



NITRO RUSTLER

OPERATING INSTRUCTIONS

COVERS MODELS 4404 AND 4410

WARNING!

FOLLOW ALL THE INSTRUCTIONS IN THIS AND THE ACCOMPANYING MANUALS IN ORDER TO AVOID SERIOUS DAMAGE TO YOUR MODEL. IF THESE INSTRUCTIONS ARE NOT FOLLOWED, THE RESULTING DAMAGE WILL BE CONSIDERED ABUSE AND/OR NEGLIGENCE, THEREBY RELEASING BOTH TRAXXAS AND YOUR DEALER FROM ANY FURTHER WARRANTY RESPONSIBILITY.

INTRODUCTION

Thank you for purchasing the Traxxas Nitro Rustler. This manual contains the instructions you will need to operate, and maintain your Nitro Rustler. **Look over the manual and examine the Nitro Rustler carefully before running it.** If for some reason you think the Nitro Rustler is not what you wanted, then do not continue any further. **Your hobby dealer absolutely cannot accept a Nitro Rustler for return or exchange after it has been run.**

Please read **ALL** of the Operating Instructions and Precautions before attempting to drive the Nitro Rustler. Even if you are an experienced R/C enthusiast, continue reading to learn about Nitro Rustler's unique features. Pay special attention to the mechanical and safety precautions outlined in the manual.

If you have any questions about your new model, feel free to call Traxxas' technical support line toll-free at 1-888-TRAXXAS (1-888-872-9927) Outside the U.S. call 972-265-8000. Technical support is available Monday through Friday, from 8:30am to 9:00 am Central time. Technical assistance is also available through our website at www.Traxxas.com (e-mail us at support@Traxxas.com). We hope that you will enjoy many hours of fun with your new Nitro Rustler.

FUEL

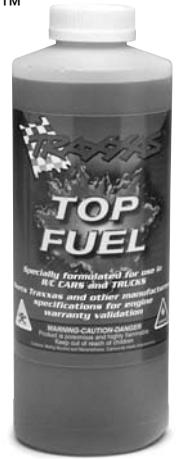
**CAUTION:
ALWAYS FOLLOW THE PRECAUTIONS PRINTED ON THE CONTAINER OF FUEL. KEEP IT AWAY FROM FLAMES AND CHILDREN. THE MIXTURE IS FLAMMABLE AND POISONOUS.**

Fuel is the most critical component for making your engine perform properly. Improper fuels will cause hard starting, poor performance, and excessive wear on the engine. For the best performance from your TRX Pro.15 engine, use **Traxxas Top Fuel™**. Traxxas Top Fuel is the only model engine racing fuel which exceeds all of the Traxxas engine warranty requirements,

is specially formulated to resist heat, and is guaranteed to provide the best performance and longest life from your Traxxas engine. Traxxas cannot guarantee the quality and consistency of other manufacturers' fuels. If Traxxas Top Fuel™ is not available from your hobby dealer, the fuels listed below have been tested by Traxxas and determined to be satisfactory for use in the TRX Pro.15.

Dynamite Blue Thunder
Power Master Formula 16
Byron's Originals Race 1000/2000
Morgan's Omega (Omega fuel is an airplane fuel which may be used. The higher oil content however, will not deliver the same performance and tuning ease as a good, special-purpose car fuel)

Some fuels are capable of destroying your TRX Pro.15 engine! If you must use a fuel other than those listed, contact TRAXXAS first, at 1-888-TRAXXAS, to find out if the fuel is safe for use with TRX engines.



FUEL BOTTLE

**CAUTION:
ALWAYS FOLLOW THE PRECAUTIONS PRINTED ON THE CONTAINER OF FUEL. KEEP IT AWAY FROM FLAMES AND CHILDREN. THE MIXTURE IS FLAMMABLE AND POISONOUS.**



Fuel is usually purchased by the gallon or quart, so a smaller bottle with a dispensing tube is required to fill the fuel tank. The fuel tank in the Nitro Rustler has a capacity of 75cc. The fuel bottle should always be capped to prevent the fuel from evaporating and becoming contaminated with debris or moisture. The alcohol and nitro contents of the fuel will evaporate, thus upsetting the fuel balance and spoiling the fuel. Do not use old or dirty fuel!

Traxxas #5001-Fuel Bottle

PERSONAL SAFETY PRECAUTIONS

Every precaution outlined in this manual needs to be followed to help ensure safe operation. Operate your model sensibly and with care and it will be exciting, safe, and fun for you and your spectators. Failure to operate your model in a safe and responsible manner could result in property damage and serious injury. You alone must see to it that the instructions are followed and the precautions are adhered to.

The Nitro Rustler is not intended for use by children without the supervision of a responsible adult. Traxxas 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 fuel is dangerous and poisonous.** Follow all of the directions and precautions on the fuel container.
- The fuel can look like a cool drink to a young child. **Keep it out of children's reach.**
- The fuel is flammable. Do not allow sparks, flame, or smoking in the presence of model fuel.

- The engine emits poisonous carbon monoxide gas. Always run the model in a well-ventilated area. Never attempt to run the engine indoors.
- The engine and exhaust become extremely hot during use. Be careful not to touch these parts, especially when refueling.
- Do not drive the Nitro Rustler at night.
- Never, under any circumstances, operate the Nitro Rustler in crowds of people. The Nitro Rustler is very fast and could cause injury if allowed to collide with anyone.
- Because the model 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 model in order to prevent collisions.
- The engine can be very loud. If the noise makes you uncomfortable, wear ear protection. Be considerate of your neighbors by not running your model early in the morning or late in the evening.
- **Most importantly, use good, common sense at all times.**

7.2v BATTERY PACK AND CHARGER

The EZ-Start™ electric starter requires a 7.2 volt rechargeable nicad battery pack. The battery pack straps to the bottom of the EZ-Start™ control box with the supplied tie wraps. The battery pack must be **fully charged** in order to start the engine. It can be recharged with an overnight "wall charger", a peak-detecting charger, or a 15-minute quick charger. All are available from a hobby dealer.



OTHER REQUIRED EQUIPMENT

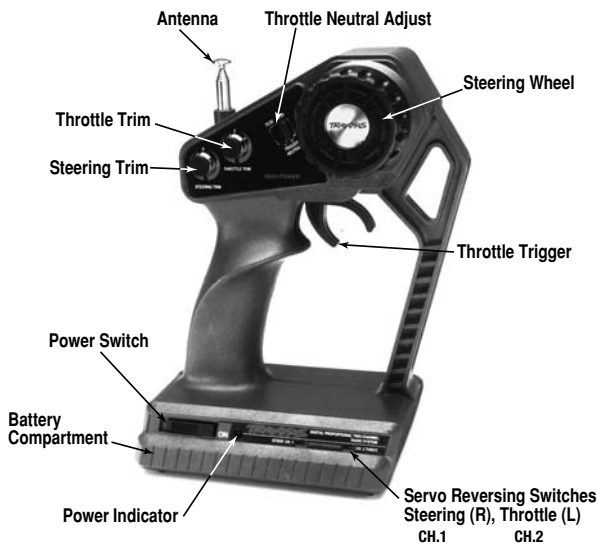
To operate the Nitro Rustler, you will need these additional items. All of these items should be available from your hobby shop.

1. "AA" size batteries for your transmitter(8) and receiver(4)
2. Small phillips head and flat screwdrivers (for adjustments)
3. After-run oil (to protect the engine from corrosion)
4. Spare glow plugs (standard plug, Traxxas part #3230; or heavy-duty plug, Traxxas part #3231).
5. In-line fuel filter (recommended)
6. Spare fuel line (recommended)

THE TQ RADIO SYSTEM

The Nitro Rustler Model 4410 is equipped with the 2-channel TQ radio system. The following radio system terms 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, and the SERVOS. It has two channels, one to operate the throttle, and one to operate the steering.



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. All Traxxas RTR models operate on a 27 MHZ FREQUENCY BAND.

