LUXURY

MICRO NITRO

MD T1

THE WORLD'S FIRST

THE WORLD'S SMALLEST

INSTRUCTION MANUAL

A WEB SITE FOR THE SERIOUS RACER

XRAY®

BEFORE YOU START

Before operating your Micro Nitro Truck, YOU MUST read through all of the operating instructions manuals and fully understand them to get the maximum enjoyment and prevent unnecessary damage.

Make sure that you review all the manuals included in the kit, and examine the truck and all items very carefully. If for some reason you decide the truck is not what you wanted, do not continue any further. Your hobby dealer cannot accept your kit for return or exchange after it has been operated.

Failure to follow these instructions will be considered as abuse and/or neglect.

CUSTOMER SUPPORT

We have made every effort to make these instructions as easy to understand as possible. However, if you have any difficulties, problems, or questions, please do not hesitate to contact the XRAY support team at info@teamxray.com. Also, please visit our Web site at www.teamxray.com to find the latest updates, set-up information, option parts, and many other goodies. We pride ourselves on taking excellent care of our customers. You can join thousands of XRAY fans and enthusiasts in our online community at:
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SAFETY PRECAUTIONS

The micro nitro truck is a high-competition, high-quality, 1/18-scale nitro truck for persons age 16 and older. This is not a toy; it is a precision racing model. This model racing truck is not intended for use by children without direct supervision of a responsible, knowledgeable adult. Contents of box may differ from pictures. In line with our policy of continuous product development, the exact specifications of the kit may very without prior notice. This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm. Take enough safety precautions prior to operating this model.

You are responsible for this model's assembly and safe operation! Please read the instruction manual before building and operating this model and follow all safety precautions. Always keep the instruction manual at hand for quick reference, even after completing the assembly. Use only genuine and original authentic XRAY parts for maximum performance. Using any third party parts on this model will void guaranty immediately. Improper operations may cause personal and/or property damage. XRAY and its distributors have no control over damage resulting from shipping, improper construction, or improper usage. XRAY assumes and accepts no responsibility for personal and/or property damages resulting from the use of improper building materials, equipment and operations. By purchasing any item produced by XRAY, the buyer expressly warrants that he/she is in compliance with all applicable federal, state and local laws and regulation regarding the purchase, ownership and use of the item. The buyer expressly agrees to indemnify and hold harmless XRAY for all claims resulting directly or indirectly from the purchase, ownership or use of the product. By the act of assembling or operating this product, the user accepts all resulting liability. If the buyer is not prepared to accept this liability, then he/she should return this kit in new, unassembled, and unused condition to the place of purchase.

In line with our policy of continuous product development, the exact specifications of the kit may vary. In the unlikely event of any problems with your new kit, you should contact the model shop where you purchased it, quoting the part number. We do reserve all rights to change any specification without prior notice. All rights reserved.

IMPORTANT NOTES – GENERAL

- This product is not suitable for children under 16 years of age without the direct supervision of a responsible and knowledgeable adult.
- Carefully read all manufacturers warnings and cautions for any parts used in the construction and use of your model.
- Assemble this kit only in places away from the reach of very small children.
- First-time builders and users should seek advice from people who have building experience in order to assemble the model correctly and to allow the model to reach its performance potential.
- Exercise care when using tools and sharp instruments.
- Take care when building, as some parts may have sharp edges.
- Keep small parts out of reach of small children. Children must not be allowed to put any parts in their mouth, or pull vinyl bag over their head.
- Read and follow instructions supplied with paints and/or cement, if used (not included in kit).
- Immediately after using your model, do NOT touch equipment on the model such as the engine and muffler, because they generate high temperatures. You may seriously burn yourself seriously touching them.
- Follow the operating instructions for the radio equipment at all times.
- Do not put fingers or any objects inside rotating and moving parts, as this may cause damage or serious injury as your finger, hair, clothes, etc. may get caught.
- Be sure that your operating frequency is clear before turning on or running your model, and never share the same frequency with somebody else at the same time. Ensure that others are aware of the operating frequency you are using and when you are using it.
- Use a transmitter designed for ground use with RC trucks. Make sure that no one else is using the same frequency as yours in your operating area. Using the same frequency at the same time, whether it is driving, flying or sailing, can cause loss of control of the RC model, resulting in a serious accident.
- Always turn on your transmitter before you turn on the receiver in the truck. Always turn off the receiver before turning your transmitter off.
- Keep the wheels of the model off the ground when checking the operation of the radio equipment.
- Disconnect the battery pack before storing your model.
- When learning to operate your model, go to an area that has no obstacles that can damage your model if your model suffers a collision.
- Remove any sand, mud, dirt, grass or water before putting your model away.
- If the model behaves strangely, immediately stop the model, check and clear the problem.
- To prevent any serious personal injury and/or damage to property, be responsible when operating all remote controlled models.
- The model truck is not intended for use on public places and roads or areas where its operation can conflict with or disrupt pedestrian or vehicular traffic.
- Because the model truck is controlled by radio, it is subject to radio interference from many sources that are beyond your control. Since radio interference can cause momentary loss of control, always allow a safety margin in all directions around the model in order to prevent collisions.
- Do not use your model:
  - Near real cars, animals, or people that are unaware that an RC truck is being driven.
  - In places where children and people gather
  - In residential districts and parks
  - In limited indoor spaces
  - In wet conditions
  - In the street
  - In areas where loud noises can disturb others, such as hospitals and residential areas.
  - At night or anytime your line of sight to the model may be obstructed or impaired in any way.

To prevent any serious personal injury and/or damage to property, please be responsible when operating all remote controlled models.

IMPORTANT NOTES – ELECTRICAL

- Insulate any exposed electrical wiring (using heat shrink tubing or electrical tape) to prevent dangerous short circuits. Take maximum care in wiring, connecting and insulating cables. Make sure cables are always connected securely. Check connectors for if they become loose. And if so, reconnect them securely. Never use R/C models with damaged wires. A damaged wire is extremely dangerous, and can cause short-circuits resulting in fire. Please have wires repaired at your local hobby shop.
- Low battery power will result in loss of control. Loss of control can occur due to a weak battery in either the transmitter or the receiver. Weak running battery may also result in an out of control truck if your truck's receiver power is supplied by the running battery. Stop operation immediately if the truck starts to slow down.
- When not using RC model, always disconnect and remove battery.
- Do not disassemble battery or cut battery cables. If the running battery short-circuits, approximately 300W of electricity can be discharged, leading to fire or burns. Never disassemble battery or cut battery cables.
- Use a recommended charger for the receiver and transmitter batteries and follow the instructions correctly. Over-charging, incorrect charging, or using inferior chargers can cause the batteries to become dangerously hot. Recharge battery when necessary. Continual recharging may damage battery and, in the worst case, could build up heat leading to fire. If battery becomes extremely hot during recharging, please ask your local hobby shop for check and/or repair and/or replacement.
- Regularly check the charger for potential hazards such as damage to the cable, plug, casing or other defects. Ensure that any damage is rectified before using the charger again. Modifying the charger may cause short-circuit or overcharging leading to a serious accident. Therefore do not modify the charger.
- Always unplug charger when recharging is finished.
- Do not recharge battery while battery is still warm. After use, battery retains heat. Wait until it cools down before charging.
- Do not allow any metal part to short circuit the receiver batteries or other electrical/electronic device on the model.
- Immediately stop running if your RC model gets wet as may cause short circuit.
- Please dispose of batteries responsibly. Never put batteries into fire.

IMPORTANT NOTES – NITRO ENGINES

- Always test the brakes and the throttle before starting your engine to avoid losing control of the model.
- Make sure the air filter is clean and oiled.
- Never run your engine without an air filter. Your engine can be seriously damaged if dirt and debris get inside the engine.
- For proper engine break-in, please refer to the manual that came with the engine.
- Do not run near open flames or smoke while running your model or while handling fuel.
- Some parts will be hot after operation. Do not touch the exhaust or the engine until they have cooled. These parts may reach 275°F during operation!

IMPORTANT NOTES – NITRO FUEL

- Handle fuel only outdoors. Never handle nitro fuel indoors, or mix nitro fuel in a place where ventilation is bad.
- Only use nitro fuel for R/C models. Do not use gasoline or kerosene in R/C models as it may cause a fire or explosion, and ruin your engine.
- Nitro fuel is highly inflammable, explosive, and poisonous. Never use fuel indoors or in places with open fires and sources of heat.
- Always keep the fuel container cap tightly shut.
- Always read the warning label on the fuel container for safety information.
- Nitro-powered model engines emit poisonous vapors and gasses. These vapors irritate eyes and can be highly dangerous to your health. We recommend wearing rubber or vinyl gloves to avoid direct contact with nitro fuel.
- Nitro fuel for RC model trucks is made of the combination of the methyl alcohol, castor or synthetic oil, nitro methane etc. The flammability and volatility of these elements is very high, so be very careful during handling and storage of nitro fuel.
- Keep nitro fuel away from open flame, sources of heat, direct sunlight, high temperatures, or near batteries.
- Store fuel in a cool, dry, dark, well-ventilated place, away from heating devices, open flames, direct sunlight, or batteries. Keep nitro fuel away from children.
- Do not leave the fuel in the carburetor or fuel tank when the model is not in use. There is danger that the fuel may leak out.
- Wipe up any spilled fuel with a cloth
- Be aware of spilled or leaking fuel. Fuel leaks can cause fires or explosions.
- Do not dispose of fuel or empty fuel containers in a fire. There is danger of explosion.

FIRST AID

- Do not swallow nitro fuel or get it in your eyes. If this happens, immediate measures should be taken.
- If fuel is swallowed, immediately drink large quantities of water and induce vomiting. Consult a physician or poison control center immediately.
- If fuel gets into the eyes, rinse them well with water, and then consult a physician immediately.
- If fuel gets onto the skin, wash it with soap and water well.

WARRANTY

XRAY guarantees this model kit to be free from defects in both material and workmanship within 30 days of purchase. The total monetary value under warranty will in no case exceed the cost of the original kit purchased. This warranty does not cover any components damaged by use or modification or as a result of wear. Part or parts missing from this kit must be reported within 30 days of purchase. No part or parts will be sent under warranty without proof of purchase. Should you find a defective or missing part, contact the local distributor. Service and customer support will be provided through local hobby store where you have purchased the kit, therefore make sure to purchase any XRAY products at your local hobby store. This model racing truck is considered to be a high-performance racing vehicle. As such this vehicle will be used in an extreme range of conditions and situations, all which may cause premature wear or failure of any component. XRAY has no control over usage of vehicles once they leave the dealer, therefore XRAY can only offer warranty against all manufacturer's defects in materials, workmanship, and assembly at point of sale and before use. No warranties are expressed or implied that cover damage caused by what is considered normal use, or cover or imply how long any model trucks' components or electronic components will last before requiring replacement.

Due to the high performance level of this model truck you will need to periodically maintain and replace consumable components. Any and all warranty coverage will not cover replacement of any part or component damaged by neglect, abuse, or improper or unreasonable use. This includes but is not limited to damage from crashing, chemical and/or water damage, excessive moisture, improper or no maintenance, or user modifications which compromise the integrity of components. Warranty will not cover components that are considered consumable on RC vehicles. XRAY does not pay nor refund shipping on any component sent to XRAY or its distributors for warranty. XRAY reserves the right to make the final determination of the warranty status of any component or part.

LIMITATIONS OF LIABILITY

XRAY makes no other warranties expressed or implied. XRAY shall not be liable for any loss, injury or damages, whether direct, indirect, special, incidental, or consequential, arising from the use, misuse, or abuse of this product and/or any product or accessory required to operate this product. In no case shall XRAY's liability excess the monetary value of this product.

Disregard of the any of the above cautions may lead to accidents, personal injury, or property damage. XRAY MODEL RACING CARS assumes no responsibility for any injury, damage, or misuse of this product during assembly or operation, nor any addictions that may arise from the use of this product. All rights reserved.

ENGINE-SPECIFIC WARRANTY INFORMATION

Our warranty covers only workmanship and manufacturing defects of the original, unmodified, and unused engine and parts, for a period 1 year from the original date of purchase. Neither the engine nor any of its individual parts and components are covered by warranty after the engine has been started or used. Claims for damage caused by customer disassembly, use of improper or substandard fuel, use of improper accessories (such as muffler, glowplug, etc.), crashes, abuse, improper operation, improper mounting, improper adjustment, or lack of or improper maintenance will not be covered by this warranty. Any use of the product for other than its specific intended use will automatically void this warranty. Use only authentic XRAY spare parts, use of any other products will void this warranty. Claims must be accompanied by a dated proof of purchase (registered receipt, credit card invoice, etc.).

THINGS TO KNOW ABOUT YOUR ENGINE

High-performance competition engines can sometimes fail; no guarantee for these types of failures exist, and we are not responsible for the use and treatment of an engine. These engines can make extremely high RPMs and build up incredible loads inside. It is extremely important that you check frequently for excess play in any components (especially the conrod/big-end) and also engine compression. Most failures occur because of low-quality fuel or mixtures, bad carburetor settings, bad functioning of the air filter, or excessive wear of moving parts. Please take note that it is suggested not to modify any parts of the engine.
If you want to repair the engine yourself, take care of the following:

- Clean the outside of the engine thoroughly before you open it, work on a clean spot, use proper tools. Any dust or dirt that enters the engine will make considerable damage.
- All moving parts inside the engine are subject to wear. If a piston/liner has worn out, or if the big-end/conrod connection has worn, you must replace these parts. If the engine has broken you must check that all other moving parts are still in good shape. If you only change one part and other parts are not in good shape, it is highly likely that your engine will suffer another failure shortly thereafter.
- If you want to replace the conrod, be sure the big-end of your crankshaft is still round and at a good size, if not replace the crankshaft. If you do not replace the crankshaft and re-use the engine, a failure may occur such as conrod or piston breakage.
- If you replace the piston and liner, be sure to check the big-end on the crankshaft.
- These high-technology engines need to be treated with precision. If you are not sure how to modify or repair your engine, ask your local dealer to do it for you or return the engine to us.

