

零戦

INSTRUCTION MANUAL

# ZERO G.S-160

(A122)



**1.60 cubic inch displacement 2-stroke(glow)  
Requires: 6-channel radio w/ 7 standard servos  
and 2 low profile retract servos**

## Specifications

Wing Span	80.0 in / 2030 mm
Wing Area	1138 sq in / 73.4 sq dm
Flying Weight	15.5-17 lbs / 7100-7700 g
Fuselage Length	68 in / 1730 mm

\* Specifications are subject to change without notice.\*

### **Warning !This model is not a toy.**

It is designed for maximum performance. Please seek advice if one is not familiar with this kind of engine powered precision model. Operating this model without prior preparation may cause injuries. Remember, safety is the most important thing. Always keep this instruction manual at hand for quick reference.



**TWM**  
The World Models  
Manufacturing Co., Ltd.  
[www.theworldmodels.com](http://www.theworldmodels.com)

FACTORY PRE-FABRICATED  
ALMOST-READY-TO-FLY (ARF) SERIES  
MADE IN CHINA

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## BEFORE YOU BEGIN

- 1 Read through the manual before you begin, so you will have an overall idea of what to do.
- 2 Check all parts. If you find any defective or missing parts contact your local dealer. Please DRY FIT and check for defects for all parts that will require CA or Epoxy for final assembly. Any parts you find to be defective after the gluing process may be difficult to remove for warranty replacement. The manufacturer will replace any defective parts. but will not extend to the parts that are good before gluing to defective parts during assembly. Warranty will not cover any parts modified by customer.
- 3 Symbols used throughout this instruction manual comprise of the following : -



Apply epoxy glue.



Apply instant glue  
(C.A.glue, super glue.)



Apply thread locker



Must be purchased separately!



Assemble left and right  
sides the same way.



Ensure smooth non-binding  
movement while assembling.



Peel off shaded portion  
covering film.



Cut off shaded portion.



Drill holes with the specified  
diameter (here: 3mm).



Pierce the shaded portion  
covering film.

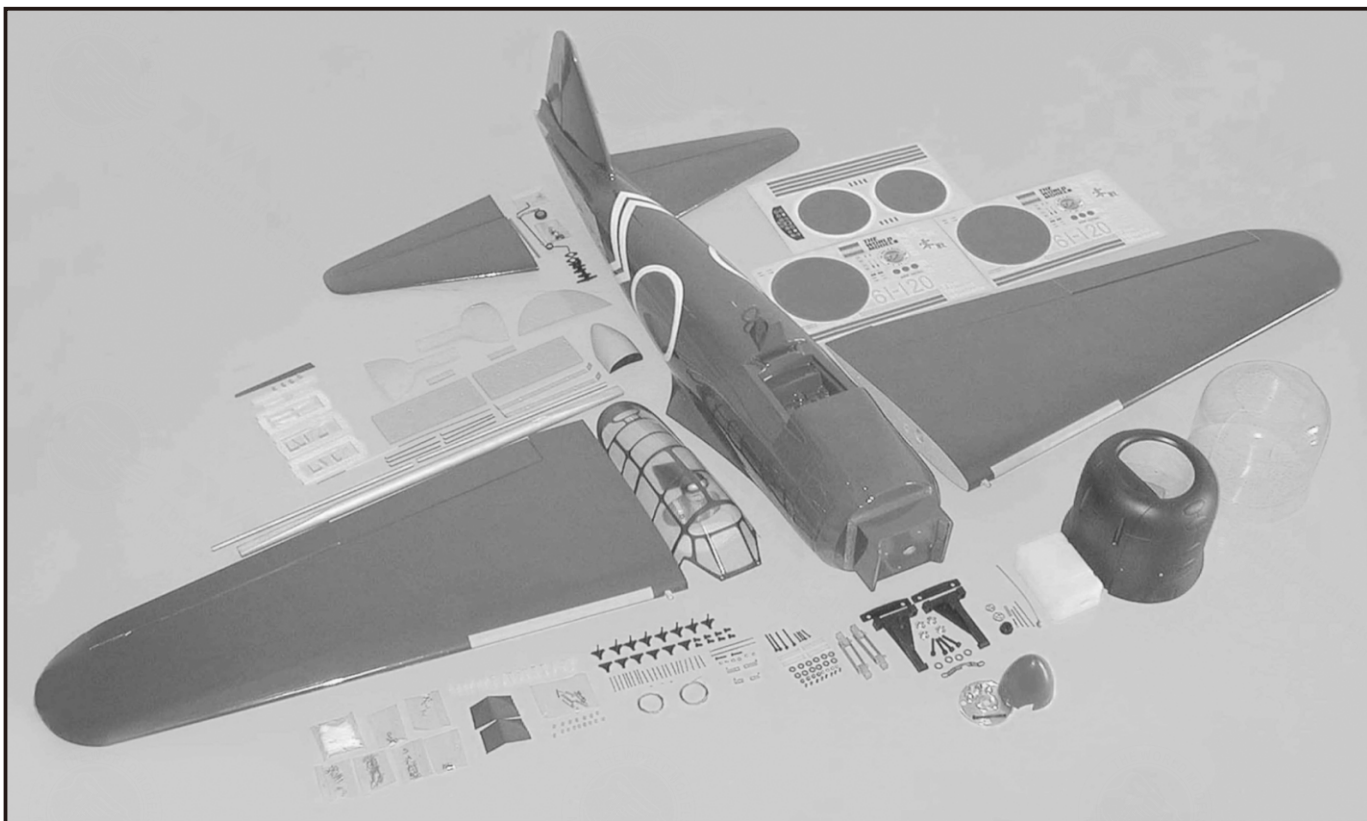


Pay close attention here!



**Warning!**

Do not overlook this symbol!



## Parts List

1. MAIN WING -- 1 pair
2. SCREW PWA2x8mm -- 16 pcs  
SCREW PB2x22mm -- 4 pcs  
SCREW PB2x20mm -- 2 pcs  
SCREW PB2x25mm -- 4 pcs  
SCREW PB2x22mm -- 2 pcs  
CLEVIS -- 4 pcs  
STRAPER -- 4 pcs  
FUEL TUBE Ø6x5mm -- 8 pcs  
TRI-HORN M3x14mm(For Aileron & Flap)(L) -- 4 sets  
PUSHROD Ø1.8x137mm w/ Threads(For Aileron Servos -- 2 pcs  
PUSHROD Ø1.8x115mm w/ Threads(For Flap Servos -- 2 pcs  
SERVO MOUNTING PANEL 22x68x78mm -- 4 pcs
3. RETRACTABLE LANDING GEAR -- 1 set  
RETRACTABLE LANDING GEAR COVER -- 1 set  
SCREW PM2x8mm -- 12 pcs  
WASHER d2xD5mm -- 24 pcs  
M2 NUT -- 12 pcs  
COVERING FILM 45x80mm -- 2 pcs  
PLYWOOD 3x261x60mm -- 1 pc.
4. FUSELAGE -- 1 pc.  
SCREW PA3x15mm -- 1 pc.  
WASHER d3.2xD12mm -- 1 pc.
5. ENGINE MOUNT PL5911120 -- 1 set  
SOCKET HEAD SCREW M6x30mm -- 4 pcs  
WASHER d6xD15mm -- 4 pcs  
BLIND NUT M6xD18mm -- 4 pcs
6. FUEL TANK 800cc -- 1 set  
DOUBLE-SIDED TAPE 40x160mm -- 1 pc.  
CABLE TIE 1.5x8x500mm -- 1 pc.  
PLYWOOD 6x61x133(For Throttle Servo) -- 1 pc.  
BALSA 6x6x41mm(For Throttle Servo Stand) -- 2 pcs
7. STABILIZER & ELEVATOR -- 1 set  
SCREW PA3x12mm -- 2 pcs  
WASHER d3xD7mm -- 2 pcs  
STABILIZER TUBE Ø9.5x458mm -- 1 pc.
8. TAIL LANDING GRAR -- 1 set  
TAIL WHEEL Ø30mm -- 1 pc.  
COLLAR Ø2.6mm w/ set screw -- 1 set  
SCREW PA3x12mm -- 2 pcs
9. VERTICAL FIN & RUDDER -- 1 set
10. SCREW PB2x30mm -- 3 pcs  
FUEL TUBE Ø6x5mm -- 1 pc.  
CLEVIS -- 1 pc.  
PUSHROD Ø1.8x970mm w/ Threads(For Rudder) -- 1 pc.  
TRI-HORN M3x14mm(L)(w/ o-Basa For Rudder) -- 1 set
11. SCREW PB2x20mm -- 4 pcs  
SCREW PB2x18mm -- 2 pcs  
FUEL TUBE Ø6x5mm -- 2 pcs  
CLEVIS -- 2 pcs  
TRI-HORN M3x14mm(L)(For Elevator) -- 2 sets  
PUSHROD Ø1.8x745mmw/ Threads(For Elevator) -- 2 pcs
12. LINKAGE CONNECTOR Ø2.1mm -- 1 set
13. PLYWOOD 6x61x133mm(For Elevator\ Rudder) -- 2 pcs  
BALSA 6x6x41mm(For Elevator\ Rudder Servo Stand) -- 4 pcs  
PUSHROD CONNECTOR PL4410010 -- 1 set  
FUEL TUBE Ø6x5mm -- 2 pcs  
STRAPER PL4112102 -- 2 pcs  
PUSHROD Ø1.8x120mm (For Elevator) -- 1 pc.  
SPONGE 10x80x200mm(For Radio Equipment) -- 2 pcs
14. ANTI-VIBRATION MOUNT 4C-120 -- 1 set  
INCLUDE:SOCKET HEAD SCREW M4x35mm -- 4 pcs  
SCREW KM3x20mm -- 8 pcs  
WASHER d4xD12mm -- 8 pcs  
M3 NYLON INSERT LOCK NUT -- 8 pcs  
M4 NYLON INSERT LOCK NUT -- 4 pcs  
COPPER TUBE d3.1xD4x9.1mm -- 4 pcs  
COPPER TUBE d4.1xD5x9.4mm -- 4 pcs  
COPPER TUBE d3.1xD5x9.1mm -- 4 pcs  
IRON PLATE 2x12x75mm(For Engine Mount) -- 1 pc.  
THROTTLE PUSHWIRE Ø1.2x360mm -- 1 pc.  
PLASTIC TUBE d2xD3x110mm -- 1 pc.
15. COWLING -- 1 pc.  
TRANSPARENT 3D TEMPLATE -- 1 pc.  
TRANSPARENT 3D TEMPLATE 0.5mmPVC -- 1 pc.  
SCREW PM3x10mm -- 4 pcs  
SILICON GROMMET d2.5xD8.5mm -- 4 pcs  
M3 NYLON INSERT LOCK NUT -- 4 pcs  
WASHER d3xD7mm -- 8 pcs  
SCREW PA3x12mm -- 4 pcs  
PLASTIC SPINNER(w/ alu .back plate)Ø89mm -- 1 set  
ALUMINUM PLATE 1.5x12x220mm -- 2 pcs
16. SCREW PM3x70mm -- 2 pcs  
WASHER d3xD7mm -- 8 pcs  
SCREW HM4x45mm -- 2 pcs  
WASHER d4xD15mm -- 2 pcs  
SOCKET HEAD SCREW M3x18mm -- 2 pcs  
M3 NYLON INSERT LOCK NUT -- 2 pcs  
M3 NUT -- 2 pcs  
SCREW PWA3x12mm -- 3 pcs  
WING TUBE Ø25.4x750mm -- 1 pc.  
WING TUBE Ø9.5x382mm -- 1 pc.  
WING PROTECTION -- 1 pc.  
ALUMINUM PLATE 2.3mm(For Wing) -- 4 pcs  
AIR SCOOP -- 1 pc.
17. CANOPY -- 1 pc.  
SCREW PWA2.3x8mm -- 8 pcs  
SILICON GROMMET d1.5xD6.5mm -- 8 pcs  
DOUBLE SIDED TAPE 8x1230mm -- 1 pc.  
DOUBLE SIDED TAPE 8x125mm -- 1 pc.  
SPONGE 10x46x57mm(For Canopy) -- 1 pc.  
PILOT PC001102B -- 1 set  
ANTENNA -- 1 pc.
18. DECALS:A122DEC -- 1 set

