

Beechcraft BE-33/BE35 Brake Master Cylinder Overhaul

(Paramount VV-15-625)

I hope the following will be helpful to those who take on the task of rebuilding the Beechcraft original equipment, Paramount VV-15-625 Master Cylinders. I have included pages from the original Beechcraft parts manuals and the Beechcraft shop/Service Manuals for the BE-33 Series but these should translate to the BE-35 Series as well. I have also included pictures of the parts required as well as close-ups when available. The O'rings are available from many sources; I used actual original equipment number O'rings, from the part numbers taken from the Beechcraft parts catalog for the BE-33 Series aircraft.

If you look at the Beechcraft parts catalog pages particularly page 110, (see pages 2 and 3 attached), which has the parts list by numbers, you will note that it curiously lists parts #5,#6,& #7 as "No Part number"?

While in reality, part number #7 is the same brass washer as part #2, (57G-107), and The O'rings, are part #5 (AN6227B-5) or MS28775-010) & #6 (AN6227B-10) or (MS28775-112) respectively. Those part numbers can be found in a later parts manual from 1984. (See pages attached 9 and 10).

From reading the two parts catalogs, it appears that the newer master Cylinder, VV-15-265-1 uses the exact same parts, but the piston rod is different and may be longer. According to another previous post listed on "CSO Beech", there is a reference made to this as well.

I did not make a step by step pictorial of the disassembly of the master Cylinder; however I did make a step by step of the re-assembly, and have provided those pictures, attached. I hope this information will be helpful to others who may undertake the rebuild task as well.

One final note, in reading a previous post on CSO Beech, there were a couple of references made to just leaving the master cylinder attached at the base and removing the snap ring and extracting the "GUTS" (rod, piston, upper wiper seals, etc), swapping out the O'rings and replacing the "Guts" back into the master Cylinder .

While this may work OK in theory and may serve as a temporary fix for a leak that needs to be stopped, I am sure that most would agree that to really do a good quality job, and by that I mean a thorough cleaning and perhaps honing of the Master Cylinder inner wall, including inspection of the piston rod (which has been found to be worn, scratched or may even be bent over time and usage, (ask me how I know that)! When I inspected the inside of my master cylinders, I found them to be brightly glazed, and found a rather thick layer of old 5606 mixed with, let's call it "Crud", for lack of a better term, on the bottom of the master cylinder.

I don't know about you, but if you just pull out the "GUTS", replace O'rings and stuff it all back together after years of use, wear and tear, I'm willing to bet that you may/might/probably would/most likely will, suck up some of that "CRUD". Thereby possibly breaking loose a glob of that "CRUD". That might find its way into the close tolerances of the tiny brass check valve assembly, even perhaps blocking the intake port which is very, very, very small, or even flushing that "Crud", further down the line toward the Wheel brake cylinders and calipers?

That being said, I am sure that it will be a personal choice to anybody who undertakes this rebuild repair process. Having observed a few dramatic, (is that a good word to use), approaches and landings at my local Airport by other Beechcraft Bonanza and Debonair owners, I can assure you that on more than one occasion, the moments after touchdown did involve the use of the aircraft's braking system which most of the time worked "Great", as designed. Nuff Said!

Assembly per Beechcraft shop manual

Pictures are attached in what I believe is an accurate order. Please follow Beechcraft manual instructions.

Picture 00 is the old piston and seals before starting the rebuild.



