

[450 Helicopter]



Step by step pictorial guide

to help you assemble a 450 helicopter
featuring the plastic 450 kit.

133 pictures

By old4570

Chapter 1
ToolsPage 3,4

Chapter 2
Assembling the 450
Skids and frame bottomPage 5

Chapter 3
Tail AssemblyPage 10

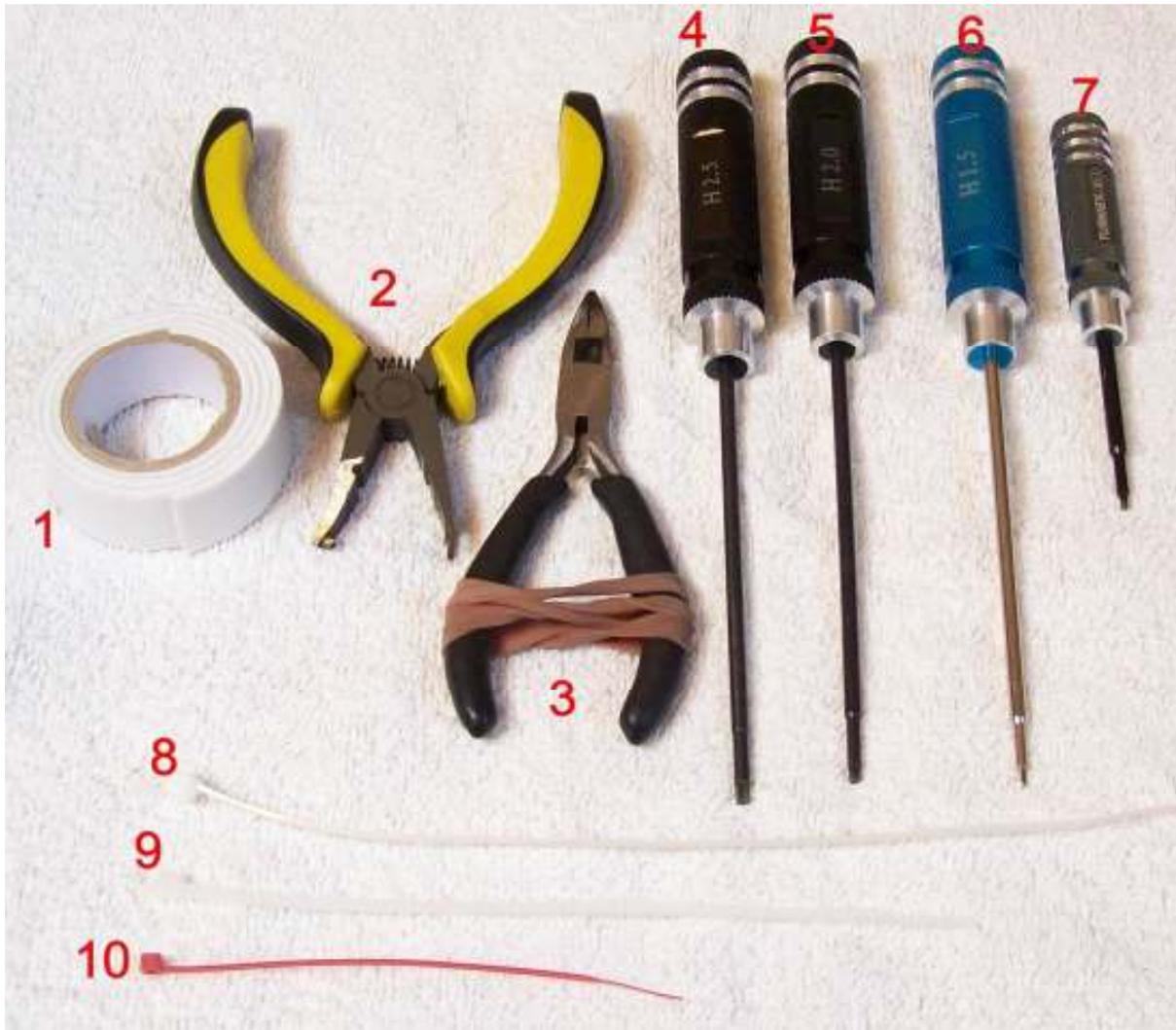
Chapter 4
Setting up the rotor headPage 20

Chapter 5
Installing Everything
MotorPage 44
Servo'sPage 46
GyroPage 52
ReceiverPage 55
EscPage 60

Chapter 6
Connecting everythingPage 63
Leveling the swash platePage 65
Flybar paddlesPage 68
Tail rotor bladesPage 69
GyroPage 70
Setting up the tailPage 71
Rotor BladesPage 72
Helicopter BalancePage 74
Flight trimmingPage 75

Chapter 1

Tools you will need .



1. Double sided Foam tape
2. Ball Link Pliers
3. Pliers
4. 2.5mm Hex driver
5. 2mm Hex driver
6. 1.5mm Hex driver
7. 1.5mm Hex driver
8. 200mm Zip tie
9. 150mm Zip tie
10. 100mm Zip tie

1. Ball link pliers .

You really need a pair of these if your going to fly 450 helicopters. They make working on a 450 so much easier and assist you in doing more work and less damage . Seriously, you need a pair .

