

**INSTALLATION INSTRUCTIONS**

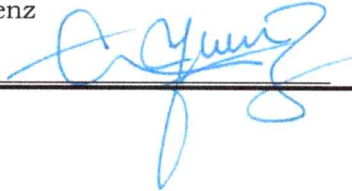
**DATE:** December 4, 2020

**PRODUCT:** Aircraft Models Per Approved Model List (AML)

**SUBJECT:** Brake Master Cylinder Seal Kit Installation


**PREPARED BY:** E. Muenz

**RELEASED BY:** \_\_\_\_\_




TRANSPORT CANADA  
DESIGN APPROVAL ORGANIZATION  
NO.: 17-C-01

**APPROVED**

By:  API  
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Issue No.: 1

**REVISION HISTORY TABLE**

Revision	Revision Date	By
N/C	December 4, 2020	E. Muenz

	<b>INSTALLATION INSTRUCTIONS</b> BRAKE MASTER CYLINDER SEAL KIT INSTALLATION	Marsh Brothers Aviation Inc. <b>II-M20001-1</b>
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## INTRODUCTION

The purpose of these installation instructions is to provide all necessary information required to install a replacement seal kit in a brake master cylinder. The seal kit repairs a leaking brake master cylinder and provides preventative maintenance with a longer lasting lip seal.

## APPLICABILITY

These installation instruction are applicable to the following brake master cylinders and seal kits:

BRAKE MASTER CYLINDER P/N	SEAL KIT P/N
96-380034-25	M-03-1001
90-380001-23	M-03-1000

Aircraft applicability per Approved Model List (AML).

## MATERIALS

### 1. Parts Required:

PART NUMBER	DESCRIPTION
M-03-1000	Seal Kit, Brake Master Cylinder, Beech
M-03-1001	Seal Kit, Brake Master Cylinder, Beech

### 2. Tools Required:

- Standard aviation tools and consumables.

## REFERENCES

1. AC43.13-2B – Acceptable Methods, Techniques, and Practices – Aircraft Alterations.
2. Refer to the applicable aircraft maintenance manual (AMM).

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## INSTRUCTIONS

### A. BRAKE MASTER CYLINDER REMOVAL PROCEDURE



#### NOTE

PREPARE THE AIRCRAFT FOR MAINTENANCE AND PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE AIRCRAFT MAINTENANCE MANUAL PROCEDURES AND STANDARD PRACTICES.



#### NOTE

FOLLOW ANY MANUFACTURER OR AMM INSTRUCTIONS / PROCEDURES FOR DISSASSEMBLY AND REASSEMBLY OF THE BRAKE MASTER CYLINDER AS REQUIRED AND AS APPLICABLE.

1. Remove the brake master cylinder from the aircraft.
2. Disassemble the brake master cylinder to gain access to the piston and seals.

