

## Draining the Seawater System

### ⚠ CAUTION

Water can enter the bilge when the drain system is open, damaging the engine or causing the boat to sink. Remove the boat from the water or close the seacock, disconnect and plug the seawater inlet hose, and ensure the bilge pump is operational before draining. Do not operate the engine with the drain system open.

**IMPORTANT:** Only drain the seawater section of the closed-cooling system.

**IMPORTANT:** The boat must be as level as possible to ensure complete draining of the cooling system.

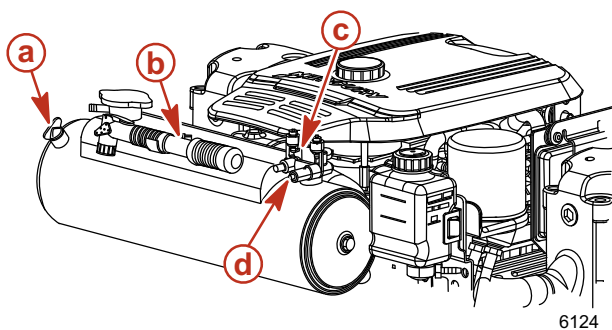
Your power package is equipped with a drain system. Refer to **Drain System Identification** to determine which instructions apply to your power package.

**IMPORTANT:** The engine must not be operating at any point during the draining procedure.

**IMPORTANT:** Mercury MerCruiser requires that propylene glycol antifreeze, mixed to the manufacturer's instructions, be used in the seawater section of the cooling system for freezing temperatures or extended storage. Make sure that the propylene glycol antifreeze contains a rust inhibitor and is recommended for use in marine engines. Be certain to follow the propylene glycol manufacturer's recommendations.

### Drain System Identification

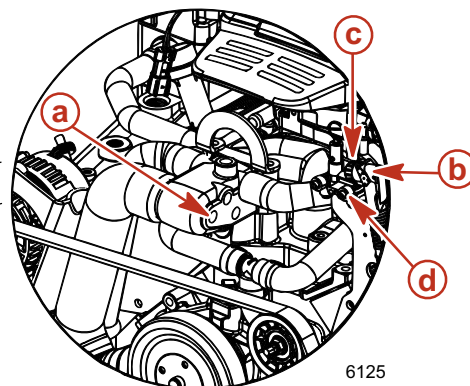
#### AIR ACTUATED SINGLE POINT DRAIN SYSTEM



**Closed Cooled Models**

**a** - Blue drain plug location

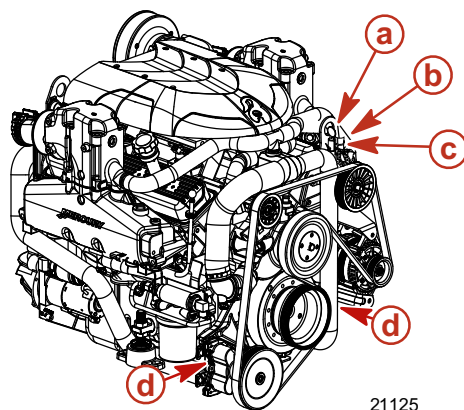
**b** - Blue air pump



**Seawater Cooled Models**

**c** - Air manifold

**d** - Green indicators



Scorpion Models

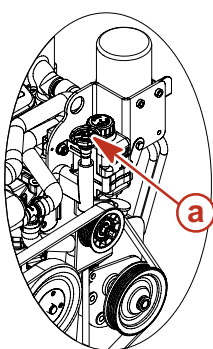
**a** - Blue air pump

**b** - Air manifold

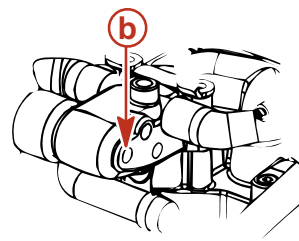
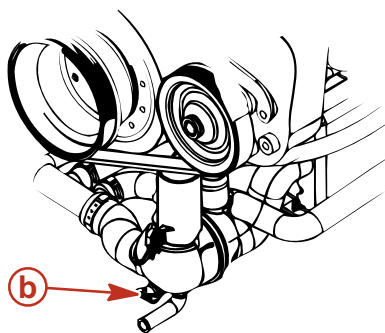
**c** - Green indicators

**d** - Blue drain plug locations

### MANUAL SINGLE POINT DRAIN SYSTEM



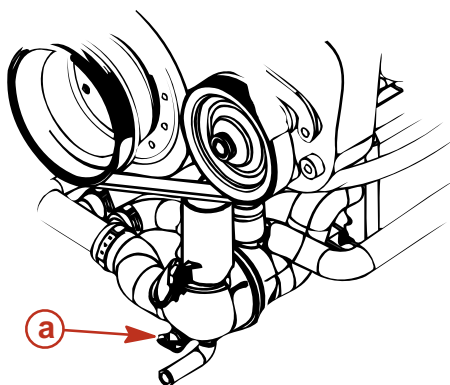
**a** - Blue handle



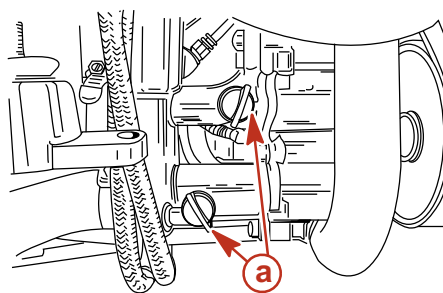
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**b** - Blue drain plug location

