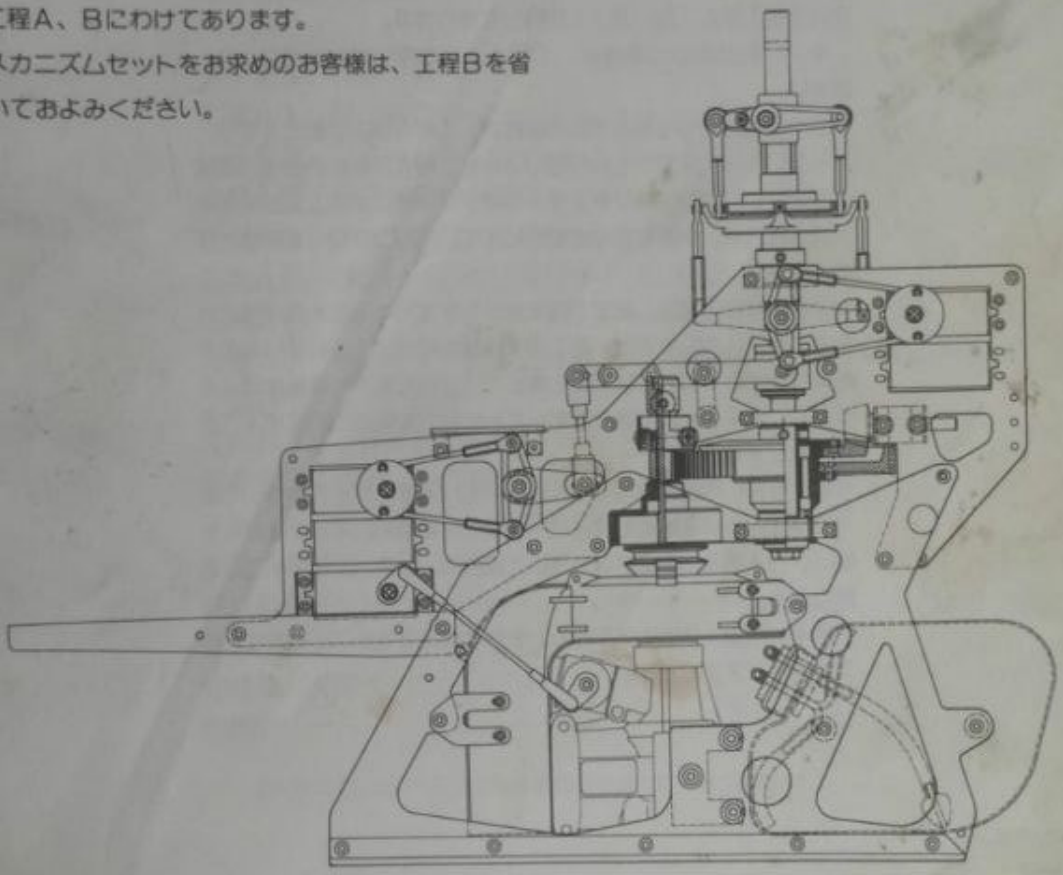
OMEGA-PRO GRAND PRIX

組立説明書

組立の前に必ずこの説明書をおよみください。
安全には十分注意して飛行を行なってください。
※本説明書はフルキット、メカニズムセットの説明を
工程A、Bにわけてあります。
メカニズムセットをお求めのお客様は、工程Bを省
いておよみください。

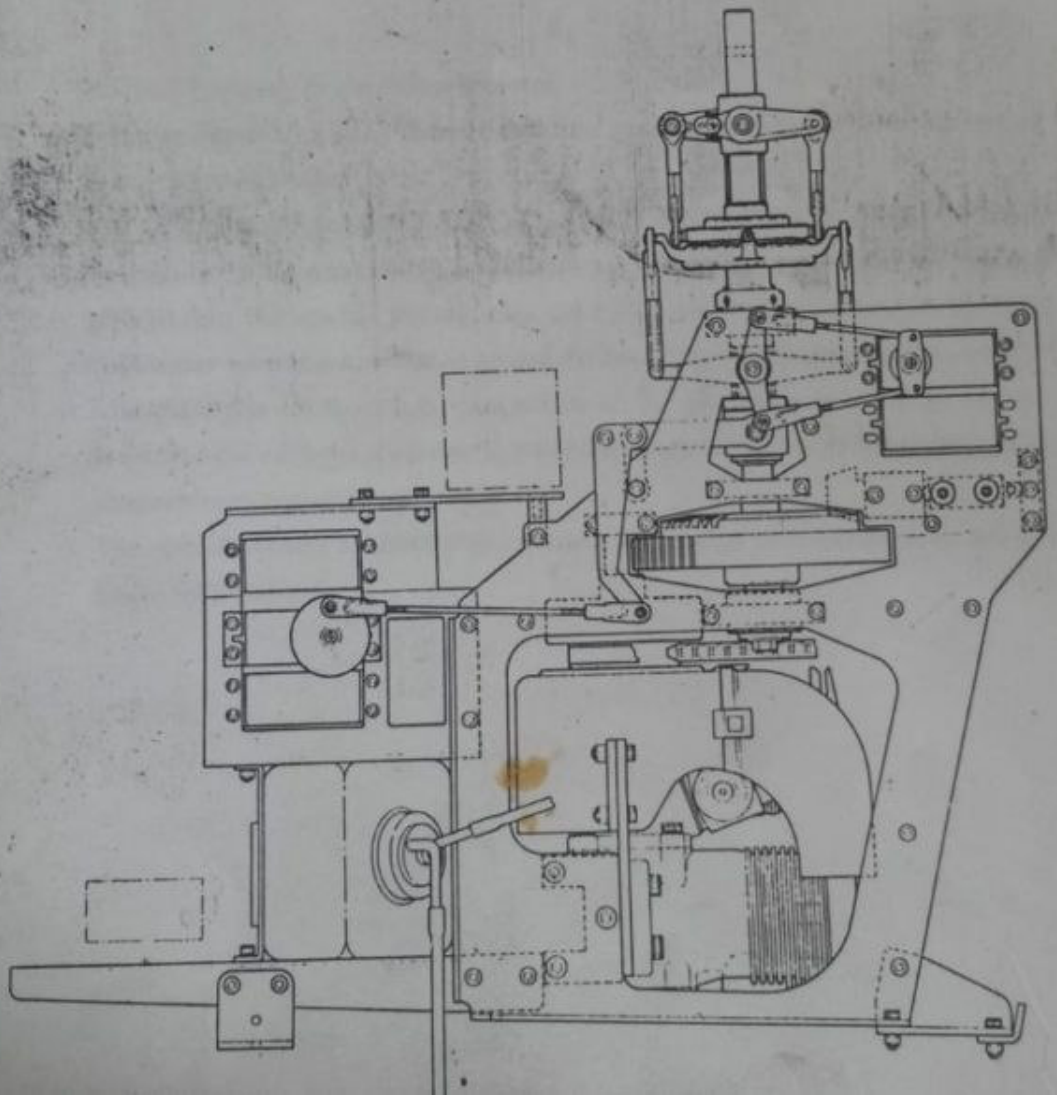


INSTRUCTION MANUAL

OMEGA

OMEGA PRO

INSTRUCTION MANUAL



Omega Professor Instruction Manual

Prior to assembly, read this instruction manual carefully. Due attention must be paid to safety when flying the helicopter.