SERVICING THE ENGINE

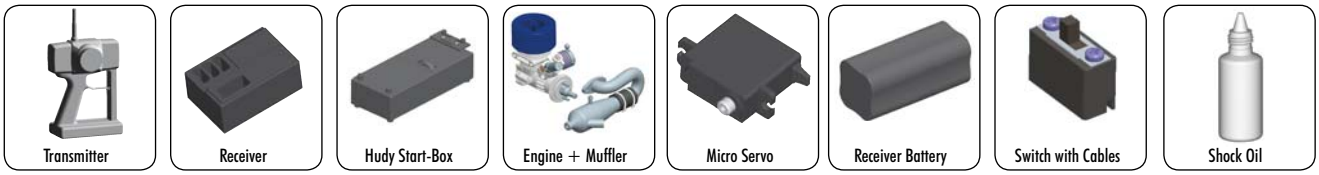
Should your engine require service, please follow the following guidelines. Do not return the engine to the place of purchase, as they are not authorized or equipped to perform service.

1. Remove the engine from the model. We cannot accept equipment for service other than the engine.
2. Along with your engine and proof of purchase, enclose a complete written explanation of the problem(s) with as much detail as possible.
3. Be sure to include your complete and proper name, address, and daytime telephone number(s).

The charges for repairs will be billed to you C.O.D. Please mention if you wish to have an estimation of repair charges prior to us beginning service. (This may cause a slight delay in your repair.) Contact your national distributor who will advise you how to proceed.

TOOLS AND EQUIPMENT

Supplied Equipment

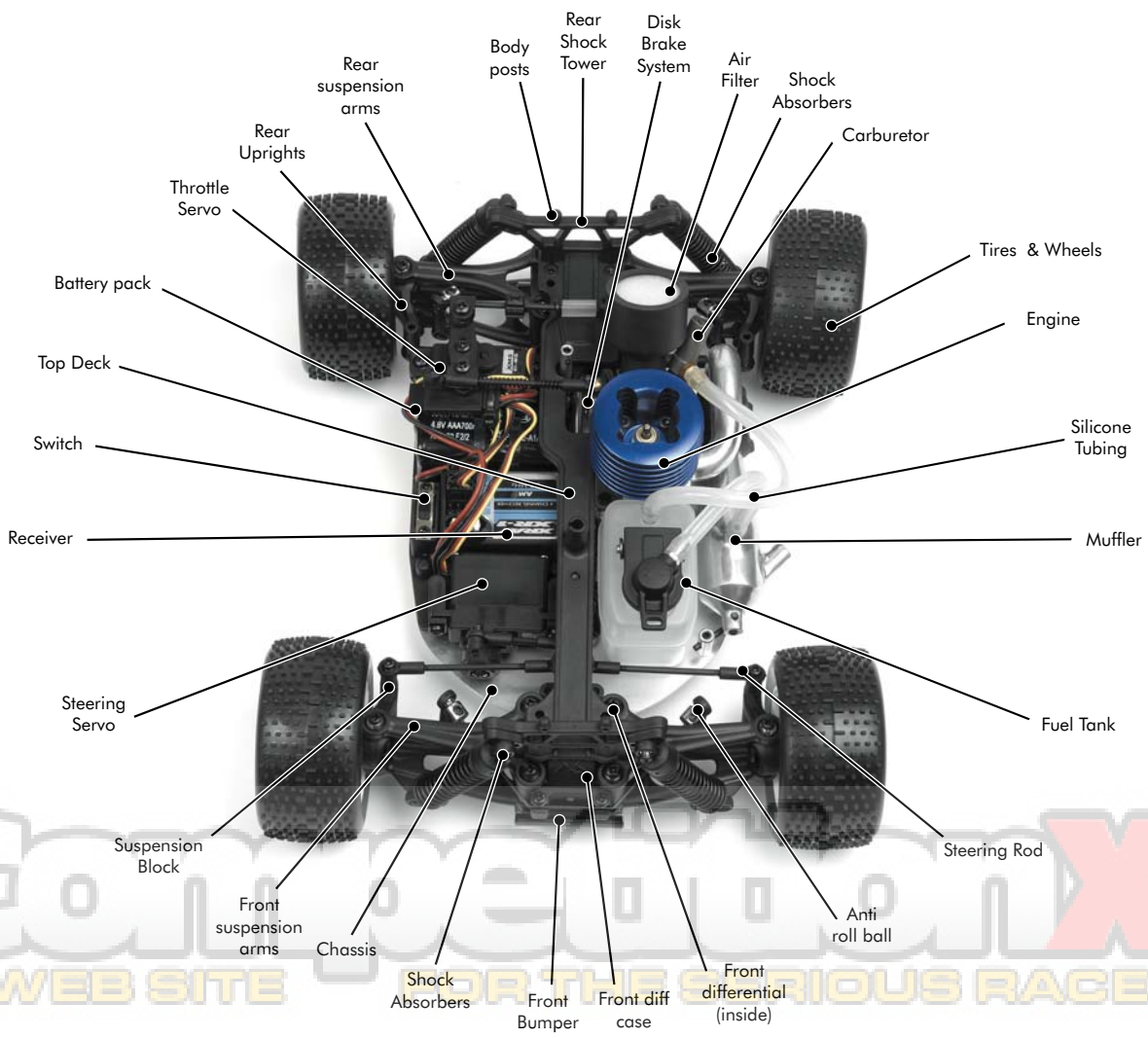


Required Equipment

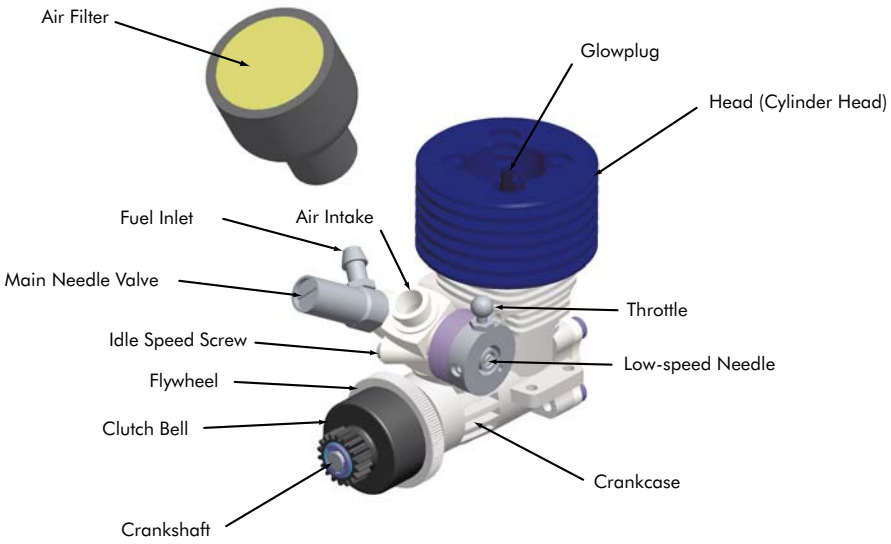
Required Tools

GETTING TO KNOW YOUR MICRO NITRO TRUCK

- Front bumper – protects the front end of the truck in the event of front collision
- Body posts – body posts support the body shell
- Body clip – small metal clips that go through the holes in the body posts, securing the body to the body posts
- Shock absorbers – coil-over shock absorbers provide smooth suspension movement when driving the truck through corners and going over bumps
- Shock springs – wound metal coil springs provide damping for the suspension when going over bumpers or around corners
- Front suspension arms – molded composite front suspension arms provide smooth suspension movement and suspension rigidity
- Front diff case – molded composite case that encloses the front gear differential
- Front differential (inside) – molded composite ball differential allows the front wheels to rotate at different speeds when turning a corner, just a like real truck
- Steering block – molded composite steering blocks support the front wheels and driveshafts, allowing smooth wheel rotation and left/right steering
- Chassis – CNC-machined aluminum chassis plate provides a solid base for the other truck components to attach to
- Steering servo – high-quality XRAY servo provides smooth, fast steering control
- Throttle servo – high-quality XRAY servo provides smooth, strong throttle/brake control
- Receiver – high-quality XRAY radio receiver receives signals from transmitter and controls the steering and throttle servos
- Switch – on/off switch for powering the onboard electronics
- Battery pack – high-quality XRAY receiver battery pack provides power to the onboard electronics
- Engine – high-performance NT18 0.8cc micro nitro engine with 2-shoe clutch provides power to the truck's wheels through the transmission
- Carburetor – machined aluminum slide carburetor is tunable for best performance
- Air filter – rugged, high-flow foam air filter cleans the air going into the engine carburetor
- Disk brake system – disk brake system with Ferodo brake pads provides strong, adjustable 4-wheel braking
- Spur gear – steel spur gear together with the composite spur gear adapter, driven by the motor, drives the truck's transmission
- Main drive shaft – machined aluminum main drive shaft connects the front and rear transmissions, providing full-time 4WD power
- Rear diff case – molded composite case that encloses the rear gear differential
- Rear differential (inside) – molded composite ball differential allows the rear wheels to rotate at different speeds when turning a corner, just a like real truck
- Rear uprights – molded composite uprights support the rear wheels and driveshafts, allowing smooth wheel rotation
- Top deck – molded composite top deck for maximum stability
- Rear suspension arms – molded composite rear suspension arms provide smooth suspension movement and rigidity



This section illustrates the parts of the NT18 engine, and also describes fuel, glowplug, and air filter that you will use in the operation of this nitro-powered engine.



MICRO NITRO TRUCK QUICK START CHECKLIST

CHARGING BATTERIES

Before operating your micro nitro truck for the first time, you need to properly charge the receiver battery pack and the starterbox battery pack.

USE THE PROPER BATTERY CHARGER

We strongly recommend using a high-quality peak-detection charger with automatic shut-off. The charger should be specifically designed for charging NiMH batteries used in the receiver pack and starterbox battery pack. Charge each pack at its recommended rate, and do not overcharge or damage or injury may result. Carefully follow the manufacturer's instructions that accompany the battery charger.

INITIAL CHARGING & CYCLING THE BATTERY PACKS

The receiver battery pack and starterbox battery pack must be cycled before first-time use. When cycling the receiver battery pack for the first time, carefully follow these instructions:

1. Set the charge current to 110 mA (0.11A).
2. Charge each battery pack for 14-16 hours. During charging it may happen that the charger will stop charging while the battery pack is not fully charged. In such case you can continue charging until the battery pack is fully charged. This may happen one or more times during charging and this issue is related to the type of charger or type of charging used.
3. After 14-16 hours disconnect the battery pack, even if the charger is still charging it.
4. Let the battery pack rest for 1 day.
5. After 1 day discharge the battery pack. Set the discharger to a 1.1A discharge rate, and set the discharge cut-off voltage to 4.5V for the pack (0.9V per cell).
6. Let the battery pack rest for 6 hours.

Your battery packs have now been cycled and you can use them safely.

RAPID CHARGING

After you have initially charged and run the receiver and starterbox battery packs, you can rapid charge the packs afterwards.

Using a peak-detection charger, set each battery pack to charge at the proper rate (1.0A for receiver pack, X.XA for starterbox battery pack). Do not use higher charge currents; rapid charging is done at a higher current, so the battery pack may generate too much heat and explode or vent. Never leave the battery pack unattended while it is charging. If the battery pack becomes too hot (113°F or higher), stop charging immediately.

DISCHARGING AND STORAGE

After use, we DO NOT RECOMMEND discharging the packs completely, as this will damage the packs. You can safely recharge the packs immediately after use without any performance degradation. If you will be storing the packs for longer than a month, partially discharge the pack down to approximately 40% capacity.

IMPORTANT WARNINGS

- Never disassemble the battery pack or peel away the cover.
- Keep the battery pack away from water.
- Do not touch the battery pack with wet hands or wet objects.
- Do not subject the battery pack to strong impacts and short circuits.
- Keep the battery pack away from fire and flammable objects.
- Disconnect the battery pack when it is not in use.
- Do not put metal objects in the battery pack connector or touch the terminals
- in the connector.
- Do not throw away the battery pack when you no longer need it. Bring it to the shop from which you bought it, or to a shop offering battery recycling service.
- If leaked battery alkaline electrolyte gets in your eyes or on your skin, flush thoroughly with clean water and consult with a doctor immediately.
- Regularly check the wiring for damage. While running the truck, vibration or movement may cause damage to the wires which if left unchecked may result in a short circuit. If any wire insulations becomes damaged, please dispose of the battery pack properly and do not use it, nor try to repair it.
- You are responsible for the proper use of this battery pack and any damage that may occur due to its use or misuse. XRAY is not liable for any injury, damage, or harm caused to any person or property arising from the use or misuse of their products.

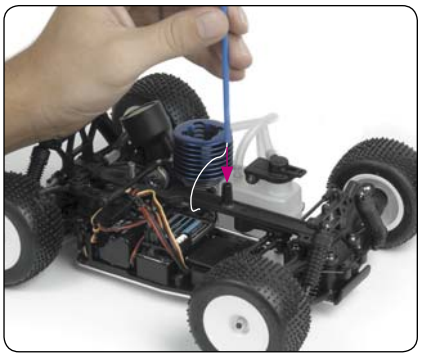
WARRANTY

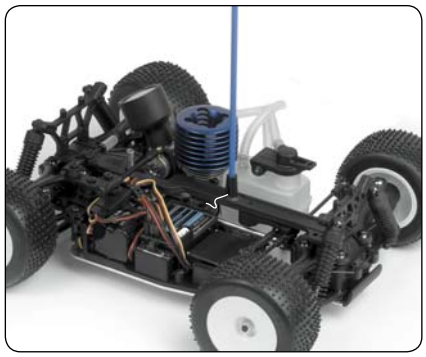
A new, unused battery pack is guaranteed against manufacturer's defects and workmanship. Any damage due to misuse by the user will be repaired at the user's expense. There is no warranty expressed or implied that covers damage caused by normal use, or covers or implies how long the battery pack will run (run time), or last before requiring replacement due to normal use and normal cell degradation. XRAY shall not be liable for any damage caused by overcharging, battery failure, improper charging or discharging, use of non-approved chargers, use of non-approved batteries, and alternations or modifications of any kind to the charger, batteries, switches, or wiring.

INSTALLING THE ANTENNA

You must install the antenna tube before operating your micro nitro truck.

1. Locate the black antenna wire that exits the receiver. The receiver is mounted on the top of the servo.
2. Pull the wire straight with your fingers and then insert the end of the wire into one end of the antenna tube. Push the wire all the way through the antenna tube.
3. Pull the remaining wire through the antenna tube, and then insert the base of the antenna tube into the molded post on the chassis to which the servo is mounted.
4. Fold the remaining antenna wire over the top of the tube. The remaining wire can stick up.





