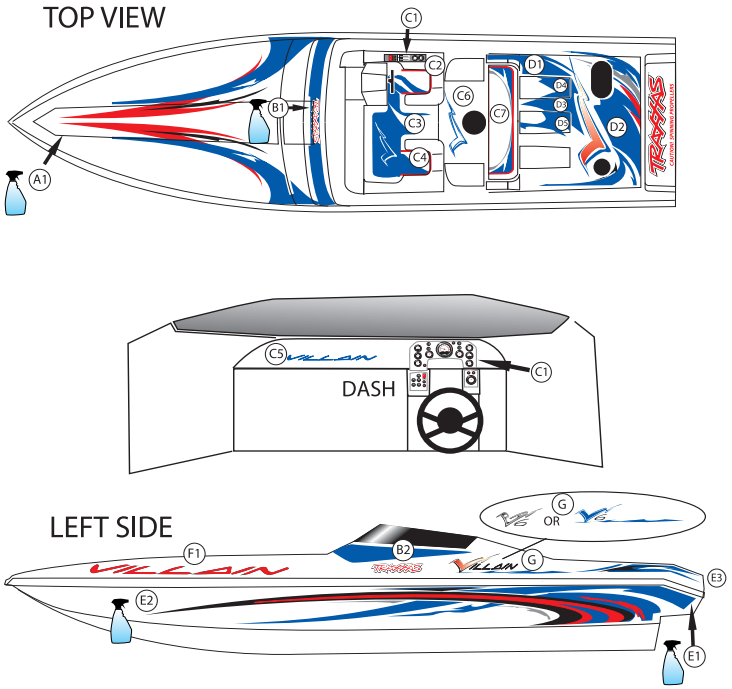
To ease the application of the large decals, fill a spray bottle with a mixture of water (16 ounces) and baby shampoo (1/4 ounce). You may also use mild dish soap or glass cleaner. The mixture will act as a lubricant when positioning the decals and prevents the decal from sticking to itself.





- The decals are die cut, however for concourse quality results, they can be trimmed closer using scissors or a hobby knife.
- Wet the boat surface (with the soap solution) where the decal will be applied.
- Position the decal, following the directions above.
- Wet surface of decal to prevent scraping or tearing when removing air bubbles (remove air bubbles from beneath the decal using a soft or rubber straight edge/squeegee).
- If air bubbles are still present, gently pierce the bubble with a needle (be sure to squeegee out any soap solution from inside the bubble).
- Allow 12 hours drying time before running the boat.

For best results, apply the decals in alphanumerical order, ie: A1, A2, A3 etc.

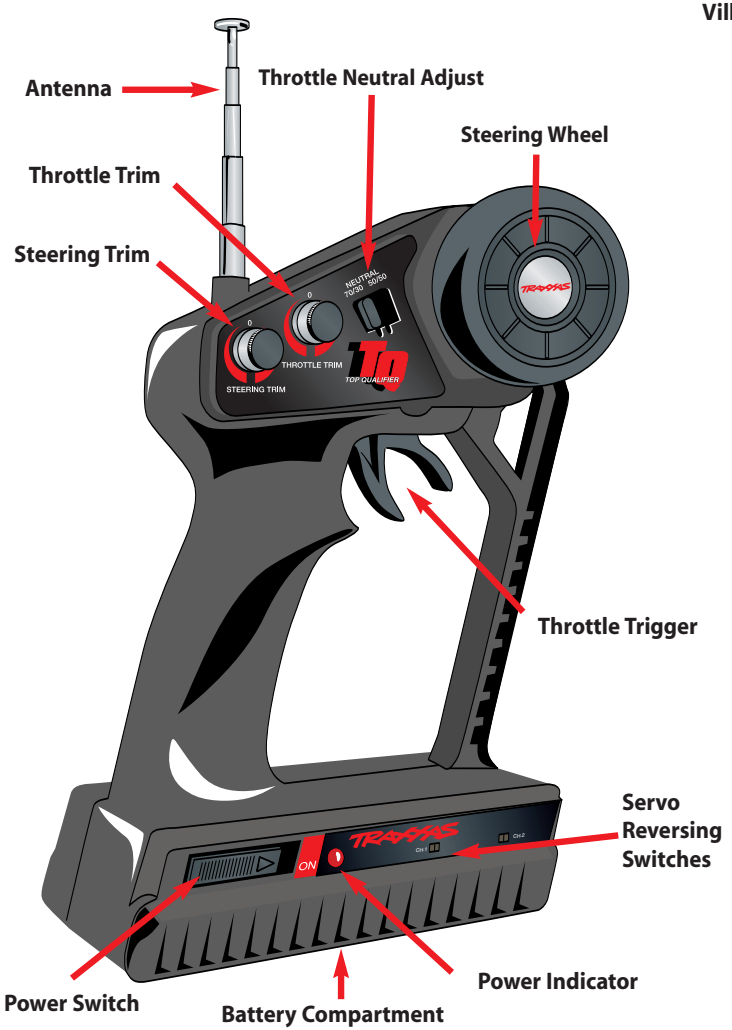


Painting the ABS Hull

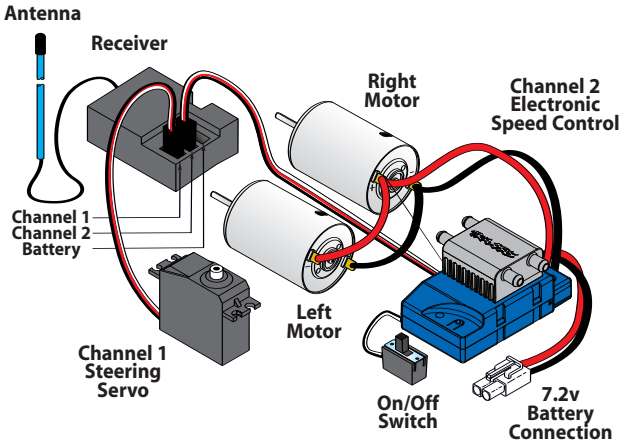
If you wish to paint your hull another color other than the factory white, then choose your paint with caution. Only use enamel paint made for plastic models (available from your hobby dealer). Do not use Lexan™ paint. Test the paint on an inconspicuous and non-critical area before painting the entire boat. Follow the manufacturer's directions for the paint. The hull will need to be thoroughly cleaned of dirt, oil and fingerprints. For the best results, use wax or grease remover. The hull may require light scuffing with a maroon ScotchBrite™ pad prior to painting. This will promote better paint adhesion. The paint on the bottom must be smooth to prevent a loss of performance.

