INSTALLATION INSTRUCTIONS and INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

Aircraft: PA-18 Series, PA-19, PA-14, PA-12, PA-11, PA-20, PA-22, J3, and J5

Replacement Master Brake Cylinder

Document No.: ST02403AK-A-ICA

Release Number: IR

Release Date: 12/7/2023

AIRFRAMES ALASKA

These instructions are to be included in the aircraft Maintenance Material when the Airframes Alaska, LLC. Replacement Master Brake Cylinders are installed on the aircraft.

The information contained in this manual supplements or supersedes the type design data only in those areas pertaining to this STC. For maintenance practices and procedures, not contained in this document, consult the maintenance material, or other information that was required by the applicable regulations under which this aircraft was type certified.

Record of Revisions

Rev Level	Date	Author	Explanation of Revisions
IR	12/7/2023	Keller	Initial Release

Distribution of Changes

A current copy of this manual will be maintained on the Airframes Alaska, LLC website
www.airframesalaska.com

LIST OF ACTIVE PAGES

ORIGINAL		ADDED PAGES					
PAGE	REV	PAGE	REV	PAGE	REV	PAGE	REV
1	IR						
2	IR						
3	IR						
4	IR						
5	IR						
6	IR						
7	IR						

Description:

In an effort to increase aircraft performance and ease piloting effort, Airframes Alaska of Palmer Alaska has designed a new Replacement Master Brake Cylinder Assembly. Unlike the OEM Scott master brake cylinders, our new system utilizes a smaller diameter piston to increase hydraulic brake pressure without adding additional pilot pedal force. In doing this the brake effectiveness is increased by making a more progressive brake pedal feel. In addition, our new replacement master brake cylinder assembly is vented, elevating the annoying requirement of constantly adding brake fluid to the brake system when the brake linings wear. Accidents have occurred in the past due to inadequate brake fluid in the system, our new assembly negates this problem.

Airworthiness Limitations:

"The Airworthiness Limitations section is FAA approved and specifies maintenance required under 14 CFR, Sections 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved."

Limitations:

None

Instructions to install the replacement master brake cylinders:

1. The replacement master cylinders come ready to install. You must install both the LH and RH cylinders, using different LH and RH cylinders is not allowed.
2. The existing brake master cylinders need to be removed. Drain the brake lines from the bottom wheel calipers so that all the brake fluid is removed from the system.
3. Un screw the hydraulic fitting that connects the brake cylinder to the hydraulic line that goes down to the wheel calipers.
4. Disconnect the front to rear brake pedal pushrods on the rear brake pedals only.
5. To be eligible for installation of these master brake cylinders, the aircraft must be equipped with FAA approved high-pressure brake lines. "FAA approved high-pressure brake lines" are brake lines which the FAA has found to be sufficiently flexible for their intended purpose, compatible with MIL-H-5606BB (red) hydraulic fluid, and capable of sustaining an ultimate hydraulic pressure of 2,547 PSA for at least 3 seconds without failure or leakage; and which the FAA has approved for installation on aircraft. Any wheel/brake assembly installed on an aircraft equipped with these master brake cylinders must have a brake caliper FAA approved for a maximum available hydraulic

pressure of at least 1698 PSI as defined by the brake calipers original certification basis (TSO-C26, TSO-C26a, TSO-C26b, or TSO-C26c; or the aircrafts certification basis if the brake calipers were approved as part of the aircraft's type design).

6. Un bolt the mounting hardware that secures the existing master brake cylinders to the airframe.
7. The existing mounting hardware can be reused to secure the replacement master brake cylinders to the airframe provided they are still airworthy. Replace the hardware if they are deemed unairworthy.
8. Remove the hydraulic fitting from the brake cylinders that are being replaced. If they are in an airworthy condition, mount them to the replacement master brake cylinders. If the hydraulic fittings are no airworthy, replace them prior to mounting them onto the replacement master brake cylinders.
9. Reconnect the front to rear brake pedal pushrods. The new replacement brake cylinder pedals are located exactly like the OEM Scott pedals so no adjustment should be required assuming they were properly adjusted prior to the brake cylinder replacement.
10. The master brake cylinders should now be ready to add MIL-H-5606 BB brake fluid. Bleed the brake system to remove all air from the system. To check this, ensure the pedal gets firm. If you are able to pump up the brakes over a couple of stokes prior to the pedal firming up, there is air in the system that needs to be removed. After completing the bleed process, inspect the entire brake system for any hydraulic leaks, if none are found the aircraft is now ready for a taxi testing. Ensure that after the bleeding process, the reservoir is at least half full.
11. Taxi the aircraft around to ensure the brake system operates properly. If it operates properly the aircraft is now safe for flight.
12. A logbook entry is needed to document the installation along with an FAA form 337 for the STC installation. The weight and balance will likely not need to be updated; it depends on what master brake system is being replaced.

Trouble Shooting

Brakes are spongy

This is an indication that air is trapped in the brake lines or the reservoir is empty of hydraulic fluid. If the reservoir is not empty, bleed the brake system until the pedal firms up.

Hydraulic external leaking at the master brake cylinder

This is an indication that the piston O-ring(s) may be worn. Remove the piston from the brake master cylinder. Snap ring pliers will be required to remove the piston retaining snap ring. Replace all (3) of the piston O-rings and reassemble the master brake cylinder using O-ring lubrication during assembly. Reinstall the master brake cylinder and bleed the system. If after replacement of the O-rings, hydraulic leakage is still present, contact Airframes Alaska for servicing assistance.

To be updated with common Problems and Corrections, if necessary, when and if they arise when more assemblies are installed in the field.

Engineering Changes and Amendments

If a change or amendment is made to the design, components, or procedures contained within this manual or STC that affect airworthiness of the installation, Airframes Alaska, LLC. will notify the recorded owners in writing of the affected element(s) and provide the necessary data for compliance.

Instructions for Continued Airworthiness:

Instruction Criteria 100

Hour / Annual

(100 hour or Annual inspection interval, whichever comes first)

Examine- The master brake cylinders for any presence of hydraulic fluid external to the master brake cylinder body. In the unlikely event hydraulic fluid is present, piston O-ring seals will need to be replaced as outlined in the trouble shooting section of this document.

Inspect – The master brake cylinders for proper pedal firmness. If the pedal is not firm air might be trapped in the brake system or the reservoir might be empty. Bleed the brake system or add fluid as required as outlined in the trouble shooting section of this document.

Inspect – All the brake lines both internal to the aircraft cabin and external down the gear legs. If cracking, chafing, or excessive wear is notice replace suspect the brake line.

AIRFRAMES
ALASKA

907.331.4480 // AIRFRAMESALASKA.COM // 81 E. COMMERCIAL DRIVE, PALMER, AK, 99645