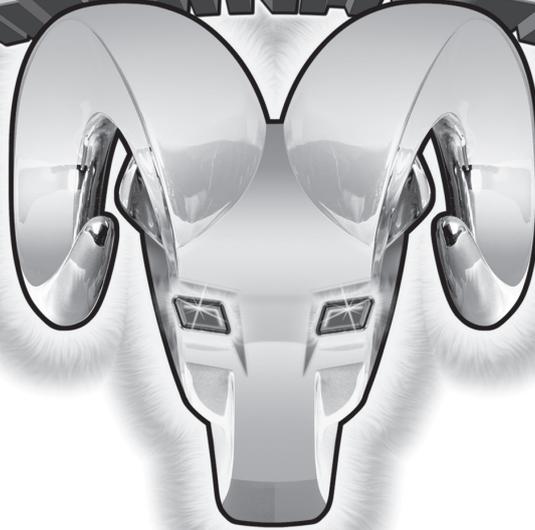


# RAMINATOR



## *Nitro Monster Truck*



# Operations Guide



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### ***Introduction***

Thank you for choosing the Losi Raminator Monster Vehicle. This is a highly developed off-road model that features a sophisticated computer-based radio system and does require some mechanical experience and direct adult supervision. This guide contains the basic instructions and drawings for operating and maintaining your new Raminator. Please take the time to read through it completely before running the model. Your hobby dealer cannot, under any circumstances, accept a model for return or exchange that has been run.

### ***Customer Support Contact***

**Horizon Hobby, Inc.  
4105 Fieldstone Road  
Champaign, IL 61822  
1-877-504-0233  
productsupport@horizonhobby.com**

### ***Safety Precautions***

THIS IS NOT A TOY! The Raminator is a sophisticated, high-performance radio controlled model, which needs to be operated with caution and common sense. Failure to operate this model in a safe and responsible manner could result in personal and/or property damage. It is your responsibility to see that the instructions are followed and precautions adhered to.

The Raminator is not intended for use by children without direct adult supervision. Losi and Horizon Hobby shall not be liable for any loss or damages, whether direct, indirect, special, incidental or consequential arising from the use, misuse or abuse of this product or any product required to operate it.

\* This is still a model; don't expect it to do unrealistic stunts.

### ***Warnings***

- Fuel is dangerous if handled carelessly. Follow all directions and precautions on the fuel container.
- Keep fuel and all chemicals out of the reach of children.
- Always keep the fuel container closed and never use around an open flame or while smoking.
- The exhaust emits poisonous carbon monoxide fumes. Always run the model in a well ventilated area and never attempt to run it indoors.
- The top of the engine and the exhaust pipe are extremely hot during and for a time after use. Use caution not to touch these parts, especially when refueling.
- The engine can be loud, especially when run in a confined area. If you find the noise objectionable, use ear protection.
- This model is controlled by a radio signal that is subject to interference from sources outside your control. Interference can cause temporary loss of control so it is advisable to always keep a safety margin in all directions to avoid collisions.
- Always operate your model in an open area away from people and cars. The potential speed of this model can cause injury or damage.

## Required Equipment

You will need the following items to operate your new Raminator.

4 AA alkaline batteries for the transmitter

Losi™ Nitrotane™ 20% Sport Fuel. (LOSF0020 or LOSF0120) This is the only fuel that supports the engine warranty.

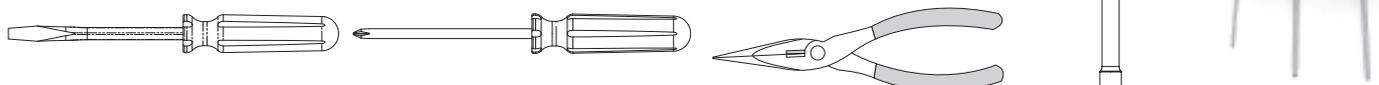
Fuel bottle (LOSB5201)

6V Receiver Pack (LOSB9949 or similar)

## Tools You Will Find Handy

In addition to the tools included with the Raminator, you will find the following both useful and in some cases necessary.

- LOSB4603 4-Way Wrench
- LOSA99167 Tuning Screwdriver
- Small flat blade and Phillips screwdrivers
- Needle-nose pliers
- Quality .050", 1/16", 5/64", 3/32", 1.5mm and 2.5mm hex (Allen) drivers



## Engine Break-In and Adjustments

Breaking in your new engine is critical for proper performance. Failure to follow the break-in procedures can cause damage and shortened engine life. During break-in and when running, always use Losi Nitrotane 20% Sport Fuel. Although the carburetor is preadjusted at the factory, you must be familiar with the following adjustments and break-in procedure. If you change fuel or run in dramatically different environments (hot/cold, high/low elevation, etc.), you will probably have to adjust at least the high speed needle to prevent overheating and maintain proper performance. Never, under any circumstances, allow the engine to rev freely with the wheels off the ground.

### Break-In Procedure

- 1.) The first three tanks of fuel should be run with the high and low speed needles noticeably "rich" (see explanation below). There should be a slight sluggishness and thick smoke when accelerating with the smoke decreasing as the model gains speed. At speed, there should still be a noticeable trail of smoke from the exhaust pipe. Run the Raminator on a flat surface in an oval pattern. Ease into the throttle as you accelerate on the straight sections, easing off as you approach turns—letting the model roll through the turn before easing back on the throttle. This will also allow you to get a feel for the steering response and handling characteristics of the model.
- 2.) You can also break in the engine by placing the model against a wall or fixed object and allowing the engine to idle through two full tanks of fuel. You may have to lean the low speed mixture (slightly) as noted below.

### Understanding "Rich" and "Lean" Fuel Mixture

Adjusting the carburetor is one of the most critical facets of running a nitro powered RC vehicle. The fuel mixture is referred to as being "rich" when there is too much fuel and "lean" when there is not enough fuel for the amount of air entering the engine. The amount of fuel entering the engine is adjusted with high and low speed threaded needle valves. The low speed needle is located in the front of the moving slide. The high speed needle sticks straight up at the back of the carburetor. Both feature a slotted head that is used as a reference and receptacle for a flat blade screwdriver for adjustments. The mixture is made richer by turning the needle counterclockwise and leaner by turning clockwise. An overly rich mixture will yield sluggish acceleration and performance with thick smoke from the exhaust. A lean mixture can cause the engine to hesitate before accelerating or, in some cases, to lose power momentarily after the initial acceleration.

A lean mixture also makes the engine run hotter than desired and does not provide enough lubrication for the internal engine components, causing premature wear and damage. It is always advisable to run the engine slightly rich and never lean to avoid overheating and possible damage.

## Base Start-up Settings from the Factory

High Speed Needle— $2\frac{3}{4}$  turns out from bottom

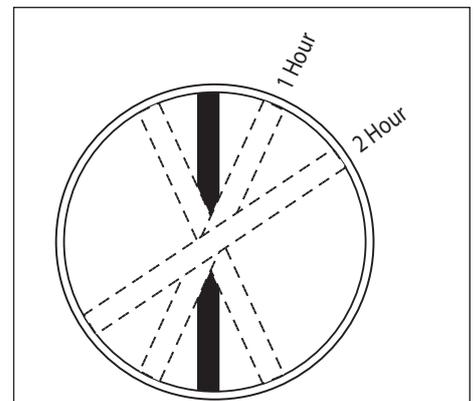
Low Speed Needle—3 turns out from bottom

## Engine Tuning

After the engine is broken in, you can tune it for optimum performance. When tuning, it is critical that you be cautious of overheating as severe damage and premature wear can occur. You want to make all carburetor adjustments in "one hour" increments.

## Low Speed Adjustment

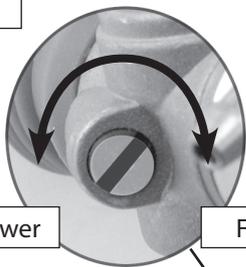
The low speed adjustment affects the idle and slightly off idle performance. The optimum setting allows the motor to idle for at least 8–10 seconds. The model should then accelerate with a slight amount of sluggishness and a noticeable amount of smoke. The simplest way to check this is to make sure the engine has been warmed up and let the engine idle for 8–10 seconds. If the low speed mixture is so far off that the engine won't stay running this long, turn the idle stop screw clockwise, increasing the idle speed. With the engine at idle, pinch and hold the fuel line near the carburetor, cutting off the flow of fuel, and listen closely to the engine rpm (speed). If the low speed needle is set correctly, the engine speed will increase only slightly and then die. If the engine increases several hundred rpm before stopping, the low speed needle is too rich. Lean the mixture by turning the needle clockwise one hour and trying again. If the engine speed does not increase but simply dies, the needle is too lean and needs to be richened up by turning the needle counterclockwise one hour before trying again. After you have optimized the low speed setting, the engine will probably be idling faster. You will have to adjust the idle stop screw counterclockwise to slow down the engine idle speed. The engine should accelerate at a constant pace without hesitating.



### Carb Adjustments:

Make all carburetor adjustments in one hour increments. Imagine the slot in the needle is the hour hand on a clock. Adjust it as though you were moving the hour hand from one hour to the next or previous one.

Idle Speed  
Needle



Slower

Faster

### Idle Speed Screw

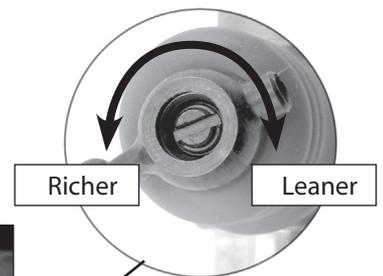
As you turn this clockwise, it increases the carburetor opening at idle and increases idle speed. Turning it counterclockwise decreases the opening and idle speed.

### Low speed Needle

As you turn this clockwise (leaner), less fuel enters the engine. Turning it counterclockwise (richer) allows more fuel to enter the engine.

### High speed Needle

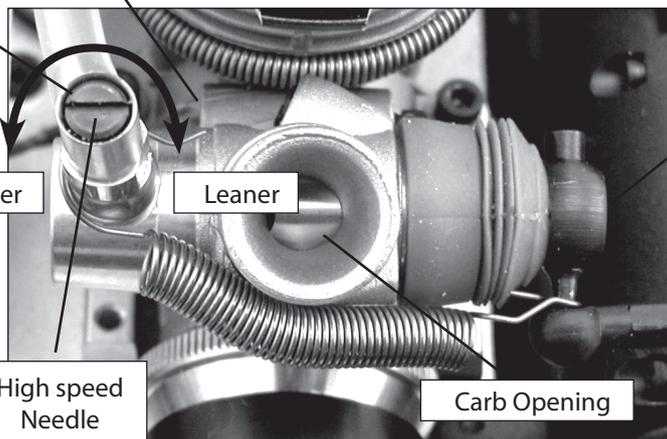
As you turn this clockwise (leaner), less fuel enters the engine. Turning it counterclockwise (richer) allows more fuel to enter the engine.



Richer

Leaner

Low speed  
Needle



Richer

Leaner

High speed  
Needle

Carb Opening

### ***Hi Speed Adjustment***

After initial acceleration the engine should pull at a steady rate while maintaining a two-stroke whine and a noticeable trail of smoke. If the engine labors and is sluggish with heavy smoke, the mixture is too rich and needs to be leaned by turning the high speed needle clockwise in one hour increments until it runs smoothly. If the engine isn't smoking or starts to die after acceleration, it is too lean and you must richen the mixture by turning the needle counterclockwise. Don't be confused by the sound of the engine and the actual performance. A leaner mixture will produce an exhaust note with a higher pitch but this does not necessarily mean improved performance, as the engine is on the verge of overheating and may incur possible damage. Ideally you want to run the engine so that it is on the slightly rich side of optimum. This will give you the best combination of speed and engine life. CAUTION: The engine is too lean and overheating if it accelerates rapidly with a high-pitched scream then seems to labor, stops smoking or loses speed. This can be caused by the terrain, atmospheric conditions or drastic altitude changes. To avoid permanent engine damage, immediately richen the mixture by turning the high speed needle counterclockwise at least "two hours" and be prepared for further adjustments before running any more.

