



864920A02

CLOSED-COOLING KIT

IMPORTANT: This document guides our dealers, boatbuilders, and company service personnel in the proper installation or service of our products. If you have not been trained in the recommended servicing or installation procedures for these or similar Mercury Marine products, have the work performed by an authorized Mercury Marine dealer technician. Improper installation or servicing of the Mercury product could result in damage to the product or personal injury to those installing or operating the product.

NOTE: After completing installation, place these instructions with the product for the owner's future use.

Models Covered

Models Covered	Serial Number or Year
All 350 MAG MPI and MX 6.2 MPI inboard models	0M317000–0W389999
All 5.0 MPI, 350 MAG MPI, and MX 6.2 MPI sterndrive models, except MPD models	0M600000–0W309999
All 4.3 MPI sterndrive models, except MPD models	0M600000 and Above
All 5.0 MPI, 350 MAG MPI, and MX 6.2 MPI sterndrive models, except MPD models	0W310000 and Above
All 350 MAG MPI and MX 6.2 MPI inboard models	0W390000 and Above

Components Contained in Kit

Components Contained in Kit

Qty.	Description	Part Number
1	Heat exchanger assembly	864395A2
1	Heat exchanger bracket	864429
2	Hose clamp	54-815504396
2	Rubber sleeve (subassembled to the hose clamp)	32-93315-6
1	Heat exchanger to port elbow hose V8 (in-line)	32-864726
1	Heat exchanger to port elbow hose V8 (V-drive)	32-864543
1	Heat exchanger to starboard elbow hose V8 (in-line)	8M0027771
1	Heat exchanger to starboard elbow hose V8 (V-drive)	32-864544
1	Heat exchanger to water circulating pump hose	32-864886
1	Heat exchanger to thermostat housing hose	32-864506
1	Thermostat housing bypass to heat exchanger hose	32-864507
1	Thermostat housing to lower port manifold hose (V8)	32-864508
1	Thermostat housing to lower starboard manifold hose (V8)	32-864509
1	Intake manifold bypass to water circulating pump hose	32-864551
1	Thermostat housing to upper port manifold hose (V8)	32-864552
1	Thermostat housing to upper starboard manifold hose (V8)	32-864539
1	Port riser to thermostat housing hose	32-864954
1	Starboard riser to thermostat housing hose	32-864956
1	Heat exchanger to water distribution housing hose	32-864431
1	Bulk hose, 102 mm (4 in.) long	32-863343-13
1	Water inlet hose	32-863343
1	Seawater pump actuator housing	863674A1
1	Coolant recovery bottle	71587A1
1	Coolant recovery decal	37-12797
1	Drive lube monitor	8M0075709
1	Drive lube monitor bracket	860065
1	Retaining strap	808023T
2	Hex head screw, 3/8-16 x 1/2 in. (0.13 mm) long	10-828552

Qty.	Description	Part Number
1	Hose clamp	54-41582 5
1	Water pump pulley	864861-1
1	Water distribution housing assembly	863802A2
2	Pipe plug, 1/4-18 NPT hex head	22-36382
1	Straight fitting, 3/4-14 x 1 in.	866725
1	90 degree elbow fitting, 3/4 in.	22-860346
1	Intake manifold hose connector, 1/2-14 NPT x 3/4 in.	22-806242
1	Y-fitting, 1-1/4 x 1-1/4 in.	22-864727
2	Block-off gasket	864549A02
2	Full flow gasket	864547A02
3	Hex head screw, 1/4-20 x 5/8 in. (16 mm) long	10-817505-1
1	Hex head screw, 3/8-16 x 1 in. (25 mm) long	10-65210
2	Thermostat housing to intake manifold hex head screw, M8 x 35 mm (1-3/8 in.) long	10-40011151
4	Screw, 5/16-24 x 3/4 in. (20 mm) long	10-47277
1	Serpentine belt, sterndrive models	57-863876-6
1	Serpentine belt, inboard models	57-863876-10
1	Thermostat housing assembly	864398A1
1	Thermostat cover	807075A1
2	Hex head screw, 5/16-18 x 7/8 in. (22 mm) long	10-28782
1	Thermostat housing gasket	27-53045-1
1	Thermostat, 77 degrees Celsius (170 degrees F)	864493
1	Thermostat seal	25-807134-1
2	Heat exchanger pad	18431
2	Spacer, 0.41 x 0.75 in. outside diameter (OD)	23-91817
2	Special stud, 2-1/8 in. (54 mm) double end with hex shoulder	8M2004610
2	Locknut, 3/4 in.-16 hex	11-826711-12
1	Flanged hex head screw 3/8-16 x 7/8 in. (22 mm) long	10-805559
1	Pressurized tubing, gray 3/16 in. OD	32-863054005
1	Pressurized tubing, green 5/32 in. OD	32-863055005
2	Vent tubing, black 5/16 in. OD	32-863056-2
4	Hose clamp	54-815504212
16	Hose clamp	8M0188621
2	Hose clamp	8M0188622
6	Hose clamp	54-815504228
24	Clamp covers	19-807992-3
1	Rubber cap	19-865189
2	Rubber cap	32877
6	Cable tie	54-816311T
2	Rubber cap	866051
2	Hose clamp	54-185504212

Notice

IMPORTANT: The engine control module (ECM) must be replaced when installing this closed-cooling kit. Engine damage will occur if the ECM is not replaced.

Refer to the ECM Recalibration and Credit Voucher Process section of this instruction sheet for ECM credit and replacement information.

IMPORTANT: Installations on Alpha sterndrive models require a seawater pump kit (46-862914A06) and a through-the-hull or through-the-transom water pickup.

IMPORTANT: Installations on V6 MPI models require a supplemental hose kit (32-865090A01).

IMPORTANT: Bravo models with closed cooling require a through-the-hull or through-the-transom pickup in addition to the sterndrive water inlets to meet the minimum flow specifications.

IMPORTANT: Sterndrive and inboard models equipped with in-line exhaust and 152 mm (6 in.) risers require a supplemental hose kit (32-865039A1).

IMPORTANT: For installations on sterndrive models serial number 0M600000–0M616623, a front lifting eye bracket (865188001) is required. For removal and installation instructions, refer to the Front Lifting Eye Bracket Replacement section in this instruction sheet.

IMPORTANT: Power package dimensions will increase slightly on the front and top sides when the closed-cooling kit is installed.

Must Order Separately

IMPORTANT: The engine control module (ECM) must be replaced when installing this closed-cooling kit. Engine damage will occur if the ECM is not replaced.

IMPORTANT: Refer to the electronic parts catalog or MercNET to identify the correct ECM for your application.

Torque Specifications

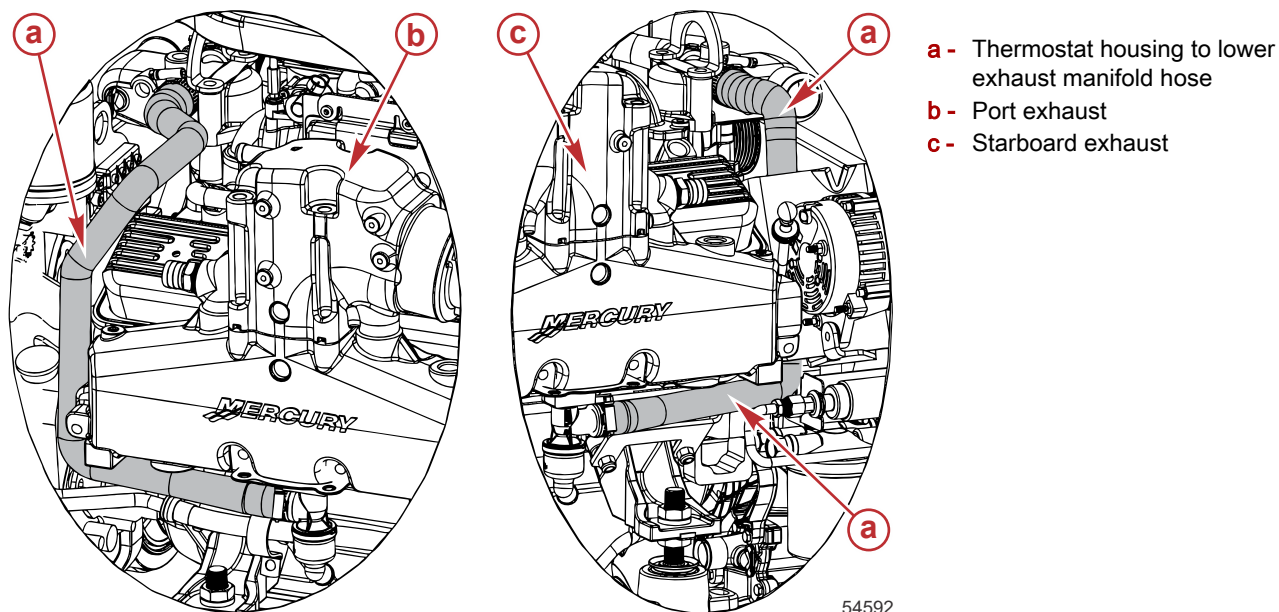
Apply the specified torques to the fasteners listed below and securely tighten all the remaining fasteners.

Description		Nm	lb-in.	lb-ft
Exhaust elbow and riser to exhaust manifold screw <i>NOTE: Tighten screws evenly using an X-pattern from corner to corner</i>	First	9.4	84	–
	Final	61	–	45
Front lifting eye bracket screw		41	–	30
Upper front lifting eye bracket fasteners		30	–	22
Lower front lifting eye bracket fasteners		41	–	30
Thermostat housing to intake manifold hex head screw M8 x 35 mm (1-3/8 in.) long		33	–	24
Heat exchanger bracket to engine screw (port side)		33	–	24
Heat exchanger bracket to engine screw (starboard side)		33	–	24
Heat exchanger bracket to thermostat housing screw		33	–	24
Thermostat housing cover screw		30	–	22
Water distribution housing screw		13.6	120	–
Seawater pump impeller housing screw		10.2	90	–
Seawater pump bracket screw		10.2	90	–
Idler pulley bracket bolt		41	–	30
Seawater pump bracket locknut		34	–	25
Idler pulley locknut		52	–	38
Idler brace to alternator fasteners		34	–	25
Special stud, 2-1/8 in. (54 mm) double end with hex shoulder		41	–	30
Hex head screw, 3/8-16 x 1/2 in. (13 mm) long		33	–	24
Drain rod bracket screw		41	–	30
Power steering fittings		31	–	23

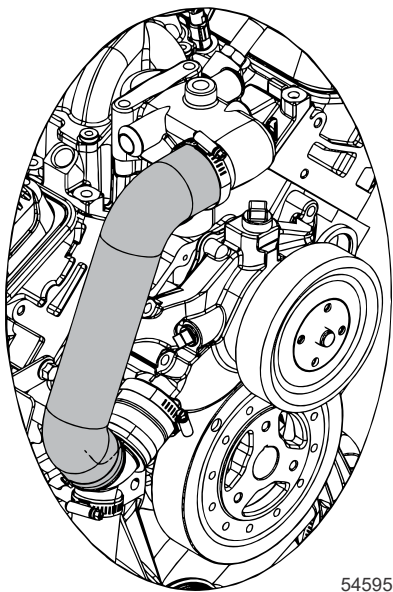
Removing the Cooling System

Bravo Models

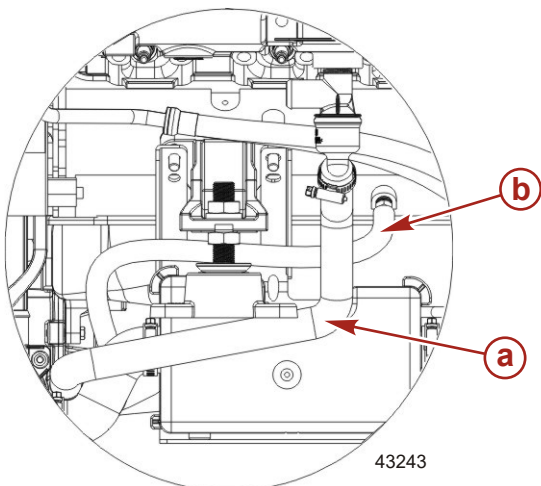
1. Remove and discard the port and starboard thermostat housing to lower exhaust manifold hoses and hose clamps.



2. Loosen the hose clamp and remove the water circulating pump hose at the thermostat housing and water circulating pump. Discard the hose clamps.



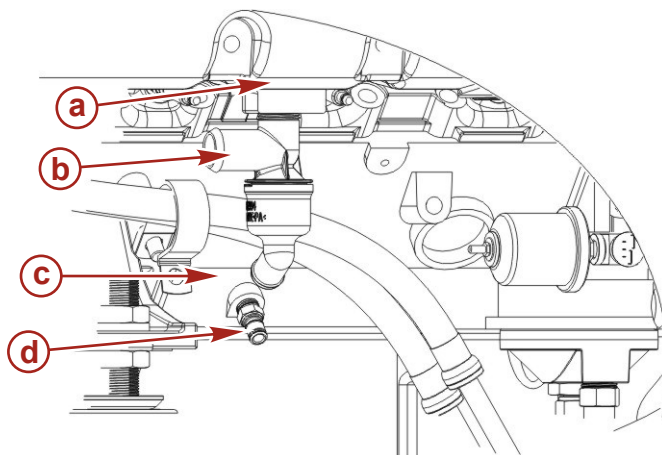
3. Loosen the hose clamps and remove the port and starboard exhaust manifold water drain hoses at the exhaust manifolds. Discard the hoses and the hose clamps.



Port side shown, starboard side similar

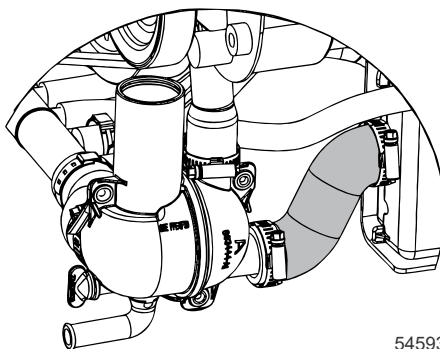
- a - Exhaust manifold hose
- b - Engine block drain hose

4. Disconnect the port and starboard engine block drain hoses from the engine block drain fittings.
5. Remove and discard the port and starboard lower exhaust manifold hose connectors.
6. Remove and discard the port and starboard engine block drain fittings.



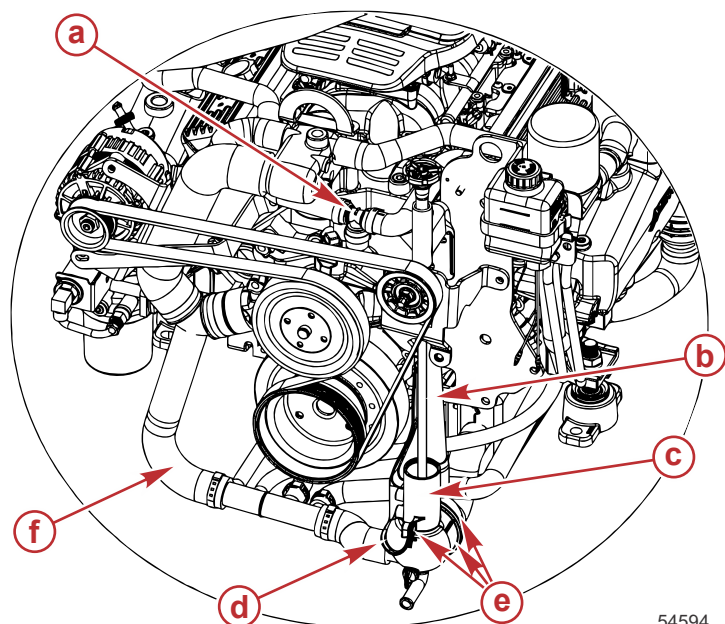
- a - Exhaust manifold
- b - Lower exhaust manifold hose connector
- c - Engine block
- d - Engine block drain fitting

7. Loosen the hose clamp and remove the water distribution to Cool Fuel hose at the water distribution housing. Retain the hose clamp.



8. Loosen and remove the T-fitting to water distribution housing hose at the water distribution housing. Discard the hose clamp.

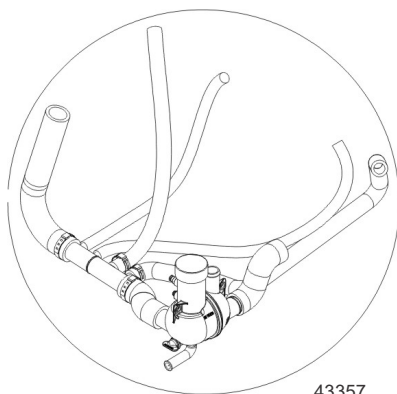
9. Remove and discard the three screws that secure the water distribution housing to the water distribution housing bracket.



