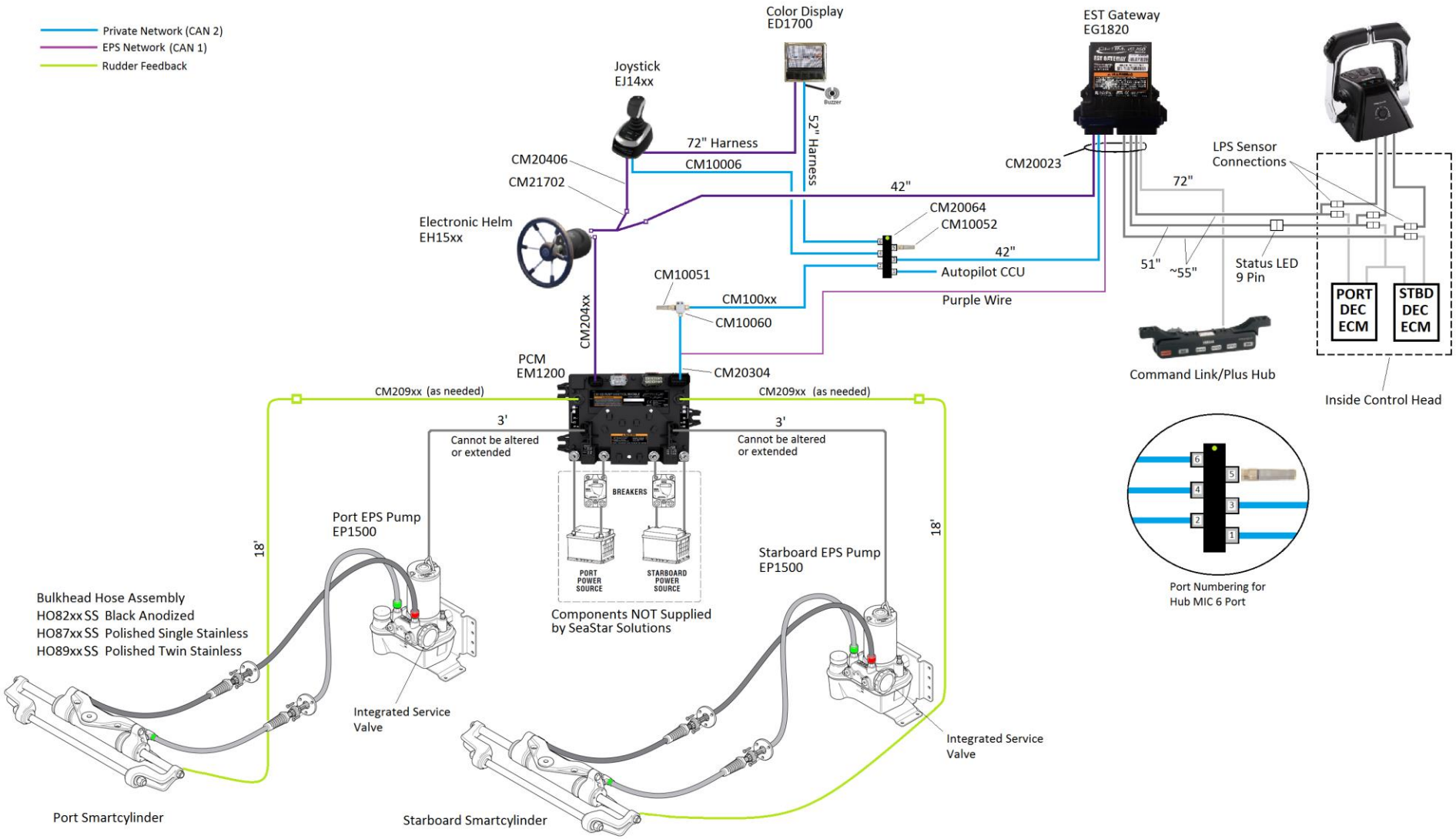
Optimus 360 – Yamaha Electronic Engines

The Optimus 360 vessel control system is readily adaptable to the Yamaha electronic engine packages that are currently available. The models include the inline 4 (F200), V6 4.2L (F300, F250 & F225) and also the V8 5.3L F350.

