



ELECTRIC SERIES ***E150 & E250***

ADVENTURE IS ALWAYS ON THE LINE!



OWNER'S MANUAL

This manual is also available online

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www.BrownieDive.com

CONGRATULATIONS ON YOUR PURCHASE OF A BROWNIE'S SYSTEM

You now have in your possession the finest, most reliable, surface supplied breathing air system available. The operation is designed with your safety and convenience in mind, and by carefully reading this brief manual you can be assured of many hours of trouble-free enjoyment.

**READ ALL SAFETY RULES AND OPERATING INSTRUCTIONS
CONTAINED IN THIS MANUAL AND FOLLOW THEM WITH EACH USE
OF THIS PRODUCT.**

MANUAL SAFETY NOTICES

Important instructions concerning the endangerment of personnel, technical safety or operator safety will be specially emphasized in this manual by placing the information in the following types of safety notices.



DANGER



DANGER INDICATES AN IMMINENTLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY. THIS IS LIMITED TO THE MOST EXTREME SITUATIONS.



WARNING



WARNING INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR INJURY.



CAUTION



CAUTION INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, MAY RESULT IN MINOR OR MODERATE INJURY. IT MAY ALSO BE USED TO ALERT AGAINST UNSAFE PRACTICES.



NOTE



NOTE ADVISE OF TECHNICAL REQUIREMENTS THAT REQUIRE PARTICULAR ATTENTION BY THE OPERATOR OR THE MAINTENANCE TECHNICIAN FOR PROPER MAINTENANCE AND UTILIZATION OF THE EQUIPMENT.

REGISTER YOUR PRODUCT ONLINE

**Go to www.BrowniesMarineGroup.com to
register your product. Registration will allow us to keep
you informed about important issues and news about
your system.**

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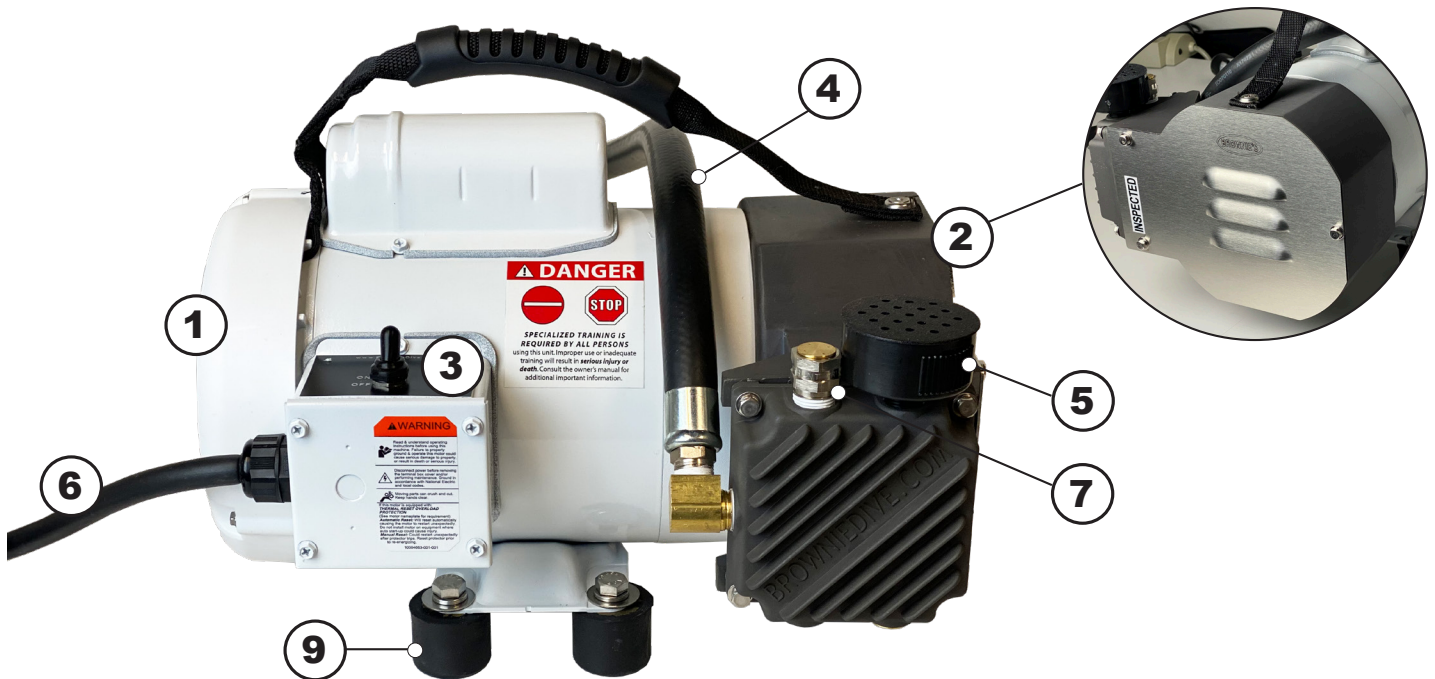
SPECIFICATIONS

| SPECIFICATIONS – E150 | SPECIFICATIONS – E250 |
|---|--|
| Air Displacement4.1 CFM (116 LPM) | Air Displacement8.9 CFM (252 LPM) |
| Air Delivery3.0 CFM @ 50 PSI(1725 RPM @ 345 kPa) | Air Delivery5.5 CFM @ 50 PSI1725 RPM @ 345 kPa) |
| Motor75 hp | Motor1.5 hp |
| Electrical12 Amp, 830 Watts, 110V, 60 Hz single | Electrical19 Amp, 1892 Watts, 110V, 60 Hz single |
| Electrical7.5 Amp, 1188 Watts, 220V, 60 Hz single | Electrical8.8 Amp, 1936 Watts, 220V, 60 Hz single |
| Fuse Requirement25 Amp | Fuse Requirement110V - 35 Amp, 220V – 20 Amps |
| Maximum Pressure100 PSI | Maximum Pressure100 PSI |
| Unit Dimensions L x W x H (in)17 x 24 x 17(cm)... 43.18 x 60.96 x 43.18 | Unit Dimensions L x W x H (in)17 x 24 x 17(cm)...43.18 x 60.96 x 43.18 |
| Compressor Type Oil-less compressor, PermaLube™ design | Compressor TypeOil-Less compressor,PermaLube™ design |

CFM = Cubic Feet per Minute
LPM = Liters per Minute
PSI = Pounds per Square Inch
KPa = kilopascals

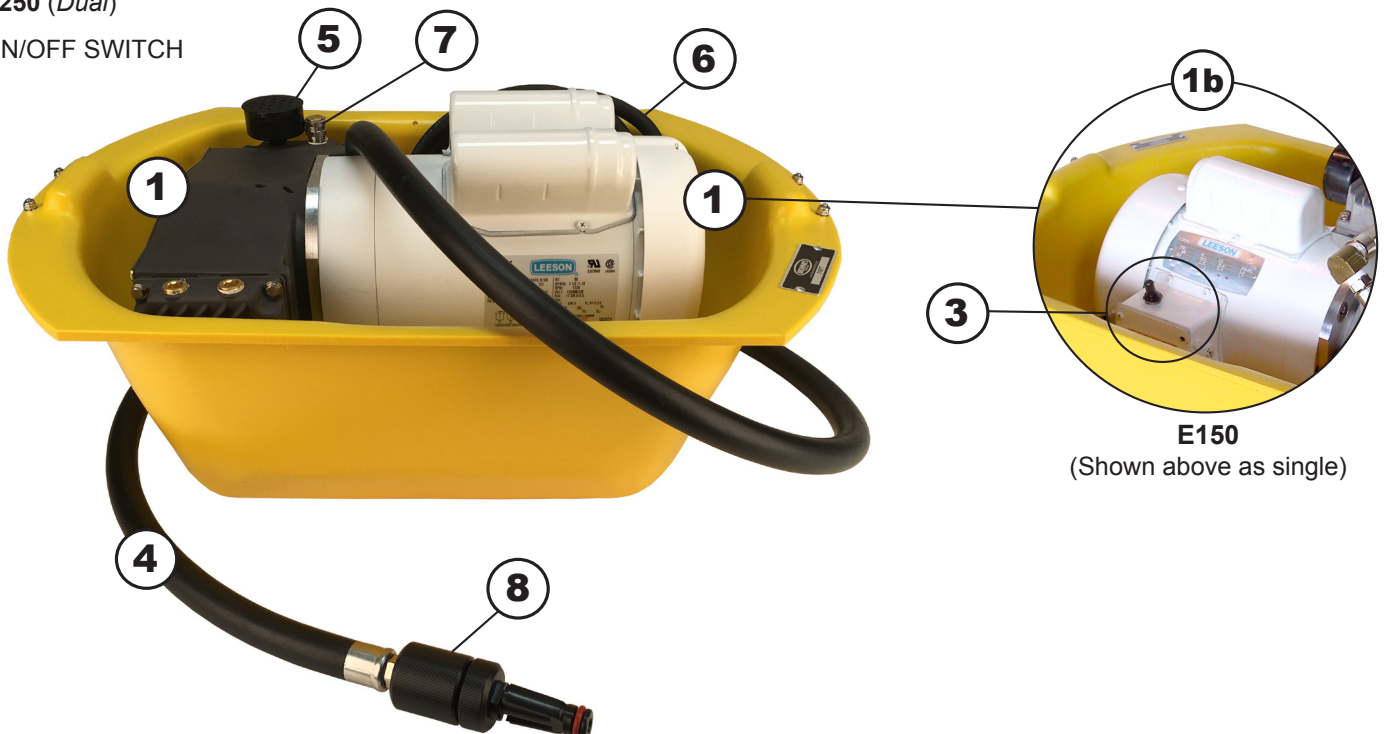
E150A (GRAB-N-GO) DIVING SYSTEM

- | | | |
|-----------------------|---------------------------|--------------------------|
| ❶ MOTOR - .75 HP | ❷ HEAT TRANSFER HOSE | ❸ PRESSURE RELIEF VALVE |
| ❹ COMPRESSOR - SINGLE | ❺ FRESH AIR INTAKE FILTER | ❻ INLINE FILTER ASSEMBLY |
| ❼ ON/OFF SWITCH | ❼ POWER CORD | ❼ RUBBER FEET |