2. Double sided foam tape .

Another must have item , invaluable for mounting ESC's , Gyro's , and even receivers . I also use it for holding the battery in place in combination with the battery strap .

3. Hex drivers .

Again , must have , you really want 1.5mm to 2.5mm hex drivers .

Now a good hex driver [especially in 1.5mm] is invaluable. You can't live without them . A lot of folks have issue with the 1.5mm hex drivers and screws. Most complaints related to hardness or toughness of the metal , be it either too soft a hex driver or screw .

Personally I have found the issue to be undersized hex drivers , with most screws being very close to size . Even if you did come across an oversized screw the problem would be made only worse if using a undersized hex driver . If you have a local supplier , ask them to measure them so you can actually get a true 1.5mm hex driver .

The larger sizes [2mm and up] hex driver size does not seem to be an issue, but with 1.5mm it seems to be almost epidemic. Find a true 1.5mm driver, it will make building / repairing 450 helicopters a lot less frustrating .

4. Pliers

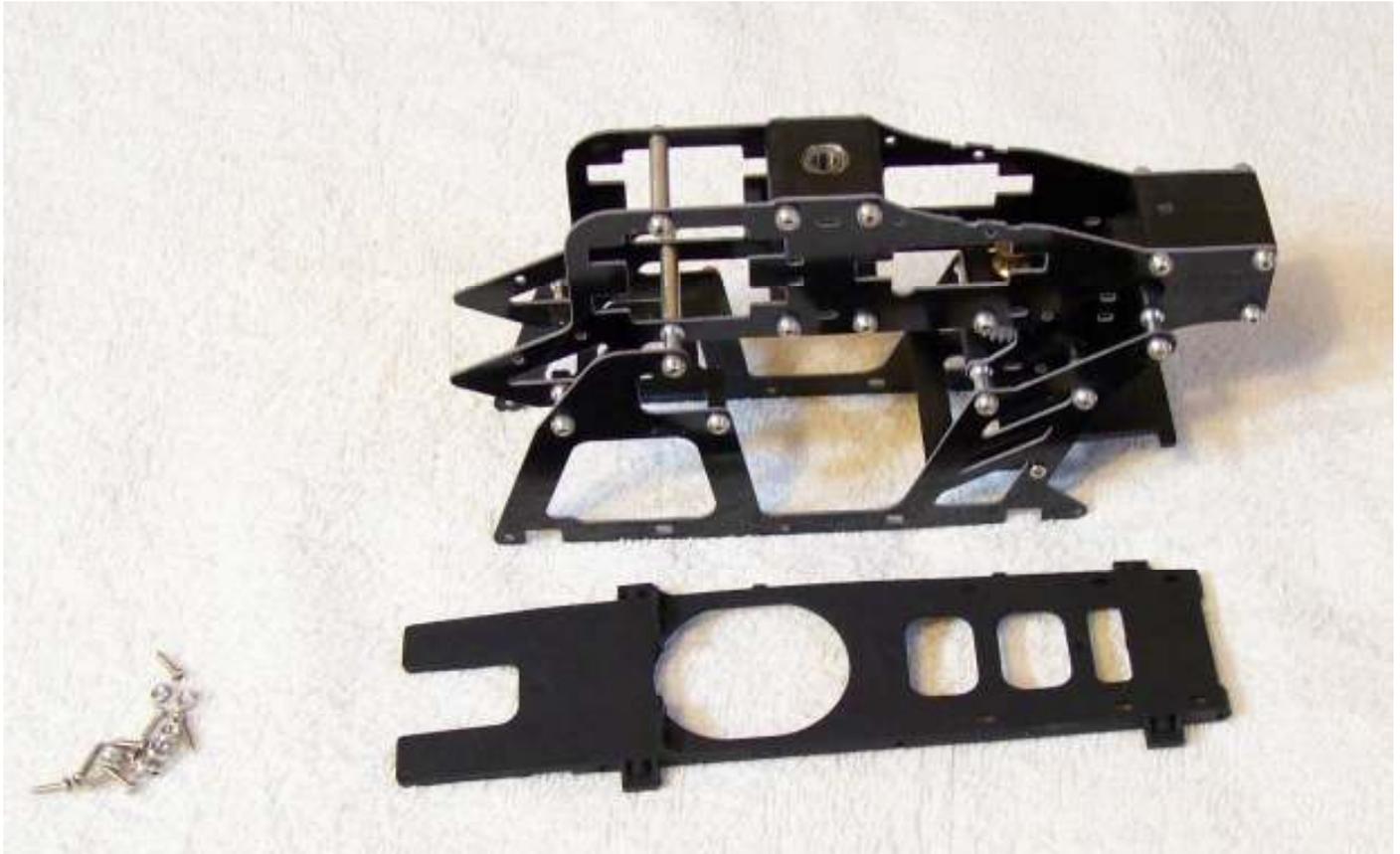
You really want a nice pair of pliers. You will notice in the picture I have a rubber band holding mine closed, this makes the pliers so much easier to use. Also it enables me to use them as a mini vice when soldering or removing parts etc .