### ***About Glow Plugs***

The glow plug is like the ignition system in your automobile. The coiled element in the center of the plug glows red hot when connected to a 1.5-volt battery (located in the igniter). This is what ignites the fuel/air mixture when compressed in the cylinder. After the engine fires, the heat generated by the burning fuel keeps the element hot. Common reasons for the engine not starting are the 1.5-volt battery being weak or dead, the glow plug being wet with fuel, or the element burned out. Use a spare glow plug to check the igniter. If the igniter makes the element glow, remove the plug from the engine to check it in the same manner. A wet glow plug means there is excess fuel in the engine. To eliminate this, put a rag over the head and turn the engine over a few seconds with your "Spin-Start." Reinstall the glow plug, making sure you have the brass gasket on it. The engine should now start.



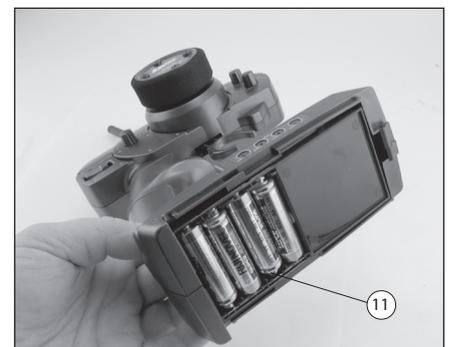
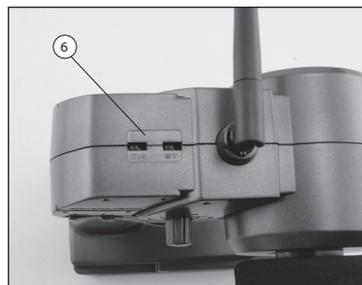
### ***Testing the Temperature***

The ideal operating temperature for the engine will vary with the air temperature but in general it should be in the 200°F to 230°F (93.3°C to 110°C) range. A simple way to check the engine temperature is to put a few drops of water on the top of the head/heat sink. It should take 3–5 seconds for the water to evaporate. If it boils away quickly the engine is overheating and the high speed needle needs to be richened (turned counterclockwise) at least "two hours." If you plan on racing or high speed running, there are several inexpensive handheld digital temperature gauges available.

## About the Radio

The Losi DSM radio installed in the Raminator is a state of the art system featuring the latest technology that requires no crystals. This system includes all the features you may find useful. Be sure to read through the Radio operation instructions on what and how to use these features. The following is a simple guide to items and functions commonly referred to.

1. Steering Wheel - Controls the trucks direction (left/right).
2. Throttle Trigger – Controls the speed and braking (pull for throttle and push forward for brakes).
3. Throttle Trim (TH.TRIM) - Allows you to set the idle/brake of the truck.
4. Steering Trim (ST.TRIM) – Adjusts the “hands off” direction of the truck.
5. Transmitter Antenna - Transmits signal to the receiver in the truck.
6. Servo Reversing Switches – Changes the direction of servo operation.
7. Power & Signal Indicators (LED's)
  - Red (left) indicates signal strength
  - Green (right) indicates battery power.
8. Power Switch - Turns your transmitter ON and OFF.
9. Steering Rate (ST.D/R) – Adjusts how much the wheels turn when steering wheel is turned right/left.
10. End Point Adjustment Pots – allow you to adjust the maximum movement of the servos.
11. Bottom Cover – Removable for installing AA batteries.
12. Binding LED – Blinks when binding—solid indicates binding complete.



## Re-Binding the Transmitter to the Receiver

The Losi DSM<sup>®</sup> radio system included in the Raminator operates on 2.4GHz and provides 79 different channels, which are automatically selected when the transmitter and vehicle are turned on. The communication between the transmitter and receiver begins in the few seconds after the transmitter and vehicle are both turned on. This is called the binding process. The Losi DSM radio system will not interfere with previous technology radio systems that operate on 27MHz or 75MHz frequencies, and you will not receive any interference from them. Although set at the factory, below are the steps required to re-bind your transmitter to the receiver should the need arise. During the binding process there is a unique ID from the transmitter communicated to the receiver to ensure trouble free radio operation.

## Steps to Re-Bind

1. Ensure that the transmitter and vehicle are both turned off.
2. Using the supplied Bind plug (which looks like a standard receiver plug with a wire loop installed) insert the Bind plug into the receiver slot labeled "BIND". Looking down on the receiver this slot would be below the LED and is the farthest from the LED, or nearest to the corner of the receiver. Note: You do not need to remove any of the other plugs to re-bind.
3. With the Bind plug installed, turn on the vehicle. Notice a blinking Orange LED within the receiver.
4. Now you are ready to turn on the transmitter. You should notice on the back of the transmitter a similar blinking Orange LED under the translucent cover.
5. Both the receiver and transmitter blinking Orange LED will stop blinking and become solid, indicating they have "bound" themselves together.
6. Turn off both the vehicle and the transmitter then remove the Bind plug from the receiver. Failing to remove the Bind plug will cause the receiver to attempt to re-bind every time you turn on the vehicle and transmitter.
7. Turn on both the vehicle and transmitter to ensure operation. If the transmitter does not control the vehicle, please repeat steps 1–6. Should this not correct the problem please call Horizon Service/Repair for further assistance.
8. The Bind process is complete. Your vehicle's radio system should be ready for use.



## Using the EPA Adjustment

The End Point Adjustment (EPA) feature of the Losi DSM radio allows you to set the amount the servo travels when you turn the steering wheel or push/pull the throttle. This is especially helpful to prevent the servos from stalling with normal operation.

**Steering:** First set the steering trim so the truck goes straight without touching the steering wheel. Lift the front of the truck off of the ground and turn the steering wheel to the right. Use the included mini screwdriver to adjust the pot marked "right" back and forth stopping when the wheels can turn to the right no more. Repeat this procedure turning left using the pot marked "left".

**Throttle:** First set your Throttle/Brake trim. With the engine not running, remove the air cleaner. Pull full back on the throttle trigger and note the position of the carburetor barrel. Adjust the pot marked "throttle" back and forth so that the barrel just reaches wide open (going further will only hurt performance).

**Brake:** Release the trigger and push it forward. Turn the pot marked "brake" counterclockwise (away from the "+") as far as it will go. Now turn it clockwise (toward the "+") until it stops moving. This will give you maximum push brake.



## Radio Operation

It is important that you familiarize yourself with the radio system, as this is your direct link to the model.

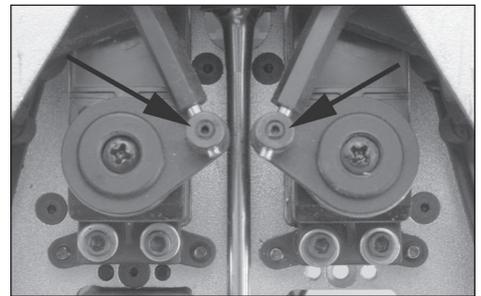
- Never run your model with low receiver or transmitter batteries.
- Never leave the power on or the batteries will not last long.
- Always turn the transmitter ON before turning the model ON.
- When finished running, always turn the model OFF before the transmitter.
- For best operation, it will be necessary to keep the "trims" adjusted for both the steering and throttle as noted below.

**Steering Trim:** The model should go straight without turning the steering wheel. If not, turn the trim knob marked "ST.TRIM" found to the upper right of the steering wheel in the direction needed to make it do so. If this is not enough, please refer to "Synchronizing the Steering Servos" below and reset your trim.

**Throttle Trim:** The model should idle without the tires rotating when the trigger is at its neutral position. If not, turn the trim knob marked "TH.TRIM" located to the lower right of the steering wheel counter-clockwise to reposition the throttle servo until it does. Note that additional braking force is applied when you push the trigger forward.

**Synchronizing the Steering Servos:** If you remove the steering servos or the servo savers you will probably have to make some small adjustments to ensure they are working together at maximum capacity. With the servo savers removed and the linkages attached:

- Turn on the radio and reset the steering trim knob so the raised dot is lined up with the line extending from the words "ST.TRIM".
- Loosen the setscrews securing the linkage slightly and mount the servo savers so they are timed as close as possible like that seen in the photo.
- Use the steering trim on the transmitter to fine-tune the timing of the servo savers.
- Make sure the front tires are pointing forward and lock the steering linkage in place by tightening the setscrews.



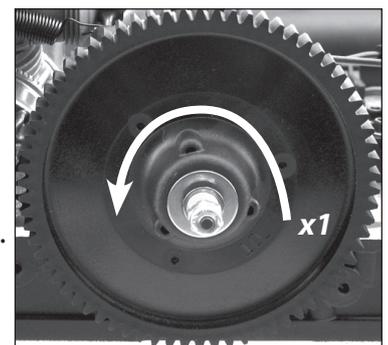
## Maintenance

In addition to the service needs pointed out in this guide, you should try to maintain your new Raminator for proper performance and to prevent wear. If dirt gets in the moving parts it can seriously hinder the performance of the model. Use compressed air, a soft paintbrush and/or a toothbrush to remove dirt and dust. Avoid using solvents, if possible, as this can actually wash the dirt into bearings and areas not accessible without disassembly, causing additional wear. We suggest you follow these basic guidelines:

- Remove as much freestanding dirt and dust as noted above.
- Never leave fuel in the tank for more than a couple of hours.
- When done running for the day or longer, let the engine run out of fuel. Remove the air cleaner and pour a little WD40, or quality after-run engine oil into the carburetor and spin the engine over a few seconds.
- If needed, clean and re-oil the air cleaner before installing it back on the model.
- Inspect the chassis for worn, broken or binding parts and repair as necessary.

## Adjusting the Slipper

The slipper is a key component of the drivetrain that is designed to help absorb sudden or large impacts that would otherwise stress various drivetrain parts. You should never run the Raminator with the slipper locked (completely tight). The slipper can also be used as a tuning aid for extremely slick conditions. To adjust the slipper, start by turning the 1/4" adjustment nut clockwise (tighten) until it gets tight and the spring is compressed. Do not over-tighten as you will strip the nut. Now turn the adjustment nut counterclockwise (loosen) one full turn. This should be a good overall setting.



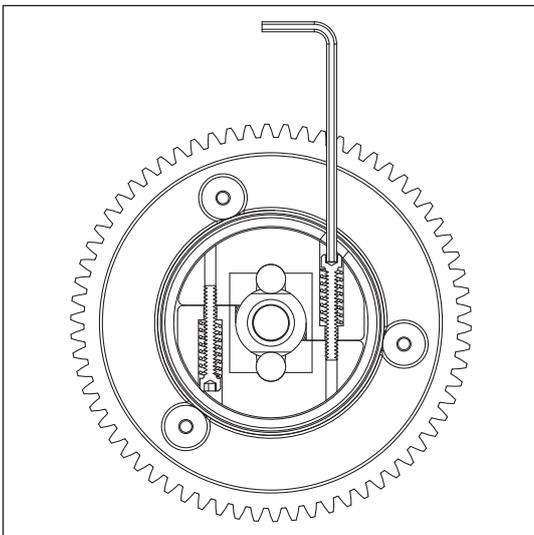
**Slipper-1 Turn Out**

## 2-Speed Adjustment

When new and during engine break-in, the two speed will not shift. Only after the engine has been broken in and the needle valve adjusted, if necessary, will it start shifting. You may need to adjust the shift point after a while as the shoes wear in.

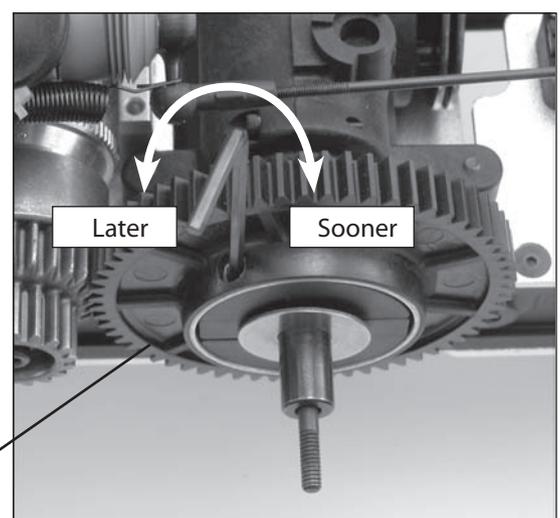
Although pre-adjusted at the factory, the two speed can be adjusted to shift at the point that suits you best. Under normal circumstances, it should shift slightly before the engine reaches maximum power. The actual distance traveled will vary with the gear ratio and tune of the engine. There are two adjustment screws (see fig 1) that must be changed evenly for the two speed to function correctly. Turning these clockwise will make it shift later and require the engine to rev higher. Turning them counterclockwise will make it shift earlier and require less engine speed. If you should get lost adjusting the two speed, start over at the factory setting by lightly bottoming out the adjustment screws and then backing them out five full turns. The procedure for adjusting the two speed is as follows:

- Remove the gear cover.
- Turn the spur gears until the adjustment hole is visible in the bell housing between the large and small spur gears.
- Hold the small spur gear and, using your thumb, rotate the slipper forward until you can see the head of one of the adjustment screws.
- Use a 5/64 Allen wrench to make your adjustment in 1/2-turn increments. Use the bent leg of the wrench as your guide.
- Turn the slipper forward 1/2 rotation to adjust the other adjustment screw like the first.  
**(Remember to always adjust BOTH screws the same amount)**
- Test drive the model to check the new shift point and replace the gear cover if satisfied.
- **Never** run your model without the gear cover, as it is dangerous and gear damage will occur!



