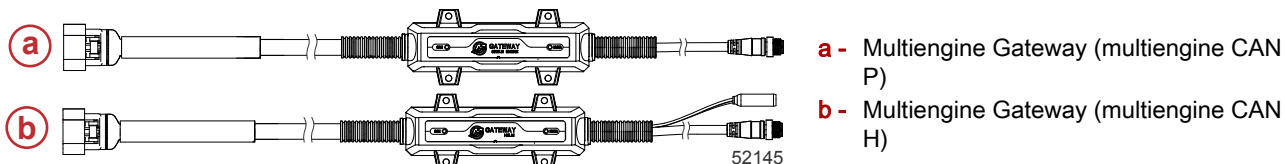


# NMEA 2000 GATEWAY MODULE ASSEMBLY CAN P MULTIENGINE (SINGLE THROUGH QUAD APPLICATIONS) AND CAN H MULTIENGINE (DUAL THROUGH QUAD APPLICATIONS)

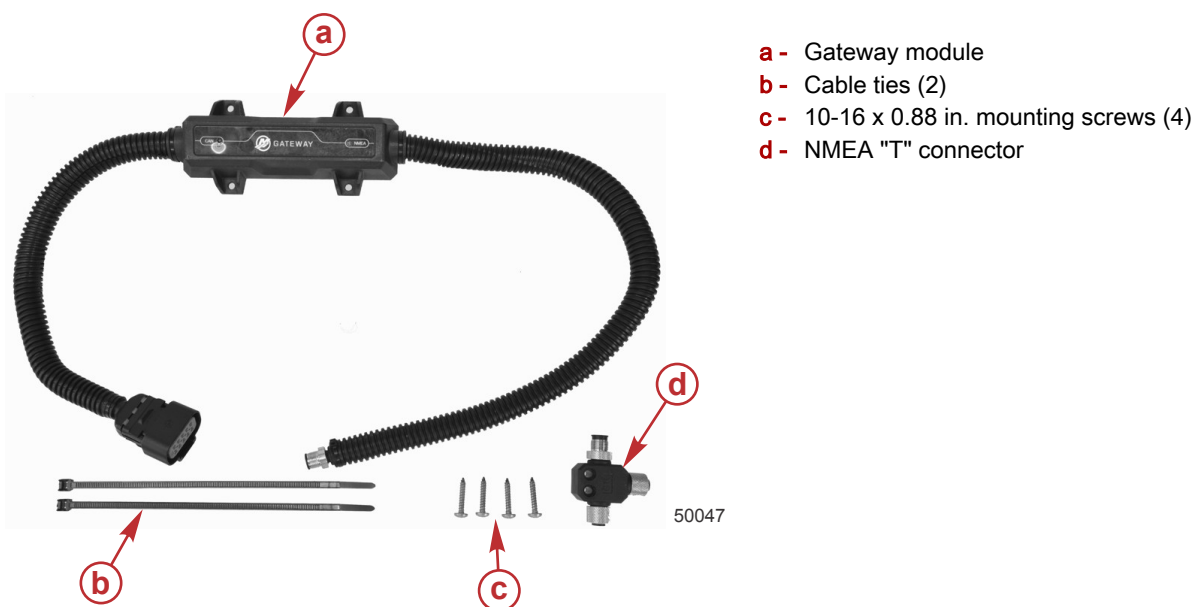
**IMPORTANT:** This document guides our dealers, boatbuilders, and company service personnel in the proper installation or service of our products. If you have not been trained in the recommended servicing or installation procedures for these or similar Mercury Marine products, have the work performed by an authorized Mercury Marine dealer technician. Improper installation or servicing of the Mercury product could result in damage to the product or personal injury to those installing or operating the product. Always refer to the appropriate Mercury Marine service manual for component removal and installation instructions.

