INSTRUCTION MANUAL

SPITFIRE G.S.

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 in / 2030 mm
Wing Area	1138 sq in / 73.4 sq dm
Flying Weight	13 lb / 5850 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.

The World Models Manufacturing Co., LTD.
www.theworldmodels.com

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

A154PO29381404

SPITFIRE G.S.

INDEX

BEFORE YOU BEGIN

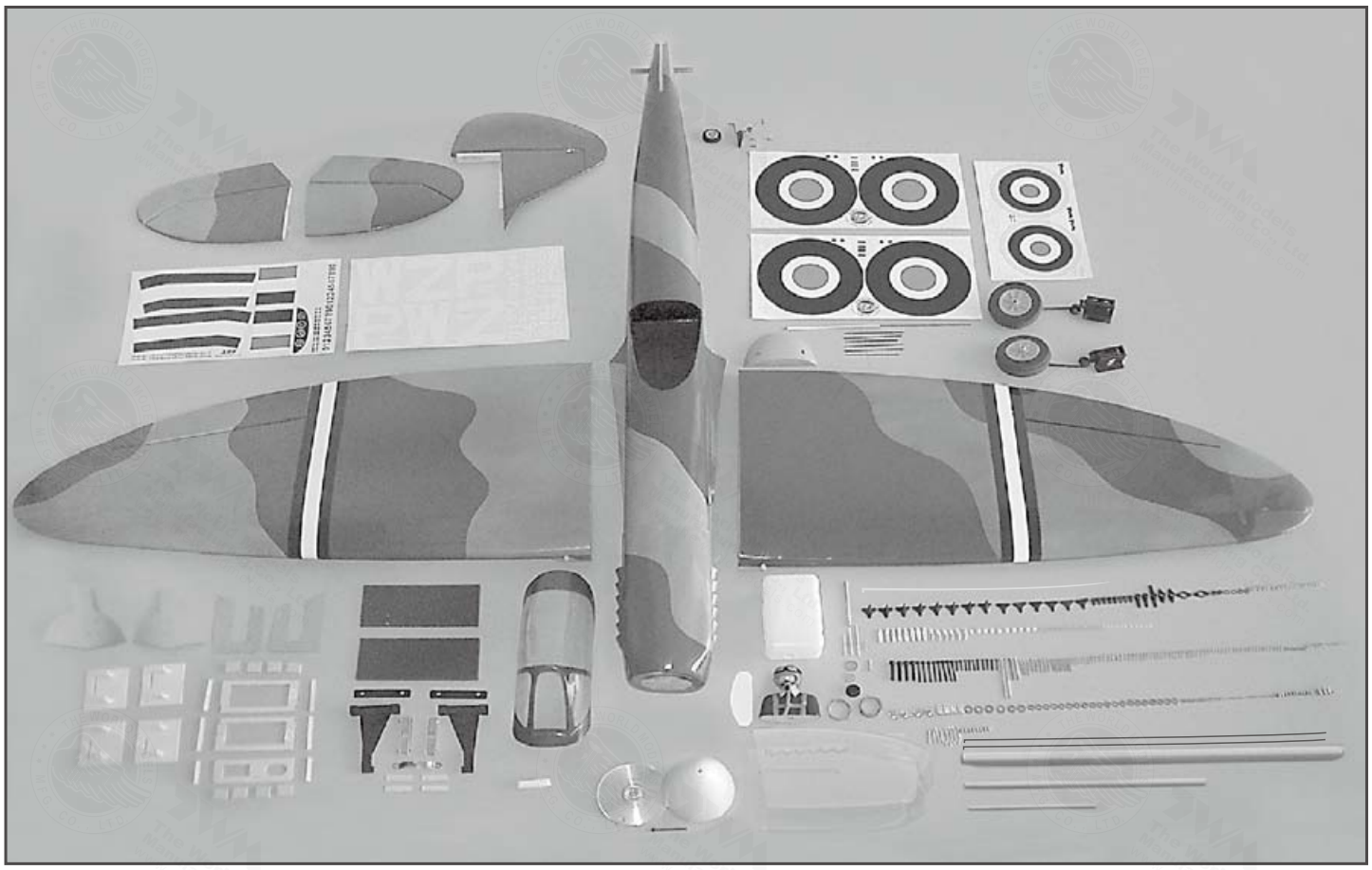
1. Read through the manual before you begin, so you will have an overall idea of what to do.

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.

3. Symbols used throughout this instruction manual comprise of the following : -

AB	Apply epoxy glue.	C.A	Apply instant glue (C.A.glue, super glue.)
	Apply thread locker	N.I.	Must be purchased separately!
L/R	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!

A154PO29381404



Parts List

1.MAIN WING -- 1 pair

2.RETRACTABLE LANDING GEAR -- 1 set
- RETRACTABLE LANDING GEAR COVER -- 1 set
- PUSHROD Ø1.8x45mm(For Retractable) -- 2 pcs
- MAIN WHEEL Ø103mm -- 2 pcs
- COLLAR Ø5.7mm w/set screw -- 2 sets
- SCREW PM2x8mm -- 8 pcs
- SCREW PWA2.3x8mm -- 8 pcs
- M2 NUT -- 8 pcs
- WASHER d2xD5mm -- 16 pcs
- COVERING FILM 45x75mm -- 2 pcs
- PLYWOOD 3x28x62mm -- 2 pcs

3.SCREW PB2x14mm -- 6 pcs
- SCREW PB2x25mm -- 6 pcs
- SCREW PWA2x8mm -- 16 pcs
- FUEL TUBE Ø6x5mm -- 8 pcs
- CLEVIS PL4112103 -- 4 pcs
- STRAPER PL4112102 -- 4 pcs
- TRI-HORN M3x14mm(L) PL4111185 -- 4 sets
- PUSHROD Ø1.8x105 w/Threads(For Aileron Servos) -- 2 pcs
- PUSHROD Ø1.8x110 w/Threads(For Flap Servos) -- 2 pcs
- SERVO MOUNTING PANEL 2x68x78mm -- 2 pairs

4.STABILIZER & ELEVATOR -- 1 set
- FUSELAGE -- 1 pc.
- SCREW PA3x12mm -- 2 pcs
- WASHER d3xD7mm -- 2 pcs
- STABILIZER TUBE Ø9.5x257mm -- 1 pc.

5.VERTICAL FIN & RUDDER -- 1 set

6.TAIL LANDING GEAR PL7100002 -- 1 set
- TAIL WHEEL Ø30mm -- 1 pc.
- COLLAR D2.6mm w/set screw -- 1 set
- SCREW PA3x12mm -- 2 pcs

7.SCREW PB2x25mm -- 6 pcs
- FUEL TUBE Ø6x5mm -- 2 pcs
- CLEVIS PL4112103 -- 2 pcs
- TRI-HORN M3x14mm(L) PL4111185 -- 2 sets
- PUSHROD Ø1.8x778mm w/Threads(For Elevator) -- 2 pcs

8.SCREW PM2x30mm -- 3 pcs
- M2 NUT -- 3 pcs
- FUEL TUBE Ø6x5mm -- 2 pcs
- CLEVIS -- 2 pcs
- RIGGING COUPLER Ø1.8x2.7mm w/Threads(For Rudder) -- 2 pcs
- WIRE Ø1x1040mm(For Rudder) -- 2 pcs
- TRI-HORN M3x14mm(L)(w/o-Base For Rudder) -- 2 sets
- COPPER TUBE d2.5xD3.2x8mm(For Rudder) -- 2 pcs

9.ENGINE MOUNT PL511120 -- 1 set
- SOCKET HEAD SCREW M6x30mm -- 4 pcs
- WASHER d6xD15mm -- 4 pcs
- BLIND NUT M6xD18mm -- 4 pcs

10.FUEL TANK 800cc PL1111810G -- 1 set
- CABLE TIE 1.5x8x500mm -- 1 pc.
- DOUBLE-SIDE TAPE 40x160mm -- 1 pc.
- PLYWOOD 3x42x125mm(For Fixing Fuel Tank) -- 1 pc.
- BALSA 8x8x42mm(For Throttle Servo Stand) -- 2 pcs

11.THROTTLE PUSHWIRE Ø1.2x350mm -- 1 pc.
w/Plastic Tube d2xD3x170mm -- 1 pc.
- ANTI-VIBRATION MOUNT 4C-120 PL5214092 -- 1 set
- INCLUDE:SOCKET HEAD SCREW M4x35mm -- 4 pcs
  - SCREW KM3x20mm -- 8 pcs
  - WASHER d4xD12mm -- 8 pcs
  - NYLON INSERT LOCK NUT M3 -- 8 pcs
  - NYLON INSERT LOCK NUT M4 -- 4 pcs
- ENGINE MOUNT SUPPORT 1x10x77mm -- 1 pc.

