

CRUSADER ENGINES

OWNERS Product Technical Specifications

PERFORMANCE TO MOVE YOU

Crusader Engines 2 YEAR/200 HOUR TRANSFERABLE LIMITED WARRANTY

Pleasurecraft Marine Engine Co., through its Crusader Engines Division ("Crusader Engines"), warrants its new products to be free from defects in material and workmanship under normal use and service conditions, to the first registered owner or registered user, as well as all subsequent users who, in accordance with Crusader Engines warranty transfer policy, have received within 30 days of a sale transaction involving the product a transfer of any remaining period of coverage under this warranty. The obligation of Crusader Engines under this warranty shall be limited to the repair or replacement with new or reconditioned components, at Crusader Engines option, of any product, or parts thereof, which have failed during the warranty period specified below and are demonstrated upon examination to have failed due to defective material and/or workmanship.

WARRANTY COVERAGE; TERM

This warranty is extended only to the first registered owner or registered user, as well as all subsequent users who, in accordance with Crusader Engines warranty transfer policy, have received within 30 days of a sale transaction involving the product a transfer of any remaining period of coverage under this warranty, as specified below.

All components, other than those itemized below and those components that are warranted by Crusader Engines suppliers, are warranted, solely for non-commercial use, for a period of 2 years or 200 hours of use, whichever first occurs, from the earlier of (1) the date of sale to the first registered owner or registered user, or (2) from the date the engine is first placed into service for demonstration or any other purpose prior to the sale of the engine to the first owner purchasing the engine at retail, as well as to all subsequent users who, in accordance with Crusader Engines warranty transfer policy, have received a transfer of any remaining portion of this warranty coverage within 30 days of any subsequent sale of the product. In the case of commercial use of the product, the term of this warranty shall be the shorter of (a) a period of 6 months from the date of sale to the first registered owner or registered user, or (b) the expiration of 200 hours of use.

Components not covered under this warranty:

- (1) Water pump impellers are not covered by this warranty.
- (2) Seals, gaskets, o-rings, and other materials affected by time are not covered by this warranty if their effectiveness is reduced by an extended storage period prior to sale or use of the product.
- (3) Items such as, but not limited to, lubricants, spark plugs and other items which are normally frequently replaced as part of routine maintenance.

NO OTHER WARRANTY GIVEN

The obligations set forth in the preceding paragraphs are Crusader Engines sole obligation and the owner's exclusive remedy. Crusader Engines makes no other express warranty. Any implied warranty of merchantability or fitness for a particular purpose that may be applicable to this product is limited in duration to the duration of this warranty. Some States do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

No distributor, dealer, agent or employee of Crusader Engines is authorized to grant any other or further warranty or incur any additional warranty obligation on Crusader Engines behalf in connection with the sale of its products. Any qualification or restriction contained herein which is prohibited by any law of mandatory application shall be deemed to be deleted from this warranty; however, such deletion shall have no effect on the remaining provisions hereof, all of which shall remain in full force and effect.

REMEDIES

The obligation of Crusader Engines set forth in the first paragraph of this warranty shall be the exclusive remedy for any breach of warranty hereunder, and any owner or user's sole remedy in the event of breach of the warranties is repair or replacement of the product or any warranted part thereof as set forth in this warranty: with this sole exception, Crusader Engines shall not be liable for any direct or indirect, incidental or consequential damages, including without limitation, any damages for property damage, loss of use or loss of profits, loss of income, inconvenience, trailering, towing, haul out, launch and/or any other in and out of water expenses, storage charges, dockage charges, expenses to deliver or pick up the product being warranted to and from the dealer, telephone expenses, lodging expenses, travel expenses, mechanic travel time and mileage, damage caused by any occurrence of an insurable nature, rental of substitute equipment of any type, removal and replacement and/or modification of any boat parts to facilitate repairs, moving of furniture, carpets, cleaning, painting, carpenter work, or re-delivery charges. Some States do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Any owner or user hereby waives for himself/herself/itself and his/her/its successor and assigns (a) any and all claims for punitive damages, and (b) all claims of negligence or strict liability or both. In no event will Crusader Engines liability exceed the purchase price of the product(s) which is actually paid to Crusader Engines.

OBTAINING PERFORMANCE UNDER WARRANTY

Crusader Engines warranty registration form should be prepared by your selling dealer, executed by you and the dealer, and mailed by you to Crusader Engines within 30 days after the date of your purchase of the product. Upon receipt of the warranty registration form, Crusader Engines will issue to you a personalized owner's registration card which will be mailed directly to you. If the owner's registration card is not received within 8 weeks after the date of purchase, please write to Crusader Engines at the address set forth below.

At the time that a claim for warranty service is made, the owner's registration card should be presented to the person or entity providing warranty service. Authorized Crusader Engines dealers or distributors are entitled to be reimbursed by Crusader Engines for some or all of the expense of warranty repairs; thus, service under the terms of this warranty will be performed by an authorized Crusader Engines dealer or distributor without charge for established flat rate labor or replacement parts, other than items not covered by the warranty, such as, but not limited to, water pump impellers, seals, gaskets, o-rings and other materials affected by time if their effectiveness is reduced by an extended storage period prior to sale or use of the product, and lubricants, spark plugs and other items which are normally frequently replaced as part of routine maintenance. Charges for additional non-warranty work and/or additional dealer charges for labor relative to warranty work in excess of flat rate must be paid for by the owner.

