Seal Dynamics

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Supplemental Instructions for Continued Airworthiness

NLG Steering Actuator Bushing Replacement
Bombardier Model CL-600-2B19

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Log of Revisions

Revision	Description	Date	Approval

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1.0 Purpose

The purpose of this report is to address FAR Part 25, Appendix H, Instructions for Continued Airworthiness (ICA), as each requirement pertains to the installation of Seal Dynamics Nose Landing Gear (NLG) Steering Actuator Bushings on Bombardier Model CL-600-2B19 Aircraft and showing compliance with FAR 25.1529.

2.0 General Description

Seal Dynamics has been working with Delta Connection Group on a way of improving the service life of feedback rotary variable differential transducers (RVDT) which are mounted directly above the NLG steering actuator bushings on the NLG steering sleeve. Malfunctions of the RVDT's have been reported and related to grease ingress into RVDT's. These sensors connect thru EICAS providing cockpit flight crew with nose landing gear steering condition indications during ground (taxi, take-off and landing roll-out) operations. Seal Dynamics NLG steering actuator bushings are constructed with self-lubricating Karon B liners eliminating greasing requirements. Using Seal Dynamics self-lubricated bushings will help prevent aircraft turn backs or flight cancelations caused by faulty RVDT indications due to grease ingress. Seal Dynamics self-lubricated bushings are manufactured from the same base material (Aluminum Bronze) providing equivalent strength, wear resistance and reliability compared to the original equipment bushings.

3.0 Distribution

This document is an integral part of the Seal Dynamics FAA-PMA data package for the installation of Seal Dynamics self-lubricating bushings on Bombardier Model CL-600-2B19 Aircraft. Seal Dynamics will furnish at least one complete copy of this document to the aircraft operator at the time of the FAA-PMA issuance. Seal Dynamics will authorize the aircraft operator to make this document available to any person required to comply with any of the terms contained in this document.

Seal Dynamics will be responsible to inform the aircraft operator of any revisions incorporated in this document and advise the operator how to obtain the latest revisions as they become available.

4.0 Introduction

Installation of Seal Dynamics NLG steering actuator self-lubricating bushings is applicable to Bombardier Model CL-600-2B19 Aircraft. Bushing installation or replacement can be accomplished during normally scheduled "C" check inspections, during line maintenance or during NLG overhaul.

Existing instructions for continued airworthiness (ICA) contained in Component Maintenance Manuals (CMM), Aircraft Maintenance Manuals (AMM), Service Bulletins (SB), Service News Letters (SNL) and Parts Information Letters (PIL) specifically relating to the original equipment bushings, when installed, remains valid for use. Permitted wear limits published per Messier-Dowty CMM 32-20-14 remain valid for both original equipment bushings and Seal Dynamics NLG steering actuator self-lubricating bushings.
This document provides Supplemental ICA specifically relating to the Seal Dynamics NLG steering actuator self-lubricating bushings where special instructions apply.

5.0 Bushing Installed Locations

Two (LH & RH) lower NLG steering actuator bushings part number 16117-13 are installed into steering plate part number 16210-1 and two (LH & RH) upper NLG steering actuator bushings part number 16117-15 are installed into steering sleeve part number 16164-1. Installed locations are illustrated in Figure 1 below. Seal Dynamics NLG steering actuator self-lubricating bushing part number 16117-13SD replaces original equipment bushing part number 16117-13 and Seal Dynamics NLG steering actuator self-lubricating bushing part number 16117-15SD replaces original equipment bushing part number 16117-15.

