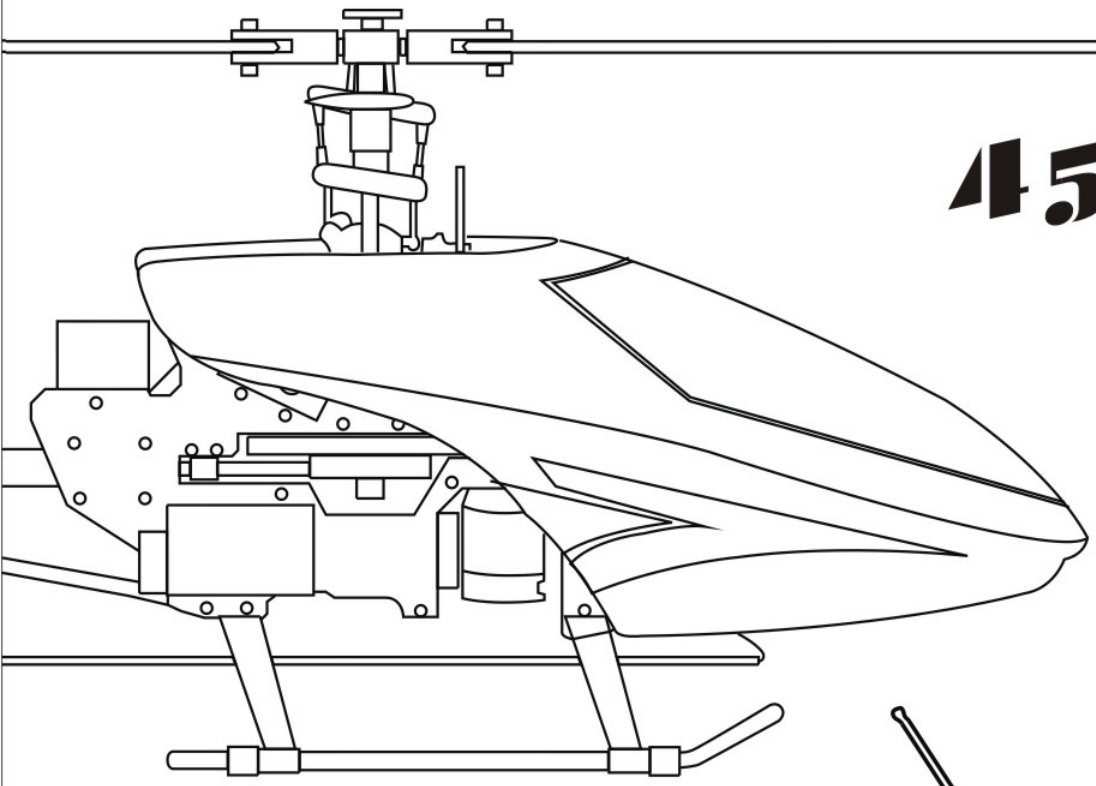
KDS MODEL

INSTRUCTION MANUAL

使用说明书



450SV

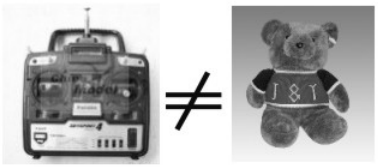
1.INTRODUCTION 前言

Thank you for purchasing KDS Products.The KDS 450SV Helicopter is designed as an easy to use,full featured Helicopter R/C model capable of all forms of rotary flight. Please read the manual carefully before assembling the model, and follow all precautions and recommendations located within the manual. Be sure to retain the manual for future reference, routine maintenance, and tuning. The KDS 450SV is a new product developed by KDS. It features the best design available on the Micro-Heli market to date, providing flying stability for beginners, full aerobatic capability for advanced fliers, and unsurpassed reliability for customer support.

感谢您选购KDS产品,为了让您容易方便的使用KDS 450SV直升机、请您详细的阅读完这本说明书之后再进行组装以及操作这台直升机，同时请您妥善的保存这本说明书、作为日后进行调整以及维修的参考。KDS 450SV是由KDS自行研发的新产品,不论你是需求飞行稳定性的初学者或是追求性能的飞行爱好者。KDS 450SV将是你最佳的选择。

IMPORTANT NOTES 重要声明

R/C helicopters, including the KDS 450SV are not toys. R/C helicopter utilize various high-tech products and technologies to provide superior performance. Improper use of this product can result in serious injury or even death. Please read this manual carefully before using and make sure to be conscious of your own personal safety and the safety of others and your environment when operating all KDS products. Manufacturer and seller assume no liability for the operation or the use of this product. Intended for use only by adults with experience flying remote control helicopters. After the sale of this product we cannot maintain any control over its operation or usage.



It is not a Toy!

KDS 450SV遥控直升机并非玩具，它是结合了许多高科技产品所设计出来的休闲用品，所以商品的使用不当或不熟悉都可能会造成严重伤害甚至死亡，使用之前请务必详读本说明书，勿轻忽并注意自身安全注意！任何遥控直升机的使用，制造商和经销商是无法对使用者于零件使用的损耗异常或组装不当所发生之意外负任何责任，本产品是提供给有操作过模型直升机经验的成人或有相当技术的人员在旁指导，以确保安全无虞下操作使用，产品售出后本公司将不负任何操作和使用控制上的任何性能与安全责任。

NOTE 声明

Fly only in safe areas, away from other people. Do not operate R/C aircraft within the vicinity of homes or crowds of people. R/C aircraft is prone to accidents, failures, and crashes due to a variety of reasons, including lack of maintenance, pilot error, and radio interference. Pilots are liable for their actions and damage or injury occurring during the operation or as a result of R/C aircraft models.
遥控模型飞机、直升机属高危险性商品，飞行时务必远离人群，人为组装不当或机件损坏、电子控制设备不良，以及操控上的不熟悉、都有可能导致飞行失控损伤等意外，请飞行者务必注意飞行安全，并需了解自负任何意外之责任。

2.SAFETY NOTES 安全注意事项

• LOCATE AN APPROPRIATE LOCATION 远离障碍物及人群

R/C helicopters fly at high speed, thus posing a certain degree of potential danger. Choose an appropriate flying site consisting of flat, smooth ground ,a clear open field, or a large open room, such as gymnasium or warehouse without obstacles.Do not fly near buildings, high voltage cables,or trees to ensure the safety of yourself, others,and your model. Do not play your model in inclement weather, such as rain, wind, snow or darkness.

直升机飞行时具有一定的速度，相对的也潜在着一点危险性，场地的选择也相对的重要,请需遵守法规到合法摇控飞行场地飞行。必须注意周围有没有人、高楼、建筑物、高压电线、树木等等,避免操控的不当造成自己与他人财产的损坏。初次练习时,务必选择在空旷合法专属飞行场地并适当搭配练习架飞行,这对飞行失误造成的损伤将会大幅的降低。请勿在下雨、打雷等恶劣天气下操作,以确保本身及机体的安全。

• OBTAIN THE ASSISTANCE OF AN EXPERIENCED PILOT避免独自操控

Before turning on your model and transmitter, check to make sure no one else is operating on the same frequency. Frequency interference can cause your model, or other models to crash. The guidance provided by an experienced pilot will be invaluable for the assembly, tuning, trimming, and actual first flight, (Recommend you to practice with computer-based flight simulator.)

至飞行场飞行前，需确认是否有相同频率的同好正进行飞行，因为开启相同频率的发射机将导致自己与他人立即干扰等意外危险。摇控飞机操控技巧在学习初期有着一定的难度，要尽量避免独自操作飞行，需有经验的人士在旁指导，才可以操控飞行。
(勤练电脑模拟器及老手指导是入门必要的选择)。

• **ALWAYS BE AWARE OF THE ROTATING BLADES** 远离运转中零件

During the operation of the helicopter, the main rotor and tail rotor will be spinning at a high rate of speed. The blades are capable of inflicting serious bodily injury and damage to the environment. Be conscious of your actions, and careful to keep your face, eyes, hands, and loose clothing away from the blades. Always fly the model a safe distance from yourself and others, as well as surrounding objects. Never take your eyes off the model or leave it unattended while it is turned on. Immediately turn off the model and transmitter when you have landed the model.

当直升机主旋翼与尾旋翼运转时，切勿触摸并远离任何物件，以避免造成危险及损坏。

• **PREVENT MOISTURE** 远离潮湿环境

R/C models are composed of many precision electrical components. It is critical to keep the model and associated equipment away from moisture and other contaminants. The introduction or exposure to water or moisture in any form can cause the model to malfunction resulting in loss of use, or a crash. Do not operate or expose to rain or moisture.

直升机内部也是由许多精密的电子零组件组成，所以必须绝对的防止潮湿或水气，避免在浴室或雨天时使用，防止水气进入机身内部而导致机件及电子零件故障而引发不可预期的意外！

• **KEEP AWAY FROM HEAT** 远离热源

R/C models are made up various forms of plastic. Plastic is very susceptible to damage or deformation due to extreme heat and cold climate. Make sure not to store the model near any source of heat such as an oven, or heater. It is best to store the model indoors, in a climate-controlled, room temperature environment.

摇控飞机多半是以PA维修或聚乙烯、电子商品为主要材质，因此要尽量远离热源、日晒以避免因高温而变形甚至熔毁损坏的可能。

• **PROPER OPERATION** 勿不当使用本产品

Please use the replacement of parts on the manual to ensure the safety of structure. This product is for R/C model, so do not use for other purpose.

请勿自行改造加工，任何的升级改装或维修，请使用KDS产品目录中的零件，以确保结构的安全。请确认于产品限界内操作，请勿过载使用，并勿用于安全、法令外其它非法用途。

• **SAFE OPERATION** 安全操作

Operate this unit within your ability. Dot not fly under tired condition and improper operation, which may cause danger.

请于自己能力内及需要一定技术范围内操作这台直升机,过于疲劳、精神不佳或不当操作,意外发生风险将可能会提高。

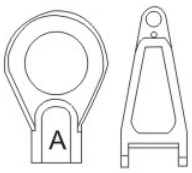
3.SAFETY CHECK BEFORE FLYING 飞行前安全检查重要事项

Before flying, please check to make sure no one else is operating on the same frequency for the safety.
Before flight, please check if the power of transmitter and helicopter are enough for the flight.
Before turning on the transmitter, please check if the throttle stick is in the lowest position. IDLE switch is OFF.
When turn off the unit, please follow the power on/off procedure. Power ON-Please turn on the transmitter first, and then turn on helicopter power. Power OFF-Please turn off the helicopter power first and then turn off the transmitter. Improper procedure may cause out of control, so please have this correct habit.
Before operation, check every movement is smooth and directions are correct. Carefully inspect servos for interference and broken gear.
Check for missing or loose screws and nuts. See if there is any cracked and incomplete assembly of parts.
Carefully check main rotor blades and rotor holders. Broken and premature failures of parts possibly resulting in a dangerous situation.
Check all ball links to avoid excess play and replace as needed. Failure to do so will result in poor flight stability.
Check the battery and power plug are fastened. Vibration and violent flight may cause the plug loose and result out of control.
Check for the tension of tail drive belt.

每次飞行前应先确认所使用的频率是否会干扰他人，以确保你自身与他人的安全。
每次飞行前确定你发射机与直升机电池的电量是在足够飞行的状态。
开机前确认油门摇杆是否位于最低点，熄火降落开关，定速开关(IDLE)是否于关闭位置。
关机时必须遵守电源开关机的程序，开机时应先开启发射机后，再开启直升机电源；关机时应先关闭直升机电源，再关闭发射机电源。不正确的开关机程序可能会造失控的现象，影响自身与他人的安全，请养成正确的习惯。
开机请先确定直升机的各个动作是否顺畅，及方向是否正确，并检查伺服的动作是否有干涉或崩齿的情形，使用故障的伺服器将导致不可预期的危险。
飞行前确认没有缺少或松脱的螺丝与螺冒，确认没有组装不完整或损毁的零件，仔细检查主旋翼是否有损坏，特别是接近主旋翼夹座的部位。损坏或组装不完整的零件不仅影响飞行，更会造成不可预期的危险。注意：对损耗、有裂痕零件更新及定期保养检查重要性。
检查所有的连杆头是否有松脱的情形，过松的连杆头应先更新，否则将造成直升机无法操控的危险。
确认电池及电源接头是否固定牢靠，飞行中的震动或激烈的飞行，可能造成接头松脱而造成失控的危险。

When you see the marks as below, please use glue or grease to ensure flying safety.

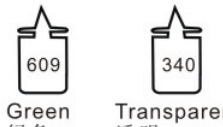
标有下符号之组装步骤，请配合上胶或上油，以确保使用之可靠度。



502:Apply CA Glue to fix.
609:Apply Anaerobics Retainer to fix.
340:Apply Thread Lock to fix.
OIL:Add Grease.
502:使用瞬间胶固定
609:使用金属管状固定缺氧胶固定
340:使用螺丝缺氧胶
OIL:添加润滑油

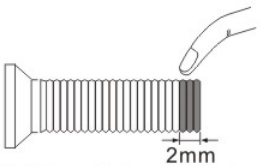
When assembling ball links, make sure the"A" character outside.

各项塑胶制连杆头扣接时, A字请朝外.



