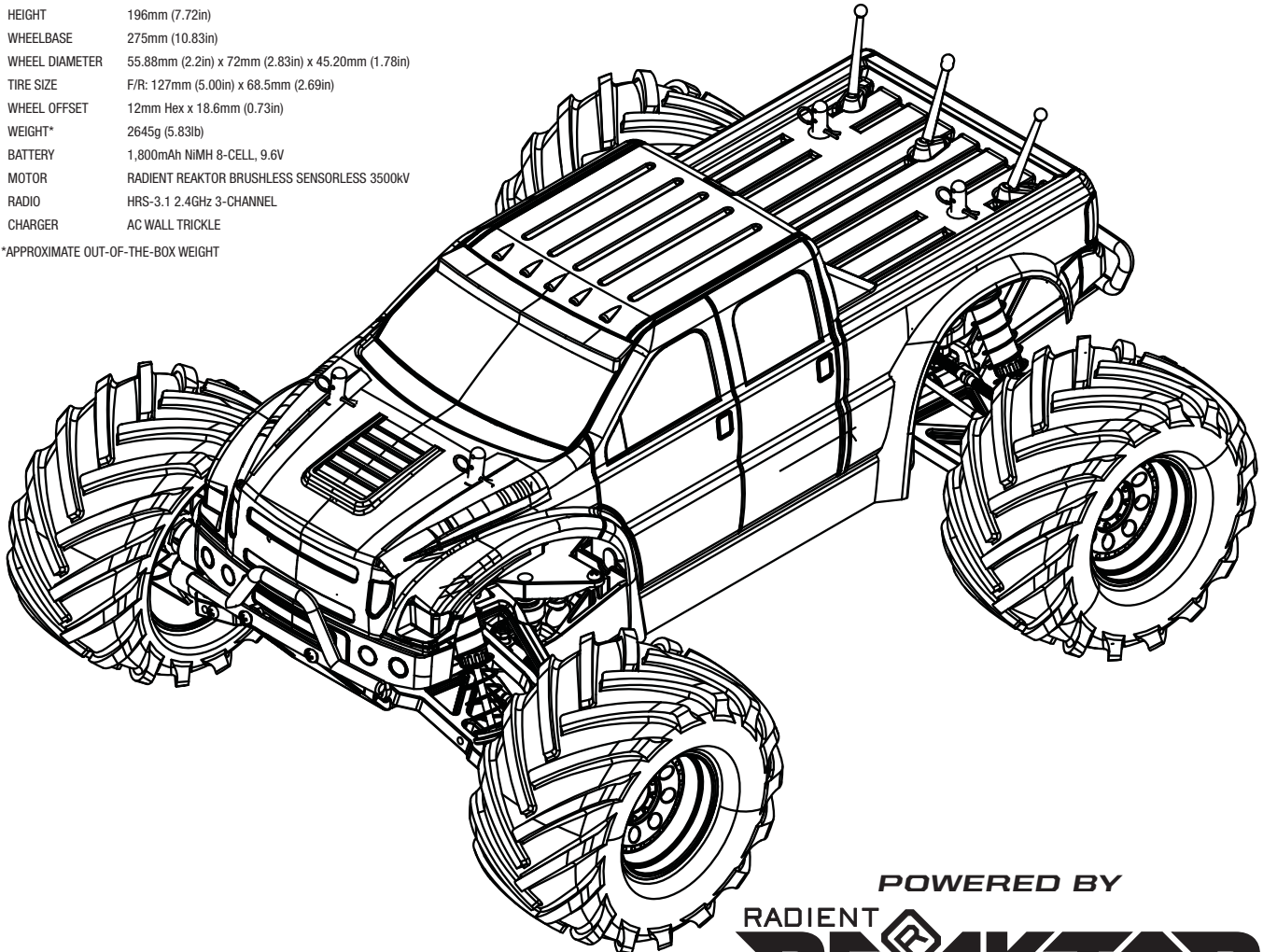


FOR HLNA0248

OWNER'S MANUAL AND EXPLODED VIEWS

LENGTH	422mm (16.61in)
WIDTH	337mm (13.27in)
HEIGHT	196mm (7.72in)
WHEELBASE	275mm (10.83in)
WHEEL DIAMETER	55.88mm (2.2in) x 72mm (2.83in) x 45.20mm (1.78in)
TIRE SIZE	F/R: 127mm (5.00in) x 68.5mm (2.69in)
WHEEL OFFSET	12mm Hex x 18.6mm (0.73in)
WEIGHT*	2645g (5.83lb)
BATTERY	1,800mAh NiMH 8-CELL, 9.6V
MOTOR	RADIANT REAKTOR BRUSHLESS SENSORLESS 3500kV
RADIO	HRS-3.1 2.4GHz 3-CHANNEL
CHARGER	AC WALL TRICKLE

*APPROXIMATE OUT-OF-THE-BOX WEIGHT



POWERED BY
RADIANT
REAKTOR

- Entire contents ©2013 Helion RC
- Before using your product, review all documentation and inspect the products carefully. If for some reason you decide it is not what you wanted, then do not continue with unpacking, setup or operation of your product. Your local hobby dealer cannot accept a product for return or exchange after partaking in actions that produce wear and tear.
- Read, understand and follow all instructions and accompanying material carefully before operating or assembling your vehicle to prevent serious damage to your vehicle. Failure to complete these tasks properly or intentional aversion to the content will be considered abuse and/or neglect.
- Product specifications are subject to change without notice. Due to ongoing development, the actual product may vary from images shown.
- This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
- This product is not a toy! (14+) Recommended for ages 14 and up. Adult supervision required for ages under 18 years old. Contains small parts, keep out of reach of children 3 years of age and younger.



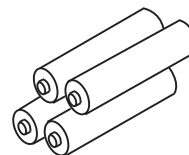
PACKAGE CONTENTS

1. [1] Invictus 10MT
2. [1] 1,800mAh 8-Cell NiMH battery pack
3. [1] HRS-3.1 2.4GHz 3-Channel transmitter
4. [1] 8-Cell Wall charger
5. [1] 4-Way cross wrench
6. [1] 1.5mm L-wrench
7. [1] 2.5mm L-wrench
8. [1] Bag extra parts
9. [1] Documentation package with exploded view



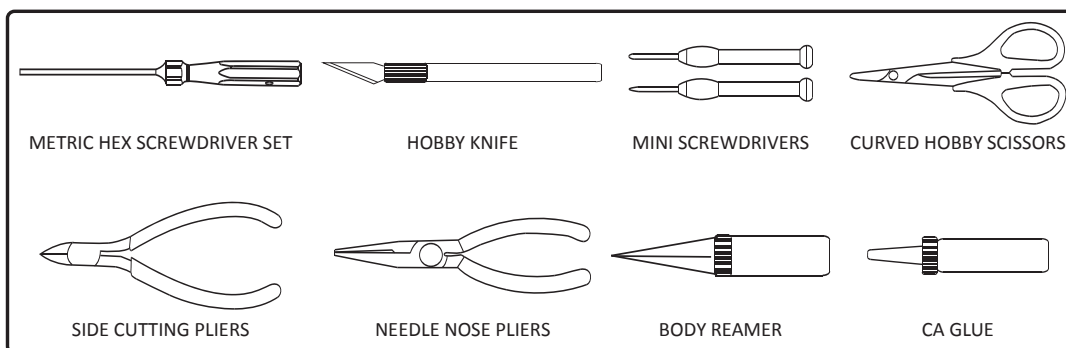
ITEMS NEEDED TO COMPLETE

1. [4] 1.5V AA type alkaline batteries for transmitter
 - a. To help the environment, consider replacing the disposable batteries for this transmitter and for other household electronic items with rechargeable batteries. Visit your local hobby dealer for hobby grade chargers and batteries.
 - b. Patience while reading thoroughly through all of the instructions and guides that will help ensure you get the most out of your new Helion RC product.

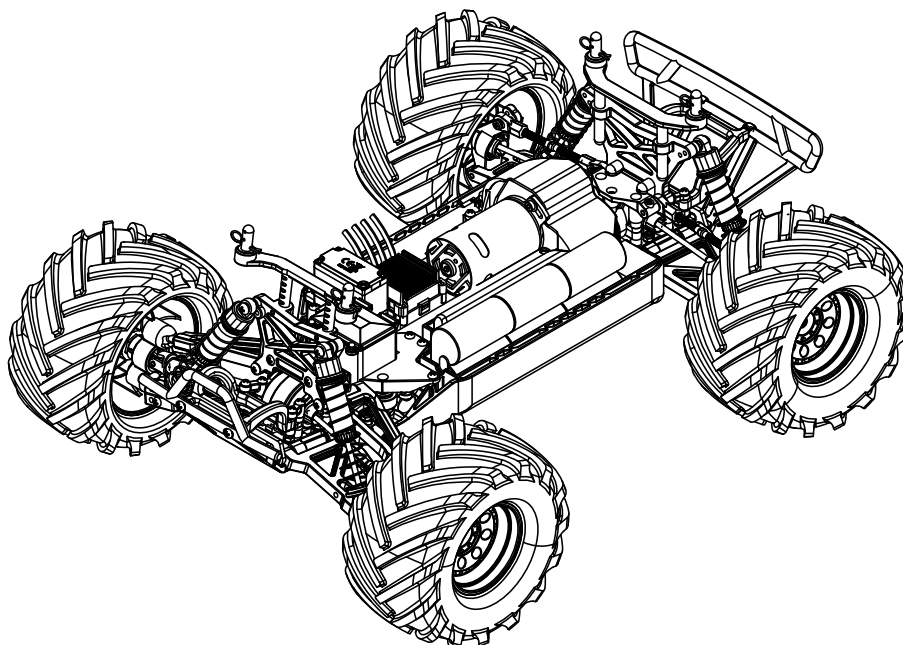


RECOMMENDED TOOLS (NOT INCLUDED)

Please use caution and follow the manufacturer's recommended operating instructions for these items and always wear eye protection.



INTRODUCING THE INVICTUS 10MT





FEATURES OF THE INVICTUS 10MT



- Steel ring and pinion gear type four wheel drive drivetrain.
- Radiant Reaktor brushless waterproof ESC and motor.
- Waterproof 6kg High Torque servo.
- Water Resistant receiver box.
- HRS-3.1 2.4 GHz 3-Channel radio system.
- 1,800 mAh 9.6V 8-Cell NiMH rechargeable battery pack with Tamiya-style plug.
- Four wheel independent suspension.
- Planetary metal gear differentials.
- Rubber sealed ball bearing supported drivetrain.
- Adjustable, oil filled, coil-over shock absorbers with bladders.
- Adjustable suspension, camber, and front toe.
- Pivot ball style front suspension with upper arm.
- Stamped aluminum hinge pin braces.
- Dual bell crank steering with servo saver.
- Aluminum center drive shaft.
- Multi-purpose battery tray and straps, LiPo and NiMH hump ready.
- Hex drive wheels
- Chevron style swamper tires and realistic wheels.
- Full size pickup body with flags.
- Adjustable body mounts.
- LiPo compatible and programmable ESC.

GETTING STARTED



1. Remove the body and battery from vehicle to prepare for charging.
 - a. Read charging instructions and understand all warnings and cautions before proceeding. ***This product is not a toy and should not be charged, operated, or maintained without supervision of an adult.***
 - b. Now is a good time to start charging so you can be up and running as soon as possible but remember to return to this guide in the presence of the charging battery, *remembering never to leave the battery unattended while charging.*
2. Install the [4] AA type alkaline batteries into the transmitter.
3. Install the fully charged battery into the vehicle, be sure to straps around the battery and secure the hook and loop material to keep the battery in place
4. Ensure the motor is plugged into the ESC.
5. Ensure the switch is in the OFF position and connect the battery to the ESC.
6. Read and understand transmitter cautions and setting instructions before use.
 - a. Confirm settings for steering and throttle trim.
 - b. Confirm ESC settings for the battery you will use (pre-programmed for included NiMH battery with reverse enabled)
7. Install body with 4 supplied clips; turn your equipment ON (radio first!) and enjoy!

CHARGING THE BATTERY



- Never leave the battery unattended while charging and never operate the charger without adult supervision.
- Never charge a warm battery, always allow the battery to cool to room temperature before charging.
- Never drop the charger or battery and do not attempt to charge a damaged battery.
- Inspect the battery and charger before use. Never use a battery or charger if the wire or connector has been damaged or if the battery has experienced a short.
- Incorrect use of the battery, connections, or charging equipment can cause personal injury or property damage.
- Never allow batteries or charger to come in contact with moisture at any time.
- Stop charging immediately if the battery or charger becomes hot or changes form during use.

NOTE: Only use chargers designed for use with NiMH batteries for the RC industry, using the supplied connector. Use of other (non-RC specific) chargers or connectors can permanently damage the battery and/or connected equipment. Genuine NiMH replacement batteries and optional high current connectors are available at your local hobby dealer.

1. Plug the charger into a properly grounded standard AC wall plug.
2. Plug the battery into the charger and place the battery on/in a non-flammable surface/container away from flammable objects.
3. The LED on the charger should turn from RED to GREEN when charging.
4. A fully discharged battery should charge in approximately 4-5 hours.
 - a. **Caution: Periodically monitor the temperature of the battery while charging, if the temperature exceeds 120°F (49°C), disconnect the battery from the charger and allow it to cool before reconnecting.**
5. Unplug the battery from the charger when the battery is slightly warm to the touch, and the LED has changed back to solid RED, indicating the battery has been charged.
 - a. NOTE: Using a peak detection charger is recommended and will provide you with a faster and better charging experience. We recommend the Origin NiMH or Primal Multi-Chemistry chargers by Radiant RC.
 - b. **Warning: Never charge the included battery at a charge current exceeding 2A.**
6. Remove charger from wall plug.



PRECAUTIONS WHEN USING THE HRS-3.1 RADIO SYSTEM

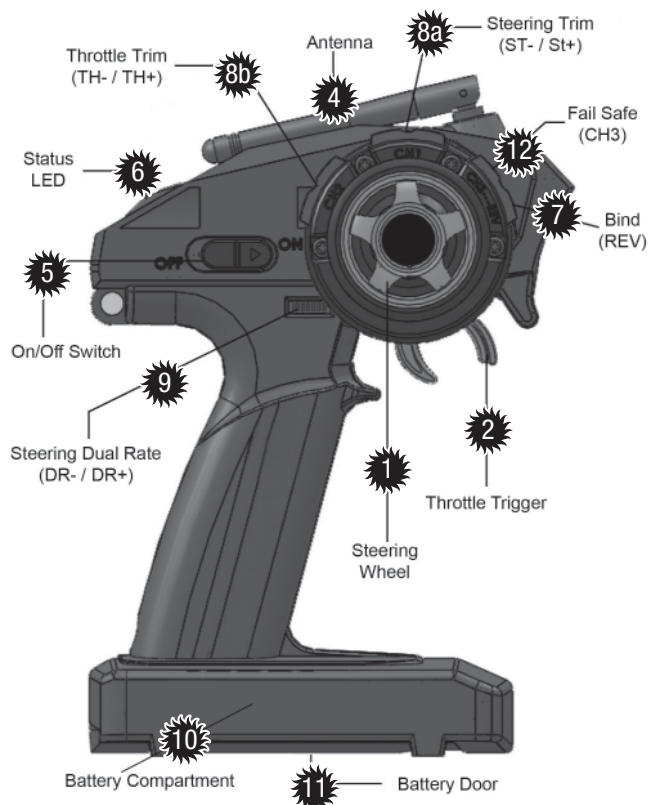
- Your model can cause serious damage or injury so please use caution and courtesy when operating your model.
- Do not expose the radio system to water or excessive moisture.
- As a safety precaution, perform all transmitter and receiver adjustments with the vehicle's wheels off the ground. This ensures the complete control over the vehicle at all times during adjustments.
- Ensure your batteries (both transmitter and vehicle) have been properly charged for use with your model.
- Keep track of the time the system is in use so you will know how long you can safely operate the transmitter batteries.
- Check all servos and electrical connections prior to each run.
- Do not operate your model near traffic, bystanders, parking areas, or any other area that could result in injury to people or damage to property.
- If at any time during the operation of your model you observe any erratic or abnormal behavior of your model, immediately stop operation and bring the mode to a safe stop in a safe location to diagnose the problem.
- Always power on your transmitter before turning your vehicle on.
- If you have little or no experience operating R/C models, we strongly recommend you seek the assistance of your local hobby dealer.

R/C models are an extremely fun hobby, but safety should never be ignored or taken lightly. Always take caution when operating your model as damage to property and injury can result from careless operation. Please consult your local hobby dealer with any questions or troubleshooting issues. And of course don't forget to have fun, you deserve it after reading through all of these safety tips!

INTRODUCING THE HRS-3.1 2.4GHz RADIO SYSTEM

Please read and understand the following instructions for your new radio system prior to operation to ensure the safest and most enjoyable experience.

Features:



1. Steering wheel: controls left/right motion (designed to be operated with right hand).
2. Throttle trigger: controls forward/reverse/brake motion (designed to be operated with left index finger).
3. Handle: For holding the transmitter (designed to be held with left hand).
4. Antenna: Transmits signal to the receiver located in the vehicle.
 - a. Flip up when transmitter in use. Folded position is only for storage.
5. ON/OFF Switch: Turns the power ON/OFF for the transmitter only.
6. Multifunction red Indicator LED:
 - a. Power indicator
 - b. Low battery voltage warning, batteries should be replaced/recharged before continued use when flashing.
7. REV/Bind:
 - a. Use to reverse servo/channel operation.
 - b. Use to put the transmitter into binding mode.
8. Digital Trim: All switches are digital so there is no need to readjust trim position for different models after initial setup.
 - a. Steering: Controls the "hands-off" left/right direction of the vehicle.
 - b. Throttle: Adjusts the motor speed to STOP when trigger is in "hands-off" (neutral) position.
9. Dual Rate Adjustment Switch: Adjusts total travel of servo
10. Battery compartment: houses [4] AA batteries for powering the transmitter. Also has connector for rechargeable NiMH battery pack.
11. Battery door: Closes the battery compartment, containing the AA batteries or rechargeable battery pack.
12. Fail Safe setting and Channel 3 toggle.



HRS-3.1 BINDING AND FAIL SAFE SETTING



Binding the Transmitter and Receiver:

The process of allowing communication to occur between a 2.4GHz transmitter and receiver is called “binding” (sometimes referred to as “matching” or “pairing”). The radio system included with your product comes pre-configured and bound from the factory. In the event your system loses binding, one of the components has been replaced, you will need to bind the transmitter and receiver. Follow the below steps for binding your radio system. Always ensure both transmitter and receiver batteries are fully charged or new when performing this process for best results.

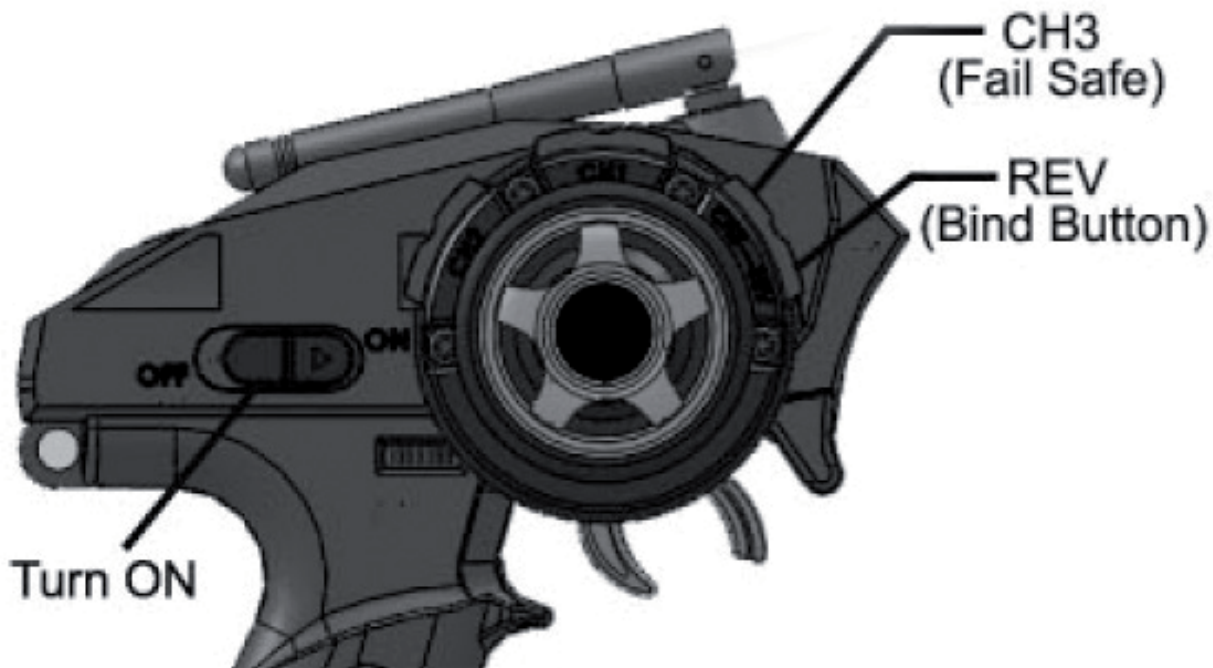
NOTE: AS A SAFETY PRECAUTION, PERFORM THE BINDING PROCESS WITH THE VEHICLE'S WHEELS OFF THE GROUND.

1. With the transmitter in close proximity but not closer than 1ft to the receiver, turn on the transmitter first, then the vehicle. The LED on the receiver will blink, indicating that the receiver is not bound to a transmitter that is on.
2. With the transmitter OFF, hold the REV/BIND button and turn the power ON to put the transmitter into binding mode.
3. Push the button on the receiver once, the LED will start to blink faster indicating it is searching for a transmitter to bind with. The transmitter will automatically search and bind to the receiver. This may take up to 10 seconds.
4. Once the transmitter and receiver are bound together, the receiver's LED will turn solid red. If the receiver's LED does not turn solid red, turn off both the transmitter and receiver and repeat steps 1-2.
5. Once binding is complete, turn the power off and back on to both the transmitter and receiver.
6. Ensure normal operation of throttle and steering.
 - a. If binding to a different vehicle you may need to reverse the steering channel on your transmitter to work properly.
7. If you experience anything other than normal operation, repeat the process.

2.4 GHz Fail-Safe Adjustment:

NOTE: AS A SAFETY PRECAUTION, PERFORM THE FAIL-SAFE ADJUSTMENTS WITH THE VEHICLE'S WHEELS OFF THE GROUND.

