PADI Sidemount Diver

Instructor Guide

Specialty Course Instructor Guide

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PADI Sidemount Diver Specialty Course Instructor Guide

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Introduction

How to Use this Guide

This guide speaks to you, the PADI Sidemount Diver Specialty Instructor. The guide contains four sections: The first contains standards specific to this course, the second contains knowledge development, the third considers practical application and the fourth addresses confined water training and details the open water dives. All required standards, learning objectives, activities, and performance requirements specific to the PADI Sidemount Diver course appear in **boldface** print. **The boldface assists you in easily identifying those requirements that you must adhere to when you conduct the course.** Items not in boldface print are recommendations for your information and consideration. General course standards applicable to *all* PADI courses are located in the General Standards and Procedures section of your PADI *Instructor Manual*.

Course Philosophy and Goals

Sidemount diving is not a new concept, but its application has spread from cave diving to open water recreational and technical diving. Sidemount diving presents divers with a different approach to equipment configuration, and a new set of skills to master. Remember that the philosophy of this course is to provide an introduction to the use, benefits and proper configuration of sidemount equipment for recreational diving, with an emphasis on safety. The *goal* of this course is to provide a systematic, methodical, approach to recreational sidemount diving, showing how to apply the skills developed using conventional backmounted equipment. Once certified, student divers will be able to use sidemount equipment comfortably for no stop recreational dives in conditions similar to, or better than, those encountered during training.

Course goals are to:

- Explain the benefits of sidemount diving
- Develop student ability to assemble, configure and wear sidemount diving equipment
- Guide students in the skills required to plan and make no stop recreational sidemount dives

Course Flow Options

Have student divers read Section One of the PADI *Sidemount Diver and Tec Sidemount Diver Manual* and complete the associated Knowledge Review. You may conduct a classroom session to verify student diver understanding and review the Knowledge Review prior to the Practical Application. Use the PADI *Sidemount Diver Specialty Course Instructor Guide* to conduct instructor-led presentations if the diver manual is not available in a language student divers understand and have them complete the Knowledge Review from the instructor guide. Student divers must complete the Practical Application prior to the confined water dive. Students must successfully complete the confined water dive prior to Sidemount Dive One. See Sections One and Four for options regarding single- and two-cylinder sidemount during Sidemount Dive One.

There are three open water dives. You may rearrange skill sequence within each dive, however the sequence of dives must stay intact. You may add more dives as necessary to meet student divers' needs. Organize your course to accommodate student diver learning style, logistical needs and sequencing preferences. Incorporate environmentally friendly techniques throughout each dive.

Section One:
Course Standards

This section includes the course standards, recommendations, and suggestions for conducting the PADI Sidemount Diver Specialty course.

Standards at a Glance

Topic	Course Standard
Minimum Instructor Rating	PADI Sidemount Diver Specialty Instructor
Prerequisites Minimum Age	PADI Open Water Diver 15 years
Ratios	Confined Water -10:1 with 4 additional students per certified assistant Open Water – 8:1
Site, Depths and Hours	Maximum Depth Varies with dive Hours Recommended: 24 over three days Minimum Water Sessions: 1 confined water dive, 3 open water dives
Materials and Equipment - Instructor and Student	Instructor - PADI *Sidemount Diver Course Specialty Instructor Guide* Student Diver - PADI *Sidemount Diver and Tec Sidemount Diver Manual* Equipment - BCD, harness and cylinders for sidemount configuration (see Materials and Equipment for details)

Instructor Prerequisites:

To qualify to teach the PADI Sidemount Diver course, an individual must be a teaching status PADI Open Water Scuba Instructor or higher. PADI Instructors may apply for the Sidemount Diver Specialty Instructor rating after completing a Specialty Instructor Training course with a PADI Course Director, or by providing proof of experience and applying directly to PADI. Proof of experience requires evidence of training as a sidemount diver and at least 20 dives using a sidemount configuration, or proof of 50 dives using sidemount configuration.

Student Diver Prerequisites:

By the start of the course, a diver must be:
1. **Certified as a PADI Open Water Diver.** Verify student diver prerequisite skills and provide remediation as necessary.
2. **At least 15 years old.**

Supervision and Ratios:

A teaching-status PADI Sidemount Diver Specialty Instructor must be in direct supervision of all activities at a maximum ratio of 10:1 in confined water and 8:1 in open water (with 4 additional student divers allowed per certified assistant).

Confined Water Dive

The confined water dive must be completed prior to Sidemount Dive One. It may be completed using a single or two-cylinder sidemount configuration. **Students must master all confined water skills using two cylinders prior to Sidemount Dive Two.** You can accomplish this by covering both single and two-cylinder sidemount skills during the confined water dive, or by adding a confined water dive between Sidemount Dive One and Sidemount Dive Two.

Open Water Dives

Sidemount Dive One may be completed using either single or two-cylinder sidemount configuration.
Sidemount Dive Two must be completed using two-cylinder sidemount. If Sidemount Dive One was completed in a single cylinder, the two-cylinder sidemount skills from Sidemount Dive One must be completed in Sidemount Dive Two.

Site, Depths and Hours:

Site

Choose sites with conditions and environments suitable for completing the performance requirements. Ideally, select sites familiar to student divers. Shallow dives will provide divers with more opportunities to complete tasks. Use different open water dive sites, if possible, to give student divers experience in dealing with a variety of environmental conditions (incorporate environment friendly techniques throughout each dive) and logistical challenges.

The fundamental skills are practiced in confined water first to provide initial skill development without environmental variables that can impede learning. Students subsequently apply their skills and continue to develop them in open water, applying what they are learning to the requirements of the dive environment.

Depths

Choose sites with condition and environmental features suitable for completing the course requirements. **The maximum planned depth must not exceed the diver's current training level and experience.**

- Open Water Divers - 18 metres/60 feet
- Advanced Open Water Divers or higher - 30 metres/100 feet

Hours

The PADI Sidemount Diver course includes at least one confined water dive and three open water dives.
Recommended course hours: 24 over three days

Materials and Equipment

- **PADI *Sidemount Diver Course Specialty Instructor Guide* (Instructor only)**
- **PADI *Sidemount Diver and Tec Sidemount Diver Manual* (Student only)**
- **Student and instructor equipment as outlined in the PADI *Instructor Manual*, General Standards and Procedures**
- **BCD and harness configured for sidemount diving**
- **Two independent cylinders, each with a regulator with a single second stage, and SPG. At least one second stage must be on a longer hose for sharing gas**

approximately one metre/three feet in length, with 1.5-2 metres/5-7 feet recommended. **At least one regulator (typically the left) must be equipped with a low pressure inflator hose to supply the BCD.**

- Optional: For the Confined Water Dive and Sidemount Dive One only, a single cylinder with first stage regulator, primary second stage, alternate second stage, SPG and LPI, may be used. **Students must master all water skills wearing two cylinders in confined water prior to open water Sidemount Dive Two.**
- Specialty equipment and supplies:

  a. Spare parts kit

  b. Extra weights in small increments for student trim

  c. Different size cylinders for students to try
- Other equipment as required by General Standards and Procedures in the PADI *Instructor Manual*.

Assessment Standards

The student diver must demonstrate accurate and adequate knowledge during the confined water and open water dives and must perform all skills (procedures and motor skills) fluidly, with little difficulty, in a manner that demonstrates minimal or no stress.

Certification Requirements

To qualify for certification, by completion of the course, student divers must meet all the performance requirements for the Sidemount Diver Confined Water Dive and Open Water Dives One, Two and Three.

The instructor certifying the student diver must ensure that all certification requirements have been met.

Links to Other Courses

Divers who successfully complete Confined Water Dive One, Sidemount Dive One and the Knowledge Review may receive credit for an Adventure Dive toward the PADI Adventure Diver and the PADI Advanced Open Water Diver certifications.

Divers may also credit the specialty certification toward the PADI Master Scuba Diver rating.

Section Two:
PADI Sidemount Diver Knowledge Development

Conduct

Divers complete Knowledge Development by reading Section One of the PADI *Sidemount Diver and Tec Sidemount Diver Manual* and completing the associated Knowledge Review. You may conduct formal and informal presentations to verify student diver understanding using the following course presentation outlines.

Because the PADI Sidemount Diver course is primarily a motor skills course, knowledge development prepares students to develop and practice those skills under your direction. Demonstrating motor skill mastery during practical application and the training dives, combined with asking students questions, other verbal interactions and assessing the knowledge review, allows you to assess knowledge development mastery.

Knowledge Development One

I. Introduction

[Have students and staff introduce and provide a bit of background about themselves.]

A. Course Goal – to qualify and certify you to set up, plan and make dives with sidemount equipment within your present certification and experience limits.
   1. Certification as a PADI Sidemount Diver means you are qualified to plan and make dives using recreational sidemount equipment within the limitations of your other recreational diver certifications, in conditions as good as, or better than, those in which you train.
   2. Important: Sidemount originated with, and has extensive application in tec diving. The PADI Sidemount Diver certification does not qualify you as a tec diver.

B. Course Overview and Schedule

[Discuss the course sequence, assignments, meeting times, places and other information about all class and practical application sessions, and training dives. Build excitement about the course, particularly the training dives.]

