

# Exhaust System

## Section 7E - Warm Risers With Dry Joint

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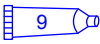
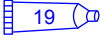
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## Lubricants, Sealants, Adhesives

Tube Ref No.	Description	Where Used	Part No.
	Loctite 567 PST Pipe Sealant	Pipe plug	92-809822
		Hose fitting	
	Perfect Seal	Bare metal gasket sealing surface	92-34227Q02
		Edge of water ports on the exhaust manifold and exhaust elbow	
		Edge of water ports on the exhaust manifold, riser, and exhaust elbow	
		Exhaust elbow bolt threads	

## Models Covered

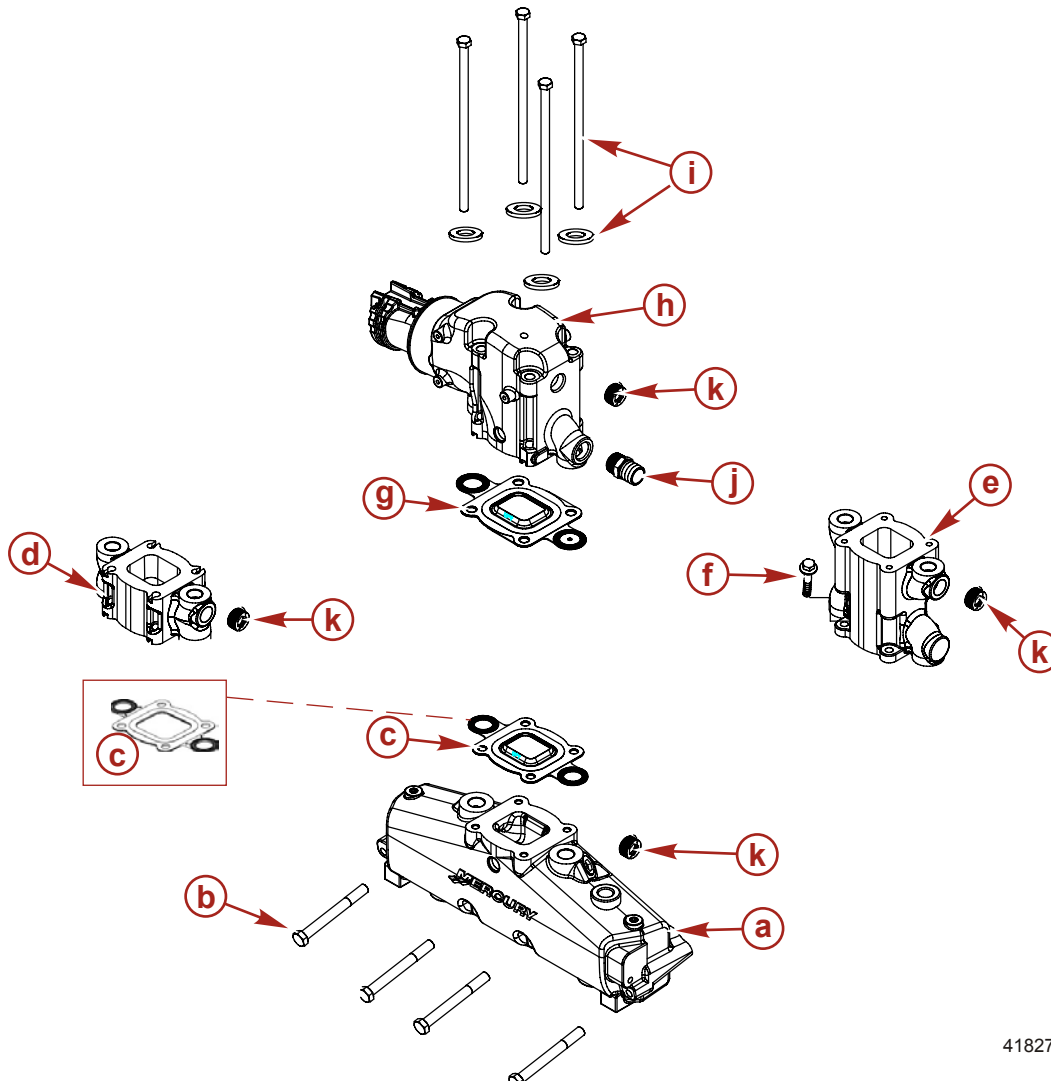
### Dry Joint Models with Warm Risers

Models Covered	Serial Number Or Year
Sterndrive models	0M615000-1A299999
Inboard and Tow Sports models	0M390000-1A089999

## Warm Risers with Dry Joint

### Seawater Cooled Models—Exploded View

**IMPORTANT:** On seawater cooled models, always position the restrictor gasket with the restricted port on the same side of the exhaust manifold as the exhaust elbow or riser hose fitting.