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

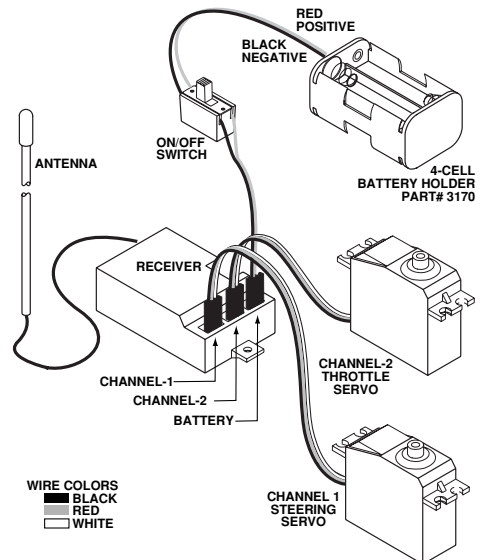
CRYSTAL (X-TAL) - The CRYSTAL is the plug-in device that determines which channel the RADIO SYSTEM will operate on. For each CHANNEL, there are two CRYSTALS, one for the RECEIVER and one for the TRANSMITTER. Of those two CRYSTALS, the one marked with the lower number (.455 MHZ lower) must be inserted 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. 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.

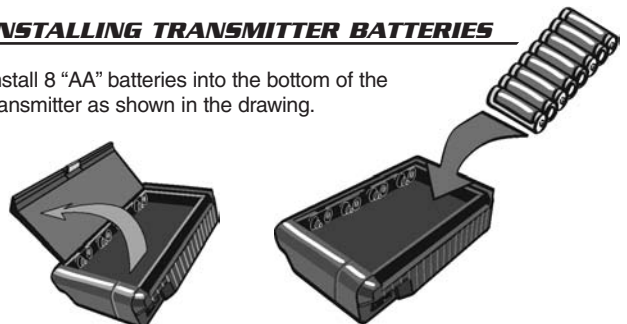
NEUTRAL POSITION - The NEUTRAL POSITION is the standing position that the SERVOS seek when the TRANSMITTER controls are at neutral.

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



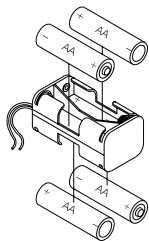
INSTALLING TRANSMITTER BATTERIES

Install 8 "AA" batteries into the bottom of the transmitter as shown in the drawing.

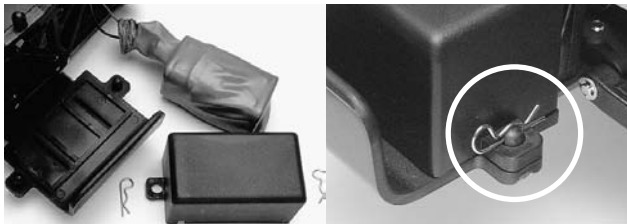


INSTALLING RECEIVER BATTERIES

The receiver battery holder is located underneath the battery cover. Remove the battery cover by removing the two body clips from the posts on both sides of the battery holder.



Install 4 "AA" batteries into the battery holder. Alkaline batteries should be used. Place the battery holder into the battery cover with the cushioning foam. Secure the battery cover to the chassis using the two body clips as shown.



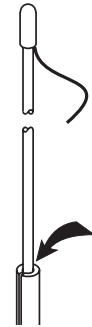
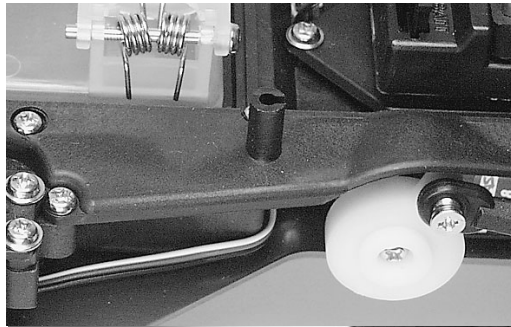
ANTENNA SETUP

Locate the plastic tube and the antenna tip (supplied in the bag with your instructions). Insert the black antenna wire, extending from the receiver housing, into one end of the tube and push it all the way through. Spray the wire with glass cleaner to make it easier to insert.



Insert the tube into the antenna mount in the side of the chassis. Fold the remaining antenna wire over the top of the antenna tube and secure it with the vinyl antenna tip.

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 the transmitter, **fully extend** the chrome telescopic antenna.



RADIO SYSTEM OPERATION

Your radio system was pre-adjusted before it left the factory, however, the adjustment should be checked prior to running the truck.

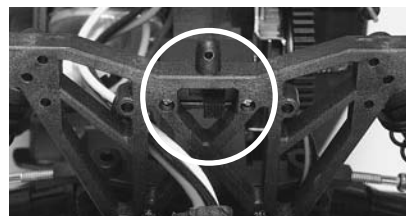
1) Before you ever turn your radio system on, you must "clear" your frequency. There are six different channels numbered 1 through 6. Each of the six channels is represented by a color. Look at the crystal in the back of the transmitter to determine which of the channels your truck is operating on. Clearing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

2) **TIP: Always turn the transmitter on first and off last.** This will prevent the model from receiving stray signals and running out of control. Slide the transmitter switch to the "on" position.



A steady red light should illuminate. **A flashing red light indicates weak batteries.** Weak batteries will limit the range of the radio signal between your transmitter and receiver. Loss of the radio signal can cause you to lose control of the truck.

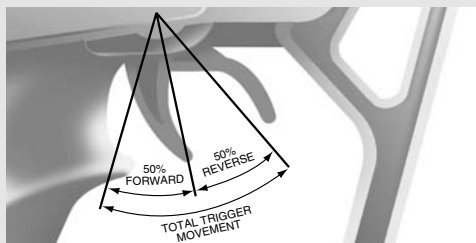
3) Turn the truck on. The switch is located on the chassis. The servos should jump and move to their idle (neutral) positions.



RADIO SYSTEM ADJUSTMENTS

• THROTTLE NEUTRAL ADJUST

The throttle neutral adjustment is located on the transmitter face and controls the forward and reverse travel of the throttle trigger. There are two settings, 50/50 which allows equal travel for both forward and brake, and 70/30 which allows more travel for throttle and less for brake. Change the adjustment by pressing the button and sliding it to the desired position. 70/30 is the recommended setting while running the Nitro Rustler.



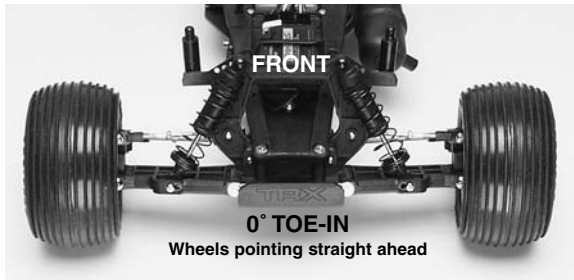
• SERVO REVERSING SWITCHES

On the front of the transmitter there are two switches. One for throttle and one for steering. Moving the switches reverses the direction of the corresponding servos. For example, if you turn your steering wheel right and the model moves left, then switch the steering servo reversing switch to correct the servo direction. You may need to adjust the corresponding trim control after moving the servo-reversing switch.

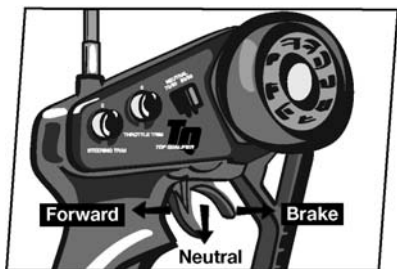


NEVER TURN THE TRANSMITTER OR RECEIVER OFF WHILE THE ENGINE IS RUNNING. THE MODEL COULD RUN OUT OF CONTROL. (The on/off switch only turns the receiver on and off. It does not turn off the engine.)

- 4) With the front wheels off the ground, operate the steering control on the transmitter (channel 1). Check for rapid operation of the steering servo and that the steering mechanism is not 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.



- 5) Operate the throttle trigger on the transmitter to ensure that the throttle servo is operating properly. When the servo is in the neutral position, the carburetor should be in its idle position (you will adjust the engine idle speed later). When the throttle trigger is pulled all of the way, the carburetor should be in the fully open position. When the throttle lever is pushed forward, the brake should be locked and the throttle should not close any further than when at idle.