E150 / E250 DIVING SYSTEM

- | | | |
|--|---------------------------|--------------------------|
| ❶ E250 MOTOR - 1.5 HP | ❷ HEAT TRANSFER HOSE | ❸ PRESSURE RELIEF VALVE |
| ❹ E150 MOTOR - .75 HP | ❺ FRESH AIR INTAKE FILTER | ❻ INLINE FILTER ASSEMBLY |
| ❷ COMPRESSOR E150 (Single) E250 (Dual) | ❼ POWER CORD | |
| ❸ ON/OFF SWITCH | | |



WHEN YOU RECEIVE YOUR NEW COMPRESSOR SYSTEM

1. Inspect the contents to be sure everything is included.
2. Contact your dealer within 5 days of receipt should your equipment be damaged or missing.
3. Read and understand the information in this and other supplied manuals before operating.

| | E150B | E150X | E250B | E250X |
|---|-------|-------|-------|-------|
| Motor/Compressor in case | 1 | 1 | 1 | 1 |
| Heat transfer hose w/filter | 5ft | 5ft | 7ft | 5ft |
| 60 ft down line | - | - | 1 | 1 |
| 40 ft down line | 1 | 1 | - | - |
| 20 ft diver hoses | 1 | 1 | 2 | 2 |
| Brownie's adjustable hookah regs | 1 | 1 | 2 | 2 |
| Brownie's Drop Weight Cumberbelt | - | 1 | - | 2 |
| Basic Tow Belt | 1 | - | 2 | - |
| Manual | 1 | 1 | 1 | 1 |
| Online Hookah Certificates | 1 | 1 | 2 | 2 |
| FREE ITEMS (Must complete our Online Registration to receive the items below.) | | | | |
| Spare Parts (2 Male & 2 Female QRS, Oring & Filter Kit) | 1 | 1 | 1 | 1 |



DANGER



BEFORE USING THIS SYSTEM OR ENGAGING IN ANY UNDERWATER ACTIVITIES YOU MUST ENSURE:
1) YOU ARE IN GOOD PHYSICAL HEALTH 2) YOU ARE IN GOOD MENTAL HEALTH 3) YOU HAVE BEEN PROPERLY TRAINED AND 4) YOU KNOW THE POTENTIAL RISKS OF DIVING.

MEDICAL CLEARANCE/POTENTIAL RISKS

Diving can be one of the most exciting and rewarding activities you will ever experience. However, like most exciting activities, there are rules and procedures you must follow. Proper training is crucial to minimize risk and maximize enjoyment. Breathing in an underwater environment can be dangerous, or even deadly, if you don't know the rules or if you chose to ignore them.

Please refer to the *RSTC Medical Statement* and *Guidelines for Recreational Scuba Divers Physical Examination* included with this manual. You should complete all portions of the medical statement including the Divers Medical Questionnaire for each user of the system. You may photocopy the form as needed. Please keep this information on file for future reference and to review with your doctor or any professional diving instructor.

The purpose of the *Divers Medical Questionnaire* is to find out if you should be examined by your doctor before participating in recreational diver training. A positive response to a question does not necessarily disqualify you from diving. A positive response means that there is a pre-existing condition that may affect your safety while diving and you must seek the advice of your physician prior to engaging in dive activities. Please answer the following questions on your past or present medical history with a YES or NO. If you are not sure, answer YES. If any of these items apply to you or you are not sure, we must request that you consult with a physician prior to participating in SSA (surface supplied air) diving. Take the *RSTC Medical Statement* and *Guidelines for Recreational Scuba Diver's Physical Examination* to your physician.



UNDERSEA &
HYPERBARIC
MEDICAL SOCIETY

MEDICAL STATEMENT

Participant Record (Confidential Information)

Please read carefully before signing.

This is a statement in which you are informed of some potential risks involved in scuba diving and of the conduct required of you during the scuba training program. Your signature on this statement is required for you to participate in the scuba training program offered

by _____ and
Instructor

_____ located in the
Facility

city of _____, state/province of _____.

Read this statement prior to signing it. You must complete this Medical Statement, which includes the medical questionnaire section, to enroll in the scuba training program. If you are a minor, you must have this Statement signed by a parent or guardian.

Diving is an exciting and demanding activity. When performed correctly, applying correct techniques, it is relatively safe. When

established safety procedures are not followed, however, there are increased risks.

To scuba dive safely, you should not be extremely overweight or out of condition. Diving can be strenuous under certain conditions. Your respiratory and circulatory systems must be in good health. All body air spaces must be normal and healthy. A person with coronary disease, a current cold or congestion, epilepsy, a severe medical problem or who is under the influence of alcohol or drugs should not dive. If you have asthma, heart disease, other chronic medical conditions or you are taking medications on a regular basis, you should consult your doctor and the instructor before participating in this program, and on a regular basis thereafter upon completion. You will also learn from the instructor the important safety rules regarding breathing and equalization while scuba diving. Improper use of scuba equipment can result in serious injury. You must be thoroughly instructed in its use under direct supervision of a qualified instructor to use it safely.

If you have any additional questions regarding this Medical Statement or the Medical Questionnaire section, review them with your instructor before signing.

Divers Medical Questionnaire

To the Participant:

The purpose of this Medical Questionnaire is to find out if you should be examined by your doctor before participating in recreational diver training. A positive response to a question does not necessarily disqualify you from diving. A positive response means that there is a preexisting condition that may affect your safety while diving and you must seek the advice of your physician prior to engaging in dive activities.

- ____ Could you be pregnant, or are you attempting to become pregnant?
- ____ Are you presently taking prescription medications? (with the exception of birth control or anti-malarial)
- ____ Are you over 45 years of age and can answer YES to one or more of the following?
 - currently smoke a pipe, cigars or cigarettes
 - have a high cholesterol level
 - have a family history of heart attack or stroke
 - are currently receiving medical care
 - high blood pressure
 - diabetes mellitus, even if controlled by diet alone

Have you ever had or do you currently have...

- ____ Asthma, or wheezing with breathing, or wheezing with exercise?
- ____ Frequent or severe attacks of hayfever or allergy?
- ____ Frequent colds, sinusitis or bronchitis?
- ____ Any form of lung disease?
- ____ Pneumothorax (collapsed lung)?
- ____ Other chest disease or chest surgery?
- ____ Behavioral health, mental or psychological problems (Panic attack, fear of closed or open spaces)?
- ____ Epilepsy, seizures, convulsions or take medications to prevent them?
- ____ Recurring complicated migraine headaches or take medications to prevent them?
- ____ Blackouts or fainting (full/partial loss of consciousness)?
- ____ Frequent or severe suffering from motion sickness (seasick, carsick, etc.)?

Please answer the following questions on your past or present medical history with a **YES** or **NO**. If you are not sure, answer **YES**. If any of these items apply to you, we must request that you consult with a physician prior to participating in scuba diving. Your instructor will supply you with an RSTC Medical Statement and Guidelines for Recreational Scuba Diver's Physical Examination to take to your physician.

- ____ Dysentery or dehydration requiring medical intervention?
- ____ Any dive accidents or decompression sickness?
- ____ Inability to perform moderate exercise (example: walk 1.6 km/one mile within 12 mins.)?
- ____ Head injury with loss of consciousness in the past five years?
- ____ Recurrent back problems?
- ____ Back or spinal surgery?
- ____ Diabetes?
- ____ Back, arm or leg problems following surgery, injury or fracture?
- ____ High blood pressure or take medicine to control blood pressure?
- ____ Heart disease?
- ____ Heart attack?
- ____ Angina, heart surgery or blood vessel surgery?
- ____ Sinus surgery?
- ____ Ear disease or surgery, hearing loss or problems with balance?
- ____ Recurrent ear problems?
- ____ Bleeding or other blood disorders?
- ____ Hernia?
- ____ Ulcers or ulcer surgery ?
- ____ A colostomy or ileostomy?
- ____ Recreational drug use or treatment for, or alcoholism in the past five years?

The information I have provided about my medical history is accurate to the best of my knowledge. I agree to accept responsibility for omissions regarding my failure to disclose any existing or past health condition.

