



Customer Support Commercial

SERVICE BULLETIN

FLIGHT CONTROLS	ELEVATOR POWER CONTROL UNIT (PCU)	INSPECT, CLEAN, GREASE ROD END, AND TAILSTOCK BEARINGS; INTRODUCE 376100-1009 CONFIGURATION.
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REVISION TRANSMITTAL SHEET

This page transmits Revision 2 for Service Bulletin 376100-27-306.

SUMMARY:

This revision is sent to include Bombardier part numbers and add clarification text.

No additional work is required for parts previously modified by prior issue of this service bulletin.

Page 1, Paragraph 1. A. - Added Bombardier part numbers.

Page 1, Paragraph 1. C. (2) - Added Bombardier part number.

Page 5, Paragraph E. - Added Bombardier part number.

Page 5, Paragraph B.1. - Added clarification text.

Page 5, Paragraph B.(2). - Added instruction text.

Page 6, Paragraph B.(3). - Added instruction text.

Page 6, Paragraph E. (1) - Added Bombardier part number.

REVISION HISTORY:

Initial Issue	Feb/2008
Revision 1	Oct 3/1999
Revision 2	Oct 17/2008

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1. PLANNING INFORMATION

A. Effectivity

This Service Bulletin is applicable to the Parker Elevator PCU, part numbers 376100-1005, -1007 (Bombardier part numbers GT411-3800-5, -7), Serial numbers 0615 and previous, excluding the serial number listed in Appendix A.

B. Concurrent Requirements

Not Applicable.

C. Reason

- (1) Service centers have reported instances of bearing stiffness or seizure in the Elevator PCU rod end assembly and tailstock bearing assembly. Analysis of the affected bearings indicate that corrosion of the bearing and also externally-induced contaminants have collected between the bearing ball and the rod end body of the rod end assembly and the bearing ball and race of the tailstock bearing assembly. This condition results in excessive loading that may cause premature wear of the actuator piston rod seal and the pivot connection with the aircraft. Cleaning and greasing of serviceable bearings will extend the operational life.
- (2) A new configuration Elevator PCU, P/N 376100-1009 (GT411-3800-9), incorporating improved bearings has also been qualified.

D. Description

- (1) Part 1 – (For fielded elevator PCU actuators)

This service bulletin describes a procedure to clean and inspect bearings on the Elevator PCU's, P/N 376100-1007 and prior. Units meeting the inspection criteria are to be greased and returned to service. Periodic inspection of the bearings will be performed at an interval to be specified in Bombardier service documentation.

For units not meeting the inspection criteria or requiring other repair activity, instructions are provided to return Elevator PCUs to Parker for repair or modification, testing, and re-identification, as required.

- (2) Part 2 – (For elevator PCU actuators in the component Repair Station)

OPTION 1

Modify elevator PCUs to the 376100-1009 configuration by incorporating the improved and greased bearings.

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(2) Part 2 – (Continued)

OPTION 2

Repair and lubricate bearings on elevator PCUs having bearings free of the damage conditions described herein, maintaining the 376100-1007 configuration level.

E. Compliance

It is recommended that this service bulletin be accomplished at the next maintenance opportunity or as directed by Bombardier Aerospace service documentation.

F. Approval

This service bulletin has been approved by Bombardier Aerospace, and the repairs and modifications herein are applicable to the Global Express-Series aircraft.

G. Manpower

This modification to 376100-1009 may be accomplished, by a crew of one (1) in the following approximate man-hours:

NOTE: This service bulletin assumes the Elevator PCU has been removed from the aircraft.

WORK PHASES	MAN-HOURS
Remove and replace rod end and tailstock bearings per Component Maintenance Manual (CMM), 27-31-21.	2.0
Test Elevator PCU per CMM 27-31-21.	2.5
Final detail and re-identify.	0.5
Total Man-Hours	5.0

H. Weight and Balance

None.

I. Electrical Load Data

Not affected.

J. Software Accomplishment Summary

Not applicable.



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K. References

Parker Hannifin Corporation, CMM 27-31-21.

L. Other Publications Affected

This service bulletin will be incorporated into the Parker Hannifin Corporation CMM 27-31-21 at the next revision.

M. Interchangeability or Intermixability of Parts

376100-1005, -1007, and -1009 are all functionally interchangeable and intermixable, however the -1009 is preferred.

