



# Service Bulletin

Bulletin No. 2016-09R1  
OEM No. 2016-08R1

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## Joystick Piloting for Outboard System Changes

<b>NOTICE</b>
Revised July 2016. This bulletin supersedes the previous bulletin number 2016-09 July 2016.

### Scope

Worldwide

### Situation

The intention of this bulletin is to inform dealers and OEM's of the following new components along with a brief description of how they look and function.

The following new Joystick components are explained in this bulletin. For detailed instructions on installations and functions, refer to the appropriate installation manual.

- Helm sensor assembly
- Global positioning system (GPS)/inertial measurement unit (IMU)
- Joystick
- New helm harness changes
- VesselView Link
- Steering current sensor diagnostic kit
- Operational features
- Rigging kit table
- Auxiliary Joystick table

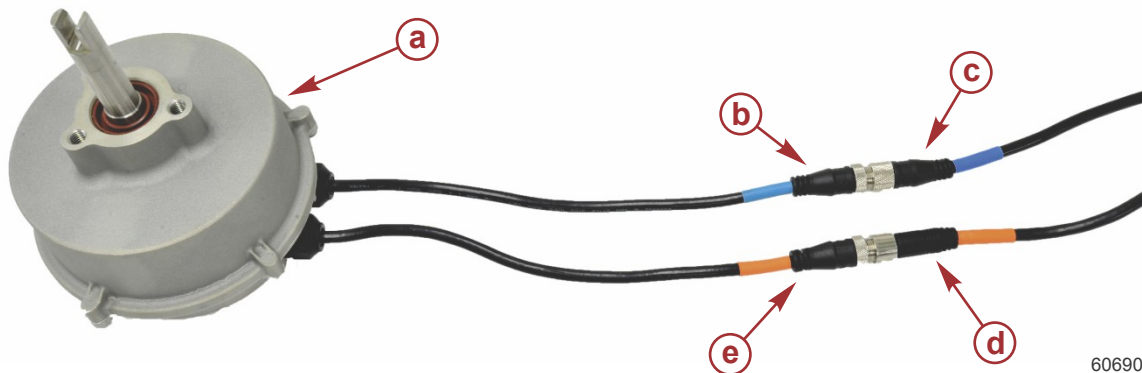
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## Helm Sensor Assembly

### Helm Sensor Assembly Overview

The following illustration covers the electrical connections of the unit:



#### Helm sensor assembly connections

- a** - Helm sensor assembly
- b** - Helm sensor assembly CAN P (blue) connection
- c** - Helm harness CAN P (blue) connection
- d** - Helm harness CAN H (orange) connection
- e** - Helm sensor assembly CAN H (orange) connection

The following items are a few key points of the helm sensor assembly.

- Each helm must have a helm sensor assembly.
- The helm sensor assembly is fully redundant between the port and starboard systems.
- The helm sensor assembly provides resistive end stops.
- The maximum drop length is 7 m (23 ft).

## GPS/IMU

### GPS/IMU Overview

The GPS antenna and IMU have been combined into one unit yet the individual features have not changed.

The following information covers the mounting recommendations, functionality, and calibration of the GPS/IMU:



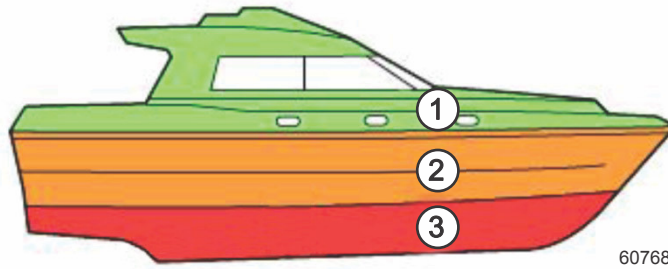
GPS/IMU

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## Mounting Recommendations

The illustration and table highlights the desired mounting location.



Location	Location description
1	This location (above the deck) provides optimal GPS performance.
2	This location (inside the boat) may obstruct the GPS performance.
3	This location (inside the boat) is not recommended for GPS installation.

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## Functionality

The light on the top of the GPS/IMU indicates the status of the unit while it is powered up. Refer to the following table for more information:



LED Color	LED Code	Status	Action Required
<p>60814</p>	Green light—1 blink every 15 seconds.	Normal operation	None
<p>60815</p>	Green light—1 flash every 0.5 second.	Unit is initializing and is in a Not Ready status.	None—normal power up takes <1 minute.
<p>60816</p>	Green light—1 flash every 1 second.	GPS sensor is initializing and is in a Not Ready status.	None—typically lasts 3–5 minutes out of the box, after factory reset, or software update.
<p>60817</p>	Green light—1 flash every 2 seconds.	Compass linearizing	None—normal operation.
<p>60818</p>	Red light—1 flash every 3 seconds.	Internal fault/error, GPS No signal.	Confirm unit has clear view of sky and unit isn't damaged. If so, contact Mercury Marine Technical Support.
<p>61029</p>	Red light—2 flashes every 4 seconds.	No CAN bus detected.	Check all wiring connections. Then contact Mercury Marine Technical Support.
<p>61028</p>	Red light—7 flashes every 9 seconds.	Power and CAN bus detected but no transfer or receive (TX/RX).	Contact Mercury Marine Technical Support.