- a** - T-fitting
- b** - T-fitting to water distribution housing hose
- c** - Water distribution housing
- d** - Water distribution housing bracket
- e** - Water distribution housing screws (not shown)
- f** - Hose assembly

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10. Remove and discard the hose assembly, including the distribution housing.



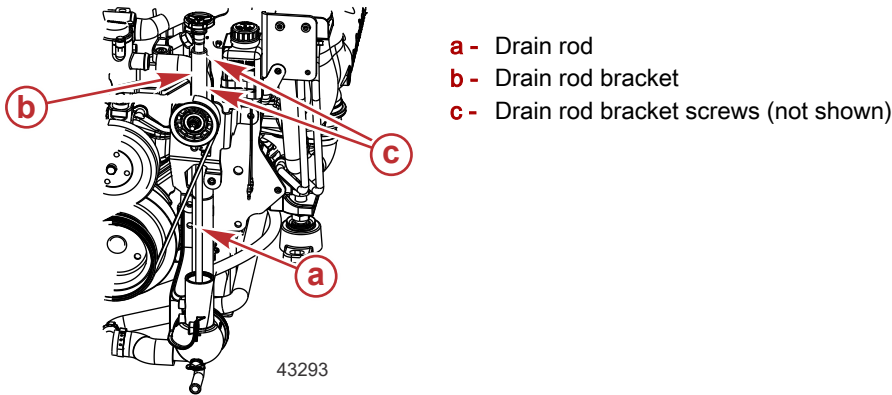
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11. Remove the port and starboard T-fitting to exhaust elbow hoses from the exhaust elbows. Discard the T-fitting hose assembly and hose clamps.
12. Disconnect, remove, and retain the temperature sender and the temperature sensor from the thermostat housing.
13. Remove and discard the thermostat housing assembly and fasteners.

Alpha Models

1. Remove and discard the E-ring from the drain rod. The E-ring is located on the lower side of the drain rod bracket.
2. Remove the drain rod from the water distribution housing and drain rod bracket by rotating counterclockwise and pulling upward. Discard the drain rod.

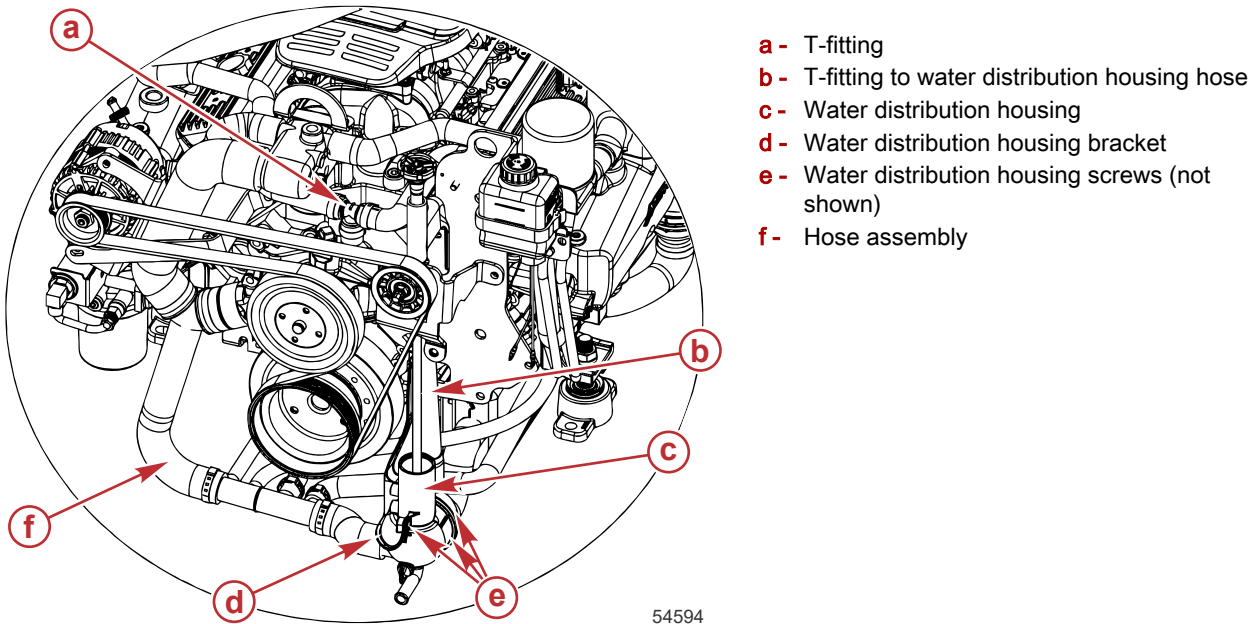
3. Remove the screws that secure the drain rod bracket to the engine. Discard the drain rod bracket.



4. Reinstall the drain rod bracket screws and tighten them to the specified torque.

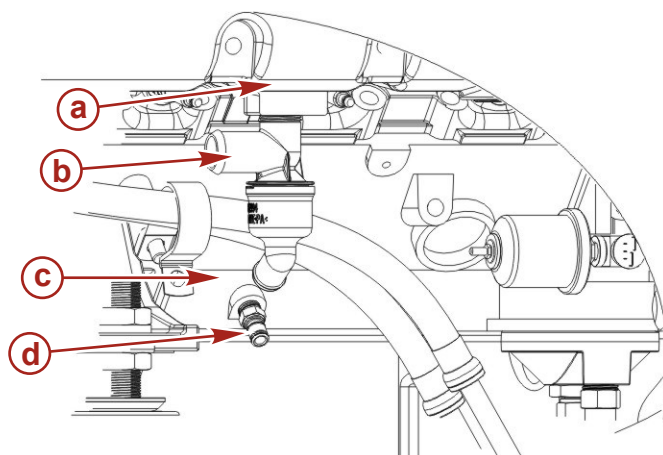
Description	Nm	lb-in.	lb-ft
Drain rod bracket screw	41	–	30

5. Remove and discard the port and starboard thermostat housing to lower exhaust manifold hoses and hose clamps.
6. Loosen the hose clamp and remove the water circulating pump hose at the thermostat housing and water circulating pump. Discard the hose clamps.
7. Loosen the hose clamps and remove the port and starboard exhaust manifold water drain hoses at the exhaust manifolds. Discard the hose clamps.
8. Disconnect the port and starboard engine block drain hoses from the engine block drain fittings.
9. Loosen the hose clamp and remove the water distribution to Cool Fuel hose at the water distribution housing. Retain the hose clamp.
10. Loosen and remove the T-fitting to water distribution housing hose at the water distribution housing. Discard the hose clamp.
11. Remove and discard the three screws that secure the water distribution housing to the water distribution housing bracket.



12. Remove and discard the hose assembly, including the distribution housing.
13. Remove the port and starboard T-fitting to exhaust elbow hoses from the exhaust elbows. Discard the T-fitting hose assembly and hose clamps.
14. Remove and discard the port and starboard lower exhaust manifold hose connectors.

15. Remove and discard the engine block drain fitting.



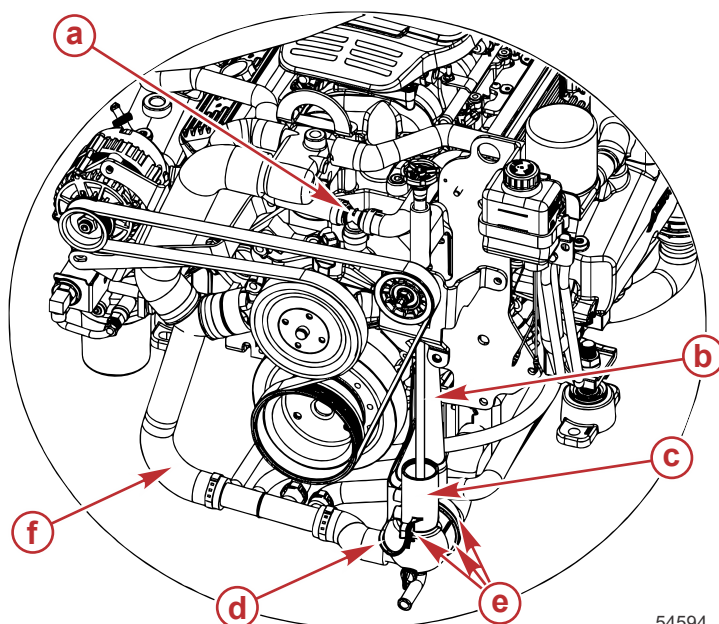
- a - Exhaust manifold
- b - Lower exhaust manifold hose connector
- c - Engine block
- d - Engine block drain fitting

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16. Disconnect, remove, and retain the temperature sender and the temperature sensor from the thermostat housing.
17. Remove and discard the thermostat housing assembly and fasteners.

Inboard Models with In-line Exhaust

1. Remove and discard the port and starboard thermostat housing to lower exhaust manifold hoses and hose clamps.
2. Loosen the hose clamp and remove the water circulating pump hose at the thermostat housing and water circulating pump. Discard the water circulating pump hose and the hose clamps.
3. Remove and discard the port and starboard exhaust manifold water drain hoses and hose clamps.
4. Disconnect the port and starboard engine block drain hoses from the engine block drain fittings.
5. Loosen the hose clamp and remove the water distribution to Cool Fuel hose at the water distribution housing. Retain the hose clamp.
6. Loosen and remove the T-fitting to water distribution housing hose at the water distribution housing. Discard the hose clamp.
7. Remove and discard the three screws that secure the water distribution housing to the water distribution housing bracket.

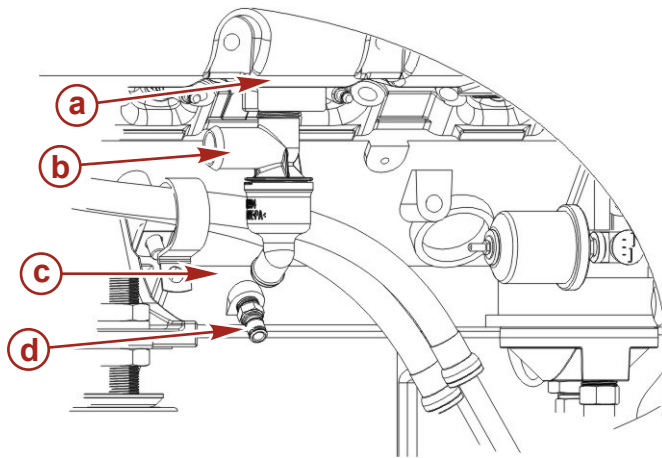


- a - T-fitting
- b - T-fitting to water distribution housing hose
- c - Water distribution housing
- d - Water distribution housing bracket
- e - Water distribution housing screws (not shown)
- f - Hose assembly

54594

8. Remove and discard the hose assembly.
9. Remove the port and starboard T-fitting to exhaust elbow hoses from the exhaust elbows. Discard the T-fitting hose assembly and hose clamps.
10. Remove and discard the port and starboard lower exhaust manifold hose connectors.

11. Remove and discard the engine block drain fittings.



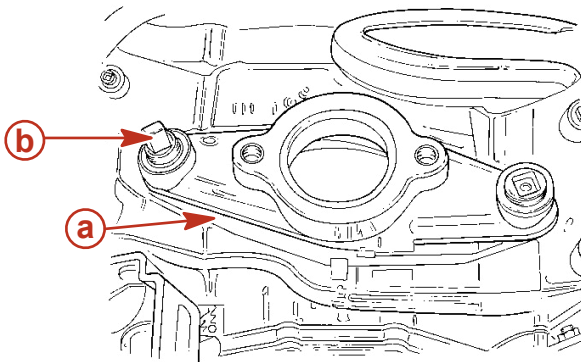
- a** - Exhaust manifold
- b** - Lower exhaust manifold hose connector
- c** - Engine block
- d** - Engine block drain fitting

43246

12. Disconnect, remove, and retain the temperature sender and the temperature sensor from the thermostat housing.
13. Remove and discard the thermostat housing assembly and fasteners.

Removing the Exhaust Elbow

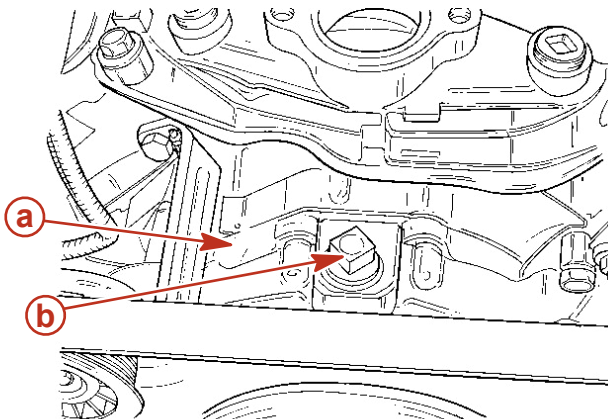
1. Remove the intermediate exhaust elbow.
2. Disconnect the engine harness from the ECM.
3. Remove the fuse block and relays from the ECM bracket.
4. Disconnect the shift cable from the shift plate.
5. For all models with risers, remove the pipe plug from the risers.
6. Remove the exhaust elbows. Retain the fasteners.
7. Remove and discard the pipe plug from the front starboard side of the intake manifold.



- a** - Intake manifold
- b** - Pipe plug

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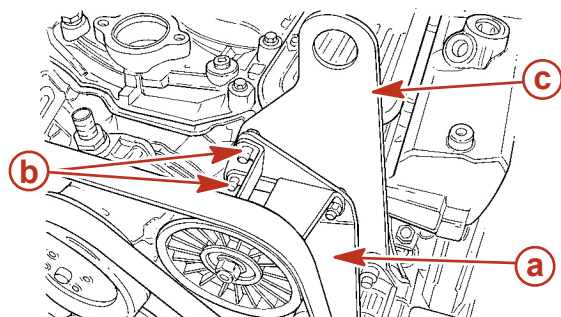
8. Remove and discard the pipe plug from the top of the water circulating pump.



- a** - Water circulating pump
- b** - Pipe plug

43247

9. Remove the nuts or screws on the starboard side of the pulley bracket. Retain the two nuts or discard the two screws as applicable.



43248

- a - Idler pulley bracket
b - Lifting eye bracket studs (nuts removed)
c - Lifting eye bracket

10. For V8 models, loosen the screws on the water circulating pump pulley with the serpentine belt installed.
- Remove and discard the serpentine belt.
 - Remove and discard the water circulating pump pulley and fasteners.
11. For V6 models, loosen the tensioner pulley and remove and discard the serpentine belt.
12. For inboard models, remove and retain the screw on the starboard side of the tensioner pulley bracket.
13. For sterndrive models, remove and retain the screw on the starboard side of the idler pulley bracket.

NOTE: For sterndrive models serial number 0M600000–0M616623, a front lifting eye bracket is required. Refer to the **Front Lifting Eye Bracket Replacement** instructions prior to installing the new serpentine belt.

Seawater Connections

Specifications

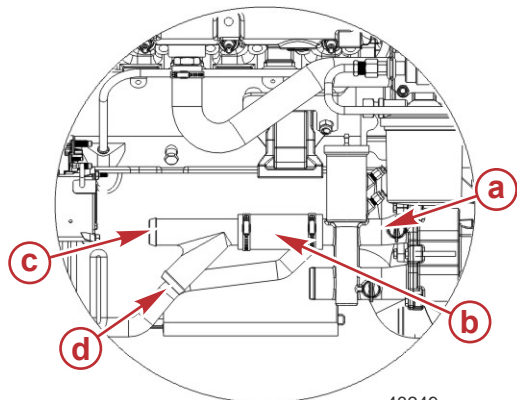
Description	Specifications
Minimum flow (models with closed cooling)	114 L/min (30 gpm) at 4000 RPM
Minimum pressure (models with closed cooling)	138 kPa (20 psi) at 4000 RPM
Water pickup size	32 mm (1.25 in.) inside diameter (ID) reinforced wire
Water inlet hose connection	32 mm (1.25 in.)
Seacock connection	
Seawater strainer connection	

Y-Fitting

IMPORTANT: Bravo models with closed cooling require a through-the-hull or through-the-transom pickup in addition to the sterndrive water inlets to meet the minimum flow specifications.

When additional water inlets are used, a Y-fitting is installed to the engine seawater pump.

- Install the 102 mm (4.0 in.) bulk hose on the engine seawater pump inlet port.
- Lubricate the Y-fitting with dish soap and install the Y-fitting on the hose. Orient the angled leg of the Y-fitting toward the through-the-hull or through-the-transom pickup.
- Secure the hose and the Y-fitting with hose clamps.



