COMANCHE GEAR

10340 Regent Circle ∞ Naples, FL 34109
Phone & fax 239/593-6944 ∞ Cell 239/404-7524

Main landing gear strut housing cracks

The crack addressed here is from the 3/16" hole to the edge of the web, see page 3. That crack can eventually propagate to the housing oleo section and which will lead to the loss of hydraulic fluid and subsequent oleo collapse. And guess what? If that doesn't happen in your hangar you are stranded, not good; read on.

The early housing designs were changed by Piper with an improved version, however those parts are rare and currently no longer available from Piper. See page 5.

If you have a cracked housing you are left with locating a serviceable part, or expensive repairs to yours. If yours is not cracked this preventative maintenance suggestion may be a big help if you implement it. Please take the time to do this yourself or have someone who understands the issues and have it done correctly.

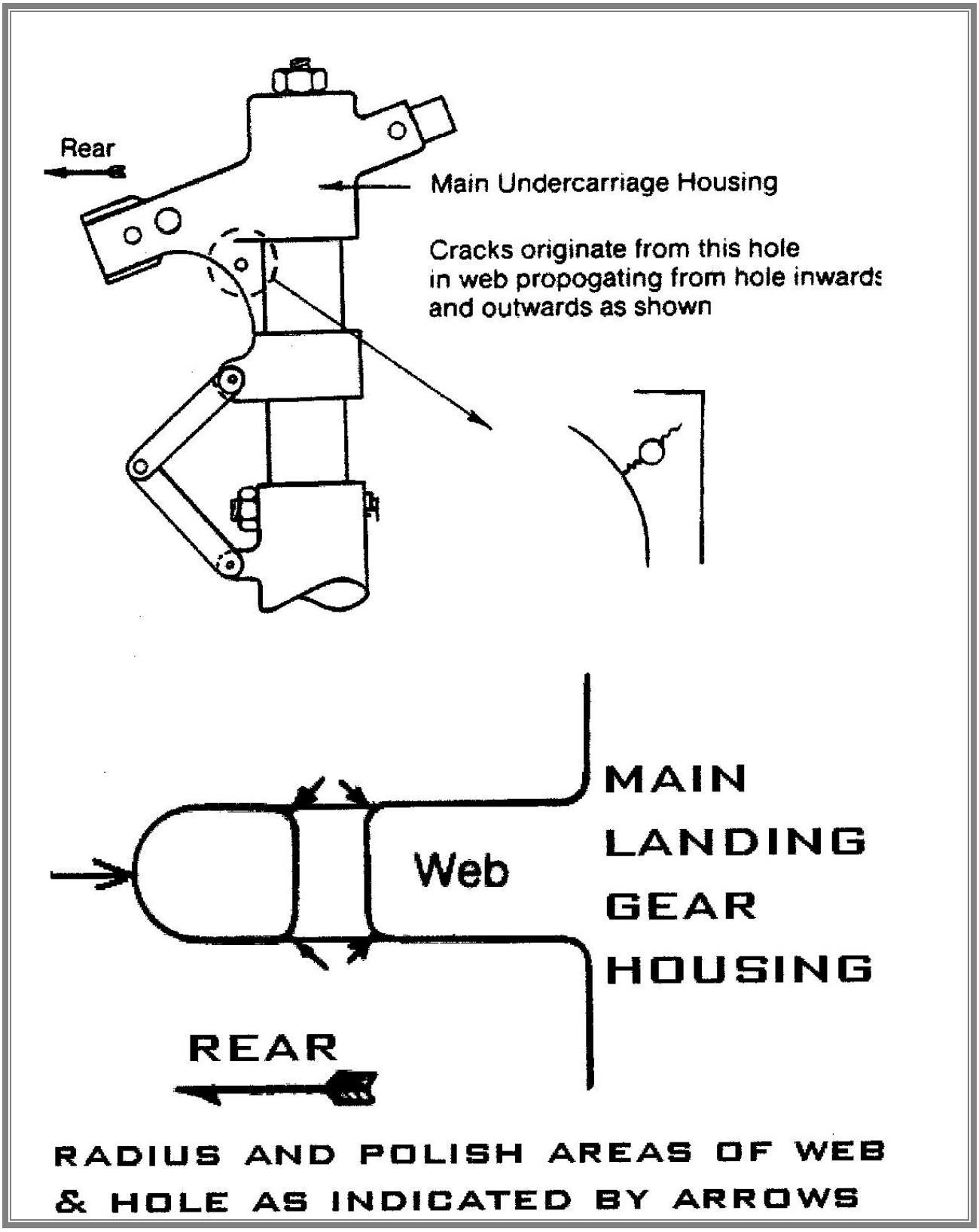
Here is the method. This has been covered in the ICS Tips previously; I have revived it and attempted to make more Comanche owners and service persons aware.