### ● COVERING:

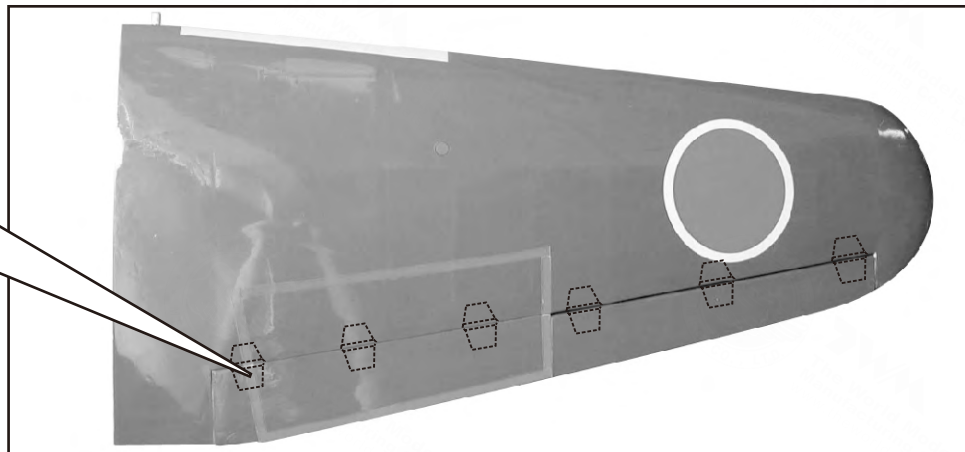
TOUGHLON STL 203 LIGHT GRAY  
TOUGHLON STL 331 CUB YELLOW  
TOUGHLON STL 340 OLIVE DRAB

## 1 Flap & Aileron



Pre-glued

L/R



## 2 Flap & Aileron Servos

PWA2x8mm Screw

16

PB2x25mm Screw

4

PB2x22mm Screw

2

PB2x22mm Screw

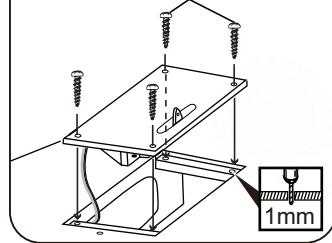
4

PB2x20mm Screw

2

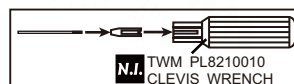
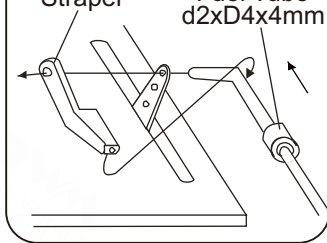
● Ø1mm pilot holes for World Models tri-horn are pre-drilled. Please look for pin-hole marks at under side of control surfaces.

PWA2x8mm

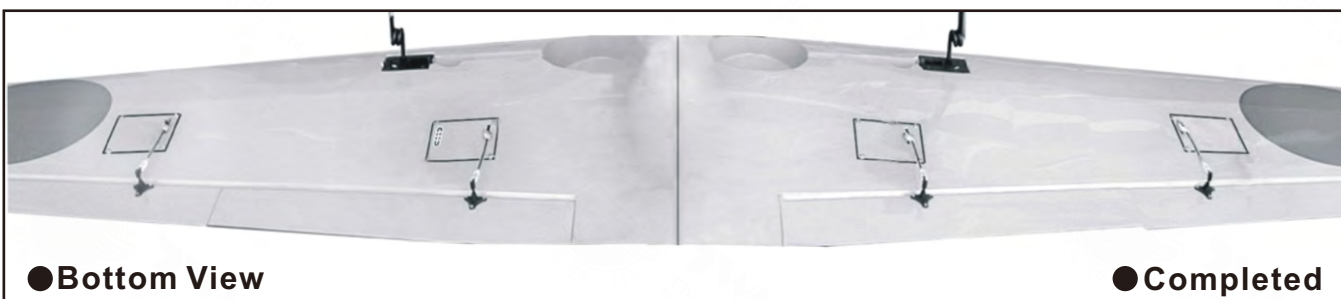
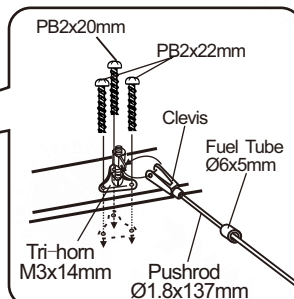
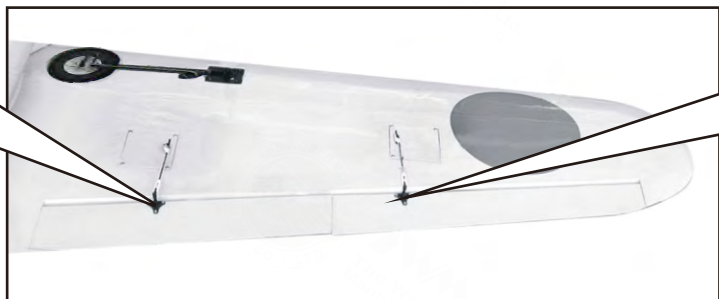
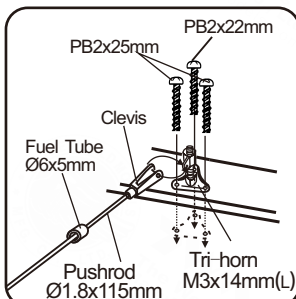


Straper

Fuel Tube  
d2xD4x4mm



TWM PL8210010  
CLEVIS WRENCH



● Bottom View

● Completed



### 3 Landing Gear & Retract Servos

PM2x8mm **Screw**

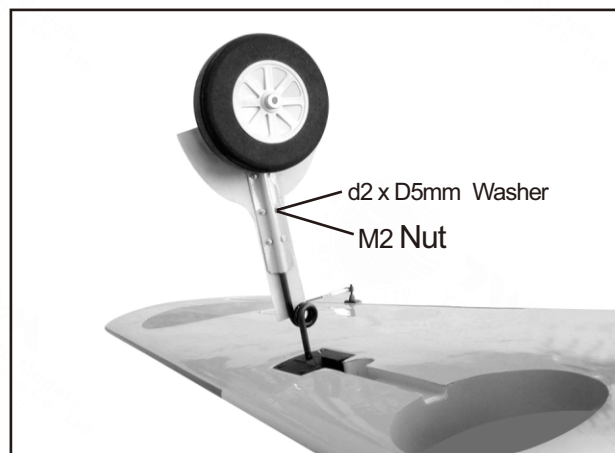
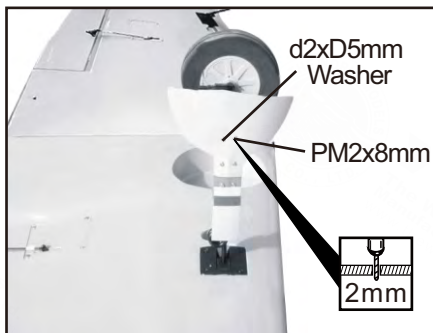
 12

d2xD5mm **Washer**

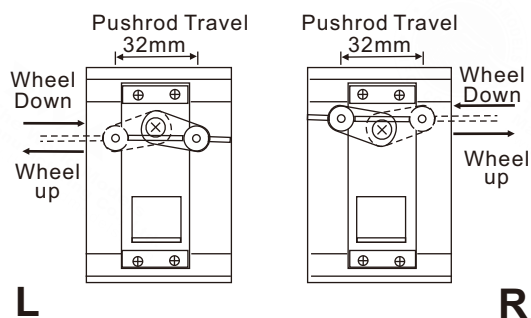
 24

M2 **Nut**

 12



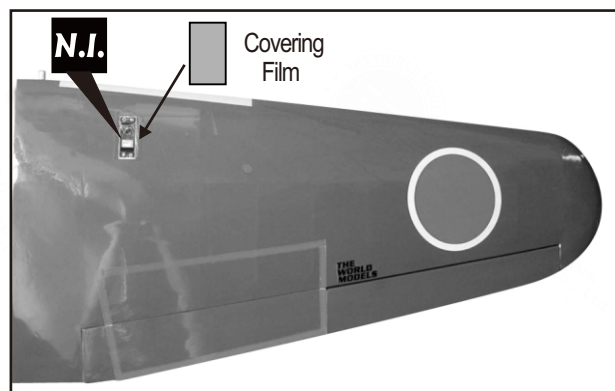
#### ● Retract Servos



**L/R**

**L**

**R**



### 4 Fueslage

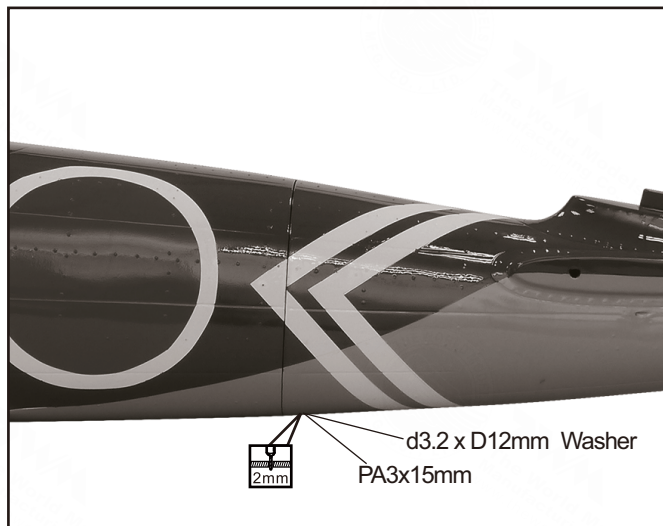
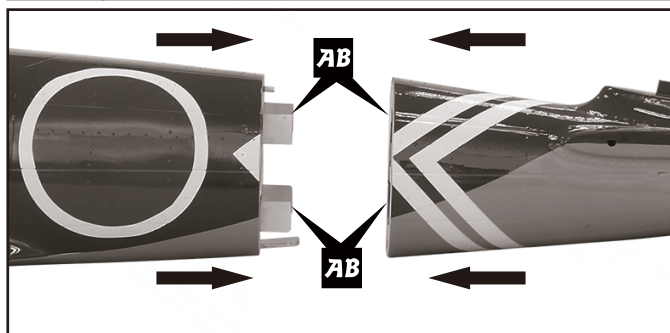
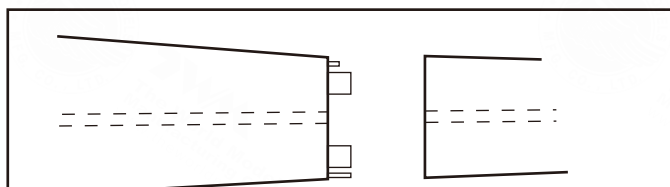
PA3x15mm **Screw**

 1

d3.2xD12mm **Washer**

 1

● Make sure no glue gets near the pushrod guide sleeves.