1. Turn the transmitter and receiver ON and move the throttle trigger to the desired position.
2. Press the Fail-Safe button for 5 seconds to program the throttle Fail-Safe setting. It is recommended and common to set the throttle Fail-Safe as Full Brake, i.e. the throttle trigger is pressed completely forward applying full brakes. This ensures that if the receiver cannot receive a signal from the transmitter, the servos or ESC will default to full brake causing the vehicle to stop.
 - a. **NOTE: WITH REVERSE MODE ACTIVE IN THE ESC, THE VEHICLE MAY GO INTO REVERSE THROTTLE INSTEAD OF BRAKE WHEN THE TRIGGER IS PRESSED FORWARD. THIS IS THE CORRECT BEHAVIOUR AND SETTING POSITION. TO PREVENT WHEELS FROM TURING LIKE THIS, SIMPLY APPLY A LITTLE FORWARD THROTTLE, THEN FULL BRAKES, THEN CONTINUE WITH THE FAIL-SAFE SETTING PROCEDURE.**
3. To test the Fail-Safe settings, turn the transmitter off while the receiver is on. The servo/ESC will default to its programmed positions and the motor should not spin (assuming you have set the fail-safe to full brake).





HRS-3.1 CONNECTION AND CONFIGURATION...

Receiver, ESC and Servo Connections:

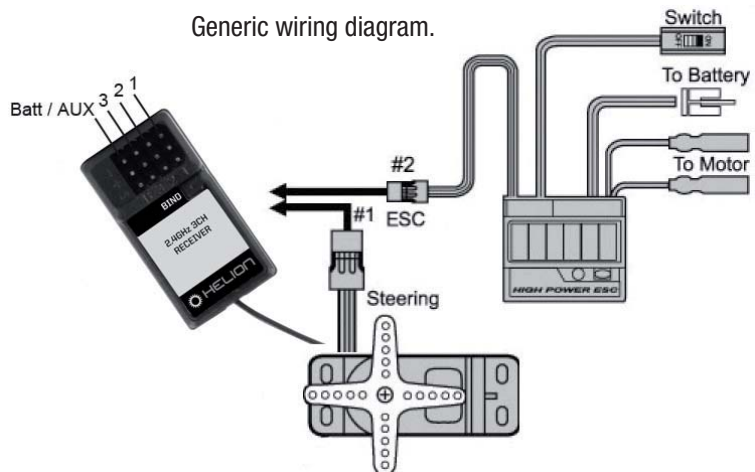
1. Channel 1: Steering Servo
2. Channel 2: ESC (Throttle/Brake)

Note: An easy way to remember this is 1 to turn, 2 to burn (as in burn-out).

Digital Trim Settings:

- Steering Trim
 - › Press the “ST+” or “ST-” button to adjust the neutral position of the steering. A long “beep” will sound
 - › Once the trim setting reaches the limit, a long steady “beep” will sound
 - » Depending on your servo configuration, “ST+” or “ST-” will move the servo either left or right. Use either “ST+” or “ST-” to ensure the vehicle can track straight with no steering input
- Throttle Trim
 - › Press the “TH+” or “TH-” button to adjust the neutral position of the throttle. A long beep will sound
 - › Once the value reaches the limit, a long steady “beep” will sound
 - » The throttle should be trimmed so the vehicle is stationary when no throttle input is applied

Generic wiring diagram.



Transmitter Model Backup:

The data for every function and model programmed to the transmitter is stored in a memory chip that does not require battery backup. The transmitter model data is automatically backed up, and is not lost during battery replacement.

Channel Reverse (REV):

The channel reverse function reverses the direction of operation of the servos or ESC's relative to the transmitter steering and throttle inputs. This function would be used if, for example, turning the transmitter steering wheel right resulted in the model turning left and vice versa. Some ESC's require that the throttle channel be reversed in order to program them properly.

NOTE: AS A SAFETY PRECAUTION, PERFORM THE CHANNEL REVERSE ADJUSTMENTS WITH THE MOTOR UNPLUGGED FROM THE ESC (CAUTION: DO NOT ALLOW THE WIRES TO TOUCH AFTER BEING DISCONNECTED WHILE PERFORMING THIS SETUP PROCEDURE) AND THE WHEELS OFF THE GROUND.

- Steering Reverse:
 - › Turn the steering wheel completely to the left (or right) and press the “REV” button for at least 2 seconds to reverse the Steering (ST) channel.
 - › The transmitter will beep once for confirmation.
- Throttle Reverse:
 - › Pull the throttle trigger completely to full throttle (or push forward for full brake) and press the “REV” button for at least 2 seconds to reverse the Throttle (TH) channel.
 - › The transmitter will beep once for confirmation.

Steering Dual-Rate (ST D/R):

Steering dual-rate allows on-the-fly end point adjustments to both sides (left and right) of the steering servo.

- The default value is 100% of the maximum servo travel. The dual-rate can be set from 20% to 100%.
 - › To increase the dual-rate, press the “DR+” button.
 - › To decrease the dual-rate, press the “DR-” button.

End Point Adjustment:

- Steering End Point Adjustment (EPA)
 - › Use this function to adjust the left and/or right steering angle relative to the steering wheel position.
 - › **CAUTION: BE CAREFUL TO NOT OVER-EXTEND THE STEERING THROW AS IT CAN CAUSE YOUR SERVO TO OVER-WORK AND OVER-HEAT.**
 - › Steering-Left Side Adjustment:
 - » Turn the steering wheel completely to the left and use the “ST+” or “ST-” buttons to adjust the steering angle to the desired location.
 - › Steering-Right Side Adjustment:
 - » Turn the steering wheel completely to the right and use the “ST+” or “ST-” buttons to adjust the steering angle to the desired location.



...HRS-3.1 CONFIGURATION CONTINUED



- Throttle and Brake End Point Adjustment (EPA)
 - › Use this function to adjust throttle and brake travel adjustments.
 - › Throttle Adjustment:
 - » Pull the throttle trigger completely to full throttle and use the “TH+” or “TH-” buttons to adjust the throttle end point to the desired location.
 - › Brake Adjustment:
 - » Push the trigger forward to full brake and use the “TH+” or “TH-” to adjust the brake end point accordingly.

Power Alarm:

- Idle and Low-Battery Alarm
 - › When the steering wheel, throttle trigger, or any button is not operated for 10 minutes while the transmitter is on, a slow beeping alarm will sound to indicate that there has been no action and the power should be turned off and back on to reset the transmitter alarm.
- Low Battery Voltage Alarm
 - › If the transmitter battery voltage drops to 4.5V or less, a slow beeping alarm sounds and the power LED light will blink.

Battery Replacement:

WARNING: Do not attempt to charge non-rechargeable batteries

NOTE: Load the four AA batteries in accordance with the polarity marking on the battery holder.

1. Remove the battery cover from the transmitter
2. Remove the old batteries
 - a. **NOTE: Never mix brands or old/new batteries.**
 - b. Always be sure to be responsible and protect the environment when disposing batteries. Most local hobby dealers provide a FREE battery disposal service.
3. Insert the four new AA batteries according to the polarity markings on the battery holder.
 - a. If using rechargeable batteries, be sure to follow the manufacturer's care and use instructions.
 - b. Rechargeable batteries must be removed from transmitter before charging.
4. Replace the battery cover.
5. Slide the Power switch to the ON position. If the voltage is low, the low battery alarm will sound. If the low battery alarm sounds, check that the batteries are properly inserted and are making sufficient contact.
 - a. Low Battery Alarm.
 - i. An alarm will sound if the transmitter voltage drops below 4.5V. This alarm is meant as a safety feature only. The transmitter should not be operated below 4.5V. If the low battery alarm sounds, stop using your model immediately and turn off both the model's receiver and the transmitter. Replace the transmitter batteries immediately with fresh AA batteries to prevent loss of control of your model.
 - b. Always check the voltage of the transmitter before use.
6. Always be sure to insert the batteries correctly according to the polarity markings, or the transmitter may be damaged.
7. When the transmitter will not be used for 1 week or more, remove the batteries to prevent damage from leaks and corrosion.

Setting the ESC:

The ESC in your Invictus 10MT is pre-programmed to work best with the HRS-3.1 radio system. Use with another radio system may not provide consistent performance and is not recommended for beginners. For detailed setup information refer to the Reaktor brushless setup section of this manual.

Standard operation:

- When looking at the face of the transmitter wheel:
 - › Turning the top of the transmitter wheel to the left from center makes the wheels on the vehicle turn LEFT.
 - › Turning the top of the transmitter wheel to the right from center makes the wheels on the vehicle turn RIGHT.
 - » When driving your vehicle for the first time, take care and notice the direction the car turns when driving away from you vs. towards you. It is best to learn how things work when driving away from your position, *but don't go too far!*
- Pulling the transmitter trigger back towards the handle will make the vehicle accelerate forward.
 - › If instead the tires turn backwards you will need to disconnect and swap 2 wires going to your motor. Any two will do to reverse the motor direction.
- Pushing the transmitter trigger forward away from the handle will have the following affects depending on the location of the trigger prior to pushing it forward.
 - › From a stop at neutral: the vehicle will travel in reverse.
 - › From pulled back: the vehicle will apply brakes to slow the speed.
 - » A second push forward of the trigger will apply brakes again

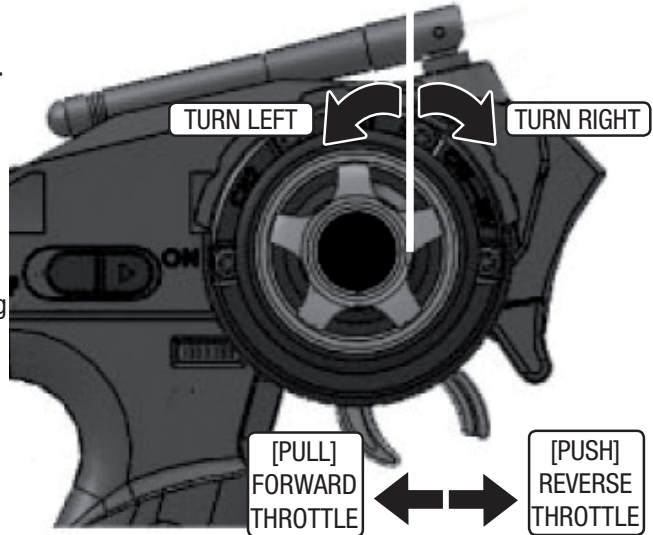


HRS-3.1 STANDARD OPERATION

- » A second push forward on the trigger will apply reverse throttle.
- » **WARNING: Causing the vehicle to make quick transitions from forward/reverse motion to the opposite direction using the throttle control can cause damage to your vehicle and electronics and will void the warranty.**

Using your transmitter for the first time:

1. Turn the transmitter ON and ensure the LED is lit SOLID and it is **not** giving an audible alarm indicating the batteries are supplying adequate voltage for proper operation.
2. Ensure the battery in your vehicle is secured, charged and plugged in with proper polarity and turn your vehicle ON.
3. Checking and setting the throttle trim.
 - a. If the wheels spin in a forward direction when the trigger is in the neutral position, turn down the trim until the motor stops by pressing the TH- button, repeatedly if necessary.
 - b. If the wheels spin in a reverse direction when the trigger is in the neutral position, turn up the trim until the motor stops by pressing the TH+ button, repeatedly if necessary.
 - c. There will be a "dead band" area where the trim can be adjusted a slight amount in either direction and the wheels will not begin to move. It is ideal to have the trim set in the middle of this "dead band".
4. Setting the steering trim.
 - a. With your vehicle and transmitter turned on (and properly responding to transmitter inputs), set the vehicle down on the ground and slowly accelerate in a direction directly away from you. If the vehicle veers slightly either to the left or right, adjust the steering trim by pressing either the ST- (more left) or ST+ (more right) buttons, repeatedly if necessary.
 - b. Reset the vehicle position and re-test; adjust the trim as needed until the vehicle travels in a straight line while the transmitter wheel remains at center location ("hands-off").



RADIENT REAKTOR BRUSHLESS ESC OVERVIEW...

The Radiant Reaktor series brushless motor and ESC is a great power plant to satisfy your need for speed and performance as an entry level brushless system. Though the Reaktor system was engineered for value, performance was definitely a factor. We've included some great features for you to help keep your system running in top shape while keeping your battery upgrade path open since it is compatible with LiPo batteries.

WARNING: ALWAYS ALLOW YOUR MOTOR TO COOL BETWEEN RUNS. EXCESSIVE ACCELERATION AND AGGRESSIVE DRIVING WILL CAUSE YOUR SYSTEM TO GET HOT. EXERCISE GREAT CARE WHEN HANDLING YOUR VEHICLE AFTER RUNNING TO AVOID GETTING BURNED.

Some great features of your new ESC include:

- Water-proof and dust-proof. The ESC can work under water for a short time.
 - › (Please remove the cooling fan when running car in water, and after running, please make the ESC clean and then dry it to avoid oxidation of the copper connectors)
- Specially designed for RC car and truck, with excellent start-up, acceleration and linearity features.
- Compatible with sensorless brushless motors.
- 2 running modes suitable for different applications ("Forward with brake" mode, "Forward/Backward with brake" mode).
- Proportional ABS brake function with 4 steps of maximum brake force adjustment, 8 steps of drag-brake force adjustment.
- 4 start modes ("Punch") from "Soft" to "Very aggressive" to be suitable for different chassis, tires and tracks.
- Multiple protection features: Low voltage cut-off protection for Lipo or NiMH battery / Over-heat protection / Throttle signal loss protection / Motor blocked protection.
- Easily programmed with the "SET" button on the ESC or with the LED Program Card.

ESC TECHNICAL SPECIFICATIONS

Continuous Current	45A	
Burst Current	220A	
Resistance	0.0012 ohm	
Motor Type	Sensorless	
Motor Limit	3650kV	
Battery	NiCd/NiMH	4-9 cells
	LiPo	2-3s
BEC	6V/1A (Linear Mode)	
Program Port	Use cooling fan port	
Dimensions	48.5mm x 38mm x 32mm	
Weight	90g	

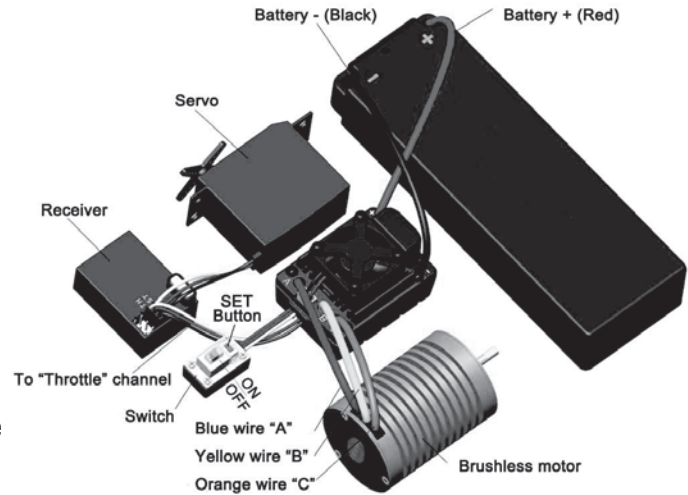


...REAKTOR ESC OVERVIEW AND CALIBRATION...

Your ESC has been pre-installed at the factory but before using your vehicle each time it is good to double check the wiring for damage or loose connections to ensure everything is in working order before use. Refere to the diagram below to check the connections of your electronics system. Some brushless motors such as the Reaktor included with your vehicle use only black wires, this is okay. On sensorless brushless systems the motor will change operating direction when any two of the motor wires are swapped.

The Reaktor ESC is programmed to communicate with you, letting you know its status.

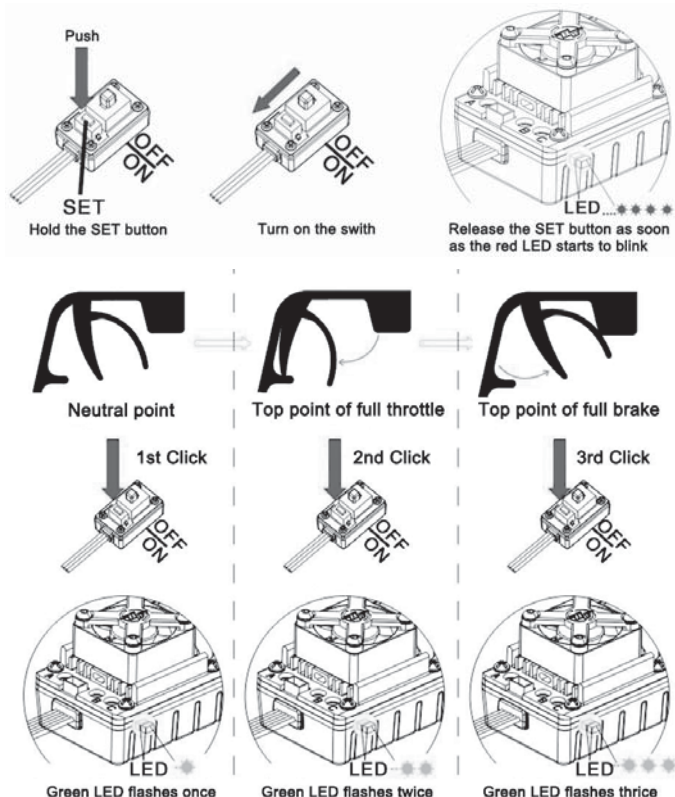
- LED Status:
 - › In normal use, if the throttle trigger is in the neutral range, neither the red LED nor the green LED light up.
 - › The red LED lights when the car is run forward or backward and it will flash quickly when the car is braking.
 - › The green LED lights when the throttle trigger is moved to the full throttle position.
- Alert Tones:
 - › Input voltage abnormal alert tone: The ESC begins to check the input voltage when power on, if it is out of the normal range, such an alert tone will be emitted: "beep-beep-, beep-beep-, beep-beep-" (There is 1 second time interval between every "beep-beep-" tone).
 - › Throttle signal abnormal alert tone: When the ESC can't detect the normal throttle signal, such an alert tone will be emitted: "beep-, beep-, beep-" (There is 2 seconds time interval between every "beep-" tone).
- Protection Functions:
 - › Low voltage cut-off protection: If the voltage of a Lipo battery pack is lower than the threshold for 2 seconds, the ESC will cut of the output power. Please note that the ESC cannot be restarted if the voltage of each Lipo cell is lower than 3.5V.
 - » For NiMH battery packs, if the voltage of the whole NiMH battery pack is higher than 9.0V but lower than 12V, it will be considered as a 3S Lipo; If it is lower than 9.0V, it will be considered as a 2S Lipo. For example, if the NiMH battery pack is 8.0V, and the threshold is set to 2.6V/Cell, it is considered as a 2S Lipo, and the low-voltage cut-off threshold for this NiMH battery pack is $2.6 \times 2 = 5.2V$.
 - › Over-heat protection: When the temperature of the ESC is over 105 degrees Celcius for 5 seconds, the ESC will cut off the output power.
 - › Throttle signal loss protection: The ESC will cut off the output power if the throttle signal is lost for 0.2 second.



Throttle range calibration:

Hold your transmitter approx 1ft away while setting.

1. Turn Transmitter ON first (transmitter should always be on if ESC is ON).
2. Ensure your Throttle channel (Ch. 2) on your transmitter is set to "Reverse".
3. Adjust both Throttle and Reverse/Brake EPA settings to 100%.
4. With the ESC OFF, press and hold the Set button near the switch and turn the ESC ON to enter setup mode. Release the button as soon as the LED begins to flash.
5. Without touching the trigger, press button to set the neutral position, GREEN LED will flash 1 time.
6. Pull/hold full throttle, press the button again, release the trigger, GREEN LED will flash 2 times.
7. Push/hold full brake/reverse, press the button again, GREEN LED will flash 3 times. Release trigger.
8. Switch ESC OFF and back ON to complete setup.
9. Check the ESC operation to ensure forward throttle is actually forward, if not, switch any two of the motor wires and re-check. Then repeat steps 3-8.





...REAKTOR ESC PROGRAMMING CONTINUED...

Programming your ESC:

The Radiant Reaktor is a programmable ESC. Although the default settings should work well for most users, these settings exist so that you can fine tune the performance of your ESC to your experience and components. It's various programmable parameters can be adjusted either by interfacing with the ESC directly button presses and counting LED flashes, or via the optional Reaktor Program Box (RDNA0031) which includes a digital readout of the settings for easier interpretation and faster setup. There are 6 programmable items for your consideration, below are descriptions of each item and following is the table and programming instructions for choosing your settings should you choose to change from default (highlighted in **BOLD** text).

NOTE: The most important of these settings is the Low Voltage Cut-Off Threshold (Item 3). Please read the description and usage scenarios below to better understand how to use this feature.

Item 1: Running Mode:

1. Forward/Brake: This setting is considered as "Race" mode where the reverse function is disabled.
2. **Forward/Reverse-Brake:** This setting is useful for normal operation since it allows for using reverse throttle to back out of a stuck situation.
 - a. **WARNING: switching from REVERSE to FORWARD throttle position quickly will cause excess load on the electronics and drivetrain of your vehicle. It is recommended to come to a stop before changing REVERSE/FORWARD direction.**

Item 2: Drag Brake Force (Automatic Brake):

1. 0%: This setting allows the vehicle to continue to roll after letting off throttle without applying automatic-brake
2. 5%: Adding some drag brake will make the vehicle a little easier to control, especially when driving on a closed circuit type course, helping you to slow down and make turns easier.
3. **10%:** Add more until you find the right balance of assistance with slowing down while still being able to maintain good corner speed without upsetting the vehicle.
4. 15%
5. 20%
6. 25%
7. 30%
8. 40%

Item 3: Low Voltage Cut-Off (LVC) Threshold:

The Reaktor ESC has 6 built in LVC options. It is essential that you use the proper LVC setting for the type of battery that your are using to achieve the optimal performance and safest operation from your ESC/Motor/Battery. This setting should be chosen based on the number and type of cells you are using. For LiPo batteries we recommend setting LVC to #5, using a setting lower than this may cause over discharge of some batteries and cause damage to your battery, which could lead to a fire.

