

# KALT HELICOPTER

# GS ALPHA

Prior to assembly, be sure to read this manual.  
Due attention must be paid to safety in flying  
the helicopter.

## Assembly Manual



## INSTRUCTION MANUAL



Thank you very much for buying Kalt product.

For easier understanding of the assembling processes, this assembly manual uses a lot of instructions and each process includes supplementary explanation. You are requested to read through this manual including such explanatory sentences and understand the contents of this kit before starting the assembly.

Although the contents of this kit and quantities were carefully checked prior to shipment, they should be checked before assembling referring to the parts list. Should there be any shortage of parts, please contact your shop.

The specifications of this kit are subject to change for improvement without notice.

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# Before Starting Assembly

The assembly of this kit is divided into 9 steps from frame assembly to rotor head installation, and the assembly should be accurately made referring to this manual. The screw sets are contained in vinyl bags numbered for each step and it should be opened just before each step is started. Since the kit includes only the necessary quantities for assembling, care must be taken not to use bolts with wrong length.

## ○ Servo motor

The servo mount included in the kit is suitable for the servo installation dimensions, width 10 mm and length 47 -50mm.

It should be noted that a servo of othersize cannot be mounted without modification.

## ○ Gyro (Stabilizer)

To assemble and fly this helicopter, the following things are required in addition to this kit.

- Radio-controlled helicopter transceiver of 5 or more channels 1 set

## ■ Tools Necessary for Assembling

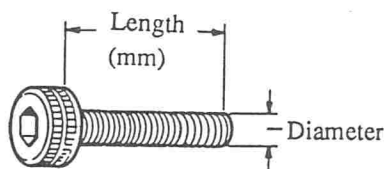
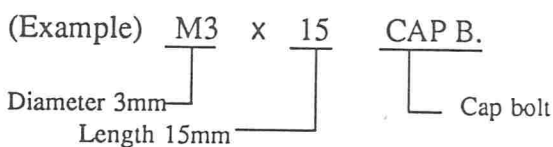
- Screwdriver (small)	- Pliers	- Instantaneous adhesive
- Radio pliers	- Monkey wrench	- Epoxy adhesive
- Nippers	- Cutter	- Silicon grease
- 5.5 mm nut turner (box screwdriver)	- File	- Scale
- $\phi 2$ , $\phi 3$ , $\phi 6$ , drill blade and hand (electric) drill	- Vinyl tape	- Benzine, etc.
	- M12 box wrench	

## ■ Bolts and Nuts

Looseness of only one bolt may cause falling of the helicopter. Therefore, this kit uses special bolts and nuts described below.

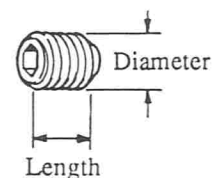
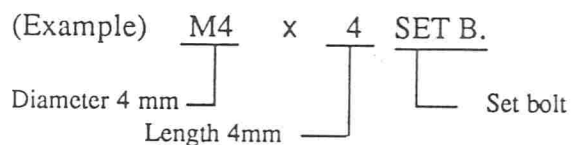
### • Cap bolt

The bolt is provided with the hexagon hole as illustrated and is to be tightened with a special hexagon wrench. In the manual the following symbol is used.



### • Set bolt

It is a setscrew with hexagon hole as illustrated and has no head.



• **Nylon nut**

It contains locking nylon ring as illustrated and is plated on iron.

(Example) M3 N.N.  
 3 mm ——— Nylon nut



• **Tapping bolt**

It is a self-tapping screw as illustrated and is used for installing the canopy to the body. The prepared hole should be made with a  $\varnothing 2$  drill.



• **Plus bolt**

It is a round-head bolt. To tighten it, use a plus screwdriver to meet the size of the bolt.

\* For ordinary nuts and washers, M2, M3, etc. are written to indicate the diameter of the screw.

• **Clip washer**

As illustrated, it has teeth and is used for locking.



## ■ Hexagon Wrench

This kit includes four types of hexagon wrenches. For the cap bolts and set bolts, use the hexagon wrenches shown in the table.

	Cap bolt	Set bolt
M3	2.5 wrench	1.5 wrench
M4	3.0 wrench	2.0 wrench
M5	4.0 wrench	
M6	5.0 wrench	3.0 wrench

\* In the explanatory drawings of this manual, the bolts and nuts and quantities to be used in each process are written. Since the kit includes only necessary quantities for assembling, care must be taken not to use the bolts, etc. of wrong length.

(Example) M3 x 8 CAP B. [ x 4]  
 4 cap bolts of M3 x 8 are used

• **Cautions in fixing bolts**

Even if the bolts are securely tightened, they may be loosened and drop under severe vibrating condition. To prevent this problem, the cap bolts,  $\oplus$  bolts, nuts, set bolts, and threaded holes of parts should be cleaned with benzine, etc., and when fixing, a small amount of Kalt Tight, etc. should be applied.

A scale is written at the bottom of each page and it should be used for checking the length of the bolt.

# Parts List

No.	Name	Q'ty	No.	Name	Q'ty
<b>Step 1</b>			<b>Step 3</b>		
0601-171-7	Lower angle	2	0103-100-8	KG-22S Engine	1 set
0601-186-6	Subframe	1	0103-101-8	KG-22S throttle adapter	1
0601-187-7	Main frame (right, left)	1 each	0103-103-8	Recoil starter	1 set
0601-189-7	Cross member GS	3	0103-103-8	Back plate for recoil starter	1
0601-191-8	Body mounting bolt F	2	0103-103-8	Spacer for recoil starter	4
0601-191-8	Body mounting bolt R	2	0103-160-6	Muffler for GS	1
<b>Step 2</b>			0601-189-7	Cross member GS	1
0101-076-8	GS Pinion gear N13	1	0601-190-6	Cross member H	1
0102-113-8	Clutch bell	1	<b>Step 4</b>		
0400-040-6	HG bell crank 60 spacer	1	0100-065-8	Tail joint B	1
0400-042-8	HG bell crank (with RF-830 ZZ )	1	0100-065-8	Joint connector	1
0402-011-8	Slide ring Ass'y	1 set	0101-043-08	60 Baron auto-ro Ass'y	1 set
0402-013-8	Slide ring hoder	1	0101-045-6	Auto-ro gear spacer (*12 x *14 x '2)	1
0402-014-8	Slide ring shaft A	1	0101-087-6	Bevel pinion gear $\alpha$	1
0402-014-8	Slide ring shaft B	2	0200-009-6	60 mast	1
0402-032-8	Slide ring arm A Ass'y (right, left )	1 each	0400-015-7	Pitch control rod (L95)	1
0402-034-6	Slide ring arm B	1	0401-054-8	Scissors arm (C) pitch control ring	1
0601-043-8	Bearing case C	1	0401-057-8	Phase adjusting ring	1
0601-160-8	Bearing case A (with 1910 ZZ )	1	0401-097-6	Swash plate collar (*10 x L14)	1
0601-161-8	Bearing case A (with 1960 ZZ )	1	0401-103-8	Scissors arm (C) Ass'y	1 set
<b>Step 3</b>			0401-112-8	Elevator control ring Ass'y	1 set
0102-115-6	Clutch shoe	2	0401-114-8	Scissors arm (C) swash plate Ass'y	1 set
0102-116-8	Cooling fan	1	0601-042-8	Bearing case B	1
0102-117-7	Cooling cover	1	71003	Rotar drive gear	1
0102-118-6	Cooling cover plate	1	401-1078	Plastic D-Ring	
0102-119-8	Taper nut	1	<b>Step 5</b>		
0103-008-8	Gasket (for muffler)	2	0500-001-7	Fuel filter	1
0103-008-8	Gasket (spare for carburetor)	1	0500-005-8	Fuel stopper	1
0103-060-6	Muffler spacer for GS	1	0501-016-6	Oil-resistant rubber tube (narrow) for GS	1
0103-062-8	Throttle lever for GS	1	0501-017-6	Oil-resistant rubber tube (thick) for GS	1

# Parts List

No.	Name	Q'ty
<b>Step 5</b>		
0501-022-8	GS 380cc fuel tank	1
0501-022-8	Tank cap	1
0501-022-8	Tank silicon tube (large 1, middle 2)	1 set
0501-022-8	Tank washer (with screw, without screw)	1 each
0501-022-8	Tank weight	1
0601-030-6	Cross member G	1
0603-022-7	Leg spacer	4
0603-051-8	Rear inclined landing gear brace	2
0603-051-8	Skid cap	4
0603-051-8	Leg skid	2
38007	Double-sided adhesive tape	1
<b>Step 6</b>		
0100-064-8	♦ 2.2 inserting piano wire	1
0100-065-8	Tail joint rear	1
0300-011-8	Tail pitch housing (with arm, without arm)	2 each
0300-011-8	Spacer	2
0300-011-8	Outer spacer	2
0300-011-8	1030 ZZ bearing	4
0601-131-7	SUS Tail clamp	2
0601-133-7	Tail pipe retainer	2
0601-135-7	♦ 2.2 inserting piano wire guide	3
0601-140-8	Tail pipe α (L - 800 )	1
0601-140-8	Tail supporter pipe	2
0601-140-8	Tail supporter end	4
0601-170-6	Tail bracket	1
0601-181-8	Vertical fin	1
0601-181-8	Horizontal fin	1
0601-181-8	Tail supporter clamp	2
0601-181-8	♦ 3 x ♦ 9 x '5 Spacer	4
0903-011-7	Tail rotor (Plastic)	1 set
73012	Omega tail gear ass'y left specification	1 set

No.	Name	Q'ty
<b>Step 7</b>		
0400-074-8	Flexible P.P. rod (piano wire)	1 set
0601-154-6	Servo frame α A	1
0601-155-6	Servo frame α B	1
06001	P.P. rod guide	1 set
74001	Servo set plate	10
<b>Step 8</b>		
0001-004-6	Body adhesive	1
0602-106-8	60 Baron α body (right, left, instrument panel)	1 each
0602-106-8	60 Baron α body (bottom reinforcement, reinforcing plate)	1 each
0602-109-6	60 Baron α canopy	1
<b>Step 9</b>		
0200-015-7	Stabilizer bar L450	1
0200-017-8	Stabilizer stopper	2
0200-018-7	Stabilizer blade (black)	2
0207-004-8	BLACK-10 SII	1 set
0207-029-7	Blade grip spacer	4
0207-036-8	Control lever	1
0902-029-8	H-55II Main rotor blade	1 set
0902-029-8	[Collar, weight, reinforcing plate (upper, lower)]	2 each
0902-029-8	(Shrink tube)	2
<b>Accessories</b>		
0001-001-6	Kalt Tight	1
0002-009-8	GS tool set	1 set
0103-061-6	Mixing container	1
	Decor	1
	GS ALPHA screw set	1 set
	GS ALPHA assembly manual	1
	BLACK-10 S II instruction manual	1
	KG-22S Engine instruction manual	1

# List of Screw Set Contents

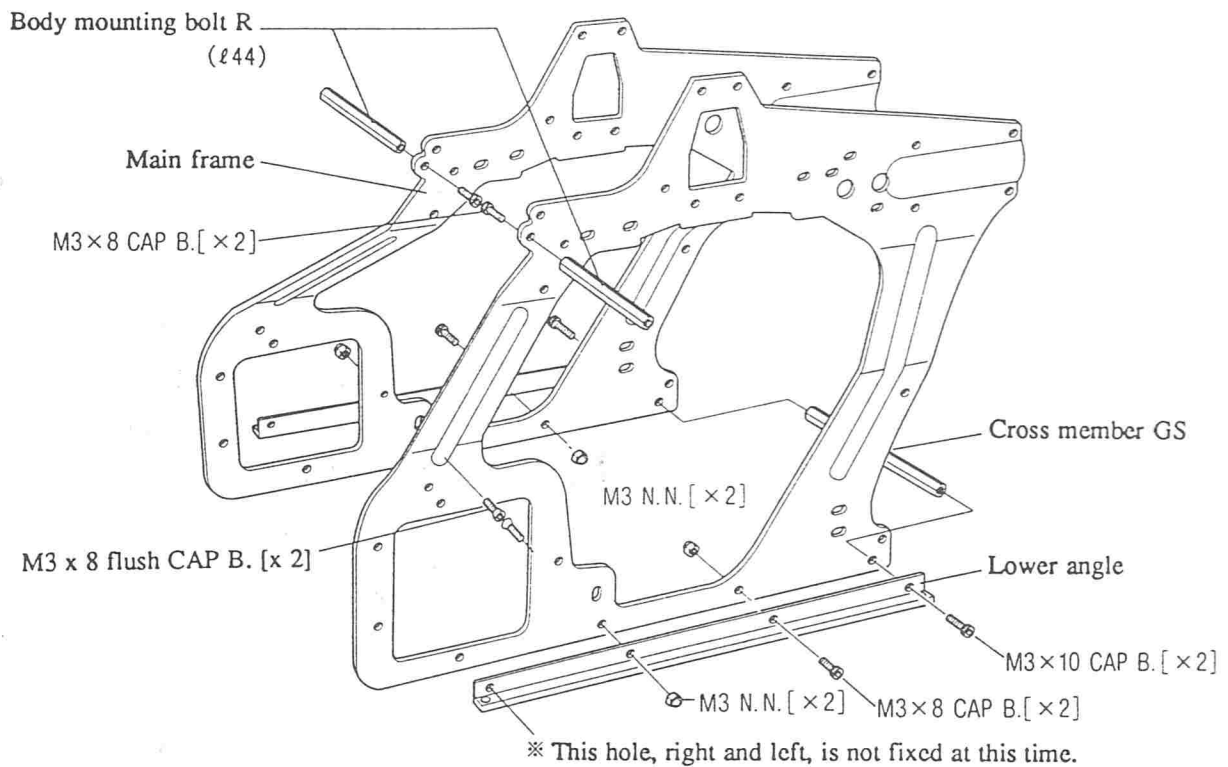
No.	Name	Q'ty	No.	Name	Q'ty	
<b>Step 1</b>	M3 x 8 CAP B.	8	<b>Step 3</b>	M3 x 4 SET B.	4	
	M3 x 10 CAP B.	4		M6 x 40 SET B.	1	
	M3 x 8 Flush CAP B.	2		M2 x 10 ⊕ Bolt	1	
	M3 x 15 SET B.	2		M4 x 12 ⊕ Bolt	4	
	M3 N.N.	4		M5 x 8 ⊕ Bolt	4	
	1.5 Hexagon wrench	1		M3 x 10 Tapping Bolt	3	
	2.0 Hexagon wrench	1		M4 N. N.	2	
	2.5 Hexagon wrench	1		M2 Nut	2	
	3.0 Hexagon wrench	1		M3 Plate washer	4	
	4.0 Hexagon wrench	1		M4 Plate washer	3	
	5.0 Hexagon wrench	1		M5 Plate washer	2	
<b>Step 2</b>	M3 x 8 CAP B.	7	<b>Step 4</b>	M3 Clip washer	3	
	M3 x 10 CAP B.	14		M4 Clip washer	3	
	M3 x 27 CAP B.	1		M5 Clip washer	6	
	M4 x 4 SET B.	2		Joint ball	1	
	M2 x 8 ⊕ Bolt	1		<b>Step 5</b>	M2 x 10 CAP B.	1
	M2 x 10 ⊕ Bolt	2			M3 x 8 CAP B.	2
	M3 N.N.	1			M3 x 10 CAP B.	4
	M2 Nut	2			M3 x 20 CAP B.	1
	φ3 x φ4.5 x '0.2 Plate washer	1			M3 x 4 SET B.	1
	φ3 x φ4.5 x '0.5 Plate washer	1			M4 x 4 SET B.	10
	φ3 x φ10 x '1.0 Plate washer	1			M3 N.N.	1
	Joint ball	3			Joint ball	1
	Joint ball spacer	2			<b>Step 5</b>	M3 x 12 CAP B.
<b>Step 3</b>	M3 x 8 CAP B.	6	M3 x 25 CAP B.			4
	M4 x 8 CAP B.	2	M4 x 22 CAP B.			1
	M4 x 12 CAP B.	1	M4 x 4 SET B.			4
	M4 x 15 CAP B.	2	M3 N.N.			6
	M4 x 30 CAP B.	2	M3 Plate washer	4		
	M4 x 35 CAP B.	2				
	M5 x 60 CAP B.	2				