Signature
PRODUCT NO. 10063 (Rev. 9/01) Ver. 2.0

Date
© Recreational Scuba Training Council, Inc. 1989, 1990, 1998, 2001

Signature of Parent or Guardian
*Printed with permission from UHMS

Date

STUDENT

Please print legibly.

Name _____ Birth Date _____ Age _____
First Initial Last Day/Month/Year

Mailing Address _____

City _____ State/Province/Region _____

Country _____ Zip/Postal Code _____

Home Phone () _____ Business Phone () _____

Email _____ FAX _____

Name and address of your family physician

Physician _____ Clinic/Hospital _____

Address _____

Date of last physical examination _____

Name of examiner _____ Clinic/Hospital _____

Address _____

Phone () _____ Email _____

Were you ever required to have a physical for diving? ☐ Yes ☐ No If so, when? _____

PHYSICIAN

This person applying for training or is presently certified to engage in scuba (self-contained underwater breathing apparatus) diving. Your opinion of the applicant's medical fitness for scuba diving is requested. There are guidelines attached for your information and reference.

Physician's Impression

☐ I find no medical conditions that I consider incompatible with diving.

☐ I am unable to recommend this individual for diving.

Remarks _____

Physician's Signature or Legal Representative of Medical Practitioner Date _____
Day/Month/Year

Physician _____ Clinic/Hospital _____

Address _____

Phone () _____ Email _____

Guidelines for Recreational Scuba Diver's Physical Examination

Instructions to the Physician: *Printed with permission from UHMS

Recreational **SCUBA** (Self-Contained Underwater Breathing Apparatus) can provide recreational divers with an enjoyable sport safer than many other activities. The risk of diving is increased by certain physical conditions, which the relationship to diving may not be readily obvious. Thus, it is important to screen divers for such conditions.

The **RECREATIONAL SCUBA DIVER'S PHYSICAL EXAMINATION** focuses on conditions that may put a diver at increased risk for decompression sickness, pulmonary overinflation syndrome with subsequent arterial gas embolization and other conditions such as loss of consciousness, which could lead to drowning. Additionally, the diver must be able to withstand some degree of cold stress, the physiological effects of immersion and the optical effects of water and have sufficient physical and mental reserves to deal with possible emergencies.

The history, review of systems and physical examination should include as a minimum the points listed below. The list of conditions that might adversely affect the diver is not all-inclusive, but contains the most commonly encountered medical problems. The brief introductions should serve as an alert to the nature of the risk posed by each medical problem.

The potential diver and his or her physician must weigh the pleasures to be had by diving against an increased risk of death or injury due to the individual's medical condition. As with any recreational activity, there are no data for diving enabling the calculation of an accurate mathematical probability of injury. Experience and physiological principles only permit a qualitative assessment of relative risk.

For the purposes of this document, **Severe Risk** implies that an individual is believed to be at substantially elevated risk of decompression sickness, pulmonary or otic barotrauma or altered consciousness with subsequent drowning, compared with the general population. The consultants involved in drafting this document would generally discourage a student with such medical problems from diving. **Relative Risk** refers to a moderate increase in risk, which in some instances may be acceptable. To make a decision as to whether diving is contraindicated for this category of medical problems, physicians must base their judgement on an assessment of the individual patient. Some medical problems which may preclude diving are **temporary** in nature or responsive to treatment, allowing the student to dive safely after they have resolved.

Diagnostic studies and specialty consultations should be obtained as indicated to determine the diver's status. A list of references is included to aid in clarifying issues that arise. Physicians and other medical professionals of the Divers Alert Network (DAN) associated with Duke University Health System are available for consultation by phone +1 919 684 2948 during normal business hours. For emergency calls, 24 hours 7 days a week, call +1 919 684 8111 or +1 919 684 4DAN (collect). Related organizations exist in other parts of the world – DAN Europe in Italy +39 039 605 7858, DAN S.E.A.P. in Australia +61 3 9886 9166 and Divers Emergency Service (DES) in Australia +61 8 8212 9242, DAN Japan +81 33590 6501 and DAN Southern Africa +27 11 242 0380. There are also a number of informative websites offering similar advice.

NEUROLOGICAL

Neurological abnormalities affecting a diver's ability to perform exercise should be assessed according to the degree of compromise. Some diving physicians feel that conditions in which there can be a waxing and waning of neurological symptoms and signs, such as migraine or demyelinating disease, contraindicate diving because an exacerbation or attack of the preexisting disease (e.g.: a migraine with aura) may be difficult to distinguish from neurological decompression sickness. A history of head

injury resulting in unconsciousness should be evaluated for risk of seizure.

Relative Risk Conditions

- **Complicated Migraine Headaches** whose symptoms or severity impair motor or cognitive function, neurologic manifestations
- **History of Head Injury** with sequelae other than seizure
- **Herniated Nucleus Pulposus**
- **Intracranial Tumor or Aneurysm**
- **Peripheral Neuropathy**
- **Multiple Sclerosis**
- **Trigeminal Neuralgia**
- **History of spinal cord or brain injury**

Temporary Risk Condition

History of cerebral gas embolism without residual where pulmonary air trapping has been excluded and for which there is a satisfactory explanation and some reason to believe that the probability of recurrence is low.

Severe Risk Conditions

Any abnormalities where there is a significant probability of unconsciousness, hence putting the diver at increased risk of drowning. Divers with spinal cord or brain abnormalities where perfusion is impaired may be at increased risk of decompression sickness.

Some conditions are as follows:

- **History of seizures other than childhood febrile seizures**
- **History of Transient Ischemic Attack (TIA) or Cerebrovascular Accident (CVA)**
- **History of Serious (Central Nervous System, Cerebral or Inner Ear) Decompression Sickness with residual deficits**

CARDIOVASCULAR SYSTEMS

Relative Risk Conditions

The diagnoses listed below potentially render the diver unable to meet the exertional performance requirements likely to be encountered in recreational diving. These conditions may lead the diver to experience cardiac ischemia and its consequences. Formalized stress testing is encouraged if there is any doubt regarding physical performance capability. The suggested minimum criteria for stress testing in such cases is at least 13 METS.* Failure to meet the exercise criteria would be of significant concern. Conditioning and retesting may make later qualification possible. Immersion in water causes a redistribution of blood from the periphery into the central compartment, an effect that is greatest in cold water. The marked increase in cardiac preload during immersion can precipitate pulmonary edema in patients with impaired left ventricular function or significant valvular disease. The effects of immersion can mostly be gauged by an assessment of the diver's performance while swimming on the surface. A large proportion of scuba diving deaths in North America are due to coronary artery disease. Before being approved to scuba dive, individuals older than 40 years are recommended to undergo risk assessment for coronary artery disease. Formal exercise testing may be needed to assess the risk.

* METS is a term used to describe the metabolic cost. The MET at rest is one, two METS is two times the resting level, three METS is three times the resting level, and so on. The resting energy cost (net oxygen requirement) is thus standardized. (Exercise Physiology; Clark, Prentice Hall, 1975.)

Relative Risk Conditions

- History of Coronary Artery Bypass Grafting (CABG)
- Percutaneous Balloon Angioplasty (PCTA) or Coronary Artery Disease (CAD)
- History of Myocardial Infarction
- Congestive Heart Failure
- Hypertension
- History of dysrhythmias requiring medication for suppression
- Valvular Regurgitation

Pacemakers

The pathologic process that necessitated should be addressed regarding the diver's fitness to dive. In those instances where the problem necessitating pacing does not preclude diving, will the diver be able to meet the performance criteria?

* NOTE: Pacemakers must be certified by the manufacturer as able to withstand the pressure changes involved in recreational diving.

Severe Risks

Venous emboli, commonly produced during decompression, may cross major intracardiac right-to-left shunts and enter the cerebral or spinal cord circulations causing neurological decompression illness. Hypertrophic cardiomyopathy and valvular stenosis may lead to the sudden onset of unconsciousness during exercise.

PULMONARY

Any process or lesion that impedes airflow from the lungs places the diver at risk for pulmonary overinflation with alveolar rupture and the possibility of cerebral air embolization. Many interstitial diseases predispose to spontaneous pneumothorax: Asthma (reactive airway disease), Chronic Obstructive Pulmonary Disease (COPD), cystic or cavitating lung diseases may all cause air trapping. The 1996 Undersea and Hyperbaric Medical Society (UHMS) consensus on diving and asthma indicates that for the risk of pulmonary barotrauma and decompression illness to be acceptably low, the asthmatic diver should be asymptomatic and have normal spirometry before and after an exercise test. Inhalation challenge tests (e.g.: using histamine, hypertonic saline or methacholine) are not sufficiently standardized to be interpreted in the context of scuba diving.

A pneumothorax that occurs or reoccurs while diving may be catastrophic. As the diver ascends, air trapped in the cavity expands and could produce a tension pneumothorax.

In addition to the risk of pulmonary barotrauma, respiratory disease due to either structural disorders of the lung or chest wall or neuromuscular disease may impair exercise performance. Structural disorders of the chest or abdominal wall (e.g.: prune belly), or neuromuscular disorders, may impair cough, which could be life threatening if water is aspirated. Respiratory limitation due to disease is compounded by the combined effects of immersion (causing a restrictive deficit) and the increase in gas density, which increases in proportion to the ambient pressure (causing increased airway resistance). Formal exercise testing may be helpful.