43249

- a - Engine seawater pump
b - Hose from the seawater pump inlet port to the Y-fitting
c - Y-fitting port to the Bravo drive
d - Y-fitting port to the additional water inlet

4. Install the water inlet hoses to the water inlet and the sterndrive.

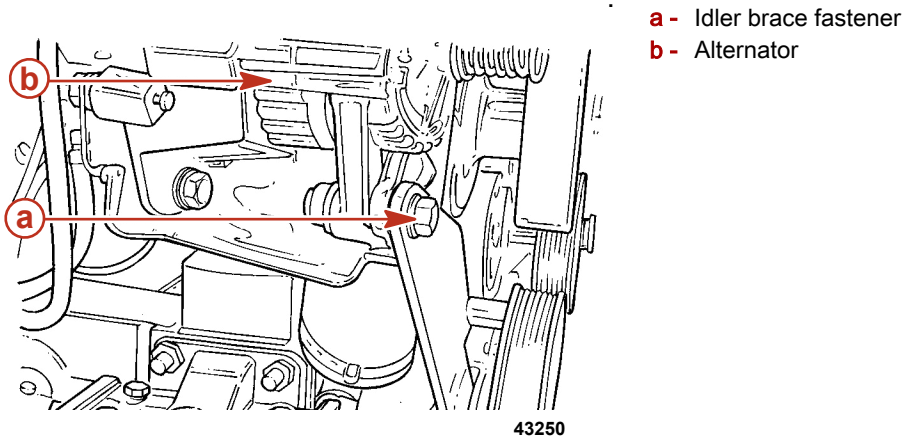
5. Refer to the appropriate Mercury MerCruiser installation or service manual for seawater pickup installation.

Seawater Pump Modification

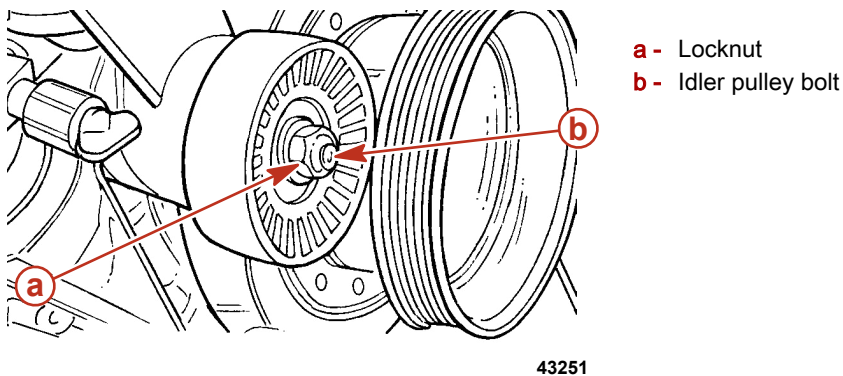
IMPORTANT: All models must remove the seawater pump impeller housing cover from the seawater pump and replace it with the seawater pump air actuator housing provided.

Seawater Pump Removal

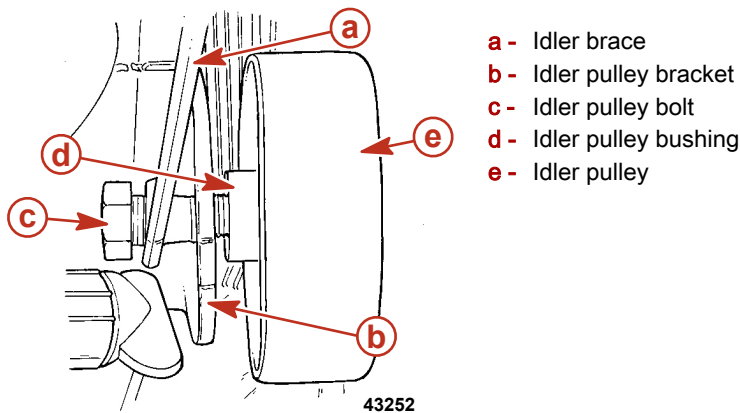
1. Loosen the fasteners for the idler pulley brace at the alternator.



2. Remove and retain the locknut from the idler pulley bolt.

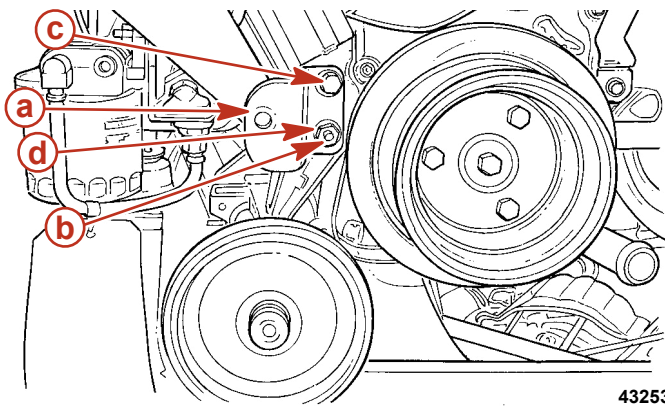


3. Remove and retain the idler pulley, the idler pulley bushing, and the idler pulley bolt.



4. Remove and retain the idler pulley bracket bolt.

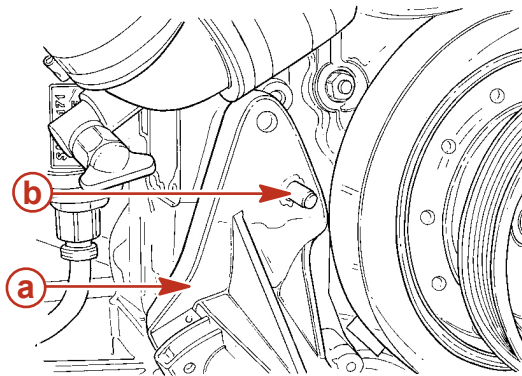
5. Remove and retain the locknut from the seawater pump stud.



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- a - Idler pulley bracket
b - Seawater pump stud
c - Idler pulley bracket bolt
d - Locknut

6. Remove the seawater pump from the seawater pump stud.

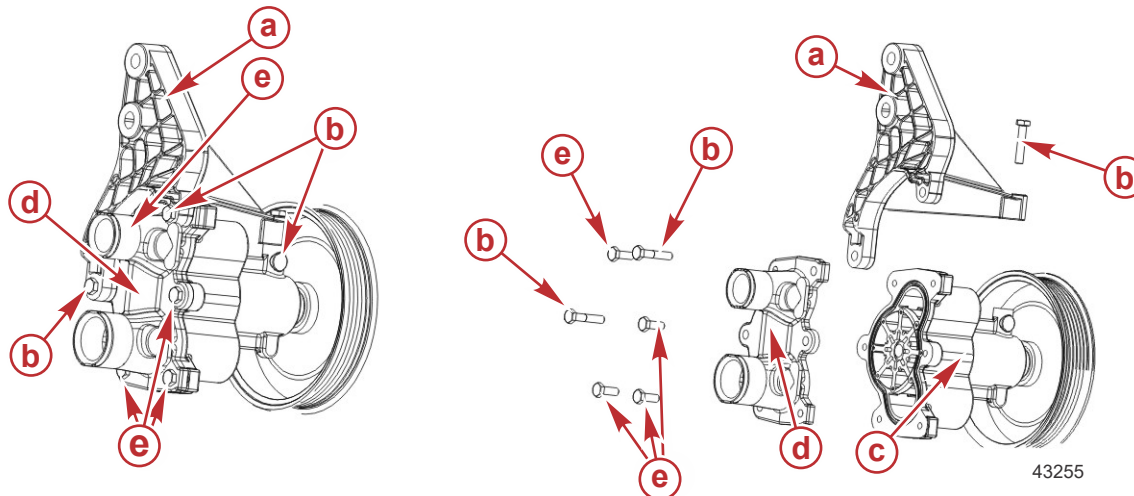


43254

- a - Seawater pump
b - Seawater pump stud

Impeller Cover Removal

1. Remove and retain the seawater pump bracket screws and bracket.
2. Remove and retain the seawater pump impeller housing cover screws.
3. Remove and discard the seawater pump impeller housing cover.

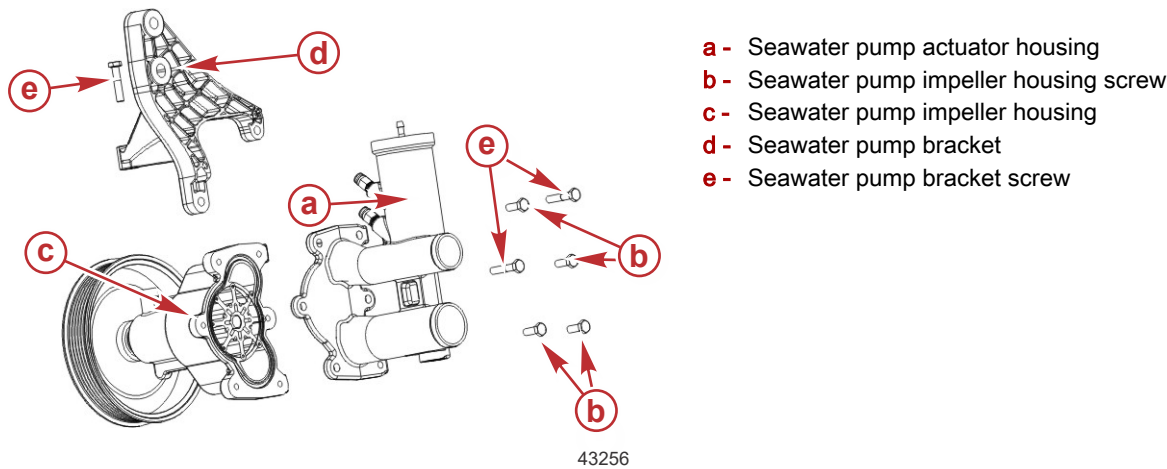


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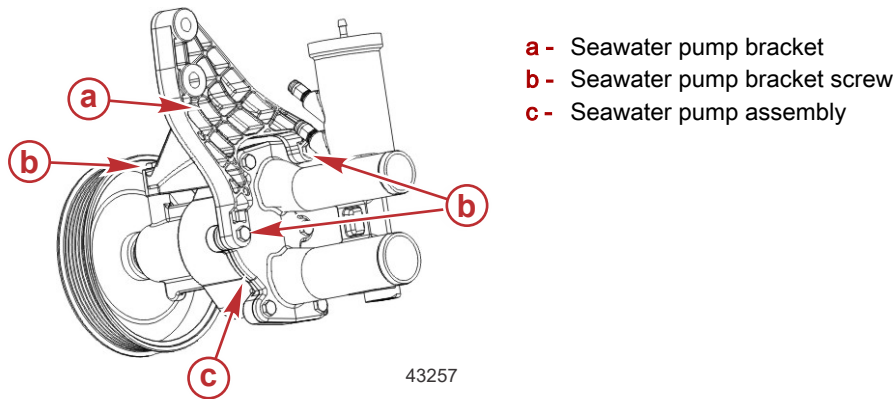
- a - Seawater pump bracket
b - Seawater pump bracket screw
c - Seawater pump impeller housing
d - Seawater pump impeller housing cover
e - Seawater pump impeller housing cover screw

Actuator Housing Installation

1. Install the seawater pump actuator housing onto the seawater pump impeller housing using the seawater pump impeller housing cover screws. Do not tighten at this time.



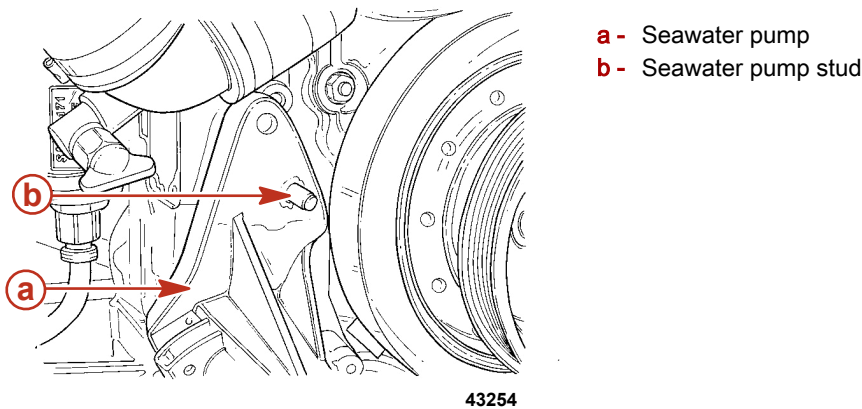
2. Install the seawater pump bracket onto the seawater pump assembly using the seawater pump bracket screws. Tighten all of the screws to the specified torque.



Description	Nm	lb-in.	lb-ft
Seawater pump impeller housing screw	10.2	90	–
Seawater pump bracket screw	10.2	90	–

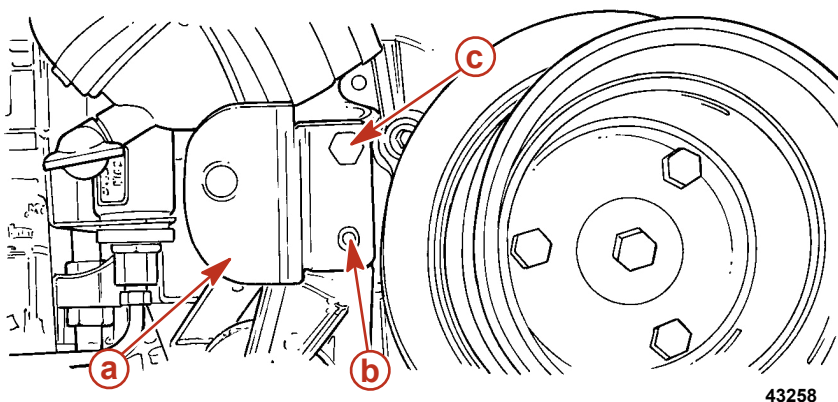
Seawater Pump Installation

1. Place the seawater pump onto the seawater pump stud and hold it in place.



2. Install the idler pulley bracket onto the seawater pump stud.

3. Install the idler pulley bracket bolt through the idler pulley bracket and seawater pump bracket and into the engine block. Tighten the bolt to the specified torque.

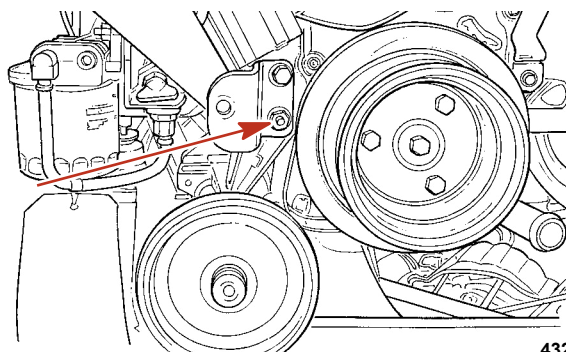


- a - Idler pulley bracket
b - Seawater pump stud
c - Idler pulley bracket bolt

43258

Description	Nm	lb-in.	lb-ft
Idler pulley bracket bolt	41	–	30

4. Install the locknut onto the seawater pump stud and tighten it to the specified torque.

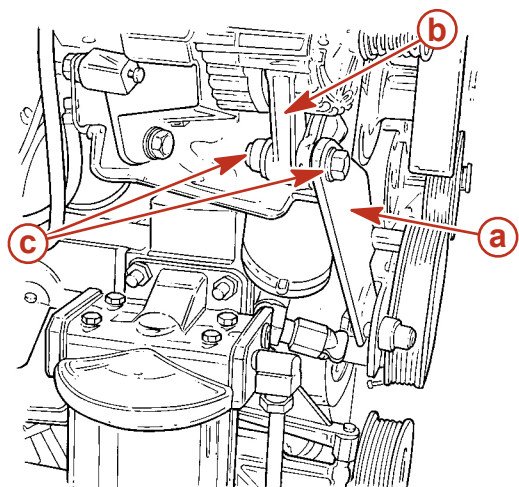


43259

Locknut

Description	Nm	lb-in.	lb-ft
Seawater pump bracket locknut	34	–	25

5. Position the idler brace to the outside of the alternator bracket.
6. Connect the idler brace to the alternator using the existing fasteners. Do not tighten at this time.

