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## Verado Upper Knock Sensor Inspection

### Models Affected

Models Covered	Serial Number
225/250/300 Verado L6	USA - 1B841800-1B869884
225/250/300 Verado L6	Belgium - 0P570495-0P572688

### Scope

Worldwide

### Situation

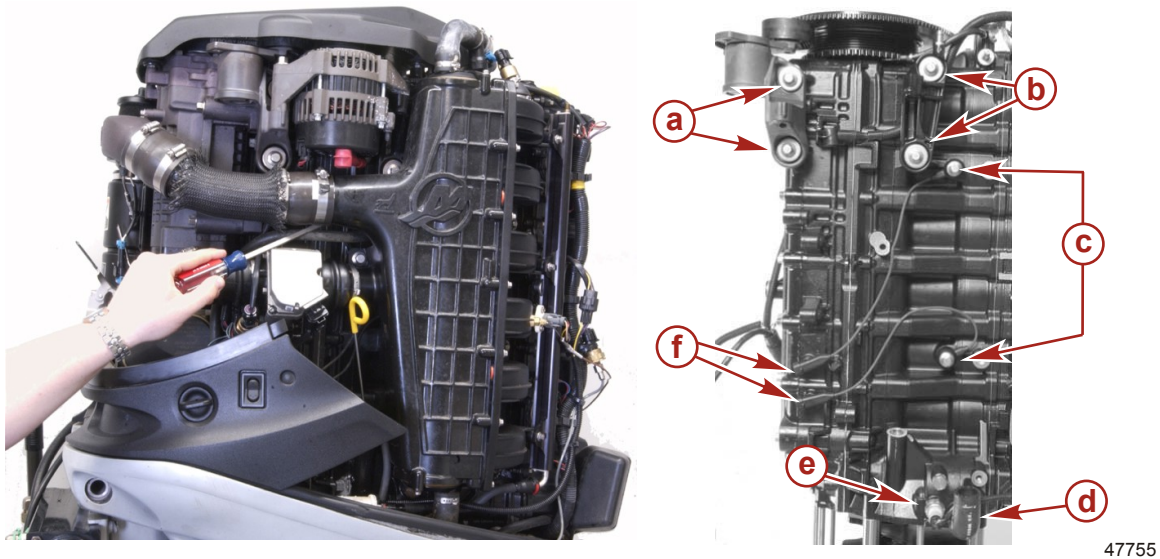
Mercury Marine has received reports of the upper knock sensor being loose on some of the above listed engines. It has been determined that the thread depth for the upper knock sensor mounting bolt was incorrect on some engines. This incorrect thread depth can cause the engine PCM to store a fault, and also to sound an audible alarm. The audible alarm will be six beeps at every key up, and the fault code listed in CDS will be fault 10.

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## Inspection

Inspection of the upper knock sensor can be performed without removing any components from the powerhead. Using a long bladed screwdriver, insert it between the charge air cooler and the cylinder block. The upper knock sensor is located just to the rear of the lower alternator mounting bracket bolt. Push the upper knock sensor to see if it is loose, or can be rotated. If the knock sensor is tight, reference step 19 on how to mark the engine. If the knock sensor is loose, follow the correction procedure.



- a - Belt tensioner bracket screws
- b - Alternator support bracket screws
- c - Knock sensor retaining screws
- d - Brass or plastic water hose fitting (hidden)
- e - Water pressure Legris connector
- f - Knock sensor harness connectors

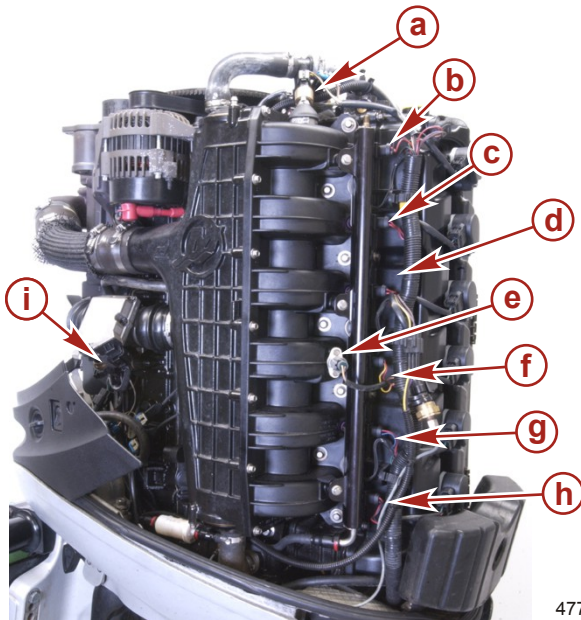
## Correction

1. Disconnect the engine from the battery.
2. Remove the top cowl and the rear cowl.
3. Remove the flywheel cover.
4. Remove the engine oil dipstick.