The Traxxas TQ Radio System

Your Villain is equipped with the Traxxas TQ Radio System. The Traxxas TQ Radio System is a 2-channel system that provides high-power output up to a quarter mile. The Villain uses one servo and an electronic speed control.



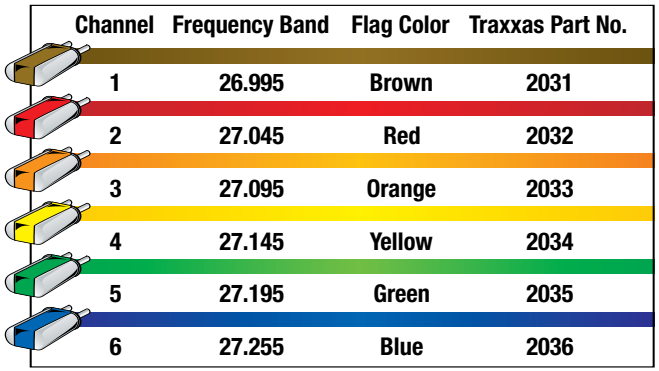
Villain Wiring Diagram



Radio System Terminology

Please take a moment to familiarize yourself with these radio-system terms. They will be used throughout this manual.

Channel - The 27 MHz frequency band is divided into 6 channels so that up to six models can be operated simultaneously. Each channel is referred to by its flag color and channel number, as shown below.



Channel	Frequency Band	Flag Color	Traxxas Part No.
1	26.995	Brown	2031
2	27.045	Red	2032
3	27.095	Orange	2033
4	27.145	Yellow	2034
5	27.195	Green	2035
6	27.255	Blue	2036

Clearing your frequency - A routine, verbal check to make sure nobody else in your area is operating on the same channel. Always clear your frequency by calling out your channel number before operating your model. Wait or move to another area if your channel is already being used.

Crystal (X-tal) - The plug-in device that determines which channel the radio system will operate on. For each channel, there are two crystals, one for the receiver and one for the transmitter. Of those two crystals, the one marked with the lower number (.455 MHz lower) must be inserted into the receiver.

ESC (Electronic Speed Control) - An electronic speed control is the electronic motor control inside the model. The Villain uses MOSFET power transistors to provide precise, digital proportional throttle control. Electronic speed controls use power more efficiently than mechanical speed controls so that the batteries run longer. An electronic speed control also has circuitry that prevents loss of steering and throttle control as the batteries lose their charge.

Frequency band - The radio frequency used by the transmitter to send signals to your Villain. All Traxxas RTR models operate on a 27 MHz frequency band.

Neutral position - The standing position that the servos seek when the transmitter controls are at the neutral setting.

NiCad - Abbreviation for nickel-cadmium. The original rechargeable hobby pack, NiCad batteries have very high current handling, high capacity, and can last up to 1000 charging cycles. Good charging procedures are required to reduce the possibility of developing a "memory" effect and shortened run times.

NiMH - Abbreviation for nickel-metal hydride. Rechargeable NiMH batteries offer high current handling, and much greater resistance to the "memory" effect. NiMH batteries generally allow higher capacity than NiCad batteries. They can last up to 500 charge cycles. A peak charger designed for NiMH batteries is required for optimal performance.

Receiver - The radio unit inside your Villain that receives signals from the transmitter and relays them to the servos.

Servo - Small motor unit in your Villain that operates the steering mechanism.

Transmitter - The hand-held radio unit that sends throttle and steering instructions to your Villain.

Trim - The fine-tuning adjustment of the neutral position of the servos, made by adjusting the throttle and steering trim sliders on the face of the transmitter.

BEC (Battery Eliminator Circuit) - The BEC can either be in the receiver or in the ESC. This circuit allows the receiver and servos to be powered by the main battery pack in an electric model. This eliminates the need to carry a separate pack of 4 AA batteries to power the radio equipment.

Thermal Shutdown Protection - Temperature sensing electronics are used in the ESC to detect overloading and overheating of the transistor circuitry. If excessive temperature is detected, the unit automatically shuts down to prevent damage to the electronics.

Charging The Batteries

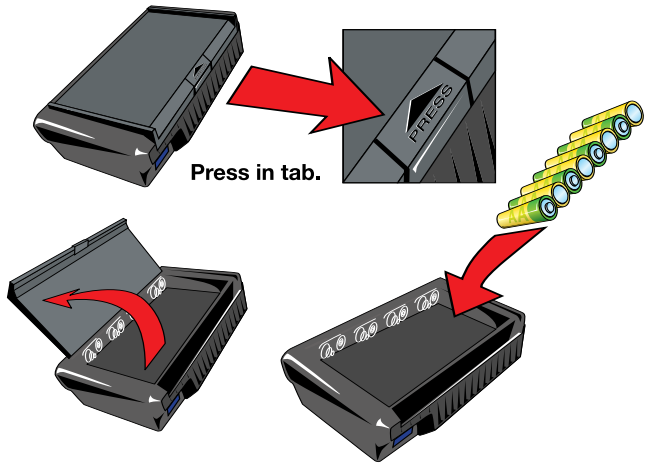
The Villain requires 8 AA batteries and a fully charged 7.2 volt NiCad or NiMH battery pack. These batteries are not included with the model. You can use either a side-by-side racing style pack or the more common stick pack. The battery compartment on the Villain is designed to handle both. The Villain's run time is greatly affected by the milliamp hour (mAh) rating of the batteries. A 3000 mAh battery pack will theoretically run twice as long as a 1500 mAh pack. Follow the charger manufacturer's directions for charging and caring for your battery packs.

The 7.2 volt battery pack (not included) must be fully charged before installing it in the boat. **Always remove the battery from the model before charging.** For convenience, we recommend using a an AC peak-detecting charger that plugs into an AC wall outlet. This type of charger uses special voltage detection circuitry that automatically shuts the charger off when the battery is fully charged. If you are using a 15-minute timed charger, always fully discharge the battery pack before each charge. Never leave a battery charging unattended. **Always follow the charger manufacturer's instructions.**

Battery Installation

Installing Transmitter Batteries

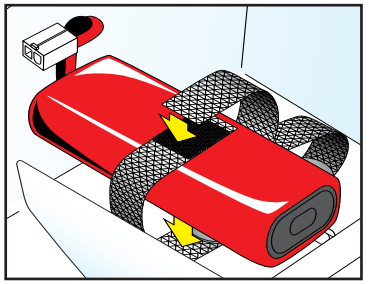
1. Remove the battery compartment door by pressing the tab and lifting the door up.
2. Install 8 AA batteries in the correct orientation as indicated in the battery compartment.
3. Reinstall the battery door and snap it closed.
4. Turn on the transmitter and check the power indicator for a solid red light.



