

# **OPERATING INSTRUCTIONS**

**COVERS MODELS 4301, 4304, AND 4310**

## INTRODUCTION

Thank you for purchasing the new Traxxas 4TEC. Your new 4-TEC is designed to provide many hours of exciting 4-wheel-drive action! This manual contains the instructions you will need to operate and maintain your new 4-TEC. **A separate manual covers assembly of kit versions. Look over both manuals and examine the 4-TEC carefully before running it.** If, for some reason, you think the 4-TEC is not what you wanted, then do not continue any further. Your hobby dealer *absolutely* cannot accept a 4-TEC for return or exchange after it has been run, or after any of the parts bags have been opened.

Please read all of the Operating Instructions and precautions before attempting to drive your new 4-TEC. These instructions are written with the assumption that this is your first electric model. Even if you are an experienced R/C enthusiast, please continue reading to learn about special features that make the 4-TEC unique. Pay special attention to the mechanical and safety precautions outlined in the manuals.

This manual includes basic steps for operating the radio system which is included on 4-TEC model 4310. Models 4301 and 4304 do **not** include the radio system.

If you have any questions about your new model, call Traxxas' technical support line at 1-888-TRAXXAS (U.S.A. residents only) or 972-613-3300. Technical support is available Monday through Friday, from 8:30 AM to 5:30 PM Central Time. We truly hope that you will enjoy driving and maintaining your new 4-TEC!

## PERSONAL SAFETY PRECAUTIONS

If the precautions are followed, and your 4-TEC is operated sensibly and with care at all times, it is exciting, safe, and fun for you and your spectators. Failure to operate your 4-TEC in a safe and responsible manner could result in property damage and injury. You alone must see to it that the instructions are followed and the precautions are adhered to.

The 4-TEC is not intended for use by children without the supervision of a responsible adult. Every precaution outlined in this manual should be followed to help ensure safe operation. **Traxxas Corporation shall not be liable for any loss or damages, whether direct, indirect, special, incidental, or consequential, arising from the use, misuse, or abuse of this product and any chemical or accessory required to operate this product.**

- The 4-TEC is not intended for use on public roads or congested areas where its operation can conflict with or disrupt pedestrian or vehicular traffic.
- Do not drive the 4-TEC at night.
- Never, under any circumstances, operate the 4-TEC in crowds of people. The 4-TEC is very fast and could cause injury if allowed to collide with anyone.
- Because the 4-TEC is controlled by radio, it is subject to radio interference from many sources that are beyond your control. Since radio interference can cause momentary losses of radio control, always allow a safety margin in all directions around the car in order to prevent collisions.
- **Most importantly, use good, common sense.**

## WHERE TO RUN

Select an area that is isolated from people and traffic. Avoid areas that are near water (pools, lakes, etc). Run the car only on dry surfaces. Mud and water will damage the electronic components and increase the wear on all mechanical parts. When choosing an area to run, always consider what would happen if you lost control of the 4-TEC at full throttle.

## THE RADIO SYSTEM (Model 4310 only)

**The following definitions will be used throughout the rest of these operating instructions.**

**TWO-CHANNEL RADIO SYSTEM** - The radio system in your model consists of the RECEIVER, the TRANSMITTER, the SERVOS, and the CRYSTALS. It has two channels, one to operate the throttle, and one to operate the steering. (Note: unassembled kits do not include the radio system.)

**TRANSMITTER** - The TRANSMITTER is the hand-held radio unit which sends throttle and steering instructions to the model.

**RECEIVER** - The RECEIVER is the radio unit inside the model which receives signals from the TRANSMITTER and relays them to the SERVOS.

**SERVO** - The SERVOS are the small motor units in the model which operate the steering and throttle mechanisms.

**FREQUENCY BAND** - The FREQUENCY band is the radio frequency that the transmitter uses to send signals to the model. The FREQUENCY BAND for radio control vehicles is 27 MHZ.

