IMPORTANT INFORMATION

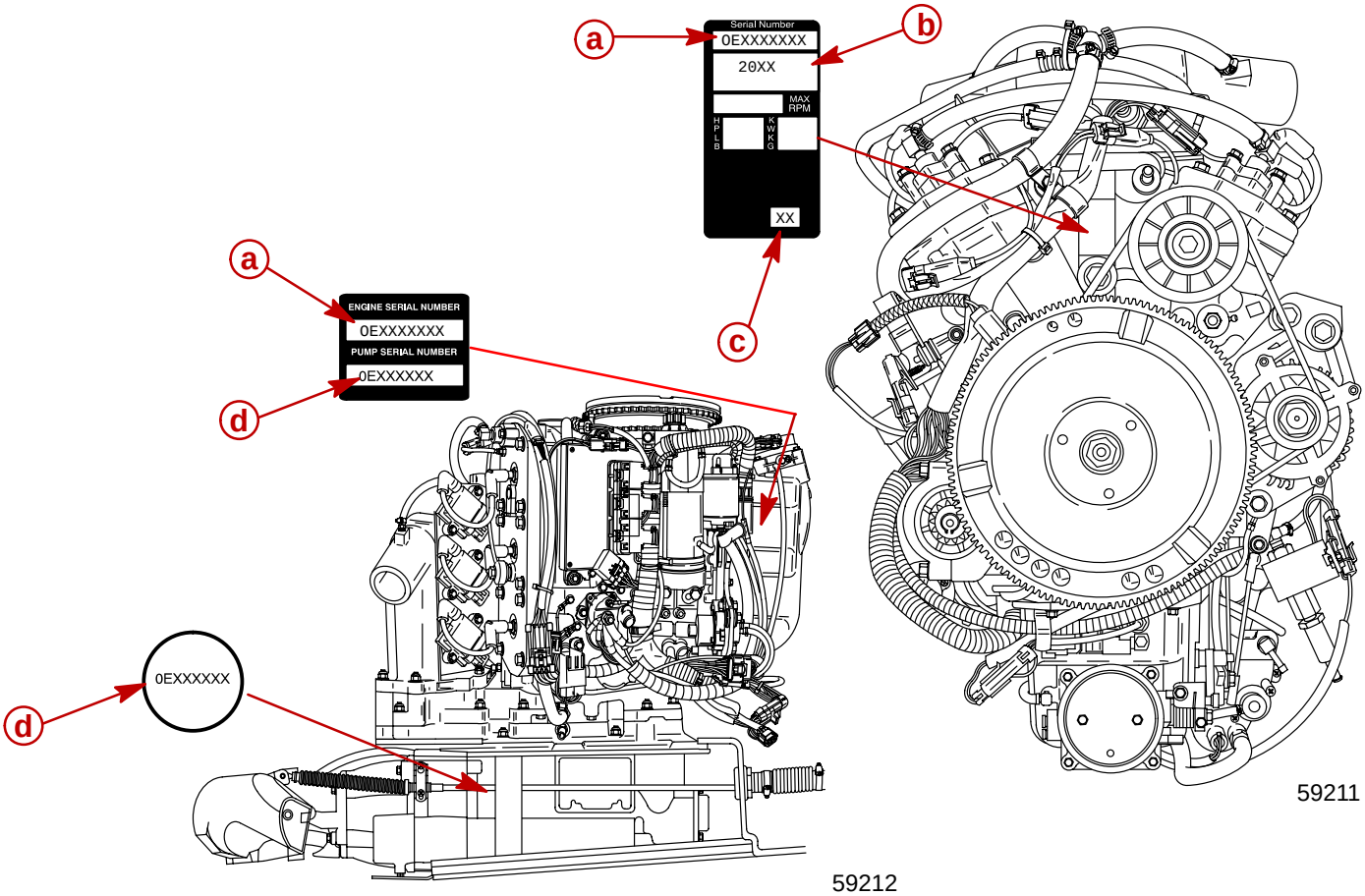
Section 1C - General Information

1 C

Table of Contents

Serial Number Location

A serial number decal is located on the side of the flywheel cover and on top of the cylinder block.



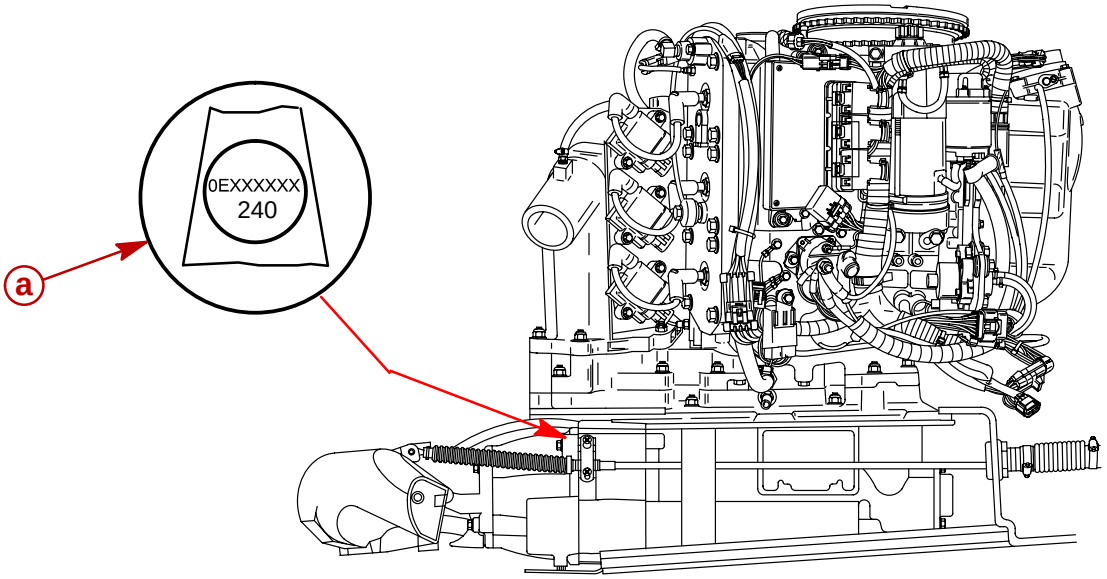
59211

59212

a - Engine Serial Number
b - Model Year
c - Year Manufactured
d - Pump Serial Number

IMPORTANT: The Pump Unit Serial Number sticker must be taken out of the envelope affixed to the pump unit and applied to decal on air intake.

