F-86 SABRE

USER MANUAL

80MM EDF JET WITH 1200MM WINGSPAN



EN	1 ~ 14
中	15 ~ 28

Item No.:FJ2031

Version No.:FJ2031-V01

MADE IN CHINA

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Introduction

EN

Thank you for purchasing our first 80 mm EDF, the North American F-86 Sabre! Orignally designed and intended for the Air Force in 1944 with the designation NA-134, the aircraft had straight wings and a rather fat fuselage with an axial flow engine. Ultimately, the NA-134 went to the Navy as the XFJ-1 Fury, which was the first fighter they had ever ordered from North American .

Shortly after WW II, the results of wind tunnel tests involving the ME 262 revealed that sweeping the wings of a fighter would enable higher sub sonic speeds so it was decided to incorporate a 35 degree sweep to the wings of the XP-86, thus turning an okay jet into the most sensational jet of the decade. The Navy eventually saw the tremendous potential of the redesigned wings and canceled it's order for the straight winged FJ-1 in favor of a swept wing version, called the FJ-2.

The Sabre eventually went through several different variants, incorporated things such as power boost and 'artificial feel' systems, an 'all-flying tail' and was the first fighter to use supersonic air missiles.

The F-86 Sabre you have purchased is a great scale model loaded with details in its design and, most importantly, great flight characteristics, to fly one is to love one. Although recommended for an intermediate pilot, many pilots transitioning from 1400 mm warbirds to jets have found this to be an excellent first jet.

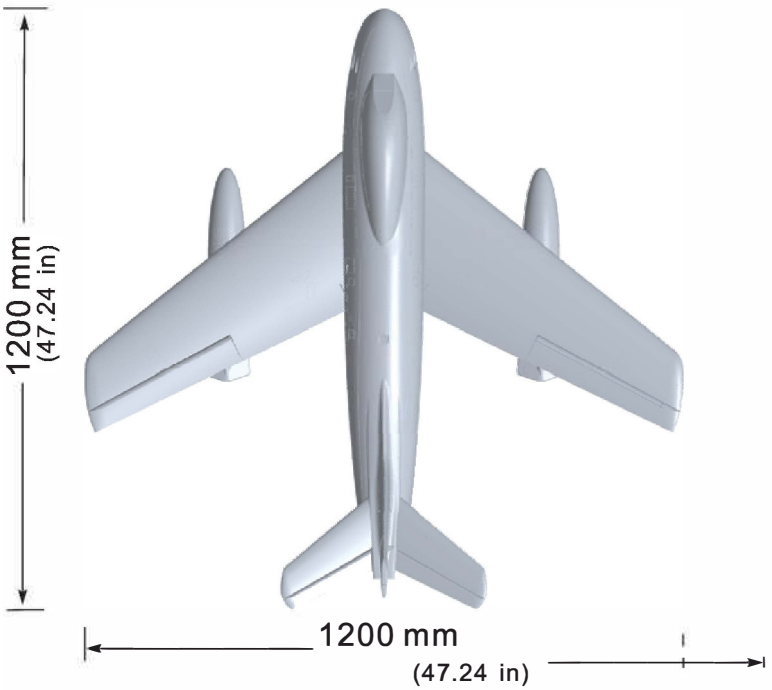
⚠ **NOTE:** This is not a toy. Not for children under 14 years. Young people under the age of 14 should only be permitted to operate this model under the instruction and supervision of an adult. Please keep these instructions for further reference after completing model assembly.

Note

1. This is not a toy! Operators should have some basic experience. Beginners should operate only under the guidance of a professional instructor.
2. Before beginning assembly, please read through the instructions and carefully follow them throughout the build.
3. Freewing and it's vendors will not be held responsible for any losses due to improper assembly and operation.
4. Model airplane operators must be at least 14 years of age.
5. This airplane is made of EPO foam material, covered with surface spray paint. Don't use chemicals to clean as it may cause damage.
6. You should avoid flying in areas such as public places, areas with high voltage power lines, nearby highways, airports or in other areas where laws and regulations clearly prohibit flight.
7. Do not fly in bad weather conditions, including thunderstorms, snow, etc...
8. Lipo batteries should be properly stored in a fire proof container and be kept at a minimum of 2M distance away from flammable or explosive materials.
9. Damaged or scrap batteries must be properly discharged before disposal or recycling to avoid spontaneous combustion and fire.
10. At the Flying Field, properly dispose of any waste you have created, don't leave or burn your waste.. Ensure that your throttle is in the low position and that your radio is turned on before connecting the Lipo battery.
11. Ensure that the throttle is in the lowest position and transmitter switch on, before connecting a Lipo Battery to the ESC of the aircraft.
12. Do not try to catch the airplane while in flight or during landing. Wait for the airplane to come to a complete stop before handling.

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Basic Product Information



4S Standard Version

- Motor
  3525-2870KV
- ESC
  80A
- Servos
  9g (8pcs)
- Battery
  4S 14.8V 4000mAh 35C
- Ducted fan
  6-Bladed 80mm EDF
- Take-off weight
  1950g (68.72 oz.)
- Thrust
  1900g (67 oz.)

6S Upgrade Version

- Motor
  3530-1750KV
- ESC
  80A
- Servos
  9g (8pcs)
- Battery
  6S 22.2V 3700mAh 35C
- Ducted fan
  12-Bladed 80mm EDF
- Take-off weight
  2290g (80.7 oz.)
- Thrust
  2600g (91.8 oz.)

⚠ Note: The parameters stated here are derived from test results using our accessories. If you use other accessories, the test results will differ. We cannot provide technical support if you have a problem when using other accessories.

Package List



Included parts will differ between the PNP version and the Kit version. Please refer to the following content list to check your parts inventory.

PNP Version

1.Fuselage set (installed, including the electrical parts and connection lines)
2.Main wing set (installed, including the electrical parts and connection lines)
3.Tail wing set (installed, including the electrical parts and connection lines)
4.Missiles and pylons
5.Main wing installing plastic part
6.Carbon tube
7.Screw
8.Glue

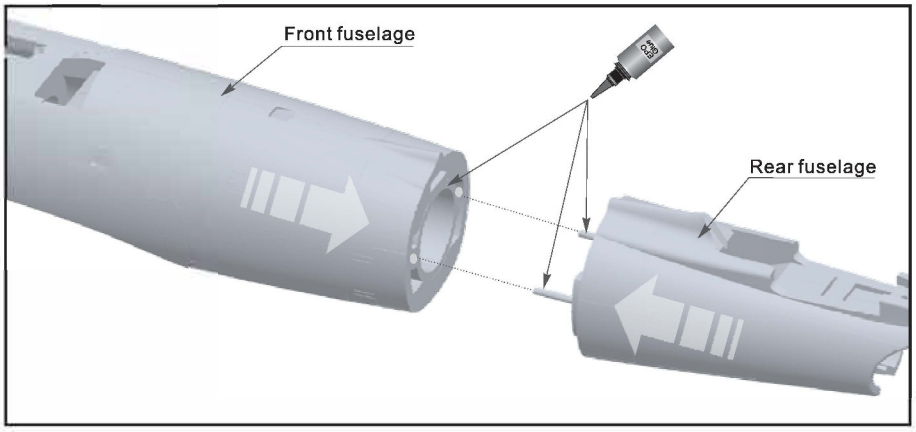
Kit Version

1.Fuselage set (installed connection lines)
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5.Main wing installing plastic part
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8.Glue

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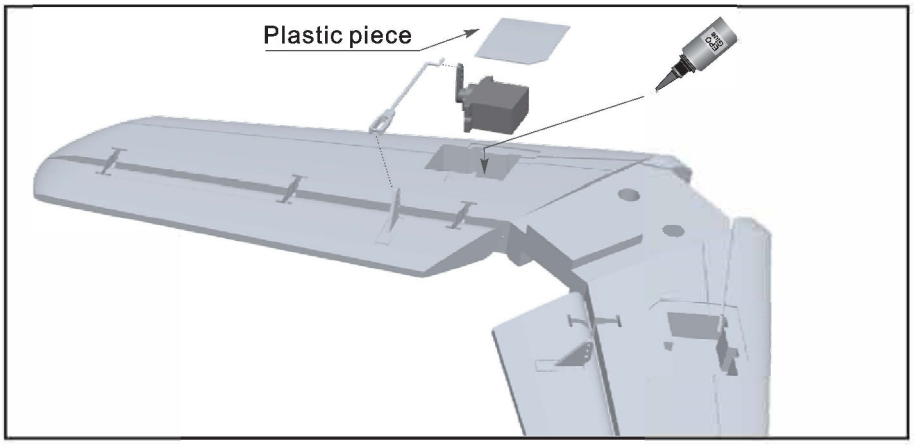
Fuselage Assembly

Apply glue to the rods and join the tail section to the fuselage. More glue can be applied to the two sections as deemed necessary. For best results, allow the glue to become tacky, then separate the two pieces so that the glue forms strings, and rejoin. Repeat three times then permanently join the two sections.

