Handling of Boat (60)	Check before Departure	Hull, Deck and Other parts・Engine・Legally Required Equipment	(2min.)
	Machinery Operation	Start, warm up and stop the engine.	(1min.)
	Handling of Navaid	Measure the direction of an object with a hand compass	(30sec.)
	Knotting	fisherman's bend, a clove hitch, cleat hitch, single sheet bend, double sheet bend, a reef knot, a bowline knot	(30sec.)
	Unmooring and Mooring	Procedures,condition,knotting	(1min.)
	Troubleshooting	Overheat,electric system,cooling system ,fuel system, instrument and gauge	(1min.)
Basic Operation (120)	Start, Run Ahead and Stop	Safety Confirmation(**around propeller**,before operating,during operating,speed),course,steering	
	Astern	Safety Confirmation(**around propeller**,before operating,during operating,speed),course,steering	
	Altering Courses,Slalom	Safety Confirmation(before operating,during operating,speed),course,steering	
Practical Operation (120)	Rescue Operation	Safety Confirmation(before operating,during operating,speed),approach,steering	
	Leaving the Pier Coming alongside the Pier	Safety Confirmation(**around propeller**,before operating,during operating,speed),course,steering, approach,stop	
	Action to Avoid Collision	Safety Confirmation(before operating,during operating,speed),course,steering	

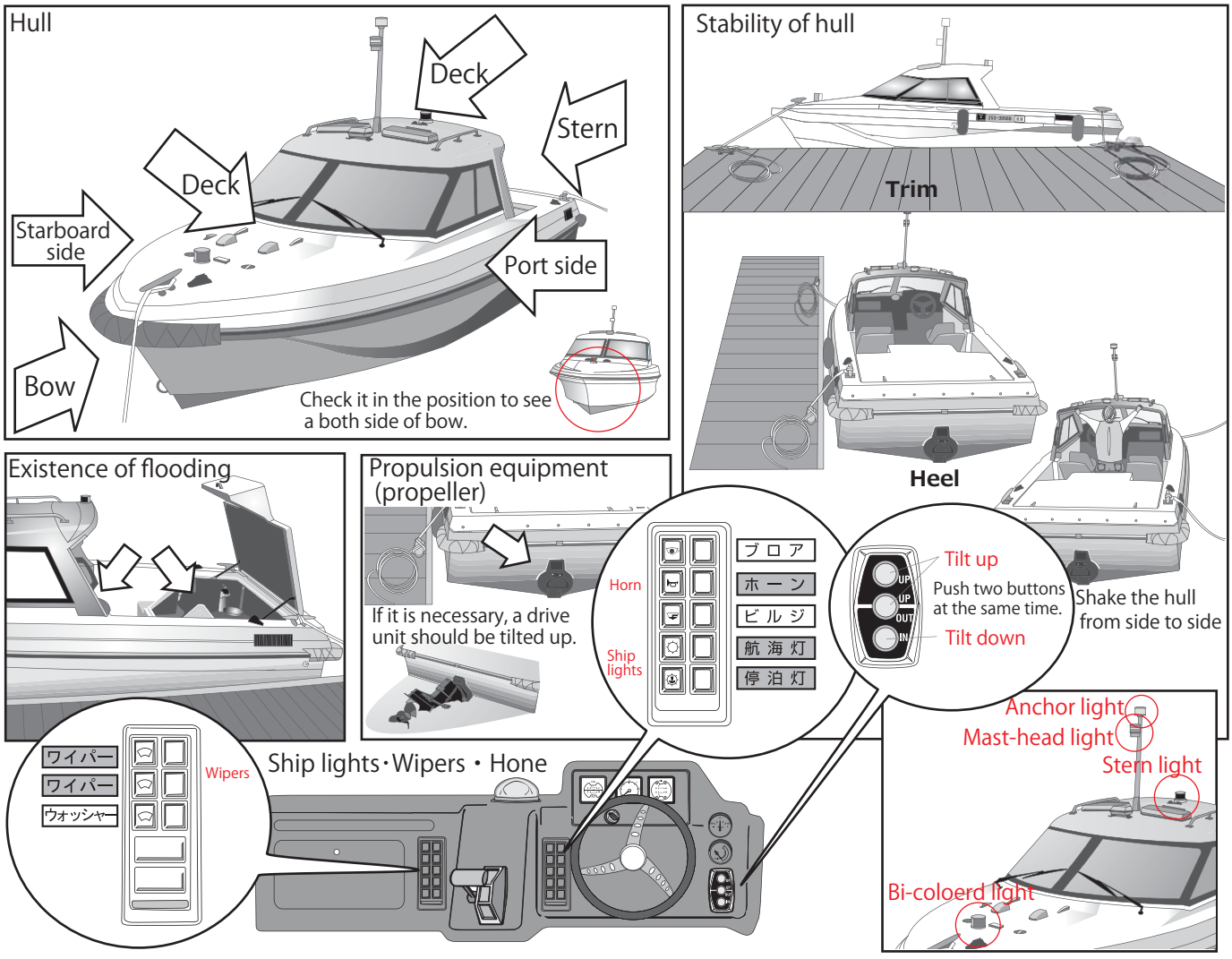
The minimum passing score is 60% for each subject and 70% for total score.

Check before Departure

Check for the preparation to prevent an accident, equipment in the case of emergency.