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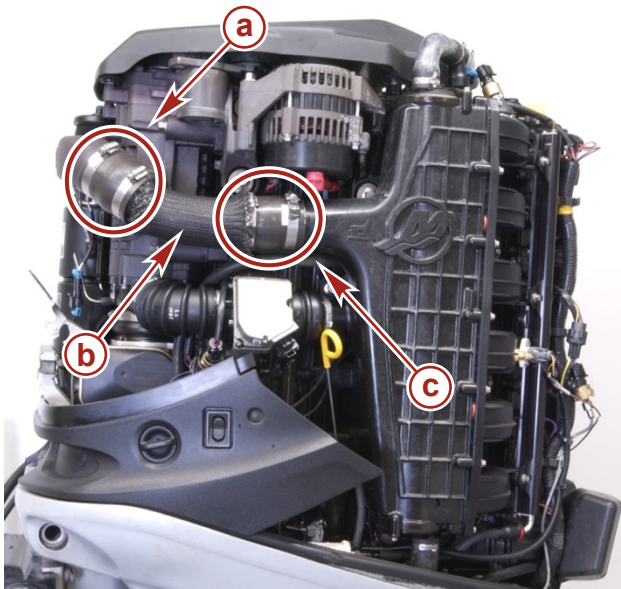
- Disconnect the MAP sensor, MAT sensor, fuel injectors, and pitot sensor.



- a - MAP sensor
- b - #1 fuel injector
- c - #2 fuel injector
- d - #3 fuel injector
- e - MAT sensor
- f - #4 fuel injector
- g - #5 fuel injector
- h - #6 fuel injector
- i - Pitot sensor

47756

- Loosen the four hose clamps securing the supercharger outlet duct to the supercharger and the charge air cooler. Remove the supercharger outlet duct.



- a - Supercharger hose clamps
- b - Supercharger outlet duct
- c - Charge air cooler hose clamps

47757

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7. Remove the two screws securing the boost control valve to the cylinder block.



- a - Upper boost control valve mounting screw
- b - Lower boost control valve mounting screw

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8. Remove the hose clamp on the water inlet hose in the top of the charge air cooler.



- a - Charge air cooler water inlet hose clamp

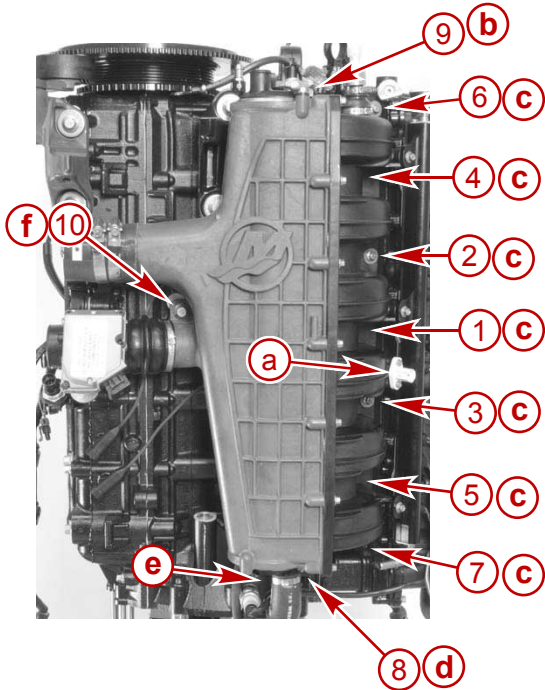
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9. Remove the screws securing the charge air cooler to the powerhead.

