

**SECTION/OPERATION**

**25**

**RIGGING**

Review all prints and follow all details of this section thoroughly. Although many details may repeat previous instructions given throughout this manual, we feel that this is absolutely necessary to stress the importance of the rigging procedures.

**ROTORWAY**

TOOLS REQUIRED FOR OPERATION 25:

Adjustable wrench 10"  
Allen wrench  
Drift punch  
Level  
Mallet  
Pliers  
Protractor level  
Ratchet with sockets of the following sizes: 1/4"  
5/16"  
3/8"  
7/16"  
1/2"  
9/16"  
11/16"  
3/4"  
7/8"

Spring Scale  
Tape Measure  
Torque wrench  
Wrenches of the following sizes: 1/4"  
5/16"  
3/8"  
7/16"  
1/2"  
9/16"  
11/16"  
3/4"  
7/8"

RIGGING: TAIL BOOM  
E09-2000

The purpose of the tail boom is to hold the trim fins and the tail rotor in the desired location. If the trim fins and tail rotor are not in the proper location and set at the correct angle, the helicopter will not respond correctly in flight. To have the best stability, the following angles and distances must be correct:

1. The angle of the top of the tail boom should be 2-1/2 degrees more than the angle of the square drive tubes in the airframe.
2. The horizontal trim fin chord line should be parallel with the top of the tail boom.
3. The vertical trim fin chord line should align 15"-16" to the pilot side from the center of the main shaft.

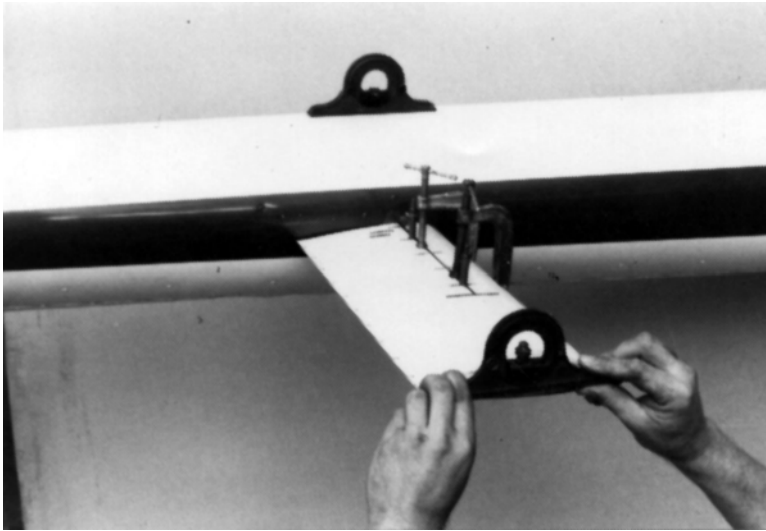


Photo #1

Place the protractor level on the top of the tail boom and center the bubble. Place the protractor on the chord line of the airfoil and the bubble should center.



Photo #2

Tape a piece of welding rod on the front and rear of the vertical trim fin air foil, extending above the fin about 1".

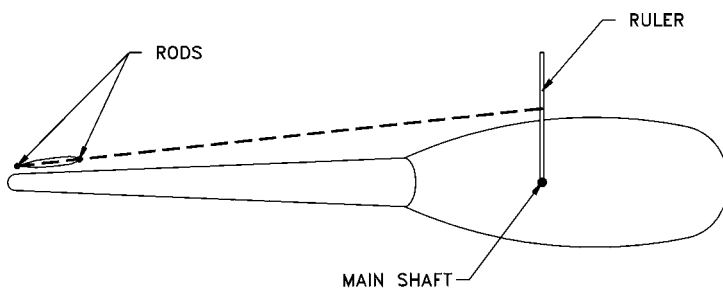


Photo #3

Sight across the welding rods. They should align 15-1/2" to the pilot side of the main shaft.

RIGGING: CYCLIC CONTROL  
E14-2000

The purpose of the cyclic control is to maintain the balance of the helicopter when it is in the air by tipping the swash plate. If the angles are not within the specified range of travel, the sensitivity of the control will be affected, possibly to the extent of being unable to control the helicopter. The angles that will give the pilot the best control throughout all maneuvers are as follows:

1. Total travel from the left to the right stops should be 52 degrees, with equal number of degrees both directions from the center.
2. Total travel from the rear to the front stop should be 52 degrees, with the rear stop set for pilot comfort.

