

Section 5 - Maintenance

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Owner/Operator Responsibilities

It is the operator's responsibility to perform all safety checks, to ensure that all lubrication and maintenance instructions are complied with for safe operation and to return the unit to an authorized Mercury MerCruiser dealer for a periodic checkup.

Normal maintenance service and replacement parts are the responsibility of the owner/operator and as such, are not considered defects in workmanship or material within the terms of the warranty. Individual operating habits and usage contribute to the need for maintenance service.

Proper maintenance and care of your power package will ensure optimum performance and dependability and will keep your overall operating expenses at a minimum. See your authorized Mercury MerCruiser dealer for service aids.

Dealer Responsibilities

In general, a dealer's responsibilities to the customer include predelivery inspection and preparation such as:

- Ensure that the boat is properly equipped.
- Prior to delivery, make certain that the Mercury MerCruiser power package and other equipment are in proper operating condition.
- Make all necessary adjustments for maximum efficiency.
- Familiarize the customer with the on-board equipment.
- Explain and demonstrate the operation of the power package and boat.
- Provide you with a copy of a Predelivery Inspection Checklist.
- Your selling dealer should fill out the Warranty Registration Card completely and mail it to the factory immediately upon sale of the new product.

Maintenance

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.

WARNING

Fuel vapors trapped in the engine compartment may be an irritant, cause difficulty breathing, or may ignite resulting in a fire or explosion. Always ventilate the engine compartment before servicing the power package.

IMPORTANT: Refer to the maintenance schedule for complete listing of all scheduled maintenance to be performed. Whereas you can perform some items, others should be performed only by an authorized Mercury MerCruiser dealer. Before attempting maintenance or repair procedures not covered in this manual, we recommend that you purchase a Mercury MerCruiser service manual and read it thoroughly.

NOTE: Maintenance points are color coded for ease of identification. See the decal on engine for identification.

Maintenance Point Color Codes	
Blue	Coolant
Yellow	Engine oil
Orange	Fuel
Brown	Transmission

Do-It-Yourself Maintenance Suggestions

Present day marine equipment, such as your Mercury MerCruiser power package, are highly technical pieces of machinery. Electronic ignition and special fuel delivery systems provide greater fuel economies, but also are more complex for the untrained mechanic.

If you are one of those persons who likes to do it yourself, here are some suggestions for you.

- Do not attempt any repairs unless you are aware of the Cautions, Warnings and procedures required. Your safety is our concern.
- If you attempt to service the product yourself, we suggest you order the service manual for that model. The service manual outlines the correct procedures to follow. It is written for the trained mechanic, so there may be procedures you don't understand. Do not attempt repairs if you do not understand the procedures.
- There are special tools and equipment that are required to perform some repairs. Do not attempt these repairs unless you have these special tools and/or equipment. You can cause damage to the product in excess of the cost a dealer would charge you.
- Also, if you partially disassemble an engine or drive assembly and are unable to repair it, the dealer's mechanic must reassemble the components and test to determine the problem. This will cost you more than taking it to the dealer immediately upon having a problem. It may be a very simple adjustment to correct the problem.
- Do not telephone the dealer, service office or the factory to attempt for them to diagnose a problem or to request the repair procedure. It is difficult for them to diagnose a problem over the telephone.

Your authorized dealer is there to service your power package. They have qualified factory trained mechanics.

It is recommended you have the dealer do periodic maintenance checks on your power package. Have them winterize it in the fall and service it before the boating season. This will reduce the possibility of any problems occurring during your boating season when you want trouble free boating pleasure.

Inspection

Inspect your power package often, and at regular intervals, to help maintain its top operating performance and correct potential problems before they occur. The entire power package should be checked carefully, including all accessible engine parts.

- Check for loose, damaged or missing parts, hoses and clamps; tighten or replace as necessary.
- Check plug leads and electrical leads for damage.
- Remove and inspect the propeller. If badly nicked, bent or cracked, contact your authorized Mercury MerCruiser dealer.
- Repair nicks and corrosion damage on power package exterior finish. Contact your authorized Mercury MerCruiser dealer.

Maintenance Schedule—Tow Sport Models

Routine Maintenance

NOTE: Only perform maintenance that applies to your particular power package.

Task Interval	Maintenance to Be Performed
Each day start	<ul style="list-style-type: none"> • Check the engine oil level. You can extend this interval based on experience with the product. • Check the transmission fluid level.
Each day end	<ul style="list-style-type: none"> • If operating in saltwater, brackish water, or polluted water, flush the seawater section of the cooling system after each use.
Weekly	<ul style="list-style-type: none"> • Check the water inlets for debris or marine growth. • Check and clean the seawater strainer, if equipped. • Check the coolant level. • Check the transmission fluid.
Every two months or 50 hours	<ul style="list-style-type: none"> • If operating in saltwater, brackish water, or polluted water, apply Corrosion Guard to the power package. • Check the battery connections and the fluid level. • Ensure that the gauges and the wiring connections are secure. Clean the gauges. If operating in saltwater, reduce this interval to every 25 hours or 30 days, whichever occurs first.

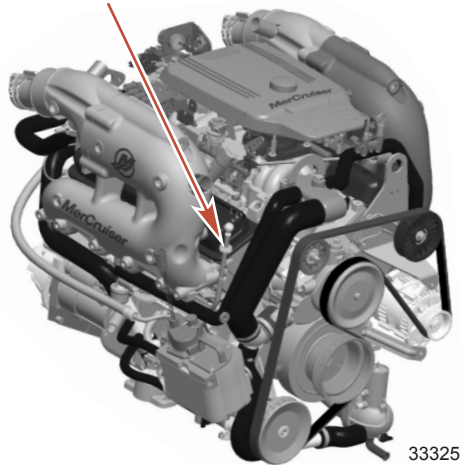
Scheduled Maintenance

NOTE: Only perform maintenance that applies to your particular power package.