**NOTE:** After completing installation, place these instructions with the product for the owner's future use.

## Gateway Module Assemblies



## Components in Kit



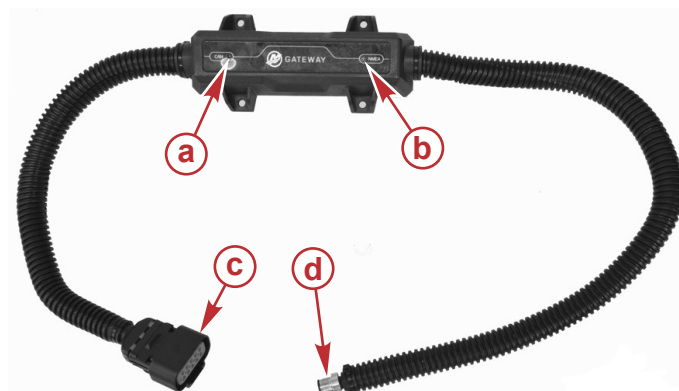
## Features

The CAN light and NMEA light will turn on when data is being transmitted through the Gateway.

**NOTE:** This installation instruction covers the installation of CAN P multiengine Gateway module used on single engine through quad engine applications. It also includes CAN H multiengine applications, dual through quad used with autopilot systems.

## CAN P Multiengine Gateway—Single Engine through Quad

**NOTE:** The Gateway module does not provide power for any device on the NMEA 2000 network. The NMEA 2000 network will require its own power source. The NMEA power input must have appropriate circuit protection for the devices on the NMEA 2000 network.



- a - CAN light (SmartCraft)
- b - NMEA light
- c - CAN 10-pin harness connector
- d - NMEA 2000 harness connector

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## Installing the Gateway

Fasten the Gateway module in one of the two following ways:

1. Fasten the Gateway module with the screws provided.
2. Secure the Gateway module to an adjacent wiring harness with the cable ties provided.

## Guidelines for Installing Harnesses

Follow these guidelines when installing the harnesses:

- The maximum CAN bus length is 70 m (230 ft).
- The maximum length of a CAN bus drop (branch off the main harness) is 7 m (23 ft).
- The combined length of all drops cannot exceed 36 m (118 ft).
- Locate an appropriate path for routing the harness connections to their installation points.
- Inspect the routing path to ensure that the surfaces are free of any sharp edges or burrs that could cut the harness.
- Fasten and support the harness with clamps or cable ties along the routing path. A clamp or cable tie must be used within 25.4 cm (10 in.) from any connection and every 45.8 cm (18 in.) along the routing path if the harness is not housed in a rigging tube.
- Ensure that all connections are tight and locked (if equipped with a lock mechanism).
- Seal all unused connectors with weather caps.
- Route the harness at least 1 m (3 ft 3 in.) from any device that produces electromagnetic interference (EMI), such as VHF radio and radar equipment.

