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Zeus Guardian Strategy and Updates for SC2.5

Notice
Revised April 2017. This bulletin supersedes the previous bulletins, numbers 2013-66 and 2013-66R1 dated June 2013 and December 2014.

Models Affected

Models Covered	Year
Zeus KH Pods	2012–2016

Scope

Worldwide

NOTICE
The service technician performing the procedures described in the bulletin must read and understand the entire service bulletin before attempting a reflash procedure. Failure to follow all service bulletin instructions and the instruction shown in CDS G3 during the reflash process may lead to a reflash failure, resulting in an inoperable or disabled vessel.

Situation

Vessels equipped with Zeus propulsion systems in the affected model range require a software reflash that includes a new engine Guardian strategy. The updated software will generate an alarm and reduce power when the exhaust temperature threshold is exceeded. A critical exhaust temperature overheat will shutdown the engine.

In addition, all vessels within the affected range require a test for audio warning horn functionality. Follow the horn test procedures outlined in this bulletin for testing the warning horn. Contact Mercury Technical Service for further instructions if the horn test fails.

If the horn test is successful, follow the procedures in this bulletin to update the vessel software to the latest calibration.

Compatible Software Combinations

After the reflash is completed, the SIM and the CCM calibrations must match this software exactly. If there is a difference in either calibration for any SIM or CCM on the boat, contact Mercury Diesel at 920-929-5884.

CCM Calibration	Compatible SIM Calibration
CCM11ZADXPAAA_000A_PDJQAX_009	SIM11ZADXPAAB_PDJQAX_REV2_000

For SC2.5 V1 and V2 Software

A new SIM calibration has been added to the SC2.5 reflash package. The CDS G3 **Home Page**, will notify you if a later version of the installed Zeus module software is available.

Use the SC2.5 Zeus Reflash Guide later in this bulletin to determine the configuration requirements of specific module updates. For SC2.5 V2 software, refer to the **SIM Reflash—V2 only** section of the bulletin before proceeding and then perform only the required steps. Zeus vessels that were addressed previously with the SC2.5 CDS G3 reflash package should be addressed with the updated reflash package for Zeus SC2.5.

For SC2.5 V0 Software

Zeus systems with SC2.5 V0 software version require a software reflash to the latest version of SC2.5 with CDS G3 to incorporate the latest improvements. In addition to the software reflash, the five hydraulic pressure transducers in the steering and trim systems require replacement with a new 3500 psi transducer. The software from the reflash and the transducer replacement cannot be applied individually. All Zeus SmartCraft SC2.5 V1 and later software require the new 3500 psi pressure transducers. To indicate that the pressure transducers have been changed, place the decals included in the transducer kit onto the steering and trim manifolds, as indicated in this bulletin.

This service bulletin will guide you through the reflash, transducer replacement, and decal installation. A Mercury Diesel-supplied vessel personality is required to be installed upon completion of the software reflash. You may need to contact your local Mercury Diesel service representative to obtain the correct vessel personality. For the U.S. and Canada, call Mercury Diesel at 920-929-5884.

New Guardian Strategy for Exhaust Temperature

Fault	Description
Exhaust_Temp_High	• Caution horn—6 beeps • Nonsticky • Exhaust temperature high, service engine soon text • 50% demand limit
Exhaust_Temp_Critical	• Critical horn—6 second beep • Sticky • Exhaust temperature critical, return to port immediately text • Engine shutdown action

IMPORTANT: The default value for a failed (high/low) exhaust temperature sensor is set to 0° C. This will prevent Guardian during a failed sensor scenario.

Required Horn Test Procedure

The horn test procedure must be performed on both engines prior to and after the software reflash.

IMPORTANT: Test the vessel horn using the following procedure to ensure horn function. If the horn is not functioning, contact Mercury Technical Service in the U.S. and Canada. Outside the United States and Canada: contact your local Mercury Marine International office.
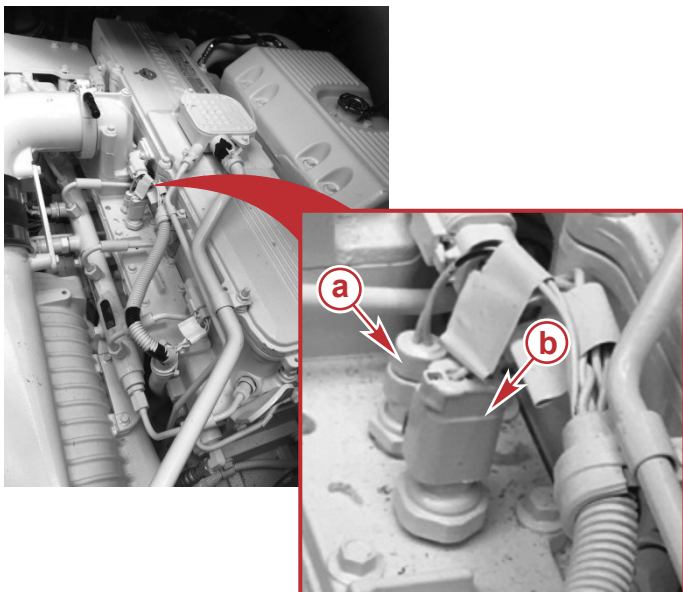
1. Turn all keys on.