C. Costs, Equipment Requirements and Paperwork

[Explain all costs, equipment requirements and logistical details as necessary. Reconfirm prerequisites if appropriate, ensure all paperwork is completed – see Section One, and Paperwork and Administrative Procedures, General Standards, PADI *Instructor Manual*. Collect outstanding fees.]

D. Performance Requirements and Certification

1. To qualify for any PADI certification, you must meet specific performance requirements.
   a. You pay for the course, but must earn the certification.
   b. This requirement exists because your ability to dive safely depends upon your ability to master and apply what you learn in this course.
   c. Performance-based learning is objective – a student either meets a requirement or not; your instructor is not arbitrary in assessing performance.
2. Although you must meet all performance requirements, having difficulty does not mean you will be unsuccessful.
   a. You take a course to learn – making mistakes and needing time to master knowledge and skill is part of learning.
   b. You may pick up some things quickly and others slowly; what matters is that you demonstrate mastery – not how long it takes.
   c. You move on at the pace you learn – you may need extra dives or other practice.

II. Benefits of Sidemount

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. **What are seven general benefits of the sidemount configuration?**
2. **What are three disadvantages of sidemount?**

1. What are seven general benefits of the sidemount configuration?

A. General benefits of sidemount

As you probably realize, in sidemount, divers wear one, or more commonly two, cylinders along their sides with no cylinders on their backs.

B. This configuration originated with cave diving, but has a growing following in recreational diving because it has these general benefits:

1. Ease of streamlining equipment. When you need or want more than one cylinder, sidemount provides a very streamlined package. When correctly configured, sidemount can reduce drag and avoids contact with the environment.
2. Easier equipment transport. Most people find it easier to carry and wear two smaller cylinders instead of one large cylinder. Divers with physical challenges may find this a big advantage, especially in that it allows them to don equipment in the water.
3. Versatility. Sidemount works well with many recreational diving activities making it a great way to expand your capabilities with a single basic configuration. Divers with physical challenges find that even when diving only one cylinder, sidemount simplifies getting in and out of the water.
4. Increased gas supply. Using enriched air nitrox and an EANx dive computer, you often have so much no stop dive time that you run out of gas long before you approach a no decompression limit. The ability to use two cylinders lets you enjoy more of this no stop dive time.
5. Accessibility. In sidemount, the regulator first stage and valves are in front of you where they're visible and accessible. This makes it easier to spot and deal with problems (you'll learn about this during the course).
6. Adjustability. Most sidemount configurations allow you to fine tune equipment fit and trim during the dive to enhance streamlining and body position. Most divers find this makes sidemount more comfortable than other configurations.
7. Problem solving. With two-cylinder sidemount, you can handle an out-of-gas problem without your buddy as your primary alternate air source.

2. What are three disadvantages of sidemount?

C. Sidemount does have some drawbacks of which you should be aware, though you'll find you can deal with them relatively easily in most circumstances.

1. Cumbersome in full kit out of the water. With two normal cylinders (11 litre/80 cubic foot) out of the water, it can be awkward to stand and perform a giant-stride in sidemount; you would normally put the cylinders on after you enter the water. With two small cylinders, however, this is much less of an issue.
2. More complex gas management. With two cylinders, you must learn to switch regularly between cylinders to keep the pressures relatively close. However, this is not overly complex, and you'll learn to do this as part of this course.

3. Buddy unfamiliarity. You may find yourself teamed with buddies who are not acquainted with sidemount procedures. Fortunately, it isn't difficult to show them what they need to know during dive planning.

III. Basic Sidemount Configuration

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. **What are the main components of a sidemount rig?**
2. **What are common harness and BCD options for sidemount rigs?**
3. **What are common cylinders and cylinder configurations for sidemount rigs?**
4. **How do you configure your right and left side regulators for use when sidemount diving?**
5. **What options do you have for weight systems and weight placement when sidemount diving?**
6. **Where do you carry accessories in a sidemount rig?**
7. **How do you don and wear a sidemount rig with one and with two cylinders?**

Note to instructor: *It's recommended that you refer to an actual sidemount rig during this presentation.*

1. What are the main components of a sidemount rig?

A. The main components of a sidemount rig

Apart from the gear you normally use, here are the main pieces of equipment you'll use as a PADI Sidemount Diver. We'll look at each item in detail shortly.

1. Harness and BCD. The harness has attachment hardware for holding cylinders on each side of your body. The BCD is typically a wing-style, but streamlined.
2. Two cylinders, each with a regulator and SPG, one on each side.
   a. Single-cylinder sidemount is sometimes used with cylinders that are nearly neutral.
   b. In single-cylinder sidemount, you typically wear the cylinder on your left side.

3. Weight system and trim options – integrated weights, weight belts and weights mounted on cylinders.
4. Pockets/attachment points for accessories.
5. In sidemount diving, snorkels can interfere with gas sharing and hose placement. Instead, carry a collapsible snorkel in your pocket that you can deploy if needed.

2. What are common harness and BCD options for sidemount rigs?

B. Sidemount harness and BCD systems

1. Modern sidemount rigs consist of a harness and BCD specifically designed for sidemount. It may be based on components you assemble to create a sidemount rig, or it may be a dedicated sidemount configuration.
2. In either case, the unit's harness has attachment points for the cylinders. The BCD attaches to the harness and will have attachments and restraints to keep it wrapped closely around your body.
    a. Cylinders attach at the hip or over the buttocks on either side (or both), and on the upper chest at armpit level.
    b. Most configurations use an elastic system (bungee, tubing, etc.) to hold the tops of the cylinders in place while worn. Some divers also have clips that attach to the chest D-rings.
3. Popular harnesses are padded for comfort and accommodate weights so you can balance your trim in the water (more about this later). Most have a crotch strap to keep the harness properly positioned.
4. BCDs have different amounts of lift.
    a. Select a BCD that provides adequate lift for your equipment and cylinders so your head is out of the water at the surface, and so that your buddy could rescue you should it be necessary.
    b. This rarely differs significantly from the BCD lift capacity you would use with a single cylinder, all else being the same.
5. Most sidemount rigs put the BCD inflator/deflator on the customary left side, with a low pressure hose supplying it from the left main regulator.
    a. This is why you normally wear a single sidemount cylinder on the left.
    b. A few sidemount rigs use the right side.
6. Sidemount configurations continue to evolve, particularly with regard to new methods of attaching BCDs and cylinders.

[Show students current configurations.]

3. What are common cylinders and cylinder configurations for sidemount rigs?

C. Cylinders and cylinder configurations

1. Cylinder types vary in size and buoyancy characteristics, giving each type advantages and disadvantages when used for sidemount.
    a. Most aluminum cylinders are less negatively buoyant, making them easy to put on, take off and adjust in the water.
        1. They require you to wear more weight elsewhere, all else being equal. This is an advantage in circumstances that require removing them underwater because your weight is on you, not the cylinders.
        2. The cylinder tails (bottoms) tend to float upward after you use about a third of the gas, so some divers put weights on them. Another option is to have high and low attachment points for different buoyancy states.
        3. In single-cylinder sidemount, aluminum cylinders are the most common due to buoyancy characteristics.
    b. Steel cylinders are usually negatively buoyant throughout the dive, though they become lighter with gas use.
        1. Steels usually allow you to wear less weight.
        2. They are harder to handle underwater than aluminum.
        3. Steels tend to be more stable as you consume the gas, and do not float tail-up as much as aluminums do.
2. As you'd expect, you plan cylinder capacity according to the dive you want to do, or you plan the dive according to the cylinders you have available.
    a. The 11 litre/80 cubic foot aluminum and the 12 litre/95 cubic foot steel are among the most popular sizes.
    b. You may not need extra gas capacity, but choose to wear sidemount for equipment convenience. For this, two 6 litre/40 cubic foot or 7 litre/50 cubic foot cylinders is a common choice.
3. DIN valves are preferred for sidemount, though yoke valves may be used if DIN valves are not available.
    a. It's helpful to have both right and left side hand wheel valves configured with the hand wheel on the outside, away from you. This makes it easier to operate while worn, and puts the regulators inward, which reduces entanglement issues.
    b. Nonetheless, standard (right side) hand wheels may be used on both sides.

4. Cylinder mounting options vary, but most use a stainless steel or fabric band with an attachment point towards the lower part of the cylinder.
    a. A large bolt snap (p-clip, sliding gate clip) normally attaches the cylinder to the harness on a hip D-ring, butt rail or other attachment hardware as appropriate for the particular harness.
    b. As mentioned, the top of the cylinder usually attaches to the harness by elastic cord or bungee that stretches around the valve. Some divers use a clip as well for extra security, especially when wearing mounted cylinders out of the water.
    c. Bungees, inner tubing or surgical tubing bands around the cylinders allow you to tuck regulator hoses along their length for streamlining and control.
    d. A growing number of manufacturers have proprietary attachment systems that are specific to their sidemount setups.