Task Interval	Maintenance to Be Performed
After the initial 20-hour break-in period	<p>Change the engine oil and filter.</p> <ul style="list-style-type: none"> • Change the engine oil and filter. • Change the transmission fluid and filter. ZF Marine requires changing the transmission fluid and filter maintain warranty.
Every 100 hours or annually (whichever occurs first)	<ul style="list-style-type: none"> • Touch up the paint on the power package. • Change the engine oil and filter. • Change the transmission fluid and filter (ZF Transmission Models). • If the condition of the spark plugs, spark plug wires, and the distributor cap and rotor was satisfactory at the initial inspection (as listed in Every 300 hours or 3 years), inspect the condition of these components. Replace as necessary. • Replace the water-separating fuel filter element. • Clean the flame arrestor, IAC muffler, and the crankcase ventilation hoses. Inspect the PCV valve, if equipped. To replace the IAC, contact your authorized Mercury MerCruiser dealer. • Inspect the condition and the tension of the belts.

1. Stop the engine. Allow the oil to drain into the oil pan for approximately five minutes with the boat at rest in the water.
2. Remove the dipstick, wipe clean, and reinstall fully into the dipstick tube. Wait 60 seconds to allow trapped air to vent.

NOTE: Install the dipstick with oil level indication marks facing the rear of the engine (flywheel end).



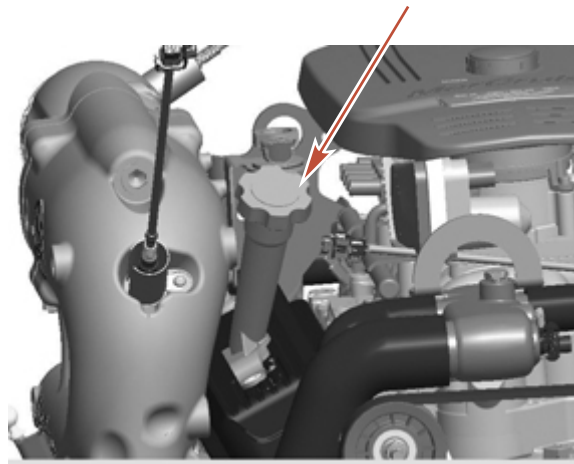
Dipstick

3. Inspect the dipstick reading, which should indicate a level between the full or "OK" mark and the "ADD" mark. Reinstall the dipstick into the dipstick tube. If the oil level is low, refer to **Filling**.

Filling

IMPORTANT: Do not overfill the engine with oil. Always use the dipstick to determine the exact quantity of oil or fluid required.

1. Remove oil fill cap.



Oil fill cap

IMPORTANT: Add the specified engine oil to bring the level up to, but not over, the full or OK range mark on the dipstick.

2. Add the specified engine oil to bring the level up to, but not over, the full or OK range mark on the dipstick. Recheck oil level.
3. Replace the fill cap.

All Models	Capacity	Fluid Type
Engine oil (with filter)	4.25 L (4.5 US qt)	Mercury Full-Synthetic MerCruiser Engine Oil 20W-40

Changing Oil and Filter

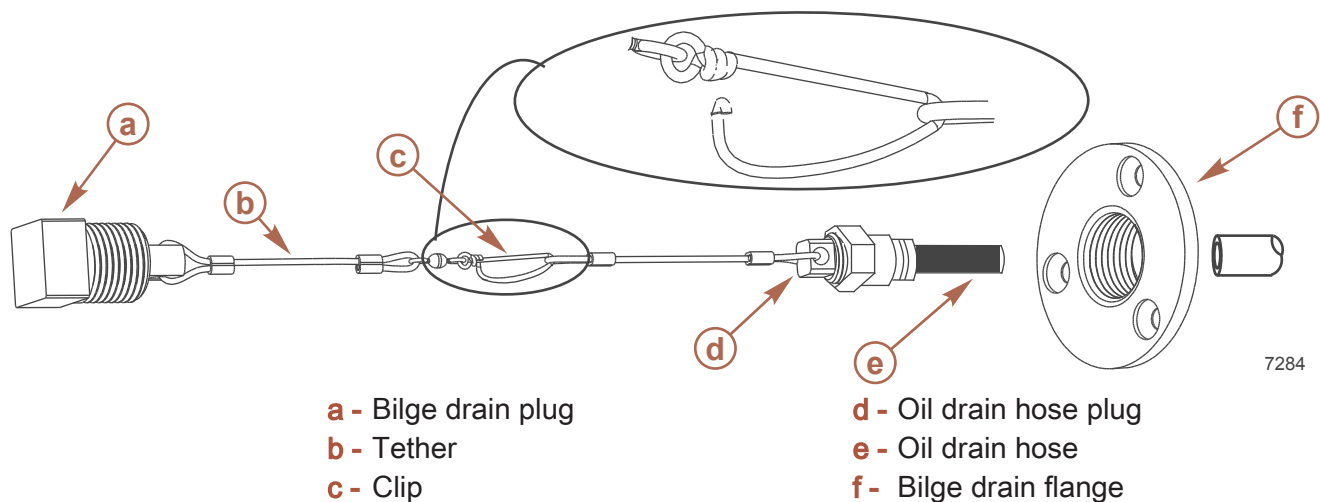
See **Maintenance Schedule** for the change interval. Engine oil should be changed before placing the boat in storage.

IMPORTANT: Change engine oil when the engine is warm from operation. Warm oil flows more freely, carrying away more impurities. Use only recommended engine oil (refer to the Specifications section).

Easy Engine Oil Drain System

NOTE: The boat must be out of water to perform this procedure.

1. Loosen the oil filter to vent the system.
2. Allow sufficient time for the oil to drain from the filter down into the engine block.
3. Remove the bilge drain plug.
4. Pull tether through the bilge drain.