## 5 Engine Mount

M6x30mm **Screw**

 — 4

d6xD15mm **Washer**

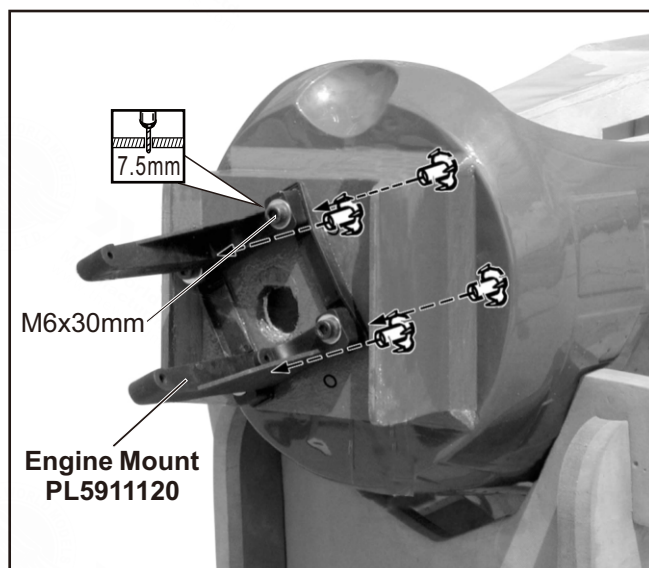
 — 4

M6x D18mm **Blind Nut**

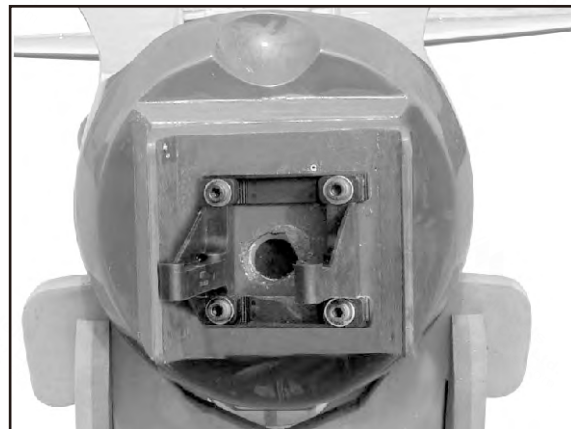
 — 4

● Apply thread locker to screws.

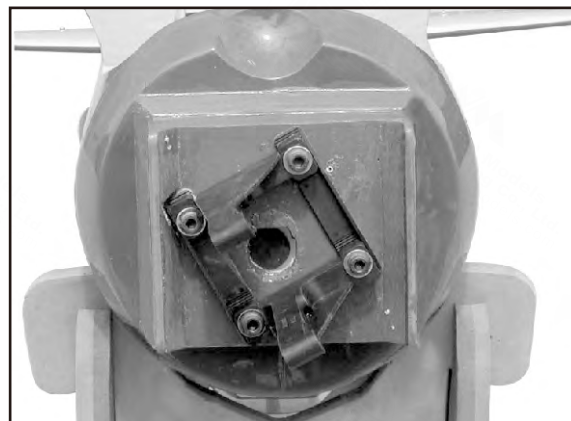
**!** Blind nuts are off-centered to keep the spinner at the fuselage axis.



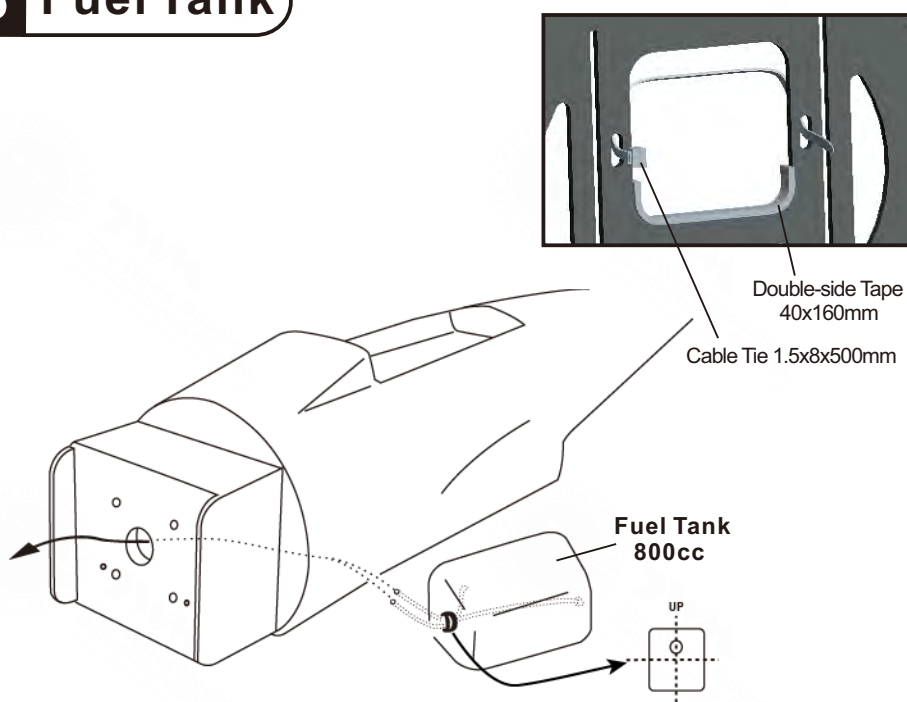
A: Inverted mount with Pitts type muffler.



B: Inverted mount for stock muffler installation.



## 6 Fuel Tank



● Completed

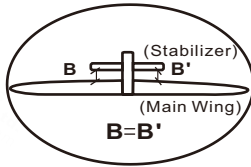
## 7 Stabilizer & Elevator

PA3x12mm **Screw**

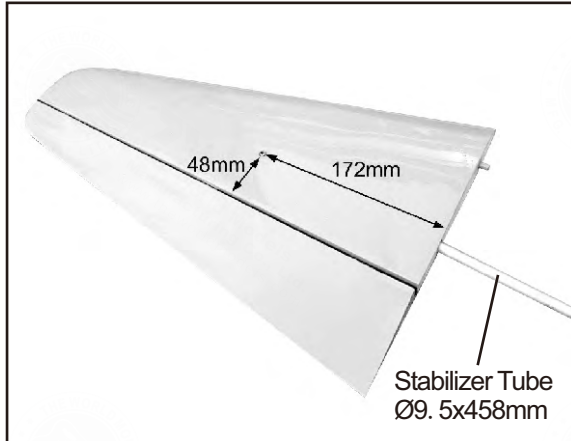
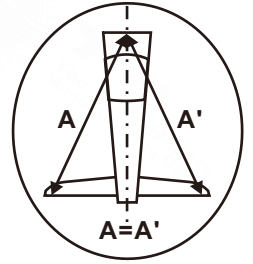
 — 2

d3xD7mm **Washer**

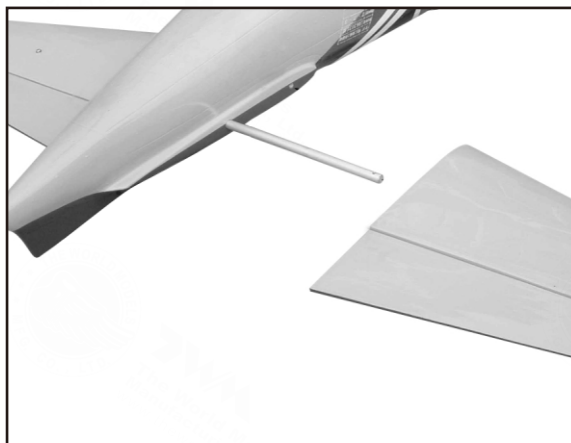
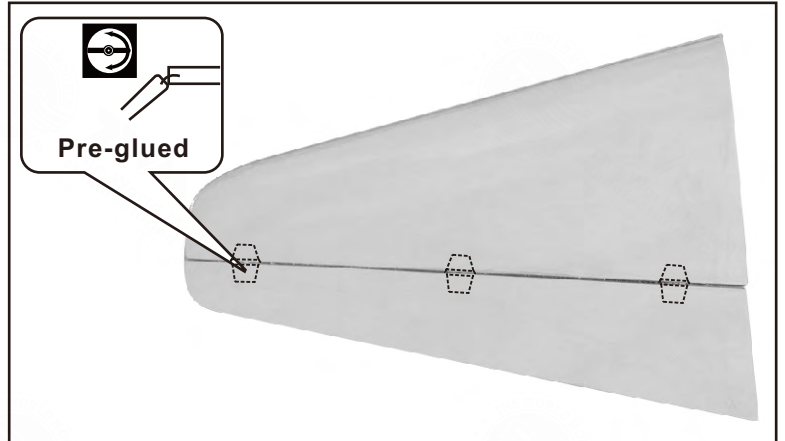
 — 2



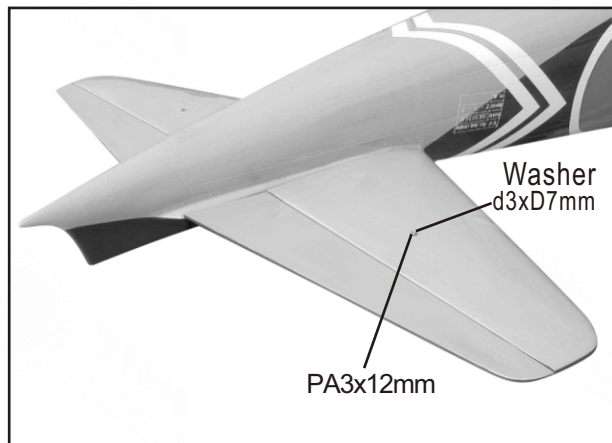
Temporary install the main wing, adjust leveling of the stabilizer to make it as parallel to the main wing as possible.



