PARKER HANNIFIN CORPORATION
AIRCRAFT WHEEL & BRAKE
AVON, OHIO

PARTS LIST

199-505 SEAL REPAIR KIT FOR

10-19, 10-19A, 10-19D, 10-19F, 10-19G,
10-20 & 10-20A MASTER CYLINDERS

PART NO.	DESCRIPTION	QUANTITY
095-01100	Washer – Seal, Rod	1
101-00700	O-Ring-Gland, MS28775-012	1
101-00800	O-Ring-Piston, MS28775-110	1
101-01100	O-Ring-Gland, MS28775-113	1

Notes:
1. Elastomeric cure date required per ESP3620

199-505
REV NC 03-01-84
REV A 05-15-00 (0312-96)

CM10-19
OVERHAUL INSTRUCTIONS FOR MASTER CYLINDERS

Cleveland
Wheels & Brakes

PARKER HANNIFIN CORPORATION
AIRCRAFT WHEEL & BRAKE
1160 Center Road
Avon, Ohio 44011 USA
ph: 1-800-272-5464
fax: (440) 937-5409

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1. MASTER CYLINDER APPLICABILITY

P/N's: 10-19, 10-22

2. INTRODUCTION

Refer to IPL, Figure 1 for component identification and seal repair kit bill of material (199-505 for 10-19, 199-507 for 10-22) for unit overhaul of the above noted master cylinders.

3. SPECIAL TOOLS. Tools not normally found in a mechanics / technician's toolbox.

- O-Ring extracting tool – 199-18 Extraction Tool Set, Parker Hannifin Corp., Aircraft Wheel & Brake

4. DISASSEMBLY

A. 10-19 Master Cylinder

CAUTION: SPRING (13) IS UNDER INSTALLED LOAD.

(1) Loosen and remove the nut (15), clevis (17), and washer (14) from the piston rod (3).

(2) Slide the spring (13) off the piston rod.

(3) Unthread the end gland (4) from the cylinder body (1) and gently slide the piston rod assembly (2) from the cylinder body.

CAUTION: SPRING (10) IS UNDER INSTALLED LOAD.

(4) Press and hold down the bushing (11) to compress the spring (10) and carefully remove the snap ring (12).

(5) Release the compressive load slowly and remove the bushing (11), spring (10), piston (8) and end gland (4).

(6) Remove the fittings (19).

(7) Discard the following which will be replaced by new components of 199-505: washer seal (7), piston O-ring (9), end gland O-rings (5), (6), washer (14), snap ring (12), and springs (10), (13).

B. 10-22 Master Cylinder

CAUTION: DO NOT REMOVE ROLL PIN (16) FROM THE PISTON ROD (3A).

(1) Use a snap ring removal tool and remove the snap ring (18).

(2) Gently pull the piston rod assembly (2) from the cylinder body (1A).

CAUTION: SPRINGS (10), (13) ARE UNDER INSTALLED LOAD.

(3) Press and hold down the bushing (11) to compress the springs (10), (13) and carefully remove the snap ring (12).

(4) Release the compressive load slowly and remove the bushing (11), spring (10), piston (8A), washer seal (7), end gland (4A), spring (13), and washer (14).

(5) Discard the following which will be replaced by new components of 199-507: washer seal (7), piston O-ring (9A), end gland O-rings (5), (6A), washer (14), snap rings (12), (18), and springs (10), (13).

5. CLEANING

A. Clean all metal parts with mineral spirits or equivalent commercially available mineral base solvents.

B. Blow low pressure, clean shop air through all internal passages and ports to ensure they are free of foreign material.

C. Use only clean, dry lint free shop towels, (cloth or paper).

6. INSPECTION

CAUTION: THE O-RINGS CANNOT PROPERLY SEAL IN OVERSIZE BORES OR AGAINST SEALING SURFACES THAT HAVE DEEP SCRATCHES. THIS CAN CAUSE FLUID LEAKAGE AND LOSS OF HYDRAULIC PRESSURE.

A. Visually inspect all components for wear, scoring, cracks, chips, nicks, burrs, pitting, corrosion, flaws, stripped or scored threads and other damage.