If the power indicator light flashes, then the transmitter batteries are weak, discharged or possibly installed incorrectly. Replace with new or freshly charged batteries. The power indicator light does not indicate the charge level of the 7.2 volt battery pack in the model.

Installing the Battery Pack

Place the battery pack into the front compartment of the boat and secure it tightly with the Velcro™ strap. Do not connect the battery pack yet.



Use the Right Batteries

Your transmitter uses AA batteries. Use new alkaline batteries, or rechargeable batteries such as NiCad or NiMH (nickel-metal hydride) batteries in your transmitter. Make sure rechargeable batteries are fully charged according to the manufacturer's instructions.

If you use rechargeable batteries in your transmitter, be aware that when they begin to lose their charge, they lose power much more quickly than regular alkaline batteries.

Caution: Discontinue running your Villain at the first sign of weak transmitter batteries (flashing red light) to avoid losing control.

Spray a little window cleaner on the antenna wire to make it easier to push through the antenna tube.

Don't shorten the length of the antenna wire. Its length is tuned to the frequency band; cutting it could severely shorten the radio system's range.

Don't push the transmitter antenna down from the top. Pull it down from the bottom, one segment at a time, to prevent binding and kinking the antenna mast.

Setting Up the Antenna

You must install the antenna mast (tube) before you operate your Villain boat. You'll find the plastic antenna tube and tip in the bag with your manuals and documentation.

1. Remove the top deck by turning the Twist-Lock™ counter-clockwise.

2. Locate the black antenna wire coiled on the outside of the radio box.

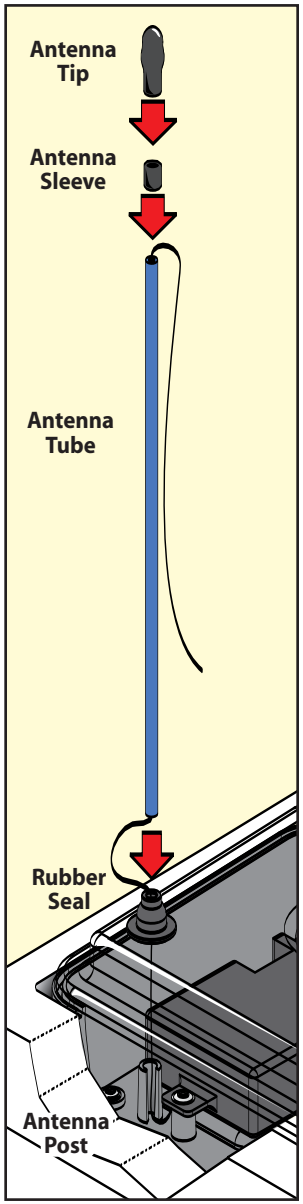
3. Straighten the antenna wire with your fingers and then insert the end of the wire into one end of the antenna tube. Push the wire all the way through the antenna tube.

4. Pull the remaining wire through the antenna tube and then insert the base of the antenna tube through the rubber seal in the radio box cover.

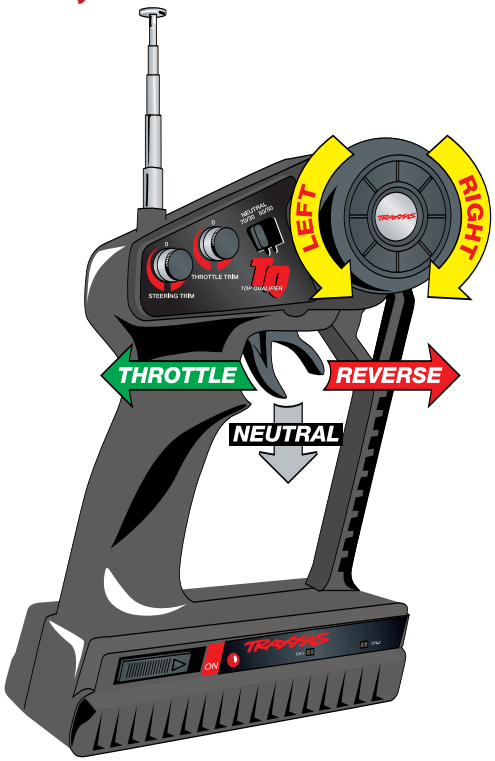
5. Push the base of the antenna tube into the post in the bottom of the radio box making sure that the antenna wire slides into the slot in the post (see illustration).

6. Fold the top of the antenna wire over the top of the antenna tube. Slide the antenna sleeve over the tube to retain the antenna wire. Now slide the antenna tip onto the top of the antenna tube. Never cut or shorten the antenna wire.

7. On the transmitter, always fully extend the telescoping antenna when running your boat. Make a habit of holding the transmitter so that the antenna points straight up.



TQ Radio System Controls

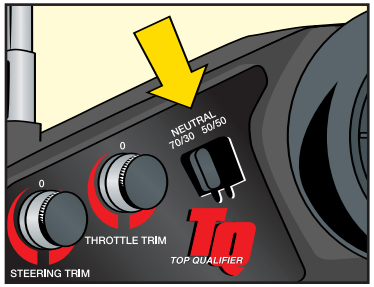


Other TQ Radio System Adjustments

In addition to the electronic throttle and steering trim controls, your radio system features throttle neutral adjustment and servo reversing switches.

Throttle Neutral Adjustment

The throttle neutral adjustment is located on the transmitter face and controls the forward/reverse travel of the throttle trigger. Change the adjustment by pressing the button and sliding it to the desired position. There are two settings available:



- 50/50: Allows equal travel for both acceleration and reverse.
- 70/30: Allows more throttle travel (70%) and less reverse travel (30%). 70/30 is the recommended setting for the Villain.

Note: If you change throttle travel, you will need to reprogram the electronic speed control.

Electronic Throttle Trim

The electronic throttle trim located on the face of the transmitter adjusts the neutral (center) point of the throttle servo when the servo is at rest. Your Villain uses an electronic speed control instead of a throttle servo. This control has been preset for you at the factory. If the adjustment is changed, the speed control will need to be reprogrammed (see page 16).

