



DRIFT SPARROWHAWK **DC II**

1/10 SCALE ELECTRIC POWERED DRIFT RACING CAR SERIES



**BRUSHLESS
SYSTEM**
inside

Racing Car Series
LED Light Kit Included



No.6576

This radio control model car is not a toy! Before beginning operation, please read this manual thoroughly.

The contents are subject to change without prior notice due to product improvements and specification changes.

Instruction Manual

WARRANTY

Thunder Tiger Corporation guarantees this model kit to be free from defects in both material and workmanship. The total monetary value under warranty will in no case exceed the cost of the original kit purchased. This warranty does not cover any components damaged by use or modification. Part or parts missing from this kit must be reported within 60 days of purchase. No part or parts will be sent under warranty without proof of purchase. To receive part or parts under warranty, the service center must receive a proof of purchase and/or the defective part or parts. Should you find a defective or missing part, contact the authorized Thunder Tiger Service/Distributor nearest you. Under no circumstances can a dealer or distributor accept return of a kit if assembly has started.

INTRODUCTION

Thank you for your purchase of this Thunder Tiger product. You should enjoy many hours of fun and excitement from this advanced R/C model. Thunder Tiger strives to bring you the highest level of quality and service we can provide. We race and test our cars around the world to bring you state-of-the-art products.

We offer on-line help on our www.thundertiger.com forum and our product specialists are ready to take your call if you have any technical questions. Please read all instructions and familiarize yourself with the systems and controls of this model before running. Have fun and enjoy the exciting world of R/C!

CAUTION

Thanks you for purchasing a Thunder Tiger product. **Please read all instructions thoroughly before operation.**

1. This product is not a toy. It is a high performance model product. It is important to familiarize yourself with the model, its manual, and its construction before assembly or operation. Children's operating under the supervision of an adult is necessary.
2. Always keep this instruction manual ready at hand for your assembling and operating reference, even after completing the assembly.
3. Do not operate model products in rain, on public roads, near crowds, near airport, or near areas with restricted radio operation.
4. This product, its parts, and its construction tools can be harmful to your health. Always exercise extreme caution when assembling and/or operating this product. Do not touch any part of model that rotates.
5. Check your radio frequency with the proper operating frequency of the area or country. Always check if there are any modelers operating on the same frequency as you are. Also, check your radio for proper operation before operating a model.
6. Use an adequate charger for the batteries and follow the instruction correctly.
7. Right after use, do not touch equipment on the model because they may generate high temperatures!
8. Do not stall the motor. The ESC may fail if power is applied to the motor when car cannot move freely.
9. By the act of assembling or operating this product, the user accepts all resulting liability. If the buyer is not prepared to accept this liability, then he/she should return this product in new, unassembled, and unused condition to the place of purchase.

WARNING: To avoid a possible fire hazard, ALWAYS unplug the battery after use. Do NOT leave your vehicle unattended with the battery plugged in.

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The ACE RC Cougar PS3 2.4GHz Radio System

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ITEMS REQUIRED FOR OPERATION

RTR CONTENTS



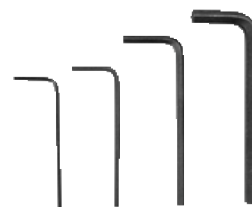
No.8307
Cougar PS3 2.4Ghz 3CH Digital Radio
TRS401ss 2.4GHz Mini Receiver



No.8114
STD Servo / S1903



4-Way Wrench



Hex Wrench Set, 1.5mm / 2.0mm / 2.5mm / 3.0mm



No.8060
ACE R/C BLC-40C speed control



No.2344
RIPPER IBL36/39-540C

ITEMS REQUIRED FOR OPERATION

EQUIPMENT NEEDED (Not included in the box)



No.2843
7.4V Li-Po Battery, 2S1P 35C



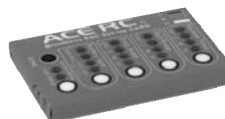
AA Alkaline dry batteries
8 pieces for transmitter



