SAN JUAN FRESH WATER COOLING SYSTEMS

SPECIAL ADVANTAGES
OF THE SAN JUAN COOLING SYSTEMS

- * **Longer Engine Life.**
- * **No corrosion or harmful salt deposits.**
- * **More uniform operating temperatures are assured for greater fuel economy and the elimination of harmful sludge.**
- * **Permanent-type Anti -freeze may be used to insure year around protection.**
- * **Equipped with standard zinc pencil to protect against electrolytic action.**
- + **Workmanship and material fully guaranteed.**

* **COMPACT**
The San Juan fresh water cooling system does not increase the height, width or length of the engine.

* **EFFICIENT**
Improved Internal design gives generous cooling capacity. Temperatures will not surge after a hard run. Additional efficiency and protection from coolant loss is obtained through the use of a pressure cap,

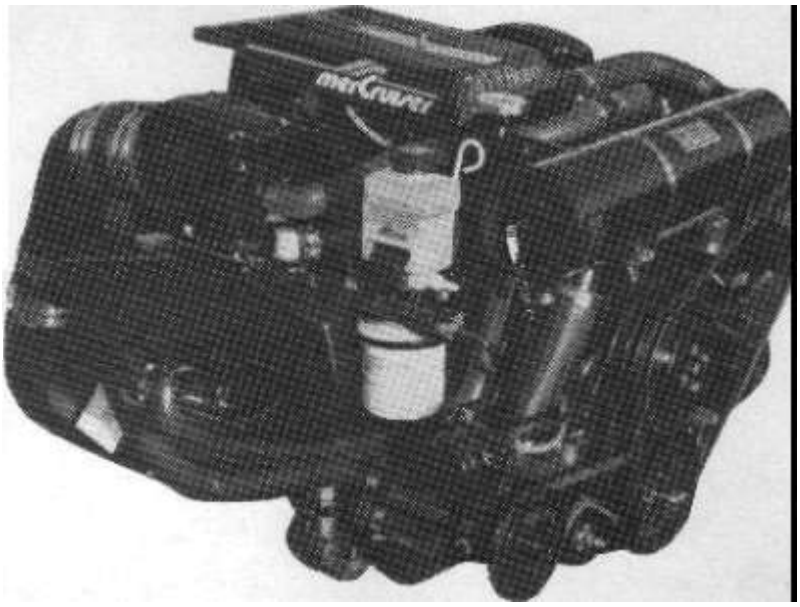
+ **DURABLE**
To insure years of satisfactory service, entire unit is constructed of pure copper with silver alloys. Also equipped with standard zinc pencil to protect against local electrolytic action.

* **QUICKLY INSTALLED**
This kit can be installed by anyone with a few common hand tools.

* **COMPLETELY ON ENGINE**
This San Juan Cooler is completely on engine, including cooler, mounting brackets, etc. Nothing in the "Bilge."

