INSTALLATION MANUAL

INBOARD JOYSTICK DOCKING SYSTEM

JC30

YANMAR

YANMAR MRINE INTERNATIONAL B.V.

https://www.yanmar.com

0FJCS-EN0070
Aug.2025-0

Precautions:

- The YANMAR Inboard Joystick Docking System is designed to operate along with the Vessel Control System. There are many control functions and diagnostic functions that are integrated in the system to ensure the safe operation of vessels. If the system is not installed properly in accordance with the instructions in this manual or the system is modified in any way, YANMAR will not be responsible for any failures in the system operation or the vessel utilizing the system.
- The YANMAR Inboard Joystick Docking System has many functions that must be configured. Also, the calibrations must be made before the vessel can be operated. Be sure to make an arrangement to have a YANMAR trained technician to inspect the vessel prior to the vessels operation.
- In addition, please refer to the thruster manual firmly.

Disclaimers:

All information, illustrations and specifications in this manual are based on the latest information available at the time of publishing. The illustrations used in this manual are intended as representative reference views only. YANMAR reserves the right to make any changes at any time without notice.

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Please be sure to follow the necessary procedure.

INSTALLATION MANUAL	MODEL	JC30
	CODE	0FJCS-EN0070

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INSTALLATION MANUAL

JC30

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CONTENTS

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SAFETY PRECAUTIONS

Safety precautions are important and warnings are necessary to operate or install this system safely.
There are safety precautions for this system.
When test-operating after the installation is completed or when a user's operation lecture is held, you should always explain to the operator about these safety precautions.

Safety Precautions

The Inboard Joystick Docking System is a system suitable for slow operation when docking (or undocking) the boat or cruising inside a marina or harbor. Be sure to comply with the precautions and navigate safely.

■ Joystick operation

⚠ WARNING

- **Operating the Inboard Joystick Docking System is difficult in stormy weather conditions. Do not operate in such conditions. It may result in accidents or cause injuries.**
- **Perform the initial setting and adjustment in an environment without obstacles to avoid unexpected accidents, such as collision with other ships or obstacles.**
- **During initial setting and adjustment (calibration), it is not possible to maneuver or operate the engine by using the control head. Take care to avoid unexpected accidents, such as collision with other ships or obstacles.**
- **Do not operate the boat near to swimmers.**

⚠ CAUTION

- **During operation, pay attention to the effect on nearby boats and piers.**
- **During operation, it is not possible to navigate with the control head. Pay attention when navigating the boat.**
- **During operation, note that, the boat will continue to move in the direction that the joystick was tilted.**
- **Operation of this system is affected according to the strength of the waves, wind, and the thruster battery condition. Pay attention when navigating the boat.**
- **During slow-mode operation, the engine speed is lower than in fast-mode, and so the system is more likely to be affected by wind and waves. Pay attention when navigating the boat.**
- **Be sure to stop the engine before inspecting the system components.**
- **If you feel any abnormalities in the boat movement during the joystick operation, switch to the control head navigation.**
- **During operation, the boat can be moved sideways and diagonally, which is different from conventional boat movement. Care must be taken that passengers do not fall overboard due to sudden movement of the boat.**
- **During operation, set the rudder to the center position. If the rudder is not kept in the center, the direction of boat movement will not conform to the direction of joystick lever tilt.**
- **Always turn off the battery switch or detach the earth cable (-) before inspecting the thruster battery, cable, terminals, connectors and harness.**

NOTICE

- This Inboard Joystick Docking System should only be used in combination with the “BOW PRO” manufactured by Vetus B.V. or “SEP SERIES” manufactured by Sleipner Motor Ltd..
  YANMAR does not warrant the proper functioning of this Inboard Joystick Docking System if any other thruster is used.
- Do not spray high-pressure water on electrical components (joystick, display etc.) when cleaning, etc.

INTRODUCTION

The Inboard Joystick Docking System is added as a system component to boats equipped with Vessel Control System.
This system consists of the thruster(s), the joystick, the ECU and the cable harnesses.
A thruster is necessary for this system.
To select the appropriate thruster size, refer to P59 [GUIDELINES FOR SELECTING A THRUSTER].

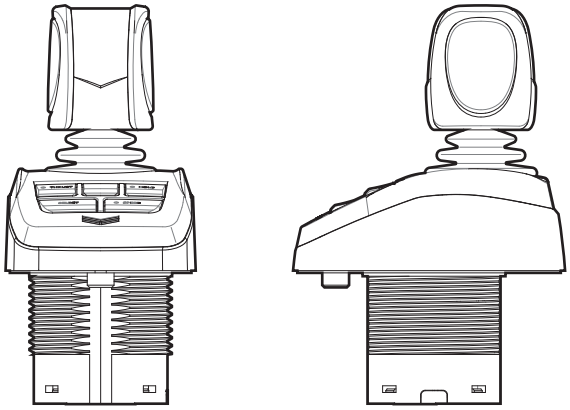
Note • ***For the Vessel Control System, refer to the Vessel Control System Installation Manual.***
- ***And, refer to the Operation Manual of Engine and Marine Gear.***
- ***Carry out thruster installation, cable wiring, and installation checks, in accordance with the thruster manual.***
- ***Take care when selecting a thruster, particularly if the boat has a special hull design. There are cases whereby the boat may not move smoothly due to bow thruster capacity or other factors.***

SYSTEM COMPONENT

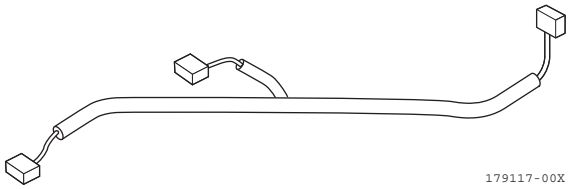
■ JC30 kit

The following parts are included in the JC30 kit.

● Joystick

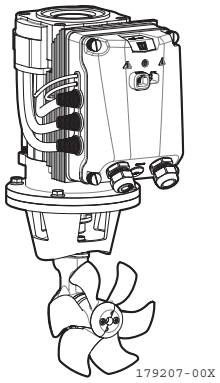


● Harness



■ Bow/stern thruster (locally procured)

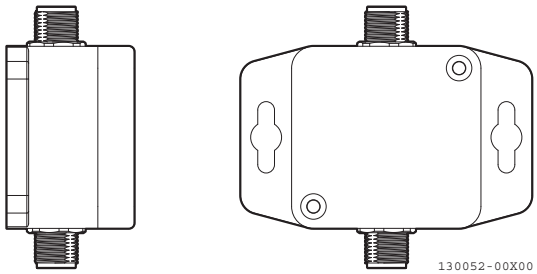
• Manufactured by Vetus B.V.



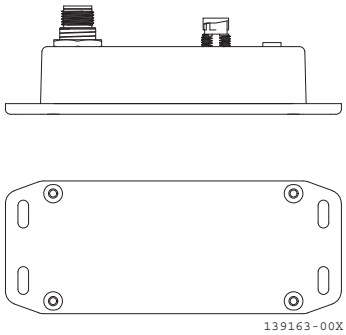
• Manufactured by Sleipner Motor Ltd.

● CAN gateway (locally procured)

• “Vetus CANverter” manufactured by Vetus B.V.



• “S-link GW-2Y” manufactured by Sleipner Motor Ltd.

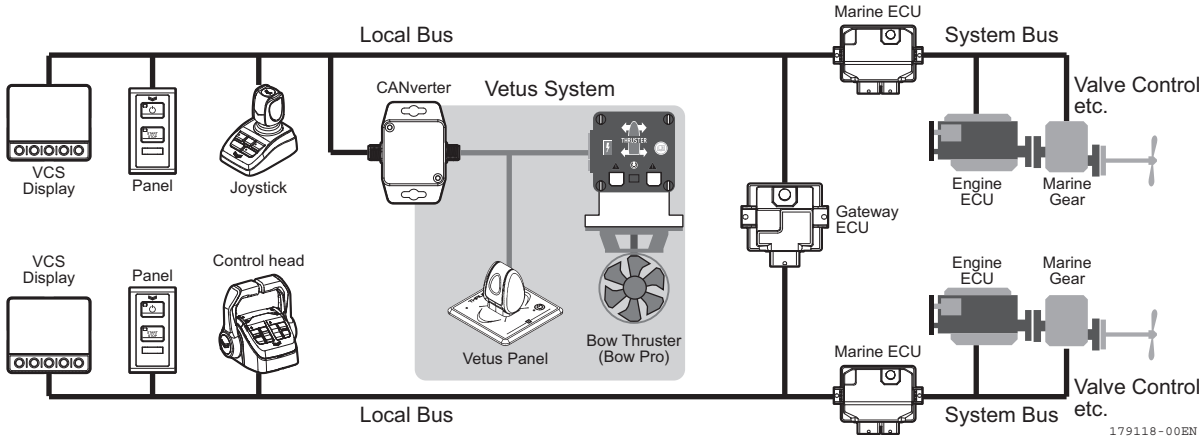


● Thruster battery, fuse, switch, cable and wiring (locally procured)

■ System configuration (For Vetus)

For twin engines

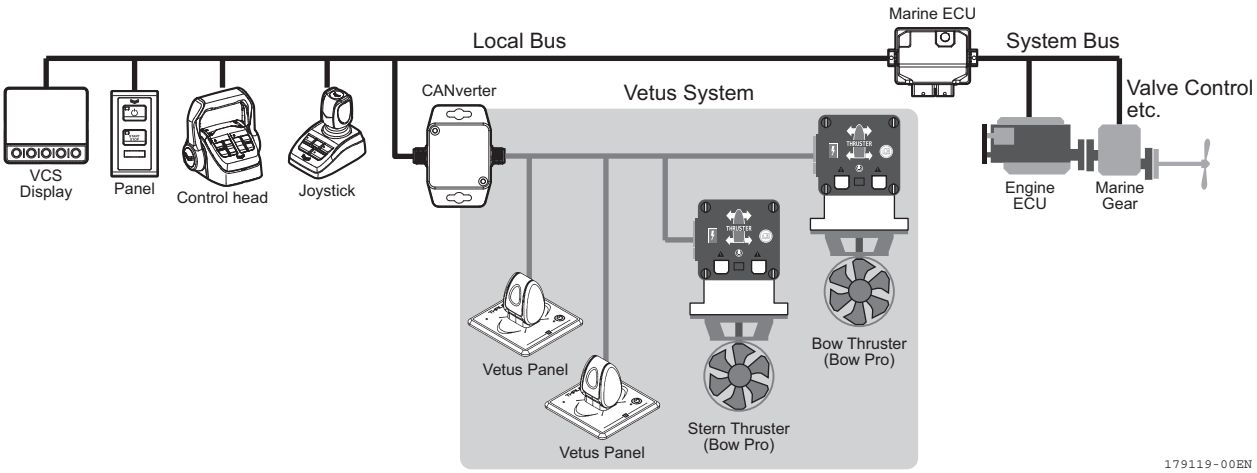
Proportional thruster system (Vetus BOW PRO)



- In case of twin engines, it is possible to connect multiple Bow Pro thrusters: Bow thruster + stern thruster, twin bow or stern thruster (catamaran), or any combination.

For single engine

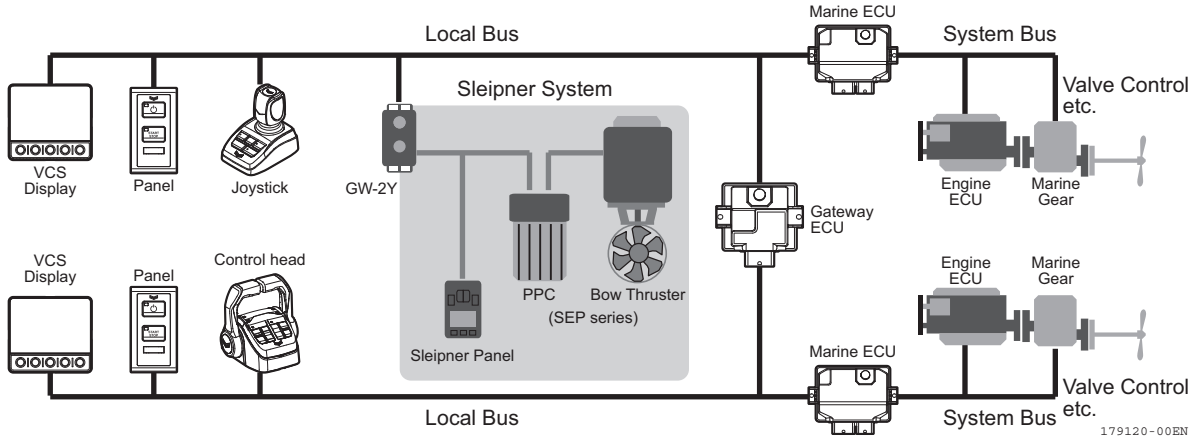
Twin proportional thruster system (Vetus BOW PRO)



■ System configuration (For Sleipner)

For twin engines

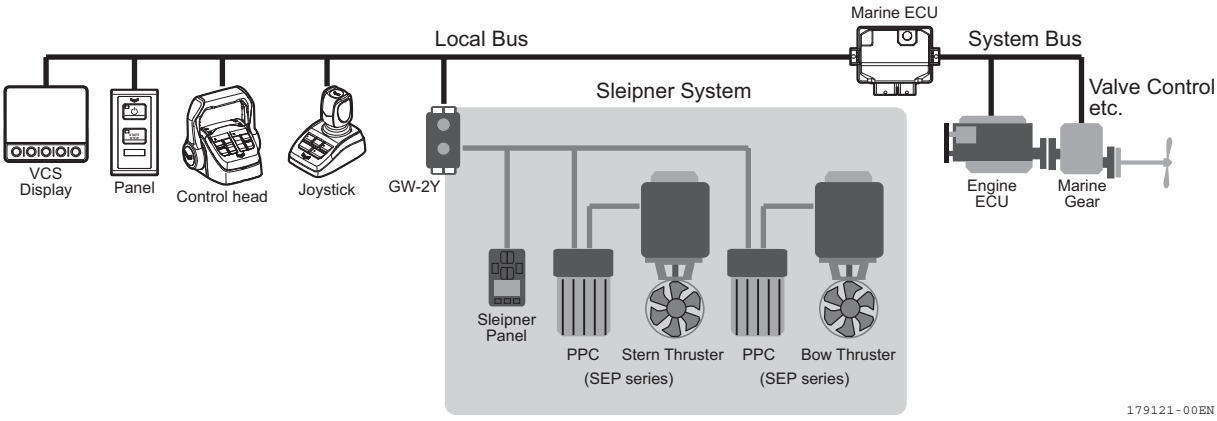
Proportional thruster system (Sleipner SEP)



- In case of twin engines, it is possible to connect multiple SEP series thrusters: Bow thruster + stern thruster, twin bow or stern thruster (catamaran), or any combination.
- It is mandatory to install the Sleipner Panel in combination with SEP series thrusters.

For single engine

Twin proportional thruster system (Sleipner SEP)

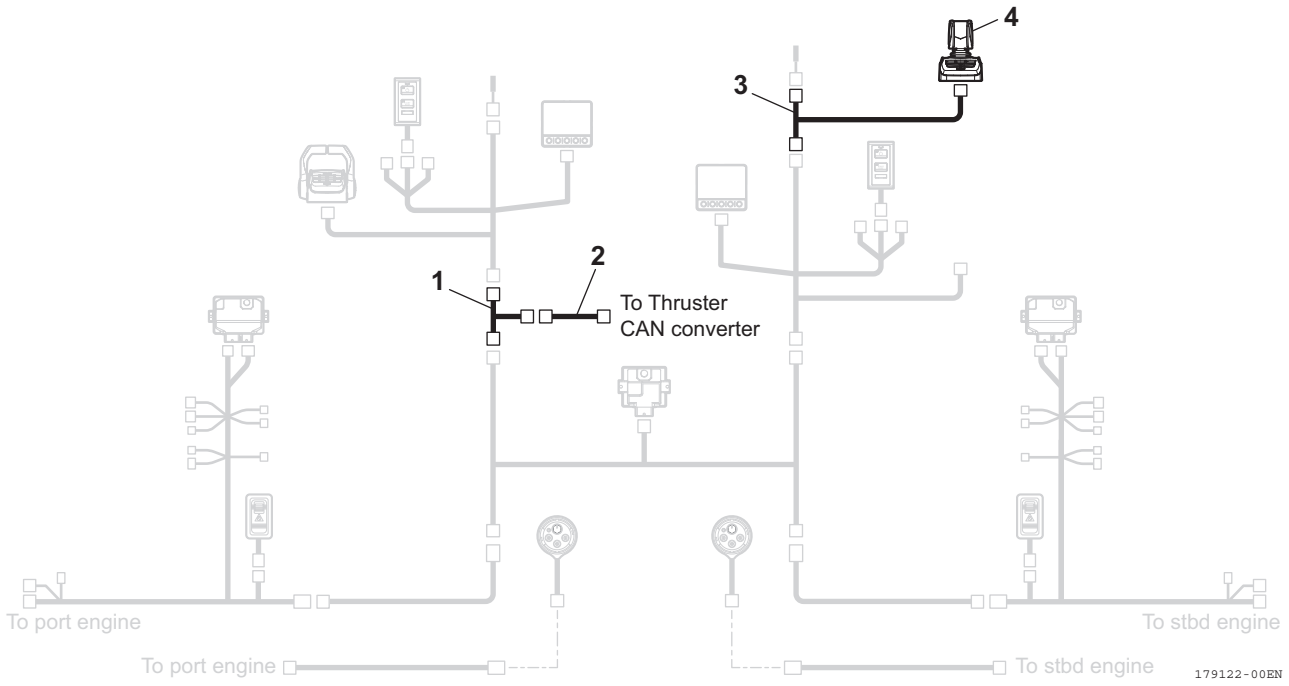


It is mandatory to install the Sleipner Panel in combination with SEP series thrusters.

■ Connection of JC30 kit

For twin engines

Proportional thruster system (Vetus BOW PRO)

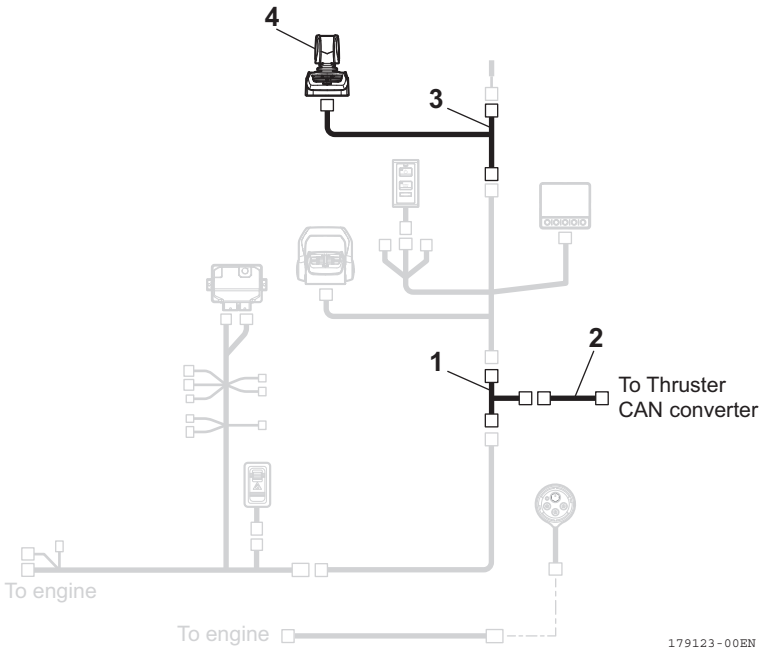


No.	Parts No.	Name	Note
1	164300-22110	Harness, CAN T	1 m
2	164000-24801	Cable, CAN A	
3	164300-22110	Harness, CAN T	1 m
	164300-22120	Harness, CAN T	2 m
	164300-22130	Harness, CAN T	3 m
4	164300-42000	Joystick	

Note: No. 1 harness must be connected to Port side (in engine room or at helm station).