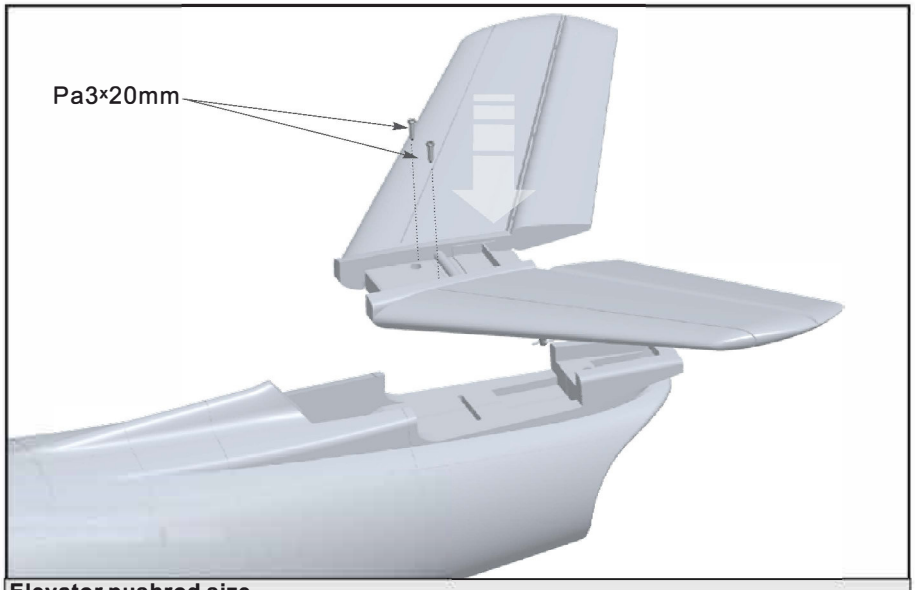


Horizontal Stabilizer Assembly

1 . Using a servo tester or radio, center the servo.
2. Use the supplied glue to secure the servo into the servo hatch.
3. Insert the servo cable into the servo wire trough.
4. Using the supplied glue, attach the servo hatch cover to the wing.
5. Feed the open end of the pushrod into the servo arm. center the elevator and adjust the control rod clevis to the correct length so that the elevator remains centered.
6. Repeat these steps for the other elevator servo.



7. Install the elevator to the rear of the fuselage and use the 2 screws to secure it.

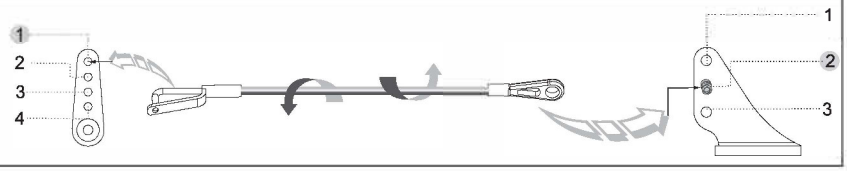


Elevator pushrod size



Pushrod diameter : Ø 1.5mm

Elevator pushrod mounting hole



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Main Wing Assembly

1. Use a servo tester or radio to center the servo.

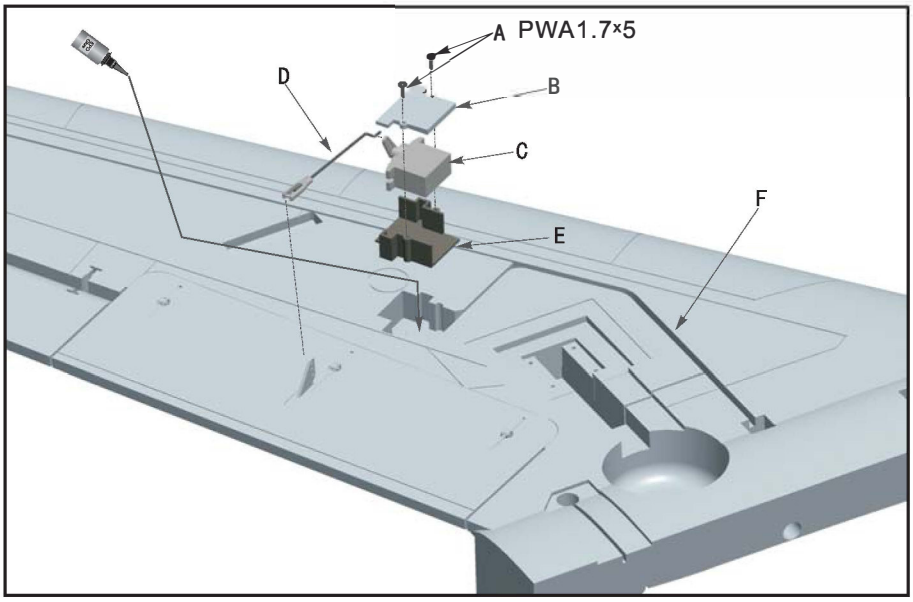
2. Use the supplied glue to secure the servo box (E) into the servo hatch.

3. Install servo (C) into the servo box(E).

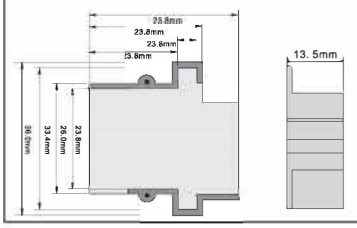
4. Use 2 screws (A) to screw the servo cover (B) to the servo hatch (E), thus securing the servo(C).

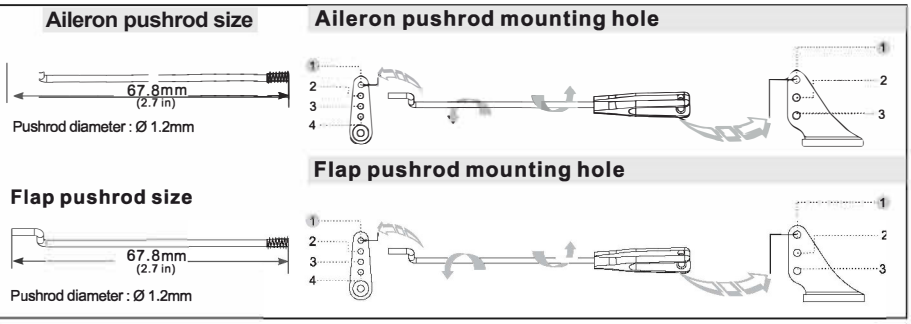
5. Feed the open end of the servo pushrod (D) into the servo arm and adjust the control rod clevis to the proper length so that at the servo's centered position, the flap is completely retracted.

6. Repeat these steps to install the other three servos to the wing, remember to center the ailerons and adjust the clevis, so that they are centered when the clevis is attached to the control horn and the servo is centered.

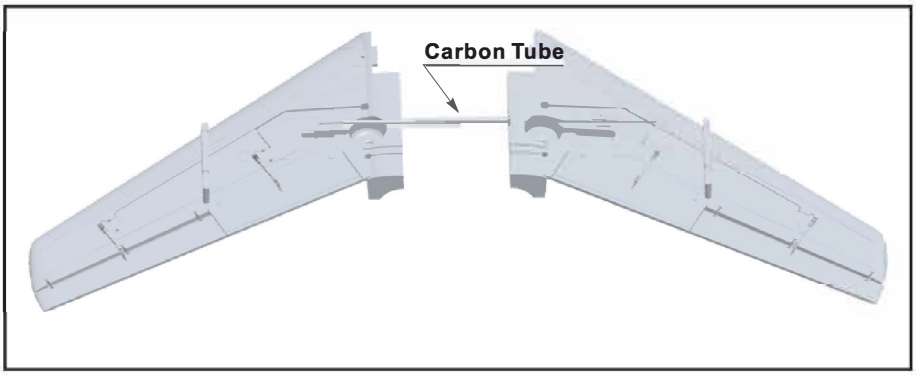


Note: all servo boxes are factory installed so if it becomes necessary to replace a servo, it will not damage the foam. If you need to replace a servo and choose not to use a Freewing product, please refer to the following diagrams for the correct size.

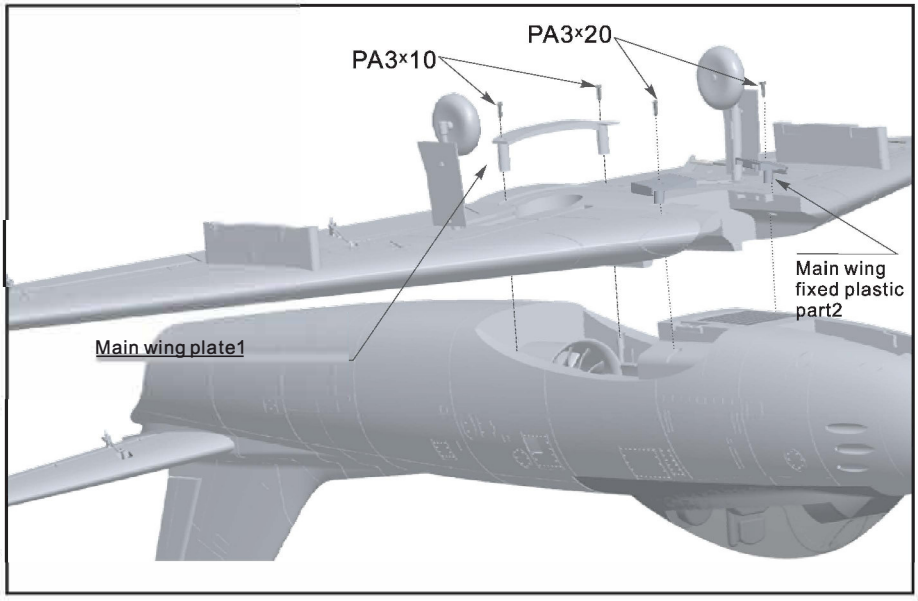




1. Use the carbon tube to connect the left and right wings.
2. Use a Y connector to connect the left and right flap servos.
3. Use a Y connector to connect the left and right aileron servos.
4. Use a 3 to 1 connector to connect the left and right main landing gear.



