SERVICE INFORMATION LETTER (SIL)

Repair and Overhaul Safety Information
For Components Used in
High Pressure Oxygen Systems

Oxygen Cleaning Guide

OXYGEN – ATA CHAPTER 35 **CAGE CODE: 04577**

This Service Information Letter (SIL) was released by Cobham (Carleton Technologies Inc.) to provide oxygen safety information that should be referred to when repairing Cobham oxygen components used in high pressure oxygen systems.

Visual cleanliness is not a sufficient criterion when dealing with oxygen components due to the hazards associated with contamination invisible to the naked eye. Components may collect contamination during storage, shipment or while installed on the aircraft. Therefore all contamination, seen or unseen must be removed prior to re-installation and system re-charge.

This SIL defines the cleaning requirements mandated by the air frame manufacturer and requires that all Cobham manufactured components installed on Boeing aircraft meet this cleanliness level.

It is the responsibility of the service provider and/or airline to ensure that all cleaning requirements are met.

This SIL will be incorporated into the next revision of all Chapter 35 CMMs under cage 04577.

A. SUBJECT

All Cobham oxygen components are manufactured to a Boeing specification. Referenced in all Boeing specifications is Boeing Part Specification BPS-O-100 which defines the cleaning requirements.

BPS-O-100 requires that all oxygen components in the high pressure stream meet the cleanliness level of Category 1. Components in Category 1 can be defined as components exposed to oxygen at pressures over 10 psi (68.9 kPa).

B. APPLICABILITY

This SIL is applicable to all Boeing aircraft where Cobham (Carleton) oxygen components are installed. Refer to the table below to review component application information.

Carleton P/N	Description	Model Eligibility
1-6-05-19	Regulator	747-100
1-6-05-20	Regulator	747-100, -200, -300, -400, -SP, -SR,-100B, -100B SUD, -50D, -200B, -200C, -200F, -400D, -400F
15830AB	Regulator	DC-9-31, -32, -32F, -33F, -34,-34F,-41,-51,-81,-82,-83,-87, MD-90-93, MD-88
15830L	Diluter Demand Regulator	737-100-200
15830M	Diluter Demand Regulator	737-200
15830P	Diluter Demand Regulator	737-200, 747-100, -200, -300
2239-0001-1	Valve	MD-11, DC-10-10,-10F,-15,-30,-30F,-40, MD-10-10F, -30F
2239-0001-3	Valve	767-200, -300, MD-10-10F, -30F
2239-0001-3	Valve	MD-11, DC-10-10,-10F,-15,-30,-30F,-40
2239-0001-5	Valve	MD-11
2279-001-1	Valve	747-200, -300, -SP, -100, -200B, -200C,-200F, -400, -400F
2279-002-1	Valve	727-200, 737-200, 747-100, -200
2279-003-1	Valve	727-200, 737-200
2279-003-11	Valve	737-200, -300. -400 757-200, 777-200, -300
2279-003-13	Valve	727-200, 757-200, -300, 737-200, -300, -500, -700, -800
2279-003-15	Valve	777-200, -300
2279-003-17	Valve	777-200, -300
2279-004-1	Valve	727-200
2279-005-1	Valve	727-200, 737-200
2279-006-1	Valve	737-200
B11174-1	Valve	737-200, -300, -400, -500, 757-200
B13500-1	Valve	737-200, -300
B14547-1	Valve	737-200
B19820-1	Bleed Valve	777-200, -300
B19820-3	Bleed Valve	777-200
B19925-1	Regulator	777-200, -300
B19925-3	Regulator	777-200LR
B42365-1	02 Cylinder and Hand Valve	747, -400, -400F, 767-200, -300, -300F, -400ER 737-600, -700,-800,-900

C. REFERENCES

Repair and overhaul of all oxygen components must be done in accordance with document BPS-O-100, the applicable ATA Component Maintenance Manual issued by Cobham (Carleton Technologies Inc.) and MIL-PRF-27210 if needed.

The latest revision of Standard Practice Manual 20-90-01 may be used as a guide to meet the requirements of BPS-O-100.

DOCUMENT NUMBER	DOCUMENT NAME	ORDERING INFORMATION
BPS-O-100	Oxygen System Components, Breathing, General Engineering Requirements	Boeing Commercial Aircraft Seattle, WA 98124 USA
MIL-PRF-27210	Performance Specification, Oxygen, Aviator's Breathing, Liquid and Gas	US Government Printing Office Washington, DC 20402 USA
20-90-01	Standard Practice Manual Cleaning Process For Boeing Oxygen System Components	Cobham (Carleton Technologies Inc.)

Reference the tables below to identify which CMM to use for a particular Cobham top assembly part number.

