

SERVICE BULLETIN 52

SUBJECT: MAIN GEAR HYDRAULIC ACTUATOR ROD RETROFIT

APPLICATION: RETRACTABLE MAIN LANDING GEAR HYDRAULIC ACTUATORS (SHIPPED PRIOR TO 05/15/88) FOR GLASAIR III KITS

DESCRIPTION: Due to our redesign of the main landing gear to use the steel half forks, the engineering analysis of the main gear system required us to also increase the column load carrying ability of the main gear hydraulic actuator rods.

COMPLIANCE: MANDATORY

SOLUTION: Replace the existing 3/8" diameter main gear hydraulic actuator rods with new, larger (.435" diameter) (522-5625-011) heat treated 15-5 stainless steel hydraulic actuator rods. The rod end bearing end of the new hydraulic actuator rods have female threaded ends rather than the male threaded ends on the earlier 3/8" dia. actuator rods.

STEP 1 HYDRAULIC ACTUATOR DISASSEMBLY


1. Disconnect the hydraulic lines from the main gear 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 the two main gear hydraulic actuators from the aircraft.
2. Push each hydraulic actuator rod into the cylinder body as far as possible so that the piston bottoms in the hydraulic actuator. (Use a cup or a jar to catch the fluid ejected from the actuator port.)

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

3. Remove the set screw from each cylinder cap and unthread the cylinder cap from the cylinder body. It should be possible to unthread the cylinder cap from the cylinder body by simply gripping the cap with your hands and turning it counterclockwise (the same direction as to 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. Remove the rod end bearing and jam nut (if installed) from the end of the actuator piston rod and push the piston rod and piston out of the cylinder body

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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 'O' ring seals, resulting in internal leaks and loss of hydraulic pressure.

5. Clamp the hydraulic actuator rod in a padded vise and remove the AN364-428A piston retaining nut, AN960-D416 washer, (600-0101-250) Stat-O-Seal, and the piston.
6. Use a pair of snap ring pliers to remove the snap ring from the hydraulic actuator bushing end of the actuating cylinder. Use a wooden dowel (or the equivalent) to push the hydraulic actuator bushing and rod seal washer out of the cylinder body. Carefully remove the 'O' ring and backup ring from the hydraulic actuator bushing, as these will be reused on the new (522-5623-001) hydraulic actuator bushing. The old hydraulic actuator bushing, rod seal washer, and Poly Pak seal will not be reused.

STEP 2 INSPECTION AND CLEANING

1. Check the condition of all the 'O' rings, backup rings, and seals. If any cuts, wear, or deformation are 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 'O' rings, back-up rings, and seals when mating them to metal components of the hydraulic actuators. Use the same hydraulic fluid (MIL-5606) as used in the landing gear hydraulic system for lubrication on the actuator parts and seals.

1. Install the back-up ring (620-8212-300) and 'O' ring (620-2126-747) onto the new hydraulic actuator bushing (522-5623-001), 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.

2. Insert the new Poly Pak seal (620-0125-437) into the new hydraulic actuator bushing (522-5623-001), as shown, with the open side of the seal facing toward the hydraulic actuator bushing.



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3. Thread the AN316-5R jam nut onto the rod end bearing (170-0100-001) and thread the rod end bearing into the end of the new hydraulic actuator rod. Tighten the jam nut against the end of the hydraulic actuator rod to lock the rod end bearing; this provides a means of holding the actuator rod while torquing the piston retainer nut.
4. Slide the new rod seal washer (522-5626-001) onto the hydraulic actuator rod and then slide the hydraulic actuator rod into the hydraulic actuator bushing from the Poly Pak side, being careful not to displace or damage the Poly Pak seal in the bushing.
5. Press the hydraulic actuator bushing/hydraulic actuator rod assembly into the cylinder body until the flange on the bushing bottoms out on the step in the cylinder body. Press the seal washer against the face of the hydraulic actuator bushing and install the snap ring into the groove in the cylinder body.
6. Install the 'O' ring (620-2126-747) and (2) back-up rings (620-8212-300) onto the piston, as shown in FIGURE (1), making sure that the concave sides of the back-up rings are toward the 'O' ring.
7. Slip the piston into the cylinder body and onto the end of the hydraulic actuator rod, as shown in FIGURE (1). Install a Stat-O-Seal (620-0101-250) into the countersink in the piston.
8. Install the AN960D416 washer and the MS21042-4 piston retainer nut onto the piston end of the hydraulic actuator rod and torque the nut to between 50 and 70 inch-pounds. Use a wrench on the rod end bearing jam nut to keep the hydraulic actuator rod from turning while torquing the piston retainer nut.
9. Install the 'O' ring (620-0909-006) into the groove in the cylinder cap, as shown in FIGURE (1). Thread the cylinder cap onto the same cylinder body from which it was removed and screw it on by hand 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 against the dimple in the cylinder body threads, using Loctite to secure it.