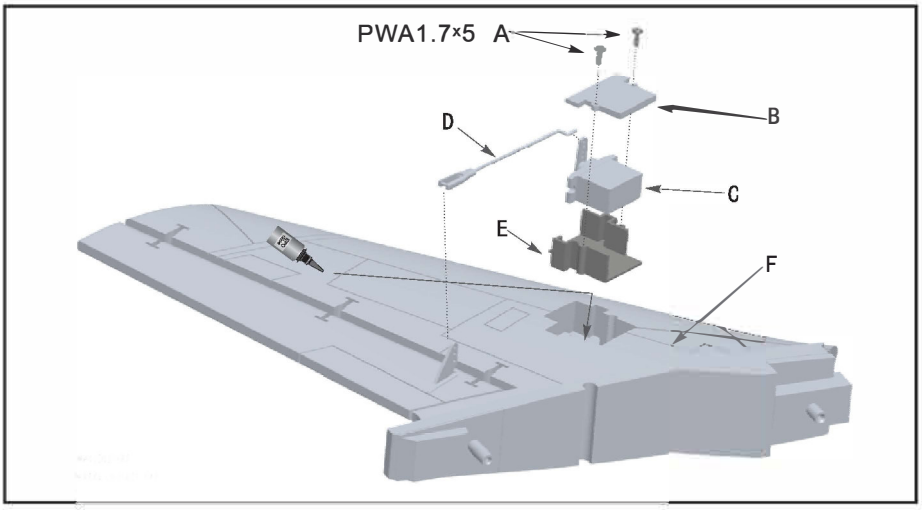
5. Secure the main wing to the fuselage and feed the connectors through to the fuselage so that they can be plugged into the receiver.
6. Secure the wing using the plastic wing plates (1 and 2)

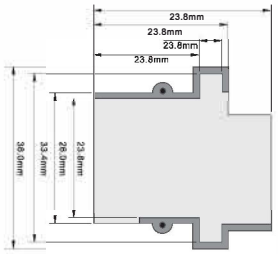


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Rudder Assembly

1. Center the servo arm with either a servo tester or your radio.
2. Insert the servo box (E) into the cavity in the vertical stabilizer.
3. Install the servo (C) inside the servo box (E).
4. Using 2 screws (A), fasten the servo cover (B) to the servo box which will secure the servo to the Stabilizer.
5. Thread the open end of the control rod into the servo arm and adjust the clevis so that the rudder is in the neutral position when it is attached.

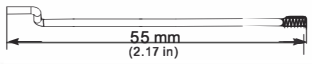




Note: all servo boxes are factory installed so if it becomes necessary to replace a servo, it will not damaged the foam. If you need to replace a servo and choose not to use a Freewing product, please refer to the following diagrams for the correct size.

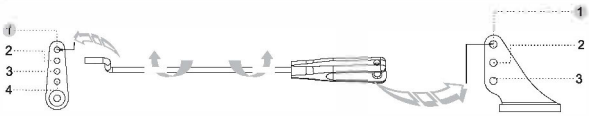


Rudder pushrod size

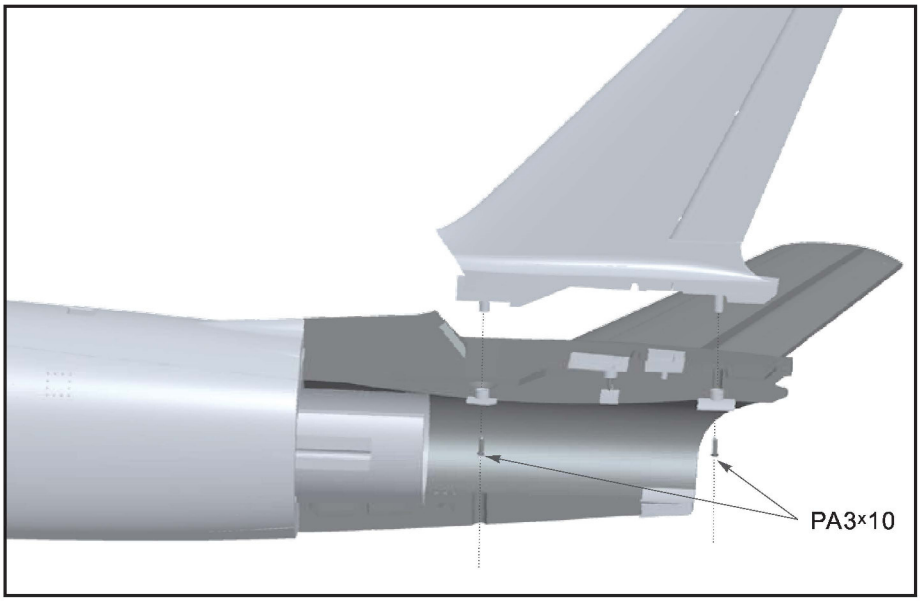


Pushrod diameter : Ø 1.2mm

Rudder pushrod mounting hole

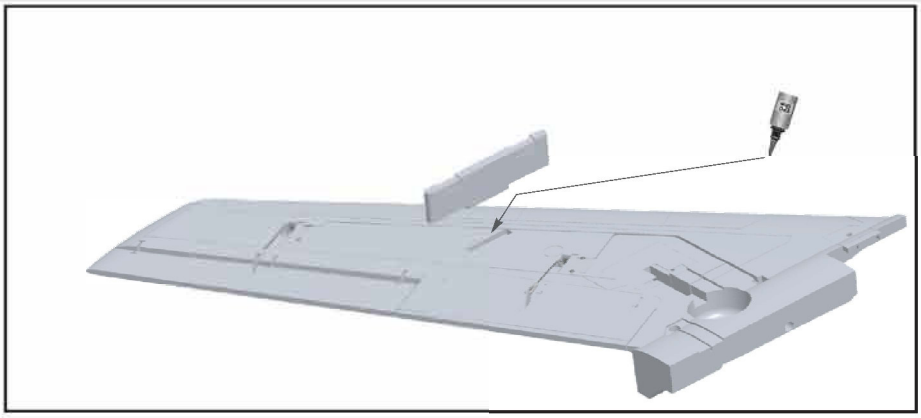


1. Attach the rudder to the fuselage.
2. Using 2 screws through the underside of the fuselage, lock the rudder in place.
3. Ensure that the screws travel into the locks correctly to avoid stripping them.



Drop tank/ scale weapon pylons

1. Apply glue to the weapons pylons and attach them to the slots on the underside of the main wing.
2. Pull the parts off slightly and reapply several times so that the glue forms strings as you separate the pylon from the wing.
3. Allow the glue to set for approximately two hours to dry, then install the drop tanks utilizing the magnets and the pylons.



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Nose Gear Assembly

The F86 has two versions: the 4S standard version and the 6S upgrade Version. The 4S version uses metal landing gear, the 6S uses a full Aluminum damping landing gear. We also provide the full aluminum damping landing gear as a spare part, so you can upgrade to the 4S version. The following is an exploded diagram of the two landing gears for reference.

Nose landing gear accessories list

A - Nose landing gear main strut
B - Nose gear door fixed plastic part
C - Spring
D - Nose landing gear damping active lever
E - U-shape damping arm
F - Screw (PM2×4mm)
G - Screw (PM2×3mm)
H - 8-shape damping shaft
I - U-shape damping arm
J - Nose wheel shaft
K - Nose wheel (Ø45×16mm)
L - Pin
M - E-clip (Ø1.5mm)
N - E-clip (Ø2.0mm)
O - Damping set
P - Grub screw (M4×3mm)
Q - Screw (PT2.6×6mm)
R - L-shaped steering tiller
S - Nose landing gear metal pin
T - Landing gear trunion
U- Nose landing gear steering control ring
V- Nose landing gear steering pushrod

1.Put the “U-shape damping arm (E)” on the “Nose landing gear main strut (A)”, and use “screw (G)”to secure it.

2.Insert the “Spring (C)” in the “Nose landing gear main strut (A)”, then insert the “nose landing gear damping active lever (D) ” into the “Nose landing gear main strut (A)”, use force to press it down, lock the “screw (F)” in the “hole of Nose landing gear main strut (A)”, to secure the “nose landing gear damping active lever (D)”

3. Use “ Pin (L) ” and “ E-clip (M)” to connect the “ 8-shaped damping shaft (H)”, “U-shape damping arm (I)”, “U-shape damping arm (E)”, “nose landing gear damping active lever (D)”.