## Precautions for Wiring and Harnesses

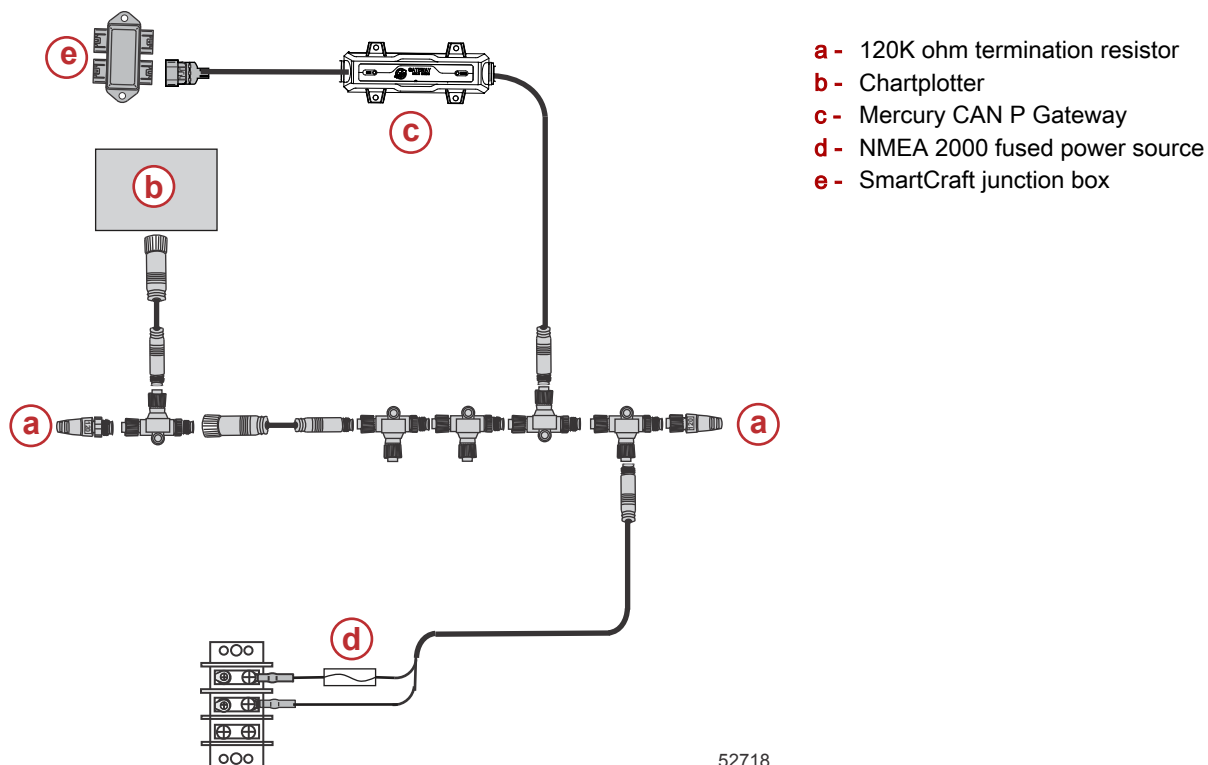
**IMPORTANT:** Refer to the following precautions to avoid damage to the electrical system when working on or around the electrical harness or when adding other electrical accessories.

- Do not attempt diagnostics without the proper approved service tools.
- Do not puncture wires for testing (probing).
- Do not splice wires into the harness.
- Do not connect, network, tie into, switch, or sink source voltage or current from the wiring harnesses.
- Do not connect any type of communication or navigation equipment to the wire harnessing other than at the designated connection point.
- Install boat accessory equipment using an appropriate power source connection, such as a fuse panel or junction box circuit breaker.
- Do not tap directly into any of the electrical wiring harnesses for a source of power.

## CAN P/H Gateway Module Harness Connection

### Single Engine

1. Connect the multiengine Gateway module in one of the two following ways:
  - a. Connect the CAN 10-pin harness connector to the SmartCraft junction box. Refer to the following diagram.
  - b. Connect the CAN 10-pin harness connector to the helm harness SmartCraft 10-pin connection using a male-male adapter harness.
2. Connect the Gateway module NMEA 2000 harness connector to the NMEA 2000 network.



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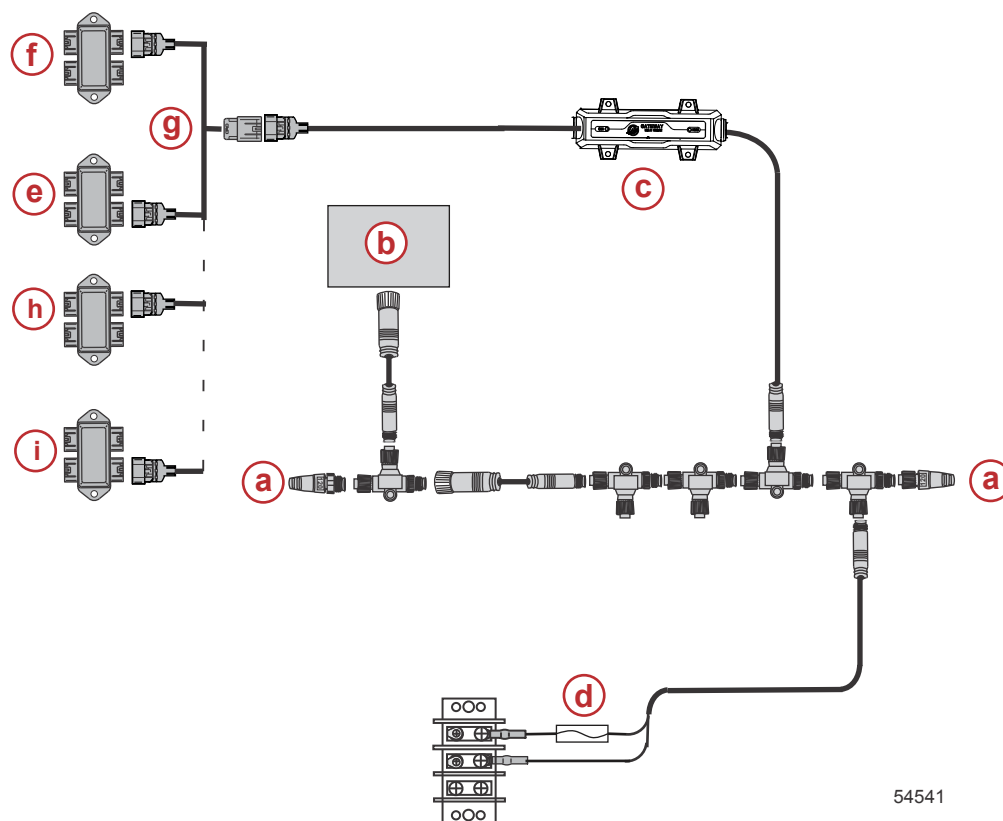
### CAN P Multiengine Gateway Module Harness Connections