For single engine

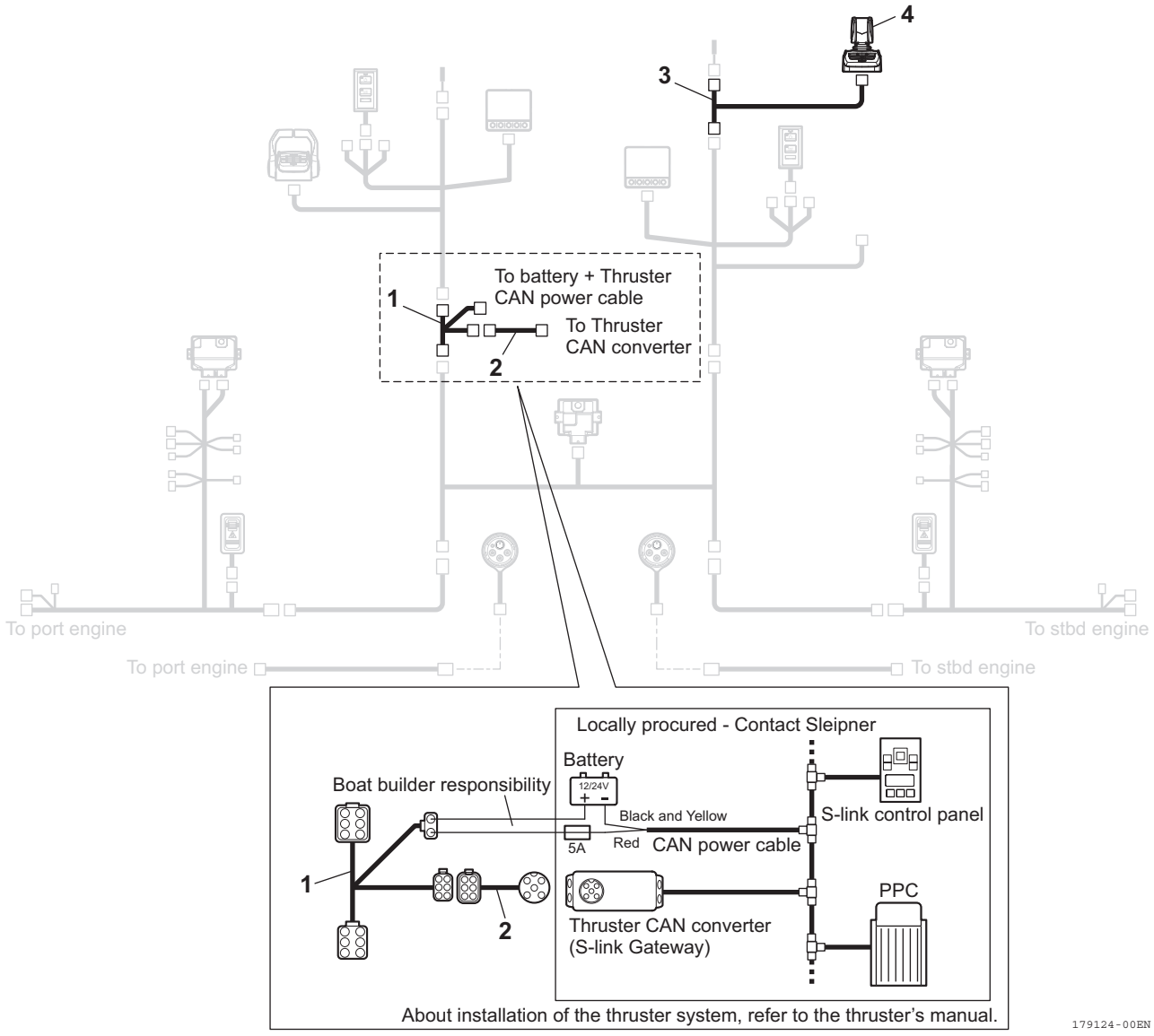
Twin proportional thruster system (Vetus BOW PRO)



No.	Parts No.	Name	Note
1	164300-22110	Harness, CAN T	1 m
2	164000-24801	Cable, CAN A	
3	164300-22110	Harness, CAN T	1 m
	164300-22120	Harness, CAN T	2 m
	164300-22130	Harness, CAN T	3 m
4	164300-42000	Joystick	

For twin engines

Proportional thruster system (Sleipner SEP)

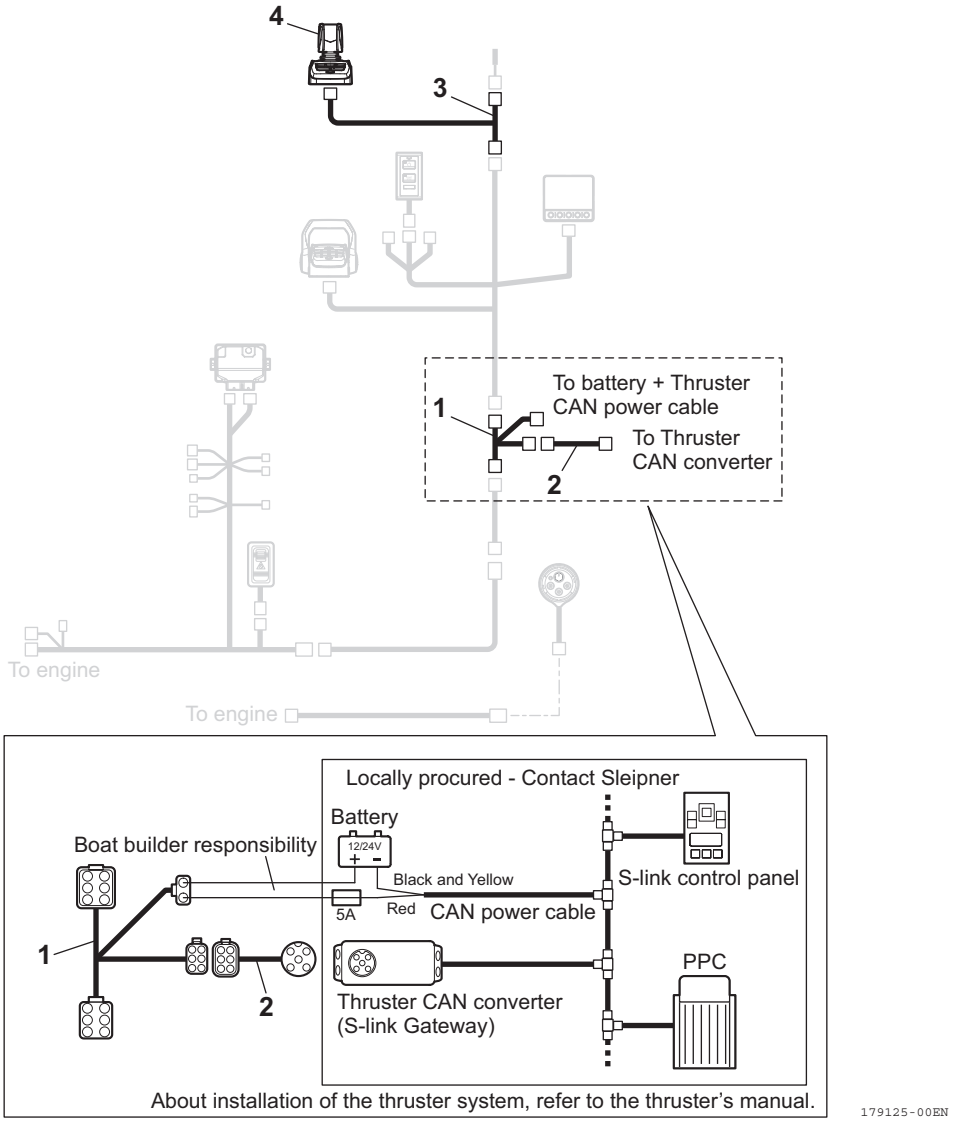


No.	Parts No.	Name	Note
1	164300-21230	Harness, THRSTR PWR	
2	164000-24801	Cable, CAN A	
3	164300-22110	Harness, CAN T	1 m
	164300-22120	Harness, CAN T	2 m
	164300-22130	Harness, CAN T	3 m
4	164300-42000	Joystick	

Note: No. 1 harness must be connected to Port side (in engine room or at helm station).

For single engine

Twin proportional thruster system (Sleipner SEP)

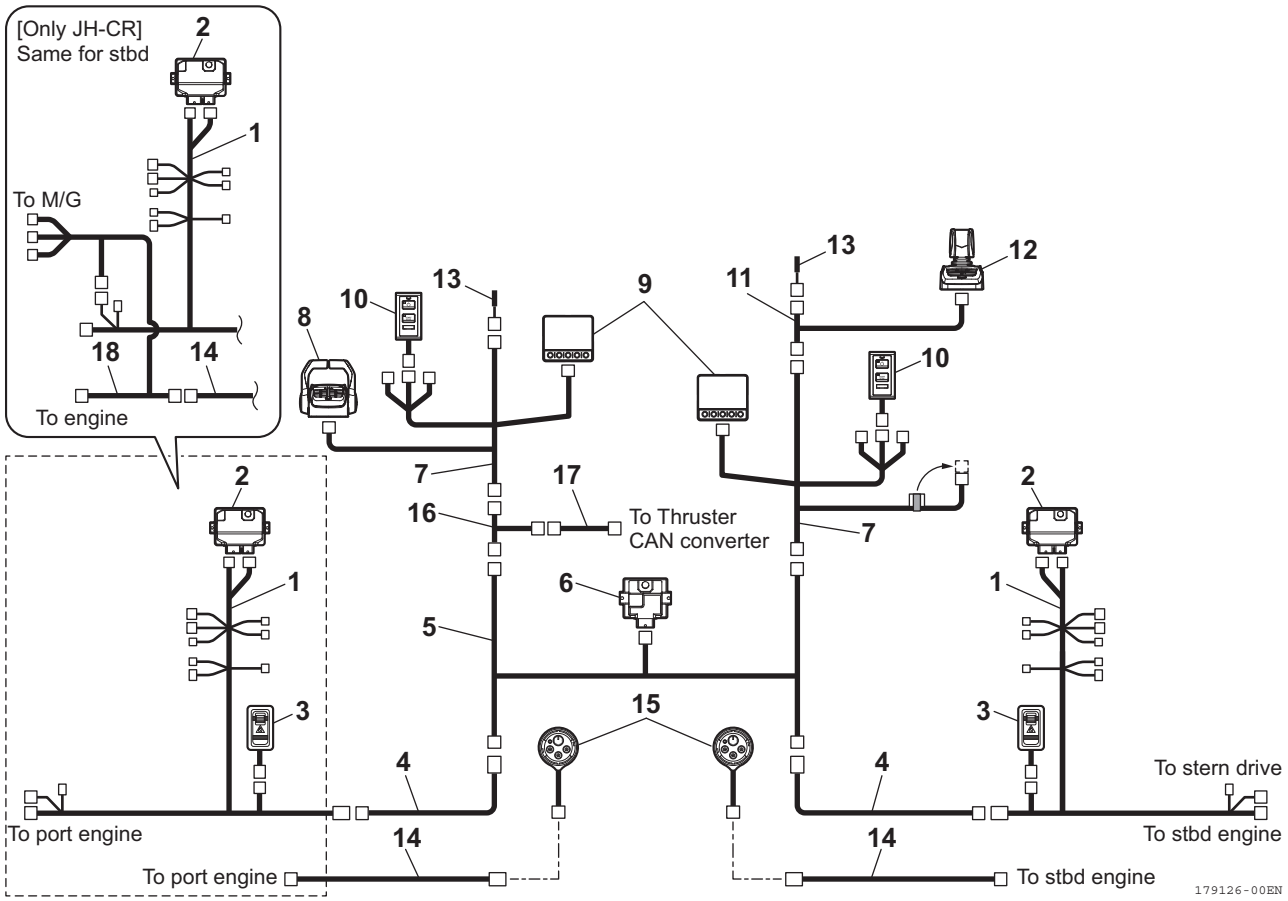


No.	Parts No.	Name	Note
1	164300-21230	Harness, THRSTR PWR	
2	164000-24801	Cable, CAN A	
3	164300-22110	Harness, CAN T	1 m
	164300-22120	Harness, CAN T	2 m
	164300-22130	Harness, CAN T	3 m
4	164300-42000	Joystick	

■ Total connection of Cable harness

For twin engines

Proportional thruster system (Vetus BOW PRO)



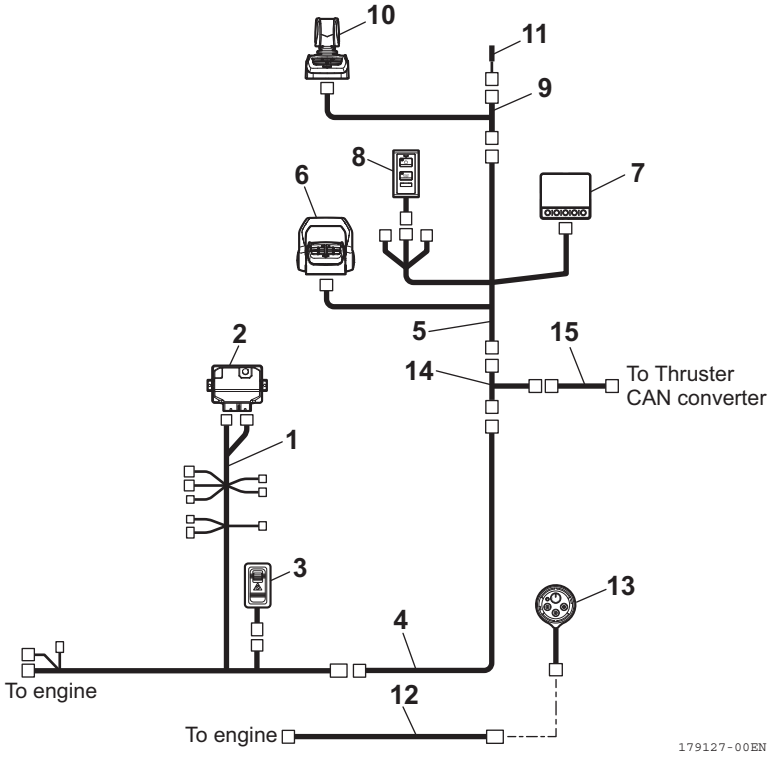
No.	Parts No.	Name	Note
1	164300-2112X	Harness, VC30 main	
2	164300-1000X	Marine ECU	
3	164100-3150X	Emergency stop switch	
4	164300-2202X	Harness, ext.	3 m
	164300-2203X	Harness, ext.	5 m
	164300-2204X	Harness, ext.	10 m
	164300-2205X	Harness, ext.	20 m
5	164300-2109X	Harness, twin	
6	164300-1001X	Marine gateway ECU	
7	164300-2101X	Harness, station	
8	164200-4112X	Control head (M/G, trolling)	
9	164300-5110X	Display	

No.	Parts No.	Name	Note
10	164200-3721X	Switch panel	
11	164300-2211X	Harness, CAN T	1 m
	164300-2212X	Harness, CAN T	2 m
	164300-2213X	Harness, CAN T	3 m
12	164300-4200X	Joystick	
13	164300-2900X	Adapter, terminal	
14	164000-2226X	Harness, ext.	5 m
	164000-2227X	Harness, ext.	10 m
15	164200-3000X	Back up panel	
16	164300-2211X	Harness, CAN T	1 m
17	164000-2480X	Cable, CAN A	
18	164300-2303X	Harness, SFT/TROLL JH	

Note: No. 16 harness must be connected to Port side (in engine room or at helm station).

For single engine

Twin proportional thruster system (Vetus BOW PRO)

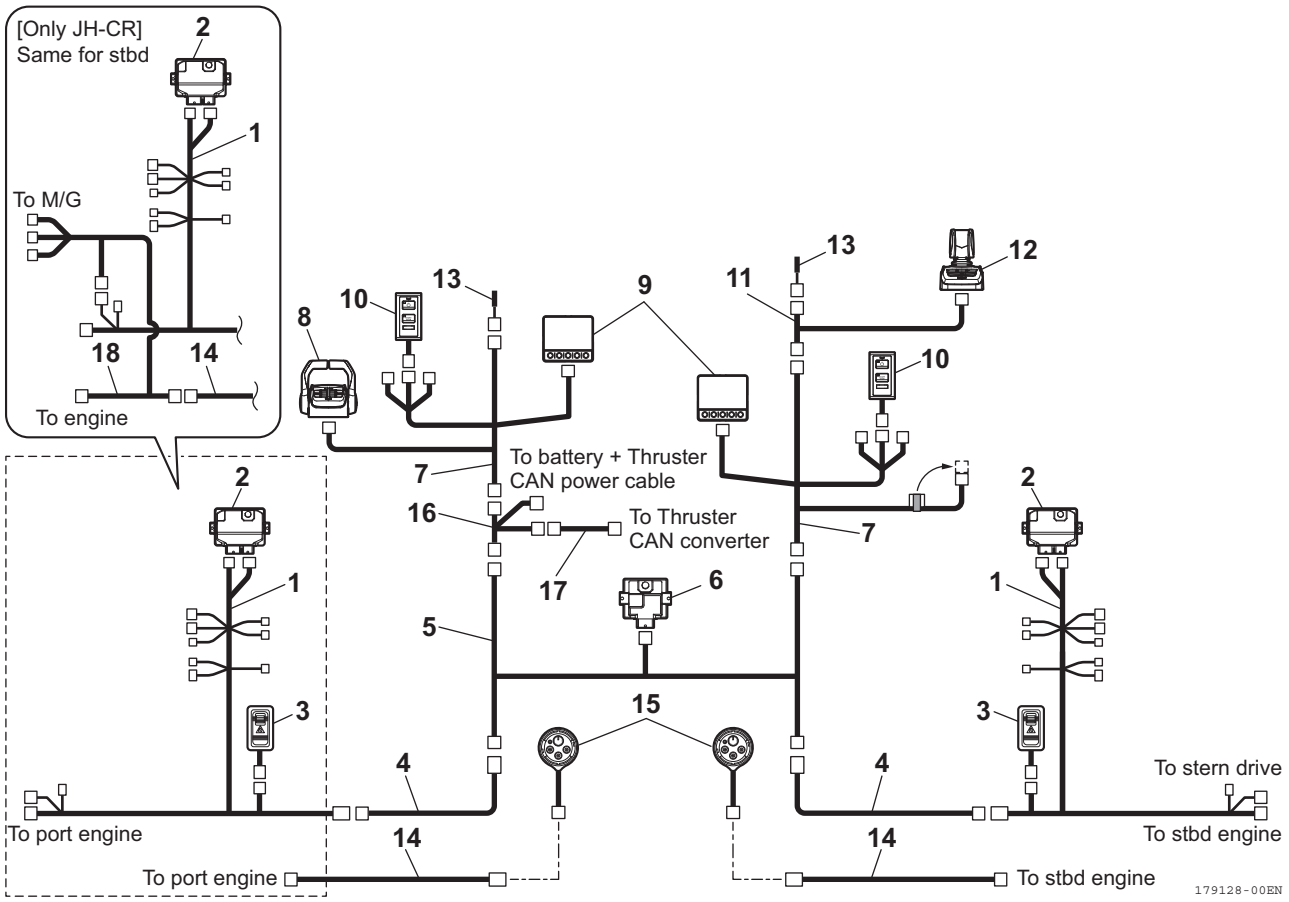


No.	Parts No.	Name	Note
1	164300-2112X	Harness, VC30 main	
2	164300-1000X	Marine ECU	
3	164100-3150X	Emergency stop switch	
4	164300-2202X	Harness, ext.	3 m
	164300-2203X	Harness, ext.	5 m
	164300-2204X	Harness, ext.	10 m
	164300-2205X	Harness, ext.	20 m
5	164300-2101X	Harness, station	
6	146200-4111X	Control head (M/G, trolling)	
7	164300-5110X	Display	
8	164200-3721X	Switch panel	

No.	Parts No.	Name	Note
9	164300-2211X	Harness, CAN T	1 m
	164300-2212X	Harness, CAN T	2 m
	164300-2213X	Harness, CAN T	3 m
10	164300-4200X	Joystick	
11	164300-2900X	Adapter, terminal	
12	164000-2226X	Harness, ext.	5 m
	164000-2227X	Harness, ext.	10 m
13	164200-3000X	Back up panel	
14	164300-2211X	Harness, CAN T	1 m
15	164000-2480X	Cable, CAN A	

For twin engines

Proportional thruster system (Sleipner SEP)



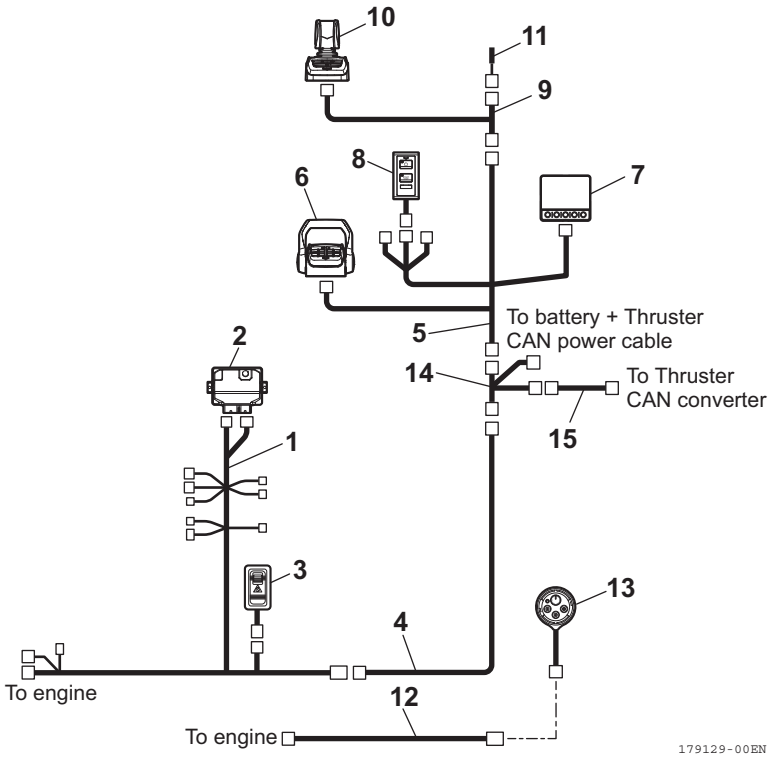
No.	Parts No.	Name	Note
1	164300-2112X	Harness, VC30 main	
2	164300-1000X	Marine ECU	
3	164100-3150X	Emergency stop switch	
4	164300-2202X	Harness, ext.	3 m
	164300-2203X	Harness, ext.	5 m
	164300-2204X	Harness, ext.	10 m
	164300-2205X	Harness, ext.	20 m
5	164300-2109X	Harness, twin	
6	164300-1001X	Marine gateway ECU	
7	164300-2101X	Harness, station	
8	164200-4112X	Control head (M/G, trolling)	
9	164300-5110X	Display	

No.	Parts No.	Name	Note
10	164200-3721X	Switch panel	
11	164300-2211X	Harness, CAN T	1 m
	164300-2212X	Harness, CAN T	2 m
	164300-2213X	Harness, CAN T	3 m
12	164300-4200X	Joystick	
13	164300-2900X	Adapter, terminal	
14	164000-2226X	Harness, ext.	5 m
	164000-2227X	Harness, ext.	10 m
15	164200-3000X	Back up panel	
16	164300-2123X	Harness, THRSTR PWR	
17	164000-2480X	Cable, CAN A	
18	164300-2303X	Harness, SFT/TROLL JH	

Note: No. 16 harness must be connected to Port side (in engine room or at helm station).