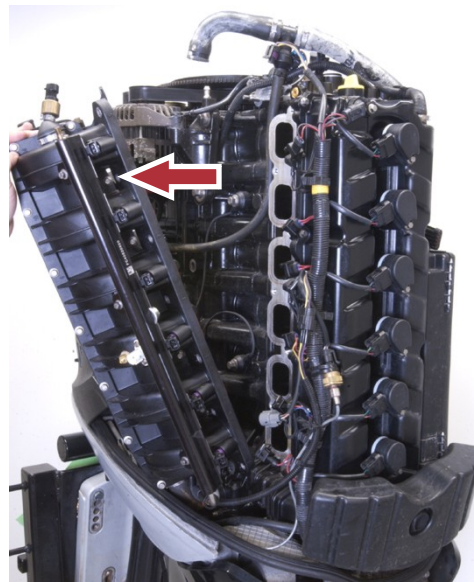


- a - Manifold air temperature (MAT) sensor
- b - Upper charge air cooler mounting nut
- c - Screws retaining charge air cooler (7)
- d - Lower charge air cooler mounting screw
- e - Lower charge air cooler hose clamp
- f - Center charge air cooler mounting screw

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10. Pull the charge air cooler away from the powerhead to access the upper knock sensor.

**NOTE:** Be careful not to lose any grommets or washers when tilting the charge air cooler away from the powerhead.

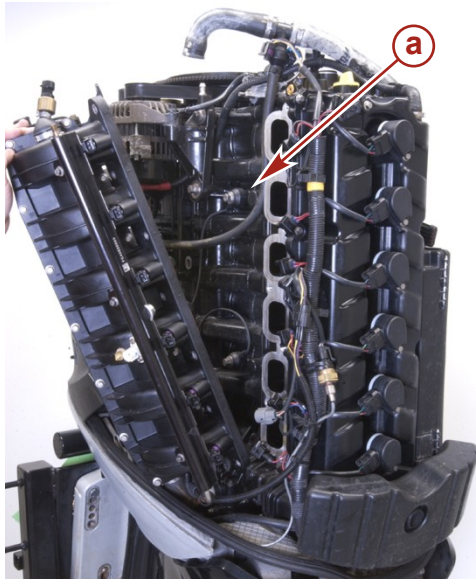


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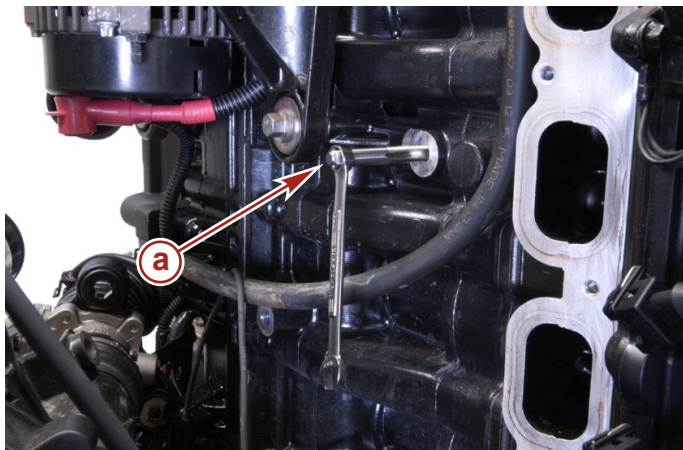
11. Remove the upper knock sensor screw and sensor.



a - Upper knock sensor

12. Insert a 10 x 1.5 mm bottoming tap (obtain locally) into the upper knock sensor mounting boss. Continue cutting the threads in the mounting boss until the tap contacts the bottom of the thread bore. Carefully remove any chips produced after tapping the hole.

**NOTE:** Care should be taken that no chips from the tapping process fall into the open intake manifold or cylinder head of the engine.

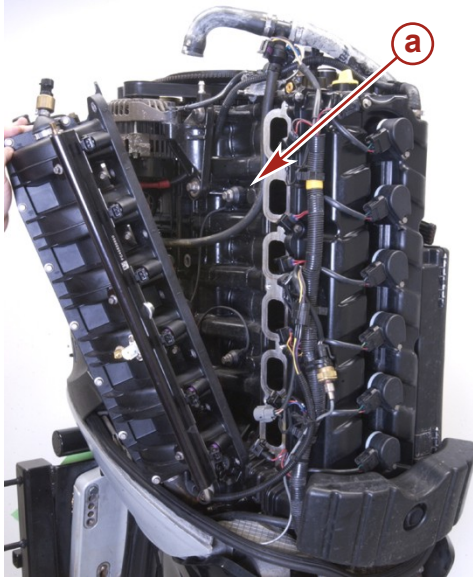


a - Upper knock sensor mounting boss tapping operation  
b - 10 x 1.5 mm bottoming tap (obtain locally)

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13. Reinstall the upper knock sensor and screw. Position the knock sensor lead so that it is pointing towards the lower alternator mounting screw. Torque the knock sensor retaining screw to the specified torque.