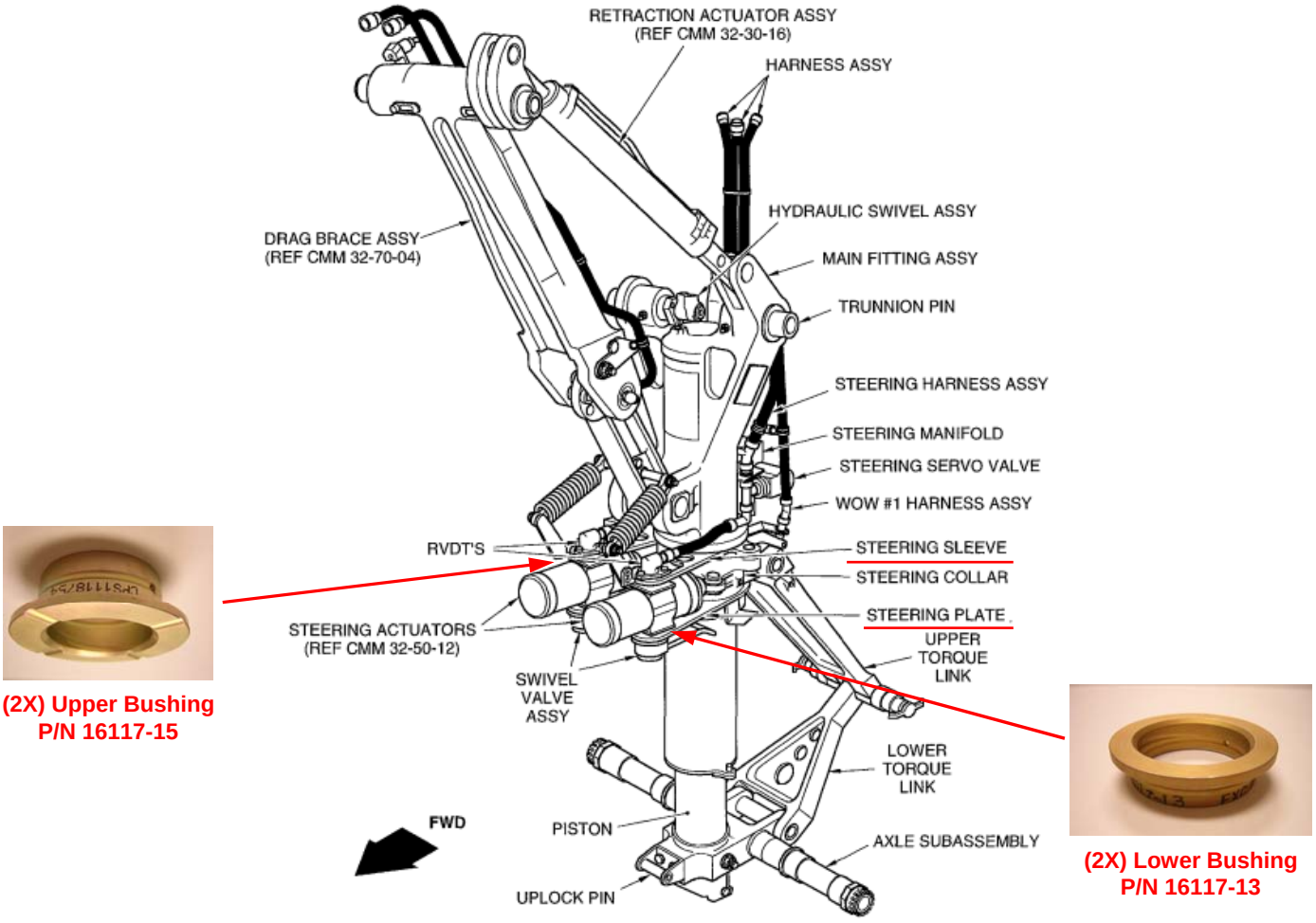

Figure 1
Messier-Dowty NLG Assy
Reference P/N 160404-101 thru -117

6.0 Servicing

No specific time interval for servicing is required since the Seal Dynamics NLG steering actuator self-lubricating bushings do not require periodic greasing. During installation of Seal Dynamics NLG steering actuator self-lubricating bushings the existing steering plate and steering sleeve grease (ZERK) fittings are capped with RED caps to indicate no lubrication is necessary. Additionally, a placard stating "Do Not Grease Actuator End" is applied to the steering sleeve further indicating that Seal Dynamics NLG steering actuator self-lubricating bushings have been installed and no greasing is required.

7.0 Maintenance Instructions

Replacement of original equipment NLG steering actuator bushings with Seal Dynamics NLG steering actuator self-lubricating bushings can be accomplished during scheduled "C" checks or line maintenance without removing the NLG assembly from the aircraft. Replacement can also be accomplished during NLG assembly overhaul or on NLG assemblies not installed on an aircraft. Estimated bushing replacement time is 10 hours. Special tools are required refer to Installation Instructions, Section 8.0 below.

