



# Operation Manual

## ***Introduction***

Thank you for choosing the 1/18th Rammunion from Losi. This guide contains the basic instructions for operating your new Mini Monster Truck. While Rammunion is great for first time R/C drivers, it does require some mechanical experience and/or adult supervision for drivers under the age of 12. It is critical that you read all of the instructions, safety warnings, and accompanying printed material in order to operate your model correctly and avoid unnecessary damage. Please take a moment to look these over before running your new Rammunion.



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## **Warning**

An R/C model is not a toy! If misused, it can cause serious bodily harm and damage to property. Operate only in open areas and follow all instructions included with your radio and model.

## **Warranty Period**

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 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 with any questions or concerns regarding this product or warranty.**

### **Safety, Precautions, and Warnings**

As the user of this product, you are solely responsible for operating it in a manner that does not endanger yourself and others or result in damage to the product or the property of others.

Carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable battery packs, etc.) that you use.

- Always operate your model in an open area away from cars, traffic, or people.
- Avoid operating your model in the street where injury or damage can occur.
- Never operate the model out into the street or populated areas for any reason.
- Never operate your model with low transmitter batteries.
- Carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable battery packs, etc.) that you use.
- Keep all chemicals, small parts and anything electrical out of the reach of children.
- Moisture causes damage to electronics. Avoid water exposure to all equipment not specifically designed and protected for this purpose.

This is a sophisticated radio controlled model that must be operated with caution and common sense. Failure to operate your Mini-Monster Baja in a safe and responsible manner could result in damage to the model and property. The Mini-Monster Baja is not intended for use by children without direct adult supervision. Team 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.



## Tools and Items You Will Find Handy

- Soft bristle brush for cleaning
- A 5.5mm nut driver for the wheel nuts.
- A #0 or #1 Phillips screwdriver
- A LOSA99100 .050" Allen Wrench

Note: Use only Team Losi tools or other high quality tools. Use of inexpensive tools can cause damage to the small screws and parts used on this type of model.



## The Radio System

The following is an overview of the various functions and adjustments found on the Rammunion radio system. Since the Rammunion operates on a radio sig that you control, it is important that you please read and understand about all of these functions and adjustments before driving.

## The Transmitter

1. **Steering Wheel:** Controls direction (left/right) of the model.

2. **Throttle Trigger:** Controls speed and direction (forward/reverse) of the model.

3. **Antenna:** Transmits signal to the model.

4. **On/Off Switch:** Turns the power on for the transmitter operation.

5. **Indicator Lights:** Green (top) light indicates adequate battery power. Red (bottom) indicates signal strength.

6. **ST. TRIM:** Adjusts the "hands off" direction of the model.

7. **TH. TRIM:** Adjusts the motor speed to stop at neutral.

8. **Steering Rate:** Adjusts amount front wheels move when the steering wheel is turned left or right.

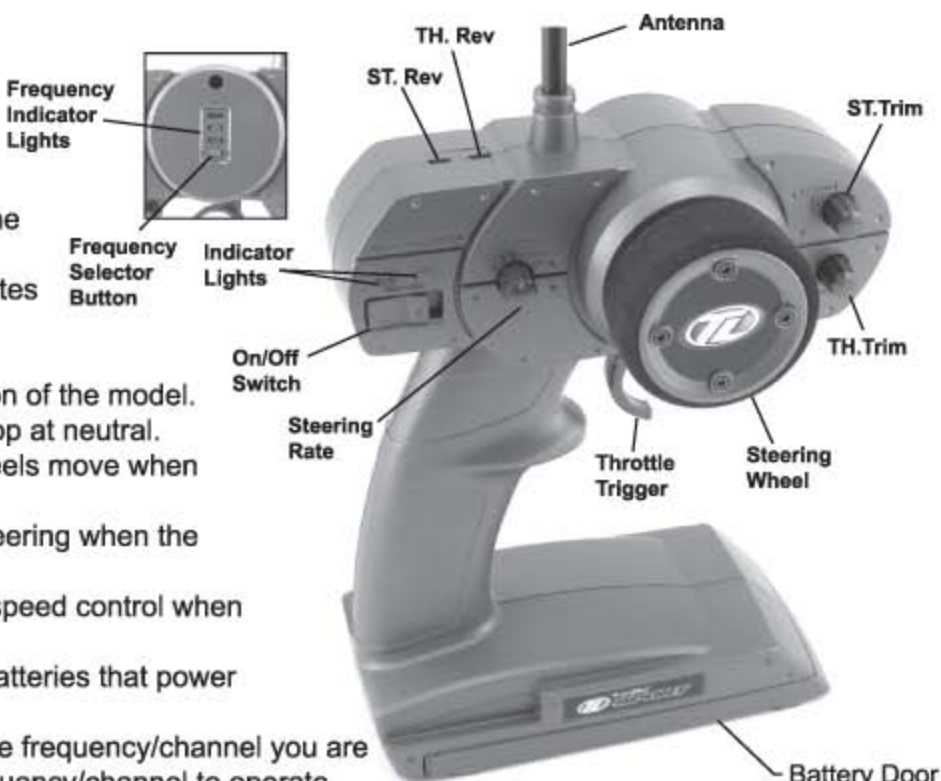
9. **ST. REV:** Reverses the function of the steering when the wheel is turned left or right.

