

KALT BLACK HEAD SB STABILIZER SYSTEM

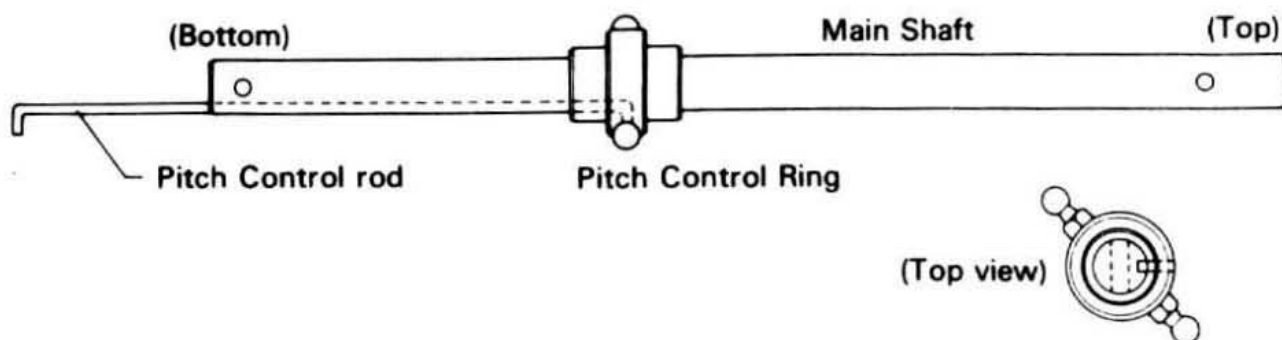


Become thoroughly familiar with this instruction manual prior to construction and flying.

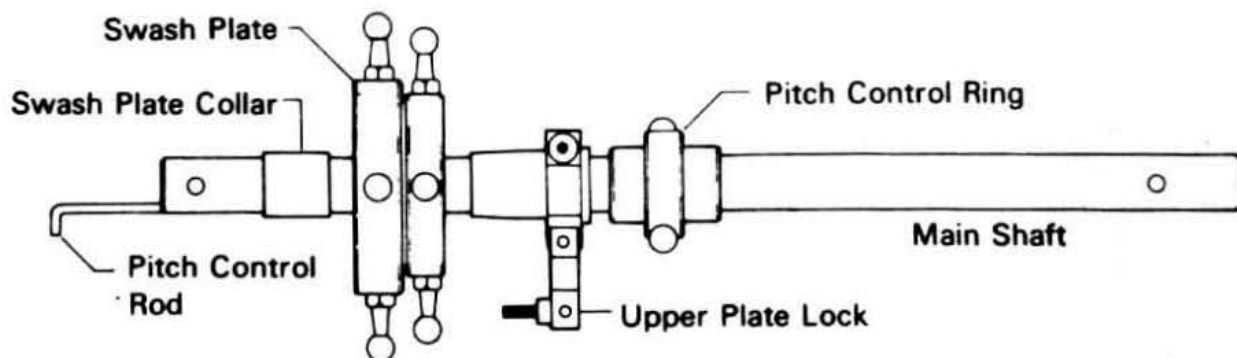
Black head SB is a high grade rotor head for expert flyers. It uses many miniature ball bearings and major parts are machine shaped.

Installation

- 1 Insert one end of the pitch control rod into the hole in the pitch control ring, then slide the unit about half way onto the main shaft, as shown in drawing.



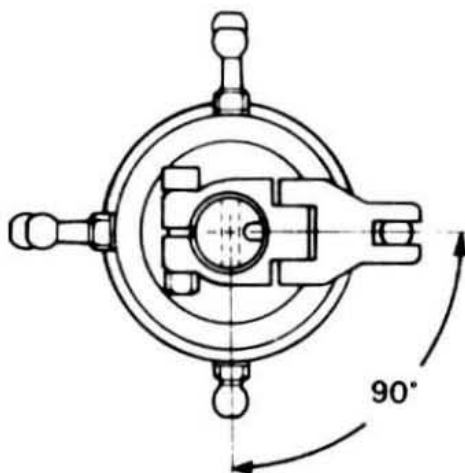
- 2 Insert the upper plate lock, swash plate and the swash plate collar, in that order, from the bottom of the main shaft, as shown in drawing.



- 3 Insert the main shaft through the top bearing, then insert the bent end of the pitch control rod into the 2mm hole of the slide ring, then drop the main shaft into the bottom bearing.