4. Use “nose wheel shaft (J)” and “E-clip (N)” to secure the “wheel (K)” to the “U-shape damping arm(I)”.

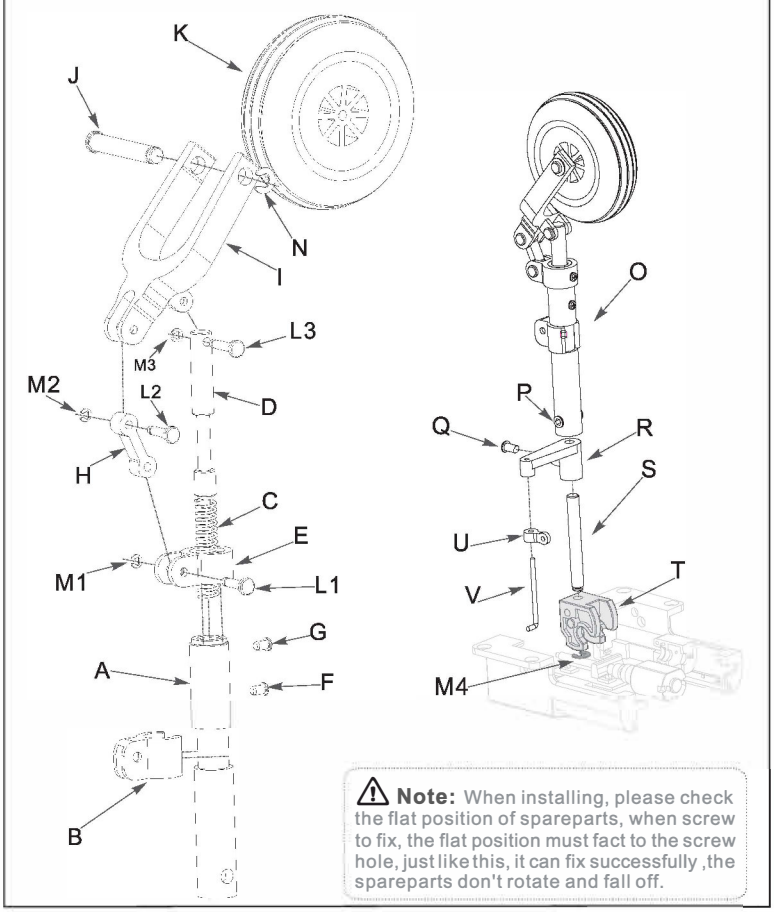
5. Clip the “nose cabin door fixed plastic part (B)” into the “Nose landing gear main strut (A)”.

6. Insert the “nose landing gear metal pin (S)” in the “ Nose landing gear main strut (A) ”, and use 2 “Grub” screws” to secure it.

7.Put the “Nose landing gear steering control ring (U)”on the ”Nose landing gear steering push rod (V) ”, then screw one screw to the thread side of the”Nose landing gear steering push rod (V)” into the ”L-shaped steering tiller (R)”.

8.Put the installed ”L-shaped steering tiller (R)” onto the ”nose landing gear metal pin (S)”, and secure it with a screw (Q)”.

Full aluminium damping landing gear instruction



Note: When installing, please check the flat position of spareparts, when screw to fix, the flat position must fact to the screw hole, just like this, it can fix successfully ,the spareparts don't rotate and fall off.

9.Insert the installed “nose landing gear metal pin (S) ” into “ Landing gear trunion (T)”, then clip “E-clip (M)” in the “notch of the nose landing gear metal pin (S) ” to secure it.

Nose landing gear accessories list

A - Nose landing gear main strut
B - Wheel (Ø45×16mm)
C - Wheel chock
D - Grub screw (M3×3mm)
E - Nose cabin door fixed plastic part
F - Nose landing gear set
G - L-shaped steering tiller
H - Nose landing gear pushrod
I - Nose landing gear steering control ring
J -Screw (PT2.6×6mm)
K -Landing gear rotating arm
L -E-clip (Ø2.Ømm)

1 .Snap the "nose cabin door fixed plastic part (E)" over "Nose landing gear main strut (A)".

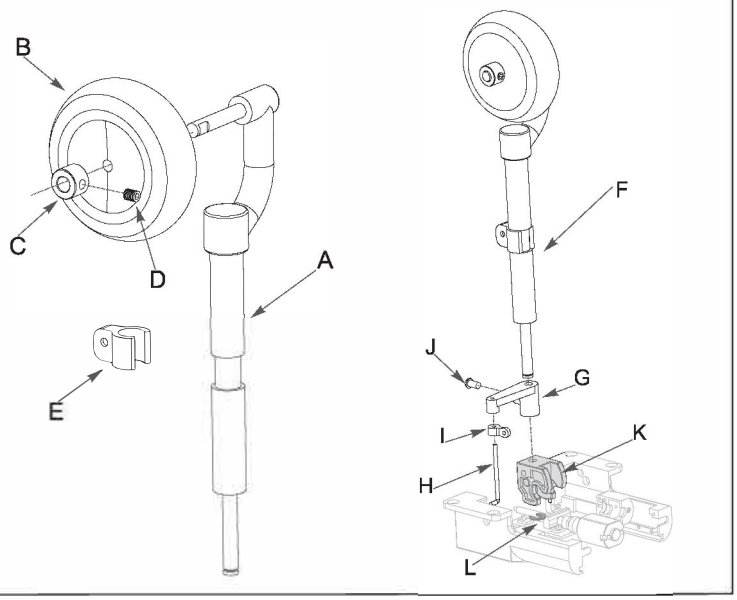
2.Put the "wheel (B)", "wheel lock (C)" on the "Nose landing gear main strut (A)", then use "Grub screw (D)" to secure it.

3.Put the "Nose landing gear steering control ring (I)" onto the" Nose landing gear push rod (H) ", then thread the thread side of "Nose landing gear push rod (H)" into "L-shaped steering tiller (G)".

4.Put the installed" L-shaped steering tiller(G)" onto the "Nose landing gear set (F)", and secure it with "screw (J)".

5.Insert the assembled " Nose landing gear set (F)" into the "Landing gear trunion (K)", then snap the "E-clip (L)" into the notch of "Nose landing gear main strut (A)" to secure it.

4S standard version metal landing gear (no damping) instructions



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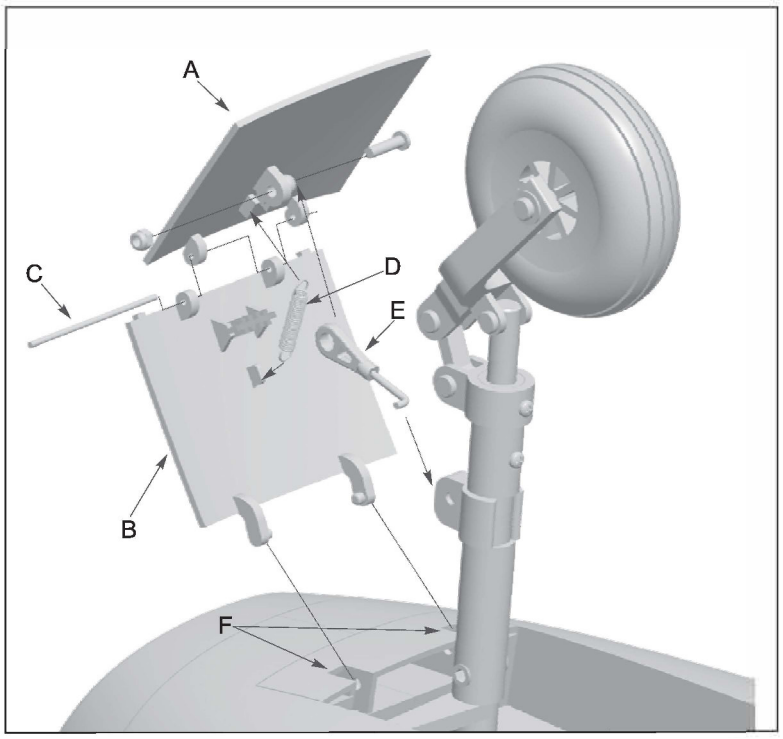
Nose landing gear door installation

Nose landing gear door accessories list

A - Nose gear door 1
B - Nose gear door 2
C - Metal wire
D - Spring
E - Push rod
F - Gear door installing mount

1. Install the metal ball head on the"nose gear door 1 (A)".
2. Use"metal wire (C)" to connect the"nose cabin door 1 (A)" and"nose cabin door 2 (B)". then bend the end of"metal wire (C)" to secure it.
3. Put one side of"Spring (D)" into the hook on nose gear door 1 (A),the other side to the hook of"nose gear door 2 (B)".
4:Secure the rotating arm at the bottom of nose cabin door 2 (B) and snap it into the"gear door installing mount (F)".
5.Finally snap the clevis side of " pushrod (E)" into the metal ball head of"nose gear door 1 (A)", and snap the other side into the nose gear door fixed plastic part.