**Figure 1**

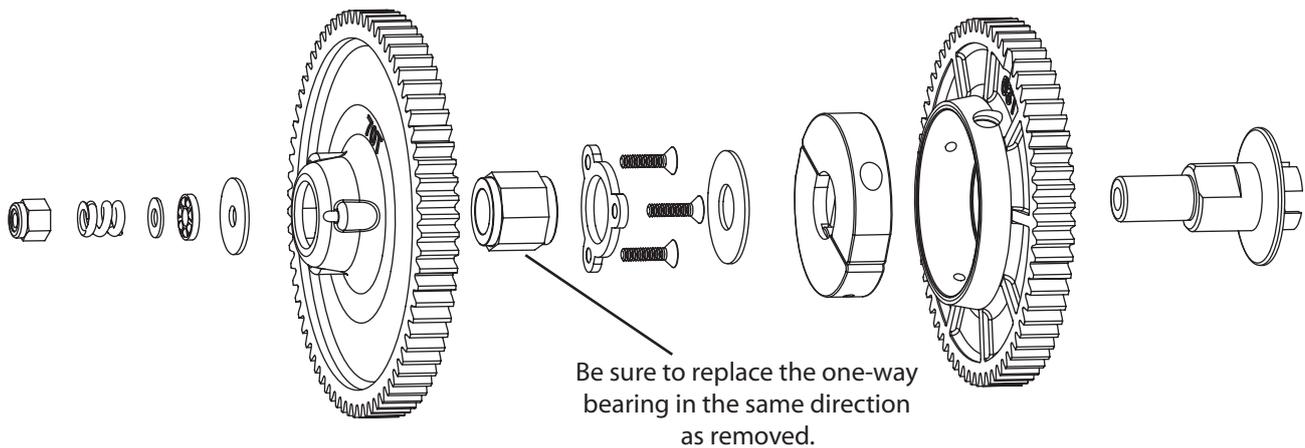
Always adjust BOTH adjustment screws evenly.



Note: Outer (1st)  
spur gear removed  
for photo

Turning the adjustment screws  
counterclockwise makes the 2-speed shift  
sooner; turning clockwise will make it shift later.

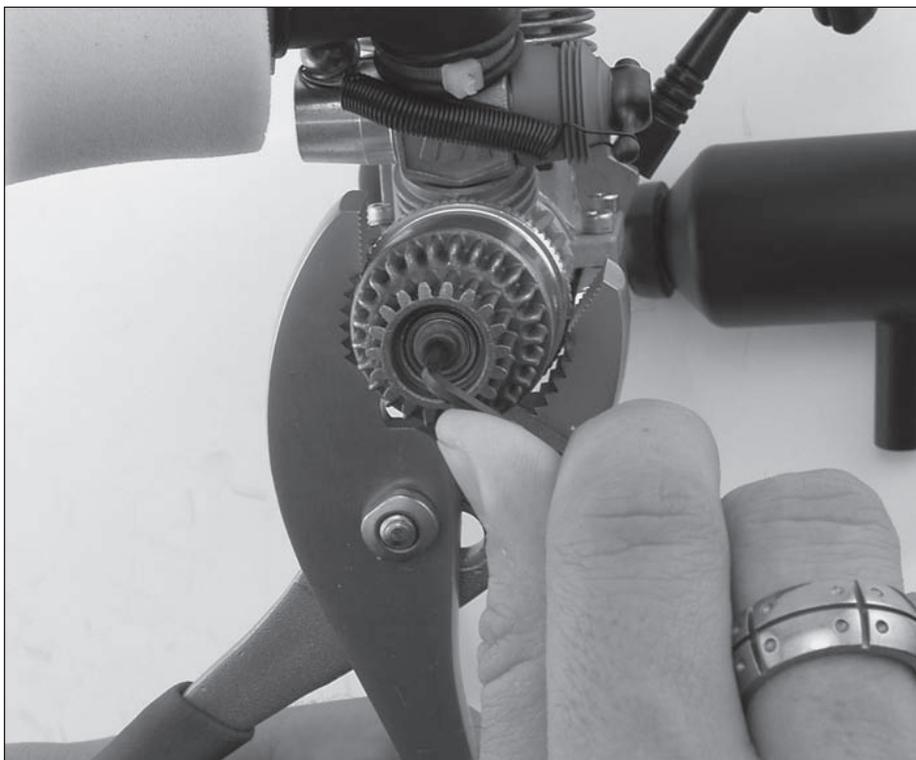
## Replacing the 2-Speed Gears



## Replacing the Clutch Bell

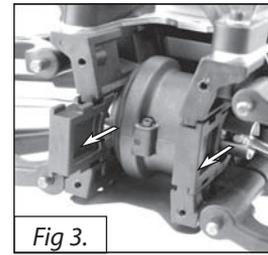
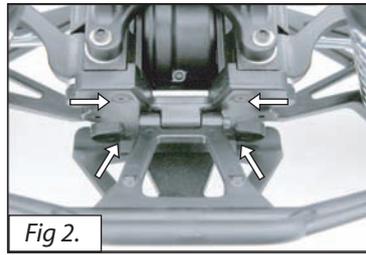
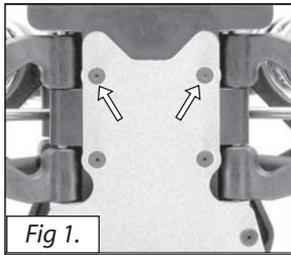
Use a 3/32" wrench (provided) to remove the retaining screw (turn counterclockwise) while firmly holding the flywheel with a pair of pliers. Remove the screw, washers and clutch bell, being careful not to lose any shims that may be used. Remove the ball bearings and brush any loose dirt away from the bearing faces. Put only ONE drop of oil on the inside face (the side facing away from the clutch shoes) near the inner race of the bearing. Install the bearings into the new clutch bell. Before replacing the clutch bell, wipe out the inside with motor spray, lacquer thinner or a similar cleaner (do not use fuel or oil-based solvents). Replace the clutch bell and secure with the retaining screw in the same manner used to remove it.

Note: Do not over-tighten the screw, as it is not necessary.



## Servicing the Differentials

The differentials should be serviced periodically. Be sure to clean and inspect all of the gears and replace if severely worn. Always use plenty of high-quality grease (like Losi LOSA3066 or LOSA99203) on all gears. NOTE: These can also be made into racing-type viscous diffs as noted below. Always service one diff at a time and pay close attention to installing the housing with the "TOP" marking up so it can be seen looking down on the chassis.

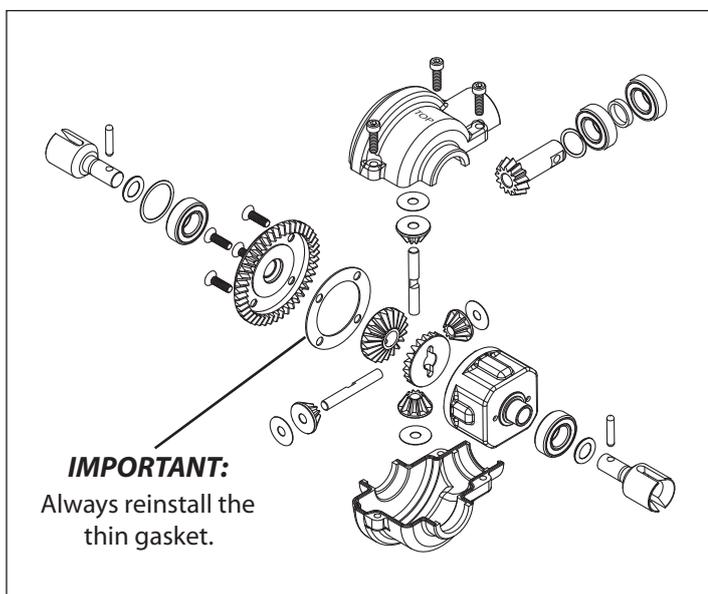


## Removing the Differentials

- Remove the two screws in the bottom at the extreme end of the chassis (fig1).
- Remove the four screws in the bulkhead allowing the bumper/skidplates and pin mounts to be removed (fig 2).
- Remove the diff retainers and slide the diff out (fig 3). NOTE: On the front end only you will have to remove the lower front shock attachment screws and swing the shocks up and out of the way. On the rear end you will need to "pop" off the rear camber links.

## Differential Service

- Remove the three 5/64" cap head screws and the top of the differential housing, then the diff.
- Remove the four 5/64" flat head screws from the ring gear allowing it to be removed.
- Inspect the ring and pinion gears for wear; replace if necessary.
- Remove the cross shafts, bevel gears and shims for the carrier.
- Clean and inspect all parts; replace as needed.
- Check all ball bearings. Clean or replace as necessary.
- Remove pins from outdrives. Remove outdrives, regrease and reinstall.
- Lube all shafts and gears with LOSA3066 or LOSA99203 assembly grease and reassemble.
- Load cross shafts with gears into the carrier with extra grease. Apply the rubber gasket to the carrier and reinstall ring gear.
- Lube ring and pinion with grease and reassemble diff into diff housing.
- Reinstall into chassis with "TOP" on housing facing up.



## For Viscous Differential

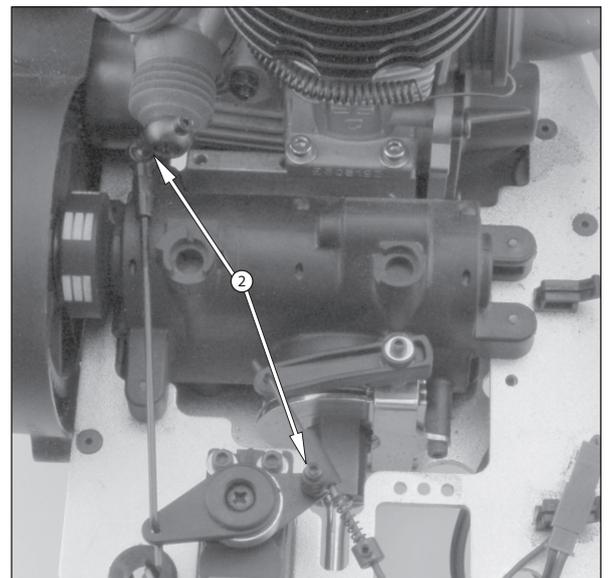
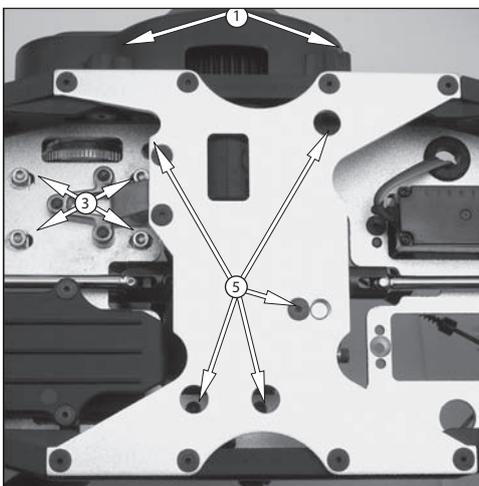
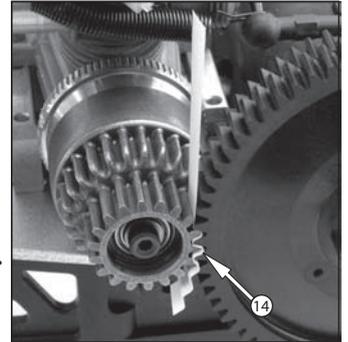
Instead of grease you can use silicone fluid in the differential for a limited slip feel as desired for racing. Simply fill the diff up to the top of the gears before replacing the ring gear. (Be sure to reinstall the gasket). You may have to replace the O-rings on the outdrives at the same time you change to this type of differential if the old ones are worn. A popular silicone fluid for your model is Losi 10,000cs (LOSA5282) and is available from your local hobby dealer.