The Optimus 360-Yamaha system uses some of the same components as the Optimus EPS: Electronic Helm, CANtrak Display, PCM, Hydraulic Pumps, Smart Cylinders with the addition of an EST Gateway and a Joystick.

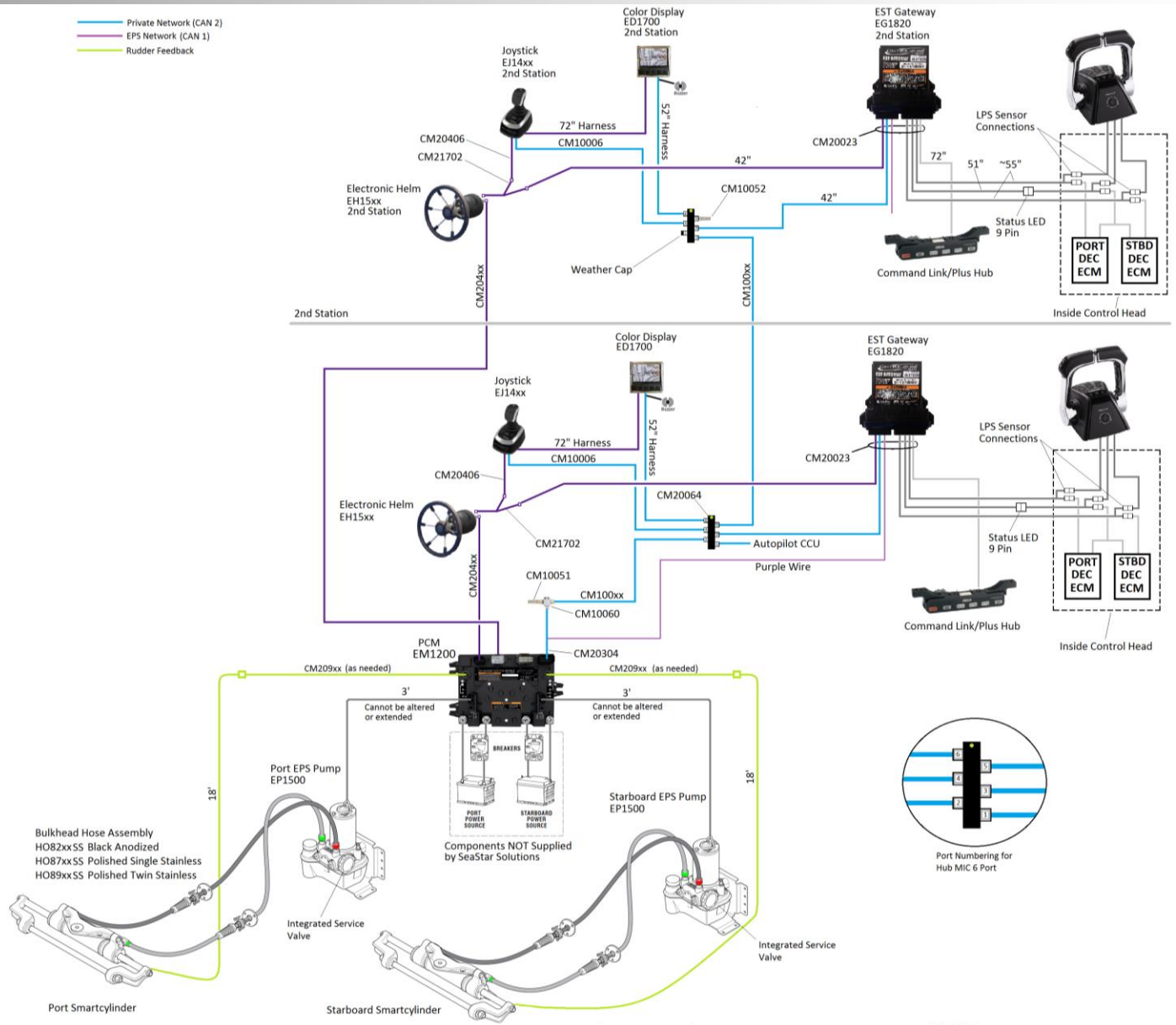
Yamaha Single Station/Twin Engine Schematic