Relative Risk Conditions

- History of Asthma or Reactive Airway Disease (RAD)*
- History of Exercise Induced Bronchospasm (EIB)*
- History of solid, cystic or cavitating lesion*
- Pneumothorax secondary to:
 - Thoracic Surgery
 - Trauma or Pleural Penetration*
 - Previous Overinflation Injury*
- Obesity

- History of Immersion Pulmonary Edema Restrictive Disease*
- Interstitial lung disease: May increase the risk of pneumothorax

* Spirometry should be normal before and after exercise

Active Reactive Airway Disease, Active Asthma, Exercise Induced Bronchospasm, Chronic Obstructive Pulmonary Disease or history of same with abnormal PFTs or a positive exercise challenge are concerns for diving.

Severe Risk Conditions

- History of spontaneous pneumothorax. Individuals who have experienced spontaneous pneumothorax should avoid diving, even after a surgical procedure designed to prevent recurrence (such as pleurodesis). Surgical procedures either do not correct the underlying lung abnormality (e.g.: pleurodesis, apical pleurectomy) or may not totally correct it (e.g.: resection of blebs or bullae).
- Impaired exercise performance due to respiratory disease.

GASTROINTESTINAL

Temporary Risks

As with other organ systems and disease states, a process which chronically debilitates the diver may impair exercise performance. Additionally, dive activities may take place in areas remote from medical care. The possibility of acute recurrences of disability or lethal symptoms must be considered.

Temporary Risk Conditions

- Peptic Ulcer Disease associated with pyloric obstruction or severe reflux
- Unrepaired hernias of the abdominal wall large enough to contain bowel within the hernia sac could incarcerate.

Relative Risk Conditions

- Inflammatory Bowel Disease
- Functional Bowel Disorders

Severe Risks

Altered anatomical relationships secondary to surgery or malformations that lead to gas trapping may cause serious problems. Gas trapped in a hollow viscous expands as the divers surfaces and can lead to rupture or, in the case of the upper GI tract, emesis. Emesis underwater may lead to drowning.

Severe Risk Conditions

- Gastric outlet obstruction of a degree sufficient to produce recurrent vomiting
- Chronic or recurrent small bowel obstruction
- Severe gastroesophageal reflux
- Achalasia
- Paraesophageal Hernia

ORTHOPAEDIC

Relative impairment of mobility, particularly in a boat or ashore with equipment weighing up to 18 kgs/40 pounds must be assessed. Orthopaedic conditions of a degree sufficient to impair exercise performance may increase the risk.

Relative Risk Conditions

- Amputation
- Scoliosis must also assess impact on respiratory function and exercise performance.
- Aseptic Necrosis possible risk of progression due to effects of decompression (evaluate the underlying medical cause of decompression may accelerate/escalate the progression).

Temporary Risk Conditions

- Back pain

HEMATOLOGICAL

Abnormalities resulting in altered rheological properties may theoretically increase the risk of decompression sickness. Bleeding disorders could worsen the effects of otic or sinus barotrauma, and exacerbate the injury associated with inner ear or spinal cord decompression sickness. Spontaneous bleeding into the joints (e.g.: in hemophilia) may be difficult to distinguish from decompression illness.

Relative Risk Conditions

- Sickle Cell Disease
- Polycythemia Vera
- Leukemia
- Hemophilia/Impaired Coagulation

METABOLIC AND ENDOCRINOLOGICAL

With the exception of diabetes mellitus, states of altered hormonal or metabolic function should be assessed according to their impact on the individual's ability to tolerate the moderate exercise requirement and environmental stress of sport diving. Obesity may predispose the individual to decompression sickness, can impair exercise tolerance and is a risk factor for coronary artery disease.

Relative Risk Conditions

- Hormonal Excess or Deficiency
- Obesity
- Renal Insufficiency

Severe Risk Conditions

The potentially rapid change in level of consciousness associated with hypoglycemia in diabetics on insulin therapy or certain oral hypoglycemic medications can result in drowning. Diving is therefore generally contraindicated, unless associated with a specialized program that addresses these issues.

Pregnancy: The effect of venous emboli formed during decompression on the fetus has not been thoroughly investigated. Diving is therefore not recommended during any stage of pregnancy or for women actively seeking to become pregnant.

BEHAVIORAL HEALTH

Behavioral: The diver's mental capacity and emotional make-up are important to safe diving. The student diver must have sufficient learning abilities to grasp information presented to him by his instructors, be able to safely plan and execute his own dives and react to changes around him in the underwater environment. The student's motivation to learn and his ability to deal with potentially dangerous situations are also crucial to safe scuba diving.

Relative Risk Conditions

- Developmental delay
- History of drug or alcohol abuse
- History of previous psychotic episodes
- Use of psychotropic medications

Severe Risk Conditions

- Inappropriate motivation to dive – solely to please spouse, partner or family member, to prove oneself in the face of personal fears
- Claustrophobia and agoraphobia

- Active psychosis
- History of untreated panic disorder
- Drug or alcohol abuse

OTOLARYNGOLOGICAL

Equalisation of pressure must take place during ascent and descent between ambient water pressure and the external auditory canal, middle ear and paranasal sinuses. Failure of this to occur results at least in pain and in the worst case rupture of the occluded space with disabling and possible lethal consequences.

The inner ear is fluid filled and therefore noncompressible. The flexible interfaces between the middle and inner ear, the round and oval windows are, however, subject to pressure changes. Previously ruptured but healed round or oval window membranes are at increased risk of rupture due to failure to equalise pressure or due to marked overpressurisation during vigorous or explosive Valsalva manoeuvres.

The larynx and pharynx must be free of an obstruction to airflow. The laryngeal and epiglottic structure must function normally to prevent aspiration.

Mandibular and maxillary function must be capable of allowing the patient to hold a scuba mouthpiece. Individuals who have had mid-face fractures may be prone to barotrauma and rupture of the air filled cavities involved.

Relative Risk Conditions

- Recurrent otitis externa
- Significant obstruction of external auditory canal
- History of significant cold injury to pinna
- Eustachian tube dysfunction
- Recurrent otitis media or sinusitis
- History of TM perforation
- History of tympanoplasty
- History of mastoidectomy
- Significant conductive or sensorineural hearing impairment
- Facial nerve paralysis not associated with barotrauma
- Full prosthodontic devices
- History of mid-face fracture
- Unhealed oral surgery sites
- History of head and/or neck therapeutic radiation
- History of temporomandibular joint dysfunction
- History of round window rupture

Severe Risk Conditions

- Monomeric TM
- Open TM perforation
- Tube myringotomy
- History of stapedectomy
- History of ossicular chain surgery
- History of inner ear surgery
- Facial nerve paralysis secondary to barotrauma
- Inner ear disease other than presbycusis
- Uncorrected upper airway obstruction
- Laryngectomy or status post partial laryngectomy
- Tracheostomy
- Uncorrected laryngocele
- History of vestibular decompression sickness

1. Bennett, P. & Elliott, D (eds.) (1993). *The Physiology and Medicine of Diving*. 4th Ed., W.B. Saunders Company Ltd., London, England.

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- Undersea and Hyperbaric Medical Society (UHMS) www.UHMS.org
- Divers Alert Network (DAN) United States, 6 West Colony Place, Durham, NC www.DiversAlertNetwork.org
- Divers Alert Network Europe, P.O. Box 64026 Roseto, Italy, telephone non-emergency line: weekdays office hours +39-085-893-0333, emergency line 24 hours: +39-039-605-7858
- Divers Alert Network S.E.A.P., P. O. Box 384, Ashburton, Australia, telephone 61-3-9886-9166
- Divers Emergency Service, Australia, www.rah.sa.gov.au/hyperbaric, telephone 61-8-8212-9242
- South Pacific Underwater Medicine Society (SPUMS), P.O. Box 190, Red Hill South, Victoria, Australia, www.spums.org.au
- European Underwater and Baromedical Society, www.eubs.org

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Diver's Alert Network (DAN)
6 West Colony Place
Durham, NC 27705



WARNING



IMPROPER USE OF ANY UNDERWATER DIVING EQUIPMENT CAN RESULT IN SERIOUS INJURY OR DEATH.
DO NOT DIVE WITHOUT PROPER TRAINING.

ONLINE TRAINING

In the interest of sharing the most accurate and up-to-date information on accepted diving practices, Brownie's Third Lung has teamed up with Scuba-Training.net to provide free online dive training with the purchase of each Surface Supplied Hookah System.