2. MATERIAL INFORMATION

A. Material Price and Availability

Elevator PCU's may be returned to Parker Hannifin Customer Support for modification to -1009 configuration. Forward Elevator PCU's to the address listed below:

NOTE: Elevator PCU's with failures not related to this service bulletin are not covered by the provisions of this Service Bulletin.

PARKER HANNIFIN CORPORATION	PHONE:	(949) 833-3000
Customer Support Inc.	FAX:	(949) 809-8390
14300 Alton Parkway	REPAIR STATION NO.:	AU4R063M
Irvine, California 92618		
USA		

B. Industry Support Information

Units under warranty will be free of charge. Price to perform mod 2 of this service bulletin for units out of warranty is \$4500 USD. The provisions contained in this service bulletin are valid for 18 months after the initial issue date of this service bulletin, and apply only to the modification described herein. Charges may apply for additional work necessary to meet serviceable requirements per the CMM. After that date, please request a quotation from Parker Hannifin Customer Support.

C. Material Necessary for Each Elevator PCU

(1) Parts required in to modify one Elevator PCU, 376100-1005, -1007 to -1009 are indicated in Table 1.

NOTE: If the bearing race in the rod end assembly or tail stock does not meet the criteria in the Accomplishment Instructions, return the entire Elevator PCU to Parker for modification.

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Parts Required, Table 1

NEW P/N	KEY WORD	OLD P/N	QTY	DISPOSITION
376149-103	Rod End Assembly	376149-101	1	Scrap or Repair (Note 2)
376149-1 (Note 1)	Rod End Ball	Same	1	Scrap
376148-103	Tailstock Bearing Assembly	376148-101	1	Scrap
376148-1 (Note 1)	Tailstock Ball	Same	1	Scrap
376101-3	Nameplate	Same	1	Scrap
202097-98	Huck Bolt	Same	1	Scrap
NAS1080C08	Huck Collar	Same	1	Scrap
Nas1448-18	Huck Bolt	Same	1	Scrap
Nas1080E08	Huck Collar	Same	1	Scrap
MS24665-153	Cotter Pin	Same	1	Scrap

Note 1: Balls are included with the rod end assembly and tailstock bearing assembly. Balls may be procured separately, if required. The two ball part numbers are intermixable and interchangeable.

Note 2: New part number applies to modifications to 376100-1009; Old part number applies to repaired 376100-1007.

- (2) The following materials and/or equipment must be procured from operator's stock or sources are indicated in Table 2:

Operator's Stock or Sources, Table 2

NOTE: Equivalent substitutes may be used for items listed below.

NOMENCLATURE	PART NO./TYPE	SOURCE
Stiff Bristle Brush	Federal Specification H-B-1490 Non-Metallic, Soft/Stiff Bristle Brush	Commercially Available
Isopropyl Alcohol	Federal Specification, TT-I-735	Commercially Available
Scrubbing Pad	Scotchbrite pad or Steel Wool Grade 00 or 000	Commercially Available
Grease	Tribolube 64 RPC (preferred) or RPA	Commercially Available

- D. Material Necessary for Each Spare:
Materials necessary for each spare are the same as the materials listed in Table 1.

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E. Re-identified Parts

Elevator PCU assemblies modified per this Service Bulletin Part 2, Option 1 will be re-identified as P/N 376100-1009 (Bombardier P/N GT4111-3800-9).

F. Tooling – Price and Availability

All tooling required is listed in Parker Hannifin Corporation CMM 27-31-21.

3. ACCOMPLISHMENT INSTRUCTIONS

Part 1: (Refer to Paragraph 1. D. (1))

NOTE: The following instructions are provided to remove, service, and re-assemble the Elevator PCU rod end and tailstock bearings in the field.

A. Clean the bearings as follows:

- (1) Turn the ball to the side to align with the slot in the one side of the race and push out the ball.
- (2) Use Scotchbrite or equivalent abrasive pad or wheel, isopropyl alcohol, solvent, or water-based degreasing solution to clean the bearing race ID and the OD of the ball. Use very fine grit Scotchbrite abrasive wheel if using a powered die grinder or deburring tool.

NOTE: The ball is coated with a dry-film lubricant. It is acceptable to remove some or all of the dark, dry-film coating. The purpose of the cleaning is to remove any loose or built up dirt/rust/scale deposits from the surface so that a visual inspection can be performed. Loss of the visible dry-film coating is normal wear and is acceptable.