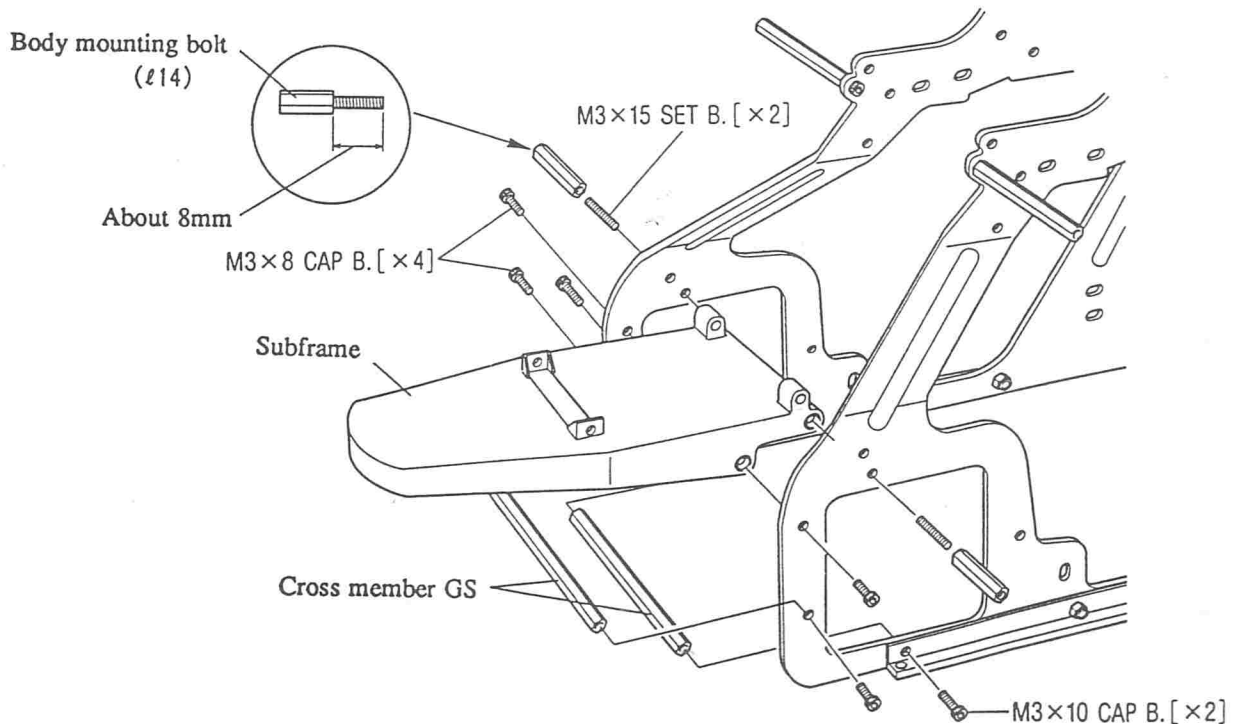
No.	Name		Q'ty	No.	Name		Q'ty
<b>Step 6</b>	M2.6 x 8	CAP B.	4	<b>Step 9</b>	M3 x 22	CAP B.	1
	M3 x 10	CAP B.	2		M4 x 32	CAP B.	2
	M3 x 15	CAP B.	6		M3 x 3	SET B.	4
	M3 x 18	CAP B.	2		M4 x 4	SET B.	1
	M3 x 30	CAP B.	4		M3	N.N.	1
	M3 x 40	CAP B.	2		M4	N. N.	2
	M4 x 4	SET B.	7		M2.3 x 17	Continuous thread rod	2
	M2 x 10	⊕ Bolt	8		M2.3 x 90	Double-end rod	2
	M2 x 12	⊕ Bolt	2		M2.3 x 110	Double-end rod	1
	M3	N.N.	14		Universal link		10
	M2	Nut	10				
	M3	Plate washer	10				
	Joint ball		2				
	<b>Step 7</b>	M2.6 x 10	CAP B.		20	Abbreviation	CAP B. : Cap bolt
M3 x 8		CAP B.	10	SET B. : Set bolt			
M3 x 20		CAP B.	2	N.N. : Nylon nut			
M2 x 10		⊕ Bolt	3				
M2		Nut	6				
M3		Plate washer	6				
M2.3 x 50		Continuous thread rod	1				
M2.3 x 70		Double-end rod	2				
M2.3 x 100		Double-end rod	1				
Link rod L185			1				
Universal link			9				
Quick link			2				
Joint ball			3				
<b>Step 8</b>	M3 x 12	CAP B.	4				
	M2.3 x 8	Tapping bolt	3				
	M3	Plate washer	8				
	Rubber grommet		4				

# Step 1. Frame Assembly

**1 - 1** Carefully fix so that the main frame and lower angle holes are accurately aligned (right and left). Here the two right and left holes at the extreme front (mark \*) are not fixed.

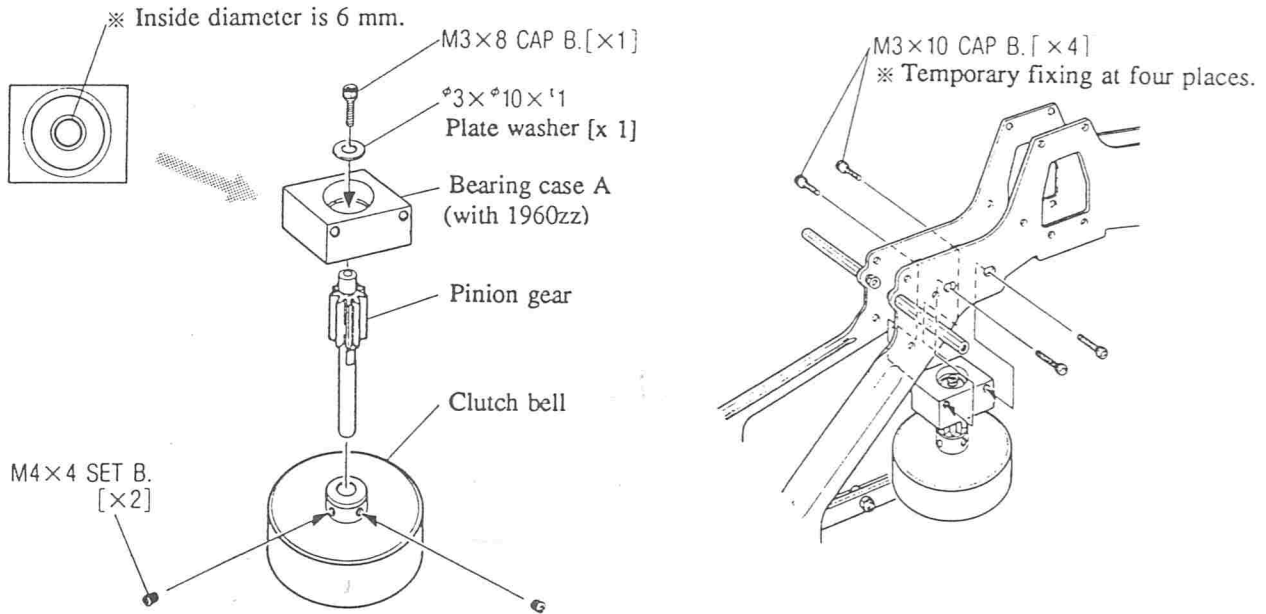


**1 - 2** Fix the M3 x 15 set bolt, about 8mm projected, in the body mounting bolt F, and bond with the Kalt Tight, before the assembly is made. Here, however, temporary fixing should be done at all the four places.

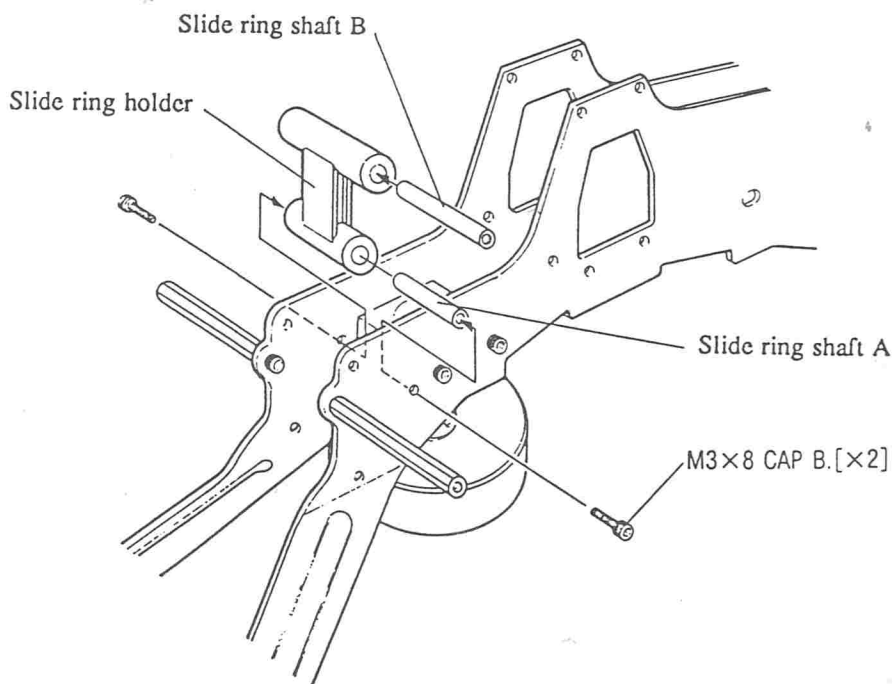


## Step 2. Ball Bearing Installation

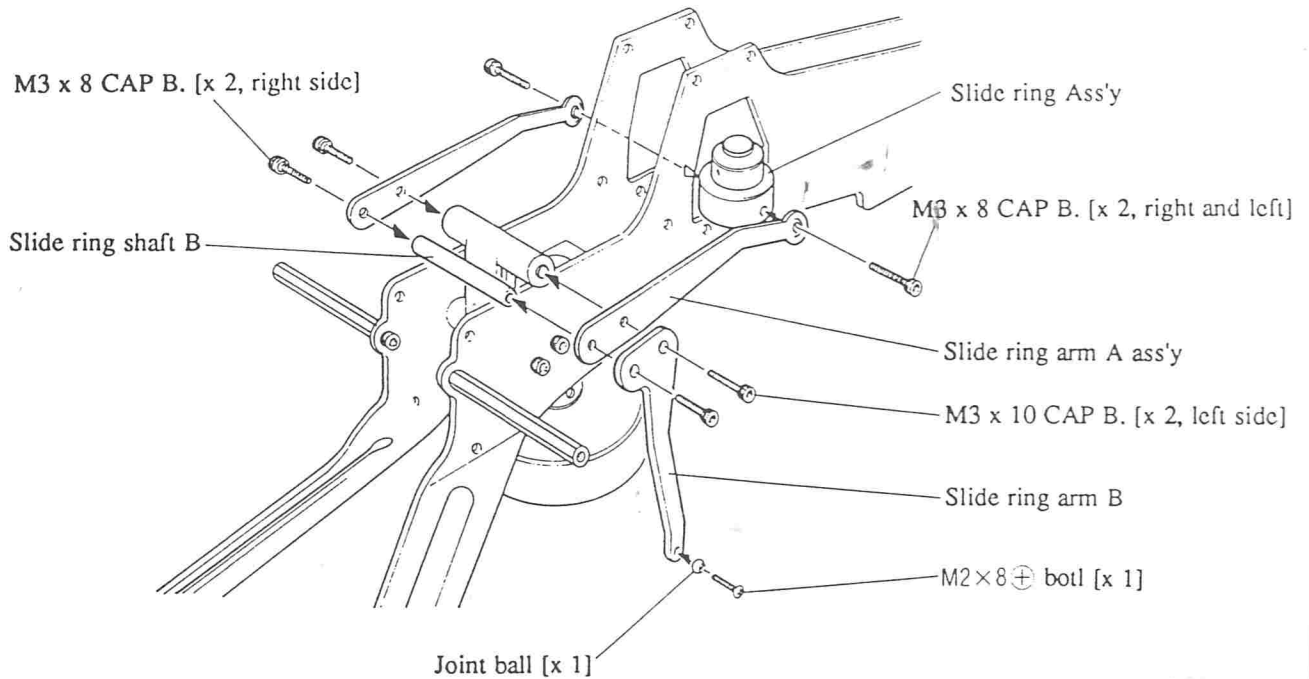
- 2 - 1** They should be fixed in such a way that the chamfered part of the shaft under the pinion gear will be aligned with one of the set bolts M 4x4 of the clutch bell. The bearing case A should be temporarily fixed to the frame.



