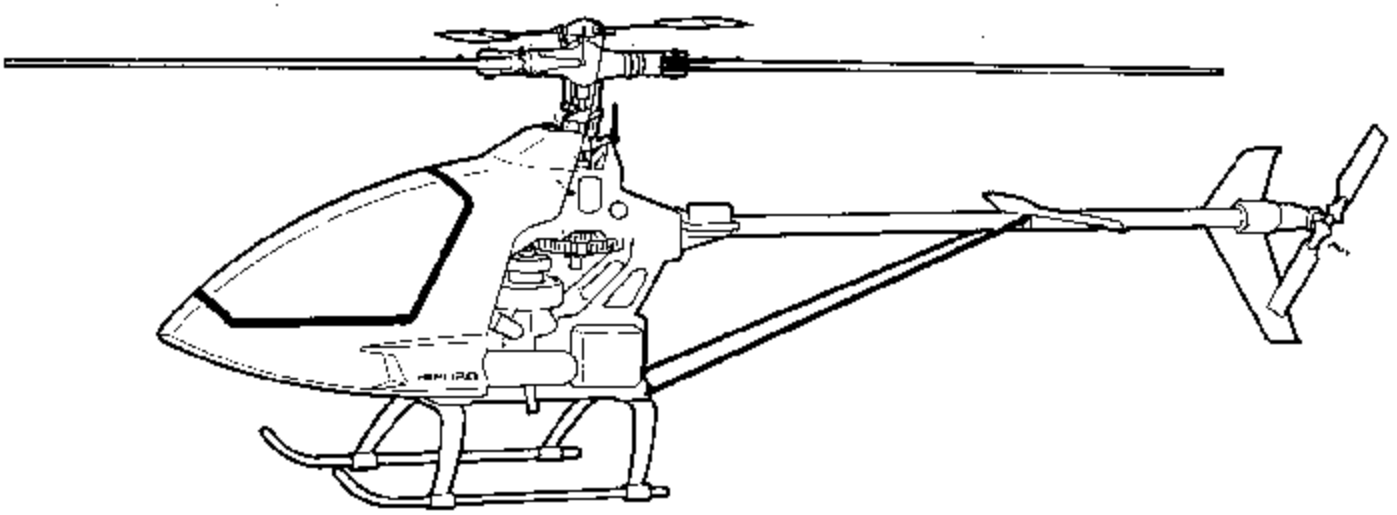
HIROBO

TSURUGI

ASSEMBLY & MAINTENANCE MANUAL



TECHNICAL DATA

Technical data	
Main rotor diameter	1,523mm (60.0 inch)
Tail rotor diameter	275mm (11.0 inch)
Body length	1,330mm (52.3 inch)
Weight (when fully equipped)	4,350g (9.57 lbs)
Engine	For 60~61
Most appropriate radio to use	5ch radio for helicopter with 5-servo

MADE IN JAPAN

Introduction

剣 TSURUGI

We thank you very much for buying "Tsurugi". This is our ultimate R/C frame helicopter, into which Hirobo has poured all the know-how it has accumulated over ten years. So we named this very fundamental, boundlessly potential product of ours "Tsurugi", which means "Sword" in Japanese. This helicopter is designed so that anyone can operate it to make the most of its performance.

However, any complicated piece of machinery like "Tsurugi" can be very dangerous if improperly assembled. So please read this explanatory pamphlet thoroughly and make sure that you fully understand all instructions before you begin assembly.

In addition, please confirm that all parts are included as listed on the parts list before starting.

It is not the policy or practice of Hirobo to exchange or return parts after the package has been opened.

In case you discover any parts that might be defective or missing, please contact the retailer who sold you the product, get their signature on your Customer's Card and contact Hirobo's Sales Dept. with a description of the problem parts.

※ When making inquiries by telephone, please let us know the Handling No.

Technical data	
Main rotor diameter	1,523mm (60.0 inch)
Tail rotor diameter	275mm (11.0 inch)
Body length	1,330mm (52.3 inch)
Weight (when fully equipped)	4,350g (9.57 lbs) The weight may vary a little with the weight of mounted servo or the battery, etc.
Engine	For 60~61
Most appropriate radio to use	5ch radio for helicopter with 5-servo

Contents

Caution

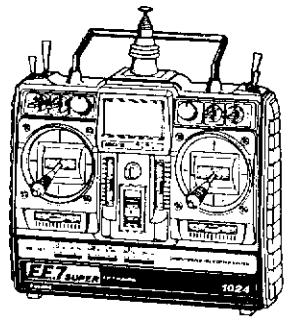
Please pay attention to the following warnings.

* Please bear in mind that helicopter's rotor is very dangerous because it rotates at a high speed.
* Fly your helicopter only where there are no other people around.
* While operating, you must be accompanied by someone who has had some experience with remote control helicopters.
* Radio waves reach a one-kilometer-distance. Please make sure that there is no one operating on R/C within your area of flight. (The same radio waves will cause interference unless you keep a minimum distance of two kilometers from other helicopter operators.)

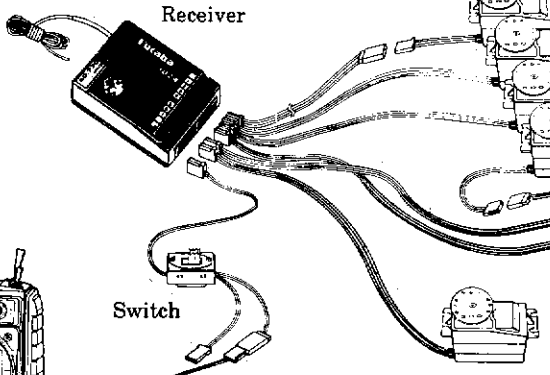
Necessary items not included in the "Tsurugi" kit (Not included)

In order to operate this machine you need to provide for the following items. (Not included)

① Radio set



Transmitter



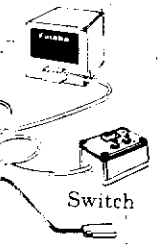
Receiver

Servo

Switch

Ni-cd battery

② Gyro



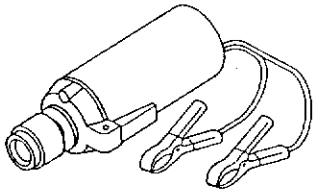
Gyro

Switch

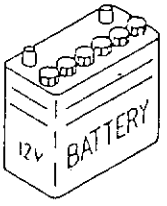
Control amp

③ Starter shaft 0404-403 ¥2,000

④ Engine starter



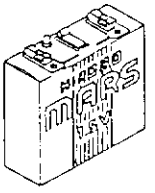
⑤ 12V battery for engine starter



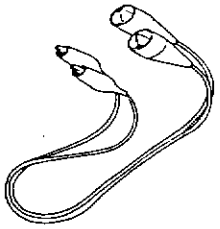
Battery

⑥ Battery for engine plug heat

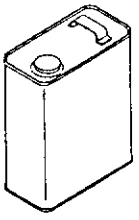
2401-004 ¥1,400



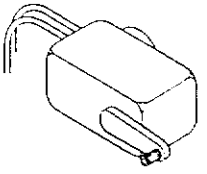
⑦ Plug booster cord



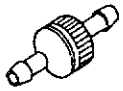
⑧ Fuel for model



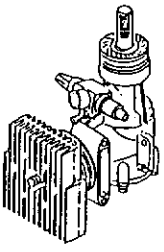
⑨ Fuel pump



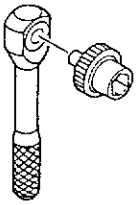
⑩ Fuel filter



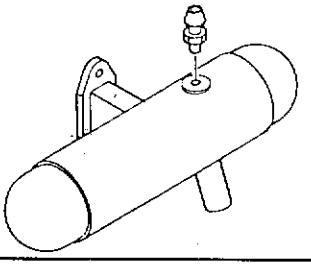
⑪ Engine 60~61 class



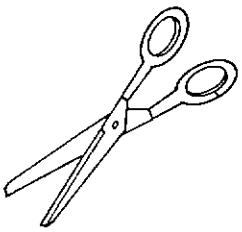
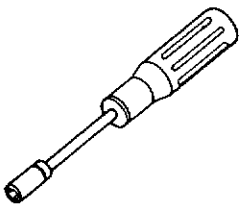
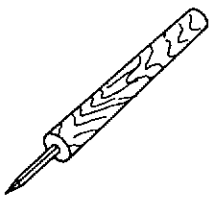
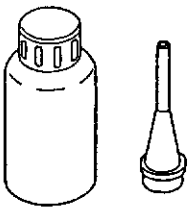
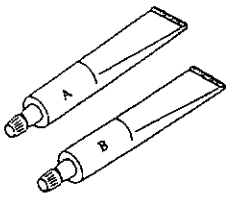
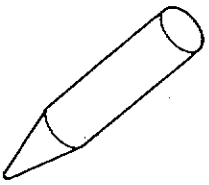
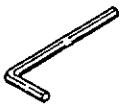
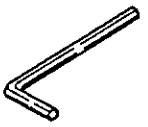
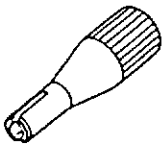
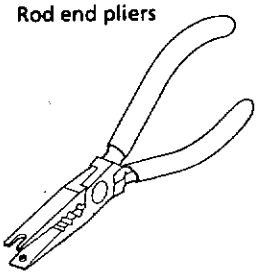
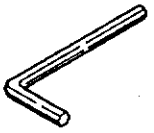
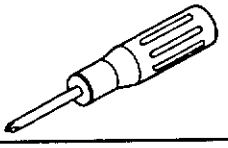
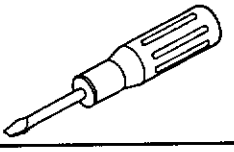
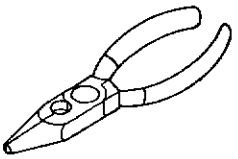
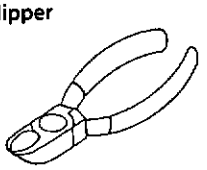
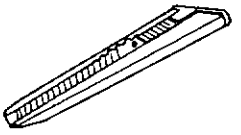
⑫ Plug wrench 2513-025 ¥2,500 2513-026 ¥1,000



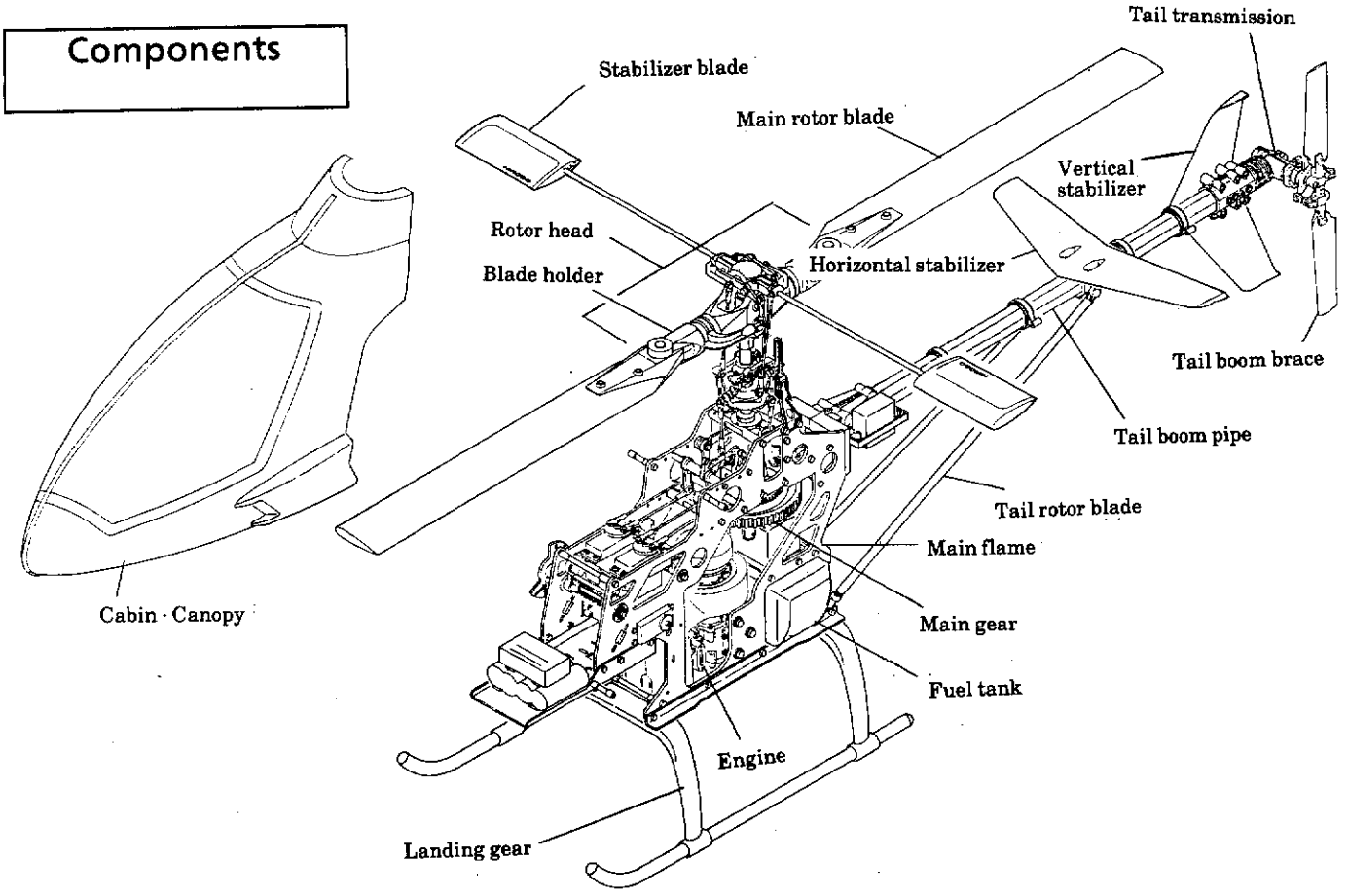
⑬ Muffler 0404-340 (For OS) 0404-341 (For YS) (For ENYA)



Tools necessary for assembly

Scissors 	5.5mm box driver for M3 	Cross gimlet 	Hobby oil 	Quick-drying glue 
Epoxy adhesive 	Parts tray  2513-023 ¥600	L-type wrench 1.5mm 	L-type wrench 2.0mm 	L-type wrench 2.5mm 
Rod end driver  2513-024 ¥600	Rod end pliers  2513-027 ¥3,200	L-type wrench 3.0mm 	Screwdriver plus large and medium 	Screwdriver minus medium 
		Needle nose plier 	Nipper 	Cutter knife 

Components

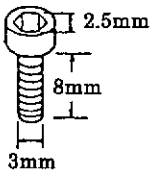


Screws & reading sizes

Symbols used in this explanatory pamphlet are indicated as follows.

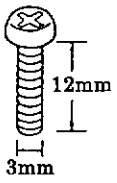
- Unit of measurement-millimeters.

1 Cap screw — indication CS



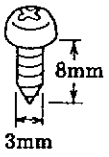
M3×8CS
Screw diameter / Screw length

2 Pan-head screw — indication PH



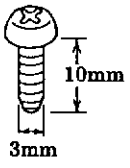
M3×12PH
Screw diameter / Screw length

3 Tapping screw 1 — indication TS-1



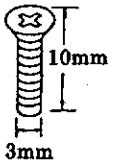
M3×8TS-1
Screw diameter / Screw length

4 Tapping screw 2 — indication TS-2



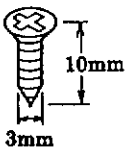
M3×10TS-2
Screw diameter / Screw length

5 Flush-head screw — indication CSS



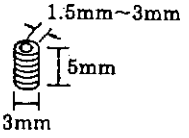
M3×10 flush-head screw
Screw diameter / Screw length

6 Flush-head tapping screw — indication CTS



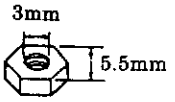
M3×10 flush-head TS
Screw diameter / Screw length

7 Set screw — indication SS



M3×5SS
Screw diameter / Screw length

8 Nut — indication Nut

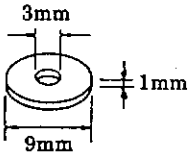


M3 nut
Screw diameter

9 Nylon nut — indication Nylon nut

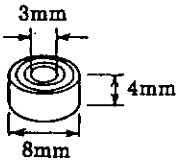
M3 nylon nut
Screw diameter

10 Flat washer — indication FW



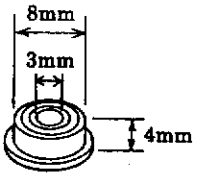
ø3×9×1FW
Inner diameter / Outer diameter / Thickness

11 Bearing (straight) — indication Bearing



Brg. 3×8×4
Inner diameter / Outer diameter / Full length

12 Bearing (w/flange) — indication Bearing F

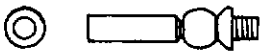


Brg. 3×8×4F
Inner diameter / Outer diameter / Full length

Pivot bolt (D)

Pivot bolt (E)

ø5 ball radius pin

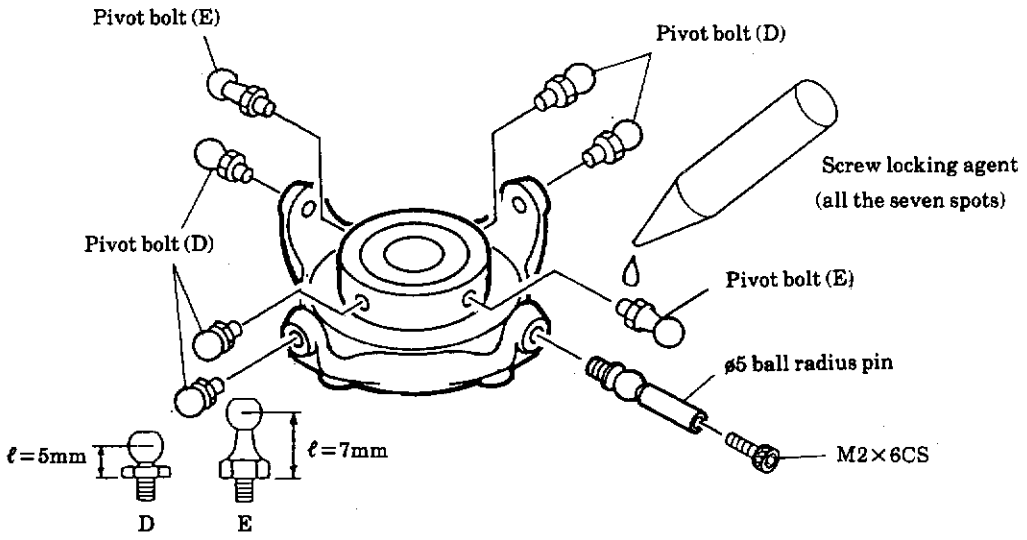


M2×6CS

2 Swash plate assembly

- Install pivot bolt (D) and pivot volt (E) to the swash plate body.

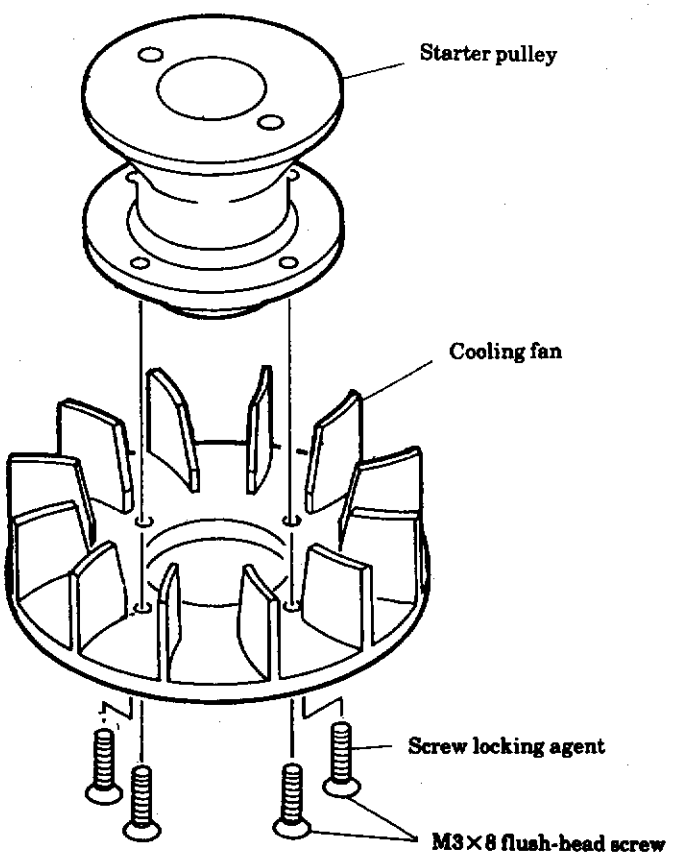
  Note: When there is a difficulty in mounting pivot volts, tie them them with M3CS etc.



3 Assembly of cooling fan and starter pulley

- Install cooling fan to starter pulley with M3×8 flush-head screw. (Screw locking agent must be used.)

M3×8 flush-head screw



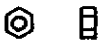
4 Engine assembly

M4×10CS

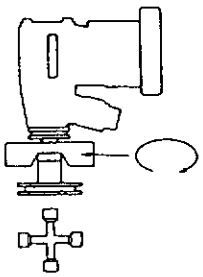
ø5 ball

M2×8PH

M2 nut



M4×15CS



Fix with vice, etc.

① Remove drive washer and key which is attached to engine.

② Put tapered collar, starter pulley and starter pulley washer on engine axis and fasten them with drive nut (lock-tight) which is part of the engine component.

Note: There are three different kinds of starter pulley washers. Use the one which fits engine axis.

③ Install clutch shoe with M3×10CS.

④ Install ø5 ball to throttle lever with M2×8CS and M2 nut.

⑤ Install engine mount with M4×15CS (temporarily).

Note: The engine blocks must be mounted on their correct positions. (See Dwg ①. The engine block with mark ○ is mounted in the right side to the engine shaft.)

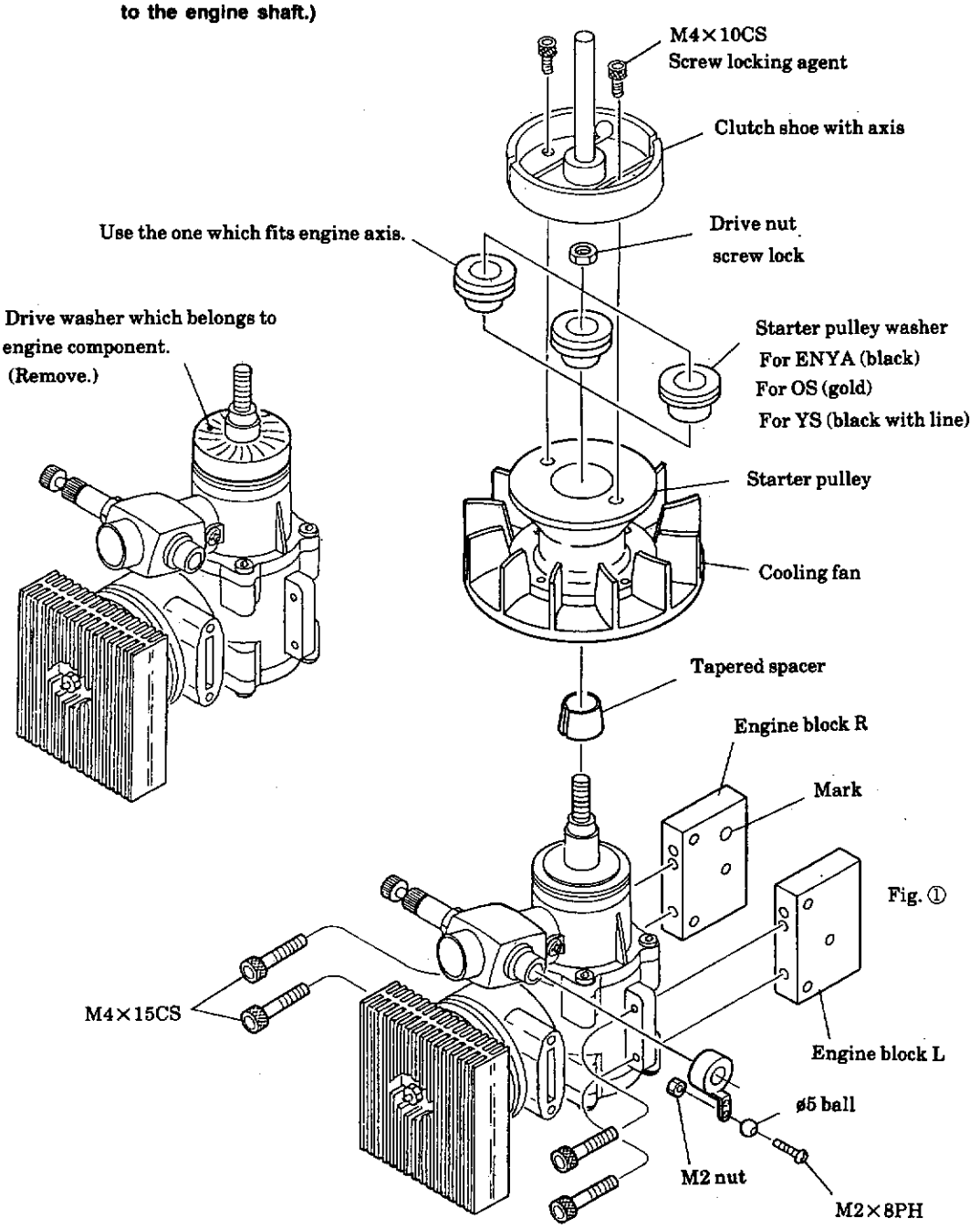
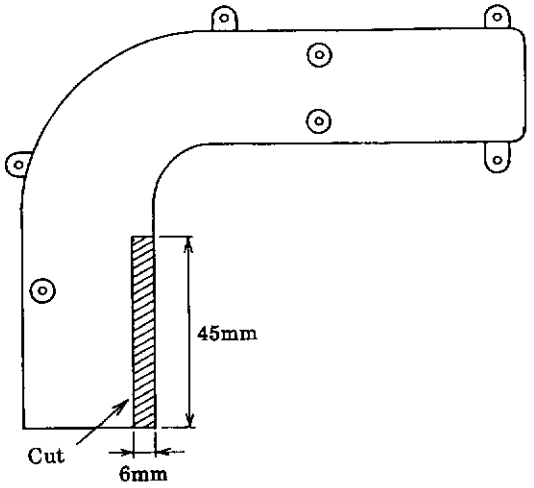


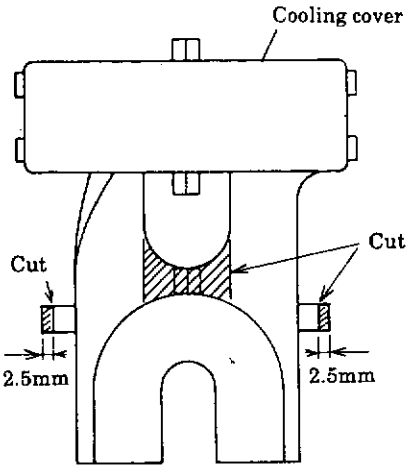
Fig. ①

5 Installation of cooling cover

① Cut the cooling cover of the engine carburetor as shown below.

② Cut cooling cover at its R and L boss areas by 2.5mm.

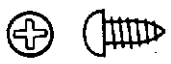


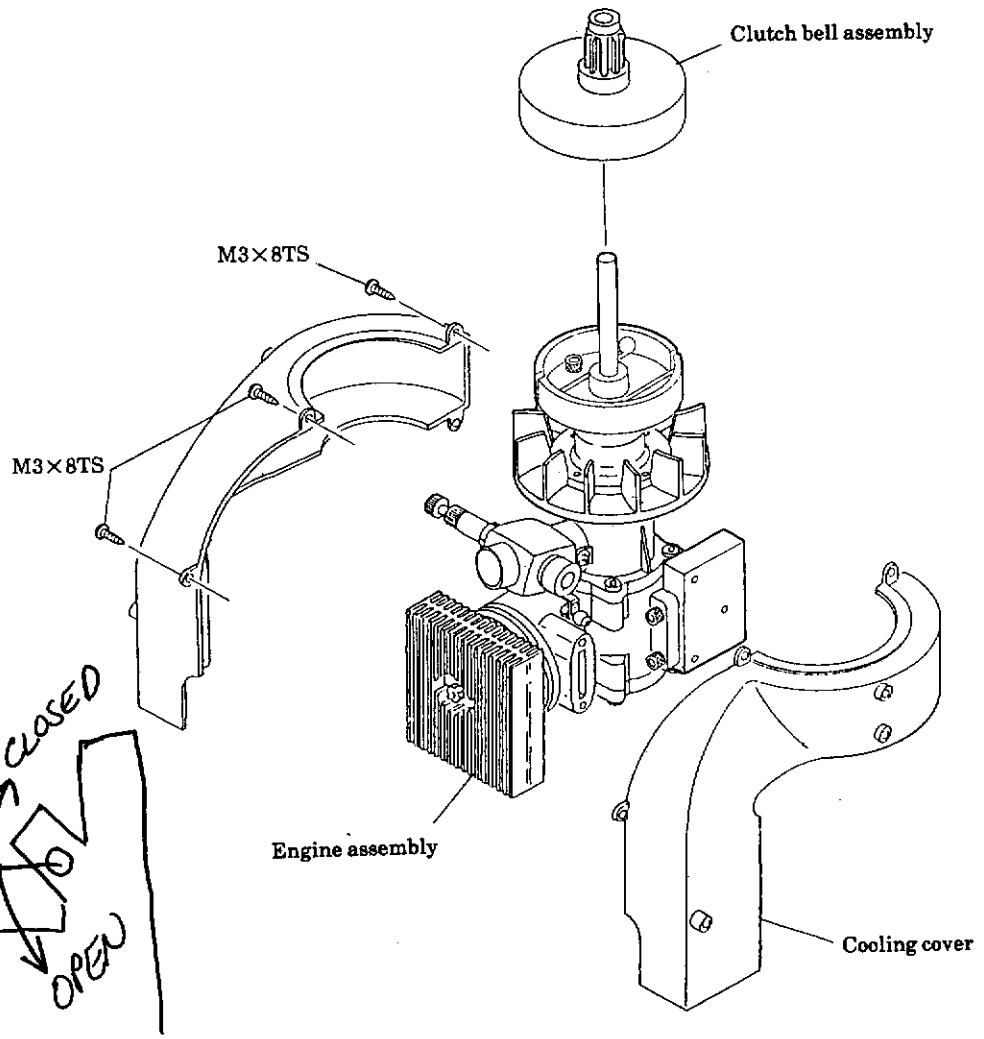


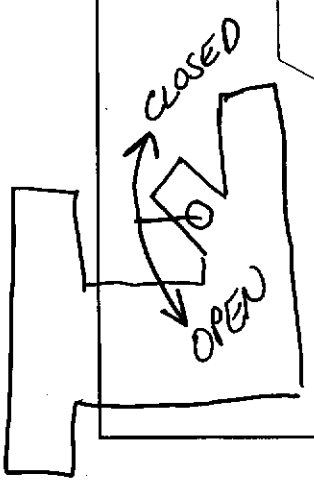
(Note) When the 0404-340 or 0404-341 HIROBO muffler is used, cut away the shaded portion of the cooling cover.

③ Install cooling cover with M3×8TS.

M3×8TS







Code No.	Particulars	Q'ty	Price	Freight charge	Remarks
0402-216	Tail housing Assy	1			
0402-217	Tail housing	1 set			
0403-025	JJ-25 tail blade holder (A)(B)	2 for each			
0404-314	Gear with shaft	1			
0404-315	Tail second shaft	1			
0404-316	ø5 miter gear	1			
0404-318	Tail pitch lever (A.B)	1 for each			
0404-320	Tail pitch plate set	1			
0404-321	Tail pitch plate	1			
0404-322	Tail pitch plate boss	1 set			
0404-336	Tail joint ø2	1			
0404-518	Tail gear case	1			
0404-519	Tail drive guide set	1			
0404-538	Tail rotor blade	2			
2500-033	Brg. ø6×ø12×4F ZZ	2			
2500-057	Brg. ø3×ø6×2.5F ZZ	2			
2500-062	Bearing ø4×ø9×4H thrust	2			
2500-068	Brg. ø5×ø13×4 ZZ	2			
2505-002	M3 nut	20			
2505-006	M3 nylon nut	10			
2505-013	M2.6 nut	20			
2506-019	FW ø3×4.5×0.5T	10			
2523-009	Tail drive shaft set	1			With SUS pipe
2524-003	Rod end pin M2×4.5	10			
2524-004	Double link pin type	2			
2531-003	Set screw M4×4	10			
2532-002	Cap screw M3×8	10			
2532-005	Cap screw M3×16	10			
2532-006	Cap screw M3×20	10			
2532-030	Cap screw M2.6×8	10			
2532-041	Cap screw M3×14	10			
2534-005	Tapping screw M2×10 No.2 type	10			
2539-006	M2×6 shouldered truss	2			

7 Main frame L assembly I

° Engine assembly, bearing holder, double bearing holder, bevel gear assembly and gyro mount are to be installed with screws shown in the figure below.