4. How do you configure your right and left side regulators for use when sidemount diving?

D. Regulators and regulator configuration for sidemount.

1. In sidemount, the regulators mount on the cylinders so that everything is streamlined without loops or protrusions that cause drag and snags. You rig the regulators and cylinders so that when worn, the first stages are inward, toward your body where they're protected yet accessible.
2. SPGs must be accessible throughout the dive.
    a. It is common to use short SPG hoses that allow the gauge to stand up from the valve in view.
    b. Other divers prefer standard SPG hoses. They route the hoses down along the cylinder and back up, held by cylinder bands, placing the gauges where they are visible. The hose is routed so that it does not trap or interfere with other hoses on your rig.
3. Your left side main regulator usually has a low pressure inflator hose supplying the BCD, with the second stage on a standard length (80-90 cm/32-36 in) hose. When not in use, this second stage is either clipped to a shoulder D-ring or secured in a necklace just under the chin. Some divers put a 90º or 45º elbow on it to streamline its position.
4. Your right side main regulator has only an SPG and second stage, unless you are supplying a backup BCD bladder or a dry suit.
    a. The second stage hose is 1.5-2 metres/5-7 feet long for gas sharing with a buddy. You route this hose down along the cylinder and back up, then across your chest and around your neck into your mouth.

b. In single-cylinder sidemount, the left regulator commonly has a second stage on a 1.5-2 metre/5-7 foot long hose for sharing gas and a second stage on an 80-90 cm/32-36 in hose.

c. The cylinder bands hold the excess slack to keep everything streamlined. You clip this second stage to a D-ring when you're not using it.

5. There are some variations in hose length and second stage placement to accommodate regional preferences, personal needs and equipment differences.

   a. Hoses should be long enough to reach the mouth comfortably without causing slack issues.

   b. Sometimes elbow adaptors help you redirect hoses for a cleaner routing, but be cautious because they can affect regulator performance and add o-rings to take care of (they're not commonly needed with modern, high end regulators). These are most common only on the left second stage.

   c. Some second stages accept the hose from either side, allowing you other routing configurations.

6. Clips used on second stages and SPGs should be breakaway clips.

   a. This means you secure the clip to the hose or other attachment point with a thin o-ring or a small pull tie.

   b. In an emergency, or should the clip jam, you can release the second stage with a sharp tug or twist that breaks the o-ring/pull tie, leaving the clip behind.

[Show students a breakaway clip.]

7. Although not common, there are some sidemount systems that have small manifolds attached to the rear of the BCD. They're designed to allow the regulators to be configured much as they would be when diving in backmount.

Note to instructor: *Provide more detail if students will be using this type of system during the course.*

5. What options do you have for weight systems and weight placement when sidemount diving?

E. Weight systems and options

1. It's important to be able to distribute your weight so you can swim or hover horizontally with little effort.

2. In sidemount diving, it is not unusual to use more than one system to distribute your weights.

3. Weight belts. Especially if you don't need much weight, a weight belt will often suffice.
    a. Sidemount harnesses typically have crotch straps, which some divers choose to place over weight belts.
    b. This is generally not recommended in recreational diving because it makes it difficult to get rid of the belt quickly. But in some forms of diving, such as tec diving, losing your weights and having an unplanned and/or uncontrolled ascent is a bigger risk.
4. Integrated weight systems. Many sidemount harnesses include, or have an option for, weight pockets similar to those you find on recreational BCDs.
5. Harness-mounted weights. Some divers like to thread weights onto their harnesses to help with balance. You can't ditch this weight, but you typically only do this with about 2 kg/5 lbs of weight.
6. Cylinder-mounted weights. Some divers put 2 kg/5 lb weights (more or less) with a nylon cam band onto their cylinders (especially aluminum cylinders). One advantage of this is that you can loosen and reposition the band to fine-tune your trim during the dive.
7. Specialized pockets. A few sidemount systems have pouches on your back (an unused space) for locating weights. This keeps the front of your rig clean, but you cannot ditch this weight.
8. You will learn how to determine how much weight you need, and where to locate it with your rig, during the training dives.

[Show students the weight and position options on a sidemount rig, ideally the same type they will be using during the course.]

6. Where do you carry accessories in a sidemount rig?

F. Options for carrying accessories
    1. Carrying accessories in sidemount has some considerations that differ from conventional backmount.
        a. Your front, waist area tends to be hard to reach in sidemount once you have your cylinders on. Avoid pockets and accessories in this area – only put here things you don't use much here, and be sure you can get to them!
        b. The upper chest is easily accessible, but needs to be kept relatively clear for second stage access and securing your cylinders. Only clip accessories here when you're using them and need to free your hands for a moment.

c. Your low rear waist and upper buttocks area is relatively easy to reach. Many sidemount divers have two or more rear D-rings to make use of this area.

d. Exposure suit thigh pockets hold a lot and are readily accessible. These are optimum storage areas.

3. You commonly store surface signaling devices (other than your whistle) in a thigh pocket or rolled and butt-mounted.
4. If you'll be using a line reel, you normally clip it to a rear D-ring.
5. Small line cutting devices typically mount on BCD hoses and dive computer wrist straps. You can carry larger devices in a pocket.
6. You can have a rear mounted "pocket book" (pouch) clipped behind you. Unclip it and bring it in front to access it.

[Show students examples of accessories and how to store them.]

7. ***How do you don and wear a sidemount rig with one and with two cylinders?***

Note to instructor: *It's recommended that you demonstrate the following steps as you describe them, pointing out details.*

G. Donning and wearing a typical two-cylinder sidemount rig

1. Assemble your cylinders.

a. When diving EANx, analyze the gas, check the pressure and label each cylinder with your name, the gas, and the deepest depth you can safely use the gas, positioned where you can read it.

b. Attach the cylinder bands and hardware, making sure to orient the regulators according to right and left. Route the hoses down the cylinder length, and for the moment, tuck all hoses into the bands to create a tight package you can easily carry.

c. Predive check both cylinders (test breathe, listen for leaks, confirm sufficient gas).

d. If appropriate for the dive, take the cylinders to the water's edge or rear of the boat, etc.

2. Prepare your mask, fins and collapsible snorkel.
3. Put on your exposure suit and weight belt (if using a weight belt). Stow your snorkel and any accessories you carry in the thigh pockets.
4. Don your harness with BCD. Clip on rear mounted accessories and clip the upper cylinder bungee (if appropriate for your rig).

5. In most instances when sidemount diving, you don the cylinders after you enter the water, but sometimes you do it before you enter.
   a. Either way, before entering, you conduct a predive check of all your gear with your buddy.
   b. Either way, inflate your BCD before entering the water. If you're donning the cylinders in the water, you do this orally.
6. Attach the cylinders, beginning with the left.
   a. Most divers find it easiest to attach the lower clip to the butt rail or hip D-ring first, then swing the cylinder into place, restrain it with the bungee and clip it to a chest D-ring (if using an upper clip).
   b. Once in place, deploy and connect the low pressure inflator hose to the BCD. Confirm the SPG is visible and open the valve (or confirm that it is open).
      - Practices vary with respect to when you open the valves on your main cylinders.
      - When entering water too deep in which to stand, you usually open the cylinder valves before entry so you can use them immediately.
      - When entering water shallow enough in which to stand, it is common to have the valves closed until you put the cylinders on.
      - Regardless, confirm that both valves are open before beginning a descent.
   c. Deploy the second stage, run it behind your neck and then under your chin to the necklace, or, if it is a left-handed second stage, run it directly to the necklace. Alternatively, clip it to a chest D-ring with most of the hose still tucked into the bands, or between your body and cylinder.
   d. In single-cylinder sidemount, you're done after you don the left cylinder. For two-cylinder sidemount, you mount the right cylinder the same way as the left, including confirming that you can access the SPG and second stage, and that the valve is open. Connect the inflator hose to your dry suit (if supplying a dry suit from it). Secure the second stage and deploy just enough hose for it to reach across your chest, around your neck and into your mouth.
   e. You usually position the right cylinder after the left so that its second stage – the one you would share – is on top and not trapped by other hoses.
   f. Keep the valves to both cylinders open throughout the dive (unless you have to shut down a freeflowing regulator).

7. If donning the cylinders before entering the water, sit on a bench while you attach your cylinders.
   a. Lift the cylinders onto the bench and orient them as you will wear them, then sit between them.
   b. Start by attaching the tail of the left cylinder. Then lift the top of the cylinder up and attach it as previously described.
   c. It helps to have someone assist you, and standing up can be awkward.
   d. In some circumstances, an option is to don only your left cylinder (supplies the BCD) out of the water, then put on the right after entering.

IV. Diving Sidemount

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. In what ways can you enter the water and put on your cylinders when sidemount diving?

2. How do you check your buoyancy and determine correct weighting with sidemount?

3. What are "gas management" and "turn pressure"? What two goals do you have when managing your gas in sidemount? What common techniques can you use to meet these goals?

4. How do you adjust for proper trim in sidemount? What are your options for refining your trim during a dive?

5. What two kicks do you most commonly use in sidemount?

6. Why might you disconnect the lower end of one or both of your sidemount cylinders, but leave it or them secured at the top?

