

16. Oxygen (O₂) Equipment Service Technician

16.1 Introduction

This course enables the successful candidate to engage in the preparation of scuba equipment for Technical Diving Gases. The objective of this course is to train candidates in the proper procedures required for oxygen equipment cleaning. This course may be combined with the TDI Visual Inspection Procedures course at the discretion of the instructor.

16.2 Qualifications of Graduates

Upon successful completion of this course candidates will be able to prepare scuba equipment, according to their certification level. There are two levels of certification, as follows:

1. Equipment O₂ service technician: Qualified to service scuba regulators, cylinders, valves and manifolds for use with EAN and other technical diving gases.
2. Cylinder O₂ service technician: Qualified to service scuba cylinders, valves and manifolds for use with EAN and other technical diving gases.

16.3 Who May Teach

Any active TDI Service Technician Instructor may teach this course.

16.4 Student to Instructor Ratio

Academic:

1. Unlimited, so long as adequate facility, supplies and time are provided to ensure comprehensive and complete training of subject matter.

Confined Water (swimming pool-like conditions):

1. N/A.

Open Water (ocean, lake, quarry, spring, river or estuary):

1. N/A.

16.5 Student Prerequisites

1. Minimum age 18.
2. Provide proof of:
 - a. Certification as a TDI Nitrox Gas Blender or equivalent.
 - b. VIP certification through a recognized agency. *
 - c. Certification through a recognized manufacturing company regulator clinic. **
 - d. Employment through a recognized scuba related facility, manufacturer/distributor or proof of intent to acquire such employment.

* VIP certification may be offered in combination with this course.

** Not required if training as TDI Cylinder O₂ Service Technician only.

16.6 Course Structure and Duration

Open Water Execution:

1. N/A.

Course Structure:

1. TDI allows instructors to structure courses according to the number of students participating and their skill level; Visual inspection procedures (VIP) may be combined with this course by O₂ service technician instructors who also hold the VIP instructor rating.

Duration:

1. The minimum number of classroom and briefing hours is 6.

16.7 Administrative Requirements

Administrative Tasks:

1. Collect the course fees from all the students.
2. Ensure that the students have the required equipment.
3. Communicate the schedule to the students.
4. Have the students complete the:
 - a. *TDI Liability Release and Express Assumption of Risk* for non-SCUBA courses Form.

- b. *TDI Medical Statement Form.*

Upon successful completion of the course the instructor must

1. Issue the appropriate TDI certification by submitting the *TDI Diver Registration Form* to TDI Headquarters or registering the students online through member's area of the TDI website.

16.8 Training Material

Required Materials:

1. *TDI Equipment Service Technician Manual*

Optional Material:

1. *TDI Equipment Service Technician PowerPoint Presentation*

16.9 Required Equipment

None.

16.10 Required Subject Areas

The TDI Equipment Service Technician Manual is mandatory for use during this course, but instructors may use any additional text or materials that they feel help present these topics. Required academic subject areas are the same for both levels of certification.

The following topics must be covered during this course:

1. The Responsibility of the Service Technician.
2. Oxygen (O₂) Handling:
 - a. Oxygen (O₂) compatible systems components.
3. Equipment Servicing:
 - a. Materials for use in oxygen cleaned systems:
 - i. Lubricants.
 - ii. O-rings.
 - iii. Cleaning chemicals.
 - b. Procedures of oxygen cleaning:
 - i. Cylinders.

- ii. Valves.
 - iii. Regulators.
 - iv. System components.
- 4. Gas Production Equipment:
 - a. Compressors.
 - b. Cylinders.
 - c. Filtration systems.
 - d. Gauges.
- 5. Mixing Techniques:
 - a. General considerations.
 - b. Continuous blending systems.
 - c. Membrane separation systems.
 - d. Pre-mix systems.
 - e. Partial pressure blending:
 - i. Mathematics of partial pressure.
 - ii. Mixing by weight (optional).
- 6. Oxygen (O₂) Analysis:
 - a. Procedures.
 - b. Oxygen (O₂) analyzers.
- 7. Cylinder Handling and Sign Out.

16.11 Required Skill Performance and Graduation Requirements

In order to complete this course, students must:

1. Candidates must successfully service a cylinder valve and regulator* for enriched air nitrox (EAN) use.
2. Satisfactorily complete the TDI Service Technician Course written examination.
3. Demonstrate proficiency in servicing scuba equipment for use with enriched air nitrox (EAN).

* Regulator service not required if training as Cylinder O₂ Service Technician only.

Note: To upgrade from TDI Cylinder to TDI Equipment O₂ Service Technician, verification of certification through a recognized manufacturing company regulator clinic is required.

Additionally, practical training and evaluation in regulator oxygen servicing must be completed with an active TDI O₂ Service Technician Instructor (+ any associated refresher training required by the instructor), who must then register the certification as per the course administration requirements.