**CHANNEL** - The 27 MHZ FREQUENCY BAND is divided into 6 CHANNELS, so that up to six cars can be operated simultaneously. These CHANNELS are referred to by their number and flag color. The chart below lists the channels and their flag colors.

27MHZ	FLAG COLOR	CH#	TRAXXAS PART#
26.995	BROWN	1	2031
27.045	RED	2	2032
27.095	ORANGE	3	2033
27.145	YELLOW	4	2034
27.195	GREEN	5	2035
27.255	BLUE	6	2036

**CRYSTAL (X-TAL)** - The CRYSTAL is the plug-in device that determines which channel (1-6) 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 in the RECEIVER.

**CLEARING YOUR FREQUENCY** - CLEARING your frequency means checking to be sure no one else in the area is operating on the same CHANNEL as you. You should always do this before operating your model.

**NICAD (Ni-Cd)** - These terms stand for rechargeable, nickel cadmium batteries. These batteries are most economical and can be recharged up to 500 times.

**NEUTRAL POSITION** - The NEUTRAL POSITION is the standing position that the SERVOS seek when the TRANSMITTER controls are at neutral.

**TRIM** - TRIM is the fine-tuning adjustment of the NEUTRAL POSITION of the SERVOS. This adjustment is made by turning the throttle and steering trim knobs on the face of the TRANSMITTER.

## PREPARING TO RUN

### • INSTALLING TRANSMITTER BATTERIES

Your transmitter uses 8 "AA" size batteries. They should be alkaline dry cells or nicad rechargeable batteries. The battery compartment is located in the bottom of the transmitter. To remove the battery door, push down on the tab and lift open the door. Be sure that the switch is turned off before installing the batteries. Insert the batteries into the battery compartment making careful note of the polarity. Now, snap the battery door back into place.

## • RECEIVER BATTERIES

The Traxxas receiver is equipped with B.E.C. (battery eliminator circuitry). This circuit eliminates the need to carry a separate 4-cell battery pack to power the radio system in battery-powered electric models. No extra receiver batteries are required.

## • ANTENNA SETUP

Locate the plastic tube and the yellow antenna tip (supplied in the bag with your instructions.) Insert the black antenna wire (coming out of the receiver in the car) into one end of the tube, and push it all the way through. Insert the tube into the upper chassis mount just over the receiver. Route the remaining antenna wire neatly in the chassis. Place the antenna tip over the end of the tube to secure the wire. Under no circumstances should you ever cut your antenna wire. Its length is specially tuned to the frequency band, and cutting it could severely shorten the radio's range.



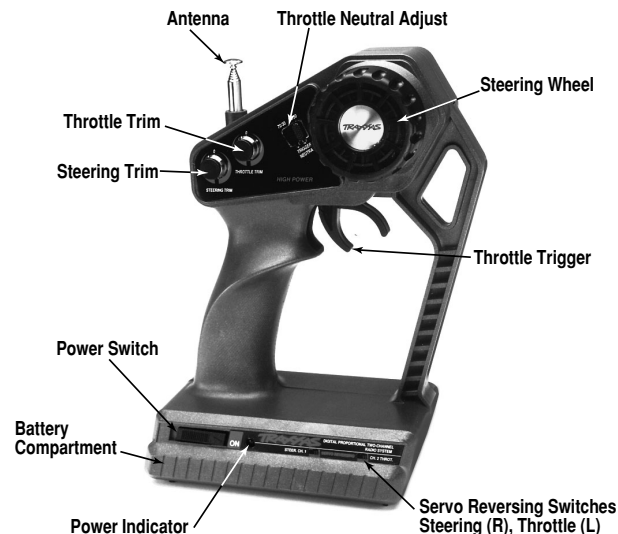
On top of the transmitter, extend the chrome telescopic antenna. Clear your frequency, slide the transmitter switch to the "on" position, and check for a steady red light (not flashing). If the light is flashing, the batteries are weak and should be replaced. Weak batteries will cause the range of your model to be limited, and you could lose control. **CAUTION:** When nicad batteries begin to lose their charge, they will fade much faster than alkaline dry cells. Stop immediately at the first sign of weak batteries.