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

10. Install and adjust the hydraulic actuators, as described in Steps AD-7 and AD-16, on pages C-181 and C-196, respectively, in the Wing Assembly section of the Glasair III Instruction Manual. When installing the actuators, use AN960C516L washers on each side of the rod end bearings as required to eliminate side play inside the side brace bellcrank arm, as shown in View A-A of FIGURE (1).


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WARNING: The piston bottoming in the cylinder serves as the up stop for the main gear. Failure to properly adjust the length of the hydraulic actuator rod may result in damage to the gear retraction mechanism or aircraft structure.

NOTE: After the rod end is adjusted, use safety wire in the hydraulic actuator rod inspection hole to check that enough of the rod end bearing threads are inserted into the actuator rod. Lock the jam nut against the actuator rod.

11. If the hydraulic system was completed and operational prior to the actuating rod retrofit, refill the actuators as follows:

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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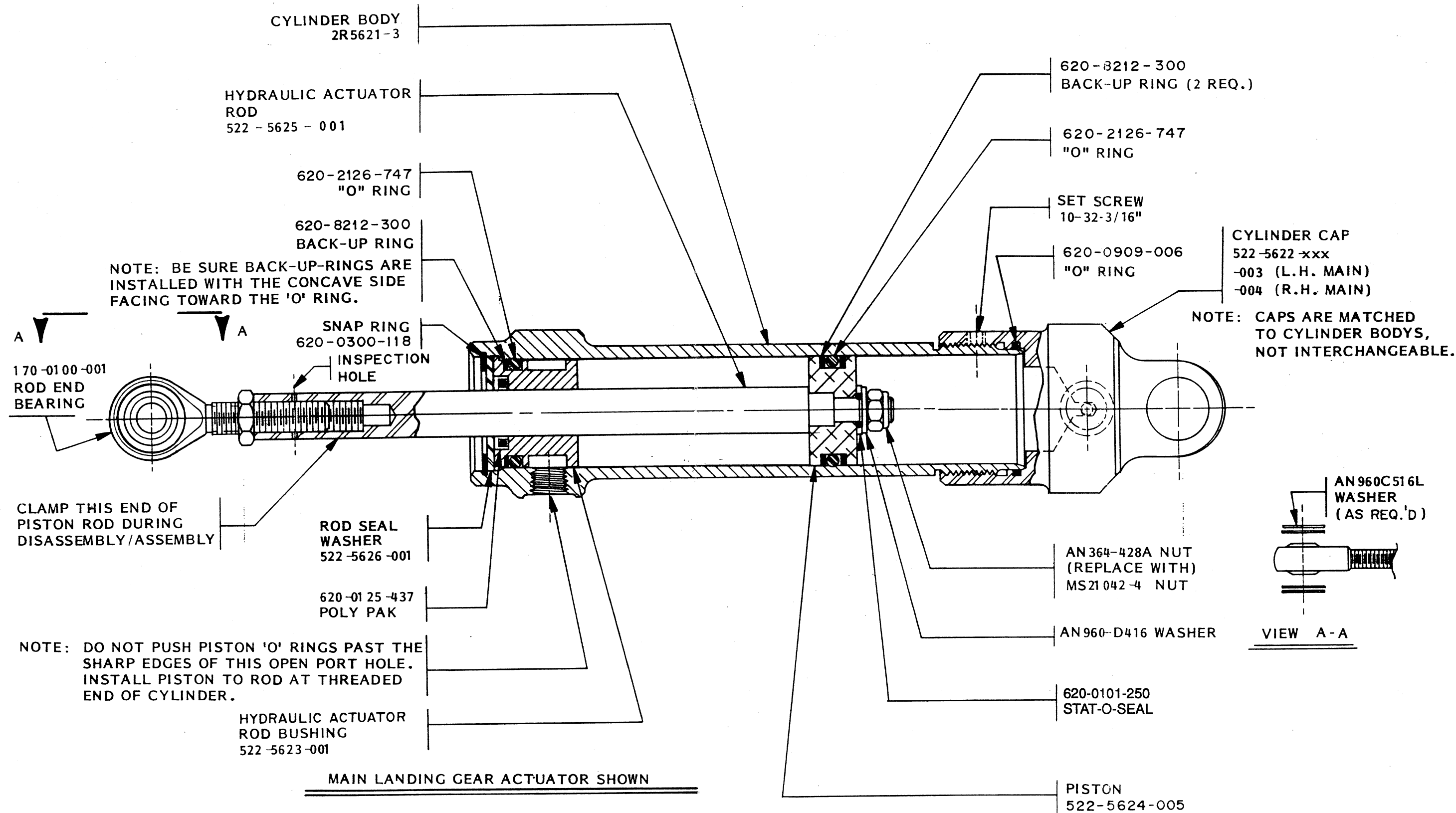


FIGURE (1)

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