TIP:
Spray a small amount of window cleaner on the antenna wire to make it easier to push through the antenna tube.
Do not push the transmitter antenna down from the top. Pull it down from the bottom, one segment at a time, to prevent binding and kinking the antenna mast.

CAUTION !!!

Do not shorten the length of the antenna wire. Its length is tuned to the frequency band; cutting it may severely shorten the radio system's range.

DECORATING THE BODY

The micro nitro truck body was hand-painted with premium-quality, high-gloss paint and several stickers were applied to the body.

If you want to use the included rear wing, you must trim it first. When installing the wing on the Monster Truck make two holes in the rear of the body as indicated. Attach the rear wing to the body using the included screws and plastic nuts. To install the wing to the truck use a double-sided tape.
Extra decals are provided to decorate and personalize your micro nitro truck body.
Use the tip of a hobby knife to lift the corner of a decal, then remove it from the backing sheet.
Position the decal over the desired location on the body, and press it onto the body. Pull tight on the decal if required, and use your fingers to smooth out any air bubbles.

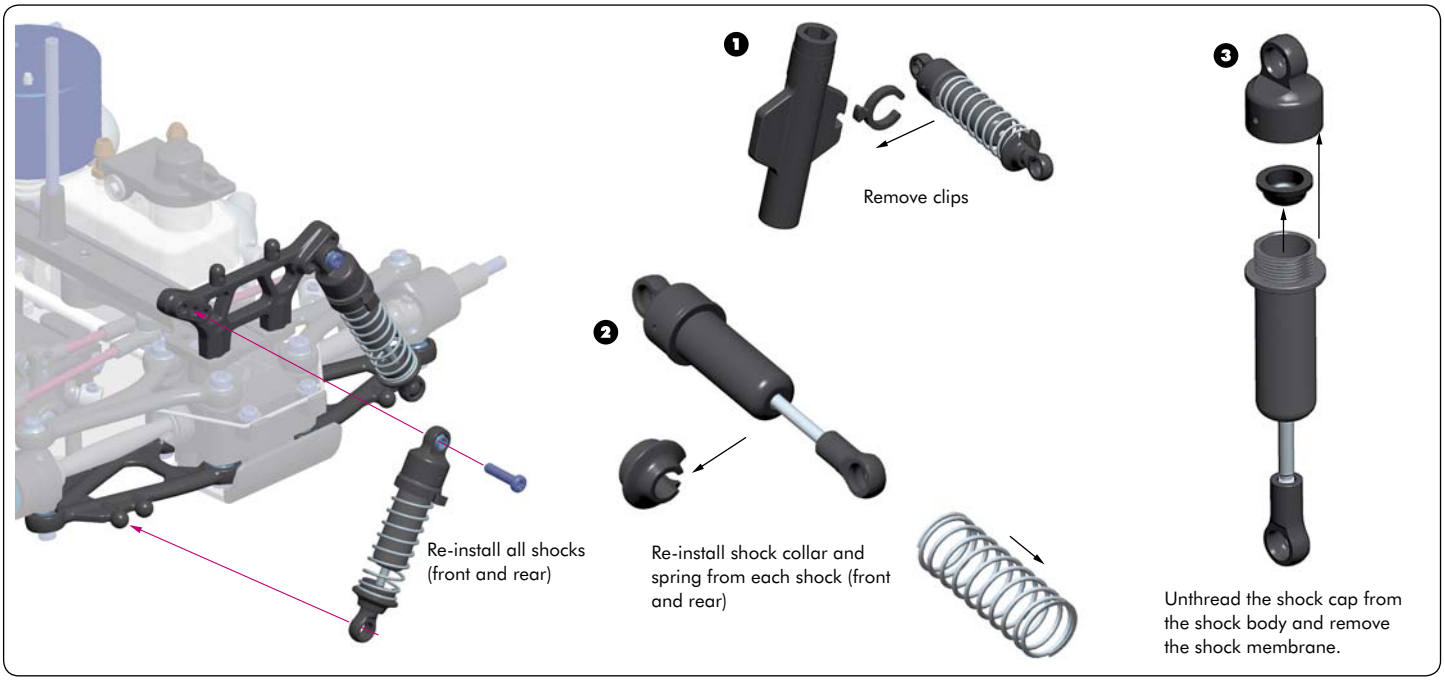
Decals for NT18T

Decals for NT18MT

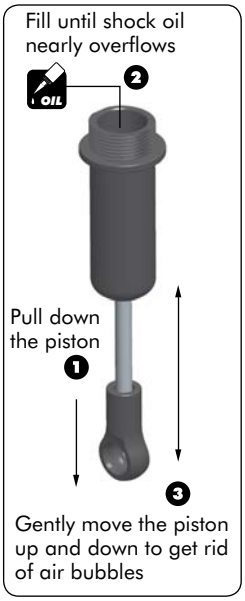
FILLING AND INSTALLING THE SHOCK ABSORBERS

Re-install each shock absorber, fill each shock absorber with the supplied shock oil, and install on the micro nitro truck.

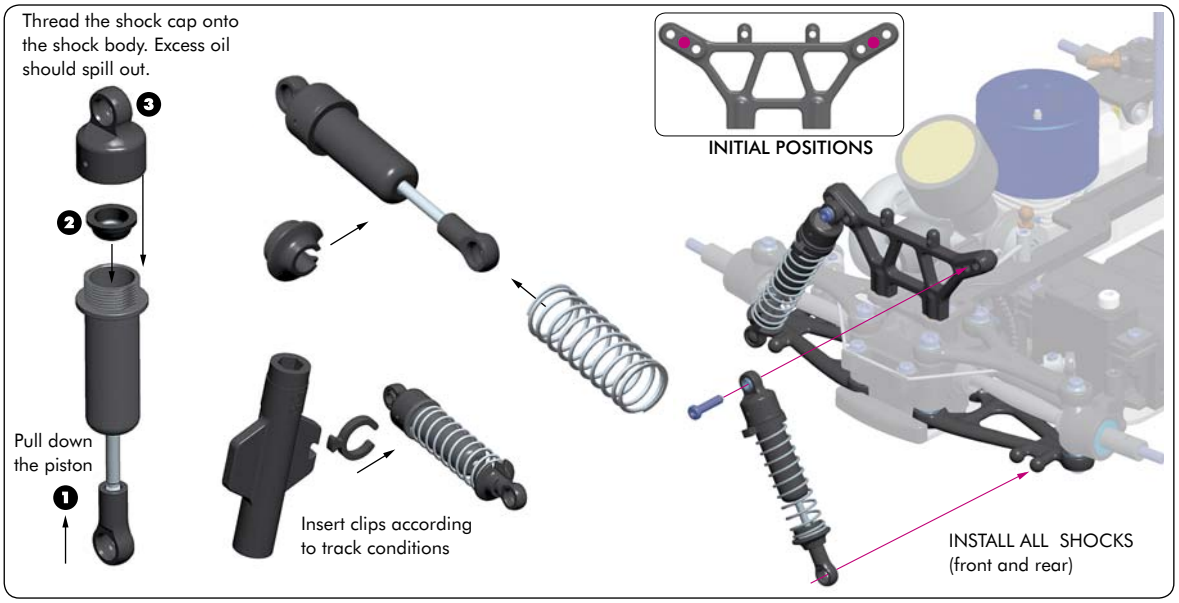
RE-INSTALLING THE SHOCKS



FILLING THE SHOCKS



INSTALLING THE SHOCKS



INSTALLING THE TRANSMITTER BATTERIES

Your XT1 Transmitter uses eight AA batteries. The battery tray is located at the base of the transmitter.

1. Remove the battery cover (bottom of transmitter) and remove the battery tray.
2. Install eight (8) AA alkaline batteries into the battery holder. Pay close attention to the correct direction of the positive (+) and negative (-) ends of the batteries as marked in the tray.
3. Reinstall the battery tray using the molded pegs in the bottom as a guide, then replace the battery cover.
4. Turn on the transmitter and check that the LED power indicator gives a solid red light.

If the power indicator does not light up, the transmitter batteries may be weak, discharged, or possibly installed incorrectly. Check the battery positions first, then replace any weak batteries with new or freshly-charged batteries as required.

The power indicator light does not indicate the charge level of the main battery pack in the truck.

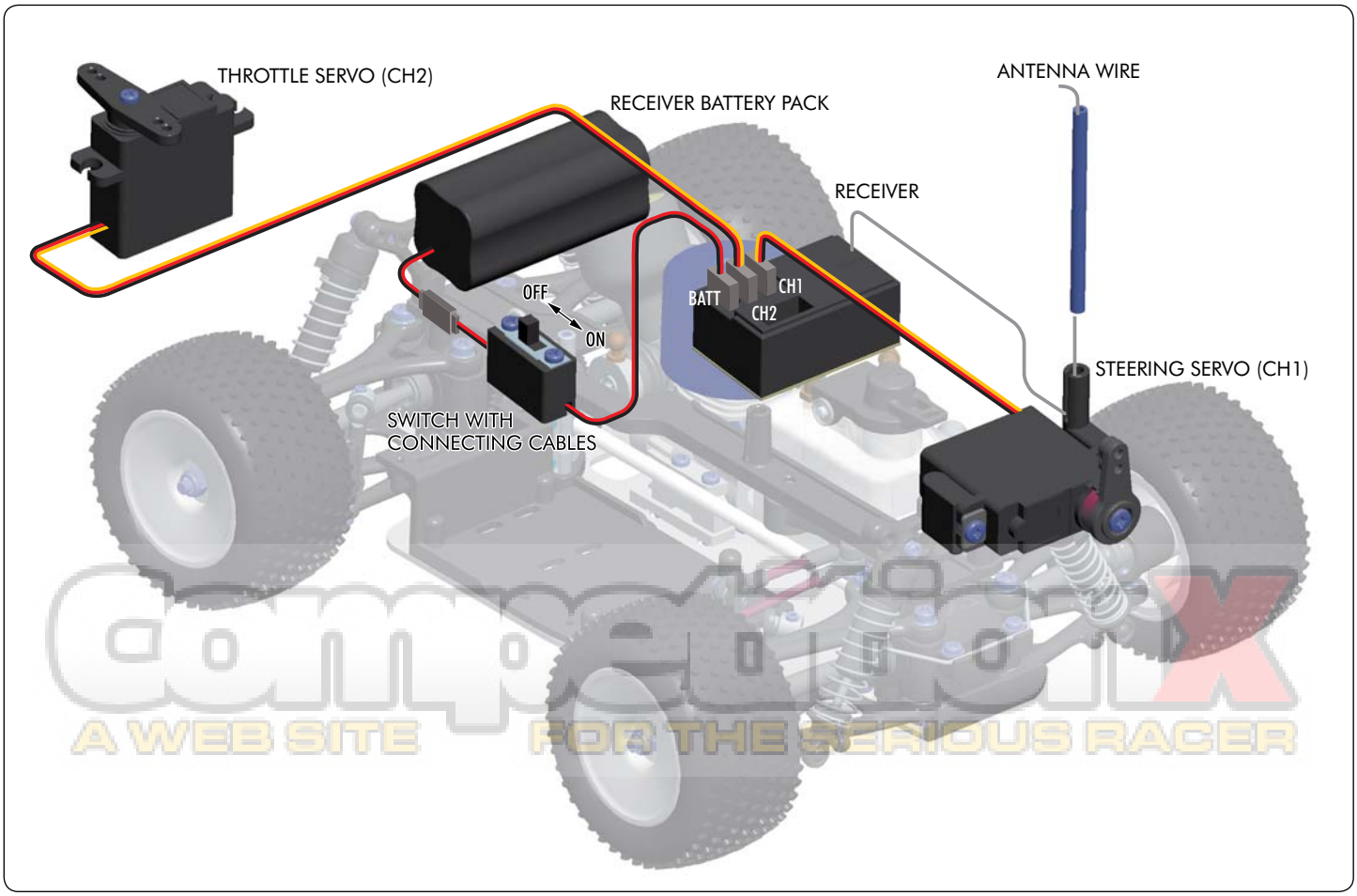
Use only fresh alkaline or rechargeable batteries, all of the same brand. Make sure that rechargeable batteries are fully charged according to the manufacturer's instructions. If you use rechargeable batteries in your transmitter, be aware that when they begin to lose their charge, they lose power much more quickly than regular alkaline batteries.

TIP: *Transmitter Battery Holder*
Make sure that the contacts in the battery holder stay clean by using a pencil eraser to gently remove any corrosion or dirt that may accumulate on them. It is recommended to do this each time you install fresh cells into your transmitter.

CAUTION !
Stop running your micro nitro truck at the first sign of weak batteries to avoid losing control.

When the transmitter will not be used for any short or long period of time, always remove the batteries. If the batteries are loaded incorrectly, the transmitter may be damaged.

ELECTRONICS ASSEMBLY AND WIRING CONNECTION



XRAY RADIO SYSTEM

XT1 TRANSMITTER CONTROLS

Transmitter Antenna
Transmits the radio signal from the transmitter. Always extend the transmitter antenna before you operate the transmitter; otherwise you risk create interference to another modeller.

Transmitter Crystal
Solid-state plug-in crystal allows you to change the frequency on which your transmitter broadcasts. The receiver must contain the matching frequency crystal.

Steering Trim
Adjusts the steering left/right in small increments so the model runs straight when the transmitter steering wheel is at rest (centered).

Throttle Trim
Adjusts the throttle neutral position up/down in small increments so the truck does not move when the transmitter throttle trigger is at rest (neutral)

Throttle Trigger
Controls the movement of the truck. Truck moves forward when you pull the throttle trigger, and brake is applied when you push the throttle trigger.

Steering Wheel
Controls the left/right steering of the truck.

Power Switch
Turns the transmitter on or off.

Steering D/R (Dual Rate)
Adjusts the steering sensitivity.

External Charging Jack
Recharges the transmitter battery if you are using a rechargeable battery pack.

Steering Reverse
Changes the direction of the truck's steering in relation to the way you turn the transmitter steering wheel. Always be sure the steering reverse is in the "R" position.

Throttle Reverse
Changes the truck's forward/reverse direction in relation to the way you move the transmitter throttle trigger. Always be sure the throttle reverse is in the "N" position.

Battery Cover
Covers the transmitter battery compartment

Battery Indicator
LED indicates the transmitter battery voltage level. If the Red LED does not light up, please replace the transmitter batteries (8x AA batteries).

