National Defence / Défense nationale

A-CR-CCP-923/PG-001

CANADIAN CADET ORGANIZATIONS

SMALL CRAFT OPERATOR PROGRAM (SCOP) MODULE 3 – POWERBOAT

(ENGLISH)

(Cette publication est disponible en français sous le numéro A-CR-CCP-923/PG-002)

Issued on Authority of the Chief of Defence Staff

OPI: D Cdts & JCR

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FOREWORD AND PREFACE

1. **Issuing Authority.** This document was developed under the authority of the Director Cadets and Junior Canadian Rangers (D Cdts & JCR) in accordance with Cadet Administrative and Training Order (CATO) 14-19 *Small Craft Operator Program*, and is issued on the authority of the Chief of Defence Staff.

2. A-CR-050-834/PC-001*, Qualifying Standard (QS) for the Cadet Instructors Cadre Occupation MOSID 00232.01 Powerboat Operator* is issued on the authority of the Chief of Reserves and Cadets.

3. This document supercedes A-CR-050-834/PC-001, *Qualification Standard (QS) for the Cadet Instructors Cadre Occupation MOSID 00232.01 Powerboat Operator* and is effective upon receipt.

4. **Development.** Development of this document was in accordance with the performance oriented concept of training outlined in the Canadian Forces Individual Training and Education System A-P9-050 Series, *Manual of Individual Training and Education*, with modifications to meet the needs of the Canadian Cadet Organization (CCO).

5. The document contains the training requirements for SCOP Module 3 – Powerboat and requirements and assessment package for those who wish to become a Powerboat Instructor. Students will receive the Powerboat Operator qualification upon successful completion of this training.

6. The Lesson Specifications (LSs) and Instructional Guides (IGs) in Chapter 4 are to be used by Technical Establishments (TEs) in conjunction with other resources to conduct SCOP Module 3 training.

7. **Suggested Changes.** Suggested changes to this document can be forwarded to cadettraining@forces.gc.ca.

TABLE OF CONTENTS

CHAPTER 1

GENERAL

AIM

1. The Small Craft Operator Program (SCOP) is the Canadian Cadet Organization's (CCO) training program for qualifying persons to operate and instruct small craft in support of Sea, Army, and Air Cadets and Cadet Instructor Cadre (CIC) on-water training activities in accordance with (IAW) CATO 14-19, *Small Craft Operator Program*.

2. SCOP Module 3 – Powerboat is composed of two separate qualifications, Powerboat and Powerboat Instructor (PI). This document includes the standard and assessments for the two qualifications.

3. The PI is trained to instruct cadets and CIC officers to the Powerboat standard and are required at cadet training centres (CTCs), training establishments (TEs) and in support of regionally and nationally directed activities. The PI will have a sound working knowledge of all orders and regulations pertaining to the planning and safe conduct of powerboat instruction.

4. The training resulting from this module will develop in the student the knowledge and skills required to obtain the Powerboat Operator qualification IAW CATO 14-19, *Small Craft Operator Program*.

PROGRAM DESIGN

5. SCOP training is designed in a modular format to allow personnel to complete only the training required to be qualified to operate a specific small craft in support of CCO on-water training activities. Each module of training has an associated performance objective (PO).

6. SCOP is used in both cadet and CIC training.

TRAINING MODULES AND POs

7. The aim of SCOP Module 3 – Powerboat is to provide the student with the knowledge and skills required to operate a powerboat with an outboard engine.

8. The aim of PI training is to provide personnel with the skills and knowledge required to plan and conduct powerboat instruction.

9. It is expected but not required that prior to the assessment, the instructor trainee will work alongside and assist a PI to gain experience in the conduct of a SCOP Module 3 – Powerboat course.

METHOD OF ACHIEVING OBJECTIVES

10. The majority of SCOP training is skills-related. Skills are acquired through practical periods of instruction and practice. In order to achieve the POs, a hands-on learning approach is essential. The following guidance may assist in the implementation of training:

a. Some theory is required for safety purposes and for introducing new material. However, most material can be taught using hands-on practical methods.

b. Ensure training is well organized and planned for in advance to allow instructors adequate time to prepare for the delivery / conduct of training. This includes reviewing lesson specifications and instructional guides and creating instructional materials as required.

c. Schedule training such that the material is presented in a manner to ensure a smooth flow from one activity to the next.

d. Take adequate time for students to reflect upon and be debriefed on training activities, to include discussing the ways that experience can benefit them in the future.

TRAINING PREREQUISITES – OPERATOR

11. Students require a Pleasure Craft Operator Competency (PCOC) card, to participate in this training.

TRAINING PREREQUISITES – INSTRUCTOR

12. Prerequisites for CIC and Cadets participation in PI are as follows:

a. held the Powerboat qualification for at least one year,
b. 17 years of age, and
c. For cadets, have completed Phase 4 and either Ship's Boat Operator (SBO) or Senior Sail.

USE OF THIS DOCUMENT

13. This document shall be used as the primary authority governing the development, implementation, conduct, and evaluation of the training and standards for the SCOP Module 3 – Powerboat. It shall also be used by D Cdts & JCR as the primary reference for validation of the SCOP.

QUALIFICATION CODES

14. The following qualifications will be awarded:

Qualification / Mite Code	Qualifications
118646	Powerboat Operator
118650	Powerboat Instructor

CHAPTER 2

TRAINING MANAGEMENT DETAILS

RESPONSIBLE AGENCY AND TRAINING ESTABLISHMENTS

1. The Designated Training Authority (DTA) for the SCOP is D Cdts & JCR. The conduct of said program is the responsibility of the Regional Cadet Support Units (RCSUs) through authorized Training Establishments (TEs), IAW CATO 14-19, *Small Craft Operator Program*. These TEs include:

a. Royal Canadian Sea Cadet Corps (RCSCC);

b. Cadet Training Centres (CTC);

c. Regional Cadet Instructor Schools (RCIS); and

d. Technical TEs, such as:

(1) Nautical Sites; and

(2) Other zone, detachment or regional TEs as authorized by the RCSU Commanding Officer (CO).

TRAINING DELIVERY

2. SCOP Module 3 – Powerboat may be conducted for cadets and CIC of all three environments whose duties require them to operate a small craft.

3. Students shall complete SCOP Module 1 – PCOC before undertaking SCOP Module 3 – Powerboat.

4. **Period Allocation.** Periods are 40 minutes in duration. Period allocation for SCOP Module 3 – Powerboat is as follows:

EO No.	Performance Objective	No. Pd
PO 003 Module 3 – Powerboat		
003.01	Prepare to Operate a Powerboat	1
003.02	Prepare for Departure	2
003.03	Manoeuvre a Powerboat	15
003.04	Secure a Powerboat	6
	Total	24

INSTRUCTOR REQUIREMENTS AND TRAINING CAPACITY

5. SCOP Module 3 – Powerboat shall be conducted by a SCOP Module 3 Instructor IAW this document and CATO 14-19, *Small Craft Operator Program*.

6. The instructor to student ratio shall not exceed 1:20 during instruction ashore and 1:4 during in- / on-water instruction, with appropriate adjustments made based on vessel capacity.

TRAINING ADMINISTRATION

7. Details on student evaluation and reports are found in Chapter 3.

8. SCOP certificates and cards shall be issued IAW CATO 14-19, *Small Craft Operator Program*.

RELATED DOCUMENTS

9. This QSP is to be used in conjunction with:

   a. Cadet Administration and Training Orders (CATOs);

   b. A-CR-CCP-030/PT-001, *Water Safety Orders*;

   c. A-CR-CCP-613/PG-001, *Royal Canadian Sea Cadets Intermediate Sail Qualification Standard and Plan*;

   d. A-CR-CCP-616/PG-001, *Royal Canadian Sea Cadets Ship's Boat Operator Qualification Standard and Plan*; and

   e. A-CR-050-803/PH-001, *Training Plan (TP), Cadet Instructors Cadre (CIC) – Sea Environmental Training Course*.

RESOURCES

10. RCSU COs are responsible for ensuring that required equipment and supplies are available. A detailed list of material, audiovisual equipment, and training / learning aids required to conduct the training is located in each lesson specification found in Chapter 4.

CHAPTER 3

STUDENT EVALUATION – OPERATOR AND INSTRUCTOR

PURPOSE

1. The purpose of this chapter is to outline the specific evaluation requirements for achievement of each performance objective.

LEARNER EVALUATION

2. “Learner evaluation is the assessment of progress made by participants during an instructional programme (formative evaluation) and of their achievement at the end of the programme (summative evaluation).” (A-P9-050-000/PT-Z01, Manual of Individual Training and Education, Volume 1 (1), Glossary).

3. Formative evaluation, or assessment **for** learning, takes place during a phase of instruction and helps students and instructors recognize progress or lapses in learning. Through formative evaluation, the instructor can; identify when corrective or remedial action is required, plan the next steps in instruction, provide students with feedback so they can improve, and reinforce learning to aid the student in retaining information. Formative evaluation may also include opportunities for students to practice using Performance Checks (PCs) employed in summative evaluation. Details for assessment of learning are outlined within the applicable lesson specifications located in Chapter 4.

4. Summative evaluation, or assessment **of** learning, takes place to determine whether learners have achieved POs, or critical EOs (those deemed prerequisites to further individual training and education) and are used at the end of a phase of instruction. Details for assessment of learning are detailed within this chapter.

ASSESSMENT OF LEARNING PLAN

5. The Assessment of Learning Plan – SCOP Module 3 – Powerboat located at Chapter 3, Annex A, provides an overall strategy for using assessment activities to determine if the student meets the outlined requirements. The Assessment of Learning Plan will:

a. provide an outline of each assessment of learning activity; including its purpose, when it will occur and details the assessment instrument(s) used to support the evaluation;

b. identify the learning target(s) associated with the PO and / or EO being assessed, to include:

(1) **Knowledge Mastery.** The facts, concepts and theory a student needs to know;

(2) **Reasoning Proficiency.** A student uses what they know to solve a problem, make a decision, make a plan, think critically, set goals, or self-assess;

(3) **Skills.** Performance demonstration; where the student demonstrates their ability to perform a skill. To be assessed, these performances must be demonstrated by the student and observed by an assessor;

(4) **Ability to Create Products.** A student uses their knowledge, reasoning and skills to create a concrete product; and / or

(5) **Attitudinal / Dispositional Changes.** A student's attitude about learning, safety, conduct, etc. Targets in this realm reflect attitude and feeling. They represent important affective goals we hold for a student as a by-product of their CP experience, and as such are not generally assessed for the purpose of attaining a qualification.

c. identify the assessment method(s) that best matches PO and / or EO learning targets, to include:

(1) **Selected Response.** A student selects the correct or best response from a list provided. Formats include multiple choice, true / false, matching, short answer, and fill-in-the-blank questions. Although short answer and fill-in-the-blank questions do require the student to generate an answer, they call for a very brief answer that is counted as right or wrong, so these have been included in the selected response category;

(2) **Extended Written Response.** A student is required to construct a written answer in response to a question or task rather than select one from a list. An extended written response is one that is at least several sentences in length;

(3) **Performance Assessment.** This assessment method is based on observation and judgment; we look at a performance or product is observed and a determination is made as to its quality; and / or

(4) **Personal Communication.** Gathering information about a student through personal communication; learning is assessed through interpersonal interaction with the student.

ASSESSMENT INSTRUMENTS

6. Specific assessment instruments have been designed to support the assessment activity within the assessment of learning plan. These are meant to standardize assessment activities and evaluation for all students.

a. Annex A consists of the assessment instructions and tools for SCOP Module 3 – Powerboat – Operator.

b. Annex B consists of the assessment instructions and tools for SCOP Module 3 – Powerboat – Instructor.

ADDITIONAL ASSESSMENT OF LEARNING ACTIVITIES

7. No additional student evaluations, eg, theory tests or performance checks, are to be used. Therefore, these national standards are not to be supplemented with additional standards.

MONITORING STUDENT PROGRESS

8. Instructors must closely monitor and keep students apprised of their progress using the provided assessment instruments. Assessment for learning should be provided through ongoing verbal feedback.

STUDENTS NOT MEETING THE STANDARD

9. A student who does not meet the standard for the PO shall be given a reasonable opportunity to achieve the standard. Unless otherwise specified in the Assessment of Learning Plan – SCOP Module 3 – Powerboat and associated assessment instruments, there is no limit to the number of additional opportunities that may be afforded to the student, provided it is within the time and resource limitations of the TE.

10. If, by the end of the course, a student has yet to successfully complete the PO, they will be assessed as “Incomplete”.

RECORDING AND REPORTING STUDENT ACHIEVEMENT

11. Recording and reporting of student achievement shall be IAW Annex A to this chapter, CATO 14-19, *Small Craft Operators Program* and any reporting procedures put in place by the Regional SCOP OPI.

CERTIFICATE OF COMPLETION

12. SCOP certificate shall be issued IAW CATO 14-19, *Small Craft Operators Program*.

Annex A

Assessment of Learning Plan – SCOP Module 3 – Powerboat

EC / PC	Scope	Purpose	Target	Method	How	When	Resources	Limitations
003 PC	PO 003	The purpose of this PC is to assess the student's ability to prepare, manoeuvre and secure a powerboat with an outboard engine.	Knowledge and Skills	Performance Assessment	The student is observed while preparing, manoeuvring and securing a powerboat. Use instructor notes and PC Checklist to track completion of associated tasks and progression of skills.	Ongoing during conduct of lessons related to PO 003.	Annex A, Appendices 1–4	Limited Assistance
Powerboat Instructor	PO 003.01	The purpose of this PC is to assess the instructor trainee's ability to instruct SCOP Module 3 – Powerboat.			Evaluated while conducting one period of instruction and two activities.	Throughout Powerboat – Operator course.	Annex B, Appendices 1–3	Nil

ANNEX A, APPENDIX 1

003 PC - POWERBOAT

ASSESSMENT INSTRUCTIONS

GENERAL

Time has not been allotted for this PC as it is to be administered during EO 003.03, Manoeuvre a Powerboat, and EO 003.04, Secure a Powerboat. It is to be conducted on open water IAW *Water Safety Orders*.

PRE-ASSESSMENT INSTRUCTIONS

1. Photocopy the 003 PC Assessment Rubric - Powerboat, located at Annex A, Appendix 2.

2. Photocopy the 003 PC Group Checklist - Powerboat, located at Annex A, Appendix 3, based on the number of students being assessed.

3. Photocopy the 003 PC Assessment Checklist - Powerboat, located at Annex A, Appendix 4, for each student.

CONDUCT OF ASSESSMENT

1. Observe the student as they operate a powerboat.

2. Evaluate the correctness of each element of preparation, starting, manoeuvring and securing a powerboat using the 003 PC Assessment Rubric - Powerboat.

3. Indicate the overall performance on the 003 PC Group Checklist - Powerboat has:

   a. **Incomplete.** The student has not achieved the performance standard by not completing one or more tasks;

   b. **Completed.** The student has achieved the performance standard by completing all the tasks.

POST-ASSESSMENT INSTRUCTIONS

1. Record the results on the 003 PC Assessment Checklist - Powerboat and any notes for each student.

2. Discuss the overall performance results with the student and provide them with a copy of the completed checklist.

3. Sign and date the 003 PC Assessment Checklist - Powerboat.

ANNEX A – APPENDIX 2

003 PC ASSESSMENT RUBRIC

POWERBOAT

	Incomplete	Completed
Moving Forward at No-Wake and Wake Speed	The student did not: - maintain control of the powerboat; - display a combination of wheel (tiller), throttle and gear selector control for the conditions present; - display situational awareness.	The student: - maintained control of the powerboat; - displayed a combination of wheel (tiller), throttle and gear selector control for the conditions present; - displayed situational awareness.
Determine Stopping Distance	The student did not: - determine stopping distance and was required to take collision avoidance actions; - display a combination of wheel (tiller), throttle and gear selector control for the conditions present; - display situational awareness.	The student: - stopped at the desired mark; - displayed a combination of wheel (tiller), throttle and gear selector control for the conditions present; - displayed situational awareness.
Manoeuvre While Moving Astern	The student did not: - maintain control of the powerboat while moving astern for a minimum of 16 m; - display a combination of wheel (tiller), throttle and gear selector control for the conditions present; - display situational awareness.	The student: - maintained control of the powerboat for a minimum distance of 16 m; - displayed a combination of wheel (tiller), throttle and gear selector control for the conditions present; - displayed situational awareness.
Leaving a Dock	The student: - made contact with the dock; - did not demonstrate a clear departure plan; - did not provide clear instructions to crew; - used the crew to fend off or push away from the dock extensively; - did not display a combination of wheel (tiller), throttle and gear selector control for the conditions present; - did not display situational awareness.	The student: - left the dock without contact; - selected the safest departure plan; - provided clear instructions to the crew; the crew was not required to fend off or push the powerboat away from the dock; - displayed a combination of wheel (tiller), throttle and gear selector control for the conditions present; - displayed situational awareness.

	Incomplete	Completed
Return to a Dock (On Dock Wind)	The student: - did not approach at the correct angle (45 degrees plus or minus 10 degrees); - approached with uncontrollable speed (fast or slow); - did not demonstrate a clear approach plan; - did not provide clear instructions to the crew; - the crew had to fend off extensively or had to use lines or equipment to draw the boat into the dock; - made extensive contact with the dock; - did not display a combination of wheel (tiller), throttle and gear selector control for the conditions present; - did not display situational awareness.	The student: - returned to the dock with minimal use and compression of fenders; - selected the safest approach plan; - provided clear instructions to the crew; - the crew was not required to fend off the dock or use lines or equipment to draw the boat into the dock; - displayed a combination of wheel (tiller), throttle and gear selector control for the conditions present; - displayed situational awareness.
Return to a Dock (Off Dock Wind)	The student: - did not approach at the correct angle (45 degrees plus or minus 10 degrees); - approached with uncontrollable speed (fast or slow); - did not demonstrate a clear approach plan; - did not provide clear instructions to the crew; - the crew had to fend off extensively or had to use lines or equipment to draw the boat into the dock; - made extensive contact with the dock; - did not display a combination of wheel (tiller), throttle and gear selector control for the conditions present; - did not display situational awareness.	The student: - returned to the dock with minimal use and compression of fenders; - selected the safest approach plan; - provided clear instructions to the crew; - crew was not required to fend off the dock or use lines or equipment to draw the boat into the dock; - displayed a combination of wheel (tiller), throttle and gear selector control for the conditions present; - displayed situational awareness.
Come Alongside Another Vessel	The student: - made contact with the vessel; - did not demonstrate a clear approach plan; - did not provide clear instructions to the crew; - used the crew extensively to fend off the vessel; - did not display a combination of wheel (tiller), throttle and gear selector control for the conditions present; - did not display situational awareness.	The student: - was able to come alongside another vessel without contact; and crew not required to fend off; - selected the safest approach plan; - provided clear instructions to the crew; - displayed a combination of wheel (tiller), throttle and gear selector control for the conditions present; - displayed situational awareness.

	Incomplete	Completed
Tow a Powerboat Using a Bridle	The student: - was unable to attach the bridle to the powerboat; - did not provide clear instructions to crew; - did not maintain proper towing distance or speed for the conditions present; - made extensive contact with the other powerboat; created an unsafe towing situation; - did not display a combination of wheel (tiller), throttle and gear selector control for the conditions present; - did not display situational awareness.	The student: - towed a powerboat using a bridle; - provided clear instructions to the crew; - maintained proper towing distance and speed for the conditions present; - did not make contact with the other powerboat; - displayed a combination of wheel (tiller), throttle and gear selector control for the conditions present; - displayed situational awareness.
Recover a Man Overboard	The student: - was unable to recover a man overboard; - applied improper manoeuvring techniques creating an unsafe situation for the crew or the man overboard; - did not provide clear instructions to crew; - used an unsafe technique to bring the man overboard into the powerboat; - did not display a combination of wheel (tiller), throttle and gear selector control for the conditions present; - did not display situational awareness.	The student: - recovered a man overboard; - applied manoeuvring techniques best suited situation for the crew and the man overboard; - provided clear instructions to the crew; - displayed a combination of wheel (tiller), throttle and gear selector control for the conditions present; - displayed situational awareness.
Secure Alongside	The student: - did not use the correct lines and fenders for the expected weather conditions; - did not use the proper knot to secure the boat.	The student: - secured alongside selecting the correct lines and fenders for the expected weather conditions; - secured the powerboat using correct knots and fittings.
De-rig	The student did not follow the SOP for de-rigging the powerboat.	The student followed the SOP for de-rigging the powerboat.

ANNEX A – APPENDIX 3
003 PC GROUP CHECKLIST
POWERBOAT

	MANOEUVRE A POWERBOAT Names	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
POWERBOAT OPERATOR	Complete Pre-Departure Checklist															
	Start the Powerboat.															
	Move Forward at No-Wake and Wake Speed															
	Determine Stopping Distance															
	Manoeuvre While Moving Astern															
	Leave a Dock															
	Return to a Dock (on Dock Wind)															
	Return to a Dock (off Dock Wind)															
	Come Alongside Another Vessel															
	Tow a Powerboat Using a Bridle															
	Recover a MOB															
	Secure Alongside															
	De-rig															

I = Incomplete C = Complete

ANNEX A – APPENDIX 4
003 PC ASSESSMENT CHECKLIST
POWERBOAT

Student's Name: _____ Division / Corps: _____

Preparing for Departure	Incomplete	Complete
Completed pre-departure tasks using the CCO Pre-Departure Checklist		
Started the Powerboat		
Manoeuvring	**Incomplete**	**Complete**
Move Forward at No-Wake and Wake Speed.		
Determine Stopping Distance.		
Manoeuvre While Moving Astern.		
Leave a Dock.		
Return to a Dock (On Dock Wind).		
Return to a Dock (Off Dock Wind).		
Come Alongside Another Vessel.		
Tow a Powerboat Using a Bridle.		
Recover a Man Overboard.		
Securing	**Incomplete**	**Complete**
Secure Alongside.		
De-rig.		

Evaluator's Feedback:

Overall Performance Assessment:

Check One	**Incomplete**		**Completed**	
Overall Performance	The student has not achieved the performance standard by not completing at least one or more of the required tasks.		The student has achieved the performance standard by completing all of the required tasks.	

Evaluator's Name: _____	**Position:** _____
Evaluator's Signature: _____	**Date:** _____

ANNEX B

003 PC POWERBOAT INSTRUCTOR

ASSESSMENT INSTRUCTIONS

Pre-Assessment Instructions:

1. Review the Assessment of Learning Plan – SCOP Module 3 – Powerboat, located at Annex A.

2. Photocopy the 003.01 PPC Powerboat Instructor – Lesson Rubric, located at Annex B, Appendix 1, two copies for each instructor trainee.

3. Photocopy the 003.01 PPC Powerboat Instructor – Activity Rubric, located at Annex B, Appendix 2, two copies for each instructor trainee.

4. Photocopy the 003.01 PPC – Powerboat Instructor – Feedback and Summative Evaluation Form, located at Annex B, Appendix 3, one copy for each instructor trainee.

Requirements:

- Pool or operating area IAW Water Safety Orders,
- Powerboat,
- 003 PC – Powerboat, Assessment Instructions, located at Annex A, Appendix 1,
- 003 PC Assessment Rubric – Powerboat, located at Annex A, Appendix 2,
- 003 PC Group Checklist Powerboat, located at Annex A, Appendix 3, and
- 003 PC Assessment Checklist Powerboat, located at Annex A, Appendix 4, one for each student.

Purpose of test: The purpose of this PPC is to assess the instructor trainee's ability to instruct small craft boat operation, IAW *Water Safety Orders*.

Type of test: This PPC is divided into two parts and requires the instructor trainee to conduct one period of instruction and two activities.

Description of how test will be conducted:

Part A

The instructor trainee will select and conduct one period of instruction on the shore or in a classroom. The instructional period will be selected from the following Enabling Objectives (EOs):

- EO 003.01 Prepare to Operate a Powerboat, or
- EO 003.02 Prepare for Departure.

The evaluator will approve the instructional period choices based on a need to avoid duplicate lessons.

The evaluator will monitor the instruction and record the instructor trainee's performance on the 003.01 PPC Powerboat Instructor – Lesson Rubric.

Part B

The instructor trainee shall conduct two activities from the following lessons:

- EO 003.02 Prepare for Departure
- EO 003.03 Manoeuvre a Powerboat
- EO 003.04 Secure a Powerboat

The instructor trainee will follow the pre-lesson instructions and adhere to the instructional method(s) identified in the instructor guide for each lesson.

An evaluator will monitor the instruction and record the instructor trainee's performance on the 003.01 PPC Powerboat Instructor – Activity Rubric.

Time allowed for the test:

Part A

Each instructor trainee will be required to conduct one 40 minute periods of instruction, within the following time frame:

5 min – preparation / set-up
40 min – lesson delivery
5 min – debrief of student

Part B

Each instructor trainee will be required to conduct two activities. The exact timings will be determined by the activity chosen but should fall within the following time frame:

5 min – preparation / setup
20–40 min – activity
5 min – debrief of student

The instructor trainee will be allocated a minimum of 10 minutes to modify their subsequent lesson plan based on the feedback received from the evaluator on their

previous period of instruction.

Resources available or denied:

Available: The instructor trainee will be provided the following for training and evaluation:

a. access to instructional guides and other lesson planning resources,

b. blank lessons plans,

c. assess to training aids, and

d. copies of the 003.01 PPC Powerboat Instructor – Lesson Rubric and 003.01 PPC Powerboat Instructor – Activity Rubric (prior to evaluation only).

Denied: Nil.

Standard of achievement required to pass:

A pass standard is achieved if all elements on the evaluation form are checked “Yes” within the time allocated.

Re-Test: If an instructor trainee is unsuccessful on the first attempt, they are permitted a second attempt.

The instructor trainee shall be retested using a lesson or activity selected by the evaluator, based on the training needs of the students.

Actions to be taken upon completion of test:

Record the lesson and activity scores on the 003.01 PPC – Powerboat Instructor – Feedback and Summative Evaluation Form.

Upon completion of the PPC, the instructor trainee shall be debriefed on their performance by the evaluator and provided feedback on their strengths and areas for improvement. The instructor trainee shall be advised if they have passed or failed. In the event of a failure, the instructor trainee should be fully advised in which areas they were unsuccessful and provided assistance in how to rectify these. However, in all cases, the circumstances of the instructor trainee’s inability to meet the standard shall be explained / recorded in the comments portion of the instructor trainee’s evaluation form.

The evaluation forms are to be forwarded to the Regional SCOP OPI to be placed on the instructor trainee’s file. Instructor trainees are to have access to these forms, if requested.