No.2532
Li-Po Battery E-Charger

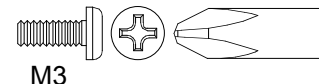


No.AT1051/-E/-U
AC/DC Adaptor, 12V/8A

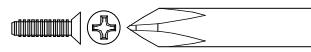


No.AQ1712
BLC ESC Setting Card

TOOLS NEEDED



M3

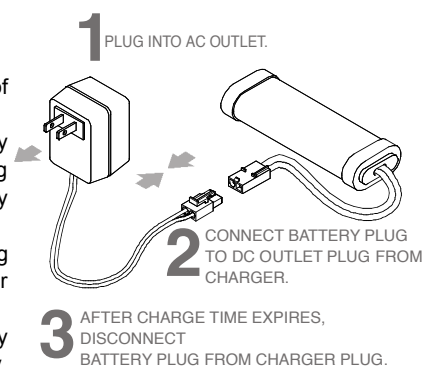


M2

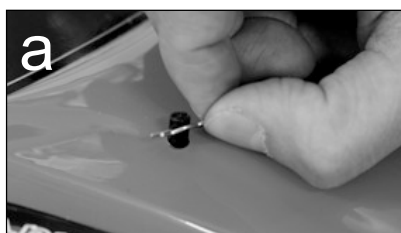
Philips Screwdriver

1 CHARGING THE BATTERY PACK (Battery and Charger are not included in the kit.)

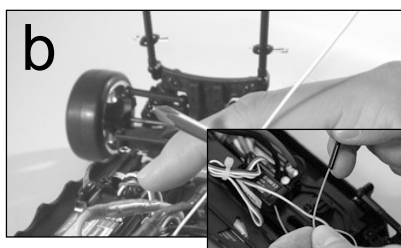
- Once the battery ready to be charged, first plug the AC quick charger into the outlet of AC power source, and then connect the battery input/output harness to the charger.
- Continued to monitor the battery as it is being charged. As soon as the battery is fully charged, disconnect the battery from the charger plug (Over-charging or charging incorrectly using inadequate chargers may cause the battery pack to become dangerously hot).
- Make sure that the battery pack is completely discharged prior to charging. Discharging the battery pack by running the electric motor until it slows down or using a discharger (Not included).
- For best results, let the battery pack cool before charging. Heat may prevent the battery pack from charging to full capacity and also decreases the performance of the battery.



2 PREPARING THE CHASSIS



a. Remove the body pins (4 pcs.) and detach the body.



b. Straighten antenna with a screwdriver so it is easier to insert into antenna tube.



c. Put the antenna wire through the antenna pipe. (Do not cut or shorten antenna wire.!) Push the antenna pipe into the chassis mount hole.

3 INSTALLING RADIO & POWER SYSTEM BATTERIES (Battery shown is not included in the kit)

- Install 8pcs alkaline or rechargeable AA-size batteries (Not Included) into transmitter.
- Install the power pack and connect to the ESC.

Caution: Confirm wiring and connections before connecting the speed control to the battery. Incorrect polarity will damage your speed control.



a



b

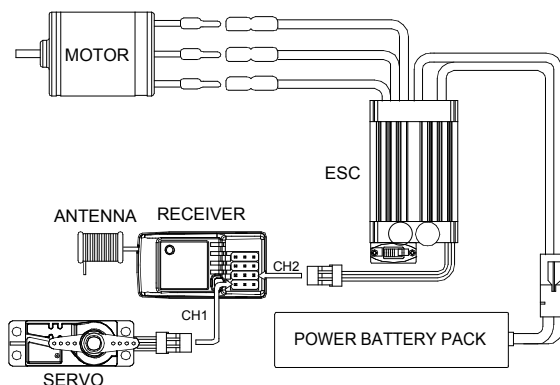
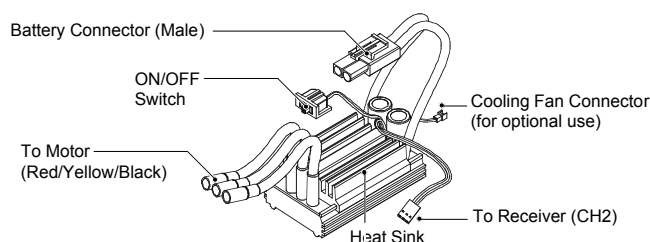
4 The ACE RC Cougar PS3 2.4GHz Radio System



TRANSMITTER CONTROLS

1. **Transmitter Antenna:** Straighten up the antenna before operating the model.
2. **Battery Level Indicator:** Three LEDs indicate the battery voltage level. If the Red LED flashes, please replace the batteries.
3. **HI/LO Throttle ATV (Adjustable Travel Volume):** Provides the function to let you independently preset the maximum travel of the throttle servo either side (high / low) of neutral.
4. **Servo reversing switches:** To reverse the servo's rotation direction at the flip of the switch. The reversing switches are recessed into the transmitter to prevent accidental operation.
5. **Steering Trim:** Adjusts the steering in small increments or decrements to run the model straight.
6. **Throttle Trim:** Adjusts the throttle in small increments or decrements to shift the neutral position.
7. **Steering D/R (Dual Rates):** Push this lever left or right to adjust the amount of the steering dual rate. Right to increase dual rate amount and left to decrease the amount.
8. **AUX Ch Button:** Provides an extra function for the control of the model.
9. **External Charging Jack:** For rechargeable NiCd/NiHM battery pack on the transmitter only.
10. **2.4GHz binding SW:** The Binding SW button is located on the back of the 2.4GHz transmitter. For additional details, please refer to the "Binding" setting procedure (Page 4).
11. **Steering Wheel:** Controls the steering of the model.
12. **Power Switch:** Sliding to turn the transmitter on or off.
13. **Throttle Trigger:** pulled or pushed to control the movement of the model.
14. **Steering Tension Adjustment:** Use a Phillip type screwdriver to tighten or loosen the tension of the steering wheel.
15. **Battery Cover:** Slide cover to install or remove batteries.

