AIRCRAFT WHEEL & BRAKE DIVISION
PARKER HANNIFIN CORPORATION
AVON, OHIO

PARTS LIST

199-50000 SEAL REPAIR KIT

FOR

015-00100, 015-00101, and 015-02000 SHIMMY DAMPERS

PART NUMBER	CODE NO.	DESCRIPTION	QUANTITY
095-02600	095-02600	Stat-O-Seal Washer	1
100-10145	100-10145	Back-up, Single Turn, Retainer-ring (Piston) (MS28774-116)	2
100-20008	100-20008	Back-up, Double Turn, Retainer-ring (Piston Rod –Gland) (MS28782-8)	1
101-00800	101-00800	O-ring (Piston Rod –Gland) (MS28775-110)	1
101-01400	101-01400	O-ring (Piston and Gland) (MS28775-116)	3

Publication Package (P/N PP199-50000)

199-500 P/L	----------	Parts List for 199-500 Kit (This Document)	1
CM 15-1	----------	Component Maintenance Manual for 15 Series	1

NOTES:

1. Elastomeric cure date required per ESP3620.
2. This Service Kit will overhaul one 015-00100, 015-00101, or 015-02000 Damper Assembly.

199-500
REV. NC 11-11-1982(271-16)
Rev A 05-15-2000 (0312-96)
Rev B 10-30-2007 (0375-96)

Cleveland
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CM15-1
OVERHAUL INSTRUCTIONS FOR SHIMMY DAMPERS

SHIMMY DAMPER APPLICABILITY: (Units With Partial Hydraulic Fluid Charge)

P/N's: 015-00100, 015-00101, 015-02000

INTRODUCTION:

Refer to IPL, Figure 2 for component identification. A prepackaged kit (199-500) contains the rings and seals required for unit overhaul of the above noted shimmy dampers.

SPECIAL TOOLS: Tools not normally found in a Mechanics / Technician's toolbox.

- Snap ring pliers (external type) - commercial source
- O-Ring extracting tool – 199-18 Extraction Tool Set, Parker Hannifin Corp., Aircraft Wheel & Brake
- Fabricated Tools (see Figure 2)

DISASSEMBLY:

CAUTION: EXCESSIVE JAW PRESSURE WILL BIND PISTON AND DAMAGE UNIT.

NOTE: Remove and discard all O-rings (3, 6), back-up rings (4, 7) and stat-o-seal (9).

a. Remove unit from aircraft, wrap with cloth and gently secure unit in a bench vise (with protective jaws) with rod end in an "up" position.
b. Draw piston rod assembly (2) up until rod is in the fully extended position.
c. Remove rod end (supplied by airframe manufacturer) from piston rod assembly.
d. Using snap ring pliers, remove the snap ring (11) from the piston rod end of cylinder (1).
e. Grasp piston rod firmly with hand and using gradual pressure outward, remove the piston rod assembly (2) and end cap bearing (5) from the cylinder body (1).

   NOTE: If the piston or piston rod are damaged, or if the piston rod is found to be non-repairable, discard piston rod assy (2).

f. Remove any burrs or wrench damage from end of rod and slide end cap bearing (5) off of rod.
g. Remove cylinder body from vise and dispose of remaining fluid left in the unit.
h. Using snap ring pliers, remove snap ring (11) securing end cap (8) and remove end cap.

CLEANING:

CAUTION: THE CYLINDER BODY (1) MAY HAVE A WATER REDUCIBLE FINISH (COLUMBIA PAINT CORP.) AND THE USE OF SOLVENTS SUCH AS MINERAL SPIRITS WILL REMOVE THE FINISH AND ARE NOT RECOMMENDED.

Degrease all metal parts with a water based cleaner/degreaser that meets or exceeds AMS1526. Blow low pressure, clean shop air thru all internal passages and ports to ensure they are free of foreign material.

INSPECTION: Replace any damaged components.

- Visually inspect all components for excessive wear, scoring, cracks, chips, nicks, scratches, burrs, pitting, corrosion, flaws, stripped or scored or otherwise defective threads and other obvious signs of damage.
- Visually inspect the cylinder body (1) bore for nicks, scratches or signs of excessive wear.
- Visually inspect the piston rod assembly (2). Piston rod assemblies that exhibit excessive, scratches, wear, or deformation from excessive loading (in excess of .005 inch runout) are to be removed from service. Piston rods that are excessively scratched, bent or have defective threads are to be removed from service.
- Inspect end cap (8) for signs of excessive side loading. Result of extreme side loading to end cap will be elongation or deformation of ∅.375 thru hole and necessitates replacement of end cap (8).
- Replace nut (16) on clamp assy (12) if locking feature is damaged or destroyed.