ANNEX B, APPENDIX 1
003.01 PPC POWERBOAT INSTRUCTOR – LESSON RUBRIC

INSTRUCTOR TRAINEE UNIT **INSTRUCTOR TRAINEE NAME** **SN (CIC ONLY)**

LESSON:_____

	CRITERIA				
	3	**2**	**1**	**0**	**SCORE**
PREPARATION					
Set-up of Training Environment	Set-up includes all of the following: functional seating formation, training area is clean, well-lit, training aids are prepared and ready for use.	The instructor missed one item in training environment set-up.	The instructor missed two items in training environment set-up.	The instructor missed more than two items, or no set-up of training environment is evident.	**/3**
Lesson Plan Content	The lesson plan contains sufficient detail to cover the teaching points (TPs) IAW the applicable QSP and includes the relevant details of how TPs are to be presented.	The lesson plan contains adequate detail to cover the teaching points (TPs) IAW the applicable QSP and includes some relevant detail of how TPs are to be presented.	The lesson plans contains insufficient material to cover the teaching points (TPs) IAW the applicable QSP and includes few details of how TPs are to be presented.	The instructor has no detail to support the delivery of an effective period of instruction or the lesson plan was not developed IAW the QSP.	**/3**
INTRODUCTION					
Introduction	The instructor stated **what** is being taught (teaching points), **why** it is important, **where** the lesson fits in.	The instructor missed one main item in their introduction.	The instructor missed two main items in their introduction.	The instructor missed more than two main items in their introduction.	**/3**
BODY OF THE LESSON					
Training Aids	A variety of visual training aids were used that were relevant, realistic, and assisted trainees in understanding the course material.	Training aids were relevant and assisted trainees in understanding course material.	Training aids were used but were limited in enhancing trainee understanding of the course material.	No training aids were used or if used hindered trainee learning.	**/3**
Method		The instructor selected one or more of the methods specifically listed for that lesson in the Instructor Guide (IG).	Method selected detracted from learning.	The instructor selected a method not condusive to learning.	**/2**
Comprehension	The instructor asked questions to confirm previous knowledge and during lesson to confirm understanding, adjusted instruction to trainee's reaction, and utilized handouts and assignments as learning activities (as applicable).	The instructor asked questions during lesson to confirm understanding, made some effort to adjust instruction to trainee's reaction, and utilized handouts and assignments as learning activities (as applicable).	The instructor asked a limited number of questions during the lesson and made little effort to adjust instruction to trainee's reaction.	The instructor asked no questions during the lesson, and did not make any effort to adjust or respond to trainee's reaction.	**/3**

	CRITERIA				
	3	**2**	**1**	**0**	**SCORE**
Participation	Students participated in the learning process through the use of thought-provoking questions, and the encouragement of expression and class solutions.	Students participated in the learning process through the use of thought-provoking questions.	Students participated in the learning process through the use of some questions.	Students did not participate in the class through the use of questions.	**/3**
Accomplishment		The instructor motivated and provided feedback to trainees consistently throughout the lesson.	The instructor motivated and provided feedback to trainees during some parts of the lesson.	The instructor did not motivate or provide feedback to trainees.	**/2**
Confirmation		The instructor consistently confirmed understanding of lesson material by conducting periodic progress checks using questions, and / or practice, exercises, assignments, group activities (as applicable) during the lesson.	The instructor confirmed understanding of lesson material by conducting periodic progress checks using questions, and / or practice, exercises, assignments, group activities (as applicable) for some parts during the lesson.	The instructor did not confirm understanding of lesson material.	**/2**
Lesson Development	The instructor introduced each stage, presented all the teaching points applicable to the stage, and confirmed understanding at the end of each stage.	The instructor missed either the intro or confirmation for one of the stages or did not cover all teaching points adequately within one stage.	The instructor missed all of the introductions or all of the confirmations for each stage.	The instructor missed all introductions and confirmations or missed the majority of teaching points of the lesson.	**/3**
CONCLUSION					
End of Lesson Check	The instructor confirmed the lesson by conducting an end of lesson confirmation / test, which covered all of the main teaching points in the lesson.	The instructor confirmed the lesson by conducting an end of lesson confirmation / test, which covered the majority of the main teaching points in the lesson.	The instructor confirmed the lesson by conducting an end of lesson confirmation / test, which covered only some of the main teaching points in the lesson.	The instructor did not conduct an end of lesson confirmation / test.	**/3**
COMMENTS:				**TOTAL**	**/30**
				SCORE REQUIRED: 18 / 30 (60%)	

INSTRUCTOR TRAINEE'S SIGNATURE
(I have read and discussed this evaluation)

DATE

EVALUATOR'S SIGNATURE

DATE

ANNEX B, APPENDIX 2

003.01 PPC POWERBOAT INSTRUCTOR – ACTIVITY RUBRIC

INSTRUCTOR TRAINEE'S UNIT	**INSTRUCTOR TRAINEE'S NAME**	**INIT.**	**SN (CIC only)**
EVALUATION LOCATION	**EVALUATOR LAST NAME**	**INIT.**	

ACTIVITY: _____

	CRITERIA				
	3	**2**	**1**	**0**	**SCORE**
PREPARATION					
Set-up of Training Environment	Set-up includes all of the following: selected training area is of sufficient size and safely positioned in a low traffic area, resources (i.e. safety boats, sailboats, buoys, PFDs) are prepared and ready for use, and the introduction briefing is prepared and ready to present.	The instructor missed one item in training environment set-up.	The instructor missed two items in training environment set-up.	The instructor missed more than two items, or no set-up of training environment is evident.	**/3**
INTRODUCTION					
Introduction	The instructor correctly stated **why** the activity is important (objective), **what** is being practiced (key points), **how** the activity will be conducted (drill(s)) all IAW how the activity is described in the SCOP IG.	The instructor missed or incorrectly described one main item in their introduction.	The instructor missed or incorrectly stated two main items in their introduction.	The instructor missed or incorrectly stated more than two main items in their introduction.	**/3**
CONTENT					
Activity Demonstration	The instructor correctly demonstrated all of the steps to follow all IAW the content of the activity as described in the SCOP IG.	The instructor missed or incorrectly demonstrated one step.	The instructor missed or incorrectly demonstrated two steps.	The Instructor did not state the steps to follow or incorrectly demonstrated more than two steps.	**/3**

	CRITERIA				
	3	**2**	**1**	**0**	**SCORE**
Activity Development	The instructor introduced each stage, reviewed all the teaching points applicable to the stage, and confirmed understanding at the end of each stage.	The instructor missed either the intro or confirmation for one of the stages or did not review all teaching points adequately within one stage.	The instructor missed all of the introductions or all of the confirmations for each stage.	The instructor missed all introductions and confirmations or missed the majority of teaching points of the activity.	**/3**
Safety	The instructor immediately stopped any unsafe actions, was attentive and maintained control, and continuously promoted safe practices through discussion and / or demonstration.	The instructor immediately stopped any unsafe actions and occasionally promoted safe practices through discussion and / or demonstration.	The instructor delayed in stopping unsafe actions or was frequently inattentive during the activity.	The instructor did not stop any unsafe actions or was not in control of the activity or displayed unsafe practices during the activity.	**/3**
Participation		Each trainee practiced the skill multiple times or until they were assessed as competent.	Each trainee was given only one opportunity to practice the skill	One or more trainees were not given an opportunity to practice the skill.	**/2**
Accomplishment		The instructor motivated and provided feedback to trainees consistently throughout the activity.	The instructor motivated and provided feedback to trainees during some parts of the activity.	The instructor did not motivate or provide feedback to trainees.	**/2**
CONCLUSION					
Conclusion	The instructor provided detailed feedback to each trainee regarding their performance during the activity IAW the activity objectives as described in the SCOP IG.	The instructor provided some detailed feedback to trainees IAW the activity objectives as described in the SCOP IG.	The instructor provided generalized feedback to the trainees IAW the activity objectives as described in the SCOP IG.	The instructor did not provide any feedback or the feedback was not IAW the activity objectives as described in the SCOP IG.	**/3**
COMMENTS:				**TOTAL**	**/22**
				PASS SCORE REQUIRED: 13/22 (60%)	

INSTRUCTOR TRAINEE'S SIGNATURE
(I have read and discussed this evaluation)

DATE

EVALUATOR'S SIGNATURE

DATE

ANNEX B APPENDIX 3

003.01 PPC – POWERBOAT INSTRUCTOR

FEEDBACK AND SUMMATIVE EVALUATION FORM

INSTRUCTOR TRAINEE UNIT	INSTRUCTOR TRAINEE NAME	INIT.	SN (CIC only)
EVALUATION LOCATION	EVALUATOR LAST NAME	INIT.	

	The instructor trainee successfully conducted	YES	NO	REMARKS
1	Lesson 1:_____ (title)			Score: /30 PASS SCORE: 18 / 30 (60%)
2	Activity 1:_____ (title)			Score: /22 PASS SCORE: 13 / 22 (60%)
3	Activity 2:_____ (title)			Score: /22 PASS SCORE: 13 / 22 (60%)

All elements must be checked “Yes” in order for the student to be successful.

COMMENTS:

INSTRUCTOR TRAINEE’S SIGNATURE
(I have read and discussed this evaluation)

DATE

EVALUATOR’S SIGNATURE

DATE

CHAPTER 4

PERFORMANCE OBJECTIVES (POs) AND TRAINING PLAN

PURPOSE

1. The purpose of this chapter is to outline the specific POs and Training Plan for associated with the Module 3 – Powerboat qualification..

PERFORMANCE OBJECTIVES

2. POs are a description of the student's ability after training is complete. They include a description, in performance terms, of what the individual must do, the conditions under which the performance must be completed, and the standard to which the performance must conform. These three elements are respectively defined as:

a. a performance statement;

b. a conditions statement; and

c. a standard.

TRAINING PLAN

3. This chapter also details the training plan that is designed to assist students to achieve the required POs using Enabling Objectives (EOs) and Lesson Specifications (LS) that are the key reference used for development of the Instructional Guides*.*

ENABLING OBJECTIVES

4. EOs are a description of the student's ability after each unit of learning is complete and constitute a major step towards achieving the PO. EOs may correspond to the major components identified in the first round of deconstructing POs or they may result from grouping several related components. They are composed of three essential parts:

a. a performance statement;

b. a conditions statement; and

c. a standard.

LESSON SPECIFICATIONS

5. LS describe the instructional strategy to be applied to each EO, and include:

a. supporting teaching points;
b. references;
c. learning activities (methods, media and environment);
d. estimated timings;
e. assessment directions; and
f. any remarks that further clarify the design intent.

INSTRUCTIONAL METHODOLOGIES AND THEIR APPLICATION

6. General information including age-appropriateness, definition, application, advantages and disadvantages for the various methods of instruction commonly accepted as appropriate for cadet training are located at Annex A.

ASSESSMENT FOR LEARNING

7. Formative evaluation, or assessment for learning, takes place during a phase of instruction and helps candidates and instructors recognize progress or lapses in learning. These assessments can also provide candidates with opportunities to practice PCs. This helps to diagnose candidate needs, eg, corrective action or remedial instruction, plan the next steps in instruction and provide candidates with feedback they can use to improve. It also reinforces learning so that it can be retained longer. Details for Module 3 – Powerboat assessment for learning are outlined within the applicable lesson specifications.

PO 003

1. **Performance**: Operate a Powerboat With an Outboard Engine

2. **Conditions**:

   a. Given:

      (1) Fully equipped powerboat,
      (2) Personal floatation device (PFD),
      (3) Supervision, and
      (4) Assistance as required.

   b. Denied: Nil.

   c. Environmental:

      (1) Training area large enough to accommodate the entire group, and

      (2) During daylight hours, in suitable weather conditions, IAW A-CR-CCP-030/PT-001, *Water Safety Orders*.

3. **Standard**: The student will operate a powerboat by:

   a. preparing the powerboat and crew;

   b. using manoeuvring techniques required for the prevailing circumstances and conditions; and

   c. securing the powerboat and equipment.

4. **Remarks**: The student shall have attained Pleasure Craft Operator Competency (PCOC) and carry it while operating a powerboat.

EO 003.01

1. **Performance**: Prepare to Operate a Powerboat

2. **Conditions**:

   a. Given:

      (1) *Chart 3441 Haro Straight, Boundary Pass and Satellite Channel,*
      (2) Fully equipped powerboat,
      (3) Supervision, and
      (4) Assistance as required.

   b. Denied: Nil.

   c. Environmental: Training area large enough to accommodate the entire group.

3. **Standard**: The student shall:

   a. identify chart information, to include:

      (1) depth markings, and
      (2) hazards; and

   b. identify parts of a powerboat.

4. **Teaching Points**:

TP	Description	Method	Time	Refs
TP1	Identify the following information found on a chart: a. depth colour schemes and contours, b. soundings, and c. charted hazards.	Interactive Lecture	20 min	7c (pp. 42–43, pp. 46–49)
TP2	Identify the following parts of a powerboat: a. chine, b. deck, c. gunwale, d. keel, e. thwarts, f. transom, g. transom plug, h. buoyancy tube (if fitted), i. floatation material (if fitted), j. gearshift lever, k. throttle, l. fuel line, m. primer bulb,	Interactive Lecture	15 min	7a (p. 3-5, p. 3-25, p. 3-28) 7b (p. 5-27 to 5-28) 7d (p. 23–27)

TP	Description	Method	Time	Refs
	n. fuel tank, o. air vent screw, and p. water exhaust outlet.			

5. **Time**:

a.	Introduction / Conclusion:	5 min
b.	Interactive Lecture:	35 min
c.	Total:	40 min

6. **Substantiation**: An interactive lecture was chosen for this lesson to introduce the students to the preparation requirements for operating a powerboat.

7. **References**:

a. B-GN-181-105/FP-E00 Chief of Maritime Staff. (1997). *CFCD 105 fleet seamanship rigging and procedures manual*. Ottawa, ON: Department of National Defence.

b. BON-050-002/PT-004 Command of the Defence Council. (1995). *BR 67 Admiralty manual of seamanship*. London, England: Her Majesty's Stationary Office Publications Centre.

c. Minister of Fisheries and Oceans. (2004). *Symbols abbreviations terms (Chart 1)*. Ottawa, ON: Canadian Hydrographic Service.

d. ISBN 0-920232-15-9 Neff, D. (1990). *Basic power boating skills*. Gloucester, ON: Canadian Yachting Association.

8. **Training Aids**:

a. Presentation aids (eg, whiteboard / flip chart / OHP / multimedia projector) appropriate for the classroom / training area,

b. Fully equipped powerboat,

c. *Symbols Abbreviations Terms (Chart 1)*, and

d. *Chart 3441 Haro Straight, Boundary Pass and Satellite Channel.*

9. **Learning Aids**:

a. *Chart 3441 Haro Straight, Boundary Pass and Satellite Channel*,
b. Chart symbols handout, and
c. Fully equipped powerboat.

10. **Test Details**: Nil.

11. **Remarks**: Nil.

EO 003.02

1. **Performance:** Prepare for Departure

2. **Conditions:**

   a. Given:

      (1) Fully equipped powerboat,
      (2) Personal floatation device (PFD),
      (3) Pre-departure checklist,
      (4) *SCOP Reference Cards*,
      (5) Supervision, and
      (6) Assistance as required.

   b. Denied: Nil.

   c. Environmental: Training area large enough to accommodate the entire group.

3. **Standard:** The student shall:

   a. explain fuelling procedures;
   b. perform a pre-departure check; and
   c. perform starting and stopping procedures.

4. **Teaching Points:**

TP	Description	Method	Time	Refs
TP1	Explain fuelling procedures, to include: a. fuel / oil mixture, b. environmental considerations, c. use of a spill kit, d. personal safety equipment, e. portable tanks, and f. fuelling checklist.	Interactive Lecture	15 min	7a (p. 24)
TP2	Demonstrate and have the students perform a pre-departure check, to include: a. inspection of hull and fittings, to include: (1) hull, lines and fenders, (2) steering, (3) throttle, (4) fuel system, (5) electrical system (if fitted), (6) bilge pump (if fitted), (7) inflation of compartments (if fitted), (8) floorboards (if fitted), and	Demonstration and Performance	40 min	7b (pp. 129–131)

TP	Description	Method	Time	Refs
	(9) cleanliness; b. operating equipment, to include: (1) accessibility, and (2) radio check; c. planning for departure, to include: (1) completing a trip plan; (2) obtaining a weather report; and (3) giving a safety briefing; and d. preparation of personnel, to include: (1) suitable clothing, (2) sunscreen, and (3) footwear.			
TP3	Demonstrate and have the students: a. wear the cut-off switch; b. start an outboard engine; c. stop an outboard engine; and d. troubleshoot engine problems.	Demonstration and Performance	15 min	7b (pp. 30–32, (pp. 131–132)

5. **Time:**

a.	Introduction / Conclusion:	10 min
b.	Interactive Lecture:	15 min
c.	Demonstration and Performance:	55 min
d.	Total:	80 min

6. **Substantiation:**

a. An interactive lecture was chosen for TP 1 to introduce the students to the procedures for fuelling a powerboat.

b. A demonstration and performance was chosen for TPs 2 and 3 to allow the instructor to demonstrate the pre-departure check, starting and stopping procedures for a powerboat while providing an opportunity for the students to practice this skill under supervision.

7. **References:**

a. ISBN 0-662-42286-4 Office of Boating Safety. (2006). *Safe boating guide*. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by Transport Canada.

b. ISBN 0-920232-15-9 Neff, D. (1990). *Basic power boating skills*. Gloucester, ON: Canadian Yachting Association.

c. Director of Cadets and Junior Canadian Rangers 6. (2014). *SCOP Reference Cards*. Ottawa, ON: Department of National Defence.

8. **Training Aids:**

a. Presentation aids (eg, whiteboard / flip chart / OHP / multimedia projector) appropriate for the classroom / training area,

b. *SCOP Reference Cards*,

c. Fully equipped powerboat, and

d. Pre-departure checklist.

9. **Learning Aids:**

a. Fully equipped powerboat,
b. PFD,
c. Pre-departure checklist, and
d. *SCOP Reference Cards*.

10. **Test Details:** This EO is assessed IAW Chapter 3, Annex A.

11. **Remarks:** This EO should be taught as two consecutive periods.

EO 003.03

1. **Performance**: Manoeuvre a Powerboat

2. **Conditions**:

   a. Given:

      (1) Fully equipped powerboat,
      (2) Personal floatation device (PFD),
      (3) Supervision, and
      (4) Assistance as required.

   b. Denied: Nil.

   c. Environmental: During daylight hours, in suitable weather conditions, IAW A-CR-CCP-030/PT-001, *Water Safety Orders*.

3. **Standard**: The student shall safely manoeuvre a powerboat, to include:

   a. determining stopping distance while:

      (1) moving forward at no-wake speed;
      (2) moving forward at wake speed; and
      (3) moving astern;

   b. coming alongside another vessel;
   c. towing; and
   d. recovering a man overboard.

4. **Teaching Points**:

TP	Description	Method	Time	Refs
TP1	Explain manoeuvring theory, to include: a. body position, b. tilt and trim of engine, c. terms, to include: (1) displacement mode, (2) plowing mode, and (3) planing mode; and d. operating in different conditions.	Interactive Lecture	15 min	7b (p. 70, p. 119, pp. 138–139)
TP2	Demonstrate and have the students determine stopping distance, to include: a. moving forward at no-wake speed; b. moving forward at wake speed; and	Demonstration and Performance	300 min	7b (pp. 135–137) 7c (pp. 43-47)

TP	Description	Method	Time	Refs
	c. moving astern.			
TP3	Demonstrate and have the students come alongside another vessel.	Demonstration and Performance	55 min	
TP4	Demonstrate and have the students tow another vessel using a bridle.	Demonstration and Performance	60 min	7a (pp. 11-24 to 11-25)
TP5	Demonstrate and have the students recover a man overboard.	Demonstration and Performance	60 min	7a (pp. 11-17 to 11-18)

5. **Time**:

a. Introduction / Conclusion: 10 min
b. Interactive Lecture: 15 min
c. Demonstration and Performance: 575 min
d. Total: 600 min

6. **Substantiation**:

a. An interactive lecture was chosen for TP 1 to introduce the students to manoeuvring theory for a powerboat.

b. A demonstration and performance was chosen for TPs 2–5 to allow the instructor to demonstrate manoeuvring a powerboat while providing an opportunity for the students to practice these skills under supervision.

7. **References**:

a. B-GN-181-105/FP-E00 Chief of Maritime Staff. (1997). *CFCD 105 fleet seamanship rigging and procedures manual*. Ottawa, ON: Department of National Defence.

b. ISBN 0-920232-15-9 Neff, D. (1990). *Basic power boating skills*. Gloucester, ON: Canadian Yachting Association.

c. ISBN 0-901501-99-9 Glatzel, P. (2005). *Powerboat handbook*. Southampton, England: The Royal Yachting Association.

d. Director of Cadets and Junior Canadian Rangers 6. (2014). *SCOP Reference Cards*. Ottawa, ON: Department of National Defence.

8. **Training Aids**:

a. Presentation aids (eg, whiteboard / flip chart / OHP / multimedia projector) appropriate for the classroom / training area,

b. Fully equipped powerboat,

c. Tow line.

9. **Learning Aids**:

a. Fully equipped powerboat,
b. Tow line, and
c. PFD.

10. **Test Details**: This EO is assessed IAW Chapter 3, Annex A.

11. **Remarks**: Students may have prior experience operating a powerboat; at the discretion of the instructor, the time spent practicing skills in TP2 through TP5 can be adjusted based on the skill level of the group.

EO 003.04

1. **Performance:** Secure a Powerboat

2. **Conditions:**

   a. Given:

      (1) Fully equipped powerboat,
      (2) Personal floatation device (PFD),
      (3) Anchor with chain,
      (4) Supervision, and
      (5) Assistance as required.

   b. Denied: Nil.

   c. Environmental: During daylight hours, in suitable weather conditions, IAW A-CR-CCP-030/PT-001, *Water Safety Orders*.

3. **Standard:** The student shall:

   a. explain how to moor a powerboat;
   b. explain how to beach a powerboat;
   c. explain how to anchor a powerboat;
   d. secure a powerboat; and
   e. de-rig a powerboat.

4. **Teaching Points:**

TP	Description	Method	Time	Refs
TP1	Explain the procedures for mooring a powerboat.	Interactive Lecture	10 min	7b (pp. 20–22), 7c (pp. 51, 52)
TP2	Explain the procedures for beaching a powerboat.	Interactive Lecture	10 min	
TP3	Explain anchoring a powerboat, to include: a. anchor parts and types, b. selection of the rode (cable), and c. anchorage considerations.	Interactive Lecture	15 min	7a (p. 7-15) 7c (pp. 53–54)
TP4	Demonstrate and have the students secure a powerboat to a dock.	Demonstration and Performance	20 min	7c (pp. 43–57)
TP5	Demonstrate and have the students de-rig a powerboat.	Demonstration and Performance	15 min	
TP6	Have the students practice manoeuvring a powerboat.	Practical Activity	160 min	

5. **Time:**

a.	Introduction / Conclusion:	10 min
b.	Interactive Lecture:	35 min
c.	Demonstration and Performance:	35 min
d.	Practical Activity	160 min
e.	Total:	240 min

6. **Substantiation:**

a. An interactive lecture was chosen for TPs 1–3 to introduce the students to the procedures for mooring, beaching and anchoring a powerboat.

b. A demonstration and performance was chosen for TPs 4 and 5 to allow the instructor to demonstrate securing to a dock and de-rigging a powerboat while providing an opportunity for the students to practice these skills under supervision.

c. A practical activity was chosen for TP 6 as it is an interactive way to allow students to practice manoeuvring a powerboat in a safe, controlled environment.

7. **References:**

a. B-GN-181-105/FP-E00 Chief of Maritime Staff. (1997). *CFCD 105 fleet seamanship rigging and procedures manual*. Ottawa, ON: Department of National Defence.

b. ISBN 978-1-905104-83-3 Gibson, R. (2008). *Introduction to boat handling skills for sail and power*. Southampton, England: The Royal Yachting Association.

c. ISBN 0-901501-99-9 Glatzel, P. (2005). *Powerboat handbook*. Southampton, England: The Royal Yachting Association.

d. Director of Cadets and Junior Canadian Rangers 6. (2014). *SCOP Reference Cards*. Ottawa, ON: Department of National Defence.

8. **Training Aids:**

a. Presentation aids (eg, whiteboard / flip chart / OHP / multimedia projector) appropriate for the classroom / training area,

b. Anchor with chain, and

c. Fully equipped powerboat.

9. **Learning Aids:**

a. Fully equipped powerboat,
b. Anchor with chain, and
c. PFDs.

10. **Test Details:** This EO is assessed IAW Chapter 3, Annex A.

11. **Remarks:**

a. TPs 1–3 are intended to reinforce the requirements for local conditions and the existing skill set of the students.

b. Time for TP 6 must stay within the allocation; however the instructor has the flexibility of reviewing manoeuvres based on local conditions and the skill set of the students.

SMALL CRAFT OPERATOR PROGRAM

MODULE 3 – POWERBOAT

INSTRUCTIONAL GUIDES

1. The IG provides instructors with the base means from which to deliver training. Individual IGs are to be reviewed in conjunction with the LSs, when developing lesson plans, so that each instructor can adequately plan for and prepare each lesson. Instructors may be required to develop instructional materials to support training in addition those provided, eg, posters, videos, handouts, models, etc, supplemental to training control and support documents. Suggested instructional activities are included in the IGs to maximize learning and fun. Instructors are also encouraged to modify / enhance the activities, as long as they continue to contribute to enabling objective achievement.

2. Throughout the IGs, a series of information boxes are used to highlight information; they include:

	Note to the Instructor.
	Key information to pass along to the students.
	Refer to the following CAF regulations and policies.
	Points of interest or special instructions the instructor should pass along to the students.

SMALL CRAFT OPERATOR PROGRAM

MODULE 3 – POWERBOAT

INSTRUCTIONAL GUIDE

SECTION 1

EO 003.01 – PREPARE TO OPERATE A POWERBOAT

Total Time:	40 min

PREPARATION

PRE-LESSON INSTRUCTIONS

This IG supports EO 003.01 (Prepare to Operate a Powerboat).

Photocopy the handouts located at Annexes A–C in colour, one for every two students.

Gather the required resources:

- *Symbols Abbreviations Terms (Chart 1),* and
- *Chart 3441 Haro Straight, Boundary Pass and Satellite Channel.*

Download *Symbols Abbreviations Terms (Chart 1)* from the Fisheries and Oceans website, http://www.charts.gc.ca/publications/chart1-carte1/index-eng.asp.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to introduce the students to the preparation requirements for operating a powerboat.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the student shall have identified chart information and parts of a powerboat.

IMPORTANCE

It is important for students to operate a powerboat safely. This can be accomplished by understanding the safe operation of the different types of powerboats available in the Cadet Program. Knowing local hazards, conditions and equipment on board contributes to a safer boating experience.

Teaching Point 1 **Identify information found on a chart.**

Time: 20 min Method: Interactive Lecture

This lesson contains numerous symbols that can be found on a chart. The purpose of this lesson is not to have the students memorize the symbols, but rather, to know the common ones and where to find information on symbols.