4.2 MODEL WIRING DIAGRAM



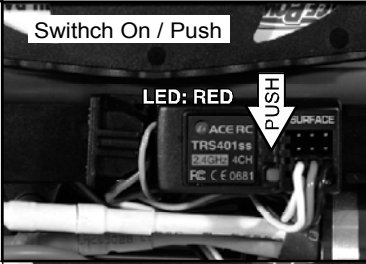



5 BINDING PROCESS

A binding feature is included in the ACE RC Cougar 2.4GHz spread spectrum system to ensure the transmitter and receiver bind properly and prevent interference from other controllers. To manually bind Tx/Rx, please proceed as per the following steps:

- Press and hold the "Binding SW" button on the back side of the transmitter while turning on the transmitter.
- Release the "Binding SW" button after the green LED flashes indicating the transmitter is binding.
- Press and hold the bind button on the receiver while turning on the receiver. Binding process will then start automatically. The LED will turn green/red flash on the receiver.
- Release the "Binding SW" button. Successful binding is confirmed by the binding LED changing from a quick blinking and then remain solid on the transmitter. The LED will turn green on the receiver. Once binding is complete, the system will automatically connect.

Note: Binding process may take 3~10 seconds to execute. If binding fails, the LED on the receiver will turn red. Please turn off the power and repeat the steps from a) ~d).

Step	TX Action	RX Action	LED
a	Switch On / Push 	No Action	—
b	Release 	No Action	TX LED : Green Flash
c	No Action	Switch On / Push 	RX LED : Green / Red Flash
d	No Action	Release 	TX LED : Green Flash-->Green Solid RX LED : Red Solid-->Green Solid

6 FAIL SAFE(F/S) FUNCTION SETTING

ACE RC COUGAR 2.4GHz R/C system features a built-in Failsafe function to automatically set a servo command if the receiver loses the signal from transmitter due to interference. For safety, we strongly recommend to active the FAILSAFE function on your Cougar R/C system.

Setting up the Failsafe (F/S) Function:

- After binding the transmitter and receiver, you can continually set up the F/S function. Turn on the transmitter power and then receiver power.
- Press and hold the "Binding SW" button on the receiver for 10 seconds. The LED will start flashing GREEN on the receiver.

CAUTION: Do not release the "Binding SW" button on the receiver until STEP C is completed.

- Move and hold the throttle trigger to the position you want the control to be in if a failsafe condition should occur. First, keep steering wheel at neutral position (steering servo at neutral position). To set up F/S function with the throttle servo position at "Brake", first push the trigger to the brake position and hold. To set up F/S function with servo position at "Neutral", keep the trigger at neutral position.

NOTE: Always set the throttle trigger to neutral or full brake position and steering servo to neutral position in case of any unexpected control error!

Factory pre-settings for RC car F/S function are :

- Electric Car- Steering servo at neutral, throttle at neutral.
- Nitro Car- Steering servo at neutral, throttle at iddle and car brakes.



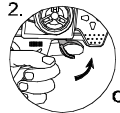





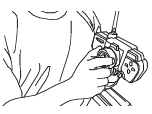
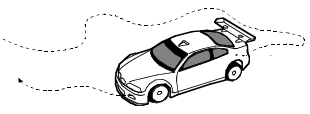
- After the Step C, release the "Binding SW" button on the receiver first and then the throttle trigger. The LED turns to solid "RED" and then back to solid "GREEN" indicating the F/S function has now been activated.
- Test by turning off your transmitter and watching the servo failsafe position activate.

F/S at "Neutral" : To check the fail safe is working properly, by moving the throttle trigger to the full forward (full brake), hold this position and then turn off the transmitter. The F/S function should move the throttle servo to "Neutral" position and the steering servo to "Neutral" position.

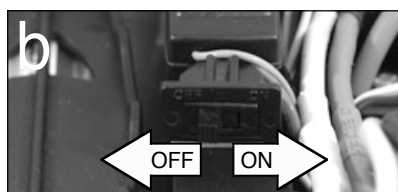
F/S at "Brake" : To check the fail safe is working properly, by keeping the throttle trigger at neutral and then turn off the transmitter. The F/S function should move the throttle servo to "Brake" position and the steering servo to "Neutral" position.

- If the F/S function fails or need to change the F/S hold position, repeat the steps a) ~e). After the F/S is completed, you can start normal operation.

CAUTION: ALWAYS reset FAILSAFE function after binding your transmitter & receiver.

Step	TX Action	RX Action	Check
a	Binding complete	Binding complete	TX LED : green solid RX LED : green solid
b	No action	Push for 10 seconds  Switch on Power	RX LED : green flash
c	1. Steering: neutral 2. Keep brake or trigger at neutral   or 	No action	Pre-settings for f/s function: EP car :steering at neutral / ESC at neutral GP car :steering at neutral / Carb. at iddle
d	Release later 	Release first 	RX LED : red solid-2s->green solid
e	1. Keep brake 2. Switch off  	No action	F/S function activates
f	OK!  		