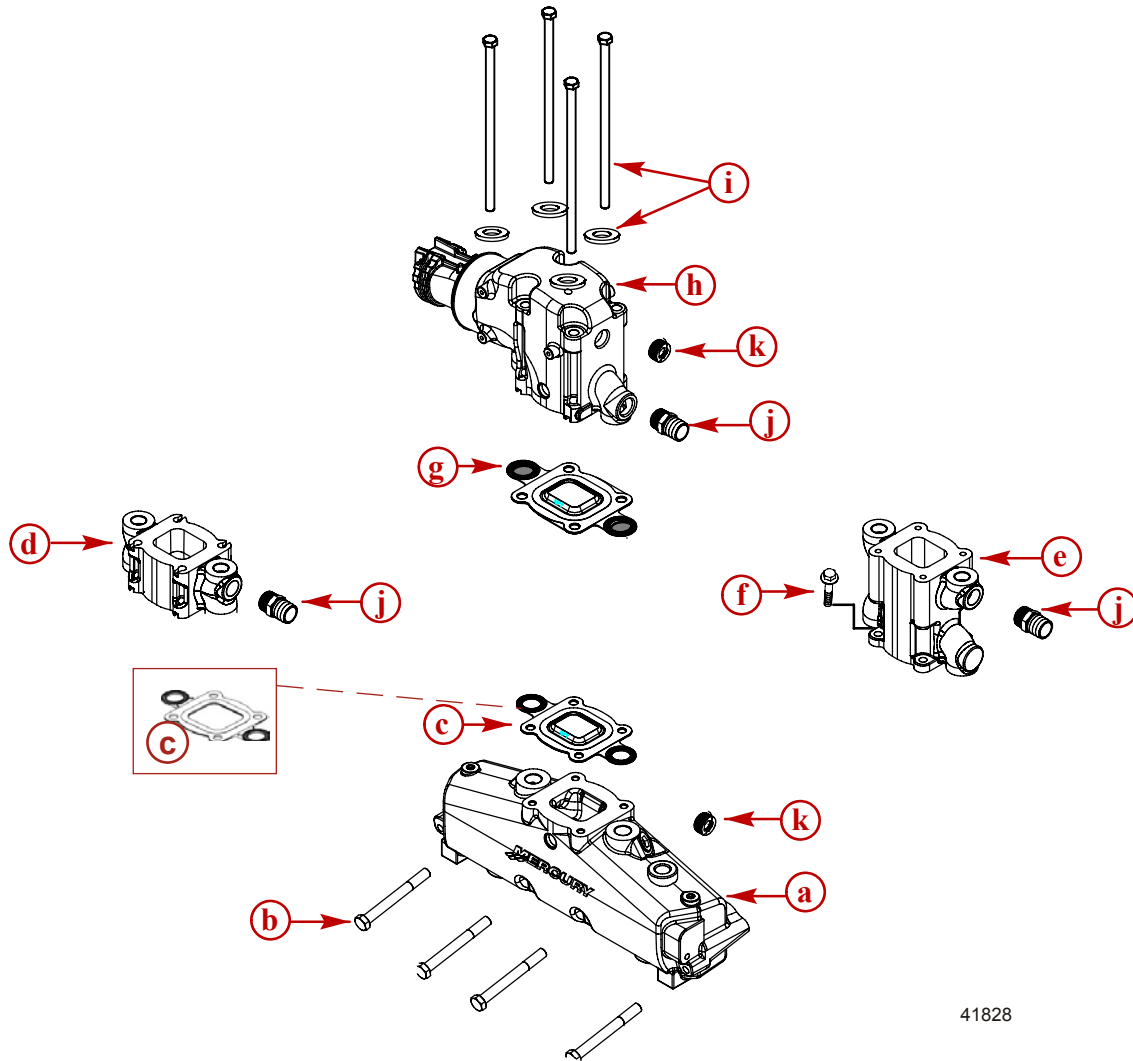
41827

**Some riser options are not shown**

- a**- Exhaust manifold
- b**- Manifold to cylinder head bolt (4)
- c**- Full flow gasket, with or without turbulator
- d**- 76 mm (3 in.) warm riser
- e**- 152 mm (6 in.) warm riser
- f**- Riser to exhaust manifold bolt (4)
- g**- Restrictor gasket, with turbulator (seawater cooled models)
- h**- Exhaust elbow
- i**- Exhaust elbow to riser or exhaust manifold bolt and washer (4 each)
- j**- Hose fitting
- k**- Pipe plug

**NOTE:** Replacement fasteners will be flange head bolts.

## Closed Cooled Models—Exploded View



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### Some riser options are not shown

- a - Exhaust manifold
- b - Manifold to cylinder head bolt (4)
- c - Full flow gasket, with or without turbulator
- d - 76 mm (3 in.) warm riser
- e - 152 mm (6 in.) warm riser
- f - Riser to exhaust manifold bolt (4)
- g - Block-off gasket, with turbulator (closed cooled models)
- h - Exhaust elbow
- i - Exhaust elbow to riser or exhaust manifold bolt and washer (4 each)
- j - Hose fitting
- k - Pipe plug

**NOTE:** Replacement fasteners will be flange head bolts.

## Removal

### ⚠ WARNING

Performing service or maintenance without first disconnecting the battery can cause product damage, personal injury, or death due to fire, explosion, electrical shock, or unexpected engine starting. Always disconnect the battery cables from the battery before maintaining, servicing, installing, or removing engine or drive components.

1. Disconnect both battery cables from the battery.


2. For seawater cooled models, drain the seawater section of the engine.
3. For closed cooled models, drain the coolant section of the engine. Refer to **Section 6C**.
4. Disconnect the engine exhaust hoses. Retain the fasteners.
5. Disconnect all hoses from the exhaust manifold, riser, and exhaust elbow. Retain the fasteners.
6. Remove and retain any items or components that are mounted to the exhaust manifold, riser, and the exhaust elbow of the engine.
7. Remove the exhaust elbow and riser. Retain the fasteners.
8. Remove the exhaust manifold. Retain the fasteners.
9. Discard the used gaskets.

### Cleaning and Inspection

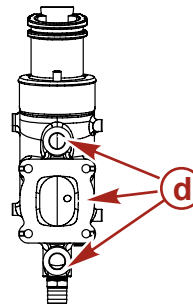
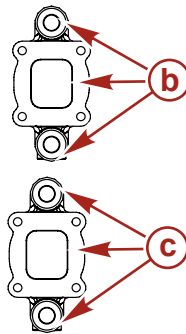
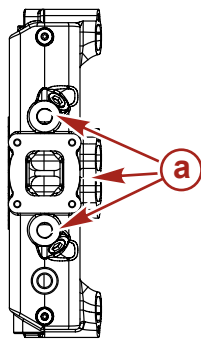
1. Clean the gasket material from all surfaces and wash the parts in solvent.
2. Inspect the water passages for debris. The passages must be clean for efficient cooling.

**NOTE:** If a more thorough inspection is desired, remove the pipe plugs from the exhaust manifold and the exhaust elbow.

**IMPORTANT:** If the pipe plugs are removed, coat the threads with sealant before installing.

Tube Ref No.	Description	Where Used	Part No.
	Loctite 567 PST Pipe Sealant	Pipe plug	92-809822

3. Inspect the manifold, elbow, and riser for cracks.
4. Inspect all parts carefully. The machined surfaces must be clean and free of all marks and deep scratches, water or exhaust leaks may result.
5. Inspect for damaged metal caused by saltwater or exhaust gas corrosion in the manifold, elbow, and riser.
6. Use a straightedge and feeler gauge to measure the profile flatness of all gasket surfaces on the manifold, elbow, and riser.
7. Measure the surface flatness of all gasket surfaces on the manifold, elbow, and riser.



32257

- a** - Exhaust manifold gasket sealing surface
- b** - Riser gasket sealing surface on top side
- c** - Riser gasket sealing surface on bottom side
- d** - Exhaust elbow gasket sealing surface

**NOTE:** Only use this specification if the gasket surfaces on used exhaust components have to be machined to remove minor corrosion.

Description		mm (in.)
Surface flatness	Maximum overall difference	0.07 mm (0.003 in.)

**NOTE:** The maximum material that can be removed is 0.25 mm (0.010 in.). When tightening the attaching bolts, ensure they are not contacting the bottom of the threaded hole in the manifold.

**NOTE:** Gasket is not reusable. Inspect for proper gasket replacement before disassembly and assembly.

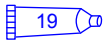
8. Replace all damaged components.

### Assembly

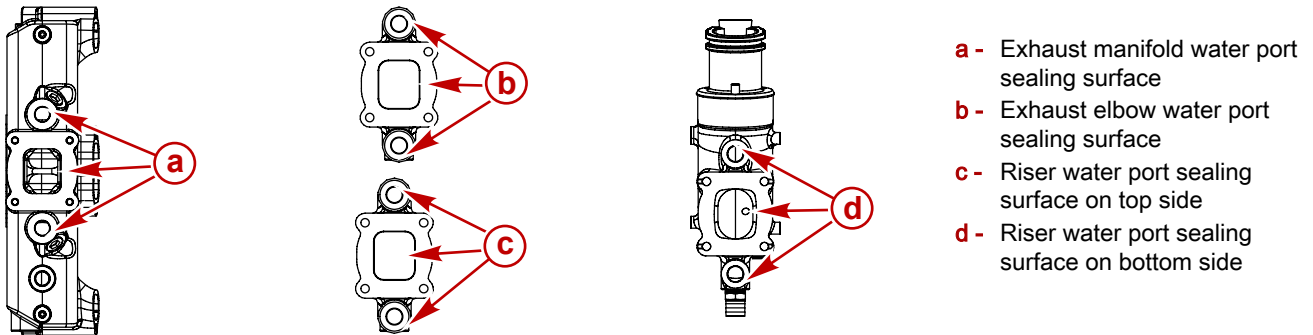
**IMPORTANT:** The edge of the water ports on all cast iron parts must be coated with Perfect Seal during assembly.