- **When running a LiPo battery it is required to change the included battery connector to a high current connector. We recommend W.S. Deans Ultra-Plugs (WSD1300) available at your local hobby dealer. Using the supplied connector with LiPo batteries will cause the connector to over-heat and possibly melt which could lead to the battery experiencing a dead-short and causing fire. It is critical that the connector be changed and that you do not try to use an adapter in this application. You can purchase an adapter from Ultra-Plug (F) to Tamiya style (F) from your local hobby dealer which will allow you to continue to use your included Helion battery after you have changed your main power connector.**
 - **When running a LiPo battery it is also recommended to run the optional (RDNA0026) motor heat sink with cooling fan to keep your motor and ESC running at lower temperatures.**
1. **No Protection:** ONLY to be used with NiMH or NiCd type batteries. Since your vehicle comes equipped with an 8 cell NiMH battery, we have set this mode as the default. The ESC will run as long as possible, draining all possible energy from the batteries and eventually your vehicle will cease to function properly.
 - a. When you notice the operation of your vehicle change, it is time to STOP running and re-charge your battery.
 - b. If you are running your vehicle and notice a sudden decrease in power, your ESC has detected battery voltage that is lower than what should be safely run without causing damage to your battery or electronic equipment. If you are using NiMH batteries while this happens and you have only been running for a very short time, it is very likely that you are mistakenly using one of the below LVC modes.
 2. 2.6V/Cell: This setting will cause the ESC to enter LVC protection mode when the battery voltage is calculated at the selected voltage or less for more than 2 seconds. Since the setting is "per cell" this means that if you are running a 2 cell battery, the voltage protection will activate relative to $2 \times 2.6V = 5.2V$. This setting is primarily for use with LiFe type batteries as the lower end of LVC settings. **DO NOT USE THIS SETTING WITH LIPO BATTERIES.**
 3. 2.8V/Cell: This setting would be the starting point for using LiFe type batteries and is not recommended for LiPo batteries.
 4. 3.0V/Cell: This setting is only recommended for use with extremely high quality and highly durable LiPo batteries suitable for



...REAKTOR ESC PROGRAMMING CONTINUED...



competition racing. Using a setting this low with a LiPo battery may cause excessive “wear and tear” on your batteries, shortening their lifespan.

5. 3.2V/Cell: This setting is recommended as the default for running average grade LiPo batteries. If your batteries are relatively old it is recommended to use setting 6 instead.
6. 3.4V/Cell: This setting can be used with any LiPo battery and will provide the “safest” discharge level for your batteries however some lower quality batteries do not sustain their voltage under heavy load and will cause premature LVC activation. Starting here is a good choice if you are unsure or just want to be extra cautious.

Item 4: Start Mode/Punch (Higher value is more aggressive):

The Reaktor ESC has 4 “punch” profiles that allow you to tune the initial power output of the ESC to suit your driving, vehicle, and the surface. You will typically want a lower punch setting when the surface has less traction. To get the optimal performance out of LiPo batteries, on high traction surfaces, setting 4 is recommended.

1. Level 1 (70%): This setting will provide the smoothest throttle feel and least wheel spin.
2. Level 2 (80%)
3. **Level 3 (90%)**: This is the highest setting that should be used with high performance NiMH batteries such as those included with your vehicle.
4. Level 4 (100%): This setting is recommended for use with LiPo batteries only and allows you to get the maximum acceleration from your power system. Choosing a setting higher than #3 for use with NiMH batteries will cause inconsistent operation of your ESC, including possible momentary power loss.

Item 5: Maximum Brake Force:

The Reaktor ESC has 4 maximum brake force settings allowing you to tune your brakes for different driving surfaces. This setting works in conjunction with the brake EPA setting on your transmitter which can still be used to fine tune the braking force, however this setting affects the initial brake force also. Since your vehicle is using a high performance brushless motor which has great braking efficiency already, we have reduced the setting to #3. On some surfaces you may still find this setting to be too high and find that under heavy braking with 4wd vehicles the rear tires may come off the ground. This is a very unstable situation and should be avoided at all costs. If this happens, reduce the maximum braking force to a lower setting. If however you are unable to stop and the lack of deceleration is not due to wheel slipping, you can increase the braking force.

WARNING: Be sure to check your maximum brake settings by driving from full throttle to full hard brake in an open area. If the rear tires come off the ground causing a front flip, the vehicle will tumble out of control and could cause personal or property damage.

1. 25%: This is the lowest setting and should only be used when driving with slow motors and on loose (low traction) surfaces.
2. 50%: It is not recommended to go below this setting on asphalt surfaces as the stopping power may not be enough to safely slow your vehicle.
3. **75%**: This is the default setting we feel will provide you the best starting point for many different levels of traction on various surfaces. Remember it is extremely important to only drive a vehicle as fast as you can safely stop it. If the vehicle hits something or someone it can cause serious injury.
4. 100%: This setting is only recommended if you are running a slotted type motor, running this with a slotless style motor combined with a 4wd vehicle will likely cause front flips thus a loss of control of your vehicle.

Reset to Factory Defaults:

At any time when the throttle is located in neutral zone (except in the throttle calibration or programming mode), hold the “SET” key for over 3 seconds, the red LED and green LED will flash at the same time, which means each programmable item has been reset to its default value.

Audible/Visual Programming Alerts:

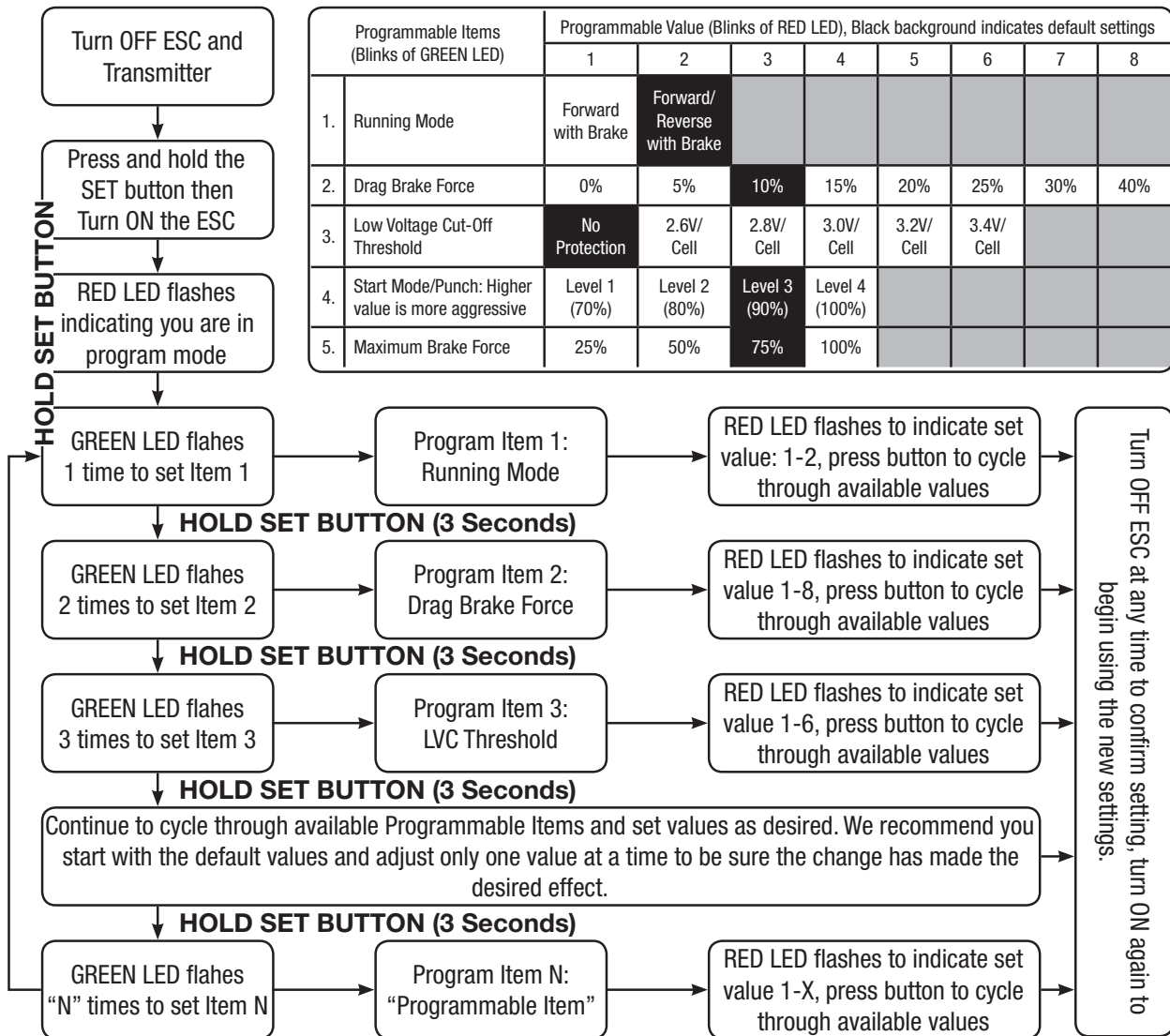
In dirty conditions or with various installations scenarios, visibility of the LED's may be obstructed. To assist with setting the ESC parameters you will also be able to hear audible beeps from the motor that will indicate the value of flashes the LED is transmitting. To help interpret the beeps and flashes we use a long time flash and long “Beep---” tone to represent number “5”, so it is easy to identify the higher quantity of flashes/beeps. This applies to both the programming parameter selection and also the value of each programmable item.

- For example, if the LED flashes as the following:
 - › “A long time flash” (Motor sounds “B---”) = the No. 5 item
 - › “A long time flash + a short time flash” (Motor sounds “B---B”) = the No. 6 item
 - › “A long time flash + 2 short times flash” (Motor sounds “B---BB”) = the No. 7 item
 - › “A long time flash + 3 short times flash” (Motor sounds “B---BBB”) = the No. 8 item
 - › “A long time flash + 4 short times flash” (Motor sounds “B---BBBB”) = the No. 9 item.



...REAKTOR ESC PROGRAMMING TREE AND PARAMETERS

Use the tabel below to better understand the programming process. This should help you navigate thurgh the programming menu.

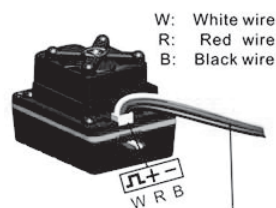


OPTIONAL ACCESSORIES FOR YOUR REAKTOR BRUSHLESS SYSTEM

- To assist with programming your ESC we offer an LED based program box that when connected will give a digital readout of the current Item being programmed and the value. It will also allow you to modify these settings right on the box. You can purchase this program box at your local hobby dealer as part number RDNA0032. The program box communicates with the ESC through the fan port. You must disconnect the fan and plug in the program box. Simply plug in the program box and program with normal sequence but using box instead of counting flashes and beeps. Remember to plug the fan back in when you are done.

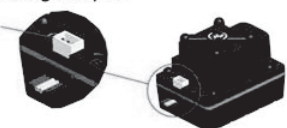


RDNA0032 Reaktor ESC Program Box



Connect to LED Program Box

Cooling fan port



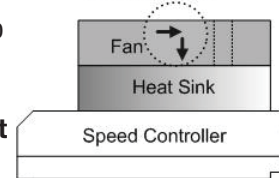
The cooling fan port is also a program port for the ESC



OPTIONAL ACCESSORIES FOR YOUR REAKTOR BRUSHLESS SYSTEM

2. Also offered is a 12V fan (RDNA0034). Though the default fan installed on the ESC will work with a 3s LiPo connected, it is recommended that the fan be changed out to a 12V version for extend use with 3s LiPo to prevent premature failure. Another option would be to manually re-wire the fan to plug into the receiver. Note when installing the fan, the orientation is critical for proper cooling. Refer to the diagram to the right for installation orientation.

Mark: Direction of the airflow and the impeller



NOTE: If you are planning to run in a lot of water, it is recommended to disconnect the fan from the ESC. Running the fan in water will cause excess load on the fan and ESC and may cause permanent damage to the ESC and fan.

TROUBLESHOOTING THE REAKTOR BRUSHLESS SYSTEM...

Problem / Symptom	Possible Cause	Possible Solution
ESC will not set to transmitter	Receiver and transmitter not bound	Try re-binding
	Throttle Channel not set to Reverse	Unless using Futaba radio, set Th channel to Reverse
	Batteries dead in car or transmitter	Replace batteries
	Transmitter is too close to vehicle	Hold transmitter farther away from vehicle
After turning ON, the motor won't work and no sound comes from motor	The connections between the battery and the ESC are not correct	Check the power connections. Replace the connectors if they are worn or damaged
After turning ON the ESC, the motor won't operate normally but instead gives a beep-beep, beep-beep alert tone with 1 second interval of each beep-beep	The input voltage is abnormal, too high or low	Check the voltage of the battery pack
After turning ON the ESC the motor won't operate normally but instead gives a beep-, beep-, beep-alert tone with each beep-having an interval of one second	The throttle signal is abnormal	Check the transmitter and receiver connections. Check the wire of throttle channel. Reset the EPA and trim on transmitter and recalibrate the ESC to the transmitter.
Car slowed down or stopped drastically during run	Battery voltage too low, LVC active	Charge or change batteries
	ESC over-temp protection active	Turn off ESC and allow ESC and motor to cool before running again
	Loss of throttle signal	Check transmitter and receiver, check wiring
Random stopping or re-start, irregular operation	Strong electro-magnetic interference in the operating area	Reset ESC or change operation location.
Car doesn't accelerate	Ensure the proper punch mode is used	Change punch mode based on battery you are using
Reverse not working	Reverse mode has been disabled in ESC	Follow setup instructions to turn back on
	ESC was improperly set to transmitter	Re-set to transmitter, ensure Th channel is set to Reverse for non Futaba transmitters
	EPA on transmitter has been turned down for reverse	Adjust EPA's to 100% and recalibrate ESC to transmitter
Motor only goes in reverse or goes in reverse when I pull trigger to go forward	Throttle Channel not set to Reverse	Unless using Futaba radio, set Th channel to Reverse and reset ESC to transmitter
	Motor connected to ESC improperly	Switch any two motor wires
	EPA on transmitter has been turned down for reverse	Adjust EPA's to 100% and reset ESC to transmitter



ADJUSTING AND TUNING YOUR INVICTUS 10M

The Invictus 10MT has been engineered with some available tuning options listed here for reference. The default configuration has been chosen to provide what we feel is the most enjoyable experience for most operating conditions. However we do encourage experimentation and testing as that's where the real fun begins!

Ride height adjustment: It is possible to adjust the ride height of your Invictus 10MT by installing and or removing adjustment clips located directly above the shock springs.

- Adding more clips will raise the ride height of the vehicle and if done excessively may decrease stability.
- Removing clips will lower the ride height and may cause the chassis to drag on the ground.
- It is ideal to have the drive shafts above level but still allow the shocks to extend when you lift the truck while the vehicle is sitting on a flat surface with the body installed. Add or remove clips to achieve the desired ride height.

Upper Shock Position: There are two shock installation locations for the top mounting location of the shock towers. The default position is outside (located farther from the centerline of the chassis). Moving the shock mounting location to the inner location will result in a slightly less responsive feel on the front or rear of the vehicle but it will be a little more stable.

Lower Shock Position: There are two shock installation locations for the lower mounting location of the shocks in the suspension arm. The default location is inside. Moving the shocks to the outside location will result in a slightly less responsive feel on the front or rear of the vehicle but become a little more stable. This change will also decrease the vehicle's articulation and you will notice less body roll. Always check and adjust, if necessary, the ride height of your vehicle after moving the shock mounting locations.

Battery mounting: Your vehicle comes equipped with and default mount setting for a 8-Cell NiMH hump battery. It is also possible to fit lower cell count NiMH batteries and also 2-3s LiPo batteries (we highly recommend hard cased batteries that resist wear). Ensure the foam block is in place to keep the battery pack from changing position in the battery tray.

Body Mount Height: The body mounts are capable of vertical adjustment with many height options available. The default setting allows for the lowest body position while maintaining component clearance. Adjust the body mounts to achieve a desired look, we recommend the lowest possible mounting for best performance.



SAFETY TIPS

Although great for first time users, Helion RC products are indeed advanced radio controlled vehicles with sensitive electronics and moving parts capable of causing injury if used improperly. Always use caution and common sense as failure to operate your Helion RC product in a safe and responsible manner can result in damage to the product or other properties. Therefore this product is not intended for use or maintenance by children without direct adult supervision. Helion RC and your hobby dealer 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 or maintain it.

- Do not operate your vehicle in rain, electrical, or thunder storms.
- The vehicle should never be turned ON without the transmitter being turned ON.
- Never operate your vehicle when with low transmitter batteries.
 - › Indicated by flashing LED on the transmitter.
- Always check for proper radio system operation (steering and throttle) prior to letting go of the vehicle. If the vehicle does not respond properly to transmitter input, turn the vehicle OFF and inspect all connections and operating environment. Also see the Troubleshooting guide in this manual.
- Optimal enjoyment and safety will occur in a dry (no puddles), open environment away from traffic, and cars (never run into the street for any reason).
- Always turn off both transmitter and ESC and disconnect the battery from the ESC after use.
- Exercise extreme caution when touching the motor and battery connectors immediately after running your vehicle, they may be HOT and cause a burn.
- Always allow the motor in your vehicle to cool before using again.

NOTE: Only use genuine replacement or aftermarket parts available from your local hobby dealer to ensure proper operation of your Helion RC product.



GENERAL CARE AND MAINTENANCE...

General Care:

- Always use clean, dry cloth or soft bristle brush to clean your equipment.
- Never use chemical cleansers to avoid damage to the sensitive electronics and plastics.

Maintenance:

We want you to enjoy your product to its fullest potential. For this to happen it is important to keep your product clean and properly maintained. Lack of cleaning and maintenance can cause component failure. For best and continued performance from your product it is recommended to briefly inspect your product for damage every few runs. Typically, a good time to do this is when changing the battery or while it is charging. If a problem is discovered, stop use immediately and perform repairs or seek assistance. Continued



...GENERAL CARE AND MAINTENANCE CONTINUED...



use of failed components can cause more unnecessary damage to your product. Always remember to use genuine replacement parts from your local hobby dealer. Below is a list of items for inspection. Inspection should not be limited to this list; if you notice any problem, listed or not, it is recommended to give it proper attention.

1. Electronics: Although the ESC and servo included in your vehicle are waterproof the receiver is not, however it is contained in a water resistant box. It is recommended that you avoid submersion of the vehicle however light running in puddles and light rain should not be damaging. If you plan to run for extended periods of time in light or heavy rain it is recommended to secure the receiver in an additional waterproof membrane. Since the Helion HRS-3.1 receiver is a micro size receiver, fitting it into a balloon is fairly easy. Simply insert the receiver with connected wiring into a balloon and secure the balloon around the wires with an additional rubber band as close to the receiver as possible, allowing the most exposure of the antenna as possible.
2. Antenna: To achieve full operating range with your radio system, it is critical that the receiver antenna be installed properly and undamaged.
 - a. Inspect any exposed antenna for cuts or abrasions.
 - b. Ensure there are no kinks in the antenna or antenna tube.
 - c. Never fold the end of the antenna over the tube, this will reduce the range and damage the antenna.
 - d. Ensure the antenna is not being pinched by the set screw that holds the antenna tube in place.
3. Gears: Periodically remove the gear cover to clearly inspect the gears and ensure there is no debris in the gear compartment.
 - a. Proper gear mesh setting is crucial for proper operation and life of gears in your product. It is important to have the pinion gear (attached to motor) as close to the spur gear (attached to drive shaft) as possible yet while providing a minimal amount of backlash. Backlash is the rotation one gear has to make before contacting the other. Having the gear mesh set too tight will cause excess load on the electrical components and may cause premature failure. Having gear mesh set too loose will cause excess wear and possible skipping of teeth during operation thus causing excess wear and premature failure.
 - b. Checking the gear mesh.
 - i. Remove the spur gear cover.
 - ii. Check how much movement is allowed of the spur gear before the pinion gear moves (this is purely by feel, not visual). Check this movement in multiple places by rotating the spur gear approximately 1/6 rotation and checking again.
 - iii. If the spur gear is allowed to move more than a very small amount, or if it there is no backlash, the gear mesh must be adjusted. If there is a lot of movement, it is recommended to attempt to tighten the mesh. Attempted adjustment should only improve the situation; if the mesh was correct to begin with, you will know what that feels like, and if it wasn't correct, it will be when you are done after following these procedures.
 - iv. Setting the gear mesh.
 - 01). Loosen the top screw securing the motor plate to the motor mount, only enough to allow the plate to move. Check and ensure there is no debris in the gears affecting the mesh.
 - 02). Slide the top of the motor plate away from the center of the chassis, insert a strip of notebook paper between the pinion and spur gear, then slide the motor plate back until there is no backlash. You will have to push relatively hard to ensure the paper is pressed all the way into the teeth.
 - 03). Hold the motor snugly in position while retightening the screw.
 - 04). Rotate the spur gear to feed the paper out of the mesh, re-check the gear mesh and adjust again if necessary.
 - v. Re-install the spur gear cover.

WARNING: Never operate your vehicle with the spur gear cover removed. Severe injury, damage to electrical components, and excessive wear and tear on drivetrain may result.

4. Shocks: Periodically inspect the shocks for smooth motion, leaking oil and dirt residue build up around the shaft.
 - a. Do not allow dirt to build up around the shock shaft and bottom of the shock. Doing so will reduce the life of the shock and cause a shock to leak oil. Be sure to clean the shocks regularly with a clean and dry soft bristle brush and/or rag.
 - b. Signs to look out for determining if your shock needs to be maintained or rebuilt.
 - i. Oil around the shaft means the oil leaked from inside and needs to be replaced.
 - ii. Persistent oil around the shock shaft or lower portion of the shock typically points to damaged O-rings which will need replacing. See your local hobby dealer for replacement parts.
 - iii. Refilling your shocks:
 - 01). Remove shock from vehicle, remove spring and top cap.
 - 02). With shock shaft extended, add oil to top of body (use only 100% silicone oil).
 - 03). Slowly compress the shock shaft 50% of travel using a towel or paper napkin to clean up overflowed oil.
 - 04). Slowly reinstall the shock cap and check for free motion of shock.
 - 05). It is normal for the shock to rebound (with the spring removed) after full compression and release.
 - iv. Replacing the O-rings:



...GENERAL CARE AND MAINTENANCE CONTINUED

- 01). Disassemble shock and remove shaft from the body.
- 02). Carefully remove lower cap by unscrewing from the shock body.
- 03). Remove the O-rings and spacer and replace with genuine replacement parts.
- 04). Re-assemble the shock following the refilling instructions above.

5. Tires and wheels:

- a. Inspect the tires to ensure they are properly glued to the wheels. The tires on your vehicle come pre-glued from the factory; however after running your vehicle it is possible for the glue to come loose in some areas.
 - i. To reattach the tire to the wheel, use hobby grade Cyanoacrylate (CA) glue and apply small amounts (one drop at a time) between the tire and wheel. Allow the glue to fully dry before operating your vehicle.

Caution: Be sure to use extreme care when using hobby-grade CA glue. It is specially formulated to cure quickly and create a strong bond. It will bond skin and can cause injury if used improperly. Follow manufacturer's warnings and directions when using CA glue. It is always recommended to wear eye protection when maintaining your vehicle.