10. **TH. REV:** Reverses the function of the speed control when pulled back or pushed forward.

11. **Bottom Cover:** Covers and holds the batteries that power the transmitter

12. **Frequency Indicator Lights:** Shows the frequency/channel you are on. The receiver must have a matching frequency/channel to operate.

13. **Frequency Selector Button:** Used to choose 1 of 6 available 27MHz frequencies



## The Receiver

1. **Throttle Port:** Where the Electronic Speed Control (ESC) plugs in.

2. **Steering Port:** Where the steering Servo(s) plug in.

3. **Frequency Selector Button:** Used to program the desired frequency/channel.

4. **Frequency Indicator Lights:** Shows what frequency/channel is being received.

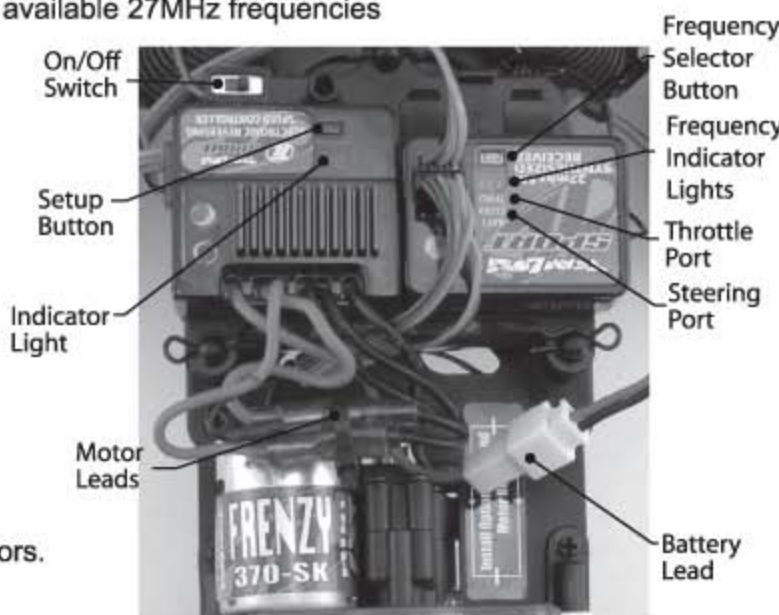
## The Electronic Speed Controller (ESC)

1. **On/Off Switch:** Powers the receiver and ESC.

2. **Setup Button and Indicator Light:** Used for re-setting the ESC.

3. **Battery Lead:** Connect to the battery pack for power.

4. **Motor Leads:** Connects to the wire leads from the motors.