## B. SEAL KIT INSTALLATION PROCEDURE

### PREAMBLE:

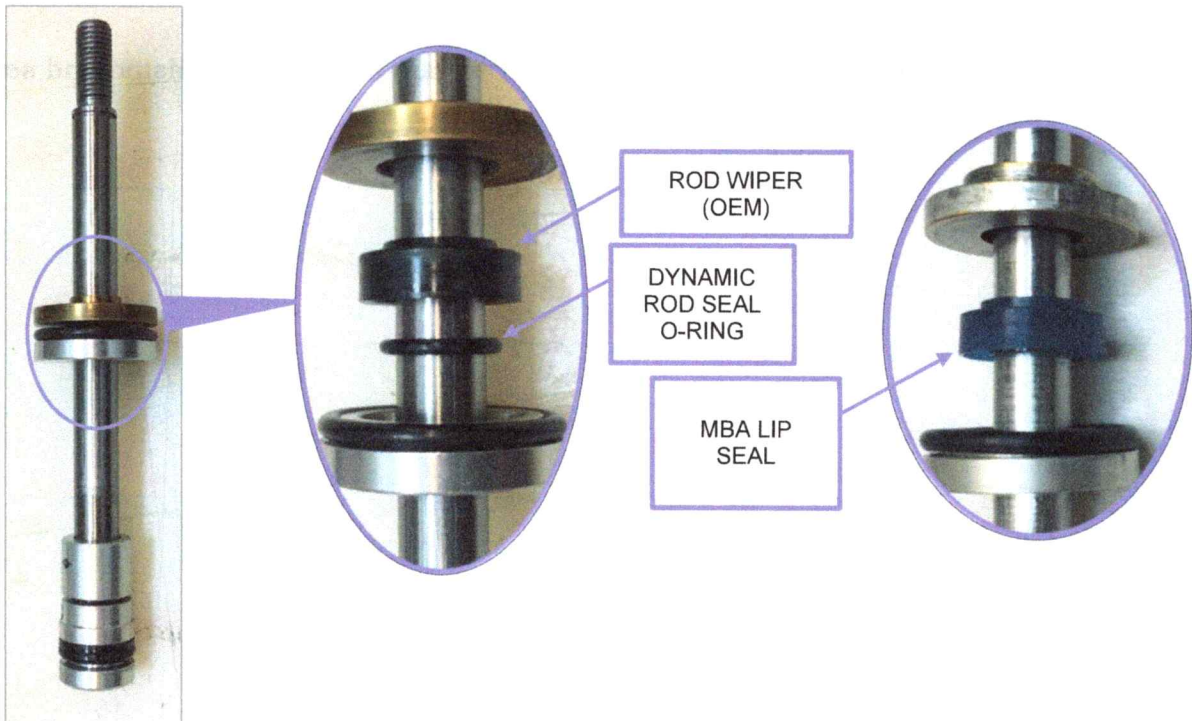
This section provides visual reference to key elements associated with the task of installing the MBA Lip Seal onto the piston rod.



**(Left)**  
Beech brake master replacement seal geometry; taller height/thicker cross-section.

**(Below)**

MB Aviation designed Lip Seal replaces both the OEM Rod Wiper and the Piston Rod dynamic seal O-Ring.



**CAUTION**



**DAMAGE TO THE INNER AND/OR OUTER SEAL LIPS MAY CAUSE LEAKAGE.**

**TAKE CARE DURING INSTALLATION TO PREVENT DAMAGE TO SEAL LIPS.**

**(Below)**

Attempting to install the Lip Seal over the unprotected piston rod end threads and onto the piston rod may result in damage to the inner lips, which will cause the seal to leak.



RISK OF DAMAGE TO SEAL  
INNER LIP FROM THREAD  
CRESTS



RISK OF DAMAGE TO SEAL  
INNER LIPS FROM PISTON ROD



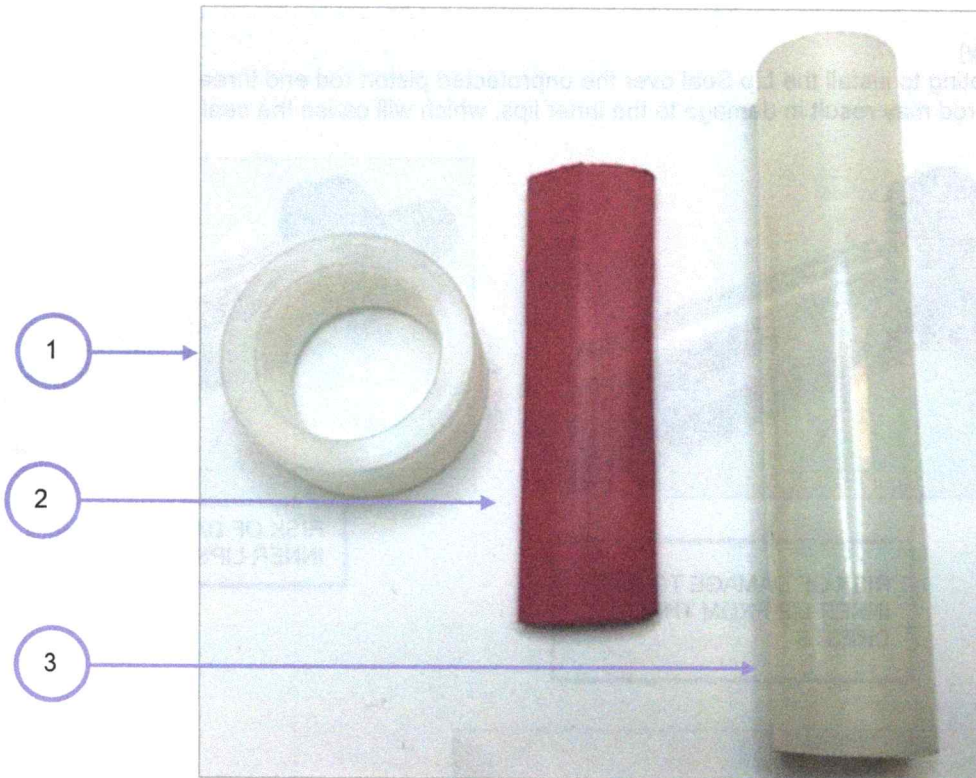
RISK OF DAMAGE TO SEAL  
OUTTER LIP FROM PISTON  
ROD GUIDE BUSHING.