For single engine

Twin proportional thruster system (Sleipner SEP)

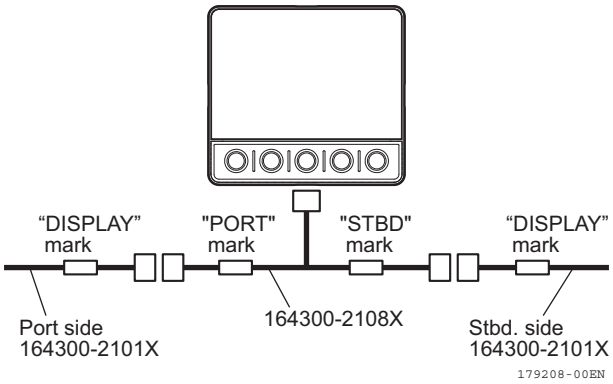


No.	Parts No.	Name	Note
1	164300-2112X	Harness, VC30 main	
2	164300-1000X	Marine ECU	
3	164100-3150X	Emergency stop switch	
4	164300-2202X	Harness, ext.	3 m
	164300-2203X	Harness, ext.	5 m
	164300-2204X	Harness, ext.	10 m
	164300-2205X	Harness, ext.	20 m
5	164300-2101X	Harness, station	
6	164200-4111X	Control head (M/G, trolling)	
7	164300-5110X	Display	
8	164200-3721X	Switch panel	

No.	Parts No.	Name	Note
9	164300-2211X	Harness, CAN T	1 m
	164300-2212X	Harness, CAN T	2 m
	164300-2213X	Harness, CAN T	3 m
10	164300-4200X	Joystick	
11	164300-2900X	Adapter, terminal	
12	164000-2226X	Harness, ext.	5 m
	164000-2227X	Harness, ext.	10 m
13	164200-3000X	Back up panel	
14	164300-2123X	Harness, THRSTR PWR	
15	164000-2480X	Cable, CAN A	

■ Optional display harness (Dual engine one display)

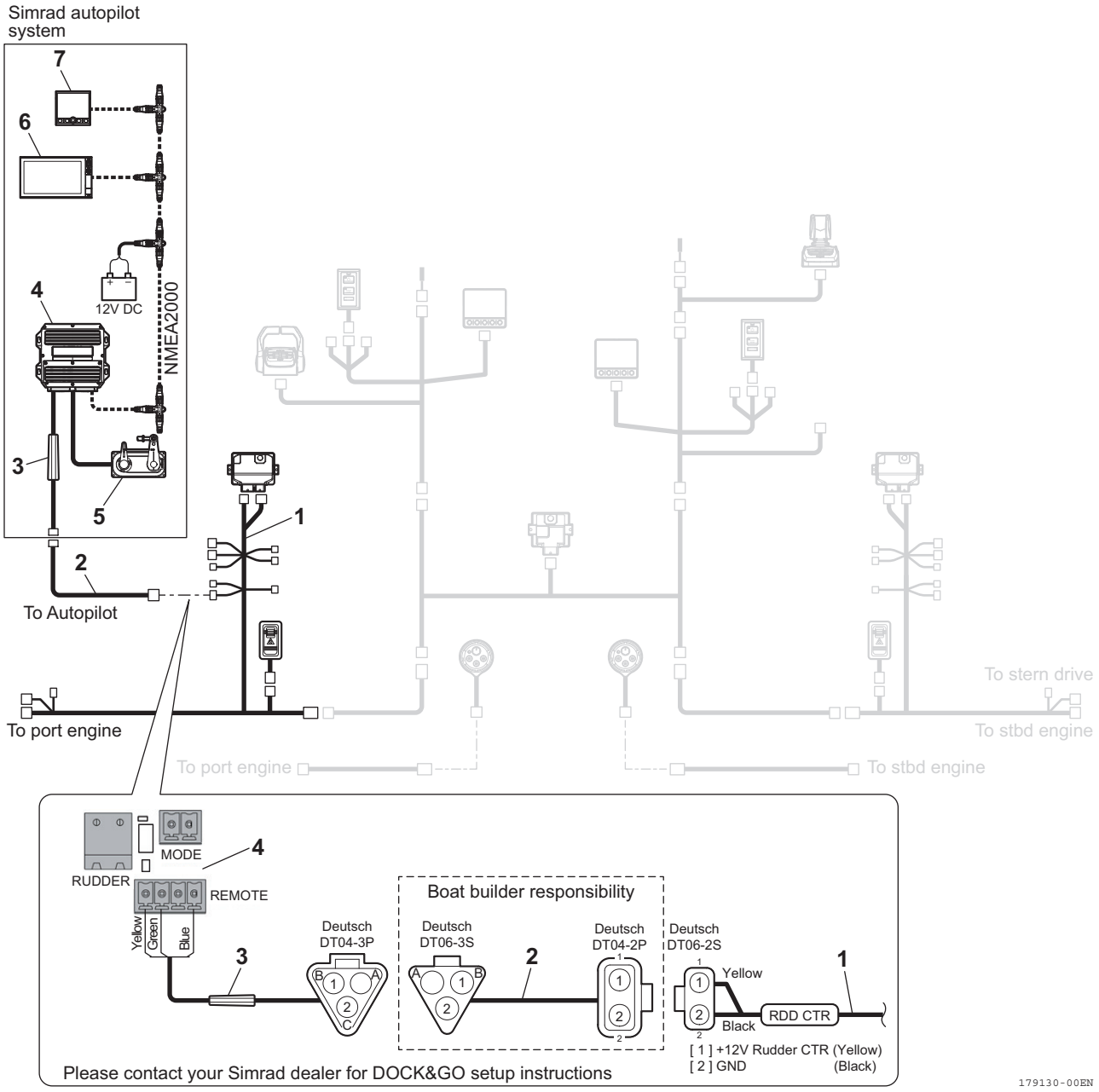
If you want to show the engine data of Port and Stbd. on one display, connect 164300-2108X as shown in the illustration on the right.



■ Connection of autopilot system for rudder automatic centering

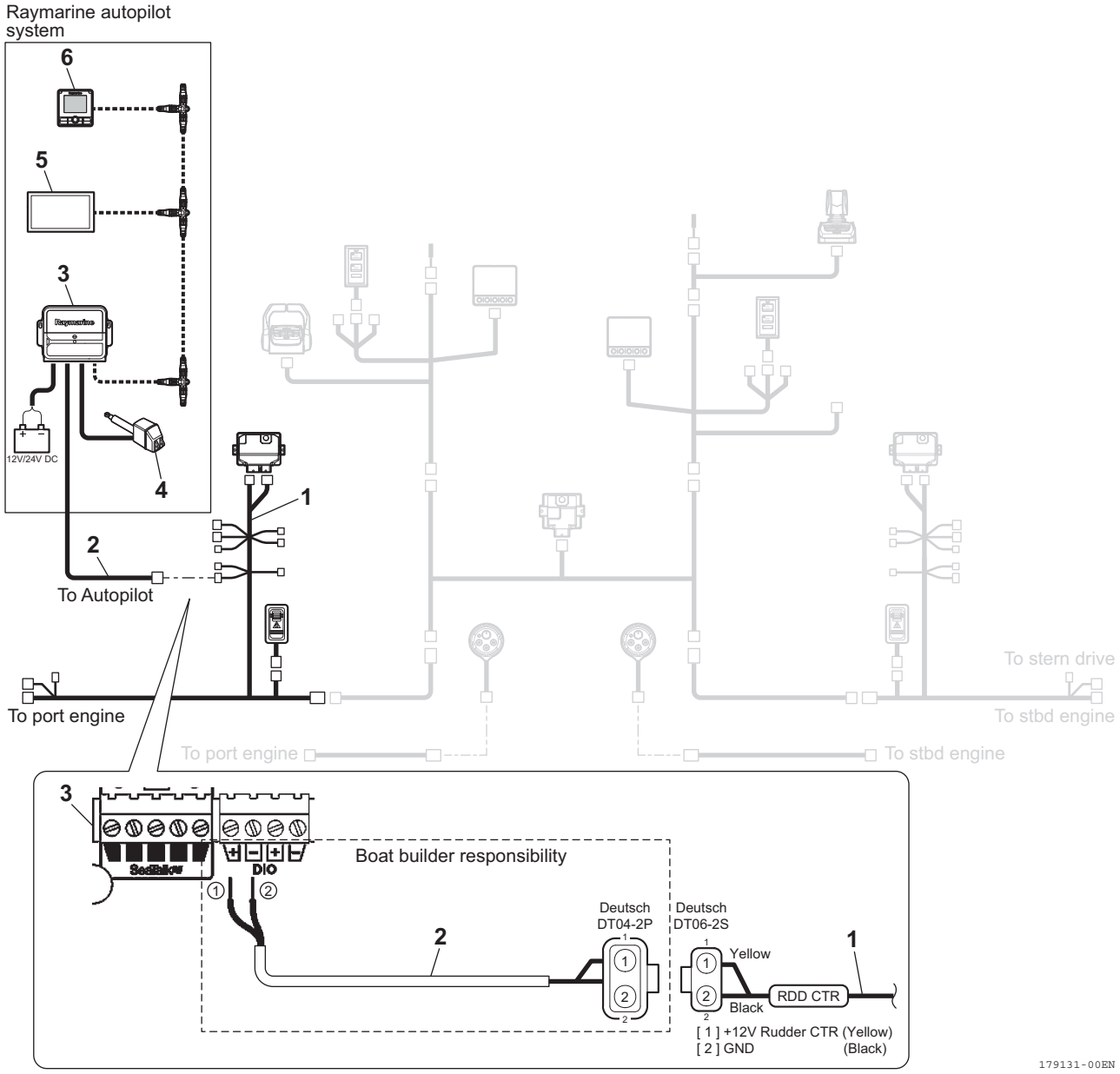
When you connect to the signal for the autopilot rudder sensor and select the joystick, the rudder is automatically driven to the center.

Connection of Simrad autopilot



No.	Parts No.	Name	Note
1	164300-2112X	Harness, VC30 main	
2		Harness, adapter	Boat builder responsibility
3		DOCK&GO cable, 000-14158-001	Please contact your Simrad dealer
4		NAC-3	Please contact your Simrad dealer
5		Drive unit	Please contact your Simrad dealer
6		Multifunction display	Please contact your Simrad dealer
7		Autopilot controller AP44	Please contact your Simrad dealer

Connection of Raymarine autopilot



No.	Parts No.	Name	Note
1	164300-2112X	Harness, VC30 main	
2		Harness, adapter	Boat builder responsibility
3		ACU400	Please contact your Raymarine dealer
4		Drive unit	Please contact your Raymarine dealer
5		Multifunction display	Please contact your Raymarine dealer
6		Autopilot controller	Please contact your Raymarine dealer

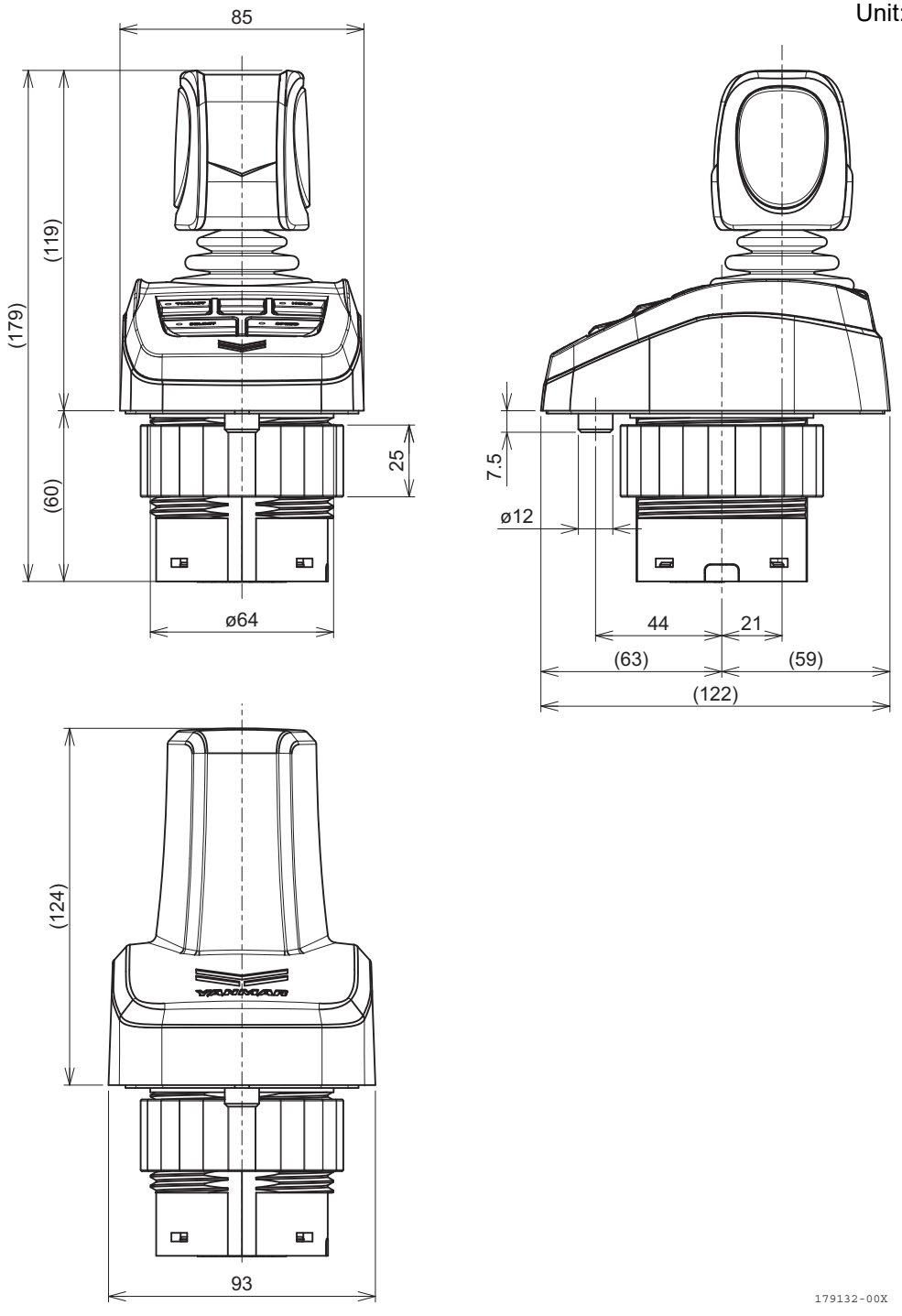
INSTALLATION (OF COMPONENTS)

■ Installation of the joystick

Like the electronic helm, install the joystick to the steering part.
Apply the sealing compound to the installation part as required.

Note: To enable the emergency stop for your safety, install the joystick near the engine switch panel.

Unit: m



Note: For the cutout template, refer to P61 [Joystick].

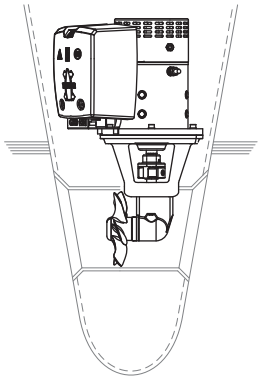
■ Installation of the bow/stern thruster

This system should only used in combination with “BOW PRO” manufactured by Vetus B.V. or “SEP SERIES” manufactured by Sleipner Motor Ltd..

About installation of the thruster, refer to the thruster’s manual.

Particularly if the boat has a special hull design, such as a catamaran, there are cases whereby the boat may not move smoothly. Therefore, attention is required when selecting the bow/stern thruster size.

Note: Confirm with the thruster supplier on installing the thruster, thruster battery, cable and wiring.



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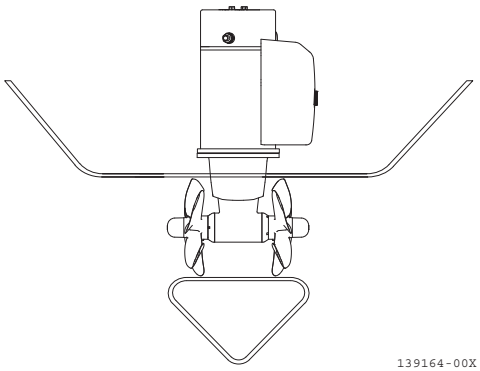


139164-00X

■ Connection of the wire harness

After the installation of the components, connect each wire harness around the helm station and engine room.

CHECKING OF INSTALLATION

Inspect the system and check for abnormalities after the completion of the installation of components and wiring.
For the thruster checking, refer to the thruster's manual.

■ Connection check

- Check that all connection parts are securely connected without incorrect connection to the equipment, switches and controllers.

■ Circuit check

- Check that the display appears after turning ON the battery switch and the switch panel.
- Check that the button lamp lights by pressing the system start button of the joystick.

■ Bow/Stern thruster check

- Check that the bow/stern thruster and the thruster battery is securely installed.
- Check that the connection cable and harness are securely connected.
- Additionally check others based on the thruster's manual.

■ Sea trials

- After carrying out of installation checking, set and calibrate the system, and check operation at the time of sea trials of engines.
- Check the operation of other ones after confirming first that boat movement is same as the direction where a joystick lever was tilted.
  If the movement of the boat is opposite to the direction in which the joystick lever was tilted, refer to P35 [About thruster] and calibrate.

SETTING OF DISPLAY

Be sure to perform the initial setting of the display after the completion of the installation check.
Perform the settings of JC30 and VC30 at the same time, as SETTING shows below.
You already have a VC30 installed on your boat, refer to RECONFIGURATION on page 29 for adding JC30.
(See VC30 Installation Manual.)

