

# LST XXL



## Operations Guide



## **Introduction**

Thank you for choosing the Losi LST XXL™ 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 LST XXL. 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.**

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## **Safety Precautions**

THIS IS NOT A TOY! The LST XXL 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 LST XXL 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**

**The LST XXL is equipped with a reverse gear. Just like a real automobile you must wait for the model to come to a complete stop before shifting between forward and reverse. Failure to do so will cause damage to the transmission.**

- 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**

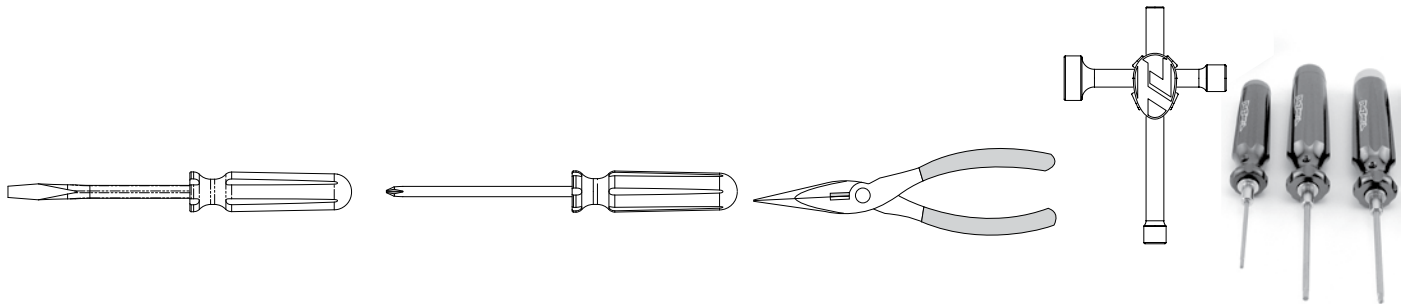
You will need the following items to operate your new LST XXL.

- Losi® Nitrotane™ 20% Sport Fuel. (LOSF0020 or LOSF0120) This is the only fuel that supports the engine warranty.
- Fuel bottle (LOS5201)
- 1 C size alkaline battery for the igniter (igniter not included)
- 7.2V battery and charger for the Spin-Start (included)
- Optional: Rechargeable Glow Igniter (LOS5221)
- Optional: Charger for receiver battery

## **Tools You Will Find Handy**

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

- Small flat blade and Phillips screwdrivers
- Needle-nose pliers
- Quality .050-inch, 1/16-inch, 5/64-inch, 3/32-inch, 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 LST XXL 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.
3. Note: The 2-speed will not shift during break-in. Do not expect the 2-speed to shift until at least the fifth or sixth tank of fuel. If you want it to shift earlier follow the directions in “2-Speed Adjustment”.

### **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

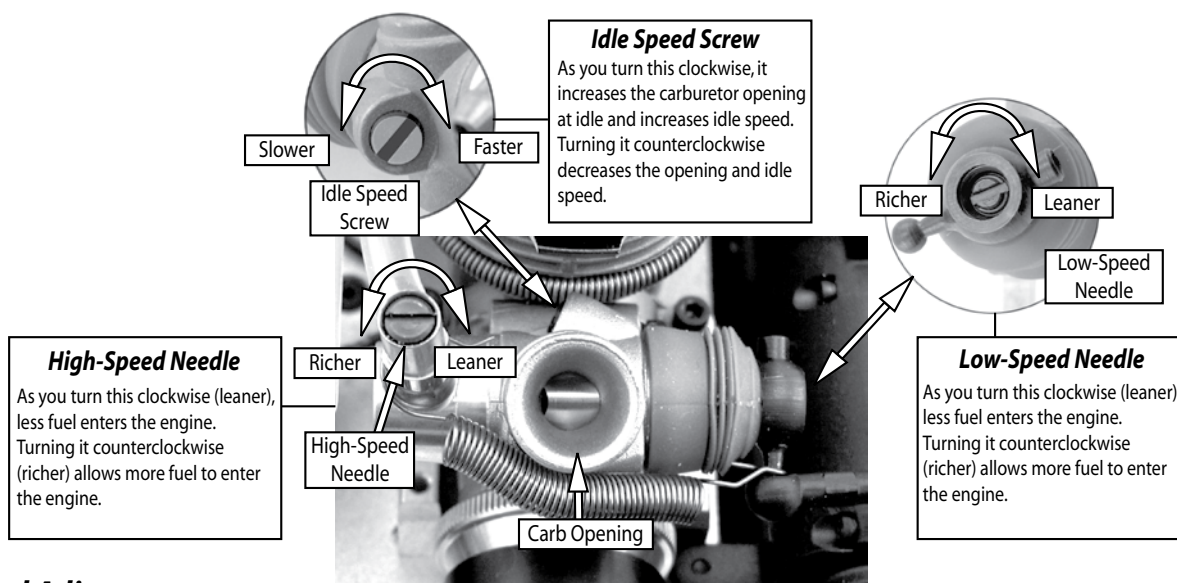
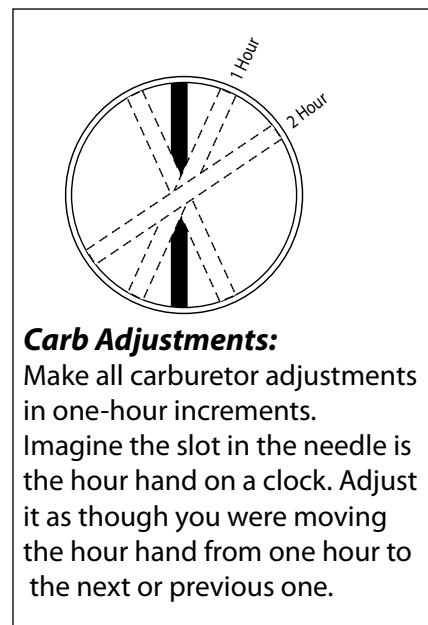
Low-Speed Needle— $2\frac{1}{2}$  turns out from bottom

## 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 that 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 the engine idle speed down. The engine should accelerate at a constant pace without hesitating.



### 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. **Note:** The normal operating temperature as seen on your radio screen should be in the 190 to 220° F (88 to 105° C) range.

### **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, 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.

DYN2495 Shown



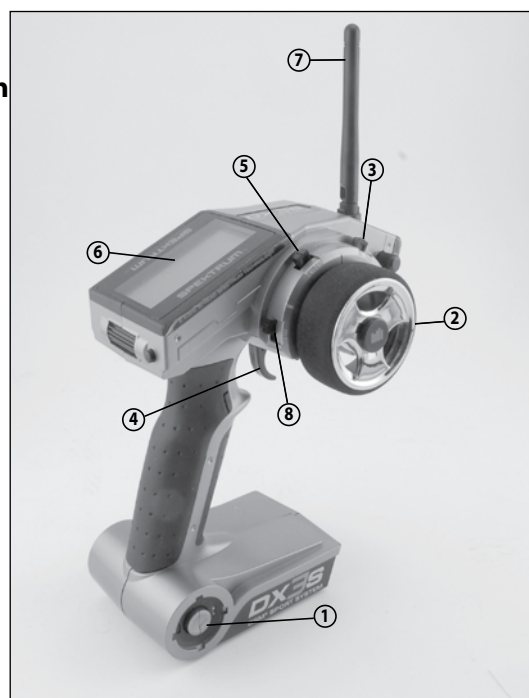
### **Testing the Temperature**

Although the DX3S Radio offers temperature readout, the following is a handy backup method. The ideal operating temperature for the engine will vary with the air temperature but in general it should be in the 190 to 220° F (88 to 105° 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.”

### **About the Radio**

The Spektrum DX3S radio installed in the LST XXL is a professional level system with more than the usual features you may find useful. Be sure to read through the included radio manual for complete instructions. The following is a simple guide referring to items that are commonly used and/or needed to run your model.