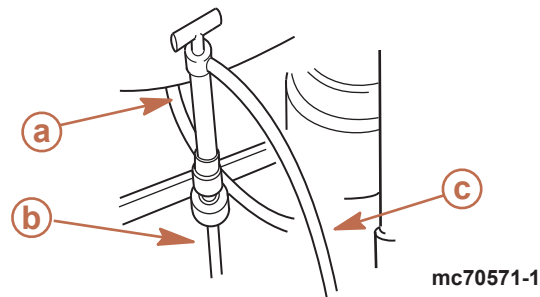


5. Place the oil drain hose in a suitable container.
6. Remove the drain plug from the oil drain hose.
7. After oil has drained completely, install the drain plug in the oil drain hose.
8. Push the hose through bilge drain and install the plug.
9. Replace the engine oil filter. See **Changing the Oil Filter**.

Engine Oil Drain Pump

1. Loosen the oil filter to vent the system.
2. Remove the dipstick.

3. Install the oil pump onto the dipstick tube.

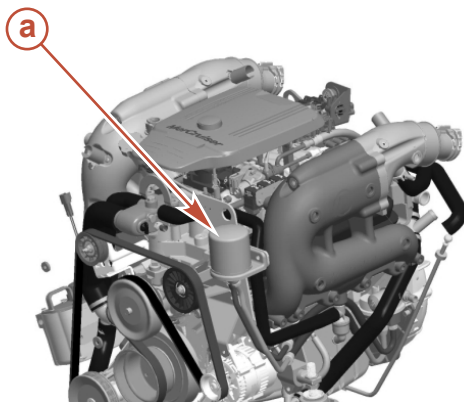


- a** - Oil pump
- b** - Dipstick tube
- c** - Oil drain hose

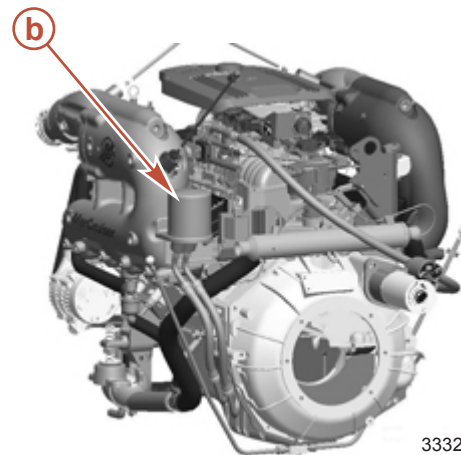
4. Insert the hose end of the crankcase oil pump onto an appropriate container and use the handle to pump until the crankcase is empty.
5. Remove the pump.
6. Install the dipstick.

Changing the Oil Filter

1. Remove and discard oil filter.



a - Oil filter (in-line exhaust)



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b - Oil filter (V-drive exhaust)

2. Coat the sealing ring on the new filter with engine oil.
3. Install and tighten the oil filter securely following the filter manufacturer's instructions. Do not overtighten.
4. Remove oil fill cap.
5. Use the dipstick to determine the amount of engine oil required. Replace the dipstick.
6. Add the required amount of the recommended oil to bring the level up to the bottom of the OK range on the dipstick.
7. With the boat at rest in the water, repeat steps 5 and 6 if necessary.

NOTE: Adding 0.95 L (1 US qt) of engine oil raises the level from the add mark to the top of the OK range.

All Models	Capacity	Fluid Type
Engine oil (with filter)	4.25 L (4.50 US qt)	Mercury Full-Synthetic MerCruiser Engine Oil 20W-40

8. Start the engine and operate for three minutes, checking for leaks.
9. Stop the engine and allow the oil to drain into the oil pan for approximately five minutes with the boat at rest in the water.

Transmission Fluid

Checking While the Engine is Warm

1. Velvet Drive Transmissions - Stop the engine and immediately check fluid level by turning T-handle counterclockwise, to remove dipstick. Fluid level should be up to full mark. If low, add specified fluid through dipstick tube on transmissions.
2. ZF Marine Transmissions - Stop the engine and remove the dipstick to check level. If fluid is below top (full) line, add specified fluid through dipstick hole. Do not overfill. Reinstall dipstick with cap fully seated.
3. Walter V-Drive Transmissions - Stop the engine and remove the dipstick to check the level. If the fluid is below the top (full) line, add the specified fluid through the breather elbow. Do not overfill. Reinstall the dipstick with the cap fully seated.

Checking While Engine is Cold

NOTE: Cold fluid level check: To ease checking the fluid level, the dipstick can be marked or scribed with a cold level mark.

1. Follow the procedure for the warm fluid level check, then allow the boat to sit overnight.
- IMPORTANT:** Be sure to push the dipstick all the way down into the dipstick tube when checking the fluid level.
2. Remove the dipstick, wipe clean and reinsert.
 3. Remove the dipstick, observe the fluid level and mark the cold fluid level.
 4. Reinstall the dipstick, tighten the T-handle securely. Do not overtighten.

Changing

Contact your authorized Mercury MerCruiser dealer.

Battery

Refer to specific instructions and warnings accompanying your battery. If this information is not available, observe the following precautions when handling a battery.

WARNING

Recharging a weak battery in the boat, or using jumper cables and a booster battery to start the engine, can cause serious injury or product damage from fire or explosion. Remove the battery from the boat and recharge in a ventilated area away from sparks or flames.

WARNING

An operating or charging battery produces gas that can ignite and explode, spraying out sulfuric acid, which can cause severe burns. Ventilate the area around the battery and wear protective equipment when handling or servicing batteries.

Multiple EFI Engine Battery Precautions

Alternators: Alternators are designed to charge the battery that supplies electrical power to the engine that the alternator is mounted on. When batteries for 2 different engines are connected, one alternator will supply all of the charging current for both batteries. Normally, the other engine's alternator will not be required to supply any charging current.

EFI Electronic Control Module (ECM): The ECM requires a stable voltage source. During multiple engine operation, an onboard electrical device may cause a sudden drain of voltage at the engine's battery. The voltage may go below the ECM's minimum required voltage. Also, the alternator on the other engine may now start charging. This could cause a voltage spike in the engine's electrical system.

In either case, the ECM could shut off. When the voltage returns to the range that the ECM requires, the ECM will reset itself, and the engine will operate normally. The ECM shuts off and resets itself so quickly that the engine may only seem to have an ignition miss.