## Servicing the Transmission

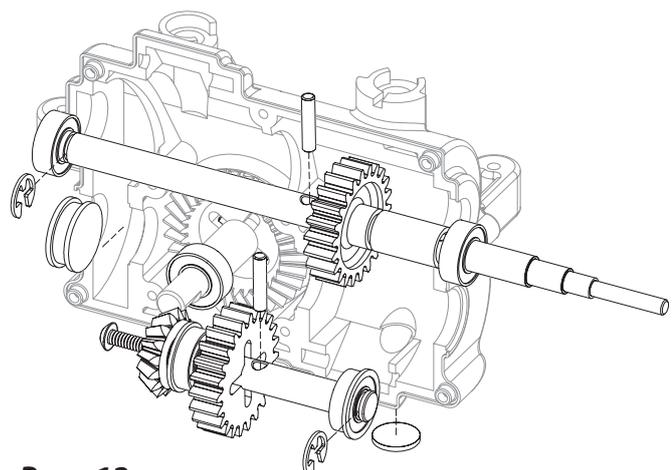
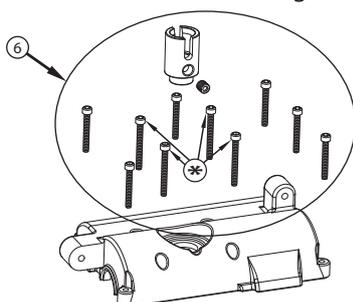
The Transmission should also be cleaned and serviced periodically. All gears and shafts should be closely inspected for wear and replaced if necessary. Always use a high quality grease or lubricant to prevent premature wear and/or failure.

## Removing the Transmission

1. Remove the gear cover.
2. Remove the throttle linkage from the carburetor and the brake linkage from the servo arm.
3. Loosen the four motor mount screws (bottom of the chassis) and slide the motor back.
4. Remove 2-speed spur gears.
5. Remove the five transmission mounting screws and lift the transmission out.
6. Remove the outdrive and ten 5/64" cap head screws. Remove the transmission case half.
7. Regrease the gears and shafts, inspecting each for wear.
8. Replace any worn or failed gears.
9. Wipe out the inside of the gear case, removing any debris, old grease and foreign matter.
10. Check all ball bearings for free movement cleaning or replacing as necessary.
11. Reinstall gears on the shafts lubing with LOSA3066 or LOSA99203 Losi Assembly Grease.
12. Reassemble the transmission lubricating liberally with LOSA3066 or LOSA99203 or a similar high-grade grease.
13. Make sure the setscrews in the outdrive cups are tightened (a locking compound is highly suggested).
14. Install the transmission in the chassis; reset the gear mesh by using a small piece of paper between the pinion and spur gears, applying pressure while retightening the engine. Reconnect all linkages and connections as necessary.

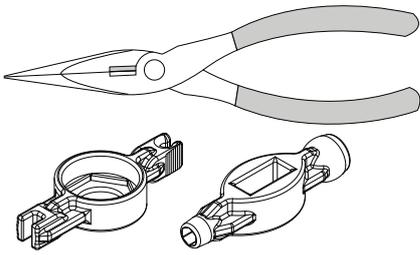


Note: These four screws are longer 2-56 x 3/4"



# Rebuilding/Refilling the Shocks

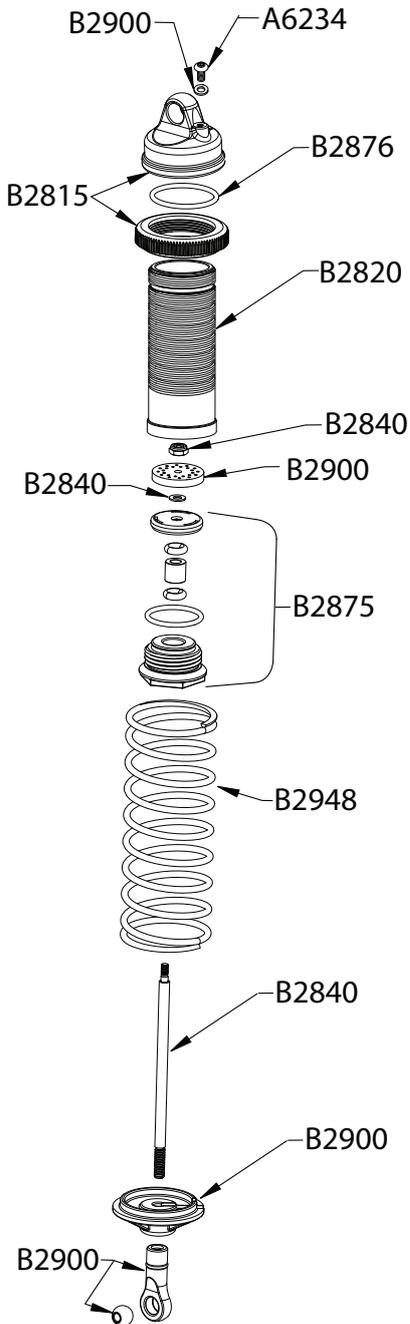
## Tools Needed



**Step 1.**  
After removing the shock, push up on the lower spring cup and snap it off of the shaft. Remove the spring.

**NOTE:** If you only wish to change or fill the shock fluid, skip to step 6.

**Step 2.**  
Turn the shock upside down and, using the included shock tool, remove the black shock cartridge/shaft assembly from the shock body by turning it counterclockwise.



**Step 3.**  
Remove the 1/4" nut by turning it counterclockwise. Remove the piston and washer. Remove the old cartridge. Put a drop of shock oil on the shock shaft before installing new shock cartridge.

Hold here with needle-nose pliers

**Step 4.**  
Install washer onto the shock shaft until it stops. Slide the shock piston onto the shaft against the washer. Reinstall 1/4" nut and tighten by turning it clockwise.

Be sure to reinstall washer

**Step 5.**  
If you plan on completely changing the shock fluid (suggested), dump out the old fluid from the shock body before reinstalling the cartridge/shaft assembly. Pull the shaft out so that the piston is next to the cartridge and reinstall the assembly into the shock body; tighten in a clockwise direction.

**Step 6.**  
**Note:** If you are just refilling your shocks, be sure to use Losi 30wt Silicone Shock Fluid (LOSA5224). Remove the shock cap and the small button head screw and washer in the top of it. Carefully fill the shock body with fluid to the top. Move the shaft up and down slowly to remove bubbles. Top off with oil if needed.

**Step 7.**  
Holding the shock upright, push the shock shaft in slowly until it bottoms out. While holding the shock shaft in this position, replace the small screw and washer in the shock top. If fluid leaks around the threads of the cartridge, it is probably not tight enough.

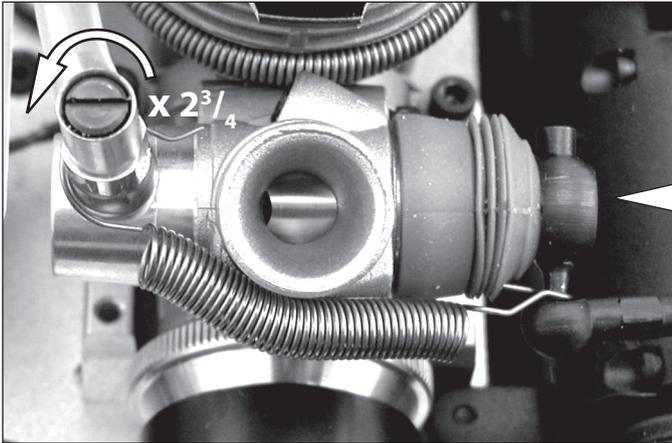
**Step 8.**  
Slide the spring over the shock body against the shock adjuster nut. Slide the lower shock cup onto the shock shaft and snap it onto the shock end being sure that it seats on the mount. Reinstall the shock.

"snap!"

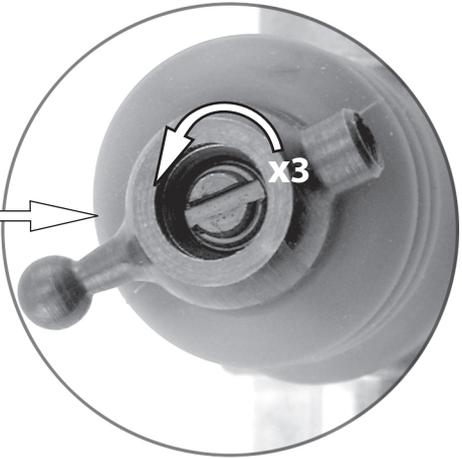
# Quick Reference Guide

## Initial Factory Settings Using Nitrotane 20% Sport Fuel

### Engine

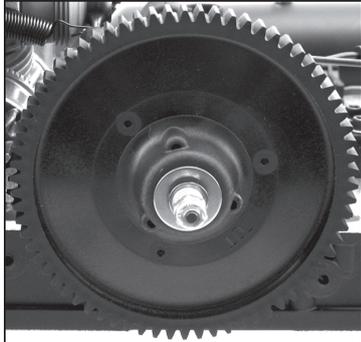


High Speed Needle -  $2\frac{3}{4}$  turns out

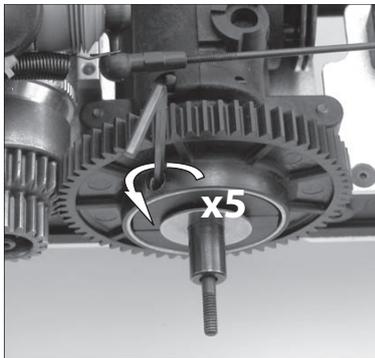


Low Speed Needle - 3 turns out

### Transmission



Slipper - 1 turn out



Two Speed - 5 turns out

### Axles & Nuts



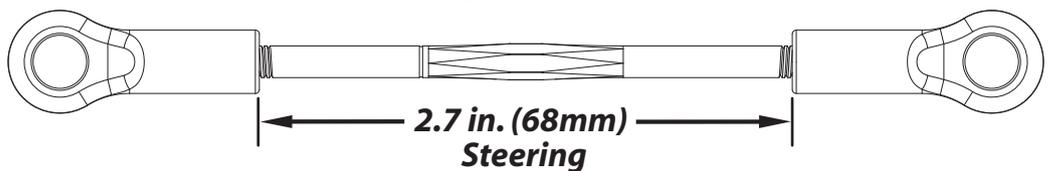
Black Axles = Left Side  
Silver Axles = Right Side

### Shocks

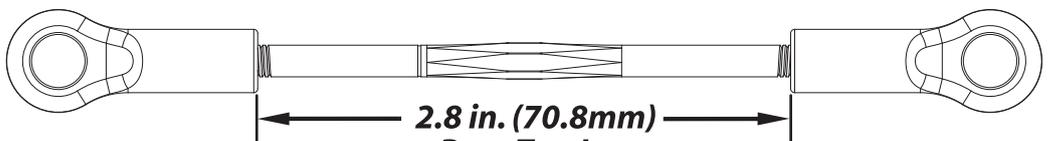


Losi 30wt  
Shock Oil  
(LOSA5224)