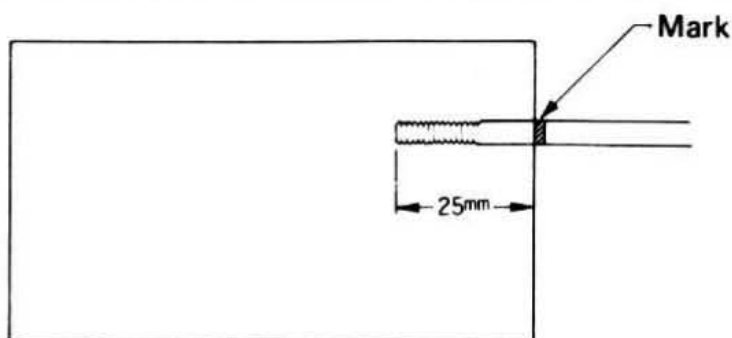
Notice : The pitch control rod must move freely in the main shaft. If there is any friction, check to see that the bent ends are exactly 90 degrees.

- 4 Adjust the stroke of the pitch control servo so the pitch control ring moves 9 ~ 10mm. If you installed a scissors arm instead of a pitch control ring, the stroke must be changed. Refer to the explanation of the scissors arm.
- 5 Connect up the radius support and the short arm of the swash plate with two universal links and threaded rod. Adjust the length of the rod so that the short arm of the swash plate is 90 degrees to the center line of the frame.
- 6 Link up the pitch (elevator) and roll (aileron) servos to the swash plate.
- 7 Pull the main shaft upwards, and push down the upper plate lock, then tighten up the bolt on the upper plate lock. At this time, the upper plate lock must be 90 degrees from the 3mm hole in the main shaft.

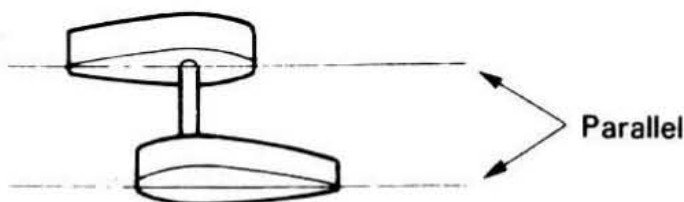


- 8 ※ When using the plastic upper plate lock.
Attach a ball joint to the upper plate lock. Connect the ball joint and the arm of the swash plate with two universal links and a threaded rod. Adjust the length of the rod so that the upper plate lock and swash plate arm are at right angles to each other.
- ※ When using the metal upper plate lock.
Screw the short universal link (contained in the same place as the upper plate lock) to the threaded tip of the swash plate arm.
- 9 Place the control lever into the see-saw, insert the stabilizer bar to the see-saw and control lever.

- 10** Put two stabilizer retainers to both sides of the see-saw. Screw stabilizer blades to the both ends of the bar. At this time make a mark 25mm from each tip of the bar, and screw on the stabilizer blade to exactly line up with the mark.



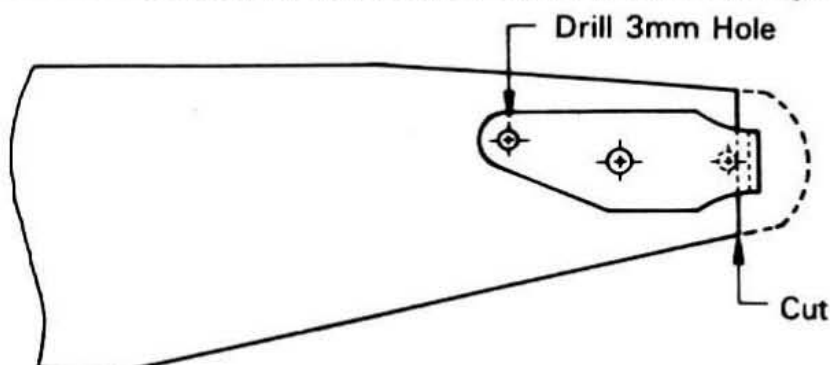
- 11** Adjust the chord lines of the two stabilizer blades so that they are exactly parallel and face in opposite directions. Secure them into position, when satisfied, with cyanoacrylate.



- 12** Two stabilizer retainers are properly positioned when the distance between the two stabilizer blades and the see-saw is equal. At this time there must be a little clearance between the see-saw and retainers for smooth operation.

- 13** Secure the control lever to the stabilizer bar with a M4 \times 4 set screw. At this time secure the ball joint of the control lever at the same level as the blades.