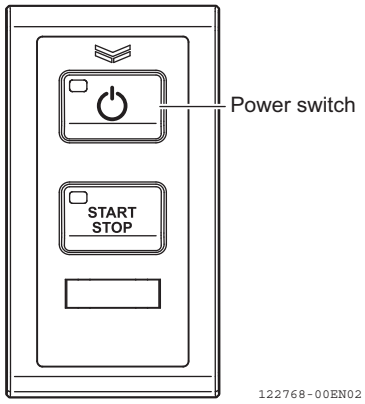
■ SETTINGS

Your Vessel control system is configured with the default settings at the factory. However, you need to change and set some of the defaults before the first engine running.

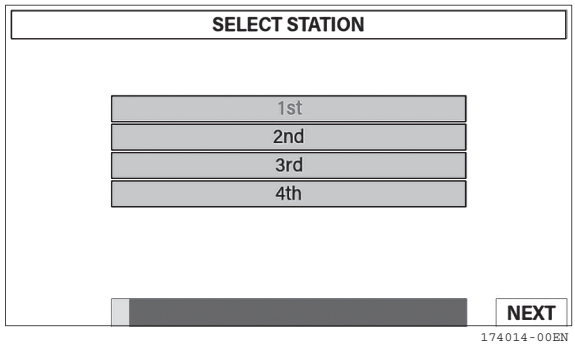
Display settings

Note: Perform the following initial setups on all screens.

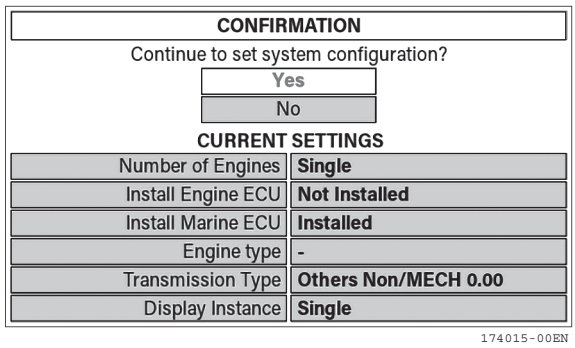
1. When you turn on the switch panel, “SELECT STATION” automatically shows on.
2. Be sure to wait for 2 minutes because the initial startup for ECU takes some time.



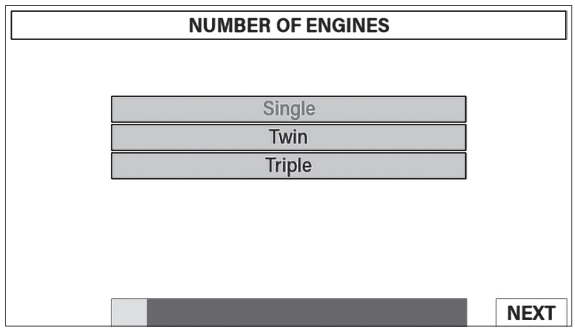
3. “SELECT STATION”
   Select the station where the display is installed and press the enter button.
   (Select one from “1st”, “2nd”, “3rd” and “4th”.)
   Select “NEXT” and press the enter button.



4. “CONFIRMATION”
   Select “YES” and press the enter button.
   (Only needed 1 time per engine)

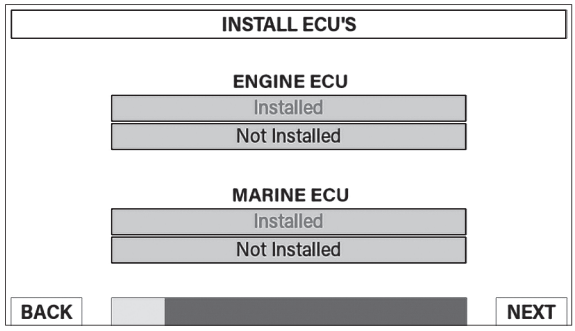


5. “NUMBER OF ENGINES”
   Select the number of engines and press the enter button. Select “NEXT” and press the enter button.



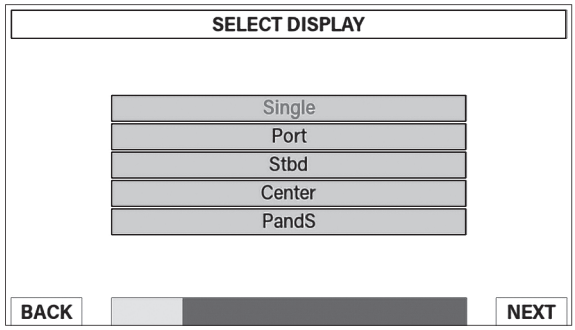
174016-00EN

6. “INSTALL ECU’S” - “ENGINE ECU & MARINE ECU”
   Select “Installed” and press the enter button. Select “NEXT” and press the enter button.



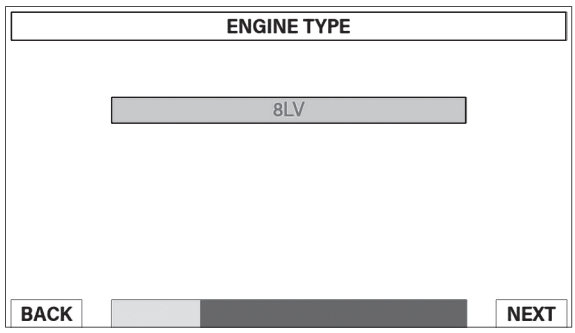
174017-00EN

7. “SELECT DISPLAY”
   Select the information to be indicated on the display.
   - “Single”: To indicate the engine data of a boat with single engine installation.
   - “Port”: To indicate the port side engine data of a boat with twin engine installation.
   - “Stbd”: To indicate the starboard side engine data of a boat with twin engine installation.
   - “Center”: To indicate the center side engine data of a boat with triple engine installation.
   - “P and S”: To indicate both engine data of a boat with twin engine installation on one display.



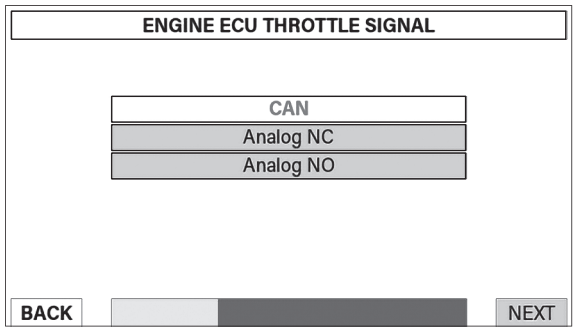
174018-00EN

8. “ENGINE TYPE”
   Select “Engine type” and press the enter button. Select “NEXT” and press the enter button.

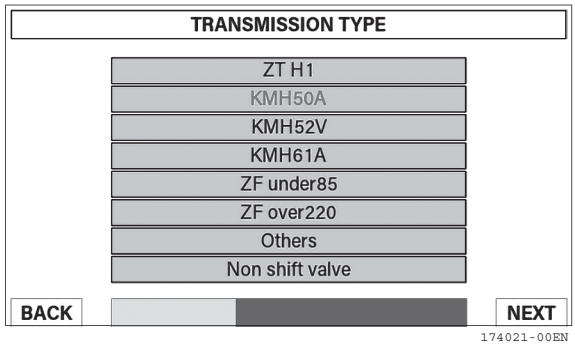


174019-00EN

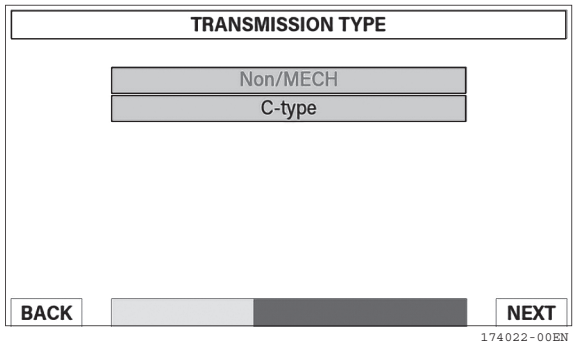
9. (4LV only)
   “ENGINE ECU” - “THROTTLE SIGNAL”
   Select “Throttle signal” and press the enter button.
   “CAN”: Choose in case of VC30 control head.
   “Analog NC”: Choose in case of mechanical control head (push-pull cable), with Normally Closed neutral start protection (for KMH gears).
   “Analog NO”: Choose in case of mechanical control head (push-pull cable), with Normally Open neutral start protection.



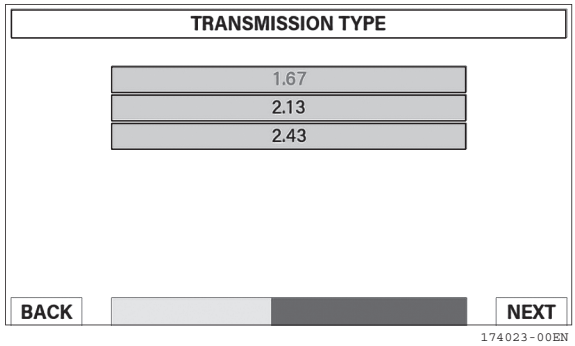
10. “TRANSMISSION TYPE”
    Select “Transmission type” referring to the list on page and press the enter button.
    Select “NEXT” and press the enter button.



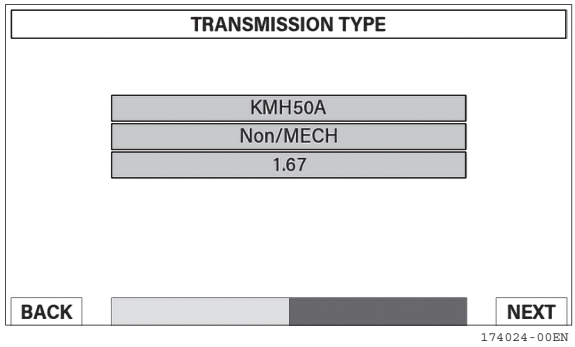
11. (If you select Marine gear)
    “TRANSMISSION TYPE” - “Trolling”
    Select “Trolling type” referring to the list on page and press the enter button.
    Select “NEXT” and press the enter button.



12. “TRANSMISSION TYPE” - “Reduction ratio”
    Select “Reduction ratio” referring to the list on page and press the enter button.
    Select “NEXT” and press the enter button.



13. “TRANSMISSION TYPE” - “Confirmation”
    Make sure that the transmission type setting is completed.
    Select “NEXT” and press the enter button.



NOTICE

List of "Transmission type"

8LV		
Transmission type	**Trolling**	**Reduction ratio**
KMH50A	Non/MECH trolling	1.67
		2.13
		2.43
	E-type trolling (When installing optionally)	1.67
		2.13
		2.43
	C-type trolling (When installing optionally)	1.67
		2.13
		2.43
KMH52V	Non/MECH trolling	1.22
		1.58
		2.08
		2.47
	E-type trolling (When installing optionally)	1.22
		1.58
		2.08
		2.47
	C-type trolling (When installing optionally)	1.22
		1.58
		2.08
		2.47
KMH61A	Non/MECH trolling	1.55
		2.04
		2.43
	E-type trolling (When installing optionally)	1.55
		2.04
		2.43
	C-type trolling (When installing optionally)	1.55
		2.04
		2.43
ZF Over 220	Non/MECH trolling	–
	E-type trolling	–
ZF Under 85	Non/MECH trolling	–
	E-type trolling	–
Others	–	–
Non shift valve	–	–

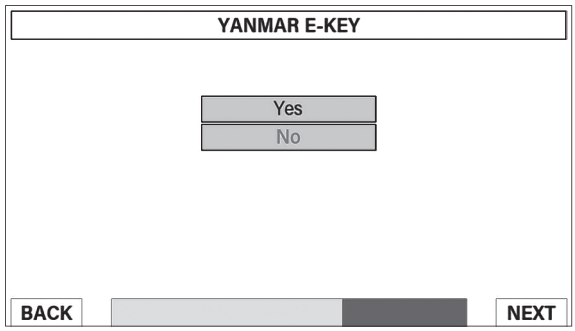
JH		
Transmission type	**Trolling**	**Reduction ratio**
KMH50V	Non/MECH trolling	–
ZF Under 85	Non/MECH trolling	–
	E-type trolling	–
Others	–	–
Non shift valve	–	–

4LV		
Transmission type	**Trolling**	**Reduction ratio**
KMH50A	Non/MECH trolling	1.55
		2.04
		2.43
	C-type trolling (When installing optionally)	1.55
		2.04
		2.43
KMH50V	Non/MECH trolling	1.22
		1.58
		2.08
		2.47
	C-type trolling (When installing optionally)	1.22
		1.58
		2.08
		2.47
ZF Under 85	Non/MECH trolling	–
	E-type trolling	–
Others	–	–
Non shift valve	–	–

6LY400/440		
Transmission type	**Trolling**	**Reduction ratio**
KMH61A	Non/MECH trolling	1.55
		2.04
		2.43
	E-type trolling (When installing optionally)	1.55
		2.04
		2.43
	C-type trolling (When installing optionally)	1.55
		2.04
		2.43
KMH61V	Non/MECH trolling	–
	E-type trolling (When installing optionally)	–
ZF Over 220	Non/MECH trolling	–
	E-type trolling	–
ZF Under 85	Non/MECH trolling	–
	E-type trolling	–
Others	–	–
Non shift valve	–	–

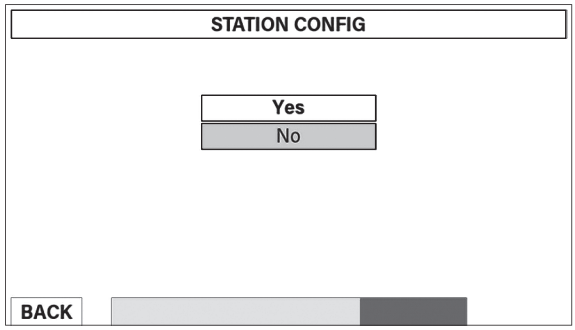
6LF/6LT		
Transmission type	**Trolling**	**Reduction ratio**
ZF Over 220	Non/MECH trolling	–
	E-type trolling	–
Others	–	–
Non shift valve	–	–

14. “YANMAR E-KEY”
    Selection to enable YANMAR E-key
    “YES” : Use YANMAR E-key
    “NO” : Do not use YANMAR E-key



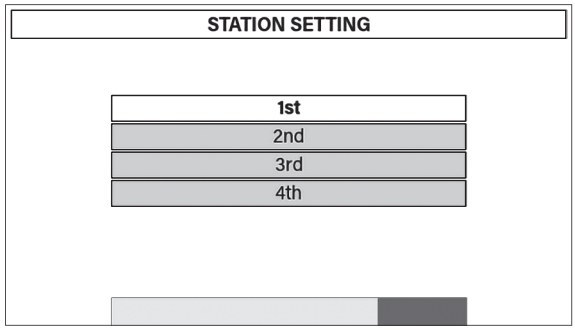
174025-00EN

15. “STATION CONFIG”
    Select “YES” and press the enter button.
    (Only needed 1 time per engine)



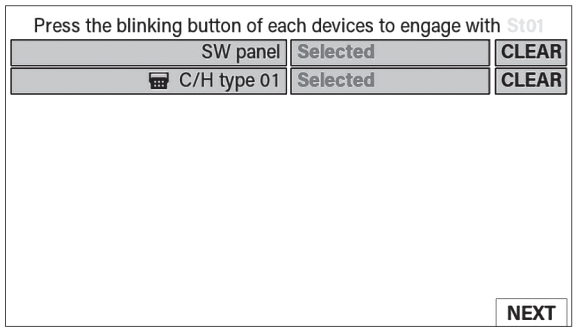
174027-00EN

16. “STATION SETTING”
    Select the number of the station you want to setup and press the enter button.



174028-00EN

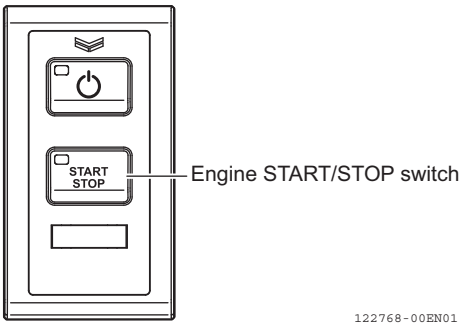
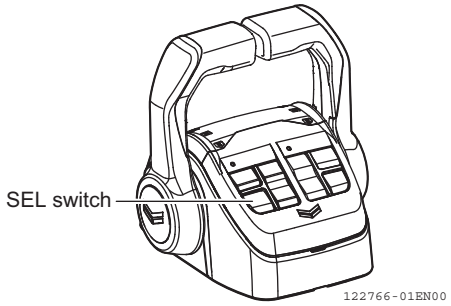
17. (Select the devices)
    Select the devices that you want to register to the station.
    The lamp lights up when the device is registered.
    After the registration is completed, select “NEXT” and press the enter button.
    - If you have registered the wrong device, select “CLEAR” and press
    - If you use the Option Control Head, “C/H type 2” is indicated on the display.



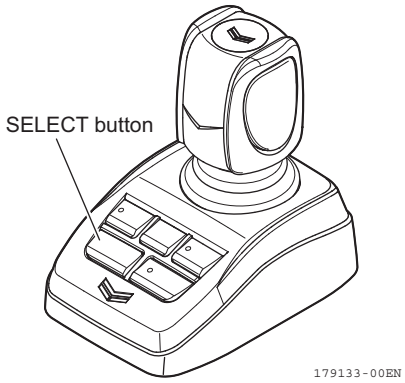
174029-00EN

NOTICE

Selection method

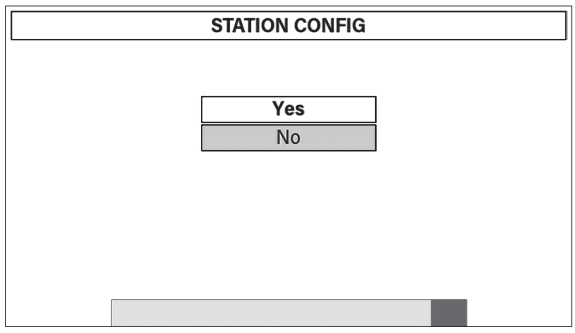
Switch Panel • Press Engine START/STOP switch.	**Control Head** • Press SEL switch.
	

Joystick
• Press SELECT button.



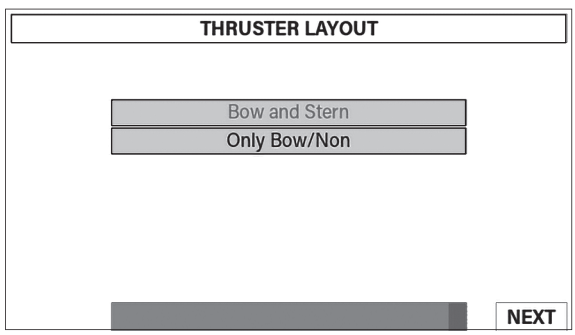
18. Select whether or not to continue setting the other stations.

    “YES” : To continue station settings.
    (Return to step 16)
    “NO” : Complete the station settings.

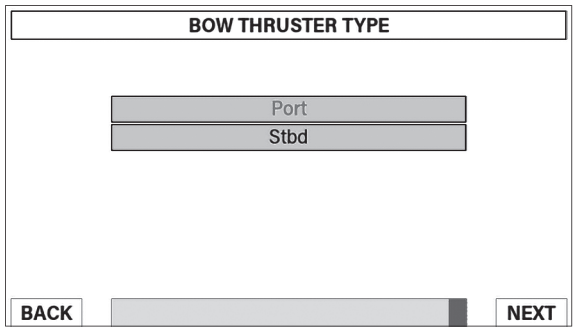


19. “THRUSTER LAYOUT”
    Select the thruster specification, “Bow and Stern thruster” or “Bow thruster only / Non thruster” and press ENTER.
    Select “NEXT” and press the enter button.

    Note: The proportional type thruster(s) has to be installed on port side always.



20. (PandS only)
“THRUSTER LAYOUT”
Select “Port” or “Stbd” and press the enter button.
Select “NEXT” and press the enter button.