Batteries: Boats with multi-engine EFI power packages require each engine be connected to its own battery. This ensures that the engine's ECM has a stable voltage source.

Battery Switches: Battery switches should always be positioned so each engine is operating off of its own battery. Do not operate engines with switches in both or all position. In an emergency, another engine's battery can be used to start an engine with a dead battery.

Battery Isolators: Isolators can be used to charge an auxiliary battery used for powering accessories in the boat. They should not be used to charge the battery of another engine in the boat unless the type of isolator is specifically designed for this purpose.

Generators: The generators battery should be considered another engine's battery.

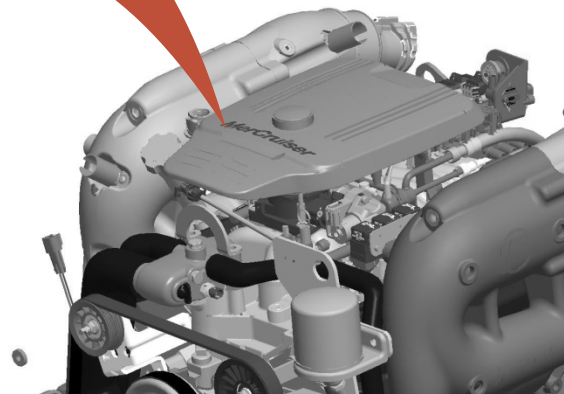
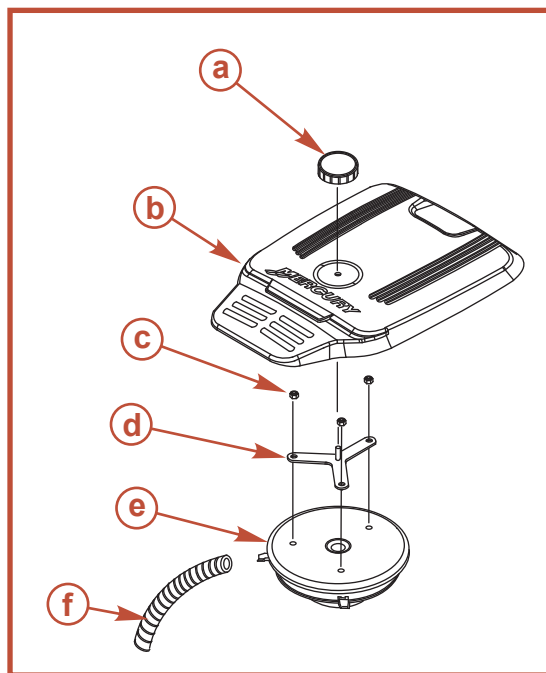
Cleaning the Flame Arrestor

 **WARNING**

Fuel is flammable and explosive. Ensure the key switch is off and the lanyard is positioned so that the engine cannot start. Do not smoke or allow sources of spark or open flame in the area while servicing. Keep the work area well ventilated and avoid prolonged exposure to vapors. Always check for leaks before attempting to start the engine and wipe up any spilled fuel immediately.

1. Remove the engine cover.
2. Disconnect and remove the crankcase ventilation hose from the fitting on the flame arrestor and valve cover.

- Remove the flame arrestor.



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a - Engine cover knob
b - Engine cover
c - Nuts, flame arrestor

d - Cover mount bracket
e - Flame arrestor
f - Crankcase ventilation hose

- Clean the flame arrestor with warm water and a mild detergent.
- Inspect the flame arrestor for holes, cracks or deterioration. Replace if necessary.
- Allow the flame arrestor to air dry completely before use.
- Clean the crankcase ventilation hose with warm water and a mild detergent. Dry with compressed air or allow to air dry completely.
- Inspect the crankcase ventilation hose for cracks or deterioration. Replace if necessary.
- Install the flame arrestor and flame arrestor bracket. Torque the flame arrestor bracket nuts.

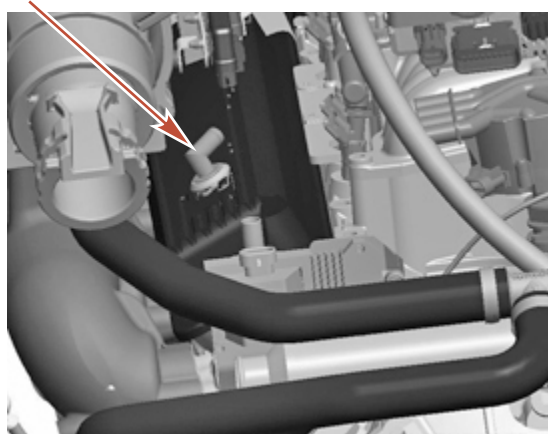
Description	Nm	lb-in.	lb-ft
Flame arrestor bracket nut	12	106	–

- Connect the crankcase ventilation hose to the fitting on the flame arrestor and valve cover.
- Install the engine cover.

Positive Crankcase Ventilation Valve (PCV) CHANGING

IMPORTANT: Use only Mercury MerCruiser replacement parts to ensure compliance with emission regulations.

1. Remove the PCV valve from the port valve cover.



PCV valve (hose not shown)

2. Disconnect the PCV valve from the hose and discard the valve.
3. Install a new PCV valve in the valve cover and reconnect the hose.
4. Ensure that the PCV valve is tightly seated in the valve cover.