Prior authorization in writing must be obtained from Crusader Engines for any warranty repairs over \$50.00 and in all cases where the owner fails to establish the purchase and warranty expiration dates with the owner's registration card sent upon receipt of the warranty registration form by Crusader Engines. While failure to present the owner's registration card will not prevent you from obtaining coverage hereunder, this warranty shall not be effective and, therefore, cannot be honored until the product purchase date can be confirmed by Crusader Engines. If the card is lost, communicate with Crusader Engines at the address listed below, and, for a processing fee of \$10.00, a new owner's registration card will be issued to you.

Any questions concerning service, parts or this warranty should be directed to your selling dealer. If your dealer is unable to assist or if you relocate or are travelling or need a referral to your nearest dealer contact: Pleasurecraft Marine Engine Co., P.O. Drawer 369, Little Mountain, SC 29075 ((803) 345-0050).

FAILURES EXCLUDED FROM WARRANTY

This warranty will not apply to any failure which results from accidents, sinking, fire, neglect, abuse or abnormal service or use, such as racing, towing or operation in water of insufficient depth, or to any failure resulting from improper installation, improper adjustments, repairs or improper delivery service, or to any failure resulting from the use of parts, fuels, oils or lubricants not suitable for use with the product and/or materials or parts not approved by Crusader Engines. This warranty does not apply to any engine or drive which has been modified, or altered, or repaired in such a manner as, in the opinion of Crusader Engines, to affect its stability, reliability or performance. Further, this warranty will not apply to product failure resulting from (1) use of non-recommended lubricants or fuels, (2) failure to follow maintenance or lubrication schedules, (3) failure caused or contributed to by improper or contaminated fuel, (4) failure caused by water intrusion, salt corrosion to external components, or improper installation or misapplication of the engine or drive, (5) the owner's or operator's failure to exercise due or normal care and precaution, (6) failure of components and/or assemblies that are warranted by Crusader Engines suppliers, and (7) damage resulting from the owner's or operator's failure to timely replace failed water pump impellers, seals, gaskets and o-rings.

OWNER'S RESPONSIBILITY

Performance under this warranty shall be conditioned upon the first registered owner's or registered user's compliance with the following requirements:

- (1) Owner or user shall verify that the pre-delivery service has been performed, all requested information recorded and that the selling dealer has signed the warranty registration.
- (2) Owner or user shall promptly mail the warranty registration to Crusader Engines after accepting delivery.
- (3) Owner or user shall follow the instructions in the owner's manual regarding operation, break-in, lubrication and fuel.
- (4) Owner or user shall follow or comply with the maintenance schedule, operation limits, and lay up instruction, as outlined in the owner's manual.

CHOICE OF LAW

This limited warranty shall be governed by, and construed and interpreted in accordance with, the local laws of the State of Ohio (without application of its conflicts of laws principles), except only to the extent replaced or precluded by other law of mandatory application.

GENERAL

This warranty gives you specific legal rights, and you may also have other rights which vary from State to State.

The Crusader Engines Federal/California Emissions Warranty and Federal/California Emissions Control Warranty Statement are separate documents included in the owner's manual. Any questions concerning the Emissions Warranty can be obtained by calling (803) 345-0050.

Crusader Engines policy is one of continued improvement of its products, and Crusader Engines hereby reserves the right to improve and change the design and production of any of its products without assuming any obligation to modify products previously manufactured and/or sold.

CRUSADER ENGINES WARRANTY TRANSFER APPLICATION

The remainder of the warranty coverage period of the original Crusader Engines ("Crusader") limited warranty is transferable within thirty (30) days of date of sale by the original owner/user to a subsequent purchaser for the remainder of the unused portion of the original warranty coverage period, or the remainder of 200 hours of use, whichever first occurs. The original date of sale or original in-service date (whichever comes first) begins the warranty coverage period. For commercial use such as, but not limited to, use of the product by ski schools, for promotional use, for athletes' boats, for rentals, etc., the warranty coverage period starts from the earlier of (1) the date in which the engine is first registered, or (2) within 30 days from the date the boat was manufactured.

Direct Sale by Authorized Crusader Marine Dealer:

If the sale is conducted through an authorized Challenger Marine dealer, the dealer must complete and submit the Crusader Engines Warranty Transfer Application, the required engine photographs, Diacom recording and warranty transfer fee. The warranty transfer application will be processed based on the approval of Crusader. This inspection will be at the seller or purchaser's expense.

Sale by Private Individual / Non-Authorized Dealer:

If the sale is conducted between private individuals, or between a private individual and an unauthorized Crusader Engines dealer, the engine/drivetrain must be inspected by an authorized Crusader Engines dealer. This inspection will be at the seller or purchaser's expense. The dealer must complete and submit the Warranty Transfer Application, the required engine photographs, Diacom recording and warranty transfer fee. The warranty transfer will be processed based on the approval of Crusader.

The fee for warranty transfer is \$400. The transfer fee (via certified check) and Warranty Transfer Application must be submitted to Crusader within 30 days of date of sale to:

Pleasurecraft Engine Group
P.O. Drawer 369
Little Mountain, S.C., 29075

- The new owner will be notified within 10 days of Crusader's receipt of the Warranty Transfer Application form regarding whether the transfer has been approved by Crusader. If the transfer is approved, the warranty expiration date will be provided.
- A Warranty Registration Card will be issued to the second owner, reflecting the change has been made in Crusader's computer.

OUTSIDE THE U.S. AND CANADA, CONTACT YOUR LOCAL PLEASURECRAFT DEALER OR CRUSADER WARRANTY SERVICES AT (803) 345-0050 FOR MORE INFORMATION ON HOW TO APPLY FOR A WARRANTY TRANSFER.

IMPORTANT! PURCHASER NOTICE: The inspection below is designed to insure safety and satisfaction. Therefore, we require the following inspection to be performed at your expense, by an authorized Challenger technician, prior to purchase. By signing below, the technician certifies that he/she has checked the installation and operation of the engine and finds it to be performing properly. All terms in the Limited Warranty located in the Engine Owner's Manual still apply.