WARNING: COMPRESSED AIR CAN CAUSE AIRBORNE PARTICLES THAT CAN GO INTO EYES OR SKIN. DO NOT USE MORE THAN 25 PSIG (172 KPAG) NOZZLE PRESSURE WHEN COMPRESSED AIR IS USED TO DRY PARTS. WEAR EYE PROTECTION. DO NOT POINT AIR STREAM AT YOURSELF OR OTHER PERSONNEL.

- (3) Dry the bearing race and ball using compressed air.

B. Check rod end and tailstock bearings as follows:

- (1) Balls with scoring or wear-ridges on the outside diameter are acceptable for re-use providing the on-wing backlash requirements are met.

NOTE: It is normal for the dark gray dry-film coating to wear off the ball surface and it is not cause for rejection. The balls are not matched to the links; therefore, they can be interchanged with other links to make an acceptable link assembly.

- (2) Balls with scoring or galling on the inner diameter may be reworked to remove raised or loose material that may interfere with installation of the bolt. The nominal bore diameter, excluding damaged areas, must not exceed 0.6250 inch (15.875 mm).

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- (3) Balls with scoring or galling on the side surfaces that mate with the elevator panel bushings are acceptable for continued use, providing that the nominal width measures 0.870/0.875 inch (22.098/22.223 mm). Remove any raised material.

C. Check the races to the following criteria:

- (1) The following illustrations, Figures 1 through 5, reference acceptable conditions for the races. Damage estimated to exceed that depicted in Figure 5 may be considered on a case-by-case basis, or otherwise necessitates return of the PCU for modification per Part 2 of this service bulletin. While the photos are from an aileron PCU toggle link, the surface conditions shown apply also to the elevator PCU rod end and tailstock bearings.
- (2) During inspection, it may be observed that the swaged bearing race in the actuator tailstock has rotated such that the ball loading-slot is other than at a 90-degree angle to the piston rod. In some cases the race is free to rotate by hand.

Bearings with races found rotated out of position, but that cannot be rotated by hand, are acceptable to return to service providing they meet all other inspection criteria until further notice.

PCUs found with loose tailstock bearing races that can be rotated by hand should be returned for repair or update per Part 2 until further notice.

D. Re-installing Balls

- (1) Prior to re-installing the balls, apply a generous film of grease, Tribolube 64 RPC (preferred) or RPA, to the ball and race.
- (2) Align ball with the slot in the race.
- (3) Insert the ball and turn 90 degrees into position.
- (4) Make sure the ball moves freely in the race.
- (5) Remove excess grease from the race.
- (6) Perform applicable return to service checks.

E. Part 2: (Refer to Paragraph 1. D. (2))

- (1) Option 1: Elevator PCUs modified with the new 376148-103 and 376149-103 bearing assemblies greased with Tribolube 64 RPC or RPA will be re-identified as P/N 376100-1009 (GT411-3800-9).
- (2) Option 2: Return Elevator PCUs requiring repair to the address listed in Paragraph 2.A. for servicing. Bearings will be service per the service bulletin as required.



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Acceptable Condition
Figure 1