For multiengine installations all engines must be networked on the CAN P bus. To ensure proper Gateway operation it must be connected to a 10-pin connection that receives a wake signal from any key switch. The two most common methods are listed below. Refer to 14-pin architecture drawings for more detail.

**NOTE:** Data is carried from the SmartCraft junction box to the Gateway module on the CAN P data bus.

1. Connect the multiengine Gateway module in one of the two following ways:

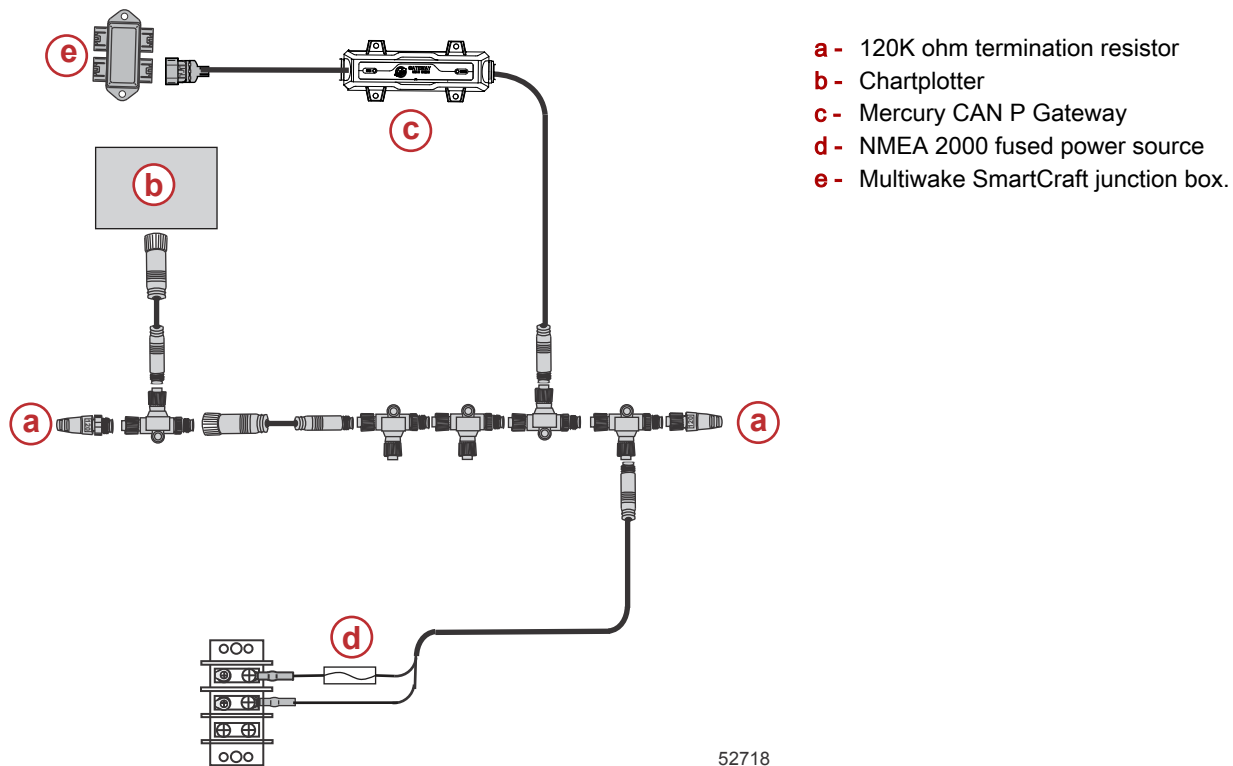
- a. For non-DTS installations connect the CAN 10-pin harness connector to the multiengine instrument adapter.