Thank you every much for purchasing the OMEGA PROFESSOR (OMEGA PRO) kit.

To ensure correct assembly and safe operation, you are requested to read this manual carefully before assembling the craft. Please note that since the kit is intended for intermediate and advanced R/C helicopter operators, detailed explanations of flight adjustment, etc. have been omitted from the manual.

Although the contents and quantities in the kit were throughly checked before shipment, you are requested to recheck all items against the parts list prior to assembly, Should you find any parts missing, please contact your local dealer.

The specifications of this kit are subject to change without notice. All dimensions given in this manual are in millimeters.

CONTENTS

arts Required to Complete OMEGA PRO

his kit includes the basic power control mechanism for the Omega ro. In order to complete the helicopter, the following parts are equired and should be obtained separately.

Engine-related Parts

Engine	60-class helicopter engine
Muffler	Muffler matched to engine
Clutch	4-way clutch set
Cooling fan	
Cooling cover for 60-class engine	
Starting belt	

Rotor Head Parts

Rotor head	Black 10-S, FS, etc.
Main rotor blade	H, G series, etc.
Stabilizer blade	
Stabilizer bar	

Tail Parts

* Omega tail gear assembly or Kalt HG tail gear assembly

Flexible PP rod	
Tail rotor blade	Wooden tail rotor blade

Others

* Body set or Baron body, etc.

Skids (leg)	
Fuel tank	Kalt 380cc 420cc 470cc fuel tank
Fuel filter	
Silicon tube	

Parts with the above mark * differ by type used; please refer to the following for specific requirements:

* When Omega tail gear assembly is used:
  - Tail pitch housing set (with bearing)
* When Kalt HG tail gear assembly is used:
  - Tail rotor hub assembly
  - Tail pitch housing set (without bearing)
  - Tail PC plate assembly
  - Tail PC system
* When body is installed:

Body set	Jet Stream (or, 60-class bodies manufactured by Omega or Kalt)
Skids	As required by body used
Tail gear adapter	Omega (for Jet Stream)
Tail gear ring	Omega (when Kalt HG tail gear assembly is used)

* When Baron body, etc. is used:

50 Baron, Orion	
Cabin installation stay set	
Tail pipe support	For Omega OMEGA PRO only
Tail gear support	Omega (when Omega tail gear assembly is used)
Tail support set for 60-class	
Tail pipe (ℓ 800)	
Piano wire guide	
Horizontal, vertical stabilizer	
Piano wire for tail drive or pipe drive assembly	

(When piano wire is used, a tail joint set is required)

The assembly of this mechanism kit is divided into 7 steps, from frame assembly to linkage, and all steps must be correctly completed, referring to this instruction manual.
The screw sets are contained in polyethylene bags numbered by steps, and these bags should not be opened until beginning the appropriate step. Since the kit includes only the quantities necessary for assembly, correct bolts, etc. must be used, with special attention to bolt length.

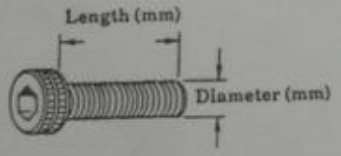
■ Hexagon Wrench

This kit includes four sizes of hex wrenches. For the cap bolts and set bolts, use the hex wrenches as shown in the following tables.

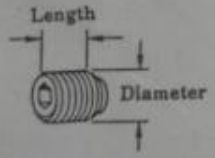
	Cap bolt	Set bolt
M3	2.5 wrench	1.5 wrench
M4	3.0 wrench	2.0 wrench

■ Bolts and Nuts

Cap Bolt



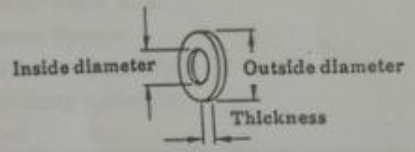
Set Bolt



(Example) M3 x 10 Cap bolt
Diameter — Length

Nylon Nut

Plate Washer



(Example) ⌀3 x ⌀10 x t1 Plate Washer
Inside diameter — Thickness
Outside diameter

Check bolt lengths against the scales provided at the bottom of each page.

■ Tools Necessary for Assembly

Hexagonal spanner (opposite side 5.5), needle-nose pliers, ⌀2 and ⌀2.6 drills, file (flat smooth cut), cyanoacrylate adhesive, etc.

■ Screw Locking

Screw-attached parts in this kit should be secured with a screw locking agent after degreasing with benzene.
Note: This does not apply where screws are driven into nylon nuts or resin materials.

No.	Item	Quantity
(Step 1)		
71001	Engine Mount	1
71002	Pinion Gear	1
71004	Bevel Pinion Gear Assembly	1 set
71007	Fan Cover Stay	2
74003	Elevator Arm Assembly	1 set
76001	Main Frame Set (left, right)	1 set
76003	Lower Cross Member	1
76004	Middle Cross Member	1
76005	End Cross Member	1
76012	Cross Member A (ℓ = 32)	3
76013	Cross Member B (ℓ = 62)	4
76018	Pinion Bearing Case Assembly	1 set
76022	Bevel Bearing Case Assembly	1 set
76025	Top Bearing Assembly	1 set
76027	Bearing Holder Assembly	1 set
(Step 2)		
74002	Pitch Servo Spacer	2
76006	Gyro Mounting Plate	1
76007	Gyro Mount B, K, T	1
76008	Servo Bed	1
76011	Front Skid Stay	2
76014	Cross Member C (ℓ = 33)	2
76015	Cross Member D (ℓ = 27)	2
76019	Subframe Set (left, right)	1 set
76021	Servo Plate Retainer	1
(Step 3)		
72001	Mast	1
72002	Master Mast	1
72003	Mast Stopper	1

No.	Item	Quantity
(Step 3)		
74008	Connecting Link	1
74009	Pitch Lever A	1
74010	Pitch Lever B Assembly	2 sets
74013	Pitch Lever Cross Member	1
74014	Pitch Lever Shaft A, B	1 ea.
74016	Pitch Lever Spacer	1
74021	Scissors Arm Assembly	1 set
74027	Rod End Body Assembly	2 sets
74037	Pitch Rod	2
(Step 4)		
71003	Main Gear	1
71008	One-way Housing Assembly	1 set
72004	Mast Bolt Washer	1 ea.
74017	Slide Ring Washer	1 set
74034	Swash Plate Assembly	1 set
76030	Thrust Washer	1
	Thrust Bearing (1810 DSG)	1 set
(Step 5)		
74005	Elevator Arm Lever	1
74007	Elevator Collar	1
74030	Tee Lever Assembly	1 set
(Step 6)		
74001	Servo Set Plate	10
(Step 7)		
74033	Rod	4
76009	Rear Skid Stay Set	1 set
76016	Upper Body Stay	2
76017	Lower Body Stay	1
76031	Upper Body Stay Extension	2