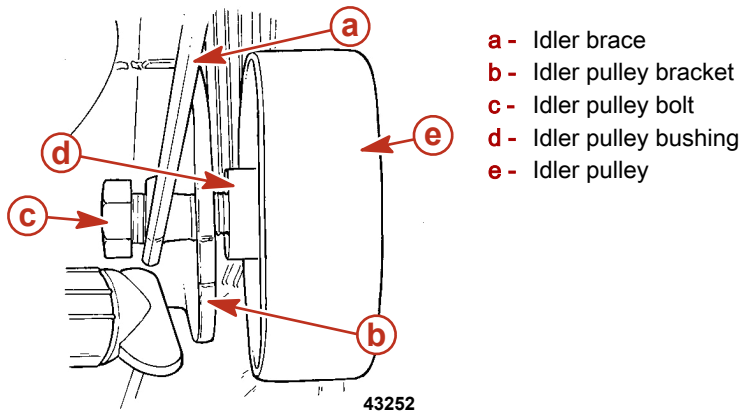


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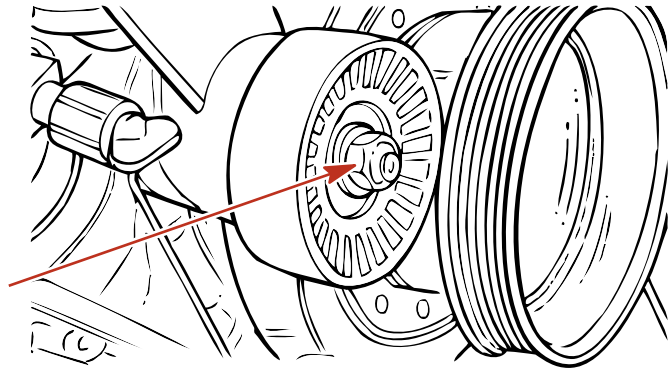
- a - Idler brace
b - Alternator bracket
c - Fasteners

7. Position the loose end of the idler brace to the rear side of the idler pulley bracket.
8. Install the idler pulley bolt through the rear side of the idler brace and idler pulley bracket.

9. Install the idler pulley bushing and idler pulley onto the bolt.



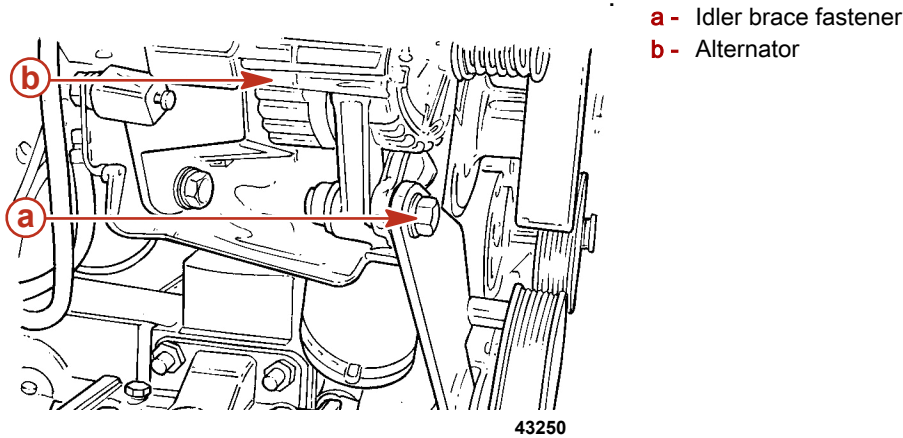
10. Secure the idler pulley with the locknut retained from the removal procedure. Tighten the locknut to the specified torque.



43261

Description	Nm	lb-in.	lb-ft
Idler pulley locknut	52	–	38

11. Tighten the fasteners for the idler brace at the alternator to the specified torque.



Description	Nm	lb-in.	lb-ft
Idler brace to alternator fasteners	34	–	25

Cooling System Installation

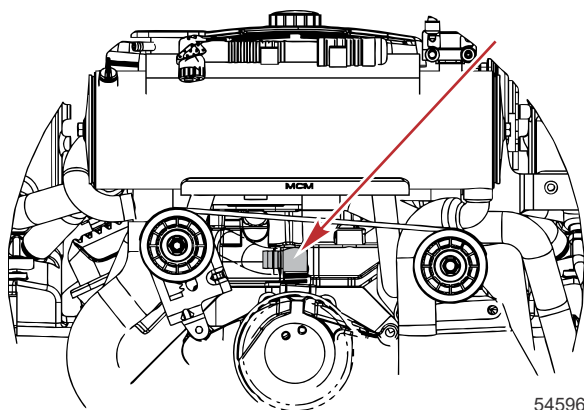
1. For V8 models, install the new water circulating pump pulley using the screws provided. Tighten securely.
2. Ensure that the threads of the water ports on the water circulating pump and the intake manifold are clean and free of debris.

3. Apply sealant to the threads of the hose fitting for the water circulating pump.

Qty.	Description	Part Number
1	90-degree elbow fitting	22-860346

Description	Where Used	Part No.
Loctite 567 PST Pipe Sealant	Threads on the hose fitting for the water circulating pump	92-809822

4. Install the 90-degree elbow fitting into the top of the water circulating pump. Turn 1 to 1-1/2 turns past hand-tight and then orient as shown.



90-degree elbow fitting

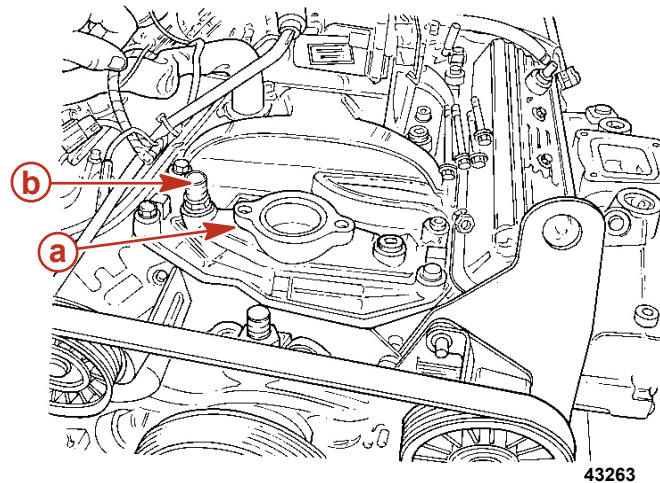
Qty.	Description	Part Number
1	90-degree elbow fitting, 3/4 in.	22-860346

5. Apply sealant to the threads of the hose connector for the intake manifold.

Qty.	Description	Part Number
1	Intake manifold hose connector 1/2-14 NPT x 3/4 in.	22-806242

Description	Where Used	Part No.
Loctite 567 PST Pipe Sealant	Threads of the hose connector for the intake manifold	92-809822

6. Install the connector fitting into the starboard side of the intake manifold. Tighten by turning 1-1/2 to 2-1/2 turns past hand-tight.



- a - Intake manifold
b - Connector fitting

7. Install the intake manifold bypass to water circulating pump hose. Tighten the hose clamps securely.

Qty.	Description	Part Number
1	Intake manifold bypass to water circulating pump hose	32-864551

8. Apply sealant to the threads of the straight hose fittings for the exhaust manifolds.

Qty.	Description	Part Number
1	Straight fitting, 3/4-14 x 1 in.	866725

Description	Where Used	Part No.
Loctite 567 PST Pipe Sealant	Threads on the straight hose fitting for the exhaust manifold	92-809822

9. Install the straight hose fittings into the bottom of the port and starboard exhaust manifolds. Tighten by turning 1-1/2 to 2-1/2 turns past hand-tight.
10. Apply sealant to the threads of the pipe plugs for the engine block water drain ports.

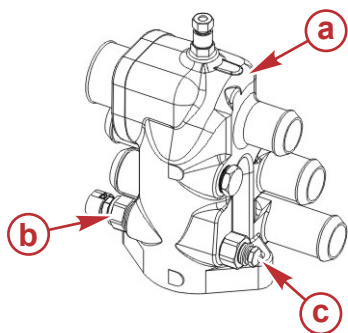
Qty.	Description	Part Number
2	Pipe plug, 1/4-18 NPT hex head	22-36382

Description	Where Used	Part No.
Loctite 567 PST Pipe Sealant	Threads on the pipe plugs for the engine block water drain ports	92-809822

11. Install the pipe plugs into the port and starboard engine block water drain ports. Tighten by turning 1-1/2 to 2-1/2 turns past hand-tight.
12. Apply sealant to the threads of the temperature sensor and the temperature sender.

Description	Where Used	Part No.
Loctite 567 PST Pipe Sealant	Thermostat housing temperature sender threads	92-809822
Loctite 567 PST Pipe Sealant	Thermostat housing temperature sensor threads	92-809822

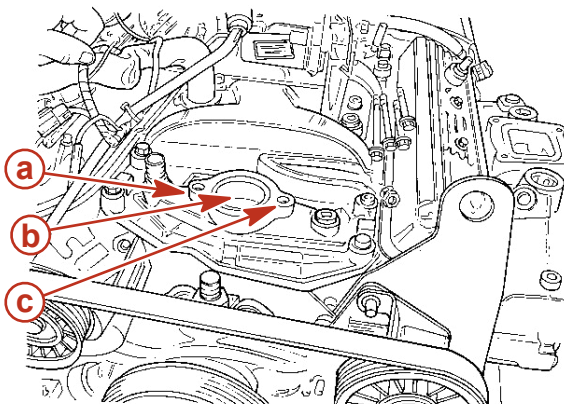
13. Install the temperature sensor and the temperature sender into the thermostat housing. Do not tighten at this time.



43264

- a - Thermostat housing assembly
- b - Temperature sensor
- c - Temperature sender

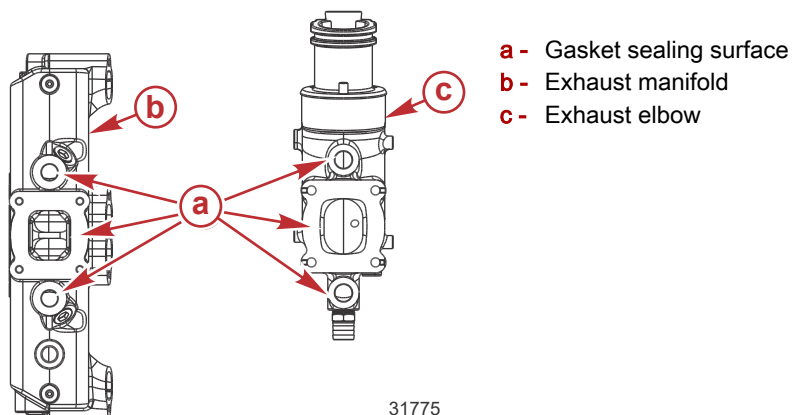
14. Clean the gasket sealing surface of the intake manifold thermostat housing port.



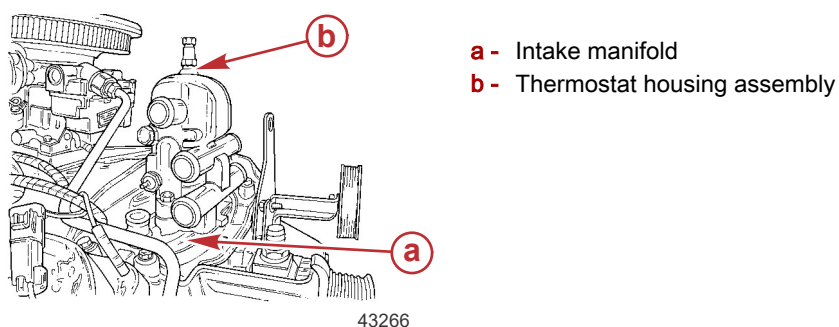
43265

- a - Intake manifold
- b - Thermostat housing port
- c - Sealing surface

15. Clean the gasket sealing surface of the exhaust manifold and exhaust elbow.

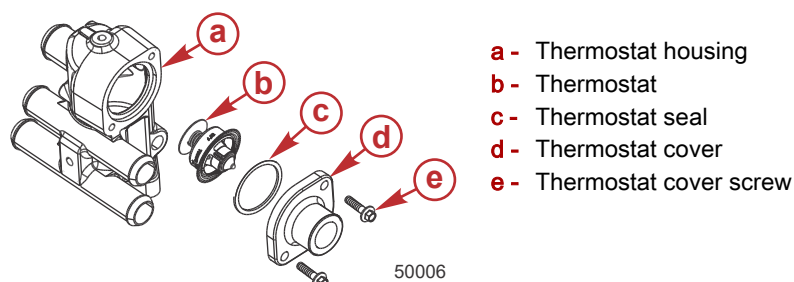


16. Place the thermostat housing gasket on the intake manifold.
17. Tighten the temperature sensor and the temperature sender by turning 1-1/2 to 2-1/2 turns past hand-tight.
18. Install the thermostat housing assembly onto the intake manifold and tighten the screws to the specified torque.

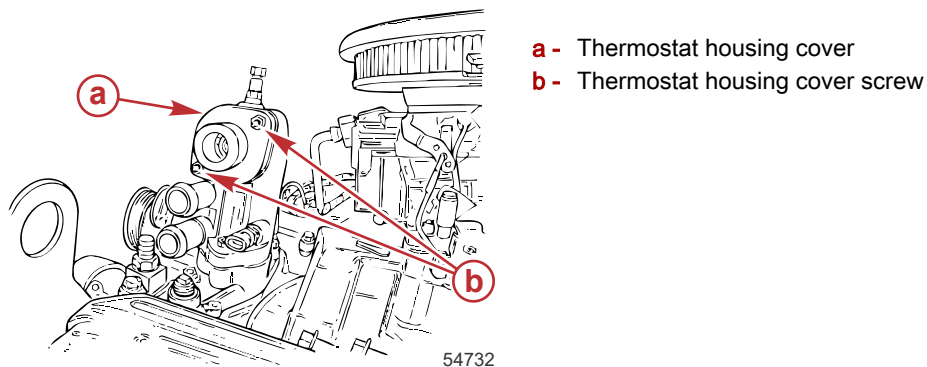


Description	Nm	lb-in.	lb-ft
Thermostat housing to intake manifold hex head screw M8 x 35 mm (1-3/8 in.) long	33	–	24

19. Install the thermostat with the seal into the thermostat housing.

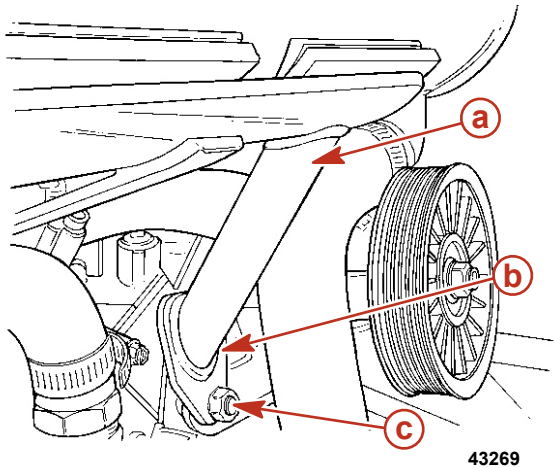


20. Install the thermostat housing cover and tighten the screws to the specified torque.



Description	Nm	lb-in.	lb-ft
Thermostat housing cover screw	30	–	22

21. Install the heat exchanger bracket.
- a. On inboard and Tow Sport models, secure the port side of the heat exchanger bracket using the existing fasteners from the idler pulley bracket. Do not tighten at this time.



- a - Heat exchanger bracket
b - Idler pulley bracket
c - Heat exchanger bracket screw

- b. On sterndrive models, apply sealant to the threads of the special studs to be installed into the engine block.

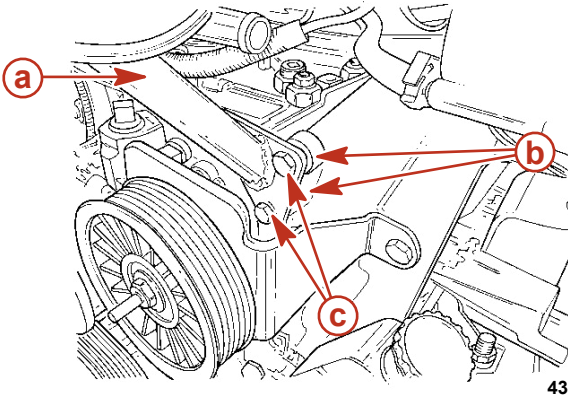
Qty.	Description	Part Number
2	Special stud, 2-1/8 in. (54 mm) double end with hex shoulder	16-805357

Description	Where Used	Part No.
Loctite 271 Threadlocker	Special stud threads	92-809819

- c. On sterndrive models, install the special studs through the lifting eye bracket and into the engine block. Tighten the special studs to the specified torque.

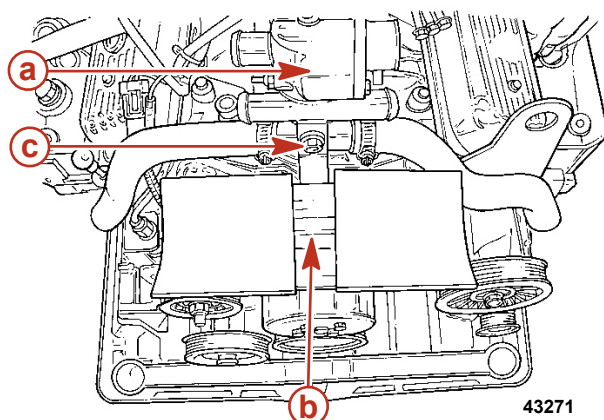
Description	Nm	lb-in.	lb-ft
Special stud, 2-1/8 in. (54 mm) double end with hex shoulder	41	–	30

- d. On sterndrive models, use the spacers and the locknuts provided to secure the heat exchanger bracket. Do not tighten at this time.