When operating a powerboat, knowledge of the local area and safe operating procedures must be employed to ensure a successful trip. One of the fundamental rules involved in the operation of a powerboat is knowing where safe water is located. Through the use of a chart and knowledge of the local area, a powerboat operator can determine the safe operating area.

Chart 1 is a publication containing explanations of the symbols, abbreviations and terms needed to interpret nautical charts published by the Canadian Hydrographic Service. Member nations of the International Hydrographic Organization produce Chart 1 using a common format. That common format consists of sections identified by letters and symbols, abbreviations or terms identified by a reference number. All Chart 1s organize these sections and symbols, abbreviations, or terms in the exact same order.

A copy of *Symbols Abbreviations Terms (Chart 1)*can be downloaded from the Fisheries and Oceans Canada website http://www.charts.gc.ca/publications/chart1-carte1/index-eng.asp

DEPTH COLOUR SCHEMES AND CONTOURS

There are many colours found on a chart. Each colour represents a specific height or depth of water.

Distribute the handout located at Annex A for Depth Colour Schemes and Contours.

Show a chart to the students to demonstrate the ease of reading the colour scheme. See if the students can locate any of the colours on the chart.

Chart datum is the low water plane of reference for soundings and is stated in the title block of each chart.

Beige. Indicates dry land.
Green. The area above chart datum that is covered with water at high water and is dry at low water.
Light blue. The area above chart datum that has a depth of 0–5 m.
Dark blue. The area above chart datum that has a depth of 5–10 m.

White. Indicates the area above chart datum that has a depth of 10 m or more.
Contour lines. Lines on a chart that indicate a marked change in depth.

Colour schemes and contours are processed at a glance of the chart. The more familiar a student is with the colour schemes on a chart, the faster they will be able to interpret the depth of water.

In the following tables there are references to the International Hydrographic Organization (IHO) and the Canadian Hydrographic Services (CHS). In Canadian waters the CHS symbols are followed.

DEPTH CONTOURS

Ref. #	IHO Symbology	Description	CHS Symbology
I30	0 2 3 5 6 10 15 20 25 30 40 50 75 100 200 300 400 500 600 700 800 900 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000	One of two lighter blue tints may be used instead of the 'ribbons' of tint at 10 or 20 m.	Metres/Mètres: 0 2 5 10 15 20 30 50 100 200 (2 5 10 15 20 30 50 100 200) † Fathoms Brasses / Feet Pieds: 0 0; 1 6; 2 12; 3 18; 5 30; 6 36; 10 60; 20 120; 50; 100; 500; 1000 †
I31	20 50	Approximate depth contours	5 10 5 10 †

Note
The green tint between the High and Low Water lines identifies drying areas, while a blue tint emphasizes the shallow water areas. The extent of the blue tint varies with the scale and purpose of the chart or its sources. On some charts, the contours and figures are printed in black.

Figure 1 Depth Colour Schemes and Contours

Note. From *Symbols Abbreviations Terms (Chart 1*) (p. 42), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

SOUNDINGS

The areas on a chart marked as water contain many numbers. These numbers represent depth soundings that have been taken during surveys conducted by the CHS. These soundings are accurate as of the survey date unless noted by specific symbols. Symbols can be found in *Symbols Abbreviations Terms (Chart 1)* (as shown in Figure 2).

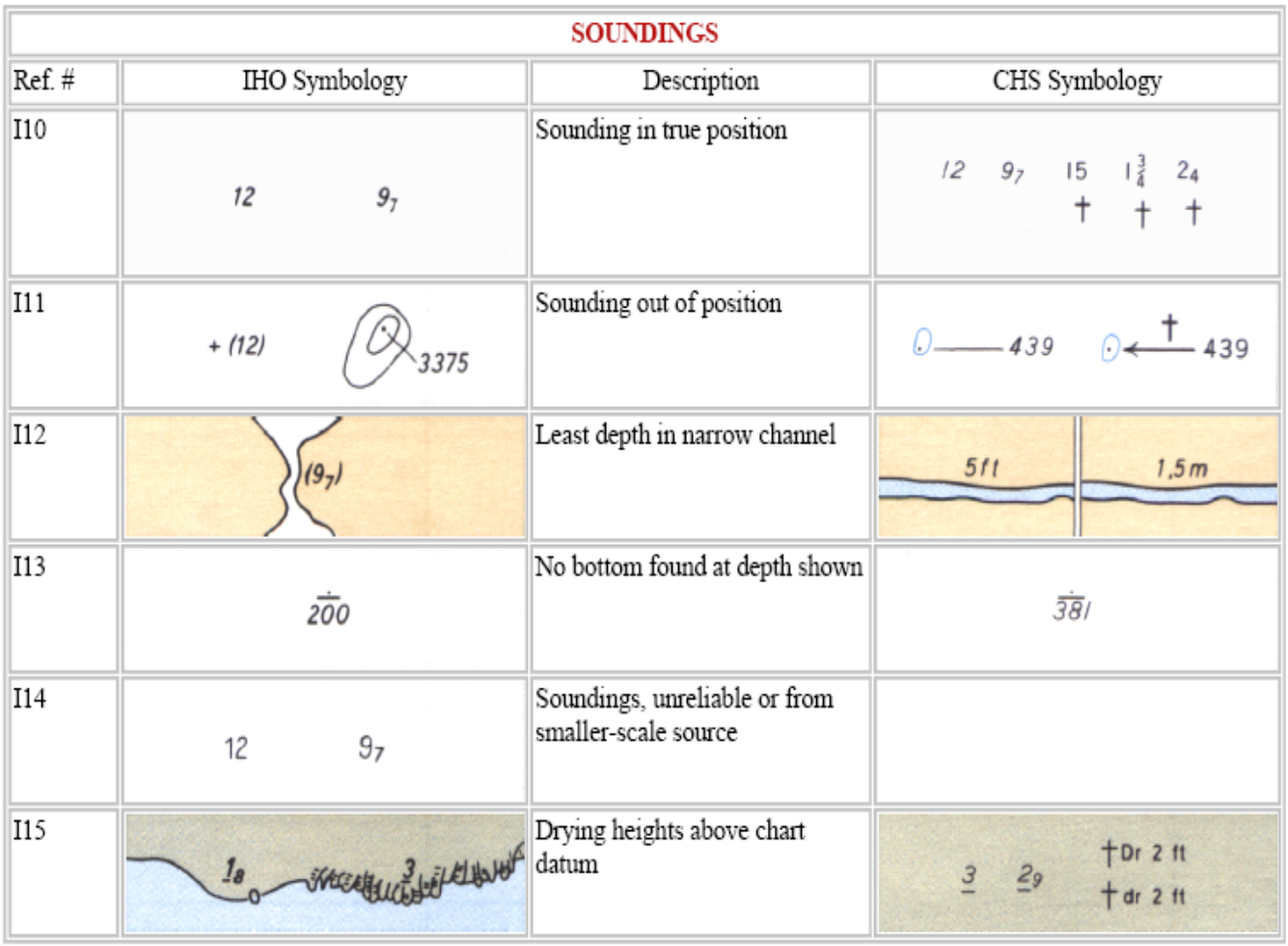


Figure 2 Sounding Symbols

Note. From *Symbols Abbreviations Terms (Chart 1)* (p. 40), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

The students should know how to read the soundings in true position (as shown in Figure 2). This is the simplest form of determining the depth of water.

More information on symbols can be found in *Symbols Abbreviations Terms (Chart 1)*.

CHARTED HAZARDS

Charted hazards are marked on a chart by the use of symbols. Hazards are items such as rocks, wrecks and other obstructions. They may be submerged or above water depending on the height of the tide. Students should be familiar with danger lines, rocks, wrecks and obstructions of known and unknown depth.

Distribute the handout located at Annex B to each student. Have the students look for the various hazards on the chart.

Rocks, Wrecks and Obstructions

GENERAL			
Ref. #	IHO Symbology	Description	CHS Symbology
K1		Danger line, in general	
K2		Swept by wire drag	

Figure 3 Rock Danger Lines

Note. From *Symbols Abbreviations Terms (Chart 1*) (p. 45), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

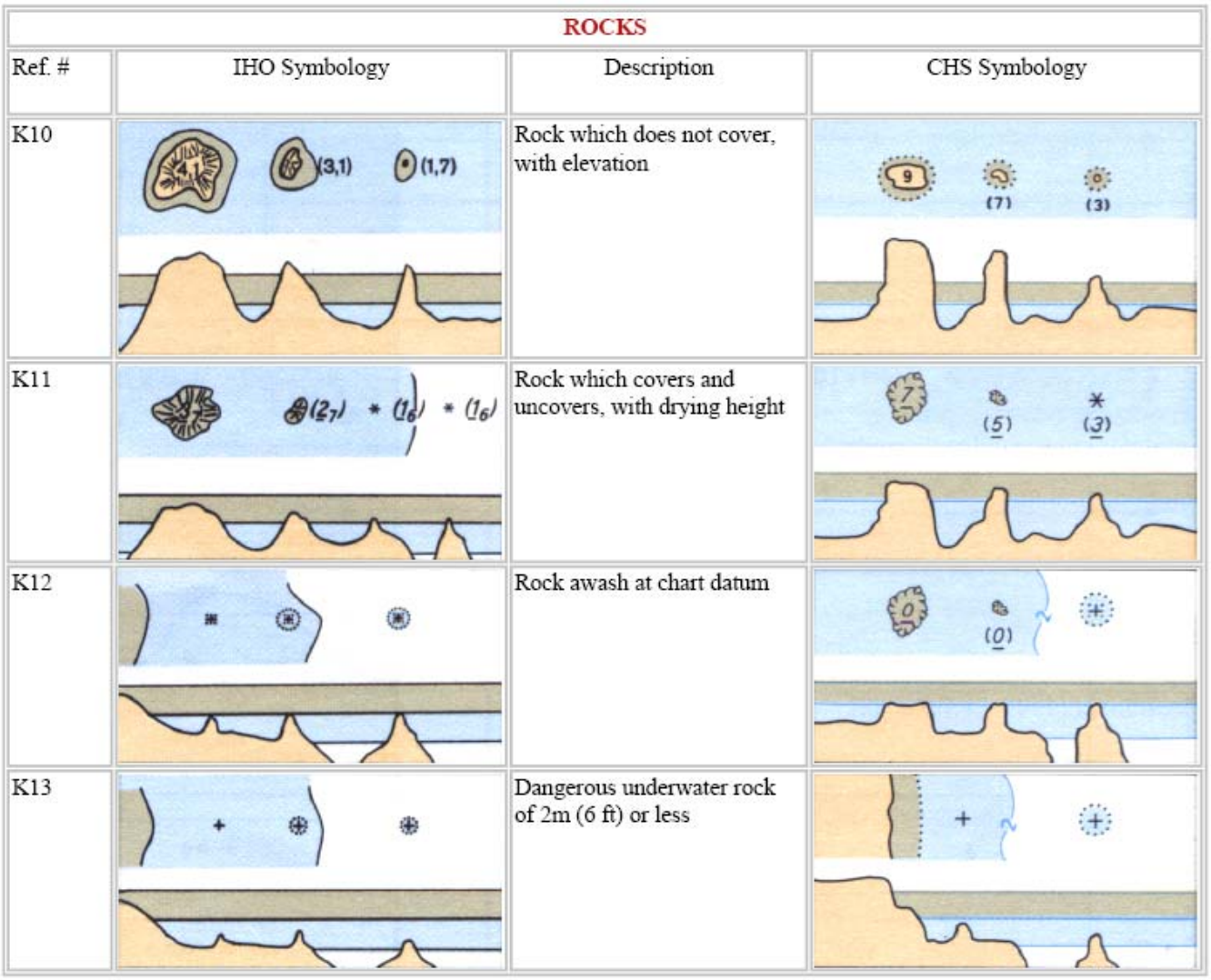


Figure 4 Rock Symbols

Note. From *Symbols Abbreviations Terms (Chart 1)* (p. 46), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

The students should be able to identify rock symbols in general. More information on symbols can be found in *Symbols Abbreviations Terms (Chart 1)*.

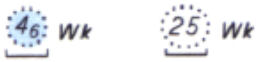
WRECKS			
Ref. #	IHO Symbology	Description	CHS Symbology
K20		Wreck, hull always dry, on large-scale charts	
K21		Wreck, covers and uncovers, on large-scale charts	
K22		Submerged wreck, depth known, on large-scale charts	
K23		Submerged wreck, depth unknown, on large-scale charts	
K24		Wreck showing any portion of hull or superstructure	
K25		Wreck, masts visible	
K26		Wreck, depth known	
K27		Wreck, least depth known, swept by wire drag	

Figure 5 Wreck Symbols

Note. From *Symbols Abbreviations Terms (Chart 1*) (p. 47), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

Distribute the handout located at Annex C to each student.

OBSTRUCTIONS

Ref. #	IHO Symbology	Description	CHS Symbology
K40	Obstn Obstn	Obstruction, depth unknown	Obstn Obstr Obstr
K41	4 6 Obstn 16 8 Obstn	Obstruction, depth known	4 Obstn 4 Obstr
K42	4 6 Obstn 16 8 Obstn	Obstruction, least depth known, swept by wire drag	4 Obstn 4 Obstr
K43.1	Obstn	Snags or stumps, exact position unknown	
K43.2		Snag or stump, exact position known	
K44.1		Fishing stakes	
K44.2		Fish traps, Fish weirs, Tunny nets	
K45	Fish traps Madragues Tunny nets Thonnaires	Fish traps or tunny nets area	Fish Traps Madragues

Figure 6 Obstruction Symbols

Note. From *Symbols Abbreviations Terms (Chart 1*) (p. 48), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

The students should be able to identify obstruction symbols in general. More information on symbols can be found in *Symbols Abbreviations Terms (Chart 1)*.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What does the beige area on a chart indicate?

Q2. What publication has more detailed information on chart symbols?

Q3. What do the sounding numbers indicate on a chart?

ANTICIPATED ANSWERS:

A1. Dry land.

A2. *Symbols Abbreviation Terms (Chart 1)*.

A3. Depth of water.

Teaching Point 2	**Identify parts of a powerboat.**
Time: 15 min	Method: Interactive Lecture

PARTS OF A POWERBOAT

Chine. The fore and aft lines where the side and bottom of the hull meet. A boat has a hard chine when the side and bottom form a sharp edge and a soft chine when the sides form a rounded edge.

Deck. The surface extending between a boat's sides forming an integral part of the powerboat's structure.

Gunwale. The upper edge of a powerboat's sides.

Keel. The centreline structural member running fore and aft along the bottom of the powerboat.

There are two different hull configurations. The solid hull, usually made of fibreglass or metal, and the inflatable hull, made with a buoyancy tube for floatation.

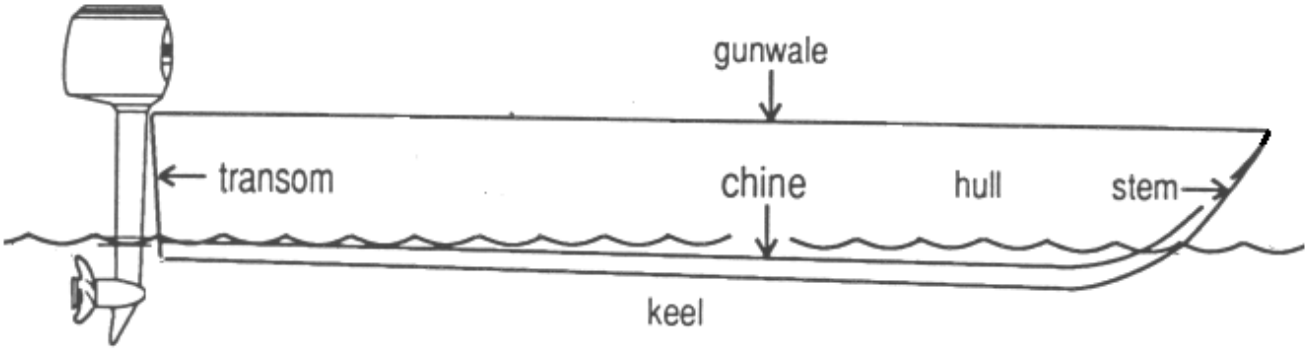


Figure 7 Powerboat Parts (Solid Hull Side View)

Note. From *Basic Powerboating Skills* (p. 15), by D. Neff, 1945, Gloucester, ON: Copyright 1990 by Canadian Yachting Association.

Thwarts. The seats in a powerboat that usually run port to starboard and provide lateral support to the sides of the powerboat.

Transom. The flat, vertical area across the stern.

Transom plug. The fitting located on the transom used for draining water from the interior of the boat.

Buoyancy tube. The inflatable tube that forms part of the hull on an inflatable hull boat.

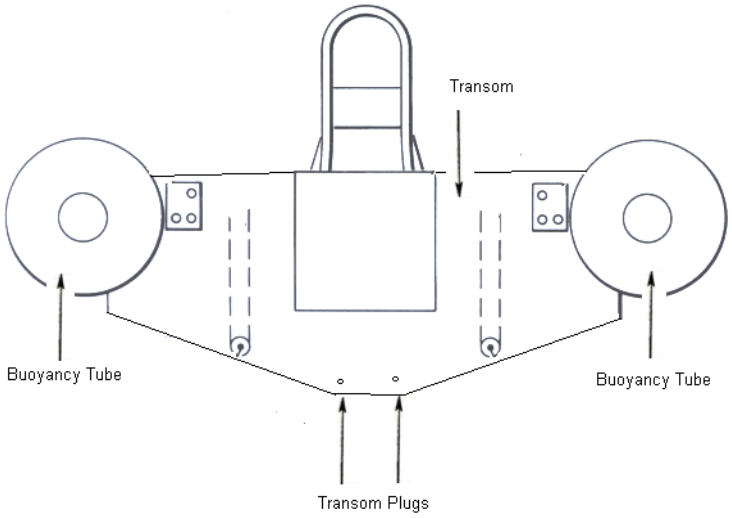


Figure 8 Powerboat Parts (Inflatable Hull Stern View)

Note. From *BR 67 Admiralty Manual of Seamanship* (p. 3-155), by the Command of Defence Council, London, England: Her Majesty's Stationery Office. Copyright 1995 by Her Majesty's Stationery Office.

Floatation material. The material (usually a type of rigid foam) located in voids of the solid hull boat to give it inherent floatation.

Gearshift lever. The lever that allows selection of forward, neutral or reverse.

Throttle. The lever that controls the engine speed.

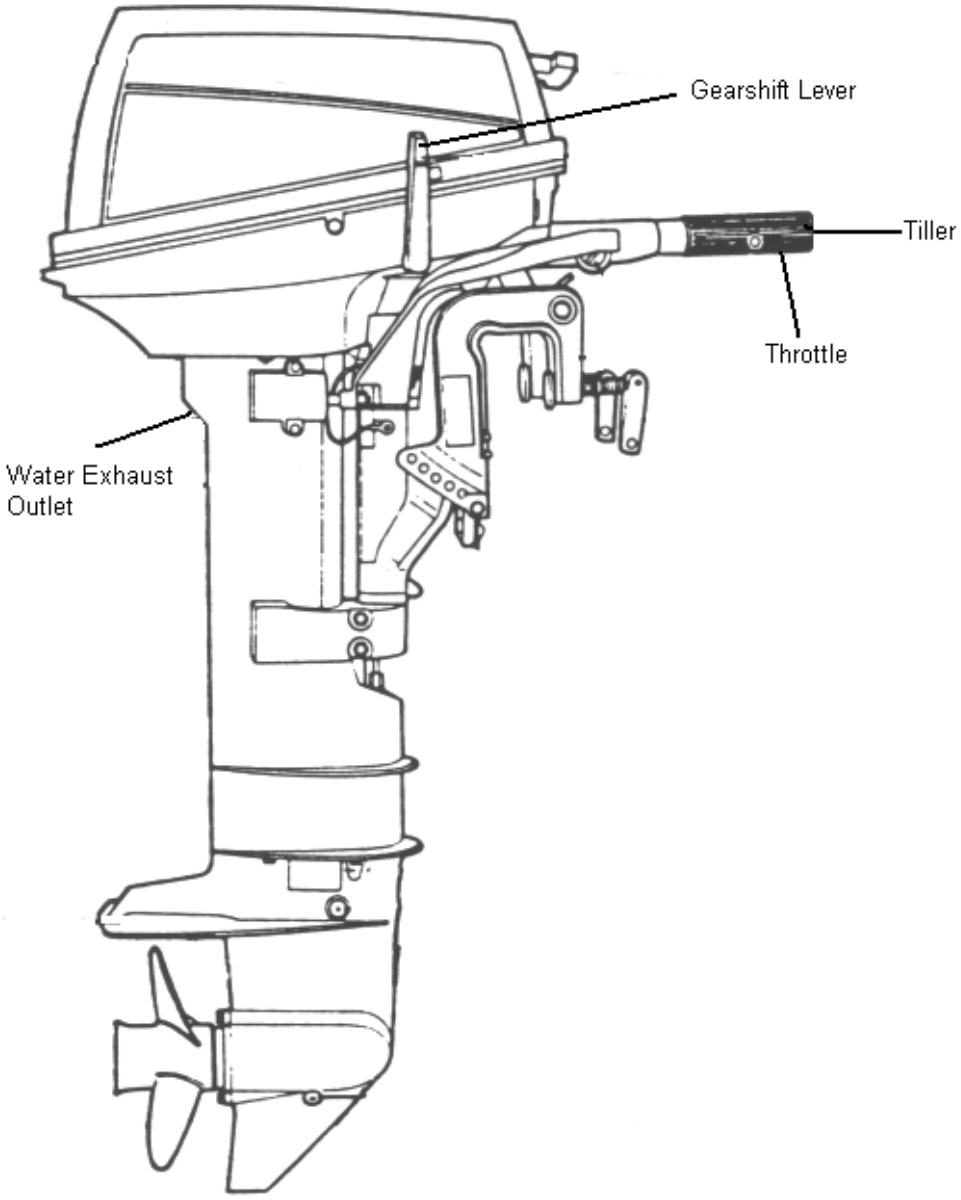


Figure 9 Outboard Engine Side View

Note. From *Basic Powerboating Skills* (p. 24), by D. Neff, 1945, Gloucester, ON: Copyright 1990 by Canadian Yachting Association.

Fuel line. The line that carries fuel from the fuel tank to the engine.

Primer bulb. A compression bulb in the fuel line that allows fuel to be manually pumped into the engine.

Fuel tank. Supplies fuel to the engine.

Air vent screw. A vent on the cap of the fuel tank that allows air to flow into the tank in order to prevent a vacuum from forming in the fuel tank, stopping the flow of fuel.

Water exhaust outlet. The outlet on the engine shaft for cooling water and exhaust to exit.

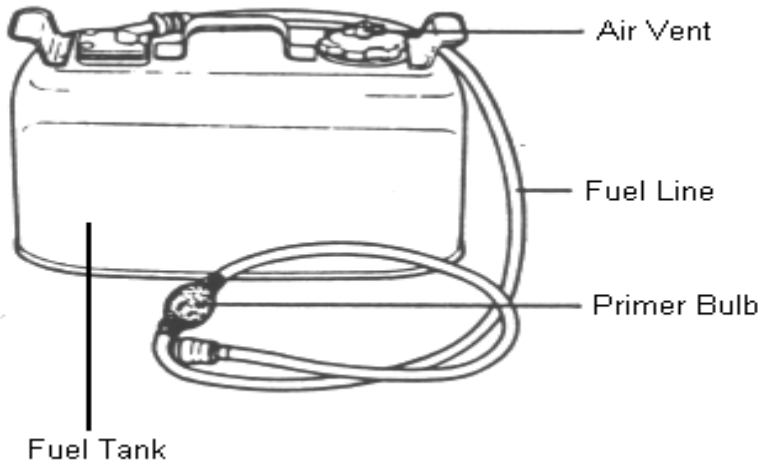


Figure 10 Fuel Tank Assembly

Note. From *Basic Powerboating Skills* (p. 24), by D. Neff, 1945, Gloucester, ON: Copyright 1990 by Canadian Yachting Association.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. When does a boat have a hard chine?

Q2. What are thwarts?

Q3. What does the throttle do?

ANTICIPATED ANSWERS:

A1. When the bottom and sides form a sharp edge.

A2. The seats in a boat that usually run from port to starboard and provide lateral support to the sides of the powerboat.

A3. Controls the engine speed.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. What can help determine the safe operating area of a powerboat?

Q2. What is floatation material?

Q3. What is a primer bulb?

ANTICIPATED ANSWERS:

A1. Charts and knowledge of the local area.

A2. The material (usually a type of rigid foam) located in voids of the solid hull boat to give it inherent floatation.

A3. A compression bulb in the fuel line that allows fuel to be manually pumped into the engine.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW Chapter 3.

CLOSING STATEMENT

It is important for students to operate a powerboat safely. This can be accomplished by understanding the safe operation of the different types of powerboats available in the Cadet Program. Knowing local hazards, conditions and equipment on board the powerboat will contribute to a safer boating experience.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

B-GN-181-105/FP-E00 Chief of Maritime Staff. (1997). *CFCD 105 fleet seamanship rigging and procedures manual*. Ottawa, ON: Department of National Defence.

BON-050-002/PT-004 Command of the Defence Council. (1995). *BR 67 Admiralty manual of seamanship*. London, England: Her Majesty's Stationary Office Publications Centre.

Minister of Fisheries and Oceans. (2004). *Symbols abbreviations terms (Chart 1)*. Ottawa, ON: Canadian Hydrographic Service.

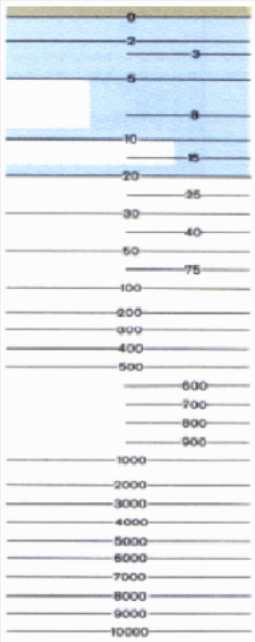
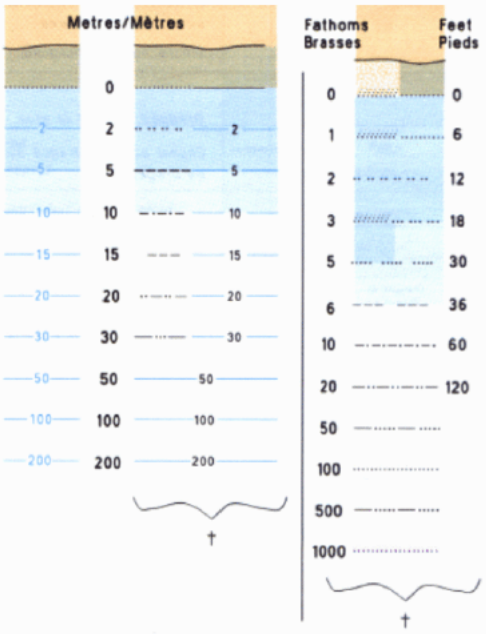
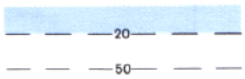
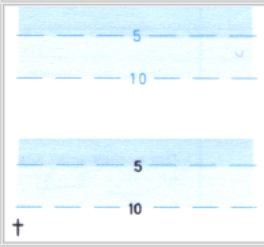
ISBN 0-920232-15-9 Neff, D. (1990). *Basic power boating skills*. Gloucester, ON: Canadian Yachting Association.