NOTE: The cyclic control must tip the swash plate to the correct angle in reference to the main shaft for proper control of the helicopter.



Photo #4

Set the protractor to read 26 degrees and place it on the side of the cyclic handle. Move the cyclic to the left until the bubble centers.



Photo #5

Adjust the stop bolt so it makes contact with the cross shaft.

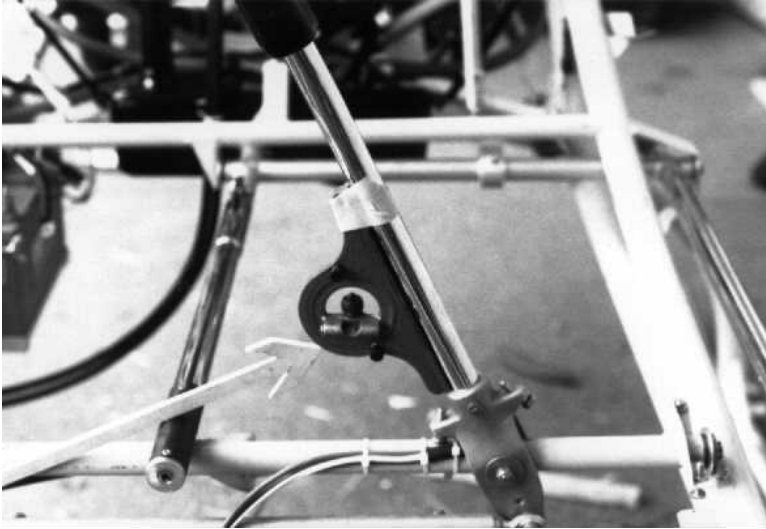


Photo #6

Set the protractor level to read 26 degrees in the other direction, leaving it in place on the side of the cyclic. Move the cyclic to the right until the bubble centers.



Photo #7

Adjust the stop bolt so it makes contact with the cross shaft.

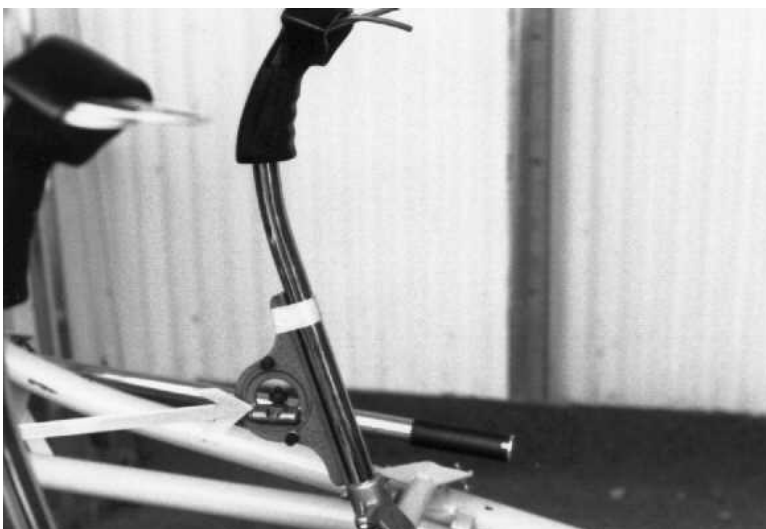


Photo #8

Set the protractor level to read 26 degrees and place it on the rear of the cyclic stick. Move the cyclic to the rear until the bubble centers.



Photo #9

When the seat is installed, there will be approximately 1-1/4" between the cyclic and the front of the seat.



Photo #10

Adjust the rear stop bolt against the stop bracket.



Photo #11

Set the protractor to read 26 degrees in the other direction and move the cyclic forward until the bubble centers.