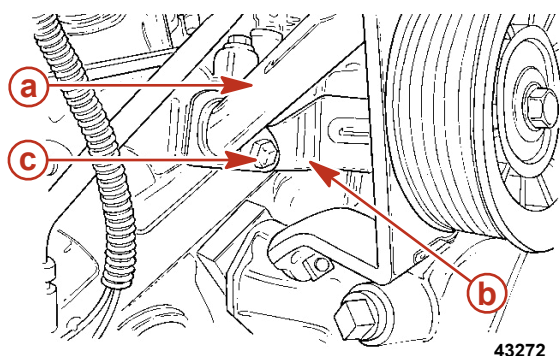
- a - Heat exchanger bracket
b - Spacer
c - Locknut (screws shown)

22. Secure the heat exchanger bracket to the thermostat housing using the screw provided. Do not tighten at this time.



- a - Thermostat housing
b - Heat exchanger bracket
c - Screw

23. Install the starboard side screw to secure the heat exchanger bracket on the tensioner pulley bracket or idler pulley bracket as applicable. Tighten the screw to the specified torque.



- a - Heat exchanger bracket
b - Idler pulley bracket (tensioner pulley bracket similar)
c - Fastener

Description	Nm	lb-in.	lb-ft
Heat exchanger bracket to engine screw (starboard side)	33	–	24

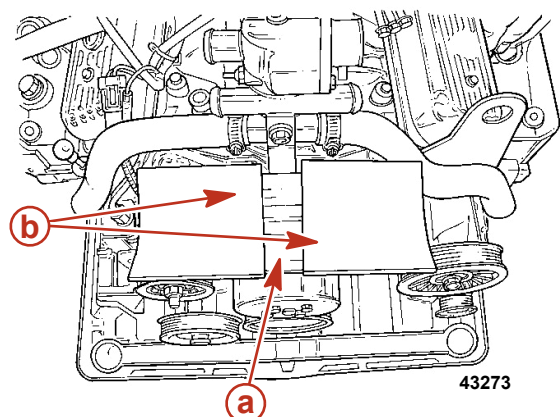
24. Tighten the fasteners for the idler pulley bracket to secure the heat exchanger bracket on the port side of the engine.

Description	Nm	lb-in.	lb-ft
Heat exchanger bracket to engine screw (port side)	33	–	24

25. Tighten the heat exchanger bracket to the thermostat housing screw.

Description	Nm	lb-in.	lb-ft
Heat exchanger bracket to thermostat housing screw	33	–	24

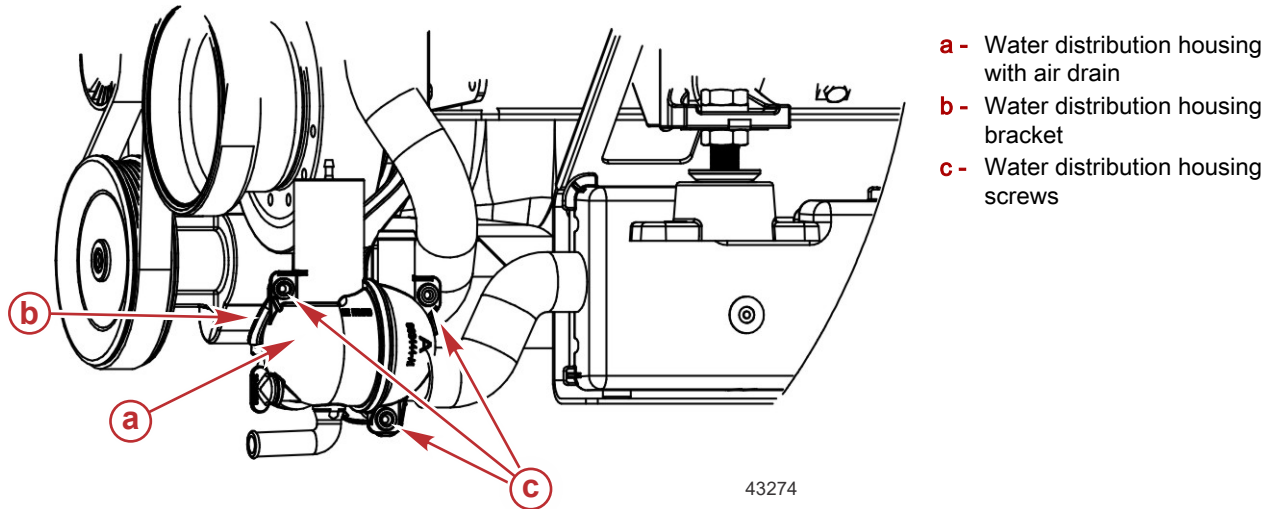
26. Install the two heat exchanger bracket pads. Peel the protective cover off of the back of each pad and center them on the bracket. Allow the pads to overlap the ends of the bracket by about 3.0 mm (1/8 in.).



- a - Heat exchanger bracket
b - Heat exchanger bracket pads

27. Install the new serpentine belt. Refer to the appropriate Mercury MerCruiser service manual for installation instructions.
28. Install the Cool Fuel to water distribution housing hose. Tighten the hose clamps securely.

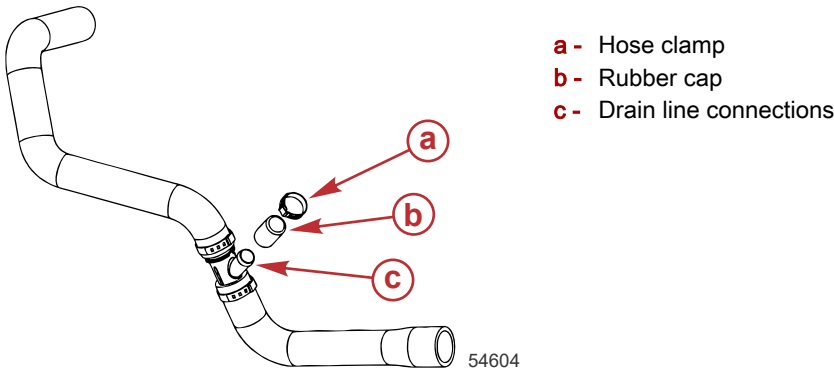
29. Install the water distribution housing with air drain onto the water distribution housing bracket using the screws provided in the kit. Tighten the screws to the specified torque.



Description	Nm	lb-in.	lb-ft
Water distribution housing screws	13.6	120	–

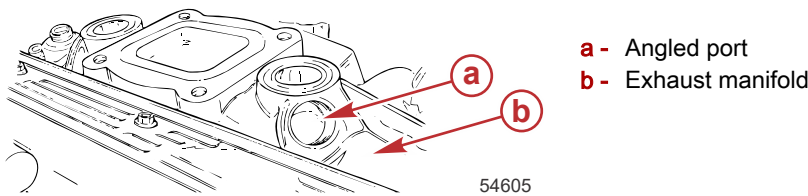
Special Instructions: Inboard and Tow Sport Models

1. Install the rubber cap on the port and starboard exhaust manifold drain line connections.
2. Secure the cap with a hose clamp and tighten the clamp securely.



Special Instructions: Models without Risers

1. Remove the pipe plug from the angled port on the exhaust manifold.



2. Apply sealant to the straight hose fitting.

Qty.	Description	Part Number
1	Straight fitting, 3/4-14 x 1 in.	866725

Description	Where Used	Part No.
Loctite 567 PST Pipe Sealant	Straight hose fitting for exhaust manifold	92-809822

3. Install the straight hose fitting into the inboard port of the port and starboard exhaust manifold. Tighten by turning 1-1/2 to 2-1/2 turns past hand-tight.

Thermostat Housing Hose Connections

NOTE: Refer to the cooling system water flow diagrams at the end of this instruction sheet for hose routing illustrations.

1. Install the port and starboard hoses from the lower exhaust manifold hose fitting to the lower ports on the thermostat housing.

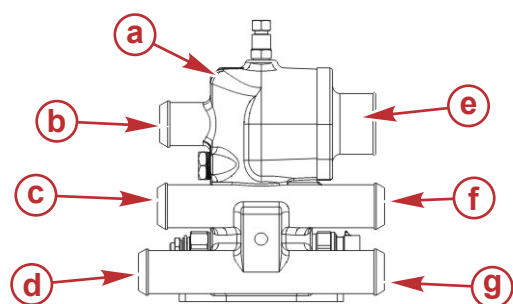
Qty.	Description	Part Number
1	Thermostat housing to lower port manifold hose (V8)	32-864508
1	Thermostat housing to lower starboard manifold hose (V8)	32-864509

2. Install the hoses from the middle ports on the thermostat housing to the hose fittings on the exhaust manifold. Tighten the hose clamps securely.

NOTE: For models with risers, these hoses will connect to the riser outlet ports, once the risers have been installed.

3. Position the hose clamps at the thermostat down and out. Tighten hose clamps securely.

Qty.	Description	Part Number
1	Thermostat housing to upper starboard manifold hose (V8)	32-864539
1	Thermostat housing to upper port manifold hose (V8)	32-864552

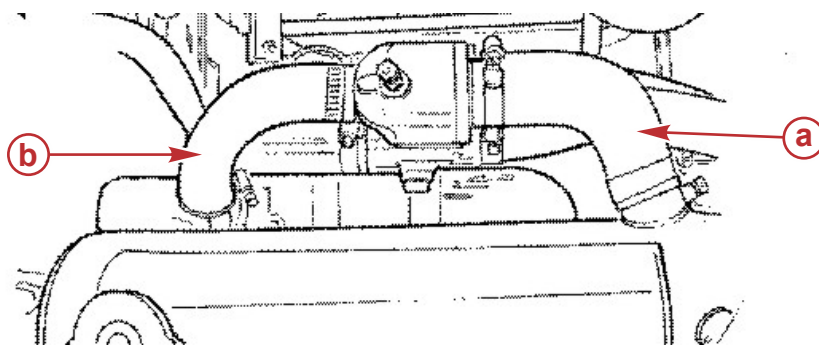


- a - Thermostat housing assembly
- b - Upper thermostat housing port (starboard side)
- c - Middle thermostat housing port (starboard side)
- d - Lower thermostat housing port (starboard side)
- e - Upper thermostat housing port (port side)
- f - Middle thermostat housing port (port side)
- g - Lower thermostat housing port (port side)

43275

Heat Exchanger Installation

1. Place the heat exchanger onto the heat exchanger bracket.
2. Install the heat exchanger to thermostat housing top fitting hose and tighten the hose clamp at the exchanger.
3. Install the bypass hose from the heat exchanger to the thermostat housing and tighten the hose clamp at the heat exchanger.



- a - Heat exchanger to thermostat housing top fitting hose
- b - Bypass hose

43276

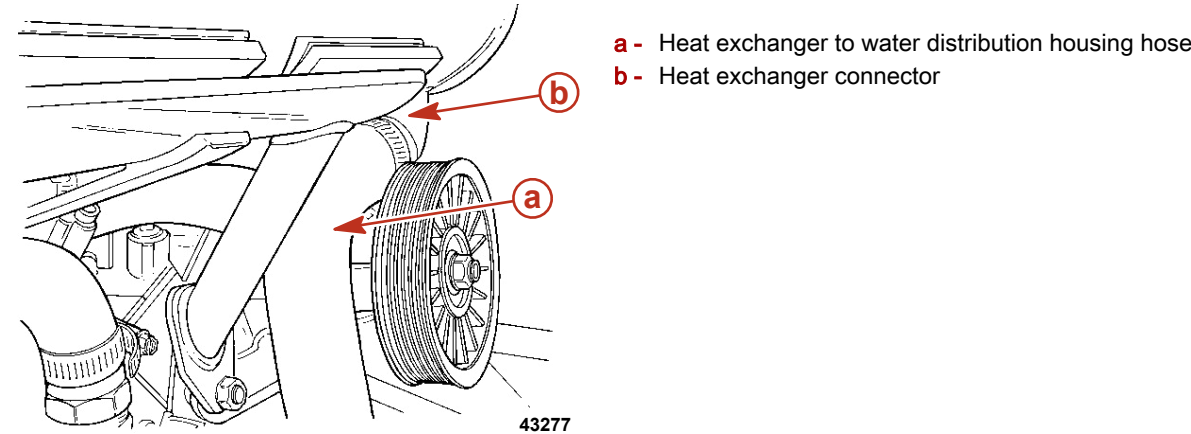
Qty.	Description	Part Number
1	Heat exchanger to top fitting of thermostat housing hose	32-864436
1	Thermostat housing bypass to heat exchanger hose	32-864437

4. Install the heat exchanger to water circulating pump hose on the pump and tighten the hose clamp securely.

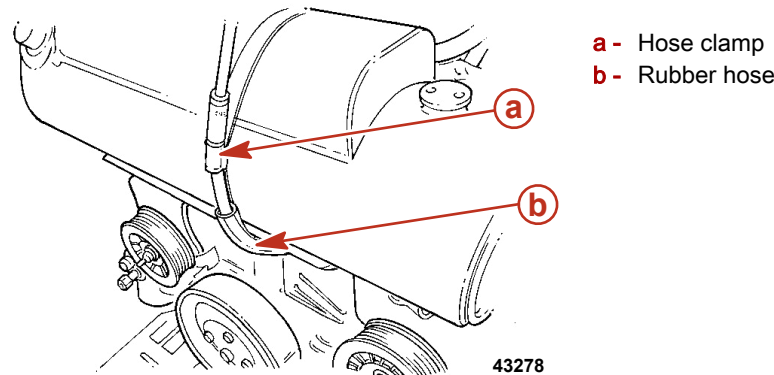
Qty.	Description	Part Number
1	Heat exchanger to water circulating pump hose	32-864886

5. Install the heat exchanger to water distribution housing hose. Tighten the hose clamps securely.

Qty.	Description	Part Number
1	Heat exchanger to water distribution housing hose	32-864431



6. Install the hose clamps around the heat exchanger.
- NOTE:** The rubber hose should be positioned underneath the bracket to prevent the bracket from directly contacting the hose clamp.



Seawater Pump Connections

Air Line Connections - All Models

IMPORTANT: Ensure that the air lines are routed to avoid sharp bends and/or contact with moving parts.

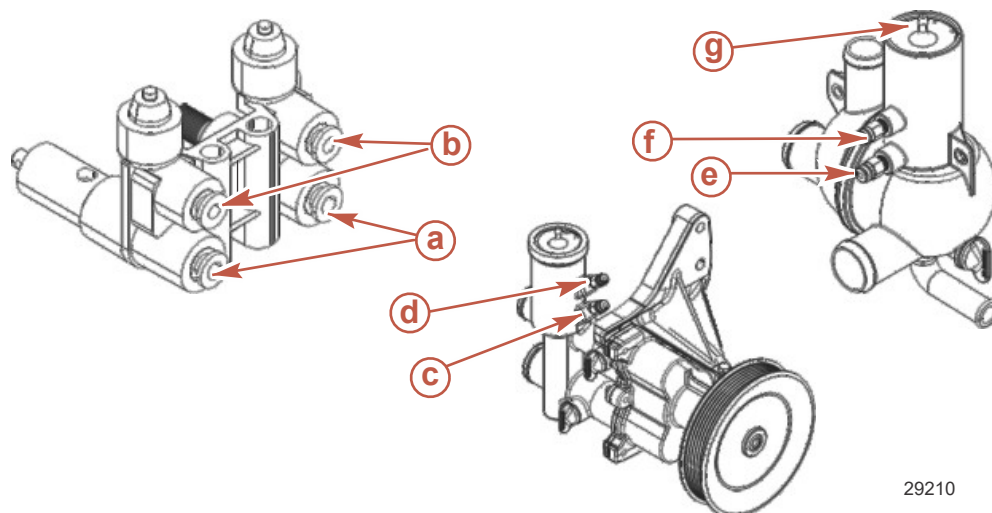
NOTE: The air line must remain cylindrical. The air line must not be distorted when cut. There is a 1.0 mm (0.04 in.) maximum allowable angle on the end of the air lines.

1. Using the air line cutter, cut the bulk air line to the appropriate length for installation.

Air Line Cutter	Source Locally
<p>24887</p>	Cuts water drain system air lines without collapsing them.