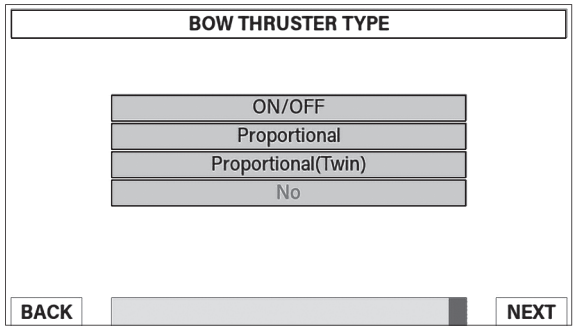
179135-00EN

21. “Bow thruster Type” - “Port”
Select the bow thruster type, “ON/OFF” or “Proportional” or “Proportional (Twin)” and press the enter button.
Select “NEXT” and press the enter button.

In the case of twin engine;
[ON/OFF]
The thruster setting should be done on the side where the thruster is installed.

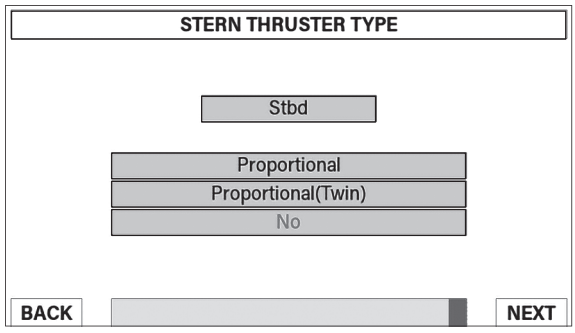
Note: “Extended runtime thruster” (ON/OFF) is currently not applicable.

[Proportional]
The thruster has to be installed on port side always.



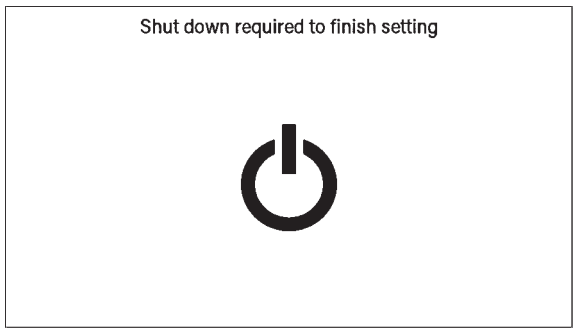
179136-00EN

22. (Bow and Stern only)
“STERN THRUSTER TYPE”
Select the stern thruster type, “Proportional” or “Proportional (Twin)” and press the enter button.
Select “NEXT” and press the enter button.



179197-00EN

23. The station setting is completed.
NEXT, set the starboard engine.
No need to repeat Station Config setting.



174031-00EN

■ RECONFIGURATION

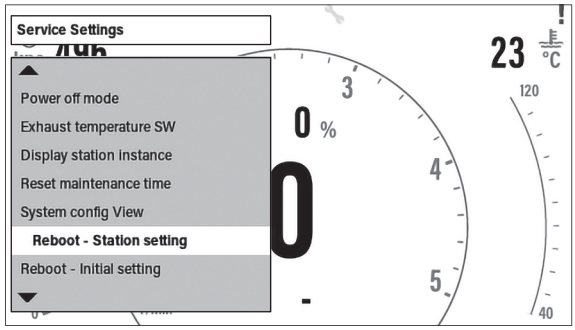
If you add a new device to the system or replace a device, you must reconfigure it.
If the system detects an unregistered device when the power is turned on, “DETECT NEW PARTS” is displayed.
To perform the reconfiguration, enter the Service ID and switch to the Service mode display. Contact your YANMAR dealer or distributor with reference to *Operating in Service Mode*.

179138-00EN

Display Settings

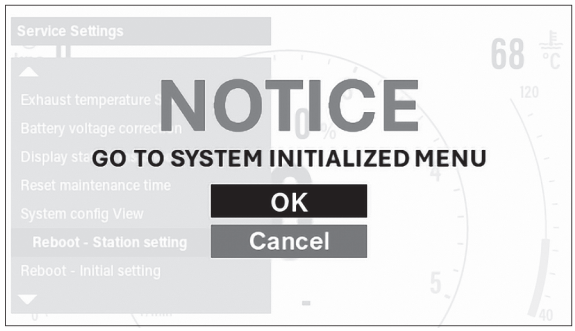
1. Select the reset menu.
   The reset menu has “Reboot - Station setting” or “Reboot - Initial setting”.

   “Reboot - Station setting”
   (Service Settings: Reboot - Station setting: YES)
   For example, when adding stations or replacing Control Head.
   “Reboot - Initial setting”
   (Service Settings: Reboot - Initial setting: YES)
   For example, when replacing Marine ECU.



179139-00EN

2. A confirmation message is displayed.
   Select “OK” and press the enter button.



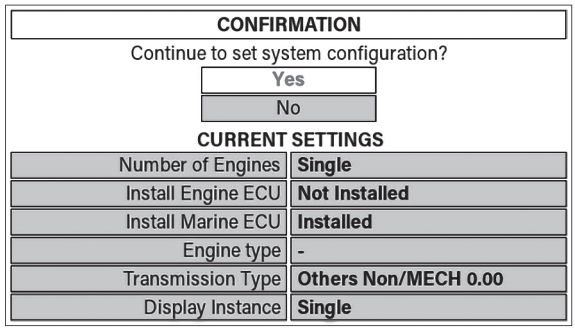
179140-00EN

3. Reconfigure according to *SETTING OF DISPLAY*.

Supported devices for reset menu

Reboot - Station setting	Reboot - Initial setting
Control Head	Marine ECU
Switch Panel	(Control Head*)
Joystick	(Switch Panel*)
EPS	(Joystick*)
	(EPS*)

* If “Reboot - Initial setting” is selected, it will continue to “Reboot - Station setting”.

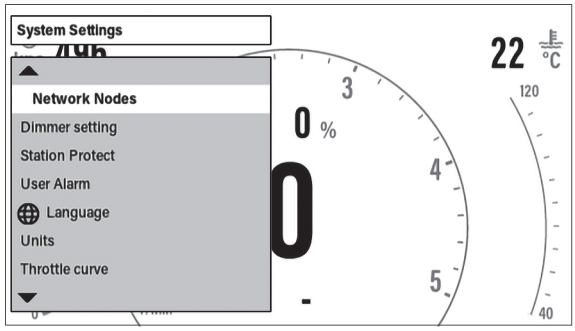


179141-00EN

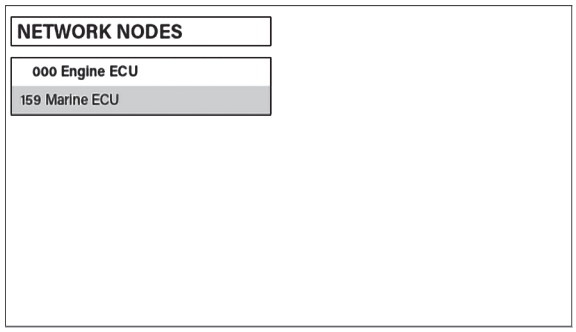
■ Operating in service mode

By switching to the Service mode screen, more functions than those indicated in P34 [About joystick], P35 [About thruster] can be used. However, for functions such as to delete the initial setting of the display setting, contact your YANMAR dealer or distributor for the required Service ID. Select network nodes (System Settings: Network nodes) and hold the display's menu button down for 5 seconds.

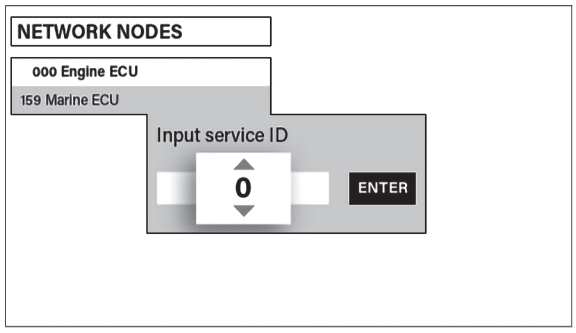
- Select a number from 0 to 9 with the ▼ ▲ buttons and enter the Service ID. When you press the enter button, the entered number is displayed as an asterisk and the next digit is highlighted.
- Press the enter button when all 4 digits are entered. This switches to Service mode.



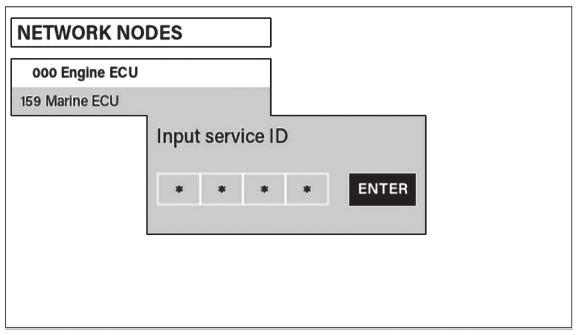
179142-00EN



179143-00EN



179144-00EN

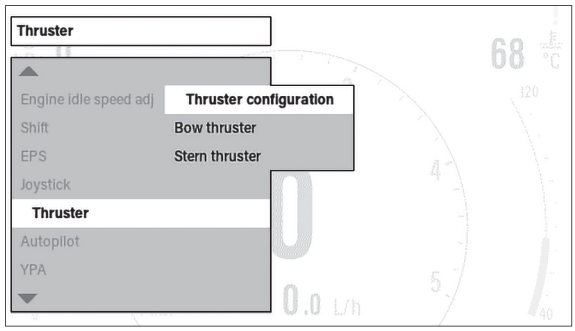


179145-00EN

Setting of Thruster

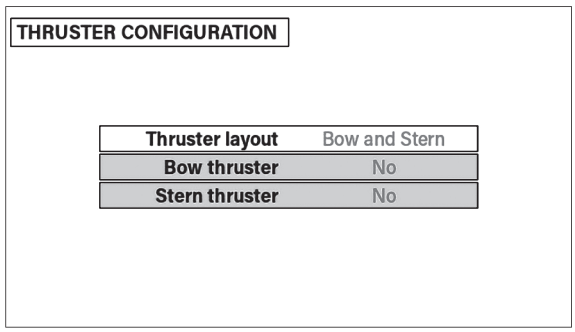
This step can be skipped when setup is done according to Setting of display step 19-23.

To perform the reconfiguration, enter the Service ID and switch to the Service mode display. Contact your YANMAR dealer or distributor with reference to Operating in Service Mode.



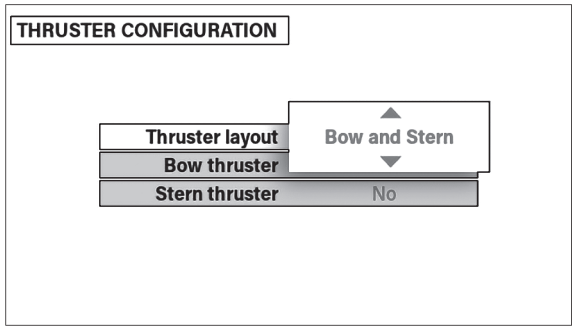
179198-00EN

Select [Thruster] from [Service setting] of the display [MAIN MENU], and then select [Thruster configuration].



179199-00EN

Select the thruster specification, [Bow and Stern thruster] or [Bow thruster only / Non thruster].



179200-00EN

Select the bow thruster type [ON/OFF], [Proportional] or [Proportional (Twin)].

Note: In the case of twin engine;

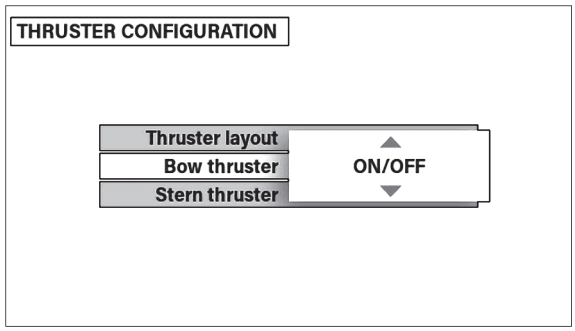
[ON/OFF]

The thruster setting should be done on the side where the thruster is installed.

"Extended runtime thruster" (ON/OFF) is currently not applicable.

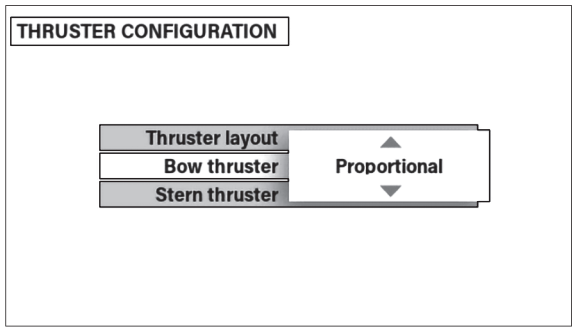
[Proportional]

The thruster has to be installed on port side always.



179201-00EN

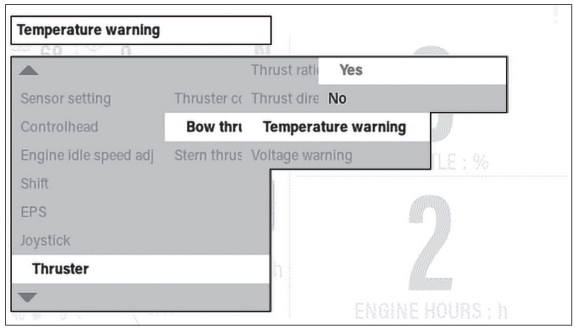
Select the stern thruster type [Proportional] or [Proportional (Twin)].



179202-00EN

Setting of Thruster Temperature Warning and Voltage Warning

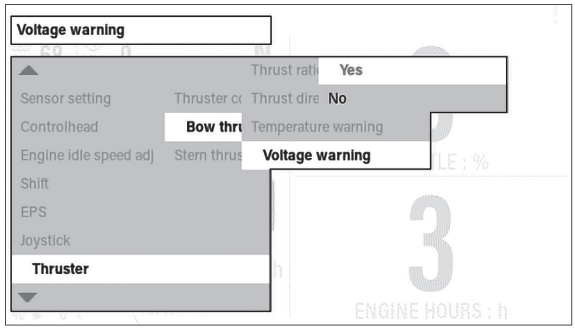
(Only needed in case of ON/OFF thruster)
When Vetus BOWxxxxDY is installed:
Confirm [Bow Thruster] and [Temperature Warning] from [Thruster] of the display [MAIN MENU] and [YES].



179149-00EN

Confirm [Bow Thruster] and [Voltage Warning] from [Thruster] of the display [MAIN MENU] and [YES].

When Vetus BOWxxxxDE is or another brand ON/OFF thruster is installed:
Confirm [Bow Thruster] and [Temperature Warning] from [Thruster] of the display [MAIN MENU] and [NO].



179203-00EN

Confirm [Bow Thruster] and [Voltage Warning] from [Thruster] of the display [MAIN MENU] and [NO].

Note: After completing the display settings, be sure to turn OFF the power switch.
If you don't turn the power switch OFF, the settings can't be fixed.
"Extended runtime thruster" (ON/OFF) is currently not applicable.

CALIBRATING

⚠ WARNING

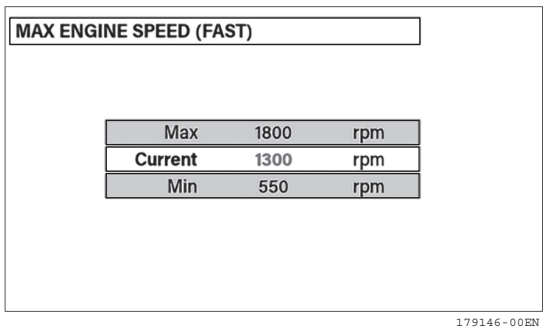
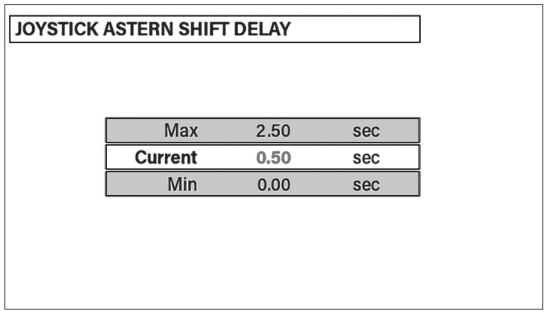
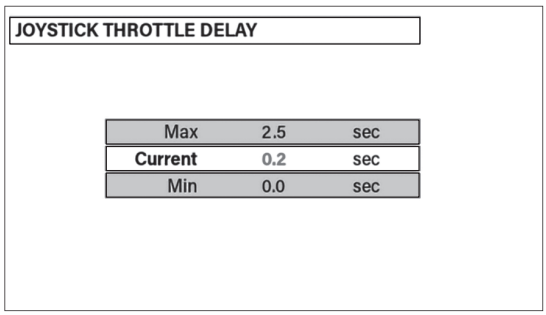
- **Perform the initial setting and adjustment in an environment without obstacles and do not interfere with other cruising boats, to avoid unexpected accidents, such as a collision with other ships or obstacles.**
- **During calibration, you cannot navigate or operate the engine with the control head and do not interfere with other cruising boats, to avoid unexpected accidents, such as collision with other ships or obstacles.**

Changing Defaults

The Inboard Joystick Docking System was configured at the factory with the default settings, but the boat movement by the joystick may differ depending on the size, weight and shape of the boat. So, some defaults have to be changed.
The default settings you can change from the display are as follows.

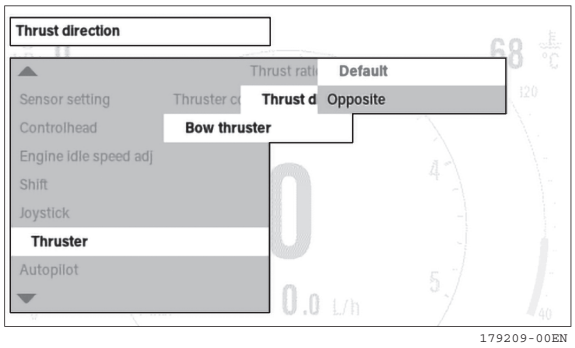
Note • ***Use Service mode to change the default settings.***
- ***If there are multiple joysticks, calibration set in one joystick applies to all joysticks.***
- ***If you change the settings, be sure to perform a check after making the change.***

■ About joystick

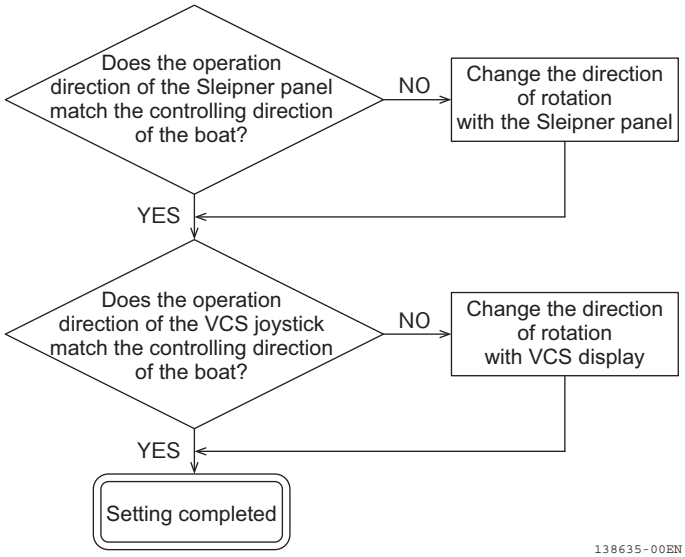
Service ID	Display menu		Default	Setting content
× (n/a)	Joystick	Joystick monitor	YES	Enable/Disable displaying the navigation monitoring screen when switching to joystick operation. Yes/No
×		Initial mode	Fast mode	You can change Fast mode/Slow mode when pressing the SPEED button.
○ (need)	Joystick Joystick settings	Max engine speed	1300 min^{-1} at Fast mode	You can set the maximum engine speed when navigating with the joystick. Fast mode: 1800 min^{-1}, Slow mode: 1000 min^{-1} 
			800 min^{-1} at Slow mode	
○		Astern shift delay	0.5 sec.	You can change the shifting delay time to prevent shock when navigating with the joystick. 0 - 2.5 sec. 
○		Throttle delay	0.5 sec.	You can change the throttle delay time to prevent shock when navigating with the joystick. 0 - 2.5 sec. 
○		Throttle response	2	You can adjust the engine speed startup condition during the joystick navigation. 1. Slow - 3. Quick
○		Joystick idle speed	0 min^{-1}	Please set the same value as the engine setting value.

Note: Select Joystick- View- Reset all to restore all items to their default values.