DEPTH COLOUR SCHEMES AND CONTOURS

In the following tables there are references to the International Hydrographic Organization (IHO) and the Canadian Hydrographic Services (CHS). In Canadian waters follow the CHS symbols.

DEPTHS

DEPTH CONTOURS

Ref. #	IHO Symbology	Description	CHS Symbology
I30		One of two lighter blue tints may be used instead of the 'ribbons' of tint at 10 or 20 m.	
I31		Approximate depth contours	

Note
The green tint between the High and Low Water lines identifies drying areas, while a blue tint emphasizes the shallow water areas. The extent of the blue tint varies with the scale and purpose of the chart or its sources. On some charts, the contours and figures are printed in black.

Figure A-1 Depth Colour Schemes and Contours

Note. From *Symbols Abbreviations Terms (Chart 1)* (p. 42), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

SOUNDING SYMBOLS

SOUNDINGS			
Ref. #	IHO Symbology	Description	CHS Symbology
I10	12 9_7	Sounding in true position	12 9_7 15 $1\frac{3}{4}$ 2_4
I11	+ (12) 3375	Sounding out of position	439 439
I12	(9_7)	Least depth in narrow channel	5ft 1,5m
I13	$\overline{200}$	No bottom found at depth shown	$\overline{38}$
I14	12 9_7	Soundings, unreliable or from smaller-scale source	
I15	1a 3	Drying heights above chart datum	$\underline{3}$ $\underline{2_9}$ Dr 2 ft dr 2 ft

Figure A-2 Sounding Symbols

Note. From *Symbols Abbreviations Terms (Chart 1*) (p. 40), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

ROCKS AND DANGER LINES

In the following tables there are references to the International Hydrographic Organization (IHO) and the Canadian Hydrographic Services (CHS). In Canadian waters we follow the CHS symbols.

GENERAL

Ref. #	IHO Symbology	Description	CHS Symbology
K1		Danger line, in general	
K2		Swept by wire drag	

ROCKS

Ref. #	IHO Symbology	Description	CHS Symbology
K10		Rock which does not cover, with elevation	
K11		Rock which covers and uncovers, with drying height	
K12		Rock awash at chart datum	
K13		Dangerous underwater rock of 2m (6 ft) or less	

Figure B-1 Rocks and Danger Lines

Note. From *Symbols Abbreviations Terms (Chart 1*) (p. 42), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

ROCK SYMBOLS

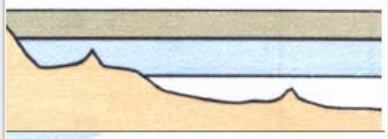
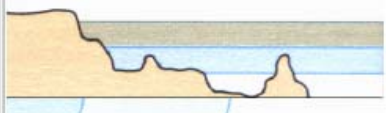
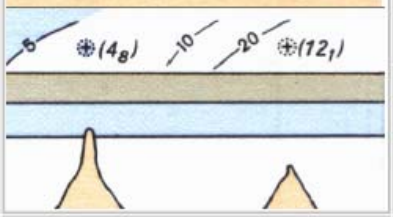
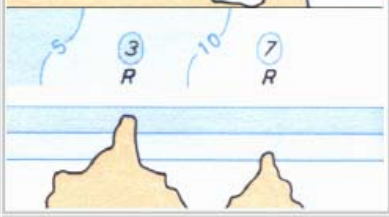
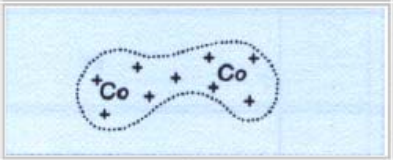
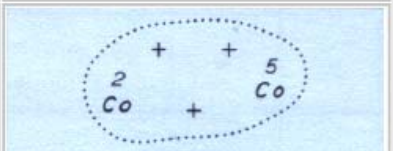
ROCKS			
Ref. #	IHO Symbology	Description	CHS Symbology
K14		Dangerous underwater rock of known depth	
K14.1		-in the corresponding depth area	
K14.2		-outside the corresponding depth area	
K15	*21* *R*	Non-dangerous rock of known depth	*21* *R*
K16		Submerged coral reef	
K17		Breakers	

Figure B-2 Rock Symbols

Note. From *Symbols Abbreviations Terms (Chart 1)* (p. 46), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

WRECK SYMBOLS

WRECKS			
Ref. #	IHO Symbology	Description	CHS Symbology
K20		Wreck, hull always dry, on large-scale charts	
K21		Wreck, covers and uncovers, on large-scale charts	
K22		Submerged wreck, depth known, on large-scale charts	
K23		Submerged wreck, depth unknown, on large-scale charts	
K24		Wreck showing any portion of hull or superstructure	
K25		Wreck, masts visible	
K26		Wreck, depth known	
K27		Wreck, least depth known, swept by wire drag	

Figure B-3 Wreck Symbols

Note. From *Symbols Abbreviations Terms (Chart 1*) (p. 47), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

WRECK SYMBOLS

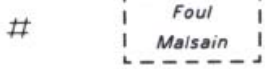
WRECKS			
Ref. #	IHO Symbology	Description	CHS Symbology
K28		Dangerous wreck, depth unknown	
K29		Non-dangerous wreck, depth unknown	
K30		Wreck, least depth unknown, but considered to have a safe clearance to depth shown	
K31		Foul ground non dangerous to surface navigation but to be avoided by vessels anchoring or trawling -CAUTION: On some CHS charts, this symbol may represent a foul area dangerous to surface navigation.	

Figure B-4 Wreck Symbols

Note. From *Symbols Abbreviations Terms (Chart 1*) (p. 47), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

OBSTRUCTION SYMBOLS

In the following tables there are references to the International Hydrographic Organization (IHO) and the Canadian Hydrographic Services (CHS). In Canadian waters we follow the CHS symbols.

OBSTRUCTIONS

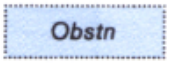
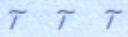
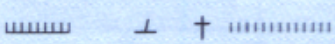
Ref. #	IHO Symbology	Description	CHS Symbology
K40	Obstn 	Obstruction, depth unknown	Obstn 
K41	4 6 Obstn 16 8 Obstn	Obstruction, depth known	4 Obstn 4 Obstr
K42	4 6 Obstn 16 8 Obstn	Obstruction, least depth known, swept by wire drag	4 Obstn 4 Obstr
K43.1	Obstn 	Snags or stumps, exact position unknown	
K43.2		Snag or stump, exact position known	
K44.1		Fishing stakes	
K44.2		Fish traps, Fish weirs, Tunny nets	
K45	Fish traps Madragues Tunny nets Thonnaires	Fish traps or tunny nets area	Fish Traps Madragues

Figure C-1 Obstruction Symbols

Note. From *Symbols Abbreviations Terms (Chart 1)* (p. 48), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

SUPPLEMENTARY OBSTRUCTION SYMBOLS

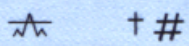
SUPPLEMENTARY NATIONAL SYMBOLS			
Ref. #	IHO Symbology	Description	CHS Symbology
Ka		Depth over an artificial feature	
Kb		Awash	
Kc		Foul area dangerous to surface navigation	

Figure C-2 Supplementary Obstruction Symbols

Note. From *Symbols Abbreviations Terms (Chart 1*) (p. 48), by Minister of Fisheries and Oceans, 2004, Ottawa, ON: Canadian Hydrographic Service.

SMALL CRAFT OPERATOR PROGRAM

MODULE 3 – POWER BOAT

INSTRUCTIONAL GUIDE

SECTION 2

EO 003.02 – PREPARE FOR DEPARTURE

Total Time:	80 min

PREPARATION

PRE-LESSON INSTRUCTIONS

This IG supports EO 003.02 (Prepare for Departure).

Photocopy the checklist located at Annex A for each student.

Gather the spill kit required for TP 1.

Ensure the students have their *SCOP Reference Cards*.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TP 1 to introduce the students to the procedures for fuelling a powerboat.

A demonstration and performance was chosen for TPs 2 and 3 to allow the instructor to demonstrate the pre-departure check, starting and stopping procedures for a powerboat while providing an opportunity for the students to practice this skill under supervision.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the student shall have explained fuelling procedures and performed a pre-departure check and starting and stopping procedures.

IMPORTANCE

It is important for students to know pre-departure procedures to ensure the preparedness of the powerboat. Being prepared will help the operator and crew have a safe boating experience.

Teaching Point 1	**Explain fuelling procedures.**
Time: 15 min	Method: Interactive Lecture

Review fuelling procedures covered on SCOP Module 1, EO 001.05.

FUELLING PROCEDURES

Precautions must be taken during fuelling to ensure safety of equipment, the environment and most importantly personnel.

Fuel / Oil Mixture

There are two different types of outboard engines, the two-stroke and the four-stroke. Each of these engines uses different fuel mixtures.

The two-stroke engine burns a gas-oil mixture that must be pre-mixed to the manufacturer's ratio. The engine is only lubricated by the oil that is in the fuel mixture, so it is important that the gas-oil ratio be mixed as per the manufacturer's specification. The two strokes of the two-stroke engine are the compression / combustion and power / exhaust strokes.

Four-stroke engines burn gas that is not mixed with oil. The engine is lubricated by oil that is contained in a gearbox (similar to an automobile engine). The four strokes of the four-stroke engine are the intake, compression, power and exhaust.

Pre-mixed fuel (gas-oil) can be differentiated from gas by its colour. Pre-mixed fuel has a dark haze, while gas is clear.

It is important to know what type of engine is on the powerboat. Burning the wrong fuel or gas-oil ratio in a two-stroke engine may cause irreparable damage.

Environmental Considerations

Every effort should be taken prior to fuelling to ensure the environment is protected in the event of a fuelling mishap. Due diligence is the primary concern while making preparations to fuel. A mishap such as spilling fuel into the water is harmful to marine wildlife and eco-systems.

Use of a Spill Kit

The use of a spill kit is the first response to a minor fuel spill. It is important to know how to use the contents of a spill kit. Spill kits can be used as a preventative tool to avoid spills as well.

The use of absorbent pads or socks around the fuelling area can help prevent minor spills from entering the water. Every spill kit should contain:

- absorbent pads,
- absorbent socks, and
- clear plastic garbage bags.

Every spill kit is unique. Students should familiarize themselves with the spill kits used locally.

Pass around so the students can become familiar with the contents.

Personal Safety Equipment

Gas and oils are hazardous materials. Proper care and protection must be maintained at all times to prevent serious personal injury. The following personal safety equipment must be used while fuelling:

- safety glasses,
- rubber gloves, and
- proper footwear (as defined in *Water Safety Orders*).

Portable Tanks

When fuelling portable tanks, they must be removed from the powerboat and filled in a designated area. This area should be away from the water and equipped with a spill pan and spill kit.

Fuelling Checklist

Students were introduced to the Fuelling Checklist in SCOP Module 1 - PCOC, EO 001.05 (Describe Safe Vessel Operations). A copy of the checklist is included in the SCOP Reference Cards.

To fuel a powerboat safely and efficiently, the following fuelling checklist has been developed:

Item	Completed
Lines Secure	
Engines Shut Off	
Personnel Ashore	
Extinguish Open Flames	
No Smoking	
Power Off	
Close All Hatches / Windows / Port Holes	
Remove Portable Tanks	
Ground Nozzle to Fill Pipe	
Know Fuel Tank Capacity	
Wipe Up Spillage	
Run Engine Compartment Blower (if fitted)	
Check for Vapours Before Start-up	

Figure 1 Fuelling Checklist

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What kind of fuel does a two-stroke engine burn?

Q2. What is the primary environmental concern when preparing to fuel?

Q3. What must be done with portable tanks when fuelling a powerboat?

ANTICIPATED ANSWERS:

A1. A gas-oil mixture.

A2. Due diligence.

A3. They must be removed from the powerboat and filled in a designated area.

Teaching Point 2	**Demonstrate and have the students perform a pre-departure check.**
Time: 40 min	Method: Demonstration and Performance

Review the pre-departure material covered in SCOP Module 1 - PCOC, EO 001.05 (Describe Safe Vessel Operations).

Distribute the Pre-Departure Checklist, located at Annex A, to each student. This checklist was created to be used by all personnel in the Canadian Cadet Organizations.

Prior to departing a dock the operator must ensure the powerboat is ready to proceed to sea. The simplest way to perform this check is with the use of a pre-departure checklist.

INSPECTION OF HULL AND FITTINGS

During the inspection of the hull and fittings, the operator must ensure that all parts of the equipment are in good working order and operate freely and unobstructed.

- **Hull, lines and fenders.** Ensure the hull is in good shape; no holes or cracks. Ensure that all lines, fenders and lanyards are in good condition and do not need to be repaired or replaced.

- **Steering.** Ensure engine clamps are tight and the engine turns freely by the tiller or steering wheel.

- **Throttle.** Move the throttle to ensure the linkage is working and not crimped.

- **Fuel system.** Verify the fuel tanks are secured, fuel in the tanks and fuel lines connected properly.

- **Electrical system (if fitted).** Ensure all systems are functional.
- **Bilge pump (if fitted).** Switch the bilge pump on to ensure it is pumping as required.
- **Inflation of compartments (if fitted).** Ensure buoyancy tubes are set to proper inflation.
- **Floorboards (if fitted).** Ensure all floorboards are seated properly.
- **Cleanliness.** Ensure bilges are clean and free of debris and all other spaces are clean.

INSPECTION OF OPERATING EQUIPMENT

Operating Equipment Stowed

The weight distribution in a powerboat can affect performance, stability and safety. When loading equipment and cargo, the operator shall:

- adhere to the recommended gross load capacity or the equivalent number of adult persons by not overloading the craft;
- position the persons on board and the equipment / cargo so as to evenly distribute the weight;
- position the load as low as possible;
- lash the equipment / cargo or stow the gear in lockers to prevent uncontrolled movement; and
- ensure safety equipment is accessible.

Review the operating equipment that is required to be carried in readily accessible locations on board, IAW *Small Vessel Regulations*.

Radio Check

Ensure all functions of the radio work and a radio check is performed with another station.

Additional Operating Equipment Stowed (for Safety Boat)

The following additional operating equipment is required to be carried in readily accessible locations on board the powerboat, if it is operating as a safety boat:

- spare rescue assistance device,
- blankets (two blankets stowed in watertight bags),
- Class C first aid kit,
- wire cutters,
- boathook, and
- tow line (9 m).

PLANNING FOR DEPARTURE

Prior to departure:

- Complete a trip plan and file with operations centre.
- Obtain a weather report.
- Give the crew a safety briefing including daily activities, operational area, special duties or assignments.

PREPARATION OF PERSONNEL

The powerboat operator must ensure that the crew is wearing:

- suitable clothing according to weather conditions and forecast,
- sunscreen and are in possession of sunscreen, and
- footwear in accordance with *Water Safety Orders*.

Using a powerboat and the pre-departure checklist, demonstrate and have the students perform a pre-departure check.

If the training establishment has an SOP with a pre-departure checklist, refer to it for specific details.

PRE-DEPARTURE CHECKLIST		
ITEM	REQUIRED CORRECTION	CORRECT
Inspection of Hull and Fittings		
Hull, Lines and Fenders		
Steering		
Throttle		
Fuel System		
Electrical System (if fitted)		
Bilge Pump (if fitted)		
Inflation of Compartments (if fitted)		
Floorboards (if fitted)		
Cleanliness		
Operating Equipment Stowed		
Heaving Line		
Reboarding Device (if required)		
Propelling Device / Anchor		
Bailer / Water Pump		
Fire Extinguisher (if required)		
Flashlight		
Flares (if required)		
Sound-Signalling Device		
Navigation Lights (if required)		
Radio Check		

PRE-DEPARTURE CHECKLIST		
ITEM	REQUIRED CORRECTION	CORRECT
Additional Operating Equipment Stowed (for Safety Boat)		
Spare Rescue Assistance Device		
Blankets (2)		
Class C First Aid Kit		
Wire Cutters		
Boathook		
Tow Line (9 m)		
Planning for Departure		
Complete Trip Plan		
Obtain Weather Report		
Give Crew Safety Briefing		
Preparation of Personnel		
Suitable Clothing		
Sunscreen		
Footwear		

Figure 2 Pre-Departure Checklist

CONFIRMATION OF TEACHING POINT 2

The students' participation in completing the pre-departure checklist will serve as the confirmation of this TP.

Teaching Point 3 **Demonstrate and have the students locate the cut-off switch, start and stop an outboard engine and troubleshoot engine problems.**

Time: 15 min Method: Demonstration and Performance

Students must wear the cut-off switch while operating a small craft.

CUT-OFF SWITCH

Outboard engines are designed with a cut-off switch as a safety feature. The cut-off switch location is dependent on the make and model of the outboard engine in use (as illustrated in Figures 3 and 4). The cut-off switch has a lanyard attached to it which is secured to the operator. If the operator falls overboard, the lanyard activates the cut-off switch and the engine shuts off.

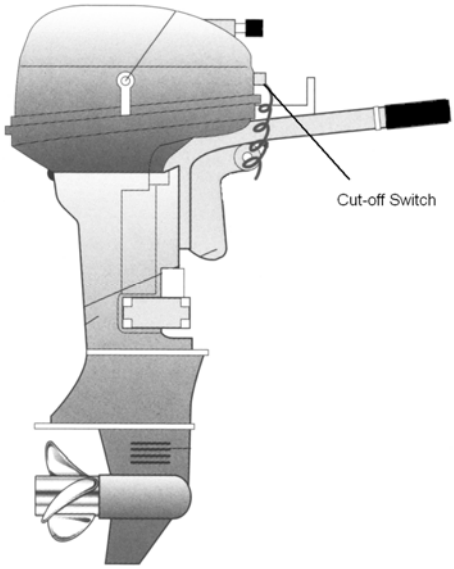


Figure 3 Engine Cut-Off Switch

Note. From *Start Powerboating* (p. 11), by J. Mendez, 2006, Southampton, England: Copyright 2006 by The Royal Yachting Association.

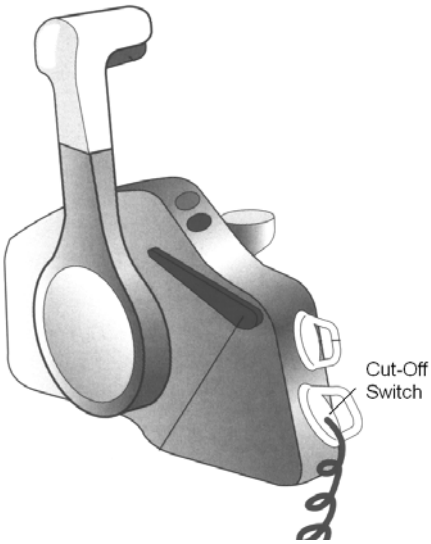


Figure 4 Console Cut-Off Switch

Note. From *Powerboating Handbook* (p. 16), by P. Glatzel, 2006, Southampton, England: Copyright 2006 by The Royal Yachting Association.

STEPS TO STARTING AN OUTBOARD ENGINE

1. Check that the mounting clamps are tight.
2. Connect the fuel line.
3. Place the gearshift in NEUTRAL.

4. Attach the cut-off switch lanyard.
5. Set the throttle to START.
6. Squeeze the primer bulb until firm.
7. Pull out the choke.
8. Start the engine.

    a. **Pull start.** Check that there is a clear area to pull the starter cord and pull the starter cord with a firm, quick motion. More than one pull may be necessary.

    b. **Electric start.** Push the start button or turn the key for several seconds until the engine starts.

9. Check that cooling water is exiting the engine.
10. Push the choke in slowly.
11. Move the throttle to IDLE.

STEPS TO STOPPING AN OUTBOARD ENGINE

1. Set the throttle to IDLE.
2. Put the gearshift in NEUTRAL.
3. Allow the engine to idle slowly for a few minutes to cool down.
4. Push the STOP button, or if there is no STOP button, pull the CHOKE out all the way.

TROUBLESHOOT ENGINE PROBLEMS

Even when preventive maintenance is performed on engines, breakdowns can occur. When they do occur, troubleshooting techniques can be used to locate, and solve the problem.

To be successful at troubleshooting, start with the simple and sometimes obvious solutions and proceed to the more difficult. Make one adjustment at a time and try starting the engine before proceeding to the next item.

If the engine is not starting or quits check the following:

- Fuel is old and contains gummy deposits that are clogging up fuel line, carburetor, etc. (Replace fuel or fuel-oil mixture).
- Fuel line not connected or kinked or connected backwards. Check flow direction arrow on primer bulb.
- Primer bulb not pumped till hard.
- If motor is warm, choke pulled out too far or too long.
- If motor is cold, choke not pulled out far enough or long enough.
- Shift lever not in neutral before pulling starter cord.
- Dirt or water in fuel tank, lines or filter.

- Air leak in fuel lines. For example, damaged or worn 0-ring in fuel line connector.
- Motor is flooded. Disconnect fuel line and pull starter cord to clear excess fuel.
- Ignition lead is loose or shorting out. Re-check all connections. Replace leads, if worn or damaged.
- If electric start, battery not fully charged or poor cable connections. Charge battery or clean and tighten battery cable connections.

Any other issues, return the powerboat to the jetty and report the issue. Do not attempt to fix the engine.

CONFIRMATION OF TEACHING POINT 3

The students' participation in starting the engine will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The students' participation in pre-departure checks and starting the engine will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW Chapter 3.

CLOSING STATEMENT

It is important for operators to know the procedures to ensure the preparedness of the powerboat prior to departure to ensure a safe and enjoyable experience.

INSTRUCTOR NOTES / REMARKS

This EO should be taught as two consecutive periods.

REFERENCES

ISBN 0-662-42286-4 Office of Boating Safety. (2006). *Safe boating guide*. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by Transport Canada.

ISBN 0-920232-15-9 Neff, D. (1990). *Basic power boating skills*. Gloucester, ON: Canadian Yachting Association.

Director of Cadets and Junior Canadian Rangers 6. (2014). *SCOP Reference Cards*. Ottawa, ON: Department of National Defence.

PRE-DEPARTURE CHECKLIST		
ITEM	REQUIRED CORRECTION	CORRECT
Inspection of Hull and Fittings		
Hull, Lines and Fenders		
Steering		
Throttle		
Fuel System		
Electrical System (if fitted)		
Bilge Pump (if fitted)		
Inflation of Compartments (if fitted)		
Floorboards (if fitted)		
Cleanliness		
Operating Equipment Stowed		
Heaving Line		
Reboarding Device (if required)		
Propelling Device / Anchor		
Bailer / Water Pump		
Fire Extinguisher (if required)		
Flashlight		
Flares (if required)		
Sound-Signalling Device		
Navigation Lights (if required)		
Radio Check		
Additional Operating Equipment Stowed (for Safety Boat)		
Spare Rescue Assistance Device		
Blankets (2)		
Class C First Aid Kit		
Wire Cutters		
Boathook		
Tow Line (9 m)		
Planning for Departure		
Complete Trip Plan		
Obtain Weather Report		
Give Crew Safety Briefing		
Preparation of Personnel		
Suitable Clothing		
Sunscreen		
Footwear		

Figure A-1 Pre-Departure Checklist

SMALL CRAFT OPERATOR PROGRAM

MODULE 3 – POWER BOAT

INSTRUCTIONAL GUIDE

SECTION 3

EO 003.03 – MANOEUVRE A POWERBOAT

Total Time:	600 min

PREPARATION

PRE-LESSON INSTRUCTIONS

This IG supports EO 003.03 (Manoeuvre a Powerboat).

Photocopy and laminate Annexes A–G for each powerboat. The students can refer to the Annexes while manoeuvring the powerboat.

Gather the required resources:

- Fully equipped powerboat, and
- Ten buoys with lines and weights.

Set up the activities in advance using the diagrams and materials indicated on the Annexes.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TP 1 to introduce the students to manoeuvring theory for a powerboat.

A demonstration and performance was chosen for TPs 2–5 to allow the instructor to demonstrate manoeuvring a powerboat while providing an opportunity for the students to practice these skills under supervision.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the student shall have safely manoeuvred a powerboat.

IMPORTANCE

It is important for students to learn how to manoeuvre a powerboat to ensure the safety of the crew, powerboat and the environment in which they operate.

Teaching Point 1	**Explain manoeuvring theory.**
Time: 15 min	Method: Interactive Lecture

BODY POSITION

While in a powerboat, it is important to maintain a safe body position for the operations being conducted.

The operator is in control of the steering and engine operations and safely seated inside the powerboat on a thwart or console, not on the gunwales. Other crew members are safely seated and ready to assist the operator as requested.

TILT AND TRIM OF ENGINE

Most outboard engines have a mechanism that adjusts the tilt and trim of the drive unit. On some outboard engines the tilt lever is adjusted manually and some are adjusted hydraulically with the use of buttons at the helm.

For optimum performance and steering, the propeller's thrust should be adjusted so that the boat runs at a three- to five-degree angle to the water with the front of the hull just slightly out of the water. This is called trimmed neutral (as illustrated in Figure 1).

Figure 1 Trimmed Neutral

Note. From "Motorboat Operations", *Canadian Safe Boating Course*, Copyright 2007 by Skipper Online Services (SOS) Inc. Retrieved November 17, 2008, from http://www.boaterexam.com/canada/education/c2-motorboatOperation-en.aspx

When the engine is trimmed in (down) the bow is forced into the water (as illustrated in Figure 2). This gives the powerboat more stability in choppy water.

Figure 2 Trimmed In (Down)

Note. From "Motorboat Operations", *Canadian Safe Boating Course*, Copyright 2007 by Skipper Online Services (SOS) Inc. Retrieved November 17, 2008, from http://www.boaterexam.com/canada/education/c2-motorboatOperation-en.aspx

When the engine is trimmed out (up) the bow is forced out of the water (as illustrated in Figure 3). This gives the powerboat a higher top speed and increases clearance in shallow water. However, this position may cause the hull of the powerboat to bounce on the water, which can cause a loss of control.

Figure 3 Trimmed Out (Up)

Note. From "Motorboat Operations", *Canadian Safe Boating Course*, Copyright 2007 by Skipper Online Services (SOS) Inc. Retrieved November 17, 2008, from http://www.boaterexam.com/canada/education/c2-motorboatOperation-en.aspx

TERMS

When operating a powerboat at different speeds, the hull can be in displacement mode, plowing mode or planing mode.

Displacement Mode

When operated at no-wake speeds, the hull of a powerboat cuts through the water (as illustrated in Figure 4).