**a** - Upper knock sensor

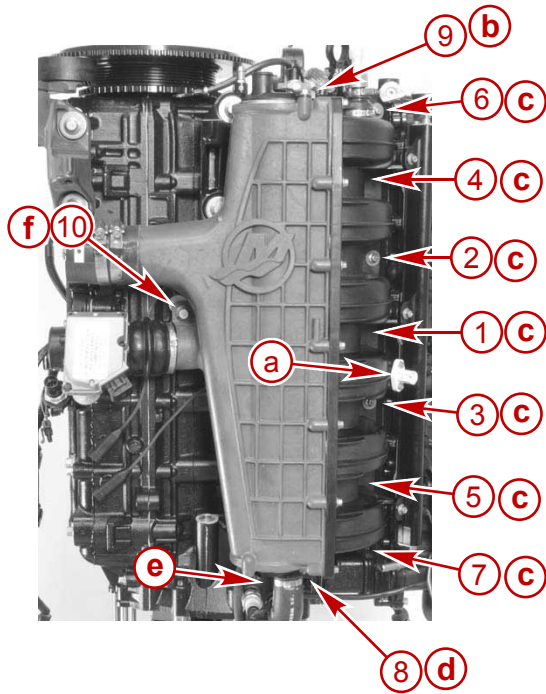
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Description	Nm	lb-in.	lb-ft
Knock sensor retaining screw	20	177	15

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14. Reinstall the charge air cooler and torque to the specified torque in the sequence shown.



- a - Manifold air temperature (MAT) sensor
- b - Upper charge air cooler mounting nut
- c - Screws retaining charge air cooler (7)
- d - Lower charge air cooler mounting screw
- e - Lower charge air cooler hose clamp
- f - Center charge air cooler mounting screw

3911

Description	Nm	lb-in.	lb-ft
Upper charge air cooler mounting nut (b)	32.5		24
Screw retaining charge air cooler (M6 x 33) ©	9	80	
Lower charge air cooler mounting screw (M10 x 30) (d)	32.5		24
Center charge air cooler mounting screw (M10 x 30) (f)	32.5		24

15. Reinstall a new (34.6 mm) hose clamp on the water inlet hose into the charge air cooler.



- a - Charge air cooler water inlet hose clamp

47759

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16. Reinstall the two screws securing the boost control valve to the cylinder block. Torque to the specified torque.

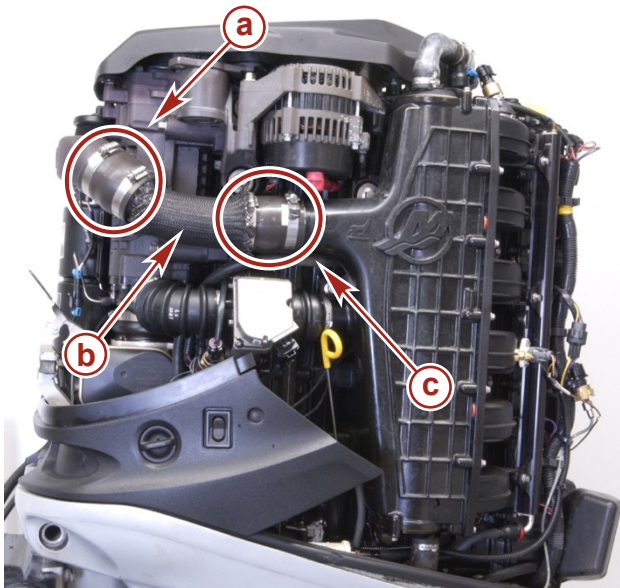


- a - Upper boost control valve mounting screw
- b - Lower boost control valve mounting screw