It will become self evident as we progress into thread locking the head how handy the pliers are .

5. Zip Ties

You want some assorted sizes to tie down leads to attach or hold your ESC or receiver and maybe your training gear . The sizes I use most are 100mm and 150mm with 200mm seeing some use .

Chapter 2
Assembling the 450
Skids and frame bottom.



This is where I like to begin, installing the base to the frame .

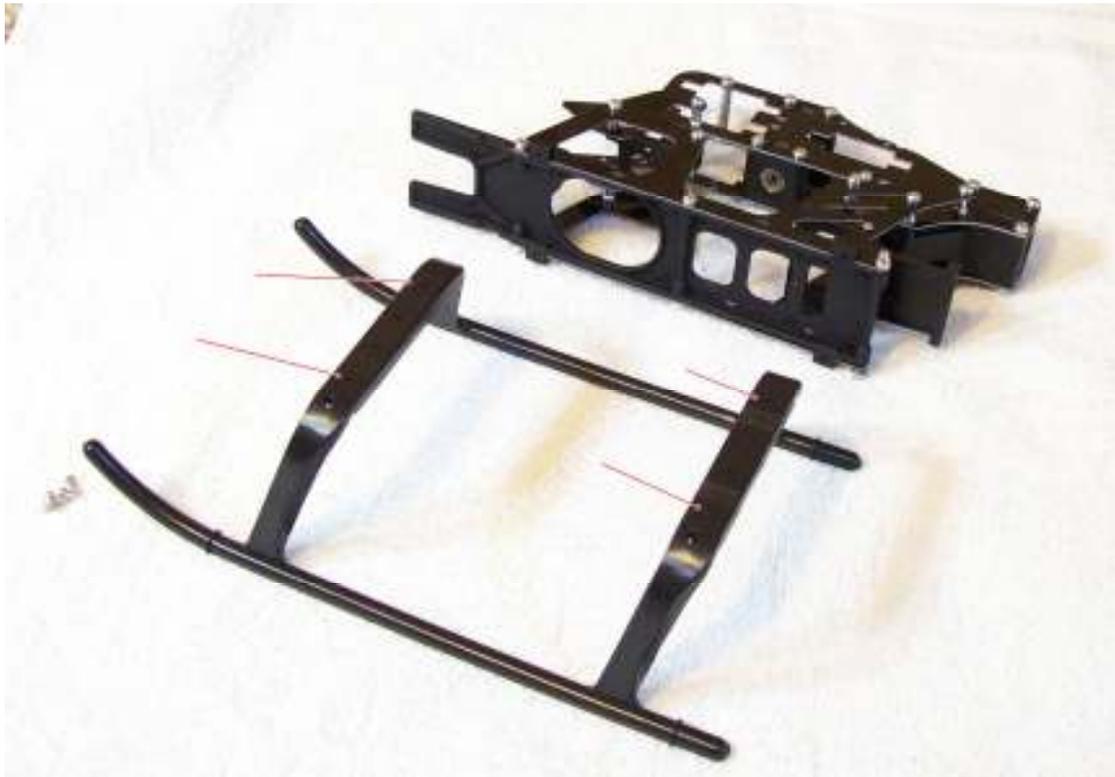


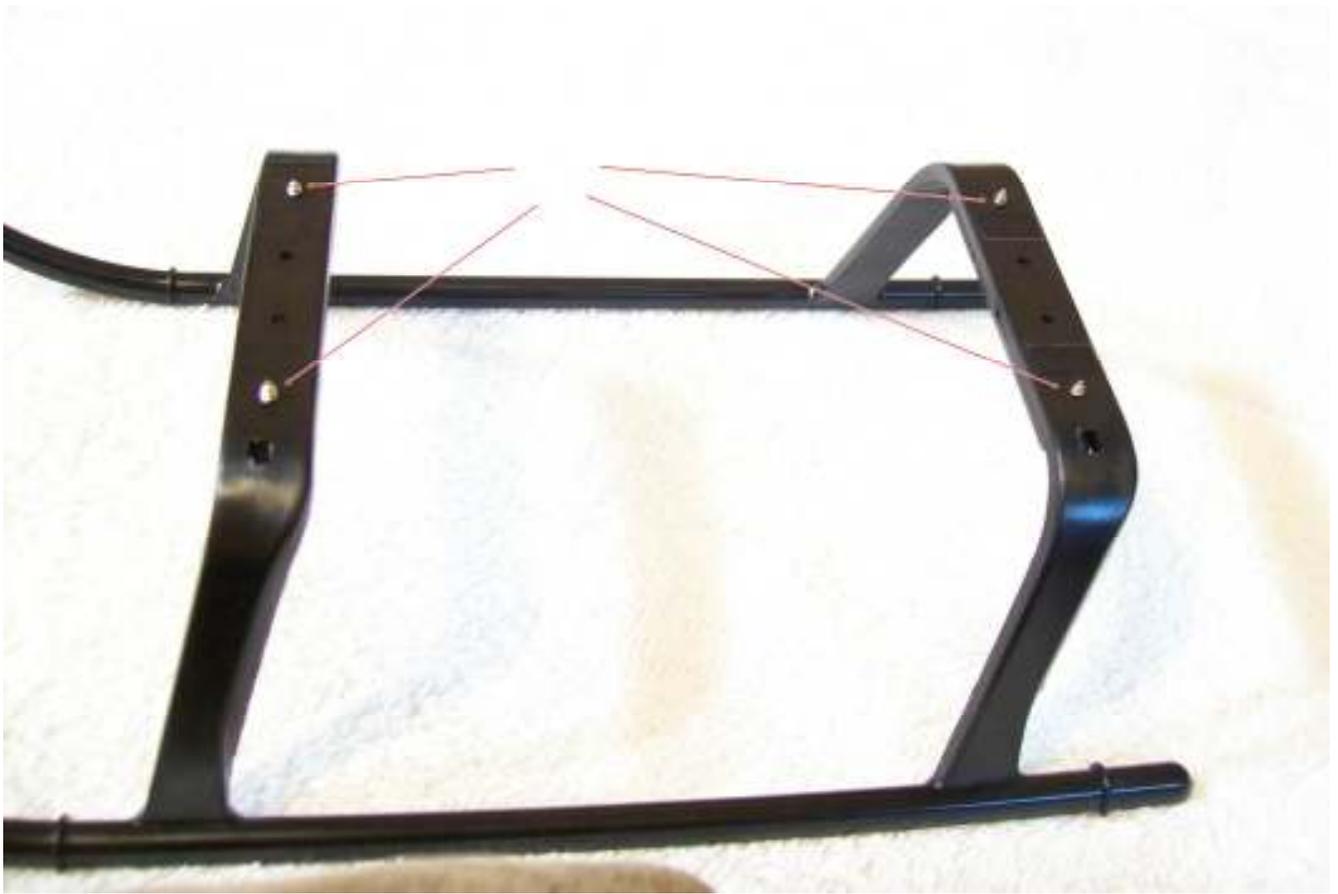
I test fit the base first and then add the screws.

In the frame kit there are the normal sized screws, as well as two screws a little longer than the others . (pictured) I like to use these to screw in the tail boom struts as the extra length comes in handy .