RADIO SYSTEM TERMINOLOGY

Take some time to familiarize yourself with these radio system terms that are used throughout this manual.

BEC (Battery Eliminator Circuitry)
BEC circuitry powers the receiver and steering servo from the main battery pack. This eliminates the need for using a separate receiver battery pack to power the radio equipment on the truck.

Channel
The 27 MHz frequency band is divided into 6 channels so that up to 6 models can be operated simultaneously. Each channel is referred to by its flag color and channel number according to the following table.

Channel	Frequency (MHz)	Flag Color
1	26.995	Brown
2	27.045	Red
3	27.095	Orange
4	27.145	Yellow
5	27.195	Green
6	27.255	Blue

Clearing your Frequency
A routine, verbal check to make sure nobody else in your area is operating on the same channel. Always clear your frequency by calling out your channel number before operating your model. If the channel is already in use, wait until it is clear to use.

Crystal
The small, plug-in solid state in device that sets the operating frequency (channel) on which the radio system will operate. For each channel there are two crystals: one for the transmitter and one for the receiver. Each crystal should be marked with either Tx (transmitter) or Rx (receiver).

It is recommended that you use only authentic XRAY crystal sets, and to change both the transmitter and receiver crystal at the same time.

Switch
The mechanical on/off switch that controls the power to the onboard electronics.

Frequency Band
The radio frequency band used by the transmitter to send signals to your truck. Your radio system operates on the 27 MHz frequency band.

Neutral Position
The positions that the steering servo and throttle servo go to when the transmitter controls are at their neutral settings.

NiMH
Refers to rechargeable, nickel-metal hydride (NiMH) batteries.

Receiver
The radio receiver inside your truck that receives signals from the transmitter and relays them to the steering servo and throttle servo.

Servo
Small electronic motor unit in your truck that operates the steering mechanism or throttle/brake mechanism.

Transmitter
The hand-held radio unit that sends throttle and steering signals to your truck.

Trim
The fine-tuning adjustment for the neutral position of the steering servo and throttle servo, made by turning small knobs on the transmitter.

USING THE RADIO SYSTEM

Now that everything is prepared for operating the micro nitro truck, please follow these instructions.

Radio System Rules

- Each time you prepare to run your micro nitro truck, you must clear your frequency to be sure no one else in the area is using the same channel as you.
- There are six possible channels, numbered #1 through #6. Each is represented by a color. Look at the crystal plugged into the back of your transmitter to determine which channel your micro nitro truck is assigned to.
- Always turn your micro nitro truck transmitter **on first** and **off last**. This will help to prevent your micro nitro truck from receiving stray signals from another transmitter or other source, and running out of control.
- Always have the transmitter turned on before you plug in the battery pack in the model (having the switch in ON position).
- Always use new or freshly charged batteries for the radio system. Weak batteries will limit the range of the radio signal between the receiver and the transmitter. Loss of the radio signal can cause you to lose control of your micro nitro truck.

1. Turn on the Transmitter

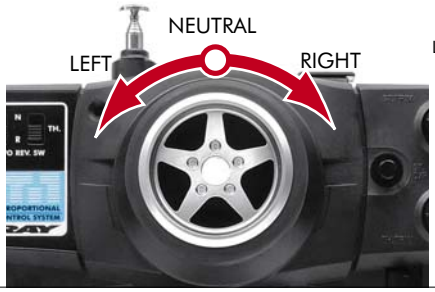
Always turn on the transmitter first by sliding the power switch to the ON position. The red light should go on. If the red light does not go on, check for incorrectly installed batteries or weak batteries.

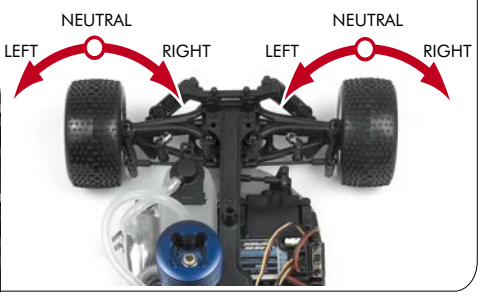
2. Start the engine

After the transmitter is on, turn on the receiver power switch to the ON position, and then start the engine. (For starting procedure see page 16).

Check the radio range by walking away from the truck.

Turn the transmitter steering wheel left then right to check if the front wheels move correctly. The amount of steering varies according to the steering wheel movement. If the steering wheel is turned all the way left or right, the front wheels will also steer all the way right or left.

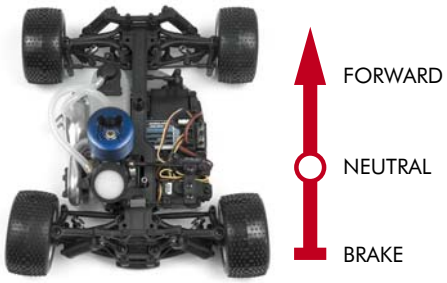




4. Check the Driving Operation

Operate the throttle trigger to check if the truck goes forward and backwards.
Pull the trigger backward to make the truck move forward; push the trigger forward to apply the brakes.

The amount of acceleration varies according to the throttle trigger movement. If the throttle trigger is pulled all the way back, the faster the truck will run.



5. Adjust the Steering Trim (optional)

Use the steering trim knob on the transmitter to fine-tune the steering position if the truck does not drive straight with the steering wheel in the neutral position (centered).

Always be sure the servo-reversing switch (**ST.REV**) is in the '**R**' position

6. Steering Dual Rate

Steering Dual Rate is used to adjust the amount of steering servo movement.

7. Adjust the Throttle Trim (optional)

Use the throttle trim knob on the transmitter to fine-tune the throttle neutral position if the truck wheels are rotating with the throttle trigger in the neutral position.

Always be sure the servo-reversing switch (**TH.REV**) is in the '**R**' position

8. When Turning the Vehicle OFF

Stop the truck's engine first, then turn off the truck's power (using the on/off switch), then turn off the transmitter. (For stopping procedure see page 16).

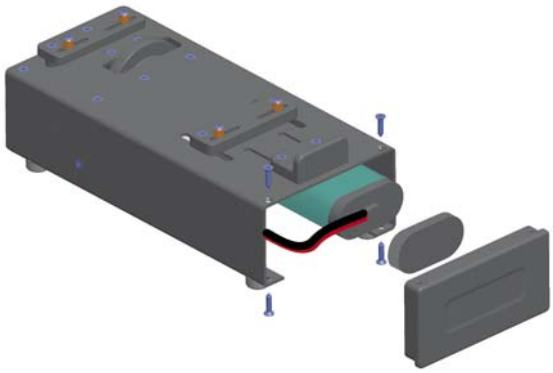
TESTING THE RANGE OF THE RADIO SYSTEM

It is important to test the range of the radio system before driving the truck. This will let you know if there is any interference in the signal between your transmitter and the truck, or if the batteries are low. It is best to perform a range test with 2 people.

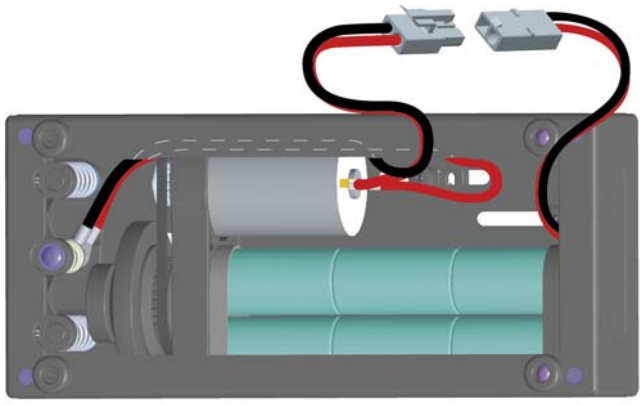
1. Make sure that the transmitter batteries and receiver pack batteries are fully charged.
2. Turn on the transmitter, turn on the truck, and then start the truck engine.
3. Have someone hold the truck while it is running. Make sure s/he holds it safely.
4. While near to the truck, operate the throttle/brake and steering controls.
5. Walk away from the person holding the truck, and continue to operate the controls. The truck should respond to your transmitter without glitching.
6. Continue to walk away, still operating the transmitter controls, until the truck stops responding to your transmitter or it starts behaving erratically (glitching).
7. Walk back towards the person holding the truck until the truck again responds properly to your transmitter. THIS IS THE MAXIMUM SAFE RANGE OF THE RADIO SYSTEM.
8. Stop the truck engine, turn off the truck, and then turn off the transmitter.

PREPARING AND CHECKING THE STARTERBOX

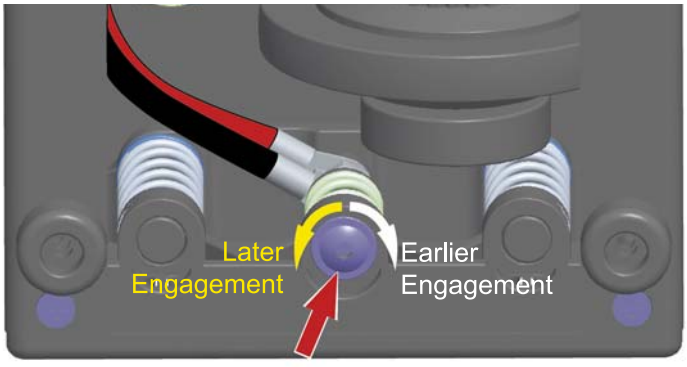
❶ Use standard 6-cell 7.2V battery pack. To install the battery pack, dismantle the rear cover and insert the battery pack within the battery slots and route the cables within the slot. In case the battery pack is shorter, use the included foam cushion. Reinstall the rear cover again.



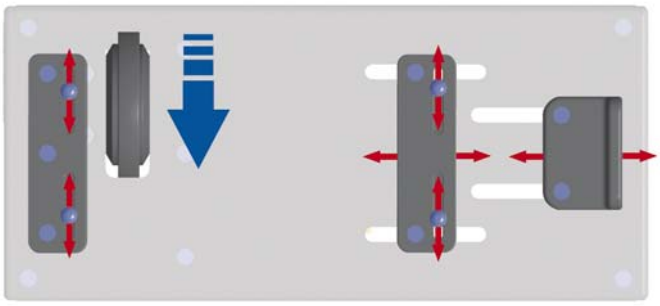
❷ Connect the battery pack to the motor.



❸ You can easily adjust the start-box engagement point; it is pre-adjusted at the factory for the XRAY micro nitro truck. Tighten or loosen the screw as shown to set an earlier or later engagement



❸ Place the truck on the box so that the flywheel of the engine matched up with the starter wheel. If the truck does not fit the back-stop properly, you can easily adjust them in any direction. Before placing the truck on the start-box, operate the start-box to ensure the starter wheel spins in the indicated direction.



IMPORTANT NOTES – ELECTRICAL

- Do not disassemble the battery pack or cut battery cables. If the running battery short-circuits, approximately 300W of electricity can be discharged, leading to fire or burns. Never disassemble the battery pack or cut battery cables.
- Use a recommended charger for the battery pack and follow the instructions correctly. Over-charging, incorrect charging, or using inferior chargers can cause the battery pack to become dangerously hot. Recharge battery when necessary. Continual recharging may damage battery and, in the worst case, could build up heat leading to fire. If battery becomes extremely hot during recharging, please ask your local hobby shop for check and/or repair and/or replacement.
- Regularly check the charger for potential hazards such as damage to the cable, plug, casing or other defects. Ensure that any damage is rectified before using the charger again. Modifying the charger may cause short-circuit or overcharging leading to a serious accident. Therefore do not modify the charger.
- Always unplug charger when recharging is finished.
- Do not recharge battery while battery is still warm. After use, battery retains heat. Wait until it cools down before charging.
- Disconnect and remove the battery pack if you plan to not use the start-box for a period of time (e.g., several days).

OPERATING TIPS

- Inspect the start-box wiring and components before each use, and do not use the start-box if any wiring or components appear to be damaged, cut, or worn.
- Before placing a truck on the start-box, operate the start-box to ensure the starter wheel spins in the proper direction.
- If the truck's nitro engine seizes at TDC while the truck is on the starter box, do not continue to try starting the engine; damage will result to the start-box and the engine flywheel. Rotate the nitro engine flywheel until the piston is at BDC and try starting the truck again.
- When the starter wheel speed is noticeably reduced, you should fully charge the battery pack.

MAINTENANCE

Remove excess build-up of debris, dirt, fuel, etc. from the start-box to ensure proper, clean operation. Do not use solvent-based chemicals to clean the components of the start-box.

MICRO NITRO TRUCK ENGINE

Your micro nitro truck comes with the high-performance NT18 0.8cc nitro-powered engine. Developed for highest performance and excellent reliability, this engine represents the perfect combination of manufacturing quality and race-winning experience.

The XRAY NT18 0.8cc engine has the following features:
- uses standard model car fuel
- standard glowplug design
- durable construction
- adjustable, dual-needle, slide carburetor (aluminum)
- large, blue-anodized billet aluminum heatsink cooling head

Internal combustion (or "nitro-powered") engines require some basic knowledge and understanding, as well as important safety considerations.

SAFETY FIRST

!! READ & UNDERSTAND BEFORE OPERATING THE ENGINE !!

This engine is NOT A TOY, it is a precision-manufactured machine. This machine can injure to you or other nearby, and can also damage property. It is very important to pay attention as indicated in this manual. Improper use of the machine can be very dangerous.

You alone are responsible for operating your engine safely; act with discretion and pay special attention at all times.
- Carefully read and fully understand all of the safety instructions and engine operation instructions before you operate your engine.
- Keep these manuals in a place so you know where they are at all times.
- Follow the instructions carefully.

The information in this manual will help to prevent injuries to users and other as well as protecting objects from damage.

GRAPHIC INDICATIONS

The following words and graphic indications are used throughout this manuals. Be sure you fully understand these meanings before reading the text.