- 1. Power Switch - Turns your transmitter ON and OFF**
- 2. Steering Wheel - Controls the steering of your model**
- 3. Steering Trim Tab - Allows you to fine-tune the neutral position of the steering**
- 4. Throttle Trigger - Pull back for throttle and push forward for brakes**
- 5. Throttle Trim Tab - Allows you to set the idle/brake of the model**
- 6. Transmitter Display - Digital readout shows battery voltage, temperature, RPM/Speed and functions/settings**
- 7. Transmitter Antenna - Transmits signal to the receiver in the model**
- 8. AUX - Lever for forward/reverse**



### **Radio Operation**

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

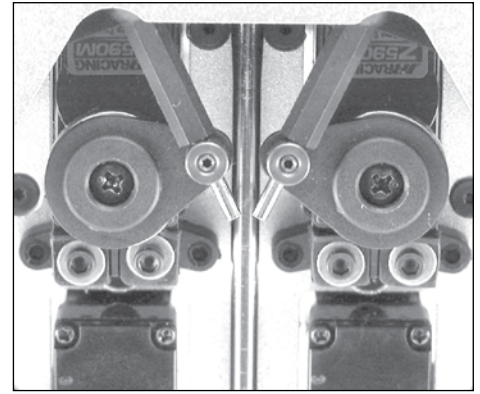
- Never run your model with low receiver or transmitter batteries.
- Always fold the antenna to the upright position before running your model.
- Never leave the power on or the batteries will not last long.
- Always turn the transmitter ON before turning the model ON.
- When finished running, always 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 on the following pages.

**Steering Trim:** The model should go straight without turning the steering wheel. If not, tap the trim lever found just above and to the right of the steering wheel in the direction needed for the model to go straight. Each tap of the trim button will be accompanied by an audible tone indicating a change has been made. It may take several taps to get the correct trim setting.

**Throttle Trim:** The model should idle without the tires rotating when the trigger is at its neutral position. If not, tap the trim lever found just above and to the left of the steering wheel to reposition the throttle servo and close the carburetor and apply more brakes. Note that additional braking force is applied when you push the trigger forward.

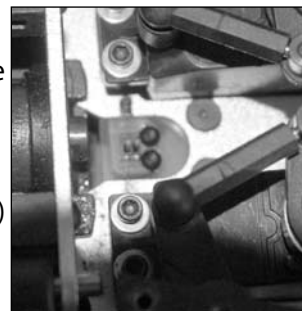
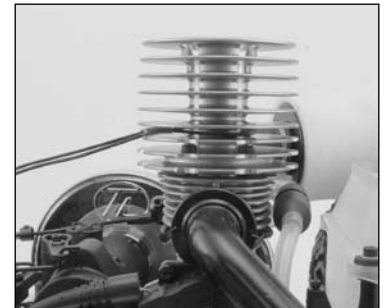
**Synchronizing the Steering Servos:** If you remove the steering servos or the servo savers you will probably have to make some small adjustments to ensure they are working together at maximum capacity. With the servo savers removed and the linkage attached,

- Turn on the radio and reset the steering trim to read "0" (which is neutral) on the radio screen.
- 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.



### **Telemetry Sensors**

- The battery power of the receiver pack will automatically register on the readout screen.
- The engine temperature requires that the temperature sensor (SPM1450) be installed around the head just above the head bolts as seen in the photo. Note: The temperature sensor must be removed before removing the head from the engine. There is an external plug near the radio box which will allow you to disconnect it if you wish to remove the engine for cleaning.
- The RPM/Speed sensor (SPM1452) mounts directly below the front of the radio box. It must be kept clean to operate correctly. There is a silver stripe on the drive coupler (just below the sensor) that must also be kept clean. Use only a soft brush to clean these – Do Not Use Any Solvents at any time on these items. If the silver stripe gets removed use one from the (SPM1512) Telemetry RPM sticker sheet.



### **Maintenance**

In addition to the service needs pointed out in this guide,

you should try to maintain your new LST XXL 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 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 LST XXL 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-inch adjustment nut clockwise (tighten) until it gets tight and the spring is compressed. **Do not overtighten** as you will strip the nut. Now turn the adjustment nut counterclockwise (loosen) one full turn. This should be a good overall setting.

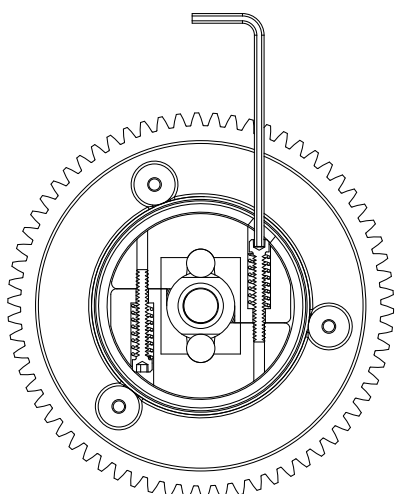
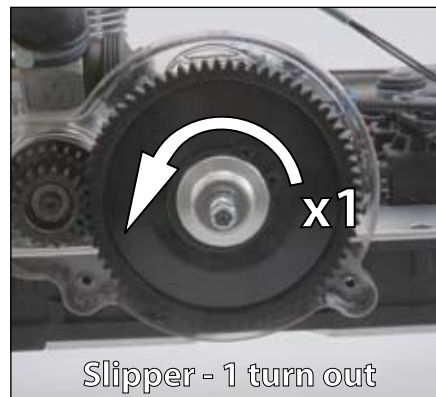
## 2-Speed Adjustment

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.

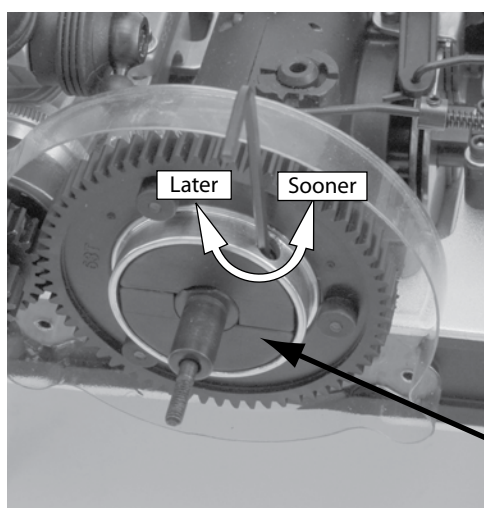
**(Remember to always adjust BOTH screws the same amount)**

- 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!



**Fig 1**

**Always adjust BOTH adjustment screws evenly.**



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

## **Replacing the 2-Speed Gears**

### **First (Low) Gear:**

After removing the outer gear cover remove the large circlip at the outer face of the gear. Remove and replace the gear being sure to insert the molded pins on the back of the gear with the holes in the aluminum hub. Replace the circlip. Note: Special pliers are made that make removal and installation of the circlip easier.

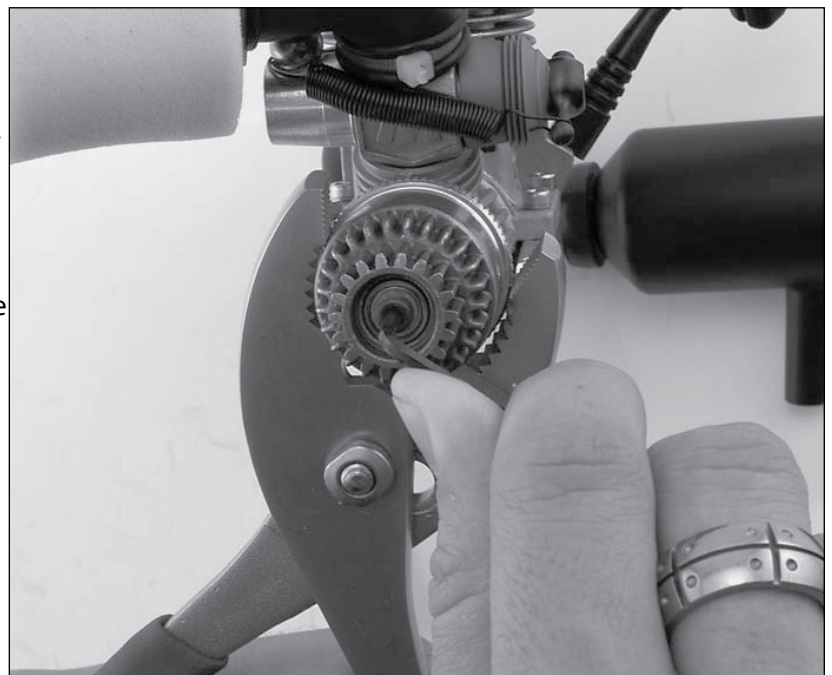


### **Second (High) Gear:**

Remove the nut and the thrust washer assembly from the slipper. Slide both gears off of the shaft being careful to leave the slipper pads in the steel slipper cage. The 2-speed clutch shoes will be inside the bell for the high gear. Use a 1/16-inch hex wrench to remove the three button head screws and replace the gear. Reinstall the high gear with the clutch shoes in the bell, the large washer, low gear assembly and thrust washer assembly as seen in the exploded view. Adjust per the "Adjusting the Slipper" instructions and replace the gear cover.