## Calibration

Calibration of the GPS/IMU is not required. To program a Heading offset, use CDS G3.

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# Joystick

## Joystick Overview

The following photos illustrate the visual differences between the two designs of the joystick.

**NOTE:** The initial production of the joystick will have the external noise suppressor in-line and will be short-term. Long-term production of the joystick will have the noise suppressor incorporated inside the joystick. Either joystick can be used, the functionality remains the same between the two designs of the joystick.

This photo depicts the joystick with an external noise suppressor.



**Joystick with external noise suppressor**

This photo depicts the joystick with an internal noise suppressor.

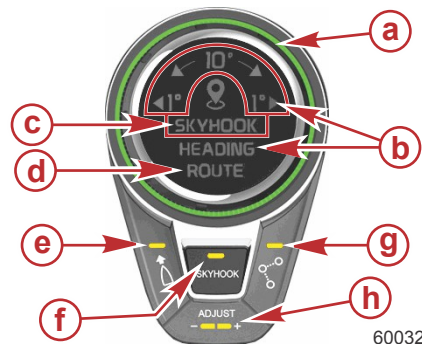


**Joystick with internal noise suppressor**

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The following illustration and table gives an overview of how the joystick functions:



60032

Ref	Description	Notes
a	Light ring	The light ring will illuminate, flash, pulse, or rotate, to indicate a large variety of states. Refer to the individual operation for specifics. The light ring will flash when an input error occurs.
b	Heading mode course adjustment indicators and textual indicator	The course adjustment indicators illuminate when the system is in auto heading mode. They remind the operator that: <ul style="list-style-type: none"> <li>Twisting the joystick to the right will change the heading by 10° starboard</li> <li>Twisting the joystick to the left will change the heading by 10° port</li> <li>Bumping the joystick to the right will change the heading by 1° starboard</li> <li>Bumping the joystick to the left will change the heading by 1° port</li> </ul> The textual indicator illuminates whenever the auto heading mode is engaged.
c	Skyhook mode indicators	Both the textual indicator SKYHOOK and the Skyhook icon illuminate when Skyhook mode is engaged.
d	Route textual indicator	Illuminates when the route (waypoint sequencing) mode is engaged.
<b>Trackpad Lights</b>		
e	Heading button light	Illuminates when the auto heading mode is engaged.
f	Skyhook button light	Illuminates when Skyhook is engaged.
g	Route (waypoint sequencing) button light	Illuminates when the route (waypoint sequencing) mode is engaged.
h	Adjust button lights	These two light segments illuminate to indicate the degree of fine-tuning applied to each function. Refer to the individual function description for details.

