

# **Clinic guideline**

## **BOAT HANDLING UNDER POWER AND DOCKING**

Docking can be the most stressful part of our sailing day. It is great to practice on the water, but you must first understand the basic principles of maneuvering the boat under power.

*(Initial discussion at dock – items 1-8, may take upwards of an hour to go through this. After each item get students involved in a discussion on how the point relates to the boat they are on)*

### **1. Understanding the boat**

- a. Engine operation – starting, throttle, gears, turning off
- b. Docking lines – breast lines, spring lines
- c. Cleats – location and use
- d. Fenders – height and location
- e. Freeboard
- f. Getting on and off the boat

### **2. Understanding the crew**

- a. Number of crew members
- b. Experience of each crewmember
- c. Physical limitations

### **3. Knots and cleats**

- a. Rope characteristics
  - i. Nylon – strong, stretches to absorb shock, resistant to UV
- b. Fastening points at a dock
  - i. Types of cleats, rings and piles
- c. Belaying a cleat
- d. Basic knots to be used for securing the vessel and fenders
  - i. Bowline
  - ii. Round turn and 2 half hitches

#### 4. Factors affecting maneuverability

- a. **Pivot** point of the vessel – Center of Lateral Resistance
  - i. Hull shape
  - ii. Keel shape and location
  - iii. Rudder shape and location

These criteria will determine the location of the CLR and they will also affect how easily the boat will react to changes in course by the helmsperson.

When the boat moves forward the pivot point also move forward to about 1/3 of the boat length from the bow. When reversing the pivot point moves aft to about 1/3 of boat length from the stern.

*(find the CLR of the vessel)*

#### b. Windage

The amount of drift caused by wind will depend on wind speed, the underwater surface area of the boat and;

- i. Shape of boat above waterline
- ii. Accessories
  - 1. bimini
  - 2. dodgers
  - 3. roller furling
  - 4. pilot house
- iii. drift can be in any direction – both sideways or fore and aft

#### 5. Steering

- a. **Rudder** – a rudder needs a flow of water over it in order for it to work. The greater the flow the more effective the rudder will be.

This flow can be created by

- i. The boat moving through the water
- ii. A current
- iii. Water being pushed by a propeller

The effectiveness of the rudder will also be determined by its'

Size  
Shape  
Location

- b. **Prop wash** – is the flow of water created by the propeller turning in the water.
  - i. Will be more or less effective depending on the location of the propeller in relation to the rudder.
    - 1. The propeller should be in line with the rudder
    - 2. They should be close to each other
  - ii. Use prop wash to steer the boat even when we have no forward movement of the boat. The propeller pushes water past our rudder and we direct the flow by turning the rudder
  - iii. When reversing, we get no benefit from prop wash because the flow of water is not directed over the rudder
  
- c. **Prop walk** – the effect of the propeller (acting like a paddlewheel) trying to walk the stern of the vessel sideways. It affects the boat while moving forward or reverse. However, it is much more obvious in reverse because there is no prop wash acting on the rudder. As the vessel begins to make way the prop walk is reduced. When reversing from a stopped position it is important to get way on quickly then put the engine into neutral in order to steer the boat in the intended direction.
  
- d. **Track or ease of turning**
  - Full keel versus fin keel

## 6. Steering while moving astern

- a. More power is required to get the boat moving backward than forward because the shape of the hull is designed to maximize forward movement.
- b. Start your movement astern with more power than you would in forward in order to get the boat up to **minimum operating speed** quicker to overcome the propwalk. Once momentum is developed you can reduce power or cut it completely (neutral). But don't let your speed decrease to much or you will have to overcome the propwalk again.
- c. When reversing, never let go of the wheel or the tiller. The rudder shaft is placed at the forward edge to keep the helm light when moving forward, but when moving backward the water flow is meeting the unsupported edge of the rudder and will make steering very heavy. There can be enough pressure to rip the tiller or wheel out of the hands of an unsuspecting helmsperson.
- d. When reversing the pivot point moves toward the stern. So when you execute a turn in reverse the stern will move a small amount in the direction of the turn and the bow will move a lot in the opposite direction.

## 7. Turning – When in tight quarters we want to execute our turns with the smallest radius possible.

- a. With **no wind or current** we can use prop wash and prop walk to turn the boat. This is done with almost no forward speed. If the vessel has port prop walk when in reverse, we execute the turn by putting the helm hard over to starboard and put the engine into forward. Increase the revs to create water flow over the rudder. This prop wash will start to push the stern to port. Before the vessel begins to pick up speed switch the engine into reverse and use the prop walk to continue to walk the stern to port, but don't leave it in reverse long enough to get the boat moving in reverse. It is important to keep the helm hard over to starboard at all times. Repeat the forward and reverse throttle until the boat is turned in the direction you want.