2. Ensure the VesselView is on, agree to the license, and ensure that there is visible data from both engines showing up on the screen.

QSC Models

   a.   Disconnect the intake manifold temperature sensor.

a - Intake manifold temperature sensor
b - Boost pressure sensor

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    b.   Ensure that a fault has occurred by viewing the VesselView screen for the fault indication. Alternatively you can observe CDS G3 in the module data screen. A module that is faulting will indicate so in the right hand column of CDS G3's module data. Ensure the Intake Manifold Temperature fault you are triggering shows up in the starboard or port SIM.

QSB Models

    a.   Disconnect the coolant level sensor.
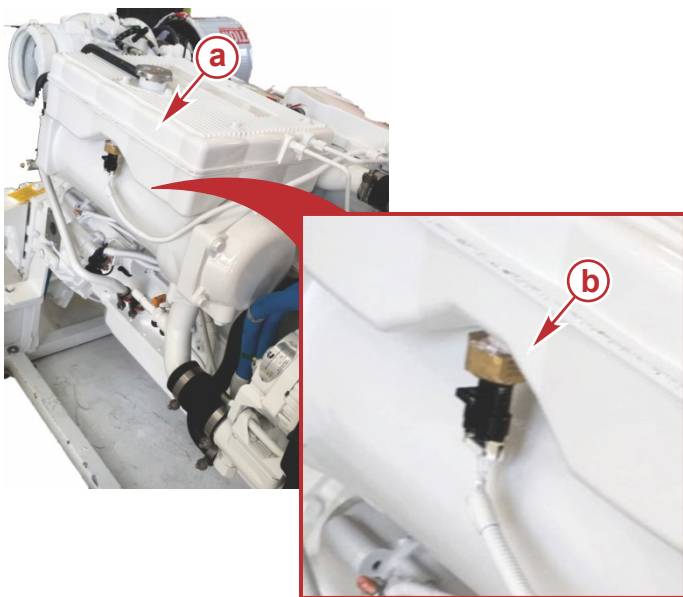
a - Reservoir
b - Coolant level sensor

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    b.   Ensure that a fault has occurred by viewing the VesselView screen for the fault indication. Alternatively you can observe CDS G3 in the module data screen. A module that is faulting will indicate so in the right hand column of CDS G3's module data. Ensure the Coolant Level Sensor fault you are triggering shows up in the starboard or port SIM.

3.   The audio warning system should sound for six one-second intervals.

4.   Turn the keys off and pull the electronic remote control handles back to reverse wide open.

5.   Turn the keys on again and verify the presence of the faults and the audible caution horn—6 beeps.

6. Connect the sensor that was disconnected during the test procedure.

7. If the audio warning system did not sound audibly, contact Mercury Diesel customer service. In the US and Canada call (920) 929 5884. Outside the United States and Canada: contact your local Mercury Marine International office.

Owner Notification

Zeus-equipped vessels that contain SC2.5 software packages should be reflashed to the latest version of software using version 1.7.8 CDS G3 or above during the next service interval.

Obtain Vessel Personality

A vessel personality must be installed upon completion of the software reflash.

Connect to CDS G3

IMPORTANT: Version 1.7.8 CDS G3 or greater must be used to complete the reflash. To verify your current version of CDS G3, click on the word Help at the top of the G3 screen and select About. The current version will be displayed.

Connect the CDS G3 to the vessel, turn the keys on. The **Home** screen, which is the first screen shown when CDS G3 launches, will list any priority action items that must be addressed, including software updates. One of these items may be **CDS G3 has identified that an upgrade is available for the engine or vessel system that you're connected to. Please select the Update button to perform the upgrade**, as shown in the following screenshot.
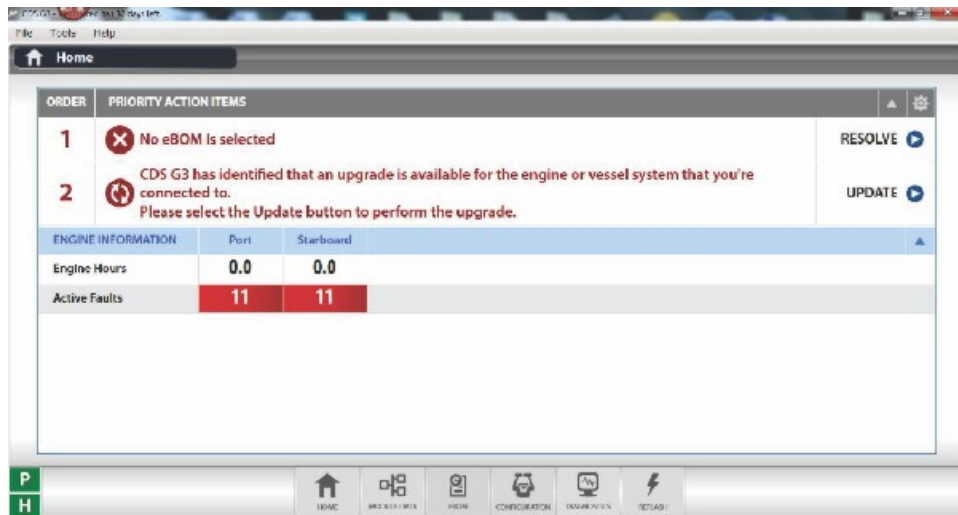
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On the **Home** screen, select the **Update** button to the right of the priority action item that indicates there are available upgrades. Clicking on this will call up the **Reflash Package Browser** from which you can select the reflash packages that are available for your vessel.

