

SUBJECT: Hydraulic Actuator Piston Retaining Nut

APPLICABILITY: Retractable Landing Gear Hydraulic Actuators For Glasair I, II RG, and III kits shipped before 12/17/87

DESCRIPTION: Glasair RG landing gear hydraulic actuators shipped prior to 12/17/87 have their pistons held in place on the piston rods with an AN364-428A nut. This nut is not approved for applications in which a tension load is applied, and must be replaced by an MS21042-4 tension nut. A failure of the AN364 piston retaining nut would result in loss of hydraulic pressure and subsequent landing gear failure.

REQUIRED ACTION: Replace the AN364-428A piston retaining nuts in the hydraulic actuators with MS21042-4 nuts as follows:

STEP 1: HYDRAULIC ACTUATOR DISASSEMBLY

1. Disconnect the hydraulic lines from the hydraulic actuators. Plug the ends of the hydraulic lines to prevent loss of fluid and to prevent the entry of foreign material while the lines are disconnected. Remove all three hydraulic actuators from the aircraft.
2. Push each piston rod into the hydraulic actuator cylinder body as far as possible so that the piston bottoms out in the cylinder. (Be sure to point the actuator port into a cup or jar to catch the fluid.)

WARNING: Be very careful not to have the actuator port pointed toward your face or eyes when depressing the piston.

3. Remove the set screw from each hydraulic actuator cylinder cap and unthread the cylinder cap from the cylinder body. It should be possible to unthread the cap from the body simply by gripping the cap with your hands and turning it counterclockwise (the same way you would unthread a standard nut).

NOTE: The cylinder caps and cylinder bodies are manufactured in matched sets. The caps are not interchangeable so do not mix them up.

4. With the piston still retracted all the way into the cylinder body, clamp the protruding end of the piston rod (the end opposite the piston) in a padded vise. If you are careful when clamping, you won't have to remove the rod end bearings from the piston rods; this will save you the trouble of readjusting the positions of the rod ends on the piston rod when reassembling.

CAUTION: Clamp only the part of the piston rod that protrudes from the end of the cylinder when the rod is completely retracted into the cylinder. Do not clamp the rod end bearings or any other



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part of the piston rod. If the piston rod is damaged on any surface that contacts the Poly Pak seal in the cylinder bushing, leaks may result.

5. Use a 7/16" wrench to remove the AN364-428A piston retaining nut from the piston rod. Remove the AN960D416 washer; this washer will not be reused.

NOTE: If the actuators are still unused, skip the remainder of Step 1. Inspect the cylinder cap "O" ring according to the instructions in Step 2. Then skip directly to Step 3, Item 8. If further disassembly is required, remove the rod end bearing and jam nut from the end of the actuator piston rod and push the piston rod and piston out of the cylinder body. Count and record the number of turns required to remove the rod end bearings so they can be reinstalled in the same positions.

CAUTION: When removing or installing the piston, always do so from the cylinder cap end of the cylinder body. Pulling or pushing the piston past the sharp edges of the port in the bushing end of the cylinder body can damage the piston seals, resulting in internal leaks and loss of hydraulic pressure.

6. Use a pair of snap ring pliers to remove the snap ring from the bushing end of the actuating cylinder. Use a wooden dowel (or equivalent) to push the cylinder bushing and retaining washer out of the cylinder body.

STEP 2: INSPECTION AND CLEANING

1. Check the condition of all the seals and back-up rings. If any cuts, wear, or deformation is evident, order new replacement seals from Stoddard-Hamilton's parts department. Use the part numbers specified in FIGURE (1) when ordering.
2. Clean all the hydraulic actuator components to remove any foreign material that might be present in the system.

STEP 3: HYDRAULIC ACTUATOR REASSEMBLY

NOTE: Always lubricate the seals and back-up rings when mating them to metal components of the hydraulic actuators. Use the same hydraulic fluid as used in the landing gear hydraulic system for lubrication of the actuator parts and seals.

1. Install the 620-8212-300 back-up ring and 620-2126-747 "O" ring on the cylinder bushing, as shown in FIGURE (1). Install the back-up ring on the outboard side of the bushing (the side closest to the snap ring), as shown.

NOTE: Always install the back-up rings with their concave sides toward the "O" ring.