B. Inspect the cylinder body (1), (1A) bore area; piston (8), (8A) O.D. and end gland (4), (4A) O.D. for scratches. Replace components that are excessively scratched.

C. Piston rods (3), (3A) that are bent, have defective threads or a bent roll pin (16) are to be replaced.

D. Discard bent or corroded springs (10), (13). Replace components that exceed the following limits:

- Piston bore diameter for item (1): 0.564" maximum; item (1A): 0.751" maximum.
- Piston rod (3), (3A) outside diameter: 0.3707" minimum.
- Spring free length for item (10): 0.490" minimum; item (13): 4.125" minimum.

7. REPAIR. Repair is limited to the cylinder body (1), (1A) and the piston rod (3), (3A) areas specified below. Use #600 grit or finer, wet or dry aluminum oxide paper.

A. Cylinder body (1), (1A): Polish out small nicks and scratches on exterior of cylinder body and bore. Finish must be 16 RMS or better in cylinder bore. Clean with a water-based cleaner/degreaser per AMS 1526 or equivalent.

(1) Treat repaired areas of the aluminum cylinder body (1) with Alodine 1200 or equivalent per MIL-C-5541, Class 1A.

B. Piston rod (3), (3A): Polish or burnish out small scratches on stainless steel rod O.D. Finish must be 16 RMS or better.

8. REASSEMBLY. Reassemble in the reverse order of disassembly.

CAUTIONS:

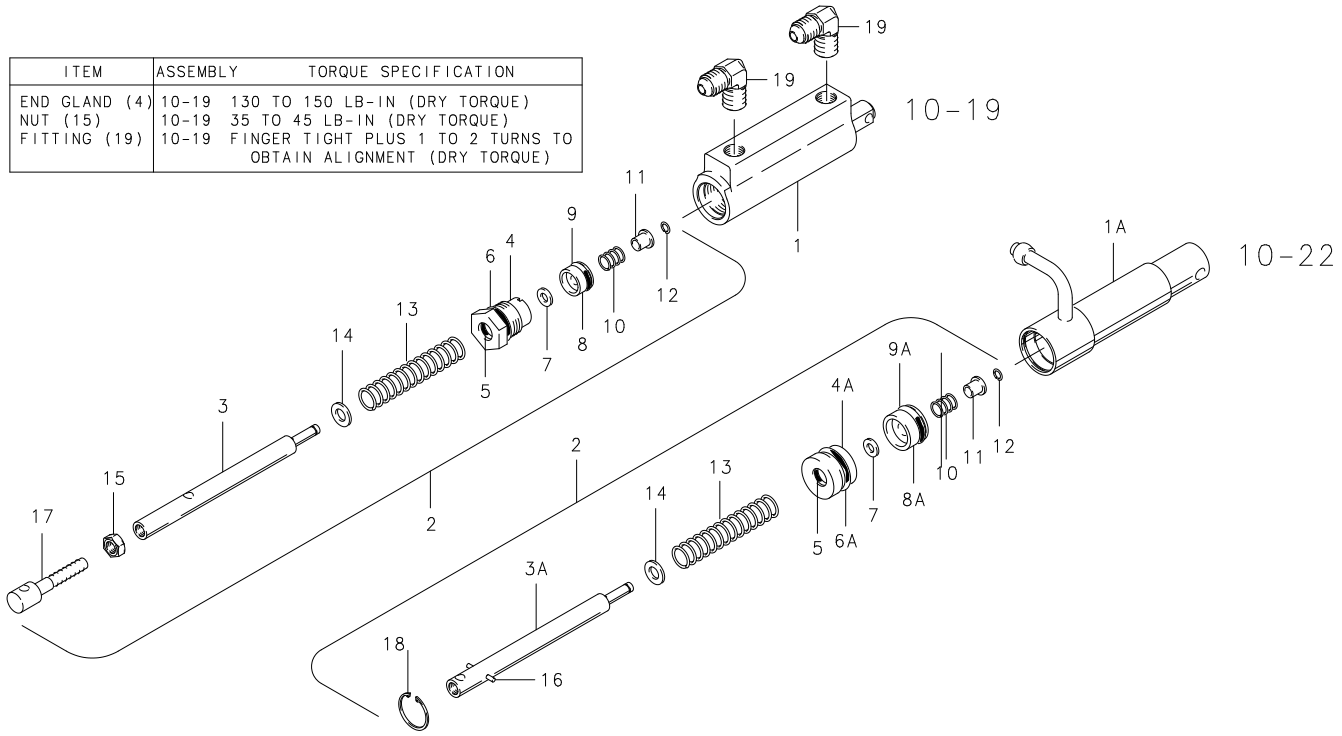
- DO NOT OVERSTRETCH AN O-RING. OVERSTRETCHING CAN CAUSE SMALL SPLITS AND TEARS. THIS CAN RESULT IN FLUID LEAKAGE AND THE LOSS OF HYDRAULIC PRESSURE.
- INSTALL SNAP RING (12) WITH SHARP EDGE AWAY FROM THE BUSHING (11).
- INSTALL SNAP RING (18) WITH SHARP EDGE AWAY FROM THE END GLAND (4A).