### Tie Rods



2.7 in. (68mm)  
Steering



2.8 in. (70.8mm)  
Rear Toe-In

# Troubleshooting Chart

Problem	Things to Check	Remedy
Engine won't start.....	Out of fuel Spoiled or improper fuel Glow plug not lighting Glow igniter battery low Engine overheated Engine flooded Air cleaner blocked Exhaust blocked	Check/replace glow plug Charge/change battery Let cool - see "Testing the Temperature" Clean and reoil aircleaner
Engine won't turn over.....	Engine is flooded Engine seized	Loosen glow plug and try again Damaged, if will not turn over
Engine starts, then stalls.....	Idle speed set too low Glow plug is fouled/weak Air bubbles in fuel line Engine is overheated Insufficient fuel tank pressure/blockage	See "Carburetor Adjustments" See "About Glow Plugs" Check for split/hole in fuel line See "Testing the Temperature" Clear pressure line
Engine performing poorly.....	Hi Speed fuel mixture is too rich Engine overheating Leaking glow plug Carburetor dirty or blocked Fuel bad or contaminated Clutch or slipper slipping Bound up drivetrain Engine worn out	See "Engine Tuning" See "Engine Tuning" Richen 2 hours Replace glow plug  Try fresh fuel Clean/Adjust/Repair Check for binds in drivetrain Rebuild
Engine overheats.....	High speed fuel mixture is too lean Low speed fuel mixture too lean Spoiled or improper fuel Cooling air is being blocked Excessive load on the engine	See "Understanding Rich and Lean"  Clean head fins Check for binds/dirt build up
Engine hesitates or stumbles.....	Engine overheated High speed mixture too lean Low speed mixture too rich Air bubbles in fuel line Glow plug fouled	See "Engine Tuning," Richen 2 hours See "Engine Tuning," Richen 2 hours See "Engine Tuning," Richen 1 hour Check fuel line for holes Change glow plug
Engine stalls instantly when throttle is fully opened from idle.....	Glow plug fouled High speed mixture too rich Low speed mixture too lean	Change glow plug See "Engine Tuning" See "Engine Tuning," Richen 1 hour
Engine stalls while driving around turns.....	Fuel level is low Idle speed set too low	Add Fuel Increase idle speed
Engine stalls while idling.....	Low speed mixture too rich Low speed mixture too lean Idle speed too low Clutch shoes dragging  Clutch bearings failed Engine worn out	See "Engine Tuning" See "Engine Tuning"  Increase idle speed Check for broken clutrch springs  Check/Clean/Replace Rebuild

# Raminator Replacement Parts List

## RADIO PARTS

LOSB0806	MRX 3000 Pro DSM Receiver.....	\$109.99
LOSB0807	MTX Pro DSM Transmitter .....	\$69.99
LOSB0818	MSX Digital Servo .....	\$16.99
LOSB0819	MSX Digital Hi-Torque Servo.....	\$26.99

## SUSPENSION PARTS

LOSB2001	F/R Suspension Arms (pr) (LST/AFT) .....	\$10.00
LOSB2101	F/R Spindles & Carriers (LST/AFT).....	\$7.00
LOSB2102	Steering Bell Cranks, Shafts, & Chassis Braces (LST/2).....	\$7.00
LOSB2201	F/R Suspension Pin Brace Set (AL) (LST/2).....	\$7.00

## CHASSIS PARTS

LOSB2252	Chassis Skid Plate (LST/2).....	\$9.50
LOSB2253	Top & Bottom Chassis Plates (LST/2).....	\$13.99
LOSB2254	Motor Plate/Chassis Brace (LST/2).....	\$6.00
LOSB2256	Chassis Side Plate (LST/2) .....	\$8.50
LOSB2257	R&L Bulkheads & Hardware (LST/2).....	\$6.00
LOSB2259	Main Chassis Plate (For LG Servo) (RAM) .....	\$26.99
LOSB2350	Radio Box & Hardware (LST/2).....	\$7.00
LOSB2351	Battery Mount Set (LST/2).....	\$5.50
LOSB2401	F/R Bumpers & Braces (LST/2).....	\$10.99
LOSB2450	F/R Body Mount Posts & Hardware (LST/2).....	\$3.50
LOSB2451	Extra Long Body Mounts .....	\$4.50

## SHOCKS

LOSB2815	Shock Nut & Cap Molded (4) (LST).....	\$9.00
LOSB2820	Molded Shock Body (2) (AFT).....	\$9.99
LOSB2840	Shock Shaft (LST/2).....	\$5.00
LOSB2875	Shock Cartridges & Seals (2) (LST/2).....	\$6.00
LOSB2876	Shock Cartridge & Cap O-Rings (8) (LST/2).....	\$3.00
LOSB2880	Assm. Molded Shock w/Spring (no oil) (AFT).....	\$19.99
LOSB2900	Shock Hardware - All Plastic (LST/2) .....	\$6.50
LOSB2948	Shock Springs - Flat Black (AFT).....	\$6.00

## TRANSMISSION

LOSB3102	Transmission Case Set (LST/2) .....	\$10.99
LOSB3118	F/R Bevel Gear Set (LST/2/AFT).....	\$8.00
LOSB3125	Trans Drive & Selector Pin Set (LST/2).....	\$2.00
LOSB3127	Trans Output Shaft & Spacer (LST/2) .....	\$3.50
LOSB3128	Trans Outdrive Cup Set (LST/2).....	\$9.00
LOSB3132	Fwd. Only Input Shaft Set (LST/2/AFT).....	\$5.50
LOSB3133	Fwd. Only Input Gear 22T (LST/2/AFT) .....	\$9.00
LOSB3135	Fwd. Only Counter Shaft Set (LST/2/AFT).....	\$3.50
LOSB3136	Fwd. Only Counter Gear 23T Ti-ni (LST/2/AFT).....	\$9.99
LOSB3138	Fwd. Only Trans Plug Set (LST/2/AFT).....	\$3.50
LOSB3190	Gear Cover (2-Speed) (LST).....	\$4.50
LOSB3193	Inside Gear Cover (LST) .....	\$5.50
LOSB4203	FWD/REV & Brake Arms (LST/2).....	\$3.00

## CLUTCH PARTS

LOSB3301	Flywheel, Collet & Nut (LST/2).....	\$10.99
LOSB3322	Clutch Spring Set (3) Silver (LST/2).....	\$3.00
LOSB3341	18T/25T One-Piece Clutch Bell-Steel (LST/2).....	\$19.99

## 2-SPEED & SLIPPER PARTS

LOSB3401	2-Speed Cam & Bushings (LST/2).....	\$17.99
LOSB3404	2-Speed Clutch Shoes & Hardware (LST/2) .....	\$3.50
LOSB3409	2-Speed Low-Gear 1-Way (AFT).....	\$14.99
LOSB3421	70T Spur (Low) Gear & Hard. (AFT) .....	\$5.00
LOSB3423	63T Spur (Hi) Gear & Bell (AFT) .....	\$7.00
LOSB3450	Slipper Cage (LST/2).....	\$14.99
LOSB3451	Slipper Pads & Plates (LST/2).....	\$7.00
LOSB3455	2-Speed/Slipper Thrust Bearing & Hardware (LST/2).....	\$5.00

## DRIVETRAIN PARTS

LOSB3501	F/R CV Driveshaft Set (2) (LST/AFT).....	\$37.99
LOSB3502	F/R Driveshaft Only (2) (LST/AFT).....	\$11.95
LOSB3503	F/R Axle Right Side - Silver (LST/AFT) .....	\$6.50
LOSB3504	F/R Axle Left Side - Black (LST/AFT) .....	\$6.50
LOSB3505	CV Driveshaft Rebuild Set (LST/AFT).....	\$7.00
LOSB3508	Wheel Hexs & Drive Pins (4ea) (LST/AFT).....	\$3.00
LOSB3529	F/R Differential Assembled Complete.....	\$49.99
LOSB3533	Cast Aluminum Diff Case (AFT) .....	\$9.00
LOSB3534	F/R Diff Ring & Pinion (LST/2).....	\$26.99
LOSB3537	F/R Diff Housing (LST/2).....	\$4.00
LOSB3538	F/R Diff Bevel Gear Set (LST/2).....	\$7.00
LOSB3539	F/R Diff Seal Set (2) (LST/2).....	\$3.50
LOSB3540	F/R Diff Outdrive Set (LST/2) .....	\$9.00
LOSB3541	F/R Diff Frive Yoke (LST/2).....	\$5.00
LOSB3545	Center CV Driveshaft (LST/2).....	\$10.99

LOSB3601	Brake Disks - Steel(2) (LST/2).....	\$4.00
LOSB3603	Brake Cam (LST/2).....	\$3.00
LOSB3605	Brake Pads & Bracket (LST/AFT).....	\$5.00

## HARDWARE

LOSA3045	Gear Cover Access Plug .....	\$1.50
LOSA4002	Antenna Tube & Cap .....	\$2.25
LOSA4003	Antenna Caps.....	\$1.25
LOSA6100	1/8" E-Clips.....	\$1.25
LOSA6103	3/32" E-Clips.....	\$1.25
LOSA6106	4mm E-Clips (12).....	\$2.00
LOSA6107	6mm W-Clips (12).....	\$2.00
LOSA6204	4-40 x 1/2" Cap Head Screw (10).....	\$1.50
LOSA6205	4-40 x 3/4" Cap Head Screw (10).....	\$1.50
LOSA6206	4-40 x 3/8 Cap Head Screw (10).....	\$1.50
LOSA6210	4-40 x 3/8 Flat Head Screw (10).....	\$1.50
LOSA6216	4-40 x 7/8" Cap Head Screw (10).....	\$1.50
LOSA6220	4-40 x 1/2" Flat Head screw (10).....	\$1.50
LOSA6221	4-40 x 5/8" Cap Head Screw (6).....	\$1.50
LOSA6227	4-40 Hardened Setscrew (10) .....	\$1.80
LOSA6229	4-40 x 3/8" Button Head Screw (10).....	\$2.00
LOSA6232	2-56 x 1/4" Cap Head Screw (10).....	\$2.50
LOSA6233	4-40 x 5/8" Flat Head Screw (10) .....	\$2.50
LOSA6234	4-40 x 1/4" Button Head Screw (10).....	\$2.50
LOSA6240	5-40 x 1/2" Cap Head Screw (8).....	\$2.50
LOSA6241	5-40 x 5/8" Cap Head Screw (8).....	\$2.50
LOSA6242	5-40 x 1-1/4" Cap Head Screw (4).....	\$2.50
LOSA6244	Kingpin Screw (LST) (8).....	\$4.00
LOSA6245	4-40 x 5/16" Cap Head Screw (10).....	\$2.00
LOSA6246	2-56 x 5/8" Cap Head Screw (8).....	\$3.00
LOSA6247	2-56 x 3/4" Cap Head Screw .....	\$3.00
LOSA6250	4 & 5mm Setscrews (4 ea).....	\$2.50
LOSA6252	3 x 10mm Button & Flat Head Machine Screws .....	\$2.00
LOSA6307	5-40 Nuts - Lock & Hex (4 ea).....	\$2.00
LOSA6305	4-40 Steel Locknuts.....	\$3.50
LOSA6321	5mm Locknuts - R & L Thread (4 ea) .....	\$4.00
LOSA6350	#4 x 1/8" Hardened Washers.....	\$2.50
LOSA6355	2.2 & 3.6mm Washers (6 ea).....	\$2.00
LOSA6356	5 & 6mm Shim Set.....	\$2.00
LOSA6907	5 x 8mm Shielded Ball Bearings .....	\$6.50
LOSA6937	5 x 10mm Shielded Ball Bearings (2) .....	\$5.00
LOSA6939	6 x 10mm Shielded Ball Bearings (4) .....	\$8.00
LOSA6940	6 x 12mm Shielded Ball Bearings (4) .....	\$8.00
LOSA6941	6 x 12mm Flanged Ball Bearings (4) .....	\$13.99
LOSA6942	8 x 16mm Sealed Ball Bearings (4).....	\$8.00
LOSA6944	15x21x4mm Shielded Ball Bearings.....	\$7.00
LOSA8200	Body Clips .....	\$1.25
LOSB3951	Differential Shims (13mm) (LST/2/AFT) .....	\$2.00
LOSB4001	93mm Turnbuckle Set w/Ends (2) (LST) .....	\$5.50
LOSB4104	Pivot Pin Set (4 ea) (LST).....	\$11.99
LOSB4020	Rod Eds & Pivot Balls (8) (LST).....	\$7.00
LOSB4104	Pivot Pin Set (4 ea) (LST).....	\$11.99
LOSB4111	Spindle Bearing Spacer Set (LST/AFT) .....	\$2.50
LOSB4201	Steering Hardware Set (LST/2).....	\$7.50
LOSB4203	Fwd/Rev & Brake Arms (LST/2/AFT).....	\$3.00
LOSB4204	Throttle, Brake Reverse Linkage Set (LST) .....	\$6.00
LOSB4250	Servo Saver & Mount Set (LST/2).....	\$10.99
LOSB4601	Tool Set (LST/AFT).....	\$4.50