Optimus 360 - Yamaha DEC - Single Station, Twin Engine

04/18/16

Yamaha Dual Station/Twin Engine Schematic



Optimus 360 - Yamaha DEC - Dual Station, Twin Engine

04/18/16

Yamaha System Installation

YAMAHA

To complete the system installation for a Yamaha DEC engine you need to:

1. Connect the gateway harness to the Yamaha remote control
2. Install the Optimus EST gateway
3. Complete the CAN network connections
4. Configure the gateway

Once you've completed these steps you can move on to sea trial (Book 50) and then to the joystick setup.

Yamaha Remote Control Connections

The EST Gateway harness (CM20023) connects to the Lever Position Sensor (LPS) and station status indicator (LED) harnesses at the remote control binnacle. These connections are illustrated in the figures that follow. Although a twin-engine remote control is shown, the connections are identical for a triple-engine control.

1. Ensure the power is switched off to the system.
2. Remove the two screws securing the binnacle cover. (Refer to figure 7-1.)
3. Remove the four screws that mount the control head binnacle to the dash. (Refer to figure 7-1.)

NOTICE

If the remote control is not yet installed, ignore the instructions regarding removal from the dash.

Yamaha System Installation

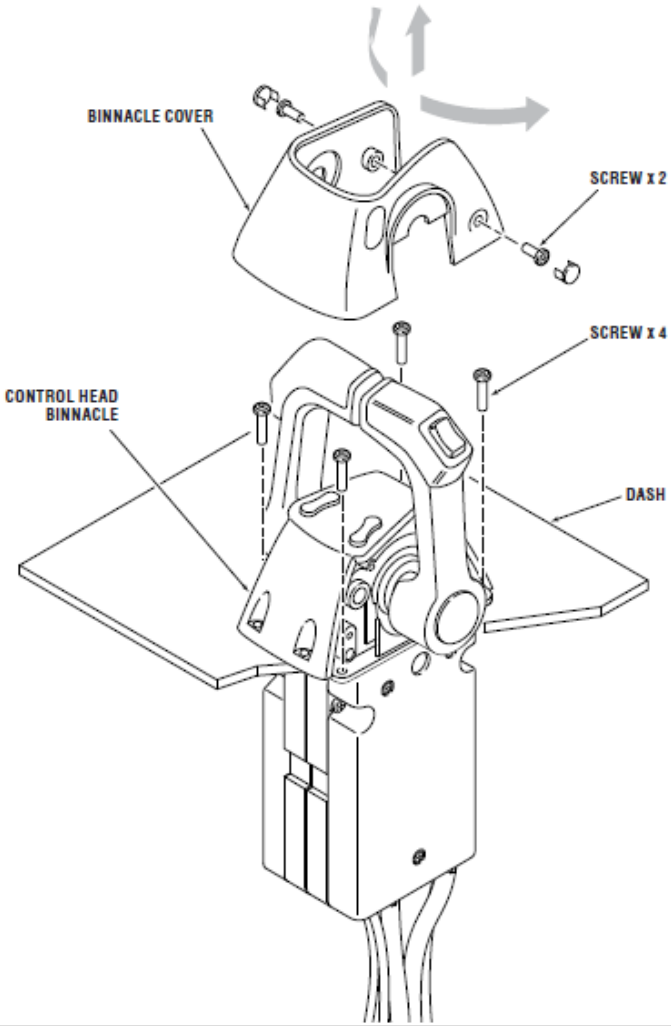


Figure 7-1. Control Head Binnacle removal.