SIM Reflash—V2 only

1. On the **Home** screen, click on the **Update** button to the right of the priority action item to open the **Reflash Package Browser** from which you can select the reflash packages that are available for your vessel. Or, select the **Reflash** icon at the bottom of the **Home** screen and select **Module Reflash** to enter the **Reflash Package Browser** and select the applicable reflash package that is listed.

2. Reflash the starboard SIM.

3. Reflash the port SIM.

4. Turn all keys to the off position, and pull all control levers to the reverse wide-open throttle (WOT) position.

5. Turn all keys to the on position, wait five seconds and turn the keys to the off position again.

6. Turn all keys to the on position and return the control levers to the neutral position.

7. Following the completion of the reflash select the **eBOM** icon from the bottom of the **HOME** screen.

8. Use CDS G3 to import the vessel personality (.vsl file).

9. The personality information must be restored using the **Import** function in CDS G3. Go to **Configuration** and then select **Import**.

10. Vessel personality files can be downloaded from the SmartCraft download center or are sent via e-mail from Mercury Diesel Product Support. The personality can be stored on a memory stick, or a folder can be created on the computer desktop.

11. Use **Select File** to query the memory stick or file folder that contains the vessel personality.

12. Double click the personality. Then select **Begin Import** to complete the VSL import process.
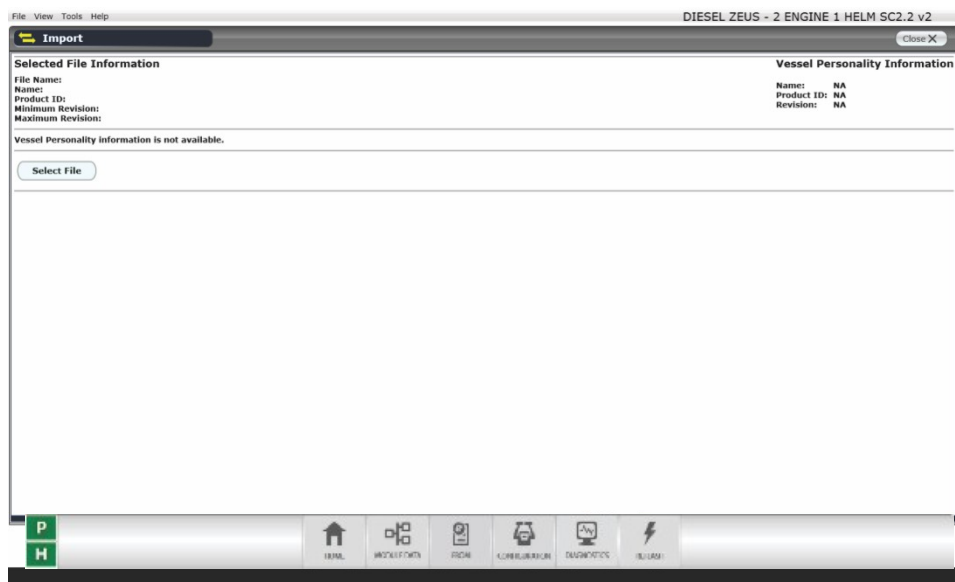
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13. Connect the VesselView displays and SmartCraft gauges.

14. Perform the sea trial and test autopilot features.

15. This completes the SC2.5 reflash. No other configuration procedures are required.

V0 and V1 Reflash

Inspection for Transducer Replacement

IMPORTANT: To determine if the hydraulic pressure transducers must be replaced, select the eBOM screen in CDS G3. If the uppermost eBOM, the one with the most matches is "Pod Drive - Zeus SC2.5 V0," replace the transducers. A physical inspection of the label on the transducers can also show you if replacement is necessary. Transducers labeled as 3000 psi must be replaced.