Note: Tentative assembly

M3×8TS

M4×4SS

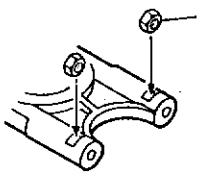
M3 nut

M3×8CS

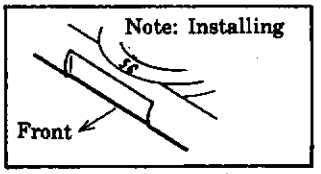
M3×10CS

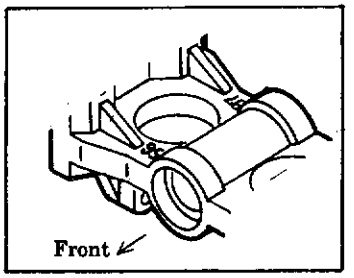
M3×12TS

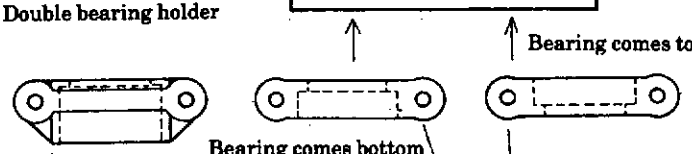
M4×10CS

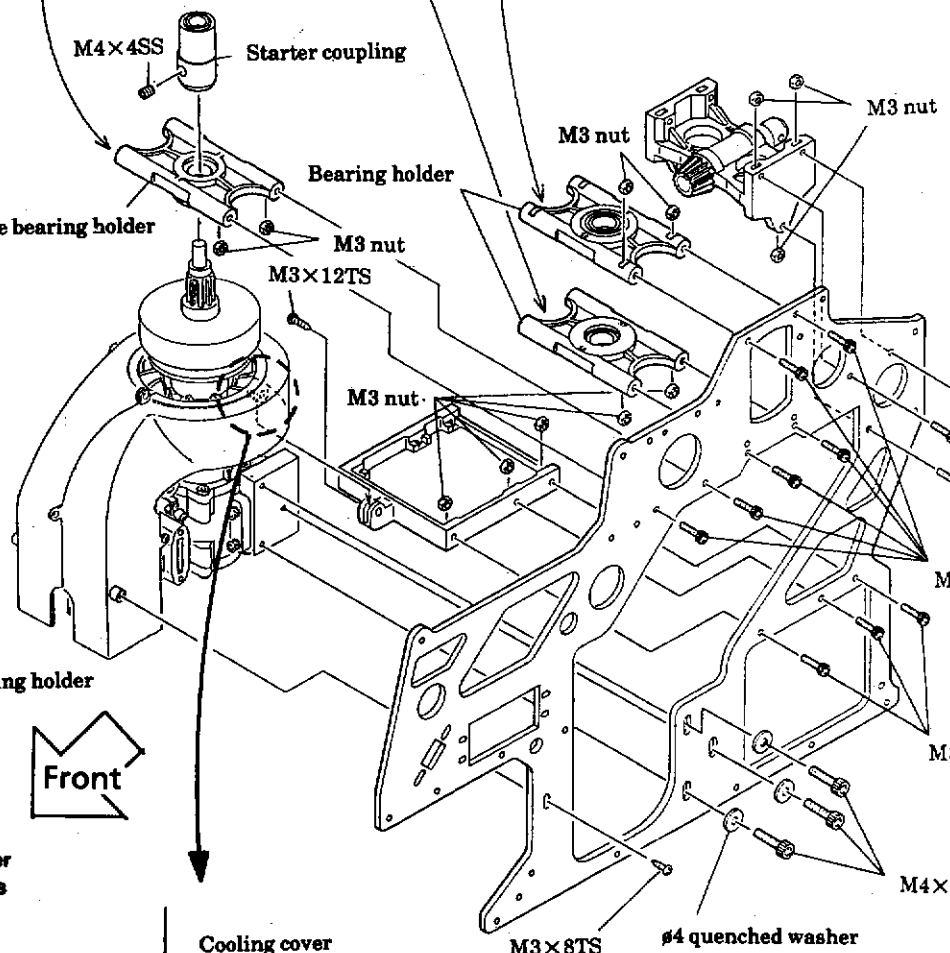


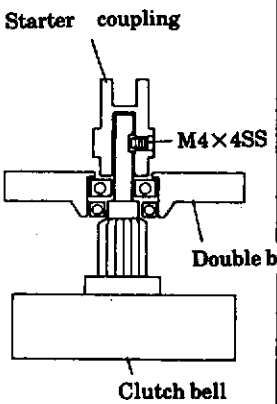
Note: Use quick-drying glue to fix M3 nuts to bearing holder, double bearing holder and bevel gear case.





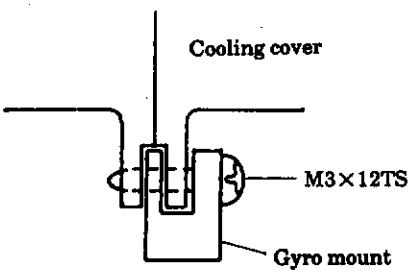






Note: Install the W bearing holder so that the clutch bell does not move vertically.

ø4 quenched washer



8 Lever assembly

① Install ø5 ball to each lever with M2×8PH screw.
② Install ø5×8×2.5 metal to each lever and match it with either lever shaft A or B.

EX ø5 ball

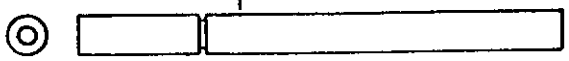
ø5 ball

M2.6×6CS

M2.6×6 flush-head screw

Lever shaft A

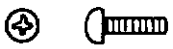
Lever shaft B



ø4 E-ring

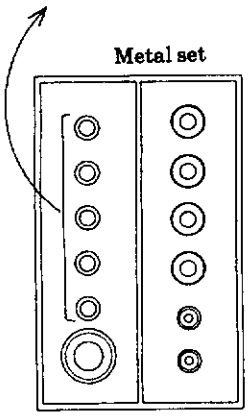
ø5×7×0.4FW

M2×8PH

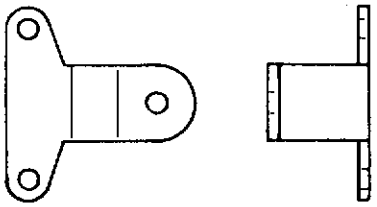


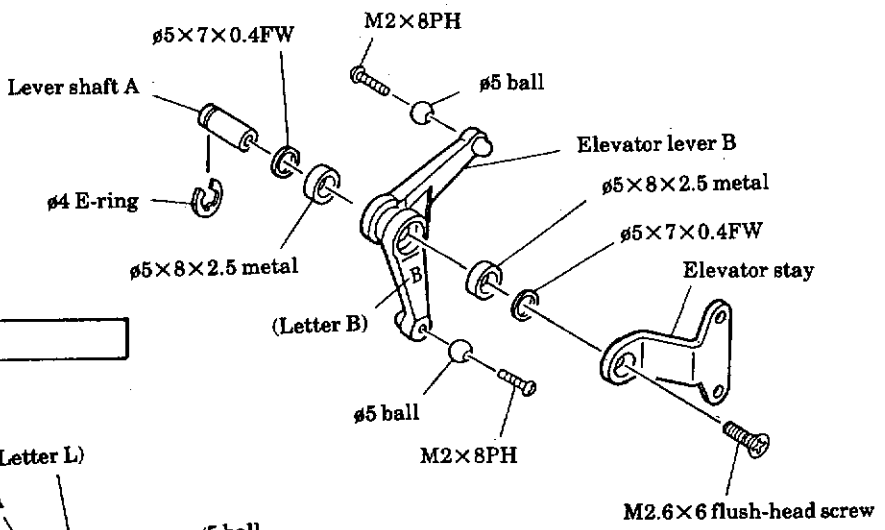
ø5×8×2.5 metal

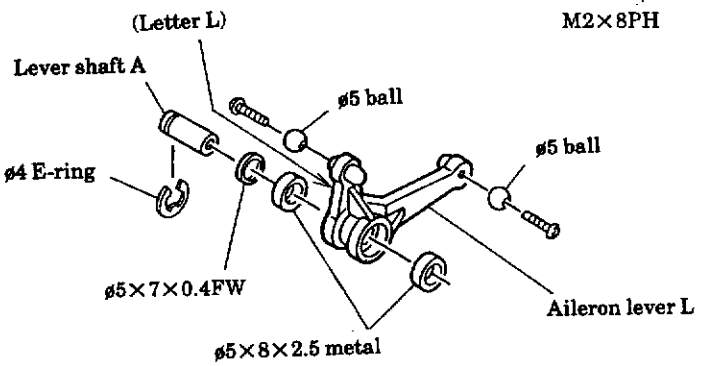
Metal set

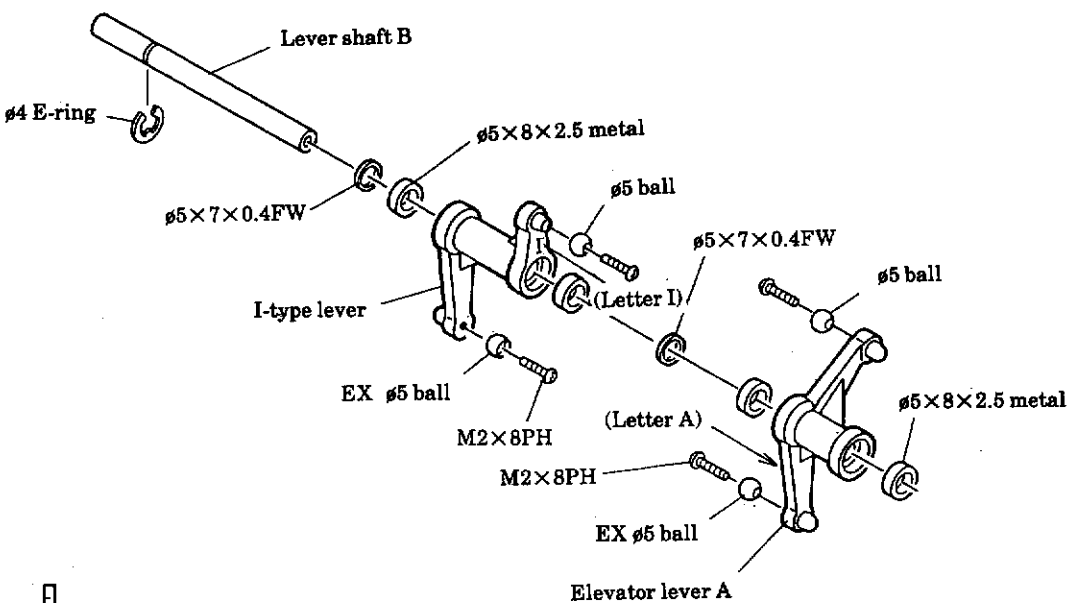


Elevator stay





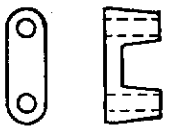




9 Main frame L assembly II

① Install each lever to main frame L with screws shown below.
② Install engine-control servo with screws shown below.

Servo attaching nut



ø2.6FW

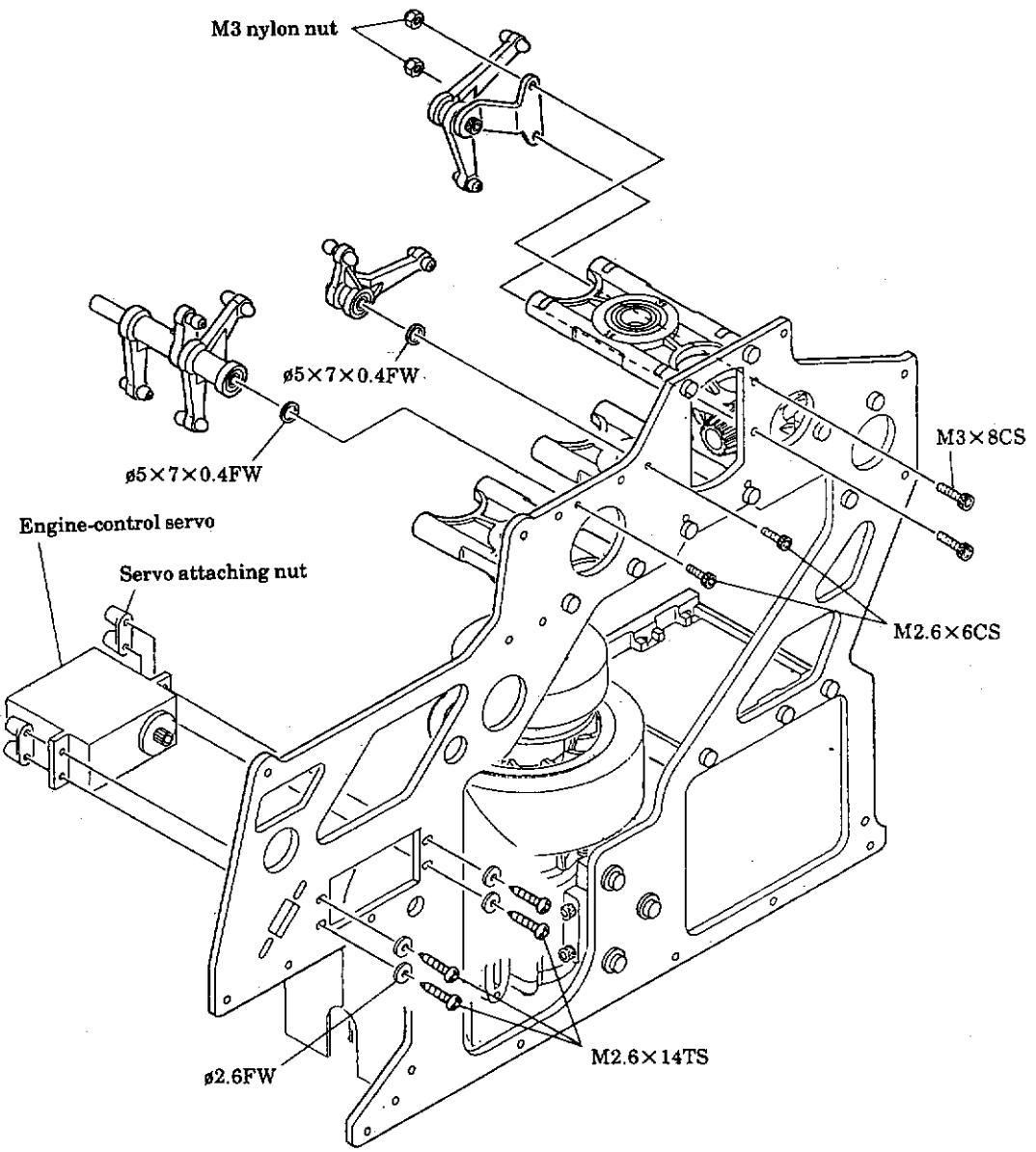
M2.6×14TS

M2.6×6CS

M3×8CS

M3 nylon nut

ø5×7×0.4FW



M2.6×6CS

M2.6×14TS

ø2.6FW

ø5 ball

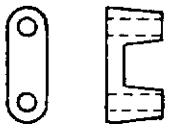
M2×8PH

Lever shaft A

ø5×7×0.4FW

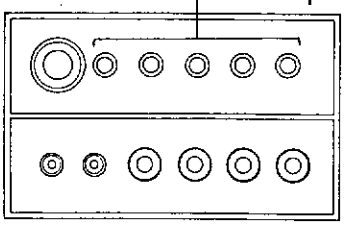
ø4 E-ring

Servo attaching nut

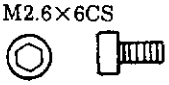


ø5×8×2.5 metal

Metal set



M2.6×6CS



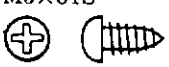
M3×8CS

M3×10CS

M4×10CS

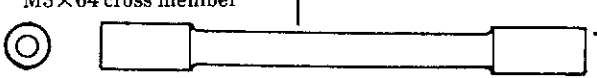
M3 nut

M3×8TS



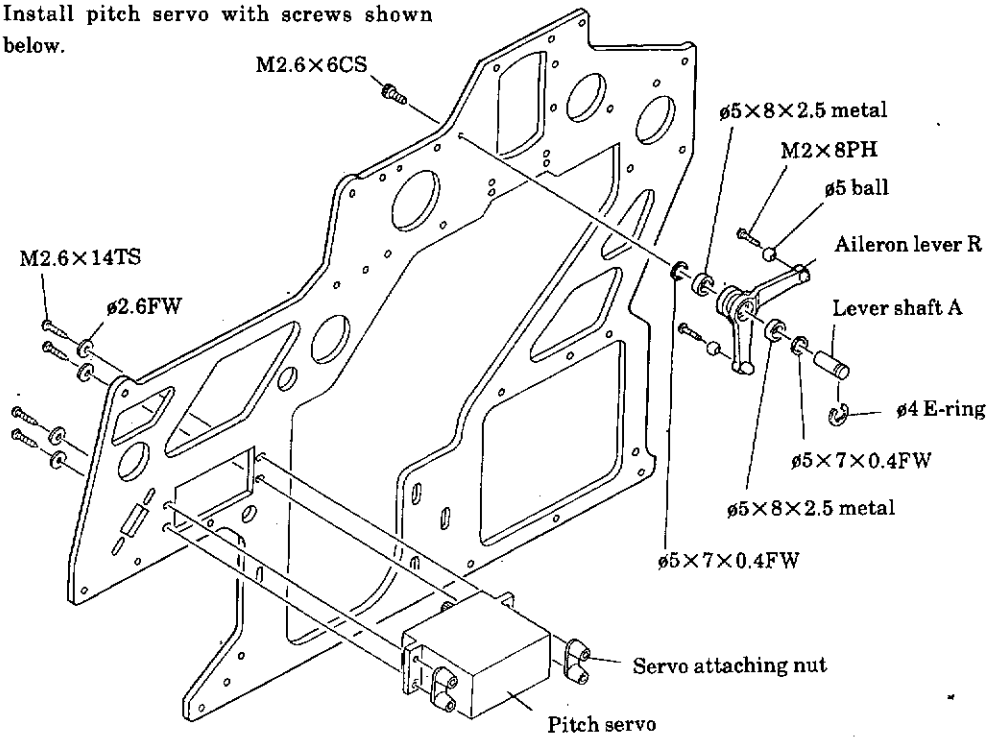
ø4 quenched washer

M3×64 cross member



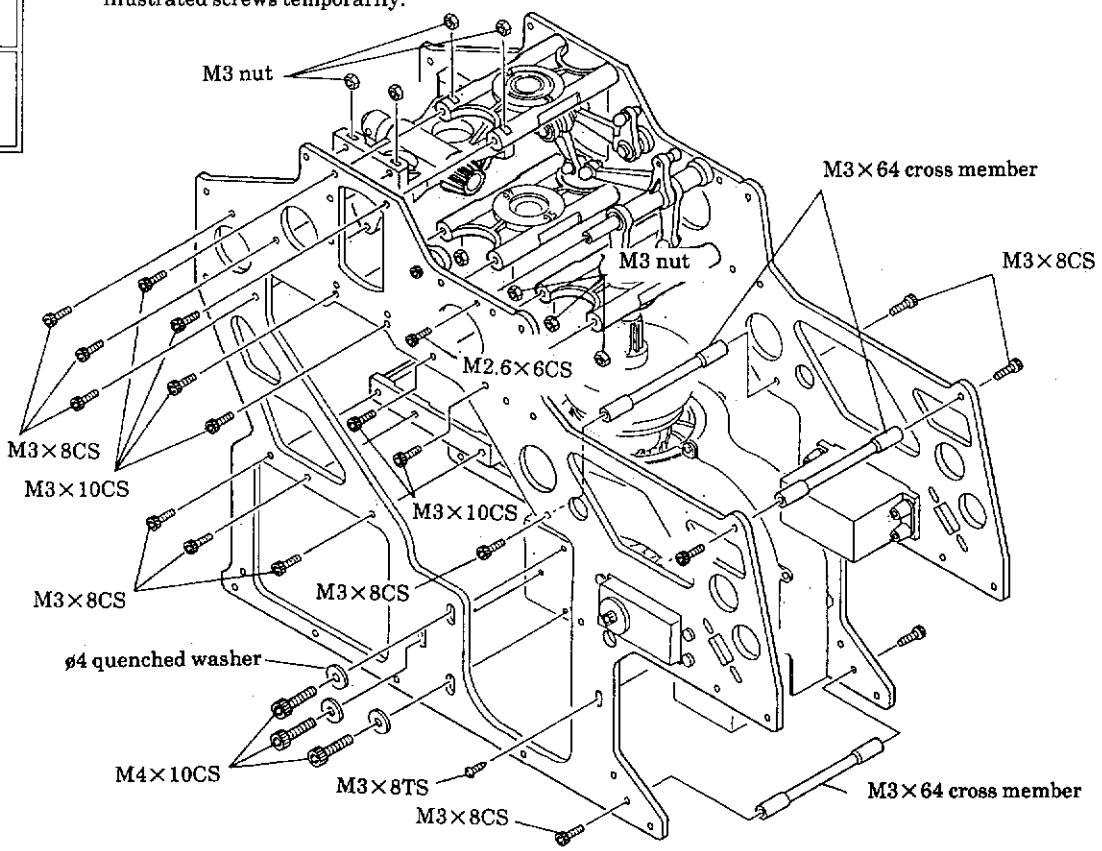
10 Main frame R assembly

- Install ø5 ball to aileron lever R with M2×8PH screw.
- Install ø5×8×2.5 metal to aileron lever R, match ø5×7×0.4W with lever shaft A and assemble them with illustrated screws.
- Install pitch servo with screws shown below.



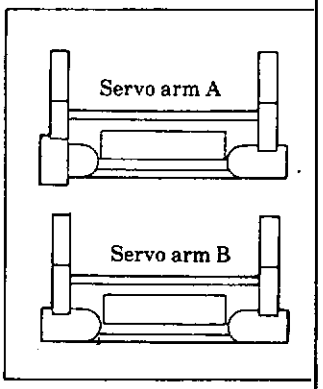
11 Main frame assembly

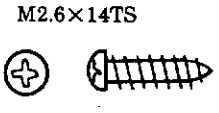
- Assemble main frames R and L with illustrated screws temporarily.

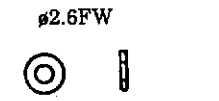


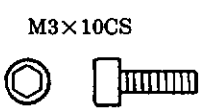
12 Installation of servo slide mount

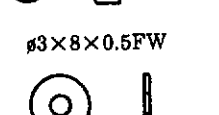
- Install elevator servo and aileron servo to the servo slide mount with M2.6×14TS and ø2.6FW screws.
- Install servo arm A and servo arm B to the servo slide mount with metals, collars, washers, and screws shown below.
- Attach metals shown below to main frames R and L with screws, collars, and washers.

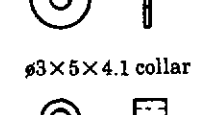


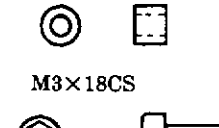


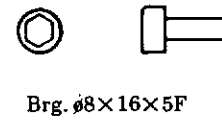


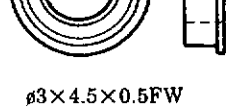


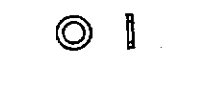


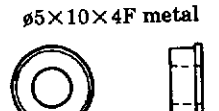


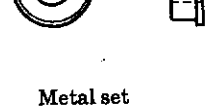


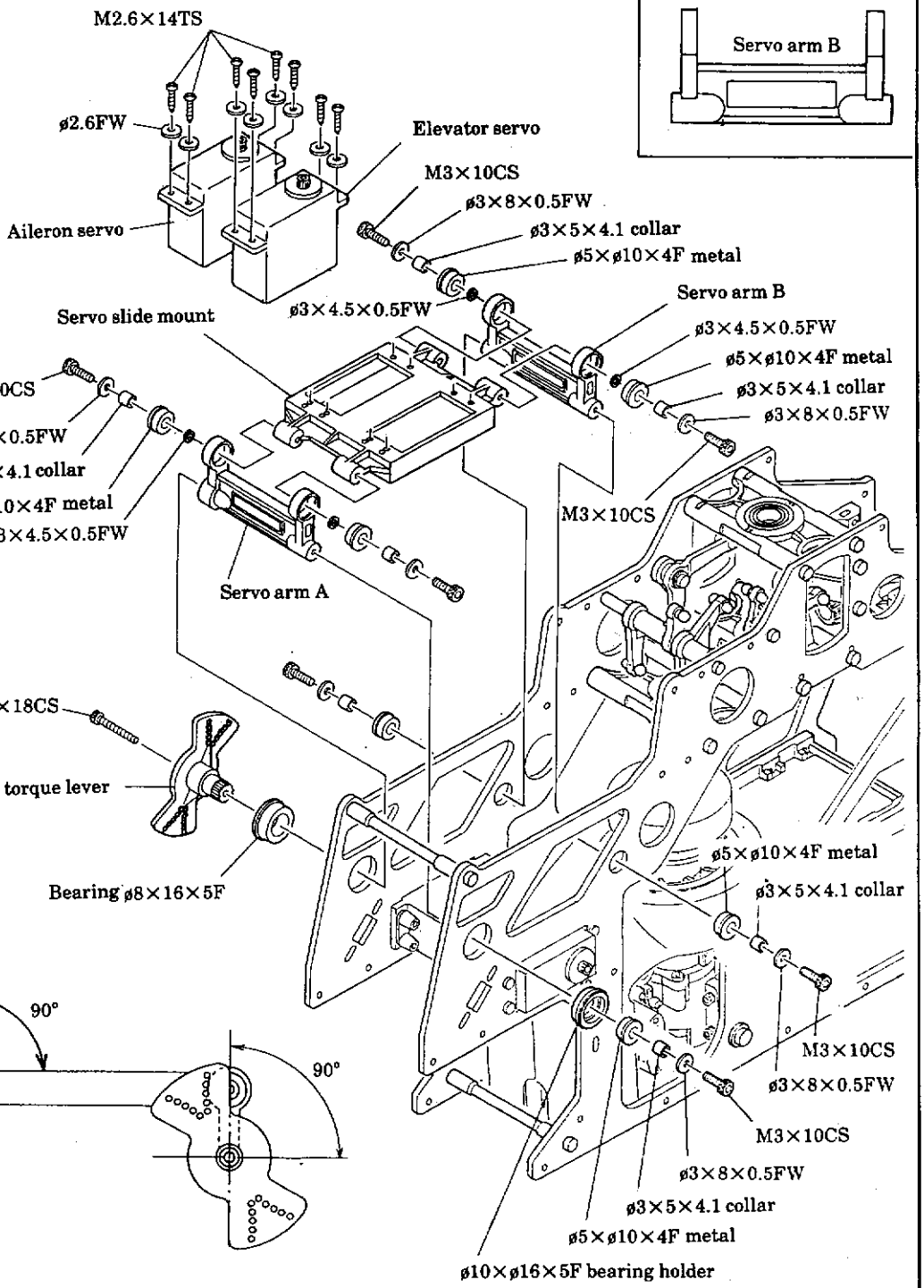












Note: Attach pitch torque lever with servo arms at right angles to the frame.

13 Installation of radius stay and L angle

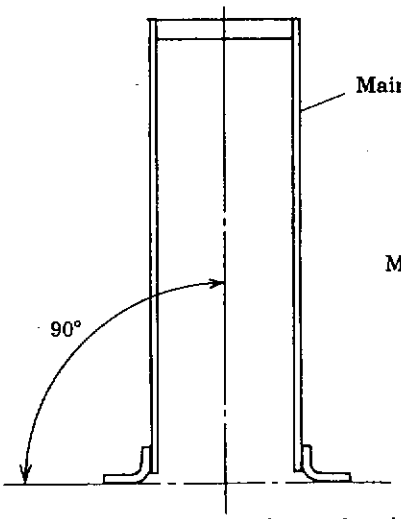
- Install radius stays R and L respectively with screws shown below.
- Install L angle with M3×8CS and M3 nylon nut.
- Fasten all screws securely.

M3×8CS

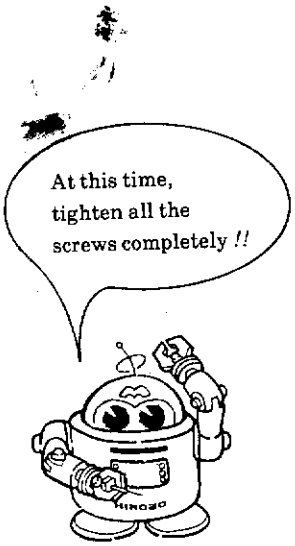
M3×10CS

M3×12CS

M3 nylon nut



Note: Fasten screws on the service plate.



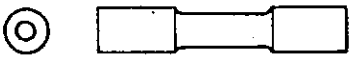
14 Installation of front stay and crossmember

- Install front stay with M3×8CS screws and M3 nylon nuts.
- Install crossmembers M3×21 and M3×33 with M3×8CS screws.

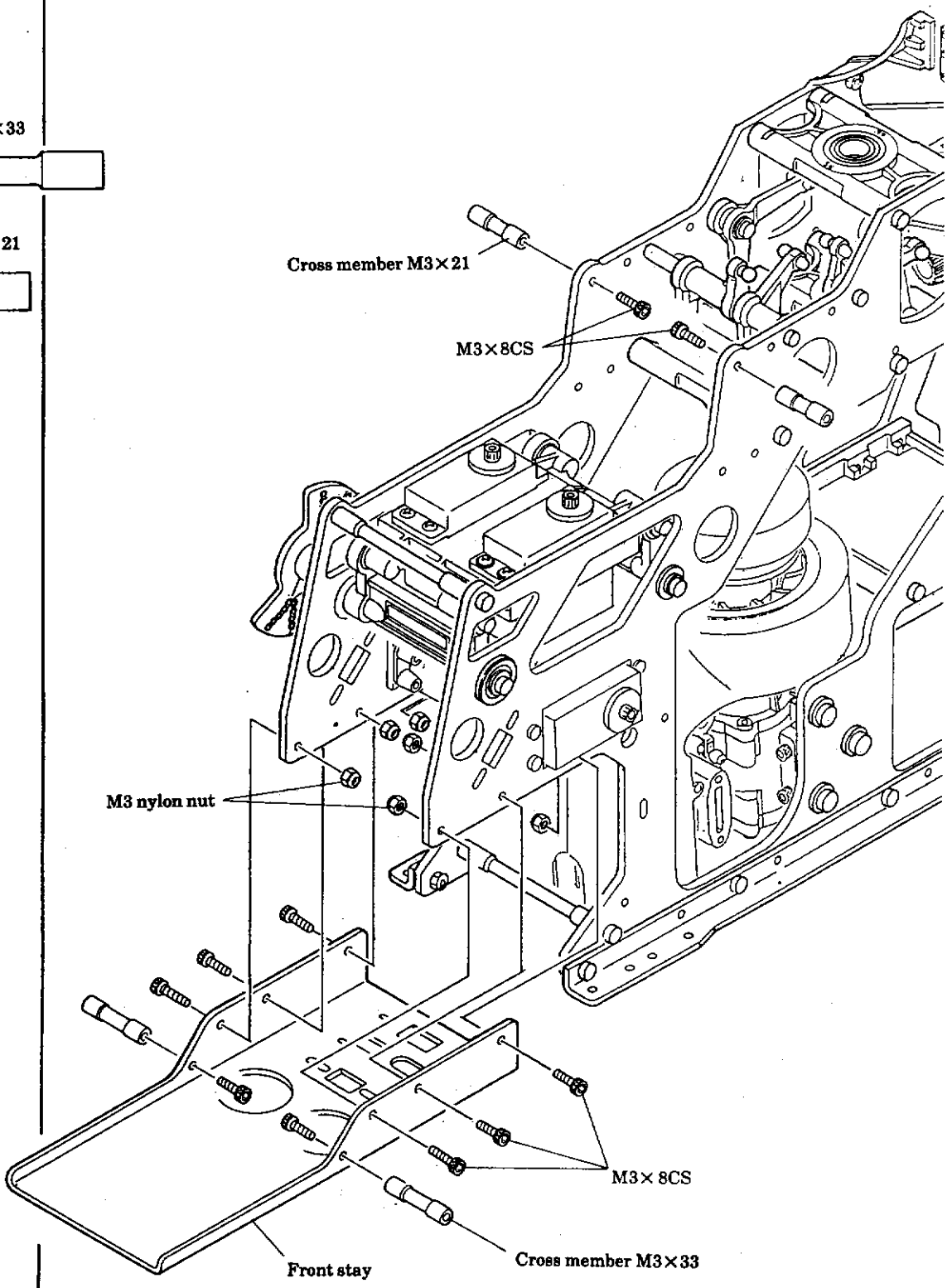
M3×8CS

M3 nylon nut

Cross member M3×33



Cross member M3×21

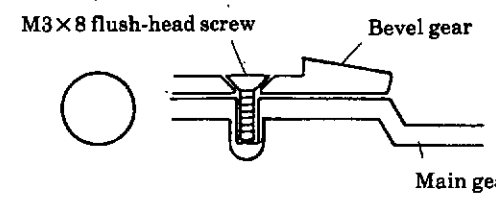


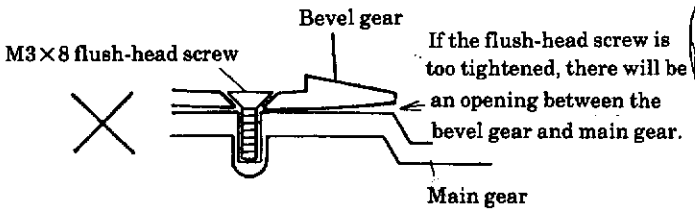
15 Main gear assembly

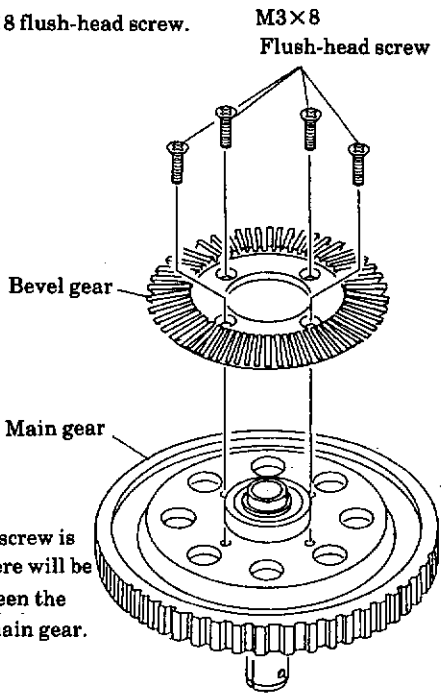
M3×8 flush-head screw

° Install bevel gear to the main gear assembly with M3×8 flush-head screw.