Once you get to this point it's time to add the skids to the frame. I like to put in the screws so they just protrude a little out of the other end. This way I can test fit the skids and see how the screws align with the holes in the base . If there not a good match its much easier to drill out the holes in the skids a little , so that the screws will match the holes in the base .





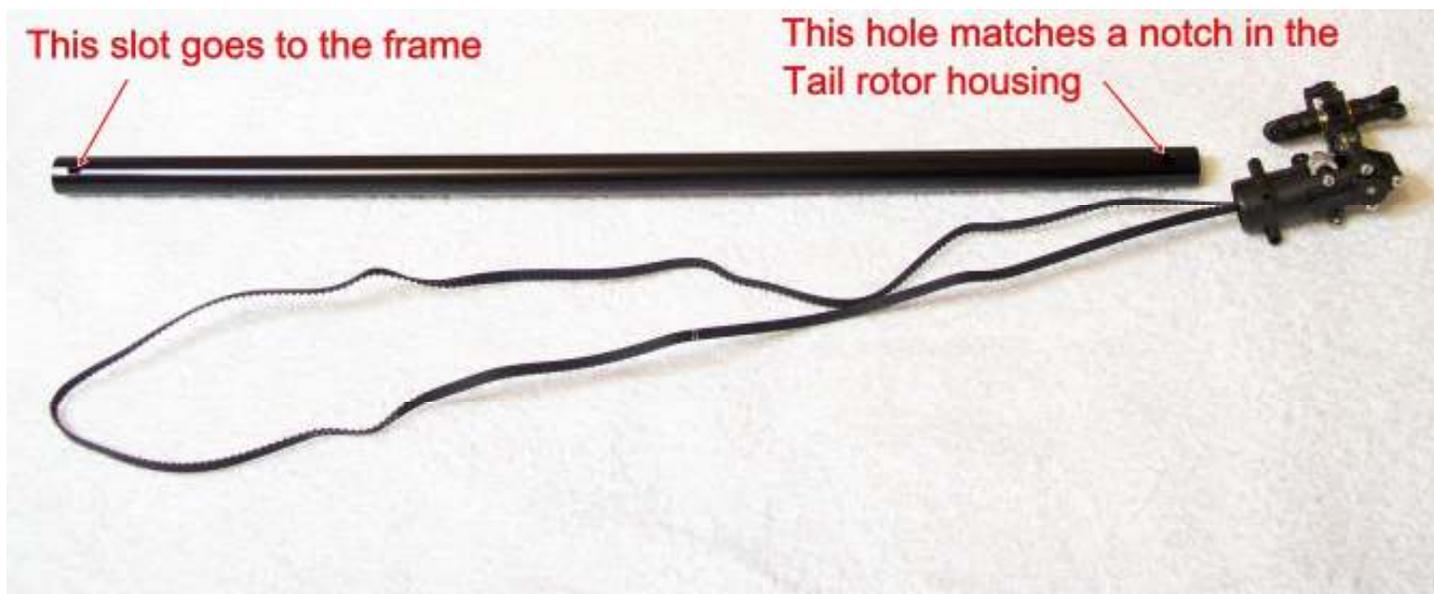


Once you have the holes in the skids matching the holes in the base of the body , you can screw the skids to the base . Next we move onto tail assembly .