## Changing Frequencies/Channels

The Rammunion radio operates on 27MHz and has 6 different frequencies – often referred to as “channels” available. This allows you to operate without interference while up to 5 other models on 27MHz are also operating. Simply put, a frequency is like a TV channel. The transmitter you hold in your hand is like the TV station and the receiver in the Rammunion is like your TV at home that must be set to the correct channel to receive the signal your transmitter is sending. Unlike most radio systems, the Rammunion features a “synthesized” system that does not require crystals to be physically changed to select the channel you wish to operate on. Both the transmitter and the receiver must be set to the same frequency/channel for the model to operate correctly. This can be easily checked by noting the colored LED’s (lights) on the top of the receiver and the back of the transmitter. These should always be the same on both or you will not have control of the model. Always program the transmitter first then the receiver. To select a frequency, follow the five easy steps below.

1. Turn on the transmitter and/or receiver. Note that both should display the same light(s).
2. Locate the frequency selector button.
3. Press the selector button until the desired frequency light(s) are illuminated.
4. Repeat for the receiver if necessary.
5. Double-check to make sure both the transmitter and receiver have the same LED’s (lights) on.

### Frequency/Channel Guide

Channel/Color	Frequency	LED Indicators
Ch. 1 (Brown)	26.995MHz	Red (top) only
Ch. 2 (Red)	27.045MHz	Yellow (middle) only
Ch. 3 (Orange)	27.095MHz	Red & Yellow (top & middle)
Ch. 4 (Yellow)	27.145MHz	Green (bottom) only
Ch. 5 (Green)	27.195MHz	Red & Green (top & bottom)
Ch. 6 (Blue)	27.225MHz	Yellow & Green (middle & bottom)

NOTE: A frequency guide sticker is included with your Rammunion for use on the back of the transmitter (if desired).

## Re-Setting the ESC

The ESC comes from the factory pre-set and ready for use. If for some reason you should need to re-set the ESC, used the following instructions:

1. Turn on the transmitter and ESC. Press the set-up button -- **both** the **RED** and **Green** LED’s will come on.
2. Pull the throttle trigger all the way back (full speed) and press the set-up button once -- **only** the **GREEN** LED will come on.
3. Push the throttle trigger full forward (brake/reverse) and push the set-up button once -- **only** the **RED** LED will come on.
4. Let the throttle trigger return to the neutral (center) position and press the set-up button once more to save the program and exit set-up mode -- **only** the **GREEN** LED will be on.

## NOTES

- A:** If the receiver does not receive a signal from the Transmitter, the ESC will not enter the Program mode.
- B:** While in Program mode, the motor will not run.
- C:** If the set-up button is not pressed for 20 seconds while in the Program mode, the ESC will exit the Program mode and the data will be saved.

## Chassis Tuning

The Rammunion has several adjustments available to you for tuning the performance for your needs. Although there are multiple shock positions and camber link locations provided, as noted above we have built the model with the best overall settings. The following are simple adjustments and easily maintained settings that will assure proper operation and performance. It is advised that when making any adjustment you do so in small increments and always check for other parts of the chassis that may be affected.

## Slipper Adjustments

The slipper is a key component of the drivetrain that is designed to absorb sudden or large impacts that would otherwise stress various drivetrain parts. You should never run the Rammunion with the slipper locked (all the way tight). The slipper can also be used as a tuning device for extreme conditions. Running the slipper so it slips for a few inches upon initial acceleration will help the overall drivability. If the surface is very slick, this will allow the tires to establish some grip without spinning. In extremely good traction conditions it will help keep the front tires on the ground and actually provide better acceleration and steering.

1. Hold the spur gear with your thumb and using the wrench included, tighten the slipper adjustment nut until relatively tight. Do not try to torque it as tight as possible - only until you feel it stop turning.
2. While still holding the spur gear, back off the adjustment nut one full turn (marking one flat on the adjustment nut with a marking pen makes it easy to see how much the nut has turned).
3. Place the Rammunion on the ground -- preferably carpet or asphalt and test the acceleration by rolling it backwards and pulling the throttle trigger.
4. If there is any slippage, turn the adjustment nut clockwise one flat and retest.
5. Replace the gear cover.





### Steering Rate

Your transmitter is equipped with a steering rate control to the left of the steering wheel. This advanced feature, usually found only on competition type radios, allows you to adjust the amount the front tires move when you turn the steering wheel. This is really helpful when you are on slick as well as high traction surfaces. If your Raminator turns too sharply and/or spins out easily, try turning the steering rate down by rotating the knob counter-clockwise (to the left). For sharper or additional steering try turning the knob clockwise (to the right).