2. Connect the air lines from the air manifold assembly to the seawater pump connectors and the water distribution housing connectors by inserting the end of the air line into the connector approximately 6 mm (1/4 in.).
- a. Connect the gray 3/16 in. OD air lines into the lower connectors on the air manifold, the water distribution housing, and the seawater pump.
 - b. Connect the green 5/32 in. OD air lines into the upper line connectors on the air manifold, the water distribution housing, and the seawater pump.

- c. Connect the black 5/16 in. OD vent tube into the water distribution housing air actuator; secure with cable ties provided.



- a** - Lower air manifold assembly air line connector 3/16 in.
- b** - Upper air manifold assembly air line connector 5/32 in.
- c** - Lower seawater pump air actuator air line connector 3/16 in.
- d** - Upper seawater pump air actuator air line connector 5/32 in.
- e** - Lower water distribution housing air actuator air line connector 3/16 in.
- f** - Upper water distribution housing air actuator air line connector 5/32 in.
- g** - Vent tubing connection 5/16 in.

3. Ensure that the air line is securely connected by pulling on each line.
4. Secure the air lines using the cable ties provided.

Seawater Pump Connections - Sterndrive Models

NOTE: The outer diameter of the seawater pump inlet is 1-1/4 in. The outer diameter of the seawater pump outlet is 1-1/2 in. To ensure proper water flow, connect the hoses accordingly.

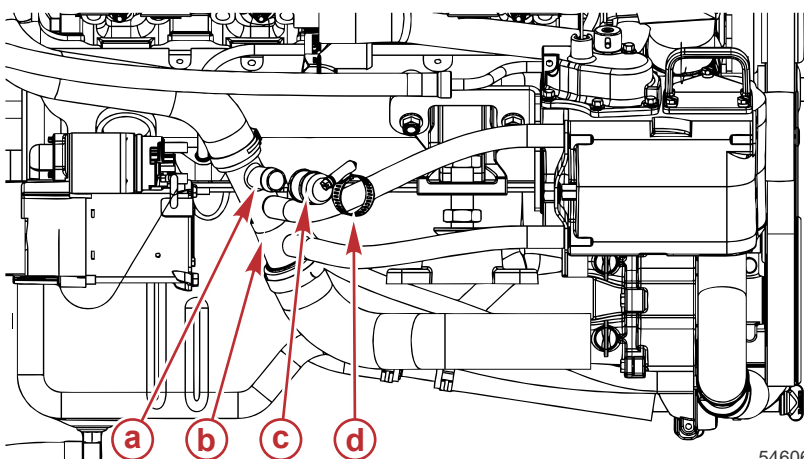
1. Connect the seawater supply hose to the 1-1/4 in. seawater pump inlet on the seawater pump. Tighten the hose clamp securely.
2. For all models except V8 small block Bravo models, serial number 0W060000 and above, connect the power steering cooler to seawater pump outlet hose to the 1-1/2 in. seawater pump outlet. Tighten the hose clamp securely.

V8 Small Block Bravo Models, S/N 0W060000 and Above

NOTE: To ensure proper fit it is necessary to cut 50 mm (2 in.) off of the seawater pump outlet end of the power steering cooler to seawater pump outlet hose.

1. Cut 50 mm (2 in.) off of the seawater pump outlet end of the power steering cooler to seawater pump outlet hose.
2. Connect the power steering cooler to seawater pump outlet hose to the 1-1/2 in. seawater pump outlet. Tighten the hose clamp securely.
3. Install the rubber cap onto the orifice meter drain port.

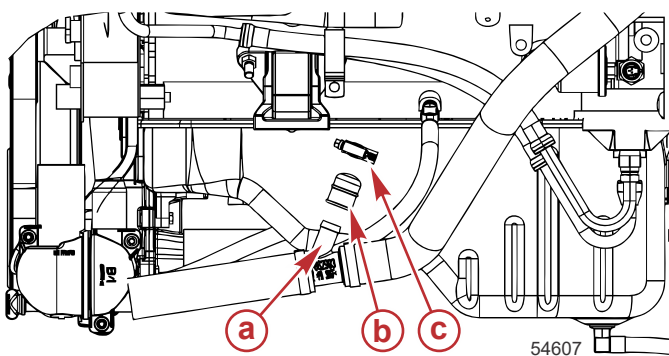
4. Install the hose clamp onto the rubber cap. Tighten the hose clamp securely.



- a - Orifice meter drain port
- b - Orifice meter
- c - Rubber cap
- d - Hose clamp

54606

5. Install the rubber cap onto the Y-fitting water port.
6. Install the hose clamp onto the rubber cap. Tighten the hose clamp securely.



- a - Y-fitting water port
- b - Rubber cap
- c - Hose clamp

54607

Seawater Pump Connections - Inboard Models

NOTE: The outer diameter of the seawater pump inlet is 1-1/4 in. The outer diameter of the seawater pump outlet is 1-1/2 in. To ensure proper water flow, connect the hoses accordingly.

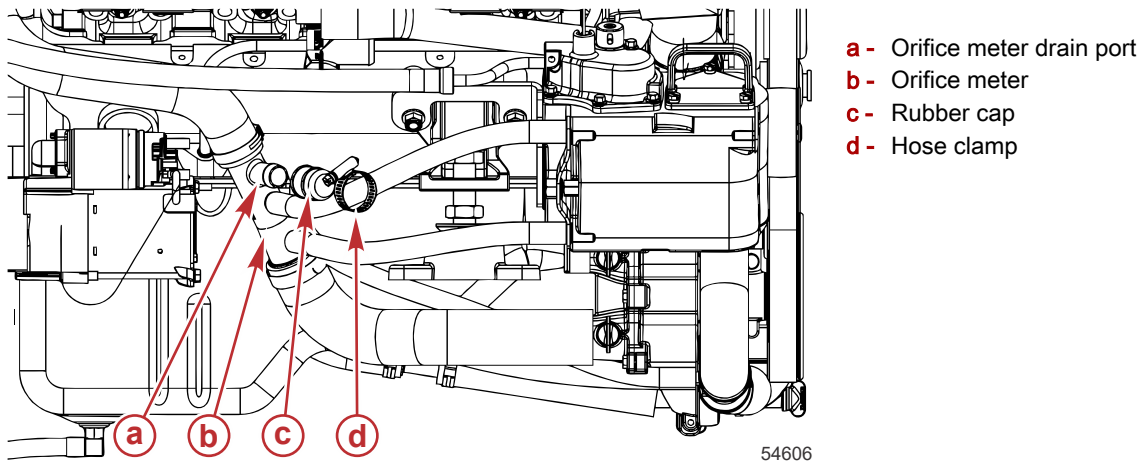
1. Connect the seawater supply hose to the 1-1/4 in. seawater pump inlet on the seawater pump. Tighten the hose clamp securely.
2. For all models except V8 small block MPI models, serial number 0W090000 and above, connect the transmission cooler to seawater pump outlet hose to the 1-1/2 in. seawater pump outlet. Tighten the hose clamp securely.

V8 Small Block MPI Models, S/N 0W090000 and Above

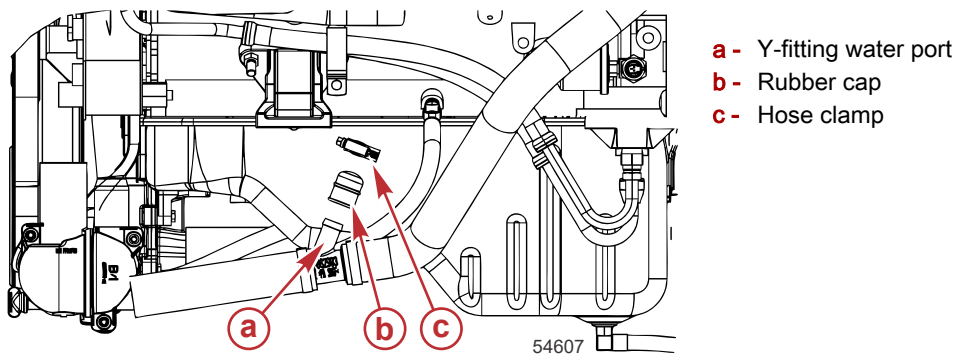
NOTE: To ensure proper fit it is necessary to cut 50 mm (2 in.) off of the seawater pump outlet end of the power steering cooler to seawater pump outlet hose.

1. Cut 50 mm (2 in.) off of the seawater pump outlet end of the power steering cooler to seawater pump outlet hose.
2. Connect the power steering cooler to seawater pump outlet hose to the 1-1/2 in. seawater pump outlet. Tighten the hose clamp securely.
3. Install the rubber cap onto the orifice meter drain port.

4. Install the hose clamp onto the rubber cap. Tighten the hose clamp securely.



5. Install the rubber cap onto the Y-fitting water port.
6. Install the hose clamp onto the rubber cap. Tighten the hose clamp securely.



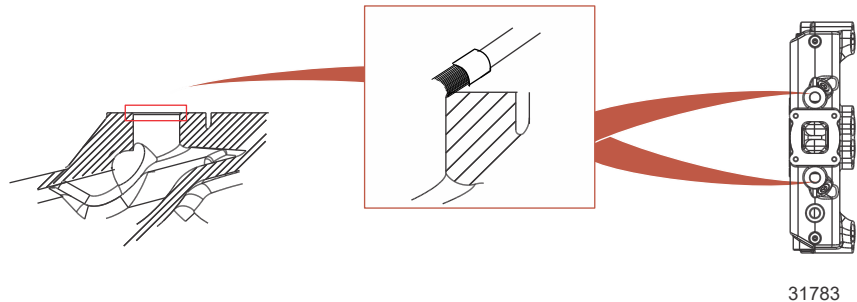
Exhaust System Assembly

Exhaust Manifold Top Gasket Installation

Notice

For installations on Alpha sterndrive models, a seawater pump kit (46-862914A06) and a through-the-hull or through-the-transom water pickup are also required.

1. Apply sealant to the inside edge of each of the two water ports located on the exhaust manifold and any gasket sealing surface where metal is exposed.



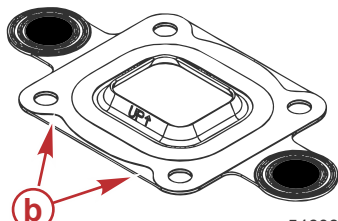
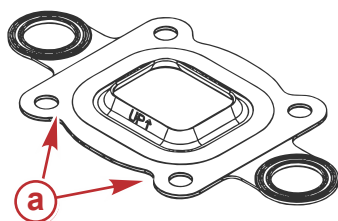
Description	Where Used	Part No.
Perfect Seal	Inside edge of water ports in exhaust components and gasket sealing surface where metal is exposed	8M0170149

Notice

Avoid severe engine damage. The turbulator gasket used **must be** the Mercury MerCruiser turbulator gasket specified for your engine package. Engine damage that results from improper gasket use is considered misuse of the engine and is not covered under Mercury MerCruiser Warranty.

IMPORTANT: Gasket identification can be viewed on the engine package. The outer edge of each turbulator gasket identifies the gasket and the gasket position.

NOTE: The gasket is not reusable. Inspect for proper gasket replacement before final assembly.



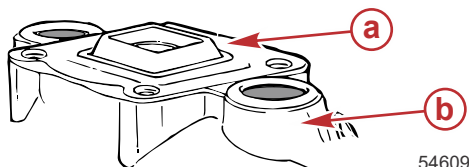
54608

- a -** Full flow gasket with edge of gasket contoured to show full flow at each water port (riser models)
- b -** Block-off gasket with edge of gasket straight to show no flow at each port

Notice

Avoid severe engine damage. The turbulator gasket **must be** properly installed to avoid overheating due to insufficient water flow or coolant loss through exhaust.

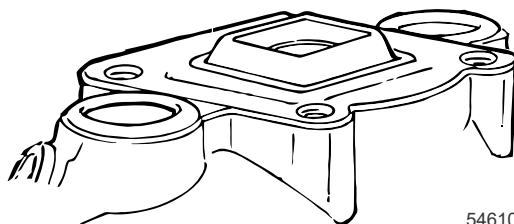
2. Place the appropriate gasket on the exhaust manifold with the side marked "UP" visible.
 - For models without risers, use the block-off gasket.



54609

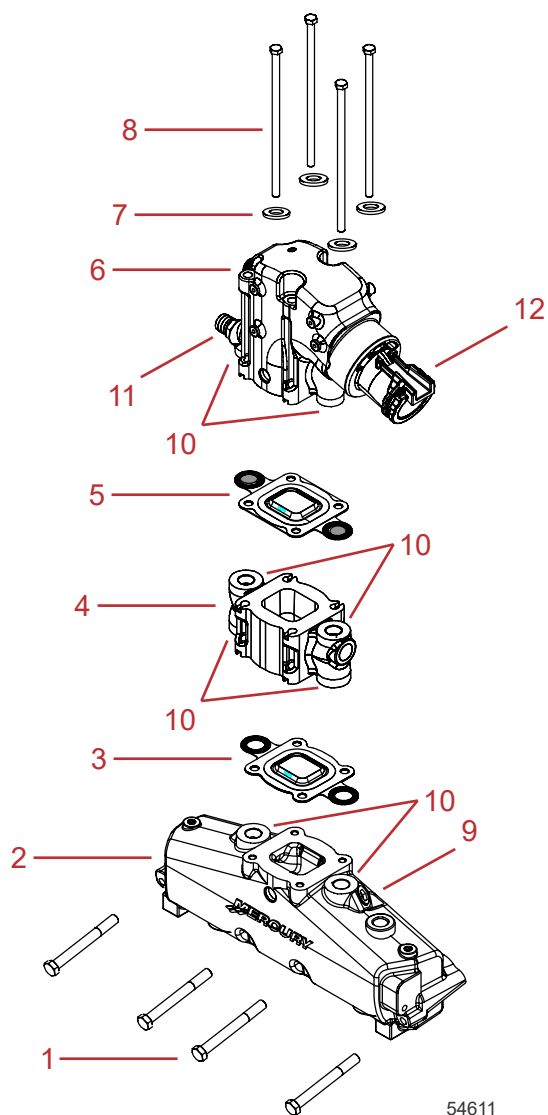
- a -** Block-off gasket
- b -** Exhaust manifold

- For models with risers, use the full flow gasket.



54610

Exhaust Riser Installation



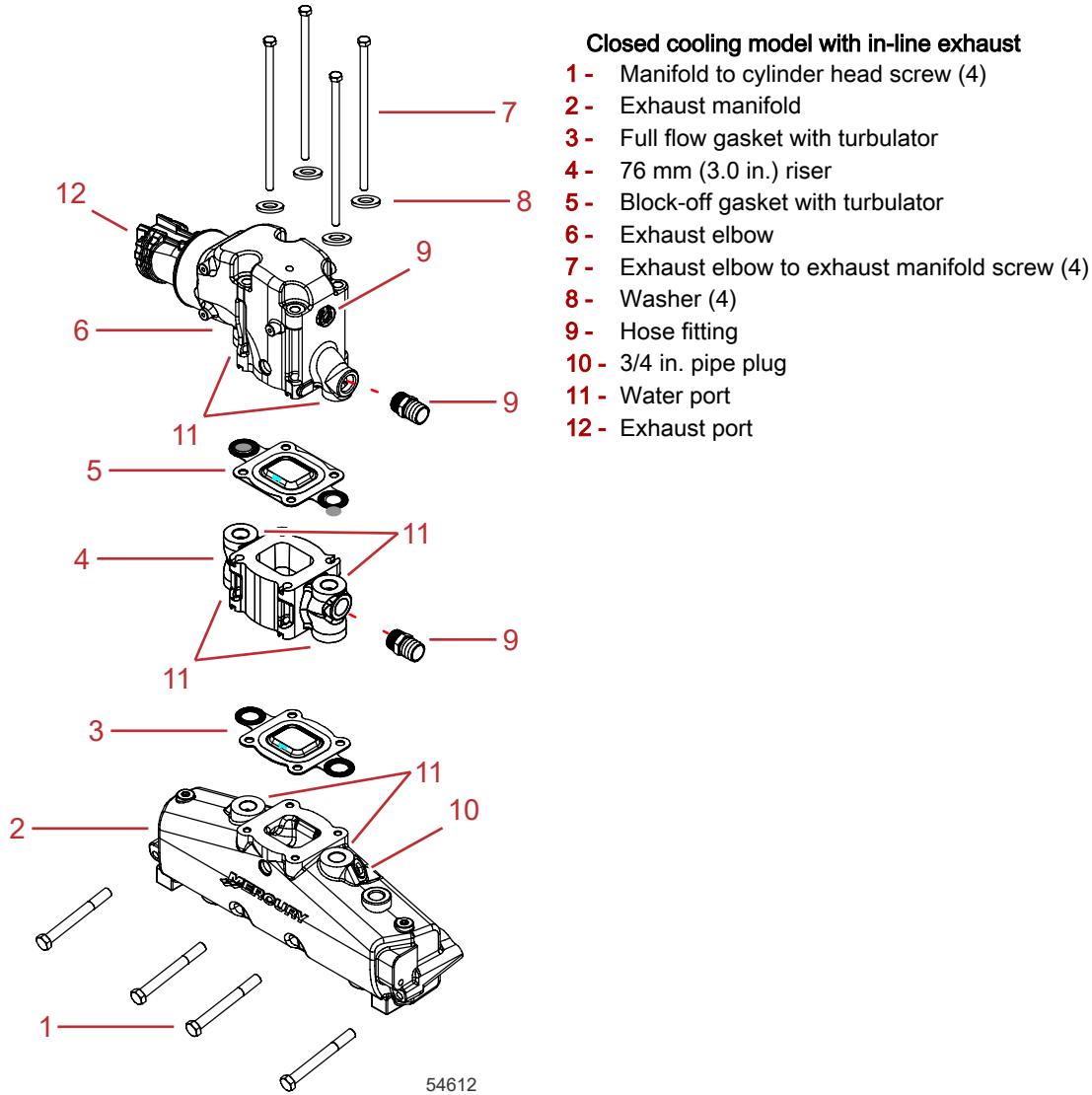
MIE model with closed cooling and V-drive exhaust