- ii. When reinstalling tires, use caution when tightening the nuts that secure the wheels to the vehicle. Ensure the wheels rotate freely after installed but don't wobble excessively. Over tightening the wheels may cause excess strain on the electrical and mechanical components of your vehicle. Operating your vehicle under these conditions will void your warranty.
- iii. Taking the above into consideration, leaving wheels too loose can cause them to strip. It is recommended to check that the wheel nuts are tight every time you run your vehicle.
- iv. Tire wear: Consequently running your vehicle will cause the tires to eventually wear out. Be sure to obtain and use genuine replacement parts from your local hobby dealer when necessary.

6. General wear and tear:

- a. Use of your vehicle will cause general wear and tear which is not covered under warranty yet may necessitate replacement of components. Continued operation of your product with worn components may cause continued damage to other components.
- b. Be sure to regularly inspect your vehicle and accessories for excess wear and damaged components.



STORAGE AND DISPOSAL

Storage:

- Always store all equipment in a cool dry place when not in use.
- Always disconnect the batteries before storage.
- Never store the battery, vehicle or transmitter in direct sunlight for extended periods of time.
- Never store the transmitter with batteries installed for extended periods of time. Doing so may allow the batteries to leak and cause permanent damage to the transmitter.

Disposal:

Your product is equipped with NiMH batteries which are considered electronic waste and should never be discarded in standard garbage containers. Please visit your local hobby dealer (and some hardware stores too) and use the FREE battery disposal center for proper disposal/recycling. Consult your local city hall for information on recycling other electronic waste.



TROUBLESHOOTING GUIDE

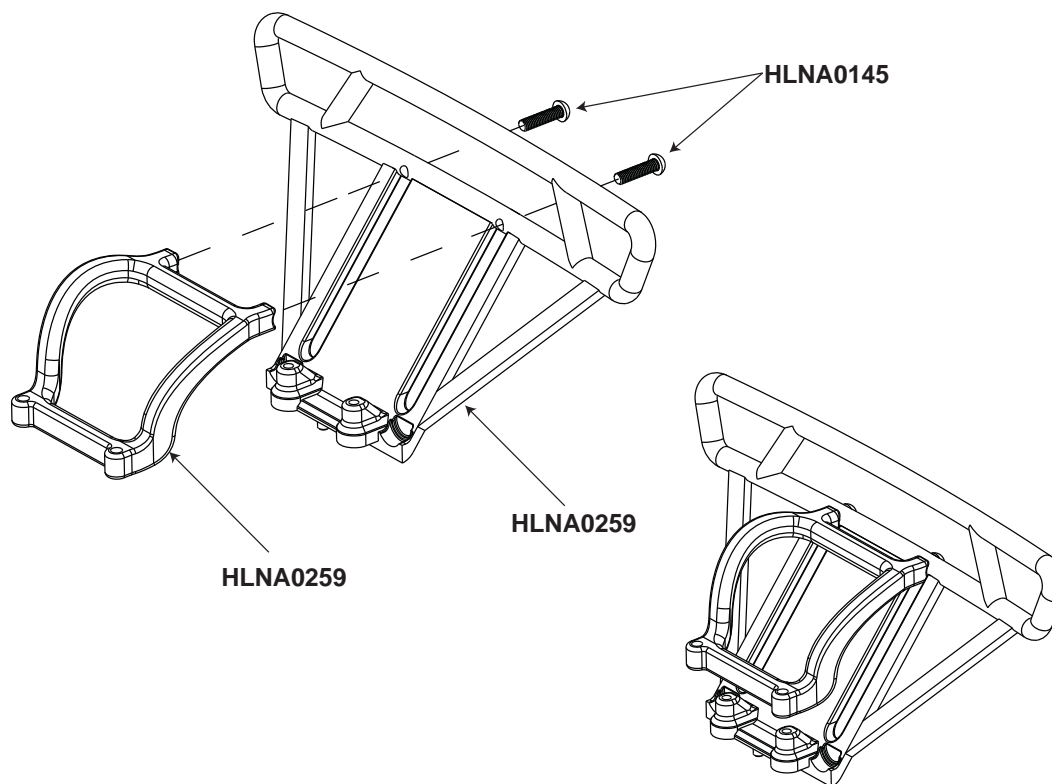


Problem / Symptom	Possible Cause	Possible Solution
Vehicle will not turn on	Battery voltage too low	Charge battery
	Battery not connected	Re/connect battery
	Damaged battery	Replace battery
Transmitter will not turn on	Battery voltage too low	Charge or change batteries
	Battery/ies installed improperly	Correct installation
Short radio range (Vehicle stops responding to transmitter at short distances)	Damaged or improperly installed receiver and antenna	Check receiver antenna for damage. Ensure antenna is properly installed in tube and mount, extending perpendicular from the ground. Ensure all connections are secure
	Receiver is malfunctioning	Replace receiver
	Battery voltage too low	Replace or recharge batteries in transmitter and vehicle
Steering not responding as expected	Trim not set properly	Adjust steering trim
	Screws too tight on steering parts	Adjust screws to allow for free motion
	Fasteners have become loose	Check and tighten all fasteners to as new condition, be careful to not over tighten
Vehicle not responding as expected to transmitter	Trims not set properly	Adjust throttle and/or steering trim
	Radio system lost bind	Re-bind radio system
	Bad electrical connections	Check motor and battery plugs to ensure they are fully connected
Wheels twitch while vehicle is idle (controls at neutral)	Transmitter too close to receiver (<1m)	Increase distance between the units
	Receiver wire damaged	Inspect antenna for damage and replace if necessary
	Receiver antenna not installed in vertical position	Install in mount with care to not damage antenna wire
Steering will not trim straight, always has right or left bias	Binding in steering system	Inspect and correct any binding components or loosen screws if over tight
	Front wheels too tight	Check and adjust wheel nuts to ensure the wheels are not too tight
Vehicle top speed and acceleration is slow	Battery voltage too low	Charge battery
	Drivetrain has too much friction	Check for debris/excessive wear on gears, inspect bearings
	Gear mesh too tight	Loosen gear mesh
	Pinion gear is loose	Check and tighten set screw on motor pinion
	Differential broken	Check differential and ensure the outdrives are secured and gears intact. You should not be able to pull them out
	Drive pin missing	Check for missing wheel pins (behind wheel hexes), or dog-bone pins
Battery charge stops lasting as long as it used to	ESC not set to transmitter	Follow ESC instructions to set to transmitter
	Wheels too tight	Check and adjust wheel nuts
	Differentials stripped	Check differentials and replace/repair if necessary
	The battery has become old	Replace battery
Battery charge stops lasting as long as it used to	Battery not charged completely due to insufficient charge time	Charge for longer period of time or try a peak detection charger. We recommend the Radiant Primal (RDNA0001)
	Gear mesh too tight	Check and reset gear mesh setting
	Charger, battery, wires, or plug has malfunctioned	Check all connections and wires for damage or excessive wear and replace if necessary
	Shock O-ring seals are worn	Replace O-rings and refill shock with oil
Shocks and/or arms covered in oil	Top shock cap too loose or over tightened	Check tightness (finger tight), refill shock oil
	Bottom shock cap dislodged	Check installation, refill shock oil
	Gear mesh too loose	Tighten gear mesh for proper backlash
Spur gears stripping	Fasteners loose or missing	Check for loose fasteners on spur gear mount and ensure all E-clips are in place