4. Remove the control head from the dash far enough to expose the cover mounting screws. (Refer to figure 7-2. Port side is shown.) Both sides will need to be removed, but it is recommended that you proceed with one side at a time. **Be sure to support the control head so that the harnesses are not under strain.**
5. Cut the cable tie securing the harnesses to the binnacle chassis. (Refer to figure 7-2.)

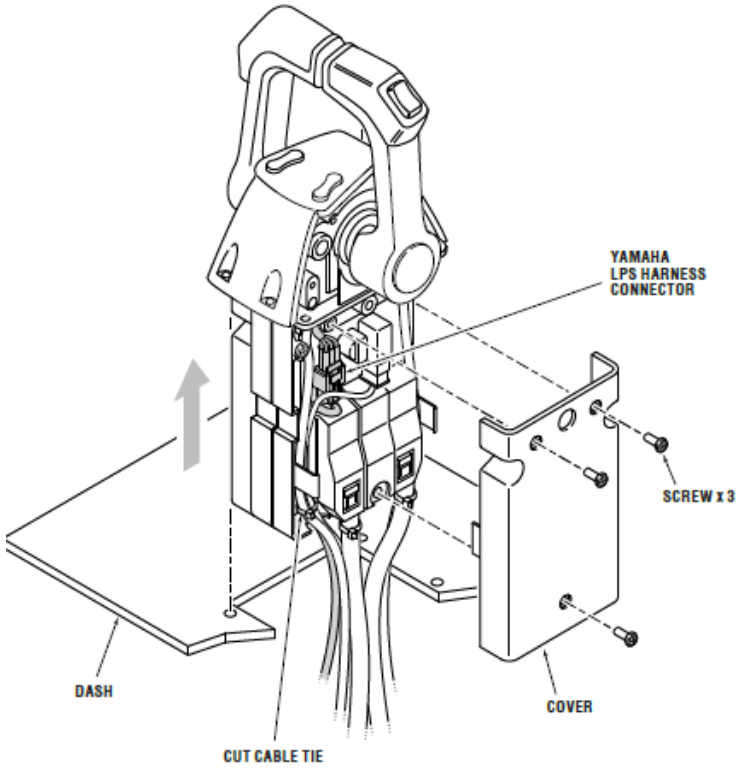


Figure 7-2. Cover removal and LPS harness identification.

Yamaha System Installation

6. Disconnect the Yamaha LPS harness. The port harness will be identified with a 'P' and the starboard harness will be identified with an 'S'. (Refer to figure 7-2.) If this is a triple, do not connect to the harnesses labeled 'PC' or 'SC'.
7. Connect the SeaStar gateway harness as shown in figure 7-3. Port harness is identified 'P_LPS' and the starboard harness is identified 'S_LPS.'

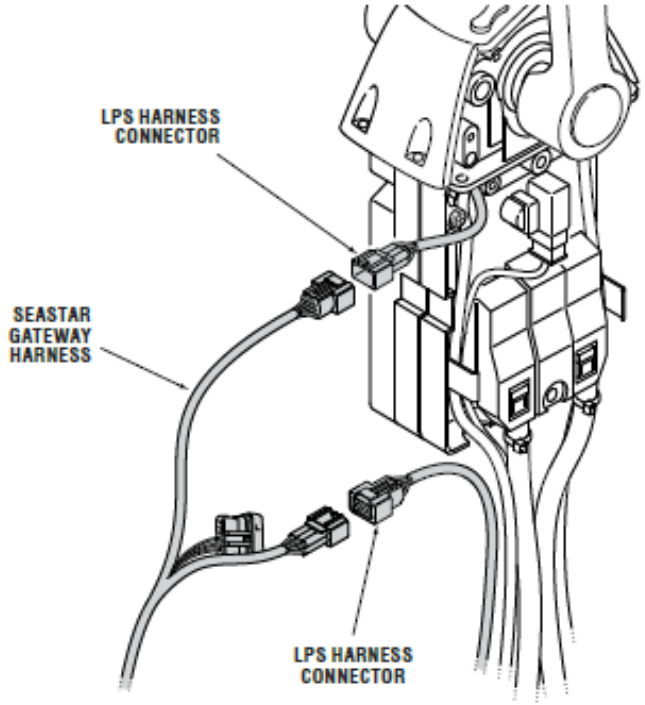


Figure 7-3. Gateway harness connection.