## **Replacing the Clutch Bell**

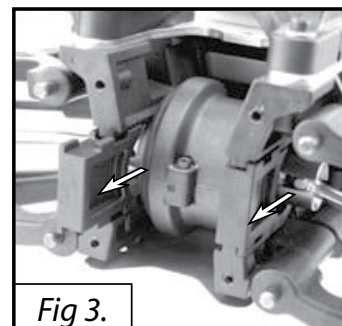
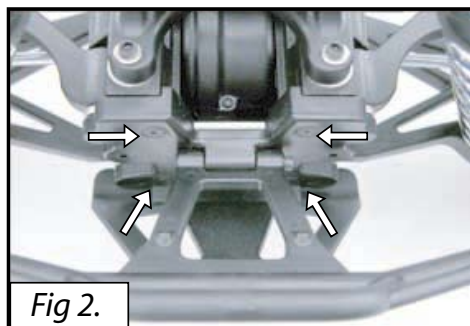
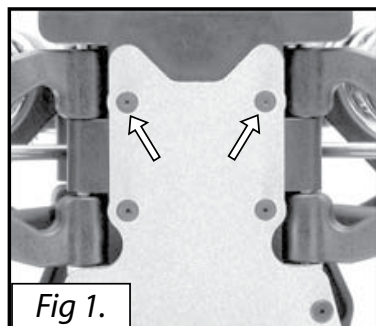
Use a 3/32" wrench (provided) to remove the retaining screw (turn counterclockwise) while firmly holding the flywheel with a pair of pliers. Remove the screw, washers and clutch bell, being careful not to lose any shims that may be used. Remove the ball bearings and brush any loose dirt away from the 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) 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.

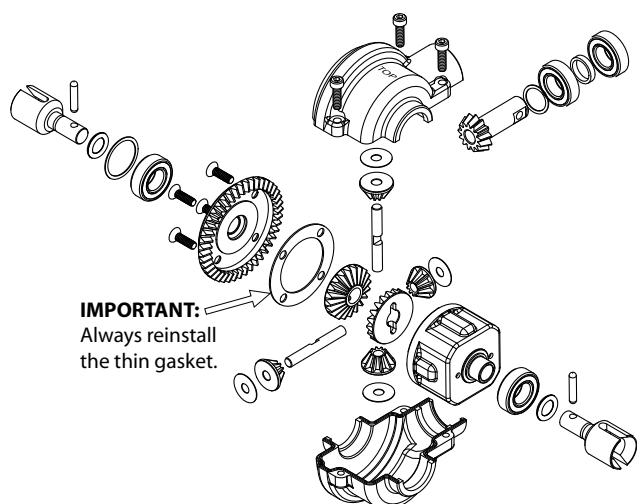
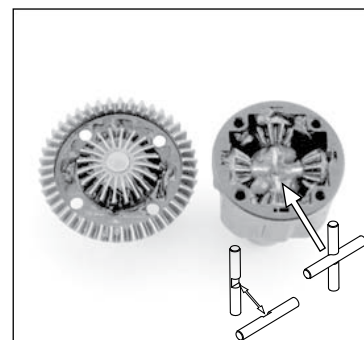


## Removing the Differentials

- 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 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

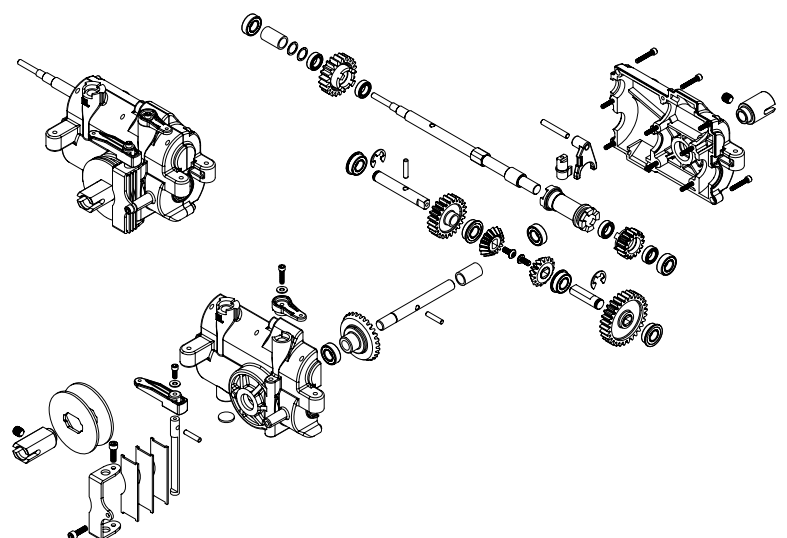
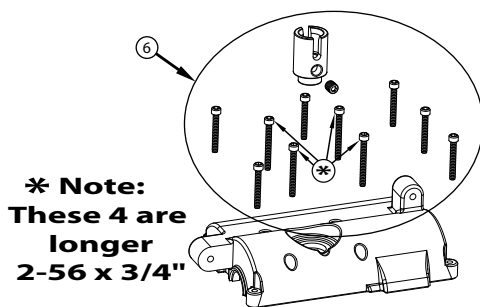
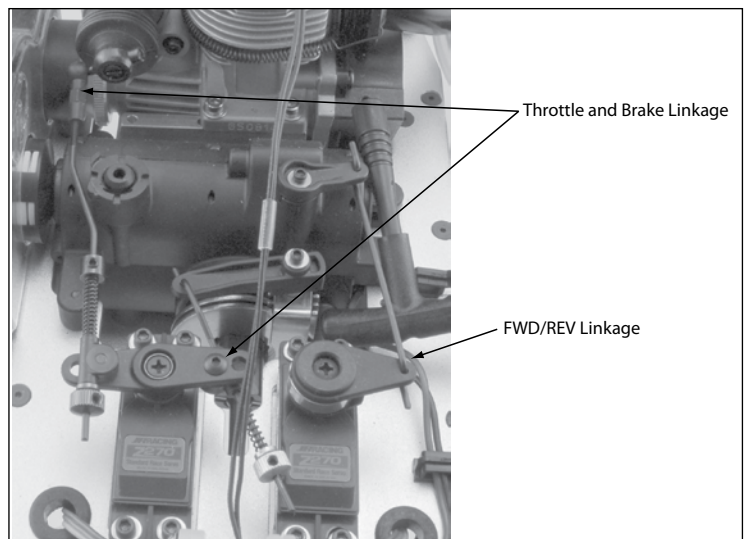
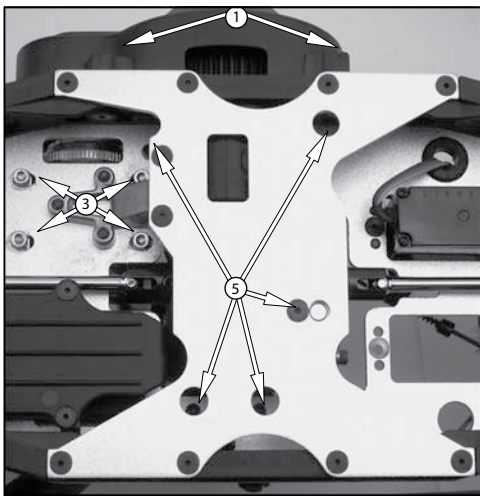
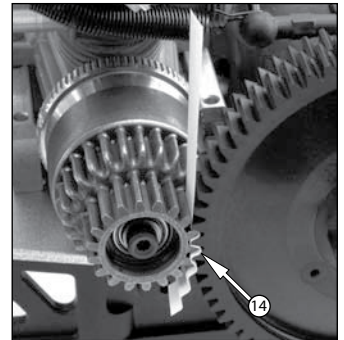
Instead of grease you can use silicone fluid in the differential for a limited slip feel as desired for racing. Simply fill the diff up to the top of the gears before replacing the ring gear. (Be sure to reinstall the gasket). You may have to replace the O-rings on the outdrives at the same time you change to this type of differential if the old ones are worn. 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 like LOSA99203 to prevent premature wear and/or failure.