## TRANSMITTER CONTROLS

For even more detailed information about the operation of the radio system, refer to the "Radio System Operating Instructions" included with your model.

## RADIO SYSTEM ADJUSTMENT

Your radio system was pre-adjusted before it left the factory; however, the adjustment should be checked prior to running the car. These instructions are for Traxxas radio systems only. If you installed your own radio, refer to your radio system's instructions.



1) Before you ever turn your radio system on, you must "clear" your frequency. Clearing your frequency means checking to be sure that no one else in the area is operating on the same channel as you. There are six different channels numbered 1 through 6. Each of the six channels is represented by a color. Look at the crystal on the back of the transmitter to determine which of the channels your car is operating on.

2) Always turn the transmitter on first, before you plug in the battery pack in the car. Slide the transmitter switch to the "on" position. The red light should be on and not flashing. A flashing red light indicates weak batteries. Do not operate your car with weak or discharged batteries.

3) Plug the nicad battery in the car into the speed control. This turns the car on (there is no other on/off switch). The servos should jump and move to their idle (neutral) position.

**NEVER TURN THE TRANSMITTER OFF WHEN THE CAR BATTERY IS PLUGGED IN. THE MODEL COULD RUN OUT OF CONTROL.**

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 batteries. Turn the "steering trim" control on the transmitter to adjust the servo so that the front wheels are pointing straight ahead. Check to be sure that the wheels do not turn more in one direction than in the other. If you cannot align the front wheels, you will have to re-center your steering servo. Refer to your "Radio System Operating Instructions" for detailed information on how to center the servo.

**Hold the steering wheel with just your fingertips! If you grip the wheel with your entire hand, you may be able to exert enough force to break the steering mechanism by overturning. Overturning the wheel is not covered by warranty.**

5) Operate the trigger on the transmitter to ensure that the throttle servo is operating properly. When the servo is in the neutral position, the rear wheels should not be moving. If they are spinning, adjust the throttle trim control on the transmitter (channel-2) until the wheels stop spinning. If there is not enough adjustment at the transmitter, the throttle servo will need to be re-centered. Refer to your "Radio System Operating Instructions" for detailed information on how to center the servos.

6) The radio system should be range-tested before each session of running. With the radio system on, have a friend carry the car away from you a distance equal to the maximum range you plan to operate the the car. Make sure your friend holds the car carefully to avoid contact with the wheels. At distance, once again test for complete radio control. Never attempt to run the car if the radio appears to be malfunctioning in any way.

## INSTALLING OTHER RADIO SYSTEMS

Before installing the radio system, center your servos as described in your radio system's operating instructions. **Note:** *The plug on the Traxxas speed control is compatible with Traxxas and Futaba radio systems. Some Airtronics, Sanwa, and Novak receivers require that the positive and negative leads in the plug be reversed. Refer to your radio system's schematic to ensure that the polarity is correct.*

The splines inside the steering servo saver and the throttle servo arm are compatible with Traxxas and Futaba servos. Other brands of servos may not fit properly and require you to purchase a compatible servo saver and servo arm. The designs are industry

standards, so it should not be difficult to locate identical parts that will fit your servos.

Refer to the radio system installation steps in your 4-TEC Assembly Manual to complete the radio installation. Route your wires neatly to prevent them from being damaged.

## VISUAL INSPECTION

Form the habit of visually inspecting the mechanical integrity of the 4-TEC before each run.

- 1) Check the wheels and steering for binding. Check the operation of the shock absorbers.
- 2) Check the wiring for any frayed wires or loose connections.
- 3) Check the mounting of the receiver and servos.
- 4) Check the tightness of the wheel nuts with a wrench.
- 5) Check the operation of the radio system, especially the condition of the batteries.