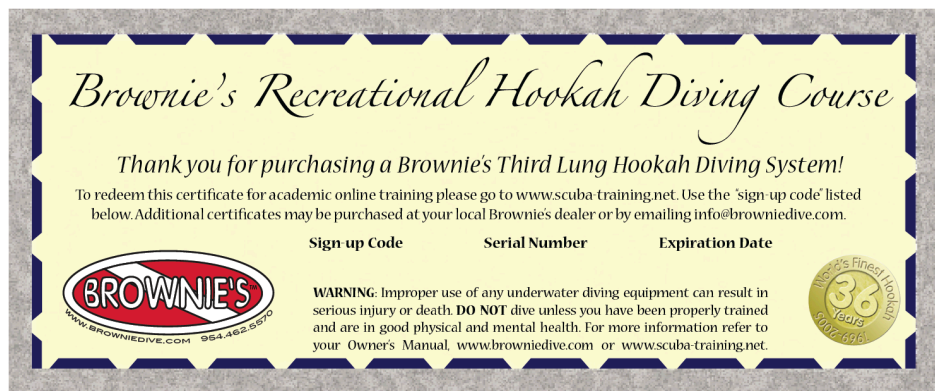
The program is an interactive, web-based learning course designed to teach you how to properly and safely use your hookah system. It is broken down into 7 modules each with specific Knowledge Requirements and Objectives.

The course utilizes a variety of written explanations, illustrations, photographs and streaming video to clearly convey each subject. Brownie's makes it easy for students of all ages, including children, to enjoy learning.

Each chapter concludes with a multiple choice quiz to test your understanding and comprehension of the topics covered. Incorrect answers are automatically reviewed and retested. Once you have successfully completed the quiz for that module, you can move on to the next module. After all chapters and quizzes have been completed there is a final comprehensive exam. The final exam follows the same format as the quizzes and may be retaken until it is successfully completed.

TO BEGIN ONLINE TRAINING

1. Launch your browser window (Internet Explorer, Chrome, etc.).
2. Go to www.scuba-training.net.
3. Locate the "sign-up code" (found on the hookah training certificate that came with your purchase) and enter it. (Example pictured below).
4. You will be asked to create an account choosing a "user name" (usually email address) and password. You will also be asked to enter pertinent information to create an account, such as address and telephone number.
5. There will be a medical questionnaire that must be filled out before beginning the chapters. Answering yes to any question will require a consultation with a physician prior to participating in the in-water training phase.



AFTER THE ONLINE COURSE IS COMPLETED

It is time to visit your local dive store for the in-water training phase.

The online course will provide academic knowledge. To complete your training you'll need to practice that knowledge in a controlled environment before venturing into open water. The course website, www.scuba-training.net, includes a list of affiliated independent scuba instructors and professional dive stores by geographic region. You should enroll in an in-water skills course with a professional scuba instructor to review your academic knowledge and practice your water skills. Your instructor will review with you the topics covered in the online course and evaluate your comprehension of the course content. Next, they will arrange a series of dives in a controlled environment (usually a pool) to practice breathing through a regulator and other water skills. He or she will share techniques to improve your efficiency and comfort in the water. By working closely with your instructor, you will become a better (and safer) diver.



WARNING



YOUR THIRD LUNG IS DESIGNED FOR SHALLOW WATER, UNOBSTRUCTED DIVING AND SHOULD NEVER BE USED IN ENCLOSED AREAS, SUCH AS CAVES, SHIPWRECKS OR LEDGE OVERHANGS.



WARNING



DO NOT POUR OIL INTO COMPRESSOR. THIS WILL CONTAMINATE THE COMPRESSOR AND RUIN IT FOR AIR BREATHING. BREATHING FROM A COMPRESSOR THAT HAS HAD OIL MISTAKENLY ADDED MAY RESULT IN SERIOUS INJURY. DO NOT SPRAY CORROSION X OR ANY PETROLEUM BASED PRODUCT ON, IN, OR AROUND THE COMPRESSOR.



WARNING



NEVER OPERATE THE EQUIPMENT IN AN ENVIRONMENT WHERE TOXIC FUMES ARE PRESENT SUCH AS NEAR RUNNING OUTBOARD ENGINES, EXPOSED CHEMICALS OR FUEL SPILLS.

RULES FOR SAFE OPERATION

RULES FOR SAFE OPERATION

1. The compressor should be located in a dry, clean and well-ventilated area.
2. Prior to use, inspect hoses, plug, and electric cord for signs of damage. Do not use if a deficiency is found. Contact Brownie's Third Lung for replacement parts. NEVER operate a damaged unit.
3. Do not tamper with pressure relief valve, as it has been factory set. Any readjustment of this valve could result in serious injury.
Some compressors have an adjustable pressure relief valve. Do not set the valve higher than 60 psi. Regulator free flow may result at higher pressure.
4. Do not lubricate this compressor. Applying any type of oil, solvent or other material to any part of the compressor could result in polluted air not suitable for breathing.
5. Compressed air should not be aimed at anyone. Serious eye injury could result.
6. Compressor may not start if compressed air remains in the hose. Purge hose before starting.
7. All compressors generate heat even under normal operating conditions. To avoid serious burns, never touch the compressor during or immediately after operation.
8. Always disconnect air compressor from power source when attaching or detaching hoses. This prevents air pressure from blowing the fittings from hand and possibly causing injury.
9. When the unit is not in use, wrap cord around compressor and store in a dry place. Do not abuse cord.
10. Servicing should be performed by an Authorized Service Center.



WARNING



THE E150/E250 COMPRESSORS ARE DESIGNED TO BE USED IN A DRY ENVIRONMENT. DO NOT USE AN ELECTRIC COMPRESSOR IN AREAS THAT WILL BE SUBJECT TO DIRECT WATER EXPOSURE (RAIN, SPRAY, SPLASHING OR OTHER WATER SOURCES).

ELECTRICAL INFORMATION

The motor of this compressor has a thermal overload protector. If the motor should overheat, the overload protector will shut the motor off. If this should occur, push the on/off switch to the off position and allow the motor to cool for about 5 minutes. Restart the compressor. If the compressor fails to start, check for blown fuses. The compressor may need to cool further before attempting to restart.

If the overload protector shuts off the motor frequently, you may have a low voltage situation. Low voltage can also be suspected when:

1. the motor does not get up to full power or speed,
2. fuses or circuit breakers activate when starting the compressor,
3. lights dim or remain dim when compressor is started,
4. other motor operated appliances fail to operate properly (too many motor operated appliances on the same circuit),
5. an extension cord of insufficient gage to carry the necessary voltage (see EXTENSION CORDS next section)



WARNING



IF YOU ARE UNSURE OF THE ELECTRIC POWER SUPPLIED BY A CONNECTION, TEST THE CIRCUIT WITH AN ELECTRIC METER PRIOR TO USE. IF YOU ARE UNABLE TO PERFORM THE TEST, SEEK THE ASSISTANCE OF A PROFESSIONAL ELECTRICIAN. DO NOT ALLOW THE ELECTRICAL LEADS TO COME INTO CONTACT WITH COMPRESSOR DURING OPERATION. DAMAGE MAY OCCUR.



NOTE



SUITABLE FOR OPERATION IN A MAXIMUM SURROUNDING AIR TEMPERATURE OF 104°F (40°C).

SETTING UP

1. **Select a location with fresh, clean air.** The compressor will pump the air from the immediate area through the hoses to the diver(s). Must maintain the lid OPEN for fresh air circulate while compressor is in operation.



WARNING



THE COMPRESSOR CASE LID MUST BE IN THE FULLY OPEN POSITION DURING OPERATION. OPERATING THE COMPRESSOR WHILE THE CASE LID IS PARTIALLY CLOSED MAY CAUSE DAMAGE, INJURY OR DEATH.

2. **Make connection to a suitable power supply.**

GROUNDING INSTRUCTIONS

This product is for use on a nominal 120-volt circuit and has a three pronged grounding plug. A temporary adapter may be used to connect this plug to a 2-pole receptacle, if a properly grounded outlet is not available. The temporary adapter should only be used until a qualified electrician can install a properly grounded outlet. The green colored rigid ear, lug, or the like extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box cover.

This product should be grounded. In the event of an electrical short circuit, grounding reduces the risk of electrical shock by providing an escape wire for the electrical current.

DANGER—Improper installation of the grounding plug can result in a risk of electrical shock. If repair or replacement of the cord or plug is necessary, do not connect the grounding wire to either flat blade terminal. The wire with or without yellow stripes is the grounding wire. Check with a qualified electrician or service person if the grounding instructions are not completely understood or if in doubt as to whether the product is properly grounded. Do not modify the plug provided; if it will not fit the outlet, have the proper outlet installed by a qualified electrician.

EXTENSION CORDS

Use only a 3-wire extension cord that has a 3-blade grounding plug and a 3-slot receptacle that will accept the plug on the product. Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power, over heating and possible shutdown.

| 25' Length | 50' Length | 100' Length | 150' Length | 200' Length |
|------------|------------|-------------|-------------|-------------|
| 16 Gage | 14 Gage | 10 Gage | 8 Gage | 8 Gage |

3. **Secure the compressor** to void an unexpected disconnection from the power source, and to avoid pulling the compressor into the water while diving.

4. Check the inline particle filter at the end of the black heat transfer hose.

- Unscrew the 2 knurled container parts to reveal the screen assembly.
- Gently rock the screen until it drops out of the container.
- Inspect the screen. It should be clean and free of debris. The screen can be cleared by gently scrubbing with a clean toothbrush and rinsed with fresh, warm water. Clean or replace as necessary.
- Reassemble by inserting the domed area of the screen toward the compressor.

