

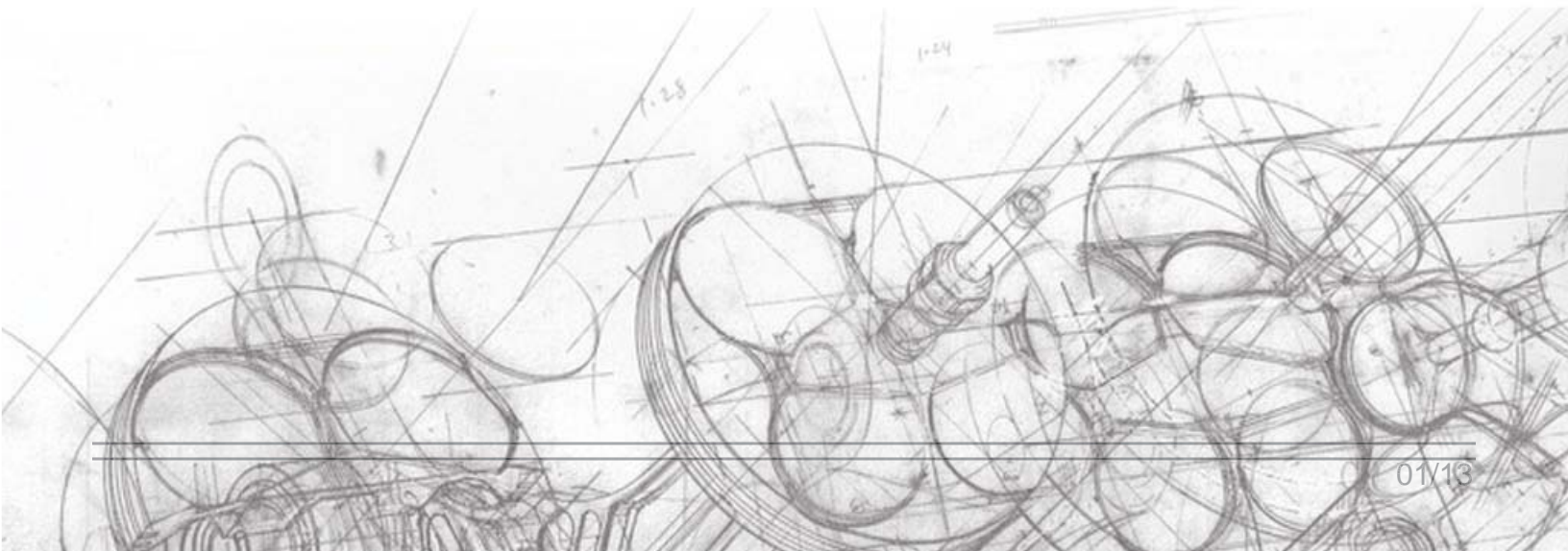


# PCM PRE-DELIVERY INSPECTION PROCEDURE

ENGINE SERIAL #: \_\_\_\_\_

TRANS. SERIAL#: \_\_\_\_\_

OWNER NAME: \_\_\_\_\_



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# Pre-Delivery Inspection

- REFERENCES:**     **PCM Owner’s Operation and Maintenance Manual**  
                          **PCM Master Engine Specifications Sheet**  
                          **Boat Owner’s Manual**

The Pre-Delivery Inspection ensures that the engine is performing properly and there are no deficiencies.. It is necessary that the inspection procedures be performed in the order given. PCM recommends that the inspection be accomplished in a timely manner, prior to the boat’s delivery to our customer. This will allow for repairs (if necessary) to made without inconvenience to our customer.

The inspection is laid out in three stages. Stage number one is performed prior to launching the boat. Stage number two is performed in the water, at the dock, after launching the boat. Stage number three is a performance test of the engine, on the water. After completion of the Pre-Delivery Inspection you will have the information necessary to accurately and completely fill out the Pre-Delivery Checklist portion of the Warranty Registration Form.

## Stage 1 - Prelaunch Inspection

### 1. Engine and Transmission Identification.

*(Refer to the PCM Owner’s Operation and Maintenance Manual for Engine and Transmission Identification locations.)*

Locate the engine identification tag and record the model and serial number in the space provided. The PCM model identification provides you with valuable information concerning the engine you are working on. Information includes raw/fresh water cooling, engine rotation, engine type, drive type and function, propeller shaft rotation, gear ratio, and ignition and fuel type. This information will be needed for the next step in this procedure so you can narrow your search for Service Updates to only those associated with the engine you are preparing to put into service.