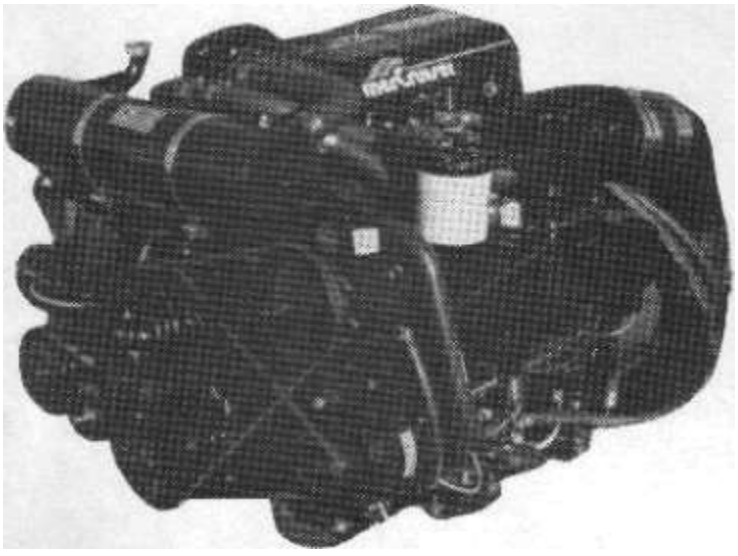
MC 311
MERCRUVSER
7.4 Litre Bravo

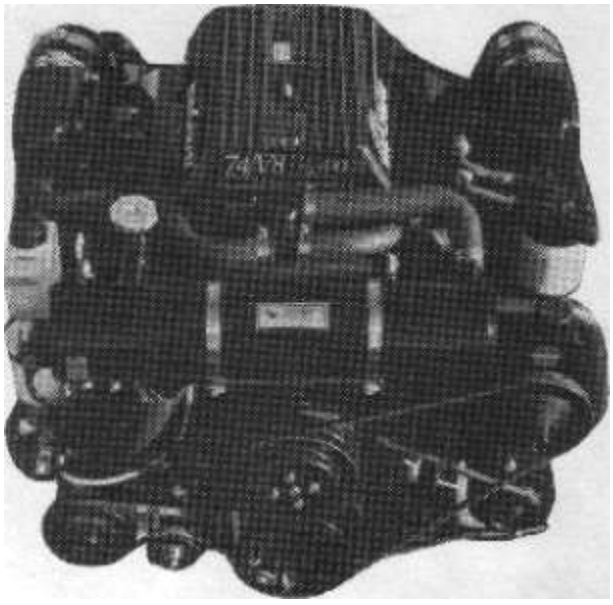
full system



NO EXTRAS TO BUY

Designed for close tolerance Engine Compartment Installations





SAN JUAN ENGINEERING & MANUFACTURING CO.
766 MARINE DRIVE • BELLINGHAM, WASHINGTON 98225 • (360)734-1910

P/N# MC 311

INSTALLATION INSTRUCTIONS FOR THE 7.4 MERCRUISER BRAVO V-8 SAN JUAN FRESH WATER COOLING

NOTE: In these instructions, R(right) and L(left) refers to the engines R. & L. while standing at the vessels transom and looking forward.

1. Drain both block and manifolds. The block drains are located on each side of the block below manifolds. To drain manifolds, remove the hose located center bottom of each manifold. If there are plastic adapters the hoses are connected to remove and replace with brass fitting provided.

2. A. Remove and Save the temperature sending units (2) from the original thermostat housing (located top, front, center of engine). Carefully note which wire connects to each unit.

   B. Loosen and remove all hoses from the thermostat housing. Leave the other ends connected

   C. Remove the thermostat housing and lifting ring. Discard.

3. A. Clean gasket surface,

   B. Now with the new thermostat, gasket, housing and 3/8" X 7/8" bolts, place the new thermostat in the recess in the intake manifold, with the pointed end up. Place the new gasket over the thermostat then place the new thermostat housing in place with the two threaded openings pointing aft. Secure with 3/8" X 7/8" bolts. Install the two sending units in the threaded openings, connect corresponding wires.

4. Install the heat exchanger mount: Two options

   A-1. Oil cooler mounted in front. Use the lower holes in the steel bracket when mounting the bracket on the engine. You may have to loosen the bracket on the oil cooler and push the oil cooler down slightly.

   A. There are two 7/16" threaded horizontal holes in the top front of the engine. Each is about 4" on each side of the 1" dia, 90° curved by-pass hose that connects down into the engines water pump. The L. hole has a 5/8" Hex bolt in it holding the power steering pump mount.

   B. Remove and discard that bolt. Using the 7/16" X 1-1/2" bolt supplied and the mount from the kit, hold mount up to the engine front with the cradle pert up and forward. Start the bolt into the power steering mount hole.

   C. Using the 7/16" X 2" bolt and the 1" spacer supplied. Install the bolt in to the right cylinder heads corresponding hole. TIGHTEN BOTH BOLTS FIRMLY.

5. Remove both exhaust risers:**(See Note 2)

   A. Carefully clean both the riser and the exhaust manifold gasket surfaces. They must be absolutely free from all gasket particles,

   B. At this time remove the two hollow headed 3/4" pipe plugs from each manifold. They are just forward of the manifolds exhaust gasket surface. (Use a 1/2" drive flex bar for this).

   C. Remove from the kit two brass, 90° 3/4" pipe to 1" hose, adapter elbows. Screw these into manifolds and tighten so the hose spuds point forward and approximately 45° in, toward center and/or toward the top front corner of each corresponding valve cover.

   D. Now carefully re-install the exhaust risers using the blank gaskets provide. Tighten bolts alternately and evenly until they are very firm.