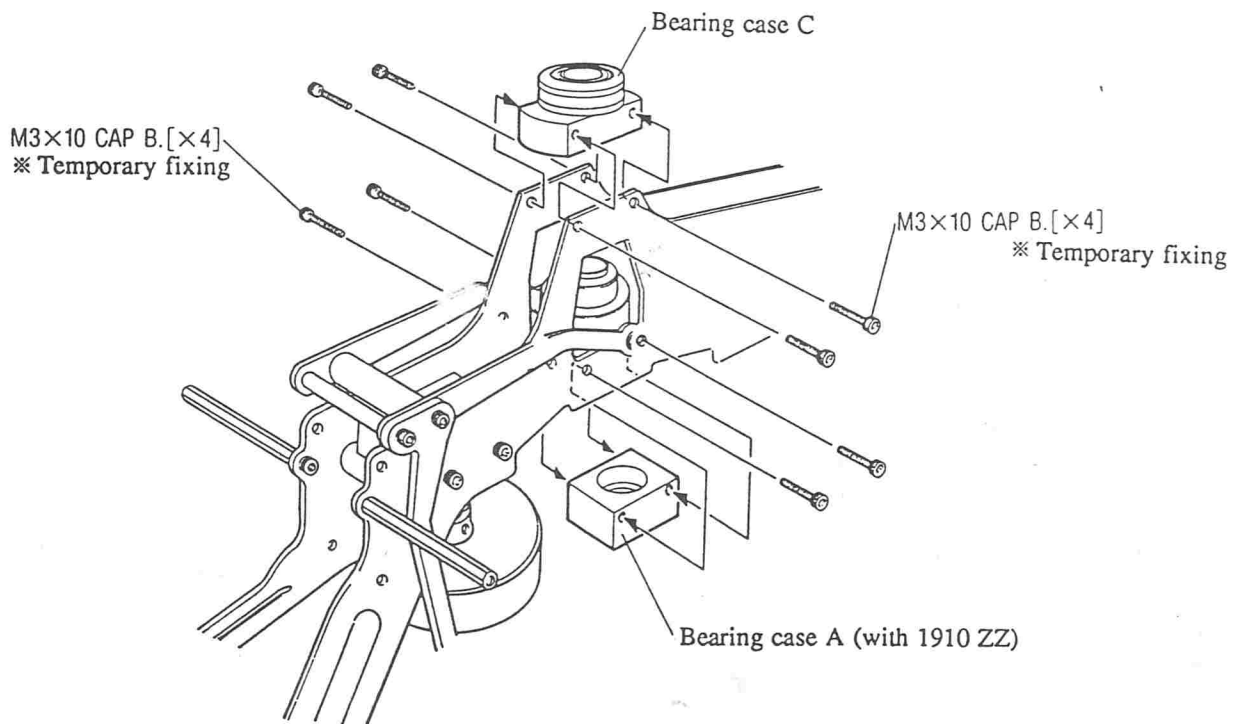
- 2 - 2** When the slide ring shaft A is fixed, make sure that the shaft is not inclined against the main frame.



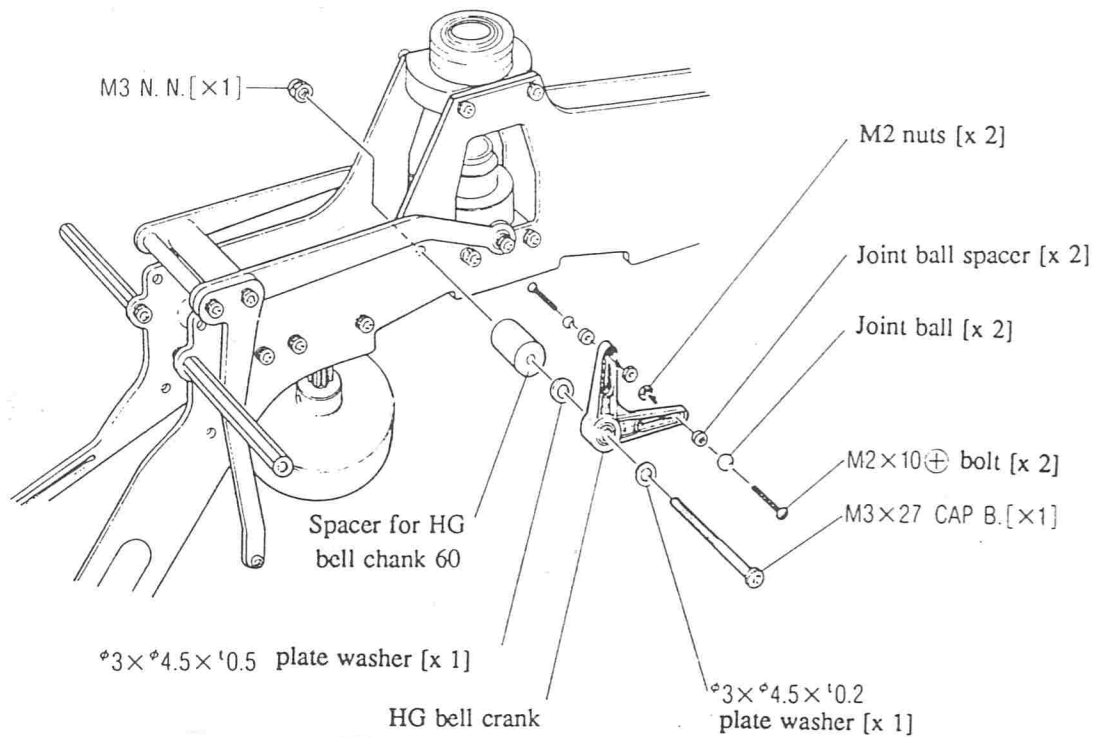
**2 - 3** The slide ring arm A should be installed in such a way that the convex side of the bearing portion is faced inward. On the side where the slide ring arm B is attached the cap bolts M3 x 10 are to be used. Be careful not to twist the right and left arms.



**2 - 4** The bearing case A with the inside diameter 10 mm should be used. Both bearing cases A and C should be temporarily fixed.



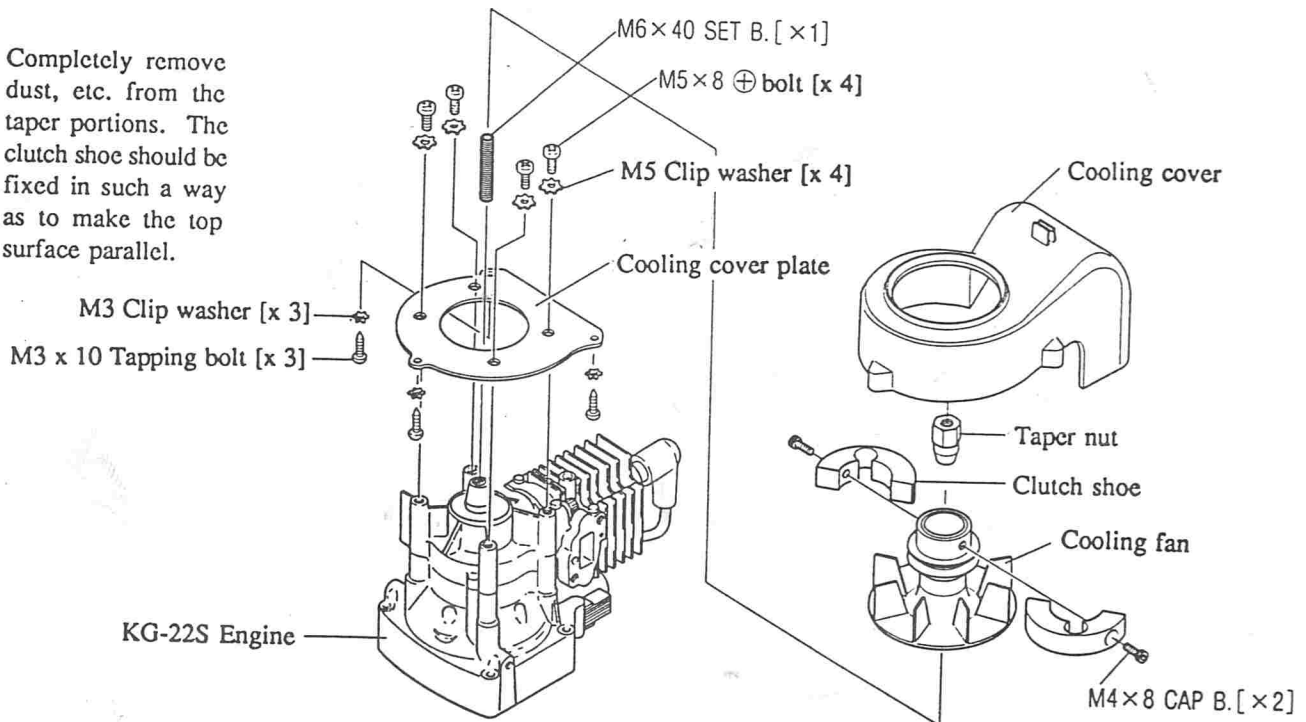
**2 - 5** Make sure of the installation position of the joint ball. For installing the HG bell crank, be sure to insert the washers.



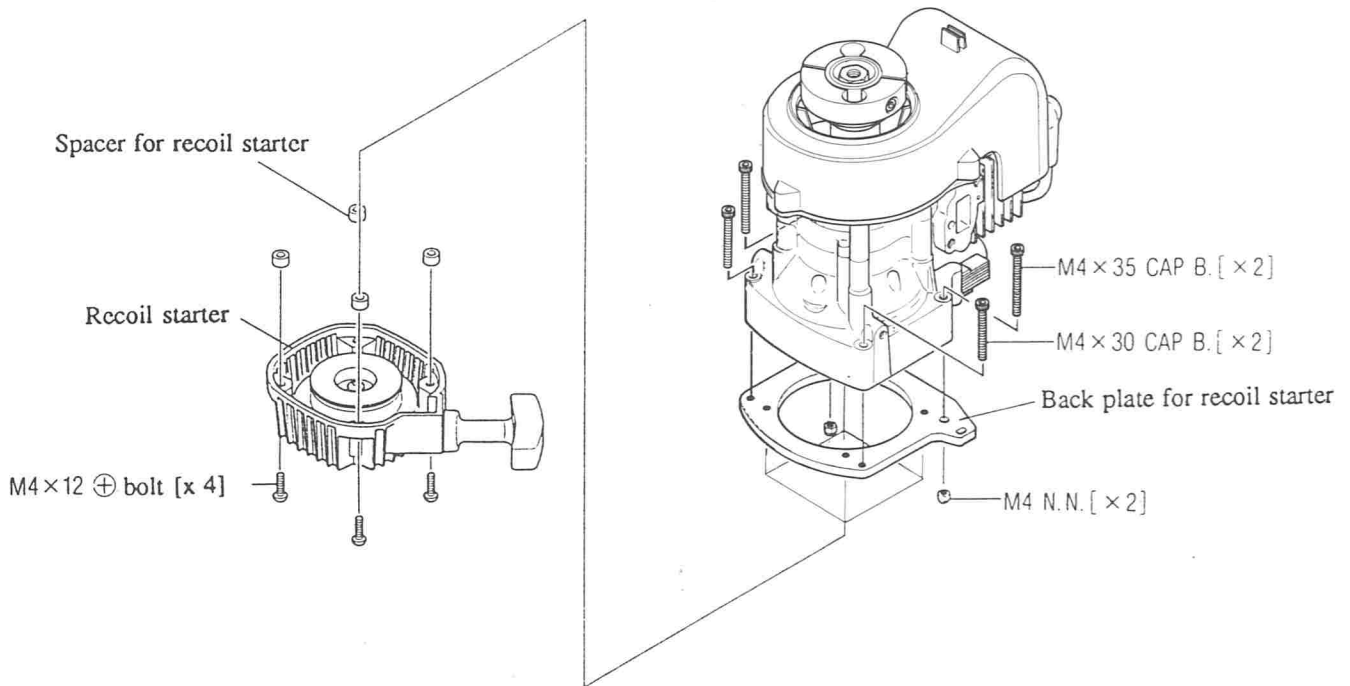
## Step 3. Assembly of Power Section

**3 - 1** After installing the cooling cover plate to the engine, insert the cooling fan onto the engine shaft. Apply the silicon grease to the bearing portion of the taper nut and firmly fix the fan with the taper nut.

※ Completely remove dust, etc. from the taper portions. The clutch shoe should be fixed in such a way as to make the top surface parallel.