## DRIVING PRECAUTIONS

- The radio system is not waterproof. Avoid driving through puddles or mud. If water gets into the electronics it could damage them.
- Do not continue to operate the 4-TEC with low batteries or you could lose control of it. After the battery power drops below a certain point, the model will continue with the last command it had from the transmitter. Indications of low battery power include slow operation and sluggish servos (slow to return to neutral). Stop immediately at the first sign of weak batteries. When the batteries in the transmitter become weak, the red power light will begin to flash. Stop immediately and install new batteries, or you could lose control of your model.
- Do not drive the 4-TEC at night, on public streets, or in large crowds of people.
- If the 4-TEC becomes stuck against an object, do not continue to run the motor. Remove the obstruction before continuing.
- Do not attempt to push objects or tow objects with the 4-TEC.
- Because the 4-TEC is controlled by radio, it is subject to radio interference from many sources beyond your control. Since radio interference can cause momentary losses of control, allow a safety margin of space in all directions around the 4-TEC in order to prevent collisions.
- Use good, common sense whenever you are driving your 4-TEC. Intentionally driving in an abusive and rough manner will only result in poor performance and broken parts. Take care of your car, so that you can enjoy it for a long time to come.

## ADJUSTMENTS

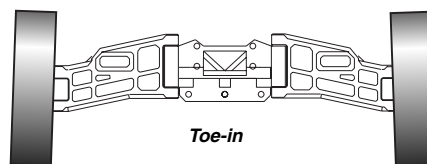
### • SHOCKS

The four shocks on 4-TEC greatly influence its handling. Whenever you rebuild your shocks, or make any changes to the pistons, springs or oil, always do it carefully and in pairs (front or rear). Piston head selection depends on the range of oil viscosities that you have available. For example, using a two-hole piston with a lightweight oil will, at one point, give you the same dampening as a three-hole piston with heavier oil. We recommend using the two-hole pistons with a range of oil viscosities from 10W to 50W (available from your hobby shop). The thinner viscosity oils (30W or less) flow more smoothly and are more consistent, while thicker oils provide more dampening. Use only 100% pure silicone shock oil to prolong seal life.

The ride height for 4-TEC can be adjusted by adding or removing the clip-on spring pre-load spacers. Adjust the ride height so that the suspension arms are slightly above being parallel to the ground. Observe how 4-TEC handles in turns. Proper set-up will add stability and help prevent spin outs. Experiment with different settings to find out what works on your track and conditions.

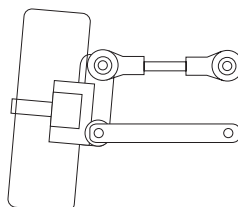
### • TOE IN

Geometry and alignment specs play an important roll in your car's handling. Take the time to set them correctly. Set the steering trim on your transmitter to neutral. Now, adjust your servo and tie rods so that both wheels are pointing straight ahead and are parallel to each other (0 degrees toe in). This will ensure the same amount of steering in both directions. For increased stability add 1-2 degrees of toe in to each front wheel. Use the turn-buckles to adjust the alignment.

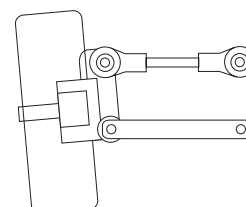


### • CAMBER

The camber angle of the front and rear wheels can be adjusted using the stock camber links (upper suspension arms). Remove the outer attachment point of the camber link and turn the rod end in or out to adjust the camber. The wheels should be set to 0 degrees of camber (wheels are perpendicular to the ground). These adjustments should be set with the car positioned at its normal ride height. Use a square or right-angle triangle to set the camber accurately.