Green 绿色

Transparent 透明

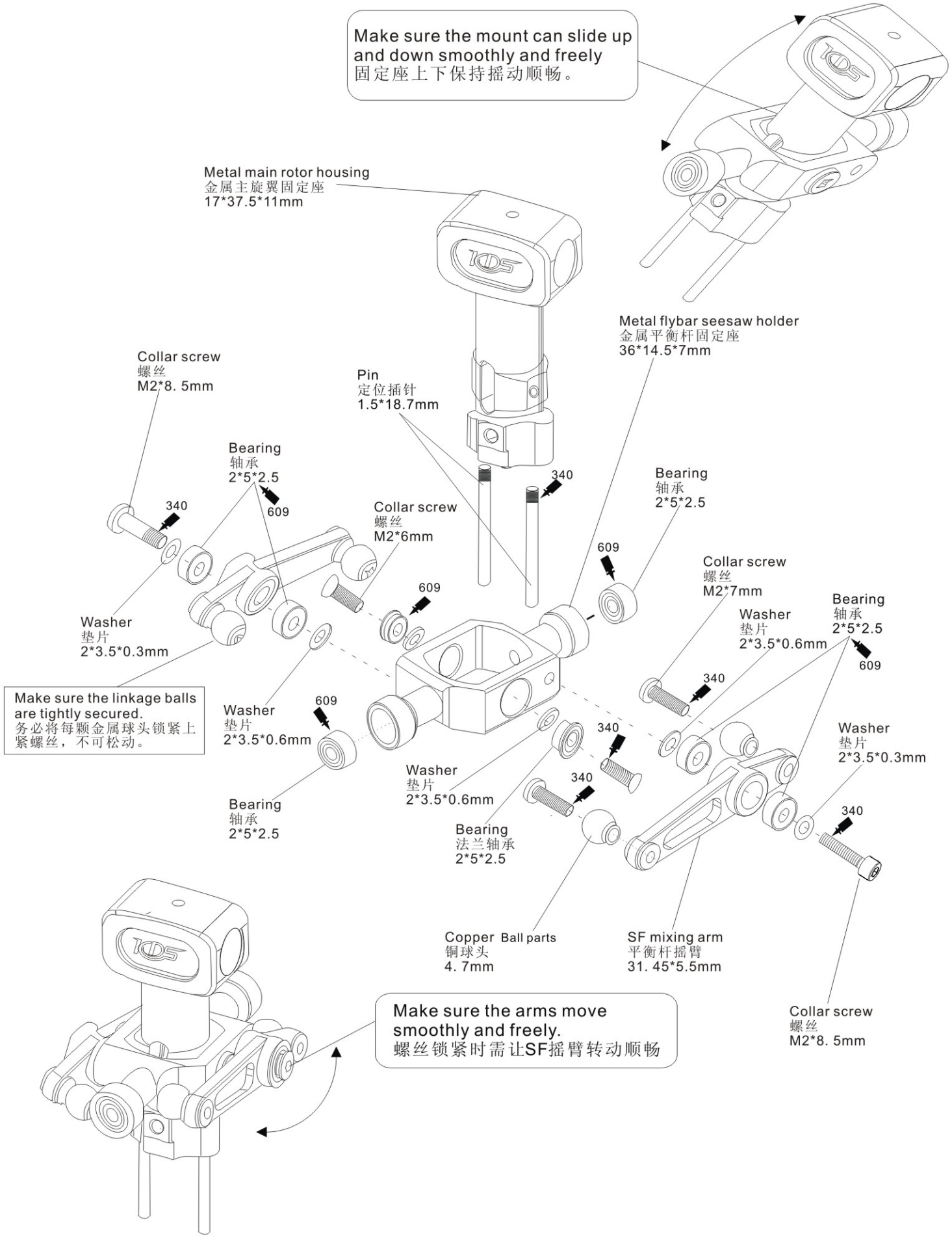


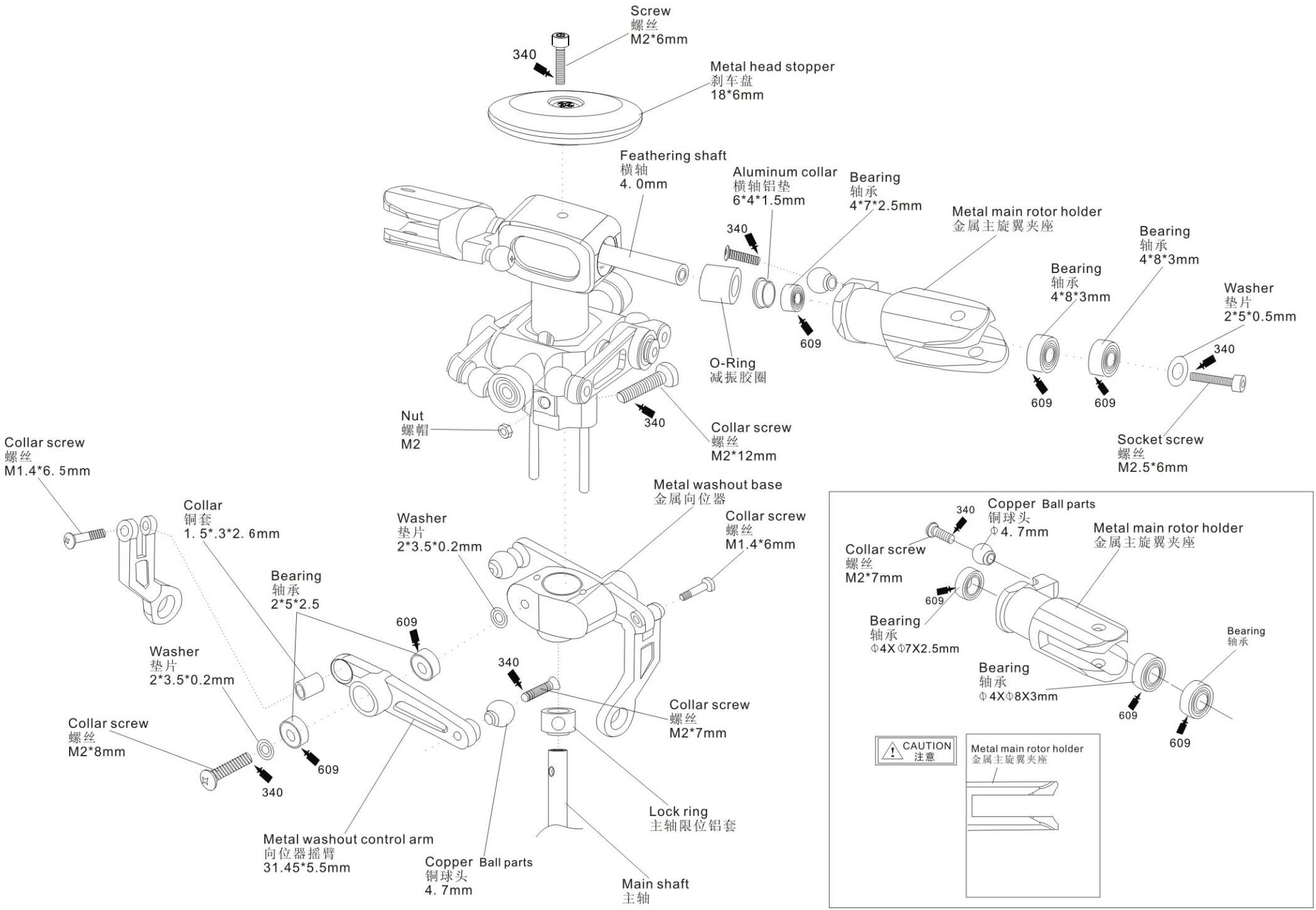
340 Glue width:approx.1mm
340上胶宽度约1mm

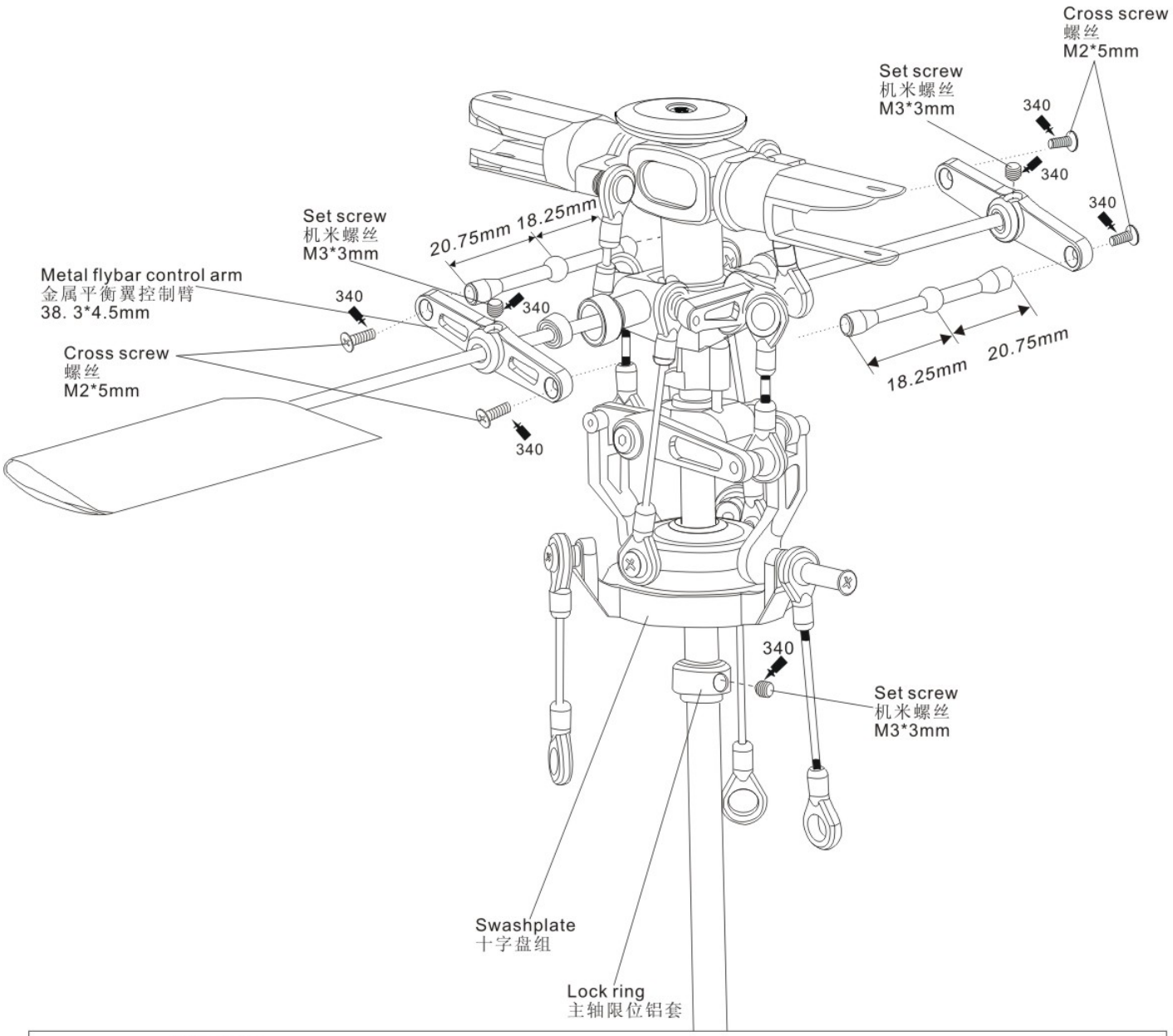
609 metal tubular adhesive(eg.Bearings).340 thread lock, apply a small amount on screws or metal parts and wipe surplus off. When disassembling, recommend to heat the metal joint about 15 Seconds.(NOTE:Keep plastic parts away from heat.)

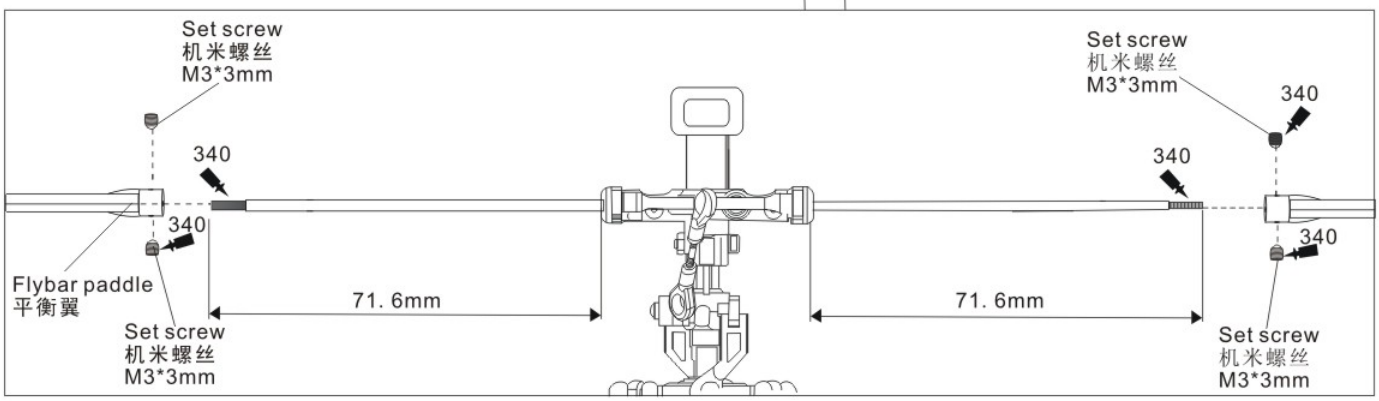
609 为强力金属管状（如轴承）接著处，340为螺丝胶，胶合螺丝或金属内外经请务必少量使用，必要时请用手去除胶量，欲拆卸时可以金属接合部位热烤约15秒。（注意！塑胶件避免接近热源）

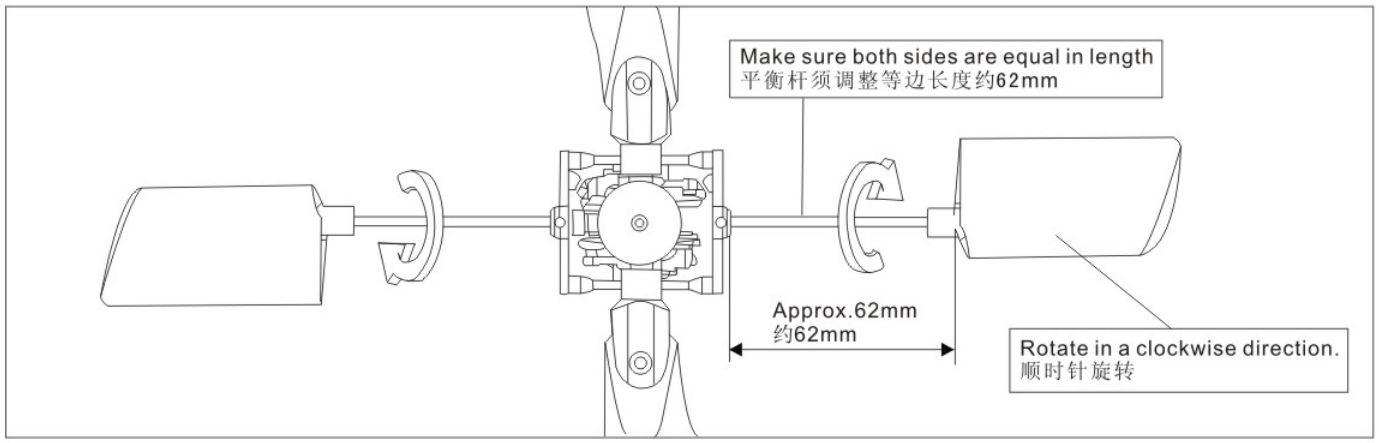
4.ASSEMBLY SECTION 组装说明

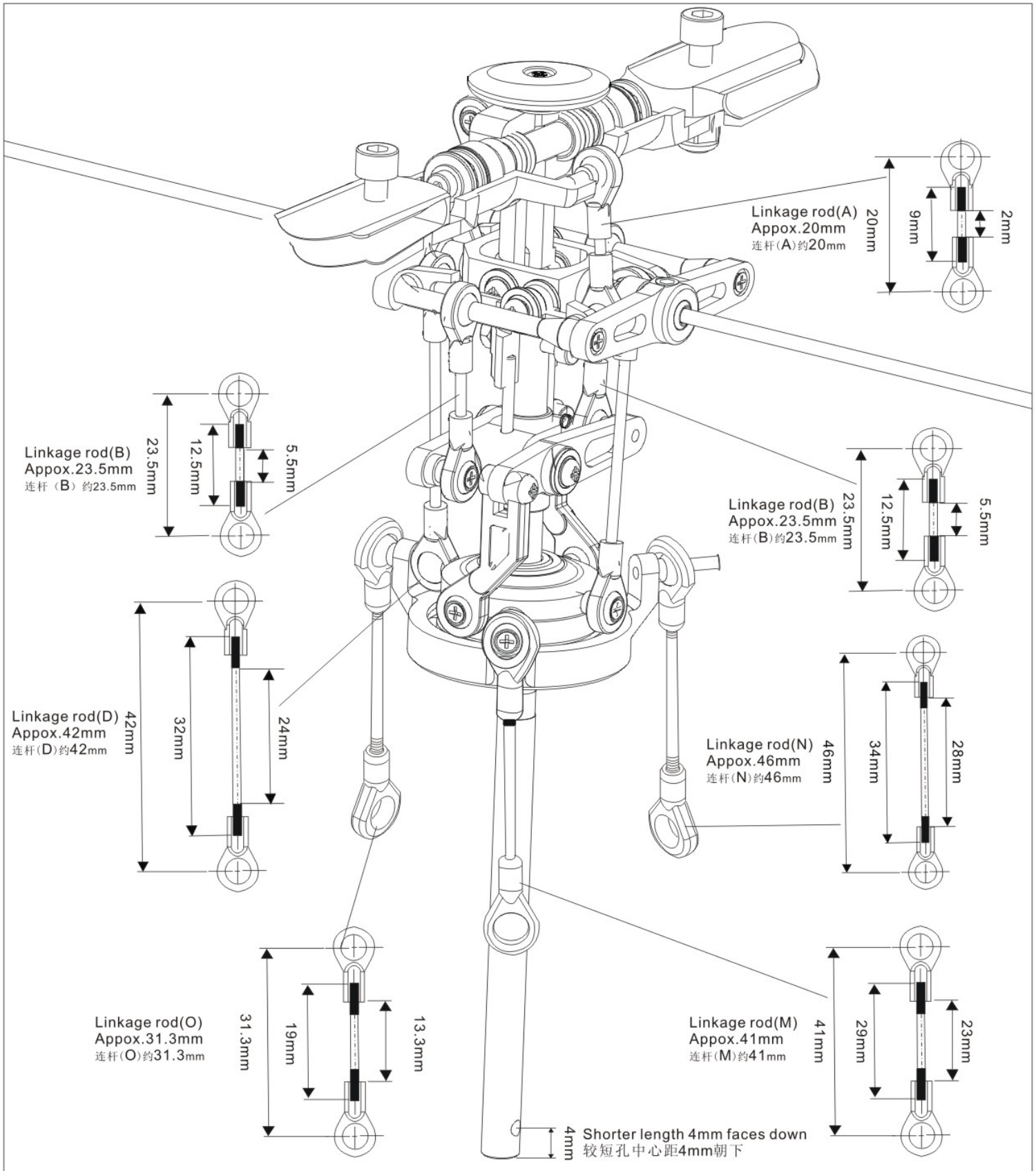



Screw
螺丝
M2*6mm
340
Metal head stopper
刹车盘
18*6mm
Feathering shaft
横轴
4. 0mm
Aluminum collar
横轴铝垫
6*4*1.5mm
Bearing
轴承
4*7*2.5mm
Metal main rotor holder
金属主旋翼夹座
Bearing
轴承
4*8*3mm
Bearing
轴承
4*8*3mm
Washer
垫片
2*5*0.5mm
340
609
609
609
O-Ring
减振胶圈
Nut
螺帽
M2
340
Collar screw
螺丝
M2*12mm
Socket screw
螺丝
M2.5*6mm
Collar screw
螺丝
M1.4*6. 5mm
Collar
铜套
1. 5*.3*2. 6mm
Bearing
轴承
2*5*2.5
609
Washer
垫片
2*3.5*0.2mm
Collar screw
螺丝
M2*8mm
609
340
Metal washout control arm
向位器摇臂
31.45*5.5mm
Copper Ball parts
铜球头
4. 7mm
Main shaft
主轴
Lock ring
主轴限位铝套
Collar screw
螺丝
M2*7mm
340
Metal washout base
金属向位器
Washer
垫片
2*3.5*0.2mm
Collar screw
螺丝
M1.4*6mm
340
Copper Ball parts
铜球头
Φ4. 7mm
Metal main rotor holder
金属主旋翼夹座
Collar screw
螺丝
M2*7mm
609
Bearing
轴承
Φ4XΦ7X2.5mm
Bearing
轴承
Φ4XΦ8X3mm
Bearing
轴承
609
609
CAUTION
注意
Metal main rotor holder
金属主旋翼夹座

