

Powerhead Water Ingestion - 225 Model

Mariner and Mercury

1994 and 1995
225 hp Models
S/N 0D280813 thru 0G178947

There have been some reports of water ingestion into the lower cylinders on these engines.

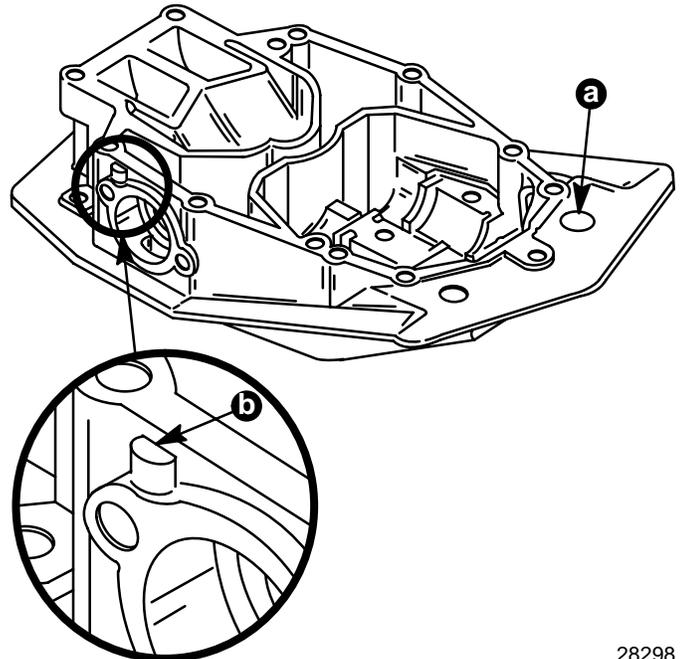
Water may enter the lower cylinders from the cooling slots on the exhaust adapter plate. Water can cause spark plug misfire, internal rust and possibly powerhead damage. Modifications to the exhaust adapter plate are to be made to avoid water ingestion through the exhaust ports.

Water may also accumulate in the lower cowl from leaking hoses or from external spray. Accumulated water can cause electrical problems and can be drawn into the lower carburetors to cause spark plug misfire, internal rust and possibly powerhead damage. Hose leaks are to be repaired. Additional cowl air inlet holes, to reduce under-cowl vacuum, and longer water drain check valves are to be added/installed to help drain the lower cowl.

DEALER OUTBOARD INVENTORY:

Outboards within this serial number range must be modified before use or retail sale.

Some outboards within this serial number range were modified at the factory. Factory modifications and some early field modifications have the new exhaust adaptor plate p/n 818450A-1 installed. The new adaptor plate is identified with a raised boss above the poppet valve opening and p/n 818450C-2 is cast in the front of the plate as shown in figure 1.



a - Casting Number 818450C-2
b - Raised Boss

Figure 1. New Exhaust Adaptor Plate.

Outboards modified at the factory also have an orange dot on the outside of the shipping carton next to the serial number. Outboards with this new adaptor plate have all modifications required by this bulletin and require no further action.

OWNER NOTIFICATION (US AND CANADA):

A combination letter/claim will be sent to registered owners of outboards within this serial number range. The letter will advise the owner to return their outboard to the selling dealer or authorized dealer for warranty modifications. A copy of the letter is attached to this service bulletin.

REQUIRED TOOLS AND PARTS:

Order (1) p/n 828809A-1 Drill Fixture Kit (with drills)
- no charge.

Order (1) p/n 19-828808A-1 Repair Kit for each used
outboard.

Order (1) p/n 19-828808A-2 Repair Kit for each new
outboard.

Rust-oleum 7785 Cold Galvanizing Compound -
purchase locally.

Quicksilver Leveler p/n 92-75996.

Quicksilver Silicone Dielectric Grease
92-823506--1

MODIFICATIONS:

S/N 0D280813 thru 0G178947 CYLINDER BORE INSPECTION

Inspect cylinders for corrosion if the engine has been
operated. Disregard this section if the engine has not
been operated.