Note 1: This would also be a good time to install the two original hoses removed in Step 2,B. that connect from under the exhaust manifold, up to the front of engine. Connect each hose onto a corresponding spud on the NEW thermostat housing. Clamp.

6. Installing the heat exchanger:

   A. Place the rubber pad supplied onto the mount. Do not caver slots in mount.

   B. Place the heat exchanger onto the mount with its fill cap up and level to the carburetor flame arrestor cover and with the R. end approximately 1" from the drive oil reservoir.

C. Secure in place with two size 80 clamps provided. Note: Place long end of clamp down around the rear of the heat exchanger and into the mounts slots then under the mount. Screw end should be pointing forward and positioned against the forward slope at "V" in mounts. Tighten Just Snugly.

7. Hosing up:

A. Carefully cut the original large hose that connects onto the engines water pump inlet, so that it can connect onto the large spud under the R. end of the heat exchanger. Clamp.

B. Hold the 1-1/4" sea water hose up to the 1-1/4" hose spud on the left bottom side of the heat exchanger. Cut to lenght and Install, clamp. This Is the hose that comes from the sea water pump through the oil cooler.

C. Now, connect the 90° brass spud, installed the L. manifold, to the 1" spud on left upper, rear inlet of the heat exchanger with the 1" X 10-1/2" hose. Then use the 1" X 23" hose to connect the brass elbow on R. manifold to the other 1" spud on the heat exchanger inlet.

D. Take the 1-1/4" 90^{D} rubber elbow and the 1" X I" X 1-1/4" 90° tee, connect the long leg of the rubber elbow to the 90* elbow on the tee. Tilt the tee toward the carburetor, it will be between the heat exchanger and the carburetor. Slip the other end of the rubber elbow over the 1-1/4" hose spud on the heat exchanger.

**Note2:If the exhaust high rises on the manifolds do not have hoses or fittings, remove the 3/4" plugs from high rises. Install one 3/4" X 1" 90* adapters from the kit in port high rise and one straight fitting in starboard side. In the kit you will find a 1" X 42" hose. Measure from each bigh rise fitting to the tee you Installed in 7.D. Cut and connect hoses, clamp.

8. This system uses a recovery type accumulator for the expansion of the coolant and also removal of air from the system. The best location for this accumulator tank varies vessel to vessel. So find a suitable location where it will be visible and easy to add water.

A. Mount the plastic accumulator tank In its wire hanger in a vertical position near the engine and as high as possible. Use 5/32" drill for pilot holes for the mounting screws.

B. Install the plastic tube onto the heat exchanger overflow spud, just under the heat exchanger fill cap. Then route the tube in the least obstruct ional path and connect to the lower nipple on the plastic tank. Use spring clamp to secure tube to tank. Be sure that there is no sharp bends or kinks In this tube. Then place rubber hose supplied on tanks top overflow spud.

8. C. Fill accumulator tank to cold line. When filling the system with coolant water fill through the fill cap neck on the heat exchanger. Continue to fill until water is overflowing at the fill neck. As it is important to remove all air from the system, leave the fill cap off after starting engine and be prepared to refill water into fill neck as air is removed and water level drops. ALL AIR MUST BE OUT of system if it is to work properly. This may take 10 minutes, or more, of running the engine in neutral at 1,000 to 1,500 RPM at the dock. DO NOT run the engine at all without a water supply to the sea water pump. The sea water pump will be damaged or destroyed .IF RUM DRY. When you are sure all air has been purged from the system and the water level has stabilized at the fill neck and it is full, install the fill cap. Re-check this several times after a few hours of use. ONLY when engine is cold. DO NOT REMOVE FILL CAP WHEN ENGINE IS H0T!

Note 3: Check to be sure that all hose clamps are snug. DO NOT over tighten. Also, check all hoses to be sure they do not chaff on engine parts, belts, etc.

Note 4: Coolant capacity is approximately 14 quarts U.S.

Note 5: Some engine parts are not protected by antifreeze in the system. Such as the sea water side of the heat exchanger. Drain by removing the zinc anode under the R. end. Also, remove the lower hose on the Sea water pump (be sure to replace) and the oil cooler on the L. side of the engine down by the oil pan. Consult your engine manual for specifics.