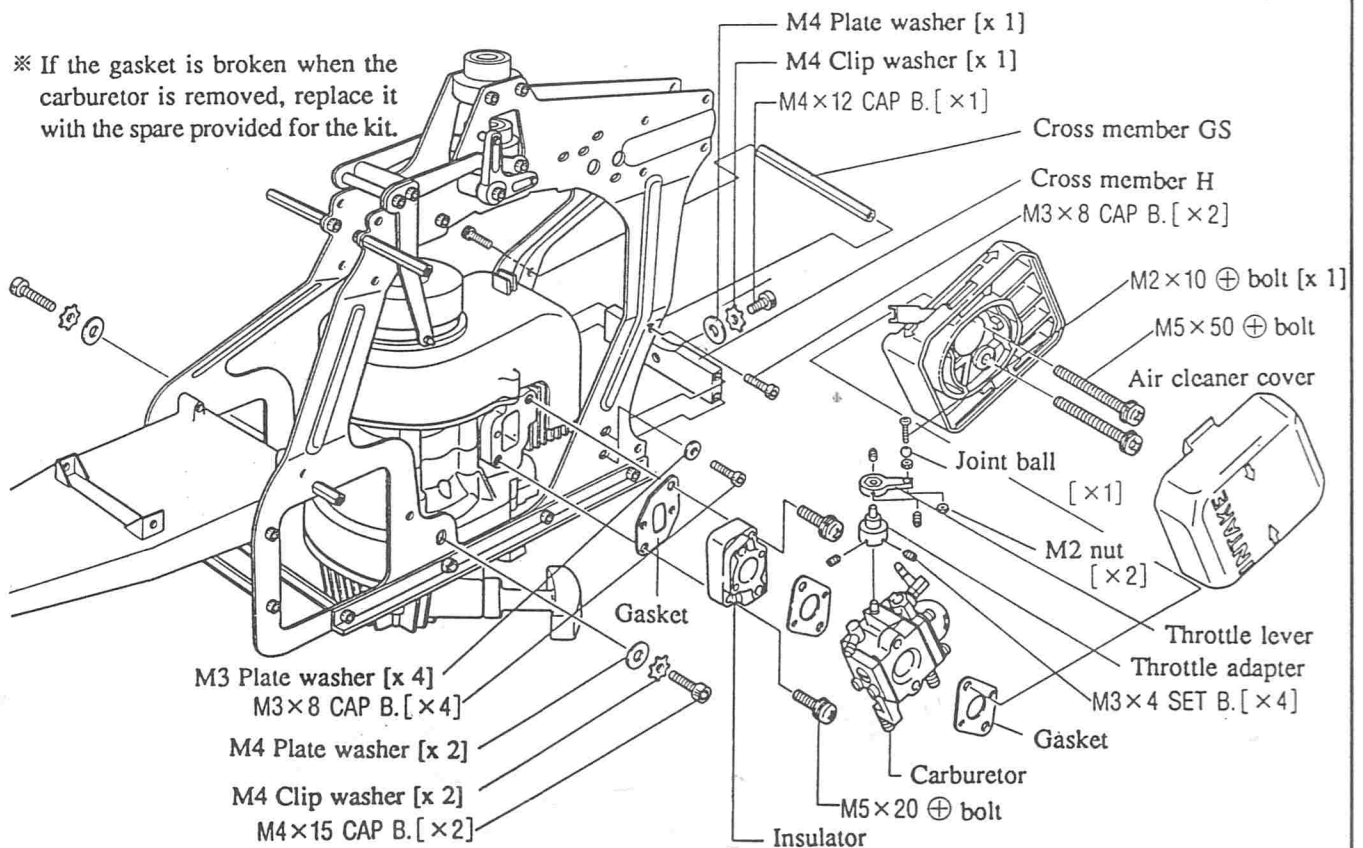


**3 - 2** Install the back plate for recoil starter to the rear portion of the engine making sure of the direction. The recoil starter should be fixed via the spacer with the M4 x 12 ⊕ bolts.

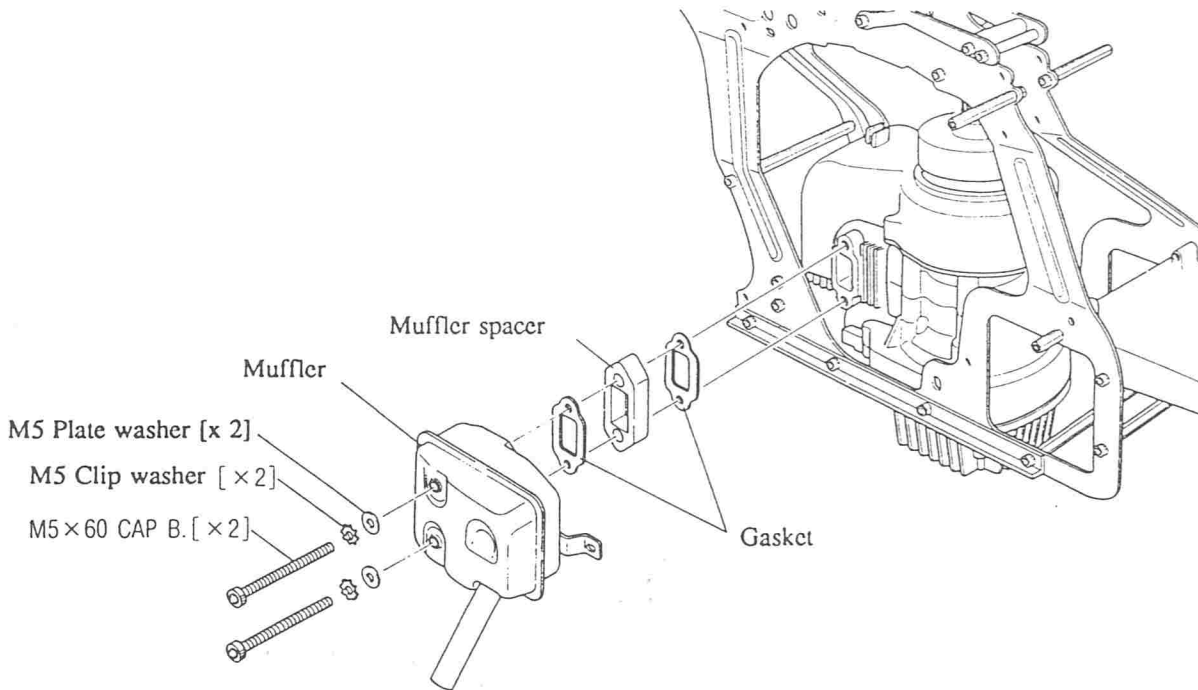


**3 - 3** Remove the air cleaner cover of the engine, remove two M5 ⊕ bolts and the carburetor, and then remove two M5 ⊕ bolts and the insulator. At that time remember the direction and positional relationship of the parts. Put the engine in the main frame, insert the clutch shoe into the clutch bell, align the engine mounting holes, and temporarily tighten the bolts. Then assemble the carburetor portion in the original state. To fix the bolts in the insulator, uniformly and lightly screw them in, and then tighten them alternately.

※ If the gasket is broken when the carburetor is removed, replace it with the spare provided for the kit.



3 - 4 Install the muffler spacer and muffler to the exhaust port of the engine via the gaskets.

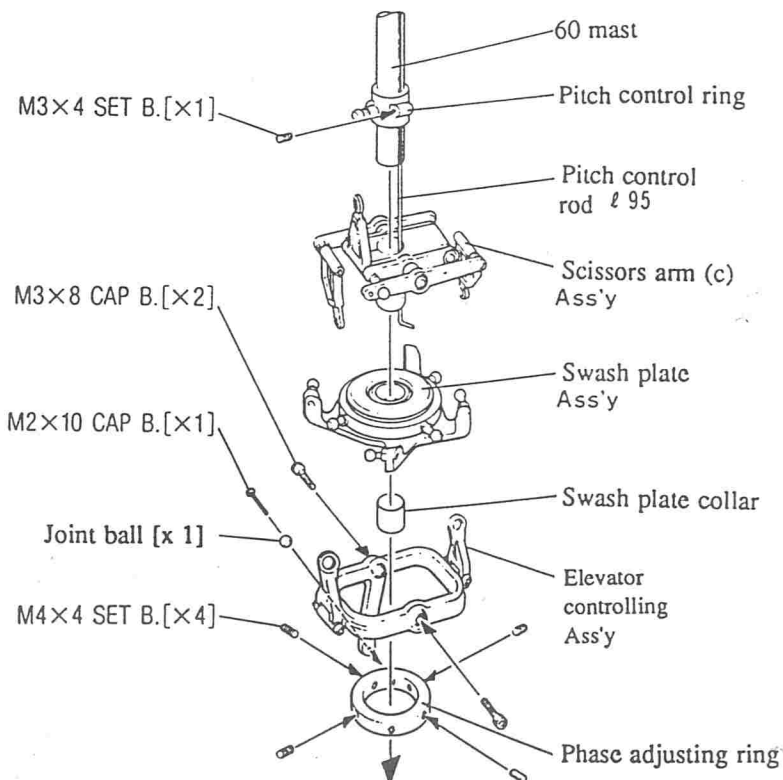


## Step 4. Assembly of Control Section and Gears

4 - 1

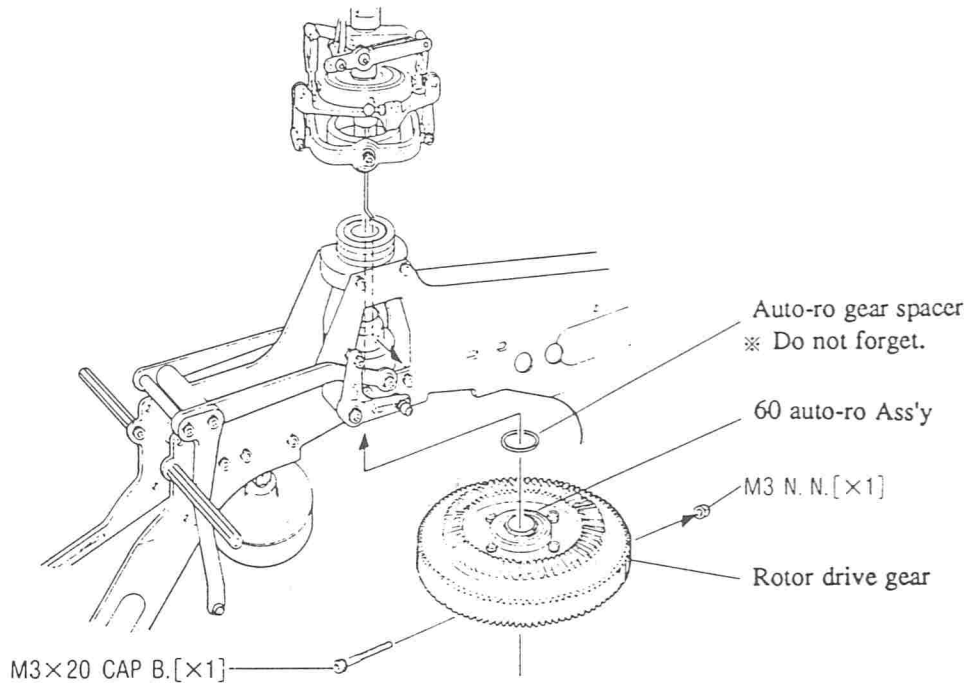
### IMPORTANT

Install the joint ball in the elevator control ring and assemble the elevator control ring and phase adjusting ring. Insert one end of the pitch control rod into the pitch control ring and pass it through the mast and fix the rod with the setbolt M3x4. Check that the pitch control ring slides smoothly. If it does not move lightly, adjust the bent angle of the pitch control rod. Put out the lower end of the pitch control rod a few centimeters from the mast and pass it through the scissors arm, swash plate, swash plate collar and phase adjusting ring in that order, and fit the universal links in the ball arm.

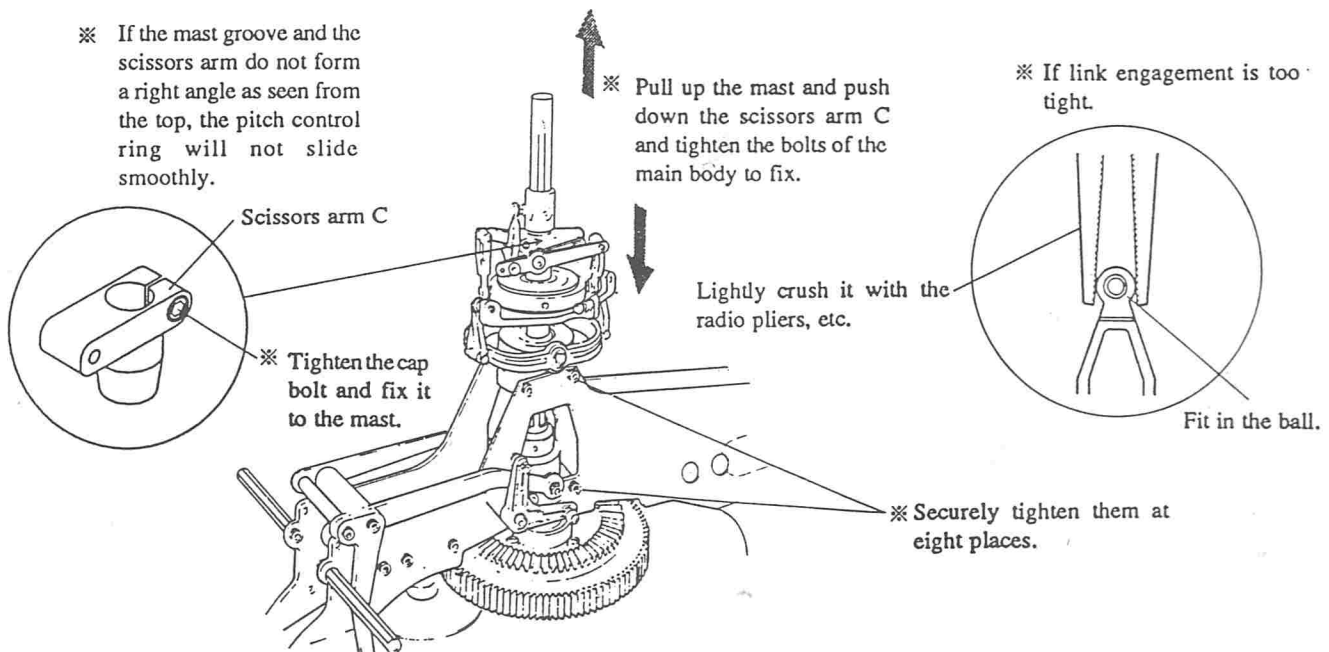




- 4 - 2** With the lower end of the pitch control rod put out a few centimeters from the mast, pass it through the bearing case C and insert it from the inside of the slide ring Ass'y into the  $\phi 2$  hole, and then pass the mast through the bearing cases C and A. Be sure to insert the auto-low gear spacer and install the rotor drive gear Ass'y.