Negative camber



Positive camber

### • GEAR RATIOS

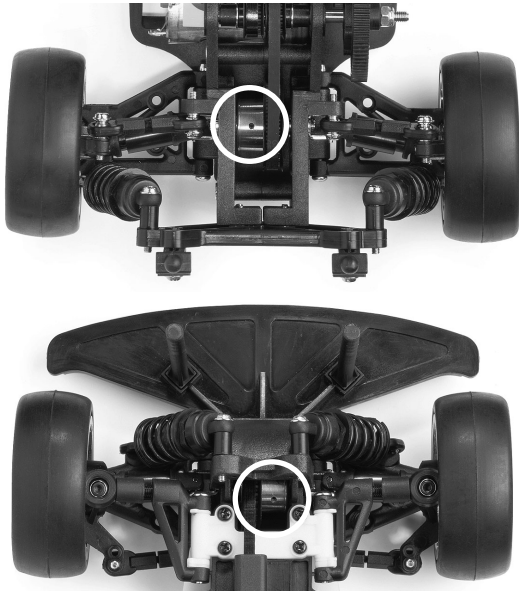
4-TEC will allow you to adjust the gearing over a broad range. Use the following formula to calculate the overall ratio:

$$\frac{\# \text{ SPUR GEAR TEETH}}{\# \text{ PINION GEAR TEETH}} \times 2.1 = \text{OVERALL DRIVE RATIO}$$

The 4-TEC is equipped with an 84-tooth spur gear and a 28-tooth pinion gear. This combination will provide good overall acceleration and top speed. If you want more acceleration and less top speed, use a smaller pinion gear (fewer teeth). For more top speed, use a larger pinion gear.

Pinion ▶ Spur ▼	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
84	-	-	-	-	-	-	-	-	-	-	-	-	6.39	6.16	5.96
87	-	-	-	-	-	-	-	-	-	7.41	7.12	6.86	6.62	6.39	6.17
93	-	-	-	10.42	9.90	9.43	9.00	8.61	8.25	7.92	7.61	7.33	7.07	6.03	-
96	12.78	12.02	11.35	10.76	10.22	9.73	9.29	8.89	8.52	8.17	7.86	-	-	-	-

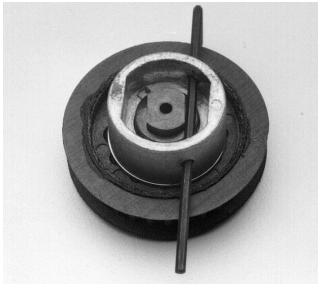




#### • BALL DIFFERENTIAL

The ball differential can be adjusted through the hole in each diff housing. insert the 1.5mm allen wrench (provided) through the hole. Push down on the wrench and rotate the left wheel until the wrench locks into the hole in the differential housing. See the picture for step A-12 in the 4-TEC Assembly Manual. Continue to push on the wrench and rotate the wheel until the wrench is fully inserted into the differential. This locks the diff. Now, turn the right

rear wheel clockwise to tighten the diff, or counterclockwise to loosen it. Turn the left front wheel to adjust the front diff. (following the same procedure as the rear). ***The preliminary setting for the ball diff is to tighten it until it stops and then back it off 1/4 of a turn.*** The range of adjustment from that point is plus or minus 1/8



of a turn. Adjust the Ball diffs for the best cornering performance on your track conditions. Do not run either ball differential so loose that you can see and hear slippage (high pitch squealing sound) while the 4-TEC is accelerating. This could damage your differential.

### MAINTENANCE

- Keep the 4-TEC clean of accumulated dirt and oil, especially around the shock absorbers and the bushings in the wheels.
- Clean and re-oil the bushings whenever the wheels are not rolling freely. Lightly oil the bushings with a lightweight electric motor oil. If the wheels are wobbly and loose, the bushings should be replaced. Consider upgrading to Traxxas ball bearings (part #4606 and 4611).
- The steering servo saver will wear out over time. If the steering becomes loose, the servo saver should be replaced.

### PAINTING THE BODY

Please read this entire section and plan your paint job first.

#### • BUYING PAINT

The body supplied with your kit is molded from clear Lexan<sup>®</sup>, so that it will be extremely lightweight and durable. The body

should be painted on the underside so that the color will not be scratched off while running. The best way to paint the body is by using thinned paints sprayed through an airbrush or spray gun. If you do not have these tools, the next best way is using spray can paints. Whatever paint you use, be sure that it is made for painting Lexan<sup>®</sup> and polycarbonate. Other types of paints and solvents can attack the body material and cause it to appear foggy.