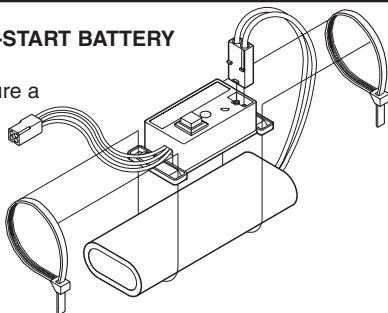
RANGE TEST THE RADIO

There are many things such as buildings, power lines, radio transmitters, etc. which can adversely affect the performance of your radio system. To make sure you do not have a "runaway" model, range test the radio system. With the radio system on and working, hold the truck and have a friend carry the transmitter away from you the distance you plan to run the truck. Have the friend operate the controls on the transmitter to be sure that everything is working at full range.

PREPARING TO RUN

• INSTALLING THE EZ-START BATTERY

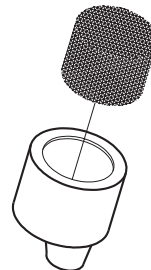
Use tie wraps to secure a fully-charged 7.2 volt battery back to the EZ-Start control box. Plug the battery connector into the face of the control box. The plug will only go in one way.



STARTING THE ENGINE

STEP 1: INSTALL THE AIR FILTER

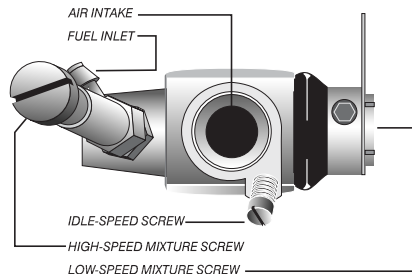
Remove the protective cap from the carburetor air intake. Install the rubber air filter base and pre-lubed foam element onto the carburetor intake. The foam air filter element may be cleaned and reused. **Always be sure the filter element is oiled properly before running the engine.** For the best filtration, use the type of oil made for foam air filters. It should be available locally from motorcycle shops and small engine repair shops. Lightweight motor oil or after-run oil may also be substituted. When the element gets dirty, clean it with dish soap and rinse. Next, saturate it with oil and then squeeze out the excess oil. For extremely dusty conditions, special two or three-stage, pre-lubed filters are available from Traxxas (Part #4062 and #4063).



STEP 2: FILL THE FUEL TANK

Use a small fuel bottle or bulb to put fuel into the tank. Only fill the tank to the bottom of the fill neck. The Nitro Rustler can be carefully refueled while the engine is running.

STEP 3: HIGH-SPEED MIXTURE SETTING

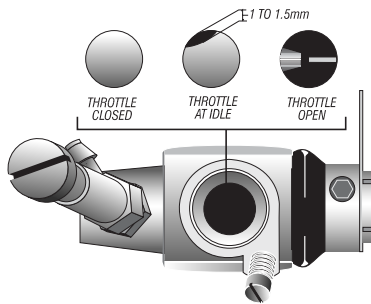


Note: Your carburetor has been factory preset for break-in. Do not readjust your carburetor settings unless you suspect a problem. The following steps are for reference only.

The high-speed mixture screw controls how much fuel enters the engine during mid and high-speed operation. Turn the high-speed mixture screw clockwise, by hand, until it stops (**Do not tighten or the needle may be damaged**). Now, turn the mixture screw counter-clockwise 2 1/2 complete turns.

STEP 4: SETTING THE IDLE SPEED

The idle screw regulates the throttle opening to control the idle speed. The throttle opening at idle should be set as shown in the drawing. The opening should be 1 to 1½ millimeters at the widest point in the opening. The engine may not idle well until it is warmed.



STEP 5: LOW SPEED MIXTURE SETTING

This screw meters the fuel at low speeds. The low-speed mixture screw is located in the end of the carburetor, inside the throttle arm. This screw controls how much fuel enters the engine at idle and low throttle. This adjustment will smooth the idle and improve acceleration to mid-speed. Make this adjustment with the throttle closed, after setting the idle. To get the low speed mixture into the correct range of adjustment, turn it in or out until the head of the screw is flush (even) with the end of the throttle arm assembly. This will be the starting point for future adjustments. Fine tuning the low speed mixture is described on page 7.

STEP 6: PRIME THE ENGINE

Connect the plug from the EZ-Start control box into the connector mounted at the rear of the truck. The plug is keyed so it will only insert one way.



Closely watch the fuel line going into the carburetor. Hold your finger over the exhaust outlet and press the button on the EZ-Start until the fuel moves through the fuel line towards the carburetor. Once fuel reaches the carburetor, STOP. If you press the EZ start button too long, you will flood the engine and the EZ-Start will not be able to spin it over (see page 10). With a full tank of fuel, it will only take a second to move the fuel up to the carburetor.



STEP 7: SHUTTING OFF THE ENGINE

Before starting the engine it is important to know how to shut it off. The correct method is to pinch and hold the carburetor's fuel line at idle speed, until the engine dies.

STEP 8: START THE ENGINE

Before starting your engine, review the safety and driving precautions in this manual.

- 1) Turn the radio system on (transmitter then receiver). Place the truck against a curb or some other immovable object to prevent it from moving forward.
- 2) Press the start button on the EZ-Start to turn over the engine. Do not hold for more than 5-10 seconds to start the engine. Once the engine has started, it may be necessary to continue to hold the start button to keep the plug lit until the engine has warmed up.

Note: The red LED on the EZ-Start will light when the start button is pressed. This indicates that the glow plug is hot (ignited). If the LED does not light, make sure that the glow plug connector (blue wire) is firmly attached to the glow plug. If the connection is secure, and the LED still does not light, replace the glow plug with a Traxxas, standard plug #3230.

- 3) If the engine did not start in step 2, prime it again and retry. Continue this sequence until the engine starts.

BREAKING-IN THE ENGINE (VERY IMPORTANT!)

CAUTION:

TRX ENGINES MUST BE BROKEN-IN FOR MAXIMUM LIFE AND HIGHEST LEVEL OF PERFORMANCE. THIS PROCESS MUST NOT BE SKIPPED. A SHORTCUT HERE COULD SHORTEN THE ENGINE LIFE.

Once your engine is running, it must be broken-in. The key to breaking in your engine is patience. **The break in time will take about 1 to 1½ hours.** During the break-in period, your engine may appear to malfunction with symptoms such as stalling, inconsistent performance, and fouled glow plugs. Don't give up on it! These are just "break-in pains" that every new engine has to go through. They will disappear once you get through the break in period. **Just keep it running, and throttle on and off as smoothly as you can. Sudden bursts or releases of the throttle can stall your engine.** Resist the temptation to tune the engine for performance and/or run for extended times at wide open throttle. Soon, after about the fourth tank of fuel, your patience will pay off with solid, consistent, performance.

DRIVING PRECAUTIONS

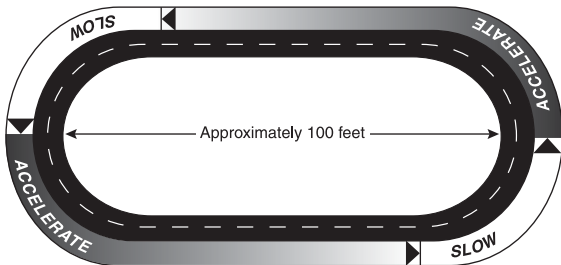
- The radio system is not waterproof. Avoid driving through puddles, wet grass, or mud. Water could damage the electronics.
- Do not continue to operate the Nitro Rustler with low batteries. After the battery power drops below a certain point, the model will continue with the last command it had from the transmitter. Indications of low battery power include slow operation and sluggish servos. On the transmitter, a flashing red light indicates low transmitter batteries.
- Do not drive the Nitro Rustler at night, on public streets, or in large crowds of people.
- If the truck becomes stuck, do not continue to run the engine. Remove the obstruction before continuing to drive.
- Do not attempt to push or tow objects with the Nitro Rustler.
- The model 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 around the truck in order to prevent collisions.
- Use common sense whenever you are driving your model. ***Intentionally driving in an abusive and rough manner will only result in poor performance and broken parts.***

DURING BREAK IN...