1. Disconnect the battery cables from the battery by disconnecting the negative (–) battery cable first.

2. Refer to service manual **Zeus 3000 Series Pod Drive - Section 1B** to remove the drive cover, if equipped.

3. Clean the exterior of the hydraulic hoses, fittings, and hydraulic system components with a clean, dry cloth.

IMPORTANT: The rubber interface ring seal has an outside coating that protects the inner core. Tears, cuts, scrapes, or exposure to lubricants or sealing compounds can damage this coating and the inner core causing water to leak into the boat. Use caution when installing and working around the interface ring seal to prevent damage.

NOTE: To protect the rubber interface ring seal, position the oil absorbing pads to catch any spills.

Parts Required for SC2.5 V0 Update

3500 psi pressure transducers should **only** be installed in place of previous 3000 psi transducers where the software in the TVM is being updated from SC2.5 V0. The software reflash cannot be applied to those vessels without the 3500 psi pressure transducer installation because the pressure values will read incorrectly in CDS G3.

Qty.	Description	Part Number
1	Transducer kit	8M0078384

Hydraulic Pressure Transducer Replacement

IMPORTANT: The trim circuit is equipped with a check valve to prevent the trim tab from lowering when the hydraulic pump is not operating. When servicing the trim system, the trim tab should be all the way down. If the vessel is out of the water, supply water to the seawater pickup and operate the engine to lower the trim tab. If the transmission-driven hydraulic pump will not operate, refer to service manual Zeus 3000 Series Pod Drive - Section 5D, for instructions on manually lowering the trim tab.

There are a total of five transducers on the steering and trim tab hydraulic systems of each pod. Replace each of the five transducers on each pod.

The hydraulic steering manifold for each pod contains three pressure transducers. These steering pressure transducers are identified by letters b, c, and e in the following illustration.

a - Trim tab coil A (TCA)
b - Pump pressure transducer
c - Steering A pressure transducer
d - Steering coil A (SCA)
e - Steering B pressure transducer
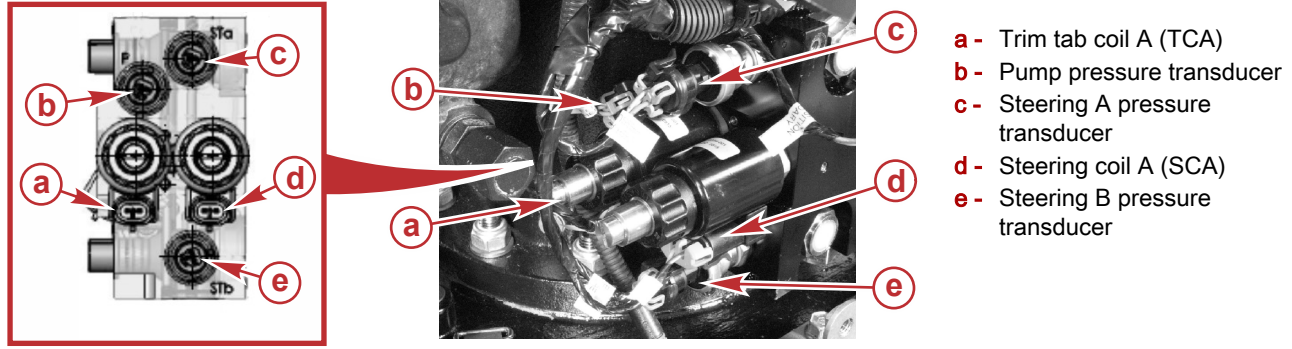
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The hydraulic trim tab manifold for each pod contains two pressure transducers. These trim tab pressure transducers are identified by letters a and b in the following illustration.

a - Trim tab pressure transducer B
b - Trim tab pressure transducer A
c - Hydraulic line connector B
d - Hydraulic line connector A
e - Hydraulic manifold
f - Trim tab position transducer
g - Trim cylinder
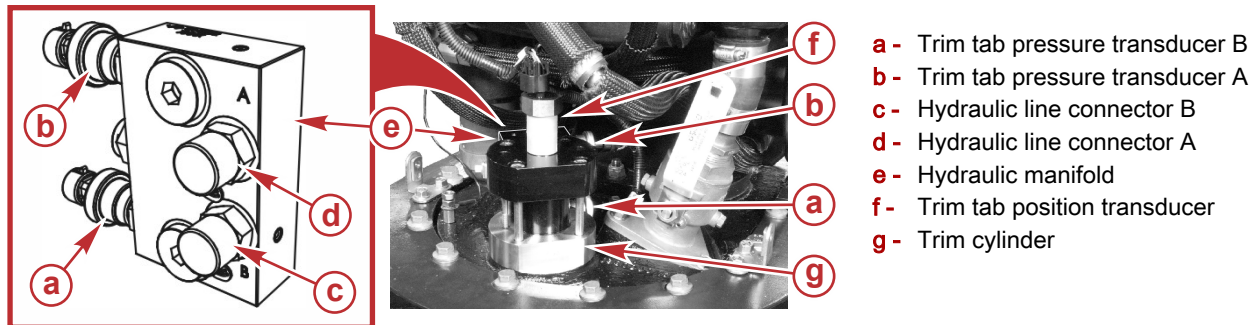
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Tighten each transducer to the specified torque.

| Description	Nm	lb-in.	lb-ft
Hydraulic pressure transducer	25	–	18

Label Placement

IMPORTANT: Label installation is not necessary unless the pressure transducers were replaced. Refer to the hydraulic pressure transducer replacement section of this bulletin.