MC 311 SUPPLEMENT MC 311 - 7.4 NEW MODELS

1. OIL COOLER MOUNTED IN FRONT.

   A: USE THE LOWER HOLES IN THE STEEL BRACKET WHEN MOUNTING THE BRACKET ON THE ENGINE. (4-A).

   B: IGNORE 7-B. DISCARD 1-1/4" COPPER TUBE & 4" HOSE.

   C: YOU MAY HAVE TO LOOSEN THE BRACKET ON THE OIL COOLER AND PUSH THE OIL COOLER DOWN SLIGHTLY. CAREFULLY MEASURE THE HOSE COMING OUT OF THE TOP OF THE OIL COOLER TO THE SPUD ON THE HEAT EXCHANGER . CUT AND INSTALL.

2. 7-D, THE NEW MODELS DO NOT HAVE A 1" HOSE CONNECTED TO THE HIGH RISE, THEREFORE, YOU WILL HAVE TO REMOVE THE PLUGS AND INSTALL A 90° ADAPTER IN THE PORT HIGH RISE AND A STRAIGHT ADAPTER IN THE STARBOARD SIDE. CONNECT THE TEE WITH THE 1" HOSE PROVIDED TO THE TWO FITTINGS IN THE HIGH RISE. YOU SHOULD INSTALL THE FITTINGS IN THE HIGH RISE BEFORE REPLACING THE RISERS.

Detaljlista 4.3, 5.0-5.7 Alpha and Bravo MerCruiser

Detaljnummer	Antal	Beskrivning	
MC 313-0	1	Installationsmanual	
IMC 313-1	1	Heat Exchanger, SJE ID# located on top RH end.	Värmeväxlare, nr i övre högra änden
MC 313-2	1	Cross Over Tube	Korsande rör
MC313-3	1	Thermostat Assembly	Termostatenhet
IV1C 313^1	1	LH Hanging Bracket	Vänster hängfäste
MC 313-5	1	RH Hanging Bracket	Höger hängfäste
IMC 313-6	1	Expansion Tank	Expansionstank
MC 313-7	1	Expansion Tank Bracket	Expansionstankfäste
MC 313-3	1	Pressure Cap	Trycklock
		Hoses	***Slangar***
MC 313-9	1	1 1/2" 90° Elbow, Heat Exchanger to Thermostat Assembly	Slangkrök,värmeväxlare/termostat
MC 313-10	1	1" x 3", Heat Exchanger to Cross Over "T"	Värmeväxlare till T-stycke
MC 313-11	1	5/8" x 24", Fresh Water By-Pass	Färskvatten förbikoppling
MC 313-12	1	5/16° x 47", Expansion Tank Overflow	Expansionstank bräddavlopp
		Hose Clamps	***Slangklämmor***
MC 313-13	3	#68, Heat Exchanger to Brackets and Expansion Tank	Värmeväxlarfäste/Expansionstank
MC 313-14	2	#24, Heat Exchanger to Thermostat Assembly	Värmeväxlare till termostat
MC 313-15	2	#16, Heat Exchanger to Cross Over "T"	Värmeväxlare till korsande "T"
MC 313-16	2	#08, Fresh Water Bi-Pass	Färskvatten förbikoppling
MC 313-17	2	5/16" Spring Clamps, Expansion Tank Hose	Fjäderklämmor, Expansionstank
		Gaskets	***Packningar***
MC 313-16	1	Thermostat, SJE 023-4A	Termostat
		Fittings	***Kopplingar***
MC 313-19	2	1/2" x 5/8*. NPT to Hose, straight, Fresh Water Bi-Pass	Konisk till slang, rak, färskvatten förbi
		Bolts, Nuts and Washers	***Bultar, muttrar och brickor***
MC 313-20	2	3/8" X 7/8"	
MC 313-21	1	3/8" X 1 1/2"	
MC 313-22	1	3/8" Flat Washer	Plan bricka
MC 313-23	4	3/8" Lock Washer	Låsbricka
MC 313-24	1	3/8" NPT Zinc	Anode Zinkanod
MC 313-25	2	1/4" x 3/4"	
MC 313-26	2	1/4" Nuts	Muttrar
MC 313-27	2	1/4" Flat Washers	Plan bricka
MC 313-28	2	1/4" Lock Washers	Låsbricka

Skärmall för slang