ENGINE MODEL: _____

ENGINE SERIAL: _____

TRANS. SERIAL: _____

ENGINE HOURS: _____

HULL SERIAL #: _____

BOAT MANUFACTURED DATE: _____

INSPECTION DATE: _____

Warranty Transfer Inspection

- | | | |
|---|---|---|
| <input type="checkbox"/> Check for Bulletins

<input type="checkbox"/> Engine Oil: Check
<input type="checkbox"/> VDrive Lube: Check

<input type="checkbox"/> Transmission Fluid: Check
<input type="checkbox"/> Propshaft Alignment
<input type="checkbox"/> Battery Rating, Charge, and Level: Check
<input type="checkbox"/> Diacom Recording:
Ignition ON, Engine OFF Recording
(submit with application) | <input type="checkbox"/> Trouble Codes Checked
Trouble Codes Cleared

<input type="checkbox"/> All Fuel Lines: Confirm No Leaks
<input type="checkbox"/> All Oil Lines: Confirm No Leaks

<input type="checkbox"/> All Water Lines: Confirm No Leaks
<input type="checkbox"/> All Drain Plugs: Confirm
Proper Installation

<input type="checkbox"/> (3) Engine Photos:
Include engine top, port and starboard (photos must be clear and in good light) | <input type="checkbox"/> Belt and Pulley: Inspect for Damage

<input type="checkbox"/> Exhaust Hoses/Clamps: Inspect
<input type="checkbox"/> Record Propeller Size and Rotation
Diameter _____ Pitch _____ Rotation _____

<input type="checkbox"/> Engine Compression
Cylinder 1 _____ Cylinder 2 _____
Cylinder 3 _____ Cylinder 4 _____
Cylinder 5 _____ Cylinder 6 _____
Cylinder 7 _____ Cylinder 8 _____ |
|---|---|---|

I hereby certify the warranty transfer inspection on engine S/N _____ and have corrected any abnormality revealed by this inspection.

(Technician signature, Dealer & Date)

(Seller's Signature and Date)

(Purchaser's Signature and Date)

DATE OF SALE (2ND Owner) ____/____/____

DATE OF SALE (1st Owner/1st Operator) ____/____/____

(New Owner)

(Previous Owner)

NAME: _____

NAME: _____

ADDRESS: _____

ADDRESS: _____

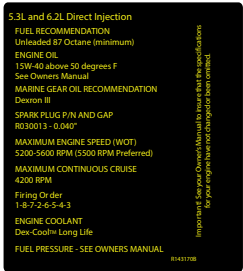
CITY, STATE, ZIP: _____

CITY, STATE, ZIP: _____

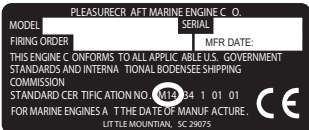
EMAIL ADDRESS: _____

☐ By checking this box, you are authorizing Crusader to send the email address to receive emails whenever a product bulletin or safety recall affects this product.

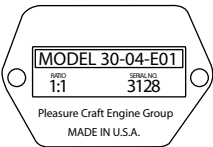
Engine Serial Number and Specification Decal Locations



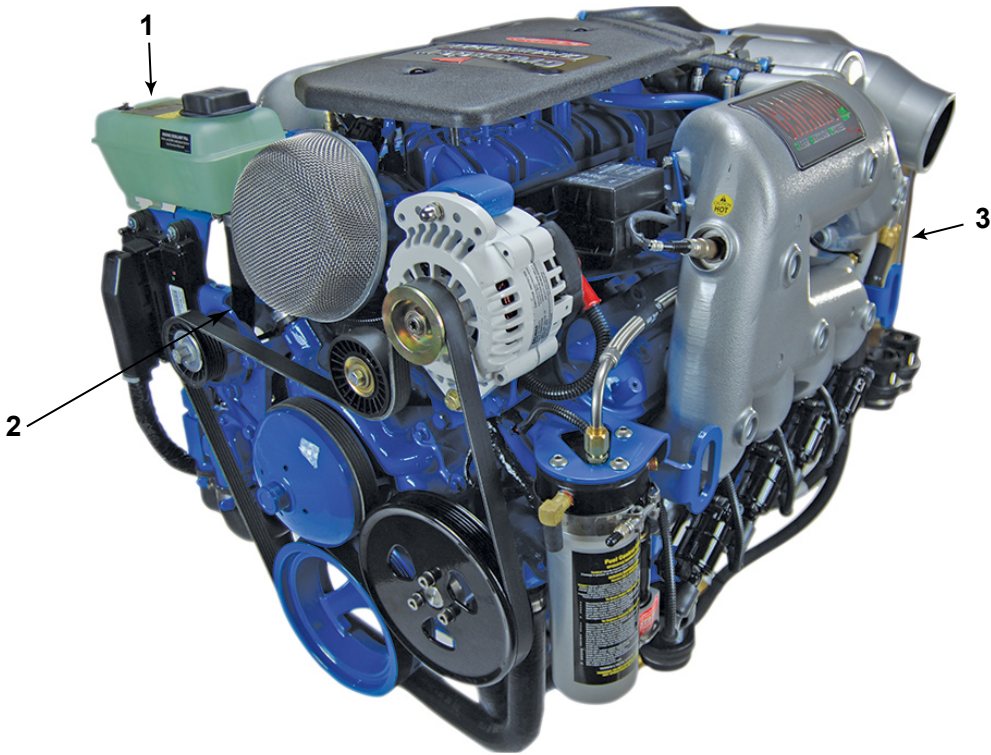
1. ENGINE SPECIFICATION DECAL



2. ENGINE IDENTIFICATION DECAL



3. TRANSMISSION IDENTIFICATION PLATE



ENGINE RPM CHART

Model	Minimum Full Load	Preferred	Maximum
6.0L CES	5400	5500	5600

IMPORTANT

Your new Pleasurecraft Marine engine incorporates an RPM “MAX GOVERNOR” in order to prevent the engine from over-revving. Operation above the Maximum RPM is not recommended. If your engine is operating above the maximum RPM listed, a higher pitched propeller would be required to lower the engine maximum RPM to the Preferred RPM.