No.	Item	Quantity
(Accesso-ries)	Kalt Tight	1
	OMEGA PRO Screw Set	1 set
	OMEGA PRO Assembly Instruction Manual	1

Screw Set Contents List

Step No.	Item and Dimensions		Q'ty
1	M3 x 8	Cap Bolt	38
	M4 x 12	Cap Bolt	6
	M4 x 18	Cap Bolt	4
	⌀3 x ⌀8 x t0.5	Plate Washer	8
	⌀3 x ⌀10 x t1	Plate Washer	1
	⌀4 x ⌀10 x t0.8	Plate Washer	6
	M2.3 x 17	Fully Threaded Rod	2
	Universal Link		2
	1.5	Hex Wrench	1
	2.0	Hex Wrench	1
	2.5	Hex Wrench	1
	3.0	Hex Wrench	1
2	M2.6 x 6	Cap Bolt	4
	M3 x 8	Cap Bolt	19
	M3 x 8	Flat Head Cap Bolt	2
	M3	Nylon Nut	13
	M3 x 15	Set Bolt	2
3	M3 x 8	Cap Bolt	2
	M3 x 15	Cap Bolt	2
	M3 x 15	Cap Bolt	2
	⌀3 x ⌀4.5 x t0.5	Plate Washer	2

Step No.	Item and Dimensions		Q'ty
3	M3 x 3	Set Bolt	2
	M4 x 6	Set Bolt	4
	Universal Link		2
4	M3 x 8	Cap Bolt	2
	M3 x 40	Cap Bolt	1
	M3	Nylon Nut	1
	Super Joint Ball B (Separate bag)		1
	Ball Spacer		1
5	M3 x 8	Cap Bolt	2
	M3 x 18	Cap Bolt	1
	⌀3 x ⌀4.5 x t0.5	Plate Washer	1
	⌀3 x ⌀10 x t1	Plate Washer	2
	Super Joint Ball A (separate bag)		2
	Super Joint Ball B (separate bag)		3
6	M3 x 8	Cap Bolt	6
	M3	Nylon Nut	6
	M2.6 x 10	Cap Bolt	20
	Nylon Strap		2
7	M2.3 x 50	Fully Threaded Rod	1
	M2.3 x 70	Double-end Threaded Rod	2
	M2.3 x 85	Double-end Threaded Rod	1
	M2.3 x 110	Double-end Threaded Rod	1
	M2.3 x 130	Double-end Threaded Rod	1
	M3 x 8	Cap Bolt	2
	M3 x 12	Set Bolt	2
	M1.5	E Ring	4
	Universal Link		16
	Super Joint Ball B (separated bag)		4
	Ball Spacer		4
	M2	Nut	4

Step 1. Assembly of Main Frame

(See Fig. 1 and 2)

1 Secure the universal link to the elevator arm assembly using the threaded rods M2.3 x 17.

[M2.3 x 17 Fully Threaded Rod ..... 2]
[Universal Link ..... 2]

2 Insert the longer shaft of the elevator arm assembly in the left frame and the shorter shaft in the bearing hole of the right frame, both from the inside.

3 Install the clutch bell (sold separately) on the longer shaft of the pinion gear, and insert the shorter shaft of the pinion gear into pinion bearing case assembly, referring to Fig. 1 below for the proper direction. Tighten the cap bolts M3 x 8 using plate washers ⌀3 x ⌀10 x t1.

[M3 x 8 Cap Bolt ..... 1]
[⌀3 x ⌀10 x t1 Plate Washer ..... 1]

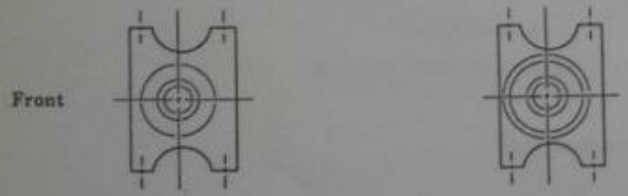


Fig. 1

Note: Install on the frame after checking for proper front and rear positioning and temporarily tighten using cap bolts M3 x 8 and plate washer ⌀3 x ⌀8 x t0.5.

[M3 x 8 Cap Bolt ..... 4]
[⌀3 x ⌀8 x t0.5 Plate Washer ..... 4]

4 Glue the bevel pinion gear assembly shaft to the bearing in the bevel pinion bearing case using the screw locking agent. Install the bevel pinion bearing case assembly on the frame and temporarily tighten using cap bolt M3 x 8 and plate washer ⌀3 x ⌀8 x t0.5.

[M3 x 8 Cap Bolt ..... 4]
[⌀3 x ⌀8 x t0.5 Plate Washer ..... 4]

5 Attach the cooling fan and clutch(sold separately)to the engine, and then install the engine on the engine mount, passing cap bolts M4 x 18 through the fan cover stays. Temporarily secure the engine between the main frames using cap bolts M4 x 12 and plate washers ⌀4 x ⌀10 x t0.8. Do not forget to install the starting belt (sold separately).

[M4 x 12 Cap Bolt ..... 6]
[M4 x 18 Cap Bolt ..... 4]
[⌀4 x ⌀10 x t0.8 Plate Washer ..... 6]

6 Attach the remaining parts shown in Fig. 2 to the frame and temporarily tighten using cap bolts M3 x8. When all parts are installed, remove cap bolts M3 x 8 one by one, apply screw locking agent to each, and then retighten. It is advisable to mark each cap bolt as it is retightened ensure that all bolts are properly installed.

[M3 x 8 Cap Bolt ..... 29]

Note: The parts in 3, 4 and 5 above should be left temporarily tightened.