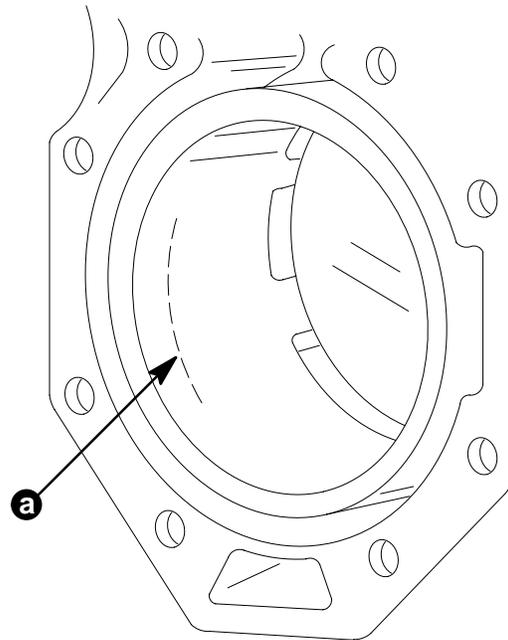
1. Remove both cylinder heads.
2. Clean bores with Quicksilver Paint Leveler p/n
92-75996.
3. Inspect cylinder bores for cross hatch pattern, pit-
ting and wear. Figure 2 shows piston ring travel
limit.

Acceptable:

- Corrosion/discoloration above ring travel area
- Non-Uniform honing cross hatch
- Minor scratches

Unacceptable:

- Heavy corrosion or pitting in ring travel area.
- Honing cross hatch worn away.
- Scored Cylinder - deep vertical marks.



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a - Limit of Ring Travel.

Figure 2. Cylinder Inspection.

4. For help or authorization to replace the power-
head if the bore(s) is not acceptable:

US - Call Outboard Service (414) 929-5884 or Quick-
Fax (800) 842-4550.

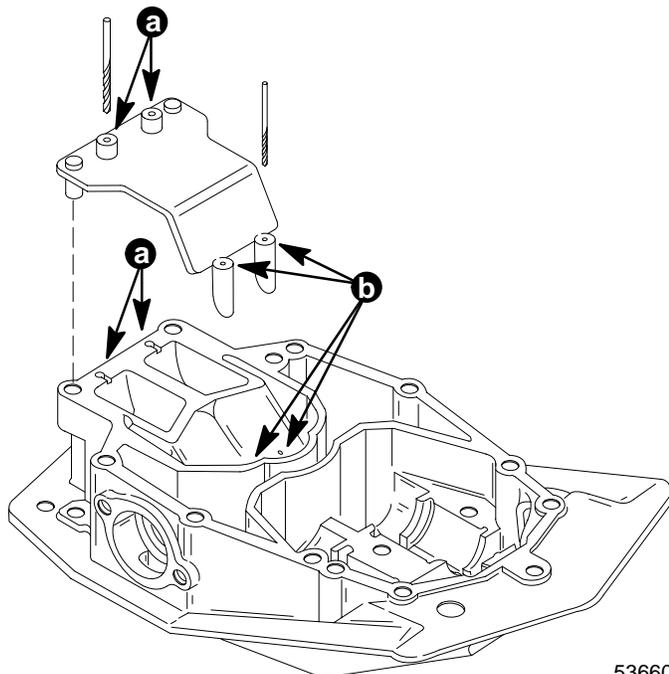
CANADA - Call Mercury Marine Service/Warranty
(905) 270-4481 or Quick Fax (800) 663-8334.

INTERNATIONAL - Call your area office.

5. If the cylinders are acceptable, oil all cylinder
bores and rotate crankshaft.
6. Reassemble cylinder heads with new o-rings and
seals. Oil and install cylinder head bolts. Torque
bolts holding thermostat housing to 30 lb. ft. (40.7
Nm) and rotate an additional 90°. Torque all other
cylinder head bolts to 20 lb. ft. (27.1 Nm) and ro-
tate an additional 90° as outlined in Service
Manual 90-822900 page 4A-36.

S/N 0D280813 thru 0G178947
MODIFY EXHAUST ADAPTER PLATE

1. Remove powerhead per Service Manual 90-822900 page 4A-7 thru 4A-10.
2. Clean gasket material from powerhead base flange and exhaust adapter plate surface.
3. Clean any corrosion from the powerhead base flange using a small diameter wire wheel on an electric or air tool. Use care not to damage or round-off the gasket surfaces.
4. Paint the powerhead base flange with cold-galvanizing or zinc-rich paint, such as Rust-oleum ZINC-SELE 7785 to prevent corrosion. Apply two light, uniform coats and allow to dry 30 minutes for each coat. Outboards after s/n 0G178948 have a protective coating on the gasket surface.
5. Assemble drill fixture 828809 to the exhaust adapter plate and drill four holes per figure 3.