Yamaha System Installation

8. Install a new cable tie to secure the harnesses to the chassis and re-install the cover. (Refer to figure 7-4.)
9. Repeat steps 5–8 for the other side.
10. Re-install the control head in the dash. Take care not to pinch or damage any harnesses. Re-install the binnacle cover. This is a reversal of the removal procedure shown in step 2 and 3.
11. From behind the dash, find the 9-pin connection from the control head, disconnect it, and plug the connectors to the portion of the SeaStar gateway harness labeled 'LED' (Refer to figure 7-5).

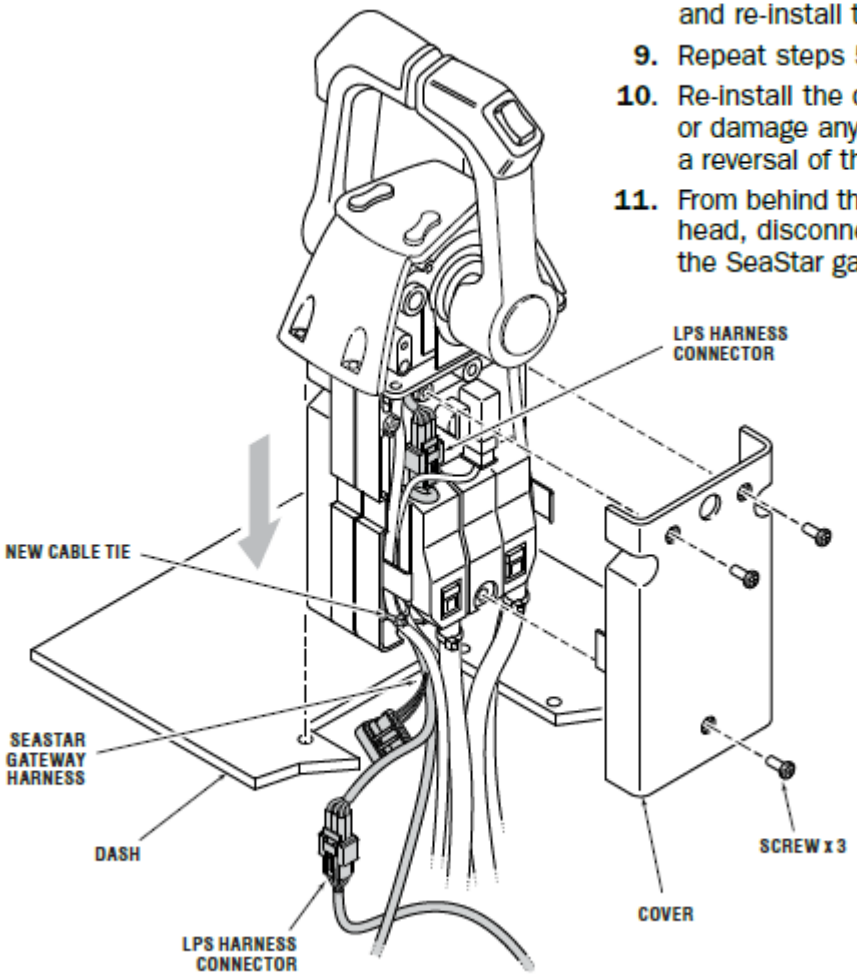


Figure 7-4. Cable tie and cover installation.