### Toe-In/Toe-Out

This is the relationship of the left and right side tire to one another. Ideally you want the front of the tires to be pointed inward toward each other just slightly when viewed from above. This makes the model track straight and stable. This is controlled with the threaded steering rods on either side. As you make them longer you will increase the toe-in. To create toe-out, you will need to trim the inside end of the ball cup to allow for adjustment.



### Ride Height

This is the height the chassis sits and runs at. There are spring spacers included with the Rammunition that, when installed between the shock top and spring, will increase the pre-load on the spring and raise the chassis. You may want to try this when running on extremely rough surfaces.

**Cleaning:** Performance can be hindered if dirt gets in any of the moving suspension parts. Use compressed air, a soft paintbrush, or toothbrush to remove dust or dirt. Avoid using solvents or chemicals as they can actually wash dirt into the bearings or moving parts as well as cause damage to the electronics.

### Rebuilding the Front and Rear Differentials

The gears in the differentials will wear over time. The same is true for the outdrives, driveshafts, and axles. We suggest using a small rag or paper towel to lay out the parts you remove, to make it easier to reassemble.

#### Step 1.



Remove upper bumper mount screw.

#### Step 2.



Remove 4 chassis screws (1). Loosen chassis screws (2) enough to allow the bumper to slide out from under the chassis plate. **NOTE: If you are rebuilding the front diff, skip to step 6.**

#### Step 3.



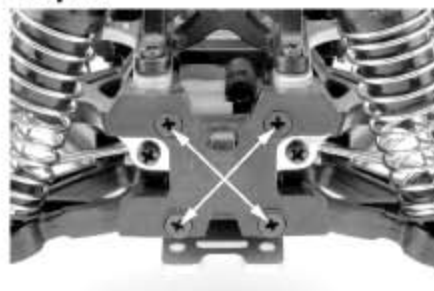
Using pliers, remove tie rod end as pictured.

#### Step 4.



Remove both brass ball studs as pictured above.

#### Step 5.



Remove 4 cover screws and remove cover.

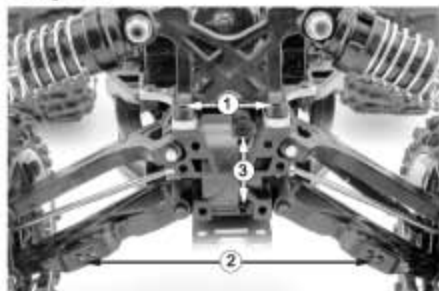
#### Step 6.



Remove both screws pictured

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**Step 7.**



Remove both shock tower screws (1). Remove lower shock mounting screws (2). Remove both diff cover screws (3).

**Step 8.**



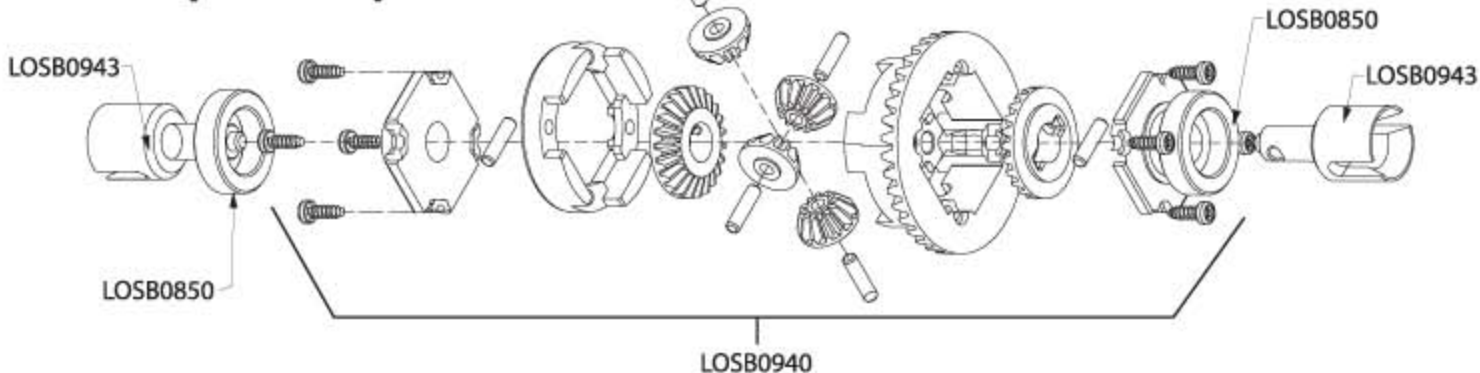
Using a small flat head screwdriver, carefully pry and remove the diff case cover.