### THREE POINT MANUAL DRAIN SYSTEM

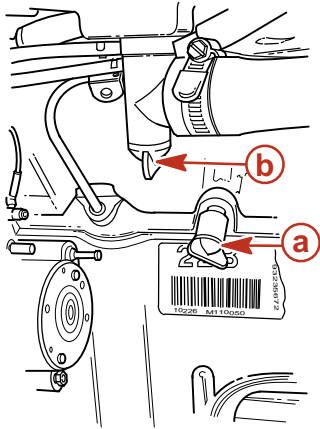


**a** - Blue drain plug

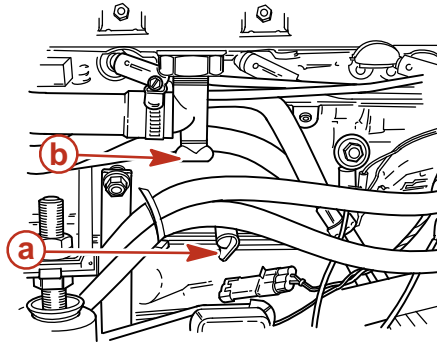


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## MULTI-POINT DRAIN (MPD) SYSTEM

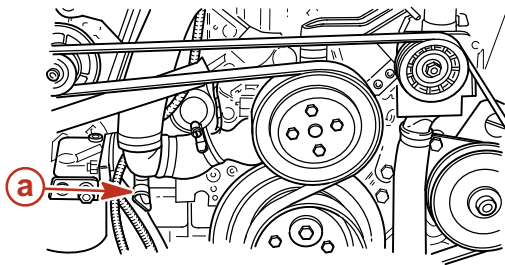


**a** - Side of cylinder block

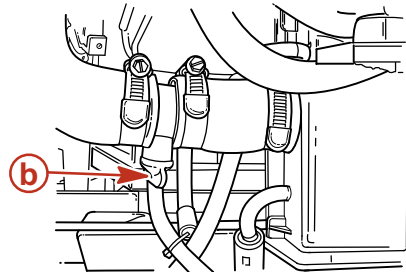


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**b** - Bottom of exhaust manifolds

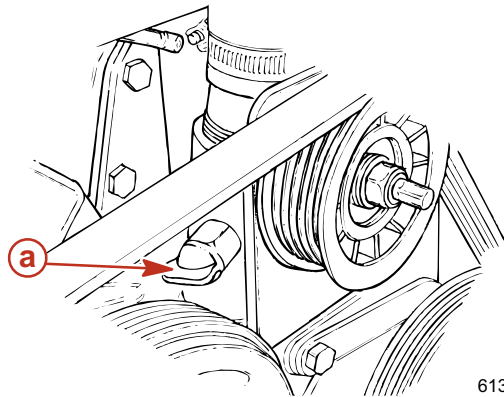


**a** - Water circulating pump hose



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**b** - Fuel cooler to thermostat housing



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**a** - Check valve (if equipped)

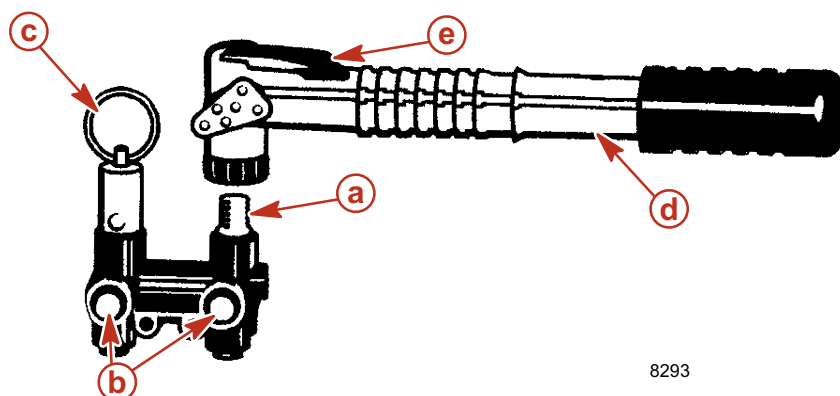
## Air-Actuated Single-Point Drain System

### BOAT IN THE WATER

**NOTE:** This procedure is written for the air pump that is attached to the engine. However, any air source can be used.

1. Close the seacock (if equipped) or remove and plug the water inlet hose.
2. Remove the air pump from the engine.
3. Ensure that the lever on top of the pump is flush with the handle (horizontal).
4. Install the air pump on the actuator fitting.

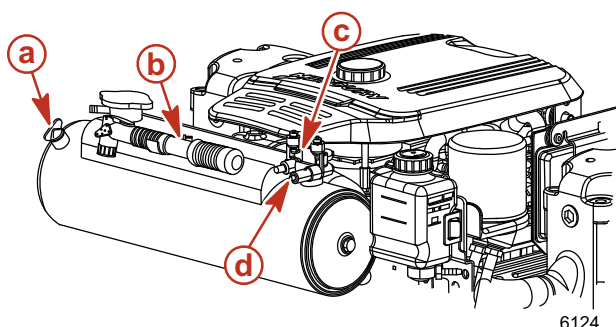
5. Pull lever on air pump (vertical) to lock pump on the fitting.