step00.jpg



step01.jpg



step02.jpg



step03.jpg



step04.jpg



step05.jpg



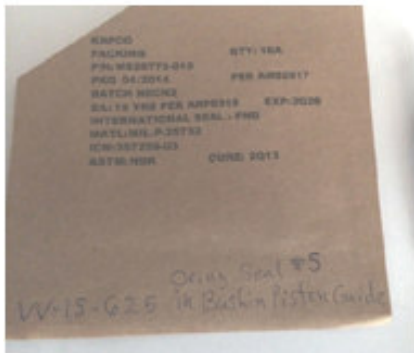
step06.jpg



step07.jpg



step08.jpg



step09.jpg



step10.jpg



step11.jpg



step12.jpg



step13.jpg



step14.jpg



step15.jpg



step16.jpg



step17.jpg



step18.jpg



step19.jpg

Beechcraft

A-33

33



B-33

PARTS CATALOG

33-590011-3
Issued Nov. 5, 1959

PUBLISHED BY
CUSTOMER SERVICE DIVISION
BEECH AIRCRAFT CORPORATION
WICHITA, KANSAS

33-590011-3B1
Revised: August 31, 1962

MODEL 33 PARTS CATALOG

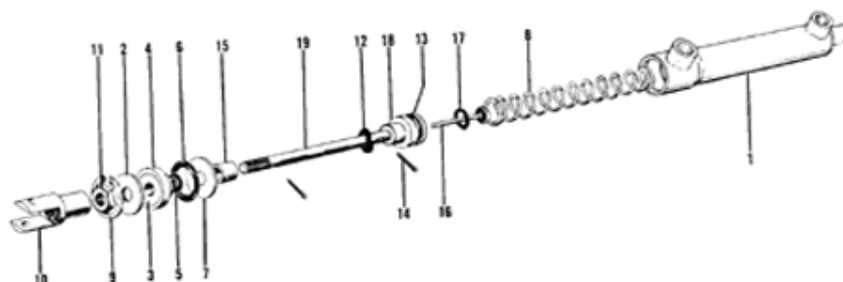


Figure 45. Brake Master Cylinder Assembly

33-24-43

FIG. & INDEX NO.	PART NO.	DESCRIPTION						UNITS PER ASSY	USABLE ON CODE
		1	2	3	4	5	6			7
45	0VV-15-625	CYLINDER ASSY, BRAKE MASTER /HMX/	.	.	.	.	.	.	REF
-	1 057G-104	• BRAZE ASSY, CYLINDER /HMX/	.	.	.	.	.	.	1
-	2 057G-107	• WASHER, RETAINING /HMX/	.	.	.	.	.	.	1
-	3 0109010	• WIPER, EQUI-FLEX ROD	.	.	.	.	.	.	1
-	4 057G-118	• BUSHING, PISTON GUIDE /HMX/	.	.	.	.	.	.	1
-	5 NO NUMBER	• RING, O /HMX/	.	.	.	.	.	.	1
-	6 NO NUMBER	• RING, O /HMX/	.	.	.	.	.	.	1
-	7 NO NUMBER	• WASHER	.	.	.	.	.	.	1
-	8 057G-111	• SPRING, RETURN /HMX/	.	.	.	.	.	.	1
-	9 05000-68	• RING, SNAP /WKI/	.	.	.	.	.	.	1
-	10 057G-105	• CLEVIS /HMX/	.	.	.	.	.	.	1
-	11 057G-115	• NUT, 1/4-28 STANDARD TRIM CHECK /HMX/	.	.	.	.	.	.	1
-	AN380C2-2	• PIN, COTTER	.	.	.	.	.	.	1
-	57G-103	• VALVE ASSY, MASTER CYLINDER /HMX/	.	.	.	.	.	.	1
-	12 3502-14-22-0511	• SPRING, VALVE /SH/	.	.	.	.	.	.	1
-	13 AN6227-9	• RING, O	.	.	.	.	.	.	1
-	14 57G-108	• PIN, COTTER /HMX/	.	.	.	.	.	.	1
-	15 57G-109	• COLLAR, VALVE /HMX/	.	.	.	.	.	.	1
-	16 57G-113	• VALVE /HMX/	.	.	.	.	.	.	1
-	17 AN6227-3	• RING, O	.	.	.	.	.	.	1
-	18 57G-116	• HEAD, PISTON /HMX/	.	.	.	.	.	.	1
-	19 057G-106	• ROD, PISTON /HMX/	.	.	.	.	.	.	1

Beechcraft

Debonair 33 Series

CD-1 Thru CD-1118 , CE-1 Thru CE-179

Bonanza 33 Series

CD-1119 Thru CD-1304 , CE-180 Thru CE-771 Except CE-748

CJ-1 Thru CJ-148

SHOP MANUAL

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33-590011-1C
Reissued: January 21, 1986

33-590011-1C17
Revised: May 22, 1989

k. After aligning the torque arm spacer and torque arm of the brake assembly on the backside of the landing gear torque flange, secure the brake assembly in place with the four attaching bolts, washers, and nuts.

l. Connect the hydraulic line to the elbow on the brake housing, and bleed the brake. The back fill method of pressure filling from the brake bleeder screw is recommended.

m. Install the wheel on the landing gear axle as described in the instructions previously outlined in this section.

CAUTION

When installing the wheel, carefully guide the ring disc into position between the brake linings to avoid possible damage to the linings. This means that the brake piston must be forced far enough back into the recess of the brake housing for the piston lining to clear the ring disc during this operation.

n. Apply the brake several times to seat the parts.

o. Release the brake and check to be sure that the wheel rotates freely.

DISASSEMBLY AND REASSEMBLY OF BEECH BRAKES (CD-1106 through CD-1271, CE-173 through CE-300, CJ-1 through CJ-30)

For disassembly and reassembly of brakes on the above airplanes, refer to BEECHCRAFT Supplementary Publications Manual 98-33281B or subsequent.