- **Special break-in fuels are not required.**
- **Drive the model on a smooth hard surface.**
- **If possible, avoid running on very hot, humid days.**
- **Run with the body off for extra engine cooling.**
- **Do not allow the fuel tank to run completely empty, possibly leading to a burned plug. An extremely low fuel level causes the fuel mixture to be too lean.**
- **Keep extra glow plugs handy. The break-in process, because of the engine running rich, can cause deposits to form on the glow plug, leading to failure.**
- **Turn the mixture screw (needle) clockwise (in) to lean the mixture and counter-clockwise (out) to richen the mixture.**

THE FIRST TANK OF FUEL

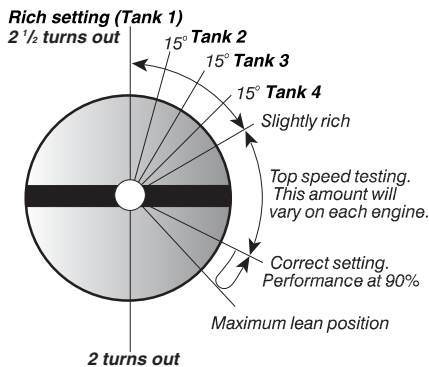
• Drive the Nitro Rustler on a flat paved surface in an oval configuration. This will cause you to naturally vary your speed over the entire RPM range. During this break in time, ease in and out of the throttle slowly to avoid stalling the engine. The goal is to simply keep the engine running.



• The fuel mixture setting may require slight adjustment to correct for different altitudes and temperatures. To tell if the engine is running rich (high volume of fuel flowing through the engine) look for the following conditions:

- 1) The engine should accelerate sluggishly
 - 2) There should be a thick trail of blue smoke coming from the exhaust.
- If you do not observe the conditions above, then turn the high speed needle out 15° (counterclockwise) and retest.
 - Do not run at full speed during the first tank of fuel.
 - **Do not rev the engine with the wheels off the ground.** High, no-load RPMs can damage the engine, **usually resulting in a broken connecting rod.** At the end of the first tank of fuel, stop the engine and allow it to cool for 5-10 minutes before proceeding.

TANKS TWO-FOUR



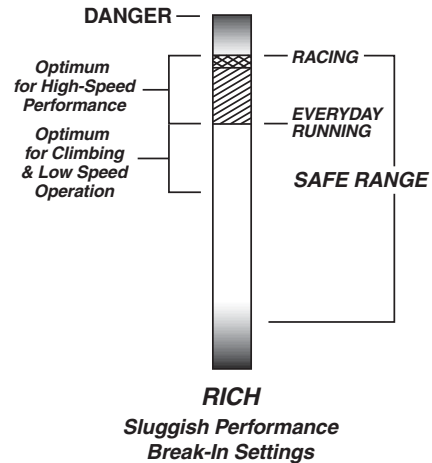
Turn the high-speed mixture screw clockwise 15° and run through the second tank of fuel. Repeat this process for the third and fourth tanks of fuel.

Important: Do not lean the high speed mixture less than 2 turns out from closed (see illustration). Also, be sure to allow the engine to cool between each run.

TANK FIVE AND BEYOND

- All final tuning adjustments must be made to the engine at its normal operating temperature.
- The engine's performance depends on the fuel mixture. Leaning the fuel mixture with the high-speed needle (turning clockwise) will increase engine power up to engine's mechanical limits. Leaning the fuel mixture beyond the safe allowable limits will result in poor performance and engine damage.
- After the fourth tank of fuel, the break in process should be complete. Now its time to tune the engine for maximum power.
- Turn the mixture screw in (clockwise) 1/16 of a turn and continue driving. Note any increase in speed and performance.
- Continue to lean the fuel mixture in 1/16 turn increments until :
 - 1) There is no longer any performance increase or
 - 2) The engine begins to cut out at high speed or
 - 3) The engine begins to overheat. Symptoms include:
 - Steam or smoke coming from the engine surfaces
 - Hesitation during acceleration (as if running out of fuel)
 - Popping or clattering sound when decelerating (detonation)
 - The idle speed will fluctuate
- Any of the above symptoms indicate that the fuel mixture is past the maximum safe lean setting. Turn the mixture screw back out (counterclockwise) the previous 1/16 of a turn to reach the optimum fuel mixture setting.
- Turn the mixture screw out another 1/16 of a turn for non-race applications. This will extend engine component life. This setting will vary slightly with each engine depending upon fuel brand, temperature, humidity, etc.

High-Speed Power Loss Overheating LEAN



FINE TUNING THE LOW-SPEED MIXTURE

The low-speed mixture screw is located in the end of the throttle shaft (see the drawing on page 5). The low speed mixture affects the idle quality and the low end engine power and throttle response. To check your low speed mixture setting, perform this simple test.

- 1) Drive the truck for several minutes until the engine is in its normal operating temperature range.
- 2) Pull it in, stop, and listen to the idle speed. If, after a few seconds, the idle speed begins to drop then lean the low speed mixture 1/8 of a turn (clockwise) and retest.
- 3) Continue leaning the engine in small steps until the idle speed will stay even for at least 20-30 seconds after stopping.
- 4) The truck should accelerate quickly from a standing start without bogging. The idle should be smooth and consistent. Lean the mixture 1/8 of a turn (clockwise) and re-test. If you experience any stalling or hesitation when accelerating, then the low speed mixture is too lean. Richen it 1/8 of a turn (counter clockwise) and retest.

SETTING THE IDLE SPEED

Now that the engine mixture is tuned, the idle speed may be set too high. Only set the idle speed when the engine is at its normal operating temperature. Adjust the throttle trim on the transmitter so that the brake on the truck is applied. Next, reset the idle speed by removing the air filter and adjusting the idle speed screw on the side of the carburetor (see drawing on page 5). Turn the screw out (counter-clockwise) to reduce the idle. Re-adjust the throttle trim on the transmitter as necessary (so that the brake is no longer applied). The idle should be set slow enough that the truck does not try to move at idle.

ADJUSTMENTS

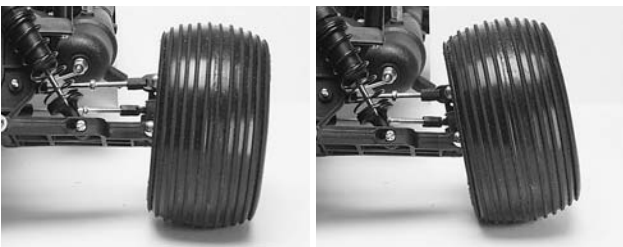
• TOE IN

Geometry and alignment specs play an important roll in your truck's handling, so take the time to set them correctly. Set the steering trim on your transmitter to neutral. Now, adjust your 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. If you run out of adjustment, then the steering servo will have to be re-centered (see "centering your servos on page 9). **For increased stability add 1-2 degrees of toe in to each front wheel. Use the turnbuckles to adjust the alignment.**



• CAMBER

The camber angle of both the front and rear wheels can be adjusted with the camber rods (upper turnbuckles). Use a square or right-angle triangle to set the camber accurately. Adjust the front wheels to 0 degrees of camber (wheel perpendicular to the ground). In the rear, adjust the wheels to 1 to 2 degrees of negative camber. These adjustments should be set with the truck positioned at its normal ride height.

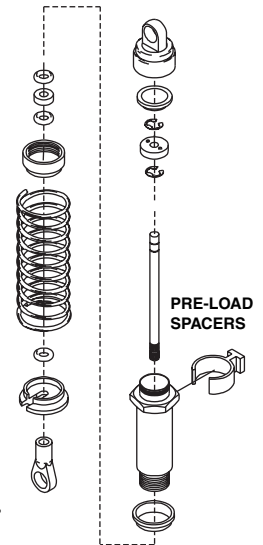


Positive camber

Negative camber

• SHOCKS

The four shocks on Nitro Rustler have the most influence on 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 Nitro Rustler can be adjusted by adding or removing the clip-on spring pre-load spacers. Instead of adding spacers to increase stiffness, use stiffer springs. Adjust the ride height so that the suspension arms are slightly above being parallel to the ground. Observe how the Nitro Rustler handles in turns. If it is picking up the inside rear wheel in hard turns, then stiffen the *front* suspension. If it picking up the inside front wheel in hard turns, then stiffen the *rear* suspension. Proper set-up will add stability and help prevent roll-overs.