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- a** - Actuator fitting
- b** - Green indicators
- c** - Manual release valve
- d** - Air pump
- e** - Lever (locking)

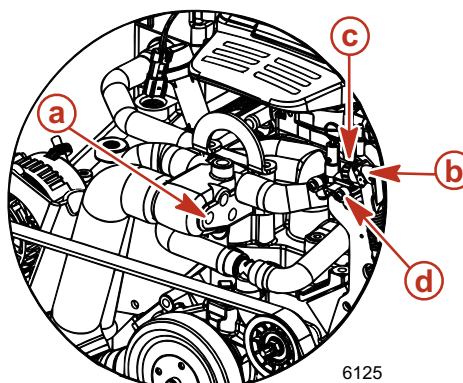
6. Pump air into the system until both green indicators extend and water drains from both sides of the engine. The port side will begin draining before the starboard side.
7. Immediately remove the blue drain plug from the side of the thermostat housing or the heat exchanger. This must be removed within 30 seconds to properly vent the cooling system.



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**Closed Cooled Models**

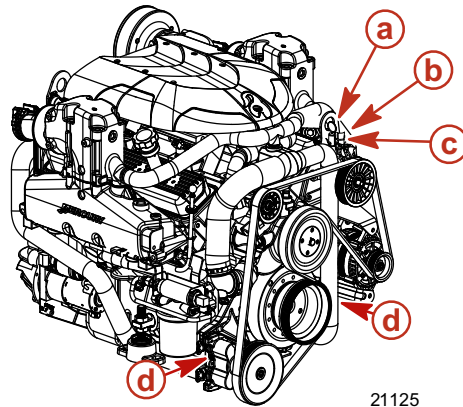
- a** - Blue drain plug location
- b** - Blue air pump



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**Seawater Cooled Models**

- c** - Air manifold
- d** - Green indicators

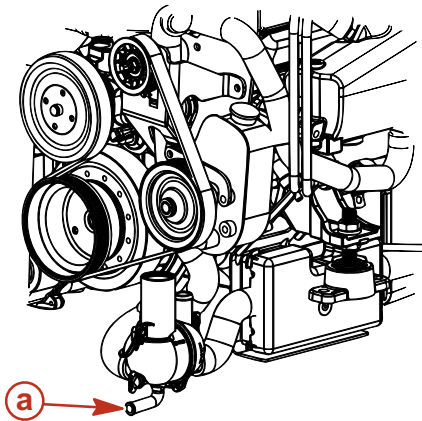


Scorpion Models

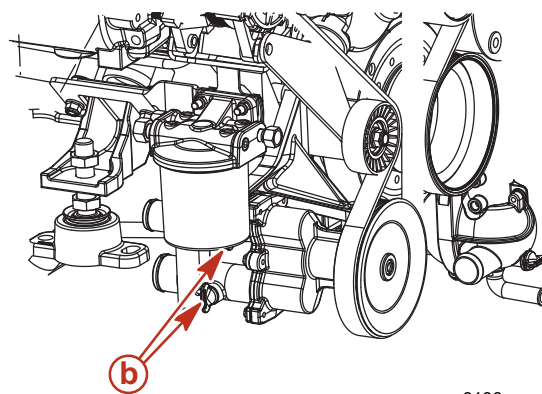
**a** - Blue air pump  
**b** - Air manifold

**c** - Green indicators  
**d** - Blue drain plug locations

8. Verify that water is draining from each opening. If not, use the **Three Point Manual Drain System** instructions.



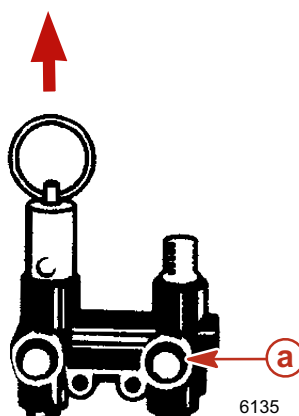
**a** - Port side drain location



**b** - Starboard side drain location

9. Allow the system to drain for a minimum of five minutes. Pump air as necessary to keep the green indicators extended.
10. Crank the engine over slightly with the starter motor to purge any water trapped in the seawater pump. Do not allow engine to start.
11. Reinstall the blue drain plug in the thermostat housing or heat exchanger.
12. Remove the air pump from the air manifold and return it to the mounting bracket.
13. Mercury MerCruiser recommends leaving the drain system open while transporting the boat or while performing other maintenance. This helps ensure that all water is drained.

14. Before launching the boat, pull up on the manual release valve. Verify that the green indicators are no longer extended.



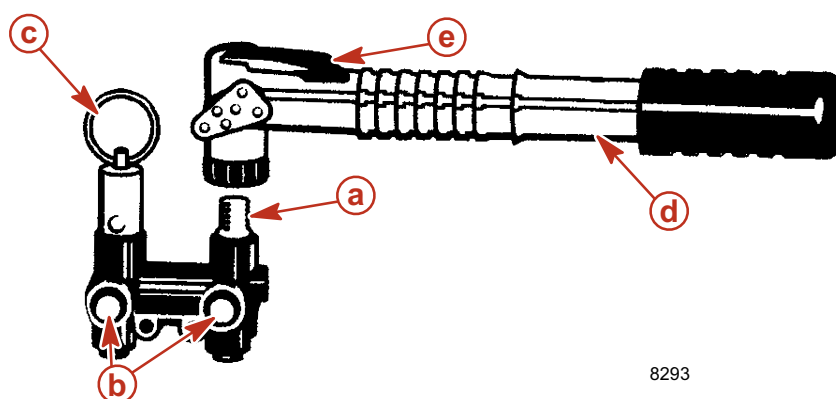
**a** - Green indicators

15. Open the seacock, if equipped, or unplug and reconnect the water inlet hose prior to operating the engine.

## BOAT OUT OF THE WATER

**NOTE:** This procedure is written for the air pump that is attached to the engine. However, any air source can be used.