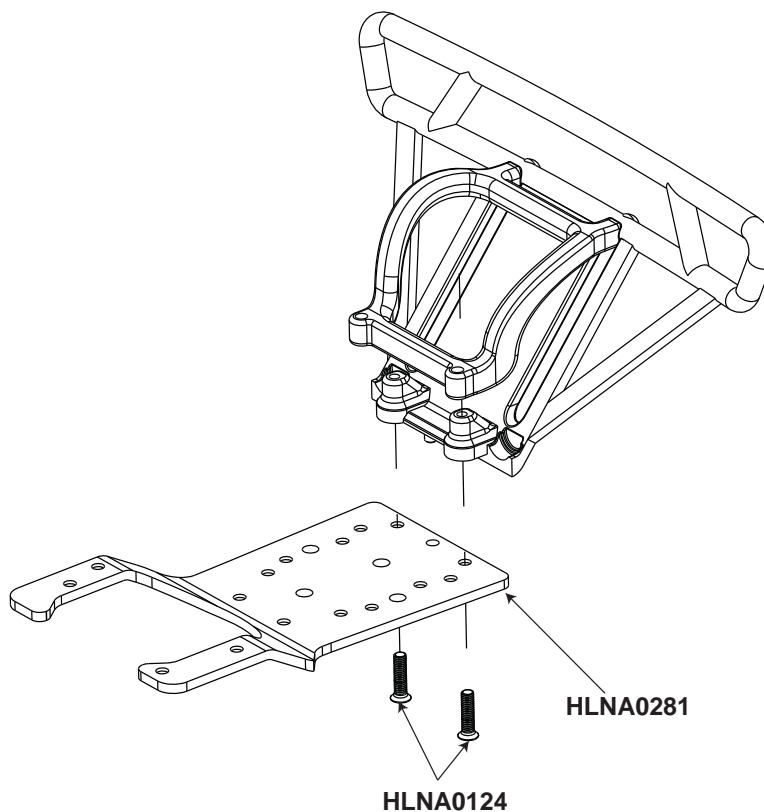




REAR BUMPER ASSEMBLY

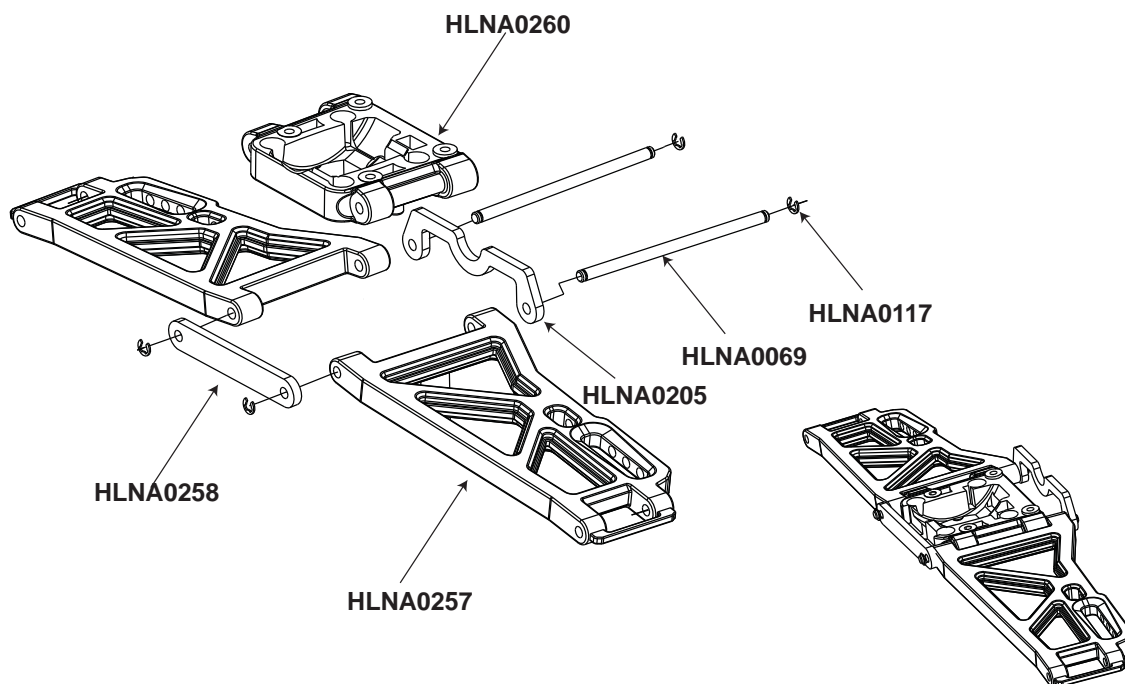


REAR BUMPER INSTALLATION

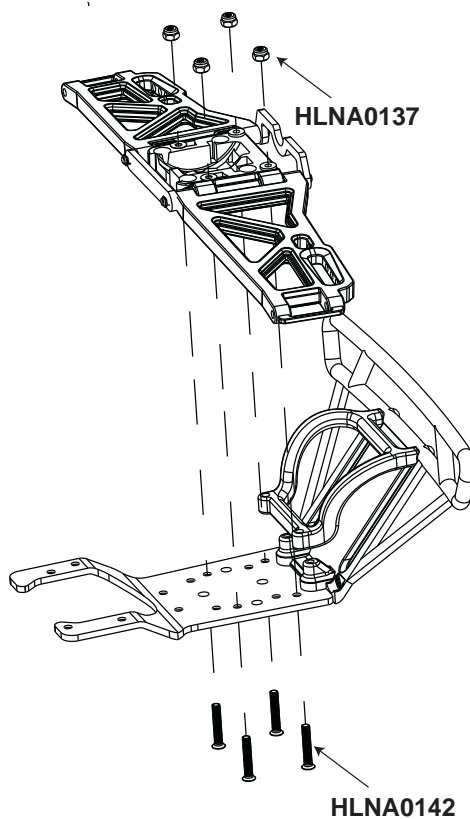




REAR SUSPENSION PIVOT ASSEMBLY

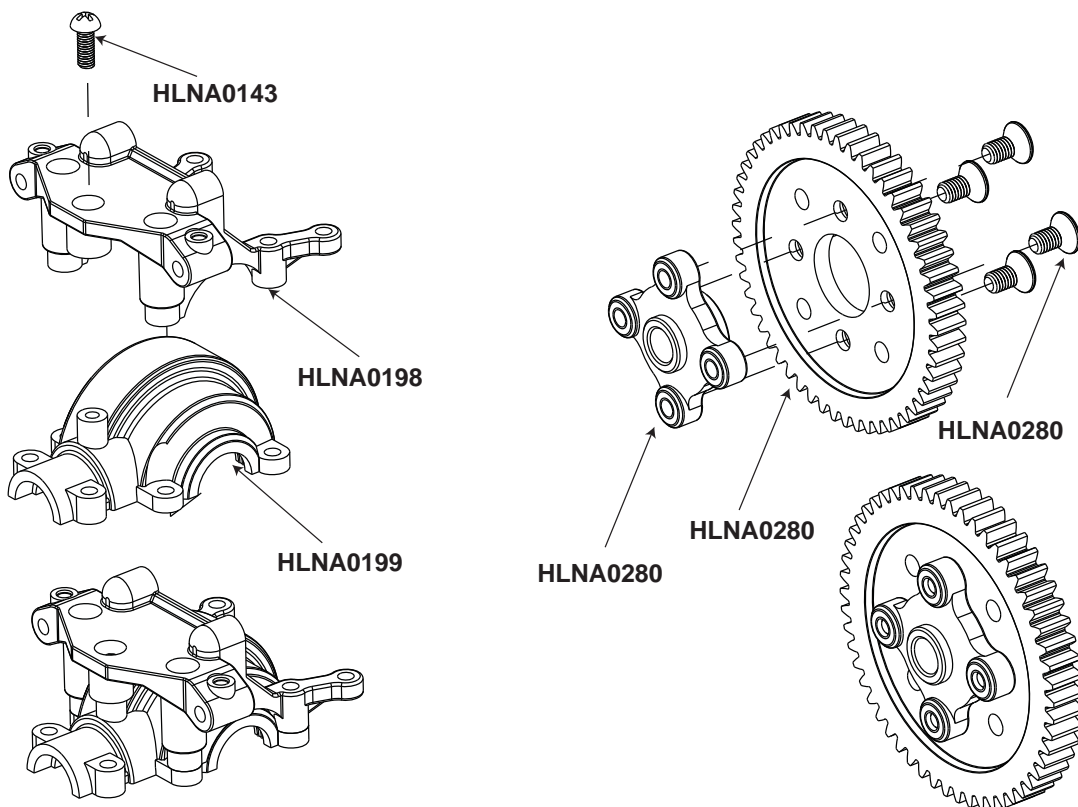


REAR SUSPENSION PIVOT INSTALLATION

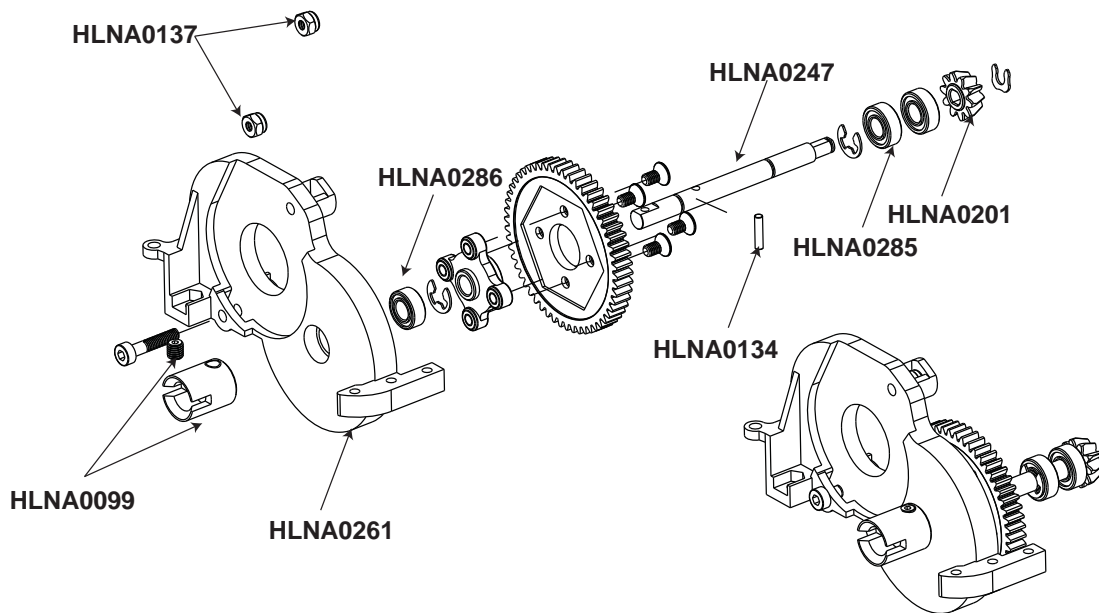




REAR BULKHEAD AND SPUR GEAR ASSEMBLY

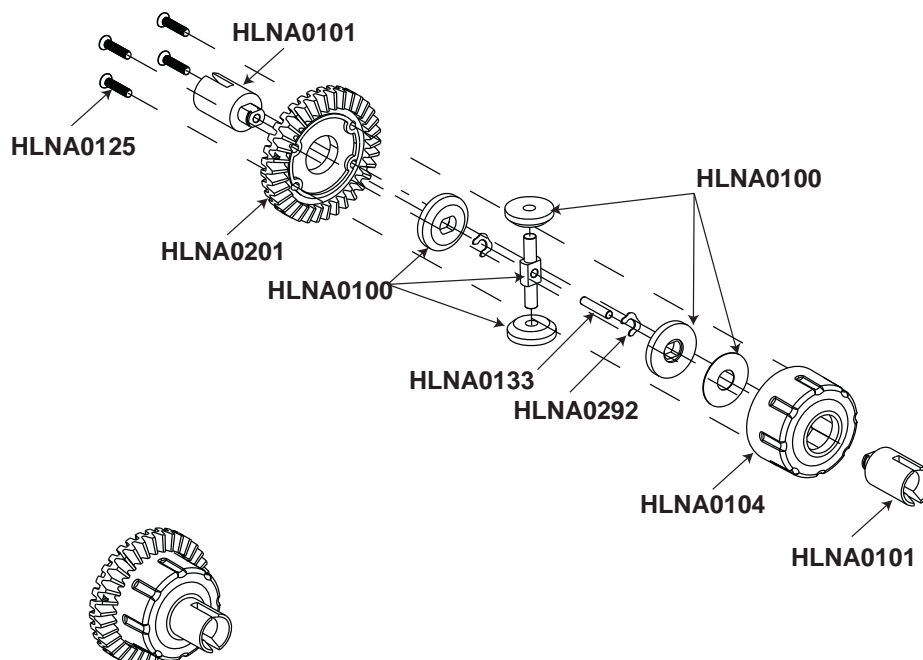


REAR INPUT SHAFT AND MOTOR MOUNT ASSEMBLY

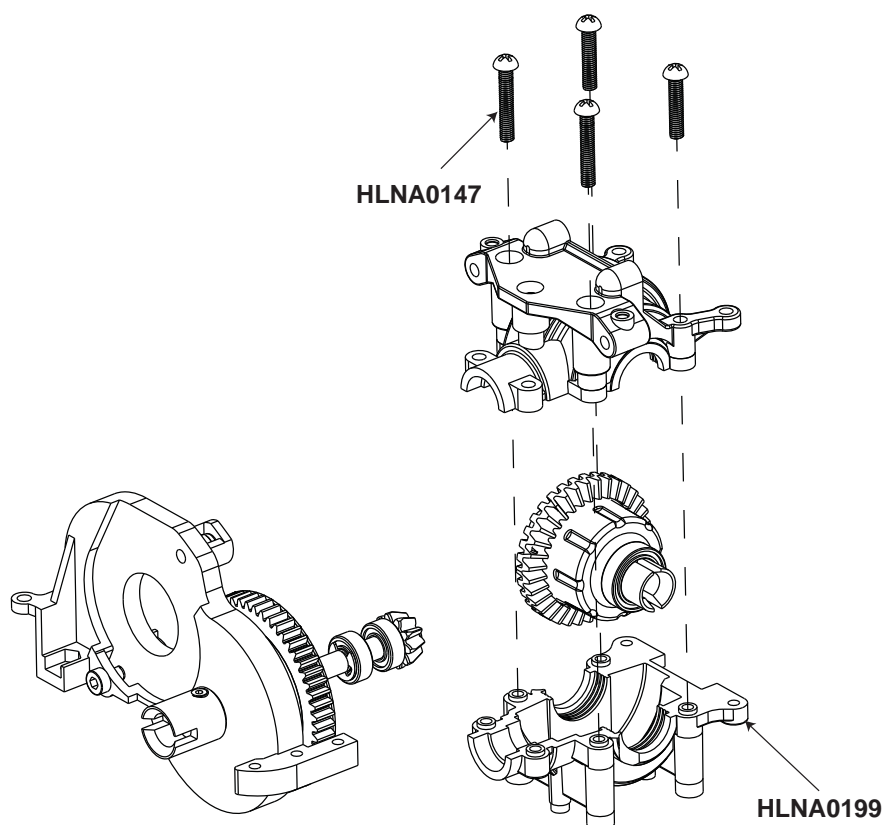




FRONT/REAR DIFFERENTIAL ASSEMBLY

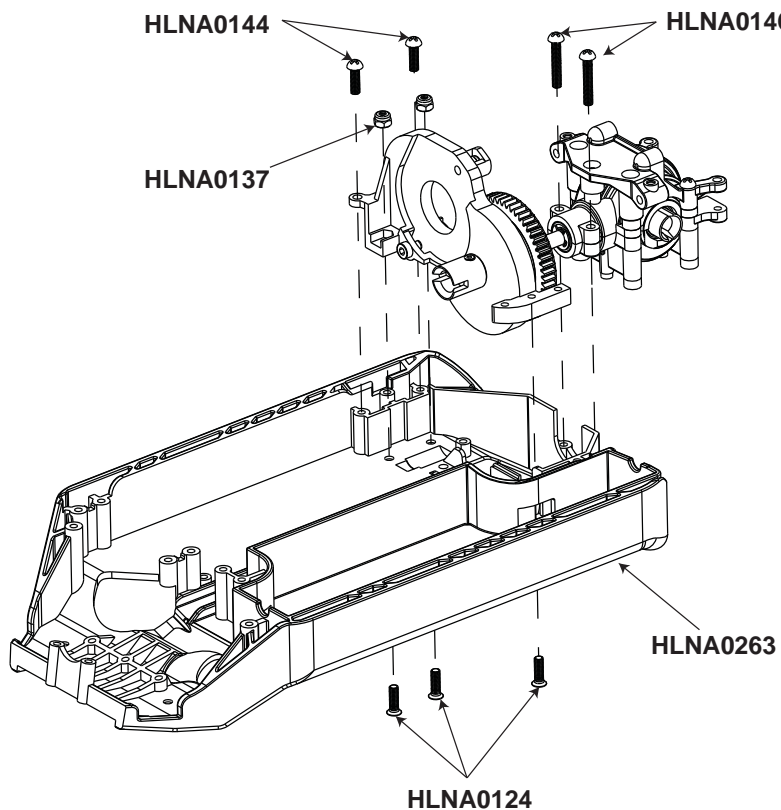


REAR GEARBOX ASSEMBLY

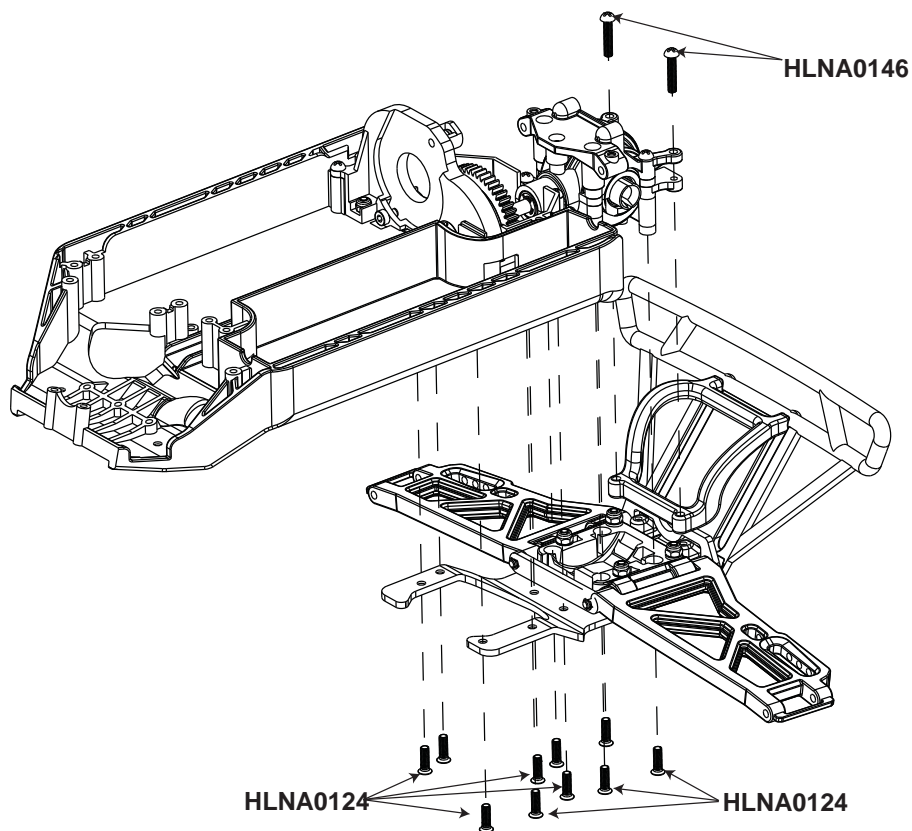




REAR GEARBOX INSTALLATION

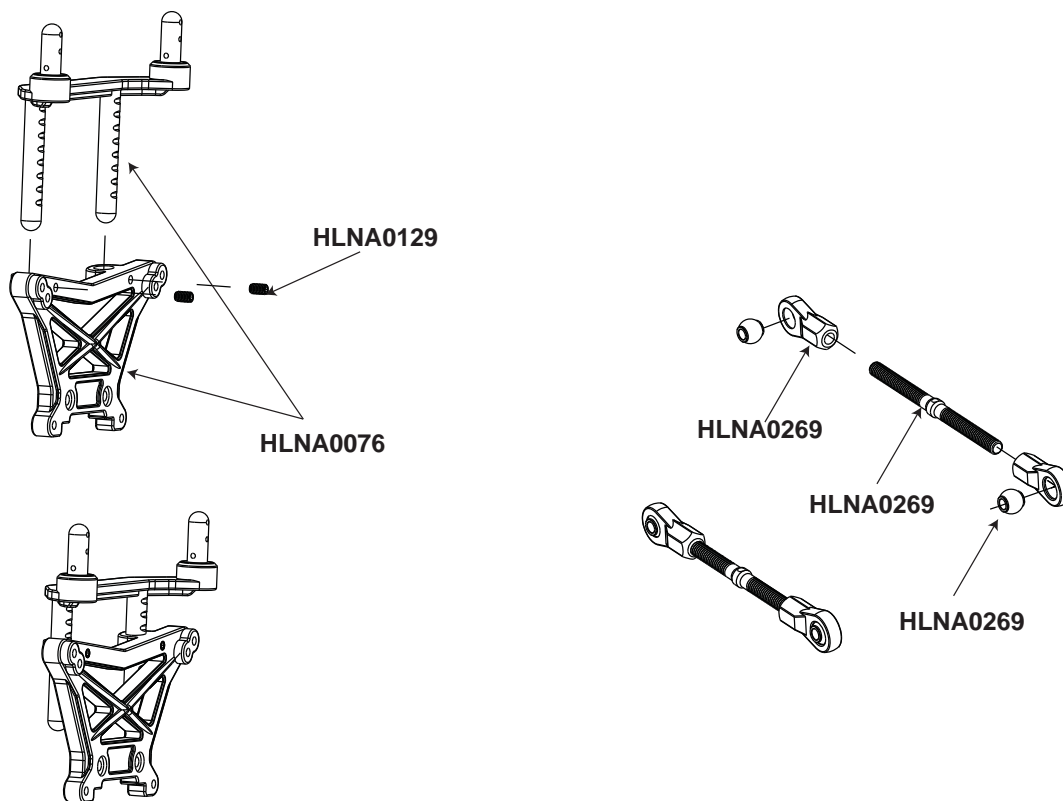


REAR SUSPENSION INSTALLATION

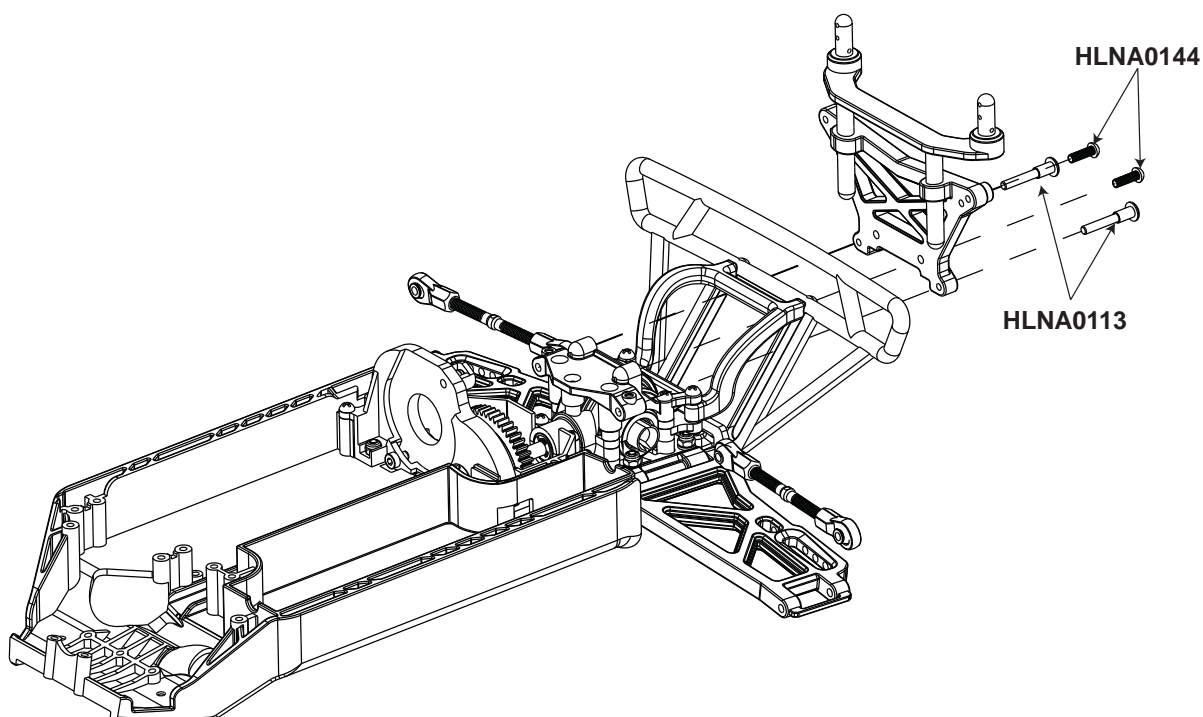




REAR SHOCK TOWER ASSEMBLY

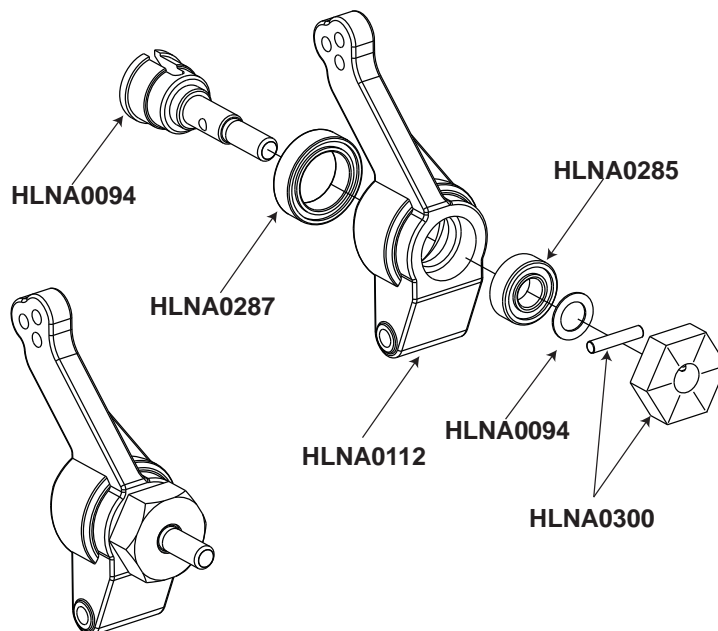


REAR SHOCK TOWER INSTALLATION

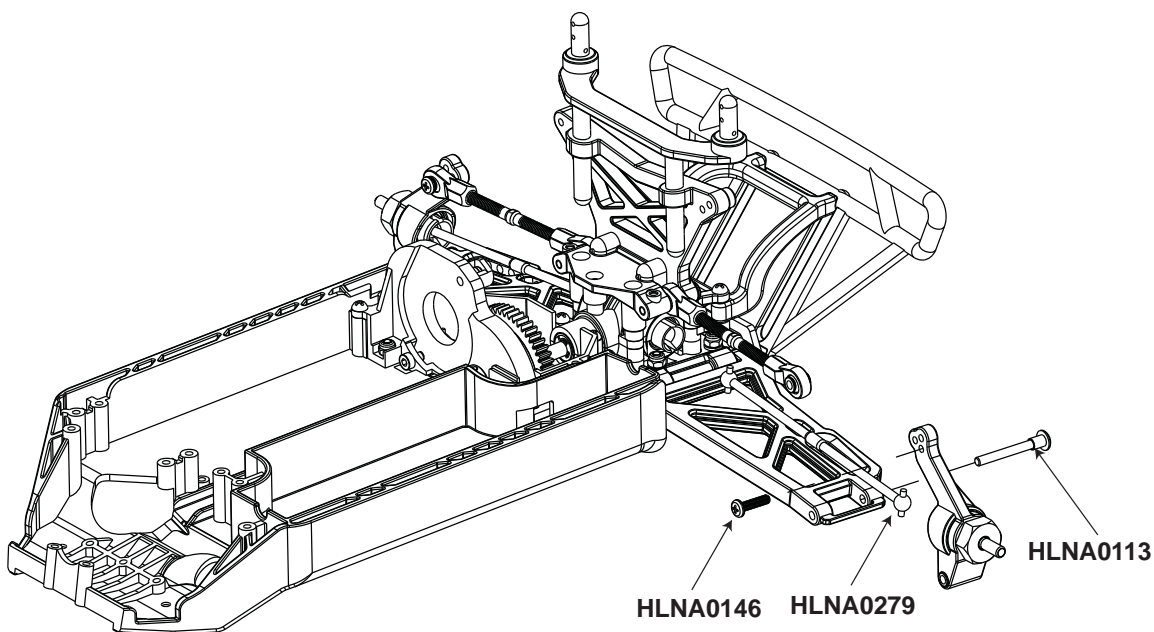




REAR HUB CARRIER ASSEMBLY

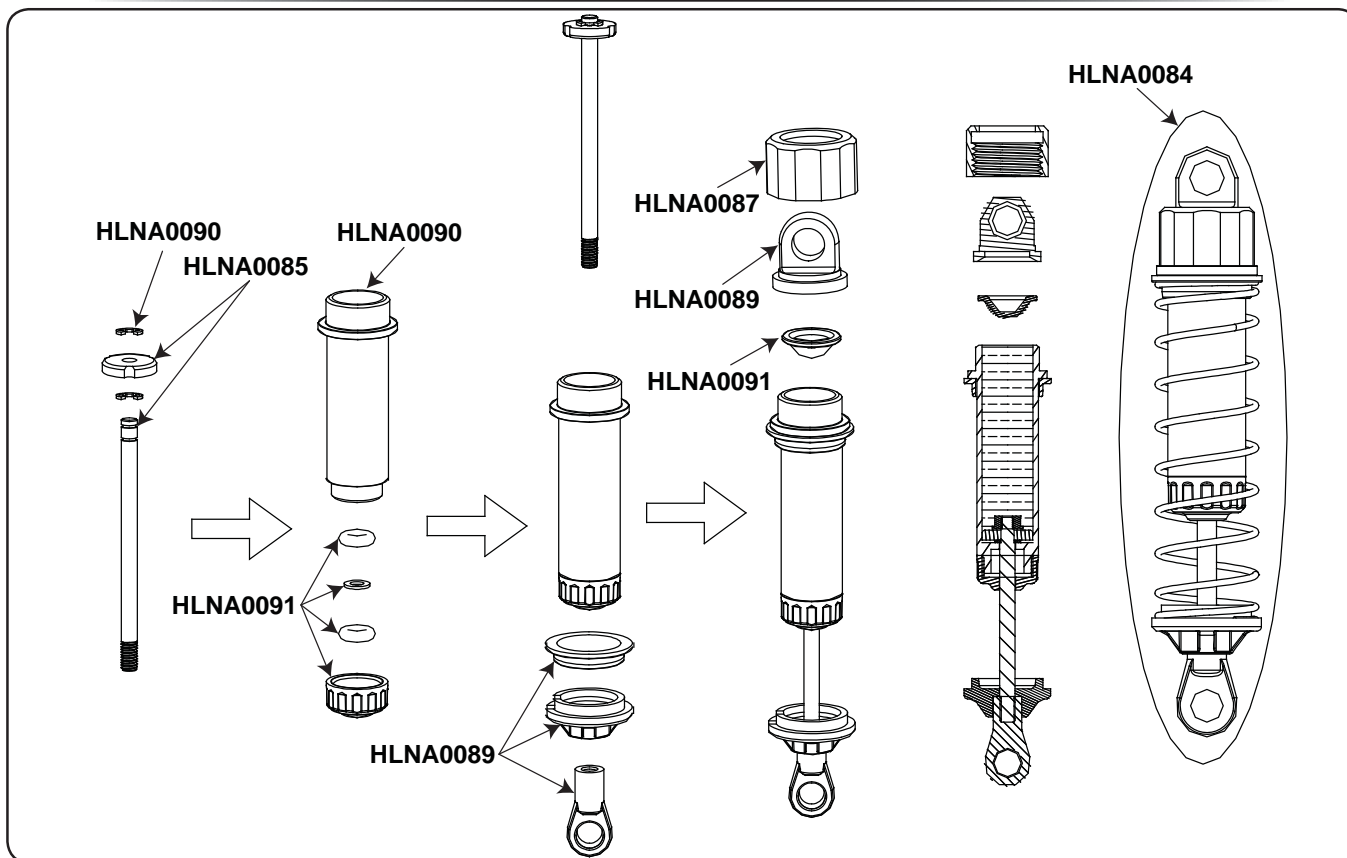


REAR HUB CARRIER INSTALLATION

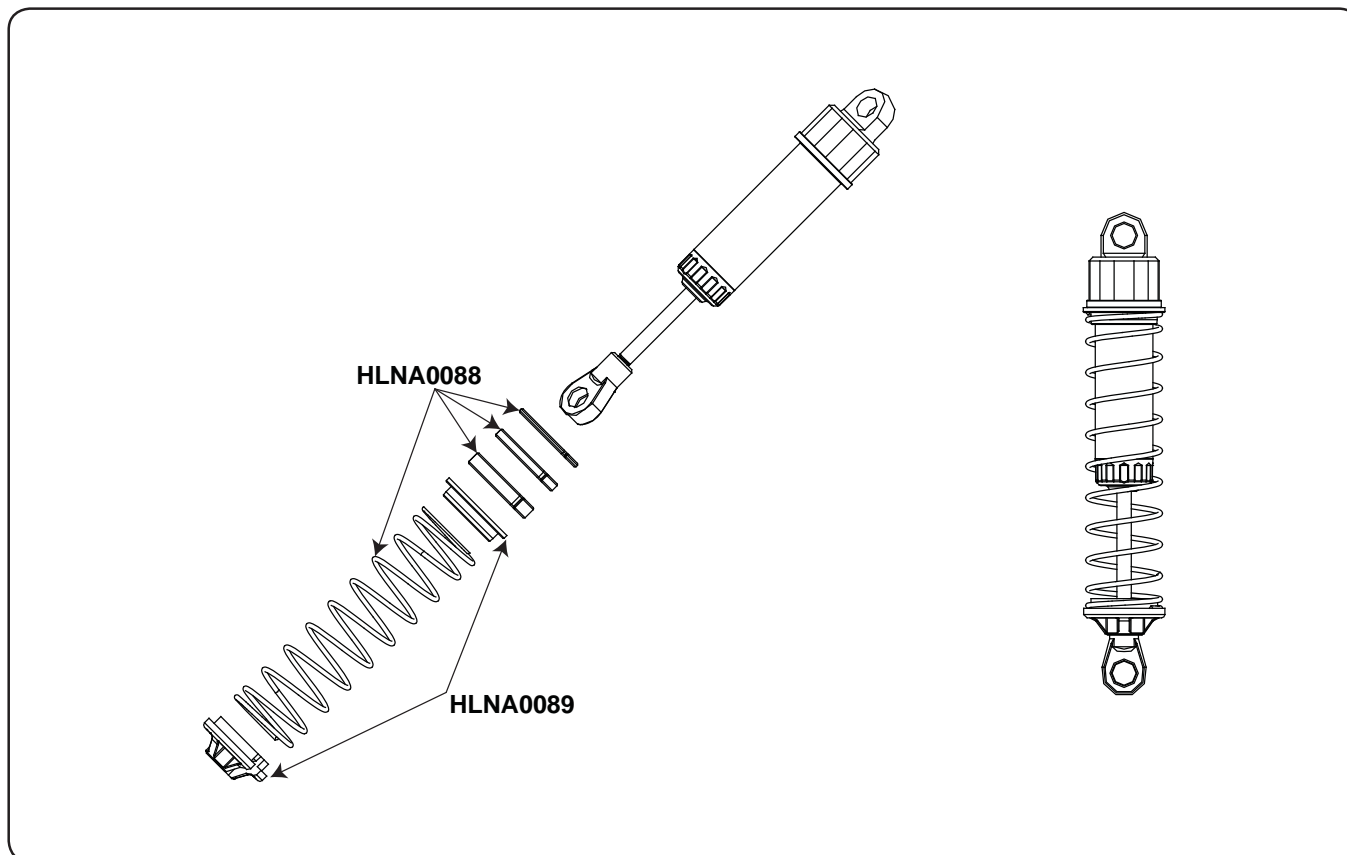




SHOCK ASSEMBLY

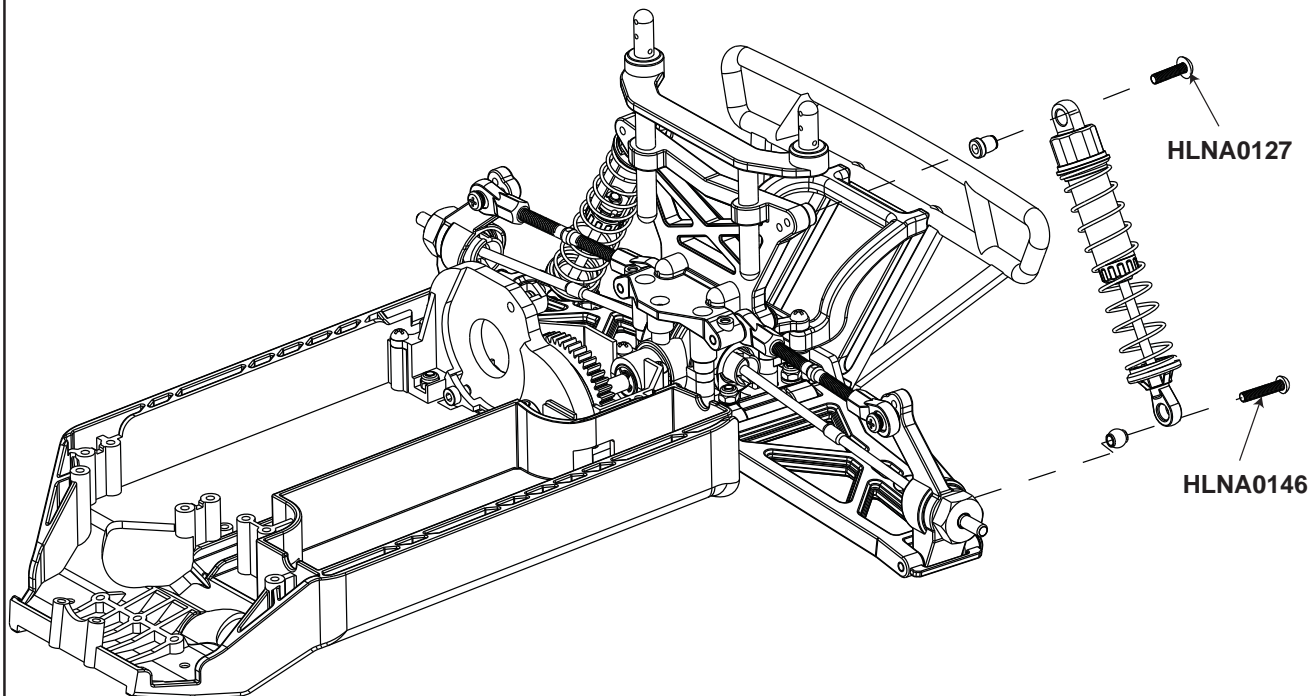


SHOCK SPRING INSTALLATION

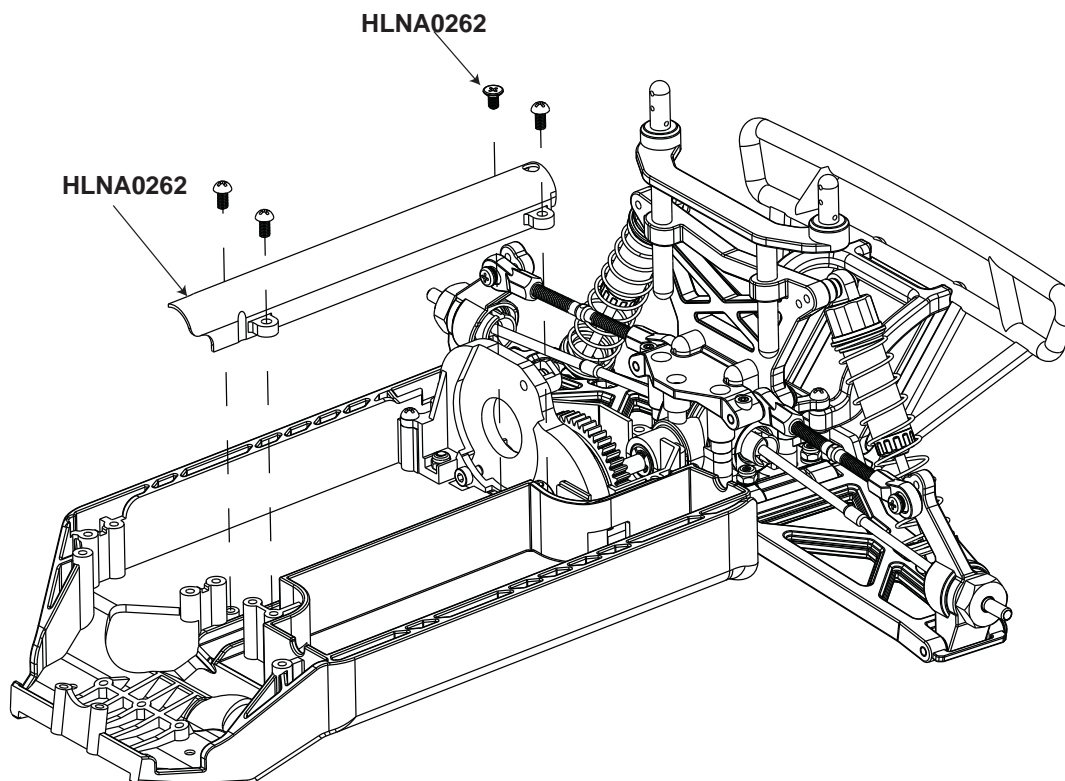




REAR SHOCK INSTALLATION

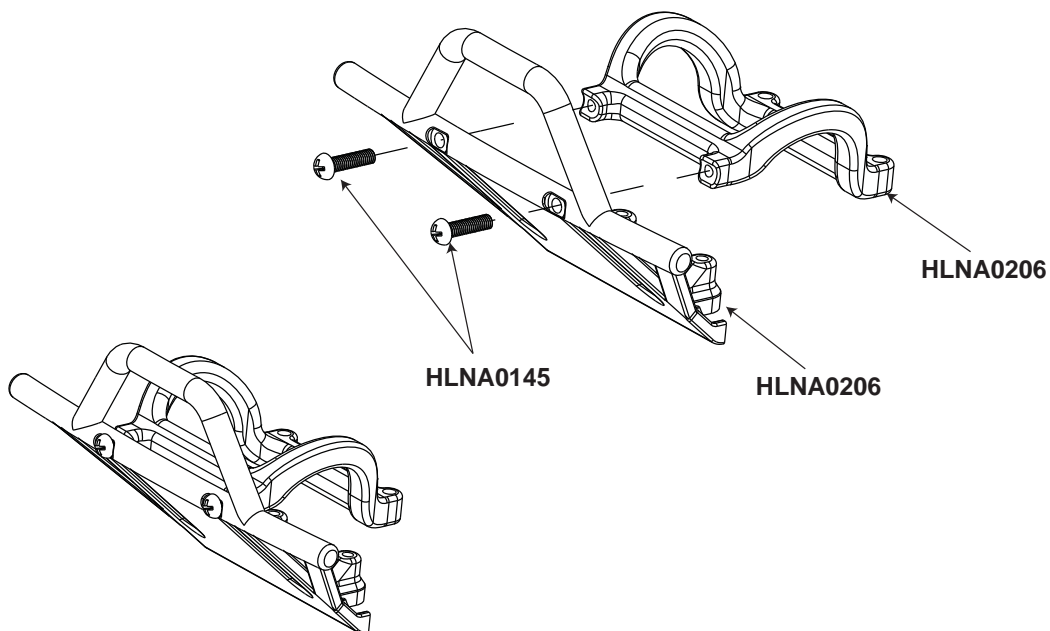


CENTER DRIVE SHAFT COVER INSTALLATION

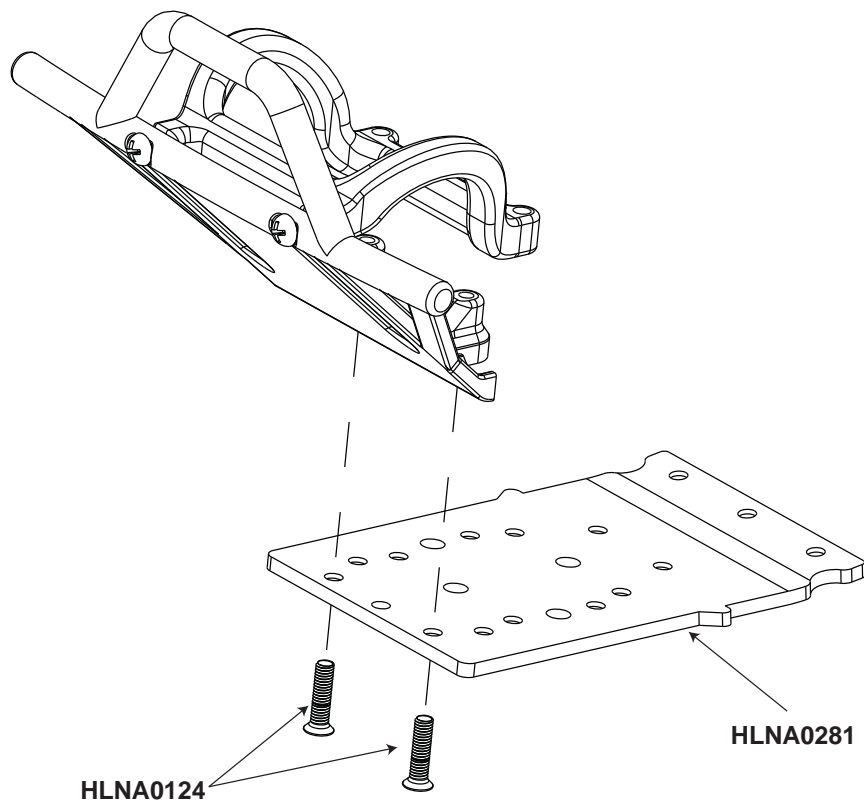




FRONT BUMPER ASSEMBLY

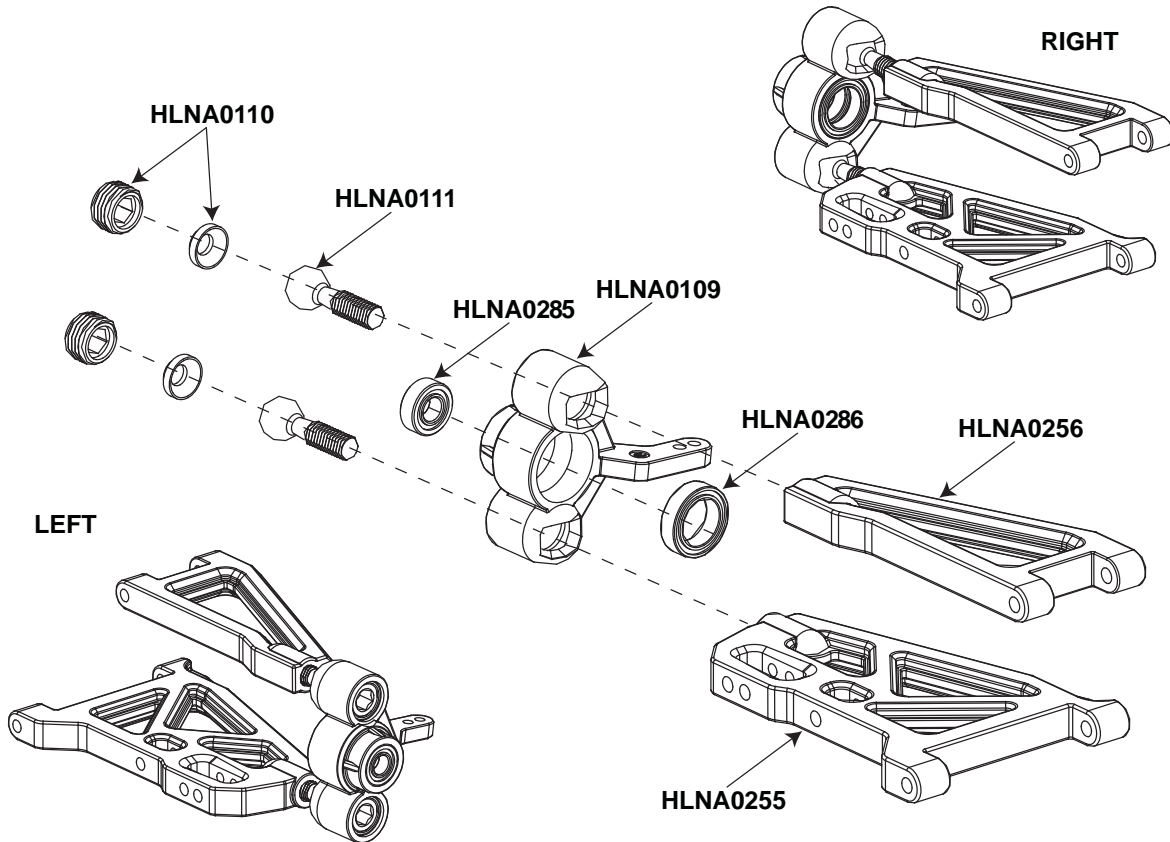


FRONT BUMPER INSTALLATION

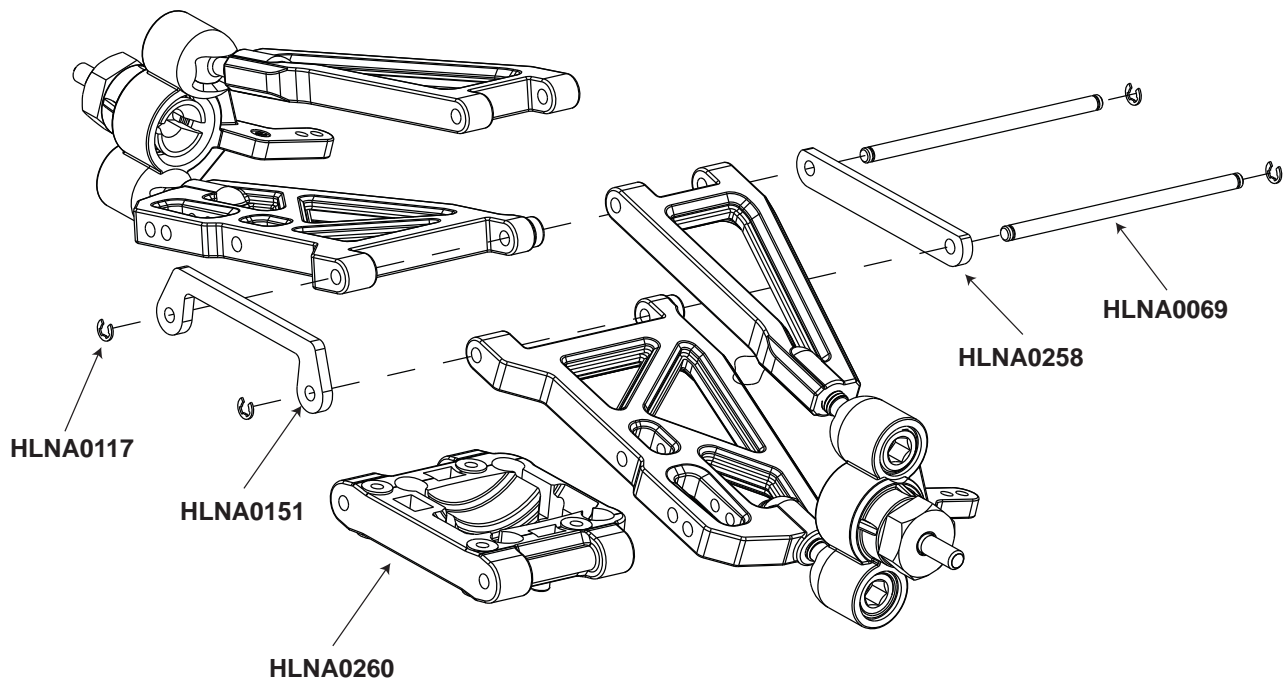




FRONT STEERING BLOCK ASSEMBLY

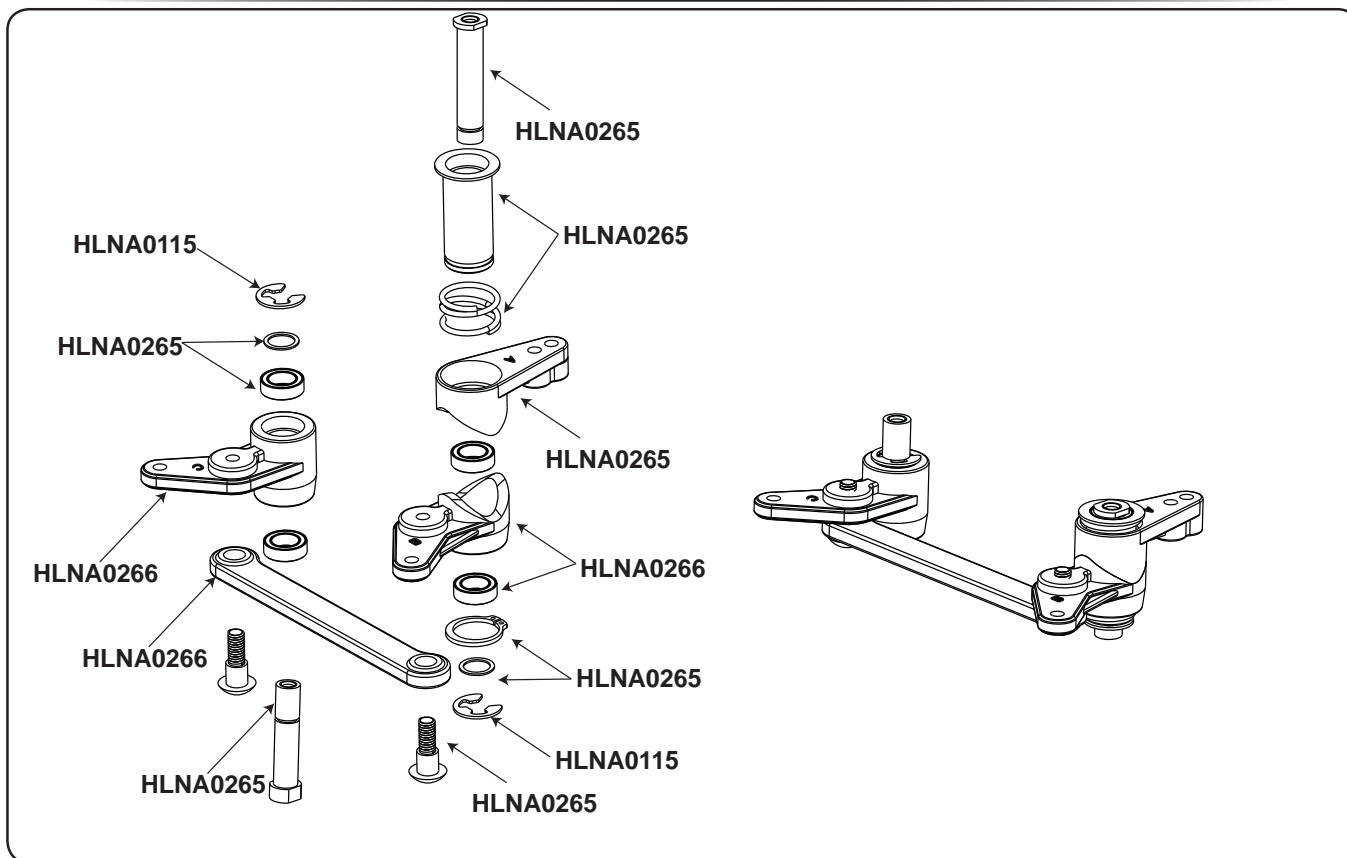


FRONT SUSPENSION ASSEMBLY

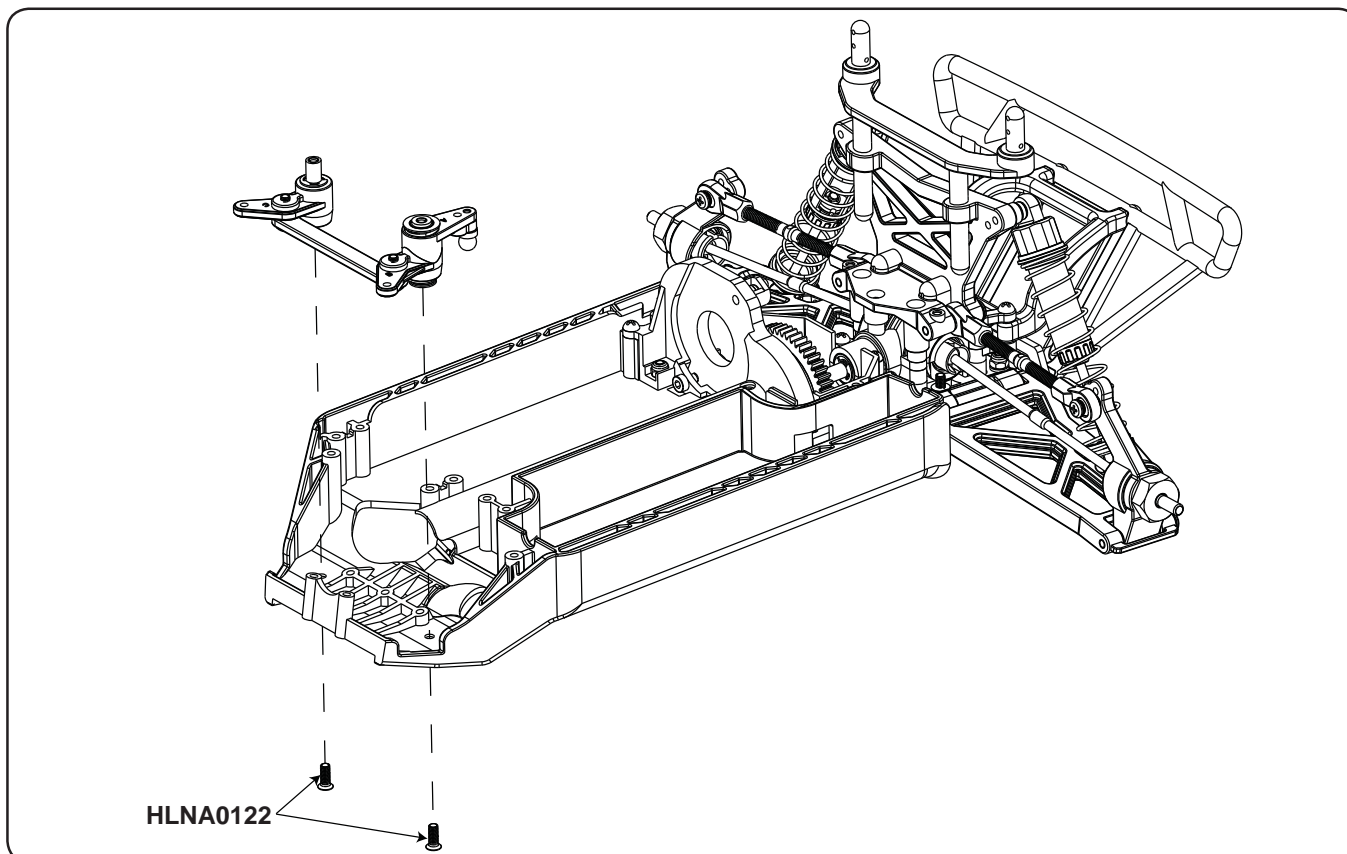




STEERING AND SERVO SAVER ASSEMBLY

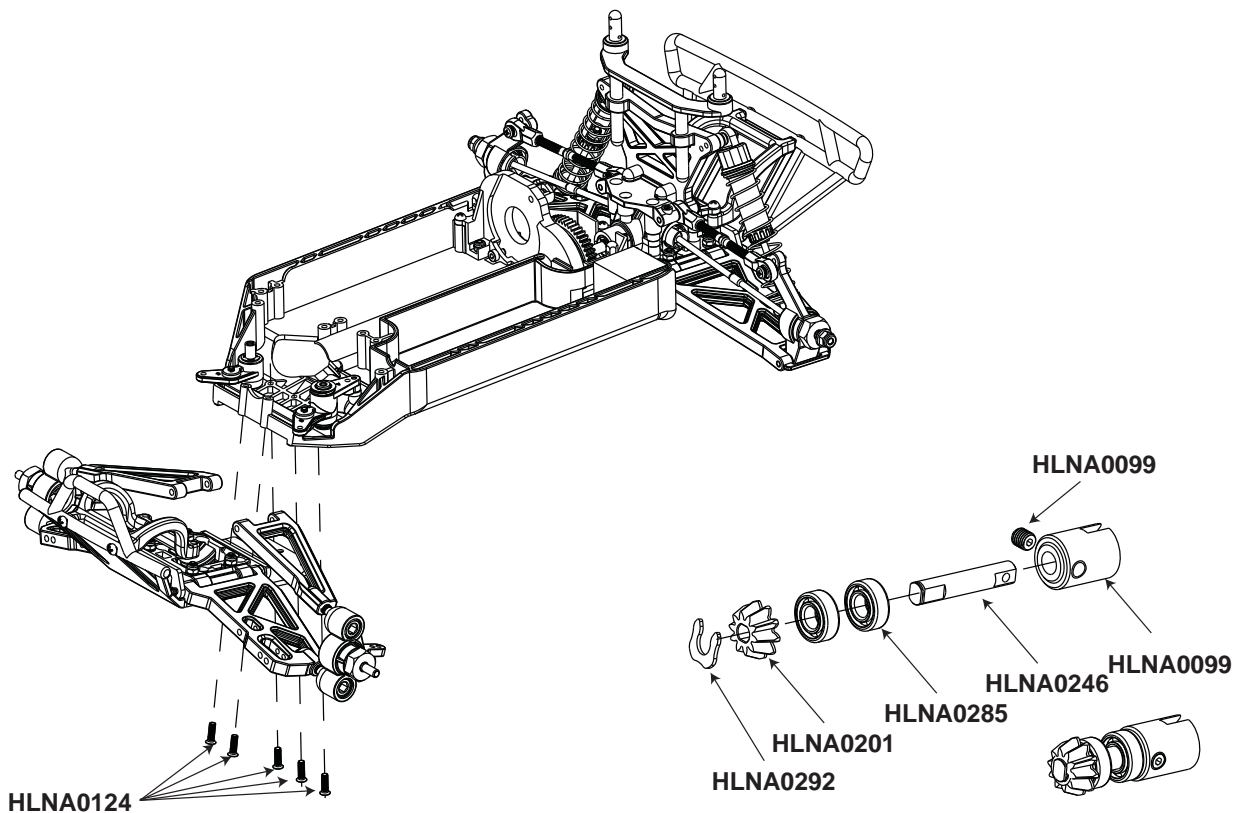


STEERING BELL CRANK INSTALLATION

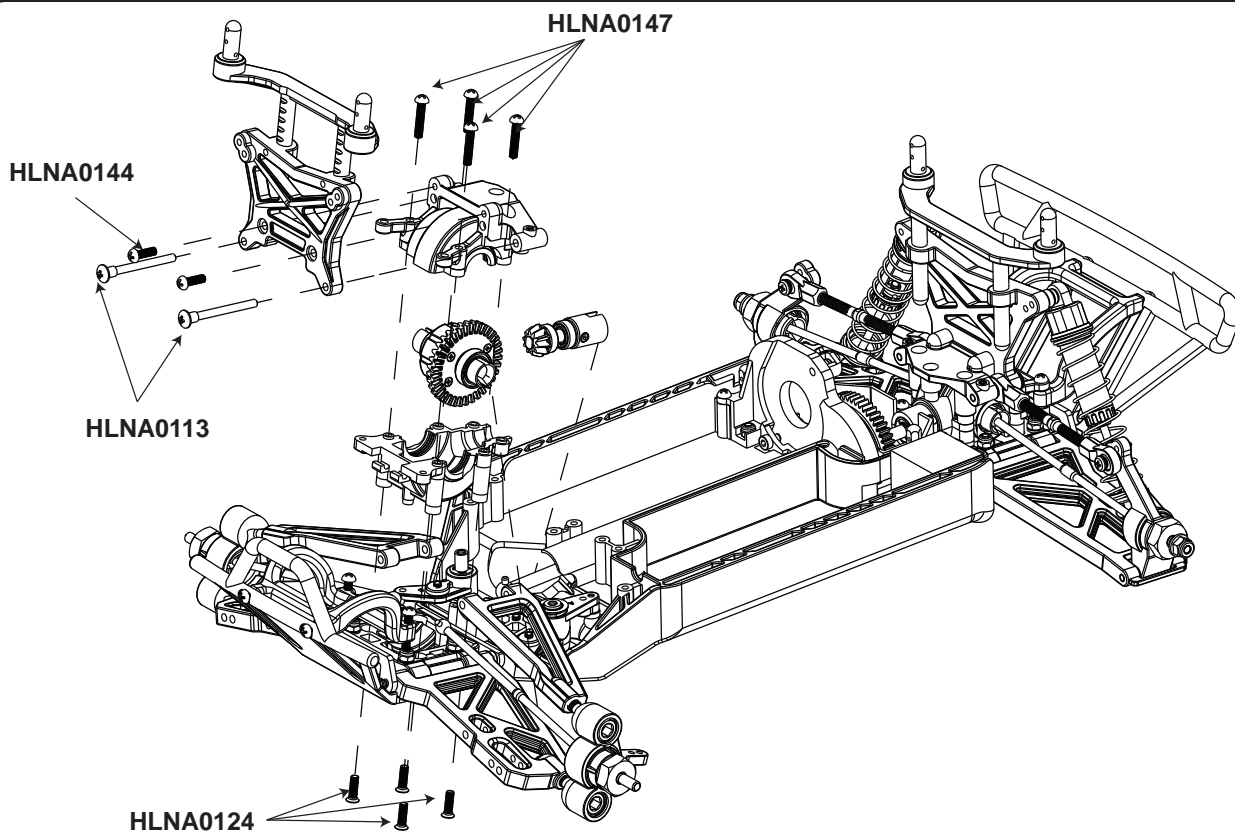




FRONT SUSPENSION INSTALLATION

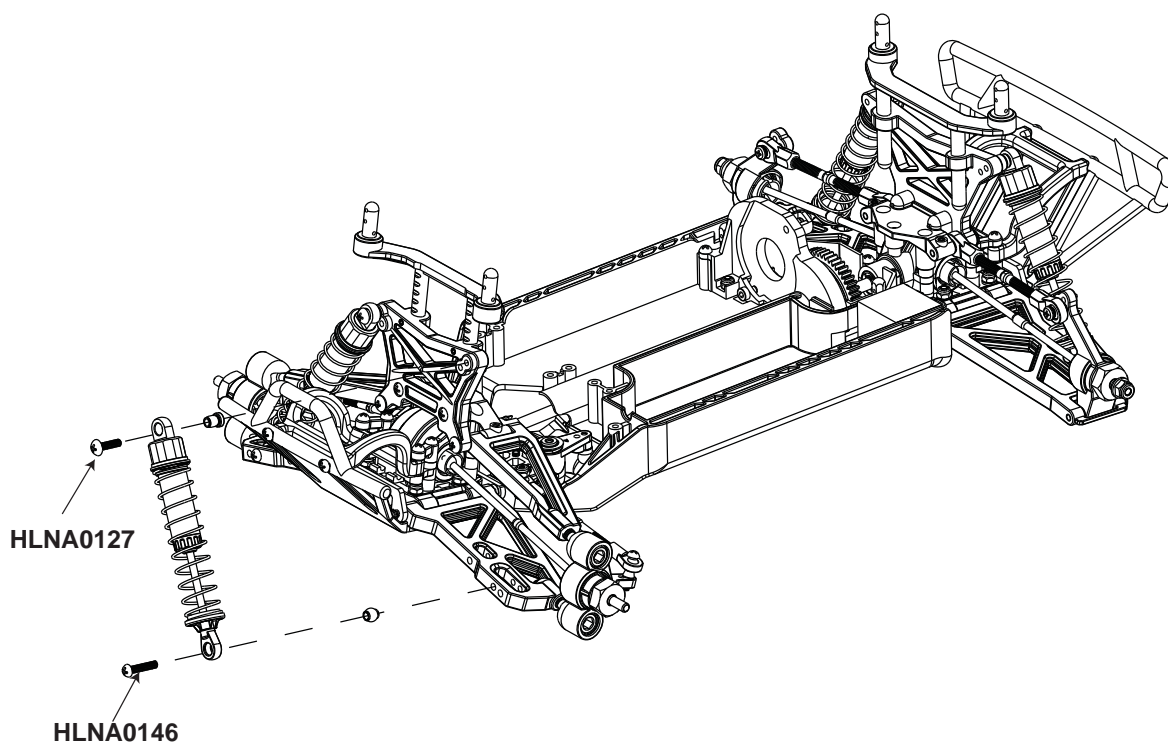


FRONT GEARBOX INSTALLATION

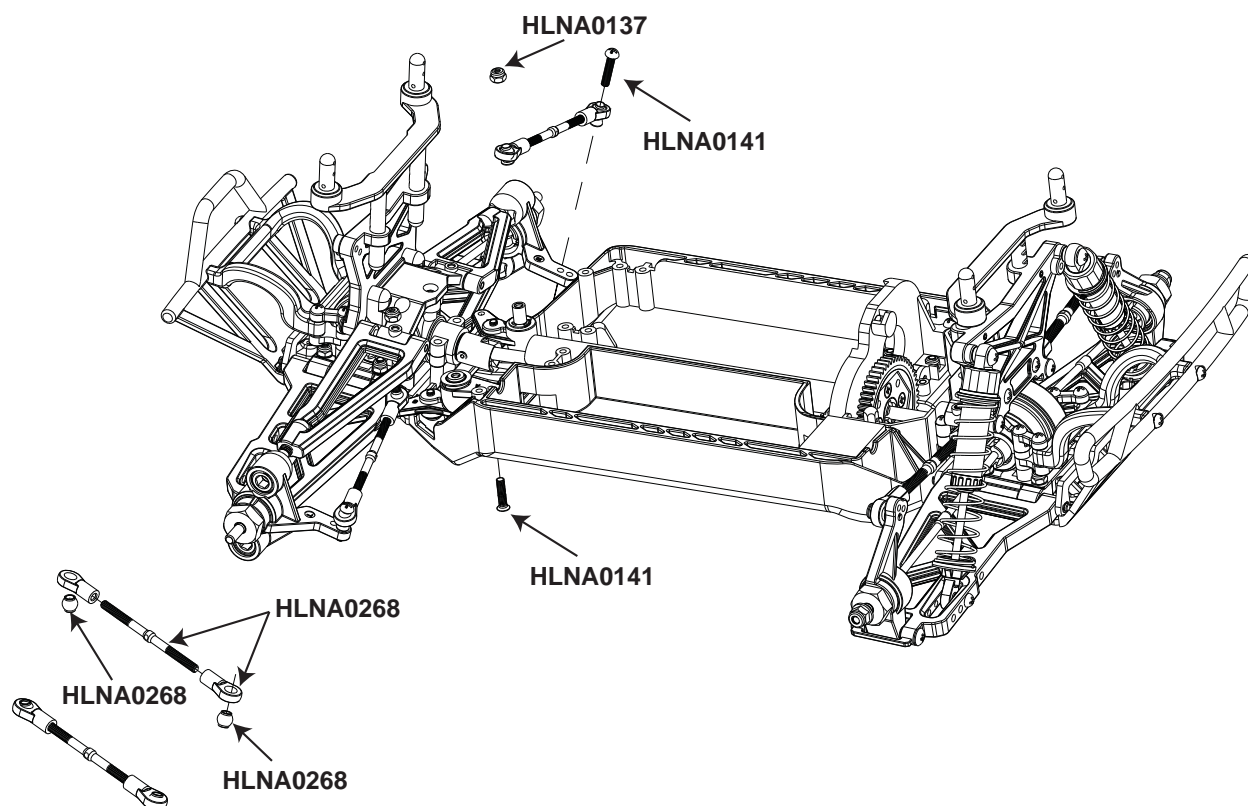




FRONT SHOCK INSTALLATION

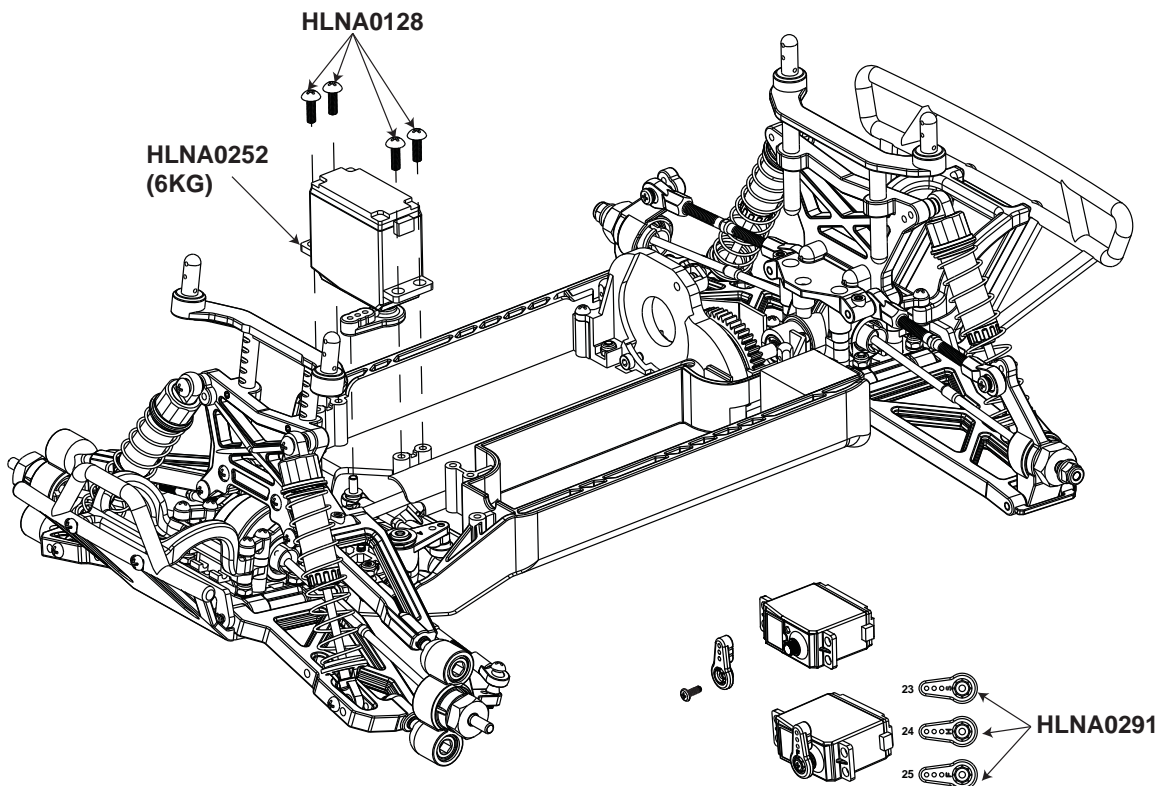


FRONT STEERING LINK ASSEMBLY

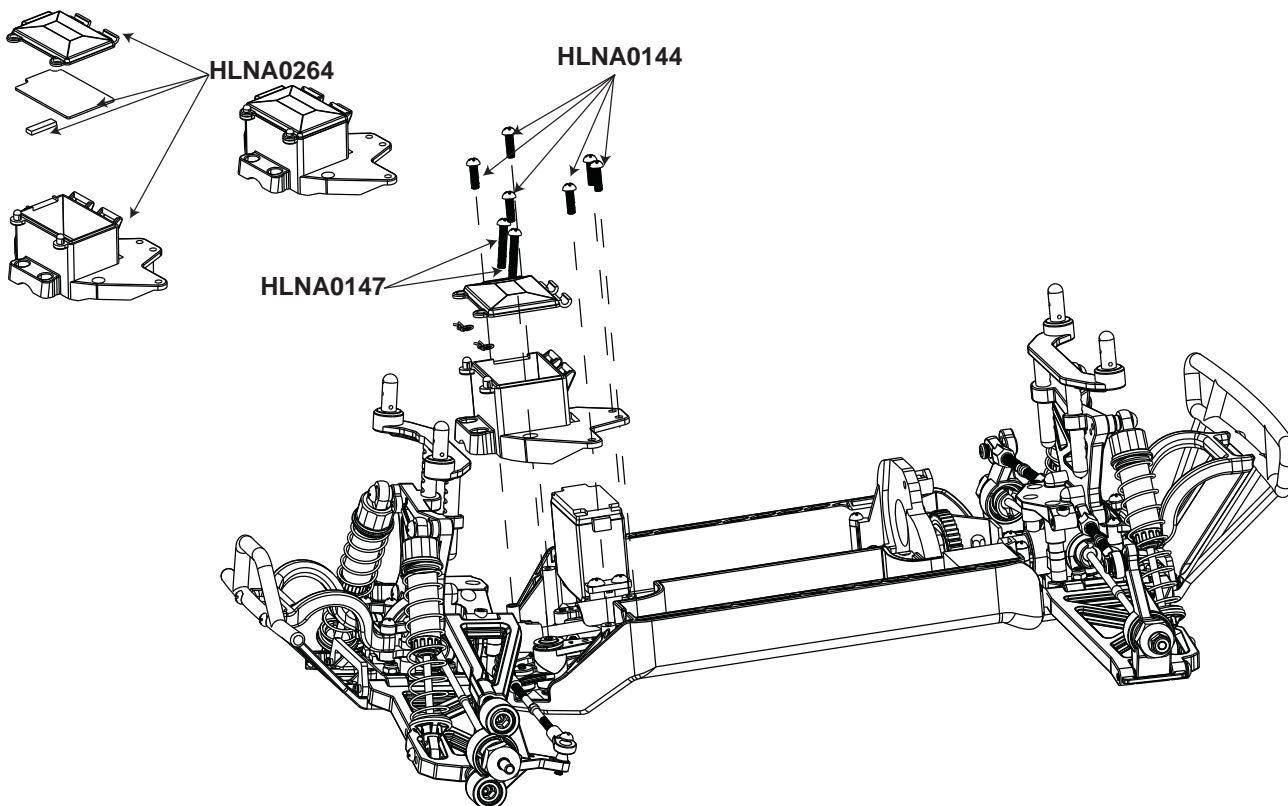




SERVO ASSEMBLY AND INSTALLATION

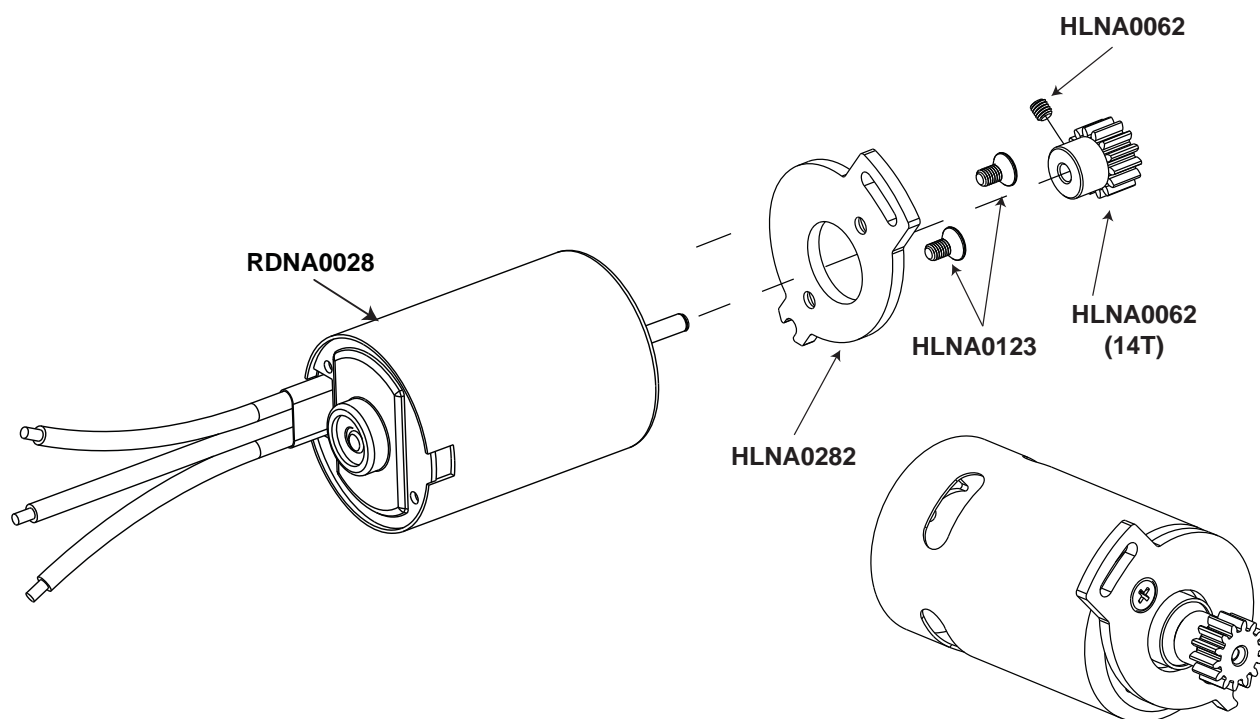


FRONT TOP PLATE ASSEMBLY

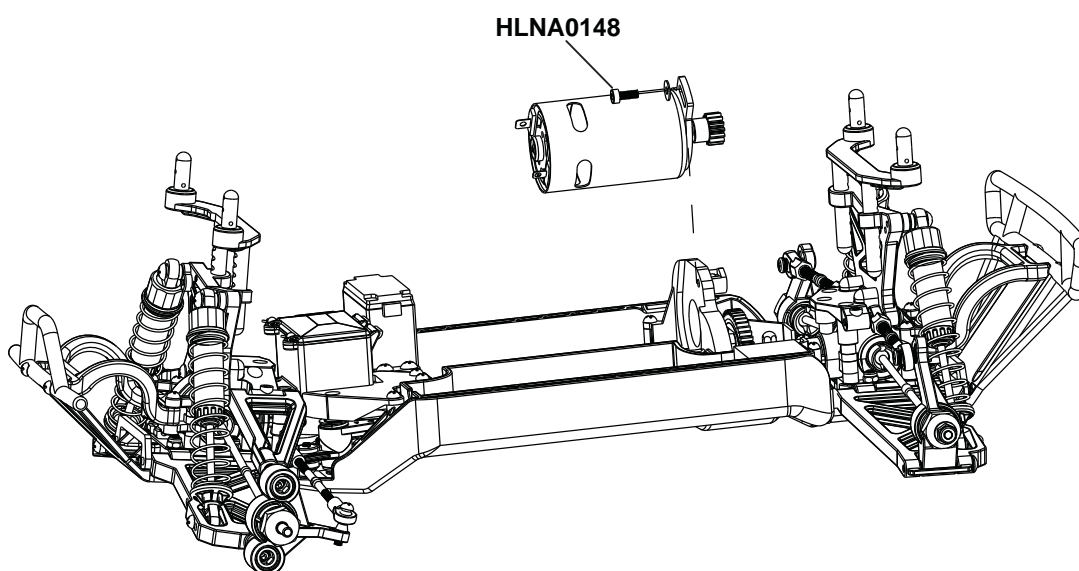




MOTOR ASSEMBLY

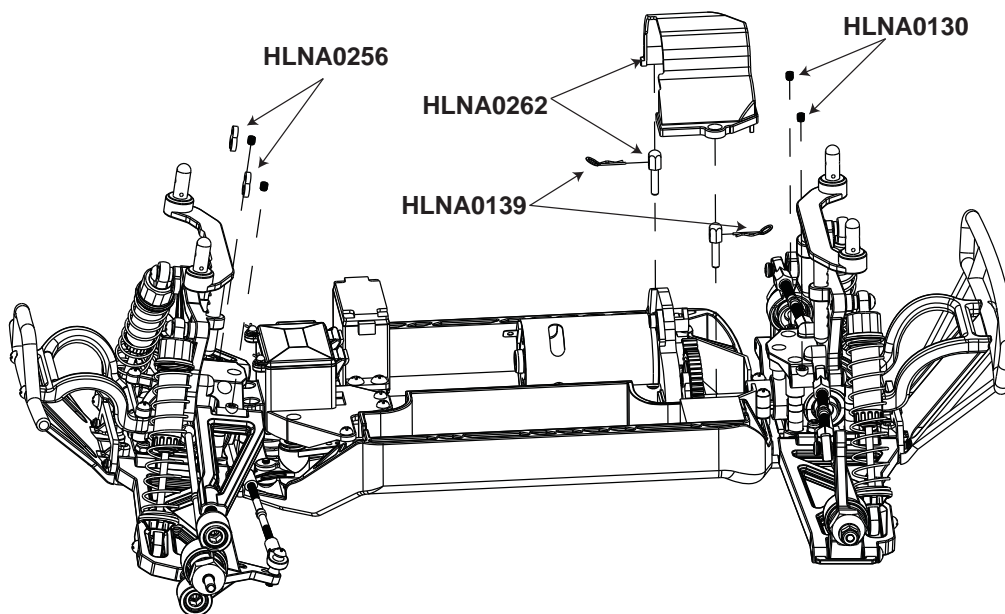


MOTOR INSTALLATION

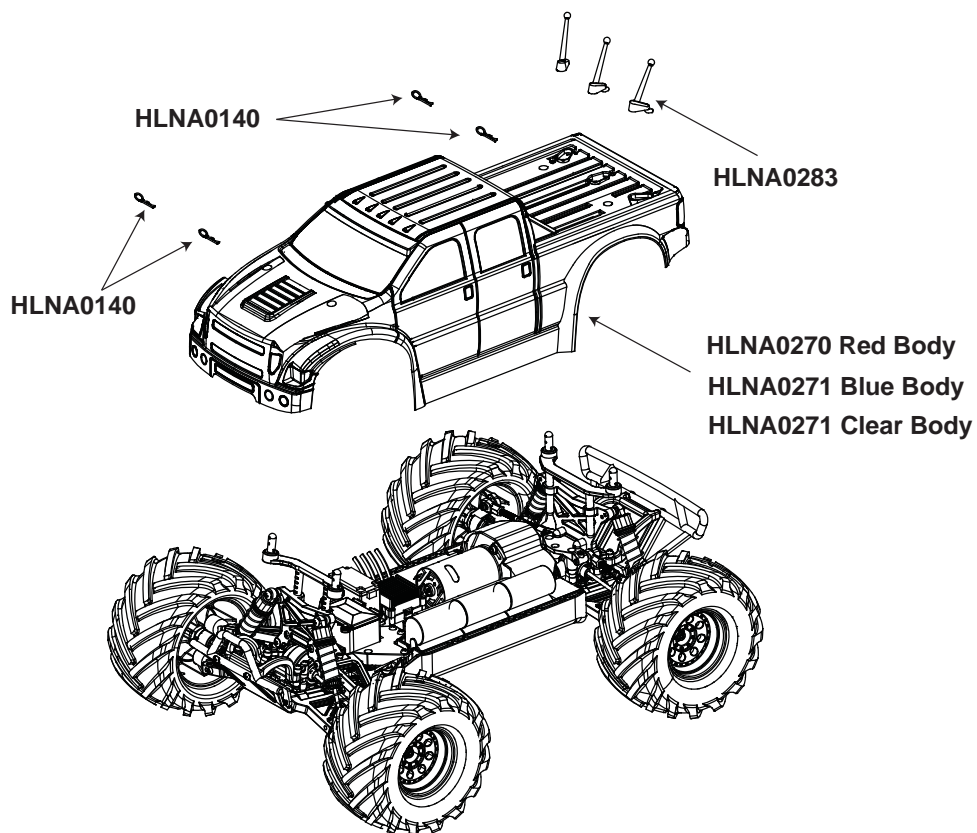




REAR GEAR COVER INSTALLATION



BODY ASSEMBLY AND INSTALLATION