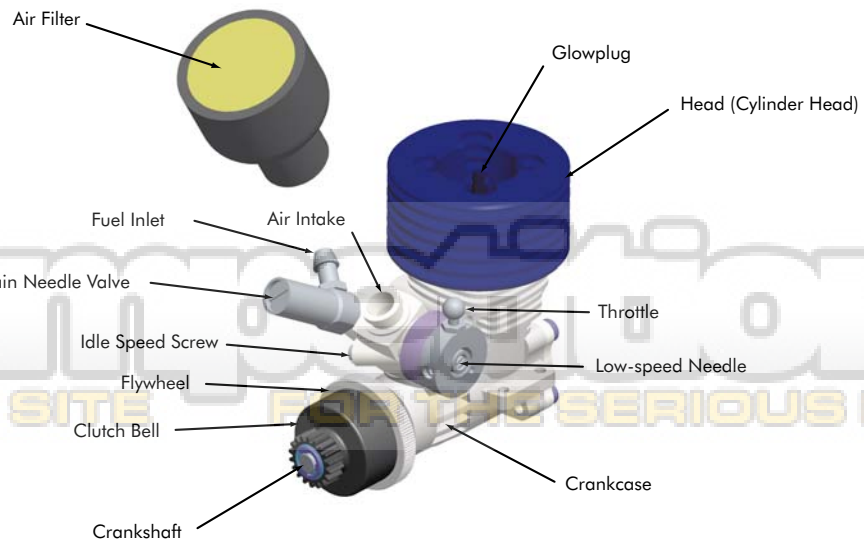
DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderated injury, or damage of objects nearby.

Example of graphic indications:

	Warning or caution	The illustration indicates the contents of the warning or cautions. This graphic means be careful of high temperatures.
DO NOT TOUCH	Actions are prohibited	The actions prohibited are indicated in or near the illustration. This graphic means do not touch.
COMPULSORY	Compels or instructs certain actions	You must follow the instruction carefully. This graphic means "compulsory."

GETTING TO KNOW THE MICRO NITRO TRUCK ENGINE

This section illustrates the parts of the NT18 engine, and also describes fuel, glowplug, and air filter that you will use in the operation of this nitro-powered engine.



Fuel

For break-in and general running, use high-quality, market-available model car fuel containing 20% lubricant and 15~30% nitromethane by volume ratio. Although you can obtain more power by increasing the nitromethane content, it will shorten engine life.

Glowplug

The type and quality of glowplug used for your engine has a substantial impact on overall performance and reliability. We strongly recommend glowplugs by XRAY. Glowplugs are consumables and the life of plug depends on several factors and manners of use.

Air Filter

Do not run engine without an air filter!
The air filter protects the engine from the intake of dust and other contaminants. A properly maintained air filter is essential to the life and performance of the engine. Use proper air filter oil with your air filter.

Exhaust System

We recommending using only the XRAY-supplied 2-piece exhaust system for best performance.

STARTING & SUPPORT EQUIPMENT

Starter Box

You must start the engine by first spinning the clutch flywheel. We strongly recommend using the #104300 HUDY Micro Start-Box, which is specifically designed for starting the NT18 engine.

Glowplug Starter

A glowplug starter is required to ignite the glowplug for starting. We recommending using a high-quality, battery-operated glowplug starter from a reputable manufacturer.

Glowplug Wrench

A glowplug wrench is required for removing/installing the engine glowplug. We recommend using a high-quality glowplug wrench such as the #107581 HUDY Wrench-Glowplug.

Screwdriver

A small flat-blade screwdriver is required for adjusting the carburetor. We recommend using high-quality tools such as those offered by HUDY.

HANDLING NITRO FUEL

- Read and follow all directions and warnings on the fuel container.
- Read and follow the safety precautions in the NT18 Engine Instruction & Safety Manual.
- Keep the fuel container tightly sealed at all times. Nitro fuel is very volatile, evaporates quickly, and also absorbs moisture from the air very rapidly.
- Do not store unused fuel in the fuel bottle. Immediately return fresh unused fuel back into the fuel container. Do not mix old and new fuel, and never mix different brands of fuel together.
- Store the fuel in a cool, dry location away from any source of heat, ignition, or combustion.

FILLING THE FUEL TANK

Use a fuel bottle to put fuel into fuel tank; DO NOT attempt to pour fuel directly from the fuel container into the fuel tank.

To fill the fuel bottle squeeze the bottle to remove the air, insert the tip into the fuel container, and then release your grip on the fuel bottle. Fuel will be drawn into the fuel bottle as the bottle expands.

To fill the fuel tank pull up on the fuel tank cap, insert the tip of the fuel bottle into the tank, and then gently squeeze the fuel bottle to dispense the fuel. Be very careful not to squeeze to hard or fast, or overfill the fuel tank.

AIR FILTER

Do not run engine without an air filter!

The air filter protects the engine from the intake of dust and other contaminants. A properly maintained air filter is essential to the life and performance of the engine. Use proper air filter oil with your air filter. The oil softens the foam element and traps dirt more easily.

We strongly recommend that you clean and re-oil the air filter after every 1 hour of runtime (even if the filter looks clean) to maintain proper engine performance and avoid engine damage. To clean the air filter parts (including the foam filter element), wash the parts in hot soapy water, and rinse thoroughly with clean water. Dry the parts with a clean towel or compressed air (use safety eyewear). Oil the foam element with proper air filter oil.

Air Filter Cleaning Instructions

1. Pull the air filter body off of the carburetor.
2. Remove the foam element from the air filter body.
3. Clean the air filter parts thoroughly by washing them in hot soapy water (liquid dishwashing detergent works well). Repeat twice.
4. Thoroughly dry the air filter parts with a clean towel or compressed air. Wear safety glasses if using compressed air.

GETTING READY TO START THE ENGINE

1. Check that your radio channel is not in use by anyone else; YOU MUST NOT turn on your transmitter if the channel is in use.
2. Turn on the truck, and then turn on the transmitter.
3. Check radio operation.
4. Place the truck on the starterbox, and align the truck so the engine flywheel is directly over the starterbox wheel.

STARTING THE ENGINE

This section describes proper starting techniques and some troubleshooting information.

Safety Information

WARNING	PROHIBITION	Keep loose objects such as shirt sleeves, neckties, and scarves away from the spinning tires, flywheel, and gears. Be careful not to drop utensils such as screwdrivers and pencils into the spinning tires, flywheel, and gears. If these objects contact moving engine or transmission parts, it may cause mechanical breakage and personal injury.
	PROHIBITION	When you operate an engine, keep children and others away from you and the engine. Anyone who is not operating the engine must be at least 6 meters away from the engine. If the engine comes off, it may cause injury.
	PROHIBITION	Never operate the engine in an enclosed area such as a basement or a garage. Model engines, like automobiles, emit poisonous exhaust fumes during operation. Only operate the engines outdoors where there is good ventilation.
	DO NOT TOUCH	Make certain the glowplug clip is not in the way of the spinning tires, flywheel and gears. Damage may be caused if it contacts the spinning tires, flywheel or gears.
CAUTION	COMPULSORY	Check the throttle linkage connections before starting and running the model truck. If any connections fail, it may cause personal injury.
	COMPULSORY	We strongly recommend wearing safety eyeglasses or safety shields when you operate an engine.
	FLAMMABLE	Model engine fuel is highly flammable and must be handled with the extreme caution. Keep objects that create fire risks (such as cigarettes) away from the engine and fuel supply system. No-one should be smoking nearby the engine or fuel.

STARTING PROCEDURE

Fill up the fuel tank and "dry-start" the engine for 2-3 seconds without applying the glowplug starter, and with the carburetor in "idle" position; this primes the fuel lines and allows the fuel to reach the engine. Then apply the glowplug starter and start the engine. The engine should fire up immediately.

If the engine does not fire up immediately, check the fuel line to see if fuel is reaching the carburetor. If fuel is not reaching the carburetor, remove the glowplug starter, cover the exhaust tailpipe and "dry-start" the engine for 2 seconds. This will build up extra pressure in the pipe and in the pressure line to the fuel tank, causing the fuel to be pushed to the carburetor.

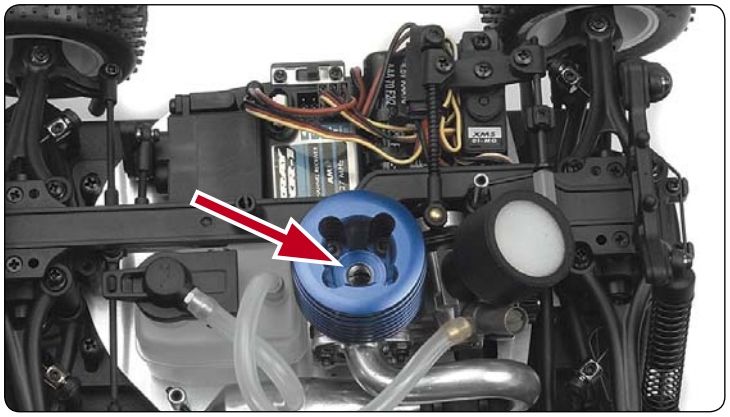
Apply the glowplug starter, and start the engine.
Once the engine has started, apply a little throttle and allow the engine to warm up to operating temperature. This is an important routine that you should always follow. The internal parts need to receive lubrication and reach operating temperature before the engine can have a load applied to it.

If your transmitter has throttle servo trim adjustment (a.k.a. "end point adjustment"), adjust the range of motion of the throttle linkage for full throttle and full brake.

FLOODING & HYDRAULIC LOCKUP

Excess fuel in the cylinder may cause the engine to flood (by extinguishing the glowplug), or it may cause a hydraulic lockup (when excess fuel fills the cylinder above the piston, preventing the piston from moving upward). If this happens, DO NOT try to start the engine, or severe engine damage may result.

1. Remove the glowplug, open the throttle fully, cover the glowplug hole with a cloth, then turn over the engine. The excess fuel will be ejected through the glowplug hole.
2. Check the operation of glowplug with the glowplug starter before screwing the glowplug back in again.
   Restart the engine.



STOPPING THE ENGINE

To stop the engine safely and quickly, turn the truck over and press a hard plastic part (for example, the handle of a screwdriver) against the rotating flywheel.

BREAKING IN THE MICRO NITRO TRUCK ENGINE

The micro nitro truck nitro engine requires careful break-in the first time the engine is used to allow the internal parts to achieve proper operating clearances. This is especially true of the piston/cylinder, crankshaft, and connecting rod (conrod). Pay close attention during the initial break-in period; this process is very important to achieve the best engine performance, reliability, and lifespan.

Each micro nitro truck engine is shipped from the factory with all carburetor settings set to a standard position.

The proper way to break in the micro nitro truck nitro engine is to "heat cycle" the engine with short periods of running followed by cooling down periods. Heat cycling allows the engine to heat up to its optimum operating temperature, allowing the components to "wear in" to each other properly. During the running time, the engines should be run only SLIGHTLY rich at the top end; overly rich mixtures and cold temperature break-in will lead to premature wear and failure of the piston & sleeve and other engine components.

First, break in the engine by performing the following process:

1. Keep the carburetor factory settings; do not adjust.
2. Fill the fuel tank and "dry-start" the engine for 2-3 seconds without applying the glowplug starter, and with the carburetor in the "idle" position. This primes the fuel lines and allows the fuel to reach the engine.
3. Apply the glowplug starter and start the engine.
4. Allow the engine to idle for a short time so the engine warms up.
5. Run the engine for 5–8 minutes, varying the throttle setting, without exceeding 1/2 throttle. The engine should run cleanly, and only SLIGHTLY rich at the top (noted by a very slight "burbling"). If the engine runs very crisply with high temperature and hard acceleration, it is probably running too lean; turn the main needle CCW slightly to richen the mixture very slightly at the top.
6. Stop the engine and allow it to cool down completely. Make sure the piston does not get stuck at top of the cylinder (TDC); rotate the flywheel to move the piston to the bottom of the cylinder (BDC).
7. Run the engine for several more heat cycles:
   - 5–8 minutes up to 2/3 throttle, then complete cool-down.
   - 5–8 minutes up to 3/4 throttle, then complete cool-down. (During the running, start to lean the main needle so it runs only very slightly rich – less than before – on top.)
   - Run through a full tank of fuel up to full throttle, adjusting the main needle so the engine runs cleanly at high RPM.

Do not run the engine at high RPM without load; that is, don't pick the truck off the ground and run the engine hard. The engine will overheat without the airflow over its cooling head, damaging the engine components.

ADJUSTING THE MICRO NITRO TRUCK ENGINE

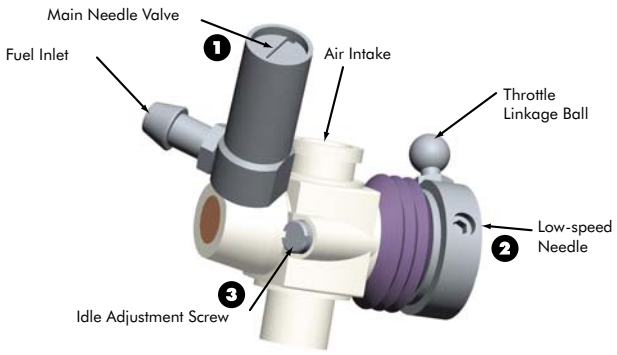
CARBURETOR ADJUSTMENT - OVERVIEW

The "Golden Rule of Carburetor Adjustment" is to make only small adjustments at one time, maximum 1/8 turn (45°), especially when fine tuning. The engine is very responsible to small changes in mixture settings.

The carburetor on the NT18 engine is preset at the factory, meaning that the original settings are close to where they should be for normal operation.

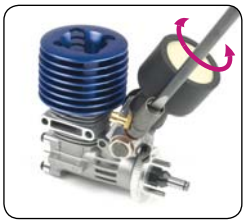
The engine carburetor has 3 adjustments:

1. Main needle valve
2. Low-speed needle
3. Idle adjustment screw



The carburetor has three settings that may be adjusted. Note that the initial position of each setting has been adjusted by the air gauge before shipping from our factory.

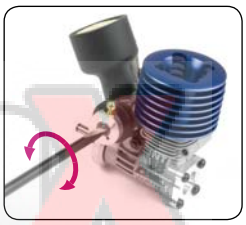
1 MAIN NEEDLE VALVE



The main needle valve controls the overall fuel flow to the carburetor, though its effects are particularly noticeable between ¼ and full throttle.

In the situation where this setting has not been adjusted, or if you get lost with your setup, put the main needle valve to the factory setting:
- Turn the needle CW until it barely stops (do not tighten it further or you will damage the carburetor).
- Turn the needle CCW by 3-4 turns from the fully-closed position.

2 LOW-SPEED NEEDLE



The low-end needle controls the amount of fuel at idle and low RPM (up to approximately ¼ throttle).