• GEAR RATIOS

A unique Nitro Rustler feature is the ability to change the gear ratios. The final drive ratio of the gearbox is 2.81 to 1. Use the following formula to calculate the overall ratio:

$$\frac{\text{Number of Spur gear teeth}}{\text{Number of Clutch bell gear teeth}} \times 2.81 \text{ Final drive ratio}$$

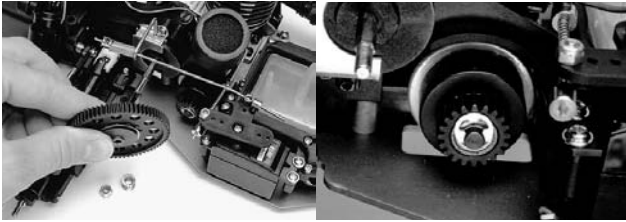
Nitro Rustler comes with a 70-tooth spur gear and an 20-tooth pinion (clutch bell) gear. This combination will provide the best overall acceleration and top speed. If you want more acceleration and less top speed, then use a smaller clutch bell gear (fewer teeth). For more top speed, use a larger clutch bell gear.

PINION	SPUR GEAR	FINAL DRIVE	
22	66	8.43:1	↑ TOP SPEED ↓ ACCELERATION
22	70	8.94:1	
22	72	9.19:1	
20	70	9.83:1	
20	72	10.11:1	
18	70	10.92:1	
18	72	11.24:1	
16	70	12.27:1	
16	72	12.64:1	

MAINTENANCE

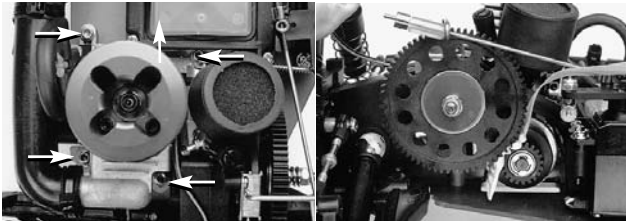
- 1) Check the wheels and steering for binding. Check the operation of the shock absorbers.
- 2) Check the wiring for any frayed wires or loose connections, including the wires on the EZ-Start quick connector. Fraying or melting of the blue wire on your EZ Start system can cause your glow plugs to immediately short out.
- 3) Check the tightness of the grub screws in the collars on the throttle and steering linkages.
- 4) Check the air filter for proper mounting and filtration.
- 5) Check the mounting of the receiver and servos.
- 6) Check the tightness of the wheel nuts with a wrench.
- 7) Check the fuel tank and all hoses for signs of leaks.
- 8) Check the operation of the radio system, especially the condition of the batteries.
- 9) Check the exhaust system for leaks, cracks, or tears. Do not run the model if there are any exhaust leaks.
- 10) Use Traxxas Nitro Wash spray cleaner to keep the model clean of accumulated dirt and oil. Do not spray any radio components with Nitro Wash. Do not spray Nitro Wash into a dirty air filter while it is installed on the engine.
- 11) The steering servo saver will wear out over time. If the steering becomes loose, the servo saver should be replaced.

• CHANGING THE CLUTCH BELL AND SPUR GEARS



Remove the 4mm nylon locknut and the spring from the slipper clutch. Try to remove the slipper clutch as one assembly by holding the pressure plates together with your thumb and index finger. Remove the large E-clip on the clutch shaft and the clutch bell

gear. Remove the ball bearings and install them in the new clutch bell gear. Reinstall the clutch bell gear and E-clip. Note: Smaller clutch bell gears use smaller ball bearings. Refer to your parts list for the correct bearings.



If you changed the gear ratio, then you will need to reset the gear mesh. Loosen the four 3x10mm caphead screws which hold the slotted adjusting plates to the engine mount. Reinstall the slipper assembly on the slipper shaft and secure it with

the spring and 4mm locknut. Slide a strip of thin note paper between the spur gear and the clutch bell gear. Push the clutch bell gear against the spur gear and tighten the 3x8mm adjusting plate screws. Remove the paper and the gear mesh should be correctly adjusted.

• ADJUSTING THE SLIPPER CLUTCH

The Nitro Rustler is equipped with an adjustable slipper clutch which is built into the large spur gear. The purpose of the slipper clutch is to regulate the amount of power sent to the rear wheels in order to prevent rear tire spin. It also reduces the shock transferred to the drive components when the truck is jumped. When it slips, the slipper clutch makes a high-pitch chirping noise, which you may be able to hear over the engine noise. Use a 5mm wrench to turn the nut in until it stops. Now, turn the nut back out one half turn. When running on pavement, set the clutch so that it is tighter. When running on dirt, slightly loosen the adjusting nut to help reduce tire spin. Do not allow the slipper clutch to become too loose. Excess slippage is apparent when the engine sounds fast but the truck's acceleration is sluggish. **Excess slippage will quickly damage the slipper clutch.** The clutch should only slip for 1 or 2 feet from a standing start on a high traction surface such as rough concrete.

CENTERING YOUR SERVOS

Whenever your radio system has been removed for service or cleaning, the servos must be re-centered prior to installing the radio system in the model. If the radio system is installed in the truck, disconnect the servo horns from the servos.

Connect the steering servo to channel 1 on your receiver and the throttle servo to channel 2. The white wire on each servo cable is positioned towards the crystal. Connect the red and black cable from the battery holder to the "batt" terminal on the receiver. The red wire is positive and the black wire is negative.

Place fresh "AA" batteries in the transmitter and turn the power switch on. Slide the throttle and steering trim adjustments to the center position. Now install fresh "AA" batteries into the battery holder and turn the power switch to the on position. The servos will automatically jump to their center positions.

Turn off the battery holder switch followed by the transmitter. The servos are now ready to be installed. Be careful not to move the servo shaft when reinstalling the servo horns.

STORAGE

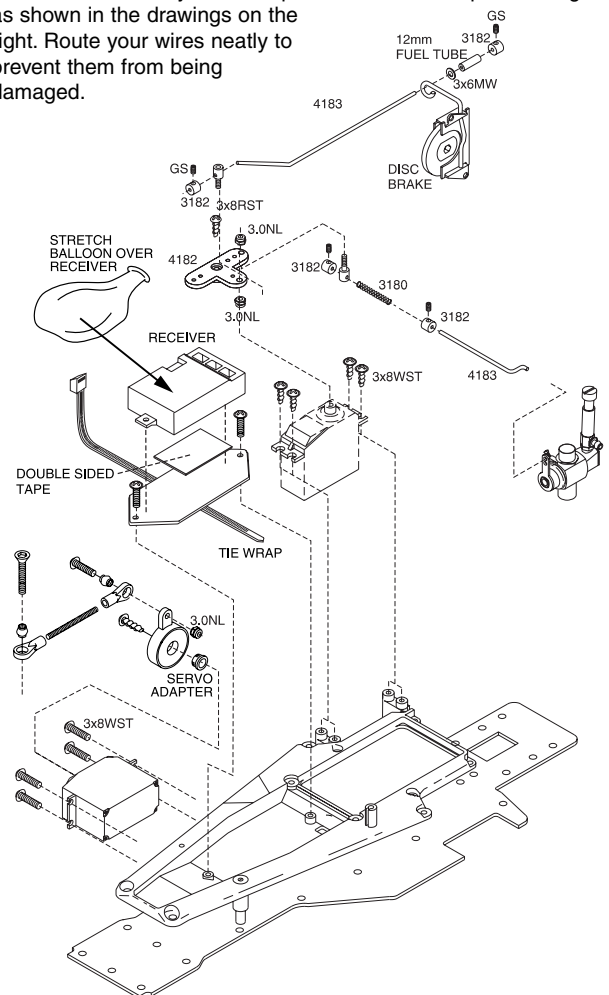
After running your Nitro Rustler, use a good "after-run" product prior to storage. The chemicals used in the fuel attract moisture and can cause moisture and corrosion to form inside the engine. Drain the fuel tank, start the engine and run it until all of the remaining fuel is completely used up. Remove the air cleaner and place the recommended number of drops (usually 6 drops) of the after-run oil into the carburetor. Now, spin the engine for 2-3 seconds with the EZ-Start to circulate the oil. Replace the air cleaner. **Never store your model with unused fuel in it.**

INSTALLING A RADIO SYSTEM (Model 4404)

Before installing the radio system center your servos as described in your radio system's operating instructions. Note: the plug on the Traxxas 4-cell battery holder 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 an industry standard so it should not be difficult to locate identical parts that will fit your servos.