**IMPORTANT:** Apply Perfect Seal to any bare metal is present on the gasket sealing surface.

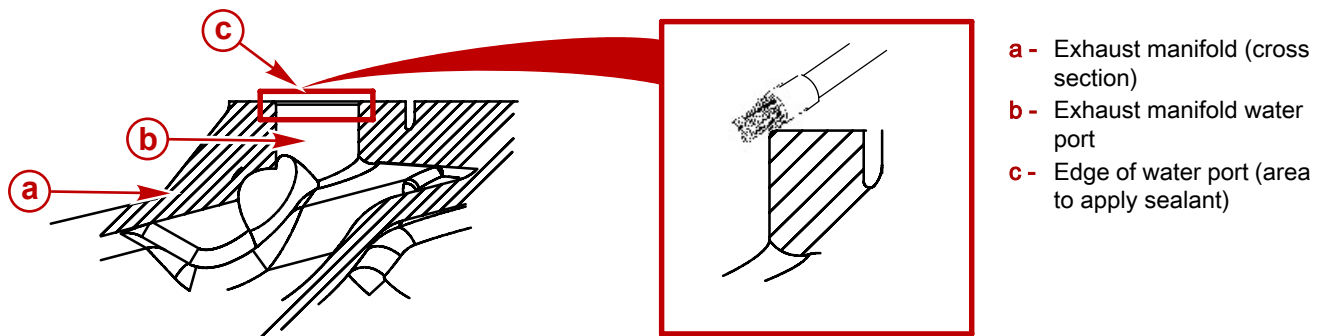
## Warm Risers With Dry Joint

Tube Ref No.	Description	Where Used	Part No.
 19	Perfect Seal	Bare metal gasket sealing surface	92-34227Q02

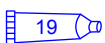
- If exhaust elbow assembly is disassembled or risers are added, apply sealant to the edge of all water ports (exhaust manifold, both sides of the riser, and exhaust elbow).



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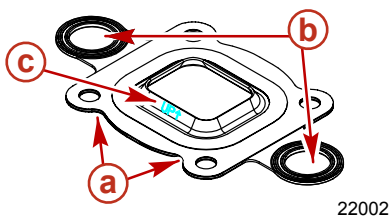
Tube Ref No.	Description	Where Used	Part No.
 19	Perfect Seal	Edge of water ports on the exhaust manifold and exhaust elbow	92-34227Q02

## Gasket Application

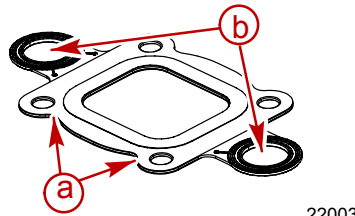
### Full Flow Gasket

Models Covered	Description
Engines with risers	Full flow gasket

**IMPORTANT:** On warm riser models, the full flow gasket must be placed between the exhaust manifolds and riser.



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#### Full-flow gasket with turbulator

- a** - Edge of gasket contoured to show full flow at each water port
- b** - Passages fully open
- c** - Turbulator facing up

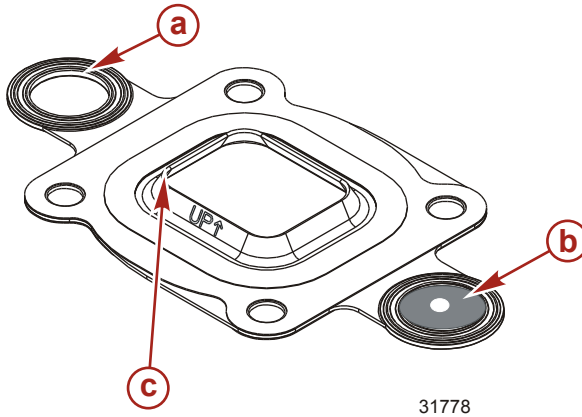
#### Standard full-flow gasket without turbulator

## Restrictor Gasket

Models Covered	Description
Seawater cooled	Restrictor gasket

**IMPORTANT:** On warm riser models, the restrictor gasket must be placed between the riser and the exhaust elbow.

**IMPORTANT:** The restrictor end of the gasket must be positioned to the seawater inlet side of the exhaust elbow.

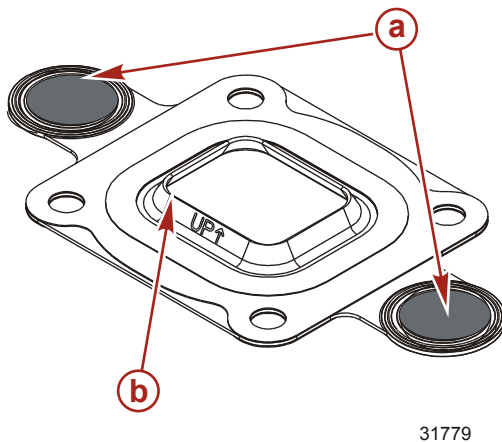


- a - Full flow passage
- b - Restricted flow passage
- c - Turbulator oriented up

## Block-Off Gasket

Models Covered	Description
Closed cooled	Block-off gasket

**IMPORTANT:** On warm riser models, the block-off gasket must be placed between the riser and the exhaust elbow.



- a - No opening for water flow
- b - Turbulator oriented up

## Installation

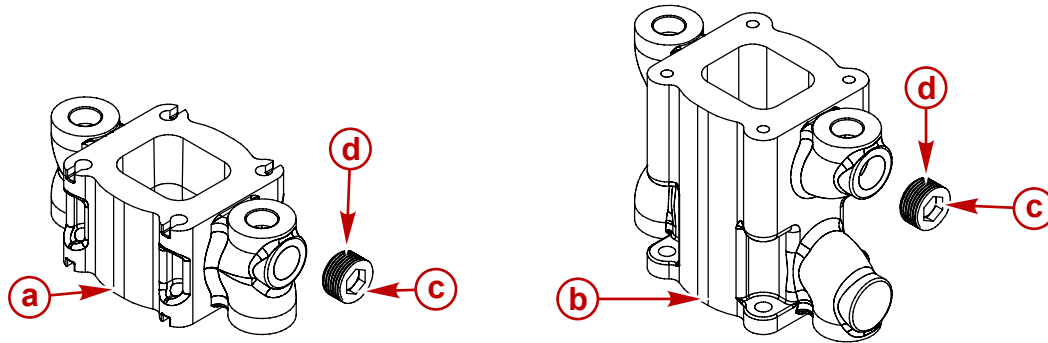
We refer to two riser models in the following installation procedure. Use the chart below for other riser models and follow the proper assembly information.

Models	Height
Dry Joint Risers assembled the same	43 mm (1.7 in.)
	76 mm (3.0 in.)
Dry Joint Risers assembled the same	119 mm (4.7 in.)
	152 mm (6.0 in.)

**IMPORTANT:** The correct turbulator gasket must be properly installed to avoid overheating due to insufficient water flow or coolant loss through the exhaust.