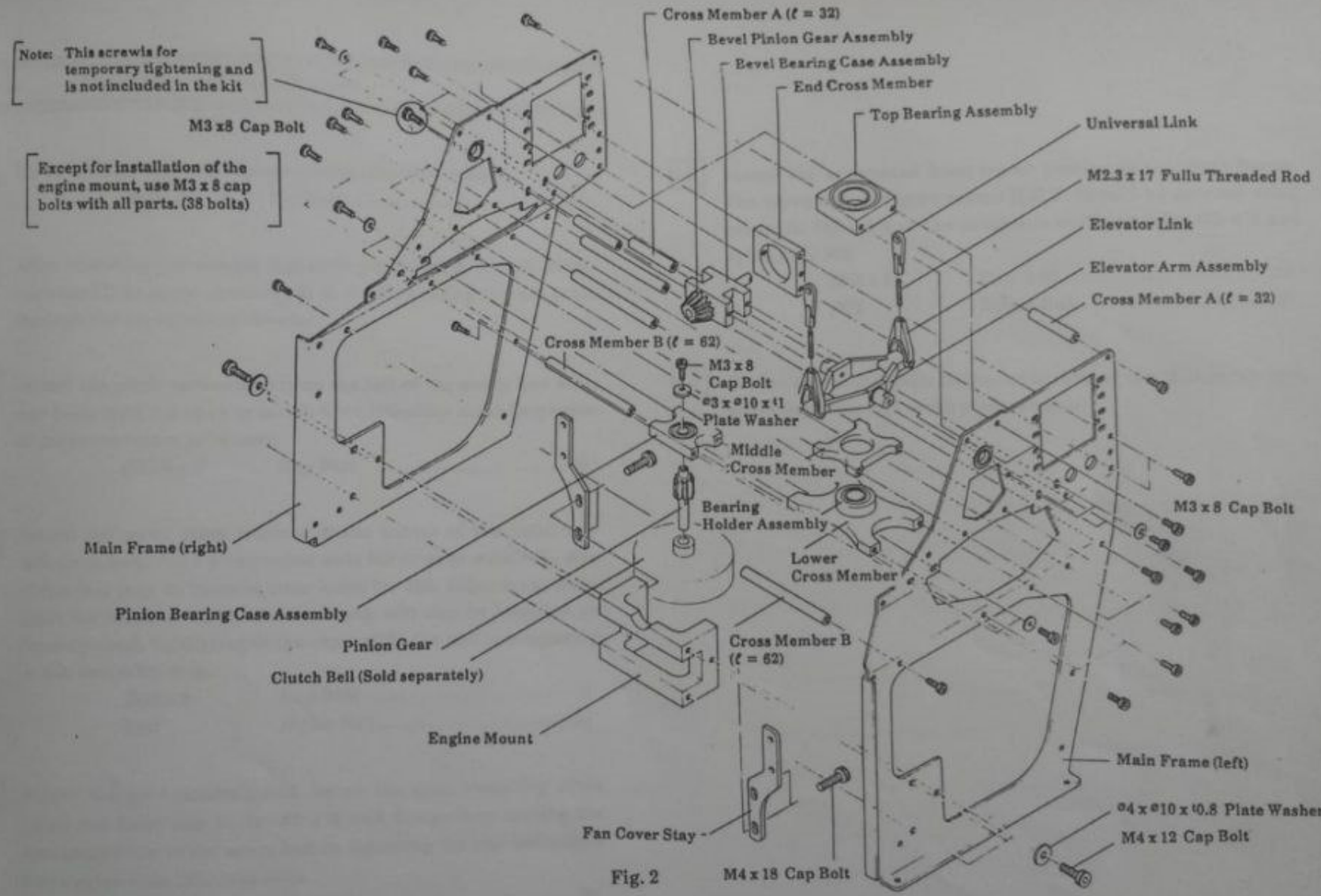

Note: This screw is for temporary tightening and is not included in the kit
M3 x 8 Cap Bolt
Except for installation of the engine mount, use M3 x 8 cap bolts with all parts. (38 bolts)
Cross Member A (ℓ = 32)
Bevel Pinion Gear Assembly
Bevel Bearing Case Assembly
End Cross Member
Top Bearing Assembly
Universal Link
M2.3 x 17 Fullu Threaded Rod
Elevator Link
Elevator Arm Assembly
Cross Member A (ℓ = 32)
Cross Member B (ℓ = 62)
M3 x 8 Cap Bolt
ø3 x ø10 x t1 Plate Washer
Middle Cross Member
Bearing Holder Assembly
Lower Cross Member
M3 x 8 Cap Bolt
Main Frame (right)
Pinion Bearing Case Assembly
Pinion Gear
Clutch Bell (Sold separately)
Engine Mount
Cross Member B (ℓ = 62)
Main Frame (left)
ø4 x ø10 x t0.8 Plate Washer
M4 x 12 Cap Bolt
Fan Cover Stay
M4 x 18 Cap Bolt

Fig. 2

Step 2. Assembly of Front Frame

7 Screw set bolts M3 x 15 into cross members C (ℓ = 33)

[M3 x 15 Set Bolt ..... 2]

8 After checking for proper right-left positioning, attach cross members C to cross members D (ℓ = 27), passing the set bolts through the servo bed as shown.

9 Install the pitch servo spacers on the left of the servo bed with cap bolts M2.6 x 6 so as to match the widthofthe mounting holes of the servo motor to be used.

[M2.6 x 6 Cap Bolt ..... 4]

10 Install the servo plate retainer at the center of the subframe using cap bolts M3 x 8 and nylon nuts M3 so as to match the size of the fuel tank to be used (rear holes for 380, 420cc tank; front holes for 470cc tank). As the fuel tank will also be installed on the servo bed, tightening of the cap bolt in the slot is temporary in this assembly step.

[M3 x 8 Cap Bolt ..... 7]
[M3 Nylon Nut ..... 7]

11 Attach the gyro mount B.K.T. below the gyro mounting plate using flat head cap bolts M3 x 8 and temporary secure the mounting plate to the servo bed by tightning the cap bolts M3 x 8 and nylon nuts M3 at the slots.

[M3 x 8 Cap Bolt ..... 2]
[M3 x 8 Flat Head Cap Bolt ..... 2]
[M3 Nylon Nut ..... 2]

12 Install the assembled front frame portion in the main frame. The servo bed and gyro mount B.K.T. should be secured using cap bolts M3 x 8 and the subframe with cap bolts M3 x 8 and nylon nuts M3.

[M3 x 8 Cap Bolt ..... 10]
[M3 Nylon Nut ..... 4]