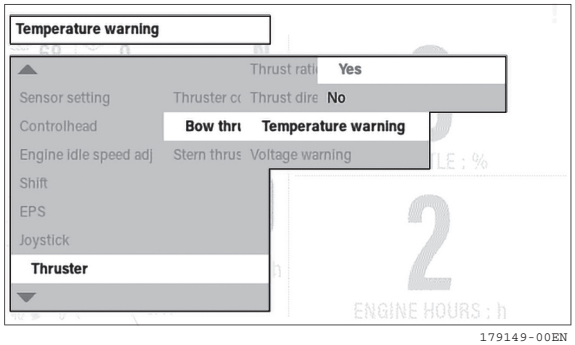
■ About thruster

<table>
<tr><th>Service ID</th><th colspan="2">Display menu</th><th>Default</th><th>Setting content</th></tr>
<tr><td rowspan="2">○</td><td rowspan="2">Thruster
Bow Thruster
Stern Thruster</td><td>Thrust Direction</td><td>Default</td><td rowspan="2">If the movement of the boat is opposite to the direction in which the joystick lever was tilted, change [Default] to [Opposite].
 

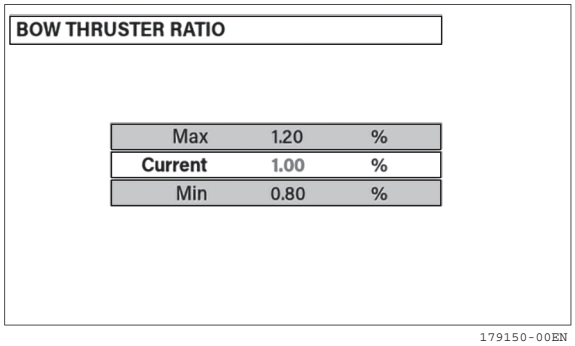
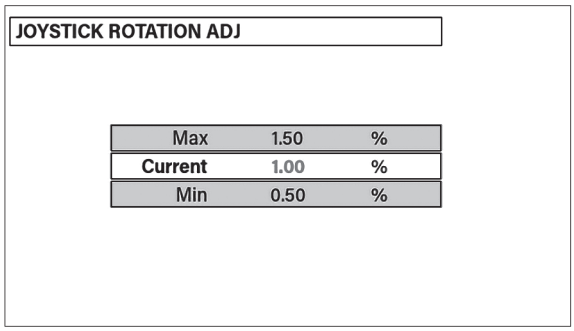
179209-00EN

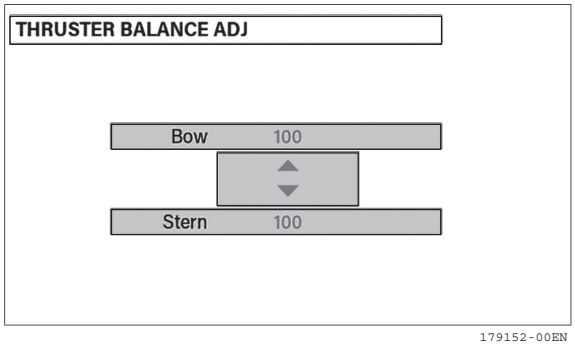
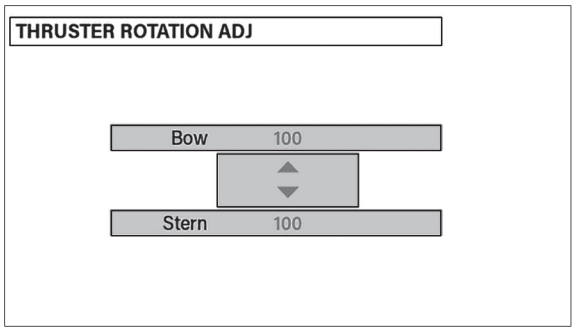
If you are using a Sleipner thruster, follow the procedure below.
 

138635-00EN

Note: For how to change the settings on the Sleipner panel, refer to the Sleipner panel manual.</td></tr>
<tr><td rowspan="2">○</td><td>Thruster
Bow Thruster</td><td>Temperature Warning</td><td>YES</td></tr>
<tr><td>Thruster
Bow Thruster</td><td>Voltage Warning</td><td>YES</td><td>If using a thruster other than “EXTENDED RUNTIME BOW THRUSTER for YANMAR” manufactured by Vetus B.V. (BOWxxxDY), set the thruster’s [Temperature Warning] and [Voltage Warning] to [NO].
 

179149-00EN</td></tr>
</table>

Service ID	Display menu		Default	Setting content
○	Thruster Bow Thruster Stern Thruster	Thruster ratio	1.00	During independent thruster operation using the thruster switch (optional). If there is a big difference in turning time between right and left, adjust the current value so that there is no difference.  179150-00EN **When thrust direction is set to [Default]:** • If left turning time < right turning time, reduce the current value • If left turning time > right turning time, increase the current value **When the thrust direction is set to [Opposite]:** • If left turning time < right turning time, increase the current value • If left turning time > right turning time, reduce the current value
○	Joystick Joystick adj	Rotation adj	1.00	(Only when Thruster layout = [Bow thruster only]) When using the joystick lever to turn the boat on-the-spot, if the boat's center of turning shifts significantly, adjust the current value.  179210-00EN **When the center of rotation shifts forward:** • Increase the current value **When the center of rotation shifts backward:** • Decrease the current value

Service ID	Display menu		Default	Setting content
○	Joystick Joystick adj	Thrust balance adj	BOW 100 Stern 100	(Only when Thruster layout = [Bow and Stern thruster]) When using the joystick lever to move the boat sideways, if the boat is rotating, adjust the current value.  179152-00EN **When the bow of the boat moves late:** • Decrease the value of Stern **When the stern of the boat moves late:** • Decrease the value of Bow
○	Joystick Joystick adj	Thrust rotation adj	BOW 100 Stern 100	(Only when Thruster layout = [Bow and Stern thruster]) When using the joystick lever to turn the boat on-the-spot, if the boat's center of turning shifts significantly, adjust the current value.  179153-00EN **When the center of rotation shifts forward:** • Decrease the value of Stern **When the center of rotation shifts backward:** • Decrease the value of Bow

Note: Select Thruster- Bow thruster- View- Reset all to restore all items to their default values.

Calibrating of the Joystick Control

Calibrate the boat in the sideways direction, diagonal direction and position turning (turning on-the-spot).

Note ***• After confirming that the boat operating direction is same as a joystick lever operating direction first, sideways direction, diagonal direction and position turning are calibrated.***
• During calibrating, the rudder must be moved to the center position.
• Calibrate the boat in a place where there is little wind and no tidal current.

Depending on the thruster configuration, different steps are needed to calibrate the joystick system:

Bow thruster only

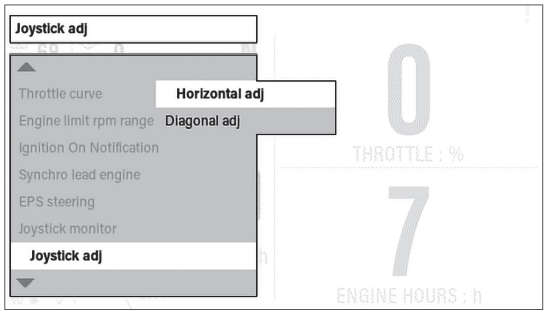
- Sideways direction calibration: Horizontal adj (see page 39)
- Diagonal direction calibration: Diagonal adj (see page 41)
- Rotational direction calibration: Rotation adj (see page 42)

Bow and stern thruster

- Sideways direction calibration: Thrust balance adj (see page 40)
- Diagonal direction calibration: Diagonal adj (see page 41)
- Rotational direction calibration: Thrust rotation adj (see page 43)

■ Calibrating in the sideways direction (Bow thruster only)

1. Set the display validation to [Service ID]. Select [Joystick] and [Joystick adj] from the display menu.
2. Select [Horizontal adj] and calibrate in the sideways direction.



179154-00EN

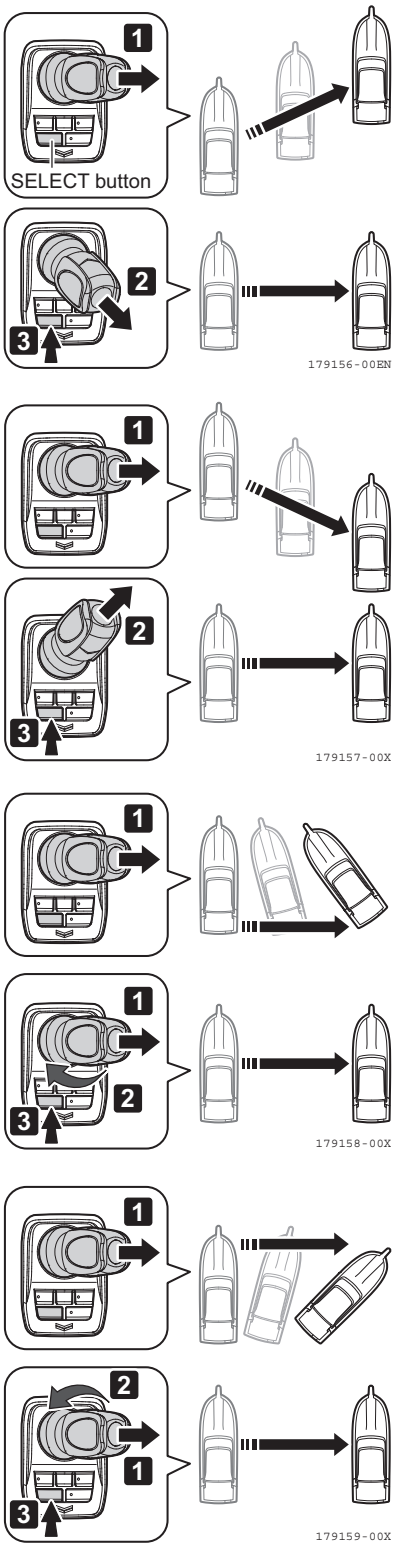
- A beep sounds continuously, the SELECT button flashes and you can calibrate in the sideways direction. A beep sounds continuously during calibration and it stops when the calibration is done.
- Move the joystick lever to the sideways (left or right). The SELECT button changes from flashing to lighting and it is ready to calibrate.

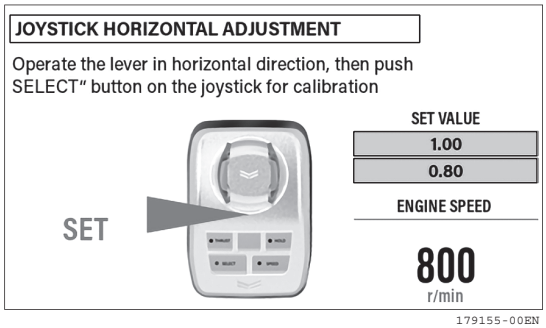
Note: You cannot calibrate in the sideways direction in the other directions (forward, backward, and diagonal).

- If the boat moves in the sideways direction (where the joystick lever is moved), press the SELECT button and finish the sideways calibration.
- If the boat does not move in the sideways direction, operate the joystick lever as shown in the right illustrations. While continuing to move in the sideways direction, press the SELECT button to confirm.

Note • When pressing the SELECT button to complete the calibration, hold the lever in the desired direction. If the lever is released, the calibration value is not recorded correctly.
• If you calibrate in one sideways direction (left or right), you don't need to calibrate in the opposite sideways direction.

- The calibration condition is shown on the display. If you move the joystick within the settings range, the Green Zone is shown and you can calibrate. If you move the joystick outside the range, the Red Zone is shown. In this case, you cannot calibrate. To show the Green Zone, move the joystick in the sideways direction.

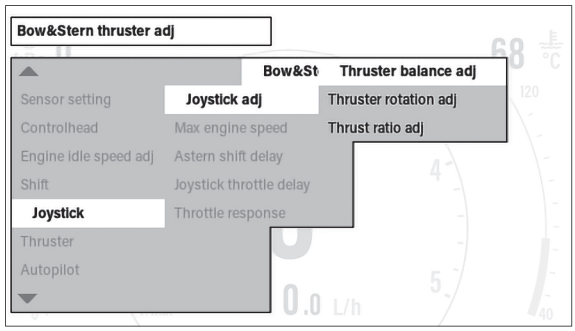




179155-00EN

■ Calibrating in the sideways direction (Bow and stern thruster)

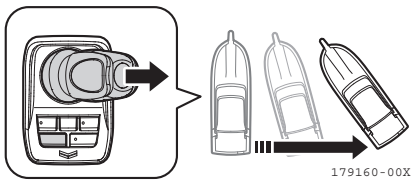
1. Set the display validation to [Service ID].
   Select [Joystick], [Joystick adj], and [Bow&Stern thruster adj] from the display menu.
2. Select [Thruster balance adj].

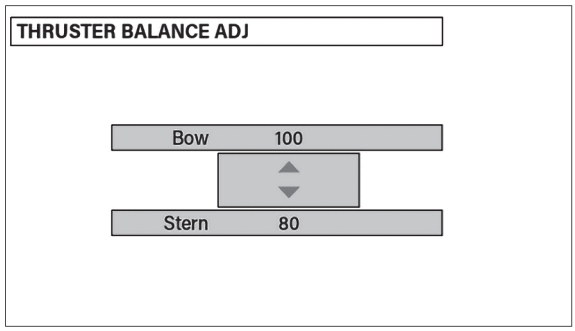


179204-00EN

- Move the joystick lever to the sideways (left or right).

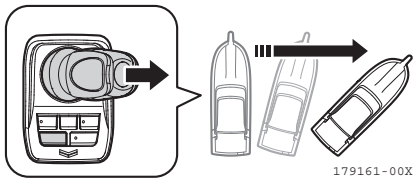
If the boat turns to the left, use the ▲ button to increase the Bow value.
When the Bow value reaches 100, the Stern value decreases.

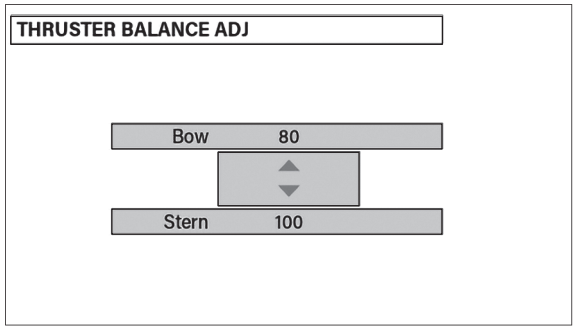

179160-00X



179205-00EN

If the boat turns to the right, use the ▼ button to increase the Stern value.
When the Stern value reaches 100, the Bow value decreases.


179161-00X



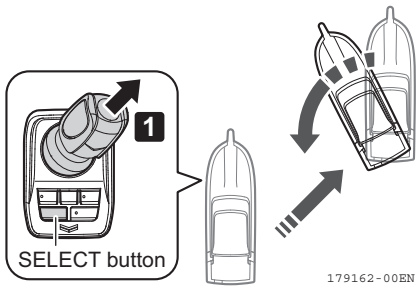
179206-00EN

■ Calibrating in the diagonal direction

Select [Diagonal adj] and calibrate in the diagonal direction.

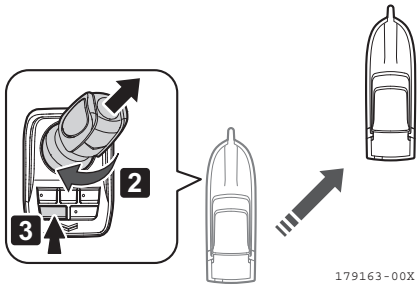
- A beep sounds continuously and the SELECT button flashes and you can calibrate in the diagonal direction. A beep sounds continuously during calibration and it stops when the calibration is done.
- Move the joystick lever 30 degrees diagonally forward (left or right). The SELECT button changes from flashing to steady lighting and the system is ready to calibrate.

Note: You cannot calibrate other directions (forward, backward, and sideways) in the diagonal direction.

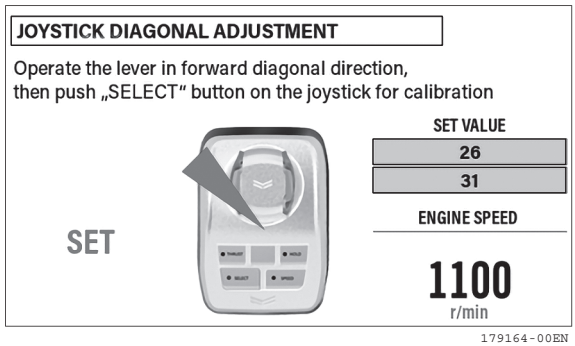


- If the boat moves in the diagonal direction without slewing, press the SELECT button and finish the calibration.
- If the boat slews while moving, twist the top of the joystick to the opposite direction of slewing and while maintaining the non-slewing condition, press the SELECT button to confirm.

Note• When pressing the SELECT button to complete the calibration, hold the lever in the desired direction. If the lever is released, the calibration value is not recorded correctly.
• If you calibrate in one diagonally forward direction (left or right), you don't need to calibrate in the opposite diagonally forward direction.



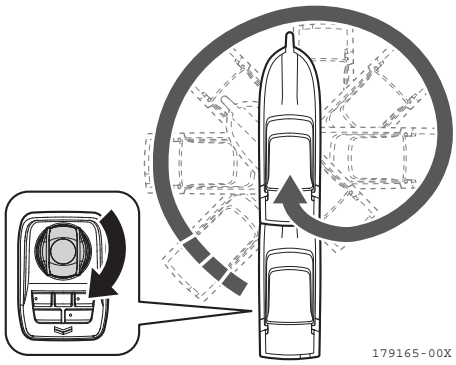
- The calibration condition is shown on the display. If you move the joystick within the settings range, the Green Zone is shown and you can calibrate. If you move the joystick outside the range, the Red Zone is shown. In this case, you cannot calibrate. To show the Green Zone, move the joystick 30 degrees in the forward direction.



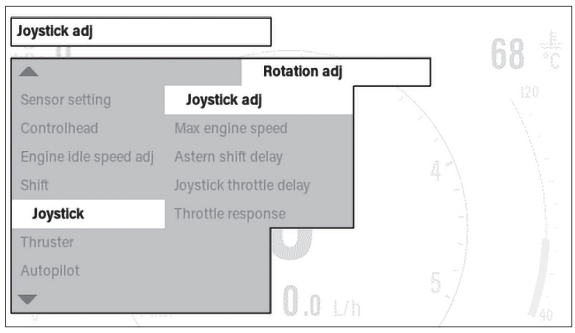
■ Calibrating position turning (Bow thruster only)

When the boat's center of turning shifts significantly during position turning, calibration is needed.

1. Set the display validation to [Service ID].
   Select [Joystick] and [Joystick adj] from the display menu.
2. Select [Rotation adj].



The turning center shifts to the front/Instance

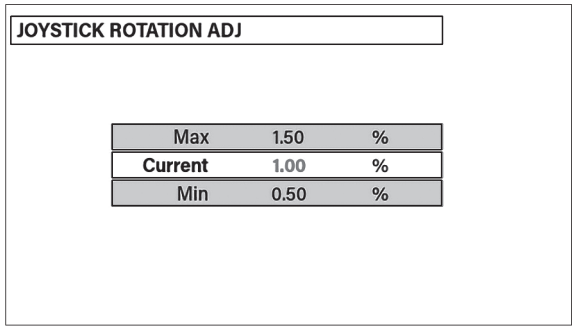


When the center of rotation shifts forward:

• Use the ▲ button to increase the current value.

When the center of rotation shifts backward:

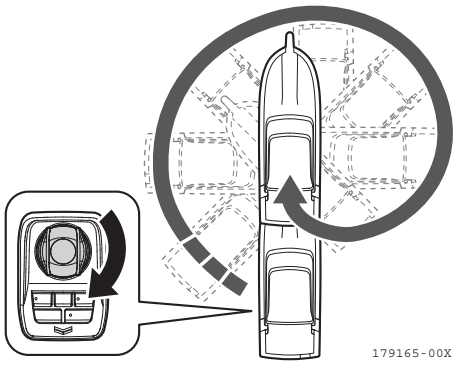
• Use the ▼ button to increase the current value.