CAUTION

Prolonged WOT operation will shorten the life of your engine and could cause premature engine failure. Problems caused by prolonged WOT operation are considered abuse and are not covered under the Pleasurecraft Marine Warranty.

ENGINE FLUID CAPACITIES

Model	ALL MODELS
Crankcase Oil Capacity W / NEW FILTER	Start with 4 Quarts (4.5 L) ¹
Fresh Water Cooling System Capacity	Fill Until Completely Purged ³

TRANSMISSION FLUID CAPACITIES

Model	All Models	Type
Velvet Drive, 1:1 Ratio ^{1,2}	2.5 Quarts (2.37 L)	DEXRON III
Velvet Drive, 1:52 - 2.91:1 Ratio ^{1,2}	3.5 Quarts (3.31 L)	DEXRON III
Velvet Drive, V-Drive (exc. 5000), All Ratios ^{1,2}	4.5 Quarts (4.26 L)	DEXRON III
Velvet Drive 5000 (exc. V-Drive), All Ratios ^{1,2}	3.0 Quarts (2.37 L)	DEXRON III
Velvet Drive 5000 V-Drive, All Ratios ^{1,2}	4.5 - 5.0 Quarts (4.26 - 4.73 L)	DEXRON III
Hurth (Exc. V-Drive), All Ratios ^{1,2}	4.0 Quarts (3.79 L)	DEXRON III
Hurth V-Drive, All Ratios ^{1,2}	4.5 - 5.0 Quarts (4.26 - 4.73 L)	DEXRON III
Walters RV-36D V-Drive	1.5 Quarts (1.42 L)	SAE 30

- 1 - **Capacities are dependent on installation angle. ALWAYS** use the dipstick to determine the exact quantity of oil required. Add the correct amount of oil to fill to the "FULL" mark on the oil level dipstick. If you are unsure of the correct amount of oil to use during a service interval, perform the following procedure:
1. Drain the oil and change the oil filter.
 2. Add four (4) quarts of new oil.
 3. Start and run the engine allowing sufficient time for the new oil to circulate and fill the new oil filter.
 4. Shut the engine off. Allow a sufficient amount of time for the oil to drain back to the pan. Check the oil level with the dipstick and add the correct amount of oil to fill to the "FULL" mark on the oil level dipstick.
- 2 - Check the transmission fluid level at operating temperature and immediately after shutdown of the engine.
- 3 - Fresh Water Cooling systems vary depending on half-systems, full-fresh systems, heaters, hose lengths, etc. System should be completely purged of air and the coolant level should be within the MIN/MAX level of the degas bottle after the engine has been ran at operating temperature and the system is allowed to cool down overnight. Top off as necessary.

MASTER ENGINE SPECIFICATIONS

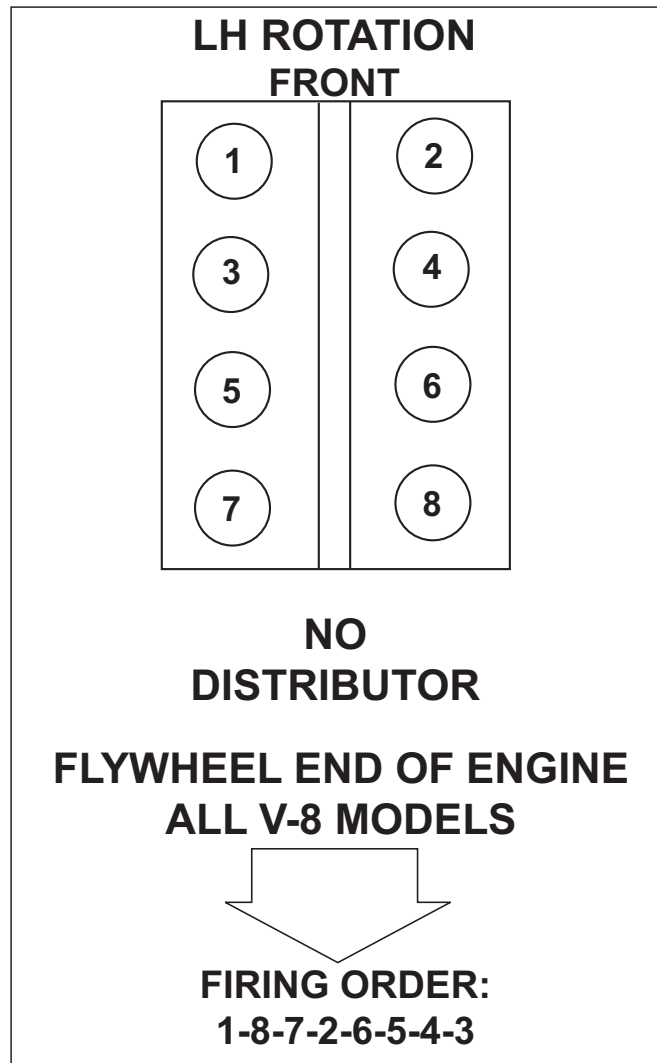
MODEL	MP 6.0L CES
Displacement	6.0L (366 CID)
Bore	4.0007 in. (101.618 mm)
Stroke	3.622 in. (92.0 mm)
Compression Ratio	9.67:1
Compression Pressure	130 - 215 psi
WOT Operating RPM Preferred WOT RPM	5400 - 5600 (**5600) 5500
Cruising RPM (Max)	4200
Idle RPM (In Gear)	650 (Not Adjustable)
Oil Pressure @ 2000 RPM	25 - 80 psi (172 - 552 kPa)
Minimum Oil Pressure	6 psi (41.3 kPa) at Idle
Spark Plug P/N Spark Plug Gap	R030011 0.040 in.
Firing Order	1-8-7-2-6-5-4-3 (LH)
Thermostat	FWC 170°F (76.7°C)
Over-Temperature	200° F (93.3° C)
Electrical System	12 Volt Negative (-) Ground
Alternator Rating	70 / 100 Amps
Ignition Timing	Not Adjustable
CAM Retard	Not Adjustable
Battery Rating	650 CCA (Minimum) 120 Ah