Figure 4 Hull in Displacement Mode

Note. From "*Know Your Boat - Types of Hulls* " by www.boat-ed.com, 2008, Retrieved November 18, 2008, from http://www.boat-ed.com/ut/course/p1-2_hulltype.htm

Plowing Mode

As speed increases, the bow of the powerboat rises, reducing the operator's view and throwing a large wake (as illustrated in Figure 5). Operators should always consider this when operating the boat in plowing mode.

Figure 5 Hull in Plowing Mode

Note. From "*Know Your Boat - Types of Hulls* " by www.boat-ed.com, 2008, Retrieved November 18, 2008, from http://www.boat-ed.com/ut/course/p1-2_hulltype.htm

Planing Mode

A powerboat is in planing mode when enough power is applied so the hull glides on top of the water (as illustrated in Figure 6). Different powerboats reach planing mode at different speeds.

Figure 6 Hull in Planing Mode

Note. From "*Know Your Boat - Types of Hulls* " by www.boat-ed.com, 2008, Retrieved November 18, 2008, from http://www.boat-ed.com/ut/course/p1-2_hulltype.htm

OPERATING IN DIFFERENT CONDITIONS

Even if the weather has been checked prior to departure and during operations, unexpected conditions may occur. These weather conditions may include:

- heavy winds and rough seas,
- rain, and
- restricted visibility.

Heavy winds and rough seas usually occur together. The worst conditions can be found where the water is shallow; for example, over sand bars and rocky ledges where the rolling mass of water is pushed upward until it breaks (as illustrated in Figure 7). Operators should be aware of these underwater anomalies and take precautions to avoid them.

Safety boat operators must be prepared to make adjustments for heavy wind and waves during training and rescue situations. Operators should approach the crest of the wave

at a 30-degree angle.

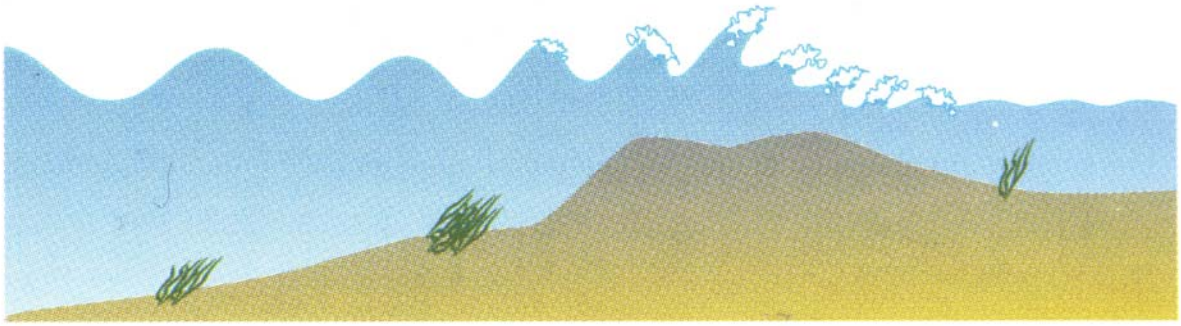


Figure 7 Ground Effects on Waves

Note. From *Introduction to Boat Handling for Sail and Power* (p. 82), by R. Gibson, 2008, Southampton, England: The Royal Yachting Association. Copyright 2006 by The Royal Yachting Association.

Rain is not a large concern to a powerboat operator except for the comfort level of the crew. However, if the intensity of the rain increases, visibility is reduced, making it difficult to see dangers, hazards and points ashore.

Reduced visibility is defined as any condition or combination of conditions that impairs visibility. These conditions can include, but are not limited to, fog, rain and hazy skies.

During conditions of adverse weather, such as high winds or reduced visibility, a powerboat operator should head toward the nearest safe haven.

Safe haven. Any protected anchorage or harbour where the small craft is protected from the effects of weather conditions.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. For optimum performance and steering, how should the propeller's thrust be adjusted?

Q2. What are the three modes a hull can achieve?

Q3. What are three conditions of unexpected weather?

ANTICIPATED ANSWERS:

A1. It should be adjusted so that the boat runs at a three- to five-degree angle to the water with the front of the hull just slightly out of the water.

A2. They are displacement mode, plow mode and planing mode.

A3. Three conditions are:

- heavy winds and rough seas,
- rain, and
- restricted visibility.

Teaching Point 2	**Demonstrate and have the students determine stopping distance.**
Time: 300 min	Method: Demonstration and Performance

When operating at no-wake speed, the throttle is set to slow and the powerboat is in displacement mode.

MANOEUVRING AT NO-WAKE SPEED

Proficient powerboat handling can only be achieved through practice. To become familiar with how a powerboat handles, proceed cautiously while perfecting skills at no-wake speeds and gradually building to faster speeds. Practice should take place in an open area with minimal wind and current.

Moving Forward and Turning

For most novice powerboat operators, the stern swings in the direction opposite of the turn when they pull away from the dock. This usually results in an unexpected bump against the dock. This effect is known as stern swing.

When moving forward, the powerboat's pivot point is approximately one third of the length aft of the bow. For example, when turning to port, the front third of the hull moves to port, and the last two thirds of the hull moves to starboard.

When moving astern, the powerboat's pivot point shifts and is approximately two thirds of the length aft of the bow. For example, when turning to port, the back third of the hull moves to port, and the front two thirds of the hull moves to starboard (as illustrated in Figure 8).

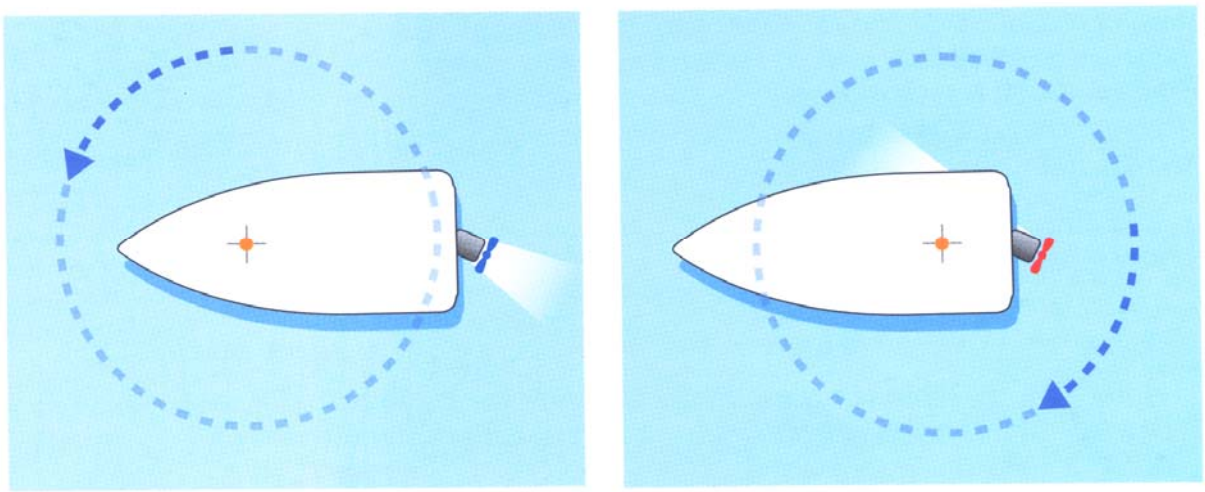


Figure 8 Pivot Points

Note. From *Start Powerboating* (p. 18), by J. Mendez, 2006, Southampton, England: The Royal Yachting Association. Copyright 2006 by The Royal Yachting Association.

Shifting Gears

When shifting gears considerable care must be taken not to damage the clutch. The operator must always pause in NEUTRAL to allow the throttle linkage to bring the engine down to idling speed before shifting to another gear. To move the gearshift from NEUTRAL to ASTERN there is a tendency for the gears to bind. A rapid and deliberate movement of the gearshift overcomes this tendency. Through practice, students will become increasingly familiar and comfortable with shifting gears.

MANOEUVRING AT WAKE SPEED

Moving Forward

When moving forward at wake speed the powerboat is in planing mode and the hull glides on top of the water (as illustrated in Figure 6).

Turning

When turning at wake speed, the powerboat is moving faster and is less balanced because there is very little hull in the water. When making a turn, the hull "digs in" and gives a false sense of stability.

When operating at wake speed, the throttle is set so that the powerboat achieves planing mode.

MANOEUVRING WHILE MOVING ASTERN

There are many forces, including wind and currents, which can manipulate the handling characteristics of a powerboat.

Wind affects the movement of the powerboat because of the forces acting on the part of the hull that is not in the water. The hull of the powerboat acts like a sail when the wind exerts force on it causing the powerboat to drift off course (as illustrated in Figure 9).

Similarly, the forces of the current act on the powerboat's hull that is submerged in the water causing it to drift off course.

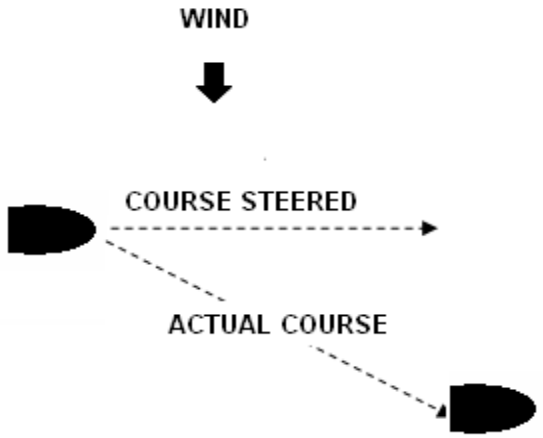


Figure 9 Effects of Wind on a Powerboat

ACTIVITY #1 Moving Forward Course

1. Conduct the briefing for the activity.
2. Demonstrate how to manoeuvre the powerboat through the course.
3. Have each student manoeuvre the powerboat through the course
4. Conduct a debrief.
5. Have the students rotate positions.

ACTIVITY #2 Stopping Course

1. Conduct the briefing for the activity.
2. Demonstrate how to stop the powerboat.
3. Have each student practice stopping the powerboat.
4. Conduct a debrief.
5. Have the students rotate through positions.

ACTIVITY #3 Close Quarters Turning Course

1. Conduct the briefing for the activity.
2. Demonstrate how to manoeuvre the powerboat in close quarters.
3. Have each student manoeuvre the powerboat in close quarters.
4. Conduct a debrief.

5. Have the students rotate through positions.

This activity may be modified by challenging the students to continue in circles and make the smallest turning circle possible.

ACTIVITY #4 Moving Astern Course

1. Conduct the briefing for the activity.
2. Demonstrate how to manoeuvre the powerboat astern.
3. Have each student manoeuvre the powerboat astern through the course.
4. Conduct a debrief.
5. Have the students rotate through positions.

DEPARTING A DOCK

Leaving a dock is a simple manoeuvre. If the route is clear and there is no wind or current, then a push off the dock with a boathook works. A larger powerboat has to power away from the dock.

Departing in reverse is usually the best method to leave a dock because of the increased manoeuvrability. Use the following steps when leaving a dock in reverse (as illustrated in Figure 10):

1. Steer away from the dock.
2. Engage ASTERN.
3. As the stern starts to move away from the dock, straighten the helm.
4. Once well clear, drive away going ahead.

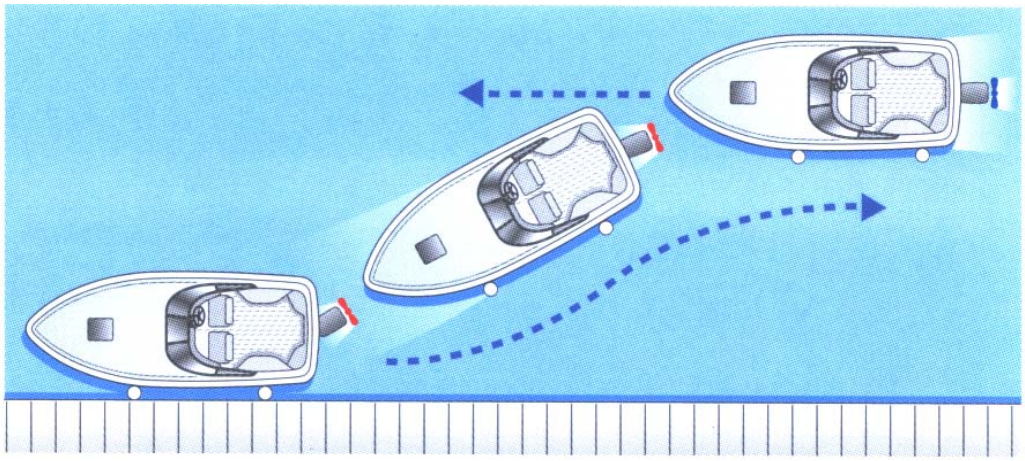


Figure 10 Leaving a Dock

Note. From *Powerboat Handbook* (p. 43), by P. Glatzel, 2005, Southampton, England: The Royal Yachting Association. Copyright 2005 by The Royal Yachting Association.

Moving away forward on any powerboat can kick the stern into the dock.

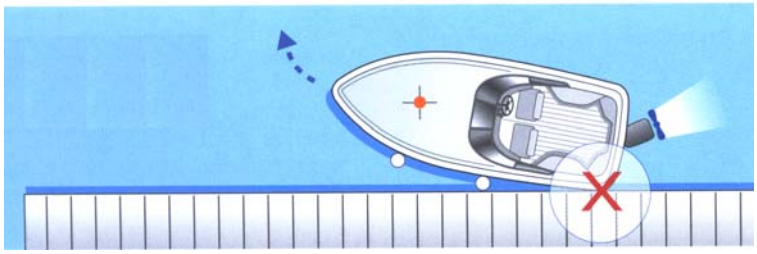


Figure 11 Improper Departure

Note. From *Powerboat Handbook* (p. 44), by P. Glatzel, 2005, Southampton, England: The Royal Yachting Association.

RETURNING TO A DOCK

Tight manoeuvring between docks and other boats can be easier and less stressful with planning and preparation, taking into account how the wind and current affects the powerboat. Before approaching a dock:

- Consider the direction of the wind and current. How do they affect the approach? Approaching into the wind or current acts as a brake. Ideally, approach into the one with the greatest effect on the powerboat's helm.
- Brief the crew so they know what to expect.
- Prepare the fenders and lines.
- Plan an escape route or second option in case something goes wrong.

The goal is to have the students dock the powerboat in one continuous movement, however the process is divided into smaller steps to make it easier to learn.

Steps for Returning to a Dock With Little or no Wind

1. Start the approach as far off the dock as practicable. The angle of approach should be approximately 45 degrees. Keep the speed to a minimum by using NEUTRAL on the approach.
2. When close to the dock, steer away from the dock and engage the forward gear momentarily to bring the powerboat parallel to the dock. Ideally the powerboat should glide to a stop alongside the dock. Be prepared to go astern to stop the momentum.

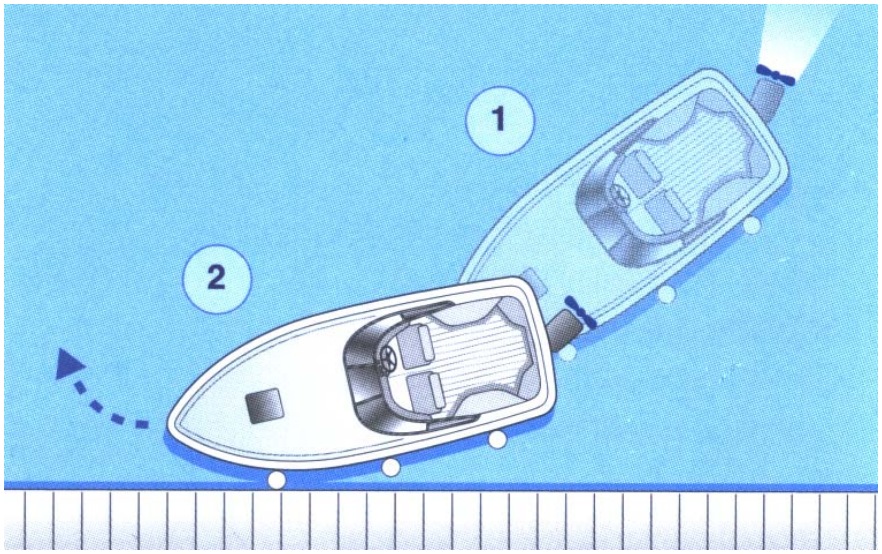


Figure 12 Returning to a Dock Steps 1 and 2

Note. From *Powerboat Handbook* (p. 45), by P. Glatzel, 2005, Southampton, England: The Royal Yachting Association. Copyright 2005 by The Royal Yachting Association.

3. As an alternative, slow the powerboat and draw the stern in by turning the wheel toward the dock and applying astern momentarily (as illustrated in Figure 1).

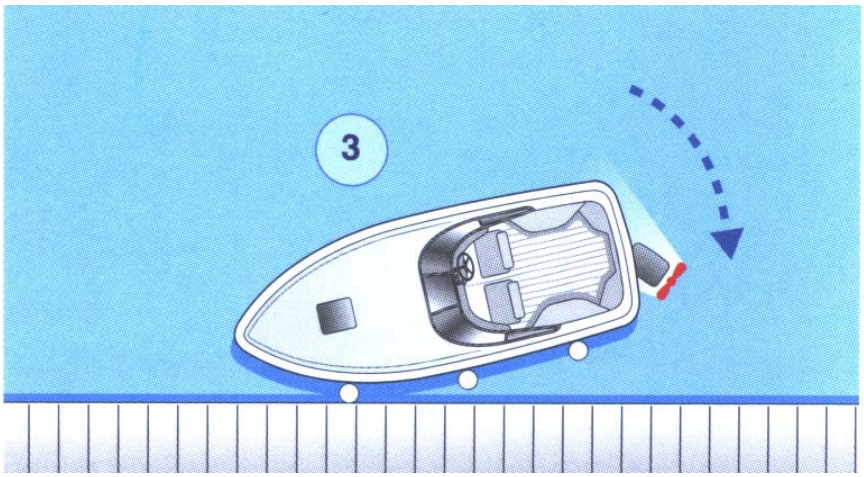


Figure 13 Returning to a Dock Step 3

Note. From *Powerboat Handbook* (p. 45), by P. Glatzel, 2005, Southampton, England: The Royal Yachting Association. Copyright 2005 by The Royal Yachting Association.

ACTIVITY #5 Safe Departure Course

1. Conduct the briefing for the activity.
2. Demonstrate how to leave and return to a dock.
3. Have each student leave and return to a dock.
4. Conduct a debrief.
5. Have the students rotate through positions.

The following information on line assisted departures is provided in case this type of departure is required based on local circumstances or on the experience of the students.

BACKGROUND KNOWLEDGE

LINE ASSISTED DEPARTURES

If the wind is pushing the powerboat onto the dock, or if the berth is restricted, powering against a line can allow the stern to get into clear water.

Reversing on a Bowline

Use the following steps when leaving a dock using the reversing on the bowline method (as illustrated in Figure 14):

1. Rig a bowline to slip.
2. Fender the bow well.
3. Steer away from the dock.
4. Engage ASTERN.
5. When the stern starts to pivot away from the dock into clear water, engage NEUTRAL.
6. Slip the bowline and reverse away.

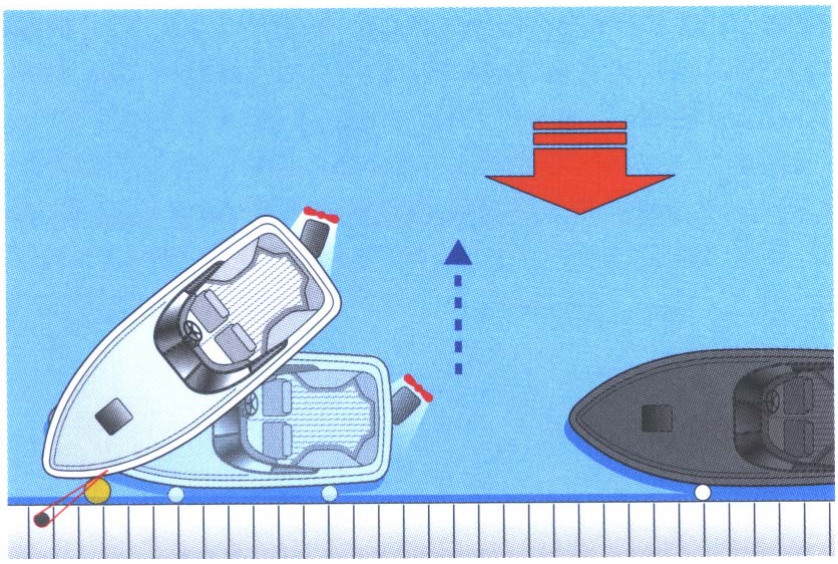


Figure 14 Reversing on a Bowline

Note. From *Powerboat Handbook* (p. 44), by P. Glatzel, 2005, Southampton, England: The Royal Yachting Association. Copyright 2005 by The Royal Yachting Association.

Forward Spring Line

Use the following steps when using the forward spring line method (as illustrated in Figure 15):

1. Rig a forward spring line and fender in the bow area.

2. Steer toward the dock.
3. Power forward to bring the bow into the dock and the stern away from the dock.
4. Engage NEUTRAL.
5. Slip the forward spring line and reverse away.

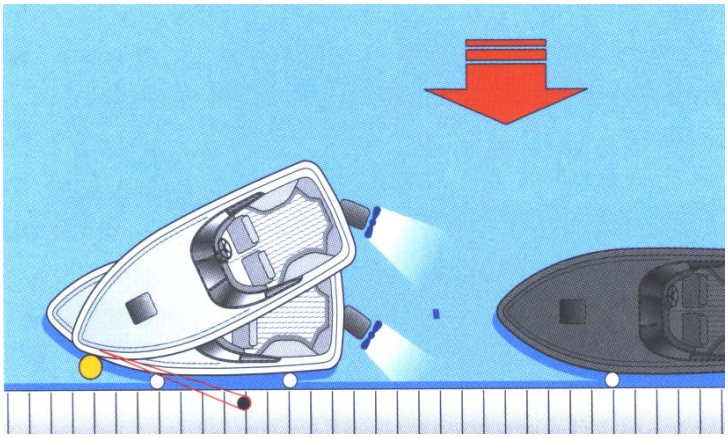


Figure 15 Forward Spring Line

Note. From *Powerboat Handbook* (p. 44), by P. Glatzel, 2005, Southampton, England: The Royal Yachting Association. Copyright 2005 by The Royal Yachting Association.

Steps for Returning to a Dock With Wind

Just as lines are used to help leave a dock, they also can be used to help get the powerboat alongside a dock. When the wind is blowing the powerboat away from the dock:

1. Attach a bowline to a cleat on the dock; if required, lasso the cleat using a similar method.

2. Turn the engine toward the dock. Alternate between NEUTRAL and ASTERN (as illustrated in Figure 16).

3. As the powerboat moves slowly alongside, attach a stern line and secure the powerboat.

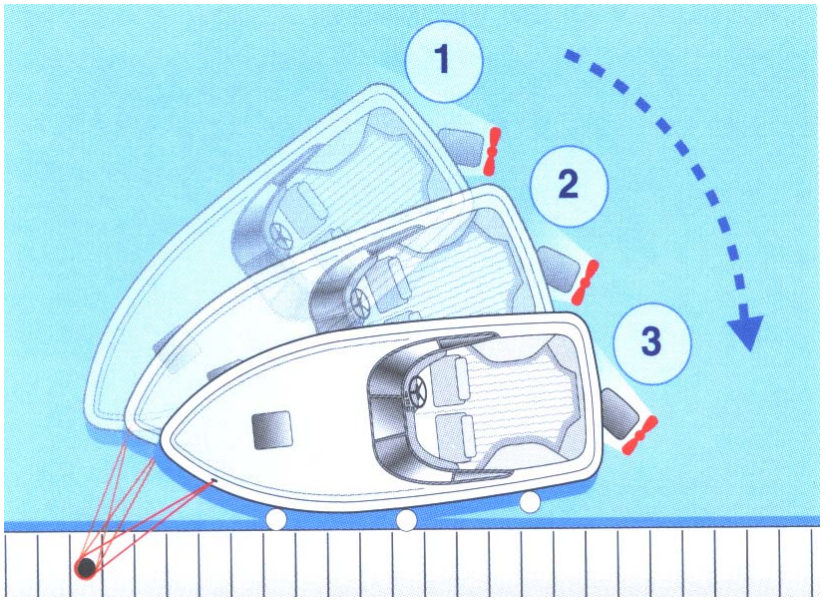


Figure 16 Returning to a Dock With Wind

Note. From *Powerboat Handbook* (p. 46), by P. Glatzel, 2005, Southampton, England: The Royal Yachting Association. Copyright 2005 by The Royal Yachting Association.

Returning to a Dock in a Marina

Coming into a marina dock requires extra care because there are other boats moored and moving around.

Figure 17 illustrates various methods of returning to a dock in a marina setting.

Methods of returning to a dock in a marina include:

- Approach into the wind. This naturally slows the powerboat. The momentum of the boat helps it slide sideways alongside the dock (as illustrated in Example A of Figure 17).
- Slide the boat away from the dock using the turning momentum (as illustrated in Example B of Figure 17).
- As the stern aligns with the wind in astern, reverse the boat (as illustrated in Example C of Figure 17).
- Let the wind push the powerboat into the dock. Use caution and do not overshoot. Engage engines astern early (as illustrated in Example D of Figure 17).