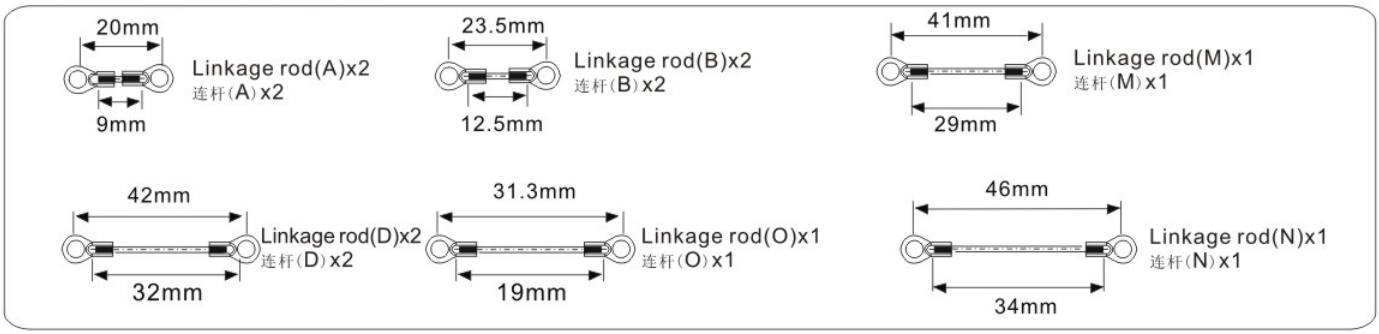

Cross screw
螺丝
M2*5mm
Set screw
机米螺丝
M3*3mm
340
340
340
Set screw
机米螺丝
M3*3mm
20.75mm 18.25mm
Metal flybar control arm
金属平衡翼控制臂
38. 3*4.5mm
340
340
Cross screw
螺丝
M2*5mm
340
18.25mm
20.75mm
340
Set screw
机米螺丝
M3*3mm
Swashplate
十字盘组
Lock ring
主轴限位铝套

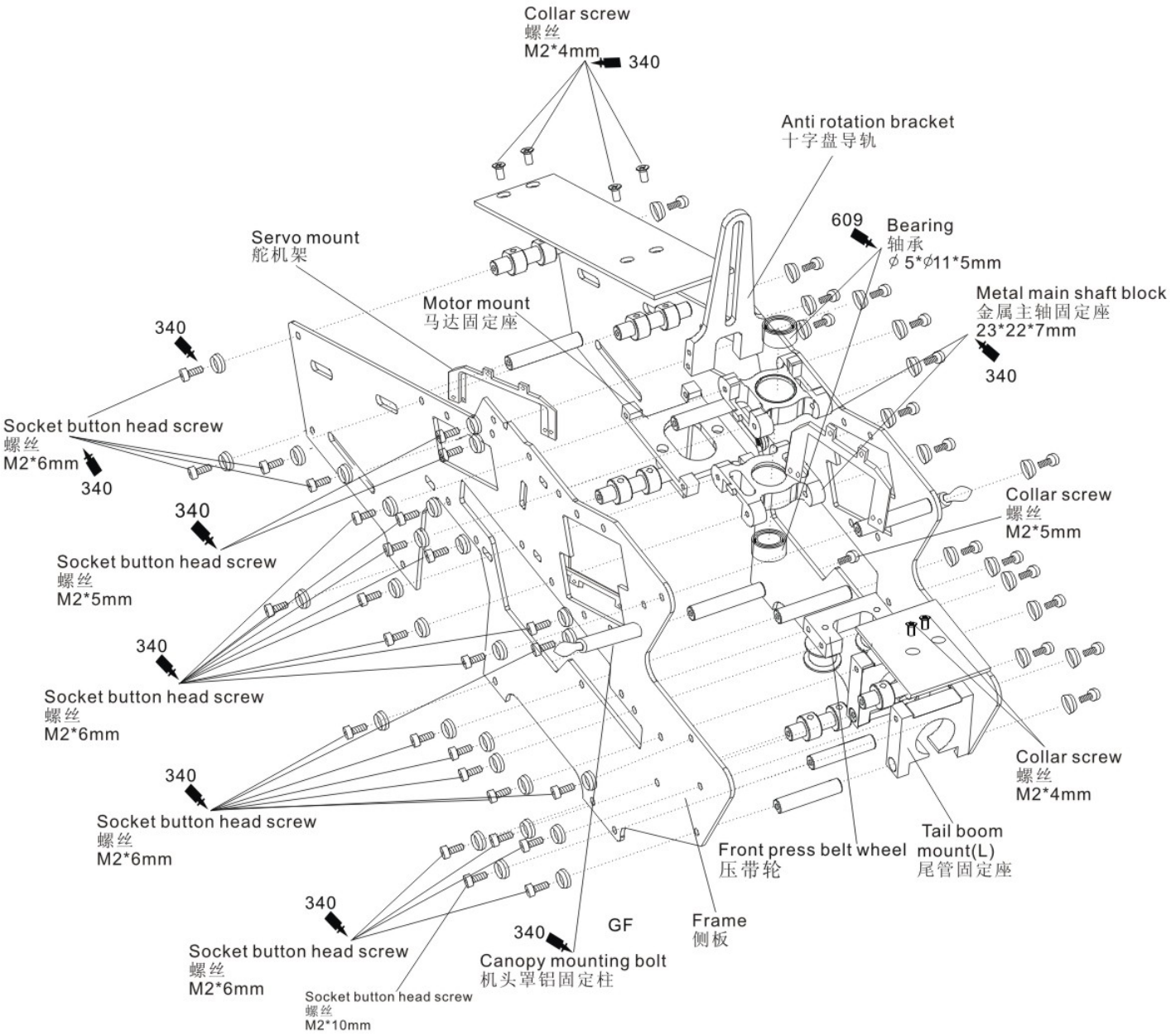

Set screw
机米螺丝
M3*3mm
340
340
Flybar paddle
平衡翼
Set screw
机米螺丝
M3*3mm
71. 6mm
Set screw
机米螺丝
M3*3mm
340
340
340
71. 6mm
Set screw
机米螺丝
M3*3mm

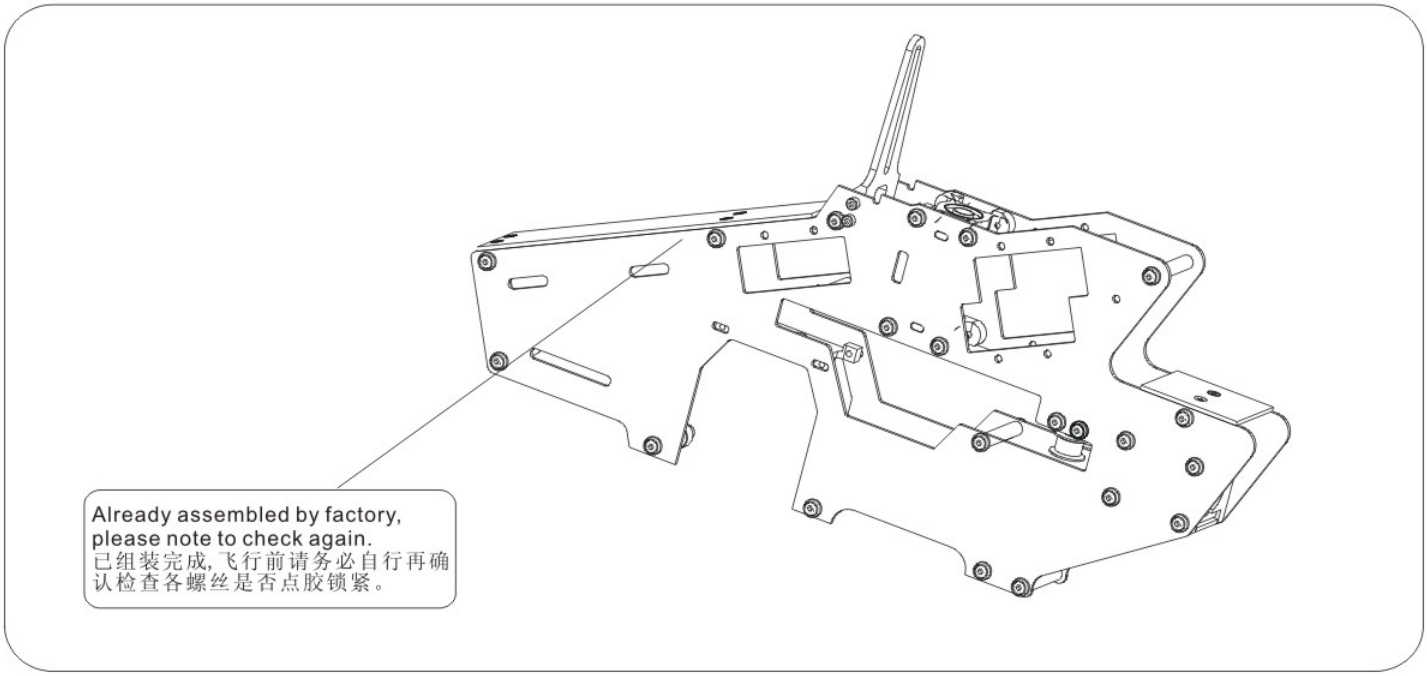

Make sure both sides are equal in length
平衡杆须调整等边长度约62mm
Approx.62mm
约62mm
Rotate in a clockwise direction.
顺时针旋转

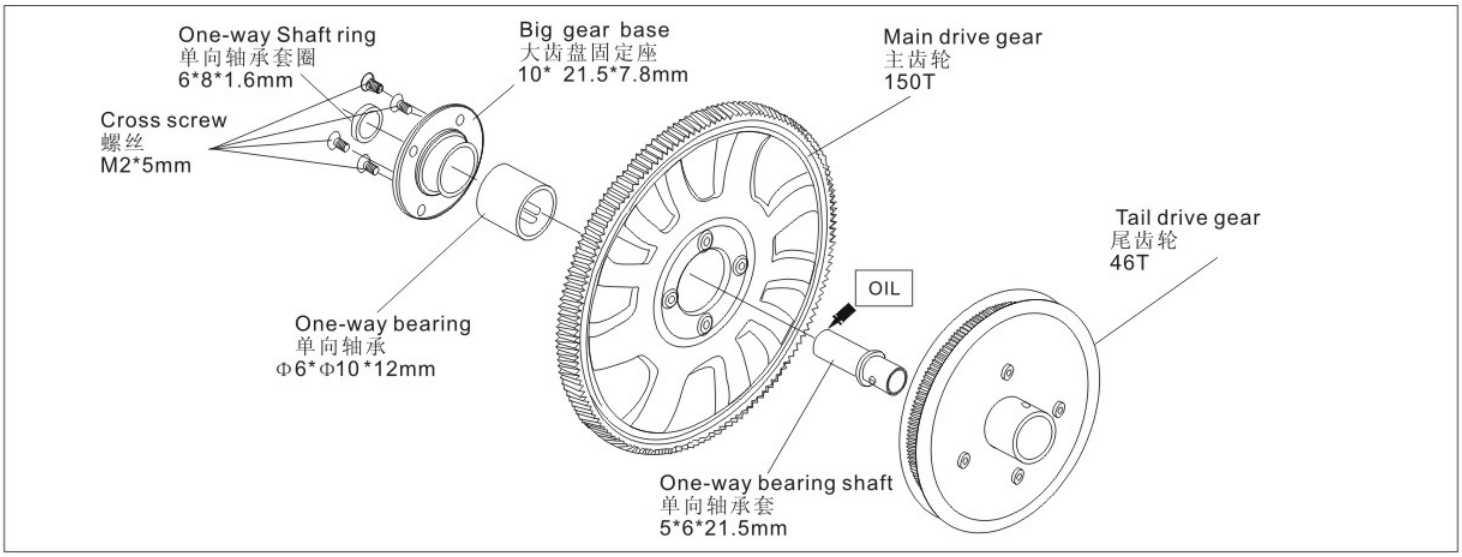


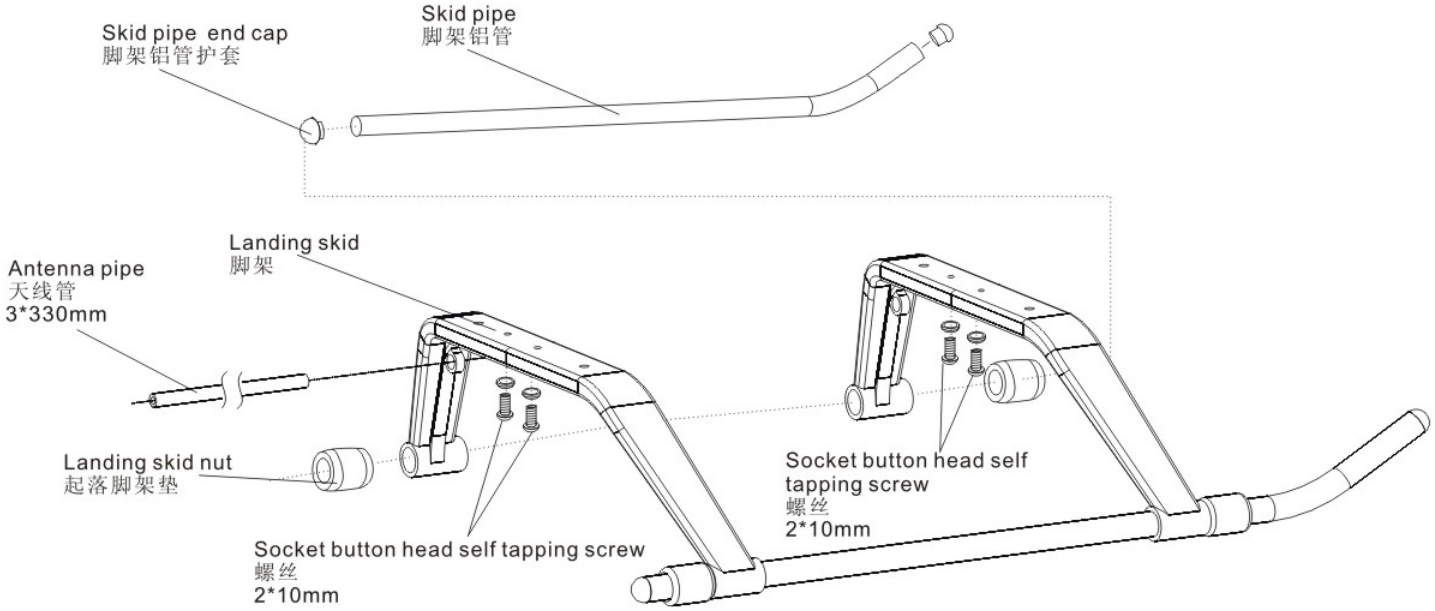
LINKAGE ROD 连杆组

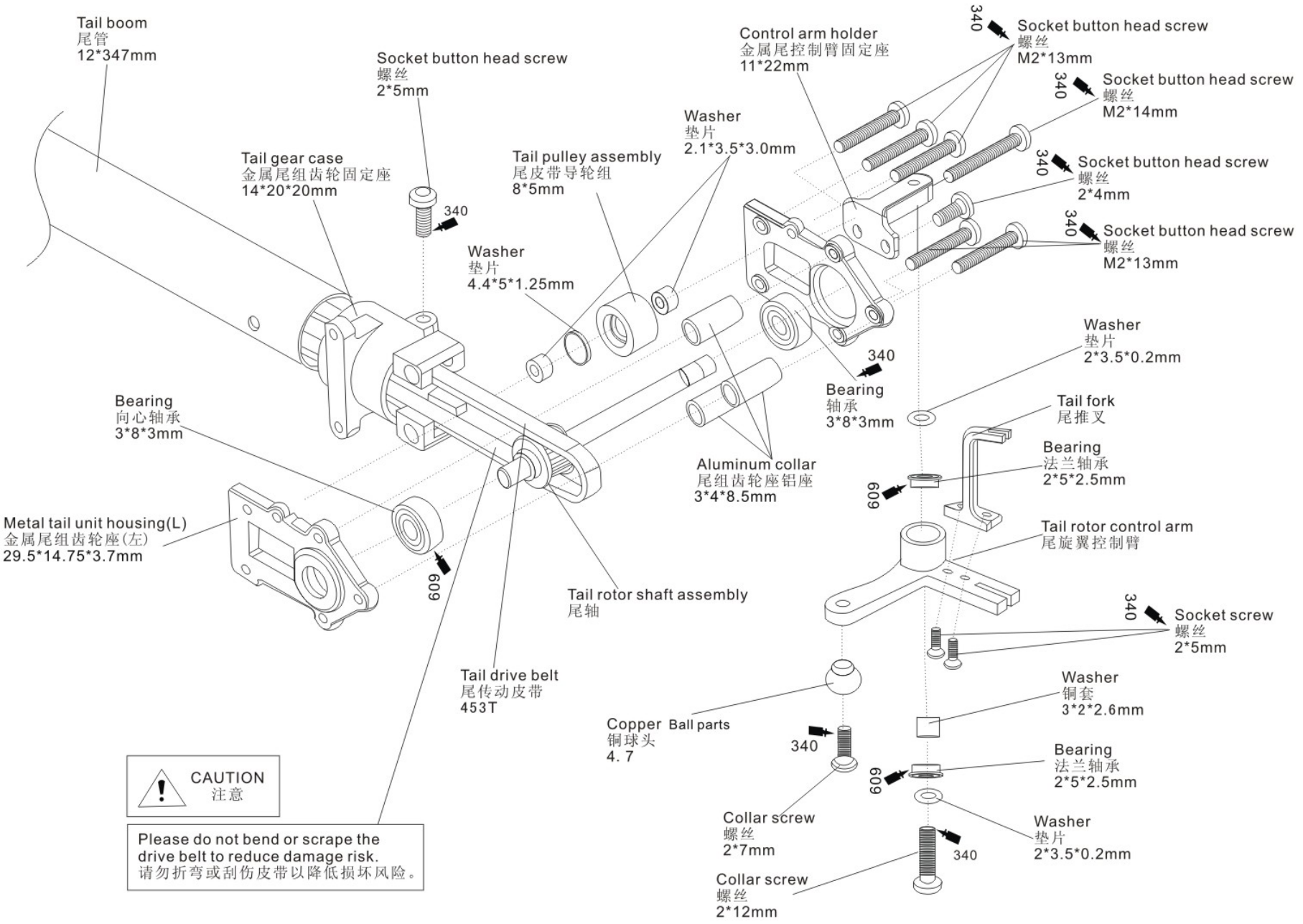



Collar screw
螺丝
M2*4mm
340
Anti rotation bracket
十字盘导轨
609
Bearing
轴承
ø 5*ø11*5mm
Servo mount
舵机架
Motor mount
马达固定座
Metal main shaft block
金属主轴固定座
23*22*7mm
340
340
Socket button head screw
螺丝
M2*6mm
340
340
Socket button head screw
螺丝
M2*5mm
Collar screw
螺丝
M2*5mm
340
Socket button head screw
螺丝
M2*6mm
Collar screw
螺丝
M2*4mm
340
Socket button head screw
螺丝
M2*6mm
Front press belt wheel
压带轮
Tail boom
mount(L)
尾管固定座
340
GF
Frame
侧板
340
Socket button head screw
螺丝
M2*6mm
Canopy mounting bolt
机头罩铝固定柱
Socket button head screw
螺丝
M2*10mm