The engine serial number and pump serial number are different and unique. The engine serial number is located on top of cylinder block. The pump unit serial number is stamped in a plug located above the shift cable hole on the starboard side of the pump housing.



59212

a - Pump Unit Serial Number

Conditions Affecting Performance

Weather

It is a known fact that weather conditions exert a profound effect on power output of internal combustion engines. Therefore, established horsepower ratings refer to the power that the engine will produce at its rated RPM under a specific combination of weather conditions.

Corporations internationally have settled on adoption of I.S.O. (International Standards Organization) engine test standards as set forth in I.S.O. 3046, standardizing the computation of horsepower from data obtained on the dynamometer. All values are corrected to the power that the engine will produce at sea level, at 30% relative humidity, at 77° F (25° C) temperature and a barometric pressure of 29.61 inches of mercury.

Summer conditions of high temperature, low barometric pressure and high humidity all combine to reduce the engine power. This, in turn, is reflected in decreased boat speeds--as much as 2 or 3 miles-per-hour (3 or 5 km per hour) in some cases. Nothing will regain this speed for the boater, but the coming of cool, dry weather.

In pointing out the practical consequences of weather effects, an engine running on a hot, humid, summer day may encounter a loss of as much as 14% of the horsepower it would produce on a dry, brisk spring or fall day. The horsepower that any internal combustion engine produces depends upon the density of the air that it consumes and in turn, this density is dependent upon the temperature of the air, its barometric pressure and water vapor (or humidity) content.

Boat

WEIGHT DISTRIBUTION

1. Proper positioning of the weight inside the boat (persons and gear) has a significant effect on the boat's performance, for example:

   a. Shifting weight to the rear (stern)

(1.) Generally increases top speed.

(2.) If in excess, can cause the boat to porpoise.

(3.) Can make the bow bounce excessively in choppy water.

(4.) Will increase the danger of the following wave splashing into the boat when coming off plane.

b. Shifting weight to the front (bow)

(1.) Improves ease of planing off.

(2.) Generally improves rough water ride.

(3.) If excessive, can make the boat veer back-and-forth (bow steer).

BOTTOM

1. **Boat Bottom:** For maximum speed, a boat bottom should be nearly a flat plane where it contacts the water and particularly straight and smooth in fore-and-aft direction.

   a. **Hook:** Exists when bottom is concave in fore-and-aft direction when viewed from the side. When boat is planing, “hook” causes more lift on bottom near transom and allows bow to drop, thus greatly increasing wetted surface and reducing boat speed. “Hook” frequently is caused by supporting boat too far ahead of transom while hauling on a trailer or during storage.

   b. **Rocker:** The reverse of hook and much less common. “Rocker” exists if bottom is convex in fore-and-aft direction when viewed from the side, and boat has strong tendency to porpoise.

   c. **Surface Roughness:** Moss, barnacles, etc., on boat or corrosion of motor’s gear housing increases skin friction and cause speed loss. Clean surfaces when necessary.

   d. **Jet Unit:** If unit is left in the water, marine vegetation may accumulate over a period of time. This growth MUST be removed from unit before operation, as it may clog the water inlet holes in the gear housing and cause the engine to overheat.

WATER ABSORPTION

It is imperative that all through hull fasteners be coated with a quality marine sealer at time of installation. Water intrusion into the transom core and/or inner hull will result in additional boat weight (reduced boat performance), hull decay and eventual structural failure.

CAVITATION

Cavitation is caused by water vapor bubbles forming either from sharp turns or from an irregularity in the impeller blade itself. These vapor bubbles flow back and collapse when striking the surface of the impeller blade resulting in the erosion of the impeller blade surface. If allowed to continue, eventual blade failure (breakage) will occur.

VENTILATION

Ventilation occurs when air is drawn from the water’s surface or from the engine exhaust flow (in reverse) into the impeller blades. These air bubbles strike the impeller blade surface and cause erosion of the blade surface. If allowed to continue, eventual blade failure (breakage) will occur.

Engine

DETONATION

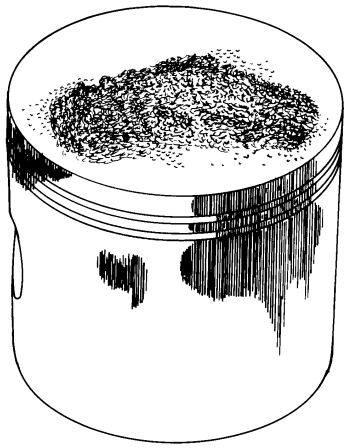
Detonation in a 2-cycle engine resembles the “pinging” heard in an automobile engine. It can be described as a “rattling” or “plinking” sound.

Detonation generally is thought of as spontaneous ignition, but it is best described as a noisy explosion in an unburned portion of the fuel/air charge after the spark plug has fired. Detonation creates severe, untimely shock waves in the engine and these shock waves often find or create a weakness: the dome of a piston, piston rings or piston ring lands, piston pin and roller bearings.

While there are many causes for detonation in a 2-cycle engine emphasis is placed on those causes which are most common in marine 2-cycle application. A few which are not commonly understood are:

1. Over-advanced ignition timing.
2. Use of low octane gasoline.
3. Lean fuel mixture at or near wide open throttle.
4. Spark plugs (heat range too hot, incorrect reach, cross-firing).
5. Inadequate engine cooling (deteriorated cooling system).
6. Combustion chamber/piston deposits (result in higher compression ratio).