Install the radio system components and hook up the linkages as shown in the drawings on the right. Route your wires neatly to prevent them from being damaged.



LIMITED WARRANTY INFORMATION

Every effort has been made in component design and material selection to make your Nitro Rustler 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 that is 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. Due to the special nature of the TRX Pro .15 engine, it is also covered by a separate warranty page provided with your model.

Traxxas reserves the right to make changes, modifications and improvements to this product without notification, and 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.

• TO OBTAIN WARRANTY SERVICE

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. Do not return to Traxxas without first speaking with a service technician, toll-free, at 1-888-TRAXXAS. Drain all fuel and remove all batteries. Remember that the warranty only covers brand new products which are defective right out of the box. All other service or exceptions will be estimated on an individual basis.

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

**TRAXXAS
1100 KLEIN ROAD
PLANO, TEXAS 75074**

For technical assistance regarding your model, call 888-TRAXXAS (872-9927), 972-265-8000 (outside of the U.S.A.), or e-mail Traxxas at support@Traxxas.com For orders and other information, call 972-265-8000 or fax 972-265-8011.

ENGINE TROUBLE SHOOTING

The troubleshooting guide on the following page has been provided to help you in diagnosing and repairing common engine problems. Most difficulties with engines can be traced back to problems with adjustment, fuel quality, dirt blockage, or common parts that wear with everyday use.

FLOODED ENGINE

The engine can become flooded if it is primed too many times during the course of a routine start up. When the engine is flooded, the EZ-Start cannot turn the engine and it will appear to be locked. Use the following procedure to clear a flooded engine.

- Remove the blue glow plug wire
- Remove the glow plug with a 5/16 nut driver
- Plug in the EZ Start and turn the truck upside down
- Push the EZ-Start button for several seconds to clear the excess fuel from the combustion chamber
- Turn the truck over and re-install the glow plug with gasket
- Reconnect the blue glow plug wire
- Remove one of the motor wires from the EZ-Start motor
- Push the EZ-Start button for several seconds. This lights the glow plug and burns off any remaining fuel
- Reconnect the EZ-Start motor
- Do not prime the engine. Partially open the throttle and press the EZ-Start button. The engine should start immediately.

GLOW PLUGS

The glow plug in your engine is a consumable item which must be replaced periodically to maintain peak performance and starting ease. To test for a leaking glow plug, place a few drops of fuel around the base of the glow plug when the engine is cool. With the engine running, look for bubbles around the glow plug. If the gasket is leaking, tighten the plug or replace the gasket.

The EZ-Start control box has an LED which lights to indicate the condition of the glow plug. If the LED does not light when the button is pressed, then the glow plug element is broken. However, glow plug performance can deteriorate significantly before the element actually burns in two. **The only sure way to test for a faulty glow plug is to replace it with a new one to see if the problem goes away.** You can view the glow plug element by removing it and touching it against the engine head

while pressing the EZ-Start button. The glow plug will not light unless it is grounded against the engine. Glow plugs can be damaged by particles in the combustion chamber or by running the fuel mixture excessively lean.

Traxxas makes 2 glow plugs. The standard hot plug (part#3230) is the stock replacement plug for Traxxas engines. The optional heavy-duty plug (part#3231) will last longer in most cases however, it is a medium temperature plug so performance may be reduced slightly. Do not use plugs with idle bars!

CARBURETOR

Dirt is the main enemy to your carburetor. If you notice a sudden change in the fuel mixture (lean) and performance of your model, you may have dirt lodged in the carburetor. To dislodge a dirt particle in your carburetor try screwing the high and low speed needles all the way in and then back out to their original settings. If the engine doesn't return to normal operation, then try backing the mixture screws out and prime the engine to force fuel through the carburetor. Return the mixture screws back to their original settings. The engine will be flooded at this point so follow the directions for relieving a flooded engine. If this fails, then the carburetor will need to be removed and cleaned with Traxxas Nitro Wash or denatured alcohol. Do not blow on carburetor passages or fuel lines with your mouth. Fuel and solvents are extremely poisonous. To prevent this from occurring again, insert a fuel filter in the line between the tank and the carburetor.

EZ-START

The battery to the EZ-Start must be fully charged for the best performance. If the battery is weak, the EZ-Start may appear to be spinning the engine fast enough to start however, there is not enough current to adequately light the glow plug. If the EZ-Start appears to spin normally, but doesn't seem to "catch" and spin the engine adequately, then inspect the one way bearing inside the starter. If it becomes saturated with castor oil from the engine fuel, then it will slip on the starter shaft. Clean or replace the one way bearing. If there is excessive gear noise, then suspect broken gears inside the EZ-Start. If the EZ-Start motor spins freely with no gear noise, then the motor pinion gear may be stripped. If this occurs, then the EZ-Start motor assembly must be replaced. The pinion gear is pressed on, and not available separately.

ENGINE TROUBLESHOOTING GUIDE

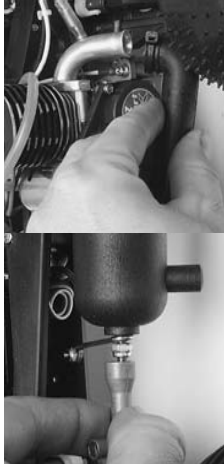
Engine will not start	1	3	7	28	8	16	13	14	21	29	19	39	40	36			
EZ-Start motor will not turn	8	10	17														
EZ-Start turns but engine does not	11	12	41														
Engine starts and then stalls	16	21	27	24	29	28	30	36									
Engine sluggish, poor performance	3	6	16	15	21	24	26	22	20	32	34	33	38	35	36		
Engine Overheats	3	4	5	6	21	25	23	28	29	37	38	35					
Engine chokes/hesitates at speed	1	2	16	21	23	28	29	30	20	31							
Engine stalls under hard acceleration	1	2	16	21	24	25	26	27	28	29							
Engine stalls around turns	1	2	30														
Engine stalls during normal driving	1	2	3	16	28	29	30	21	20	36							

- 1 Out of fuel Fill fuel tank
- 2 Fuel level is low Refill fuel tank
- 3 Improper or contaminated fuel Replace fuel
- 4 Excessive nitro in the fuel Use fuel with a lower nitro content (page 2)
- 5 Incorrect oil content in the fuel Switch to a recommended brand of fuel (page 2)
- 6 Poor Quality fuel Switch to a recommended brand of fuel (page 2)
- 7 Engine not primed Prime engine (page 6)
- 8 EZ-Start battery not charged..... Use a freshly-charged battery (page 3)
- 9 EZ-Start ground wire (yellow) faulty Clean, tighten, or replace ground wire (page 12)
- 10 EZ-Start Motor wire loose Check motor connections on the EZ-Start motor
- 11 One-way starter bearing slipping..... Remove EZ-Start/ Clean or replace bearing (page 12)
- 12 EZ-Start gears damaged Listen for excessive gear noise/ Replace gears/motor.
- 13 Glow plug wire loose from glow plug..... Crimp the connector on the glow plug wire
- 14 Glow plug wire damaged..... Replace or repair glow plug wire
- 15 Leaking glow plug gasket Check glow plug gasket/ tighten glow plug
- 16 Glow plug fouled or weak Check for a solid red light when the EZ-start button is pressed/ No light indicates a completely shorted plug/ Replace with Traxxas 3230 or 3231 glow plugs (page 10)
- 17 Engine flooded..... Clear the engine of excess fuel (page 10)
- 18 Engine overheated..... Allow engine to cool- find cause for overheating
- 19 Exhaust blocked Clear any obstructions
- 20 Air cleaner plugged Clean and replace air cleaner element (page 5)
- 21 Carburetor incorrectly adjusted Readjust carburetor to factory break-in settings (page 5)
- 22 High-speed fuel mixture is too rich Lean the high-speed mixture (page 7)
- 23 High-speed fuel mixture is too lean..... Richen the high-speed mixture (page 7)
- 24 Low speed mixture misadjusted Fine tune the low speed mixture adjustment (page 7)
- 25 Low speed mixture too lean Richen the low speed mixture adjustment (page 7)
- 26 Low speed mixture too rich Lean the low speed mixture adjustment (page 7)
- 27 Idle speed set too low Increase idle speed (page 8)
- 28 Fuel flow blocked Check that all fuel lines are clear with no pin-hole leaks
Check for dirt blockage in the carburetor fuel inlet and high-speed needle seat/ Install inline fuel filter (page 10)
- 29 Air bubble in the fuel line Prime the engine to force the air through/ Check for pin-hole leaks in the fuel line
- 30 Insufficient fuel tank pressure Replace the pressure hose (between pipe and fuel tank)/ clear blockage in the tuned pipe hose fitting/ check flow to and from tank/ Check fuel tank cap seal
- 31 Engine overheated..... Allow engine to cool/ find cause for overheating
- 32 Slipper clutch loose Tighten the slipper clutch (page 8)
- 33 Engine overgeared for application Use a lower gear ratio (page 8)
- 34 Engine clutch slipping Replace clutch shoes (see engine repair section, page 13)
- 35 Drive system is bound Locate the bound item and repair
- 36 Engine excessively worn Repair or replace engine (page 12)
- 37 Cooling air to the head is blocked Cut ventilation holes in the body (windshield)
- 38 Excessive load on the engine Check for bound drivetrain
- 39 Broken clutch shoe spring Replace clutch shoe spring (page 13)
- 40 Loose flywheel Replace flywheel nut (page 13)
- 41 EZ-Start motor pinion stripped Replace EZ-Start motor