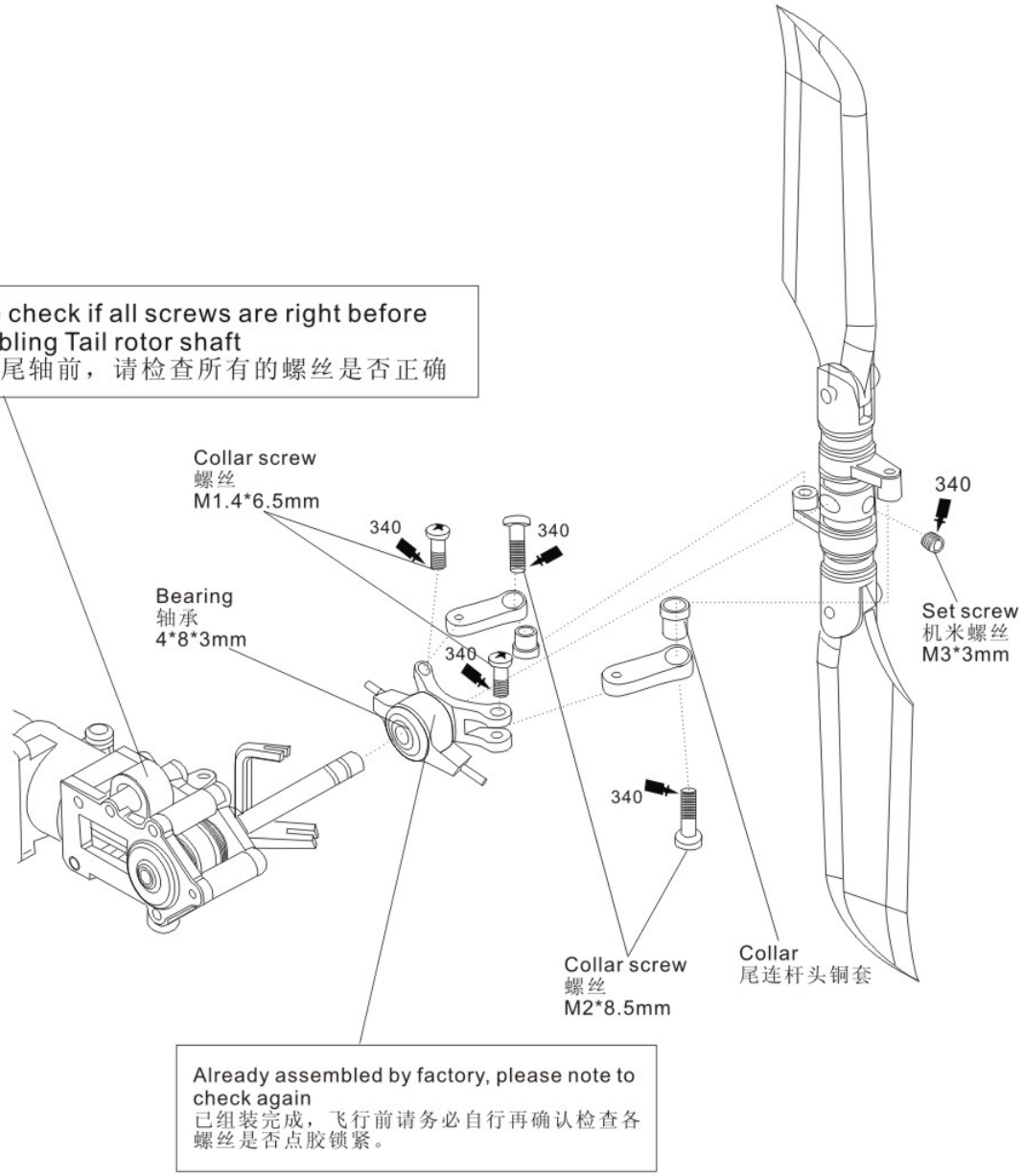

Already assembled by factory,
please note to check again.
已组装完成,飞行前请务必自行再确
认检查各螺丝是否点胶锁紧。


One-way Shaft ring
单向轴承套圈
6*8*1.6mm
Big gear base
大齿盘固定座
10* 21.5*7.8mm
Main drive gear
主齿轮
150T
Cross screw
螺丝
M2*5mm
Tail drive gear
尾齿轮
46T
OIL
One-way bearing
单向轴承
Φ6*Φ10*12mm
One-way bearing shaft
单向轴承套
5*6*21.5mm

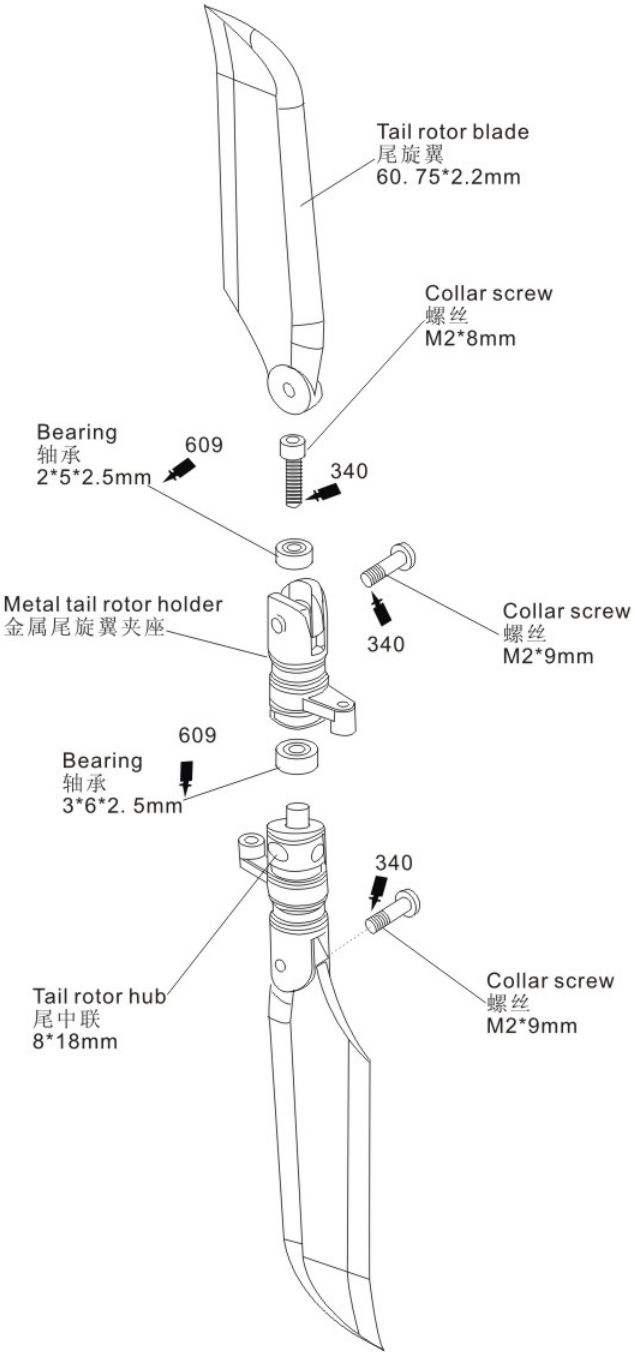

Skid pipe end cap
脚架铝管护套
Skid pipe
脚架铝管
Antenna pipe
天线管
3*330mm
Landing skid
脚架
Landing skid nut
起落脚架垫
Socket button head self tapping screw
螺丝
2*10mm
Socket button head self
tapping screw
螺丝
2*10mm

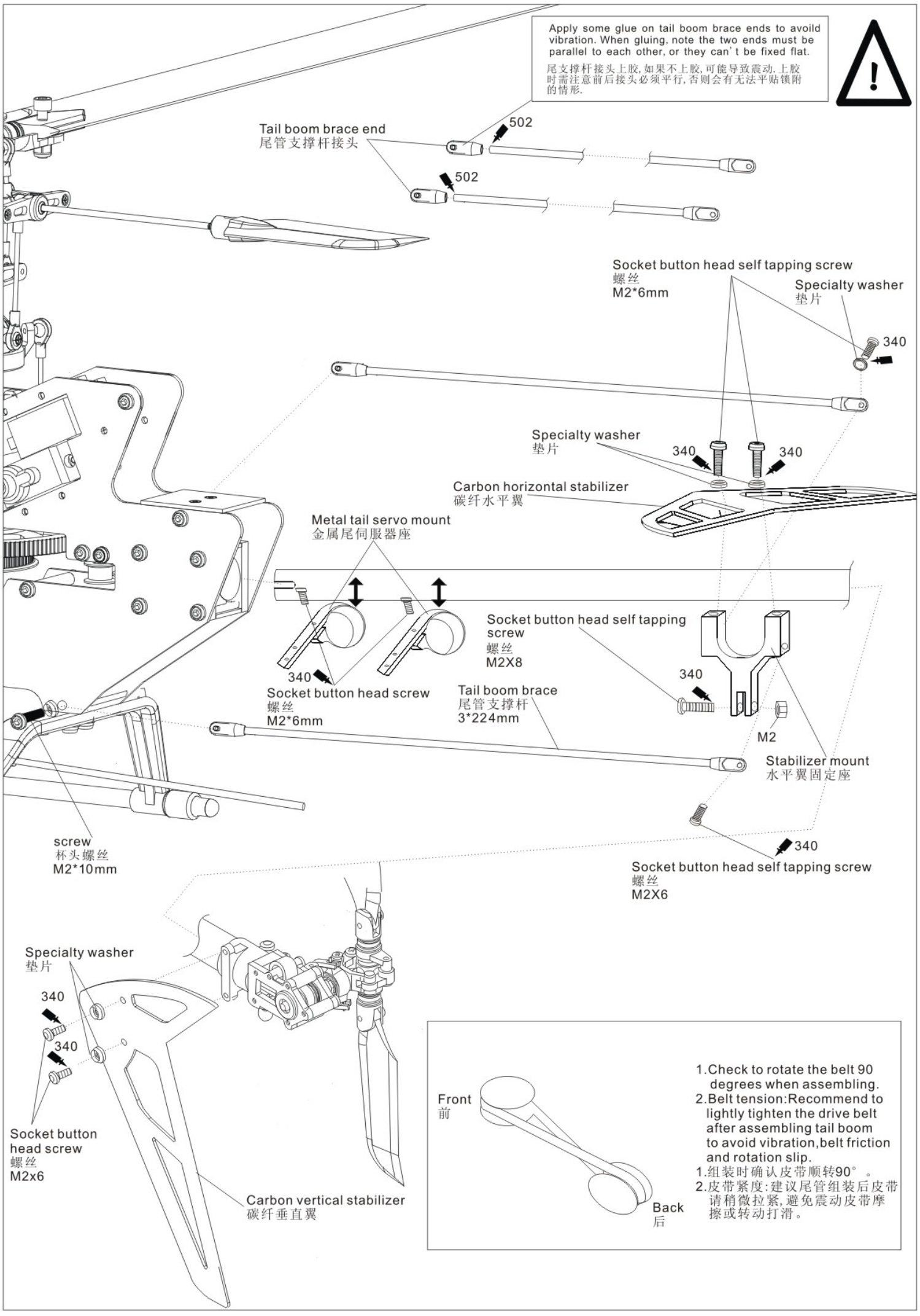

Tail boom
尾管
12*347mm
Socket button head screw
螺丝
2*5mm
Tail gear case
金属尾组齿轮固定座
14*20*20mm
340
Washer
垫片
4.4*5*1.25mm
Tail pulley assembly
尾皮带导轮组
8*5mm
Washer
垫片
2.1*3.5*3.0mm
Control arm holder
金属尾控制臂固定座
11*22mm
340
Socket button head screw
螺丝
M2*13mm
340
Socket button head screw
螺丝
M2*14mm
340
Socket button head screw
螺丝
2*4mm
340
Socket button head screw
螺丝
M2*13mm
Washer
垫片
2*3.5*0.2mm
340
Bearing
轴承
3*8*3mm
Tail fork
尾推叉
Bearing
法兰轴承
2*5*2.5mm
609
Aluminum collar
尾组齿轮座铝座
3*4*8.5mm
Bearing
向心轴承
3*8*3mm
Metal tail unit housing(L)
金属尾组齿轮座(左)
29.5*14.75*3.7mm
609
Tail rotor shaft assembly
尾轴
Tail rotor control arm
尾旋翼控制臂
340
Socket screw
螺丝
2*5mm
Tail drive belt
尾传动皮带
453T
Copper Ball parts
铜球头
4. 7
340
Washer
铜套
3*2*2.6mm
Bearing
法兰轴承
2*5*2.5mm
609
Collar screw
螺丝
2*7mm
Washer
垫片
2*3.5*0.2mm
340
Collar screw
螺丝
2*12mm
CAUTION
注意
Please do not bend or scrape the drive belt to reduce damage risk.
请勿折弯或刮伤皮带以降低损坏风险。

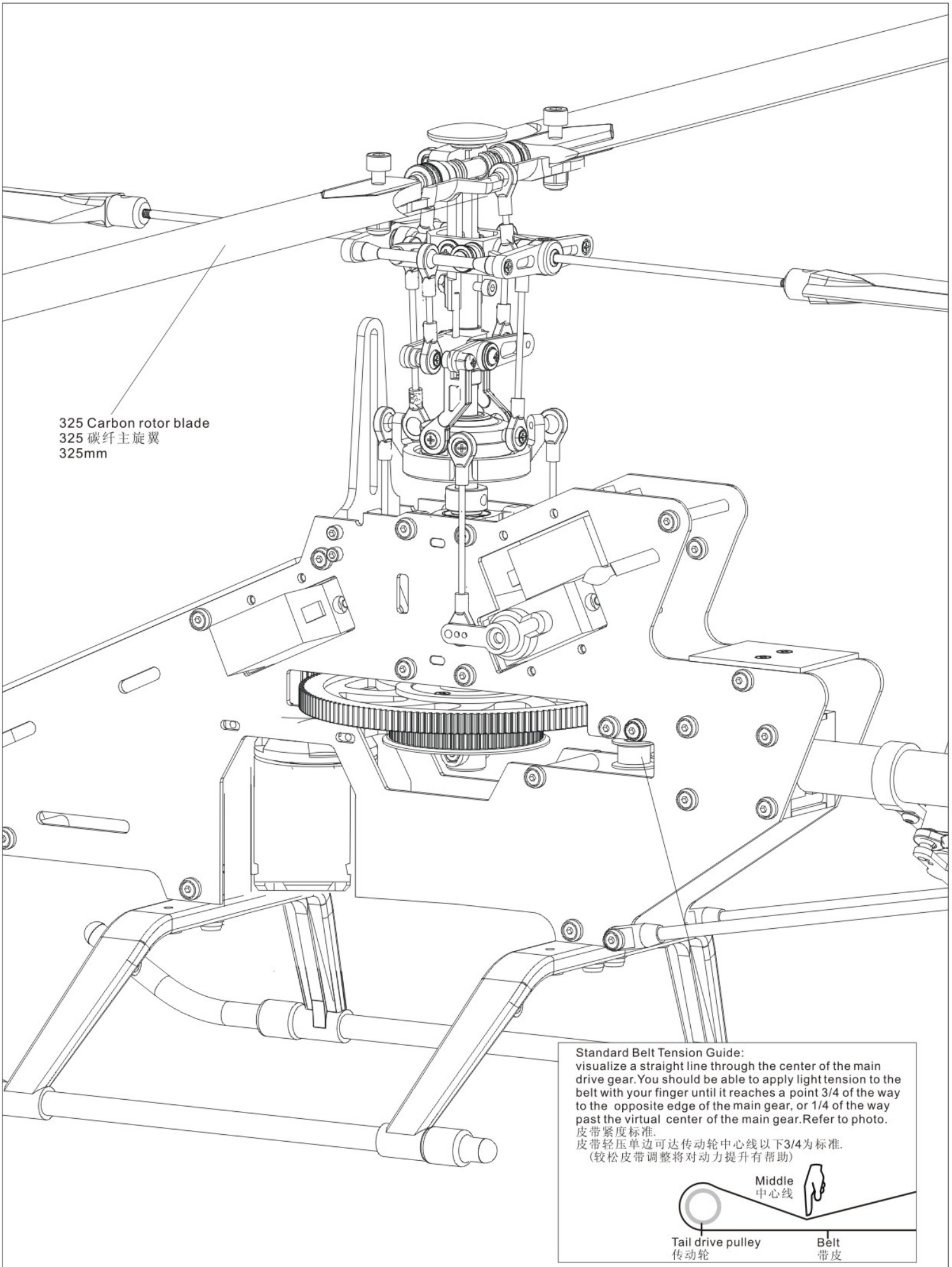
Please check if all screws are right before assembling Tail rotor shaft
在安装尾轴前，请检查所有的螺丝是否正确



Already assembled by factory, please note to check again
已组装完成，飞行前请务必自行再确认检查各螺丝是否点胶锁紧。