Detonation usually can be prevented provided that (1) the engine is correctly set up and (2) diligent maintenance is applied to combat the preceding detonation causes listed.



51115

Damaged Piston Resulting from Detonation

Engine Compression

1. Remove spark plugs.
2. Install compression gauge in spark plug hole.
3. Hold throttle plate at W.O.T.
4. Crank engine through at least four compression strokes to obtain highest possible reading.
5. Check and record compression of each cylinder. Variation of more than 15 psi (103.5 kPa) between cylinders indicates that lower compression cylinder is in some way defective such as worn or sticking piston rings and/or scored piston and cylinder.
6. Compression check is important because an engine with low or uneven compression cannot be tuned successfully to give peak performance. It is essential, therefore, that improper compression be corrected before proceeding with an engine tune-up.
7. Cylinder scoring: if powerhead shows any indication of overheating, such as discolored or scorched paint, visually inspect cylinders for scoring or other damage as outlined in Section 4: **Powerhead**.

Water Pressure Check

Water pressure may be checked by using a Digital Diagnostic Terminal (91-823686A2), or if the boat is so equipped, with a Mercury Monitor or Smartcraft Gauges.

RPM	Water Pressure PSI (kPa)
1,000 - 1,100 (in Neutral)	1/2 - 1-1/2 (3.4 - 10.0)
5300 (Boat on Plane)	10 - 15 (69 - 103)
6000 (Boat on Plane)	13 - 17 (90 - 117)

Following Complete Submersion

Submerged engine treatment is divided into three distinct problem areas. The most critical is submersion in salt water, the second is submersion while running, the third is submerged in fresh water.

Salt Water Submersion

Due to the corrosive effect of salt water on internal engine components complete disassembly is necessary before any attempt is made to start the engine.

Submerged While Running

When an engine is submerged while running, the possibility of internal engine damage is greatly increased. If, after engine is recovered and with spark plugs removed, engine fails to rotate freely when turning flywheel, the possibility of internal damage (bent connecting rod and/or bent crankshaft) exists. If this is the case, the powerhead must be disassembled.

Fresh Water Submersion

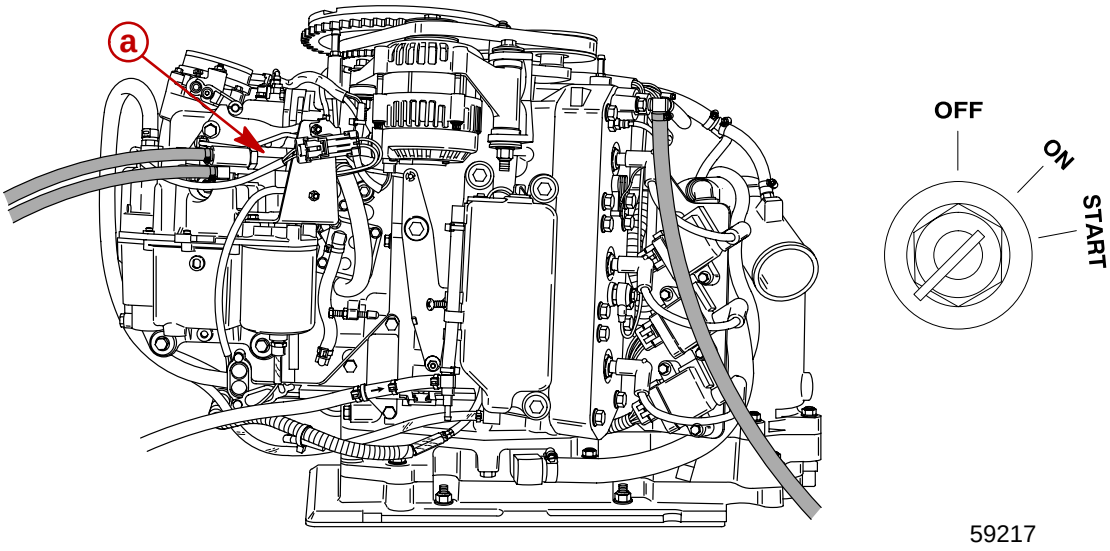
IMPORTANT: Engine should be run within 2 hours after recovery, or serious internal damage may occur. If unable to start engine in this period, disassemble engine and clean all parts. Apply oil as soon as possible.

NOTE: *If sand has entered the air intake on the engine, do not attempt to the start the engine. Sand will cause internal engine damage. Disassembly is required to clean all internal engine components of sand.*

1. Recover engine from water as quickly as possible.
2. Clean the exterior of powerhead with fresh water.
3. Dry all wiring and electrical components using compressed air.
4. Drain water from fuel system as follows:
   a. Disconnect remote fuel hose from engine.
   b. Remove drain plug from vapor separator and drain fuel/water. Reinstall plug after draining.
   c. Remove the water separating fuel filter and empty contents.
5. Drain water from engine as follows:
   a. Remove throttle plate assembly (4 bolts) and sponge water/debris out of air plenum.
   b. Remove spark plugs from engine.
   c. Rotate flywheel manually to blow out any water from the cylinders.

d. Add approximately one ounce (30ml) of engine oil into each spark plug hole. Rotate the flywheel manually several times to distribute the oil in the cylinders. Reinstall spark plugs.