Note: If too tightly fastened, the bevel gear becomes distorted.







16 Main mast assembly

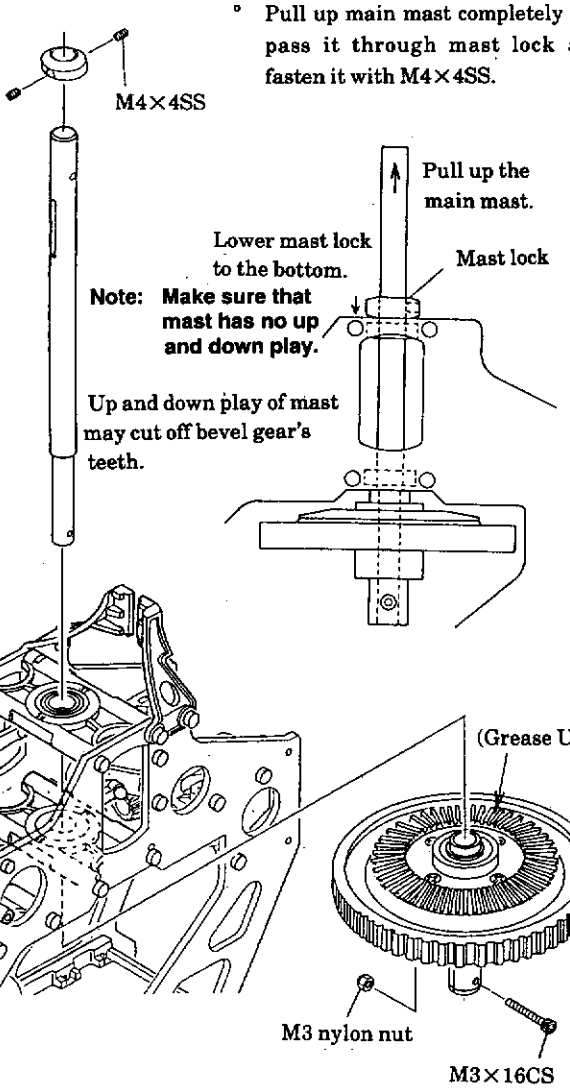
M3×16CS

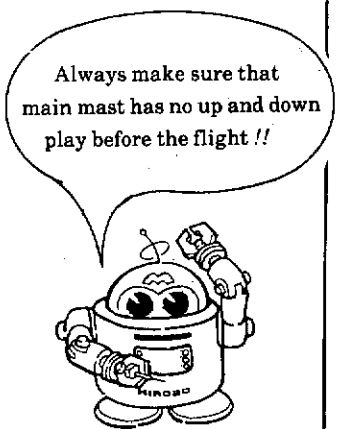
M3 nylon nut

M4×4SS

° Pass main mast through bearing holder of the main frame assembly and install the main gear assembly with M3×16CS screw and M3 nylon nut.

° Pull up main mast completely and pass it through mast lock and fasten it with M4×4SS.





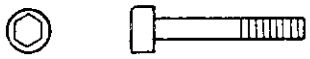
17 Installation of rotor head, wash-out, and swash plate

- Install ø5 ball to wash-out with M2×8PH screw.
- Pass main mast through swash plate, wash-out set, and rotor head.
- Install wash guide pin to wash-out set.
  Note: Screw it in to fit the groove of main mast.
- Install rotor head with M3×20CS screw and M3 nylon nut.

M3 nylon nut

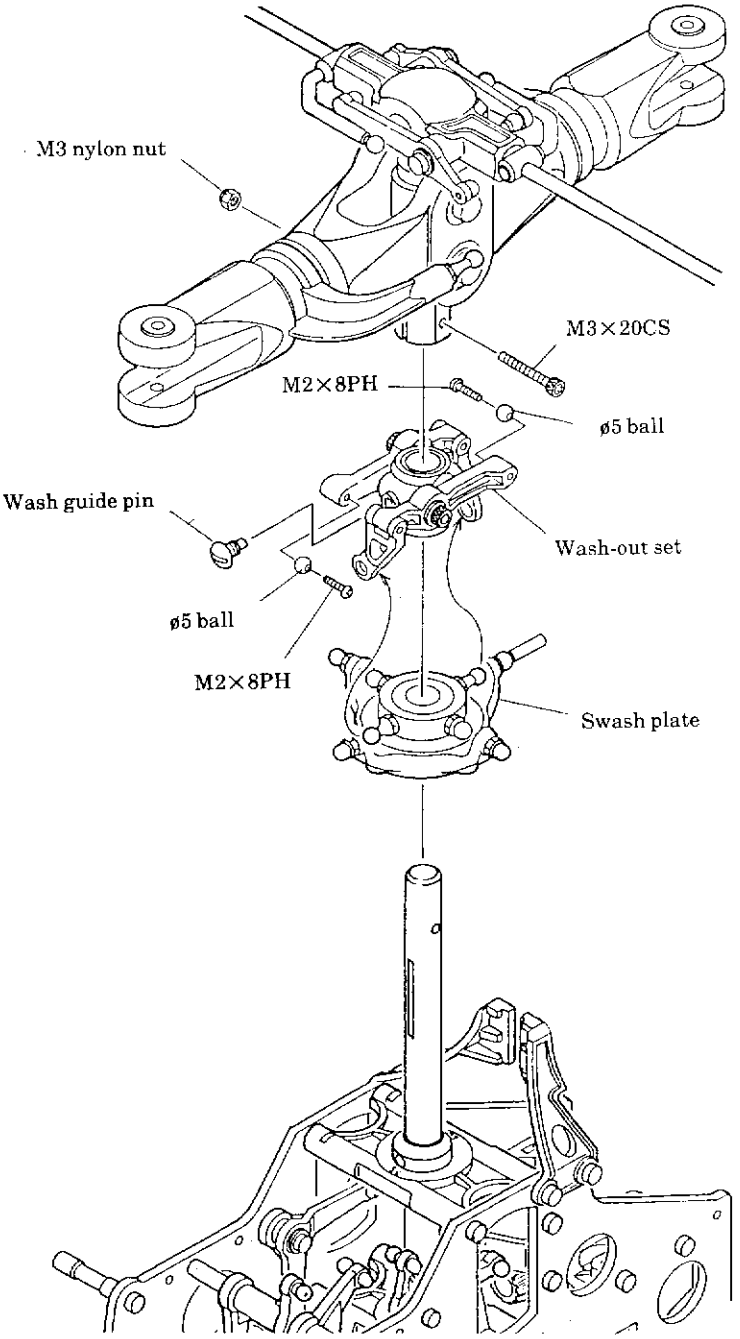
M2×8PH

M3×20CS



Wash guide pin

ø5 ball



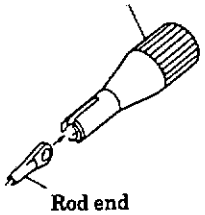
18 Adjusting rod assembly

- Screw rod end into adjusting rod as shown below.

M2 rod end

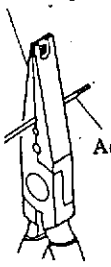
Note: For easier assembly, option parts such as rod end driver and rod end pliers are available.

Option parts
2513-024 ¥600
Rod end driver



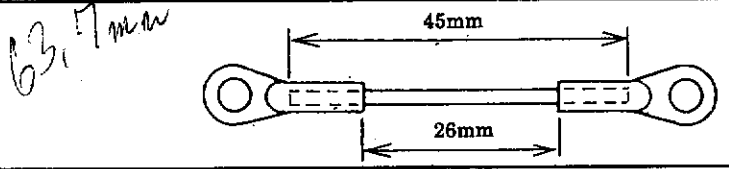
Rod end

Option parts
2513-027 ¥3,200
Rod end pliers



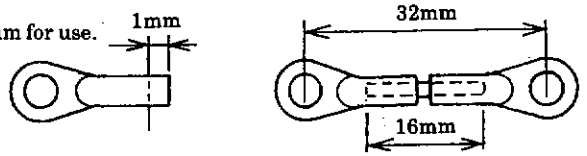
Adjusting rod

Swash control rod	4 required	◦ Use M2×45 adjusting rod.

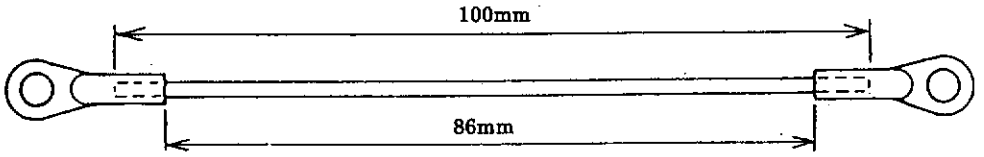


Aileron type Ⅰ lever rod	1 required	◦ Use M2×16 adjusting rod.

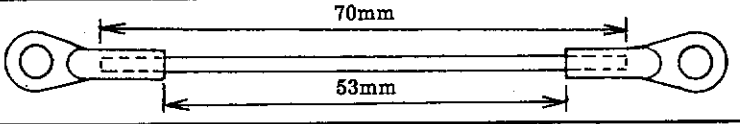
Cut rod end by 1mm for use.



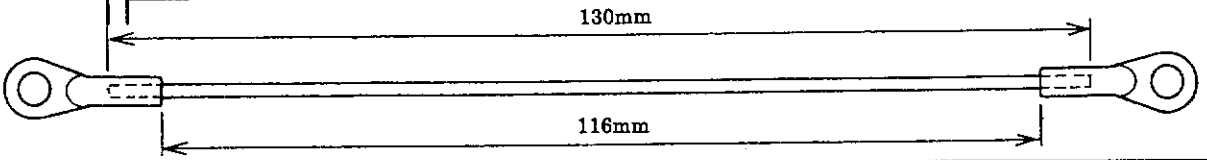
Aileron servo rod (R)	1 required	◦ Use M2×100 adjusting rod.



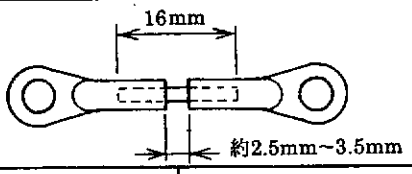
Aileron servo rod (L) Elevator servo rod (R)	2 required	◦ Use M2×70 adjusting rod.



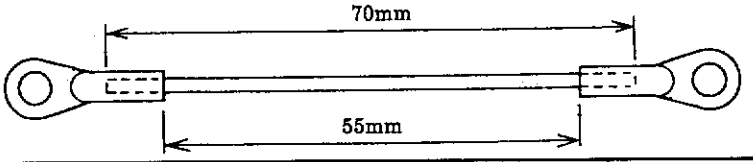
Elevator servo rod (L)	1 required	◦ Use M2×130 adjusting rod.



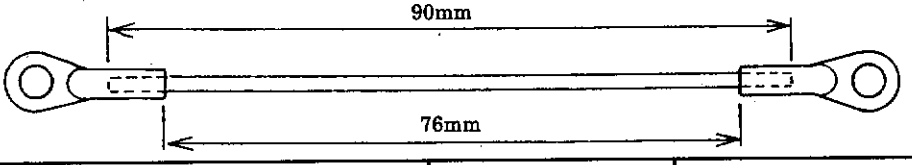
Pitch rod	2 required	◦ Use M2×16 adjusting rod.



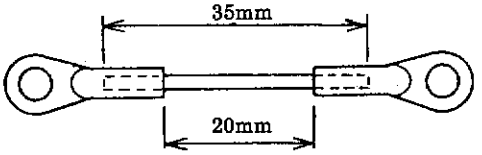
Stabilizer control rod	2 required	◦ Use M2×70 adjusting rod.



Mixing arm rod	2 required	◦ Use M2×90 adjusting rod.



Pitch torque rod	2 required	◦ Use M2×35 adjusting rod.

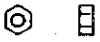


19 Installation of each rod

M2×10PH

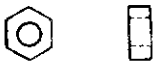
ø5 ball

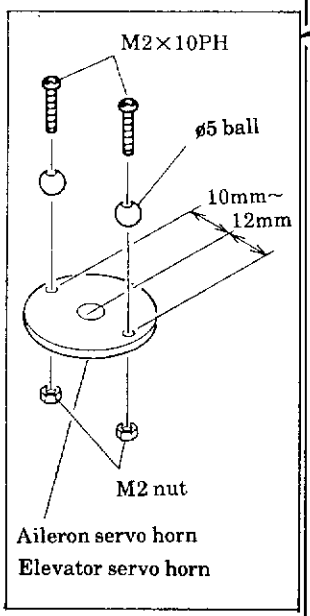
M2 nut

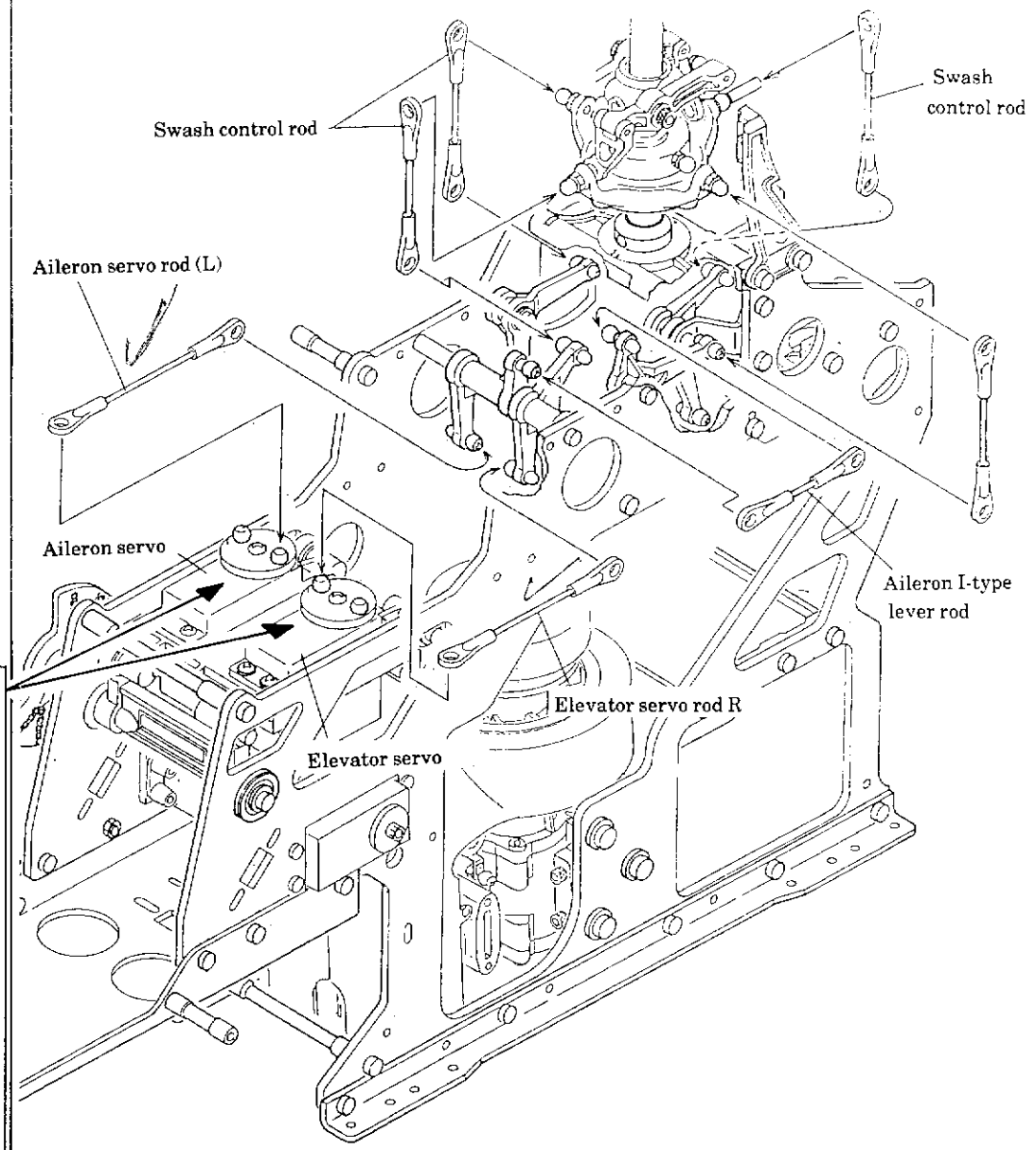


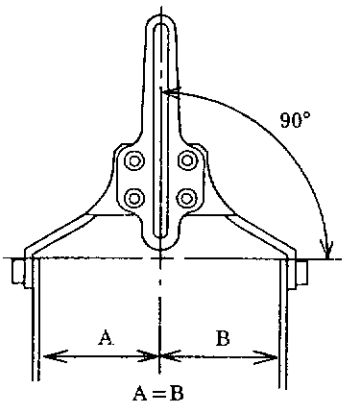
M3×10CS

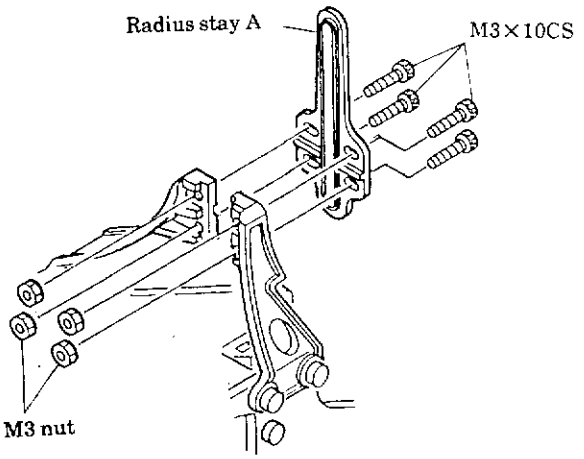
M3 nut







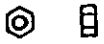


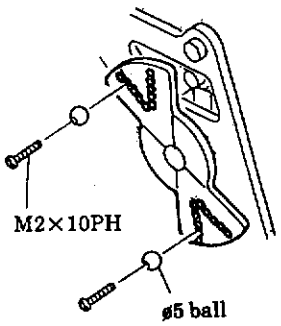


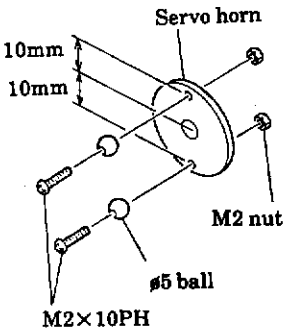
M2×10PH

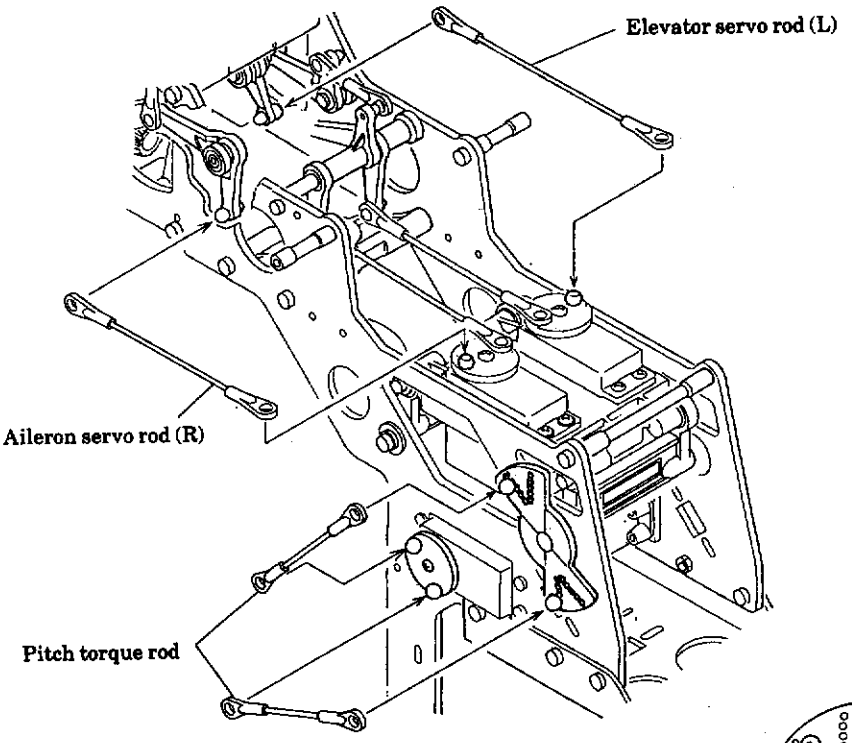
ø5 ball

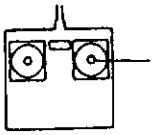
M2 nut



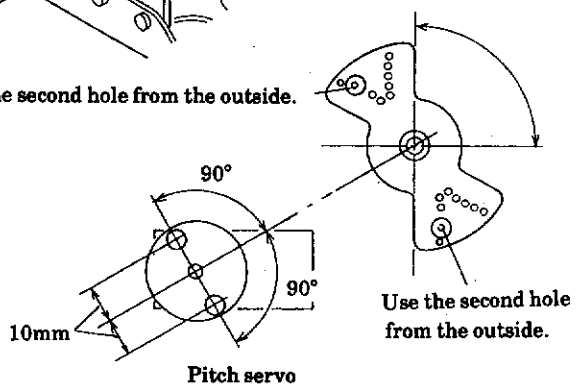


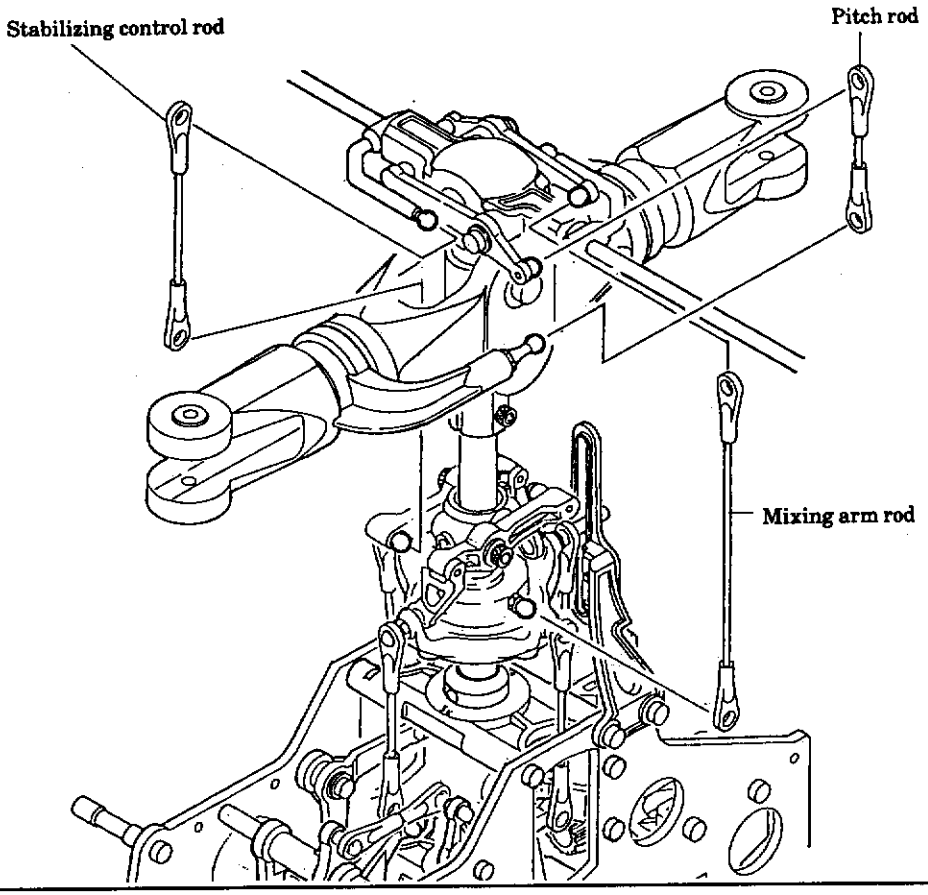






Setting up a hovering position

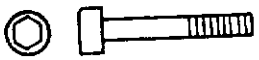




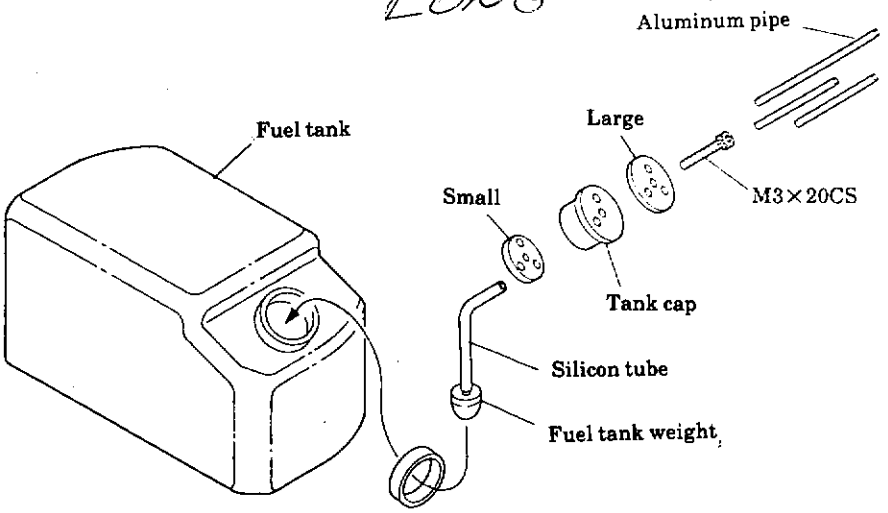
20 Fuel tank assembly

MED = TO EXHAUST
SHORT = FILL-UP
LONG = TO MOTOR

M3×20CS



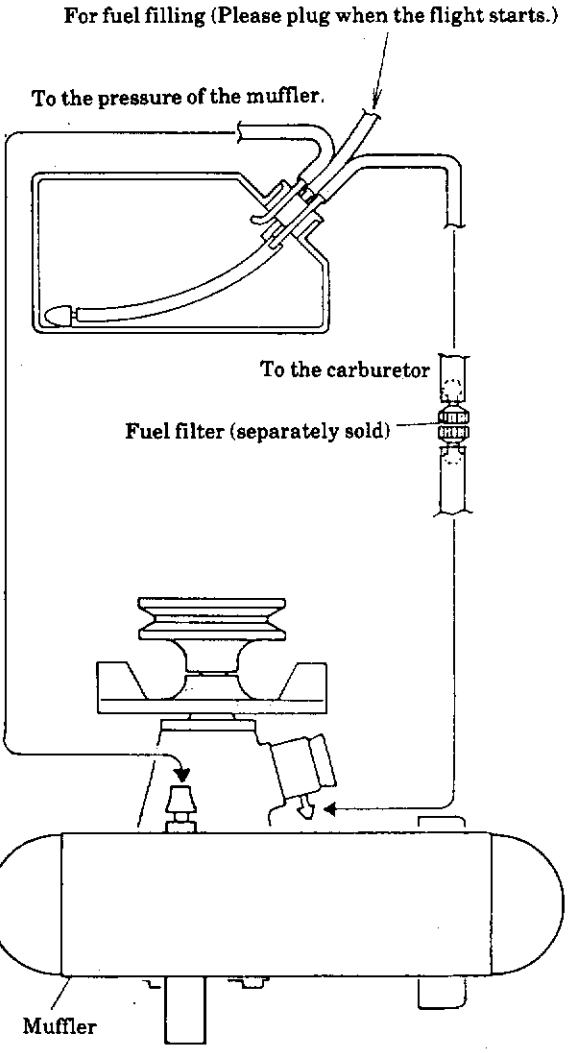
① Fuel tank assembly

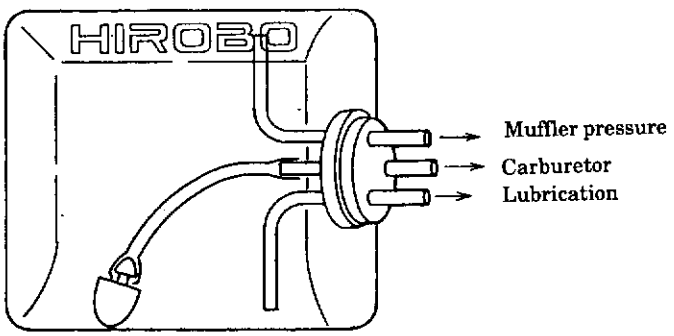


② Fuel pipe laying

Fit the silicon pipe (separately sold) into the pipe with a weight in the fuel-tank, then connect it to the engine carburetor. (Better to attach the fuel filter separately sold.)

Notes: The fuel pipe lays differently depending on the engine and the amount of muffler pressure. Please read each engine's manual.