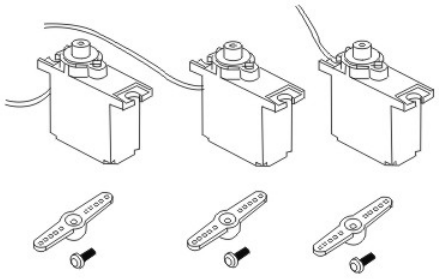


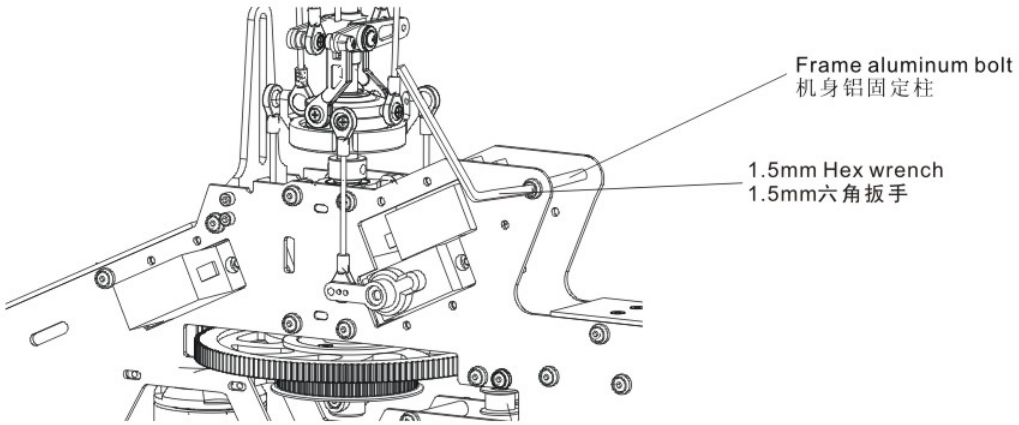

Apply some glue on tail boom brace ends to avoild vibration. When gluing, note the two ends must be parallel to each other, or they can't be fixed flat.
尾支撑杆接头上胶,如果不上胶,可能导致震动.上胶时需注意前后接头必须平行,否则会有无法平贴锁附的情形.
Tail boom brace end
尾管支撑杆接头
502
502
Socket button head self tapping screw
螺丝
M2*6mm
Specialty washer
垫片
340
Specialty washer
垫片
340
340
Carbon horizontal stabilizer
碳纤水平翼
Metal tail servo mount
金属尾伺服器座
Socket button head self tapping screw
螺丝
M2X8
340
Socket button head screw
螺丝
M2*6mm
Tail boom brace
尾管支撑杆
3*224mm
340
M2
Stabilizer mount
水平翼固定座
screw
杯头螺丝
M2*10mm
340
Socket button head self tapping screw
螺丝
M2X6
Specialty washer
垫片
340
340
Socket button head screw
螺丝
M2x6
Carbon vertical stabilizer
碳纤垂直翼
Front
前
Back
后
1.Check to rotate the belt 90 degrees when assembling.
2.Belt tension:Recommend to lightly tighten the drive belt after assembling tail boom to avoid vibration,belt friction and rotation slip.
1.组装时确认皮带顺转90°。
2.皮带紧度:建议尾管组装后皮带请稍微拉紧,避免震动皮带摩擦或转动打滑。

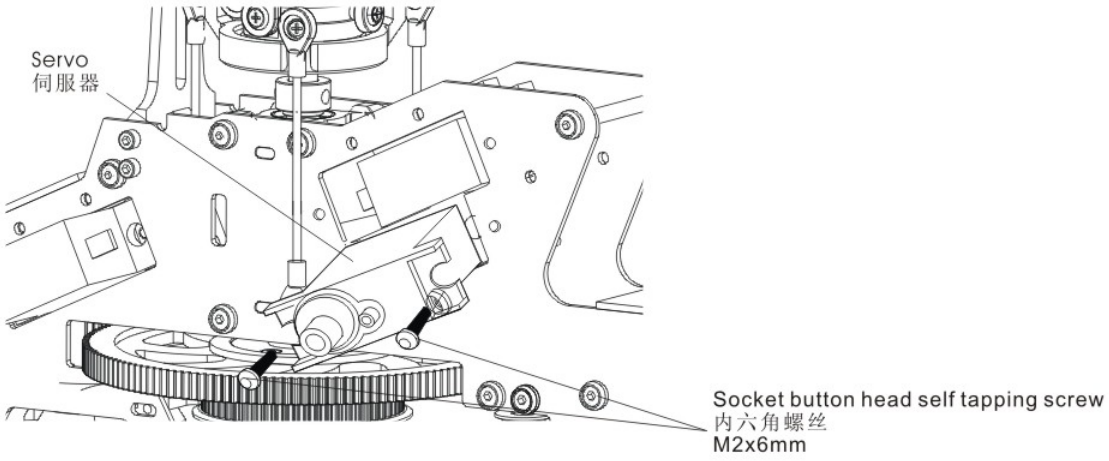

325 Carbon rotor blade
325 碳纤主旋翼
325mm
Standard Belt Tension Guide:
visualize a straight line through the center of the main drive gear.You should be able to apply light tension to the belt with your finger until it reaches a point 3/4 of the way to the opposite edge of the main gear, or 1/4 of the way past the virtual center of the main gear.Refer to photo.
皮带紧度标准.
皮带轻压单边可达传动轮中心线以下3/4为标准.
（较松皮带调整将对动力提升有帮助）
Middle
中心线
Tail drive pulley
传动轮
Belt
带皮

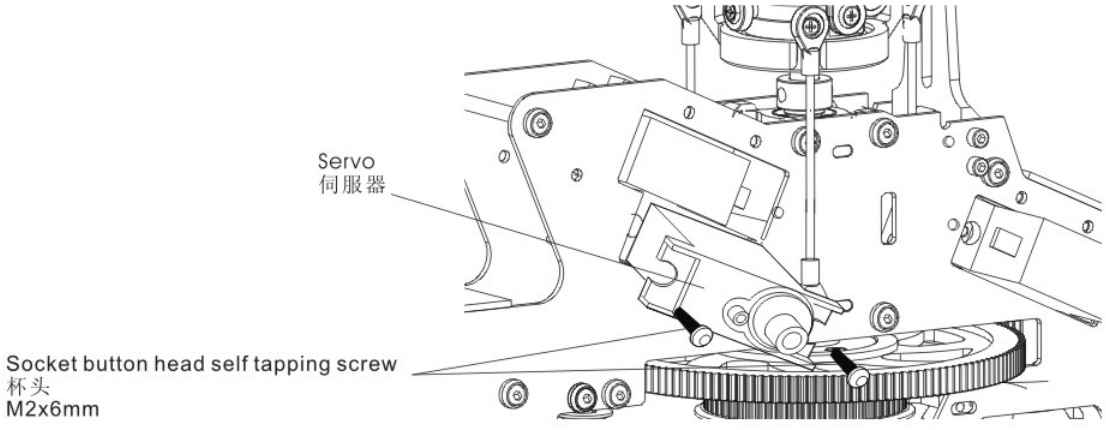
5.SERVO INSTALLATION 伺服器安装

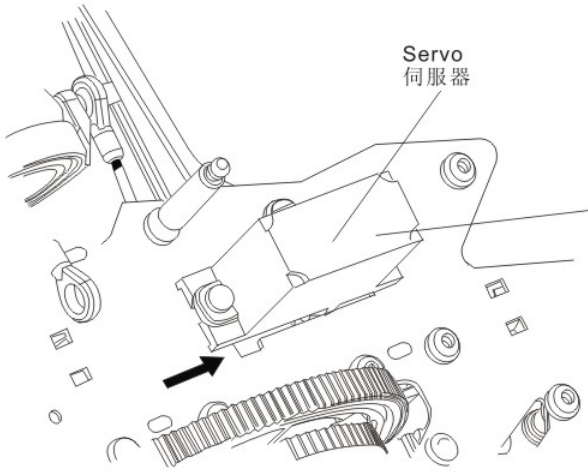
1.Please prepare three micro servos(9g)for CCPM swashplate control and one quick speed(0.12sec/within 60degrees)micro servo(6~9g) for tail rudder control. First remove the servo horn from the three servos for swashplate.
请准备3个型号相同的小型伺服器（9g）作为CCPM十字盘控制用，1个速度较快（0.12sec/60度以内)的小型伺服器(6-9g)
,作为尾舵控制用:首先将十字盘控制用伺服器的舵片拆下.



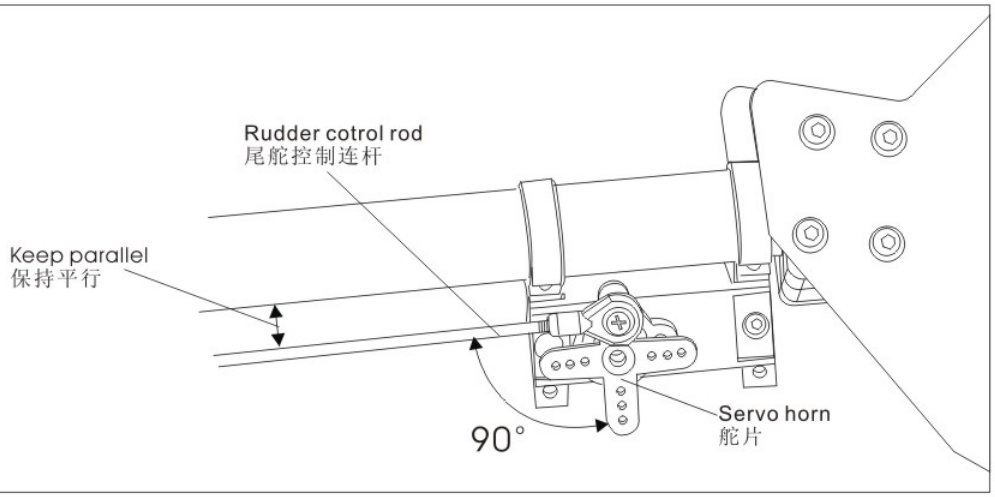


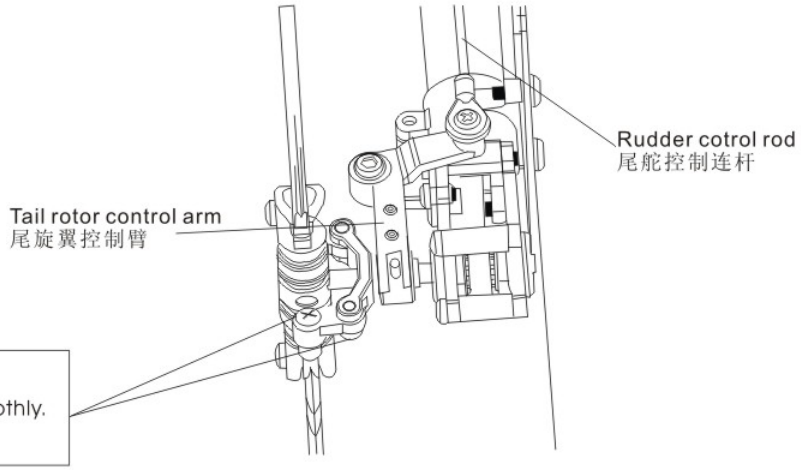






See the picture, install the third servo outside the rear mount of the main frame(L) or (R).The servo is installed outside of the frame and the output shaft must be oriented toward the rear of the helicopter, set the signal wire in the retained space to avoid any scrape. Then use the screws and nuts to fix.
如图示，第三颗伺服器安装在左侧板（或右侧板）后方的固定座，伺服器本体外露机身，伺服器齿轮轴偏向直升机后方，讯号线可置于预留的小孔避免刮伤，再以螺丝及螺帽将伺服器锁附固定。



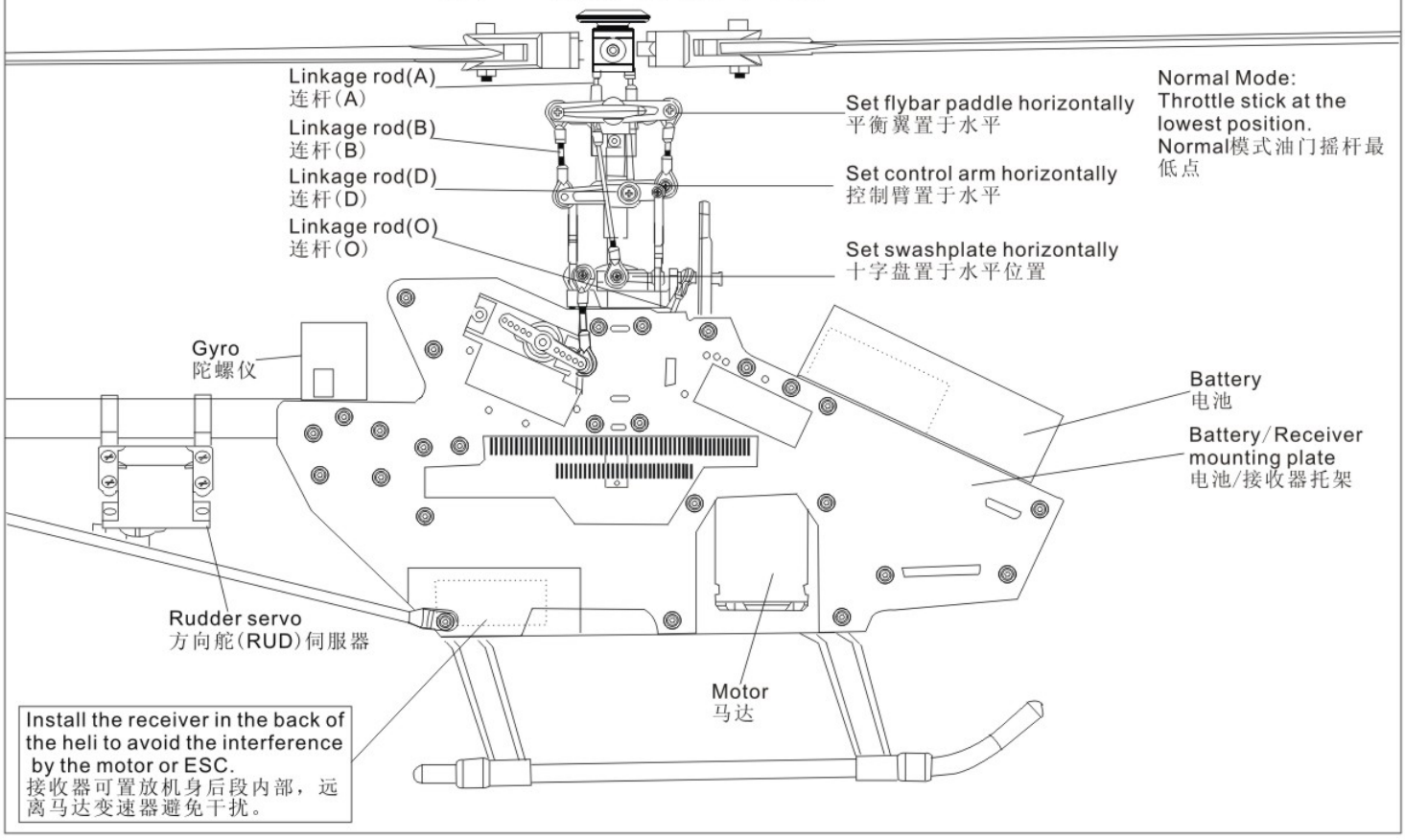


Please not over tighten the screws to make sure the control arm moves smoothly.
尾旋螺丝请勿过紧以确保控制臂滑顺.