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2. Insert the correct size Poly Pak seal for the actuator piston rod diameter used (refer to Figure (1)) into the cylinder bushing with the open side of the seal facing toward the cylinder bushing, as shown.
3. Slide the retaining washer onto the piston rod and then slide the piston rod into the cylinder bushing from the Poly Pak side, being careful not to displace or damage the Poly Pak seal in the bushing.
4. Press the cylinder bushing/piston rod assembly into the cylinder body until the flange on the bushing bottoms out on the step in the cylinder body. Press the retaining washer against the face of the cylinder bushing and install the snap ring into the groove in the cylinder body.
5. Push the piston rod into the cylinder body to the fully retracted position. Clamp the protruding end of the actuator piston rod in a padded vise, as before.
6. At this point you may want to consider up-grading to the current-style piston assembly. Refer to Figure (4) for the current piston configuration as of the date of this revision.
 - a) For the Original Piston Assembly install the 620-2026-647 "O" ring and two 620-8212-300 back-up rings on the piston, as shown in FIGURE (1), making sure that the concave sides of the back-up rings are toward the "O" ring. The newer 620-4212-212 quad seal and two 620-8212-212 back-up rings may be used on the original piston assembly in place of the "O" ring and -300 back-up rings if so desired.
 - b) For the Current-Style Piston Assembly install the MS28775-012 internal "O" ring in the piston and install the 620-4212-212 quad seal and two 620-8212-212 back-up rings on the piston, as shown in FIGURE (2).
7. Slip the piston into the cylinder body and onto the end of the piston rod, as shown in FIGURE (1). Install a 620-0101-250 Stat-O-Seal against the countersink in the piston.
8. Install the AN960D416 washer. Thread on the MS21042-4 piston retainer nut and torque it to between 50 and 70 inch-pounds.
9. Install the 620-2026-674 "O" ring in the groove in the cylinder cap, as shown in FIGURE (1). Thread the cylinder cap by hand onto the same cylinder body it was removed from until the set screw hole in the cap is aligned with the set screw dimple in the cylinder body threads. Install the set screw and tighten it just until it bottoms out against the dimple in the cylinder body threads; use Loctite to secure it.

CAUTION: Do not over-tighten the set screw, as this can deform the bore of the cylinder body, preventing free movement of the piston inside. Run the actuator rod in and out by hand to check for smoothness and freedom of movement.