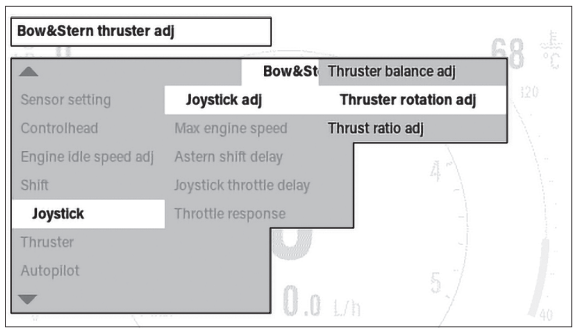
■ Calibrating position turning (Bow and stern thruster)

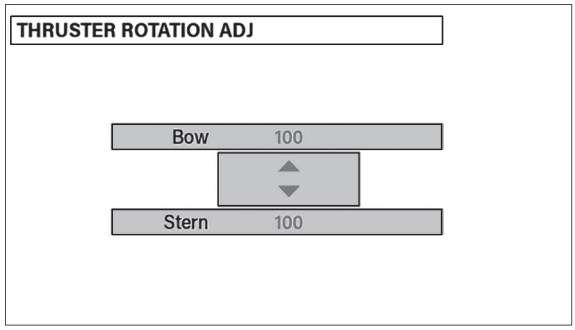
When the boat's center of turning shifts significantly during position turning, calibration is needed.

1. Set the display validation to [Service ID].
   Select [Joystick], [Joystick adj], and [Bow&Stern thruster adj] from the display menu.
2. Select [Thruster rotation adj].



The turning center shifts to the front/Instance





When the center of rotation shifts forward:

- Use the ▲ button to increase the Bow value.
  When the Bow value reaches 100, the Stern value decreases.

When the center of rotation shifts backward:

- Use the ▼ button to increase the value of Stern.
  When the Stern value reaches 100, the Bow value decreases.

■ Canceling the calibration

To cancel the calibration, return the joystick lever to the center position and press the SELECT button.
The beep stops and calibration is canceled.

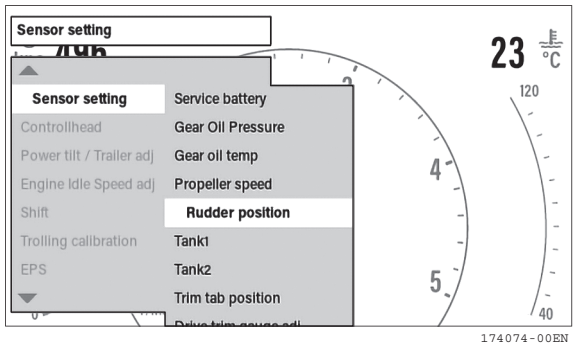
■ Re-calibration

If the boat does not move in the direction of steering after finishing calibration, re-calibrate the boat.
You may need to calibrate the boat multiple times before it is stable.

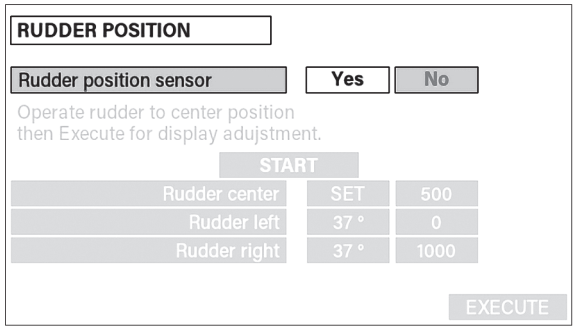
■ Calibrating Rudder Position (If installed)

Set using the display on the side to which the sensor is installed.

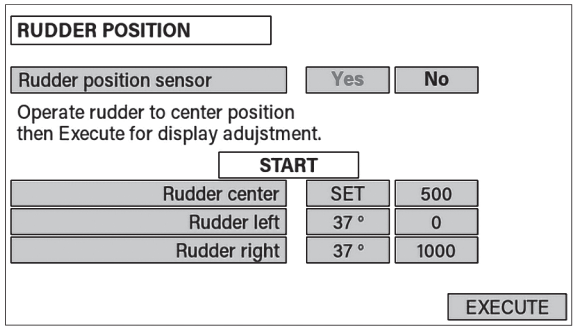
1. Switch to the [Service mode] and set [Service ID]. Select [Sensor setting] and [Rudder position].



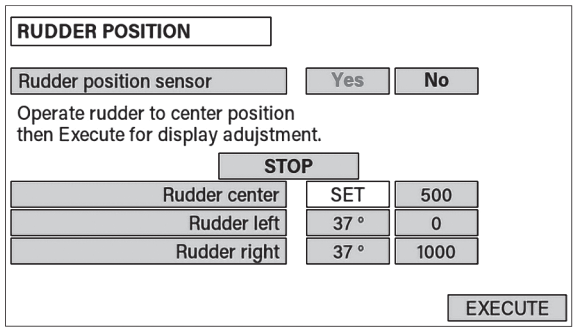
2. Select [YES] and press the enter button.



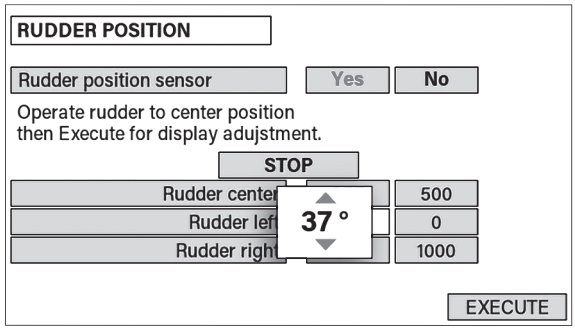
3. Select [START] and press the enter button.



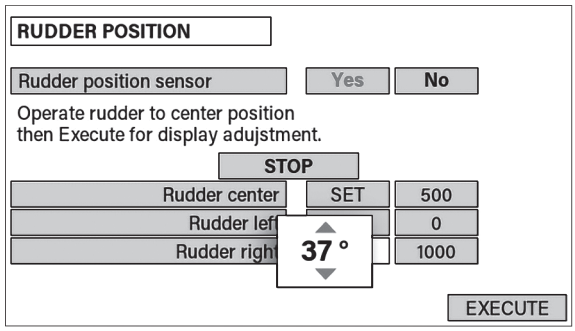
4. Make the rudder to the center position and press the enter button by highlighting [SET]. The value will be changed to [Rudder center].



5. Make the rudder to the Full right position and highlight [Rudder left], then enter the rudder angle by pressing the ▼ and ▲ buttons, and press the enter button.

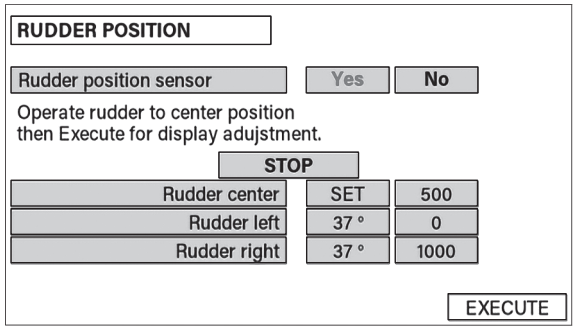


6. Make the rudder to the Full right position and highlight [Rudder right], then enter the rudder angle by pressing the ▼ and ▲ buttons, and press the enter button.



174079-00EN

7. Select [EXECUTE] and press the enter button.

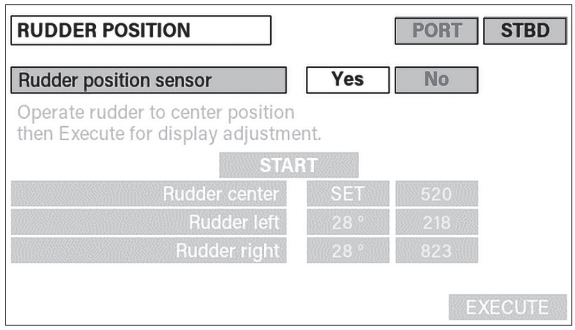


174080-00EN

● In the case of 1 display

Switch to the [Service mode] and set [Service ID]. Select [Monitor setting] [Rudder position], and select to [Port] or [Stbd].

Note: When selecting [Port] or [Stbd], select the side to which the rudder sensor is connected.



179213-00EN

TROUBLESHOOTING

Symptom	Possible causes	Measures
The button lamp does not turn on when you press the SELECT button on the joystick.	• The engines in the both sides are not operating • Joystick failure • Joystick lamp and internal connection failure	• Operate the engines in the both sides • Inspect and replace • Inspect and replace
The beep does not sound when you press the SELECT button.	• Display buzzer and internal connection failure • Mute is ON	• Inspect and repair • Cancel Mute
Joystick lever does not move, is jammed or broken.	• Joystick failure	• Inspect and replace
The boat does not move when you operate the joystick lever.	• The power (SELECT button) for the joystick is not turned on • Joystick failure • Thruster failure • Marine gear forward/reverse solenoid failure	• Turn on the power • Inspect and replace • Inspect and repair • Inspect and replace
The boat moves only slightly when you operate the joystick lever.	• The joystick is in the slow-mode operation • Thruster failure • Marine gear forward/reverse solenoid failure • Effected by wind and waves • The boat is too heavy	• Switch to the fast-mode operation • Inspect and repair • Inspect and replace
There is a difference between the joystick lever operation direction and the boat movement.	• Calibration is required • Rudder is not center position • One side engine is stopped • Thruster failure • Effected by wind and wave	• Calibrate • Rudder set to the center position • Restart the stopped engine • Inspect and repair
Response and moving of the joystick is abnormal.	• Joystick failure	• Inspect and replace
During the operation, “WARNING” or “NOTICE” appear on the display.	• Joystick failure • Joystick/ECU failure • One side engine is stopped • Thruster failure • Thruster battery and/or connecting cable failure	• Inspect and replace • Inspect and replace • Restart the stopped engine • Inspect and repair • Inspect, charge and repair
The button lamp does not turn on when you press the SPEED button on the joystick.	• Not in joystick mode • Joystick lamp and internal connection failure	• Switch to joystick mode • Inspect and replace
The button lamp does not turn on when you press the THRUST button on the joystick.	• Thrusters are not set up • Joystick lamp and internal connection failure	• Check the thruster settings • Inspect and replace

Note: For failure on the thruster, refer to the thruster manual.

Warning on the Display

If any error occurs, a warning or notice will appear on the display and a buzzer will sound.
Check the warning details on the display. Then stop operation and consult your authorized YANMAR dealer or distributor.

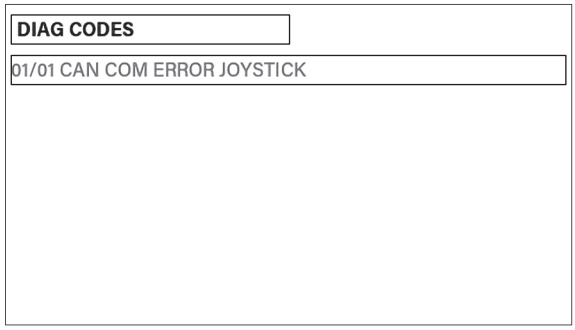
■ Check warning detail on the display

1. Warnings will be shown in a pop-up window on the display.

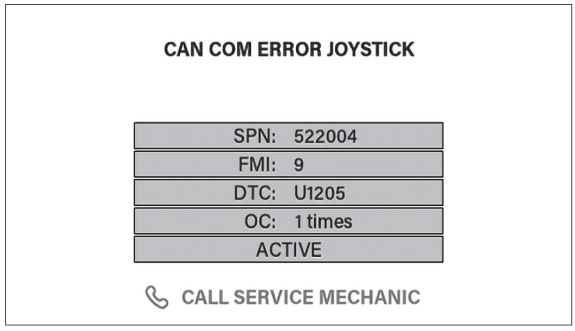
2. Select “Detail” and press the enter button on the display.

179166-00EN

3. Check the DIAG list and DIAG DETAIL/DTC.



179167-00EN



179168-00EN

■ DTC list

DTC	FMI	SPN	Description	Detail	Reference page number
B1040	3	521252	JOYSTICK X-AXIS SENSOR CIRCUIT	Joystick X-axis sensor input - Too high	P49
B1046	4		JOYSTICK X-AXIS SENSOR CIRCUIT	Joystick X-axis sensor input - Too low	
B1044	3	521253	JOYSTICK Y-AXIS SENSOR CIRCUIT	Joystick Y-axis sensor input - Too high	
B1047	4		JOYSTICK Y-AXIS SENSOR CIRCUIT	Joystick Y-axis sensor input - Too low	
B1045	3	521254	JOYSTICK Z-AXIS SENSOR CIRCUIT	Joystick Z-axis sensor input - Too high	
B1048	4		JOYSTICK Z-AXIS SENSOR CIRCUIT	Joystick Z-axis sensor input - Too low	
B1038	3	520734	JOYSTICK SELECT-SWITCH CIRCUIT	Joystick SELECT button - Failure	
B1039	3	520735	JOYSTICK SPEED-SWITCH CIRCUIT	Joystick SPEED button - Failure	
B1049	3	522057	CAN JOYSTICK THRUST-SWITCH CIRCUIT	Joystick THURST button - Failure	
P1694	12	516904	JOYSTICK NVRAM ERROR	Joystick NVRAM error	
U1205	9	522004	CAN COM ERROR JOYSTICK	CAN communication error - Joystick	
U1217	9	523792	CAN COM ERROR THRUSTER CONVERTER	CAN communication error at proportional thruster signal converter	
C1065	11	523790	SOFTWARE VERSION ERROR THRUSTER CONVERTER	Proportional thruster signal converter software version mismatch with MARINE-ECU	

■ Description items

DTC	FMI	SPN	Description
Code No.	Code	Code	DTC name

DTC detect condition

1 - Detection, 2 - Judgment, 3 - Time to detect, 4 - Etc.	Check points
1. Precondition for error detection 2. Error detection condition 3. Time taken to detect error 4. Display indication and etc	Check points to specify the cause of error occurrence. Refer to “Diagnosis procedure” for details.

Movement at error occurrence

Fail mode	Engine operation at the time of error detection is listed.
Limited operation	Yes/No: Details of limited operation at the time of error are listed.
Fail release	Yes/No: Requirement for releasing fail mode is listed.
Remarks	Notes and the like are listed.

Probable cause of trouble and abnormal condition

From the detected DTC, probable place of error and cause of error (e.g. disconnection of sensor wiring or the like), or abnormal condition of system (e.g. abnormal increase of coolant temperature or the like) are listed.

Note: Error related to the detected DTC is listed.

Diagnosis procedure

Method and procedure of failure diagnosis are listed.

Be sure to re-check after key of after diagnosis.

■ JOYSTICK error

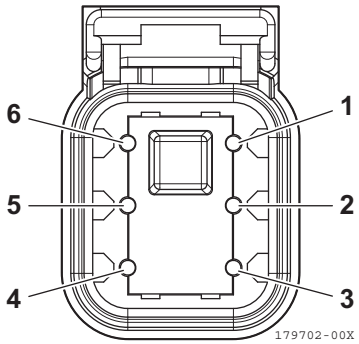
Description items

DTC	FMI	SPN	Description	Detail
B1040	3	521252	JOYSTICK X-AXIS SENSOR CIRCUIT	Joystick X-axis sensor input - Too high
B1046	4		JOYSTICK X-AXIS SENSOR CIRCUIT	Joystick X-axis sensor input - Too low
B1044	3	521253	JOYSTICK Y-AXIS SENSOR CIRCUIT	Joystick Y-axis sensor input - Too high
B1047	4		JOYSTICK Y-AXIS SENSOR CIRCUIT	Joystick Y-axis sensor input - Too low
B1045	3	521254	JOYSTICK Z-AXIS SENSOR CIRCUIT	Joystick Z-axis sensor input - Too high
B1048	4		JOYSTICK Z-AXIS SENSOR CIRCUIT	Joystick Z-axis sensor input - Too low
B1038	3	520734	JOYSTICK SELECT-SWITCH CIRCUIT	Joystick SELECT button - Failure
B1039	3	520735	JOYSTICK SPEED-SWITCH CIRCUIT	Joystick SPEED button - Failure
B1049	3	522057	CAN JOYSTICK THRUST-SWITCH CIRCUIT	Joystick THURST button - Failure
P1694	12	516904	JOYSTICK NVRAM ERROR	Joystick NVRAM error
U1205	9	522004	CAN COM ERROR JOYSTICK	CAN communication error - Joystick
U1217	9	523792	CAN COM ERROR THRUSTER CONVERTER	CAN communication error at proportional thruster signal converter
C1065	11	523790	SOFTWARE VERSION ERROR THRUSTER CONVERTER	Proportional thruster signal converter software version mismatch with MARINE-ECU

Electrical circuit chart

Connector at the bottom of the joystick

Pin	SIGNAL
1	Power
2	CAN_H
3	CAN_L
4	GND
5	Not connected
6	Shield



DTC detect condition

DTC	FMI	SPN	1 - Detection, 2- Judgment, 3 - Time to detect, 4 - Etc.	Check points
B1040	3	521252	1. When operating JOYSTICK in the X-axis. 2. X-axis signal > 4.8 V or central signal > 4.0 V 3. The above state continues for 0.5 seconds. 4. Displays “JOYSTICK X-AXIS SENSOR CIRCUIT”.	• Short circuit between X-axis signal line and 5 V line • Open circuit of GND line • Short circuit between central tap signal line and 5 V line
B1046	4	521252	1. When operating JOYSTICK in the X-axis. 2. X-axis signal < 0.2 V 3. The above state continues for 0.5 seconds. 4. Displays “JOYSTICK X-AXIS SENSOR CIRCUIT”.	• Short circuit between X-axis signal line and GND line • Open circuit of X-axis signal line • Open circuit of 5 V line
B1044	3	521253	1. When operating JOYSTICK in the Y-axis. 2. Y-axis signal > 4.8 V or central signal > 4.0 V 3. The above state continues for 0.5 seconds. 4. Displays “JOYSTICK Y-AXIS SENSOR CIRCUIT”.	• Short circuit between Y-axis signal line and 5 V line • Open circuit of GND line • Short circuit between central tap signal line and 5 V line

DTC	FMI	SPN	1 - Detection, 2- Judgment, 3 - Time to detect, 4 - Etc.	Check points
B1047	4	521253	1. When operating JOYSTICK in the Y-axis. 2. Y-axis signal < 0.2 V 3. The above state continues for 0.5 seconds. 4. Displays “JOYSTICK Y-AXIS SENSOR CIRCUIT”.	• Short circuit between Y-axis signal line and GND line • Open circuit of Y-axis signal line • Open circuit of 5 V line
B1045	3	521254	1. When operating JOYSTICK in the Z-axis. 2. Z-axis signal > 4.8 V or central signal > 4.0 V 3. The above state continues for 0.5 seconds. 4. Displays “JOYSTICK Z-AXIS SENSOR CIRCUIT”.	• Short circuit between Z-axis signal line and 5 V line • Open circuit of GND line • Short circuit between central tap signal line and 5 V line
B1048	4	521254	1. When operating JOYSTICK in the Z-axis. 2. Z-axis signal < 0.2 V 3. The above state continues for 0.5 seconds. 4. Displays “JOYSTICK Z-AXIS SENSOR CIRCUIT”.	• Short circuit between Z-axis signal line and GND line • Open circuit of Z-axis signal line • Open circuit of 5 V line
B1038	3	520734	1. — 2. SELECT switch ON 3. The above state continues for 60 seconds. 4. Displays “JOYSTICK SELECT-SWITCH CIRCUIT”.	Short circuit of SELECT switch
B1039	3	520735	1. — 2. SPEED switch ON 3. The above state continues for 60 seconds. 4. Displays “JOYSTICK SPEED-SWITCH CIRCUIT”.	Short circuit of SPEED switch
B1049	3	522057	1. — 2. THRUST switch ON 3. The above state continues for 60 seconds. 4. Displays “CAN JOYSTICK THRUST-SWITCH CIRCUIT”.	Short circuit of THRUST switch
P1694	12	516904	1. — 2. NVRAM error detected. 3. — 4. Displays “JOYSTICK NVRAM ERROR”.	Joystick NVRAM error
U1205	9	522004	1. — 2. Communication from JOYSTICK to MARINE-ECU is not received. 3. Not received within 300 msec. 4. Displays “CAN COM ERROR JOYSTICK”.	Connection of JOYSTICK
U1217	9	523792	1. There was communication from the proportional thruster signal converter at least once. 2. Communication from the proportional thruster signal converter to MARINE-ECU is not received. 3. Not received within 300 msec. 4. Displays “CAN COM ERROR THRUSTER CONVERTER”.	• Open circuit thruster harness • Damage of thruster signal converter
C1065	11	523790	1. — 2. The thruster is a proportional type and the thruster signal converter version is under 1. 3. — 4. Displays “SOFTWARE VERSION ERROR THRUSTER CONVERTER”.	Incorrect version on thruster signal converter

Movement at error occurrence

Fail mode	Warning
Limited operation	B1040, B1046, B1044, B1047, B1045, B1048: All engines derate and stop, JOYSTICK operation disabled, OFF and cannot control positioning B1038 : Cannot switch to JOYSTICK operation, Cannot calibrate B1039 : Cannot switch to slow mode operation B1049 : Cancel thruster driving mode P1694 : JOYSTICK operation is disabled, Station selection unavailable U1205 : All engines derate and stop, JOYSTICK operation is disabled, Autopilot on standby, Positioning OFF, Station selection unavailable U1217 : No limited operation C1065 : JOYSTICK operation disabled
Fail release	B1040 : The input signals (X-axis and center) during operating JOYSTICK keep within the normal range for 0.5 seconds or more B1046 : The input signal (X-axis) during operating JOYSTICK keep within the normal range for 0.5 seconds or more B1044 : The input signals (Y-axis and center) during operating JOYSTICK keep within the normal range for 0.5 seconds or more B1047 : The input signal (Y-axis) during operating JOYSTICK keep within the normal range for 0.5 seconds or more B1045 : The input signals (Z-axis and center) during operating JOYSTICK keep within the normal range for 0.5 seconds or more B1048 : The input signal (Z-axis) during operating JOYSTICK keep within the normal range for 0.5 seconds or more B1038 : The signal is turned off, and then turned on again B1039 : The signal is turned off, and then turned on again B1049 : The signal is turned off, and then turned on again P1694 : Replace the JOYSTICK, and set again U1205 : The signal to MARINE-ECU was received U1217 : Communication from proportional thruster signal converter to MARINE-ECU was received C1065 : Replace the thruster signal converter with version 1 or later, and turn on again
Remarks	

Contents of trouble

1. Open or short circuit of wire harness.
2. JOYSTICK damage.
3. JOYSTICK switch damage (SELECT, SPEED, THRUST, HOLD).
4. Proportional thruster signal converter damage.