REBUILDING THE ENGINE

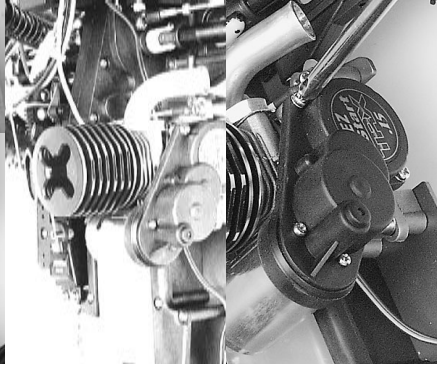
STEP 1:

Remove the 4mm locknut from the front pipe hanger. Pull the pipe from the rear exhaust header



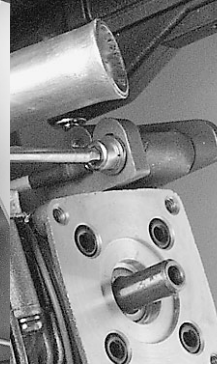
STEP 2:

Unplug the blue wire from the glow plug. Remove the fuel line from the carburetor inlet and from the exhaust header pressure fitting. Disconnect the red and black wires from the EZ-Start motor.



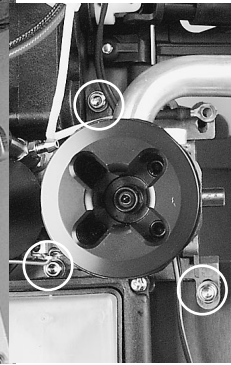
STEP 3:

Remove the EZ-Start gearbox by removing the three 3x8mm roundhead machine screws.



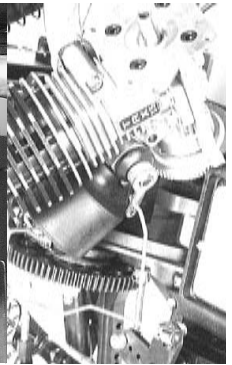
STEP 4:

Use a 2.5mm hex driver to remove the yellow ground wire from the engine mount. Move the EZ Start wiring harness out of the way.



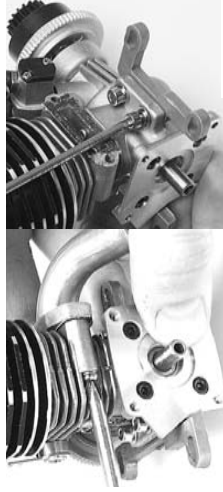
STEP 5:

Use a 2.5mm hex driver to remove the three remaining 3x10mm caphead machine screws from the engine mount.



STEP 6:

Pull the engine from the chassis. Turn the engine so that the throttle linkage to the carburetor will come out.



STEP 7:

Remove the 3x23mm roundhead machine screws that fasten the header to the engine. Carefully remove the header to avoid damaging the gasket.

To separate the engine from the engine mount, remove the four 3x8mm caphead machine screws.

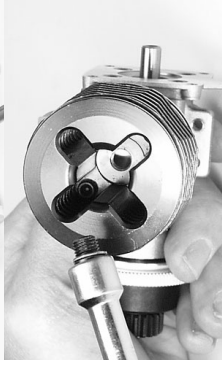
STEP 8:

Removing the carburetor is not necessary to rebuild the engine, unless you intend to replace the internal bearings of the engine. Remove the carburetor by loosening the 3mm locknut and pulling the carburetor straight up.



STEP 9: Changing the piston and sleeve assembly

Use a 5/16 inch nut driver to remove the glow plug and copper gasket.



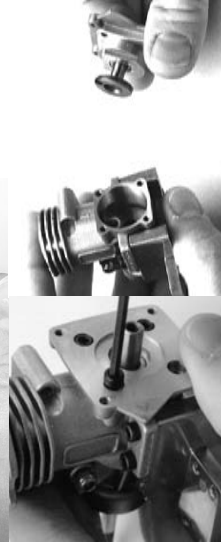
STEP 10:

Use a 2.5mm allen wrench to remove the four 3x12mm cap head screws that fasten the cylinder head. Rock the cylinder head gently from side to side to release it from the sleeve. Note the thin aluminum head gaskets. We recommend that you replace these gaskets with new ones upon reassembly.



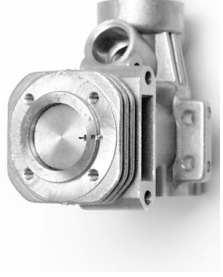
STEP 11:

Remove the backplate and the starter shaft. Replace the backplate gasket with a new one during assembly.



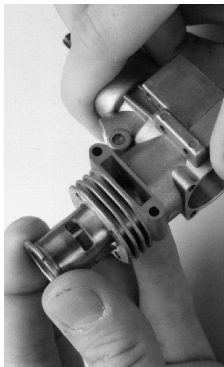
STEP 12:

The piston and sleeve are a matched set. When the piston and sleeve are disassembled, they must be reassembled in the same orientation. Use a hobby knife to scratch a mark to indicate the location of the piston in relation to the pinning of the sleeve.



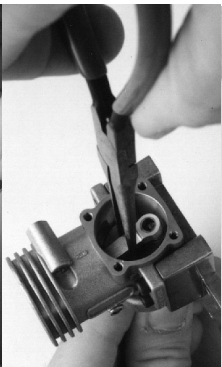
STEP 13:

Pull the sleeve straight up and out of the crankcase. If the sleeve will not move, rotate the crankshaft until the sleeve pushes up.



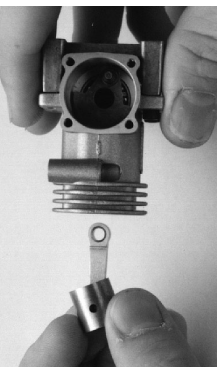
STEP 14:

Rotate the crankshaft to bottom dead center. Lightly grab the connecting rod with a pair of needlenose pliers and gently pull it off of the crankshaft journal.



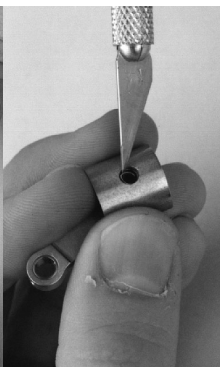
STEP 15:

Remove the connecting rod and piston through the top of the crankcase.



STEP 16:

To remove the connecting rod from the piston, use a sharp-pointed tool to remove the small metal G-clip in the side of the piston. Do not re-use the old G-clip. When installing a new connecting rod, use the supplied new G-clip.