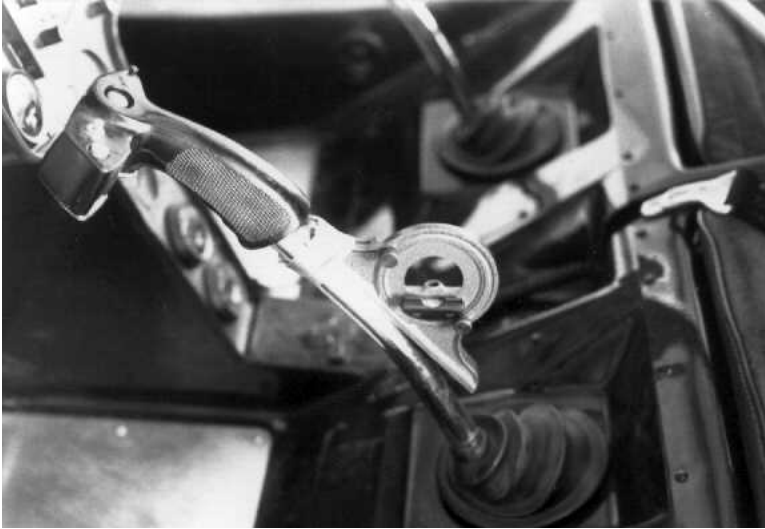


Photo #12

This will provide clearance between the cyclic and the instrument panel.

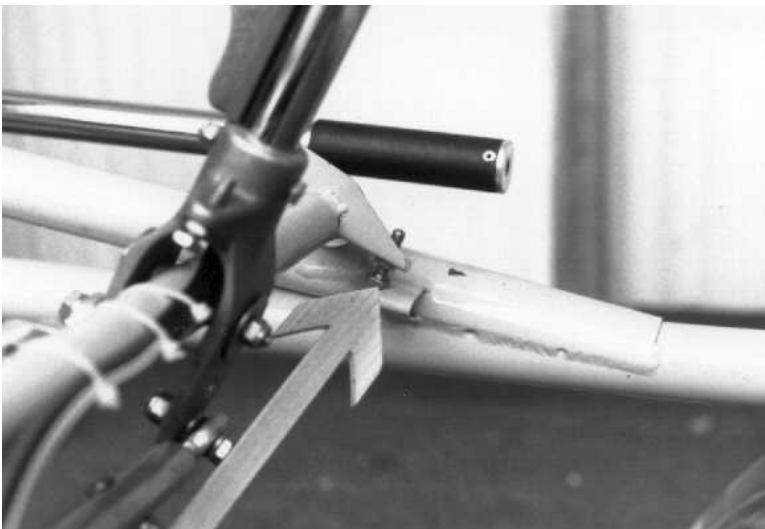


Photo #13

Adjust the forward stop bolt against the forward stop bracket.



RIGGING: COLLECTIVE CONTROL  
E15-2000

The purpose of the collective control is to control the amount of pitch on the main blades and the amount of throttle on the engine, which determines how much lift you have to work with. To obtain the best control of both items (pitch of blades and throttle), the collective control must be set up as follows:

1. The collective control must have freedom of movement throughout its full range of travel, from the bottom of the pocket in the floor pan to where it contacts the seat and airframe bracket.
2. The throttle is checked by placing the collective in the full down position and twisting the throttle from stop to stop. The throttle transfer rod should rest on the fore/aft throttle shaft at each end of travel.

With the collective in the full up position and the throttle in the full off position (top of handle inward roll), the butterfly in the carburetor should be closed.

With the collective set so that the main rotor blades are at the 4 degree positive position in reference to the rotor hub, and the throttle in the full on position (top of handle outward roll), the butterfly in the carburetor should be fully open.

NOTE: The collective must change the pitch of the main rotor blades and maintain the correct RPM of the engine while flying.



Photo #14

The collective in the full up position. The fore/aft tube should make contact with the bracket welded to the airframe and the seat at the same time. See next photo for seat stop.



Photo #15

Another view in the up position. In the down position the handle should be in the pocket.