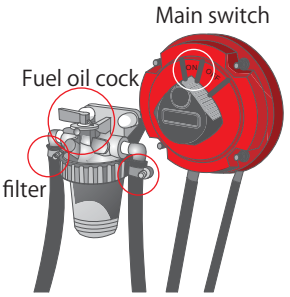
1 .Hull, Deck and Other parts

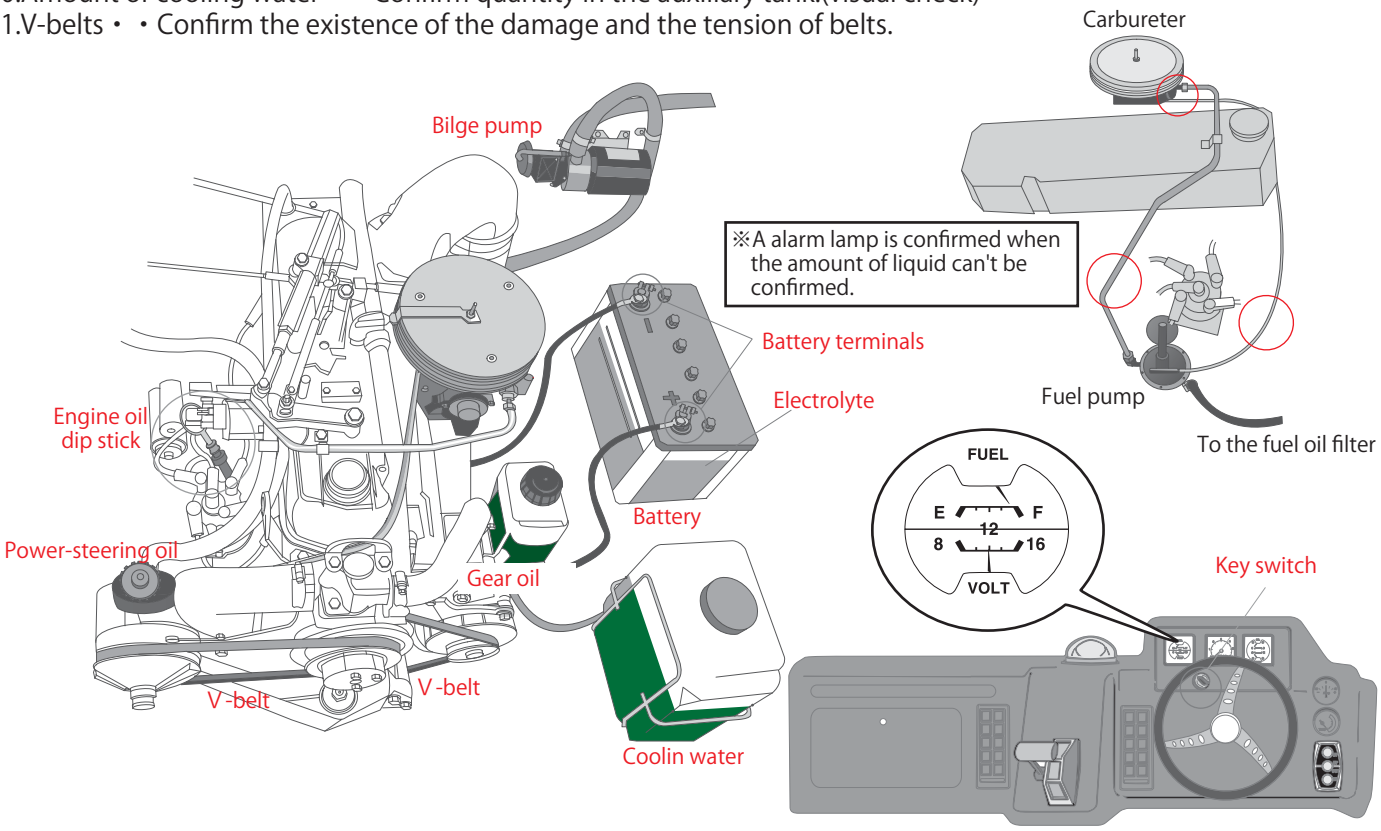
1.Hull（bow,stern,starboard side,port side,deck）・・The confirmation of the existence of the damage
2.Existence of flooding・・In the engine compartment,and the cabin
3.Stability of hull・・Rock the boat left and right to check her trim and heel.
4.propulsion equipment(propeller)・・Check the propeller for foreign objects, damage, and oil floating around it.
5.Ship lights(bi-coloured light,mast head light,stern light)and anchor light)・・Lighting is confirmed.
6.Horn・・Actuation is confirmed.
7.Wipers・・Actuation is confirmed.



2-1.Engine(Inboard Outdrive Engine)

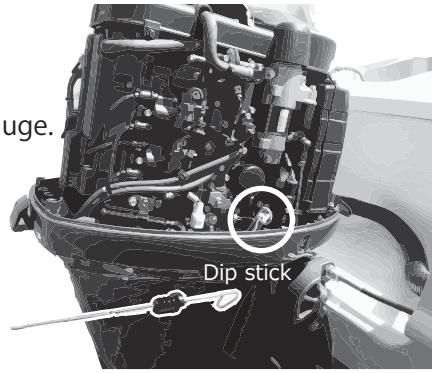
1.Battery・・The installation of the body,terminals,amount of electrolyte
2.Main switch・・" ON" is confirmed.
3.Amount of fuel oil・・A keyed switch is turned on, and confirm it with a fuel gauge.
4.Fuel oil cock・・Confirm whether it is open.
5.Fuel oil filter・・Confirm whether foreign matter and water are not inside.
6.Fuel oil piping(system)・・Confirm whether a hose and a pipe and a connection part don't have fuel a leak.
7.Engine oil・・Confirm quantity and quality.
8.Power-steering oil・・Confirm quantity and quality.
9.Gear oil・・Confirm quantity.(visual check)
10.Amount of cooling water・・Confirm quantity in the auxiliary tank.(visual check)
11.V-belts・・Confirm the existence of the damage and the tension of belts.

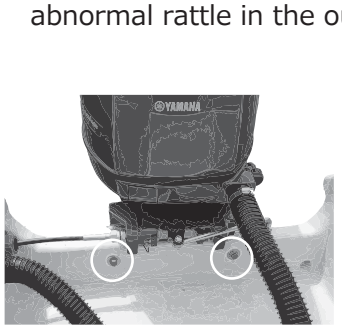




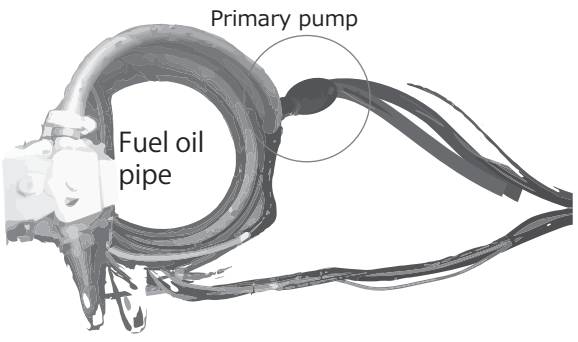
2-2.Engine(Outboard Engine)

1.Battery・・The installation of the body,terminals,amount of electrolyte
2.Main switch・・" ON" is confirmed.
3.Amount of fuel oil・・A keyed switch is turned on, and confirm it with a fuel gauge.
4.Fuel oil cock・・Confirm whether it is open.
5.Fuel oil filter・・Confirm whether foreign matter and water are not inside.
6.Fuel oil piping・・Confirm whether a hose and a pipe and a connection part don't have fuel a leak.
7.Engine oil・・Confirm quantity and quality.
8.Primary pump・・Squeeze it to see if it's hardened.
9.Emargency engine stop cord・・Make sure it's installed.
10.Engine installation・・・・Check that the mounting bolts are not loose and that there is no abnormal rattle in the outboard motor.