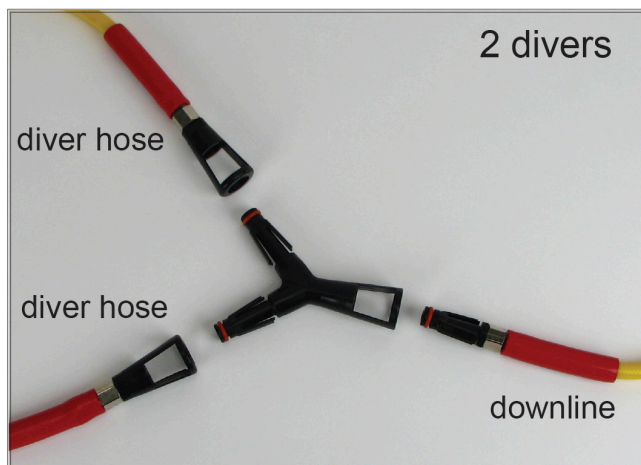


5. Turn the compressor ON to verify the output volume and pressure. Turn the compressor OFF.

6. Connect the appropriate hose sections in the following order:

Single diver configuration: downline, 20ft diver hose, regulator & belt.

Multiple diver configuration: common downline, Y-divider(s), 20ft diver hose (s), regulator(s) & belt(s).
(See HOSES for additional information on the QRS connect/disconnect procedure.)



7. Connect the appropriate hose sections in the following order:

Single diver configuration: downline, 20ft diver hose, regulator & belt.

Multiple diver configuration: common downline, Y-divider(s), 20ft diver hose(s), regulator(s) & belt(s).
(See HOSES for additional information on the QRS connect/disconnect procedure.)



WARNING



SUDDEN BURSTS OF ENERGY MIGHT USE UP MORE AIR VOLUME THAN THE COMPRESSOR CAN SUPPLY. THIS WILL RESULT IN RESTRICTIVE BREATHING. IF YOU ENCOUNTER THIS, SIMPLY **SLOW DOWN** YOUR BREATHING OR REFRAIN FROM EXERTING GREAT AMOUNTS OF ENERGY UNTIL YOUR RESPIRATION RATE BECOMES NORMALIZED. EXCITEMENT, ACTIVITY LEVEL, CURRENT FLOW, DEPTH AND EXPERIENCE LEVEL OF DIVERS WILL DICTATE YOUR DIVE.

HOSES

Your Brownie's hookah system features our proprietary Quick Release Swivel (QRS) connectors, allowing you to engage or disengage hoses instantly, securely and without tools.

To engage the QRS hose ends:

1. Inspect the o-ring on the male fitting for any damage or foreign matter (hair, sand, etc). Clean and lightly lubricate with silicone grease as needed.
2. Insert the male fitting into the female fitting. Push together until you hear an audible "click", which indicates the fittings are correctly engaged.

To disengage the QRS hose ends:

1. Rotate the connection until the "wings" of the male fitting are visible in the "windows" of the female fitting.



2. While holding one hose end in each hand, squeeze the "wings" of the male fitting together and simultaneously pull the hose ends apart.

The QRS fittings are exclusive to Brownie's Third Lung and provide the following advantages:

- The plastic material is extremely durable and will provide years of reliable service. It is impervious to UV or ozone degradation.
- The fittings are much lighter than metal hoses ends. They will not hurt your feet or boat deck if dropped.
- The connection provides an audible "click" to confirm it is properly engaged, and it requires 2 hands to disengage.
- In the unlikely event that a fitting fails, a replacement can be installed on the hose end without special crimping or clamps.



Tips for use:

Coiled hoses will tend to remain coiled. To reduce the coiling effect, allow the hoses to warm in sunlight. Lay the hoses as straight as possible on the boat deck, pool deck, grassy area, or any other suitable location.

When stowing, larger loops have less coil effect than smaller, tighter loops.

Avoid allowing water, sand or other contaminants to enter the hoses. The easiest way to avoid intrusion is to engage the male and female fittings onto each other prior to rinsing or stowing the hose.

If something should enter the hose, follow these steps:

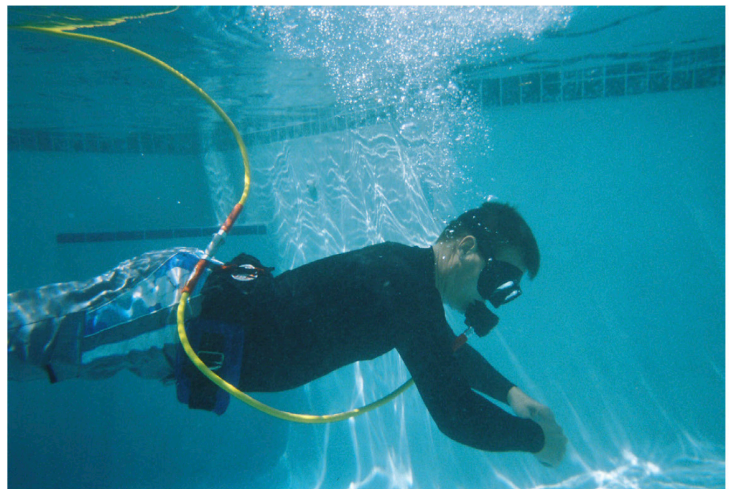
1. Shake as much material out of the hose as possible.
2. You can soak the hose in FRESH WATER ONLY to dissolve or dislodge any materials.
3. Force FRESH WATER ONLY through the hose.
4. Force clean fresh air through the hose.
5. When fully dry, engage the male and female QRS fittings to seal the ends prior to storage.

BROWNIE'S BOTTOM-MOUNT REGULATOR

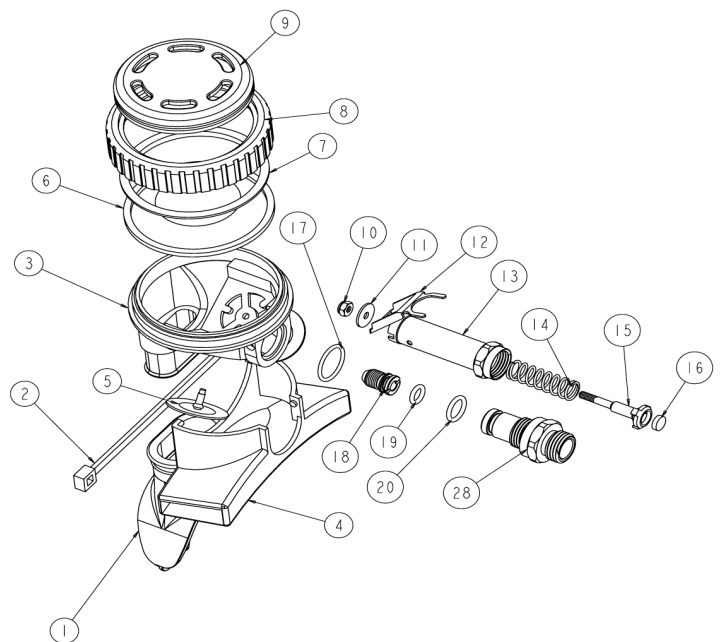
We've changed the placement of the hose to follow a more natural path!

While scuba hoses are typically routed from the top of the tank around the diver's shoulder, hookah regulator hoses are attached to the diver's waist. By moving the hose to the bottom of the regulator the hose can lay cleanly next to the diver's body thereby creating a more efficient, streamlined profile in the water and reducing the chance of snagging the hose on objects nearby.

Additionally, there is a substantial reduction in the sideways torque placed on the second stage from the hose resulting in reduced jaw effort to grip the regulator.



| NO: | P/N NO | DESCRIPTION |
|-----|----------------|--|
| 1 | A-02-010-11 | LONG MOUTHPIECE-P5 |
| 2 | A-02-010-12 | NYLON TIE |
| 3 | A-02-008-03 | MAIN HOUSING |
| 4 | A-02-008-04 | EXHAUST TEE |
| 5 | A-02-008-05 | EXHAUST VALVE |
| 6 | B-02-010-01 | DIAPHRAGM |
| 7 | A-02-010-10 | DIAPHRAGM WASHER |
| 8 | A-02-010-04 | COVER RING PLASTIC/ALUMINUM(C-02-010-07) |
| 9 | A-02-010-05 | COVER BUTTON |
| 10 | C-02-010-06 | NUT SCREW 5-40 |
| 11 | P-02-008-01 | STAINLESS SPACER |
| 12 | S-02-008-01 | LEVER ARM |
| 13 | C-02-008-01 | ADJUST TUBE |
| 14 | D-02-008-01 | SPRING |
| 15 | C-02-008-02 | POPPET |
| 16 | A-02-008-01 | LP SEAT |
| 17 | O-EKM-15MX-1-5 | O-RING-N70 |
| 18 | A-02-010-06 | ORIFICE |
| 19 | O-AS568-010 | O-RING-N70 |
| 20 | O-AS568-012 | O-RING-N70 |
| 28 | C-02-008-09 | ADJUST SCREW |



HOW TO ADJUST THE DROP WEIGHT CUMMERBELT:

1. Unclip the front buckle
2. Undo the Velcro underneath the buckle
3. Lay the belt flat open. Unzip the sleeve located on the back of the belt. You will see that there is a piece of elastic with the Velcro adjustments on both sides. The belt should be adjusted evenly on both sides so the front buckle is centered across the mid-section. Simply undo the Velcro and re-adjust them to fit the waist of the diver. (*For extremely small waist divers: You can switch the ends of the belt from opposite stainless steel loops to the loops that are next to each other. Bottom belt configuration will reduce belt size by approximately 3 inches.) Zip the sleeve back up.
4. Unclip the buckles that hold the drop weight pockets in place. Each pocket can hold up to 10 lbs. of weight. We recommend using soft lead shot weights rather than hard weights as they conform better to the shape of the pocket. Undo the Velcro and distribute the weight evenly into each pocket, then re-Velcro.
5. Reinsert the pockets matching the bend in the pocket to the bend in the belt itself, and reconnect the buckles.