## Warm Risers With Dry Joint

- For seawater cooled models, apply sealant to threads of the pipe plug and install into the riser.



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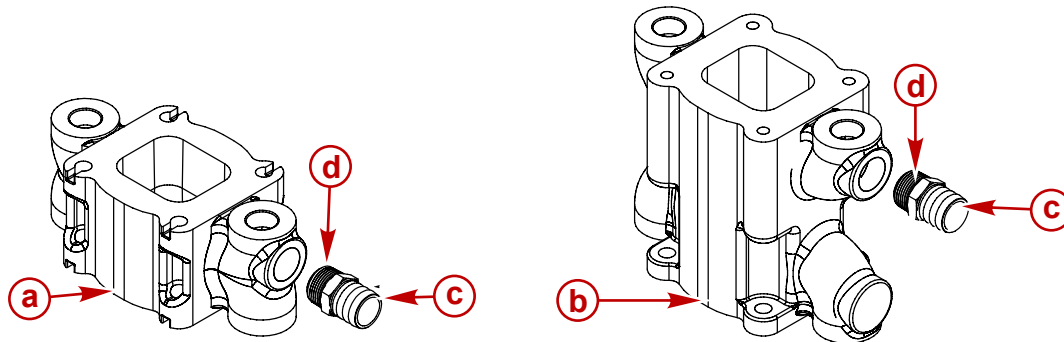
- a - 76 mm (3 in.) riser
- b - 152 mm (6 in.) riser
- c - Pipe plug
- d - Sealant applied to threads

Tube Ref No.	Description	Where Used	Part No.
	Loctite 567 PST Pipe Sealant	Pipe plug	92-809822

- Tighten the pipe plug to specification.


Description	Nm	lb-in.	lb-ft
Pipe plug to riser	50	-	37

- For closed cooled models, apply sealant to threads of the hose fittings and install into the risers.



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- a - 76 mm (3 in.) riser
- b - 152 mm (6 in.) riser
- c - Hose fitting
- d - Sealant applied to threads

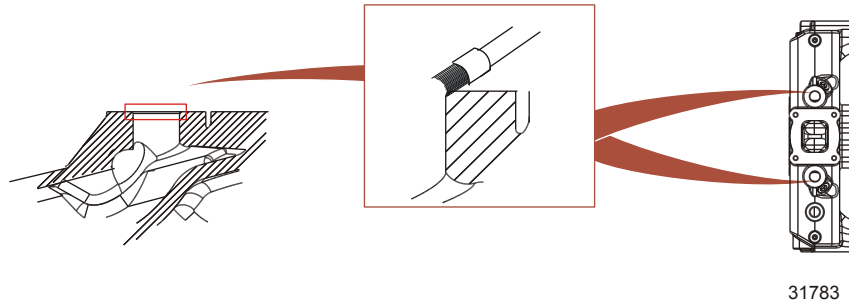
Tube Ref No.	Description	Where Used	Part No.
	Loctite 567 PST Pipe Sealant	Hose fitting	92-809822

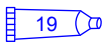
- Tighten the hose fitting to specification.

Description	Nm	lb-in.	lb-ft
Hose fitting to riser	50	-	37

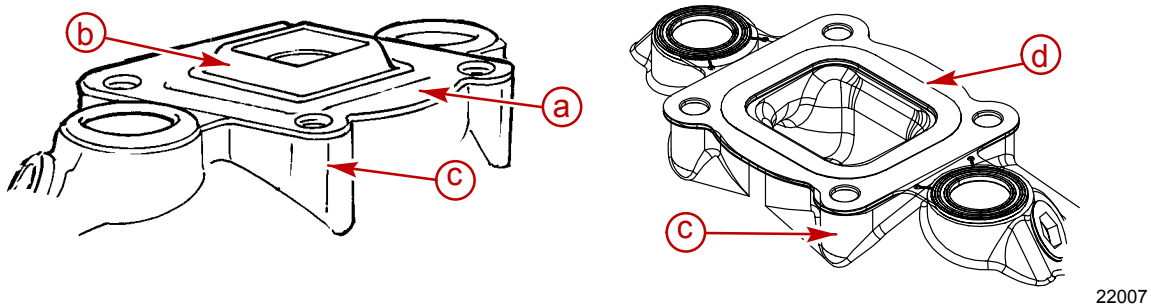


5. Apply sealant to the edge of each of the two water ports located on the exhaust manifold.



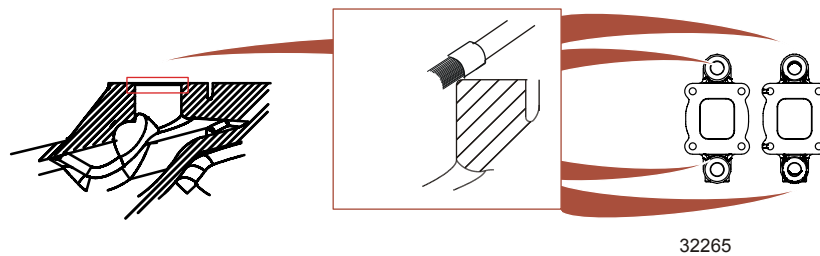
Tube Ref No.	Description	Where Used	Part No.
 19	Perfect Seal	Edge of water ports on the exhaust manifold, riser, and exhaust elbow	92-34227Q02

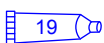
6. Place the full flow gasket on the exhaust manifold with the side marked "UP" visible.



- a - Full-flow gasket with turbulator
- b - Turbulator
- c - Exhaust manifold
- d - Standard (non turbulator) full-flow gasket

7. Apply sealant to the edge of each of the four water ports located on the riser.

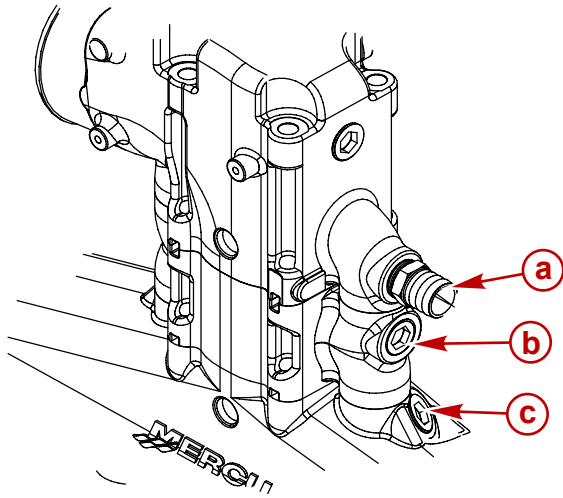


Tube Ref No.	Description	Where Used	Part No.
 19	Perfect Seal	Edge of water ports on the exhaust manifold, riser, and exhaust elbow	92-34227Q02

**NOTE:** Position of the riser outlet water port is closest to exhaust elbow.

## Warm Risers With Dry Joint

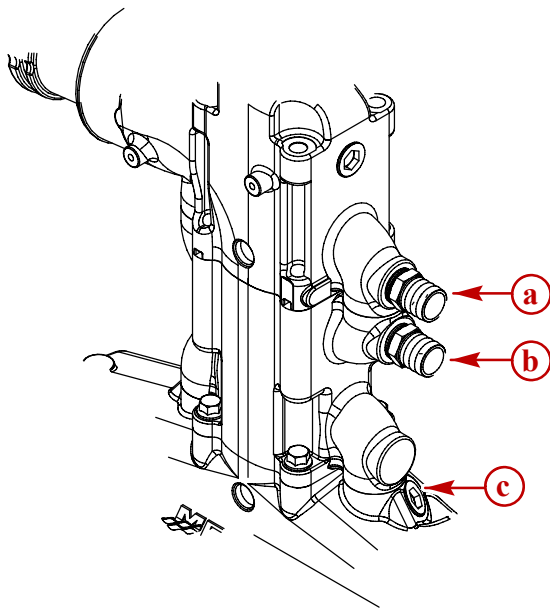
- Place the riser on the exhaust manifold as shown.