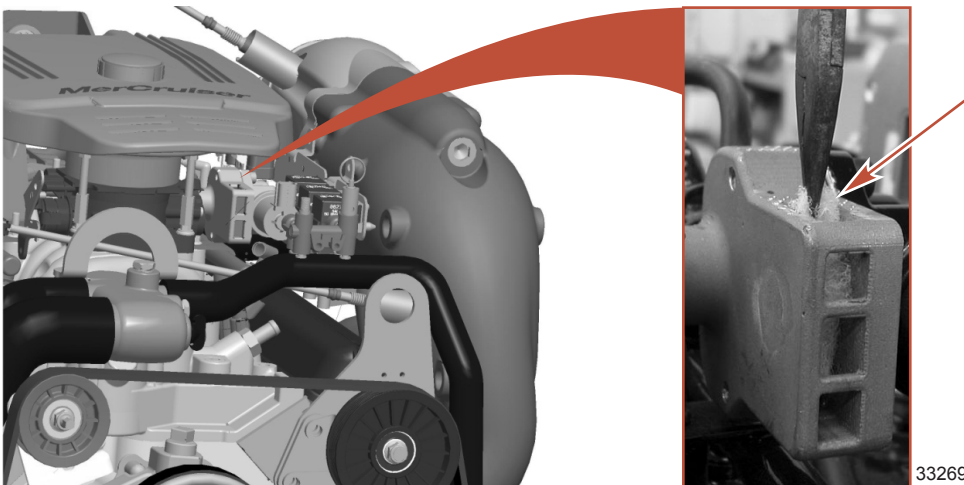
Cleaning The IAC Muffler

⚠ WARNING

Fuel is flammable and explosive. Ensure the key switch is off and the lanyard is positioned so that the engine cannot start. Do not smoke or allow sources of spark or open flame in the area while servicing. Keep the work area well ventilated and avoid prolonged exposure to vapors. Always check for leaks before attempting to start the engine and wipe up any spilled fuel immediately.

NOTE: The IAC muffler may be installed in the throttle body or in the IAC adapter. Locate your IAC muffler by removing the engine cover.

1. Remove the engine cover.
2. Remove the IAC muffler.



IAC muffler installed in the IAC adapter

3. Inspect the IAC muffler for holes, cracks, or deterioration. Replace the IAC muffler if damaged.

IMPORTANT: Do not get cleaner on electrical connections and do not use cleaner containing methyl ethyl ketone.

4. Clean the IAC muffler with warm water and a mild detergent. Replace if necessary.
5. Allow the IAC muffler to completely, then install.

Water-Separating Fuel Filter

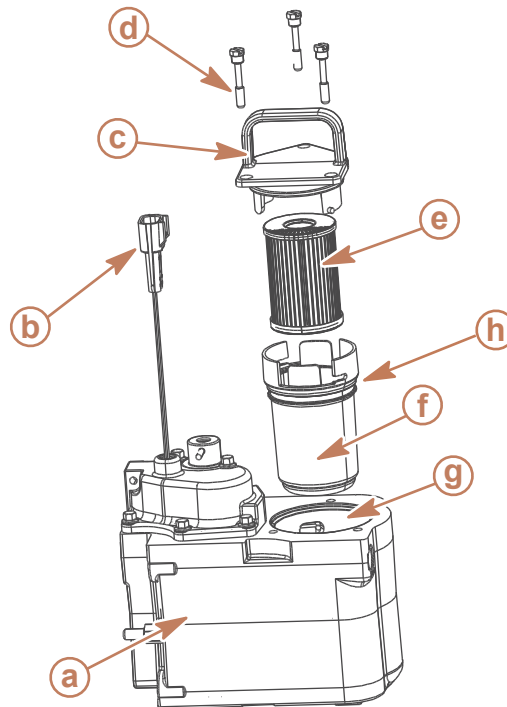
⚠ WARNING

Fuel is flammable and explosive. Ensure the key switch is off and the lanyard is positioned so that the engine cannot start. Do not smoke or allow sources of spark or open flame in the area while servicing. Keep the work area well ventilated and avoid prolonged exposure to vapors. Always check for leaks before attempting to start the engine and wipe up any spilled fuel immediately.

⚠ CAUTION

Failure to release pressure from the fuel system will result in fuel spraying out, which can cause a fire or explosion. Allow the engine to cool completely and release all fuel pressure before servicing any part of the fuel system. Always protect eyes and skin from pressurized fuel and vapors.

GEN III Models



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- | | |
|--|--|
| a - Cool Fuel Module | e - Fuel filter element |
| b - Cool Fuel Module harness | f - Filter cup |
| c - Filter cap | g - Cool Fuel Module filter reservoir |
| d - Filter assembly retaining screw | h - O-ring |

REMOVAL

1. Allow the engine to cool down.

NOTE: Mercury MerCruiser recommends that the engine be shut off for 12 hours prior to filter removal.

2. Close fuel supply valve, if equipped.
3. Disconnect the Cool Fuel Module harness from the engine wiring harness.
4. Turn the key switch to the start position and allow the starter to operate for 5 seconds.
5. Turn key switch to off position.
6. Loosen each filter assembly retaining screw until the screw is disengaged from the Cool Fuel Module. Do not remove the filter assembly retaining screws from the filter cap.
7. Unseat the filter assembly by grasping the filter assembly handle and pulling upward. Do not remove the filter assembly from the Cool Fuel Module at this time.
8. Allow any fuel that may be in the filter assembly to drain out through the bottom of the filter assembly and into the Cool Fuel Module filter reservoir.
9. Remove the filter cup from the filter cap by grasping the filter cap and rotating it in a clockwise direction while holding the filter cup stationary.
10. Remove the used water-separating fuel filter element from the filter cup, place it in a clean, approved container.
11. Dispose of any water or debris that may be in the filter cup.

INSTALLATION

1. Install a new water-separating fuel filter element into the filter cup. Push the element into the cup until completely seated.
2. Install new O-ring on the filter cup.
3. Attach the filter cap to the filter cup by grasping the filter cap and rotating it in a counter clockwise direction while holding the filter cup stationary, until the filter cap locks securely into place.
4. Install the fuel filter assembly slowly into the Cool Fuel Module to prevent spilling fuel, and align the screws retained in the filter cap with the screw holes in the Cool Fuel Module. Tighten the filter assembly retaining screws until hand tight.
5. Ensure that the filter cap is firmly seated against the Cool Fuel Module and torque each filter assembly retaining screw.