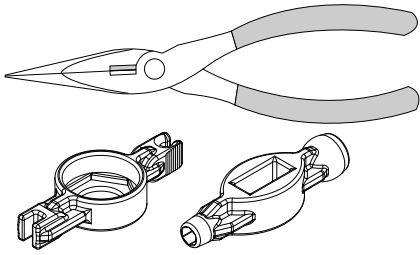
## Removing the Transmission

1. Remove the gear cover.
2. Remove the throttle and brake linkage as well as the fwd/rev linkage.
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 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.



# Rebuilding/Refilling the Shocks

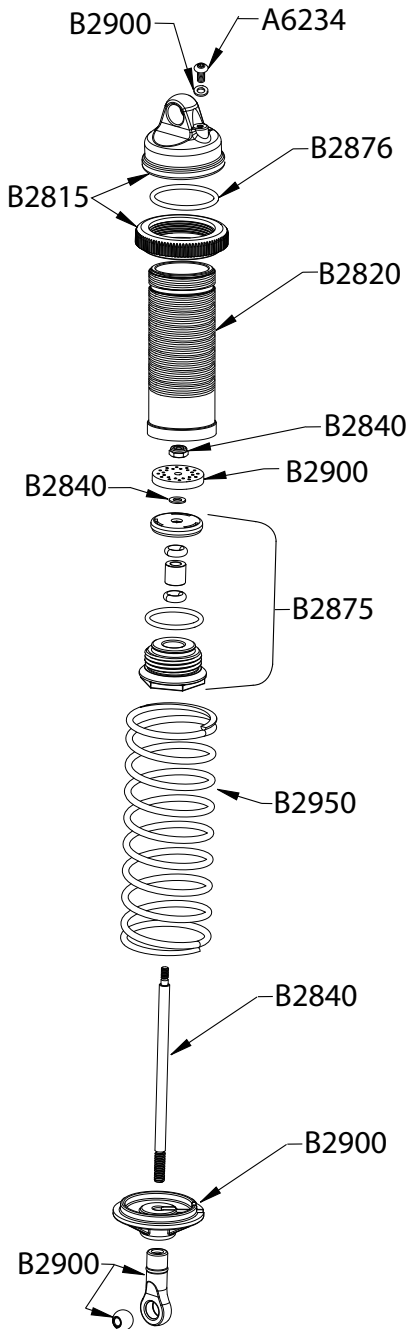
## Tools Needed



**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 a new shock cartridge.

Hold here with needle-nose pliers

**Step 4.**  
Install the 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.

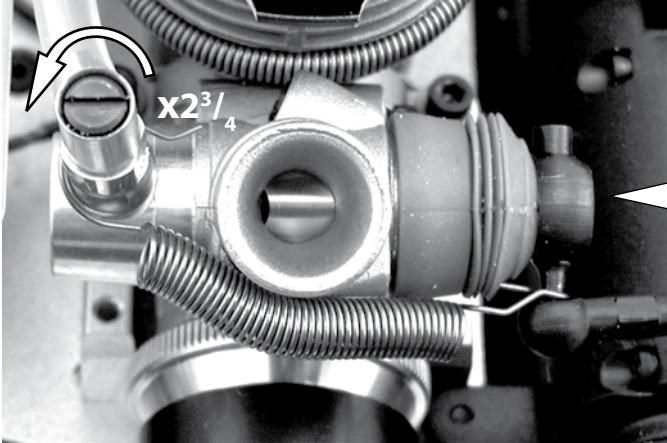
**Step 8.**  
Slide the spring over the shock body against the shock adjuster nut. Slide the lower shock cup onto the shock shaft and snap it onto the shock end being sure that it seats on the mount. Reinstall the shock.

"snap!"

# Quick Reference Guide

## Initial Factory Settings Using Nitrotane 20% Sport Fuel

### Engine

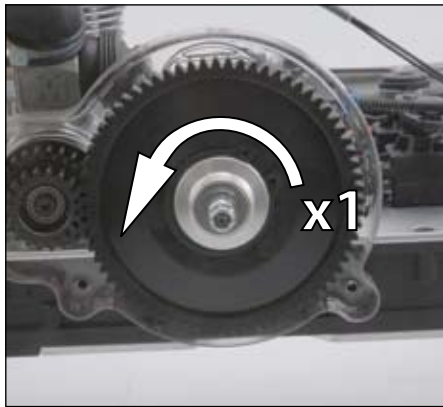


High-Speed Needle - 2<sup>3</sup>/<sub>4</sub> turns out

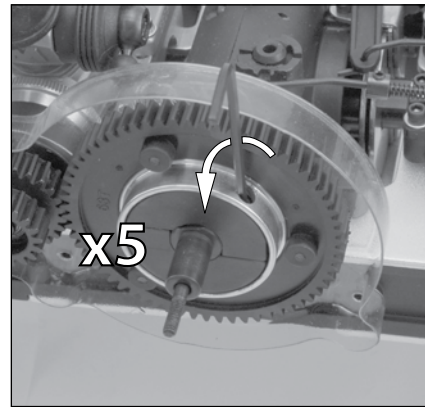


Low-Speed Needle - 2<sup>1</sup>/<sub>2</sub> turns out

### Transmission



Slipper - 1 turn out



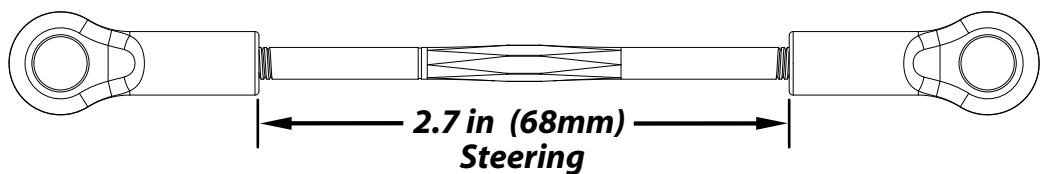
Two-Speed - 5 turns out

### Shocks



Losi 30wt  
Shock Oil  
(LOSA5224)

### Tie Rod



2.7 in (68mm)  
Steering

# 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

# LST XXL Parts List

## SUSPENSION PARTS

LOSB2035	F/R HD Suspension Arms (pr) (XXL/LST2)	\$12.99
LOSB2102	Steering Bell Cranks, Shafts, & Chassis Braces (LST/2)	\$8.99
LOSB2104	Front Spindles & Carriers (LST2/XXL)	\$8.99
LOSB2106	Rear Hub Carriers (LST/2/XXL)	\$5.99
LOSB2201	F/R Suspension Pin Brace Set (AL) (All)	\$7.99

## CHASSIS PARTS

LOSB2250	Chassis Side Rails - Long (XXL)	\$11.99
LOSB2252	Chassis Skid Plate (LST/2/XXL)	\$10.99
LOSB2253	Top & Brace Chassis Plates (LST/2/XXL)	\$15.99
LOSB2254	Motor Plate/Chassis Brace (LST/2/XXL)	\$6.99
LOSB2257	R&L Bulkheads & Hardware (LST/2/XXL)	\$6.99
LOSB2278	Main Chassis Plate - Long (XXL)	\$31.99
LOSB2350	Radio Box & Hardware (LST/2/XXL)	\$8.99
LOSB2351	Battery Mount Set (LST/2/XXL)	\$6.99
LOSB2361	RPM Sensor Mount (XXL)	\$2.99
LOSB2401	F/R Bumpers & Braces (LST/2/XXL)	\$12.99
LOSB2450	F/R Body Mount Posts & Hardware (LST/2/XXL)	\$4.99

## SHOCKS

LOSB2815	Shock Nut & Cap Molded (4) (LST)	\$9.99
LOSB2820	Molded Shock Body (2) (AFT)	\$11.99
LOSB2840	Shock Shaft (LST/2)	\$5.99
LOSB2875	Shock Cartridges & Seals (2) (LST/2)	\$5.99
LOSB2876	Shock Cartridge & Cap O-Rings (8) (LST/2)	\$3.99
LOSB2880	Assm. Molded Shock w/Spring (no oil) (AFT)	\$22.99
LOSB2900	Shock Hardware - All Plastic (LST/2)	\$7.99
LOSB2950	Shock Springs - Silver (pr) (LST/2/XXL)	\$7.99