This image shows a full page of blank, lined paper. It features approximately 28 horizontal blue or grey lines spaced evenly apart, typical of notebook paper. The lines extend across the entire width of the page, leaving small margins at the top and bottom. There are no vertical lines, text, or other markings on the page.



HELION SPARE PARTS LIST...



HLNA0062	.. PINION GEAR, 14T, 32P, BRASS
HLNA0069	.. INNER HINGE PIN SET (DOMINUS)
HLNA0076	.. SHOCK TOWER AND BODY MOUNT SET (DOMINUS, SC)
HLNA0084	.. SHOCK SET (DOMINUS, SC)
HLNA0085	.. SHOCK SHAFT SET (DOMINUS, SC)
HLNA0086	.. SHOCK CAPS (DOMINUS)
HLNA0087	.. SHOCK CAP RINGS, ORANGE (DOMINUS)
HLNA0088	.. SPRING SET, BLACK, FRONT AND REAR (DOMINUS, SC)
HLNA0089	.. SHOCK PLASTIC REBUILD (DOMINUS)
HLNA0090	.. SHOCK BODIES (DOMINUS, SC)
HLNA0091	.. SHOCK SEAL REBUILD KIT (DOMINUS)
HLNA0094	.. AXLE SET (DOMINUS)
HLNA0099	.. OUTDRIVE CUP, CENTER, SET (DOMINUS)
HLNA0100	.. PLANETARY GEAR SET, DIFFERENTIAL (DOMINUS)
HLNA0101	.. OUTDRIVE CUP SET, FRONT AND REAR (DOMINUS)
HLNA0104	.. DIFFERENTIAL CASE (DOMINUS)
HLNA0109	.. STEERING HUBS (DOMINUS)
HLNA0110	.. THREADED NUTS, PILLOW BALL (DOMINUS)
HLNA0111	.. PILLOW BALL SET (DOMINUS)
HLNA0112	.. HUB CARRIER SET, REAR (DOMINUS)
HLNA0113	.. HINGE PIN SET, THREADED, UPPER ARMS AND REAR OUTER (DOMINUS)
HLNA0115	.. E-CLIPS, 7MM
HLNA0116	.. E-CLIPS, 4MM
HLNA0117	.. E-CLIPS, 2.5MM
HLNA0121	.. SCREW KIT, FHPS (DOMINUS)
HLNA0122	.. FLAT HEAD PHILIPS SCREWS (FHPS), M3X8MM
HLNA0123	.. FLAT HEAD PHILIPS SCREWS (FHPS), M3X6MM
HLNA0124	.. FLAT HEAD PHILIPS SCREWS (FHPS), M3X10MM
HLNA0125	.. FLAT HEAD PHILIPS SCREWS (FHPS), M2X8MM
HLNA0126	.. SCREW KIT, BUTTON HEAD PHILIPS SCREWS (BHPS) (DOMINUS)
HLNA0127	.. BUTTON HEAD PHILIPS SCREWS (BHPS), M3X12MM
HLNA0128	.. BUTTON HEAD PHILIPS SCREWS (BHPS), M3X8MM
HLNA0129	.. SET SCREWS (SHSS), M3X5MM
HLNA0130	.. SET SCREWS (SHSS), M3X3MM
HLNA0131	.. SET SCREWS (SHSS), M4X4MM
HLNA0132	.. SOLID PINS, 2X11MM
HLNA0133	.. SOLID PINS, 2X10MM
HLNA0134	.. SOLID PINS, 2X9MM
HLNA0135	.. WASHERS, 4X8X0.5MM
HLNA0136	.. SHIMS, 4X12X1MM
HLNA0137	.. LOCKNUTS, M3
HLNA0138	.. LOCKNUTS, FLANGED, M4
HLNA0139	.. BODY CLIPS, SMALL
HLNA0140	.. BODY CLIPS, LARGE
HLNA0141	.. FLAT HEAD PHILIPS SCREWS (FHPS), M3X13MM
HLNA0142	.. FLAT HEAD PHILIPS SCREWS (FHPS), M3X15MM
HLNA0143	.. BUTTON HEAD PHILIPS SCREWS (BHPS), M3X8MM
HLNA0144	.. BUTTON HEAD PHILIPS SCREWS (BHPS), M3X10MM
HLNA0145	.. BUTTON HEAD PHILIPS SCREWS (BHPS), M3X12MM
HLNA0146	.. BUTTON HEAD PHILIPS SCREWS (BHPS), M3X15MM
HLNA0147	.. BUTTON HEAD PHILIPS SCREWS (BHPS), M3X18MM
HLNA0148	.. SOCKET HEAD CAP SCREWS (SHCS), M3X8MM
HLNA0150	.. HINGE PIN BRACE SET, ABCD, ORANGE (DOMINUS, SC)