- 14** Shave down the root end of the main rotor blades to an 8mm thickness. Add the blade reinforcement, drill 3mm holes and bolt them to the blades with M3 \times 18 cap bolts and nylon nuts. Install the rotor blades to the blade grip of the rotor head. Do not tighten down the screws too tightly as the blades must be free to move. Centrifugal force keeps them in position during rotation.



15 Hold the stabilizer bar horizontally and balance the blades. If they are not in balance, apply vinyl tape to the lighter blade tip. Even if the blades are in balance, place different colored tape on each blade tip for tracking adjustment.

16 Attach the completed rotor head to the main shaft. Make sure that the clearance between the main and tail rotor blades is more than 10mm. If necessary, cut the main rotor blades to make the clearance over 10mm.

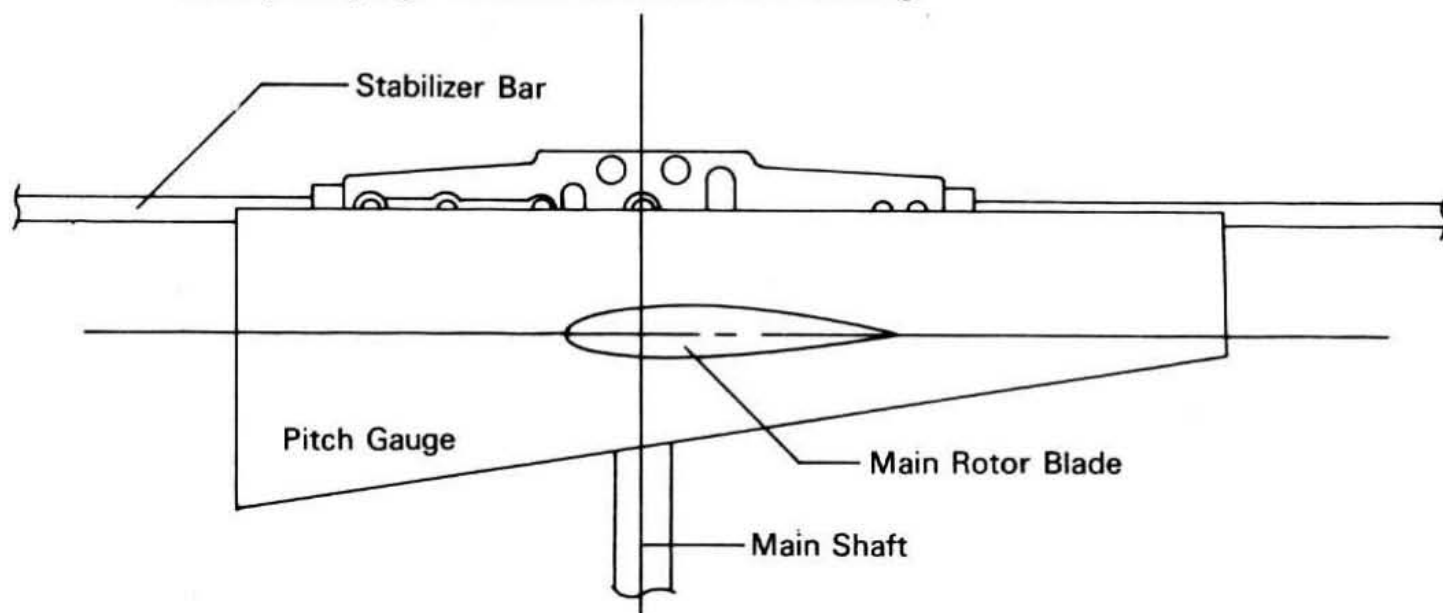
Notice : If the diameter of your main shaft is 8mm, use the $\phi 8$ collar contained in the kit.

17 Connect the ball joint of the pitch control ring and tip of the see-saw arm with M2.3 \times 85 threaded rods and universal links. The little bent side of the rods must be on the bottom side. Adjust the length of the rods (both are same length) so that when the pitch control servo is in neutral position, the see-saw arm is horizontal

18 Connect up the control lever and the swash plate with two universal links and M2.3 \times 120 threaded rod. Adjust the length so that the swash plate and the chord lines of stabilizer blades are parallel.

Notice : In case it is necessary to adjust the length of the M2.3 \times 120 threaded rod, to fit your helicopter, cut the rod and shape the cut end with a file, then screw on the universal links.

