Applies To

Control Bar Elbows – All gliders with AT hardware (1989 and later models)

Introduction

Wills Wing gliders using "AT" hardware utilize a machined aluminum "elbow" that connects the control bar top end fitting to the keel bracket or apex slider. There are two different types of elbows – one is used with round downtubes and the other is used with streamlined downtubes.

The original part numbers and descriptions for these parts are:

ID	Description
20G-1701	CBAR ELBOW AT TOP ROUND
20G-1711	CBAR ELBOW AT TOP STREAM

The part numbers and descriptions for the new replacement parts are:

ID	Description	Specification
20G-1703	CBAR ELBOW AT TOP ROUND	REV B
	REPLACES -1701, HARD ANODIZED, NO BUSHING - Changeover made in July 2002	
20G-1712	CBAR ELBOW AT TOP STRM	REV B
	REPLACES -1711, RECTANGULAR RECESS, NO BUSHING - Changeover made in April 2002	

Additional Parts Required

For 20G-1703 CBAR ELBOW AT TOP ROUND REV B:

None.

For 20G-1712 CBAR ELBOW AT TOP STRM REV B:

Qty	ID	Description
1	10A-3251	BOLT AN5-25A (For Keel Bracket Applications) or,
1	10A-3172	BOLT AN5-17A GROUND & SLOTTED (For Apex slider applications)
1	10N-1250	LOCKNUT LOWPRO 5/16 AN364-5

Tools Required

For 20G-1703 CBAR ELBOW AT TOP ROUND REV B:

Large tip Phillips screwdriver, 5/16" wrench.

For 20G-1712 CBAR ELBOW AT TOP STRM REV B:

Large tip Phillips screwdriver, 5/16" wrench, large blade, flat blade screwdriver, 3/8" socket wrench.

Procedures

For 20G-1703 CBAR ELBOW AT TOP ROUND REV B:

No special procedures are required to remove old parts. When installing new parts, discard the bushings that fit inside the old elbows – they are not used with the new elbows. Retain the plastic washers, and use those in the same locations in the new installation.

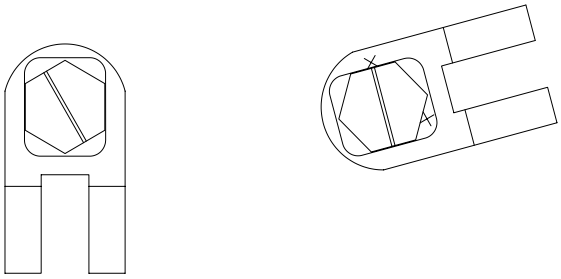
For 20G-1712 CBAR ELBOW AT TOP STRM REV B:

No special procedures are required to remove old parts. When installing new parts, discard the bushings that fit inside the old elbows, and the 5/16 clinch nut – they are not used with the new elbows. Retain the plastic washers, and use those in the same locations in the new installation.

To install the new elbows follow the procedure below:

1) Insert the 5/16" locknut in one elbow and the appropriate 5/16" bolt in the other so that the flats of the nut and bolt are captured by the flats on the long sides of the rectangular recesses in the elbows. After assembling the elbows onto the keel hardware, turn the elbows relative to one another to tighten the nut on the bolt until all the play is taken out of the assembly (the elbows assembly will not turn freely on the keel bracket or slider). (Note: You may find that you need additional leverage to overcome the friction of the nut on the bolt when tightening the assembly. If so, you can use any ¼" or smaller diameter screwdriver, bolt, or pin, inserted into the bolt holes in the elbows, or you can install the downtube top plugs in the elbows and use those to obtain the leverage required.)
2) After tightening the elbows until all of the play is out of the assembly, loosen the elbows just enough to allow the assembly to rotate freely relative to the bracket or slider. At this point, note the relative alignment of the elbows. In the final assembly, you want the elbows to be aligned with one another.
3) If you can align the elbows by loosening the assembly by no more than 30 degrees of rotation – then loosen the assembly to align the elbows in this manner, and skip over steps 4 and 5.
4) If it would require loosening the assembly by more than 30 degrees of rotation to align the elbows, then you must dis-assemble the elbows and rotate one elbow relative to the nut or bolt-head. It is easiest to work with the elbow on the bolt head side.

Note that there are six flats on the hex head of the bolt, allowing you to adjust the alignment of the elbow to the bolt in increments of sixty degrees. Refer to the diagram below for an example of an assembly that requires disassembly and re-alignment of the elbow relative to the bolt head in order to achieve the proper final alignment of the elbows without excessive play in the bolt.



In the illustration above, the drawing on the left shows the desired final alignment of the elbow, and the drawing on the right shows the alignment obtained after completing the assembly through step 2 above. Note that since the assembly is already adjusted as tight as it can be without binding, you can only loosen the bolt to correct the alignment. Note also that if the assembly were to be taken apart, and re-assembled so that the small X indicated on the elbow was aligned with the X indicated on the bolt head, the assembly could then be loosened by about 15 degrees rotation, and properly aligned.

5) The procedure from this point is thus to mark the bolt head and the elbow as in the example above, to indicate the relative alignment to be set during re-assembly in order to achieve the proper final alignment of the elbows without excessive play in the bolt. Then, take the assembly apart, re-assemble it as indicated by the marks you made, and tighten until the bolt and nut are snug, and then loosen until the elbows are properly aligned with each other. If done properly, your final adjustment should not require you to loosen the assembly by more than 30 degrees rotation.
6) Finally, install the downtube plugs onto the elbows.