● Bottom View



● Bottom View




● Bottom View

L/R

## 8 Tail Landing Gear

PA3x12mm **Screw**

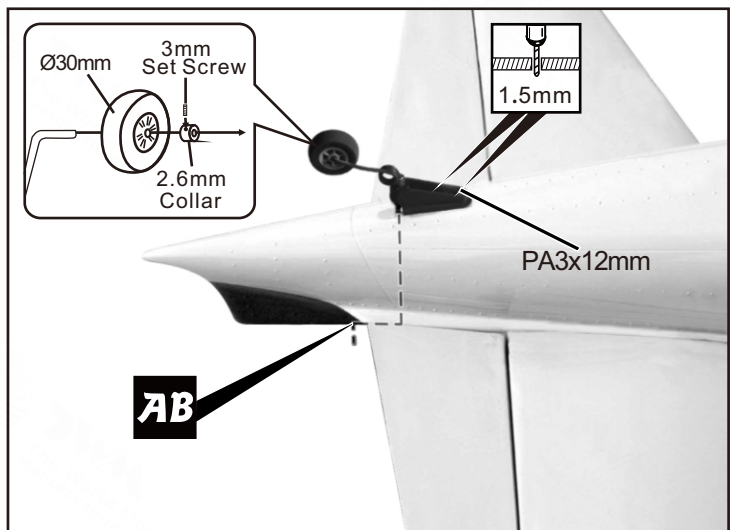
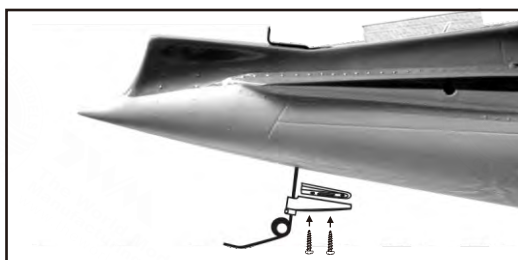
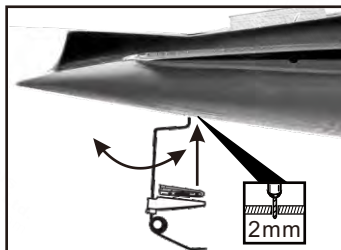
 — 2

3mm **Set Screw**

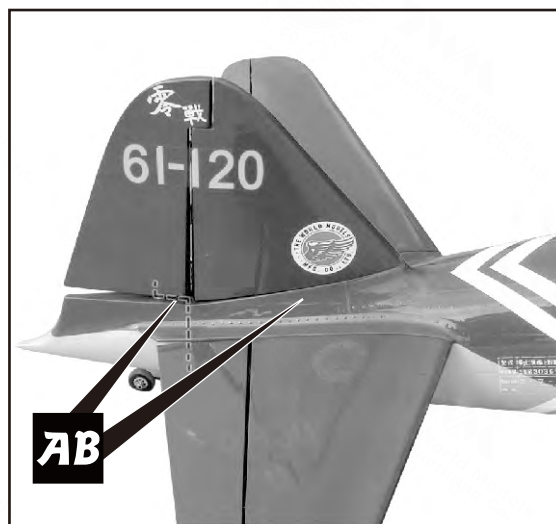
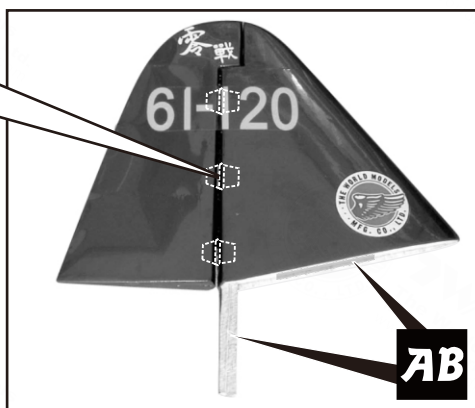
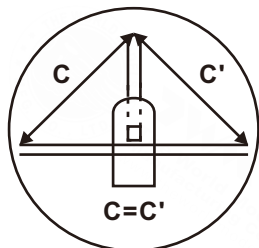
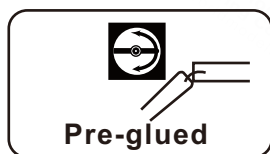
 — 1

2.6mm **Collar**

 — 1



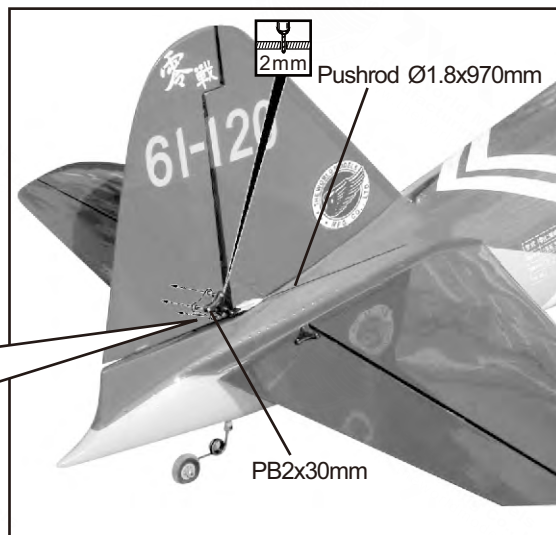
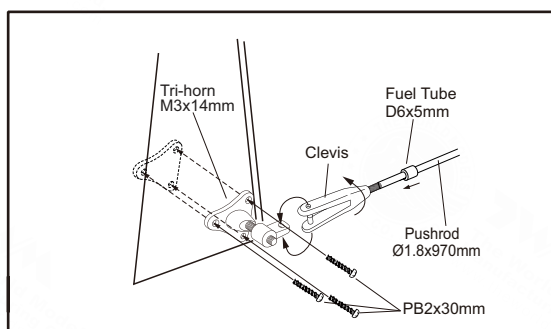
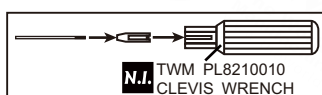
## 9 Vertical Fin & Rudder



## 10 Rudder Pushrod

● Ø1mm pilot holes for World Models horn are pre-drilled. Please look for pin-hole marks at side of control surfaces.

PB2x30mm Screw

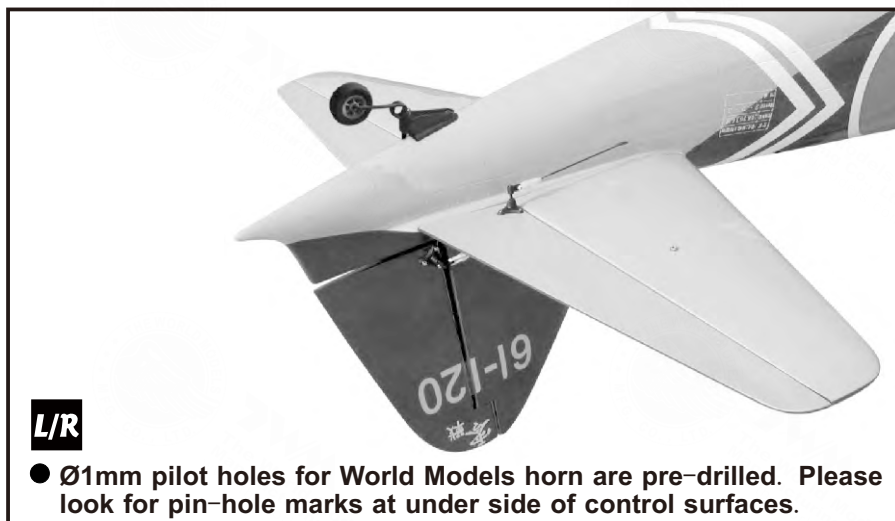
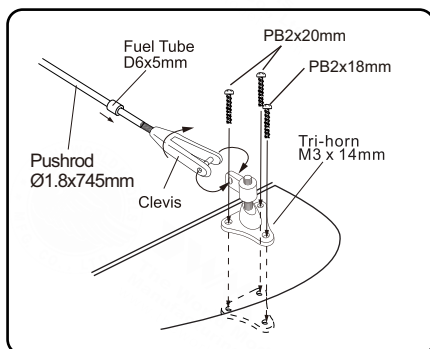
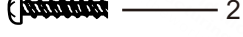