STEP 17: Removing the clutch and flywheel

It is not necessary to remove the clutch assembly unless you are servicing the clutch, crankshaft, or engine bearings. Use the tip of a small screwdriver to remove the E-clip which holds the clutch bell gear.



STEP 18:

Remove the clutch bell gear and the clutch shoes. Note that there are two 5x8mm teflon washers, one on each side of the clutch bell gear. Check the clutch shoes for excessive wear or



cracking around the pin holes. If the clutch shoes are worn to the point that the clutch spring contacts the clutch bell, then the shoes must be replaced.

STEP 19:

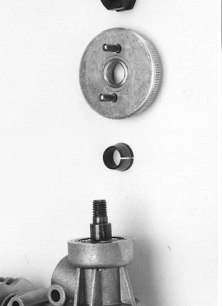
Grip the flywheel with a pair of pliers (locking pliers work best). Remove the clutch adapter nut with a 10mm deep socket. Hold the engine just above your workbench and tap the flywheel from behind with a non-marring hammer (plastic or wood). Several easy blows may be necessary to release the flywheel and split beveled cone.



non-marring hammer (plastic or wood). Several easy blows may be necessary to release the flywheel and split beveled cone.

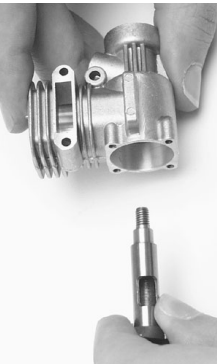
STEP 20:

The flywheel and the split-beveled cone should pull smoothly off of the crankshaft.



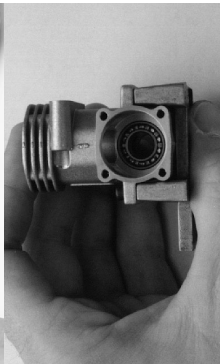
STEP 21:

Remove the crankshaft by pulling it straight out of the crankcase.



STEP 22:

The bearings are press-fit into the crankcase. To remove them, the crankcase must be heated with a heat gun or torch. The crankcase will expand with heat and release the bearings. To avoid the possibility of burns or other damage, do not attempt remove the bearings. Clean the bearings by flushing them with denatured alcohol and then place one or two drops of after-run oil on the races.



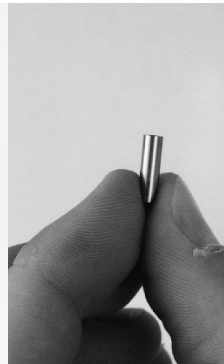
STEP 23:

Before installing a new connecting rod, you can increase connecting rod life by polishing the crankshaft journal. Use 1200 grit sandpaper to remove the surface scratches followed by liquid metal polish to buff the crankshaft journal to a bright, smooth shine. Rinse thoroughly with Traxxas Nitro Wash or denatured alcohol. Lube with after-run oil.



STEP 24:

Use the 1200 grit sandpaper and the liquid metal polish on the wrist pin also. Rinse thoroughly with denatured alcohol and lube with after-run oil.

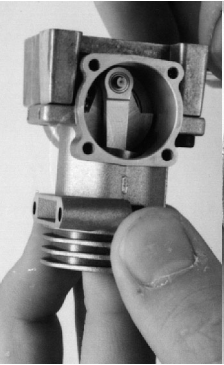


STEP 25:

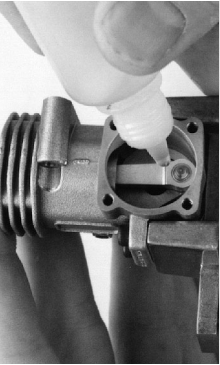
To assemble the connecting rod and piston, place a drop of castor oil in the top end of the connecting rod. Insert the wrist pin through the piston and the top of the connecting rod. Secure the wrist pin with the G-clip. Make sure the G-clip fits securely into the groove machined in the piston. Be careful not to scratch the sides of the piston.

**STEP 26:**

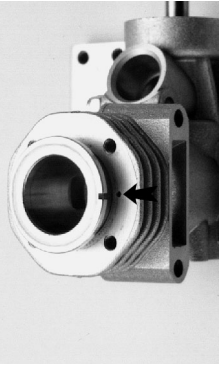
Reinstall the crankshaft into the engine and make sure that it spins freely. Insert the connecting rod and piston assembly through the top of the crankcase. The G-clip should face the carburetor. Put a drop of castor oil after-run oil in the bottom end of the connecting rod. Use your fingers to gently push the end of the connecting rod over the crankshaft journal.

**STEP 27:**

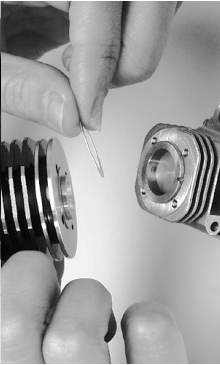
Place another drop of oil on the connecting rod bushing. Rotate the crankshaft several times to distribute the oil.

**STEP 28:**

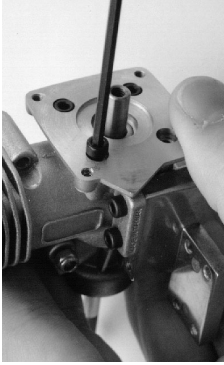
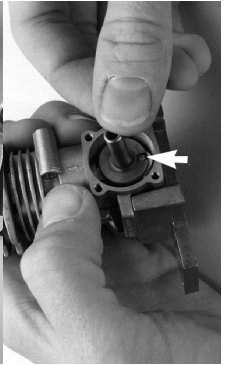
Insert the sleeve into the top of the crankcase. Rotate the sleeve so that the notch in the sleeve will line up with the pin in the crankcase. Holding the engine upside down will make it easier for the sleeve to go over the piston.

**STEP 29:**

Install new head gaskets on the head. Use one thick and one thin gasket. Reinstall the head using the 3x12mm caphead machine screws. Tighten the screws in small increments, in a criss-cross pattern, until all the screws are tight.

**STEP 30:**

Reinstall the starter shaft. Align the notch in the starter shaft with the crankshaft journal pin (arrow).

**STEP 31:**

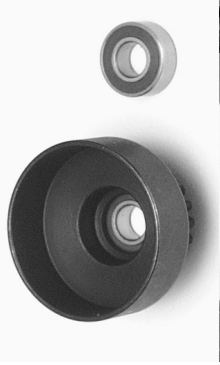
Reinstall the backplate and a new backplate gasket with the 3x8mm caphead machine screws. Tighten the screws in small increments, in a criss-cross pattern until all the screws are tight.

STEP 32:

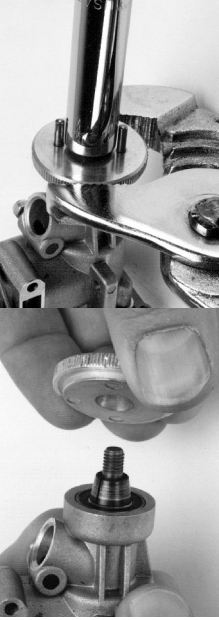
Install the appropriate size ball bearing into one side of the clutch bell gear. The Nitro Stampede comes stock with an 18-tooth clutch bell gear which requires 5x11mm ball bearings.

**STEP 33:**

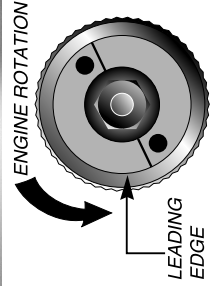
Turn the gear over and install the other ball bearing.

**STEP 34:**

Install the split-beveled cone onto the crankshaft. Next, install the flywheel. Install the clutch adapter nut with a 10mm deep socket. Grip the flywheel with pliers while tightening the adapter nut.

**STEP 35:**

Install the clutch shoes exactly as shown in the drawing (leading edge engagement). Next, install a 5x8mm teflon washer followed by the clutch bell gear (with bearings installed). Install the remaining 5x8mm teflon washer followed by the E-clip (see step 14).

**STEP 36:**

Reinstall the carburetor with a new o-ring, header, a NEW glowplug, and engine mount. Use a new header gasket when re-installing the header on the engine. Reinstall the engine in the truck in the reverse order of removal. Don't forget to reconnect the yellow grounding wire to the engine mount. The rebuilt engine must now be broken in.