A. Prior to assembly, coat all O-rings (5), (6), (6A), (9), (9A) with Dow Corning 55-O-ring compound to facilitate installation and sealing.

B. Apply a coating of hydraulic brake fluid (MIL-H-5606) to bore of the cylinder body.

C. Apply a light coat of Lubon #404 (or equivalent) thread lubricant and sealant to the first three threads of each fitting (19).

D. Screw the fittings (19) into the assembly to achieve a hand tight fit. Tighten the fitting an additional one to two turns to secure and achieve the desired orientation. Remove any excess thread lubricant from the assembly.



IPL Figure 1 Master Cylinder Assembly

Figure Item	Part Number	Nomenclature	10-19	10-22	199-505 (10-19)	199-507 (10-22)
1	144-01204	•Cylinder Body	1	--	--	--
1A	189-00900	•Cylinder Assembly	--	1	--	--
2	182-00300	•Piston Rod Assy	1	--	--	--
	182-00700	•Piston Rod Assy	--	1	--	--
3	142-00500	••Piston Rod	1	--	--	--
3A	142-00900	••Piston Rod	--	1	--	--
4	141-00500	••End Gland	1	--	--	--
4A	141-01000	••End Gland	--	1	--	--
5	101-00700	••O-Ring, Gland (MS28775-012)	1	1	1	1
6	101-01100	••O-Ring, Gland (MS28775-113)	1	--	1	--
6A	101-01200	••O-Ring, Gland (MS28775-114)	--	1	--	1
7	095-01100	••Washer Seal, Rod	1	1	1	1
8	148-00900	••Piston	1	--	--	--
8A	148-00901	••Piston	--	1	--	--
9	101-00800	••O-Ring, Piston (MS28775-110)	1	--	1	--
9A	101-01100	••O-Ring, Piston (MS28775-113)	--	1	--	1

Figure Item	Part Number	Nomenclature	10-19	10-22	199-505 (10-19)	199-507 (10-22)
10	082-00800	••Spring	1	1	1	1
11	145-01500	••Bushing	1	1	--	--
12	155-00500	••Snap Ring	1	1	1	1
13	082-00900	••Spring	1	1	1	1
14	095-10200	••Washer (AN960-416L)	1	--	1	--
	095-10600	••Washer (AN960-616)	--	1	--	1
15	094-03000	••Nut, Jam (AN316-4)	1	--	--	--
16	223-00100	••Roll Pin	--	1	--	--
17	143-00400	••Clevis	1	--	--	--
18	155-01000	•Snap Ring	--	1	--	1
19	104-00400	•Tube Fitting (MS20822-4D)	2	--	--	--

9. TEST PROCEDURE. Failure of the unit to perform any one of the following tests is cause for rejection.

A. See Figure 2. Support the unit in a test fixture. Attach appropriate plumbing, and test fixture hardware. Service with hydraulic fluid being used on aircraft.

B. Bleed all air from the assembly.

C. Actuate the rod manually for full length of stroke a minimum of two [2] times.

(1) Rod shall return to free length position independently.