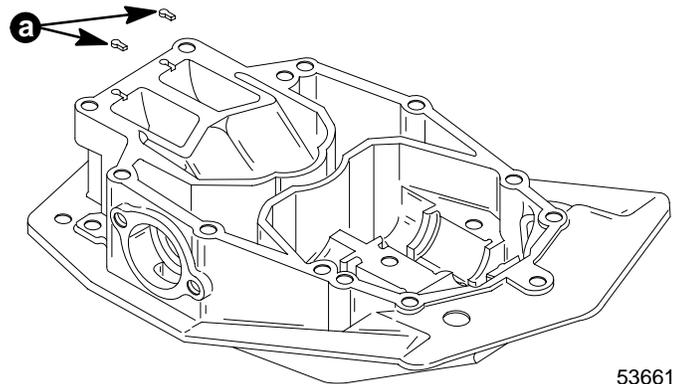


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- a - 3/16 inch (4.8 mm) Diameter Holes 1/8 inch (3.2 mm) Deep.
- b - #39 Drill (2.6 mm) Hole Completely Through Casting Section.

Figure 3. Drilling Fixture.

6. Install two p/n 19-828808 plugs into the exhaust adapter plate as shown in figure 4. The top of the plugs must be flush with the gasket surface. It is not necessary to Loctite or seal the plugs in place.



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- a - Plugs (2).

Figure 4. Plug installation.

7. Assemble new base gasket with the sealing bead up and reassemble the powerhead. Torque the 10 powerhead nuts to 50 lb-ft (67.8 N.m) in 3 progressive steps as per the Service Manual 90-822900 page 4A-43. DO NOT use the "feel" method. Non uniform torque can result in a crushed gasket, water leaks or broken bolt(s) later in service.
8. Secure the thermostat bypass hoses to the exhaust adapter plate fittings with p/n 54-815504206 stainless steel hose clamps.

S/N 0D280813 thru 0G147353
INSTALL LONGER WATER DRAIN CHECK VALVES:

1. Remove the two 2-1/4 inch (57 mm) long water drain check valves from the exhaust adaptor plate as shown in Figure 5.

2. Install new 3-1/2 inch (89 mm) long drain check valves p/n 21-817519A-1 by pushing them securely into the exhaust adaptor plate. Outboards after s/n 0G147354 have the longer drain check valves installed.

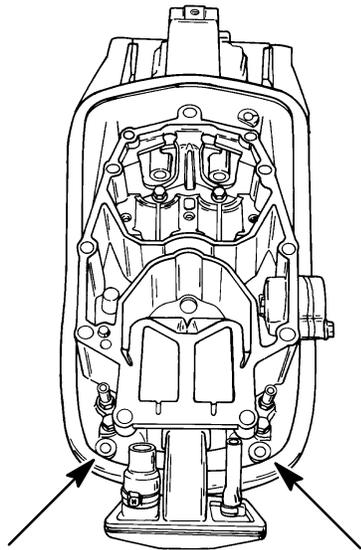


Figure 5. Water Drain Check Valves.

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**S/N 0D280813 thru 0G129211
APPLY DIELECTRIC GREASE:**

Inspect, clean, and apply dielectric grease p/n 92-823506--1 to the engine harness connector pins. The engine harness connector located on the starboard side of the engine, lays in the lower cowl on 1994 models and requires extra protection.