8.0 Installation Information

Refer to Seal Dynamics Report Number SD3122015INSTL for installation instructions for Seal Dynamics NLG steering actuator self-lubricating bushings.

9.0 Special Tools

Special tools are required refer to Installation Instructions, see Section 8.0.

10.0 Airworthiness Limitations Section

"The Airworthiness Limitations Section is FAA approved and specifies maintenance required under 14 CFR §§ 43.16 and 91.403 of the Federal Aviation Regulations, unless an alternative program has been FAA approved."

Installation of Seal Dynamics NLG steering actuator self-lubricating bushings does not impose any airworthiness limitations on the aircraft. No changes are required to existing manuals.

"There are no new (or additional) Airworthiness Limitations associated with this equipment and/or installation."

11.0 Troubleshooting

The nose wheel steering (NWS) system has two operational modes (1) Steer-By-Wire (SBW) and (2) Free Castoring. The system is electro-hydraulic and operates thru an Electronic Control Unit (ECU) with hydraulic pressure from system No. 3 connected to two (LH & RH) nose wheel steering actuators. Multiple position feedback RVDT's connect thru the ECU which has Built-In-Test (BIT) capability for power-up and continuous monitoring of the NWS system. The ECU is connected to EICAS providing cockpit flight crew with steering condition information as well as failure indications. The primary SBW mode is armed when the nose landing gear is downlocked and the NWS selector switch is in the ARMED position. Nose wheel steering will operate in Free Castoring mode when the NWS selector switch is in the OFF position or if the SBW system fails. The maximum steering angle of the nosewheel is approximately 70 degrees each side of center line.

12.0 Periodic Scheduled Servicing Tasks

None required.

13.0 Special Inspection Requirements

None Required.

14.0 Periodic Scheduled Preventative Maintenance

None required.