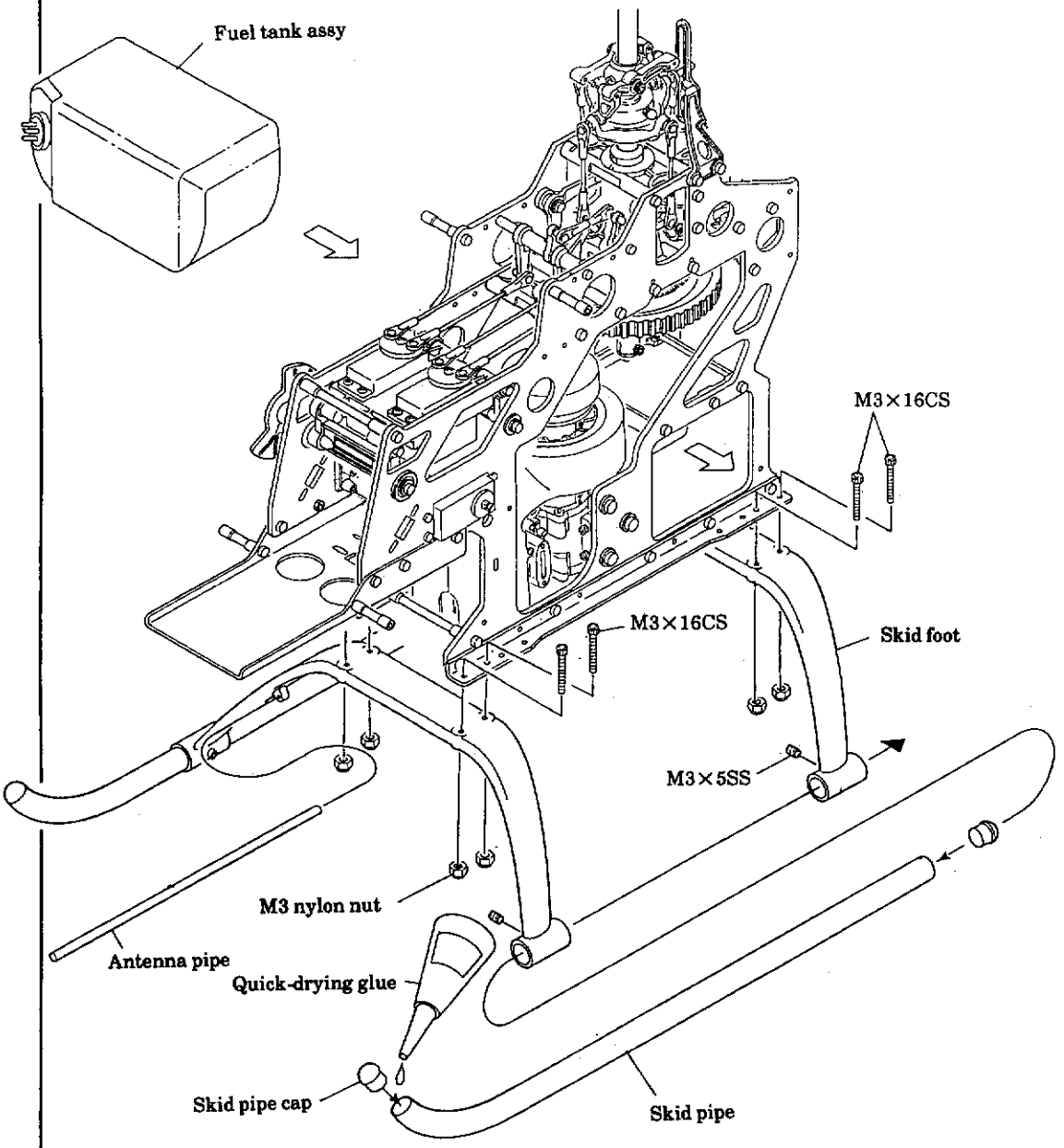


21 Landing gear assembly and installation of fuel tank

M3×16CS

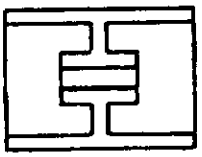
M3 nylon nut

M3×5SS

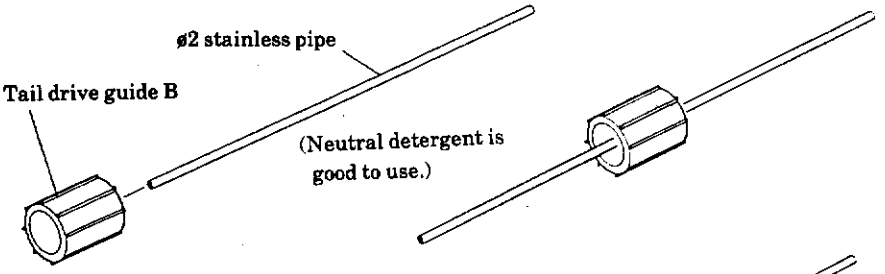


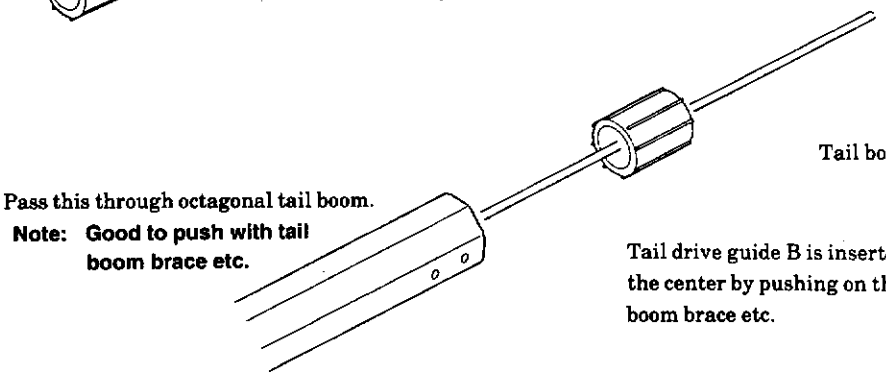
22 Tail boom assembly

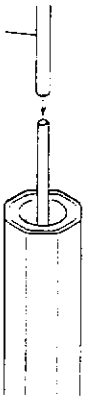
Tail drive guide B

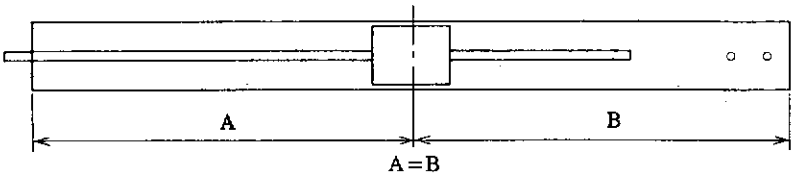


1 Pass ø2 stainless pipe through tail drive guide B.

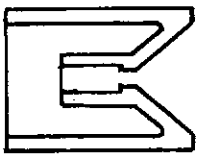




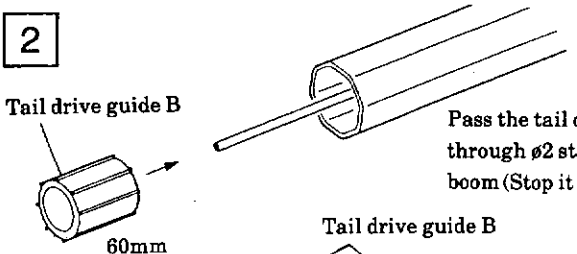




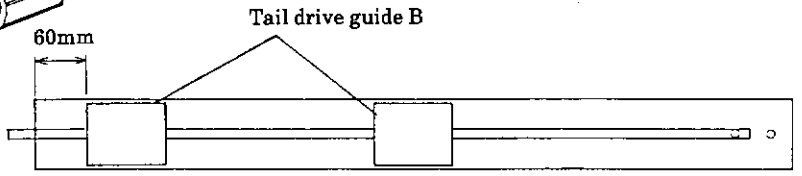
Tail drive guide A



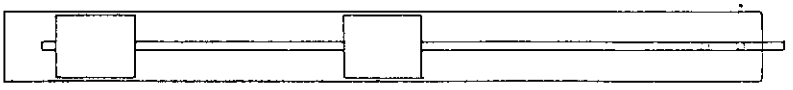
2

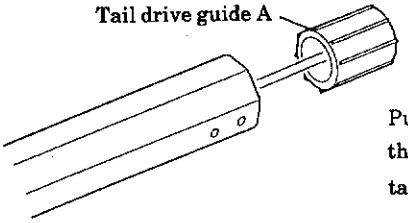


Pass the tail drive guide B (from the front of octagonal tail boom) through ø2 stainless pipe, and then insert it in the octagonal tail boom (Stop it by 60mm from the front).



Push the stainless pipe.

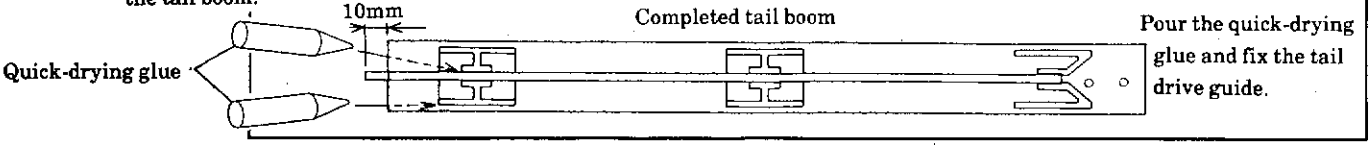




Push the tail drive guide A into the back of the octagonal tail boom, then stop ø2 stainless pipe 10mm from the tip of the octagonal tail boom.

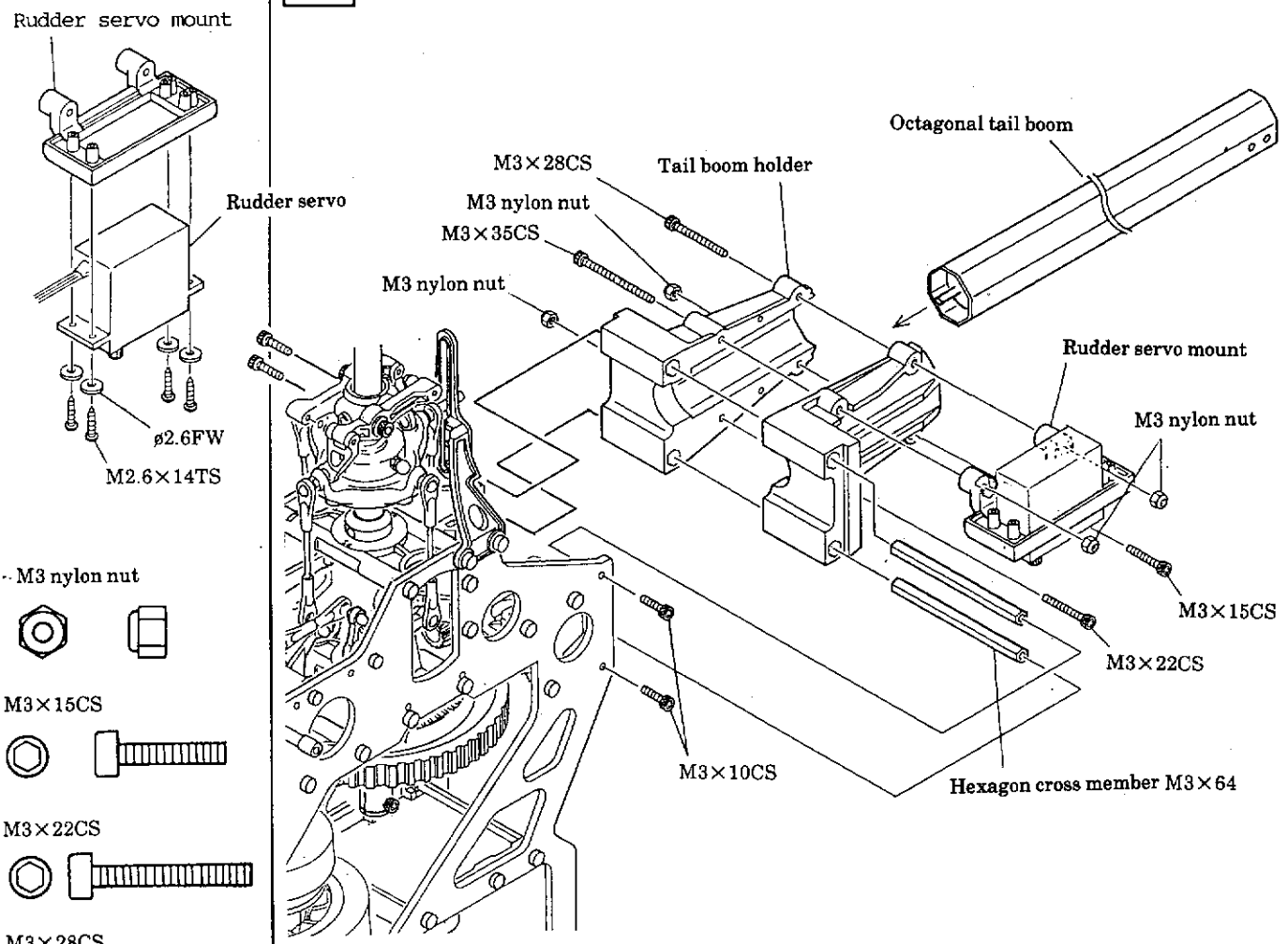
Push the ø2 stainless pipe to the front of the tail boom.

Quick-drying glue



Pour the quick-drying glue and fix the tail drive guide.

23 Installation of tail boom and rudder servo

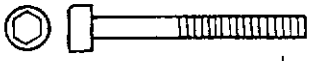


M3 nylon nut

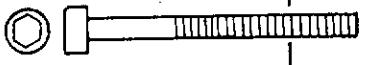
M3×15CS

M3×22CS

M3×28CS

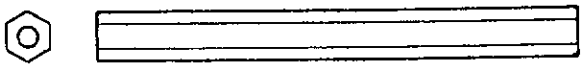


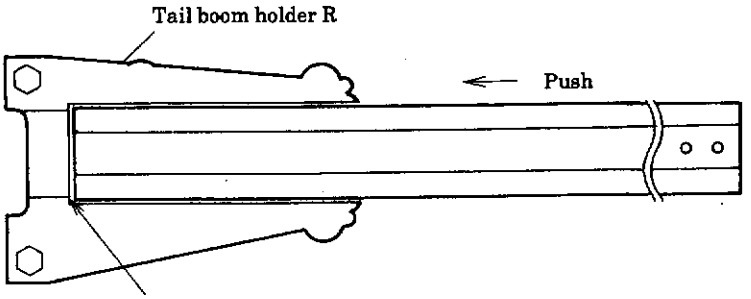
M3×35CS

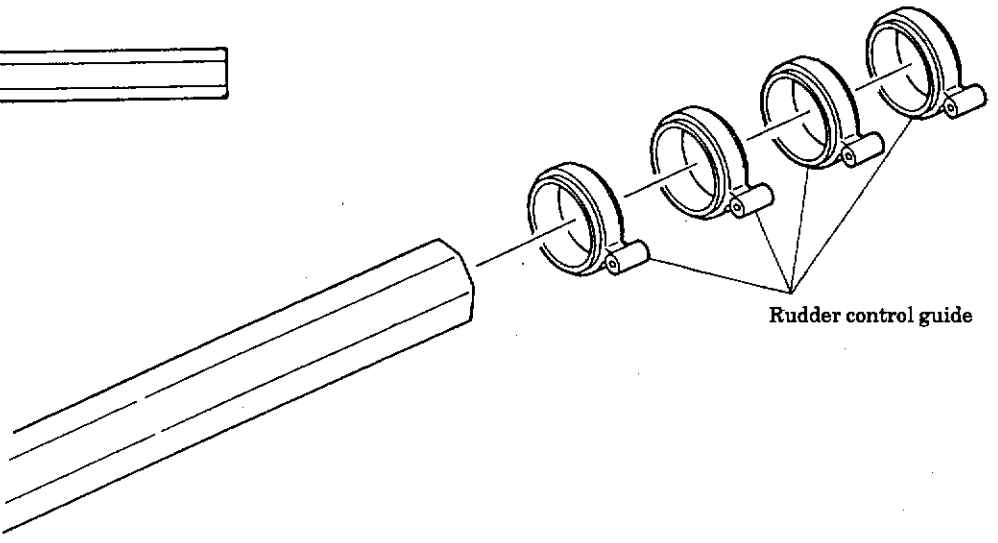


M3×10CS

Hexagon cross member M3×64







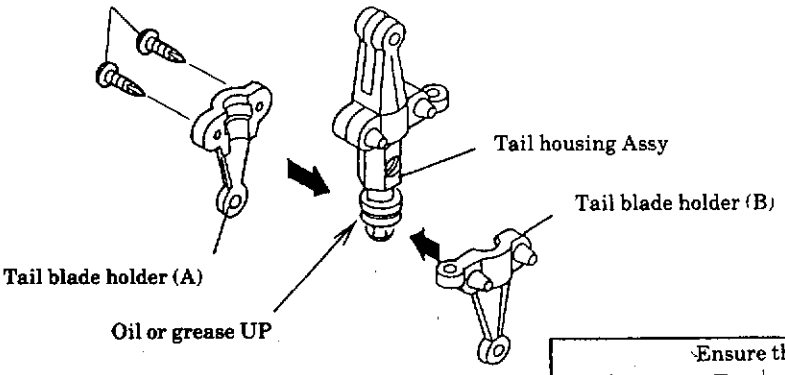
24 Tail gear assy assembly

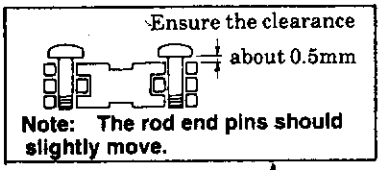
M2×10TS with slot

① Tail blade holder assembly

- Combine the tail blade holder (A) and (B) to the tail housing Assy, then assemble them with M2×10TS.

M2×10TS with slot





② Tail transmission Assy assembly

- Install ø5 ball to the tail pitch lever with M2×8CS.
- Install the joint to the tail transmission Assy with M4×4SS.

Rod end pin M2×4.5

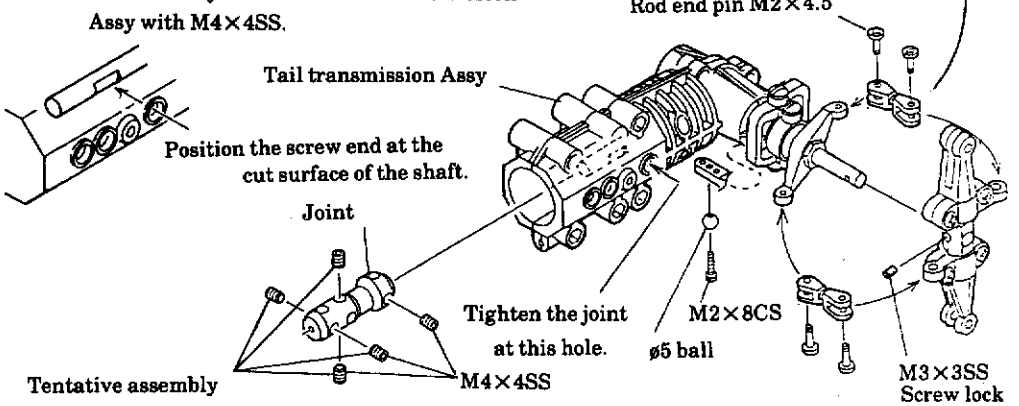
M3×3SS

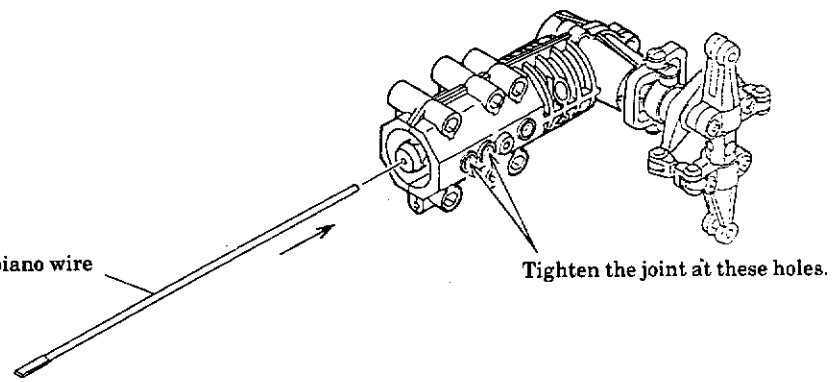
M4×4SS

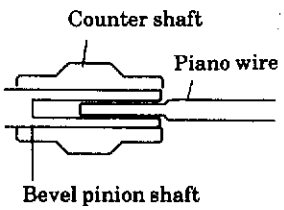
ø5 ball

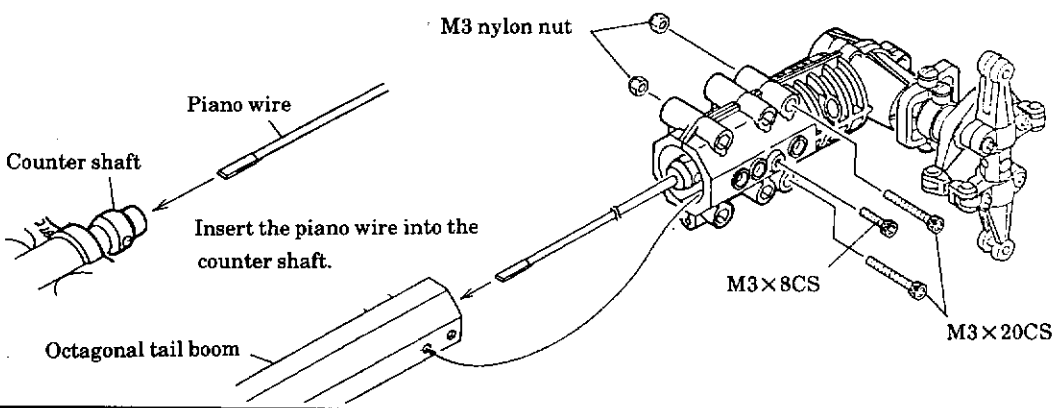
M3 nylon nut

M3×8CS

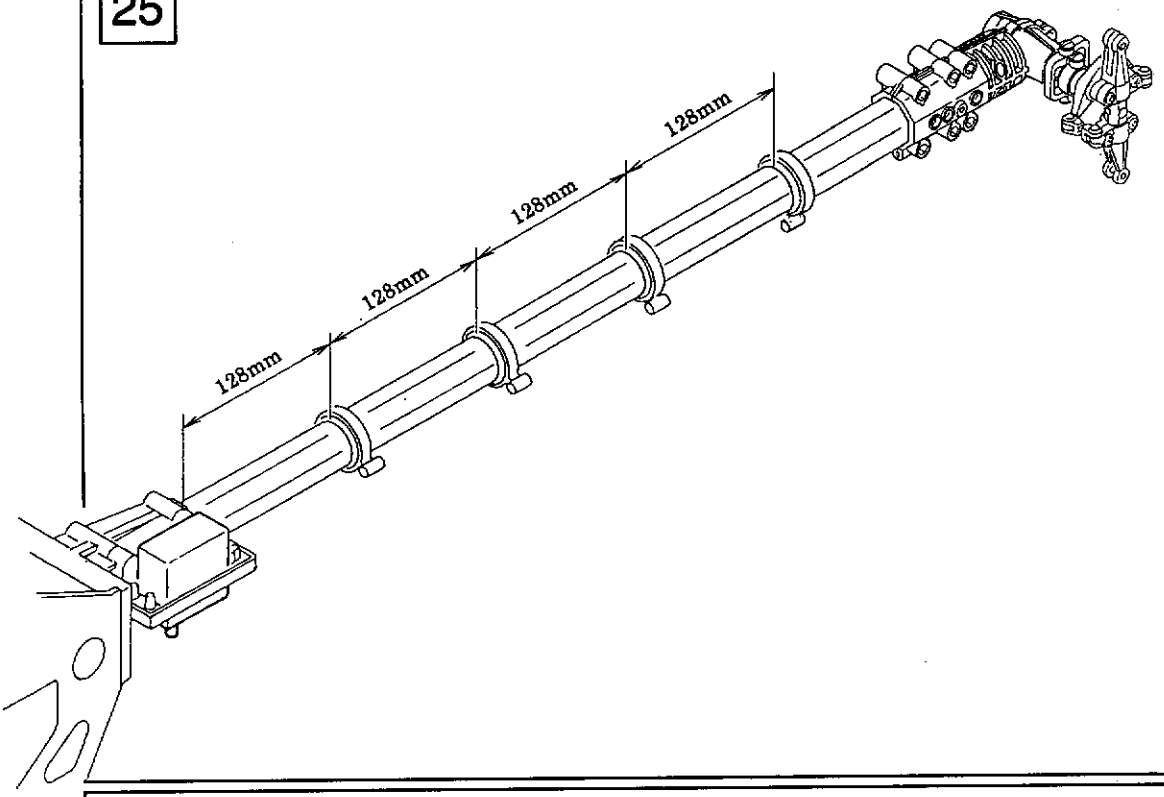








25 Installation of rudder control guide



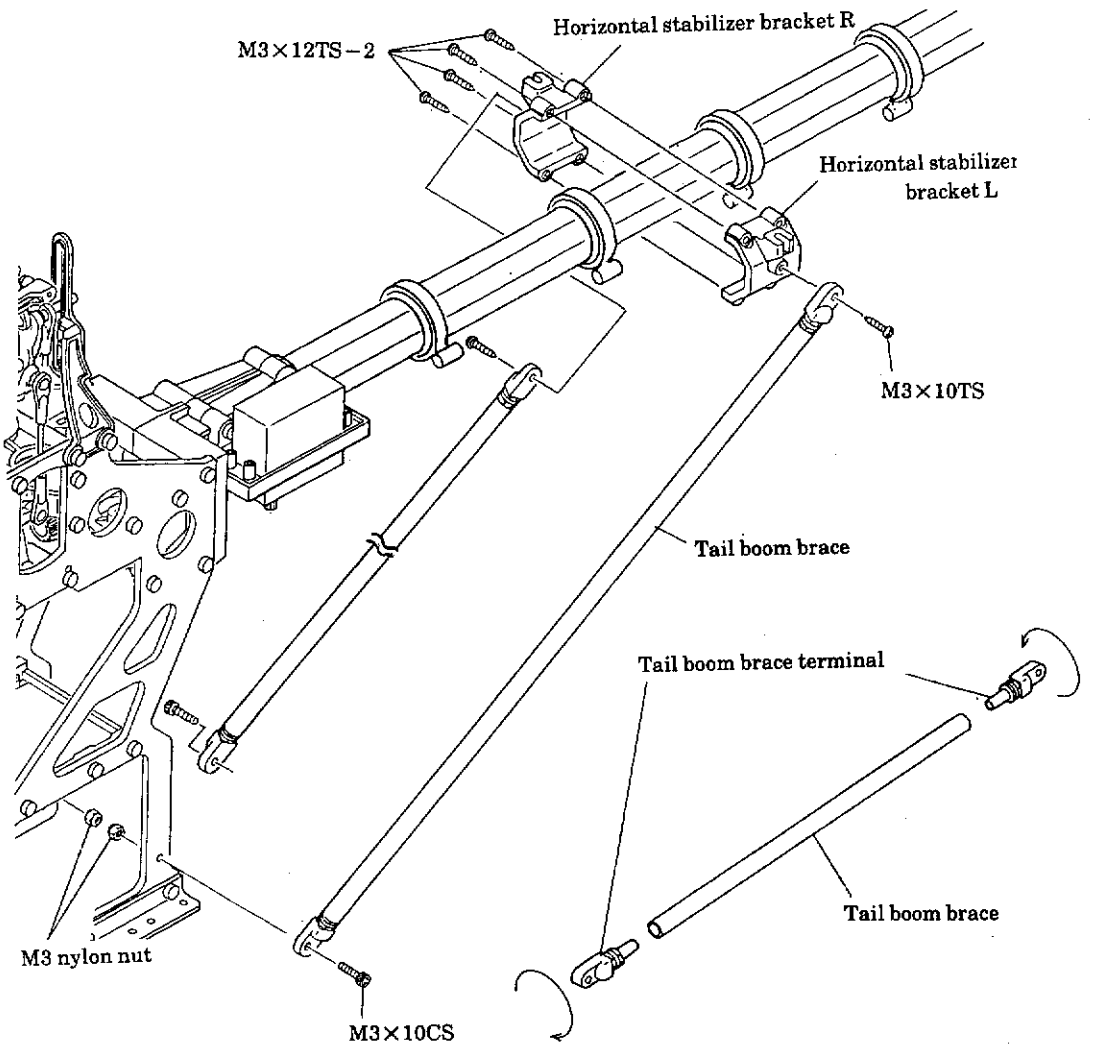
26 Installation of tail boom brace

M3×10CS

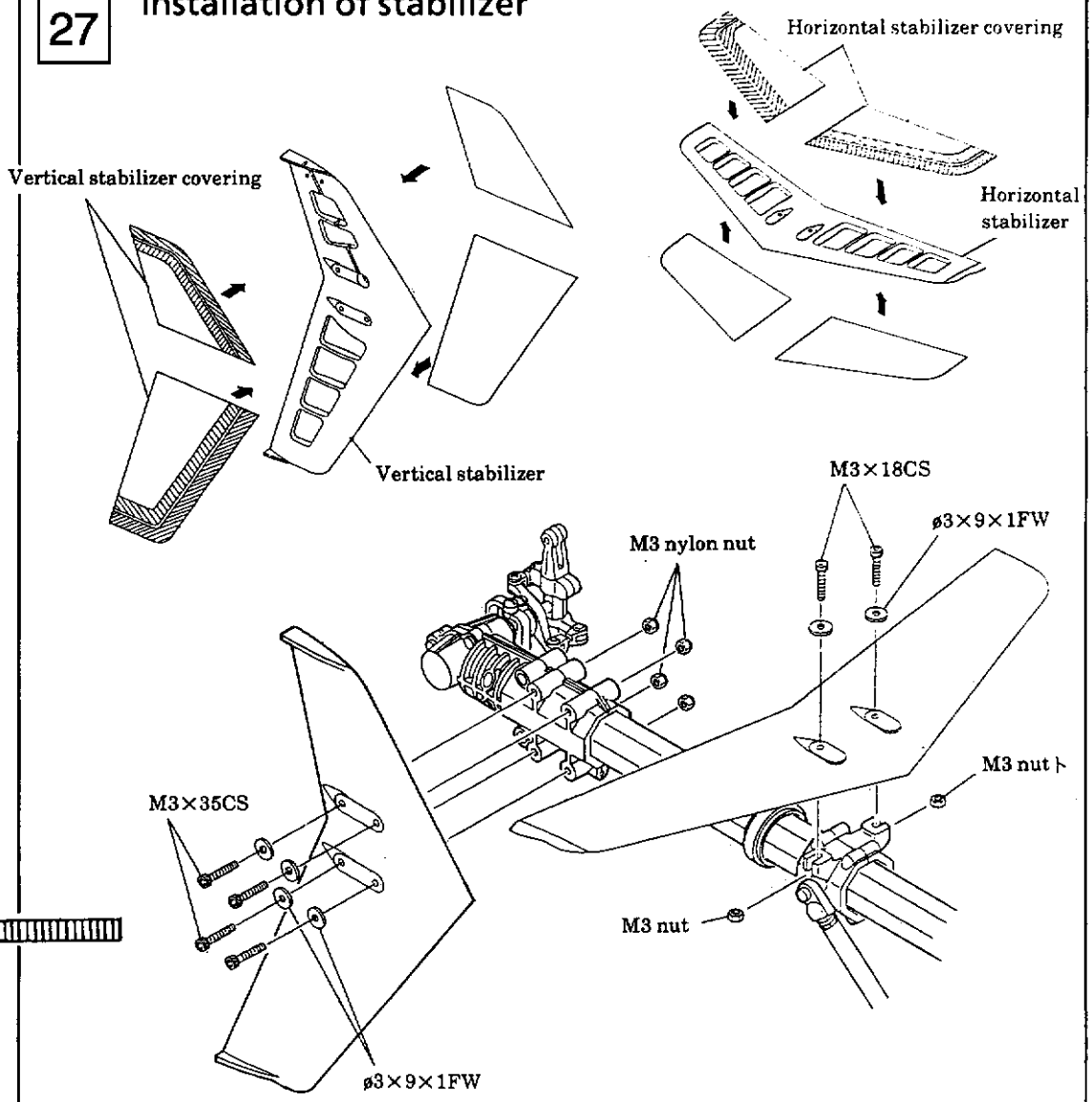
M3 nylon nut

M3×12TS－2

M3×10TS



27 Installation of stabilizer



M3 nut

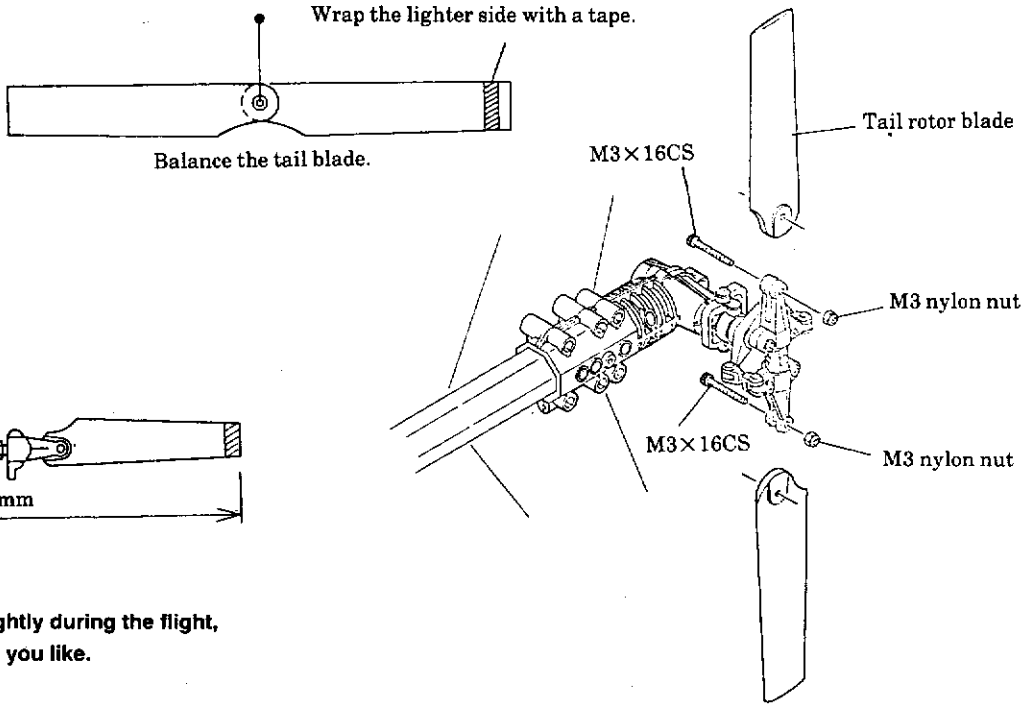
M3 nylon nut

ø3×9×1FW

M3×18CS

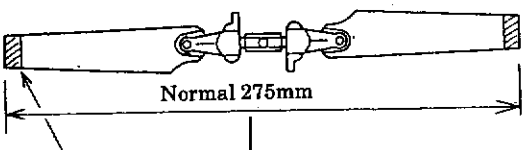
M3×35CS

28 Installation of tail blades



M3×16CS

M3 nylon nut



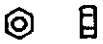
Note: **If the tail moves slightly during the flight, cut the tail blade as you like.**