13 Secure the temporarily tightened screws at the slots in the gyro mounting plate and servo plate retainer.

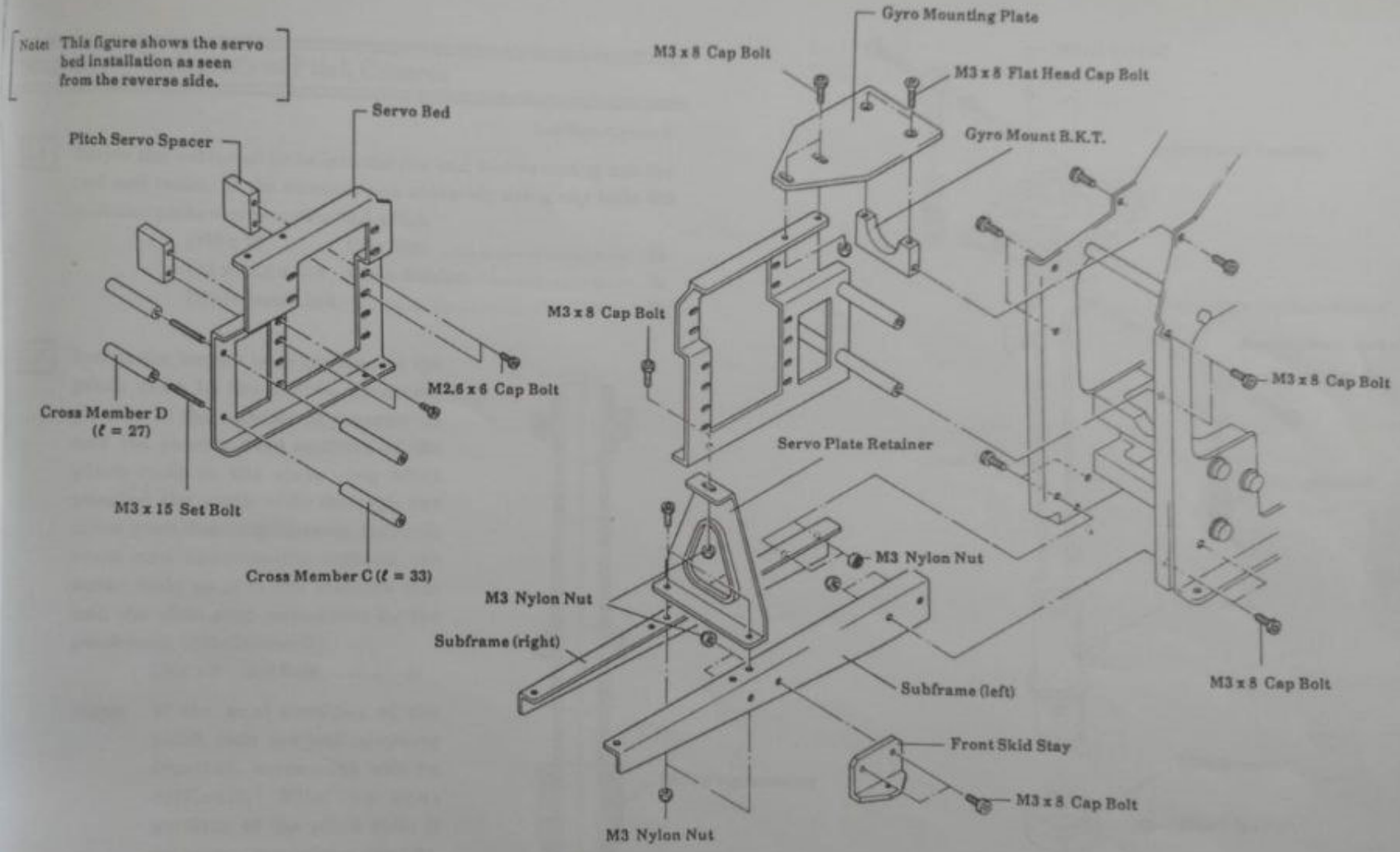

Note: This figure shows the servo bed installation as seen from the reverse side.
Servo Bed
Pitch Servo Spacer
M2.6 x 6 Cap Bolt
Cross Member D (ℓ = 27)
M3 x 15 Set Bolt
Cross Member C (ℓ = 33)
Gyro Mounting Plate
M3 x 8 Cap Bolt
M3 x 8 Flat Head Cap Bolt
Gyro Mount B.K.T.
M3 x 8 Cap Bolt
M3 x 8 Cap Bolt
Servo Plate Retainer
M3 Nylon Nut
M3 Nylon Nut
Subframe (right)
Subframe (left)
M3 x 8 Cap Bolt
Front Skid Stay
M3 x 8 Cap Bolt
M3 Nylon Nut

Fig. 3

Step 3. Assembly of Pitch Control

(see Figs. 4, 5 and 6)

14 Screw the universal links into the rod end bodies and attach the rod end bodies to the scissors arm assembly using cap bolts M3 x 15 and plate washers ø3 x ø4.5 x t0.5.

[M3 x 15 Cap Bolt ..... 2]
[ø3 x ø4.5 x t0.5 Plate Washer ..... 2]
[Universal Link ..... 2]

15 Insert the longer bent sections of the pitch rods in the inside diameter portion of the scissors arm assembly and the shorter bent sections of the pitch rods in the slide ring after passing the pitch rods through the outer mast. Insert the mast in the outer mast and temporarily tighten the outer mast so that the scissors arm and the slide ring, connected by the pitch rods, will slide easily.

[M4 x 6 Set Bolt ..... 4]

Note: If the bent portions of the pitch rods are not properly inserted, movement will be difficult. File the bent portions of the pitch rods if necessary to ensure a good fit. Recheck the sliding action after tightening set bolts M3 x 3 to scure the pitch rods.

[M3 x 3 Set Bolt ..... 2]

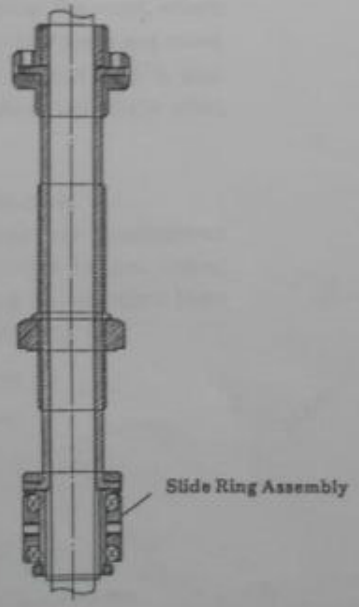


Fig. 4

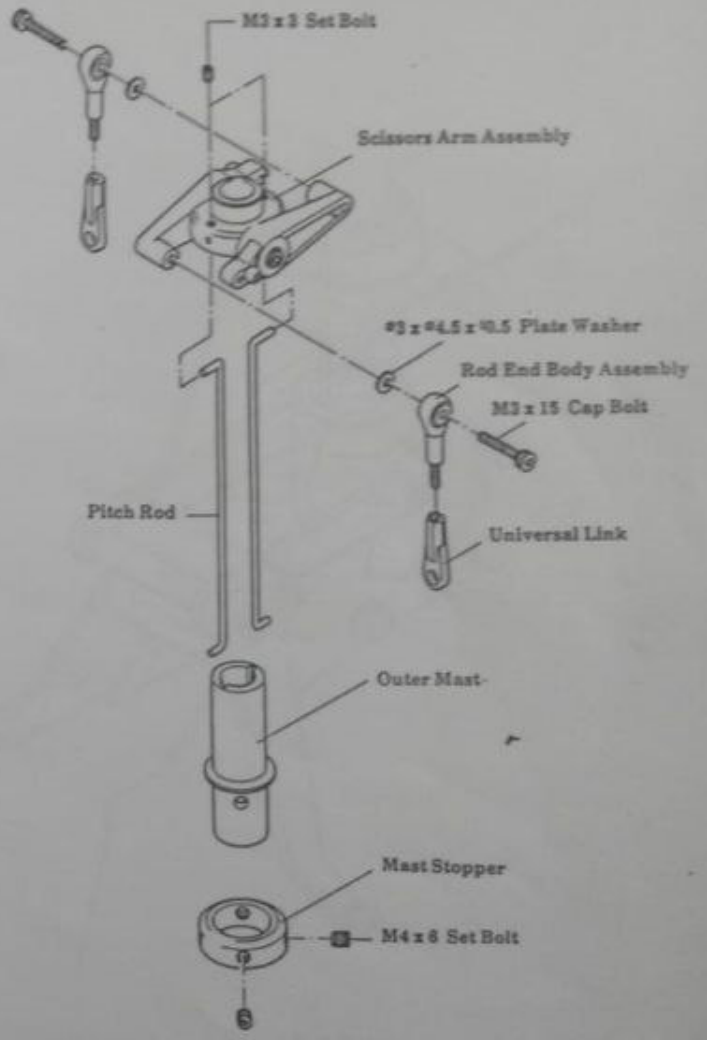


Fig. 5

16 In assembly the pitch leaver, do not mistake shaft B,which is passed trough the connecting link, the for the aluminium cross member. Note that shaft B is of polished steel. (See Fig. 6)

[M3 x 8 Cap Bolt ..... 2]
[M3 x 15 Cap Bolt ..... 2]

Step 4. Assembly of Mast-related Mechanism

(See Fig. 7 & 8)

17 Before tightening the mast bolt at the bottom of the mast, check the operation of the assembled pitch lever. If it does not move easily, remove the mast referring again to Figs. 4 and 5, and correct the inclination and right-or-left dislocation of the slide ring assembly.