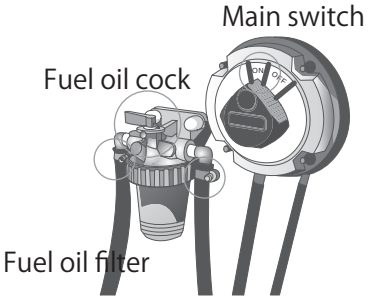




Mounting bolts

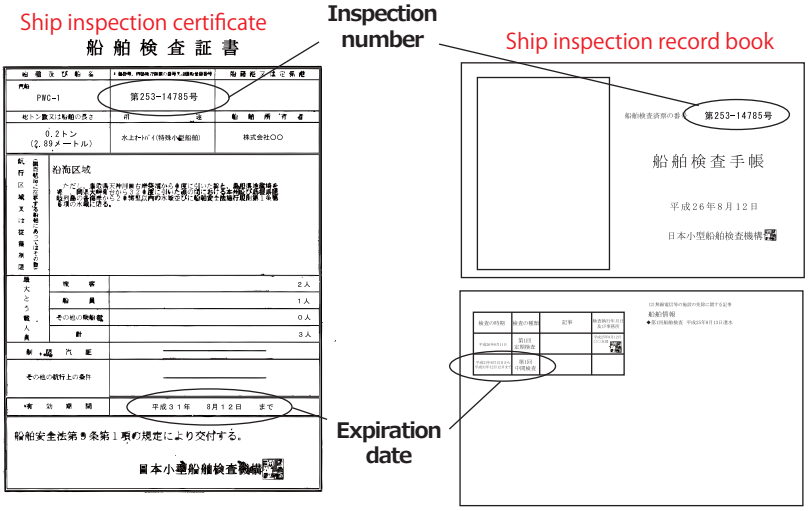



Emargency engine stop cord

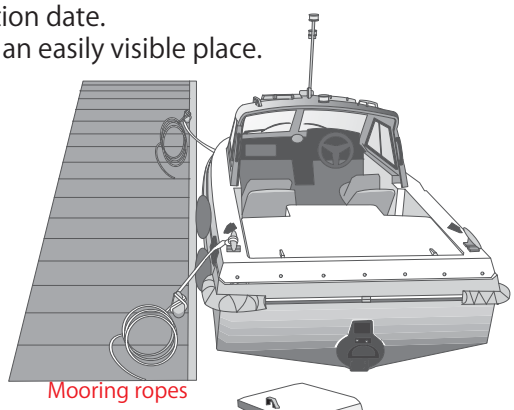


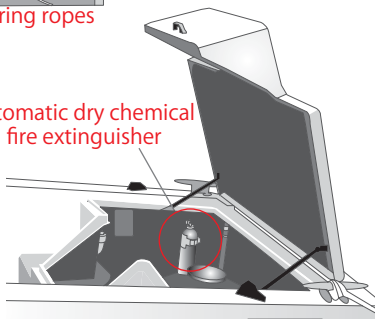
3 .Legally Required Equipment

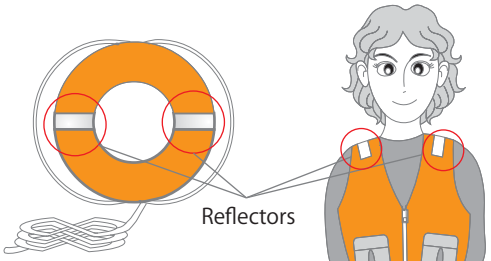
1.Red hand flare・・Confirm the existence of the damage and the expiration for use.
2.Life buoy・・Confirm the existence of the damage(incl. reflectors)
3.Life jacket・・Confirm the existence of the damage(incl. reflectors)and that the product is certified and worn by all crew members
4.Red bucket・・Confirm the existence of the damage
5.Bailer・・Confirm the existence of the damage
6.Fire extinguisher(in the engine compartment)・・Confirm the existence
7.Anchor and anchor rope・・Confirm the existence of the damage,condition of storage
8.Mooring lines・・Confirm the existence of the damage
9.Ship inspection certificate・・Confirm the inspection number and expiration date.
10.Ship inspection record book・・Confirm the inspection number and expiration date.
11.Ship inspection completion slip and ship number・・Confirm it is posted in an easily visible place.

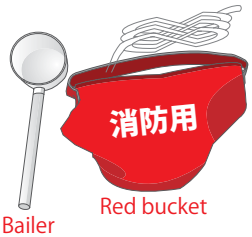


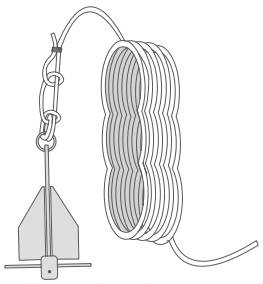
Ship inspection completion slip and ship number

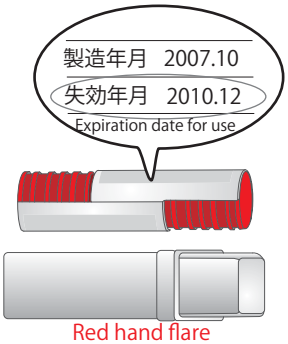

Mooring ropes





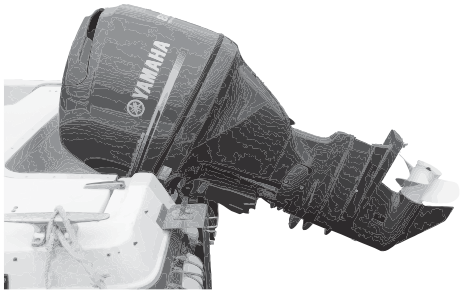



Anchor and anchor rope



型
Certified product mark

※Do confirmation from the suitable position, confirmation by the touch, the confirmation of the expiration date.
※You can ask an examiner when you don't know the place of the accessories of the engine and the equipment.

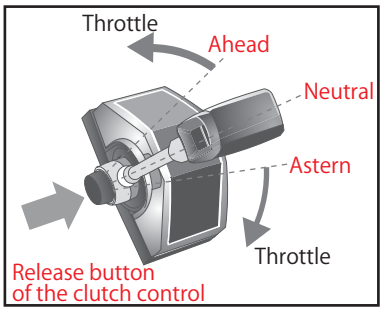


Tilt up

Operation Basic operation can be done with safety.

1 .Machinery Operation

①Start



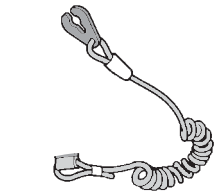
1.Set the key, and in the case of an outboard motor, also set the emergency engine stop code.
For inboard and outboard engines, turn on the blower switch to ventilate the engine room.
2.Check the neutral position of the remote control lever and the outboard motor is tilt-down(the cooling water inlet does not come out of the water surface).
3.An ignition key is turned to "START" position, and an engine starts.
4.Turn off a blower.(I/O engine)
5.Check that there is no abnormal engine sounds or vibrations, and that cooling water is flowing.

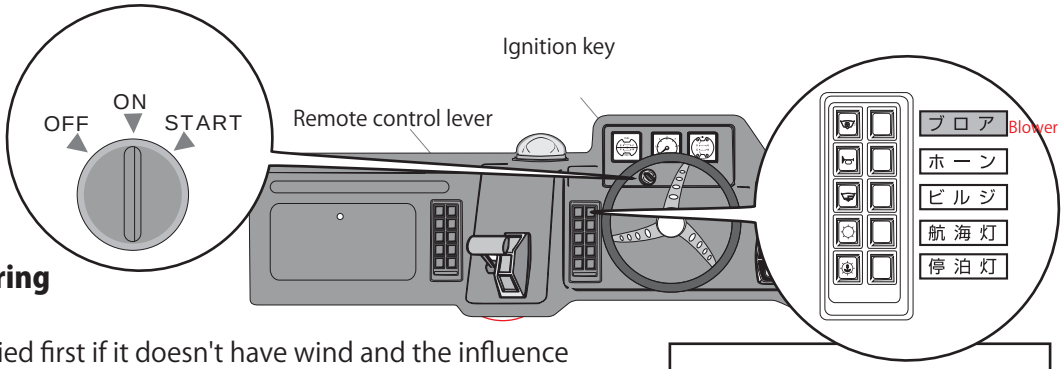
②Warm up

1.A lever is moved with pushing the button of the base of the lever.
And, It is adjusted to the number of rotation indicated.
2.A lever is put back by the examiner's indication, and a neutral position is confirmed.

③Stop

Upon the examiner's instruction, finish the warm-up operation, turn the key switch to OFF, and stop the engine.
After that, remove the key (including the emergency engine stop code).