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- a** - 120K ohm termination resistor
- b** - Chartplotter
- c** - Mercury CAN P Gateway
- d** - NMEA 2000 fused power source
- e** - Starboard outer engine junction box
- f** - Starboard inner engine junction box
- g** - Wake harness or dual engine instrument adapter
- h** - Port inner engine junction box
- i** - Port outer engine junction box

- b. For DTS installations, connect the CAN 10-pin harness connector to the multiwake SmartCraft junction box.

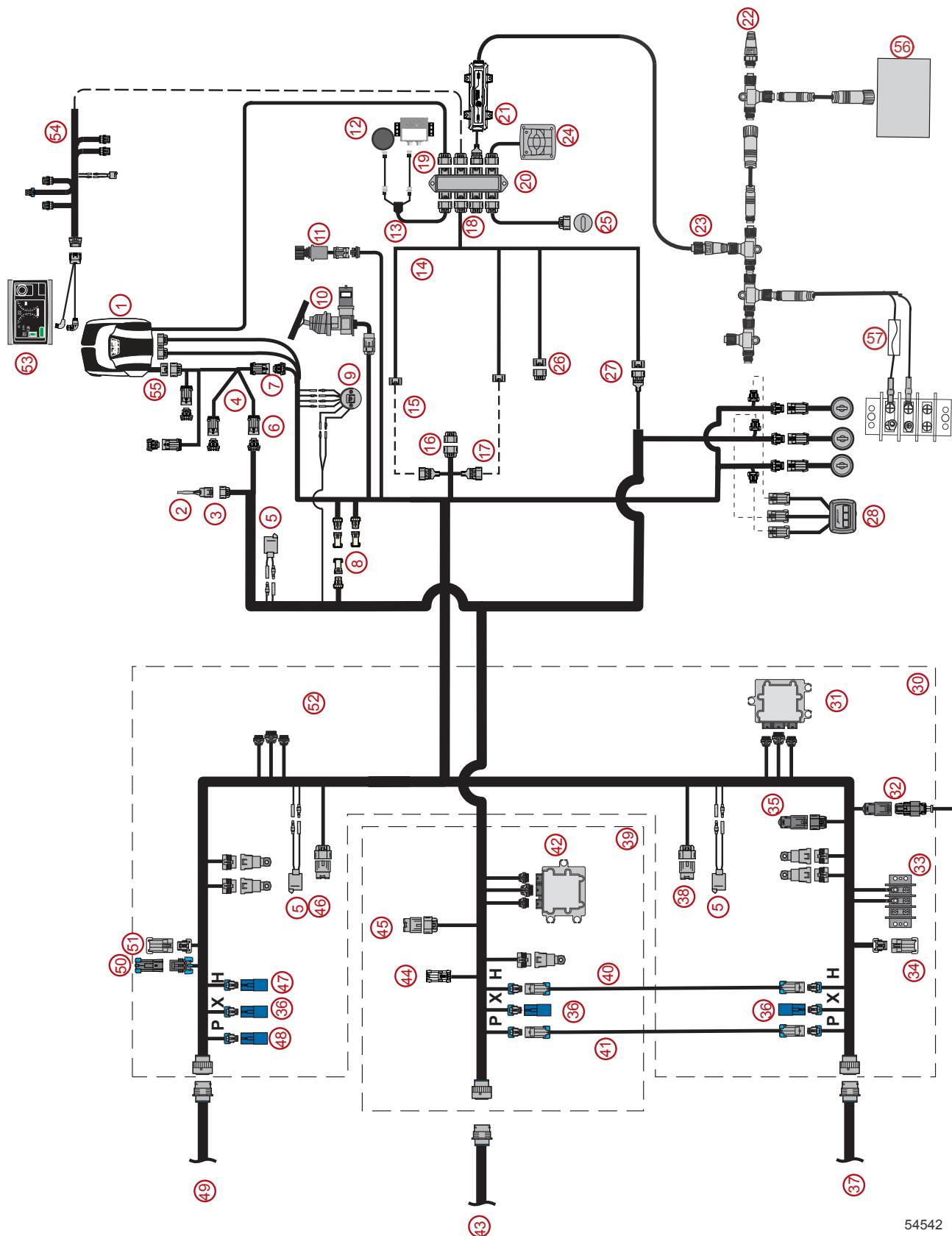


2. Connect the multiengine Gateway module NMEA 2000 harness connector to the NMEA 2000 network.

## CAN H Multiengine Helm Gateway (Autopilot)

1. Connect the CAN 10-pin harness connector to the multiwake SmartCraft junction box.
2. Connect the Gateway module to receive chartplotter autopilot information in only one of the two following ways:

- a. For NMEA 2000 installations, connect the Gateway module NMEA 2000 harness connector to the NMEA 2000 chartplotter network.