REPAIR: Repair is limited to the cylinder body (1) and the piston rod of the piston rod assembly (2).

Piston rod assy (2): Polish or burnish out small scratches on stainless steel rod O.D. using #400 grit or finer, wet or dry aluminum oxide paper. Finish must be 16 RMS or better. Repair of piston is prohibited.

Cylinder body (1): Polish out small nicks and scratches on exterior of cylinder body using #400 grit or finer, wet or dry aluminum oxide paper. Clean with a water-based cleaner/degreaser per AMS 1526 or equivalent. Treat repaired areas with alodine 1200 or equivalent per MIL-C-5541, Class 1A. Mask or plug cylinder bore and apply primer and topcoat to the repaired areas on the outside of the cylinder body per Table 1.

Table 1

MANUFACTURER	PRIMER	TOPCOAT	DRY FILM THICKNESS AND DRYING TIMES (AIR)
Sherwin Williams Co. Cleveland, OH	2 parts washcoat (P/N P60G2) 3 parts catalyst reducer (P/N R7K44)	6 parts base (P/N F63W13) 1 part catalyst (P/N V66V27) Thin using up to 20% polane reducer (P/N R7K84).	Primer: .0002-.0004 in. 3-10 minutes (to touch) 10-60 minutes (to topcoat) Topcoat (including primer): .0008-.0014 in. 20 minutes (to touch) 60 minutes (to handle) 24 hours (dry hard)
Columbia Paint Corp. Huntington, WV	P/N 11-347Z (water reducible) No mixing required.	P/N 11-358A (water reducible) No mixing required. It is desirable to apply topcoat without thinning, however, topcoat material may be thinned up to 10% by volume with either water (use distilled) or a mixture of 4 parts water to 1 part butyl cellosolve..	Primer: .0002-.0005 in. 15 minutes min. (to touch) 15-60 minutes (to topcoat) Topcoat (including primer): .0008-.0014 in. 15 minutes (to touch) 30 minutes (to handle) 48 hours (dry hard)

ASSEMBLY: Refer to Figure 1 for reference.

Prior to assembly, liberally coat O-rings (3), and (6) with Dow Corning 55-O-ring Compound (not furnished in kit) to facilitate installation and sealing. Also coat bores, rod ends, and wrench flats to prevent O-ring damage. Assemble as follows:

a. Install O-ring (3) on O.D. groove of piston between the two single turn backup rings (4).
b. Install O-ring (3) on O.D. groove of end cap bearing (5). Install O-ring (6) and back-up ring (7) in I.D. groove of end cap bearing. Refer to Figure 1 for orientation of O-ring (6) and back-up ring (7).

CAUTION: USE ASSEMBLY BULLET TOOL TO PREVENT THE POSSIBILITY OF CUTTING THE O-RING (6) AND BACKUP RING (7) IN THE END CAP BEARING WHEN SLIDING PAST THE CLEVIS END OF THE PISTON ROD ASSEMBLY. A LIBERAL COAT OF DOW 55 ON THE SEAL AND THE ROD END HELPS AVOID O-RING DAMAGE.

c. Thread assembly bullet (see Figure 2) into clevis end of piston rod assy and slide end cap bearing (5) over piston rod and then coat cylinder bore liberally with MIL-H-5606 hydraulic fluid.
d. Insert piston rod assy (2) into cylinder body being careful not to cut O-rings or back-up rings.
e. Secure end cap bearing (5) with snap ring (11) – sharp edge out (refer to Figure 1).
f. Extend piston rod assy (2) to the fully extended position and then place unit, rod side down, in a bench vise (with protective jaws) or suitable holder to aid in filling.

CAUTION: THIS IS A PARTIAL HYDRAULIC FLUID CHARGED SHIMMY DAMPER. OVERFILLING UNIT WILL COMPROMISE ITS PERFORMANCE.

g. Pour 36 ml or 1.1 to 1.2 oz. Of MIL-H-5606 hydraulic fluid into cylinder body.
h. After filling, install O-ring (3) on end cap (8).
i. Place stat-o-seal (9) on filler/bleeder screw (10) and install screw onto end cap and snuggly tighten (final torque following test procedure is 25 – 30 in-lb).
j. Install end cap (8) into cylinder body and secure with snap ring (11) – sharp edge out (refer to Figure 1).
k. Test unit per testing procedure.
l. If previously removed, reinstall clamp assy (12).
m. Reinstall shimmy damper on aircraft on reverse order that unit was removed. Torque clamp assy nut to 30 – 45 in-lb.

TESTING: Failure of the unit to perform any one of the following tests is cause for rejection.