Lightly chamfer both sides of the 3/16" hole with a 45° tool which is used specifically for this purpose, no chattering; then polish the edges of the 3/16 hole with an abrasive impregnated polishing tool in a Dremel-type tool. For the web area near the hole use a 120 grit 3" diameter sanding drum [flapper-type sanding wheel is OK too] and finish on a 7" Scotch-Brite® wheel; portable equipment and a smaller Scotch-Brite® wheel is likewise acceptable. The tooling I reference is available at McMaster-Carr, or send the housings to me; it's easy when you have the right stuff to do it. After you've finished the above, redo the Alodine® conversion coating, that's the gold-colored treatment seen on the originals and the photos below. The reason for the Alodine® is corrosion prevention and paint adhesion. The steel clamp you removed to gain access should also be treated properly; don't reinstall a rusty component back onto the strut housing with the old nasty hardware and merrily go your way. You need to think really long term when doing this. I prefer to have the steel components cadmium plated; I know that sounds like a pain; most propeller shops should have that capability. Plan ahead and do it. Install the components with new hardware. If you have corrosion under the clamp or elsewhere on the housing, it should be removed. Disassemble the strut, use paint remover [if possible save the advisement placards], and then glass bead blast to remove the corrosion. Again I know this sounds like a pain; it's the proper procedure. Refinish with epoxy zinc chromate or other epoxy primer [paint won't adhere well without the Alodine® so don't try it without - you'll be sorry! Then apply your choice of top coat color. Please don't use aerosol cans; I fear the longevity just isn't in that method. If you've decided to go this route, then plan for catalyzed finishes too. Now you have a strut housing that you won't have to worry about, looks good again, and you can be the envy of the next hangar BS session.

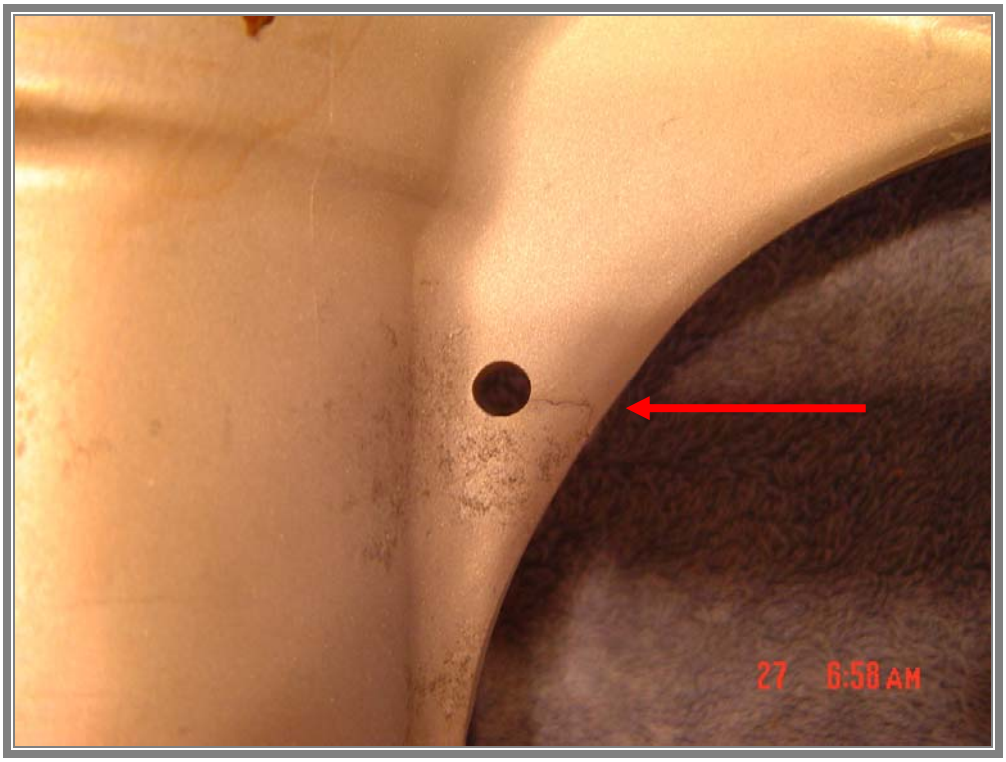
Let me know if I can help further, such as specifics for the tooling or performing the operations except the painting – way too much trouble. The pictorial below is from the ICS "TIPS". The photos following are suggestions and results.