3 IDLE ADJUSTMENT SCREW

The idle screw controls the idle RPM when the carburetor is fully closed. We strongly recommend that the initial, factory-default setting be used for normal operation.

MAIN NEEDLE ADJUSTMENT

When the main needle is properly adjusted, the engine immediately responds to the throttle operation with clean, hard acceleration without hesitation.
To check if the engine is running at a proper setting, pinch the fuel line to the carburetor and observe the results:

- At a proper setting, the engine RPM increases instantly then the engine dies out.
- If engine dies out immediately without increasing RPM, the main needle setting is too lean.

LOW-END NEEDLE ADJUSTMENT

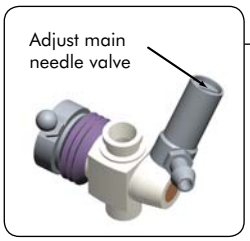
The most difficult thing to adjust is the low-speed adjustment. Keep the following principles in mind when doing this:

- Use the idle adjustment screw to adjust the idle RPM immediately after closing the carburetor.
- Use the low-speed needle to adjust the fuel mixture 2-5 seconds after closing the carburetor.
- Use only a ½ turn each way.

The low-end needle of each individual engine is precisely adjusted at the factory. The low-end needle adjusts the performance of the engine between idle up to approximately ¼ throttle. Above ¼ throttle the main needle has the most effect on engine performance.

CARBURETOR ADJUSTMENT - BEFORE PUTTING THE TRUCK ON THE TRACK

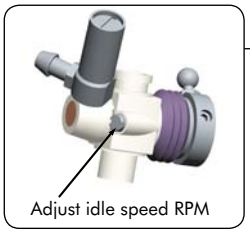
After the engine is running and has come up to operating temperature (within 15-20 seconds) proceed as follows:



STAGE 1: SETTING THE MAIN NEEDLE SLIGHTLY RICH

Take the truck off the ground, and open the throttle fully. The engine should run cleanly until it reaches 80% of top RPM, after which it should start to run slightly rich (4-stroking):

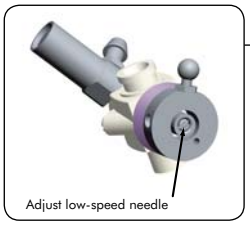
- If the engine runs cleanly all the way up to top RPM, richen the main needle (counter-clockwise) until it starts to 4-stroke at approximately 80% of its top RPM
- If the engine runs too rich (4-stroking all the way) lean the main needle (clockwise) until it only starts to 4-stroke at approximately 80% of its top RPM



STAGE 2: SETTING THE IDLE SPEED

Take the truck off the ground, and open the throttle fully for 2-3 seconds. Close the carburetor and check the idle speed that occurs immediately after.

- If the engine stops almost immediately, turn the idle adjustment screw clockwise to increase the idle RPM.
- If the idle RPM is too high, turn the idle adjustment screw counter-clockwise to reduce the idle RPM.



STAGE 3: SETTING THE LOW-SPEED NEEDLE

Open the carburetor for 2-3 seconds and let the engine clean out. Close the carburetor and let the engine idle.

- If the engine idles for 2-5 seconds and then the idle RPM decreases, the engine is running too rich during idle. Lean the low speed needle (clockwise) to remedy this condition. Repeat this step until the engine idles reliably at a constant RPM for at least 20-30 seconds after the carburetor has been opened for 2-3 seconds.
- If the engine idles for 2-5 seconds and then the idle RPM increases, the engine is running too lean during idle. Richen the low speed needle (counter-clockwise) to remedy this situation.
- If the engine will not idle at all, rich the low speed needle (counter-clockwise), or turn the idle adjustment screw clockwise to increase the idle RPM.

NOTE: Because adjusting the low speed needle affects the idle RPM, use the idle adjustment screw to get the engine to idle at the right RPM.
Once you are satisfied that you have achieved reliable carburetor settings, you are ready to put your truck on the track.

CARBURETOR ADJUSTMENT - AT THE TRACK

You can only fine-tune the main needle setting at the track. Initially, the main needle should still be set a little rich. Fill the fuel tank, run the truck up to maximum speed for a few laps, and check if it reaches top RPM without running rich towards the end (4-stroking). Lean the main needle by small increments (1/12 of a turn, like 1 hour on a clock) and run the truck again. Repeat these small adjustments until the engine accelerates well and reaches maximum speed without running rich. It is advised to then richen the main needle 1/8 of a turn (counter-clockwise).

Running the engine too lean will cause the engine to overheat, resulting in excessive engine wear and possibly breakdown. A fast, simple way to check the engine temperature is to apply a few drops of water to the cylinder head. The drops should evaporate only after 3-5 seconds. If they evaporate immediately the engine is too hot; richen the main needle 1/8 of a turn (counter-clockwise). Check engine temperature regularly and often.

The idle RPM and low-speed needle settings may require a little fine tuning after the main needle has been set properly. Once properly adjusted, the engine should produce a strong, high-pitched sound at maximum speed, and a thin trail of smoke should be visible from the exhaust tailpipe.

For more information about setting the idle and low-speed needle settings, see section Carburetor Adjustment – Before Putting the Truck on the Track.

NOTE: The carburetor settings may change with changes in weather conditions, fuel, glowplug, or exhaust system. After changing any of these, always richen the main needle (counter-clockwise) ¼ to ½-turn and then re-adjust the main needle again on the track.

FINE-TUNING THE CARBURETOR

After your engine has been properly broken in and tuned at the track, be aware that changes in weather (temperature, humidity, barometric pressure), altitude, and fuel nitro content will affect the performance of the engine. See the table below for guidelines on how to adjust your engine's carburetor settings to compensate for these various changes.

WHEN...	DOES THIS...	CHANGE MAIN NEEDLE SETTING...
Temperature	decreases	richer
	increases	leaner
Humidity	decreases	slightly richer
	increases	slightly leaner
Barometric pressure	decreases	leaner
	increases	richer
Altitude	lower	richer
	higher	leaner
Fuel nitro content (%)	lower	leaner
	higher	richer

BREAKING IN THE BALL DIFFERENTIALS

Please note that the factory pre-assembled ball differential is pre-built but is NOT tightened. To enjoy long life and smooth performance of the differential, you need to break in both front and rear differentials properly. You will need to run the truck several times for a short time, and each time tighten both differentials a small amount.

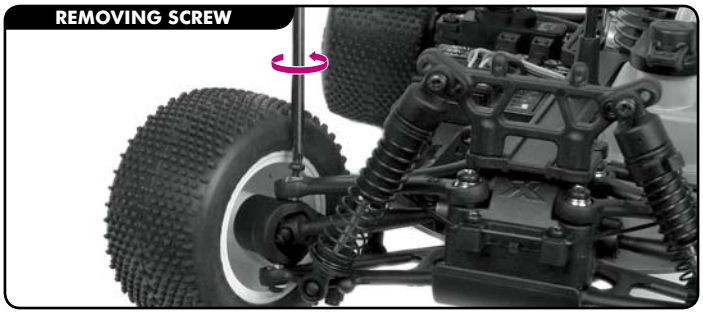
DIFFERENTIAL SETTING

To tighten the differentials, remove the front/rear upper arms as described below, and use a Phillips screwdriver to tighten the diff adjustment screw.

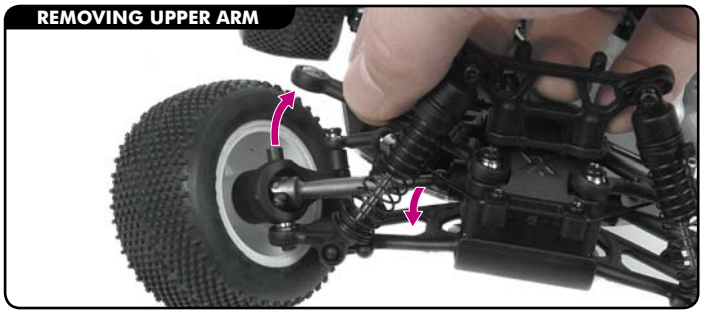
BREAK-IN PROCEDURE

1. Run the truck for the first time at only ¼ throttle for 30-60 seconds.
2. Tighten both front and rear diffs slightly by 1/16 turn.
3. Run the truck again for 2 minutes at ¼ throttle.
4. Tighten both front and rear diffs slightly by 1/16 turn. The differential should still turn freely.
5. Run the truck again for 5 minutes, this time up to ½ throttle.
6. Again tighten both front and rear diffs by 1/16 turn.

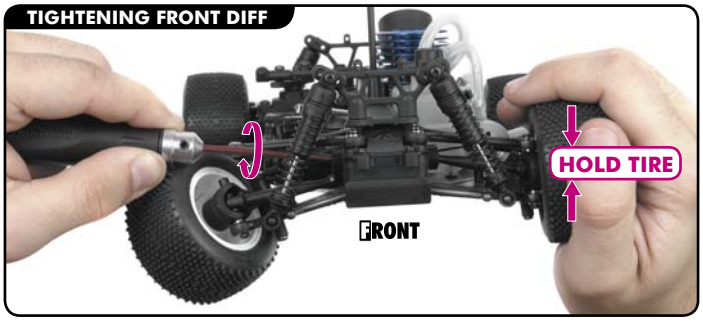
Now the differential should be tight enough. The differentials should still turn freely but it must slip with higher resistance.



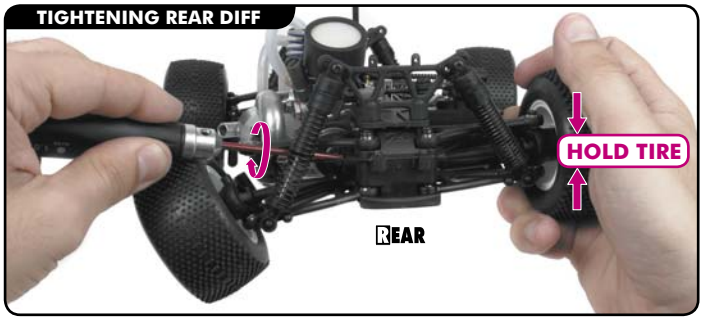
Remove the screw from the top of the front steering block or rear upright.



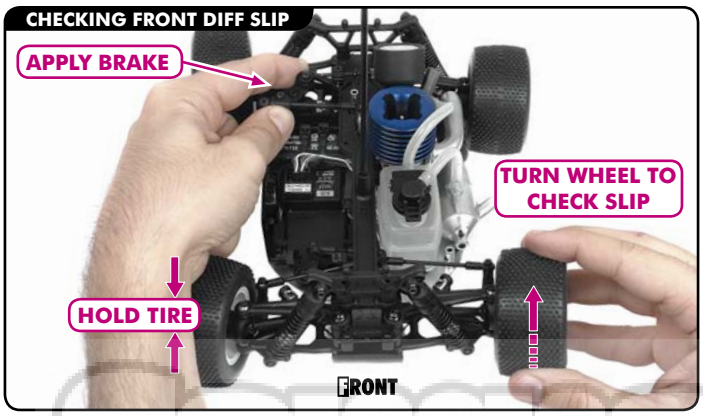
After removing the screw, lift the upper arm to allow the drive shaft to disconnect from the differential. You can now fit the screwdriver into the ball diff.



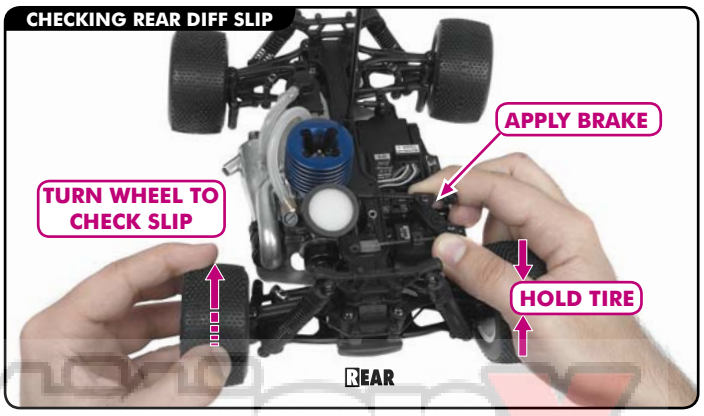
To tighten the front differential you need to remove the RIGHT front upper arm to give access into the diff for adjustment with the included Phillips screwdriver. Insert the screwdriver tip into the differential adjustment screw, hold the left front wheel firmly and then tighten (CW) the screw as required.



To tighten the rear differential you need to remove the LEFT rear upper arm to give access into the diff for adjustment with the included Phillips screwdriver. Insert the screwdriver tip into the differential adjustment screw, hold the right rear wheel firmly and then tighten (CW) the screw as required.



To check the slip of the front differential, grab the RIGHT front wheel and apply the brake. Turn the left front wheel. You should be able to turn the wheel but with resistance.



To check the slip of the rear differential, grab the RIGHT rear wheel and apply the brake. Turn the left rear wheel. You should be able to turn the wheel but with resistance.

BREAK-IN PROCEDURE QUICK TABLE

Run	Run-time	Throttle applied	After run tighten diff by
1st	30~60sec.	¼ throttle	1/16 turn (CW)
2nd	2 min	¼ throttle	1/16 turn (CW)
3rd	3 min	½ throttle	1/16 turn (CW)

DRIVING THE MICRO NITRO TRUCK

After you have broken in and adjusted the engine… and broken in the ball differentials… it's time to drive your micro nitro truck and have some fun!

Here are some things to keep in mind when driving your micro nitro truck:

- DO NOT run the truck in or through water, snow, or mud. Water and mud drawn through the air filter and will severely damage the engine, and even small amounts of water can cause electronics failure and loss of control.
- The micro nitro truck engine is a high-performance, powerful engine. Apply throttle gently to prevent flipping or loss of control.
- Avoid over-revving the engine with the wheels off the ground. This "no load" condition may result in internal engine damage.
- Avoid excessive high-speed operation running for long periods of time or long distances. This may exceed the engine's maximum safe RPM limit.
- Do not drive the truck with any kind of damage, especially drivetrain damage. This may cause engine damage from overloads due to drivetrain drag or friction, or over-revving due to loose or missing parts.
- Do not use your truck to tow anything behind it. The engine is cooled by airflow over the finned cylinder head when the truck is at speed. Towing puts a high load on the engine, while at the same time limits engine cooling of the engine due to low speed.
- If your truck gets stuck, stop immediately! Move the truck and then continue driving.
- NEVER turn off the radio system while the engine is running, as this could cause the truck to go out of control.