**NOTE**



**MB AVIATION MAKES AVAILABLE THE FOLLOWING TOOLS TO AID IN THE INSTALLATION OF THE THORFLEX LIP SEAL INCLUDED ALONG WITH KIT P/N MB-03-1000 AND P/N MB-03-1001**

Lip seal installation tool kit:



Item	Description	Function/Use
1	Seal Compression Ring	Used to compress LIP SEAL outer lip into PISTON ROD GUIDE BUSHING.
2	Thread Sleeve	Installed over PISTON ROD threads and shoulder to protect LIP SEAL inner lip during assembly.
3	Push Tube	Used to push LIP SEAL through COMPRESSION RING onto PISTON ROD.

## **INSTALLATION AND ASSEMBLY PROCESS:**



### **CAUTION**

**SEAL ORIENTATION IS CRITICAL TO FUNCTION. ENSURE LIPS OF SEAL FACE THE PISTON HEAD.**



### **CAUTION**

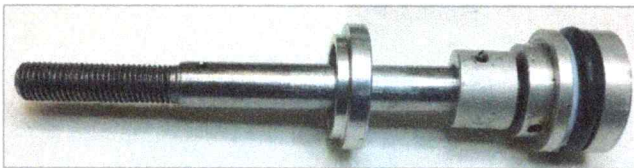
**ENSURE THAT WORK AREA IS CLEAN AND FREE OF ANY F.O.D**

The following assembly process is depicted incorporating the use of the recommended MB Aviation tooling.

The installation of the LIP SEAL into the PISTON ROD GUIDE BUSHING may be accomplished by alternate means, using best shop practices, however using the MB Aviation installation tools is recommended.

### **STEP 1**

- (a) Install PISTON ROD GUIDE BUSHING onto piston rod, as shown in Figure 1.
- (b) Insert COMPRESSION RING over piston rod and firmly seal it onto stepped end of PISTON ROD GUIDE BUSHING, as shown in Figure 2.
- (c) Install LIP SEAL with THREAD SLEEVE inserted into LIP SEAL bore over threaded end of PISTON ROD. Ensure that THREAD SLEEVE fully covers threads and PISTON ROD shoulder, as shown in Figure 3.
- (d) Apply a thin film of hydraulic fluid over piston rod.



**FIGURE 1** – Piston sub-assembly with PISTON ROD GUIDE BUSHING installed.

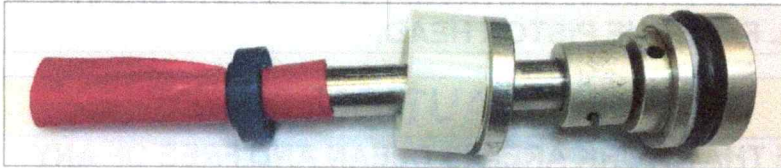


**FIGURE 2** – COMPRESSION RING installed onto PISTON ROD GUIDE BUSHING.



**CAUTION**

**ENSURE THAT SEAL LIPS FACE PISTON HEAD AS SHOWN.**



**FIGURE 3** – THREAD SLEEVE with LIP SEAL installed over piston threads and shoulder.

**STEP 2**

Using the PUSH TUBE, push LIP SEL through COMPRESSION RING into and firmly seat seal into PISTON ROD GUIDE BUSHING.



**FIGURE 4** – PUSH TUBE, used to push LIP SEAL onto piston rod and into compression ring into PISTON ROD GUIDE BUSHING.

**STEP 3**

Remove tooling from piston.