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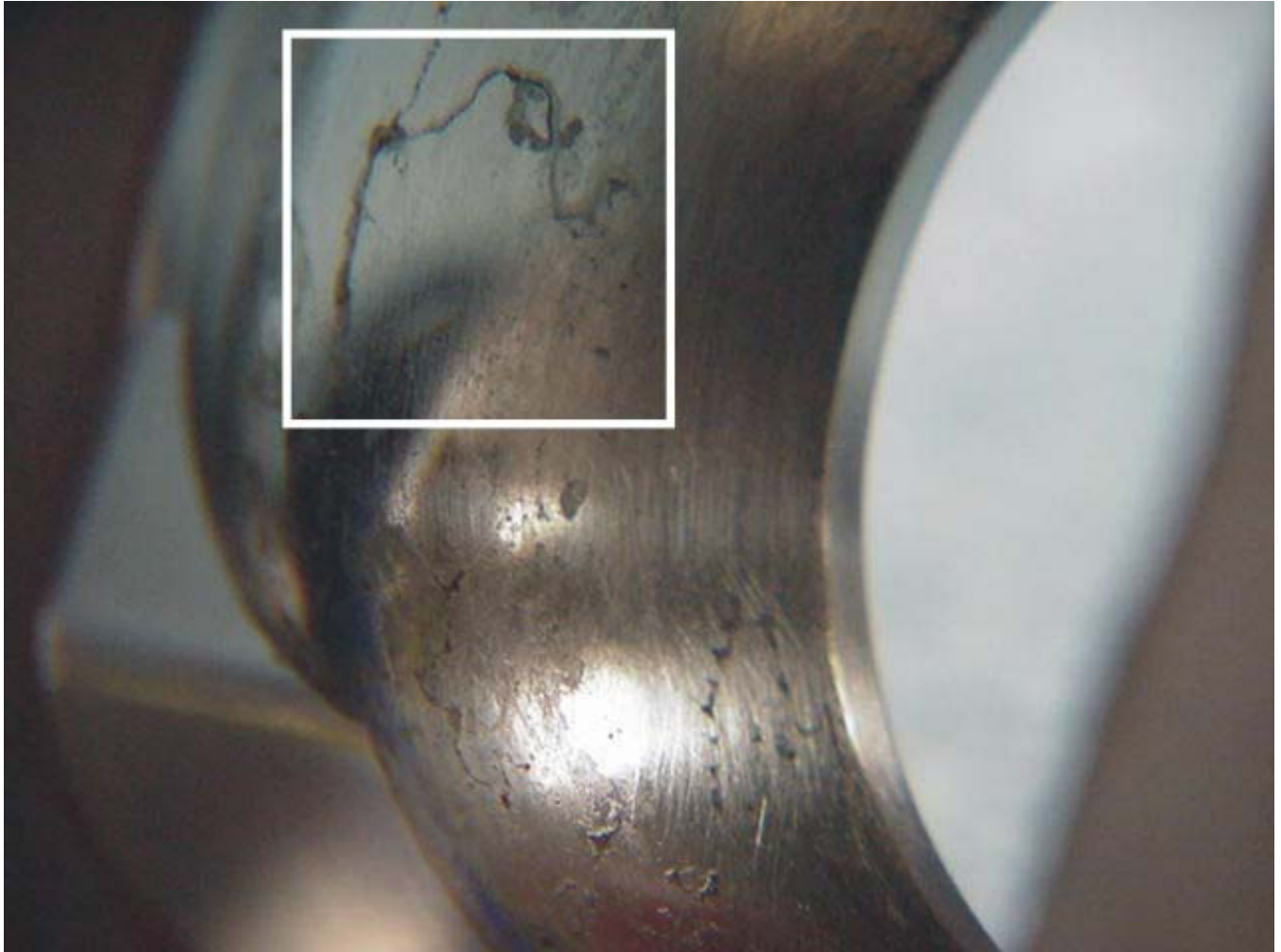
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Acceptable Condition
Figure 2

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Acceptable Condition
Figure 3

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Acceptable Condition
Figure 4

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Acceptable Condition
Figure 5

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4. APPENDIX A

Below is a list of PN 376100 SNs that were returned to Parker from Jun 03 to present. This list is confined to SNs below SN 0616. (119 Total unit SNs)	
Units returned to Parker as a -1007 and returned as a -1007 with greased bearings (SN)	Units returned to Parker as a -1007 and returned as a -1009 with out greased bearings (SN)
0030	0199
0031	0202
0033	0205
0041	0206
0046	0208
0060	0210
0062	0214
0066	0218
0081	0222
0083	0223
0087	0240
0092	0262
0097	0265
0101	0281
0105	0296
0108	0301
0109	0310
0110	0323
0111	0365
0119	0369
0130	0406
0138	0407
0141	0408
0145	0413
0156	0420
0161	0427
0163	0429
0164	0430
0165	0431
0171	0433
0173	0435
0174	0438
0178	0453
0179	0491
0181	0495
0183	0504
0188	0506
0190	0513
0191	0533
0197	0536
0198	0586
	0004
	0005
	0006
	0010
	0014
	0016
	0017
	0028
	0043
	0096
	0098
	0102
	0106
	0118
	0123
	0132
	0150
	0168
	0170
	0177
	0184
	0200
	0231
	0246
	0254
	0269
	0371
	0432
	0440
	0446
	0452
	0455
	0458
	0507
	0508
	0540
	0587

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