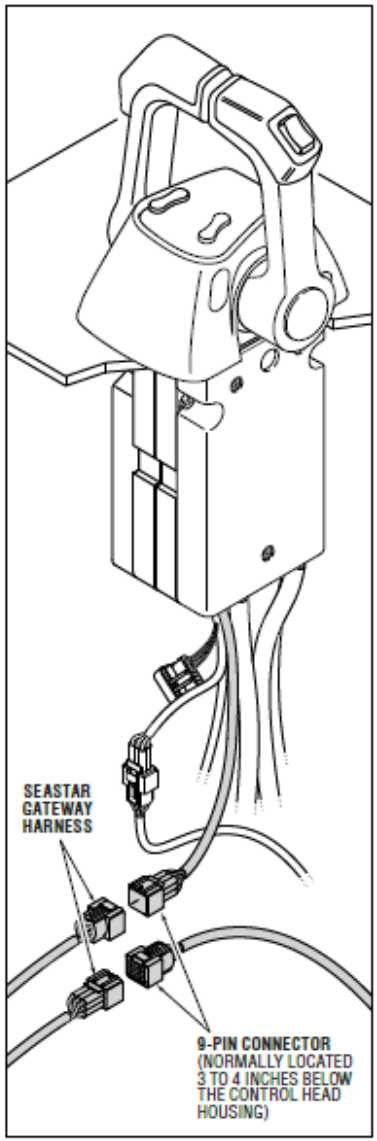


Figure 7-5. Status LED connector identification and connection.

⚠ CAUTION **All harness runs should be sufficiently bundled and strain relieved to avoid accidental damage.**

Yamaha System Installation

EST Gateway Installation

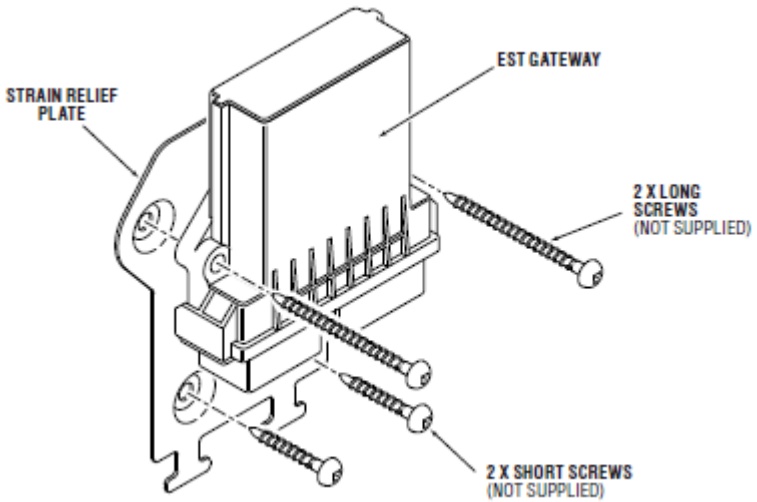


Figure 7-6 Gateway with strain relief plate.

The EST gateway is an electronic interface device that connects the Optimus control system to the OEM shift and throttle control system. It passes shift and throttle commands from the joystick to the engine manufacturer's EST system, and monitors station selection, network status and ignition state.

Location

A gateway (EG1820) is required at each control station equipped with a joystick. It should be installed underneath the dash and as close as practical to the control head. Before installation, test fit with harness CM20023 to ensure that the harness connects to the remote control and the gateway without strain.

Installation

Install the gateway with the strain relief plate and screws as shown in figure 7-6. The preferred orientation is vertical with connections facing down, but it may also be installed horizontally. Avoid mounting the gateway with the connections facing upwards.

Use cable ties to secure the harness cables to the strain relief plate as shown in figure 7-7.