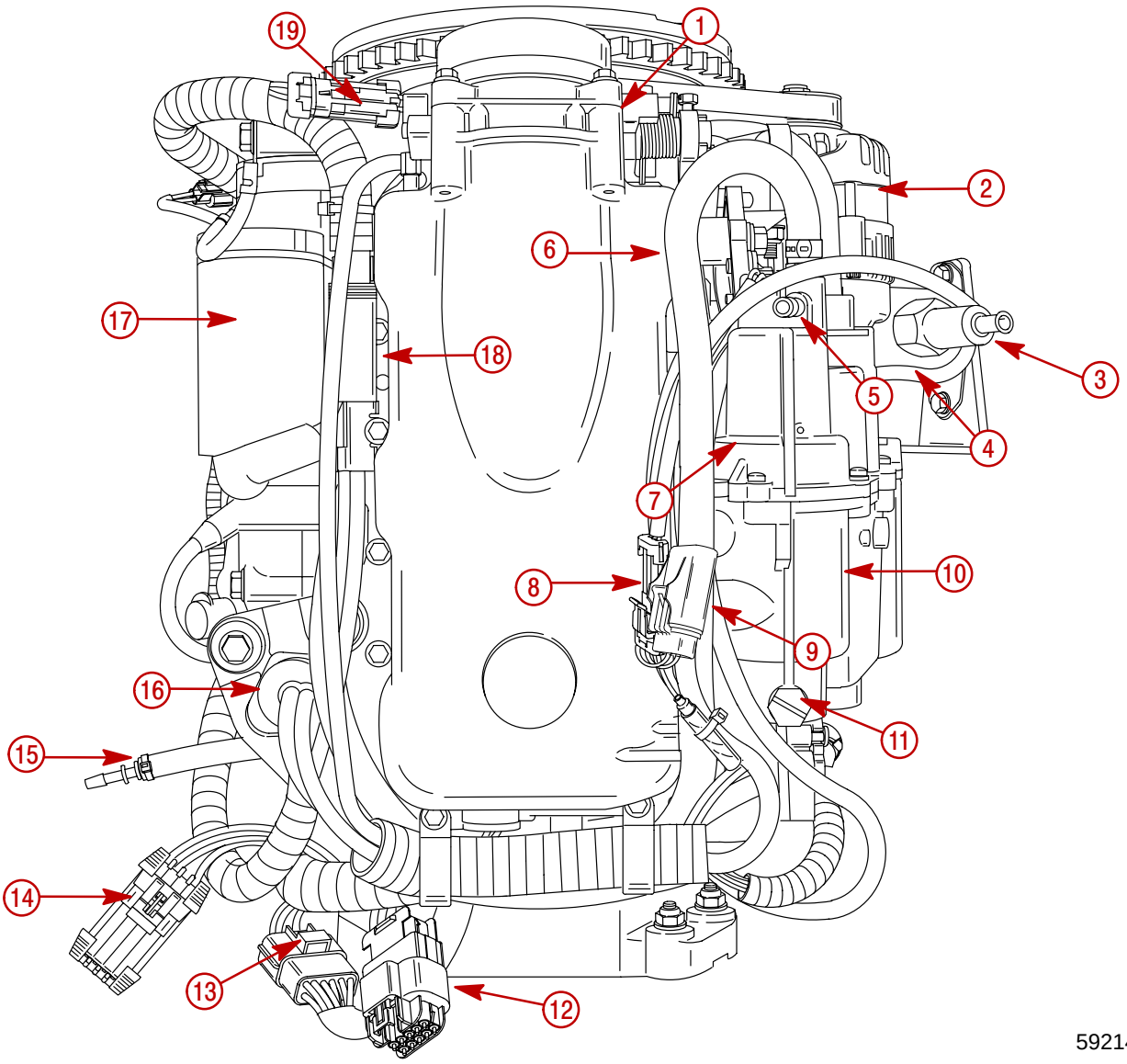
6. Drain water from the oil injection system as follows:
   a. Remove remote oil hose (black without blue stripe) from pulse fitting on starboard side of engine.
   b. Drain any water from hose and reconnect.
   c. If water was present in hose, check for water in the remote oil tank. Drain tank if water is present.
7. Disassemble the engine starter motor and dry components.
8. Prime the oil injection pump as follows:
   a. Fill the engine fuel system with fuel. Connect fuel hose to fuel lift pump (a).
   b. Turn the ignition key switch to the “ON” position.



NOTE: *Audible click from the oil pump will tell you the pump is priming. It may take a few minutes for the pump to complete the priming process.*

9. Attempt to start engine, using a fresh fuel source. If engine starts, it should be run for at least one hour to eliminate any water in engine.
10. If engine fails to start, determine cause (fuel, electrical or mechanical).