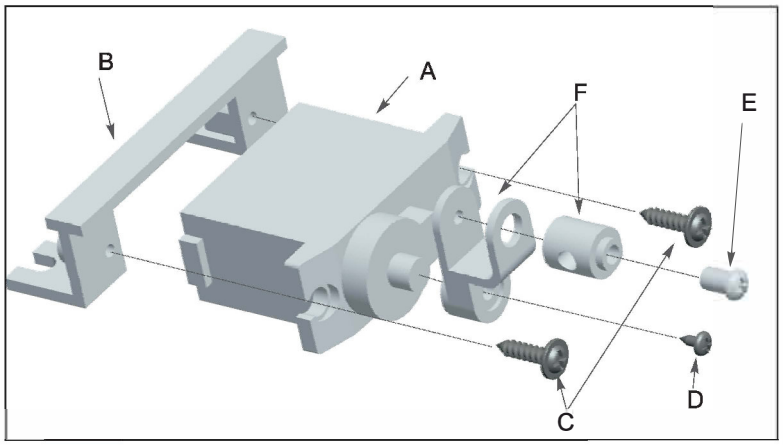
⚠ **Note:** After installation, test the retraction/ deployment of the gear door. Adjust the length of "metal wire (E)", to achieve the best results.

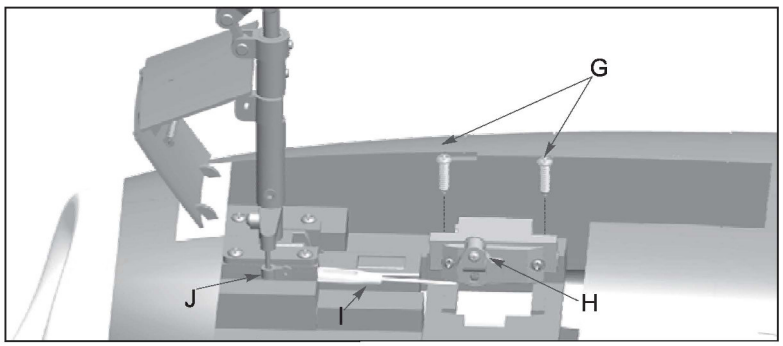


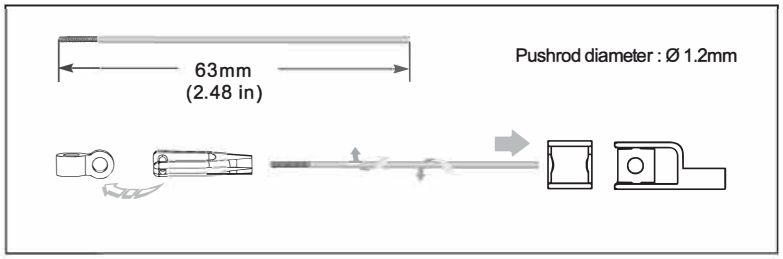
Nose steering control accessories list

1. Refer to the diagram at the right and attach the servo to the plastic anchor.
2. Use 2 screws (G) to mount this assembly to the fuselage.
3. Feed the pin on the steering control rod through the eye of the nose gear steering control ring and snap it to lock it.
4. Insert the open end of the control rod through the U shaped servo arm (F).
5. Adjust the nose wheel so that it is centered and lock the control rod down using screw (E)

A- Servo
B - Servo plastic anchor
C - Screw (PWA1.7x5mm)
0 - Screw (PWA1.7X5mm)
E - Screw (PM3>6mm)
F - U-shaped servo arm
G- Screw (PWA2.0>8mm)
H- 9g servo installed set
I- Nose steering pushrod
J- Nose landing gear steering control ring







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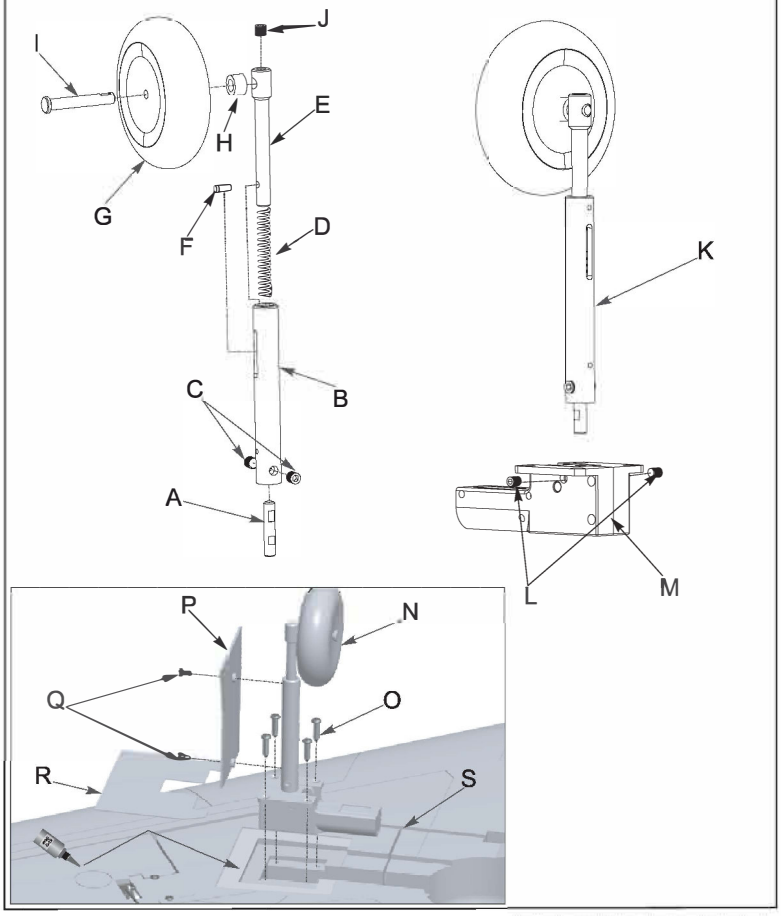
Main landing gear installation

Rear landing gear accessories list

A- Main landing gear metal pin
B - Main landing gear main strut
C -Grub screw (M4•3mm)
D- Spring
E - Rear landing gear damping shaft
F- Pin
G- Rear wheel (050'16mm)
H - Metal spacer
I - Wheel shaft
J - Grub screw (M3•3mm)
K - Assembled main landing gear set
L- Grub screws (M3•3mm)
M- Landing gear electric retract
N - Assembled landing gear
0 - Screws (PA3•10mm)
P- Main landing gear door
Q - Screw (PM2•4mm)
R - Retract cover
S - Trough

1.Insert the main landing gear metal pin (A) into main landing gear main strut (B) and secure it with two Grub screws (C).
2.Insert the Spring (D) into the Main landing gear main strut (B), then insert the Main landing gear damping shaft (E) into the Main landing gear main strut (B), press it down, through the side of the trough of the main landing gear main strut (B), press the pin (F) to the hole of the main landing gear damping shaft (E), to prevent the main landing gear damping shaft (E) from falling off.
3.Put the main wheel (G)and metal spacer (H)on the wheel shaft (I), then insert the wheel shaft (I) into the main landing gear damping lever(E), and use Grub screw (J)to secure it.
4.Insert the assembled main landing gear set (K) into the Landing gear electric retract (M), and use 2 Grub screws (L)to secure it.
5.Place the landing gear set (N)on the landing gear hard point of main wing , use 4 screws (O) to secure it, then run the wires through the trough (S).
6.Then use 2 screws (Q)to secure the main landing gear door (P)to the Main landing gear strut (B).
7.Apply glue to attach the retract cover (R) to the main wing.

Full aluminum damping landing gear instructions



Note:. When installing, check that the flat position of the part is in line with the screw hole to ensure that the part is properly seated and will not come loose.

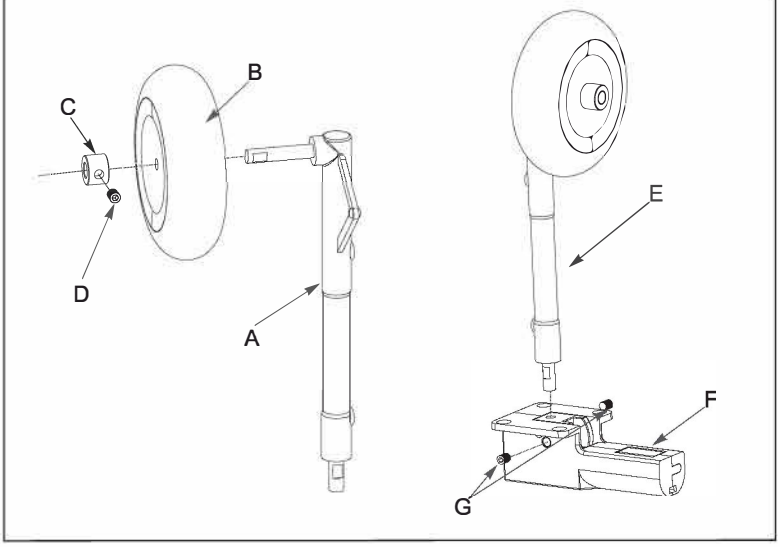
Main landing gear accessories list

A - Main gear strut
B - Wheel (Ø50×16mm)
C - Wheel chock
D - Grub screw (M3×3mm)
E - Rear landing gear installed set
F - Retractable controller
G - Grub screw (M3×3mm)

1. Put the wheel (B) and the wheel lock (C) onto the main gear strut (A) and use the Grub screw (D) to secure it.
2. Insert the assembled main landing gear (E) onto the electric retract (F) and secure it using 2 Grub screws (G).
3. Use the above diagrams to attach the main landing gear to the main wing.