## TRANSMISSION

LOSB3102	Transmission Case Set (LST/2)	\$12.99
LOSA3103	Main Input Shaft (F/R) (LST/2/XXL)	\$6.99
LOSB3111	22T Hi-only Gear & Spacer	\$11.99
LOSB3114	FWD/REV Selector (LST/2/XXL)	\$23.99
LOSB3116	Reverse Pinion (LST/2/XXL)	\$10.99
LOSB3117	Reverse Gear (LST/2/XXL)	\$9.99
LOSB3119	F/R Bevel Gear Set 16/29 (XXL)	\$9.99
LOSB3124	Shift Forks (LST/2/XXL)	\$3.99
LOSB3125	Trans Drive & Selector Pin Set (LST/2)	\$2.99
LOSB3127	Trans Output Shaft & Spacer (LST/2)	\$3.99
LOSB3128	Trans Outdrive Cup Set (LST/2)	\$10.99
LOSB3135	Fwd. Only Counter Shaft Set (LST/2/AFT)	\$4.99
LOSB3136	Fwd. Only Counter Gear 23T Ti-ni (LST/2/AFT)	\$11.99
LOSB3138	Fwd. Only Trans Plug Set (LST/2/AFT)	\$4.99
LOSB3190	Gear Cover (2-Speed) (LST)	\$5.99
LOSB3193	Inside Gear Cover (LST)	\$6.99
LOSB4203	FWD/REV & Brake Arms (LST/2)	\$3.99

## CLUTCH PARTS

LOSB3301	Flywheel, Collet & Nut (LST/2)	\$12.99
LOSB3322	Clutch Spring Set (3) Silver (LST/2)	\$3.99
LOSB3323	Aluminum Clutch Shoe & Spring Set (All)	\$22.99
LOSB3342	19T/26T One-Piece Clutch Bell-Steel (All)	\$19.99

## 2-SPEED & SLIPPER PARTS

LOSB3401	2-Speed Cam & Bushings (LST/2)	\$19.99
LOSB3404	2-Speed Clutch Shoes & Hardware (LST/2)	\$3.99
LOSB3410	2-Speed Low Gear Hub w/One-Way (LST/2/XXL)	\$26.99
LOSB3411	2-Speed High Gear Hub w/Bearing (LST/2/XXL)	\$19.99
LOSB3420	70T Spur (1st) Gear (LST/2/XXL)	\$4.99
LOSB3424	63T Spur (2nd) Gear (LST/2/XXL)	\$4.99
LOSB3450	Slipper Cage (LST/2)	\$18.99
LOSB3451	Slipper Pads & Plates (LST/2)	\$8.99
LOSB3455	2-Speed/Slipper Thrust Bearing & Hardware (LST/2)	\$5.99

## DRIVETRAIN PARTS

LOSB3512	20mm Wheel Hex Set - Blue (4ea) (LST2/XXL)	\$19.99
LOSB3513	Wheel Nuts for 20mm Hexes - Blue (LST2/XXL)	\$4.99
LOSB3520	F/R Super-Duty CV Drive Shaft (pr) (LST2/XXL)	\$45.99
LOSB3521	F/R Super-Duty CV Drive Shaft Only (LST2/XXL)	\$14.99
LOSB3522	F/R Super-Duty CV Axle (LST2/XXL)	\$8.99
LOSB3523	F/R Super-Duty CV Rebuild Set (pr) (LST2/XXL)	\$8.99
LOSA3532	Aluminum Diff Case - Blue (All)	\$13.99
LOSB3534	F/R Diff Ring & Pinion Gears (All)	\$29.99
LOSB3537	F/R Diff Housing (All)	\$4.99
LOSB3538	F/R Diff Bevel Gear Set (All)	\$8.99
LOSB3539	F/R Diff Seal Set (2) (All)	\$4.99
LOSB3540	F/R Diff Outdrive Set (All)	\$10.99
LOSB3541	F/R Diff Drive Yoke (All)	\$5.99
LOSB3547	Center CV Driveshaft Assm. - Long (XXL)	\$16.99

LOSB3601	Brake Disks - Steel(2) (LST/2)	\$4.99
LOSB3603	Brake Cam (LST/2)	\$3.99
LOSB3605	Brake Pads & Bracket (LST/AFT/XXL)	\$5.99

## HARDWARE

LOSA3045	Gear Cover Access Plus	\$1.99
LOSA4002	Antenna Tube & Cap	\$2.99
LOSA4003	Antenna Caps	\$1.99
LOSA6100	1/8" E-Clips	\$1.99
LOSA6103	3/32" E-Clips	\$1.99
LOSA6106	4mm E-Clips (12)	\$2.99
LOSA6107	6mm W-Clips (12)	\$2.99
LOSA6204	4-40 x 1/2" Cap Head Screw (10)	\$1.99
LOSA6205	4-40 x 3/4" Cap Head Screw (10)	\$1.99
LOSA6206	4-40 x 5/8" Cap Head Screw (10)	\$1.99
LOSA6210	4-40 x 3/8 Flat Head Screw (10)	\$1.99
LOSA6216	4-40 x 7/8" Cap Head Screw (10)	\$1.99
LOSA6220	4-40 x 1/2" Flat Head screw (10)	\$1.99
LOSA6221	4-40 x 5/8" Cap Head Screw (6)	\$1.99
LOSA6227	4-40 Hardened Setscrew (10)	\$2.49
LOSA6229	4-40 x 3/8" Button Head Screw (10)	\$2.49
LOSA6232	2-56 x 1/4" Cap Head Screw (10)	\$4.99
LOSA6233	4-40 x 5/8" Flat Head Screw (10)	\$2.99
LOSA6234	4-40 x 1/4" Button Head Screw (10)	\$2.99
LOSA6240	5-40 x 1/2" Cap Head Screw (8)	\$2.99
LOSA6241	5-40 x 5/8" Cap Head Screw (8)	\$2.99
LOSA6242	5-40 x 1-1/4" Cap Head Screw (4)	\$2.99
LOSA6244	Kingpin Screw (LST) (8)	\$2.99
LOSA6245	4-40 x 5/16" Cap Head Screw (10)	\$2.99
LOSA6246	2-56 x 5/8" Cap Head Screw (8)	\$3.49
LOSA6247	2-56 x 3/4" Cap Head Screw	\$3.49
LOSA6250	4 & 5mm Setscrews (4 ea)	\$2.99
LOSA6252	3 x 10mm Button & Flat Head Machine Screws	\$2.99
LOSA6307	5-40 Nuts - Lock & Hex (4 ea)	\$2.99
LOSA6305	4-40 Steel Locknuts	\$4.20
LOSA6321	5mm Locknuts - R & L Thread (4 ea)	\$4.99
LOSA6350	#4 x 1/8" Hardened Washers	\$2.99
LOSA6355	2.2 & 3.6mm Washers (6 ea)	\$2.49
LOSA6356	5 & 6mm Shim Set	\$2.49
LOSA6907	5 x 8mm Shielded Ball Bearings	\$7.99
LOSA6937	5 x 10mm Shielded Ball Bearings (2)	\$5.99
LOSA6939	6 x 10mm Shielded Ball Bearings (4)	\$9.99
LOSA6940	6 x 12mm Shielded Ball Bearings (4)	\$9.99
LOSA6941	6 x 12mm Flanged Ball Bearings (4)	\$15.99
LOSA6942	8 x 16mm Sealed Ball Bearings (4)	\$9.99
LOSA6944	15x21x4mm Shielded Ball Bearings	\$7.99
LOSA8200	Body Clips	\$1.49
LOSB3951	Differential Shims (13mm) (LST/2/AFT)	\$2.99
LOSB4001	93mm Turnbuckle Set w/Ends (2) (LST)	\$6.99
LOSB4020	Rod Eds & Pivot Balls (8) (LST)	\$7.99
LOSB4104	Pivot Pin Set (4 ea) (LST)	\$11.99
LOSB4111	Spindle Bearing Spacer Set (LST/AFT)	\$2.99
LOSB4201	Steering Hardware Set (LST/2)	\$8.99
LOSB4203	Fwd/Rev & Brake Arms (LST/2/AFT)	\$3.99
LOSB4204	Throttle, Brake Reverse Linkage Set (LST)	\$6.99
LOSB4250	Servo Saver & Mount Set (LST/2)	\$12.99
LOSB4601	Tool Set (LST/AFT)	\$5.99
LOSB4603	4-Way Wrench (Steel)	\$8.99