D. With rod (3), or (3A) in fully relaxed position, connect a pressure source to the outlet port and apply 2 to 10 psi.

(1) Fluid shall flow freely from the inlet port.

E. Position rod at approx. ¼ to ½ of the available stroke. Apply 900 psi to the outlet port and hold for 15 seconds.

(1) There shall be no leakage from inlet port, from the cylinder body (1) or (1A), or from the rod gland area.

F. Plug the inlet port and apply 10 to 20 psi to outlet port. Hold for 20 to 30 seconds.

(1) There shall be no leakage around the rod or gland area.

(2) If cylinder fails to hold pressure or if leakage is seen; disassemble and check O-rings for cuts, scratches, abrasions, dirt or contamination around the O-rings.

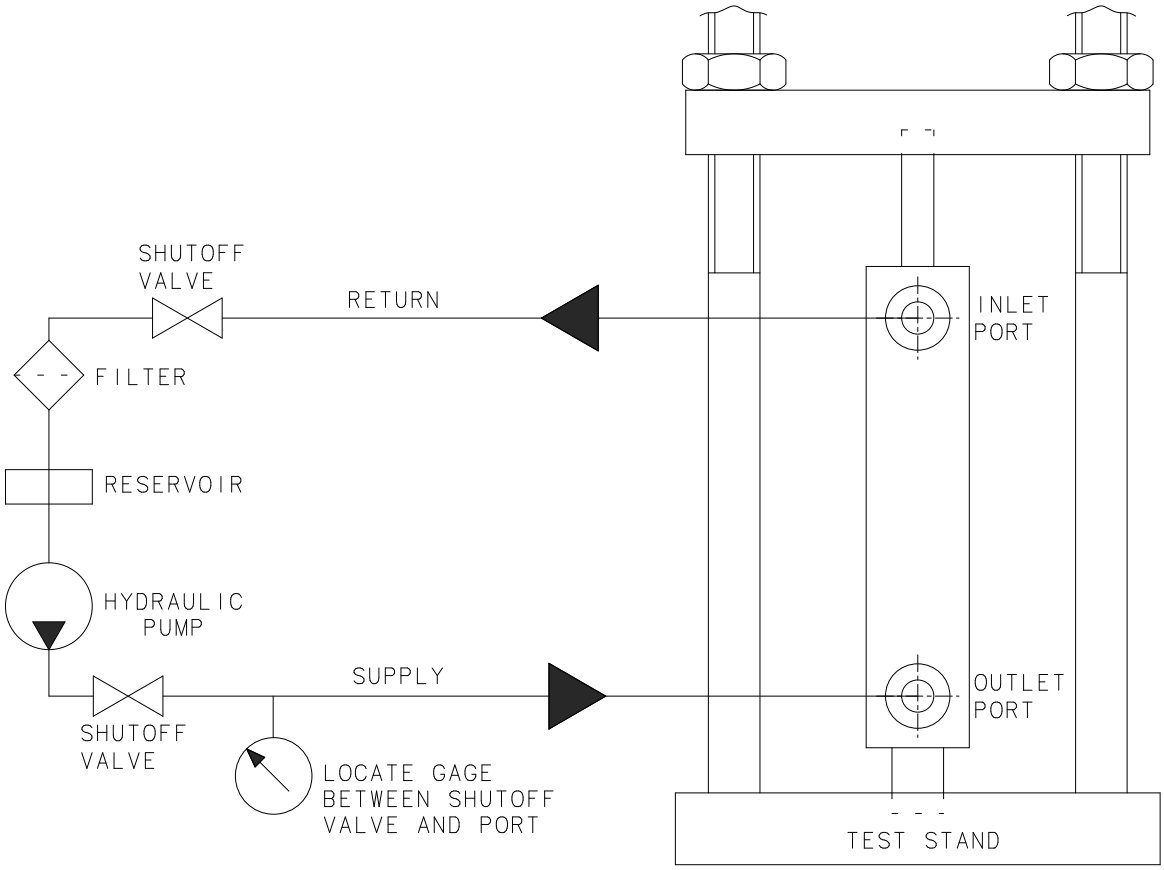


Figure 2 Test Setup