Tail Assembly

I like to start by installing the tail rotor to the tail boom. Then test fitting it to the body to make sure everything is ok .

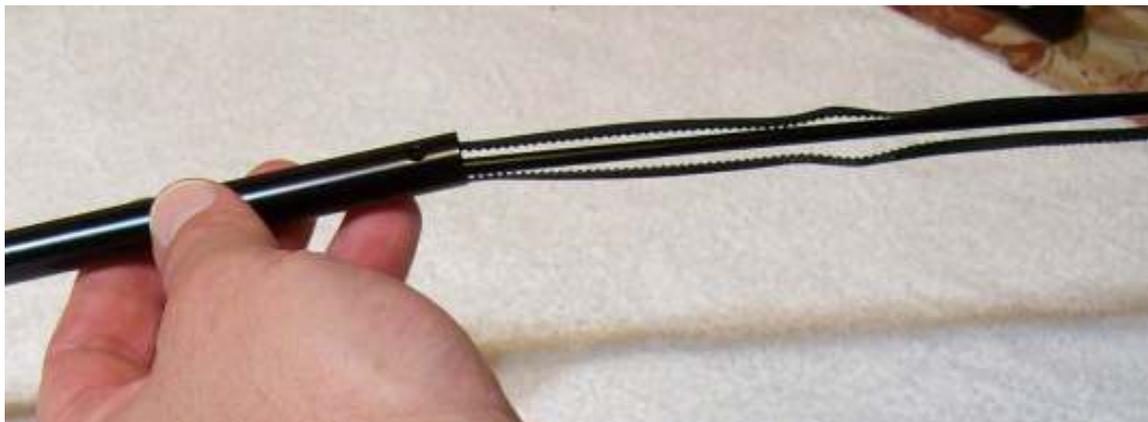




As can be seen in the picture, there is a locator built into the tail housing. This fits the hole in the tail boom. The slot in the tail boom goes into the tail boom mount in the body and it also has a locator for the slot.

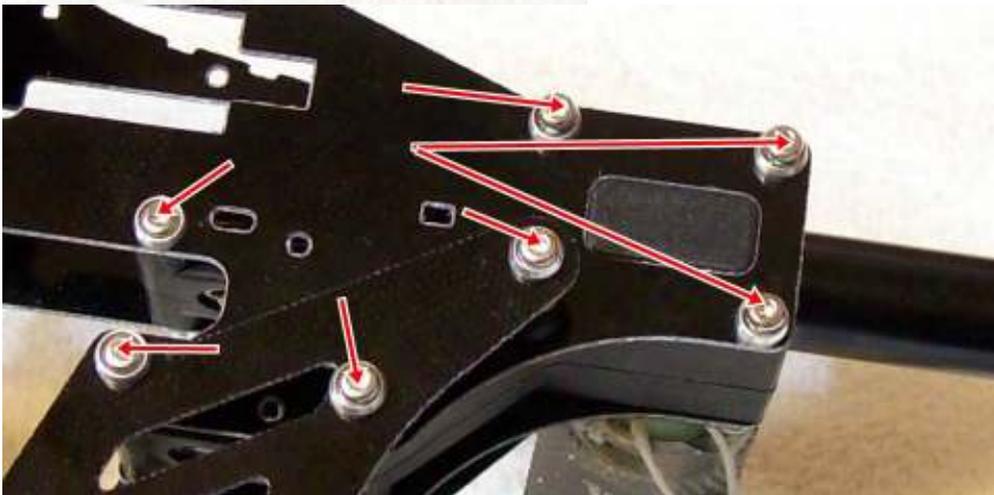


One of the more interesting tasks is getting the belt through the tail boom. I just use a rod that's not going to damage the belt to push it through the boom. Then fit the tail rotor housing correctly to the tail boom, making sure the locator fits into the hole in the tail boom.