## MOTOR ACCESSORIES

LOSB5002	Fuel Tank Hi-Volume (LST2/XXL)	\$18.99
LOSB5003	Fuel Tank Lid & Spring (LST/2)	\$4.99
LOSB5005	Fuel Tank Mounts & Hardware (LST/2)	\$4.99
LOSB5009	Fuel Filter - Heat Resistant (All)	\$4.99
LOSB5020	Air Clearer w/Oil (LST/2)	\$15.99
LOSB5021	Air Cleaner Foam Set (LST/2)	\$7.99
LOSB5030	Engine Mounts (LST/2)	\$12.99
LOSB5050	Exhaust Header (RE) & Springs(LST/2/XXL)	\$19.99
LOSB5051	Exhaust Header Seals & Springs (2) (LST/2/XXL)	\$6.99
LOSB5054	Exhaust Pipe Seals & Springs (LST/2/XXL)	\$6.99
LOSB5056	Tuned Pipe Mount & Hardware (LST/2/XXL)	\$2.99
LOSB5059	"HT" Tuned Pipe (XXL/LST2)	\$44.99
LOSB5100	Spin-Start Hand Held Starter (all)	\$49.99
LOSB5102	Spin-Start Motor & Battery leads	\$19.99
LOSB5103	Spin-Start Mechanics	\$26.99
LOSB5104	Spin-Start Hex Starter Shaft	\$5.99
LOSB5105	Spin-Start Hand Strap & Pin	\$5.99
LOSB5106	Spin-Start Case & Switch Set	\$9.99
LOSB5108	Spin-Start Drive Gear (Metal)	\$3.99
LOSA9315	Fuel Tubing 24"	\$5.99

# LST XXL Parts List

## WHEELS & TIRES

LOSB7012	420 Series Force Chrome Wheels (All)	\$23.99
LOSB7202	420 Series ATX Tires w/Foam	\$29.99
LOSB7407	420 Series Force Chrome Wheels w/ATX Tires	\$48.99

## MOTOR ACCESSORIES

LOSR2200	Losi 454 Engine w/Combo PS/SS & SG Shaft	\$249.99
LOSB5100	Spin-Start Hand Held Starter (LST/2)	\$49.99
LOSB5102	Spin-Start Motor & Battery Leads (LST/2)	\$19.99
LOSB5103	Spin-Start Mechanics (LST/2)	\$26.99
LOSB5104	Spin-Start Hex Starter Shaft (LST/2)	\$5.99
LOSB5105	Spin-Start Hand Strap & Pin (LST/2)	\$5.99
LOSB5106	Spin-Start Case & Switch Set (LST/2)	\$9.99
LOSB5108	Spin-Start Drive Gear (Metal) (LST/2)	\$3.99

## BODIES & ACCESSORIES

LOSB8022	XXL Body Painted Red w/Stickers	\$59.99
LOSB8023	XXL Body Painted Blue w/Stickers	\$59.99
LOSB8207	XXL Logo Sticker Sheet	\$5.99

## OPTIONAL PARTS

### SUSPENSION PARTS

LOSB2221	Sway Bar Kit (LST/2)	\$17.99
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### CHASSIS PARTS

LOSB2261	Heavy Duty Chassis Skid Plate - Hard Ano. (LST/2)	\$29.99
LOSB2262	Heavy Duty Chassis Top Plate - Hard Ano. (LST/2)	\$19.99
LOSB2263	Heavy Duty Front Bottom Plate - Hard Ano. (LST/2)	\$19.99
LOSB2264	Heavy Duty Rear Bottom Plate - Hard Ano. (LST/2)	\$21.99
LOSB2271	Hi-Perf Aluminum Skid Plate - Hard Ano. (LST/2)	\$29.99
LOSB2272	Hi-Perf Graphite Top Plate (LST/2)	\$42.99
LOSB2273	Hi-Perf Alum Front Bottom Plate - Hard Ano. (LST/2)	\$21.99
LOSB2274	Hi-Perf Alum Rear Bottom Plate - Hard Ano. (LST/2)	\$21.99
LOSB2451	Extra Long Body Mounts	\$5.99
LOSB2501	Wing Mount Plastics (LST/2/AFT)	\$10.99

### SHOCKS

LOSB2801	Shock Body - Blue (LST/2/AFT/XXL)	\$13.99
LOSB2802	Shock Cap - Blue (LST/2/AFT/XXL)	\$8.99
LOSB2803	Shock Body - Red (LST/2/AFT/XXL)	\$13.99
LOSB2804	Shock Cap - Red (LST/2/AFT/XXL)	\$8.99
LOSB2805	Shock Body - Gold (LST/2/AFT/XXL)	\$13.99
LOSB2806	Shock Cap - Gold (LST/2/AFT/XXL)	\$8.99
LOSB2807	Shock Body & Cap Set - Red (4) (LST/2/AFT/XXL)	\$79.99
LOSB2808	Shock Body & Cap Set - Gold (4) (LST/2/AFT/XXL)	\$79.99
LOSB2811	Threaded Shock Body - Hard Anodized (LST/2/AFT/XXL)	\$14.99
LOSB2813	Shock Adjuster Nut - Blue Aluminum (LST/2/XXL)	\$6.99
LOSB2814	Hard Ano. Thrd. Shock Body & Adj. Set (4) (LST/2/AFT/XXL)	\$59.99
LOSB2841	Titanium Nitride Shock Shaft (LST/2/AFT/XXL)	\$8.99
LOSB2879	Assembled Threaded Shock w/Spring (Blue) (LST2)	\$39.99
LOSB2901	Shock Pivot Balls - Hard Ano. Aluminum (4) (LST/2/AFT/XXL)	\$8.99
LOSB2949	Shock Springs - White 4.0 lb Rate (pr) (LST/2/AFT/XXL)	\$7.99
LOSB2951	Shock Springs - Black 6.0 lb Rate (pr) (LST/2/AFT/XXL)	\$7.99
LOSB2952	Shock Springs - Yellow 7.4 lb Rate (pr) (LST/2/AFT/XXL)	\$7.99

### TRANSMISSION

LOSB3118	F/R Bevel Gear Set 15/30 (XXL)	\$9.99
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### CLUTCH PARTS

LOSB3323	Aluminum Clutch Shoe & Spring Set (LST2)	\$22.99
LOSB3328	Long Wear Aluminum Clutch Shoes (3) (LST/2/XXL/Aft)	\$24.99
LOSB3340	Clutch Bell Only 2-Seed (Threaded) (LST/2)	\$10.99
LOSB3341	18T/25T One-Piece Clutch Bell-Steel (LST/2)	\$22.99
LOSB3350	18T Steel Pinion (LST/2)	\$5.99
LOSB3351	18T Steel Pinion w/Ti-Nitride (LST/2)	\$17.99
LOSB3356	25T Steel Pinion (LST/2)	\$5.99
LOSB3357	25T Steel Pinion w/Ti-Nitride (LST/2)	\$17.99

### 2-SPEED & SLIPPER PARTS

LOSB3428	2-Speed Steel. Ti-Nitride Gear Conversion (LST/2)	\$89.99
LOSB3429	70T Steel Spur w/Ti-Nitride (1st) (LST/2)	\$39.99
LOSB3430	63T Steel Spur w/Ti-Nitride (2nd) (LST/2)	\$29.99
LOSB3431	Drive Rings for 70T Steel Spur (2)	\$2.99

### DRIVETRAIN PARTS

LOSB3531	Aluminum Diff Case - Polished (LST/2/AFT)	\$11.99
LOSB3535	Ti-Nitride F/R Ring & Pinion (LST/2/AFT)	\$44.99

## HARDWARE

LOSB4021	Pivot Balls - Hard Anodized Aluminum (4) (LST/2)	\$9.99
LOSB4102	Titanium Nitride Inner Hinge Pins (2) (LST/2)	\$9.99
LOSB4103	Titanium Nitride Outer Hinge Pins (2) (LST/AFT)	\$9.99