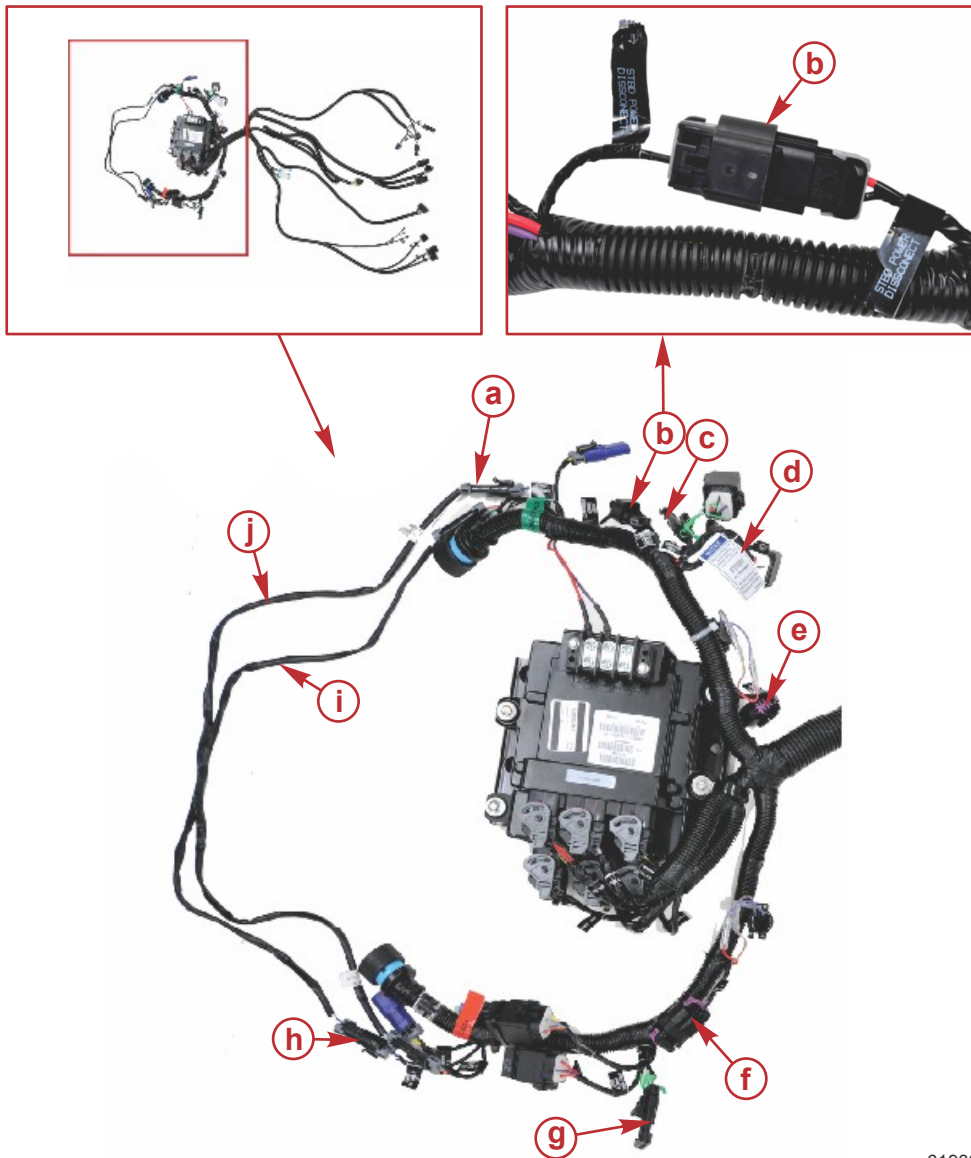
## New Helm Harness Changes

Previous Mercury Marine Joystick products (Zeus, Axius, and JPO—design I) required an external power and ground at the helm harness. This was accomplished by connecting the main power relay harness to the **STBD POWER DISCONNECT** connector on the helm harness. Refer to callout **b** in the following illustration.

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Current Mercury Marine Joystick products (JPO—design II, JPS, and Zeus Joystick Piloting) no longer require a main power relay harness to be connected to the helm harness. The **STBD POWER DISCONNECT** connector must remain connected. Refer to callout **b** in the following illustration.



**Dual-engine helm harness, helm panel end**

- a** - CAN P—also known as CAN 1 connectors
- b** - STBD POWER DISCONNECT
- c** - Starboard switched load
- d** - OEM Skyhook—under tag
- e** - Starboard tachometer link
- f** - Port tachometer link
- g** - Port switched load
- h** - CAN H—also known as CAN 3 connectors
- i** - CAN H link—for triple-engine and quad-engine applications
- j** - CAN P link—for triple-engine and quad-engine applications

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## VesselView Link

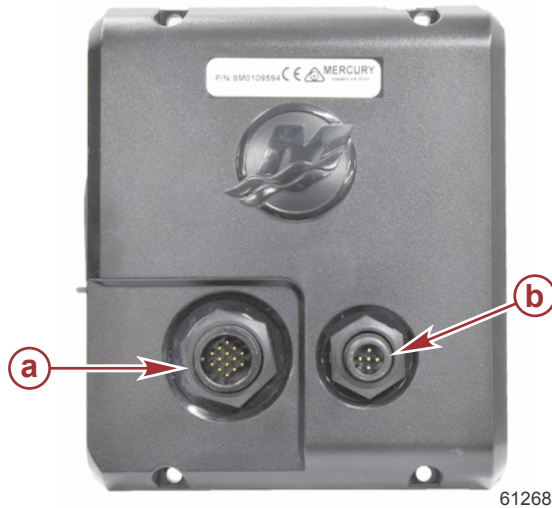
### VesselView Link Overview

The VesselView Link allows the joystick piloting system to communicate with NMEA 2000 components, such as an approved multifunction display (MFD) or chartplotter.

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**IMPORTANT:** The VesselView Link can be used in a single or multiengine application. Ensure you choose the correct part number since the part numbers are different between the single and multiengine application.



**VesselView Link**

- a** - VesselView Link (SmartCraft) connector
- b** - NMEA 2000 connector

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**VesselView Link Connections**

Connect the VesselView Link harness to the SmartCraft junction box. Different connection options may exist, depending on your application.