7. How do you exit the water in sidemount?

1. In what ways can you enter the water and put on your cylinders when sidemount diving?

A. Sidemount entries

1. After donning all your gear and completing your predive safety check, you can enter the water several ways when sidemount diving. The choice depends upon the environment, and most of these methods work with single-cylinder sidemount as well as two-cylinder sidemount.
   a. Before all entries, inflate your BCD enough to assure adequate buoyancy.
   b. Check the area and be sure your buddy is ready to go, too.

2. Don cylinders in the water.
   a. Put cylinders in shallow water or dangle them just in the water from a line.
   b. Enter the water and don the cylinders at the surface.
   c. This is probably the most popular entry method, but it isn't always possible from boats, especially with a moderate current.
3. Don cylinders out of the water and giant stride.
   a. Buddies help each other into cylinders as described earlier.
   b. Use a giant stride entry as you're already familiar, but hold the cylinders firmly to prevent them from striking upward when you impact the water.
   c. This is a good choice for boat entries from an elevated height, but getting into your gear and standing can be awkward if the boat is unstable.
4. Don cylinders out of the water and use a seated back roll.
   a. Buddies help each other into cylinders as described earlier.
   b. Use a seated back roll entry as you're already familiar.
   c. This is a good choice for small boat entries, and from a low to moderate height from an unstable platform.
   d. Be sure to hold cylinder valves so that they don't hit your head area during the entry.
5. Don one cylinder, hold the other and giant stride.
   a. Divers don the left cylinder (right with setups that supply the BCD with the right). They giant stride breathing the left cylinder and holding the mask with the left hand, holding the right cylinder with the right. (It can also be handed in after entry.)
   b. Don the right cylinder after entry.
   c. It's easier for the diver to stand and be stable before entry, making it a good compromise when you need to use a giant stride from a moderately unstable platform.
   d. The disadvantage is you have to be careful not to drop the right cylinder when you impact the water.
6. There are variations on these to fit the circumstances.

[Describe any local variations you'll have students practice.]

2. How do you check your buoyancy and determine correct weighting with sidemount?

B. Buoyancy check and correct weighting

1. Correct weighting with sidemount is the same as with backmount. The goal is to be able to maintain a safety stop at 5 metres/15 feet with your cylinders at reserve pressure.

2. To check your weight, wearing your two cylinders (or one cylinder with single cylinder configuration) with 35 bar/500 psi in each, you should float at eye level with an empty BCD and holding a normal breath. When you exhale, you should slowly sink. Adjust your weight until you reach this buoyancy state.
3. If you check with full cylinders (commonly the situation), add about 2.5 kg/6 pounds for each 2250 litres/80 cubic feet of free gas.
4. Using two of the popular 11 litre/80 cubic foot cylinders, for example, if you are correctly weighted you should be 5-6 kg/10-12 lbs negatively buoyant with full cylinders at the start of the dive.

3. What are "gas management" and "turn pressure"? What two goals do you have when managing your gas in sidemount? What common techniques can you use to meet these goals?

C. Gas management.

1. Gas management means you have
   a. the gas required for the dive plan.
   b. a reserve for emergencies beyond the planned amount.
   c. determined your turn pressure – the pressure at which you must head up or back so you finish the dive with your planned reserve.
2. Generally, in recreational single- or two-cylinder diving, this means you finish the dive with at least 35 bar/500 psi in each cylinder.
   a. Allow a greater reserve for more challenging conditions or situations, just as you always would.
   b. Dive well within your limits.
3. Because you usually don't wear a snorkel sidemount diving, you may choose to breathe from your cylinders at the surface while kitting up and waiting for your buddy if it won't be long.
   a. If you will be waiting at the surface more than a short interval, deploy your snorkel to breathe from so you don't waste gas.
   b. If you surface away from your exit point with low cylinder pressures, you may choose to deploy your snorkel for the swim back to the boat or shore.

D. Gas management goals

1. In two-cylinder sidemount, you have two special gas management goals.
   a. The first is to keep both of your cylinders available for use so you always have two useable systems, which is one of the advantages of sidemount.
   b. The second is to keep your cylinders from having a substantial buoyancy difference that throws your trim out of balance.

2. You accomplish both by breathing alternately from your cylinders; you don't breathe one all the way down before you switch.
   a. There are differing views on how often you alternate cylinders.
   b. Alternating too often makes the dive little more than a gas management exercise.
   c. Alternating too little throws your trim off and (worst case) leaves you with one cylinder empty and one full. If the full cylinder were to have a problem, you would have to ascend on your buddy's alternate air source rather than switch to the other cylinder and ascend.
   d. The technique is to watch your SPGs and then switch from one cylinder to the other following a pattern based on the gas you use.
   e. With practice, many divers can feel when they are nearing a switch by the changes in cylinder buoyancy (although they still use their SPGs).
3. Method one: Thirds
   a. Use one third of your right.
   b. Use two thirds of your left.
   c. Return to your right and breathe to reserve pressure (35 bar/500 psi), then return to the left. Plan to finish the dive with 35 bar/500 psi in both cylinders.
   d. This method reduces the number of gas switches; the maximum buoyancy difference between cylinders (at switch pressure) is about 1-1.5 kg/2-3 lbs, which most divers find manageable.
   e. Some divers advocate switching every third rather than switching and breathing the left cylinder two thirds. That is, breathe one third of your right, one third of your left, one third of your right and so on.
4. Method two: 30 bar/500 psi [Note: 30 bar and 500 psi are not identical pressures; they are easily read on the SPG for the respective systems.]
   a. Breathe 30 bar/500 psi from your right main cylinder.
   b. Switch to your left main and breathe 30 bar/500 psi.
   c. Return to your right main and breathe 30 bar/500 psi.
   d. Continue until you reach turn pressure, or for no stop diving, so you end the dive with 35 bar/500 psi in each cylinder.
   e. This method has you trading more often, but some divers like to have less weight difference between cylinders.
5. Other management strategies are acceptable, provided your buddies agree, they keep you within your planned gas use, and they balance the gas use from your cylinders so you always have good trim and a backup to which you can switch.

6. Some divers prefer to start breathing on the left instead of the right, which does not make a significant difference. It is important, however, that you establish and stick to a personal habit for which cylinder you start with and for managing your gas supply.
7. With single-cylinder sidemount, you manage your gas as you normally do on a single cylinder backmount dive.

4. How do you adjust for proper trim in sidemount? What are your options for refining your trim during a dive?

E. Proper trim in sidemount.

1. You need optimum trim and streamlining to move cleanly and efficiently, which saves energy and gas. Streamlining reduces damage to the environment because you're not dragging gear across sensitive aquatic life.
2. On your first sidemount dives, your instructor will have you establish neutral buoyancy.
   a. Relax and hover. See what your natural attitude is in the water (horizontal, feet high, low, etc.).
   b. Your buddies and the instructor will help you be sure your cylinders are relatively in line with your body (you can't always see them on yourself).
3. Because sidemount is designed for proper trim and streamlining, you may find you need little or no adjustment after you kit up. As you use gas, however, you may find it changes. Your trim may become more head-down.
4. Regardless, as necessary, to adjust for proper trim and streamlining, arrange your weights so you can hover horizontally with little or no effort, and so you can easily change positions during the dive. Arrange your cylinders so they're inline with your body.
5. Changing cylinder attachment points and sliding weights up or down on the cylinders (if you have weights on them) can help.
6. It may take some practice initially, but usually becomes intuitive quickly.

5. What two kicks do you most commonly use in sidemount?

F. Common sidemount kicks

1. Flutter kick
   a. This is the same kick you already know.
   b. Remember to kick primarily from the hip, with little bend to the knees.
2. Frog kick
   a. You will learn to frog kick during the training dives if you're not already familiar with this kick.

b. Many prefer this kick because it does not stir up silt.

c. When neutrally buoyant in a horizontal position, you can use a "reverse" frog kick to back up without using your hands. Your instructor will show you this technique.

3. As in backmount scuba, any effective propulsion technique that doesn't stir up the bottom or harm the environment is acceptable. Divers with physical challenges may swim with their arms, etc., as appropriate for their particular situation.

6. Why might you disconnect the lower end of one or both of your sidemount cylinders, but leave it or them secured at the top?

G. Partially removing one or both cylinders

1. There are times when you may release the lower end of one (or both) of your cylinders, leave it secured on your upper chest, and swing it (or both) so that it is pointed ahead of you.
2. One reason you may do this is to adjust a weight on the cylinder, or some of its hardware, to fine tune your trim, as previously discussed.
3. You may also do this to prepare to remove the cylinder at the surface or exit, but you want to swim some distance before releasing it completely.
4. The cylinders you use affect your ability to do this.
   a. With aluminum cylinders, you can generally do this with both cylinders because most of your weight is on your harness, in your weight system.

7. How do you exit the water in sidemount?

H. Exits in sidemount

1. After your ascent and safety stop(s), you surface together with your buddy in sidemount just as you always would.
2. The most common exit procedure, whether on boat or shore, is to remove your cylinders and hand them up, or leave them some place appropriate to retrieve after exiting (shallow water, clipped to a line, etc.).
   a. Inflate your BCD; assure adequate buoyancy before disconnecting the inflator.
   b. To reduce damage risk, retuck the hoses in the cylinder bands before passing them up, suspending them, etc.
3. In some circumstances, you may need to climb a boat ladder or exit on to shore wearing your cylinders.
   a. You will need to get help or use a bench to support the cylinder weight to take them off.
   b. Before exiting, confirm you've reclipped the upper end of the cylinders if you unclip them during the dive.