12.LINKAGE CONNECTOR Ø2.1mm -- 3 sets

13.PLYWOOD 6x62x125mm(For Elevator Servo) -- 1 pc.
- PLYWOOD 6x62x125mm(For Rudder Servo) -- 1 pc.
- PLYWOOD 3x12x119mm(For Plastic Tube) -- 1 pc.
- BALSA 8x8x62mm(For Elevator & Rudder Servos Stand) -- 4 pcs
- SPONGE 60x70x125(For Radio Equipment) -- 1 pc.
- FUEL TUBE Ø6x5mm -- 1 pc.
- STRAPER PL4112102 -- 1 pc.
- PUSHROD Ø1.8x70mm(For Elevator) -- 1 pc.
- RIGGING Z BEND Ø1.8x27mm(For Rudder) -- 2 pcs
- COPPER TUBE Ø2.5xD3.2x8mm -- 2 pcs
- Y-CONNECTOR PL4410010 -- 1 set

14.COWLING -- 1 pc.
- TRANSPARENT 3D TEMPLATE -- 1 pc.
- SCREW PWA2.6x12mm -- 4 pcs
- SILICON GROMMET d1.5xD6.5mm -- 4 pcs
- QUICK RELEASE NYLON RIVET PL1208042 -- 10 pcs
- SCREW KA2.3x8mm -- 10 pcs
- PLASTIC SPINNER(w/alu.back plate) Ø114mm -- 1 set

15.SCREW PM3x75mm -- 2 pcs
- WASHER d3xD7mm -- 8 pcs
- WASHER d4xD15mm -- 2 pcs
- SCREW HM4x40mm -- 2 pcs
- SOCKET HEAD SCREW M3x15mm -- 2 pcs
- NYLON INSERT LOCK NUT M3 -- 2 pcs
- M3 NUT -- 2 pcs
- WING TUBE Ø25.4x670mm -- 1 pc.
- WING TUBE Ø9.5x325mm -- 1 pc.
- WING PROTECTION -- 1 pc.
- ALUMINUM PLATE 2mm(For Main Wing) -- 4 pcs

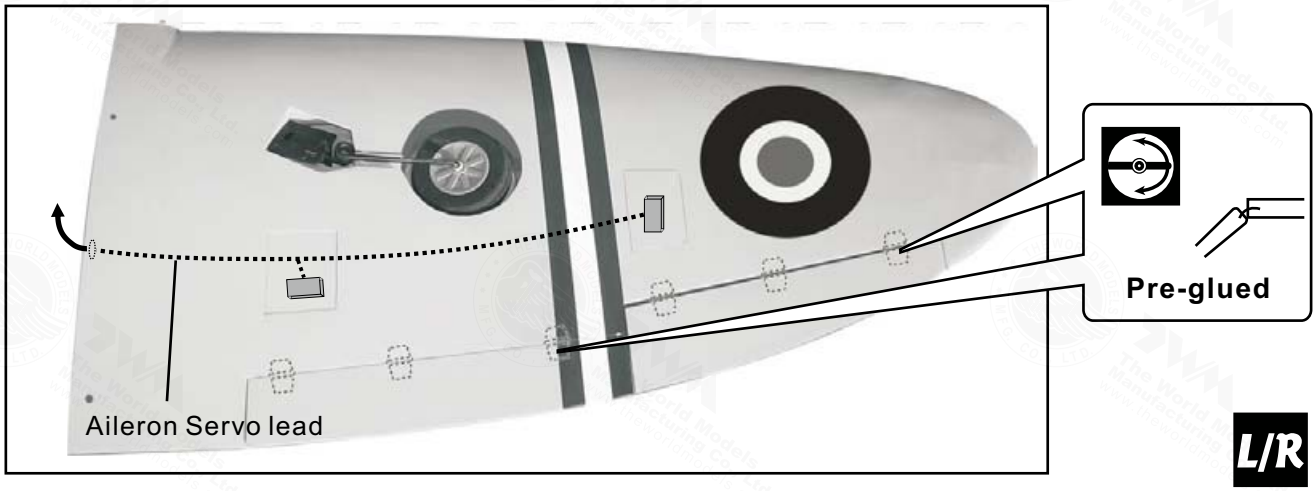
16.CANOPY -- 1 pc.
- DOUBLE SIDED TAPE 6x800mm -- 1 pc.
- SCREW PWA2.3x8mm -- 4 pcs
- SILICON GROMMET d1.5xD6.5mm -- 4 pcs
- PILOT PC001103B -- 1 set

17.DECALS : A154DEC -- 1 set

●**COVERING:--**

TOUGHLON STL 100 WHITE
TOUGHLON STL 203 LIGHT GRAY
TOUGHLON STL 351 DARK BLUE
TOUGHLON STL 340 OLIVE DRAB

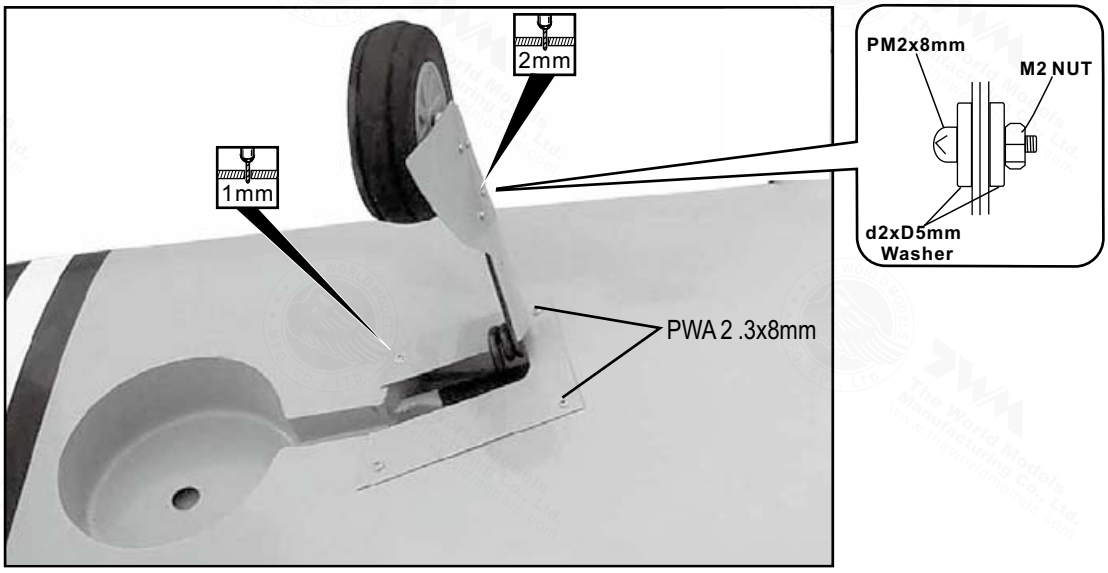
1 Flap & Aileron



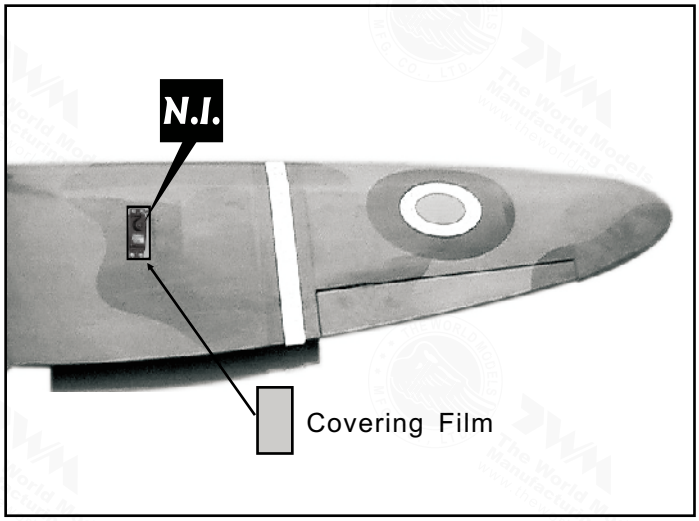
●Bottom View

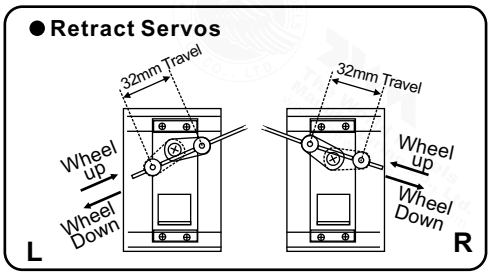
2 Landing gear & Retract Servos

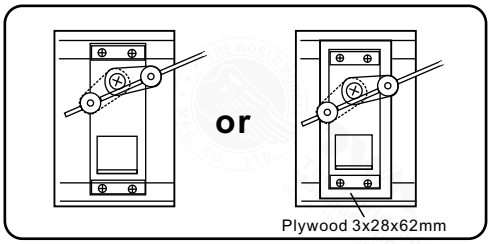
PM2x8mm **Screw** — 8
PWA 2.3x8mm **Screw** — 8
M2 **Nut** — 8
d2xD5 **Washer** — 16