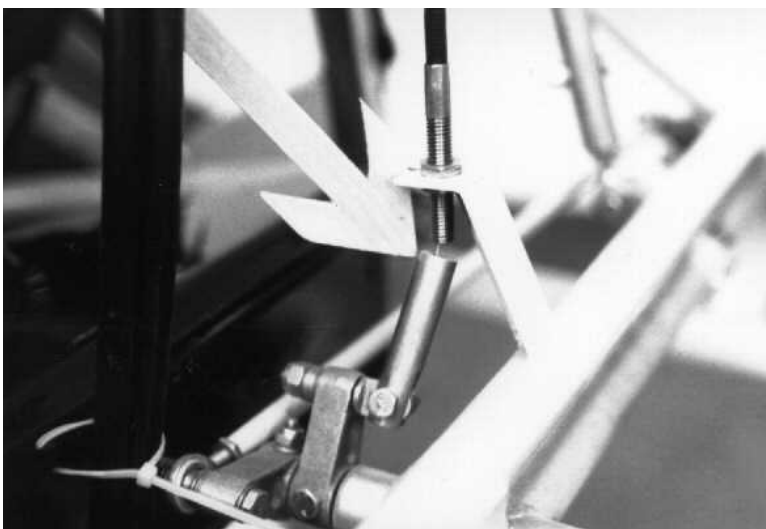


Photo #16

Collective full down and throttle off. The throttle cable should be adjusted so there is approximately 1/8" between cable housing and the aluminum barrel. The 3/16" hole in the eye bolt should be 1" to 1-1/16" from the rear of the collective cross shaft for proper correlation.

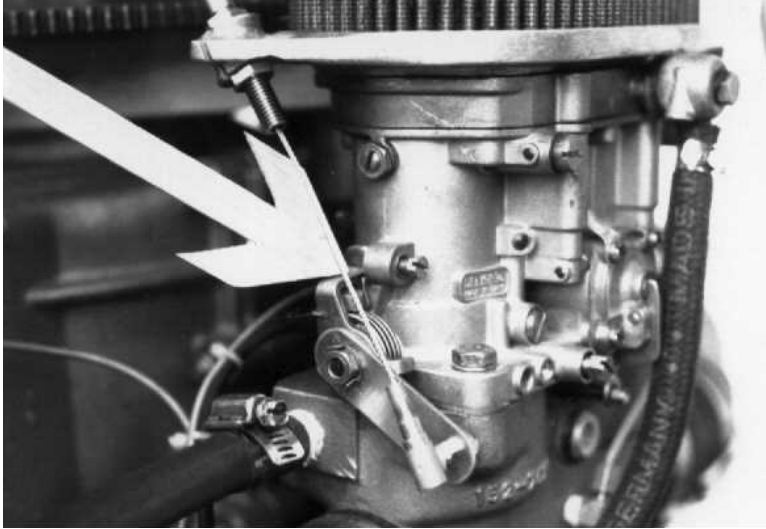


Photo #17

Collective up so the main rotor blades are a minimum of 8 degrees positive pitch with the throttle rolled to off. The butterfly in the carburetor should be on the idle stop (or only slightly off).

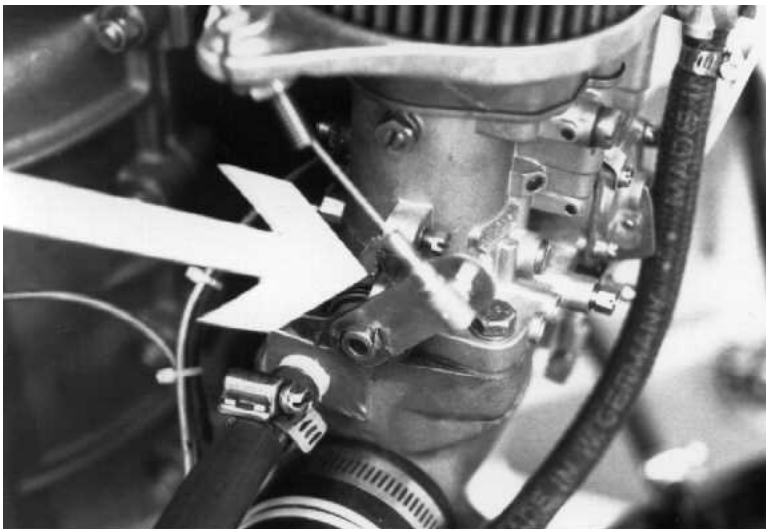


Photo #18

Collective up so the main rotor blades are at 4 degrees positive pitch with the throttle rolled to on. The butterfly in the carburetor should be on the full open stop.

RIGGING: DIRECTIONAL CONTROL  
E16-2000

The purpose of the anti-torque pedals is to control the pitch of the tail rotor blades. Changing the pitch on the tail rotor controls which way the helicopter will turn. To have enough control in all maneuvers and power settings, set the pedal travel as follows:

1. The anti-torque pedal control should have freedom of travel from stop to stop with the push/pull cable traveling 2-7/8".