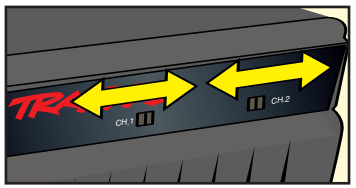
Electronic Steering Trim

The electronic steering trim located on the face of the transmitter adjusts the neutral (center) point of the steering servo when the servo is at rest. Adjust this control to make the model drive straight with no steering input at the wheel.

Servo Reversing Switches

The servo reversing switches are located on the front of the transmitter, next to the on/off switch. Moving a switch reverses the direction of the corresponding servo.

Each switch corresponds to a channel, as shown below. For example, if you turn the steering wheel to the right and your outdrives turn left, you would move the channel 1 switch to correct the servo direction. It may be necessary to adjust the corresponding trim control after moving a switch.



Channel	Servo
1	Steering
2	Throttle

Default Setting

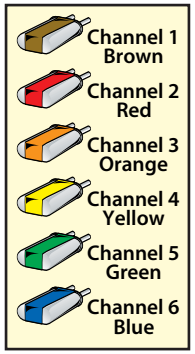
Remember, always turn the transmitter *on first* and *off last* to avoid damage to your model.

Your electronic speed control was adjusted to the radio from the factory. It is possible for the throttle trim control on the transmitter to have moved during transit or while handling the transmitter. If the motors run when the boat (esc) is switched on, then move the throttle trim control on the transmitter until the motors stop. If anything more than a slight adjustment of the throttle trim control is required, then you should readjust your speed control. Refer to the Adjustments section on pages 16.

Radio System Rules

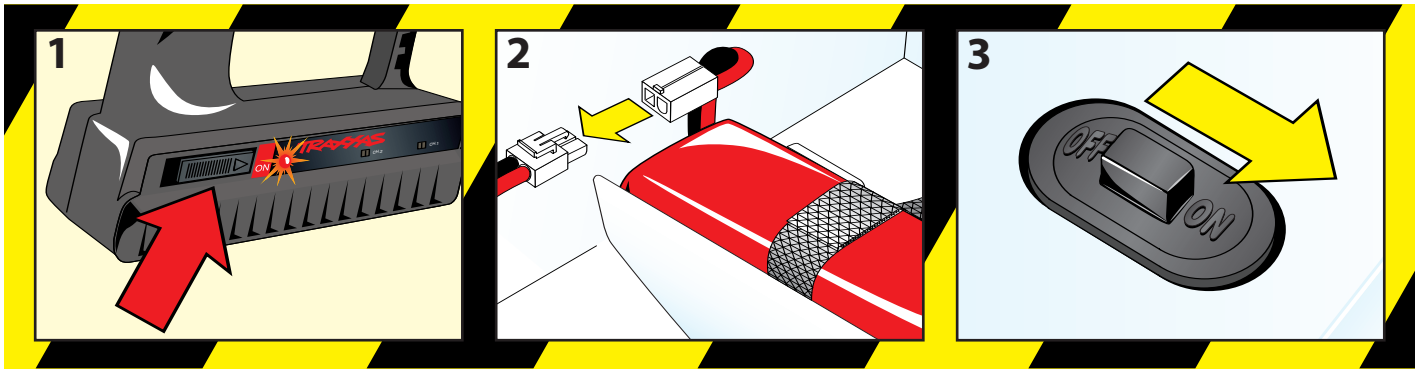
- Each time you prepare to run your model, you must clear your frequency to be sure no one else in the area is using the same channel as you.

  There are six possible channels, numbered 1 through 6. Each is represented by a color. Look at the crystal plugged into the back of your transmitter to determine which channel your boat is assigned to.



- Always turn your transmitter **on first** and **off last.** This procedure will help to prevent your Villain from receiving stray signals from another transmitter, or other source, and running out of control.
- Always have the transmitter turned on before you plug in the battery pack in the model. Also make sure that objects and people (fingers!) are clear of the props before connecting the battery.
- Always use new or freshly charged batteries for the radio system. Weak batteries will limit the range of the radio signal between the receiver and the transmitter. Loss of the radio signal can cause you to lose control of your Villain.

Caution: Always be sure that objects and people (hands!) are clear of the props before connecting the battery!



Using the Radio System

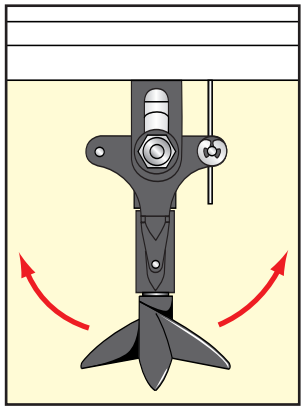
The radio system was pre-adjusted at the factory.
The adjustment should be checked, before running the model, in case of movement during shipping. Here's how:

1. Place the Villain on the boat stand.

2. Slide the transmitter switch to the "on" position. The red light should be on and not flashing. A flashing red light indicates weak transmitter batteries. Weak batteries will cause the range of your model to be limited and you could lose control.

3. **Keep fingers and objects away from the propeller.** Push the switch on the boat to the "on" position. The steering servo should jump and move to its idle (neutral) position.

4. Operate the steering control on the transmitter (channel 1). Check for rapid operation of the steering servo and that none of the steering mechanism is loose or binding. If the servo operates slowly, check for weak or discharged 7.2 volt battery pack. Adjust the "steering trim" control on the transmitter to adjust the servo so that the outdrives are pointing straight out from the back of the boat. Also, check to be sure that the outdrives do not turn more in one direction than in the other. If you cannot align the outdrive, refer to "Centering Your Servo" on page 21.



5. Operate the throttle control on the transmitter to ensure that the throttle is operating properly. If the propellers start spinning after you plug in the battery, or the boat doesn't seem to reach full speed, then refer to the directions for adjusting the electronic speed control on page 16.

Range-Testing the Radio System

Before each running session with your Villain, you should range-test your radio system to ensure that it operates properly.

1. Turn on the radio system and check its operation as described in the previous section.

2. Place the Villain on the boat stand. Have a friend watch the model. Make sure hands and clothing are clear of the propeller and other moving parts on the Villain.

3. Make sure your transmitter antenna is fully extended, and then walk away from the model with the transmitter until you reach the farthest distance you plan to operate the model.

4. Operate the controls on the transmitter once again to be sure that the model responds correctly.

5. Do not attempt to operate the model if there is any problem with the radio system or any external interference with your radio signal at your location.