●Bottom View





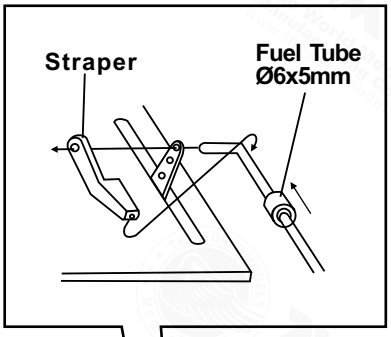


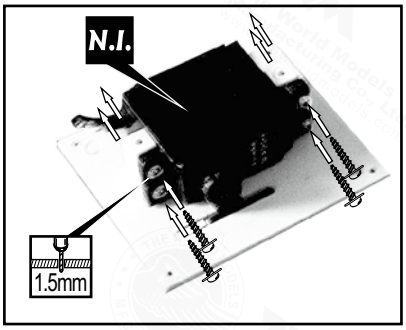
3 Flap & Aileron Servos

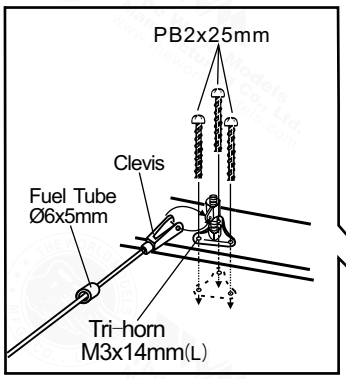
PB2x14mm **Screw** — 6

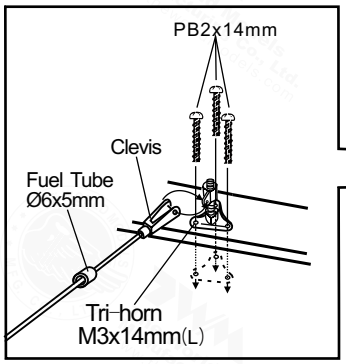
PB2x25mm **Screw** — 6

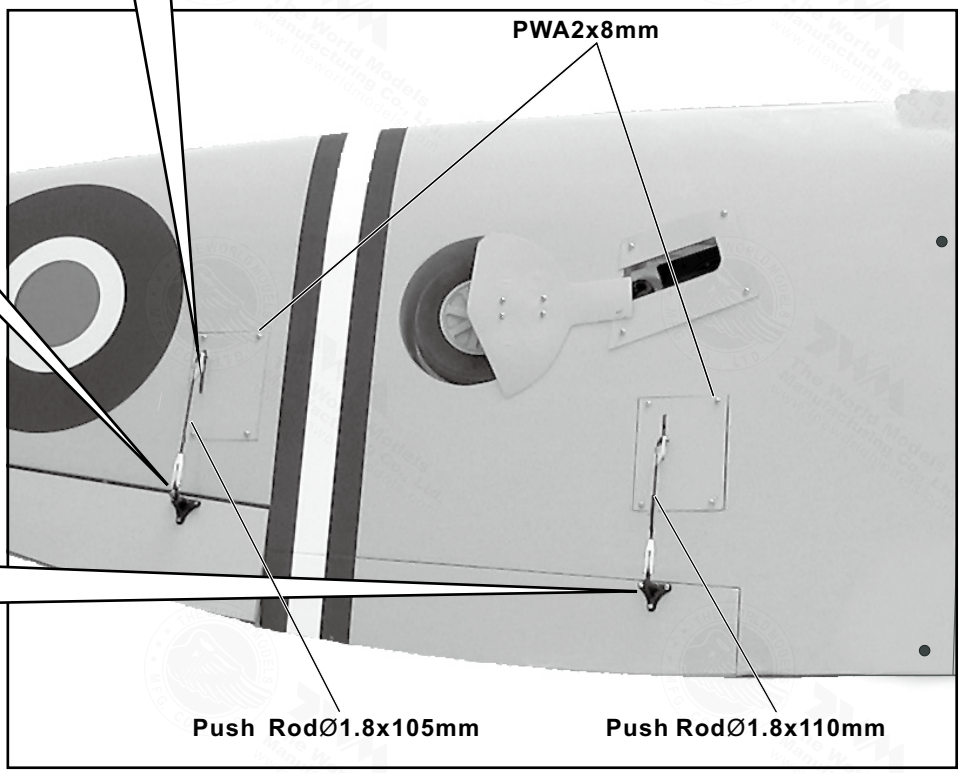
PWA 2x8 mm **Screw** — 16





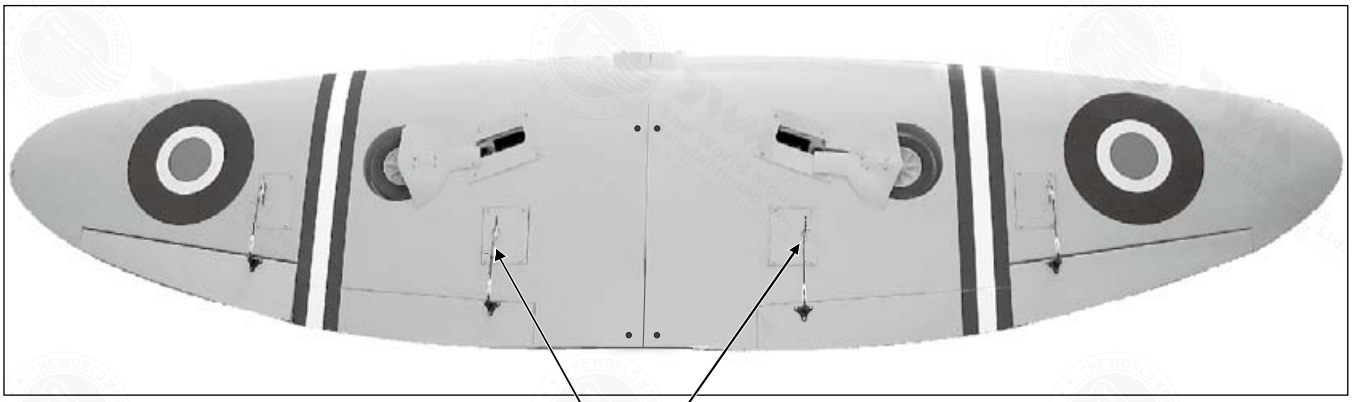






L/R

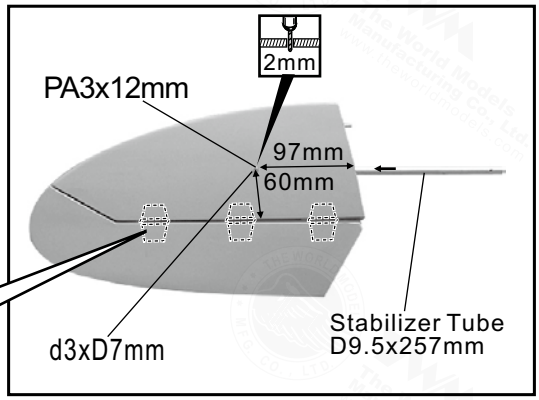
● ∅**1mm pilot holes for World Models tri-horn are pre-drilled. Please look for pin-hole marks at under side of control surfaces.**

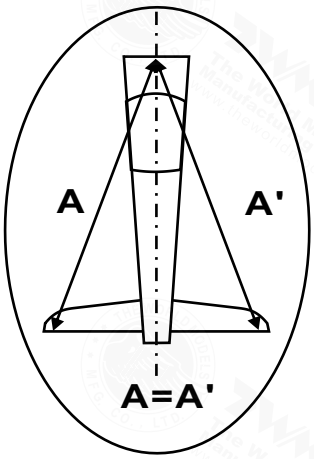


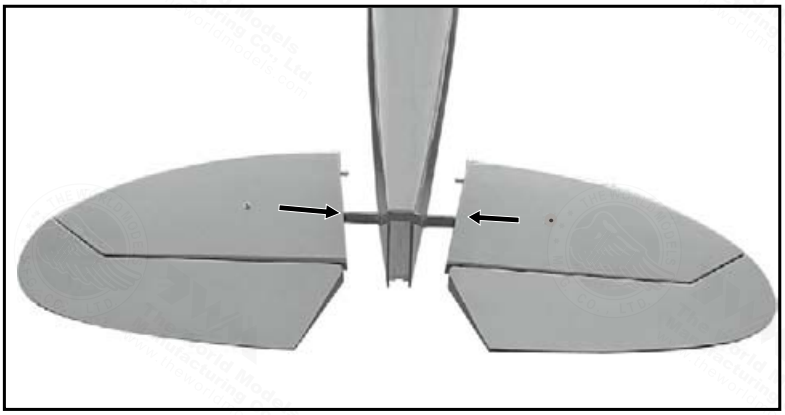
● **The existing slots are for 2 channels (mixing) operation of the flaps.**