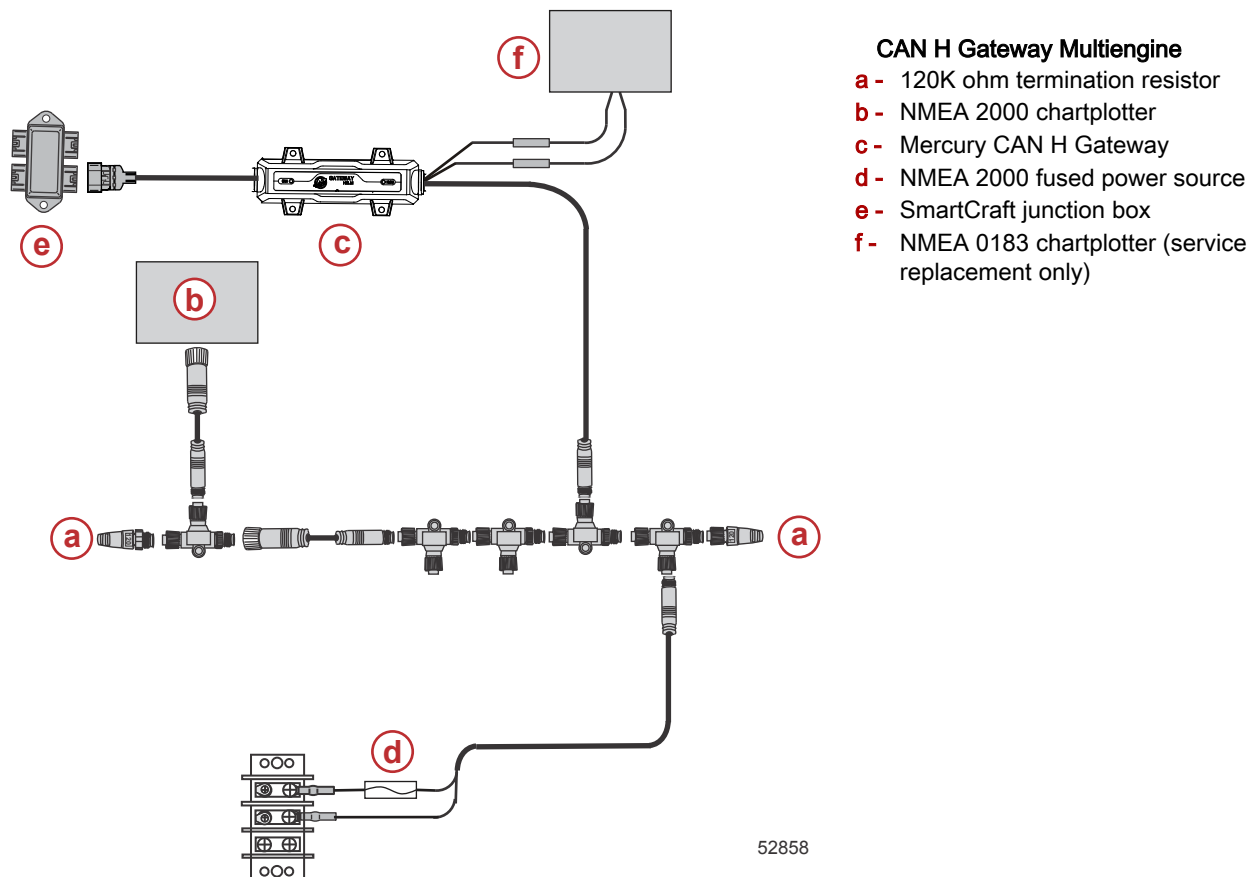


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1 - Electronic remote control (ERC)

- 2 -** Shadow pack resistor 93
- 3 -** Center lever connector
- 4 -** Trim harness
- 5 -** Warning horn
- 6 -** Center trim connector
- 7 -** Port and starboard trim connector
- 8 -** Lever control connectors (for Zero Effort controls)
- 9 -** Lanyard switch
- 10 -** Steering motor
- 11 -** Joystick
- 12 -** GPS antenna
- 13 -** CAN H Y-harness
- 14 -** J-box harness
- 15 -** Port J-box connector
- 16 -** Multiwake J-box connector and weather cap
- 17 -** Starboard J-box connector
- 18 -** Weather cap
- 19 -** Inertial measurement unit (IMU)
- 20 -** 8-way junction box (J-box)
- 21 -** Mercury CAN H gateway
- 22 -** 120K ohm termination resistor
- 23 -** NMEA 2000 connector
- 24 -** Autopilot trackpad
- 25 -** Diagnostic connector
- 26 -** Weather cap on unused port inner J-box harness connector
- 27 -** Center J-box connector
- 28 -** Start/stop buttons
- 29 -** Key switches
- 30 -** Dual-engine helm board
- 31 -** Starboard CCM
- 32 -** MPR power harness
- 33 -** Accessory power
- 34 -** Starboard switched load connector
- 35 -** Weather cap
- 36 -** CAN X terminator
- 37 -** 14-pin data harness from starboard TVM
- 38 -** Starboard tach link connector
- 39 -** Center helm board
- 40 -** CAN H link harness
- 41 -** CAN P link harness
- 42 -** Center CCM
- 43 -** 14-pin data harness from center TVM
- 44 -** Center switched load connector
- 45 -** Center tach link connector
- 46 -** Port tach link connector
- 47 -** CAN H terminator
- 48 -** CAN P terminator
- 49 -** 14-pin data harness from port TVM
- 50 -** OEM Skyhook connector
- 51 -** Port switched load connector