MODEL	MP 6.0L CES
Fuel Pressure FCC	59-62 psi @ WOT
Fuel Pressure - FCC Returnless Fuel System w/mounted LPFP	66-69 psi @ WOT
Fuel Pressure mounted LPFP	7 - 9 psi (WOT)

MODEL	MP 6.0L CES
Coolant Over-Temperature Sensor	200°F DTC 116/217 Check Gauges Lamp and Buzzer Engine Derates
Exhaust Manifold Water Temperature Sensors (CES Applications ONLY)	240°F DTC 1415/1416/ 1417/1418 Check Gauges Lamp and Buzzer Engine Derates
Transmission Over-Temperature Switch	235° F ± 10° F DTC 1542 Check Gauges Lamp
Low Oil Pressure Sensor	< 5 psi @ idle / < 24 psi @ 4000 M.I.L. - DTC 524 Check Gauges Lamp and Buzzer

NOTE: FOR NEW BOAT PROPPING, IT IS RECOMMENDED THAT OEMS PROP TO THE MAXIMUM RPM LISTED.

IMPORTANT: FUEL PRESSURE VALIDATION MUST BE MADE WITH THE ENGINE UNDER LOAD.



TUNE-UP SPECIFICATIONS

Model	6.0LCES
Spark Plug Type	R030011
Spark Plug Gap	0.040 in. (1.02 mm)
Ignition Timing	Fixed, Not Adjustable
Firing Order	1-8-7-2-6-5-4-3 (LH Rotation)
CAM Retard	Not Adjustable

ACCESSORY DRIVE BELT

Challenger engines use a single serpentine belt to drive the engine water circulation pump, sea-water pump and the alternator.



WARNING

Engine must be shut OFF and the ignition key removed before inspecting the drive belt(s). The drive belt(s) should be checked periodically for condition and tension. If the belt(s) shows signs of cracking, glazing or deterioration, replace with new belt(s).

DRIVE BELT INSPECTION

Inspect the drive belt for excessive wear, shredding or missing sections.

Inspect the drive belt for contamination from excessive dirt, oil, coolant or other substances that may effect the drive belt operation.

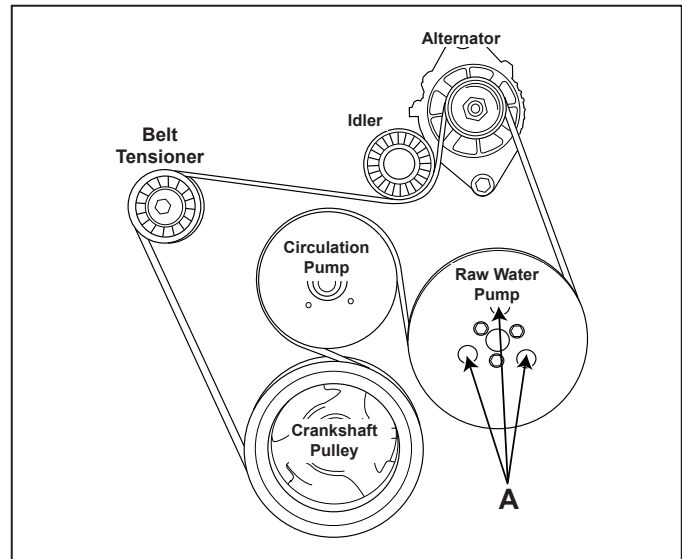
If a problem is found, replace the belt after inspecting the following items:

- All pulleys and tensioners for signs of misalignment
- All pulleys and tensioners for signs of rust or other damage
- Bent pulleys or tight bearings in the engine water circulation pump, sea-water pump and alternator

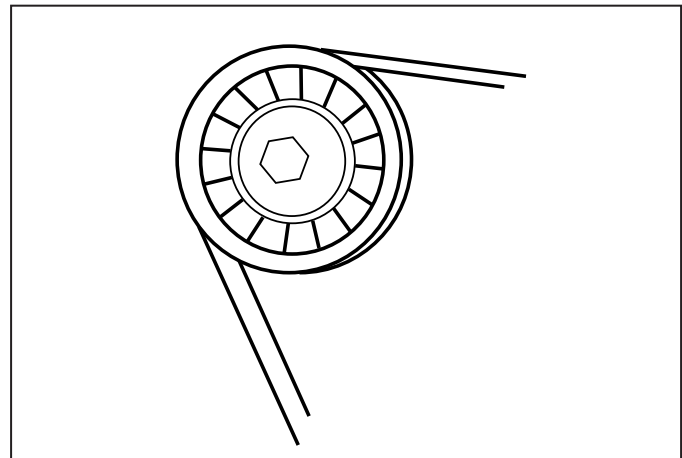
DRIVE BELT REPLACEMENT

6.0L CES BELT #: R066033

1. Note the routing of the belt before removing.
2. Using a 15 mm box wrench or socket, turn the belt tensioner to relieve the tension on the belt. Slide the belt off of the pulleys. **Release the tensioner slowly to prevent the tensioner from snapping against its stop, and possibly causing damage to the tensioner.**
3. Slide the new belt onto the pulleys using the same routing as noted prior to removal.
4. Compress the belt tensioner, and slide the belt over the tensioner pulley. Release the tension slowly to tension the belt.