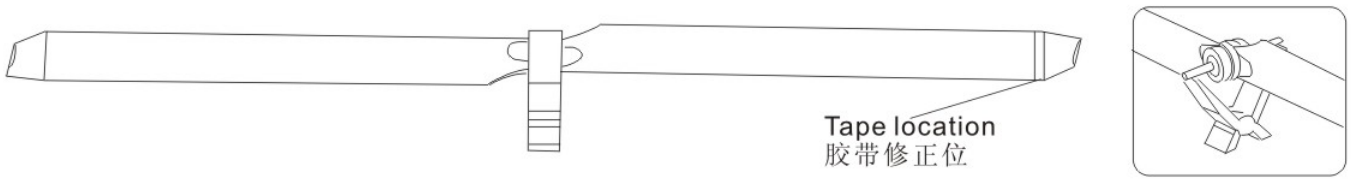
6.EQUIPMENT ILLUSTRATION 设备建议配置图示

PARTS AND EQUIPMENT ASSEMBLY ILLUSTRATION
零件与组件的组装图

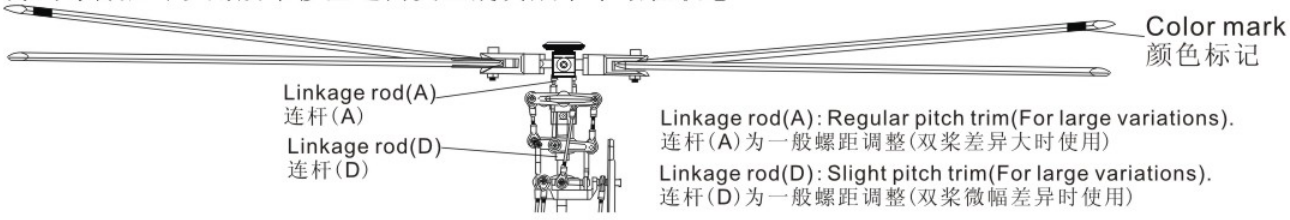
Illustration of Main Rotor's Pitch at 0 degree
主旋翼Pitch 0度角,各相关结构摆位示意图



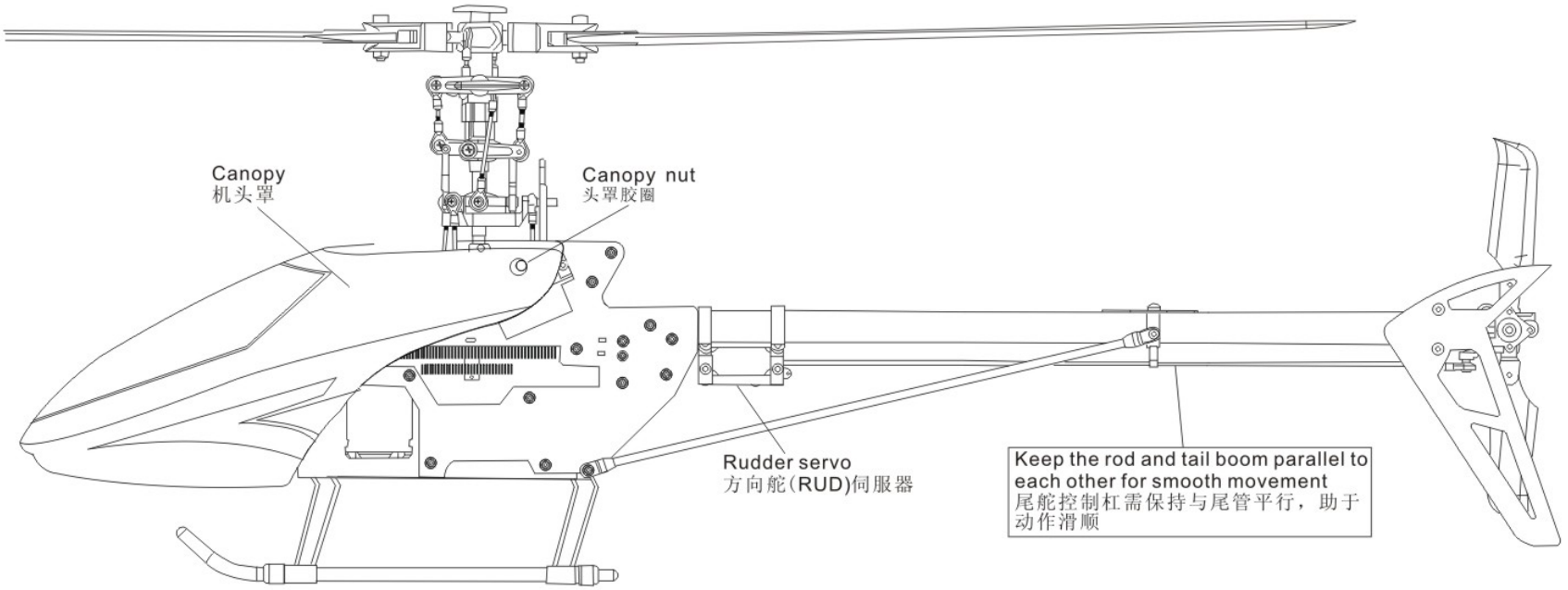
7.MAIN ROTOR BLADE BALANCING AND CORRECTION
主旋翼平衡与双桨校正



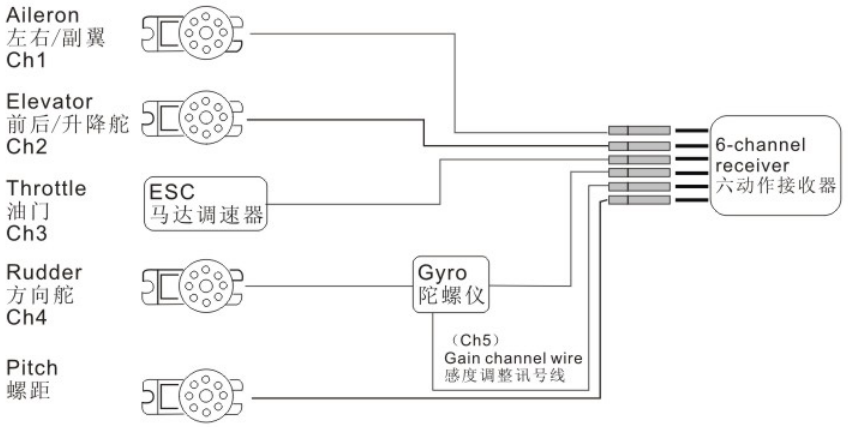
Important-Before flying it is necessary to balance the blades. Screw the rotor blades together as in the illustration. The rotor blades are properly balanced when they are suspended exactly horizontally. If not, the blades are not in equilibrium. This is corrected by applying tape to lighter blade.
当主旋翼转动时，请先执行平衡校正将两支主旋翼使用M3螺丝固定并保持两支将成一直线，至于测试跨台后可以用胶带修正达两支主旋翼成水平最佳状态。



Apply a red piece of tape on one blade, or paint a red stripe with a marker or paint to identify one blade. Run the helicopter at a safe distance and have someone look at the spinning blades at the reference angle shown in the photo. If the blade tracking is not set correctly, you will be able to identify the blade with the red identifying mark rotating higher or lower than the other blade. Adjust the linkage rod length shorter or longer to make both blades track level.
可使用螺旋桨附赠的红、蓝贴纸分别贴于两桨翼端，或于单桨翼端处画上颜色记号，方便双桨调整辨记。
标示颜色桨偏高（螺距过大）请调整连杆(A)修正，或需更小螺距微调修正请调短连杆(D)修正。

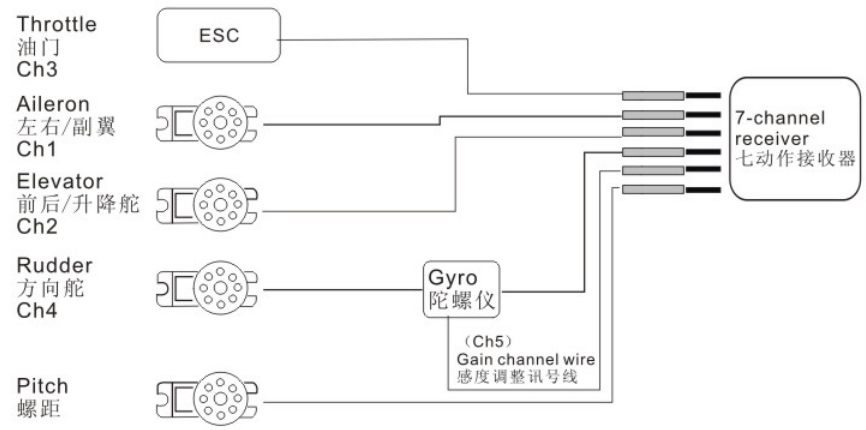


HITEC,FUTABA 6CH receiver wiring
HITEC、 FUTABA 6CH接收器接线示意图



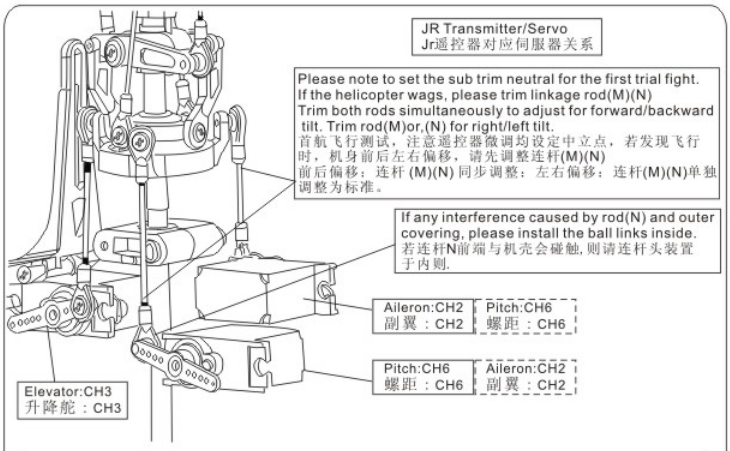
6-Channel Receiver is adequate for the requirements of the KDS heli. You will need the following channels at a minimum: Throttle,Rudder, Elevator, Aileron,and especially Pitch(CH6) and Gyro(CH5) controls.
六动作的接收器已足够应对KDS摇控直升机的频道需求,除了油门、方向舵、升降舵、副翼等基本动作外,亦可以对应具备感度调整讯号线的陀螺仪(CH5)与螺距(CH6)。

JR 7CH receiver wiring
JR 7CH接收器接线示意图

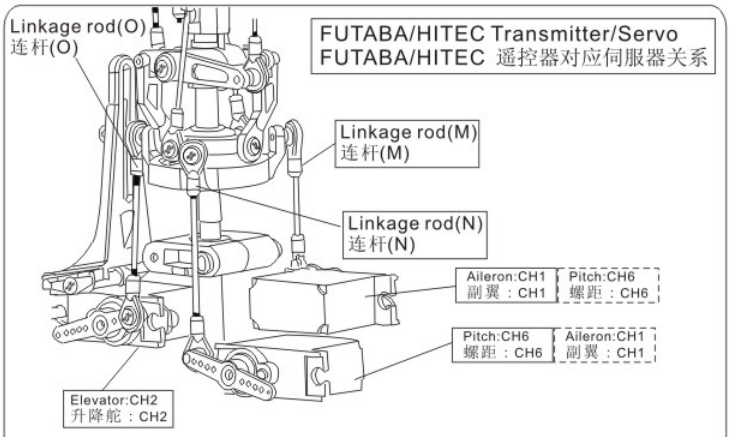


7-Channel Receiver is adequate for the requirements of the KDS heli. You will need the following channels at a minimum: Throttle,Rudder, Elevator, Aileron, and especially Pitch and Gyro controls.
七动作的接收器已足够应对KDS摇控直升机的频道需求,除了油门、方向舵、升降舵、副翼等基本动作外,亦可以对应具备感度调整讯号线的陀螺仪(AUX2)与螺距(AUX1)。

9.SERVO SETTING AND ADJUSTMENT 伺服器设定与调整



Positions of CH2、CH6 are exchangeable, After assembling as photo (Note: Set the transmitter under CCPM 120 degrees mode),pull throttle stick (pitch) upward. If one swashplate servo (or two servos),pull throttle stick (pitch) upward. If one swashplate(REV) on the transmitter to make it moves upward. If three servos move downward, adjust the travel value(+-)of SWASH Ch6 on the transmitter to make them move upward. When the actions of Aileron and Elevator are opposite, adjust travel values of SWASH Ch2 and Ch3.
CH2、CH6可互换配置，依图连结后（注意：摇控器须设定于CCPM 120°十字盘模式），将油门摇杠（Pitch)往上推，若十字盘伺服器有1个或2个往下移时，请调整摇控器的反转开关（REV）使伺服器往上，若3个伺器同时往下移时，请调整摇控器SWASH Ch6 行程量的正负值，使伺服器同时往上平移，副翼与前后动作相反时，同样调整流器 SWASH CH2、CH3 行程量正负值。



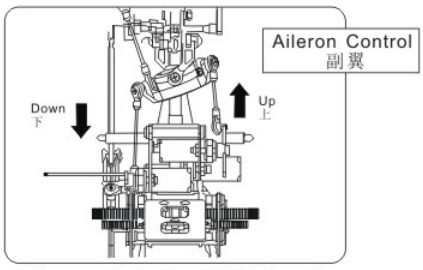
Positions of CH1、CH6 are exchangeable, After assembling as photo (Note: Set the transmitter under CCPM 120 degrees mode),pull throttle stick (pitch) upward. If one swashplate servo (or two servos),pull throttle stick (pitch) upward. Lf one swashplate(REV) on the transmitter to make it moves upward. If three servos move downward, adjust the travel value(+-)of SWASH Ch6 on the transmitter to make them move upward. When the actions of Aileron and Elevator are opposite, adjust travel values of SWASH Ch1 and Ch2.
CH1、CH6可互换配置，依图连结后（注意：摇控器须设定于CCPM 120°十字盘模式），将油门摇杠（Pitch)往上推，若十字盘伺服器有1个或2个往下移时，请调整摇控器的反转开关（REV）使伺服器往上，若3个伺器同时往下移时，请调整摇控器SWASH Ch6 行程量的正负值，使伺服器同时往上平移，副翼与前后动作相反时，同样调整流器 SWASH CH1、CH2 行程量正负值。

9.PRE-FLIGHT CHECKLIST（"MODE 1"CONTROLS）

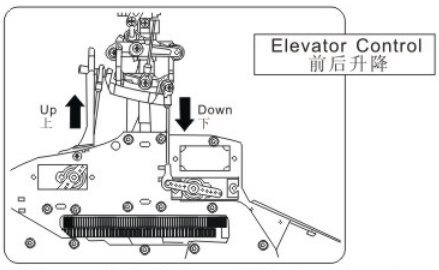
飞行前的检查重点(MODE 1 遥控器控制模式)

This model helicopter is an electronically controlled mechanical device traveling at high speeds and altitudes, with high-speed rotating blades posing a potential dangerous risk. Please make worn a habit to always perform a pre-flight check of the entire model prior to each flight. If you discover any broken, loose, or worn parts, do not fly the model. Repair or replace items immediately. After each flight, completely clean the model and check for damage or wear. Following these simple steps will provide for maximum enjoyment owning and operating the KDS Helicopter.

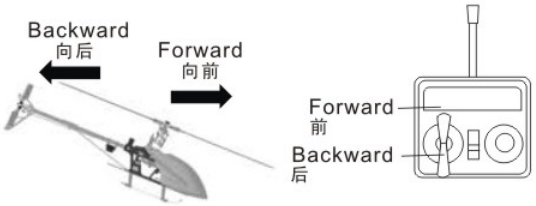
遥控直升机属高动力、高危险性模型商品，每次飞行前请详细检查各飞行动作正确性与零件是否有松脱磨损情况，若经发现异常，请立即进行检修更换，飞行完毕请养成机体各部零件清洁保养之安全与飞行乐趣。

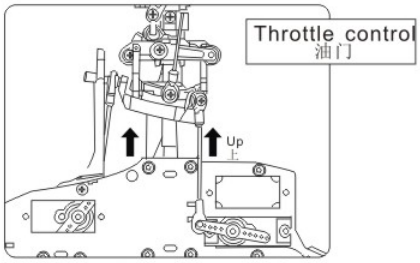


Flying control of Letf/Right cyclic
左右飞行操控动作

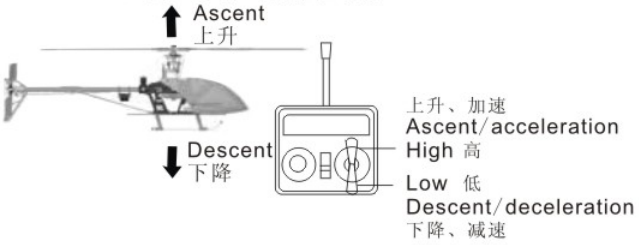


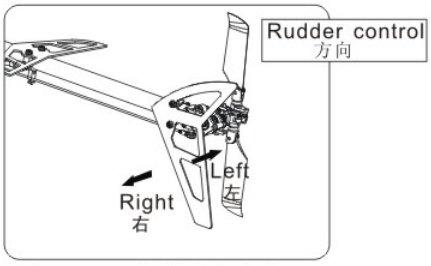
Flying control of Forward/Backward cyolic
前进、后退飞行操控动作





Flying control of ascent/descent
上升、下降飞行操控动作

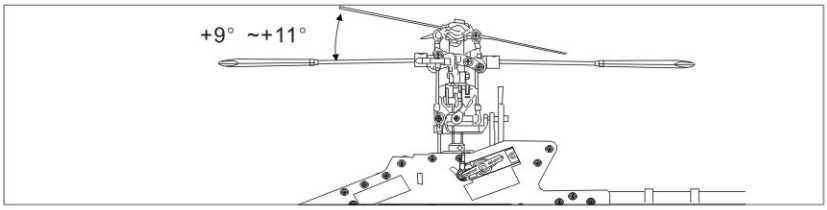




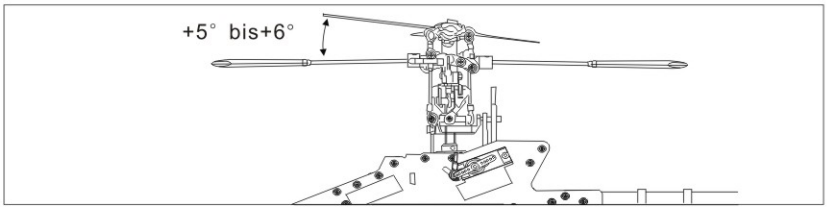
Flying control of right/left turn
向左、向右飞行操控动作

11.PITCH AND THROTTLE SETTING 主旋翼螺距与油门设定

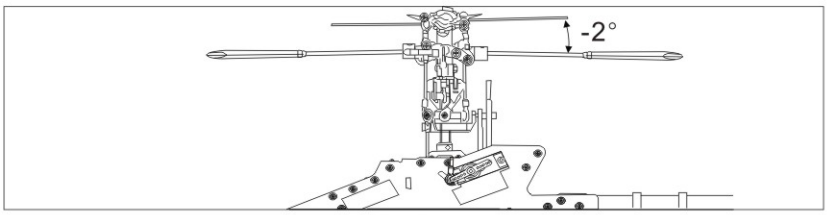
GENERAL FLIGHT一般飞行模式



Stick position at high/Throttle100%/Pitch+9° ~+11°
摇杆高速/油门100%/Pitch+9° ~+11°

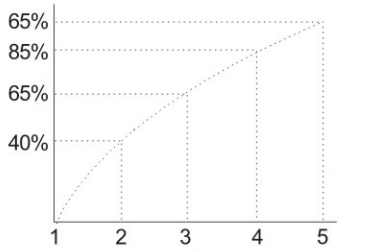


Stick position at Hovering/Throttle 65%~70%/Pitch+5° ~+6°
摇杆停悉/油门65%~70%/Pitch+5° ~+6°