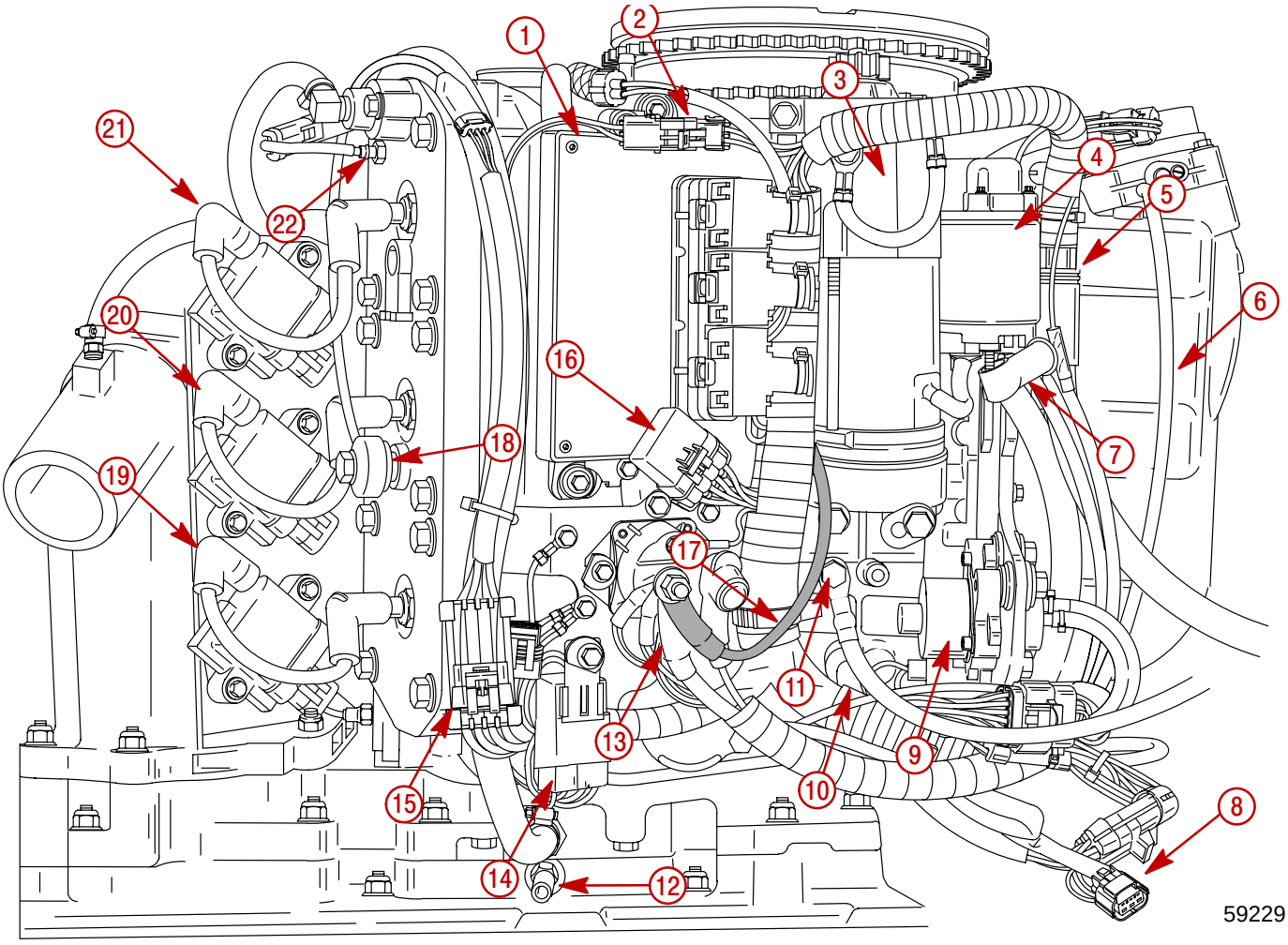
Model 240 HP Front View



59214

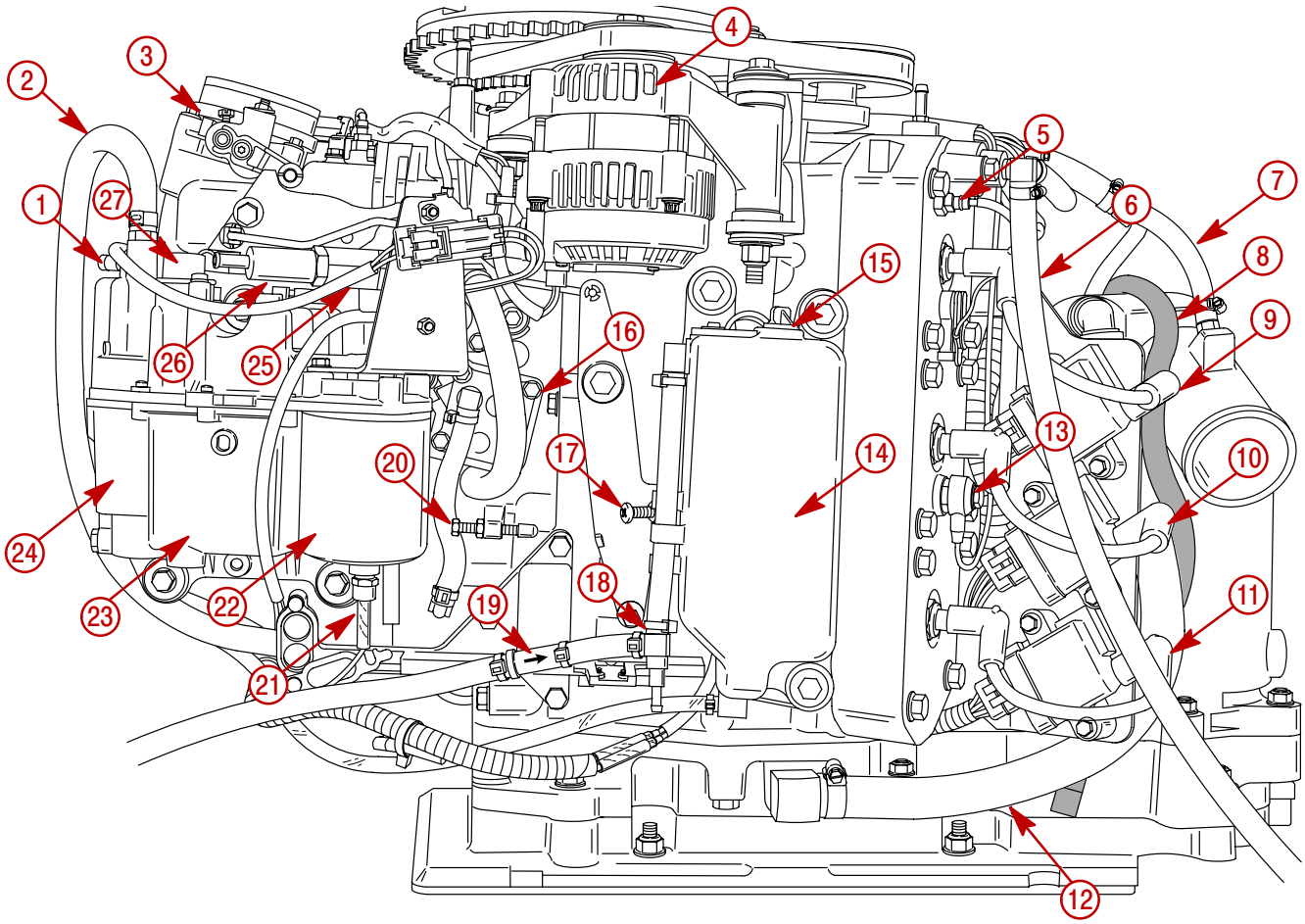
1 - Throttle Plate Assembly
2 - 60 Ampere Alternator
3 - Fuel Filter
4 - Fuel Lift Pump
5 - Fuel Pressure Test Port
6 - High Pressure Fuel Hose 41-45 psi (283-310 kPa)
7 - High Pressure Electric Fuel Pump (Inside Vapor Separator)
8 - Electric Fuel Pump Harness Connector
9 - 3 Amp Fuse for Fuel Lift Pump
10 - Vapor Separator Tank (VST)
11 - Vapor Separator Drain Plug
12 - SmartCraft Harness Connector
13 - Fuel Injector Harness Connector
14 - Fuel Tank/Oil Tank/Speedo Paddle Wheel Harness Connector
15 - Remote Oil Tank Pressure Hose
16 - Oil Pump
17 - Starter Solenoid
18 - Engine Harness Connector
19 - Air Temperature Sensor Connector