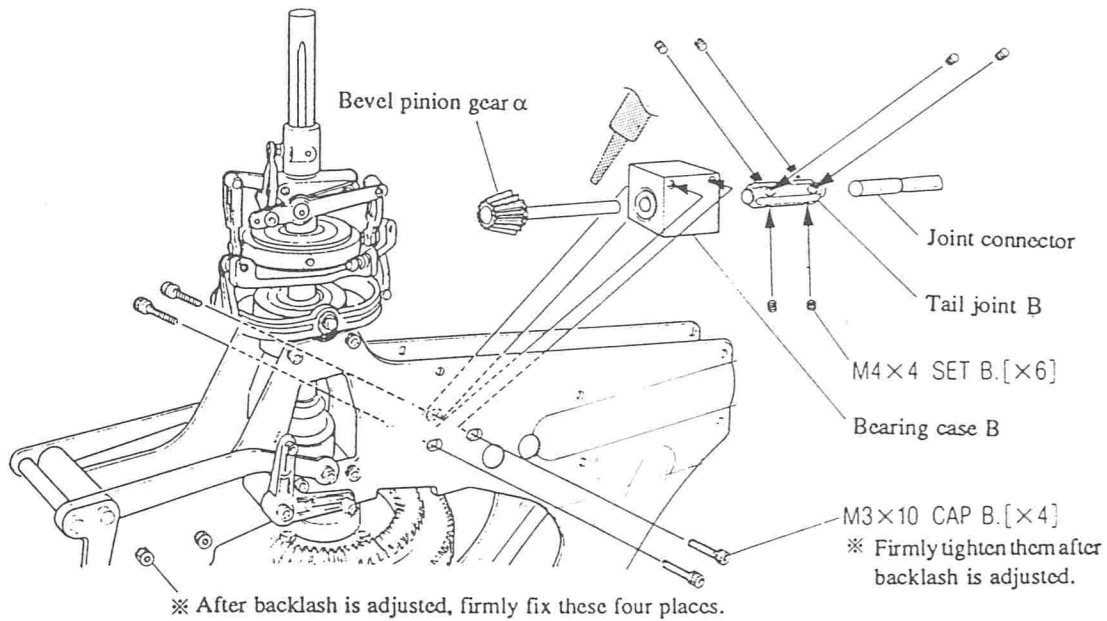


- 4 - 3** Insert the phase adjusting ring in the bearing case C. The set bolts M4 x 4 should not yet be fixed. While sufficiently pulling the mast, hold the scissors arm C, adjust the angle of the main body so that the pitch control ring will slide lightly, and fix the bolts. Then move the elevator control ring several times back and forth, adjust the height position of the phase adjusting ring to the swash plate, and fix the set bolts at the lightly moving position. At that time, the phase should be set to 0 degree and should be offset as required after flying. Securely fix the bearing cases A and C which were temporarily fixed in 2-4.



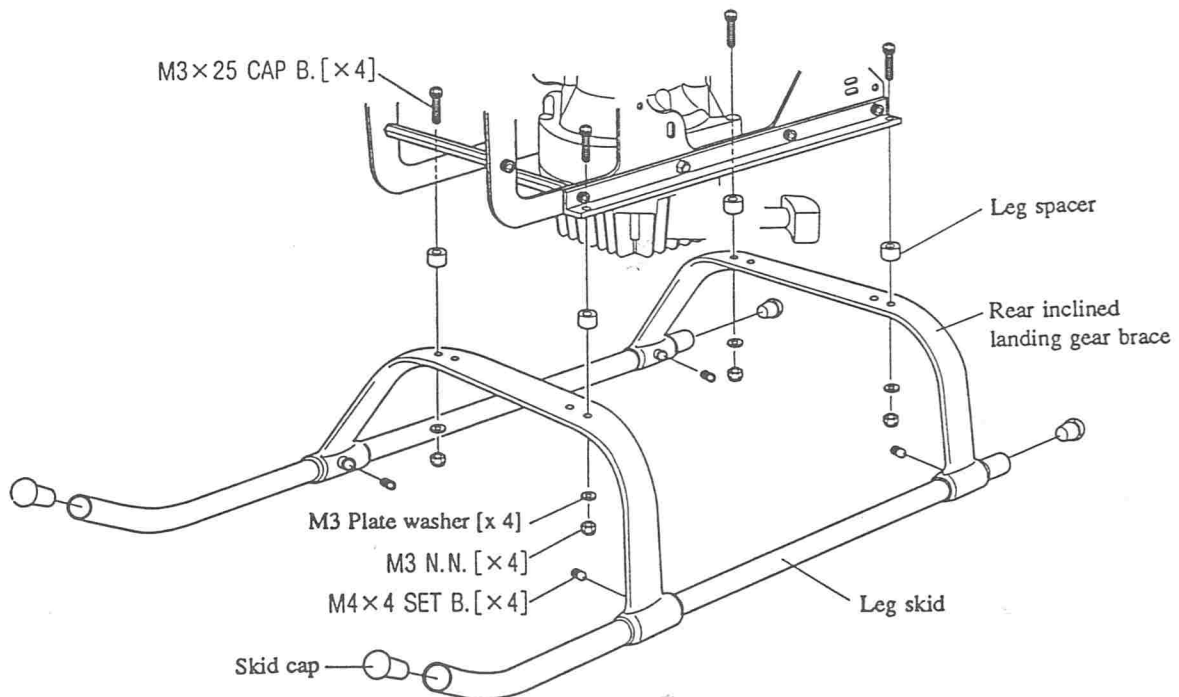


- 4 - 4** Clean and bond with Kalt Tight, etc., the bevel pinion gear shaft and inner circumference of the bearing of the bearing case B. The bearing case B should be firmly fixed after the backlash with the bevel gear is adjusted. Also adjust the pinion gear/drive gear backlash and center the pinion gear and the engine as shown in 3-3, and firmly tighten the bolts which were temporarily tightened in 2-1 and 3-3.



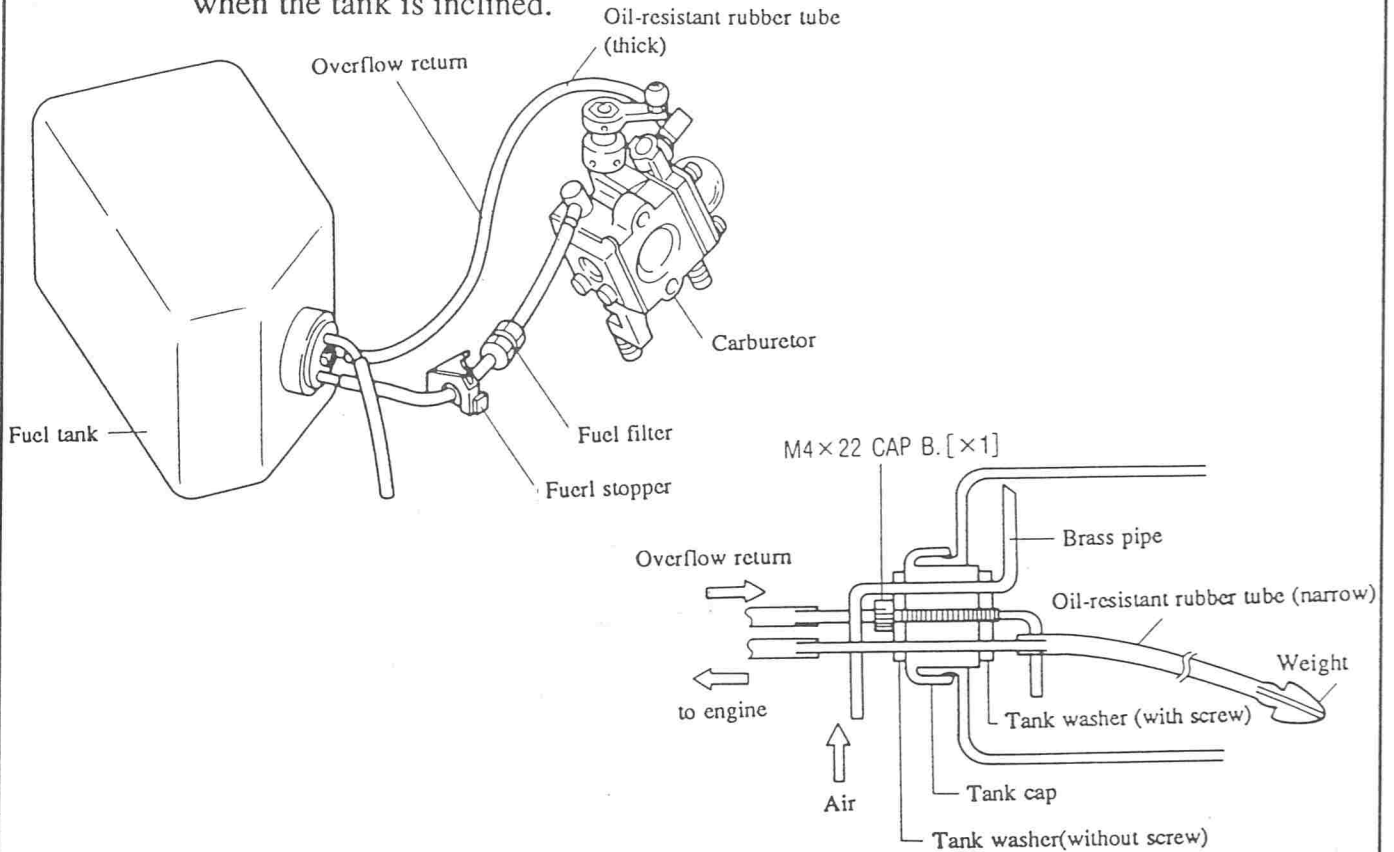
## STEP 5. Assembly of Legs, and Fuel Tank

- 5 - 1** When the leg skid is fixed to the rear inclined landing gear brace, the set bolts M4x4 should not be tightened too strongly because there is a fear of damaging the threaded portion.



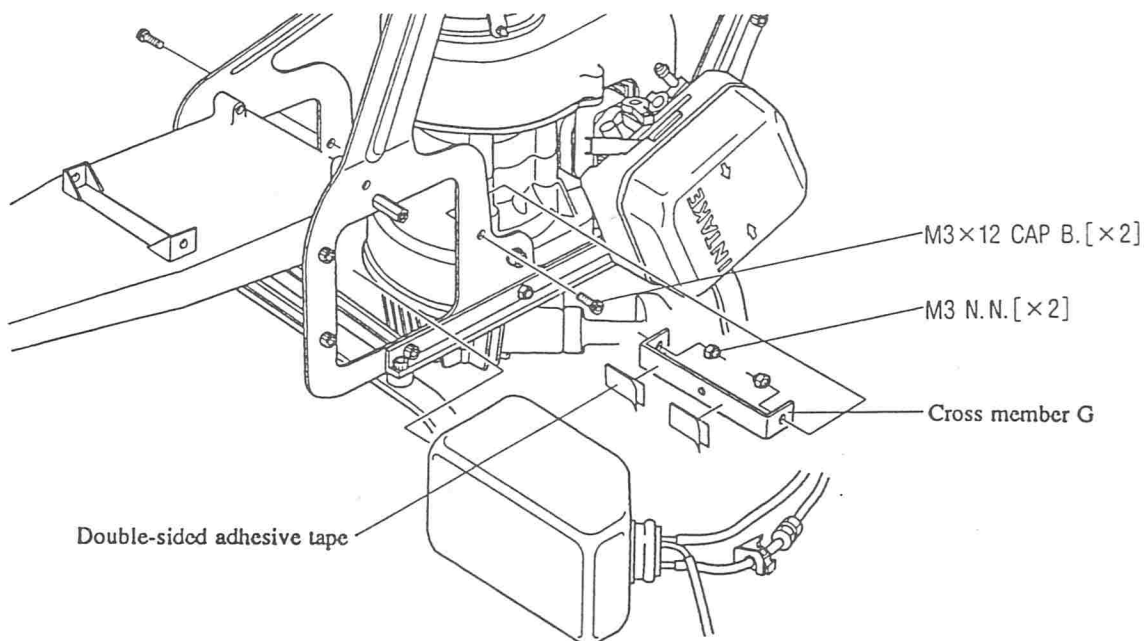
## 5-2

For the weight in the fuel tank, adjust the length of the oil-resistant rubber tube (narrow) so that the weight can sufficiently reach the tank bottom and can move freely when the tank is inclined.