Stick position at low/Throttle 0%/Pitch 0°-2°
摇杆低速/油门0%/Pitch 0°

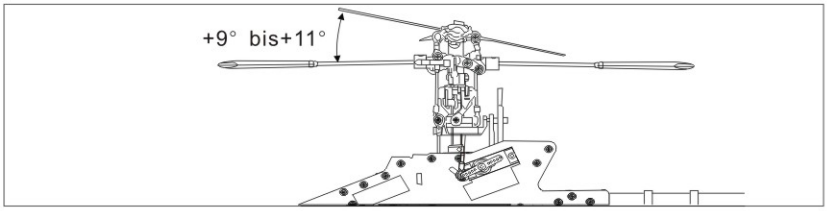
Standard-Flug		
	Throttle 油门	Pitch 螺距
5	100%High speed 100%高速	+9°+11°
4	85%	
3	65%Hovering 100%停息	+5°~+6°
2	40%	
1	0% Low speed 100%低速	-2°



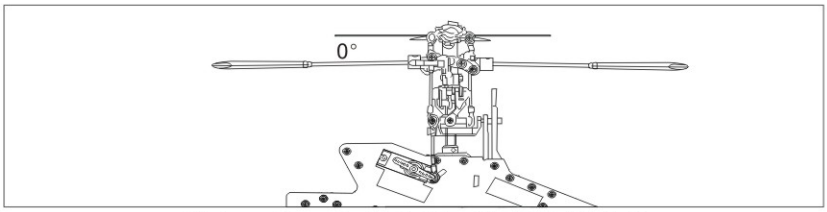
Throttle Curve(Hovering Fight)
停息模式油门曲线

Pitch and Rotation Speed Pitch与转速关系
TIP：It is recommended to use a lower pitch setting when using higher RPM\Head speed. This will allow for better power.
搭配要领：如果使用较高转速马达动力建议搭配调低 Pitch，将获得较佳传动力效能。

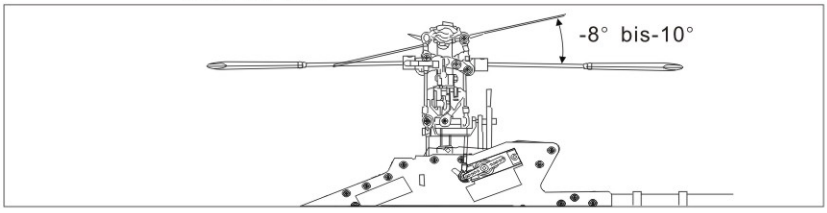
3D FLIGHT 3D特技飞行模式



Stick position at high/Throttle100%/Pitch+9° ~+11°
摇杆高速/油门100%/Pitch+9° ~+11°

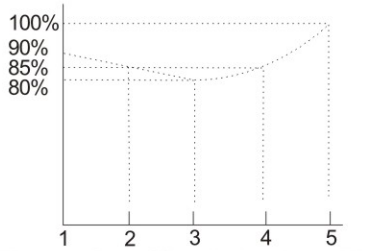


Stick position at middle/Throttle 90%/Pitch 0°
摇杆高速/油门90%/Pitch 0°



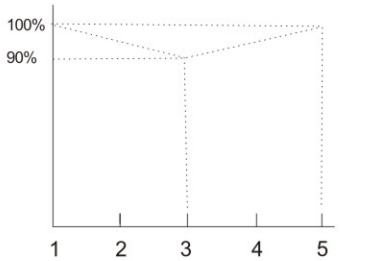
Stick position at low/Throttle 100%/Pitch-8°~-10°
摇杆低速/油门100%/Pitch-8°~-10°

IDLE1:SPORT FLIGHT		
	Throttle 油门	Pitch螺距
5	100%	+9°+11°
4	85%	
3	80%	+5°~+6°
2	85%	
1	90%	-5°



Throttle Curve(Simple Aerobatic Flight)
空中飞行模式油门曲线

IDLE2:3D FLIGHT		
	Throttle 油门	Pitch 螺距
5	100%	+9°+11°
3	90%	0°
1	100%	-8°~-10°

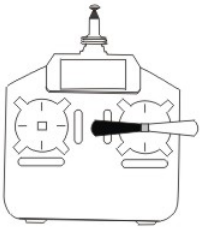
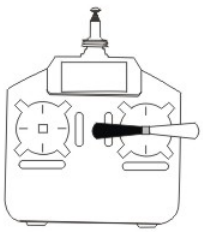
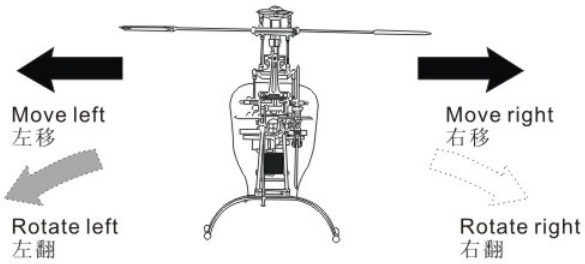
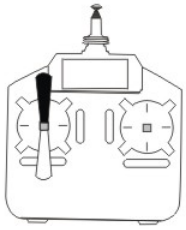
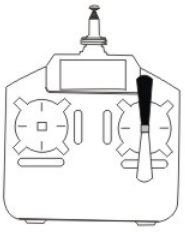
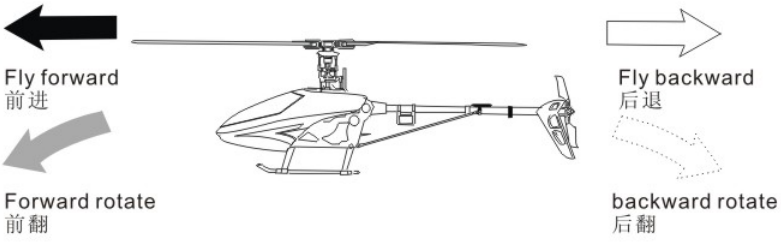
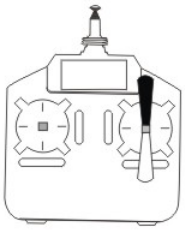
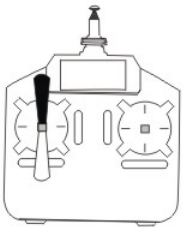
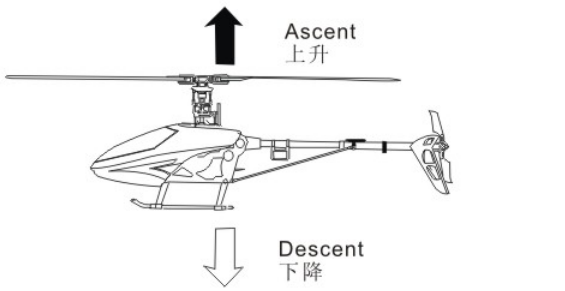
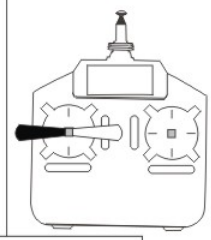
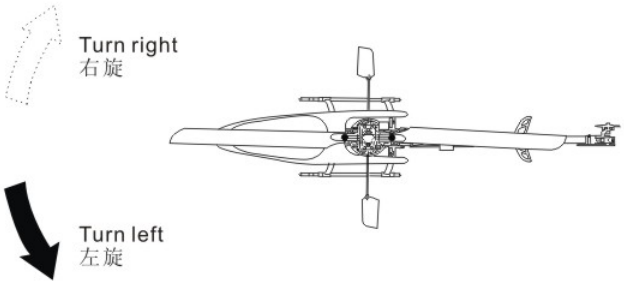


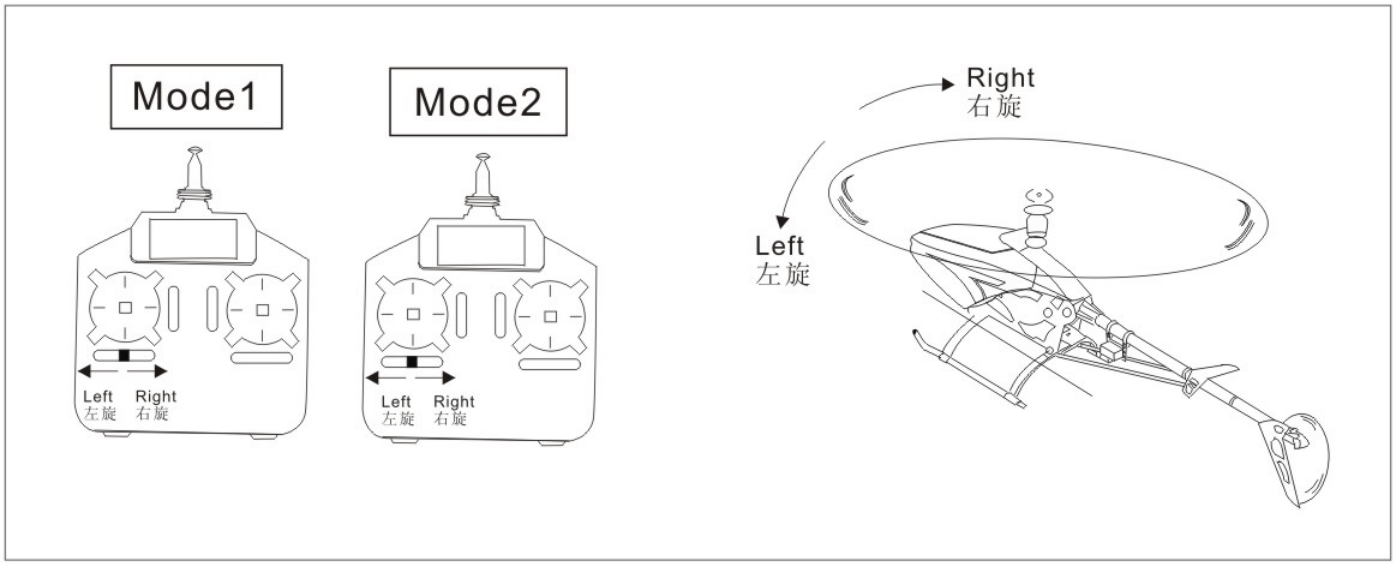
Throttle Curve(3D Flight)
特技飞行模式油门曲线

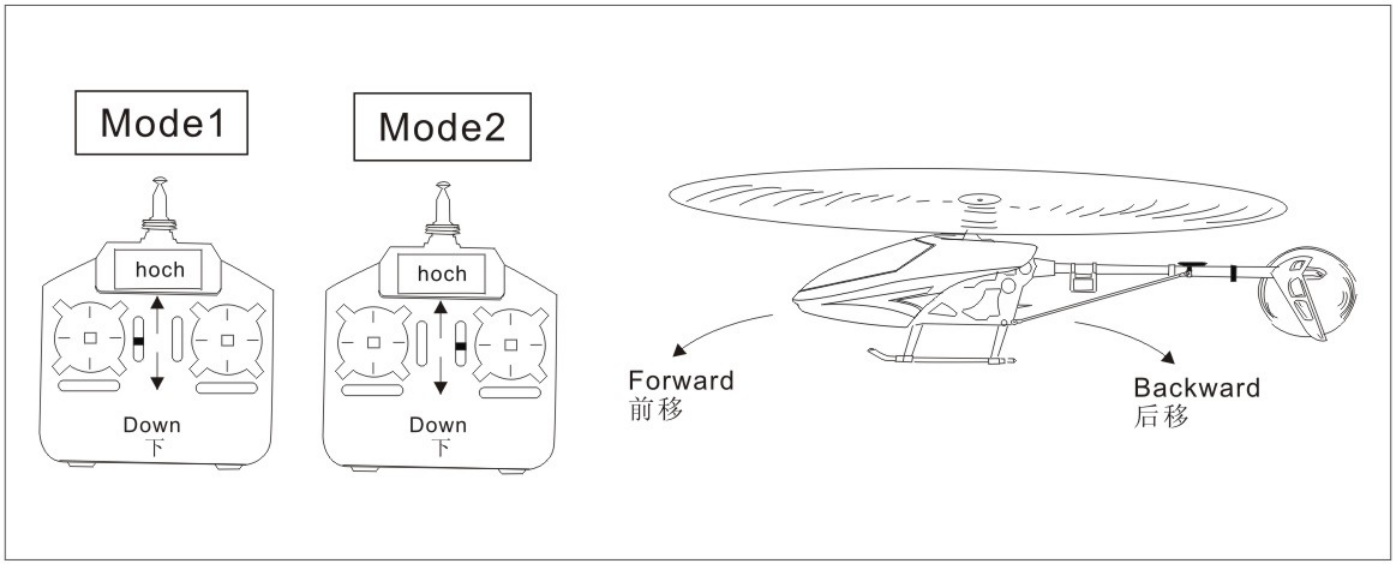
CAUTION! 注意

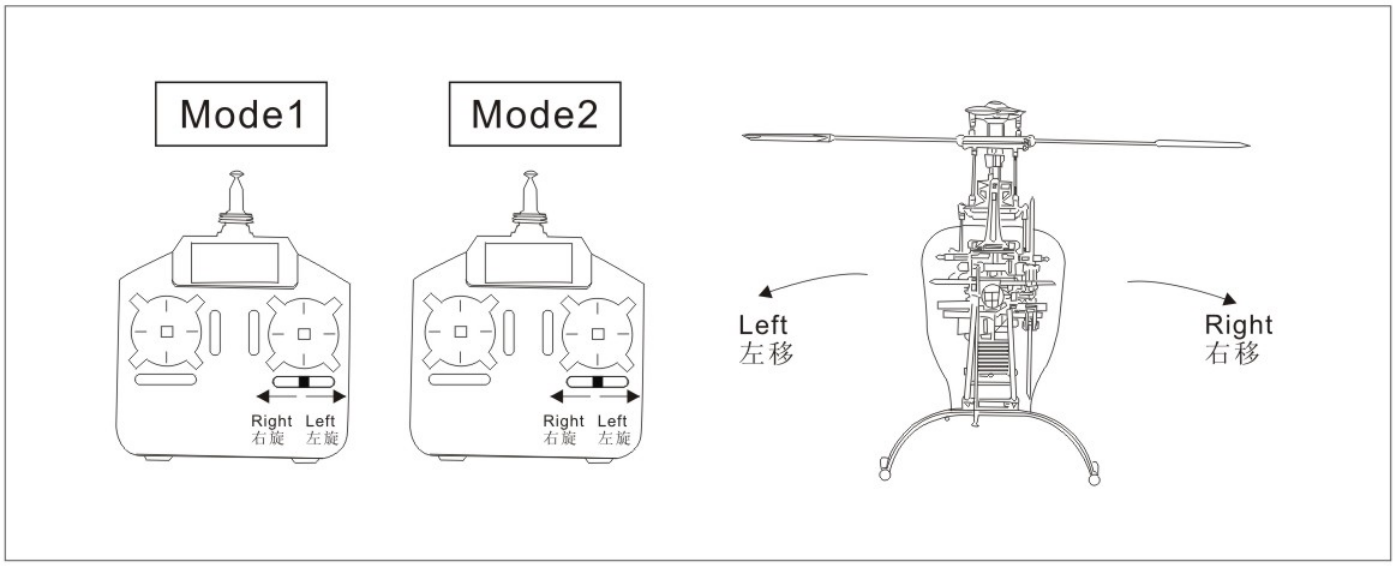
1.Pitch range: Approx.25 degrees.
2.If the pitch is set too high, it will result in shorter fight duration and poor motor performance.
3.Setting the throttle to provide a higher speed is preferable to increasing the pitch too high.
1.螺距（Pitch）总行程约25°
2.过大螺距设定，会导致动力与飞行时间降低。
3.动力提升以较高转速的设定方式，位于螺距调大的设定。