HLNA0198	.. BULKHEAD SET, FRONT AND REAR (DOMINUS, TR)





...HELION SPARE PARTS LIST CONTINUED...

HLNA0199	.. GEARBOX SET, FRONT AND REAR (DOMINUS, TR).....
HLNA0200	.. DIFFERENTIAL, COMPLETE, FRONT OR REAR, 10-34 (DOMINUS, TR)
HLNA0201	.. GEAR SET, DIFFERENTIAL, 10-34 (DOMINUS, TR)
HLNA0225	.. HELION HRS-3.1 2.4GHz 3-CHANNEL TRANSMITTER
HLNA0226	.. HELION HRS-3.1 2.4GHz 3-CHANNEL RECEIVER
HLNA0228	.. SERRATED NUTS, FLANGED, M4
HLNA0252	.. SERVO, 6KG-WP
HLNA0253	.. BATTERY, 8-CELL 1800MAH 9.6V, TAMIYA PLUG.....
HLNA0254	.. WALL CHARGER, 8 CELL 9.6V NIMH.....
HLNA0255	.. SUSPENSION ARMS, FRONT LOWER (INVICTUS 10MT)
HLNA0256	.. SUSPENSION ARMS, FRONT UPPER (INVICTUS 10MT)
HLNA0257	.. SUSPENSION ARMS, REAR (INVICTUS 10MT).....
HLNA0258	.. HINGE PIN BRACES, AD (INVICTUS 10MT).....
HLNA0259	.. BUMPER SET, FRONT/REAR (INVICTUS 10MT)
HLNA0260	.. SUSPENSION MOUNT, FRONT/REAR (INVICTUS 10MT).....
HLNA0261	.. MOTOR MOUNT (INVICTUS 10MT).....
HLNA0262	.. GEAR AND SHAFT COVER SET (INVICTUS 10MT)
HLNA0263	.. MAIN CHASSIS (INVICTUS 10MT)
HLNA0264	.. FRONT TOP PLATE (INVICTUS 10MT).....
HLNA0265	.. STEERING KIT (INVICTUS 10MT).....
HLNA0266	.. STEERING PLASTIC (INVICTUS 10MT).....
HLNA0267	.. SERVO LINK (INVICTUS 10MT).....
HLNA0268	.. STEERING TURNBUCKLE SET (INVICTUS 10MT).....
HLNA0269	.. REAR CAMBER TURNBUCKLE SET (INVICTUS 10MT).....
HLNA0270	.. RED BODY (INVICTUS 10MT)
HLNA0271	.. BLUE BODY (INVICTUS 10MT)
HLNA0273	.. TIRES AND WHEELS (INVICTUS 10MT).....
HLNA0277	.. CENTER SHAFT (INVICTUS 10MT)
HLNA0278	.. DOGBONES, FRONT (INVICTUS 10MT).....
HLNA0279	.. DOGBONES, REAR (INVICTUS 10MT)
HLNA0280	.. SPUR GEAR, 54T (INVICTUS 10MT)
HLNA0281	.. CHASSIS PLATES, FRONT/REAR (INVICTUS 10MT).....
HLNA0282	.. MOTOR PLATE (INVICTUS 10MT).....
HLNA0283	.. FLAG MOUNTS (INVICTUS 10MT)
HLNA0284	.. BATTERY STRAPS (INVICTUS 10MT).....
HLNA0285	.. BEARINGS, RUBBER SEALED, 5X11X4.....
HLNA0286	.. BEARINGS, RUBBER SEALED, 5X10X4.....
HLNA0287	.. BEARINGS, RUBBER SEALED, 10X15X4.....
HLNA0289	.. INVICTUS 10MT OWNER'S MANUAL AND EXPLODED VIEWS
HLNA0290	.. INVICTUS 10MT EXPLODED VIEW
HLNA0291	.. SERVO HORNS, 23, 24, 25
HLNA0292	.. U-CLIPS, 3MM
HLNA0300	.. WHEEL HEXES, 12MM RIBBED (INVICTUS, MT).....





... **HELION OPTION PARTS LIST...**



HLNA0061	.. SPUR GEAR, 50T, 32P (DOMINUS)	.....
HLNA0063	.. PINION GEAR, 15T, 32P, BRASS	.....
HLNA0064	.. PINION GEAR, 16T, 32P, BRASS	.....
HLNA0106	.. DIFFERENTIAL, COMPLETE, FRONT OR REAR, 11-34 (DOMINUS, SC)	.....
HLNA0177	.. SLIPPER CLUTCH (DOMINUS, SC, TR)	.....
HLNA0178	.. ALUMINUM WHEEL HEX SET (DOMINUS, SC)	.....
HLNA0179	.. CENTER DIFFERENTIAL (DOMINUS, SC, TR)	.....