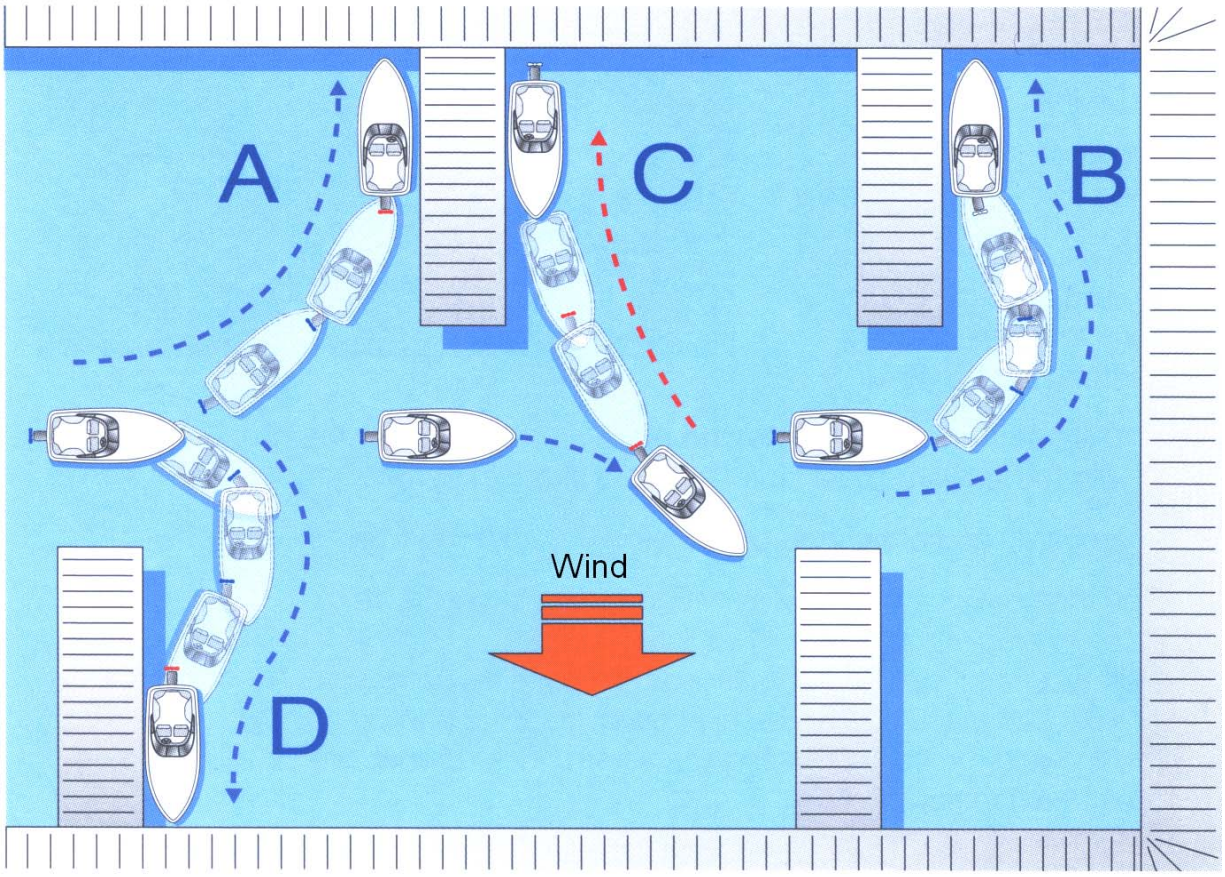


Figure 17 Returning to a Dock in a Marina

Note. From *Powerboat Handbook* (p. 47), by P. Glatzel, 2005, Southampton, England: The Royal Yachting Association. Copyright 2005 by The Royal Yachting Association.

Docking in Wind and Current

It is possible to drift the powerboat sideways by steering into the elements using gentle throttle control and turning the powerboat slightly so the wind or current is pushing on one side of the bow. This enables the powerboat to "crab" sideways in that direction. This is called ferrying and it can be used to come alongside docks or other boats in a slow and controlled manner (as illustrated in Figure 18).

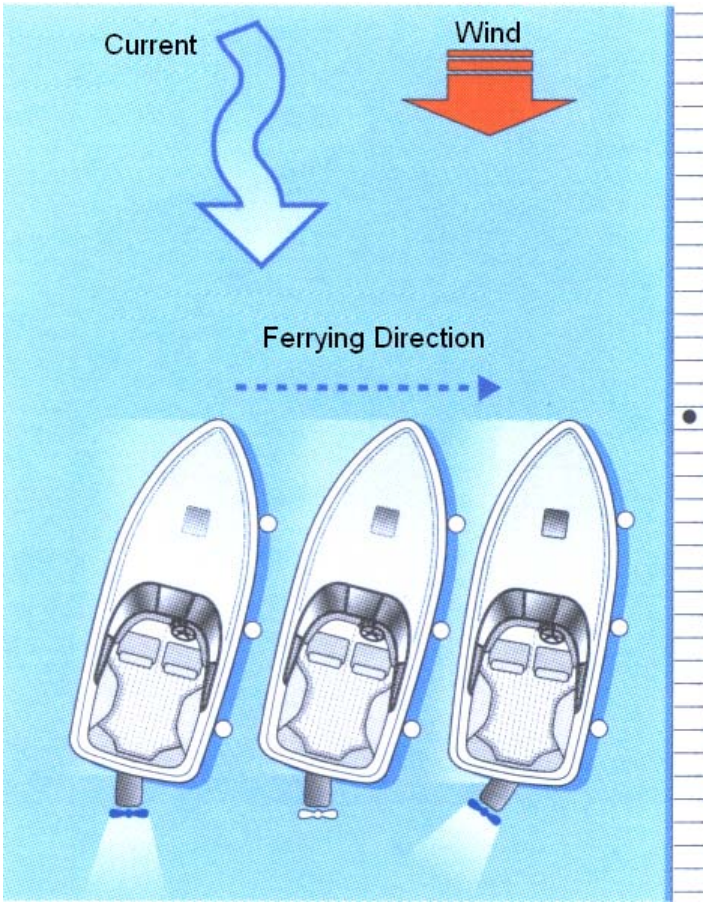


Figure 18 Ferrying a Powerboat

Note. From *Powerboat Handbook* (p. 47), by P. Glatzel, 2005, Southampton, England: The Royal Yachting Association. Copyright 2005 by The Royal Yachting Association.

Teaching Point 3	**Demonstrate and have the students come alongside another vessel.**
Time: 55 min	Method: Demonstration and Performance

It is very important to communicate intentions to come alongside so the other vessel does not start moving or turn into your course. To come alongside, the best approach is the off dock wind approach which provides better control of the powerboat (as illustrated in Figure 19). This approach is used because the wind or current may change the aspect of the vessel being approached. The angle of approach can be altered as required to come alongside.

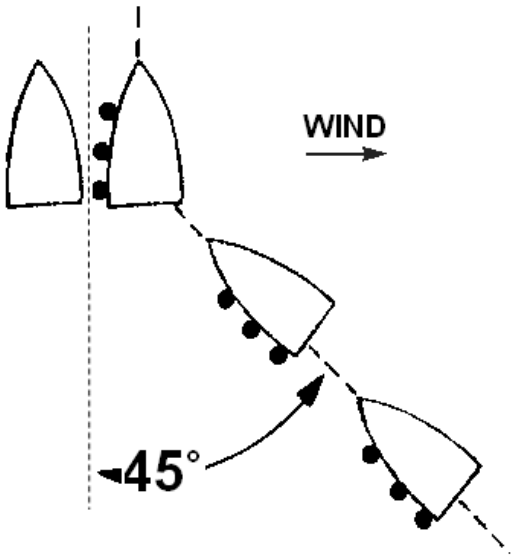


Figure 19 Coming Alongside Another Vessel

ACTIVITY #6 Coming Alongside

1. Conduct the briefing for the activity.
2. Demonstrate how to come alongside another vessel.
3. Have each come alongside another vessel.
4. Conduct a debrief.
5. Have the students rotate through positions.

CONFIRMATION OF TEACHING POINT 3

The students' coming alongside another vessel will serve as the confirmation of this TP.

Teaching Point 4	**Demonstrate and have the students tow another vessel using a bridle.**
Time: 60 min	Method: Demonstration and Performance

When towing astern, a bridle should be used to position the tow line directly behind the powerboat (as illustrated in Figure 20). Care must be taken to ensure the tow line does not get fouled in the propeller when passing the tow line to the other vessel and during the tow.

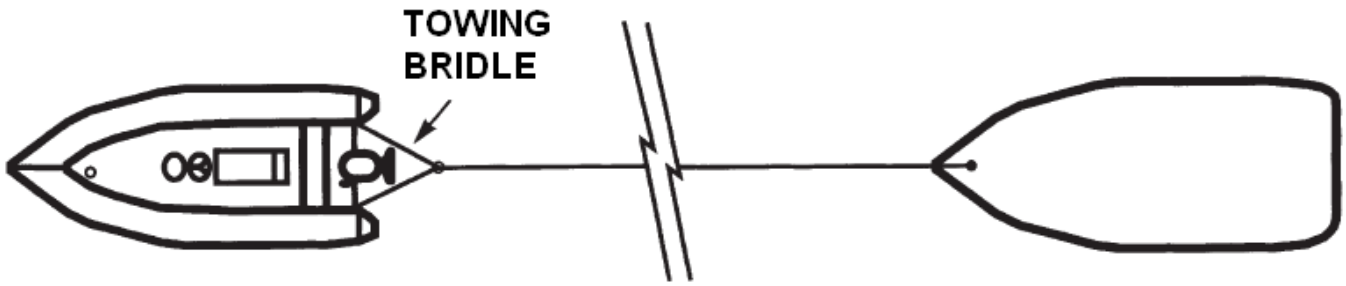


Figure 20 Towing a Vessel Astern

Note. From *Canadian Forces CFCD 105, Seamanship Rigging and Procedures Manual* (p. 11-25), by Chief of Maritime Staff, 1997, Ottawa, ON: Department of National Defence. Copyright 1995 by HMSO Publications.

If towing in waves, the tow line should be the same length as the distance between the waves so that both boats ride up and down the waves at the same time (as illustrated in Figure 21).

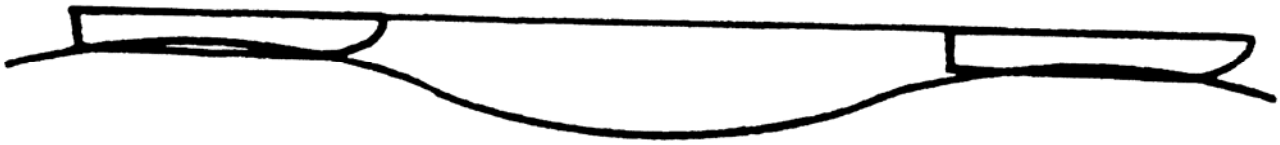


Figure 21 Tow Line Lengths

Note. From *Basic Powerboating Skills* (p. 73), by D. Neff, 1945, Gloucester, ON: Copyright 1990 by Canadian Yachting Association.

ACTIVITY #7 Towing Course

1. Conduct the briefing for the activity.
2. Demonstrate how tow another vessel using a bridle.
3. Have each student tow another vessel using a bridle.
4. Conduct a debrief.
5. Have the students rotate through positions.

CONFIRMATION OF TEACHING POINT 4

The students' towing another vessel using a bridle will serve as the confirmation of this TP.

Teaching Point 5 **Demonstrate and have the students recover a man overboard.**

Time: 60 min Method: Demonstration and Performance

RECOVERING A MAN OVERBOARD (MOB)

Upon hearing the MAN OVERBOARD call:

1. Appoint one crew member to keep sight on the MOB.

2. Have a crew member throw a buoyant object to assist the MOB and to mark the location.

3. Turn the powerboat towards the same side the MOB falls over from so that the engine does not swing into the MOB.

4. Position the powerboat directly downwind of the MOB.

5. Approach to the leeward of the MOB using the throttle to hold the powerboat’s position.

6. Once alongside the MOB, stop the engines and have crew recover the MOB on the windward side of the vessel, using an assist.

7. Have the crew yell ‘made’ when they have contact with the MOB.

8. If the MOB is missed on the first approach, circle around again keeping the MOB on the inside of the circle and keeping the propeller away from the MOB (as illustrated in Figure 22).

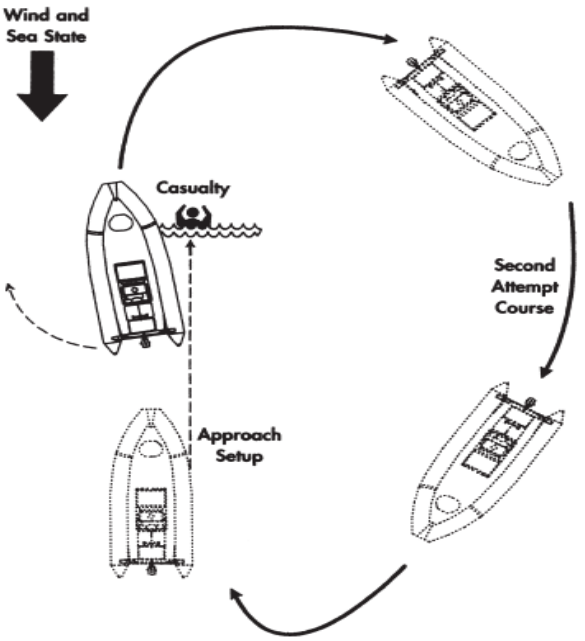


Figure 22 Recovering a MOB

Note. From *Canadian Forces CFCD 105, Seamanship Rigging and Procedures Manual* (p. 11-18), by Chief of Maritime Staff, 1997, Ottawa, ON: Department of National Defence. Copyright 1995 by HMSO Publications.

ACTIVITY #8 Man Overboard

Ensure students are using a PFD or kisbie ring as opposed to a real person for the MOB.

1. Conduct the briefing for the activity.
2. Demonstrate how to recover a MOB.
3. Have each student recover a MOB.
4. Conduct a debrief.
5. Have the students rotate through positions.

CONFIRMATION OF TEACHING POINT 5

The students' manoeuvring a powerboat while recovering a MOB will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The students' manoeuvring a powerboat will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW Chapter 3.

CLOSING STATEMENT

Manoeuvring a powerboat safely ensures the safety of the crew, the vessel and the environment in which you operate.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

B-GN-181-105/FP-E00 Chief of Maritime Staff. (1997). *CFCD 105 fleet seamanship rigging and procedures manual*. Ottawa, ON: Department of National Defence.

ISBN 0-920232-15-9 Neff, D. (1990). *Basic power boating skills*. Gloucester, ON: Canadian Yachting Association.

ISBN 0-901501-99-9 Glatzel, P. (2005). *Powerboat handbook*. Southampton, England: The Royal Yachting Association.

Director of Cadets and Junior Canadian Rangers 6. (2014). *SCOP reference cards*. Ottawa, ON: Department of National Defence.

MOVING FORWARD AT NO-WAKE AND WAKE SPEED COURSE

Objective: To become familiar with the handling characteristics of a powerboat while manoeuvring forward at no-wake speed and wake speeds.

Complete the following manoeuvres:

1. Start with the marker to the starboard side and the wind from astern.
2. Complete three figure-eight circuits of the course.
3. Upon completion of the third figure eight, exit with the wind ahead and the marker buoy on the starboard side.
4. Return to the start position.

Key Points:

As the powerboat manoeuvres at no-wake and wake speeds, focus on the following:

- **Crew control.** Explain to the crew their actions and the manoeuvre to be attempted.
- **Powerboat control.** Apply both throttle and gear selection for the selected technique, keeping one hand on the tiller or wheel and the other hand on the throttle / gear selector if fitted. Be aware of wind and wave action during turns.
- **Situational awareness.** Be aware of the surroundings and operate according to the conditions and the limitations of the area. Complete shoulder checks and communicate with the crew.

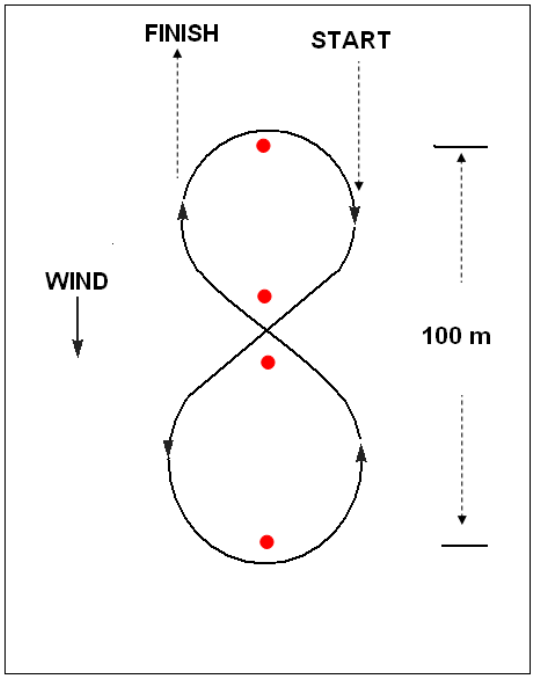


Figure A-1 No-Wake and Wake Speed Course

STOPPING DISTANCE COURSE

Objective: To become familiar with the handling characteristics of a powerboat while approaching and stopping on a stationary object.

Complete the following manoeuvres:

1. Proceed from the Start line toward the Finish line in a forward direction.
2. Cut the engine and use nature's forces to stop at the Finish line with the bow no more than a boat length from the buoy.
3. Return to the Start line.

Key Points:

As the powerboat manoeuvres to a stop, focus on the following:

- **Crew control.** Explain to the crew their actions and the manoeuvre to be attempted.
- **Powerboat control.** Apply both throttle and gear selection for the selected technique, keeping one hand on the tiller or wheel and the other hand on the throttle / gear selector if fitted.
- **Situational awareness.** Be aware of the surroundings and operate according to the conditions and the limitations of the area. Complete shoulder checks and communicate with the crew.

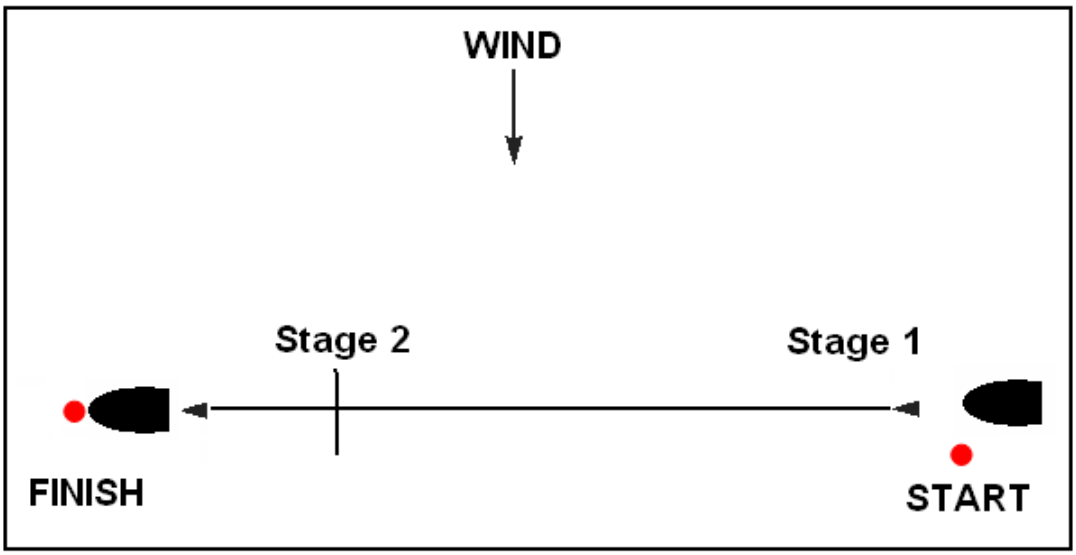


Figure B-1 Stopping Course
Buoys are 50 m apart.

CLOSE QUARTERS COURSE

Objective: To become familiar with the handling characteristics of a powerboat in close quarters.

Complete the following manoeuvres:

1. Proceed in a forward direction.
2. Turn hard to starboard.
3. Once the powerboat has turned 90 degrees from the original course, put the engine into reverse.
4. Proceed astern until the powerboat is 180 degrees from its original course.
5. Put the engine ahead and proceed on the new course.

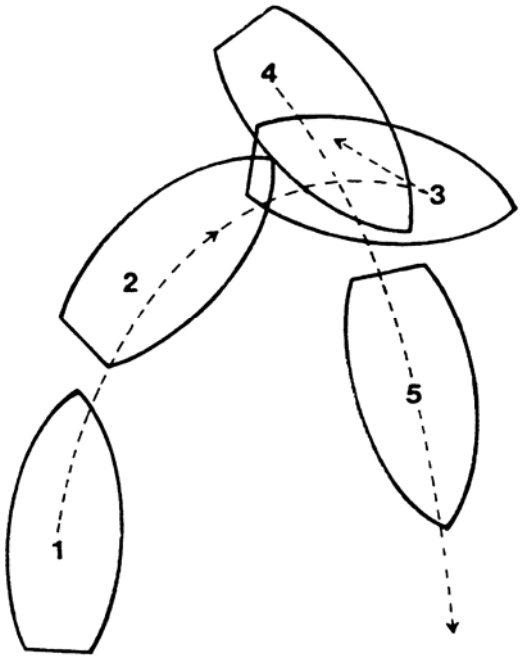


Figure C-1 Close Quarters Turning

Note. From *Basic Powerboating Skills* (p. 157), by D. Neff, 1945, Gloucester, ON: Copyright 1990 by Canadian Yachting Association.

MANOEUVRING ASTERN COURSE

Objective: To become familiar with the handling characteristics of a powerboat while manoeuvring astern.

Complete the following manoeuvres:

1. Manoeuvre the powerboat astern with the wind blowing on the beam of the powerboat.
2. Manoeuvre the powerboat astern with the wind blowing over the bow of the powerboat.
3. Manoeuvre the powerboat astern with the wind blowing on the beam of the powerboat over 16 metres.

Key Points:

As the powerboat manoeuvres astern, focus on the following:

- **Crew control.** Explain to the crew their actions and the manoeuvre to be attempted.
- **Powerboat control.** Apply both throttle and gear selection for the selected technique, keeping one hand on the tiller or wheel and the other hand on the throttle / gear selector if fitted.
- **Situational awareness.** Be aware of the surroundings and operate according to the conditions and the limitations of the area. Complete shoulder checks and communicate with the crew.

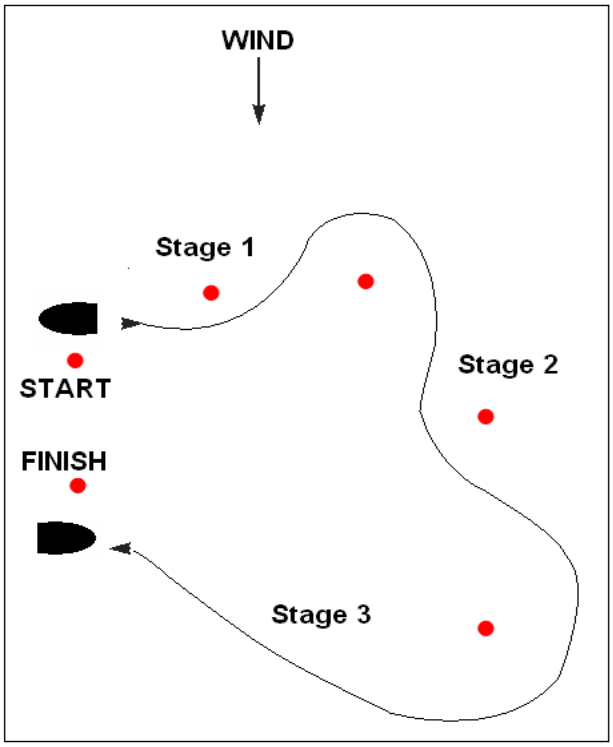


Figure D-1 Manoeuvring Astern Course

SAFE DEPARTURE COURSE

Objective: The objective of this activity is to have students practice leaving and returning to a dock.

Complete the following manoeuvres:

1. Manoeuvre the powerboat away from the jetty and into the square
2. Manoeuvre the powerboat out of the square and return to the dock.

Key Points:

As the powerboat manoeuvres to and from the jetty, focus on the following:

- **Crew control.** Explain to the crew their actions and the manoeuvre to be attempted.
- **Powerboat control.** Apply both throttle and gear selection for the selected technique, keeping one hand on the tiller or wheel and the other hand on the throttle / gear selector if fitted.
- **Situational awareness.** Be aware of the surroundings and operate according to the conditions and the limitations of the area. Complete shoulder checks and communicate with the crew.

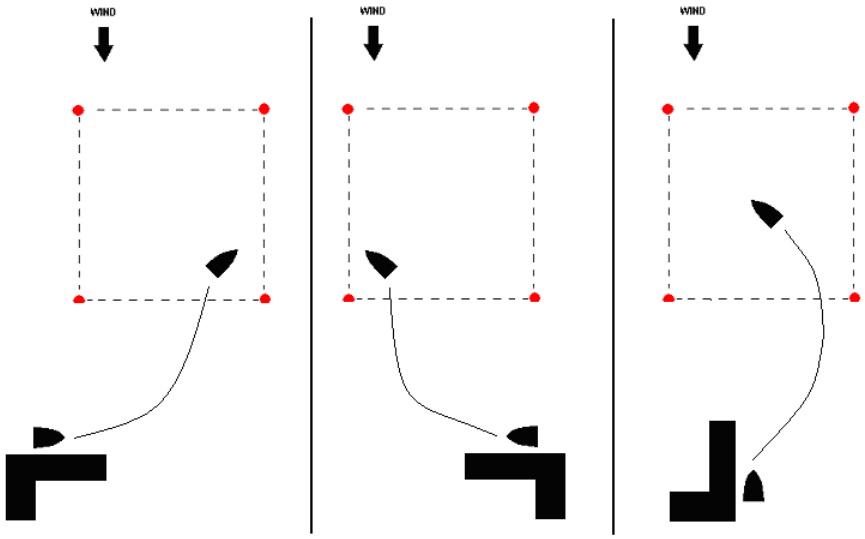


Figure E-1 A Safe Departure

COMING ALONGSIDE ANOTHER VESSEL

Objective: To become familiar with the handling characteristics of a powerboat while coming alongside another vessel.

1. Manoeuvre your powerboat to come alongside another powerboat.
2. Rotate and repeat Step 1.

Key Points:

As the powerboat manoeuvres come alongside another vessel, focus on the following:

- **Crew control.** Explain to the crew their actions and the manoeuvre to be attempted.
- **Powerboat control.** Apply both throttle and gear selection for the selected technique, keeping one hand on the tiller or wheel and the other hand on the throttle / gear selector if fitted.
- **Situational awareness.** Be aware of the surroundings and operate according to the conditions and the limitations of the area. Complete shoulder checks and communicate with the crew.

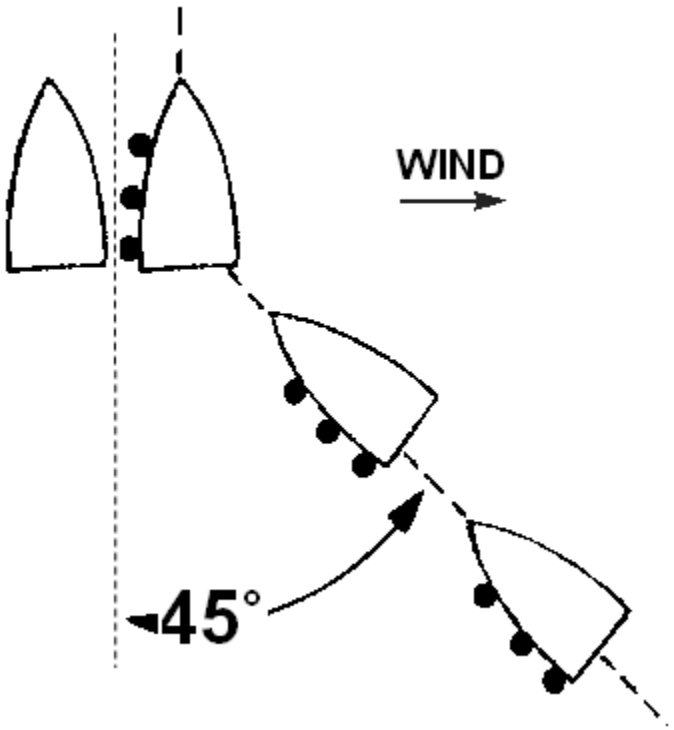


Figure F-1 Coming Alongside Another Vessel

TOWING COURSE

Objective: To become familiar with the handling characteristics of a powerboat while towing another vessel using a bridle.