## MOTOR ACCESSORIES

LOSB5001	Fuel Tank (LST/AFT) .....	\$14.99
LOSB5003	Fuel Tank Lid & Spring (LST/2) .....	\$4.00
LOSB5005	Fuel Tank Mounts & Hardware (LST/2) .....	\$3.75
LOSB5009	Molded Fuel Filter Heat Resistant Plastic (2) .....	\$3.99
LOSB5020	Air Clearer w/Oil (LST/2) .....	\$11.99
LOSB5021	Air Cleaner Foam Set (LST/2).....	\$6.99
LOSB5030	Engine Mounts (LST/2).....	\$10.99
LOSB5049	Exhaust Header, Spring & Seal (AFT).....	\$14.99
LOSB5052	Exhaust Connector & Pull Ties (AFT) .....	\$3.50
LOSB5062	Exhaust Pipe/Muffler (AFT) .....	\$19.99
LOSA9314	Fuel Tubing (24") .....	\$2.50

## BODIES & ACCESSORIES

LOSB8004	Raminator Painted Body w/Stickers (LST,AFT,MB).....	\$49.99
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## WHEELS AND TIRES

LOSB7008	Raminator Wheels (pr) Red (LST,AFT,MB) .....	\$11.99
LOSB7211	Raminator Tires (pr) w/Foam Inserts (LST,AFT,MB).....	\$29.99
LOSB7411	Raminator Wheels & Tires(pr) Glued (LST,AFT,MB) .....	\$44.99

# Raminator Optional Parts List

## OPTIONAL PARTS

### SUSPENSION PARTS

LOSB2221 Sway Bar Kit (LST/2)..... \$14.99

### CHASSIS PARTS

LOSB2260 Heavy Duty Chassis Plate - Hard Ano. (LST/2)..... \$49.99  
LOSB2261 Heavy Duty Chassis Skid Plate - Hard Ano. (LST/2)..... \$24.99  
LOSB2262 Heavy Duty Chassis Top Plate - Hard Ano. (LST/2)..... \$16.99  
LOSB2263 Heavy Duty Front Bottom Plate - Hard Ano. (LST/2)..... \$16.99  
LOSB2264 Heavy Duty Rear Bottom Plate - Hard Ano. (LST/2)..... \$18.99  
LOSB2270 Hi-Perf Graphite Chassis Plate (LST/2)..... \$109.99  
LOSB2271 Hi-Perf Aluminum Skid Plate - Hard Ano. (LST/2)..... \$24.99  
LOSB2272 Hi-Perf Graphite Top Plate (LST/2)..... \$36.99  
LOSB2273 Hi-Perf Alum Front Bottom Plate - Hard Ano. (LST/2)..... \$18.99  
LOSB2274 Hi-Perf Alum Rear Bottom Plate - Hard Ano. (LST/2)..... \$18.99  
LOSB2501 Wing Mount Plastics (LST/2/AFT)..... \$9.00

### SHOCKS

LOSB2801 Shock Body - Blue (LST/2/AFT)..... \$11.99  
LOSB2802 Shock Cap - Blue (LST/2/AFT)..... \$8.00  
LOSB2803 Shock Body - Red (LST/2/AFT)..... \$11.99  
LOSB2804 Shock Cap - Red (LST/2/AFT)..... \$8.00  
LOSB2805 Shock Body - Gold (LST/2/AFT)..... \$11.99  
LOSB2806 Shock Cap - Gold (LST/2/AFT)..... \$8.00  
LOSB2807 Shock Body & Cap Set - Red (4) (LST/2/AFT)..... \$68.99  
LOSB2808 Shock Body & Cap Set - Gold (4) (LST/2/AFT)..... \$68.99  
LOSB2811 Threaded Shock Body - Hard Anodized (LST/2/AFT)..... \$12.99  
LOSB2813 Shock Adjuster Nut - Blue Aluminum (LST/2)..... \$6.00  
LOSB2814 Hard Ano. Thrd. Shock Body & Adj. Set (4) (LST/2/AFT)..... \$58.99  
LOSB2841 Titanium Nitride Shock Shaft (LST/2/AFT)..... \$7.50  
LOSB2879 Assembled Threaded Shock w/Spring (Blue) (LST2)..... \$34.99  
LOSB2901 Shock Pivot Balls - Hard Ano. Aluminum (4) (LST/2/AFT)..... \$7.50  
LOSB2949 Shock Springs - White 4.0 lb Rate (pr) (LST/2/AFT)..... \$6.50  
LOSB2951 Shock Springs - Black 6.0 lb Rate (pr) (LST/2/AFT)..... \$6.50  
LOSB2952 Shock Springs - Yellow 7.4 lb Rate (pr) (LST/2/AFT)..... \$6.50

### TRANSMISSION

LOSB3193 Inside Gear Cover (LST2)..... \$5.50

### CLUTCH PARTS

LOSB3323 Aluminum Clutch Shoe & Spring Set (LST2)..... \$19.99  
LOSB3340 Clutch Bell Only 2-Seed (Threaded) (LST/2)..... \$10.00  
LOSB3350 18T Steel Pinion (LST/2)..... \$5.00  
LOSB3351 18T Steel Pinion w/Ti-Nitride (LST/2)..... \$14.99  
LOSB3356 25T Steel Pinion (LST/2)..... \$5.00  
LOSB3357 25T Steel Pinion w/Ti-Nitride (LST/2)..... \$14.99

### 2-SPEED & SLIPPER PARTS

LOSB3410 2-Speed Low-Gear w/One-Way (LST/2/AFT)..... \$22.99  
LOSB3411 2-Speed High-Gear Hub w/Bearing (LST/2)..... \$16.99  
LOSB3420 70T Spur (Low) Gear (LST/AFT) (Stock)..... \$4.00  
LOSB3424 63T Spur (High) Gear (LST/AFT) (Stock)..... \$4.00  
LOSB3428 2-Speed Steel. Ti-Nitride Gear Conversion (LST/2)..... \$79.99  
LOSB3429 70T Steel Spur w/Ti-Nitride (1st) (LST/2)..... \$33.66  
LOSB3430 63T Steel Spur w/Ti-Nitride (2nd) (LST/2)..... \$25.99  
LOSB3431 Drive Rings for 70T Steel Spur (2)..... \$2.00

### DRIVETRAIN PARTS

LOSB3509 Wheel Hex Set - Hard Anodized Alum. (LST/AFT)..... \$19.99  
LOSB3510 20mm Wheel Hexes - Alum (2) (LST/AFT)..... \$15.99  
LOSB3511 Nut Set (Large/Small) for 20mm Hex (2 ea)..... \$4.00  
LOSB3531 Aluminum Diff Case - Polished (LST/2/AFT)..... \$10.99  
LOSB3532 Aluminum Diff Case - Blue (LST/2/AFT)..... \$11.99  
LOSB3535 Ti-Nitride F/R Ring & Pinion (LST/2/AFT)..... \$37.99

### HARDWARE

LOSB4021 Pivot Balls - Hard Anodized Aluminum (4) (LST/2)..... \$8.00  
LOSB4102 Titanium Nitride Inner Hinge Pins (2) (LST/2)..... \$8.00  
LOSB4103 Titanium Nitride Outer Hinge Pins (2) (LST/AFT)..... \$8.00

### MOTOR ACCESSORIES

LOSB5006 Fuel Filter - High Volume Aluminum (LST/2)..... \$8.95  
LOSB5031 Finned Engine Mounts - Hard Ano. Aluminum (LST/2)..... \$12.99  
LOSB5050 Exhaust Header (RE) & Springs (LST/2/AFT)..... \$17.99  
LOSB5051 Exhaust Header Seals & Springs (2) (LST/2/AFT)..... \$6.00  
LOSB5054 Exhaust Pipe Seals & Springs (LST/2)..... \$6.00  
LOSB5055 Tuned Exhaust Pipe (LST)..... \$39.99  
LOSB5056 Tuned Pipe Mount & Hardware (LST/2)..... \$2.50  
LOSB5057 Tuned Pipe & Header - Polished (LST/2)..... \$69.99  
LOSB5058 Tuned Pipe & Header - Hard Anodized (LST/2)..... \$74.99  
LOSB5060 "HT" Tuned Pipe & Header - Polished (LST/2)..... \$69.99  
LOSB5061 "HT" Tuned Pipe & Header - Hard Anodized (LST/2)..... \$74.99  
LOSB5100 Spin-Start Hand Held Starter (LST/2)..... \$44.99

### WHEELS & TIRES

LOSB7001 "Magneto" Chrome Wheels (pr) (LST/AFT)..... \$12.99  
LOSB7005 Bead Lock "Look" Wheels/Blue Rings (pr) (LST/AFT)..... \$24.99  
LOSB7006 Bead Lock "Look" Rings - Red (4) (LST/AFT)..... \$24.99  
LOSB7007 Bead Lock "Look" Rings - Blue (4) (LST/AFT)..... \$24.99  
LOSB7202 "Claw" MT Tires w/Foam (LST/AFT)..... \$29.99  
LOSB7401 "Magneto" Wheels/"Claw" Tires Glued (pr) (LST/AFT)..... \$44.99  
LOSB7721 Foam Tire Inserts - Firm (pr) (LST/2/AFT)..... \$8.00  
LOSB7222 Foam Tire Inserts - 2-Stage (pr) (LST/2/AFT)..... \$12.99  
LOSB7650S Super King pin MT Tires w/Foam Liners (pr)..... \$24.99

### BODIES & ACCESSORIES

LOSB8001 LST Body Painted Blue w/Stickers..... \$49.99  
LOSB8002 LST Body Painted Red w/Stickers..... \$49.99  
LOSB8003 LST Body Clear w/Stickers & Masks..... \$29.99  
LOSB8005 LST "Racer" Clear Body w/Stickers & Masks..... \$30.99  
LOSB8011 LST2 Body Painted Grey w/Stickers..... \$49.99  
LOSB8012 LST2 Body Painted Red w/Stickers..... \$49.99  
LOSB8014 LST2 Body Clear w/Stickers..... \$34.99  
LOSB8015 Aftershock Painted Body w/Stickers (Blue)..... \$49.99  
LOSB8016 Aftershock Clear Body w/Stickers & Mask..... \$34.99  
LOSB8020 Mega Baja Printed/Trimmed Body w/Stickers..... \$49.99  
LOSB8021 Mega Baja Super 1600 Clear Body w/Stickers..... \$36.99  
LOSB8150 Wing Kit (LST/2/AFT)..... \$14.99  
LOSB8151 Wing Only (LST/2/AFT)..... \$9.00  
LOSB8201 LST Sticker Set..... \$5.00  
LOSB8202 LST2 Sticker Set..... \$5.00  
LOSB8203 Aftershock Sticker Set..... \$6.00  
LOSB8205 Mega Baja Sticker Sheet..... \$6.00

### RECEIVER PACK

LOSB9939 6V 900 Ni-MH Rx Flat Pack w/Charger (LST/2/AFT)..... \$24.99  
LOSB9950 5-cell 6V 1100mAh Ni-MH Receiver Pack (LST/2)..... \$31.99