1. Place the boat on a level surface to ensure complete draining of system.
2. Remove the air pump from the engine.
3. Ensure that the lever on top of the pump is flush with the handle (horizontal).
4. Install the air pump on the actuator fitting.
5. Pull lever on air pump (vertical) to lock pump on the fitting.

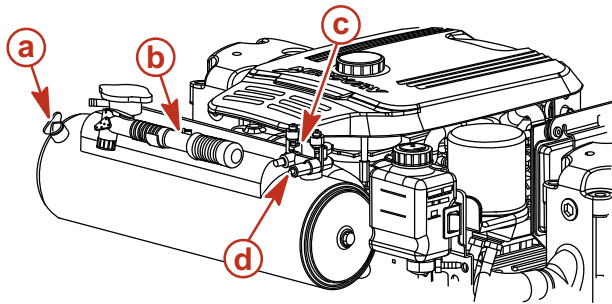


**a** - Actuator fitting  
**b** - Green indicators  
**c** - Manual release valve

**d** - Air pump  
**e** - Lever (locking)

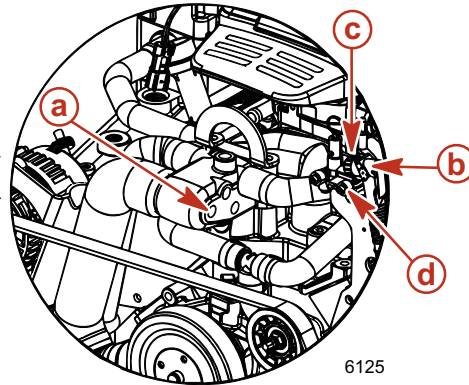


6. Pump air into the system until both green indicators extend and water drains from both sides of the engine. The port side will begin draining before the starboard side.



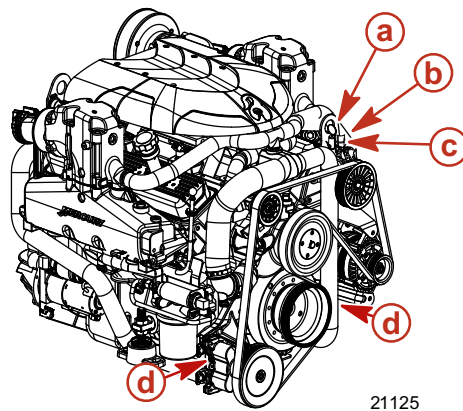
**Closed Cooled Models**

- a** - Blue drain plug location
- b** - Blue air pump



**Seawater Cooled Models**

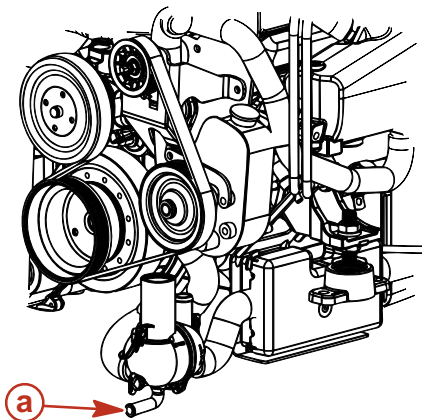
- c** - Air manifold
- d** - Green indicators



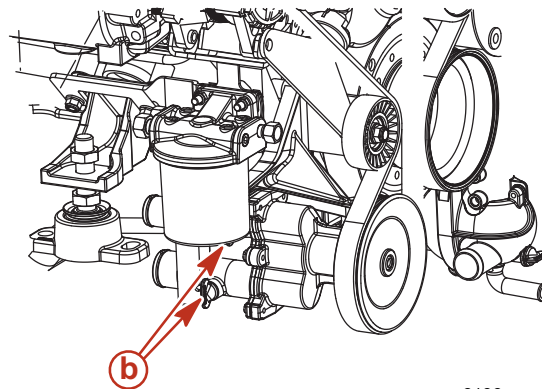
**Scorpion Models**

- a** - Blue air pump
- b** - Air manifold
- c** - Green indicators
- d** - Blue drain plug locations

7. Verify that water is draining from each opening. If not, use the **Three Point Manual Drain System** instructions.

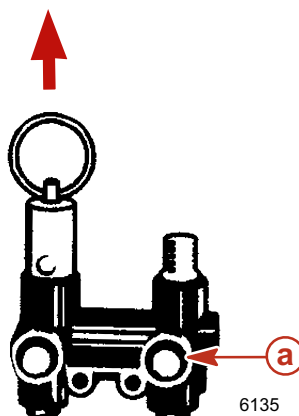


**a** - Port side drain location



**b** - Starboard side drain location

8. Allow the system to drain for a minimum of five minutes. Pump air as necessary to keep the green indicators extended.
9. Crank the engine over slightly with starter motor to purge any water trapped in the seawater pump. Do not allow engine to start.
10. Remove the air pump from the air manifold and return it to the mounting bracket.
11. Mercury MerCruiser recommends leaving the drain system open while transporting the boat or while performing other maintenance. This helps ensure that all water is drained.
12. Before launching the boat, pull up on the manual release valve. Verify that the green indicators are no longer extended.