- 1 - Manifold to cylinder head screw (4)
- 2 - Exhaust manifold
- 3 - Full flow gasket with turbulator
- 4 - 76 mm (3.0 in.) riser
- 5 - Block-off gasket with turbulator
- 6 - Exhaust elbow
- 7 - Washer (4)
- 8 - Exhaust elbow to exhaust manifold screw (4)
- 9 - 3/4 in. pipe plug
- 10 - Water port
- 11 - Hose fitting
- 12 - Exhaust port

54611

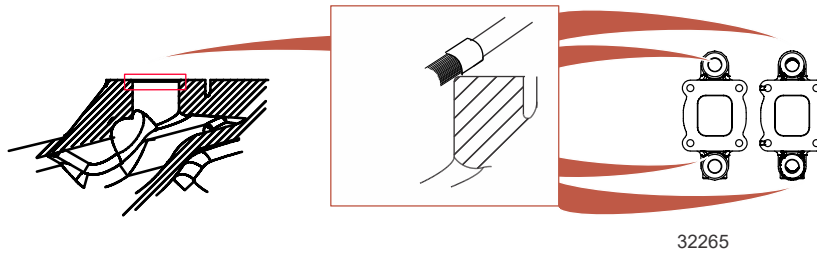
Description	Where Used	Part No.
Perfect Seal	Edge of water ports in exhaust components	8M0170149
Perfect Seal	Exhaust elbow to exhaust manifold screw threads	8M0170149

Loctite 567 PST Pipe Sealant	Hose fittings for exhaust elbows	92-809822
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Description	Where Used	Part No.
Perfect Seal	Water ports on the exhaust manifold, riser, and exhaust elbow	8M0170149
Perfect Seal	Exhaust elbow to exhaust manifold screw threads	8M0170149
Loctite 567 PST Pipe Sealant	Hose fittings for exhaust elbows	92-809822

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



Description	Where Used	Part No.
Perfect Seal	Inside edge of water ports in exhaust components	8M0170149

2. For V8 models, apply sealant to the threads of the straight hose fitting, and install the fitting into the riser until it is hand-tight.

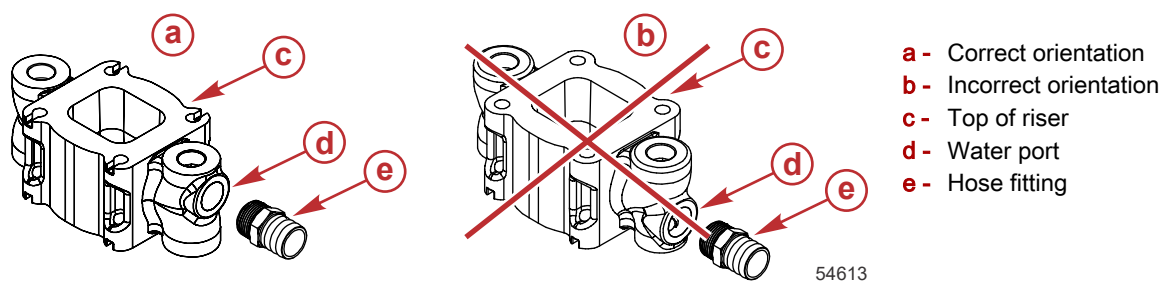
Qty.	Description	Part Number
1	Straight fitting, 3/4-14 x 1 in.	866725

Description	Where Used	Part No.
Perfect Seal	Threads of the straight hose fitting	8M0170149

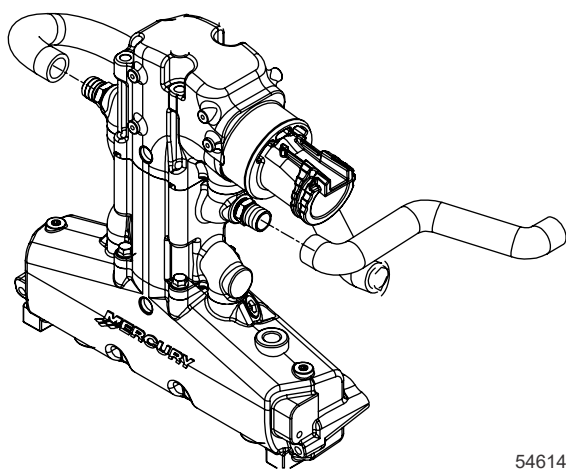
3. For V6 models, apply sealant to the threads of the 45-degree hose fitting supplied in the supplemental hose kit (32-865090A01), and install the fitting into the riser until it is hand-tight.

Description	Where Used	Part No.
Perfect Seal	Threads of the 45-degree hose fitting	8M0170149

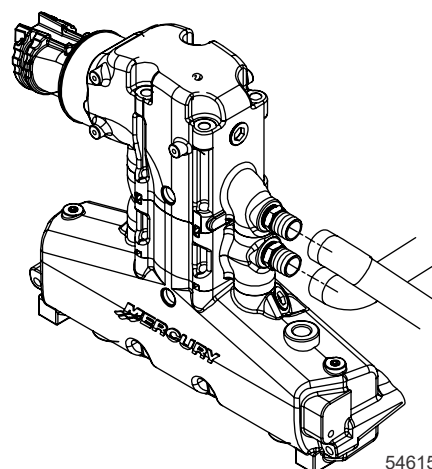
4. Ensure that the hose fitting, located in the riser water port, is positioned at the top of the riser closest to the exhaust elbow.



5. Place the riser on the exhaust manifold.



MIE V-drive with 152 mm (6.0 in.) riser shown, others similar

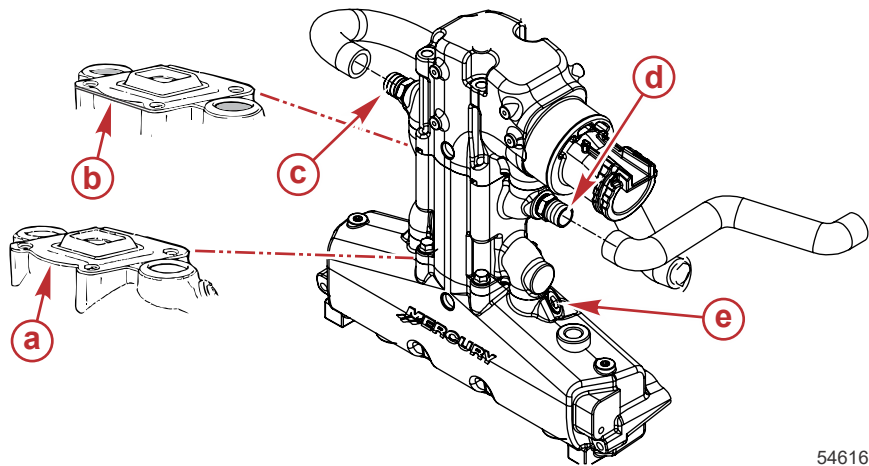


MCM closed-cooling model with 76 mm (3.0 in.) riser shown, others similar

Notice

Avoid severe engine damage. The turbulator gasket **must be** properly installed to avoid overheating due to insufficient water flow or coolant loss through the exhaust.

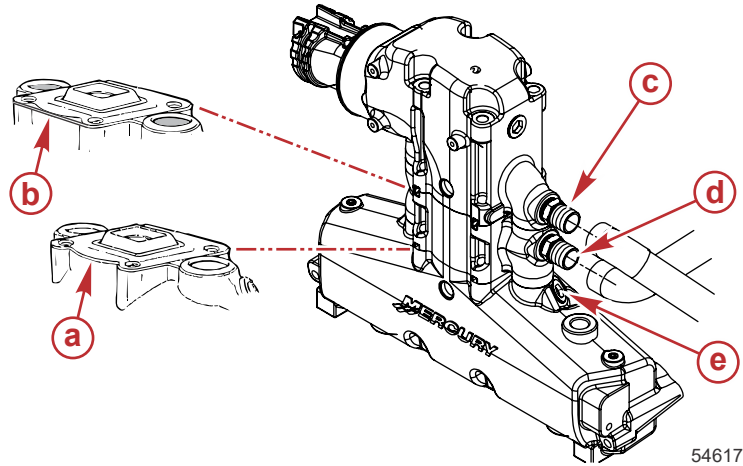
6. Place the block-off gasket on the riser with the side marked "UP" visible.



54616

MIE V-drive with closed cooling

- a** - Full flow gasket positioned between the exhaust manifold and the riser
- b** - Block-off gasket positioned between the riser and the exhaust elbow
- c** - Exhaust elbow inlet water port with hose fitting (seawater)
- d** - Riser outlet port (ethylene glycol mixture)
- e** - Exhaust manifold outlet port (plugged)



54617

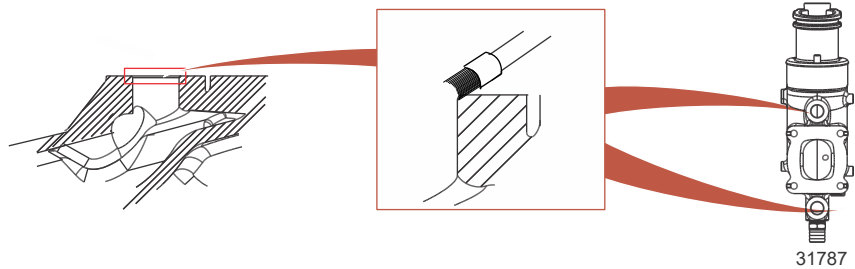
MCM model with closed cooling

- a** - Full flow gasket positioned between the exhaust manifold and the riser
- b** - Block-off gasket positioned between the riser and the exhaust elbow
- c** - Exhaust elbow inlet water port with hose fitting (seawater)
- d** - Riser outlet port (ethylene glycol mixture)
- e** - Exhaust manifold outlet port (plugged)

7. Connect the hoses from the thermostat housing to the riser outlet ports. Secure each connection with a hose clamp.

Exhaust Elbow Installation

1. Apply sealant to the inside edge of each of the two water ports located on the exhaust elbow and any gasket sealing surface where metal is exposed.



31787

Description	Where Used	Part No.
Perfect Seal	Inside edge of water ports in exhaust components and gasket sealing surface where metal is exposed	8M0170149

2. Place the exhaust elbow on the manifold or riser. Ensure that the gaskets are properly aligned.
3. Apply sealant to the screw threads and hand-start to temporarily secure the exhaust elbow or riser to the exhaust manifold. Reuse the existing fasteners.

NOTE: Ensure that the screw threads are completely covered with sealant.

Description	Where Used	Part No.
Perfect Seal	Exhaust elbow to exhaust manifold screw threads	8M0170149

4. Align the exhaust elbow to the intermediate elbow or engine exhaust system.

NOTE: Gaskets are not reusable. Inspect for proper gasket and component position before tightening the screws that retain the exhaust elbow.

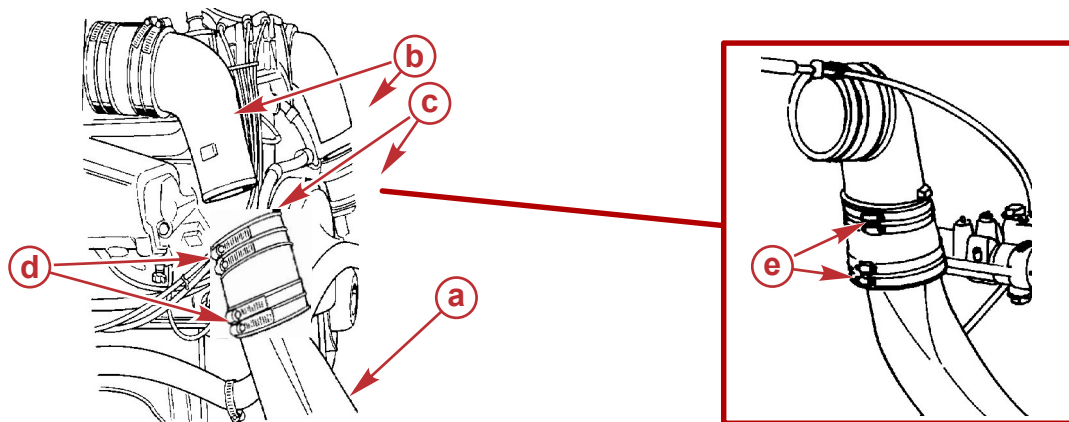
Notice

Prevent engine damage due to coolant loss. Always tighten the exhaust elbow and riser fasteners in the specified sequence.

5. Tighten the fasteners holding the exhaust elbow or riser to the exhaust manifold. Tighten the screws evenly to the specified torque, using an X-pattern from corner to corner.

Description		Nm	lb-in.	lb-ft
Exhaust elbow and riser to exhaust manifold screw	First	9.4	84	–
	Final	61	–	45

6. Line up the intermediate elbows with the exhaust tubes.
 7. Position the exhaust hose clamp screws toward the front of the exhaust tubes as shown.
 8. To help with installation, apply liquid soap (obtain locally) inside the exhaust tubes.



43280

- a** - Bullhorn
b - Intermediate elbow
c - Exhaust tube
d - Exhaust hose clamp screw position (front, port side)
e - Exhaust hose clamp screw position (front, starboard side)

9. Connect the hoses from the heat exchanger to the exhaust elbows. Tighten the hose clamps securely.

Qty.	Description	Part Number
1	Heat exchanger to port elbow hose V8 (in-line)	32-864726
1	Heat exchanger to port elbow hose V8 (V-drive)	32-864543
1	Heat exchanger to starboard elbow hose V8 (in-line)	8M0027771
1	Heat exchanger to starboard elbow hose V8 (V-drive)	32-864544

10. Ensure that clamp covers are installed on all hose clamps.
 11. Reinstall all front dress components that were removed.
 12. Fill the closed-cooling system. Refer to the appropriate Mercury MerCruiser service manual.

Gear Lube Monitor Relocation

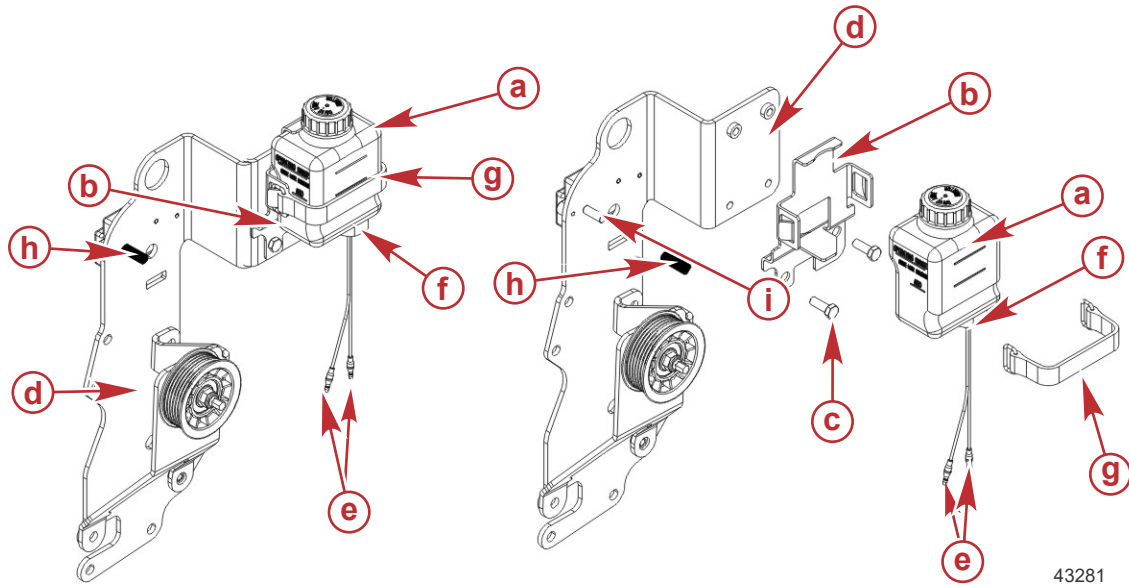
NOTE: The following instructions apply only to sterndrive engines with serial number 0M640000 and above.