- b. **In wind** we must use a different strategy. We need to use the wind to our advantage. If in forward, try to make your turn by putting the bow of the boat into the wind. This helps our maneuver in three ways
- i. Our turning circle will be compressed
  - ii. If we get our bow pointing thru the wind, there will be less chance of being blown into hazards
  - iii. Once the bow passes thru the wind, the wind will help push our bow around to finish the turn.
  - iv. If reversing, let the wind blow your bow downwind and bring your stern into the wind
  - v. If the wind is too strong you may not be able to power your bow into the wind within a restricted area.

Depending on the direction of your turn you may also be able to use prop walk.

- c. **In current** we use a similar strategy as in wind – always try to turn into the current. However, remember that water is much more dense than air and a small current will have a greater influence on your boat than a wind of almost 5-10 times the velocity of the current.

**When entering an area where there may be problems maneuvering, plan out all the ‘what if’ scenarios in your head and develop solutions before continuing.**

## 8. Docking

Docking and undocking can be a nerve wracking experience. It is probably what we fear most, especially when there is an audience. But remember, the people watching you encounter the same problems and have the same fears you have. Their boat probably has more scratches and dents on it than yours.

Each boat will react differently to the forces we have been discussing and it is important that you are familiar with the boat you are sailing. Practice figure eights in forward and reverse. See how far the boat will glide when you put it into neutral when doing 1-2 knots. How much prop walk does it have.

All docking is to be done at **minimal operating speed**. This is the slowest speed you can go and still maintain directional control of the boat. This speed will vary with different conditions.

**Use wind, current and prop walk to your advantage, not detriment.**

**Before attempting to leave the dock or enter a marina you must stop and consider**

1. Amount of room to maneuver
2. Amount of traffic
3. Wind speed
4. Wind direction
5. Current speed
6. Current direction
7. Amount of prop walk
8. How well does your engine and prop combination drive the boat
9. How much windage does the boat have
10. Hull, keel and rudder configuration – how easily does the boat maneuver

**Decide on a plan** to successfully get you away from or to the dock. Then **effectively communicate your plan to the crew.**

**Commands should always be loud and clear. Helmsperson should wait for responses from crew.**

“Prepare to cast off” “Ready” “Cast Off”

The lines are cast off, and the helmsman puts boat into reverse as they step aboard.

When docking the crew must get one docking line around a cleat quickly to control the vessel. (This should be a midship or stern line). They must not try to control the boat by holding the line without going around a cleat first.

*Generally I make a point of not passing docking lines to “helpers” on the dock unless conditions really require it. You have briefed the boat crew on your intentions and have given them specific instructions on what to do when you dock. As soon as lines are passed to helpers on the dock your plan can’t be executed.*

Crew should not have to jump to the dock or have to jump to the boat. The helmsperson must maintain control of the boat and park it. Then the crew step off and secure the boat to the dock.

## **Unfamiliar Dock**

When approaching an unfamiliar you should make a reconnaissance pass, checking for

**Dock condition** – will it support my boat

**Dock height** - location of fenders

**Dock length** – location to tie lines on your boat

**Type of cleats**, location and condition – length of dock and spring lines

**Water depth** as you approach – look around at the other types of boats dock in the vicinity

**Any hazards** in the water or on the dock – is it safe to approach and for my crew to step on to

Proximity of other boats

After this pass by, make a circle or return to a more open area giving yourself adequate time to brief the crew, adjust docking lines and fenders

## ***PRACTICAL EXERCISES***

**Complete circles or figure eights in forward and reverse. Use a marker in the water to give an idea of distances travelled**

**Check momentum of vessel when going into neutral from forward/reverse**

**Stop vessel at marker in forward/reverse**

*(careful that your marker doesn't drift into shallow water)*

### **Docking at a pontoon**

**No wind**

**Wind blowing you on dock**

**Wind blowing away from dock**

### **Docking at a wall**

**Wind blowing you on wall**

**Wind blowing you off the wall**

### **Using dock lines as control**

**Casting off**

**Reversing**

**Adjusting angle of boat**

**Springing off dock**

### **Short Handed Docking**

Securing a line that will allow the helmsperson to control the boat while the crewmember secures the other docking lines