Photo #19

These are the stop bolts used to set the travel of the pedals.

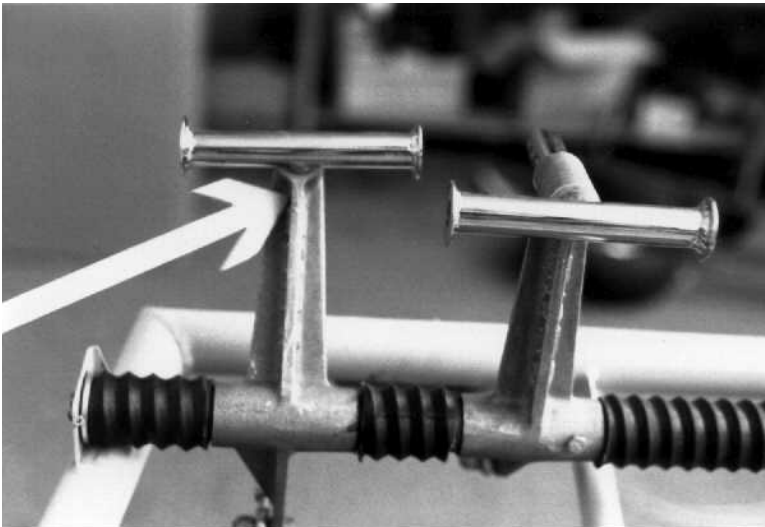


Photo #20

Push the left pedal to the stop.



Photo #21

The tail rotor directional control cable should move forward.

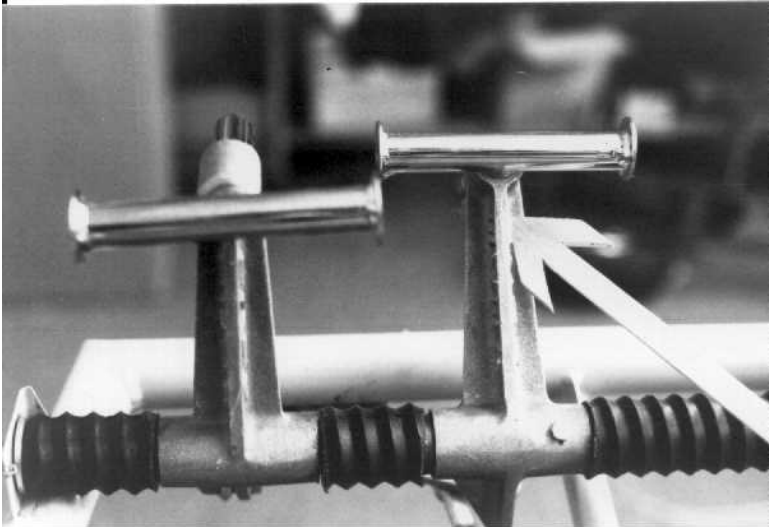


Photo #22

Push the right pedal to the stop.



Photo #23

The tail rotor directional control cable should move to the rear. The total travel of the cable should be 2-7/8".

RIGGING: TAIL ROTOR  
E17-2000

The purpose of the tail rotor is to counter the effect of torque. If the tail rotor does not work properly, the helicopter will turn as soon as it becomes light on the skids and there will be no way to stop it. Follow these steps when rigging the tail rotor:

1. The key on the tail rotor shaft should extend the same amount out of the slider at each end of travel of the pedals.

NOTE: To prevent a lock up, the key must not extend more than 5/16" out of the slider.

2. When the right pedal is against the stop, set the pitch on the tail rotor at 24 degrees positive pitch with the barrel 90 degrees to the shaft.
3. When the left pedal is against the stop, set the pitch on the tail rotor at 8 degrees negative pitch with the barrel 90 degrees to the shaft.
4. The rod end on the pitch horns should be centered over the 3/8" bolt holding the barrel to the shaft.
5. The ratio between the tail rotor and main rotor blades is 5 revolutions of the tail rotor to 1 revolution of the main rotor.



Photo #24

The rod end on the pitch horn must be centered over the 3/8" bolt that holds the barrel to the shaft. Use washers if necessary to achieve this alignment. If more than 4 washers are required to position these rod ends, contact RotorWay.