1. Starting at Point A tow Powerboat B.
2. Proceed around Point B and back to Point A.
3. Upon completion, rotate and repeat Steps 1-3.

Key Points:

As the powerboat manoeuvres to tow another vessel and from the jetty, focus on the following:

- **Crew control.** Explain to the crew their actions and the manoeuvre to be attempted.
- **Powerboat control.** Apply both throttle and gear selection for the selected technique, keeping one hand on the tiller or wheel and the other hand on the throttle / gear selector if fitted.
- **Situational awareness.** Be aware of the surroundings and operate according to the conditions and the limitations of the area. Complete shoulder checks and communicate with the crew.

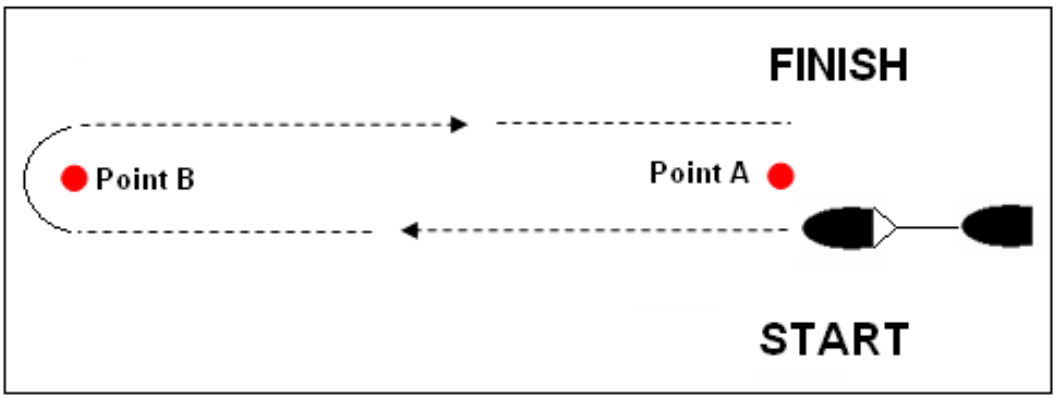


Figure G-1 Towing Activity

RECOVER A MAN OVERBOARD (MOB)

Objective: To become familiar with the handling characteristics of a powerboat while recovering a man overboard.

Upon hearing the MAN OVERBOARD:

1. Appoint one crew member to keep sight on the MOB.
2. Have a crew member throw a buoyant object to assist the MOB and to mark the location.
3. Turn the powerboat towards the same side the MOB falls over from so that the engine does not swing into the MOB.
4. Position the powerboat directly downwind of the MOB.
5. Approach to the leeward of the MOB using the throttle to hold the powerboat's position.
6. Have the crew recover the MOB on the windward side of the vessel, using an assist.
7. Have the crew yell 'made' when they have contact with the MOB.
8. Once alongside the MOB, stop the engines and have crew recover the MOB.
9. If the MOB is missed on the first approach, circle around again keeping the MOB on the inside of the circle and keeping the propeller away from the MOB.

Key Points:

As the powerboat manoeuvres to recover a MOB, focus on the following:

- **Crew control.** Explain to the crew their actions and the manoeuvre to be attempted.

- **Powerboat control.** Apply both throttle and gear selection for the selected technique, keeping one hand on the tiller or wheel and the other hand on the throttle / gear selector if fitted.

- **Situational awareness.** Be aware of the surroundings and operate according to the conditions and the limitations of the area. Complete shoulder checks and communicate with the crew.

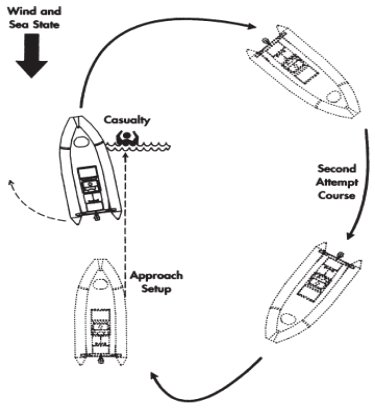


Figure H-1 Recovering a Man Overboard

Note. From *Canadian Forces CFCD 105, Seamanship Rigging and Procedures Manual* (p. 11-18), by Chief of Maritime Staff, 1997, Ottawa, ON: Department of National Defence. Copyright 1995 by HMSO Publications.

SMALL CRAFT OPERATOR PROGRAM

MODULE 3 – POWERBOAT

INSTRUCTIONAL GUIDE

SECTION 4

EO 003.04 – SECURE A POWERBOAT

Total Time:	240 min

PREPARATION

PRE-LESSON INSTRUCTIONS

This IG supports EO 003.04 (Secure a Powerboat).

Photocopy the Anchors handout, located at Annex A, for each student.

TPs 1–3 are intended to reinforce the requirements for local conditions and the existing skill set of the students.

Time for TP 6 must stay within the allocation; however the instructor has the flexibility of reviewing manoeuvres based on local conditions and the skill set of the students.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TPs 1–3 to introduce the students to the procedures for mooring, beaching and anchoring a powerboat.

A demonstration and performance was chosen for TPs 4 and 5 to allow the instructor to demonstrate securing to a dock and de-rigging a powerboat while providing an opportunity for the students to practice these skills under supervision.

A practical activity was chosen for TP 6 as it is an interactive way to allow students to practice manoeuvring a powerboat in a safe, controlled environment.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the student shall have explained how to secure a powerboat by mooring, anchoring or beaching and securing a powerboat to a dock and de-rigging a powerboat.

IMPORTANCE

It is important for students to learn how to secure a powerboat because as a powerboat operator they will have to complete this task many times in various conditions. A properly secured powerboat will not be damaged in poor weather conditions and can quickly be un-secured in urgent situations. When the powerboat is secured properly it ensures the safety of the equipment, operator and crew.

Teaching Point 1 **Explain the procedures for mooring a powerboat.**

Time: 10 min Method: Interactive Lecture

Although there are a number of mooring techniques, for the purpose of this lesson, mooring is limited to securing a powerboat to a single floating mooring buoy.

MOORING BUOYS

Mooring buoys are provided by harbour authorities and yacht clubs. There are two types of moorings buoys, temporary and permanent. There is no standard shape, size or description. Some have visible Annex points where others have picking up buoys with Annex lines.

A picking up buoy is a smaller buoy attached to the mooring buoy which holds a mooring line (as illustrated in Figure 1) that is attached to the powerboat.

Temporary moorings are usually seasonal and are held in place with anchors or weights and do not have a fixed position on a chart. They are best suited for smaller powerboats and sailboats and are placed in areas where there is little effect from tide and weather.

Permanent moorings are usually held in place with large concrete blocks and can often be located on a chart. Permanent moorings are generally larger and may also have a picking up buoy attached. Permanent moorings are designed for larger powerboats, sailboats and other large vessels. Due to their size and substantial anchor systems, they resist the stresses from the weight of the attached vessel, changing states of weather and the effects of tides.

A powerboat should never be moored directly to the picking up buoy.

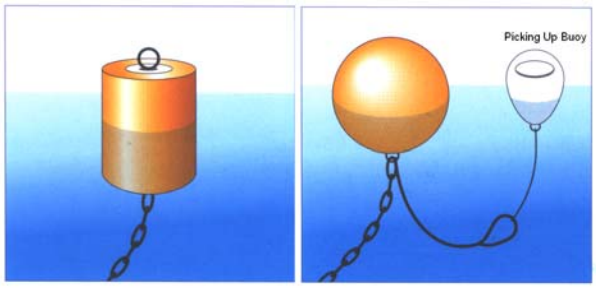


Figure 1 Typical Mooring Buoys

Note. From *Powerboat Handbook* (p. 51), by P. Glatzel, 2005, Southampton, England: The Royal Yachting Association. Copyright 2005 by The Royal Yachting Association.

CONSIDERATIONS BEFORE PICKING A MOORING

Considerations before picking a mooring:

- Check that there is sufficient depth for the duration of stay.
- Ensure the location provides shelter from the present and forecasted wind.
- Sailboats and powerboats float in different directions due to the effects of wind and stream. Sailing yachts have a keel under the water; therefore their position is affected more by the current. Powerboats have little grip on the water and tend to position with the direction of the wind.
- Pick up buoys float downstream and are a good indication of stream direction and current.

APPROACHING A MOORING BUOY

When approaching a mooring buoy, the main consideration is the effect of wind and current. A mooring buoy should always be approached with the head of the boat into the current (as illustrated in Figure 2). To compensate for the wind, use additional steerage or engine thrust to keep the powerboat headed upstream and in the proper position.

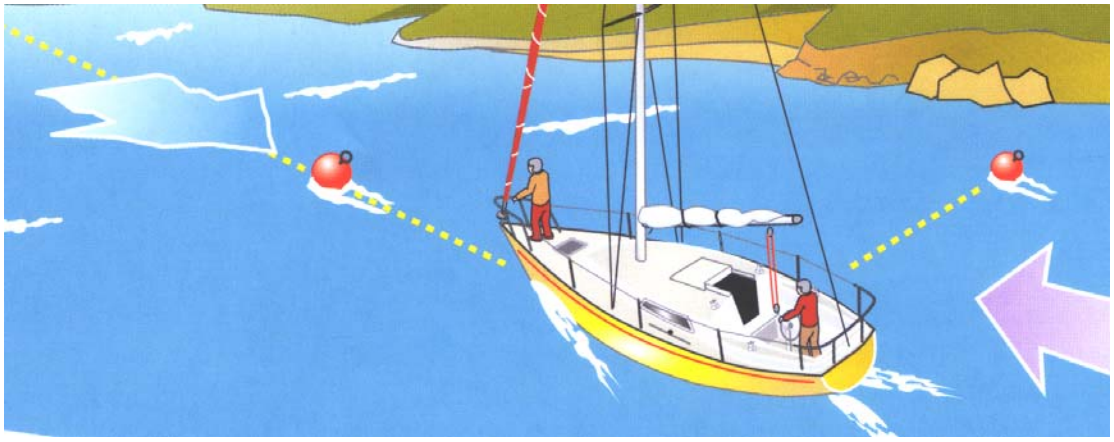


Figure 2 Approaching a Mooring Buoy

Note. From *Introduction to Boat Handling for Sail and Power* (p. 20), by R. Gibson, 2008, Southampton, England: The Royal Yachting Association. Copyright 2008 by The Royal Yachting Association.

When there is crew in the powerboat, communicate well in advance of the approach to the mooring and explain what actions the crew are expected to take. The crew should be prepared to take the following actions:

- position themselves on the foredeck with a boathook ready;
- point at the buoy with the boathook to aid in directing;
- call out the distances to the buoy;
- once the powerboat is stopped, hook the picking up buoy line with the boathook and bring it aboard (as illustrated in Figure 3); and
- secure the mooring line inboard to a cleat.

The powerboat operator may decide not to secure the mooring line inboard to a cleat due to the amount of marine growth that may be present on the mooring line. In this case, use the bow line of the powerboat and secure it to the mooring line.

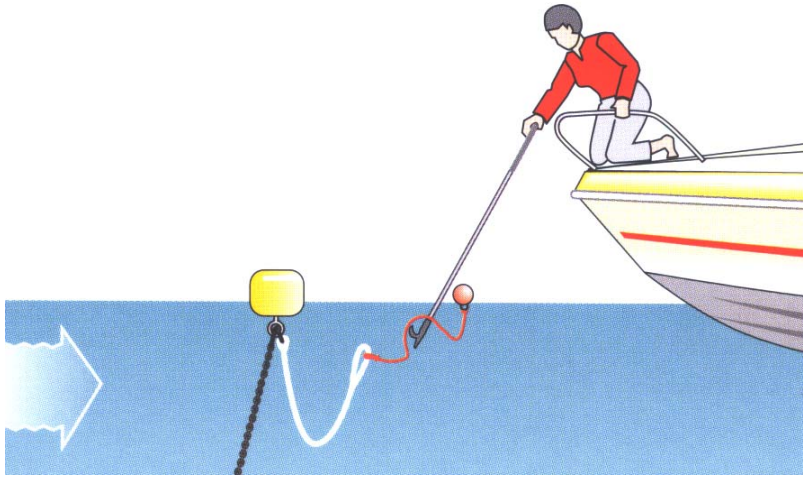


Figure 3 Bring the Picking Up Buoy Line Aboard

Note. From *Introduction to Boat Handling for Sail and Power* (p. 20), by R. Gibson, 2008, Southampton, England: The Royal Yachting Association. Copyright 2008 by The Royal Yachting Association.

APPROACHING A MOORING BUOY WITHOUT A PICKING UP BUOY

When approaching a mooring buoy without a picking up buoy, take the same actions as if there was one, however, use the lines on the powerboat to secure to the mooring buoy. Consider if the crew should use a boathook. In strong winds and current, it becomes difficult to control the boathook safely and secure the powerboat at the same time.

An alternative method of capturing the mooring is using the lasso method (as illustrated in Figure 4). This method allows the crew to use both hands to secure the powerboat without the risk of losing the boathook or being pulled overboard due to strong winds or currents.

When using the lasso method, never use a line with a bowline or other similar knot in it as the lasso and cast it "rodeo style" as the line may get tangled in the mooring chain or other fittings below the surface.

When using the lasso method, have the crew prepare by:

- having a long line available to use;
- securing both ends inboard to cleats; and
- coiling the large bight of line in both hands, ready to heave it over the mooring buoy.

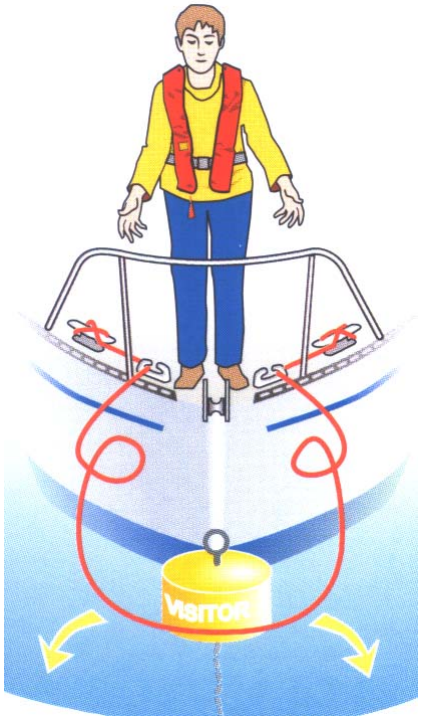


Figure 4 Capturing a Mooring Using the Lasso Method

Note. From *Introduction to Boat Handling for Sail and Power* (p. 20), by R. Gibson, 2008, Southampton, England: The Royal Yachting Association. Copyright 2008 by The Royal Yachting Association.

SECURING TO A MOORING BUOY WITHOUT A PICKING UP BUOY

As there is no picking up line on this type of buoy, the bow line of the powerboat is used as a mooring line. To properly secure to this type of mooring buoy, feed the bow line from the powerboat, around the mooring buoy ring and secure it back to a cleat inboard of the powerboat.

To prevent additional wear on the bow line, put a round turn on the mooring buoy ring (as illustrated in Figure 5). Keep lines equal in length.

Figure 5 Securing to a Mooring Buoy

Note. From *Introduction to Boat Handling for Sail and Power* (p. 22), by R. Gibson, 2008, Southampton, England: The Royal Yachting Association. Copyright 2008 by The Royal Yachting Association.

When required to stay for longer periods, the mooring line can be doubled up by employing a secondary mooring line that is loosely fitted to the ring and secured inboard of the powerboat (as illustrated in Figure 6). This secondary line provides a backup should the main mooring line fail due to excessive wear caused by rough water or high wind speeds.

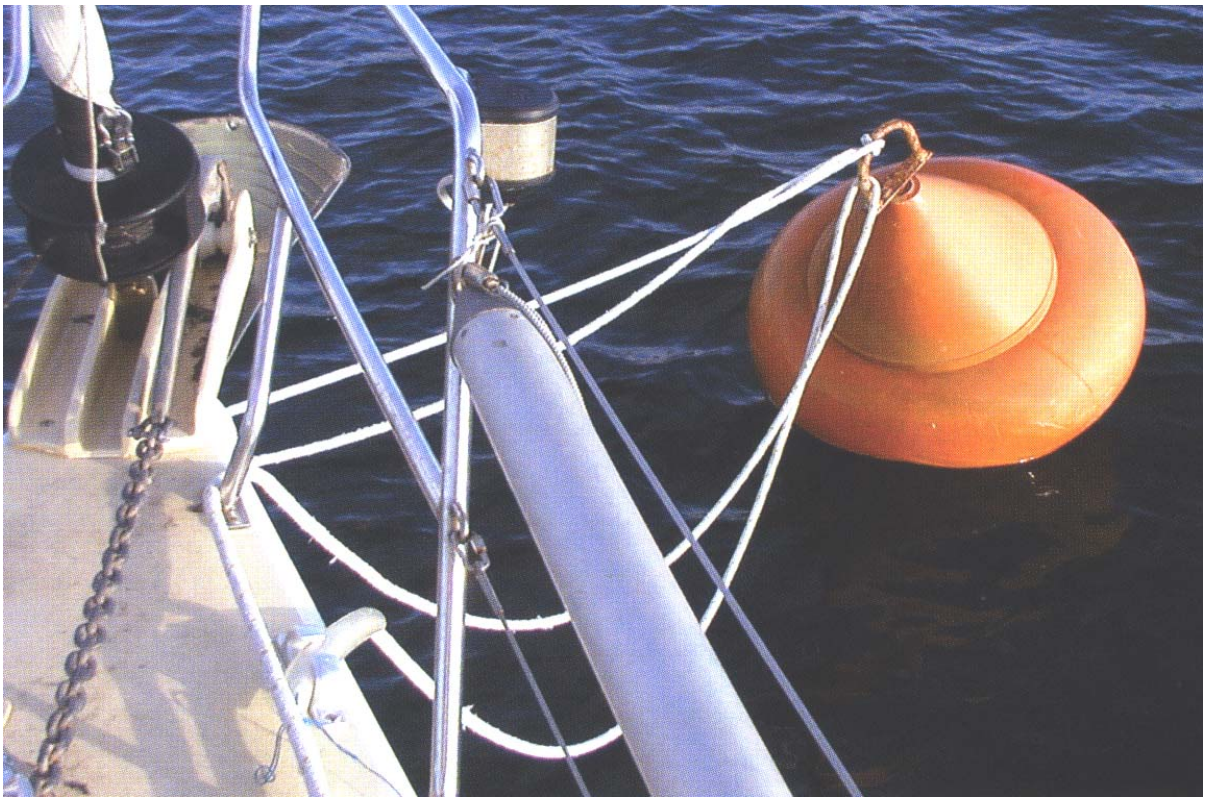


Figure 6 Doubling Up a Mooring Line

Note. From *Introduction to Boat Handling for Sail and Power* (p. 22), by R. Gibson, 2008, Southampton, England: The Royal Yachting Association. Copyright 2008 by The Royal Yachting Association.

SECURING TO A MOORING BUOY WITHOUT A CREW

There may be times when there is a requirement to moor the powerboat with no crew aboard to assist.

To approach a mooring buoy, use the following as a guide:

- Approach the buoy from downstream. Alternate between forward and neutral to ensure the approach is slow and controlled.
- Judge the speed of the powerboat by looking sideways at passing objects.
- Use a minimum amount of speed while still maintaining full control.
- If the buoy is overshot, put the engine in neutral to avoid tangling the mooring in the propeller.

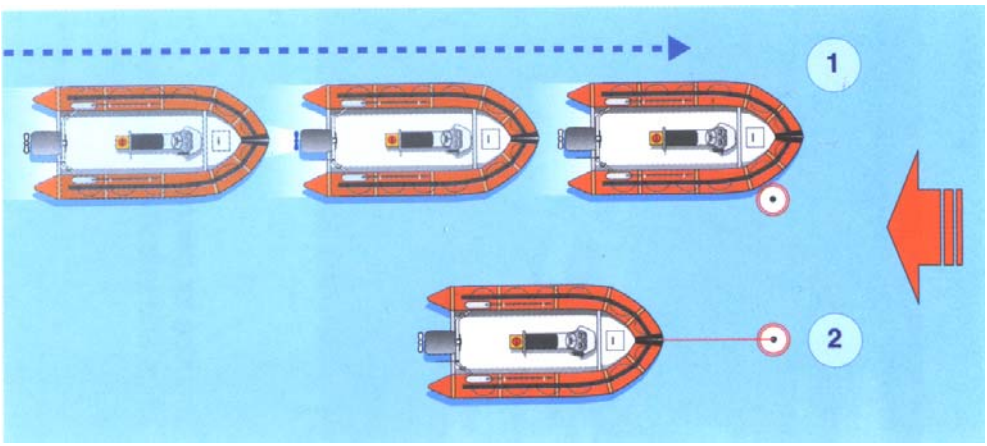


Figure 7 Approaching a Mooring Buoy Ahead

Note. From *Powerboat Handbook* (p. 52), by P. Glatzel, 2005, Southampton, England: The Royal Yachting Association. Copyright 2005 by The Royal Yachting Association.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What are the two types of mooring buoys?

Q2. How should a mooring buoy be approached?

Q3. When staying at a mooring for longer periods or in rough weather, what additional step should be taken?

ANTICIPATED ANSWERS:

A1. Temporary and permanent.

A2. A mooring buoy should be approached from downstream.

A3. Double up mooring line.

Teaching Point 2	**Explain the procedures for beaching a powerboat.**
Time: 10 min	Method: Interactive Lecture

BEACHING A POWERBOAT

When a mooring buoy or dock is not available and there is a requirement to go ashore it may be necessary to beach the powerboat. Before beaching, determine that the beach will not damage the powerboat and that the act of beaching can be completed safely.

Beaching is a regular practice in areas that have no moorings or docks. In these cases, the beaches are inspected regularly and are known to the powerboat operator.

In unfamiliar areas, beaching should only be considered in urgent situations. In all other cases, a mooring or dock should be used.

The following should be considered prior to beaching:

- Survey the beach from a distance and ensure that the landing area is free from rocks, pilings, debris and other hazards.
- Beaching is allowed since some beaches do not allow boats to beach due because it causes erosion.
- Ensure that a suitable anchor and cable are on board.

If the beach is suitable for landing, complete the following steps:

1. When there is crew in the powerboat, communicate well in advance the approach to the beach and what actions the crew is expected to take.
2. Find an opening on the beach where the boat fits.
3. Trim up the motor. If possible, if not put it into shallow drive. The propellers should not hit the sand as it could cause damage to the propellers and could also clog up the engine with sand.
4. Idle towards the beach. Point the bow towards the open space on the beach and idle up to it. Once close to the beach give a burst of acceleration to get further up the beach. Look for underwater obstructions (eg, rocks, shallow water etc) on approach to the beach.
5. Lift the engine. As soon as the acceleration is completed, shut off the engine and trim the engines up using the automatic trim or lift the engines manually.

6. Anchor it to the beach. Anchor the boat to the beach. This stops the boat from floating away. Tie the anchor off to a front cleat and put the anchor in the sand up on the beach.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. When should you consider beaching a powerboat?

ANTICIPATED ANSWERS:

A1. In urgent situations or when a mooring or dock is not available.

Teaching Point 3 **Explain anchoring a powerboat.**

Time: 15 min Method: Interactive Lecture

ANCHORING

Anchoring is used to secure a powerboat when a suitable mooring buoy or dock is not available, in stormy weather when it is unsafe to proceed or in an emergency.

Each powerboat is fitted with a suitable anchor and cable for the size of the powerboat. To anchor safely, consult a chart of the area to determine:

- an area that provides the best protection from the prevailing conditions,
- the depth of water, and,
- the type of bottom.

ANCHOR PARTS AND TYPES

Distribute Anchor Parts Handout located at Annex A and review the anchoring material covered in SCOP Module 1 - PCOC, EO 001.05 (Describe Safe Vessel Operations).

There are many types of anchors—each with advantages and disadvantages. When selecting an anchor, the weight, size and shape, and the type of bottom must be considered. For small powerboats, a Danforth or Bruce anchor is sufficient. Anchors may land in any position but must turn over so that the flukes dig into the bottom. The pull angle must be low to penetrate and high to pull out.

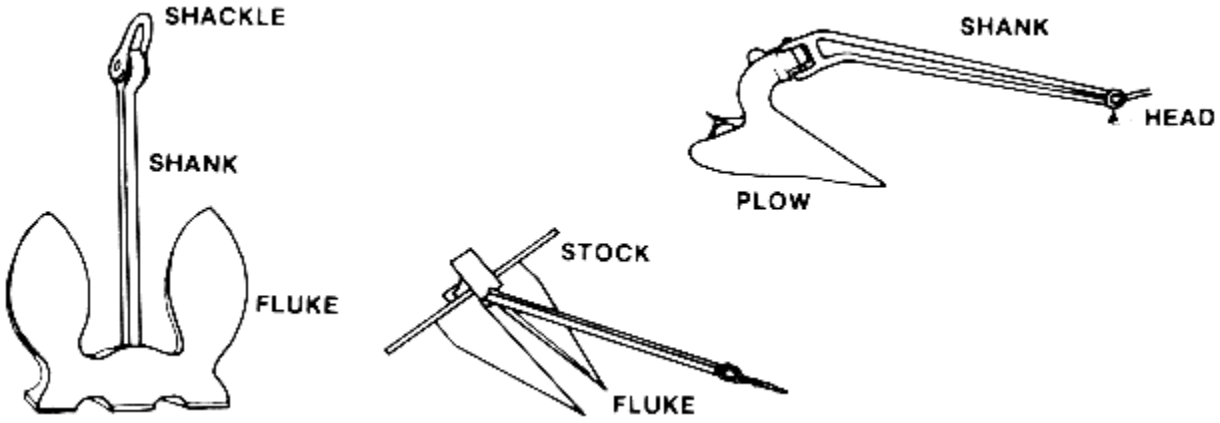


Figure 8 Parts of Anchors

Note. From *Advanced Sailing Skills* (p. 190), by D. Griffin, 1989, Glouchester, ON: Canadian Yachting Association. Copyright 2003 by Canadian Yachting Association.

Danforth (or patent). Has a long stock with welded, large-area, sharp-pointed flukes. It holds well in sand, hard mud or soft clay bottoms. Although difficult, it is possible to set in grass or rocky bottoms, but should be done with caution, as the flukes may become caught on rocks making retrieval difficult. The Danforth anchor is not good in weeds.

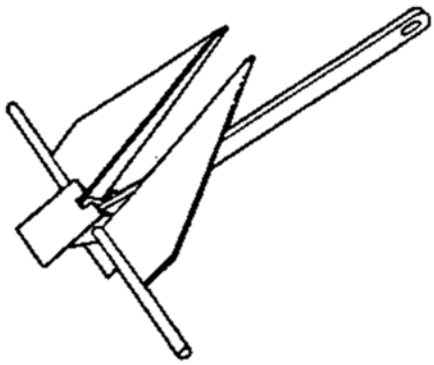


Figure 9 Danforth Anchor

Note. From *Basic Power Boating Skills* (p. 69), by D. Neff, 2003, Kingston, ON: Canadian Yachting Association. Copyright 2003 by Canadian Yachting Association.