Model 240 HP Starboard View



1 - Electronic Control Module
2 - DDT Connector
3 - Starter Motor
4 - Starter Solenoid
5 - Engine Harness Connector
6 - Fuel Regulator Vacuum Hose
7 - Positive (+) Cable from Slave Solenoid
8 - OIL/Fuel/Paddle Wheel Sensor Connector
9 - Oil Pump
10 - Remote Oil Tank Pressure Hose
11 - Negative (–) Battery Connector
12 - Powerhead/Jet Pump Flush Fitting
13 - Slave Solenoid/Positive(+) Battery Cable
14 - Main Power Relay
15 - Knock Sensor Harness Connector
16 - Fuses (4)
17 - 3 Amp Fuseable Link Lead
18 - Starboard Knock Sensor
19 - Cyl. # 5 Ignition Coil
20 - Cyl. # 3 Ignition Coil
21 - Cyl. # 1 Ignition Coil
22 - Starboard Temperature Sensor

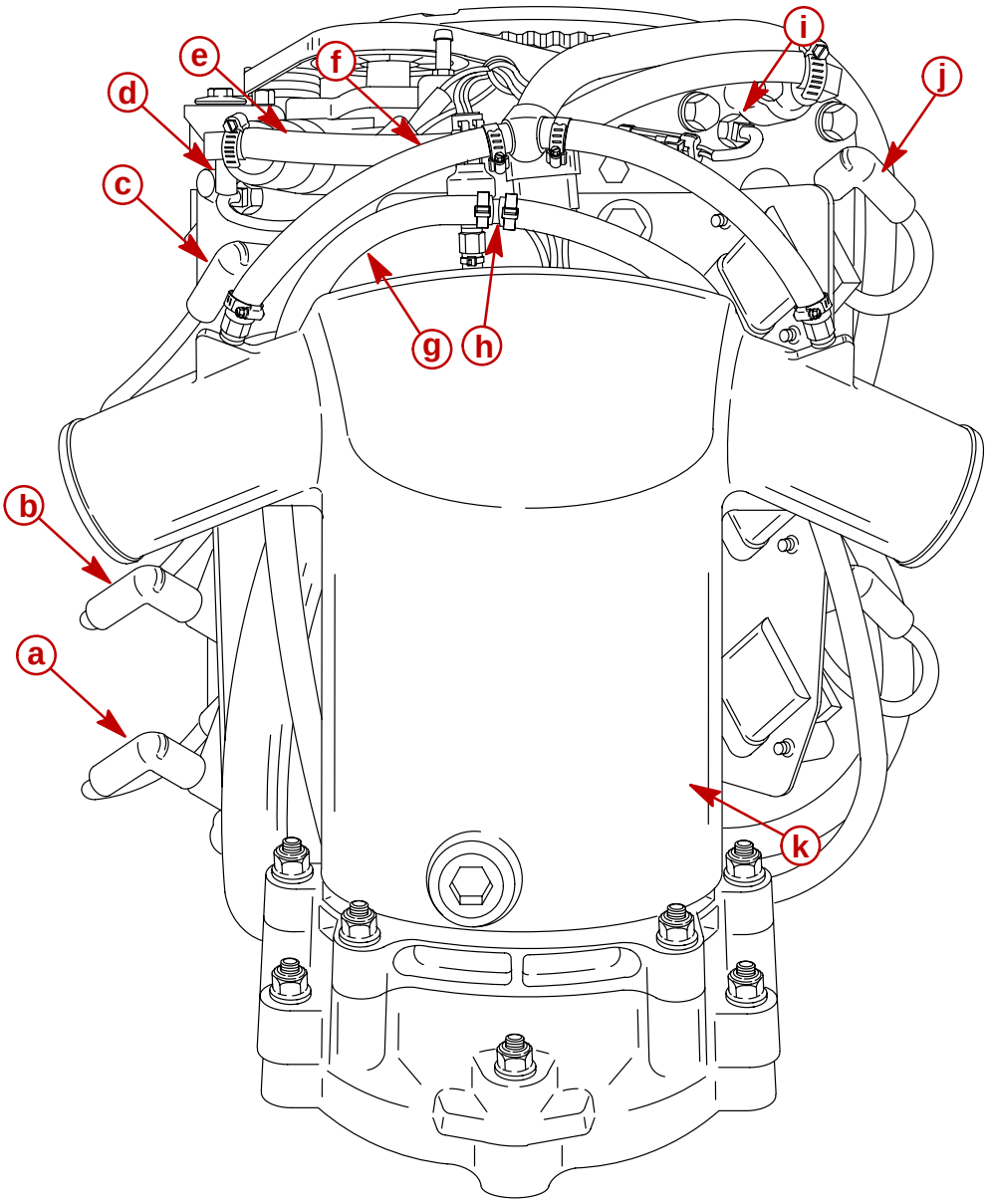
Model 240 HP Port View



59213

1 - Fuel Pressure Test Port
2 - High Pressure Fuel Hose 41-45 psi (283-310 kPa)
3 - Throttle Plate Assembly
4 - 60 Ampere Alternator
5 - Port Temperature Sensor