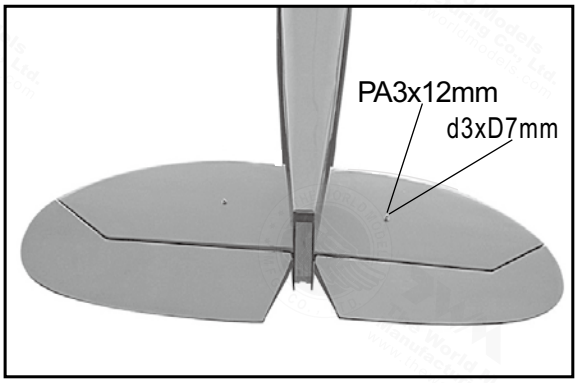
4 Stabilizer & Elevator

PA3x12mm **Screw** — 2
d3xD7mm **Washer** — 2



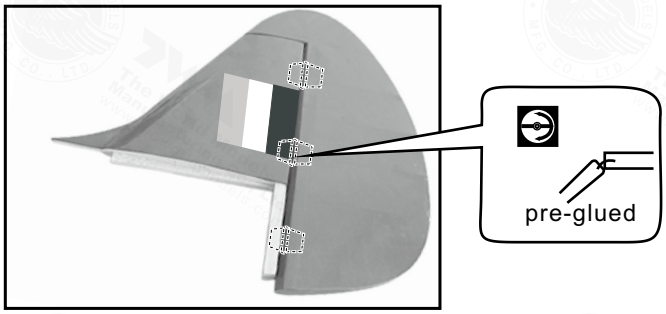


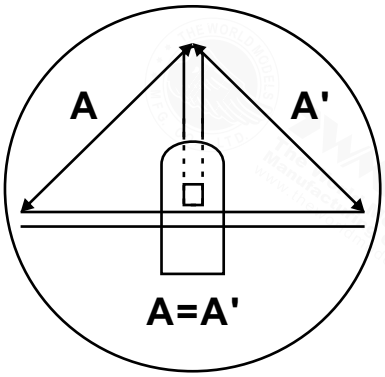


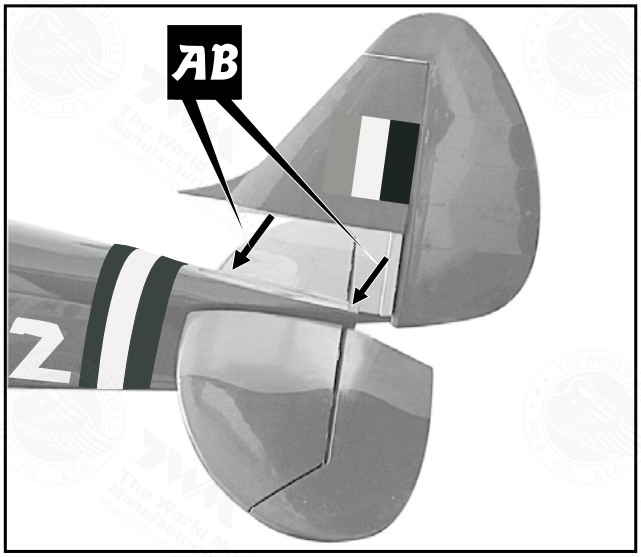


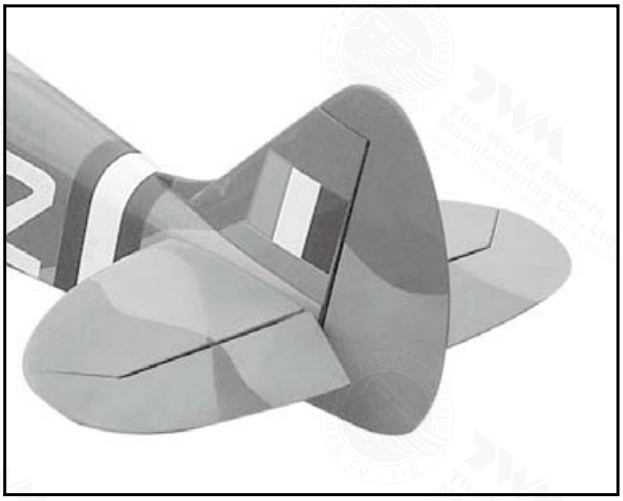
Completed

5 Vertical Fin & Rudder









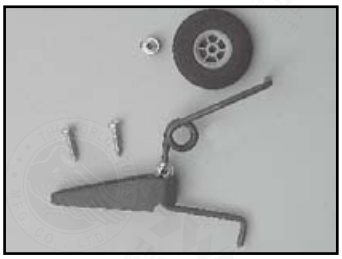
Completed

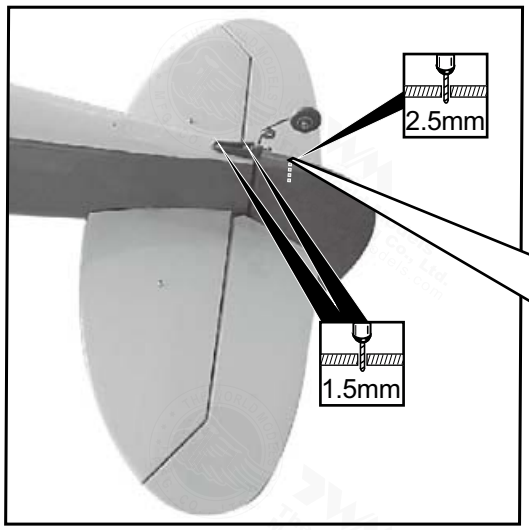
6 Tail Landing Gear

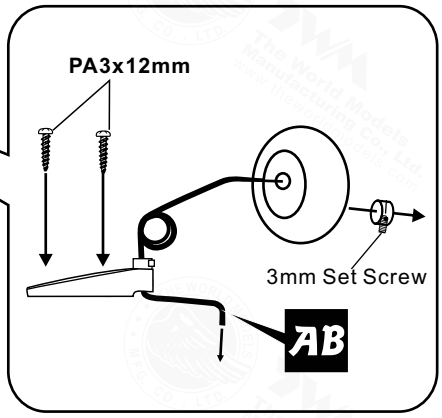
PA3x12mm **Screw** — 2

3mm **Set Screw** — 1

2.6mm **Collar** — 1



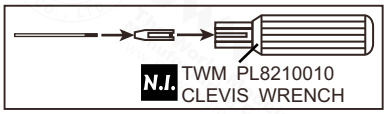




7 Elevator Pushrod

PB 2x25 mm **Screw** — 6

3x3mm **Set Screw** — 1



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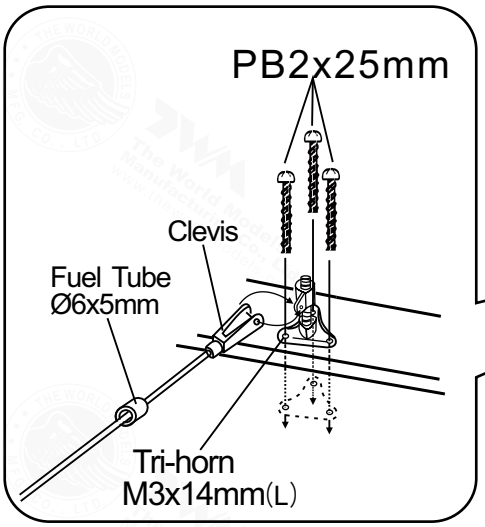
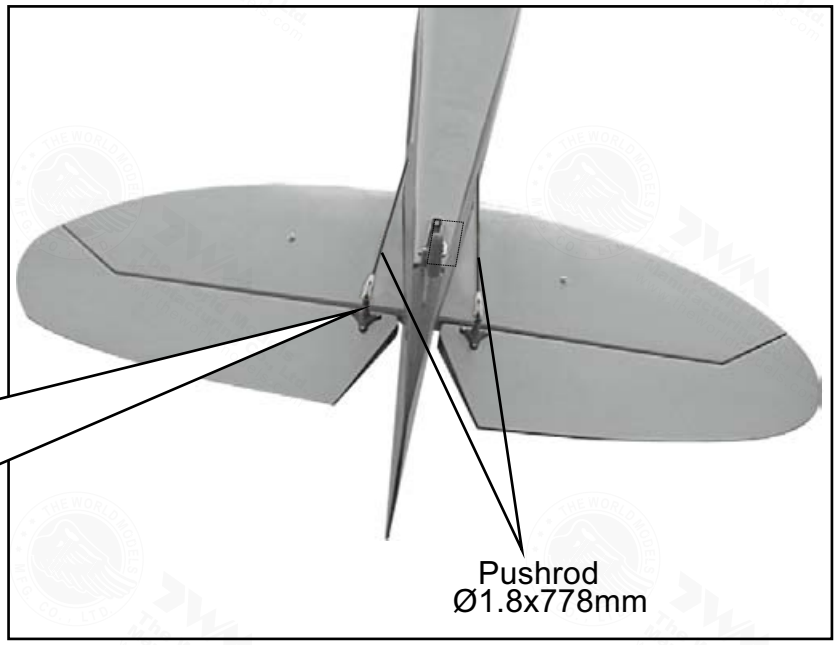
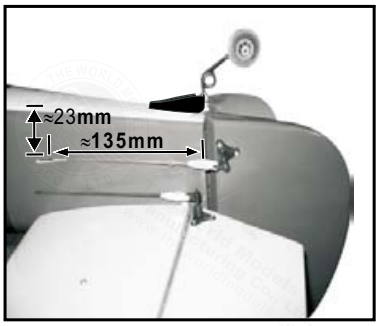


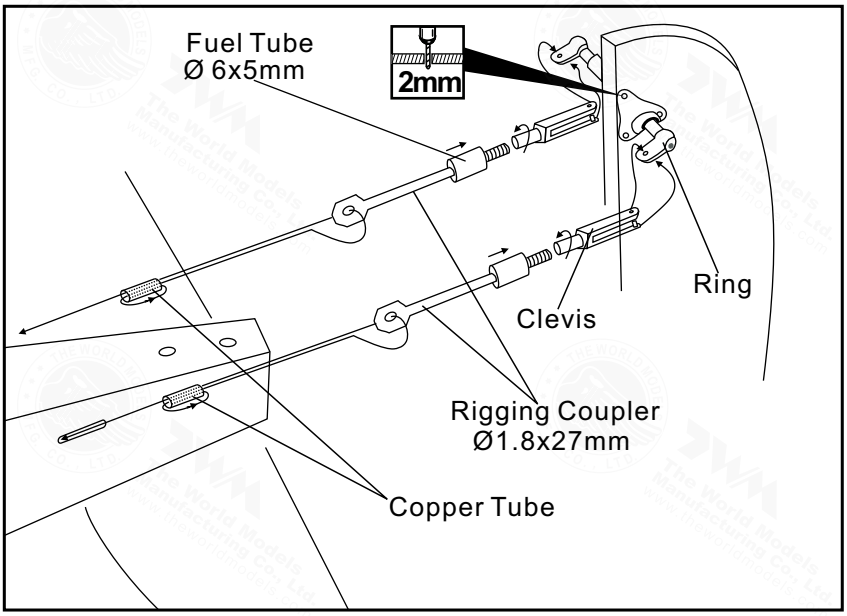


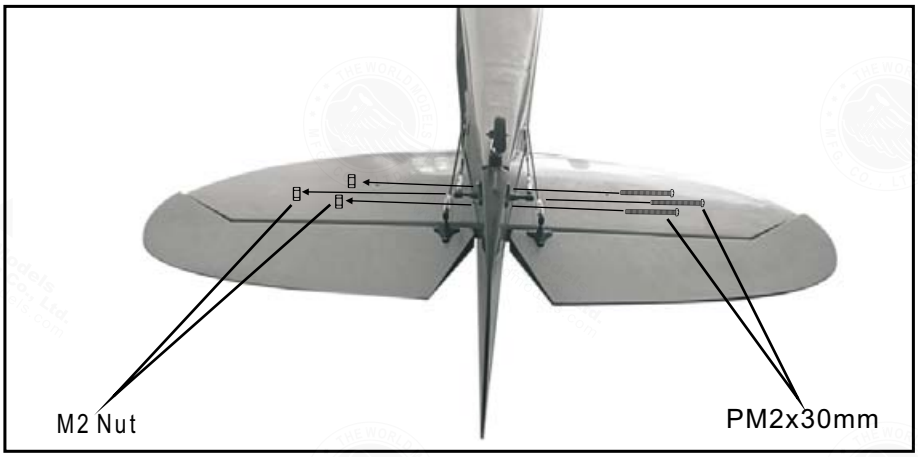
● **Ø1mm pilot holes for World Models tri-horn are pre-drilled. Please look for pin-hole marks at under side of control surfaces.**