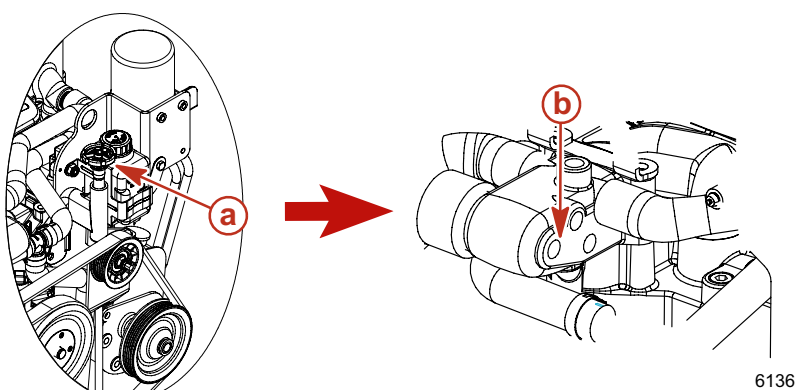


**a** - Green indicators

## Manual Single-Point Drain System

### BOAT IN THE WATER

1. Close the seacock (if equipped) or remove and plug the water inlet hose.
2. Rotate the blue handle counterclockwise until it stops (approximately two turns). The red on the handle shaft indicates that the drain system is open. Do not force the handle as this will create new threads.
3. Immediately remove the blue drain plug from the side of the thermostat housing. This must be removed within 30 seconds to properly vent the cooling system.

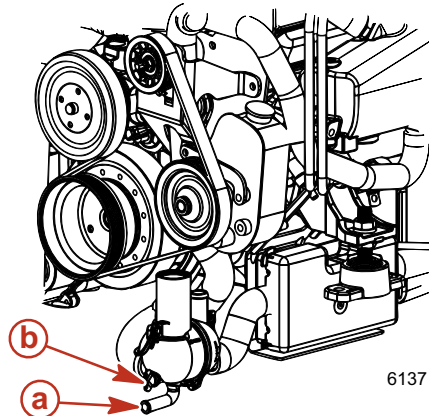


**a** - Blue handle

**b** - Blue drain plug location



4. Visually verify that water is draining. If water does not drain, remove the blue drain plug from the distribution housing and drain manually.

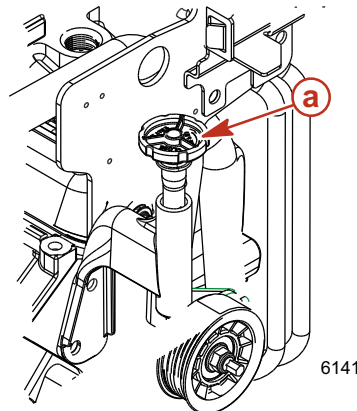


**a** - Drain location - orange or red      **b** - Blue drain plug

5. Allow the system to drain for a minimum of five minutes. We recommend leaving the drain system open while transporting the boat or performing other maintenance.
6. Reinstall the blue drain plug in the thermostat housing.
7. Close the drain system by rotating the blue handle clockwise until it stops and install the blue drain plug, if removed. The handle is fully seated when no red is visible. Do not overtighten the handle, as this action will create new threads.
8. Open the seacock (if equipped) or unplug and reconnect the water inlet hose before operating the engine.

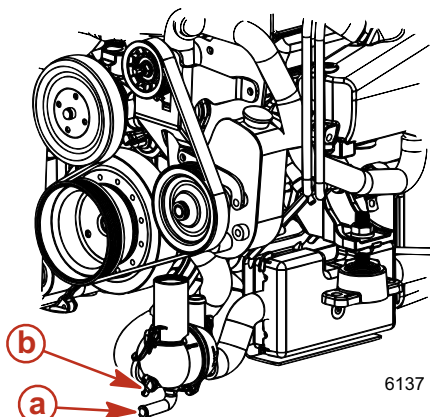
## BOAT OUT OF THE WATER

1. Place the boat on a level surface to ensure complete draining of system.
2. Rotate the blue handle counterclockwise until it stops (approximately two turns). The red on the handle shaft indicates that the drain system is open. Do not overtighten the handle, as this action will create new threads.



**a** - Blue handle

3. Visually verify that water is draining. If water does not drain, remove the blue drain plug from the distribution housing and drain manually.



**a** - Drain location - orange or red

**b** - Blue drain plug

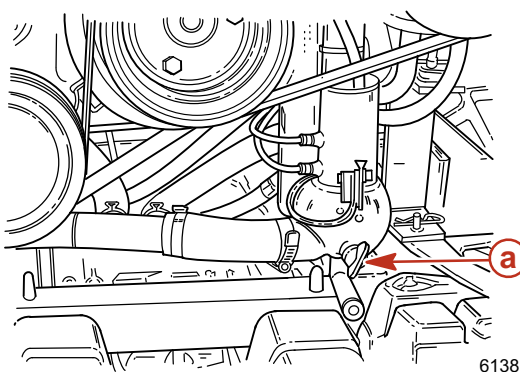
4. Allow the system to drain for a minimum of five minutes. We recommend leaving the plugs out while transporting the boat or performing other maintenance to ensure that all water is drained.
5. Close the drain system by rotating the blue handle clockwise until it stops or installing the blue drain plug. The handle is fully seated when no red is visible. Do not overtighten handle, as this action will create new threads.