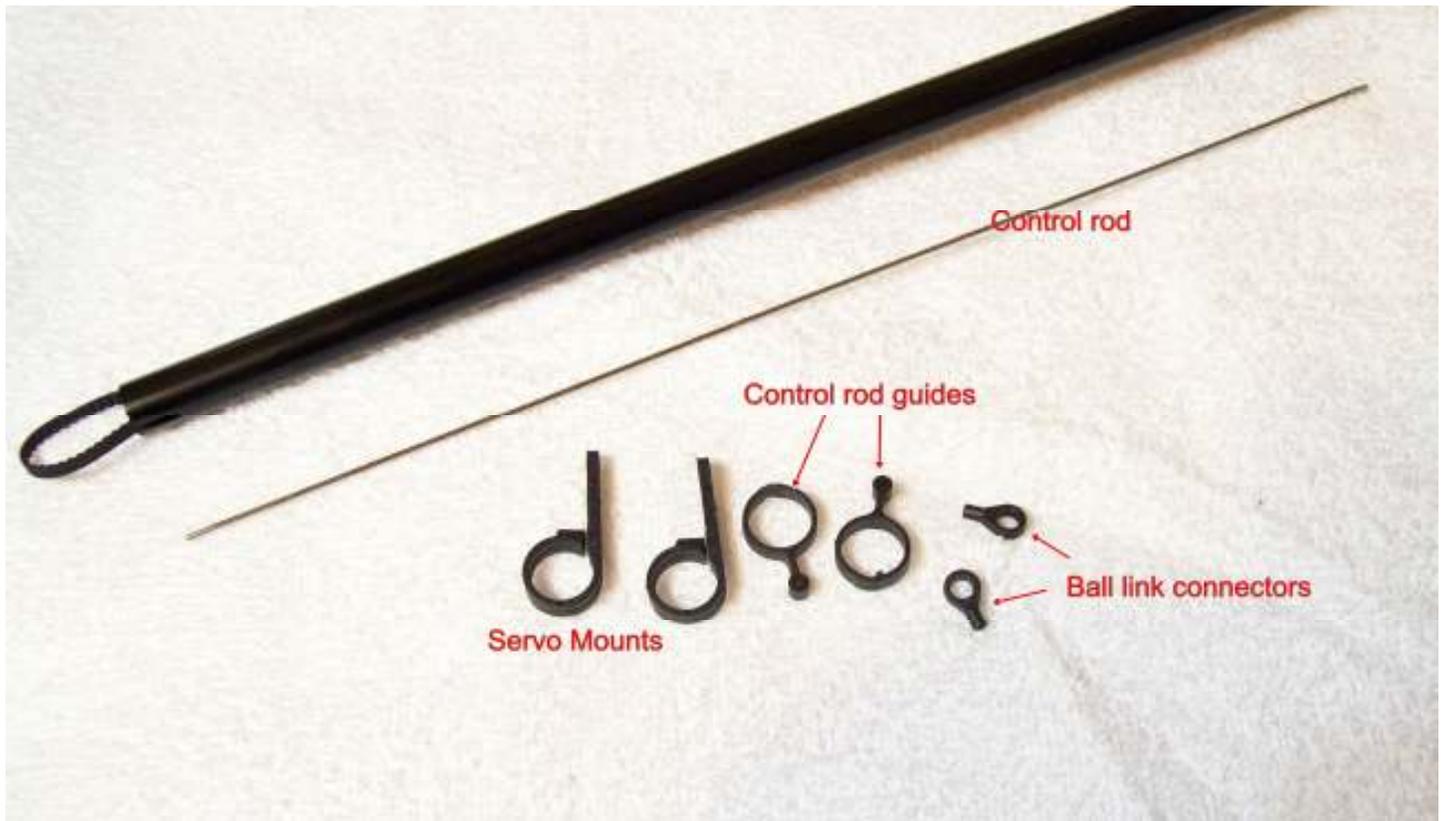




Once the belt has been threaded through the tail boom I use a flashlight to align it straight. Make sure it does not cross over itself when looped over the tail rotor drive pinion. We have to loosen some screws in the tail boom mounting block before inserting the boom.



Loosen these 7 screws (both sides) and gently pull the mounting block apart. Then slide in the tail boom with the slot in the 9 O'clock position to match the notch in the tail boom block. Once the tail boom is in place we need to keep in mind a few things. The direction of the tail gear box pinion and the direction the tail rotor needs to spin .. Both spin anti clock wise .



After test fitting the tail to the body I remove it and then fit the Control rod Guides. Then screw on one Ball Link connector to the control rod .



Now thread the control rod through the guides. Proceed to see which side of the ball link connector fits the ball link in the tail rotor best .



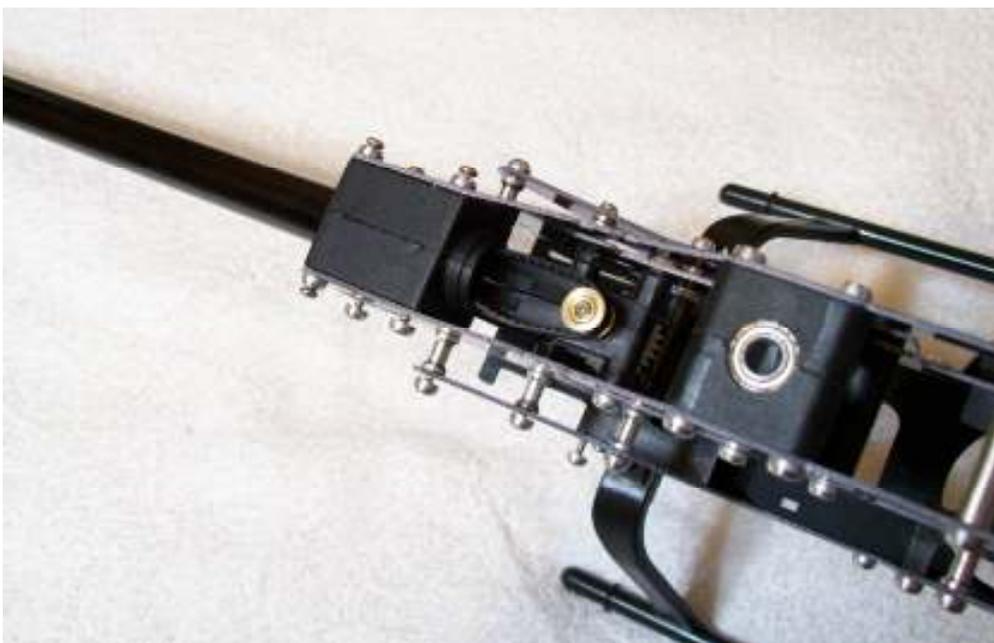
As can be seen in picture of the tail rotor ball link, one side of the connector fits best [deeper]. Just find the best supported location for the control arm ball link and push the connector down gently till it snaps in place .