6 - Water Bypass Hose
7 - Exhaust Pipe Coolant Hose
8 - Bilge Siphon Hose
9 - #2 Ignition Coil
10 - #4 Ignition Coil
11 - #6 Ignition Coil
12 - Expansion Chamber Coolant Hose
13 - Port Knock Sensor
14 - Oil Reservoir
15 - Low Oil Switch
16 - Pulse Fuel Pump
17 - Idle Stop Screw
18 - 4 psi Check Valve
19 - Inlet Oil Hose Filter
20 - Full Throttle Stop Screw
21 - Fuel/Water Sensor
22 - Fuel/Water Separator
23 - Vapor Separator
24 - High Pressure Electric Fuel Pump (Inside Vapor Separator)
25 - Fuel Lift Electric Fuel Pump
26 - Fuel Filter
27 - Fuel Pressure Regulator

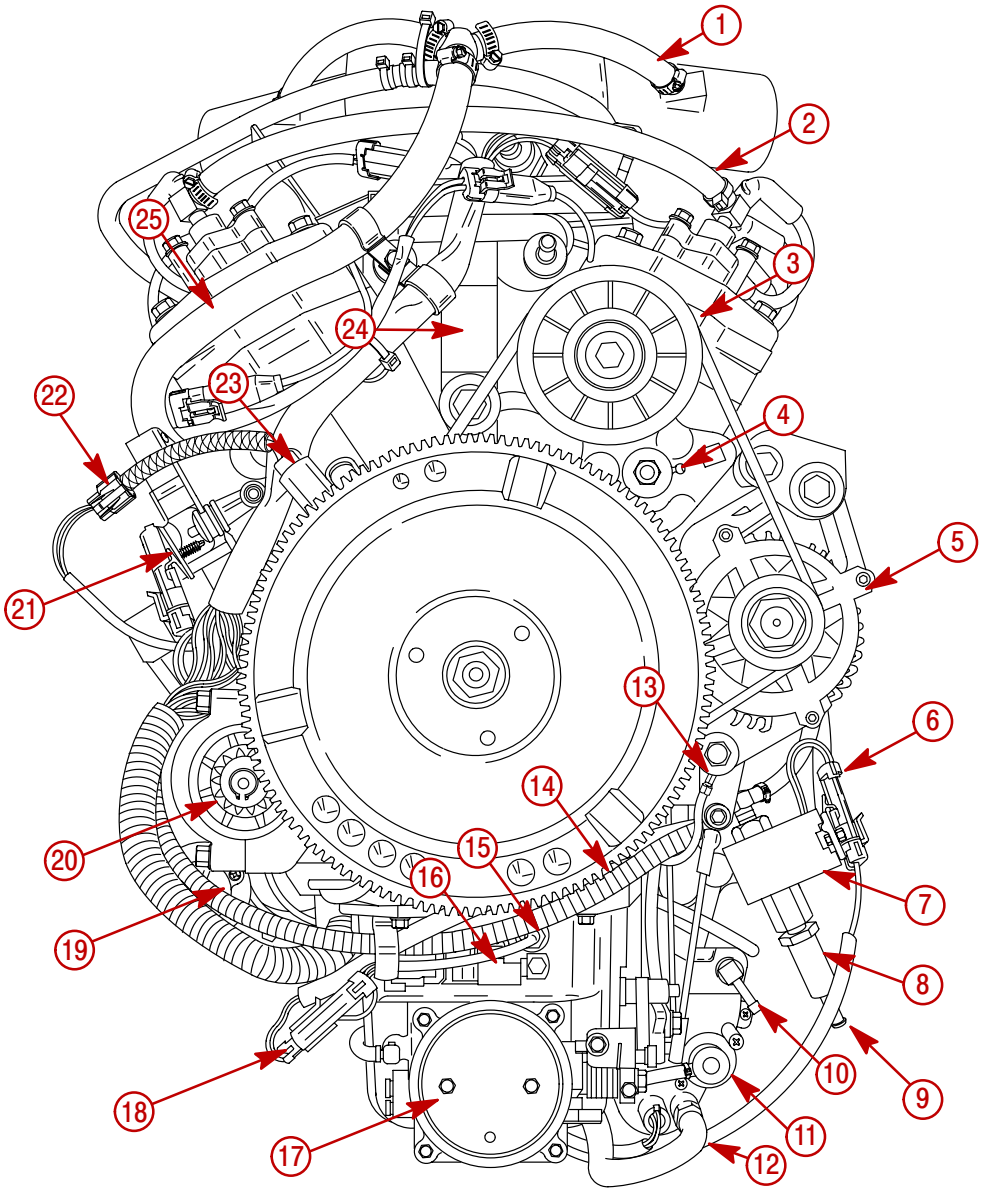
Model 240 HP Aft View



59210

a - #6 Ignition Coil
b - #4 Ignition Coil
c - #2 Cylinder
d - Port Temperature Sensor
e - Water Bypass Hose
f - Exhaust Pipe Coolant Hose
g - Bilge Suction Hose
h - Siphon Break
i - Starboard Temperature Sensor
j - #1 Cylinder
k - Expansion Chamber