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Seawater cooled models (76 mm (3 in.) riser shown, 152 mm (6 in.) riser similar)

- a - Exhaust elbow inlet water port with hose fitting
- b - Riser outlet water port with pipe plug (seawater cooled)
- c - Exhaust manifold outlet water port with pipe plug



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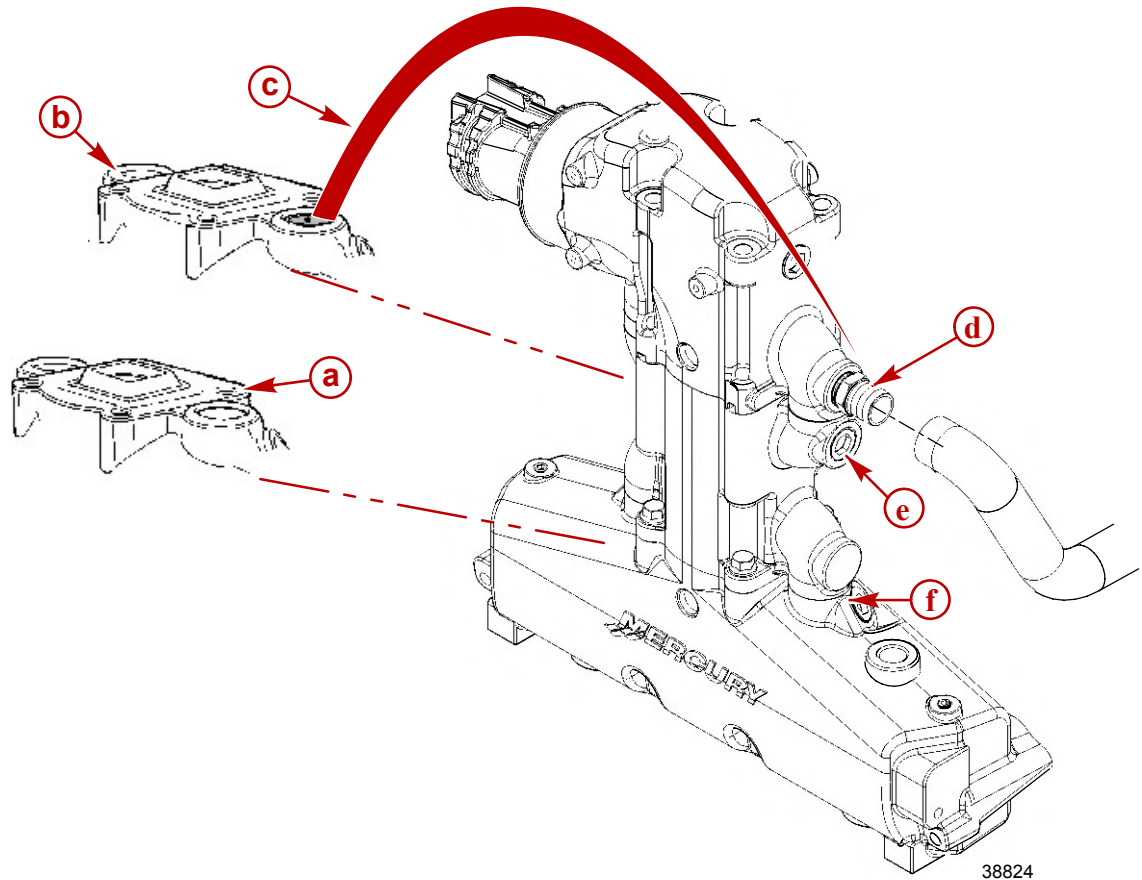
Closed cooled models (152 mm (6 in.) riser shown, 76 mm (3 in.) riser similar)

- a - Exhaust elbow inlet water port with hose fitting
- b - Riser outlet water port with hose fitting (closed cooled)
- c - Exhaust manifold outlet water port with pipe plug

**NOTE:** With closed cooled models, ensure the hose fitting located in the riser outlet water port is positioned to accept the engine coolant hose.

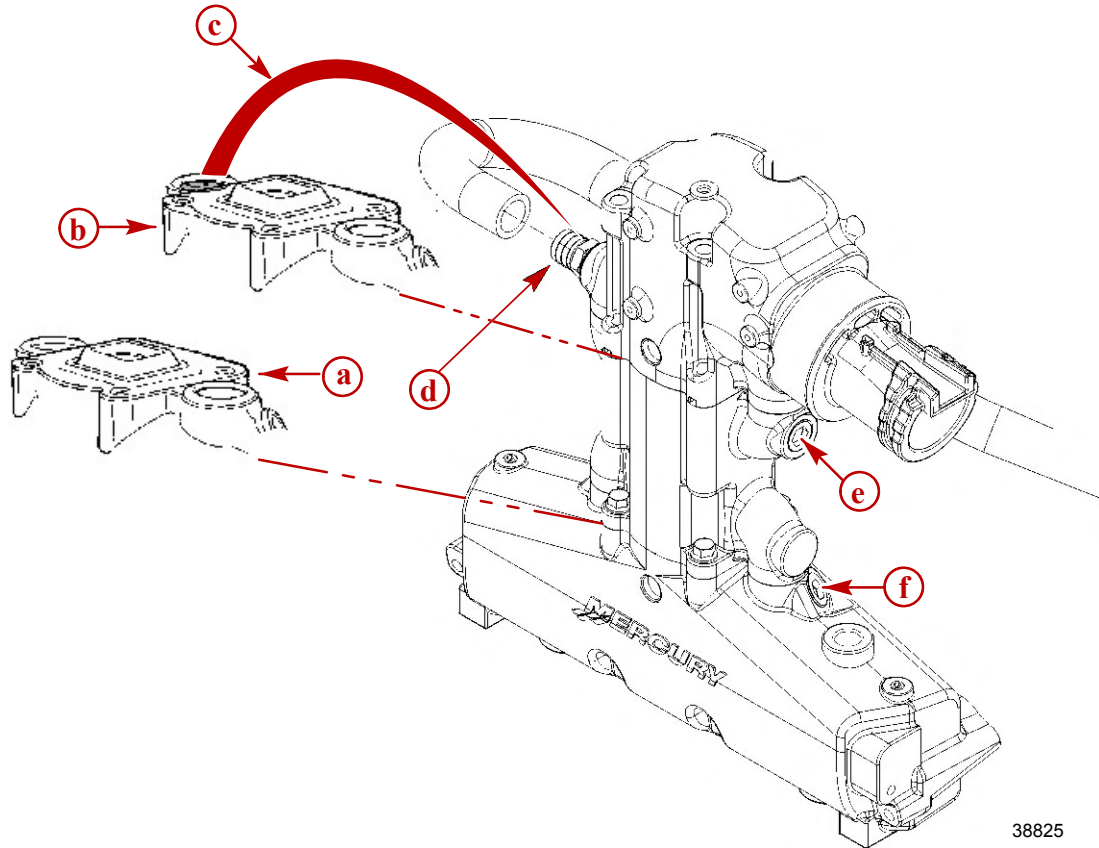
- For 152 mm (6 inch) riser models, install and hand-tighten the screws to temporarily secure the riser and gasket to the exhaust manifold.