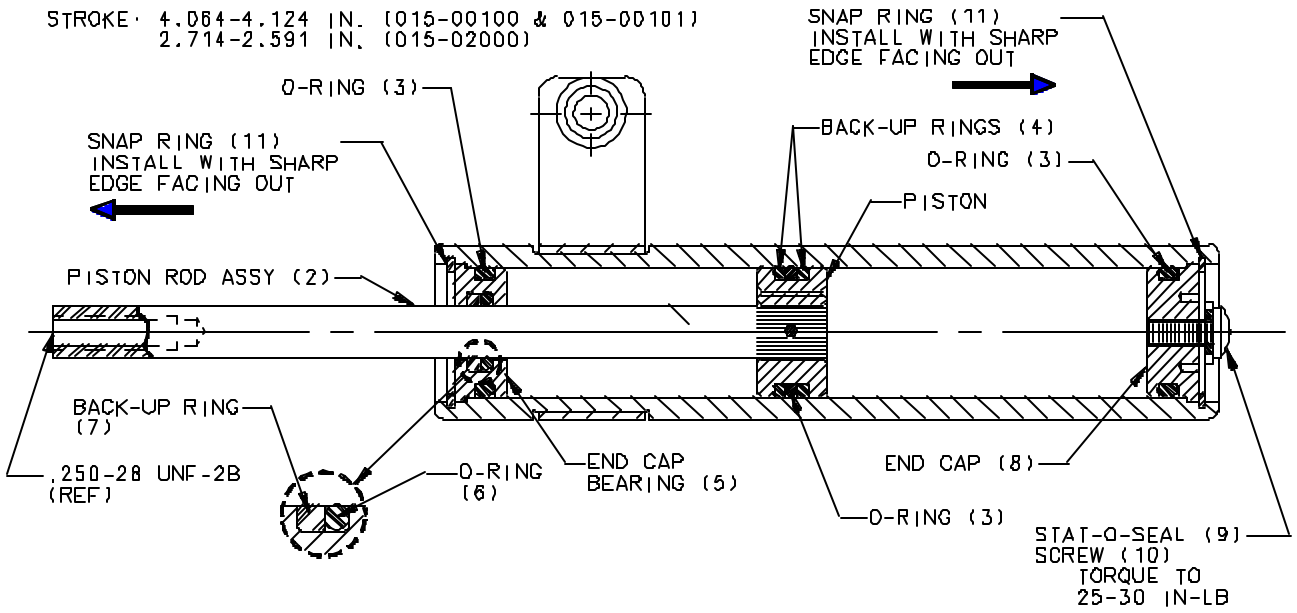
NOTE: A fabricated device to aid in compression and stroking will be required to perform the test. Refer to Figure 2. Refer to Figure 1 for stroke parameters

To achieve full retraction of the piston rod assy (2), the unit must be bled as follows:

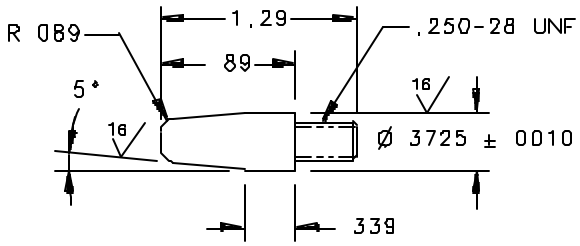
Remove unit from vise. Loosen filler/bleeder screw (10) approximately 2-1/2 – 3 turns. Grasp cylinder body with hand and compress piston rod assy (2) to the fully retracted position. When piston contacts end cap (8) (fully retracted), torque filler/bleeder screw (10) against end cap (8) to 25 – 30 in-lb.

Support the unit in a test fixture or other suitable means and test as follows:

Hand stroke unit a minimum of two complete strokes to demonstrate satisfactory rod movement/or stroking. A lag of ½ inch is acceptable at the beginning of the retraction stroke. During the test there shall be no sign of any external leakage. Rod movement must be free from any indication of binding.

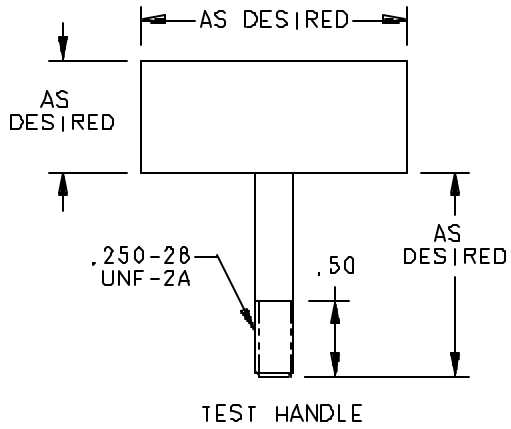


Shimmy Damper– Figure 1



NOTES: (FOR BULLET)