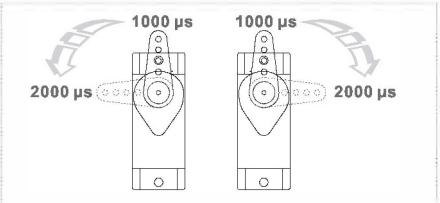
Note: . When installing, check that the flat position of the part is in line with the screw hole to ensure that the part is properly seated and will not come loose.

4S standard version metal landing gear (no damping) instructions

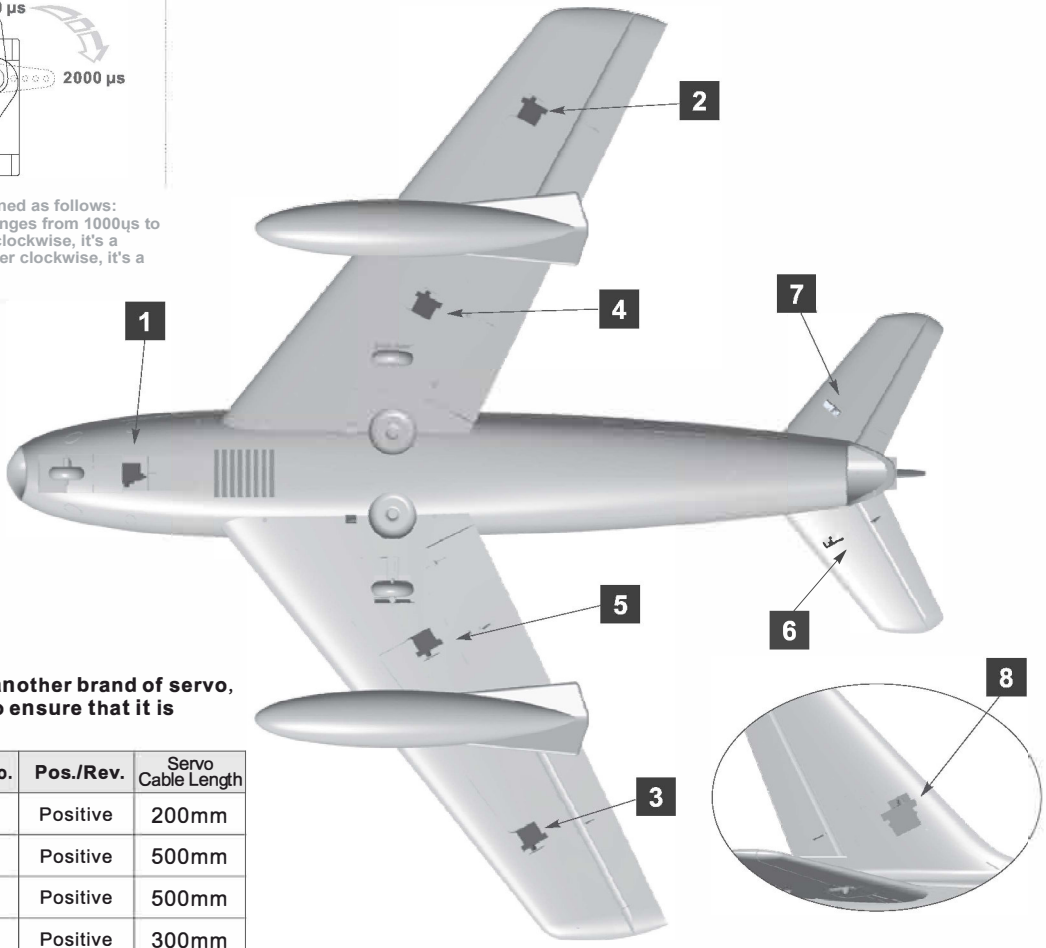


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Servo introduction



A servo or reversed servo is defined as follows: When the servo input signal changes from 1000µs to 2000µs, if the servo arm rotates clockwise, it's a positive servo. If it rotates counter clockwise, it's a reversed servo.



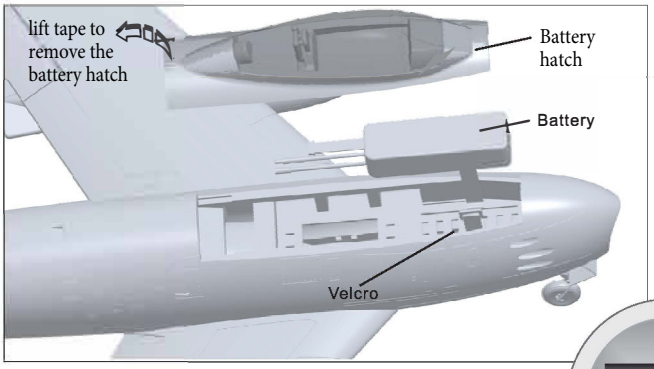
If you decide to purchase another brand of servo, refer to the following list to ensure that it is correct type and size .

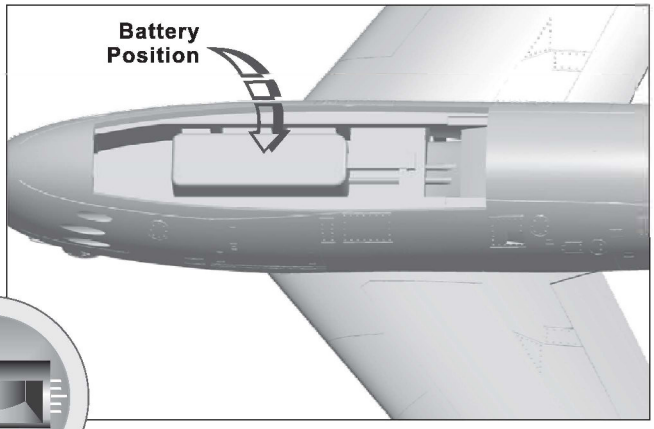
Servo installing position	Servo No.	Pos./Rev.	Servo Cable Length
Nose gear steering servo	1	Positive	200mm
Aileron servo (Left)	2	Positive	500mm
Aileron servo (Right)	3	Positive	500mm
Flap servo (Left)	4	Positive	300mm
Flap servo (Right)	5	**Reverse**	300mm
Elevator servo (Left)	6	**Reverse**	150mm
Elevator servo (Right)	7	Positive	150mm
Rudder servo	8	**Reverse**	150mm

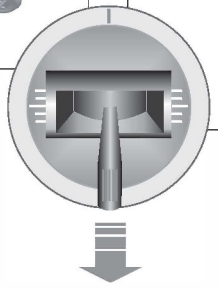
Servo connection instructions

1.Use a Y-cable to join the No.**1** and No.**8** servos.
2.Use a Y-cable to join the No.**2** and No.**3** servos.
3.Use a Y-wire to join the No.**4** and No.**5** servos.
4.Use a Y-wire to join the No.**6** and No.**7** servos.

Battery Installation







Lift tape to remove the battery hatch.
Use the Velcro strap to secure the battery.

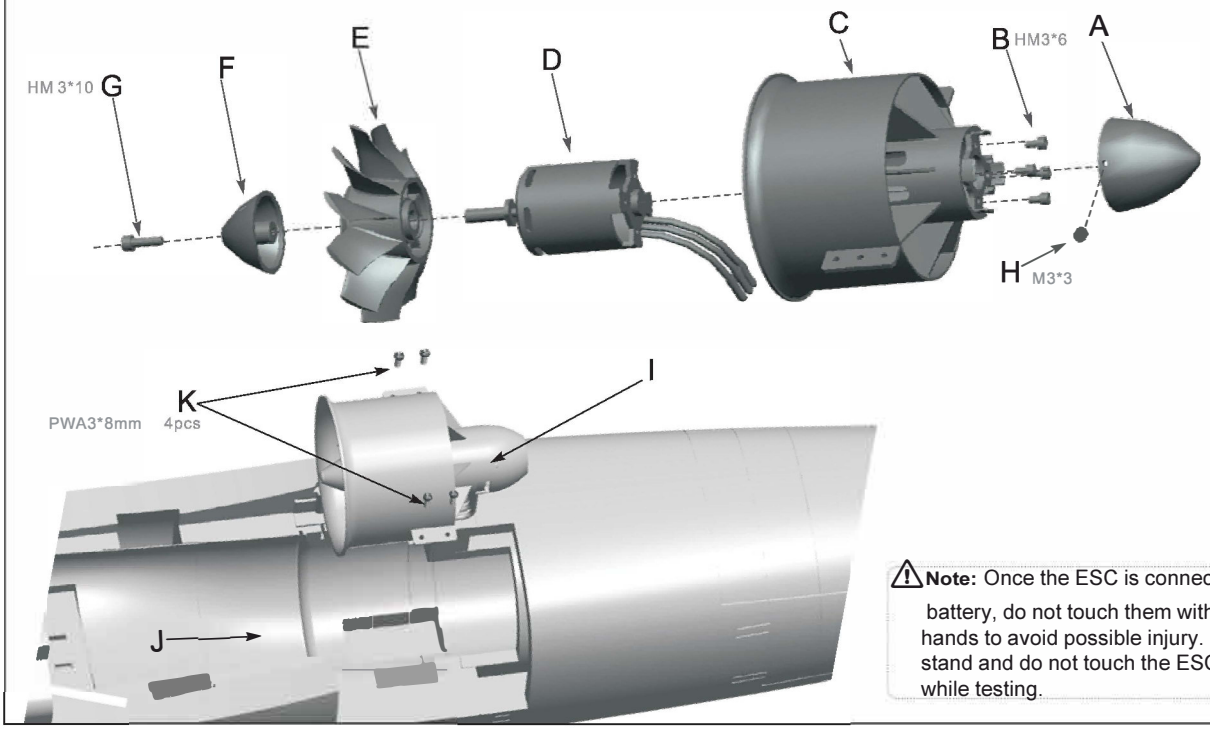
Before connecting the battery to the ESC, switch on the transmitter and ensure that the throttle is in the low position. Engage the kill switch if you have one assigned.