**Step 9.**



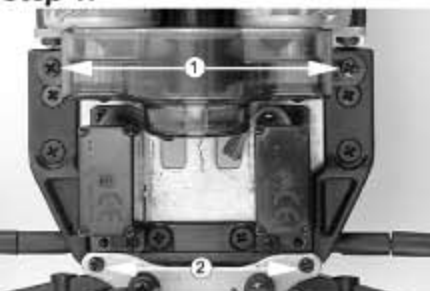
Remove complete diff assembly.

## Complete Exploded View of Front or Rear Differential



### Rebuilding the Center Transmission

**Step 1.**



Remove both gear cover screws (1). Remove both front top plate screws (2).

**Step 2.**



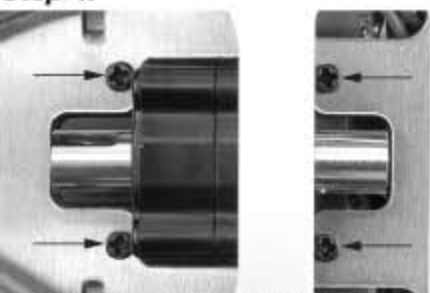
Remove both rear top plate screws (1).

**Step 3.**



Remove 4 front lower chassis plate screws (1). Remove 4 rear lower chassis plate screws (2).

**Step 4.**



Remove all 4 transmission mounting screws.

**Step 5.**



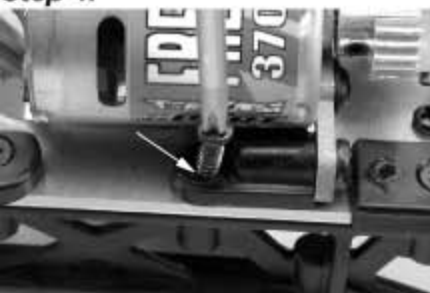
Slide the complete front end assembly out until the drive shaft slides out.

**Step 6.**



Slide the complete rear end assembly out until the drive shaft slides out.

**Step 4.**



Remove transmission side mounting screw from each side. Once the screws have been removed, the transmission can now be removed from the chassis.







### Changing the Spur Gear

If you are changing the size of the spur gear and/or pinion, you will have to loosen the two screws that attach the motor to the plate and follow the directions for adjusting the gear mesh.

1. Remove the gear cover. Use the included wrench to remove the slipper adjustment nut by turning it counter-clockwise. Carefully remove the nut, washers and plastic outer slipper plate.
2. Remove the old spur gear and install the new one of the same size.
3. Replace the slipper plate, washers and nut. See "adjusting the slipper" for proper adjustment directions.



### Changing the Pinion Gear

The Rammunition includes an optional 20tooth Pinion gear. This gear can be installed for more torque to hill climb or increase acceleration. If adding the optional motor, you must always use the same spec of motor and size of pinion gear on both motors. At this point both motors should be slightly loose on the motor plate.

1. Use the small Allen wrench included to loosen the setscrew on the pinion gear. Slide off the pinion and replace with the new size. If the new pinion does not slide on and line up with the spur gear, pull the motor away from the spur for more clearance.
2. When aligned properly with the spur gear, tighten the setscrew on the pinion.
3. While looking closely at the teeth of the spur gear and one pinion, push the motor toward the spur until you can see they are just starting to mesh and slightly snug the mounting screws for that motor. Repeat this step if you install the optional second motor.
4. Match and plug in the male Red and Black leads into the female leads on the speed controller.