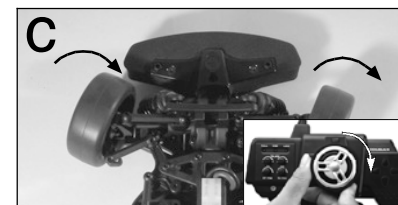
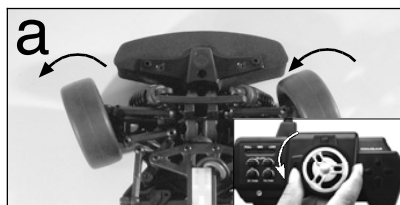
7 RADIO OPERATION



- When turning radio system on. Turn the transmitter on first, then turn on the ESC.
- When turning the radio system off. Turn the ESC off first, then turn off the transmitter.
- Servo Reversing: It is sometimes necessary or convenient to reverse the output direction of the servo. The direction of the rotation for each individual servo can be changed by simply flipping the reversing switch that corresponds to the channel number on the receiver where the servo is plugged in. Under normal circumstances, Ch1 is steering, Ch2 is throttle, and Ch3 is for extra function. Using the reversing switches as needed.

Caution: Do not run the transmitter's battery flat or you will lose control of the car. For additional details, please refer to the transmitter instruction manual.

8 OPERATING RADIO STEERING FUNCTION



- Check the radio steering functions. With the radio transmitter and receiver on, turn the steering wheel to the left. The front tires/wheels should turn left accordingly. If not, flip the steering servo reverse switch.
- Return the steering wheel to neutral. The front tires/wheels should point straight forward. If not, use the steering trim lever to correct it.
- Turn the steering wheel to the right. The front tires/wheels should turn right accordingly.

9 ADJUSTING THE ELECTRONIC SPEED CONTROL(ESC)

Calibrating your ESC and transmitter.

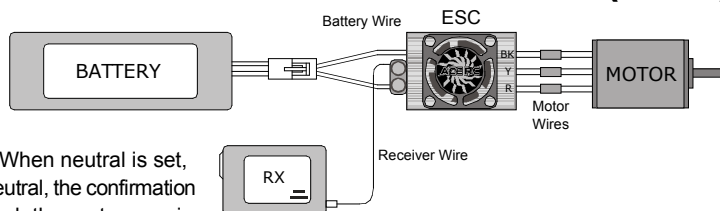
- Install the ESC according to the diagram shown above. Switch on the transmitter first, and then switch on the ESC power. Once the ESC is switched on, it will emit a series sound indicating the ESC is actuating. Adjust the throttle trim to get the best neutral position. When neutral is set, another confirmation sound is emitted. If it fails to set up neutral, the confirmation sound will not be heard. In such a case, re-do & re-check the system again starting from Step 1 of these instructions. This ESC is applicable to transmitters with either 50/50 or 70/30 throttle/brake movement range.
- Confirm that the throttle forward direction coincides with the ESC forward direction. Lift the car off its wheels. Move the throttle forward and watch the wheel's rotation direction, then move the throttle backwards and see if the system brakes.
- If the wheels' movement coincides with the throttle input then the setting is correct. If the movement is opposite then switch off the ESC, change the setting on the transmitter's throttle reversing switch, and go back to Step 2.
- Motor rotation direction - Slowly apply throttle to check if the motor is rotating in the correct direction. To reverse the direction of the motor, switch any two of the motor wires. Note: Do not reverse the battery wire connections! Reversing the battery polarity will permanently damage the ESC.
- For the first trial run, start with a smaller gear motor for 2~3 minutes then monitor the temperatures of both the ESC & motor. If both temperatures are similar to each other, they are at good match. The gear ratio can then be properly adjusted to the desired optimum ratio depending on the type of car and track. However, it is very important to always keep both temperatures under 95 °C, when selecting a gear ratio. A higher gear ratio (larger pinion or smaller spur gear) will increase the system temperature. Running the system at increased temperatures will cause demagnetization of the motor, resulting in a dramatic drop of motor efficiency.
- It is ok to replace a higher gear ratio or a higher KV motor if the temperature is kept under 80 °C but it should be done in accordance to the instructions in Step 6. Start from a lower ratio then incrementally adjust higher. Battery selection is also an important consideration. Changing to a higher voltage battery will require a lower KV motor and/or a lower gear ratio, unless the original motor has a low enough KV rating to begin with. The ESC will be burn out if the motor and gear ratio does not match the input voltage properly. See the example below showing how battery voltage affects power output.

Input 7.2V, internal resistance 0.18Ω--- 40A

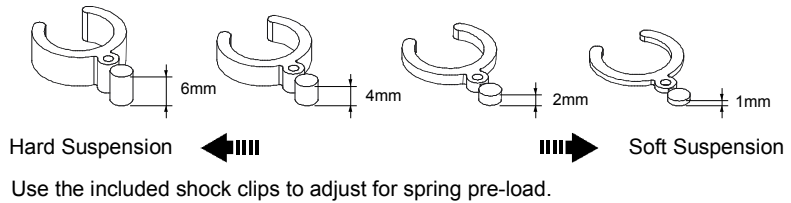
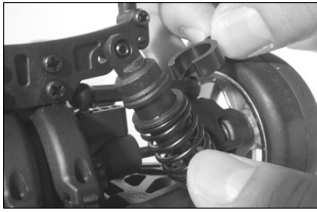
(V/R=I 7.2/0.18=40A)

Input 11.1V, internal resistance 0.18Ω--- 61.6A

(V/R=I 11.1/0.18=61.6A)



11 SHOCK ADJUSTMENT



12 WHEEL AND TIRE PREPARATION



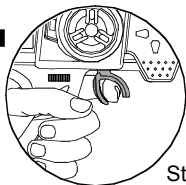
- Remove wheel lock nut using the 4-way wrench and detach wheels.
- Replace fresh tires and wheels if the original tires are worn out.
- Tighten the wheel lock nut.