1. Remove and discard the existing gear lube monitor and gear lube hose.
 2. Install the gear lube monitor bracket onto the front of the lifting eye bracket. Tighten the screws to the specified torque.

Description	Nm	lb-in.	lb-ft
Hex head screw, 3/8-16 x 1/2 in (13 mm) long	33	–	24

3. Connect the gear lube hose and wiring leads to the gear lube monitor.

4. Route the gear lube hose so that it does not contact rotating or moving parts. Use cable ties to secure the hose.
5. Install the gear lube monitor onto the gear lube monitor bracket using the retaining strap.



- a - Gear lube monitor
- b - Gear lube monitor bracket
- c - Screw
- d - Lifting eye bracket
- e - Wiring leads
- f - Gear lube hose connector (not shown)
- g - Retaining strap
- h - Rubber cap
- i - Stud

6. Fill the gear lube monitor with gear lube. Refer to the appropriate Mercury MerCruiser service manual.

Front Lifting Eye Bracket Replacement

NOTE: For sterndrive models serial number 0M600000–0M616623 only.

Parts List

Qty.	Description	Part Number
1	Front lifting eye bracket	864922-1

Removal

1. Remove the power steering pump. Retain the fasteners and brace and leave the power steering pump lines connected to the pump.
2. Remove and retain the tensioner pulley bracket and fasteners.
3. Remove and discard the front lifting eye bracket along with the two upper fasteners. Retain the two lower fasteners.

Installation

1. Install the front lifting eye bracket using the two studs provided.
2. Place the front lifting eye bracket on the engine block.
3. Align the holes on the upper right-hand side of the bracket with the holes in the engine block.
4. Install the short end of the stud through the lifting eye bracket into the engine block. Do not tighten at this time.
5. Reinstall the tensioner pulley bracket and lower lift bracket fastener.
6. Tighten all of the fasteners to the specified torque.

Description	Nm	lb-in.	lb-ft
Upper front lifting eye bracket fasteners	30	–	22
Lower front lifting eye bracket fasteners	41	–	30

7. Reinstall the power steering pump and brace. Tighten the fasteners to the specified torque.

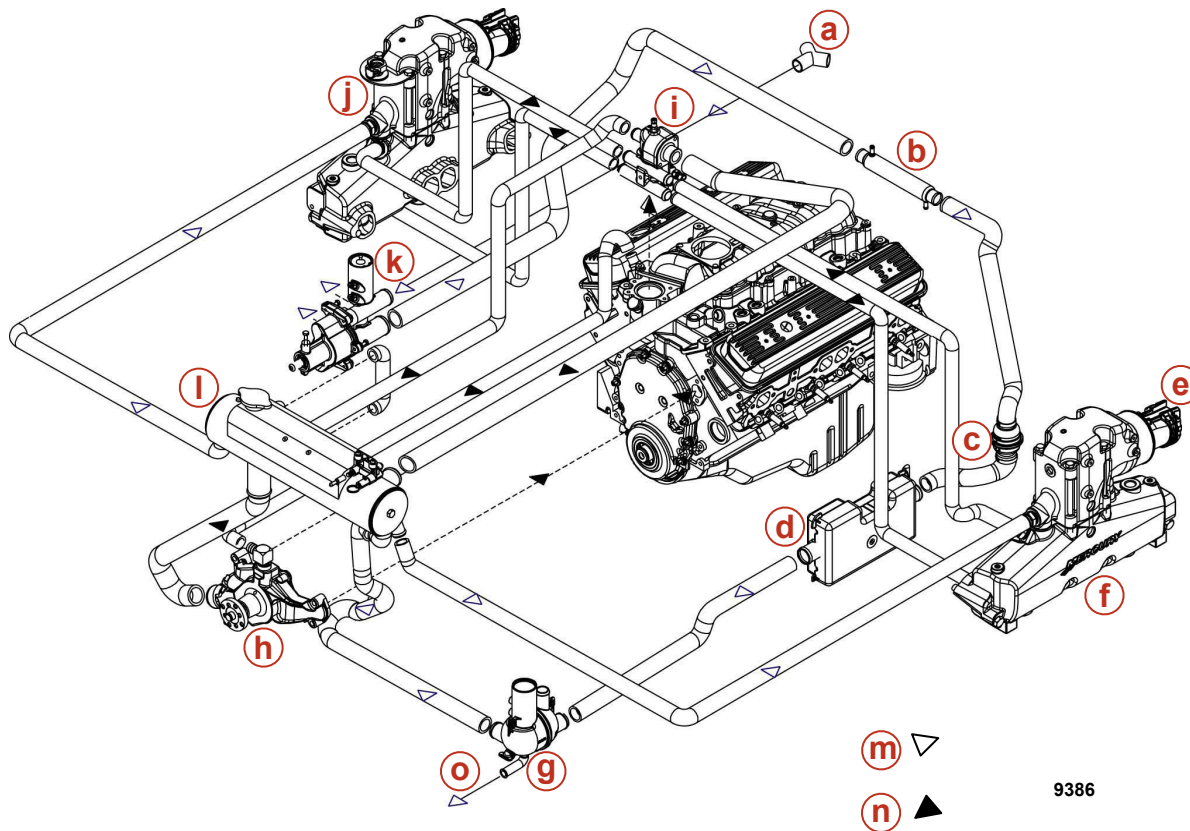
Description	Nm	lb-in.	lb-ft
Power steering fasteners	31	–	23

8. Refer to **Gear Lube Monitor Relocation** for connection steps.

Water Flow Diagrams

Sterndrive (Dry Joint)

Starting Serial Number	Ending Serial Number
0M600000	1A299999

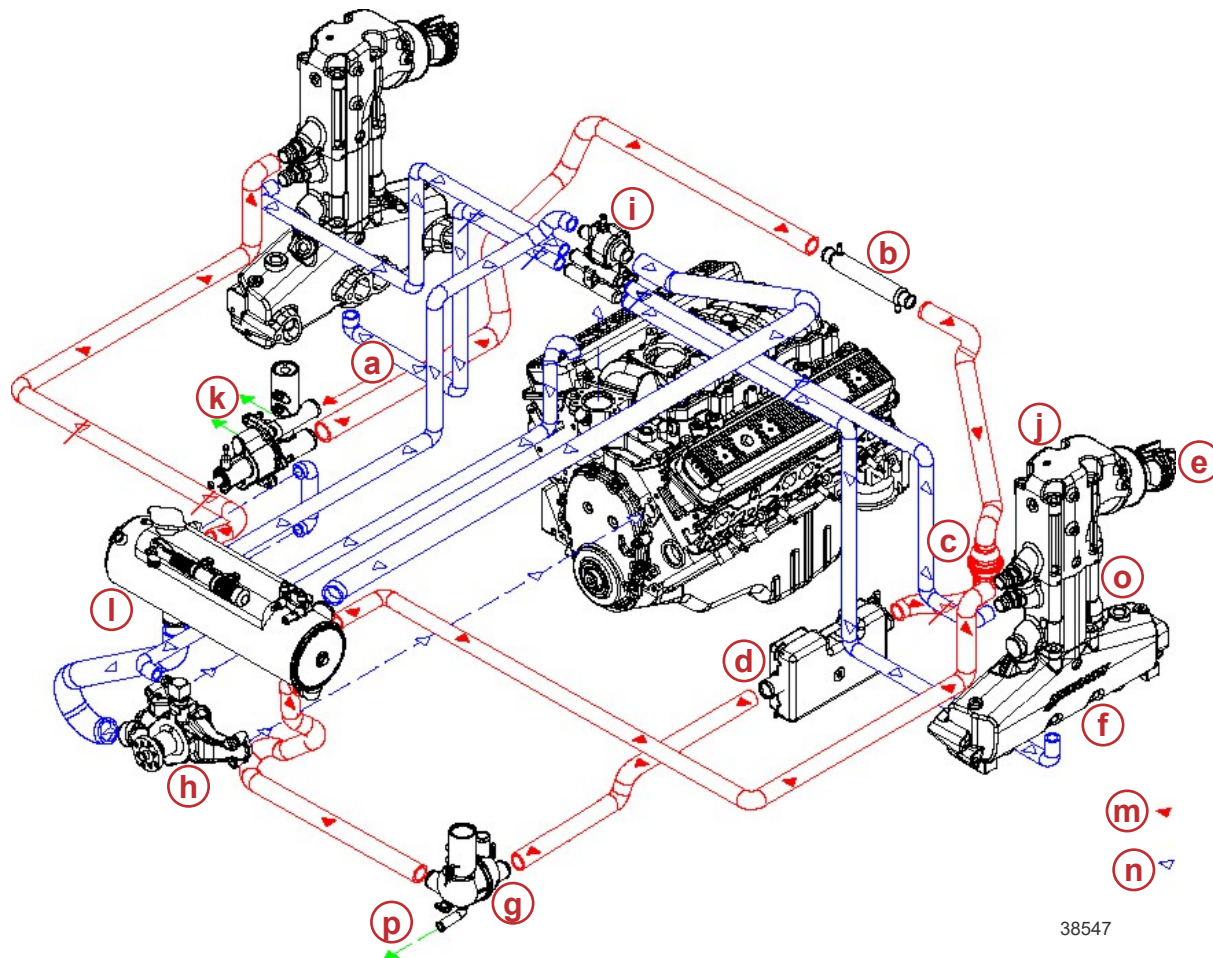


9386

- a** - Y-fitting (Bravo models only)
- b** - Power steering cooler
- c** - Check valve
- d** - Fuel cooler
- e** - Exhaust and seawater outlet
- f** - Exhaust manifold
- g** - Distribution housing
- h** - Water circulating pump
- i** - Thermostat housing
- j** - Exhaust elbow
- k** - Seawater pump
- l** - Heat exchanger
- m** - Seawater
- n** - Ethylene glycol mix
- o** - Drain points

In-line Inboard (Dry Joint, Warm Riser)

Starting Serial Number	Ending Serial Number
0M390000	0M398371 (350)
	0M398394 (6.2 L)

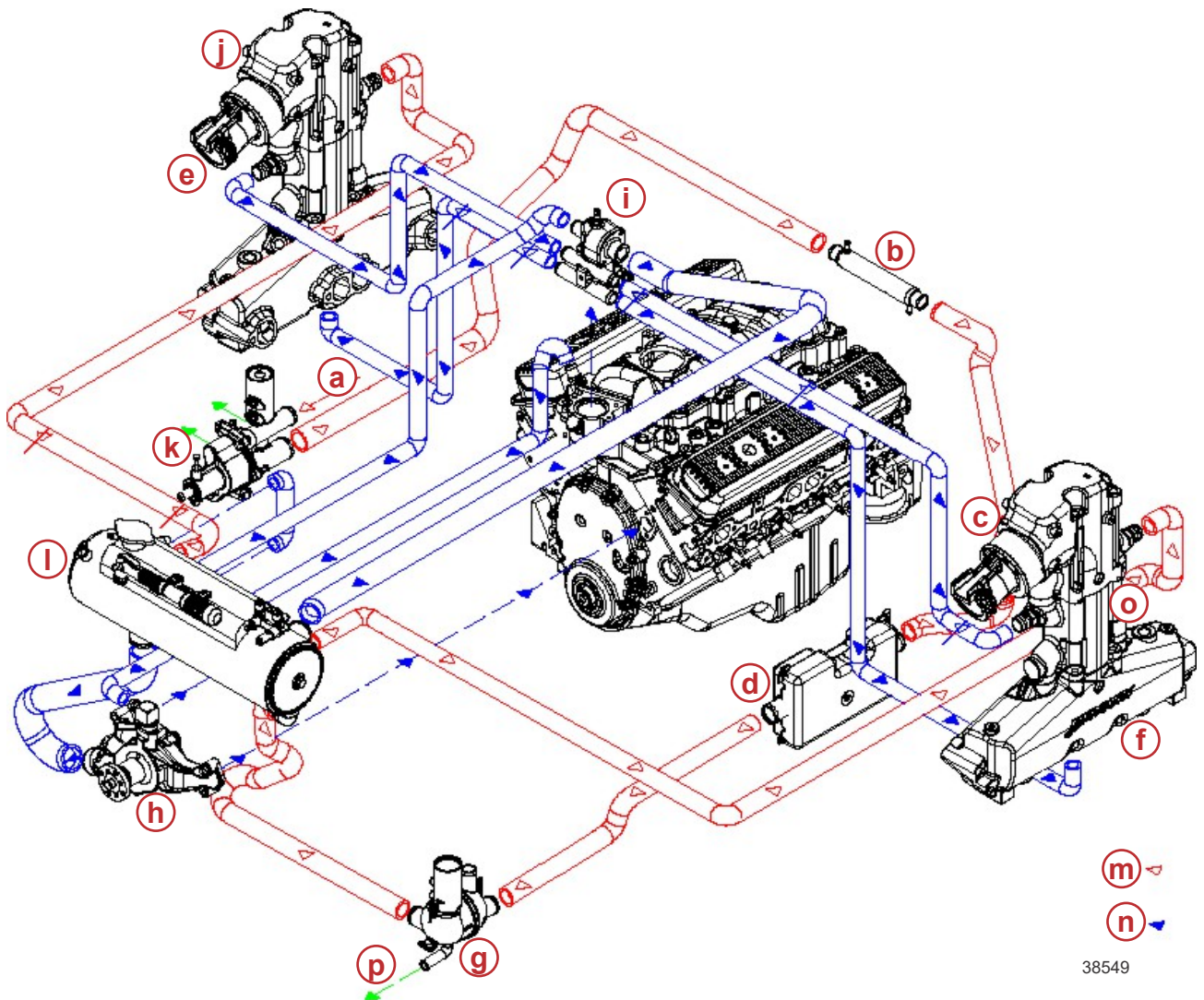


38547

- a** - Seawater inlet
- b** - Transmission cooler
- c** - Check valve
- d** - Fuel cooler
- e** - Exhaust and seawater outlet
- f** - Exhaust manifold
- g** - Distribution housing
- h** - Water circulating pump
- i** - Thermostat housing
- j** - 14 degree inboard exhaust elbow
- k** - Seawater pump
- l** - Heat exchanger
- m** - Seawater
- n** - Ethylene glycol mix
- o** - Warm risers
- p** - Drain points

V-drive Inboard (Dry Joint, Warm Riser)

Starting Serial Number	Ending Serial Number
0M390000	0M398371 (350)
	0M398394 (6.2 L)



38549

- a - Seawater inlet
- b - Transmission cooler
- c - Check valve
- d - Fuel cooler
- e - Exhaust and seawater outlet
- f - Exhaust manifold
- g - Distribution housing
- h - Water circulating pump
- i - Thermostat housing
- j - Exhaust elbow
- k - Seawater pump
- l - Heat exchanger
- m - Seawater
- n - Ethylene glycol mix
- o - Warm risers
- p - Drain points

ECM Recalibration and Credit Voucher Process

Continental United States and Canada—ECM Replacement Credit

IMPORTANT: Customers in the continental U.S. and Canada should return items listed below to the appropriate address. All other customers should return parts to their distribution center. The distribution center will return the parts to Mercury Marine.

Items to Return

Please note the information requested in the table below; do not write on the ECM.

- Copy of the purchase invoice for the closed-cooling kit
- Copy of the purchase invoice for the replacement ECM
- Serial number of the engine on which the kit was installed
- Installation date
- Original engine ECM

Send to

Returns must be sent freight prepaid to the appropriate address as listed below.

In the Continental United States

Mercury Marine
Attn.: Parts and Accessories Non-Warranty Goods
4857 Ronald Reagan Pkwy
Brownsburg, IN 46112

In Canada

Mercury Marine Canada
Attn.: Return Goods
8698 Escarpment Way
Milton, Ontario L9T 0M1

Outside the Continental United States and Canada—ECM Replacement and Credit Process

1. Purchase the replacement ECM through your usual part order channel.
2. Pre-authorization is required before the claim is submitted to the Marine Power International office or your distributor.
3. Submit a warranty claim to the Marine Power International office or your distributor.
4. Complete the warranty claim form with the following:
 - Engine Serial Number
 - Date of sale
 - No labor allowed
 - Part Code: 731
 - Code Failure: 40 - Fix program

Products of Mercury Marine
W6250 Pioneer Road
Fond du Lac, WI 54936-1939

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