Parts needed to install optional second motor.

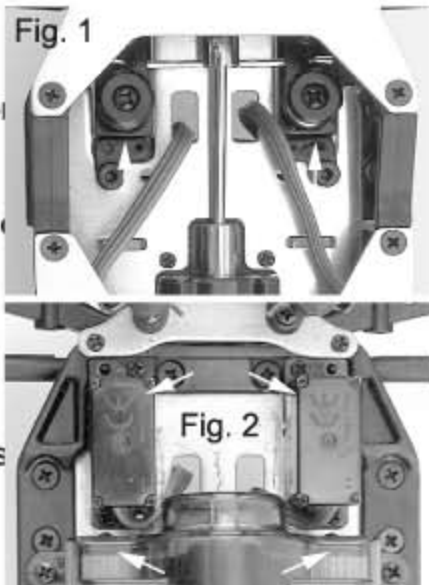
LOSB0835 "Frenzy 370" Mini LST Motor, LOSB0919 Complete Screw Kit, LOSB0969 20T Pinion Gear Set (2) or LOSB0970 22T Pinion Gear Set (2)

### Setting the Gear Mesh

1. Insert a small strip of common notebook paper between the pinion and spur gear by feeding it into the gears as you slowly turn the spur gear with your finger.
2. Lightly push the motor in toward the spur (if the motor will not move freely, loosen the top screw slightly) until it is resting solidly against the spur and tighten both mounting screws.
3. Remove the paper and test the mesh by holding your finger against the pinion while trying to rock the spur back and forth. There should be a slight bit of movement before the motor is forced to turn over. If not, loosen the motor screws slightly and push the motor away from the spur ever so slightly.
4. Retest the mesh and repeat with the other motor, making sure all motor screws are tight when done.
5. Replace the gear cover or adjust the slipper if you have also changed the spur gear.

### Replacing a Steering Servo

1. Locate and disconnect the servo where it plugs into the receiver harness. There will be two of these, one for the left and one is for the right servo.
2. Turn the Rammunition upside down and with the wheels pointing straight forward, remove the Phillips screw from the center of the servo arm (fig 1.). Set the screw, washer and spring to one side and remove the bell crank.
3. Turn the Rammunition over, remove the small screws at the front and back of the servo (fig 2.). Carefully remove the servo, feeding the servo lead through the chassis noting the proper routing for the new one.
4. Install the new servo connecting and routing the wires like the one you removed. Secure it with the screws at the front and rear.
5. Turn on the radio and remove the servo saver bottom from the removed servo and install it on the new servo, so that the "V-groove" is pointing towards the other servo.
6. Reinstall the bell crank, spring, and washer securing them with the Phillips screw.



# Rammunition Troubleshooting Guide

Doesn't Operate

Battery not charged or connected properly  
Radio transmitter and receiver not on same frequency  
ESC Switch not "on" or broken  
Transmitter not "on" or low battery

Motors run but wheels don't move

Slipper too loose  
Gears stripped in center gearbox  
Gear stripped in front and/or rear gearbox  
Spur gear stripped  
Pinion gear setscrews loose  
Drive pins in axles/wheels missing

Steering doesn't work

Servo plug improperly installed in receiver or unplugged  
Bind in steering  
Servo or receiver damaged

Won't turn in one direction

Servo gears broken  
Steering linkage broken or bound

Motors do not run

Motor plugs loose  
Motor wire broken  
Motors bound or broken  
ESC damaged

ESC gets hot

Motors over-gearred  
Shorted Motor  
Driveline bound / Dirty

Poor run time / sluggish acceleration

Batteries low or shorted  
Charger not allowing full charge  
Slipper adjustment set too loose (slipping too much)  
Motors worn out  
Driveline bound / Dirty  
ESC needs to be programmed

Poor range / glitches

Transmitter batteries low  
Transmitter antenna loose  
Receiver antenna broken  
Battery pack in truck low  
Loose wires or plugs  
Transmitter and receiver not on same frequency

Slipper won't adjust

Drive pin missing in shaft  
Spur gear face worn out  
Adjuster nut stripped