## MOTOR ACCESSORIES

LOSB5031	Finned Engine Mounts - Hard Ano. Aluminum (LST/2)	\$14.99
LOSB5050	Exhaust Header (RE) & Springs (LST/2/AFT)	\$19.99
LOSB5051	Exhaust Header Seals & Springs (2) (LST/2/AFT)	\$6.99
LOSB5054	Exhaust Pipe Seals & Springs (LST/2)	\$6.99
LOSB5056	Tuned Pipe Mount & Hardware (LST/2)	\$2.99
LOSB5055	Tuned Exhaust Pipe (LST)	\$45.99
LOSB5057	Tuned Pipe & Header - Polished (LST/2)	\$79.99
LOSB5058	Tuned Pipe & Header - Hard Anodized (LST/2)	\$86.99
LOSB5060	"HT" Tuned Pipe & Header - Polished (LST/2)	\$79.99
LOSB5061	"HT" Tuned Pipe & Header - Hard Anodized (LST/2)	\$86.99

## WHEELS & TIRES

LOSB7203	420 Series Rear Paddle Tires w/Foam	\$31.99
LOSB7204	420 Series Front Razor (sand) Tires w/Foam	\$31.99
LOSB7205	420 Series Road Rash Tires w/Foam	\$31.99
LOSB7206	420 Series Super Bolt-On Tires w/Foam	\$31.99
LOSB7210	420 Series King-Pin Tires w/Foam	\$29.99

## BODIES & ACCESSORIES

LOSB80009	XXL Body Painted Body w/Stickers (Red)	\$59.99
LOSB80010	XXL Body Painted Body w/Stickers (Blue)	\$59.99
LOSB8207	XXL Logo Sticker Set	\$5.99

## 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)	\$33.99

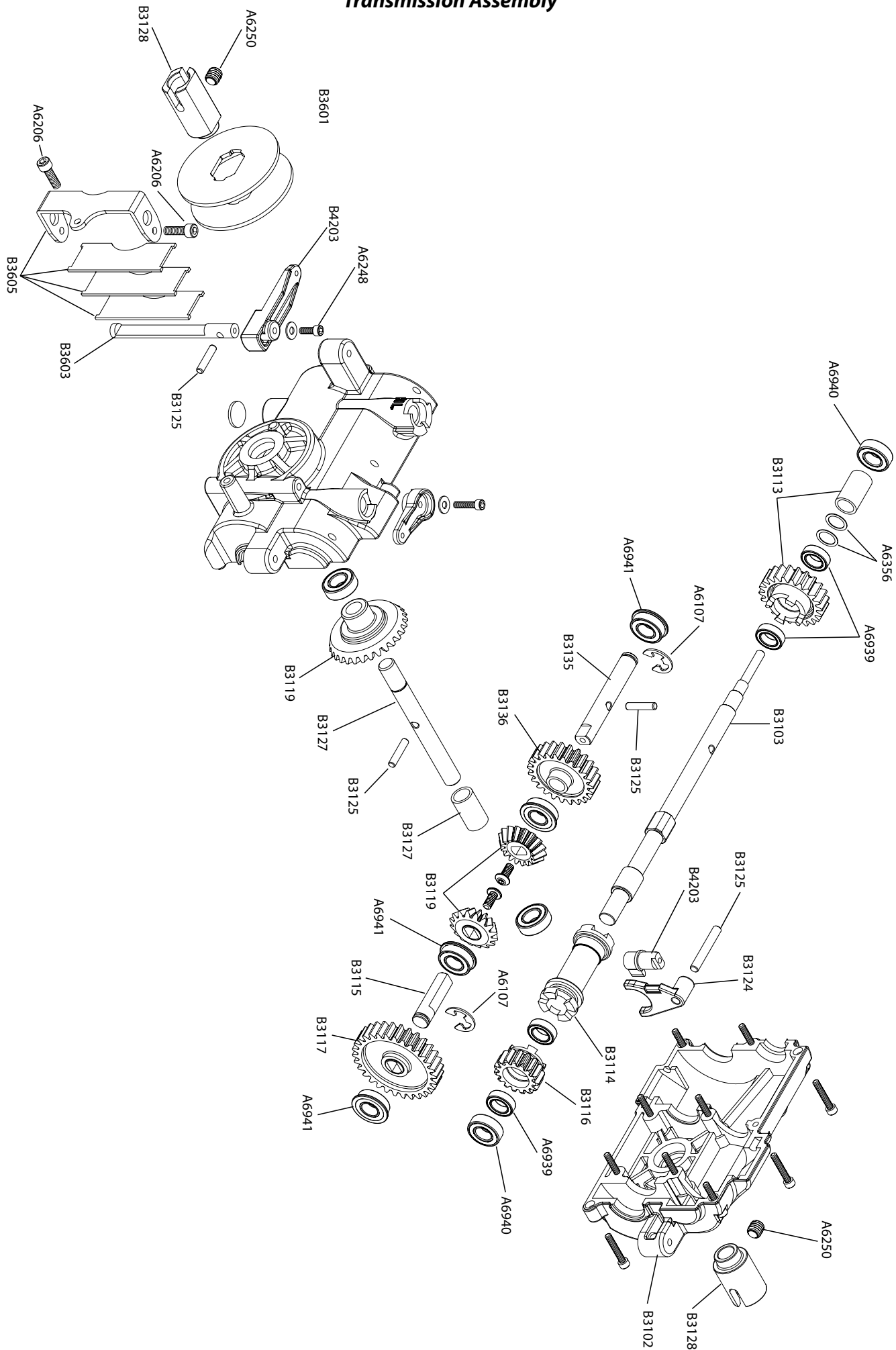
## MISCELLANEOUS ACCESSORIES

LOSA99004	Losi Cargo Bag	\$69.99
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
LOSA99171	Temp-Tuner Temp Gauge & Screwdriver	\$44.99
LOSA99202	Losi-Lok Threadlock (Blue)	\$4.99
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)	