10. For seawater cooled models, place the restrictor gasket on the riser with the side marked "UP" visible. Ensure that the restricted water port of the restrictor gasket is on the same side as the water hose fitting of the exhaust elbow.



**Sterndrive, Inboard and Tow Sports In-line exhaust seawater cooled models**

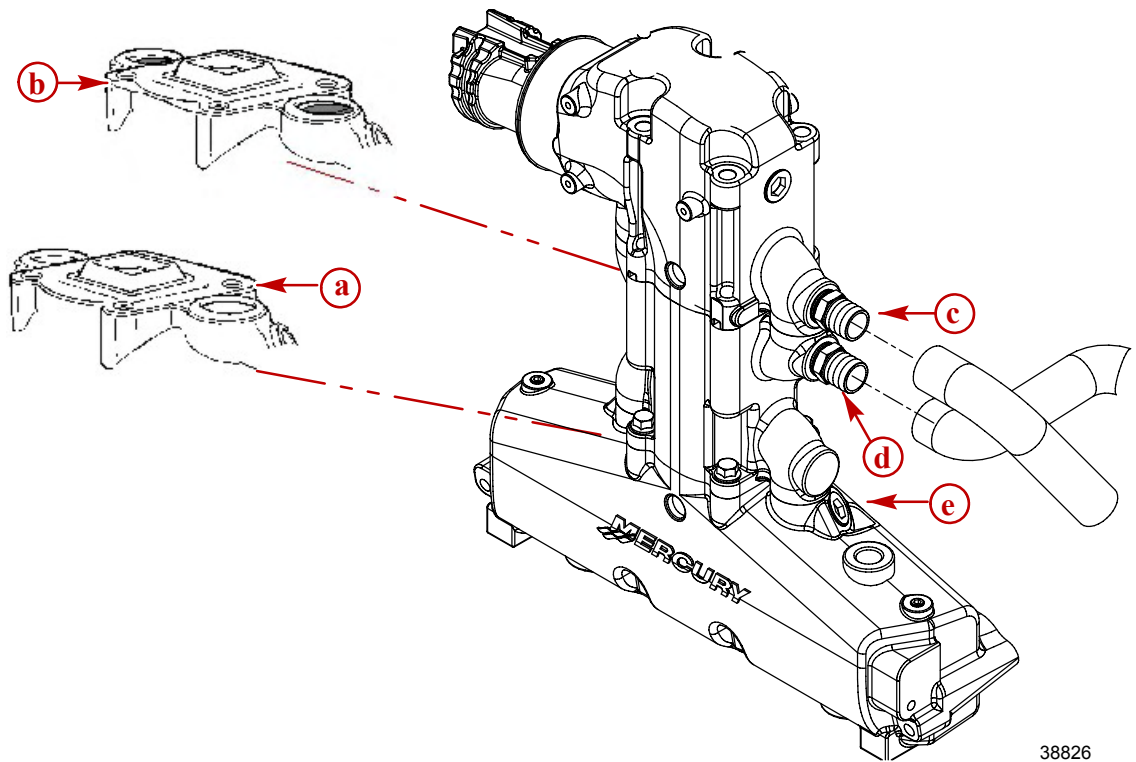
- a** - Full flow gasket positioned between exhaust manifold and riser (turbulator shown, some without)
- b** - Restrictor gasket positioned between riser and exhaust elbow
- c** - Restricted water port of gasket is in line with hose fitting of exhaust elbow
- d** - Exhaust elbow inlet water port with hose fitting
- e** - Riser outlet water port with pipe plug
- f** - Exhaust manifold outlet water port with pipe plug



**Inboard V-drive seawater cooled models**

- a-** Full flow gasket positioned between exhaust manifold and riser (turbulator shown, some without)
- b-** Restrictor gasket positioned between riser and exhaust elbow
- c-** Restricted water port of gasket is in line with hose fitting of exhaust elbow
- d-** Exhaust elbow inlet water port with hose fitting
- e-** Riser outlet water port with pipe plug
- f-** Exhaust manifold outlet water port with pipe plug

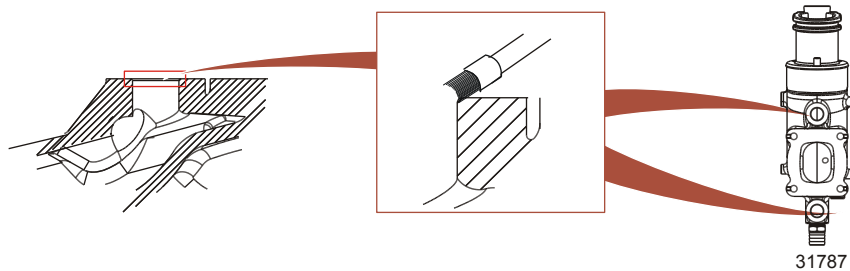
11. For closed cooled models, place the block-off gasket on the riser with the side marked "UP" visible.




**Sterndrive, Inboard In-line exhaust closed cooled models**

- a - Full flow gasket positioned between exhaust manifold and riser (turbulator shown, some without)
- b - Block-off gasket positioned between riser and exhaust elbow
- c - Exhaust elbow inlet water port with hose fitting
- d - Riser outlet water port with hose fitting
- e - Exhaust manifold outlet water port with pipe plug

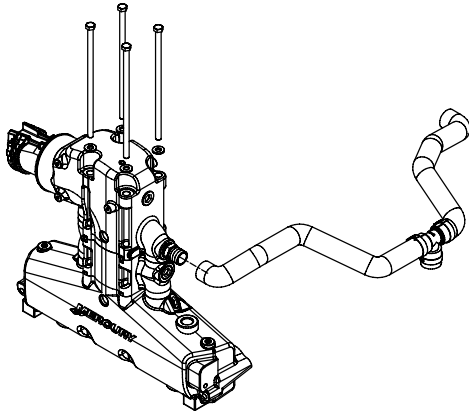
12. Apply sealant to the edge of each of the two water ports located on the exhaust elbow.