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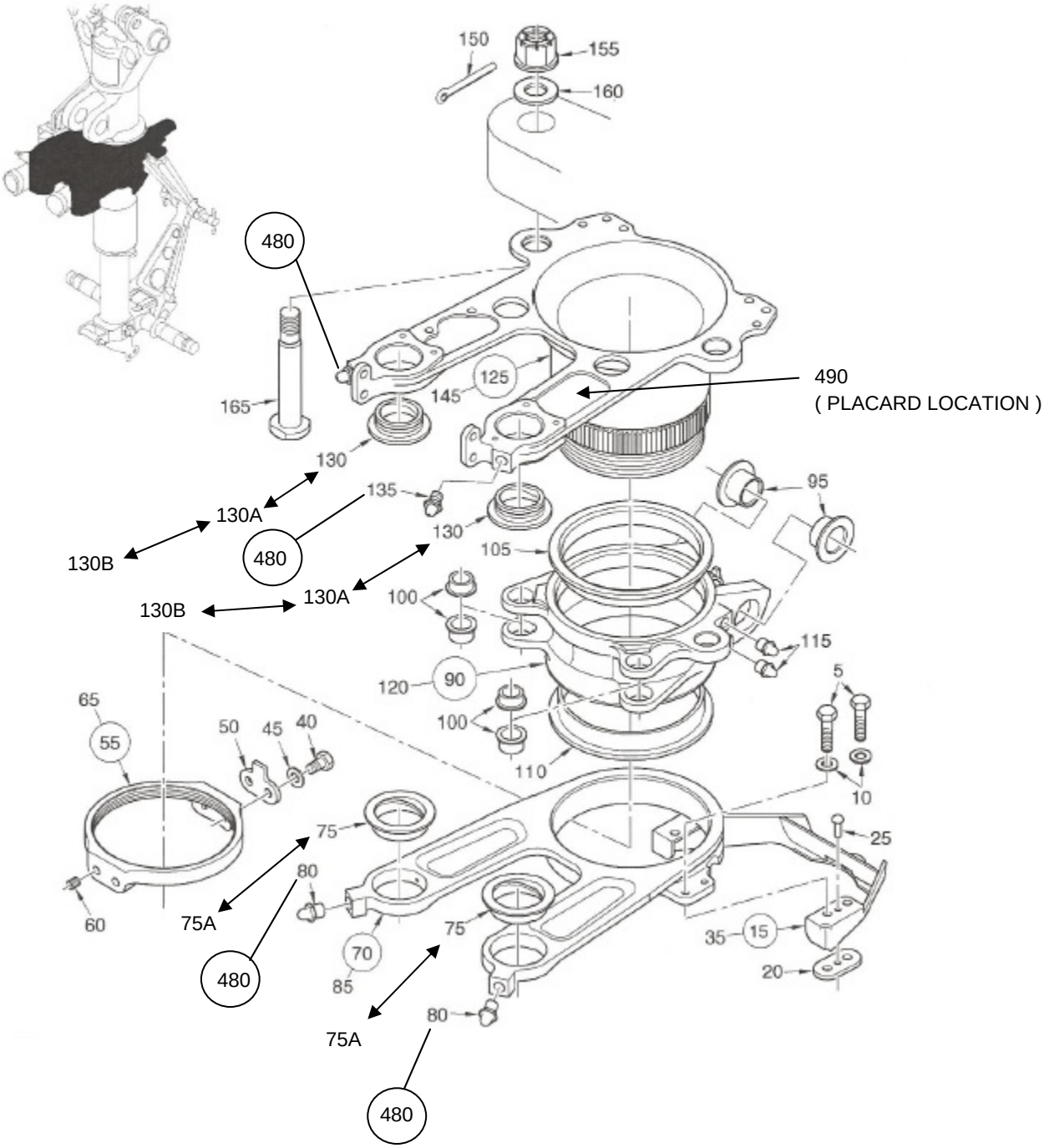
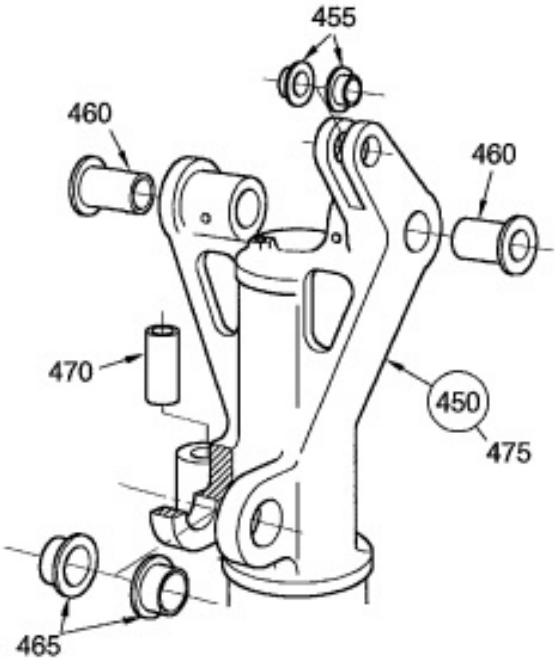
Appendix A

Supplemental Illustrated Parts List (IPL)
Messier-Dowty CMM 32-20-04 Figure 7A



NLG Shock Strut Subassembly
(Steering Components and Main Fitting Assembly
FIGURE 7A (SUP) - (Sheet 1 of 2)



NLG Shock Strut Subassembly
(Steering Components and Main Fitting Assembly
FIGURE 7A (SUP) - (Sheet 2 of 2)

FIG. ITEM	PART NO.	AIRLINE PART NO.	NOMENCLATURE	EFF CODE	UNITS PER ASSY
7A -					
75	16117-13		....BUSHING, FLANGED		2
75A ①	16117-13SD		....BUSHING, FLANGED (5N582)		2
130	16117-11		....BUSHING, FLANGED (Removed by SB16040-32-17)		2
130A	16117-15		....BUSHING, FLANGED (Added by SB16040-32-17)		2
130B ①	16117-15SD		....BUSHING, FLANGED (5N582)		2
480 ①	2PB19		....CAP PLUG (5N582)		4
490 ①	SD3122015PLCD		....PLACARD (5N582)		1

① Items 480 and 490 are only installed when items 75A & 130B are installed.