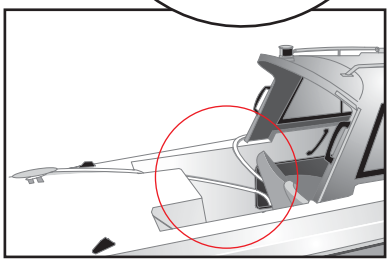

Emergency engine stop code.



2 .Mooring and Unmooring

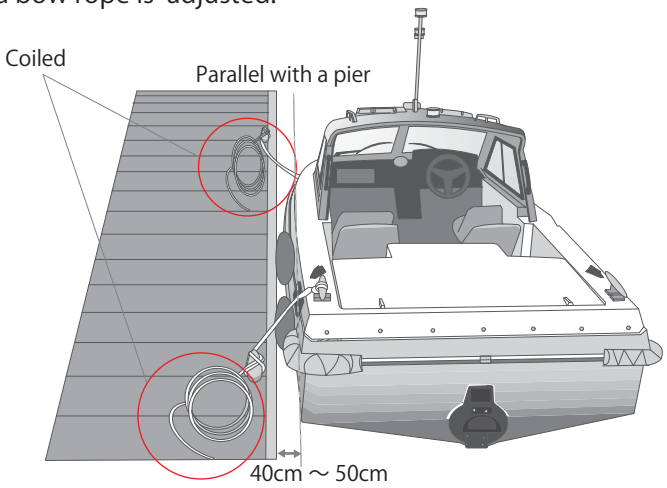
①Unmooring

1.A bow rope is usually untied first if it doesn't have wind and the influence of the flow.（When wind and flow are strong, it is untied from the rope on the leeward side, the downstream side）
2.Go to the stern with having a bow rope, and a stern rope is untied .
3.Pull a boat, and board a boat with holding both of ropes.
4.A rope is stored in the side space of the cabin.

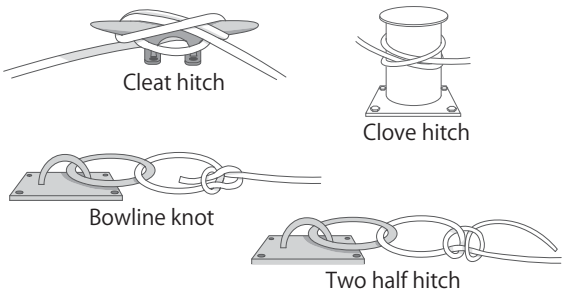


②Mooring

1.Gets off the boat with holding both ropes.
2.A stern rope is usually tied to a pier first if it doesn't have wind and the influence of the flow.
(When wind and flow are strong, it is tied from the rope on the windward side, the upstream side)
3.A clearance with the pier is adjusted with a stern rope.
（The length to board easily, and which fenders can be set. It should be adjusted so that excessive tension may not be applied to the rope and the mooring fittings,when boarding.Almost, about 40-50cm）
4.A bow rope is tied so that a pier and a boat may become parallel.
5.Coil the unused rope.
6.A boat is pushed, and a mooring condition is confirmed.
※When wind from the bow direction and flow are strong, tie a longish bow rope first. After a stern rope is tied , a bow rope is adjusted.



Knot by the difference in the mooring fittings



3 .Start, Run Ahead and Stop,Astern,Altering Courses

★Go ahead toward ○○ at a slow speed. ★Examiner' s orders

1.Check the safety of the circumference of a propeller.
2.Check the safety of the circumference.
3.Shift into ahead,and go ahead toward the object with a speed of 1,000 rev. and under.
4.Keep going straight ahead with a proper lookout.(every 20-30 seconds)


Safety Confirmation around a prop.

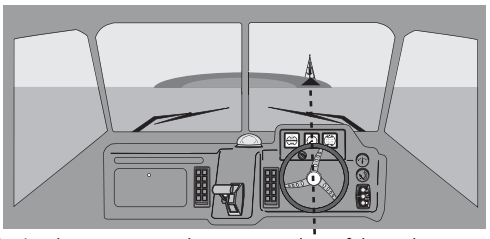
★Accelerate to planing speed.(increase speed to planing condition)

1.Check the safety of the circumference.
2.Increase the speed to the specified rpm while maintaining the target.
3.If a course, a speed become stable,the revolution speed is reconfirmed.
4.Keep going straight ahead with a proper lookout.(every 20-30 seconds)

★Can you see ○○ ? Alter the course toward ○○.

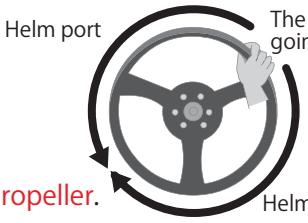
(※When there is no landmark object, it may be indicated in the compasses course.)

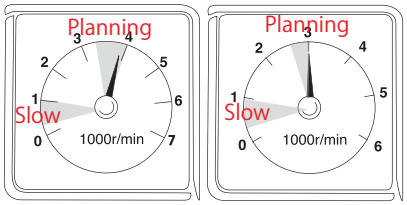
1.Check the safety of the circumference.(especially a back of that course)
2.Steer with half-turn of a wheel from the position which you hold a wheel.
3.Keep a planning speed, ease a helm just before facing the object.
(Steer back to the position of going straight. Do not take your hands off the wheel when you steer during high speed running.)
4.Keep going straight ahead with a proper lookout until examiner' s next order.


Let's take a course on the extension line of the tachometer.

★Decrease the speed and put the engine in neutral.

1.Check the safety of the back.
2.Slow down to low speed.(undrer 1,000rev.)
3.Put a lever the neutral position.



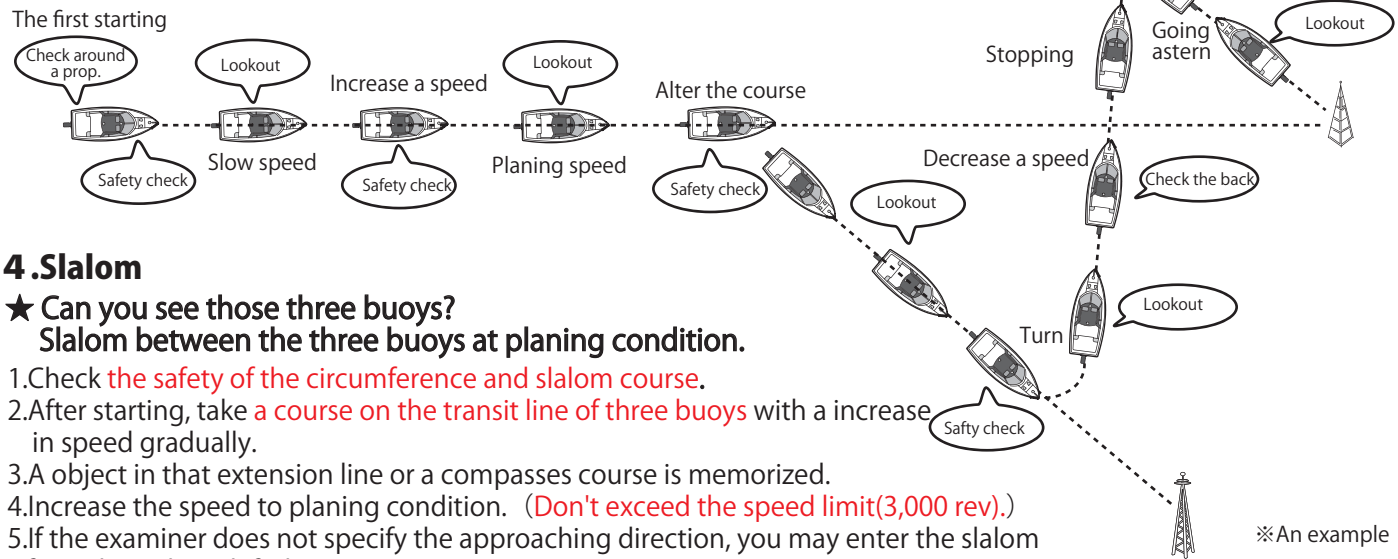


O/B engine I/O engine

※The planing (high speed) speed will vary depending on the boat or weather conditions.
※The speed at low speed (launching, backing up, etc.) is less than 1,000 rpm.