29 Linkage of rudder

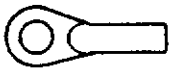
M2×10PH

ø5 ball

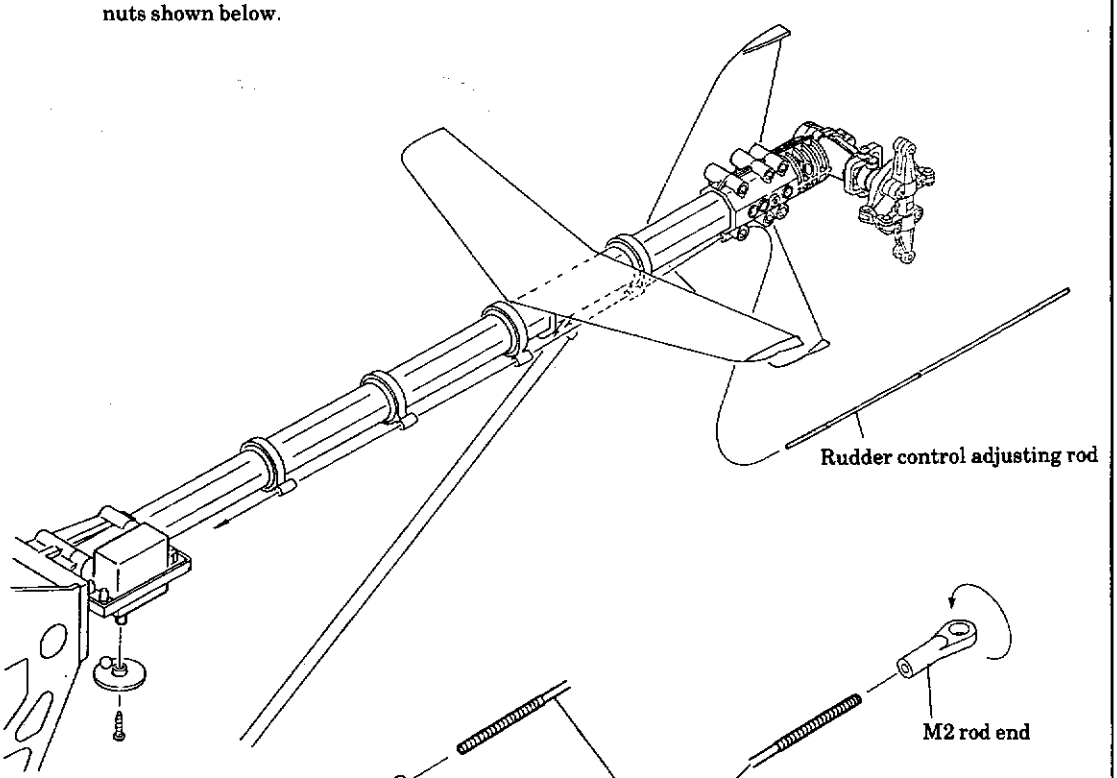
M2 nut

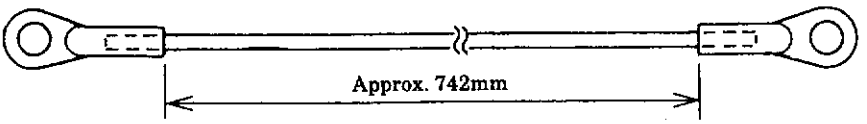


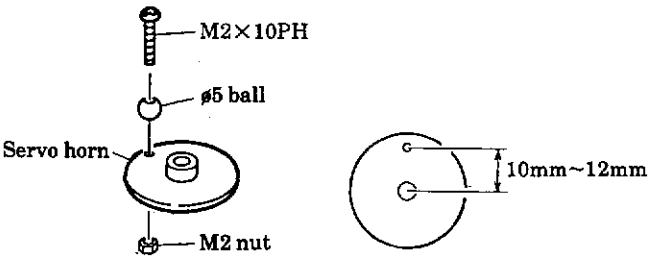
M2 rod end



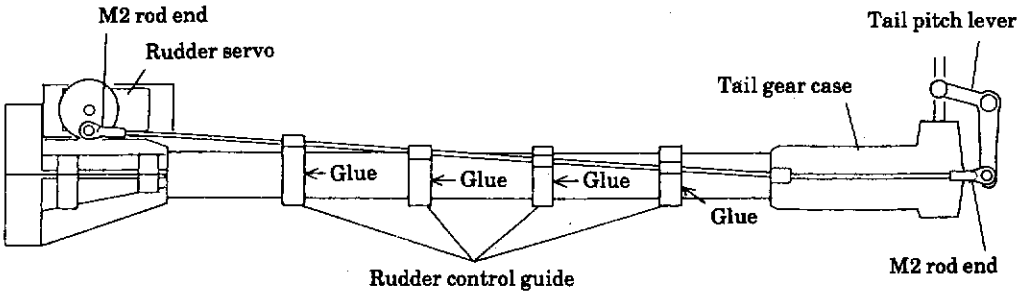
- Pass the rudder control adjusting rod.
- Install the ø5 ball to the servo horn with the nuts shown below.





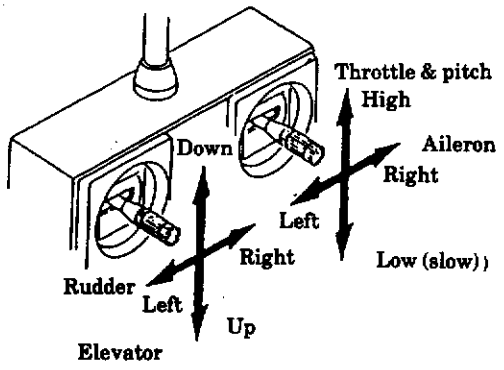


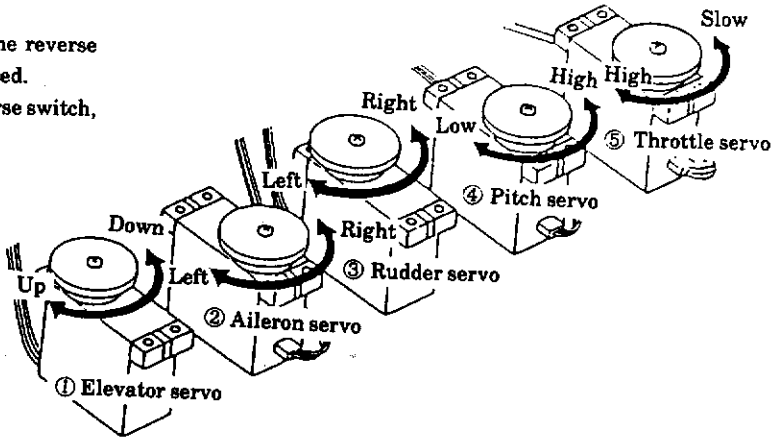
- Insert the rudder control adjust rod as shown below, and then fix it with quick-drying glue.



30 Transmitter and servo setting

① To confirm that the servo (mode Ⅰ) works, turn on switch after connecting transmitter, receiver, and servo. Then confirm the direction of rotation of the sticks and the servo.
When the direction of rotation is incorrect, change the reverse switch of the transmitter and set it to move as designated.
(In the case of using the transmitter set without a reverse switch, please use the reversal servo.)



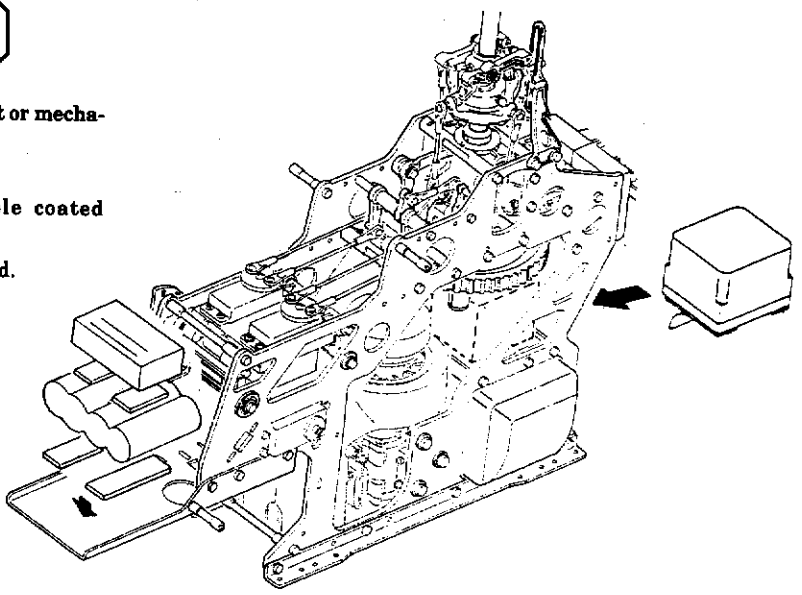


② Installation of gyro

- Affix the gyro to the gyro-mount with two layers of double coated adhesive tape.

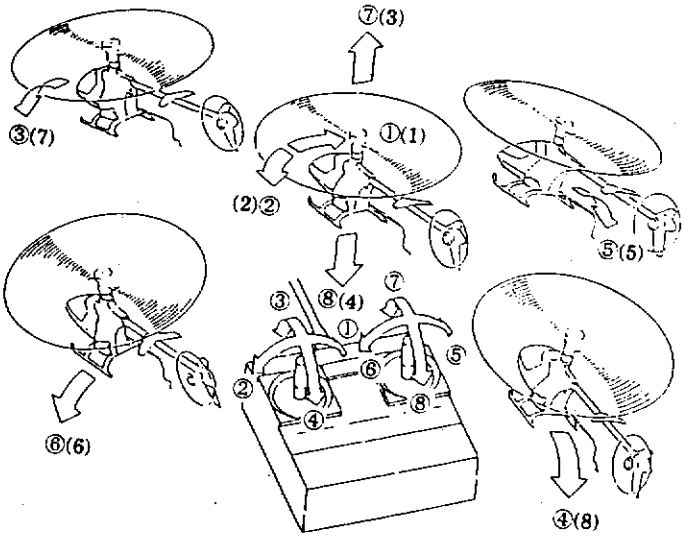
(Be careful of the direction about installation.
The details are shown in the manual of the gyro.)

- Installation of receiver and gyro-switch
  Install the switch, as desired, to either servo mount or mecha-mount.
- Installation of battery and receiver
  Install them to the mecha-mount with double coated adhesive tape.
  Fix the servo cord, etc. with the attached unity band.



③ Basic operation of sticks

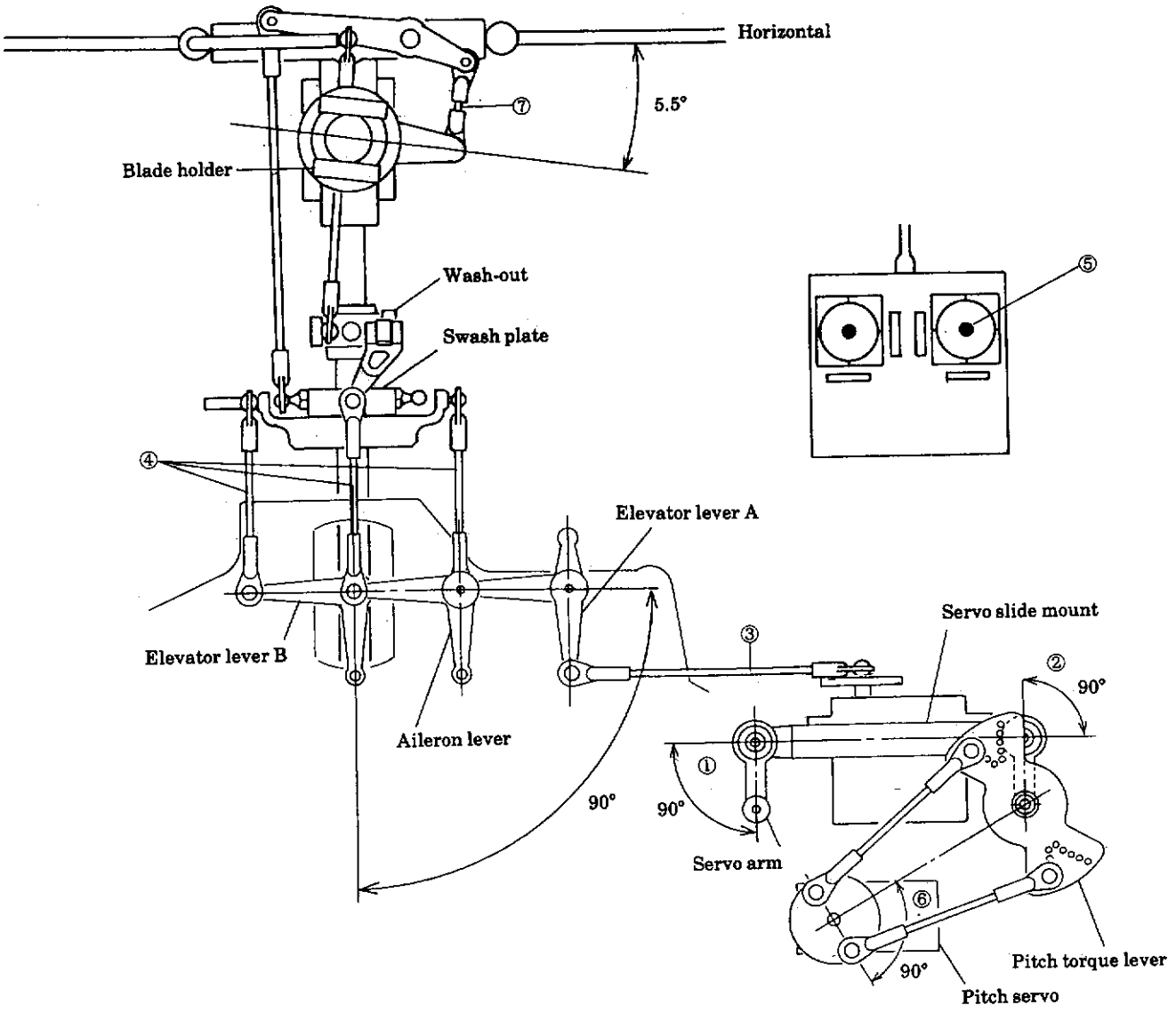
Basic operation of sticks of SST-EAGLE is the same as the large-sized R/C helicopter.



①	Rudder	Right
②	Rudder	Left
③	Elevator	Down
④	Elevator	Up
⑤	Aileron	Right
⑥	Aileron	Left
⑦	Engine-control	High
⑧	Engine-control	Slow

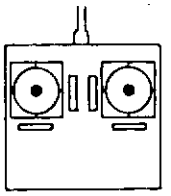
31 Adjustment of linkage

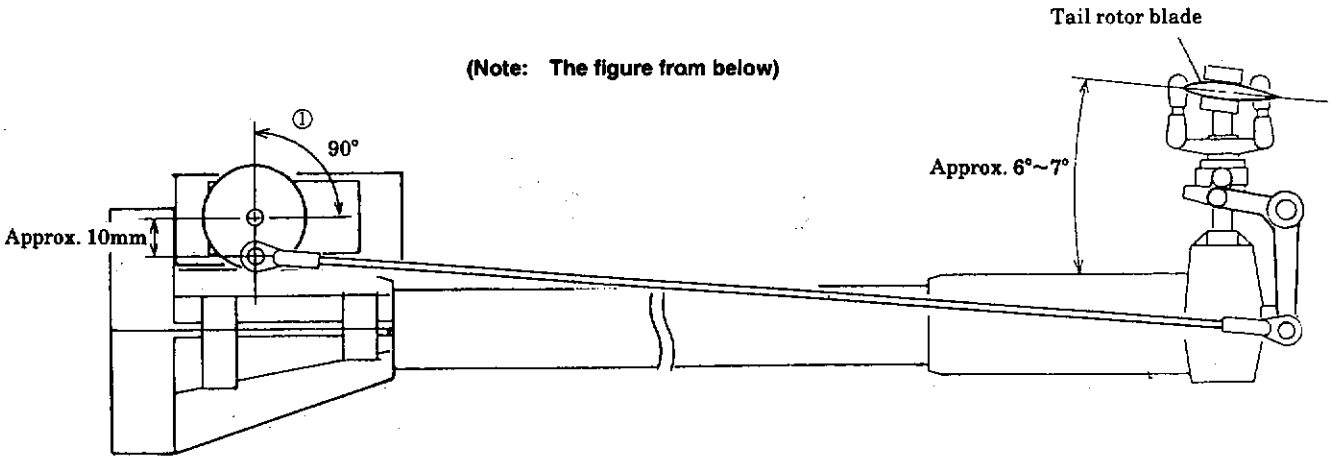
Linkage during hovering



① Mount the servo slide at right angle to the servo arm.
② Mount the pitch torque lever parallel to the servo arm.
③ Keep elevator levers A and B, and aileron lever R · L, at right angles (Adjust with four pieces of linkage ③).
④ Assemble the swash plate parallel to the frame. (Adjust with four pieces of rod ④).
⑤ Turn on the transmitter switch and keep the servo of the pitch in neutral.
Set the transmitter stick at hovering place.
⑥ Set up the servo horn as shown in figure ⑥.
(Note) Adjust the lot not to be stretched tight.
⑦ Set up the blade holder at 5.5° with the pitch gauge.
(Adjust by the pitch rod ⑦)

32 Linkage of rudder



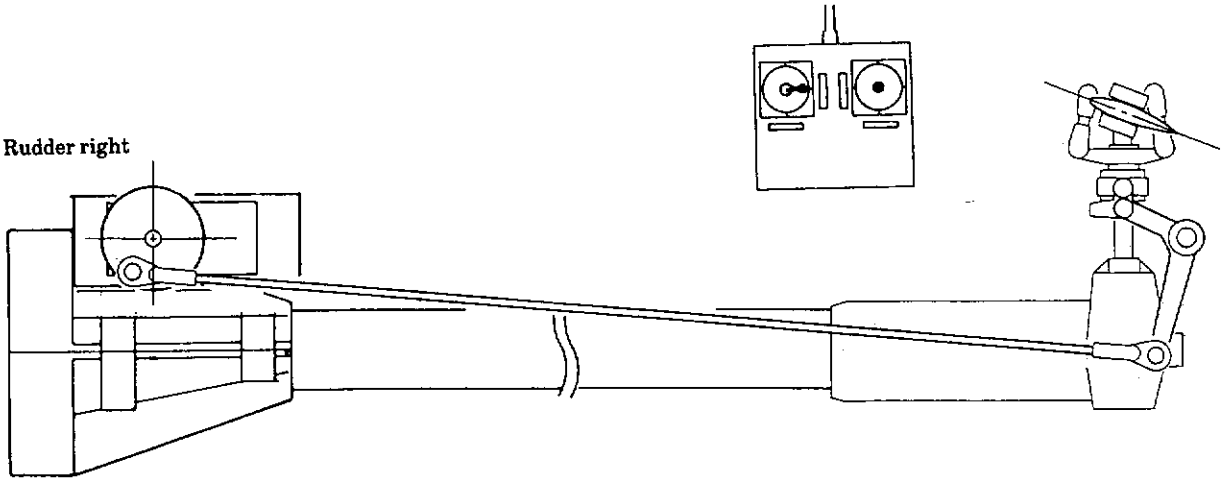


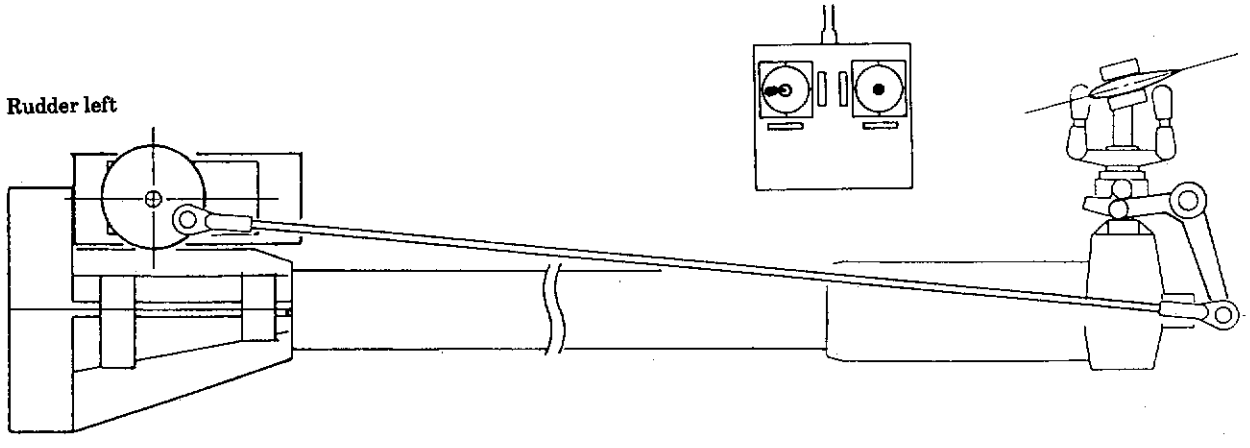
① Turn on the switch of the transmitter, and set the rudder servo at neutral.

② Set up the tail blade between 5° and 6° with M2 rod end.

Note: Hovering speed of rotation changes the pitch of the tail blade holder.

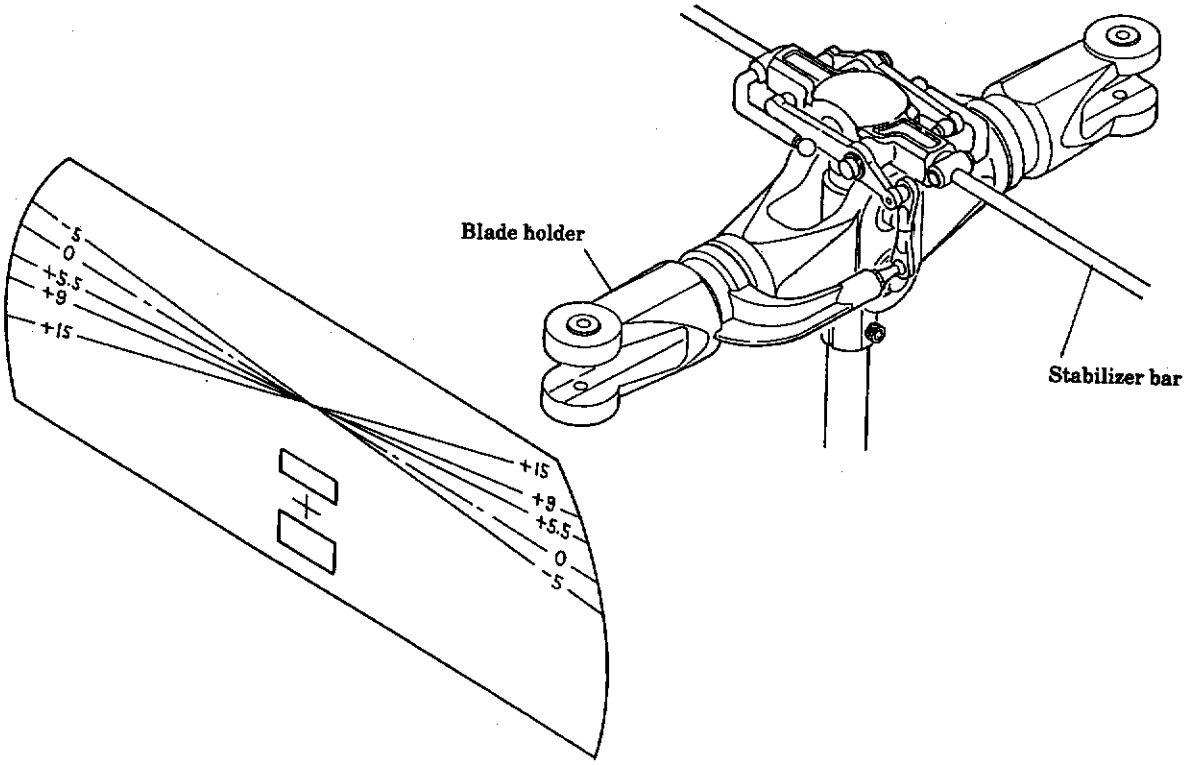
Rudder movement

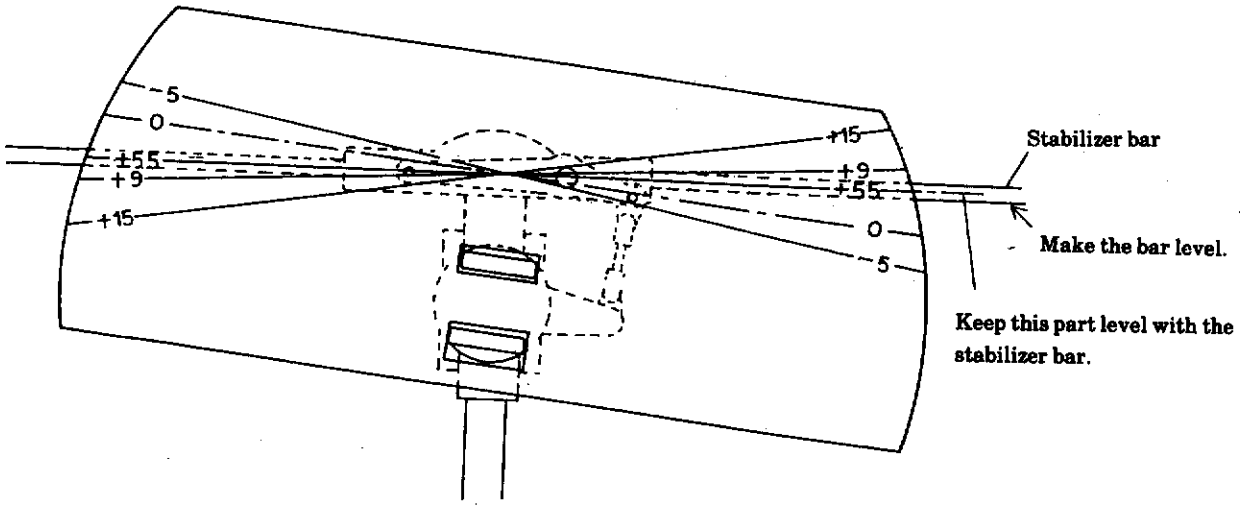




33 Handling method of pitch gauge

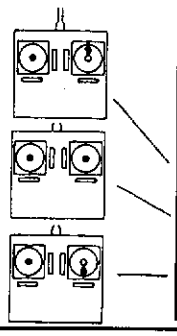
① Put the pitch gauge into the blade holder of the rotor head Assy.





② Keep the stabilizer bar level. (Lay the body horizontally.)
③ Referring to the table below, set the stabilizer bar to each pitch gauge line, and read the pitch.
④ Use transmitter to set angle as shown below.

※ The pitch depends on the engine fuel, muffler, etc. The standard value is indicated.

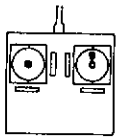


Pitch setting

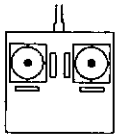
(This data is available when the computer transmitter is used.)

Pitch stick	Hovering	Idle UP 1	Idle UP 2	Auto-rotation
High pitch	13°	9°	9°	15°
Hovering	5.5°	5°	5°	5.5°
Low pitch	Minus 3°	Minus 3°	Minus 5°	Minus 5°

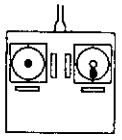
Pitch curve setting



Stick high

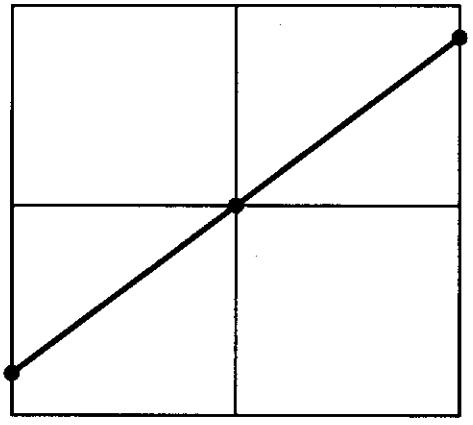


Hovering

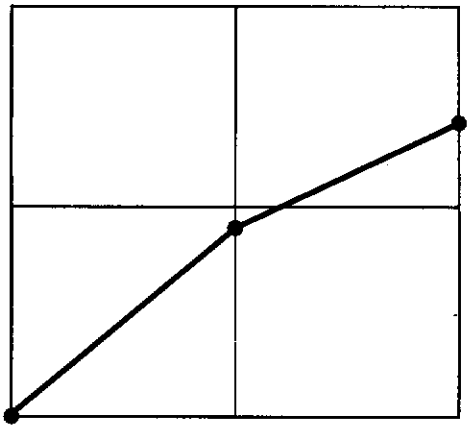


Stick low

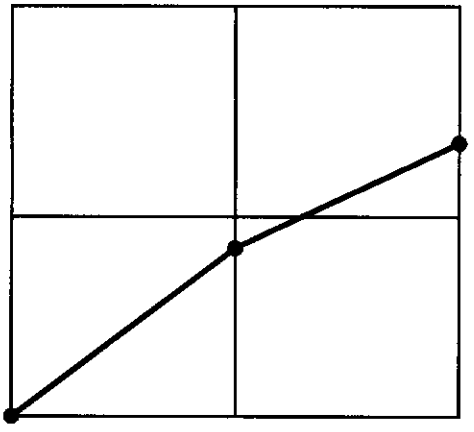
Hovering



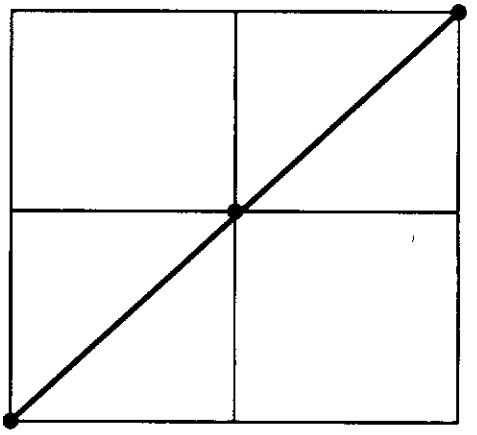
Idle UP 1



Idle UP 2

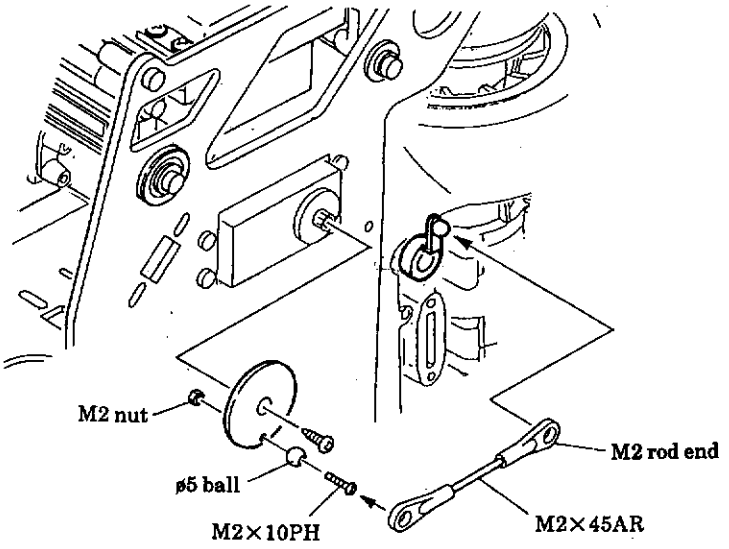


Auto-rotation



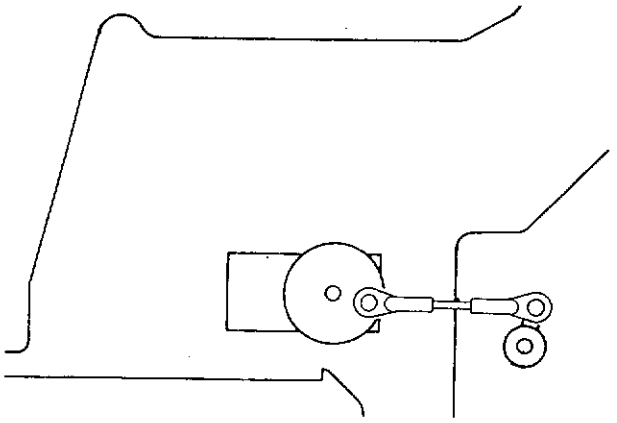
(Notes) This setting shows general pitch curve. (Computer transmitter)
Difference will sometimes occur by the engine or the body.
Adjust it by flying.