Yamaha System Installation

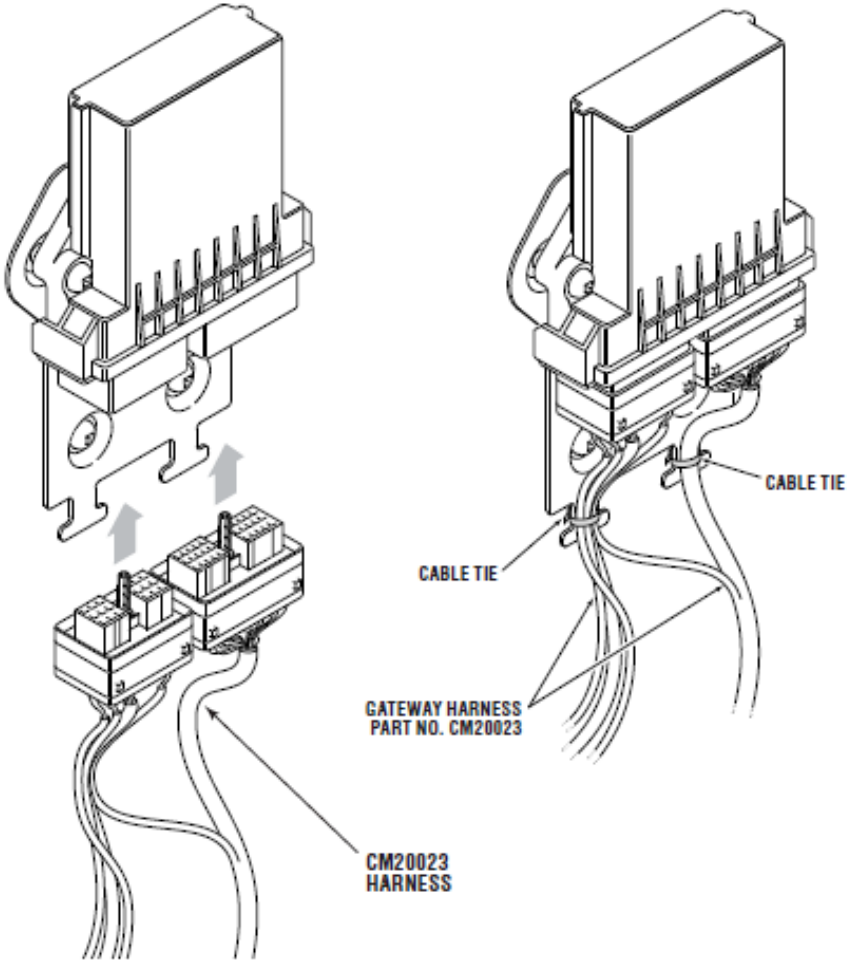


Figure 7-7. Harness connection to EST gateway.

Yamaha System Installation

Yamaha EST Gateway & Optimus 360 Interconnection

The Yamaha DEC (Digital Electronic Control) shift and throttle system connects to the Optimus 360 system through the EST Gateway, using the harness CM20023. The gateway in turn connects to the Optimus 360 CAN1 and CAN2 networks, the Yamaha Command Link or Command Link Plus network, and the PCM ignition, through the same harness.

Figure 7-8 and figure 7-9 show the interconnections for single and dual station implementations. Although the figures show twin engine configurations, the Optimus and gateway connections are identical for a triple engine boat. You may need to add additional Command Link/Plus hubs if there is no port available to connect the gateway harness. Refer to the Yamaha documentation for part numbers.