So what causes the crack? The reduced diameter section of the strut housing is weaker than the larger diameter section. A side load will bend the strut slightly and this is the section where the bending occurs. The stress riser is the un-chamfered 3/16" hole. Try avoiding fast turns and no sharp turns at any speed above creep will help prevent this cracking issue. Brake application in a turn will aggravate this.

Please don't let all the involved procedures I have mentioned above prevent you from at least doing the minimal preventative treatment, the chamfer and polish portion. It can save a strut housing; do all the pretty stuff later.



The above sketch is from the ICS Tips.
Can you find the mistake; it's the bolt orientation?



To potentially avoid the costly repair like this cracked housing will require, see the previous pages and the photo on page 4. Notice the 3/16" hole's sharp edge; see the chamfered & polished hole on page 4.

The screwdriver pointing indicates where to look for the crack; at the backside of the web.

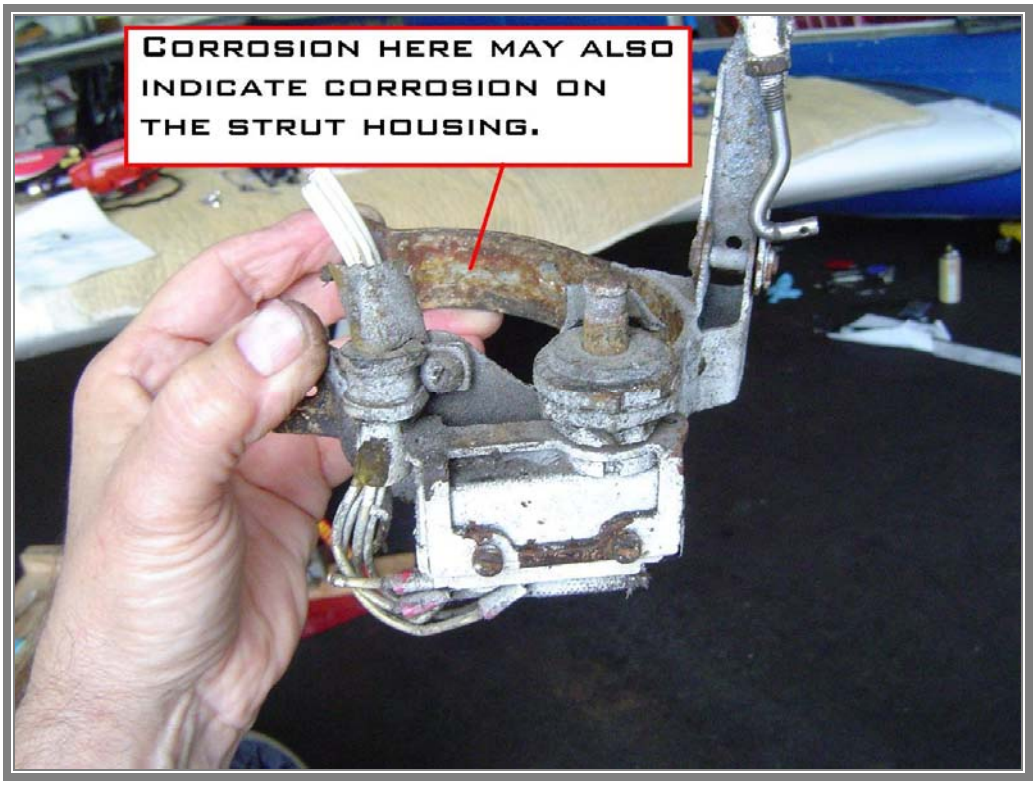
Radius and polish the edge of the web, and chamfer and polish the hole edges as suggested in the "Comanche Tips"; refer to the previous pages.

These housings have been polished and chamfered, glass bead blasted, and Alodine® treated; ready for primer.

Piper's improved-version strut housing shown on the left. Notice the straight section; no reduced-diameter section as the original on the right.

Right side ready for re-assembly; notice the pretty paint job.

One sample of a cadmium plated component after glass bead blasting to remove any corrosion.



Here's a similar component – not mine. Don't re-install a component such as this without proper corrective action.