34 Linkage of engine control

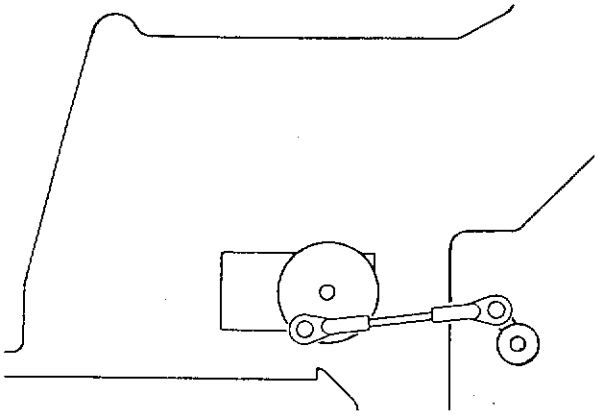


Engine control servo slow

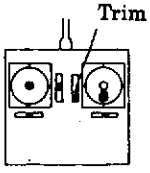
Trim slow

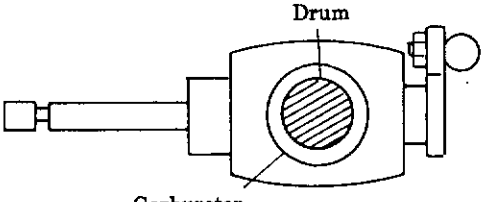


Engine control servo high

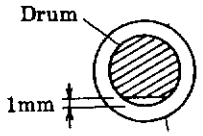


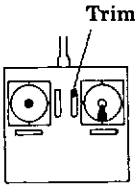
Slow (engine stop)



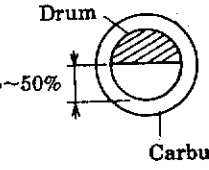


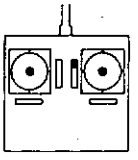
Slow (idling)

② 

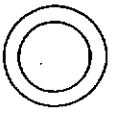


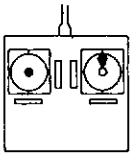
(Hovering)

③ 



(Full opening)

④ 



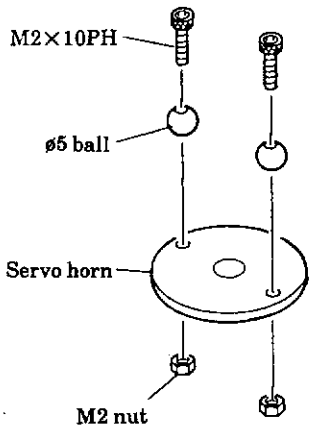
① Turn the engine-control stick to slow and trim to slow.
Install the servo horn to figure ①.
Use M2 rod end to adjust carburetor until fully closed.

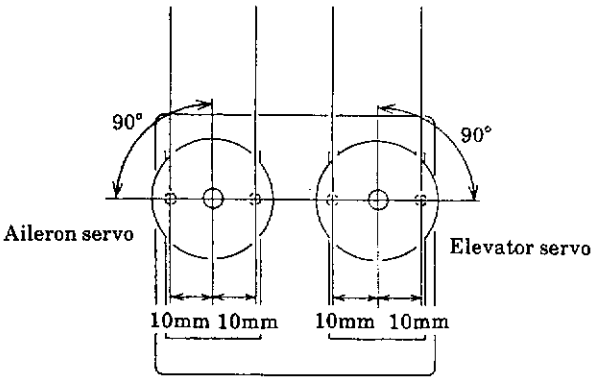
② Turn the engine control stick to show trim-high.
Adjust the carburetor drum to be open by about 1mm.
(Figure ②)

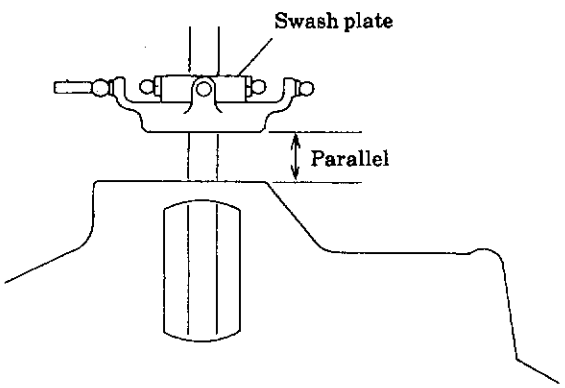
③ Set the engine control stick to the hovering. Adjust the carburetor drum to be open by about 40 to 50%. (Figure ③)

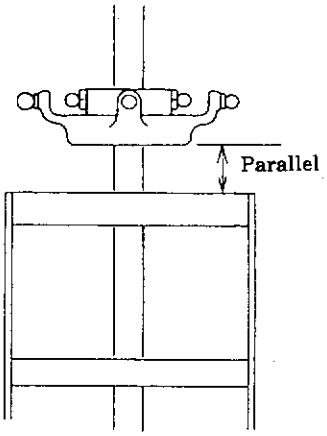
④ Turn the engine control stick to high.
Adjust the carburetor drum to be fully open.
(It is adjusted until it comes to the length of M2 rod end and the servo horn.)

35 Linkage of aileron and elevator





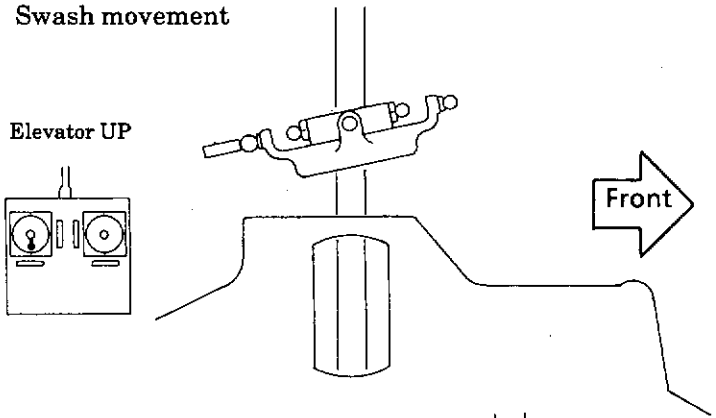


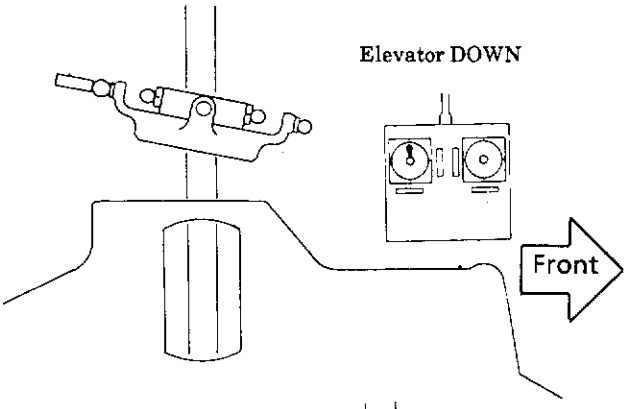


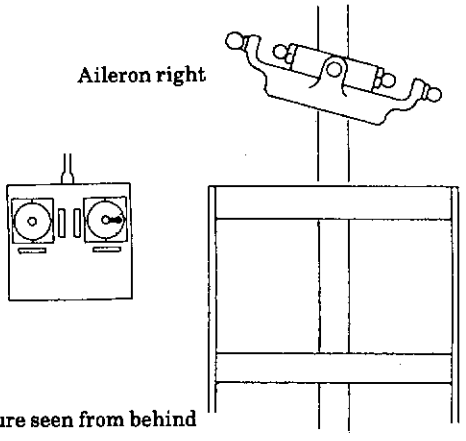
① Make ø2 holes on the servo horn of aileron servo and elevator servo 10mm from the center, and then install ø5 balls using M2×10PH M2 nuts.

② Adjust the swash plate in parallel using M2 rod end.

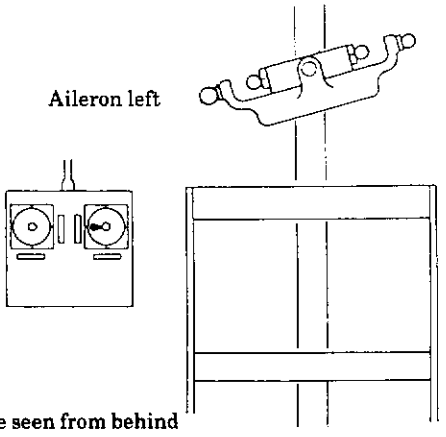
◦ Swash movement







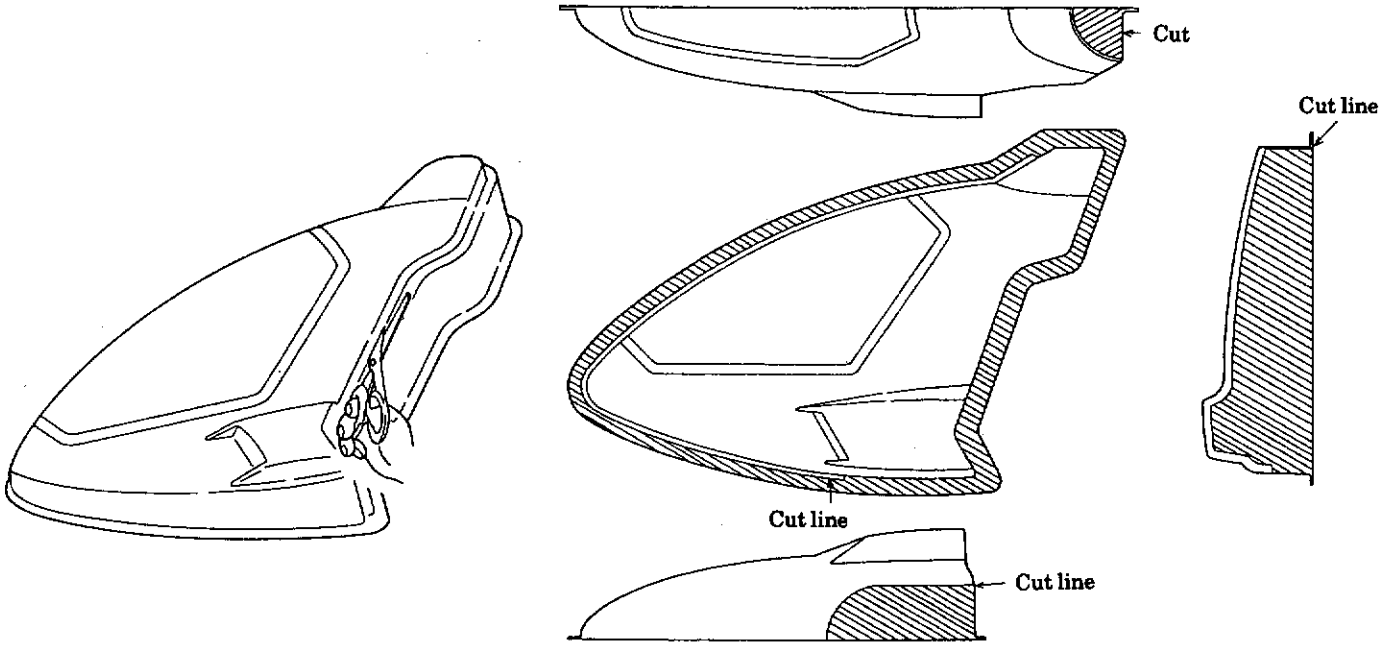
The figure seen from behind



The figure seen from behind

36 Cabin assembly

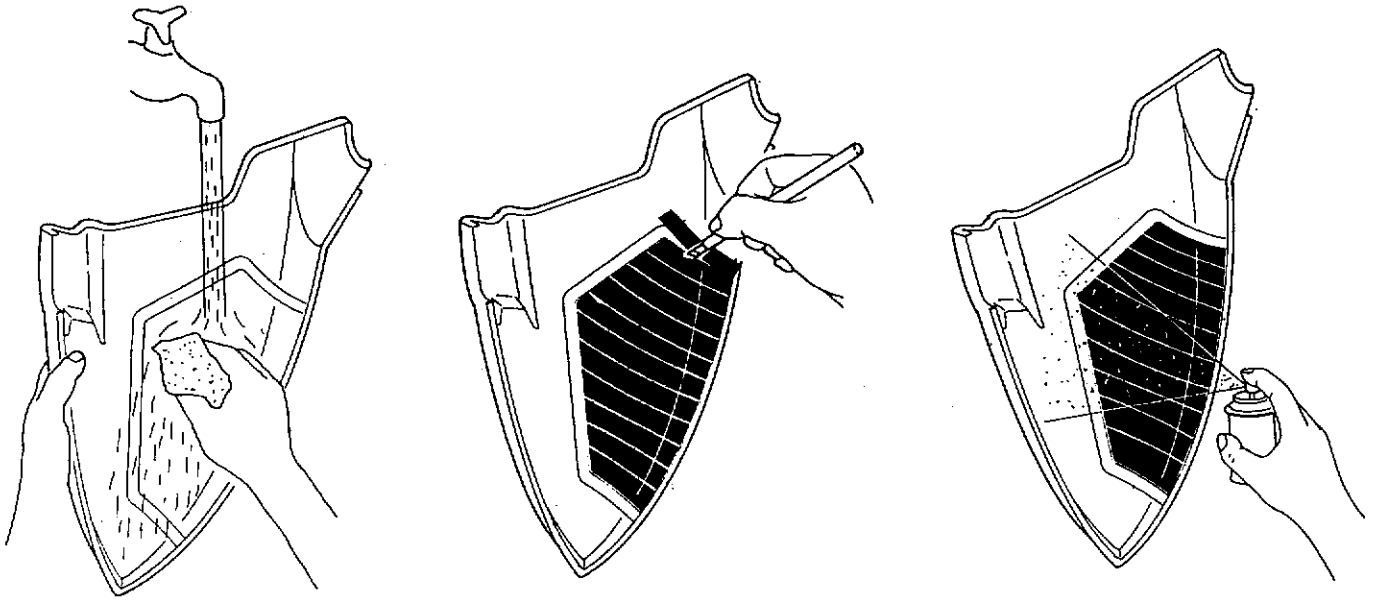
① Cut to the right and left of a cabin after putting cut line together.



② Wash the cabin with the detergent.

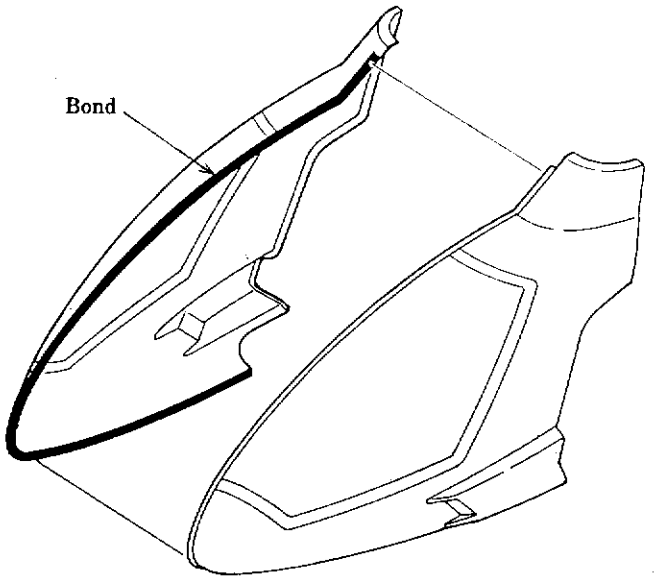
③ Mask the wind shield with the masking tape.

④ Coat with paint used for poly-carbonate.
Note: Coat from the back.

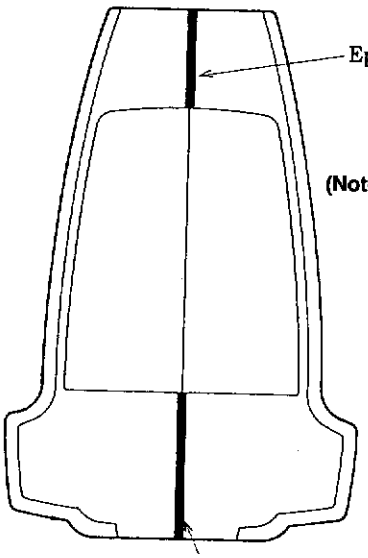


Note: After the coating has dried, remove the masking tape.

⑤ Glue flange into cabin with the clear-bond (used for the rubber and plastic).

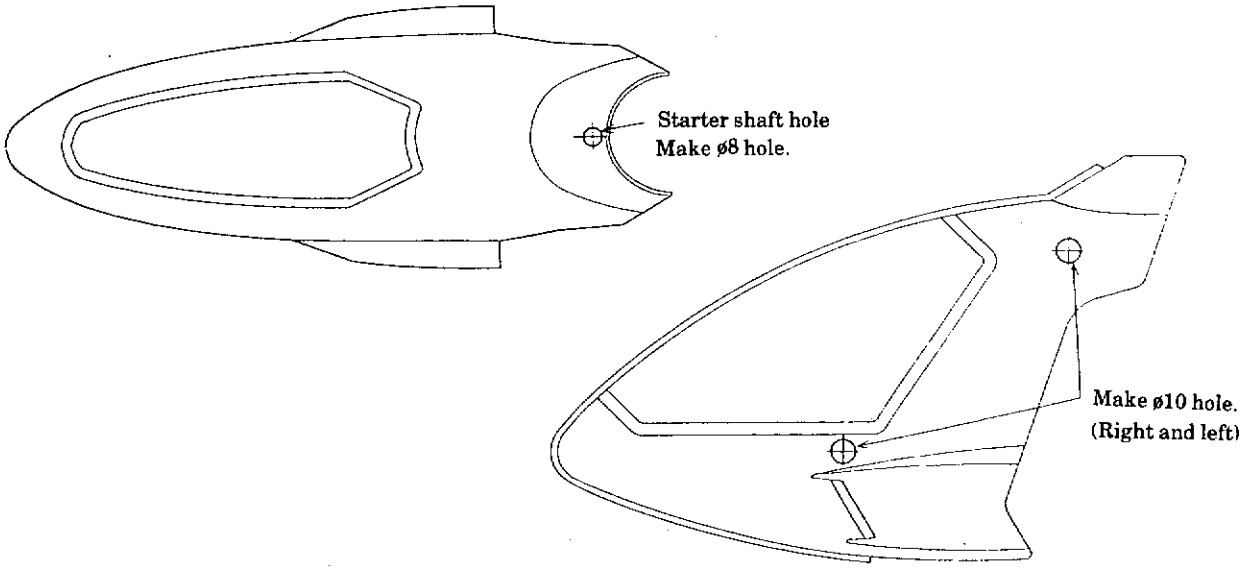


⑥ Glue epoxy-type adhesive to adhesive parts of back sides of cabin.

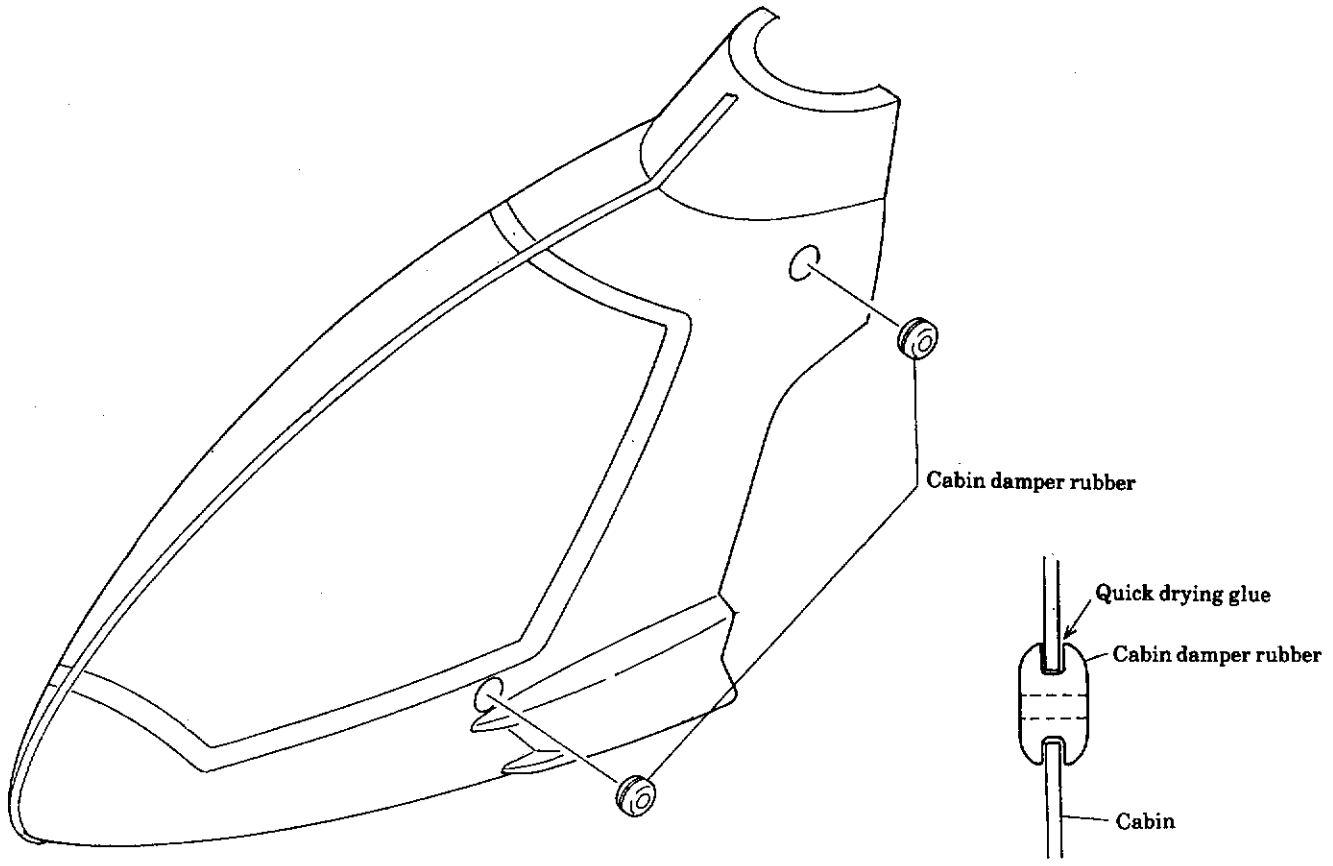


(Note) Don't use epoxy adhesive on this part of canopy.

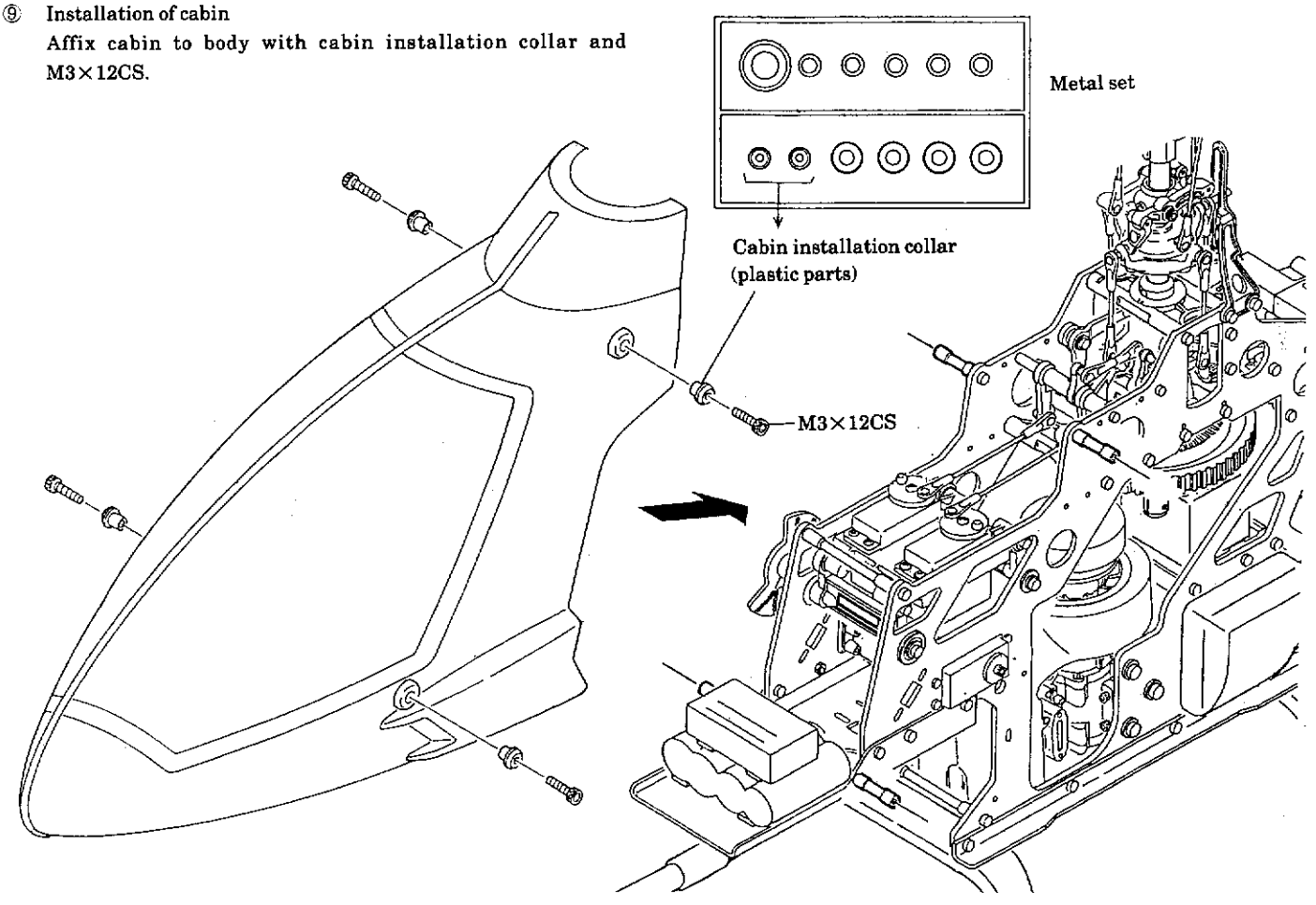
⑦ Hole for the cabin installation & starter shaft processing



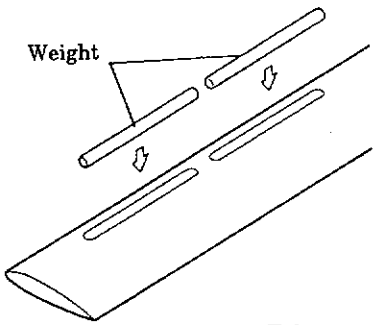
⑧ Installation of cabin damper rubber
Install cabin damper rubber to the part with holes ⑦, and fix it with quick drying glue.

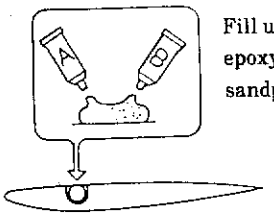


⑨ Installation of cabin
Affix cabin to body with cabin installation collar and M3×12CS.

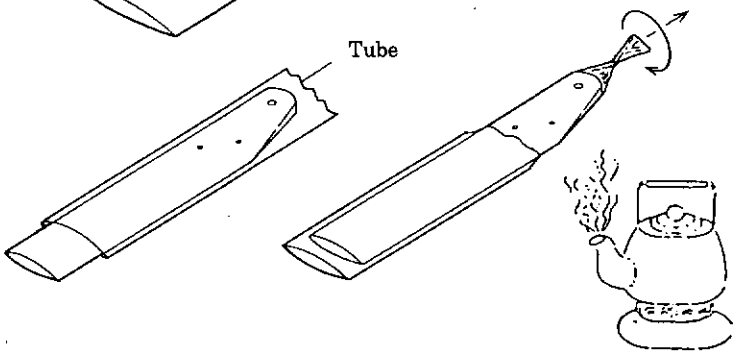


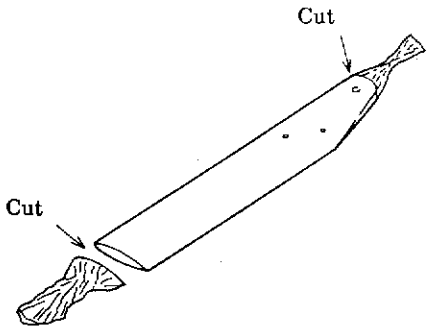
37 Main rotor assembly



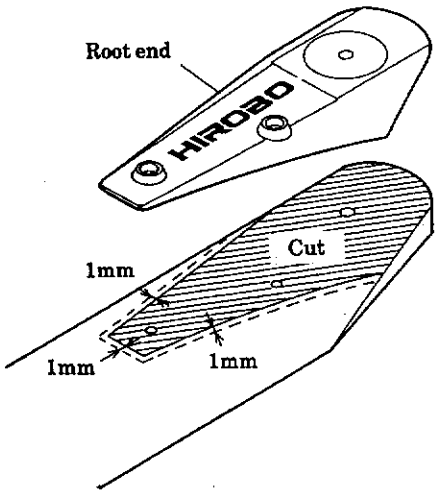


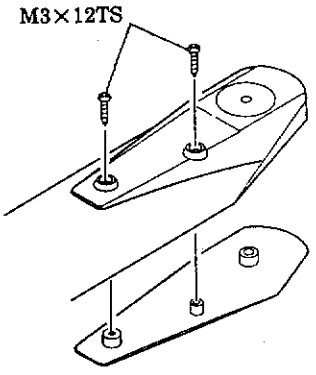
Fill up the opening at the weight with the epoxy adhesive, and rub the convex with sandpaper etc to make the main rotor wing.

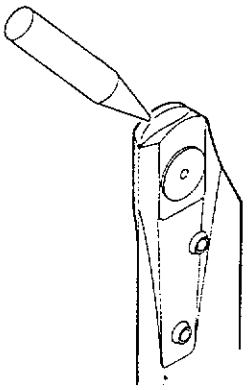




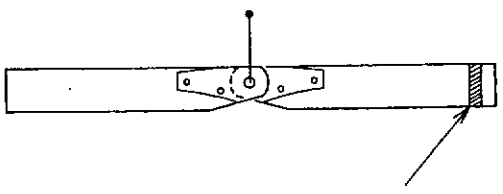
- Install the root end to the main rotor blade.
- Mark with a ball point pen etc at the outer circumference of the root end. (On both sides)
- Cut the tube with the cutter knife at about 1mm inside of the mark. (From both sides)
- Screw the root end with M3×12TS.
- Glue the root end with an quick drying glue.
- Before the quick drying glue is hardened, insert the root end into the blade holder of the rotor head so that there is no opening between the root end and main rotor blade.



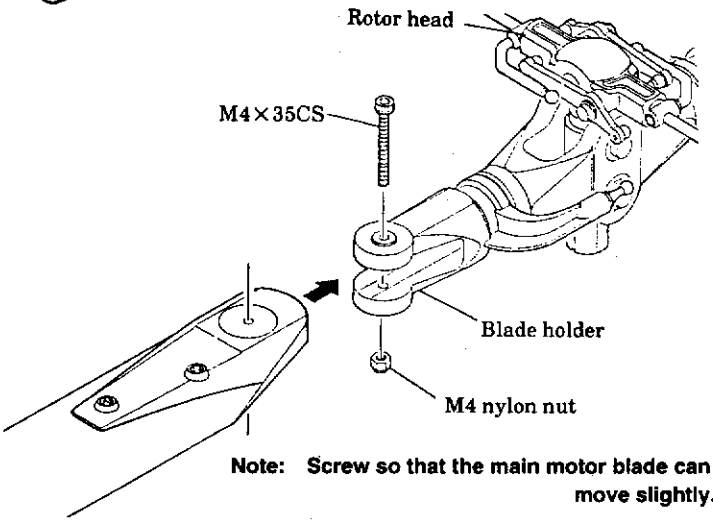




- Balance the main rotor blade.