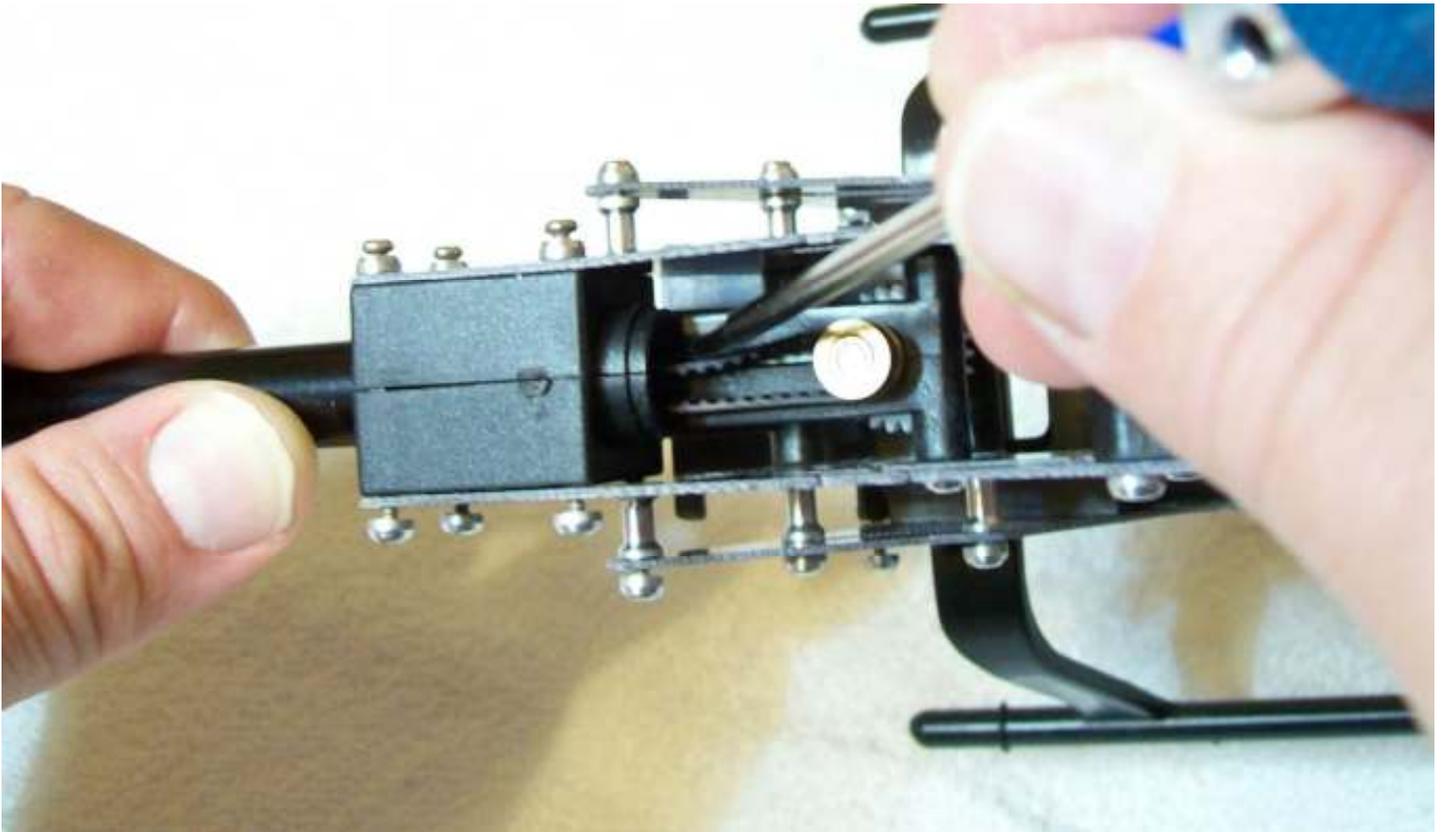


Here you can see the connector sitting in place on the ball link . Now is a good time to check for slop or binding . What you want is a nice fitting connector , not lose and not binding .



Once you are happy with the fit of the control rod , fit the tail boom servo mounts. Now your ready to install the tail back into the body of the helicopter.