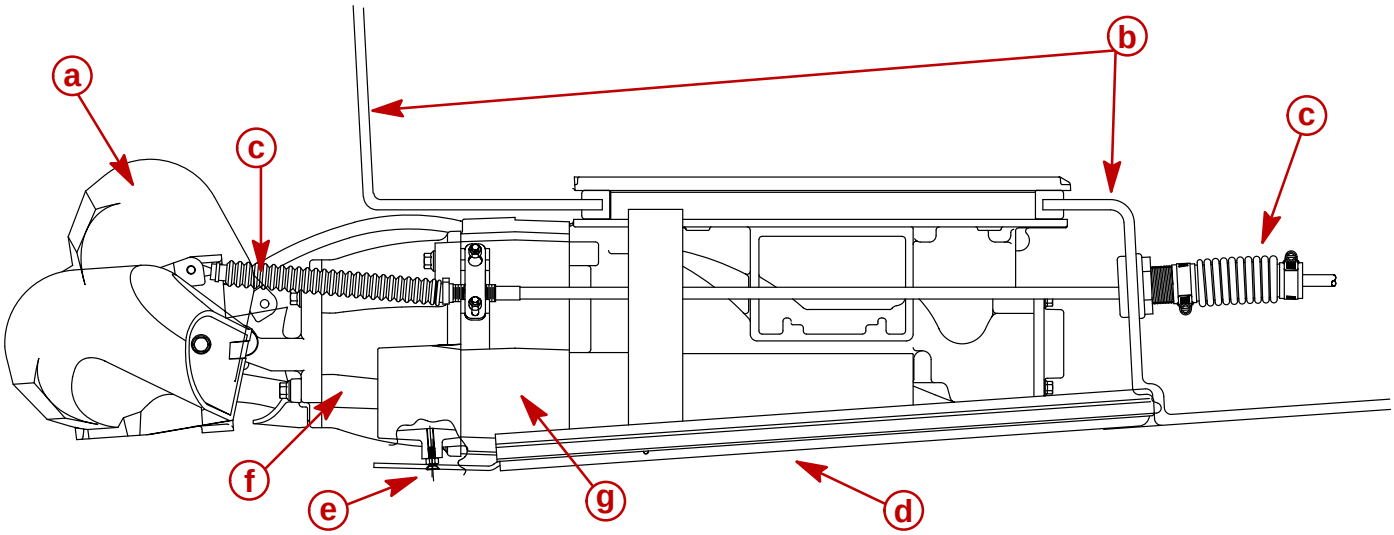
Model 240 HP Top View



59211

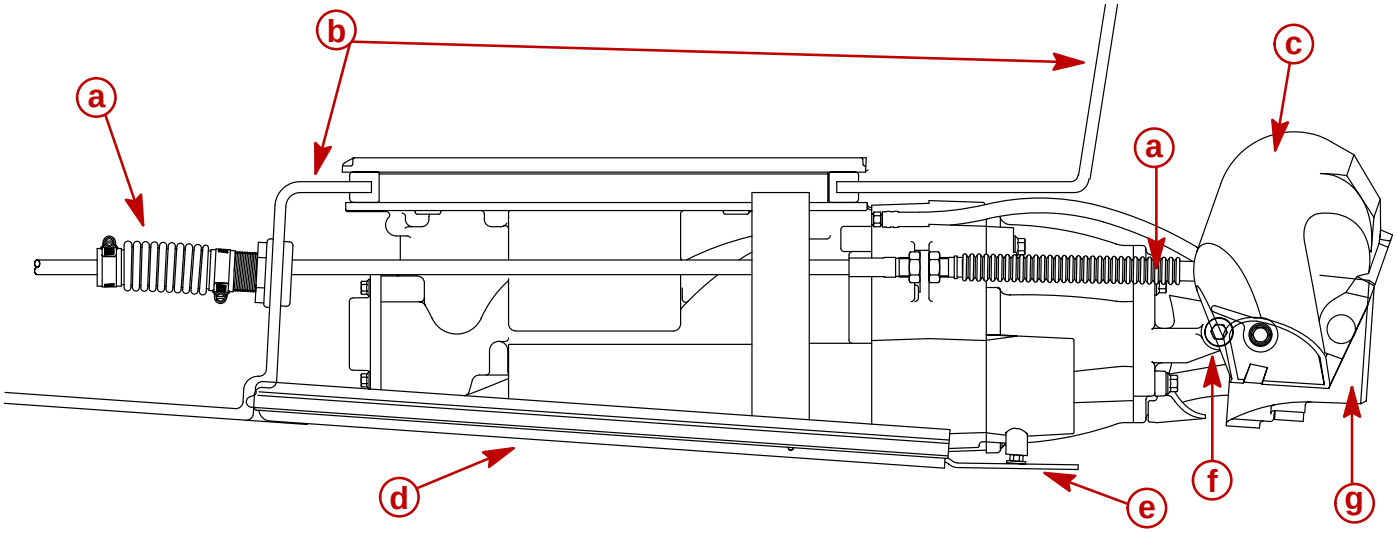
1 - Exhaust Pipe Coolant Hose
2 - Water Bypass Hose
3 - Belt Tensioner
4 - Tensioner Grease Fitting
5 - 60 Ampere Alternator
6 - Fuel Lift Pump Connector
7 - Fuel Lift Pump
8 - Fuel Filter
9 - Fuel Inlet
10 - VST Vent Hose Fitting
11 - Fuel Pressure Regulator
12 - High Pressure Fuel Hose 41-45 psi (283-310 kPa)
13 - Throttle Position Sensor
14 - 3 Amp Fuseable Link Lead
15 - Air Temperature Sensor
16 - MAP Sensor
17 - Throttle Plate Assembly
18 - Air Temp Sensor Connector
19 - Starter Solenoid
20 - Starter Motor
21 - Digital Diagnostic Terminal (DDT) Connector
22 - Crank Position Sensor Connector
23 - Crank Position Sensor
24 - Engine Serial Number
25 - Exhaust Coolant Supply Hose

Mercury Jet Pump Starboard View



a - Reverse Gate
b - Hull
c - Shift Cable Assembly
d - Water Intake
e - Trim Plate Assembly
f - Stator
g - Wear Ring

Mercury Jet Pump Port View



a - Steering Cable Assembly
b - Hull
c - Reverse Gate
d - Water Intake
e - Trim Plate Assembly
f - Forward Stop
g - Rudder