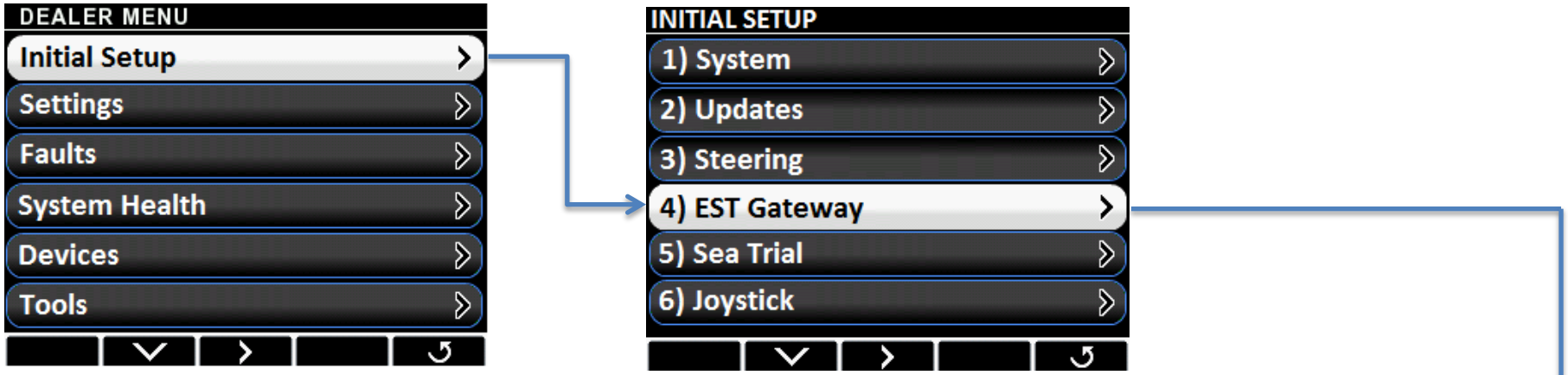
The gateway harness has two purple ignition leads to provide the ignition-on signal to the PCM. Splice them to the two purple ignition leads on the PCM CAN2 harness CM20304. It is not important which wire connects to which, only that both are connected. (If this is a retrofit to an existing Optimus steering system, leave the existing ignition connection as is and ignore the purple wires on the gateway harness.) Use crimped Molex Perma-Seal (or equivalent) butt splice connectors, or shrink-sealed solder connections. Locate all splices in a dry location and secure them properly against mechanical damage.

Yamaha EST Gateway Setup

Before configuring the EST gateway conduct the initial system setup

If you have more than one control station you will need to configure each gateway separately, as they need to be calibrated to their adjacent remote control. The calibration wizard records the output values from the remote control's lever position sensors (LPS) at various lever positions.

Yamaha Gateway Calibration



Procedure

1. The gateway calibration must be performed with the engines keyed on, but not running. Check the RPM reading on the color CANtrak and the Yamaha display. Both should read 0 RPM at all engines. If the RPM displays as '---' on the CANtrak, check your speed source connections.
2. At the main station CANtrak, navigate to **Dealer Menu > Initial Setup > EST Gateway** to bring up the EST Gateway Setup screen. If you have two gateways, and have correctly set the number of gateways, then you will also see a 2nd station gateway on your screen.
3. Select **Calibrate Main EST Gateway and press >.** This will put the main station gateway into calibration mode.

Figure 7-10.

Yamaha Gateway Calibration

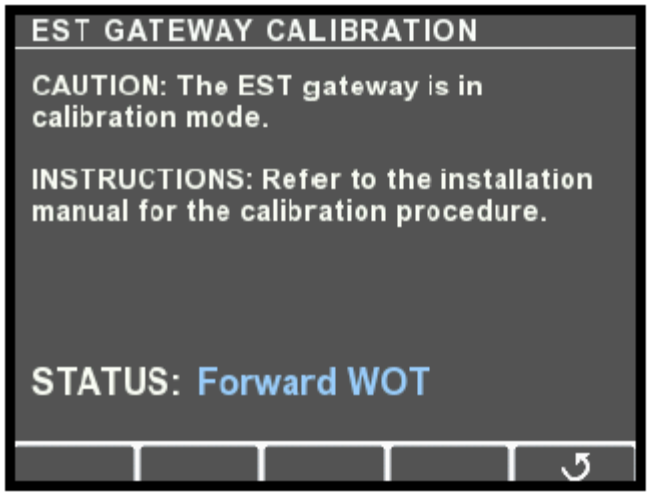


Figure 7-11.

4. The status indication will guide you through the calibration steps. Move both control levers to the position indicated in the status field. You will be directed in turn through the following:
   a. Forward WOT – move the levers to the forward throttle stops
   b. Forward detent – engage forward gear with levers in idle position
   c. Neutral – put both levers in neutral
   d. Reverse detent – engage reverse gear with levers in idle position
   e. Reverse WOT – move levers to the reverse throttle stops
5. After the final calibration step the wizard will exit automatically.
6. Repeat the calibration wizard from the second station, if applicable.