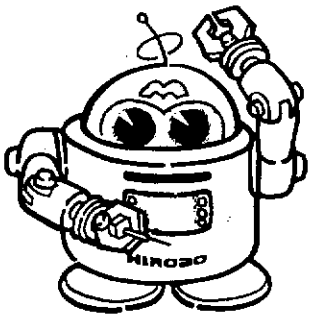


Wrap a lighter main rotor blade with a tape or decal.



Note: Screw so that the main motor blade can move slightly.

Maintenance



In the case of a fall or crash

Replace the main rotor.

Check each section. — Parts have scratch or are broken.

YES → Replace the parts.

NO

Hovering flight — A vibration can be seen. (Set the tracking.)

YES

Check the main mast — The main mast is bent.

YES → Replace the main mast.

NO

Check the main rotor blade. — The main rotor blade is not balanced.

YES → Balance the main rotor blade.

NO

Balance of the tail rotor blade. — The tail rotor blade is not balanced.

YES → Balance the tail rotor blade.

NO — The yoke and feathering spindle are bent.

Check the rotor head.

YES → Replace the yoke.

NO — The center hub is bent.

Check the center hub.

YES → Replace the center hub.

NO

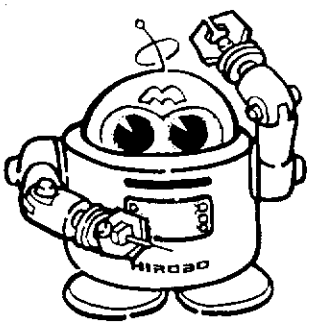
Please contact HIROBO Service Engineering.

TEL. 0847-41-7400
FAX. 0847-41-9361

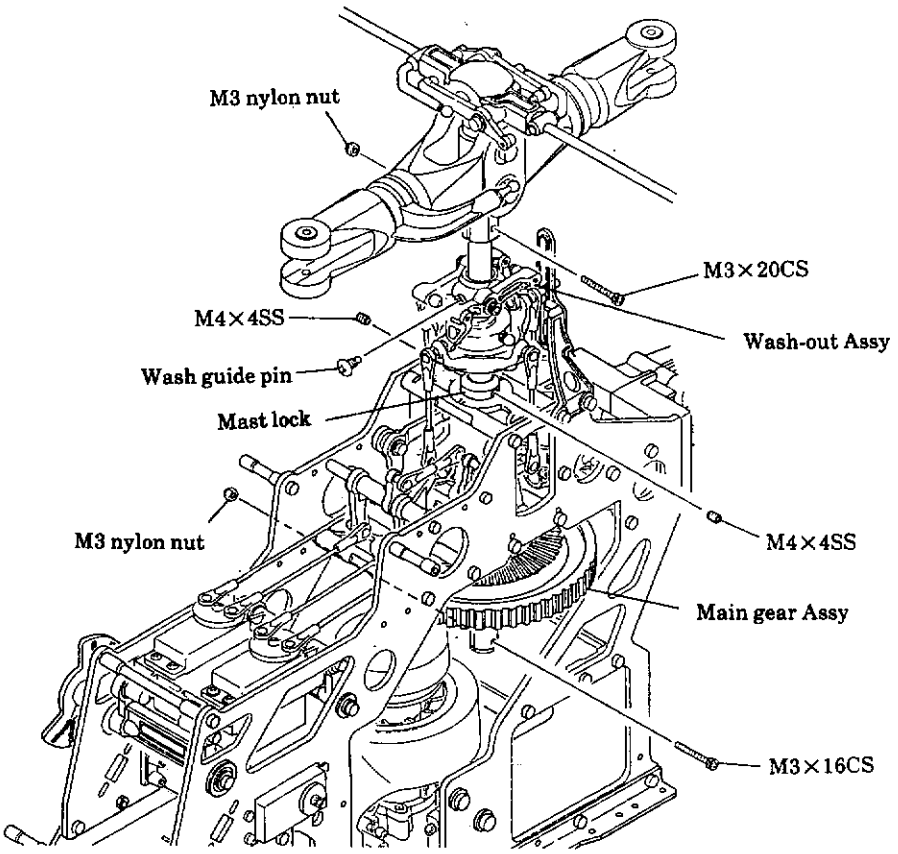
NO

O K

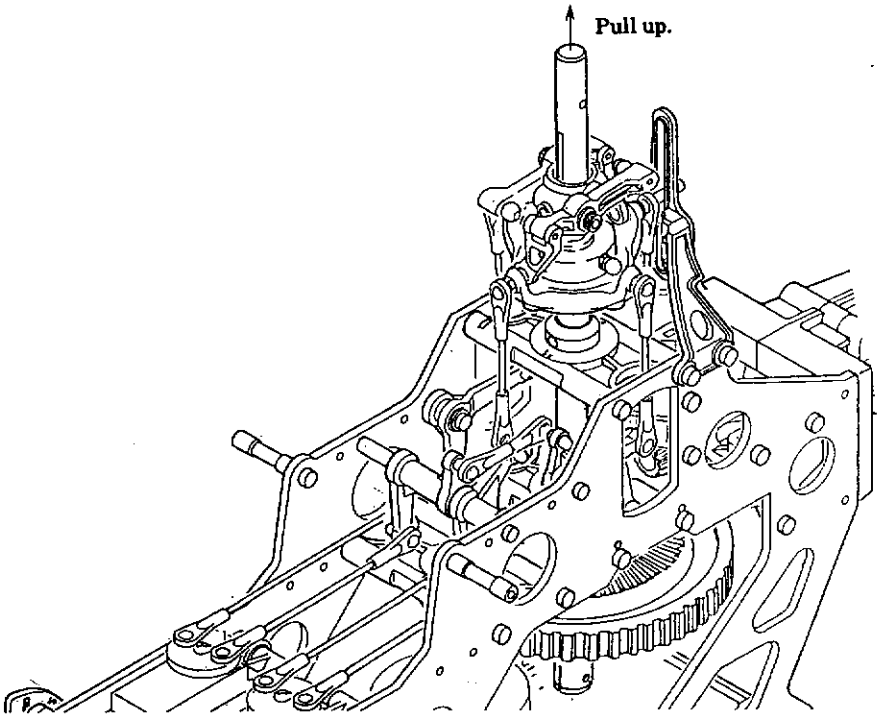
I Replasement of main mast

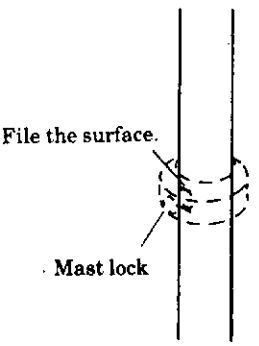


① Remove the M3×20CS and M3 nylon nut from the rotor head assembly.
② Remove the wash guide pin.
③ Remove the main mast lock M4×4SS.
④ Remove the main gear assembly, M3×16CS, and M3 nylon nut.



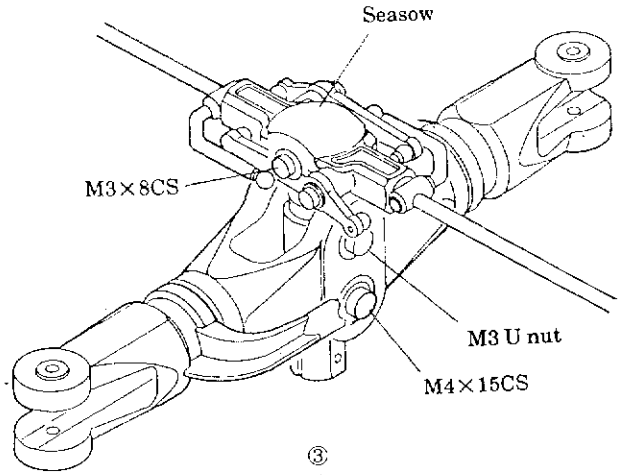
⑤ On the main mast, there is a flaw when the mast lock is installed. File the surface.
⑥ Pull up the main mast to remove it.

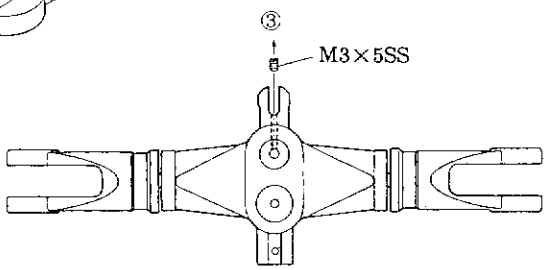


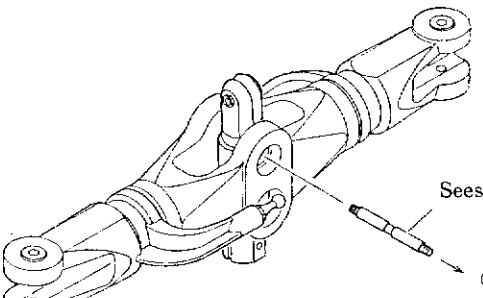


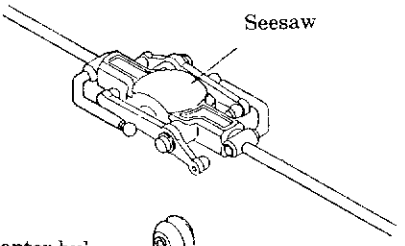
II Replacement of center hub

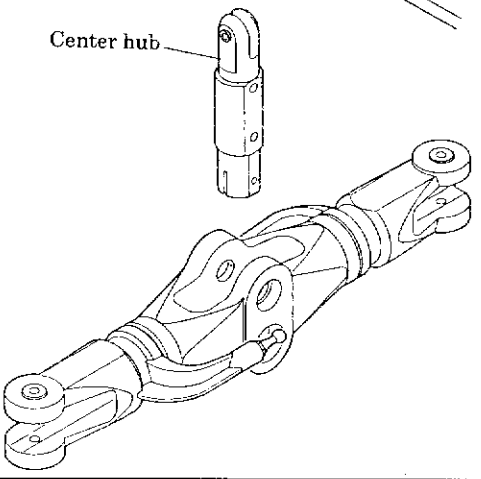
① Remove the M3 U nut and M4×15CS.
② Remove M3×8CS from the seesaw.
③ Remove the M3×5SS.
④ Remove the seesaw pin.





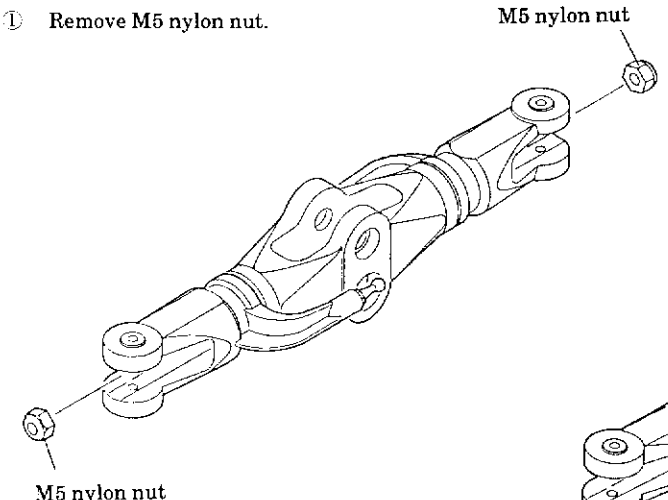




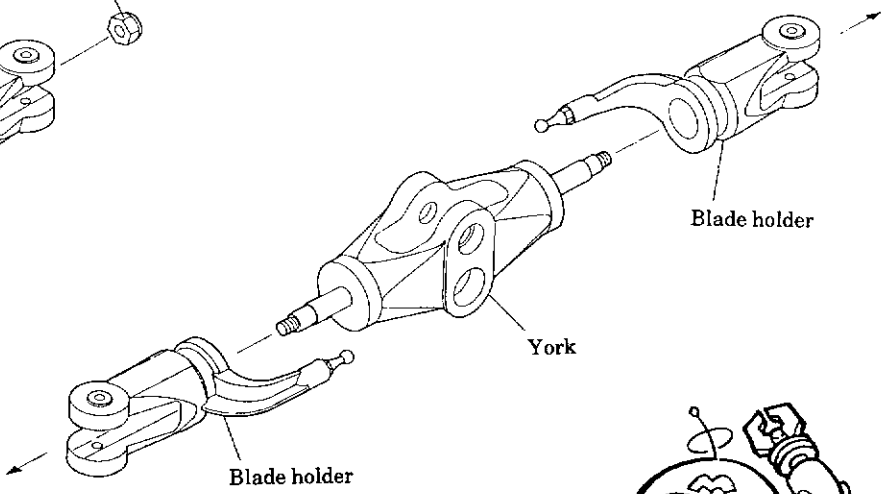


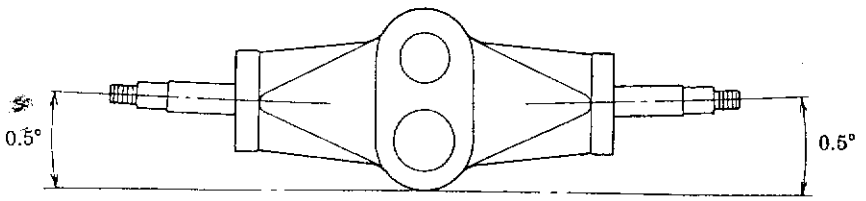
III Replacement of yoke

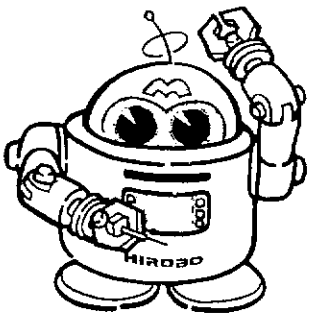
① Remove M5 nylon nut.



② Remove the blade holder.







Note: The yoke has a coning angle of 0.5°.

Note for safety

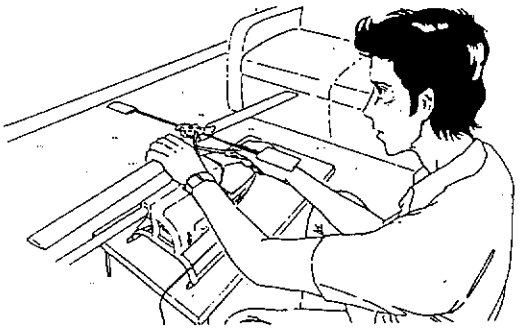
HIROBO LTD. shall have no liability or obligations whatsoever at any time for any personal injury or property damages or for any special, indirect or this product.

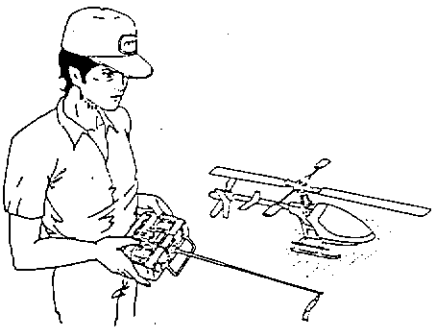
If you are new to R/C helicopter flying, please seek the assistance of an experienced R./C helicopter flier. Since a R/C helicopter is a highly complex machine, a mistake in construction or initial adjustment could result in a integrity of the machine.

A R/C helicopter flown by an expect appears quite innocuous. However, due to the high main rotor head speed sued, a potentially lethal situation does exist.

Fly only in designated areas and never near or above spectators. It is highly recommended to join a local R/C modeling club and to purchase liability insurance through the national organization.

For further details please contact the shop where you bought your helicopter.





Parts for repair and maintenance

<Purchase of parts>

If parts of your helicopter are missing or damaged, please but them at the shop where you purchased your helicopter. Please tell your healer the part numbers and the names of the parts. If it is difficult to obtain replacement parts, please place an order for parts directly to Sales Department of HIROBO LTD., or your country's distributor, with remittance including freight charges. Please state your name, address, zip code and telephone number together with the necessary parts No., name and quantity. If your order covers more than two kinds of parts at the same time, only the fright charge that is the highest among the parts is to be paid. All the other freight charges are free.

◎ The freight charges herein are based upon the current rate of Jun. 1, 1990. They are subject to change.

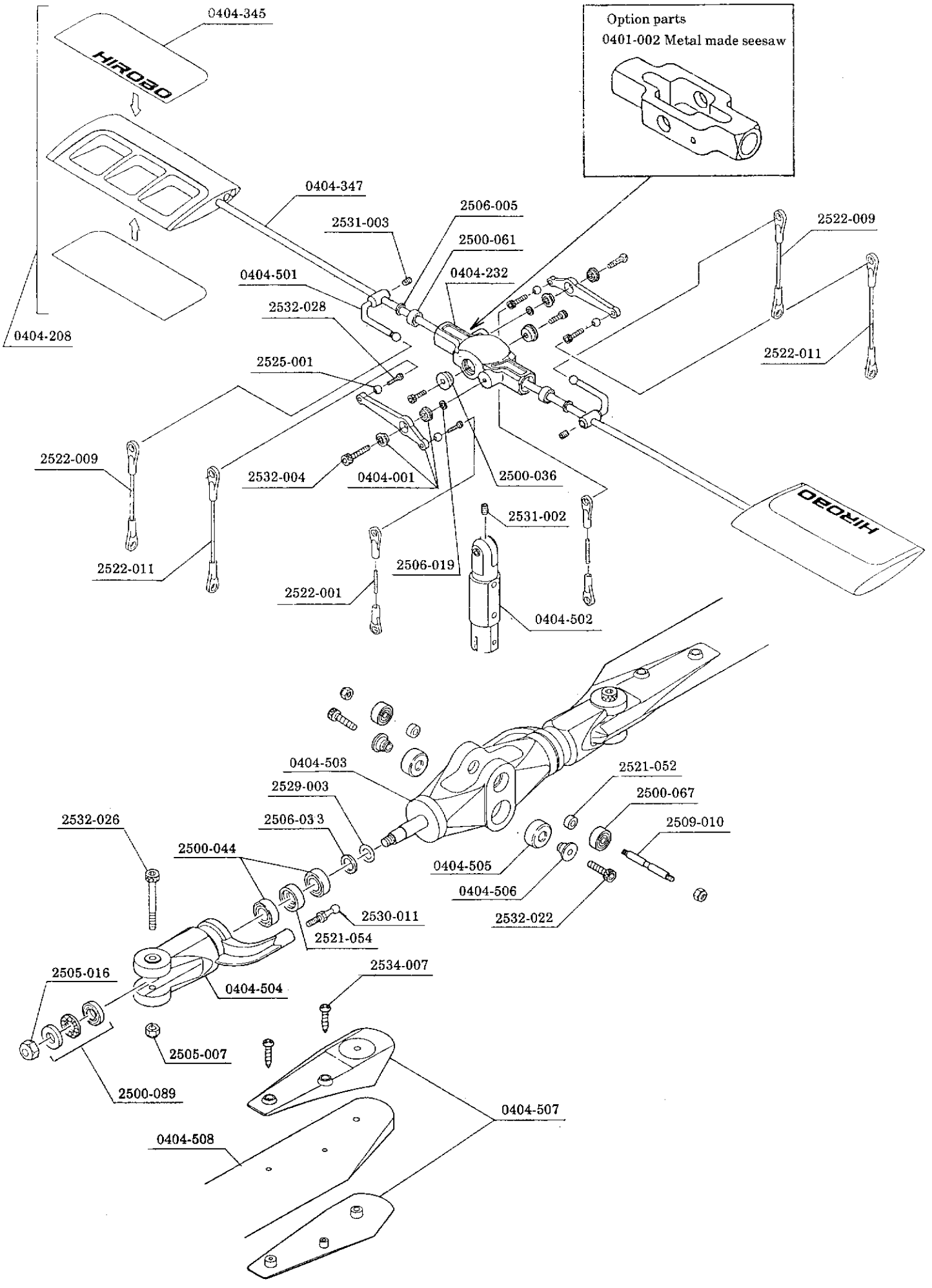
◎ The consumer tax is not included in the indicated price. Remit the amount of money (Parts list × 1.03 plus postage). (Decimals and to the next whole number is rounded off.)

Sales Department,
HIROBO LTD.
530-214, Motoyama-cho, Fuchu City, Hiroshima 726 JAPAN
Telephone: 0847-41-7400 Fax: 0847-41-9361 Telex: 645760

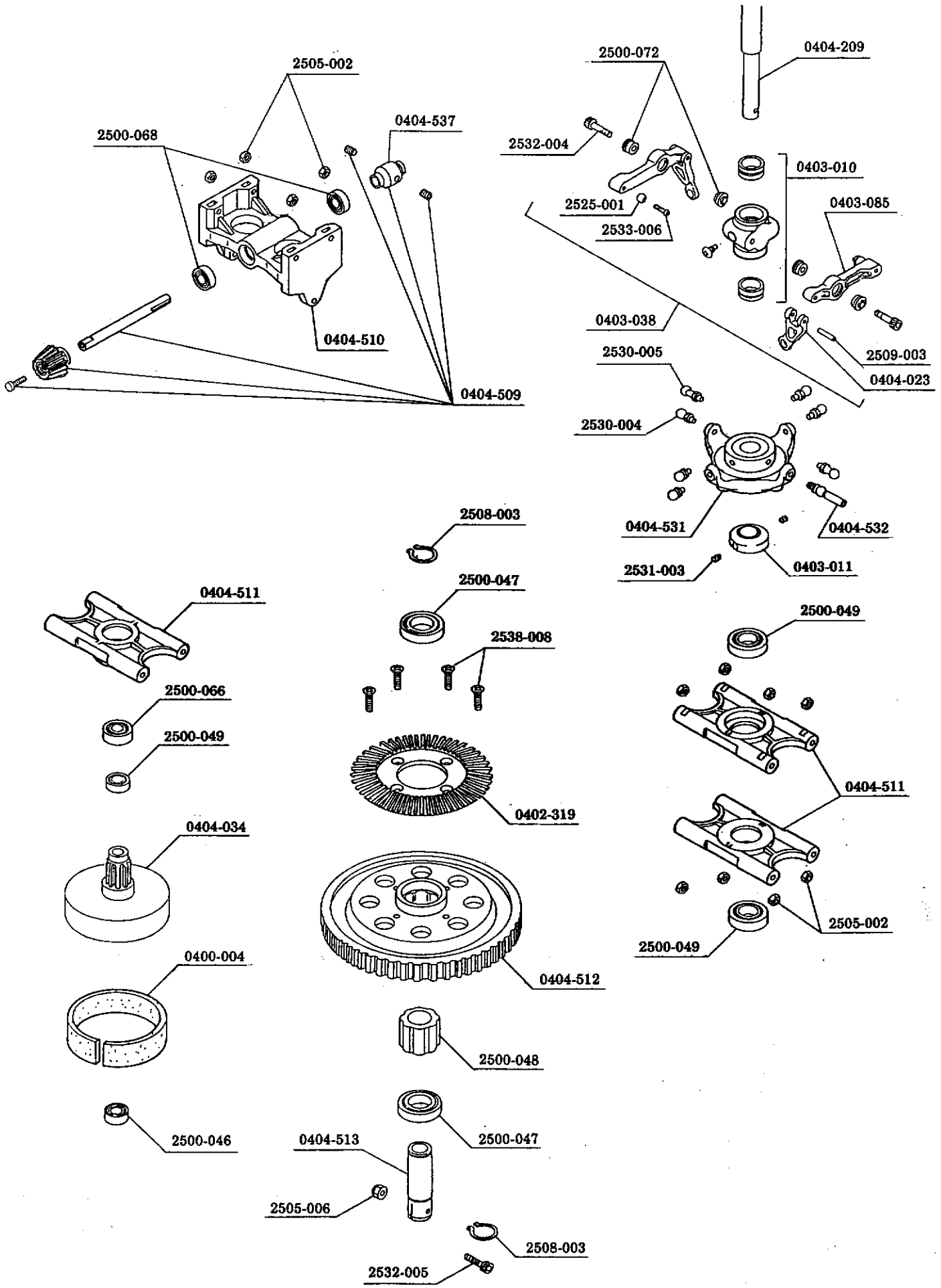
Order example

			Price			Freight charge
0404-508	Main motor blade	2 sets	4,500	=	9,000	1,000
0404-050	Octagonal tail boom pipe L=735	1 set	1,600	=	1,600	800
0404-209	Main mast L=178	2 sets	1,000	=	2,000	360

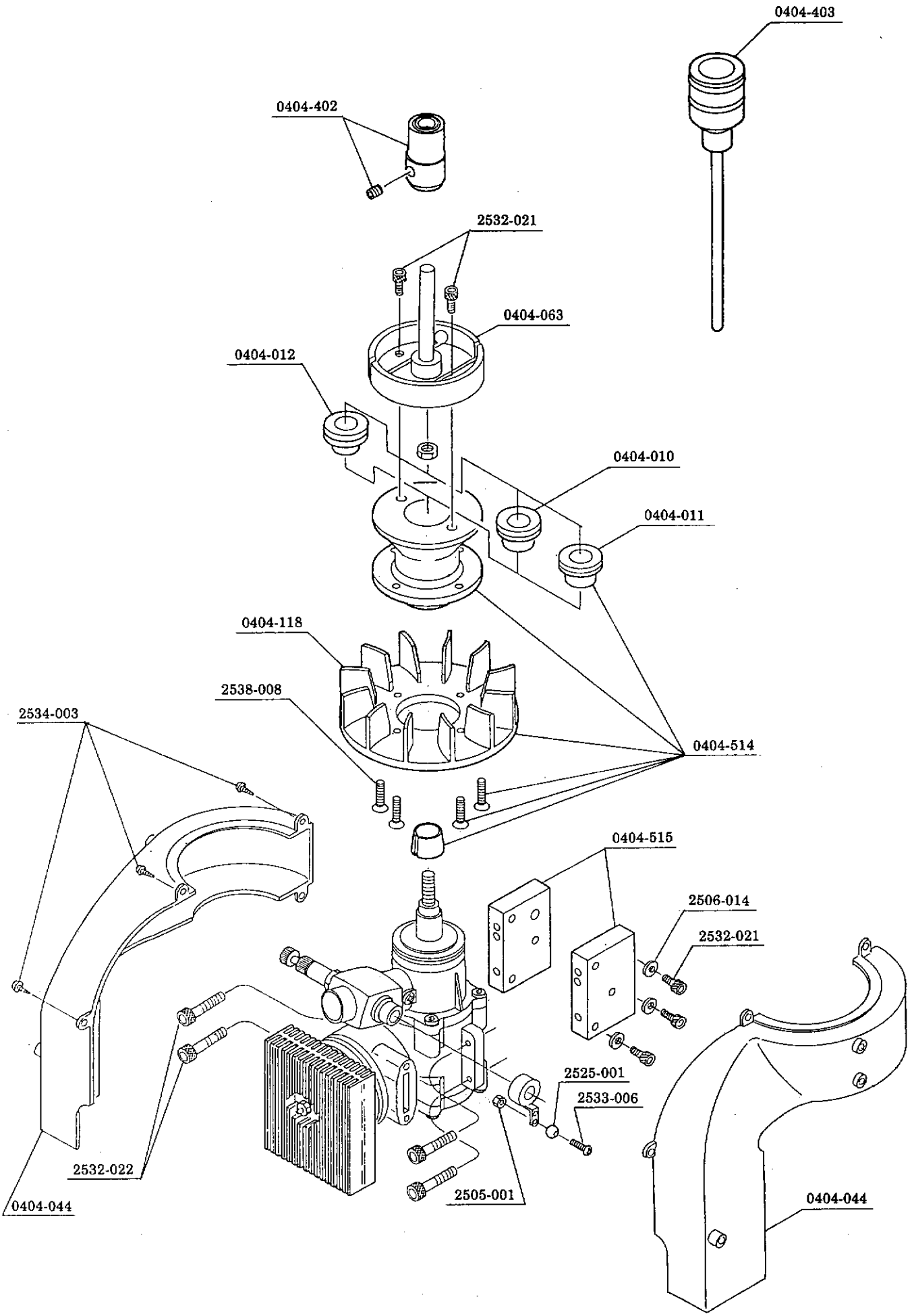
Total (12,600×1.03)+1,000
Ground total ¥13,978


0404-345
HIROBO
Option parts
0401-002 Metal made seesaw
0404-347
2506-005
2531-003
2500-061
0404-232
0404-501
2532-028
0404-208
2522-009
2522-011
2525-001
2522-009
2532-004
0404-001
2500-036
2531-002
2522-011
2506-019
2522-001
0404-502
0404-503
2529-003
2521-052
2500-067
2509-010
2532-026
2506-033
2500-044
0404-505
0404-506
2532-022
2530-011
2521-054
2505-016
2534-007
0404-504
2505-007
2500-089
0404-507
0404-508

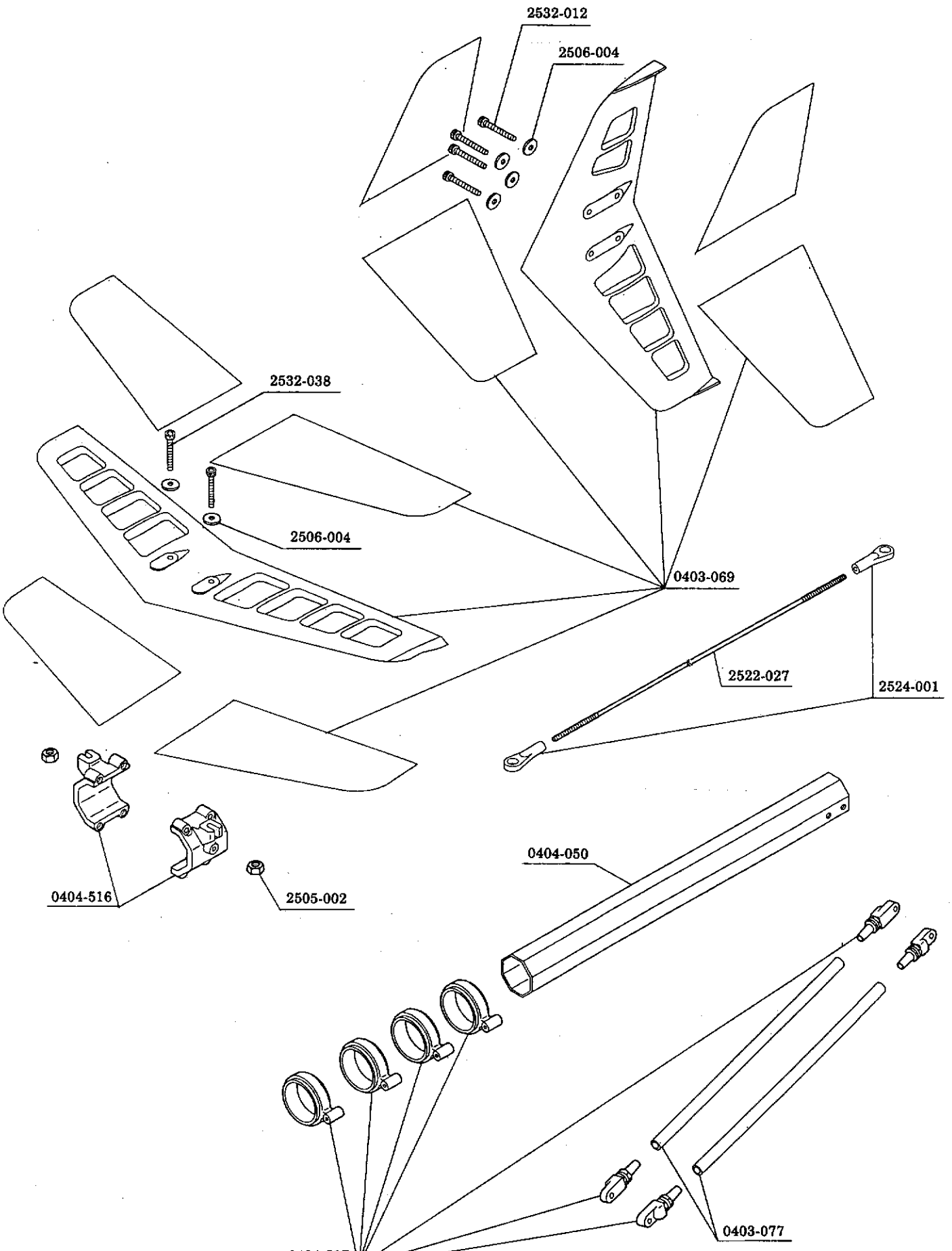
Code No.	Particulars	Q'ty	Price	Freight charge	Remarks
0401-002	Seesaw (Metal made)	1			
0404-001	Mixing arm (With bearing)	1			
0404-208	Stabilizer blade CG type	2			
0404-232	Seesaw	1			
0404-345	Cover film	1 set			
0404-347	Stabilizer bar	2			
0404-501	SX Stabilizer control arm	2			
0404-502	Center hub	1			
0404-503	Yoke	1			
0404-504	Blade holder	2			
0404-505	Damper rubber	2			
0404-506	Damper collar	2			
0404-507	Root end	2			
0404-508	Main rotor blade	2			
0404-533	FFR R/H Assy				
2500-036	Brg. ø3×ø8×4F ZZ	2			
2500-044	Brg. ø8×ø16×5 ZZ	2			
2500-061	Brg. ø4×ø9×4 ZZ	2			
2500-067	Brg. ø4×ø13×5 ZZ	2			
2500-089	Bearing thrust ø7×15	2			
2505-007	M4 nylon nut	10			
2505-016	M5 nylon nut (thin type)	10			
2506-005	FW ø4×6×0.5T	10			
2506-019	FW ø3×4.5×0.5T	10			
2506-032	ø8×12×0.5FW	5			
2509-010	SX seesaw pin	1			
2521-052	ø4×8×4 collar	2			
2521-054	SX blade holder bearing collar	2			
2522-001	Adjust rod M2×16	5			
2522-009	Adjust rod M2×70	5			
2522-011	Adjust rod M2×90	5			
2525-001	ø5 boll (hardened)	10			
2529-003	O-ring P-7	5			
2530-011	SX pivot bolt ø5×12.5 (M3×7)	2			
2531-002	M3×5SS	10			
2531-003	Set screw M4×4	10			
2532-004	Cap screw M3×12	10			
2532-022	Cap screw M4×15	10			
2532-026	Cap screw M4×35	10			
2532-028	Cap screw M2×8	10			
2534-007	Tapping screw M3×12 black	10			