★Go astern toward ○○ at slow speed.

1.Check the safety of the circumference of a propeller.
2.Check the safety of the circumference.
3.Shift into astern,and go astern toward the object with a speed of 1,000 rev. and under.
4.Keep going straight astern with a proper lookout.(every 20-30 seconds)

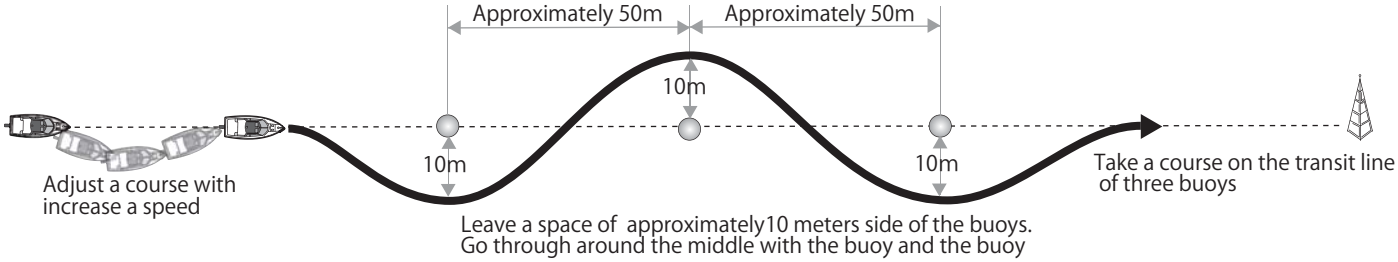


※An example

4 .Slalom

★ Can you see those three buoys? Slalom between the three buoys at planing condition.

1.Check the safety of the circumference and slalom course.
2.After starting, take a course on the transit line of three buoys with a increase in speed gradually.
3.A object in that extension line or a compasses course is memorized.
4.Increase the speed to planing condition. (Don't exceed the speed limit(3,000 rev).)
5.If the examiner does not specify the approaching direction, you may enter the slalom from the right or left direction.
6.Slalom between buoys with half-turn steering.
7.Take the course memorized after a slalom.

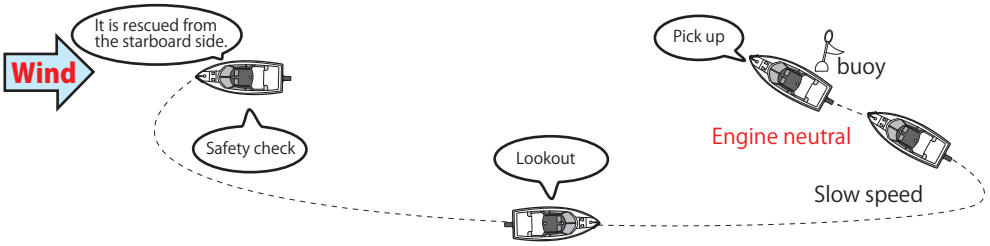


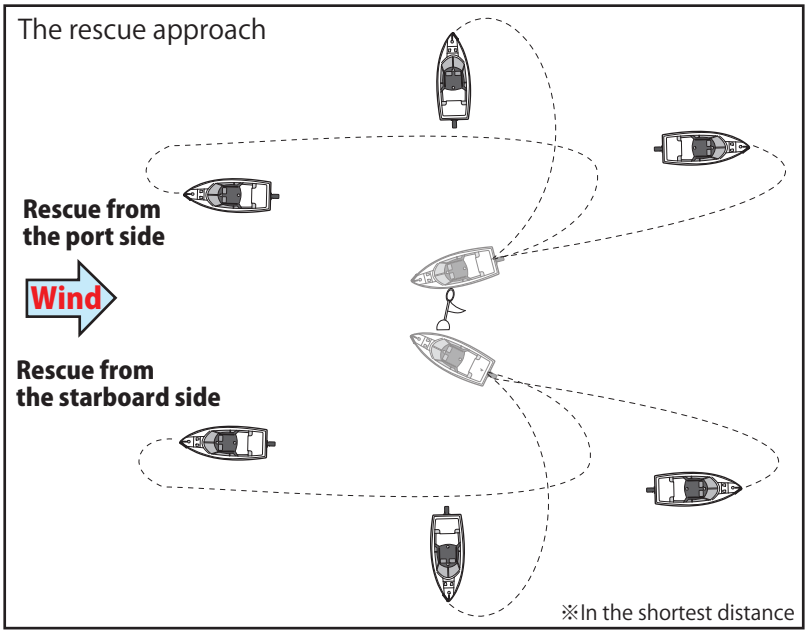
Leave a space of approximately10 meters side of the buoys.
Go through around the middle with the buoy and the buoy

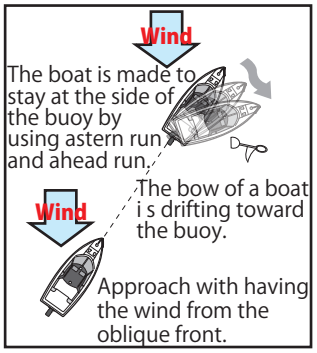
5 .Life Saving

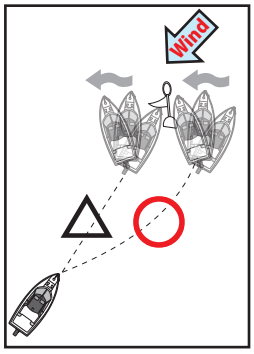
★Can you see that buoy? Try to rescue the buoy. From which side will you attempt to it rescue?

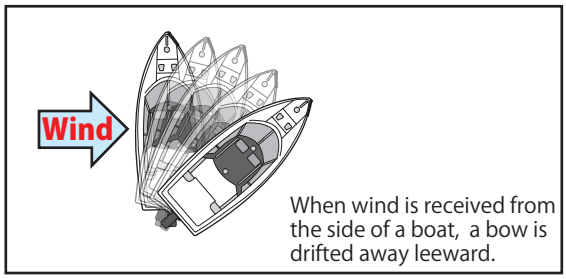
1.After a buoy is confirmed, the conditions of wind and waves are confirmed in the aft deck.
2. Declare that it is rescued on which side of the boat, A boat hook is set on that side.
3.Check the safety of the circumference.
4.Go to the rescue in consideration of the conditions of the wind and waves.
(Keep a lookout during the approach.)
5.A speed is adjusted when you approach a buoy.If it is necessary, decrease speed by slow astern run.
6.Pull the buoy out of the water and put it onboard the boat **yourself**, after the engine is made a neutral securely.
※Prepare rescue with having a boat hook.
※If it is possible, pick up that buoy,even when it came to the opposite side to which you declared.