HLNA0181	.. ALUMINUM REAR HUB CARRIERS, (DOMINUS)	.....
HLNA0182	.. ALUMINUM THREADED SHOCK SET (DOMINUS)	.....
HLNA0231	.. SLIPPER CLUTCH PADS (DOMINIUS)	.....
HLNA0232	.. SLIPPER SPRING AND NUT (DOMINUS)	.....
HLNA0233	.. SLIPPER CLUTCH PLATES AND PADS (DOMINUS)	.....
HLNA0234	.. SLIPPER CLUTCH SHAFTS (DOMINUS, SC, TR)	.....
HLNA0235	.. SPUR GEAR, CENTER DIFFERENTIAL, 50T (DOMINUS)	.....
HLNA0236	.. IN-OUT SHAFTS, CENTER DIFFERENTIAL (DOMINUS, SC, TR)	.....
HLNA0237	.. SHOCK PLASTIC REBUILD, BIG BORE (DOMINUS)	.....
HLNA0238	.. SHOCK CAP RINGS, BIG BORE, OR (DOMINUS)	.....
HLNA0239	.. SHOCK SHAFT SET, BIG BORE, FRONT (DOMINUS)	.....
HLNA0240	.. SHOCK SHAFT SET, BIG BORE, REAR (DOMINUS)	.....
HLNA0241	.. SHOCK SEAL REBUILD KIT, BIG BORE (DOMINUS)	.....
HLNA0242	.. SHOCK SPRINGS, BLACK, FRONT/REAR, BIG BORE (DOMINUS)	.....
HLNA0243	.. SHOCK BODIES, TREADED, FRONT, BIG BORE (DOMINUS)	.....
HLNA0244	.. SHOCK BODIES, THREADED, REAR, BIG BORE (DOMINUS)	.....
HLNA0245	.. SHOCK HARDWARE, BIG BORE (DOMINUS)	.....
HLNA0246	.. INPUT SHAFT, FRONT, CENTER, 10-34 (DOMINUS, TR)	.....
HLNA0247	.. SPUR GEAR SHAFT, 10-34 (DOMINUS, TR)	.....
HLNA0272	.. CLEAR BODY, PC (INVICTUS 10MT)	.....
HLNA0274	.. WHEELS, BLACK (INVICTUS 10MT)	.....
HLNA0275	.. WHEELS, SILVER (INVICTUS 10MT)	.....
HLNA0276	.. TIRES AND FOAM (INVICTUS 10MT)	.....
HLNA0288	.. UNIVERSAL DRIVE SHAFT SET, F/R (INVICTUS 10MT)	.....
HLNA0295	.. SLIPPER CLUTCH (INVICTUS, MT)	.....
HLNA0296	.. CENTER DIFFERENTIAL (INVICTUS, MT)	.....

RADIANT SPARE PARTS LIST



RDNA0028	.. REAKTOR BRUSHLESS MOTOR, SENSORLESS, 3500KV 2PSLS	.....
RDNA0030	.. REAKTOR BRUSHLESS ESC SL-45A WP-P PROGRAMMABLE SENSORLESS	.....
RDNA0033	.. REAKTOR 5V FAN FOR 45A WP ESC	.....

RADIANT OPTION PARTS LIST

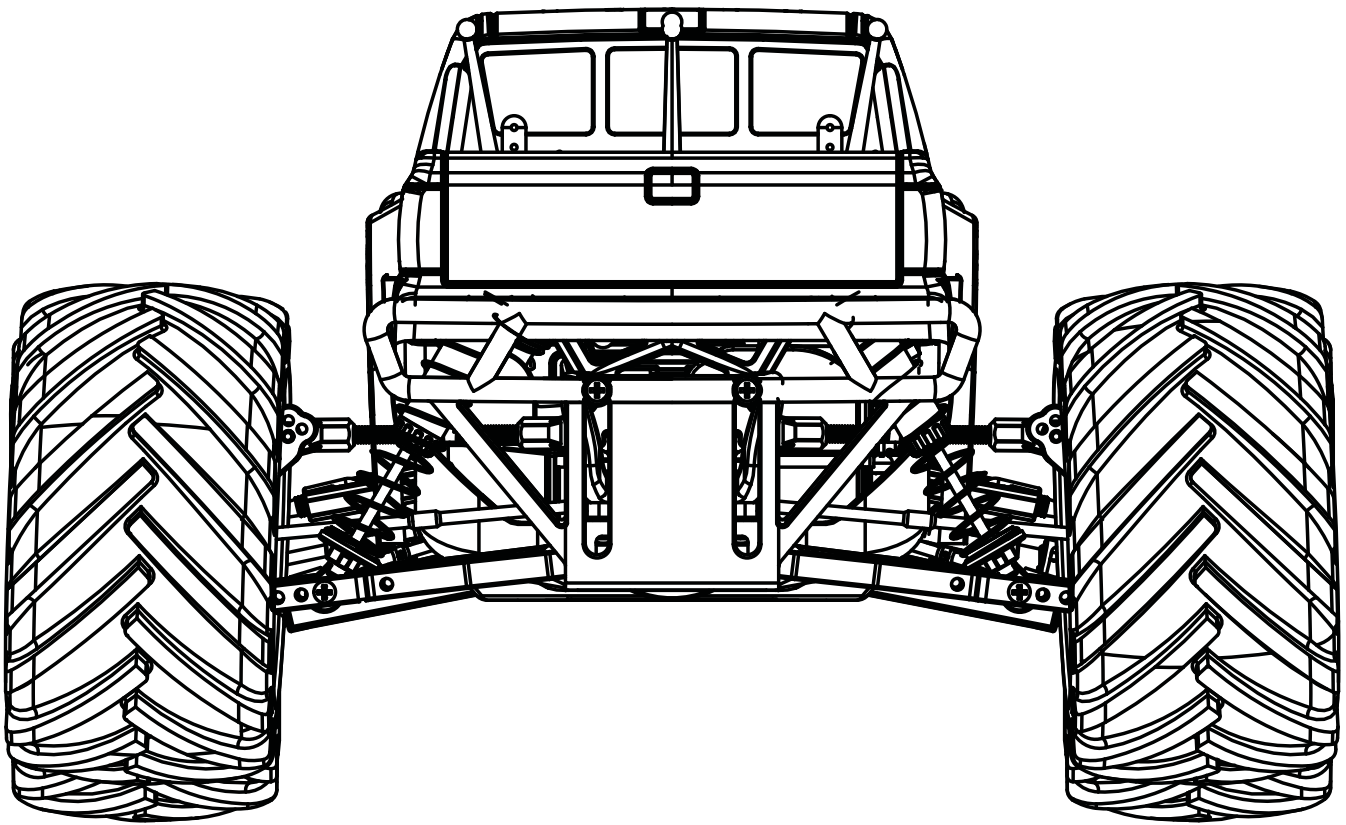


RDNA0001	.. PRIMAL LED MULTI-CHEMISTRY AC PEAK DETECTION BALANCE CHARGER	.....
RDNA0002	.. ASCEND LCD MULTI-CHEMISTRY AC/DC PEAK DETECTION BALANCE CHARGER	.....
RDNA0003	.. PRIMAL/ASCEND 2-3S UNIVERSAL BALANCE BOARD	.....
RDNA0004	.. TAMIYA TO MICRO/MINI ADAPTER	.....
RDNA0007	.. ALLIGATOR CLIPS, LARGE, BULLET CONNECTION	.....
RDNA0014	.. ORIGIN LED NIMH AC/DC PEAK DETECTION CHARGER	.....
RDNA0023	.. REAKTOR BRUSHLESS ESC AND MOTOR COMBO	.....
RDNA0026	.. REAKTOR MOTOR HEATSINK WITH COOLING FAN	.....
RDNA0027	.. REAKTOR 25MM COOLING FAN FOR ESC	.....
RDNA0032	.. REAKTOR ESC AB PROGRAM BOX	.....
RDNA0034	.. REAKTOR 12V (3S LIPO) FAN FOR 45A WP ESC	.....



INVICTUS 10MT

1/10th SCALE 4x4 BRUSHLESS POWERED
MONSTER TRUCK



POWERED BY
RADIANT
REAKTOR