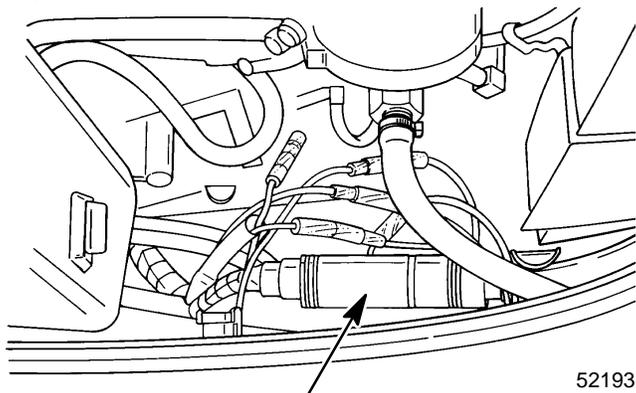


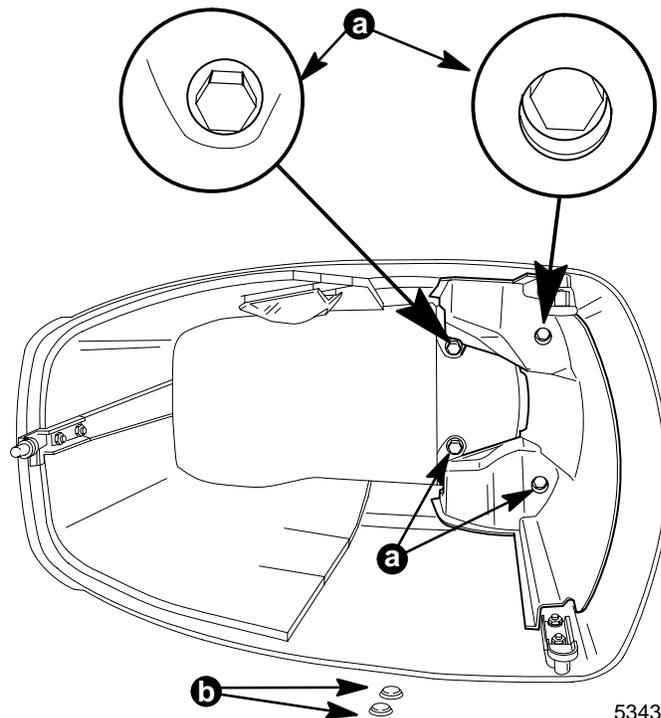
Figure 6. Engine Harness Connector.

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**S/N 0D280813 thru 0G165694
ADD COWL AIR INLET HOLES:**

Reduce the under cowl vacuum by drilling four 1 inch (25.4 mm) diameter air inlet holes in the rear of the top cowl per the drilling template 90-809591.

1. Remove the top cowl rear air inlet cap by removing the two hole plugs and the four rear cap attaching screws on the inside of the top cowl per figure 7.



a - Attaching Screws.
b - Hole Plugs.

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Figure 7. Top Cowl Bottom View.

2. Apply duct tape or masking tape on the top cowl painted surface to be drilled.
3. Align the cowl drilling template and mark the four hole center locations.
4. Drill four 1 inch (25.4 mm) diameter holes from the outside through the cowl per figure 8. Care must be taken not to allow the hole drill to contact the air deflector on the inside of the top cowl.

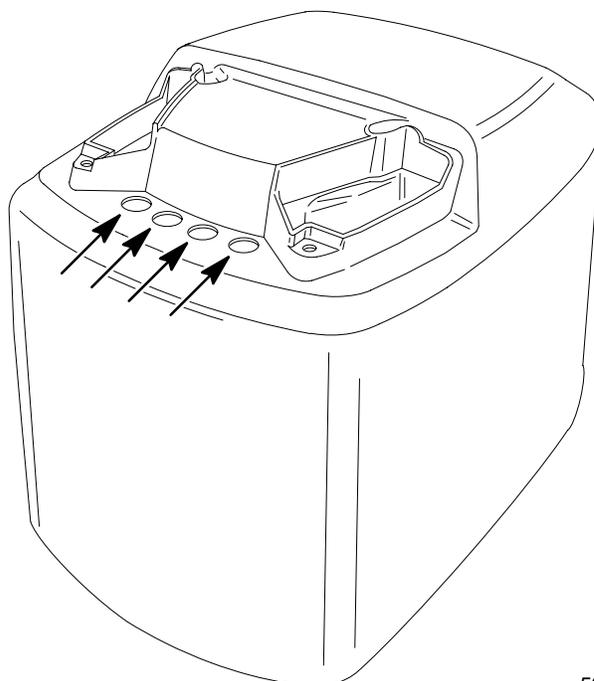


Figure 8. Cowl air Inlet Holes

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5. Sand and paint the exposed edges.
6. Reinstall the top cowl rear cap, four screws, and the two hole plugs.