V. Sidemount Problems

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. **What is your first response if you find yourself without gas from a regulator during a two-cylinder sidemount dive? What is your second response?**
2. **How do you share gas when diving sidemount?**

1. ***What is your first response if you find yourself without gas from a regulator during a two-cylinder sidemount dive? What is your second response?***

A. Your first response if you find yourself without gas from a regulator when using two cylinders is to switch to the regulator on your other cylinder. The problem could be running out of gas in that cylinder, or having to close the valve supplying a malfunctioning regulator due to uncontrolled freeflow.

1. If you're managing your gas properly, you should have enough gas on the remaining side to ascend at a safe rate to the surface. Signal your buddy and begin your ascent together. If you close a valve, be aware that you may have lost low pressure supply to your BCD and would need to use oral inflation.
2. If for some reason your other cylinder can't provide gas, your second response is to signal your buddy to share gas with you.
3. When using single-cylinder sidemount, you would share gas with your buddy's alternate air source as usual.

2. ***How do you share gas when diving sidemount?***

B. If you must share gas with a buddy, you will share gas with your long hose second stage (right side when using two cylinders).

1. If you are breathing the right side, pass the second stage from your mouth to your buddy and switch to your left cylinder second stage.
2. If you are already breathing the left side, you need only pass the long hose, right second stage.
3. If necessary, break away the clip to get gas to your buddy quickly.

4. It is possible to give a buddy the entire cylinder, but you usually avoid doing this.
   a. Giving up a cylinder may throw off your weighting and trim; you don't want to be dealing with that while dealing with a gas emergency.
   b. It should be unnecessary – make contact and begin your ascent.
5. If you're managing your gas appropriately, you should have enough gas to finish the dive on your left cylinder.
   a. In a buddy team of three, however, a wise option is to switch donors. This keeps either of the assisting divers from getting too low on gas.
   b. Switching donors adds task loading, so only do so as needed to keep either donor from running excessively low on gas.
6. If you must swim while sharing gas with the long hose, the protocol is for the out-of-gas diver to lead, with the donor behind, which allows the donor to monitor the out-of-gas diver.
   a. The long hose passes down the right side of the receiver to the donor, who is immediately behind.
   b. Both divers maintain a grip on the hose as they swim.

Section Three:
PADI Sidemount Diver Practical Application

The PADI Sidemount Diver Practical Application focuses on setting up sidemount equipment.

Sequencing

- You can conduct the Practical Application at any time prior to the confined water dive.
- It's recommended that you integrate it with Knowledge Development and conduct it while discussing equipment setup.

Performance Objectives

By the end of the Practical Application, the student should be able to:

1. Demonstrate the general setup, preparation and adjustment of a sidemount rig, including two cylinders, harness, BCD and accessories.

Recommended Sequence

1. Show students your sidemount rig, including cylinders, explaining each aspect. Highlight the importance of the attachment hardware adjustments, regulator configuration and positioning SPGs so that the diver can easily access them. If students will be using differing makes/models from your example, point out these aspects with each type as required.
2. If students will be using single-cylinder sidemount, also show them single cylinder setup.
3. Divide the students into buddy teams. Have students configure their equipment in two and one (optional) sidemount configuration working together. Provide assistance, but encourage students to solve problems together and help each other. Students must nonetheless demonstrate that they are individually capable of setting up their equipment.
4. It is recommended that you have additional clips, bungees and tools available to assist divers in configuring their equipment as necessary.

Section Four:
PADI Sidemount Diver Training Dives

Conduct

The PADI Sidemount Diver course has four required training dives – one confined water dive and three open water dives. You also have the option of splitting the Confined Water Dive into two dives if desired to cover all the skills in both two-cylinder sidemount and (optional) single-cylinder sidemount.
You may add training dives as appropriate for additional experience as needed for students to demonstrate mastery. However, student divers must demonstrate mastery of all performance objectives for each dive prior to progressing to the next training dive. Prior to certification, students must demonstrate mastery of all performance objectives in all dives.

Dives, Times, Depths and Gases

1. The minimum number of dives for certification as a PADI Sidemount Diver is four dives (one confined water, three open water).
2. All dives must be planned as no stop (no decompression) dives. Divers may use enriched air to extend no stop time if they are certified as PADI Enriched Air Divers.
3. The maximum depth is the deepest depth to which the student is qualified, or the maximum depth listed for the specific training dive, whichever is shallower.

See the PADI *Instructor Manual*, General Standards and Procedures, for definitions of confined and open water.

General Considerations

1. Plan ample time. Part of the training in this course is simply learning how to wear and adjust sidemount equipment. Especially in the Confined Water Dive, give students ample time to experiment, adjust and try again. Keep appropriate tools and accessories at hand, and encourage students to repeat skills that configuration changes may affect. Students completing the single-cylinder sidemount option must demonstrate all skills in both single- and two-cylinder configurations in confined water before Open Water Dive Two and certification; this requires extra time as well.

2. Choose sites with familiar environments. The PADI Sidemount Diver course is primarily a hardware management course. Choose environments that are not particularly challenging so students can focus their attention on the new equipment and the new skills they apply using it.
3. Use certified assistants. Certified assistants are not only helpful during the dives, but can help predive assembly and checks go faster because they can assist you in keeping up with details.
4. Have pull ties, bolts, snaps, clips, bungees, inner tubing, cam straps and other gear-rigging paraphernalia as appropriate for the sidemount system(s) in use. Success with sidemount often relies on the little adjustments and the related accessories. Have these at hand to help your students; it may even be appropriate to have some in your kit to allow minor adjustments while diving.

Sequence Options and Dives

1. **The Knowledge Development and Practical Application must be completed before the Confined Water Dive.**
2. **Training dives must be conducted in order.** You may rearrange skill sequences within a dive.

Single-Cylinder Sidemount Option

It's recognized that some PADI Sidemount Diver students will be divers who would benefit from wearing a single cylinder in sidemount. Such divers have the option, at your discretion, of using single-cylinder sidemount for Sidemount Dive One. **For certification as a PADI Sidemount Diver, however, the diver must complete Sidemount Dives Two and Three using two cylinders.**

You may have students practice both single- and two-cylinder skills during the Confined Water Dive, or you may add a confined water dive after Sidemount Dive One. If you elect to have two confined water dives, during the first confined water dive in single-cylinder sidemount, students are obviously not required to meet the performance requirements for objectives that are specific to two-cylinder sidemount. The requirements must be met in the second session.

Confined Water Dive

Performance Objectives

By the end of the Confined Water Dive, the student should be able to, as part of a buddy team and with instructor guidance as appropriate:

1. **Assemble, don and adjust the sidemount equipment that will be used on the dive.**
2. **Demonstrate an appropriate sidemount entry into water shallow enough in which to stand and donning sidemount cylinders in the water.**
3. **Inflate the BCD to establish buoyancy, swim on the surface into water too deep in which to stand, perform a buoyancy check, and adjust for proper weighting.**
4. **Execute a five-point descent with a buddy.**
5. **Locate both SPGs and indicate the gas supply in each cylinder to the instructor and buddies.**
6. **Throughout the dive, in two-cylinder sidemount, manage gas by switching second stages as planned before the dive.**
7. **Establish neutral buoyancy and swim using flutter kicks and frog kicks (unless it is not possible for the student due to a physical limitation), with a buddy, 24 metres/80 feet to assess balance and trim, to make adjustments as required, and to develop/confirm familiarity with both kicks.**
8. **Recover and clear the second stage from behind/below the cylinder.**
9. **In two-cylinder sidemount, remove and release the second stage of one cylinder, secure the second stage of the other, clear it and begin breathing from it, then recover the first second stage.**
10. **Establish neutral buoyancy and hover using breath control for at least one minute.**
11. **Respond to a simulated out-of-gas emergency as both the donor and as the receiver by sharing gas with a long hose second stage, then swimming 15 metres/50 feet maintaining contact with a buddy.**

12. **In two-cylinder sidemount, respond to a simulated failed regulator or failed cylinder valve by switching second stages (if necessary to maintain a breathing supply) and shutting down the simulated affected cylinder valve, within 60 seconds.**
13. **With a buddy, perform a safety stop in midwater for three minutes, not varying from the stop depth by more than 2 metres/7 feet.**
14. **Surface in water too deep in which to stand, establish positive buoyancy, remove the cylinder(s) and exit the water.**
15. **Establish positive buoyancy, enter water too deep in which to stand and don cylinders, connecting the BCD and other inflators as appropriate for the configuration in use.**
16. **Swim underwater for a distance of not less than 24 metres/80 feet, including at least one turn of 180 degrees and swimming backwards using only kicks (unless doing so is impossible due to a physical limitation), without making contact with the bottom.**
17. **Disconnect the lower attachment of at least one cylinder, swing it in front with the upper connection in place, swim at least 18 metres/60 feet, then reconnect the lower attachment.**
18. **Execute a proper ascent, and exit the water (any method), then enter the water using a method in which the diver dons the cylinders before entry (giant stride, seated back roll, etc.)**
19. **Throughout the session, respond calmly, correctly and appropriately to simulated emergencies presented by the instructor.**

I. Confined Water Dive One Standards

A. Environment: **Pool or confined water**

II. Suggested Sequence

A. Predive planning and equipment setup – Take students through basic planning and setup with sidemount.

1. Provide an overview of what they will be doing and the time required for planning purposes.
2. It's recommended that you provide skill descriptions and details immediately before they gear up and enter the water.