When rechargeable batteries begin to lose their charge, they will fade much faster than alkaline dry cells. Stop immediately at the first sign of weak transmitter batteries. Never turn the transmitter off when the battery pack is plugged in. The model could run out of control.

Don't attempt to operate your Villain if there are any problems with your radio system or radio interference at your location.

If the power indicator doesn't light red, check the polarity of the batteries. Check rechargeable batteries for a full charge.

If the radio system doesn't appear to work when the transmitter and model switches are turned on, check for correct battery installation

Adjusting the Speed Control

Your Villain is equipped with the XL-10 Marine Speed Control. The electronic speed control installed in your Villain has been factory set and should not require any adjustments. These instructions are provided for your reference.

Precautions

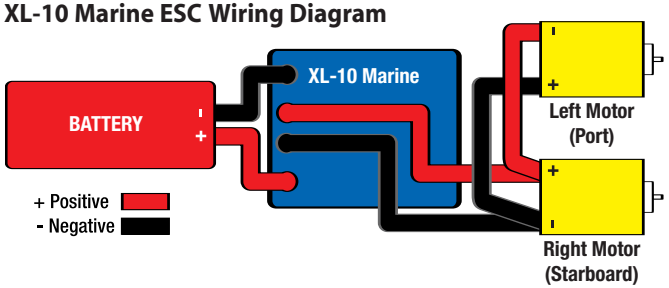
Follow these extra safety precautions for your protection and to ensure long life for the XL-10 Marine speed control.

- **Disconnect the batteries.** Always disconnect the battery pack from the speed control when not in use.
- **Transmitter on first.** Turn on your transmitter before the speed control so you will have control of the radio equipment.
- **Always use the heat exchanger.** The heat exchanger is factory-installed on the speed control and must be used for maximum cooling and performance. **Do not replace with metal heat sinks!**

These additional precautions apply if the stock Villain is modified in the future. Please be aware that damage to the speed control caused by modification of the Villain or XI-10 Marine ESC will not be covered by the warranty. This includes changing the connectors.

- **Use stock connectors.** If you decide to change the battery or motor connectors, only change one battery or motor connector at a time. This will prevent accidentally mis-wiring the speed control. If the XI-10 Marine ESC is not wired exactly as shown in the following diagram, it can be damaged!
- **Use neutrally timed motors.** Due to the need for one motor to be reverse rotation (for the counter rotating prop), the motors installed in the Villain are neutrally timed. If you replace the motors, the motors must have 0° timing. Modified motors (with adjustable end bells) timed to 0° or Johnson/Mabuchi (closed end bell) motors are recommended. Using motors with other than 0° timing will draw excess current in reverse rotation, causing the speed control to overheat and premature motor wear.
- **Motor capacitors required!** If the factory installed stock motors are replaced, three 0.1µF (50V) ceramic capacitors should be properly installed on every motor to prevent radio interference. These capacitors are available from your hobby dealer.

XL-10 Marine ESC Wiring Diagram



- **No reverse voltage!** The speed control is not protected against reverse polarity voltage. If changing the battery and/or motor, be sure to install the same type of connectors to avoid damage to the speed control. Removing the battery connectors on the speed control or using the same-gender connectors on the speed control will void the product's warranty.
- **Don't let the transistor tabs touch!** Never allow the separate transistor banks to touch each other or any exposed metal. This will create a short circuit and damage the speed control.
- **Insulate the wires.** Always insulate exposed wiring with heat shrink tubing to prevent short circuits.
- **Don't use electrically conductive heat sink compound on the heat exchanger.** The transistor tabs must remain electrically isolated.

Transmitter Adjustments for the XI-10 Marine ESC

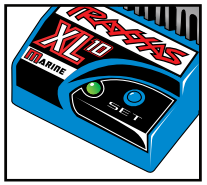
Before attempting to program your XI-10 Marine ESC, it is important to make sure that your transmitter is properly adjusted (set back to the factory defaults). Otherwise, you may not get the best performance from your speed control.

The transmitter should be adjusted as follows:

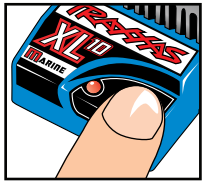
1. Set the throttle neutral switch to the 70/30 setting. This adjusts the transmitter's throttle trigger throw to 70% for throttle and 30% for brake/reverse.
2. Set the throttle trim to the middle "0" setting. This adjusts the neutral position of the throttle servo.
3. Set the Channel 1 servo reversing switch to the left position.
4. Do not change the position of any of the servo reversing switches after programming the XI-10 Marine ESC.

Setup Programming

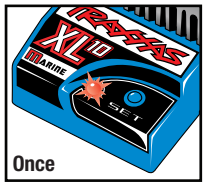
1. Place the boat on a boat stand. Always make sure that objects and fingers are clear of the props. The motors will not run during programming.
2. Connect a fully charged battery pack to the ESC.
3. Turn on the transmitter with the throttle at neutral.
4. Turn on the marine ESC with the external switch. The LED will turn solid green. (Note: If the throttle is not at neutral, the LED will turn off after one second.)

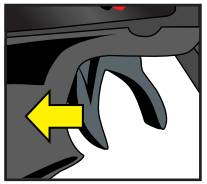


5. Press and hold the ESC set button until the LED turns red; then release the set button. The LED will turn off after 3 seconds.

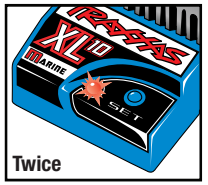


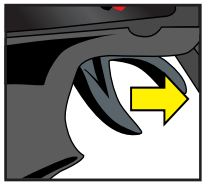
6. When the red LED blinks ONCE, pull the throttle trigger to the full throttle position and hold it there.



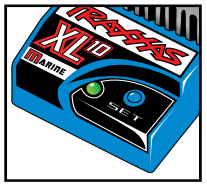


7. After 3 seconds, when the red LED blinks TWICE, push the throttle trigger to the full reverse/brake and hold it there.





8. The LED will turn solid GREEN, indicating the programming is complete.



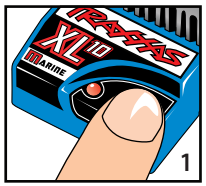
Profile Programming

The speed control is factory set to Profile #1 (forward with 25% reverse). To disable the reverse (Profile #3), or to allow full reverse (Profile #2), follow these steps. The speed control should be connected to the receiver and the transmitter adjusted as described on page 16.