8 Rudder Pullwire

PM 2x30mm **Screw** — 3
M2 **Nut** — 3



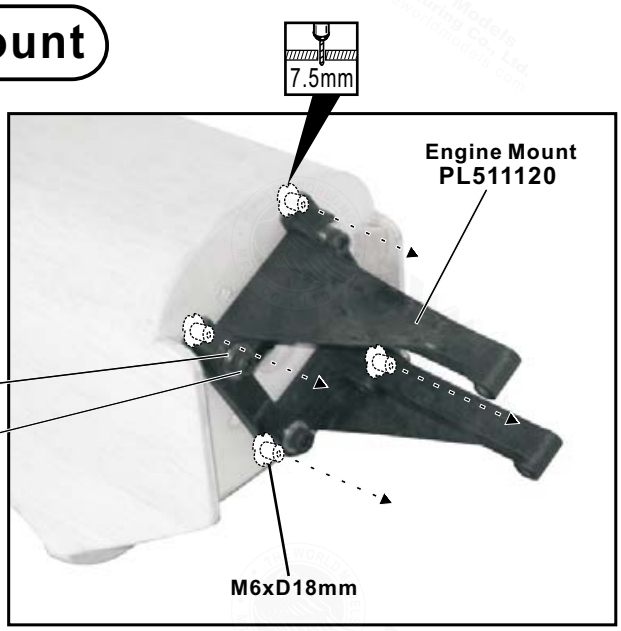




● **Ø1mm pilot holes for World Models tri-horn are pre-drilled. Please look for pin-hole marks at side of control surfaces.**

9 Engine Mount

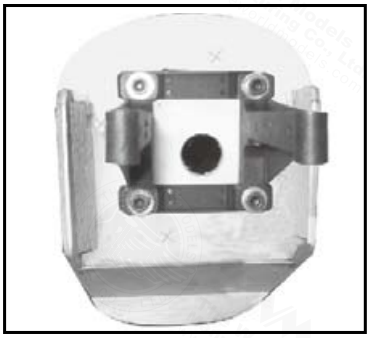
M6x30mm **Screw** — 4
d6xD15mm **Washer** — 4
M6xD18mm **Blind Nut** — 4



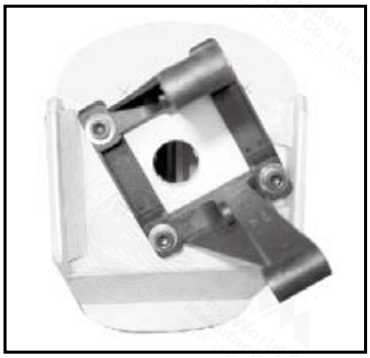
To seal off unused holes.

● **Apply thread locker to screws.**

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

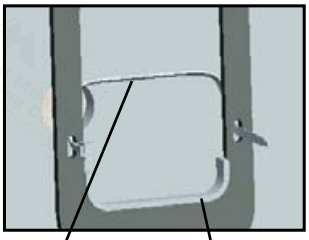


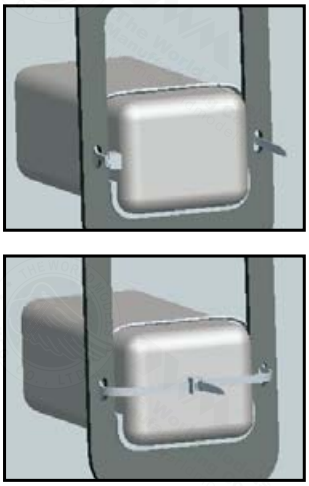
A: Inverted mount



B:Inclined mount

10 Fuel Tank





● Completed

11 Engine

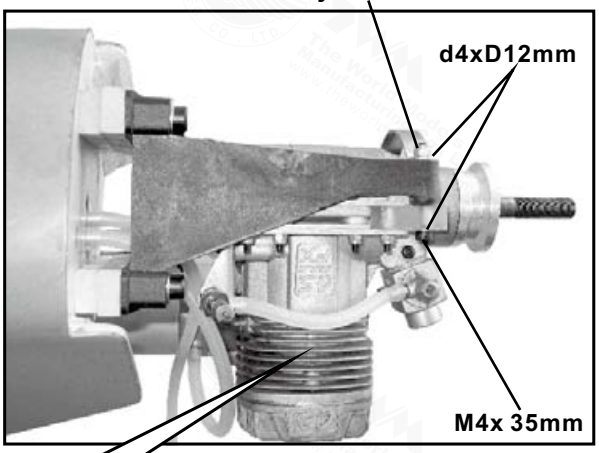
M4x35mm **Screw** — 4

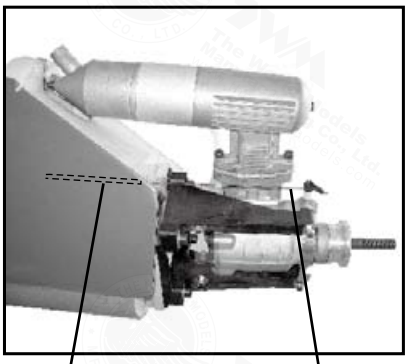
KM3x20mm **Washer** — 8

M4 **Nylon Insert Lock Nut** — 4

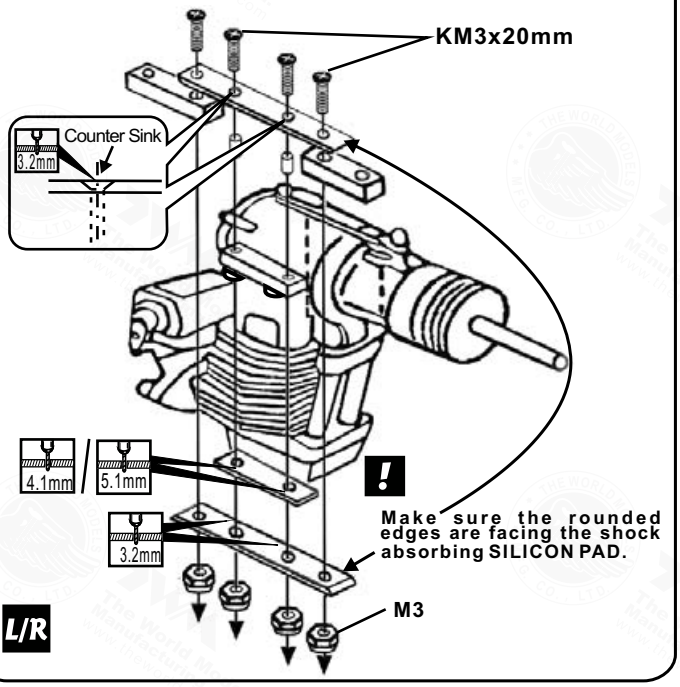
M3 **Nylon Insert Lock Nut** — 8

d4xD12mm **Washer** — 8

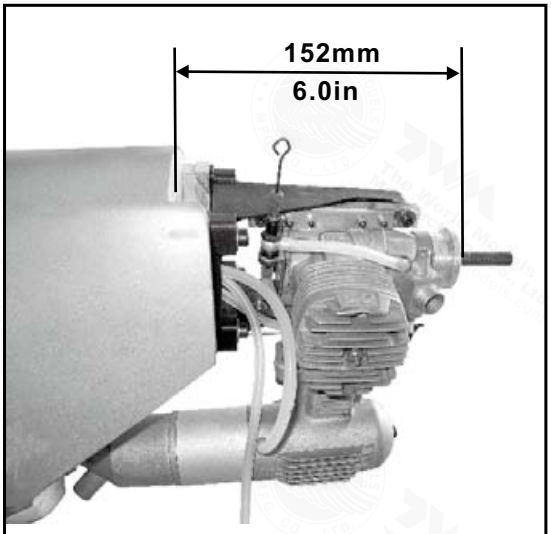




ANTI-VIBRATION MOUNT INSTALLATION



! **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.**

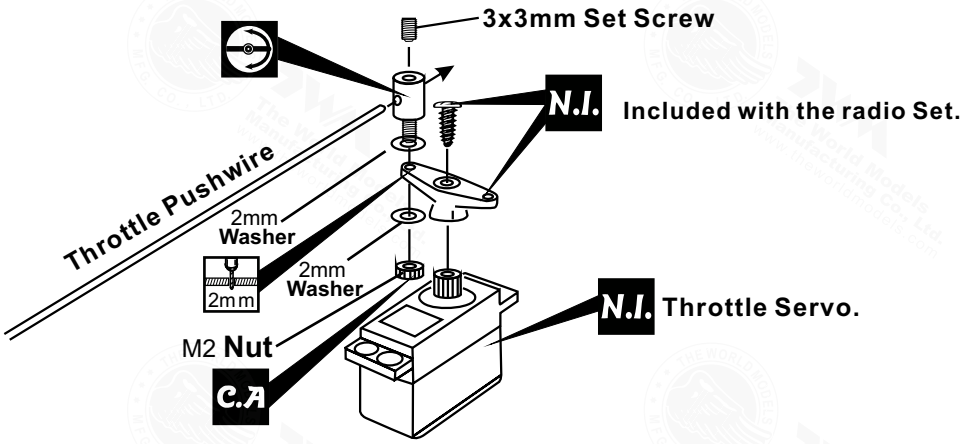


● Install Engine position

12 Servo Set

LINKAGE CONNECTOR

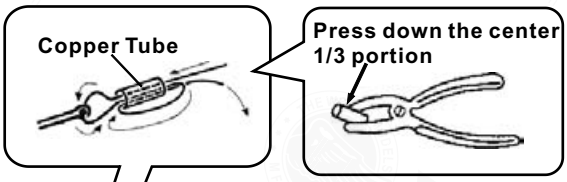
- 3x3mm **Set Screw** — 3
- **Linkage Connector** — 3
- M2 **Nut** — 3
- 2mm **Washer** — 3