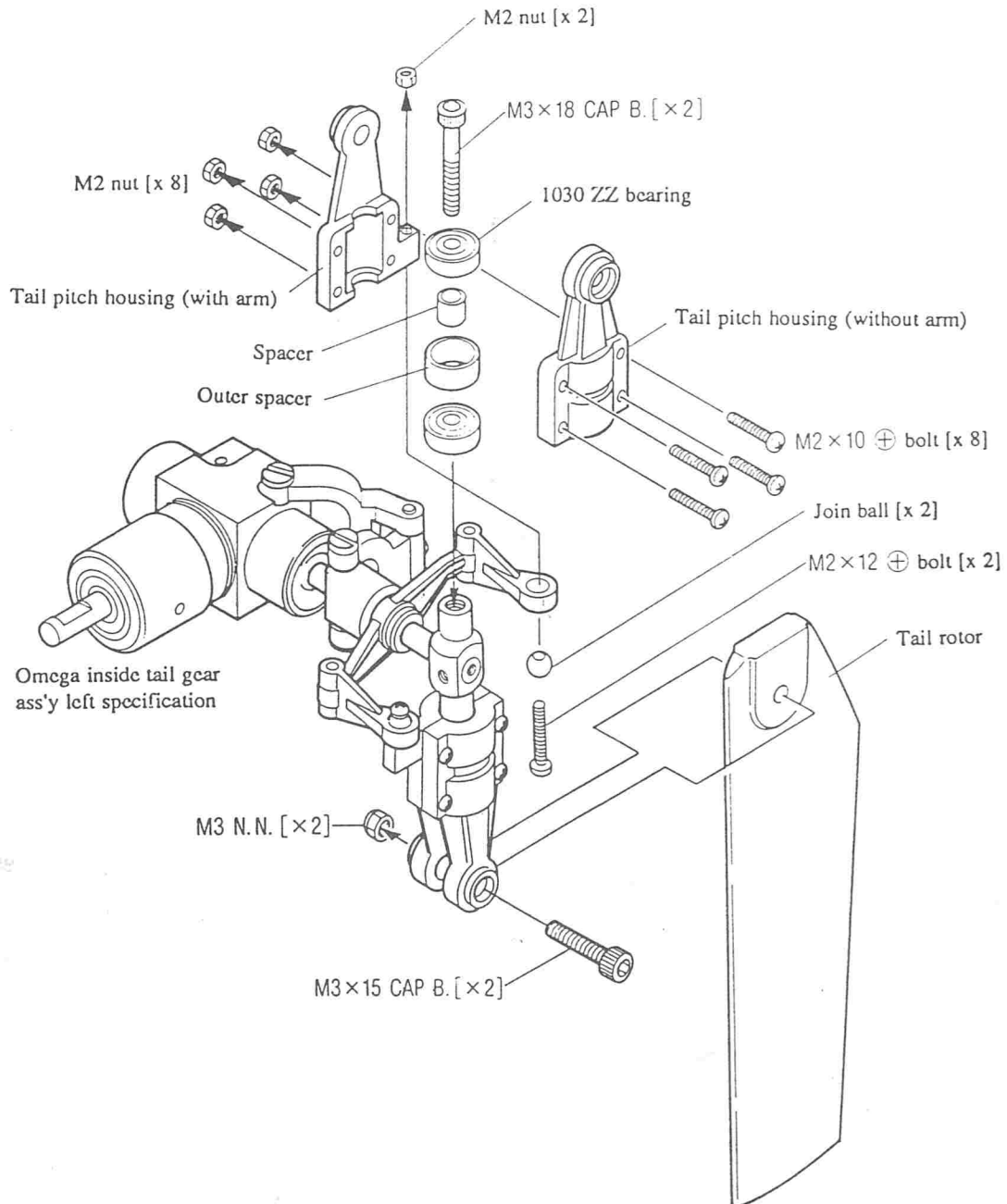
## 5-3

Put the fuel tank in the main frame and set it at the center of frame. Then attach the double-sided adhesive tape to the cross member G and fix it to prevent movement of the tank.

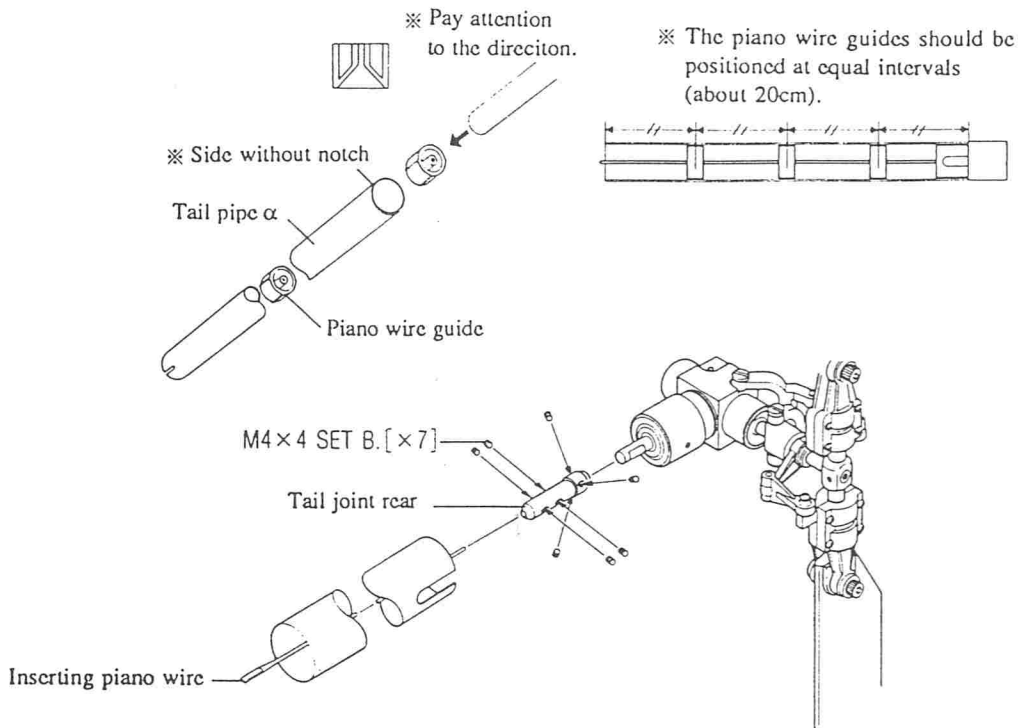


# Step 6. Assembly of Tail Portion

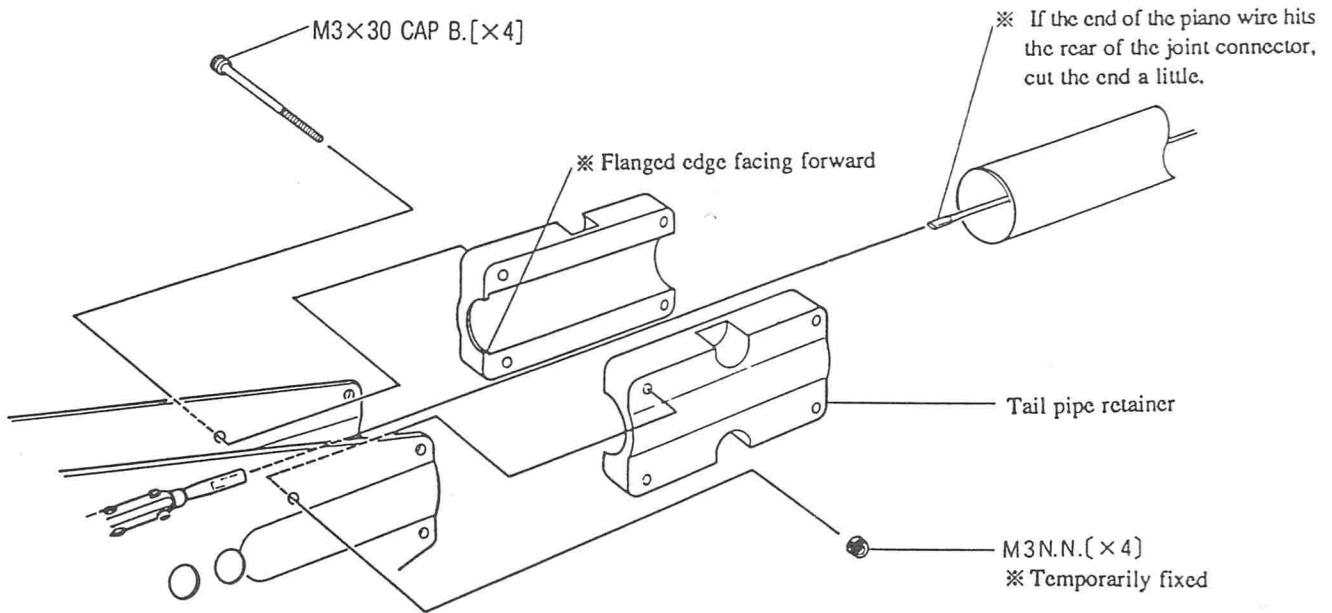
- 6 - 1 Put the spacer and outer spacer between the bearings and install them to the tail rotor hub with M3x18 cap bolt. This bolt should be degreased clean and bonded with KALT tight, etc. Be careful so that the adhesive will not enter the bearing. Sufficiently apply silicon grease to the bevel gear in the inside tail gear.



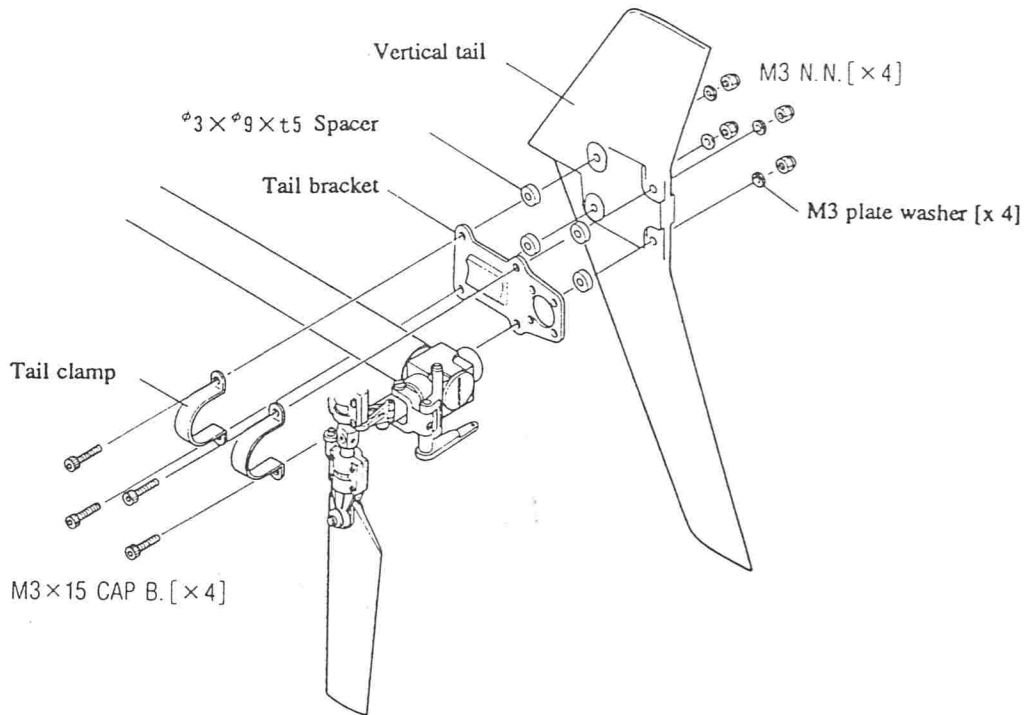
6 - 2 Using a long bar, push the piano wire guides into the tail pipe at the side without notch, making sure of the direction.



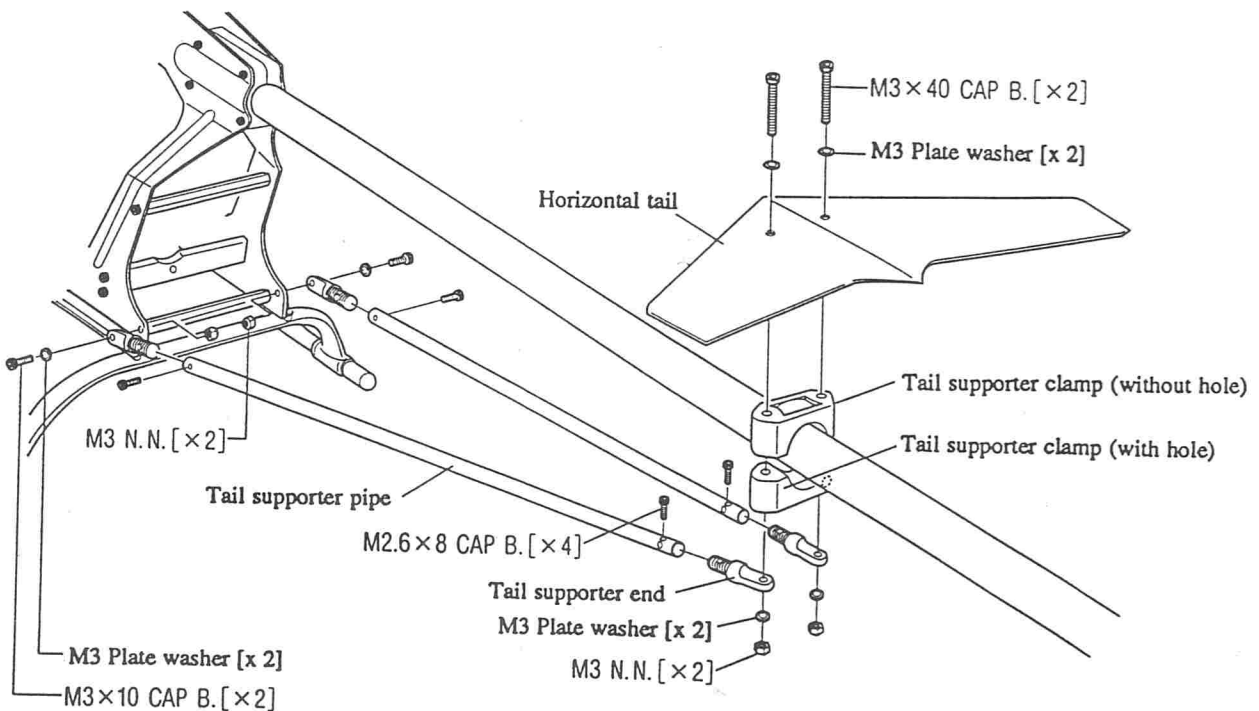
6 - 3 Temporarily fix the tail pipe retainer, flanged edge facing forward, to the frame. Then push the tail pipe into the tail pipe retainer. At that time the piano wire should be inserted making sure of the direction of the joint connector and the piano wire.