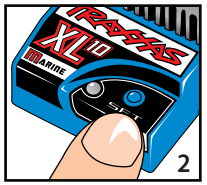
Profile Description

Profile #1: 100% forward, 25% reverse.
Profile #2: 100% forward, 100% reverse.
Profile #3: 100% forward only, no reverse.

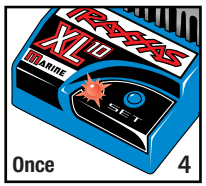
Profile #1 (100% forward, 25% reverse)

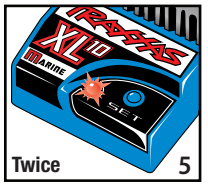


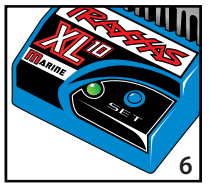
Turn on the transmitter with the throttle at neutral. Press and hold the set button until the LED turns red, then turns off. Release the set button.



Keep the throttle at neutral.





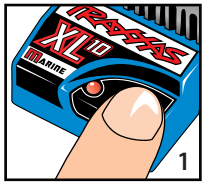


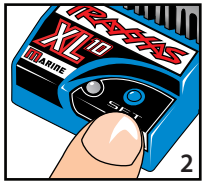
The red LED will blink ONCE, blink TWICE, and then turn solid green indicating the profile programming is complete.

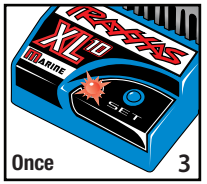
Using an Aftermarket Transmitter.
The following instructions are provided as reference only for those who are using an aftermarket transmitter in place of their factory TQ.

1. Set the High ATV or EPA to the maximum setting. This is the amount of servo throw at full throttle.
2. Set the Low ATV, EPA, or ATL to the maximum setting. This is the amount of servo throw at full reverse.
3. Set the Exponential to the zero setting. This adjusts the throttle channel linearity.
4. Set the Throttle Channel Trim to the middle setting. This adjusts the neutral position and increases or decreases the amount of coast braking.
5. Set the Throttle Channel Reversing Switch to either position. Do not change the switch position after programming.
6. Set the Trigger Throw Adjustment to 70% throttle and 30% brake throw.

Profile #2 (100% forward, 100% reverse)

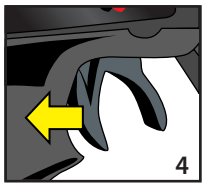


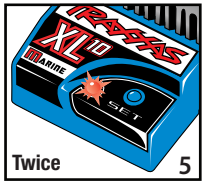


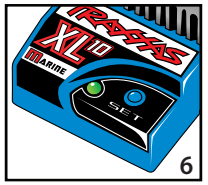


Turn on the transmitter with the throttle at neutral. Press and hold the set button until the LED turns red, then turns off. Release the set button.

When the red LED blinks ONCE...

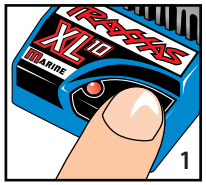


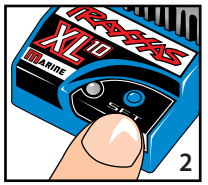


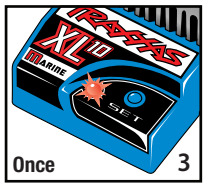


...pull the throttle trigger to the full throttle position and hold it there until the LED blinks TWICE, and turns solid GREEN indicating the profile programming is complete.

Profile #3 (100% forward only, no reverse)

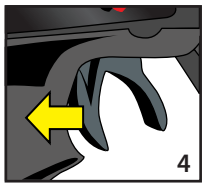


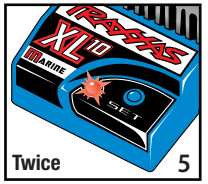


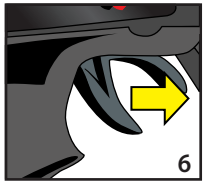


Turn on the transmitter with the throttle at neutral. Press and hold the set button until the LED turns red, then turns off. Release the set button.

When the red LED blinks ONCE...

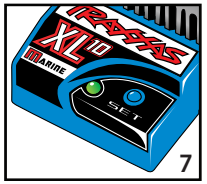






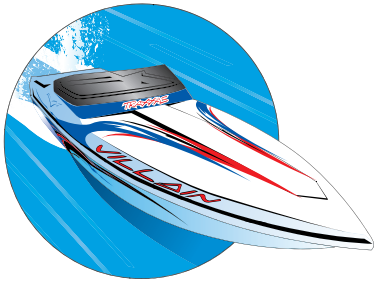
...pull the throttle trigger to the full throttle position and hold it there.

When the red LED blinks TWICE, push the throttle trigger to the full reserve/brake and hold it there.



The LED will turn solid GREEN indicating the profile programming is complete.

Now it's time to have some fun! This section contains instructions on driving and making adjustments to your Villain. Before you go on, here are some important precautions to keep in mind.



- Select a body of water, at least 10 inches deep, which is clear of moss and grass. Do not drive the Villain in extremely rough, choppy water or in high wind (more than 15mph). These conditions could cause your Villain to flip over.
- The Villain's steering is very sensitive. A slight input on the steering control will have a large effect on the boat. When the boat is out in open water, adjust the steering trim on the transmitter until the boat travels in a straight line on its own. (**Note:** The Villain will only travel in a straight line on its own when it is heading straight into or away from the wind. Crosswinds will require constant steering input to maintain a straight course.)
- To prevent spin outs, avoid steering sharply at high speed.
- Always be ready to reduce the throttle if the Villain appears to be unstable or "chine walking" (rocking violently from side-to-side). Always reduce the throttle when turning, especially in rough water. Jumping the Villain or towing anything with it should not be attempted.
- Return the Villain to shore at the first sign of a weak battery. The Villain will begin to slow and the controls will become sluggish.

Cavitation

If the Villain is running at full throttle but is only barely moving forward then the propeller is cavitating. Try advancing the throttle slowly to get the Villain on plane. If you are having trouble with cavitation, check the propellers for nicks or tangled debris. The Villain's propellers are specially designed for their application and are very sensitive to any changes or modifications. If a prop is damaged it should be replaced.

Run Time

The main factor affecting run time is the type and condition of your batteries. The milliamp hour (mAh) rating of the batteries determines how large their "fuel tank" is. A 3000 mAh battery pack will theoretically run twice as long as a 1500 mAh pack. Because of the wide variation in the types of batteries that are available and the methods with which they can be charged, it's impossible for us to give you exact run times for the Villain. Another major factor which affects run time is how the Villain is driven. Our experience has shown that the run times are shorter when the boat is driven continuously at top speed.