Outboards after s/n 0G165695 have a top cowl with an additional air inlet.

0D280813 thru 0G178947

INSTALL COWL ROLLER RETAINERS

Install improved retaining rings (copper color) p/n 53-823795-1 on cowl roller shafts. Retaining rings and extra rollers are included in the repair kit.

0D280813 thru 0G178947

FINAL INSPECTION

1. Paint a white paint dot on the exhaust adaptor plate above the poppet valve. Paint in the same location as the raised boss on the new adaptor plate. Refer to figure 1.
2. Operate the outboard. Check and correct any water leaks or other problems noted.
3. Clean salt deposits, touch-up paint as required.
4. Verify that updates per Service Bulletin 93-20 have been completed. Complete these updates as required.

WARRANTY:

Complete warranty claim listing:

Outboard serial number.

(1) p/n 19-828808A-1 for each used outboard.

(1) p/n 19-828808A-2 for each new outboard.

Four (4) hours labor.

Warranty labor rate code NJC.

Failure code 509 40

CUSTOMER WARRANTY:

Mercury Marine will restart the complete one year limited warranty on registered outboards as of the completion date of these modifications. New Warranty Registration Cards will be issued when the warranty claim for the modifications is processed. Q-Guard coverage will be restarted from the new warranty expiration date.

REFERENCE:

Drill Fixture Kit p/n 828809A-1 contents:

- (1) 828809 drill fixture
- (1) 3/16 inch drill bit
- (2) #39 drill bit

Used Outboard

Repair Kit 19-828808A-1 contents:

- (1) 27-813932--2 base gasket
- (2) 19-828808 plug
- (2) 21-817519A-1 cowl drain
- (1) 90-809591 cowl drilling template
- (2) 54-816311 sta-strap
- (3) 815263 cowl roller
- (3) 53-823795--1 retaining ring
- (6) 25-818573 O-ring
- (2) 818574 cylinder head seal
- (2) 54-815504206 hose clamp

New Outboard

Repair Kit 19-828808A-2 contents:

- (1) 27-813932--2 base gasket
- (2) 19-828808 plug
- (2) 21-817519A-1 cowl drain
- (1) 90-809591 cowl drilling template
- (2) 54-816311 sta-strap
- (3) 815263 cowl roller
- (3) 53-823795--1 retaining ring
- (2) 54-815504206 hose clamp

December, 1994

Dear Customer,

On behalf of Mercury Marine we would like to thank you for your purchase of a 225 HP outboard. Since its introduction the 225 has proven to be the best performing, most technologically advanced outboard available today -- just as you would expect from the world leader in marine propulsion. We trust that your ownership experience to date has been a pleasant one.

In our on-going efforts to continually improve our products, recent tests have shown that in rare instances water may be ingested by the engine. Since this could affect durability, we have designed and implemented improvements to eliminate the potential for water ingestion.

Mercury Marine would like to offer these improvements to you at no charge to ensure your continued satisfaction with your 225 HP outboard. We believe these improvements are necessary to maintain the long term durability of your outboard.

What You Should Do ...

The procedure is quite simple. First, contact your authorized dealer, preferably the dealer that sold you the outboard, and make an appointment to have your motor serviced per Service Bulletin 94-11. Then, where possible, deliver your boat and this letter to the dealer at the appointed time. If your boat cannot be trailered, or otherwise delivered to the dealer, discuss alternatives with your dealer. The reverse side of this letter is a claim form that the dealer must send to us for reimbursement of the work done. You will not be charged for this service work.

After this service is completed, **Mercury Marine will restart the one year limited warranty on your outboard from the date of service completion.** A new warranty card will be issued to you upon receipt of the completed claim form from your servicing dealer.

We apologize for any inconvenience this service work may cause you. Please be assured that Mercury Marine is dedicated to producing the highest quality products and delivering total customer satisfaction. We value you highly as a customer and hope you have many years of enjoyable boating ahead of you. For that reason, we are pleased to offer this product improvement at our expense to ensure your continued boating enjoyment.

Best Regards,



Bob Kachelek
Director, Outboard Service