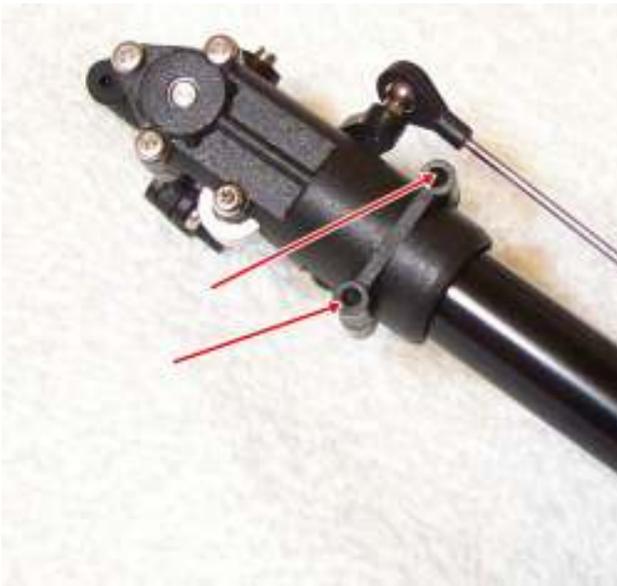


Now check that you haven't crossed the belt over and that the tail rotor is spinning in the right direction, anti clockwise. I like to use a flashlight , just shine it on the tail rotor housing , and there is enough light to see down the boom. We now need to set the belt tension. If too tight it will cause excessive drag and wear, too loose and the belt might slip. I personally set the belt tension so that when you put relatively light pressure on the belt it only deflects 50% or half way to the other side . Knowing exactly how much tension to use is trial and error, but 50% is a good place to start . Now you can tighten the tail mounting block screws .



Next we put on the tail fins. There will be 3 or 4 different screws in the tail pack, the very long ones are for the vertical tail fin.

Pictured are 3 screws, the one on the far left is only threaded part way . Put these somewhere safe as they are for the tail rotor blades .



Installing the vertical tail boom is relatively easy and should offer no real challenge .

At this stage we are close to completing the tail end of the helicopter .

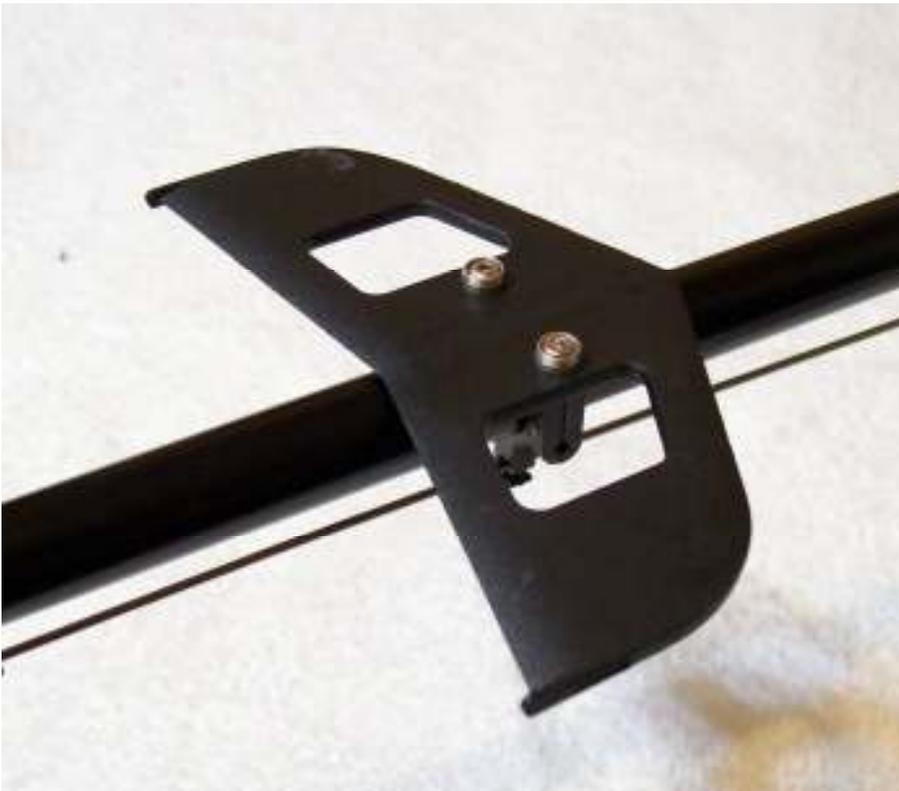




Next we are going to install the horizontal fin to the tail boom .

I like to put the tail boom tail brace mount first on the tail boom. Then fit a (single) screw to the horizontal fin and screw it in place. Then put in the second screw .

Don't over tighten as we need to position the horizontal fin to match the length of the tail boom braces.





This is why we use the slightly longer screws. The braces will add a little length and shorter screw may not offer a strong hold .

When installing the tail boom braces try to make sure you install them so that they angle towards the tail boom mount. The mounting pads are some-what offset to achieve this, so as to lower any tension at the mounting points [screws]





Once the tail boom braces are in place and aligned correctly. Tighten the screws and try to keep the horizontal fin at 90deg to the vertical fin or horizontally true .

Assembly of the tail section of the helicopter is now complete. Now we move onto the important task of setting up the rotor head .