Description	Nm	lb. in.	lb. ft.
Filter assembly retaining screw	6	53	

6. Open fuel supply valve, if equipped.
7. Reconnect the Cool Fuel Module harness to the engine wiring harness.
8. Properly ventilate the engine compartment.

NOTICE

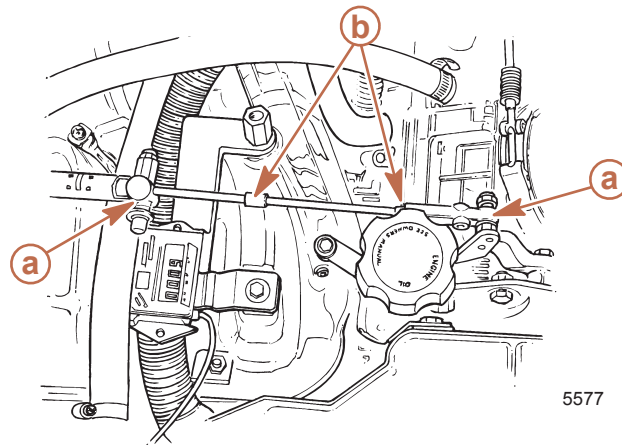
Without sufficient cooling water, the engine, the water pump, and other components will overheat and suffer damage. Provide a sufficient supply of water to the water inlets during operation.

9. Supply cooling water to the engine.
10. Start the engine. Check for gasoline leaks around the fuel filter assembly. If leaks exist, stop the engine immediately. Recheck the filter installation, clean spilled fuel and properly ventilate the engine compartment. If leaks continue, stop engine immediately and contact your authorized Mercury MerCruiser dealer.

Lubrication


Throttle Cable

1. Lubricate the pivot points and the guide contact surfaces.



a - Pivot points

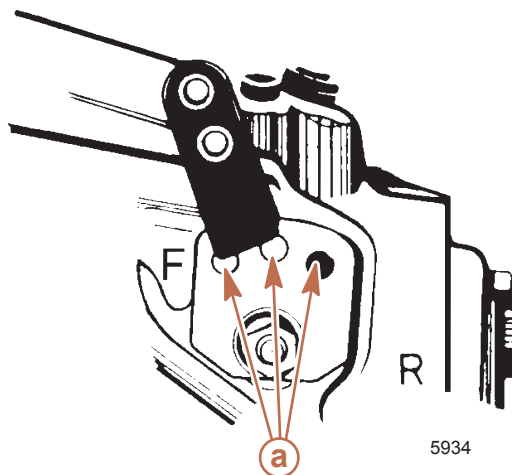
b - Guide contact surfaces

Tube Ref. No.	Description	Where Used	Part No.
	Synthetic Blend MerCruiser Engine Oil SAE25W-40	Throttle cable pivot points & guide contact surfaces	92-883725K01


Transmission Linkage

IMPORTANT: The poppet ball must be centered in the detent hole for each F-N-R position.

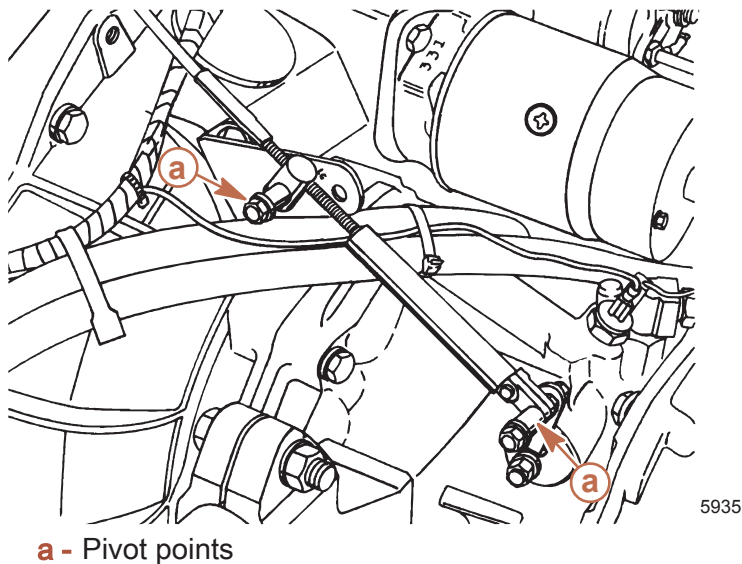
1. Lubricate the detent ball and the holes in the shift lever.




In-Line Transmission

Tube Ref. No.	Description	Where Used	Part No.
	Synthetic Blend MerCruiser Engine Oil SAE25W-40	Detent ball and shift lever holes	92-883725K01

- Lubricate the shift cable pivot points.

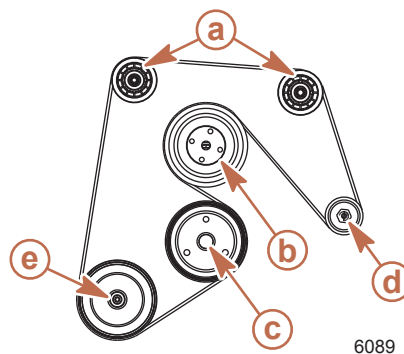


Tube Ref. No.	Description	Where Used	Part No.
	Synthetic Blend MerCruiser Engine Oil SAE25W-40	Shift cable pivot points	92-883725K01

Serpentine Drive Belt

⚠ WARNING

Inspecting the belts with the engine running may cause serious injury or death. Turn off the engine and remove the ignition key before adjusting tension or inspecting belts.



- a** - Idler pulley
- b** - Circulating pump pulley
- c** - Crankshaft pulley
- d** - Alternator pulley
- e** - Seawater pump pulley

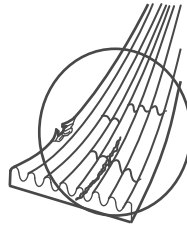
Checking

- Inspect the drive belt for proper tension and for the following:
 - Excessive wear
 - Cracks

NOTE: Minor, transverse cracks (across the belt width) may be acceptable. Longitudinal cracks (in the direction of belt length) that join transverse cracks are NOT acceptable.