### MISCELLANEOUS ACCESSORIES

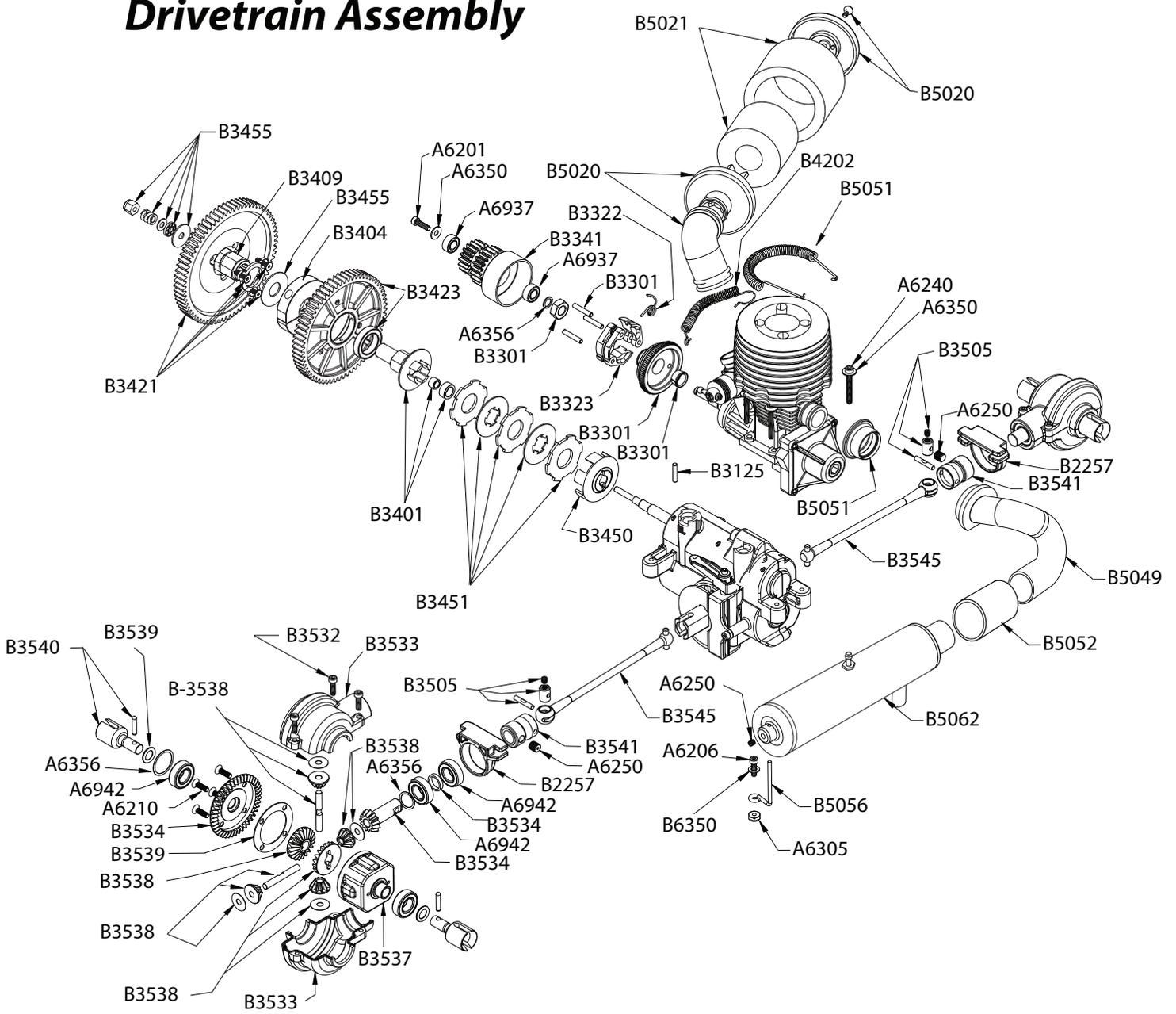
LOSA99004 Losi Cargo Bag..... \$69.99  
LOSA99006 Losi Pit Roller bag..... \$149.99  
LOSA99008 Losi Truck Diaper/Carrier..... \$24.99  
LOSA99010 Losi R/C Duffel Bag..... \$64.99  
LOSA99012 Losi R/C Backpack..... \$49.99  
LOSA99013 Losi R/C Pit Mat - Large..... \$21.99  
LOSA99104 Losi Race Wrench Four-Piece Inch Set..... \$49.99  
LOSA99150 Losi Nut Driver Set (Inch)..... \$49.99  
LOSA99166 Exhaust Spring Tool..... \$14.99  
LOSA99167 Tuning Screwdriver..... \$15.99  
LOSA99168 Clutch Shoe/Spring Tool..... \$7.00  
LOSA99202 Losi-Lok Threadlock (Blue)..... \$4.99  
LOSB4603 4-Way Wrench (Steel)..... \$6.00  
LOSB5201 Turbo Fuel Bottle (500cc)..... \$9.99  
LOSB5221 Aluminum Glow Driver w/Ni-CD & Charger..... \$22.99

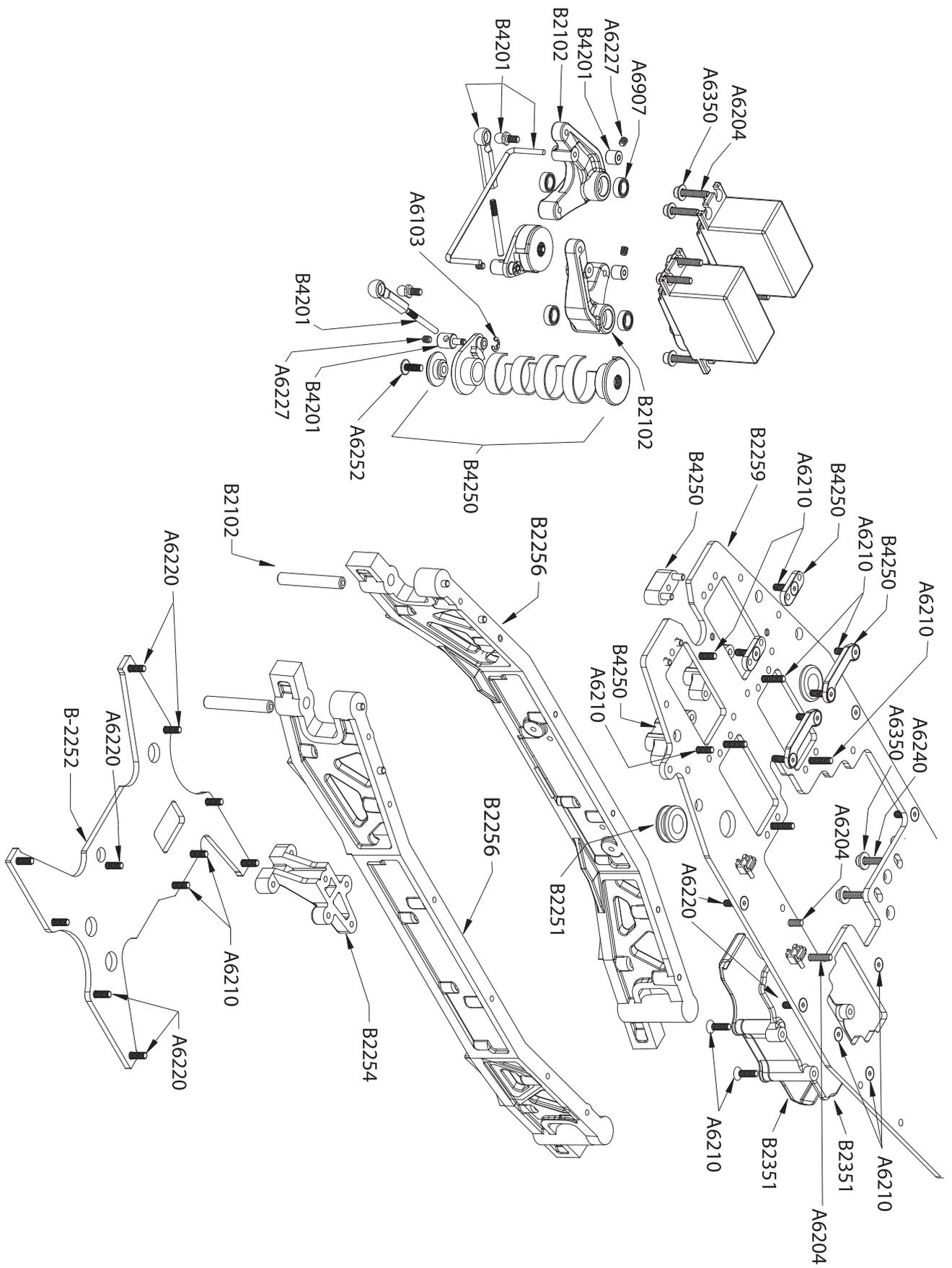
### FUEL

LOSF0020 Nitrotane 20% Sport Fuel (GAL)  
LOSF0120 Nitrotane 20% Sport Fuel (QT)