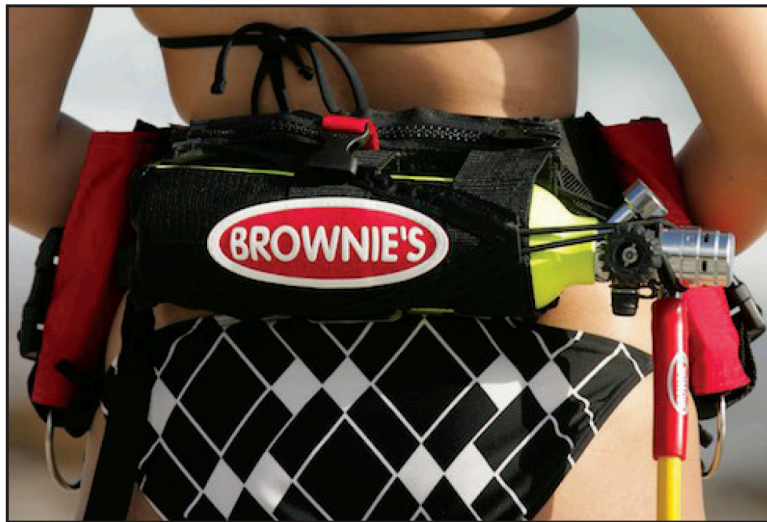


HOW TO USE THE DROP WEIGHT CUMMERBELT WITH AN EGRESSOR or SPARE AIR PACKAGE:

1. Follow above steps 1-5.
2. Then unzip the sleeve that came with the Cummerbelt, and put aside. You will no longer need this sleeve unless there are times that you choose to dive without the Egressor scuba system.



3. Zip new sleeve onto the belt with the Brownie's logo facing upright.
4. Mount the regulator onto the tank and insert the cylinder with the valve pointing outward. Secure the cylinder in place using the elastic loop around the tank neck.
5. Open the tank valve completely.
6. The mouthpiece has a bungee necklace attached so the regulator may hang easily around the neck for quick retrieval in an out of air situation.





CAUTION



DO NOT TURN THE COMPRESSOR **OFF** UNTIL ALL DIVERS ARE SAFELY OUT OF THE WATER.

POST DIVE

1. When all divers are safely out of the water, turn the compressor OFF.
2. Rinse hoses, regulators and belts with fresh water and allow to dry.
Hose ends can be engaged on each other to prevent water or contaminants from entering hose.
(See the HOSE section for additional instructions to clear debris from the hose.)
3. Do not depress the purge mechanism of the 2nd stage regulators while soaking or rinsing.
4. Allow the gear to dry, then stow neatly in the mesh gear bag or other suitable container.
5. Allow the compressor to cool before closing the lid. The compressor will get HOT during operation.
It is safe to close the lid when the compressor is warm (not hot) to touch.
6. Keep the storage case clean inside. Remove any debris and wipe the case interior surfaces with a cloth dampened with fresh water only.
Do not use commercial cleaners with fumes that may be ingested by the compressor.
7. Coil and stow the black compressor hose and electric cord inside the case before closing and latching the lid.

WARRANTY

Brownie's Third Lung products are warranted to be free of defects in materials and workmanship for a period of one year from the date of retail purchase. A copy of retail purchase receipt, showing model and serial numbers is required to verify warranty eligibility. This warranty is limited and subject to the restrictions listed below.

Brownie's will repair, replace or refund valid warranty claims, at our discretion. Brownie's shall not be liable for any special, incidental or consequential damages beyond the wholesale purchase price.

Please fill out and return enclosed *Warranty Registration Form* along with a copy of dated retail purchase receipt to register your warranty or go to www.BrowniesMarineGroup.com and register online. You will be able to upload a copy of your receipt.

What is not covered

Inspection, service and/or labor charges will be paid by the retail consumer.

Some parts are subject to wear, even under normal or minimal use. All components should be inspected for wear on a regular basis. Replacement of worn items constitutes normal maintenance and is the responsibility of the owner.

This warranty does not cover damage resulting from the introduction of water, gas, oil or other contaminants, normal wear, improper use, improper maintenance, neglect of care, alteration, or unauthorized repair.

All repairs made, not covered under the terms of this warranty, will be made at the owner's expense.

RETURN GOODS POLICY AND INSTRUCTIONS

To return merchandise to Brownie's for service or credit:

1. Call our sales department to obtain a RMA number and shipping destination (954.462.5570)
2. Pack authorized items in sturdy container
3. Boldly print the RMA number on the package exterior
4. Include: a note detailing the situation, a copy of original purchase receipt showing model number, serial number, date and place of purchase
5. Ship package, freight prepaid, to the designated location

Unauthorized returns, returns shipped freight collect and returns missing RMA numbers may be refused or subject to additional inspection/processing fees.

Items returned for credit must be in new condition (at our discretion) and will be subject to a 15% restocking fee (30% for custom orders.)

USE OF EQUIPMENT IN THE BAHAMA ISLANDS



DEPARTMENT OF FISHERIES

Ministry of Agriculture, Fisheries
& Local Government
P. O. Box N-3028
Nassau, Bahamas
Fax: (242) 393-0238

MAF&LG/FIS/10

8 April 2003

Mr. Robert M. Carmichael
President/CEO
Brownie's Third Lung
940 Northwest 1st Street
Fort Lauderdale, FL33311
U.S.A.

Dear Mr. Carmichael,

Reference is made to your email of 26th March, 2003 that was addressed to the Bahamas' Ministry of Tourism relating to the usage of air compressors, hookah and scuba dive gear in the Bahamian exclusive economic zone.

Please be advised that current Bahamian laws do permit the possession and use of Scuba, hookah dive gear or air compressors for the purposes of recreational diving. However, the use of these apparatuses are strictly prohibited for the purposes of spearfishing or the collection of any marine resource while in Bahamian waters.

It is hoped that the above fulfills your request relating to the usage of the mentioned gear while in Bahamian waters.

Sincerely,

Edison Deleveaux
For/DIRECTOR OF FISHERIES

REBUILD KIT INSTRUCTIONS

Tools needed to perform this service:

Medium (6-8") Adjustable Wrench

1/8 Allen wrench

#2 Phillips screwdriver

#3 Phillips screwdriver

1/2" and 5/16" nut driver or socket wrench

11/16", 1/2" and 5/16" wrench

Rubber Hammer

Note: This procedure will deal with the disassembly of the compressor head and installation of the components contained in the compressor head rebuild kit.

You must have free access to exterior surfaces of the compressor assembly to perform this service. You will need to remove the motor/compressor assembly from the protective case to gain adequate access to perform this service.

Remove any straps from the pan that may inhibit the removal of motor/compressor assembly.

There are 4 bolts that hold the motor onto the pan or case. Locate and hold each of the 4 bolts at the base of the motor using a 1/2" wrench, and loosen the corresponding Nylock nuts on the underneath of the pan using a 1/2" socket wrench. Set bolts and nuts aside until reassembly.