**ENGINE MODEL NO.** \_\_\_\_\_ **ENGINE SERIAL NO.** \_\_\_\_\_

Locate the transmission identification tag and record the model and serial number in the space provided.

**TRANS. MODEL NO.** \_\_\_\_\_ **TRANS. SERIAL NO.** \_\_\_\_\_

### 2. Service Update Bulletin Check

Once you have located the Engine and Transmission Model and Serial numbers, you need to review the Service Updates for any which may apply to the engine you are preparing for delivery.

Go to the PCM Premier Dealer Website and search for PCM Service Updates for the engine’s serial number. Correct any condition that may be discovered. Note Service Update number in the space provided and check the compliance box.

**SERVICE UPDATE #** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SERVICE UPDATE - CHECK**

### 3. Propeller Identification and Inspection

(Refer to the PCM Owner's Operation and Maintenance Manual and the Master Engine Specification Sheet for operational parameters based on propeller selection.)

Proper boat performance is dependent upon boat design, engine power and a properly sized propeller. The size markings will be needed if a performance issue is raised.

With the boat out of the water, rotate the propeller until the size and rotation markings can be read.

Record the markings, Diameter, Pitch, and Rotation in the space provided and compare to known standards. If you are unsure of the proper propeller size, contact the boat manufacturer for the information necessary to determine the proper size for the boat. Correct any deficiency.

**DIAMETER** \_\_\_\_\_ **PITCH** \_\_\_\_\_ **ROTATION** \_\_\_\_\_

*The boat manufacturer and/or the dealer selects and installs the propeller. Problems that are associated with the propeller or its installation should be corrected at the direction of the boat manufacturer and/or installer and are not a PCM warranty item.*

### 4. Static Leak Check of Fuel and Oil Lines

With the engine off, check all fuel and oil lines for leaks. Inspect each and every fuel and oil line to and on the engine for leaks. Note the location of any leaks found. Correct any deficiency.

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*The boat manufacturer and/or the dealer selects and installs the fuel lines from the fuel tank to the engine. Problems associated with this fuel line or its installation should be corrected at the direction of the boat manufacturer and/or installer and are not a PCM warranty item.*

### 5. Engine Wiring Inspection

Do a visual inspection to ensure that all plug-in connectors of the engine wiring harness are plugged into their proper devices. Check to ensure that the boat harness is plugged completely and correctly into the engine harness. Correct any deficiencies found and check the compliance box.

### 6. Static, Prelaunch Fluids Check

Engine and transmission oil levels must be verified prior to engine operation. These levels will again be checked after launch. Oil levels must be at least to the low oil level mark at this time.

With the boat resting close to its in-the-water position, remove the dipstick and note the oil level.

Wipe the dipstick clean of oil and insert the dipstick into the dipstick tube. Be sure that the dipstick bottoms out in the tube.

Remove the dipstick and note the oil level. Correct any deficiency

Remove the dipstick from the transmission and note the oil level.

Wipe the dipstick clean of oil and insert the dipstick into the dipstick opening. Be sure that the dipstick bottoms out on case.

Remove the dipstick from the transmission and note the oil level. Correct any deficiency.

Check the compliance box.

**7. Check Water & Exhaust Hoses for Proper Connection**

Attach hoses removed for winterization.

Inspect each hose for leaks, routing, rubbing, cuts or abrasions. Correct any deficiency.

If equipped, check to ensure that the strainer is not damaged or leaking. Correct any deficiency.

If equipped, check to ensure that the hull inlet valve is turned to its OPEN position.

If equipped, with fresh water cooling check to ensure that the coolant level is proper.

Check the compliance box on the procedure.

*The boat manufacturer selects and installs the water and exhaust hoses to the engine. Problems associated with these hoses or their installation should be corrected at the direction of the boat manufacturer and/or installer and are not a PCM warranty item.*

**8. Install and Tighten all Drain Plugs**

The drain plugs have been removed for shipping or winterization. Before the engine may be safely started the drain plugs must be installed. Refer to PCM Owner's Operation and Maintenance Manual for proper locations.