6.0L Accessory Drive Belt Configuration



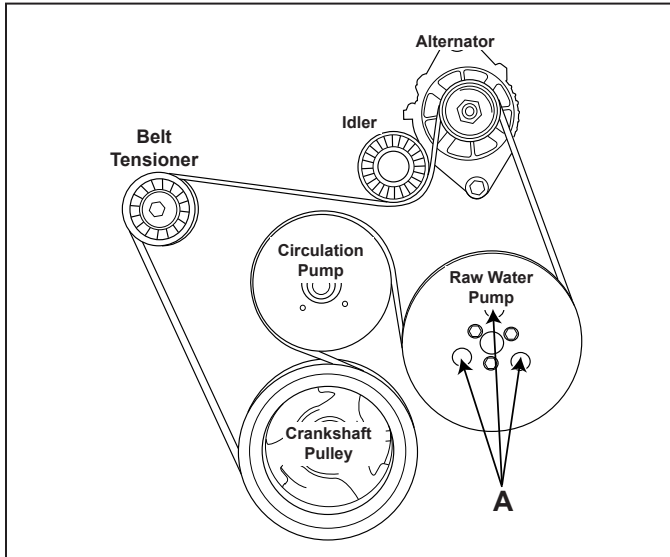
6.0L Belt Tensioner

SERVICING RAW WATER PUMP IMPELLER**IMPELLER KIT #: RP061022**

The raw water pump impeller should be serviced every 50 hours, or once a year, whichever occurs first. See Maintenance Schedule.

Locations "A" are access holes in order to loosen the raw water pump attaching bolts. The bolts are secured in the pump by O-rings, and will not fall out during removal.

Torque the raw water pump housing attaching bolts to 8.5-9 ft.lbs. (11.5-12 N-M), when re-installing the impeller.



Raw Water Pump Impeller Bolt Locations "A"

**FILLING FRESH-WATER COOLING SYSTEM
(6.0L CES Full-Fresh Applications)**

Cooling System Fill Procedure

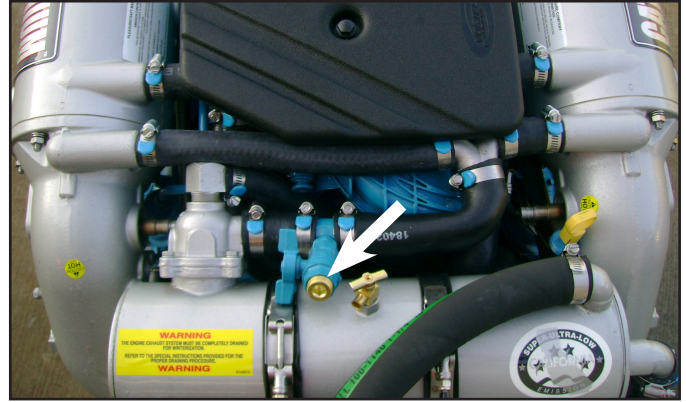
NOTE: This procedure **MUST** be completed on a cold engine and the engine not running.

Port Engine (No Water Heater Connections)

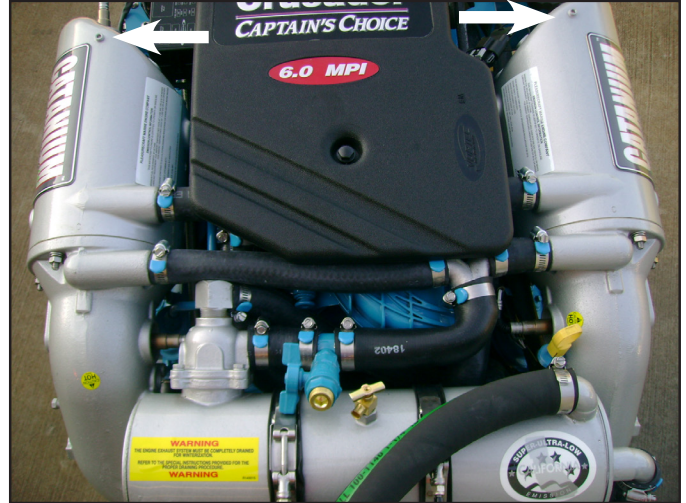
1. There are three venting points on the system. Open the valve on the Heat Exchanger. Ensure that the bleed hose is routed straight down to a low point into an approved container.



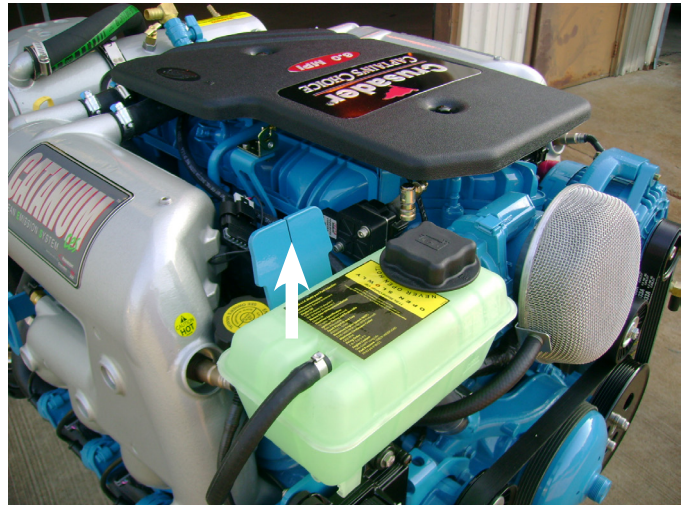
2. Remove the pipe plug from bottom of ball valve near the thermostat housing on the Heat Exchanger.
3. Open the Ball Valve.



