

Landing Gear Notes

By Dick Pedersen, ABS Technical Advisor

Almost every week there is at least one Beech aircraft that suffers a gear mishap of some type, whether from a hard landing, poor pilot technique, gear instead of flap retraction, just plain forgetting to put the gear down, or a mechanical failure of some type. Fewer and fewer of these planes are being rebuilt due to the high cost of repairs, which is diminishing the size of our flyable fleet.

Two things can be done to decrease the number of landing gear related accidents. Number one is more pilot training in the form of some takeoff and landing practice, and crosswind practice. Most pilots are flying less than they did a few years ago due to economic conditions and age – the pilot's age more so than the aircraft's age! So we tend to get a little rusty on some of our skills without some practice or a little dual from a flight instructor.

The second thing that can be done to help prevent an embarrassing “unable to taxi” condition is to have the entire retract system inspected and repaired as necessary by a qualified A&P who is well versed on the Beech landing gear system. Presenting a copy of the *ABS Landing Gear Inspection Checklist and Repair Guide* to your favorite shop can help to ensure that the job will be conducted properly. However, this guide and the Beech *Maintenance Manual* still may not cover all the possible problem areas that have gone unaddressed in years past.

It's not very often that I get to work on older Bonanzas, especially 35s thru G35s. So when I do get one in, I like to brush up on old Service Bulletins and



The larger 3/8" × 24 rod end is on the left, and the 5/16" × 24 rod end on the right, both of which are the solid shank types.



Letters from many years ago. I had a straight 35 in the shop this summer that started out as a pre-purchase evaluation. It ended up as an annual inspection with a list of discrepancies that needed to be dealt with, including some old ADs that had never been complied. One such was AD 72-22-01, now AD 2007-08-08, which covers the uplock rollers and an added grease fitting. The main focus of this AD is to ensure the rollers have an annulus, with two small holes

drilled through the annulus for grease to pass into the roller to lubricate it. The bolt that attaches the roller to the lift leg is required to be replaced with a drilled bolt with a zerk fitting so that the roller may be lubricated, so it would not seize and possibly prevent the gear from coming down.

On this particular 35 the AD was signed off as not only complied with back in 1972 when the AD came out, but also that it had been complied

with every 100 hours or annually after that. The uplock roller bolts had been replaced at some point as one had the regular grease zerk installed in it, while the other landing gear's uplock roller bolt had the late-style, flush-type grease fitting. Someone apparently thought there was a problem with the old bolt or zerk fitting and replaced the bolt/zerk assembly not all that long ago with the expensive, newer style bolt and grease fitting.

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When I tried to pump some grease into the rollers, neither one would accept grease. I knew at that point that either the bolt wasn't drilled correctly or the rollers were still the old, undrilled rollers. I pulled the rollers off and, sure enough, they were the original 1947 undrilled rollers. But every year someone complied with the AD by somehow greasing them, at least according to the log entries. This is why I would rather look at the *airplane* during a pre-purchase evaluation instead of the log books. These two rollers were quite stiff, needless to say, with 1947 grease in them yet. This was one Bonanza that was lucky not to have had a landing gear-related accident!

This same Bonanza also had very little nose gear down tension keeping the nose gear from collapsing, and less than minimum down tension on the left gear. Either could have collapsed with the right bump on the runway or taxiway, or during a right turn or swerve on the ground. While I was going through the entire retract system replacing worn bushings, bolts, springs, and old rod ends, I remembered an old Beech Service Letter that pertained to the early 35s and the nose gear rod ends. I dug out my old and dusty Service Bulletin binder and found Beech 35 Service Letter #11, dated September 19, 1947, and revised April 15, 1953. This Service

Letter applies to the front two rod ends on the nose gear retract rods, which are the ones at the lift leg attach point and at the firewall idler arm joint. This Service Letter only covers the straight 35s from S/N D-1 thru D-538 inclusive, and the rod ends were to be changed as soon as possible.

These HM-5 rod ends had only a 5/16" × 24 threaded shank that was hollow. Beech wanted them replaced as soon as possible with a solid shank version of the rod end, a HM-5S rod end. The added "S" to the part number stood for solid shank. When these planes were almost new I was just a little tyke helping my dad rebuild wrecked Bonanzas, and I can remember him ferrying several back to our shop with the nose gear braced down with a steel assembly he had fabricated just for that purpose. I remember him saying more were collapsing the nose gear as the rod end was breaking.

If you own a 35 thru G35, it probably wouldn't be a bad idea to have your shop check the two forward rod ends to be sure they are the correct solid shank type, especially if there was ever a history of a gear collapse. Sometimes the right parts don't always get installed. I've witnessed that way too many times on first-time annuals and pre-buys in my shop.

Later, Beech came out with a heavier rod end for these two locations, P/N HMX-5FG. The photo shows the difference in shank size. This started with the 1957 H35 according to the Beech Parts Catalogs. It only makes sense as the H-model had major structural changes throughout the entire airframe, with higher horsepower and gross weight among other things. This rod end has a larger 3/8" x 24 threaded shank; however, the shank was hollow again and included a grease fitting at the swivel

ball end and a brass plug screwed in at the end of the threaded shank. The purpose of the brass plug was to keep the grease you pumped into the ball end from migrating down the inside of the hollow shank and squirting out inside the hollow retract rods.

The rod end Beech now uses on new planes is a 3/8" x 24 solid shank rod end, P/N ADNE5-323. The Beech Maintenance Manual recommends the three rod ends on the nose gear retract system be replaced every 2,000 hours time-in-service (TIS). The ABS technical staff recommends the rod ends be replaced on this schedule with the solid shank style (like the late models) to further help prevent a nose gear failure.

I have found several of the hollow shank rod ends bent during my retract system inspections. When I replace these rod ends for my customers I also replace the rod

ends on the main gear retract system, as I have also found several of those bent. These were also originally hollow shank rod ends, which I replace with the latest Beech P/N 131553FG6M rod ends (solid shank). There is just one rod end on each main gear retract rod, at the outboard end.

As owners and maintenance providers, we need to do all we can to preserve to rest of our diminishing fleet of Debonair, T-34, Travel Air, Bonanza, and Baron aircraft. Yes, it is somewhat pricey to do a complete retract system inspection and rebuild, but when compared to what a new G36 Bonanza or G58 Baron costs to replace the one that just got totaled, the cost is quite insignificant. Let's all do our part to help slow the depletion of our Beech aircraft. 