# Drivetrain Assembly

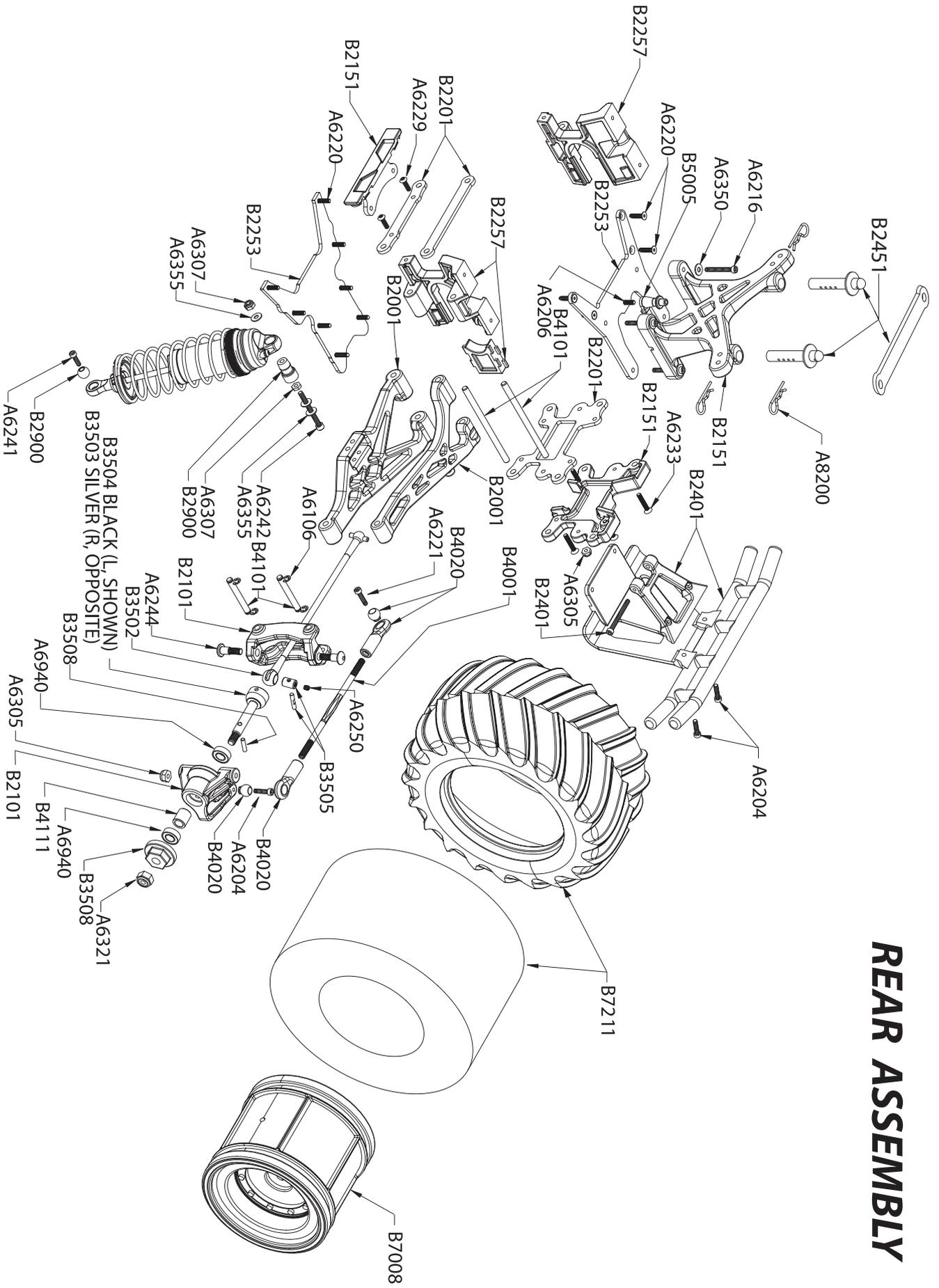




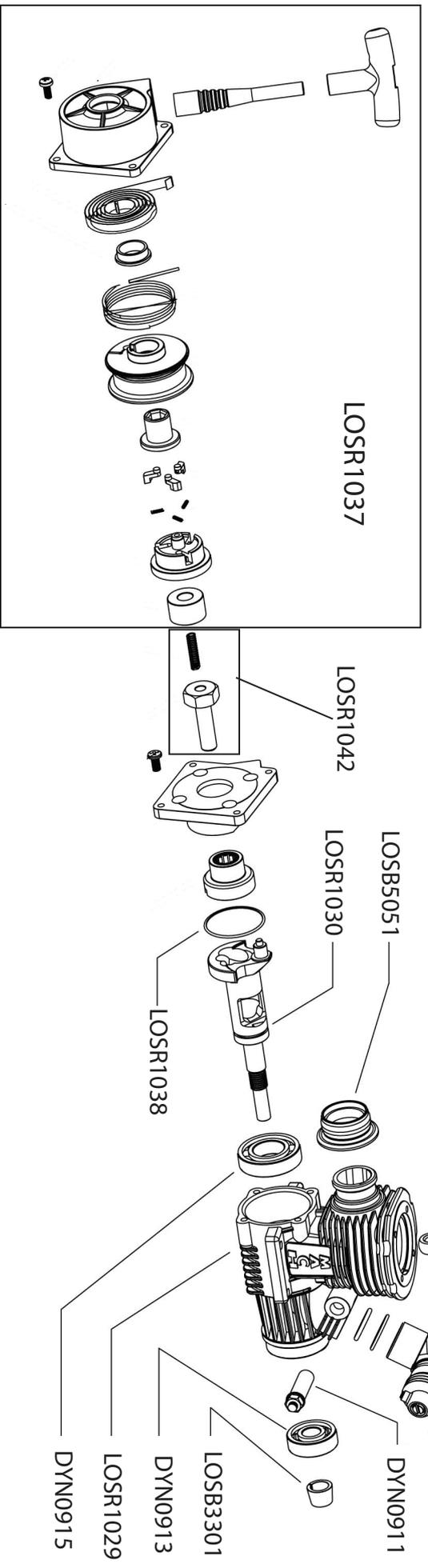
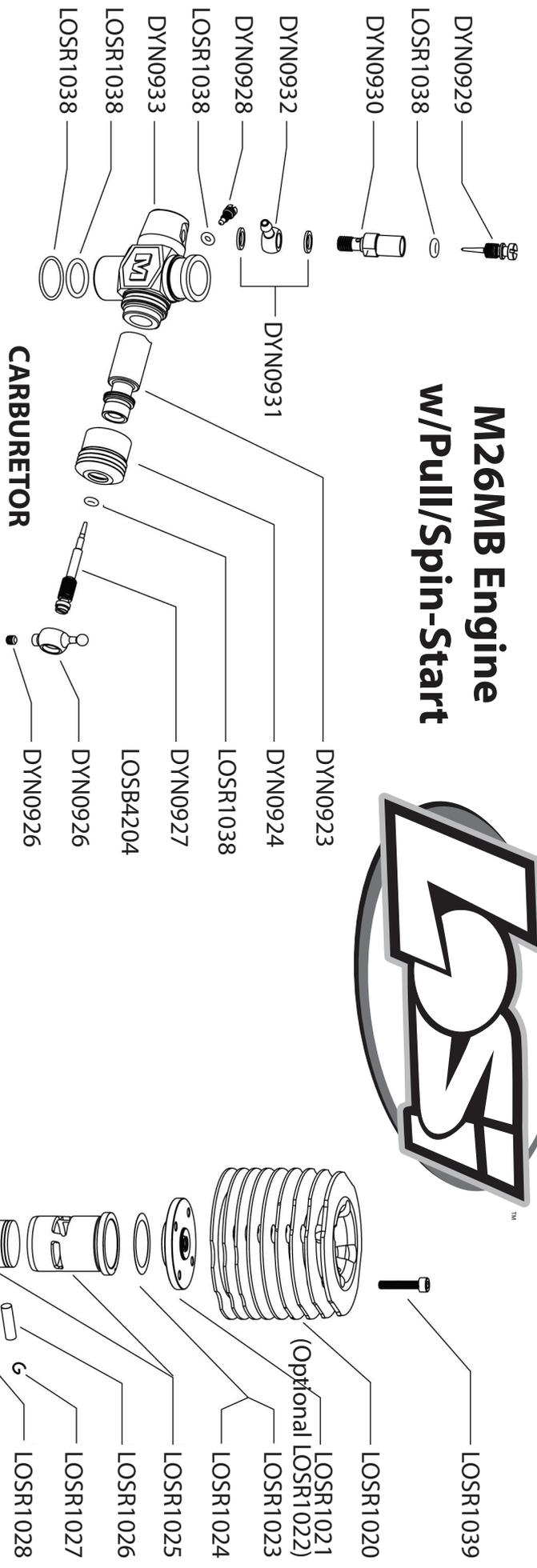
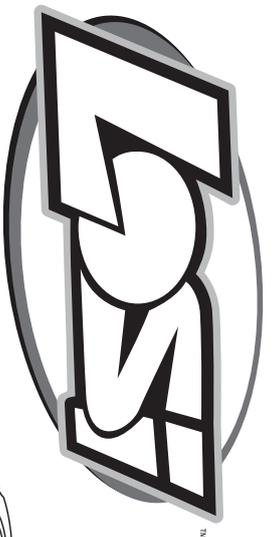




# REAR ASSEMBLY



# M26MB Engine w/Pull/Spin-Start



## **Warranty Period**

Exclusive Warranty- Horizon Hobby, Inc., (Horizon) warrants that the Products purchased (the "Product") will be free from defects in materials and workmanship at the date of purchase by the Purchaser.

## **Limited Warranty**

(a) This warranty is limited to the original Purchaser ("Purchaser") and is not transferable. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. This warranty covers only those Products purchased from an authorized Horizon dealer. Third party transactions are not covered by this warranty. Proof of purchase is required for warranty claims. Further, Horizon reserves the right to change or modify this warranty without notice and disclaims all other warranties, express or implied.

(b) Limitations- HORIZON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCT. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

(c) Purchaser Remedy- Horizon's sole obligation hereunder shall be that Horizon will, at its option, (i) repair or (ii) replace, any Product determined by Horizon to be defective. In the event of a defect, these are the Purchaser's exclusive remedies. Horizon reserves the right to inspect any and all equipment involved in a warranty claim. Repair or replacement decisions are at the sole discretion of Horizon. This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of or to any part of the Product. This warranty does not cover damage due to improper installation, operation, maintenance, or attempted repair by anyone other than Horizon. Return of any goods by Purchaser must be approved in writing by Horizon before shipment.

## **Damage Limits**

HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCT, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability.

If you as the Purchaser or user are not prepared to accept the liability associated with the use of this Product, you are advised to return this Product immediately in new and unused condition to the place of purchase.

Law: These Terms are governed by Illinois law (without regard to conflict of law principals).

## **Safety Precautions**

This is a sophisticated hobby Product and not a toy. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this Product in a safe and responsible manner could result in injury or damage to the Product or other property. This Product is not intended for use by children without direct adult supervision. The Product manual contains instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or injury.

## **Questions, Assistance, and Repairs**

Your local hobby store and/or place of purchase cannot provide warranty support or repair. Once assembly, setup or use of the Product has been started, you must contact Horizon directly. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance. For questions or assistance, please direct your email to [productsupport@horizonhobby.com](mailto:productsupport@horizonhobby.com), or call 877.504.0233 toll free to speak to a service technician.

## **Inspection or Repairs**

If this Product needs to be inspected or repaired, please call for a Return Merchandise Authorization (RMA). Pack the Product securely using a shipping carton. Please note that original boxes may be included, but are not designed to withstand the rigors of shipping without additional protection. Ship via a carrier that provides tracking and insurance for lost or damaged parcels, as ***Horizon is not responsible for merchandise until it arrives and is accepted at our facility.*** A Service Repair Request is available at [www.horizonhobby.com](http://www.horizonhobby.com) on the "Support" tab. If you do not have internet access, please include a letter with your complete name, street address, email address and phone number where you can be reached during business days, your RMA number, a list of the included items, method of payment for any non-warranty expenses and a brief summary of the problem. Your original sales receipt must also be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

## **Warranty Inspection and Repairs**

***To receive warranty service, you must include your original sales receipt*** verifying the proof-of-purchase date. Provided warranty conditions have been met, your Product will be repaired or replaced free of charge. Repair or replacement decisions are at the sole discretion of Horizon Hobby.

## **Non-Warranty Repairs**

***Should your repair not be covered by warranty the repair will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost.*** By submitting the item for repair you are agreeing to payment of the repair without notification. Repair estimates are available upon request. You must include this request with your repair. Non-warranty repair estimates will be billed a minimum of ½ hour of labor. In addition you will be billed for return freight. Please advise us of your preferred method of payment. Horizon accepts money orders and cashiers checks, as well as Visa, MasterCard, American Express, and Discover cards. If you choose to pay by credit card, please include your credit card number and expiration date. Any repair left unpaid or unclaimed after 90 days will be considered abandoned and will be disposed of accordingly. ***Please note: non-warranty repair is only available on electronics and model engines.***

Electronics requiring inspection or repair should be shipped to the following address:

Horizon Service Center  
4105 Fieldstone Road  
Champaign, Illinois 61822

All other Products requiring warranty inspection or repair should be shipped to the following address:

Horizon Product Support  
4105 Fieldstone Road  
Champaign, Illinois 61822

***Please call 877-504-0233 with any questions or concerns regarding this product or warranty.***

# Accessories/Hop-Ups Page



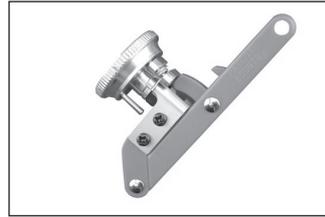
**LOSA7650S**

Super King Pin Tires  
\$34.99



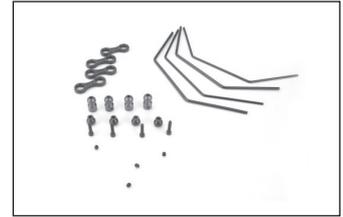
**LOSA99104**

Lozi Race Wrench  
Four-Piece Inch Set  
\$49.99



**LOSA99168**

Clutch Shoe/Spring Tool  
\$7.00



**LOSB2221**

Sway Bar Kit (LST/2)  
\$14.99



**LOSB2807**

Shock Body & Cap Set -  
Red (4) (LST/2/AFT)  
\$68.99



**LOSB2808**

Shock Body & Cap Set -  
Gold (4) (LST/2/AFT)  
\$68.99



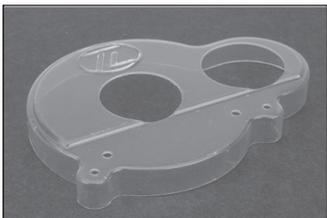
**LOSB2814**

Hard Ano. Thrd. Shock Body  
& Adj. Set (4) (LST/2/AFT)  
\$58.99



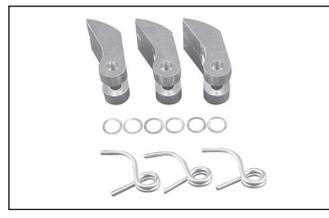
**LOSB2841**

Titanium Nitride Shock Shaft  
(LST/2/AFT)  
\$7.50



**LOSB3193**

Inside Gear Cover (LST2)  
\$5.50



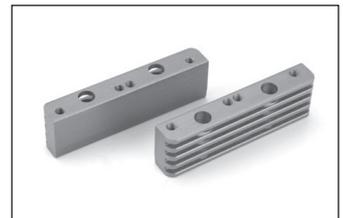
**LOSB3323**

Aluminum Clutch Shoe &  
Spring Set (LST2)  
\$19.99



**LOSB3509**

Wheel Hex Set - Hard  
Anodized Alum. (LST/AFT)  
\$19.99



**LOSB5031**

Finned Engine Mounts -  
Hard Ano. Aluminum (LST/2)  
\$12.99



**LOSB5057**

Tuned Pipe & Header -  
Polished (LST/2)  
\$69.99



**LOSB5058**

Tuned Pipe & Header -  
Hard Anodized (LST/2)  
\$74.99



**LOSB5201**

Turbo Fuel Bottle (500cc)  
\$9.99



**LOSB5221**

Aluminum Glow Driver  
w/Ni-CD & Charger  
\$22.99



**LOSB7005**

Bead Lock "Look" Wheels/  
Blue Rings (pr) (LST/AFT)  
\$24.99



**LOSB8002**

LST Body Painted Red  
w/Stickers  
\$49.99



**LOSB8013**

LST Body Painted Blue  
w/Stickers  
\$49.99



**LOSF0120**

Nitrotane 20% Sport Fuel (QT)