Tips for Increasing Run Time

- Use batteries with the highest mAh rating you can purchase.
- Use a high-quality peak-detecting charger.
- Discharge the battery completely after each run (not NiMH).
- Vary your speed. Continuous high speed shortens the run time on the Villain.
- Maintain your Villain. Do not allow debris or damaged parts to cause binding in the drivetrain. Keep the motors clean and the motor bushings lightly lubricated.
- Apply the throttle smoothly. Hard acceleration, especially from a stop, will shorten your run time.

Cooling

The motors become very hot after each run. The larger the battery capacity, the longer the Villain will run and the hotter the motors will get. Do not push the motors. Allow the motors to cool for 15 minutes between runs.

Boat Retrieval

If the Villain accidentally flips over and fills with water, it is equipped with foam floatation to help prevent it from sinking. Traxxas does not recommend swimming or wading to retrieve a boat. If you have chosen your launch site carefully (downwind), the Villain will probably drift back to you on its own.

If there is no wind, you will need a tennis ball and a length of string. Tie the tennis ball securely to one end of the string and then throw the ball over the drifting boat. Pull the ball in and try to entangle the boat in the string. Pull the boat back slowly to shore. If only the bow of the boat remains visible, try using a fishing lure with many hooks and a fishing pole. Try to snag the lip of the upper deck or drive mechanism with the hooks.

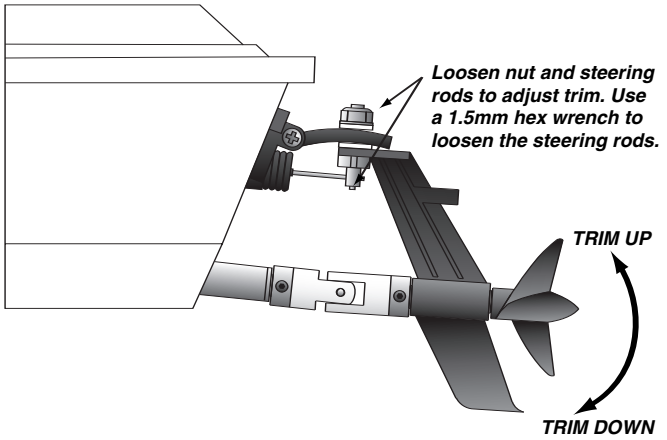
Caution! If the Villain **suddenly** stops running or runs very slowly, **release the throttle immediately!** There could be trash wound around the props (such as a plastic bag or fishing line). If you continue to drive the Villain with bound props, the high load could create excessive heat and seriously damage the batteries, speed control, or motors. Retrieve your Villain through other means *(see Boat Retrieval on the left)*.

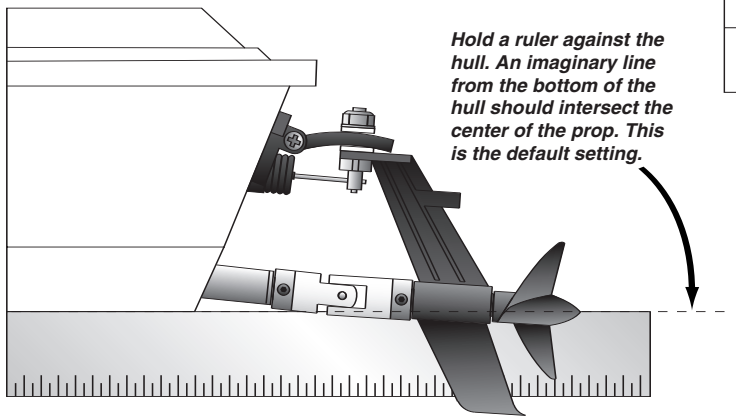
Important Note! Allow the motors to cool for 15 minutes between runs. This will extend the life of the motors.

Caution! Motor and batteries can become extremely hot, so be careful not to touch them until they cool.

Adjusting the Trim Angle

The outdrive struts on the Villain will allow you to adjust the trim angle of the propeller. The trim angle changes how high the bow of the boat rides out of the water. Setting the trim angle correctly will provide the maximum speed and efficiency from the Villain. As the outdrive is trimmed up, the bow (front) of the boat will ride higher. The Villain will run slightly faster however, it will be more unstable in the wind. Do not trim the outdrive up on windy days or when running in choppy water.

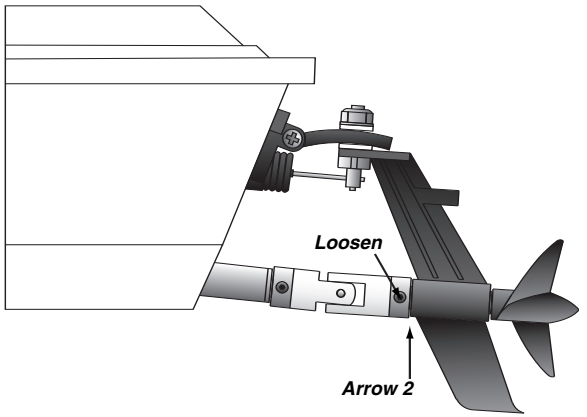




If the trim is set to high, then the bow will bounce up and down ("porpoise"), and the prop may begin to cavitate. As the outdrive is trimmed down, the bow of the boat is lowered thus increasing the wetted surface of the boat. This will slow the Villain slightly, but stability and control will be improved. Experiment with this adjustment to find out what works best for your particular conditions. Make sure the trim angle on both outdrives is set the same.

Adjusting the Outdrive Shaft End Play

There should be a slight amount of shaft end play in each outdrive housing. To adjust the end play loosen the grubscrew on the U-joint yoke (see drawing). Pull the propeller shaft until there is no more than 1mm of distance at arrow 2 in the drawing. Retighten the grub screw. This setting would not normally require adjustments unless repairs have been made, or the props have been replaced with aftermarket props.



Maintaining and Storing Your Villain

Your Villain requires maintenance in order to stay in top running condition. The following procedures should be taken very seriously. Form the habit of visually inspecting the mechanical integrity of the Villain before and after each run.