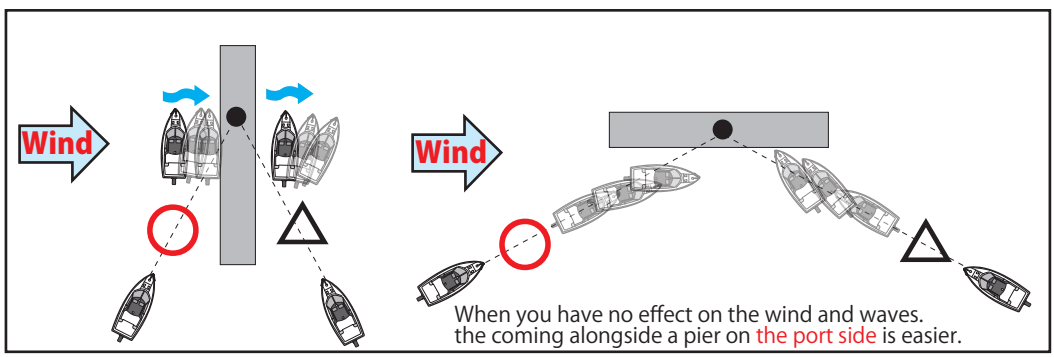


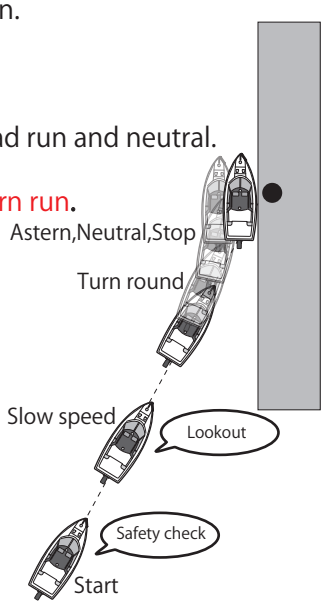
6 .Coming alongside the pier

★Along side point is ○○.Come alongside the pier.

※On account of an examination place,the case that mooring is done, and leaving the pier may be done following coming alongside a pier.

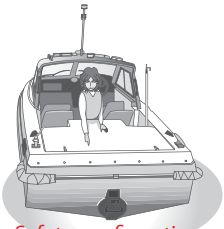
1.After the alongside point is confirmed, you declare which direction you approach. and go to a aft deck,
A boat hook and fender are set on the side of alongside pier.
※If the examiner does not specify, you may come alongside the pier from either direction.
2.Check the safety of the circumference.
3.Approach in consideration of the conditions of the wind and waves.
(Keep a lookout during the approach.)
4.When the boat gets close to the alongside point, speed is adjusted with repeating ahead run and neutral.
5.Turn round the boat While it has a distance with the pier fully.
6.When the pier and the boat become parallel, ease the helm. Stop the boat with an astern run.
7.The boat is drawn to the pier using a boat hook.





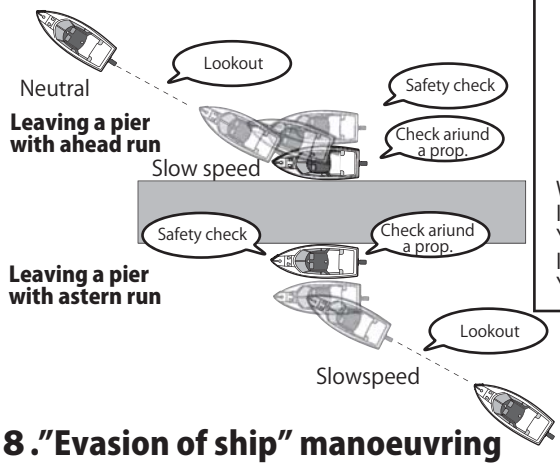
7 .Leaving a pier

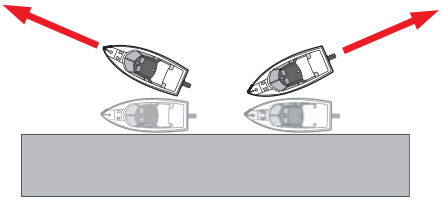
★Continue leaving the pier to that safe water area.



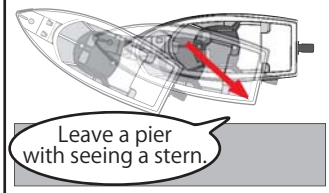
Safety confirmation around a prop.

1.You declare which direction you leave to. and go to the aft deck, check the safety of the circumference of a propaller **and** the boat is pushed from the pier and left using a boat hook.
※If the examiner does not specify, you may leave the pier from either direction.
2.Check the safety of the circumference.
3.Steer a wheel fully to the opposite side of a pier.
4.Go ahead or astern. When an angle is made between the boat and the pier, ease the helm.
5.Leave the pier until the space which the boat turns round on the pier side is made or it passes through the pier completely.





When the boat was pushed.
In case that the bow is left.
You had better leave the pier with ahead run.
In case that the stern is left.
You had better leave the pier with astern run.



When leaving a pier with ahead run, the stern gets close to the pier. Make the sufficient space between the pier before do it.

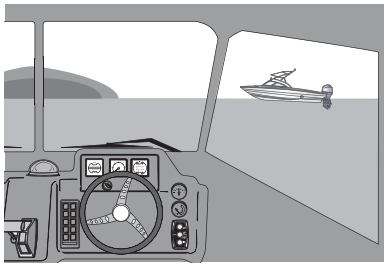
※When there are strong wind and waves to the pier, a boat drifts away leeward..And a stern sometimes strikes a pier when leaving a pier with ahead run.You had better choose astern run in such a case.

8 ."Evasion of ship" manoeuvring

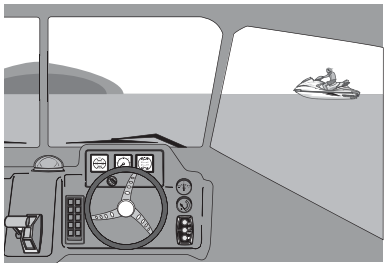
★Other vessel is approaching in the state like this picture. Perform suitable evasion operation.

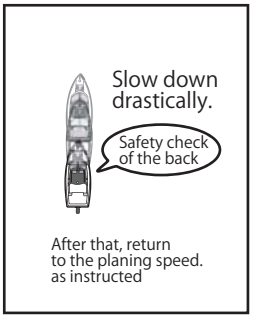
1.**Confirm the safety** corresponding to that evasion operation.
2.Perform the evasion operation which is suitable for the conditions shown by the panel below.After that, return to the original course as instructed, or return to the planing speed.

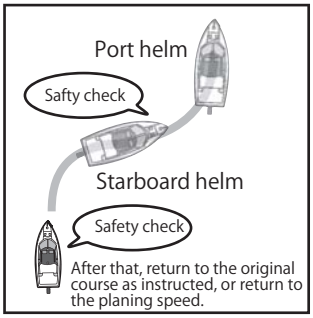
①A motorboat coming from starboard side.