The standard battery is:
4S 14.SV 4000mAh 35C
or 6S 22.2V 3700mAh 35C
The advised battery capacity and discharge rate is the following:
4S 14.SV 3200mAh - 4S 14.SV 4500mAh
6S 22.2V 3200mAh - 6S 22.2V 4500mAh
Discharge rate of C ;, 25C
Different battery weights may affect the CG, check the CG if you use a different size battery.

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Power system Installation

1.Put the motor (D) in the ducted fan housing (C).
2.Secure the motor with 4 cup head screws (B).
3.Put the rotor (E) in the motor shaft.
(During this process, please note the hardware platform of rotor should be in alignment with the motor shaft platform)
4.Use spinner (F) to cover the rotor, and secure the spinner (F) with a cup-head-screw (G).
5.Install the tail air-deflector (A) to the bottom of ducted fan housing (C), and use 2 Grub screws (H) to secure it.
6.Connect the motor and ESC.
7.Put the assembled EDF (I) into the fuselage.
8.Use 4 screws (K) to secure the EDF (I) to the wood base.



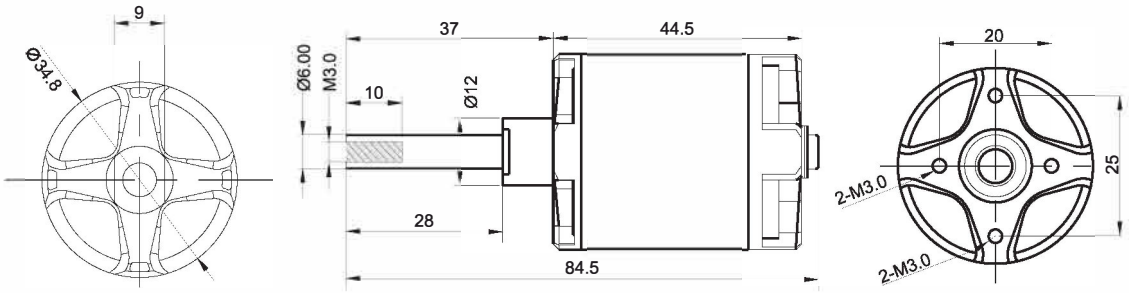
Note: Once the ESC is connected to a battery, do not touch them with your hands to avoid possible injury. Use a test stand and do not touch the ESC/motor while testing.

Motor parameters

MOJ35251

3525-2870KV

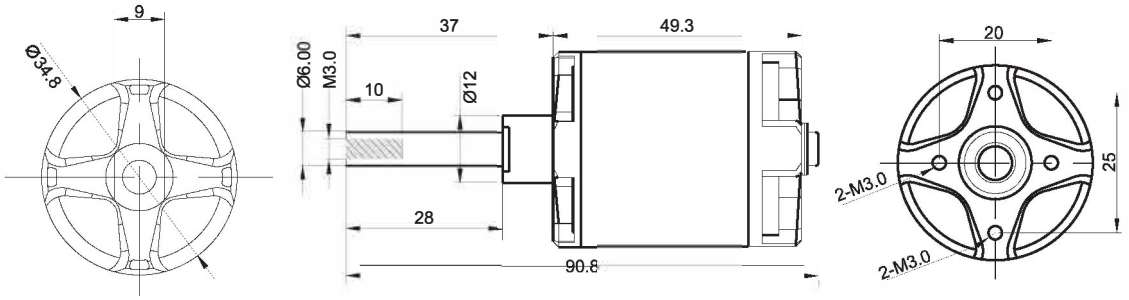
For 4S Battery Standard Version



MOJ35301

3530-1750KV

For 6S Battery Upgrade Version



Item No.	KV Value	Volate (V)	Current (A)	Thrust (g)	Motor Resistance	Weight (g)	No Load Current	Propeller	ESC
MOJ35251	2870RPM/V	14.8	63	1900	0.0087Ω	125	4.8A/15V	6-Bladed 80mm Ducted Fan	⩾80A
MOJ35301	1750RPM/V	22.2	72	2600	0.0146Ω	150	4.6A/23V	12-Bladed 80mm Ducted Fan	⩾80A

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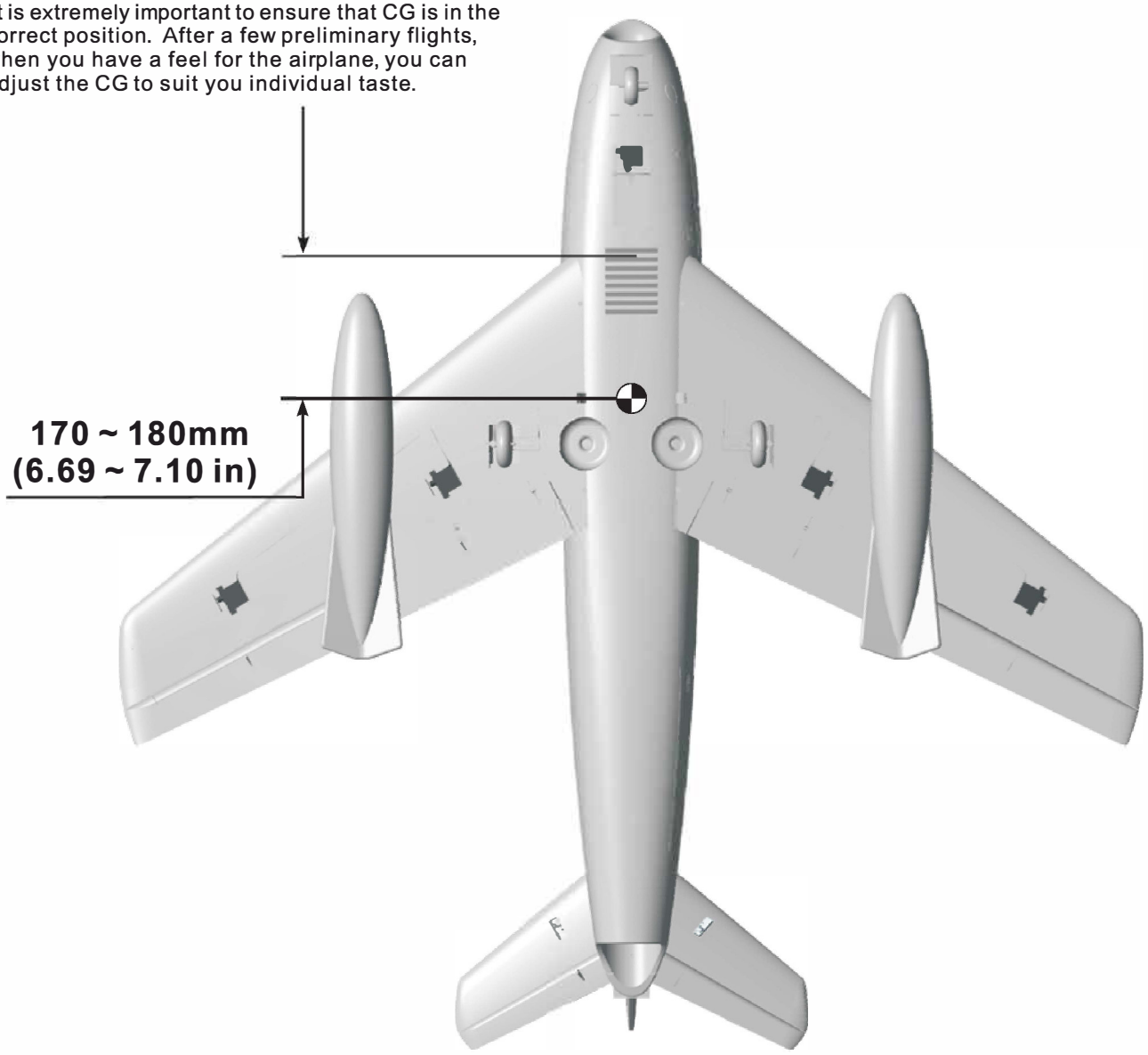
Center of Gravity

Correct center of gravity is directly related to the success of the flight, please refer to the following CG diagram to adjust your plane's center of gravity.