18 Install the thrust bearing at the bottom of the mast.

Note: The thrust bearing must be properly positioned vertically. The upper side has the larger inner diameter, while the under side has the amaller innu diameter and is marked as pictured in Fig. 8.

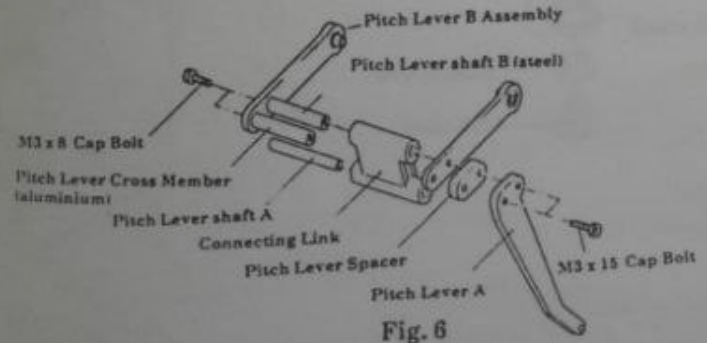


Fig. 6

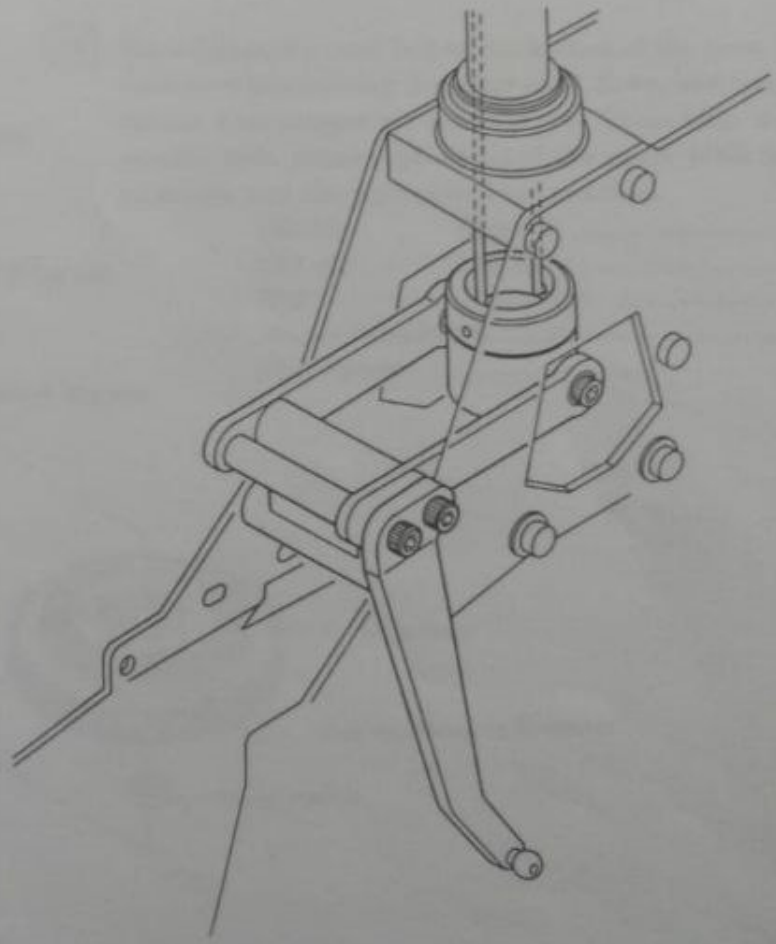


Fig. 7

20 Adjust the gear engagement. Turn the main gear to check for proper engagement at all points around the gear mechanism. The gear should turn smoothly. After checking, secure the bevel bearing case assembly and the pinion bearing case assembly. Then align the center of the pinion gear shaft and the center of the engine crank shaft and secure the engine mount.

Step 5. Assembly of Elevater leaver and Tee Lever

(See Fig. 9)

21 Attach the elevator lever to the left side of the elevator arm shaft, and fix and lock the right side shaft.

Note: Although the elevator lever installation hole is slightly tight, correction should be limited to burr removal. After partial attachment, use the cap bolt M3 x 8 to filly secure the lever.

[M3 x 8 Cap Bolt ..... 2]
[ø3 x ø10 x t1 Plate Washer ..... 2]
[Super Joint Ball A ..... 2]

22 Attach the tee lever to the side of the frame, making sure to use plate washer ø3 x ø4.5 x t0.5 as shown in Fig. 9.

[M3 x 18 Cap Bolt ..... 1]
[ø3 x ø4.5 x t0.5 Plate Washer ..... 1]
[Super Joint Ball B ..... 3]