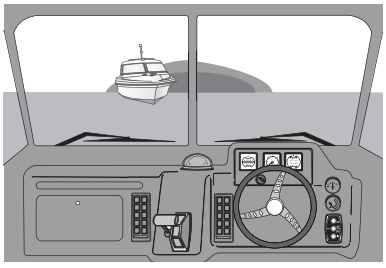
②A wet bike coming from starboard side.



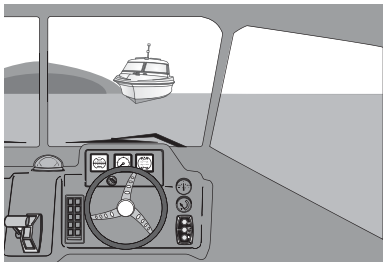


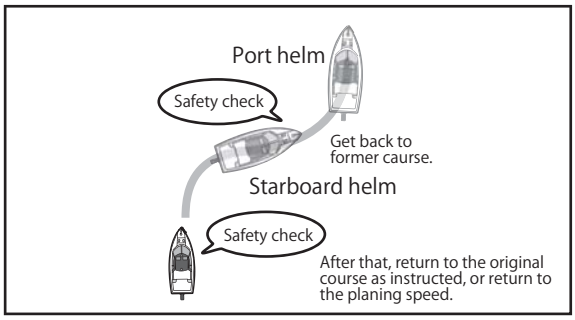


③A motorboat coming from the front of the left

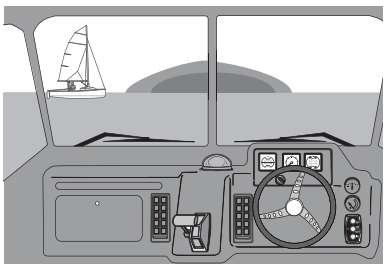


④A motorboat coming from the front of the right

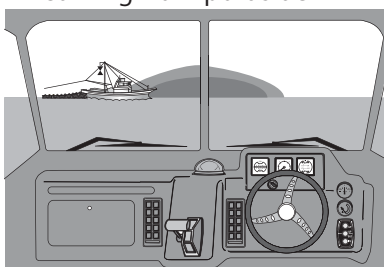


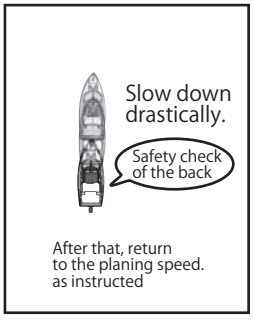


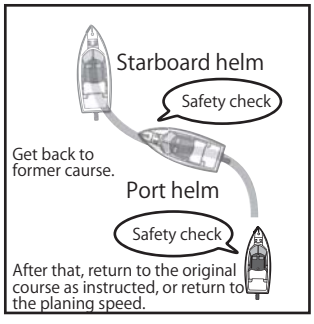
⑤A sailing vessel coming from port side



⑥A vessele ngaged in fishing coming from port side







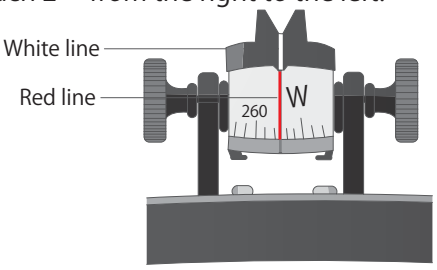
※Evasion manoeuvring・・Do it drastically so that a stand-on vessel can confirm it.
But it is not rapid steering.

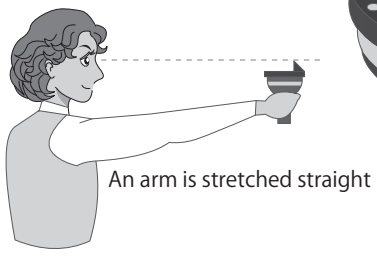
Handling of Navigational Equipment

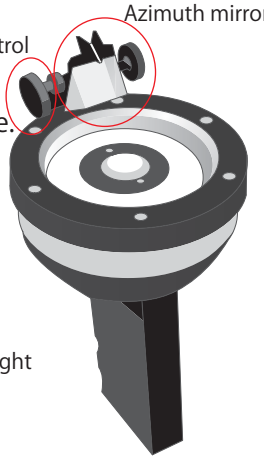
Measure the direction of an object with a hand compass.

★Take the bearing to ○○.

1.Hold a hand compass horizontally, and a azimuth mirror is set up.
2.The angle of the mirror is adjusted so that a azimuth scale may be reflected in the mirror.
3.The red line of the compass and the white line of the mirror are made to be in a straight line.
4.An arm is stretched straight, and the bearing of object is measured.
※Bearings increase at each 2° from the right to the left.







Trouble shooting

The knowledge to prevent an accident, and the emergency measure

★An engine overheats. ○○ is normal. Check one place thought a cause.

①Tilt up a stern drive unit, and check a cooling water inlet.
②Check a V-belt.
③Check engine oil.
④Check the quantity of coolant of a tank. (Indirect cooled engine)

★A hull unusually vibrates. ○○ is normal. Check one place thought a cause.

①Tilt up a stern drive unit, and check a cooling water inlet.
②Check a state of installation of the engine.

★A starter doesn't work. ○○ is normal. Check one place thought a cause.

①Check a main switch.
②Check battery terminals.
③Check whether a remote controller lever is in the neutral position.
④Check a voltmeter.

★A starter works, but an engine isn't started. ○○ is normal. Check one place thought a cause.

①Check amount of fuel.
②Check a fuel cock.
③Check a fuel filter.
④Check plug (high tension) leads

★A battery is uncharged. ○○ is normal. Check one place thought a cause.

①Check a V-belt.
②Check battery terminals.
③Check the electrolyte level of the battery.

★Fuel leak was found. Give a emergency measure.

①An engine is stopped, and a fuel cock is shut.

★Which instrument and gauge do you know the overheat and the completion of the warm up? Answer by pointing.

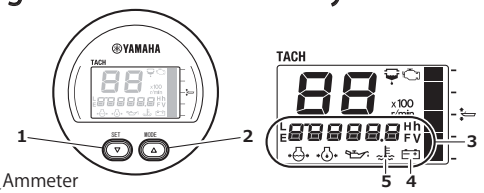
①Coolant temperature gauge(For FR20LS, check the TACH meter in mode 5.)

★Which instrument and gauge do you know the shortage of the engine oil and a state of circulation? Answer by pointing.

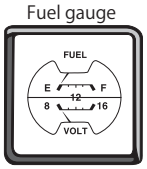
①Oil pressured gauge(In the case of FR20LS, a warning is displayed in the TACH meter and a warning sound is sounded.)

★Which instrument and gauge do you know the wrong point of the generator and the battery? Answer by pointing.

①Ammeter or voltmeter(For FR20LS, check the TACH meter in mode 4.)