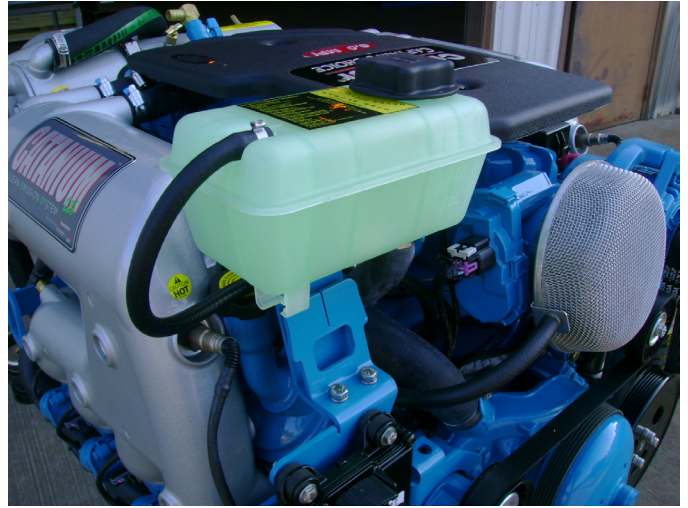
4. Remove the vent plug on the top of each exhaust manifold.



5. Position the Degas Bottle on the high bracket location for filling. The filling point must be higher than the venting points.
6. Add coolant to the degas bottle until the coolant level is at the top of the degas bottle.
7. Continue to add coolant to the degas bottle as needed until the coolant is observed escaping from the vent locations. The engine should vent coolant from the Heat Exchanger Port first.
NOTE: Once coolant without air is observed at this location, the valve can be closed.
8. The engine will vent coolant from the Ball Valve second.
NOTE: Once coolant without air is observed at this location, the ball valve can be closed.
9. The engine will vent coolant from the top of the exhaust manifolds last.
NOTE: Once coolant without air is observed at these locations, the vent plugs can be installed.
10. The coolant level in the degas bottle should be on the Full mark. If excess coolant is in the degas bottle, remove until the level is at the Full mark.



Low Bracket Location

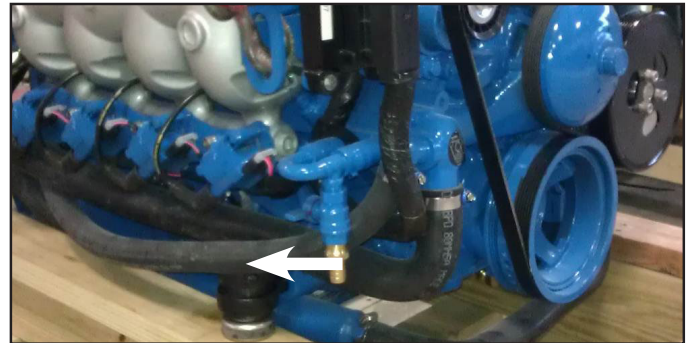
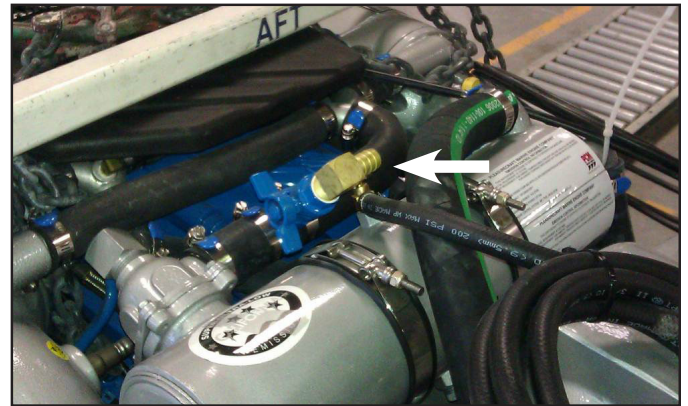