Two labels indicating that the new 3500 psi pressure transducers have been installed are included in the transducer kit. The labels should be installed on both the steering manifold and the trim tab manifold. Refer to the following graphics for the placement of the labels.
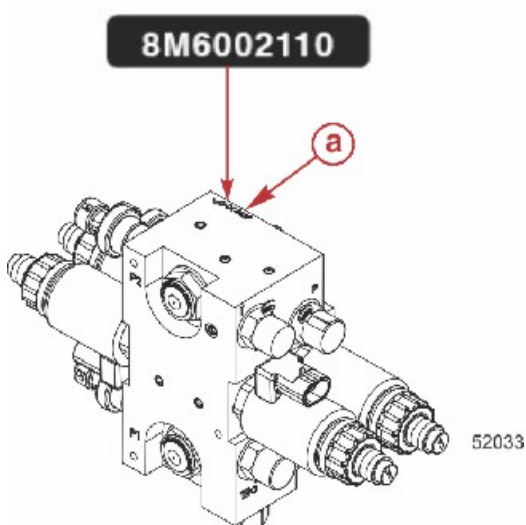
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IMPORTANT: Ensure that the label mounting surface is clean and free of oil prior to application.
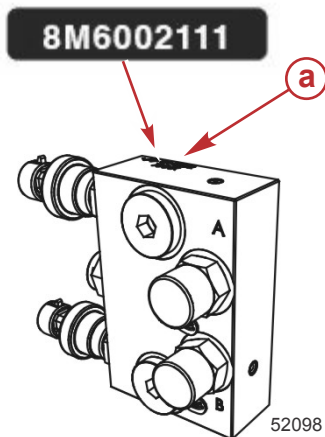
Trim tab manifold
a - Decal placement

Steering manifold
a - Decal placement

Record Mechanical Drive Offset Values

Use CDS G3 to view the live data of both port and starboard TVMs, and note the mechanical drive offset. If the value is nonzero, it will need to be reentered in the mechanical drive alignment page of CDS G3 after the reflash. If the value is zero, this step will not be necessary.

Reflash SIM Modules (Listed as Engines in CDS G3)

NOTE: In Reflash Module View, the CDS G3 lists the modules in the preferred order of reflash. As each module is reflashed, it will move down to the bottom of the display, and CDS G3 highlights the preferred module for the next reflash.

• Ensure that all VesselView displays and SmartCraft gauges are disconnected from the junction box.

• Ensure that the starboard SIM is reflashed before the port SIM. After reflash, each SIM City ID is set to Helm 1 STBD.

- As each SIM is flashed, the number of modules that appear on the starboard City ID (11 decimal, 0BHex) will increase by one. As the quantity of the starboard SIMs goes from one to two, note the display will show a red X icon next to the modules that have been completed. This is a normal part of the procedure.
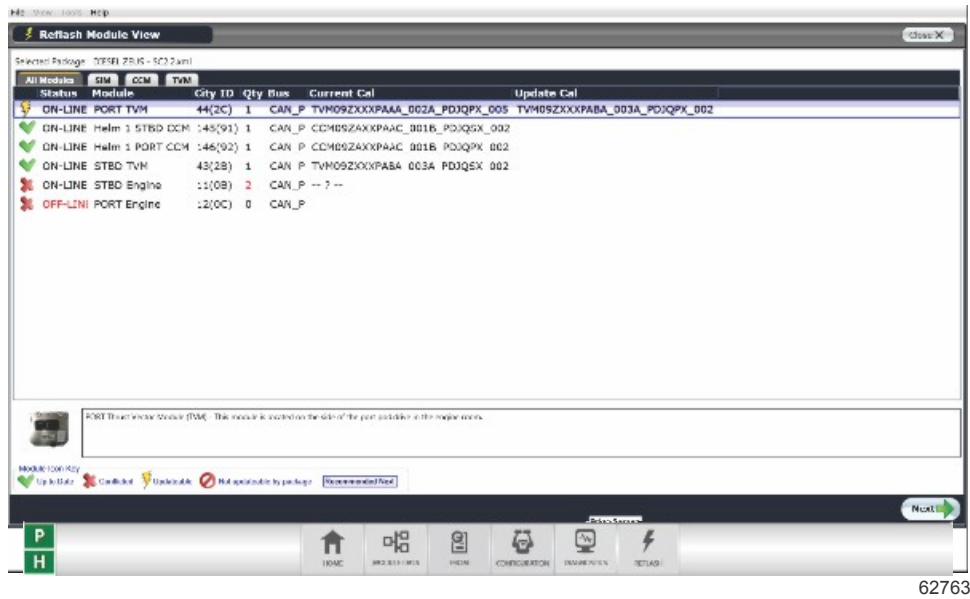
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Reflash Command Control Modules (CCM)

Ensure that the helm 1 starboard CCM is reflashed before all other CCMs. Follow that with the starboard CCM for helm 2, and then the port CCMs for each helm.