- Fraying

- Glazed surfaces
- Proper tension - 13 mm (1/2 in.) deflection, with moderate thumb pressure, on the belt at the location that has the longest distance between two pulleys.



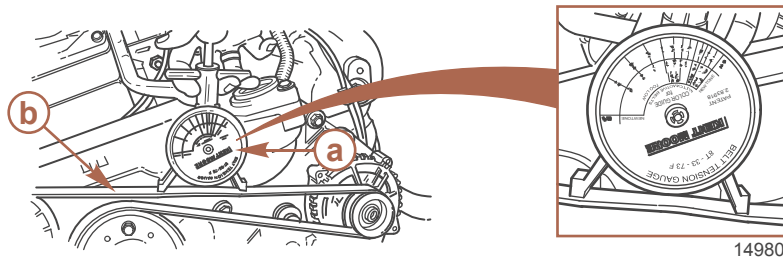
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Replacing Belt and/or Adjusting Tension

IMPORTANT: If a belt is to be reused, it should be installed in the same direction of rotation as before.

NOTE: Belt deflection is to be measured on the belt at the location that has the longest distance between two pulleys.

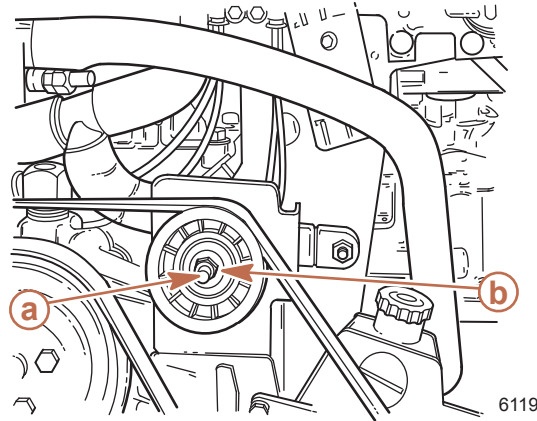
1. Loosen the 16 mm (5/8 in.) locking nut on the adjustment stud.
2. Turn the adjustment stud and loosen the belt.
3. If a new serpentine drive belt is required, remove the old belt and install a new belt onto the pulleys.
4. Put a wrench on the adjustment stud 16 mm (5/8 in.) locking nut.
5. Use a 8 mm (5/16 in.) socket and tighten adjusting the stud to adjust the belt deflection.
6. Using one of the 2 methods following, check for correct deflection.
 - a. Push down with moderate thumb pressure on the longest stretch of belt. Proper deflection is 13 mm (1/2 in.).
 - b. Attach the Kent Moore© Belt Tension Gauge to the belt. The gauge has different ranges for new and used belts.



a - Kent Moore© Tension Gauge

b - Serpentine belt

7. While holding the adjustment stud at the correct belt tension, tighten the 16 mm (5/8 in.) locking nut.



a - 8 mm (1/16 in.) adjusting stud **b** - 16 mm (5/8 in.) locking nut

8. Operate the engine for a short period of time and recheck the belt adjustment.

Flushing The Power Package—Tow Sports

The Boat Out of the Water

IMPORTANT: Flushing the power package is most effective when performed with the boat out of the water.

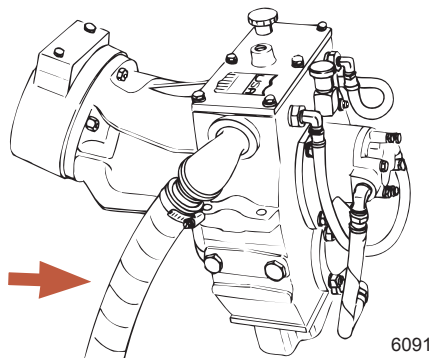
IMPORTANT: Flushing is needed if the engine package has been operated in salty, brackish, mineral-laden or polluted water. For best results flushing is recommended after each outing and before cold weather and extended storage.

WARNING

Rotating propellers can cause serious injury or death. Never operate the boat out of the water with a propeller installed. Before installing or removing a propeller, place the drive unit in neutral and engage the lanyard stop switch to prevent the engine from starting. Place a block of wood between the propeller blade and the anti-ventilation plate.

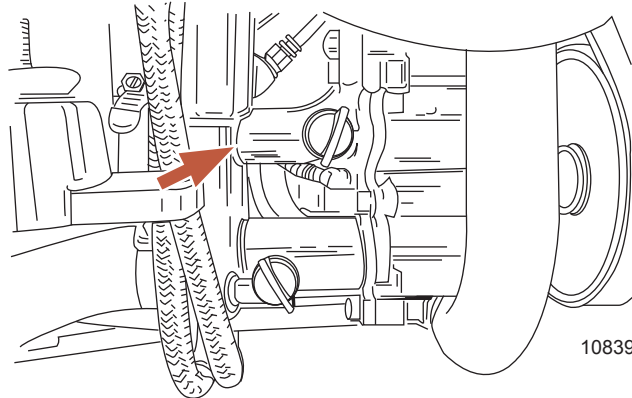
1. Models with Walter V-Drive Transmissions:

- a. Close the seacock, if equipped, and then disconnect the seawater inlet hose from the transmission seawater inlet fitting.
- b. If not equipped with a seacock, disconnect the seawater inlet hose from the transmission seawater inlet fitting and plug the seawater inlet hose.



- c. Using appropriate connector, connect the flushing water hose to the transmission seawater inlet fitting.

- d. Proceed to step 3
2. **All other models:**
 - a. Close the seacock, if equipped, and then disconnect the seawater inlet hose from the seawater pump inlet fitting..
 - b. If not equipped with a seacock, disconnect the seawater inlet hose from the seawater pump and plug the hose.



- c. Using a suitable adapter, connect the flushing hose from the water source to the water inlet of the seawater pump.
- d. Proceed to step 3.

NOTICE

Flushing the engine when it is not operating will result in water collecting in the exhaust system, damaging the engine. Do not supply flush water for more than 15 seconds without the engine operating.