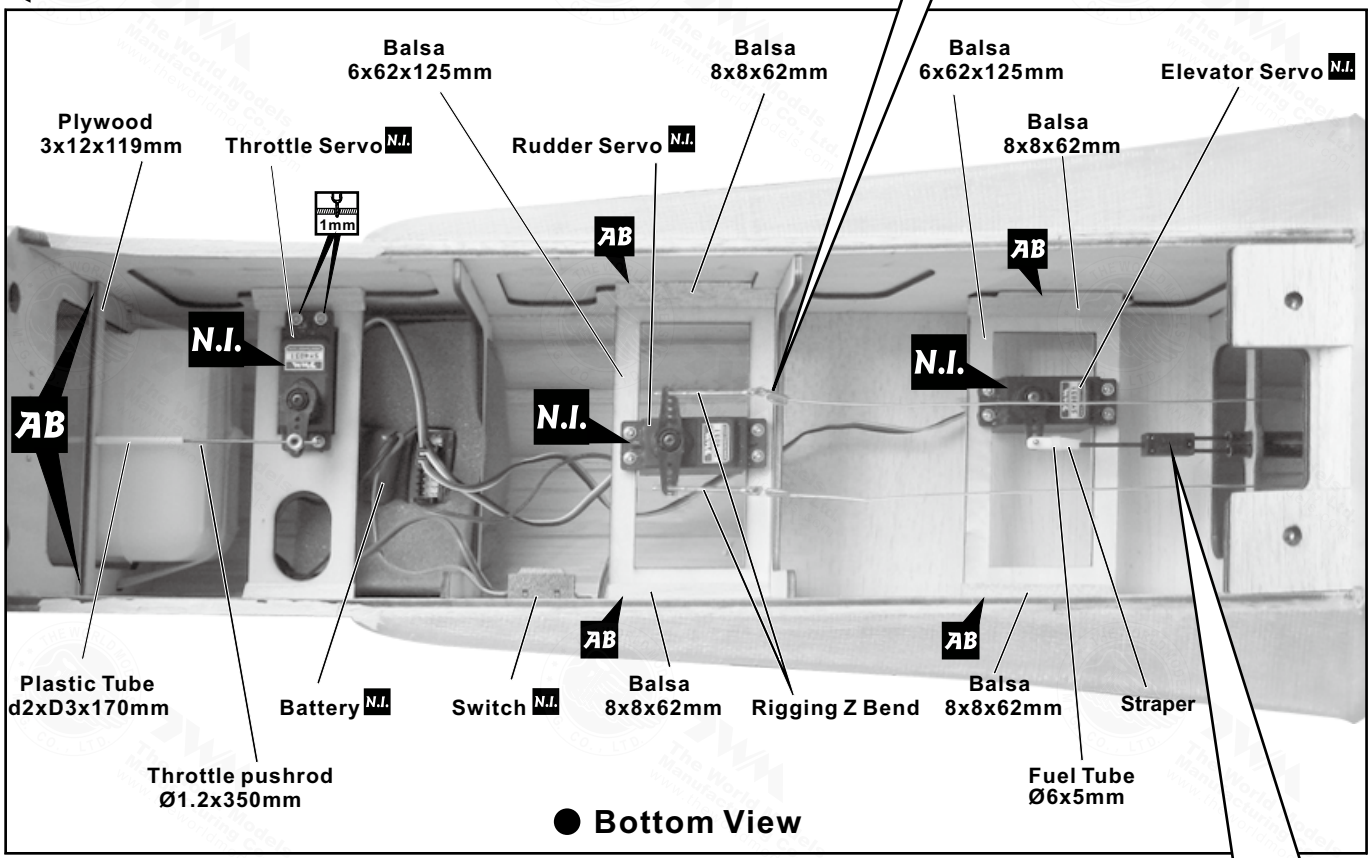


! Please refer to attached sheet for linkage connector installation.

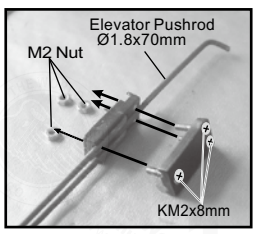
13 Servos

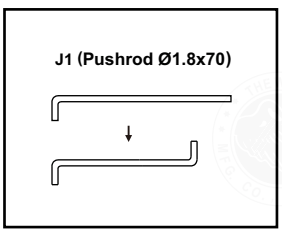
● Install and arrange the servo as shown in the diagram.

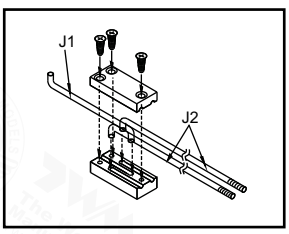


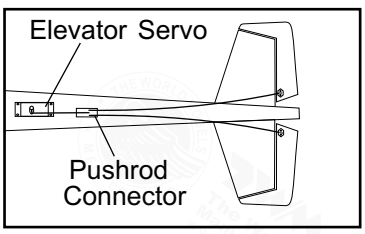


● Bottom View









14 Cowling

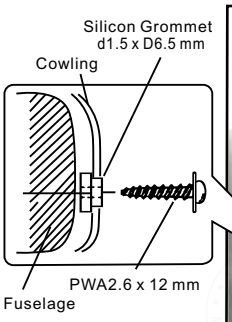
● First insert the grommet to the cowling then apply screw.