**IMPORTANT:** Connecting the VesselView Link harness to the multiwake SmartCraft junction box for multiengine applications is required to allow the VesselView Link module to be powered up when either key switch is turned on.

**Steering Current Sensor Diagnostic Kit 8M0115125**



60616

Ref. No.	Qty.	Description	Part Number
a	1	Steering current sensor	8M6004035
b	1	Adapter harness	864988
c	1	Extension harness	8M0110673

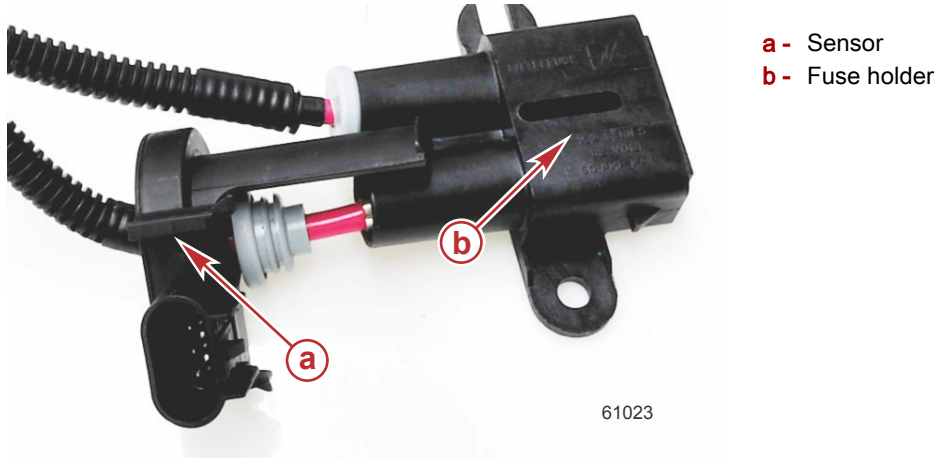
The steering current sensor is used to monitor and diagnose intermittent power steering pump problems. The current sensor is directional and it is recommended to be installed over the positive wire on the power steering pump fuse with the flag pointing towards the terminal connection. The fuse holder positive wire must be removed and the sensor installed over the wire. The steering current sensor connects to the TVM harness.

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**IMPORTANT:** If the steering current sensor is installed in the wrong direction, it will provide a negative reading and will trigger a fault, even though the pump is functioning within normal parameters. It must be installed with the flag pointing toward the positive terminal connection. If it is installed in the opposite direction, the value of current measured will be negative.



If the CDS G3 freeze frame shows the fault **pump not active**, the power steering pump has been operating intermittently. If the pump shuts off unexpectedly at some point but still operates, the vessel operator is likely to see a **SteeringMotorFollow** fault. The data item visible in the TVM (via CDS G3) is **current\_measured**.

## Operational Features

The following descriptions define how the joystick piloting system positions the engines during various operational transitions, depending on the position of the steering wheel.

### Key-Up

No action taken; the engines do not move.

### Engine Start Up

Depending on the steering wheel position relative to the true center, the engines will move to the wheel position.

### Exiting Joystick

The engines will move to the center position and the steering wheel will take the current position as the new center. To return the steering wheel to its original (true) center, operate the boat normally and the system will gradually align the center position of the engines to the original (true) center of the steering wheel.

### Exiting Skyhook

The engines will move to the center position and the steering wheel will take the current position as the new center. To return the steering wheel to its original (true) center, operate the boat normally and the system will gradually align the center position of the engines to the original (true) center of the steering wheel.

### Exiting Route or Heading Mode

The engines will not move from their last position without steering input. The steering wheel position will not match the engine or drive position, but will steer the boat with any input to the steering wheel. Steering wheel movement will gradually align the steering wheel to the engines to return the steering wheel to the steering wheel true center.

## Rigging Kit Table

**NOTE:** When rigging a boat with two stations, the main station and second station kits are required.

Application	Main Station Kit Part Number	Second Station Kit Part Number
Dual	8M0116493	8M0116604
Triple	8M0116586	8M0116606
Quad	8M0116596	8M0116609

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## Auxiliary Joystick Table

Application	Auxiliary Joystick Part Number
Auxiliary joystick kit (dual engine)	8M0115487
Auxiliary joystick kit (triple engine)	8M0115490
Auxiliary joystick kit (quad engine)	8M0117143

## Resistor Pack Table

**NOTE:** When installing a second or third auxiliary joystick, you must replace the existing resistor pack that is included in the auxiliary joystick kit with one of the following part numbers based on the application.

Resistor Pack Part Numbers	
Resistor pack for second auxiliary joystick	898091T02
Resistor pack for third auxiliary joystick	898091T03
Resistor pack for fourth auxiliary joystick	898091T04

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