3. Students assemble their equipment.
4. Give a dive site overview for diver comfort and planning purposes.
   a. Depth, temperature, entry/exit points, noteworthy features.
   b. Facilities – parking, lockers, boat dry and wet areas, where to find emergency equipment, etc.
5. Assist with any problems found during dive planning and setup.
6. The predive plan should include gas management of the cylinders and turn pressures.
7. Agree on depth and time limits, emergency signals, etc.
8. Skill Briefing – After confirming an appropriate dive plan and initial equipment assembly, student divers should be ready to enter the water.
   a. Describe each skill, the performance requirements and how you'll conduct it, including signals.
   b. You may wish to dry-demonstrate some skills during the briefing in addition to your underwater demonstration during the dive.

B. Confined Water Dive

1. Predive check
   a. Buddies conduct the predive check; watch for and correct errors.
2. Entry
   a. Teams and staff enter water shallow enough in which to stand.
   b. Demonstrate how to don cylinders in water shallow enough in which to stand.
   c. Buddies don their cylinders; watch for and correct errors.
3. Buoyancy check and proper weighting
   a. Demonstrate the skill.
   b. After establishing ample buoyancy, teams swim into water too deep in which to stand and check their buoyancy.
   c. Have students adjust their weight until it is correct.
4. Gas management
   a. Before beginning the descent (next skill), remind divers of the dive's gas management requirements.
   b. Confirm they are starting with the appropriate cylinder according to their management system.
   c. During the dive, check cylinder pressures at irregular intervals to confirm they are managing gas appropriately.

5. Descent
   a. Demonstrate a proper five-point descent with a staff member or student.
   b. Students descend using the five-point descent, staying with their buddies.
6. Locate SPGs and signal pressures
   a. Demonstrate the skill.
   b. All divers signal their cylinder pressures to their buddies and you.
7. Neutral buoyancy, trim and flutter kicks/frog kicks
   a. Demonstrate the skill.
   b. In teams, divers establish neutral buoyancy and swim at least 24 metres/80 feet using flutter kicks and frog kicks (unless not possible due to physical limitation).
   c. Note any adjustments that need to be made. If possible, divers make the adjustment themselves (use a slate to communicate if necessary).
   d. If necessary, teams should surface to make adjustments.
   e. You may have students with weighted cylinders practice adjusting those weights underwater (optional).

Note: *Allow ample time for this. Getting everything properly adjusted and the trim correct are central to sidemount diving, so provide ample time. Do not move on until everyone is rigged and trimmed properly. Time invested at this stage will save time later. Allow the same time for both single-cylinder and two-cylinder configurations.*

8. Recover and clear a second stage from below/behind a main cylinder.
   a. Demonstrate the skill.
   b. Students release the second stage from the cylinder they're breathing and allow it to fall away (outside/below).
   c. Students recover the second stage by following the hose, replace it, clear it and resume breathing.
9. Recover and clear a second stage from below/behind a main cylinder after switching.
   a. Demonstrate the skill.
   b. Students release the second stage from the cylinder they're breathing and allow it to fall away (outside/below).
   c. Students deploy and begin breathing from their other second stage.
   d. Students recover the lost second stage by following the hose, switch to it, clear it, resume breathing with it and restow/resecure the other second stage.

10. Hovering
    a. Demonstrate the skill.
    b. Students establish neutral buoyancy and hover for at least one minute.
    c. Encourage hovering in a horizontal, swimming position.
11. Long hose gas sharing
    a. Demonstrate the skill.
    b. Signal that a student is "out-of-gas." The student signals "out-of-gas" to a buddy.
    c. The buddy provides the long hose second stage (switching to the left cylinder if necessary).
    d. After settling down and getting into a rhythm, divers make contact and swim 15 metres/50 feet with the "out-of-gas" diver leading.
    e. Signal the exercise is over. Students return to their normal configuration.
    f. Repeat the exercise until all students have had a turn as the donor and the receiver.
12. Freeflow shutdown and regulator switch (if necessary) with two-cylinder sidemount
    a. Demonstrate the skill.
    b. Signal the student that a second stage is freeflowing (either one).
    c. The student shuts down the "freeflowing" one within 60 seconds and switches to the other (if necessary), and signals "end the dive" to the team.
    d. After ending the exercise, confirm reopening the closed valve.
    e. Repeat until all students complete the skill.

Note: *Some instructors like to simulate freeflows by holding the purge button. This is acceptable, but do not do this with the second stage in the diver's mouth, and be aware that it can significantly deplete the gas supply, making it necessary to change cylinders to complete the dive skills.*

13. Midwater safety stop
    a. Demonstrate the skill (if necessary).
    b. Divers make a three minute stop in midwater, not varying more than 2 metres/7 feet from the stop depth.
    c. After completing the stop, buddies ascend to the surface and establish positive buoyancy.

14. Remove cylinders in the water and deep water exit
    a. Demonstrate the skill.
    b. After confirming positive buoyancy, divers remove their cylinders in water too deep in which to stand and exit using an appropriate technique (ladder, up the side, etc.)
    c. Buddies may pass the cylinders up to one another, tie them on a line to pull up, etc.
15. Don cylinders in water too deep in which to stand
    a. Demonstrate the skill.
    b. Divers enter the water and don cylinders at the surface.
    c. The cylinders may be on lines, handed in by buddies, etc.
    d. Confirm connecting inflators as appropriate.
16. Descent
    a. Buddies make a five-point descent together.
17. Swimming as a buddy team
    a. Demonstrate kicking to swim backwards and making turns using only kicks.
    b. Students swim together as teams for at least 24 metres/80 feet without making bottom contact.
    c. The swim must include at least one 180º turn and backing up using only kicks (unless not possible due to a physical limitation).
    d. Continue until all divers demonstrate clean, effective kicks (including backing up), proper body position and good buoyancy control.
18. Swimming with a cylinder or cylinders extended ahead
    a. Demonstrate the skill.
    b. Students disconnect the lower attachment for one cylinder, swing it in front with the upper attachment secure, and swim 18 metres/60 feet.
    c. In two-cylinder sidemount, students repeat the swim with the other side cylinder extended if wearing substantially negatively buoyant cylinders (e.g. steel cylinders).
    d. In two-cylinder sidemount, students repeat the swim with both cylinders extended if wearing cylinders that are not substantially negatively buoyant (e.g. aluminum).
19. Ascent, exit and re entry
    a. On your signal, buddies ascend properly to the surface.
    b. Divers exit using any method (it is recommended that you use the method they will use in open water if it differs from what they've done so far).
    c. Demonstrate redonning the cylinders out of the water and entering using an appropriate entry (giant stride, seated back roll, etc.)

d. Divers enter the water in buddy teams. Watch for establishing buoyancy, teamwork, etc. At this point, students should be doing these with fewer and fewer reminders.

20. Free time
    a. Allow divers time to practice skills, get used to sidemount, etc.
    b. Conduct appropriate surprise drills based on what they've learned.
21. Ascent and exit
    a. On your signal, buddy teams ascend properly together, establish positive buoyancy and exit the water.
    b. It is recommended you have them practice an exit technique you will have them use in open water.

C. ***Post Dive***

1. Debriefing – Have students critique themselves on their performance. Add your observations as appropriate.
2. Students log the dive for the instructor's signature.

Sidemount Dive One

Performance Objectives

By the end of Sidemount Dive One, the student should be able to, with a buddy and with instructor guidance as appropriate:

Note – If student is making this dive in single-cylinder sidemount, skills requiring two-cylinder sidemount do not apply.