**6 - 4** The vertical tail should be installed so as to be parallel with the mast as seen from the rear.

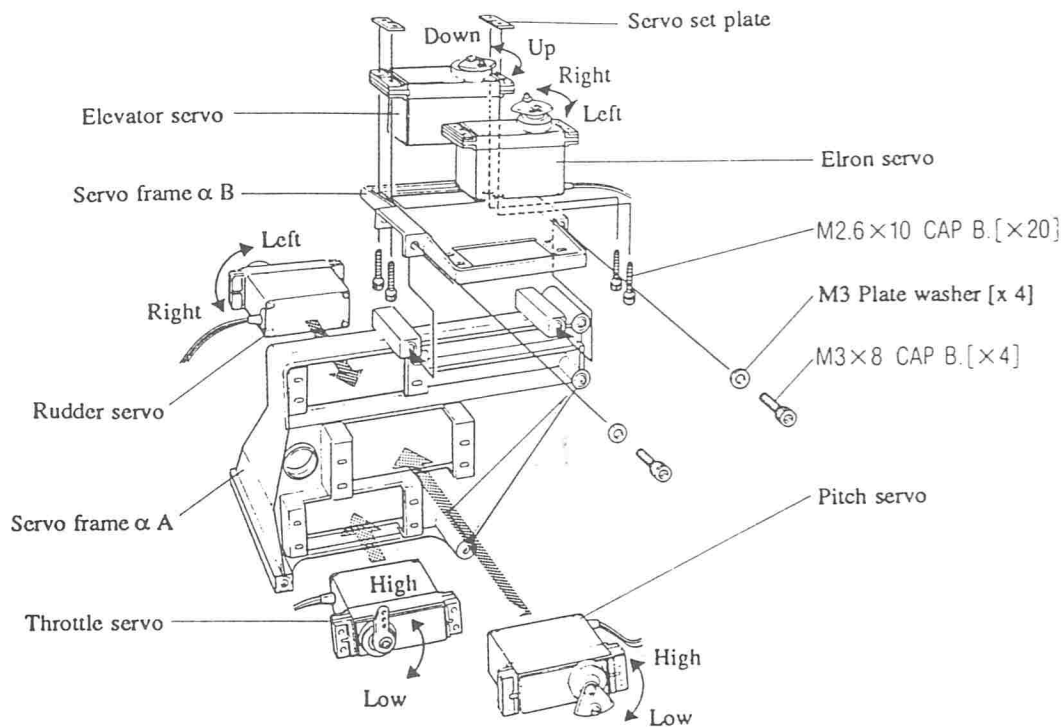


**6 - 5** When the tail supporter is installed, adjust the tail supporter clamp position back and forth so that the tail pipe will be accurately at right angles to the mast. The horizontal tail should be adjusted so as to be normal (right angled) to the mast as seen from the rear. Firmly fix the tail pipe retainer bolts and tail supporter portions.

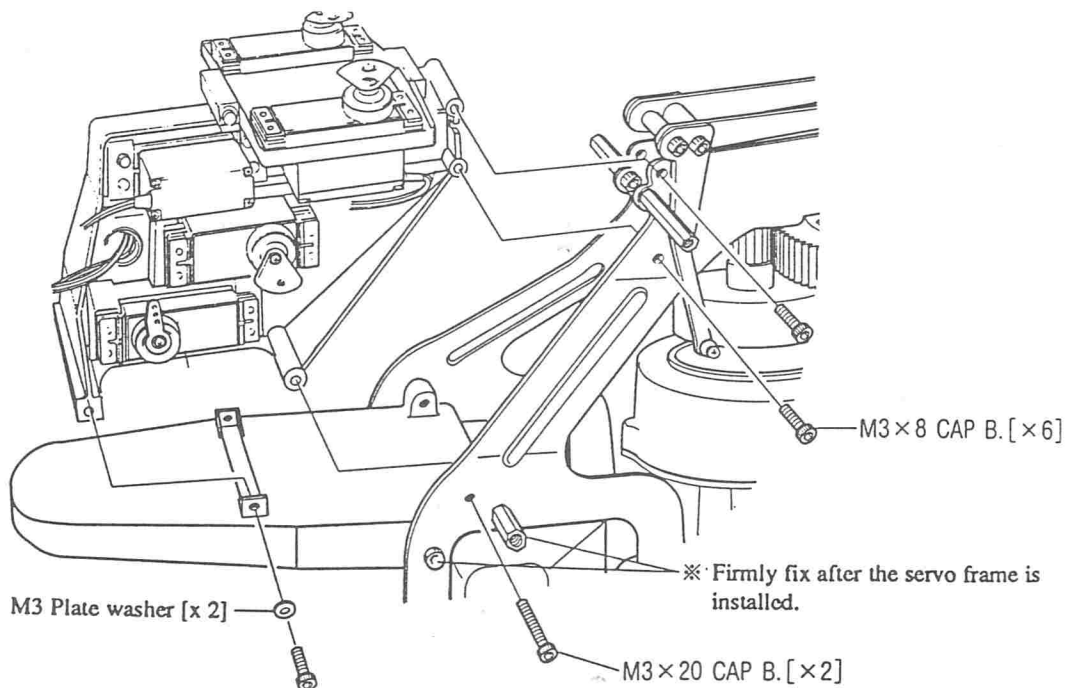


# Step 7. Mechanism installation and Linkage

- 7 - 1** Clean the servo set plates and M2. 6 x10 cap bolts and firmly fix the servos using the Kalt Tight, etc. [Be sure to install the rubber bushes (provided in radio/control set) to the servos.] Make sure of the operating direction of the servos.

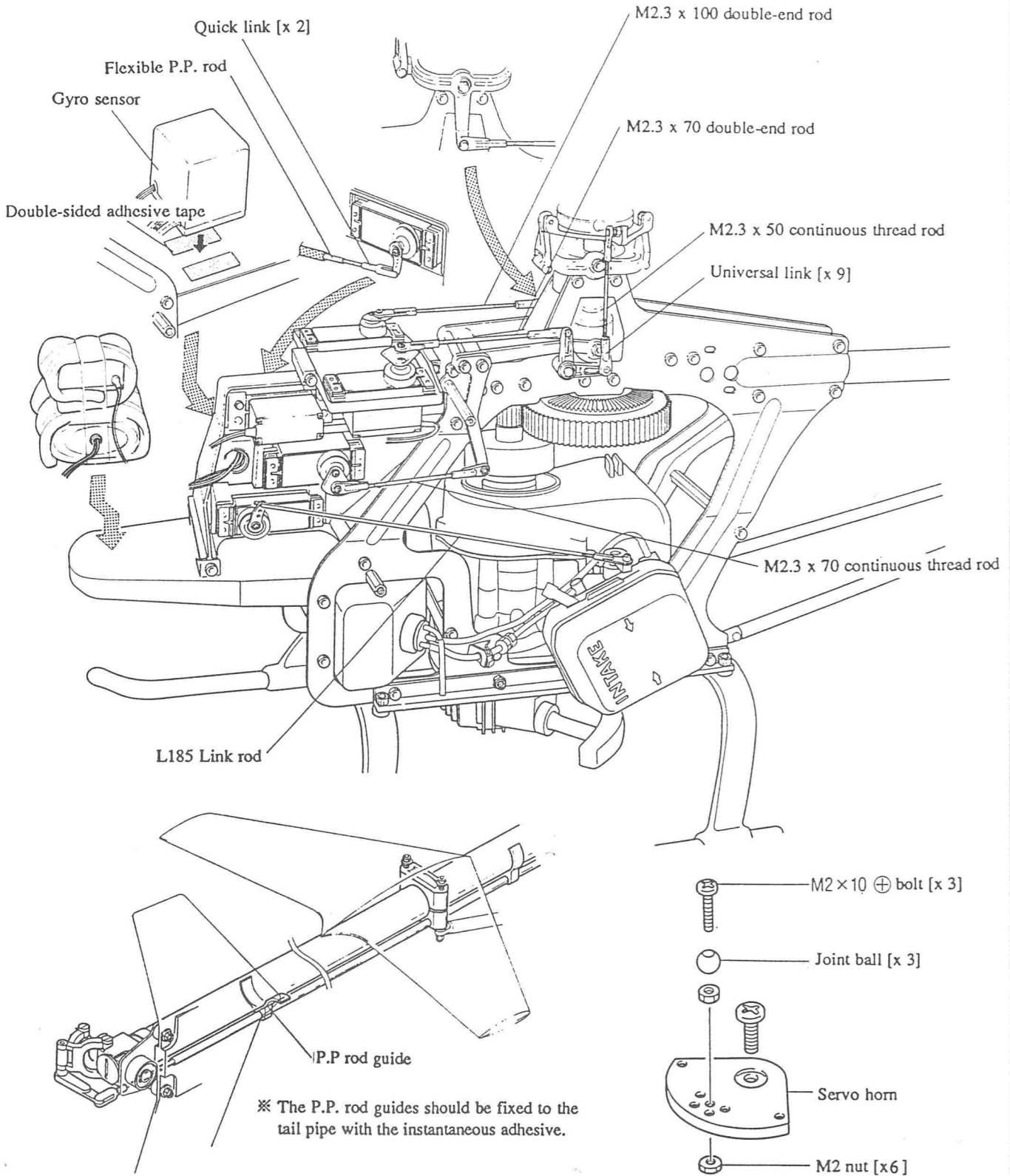


- 7 - 2** Install the servo frame in the main frame. If it does not go in smoothly, loosen the bolts fixing the subframe. They should be firmly tightened after loosening or even when they are not loosened because they were temporarily fixed.



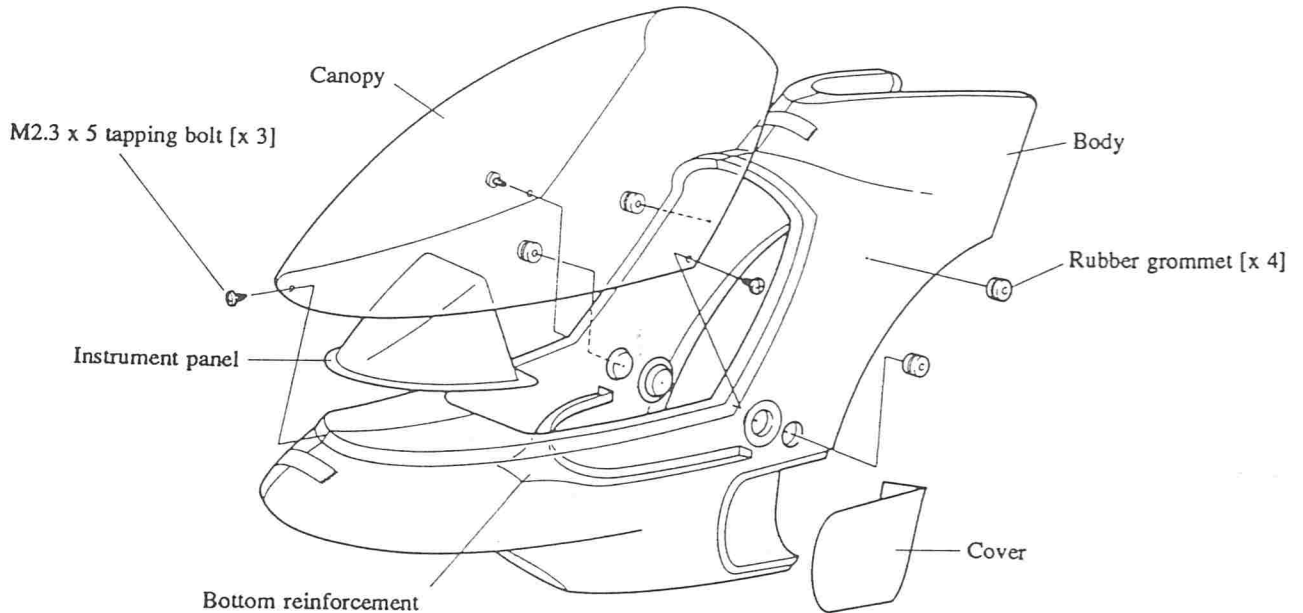
# 7 - 3

Make the linkages as illustrated below. For the Elron, elevator and pitch servos, use the disk type servo horn. Step it as illustrated, install the joint ball, and make the linkage. For linkage of the rudder, screw the quick link onto the flexible P.P. rod at both ends. The P.P. rod should be fixed to the tail pipe at proper points using the P.P. rod guides so as to prevent deflection on the way.

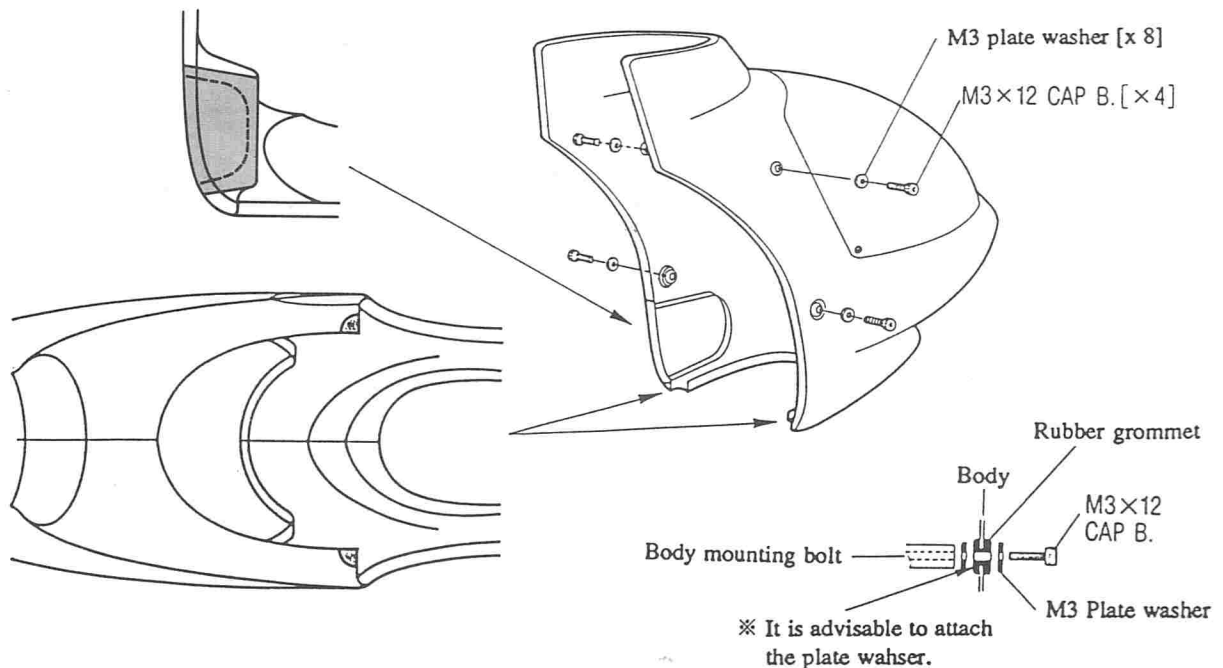


# Step 8. Body Assembly

- 8 - 1 Temporarily fix the parts of the body with adhesive cellophane tape, etc. and bond them by putting in the adhesive provided between the mating parts using a small brush. Prepare the hole  $\phi 6$  for the rubber grommet of the body and the hole  $\phi 2$  for the canopy mounting tapping bolt after attaching 2 or 3 reinforcing plates from the inside. Then, bond the provided cover to the concave portion on the side of the body.