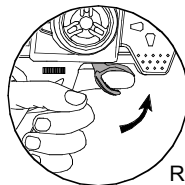
13 MAINTENANCE AFTER RUNNING

- Always turn off the radio system and disconnect the battery pack when the car is not in use.
- Remove sand, mud, dirt, and any other elements before storing the car.
- Never use chemicals or any solvents to clean the chassis as it may cause damage to the electronics components and plastic parts. Use compressed air, soft paintbrush, or toothbrush to clean dust and dirt.

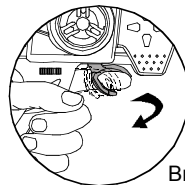
14 DRIVING BASIC



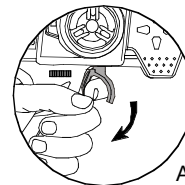
Stop (Neutral)



Reverse



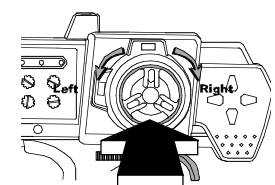
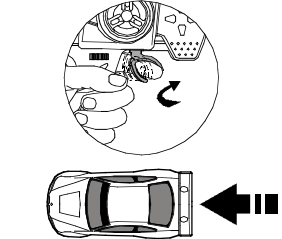
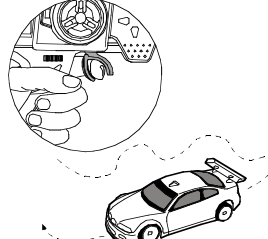
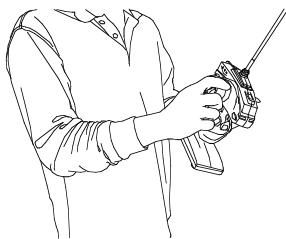
Brake



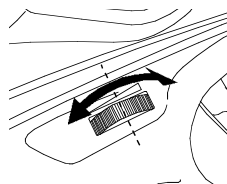
Acceleration

DRIVING TIPS

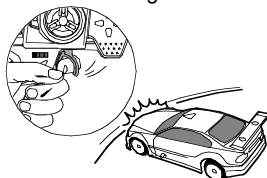
- Hold your elbows in and keep the transmitter antenna pointing straight up.
- Squeeze the throttle trigger or pull the throttle stick gently and steer the car to left and right.
- Squeeze the throttle trigger and release. Repeat this action to control car speed.
- If you are of unsure of the steering direction, practice with the transmitter facing towards you.



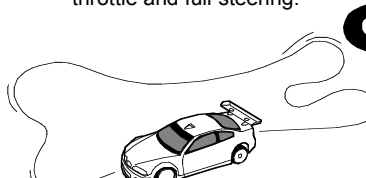
- At first, set the steering D/R function for less steering response.



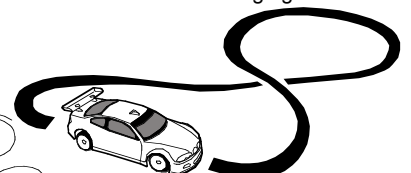
- Be careful not to squeeze the throttle trigger abruptly while steering.