19 Adjust the throw of the pitch control, using your transmitter. The maximum pitch is approximately 8 degrees. The minimum pitch is approximately ± 0 degree. These adjustments must be made by adjusting the rod length between the pitch arms and see-saw arms. For measuring blade pitch, using the plywood pitch gauge included in the kit. See drawing.



Utilize a Kalt universal pitch gauge for exact measurement.

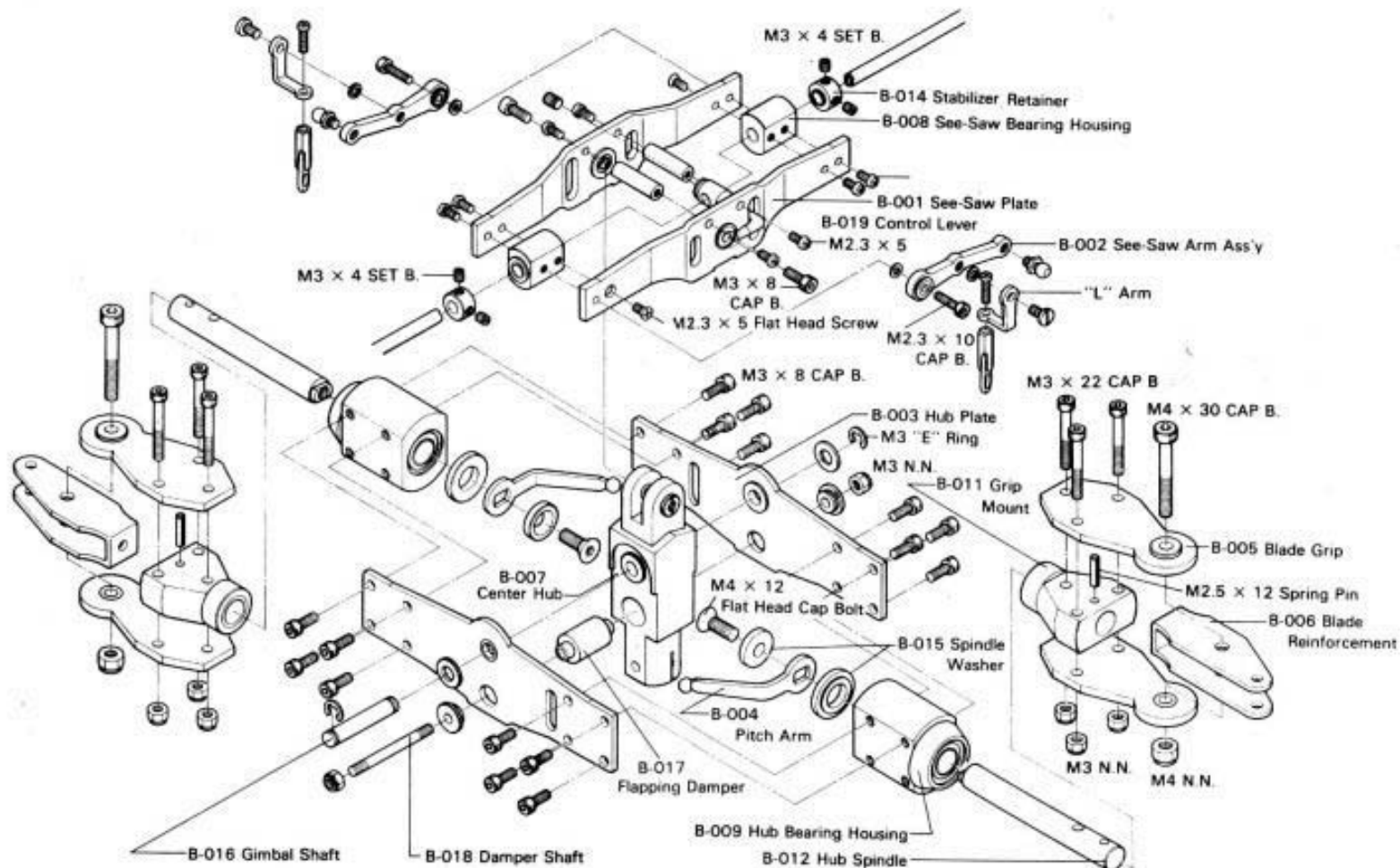
Adjustment

- 20** Start the engine and adjust the tracking of the main rotors referring to the instruction book of your kit.
- 21** The main rotor pitch may vary according to factors such as total weight, engine power, the main rotor diameter and your own preference. For a standard set up, adjust maximum pitch so that the RPM of rotor blade does not over rotate during hovering. (approx. 1,000 ~ 1,100 RPM) And when the throttle is opened suddenly the rotation speed does not come down. Adjustment of the minimum pitch is set for auto rotation flight. When closing the throttle, during level flight, if the helicopter moves pitch up (nose up), decrease the pitch. If nose comes down and sinks rapidly, increase the pitch.
- 22** The flapping damper is adjusted at the factory for a large sized helicopter. If your helicopter shakes during hovering, the flapping damper is too hard. Remove the damper and cut it a little and try again.