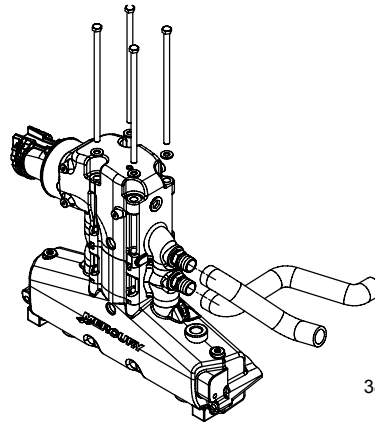
Tube Ref No.	Description	Where Used	Part No.
 19	Perfect Seal	Edge of water ports on the exhaust manifold, riser, and exhaust elbow	92-34227Q02

**Warm Risers With Dry Joint**

13. Place the exhaust elbow on the riser.

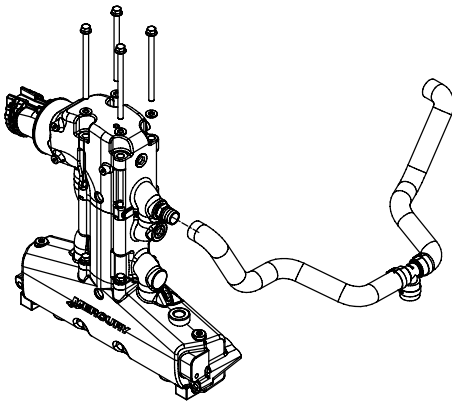


Seawater cooled 76 mm (3 in.) riser

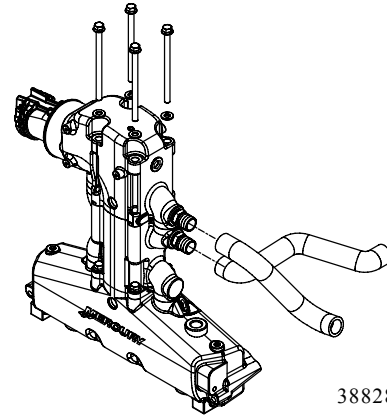


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Closed cooled 76 mm (3 in.) riser

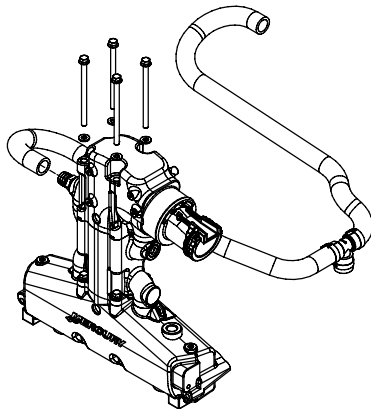


Seawater cooled 152 mm (6 in.) riser

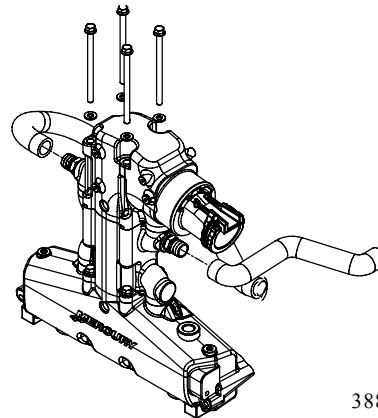


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Closed cooled 152 mm (6 in.) riser



Seawater cooled V-drive 152 mm (6 in.) riser




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Closed cooled V-drive 152 mm (6 in.) riser

**IMPORTANT:** To ensure the correct torque, the exhaust elbow screws without a flanged head require that a specific flat washer be used in conjunction with the screw. If a flange head bolt is used, no washer is needed. Refer to the Mercury Precision Parts/Quicksilver Accessories Guide.

- 14. If applicable, assemble washers to the exhaust elbow bolts.
- 15. Apply sealant to exhaust elbow bolt threads and hand-start to temporarily secure the assembly.

Tube Ref No.	Description	Where Used	Part No.
 19	Perfect Seal	Exhaust elbow bolt threads	92-34227Q02

16. Align the exhaust elbow to the engine exhaust system.

17. For 152 mm (6 in.) riser models, tighten the bolt holding the riser to the exhaust manifold to specification.

**NOTE:** Gasket is not reusable. Inspect for proper gasket and component position before tightening.

Description		Nm	lb-in.	lb-ft.
Exhaust elbow and riser to manifold bolt or nut	First pass	9	–	7
	Final pass	61	–	45

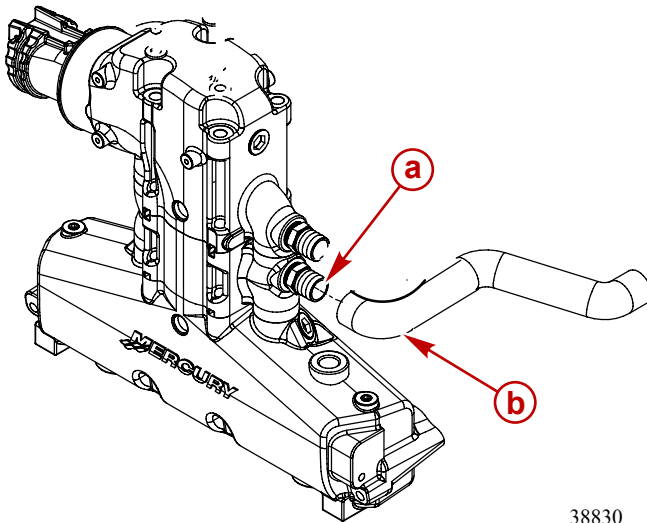
18. If applicable, ensure that washers are in place between bolt and exhaust elbow.

19. Tighten the exhaust elbow fasteners to specification.

Description		Nm	lb-in.	lb-ft.
Exhaust elbow and riser to manifold bolt or nut	First pass	9	–	7
	Final pass	61	–	45

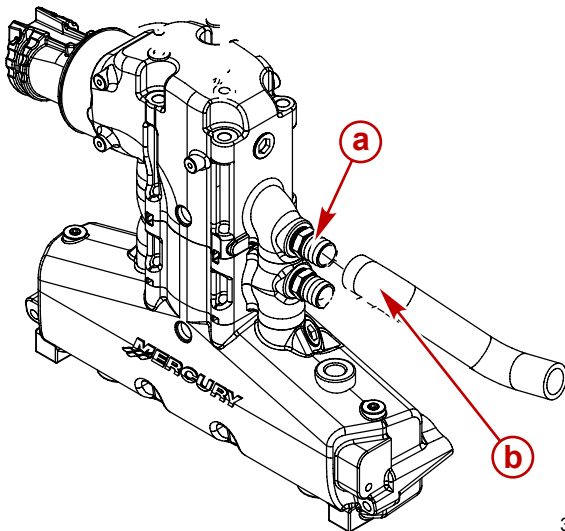
20. For seawater cooled models, connect the engine water hoses to the exhaust elbows and tighten the hose clamps securely.

21. For closed cooled models, connect the coolant hose from the thermostat housing to the hose fitting of the riser. Tighten the hose clamps securely.



- a - Riser fitting
- b - Engine coolant hose

22. For closed cooled models, connect the engine water hose from the heat exchanger to the exhaust elbow and tighten the hose clamps securely.