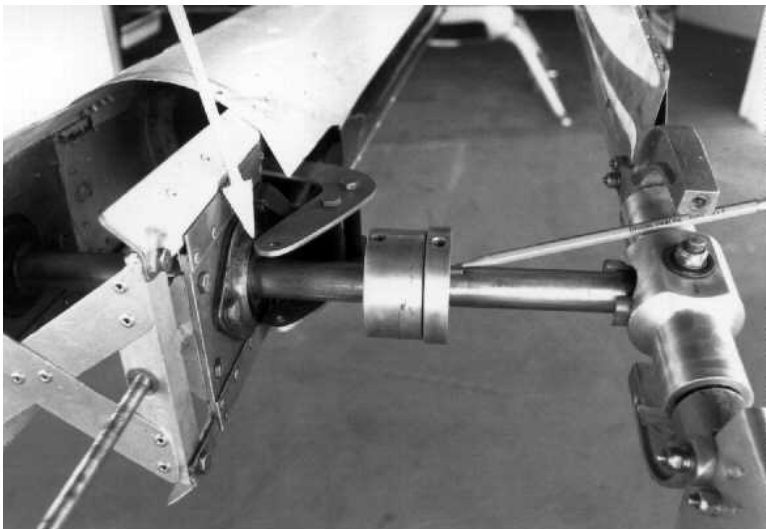


Photo #25

The key must not extend out of the slider more than half of its length (5/16").

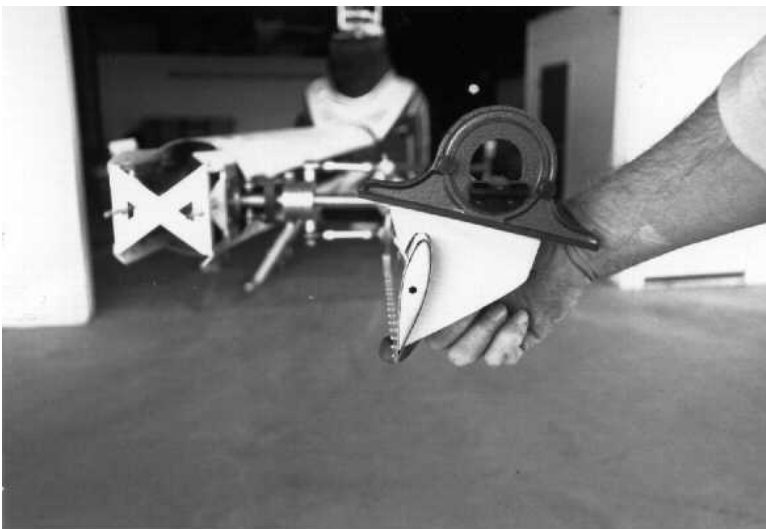


Photo #26

When the left pedal is against the stop, the tail rotor should have an 8 degree negative pitch. Use the tail rotor template and protractor level when setting the pitch.



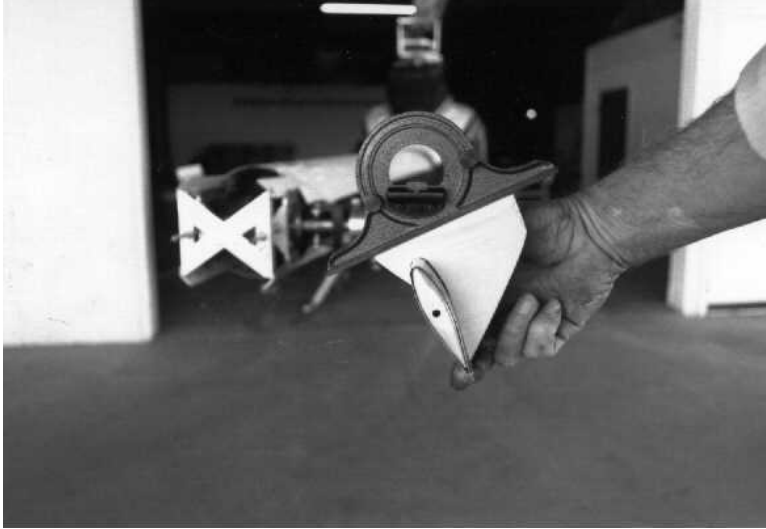


Photo #27

When the right pedal is against the stop, the tail rotor should have a 24 degree positive pitch. Use the tail rotor template and protractor level when setting the pitch.