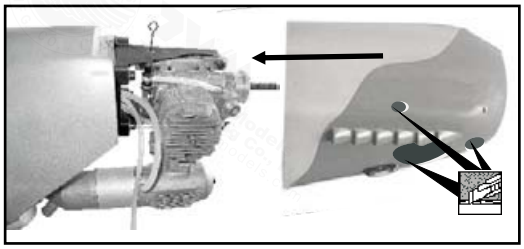
PWA2.6x12 mm **Screw** — 4

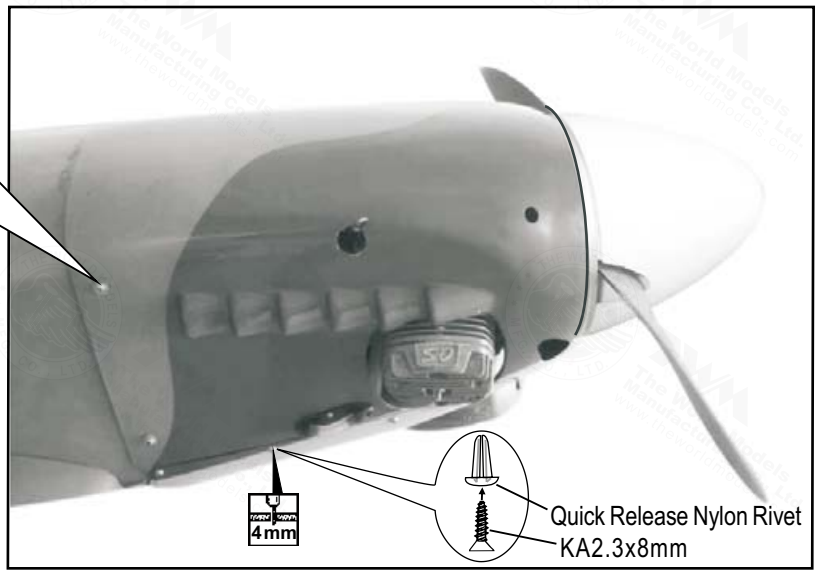
d1.5xD6.5 mm **Silicon Grommet** — 4

Quick Release Nylon Rivet — 10

KA2.3x8mm **Screw** — 10







15 Main Wing

PM3x75mm **Screw** — 2

d3xD7mm **Washer** — 8

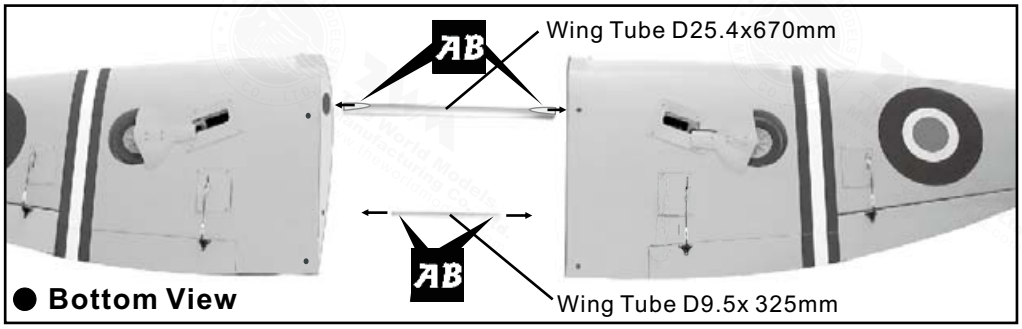
d4xD15mm **Washer** — 2

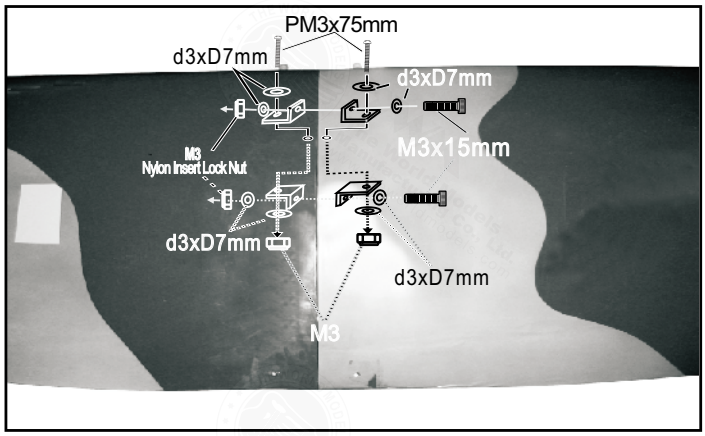
HM4x40mm **Screw** — 2

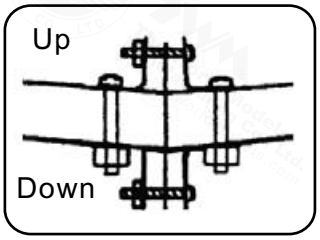
M3x15mm **Screw** — 2

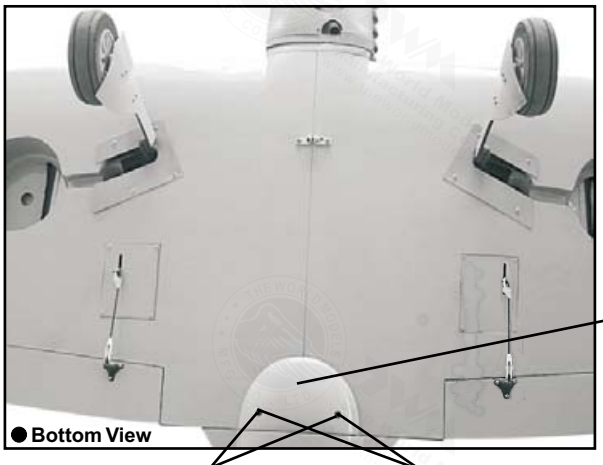
M3 **Nylon Insert Lock Nut** — 2

M3 **Nut** — 2





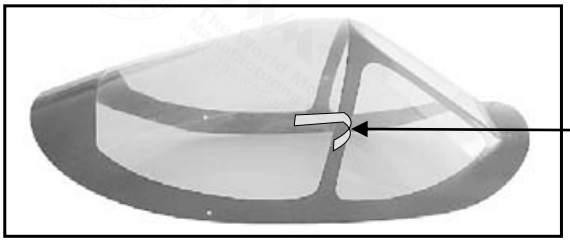


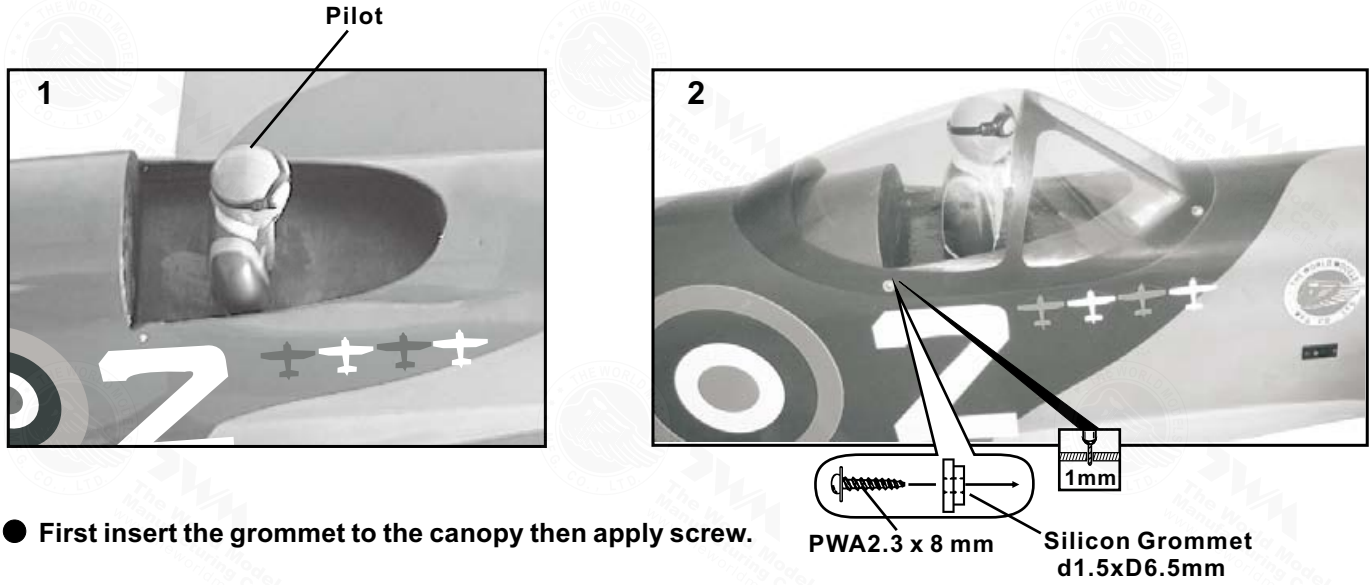


16 Canopy

PWA2.3x8 mm **Screw** — 4

d1.5 x D6.5 mm **Silicon Grommet** — 4

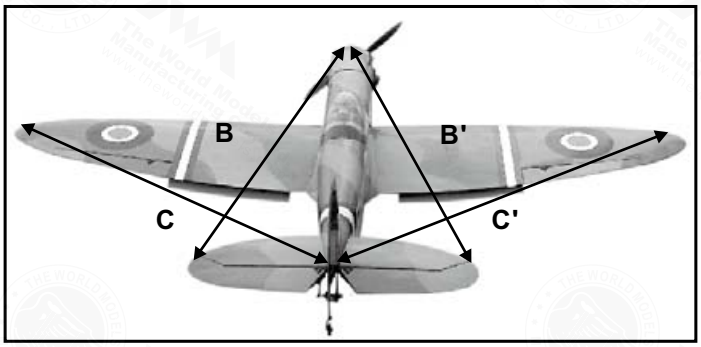


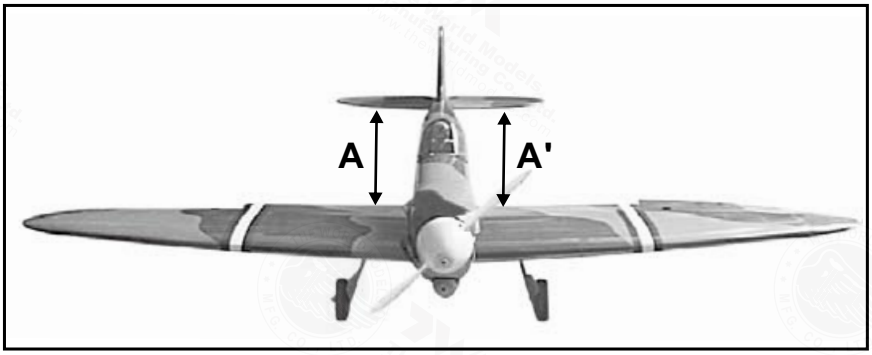


● **First insert the grommet to the canopy then apply screw.**

17 Wing Setting

Adjust the wing and fuselage configuration as show in the diagrams.

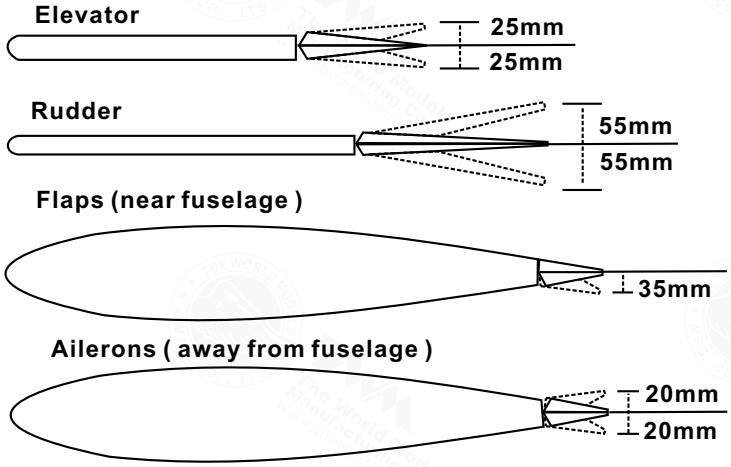




A = A ' B = B ' C = C '

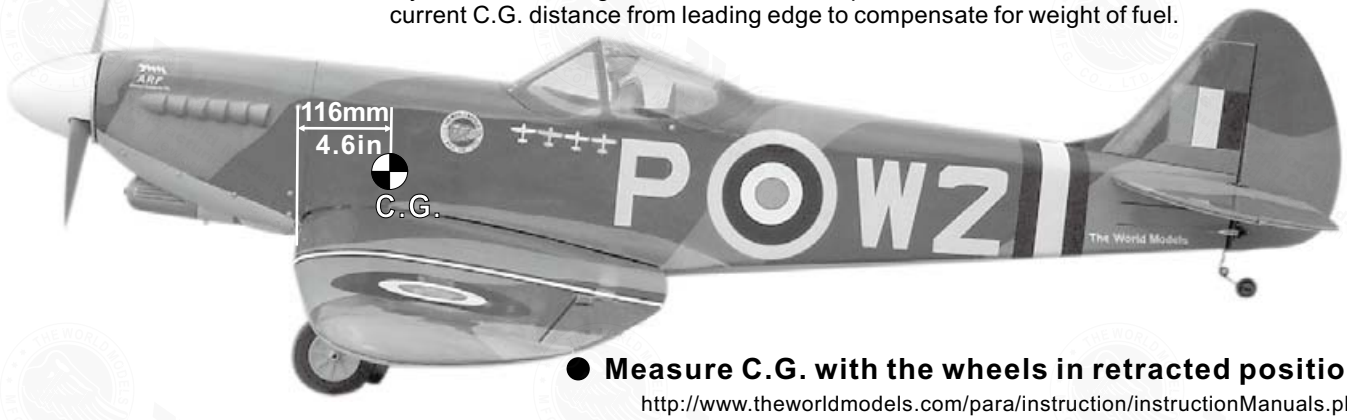
18 Control Throws

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



19 C.G.

The ideal C.G. position is **116mm (4.6 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.

 # SPITFIRE G.S. 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.

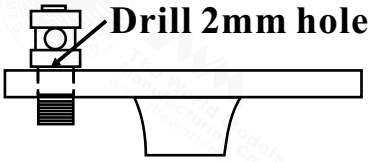
 # Check and re-tighten up all factory assembled screws, use thread locker if applicable.

 # When Flaps are lowered, nose of model will rise. The nose-up varies with the speed at which the model is flying when you lower the flaps and the extent to which they are lowered. Check effect of flaps at higher altitude to avoid surprises during landing. You may apply down trim of the elevator to compensate for the nose-up effect when lowering the flaps. Taking off with flaps lowered is not recommended, as the increased drag may require a longer runway and more engine power for the model.