- 52 -** Port CCM
- 53 -** VesselView display
- 54 -** VesselView harness
- 55 -** 14-pin trim connector
- 56 -** Chartplotter
- 57 -** NMEA 2000 fused power source

- b. For NMEA 0183 service replacement installations, connect the helm module wires white/blue (+) and blue/white (–) to the chartplotter. Ensure that the wire connections are watertight.



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## Troubleshooting

Operation of the Gateway can be checked by observing the CAN light and NMEA light. Refer to the following chart:

Gateway Module Light Functions (Engine and Helm)		
Light		Function
CAN	NMEA	
On	On	<ol style="list-style-type: none"> <li>1. The Gateway module is connected to both a functioning CAN bus and NMEA 2000 bus. Data will be transferred as required.</li> <li>2. Update/verify chartplotter software (consult manufacturer's website).</li> <li>3. If Data is not being transferred NMEA 2000 bus device ID's are not approved and are being blocked. Contact Mercury Marine service for helm Gateway (autopilot) device approval list.</li> </ol>
Off	On	<ol style="list-style-type: none"> <li>1. The Gateway module is connected to the NMEA 2000 bus and is receiving the data on the bus.</li> <li>2. The Gateway module is not connected to the CAN bus. Check the connections on the CAN bus accordingly.</li> <li>3. Power is not present at the CAN 10-pin harness connector.</li> </ol>
On	Off	<ol style="list-style-type: none"> <li>1. The Gateway module is connected to the CAN bus and is receiving the data on the bus.</li> <li>2. The Gateway module is not connected to the NMEA 2000 bus. Check the connections on the NMEA bus accordingly.</li> <li>3. Power is not present at the NMEA 2000 harness connector.</li> </ol>