- You can move the battery forward or backward to adjust the center of gravity.

- If you can not adjust the CG by moving the battery, you can also use some other suitable material weight to counterweight.

- It is extremely important to ensure that CG is in the correct position. After a few preliminary flights, when you have a feel for the airplane, you can adjust the CG to suit you individual taste.



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Control surface direction and set up

After the build is complete , power up the radio and connect a fully charged battery to the ESC. Use the radio to ensure correct control direction.

Ailerons

Stick Left



Stick Right



Elevator

Stick Back



Stick Forward



Rudder

Stick Left



Stick Right



Optional Flaps

Flaps Down

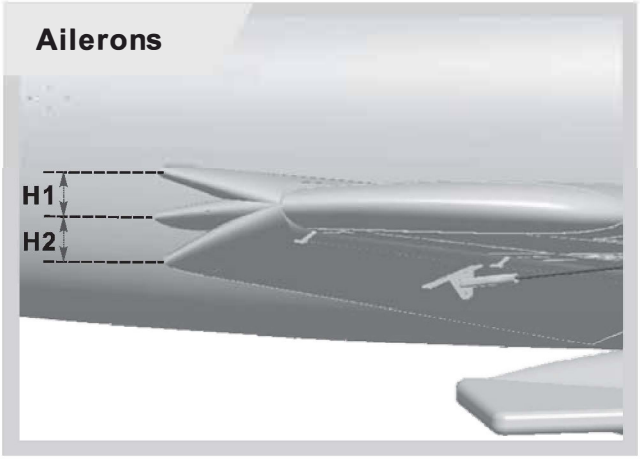


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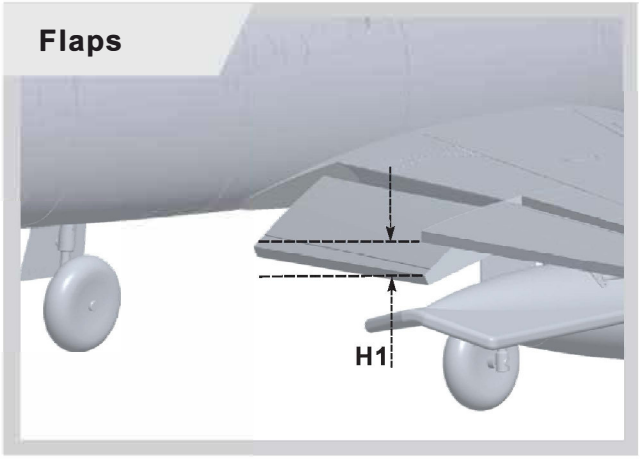
Dual Rates

According to our test results, the following rates proved to be a good starting point. Low rates are good for initial flights or less experienced pilots. High Rates will be more sensitive to control inputs After initial flights, adjust the rates to suit your own style.

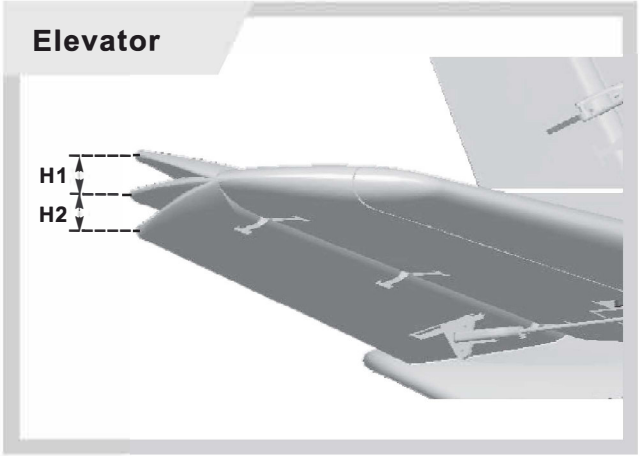
Ailerons



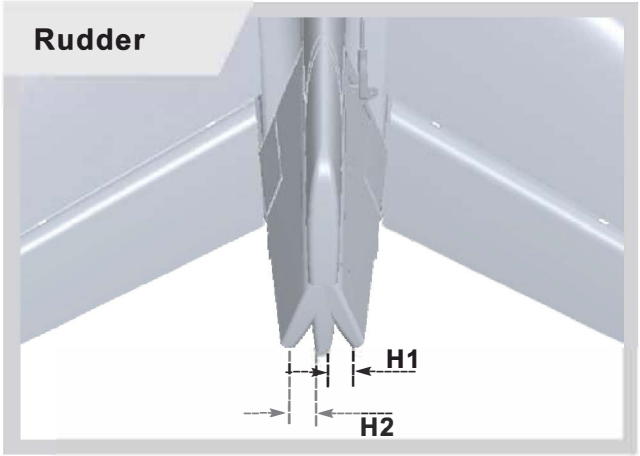
Flaps



Elevator

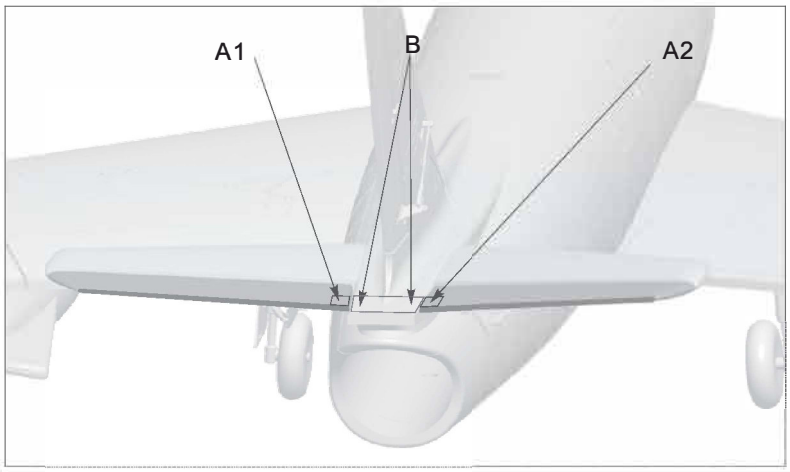


Rudder



	Aileron	Flaps	Elevator	Rudder
Low Rate	H1/H2 12mm/12mm	H1 25mm	H1/H2 18mm/18mm	H1/H2 16mm/16mm
High Rate	H1/H2 20mm/20mm	H1 40mm	H1/H2 24mm/24mm	H1/H2 22mm/22mm

Elevator angle



Note:

Correct elevator angle is very important for a successful flight.
Please refer to the diagram at the left to adjust the elevator installation angle.

When the F-86 takes off, it needs some up elevator to compensate . The elevators A1 /A2 are in the correct position with the Fuselage as shown in the diagram

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Troubleshooting Guide

Motor does not run	A) Li-Po battery depleted	A) Recharge Li-Po battery
	B) Transmitter batteries depleted	B) Replace or recharge batteries
	C) Transmitter not turned on	C) Turn on transmitter
	D) Li-Po battery not plugged in	D) Plug in Li-Po battery
	E) Motor not armed	E) Arm motor
	F) A crash has damaged an internal component	F) Replace
	G) ESC may be damaged	G) Check ESC or contact local distributor
Airplane is difficult to control	A) You are flying in too much wind	A) Fly when there is no wind
	B) Li-Po battery depleted	B) Recharge Li-Po battery
	C) Transmitter batteries depleted	C) Replace or recharge batteries
	D) Transmitter antenna not extended completely	D) Extend transmitter antenna completely
	E) Surface control rate is too high	E) Use low rate to fly
Nose always move down when flying, always needs up elevator	A) CG is forward	A) Adjust CG backward refer to instruction
Airplane constantly climbs or descends, or turns right or left without control input	A) The aircraft is out of trim adjustment	A) Adjust the transmitter trim tabs
	B) You are flying in too much wind	B) Fly when there is no wind
Elevator is too sensitive, vertical axis is not stable	A) CG is backward	A) Adjust CG forward refer to instruction
Plane will drift left or right when taxiing on the runway	A) Nose gear is not center.	A) Center nose gear
	B) Rudder is not center.	B) Center rudder
Take off is difficult	A) Thrust is not on the high position	A) Initialize the ESC
	B) Taxi distance is not enough	B) Longer runway.
	C) Elevator rate is not enough high	C) Use a higher elevator rate
Airplane will not climb	A) Li-Po battery is depleted	A) Recharge Li-Po battery
	B) Ducted fan is damaged	B) Check and replace ducted fan
	C) Motor is damaged	C) Check and replace motor
	D) ESC overheat protection,power reduction.	D) check the ESC for damage due to overheating
Li-Po battery is slightly warm after charging	A) This is normal	A) The Li-Po battery may be slightly warm when fully charged. It should not be hot to the touch.
Motor vibrates excessively	A) Ducted fan is damaged	A) Check and replace ducted fan
	B) Motor is damaged	B) Check and replace motor
	C) Ducted fan is not balance d	C) Adjust the ducted fan balance
	D) At high speed it will vibrate slightly.	D) Its normal
Control surfaces move in the wrong direction	A) Servo direction is reversed	A) Adjust servo reversing function

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