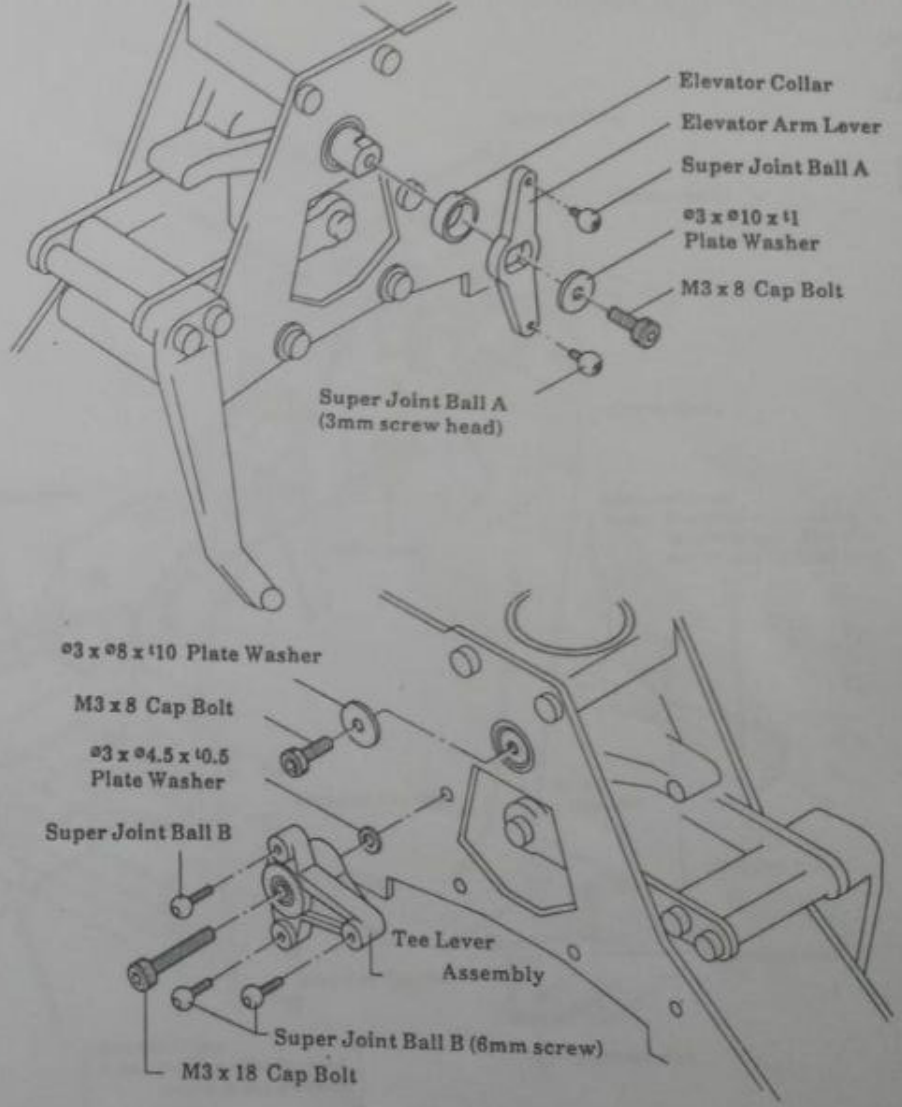


Fig. 9

Step 6. Mounting of Servo Motors

(see Figs. 10)

23 Install the aileron servo and elevator servo inside the frame.

Note: Installation will be easier if the servo set plate is glued in advance to the rubber servo installation section, using cyanoacrylate adhesive.

[M2.6 x 10 Cap Bolt ..... 8]

24 The aileron and elevator servo cords should be wired forward through the frame.

Note: Care must be taken to avoid contact of the cords and moving parts such as the gear mechanism.

[Nylon Strap ..... 2]

- For installation of the rear skid stay:

[M3 x 8 Cap Bolt ..... 4]
[M3 Nylon Nut ..... 4]

- For installation of the lower body stay:

[M3 x 8 Cap Bolt ..... 2]
[M3 Nylon Nut ..... 2]

25 The rudder, pitch, and throttle servos on the front servo bed should all have their output shafts to the rear. Only with the servo set plate of the pitch servo should through holes, of 2.6, be drilled for screw M2.6.

[M2.6 x 10 Cap Bolt ..... 12]

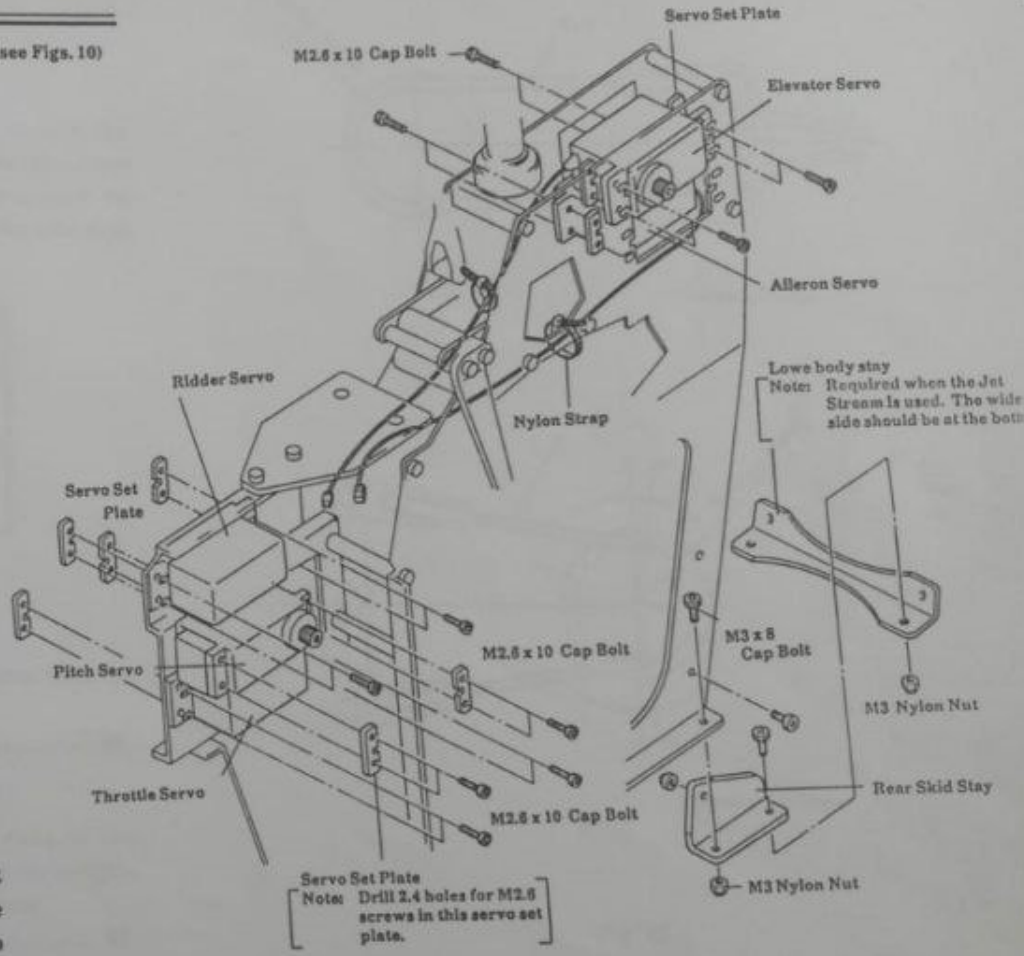


Fig. 10

Step 7. Linkage

(see Figs. 12 and 13)

26 Make holes in the servo horn for the aileron and elevator linkages, using the gauge film provided, as shown in Fig. 11.

a. with the receiver and transmitter switched on and the servo in the neutral position (and the transmitter trim lever also in the neutral position), apply the gauge film, mark on the gauge film with a scriber or compasses needle, and drill holes where indicated using a 2 drill.

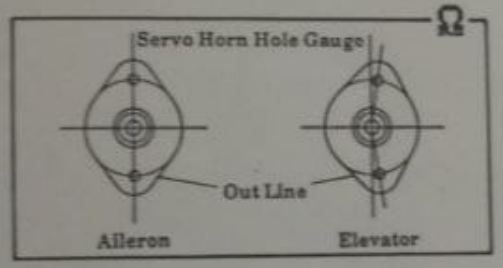


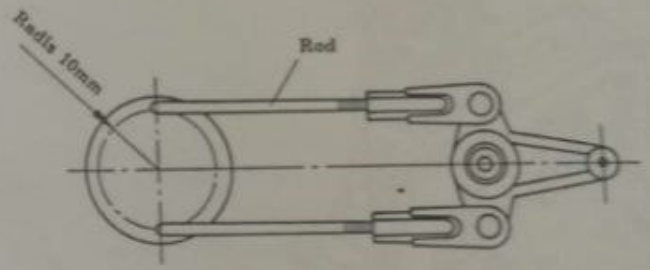
Fig. 11

b. After drilling holes, insert the rods in the servo horn as outline and secure with E rings.