Reflash Thrust Vector Modules (TVM)

- Ensure that the starboard TVM is reflashed prior to the port TVM. After reflash, each TVM is assigned a starboard City ID (43 decimal, 2BHex). As the quantity of the starboard TVMs changes from one to two, note the display will show a red X icon next to the modules that have been completed. This is a normal part of the procedure.
- Perform the Lever Adapt process when completed to set the City ID assignment for the TVMs.
- After all modules have been reflashed, select **Close** to exit reflash.

Cycle Both Key Switches

- Cycle both key switches off then on to ensure that both SIM locations will reset.

Perform City ID Assignment

1. Go to Configuration, select **Helm Configuration**, then select **Helm Device Setup**, then **Helm Setup**.
2. Manually enter the number of helms and the number of engines.
3. Assign City IDs using the tab marked **Assign City ID**.
4. Follow the on-screen directions to complete the City ID assignment.
5. Upon completion, each CCM is assigned a unique City ID.

6. Each module City ID corresponds to its helm and engine.
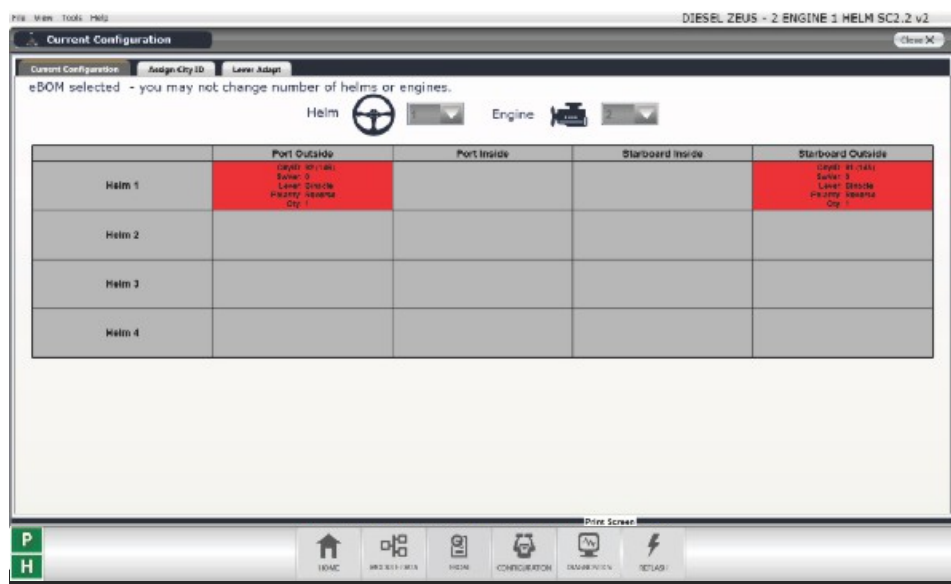
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Perform Lever Adapt

• Select the **Lever Adapt** tab, select the correct remote control type, and follow the on-screen directions to complete the process.

• Perform the lever adapt process for each helm separately.

• Upon completion, go back to the **Current Configuration** tab and ensure that all CCMs report their location correctly and show white status instead of red.
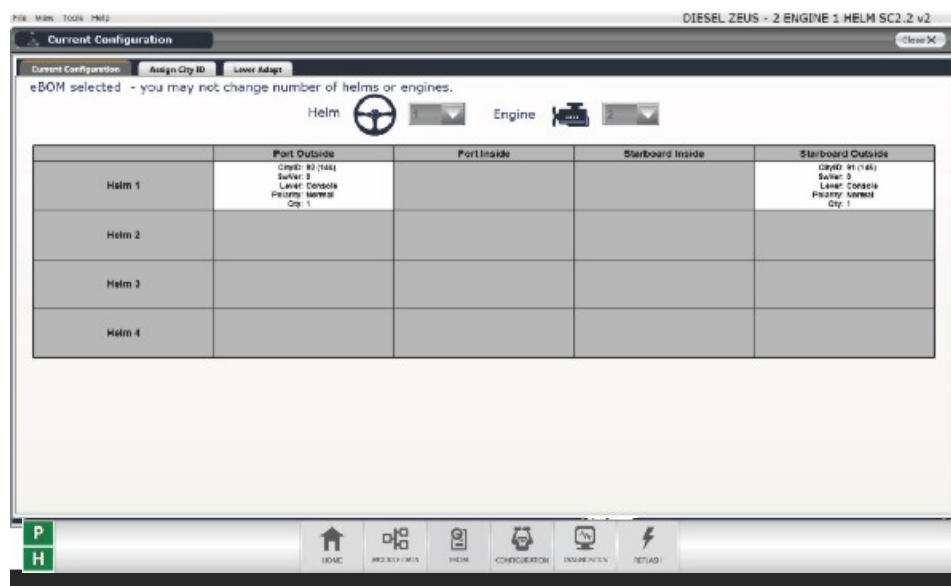
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Select an eBOM

• After the lever adapt procedure is complete, you will need to select the correct eBOM to proceed.