## 11 Elevator Pushrod

PB2x20mm Screw



PB2x18mm Screw

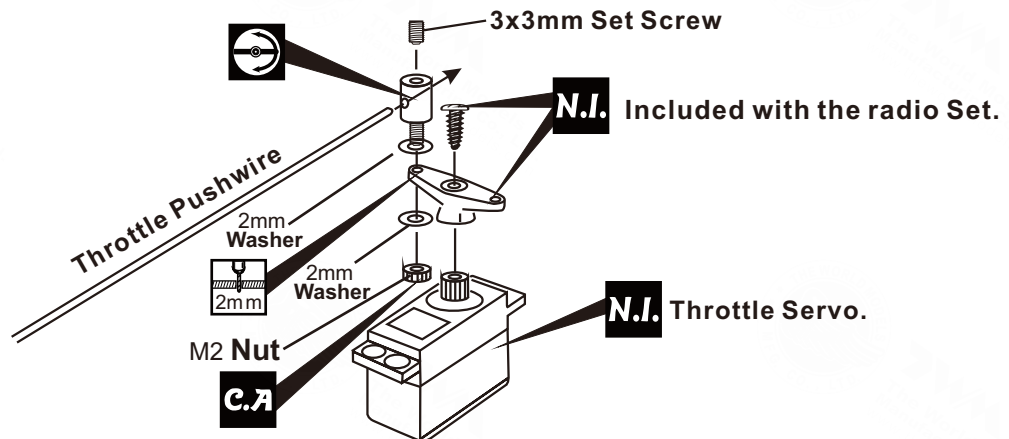




## 12 Servo Set

### LINKAGE CONNECTOR

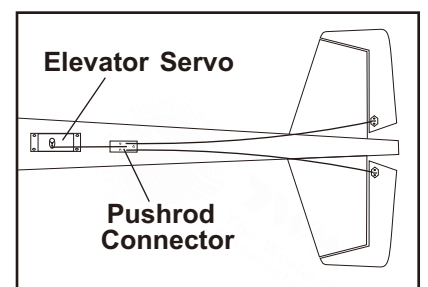
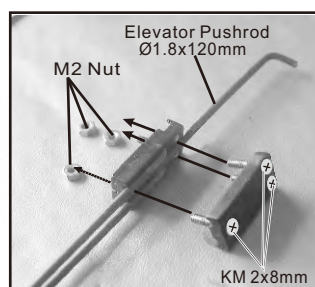
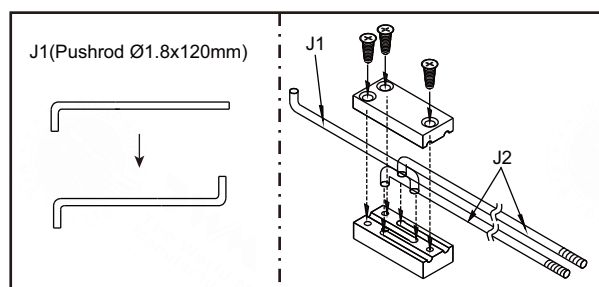
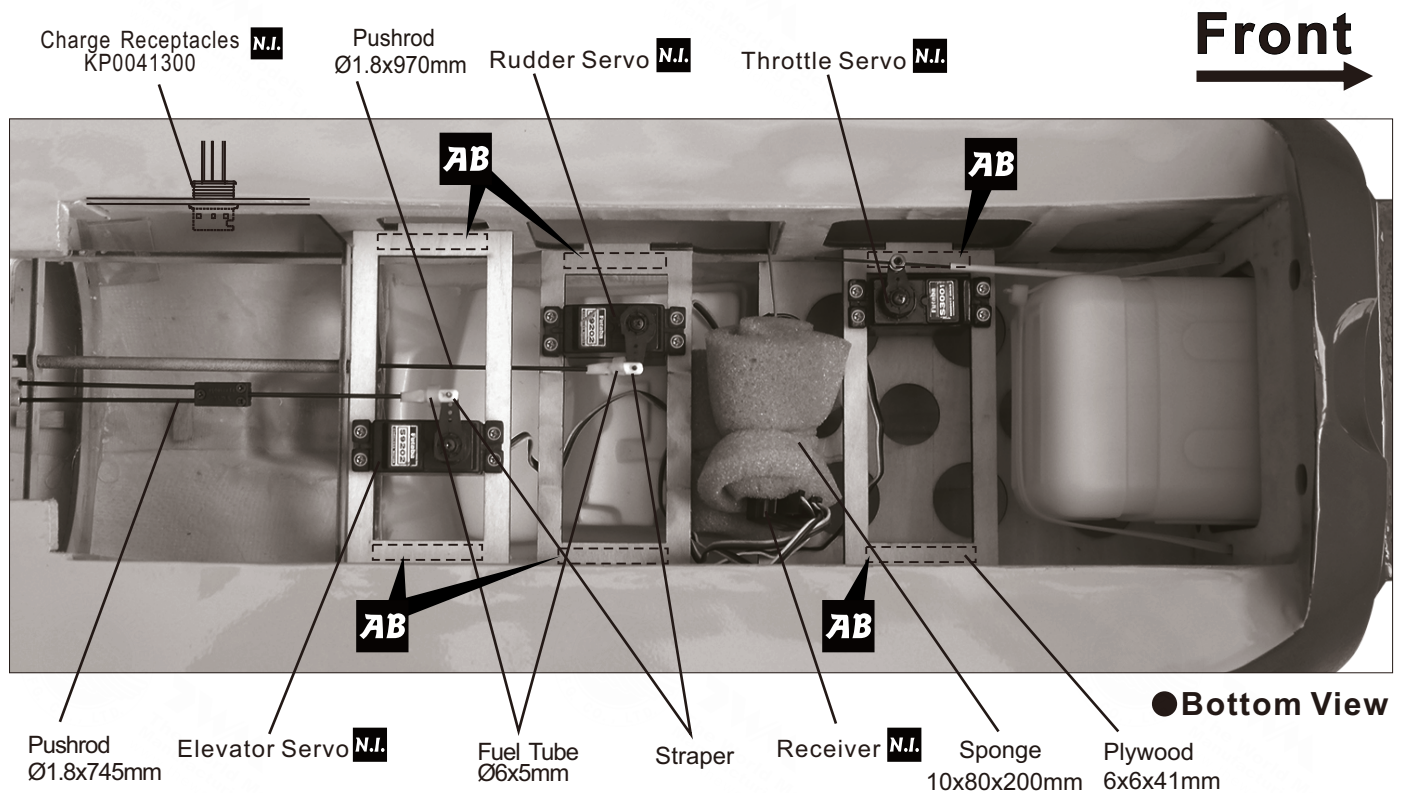
3 x 3mm Set Screw	1
Linkage Connector	1
M2 Nut	1
2mm Washer	2



Please refer to the attached sheet for linkage connector installation.

## 13 Servos

● Install and arrange the servo as shown in the diagram.



## 14 Engine

M4 x 35mm **Screw**



4

KM3 x 20mm **Screw**



8

M4 Nylon Insert Lock Nut



4

M3 Nylon Insert Lock Nut

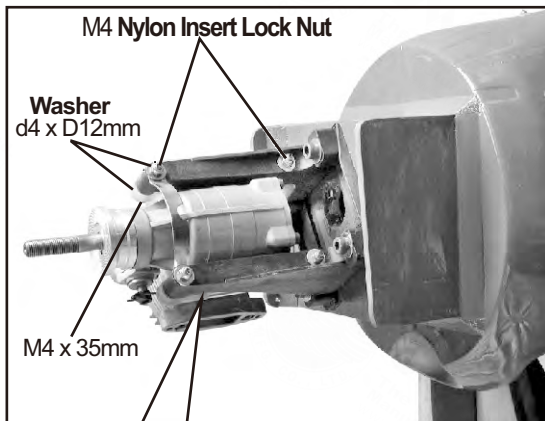


8

d4 x D12mm **Washer**

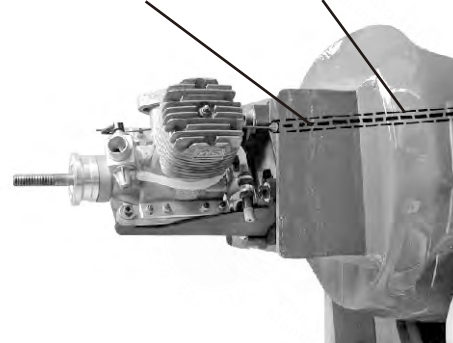


8

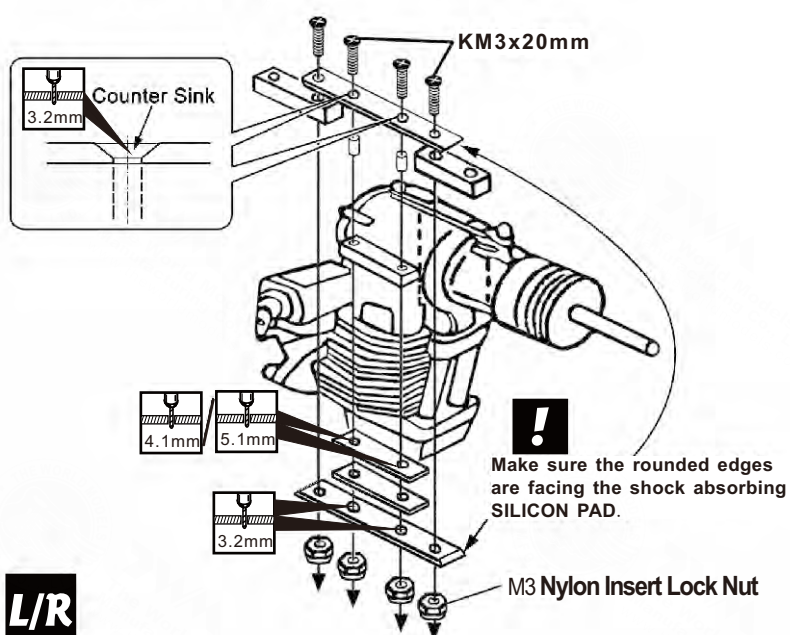


Plastic Tube  
d2xD3x110mm

Throttle Pushwire  
Ø1.2x360mm

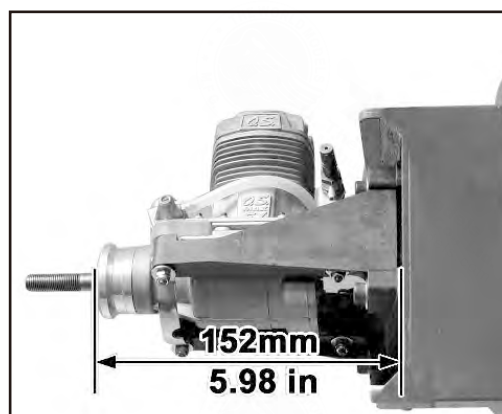


### ANTI-VIBRATION MOUNT INSTALLATION



**L/R**

**!** Illustration is for inverted mounting. You can mount the engine upright or sideways simply by rotation the engine mount. Thrust angles will not be affected.



● Install Engine position

## 15 Cowling

● First insert the grommet to the cowling then apply screw.

PM3x10mm **Screw**



4

d2.5xD8.5 mm Silicon Grommet



4

M3 Nylon Insert Lock Nut



4

d3xD7mm **Washer**

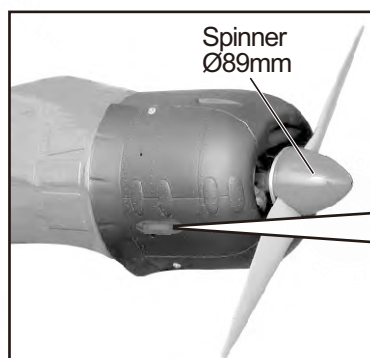
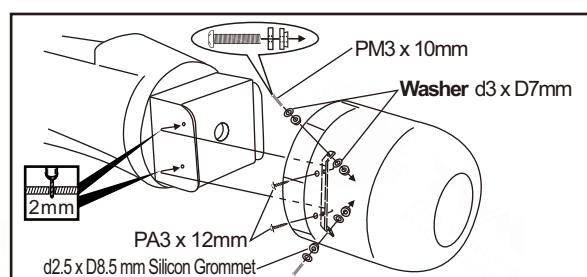
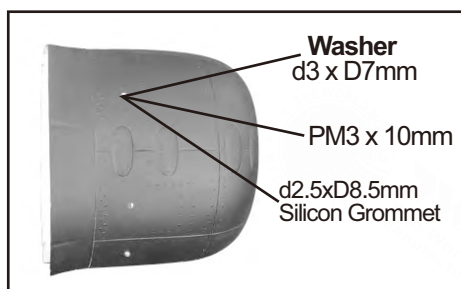
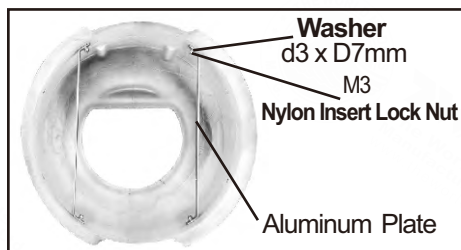