#### • PREPARING THE BODY

The body must be washed thoroughly with dish soap and water to remove any grease or oil (i.e. fingerprints) which may keep the paint from adhering to it. Dry the body completely with a soft, lint-free cloth. Be careful using paper towels on the outside of the body, as they can scratch the plastic.

Most racing regulations require that the windows be left clear and not cut out. Use the supplied adhesive tape masks to mask the windows. Mask off any stripes or custom effects with either masking tape or special tape made for striping. This special tape is available from automotive paint supply stores and will provide sharper edges than masking tape. For easy, custom-colored striping, automotive pinstriping tape can be applied to the inside of the body and painted over. Be sure that all of your tape and masks are fully pressed down (burnished) so that the paint will not run or bleed underneath.

Usually, the darker colors are painted first, followed by the lighter colors. If your paint scheme would be easier to mask by covering the dark areas and spraying them last, be sure the lighter colors are opaque enough to prevent the darker color from showing through. Lighter colors can be backed with silver to help make them opaque.

The body has a clear peel coat on the outside. Leave the peel coat on the body until after it is painted. This will protect the outside of the body from paint overspray.

#### • SPRAYING THE BODY

Read the directions on your bottle or can of paint and shake, mix, or thin the paint, as required. It is very important to avoid breathing the paint vapors, as they are extremely harmful. Spray the paint outdoors in well-ventilated areas only. Apply the paint to the body sparingly and in light coats. Be patient! Let the paint dry fully in between coats. This will prevent accidentally smearing wet paint. Take extra care when masks are being removed.

#### • CUTTING THE BODY

Use the scribe lines in the body as a guide when trimming. Hobby scissors are best; a good pair of sharp scissors will work, if they are small enough to work around the tighter curves. Do not try to cut all the way through or saw the body material with a hobby knife. To make the body mounting holes, use a tapered reamer, if available. A drill bit will not work on the Lexan body. It is better to cut the body out after it has been painted, rather than before.

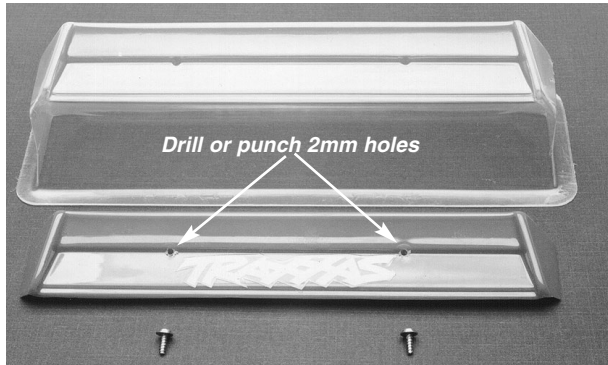
After the peel coat is removed, apply the decals. The decals are printed on clear mylar, so that you won't have to cut exactly around the image. Do try to cut as closely to the image as you can. Test position the decals before removing the backing. Once the decals have been applied, they cannot be removed without damaging them. If you have air bubbles in the decals, puncture the center of each bubble with a sharp pin and push the air out. If you have creases along the outer edges of a decal (especially when applied to curved surfaces), use a hobby knife to cut along the top of the crease and overlap the edges.

Continued

• **INSTALLING THE WING**

Paint the wing on the underside. Remove the peel coat and cut the wing out as shown. Punch two small 2mm holes in the locations marked on the wing. Use the tip of a hobby knife to start two very small holes in the top of the wing mounts on the body. Do not make these holes too large or the screws will not hold. Position the wing on the body and fasten it with the two 2x6mm washerhead self-tapping screws. Do not overtighten the screws.