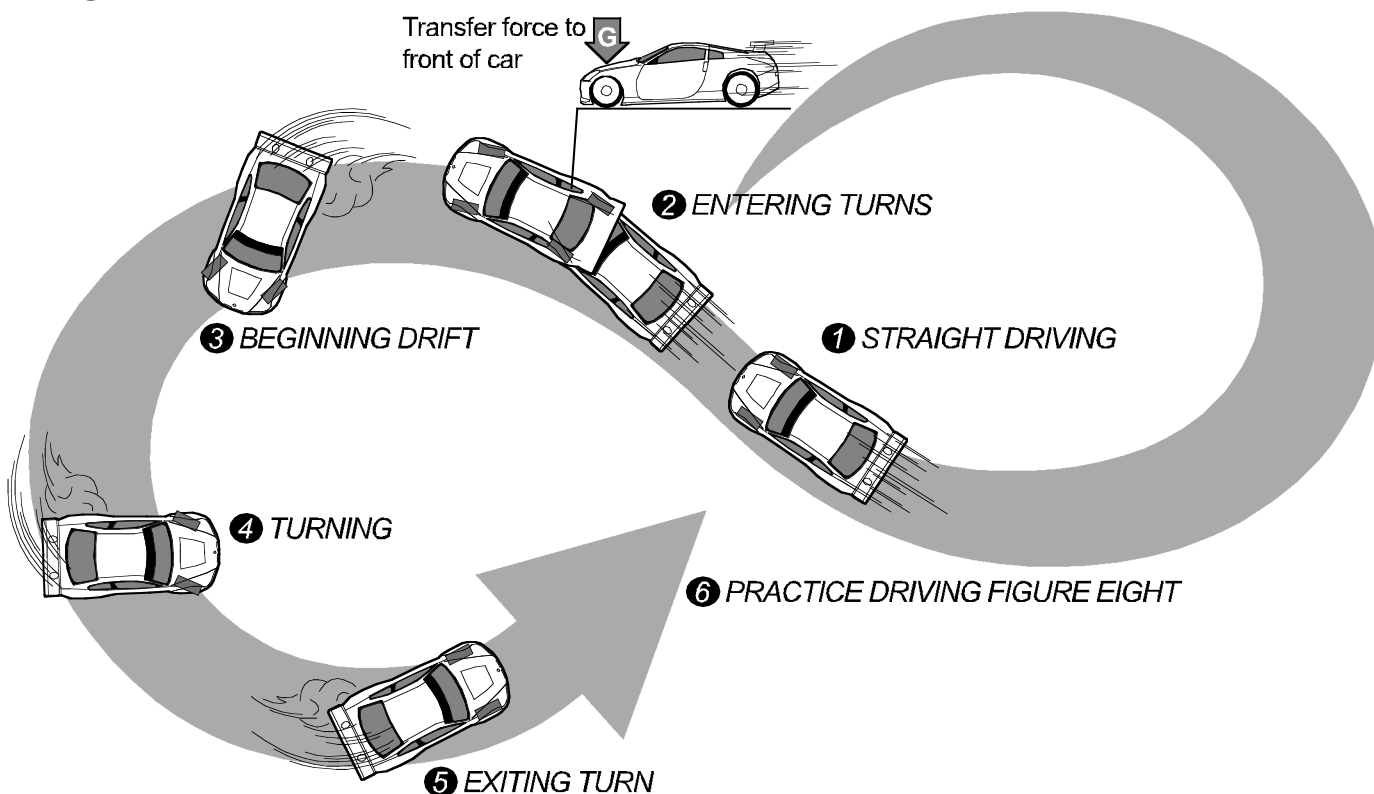
- After you become used to the controls, experiment with high performance at full throttle and full steering.



- Practice doing figure 8S.



15 DRIFT RACING SKILLS



1 STRAIGHT DRIVING

Maintain consistent throttle control. Sudden changes can throw the vehicle out of balance.



4 TURNING

Use throttle and steering to control turning radius. Start returning controls of neutral position as you near exit to turn.



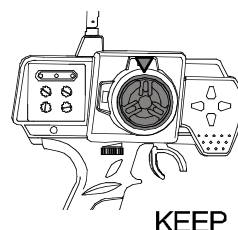
2 ENTERING TURNS

Release throttle for an instant, transferring force to front of car while cutting the steering wheel.



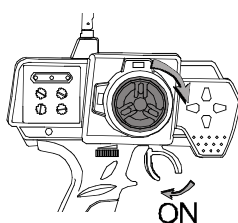
5 EXITING TURN

Return controls to neutral position, after car's position has stabilized, accelerate gradually.



3 BEGINNING DRIFT

As rear starts to slide, counter-steer to prevent spinning out. Use throttle to maintain drift posture.



6 PRACTICE DRIVING FIGURE EIGHT

The figure eight is perfect for mastering the mixture of straights and turns that drift driving entails. Practice as often as you can, perfecting the timing of when to cut steering and the best throttle position for maintaining drift. When you're ready, practice high speed oval course driving and wild drift parking!