## Three-Point Manual Drain System

### BOAT IN THE WATER

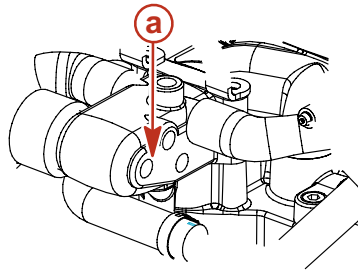
**NOTE:** Use this procedure if your engine is not equipped with an air-actuated single-point drain system or if the air-actuated single point drain system fails.

1. Close the seacock (if equipped) or remove and plug the water inlet hose.
2. Remove the blue drain plug from the distribution housing (lower front, port side).



**a** - Blue drain plug

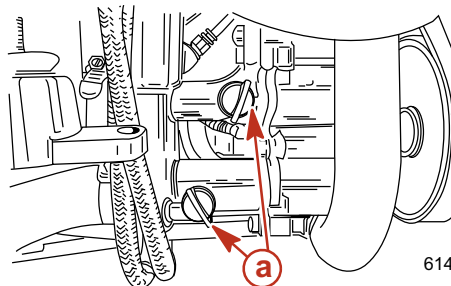
3. To properly vent the cooling system, remove the blue drain plug from the side of the thermostat housing within 30 seconds.



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**a** - Blue drain plug location

4. Remove the two blue drain plugs from the seawater pickup pump (front, starboard side).



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**a** - Blue drain plugs

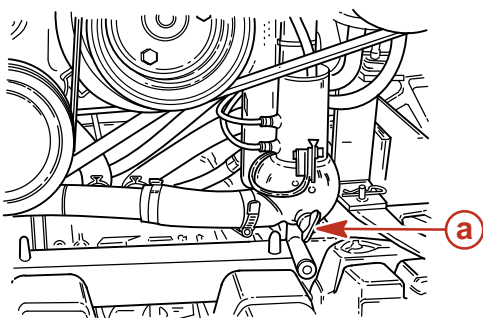
5. Verify that water is draining from each opening.
6. Allow the system to drain for a minimum of five minutes. We recommend leaving the drain system open while transporting the boat or performing other maintenance to ensure that all water is drained.
7. Crank the engine over slightly with starter motor to purge any water trapped in the seawater pickup pump. Do not allow the engine to start.
8. Before launching the boat or starting the engine, close the drain system by installing the four blue drain plugs.
9. Open the seacock, if equipped, or unplug and reconnect the water inlet hose prior to operating the engine.

## BOAT OUT OF THE WATER

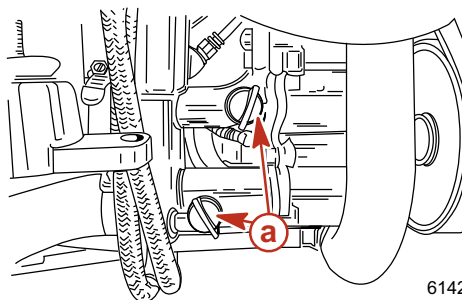
**NOTE:** Use this procedure if your engine is not equipped with an air-actuated single-point drain system or if the single-point drain system fails.

1. Place the boat on a level surface to ensure complete draining of the system.

2. Remove three blue drain plugs: one from the distribution housing (lower front, port side) and two from the seawater pickup pump (front, starboard side).



**a** - Blue drain plug



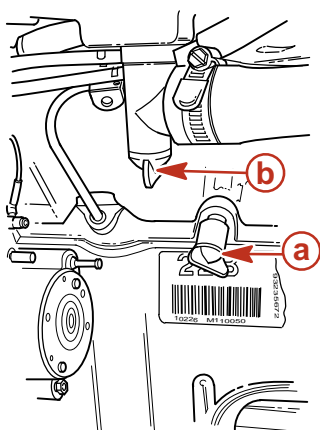
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3. Verify that water is draining from each opening.
4. Allow the system to drain for a minimum of five minutes. We recommend leaving the drain system open while transporting the boat or performing other maintenance to ensure that all water is drained.
5. Crank the engine over slightly with starter motor to purge any water trapped in the seawater pickup pump. Do not allow the engine to start.
6. Before launching the boat or starting the engine, close the drain system by installing the three blue drain plugs.

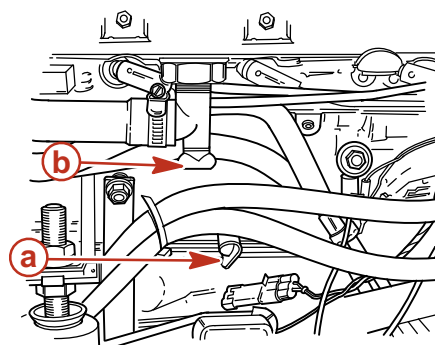
## Multi-Point Drain (MPD) System

### BOAT OUT OF THE WATER

1. Place the boat on a level surface to ensure complete draining of the system.
2. Remove the blue drain plugs from the following locations. If necessary, clean out the drain holes using a stiff piece of wire. Do so until the entire system is drained.
  - a. Port and starboard side of cylinder block
  - b. Bottom of exhaust manifolds