Insert a plug of the proper size coated with PST (Pipe Sealant with Teflon by Loctite or equivalent) into each drain location.

Tighten each drain plug securely. **Caution: Do Not Over Tighten Or Damage Could Occur.**

Check the compliance box on the procedure.

**9. Visual Check of Belt And Pulley Alignment**

All PCM engines currently use a serpentine belt at the front of the engine. This belt has a self-tensioning system which is not adjustable.

Check belt for cuts or other damage. Correct any deficiency.

Check the pulleys for damage. Correct any deficiency.

Visually inspect for pulley and belt alignment. Correct any deficiency.

Check the compliance box on the procedure.

## 10. Check Battery Installation And Charge Level

Check battery cold cranking amps against the minimum recommended Cold Cranking Amps listed on the *Master Engine Specification Sheet*. Correct any deficiency.

Check for a properly connected power cable (Red) and ground cable (Black) **at the engine**. Correct any deficiency.

Check the electrolyte level (as required) and battery charge. Correct any deficiency.

**Always connect the positive (+) cable to the battery first** and tighten securely.

Connect the negative (-) cable to the battery and tighten securely.

After following boat manufacturer's pre-start procedures, turn the Ignition Switch to the ON position and check for normal operation of the gauges. Turn the Ignition Switch to the OFF position. **Do not start the engine at this time**.

Check the compliance box.

*Problems that are associated with the battery or its installation should be corrected at the direction of the supplier and/or installer and are not a PCM warranty item.*

## 11. Check Control Adjustment, Direction and Travel

The boat manufacturer and / or the dealer selects and installs the control cables and control head. Check both the throttle (if equipped) and shift cable in accordance with the boat manufacturers and/or installers instructions. Many manufacturer's are using an electronic throttle handle which only has the shift cable adjustment.

Generally, when the control is in the neutral position, inspect that the throttle linkage is at its zero or detent position and the transmission shift arm is in its neutral position. With the control moved to its in gear and zero throttle position, the transmission shift arm should be to its **full** in gear position (both forward and reverse positions need to be checked) and the throttle linkage should still be at its zero throttle position or detent position. Adjustments should be made as necessary and in accordance with the boat manufacturer's / installer's instructions.

Control cables are not a PCM warranty item.

Check the compliance box on the procedure.

## Stage 2 - In-The-Water Inspection

### 1. Test Equipment Connection

Prior to launch, with the boat on the trailer and the trailer backed down in the water, locate the OBDM CAN Connector on the engine. Connect the Diacom cable from your computer to the engine using the CAN BUS Network Adapter.

Install the fuel pressure gauge onto the fuel rail pressure fitting. Readings should be made with the gauge positioned at the same height as the fitting to which it is attached. Consult the *Master Engine Specification Sheet* for the proper pressures for the engine being tested.

Check the compliance box.

## 2. Check for Fuel Leaks

Turn the Ignition Switch to the ON position to allow the fuel pumps to run until they shut off, then turn the Ignition Switch to the OFF position. This procedure may have to be repeated 1-3 times to prime the fuel system. Check for fuel leaks at the fuel pressure gauge connection. Repeat as necessary to build fuel pressure to the specification of this engine. Correct any leaks before proceeding.

When the fuel pressure is at the specified level, stop cycling the pumps and allow the engine to sit for one minute while observing the fuel pressure reading on fuel gauge. Pressure must remain constant when the fuel pumps are not operating.

**NOTE: While the pumps are operating fuel pressure should be within the *Master Engine Specification* range for WOT pressure. After the pumps shut off, pressure will drop slightly but remain constant. If proper pressure is not displayed, or does not remain constant, correct this condition before proceeding.**

Check for signs of fuel in the engine compartment and all fuel lines for leaks before starting the engine. Correct any deficiency prior to proceeding.

Check the compliance box.

## 3. Engine at Idle Check

Follow boat manufacturer's starting procedures regarding the blower, etc. Start the engine. ***WARNING! If fuel leaks are present shut off the engine immediately.***

- Check to ensure that the water pump is pumping water. Allow the engine to idle for approximately one minute. Shut the engine off. Inspect each fuel line and fitting for leaks. Correct any deficiency prior to proceeding.
- Inspect each oil line and fitting for leaks. Correct any deficiency prior to proceeding.
- Inspect each water hose and fitting for leaks. Correct any deficiency prior to proceeding.
- Start the engine and inspect the exhaust hose and fitting for leaks. Correct any deficiency prior to proceeding.
- Check pulleys for wobble. Correct any deficiency.
- Remove the boat from the trailer and secure it to the dock. Shut the engine off and leave the test equipment attached to the engine.