• **BODY MOUNTING HOLES**

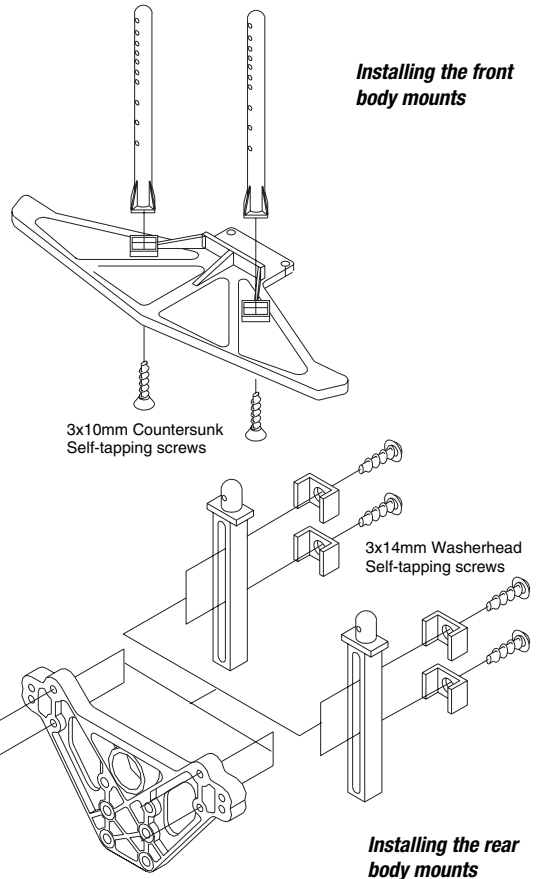


In the front, there are indentions in the body which mark where to make the holes for the front body mounts. In the rear there are four locations marked. **Use the indentions closest to the rear wing to make the holes for the rear body mounts** (see picture above).

**INSTALLING THE BODY MOUNTS**

The body mount parts are located in a separate bag with your instructions. The front body mount posts attach to the front bumper with 3x10mm countersunk self-tapping screws. The excess length should be trimmed off after the body is installed. The rear body mounts attach as shown in the drawing.

**LIMITED WARRANTY INFORMATION**



Every effort has been made in component design and material selection to make your model as durable as possible. Because the model is intended to be a hobby-class model and operate at a much higher level of performance than a "toy," no warranties can be expressed or implied relating to the longevity of the parts. Parts will wear out and require replacement. If any part of the model appears to be defective or incorrectly assembled when it is new (before it is used), it will be repaired or replaced at Traxxas' discretion. This warranty will not cover damage from wear, abuse, neglect, crashes, or water.

The radio system provided with the ready-to-run models is covered by separate warranty on a separate page (included in your documentation package). The radio system warranty does not cover water damage.

This model is not intended for use by children without the supervision of a responsible adult. Every precaution outlined in this manual should be followed to help ensure safe operation. Traxxas Corporation shall not be liable for any loss or damages, whether direct, indirect, special, incidental, or consequential, arising from the use, misuse, or abuse of this product and any accessory or chemical required to operate this product. Traxxas Corporation reserves the right to make changes, modifications, and improvements to this product without notification, which may not be reflected in these documents. Upgrades and improvements are not necessarily retroactive. Traxxas may not provide improved or updated components free of charge for models built prior to any change in specification.

If it has been determined that your model is somehow defective, return it to Traxxas with a note describing the problem and a copy of the purchase receipt or invoice. Remove all batteries. Remember that the warranty only covers brand new products which are defective right out of the box. All other service will be estimated on an individual basis.

**Be sure to include a return address and a daytime phone number.**  
**MAIL OR SHIP TO:**

**TRAXXAS CORPORATION**  
12150 SHILOH ROAD  
DALLAS, TEXAS 75228

For technical assistance regarding your model, call (888) TRAXXAS or (800) 323-0069 U.S. residents only. For orders, calls outside the U.S., and other information, call (972) 613-3300, or fax at (972) 613-3599.

Find Traxxas on the internet at [www.traxxas.com](http://www.traxxas.com)