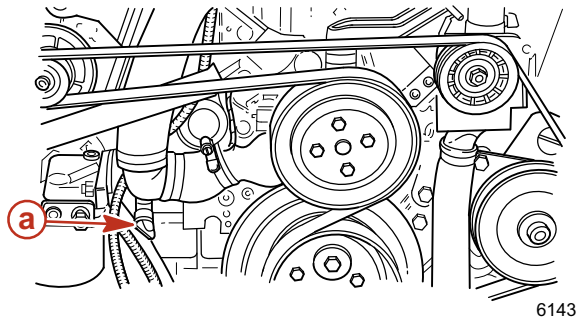
**a** - Cylinder block drain plug



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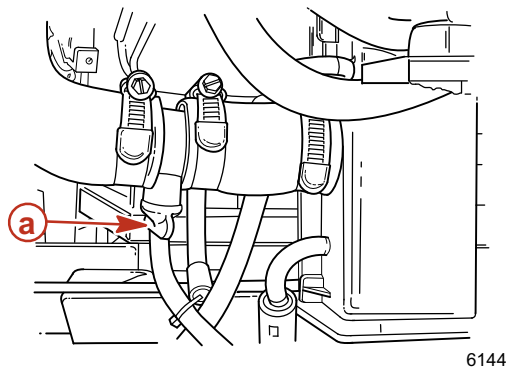
**b** - Exhaust manifold drain plug

- c. Water-circulating pump hose



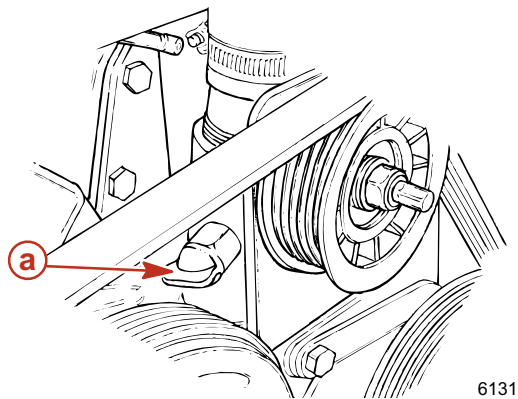
**a** - Drain plug

- d. Fuel-cooler-to-thermostat-housing hose



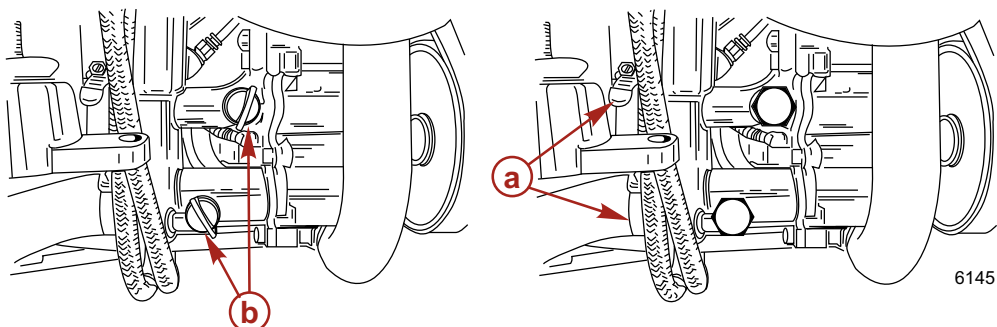
**a** - Drain plug

- e. Check valve



**a** - Drain plug (if equipped)

3. On models with a seawater pickup pump, remove the two blue drain plugs. If the seawater pickup pump does not have blue drain plugs, or you are unable to access them, loosen the clamps and remove both hoses.



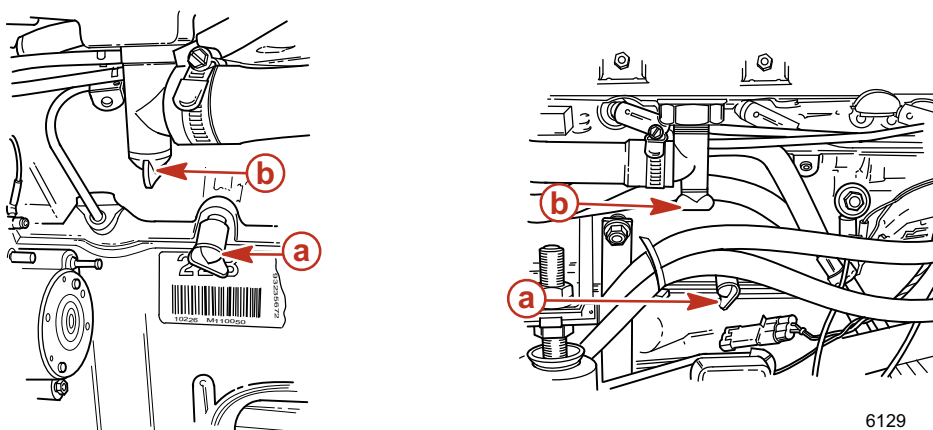
**a** - Hose clamps

**b** - Blue drain plugs

4. Crank the engine over slightly with the starter motor to purge any water trapped in the seawater pickup pump. Do not allow the engine to start.
5. After the cooling system has been drained completely, install the drain plugs, reconnect the hoses, and tighten all hose clamps securely.