Corrective action

1. Initial diagnosis with the diagnosis tool	• Check the fault indication. • Check the input voltage to JOYSTICK.

2. Check of connectors/ wiring	• Before working, make sure to turn off the power switch. • Check that the connector of JOYSTICK. • Check the connector of the proportional thruster signal converter.

3. Failure diagnosis work	• Check the input voltage to JOYSTICK. • Make sure that the wire harness is connected properly. • Check the communication signal from the proportional thruster signal converter.

Engine Stop on One Side during Operation (Only in case of twin engine)

When an engine on one side stops due to any failure during operation, the NOTICE screen is displayed and the buzzer sounds for 2 seconds.

179169-00EN

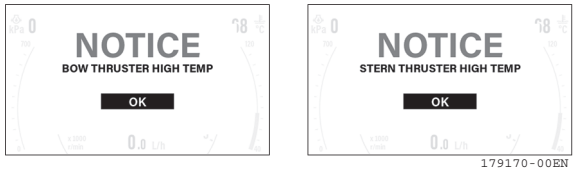
In this case, the boat can be operated in the ahead and astern directions. However, movement of the boat cannot be controlled when maneuvering in sideways and diagonal directions, or when turning the boat on the spot.
In addition, when the “SEL” switch on the control head is pressed, the boat is then operated by the control head.
The boat cannot be operated by the joystick unless the stopped engine is restarted.

Bow/Stern Thruster NOTICE Displayed during Operation

When the thruster failures occurs during operation, the NOTICE screen is displayed and the buzzer sounds for 2 seconds.
Even if the thruster stops working due to a failure etc., the joystick or control head handles can still be used to maneuver the following:

- Forward/backwards and turn (Twin engine)
- Forward/backwards (Single engine)

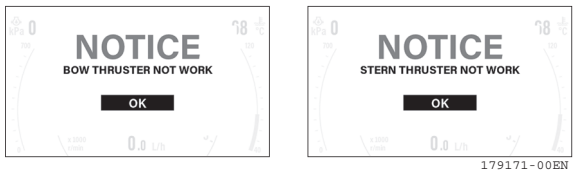
BOW THRUSTER HIGH TEMP/ STERN THRUSTER HIGH TEMP



179170-00EN

- This notice appears when the thruster overheats.
- When this notice appears, reduce use of the thruster.
- Even if this notice appears, the thruster can still be used. However, continual use will result in the thruster stopping automatically.

BOW THRUSTER NOT WORK/ STERN THRUSTER NOT WORK



179171-00EN

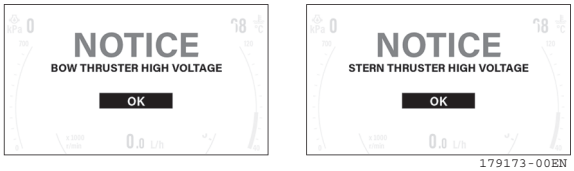
- This notice appears when the thruster does not operate or the thruster battery voltage is too low.
- When this notice appears, check the thruster and the thruster battery.
  Please refer to the thruster manual.
- If a different ON/OFF thruster that the Vetus BOWxxxxDY is installed, please check Voltage and Temperature warning setting.

BOW THRUSTER LOW VOLTAGE/ STERN THRUSTER LOW VOLTAGE

179172-00EN

- This notice appears when supply voltage to the thruster is low.
- When this notice appears, please check the thruster battery and circuit.

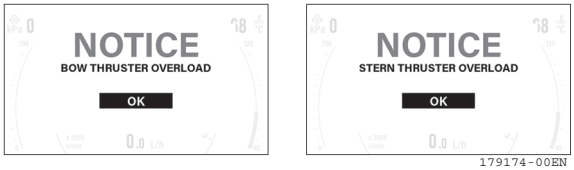
BOW THRUSTER HIGH VOLTAGE/ STERN THRUSTER HIGH VOLTAGE



179173-00EN

- This notice appears when supply voltage to the thruster is high.
- When this notice appears, please check the thruster battery and circuit.

BOW THRUSTER OVERLOAD/ STERN THRUSTER OVERLOAD



179174-00EN

- This notice appears when thruster load is overload.
- When this notice appears, reduce use of the thruster and check the thruster.

BOW THRUSTER WATER LEAK/ STERN THRUSTER WATER LEAK

179175-00EN

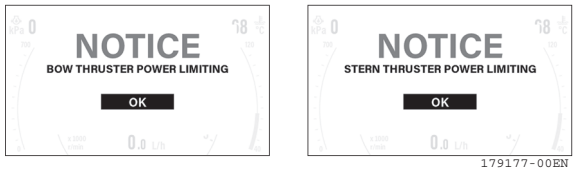
- This notice appears when the water leak into the thruster.
- When this notice appears, please check the thruster body and inside.

BOW THRUSTER OVER SPEED/ STERN THRUSTER OVER SPEED

179176-00EN

- This notice appears when the thruster rotation is overspeed.
- When this notice appears, please check the thruster.

BOW THRUSTER POWER LIMITING/ STERN THRUSTER POWER LIMITING



179177-00EN

- This notice appears when the thruster power limit operated.
- BOW PRO thruster automatically limits its power output to prevent overheating.

BOW THRUSTER NOT AVAILABLE/ STERN THRUSTER NOT AVAILABLE

179178-00EN

- This notice appears when the thruster select failure.
- When this notice appears, please check the thruster and circuit.

BOW THRUSTER POWER OFF/ STERN THRUSTER POWER OFF

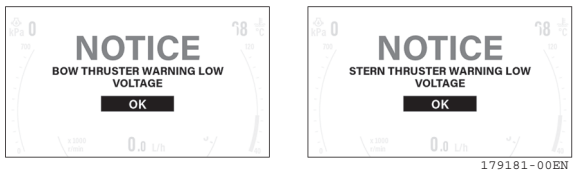
179179-00EN

BOW THRUSTER TEMPERATURE WARNING/ STERN THRUSTER TEMPERATURE WARNING

179180-00EN

- This notice appears when warns that the motor temperature is getting high.

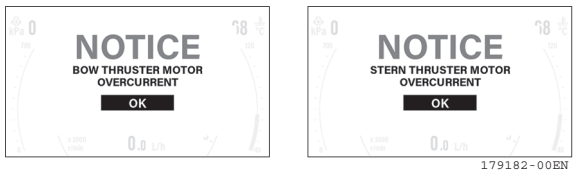
BOW THRUSTER WARNING LOW VOLTAGE/ STERN THRUSTER WARNING LOW VOLTAGE



179181-00EN

- This notice appears when Low motor voltage warning when motor is running.

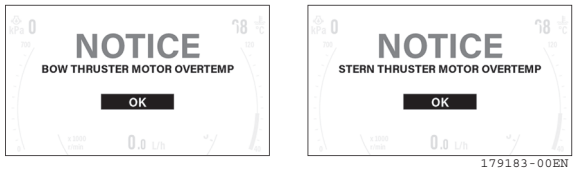
BOW THRUSTER MOTOR OVERCURRENT/ STERN THRUSTER MOTOR OVERCURRENT



179182-00EN

- This notice appears when motor current too high.
- When this notice appears, please see the thruster manual.

BOW THRUSTER MOTOR OVERTEMP/ STERN THRUSTER MOTOR OVERTEMP



179183-00EN

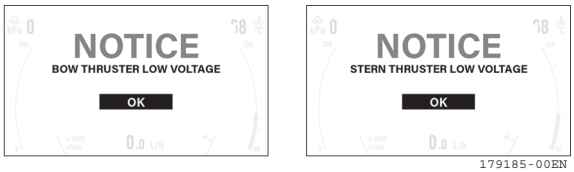
- This notice appears when motor temperature is high.
- When this notice appears, please cool down motor.

BOW THRUSTER CONTROLLER OVERTEMP/ STERN THRUSTER CONTOLLER OVERTEMP

179184-00EN

- This notice appears when PPC temperature is high.
- When this notice appears, please cool down PPC.

BOW THRUSTER LOW VOLTAGE/ STERN THRUSTER LOW VOLTAGE



179185-00EN

- This notice appears when low motor voltage alarm when motor is running.
- When this notice appears, please check the battery or power.

BOW THRUSTER THERMOSWITCH/ STERN THRUSTER THERMOSWITCH

179186-00EN

- This notice appears when thermo switch input is activated and there is an open circuit.
- When this notice appears, please cool down the thruster.

BOW THRUSTER IPC ERROR/ STERN THRUSTER IPC ERROR

179187-00EN

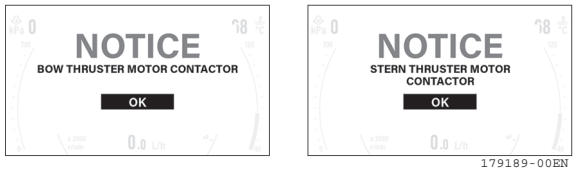
- This notice appears when motor relay fault.
- When this notice appears, please see the thruster manual.

BOW THRUSTER CRITICAL ERROR/ STERN THRUSTER CRITICAL ERROR

179188-00EN

- This notice appears when PPC output fail.
- When this notice appears, please see the thruster manual.

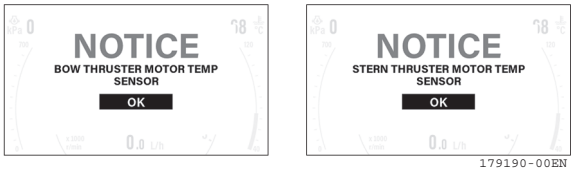
BOW THRUSTER MOTOR CONTACTOR/ STERN THRUSTER MOTOR CONTACTOR



179189-00EN

- This notice appears when no current on motor relay coil.
- When this notice appears, please check the thruster motor.

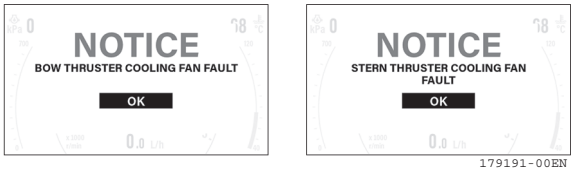
BOW THRUSTER MOTOR TEMP SENSOR/ STERN THRUSTER MOTOR TEMP SENSOR



179190-00EN

- This notice appears when motor temperature sensor fail.
- When this notice appears, please check the thruster motor temperature sensor.

BOW THRUSTER COOLING FAN FAULT/ STERN THRUSTER COOLING FAN FAULT



179191-00EN

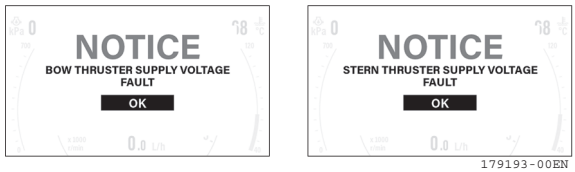
- This notice appears when cooling fan stopped running, or running too slow.
- When this notice appears, please see the thruster manual.

BOW THRUSTER SYSTEM ERROR/ STERN THRUSTER SYSTEM ERROR

179192-00EN

- This notice appears when fatal error.
- When this notice appears, please see the thruster manual.

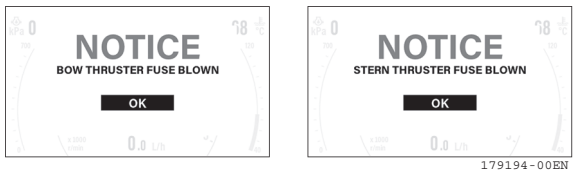
BOW THRUSTER SUPPLY VOLTAGE FAULT/ STERN THRUSTER SUPPLY VOLTAGE FAULT



179193-00EN

- This notice appears when no power.
- When this notice appears, please check power connections.

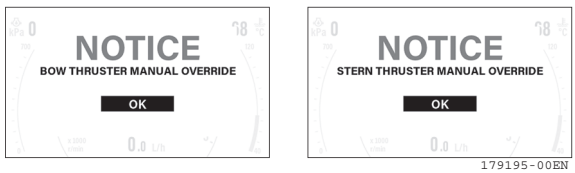
BOW THRUSTER FUSE BLOWN/ STERN THRUSTER FUSE BLOWN



179194-00EN

- This notice appears when fuse blown.
- When this notice appears, please replace fuse or check if main cable from battery and main cable to thruster has been switched.

BOW THRUSTER MANUAL OVERRIDE/ STERN THRUSTER MANUAL OVERRIDE



179195-00EN

- This notice appears when main switch manually overridden.
- When this notice appears, please pull main switch.

- This notice appears when supply power or communication is OFF to the thruster.
- When this notice appears, please check the battery volatge and communication signal.

- In the joystick + Vetus panel mode, the operation moves to the joystick.
  However, the thruster with Notice will not work.
- Thruster operation does not return automatically.
  Select the control head once.

GUIDELINES FOR SELECTING A THRUSTER

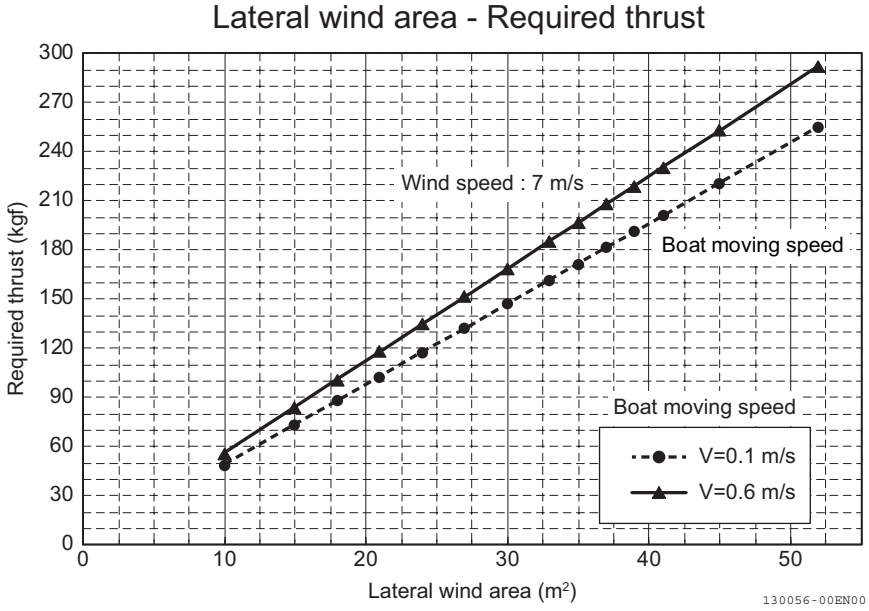
When selecting a thruster to be used with the inboard joystick docking system, select with consideration to the following points:

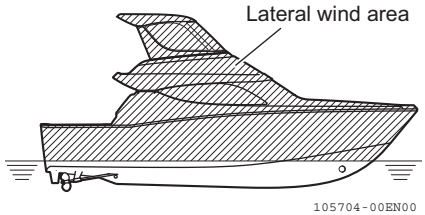
1. Lateral wind area (area of the boat exposed to wind). Detailed conditions such as lateral wind area etc. must be clearly calculated.
2. Boat length.

Selection considerations

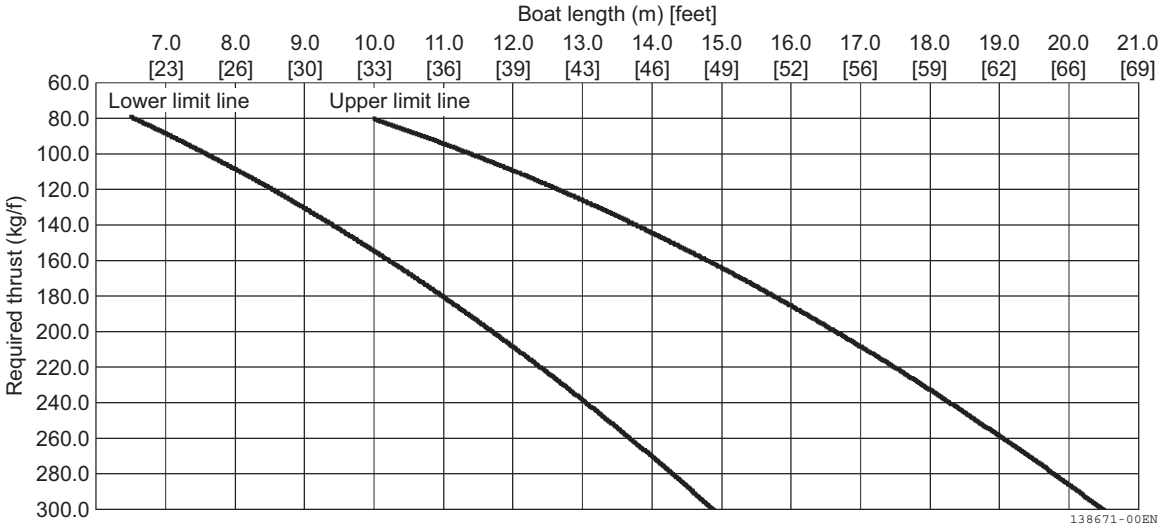
- These selection points for the thruster are intended as a guideline, and do not guarantee the performance of the inboard joystick docking system. Maneuverability varies depending on the shape and weight of boat, as well as the location of the thruster. Therefore, when selecting a thruster, give careful consideration to the characteristics and usage conditions of the boat.
- In cases where faster sideways movement is desired for heavy boats with a large lateral wind area, consider selecting a large thruster.
- For support on thruster selection (for example in case of catamaran or other “non standard” boat shapes), please contact your YANMAR dealer.

1. Selecting a thruster (lateral wind area).
   Calculate the lateral wind area, and then select a thruster capable of delivering the required thrust for sideways movement.
   - The table below shows the thrust required to move a boat sideways at a speed of 0.1 m/s or 0.6 m/s (where wind speed is 7 m/s).





2. Selecting a thruster (boat length).
   - The boat length standard table does not consider the boat shape, so it is the general guideline. Focus on a table based on the lateral wind area.



NOTICE

(1) If the thrust force of the stern thruster (relative to the center of gravity of the boat) is less compared to the thrust force of the bow thruster, the thrust force of the bow thruster will be decreased to compensate (and vice versa). This means the lateral performance will be less, which makes the boat more sensitive to wind and current influences.

(2) Required thrust is the total thruster capacity in a vessel. If a bow + stern thruster are used, then the required thrust is the sum of both thrusters, but taking into account note (1).

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■ Joystick