• Select the eBOM that matches your vessel's configuration.

Mechanical Drive Offset Values

If the values you noted for Mechanical Drive Offset were 0, this procedure can be ignored.

1. Go to Configuration and select **Drive Configuration**.
2. Select **Manual Drive Offset**.
3. Select **Zeus & Axius**.
4. Place the on-screen cursor in the mechanical drive alignment field.
5. Enter the recorded values for both port and starboard.
6. Select **Finished**.

Perform Drive Initialization

When a TVM is reflashed, the mechanical stop information is lost. Mechanical stop information must be restored using the Drive Initialization procedure.

1. Start the engines.
2. Go to Configuration and select **Drive Configuration** in CDS G3.
3. Select **Drive Initialization** and follow the on-screen directions to complete the initialization of each pod drive.
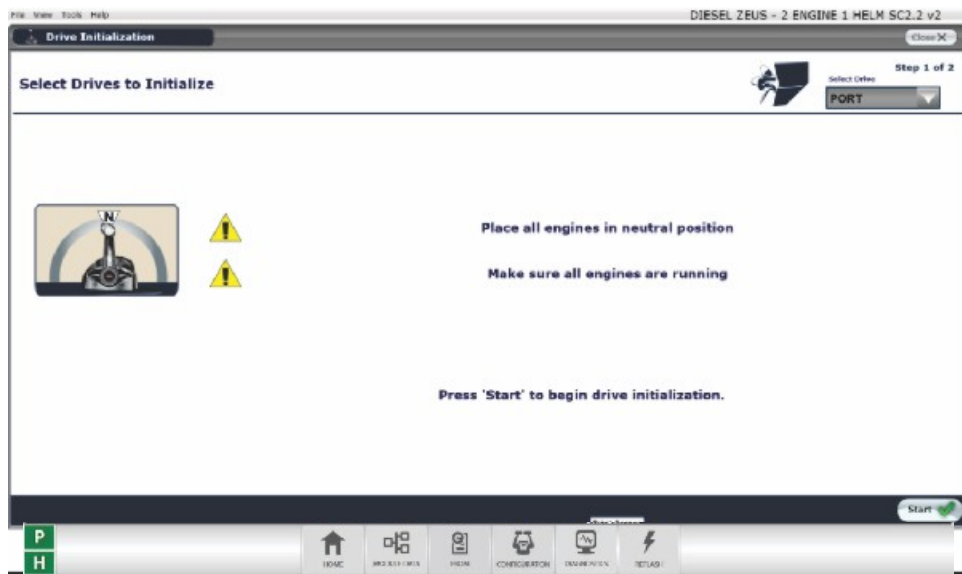

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Import Vessel Personality

- After a CCM is reflashed, all vessel personality information for that application is lost.
- The personality information must be restored using the Import function in CDS G3. Go to Configuration, and then select **Personality**, then select **Vessel Personality**.
- Vessel personality files can be downloaded from the SmartCraft download center or are sent via e-mail from MerCruiser Product Support. The personality can be stored on a memory stick, or a folder can be created on the computer desktop.
- Use **Select File** to query the memory stick or file folder that contains the vessel personality.

- Double click the personality. Then select **Begin Import** to complete the VSL import process.
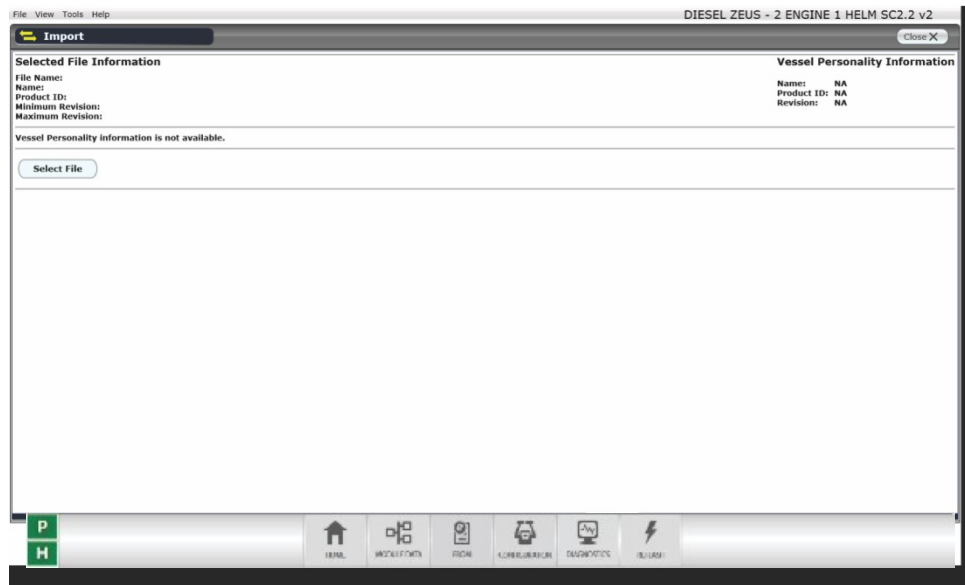