## BOAT IN THE WATER

1. Close the seacock (if equipped) or remove and plug the water inlet hose.
2. Remove the blue drain plugs from the following locations. If necessary, clean out the drain holes using a stiff piece of wire. Do so until the entire system is drained.
  - a. Port and starboard side of cylinder block
  - b. Bottom of exhaust manifolds

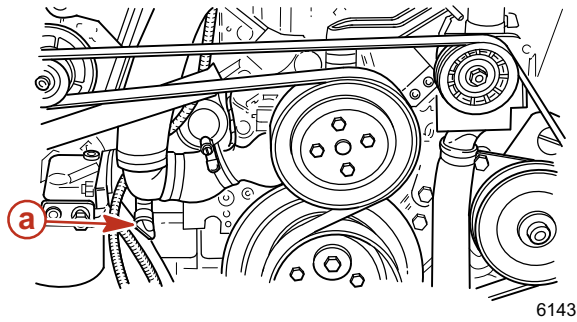


**a** - Cylinder block drain plug

**b** - Exhaust manifold drain plug

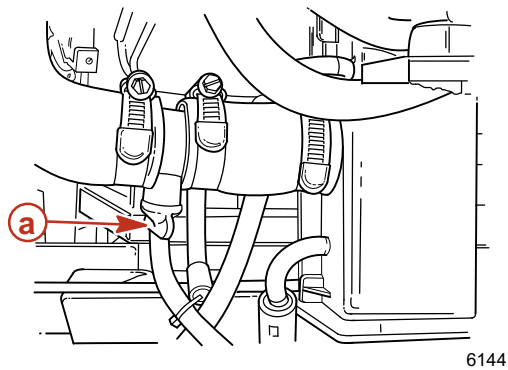


- c. Water-circulating pump hose



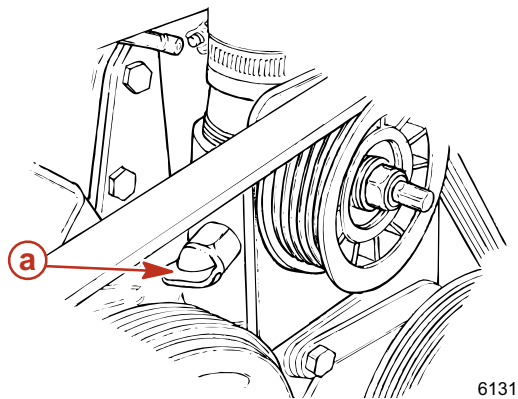
**a** - Drain plug

- d. Fuel-cooler-to-thermostat-housing hose



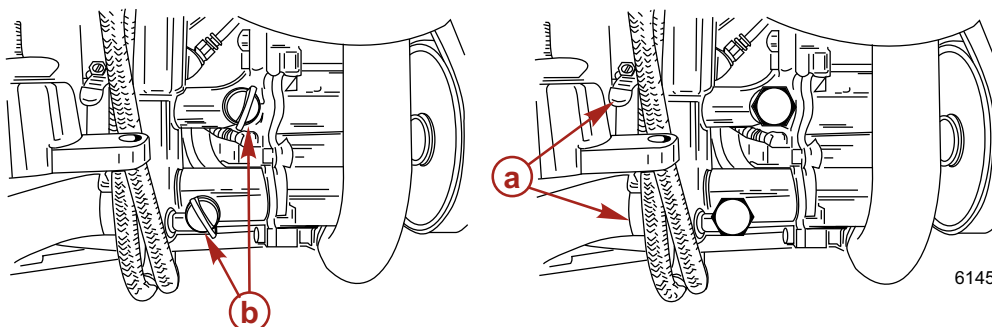
**a** - Drain plug

- e. Check valve



**a** - Drain plug (if equipped)

- On models with a seawater pickup pump, remove the two blue drain plugs. If the seawater pickup pump does not have blue drain plugs, or you are unable to access them, loosen the clamps and remove both hoses.



a - Hose clamps

b - Blue drain plugs

- Crank the engine over slightly with the starter motor to purge any water trapped in the seawater pickup pump. Do not allow the engine to start.
- Before launching the boat or starting the engine, close the drain system by installing the blue drain plugs.
- Open the seacock, if equipped, or unplug and reconnect the water inlet hose before operating the engine.

## Battery Storage

Whenever the battery will be stored for an extended period of time, be sure the cells are full of water and the battery is fully charged and in good operating condition. It should be clean and free of leaks. Follow the battery manufacturer's instructions for storage.

## Power Package Recommissioning

- Ensure that all cooling system hoses are connected properly and hose clamps are tight.

### CAUTION

Disconnecting or connecting the battery cables in the incorrect order can cause injury from electrical shock or can damage the electrical system. Always disconnect the negative (-) battery cable first and connect it last.

- Install a fully charged battery. Clean the battery cable clamps and terminals and reconnect cables. Tighten each cable clamp securely when connecting.
- Coat the terminal connections with a battery terminal anti-corrosion agent.
- Perform all the checks in the before starting column of the **Operation Chart**.

### NOTICE

Without sufficient cooling water, the engine, the water pump, and other components will overheat and suffer damage. Provide a sufficient supply of water to the water inlets during operation.

- Start the engine and closely observe instrumentation to ensure that all systems are functioning correctly.
- Carefully inspect the engine for fuel, oil, fluid, water and exhaust leaks.
- Inspect the steering system, shift and throttle control for proper operation.

**Notes:**

## Section 7 - Troubleshooting

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