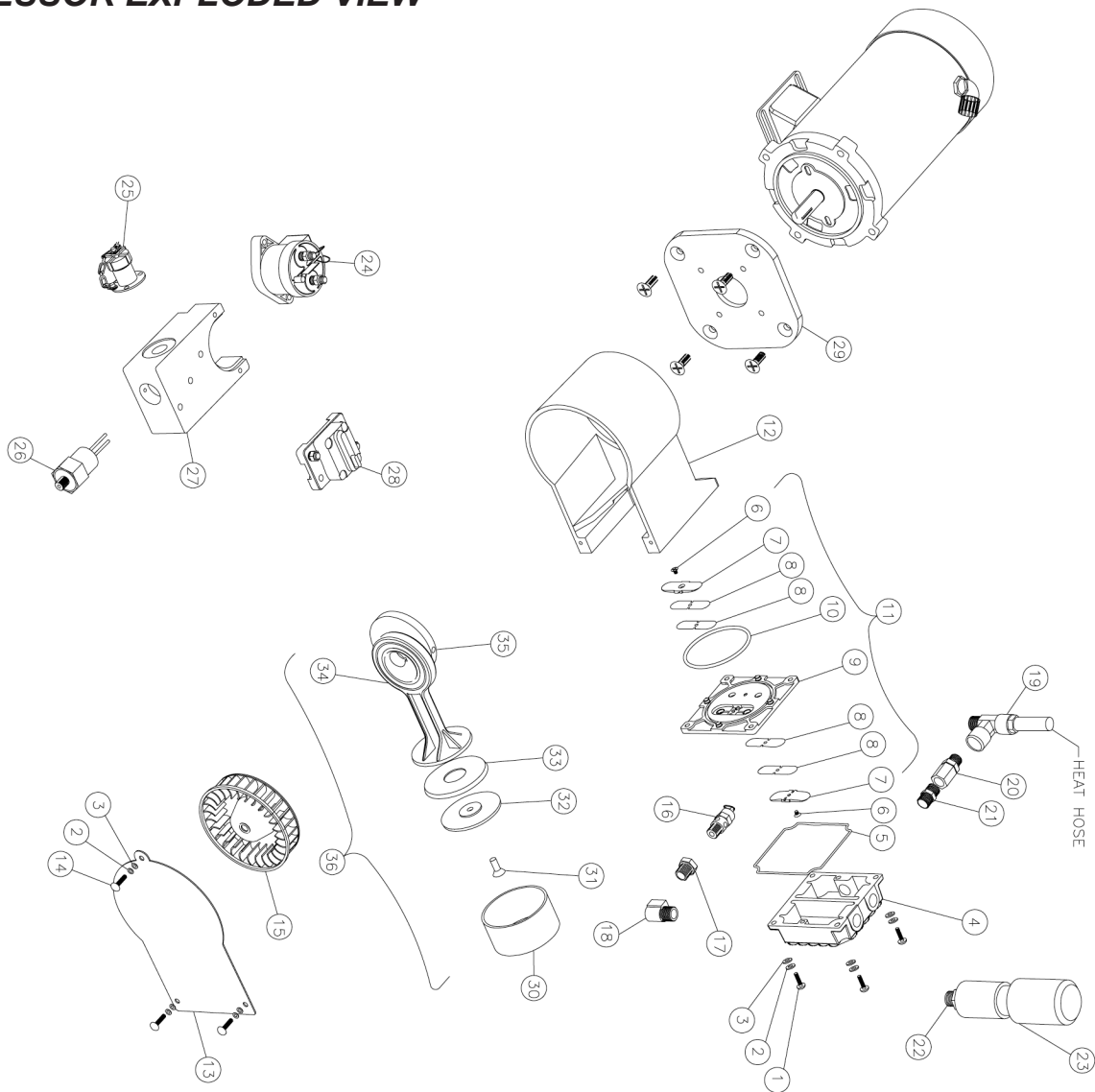
1. Using a 11/16" wrench, remove the black Heat Hose (item 23) from the compressor head.
2. Using a 5/16" socket, remove the screws (item 8), lock washers (item 9) and flat washers (item 10) from front cover (item 7). Remove cover.
3. Using 5/16" socket, remove the screws (item 17), lockwashers (item 9) and flat washers* (item 10, 4 sets) from the compressor head. Remove compressor head (item 15).
4. Separate compressor head (item 15) from valve plate assembly (item 12).
5. Pull out piston sleeve (item 11a).

Inspect rod and bearing assembly. The piston rod should pivot freely on the bearing. There should be no play perpendicular to the bearing.

6. Using a #2 Phillips screwdriver, remove screws (items 12b), valve restraints (items 12c) and flapper valves (items 12d) from plate.
7. Using a #3 screwdriver, remove screw (item 11b) from center of piston head. Remove cap (item 11c) and cup (item 11d).
8. Install new piston sleeve (item 11a) over bare piston head onto piston rod.
9. Slowly pull engine start cord, or manually turn fan (item 4) to position piston at maximum extension.
10. Place piston cap (item 11c) into center of new piston cup (item 11d).
11. Install new retainer screw (item 11b) through cap (item 11c) and cup (item 11d), into threaded center of piston head. Start screwing retainer screw into piston head. With rubber hammer tap cup & cap into sleeve then tighten screw.
12. Install new flapper valves (items 12d) located under the valve restraints (items 12c) onto valve plate (item 12e), carefully matching valves with setting posts.
13. Install new o-ring (item 12f) and gasket (item 12a) making sure each is fully seated in its appropriate groove.
14. Hold completed valve plate assembly (item 12) gasket side up. Place head (item 15) onto valve plate assembly (item 12), lining up posts.
15. Place lockwashers (item 9) and flat washers (item 10) onto screws (item 17) and install into corner holes of the head assembly. Install two flat washers* (item 10) onto the screw threads protruding through the head assembly. (Washers will be between head assembly and housing.) Align screws with holes in housing and begin threading by hand. Tighten using 5/16" socket.
16. Using adjustable wrench, remove relief valve (item 13). Install new relief valve and tighten until snug.
17. Align front cover (item 7) with holes in housing. Install screws (item 8), lockwashers (item 9) and flat washers (item 10). Tighten using a 5/16" socket.
18. Place motor/compressor assembly in pan or dish. Secure with same bolts and nuts as disassembled. Replace any straps that were removed.

* If flat washers are present during disassembly, they must be replaced during reassembly. Current production models do not have flat washers located between compressor head and housing.

COMPRESSOR EXPLODED VIEW



| NO. | PART NUMBER | DESCRIPTION |
|---------|-----------------|------------------------------|
| 1 | HMMSS10C-1 | SCREW, 10-24, 1 INCH |
| 2 | WML2210 | LOCK WASHER |
| 3 | AN960C10L | WASHER |
| 4 | AC2-15-2P | HEAD, TWIN, RIGHT SIDE |
| 4 | AC2-15-3P | HEAD, TWIN, LEFT SIDE |
| 5* | AC1-2-17 | GASKET, VALVE HEAD SPECIAL |
| 6* | AC1-2-20 | SCREW 6-32 X 3/8 |
| 7 | AC1-2-19 | VALVE RESTRAINT |
| 8* | AC1-2-18 | VALVE FLAPPER |
| 9 | AC1-2-13 | VALVE PLATE |
| 10* | AC-VPO | O-RING |
| 11 | AC2-21 | HOUSING TWIN |
| 12 | AC-VPA | VALVE PLATE ASSEMBLY |
| 13 | AC2-7SS | COVER TWIN SS VENTED |
| 14 | HMMSS10C.3/8 | SCREW, 10-24, 3/8 |
| 15 | PR25-008 | FAN-WHEEL DIRECT DRIVE TWIN |
| 16 | 638656 | VALVE, PRESSURE RELIEF |
| 17 | 110-64 | REDUCER 3/8" MIP TO 1/4" FIP |
| 18 | 28-158 | ELBOW ST 3/8" 90° BARSTOCK |
| 19 | 127F-6 | TEE STREET PIPE FORGED 3/8" |
| 20 | 5A704 | UNLOAD CHECK VALVE |
| 21 | 122-6 | 3/8" NIPPLE |
| 22 | 28-224 | NIPPLE HEX BRASS 3/8"x1/2" |
| 23 | ISS-280 | SOCKET INTAKE STAFF 280 |
| 24 | 9012 | RELAY |
| 25 | 62879 3 PRONG | CONNECTOR GROMMET |
| 25 | 62876 2 PRONG | |
| 26 | LM-2B-100R/WL82 | PRESSURE SWITCH |
| 27 | | BREAKER BLOCK |
| 28 | CB185-50 | FUSE |
| 29 | ACFP | MOTOR FACE PLATE |
| 30* | AC1-2-10 | SLEEVE, CYLINDER |
| 31* | AC1-2-9 | SCREW 1/4 20 X 5/8 |
| 32 | AC1-2-11 | PISTON CAP |
| 33* | AC1-2-12 | CUP PISTON AC-CUP |
| 34 | AC-2-8 | ROD, BARE AC UNITS |
| 35 | AC-2-6I | ECCENTRIC, INSIDE TWIN |
| 36 | AC2-BAI | ROD BEARING ASSEMBLY, INNER |
| QTY (1) | BTL-DDRB1 | COMPRESSOR HEAD REBUILD KIT |

(INCLUDED IN COMPRESSOR HEAD REBUILD KIT *)

TROUBLESHOOTING GUIDE

| Condition | Possible Cause | Solution |
|---|---|--|
| Compressor will not turn ON | Insufficient power supply Circuit protector activated Motor or compressor locked or frozen | Connect the compressor to fully charged batteries. Depress the protector to reset. If the condition recurs, verify the incoming power is adequate to support the compressor operation. Service required. Contact Brownie's for technical assistance. |
| Compressor speed slows, but will not stop, even when no air is being consumed through the second stage regulator. | Air leak | Inspect hose connections and regulators for possible leaks. Service as necessary. |
| Insufficient air. | Debris in inline filter. Too many divers for the depth attempted. Diminishing battery power. | Clean or replace screen assembly. Ascend to shallower depth. Fully recharge battery before diving again. |
| Water in 2nd stage regulator | Diver in "head down" orientation Inverted exhaust valve. Leak in 2nd stage. (Mouthpiece, diaphragm, exhaust valve, o-rings) | Change orientation while diving to normal "head up – chin down" position. Manually reseal the exhaust valve. Have regulator serviced by a qualified technician. |
| Diver headache, nausea, dizziness | Exhaust or other contaminants in the air around the compressor | Stop diving immediately and move the compressor to a location with a clean, fresh air supply. If the condition persists, seek medical attention. |
| Any strange noises or erratic behavior in the compressor. | Water intrusion. Wear or failure of a mechanical component. Loss of lubrication. | Have unit inspected and serviced by a qualified technician |

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