Carleton P/N	Applicable ATA CMM
1-6-05-19	35-11-05
1-6-05-20	35-20-01
15830AB	35-11-13
15830L	35-11-11
15830M	35-11-11
15830P	35-11-07
2239-0001-1	35-12-01
2239-0001-3	35-12-01
2239-0001-3	35-12-01
2239-0001-5	35-12-03
2279-001-1	35-09-01
2279-002-1	35-09-01
2279-003-1	35-09-01
2279-003-11	35-09-03

Carleton P/N	Applicable ATA CMM
2279-003-13	35-09-03
2279-003-15	35-09-03
2279-003-17	35-09-03
2279-004-1	35-09-01
2279-005-1	35-09-01
2279-006-1	35-09-01
B11174-1	35-09-03
B13500-1	35-09-03
B14547-1	35-09-05
B19820-1	35-11-06
B19820-3	35-11-06
B19925-1	35-22-01
B19925-3	35-22-01
B42365-1	35-22-02

D. ACTIONS

Repair and overhaul of oxygen components – all components requiring repair, overhaul or testing shall be fully disassembled, thoroughly cleaned IAW BPS-O-100, reassembled and tested in accordance with the applicable CMM.

Proper cleaning removes particles, films, greases, oils, loose scale, corrosion, dirt and dust which could prevent interference with component function and will reduce contamination which could cause ignition. ***It can not be assumed that components removed from an aircraft meet required cleanliness requirements due to system level contamination, general usage and handling. In-situ cleaning or flow through cleaning is not effective and therefore not recommended under any circumstances.***

E. INSTRUCTIONS

IF THE APPROPRIATE LEVEL OF CLEANLINESS CANNOT BE ACHIEVED PER BPS-O-100 OR MAINTAINED WITHIN THE REPAIR/OVERHAUL FACILITY HANDLING THIS UNIT, IT IS STRONGLY RECOMMENDED THAT ALL SERVICING BE REFERRED BACK TO THE ORIGINAL MANUFACTURER. A CLASS 100,000 CLEAN ROOM IS STRONGLY RECOMMENDED FOR TESTING AND/OR DISASSEMBLY PROCESSES. A CLASS 10,000 LAMINAR FLOW BENCH IS STRONGLY RECOMMENDED FOR ASSEMBLY PROCESSES.

1. Prior to any repair, overhaul or test, use the appropriate CMM to disassemble and clean the oxygen component per BPS-O-100. The end result of proper cleaning for a Category 1 component shall be a non-volatile residue (NVR) level of 3.0 mg. or less per square foot.
2. Inspect per requirements of BPS-O-100
   - (a) Determine that contamination levels meet the 3 mg./sq. ft requirement as well as records showing the cleaning and filling process are statistically in control.
   - (b) Used cylinders (cylinders having been operated, not disassembled and not having been empty) must have their gas tested for MIL-PRF-27210 compliance as well as a visual inspection for cleanliness.
   - (c) Any cylinder being modified, hydrostatically tested or depleted requires Category 1 contamination measurement, gas inspection for the MIL-PRF-27210 requirement and a visual inspection for contamination.
3. Data sheets shall be furnished with each shipment showing that compliance to the requirements of BPS-O-100 for each lot was met. The data sheet will show the quantitative results of compliance.

Inspection data sheets shall be maintained to include the following information:

- Category to which cleaned (Category 1)
- P/N
- S/N
- Lot ID, number of components in a lot and number of components sampled in a lot if a quantity of like P/Ns were cleaned by the same process, by the same operator at the same time.
- Category 1 contamination level (indicate number of mg./sq. ft.)
- Category 1 gas measurements for odor, purity and moisture.
- Category 1 MIL-PRF-27210 certification for oxygen.
- Signature and date

Per BPS-O-100 the airframe manufacturer has the right to audit for compliance.

3. Filling an Empty CFFC Cylinder and Valve Assembly

Ensure the CFFC Oxygen Cylinder & Valve Assembly is adequately secured without causing damage to the composite pressure vessel. Prepare the fill setup as shown in the appropriate CMM after verifying that it has been thoroughly cleaned, inspected, and purged with gaseous oxygen (refer to the CMM for cleaning/inspection requirements), has a valid hydrostatic test date on the composite pressure vessel, and that the CFFC Oxygen Cylinder & Valve Assembly with hand valve installed has been proof pressure tested since disassembly/re-assembly. Any cylinder that has been modified, hydrostatically tested, or depleted requires Category 1 contamination measurement IAW BPS-O-100 Oxygen gas inspection for all used cylinders shall show compliance to MIL-PRF-27210 for odor, purity and moisture. This includes cylinders that are unused, modified, hydrostatically tested and or previously depleted. Results shall be recorded on the data sheet.

F. CONTACT CARLETON TECHNOLOGIES:

- To get a Carleton oxygen component overhauled, repaired, tested or have any questions answered contact Carleton at +1 (716) 662-0006. More information is also available at www.cobham.com.