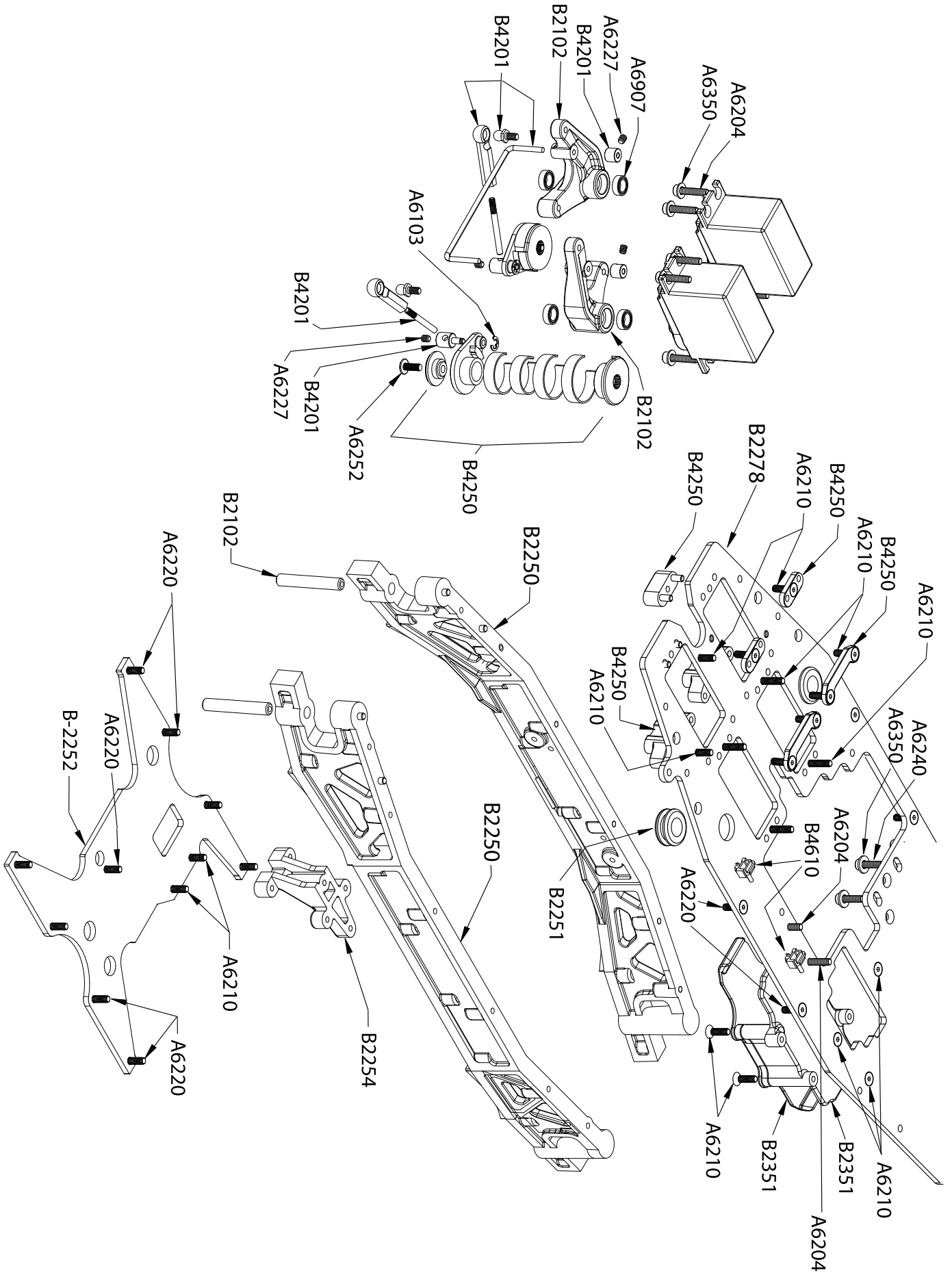
# Transmission Assembly







# Chassis

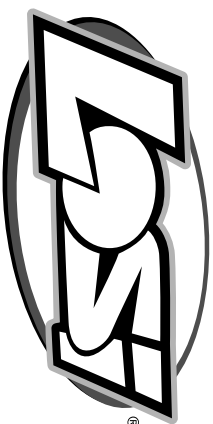
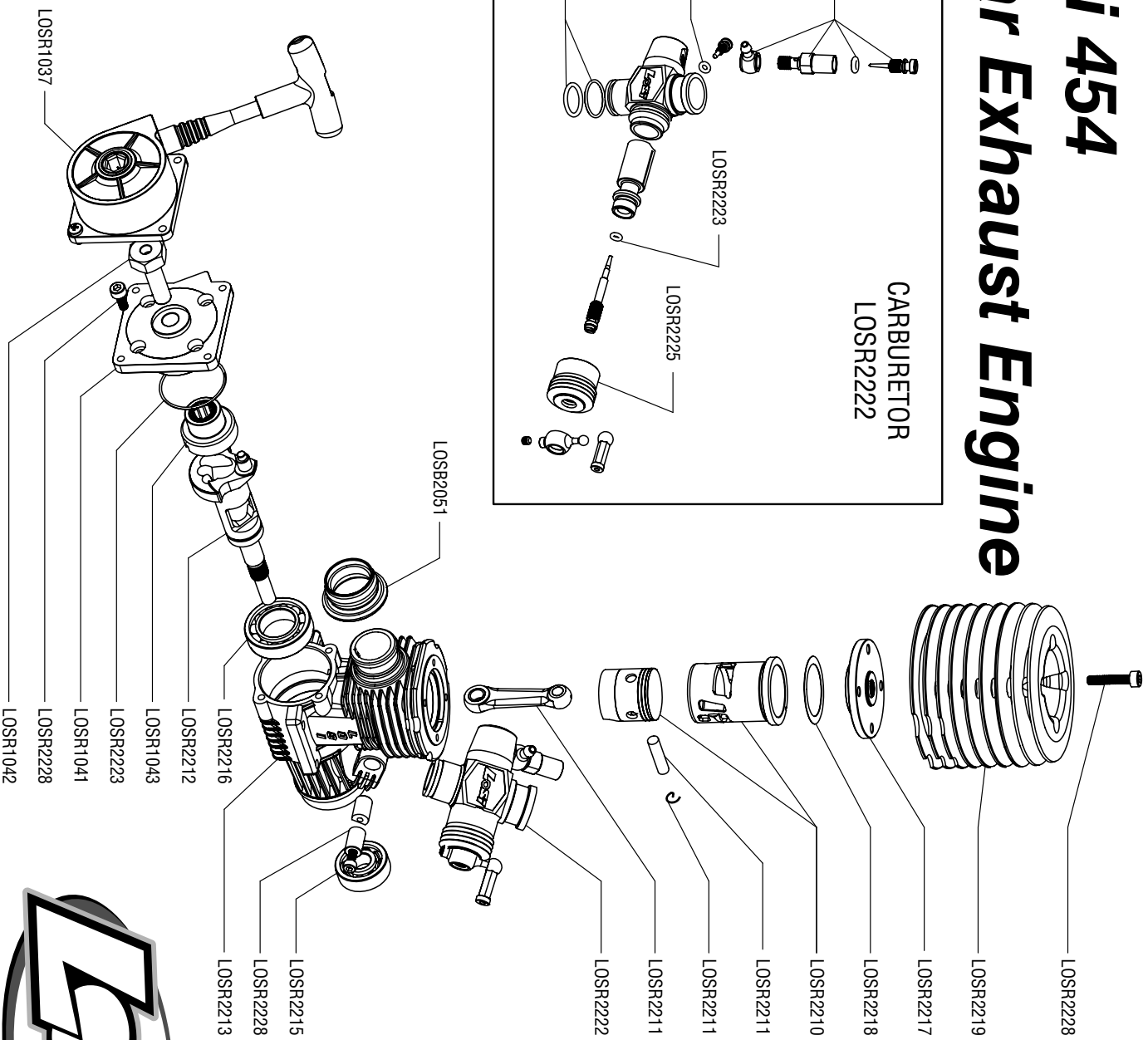
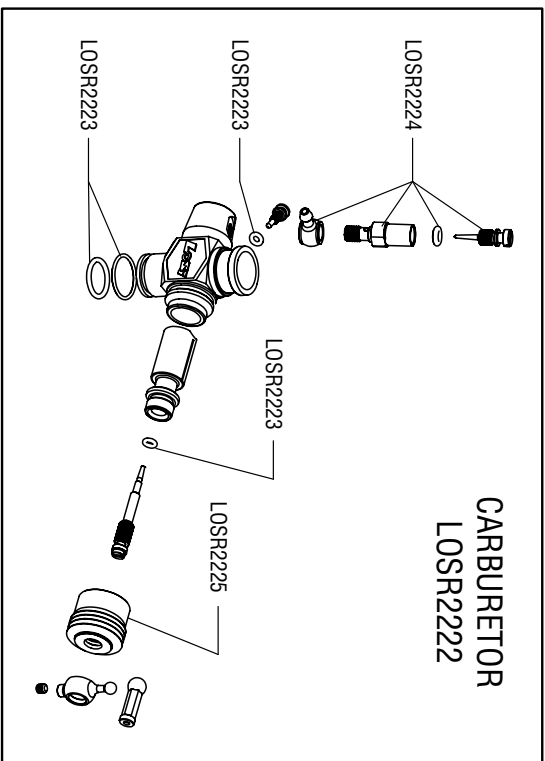








# Losi 454 Rear Exhaust Engine



## Warranty Information

### Warranty Period

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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

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(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

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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

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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

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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

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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

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**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

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**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.**

**United States:**

Electronics and engines 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 or e-mail us at [productsupport@horizonhobby.com](mailto:productsupport@horizonhobby.com) with any questions or concerns regarding this product or warranty.

**United Kingdom:**

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

Horizon Hobby UK  
Units 1-4 Ployters Rd  
Staple Tye  
Harlow, Essex  
CM18 7NS  
United Kingdom

Please call +44 (0) 1279 641 097 or e-mail us at [sales@horizonhobby.co.uk](mailto:sales@horizonhobby.co.uk) with any questions or concerns regarding this product or warranty.

**Instructions for Disposal of WEEE by Users in the European Union**

This product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.



The associated regulatory agencies of the following countries recognize the noted certifications for this product as authorized for sale and use:

UK	DE	DK	NO	SE
FI	EE	LV	LT	PL
CZ	SK	HU	RO	SI
AT	IT	ES	PT	IE
NL	LU	MT	CY	GR