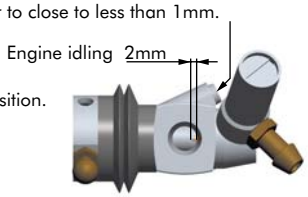
ADJUSTING THE MICRO NITRO TRUCK

THROTTLE LINKAGE ADJUSMENT

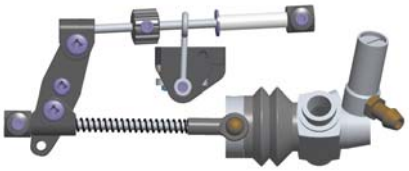
• NEUTRAL (IDLE)

- Turn on the transmitter and receiver and set the throttle servo trim to the neutral position.
- Adjust the idle adjustment screw on the carburetor to open approx. 2mm.
- Adjust both the throttle linkage and brake linkages accordingly.
- DO NOT adjust the linkage with the engine running.

Idling Adjustment Screw.
Use to adjust the idle setting of the carburetor.
Do not allow carburetor to close to less than 1mm.



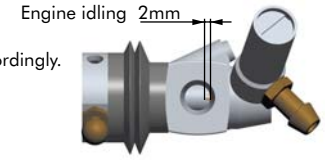
• FULL THROTTLE



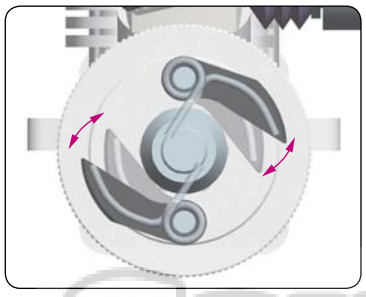
- Adjust the servo-horn mounting position for the carburetor to open fully.
- Change the pivot mounting position on the servo horn in case the carburetor is not opening fully or if it is opening excessively. Or if available on the transmitter, adjust the throttle endpoint.

• FULL BRAKE

- Adjust the brake rod collar so the brake works smoothly.
- If the brake applies too much or not enough, adjust the brake rod collar accordingly. Or if available on the transmitter, adjust the brake endpoint.
- To tighten brake, turn collar to thread brake rod INTO pivot.
- To loosen brake, turn collar to thread brake rod OUT of pivot.



CLUTCH ENGAGEMENT



TIP SETTING AN EARLIER CLUTCH ENGAGEMENT

The NT18 engine clutch shoes engage in higher RPM range. If you prefer an earlier engagement under lower RPM, deassemble the clutch bell and slightly bend the clutch shoes assembly together with the springs. The springs will become softer and will let the clutch shoes engage later. It is very important that you bend both clutch springs equally.

! ENGINE LEAKAGE

The engine manufacturer advises that due to the specifications of the micro size nitro engine and the manufacturing processes, this may result in some fuel leakage that may be of a higher rate than larger scale nitro engines. The amount of fuel leaked may differ from engine to engine; this is natural and therefore is not considered as a fault or defect.

GEARING

NT18T GEAR RATIO TABLE

INTERNAL RATIO 1:2.5	SPUR GEAR	PINION GEAR	FINAL RATIO	ACCELERATION
	54	16	8.44	
		17	7.94	
		18	7.50	
		19	7.11	
		20	6.75	
		21	6.43	SPEED

NT18MT GEAR RATIO TABLE

INTERNAL RATIO 1:2.5	SPUR GEAR	PINION GEAR	FINAL RATIO	ACCELERATION
	65	16	10.16	
		17	9.56	
		18	9.03	
				SPEED

AVAILABLE CLUTCH BELLS

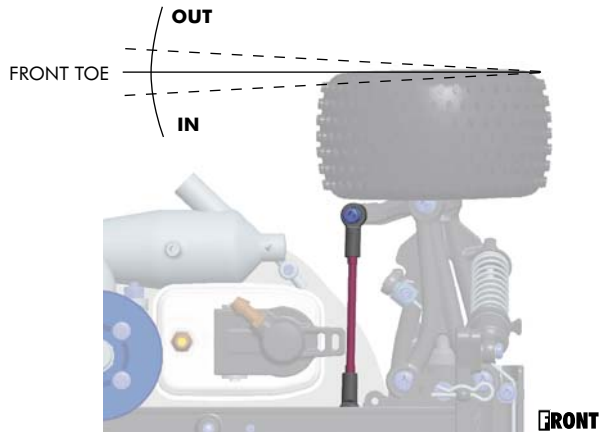
☒ fits ☐ does not fit

PART NUMBER	CLUTCH BELL	NT18T	NT18MT
388516	16 T	×	×
388517	17 T	×	×
388518	18 T	×	×
388519	19 T	×	-
388520	20 T	×	-
388521	21 T	×	-

FRONT TOE

Adjust front toe by adjusting the length of the left and right steering rods.

Steering rod length	Characteristics
More front toe-in = longer steering rod	· increases straight-line stability · decreases steering response · increases steering mid-corner and on-power corner exit
More front toe-out = shorter steering rod	· decreases straight-line stability · increases initial steering response · decreases steering on-power at corner exit



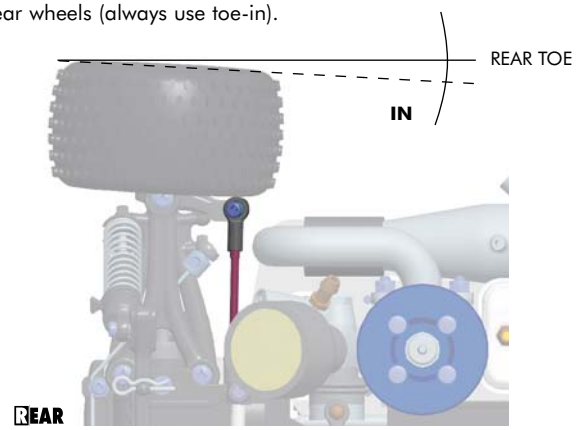
REAR TOE IN

For adjusting the rear toe-in you have to purchase the #383302 adjustable turnbuckle set.

Adjust rear toe-in by changing the length of the rear turnbuckles. Shortening the turnbuckle gives MORE rear toe-in; lengthening the turnbuckles give LESS rear toe-in.

Make sure both rods are adjusted to the same length, and NEVER use toe-out on the rear wheels (always use toe-in).

Rear toe-in angle	Characteristics
More rear toe-in	· increases stability under braking · increases stability on power at corner exit · decreases top speed · if too much rear toe-in is used, the truck will be twitchy to drive and harder to recover if it loses traction
Less rear toe-in	· increases steering · decreases stability on power at corner exit · increases top speed · if the truck slides, it will be much easier to control



SHOCK OIL

You can use shock oils of different weights in a shock absorber.

Shock Oil	Characteristics
Thinner	· same characteristics as larger pistons holes
Thicker	· same characteristics as smaller pistons holes

Note that typically you should use piston hole sizes to suit the track conditions rather than alter the oil viscosity.

Use only the genuine premium quality silicone shock oils. The shock oils are availabe in 50ml size in these viscosities:

Part	Viscosity	Part	Viscosity
359225	250 cSt	359260	600 cSt
359230	300 cSt	359270	700 cSt
359235	350 cSt	359280	800 cSt
359240	400 cSt	359290	900 cSt
359245	450 cSt	359301	1000 cSt
359250	500 cSt	359302	2000 cSt

PISTON HOLE SIZE

For each type of shock piston (conical or straight holes), there are three pistons with holes of different sizes.

Piston hole size	Characteristics
2 holes 	· harder damping · slower chassis weight transfer · slower response · decreases chance of bottoming out when landing if used with "thicker" oil · decreases chassis roll if used with "thicker" oil · use with thinner oil if track is rough
4 holes 	· softer damping · increases traction · quicker chassis weight transfer · quicker response · increases chance of bottoming out when landing if used with "thinner" oil · increases chassis roll if used with "thinner" oils · use with thicker oil if track is smooth

SHOCK SPRINGS

You can use shock springs of different rates to alter performance.

Shock spring	Characteristics
Softer	· more chassis roll · more traction · better on bumpy tracks · increases chance of bottoming out when landing
Stiffer	· less chassis roll · less traction · more responsive · better on smooth tracks · decreases chance of bottoming out when landing

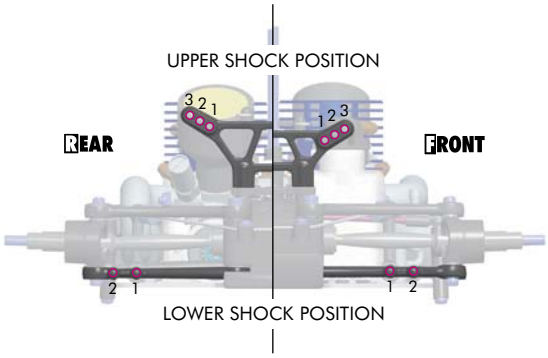
You can use shock springs of different rates to alter performance.

388181 XRAY Spring Front + Rear (4+4) - Set M18MT - SOFT
388191 XRAY Spring Front + Rear - Set M18T - SOFT-MEDIUM
388192 XRAY Spring Front + Rear - Set - MEDIUM

SHOCK MOUNTING POSITION

You can change the shock mounting position by leaning the shocks at different angles, and also moving the shock closer or further from the centerline of the truck. You accomplish this by moving the shock top and bottom mounts to different locations on the shock towers and lower arms

Shock position	Characteristics
More inclined = moving in on tower and/or moving out on lower arm	· softer initial damping · more progressive damping · more lateral (side) traction · makes the handling more "forgiving" · may be better on high-bite tracks, since it slows down the handling and makes it easier to driver
Less inclined = moving out on tower and/or moving in on lower arm	· harder damping · less lateral (side) traction · makes the truck more responsive · usually better suited on technical tracks

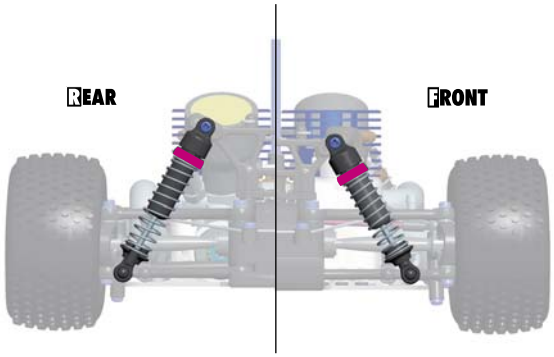


SHOCK PRELOAD

Adjust the front/rear shock spring preload by using preload clips of various thicknesses above the shock springs.

IMPORTANT!
Make equal adjustments on both left and right sides of the truck.

Shock preload	Characteristics
Less preload = thinner/less spacers	· lower ride height · may give higher corner speed on high bite tracks · better suited to smooth tracks
More preload = thicker/more spacers	· higher ride height · less prone to bottoming out · better suited to rough tracks



ANTI-ROLL BARS

Adjust the stiffness of the front or rear anti-roll bar by using a thinner or thicker wire.

Anti-roll bars are used only on micro nitro truck. Anti-roll bars are not used on micro nitro monster truck.

Anti-roll bar stiffness	Front/Rear	Characteristics
Softer = thinner wire	Front	· increases front chassis roll · increases front traction · decreases rear traction · increases off-power steering (may cause oversteer)
	Rear	· increases rear chassis roll · increases rear traction · decreases front traction · decreases on-power steering (increases understeer)
Stiffer = thicker wire	Front	· decreases front chassis roll · decreases front traction · decreases off-power steering at corner entry (increases understeer) · quicker steering response
	Rear	· decreases rear chassis roll · decreases rear traction · increases front traction · increases on-power steering (may cause oversteer) · quicker steering response in high speed chicanes

MAINTAINING THE MICRO NITRO TRUCK

To keep your micro nitro truck running at optimal performance, you should periodically perform maintenance on the truck and engine.

GENERAL TRUCK MAINTENANCE

- Make sure all fasteners are properly tightened. Check them periodically.
- Make sure that chassis screws do not protrude from the chassis.
- For the best performance, it is very important that great care is taken to ensure the free movement of all parts.
- Clean all ball-bearings so they move very easily and freely.
- Tap or pre-thread the plastic parts when threading screws.
- Self-tapping screws cut threads into the parts when being tightened. Do not use excessive force when tightening the self-tapping screws because you may strip out the thread in the plastic. We recommended you stop tightening a screw when you feel some resistance.
- Ask your local hobby shop for any advice. Please support your local hobby shop. We at XRAY Model Racing Cars support all local hobby dealers. Therefore we ask you, if at all possible, to purchase XRAY products at your hobby dealer and give them your support like we do. If you have difficulty finding XRAY products, please check out www. teamxray.com to get advice, or contact us via e-mail at info@teamxray. com, or contact the XRAY distributor in your country.

MICRO NITRO TRUCK ENGINE MAINTENANCE

You must properly and periodically maintain your micro nitro truck engine to ensure long life and performance.

Cleanliness

Always keep the outside of your engine clean.

Fuel

Use clean, fresh fuel and keep your fuel can, pump, and fuel system free from dirt.
Model fuel contains alcohol, which is hydrophilic (it attracts moisture from the atmosphere). If the fuel container is kept open it will absorb water from the air, contaminating the fuel and possibly causing corrosion of the internal engine parts.

After-run Oil

After each running session, run the engine until all fuel is used up, and then disconnect the fuel line from the carburetor. Put 4-5 drops of after-run oil (Marvel Mystery Oil, Prather, Pacer, etc.) into the carburetor and turn the engine by hand several times to coat the internal engine parts with oil. This will protect the engine bearings and internal parts from corrosion.
The use of after-run oil is also important during periods of prolonged storage (such as winter):

- Remove the engine from the model.
- Liberally apply oil into the carburetor and glowplug hole.
- Wrap your engine in a soft cloth and store it in a sealed plastic bag.

Engine Disassembly

Do not dismantle your engine unnecessarily as this may upset precision fits such as piston/cylinder and crank pin/connecting rod assembly.

If it is necessary to clean your engine completely (such as after a crash), remove only the following:

- carburetor (do not disassemble)
- exhaust pipe
- crankcase backplate
- cylinder head

Flush the entire engine with fresh fuel and reassemble. Apply after-run oil to the engine and store it or re-install the engine in the model.

Do not disassemble your engine further than described above, or your warranty may be voided!