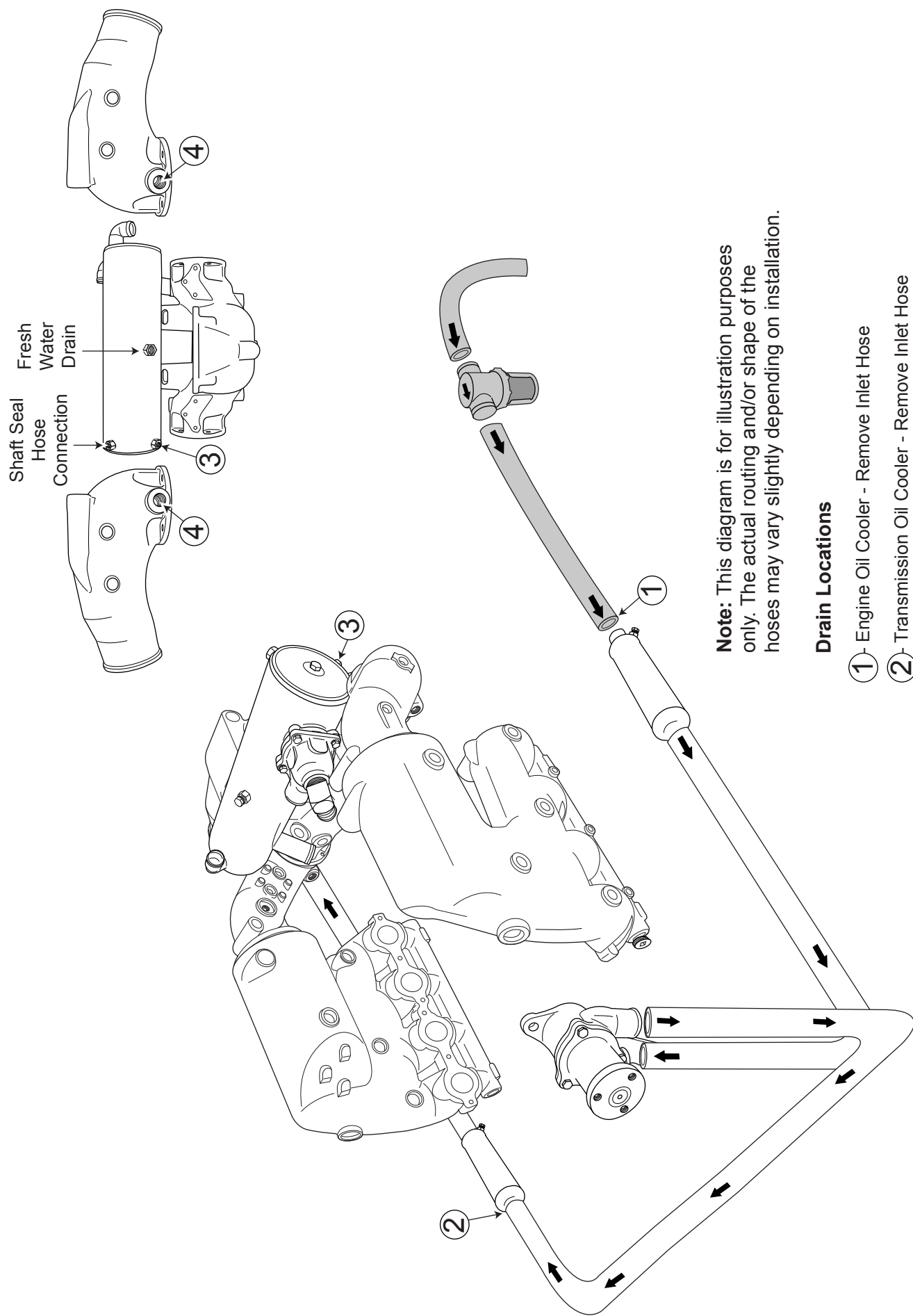
High Bracket Location (Filling Location)

Hot Water Heater Connections

NOTE: The engine **MUST** be filled and purged of air prior to water heater hoses being connected to the engine. If the system is not filled properly, the engine will run hot.

1. Close the Ball Valve near the thermostat housing on the Heat Exchanger. Remove the hose going to water heater (hose not shown in photo).
NOTE: Keep hose high or plugged to keep coolant from leaking out.
2. Close the Ball Valve on the U-Tube located on the front, right side of engine. Remove the hose going to water heater.
NOTE: Keep hose high or plugged to keep coolant from leaking out.
3. Follow the Cooling System Fill Procedure previously outlined for the Port Engine
4. The engine has now been completely filled with coolant. The water heater circuit **MUST** also be completely filled prior to connecting hoses back to the engine.
5. Using a funnel, fill the heater hoses and heater circuit completely. Make sure there are no loops or air pockets in the hoses.
6. When the hoses and heater circuit are completely filled, properly attach the hoses back to the engine. Open both Ball Valves.





Note: This diagram is for illustration purposes only. The actual routing and/or shape of the hoses may vary slightly depending on installation.

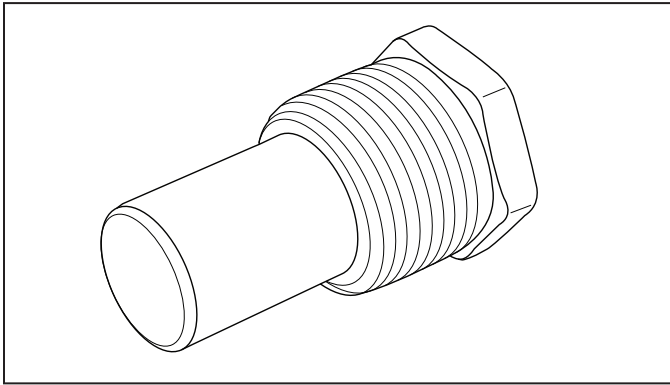
Drain Locations

- ①- Engine Oil Cooler - Remove Inlet Hose
- ②- Transmission Oil Cooler - Remove Inlet Hose
- ③- Heat Exchanger - Remove Drain Plug/Zinc Anode
- ④- Exhaust Elbow - Remove Drain Plug/Zinc Anode

COOLING SYSTEM SACRIFICIAL ANODES

Located in the raw water side of the cooling system are sacrificial anodes which are marked by a decal. To check, remove the anode and visually check the condition of the rod. The length of the anode rod when new is approximately 1.5 inches. If more than one half of the anode is gone, replace with a new sacrificial anode.

Different geographic locations and water make-up can result in either high or low sacrificial requirements. A high rate of sacrificial anode consumption should also alert the owner to a possibility of an improperly wired boat accessory, which would require complete checking by qualified service personnel.



Sacrificial Anode

SACRIFICIAL ANODE LOCATIONS

Closed Cooling Applications

- One anode is in the rear of each exhaust manifold.
- One anode is in the heat exchanger raw water drain location.
- One anode is in each of the exhaust corners for raw water drain.