DISASSEMBLY AND REASSEMBLY OF CLEVELAND BRAKES (CD-1272 and after, CE-301 and after, CJ-31 and after)

For disassembly and reassembly of brakes on the above airplanes, refer to BEECHCRAFT Supplementary Publications Manual 98-35012 or subsequent.

BRAKE MASTER CYLINDER LINKAGE ADJUSTMENT

The proper linkage arrangement will adjust the brake pedals to a straight upright position. This is considered the best adjustment since it will prevent the pedals from hitting the firewall in their extreme forward position. Linkage adjustment is obtained by removing the clevis from the rudder pedal and turning the clevis on or off the piston rod as required. After both pistons are adjusted to the same length, tighten the jam nuts.

BRAKE MASTER CYLINDER REMOVAL AND INSTALLATION

a. Close the parking brake valve by pulling the parking brake control.

b. Unsnap the floor mat and remove the floor board section below the brake pedals.

c. Disconnect the two brake hydraulic lines at each master cylinder and mark each line to ensure correct installation.

d. Remove the master cylinder attaching bolts and nuts and remove the master cylinder.

e. If a new master cylinder is to be installed, note the position of the 45-degree elbow fittings.

f. Reinstall the master cylinder by reversing the removal procedure.

g. Replenish with hydraulic fluid (MIL-H-6506) and bleed the brakes.

BRAKE MASTER CYLINDER OVERHAUL

PARAMOUNT

DISASSEMBLY

a. Remove the snap ring (3) and pull the assembled piston from the housing (18).

b. Remove the clevis (1), nut (2) and cotter pin (11) from rod (16); this will allow the removal of retaining washer (4), rod wiper (5), guide bushing (6) and O-rings (7 & 8) from the piston rod.

c. Remove the piston (10) and O-ring (9) from the piston rod and remove the spring washer (15).

d. Remove cotter pin (12) from the valve stop (14) and remove the valve stop from the piston rod.

e. The valve assembly and spring will fall free of the housing with the piston assembly removed.

f. Clean all parts with solvent (PD680).

g. Check all parts for cracks, corrosion, distortion and wear.

ASSEMBLY

a. Lubricate all parts with hydraulic fluid (MIL-H-5606).

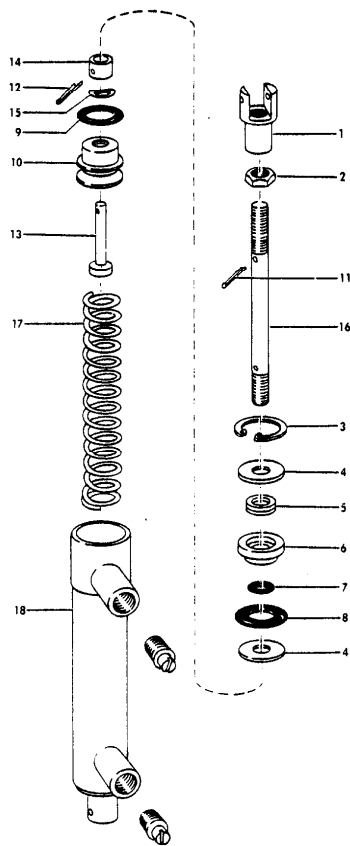
NOTE

Use new O-rings when assembling the master cylinder.

b. Install the valve assembly (13) and spring (17) into the housing.

c. Install the valve stop (14) and cotter pin (12) to the piston rod (16).

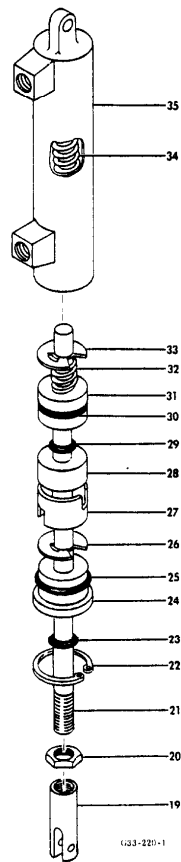
d. Install spring washer (15), O-ring (9) and piston (10) to the piston rod.



PARAMOUNT

PARAMOUNT

1. Clevis
2. Nut
3. Snap Ring
4. Retaining Washer
5. Rod Wiper
6. Guide Bushing
7. "O" Ring
8. "O" Ring
9. "O" Ring
10. Piston
11. Cotter Pin
12. Cotter Pin (Modified)
13. Valve Assembly
14. Valve Stop
15. Spring Washer
16. Piston Rod
17. Spring
18. Housing



GERDES

GERDES

19. Clevis
20. Lock Nut
21. Shaft
22. Snap Ring
23. "O" Ring
24. Cap End and Bearing
25. "O" Ring
26. Snap Ring
27. Collar
28. Spacer
29. "O" Ring
30. "O" Ring
31. Piston
32. Spring
33. Snap Ring
34. Spring
35. Housing