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Perform Steering Wheel Centering

After a CCM is reflashed, the programmed position of the steering wheel at center is lost and must be reprogrammed using CDS G3. To reprogram the steering wheel at center, go to **Configuration**, then select **Helm Configuration**, then select **Steering Wheel Centering**. Follow the on-screen directions in the CDS G3 to reset the center position of the steering wheel.

NOTE: This configuration procedure must be completed for each helm separately.
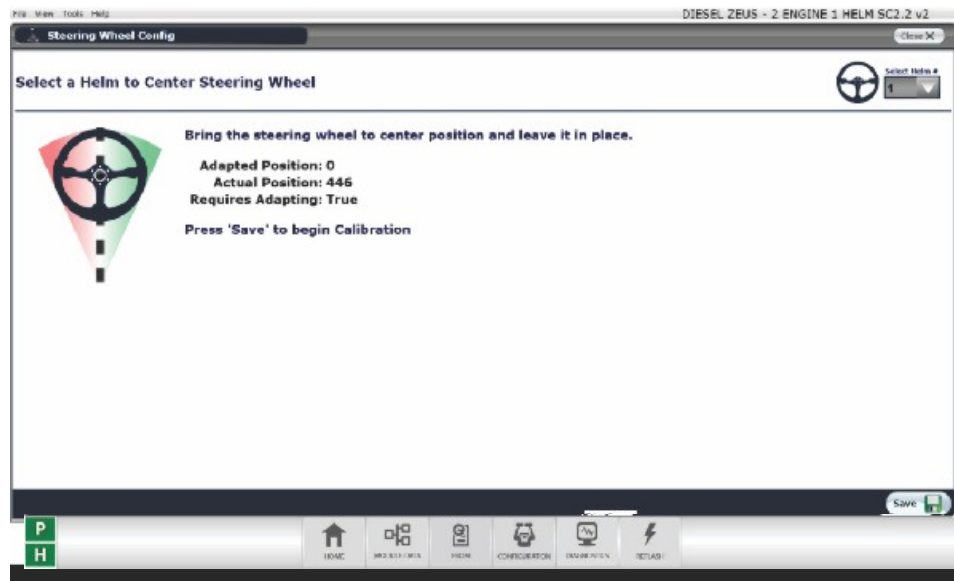
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Sea Trial

After a software upgrade to a Zeus vessel, a sea trial must be performed to verify the operation of all features of the vessel. During the sea trial, if necessary, set the drive alignment using the Drive Alignment procedure in CDS G3 to ensure the vessel tracks straight.

1. Connect SmartCraft gauges and VesselView displays.

2. Test all joystick directions for functionality.

3. Test Skyhook, AutoHeading, and Track Waypoint functions.

4. If any features are not functioning correctly, perform the **Import Vessel Personality** procedure again and retest.

Zeus SC2.5 Reflash Table

Configuration Procedure That Must be Performed After Module Reflash	TVM Reflash	CCM Reflash	SIM Reflash
City ID Assignment and Lever Adapt	–	Yes	–
Import Vessel Personality	–	Yes	Yes
Steering Wheel Centering	–	Yes	–
Record and Reenter the Mechanical Drive Alignment Numbers	Yes	–	–
On the Water Drive Alignment	Yes	–	–
Enable Auxiliary Joystick (If Equipped)	–	Yes	–
Initialize the Drives	Yes	–	–
Cycle Key Switches to Set City IDs	–	–	Yes

Warranty

United States and Canada: Mercury Marine will credit the dealer for the cost of parts and labor. Submit a warranty claim through your normal warranty-processing channel, listing:

Zeus pod serial number

Labor for reflashing software (V0), replacing transducers, installing decals, use:

• Labor: 2 hours per pod for a total of 4 hours

• Flat rate code: SB20

• Part code: 731

• Failure code: 98

Labor for reflash only (V1 or V2):

• Labor: 1 hour per pod for a total of 2 hours

• Flat rate code: SB10

• Part code: 731

• Failure code: 98

Outside the United States and Canada: Follow instructions issued by your local office or by your distributor.