Check the compliance box.

#### 4. Engine and Transmission Fluid Check

##### Engine:

Wipe the dipstick clean of oil and insert the dipstick into the dipstick tube. Be sure that the dipstick bottoms out in the tube.

Remove the dipstick and note the oil level. Correct any deficiency.

Correct a low oil level condition by adding the proper amount of oil, that meets the specification stated on the engine specification decal, to bring the oil to the full mark. Correct an over-filled condition by removing oil until the level reading on the dipstick is at the full mark.

##### PCM Transmission:

There is multiple methods of checking transmission oil level, depending on the application. Consult the PCM Owner's Operation and Maintenance manual to ensure the proper method is being used.

Remove the dipstick from the transmission and note the oil level. Correct any deficiency.

Correct any low oil deficiency by adding the proper amount of oil that meets the specification stated on the engine specification decal. Correct an over-filled condition by removing oil until the level reading on the dipstick is proper.

Check the compliance box.

#### 5. Engine Management System (EMS) Check

The DTC's also have both a Failure Mode Indicator (FMI) and Suspect Parameter Number (SPN). Each DTC has both a FMI and SPN in order to identify the exact circuit failure.

**Note:** *Diacom only displays the FMI and SPN numbers. Be sure to have both these numbers for each fault displayed.*

A check of the engine management system is done to ensure that the system has not been damaged or modified since shipment from PCM.

- With the Diacom connected to the engine and the Data Set configured to "Engine Data", turn the ignition switch to the 'ON' position (Do Not start the engine) and check the engine for codes. If codes are present, make a note of them, in the space provided on the Pre-Delivery Inspection Procedure, and then erase the codes using the 'Pencil with Eraser' icon button on the Diacom screen.
- If any code returns after the erase procedure is performed, the problem is still in the circuit indicated by the code and must be corrected by the technician before proceeding.

##### Trouble Codes

SPN	FMI	Fault Description
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

- When the system tests code-free, you may proceed to start the engine.



**After starting the engine, for 5.0L and 5.7L engines only, CAM Retard must be checked using Diacom. Consult both Master Specifications and all Service Updates as there are different specifications for various models.**

Check the compliance box.

**6. Instrumentation Check**

The boat's instrumentation is the operator's insight into the engine's vital signs. Constant monitoring of the instrumentation is necessary. This will ensure that abnormal conditions are recognized as soon as possible to prevent engine damage and/or dangerous conditions from occurring.

Check and verify proper operation of all instrumentation. Correct any deficiency.

*The boat manufacturer and/or the dealer selects and installs the instrumentation and/or gauges. Problems associated with the instrumentation and/or gauges, or their installation, should be corrected at the direction of the boat manufacturer and/or installer. These repairs are not a PCM warranty item.*

Check the compliance box.

### **Stage 3 - Performance Check and Inspection**

**1. Test Engine Performance And WOT RPM**

All instrumentation and test equipment should be observed as frequently as possible to allow the operator to react quickly to any discrepancy displayed. The operator must also listen for unusual sounds, feel for unusual vibrations, smell for signs of fuel, smoke, etc. and look for any sign of abnormal operational characteristics.

- Check all instrumentation to verify normal operation and readings.
- Once temperature is stabilized, check and record the fuel pressure while at idle.

When conditions permit, accelerate to bring the boat on plane and to a cruising speed of 3600 RPM. While frequently observing the gauges, operate the boat at this speed until oil pressure and engine temperature stabilize.

- Move the throttle to wide-open-throttle (WOT) and run at this speed (not to exceed 30 seconds) until the RPMs have stopped increasing. Reduce the throttle to 3600 RPM. Note and record the WOT RPM, Throttle Position % and fuel pressure at WOT.
- While frequently observing the gauges, return the engine to 3600 RPM until oil pressure and engine temperature stabilize.

Return to idle.