Figure 4-2. Brake Master Cylinders

Beechcraft

BONANZA

ILLUSTRATED PARTS CATALOG

33 }
A33 } (CD-1 THRU CD-387)

B33 (CD-388 THRU CD-813)

C33 (CD-814 THRU CD-1118)

E33 (CD-1119 THRU CD-1234)

C33A (CE-1 THRU CE-179)

E33A (CE-180 THRU CE-289)

BEECHCRAFT
BONANZA 33 THRU E33
ILLUSTRATED PARTS CATALOG

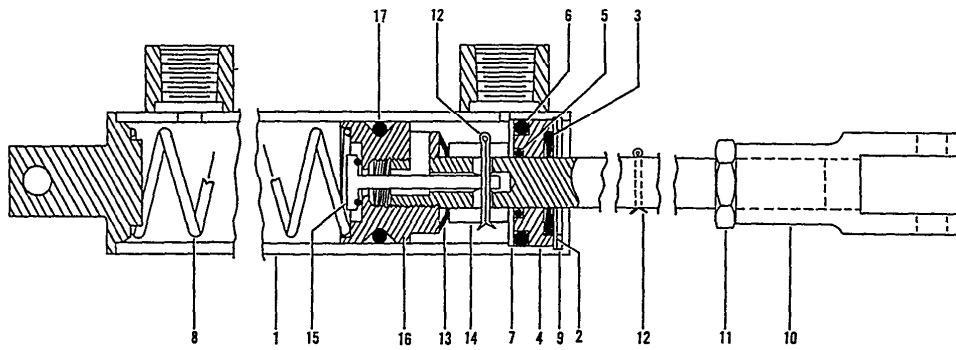


FIGURE 45. BRAKE MASTER CYLINDER

B E E C H C R A F T
 BONANZA 33 THRU E33
 I L L U S T R A T E D P A R T S C A T A L O G

FIG. & ITEM NO.	PART NO.	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		1 2 3 4 5 6 7		
45	VV15-625	CYLINDER ASSY, BRAKE MASTER.	4	1
	VV15-625-1	CYLINDER ASSY, BRAKE MASTER.	4	2
	96-380034-3	CYLINDER ASSY, BRAKE MASTER.	4	3
	A57G104	. BRAZE ASSY, CYLINDER	1	4
- 1	A57G393	. BRAZE ASSY, CYLINDER	1	3
	A57G107	. WASHER, RETAINING.	1	4
- 2	A57G395	. WASHER, RETAINING.	1	3
	A57G363	. WIPER, EQUI-FLEX ROD /SUPERSEDES 109010/	1	4
- 3	A57G401	. WIPER, EQUI-FLEX ROD	1	3
	A57G118	. BUSHING, PISTON GUIDE.	1	4
- 4	A57G399	. BUSHING, PISTON GUIDE.	1	3
	AN622785	. RING, O.	1	4
- 5	AN622786	. RING, O.	1	3
	AN6227810	. RING, O.	1	4
- 6	AN6227811	. RING, O.	1	3
	A57G107	. WASHER, RETAINING.	1	4
- 7	A57G395	. WASHER, RETAINING.	1	3
- 8	A57G111	. SPRING, RETURN	1	
	5000-68	. RING, SNAP	1	4
- 9	5000-77	. RING, SNAP	1	3
	A57G105	. CLEVIS	1	4
- 10	A57G400	. CLEVIS	1	3
	AN316-4R	. NUT, CHECK	1	4
- 11	AN316-5R	. NUT, CHECK	1	3
- 12	AN380C2-2	. PIN, COTTER.	2	
	A57G103	. VALVE ASSY, MASTER CYLINDER.	1	1
	A57G336	. VALVE ASSY, MASTER CYLINDER.	1	2
	A57G394	. VALVE ASSY, MASTER CYLINDER.	1	3
	3536-18	. WASHER, SPRING	1	4
- 13	3502-18-24-0511	. WASHER, SHAKEPROOF	1	3
	A57G109	. COLLAR, VALVE.	1	4
- 14	A50H011	. COLLAR, VALVE /SUPERSEDES A57G011/	1	3
	A57G113	. VALVE	1	4
- 15	A57G032	. VALVE	1	3
	A57G102	. PISTON & ROD.	1	1
	A57G334	. PISTON & ROD.	1	2
- 16	A57G396	. PISTON & ROD.	1	3
- 17	AN622789	. RING, O.	1	

CODES OF EFFECTIVITY

- | | |
|---------------------|----------------------|
| 1 CD-1 THRU CD-387 | 2 CD-388 THRU CD-905 |
| 3 CD-906 AND AFTER, | 4 CD-1 THRU CD-905 |
| CE-1 AND AFTER | |