1. **Assemble, don and adjust the sidemount equipment that will be used on the dive.**
2. **Complete a predive safety check.**
3. **Demonstrate a sidemount entry appropriate for the local environment.**
4. **Inflate the BCD to establish buoyancy, perform a buoyancy check, and adjust for proper weighting.**
5. **Execute a five-point descent with a buddy.**
6. **Locate the SPG(s) and indicate the gas supply to the instructor and buddies at regular intervals and when asked.**
7. **In two-cylinder sidemount, throughout the dive, manage gas by switching second stages as planned before the dive.**

8. **Establish neutral buoyancy and swim using flutter kicks and frog kicks (unless it is not possible for the student due to a physical limitation), with a buddy, 24 metres/80 feet to assess balance and trim, to make adjustments as required, and to develop/confirm familiarity with both kicks.**
9. **Recover and clear a second stage from behind/below the cylinder.**
10. **In two-cylinder sidemount, respond to a simulated failed regulator or failed cylinder valve by switching second stages (if necessary to maintain a breathing supply) and shutting down the simulated affected cylinder valve, within 60 seconds.**
11. **With a buddy, ascend at a rate no faster than 18 metres/60 feet per minute and make a three minute safety stop at 5 metres/15 feet.**
12. **At the surface in two-cylinder sidemount equipment, tow a simulated tired diver in two-cylinder sidemount equipment 24 metres/80 feet.**
13. **Surface in water too deep in which to stand, establish positive buoyancy, remove the cylinder(s) and exit the water.**
14. **Throughout the dive, respond calmly, correctly and appropriately to simulated emergencies presented by the instructor.**

I. Sidemount Dive One Standards

A. Environment: **Open Water.**
B. Depth Range: **6 metres/20 feet to 18 metres/60 feet.**

II. Suggested Sequence

A. Predive planning and equipment setup – Take students through basic predive planning specific to sidemount.

1. Plan the dive with students
   a. Provide an overview of what they will be doing and the time required for planning purposes.
   b. It's recommended that you provide skill descriptions and details immediately before they gear up and enter the water.
2. Students assemble their equipment.
3. Give a dive site overview for diver comfort and planning purposes.
   a. Depth, temperature, entry/exit points, noteworthy features.
   b. Facilities – parking, lockers, boat dry and wet areas, where to find emergency equipment, etc.
4. Assist with any problems found during the predive planning and setup.
5. The predive plan should include gas management of the cylinders (two-cylinder sidemount) and turn pressures.

6. Agree on depth and time limits, emergency signals, etc.
7. Skill Briefing – After confirming an appropriate dive plan and initial equipment assembly, student divers should be ready to enter the water.
   a. Describe each skill, the performance requirements and how you'll conduct it, including signals.
   b. Except for the tired diver tow, all of the skills will be skills already practiced in the confined water dive, so remind students you will not be demonstrating unless asked to do so (to refresh/remind, etc.).

B. Sidemount Dive One

1. Predive check
   a. Buddies conduct the predive check.
   b. Watch for and correct errors as appropriate.
2. Entry
   a. Teams and staff enter the water using a method appropriate for the environment. (An entry in which divers enter and then don their cylinder(s) is recommended.)
   b. Buddies assist each other with donning their cylinders (if necessary for the entry method).
3. Buoyancy check and proper weighting
   a. Have students check their buoyancy and adjust their weight as necessary.
4. Gas management
   a. Before beginning the descent, remind divers of the dive's gas management requirements.
   b. Confirm they are starting with the appropriate cylinder (two-cylinder sidemount) according to their management system.
   c. During the dive, check cylinder pressures at irregular intervals to confirm they are managing gas appropriately.
5. Descent
   a. Buddies execute a five-point descent.
   b. Watch for and correct errors.
6. Locate SPGs and signal pressures
   a. All divers signal their cylinder pressures to their buddies and you when asked.

7. Neutral buoyancy swim
   a. In buddy teams, divers establish neutral buoyancy and swim at least 24 metres/80 feet using flutter kicks and frog kicks (unless the student cannot due to physical limitation).
   b. Note any adjustments that need to be made. If possible, divers make the adjustment themselves (use wet notes or a slate to communicate if necessary).
8. Recover and clear a second stage from below/behind a cylinder
   a. Individually on your signal, students release the second stage from the cylinder they're breathing and allow it to fall away (outside/below).
   c. Students recover the second stage by following the hose, replace it, clear it and resume breathing.
9. Two-cylinder sidemount freeflow shutdown and regulator switch (if necessary)
   a. Signal the student that a second stage is freeflowing (either one).
   b. The student shuts down the "freeflowing" one within 60 seconds and switches to the other (if necessary), and signals "end the dive" to the team.
   c. After ending the exercise, confirm reopening the closed valve.
   d. Repeat until all students complete the skill.
10. Free time
   a. Under instructor supervision, students explore dive site, time and gas allowing.
   b. Conduct surprise drills based on the skills they have mastered.
   c. The dive ends upon reaching a planned turned pressure, time, depth or other limit.
11. Ascent and safety stop
   a. Students ascend in teams as appropriate for the local environment and make a three minute safety stop at 5 metres/15 feet.
   b. After the stop, teams ascend to the surface following proper procedures and establish buoyancy.
12. Tired diver tow
   a. Demonstrate the skill.
   b. Divers tow a simulated tired diver at least 24 metres/80 feet. Any effective method is allowed.
   c. Repeat until all students have performed the tow.
13. Exit
   a. Divers remove their cylinders in the water and hand them up or secure them as appropriate for the environment.

C. Post Dive

1. Debriefing – Have students critique themselves on their performance. Add your observations as appropriate.
2. Students log the dive for the instructor's signature.

Sidemount Dive Two

Performance Objectives

By the end of Sidemount Dive Two, the student should be able to, with a buddy and with instructor guidance as appropriate:

1. **If the student completed Sidemount Dive One in single-cylinder sidemount, the student must complete the tired diver tow from Sidemount Dive One.**
2. **Assemble, don and adjust the sidemount equipment that will be used on the dive.**
3. **Complete a predive check using proper procedures.**
4. **Demonstrate a sidemount entry appropriate for the local environment.**
5. **Execute a five-point descent as part of a buddy team.**
6. **Throughout the dive, manage gas by switching second stages as planned before the dive.**
7. **Respond to a simulated out-of-gas emergency as both the donor and as the receiver by sharing gas with a long hose second stage, then swimming 15 metres/50 feet maintaining contact with the buddy.**
8. **Establish neutral buoyancy and hover using breath control for at least one minute.**
9. **Respond to a simulated failed regulator or failed cylinder valve by switching second stages (if necessary to maintain a breathing supply) and shutting down the simulated affected cylinder valve, within 60 seconds.**
10. **Disconnect the lower attachment of at least one cylinder, swing it in front with the upper connection in place, swim at least 18 metres/60 feet, then reconnect the lower attachment.**
11. **With a buddy, ascend at a rate no faster than 18 metres/60 feet per minute and make a three minute safety stop at 5 metres/15 feet.**
12. **Surface in water too deep in which to stand, establish positive buoyancy, and exit the water.**
13. **Throughout the dive, respond calmly, correctly and appropriately to simulated emergencies presented by the instructor.**

I. Sidemount Dive Two Standards

A. Environment: **Open Water.**
B. Depth Range: **6 metres/20 feet to 18 metres/60 feet.**

II. Suggested Sequence

A. Predive planning and equipment setup

1. Provide an overview of what they will be doing and the time required for planning purposes.
2. It's recommended that you provide skill descriptions and details immediately before they gear up and enter the water.
3. Students assemble their equipment.
4. Give a dive site overview for diver comfort and planning purposes.
   a. Depth, temperature, entry/exit points, noteworthy features.
   b. Facilities – parking, lockers, boat dry and wet areas, where to find emergency equipment, etc.
5. Assist with any problems found during the planning and setup.
6. The predive plan should include gas management of the cylinders and turn pressures.
7. Agree on depth and time limits, emergency signals, etc.
8. Skill Briefing – After confirming an appropriate dive plan and initial equipment assembly, student divers should be ready to enter the water.
   a. Describe each skill, the performance requirements and how you'll conduct it, including signals.
   b. All of the skills will be skills already practiced in confined water, so remind students you will not be demonstrating unless asked to do so (to refresh/remind, etc.).
   c. If students completed Sidemount Dive One in single-cylinder sidemount, brief the two-cylinder diver tow, and explain whether you will do it at the start of the dive or at the end of the dive.

B. Sidemount Dive Two

1. Predive check
   a. Buddy teams conduct the predive safety check.
   b. Watch for and correct errors as appropriate.
2. Entry
   a. Buddy teams and staff enter the water using a method appropriate for the environment.
3. Buoyancy check and proper weighting
   a. Have students check their buoyancy and adjust their weight as necessary.
4. Gas management
   a. Before beginning the descent, confirm divers are starting with the appropriate cylinder according to their management system.
   b. During the dive, check cylinder pressures at irregular intervals to confirm they are managing gas appropriately.

5. Descent
   a. Buddy teams execute a five-point descent.
   b. Watch for and correct errors.
6. Gas sharing as donor and receiver
   a. On your signal, have divers simulate being out of gas and sharing with a buddy via the long hose.
   b. After starting to share, the donor and the receiver swim 15 metres/50 feet, maintaining contact.
   c. Repeat the exercise until all students have played the role of both donor and receiver.
7. Hovering
   a. Divers hover for at least one minute using only breath control to maintain depth.
8. Freeflow shutdown and regulator switch (if necessary)
   a. Signal the student that a second stage is freeflowing (either one).
   b. The student shuts down the "freeflowing" one within 60 seconds and switches to the other (if necessary), and signals "end the dive" to the team.
   c. After ending the exercise, confirm reopening the closed valve.
   d. Repeat until all students complete the skill.
9. Swim with cylinder(s) extended forward
   a. Divers disconnect the lower attachment of one or both cylinders (one for negatively buoyant cylinders, both for neutral/positive cylinders).
   b. In teams, divers swim 18 metres/60 feet, then reconnect the cylinders at the lower attachment point.
10. Free time
    a. Under instructor supervision, students explore dive site, time and gas allowing.
    b. Conduct surprise drills based on the skills they have mastered.
    c. The dive ends upon reaching a planned turned pressure, time, depth or other limit.
11. Ascent and safety stop
    a. Students ascend in buddy teams and make a three minute safety stop at 5 metres/15 feet.
    b. Encourage maintaining a relatively horizontal position and keeping stop depth at chest level.
    c. After the stop, divers ascend to the surface following proper procedures and establish buoyancy.
12. Exit
    a. Divers remove their cylinders in the water and hand them up or secure them as appropriate for the environment.