XRAY AUTHENTIC OPTION PARTS

Tuning your micro nitro truck can help to better the truck's performance, durability, or looks. XRAY offers high-performance option parts to enable you to fine-tune your micro nitro truck.

382095
Alu Shock Tower Front - 7075 T6 (4mm)

383095
Alu Shock Tower Rear - 7075 T6 (4mm)

385301
Alu Drive Shaft - Set (2)

382252
Alu Suspension Block FR & RL

382262
Alu Suspension Block FL & RR

383302
Adj. Turnbuckle Set for Toe-in Adjustment

388400 Front
Front Alu Oil Shock Absorbers (2)

388401 Rear
Rear Alu Oil Shock Absorbers (2)

388516 - 16T
388517 - 17T
388518 - 18T
388519 - 19T
388520 - 20T
388521 - 21T

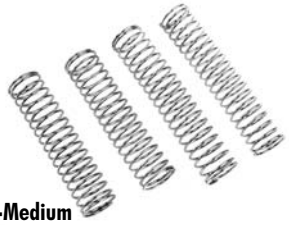
Clutch Bell with Bearings

385001
Alu Adj. Ball Differential - Hard Coated - Set

940610
High-Speed Ball-Bearing 6x10x3 Rubber Sealed (2)

NT18T only

382412
Anti-Roll Bar Front & Rear 1.2mm



388181 - Soft
388191 - Soft-Medium
388192 - Medium
XRAY Spring Set Front+Rear

NT18T only

389936 Orange
389938 Pink
389939 Yellow
XRAY M18T Aerodisk Wheels (4)

NT18T only

389611
Micro Truck Pin Tire & Insert (4+4)

NT18MT only

389946 Orange
389948 Pink
389949 Yellow
XRAY Starburst Wheels (4)

NT18MT only

389620
Micro Monster Truck Tire & Insert - Thrax (4+4)

NT18MT only

389622
Micro Monster Truck Tire & Insert - Skew (4+4)

TROUBLESHOOTING

If your micro nitro truck is performing less than optimally or is having problems, use the following troubleshooting information to attempt to determine the origin of the issue and possible solutions. We also recommend consulting with your local hobby dealer if you encounter problems.

SERVO TROUBLESHOOTING

If your micro nitro truck is performing less than optimally or is having problems, use the following troubleshooting information to attempt to determine the origin of the issue and possible solutions. We also recommend consulting with your local hobby dealer if you encounter problems.

Servo makes a grinding noise or acts erratic	■ Remove the servo from the truck. ■ Open the case and remove the gears. Examine them for broken teeth. If broken, replace with a new gear set.
Servo jitters	■ Remove the servo from the truck. ■ Open the case and remove the gears. ■ Spray a zero-residue electrical cleaner into and around the potentiometer and work it in. ■ After the cleaner has dried, re-install the gears and close the case. ■ Possible damaged receiver/transmitter crystal.
Servo doesn't center properly	■ Disconnect the steering rod from the left front steeringblock. Steer left and right with the transmitter several times. If the servo arm does not return to the same neutral position each time, the servo may be damaged. ■ Remove the servo from the truck. Open the case and check for proper gear alignment. Next check the case top for wear. If wear is evident, replace the case.
Servo is locked in place	■ Remove the servo from the truck. ■ Open the case and check for proper gear alignment. If gears are damaged, replace the gear seta ■ Check the case top for wear. If wear is evident, replace the case.
Servo hums	■ This is normal if the servo is trying to hold position against the force of a load. ■ If the servo hums when no load is applied, try loosening the servo case screws 1/4 to 1/2 turn.
Servo gets hot	■ Check the servo wiring, it should match the receiver being used. ■ If the wiring is okay, the servo motor may be stalled due to a failed gear train. Remove the servo from the truck, open the case and inspect for any damage.
Wheels turn in opposite direction to setting input	■ Change the servo reversing setting, and then re-adjust the steering subtrim and EPA settings.

MICRO NITRO TRUCK ENGINE TROUBLESHOOTING

ENGINE SPINS BUT WILL NOT START:

- Make sure your glowplug starter is fully charged and is properly connected to the glowplug. If the starter is fully charged, replace the glowplug.
- Verify that fuel is getting to the carburetor. Remove the fuel line from the carburetor and see if there is fuel in it.
- Check your carburetor settings. It may be necessary to adjust the carburetor settings if the weather has significantly changed since the last time you ran the engine.
- The engine's compression may be low due to wear. This will make the engine difficult to start when it is warm, and may tend to stall when running and when the throttle is closed suddenly.

ENGINE WILL NOT SPIN (STARTER BOX WILL NOT TURN THE ENGINE):

- The engine may be flooded and hydraulically locked. Refer to section "Flooding & Hydraulic Lockup".
- Check for binding at the engine flywheel. If you are not able to turn the engine by hand, the engine could be flooded, there could be binding in the clutch system, the piston may be stuck at the top of the cylinder (TDC), or there could be internal engine damage. (Note: During engine break-in, it is normal for the engine to be extremely tight and hard to turn when the piston reaches the top of the cylinder.)

ENGINE IS VERY SLUGGISH, HARD TO START, AND WILL NOT IDLE DURING INITIAL BREAK IN:

- The factory default break-in settings (on the carburetor) may be too rich for your location, weather conditions, or fuel brand. Extremes in temperature, humidity, barometric pressure, and altitude cannot always be accounted for by the factory default settings. These symptoms may occur when air density is very low (such as in high mountains or extremely cold temperatures. Under these conditions, lean the main needle valve slightly (1/8 turn CW), and check if there is any improvement in starting and idling. Only lean the main needle until the engine runs and idles reliably, then continue the break-in process.
- Different fuel brands/types – in combination with extreme weather conditions – can also make the factory default break-in settings too rich and cause these symptoms. Try leaning the fuel mixture slightly (1/8 turn CW), and check if there is any improvement in starting and idling.

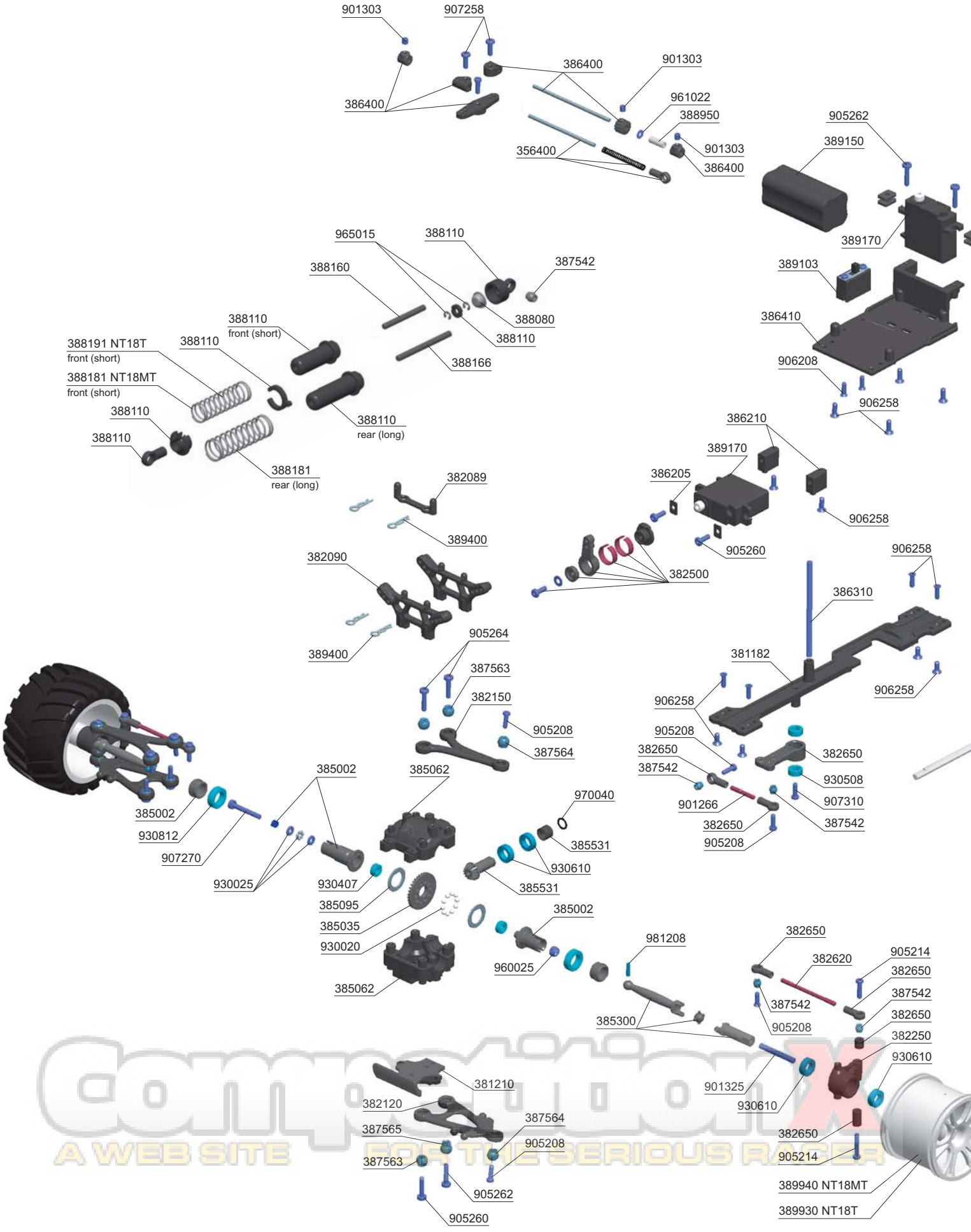
ENGINE PERFORMANCE IS SLUGGISH:

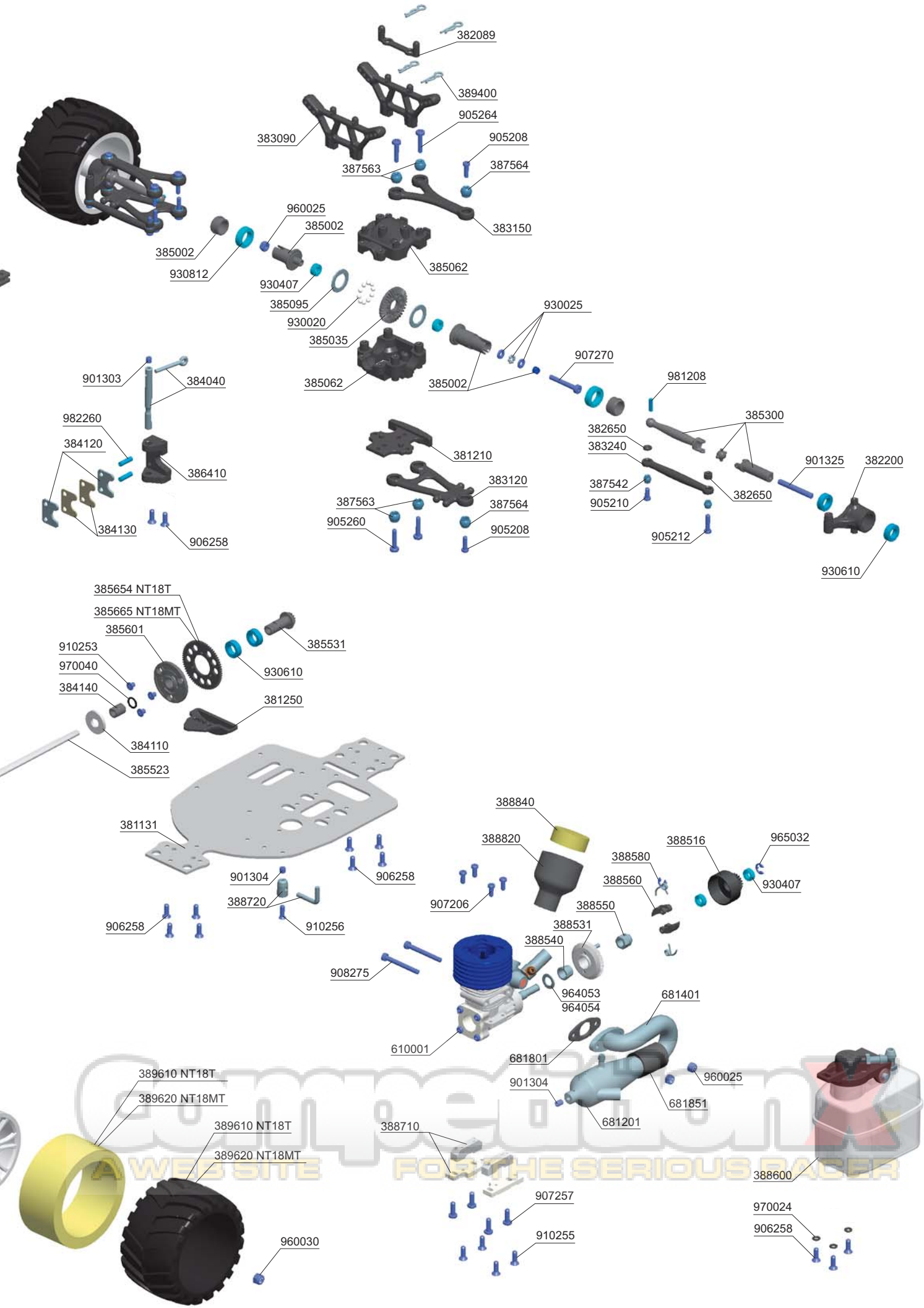
- Engine performance depends on the carburetor settings and how they compensate for the weather & atmospheric conditions. Before suspecting other issues, richen the main needle by at least 1/4 turn CCW, then retune the engine.
- Try installing a new glowplug.
- If carburetor settings are proper, ensure the fuel is fresh. Old fuel, or fuel that has been left uncapped for a long period, may cause sluggish performance.
- Verify that there is no drivetrain binding.

PISTON STUCK AT TOP OF CYLINDER – TOP DEAD CENTER (TDC):

A brand new engine that has not had a lot of break-in will typically have a very tight fit between the piston and the top of the cylinder (known as "pinch"), since the cylinder has a tapered fit. The fit should not be so tight that then engine cannot be started. If the piston gets stuck at TDC, use a pair of pliers to grasp the flywheel from the bottom of the engine. Rotate the flywheel CCW (viewed from the front of the engine) until the flywheel turns; you should feel the piston become unstuck from the top of the cylinder.

EXPLODED VIEW





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