16 LED INSTALLATION & INSTRUCTIONS

Wire Mounting

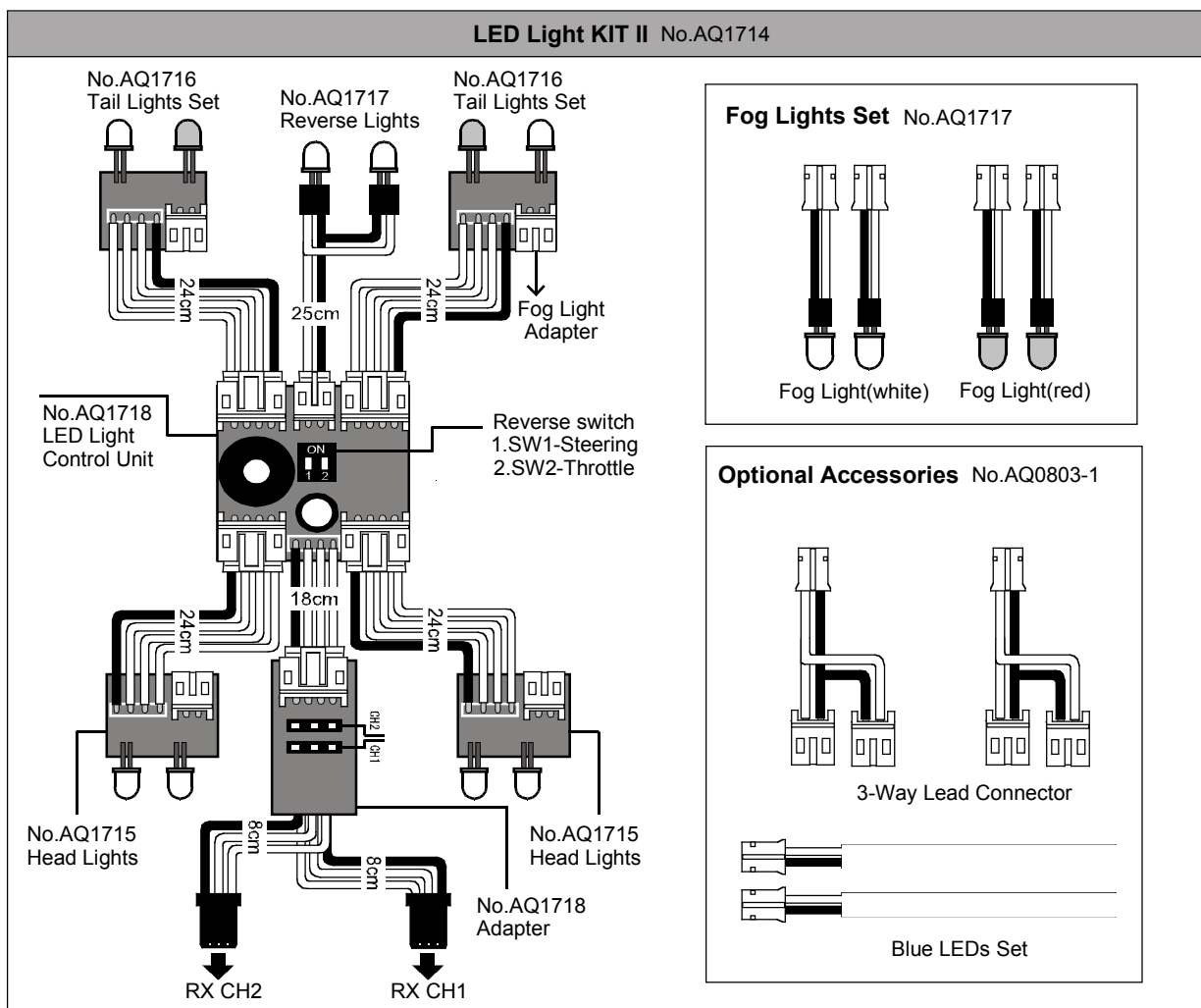
1. Use a piece of double-sided tape to mount LED Light Control Unit on the top roof inside of body. Secure all the leads accordingly behind the covered parts of the body and then connect the LED sets to the LED Light Control Unit.
2. Use a piece of double-sided tape to mount the PC board of the LED headlights / tail lights set on appropriate positions inside the body. Use mounting tape (Not included) to hold excess leads in place for not failing or binding wheels.
3. By bending the pins of the LED light to adjust the LED lights for your own body light casings.
4. Insert the LEDs into the LED light casings (holders). Secure the LEDs with the light casings (holders) with silicon glue appropriately.

Lighting / Sound Effects

1. The blinking hazard light will be activated 3 seconds right after the throttle returning to neutral position. The front and rear turn signal lights will be activated at the same time but turns off 10 seconds after being activated.
2. Slowly apply the throttle forwards, the headlights keep constant full brightness, and then the LED lights start to flash along with tail lights get half-brightness once after the trigger has been completely pulled forwards.
3. When apply the braking, the LED headlights / tail lights will be keeping fully brightness without blinking.
4. By reversing the throttle direction, the LED Control Unit will denote a series sound of "Bi.Bi.Bi" indicating the car is driving backwards.
5. If the car turns right, the right turn LED signal lights start to flash. If the car turns left, the left turn LED signal lights start to flash.

Dip Switch Adjusting

1. Connect the LED leads according to the diagram show below. Do not connect the CH1 (Steering) and CH2 (Throttle) leads onto the wrong connectors of receiver.
2. When applying the throttle to forward position, the headlights keep constant full brightness, and then the LED lights start to quickly flash once after the trigger has been completely pulled forwards. If the forward direction does not coincide with the LED lighting functions. Change the dip switch (CH2) on the LED Control Unit will correct the non-coincidence problem.
3. If the steering direction does not coincide with the car turning directions. Change the dip switch (CH1) on the LED Control Unit will correct the non-coincidence problem.