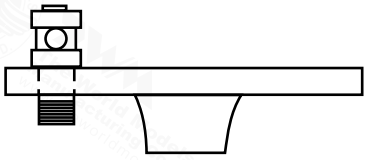
ADDENDUM

LINKAGE CONNECTOR

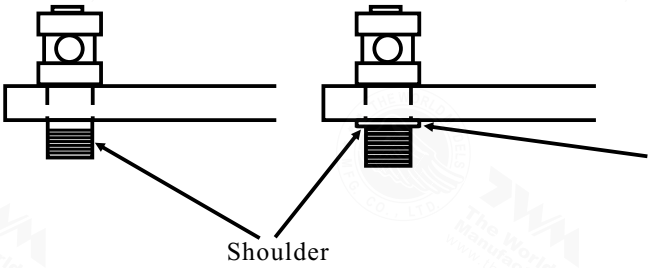
HW7111030 & HW7111060



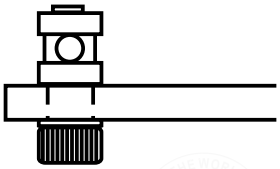
Drill 2mm hole at servo horn.



Insert linkage connector into servo horn.



Make sure shoulder of screw is cleared from servo horn.
Add washer to reduce play if necessary.

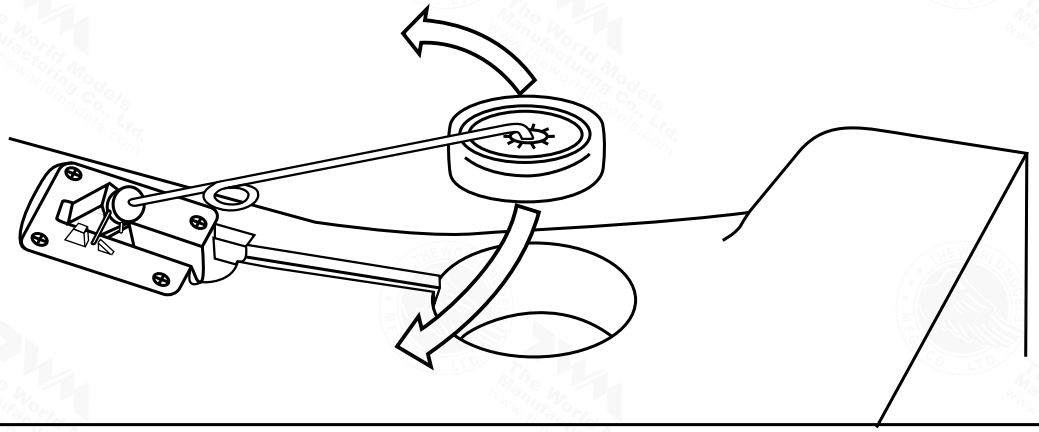


Tighten up the round nut against the shoulder. Apply CA or permanent thread locker.

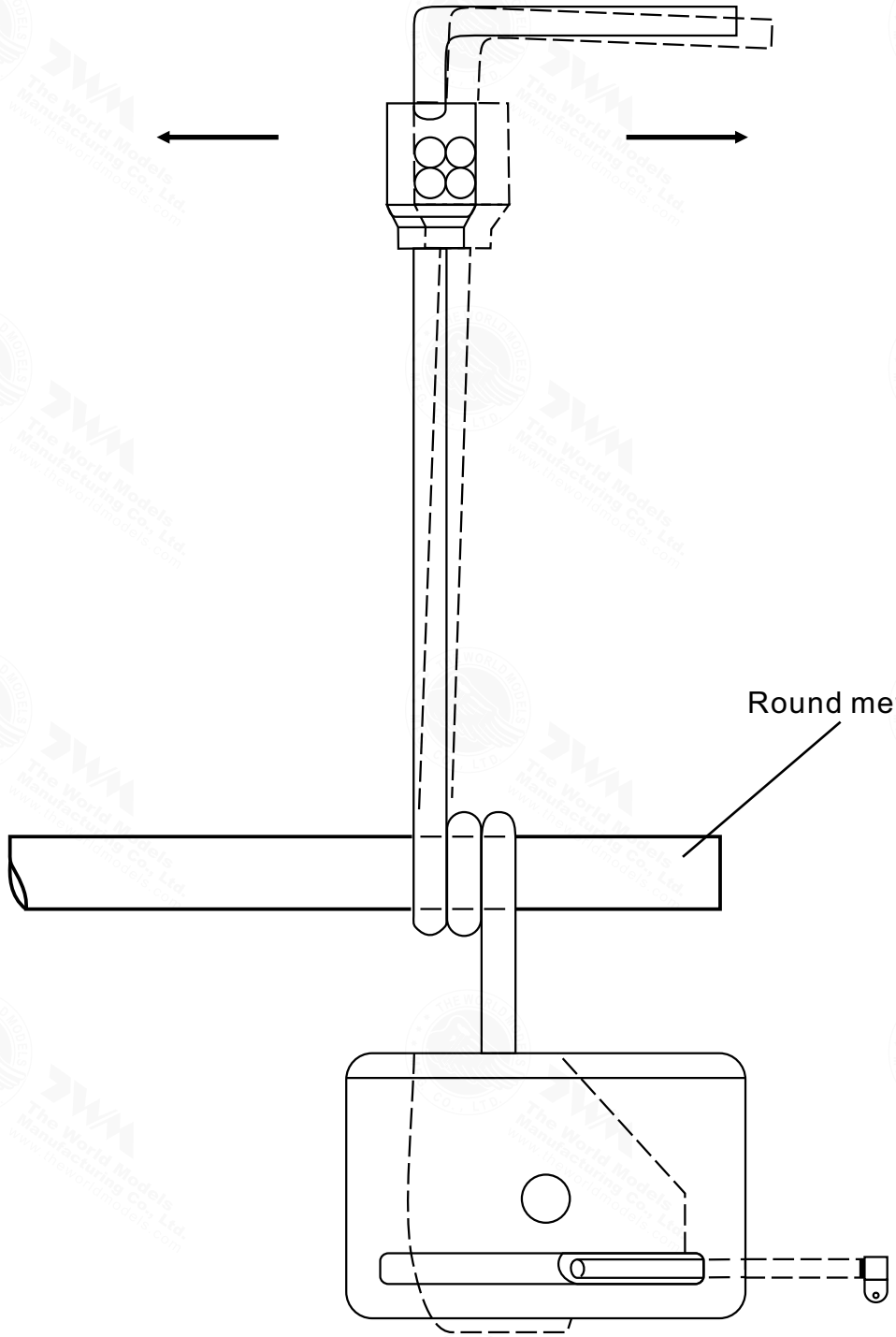
After fastening the round nut, make sure that the linkage connector can rotate freely.

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 safer to bend the wire in this position. Bending the wire in fully open position may damage the supporting structure.

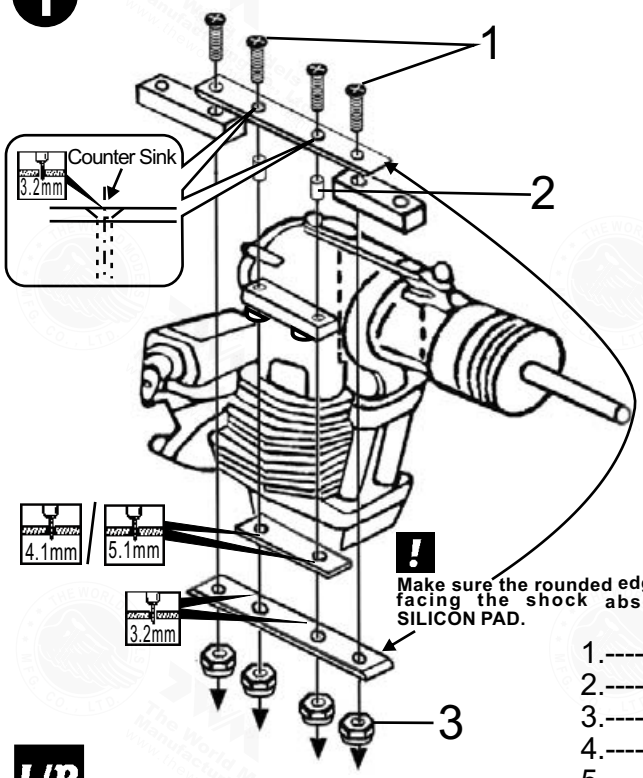


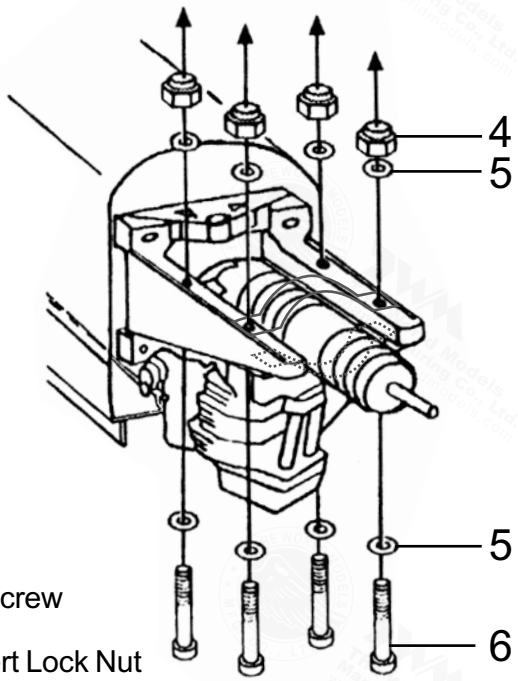
Should you require to bend the anding gear wire, please insert a round metal bar into the spring coil and apply force there as leverage. Bending the wire directly may damage the mounting block structure.



ANTI-VIBRATION MOUNT INSTALLATION

For Engine Mount (PL5911120)





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

Product Registration Form (US Customers)

We would like to share with you any relevant information regarding your model, including product news and free upgrade parts when applicable. Please fill in the following and send to Air Borne Models,4749-K, Bennett Drive ,Livermore, CA 94551 USA.

1.Name: _____

2.Address: _____

3.Phone #: _____ e-mail: _____

4.Model: _____

Wing QC#_____Fuselage QC# _____
(QC numbers are stamped on wing and fuselage)

5.Date of Purchase: _____

6.Store Name: _____

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