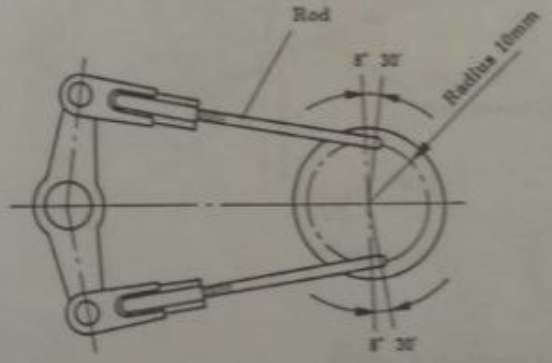
[M1.5 E Ring ..... 4]

c. Attach the universal links so that the two rods of the aileron and those of the elevator are equal in length. Install the universal links on the balls of each lever.

[Universal Link ..... 4]

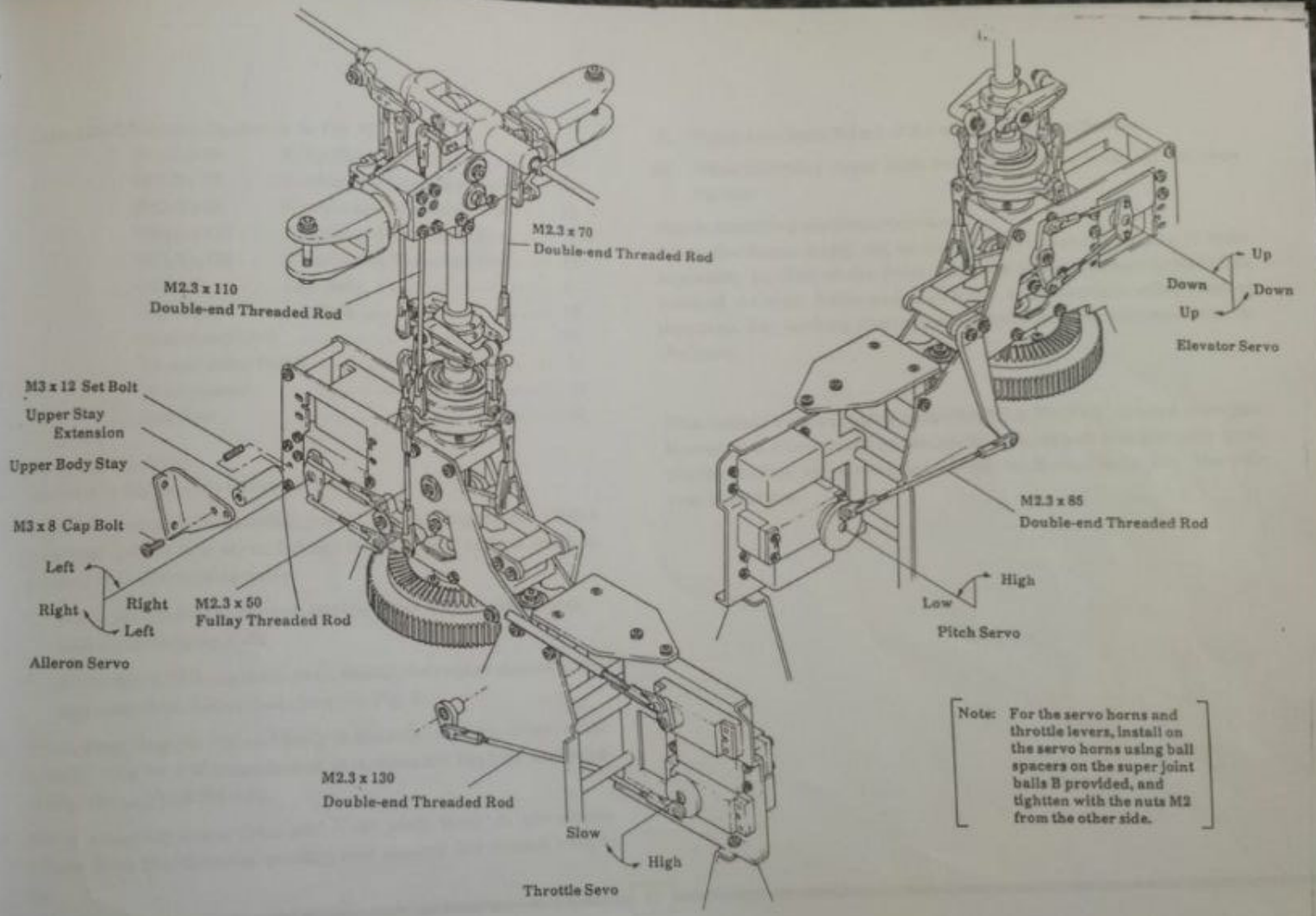


Aileron Linkage



Elevator Linkage

Fig. 12



Note: For the servo horns and throttle levers, install on the servo horns using ball spacers on the super joint balls B provided, and tighttен with the nuts M2 from the other side.

27 Connectail linkages as shown in Fig. 13.

[M2.3 x 50	Fully Threaded Rod	1]
[M2.3 x 70	Double-end Threaded Rod ...	2]
[M2.3 x 85	Double-end Threaded Rod ...	1]
[M2.3 x 110	Double-end Threaded Rod ...	1]
[M2.3 x 130	Double-end Threaded Rod ...	1]
[M3 x 8	Cap Bolt	2]
[M3 x 12	Set Bolt	2]
[Universal Link	.....	12]
[Super Joint Ball B	.....	4]
[Ball spacer	.....	4]
[M2 Nut	.....	4]

(General Assembly Tips)

(1) Do not overtighten the universal link.

(2) Before the engine is installed, install the cooling cover. Make sure that the throttle servo linkage rod in step 7 cannot come in contact with the cooling cover.

- When the YS engine is used, use the drive washer (thin type) sold separately by Kalt.
- When the ENYA engine is used, install the engine mount in the opposite direction to that shown in Fig. 2.

(3) When attaching the rod end body to the scissors arm, insert plate washer ⌀3 x ⌀4 x t0.5 (contained in a separate bag) on the head side of the cap bolt M3 x 15.

(4) When attaching super joint ball B on pitch lever A, cut about 1.5mm from the threaded portion and smooth the cutend with a ile.

(5) Tighten set bolts M4 x 6 of the mast stopper uniformly.

(6) When installing super joint ball B on the tee lever, do not overtighten.

Tips in Installing the Undercarriage

When the Baron body, etc. is used, insert cross members D (sold separately by Kalt at the front and rear undercarriage installation holes of the main frame and install the undercarriage using landing dampers. Use landing dampers when installing the undercarriage on the body.

This complete the assembly of the OMEGA PRO kit. If the mechanism is used with a body such as the Jet Stream, attach it to the body using the installation stays provided. With the Baron body, etc. Use only vear skid stays.

If any of the parts of the kit are missing, please contact your local dealer before starting assembly. Should any parts included in the kit be defective, please contact this company directly before operating the helicopter. Any defective parts will be replaced. Please note that the manufacturer cannot accept any responsibility for accidents which may occur during or result from operation of the helicopter due to the operator's failure to comply with the above request or due to errors in this manual and its drawings.

Main Specifications of OMEGA PRO

Main Rotor Diameter	1540 mm ~ 1580mm
Revolution Ratio (engine : Main : tail)	9.78:1:5.52
Engine	Class 60
R/C Equipment	5 channels