2505-002
2500-068
0404-537
0404-510
0404-509
2500-072
0404-209
2532-004
0403-010
2525-001
2533-006
0403-085
0403-038
2509-003
0404-023
2530-005
2530-004
0404-531
0404-532
2531-003
0403-011
2508-003
2500-047
2538-008
0404-511
2500-066
2500-049
0402-319
0404-034
0404-512
0400-004
2500-048
2500-046
2500-047
0404-513
2505-006
2508-003
2532-005
2500-049
0404-511
2505-002
2500-049

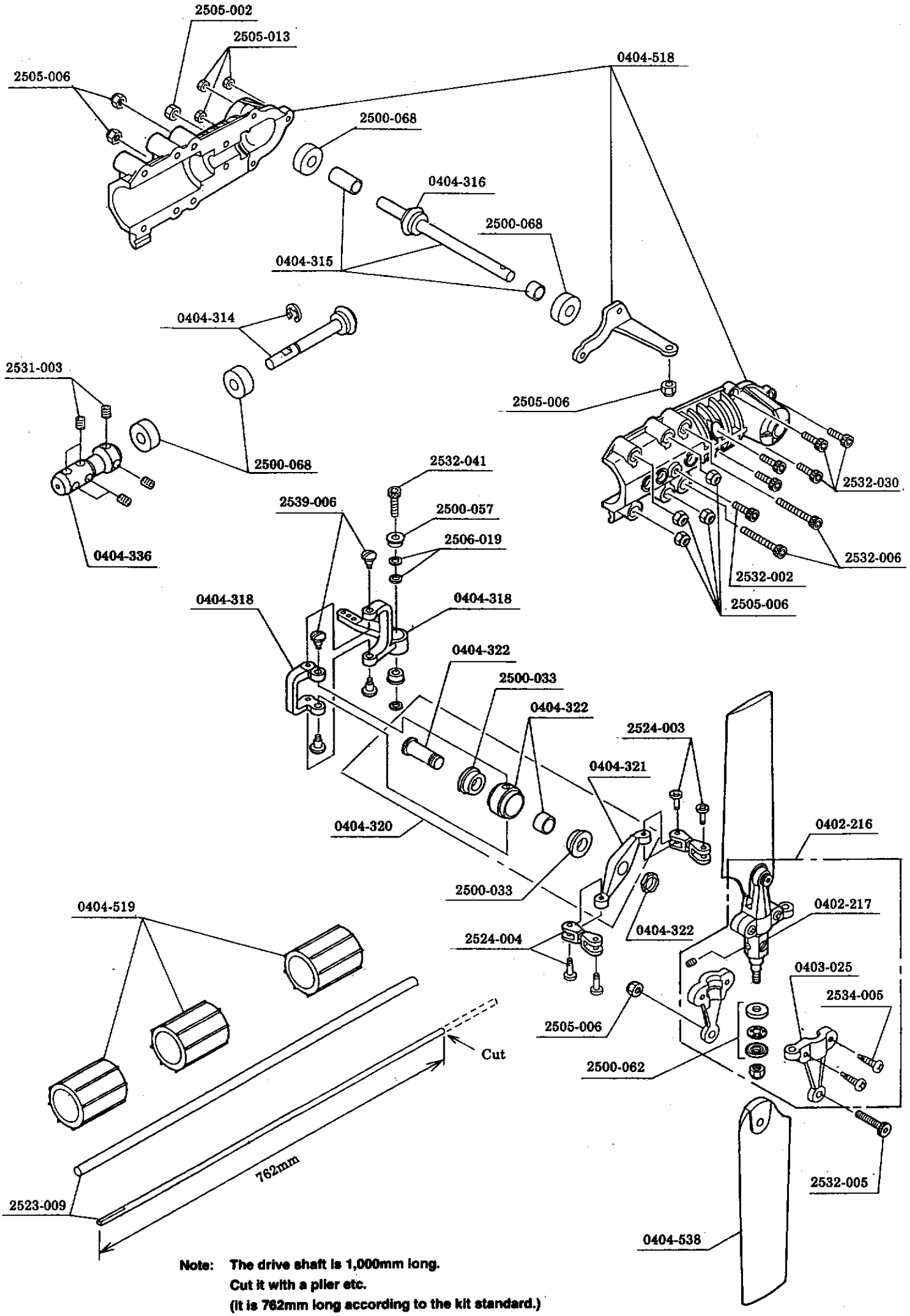
Code No.	Particulars	Q'ty	Price	Freight charge	Remarks
0400-004	Metal made clutch bell lining	2			
0402-319	SE bevel gear	1			
0403-010	JJ-10 slide block set	1 set			
0403-011	JJ-11 ø10 mast lock	1			
0403-038	JJ-38 W-type wash-out	1 set			
0403-085	JJ-85 W-type wash control arm	2			
0404-023	Radius arm	2			
0404-034	Clutch bell with gear	1			
0404-209	Main mast L=178	1			
0404-509	Bevel pinion gear set	1			
0404-510	Bevel gear holder	1			
0404-511	Bearing holder set	2 W-type 1			
0404-512	Main gear 95T	1			
0404-513	Auto-rotation drive shaft	1			
0404-531	Swash plate set	1			
0404-532	ø5 ball radius pin	1			
0404-537	Joint shaft cover	1			
2500-046	Brg. ø6×12×4 ZZ	2			
2500-047	Brg. ø12×ø21×5 ZZ	2			
2500-048	Bearing ø12×16L one-way	2			
2500-049	Brg. ø10×ø19×5 ZZ	2			
2500-066	Brg. ø6×ø19×6 ZZ	2			
2500-068	Brg. ø5×ø13×4 ZZ	2			
2500-072	Brg. ø3×ø7×3F ZZ	2			
2505-002	M3 nut	20			
2505-006	M3 nylon nut	10			
2508-003	Stop ring S-12	5			
2509-003	Needle pin 2×11.8	2			
2525-001	ø5 boll (hardened)	10			
2530-004	Pivot bolt (D) ø5×5×M3	2			
2530-005	Pivot bolt (E) ø5×7×M3	2			
2531-003	Set screw M4×4	10			
2532-004	Cap screw M3×12	10			
2532-005	Cap screw M3×16	10			
2532-006	Cap screw M3×20	10			
2533-006	Pan head screw M2×10	20			
2538-008	Countersunk screw M3×8 AS-43	10			


0404-403
0404-402
2532-021
0404-063
0404-012
0404-010
0404-011
0404-118
2538-008
2534-003
0404-514
0404-515
2506-014
2532-021
2525-001
2533-006
2532-022
2505-001
0404-044
0404-044

Code No.	Particulars	Q'ty	Price	Freight charge	Remarks
0404-010	Starter pulley washer for OS	1			
0404-011	Starter pulley washer for ENYA	1			
0404-012	Starter pulley washer for YS	1			
0404-044	Divisional type cooling cover	1			
0404-063	Clutch shoe with shaft	1			
0404-118	EX cooling fan	1			
0404-402	Starter coupling S-60	1			
0404-403	Starter shaft	1			
0404-514	Starter pulley set	1			
0404-515	Engine block	R 1 L 1			
2505-001	M2 nut	20			
2506-014	FW ø4×9×1 hardened	5			
2525-001	ø5 ball (hardened)	10			
2532-021	Cap screw M4×10	10			
2532-022	Cap screw M4×15	10			
2533-006	Pan head screw M2×10	20			
2534-003	Tapping screw M3×8 black	10			
2538-008	Countersunk screw M3×8 AS-43	10			

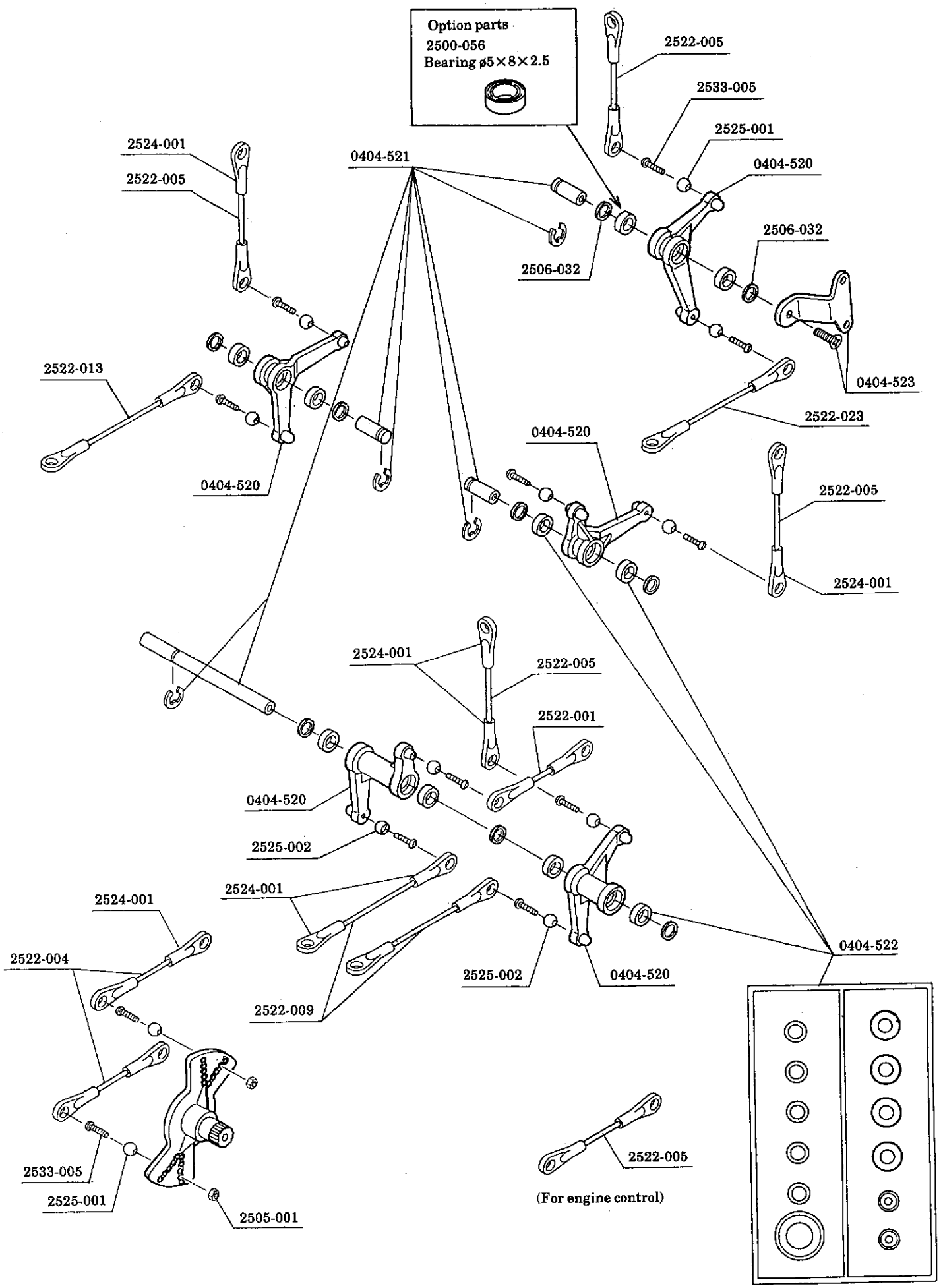

2532-012
2506-004
2532-038
2506-004
0403-069
2522-027
2524-001
0404-516
2505-002
0404-050
0404-517
0403-077

Code No.	Particulars	Q'ty	Price	Freight charge	Remarks
0403-069	JJ-69 stabilizer set	1 set			
0403-077	J-77 tail boom brace set	1 set			
0404-050	Octagonal tail boom pipe L-735	1			
0404-516	Horizontal stabilizer bracket	1			
0404-517	Rudder control guide set	1			
2505-002	M3 nut	20			
2506-004	FW ø3×8×0.5T	20			
2522-027	Control rod M2×752	2			
2524-001	Ball link	10			
2532-012	Cap screw M3×35	10			
2532-038	Cap screw M3×18	10			

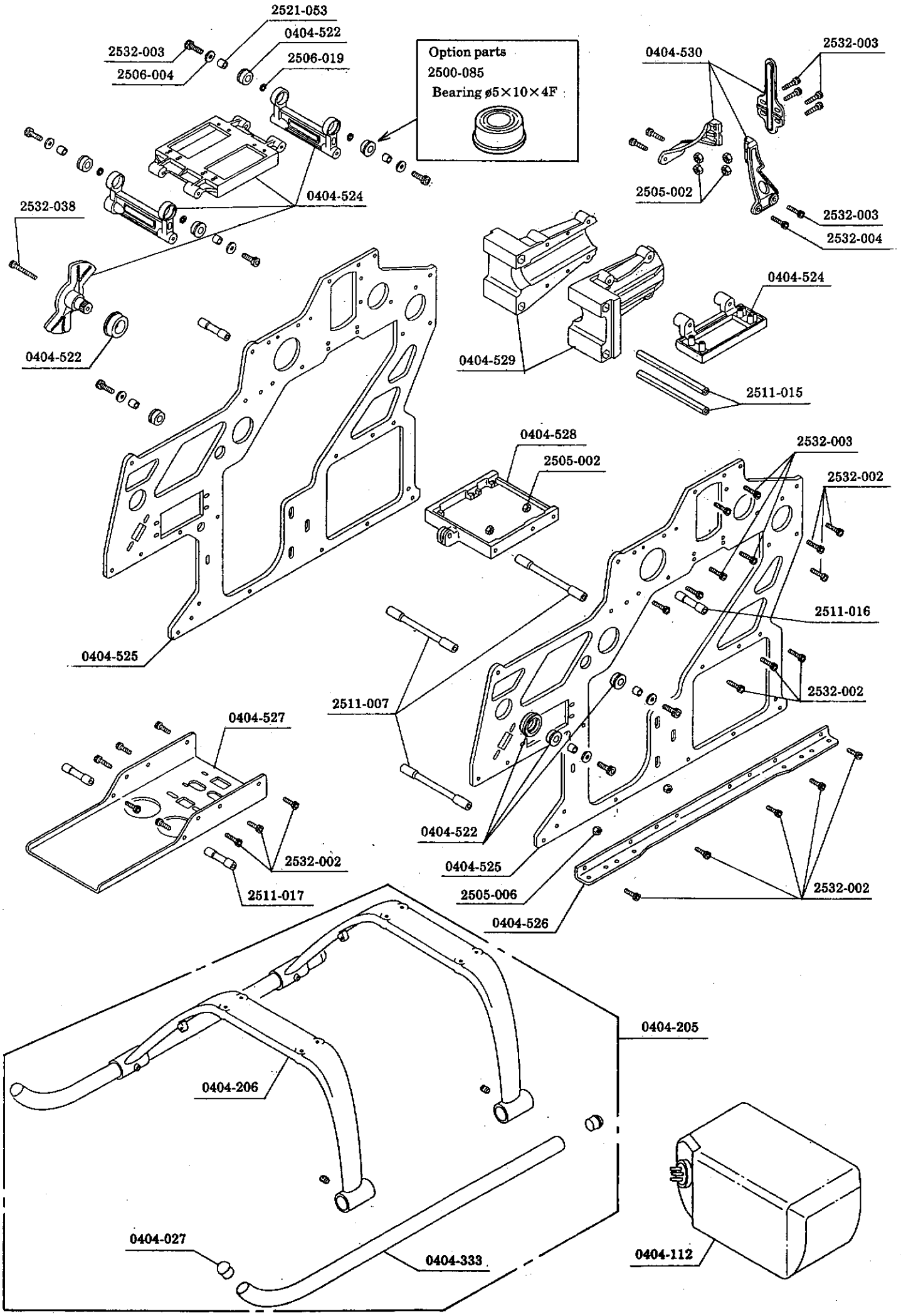


Note: **The drive shaft is 1,000mm long.**
Cut it with a plier etc.
(it is 762mm long according to the kit standard.)

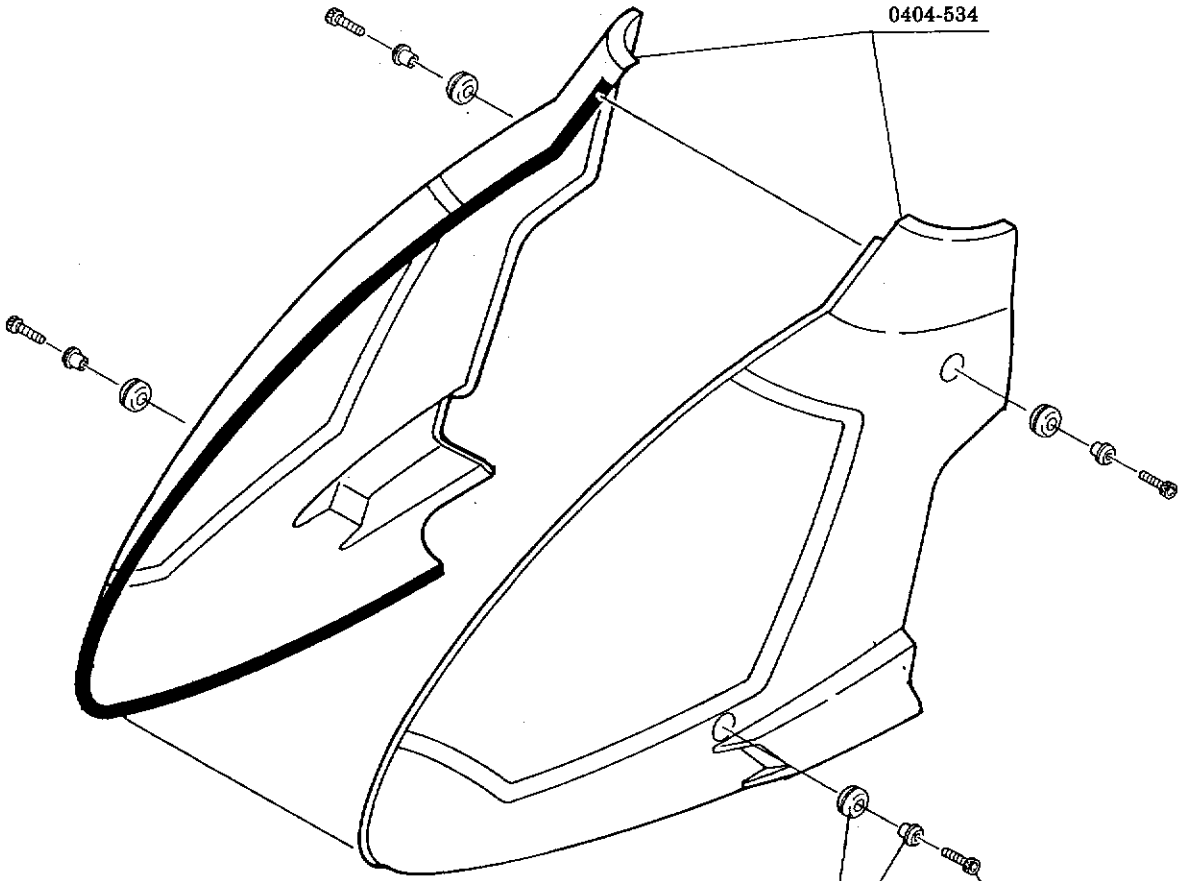
Code No.	Particulars	Q'ty	Price	Freight charge	Remarks
0402-216	Tail housing Assy	1			
0402-217	Tail housing	1 set			
0403-025	JJ-25 tail blade holder (A)(B)	2 for each			
0404-314	Gear with shaft	1			
0404-315	Tail second shaft	1			
0404-316	ø5 miter gear	1			
0404-318	Tail pitch lever (A.B)	1 for each			
0404-320	Tail pitch plate set	1			
0404-321	Tail pitch plate	1			
0404-322	Tail pitch plate boss	1 set			
0404-336	Tail joint ø2	1			
0404-518	Tail gear case	1			
0404-519	Tail drive guide set	1			
0404-538	Tail rotor blade	2			
2500-033	Brg. ø6×ø12×4F ZZ	2			
2500-057	Brg. ø3×ø6×2.5F ZZ	2			
2500-062	Bearing ø4×ø9×4H thrust	2			
2500-068	Brg. ø5×ø13×4 ZZ	2			
2505-002	M3 nut	20			
2505-006	M3 nylon nut	10			
2505-013	M2.6 nut	20			
2506-019	FW ø3×4.5×0.5T	10			
2523-009	Tail drive shaft set	1			With SUS pipe
2524-003	Rod end pin M2×4.5	10			
2524-004	Double link pin type	2			
2531-003	Set screw M4×4	10			
2532-002	Cap screw M3×8	10			
2532-005	Cap screw M3×16	10			
2532-006	Cap screw M3×20	10			
2532-030	Cap screw M2.6×8	10			
2532-041	Cap screw M3×14	10			
2534-005	Tapping screw M2×10 No.2 type	10			
2539-006	M2×6 shouldered truss	2			

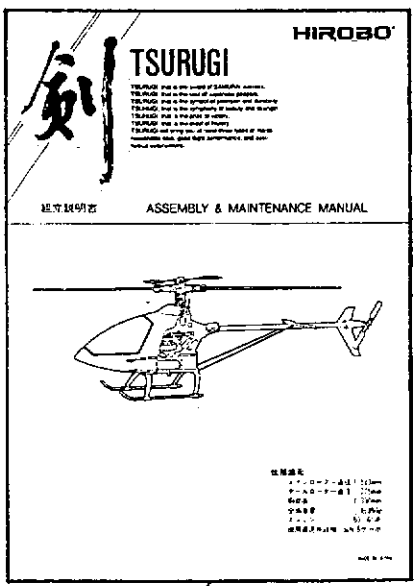

Option parts
2500-056
Bearing ø5×8×2.5
2522-005
2533-005
2525-001
0404-520
2506-032
0404-521
2524-001
2522-005
2506-032
2522-013
0404-523
2522-023
0404-520
0404-520
2522-005
2524-001
2524-001
2522-005
2522-001
0404-520
2525-002
2524-001
2524-001
2522-004
0404-522
2525-002
0404-520
2522-009
2533-005
2525-001
2505-001
2522-005
(For engine control)

Code No.	Particulars	Q'ty	Price	Freight charge	Remarks
0404-520	Lever set	1			
0404-521	Lever shaft set	A 2 B 1			
0404-522	Bushing set	2			
0404-523	Elevator lever stay	1			
2500-056	Bearing ø5×8×2.5	2			
2505-001	M2 nut	20			
2522-001	Control rod M2×16	5			
2522-004	Control rod M2×35	5			
2522-005	Control rod M2×45	5			
2522-009	Control rod M2×70	5			
2522-013	Control rod M2×100	5			
2522-023	Control rod M2×130	5			
2524-001	M2 Rod end	5			
2525-001	ø5 boll (hardened)	10			
2525-002	EX ø5 boll	5			
2533-005	Pan head screw M2×8	20			


2521-053
0404-522
2532-003
2506-004
2506-019
Option parts
2500-085
Bearing ø5×10×4F
0404-530
2532-003
2505-002
2532-003
2532-004
0404-524
2532-038
0404-522
0404-529
0404-524
2511-015
0404-528
2505-002
2532-003
2532-002
0404-525
2511-016
2511-007
2532-002
0404-527
2532-002
2511-017
0404-522
0404-525
2505-006
0404-526
2532-002
0404-205
0404-206
0404-027
0404-333
0404-112

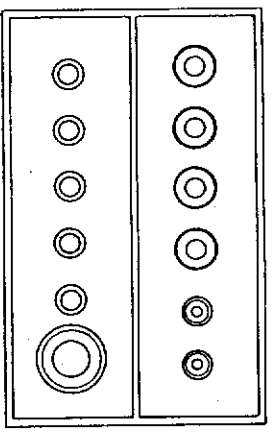
Code No.	Particulars	Q'ty	Price	Freight charge	Remarks
0404-027	Skid pipe cap	4			
0404-112	Large fuel tank	1 set			
0404-205	Landing gear Assy	1 set			
0404-206	Skid foot	2			
0404-333	Skid pipe black	2			
0404-522	Bushing set	2			
0404-524	Servo mount set	1 for each			
0404-525	Main frame	2			
0404-526	(L) angle	2			
0404-527	Mechanical plate	1			
0404-528	SX gyro mount	1			
0404-529	Tail boom holder	1			
0404-530	Radius stay	1			
2500-085	Bearing ø5×10×4F	2			
2505-002	M3 nut	20			
2505-006	M3 nylon nut	10			
2506-004	FW ø3×8×0.5T	20			
2506-019	FW ø3×4.5×0.5T	10			
2511-007	Cross member M3×64	2			
2511-015	Hexagon cross member L=64	2			
2511-016	Cross member M3×22	2			
2511-017	Cross member M3×33	2			
2521-053	ø3×5×4.1 collar	2			
2532-002	Cap screw M3×8	10			
2532-003	Cap screw M3×10	10			
2532-004	Cap screw M3×12	10			
2532-038	Cap screw M3×18	10			





0404-536

0404-535



注 文 書

お申し込み　　年　　月　　日

お名前　　（　　才）　男／女

お電話（　　）　－

ご住所

□□□-□□

入金方法：現金／切手　¥　　キット名：

	受注No.	コードNo.	品　名	数量	単　価	金　額
1						
2						
3						
4						
5						
6						
7						
8						

※太線の中は必ずご記入して下さい。

合 計 Ⓐ	¥
送 料 Ⓑ	¥
総 合 計 Ⓐ×1.03＋Ⓑ	¥

ご注文のときのお願い。

表示価格には消費税は含まれておりませんので、パーツ価格×1.03＋送料(円未満は四捨五入)にてご送金下さい。
(例) ・パーツ価格　¥1000
　　送料　¥ 250　の場合
ご送金額＝1000×1.03＋250＝¥1280となります。

ご意見欄

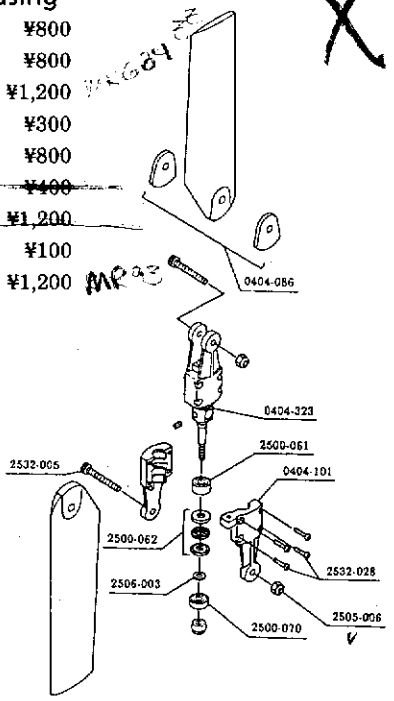
技術で拓く真心のクオリティー
ヒロボー株式会社
営業本部
広島県府中市本山町530-214 〒726
TEL:(0847)41-7400㈹ FAX:41-9361

Code No.	Particulars	Q'ty	Price	Freight charge	Remarks
0404-522	Bushing set	2			
0404-534	SX cabin	R1 L1			
0404-535	Decal	1			
0404-536	Instruction manual	1			
2532-004	Cap screw M3×12	10			

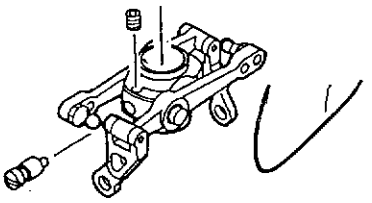
Step up option parts

EX tail housing

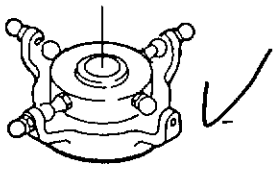
0404-086	Symmetrical tail rotor blade	¥800
0404-323	Tail housing	¥800
2500-061	Bearing ø4×9×4 ZZ	¥1,200
0404-101	EX tail blade holder	¥300
2532-028	M2×8 CS	¥800
2532-005	M3×16 CS	¥400
2500-062	Bearing ø4×ø9×4H thrust	¥1,200
2506-003	ø3×6×0.5 FW	¥100
2500-070	Bearing ø3×9×3 OP	¥1,200



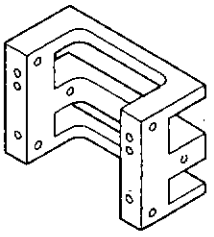
0404-120 EX II Wash-out set ¥9,800



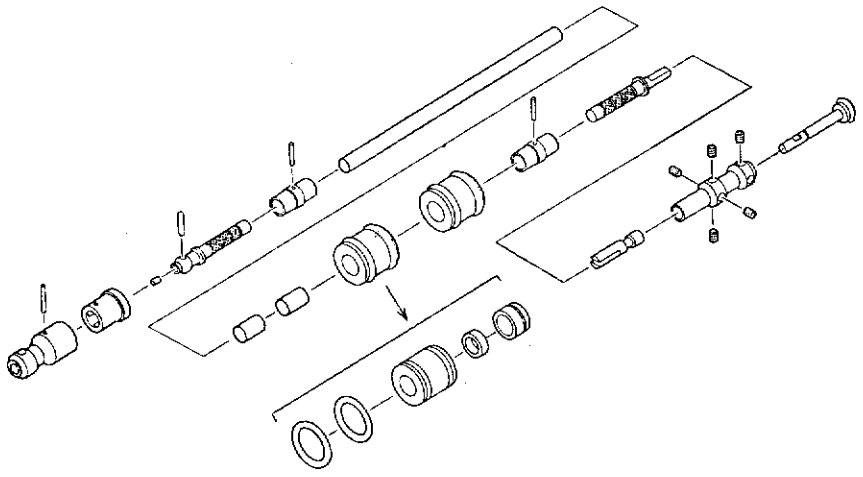
0404-121 EX swash plate ¥12,000



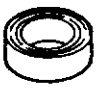
0404-307 Engine U mount ¥2,500



0404-141 EX Carbon tail drive pipe set ¥18,000
0404-539 Bevel pinion shaft for Tsurugi's carbon



2500-056 Bearing ø5×ø8×2.5 ¥1,200

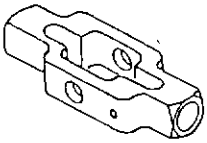


Used for the lever.

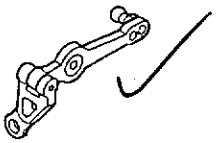
2500-085 Bearing ø5×10×4F ¥1,200

Used for the servo slide mount and servo arm.

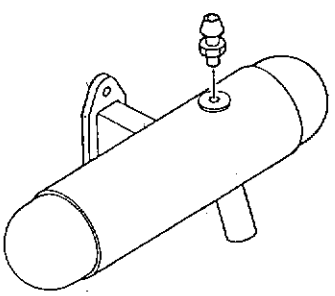
0401-002 Metal made seesaw ¥2,200



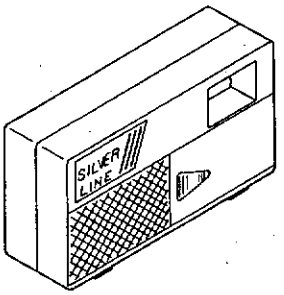
0404-330 Metal made control arm ¥1,600



0404-340 Muffler(For OS) ¥6,800
0404-341 Muffler(For YS) (For ENYA) ¥6,800



2410-001 Rev. counter Rotor revolution meter ¥24,800



0404-113EX starter pulley For OS
0404-114EX starter pulley For YS each ¥5,100