3. Completely open the water source to provide maximum water supply.
4. Place the remote control in the neutral idle speed position.
5. Immediately start the engine.

NOTICE

Operating the engine out of the water at high speeds creates suction, which can collapse the water supply hose and overheat the engine. Do not operate the engine above 1400 RPM out of the water and without sufficient cooling water supply.

6. Depress the throttle only button and slowly advance the throttle until the engine reaches 1300 RPM (\pm 100 RPM).
7. Observe the water temperature gauge to ensure that the engine is operating in the normal range.
8. Operate the engine with the transmission in neutral for a minimum of 10 minutes.
9. *For power packages operated in salty, brackish, mineral-laden or polluted water:* Continue to operate the engine until the discharge water is clear.
10. Slowly return the throttle to idle speed position.

NOTICE

Flushing the engine when it is not operating will result in water collecting in the exhaust system, damaging the engine. Do not supply flush water for more than 15 seconds without the engine operating.

11. Stop the engine.

12. Immediately shut off the supply water and remove the flushing attachment.
13. Install the water inlet hose to the seawater inlet of the seawater pump or V-Drive water inlet.
14. Tighten hose clamp securely.
15. Attach to the next engine, if equipped, and repeat procedure.

The Boat In the Water

IMPORTANT: Flushing the power package is most effective when performed with the boat out of the water.

IMPORTANT: Flushing is needed if the engine package has been operated in salty, brackish, mineral-laden or polluted water. For best results flushing is recommended after each outing and before cold weather and extended storage.

NOTICE

Disconnecting the seawater inlet hose will cause water to enter the bilge resulting in engine damage. Close the seacock before disconnecting the seawater inlet hose. Plug the seawater inlet hose immediately after disconnecting it.

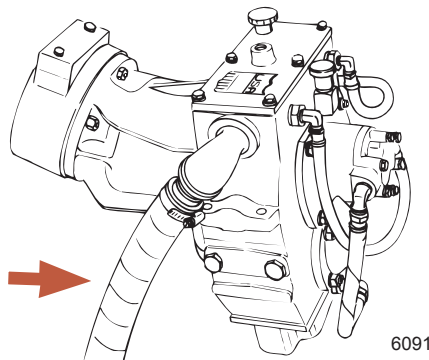
1. Models with Walter V-Drive Transmissions:

- a. Close the seacock, if equipped, and then disconnect the seawater inlet hose from the transmission seawater inlet fitting.

NOTICE

Disconnecting the seawater inlet hose will cause water to enter the bilge resulting in engine damage. Close the seacock before disconnecting the seawater inlet hose. Plug the seawater inlet hose immediately after disconnecting it.

- b. If not equipped with a seacock, disconnect the seawater inlet hose from the transmission seawater inlet fitting and immediately plug the seawater inlet hose to prevent water from siphoning into the engine or boat.

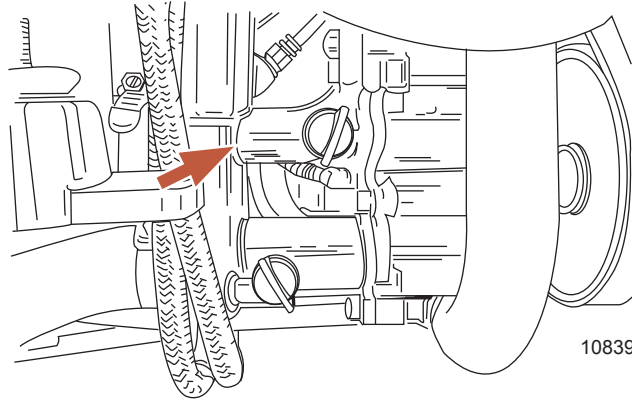


- c. Using suitable adapter, connect the flushing water hose to the transmission seawater inlet fitting.
 - d. Proceed to step 3
- #### 2. All other models:
- a. Close the seacock, if equipped, and then disconnect the seawater inlet hose from the seawater pump inlet fitting.

NOTICE

Disconnecting the seawater inlet hose will cause water to enter the bilge resulting in engine damage. Close the seacock before disconnecting the seawater inlet hose. Plug the seawater inlet hose immediately after disconnecting it.

- b. If not equipped with a seacock, disconnect the seawater inlet hose from the seawater pump inlet fitting and immediately plug the seawater inlet hose to prevent water from siphoning into the engine or boat.



- c. Using a suitable adapter, connect the flushing hose from the water source to the water inlet of the seawater pump.
- d. Proceed to step 3.

NOTICE

Flushing the engine when it is not operating will result in water collecting in the exhaust system, damaging the engine. Do not supply flush water for more than 15 seconds without the engine operating.

3. Completely open the water source to provide maximum water supply.
4. Place the remote control in the neutral idle speed position.
5. Immediately start the engine.

NOTICE

Operating the engine out of the water at high speeds creates suction, which can collapse the water supply hose and overheat the engine. Do not operate the engine above 1400 RPM out of the water and without sufficient cooling water supply.

6. Depress the throttle only button and slowly advance the throttle until the engine reaches 1300 RPM (± 100 RPM).
7. Observe the water temperature gauge to ensure that the engine is operating in the normal range.
8. Operate the engine with the transmission in neutral for a minimum of 10 minutes.
9. *For power packages operated in salty, brackish, mineral-laden or polluted water:* Continue to operate the engine until the discharge water is clear.
10. Slowly return the throttle to idle speed position.

NOTICE

Flushing the engine when it is not operating will result in water collecting in the exhaust system, damaging the engine. Do not supply flush water for more than 15 seconds without the engine operating.

11. Stop the engine.
12. Immediately shut off the water supply and remove the flushing attachment.
13. Remove the flushing connector from the water inlet.
14. Tag the ignition switch with an appropriate tag requiring the seacock to be opened or the seawater inlet hose to be reconnected prior to operating the engine.
15. Repeat the flushing procedure on the next engine, if equipped.