8

PA3x12mm **Screw**



4











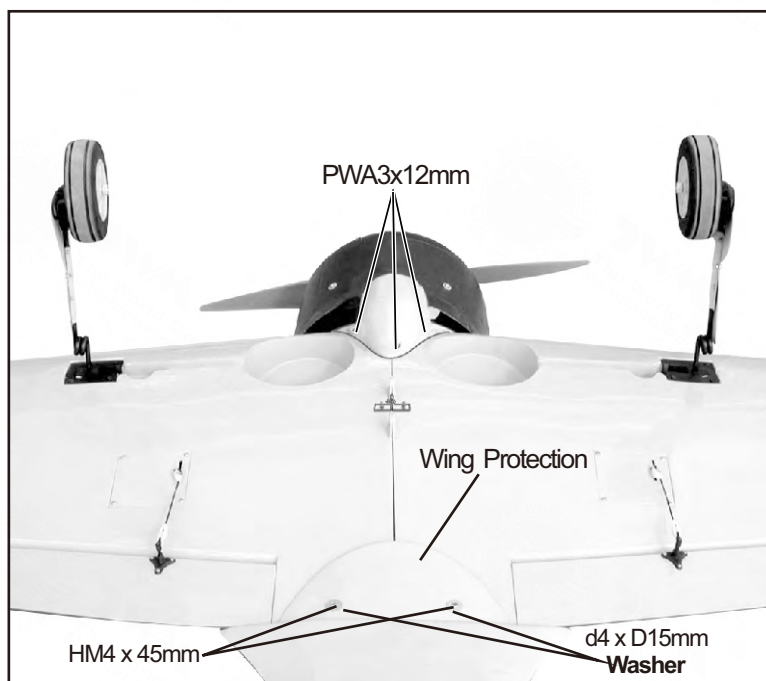
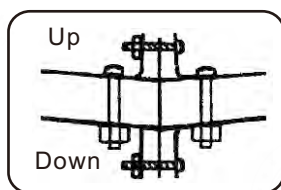
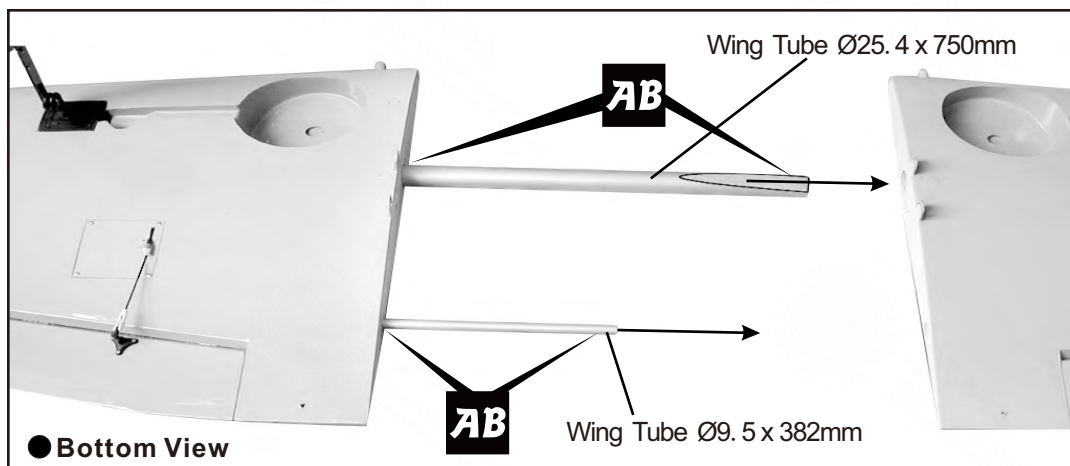
**N.I.** Fuel Filler  
PL8110030



**L/R**

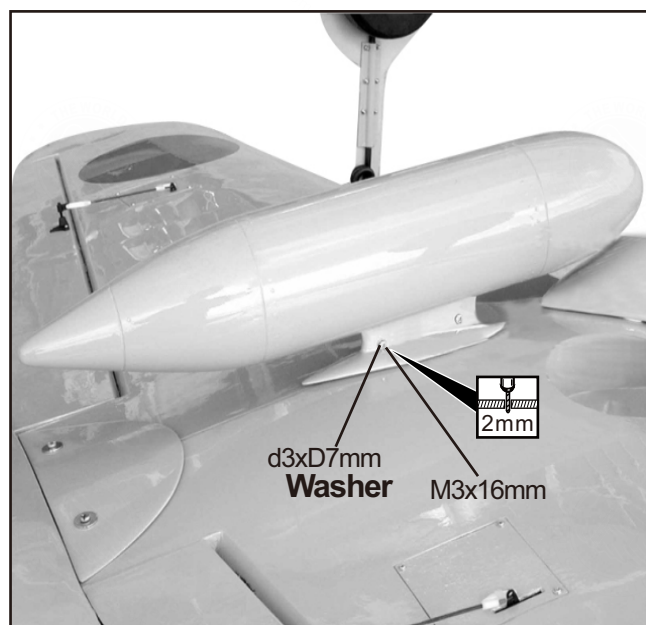
# 16 Main Wing

PM3x70mm	<b>Screw</b>
	2
d3 x D7mm	<b>Washer</b>
	8
d4 x D15mm	<b>Washer</b>
	2
HM4x45mm	<b>Screw</b>
	2
M3x18mm SOCKET HEAD SCREW	
	2
M3 Nylon Insert Lock Nut	
	2
M3 Nut	
	2
PWA3x12mm	<b>Screw</b>
	3

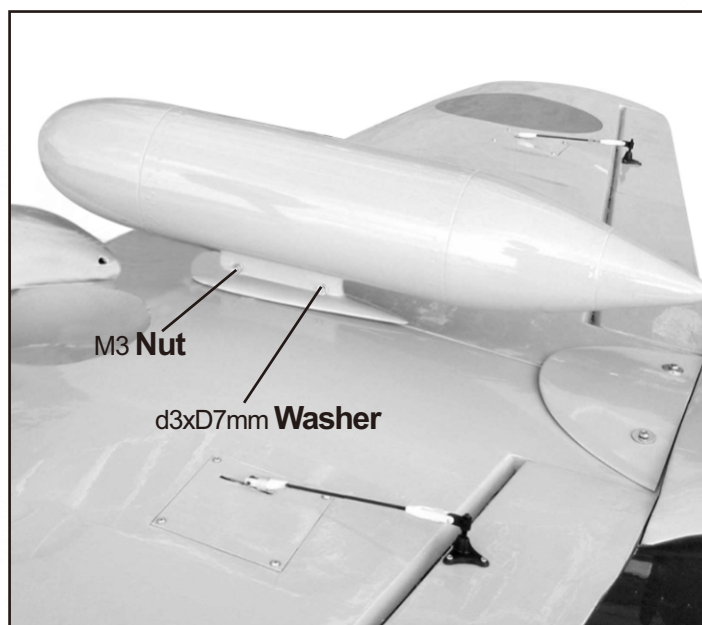


●Bottom View

## ● Installation of the optional drop tank.



●Bottom View





●Bottom View

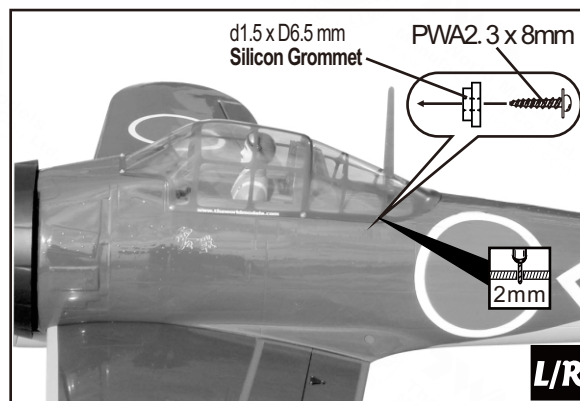
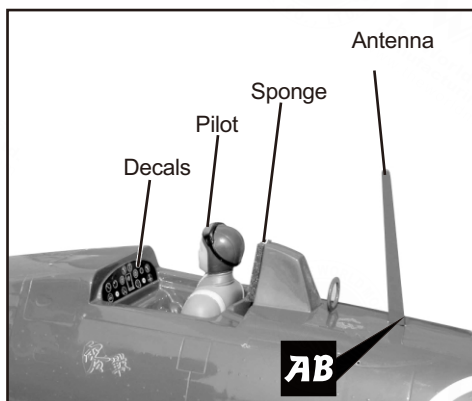
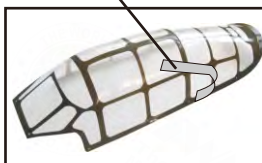


## 17 Canopy

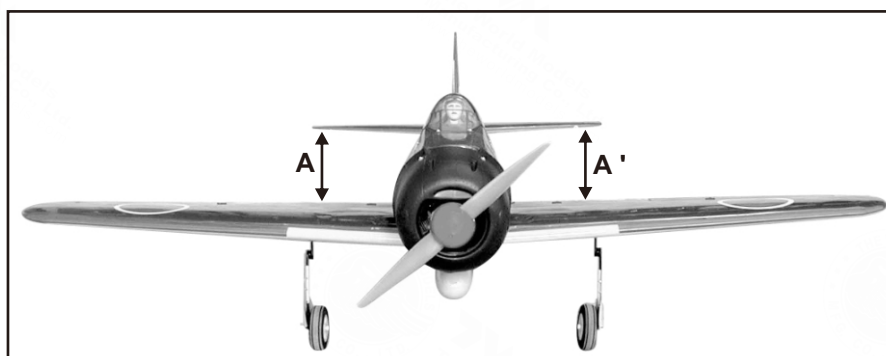
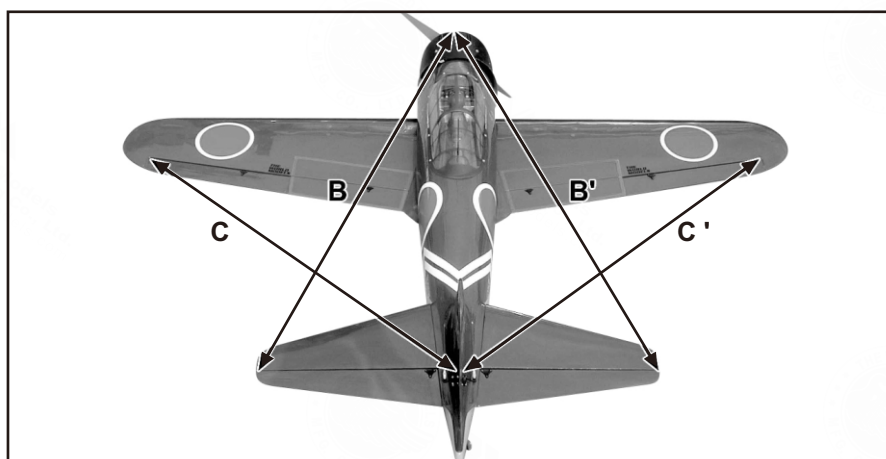
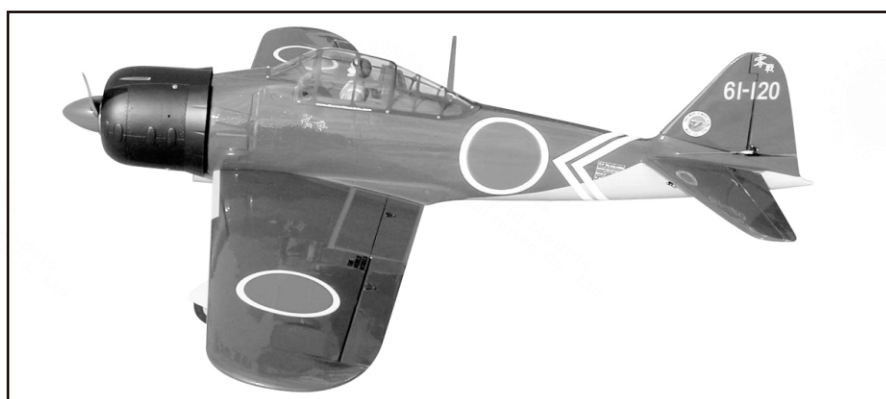
- First insert the grommet the cowling then apply screw.