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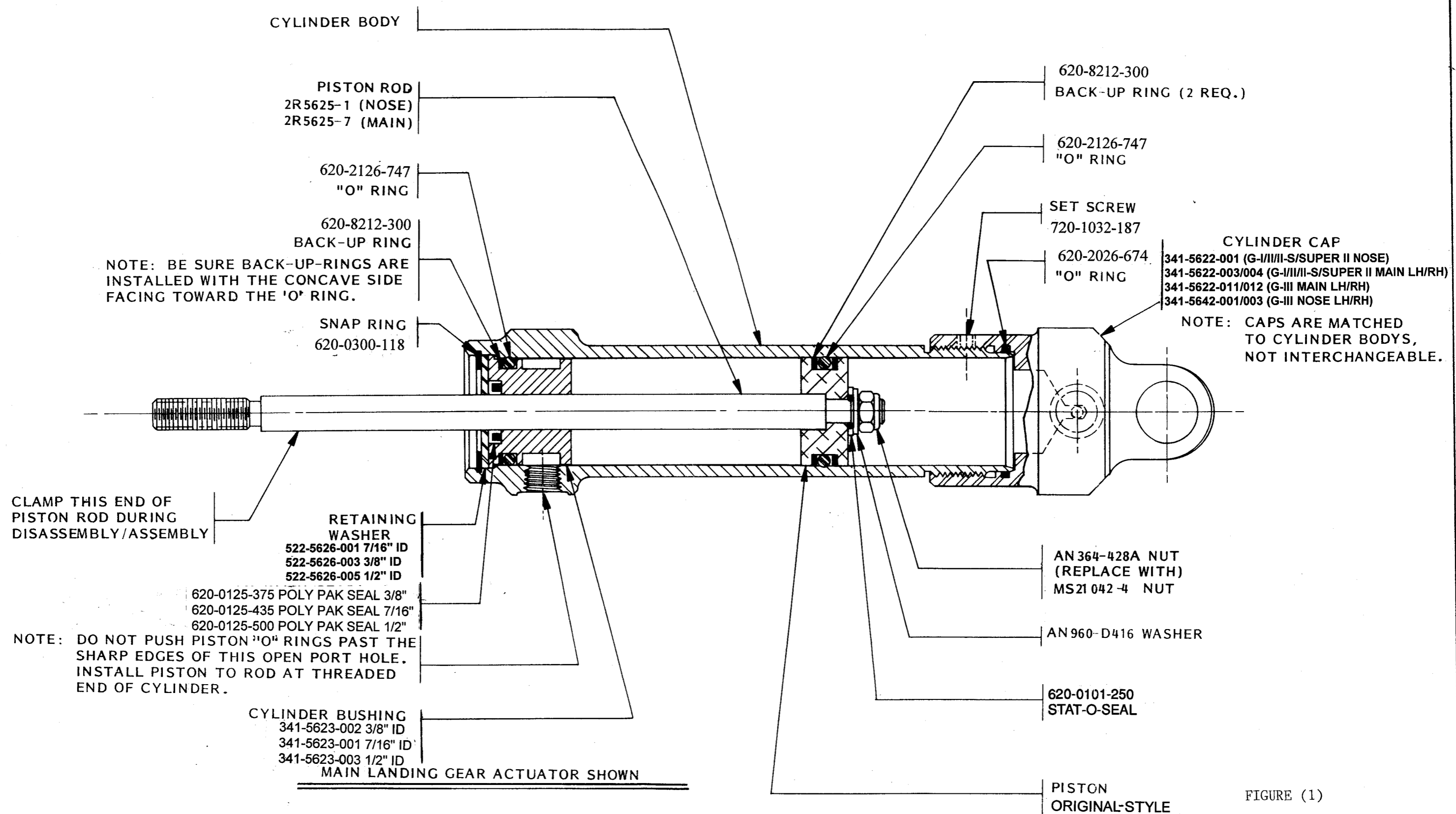
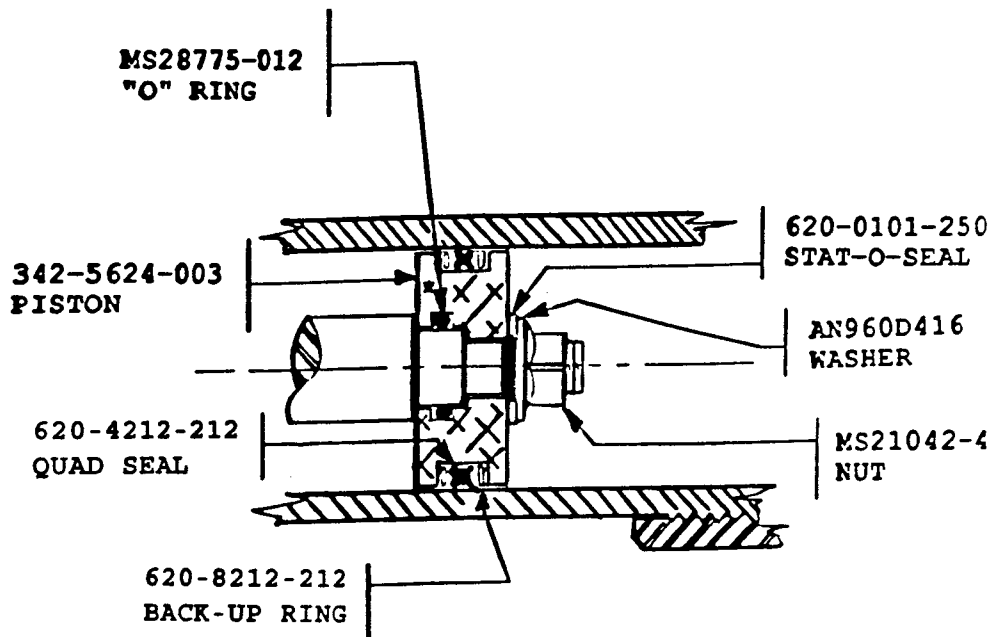


FIGURE (1)




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CURRENT-STYLE PISTON ASSEMBLY

FIGURE (2)

Jack the airplane up and make sure it is secure on the jacks. Reinstall the actuators in their proper positions. Fill all the actuators and lines with the appropriate fluid on the high pressure (gear retract) side by connecting a temporary line and using the actuator like a syringe to pull the fluid in from a container. Fill the pump reservoir. Operate the pump momentarily on the UP cycle until fluid flows out of the high pressure line into the container, and then reconnect the high pressure line to the actuator. Use the same procedures to fill the lines on the low pressure (gear extension) side. Now, after the reservoir has been replenished again, the system can be operated without trapped air in the lines. Cycle the gear two or three times. Make sure the gear is operating correctly during both the extension and retraction cycles and then let the airplane down off the jacks.


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