47758

Description	Nm	lb-in.	lb-ft
Screw (M8 x 35)	24		18

17. Reinstall the supercharger outlet duct and four hose clamps. Tighten the clamps to the specified torque.



- a - Supercharger hose clamps
- b - Supercharger outlet duct
- c - Charge air cooler hose clamps

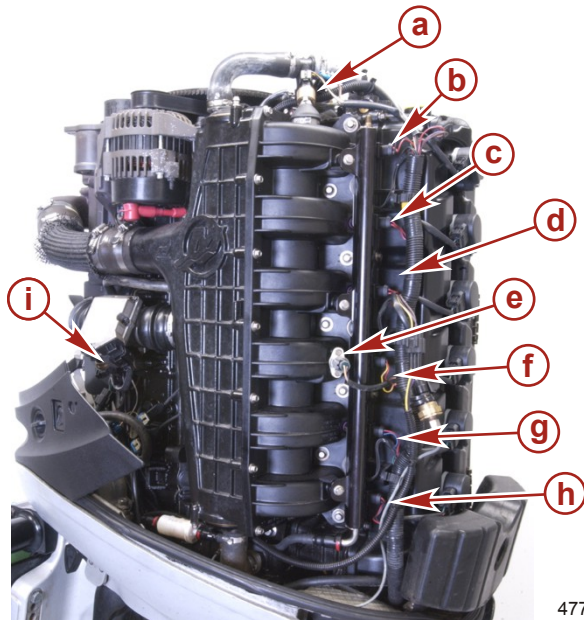
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Description	Nm	lb-in.	lb-ft
Supercharger hose clamp	6	53	

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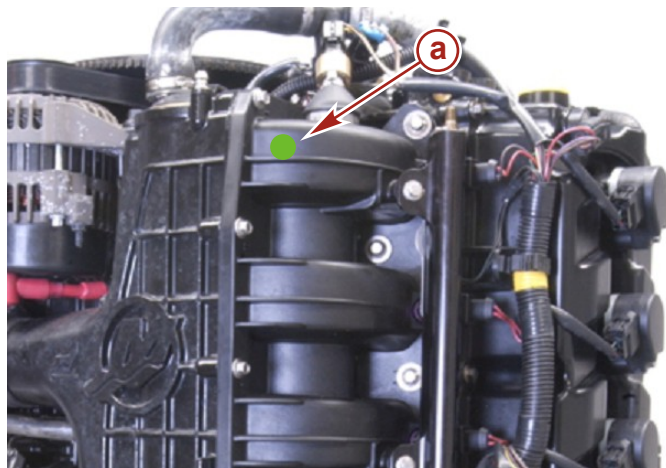
18. Reconnect the MAP sensor, MAT sensor, fuel injectors, and pitot sensor.



- a - MAP sensor
- b - #1 fuel injector
- c - #2 fuel injector
- d - #3 fuel injector
- e - MAT sensor
- f - #4 fuel injector
- g - #5 fuel injector
- h - #6 fuel injector
- i - Pitot sensor

47756

19. Using a green paint marker, mark the number one cylinder intake runner with a green dot indicating that the outboard has been inspected or repaired.



- a - Inspection mark

47764

- 20. Reinstall the engine oil dipstick.
- 21. Reinstall the flywheel cover.
- 22. Reinstall the rear and top cowl.
- 23. Reconnect the engine battery.

## Dealer Outboard Inventory

Please inspect or repair outboards mentioned above prior to sale.

## Parts Required

Qty.	Description	Part Number
1	Clamp (34.6 mm)	888988008

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## Repair Identification

Outboards reworked at the factory or by a Mercury Marine authorized dealer will have a green paint mark on the number one cylinder intake runner or a green dot on the boxing label located on the outside of the engine shipping container.

## Warranty

### For engines requiring inspection only

Complete a warranty claim listing:

- Outboard serial number
- 0.3 hour labor
- Warranty flat rate code: SB03
- Part failure code: 406
- Failure code: 00

### For engines requiring repair

Complete a warranty claim listing:

- Outboard serial number
- 1.2 hour labor
- Warranty flat rate code: SB10 and SB02
- Part failure code: 406
- Failure code: 00

## United States and Canada

Complete and process the claim via MercNET or return a warranty claim form.

## International

Follow instructions issued by the Marine Power International office or by an authorized Marine Power Distributor.

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