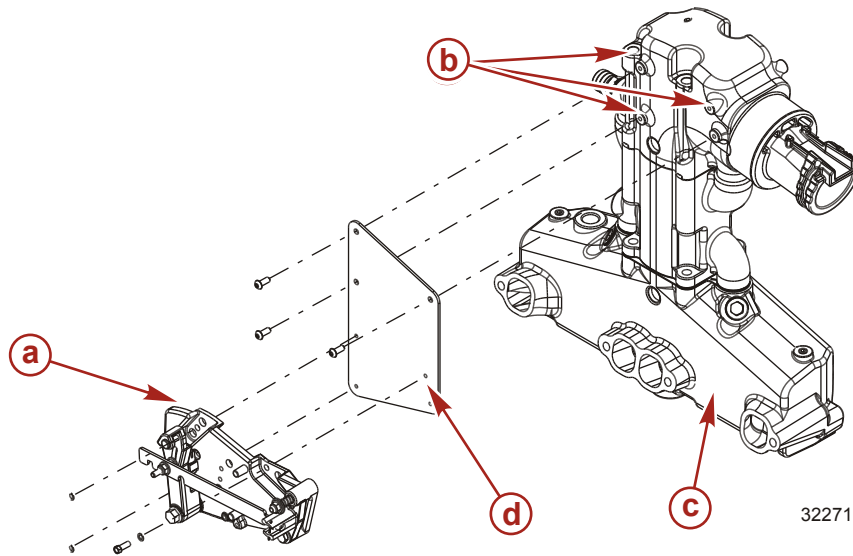
- a - Exhaust elbow fitting
- b - Engine water hose

23. Sterndrive models starboard exhaust elbow:

- a. For 152 mm (6 in.) riser, install the drop-down shift plate bracket.
- b. Install the shift plate assembly to the elbow.

## Warm Risers With Dry Joint

- c. Tighten securely.

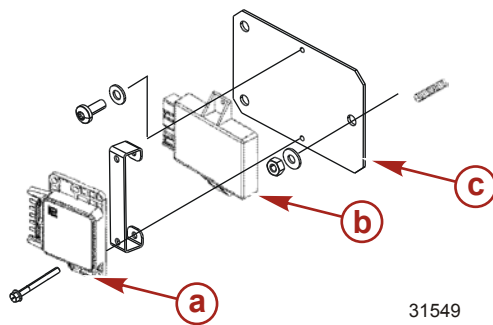


### Drop-down bracket for the 152 mm (6 in.) riser assembly

- a - Shift bracket
- b - Bracket mounting holes
- c - Exhaust manifold, riser, and elbow assembly
- d - Drop-down bracket

24. All models, port exhaust elbow with 76 mm (3 in.) riser:

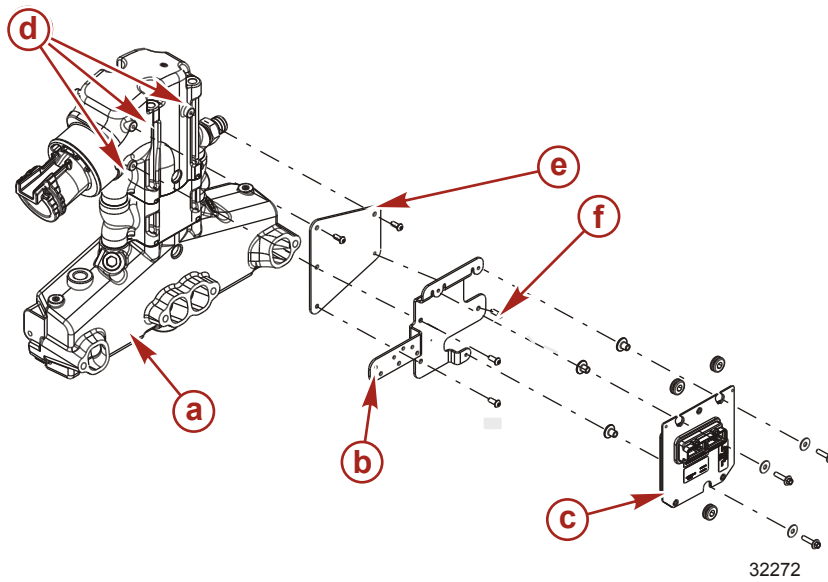
- a. Install the ECM drop-down bracket.
- b. Install the ECM bracket and the ECM or the ignition module to the exhaust elbow.
- c. Tighten securely.



### Drop-down bracket for the 76 mm (3 in.) riser assembly for carbureted models

- a - Knock module
- b - Ignition module
- c - Drop-down bracket



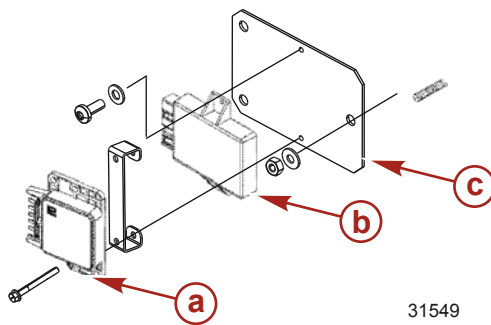


**Drop-down bracket for the 76 mm (3 in.) riser assembly for MPI models**

- a** - Exhaust manifold, riser, and elbow assembly
- b** - ECM Bracket
- c** - ECM
- d** - Bracket mounting holes
- e** - Drop-down bracket
- f** - Short screw

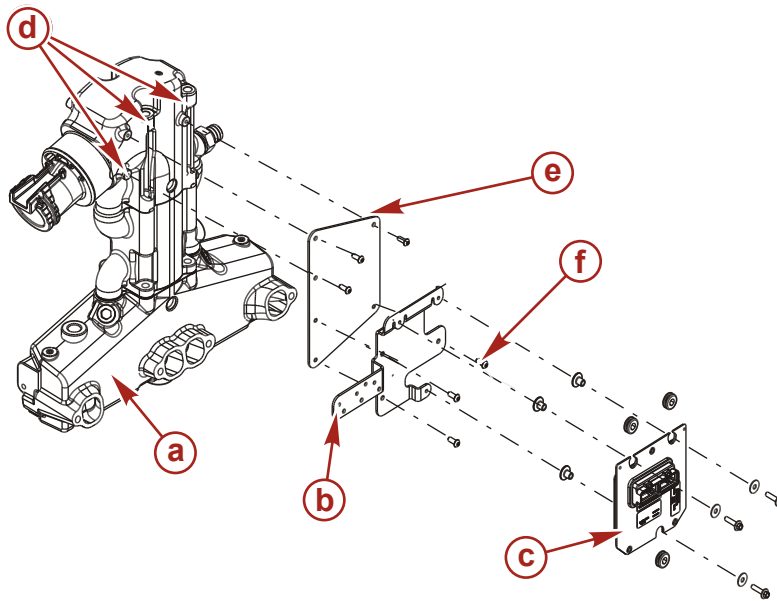
25. All models, port exhaust elbow with 152 mm (6 in.) riser:

- a. Install the ECM drop-down bracket.
- b. Install the ECM bracket and the ECM to the exhaust elbow.
- c. Tighten securely.



**Drop-down bracket for the 152 mm (6 in.) riser assembly for carbureted models**

- a** - Knock module
- b** - Ignition module
- c** - Drop-down bracket



**Drop-down bracket for the 152 mm (6 in.) riser assembly for MPI models**

- a** - Exhaust manifold, riser, and elbow assembly
- b** - ECM bracket
- c** - ECM
- d** - Bracket mounting holes
- e** - Drop-down bracket
- f** - Short screw

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26. Install the exhaust hoses and the cooling hoses.
27. Tighten the hose clamps securely.
28. Install any additional components removed during disassembly.
29. Reconnect the battery cables to the battery. Tighten securely.

**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.

30. Supply cooling water to the engine.
31. Start the engine and check for exhaust and water leaks.