12.FLIGHT ADJUSTMENT AND SETTING 飞行动作调整与设定

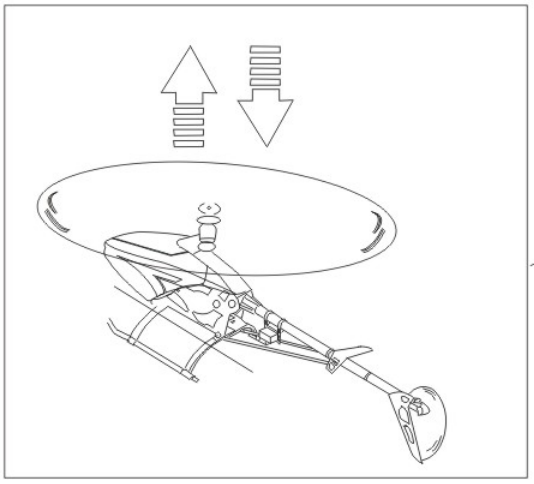
Mode 1	Mode 2	
		
Aileron副翼		
		
Elevator升降/前后		
		
Throttle油门		
		
Rudder方向		


Mode1
Mode2
Left
左旋
Right
右旋
Left
Right
左旋
右旋
Right
右旋
Left
左旋

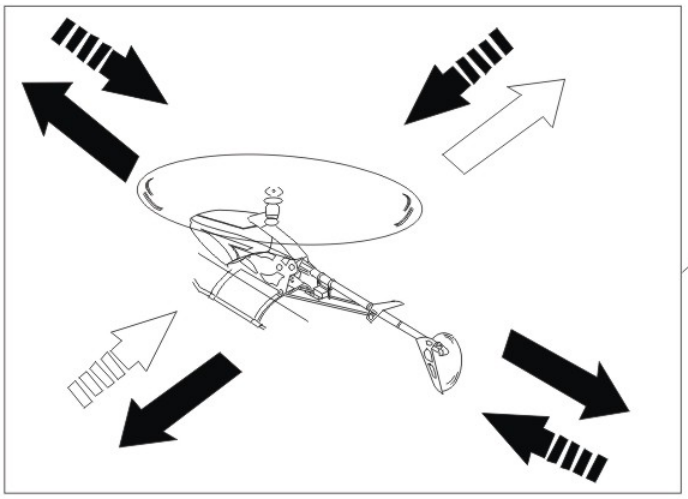

Mode1
Mode2
hoch
Down
下
hoch
Down
下
Forward
前移
Backward
后移


Mode1
Mode2
Right
右旋
Left
左旋
Right
右旋
Left
左旋
Left
左移
Right
右移

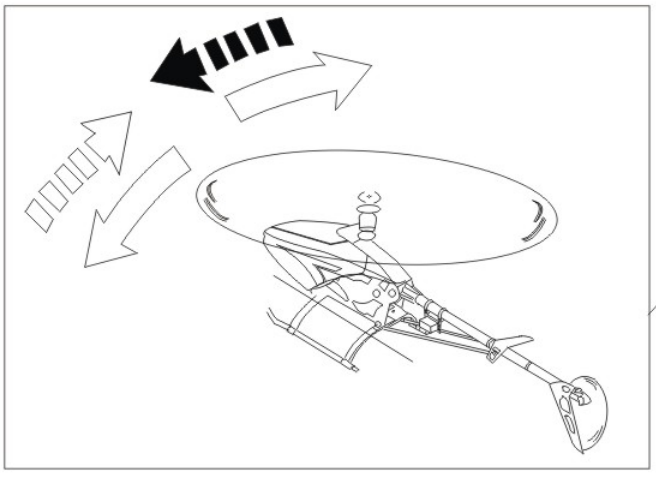
14.FLIGHT ADJUSTMENT AND SETTING 飞行动作调整与设定



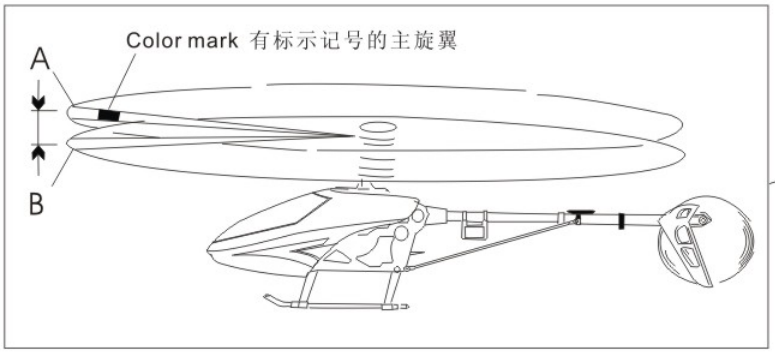
When the helicopter begins to lift-off the ground, slowly reduce the throttle to bring the helicopter back down. Keep practicing this action until you control the throttle smoothly.
当直升机开始离地时，慢慢降低油门将飞机降下。持续练习飞机从地面上升和下降直到你觉得油门控制很顺。



1. Raise the throttle stick slowly.
2.Move the helicopter in any direction back, forward, left and right, slowly move the aileron and elevator sticks in the opposite direction to fly back to its original position.
1.慢慢升起油门摇杆。
2. 使直升机依指示:移动向后/向前/向左/向右, 慢慢的反向移动副翼和升降杆并将直升机开回到原来位置。



1. Slowly raise the throttle stick.
2.Move the nose of the helicopter to right or left, and then slowly move the rudder stick in the opposite direction to fly back to its original position.
1.慢慢升起油门摇杆 。
2. 将直升机机头移动左或右, 然后慢慢反向移动方向舵摇杆并将直升机飞回原本位置。



Incorrect tracking may cause vibrations. Please repeat adjusting the tracking to make sure the rotor is correctly aligned. After tracking adjustment,please check the pitch
angle is approx.+5° when hovering.
不正确的旋翼轨迹会导致震动, 请不断重复调整轨迹, 使旋翼轨迹精度正确. 在调整轨迹后, 确认一下Pitch角度在停旋时应为大约+5° 。

15.PARTS LIST 零件明细

1211
Mail rotor head assembly
旋翼头

1142-72
Main rotor housing
中联

1065
Main rotor holder
大桨夹

1128
Flybar seesaw holder
平衡杆固定座

1129
SF mixing arm
平衡杆摇臂

1081
Flybar control
日字框

1196-72
Washout base
向位器

1024-72
Washout control arm
向位器摇臂

1111
CCPM swashplate
十字盘

1110SV
Tail holder unit assembly
尾总成

1108
Metal tail unit assembly
尾波箱

1189-72
Tail rotor holder set
尾桨夹

1117-2
Main shaft bearing block
主轴轴承座

1138-SV
FG Main fram set
机架组

1137-SV
FG Frame set
碳纤侧板

1151SV
Motor mount
马达固定座

1023
Servo mount
舵机架

1113SV
Anti rotation bracket
十字导轨

1011
Main shaft
主轴

1003-2
Feathering shaft
横轴

1104
Flybar rod
平衡杆

2002-10-4
One -way bearing
单向轴承

1014-2
Skid pipe
脚架铝管

1117
Tail boom mount
尾管固定座

1102
Tail boom347mm
尾管

1017
Rudder cotrol rod
尾舵控制连杆

1114
Metal tail servo mount
金属尾伺服器座

1208
Stabilizer mount
水平翼固定座

1135A
Tail pitch assembly
尾旋翼控制组

1135A
Tail fork
尾推叉

1154-3
Big gear base
大齿盘固定座

1140
Tail rotor shaft assembly
尾轴

1108-3
Front press belt wheel
压带轮

1189-70
Tail rotor hub
尾中联

1154-2
Main drive gear
大齿轮

1154-1-SV
Tail drive gear
小齿轮

1154
One-way bearing shaft
单向轴承套

1191
Flybar paddle
副翼

1208-75
FG Stabilizer
玻纤垂直翼

1192
Tail rotor blade
尾旋翼

1193-1
325mm FG blade
玻纤桨

1193-2
325mm CF blade
碳纤桨

1016
Tail boom brace
尾管支撑杆

1014
Landing skid
脚架

1015
Metal landing skid
金属脚架

1011-4
Lock ring
主轴限位套

1042-1
Brake plate
刹车盘

1031-SV
Drive belt(397mm)
皮带

1047-7
FG Canopy
机头罩

1041-4
Canopy mouting bolt
机头罩固定座

1036
Main blade holder
桨托

1188
Tube & washer
整机导管垫片

1040
Screw bag
螺丝包

1048-1
Copper Ball parts bag
铜球头包

1003-4
Aluminum collar
横轴垫片

002-4
Landing skid rubber gasket
起落脚架管垫

1002-1
Canopy rubber gasket
头罩胶圈

1043SV
Ball linkage rod set
球头扣拉杆

1003-1
feathering shaft o-ring
横轴胶圈

1137-3SV-1
Battery plate
碳纤电池板

2013
Aluminum case
铝箱

16.REGULAR MAINTENANCE 常规维修

Regular maintenance is required to keep the KDS 450 helicopter in optimal and safe flying condition. The model requires precise configuration of the components and settings to be kept by the owner. Maintain regular maintenance on the model to avoid accidents or loss, and optimum performance.
请定期检查:KDS 450 电动遥控直升机为精密零组件构成之精细模型商品.所以飞行者须注意确保各控制组件及结构之性能良好,使能发挥优异稳定飞行特性.如果您的维护不当,飞行时将可能导致意外或任何损失,建议您注意养成直升机定期检查的习惯,以确保让您的爱机随时保持于最佳性能.

MAIN ROTOR CHECKLIST 主旋翼机构检查重点

1.Main Rotor Housing: When the main rotor housing is worn or faulty, there will be obvious vibration and poor flight control. Check the main rotor, main shaft, and feathering shaft for wear or deformity. Replace parts as necessary to eliminate imbalance.
2.O-Rings:The O-Rings will lose their elasticity over time. This will cause excess play on rotor and cause instability. Replace as needed.
3.Main Rotor Holder: When the heli will not fly or react sluggishly, even after checking for proper setting of pitch and throttle, check the following items: Plastic Parts Bearings Ball bearings Rotor Blades
Check for excess play or broken parts, or binding or restricted movement. It is important to check for main rotor balance before each flight. Operating the model when out of balance will cause excessive wear and premature failure of parts, possibly resulting in a dangerous situation.
4.Control Arm Assembly: Check regularly for cracked, worn, bent or binding control arms and pushrods. Smooth movement of control arms and linkages is required for stable, vibration free flight.
5.Swashplate:Check for excess slop in the main ball where the main shaft rides on, and slop of looseness between the plastic and metal surfaces. Swashplate wear will result in poor stability and lack of control during flight. Replace as necessary.
1.主旋翼固定座:当主旋翼运转发生异常时,飞行当中发生明显不明的震动情形,请检查主旋翼、横轴、主轴是否有变形或平衡不良，必要时请将主旋翼头固定座更新。
2.主旋翼缓动油封:缓动油封长期使用会发生弹性疲乏,会影响飞行稳定性,此时建议更新.
3.主旋翼夹座:主旋翼夹座一般飞行前虽然确认过螺距,但实际飞行时仍需增加螺距行程才足够使用,如果飞行时升降动作迟缓情形:检查重点包含了塑胶件以及轴承、球轴承等，塑胶件及球轴承若发现明显间隙，轴承钢珠脱落均需要更换新品。
注意：飞行前主旋翼必须详细的做好动平衡的动作，并请修正双桨不良的状况，以提升升力效能，注意因平衡不佳将各导致零件损坏与松脱。
4.控制臂组：定期检查各控制臂控制滑顺，减少左右摇晃虚位可确保停态稳定性能。
5.十字盘组：当十字盘组发生严重虚位时，会导致停态时稳定性能不稳定，操控性能也会劣化，并可能发生不明原因的双桨现象，严重时则必须更新。

FUSELAGE/CHASSIS 机身组检查重点

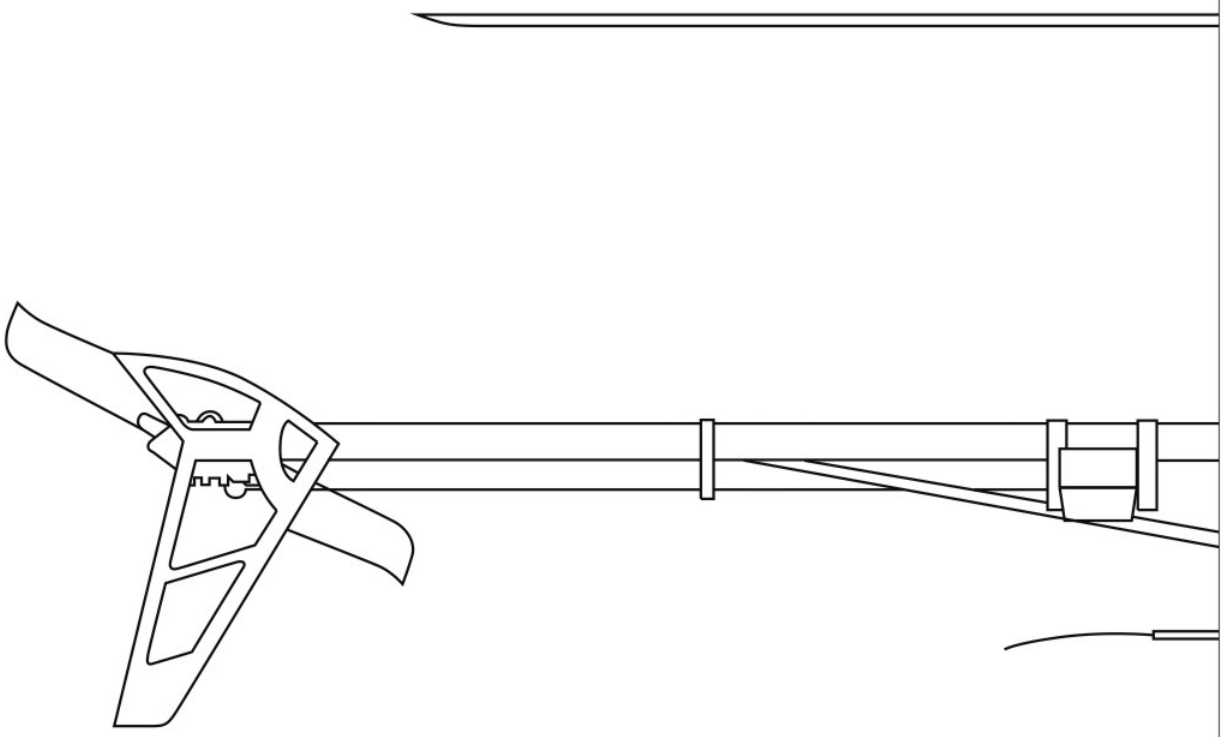
1.Main Shaft Bearing: Normal replacement interval for proper operation is between 60-100 flights. If flying 3D or extreme aerobatics often, inspect the bearing more frequently and shorten the interval as necessary.
2.One-way Bearing: One-way bearings have longer lifetimes. Failure is not common. To keep the one-way bearing in good operation, remove it to clean and lubricate after every 50 flights. If the main drive gear is loose, you should replace the one-way bearing 2002-10-4
3.Drive Belt: KDS uses only top quality, stretch-proof belts. It is however, impossible to prevent the belt from stretching or wearing out. Check belt tension regularly, and check for the wear on the teeth. Replace as necessary.
1.主轴轴承：主轴轴承经长期重负载运作，正常飞行约60-100趟必须更换新品以维持运作顺畅度。但是若经常进行激烈的3D飞行，建议您必须时常检查主轴轴承，当发现主轴轴承有明显的间隙或是转动有明显的阻碍都必须更换新品。
2.单向轴承组：单向轴承组并不常发生损坏的情形。但是为了保持良好的顺畅的运作，建议您约50趟的周期当中请拆卸下来上油。
#如果发生主齿轮明显异动，请立即更换单向轴承盘（2002-10-4）
3.尾传动皮带：尾传动皮带虽然采用日制原装纤维耐变形皮带，长时间使用时仍然会产生延展的现象。请随时检查施以心向尾管重新拉伸修正调整，以维持良好的尾舵控制机能。如果当您发现皮带的边缘发现磨耗严重现象或是断齿的状况，为了维护飞行的安全建议您将它更新。

LINKAGE RODS & CONNECTING PARTS 控制杆组头检查重点

During assembly,take special care to keep the connecting parts in smooth operation,and avoid excess play or binding.Failure to do so will result in poor flight stability.The linkage rods and ends will break and wear due to normal usage,crashing,and poor maintenance and environment.Check for wear and proper operation regularly,replace as needed.
控制连杆、控制臂连接座、升降舵连接座主装时请特别注意各连接部位需保持滑顺且尽量减少轴向左右摇晃间隙，此要点将严重影向飞行稳定性能各连接杆如因跌机损坏之外。因自然磨损或是因飞行场地恶劣因素也会发生磨损或松脱的情形。当您发现任何连接杆发生间隙或是轻推即可脱出，建议您立即更新，确保飞行性能与安全。

TAIL ROTOR SYSTEM 尾旋翼系统检查重点

1.Tail Rotor Control Set: Check the tail rotor bearing regularly. If there is excess play or gaps，replace immediately. Avoid any binding or improper contact on the tail components and bearings as this will cause excess wear and heat, potentially melting or deforming the tail system.
2.Tail Unit Assembly: Avoid flying in tall grass or weeds. If grass or weed becomes lodged in the tail rotor unit, it will interfere with the operation, and cause the helicopter to lose control. Always check for foreign objects in the tail and clean them off immediately. Avoid using lubricants on the exposed surfaces of the model as it will attract and collect dirt and debris, and cause failure.
3.Tail Rotor Housing: Disassemble Tail rotor housing for cleaning and maintenance after every 50flights. If the tail does not operate smoothly or shows any signs of stress or wear, please replace immediately.
4.Tail Rotor: Check the Tail Rotor blades regularly for damage, especially if the helicopter ever strikes the ground while flying, or after hard landings. Damaged Tail Rotor blades can induce Vibration.
output voltage:11.6V work frequency:2.4G
1.尾齿轮组：尾齿轮给请注意尾旋翼轴承的检查，当您发现轴承有明显的间隙时请更新，避免轴承咬死，并请注意尾舵轮不可将它锁死。必须能保持顺畅运动以免发生塑胶件熔毁的情形。
2.尾旋翼控制滑座：当您于草地飞行时，请注意避免查尾旋翼滑座是否有发生落地时卷入杂草的状况，若有必须立即将它清除再进行下一次飞行，否则可能会因为杂草纤维阻碍运作。造成尾旋翼控制失常的情形，平常保养尽量避免使用润滑油于外部结构，避免沾染灰尘等杂物，严重时甚至会发生其它部位轴承磨损及尾旋翼滑座无法运作的情形。
3.尾旋翼固定座：尾旋翼固定座飞行约50趟左右请拆卸进行清洁保养，确认轴承间隙是否正常。如转动不顺或间隙过大请更换轴承，确保控制系统完善。
4.尾旋翼：飞行时发生触地的情形请立即检修。若发现尾旋翼有明显的外观损坏时请立即更换。以避免发生尾部震动并因此损坏其它零件，确保飞行品质。



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