Attention

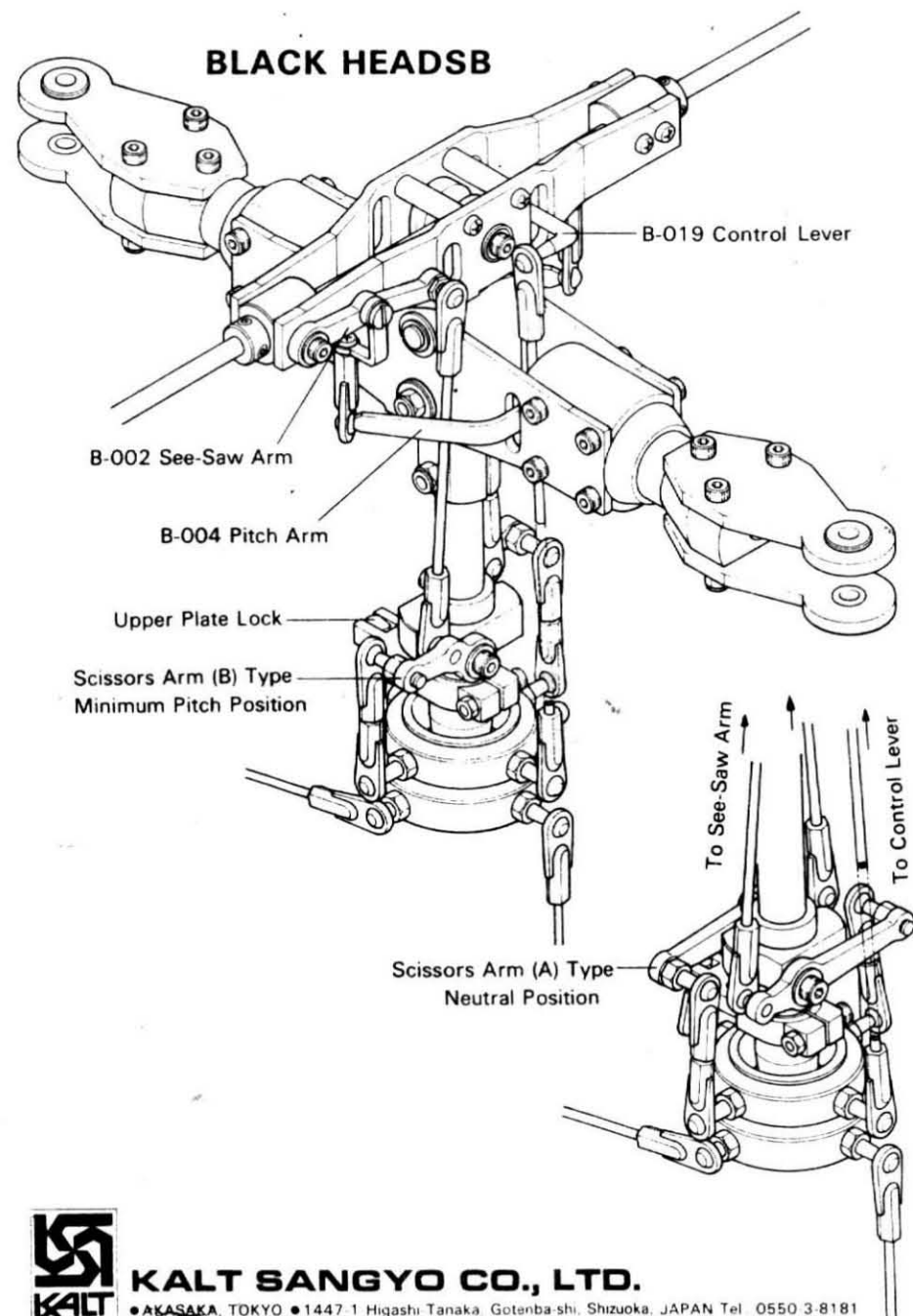
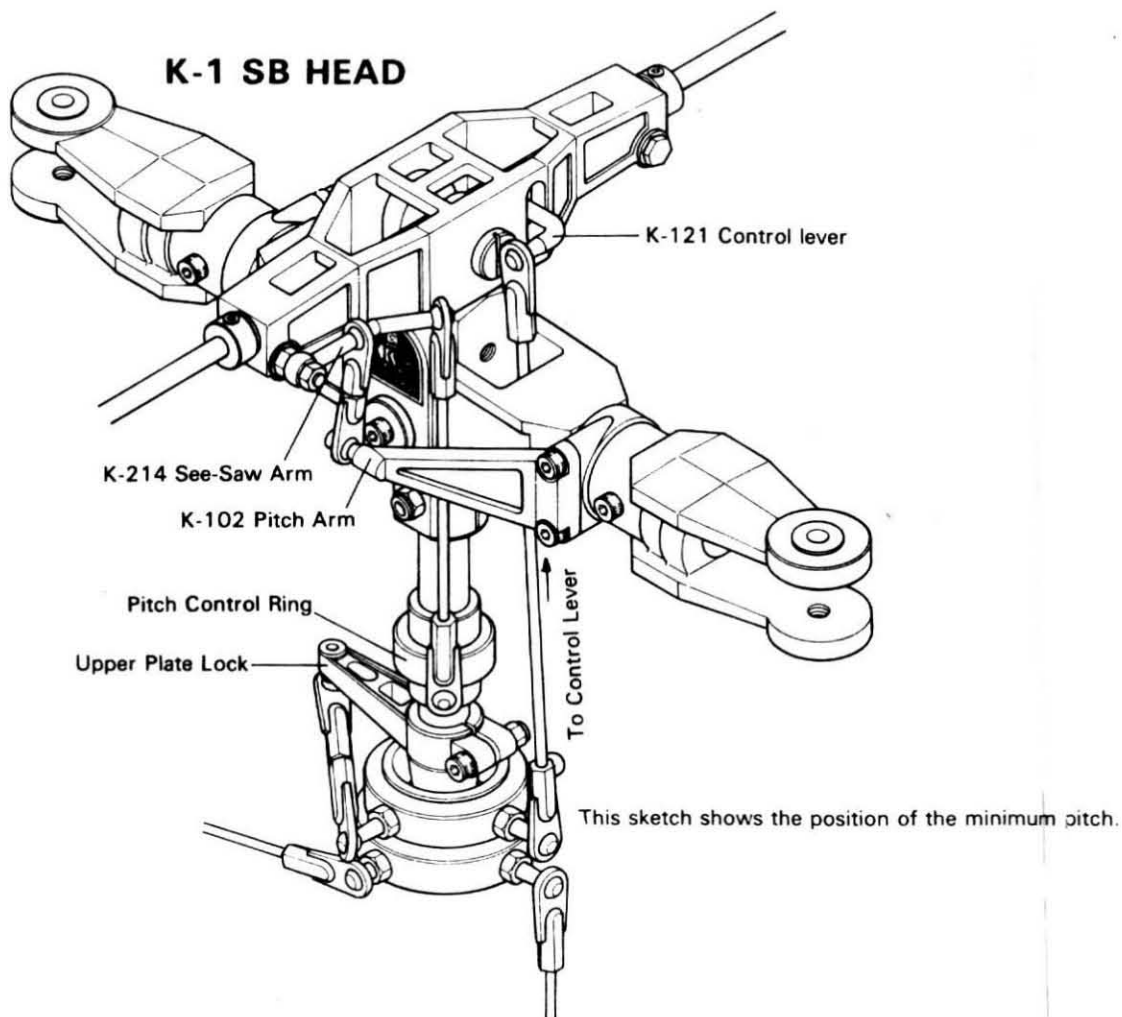
The black head SB is a precision machine. Do not fly the helicopter in a dusty place. Keep the head clean and add some machine oil to all bearing parts. Should you have an accident or crash the helicopter, check all parts and replace those that are obviously broken, and those that you are in doubt about. When reassembling the rotor head, use a little lock tite (Glue) on all screws. If the stabilizer bar is bent, you will not be able to pull it away from the see-saw bearings. In Such case, do not pull the bar by force, reform the bend or cut the bar.

BLACK HEAD SB CONSTRUCTION DRAWING



EXAMPLE OF ROTOR HEAD LINKAGES

These illustrations show the linkage between the stabilizer system rotor head and the swash plate with pitch control ring or scissors arm. In other cases, the linkage is the same way.



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