C. ***Post Dive***

1. Debriefing – Have students critique themselves on their performance. Add your observations as appropriate.
2. Students log the dive for the instructor's signature.

Sidemount Dive Three

Performance Objectives

By the end of Sidemount Dive Three, the student should be able to, with a buddy and minimal instructor guidance:

1. **Assemble, don and adjust the sidemount equipment that will be used on the dive.**
2. **Complete a predive check using proper procedures.**
3. **Demonstrate a sidemount entry appropriate for the local environment.**
4. **Execute a five-point descent as part of a buddy team.**
5. **Throughout the dive, manage gas by switching second stages as planned before the dive.**
6. **Respond to a simulated out-of-gas emergency as both the donor and as the receiver by sharing gas with a long hose second stage, then swimming 15 metres/50 feet maintaining contact with the buddy.**
7. **Establish neutral buoyancy and hover using breath control for at least one minute.**
8. **With a buddy, ascend at a rate no faster than 18 metres/60 feet per minute and make a three minute safety stop at 5 metres/15 feet.**
9. **Surface in water too deep in which to stand, establish positive buoyancy, and exit the water.**
10. **Throughout the dive, respond calmly, correctly and appropriately to simulated emergencies presented by the instructor.**

I. Sidemount Dive Three Standards

A. Environment: **Open Water.**
B. Depth Range: **6 metres/20 feet to 30 metres/100 feet, or students' maximum depth qualification, whichever is shallower.**

II. Suggested Sequence

A. Predive planning and equipment setup

1. Provide an overview of what they will be doing and the time required for planning purposes.
2. It's recommended that you provide skill descriptions and details immediately before they gear up and enter the water.

3. Students assemble their equipment.
4. Give a dive site overview for diver comfort and planning purposes.
   a. Depth, temperature, entry/exit points, noteworthy features.
   b. Facilities – parking, lockers, boat dry and wet areas, where to find emergency equipment, etc.
5. Assist with any problems found during the planning and setup.
6. The predive plan should include gas management of the cylinders and turn pressures.
7. Agree on depth and time limits, emergency signals, etc.
8. Skill Briefing – After confirming an appropriate dive plan and initial equipment assembly, student divers should be ready to enter the water.
   a. Describe each skill, the performance requirements and how you'll conduct it, including signals.
   b. All of the skills will be skills already practiced in confined water, so remind students you will not be demonstrating unless asked to do so (to refresh/remind, etc.).

B. Sidemount Dive Three

1. Predive check
   a. Buddy teams conduct the predive safety check.
   b. Watch for and correct errors as appropriate.
2. Entry
   a. Buddy teams and staff enter the water using a method appropriate for the environment.
3. Buoyancy check and proper weighting
   a. Have students check their buoyancy and adjust their weight as necessary.
4. Gas management
   a. Before beginning the descent, confirm divers are starting with the appropriate cylinder according to their management system.
   b. During the dive, check cylinder pressures at irregular intervals to confirm they are managing gas appropriately.
5. Descent
   a. Buddy teams execute a five-point descent.
   b. Watch for and correct errors.

6. Gas sharing as donor and receiver
   a. On your signal, have divers simulate being out of gas and sharing with a buddy via the long hose.
   b. After starting to share, the donor and the receiver swim 15 metres/50 feet, maintaining contact.
   c. Repeat the exercise until all students have played the role of both donor and receiver.
7. Hovering
   a. Divers hover for at least one minute using only breath control to maintain depth.
8. Free time
   a. Under instructor supervision, students explore dive site, time and gas allowing. This should be the majority of the dive – experiencing what it's like to dive in sidemount.
   b. Conduct surprise drills based on the skills they have mastered. However, allow ample "just diving" time.
   c. The dive ends upon reaching a planned turn pressure, time, depth or other limit.
9. Ascent and safety stop
   a. Students ascend in buddy teams and make a three minute safety stop at 5 metres/15 feet.
   b. Encourage maintaining a relatively horizontal position and keeping stop depth at chest level.
   c. After the stop, divers ascend to the surface following proper procedures and establish buoyancy.
10. Exit
   a. Divers remove their cylinders in the water and hand them up or secure them as appropriate for the environment.

C. Post Dive

1. Debriefing – Have students critique themselves on their performance. Add your observations as appropriate.
2. Students log the dive for the instructor's signature.

Appendix

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PADI Sidemount Diver Knowledge Review

Complete this knowledge review to hand in to your instructor for review. If there's something you don't understand, review the related material. If you still don't understand, have your instructor explain it to you.

1. Which of the following are benefits of sidemount (choose all that apply):

- ☐ Ease of streamlining equipment
- ☐ Easier equipment transport
- ☐ Increased gas supply
- ☐ Accessibility
- ☐ Adjustability
- ☐ Problem solving

2. In two-cylinder sidemount, one drawback is more cumbersome _____ management.

3. In sidemount, for gas sharing you usually have a hose that is

- ☐ a. standard length.
- ☐ 1.5-2 metres/5-7 feet long.
- ☐ attaches to the second stage left side.

4. In sidemount diving, it is not unusual to use more than one system to distribute your weights, including upon your cylinders in some cases.

- ☐ True
- ☐ False

5. In sidemount, it is typical to wear a snorkel throughout the dive, just as you do in backmount recreational diving.

- ☐ True
- ☐ False

6. When diving in two-cylinder sidemount, during the dive you breathe from one cylinder until you reach reserve pressure, then switch to the other cylinder.

- ☐ True
- ☐ False

7. During a dive wearing two-cylinder sidemount, one of your regulators starts to freeflow. Your primary first response to this would be to

   ☐ a. switch to the other cylinder.

   ☐ b. share gas with your buddy.

   ☐ c. breathe from the freeflowing regulator.

8. During your training dives, your instructor has you release the tail of your cylinder and then extend it in front of you, the top still secured to your harness, and swim. You do this because

   ☐ a. it is a useful defense posture against predators.

   ☐ b. you may do this in preparation for removing a cylinder at the surface or exit.

   ☐ c. many divers prefer to conduct the entire dive this way.

9. Due to unexpected difficulties beyond your control, you have run out of gas and are sharing gas with your buddy. Surface conditions make it desirable to swim back to the mooring line before you ascend, and your buddy has ample gas to do so. As you swim _____ would be in front and _____ would follow.

Student Diver Statement: I've reviewed the questions and answers, and any I answered incorrectly or incompletely, I have had explained to me and/or reviewed the material, so that I now understand what I missed.

Signature_____Date_____

PADI Sidemount Diver Knowledge Review Answer KEY

Complete this knowledge review to hand in to your instructor for review. If there's something you don't understand, review the related material. If you still don't understand, have your instructor explain it to you.

1. Which of the following are benefits of sidemount (choose all that apply):

- ■ Ease of streamlining equipment
- ■ Easier equipment transport
- ■ Increased gas supply
- ■ Accessibility
- ■ Adjustability
- ■ Problem solving

2. In two-cylinder sidemount, one drawback is more cumbersome ___GAS___ management.

3. In sidemount, for gas sharing you usually have a hose that is

- ☐ a. standard length.
- ■ 1.5-2 metres/5-7 feet long.
- ☐ attaches to the second stage left side.

4. In sidemount diving, it is not unusual to use more than one system to distribute your weights, including upon your cylinders in some cases.

- ■ True
- ☐ False

5. In sidemount, it is typical to wear a snorkel throughout the dive, just as you do in backmount recreational diving.

- ☐ True
- ■ False

6. When diving in two-cylinder sidemount, during the dive you breathe from one cylinder until you reach reserve pressure, then switch to the other cylinder.

- ☐ True
- ■ False

7. During a dive wearing two-cylinder sidemount, one of your regulators starts to freeflow. Your primary first response to this would be to

- ■ a. switch to the other cylinder.
- ☐ b. share gas with your buddy.
- ☐ c. breathe from the freeflowing regulator.

8. During your training dives, your instructor has you release the tail of your cylinder and then extend it in front of you, the top still secured to your harness, and swim. You do this because

- ☐ a. it is a useful defense posture against predators.
- ■ b. you may do this in preparation for removing a cylinder at the surface or exit.
- ☐ c. many divers prefer to conduct the entire dive this way.

9. Due to unexpected difficulties beyond your control, you have run out of gas and are sharing gas with your buddy. Surface conditions make it desirable to swim back to the mooring line before you ascend, and your buddy has ample gas to do so. As you swim __YOU____ would be in front and ___YOUR BUDDY_____ would follow.

Student Diver Statement: I've reviewed the questions and answers, and any I answered incorrectly or incompletely, I have had explained to me and/or reviewed the material, so that I now understand what I missed.

Signature_____Date_____