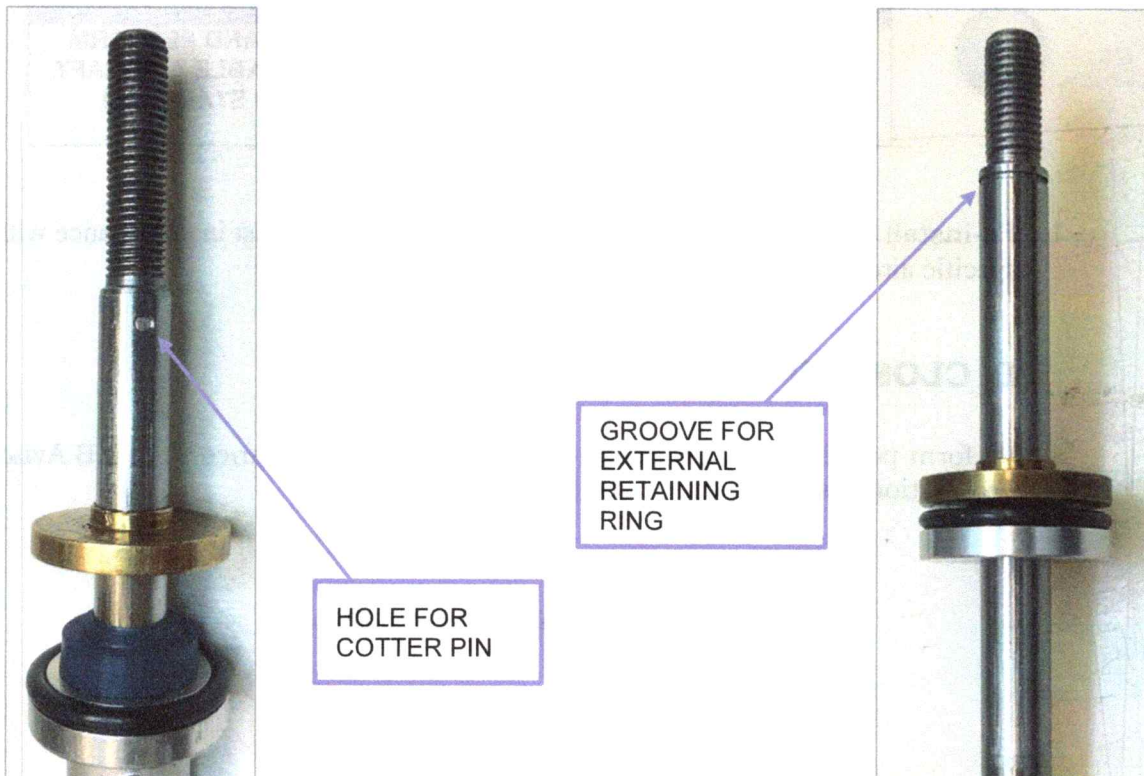


**FIGURE 5** – Once LIP SEAL is fully inserted into PISTON ROD GUIDE BUSHING, remove all tooling.



## STEP 5

Depending on the piston type, use either the MS24665-132 COTTER PIN or the MS16624-1037 EXTERNAL RETAINING RING and install on piston end. (Ref. Figure below).



## STEP 4

Complete re-assembly of BRAKE MASTER CYLINDER ASSEMBLY in accordance with aircraft maintenance manual requirements.

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## C. BRAKE MASTER CYLINDER RE-INSTALLATION PROCEDURE



### NOTE

PREPARE THE AIRCRAFT FOR MAINTENANCE AND PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE AIRCRAFT MAINTENANCE MANUAL PROCEDURES AND STANDARD PRACTICES.

1. Re-install the brake master cylinder on the aircraft and adjust in accordance with the specific aircraft model's AMM requirements and procedures.

## D. CLOSEOUT AND TESTING

1. Perform post installation check-out and test in accordance with MB Aviation production test procedure GTP-M20001-1.

-- END OF PROCEDURE --

## Contact

For additional information regarding the installation, servicing or other general inquiries contact Marsh Brothers Aviation:

Marsh Brothers Aviation Inc.,  
3225 Mainway,  
Burlington, ON L7M 1A6

Tel: 1-800-263-6242  
Email: [info@marshbrothersaviation.com](mailto:info@marshbrothersaviation.com)  
Website: [www.marshbrothersaviation.com](http://www.marshbrothersaviation.com)