Off	Off	<ol style="list-style-type: none"> <li>1. The Gateway module is not connected to the NMEA 2000 or CAN bus. Check the connections on both sides accordingly. If the connections are deemed good, the Gateway module may require replacement.</li> <li>2. Power is not present at the Gateway CAN 10-pin harness connector nor at the NMEA 2000 harness connector.</li> </ol>
Blink (connected to NMEA 2000 only)		The circuit has an intermittent connection. Check the NMEA 2000 harness and connections accordingly.
Blink (connected to NMEA 0183)		NMEA light will blink for normal operation. Refer above for CAN light blink.

## Gateway Protocol Description

The software is capable of transmitting (**TX**) information to, and receiving (**RX**) information from various parameter group number (PGN) products.

Gateway Modes	
Transmit (TX)	Receive (RX)
Transmits Mercury data to NMEA 2000 display devices.	Receives data from NMEA 2000 to display on Mercury devices.

Mercury Engine Data to NMEA 2000 Capable Products			
Signal	Special Information	NMEA 2000 PGN	Mode
Rated RPM		127498/0x1F20A	TX
Coolant pressure		127489/0x1F201	TX
Speed over water (paddle and pitot)		128259/0x1F503	TX
RPM (rapid update)		127488/0x1F200	TX
Voltage		127489/0x1F201	TX
Coolant temperature		127489/0x1F201	TX
Fuel pressure		127489/0x1F201	TX
Fuel level (percent, type)	2 tanks per engine up to 4 engines, tank 1 for each engine is type fuel 0X00, tank 2 for each engine is data not available 0X0F, Gateway will always assign STBD engine tanks 1 and 2 to NMEA tanks 0 and 1. PORT engine tanks 1 and 2 to NMEA tanks 2 and 3.	127505/0x1F211	TX
Fuel tank size		127505/0x1F211	TX
Fuel flow		127489/0x1F201	TX
Oil pressure		127489/0x1F201	TX
Oil temperature		127489/0x1F201	TX
Gear temp		127493/0x1F205	TX
Gear pressure		127493/0x1F205	TX
Boost pressure		127488/0x1F200	TX
Trim position		127488/0x1F200	TX
Rudder angle		127245/0x1F10D	TX
Depth		128267/0x1F50B	TX
Depth offset		128267/0x1F50B	TX
Seawater temp		130310/0x1FD06	TX
Engine hours		127489/0x1F201	TX
Manufacturer ID	Address claim (0 x 90 = Mercury)	060928/0xEE00	TX
Alarm data	NMEA 2000 alarm data is limited and will only display "Check Engine" when an alarm is activated. Refer to the Mercury SmartCraft Gauges for descriptive fault text. Diesel engine alarms are not transmitted to NMEA 2000.	127489/0x1F201	TX
Tabs		130576/0x1FE10	TX
Course over ground		129026/0x9F802	RX/TX
Speed over ground		129026/0x9F802	RX/TX
GPS position		129025/0x1F801	RX
Product info		126996/0x1F014	TX

Mercury Engine Data to NMEA 2000 Capable Products			
Signal	Special Information	NMEA 2000 PGN	Mode
Gear position		127493/0x1F205	TX
Engine load (diesel)		127489/0x1F201	TX

Helm (Autopilot) Gateway to NMEA 2000 Capable Products			
Signal	Special Information	NMEA 2000 PGN	Mode
Course over ground (COG)		129026/0x1F802	RX/TX
Speed over ground (SOG)		129026/0x1F802	RX/TX
GPS position (lat/long)		129025/0x1F801	RX/TX
Heading (HDG)		127250/0x1F112	RX/TX
Waypoint ID		129284/0x1F904	RX/TX

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