PWA2. 3x8mm **Screw**  
 8  
 d1.5xD6.5 mm **Silicon Grommet**  
 8

Apply double-sided tape



## 18 Wing Setting



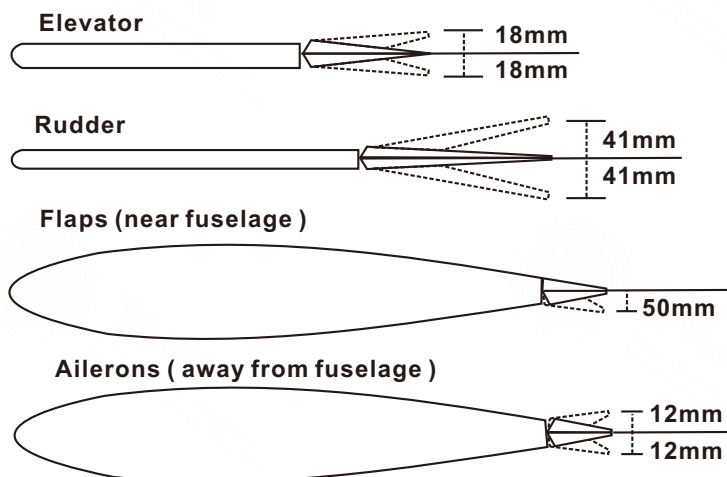
$A = A'$   
 $B = B'$   
 $C = C'$

- Adjust the wing and fuselage configuration as shown in the diagrams.



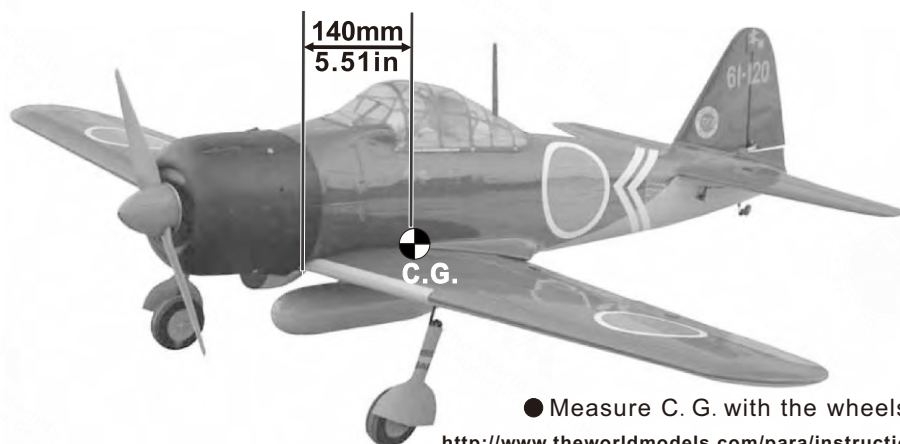
## 19 Control Throws

- Adjust the control throws as shown in the diagram. These throws are good for general flying. You can adjust according to your personal preference.



## 20 C.G.

The ideal C.G. position is 140mm (5.51 in) behind the leading edge measured at where the wing meets the fuselage. In order to obtain the C.G. specified, add weight to the fuselage or move the battery position. Check the C.G. before flying. If you are converting this model to electric, please move the C.G. forward 10% of current C.G. distance from leading edge to compensate for weight of fuel.



- Measure C. G. with the wheels in retracted position

<http://www.theworldmodels.com/para/instruction/instructionManuals.php>

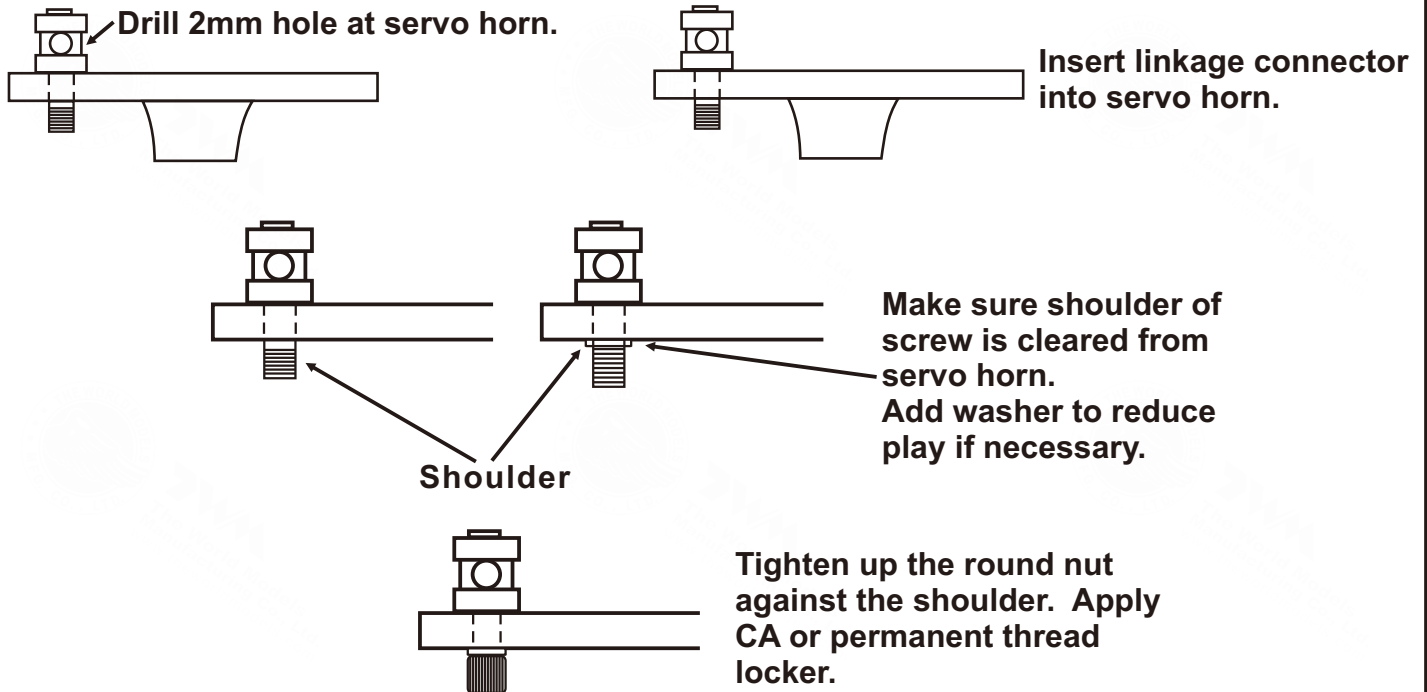
## ! Warning!

### Important Safety Precautions

- # First time flyer should never fly by himself / herself. Assistance from experienced flyer is absolutely necessary.
- # Pre - flight adjustment must be done before flying, it is very dangerous to fly a badly pre - adjusted aircraft.
- # **ZERO 6.5**-160 is specially designed to be powered by 1.60 2 stroke glow engine, using a more powerful engine does not mean better performance. In fact, over powered engine may cause severe damage and injuries.
- # Make sure the air field is spacious, never fly the plane too close to people and never get too close to a running propeller.
- # If you find wrinkles on the covering as a result of weather changes, you can use hot iron to remove the wrinkles. Please begin with lower temperature setting and gradually raise the temperature until the wrinkles are gone. Too hot an iron may damage the covering.
- # Check and re-tighten up all factory assembled screws, use thread locker if applicable.

# ADDENDUM

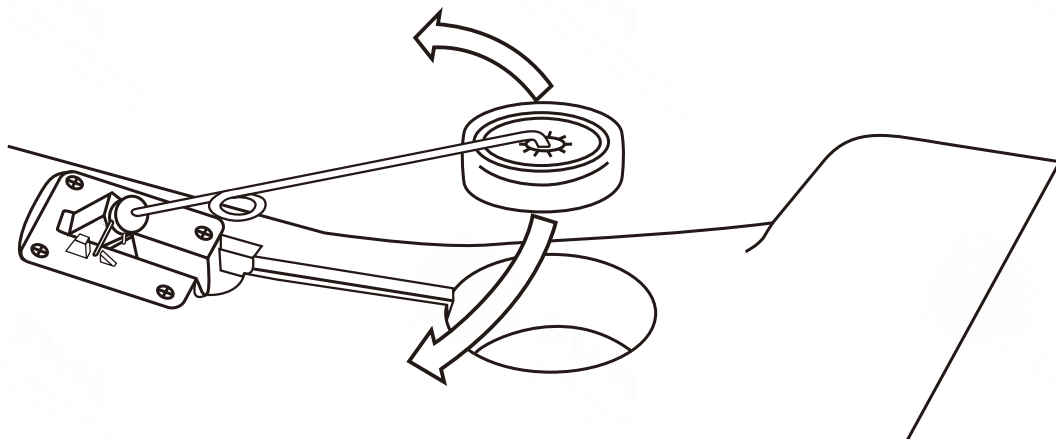
## LINKAGE CONNECTOR HW7111050 & HW7111060