Inspect the model for obvious damage or wear:

- Normally, some water will accumulate inside the boat. Empty any standing water out of the boat between runs. Pour any water out the side or front of the boat. Do not drain the water out of the back of the boat (near the radio system).
- Check the wiring for any frayed wires or loose connections.
- Check the tightness of the set screws in the collars on the steering linkages, in the propellers, and in the universal joint yokes (connecting the outdrives to the driveshafts). Thread-locking compound can be applied to these screws to prevent them from loosening.
- Check the mounting of the receiver and servo.
- Check the driveshaft seals for damage. Do not attempt to run the Villain if these seals are damaged in any way.
- Check the tightness of the propellers. Visually inspect the props for nicks, dings, and warpage. Replace if any damage is noticed.
- Check the operation of the radio system, especially the condition of the batteries.
- Visually inspect the hull for any cracks, damage, or possible leaks.
- **Drain all water out of the Villain and thoroughly dry it before you store it. Store the Villain with the top deck removed and radio compartment cover open so that any remaining moisture will evaporate.**

Other periodic maintenance:

- Keep the Villain clean of accumulated dirt and oil.
- Re-oil the motor bushings before each day of running. Use an oil made for electric motors such as 3-in-1 Oil™.
- Periodically re-oil the bushings in the outdrive housings and the driveshaft tubes. There are metal oiling nipples in each drive unit to accommodate oiling the driveshaft tube bushings.
- Keep all of the screws in the drive system tight.

Storage:

- Disconnect and remove all batteries.
- Thoroughly clean and dry the Villain before storing it.
- Always store the Villain with the top deck and radio compartment cover removed. This will allow harmful moisture and condensation to evaporate.

Centering Your Servo

Whenever your radio system has been removed for service or cleaning, the steering servo must be re-centered prior to installing the radio system in the model.

1. If the radio system is already installed in the boat, disconnect the servo horn from the servo.
2. Connect the steering servo to channel 1 on your receiver and the electronic speed control to channel 2. The white wire on the servo cable is positioned towards the crystal.
3. Place fresh "AA" batteries in the transmitter and turn the power switch on.
4. Slide the throttle and steering trim adjustments to the center position.
5. **Keep fingers and objects away from the propeller.** Connect a fresh 7.2V battery pack to the electronic speed control and turn the power switch to the on position. The servo will automatically jump to its center position.
6. Turn off the power switch in the boat followed by the transmitter. The servo horn is now ready to be installed.
7. Be careful not to move the servo shaft when installing the linkages. Readjust the electronic speed control as described in the previous section.

Increasing Performance

When replacing a motor, remove any labels on the new motor if you plan to use the aluminum heat sinks. Using a heat sink on a motor with a label will decrease the effectiveness of the heat sink.

While the Villain is a great performer out of the box, there are steps you can take to increase the speed of the boat.

1. **Adjust the trim angle correctly.** The trim angle should be trimmed down just enough to keep the bow of the boat from porpoising (bouncing up and down) in the current water conditions. If the trim is set too low, then it pushes the bow lower and increases drag in the water (see page 20).

2. **Maintain your boat.** Your Villain will be faster if it is kept clean and in good working order. Replace the props if they get nicked or damaged. Keep bushings and gears lubricated. Keep the motors clean and oiled. Make sure the drivetrain turns freely with no binding or excess friction. Maintain the batteries by completely discharging the packs after each use. This will minimize the "memory" effect of NiCad batteries.

3. **Use the best batteries and charger you can afford.** Rechargeable batteries will lose their "punch" over time and should be replaced when their fully charged performance decreases significantly. Consider replacing worn-out sport packs and a timed charger with high-performance batteries and a good peak-detecting charger. A peak-detecting charger charges batteries to their peak voltage and then automatically shuts off. This assures perfectly charged batteries every time.

4. **Use aftermarket metal props.** Polished and balanced metal props can significantly increase the speed and efficiency of the Villain. To fit aftermarket props with 3/16 inch threads, use the Traxxas accessory prop shaft (part #1529X). For the best performance, choose props that can be purchased as counter-rotating pairs, such as the Octura X447 props (available from your hobby dealer). When larger props are used, it may be necessary to use smaller pinion gears on the motors.

5. **Use more-powerful aftermarket motors.** ***Note: Do this at your own risk! Changing the motors will void the warranty for the XL-10 Marine speed control. Damage to the Xl-10 Marine ESC caused by excessive current flow is not covered by warranty. Changing the motors is only recommended for experienced users who understand the gearing needs and the increased loads and cooling requirements placed on the electronics.*** The Stinger 540 motors are matched to the XL-10 Marine speed control to provide the best balance of performance, efficiency, and run time. Higher performance, zero-timed 550 or 540 motors may be used, however efficiency and run time will decrease (sometimes by more than half!). Aftermarket performance motors will run much hotter and often require their own water-cooling system to survive. The stock gear ratio will need to be modified by changing the pinion gears on the motors. Adjust the gearing to control current draw, run-time, and destructive heat build-up. Improper gearing can destroy motors, batteries, and electronics very quickly. Always start with small pinion gears (12-tooth) and closely monitor the motor and battery temperature, and run time. Pinion gear size may be increased until any one of the motors, batteries, or speed control become too hot, or the run time becomes unacceptably short. There are practical limits to what the electronics system in the Villain is capable of. For example, it may not be possible to use the fastest 10-turn modified 540 motors and the largest aftermarket props without generating so much current draw and heat that expensive batteries and electronics will be immediately destroyed. Be reasonable and conservative with your motor, gearing and prop choices to avoid expensive damage.

6. **Replace the XL-10 Marine speed controller and the two 540 motors with the Traxxas EVX Marine speed controller (part #3015) and two Titan 550 marine motors (part# 1585).** Installing the Traxxas EVX speed controller and two Titan 550 marine motors into the Villain will double the voltage (14.4v) to the motors, significantly increasing power. It's very important to use the Titan 550 marine motors with the EVX speed control. The stock 540 motors will overheat when powered by 14.4 volts. It is recommended to use the Villain water-cooing kit when using the EVX speed controller with two Titan marine motors for extra cooling.

7. **Install the Villain water-cooling kit (part #1580).**  The water-cooling kit will provide significant cooling to both of the motors. Extreme heat (as explained above) can deteriorate the motors' performance more rapidly, and possibly cause failure if the components are allowed to get too hot. The water-cooling kit is highly recommended when replacing the two stock 540 motors and XL-10 Marine speed controller with two Titan 550 motors and the EVX speed controller or modified motors. It is still very important to allow the motors to cool down between runs for 15 minutes, even with the Villain water-cooing kit.

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