



J2 TECHNICAL ARTICLE

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WOOD ROT: DELAYING THE INEVITABLE

The following article in an aviation magazine may give you some ideas as to what must be done in restoration of the wood coach. Some editing done to the article to get in one page.

It's probably going to happen sooner or later. That's the message of experts on the subject of woodrot, the rotting of wooden aircraft components. There are a number of preventive measures to be taken, but generally, the maintenance of wooden aircraft is a time consuming, expensive chore.

The rot itself is caused by decay-producing fungi which only attack the wood in a wing or spar if temperature conditions are just right and a certain level of moisture is present. This moisture may be caused by rain, condensation, or contact with wet ground, among other things. Moisture is the major preventable cause of woodrot. If it can be kept out, then decay can be prevented. Woodrot can occur in any climate, even the desert.

One of the major manufacturers of wooden aircraft flying today is Bellanca Aircraft Corp. of Alexandria, Minnesota. Some Bellanca wooden aircraft have been flying for over 30 years, which is a testimonial both to the company's manufacturing techniques and to extremely careful inspection and maintenance methods.

The Bellanca manufacturing process includes hand-crafted assembly methods, followed by submersion of the entire wing in a water resistant wood sealer. The wing is then covered by a dacron fabric and externally sealed with several coats of paint. Even with all of these manufacturing precautions, the wing and other components need to be inspected on a regular basis.

The first inspection routine cov-

ers the entire exterior surface of the wing to determine if there is any point where it is possible for water to contact and/or enter the wood structure inside the wing. Things to look for include soft wood, delaminating fabric or paint, cracks or breaks in the paint, and exterior damage.

Once the exterior has been checked, it is time to inspect the interior of the wing to determine if water has been present inside the wing or if there are any signs of wood decay. For this part of the examination, all inspection and access covers such as the leading edge wing root fairing, rear spar attachment access cover (top), lower wing root fairing and all covers on the lower wing surface should be removed.

The interior of the wing should be inspected for wood decay, water and/or wood stains, pooled dust or dirt which may indicate evidence of previous standing water, rust or corrosion on metal surfaces, wood discoloration, and detectable moisture.

If the exterior and interior inspection procedures detect any questionable areas, then the inspection should continue with a moisture test and probing inspection to make sure the wood structure is free of decay. If the moisture level is too high, or probing indicates soft or decaying wood, the aircraft is not considered airworthy and these components must be replaced.

The final recommendation calls for modifications to the wing which will help prevent water from entering the wing or being retained by the wing.

Terry Dill, vice president of Alphin Aircraft, believes: "It's strictly based upon the way it's been preserved, the way it's protected and the way it's been inspected and maintained."

The root fittings are typically where the rot would occur because that's the lowest point of the wing," he said. "Sometimes aileron spars are overlooked. They tend to trap moisture because they are not part of the main wing. Any place where steel bolts up to it except for the strut fittings, is susceptible.

"The worst places are on the airplanes that use the wood spar and have plywood built-up wings. It's very difficult to inspect. If it's plywood laminated, it's impossible without peeling off the lamination and that's almost destructive, you splinter a lot of wood," Dill explained. If there is decay present it must be removed and a repair made.

The proper care must be taken at all times, including keeping the aircraft as free of moisture as possible. "If possible, it is better to have the aircraft hangared, and to keep the protection barrier in good repair and make sure that the drain holes are always open so that any moisture that would get into the wing can drain as it is supposed to," Holm said.

"The important thing is to fly it regularly and keep it aired out."

Dill also explained that many closed hangars with di floors have a high moisture level and a vapor barrier may be necessary to keep the humidity of the building low.