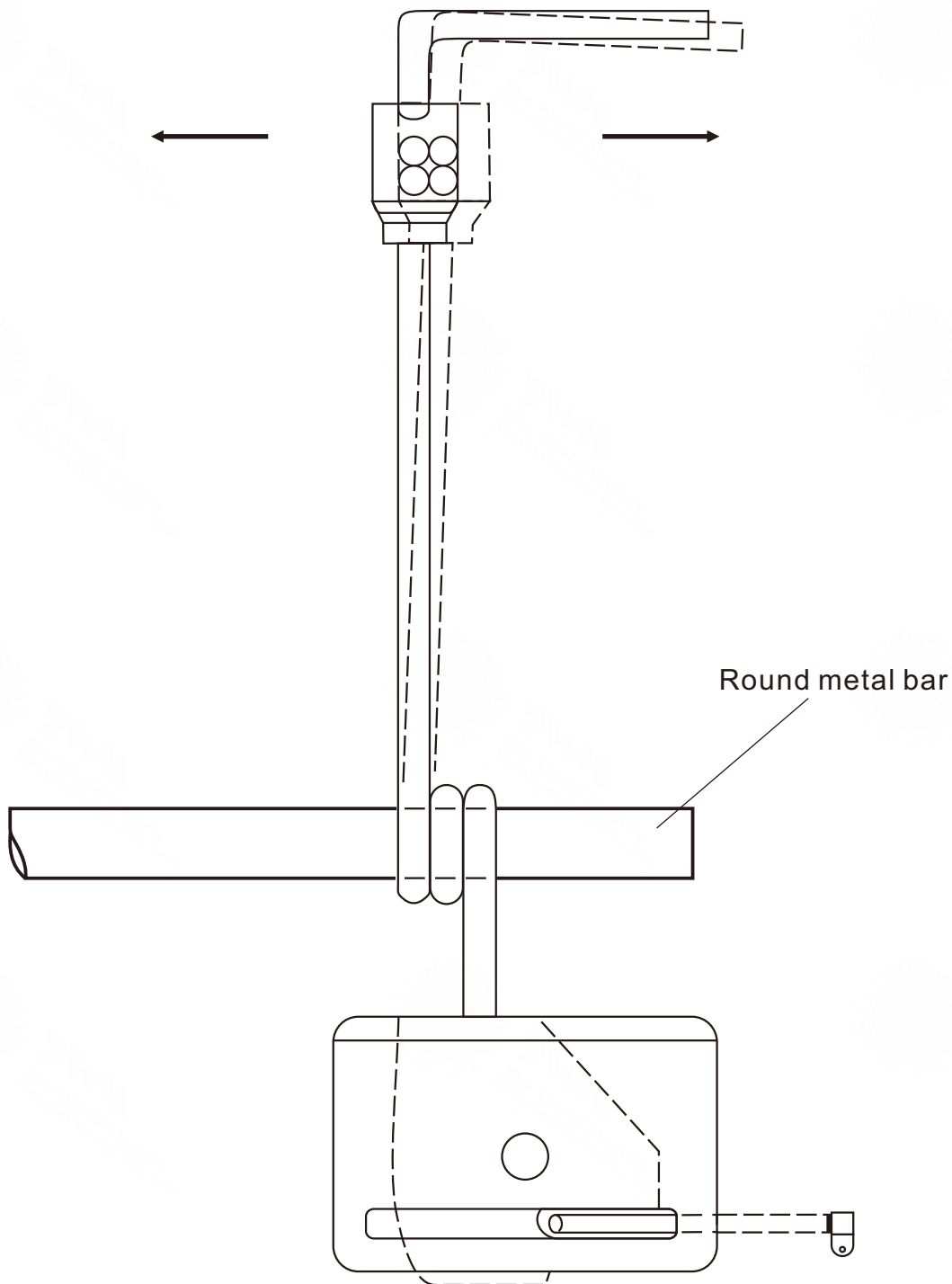
**After fastening the round nut, make sure that the linkage connector can rotate freely.**

### **Landing Gear**

Should you need to bend the landing gear wire, use the radio control to open or close the gear to 25% from fully retracted position and switch off the receiver. It is safe to bend the wire in this position. Bending the wire in fully open position may damage the supporting structure.



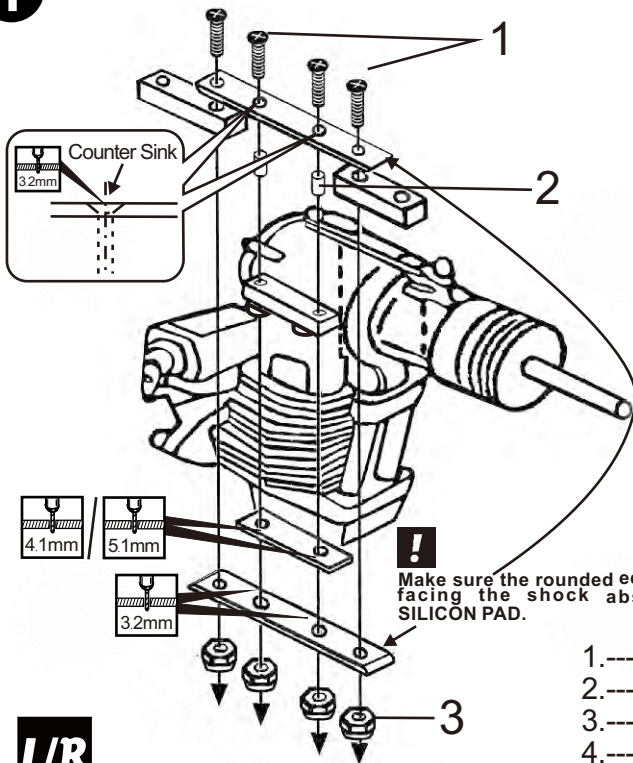
**Should you require to bend the landing gear wire, please insert a round metal bar into the spring coil and apply force there as leverage. Bending the wire directly may damage the mounting block structure.**



# ANTI-VIBRATION MOUNT INSTALLATION

For Engine Mount (PL5911120)

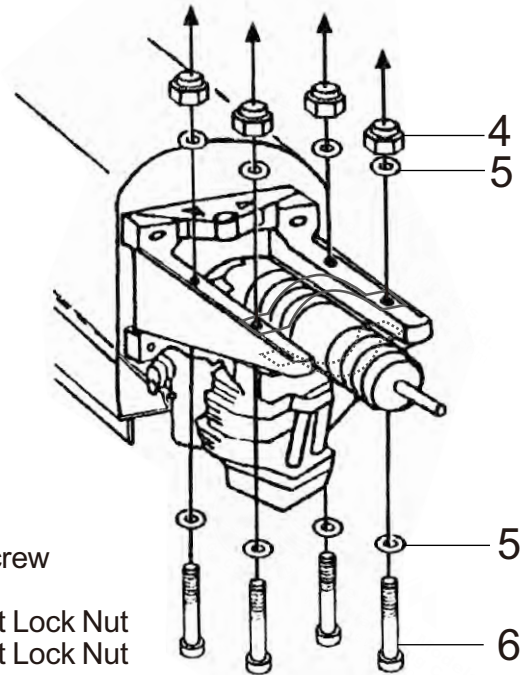
1



L/R

- 1.---- KM3x20mm Screw
- 2.---- Copper Tube
- 3.---- M3 Nylon Insert Lock Nut
- 4.---- M4 Nylon Insert Lock Nut
- 5.---- 4mm Washer
- 6.---- M4x35mm Screw

2





# Optional Parts

## ( ACCESSORIES)

### 180mm Extension

Code No.	Size	Package
----------	------	---------

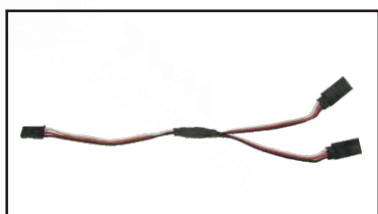
KW0011800 180mm 1 set



### 180mm Y-Cord

Code No.	Size	Package
----------	------	---------

KW0021800 180mm 1 pc



### Charge Receptacles

Code No.	Size	Package
----------	------	---------

KP0041300



### Field Stand

Code No.	Size	Package
----------	------	---------

MS9111430 600 x 240 x 310mm 1 pc



### Fuel Filler

Code No.	Size	Package
----------	------	---------

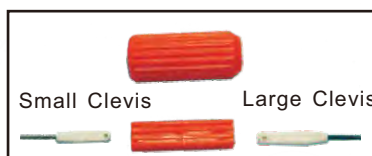
PL8110030 15 x 22 x 49mm 1 x 1 pc



### Clevis Wrench

Code No.	Size	Package
----------	------	---------

PL8210010 1 set



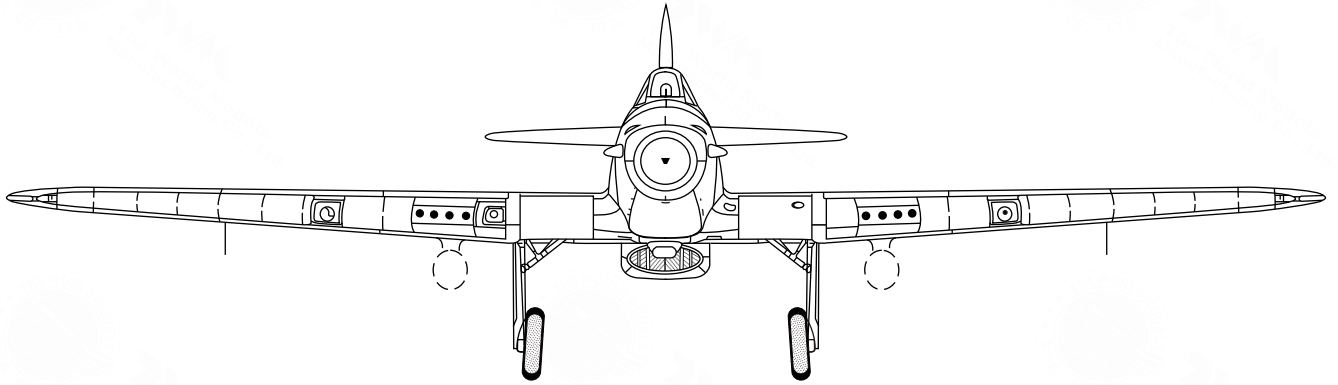
Special tool for clevis installation.  
Suitable for standard and small (EP) clevis.

### Standard Servo

Code No
---------



Speed : 0.17 sec / 60° @4.8V  
0.14 sec / 60° @6.0V  
Torque : 3.2kg.cm / 44.8 oz - in @4.8V  
4.1kg.cm / 57.4 oz - in @6.0V  
Size : 40.6 x 20 x 37mm /  
1.60 x 0.79 x 1.46 in  
Weight : 39.4 g / 1.39 oz



**Ducted Fan**

**Pattern**

**Warbirds**

**Funfly**

**Scale**

**Electric**

**Sports**

**Glider**

**Trainer**

**Boat**

**Accessories**

**Covering**

(Lightex / Toughlon)



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