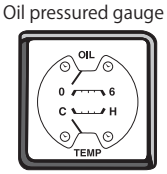
Fuel gauge



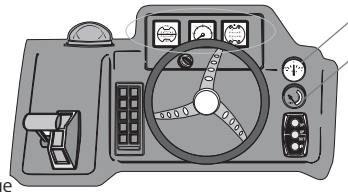
Voltmeter

Tacometer

Oil pressured gauge



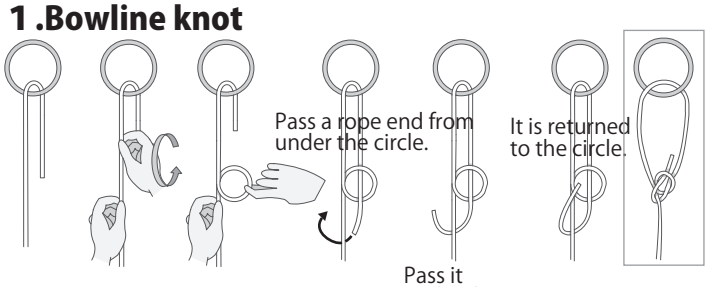
Coolant temperature gauge



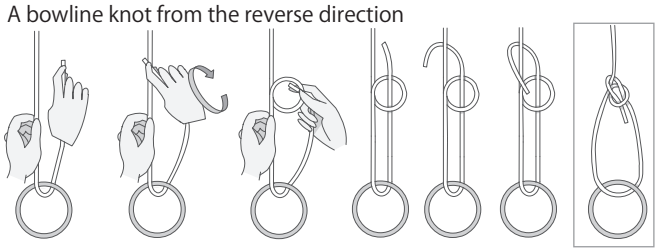
1 Set button
2 **Mode button**
3 Indicates part
4 **Voltmeter**
5 **Cooling water temperature**

Knoting Ropework

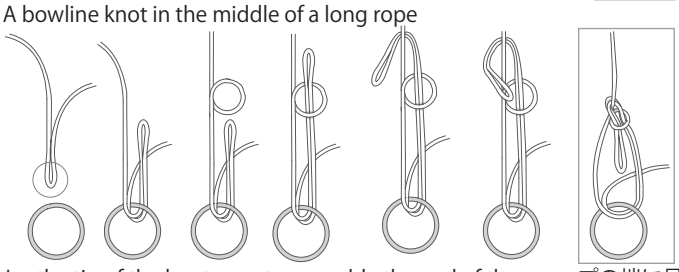
1 .Bowline knot



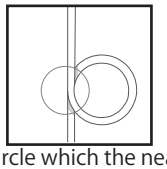
A bowline knot from the reverse direction



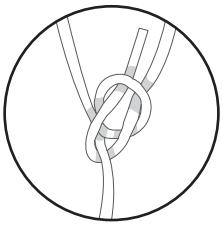
A bowline knot in the middle of a long rope



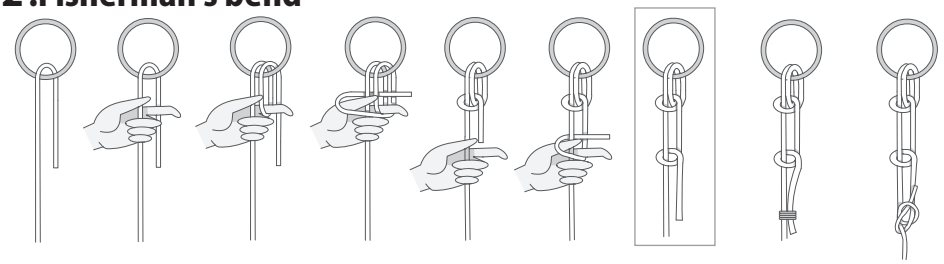
Use the tip of the bent rope to resemble the end of the rope. プの端に見立てる



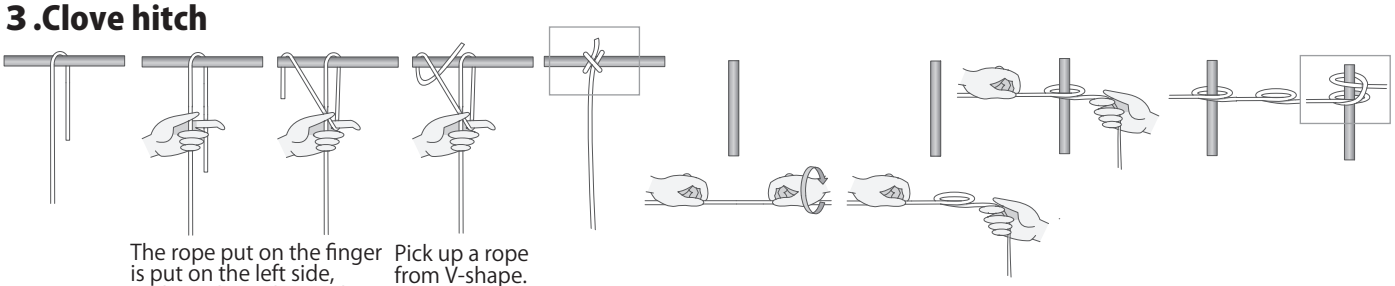
The circle which the near side rope
overlaped from beneath.



2 .Fisherman's bend



3 .Clove hitch



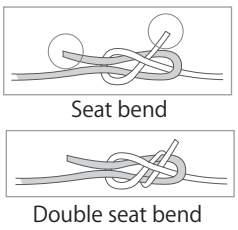
The rope put on the finger
is put on the left side,
and a V-shaped is made.

Pick up a rope
from V-shape.

4 .Seat bend 5.Double seat bend

A rope is bent
in the outside.

Pass it like
the forefinger.



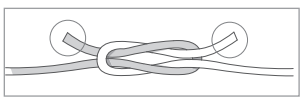
Seat bend

Double seat bend

The tip of two
ropes in the
same side

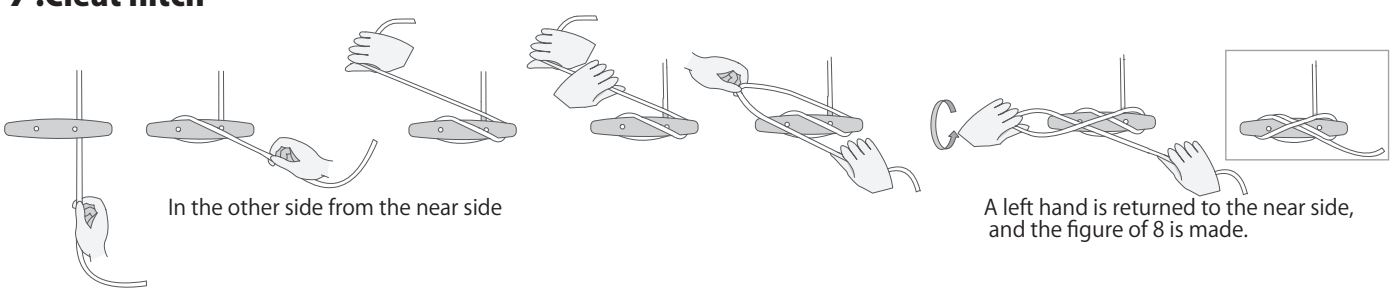
6 .Reef knot

An upward rope is overlaped
on the another rope.



The tip of two
ropes in the
same side

7 .Cleat hitch



In the other side from the near side

A left hand is returned to the near side,
and the figure of 8 is made.

Wind a rope clockwise..