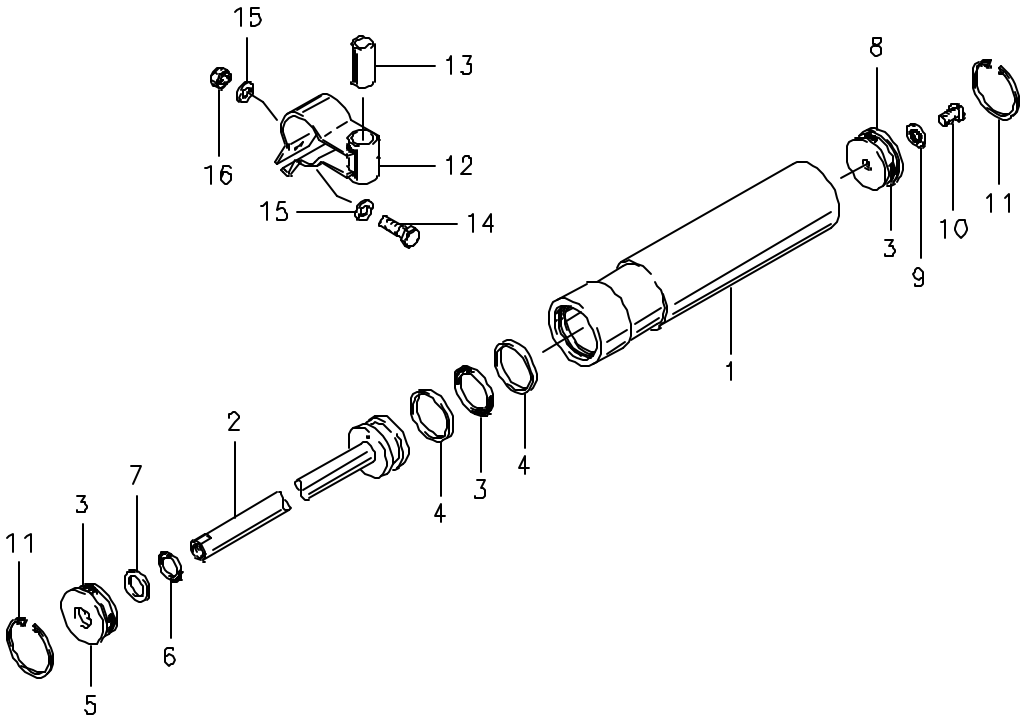
1. MATERIAL, ALUM 2024-T6
2. TOLERANCES UNLESS OTHERWISE SPECIFIED:
   .XXX ±.010 IN.
   .XX ±.03 IN.
3. BREAK UNSPECIFIED SHARP EDGES .005-.015



NOTES: (FOR HANDLE)

1. MATERIAL, 4130 STEEL
2. TOLERANCES UNLESS OTHERWISE SPECIFIED:
   .XXX ±.010 IN.
   .XX ±.03 IN.
3. BREAK UNSPECIFIED SHARP EDGES .005-.015

Fabricated Tools– Figure 2



Shimmy Damper Assembly
IPL - Figure 3

DETAILED PARTS LIST

Item #	Part Number	Description	Qty. Per Assembly	Qty. For 199-500
1	144-06600	Cylinder Body (ALL)	1	--
2	182-03800	Piston Rod Assembly (015-00100 and 015-00101)	1	--
	182-07400	Piston Rod Assembly (015-02000)	1	--
3	101-01400	O-Ring (MS28775-116) (ALL)	3	3
4	100-10145	Back-Up Ring (MS28774-116) (ALL)	2	2
5	141-04300	End Cap Bearing (ALL)	1	--
6	101-00800	O-Ring (MS28775-110) (ALL)	1	1
7	100-20008	Back-Up Ring (MS28782-8) (ALL)	1	1
8	141-04200	End Cap (ALL)	1	--
9	095-02600	Stat-O-Seal (ALL)	1	1
10	102-20400	Screw (MS51958-59) (ALL)	1	--
11	155-01100	Snap Ring (ALL)	2	--
12	185-00200	Clamp Assembly (ALL)	1	--
13	145-07900	Bushing (ALL)	1	--
14	103-00100	Bolt (AN3-5A) (ALL)	1	--
15	095-13100	Washer (AN960C10) (ALL)	2	--
16	094-10200	Nut (AN364-1032) (ALL)	1	--
	CM15-1	O/H Instructions for P/N's: 015-00100, 015-00101, 015-02000	--	1

Notes:

1. 015-00101 identical to 015-00100 except that the piston rod assy (2) exits the cylinder from the opposite end as shown.