**FUEL PRESSURE - IDLE \_\_\_\_\_ WOT \_\_\_\_\_**

**WOT RPM \_\_\_\_\_ WOT THROTTLE POSITION % \_\_\_\_\_**

**Note:** Engines equipped with electronic throttle control utilize an electronic governing feature in order to not exceed the maximum RPM. In some cases, you may find that the maximum RPM is being achieved, but throttle position has backed off to something less than 100%. In many cases this is by design for more lower end performance.

## 2. Diacom Record of Engine Performance

Record the following water test for your records, using the DIACOM recording feature. This recording is to be made after all defects, if any are found, are corrected.

1. Idling for 10 seconds.
2. Running at 1,000, 2,000, 3,000, 4,000 RPM for 10 seconds each.
3. Return to idle for 10 seconds.
4. Accelerate to 3600 RPM and run @ 3600 RPM for 30 seconds.
5. Accelerate to WOT and run at WOT until the RPM's stop increasing (not to exceed 30 seconds).
6. Return the throttle quickly to idle and allow the engine idle for 10 seconds, then stop the recording.
7. Save the recording, using the engine serial number as the *file name*.

**Note:** *This information provides a valuable baseline for each model engine. This can be used to compare against a recording on an engine, that has a drivability complaint, to help identify a problem.*

Return to the dock, turn off the engine. Compare your recorded oil pressure, WOT fuel pressure and WOT RPM value to the Master Engine Specification Sheet. Correct any defects that were noted and retest the boat.

Check the engine for leaks (water, oil and fuel) and correct any leaks noted. Recheck the fluid levels in the engine and transmission and correct as necessary.

Recover the boat from the water. If defects that could not be corrected in the water were noticed, correct those defects. After correction of defects return the boat to the water to retest the boat.

Disconnect test equipment and prepare boat for final delivery.

Check the compliance box.

## 3. Lay-Up Engine (if required)

Performance of Pre-Delivery Inspection Procedure has dewinterized the boat. Winterize the engine as necessary. Refer to the PCM Owner's Operation and Maintenance Manual for Lay-Up instructions.

Check the compliance box.

## 4. Complete the Electronic PreDelivery Checklist

Using the data noted in the Pre-Delivery Inspection Procedure, complete all the required information on the Online Engine Registration.

**Engine Model No.**

**Engine Serial No.**

**Drive Serial No.**

**Search for Service Updates**

**Engine Oil: Check**

**Drive Lube: Check**

**Battery Rating, Charge, and Level: Check**

**Control Adjustments: Confirm Proper Operation**

**Gauges: Check for Proper Operation**

**Record Propeller Size, Rotation, and WOT**

WOT RPM \_\_\_\_\_ Diameter \_\_\_\_\_ Pitch \_\_\_\_\_ Rotation \_\_\_\_\_

**Record Fuel Pressure, Idle \_\_\_\_\_ WOT \_\_\_\_\_**

**Belt and Pulley: Inspect for Damage**

**All Drain Plugs: Confirm Proper Installation**

**All Fuel Lines: Confirm No Leaks**

**All Oil Lines: Confirm No Leaks**

**All Water Lines: Confirm No Leaks**

**Electrical Wiring: Check for Proper Installation**

**Trouble Codes Checked / Trouble Codes Cleared**

*A copy of Pre-Delivery Inspection Procedure and your Diacom recording should be filed in your records by engine serial number, owner's name, or both for future reference by the technician.*

## **5. Completing Warranty Registration Form**

When the boat is sold, you will complete the remaining blocks of the Warranty Registration Form. **Completely fill in the required information.**

<b>Owner's Name</b>	<b>Date of Sale</b>
<b>Address</b>	<b>Selling Dealer</b>
<b>City, State, Zip</b>	<b>Dealer Address</b>
<b>Owner's Email Address</b>	
<b>Boat Make, Length, Type</b>	

Review the PCM 3-Year Transferable Limited Warranty with the new owner. Then complete the remaining dealer portion of the form by filling in the following blocks.

**Dealer Reviewed Warranty with Owner** (the last block of the Pre-Delivery Checklist)

**Dealer Signature** (By signing this form, the dealer certifies that he has checked the installation and operation of the engine(s) and finds them to be performing properly.)

**Owner's Signature and Date**

Give the customer their copy of the completed form along with the copy of the Warranty Statement. Register the engine through the Premier Dealer Website Online Engine Registration.

This completes the registration of a new PCM engine. By signing this form, the dealer certifies that he has checked the installation and operation of the engine(s) and finds them to be performing properly.