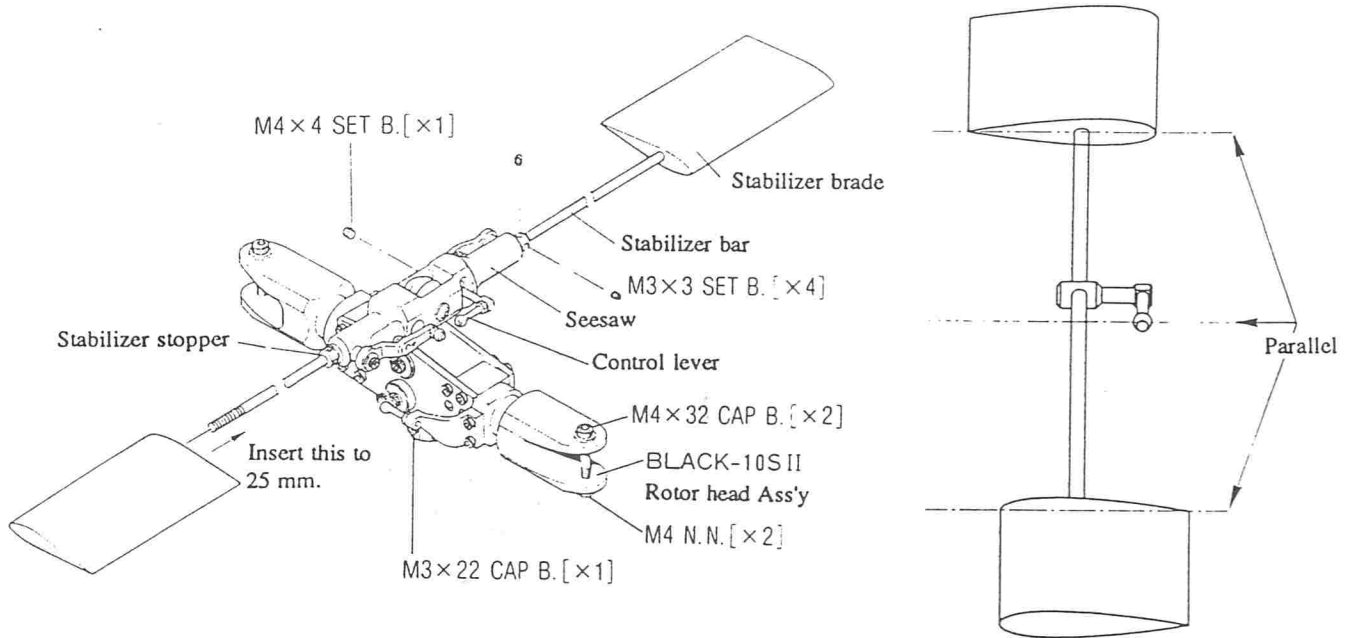
- 8 - 2 Cut the completed body as illustrated and bolt it to the airframe. Check that the linkage rod does not touch the body. If it does, cut it off.



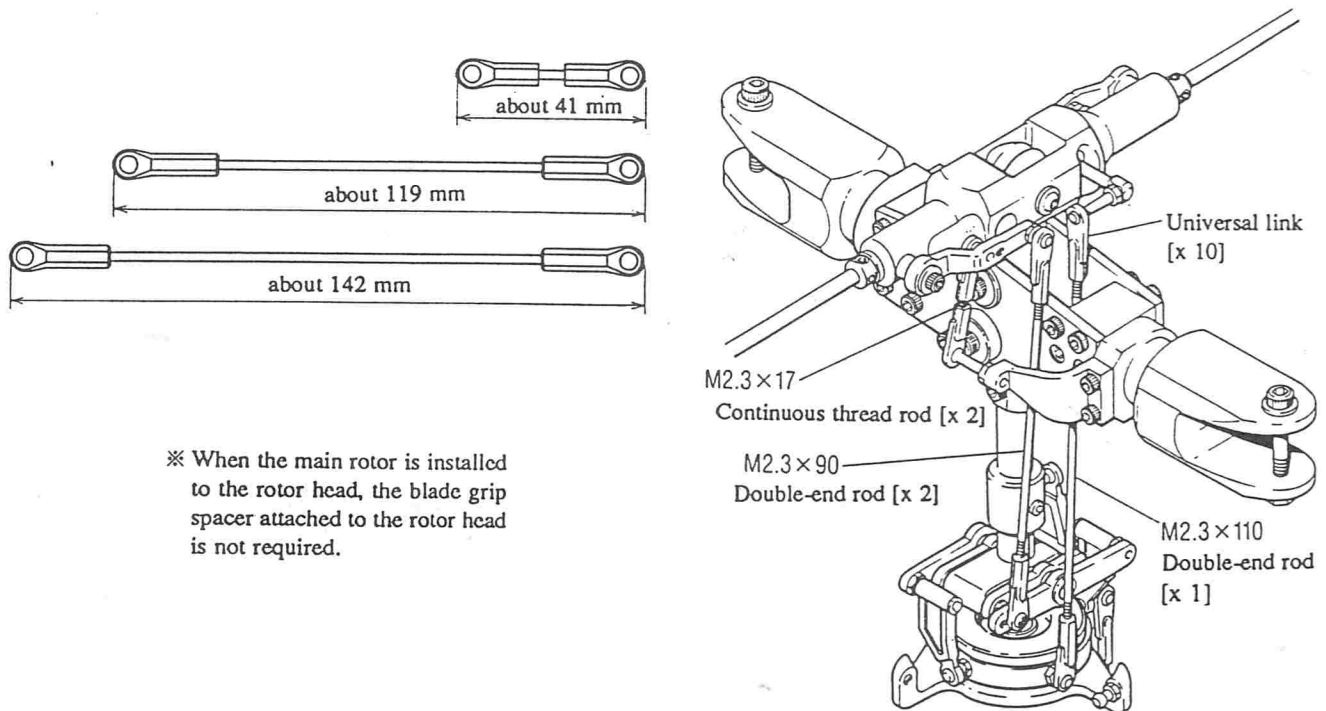


# Step 9. Rotor Head Assembly and Installation

- 9 - 1 Adjust the length of the stabilizer bar at right and left so that the length from the seesaw portion to the stabilizer blade will be same, and fix them with the set bolts. Take care so that the right and left stabilizer blades and the control lever will be in parallel.



- 9 - 2 Make linkage rods and link them as illustrated below. For the method of adjusting the rotor head, see the instruction manual for rotor head. The main rotor blades should be assembled referring to the instruction manual contained in the rotor blade box.



※ When the main rotor is installed to the rotor head, the blade grip spacer attached to the rotor head is not required.



## Adjustment after Assembly

After the assembly is completed and before flying adjustment, recheck all the processes and make sure that there is no wrong assembling or forgetting of tightening the bolts and that there is no linkage fault by operating all the servos. Sufficiently charge the transceiver in preparation for the following flying adjustment.

### • Checking of Center of Gravity

The center of gravity of the helicopter is very important.

Prior to flying, it should be set in the range from the mast to the place 5 mm ahead of the mast without fuel. For actual adjustment, the nose should be slightly lowered when the mast of the helicopter is raised.

### • Pitch of Main and Tail Rotors

Actually the pitch of main rotor considerably differs depending on the helicopter weight, engine power, diameter of main rotor and taste of the operator, and the adjustment should be made while flying the helicopter. As a yardstick when assembling, it should be set to minimum 0° and maximum 8°.

The tail rotor pitch also differs depending on the type of helicopter, but the PC plate position should be set in such a way that about 5 pitch is obtained when the rudder stick is in the neutral position and the throttle stick in the slowest position.

## Precautions in Handling Gasoline Engine

- Since the fuel is highly flammable gasoline, due attention must be paid to the fire including cigarette light.
- Never pour the gasoline to burn refuse, etc.
- Do not handle the gasoline or operate the engine in a closed place.
- It is recommendable for safety to prepare the extinguisher for car.
- To carry the gasoline, carry only a necessary minimum quantity and do not store it at a high-temperature place (in car trunk, near fire, etc.).
- Use a strong metallic container as the gasoline container and do not carry it together with bare battery. Poly container should not be used because it may be damaged due to vaporization/expansion of the gasoline.

## Precautions in Flying

- For ignition of the KG-22S engine, noise-proofing spark plug is used, but some noise may be produced, and so the radio equipment to be installed in the helicopter should be of the type strong against noise.
- During flying, it may happen that the plug cap comes off causing engine stop, and so when the plug cap is installed to the spark plug, it must be securely inserted about 19mm from the tip of the plug (lower portion of 3 grooves of the insulator).
- The carburetor of the KG-22S engine has a precision bypass portion, and if it is clogged with fine dust, etc., engine malfunction may be caused. It is, therefore, necessary to use the fuel filter and supply the oil from the tank side of the filter.
- When the plug is installed, it is not necessary to tighten it too strong because the plug includes a special washer. About half turn from the manually tightened position is enough. If it is tightened too much, the washer may be deformed and loosening tends to occur.

## Flying Adjustment

The following adjustment must be made under the guidance of an experienced person of the radio controlled helicopter.

To prevent danger, the rotor should be started after the engine is started at a place sufficiently away from people and objects, and the operator himself must not go near the rotating main and tail rotors and the extension of the plane of rotation. When the rotor is started, carefully check the helicopter for any abnormal vibration or noise, and if any abnormality is found, immediately stop the engine and investigate the cause. The parts (including engine and radio equipment) should be always checked, and any cracked or faulty parts must be replaced.

### • Engine Adjustment

Refer to the separate instruction manual for KG-22S engine.

### • Tracking Adjustment

Place the helicopter at a place 5m or more away from you, gradually raise the throttle, and when the helicopter is about to rise, check the plane of the rotation of the main rotor from the side to see whether the two rotor blades form same tracking. If the tracking is not in agreement and is doubled, adjust the tracking by decreasing the pitch of the upper rotor or increasing the pitch of the lower rotor.

This adjustment is made by turning the universal link connected to the pitch arm of the rotor head.

### • Tail Pitch Adjustment

Place the helicopter with the nose faced toward the wind and gradually increase the speed of the engine. If the tail swings when the helicopter is about to rise, the tail pitch should be adjusted. (The transmitter rudder stick and trim should be placed in the neutral position.) If the tail swings rightward (nose leftward), the pitch of the tail rotor is low, and should be increased by shortening the length of the P.P. rod.

If the tail swings leftward (nose rightward), the pitch should be decreased.

## Repair and Replacement Parts

For all the parts used in our kits, replacement parts are sold. If parts are damaged due to turnover or falling, you can obtain the replacement parts at the shop where you bought the kit. For special parts not stocked, please order to your shop describing the helicopter model name, correct name of the parts and part No.

Since the helicopters made by our company are designed in due consideration of the overall

strength and durability, it is very dangerous to use parts made by other companies or make partial reinforcement. It must be noted that if use of other parts than our genuine parts causes trouble, our company cannot guarantee anything. Repairing or adjustment should be made in accordance with this manual as in the case of assembling.

## Request

The adjustment of the radio-controlled helicopter is very complicated, and in order to achieve good condition, overall adjustment of components is required. For a beginner, it is rather difficult to achieve this total balance, and therefore, the adjustment should be made under guidance of a veteran. Since the radio-controlled helicopter is very dangerous if the adjustment or handling is wrong, it is recommended to effect the radio control insurance contract and take utmost care to secure safety. If falling or turnover should occur, all the parts should be carefully checked, and any

doubtful parts should never be used. Keeping in mind the fact that the helicopter is operated by means of the radio control equipment using very weak radio wave, the helicopter should never be flown near and over people and buildings and too near to you. If any shortage of parts included in the kit is found, please contact your shop before starting the assembly. If any parts included in the kit are faulty or defective, please contact our company before flying. They will be replaced with the good parts.

It should be noted that our company cannot take any responsibility for accidents which may occur after flying due to the above reasons and defects of this manual and drawings.

For all the main parts and designs of Kalt helicopters, the patent, utility model, and registration of design were obtained or applied for.

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JAY - CALL MRS.  
PETES MAMA.



217-355-0022

### Main Specifications

Main rotor diameter .....	1560mm
Total length of helicopter .....	1400mm
Total equipment weight .....	5.5 kg
Engine .....	KG-22S (standard equipment)
RC equipment .....	5 channels
Mechanism .....	GS ALPHA
Revolution ratio (engine : main : tail).....	6.77 : 1 : 5.52
Body material .....	ABS vacuum-molded
Temperature range for safe flying .....	0 °C ~ 40 °C

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