DRIFT

SPARROWHAWK DX II

TROUBLESHOOTING

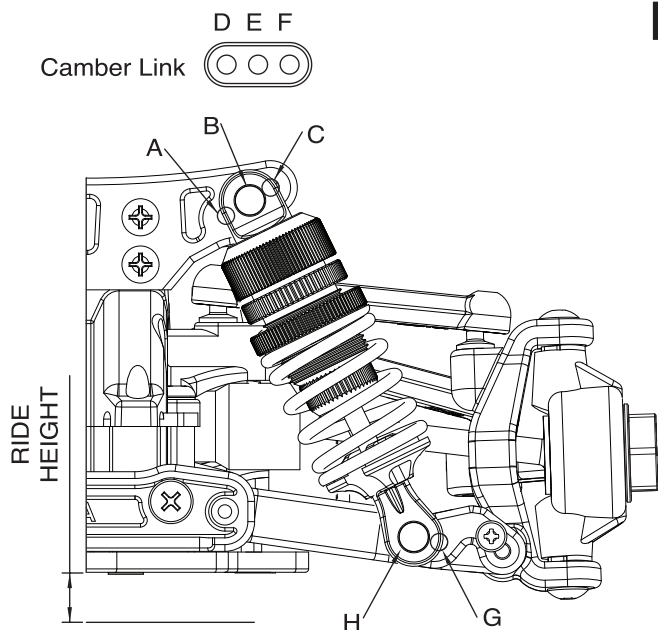
If you have trouble starting or keeping your SPARROWHAWK DX II running, here's a quick checklist of what to look for first.

DESCRIPTION	PROBLEM	SOLUTION
Car dies or slows	Speed control over heats	Let it cool and try later
Car is glitching	Car has a problem on power	Check for loose wires, dead radio batteries.or loose crystals. Check motor capacitors, losse wires or crystals.
Motor is overheats	Gear mesh is too tight	Let motor cool and check recommended gearing for motor type. Reset gear mesh
No power	Battery is discharged Battery not plugged in	Charge battery Plug battery in
No throttle	Motor not plugged in Motor failure Motor keeps running	Plug motor in Replace motor Check if the throttle trim knob is in neutral position.
No steering	Servo not plugged in Locked up steering linkage Servo failure	Plug servo into ESC unit Free up steering linkage Replace servo
Reversing	Goes backwards when you pull the trigger or goes right when turning the wheel left	Check throttle / steering reversing switches on transmitter

SPARROWHAWK **DX II** SETUP SHEET Ver 1.0

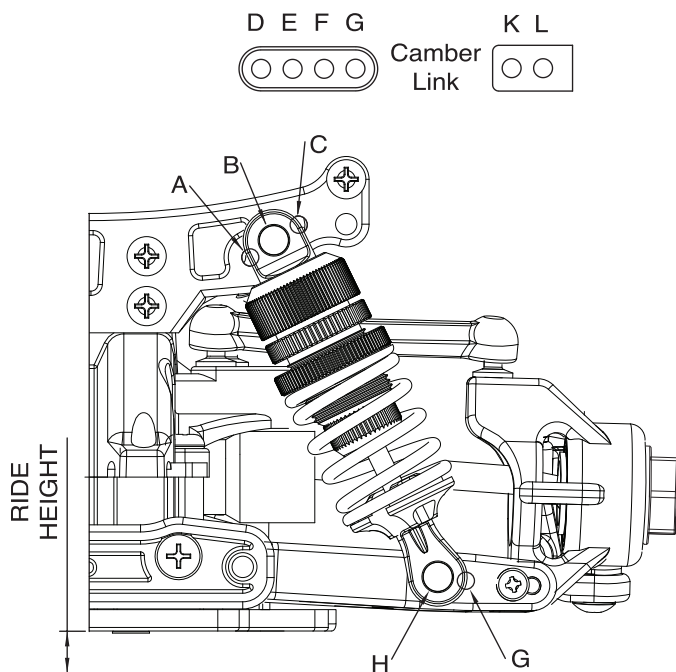
NAME		EVENT		DATE	
TRACK		TEMP		CONDITIONS	
SERVO		ESC		RADIO	

FRONT



SHOCKS	
SHOCK OIL	
SHOCK PISTON	Ø1.2 Ø1.3 Ø1.4
SPRING	
SHOCK POSITION	A B C H G
ALIGNMENT	
CASTER ANGLE	
CAMBER ANGLE	
TOE IN	
RIDE HEIGHT	
TIRES	
TIRE TYPE	
TIRE HARDNESS	
TIRE DIAMETER	
INSERT HARDNESS	
SUSPENSION GEOMETRY	
LOWER ARM POSITION	⊙ ⊙ ⊙
CAMBER LINK POSITION	D E F
SWAY BAR	
DIFFERENTIALS	
DIFF OIL	

REAR



SHOCKS	
SHOCK OIL	
SHOCK PISTON	Ø1.2 Ø1.3 Ø1.4
SPRING	
SHOCK POSITION	A B C J H
ALIGNMENT	
CASTER ANGLE	
CAMBER ANGLE	
TOE IN	
RIDE HEIGHT	
TIRES	
TIRE TYPE	
TIRE HARDNESS	
TIRE DIAMETER	
INSERT HARDNESS	
SUSPENSION GEOMETRY	
LOWER ARM POSITION	⊙ ⊙ ⊙
CAMBER LINK POSITION	D E F G K L
SWAY BAR	
DIFFERENTIALS	
DIFF OIL	

MOTOR TYPE		SPUR	t	PINION	t
BRUSH		SPRING		TIMING	°
BODY		WING		BATTERY	