

Dave Morris' Dragonfly Hoop Gear Modification



My installation of Cleveland brakes and wheels on the hoop gear.



Photo of hoop gear leg attachment using bolts

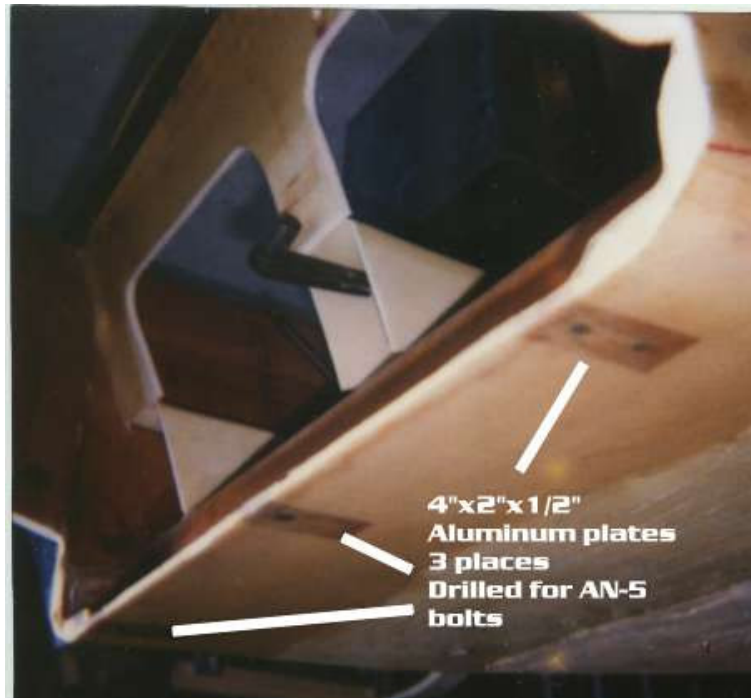


Photo of hoop gear leg attachment using bolts

Figure 10-44. Cantilever Spring Gear Attachment

The clamp has to be designed to accommodate this shape. Forward and rearward loads on the wheel are reacted by the bearing surfaces of the clamps as shown in Figure 10-45. A 500 pound drag load on the wheel results in 2375 pounds reaction on the clamp. A second set of clamps shown in Figure 10-45(b) is required to react the torsional moment ($M_T = 12,500$ in. x lb.), resulting in high bearing loads between the edges of the leaf-spring and these clamps.

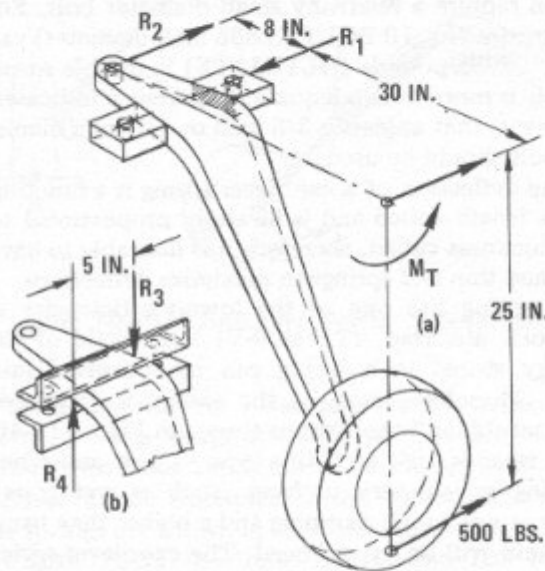


Figure 10-45. Loads on Clamps

$$M_T = 500 \text{ lb.} \times 25 \text{ in.} = 12,500 \text{ in.} \times \text{lb.}$$

$$R_1 = \frac{500 \text{ lb.} \times (30 + 8)}{8} = 2375 \text{ lb}$$

$$R_2 = \frac{500 \text{ lb.} \times 30}{8} = 1875 \text{ lb.}$$

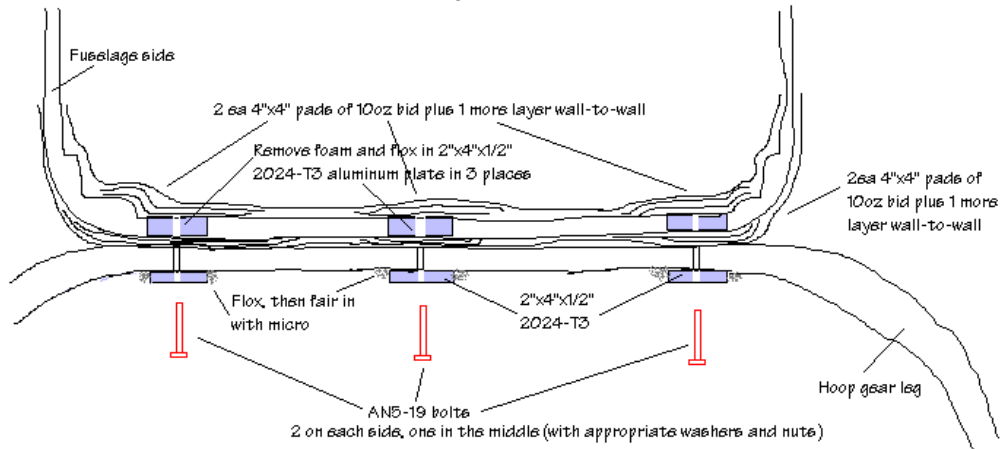
$$+R_3 = -R_4 = \frac{12,500 \text{ in.} \times \text{lb.}}{5 \text{ in.}} = 2,500 \text{ lb.}$$

This load can cause surface cracking and chafing of the leaf spring, especially if it is made of glass or carbon fibers which do not have high bearing allowables. Because of the high loads associated with the fixity of this gear to the structure, and the oscillating nature of the loads, the clamp must provide a tight, secure and chatter-free attachment.

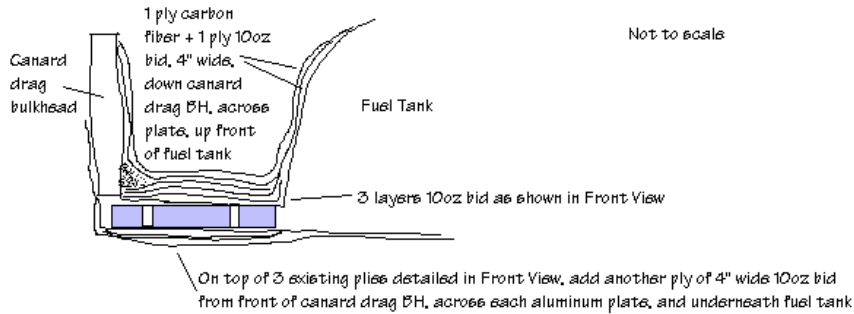
Calculating loads on hoop style gear

HOOP GEAR BOLT-ON ATTACHMENT - FRONT VIEW

Dave Morris - 30 Dec 2000 - Untested - Use at your own risk!



SIDE VIEW



My hoop gear attachment diagrams. Note that this has not been tested and should only be used at your own risk. However, after studying "Landing Gear Design for Light Aircraft" by Pazmany, and doing the computations on page 151, I do consider this a sturdy enough design to risk my butt on it.