Navy. Not recommended for use on smaller boats. It has no stock, lays flat and digs into soft sand, mud or weeds. To be effective, a very heavy anchor must be carried relative to the size of the boat.

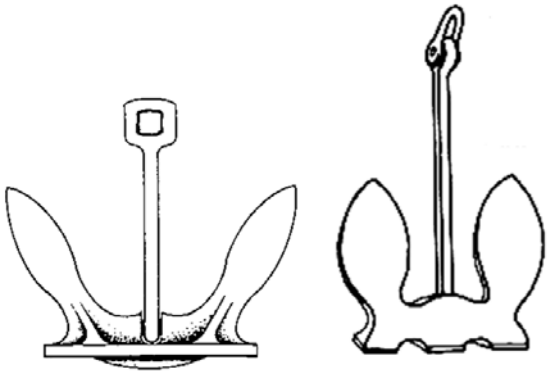


Figure 10 Navy Anchor

Note. From *Basic Power Boating Skills* (p. 69), by D. Neff, 2003, Kingston, ON: Canadian Yachting Association. Copyright 2003 by Canadian Yachting Association.

Mushroom. Used primarily for moorings. Scoops deep into soft mud and silt bottoms and is hard to recover. Unlike other anchors, the primary holding power of the mushroom anchor is dependent on its weight and is therefore heavy for its size.

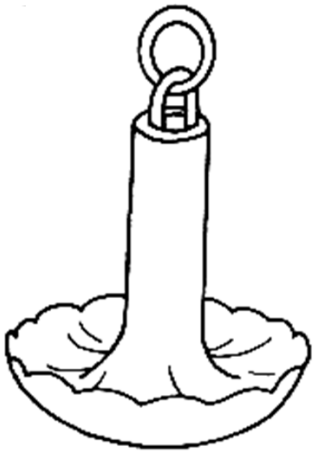


Figure 11 Mushroom Anchor

Note. From *Advanced Sailing Skills* (p. 190), by D. Griffin, 1989, Glouchester, ON: Canadian Yachting Association. Copyright 2003 by Canadian Yachting Association.

Plow (Coastal Quick Release [CQR]). Has no stock but turns upright when pulled and digs in deep with large areas to hold well in most types of bottoms. It can be effective in grass or weeds if able to penetrate. The pivoting shank allows the point of the plow to rotate and dig into the bottom when the anchor rode is strained. The plow anchor is easily tripped when pulled vertically. The plow anchor is awkward to stow on deck and is usually secured on a bow roller.

Figure 12 Plow Anchor

Note. From *Advanced Sailing Skills* (p. 190), by D. Griffin, 1989, Glouchester, ON: Canadian Yachting Association. Copyright 2003 by Canadian Yachting Association.

Bruce. Designed to right itself regardless of the way it lands on the bottom. The Bruce anchor digs in and buries itself into the bottom when the rode is strained. The Bruce anchor is easily tripped with vertical pull. It holds well in most types of bottoms. The Bruce anchor is awkward to stow on deck and is usually secured on a bow roller.

Figure 13 Bruce Anchor

Note. From *Basic Power Boating Skills* (p. 69), by D. Neff, 2003, Kingston, ON: Canadian Yachting Association. Copyright 2003 by Canadian Yachting Association.

SELECTING THE RODE (CABLE)

Ground tackle. Anchor, length of chain and a long length of rope which, when properly set, ensures the powerboat is attached to the ground.

Rode. The total line from the anchor to the deck of the powerboat including the short chain at the anchor.

The rode usually consists of 1–3 m of galvanized steel chain followed by a longer length of nylon line for small powerboats. The heavy chain helps to keep the pull of the rode horizontal and is not damaged by sharp objects on the bottom. The light nylon line is easy to handle and its stretchiness acts like a shock absorber. To increase the shock absorbing effect, a weight (called a kellet) can be hung on the centre of the rode to increase the sag effect (as illustrated in Figure 14). It is critical that the Annexs between each part of the anchoring gear are made correctly.

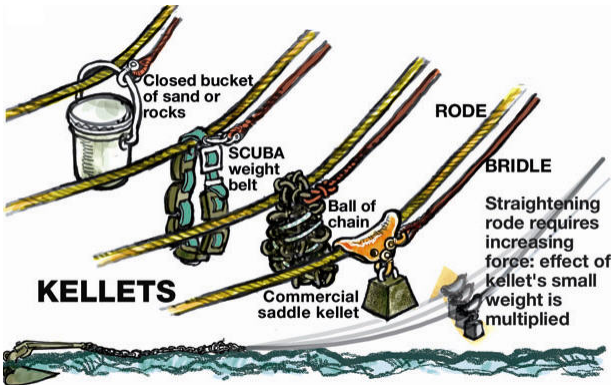


Figure 14 Kellets

Note. From "Anchoring 201", Article 29, *There are Times When Simply Finding Out Scope and Dropping the Hook Just Isn't Enough*, by F. Lanier. Retrieved November 6, 2008, from http://www.captfklanier.com/articles/art29.html

If the rode angles upward at too steep an angle, it trips the anchor. It is important to use a rode that is considerably longer than the depth of the water.

IAW Transport Canada, the minimum length of rode required is 15 m. It is recommended that a minimum of 30 m should be carried. A length of 45–60 m allows a wider choice of depth in anchorages.

Attaching the Bitter End of the Rode

Prior to lowering the anchor, ensure the bitter end (the part of the rode opposite to the anchor) of the rode is attached to a secure part of the powerboat. Leading the rode through a chock or fairlead prevents chafing and wear on the gunwale. Ensure there are no tangles in the rode prior to lowering the anchor by tracing the path of the rode from the anchor to the securing point inboard of the powerboat. This alleviates having to manage the weight of the anchor over the side while trying to untangle the rode on deck.

ANCHORAGE CONSIDERATIONS

Scope. The ratio between the vertical distance from the deck to the bottom and the length of the rode (as illustrated in Figure 15).

In Figure 15, the examples of scope are 4 : 1 and 6 : 1, or four times the depth of water and six times the depth of the water.

The scope ratio required depends on weather conditions, swing room and the anchor's holding ability. The greater the scope, the smaller the angle between the rode and the bottom and the better the anchor digs in. Greater scope also increases shock absorption because it increases the curve of the rode.

The following is a guide to scope ratios for common activities:

- 3 : 1—a brief stay, such as a lunch break.
- 5 : 1—for longer periods such as overnight under favourable conditions.
- 7 : 1—for longer periods such as overnight if wind or waves are expected.
- 9 : 1—for longer periods such as overnight in stormy conditions or in an exposed location.

If anchoring overnight, refer to the collision regulations to confirm what navigation lights are required.

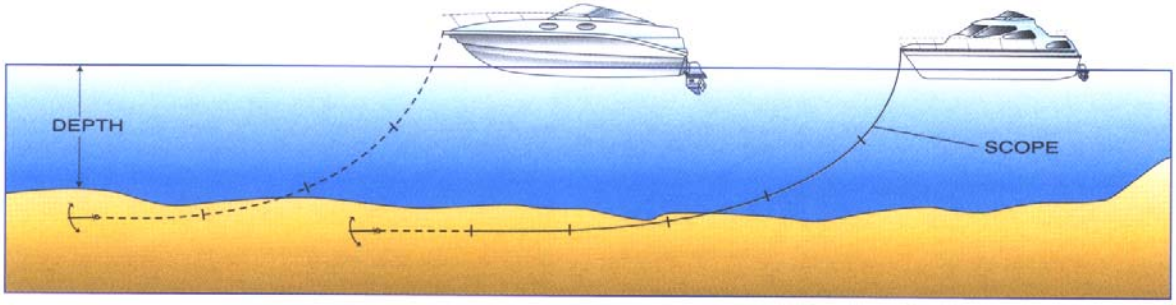


Figure 15 Anchor Scope

Note. From *Powerboat Handbook* (p. 54), by P. Glatzel, 2005, Southampton, England: The Royal Yachting Association. Copyright 2005 by The Royal Yachting Association.

The following must be considered when choosing an anchorage:

Shelter from weather and waves. Allows the powerboat to ride smoother and reduces strain on the ground tackle and the powerboat.

Depth of water at various tide heights. Ensures the powerboat does not touch bottom anywhere within its swinging circle. Too much depth may require more rode than is available. If operating in a tidal area, consider whether changes in water depth are a concern. During an ebb tide, scope increases and the boat swings in wider circles. During a flood, scope decreases and the anchor may drag or trip.

Anchoring circle and swing room. Ensures the powerboat does not collide with other boats, the shore or the bottom. The first boat into an anchorage has the right to ask later arrivals to anchor outside the first boat's swinging circle. Since the wind direction and speed can change overnight it is important that all boats in the anchorage have sufficient room to swing.

Heavier boats swing slower than lighter ones. Powerboats and sailboats swing at different rates.

Bottom type. Varies with the type of anchor used. A muddy bottom is ideal. A grassy bottom is difficult for most types of anchors to dig into. On a rocky bottom, an anchor may not grab until several attempts have been made or it may become wedged in a crevice, making retrieval difficult.

Steps to anchoring a powerboat:

1. **Ensure that the rode is attached to the anchor.** A figure eight follow-through on a round turn is recommended.

2. **Ensure that the bitter end of the rode is attached to the powerboat.** Most powerboat manufacturers design a reinforced Annex. If one is not available, select a location that does not cause damage and is strong enough to support the load.

3. **Position head to wind over the selected location.** Most powerboats drive up to an anchorage, but it may be necessary to paddle to an anchorage. Position a person at the bow to relay directions to the powerboat operator.

4. **Ensure no crew member is standing in a bight prior to lowering the anchor.** Visually trace the path of the rode, making sure it is free from obstructions when under load and no one is standing within a loop which could cause injury.

5. **Lower the anchor slowly over the bow as the boat moves astern.** Lower the anchor, hand over hand, bracing a leg against the gunwhale for support.

6. **Strain the rode to dig in the anchor.** After the anchor has reached the bottom and the scope is equal to 3 : 1, cleat the rode to the powerboat. Move the powerboat astern. The strain on the rode causes the anchor to position itself and dig into the bottom.

7. **Veer out the required scope once the anchor is dug in and secure the rode.** Once the anchor is dug in, place the remainder of the required rode into the water and secure it to the powerboat.

8. **Check for anchor drag by sighting a range.** Once the powerboat has been at anchor for a few minutes, use three sets of two stationary points to line up as a range.

RECOVERING THE ANCHOR

Steps to recovering an anchor:

1. **Position the powerboat over the anchor.** Manoeuvre slowly while the bow person brings the rode on board. The bow person signals to the powerboat operator when in position over the anchor.

2. **Lift the anchor.** When directly over the anchor, the bow person collects the remaining rode and anchor.

3. **Clean the anchor prior to placing it in the powerboat.** Before lifting the anchor on board, the bow person cleans the anchor off if it is covered with mud or grass.

4. **Stow the anchor securely.** Prior to getting underway, stow the anchor and rode securely so that they cannot come loose and tangle in the rigging or sink if the powerboat capsizes.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. Name three parts of an anchor.

Q2. Define rode.

Q3. What are the four things you must consider when selecting an anchorage?

ANTICIPATED ANSWERS:

A1. Any three of the following:

- shackle,
- head,
- shank,
- stock,
- fluke, or
- plow.

A2. The total line from the anchor to the deck of the powerboat including the short chain at the anchor.

A3. You must consider:

- shelter from weather and waves,
- depth of water at various tide heights,
- anchoring circle and swing room, and
- bottom type.

Teaching Point 4	**Demonstrate and have the students secure a powerboat to a dock.**
Time: 20 min	Method: Demonstration and performance

Securing the Powerboat Alongside a Dock

Prior to securing a powerboat, the operator must consider rigging the lines. The bow line, stern line, forward spring line, and aft spring line are the four lines used to secure the powerboat alongside a dock (as illustrated in Figure 16).

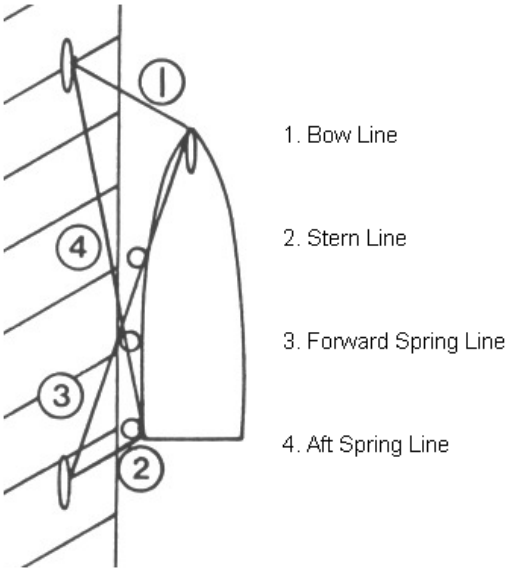


Figure 16 Securing Alongside a Dock

Note. From *Basic Powerboating* Skills (p. 140), by D. Neff, 1945, Gloucester, ON: Copyright by Canadian Yachting Association.

For shorter stays, it may be possible to limit the number of lines that are attached to the dock to just the bow and stern lines. For longer stays or in rough or windy conditions use all four lines.

The bow and stern line control the lateral movement of the powerboat while it is alongside.

When next to the dock, spring lines control the fore and aft position of the powerboat.

Have the students practice tying the boat to a horn cleat or docking ring in a manner that it would be safe and secure for the night: bowline, stern line, fore and aft spring lines as required.

CONFIRMATION OF TEACHING POINT 4

The students' participation in the activity will serve as the confirmation of this TP.

Teaching Point 5	**Demonstrate and have the students de-rig a powerboat.**
Time: 15 min	Method: Demonstration and Performance

DE-RIGGING A POWERBOAT

Each training establishment have different requirements for de-rigging, based on the type of powerboat, type of dock, prevailing weather, etc, so it is important to follow the Standard Operating Procedures (SOPs) for de-rigging a powerboat.

If the training establishment has an SOP with a de-rigging checklist, refer to that for specific details.

The following are general tasks that need to be completed when de-rigging a powerboat:

- Disembark the crew safely.
- Seek first aid or report any minor injuries immediately.
- Remove all personal gear and debris from the powerboat.
- Remove and inspect all safety gear issued to the powerboat.
- Remove fuel storage tanks and follow the CSTC storage procedure as outlined in SOPs.
- Pump bilges and clean the bilge pump.
- Complete an inspection of the powerboat and complete any required reports or checklists.
- Obtain a weather forecast and ensure that there are adequate lines and fenders applied.

CONFIRMATION OF TEACHING POINT 5

The students' participation in the demonstration will serve as the confirmation of this TP.

Teaching Point 6 **Have the students practice manoeuvring a powerboat.**

Time: 160 min Method: Practical Activity

Time for this TP must stay within the allocation; however review manoeuvres based on local conditions and the skill set of the students.

CONFIRMATION OF TEACHING POINT 6

The students' participation in the activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The students' participation in the demonstrations will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW Chapter 3.

CLOSING STATEMENT

Throughout this lesson you have practiced many techniques to secure a powerboat. These are skills that require practice for refinement. If you practice these skills often, you will be able to apply them efficiently, ensuring that your crew is safe and you have do not damage your powerboat.

INSTRUCTOR NOTES / REMARKS

Nil.

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ANCHORS

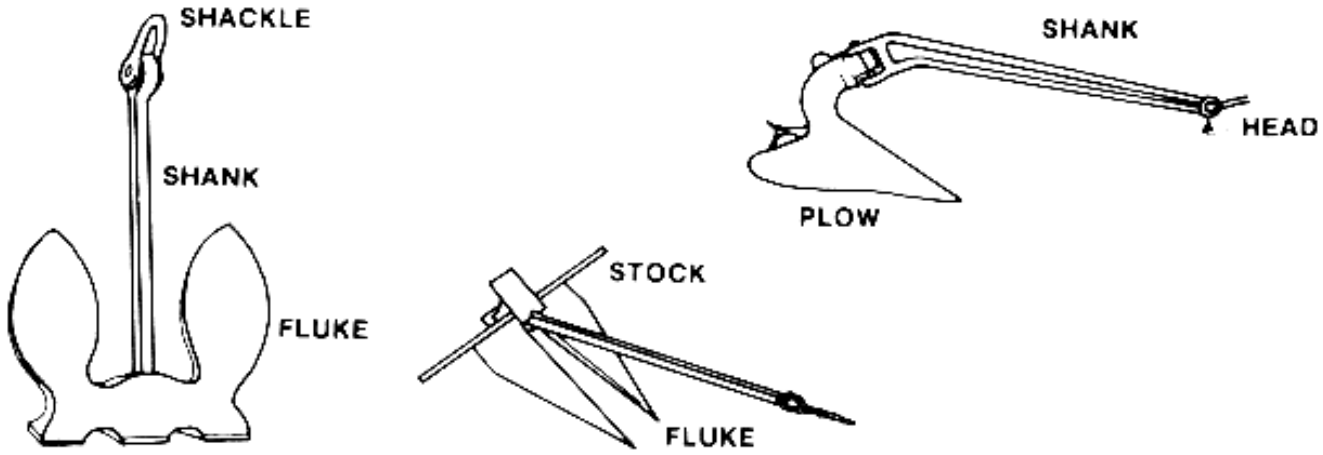

Figure A-1 Parts of an Anchor

Note. From *Advanced Sailing Skills* (p. 190), by D. Griffin, 1989, Glouchester, ON: Canadian Yachting Association. Copyright 2003 by Canadian Yachting Association.

Parts of an Anchor

Shank. The stem of the anchor in which the direction of the anchor is pulled to set it.

Stock. Bar or rod that turns the anchor over so that the flukes will dig into the seabed.

Fluke. Flat plates that dig into the seabed.

Plow. Shaped fluke used on a plow type anchor.

Shackle. U-shaped fitting that connects the anchor to its cable.

ANNEX A
INSTRUCTIONAL METHODOLOGIES AND THEIR APPLICATIONS

The various methods of instruction commonly accepted as appropriate for cadet training is outlined below.

METHOD	DEVELOPMENTAL PERIOD ONE AGES 12 – 14 EXPERIENCE-BASED	DEVELOPMENTAL PERIOD TWO AGES 15 – 16 DEVELOPMENTAL	DEVELOPMENTAL PERIOD THREE AGES 17 – 18 COMPETENCY
Case Study	Not applicable	Applicable	Applicable
Demonstration and Performance	Applicable	Applicable	Applicable
Experiential Learning	Applicable	Applicable	Applicable
Field Trip	Applicable	Applicable	Applicable
Game	Applicable	Applicable	Applicable
Group Discussion	Applicable	Applicable	Applicable
Guided Discussion	Not applicable	Not applicable	Applicable
In-class Activity	Applicable	Applicable	Applicable
Interactive Lecture	Applicable	Applicable	Applicable
Lecture	Applicable	Applicable	Applicable
On-the job Training (OJT)	Not applicable	Not applicable	Applicable
Peer Learning	Not applicable	Not applicable	Applicable
Practical Activity	Applicable	Applicable	Applicable
Role Play	Not applicable	Applicable	Applicable
Self-Study	Not applicable	Not applicable	Applicable
Simulation	Not applicable	Not applicable	Applicable
Tutorial	Not applicable	Not applicable	Applicable

ANNEX A
INSTRUCTIONAL METHODOLOGIES AND THEIR APPLICATIONS

General information follows on each method for its age-appropriateness, definition, application, advantages and disadvantages.

METHOD(S)	APPLICATIONS	ADVANTAGES	DISADVANTAGES
DEMONSTRATION AND PERFORMANCE Cadets observe the instructor performing the task in a demonstration, and rehearse it under the supervision of the instructor.			
Demonstration Method A method of instruction where the instructor, by actually performing an operation or doing a job, shows the cadet what to do, how to do it and through explanations brings out why, where and when it is done.	**Demonstration Method** 1. To teach hands-on operations or procedures. 2. To teach troubleshooting. 3. To illustrate principles. 4. To teach operation or functioning of equipment. 5. To set standards of workmanship. 6. To teach safety procedures.	**Demonstration Method** 1. Minimizes damage and waste. 2. Saves time. 3. Can be presented to large groups.	**Demonstration Method** 1. Requires careful preparation and rehearsal. 2. Requires special classroom arrangements. 3. Requires equipment and aids.
Performance Method A method in which the cadet is required to perform, under controlled conditions, the operations, skill or movement being taught.	**Performance Method** 1. To teach hands-on operations or procedures. 2. To teach operations or functioning of equipment. 3. To teach team skills. 4. To teach safety procedures.	**Performance Method** 1. Builds confidence. 2. Enables learning evaluation. 3. Reduces damage and waste. 4. Promotes safety.	**Performance Method** 1. Requires tools and equipment. 2. Requires large blocks of time. 3. Requires more instructors.

ANNEX A
INSTRUCTIONAL METHODOLOGIES AND THEIR APPLICATIONS

METHOD(S)	APPLICATIONS	ADVANTAGES	DISADVANTAGES
EXPERIENTIAL LEARNING Learning in the cadet program is centred on experiential learning. This involves learning knowledge and skills from direct experience. People learn best from their own experiences and can then apply the knowledge and skills in new situations. The four stages of the cycle may be considered and applied to all activities within the Cadet Program, regardless of methodology chosen. **Stage 1: Concrete Experience:** Cadets have an experience and take time to identify and define what the experience is. Sample activities: direct observations, simulations, field trips, and reading. **Stage 2: Reflective Observation:** Cadets need to reflect on and examine what they saw, felt and thought while they were having the experience. Sample activities: discussion, journals / logs, and graphs. **Stage 3: Abstract Conceptualization:** Cadets work to understand and make connections from the experience to new or different situations. Sample activities: interview, discussion, model building, analogies and planning. **Stage 4: Active Experimentation:** Cadets look ahead to and plan the application of skills and knowledge acquired to future experience.	1. To teach practical skills. 2. To learn how to learn. 3. To teach transferable skills. 4. To teach a process or principle. 5. To teach problem solving.	1. Knowledge is shared and created by collectively by all participants. 2. Everyone is actively involved in the teaching – learning process. 3. Appeals to many learning styles. 4. Student centred.	1. Resource intensive. 2. Requires significant planning, preparation and organization prior to activity. 3. The instructor must master the subject developed. 4. Instructor needs very good pedagogical skills. 5. May not be a good process for learning details. 6. The instructor must be a good facilitator to carry out an effective reflective session in stage 2 &3 of this method.

ANNEX A
INSTRUCTIONAL METHODOLOGIES AND THEIR APPLICATIONS

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Sample activities include: simulation, fieldwork. Note: The cycle is ongoing as each learning experience builds on another.			
FIELD TRIP Theoretical knowledge is reinforced through participation in an activity in a real-life setting. Prior planning helps to ensure all pre-training and safety standards are met. Field trip activities are planned and carried out to achieve clear instructional objectives that are understood by the cadets. Examples can include trips to areas of local interest, flying / gliding, hiking or sailing.	To introduce / illustrate and confirm topics. To allow for familiarization activities.	Immerses cadets in a specific environment.	May require additional staff to ensure adequate supervision. Requires significant planning, preparation and organization prior to activity. May have cost implications.
GAME Games are used with one or more participants to practice skills, apply strategies and enhance teams. It is critical that the game supports learning through the provision of a challenging activity that allows for the skill practice or knowledge confirmation.	1. To introduce a topic. 2. To discover concepts and principles. 3. To review and confirm.	1. Fun and interesting. 2. Creates ownership. 3. Highly participative.	1. May stratify the group by creating a winner and a loser. 2. May be difficult in providing instructor feedback.
GROUP DISCUSSION Cadets discuss issues, share knowledge, opinions and feelings about a topic in small groups to meet a specified goal. The instructor's questioning is flexible and minimal, and aims at encouraging cadets to explore their own experiences and opinions	1. To develop imaginative solutions to problems. 2. To stimulate thinking and interest and to secure cadet participation. 3. To emphasize main teaching points. 4. To supplement lectures and seminars.	1. Increases cadet interest. 2. Increases cadet acceptance and commitment. 3. Utilizes cadet knowledge and experience. 4. Results in more permanent learning because of the high degree of cadet participation / cognitive	1. Requires highly skilled instructors. 2. Time consuming. 3. Restricts size of group. 4. Requires selective group composition.

ANNEX A
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through peer interaction.	5. To determine how well cadets understand the concepts and principles. 6. To prepare cadets for application of theory or procedure. 7. To summarize, clarify points or review. 8. To prepare cadets for instruction that will follow. 9. To determine cadet progress and effectiveness of prior instruction.	involvement.	
IN-CLASS ACTIVITY In-class activities encompass a wide variety of activity-based learning opportunities that can be used to reinforce instructional topics or to introduce cadets to new experiences. In-class activities should provoke thought and stimulate interest among cadets, while maintaining relevance to the performance objectives.	1. To reinforce instructional topics. 2. To orient cadets to the subject. 3. To give direction on procedures. 4. To illustrate the application of rules, principles or concepts. 5. To review, clarify, and / or summarize.	Provokes thought and stimulates interest among cadets. Appeals to kinaesthetic learners.	1. Difficult to gauge cadet reaction. 2. Takes time to prepare.
INTERACTIVE LECTURE The instructor-driven methodology combines both lecture and interaction to meet lesson objectives. Lecture portions of the lesson are offset with relevant activities such as videos with discussion, games to confirm and completion of handouts.	1. To orient cadets to the subject. 2. To give instruction on procedures. 3. To illustrate the application of rules, principles or concepts. 4. To review, clarify, and / or summarize.	1. Saves time. 2. Permits flexibility of class size. 3. Requires less rigid space requirements. 4. Permits better control over content and sequence.	Difficult to gauge cadet reaction.
LECTURE This is a formal or semi-formal discourse in which the instructor presents a series of events, facts,	1. To orient cadets to the subject. 2. To give instruction on procedures. 3. To illustrate the	1. Proficient oral skills are required. 2. Useful for big groups. 3. Saves time because of fewer interruptions.	1. Requires preparation and a dynamic lecturer. 2. Cadets may be passive and uninvolved.

ANNEX A
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principles, explores a problem or explains relationships.	application of rules, principles or concepts. 4. To review, clarify, and / or summarize.		
PRACTICAL ACTIVITY Practical activities encompass a wide variety of activity-based learning opportunities that can be used to reinforce and practice instructional topics or to introduce cadets to new experiences. Practical activities should stimulate interest among cadets and encourage their participation, while maintaining relevance to the performance objectives.	1. To introduce a subject. 2. To practice skills. 3. To review and / or reinforce.	1. Encourages participation. 2. Stimulates an interest in the subject. 3. Fun and interesting. 4. Creates ownership.	1. Requires significant planning, preparation and organization. 2. May require additional staff to ensure adequate supervision.