

## HANDLING OXYGEN DURING AIRCRAFT MAINTENANCE

Online  
Training



### Introduction

Oxygen is a colourless, odorless and tasteless gas. Although non-flammable, oxygen readily supports combustion. Oxygen vigorously accelerates combustion - some materials which are non-combustible in air will burn in the presence of an oxygen enriched atmosphere (greater than 23%).

There is an inherent risk associated with handling oxygen under pressure. A fire can occur in any enriched oxygen environment if components become contaminated or are operated or maintained improperly, especially at elevated pressures and temperatures. Such a fire can result in serious injury, death, or severe property damage.

Good housekeeping practices are necessary in the vicinity of oxygen system maintenance. This is particularly true with combustibles such as grease, lubricating oil, asphalt, etc. The importance of cleanliness cannot be overstressed. Never permit oil, grease, or other combustibles to come in contact with any part of the aircraft's oxygen system or the charging equipment. Do not handle oxygen equipment with oily hands, gloves, cloths, or tools. Do not perform in work wearing oily or greasy clothing. Keep protective caps on equipment in position as long as possible and replace as soon as possible. Before charging, inspect all connections for cleanliness. If dust, dirt, grease, (any other contaminant is found, it shall be removed with detergent or solvent approved for oxygen service. Bleed a small amount of oxygen through hose or valve outlets before connecting to the fill fitting to eliminate foreign material which may escape external inspection.



### Safety precautions for oxygen-based products.

In general, several precautions, such as not operating electrical switches or connecting or disconnecting ground power generators when performing oxygen system maintenance, should be taken into consideration when handling oxygen-based products. It is generally not recommended to carry out aircraft servicing or maintenance operations which may inherently or, accidentally induce ignition sources or combustibles concurrently with oxygen servicing. These include fuelling, fuel and hydraulic system repairs, use flammable cleaning fluids, de-icing fluids, etc.

Avoid making sparks and keep all burning cigarettes or fire away from the vicinity of the airplane. Make sure that the oxygen shutoff valve control is in the closed position. Inspect both the airplane and charging cart filler connections for cleanliness before attaching the filler valve of the charging cart. Make sure that your hands, tools and clothing are clean, particularly of grease or oil, for these contaminants will ignite upon contact with pure oxygen under pressure. As a further precaution against fire, open and close all oxygen valves slowly during filling.

**CAUTION:** Use only aviator's breathing oxygen for servicing the oxygen system. Do not use oxygen intended for medical purposes or such industrial uses as welding. Such oxygen may contain excessive moisture that could freeze in the valves and lines of the oxygen system.

However, special precautions should be taken when handling O2 cylinders as they are heavily pressurised. These include the following essentials:

- Keep cylinders upright and restrained at all times: cylinders can easily fall or be knocked over
- Open valves slowly: rapid release can cause frictional heat and cause a fire/explosion
- Keep cylinders valves and connections clean: dust, dirt, sand, oils, and greases are potential fire hazards
- Only use fittings, lubricants and components certified safe for use with O2: incompatible fittings can cause fires and explosions
- When work halts close cylinder valves — don't nip or kink a hose to arrest the gas flow
- Keep O2 cylinders away from flammables and toxic gases: contacting flammables and incompatible toxic gases can create catastrophic fires, explosions and chemical reactions.
- Wear proper clothing and PPE: clothing containing oil and grease residues can ignite

### Oxygen Cylinder Removal from airplane.

- a) Access to the oxygen cylinder may be gained by removal of the access panel on the right side of the airplanes belly, immediately aft of the aft pressure bulkhead.
- b) Close the oxygen supply cylinder valve by pushing in the PULL ON SYSTEM READY control cable knob.
- c) Disconnect the oxygen line fittings from the regulator valve assembly.
- d) Cap the oxygen line fittings immediately with clean plastic caps or covers to prevent contaminants in the lines.
- e) Disconnect the control cable from the regulator control lever.
- f) Cut and remove the lockwire and loosen the two T-bolt wing nuts on the mounting brackets.
- g) Lift the mounting brackets and remove the oxygen cylinder from the mounting brackets.



### Recharging Oxygen Cylinder

Access to the pressure indicator and filler valve of the oxygen system may be gained through an access door located on the right side of the aft fuselage. To recharge the oxygen system, remove the protective cap from the filler valve and attach the hose from an oxygen recharging unit to the filler valve. Make sure that the airplane oxygen system and the servicing equipment are properly grounded before servicing the system.

To prevent overheating, fill the oxygen system slowly by adjusting the recharging rate with the pressure regulating valve on the recharging unit. All oxygen cylinders should be filled to 1850 ± 50 psi at a temperature of 70°F. This pressure may be increased an additional 3.5 psi for each degree of increase in temperature; similarly, for each degree of drop in temperature, reduce the pressure for the cylinder by 3.5 psi. When the oxygen system is properly charged, turn off the oxygen, disconnect the filler hose from the filler valve and replace the protective cap on the filler valve.

In the process of recharging oxygen on aircraft, workers must be equipped with the appropriate PPE for any event of emergency during the process. Example of the PPE, such as safety helmet and face shield, coverall, safety boots, apron and gloves.



### Purging Oxygen

Offensive odors may be removed from the oxygen system by purging. The system should also be purged any time the system pressure drops below 50 psi or the lines are left open. Purging is accomplished by connecting a recharging unit into the system and permitting oxygen to flow through the lines and outlets until any offensive odors have been carried away.

Avoid making sparks and keep all burning cigarettes or fire away from the vicinity of the airplane when the outlets are in use. Inspect the filler connections for cleanliness before attaching the filler valve. Make sure that your hands, tools and clothing are clean, particularly of grease or oil, for these contaminants will ignite upon contact with pure oxygen under pressure. As a further precaution against fire, open and close all oxygen valves slowly during filling.

- i. Open the cabin door to provide air circulation through the airplane.
- ii. Open the access panel for the filler valve, remove the protective cap and attach the hose from the oxygen recharging unit to the filler valve.
- iii. Pull out the PULL ON SYSTEM READY control knob located on the left side of the pedestal.
- iv. Pull out the PASSENGER MANUAL DROP OUT control knob to automatically drop the oxygen masks from their containers.
- v. Pull the lanyard pin to open the oxygen flow valve in each of the oxygen mask outlets to vent the line.
- vi. Adjust the recharging unit pressure regulator to deliver 50 psi of pressure to the system.
- vii. Allow the system to purge for one hour.
- viii. If any offensive odors still linger, continue purging the system for an additional hour.
- ix. If such odors still remain, replace the supply cylinder (Ref. 35-00-01, 401).
- x. After the system has been adequately purged, push the PASSENGER MANUAL DROP OUT control knob back to the OFF position.
- xi. Rotate the valve actuator arm aft to the armed position and insert the lanyard pin.

- xii. Pack the oxygen masks back into their containers and latch the mask container doors.
- xiii. Position the door so that the plunger can strike the block on the door when activated.

*All the topic can refer to Super King Air B300/B300C maintenance manual*

- 1) *Oxygen Cylinder Removal from airplane. (35-00-01-4)*
- 2) *Recharging Oxygen Cylinder (35-00-00-3)*
- 3) *Purging Oxygen (35-00-00-3)*

